Nitsch Engineering

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Boston, MA 02108-1928
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www.nitscheng.com

April 18, 2022

Mr. Nicholas Moreno
City of Boston Conservation Commission
Boston City Hall
One City Hall Square, Room 709
Boston, MA 02201

RE: MassDOT Project# 608807
Cypher Street
Notice of Intent
Boston, MA

Dear Mr. Moreno:

On behalf of the Applicant, the Massachusetts Department of Transportation (MassDOT), Nitsch Engineering, Inc. is filing the enclosed Notice of Intent (NOI) with the Boston Conservation Commission for the proposed construction improvements on Cypher Street in the City of Boston, MA. A Stormwater Report has been created and is included with this submission.

The Project site is located at the roadways of Cypher Street, Richards Street, E Street and Fargo Street, in Boston, Massachusetts. The Project consists of the extension of Cypher Street from D Street to E Street, with an intersection where this extension and E Street meet, creating an alternative heavy vehicle route that avoids using D Street and Summer Street west of Fargo Street. E Street is mainly of industrial use and is more suitable for heavy vehicle trips than D Street. The improvements will comply with current MassDOT and City of Boston roadway design standards regarding multimodal accommodations.

The site is located within the Land Subject to Coastal Storm Flowage designation.

MassDOT is not subject to local by-laws and local filing fees. However, the City of Boston Notice of Intent Application form has been included to help process the NOI filing. Per the Wetlands Protection Act, abutter notification is not required for projects proposed by the MassDOT Highway Division (310 CMR 10.05(4)(a)). There are no impacts to local by-law resource areas defined as part of this project.

MassDOT requests that the Boston Conservation Commission issue an Order of Conditions approving the project as proposed.

Please call with any questions at 857-206-8744.

Very truly yours,

Nitsch Engineering, Inc.

Stephen Farr, PE, ENV SP, LEED GA
Senior Project Manager
SF/mjs

Enclosures: Notice of Intent, Stormwater Report

Cc: L. Cash, MassDOT Project Management
M. Lenker, MassDOT Environmental Services
File

P:\9720.17 Cypher St Bos\Transportation\Project Data\NOI\Cover Letter.doc

Nitsch Engineering

April 15, 2022

NOTICE OF INTENT

Under the *Wetlands Protection Act* (M.G.L. c. 131, §40
and their Regulations (310 CMR 10.00)

For

ROADWAY RECONSTRUCTION
RICHARDS STREET, CYPHER STREET,
E STREET AND FARGO STREET
Boston, MA 02108

Prepared for:

Massachusetts Department of Transportation
10 Park Plaza #4160
Boston, MA 02116

Prepared by:

NITSCH ENGINEERING, INC.
2 Center Plaza, Suite 430
Boston, MA 02108

Nitsch Project #9720.17
MassDOT PFN 608807

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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

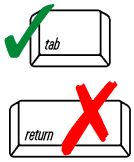
Provided by MassDEP:

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):

Richards St, S Boston Bypass Cypher St, D St, E St, and Fargo St

Boston (b. City/Town) | 02108 (c. Zip Code)

Latitude and Longitude: 42.344 (d. Latitude) | -71.051 (e. Longitude)

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

2. Applicant:

Melissa (a. First Name) | Lenker (b. Last Name)

Massachusetts Department of Transportation - Highway Division
c. Organization

10 Park Plaza Environmental Services
d. Street Address

Boston (e. City/Town) | MA (f. State) | 02116 (g. Zip Code)

(978)429-1772 (h. Phone Number) | i. Fax Number | melissa.lenker@state.ma.us (j. Email Address)

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

a. First Name | b. Last Name

Massachusetts Department of Transportation - Highway Division
c. Organization

10 Park Plaza
d. Street Address

Boston (e. City/Town) | MA (f. State) | 02116 (g. Zip Code)

h. Phone Number | i. Fax Number | j. Email address

4. Representative (if any):

Stephen (a. First Name) | Farr (b. Last Name)

Nitsch Engineering
c. Company

2 Center Plaza, Suite 430
d. Street Address

Boston (e. City/Town) | MA (f. State) | 02108 (g. Zip Code)

857-206-8744 (h. Phone Number) | i. Fax Number | sfarr@nitscheng.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)

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A. General Information (continued)

6. General Project Description:

SEE PROJECT NARRATIVE

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)

Minor roadway widening and reconstruction of existing roadways to improve safety (10.24 (7)(c))

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)

c. Book

d. Page Number

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

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

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

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

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

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

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

f. ☐ Riverfront Area

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

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☐ 200 ft. - All other projects

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

4. Proposed alteration of the Riverfront Area:

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

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

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

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

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

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

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

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

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☒ Land Subject to Coastal Storm Flowage	125,840 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

   MassGIS 2021
   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.

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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).

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Provided by MassDEP:

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Boston
City/Town

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.

Cypher Street Reconstruction
a. Plan Title

Nitsch Engineering
b. Prepared By

Stephen Farr
c. Signed and Stamped by

11/30/2021
d. Final Revision Date

1" = 20'
e. Scale

Stormwater Report
f. Additional Plan or Document Title

11/30/2021
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:

56071
2. Municipal Check Number

9/2/2021
3. Check date

56072
4. State Check Number

9/2/2021
5. Check date

NITSCH ENGINEERING
6. Payor name on check: First Name

7. Payor name on check: Last Name

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F. Signatures and Submittal Requirements

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

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

Melissa Lenker	April 13, 2022
1. Signature of Applicant	2. Date
3. Signature of Property Owner (if different)	4. Date
Steve Fan	April 7, 2022
5. Signature of Representative (if any)	6. Date

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

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

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

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

Massachusetts Department of Environmental Protection
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NOI Wetland Fee Transmittal Form

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

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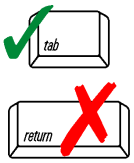

A. Applicant Information

1. Location of Project:

Richards St, S Boston Bypass, Cypher St, D St, E St and Fargo St	Boston
a. Check number: N/A	b. City/Town
c. Fee amount: $1,050	d.

2. Applicant Mailing Address:

Melissa	Lenker	
a. First Name	b. Last Name	
Massachusetts Department of Transportation - Highway Division		
c. Organization		
10 Park Plaza, Environmental Services		
d. Mailing Address		
Boston	MA	02116
e. City/Town	f. State	g. Zip Code
(978)429-1772		melissa.lenker@state.ma.us
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name	b. Last Name	
Massachusetts Department of Transportation - Highway Division		
c. Organization		
10 Park Plaza		
d. Mailing Address		
Boston	MA	02116
e. City/Town	f. State	g. Zip Code
h. Phone Number	i. Fax Number	j. Email Address

B. Fees

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

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

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

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

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

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

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

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

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NOI Wetland Fee Transmittal Form

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
3 - Roadway Reconstruction	1	3	$1,050

Step 5/Total Project Fee: $1,050

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.)

INSTRUCTIONS FOR COMPLETING APPLICATION NOTICE OF INTENT – BOSTON NOI FORM

The Boston Notice of Intent Form is intended to be a supplement to the WPA Form 3 detailing impacts to locally designated wetland resource areas and buffer zones. Please read these instructions for assistance in completing the Notice of Intent application form. These instructions cover certain items on the Notice of Intent form that are not self-explanatory.

INSTRUCTIONS TO SECTION B: BUFFER ZONE AND RESOURCE AREA IMPACTS

Item 1. Buffer Zone Only. If you check the Buffer Zone Only box in this section you are indicating that the project is entirely in the Buffer Zone to a resource area ***under both*** the Wetlands Protection Act and Boston Wetlands Ordinance. If so, skip the remainder of Section B and go directly to Section C. Do not check this box if the project is within the Waterfront Area.

Item 2. The ***boundaries of coastal resource areas*** specific to the Ordinance can be found in Section II of the Boston Wetlands Regulations. You must also include the size of the proposed alterations (and proposed replacement areas) in each resource area.

Item 3. The ***boundaries of inland resource areas*** specific to the Ordinance can be found in Section II of the Boston Wetlands Regulations. You must also include the size of the proposed alterations (and proposed replacement areas) in each resource area.

INSTRUCTIONS TO SECTION C: OTHER APPLICABLE STANDARDS AND REQUIREMENTS

Item 1. Rare Wetland Wildlife Habitat. Except for Designated Port Areas, no work (including work in the Buffer Zone) may be permitted in any resource area that would have adverse effects on the habitat of rare, "state-listed" vertebrate or invertebrate animal species.

The most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife is published by the Natural Heritage and Endangered Species Program (NHESP). See: http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm or the *Massachusetts Natural Heritage Atlas*.

If any portion of the proposed project is located within Estimated Habitat, the applicant must send the Natural Heritage Program, at the following address, a copy of the Notice of Intent by certified mail or priority mail (or otherwise sent in a manner that guarantees delivery within two days), no later than the date of the filing of the Notice of Intent with the Conservation Commission.

Evidence of mailing to the Natural Heritage Program (such as Certified Mail Receipt or Certificate of Mailing for Priority Mail) must be submitted to the Conservation Commission along with the Notice of Intent.

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581-3336
508.792.7270

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

Roadway Reconstruction Richards Street, Cypher Street, E Street and Fargo Street	Boston	02108
a. Street Address	b. City/Town	c. Zip Code
f. Assessors Map/Plat Number	g. Parcel /Lot Number	

2. Applicant

Melissa	Lenker	Massachusetts Department of Transportation - Highway Division
a. First Name	b. Last Name	c. Company

10 Park Plaza Environmental Services
d. Mailing Address

Boston	MA	02116
e. City/Town	f. State	g. Zip Code

(978)429-1772		melissa.lenker@state.ma.us
h. Phone Number	i. Fax Number	j. Email address

3. Property Owner

		Massachusetts Department of Transportation - Highway Division
a. First Name	b. Last Name	c. Company

10 Park Plaza
d. Mailing Address

Boston	MA	02116
e. City/Town	f. State	g. Zip Code

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)

Stephen	Farr	Nitsch Engineering
a. First Name	b. Last Name	c. Company

2 Center Plaza, Suite 430
d. Mailing Address

Boston	MA	02108
e. City/Town	f. State	g. Zip Code

857-206-8744		sfarr@nitscheng.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

Cypher Street is proposed to be extended from D Street to E Street to create a new route with a new intersection at the Cypher Street extension and E Street. Full depth pavement reconstruction is proposed for the existing portions of Richards Street and Cypher Street from A Street to D Street. Resurfacing and restriping is proposed for E Street between Cypher Street and Fargo Street and Fargo Street from E Street to Summer Street. Box widening, resurfacing, and restriping is proposed for the South Boston Bypass Road approaches to Cypher Street/Richards Street, and full depth pavement reconstruction is proposed for the D Street approaches to Cypher Street.

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

a. County

b. Page Number

c. Book

d. Certificate # (if registered land)

9. Total Fee Paid

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

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?

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 N/A percentage/acreage

(2) outside Resource Area N/A 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.

EXEMPT

Signature of Applicant — Date

Signature of Property Owner (if different) — Date

Signature of Representative (if any) — Date

SECTION 2

PROJECT NARRATIVE

PROJECT NARRATIVE CONTENTS

1.0 EXECUTIVE SUMMARY

On behalf of the Applicant, the Massachusetts Department of Transportation, Nitsch Engineering, Inc. is filing the enclosed Notice of Intent (NOI) with the Boston Conservation Commission for the proposed construction improvements, which are located within the FEMA Flood Insurance Rate Map Zone AE, which is Land Subject to Coastal Storm Flowage (LSCF). MassDOT is not subject to municipal Wetlands bylaws and policies, and all work is limited to Land Subject to Coastal Storm Flowage within a previously developed, disturbed, and/or impervious area. MassDOT is in the process of obtaining easements on all properties where work is proposed. The purpose of this NOI Application is to receive an Order of Conditions from the Boston Conservation Commission approving the proposed project under the *Wetlands Protection Act* (M.G.L. c. 131, §40).

A portion of the project is considered a limited project under the Wetlands Protection Act. According to Section 10.24(7)(c), maintenance, repair, and improvement of existing public roadways, limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving drainage systems can be permitted as a limited project. The work at the intersection of Richards Street, S Boston Bypass Road, and Cypher Street falls under Land Subject to Coastal Storm Flowage and includes existing roadway improvements, intersection improvements, and an improved drainage system.

The Project site is located at the roadways of Cypher Street, Richards Street, E Street and Fargo Street, in Boston, Massachusetts. The Project consists of the extension of Cypher Street from D Street to E Street, with an intersection where this extension and E Street meet, creating an alternative heavy vehicle route that avoids using D Street and Summer Street west of Fargo Street. E Street is mainly of industrial use and is more suitable for heavy vehicle trips than D Street. The improvements will comply with current MassDOT and City of Boston roadway design standards regarding multimodal accommodations.

The site is located within the Land Subject to Coastal Storm Flowage designation.

The proposed site improvements within the Land Subject to Coastal Storm Flowage include:

- Full Depth Pavement Reconstruction
- Micromilling & Overlay
- Sidewalk Reconstruction and Pedestrian accessibility
- Traffic Signals and signage
- Drainage and electric utilities;
- Landscaping; and
- Associated earthwork and revegetation.

The Project includes mitigation measures to offset the impacts including installation of new vegetation, a drainage swale, construction of a stormwater management system, plantings, and construction period erosion and sedimentation controls. These mitigation measures are further discussed in the narrative below.

2.0 EXISTING CONDITIONS

2.1 Existing Site Description

The Project site is located on Richards Street, from A Street to the South Boston Bypass, Cypher Street, from the South Boston Bypass to E Street, E Street from Cypher Street to Fargo Street, and Fargo Street from E Street to Summer Street in Boston, Massachusetts (Figure 1 – USGS Locus Map and Figure 2 – Aerial Locus Map). The site is bounded by commercial and industrial properties. The Boston Convention Center and Expedition Center (BCEC) is located north of Cypher Street.

The entirety of the existing site is a passage around the commercial/industrial and railroad properties of north central South Boston. The site currently circumvents the BCEC through the remaining commercial/industrial properties south of Summer Street, and north of residential South Boston. It is approximately 1.18± miles long from A Street to the end of Summer Street. There are various intersections, driveways and parking lots that connect to the project site. Currently, the project area is primarily used by heavy vehicles making deliveries with very little non-vehicle use of the area. Cypher Street has no sidewalks for almost the entire length of the road on both sides and there are no bicycle facilities in the project area.

The existing project area is 75% impervious made up mostly of the existing roadway pavement and the sidewalks along D and E streets. Most of what is considered pervious area in the project area is compacted gravel along both sides of Cypher Street. The site has an existing closed drainage system which collects stormwater that outlets to Boston Harbor.

2.2 Resource Areas

FEMA Flood Zone

Based on the FEMA Flood Insurance Rate Maps for Boston (Community Panel Numbers 25025C0081J and 25025C0083J), part of the Project site is located within Land Subject to Coastal Storm Flowage including the 100-year floodplain with a flood elevation of Elevation 10 NAVD (16.46 BCB). The two areas within Land Subject to Coastal Storm Flowage are Richards Street, the western end of Cypher Street, S Boston Bypass Road, and Fargo Street.

2.3 Environmental Considerations

NHESP Priority and Estimated Habitat

Based on the MASSGIS data layers for the 15th Edition of the Natural Heritage Atlas, effective August 1, 2021, the Project site is not located within designated Estimated Habitat of Rare Wildlife or Priority Habitat of Rare Species and does not contain any Certified Vernal Pools (Figure 4 – Natural Heritage and Endangered Species Program Map).

Total Maximum Daily Load

The project is located within the Boston Harbor watershed. Boston Harbor is listed as impaired under section 303(d) of the Clean Water Act due to pathogens and PCBs. There is not a Final Pollutant Total Maximum Daily Load (TMDL) for the Boston Harbor Watershed.

3.0 PROPOSED CONDITIONS

3.1 Overview of Proposed Work

The purpose of the Project is to increase safety and mobility for all users throughout the project area. The Project is proposing an extension of Cypher Street from D Street to E Street, with an intersection where this extension and E Street meet. Full depth pavement reconstruction will take place for existing portions of Cypher Street from A Street to D Street. Resurfacing and restriping is proposed for Richards Street, S Boston Bypass, E Street between Cypher Street and Fargo Street and Fargo Street from E Street to Summer Street. Box widening, resurfacing, and restriping is proposed for the South Boston Bypass Road approaches to Cypher Street/Richards Street, and full depth pavement reconstruction is proposed for the D Street approaches to Cypher Street. The proposed roadways will comply with MassDOT and City of Boston roadway design standards regarding multimodal accommodations. The project is also proposing various drainage and electrical (including traffic) utility improvements. A new drainage trunkline is proposed for the Cypher Street Extension and deep sump catch basins are proposed throughout the project to replace existing structures. The proposed project will result in an impact area of 337,757 SF, a net increase in overall impervious area of 64,127 square feet (1.47 acres) (Table 2). See Section 4.0 for resource area impacts.

Table 1. Existing and proposed land cover type for the Project

Land Use	Existing (SF)	Proposed (SF)	Change
Site Pervious	83,729	19,602	-64,127
Site Impervious Area	254,028	318,155	64,127

The increase in impervious area is due to the Cypher Street Extension as well as minor box widening to allow for bicycle lanes and the installation of sidewalk along both sides of Cypher Street. Most of the existing pervious area on the project is compacted gravel along Cypher Street where sidewalks and bicycle facilities are proposed. Table 2 shows the breakdown for the change in pervious/impervious surfaces for Cypher Street Extension.

Table 2. Existing and proposed land cover type for Cypher Street Extension

Land Use	Existing (SF)	Proposed (SF)	Change
Impervious	12,370	26,170	+13,800
Pervious	21,362	7,562	-13,800

The proposed project also includes the installation of a new stormwater management system that was designed in accordance with the MassDEP Stormwater Management Standards to the maximum extent practicable. The project is considered to be a redevelopment project under Standard 7 of the Stormwater Standards. The project will be modifying the existing roadway to improve safety by adding bicycle lanes and new sidewalks within the project limits. Best Management Practices (BMPs) will be installed including deep sump catch basins, hoods, and a grass drainage swale. The Project will also implement long-term pollution prevention and source control measures, including inspections and maintenance of stormwater BMPs. Refer to the enclosed Stormwater Report for additional information on the proposed stormwater management system.

3.2 Roadway Design and Infrastructure

According the FEMA Flood maps, the project area on Richards Street and South Boston Bypass Road, and Fargo Street and Summer Street fall within the 100 year floodplain with an elevation of 10 feet. The proposed roadway profile calls to raise the elevation of Cypher Street for most of its length due to existing hazardous soil that is currently capped by the existing asphalt. The raising of the road falls outside of Land Subject to Coastal Storm Flowage and will have negligible effects on the flood zone. The elevations of the other roads in the project area are proposed to remain the same. Cypher Street and its extension are the only areas where full depth pavement is proposed. A hazardous soil report conducted by TetraTech for the project area concludes that there is hazardous soil along the Project site. This report is submitted under separate cover. To avoid disturbing this soil and risking exposing the soil to the Project and other sites, it was concluded to avoid excavation of this soil during construction. A vertical crest curve was added to Cypher Street roughly 300 feet from the South Boston Bypass intersection to improve the flow of drainage on the street to ensure stormwater is captured in the drain system. This crest curve falls outside of the existing floodplain.

The Project proposes to add raised planters with street trees at the intersection of Cypher Street and D Street to increase shade and green space for the Project. Plantings in the ground at other locations along Cypher Street and the rest of the Project was considered but deemed not feasible due to the hazardous soil under the project. 38 3’x10’ raised planters with shrubs are proposed along Cypher Street between the bicycle facility and the sidewalk. The raised planters allow for more green space on the Project without having to plant in the hazardous soil. A grass drainage swale is also proposed at the intersection of Cypher Street Extension and E Street. The swale adds green space to the Project while also allowing for proper drainage for the site adjacent to the intersection.

A key purpose of the roadway reconstruction is to increase safety and accessibility for all modes of transportation. Currently, the project area is used exclusively for large truck deliveries with no bicycle or pedestrian accommodations along Cypher Street and limited pedestrian accommodations along the rest of the Project. The Project proposes to add a 10 foot separated bicycle facility for bicyclists as well as 7 foot typical sidewalks on both sides along Cypher Street for the length of the project. ADA pedestrian ramps and crossings will be provided at intersecting streets providing accessibility that was not previously available to pedestrians and bicyclists.

The existing site is 75.2% percent impervious, with most of the site covered with asphalt pavement and compacted gravel. According to the Climate Ready Boston Map data, the project area is classified as being a heat island area, presumably due to the lack of green space and abundance of impervious area. Planters with street trees are proposed at the intersection of Cypher Street and D Street and planters with shrubs are proposed along Cypher Street to add green space to the Project site. This area of South Boston is fast-developing, and the goal of the project is to help promote further development in the area. Through the beautification and installation of street trees and bicycle and pedestrian facilities, the City hopes to create further residential and commercial use opportunities in the Project Area which will reduce the heat island effect in the area through more green space and more climate friendly developments.

4.0 RESOURCE AREA IMPACTS

The proposed work lies within the jurisdictional resource area Land Subject to Coastal Flowage (FEMA Flood Zone AE). Table 2 provides a summary of the resource area impacted by the Project. The total Land Subject to Coastal Storm Flowage within the limits of work is approximately 125,840 square feet. The only fill areas and grade changes occur on Cypher Street and its extension as full depth pavement is required to construct the roadways and given that the existing pavement serves as a cap on the hazardous soil beneath, excavation will be avoided below the existing pavement.

Table 3. Disturbances to Land Subject to Coastal Flowage within Zone AE (in square feet)

Resource Area	Proposed Alteration
Land Subject to Coastal Storm Flowage (Zone AE)	125,840 SF

Table 4. Impervious area within Land Subject to Coastal Flowage Zone AE (in square feet)

Resource Area	Existing Impervious (within limit of work)	Proposed Impervious (within limit of work)
Land Subject to Coastal Storm Flowage (Zone AE)	101,545 SF	121,054 SF

The addition of 19,509 SF of impervious area within Land Subject to Coastal Flowage is primarily through minor box widening for the installation of bicycle facilities and the installation of sidewalks on both sides of Cypher Street and Fargo Street to comply with MassDOT and City of Boston's roadway design standards for multimodal accommodations.

5.0 PROPOSED MITIGATION MEASURES

The proposed project includes numerous mitigation measures to reduce the impact of the project on adjacent environmentally-sensitive areas.

5.1 Construction Period Erosion and Sedimentation Controls

Erosion and sedimentation controls are proposed to reduce the construction-related impact of the proposed project on adjacent resource areas. Control measures will include, but are not limited to, minimizing land disturbance, constructing temporary sediment basins, and providing stormwater inlet protection including silt sacks. The contractor will be required to do inspections of all controls regularly to ensure that the controls are working properly. The contractor shall clean and reinstall any control that needs to be cleaned or replaced.

The proposed project will disturb more than one acre of land, which requires the filing of a National Pollutant Discharge Elimination System (NPDES) Stormwater Construction General Permit. To apply for coverage under this General Permit, a Notice of Intent will be submitted to the U.S. Environmental Protection Agency prior to the commencement of construction by the Contractor. The NPDES Notice of Intent requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) for construction activities, which will be submitted to the Conservation Commission and the DEP prior to construction by the Contractor. The SWPPP is a detailed erosion and sediment control plan that indicates the structural and non-structural erosion and sediment controls that will be employed, as appropriate, to control erosion on the construction site.

5.2 Post-Construction Stormwater Management

The proposed stormwater management system is designed in accordance with the MassDEP Stormwater Management Standards to the maximum extent practicable. Best Management Practices (BMPs) will be installed as part of the Project.

The Stormwater Report includes an Operation and Maintenance Plan that was prepared in compliance with Standard 9 of the 2008 MassDEP Stormwater Handbook to provide best management practices for implementing maintenance activities for the stormwater management system in a manner that minimizes impacts to wetland resource areas.

5.3 Long-Term Pollution Prevention

A Long-Term Pollution Prevention Plan has been prepared in compliance with the Standards 4 and 9 of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook, see the Long-Term Pollution Prevention Plan in the Stormwater Report for additional details.

5.4 Climate Change Resilience

The roadway has been designed to promote climate resilience and adapt to future climate change to promote resource area values with the proposed reconstruction of the site now, and to adapt in the future. Street trees and shrubs are proposed to limit carbon emissions as well as to reduce the heat island effect along the project. The road elevation of Cypher Street and its extension is increasing due to the avoidance of roadway excavation in a hazardous soil area which prepares for higher water elevations in the future. The installation of bicycle facilities and sidewalks on both sides of Cypher Street promotes multimodal transportation through the project area which will decrease vehicle trips and emissions in the area. The extension of Cypher Street will also streamline travel for the high volume of delivery trucks in the area, directing them away from D Street which has more residential and commercial use.

6.0 CONCLUSION

On behalf of the Applicant, Nitsch Engineering is filing the enclosed Notice of Intent (NOI) Application with the Boston Conservation Commission for the construction of the reconstruction of Richards Street, Cypher Street, E Street, Fargo Street, and the Cypher Street Extension. The project will require some alteration of Resource Areas (Land Subject to Coastal Storm Flowage) under the Massachusetts Wetlands Protection Act (M.G.L. c. 131, §40) and its Regulations (310 CMR 10.00), however this work will result in negligible impact to the resource area. The Project provides mitigation measures including: improving the stormwater management system to meet the MassDEP Stormwater Management Standards to the maximum extent practicable and installation of erosion control measures. This NOI report and supporting documentation provides a thorough description of the design details and regulatory compliance in accordance with the pertinent Wetland Statutes and Regulations. The Applicant seeks an Order of Conditions approving the Project as proposed.

FIGURES

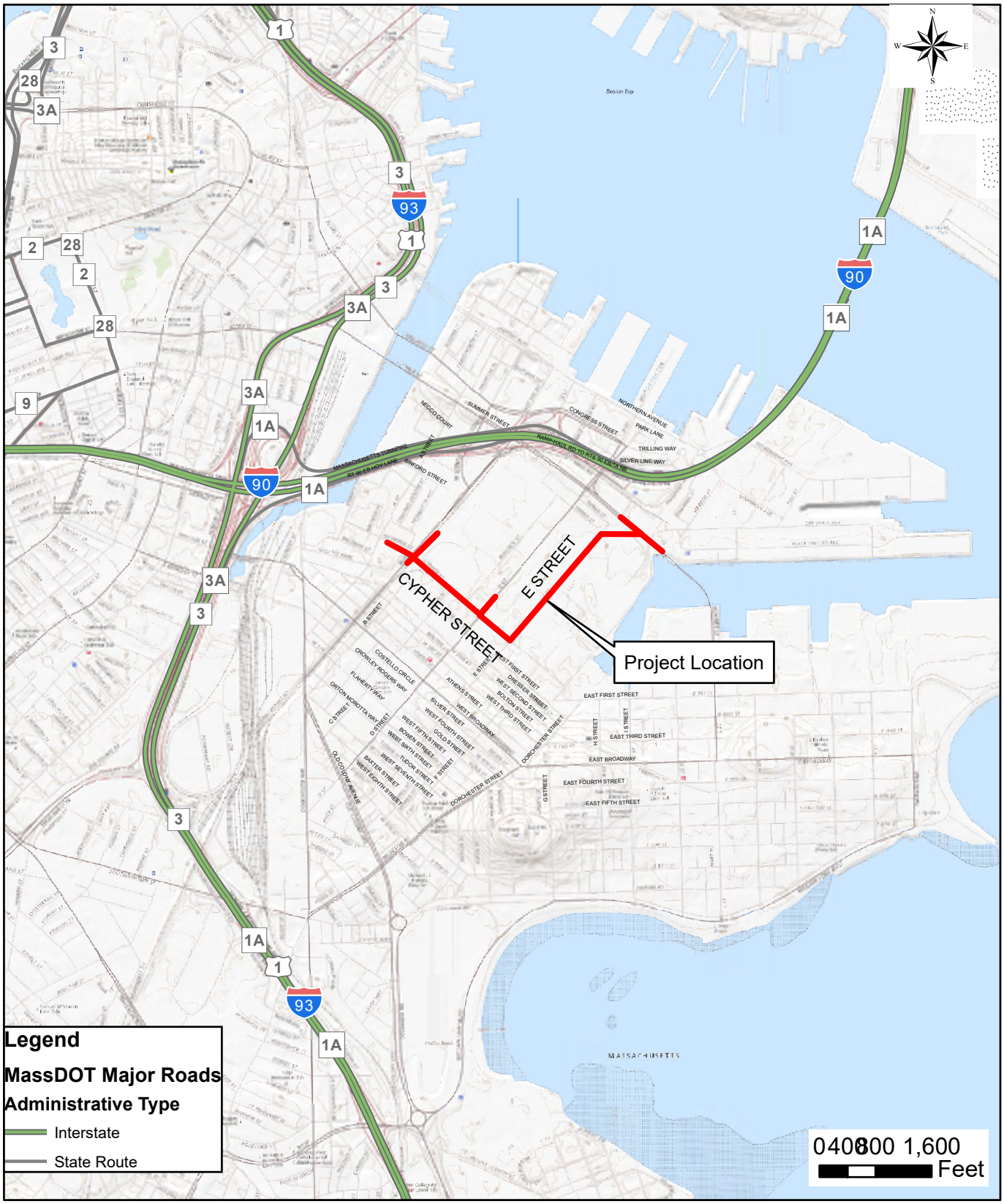


Figure 1: USGS Locus

Roadway Reconstruction on Richards Street, Cypher Street, E Street, and Fargo Street
Boston, MA

Data Source: MassGIS
Nitsch Project #9720.17

Nitsch Engineering

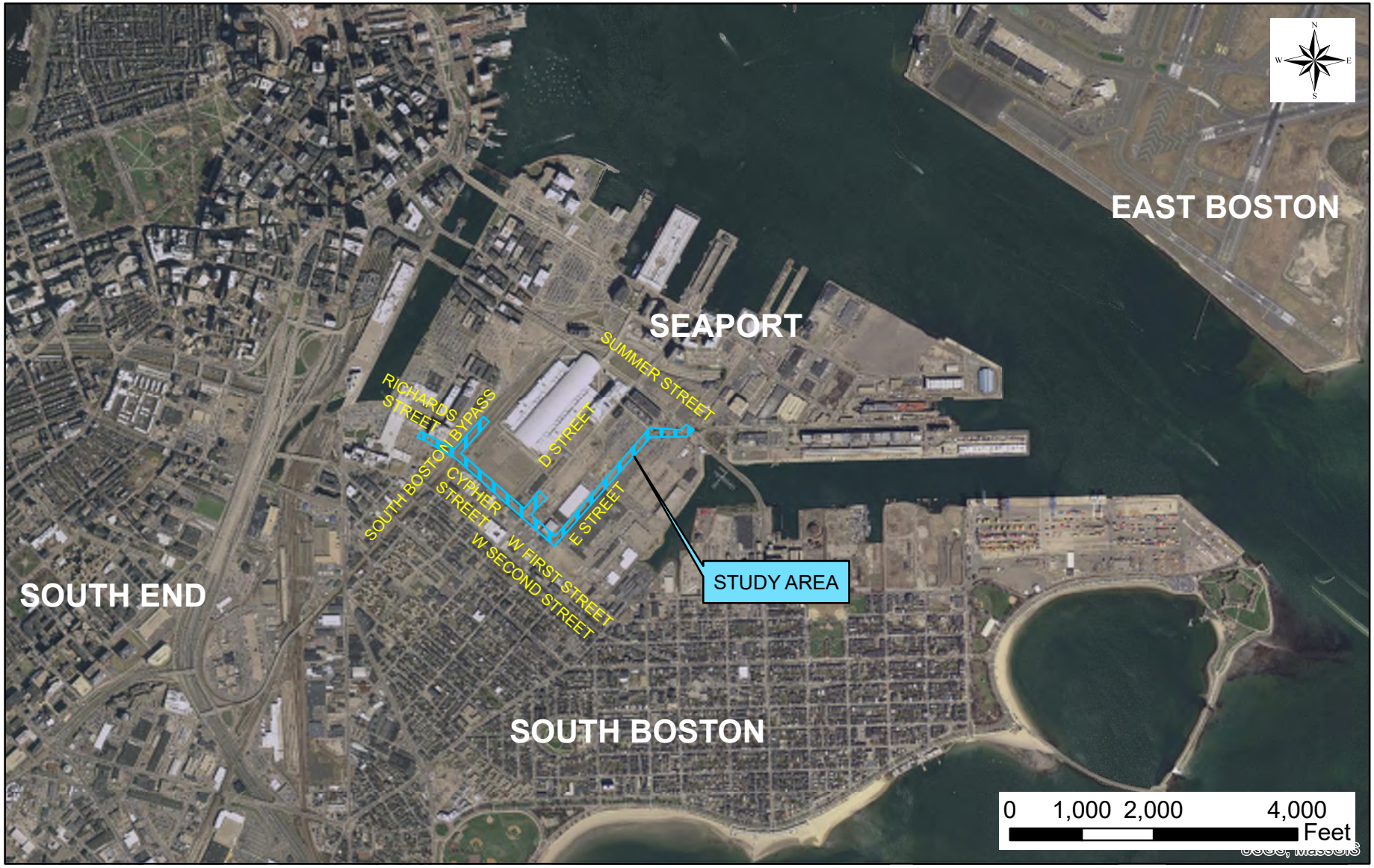


Figure 2: Aerial Locus Map

Roadway Reconstruction on Richards Street, Cypher Street, E Street and Fargo Street
Boston, MA

Data Source: MassGIS
Nitsch Project #9720.17

Nitsch Engineering

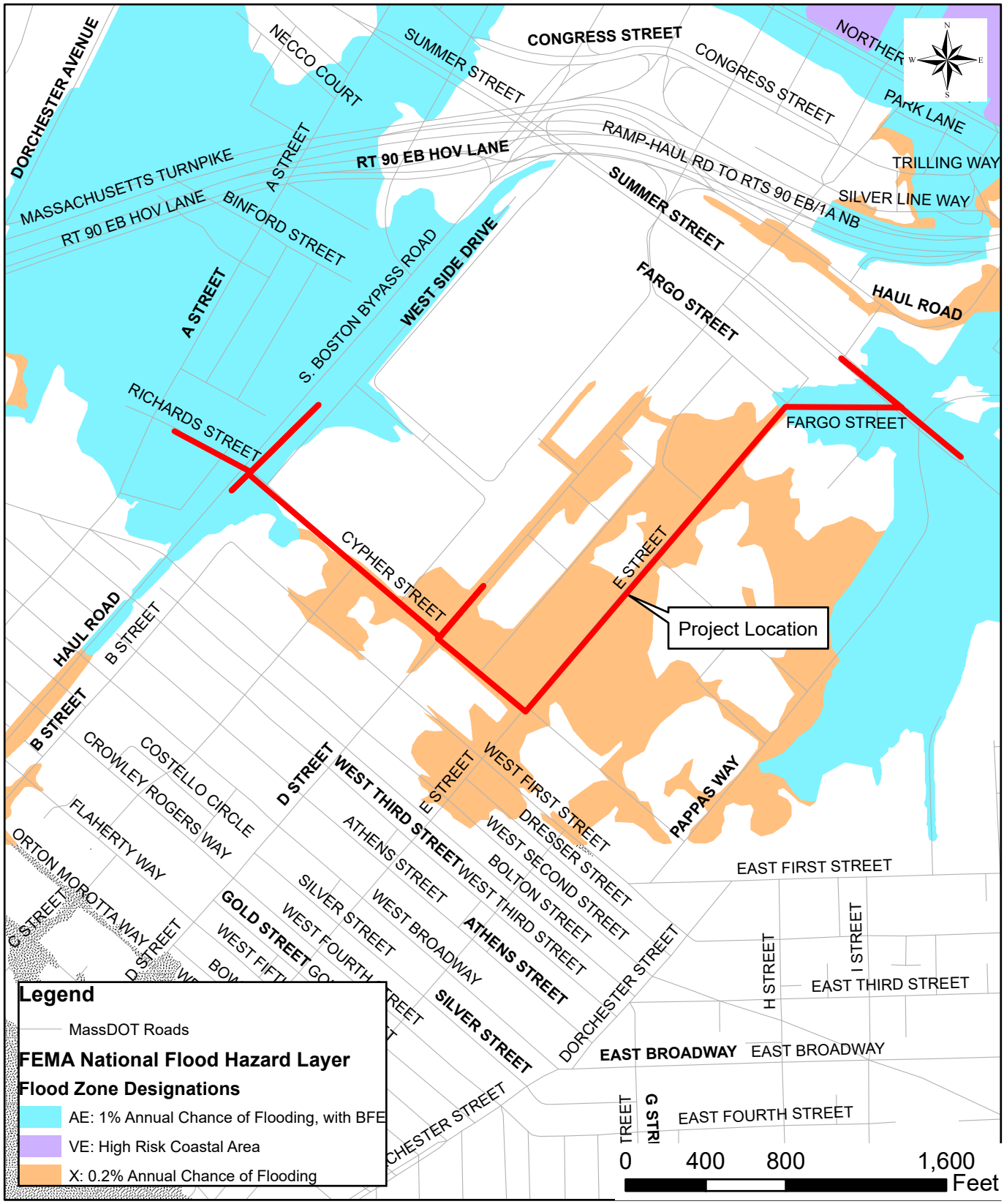


Figure 3: FEMA Floodplain Map

Roadway Reconstruction on Richards Street, Cypher Street, E Street, and Fargo Street
Boston, MA

Data Source: MassGIS
Nitsch Project #9720.17

Nitsch Engineering

Figure 4: NHESP Map

Roadway Reconstruction on Richards Street, Cypher Street, E Street, and Fargo Street
Boston, MA

Data Source: MassGIS
Nitsch Project #9720.17

Nitsch Engineering

HIGHWAY GUARD DETAILS

NONE

CONSTRUCTION PLAN NOTES

1. SILT SACKS SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS THROUGHOUT THE PROJECT.

BOSTON
CYPHER STREET

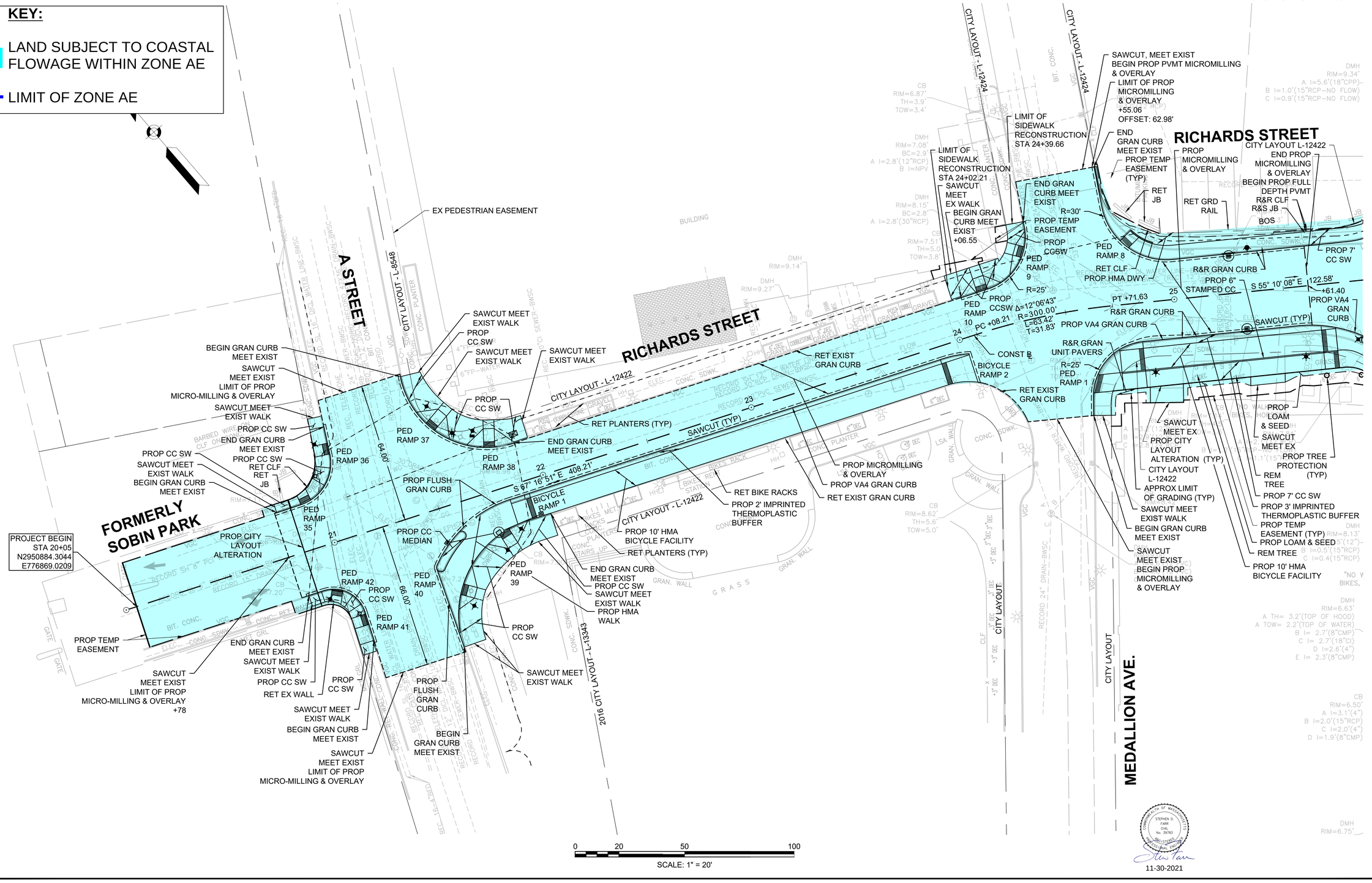
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	165
PROJECT FILE NO.	608807		

CONSTRUCTION PLANS

KEY:

🟦 LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

— LIMIT OF ZONE AE



0 20 50 100

SCALE: 1" = 20'

STEPHEN D. FARR CIVIL No. 39783

11-30-2021

Nitsch – P:\08000–09999\9720.17 Cypher St Bos\Transportation\CAD\608807 CAD\Project Drawing Data\DWG\608807_HD(CONST)_ForNOI–3.dwg Nov 11, 2021 2:18 PM

Plotted on 11-Nov-2021 2:18 PM

608807_HD(CONST)_FORNOI-3.DWG

HIGHWAY GUARD DETAILS

R&D GUARDRAIL STA 264+54.78 LT TO STA 269+11 LT
R&D GUARDRAIL STA 263+72.48 RT TO STA 263+34.05 RT
R&R GUARDRAIL STA 263+16.94 RT TO STA 263+34.05 RT
PROP GUARDRAIL, TRAILING ANCHORAGE, STA 263+34.05 RT TO STA 263+42.28 RT

CONSTRUCTION PLAN NOTES

1. SILT SACKS SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS THROUGHOUT THE PROJECT.

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	16	165
PROJECT FILE NO.		608807	

CONSTRUCTION PLANS

CONTINUED ON SHEET NO. 17
CONTINUED ON SHEET NO. 15
CONTINUED ON SHEET NO. 18

RICHARDS STREET
CYPHER ST
W SERVICE ROAD
SOUTH BOSTON BYPASS ROAD
MEDALLION AVE.
B STREET
CITY LAYOUT L-12424
CITY LAYOUT L-12422
CITY LAYOUT L-11821
CITY LAYOUT L-3229
CITY LAYOUT
FLOOD ZONE AE(EL10)
1991 SHLO NO. 6863
MAIN ℄ OF SHLO NO. 6863
MAIN BASELINE OF 1991 STATE HIGHWAY LAYOUT NO. 6863
PROJECT BEGIN STA 261+75 N2950419.0244 E777282.9513
LIMIT OF SIDEWALK RECONSTRUCTION STA 24+02.21
SAWCUT MEET EX WALK
BEGIN GRAN CURB MEET EXIST +06.55
LIMIT OF SIDEWALK RECONSTRUCTION STA 24+39.66
END GRAN CURB MEET EXIST
SAWCUT, MEET EXIST BEGIN PROP PVMT MICROMILLING & OVERLAY
LIMIT OF PROP MICROMILLING & OVERLAY +55.06 OFFSET: 62.98'
PROP TEMP EASEMENT (TYP)
PROP MICROMILLING & OVERLAY
END PROP MICROMILLING & OVERLAY BEGIN PROP FULL DEPTH PVMT
END PROP FULL DEPTH PVMT BEGIN PROP MICROMILLING & OVERLAY
PROP FULL DEPTH PVMT 1991 SHLO NO. 6863
APPROX LIMIT OF GRADING (TYP)
APPROX LIMIT OF GRADING
PROP L&S
R&R GRAN CURB
R&D GRD
PED RAMP 7
RET JB
RET GRD RAIL
R&R CLF
R&S JB
BOS
R=35'
R=30'
R=25'
PROP TEMP EASEMENT
PROP CCSW
PED RAMP 9
PED RAMP 8
RET CLF
PROP HMA DWY
PROP 7' CC SW
R&R GRAN CURB
PROP 6" STAMPED CC
S 55° 10' 08" E 122.58'
PT +71.63
PC +08.21
PC +94.21
+61.40
PROP VA4 GRAN CURB
PROP CCSW Δ=12°06'43" R=300.00' L=63.42' T=31.83'
PED RAMP 10
PED RAMP 2
SAWCUT (TYP)
PROP SIGNAL POST (TYP)
R=60'
PROP LOAM & SEED
R&R GRAN UNIT PAVERS
R=25' PED RAMP 1
CONST B
BICYCLE RAMP 2
RET EXIST GRAN CURB
PROP 2' IMPRINTED THERMOPLASTIC BUFFER
PROP 10' HMA BICYCLE FACILITY
PROP MAST ARM (TYP)
RET GRD RAIL
LIMIT OF GRADING (TYP)
SAWCUT MEET EX
PROP CITY LAYOUT ALTERATION (TYP)
CITY LAYOUT L-12422
APPROX LIMIT OF GRADING (TYP)
SAWCUT MEET EXIST WALK
BEGIN GRAN CURB MEET EXIST
SAWCUT MEET EXIST BEGIN PROP MICROMILLING & OVERLAY
PROP LOAM & SEED
SAWCUT MEET EX
PROP TREE PROTECTION (TYP)
REM TREE
PROP 7' CC SW
PROP 3' IMPRINTED THERMOPLASTIC BUFFER
PROP TEMP EASEMENT (TYP)
PROP LOAM & SEED
PROP 10' HMA BICYCLE FACILITY
RET
PROP CC SW R&D GRD
R&R GRAN CURB R=60'
PROP IMPRINTED THERMOPLASTIC BUFFER
R&D EX RAILROAD TRACK, TIES & SIGNAL EQUIPMENT
Δ=5°51'12" R=1000.00' L=102.16' T=51.12'
PT +96.37
+91.62
+00.62
PROP VA4 GRAN CURB
PED RAMP 3
R&D GRD RAIL
PROP IMPRINTED THERMOPLASTIC BUFFER
PROP HMA CYCLE TRACK
R&D GRD RAIL
PROP CC SW R=60'
R&R CLF & GATE
R&R GRAN CURB
PROP LOAM & SEED BEGIN GRAN CURB MEET EX
SAWCUT MEET EXIST BEGIN PROP FULL DEPTH PVMT
PROP TRACK CROSSING (BO)
R&R CLF & GATE
PROP GATES (BO) (TYP)
PROP LIMIT OF GRADING
PROP CITY LAYOUT ALTERATION (TYP)
PROP TEMP EASEMENT (TYP)
PROP 4" CRUSHED STONE
PROP TRAILING ANCHORAGE
R&R GRD RAIL
BEGIN GRAN CURB MEET EXIST
RET POST & GRD RAIL
10' FULL DEPTH PAVEMENT TRANSITION (SEE DETAIL SHEET)
SAWCUT LIMIT OF PAVING +17
1991 SHLO NO. 6863
PROP PERM EASEMENT
PROP 4" DENSE GRADED CRUSHED STONE
PROP 10' HMA BICYCLE FACILITY
PROP 4" CRUSHED STONE
PROP 3' IMPRINTED THERMOPLASTIC BUFFER
PROP 6" STAMPED CC
PROP CITY LAYOUT ALTERATION (TYP)
REM GRD
REM FENCE & POSTS (TYP)
R&S
R&S JB (TYP)
PED RAMP 6
PROP 7' CC SW
PROP 5' IMPRINTED THERMOPLASTIC BUFFER
PED RAMP 5
PED RAMP 4
R=20'
R&R GRAN CURB
PROP 5' IMPRINTED THERMOPLASTIC BUFFER
R&S JB & CLF
R&S CLF
R&S JB (TYP)
PROP VA4 GRAN CURB
PED RAMP 2
R&R GRAN CURB
LIMIT OF GRAN CURB MEET & MATCH EX SAWCUT MEET EXIST END PROP FULL DEPTH PVMT
10' FULL DEPTH PAVEMENT TRANSITION (SEE DETAIL SHEET)
LIMIT OF GRAN CURB MEET & MATCH EX
PROP TEMP EASEMENT (TYP)
PROP CITY LAYOUT ALTERATION (TYP)
PROP VA4 GRAN CURB
PROP 4" CRUSHED STONE
RET TREE
REM TREE
RET CLF
APPROX LIMIT OF GRADING (TYP)
R&D BIT CURB
PROP FULL DEPTH PVMT
PROP 8.5' CC SW
REM METAL TRAILER (BO)
PROP CITY LAYOUT ALTERATION (TYP)
PROP 10' HMA BICYCLE FACILITY
PROP 4' CLF (TYP)
PROP RET. WALL
APPROX LIMIT OF GRADING (TYP)
PROP PERM EASEMENT
1 STORY MET BUILDING
S 49° 18' 56" E 828.22'
FLOOD ZONE AE(EL10)

KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE

0 20 50 100
SCALE: 1" = 20'

COMMONWEALTH OF MASSACHUSETTS
STEPHEN D. FARR
CIVIL
No. 39783
REGISTERED PROFESSIONAL ENGINEER

11-30-2021

HIGHWAY GUARD DETAILS

R&D GUARDRAIL STA 264+54.78 LT TO STA 269+11.00 LT
PROP GUARDRAIL, TRAILING ANCHORAGE, STA 269+00.95 LT TO STA 269+11.00 LT

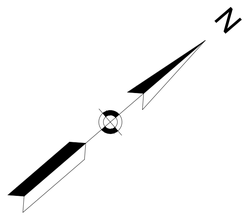
CONSTRUCTION PLAN NOTES

1. SILT SACKS SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS THROUGHOUT THE PROJECT.

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	17	165
PROJECT FILE NO.	608807		

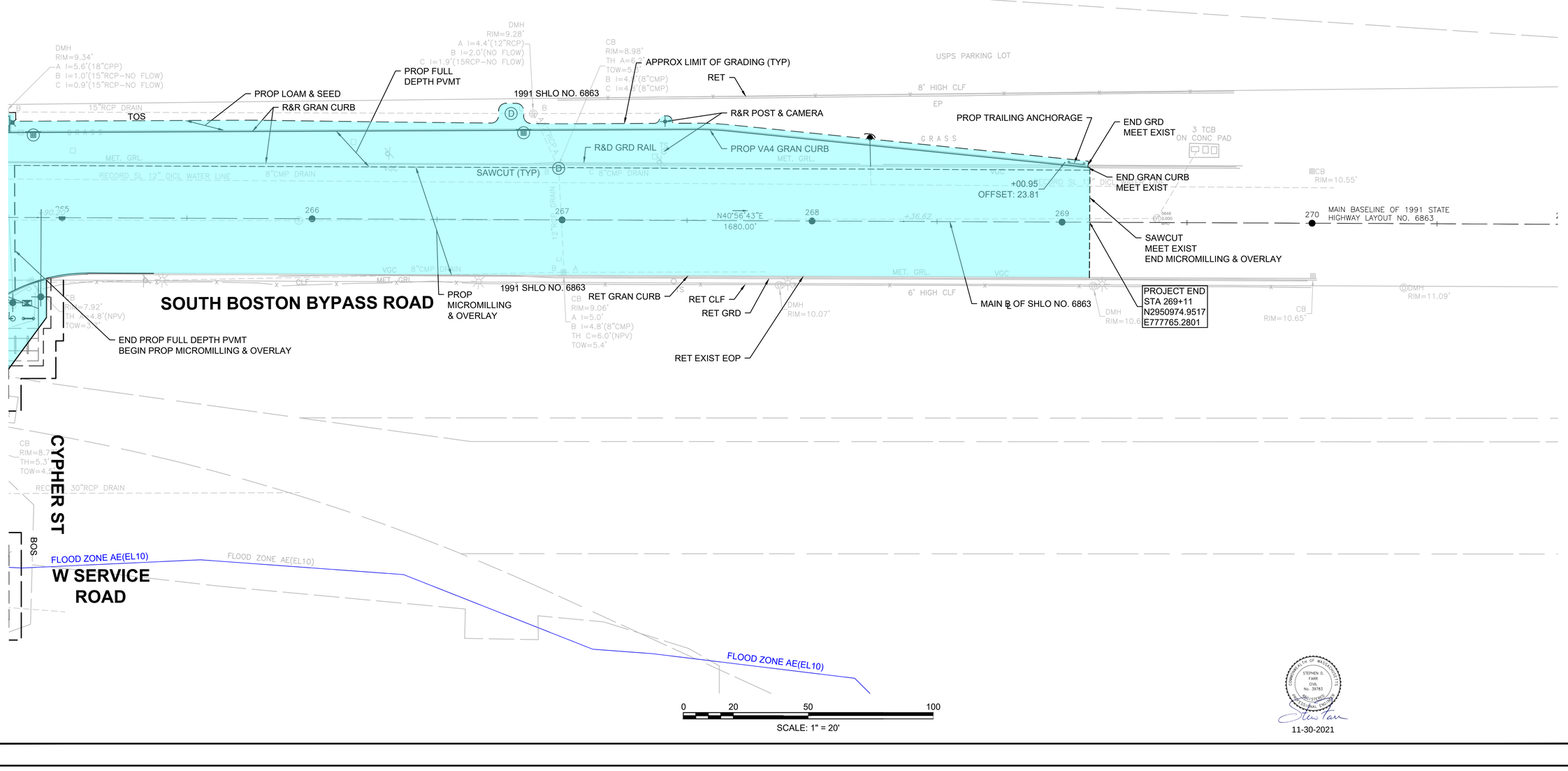
CONSTRUCTION PLANS



KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE



COMMONWEALTH OF MASSACHUSETTS
STEPHEN D. FARR
CIVIL
No. 39783
REGISTERED PROFESSIONAL ENGINEER

11-30-2021

HIGHWAY GUARD DETAILS

NONE

CONSTRUCTION PLAN NOTES

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BOSTON
CYPHER STREET

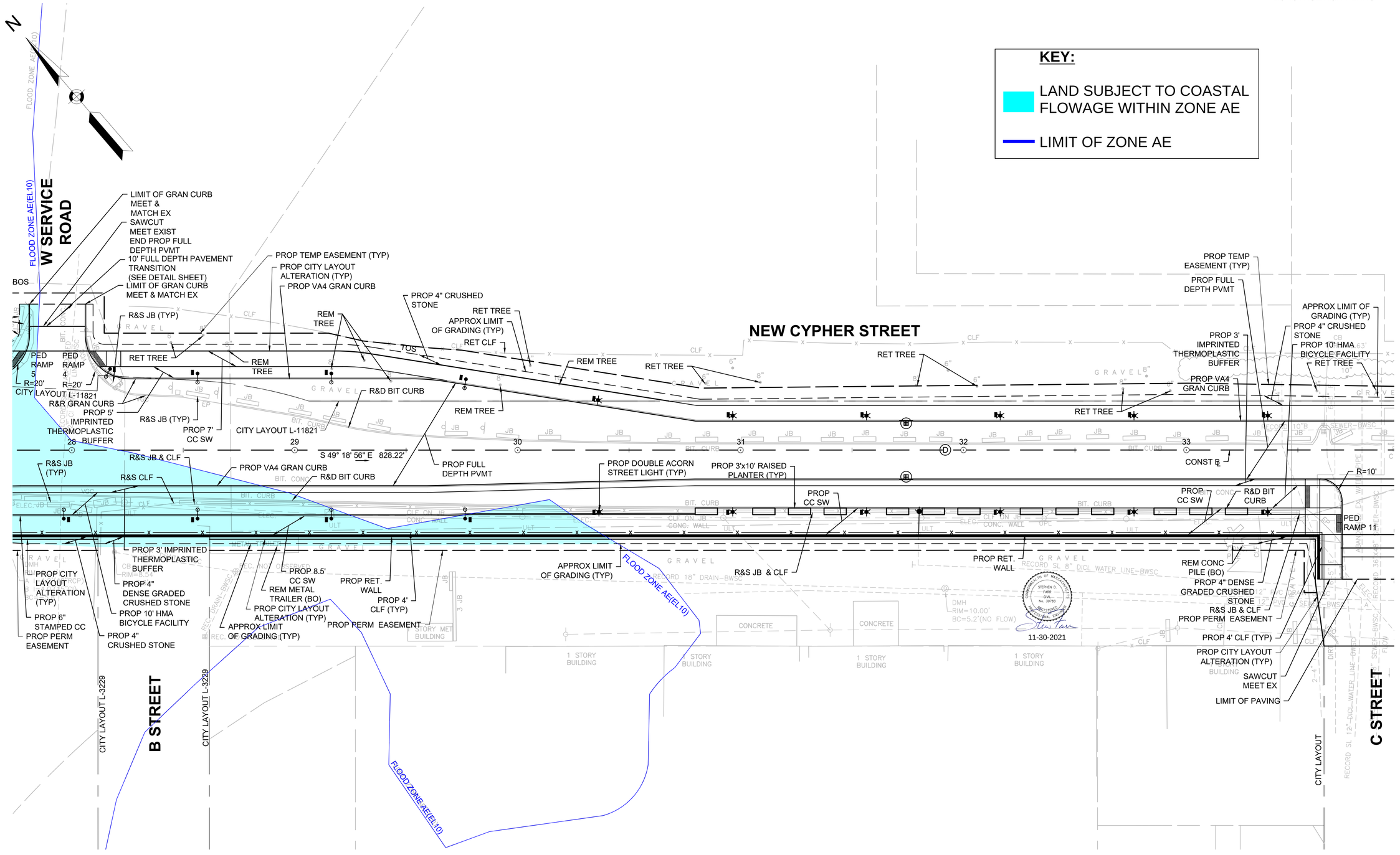
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	18	165
PROJECT FILE NO.	608807		

CONSTRUCTION PLANS

KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE



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SCALE: 1" = 20'

HIGHWAY GUARD DETAILS

NONE

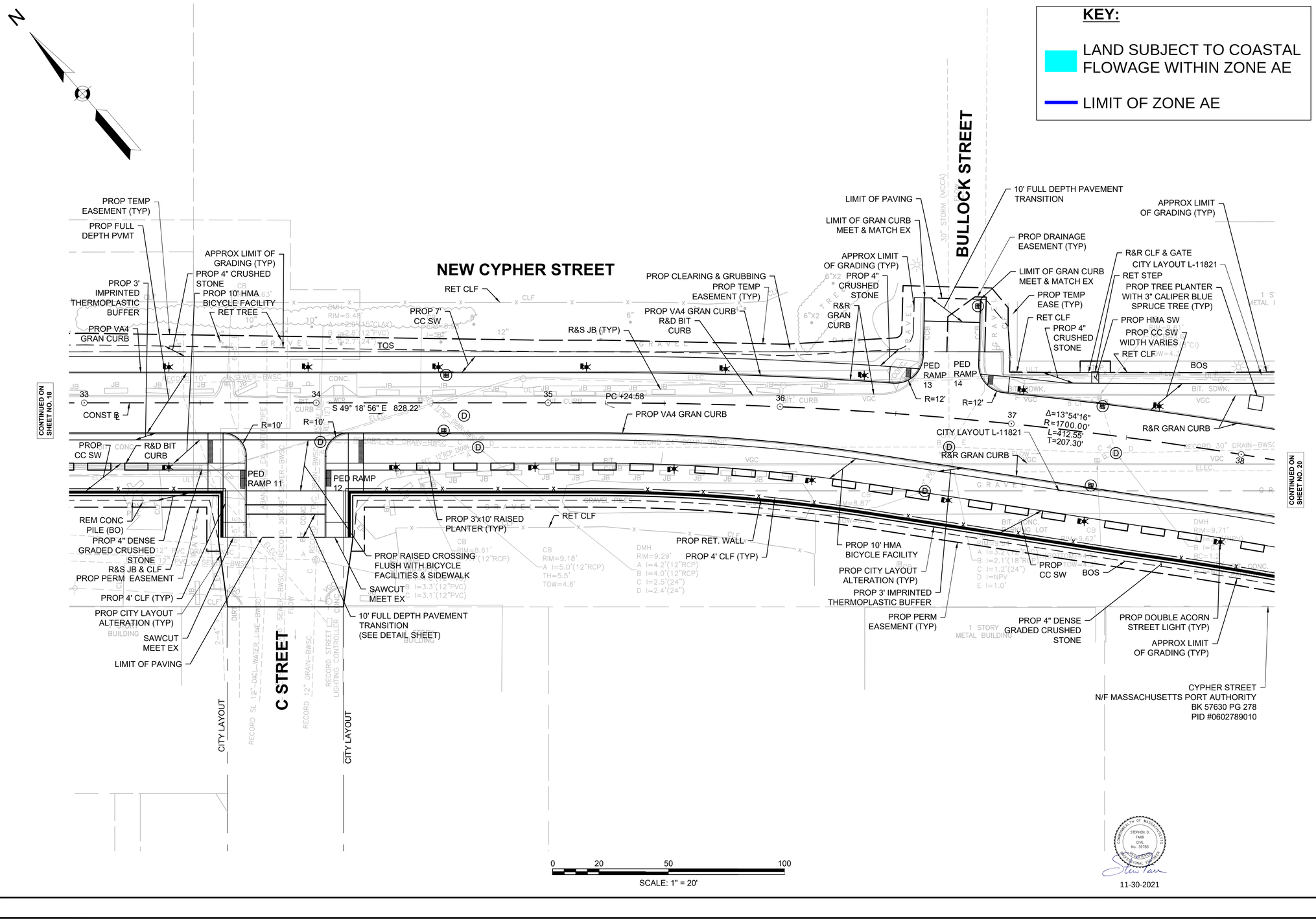
CONSTRUCTION PLAN NOTES

1. SILT SACKS SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS THROUGHOUT THE PROJECT.

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	19	165
PROJECT FILE NO.	608807		

CONSTRUCTION PLANS



COMMONWEALTH OF MASSACHUSETTS
STEPHEN D. FARR
CIVIL
No. 39783
REGISTERED PROFESSIONAL ENGINEER

11-30-2021

HIGHWAY GUARD DETAILS

NONE

CONSTRUCTION PLAN NOTES

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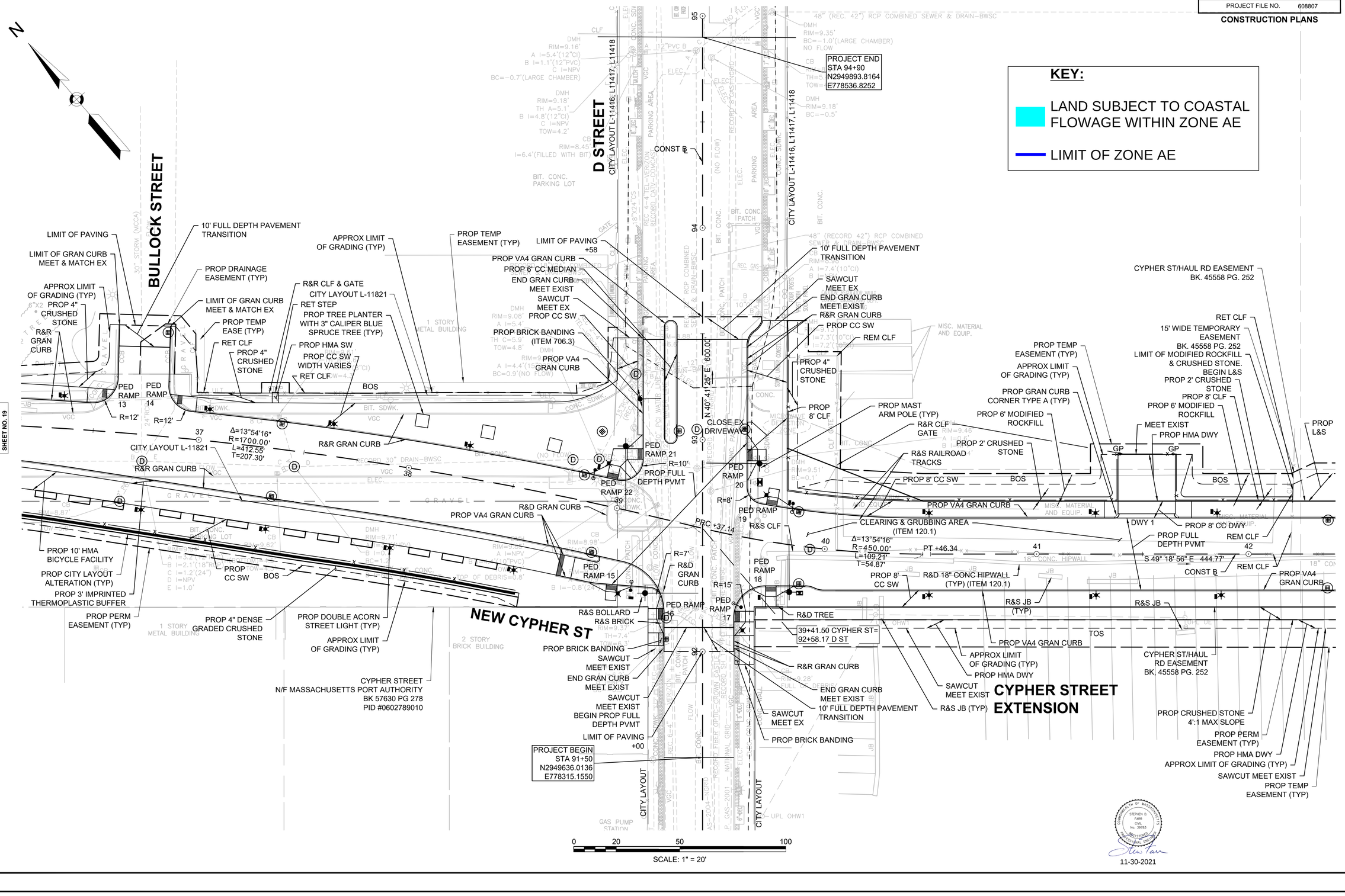
KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE



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SCALE: 1" = 20'

STEPHEN D. FAIR CIVIL No. 39783 REGISTERED PROFESSIONAL ENGINEER

11-30-2021

HIGHWAY GUARD DETAILS

NONE

CONSTRUCTION PLAN NOTES

1. SILT SACKS SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS THROUGHOUT THE PROJECT.

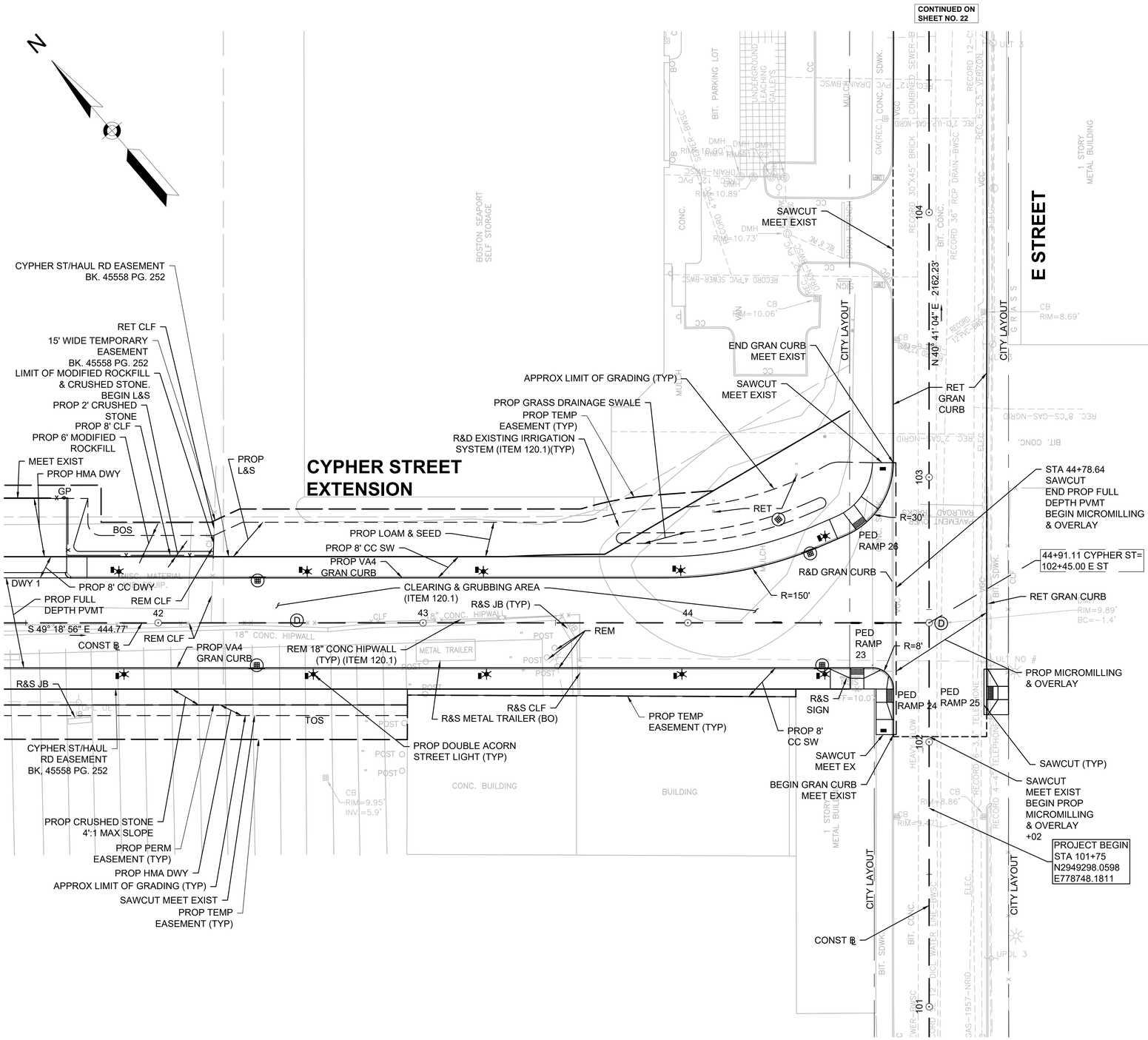
BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	165
PROJECT FILE NO.	608807		

CONSTRUCTION PLANS

KEY:

🟦	LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE
—	LIMIT OF ZONE AE



11-30-2021

STEPHEN C. FARR CIVIL No. 39783

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HIGHWAY GUARD DETAILS

NONE

CONSTRUCTION PLAN NOTES

1. SILT SACKS SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS THROUGHOUT THE PROJECT.

BOSTON
CYPHER STREET

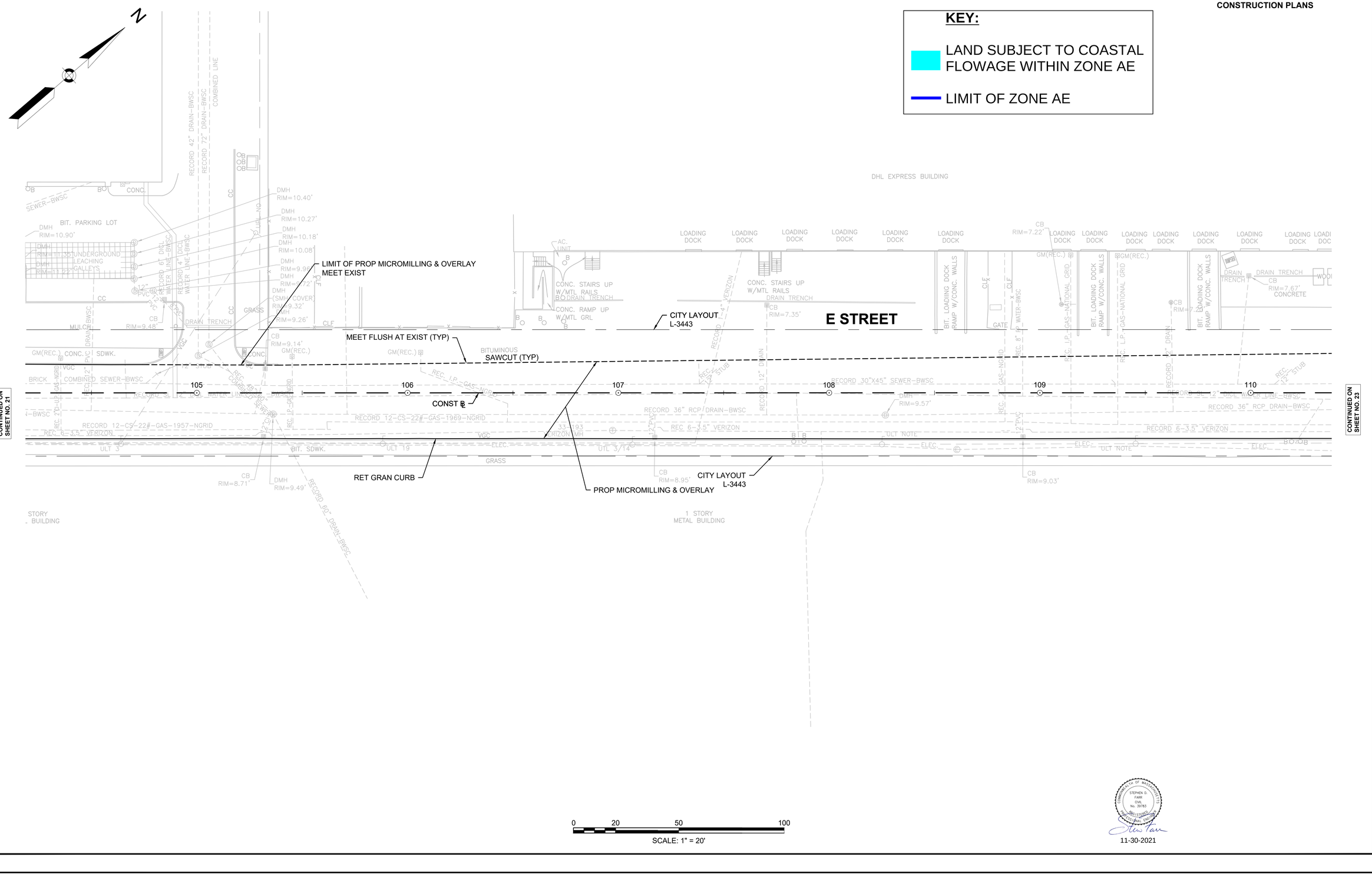
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	22	165
PROJECT FILE NO.		608807	

CONSTRUCTION PLANS

KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE



COMMONWEALTH OF MASSACHUSETTS
STEPHEN D. FARR
CIVIL
No. 39783
REGISTERED PROFESSIONAL ENGINEER

11-30-2021

HIGHWAY GUARD DETAILS

NONE

CONSTRUCTION PLAN NOTES

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BOSTON
CYPHER STREET

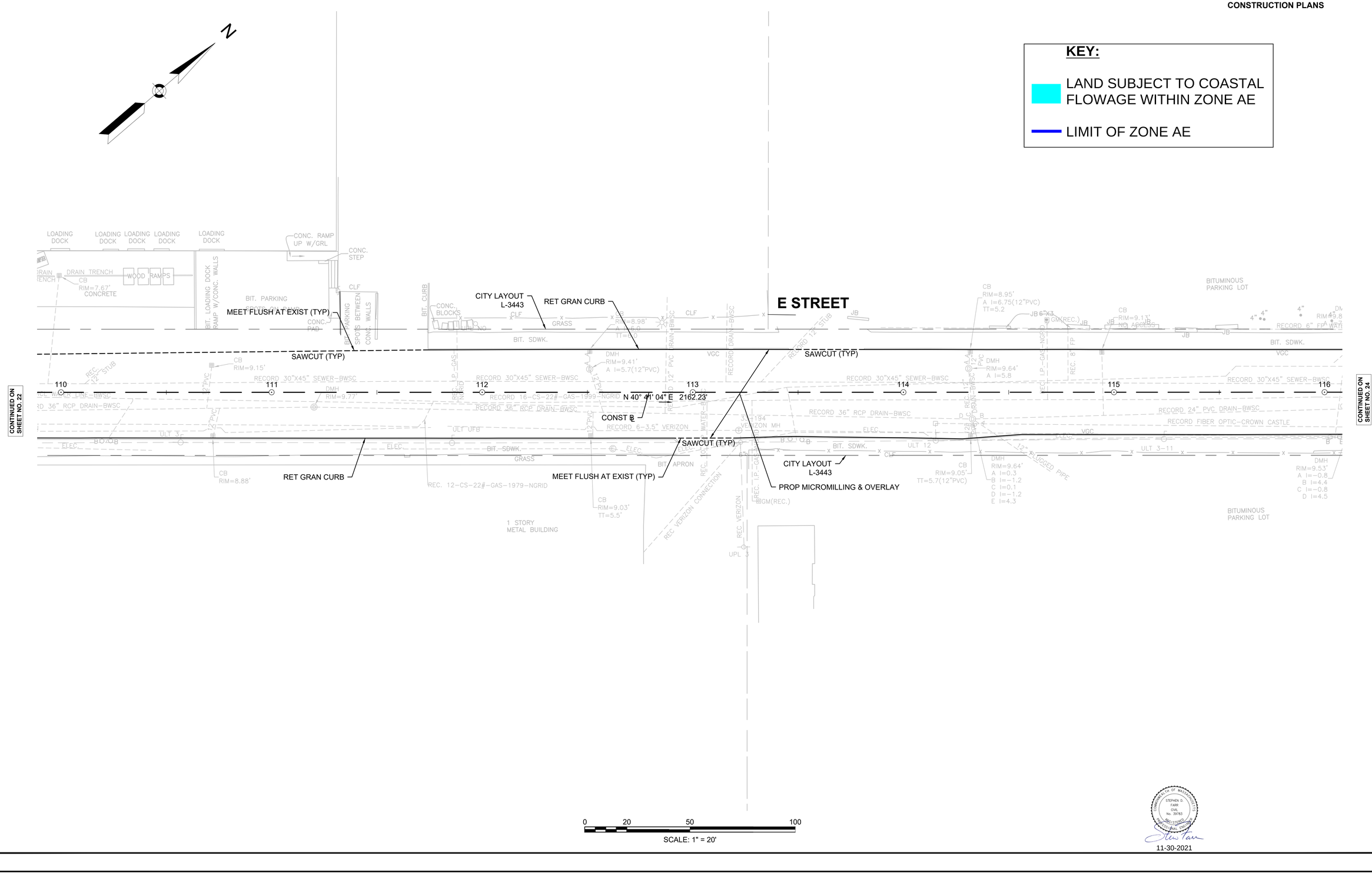
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	23	165
PROJECT FILE NO.	608807		

CONSTRUCTION PLANS

KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE



0 20 50 100

SCALE: 1" = 20'

COMMONWEALTH OF MASSACHUSETTS
STEPHEN D. FARR
CIVIL
No. 39783
REGISTERED PROFESSIONAL ENGINEER

11-30-2021

HIGHWAY GUARD DETAILS

NONE

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KEY:

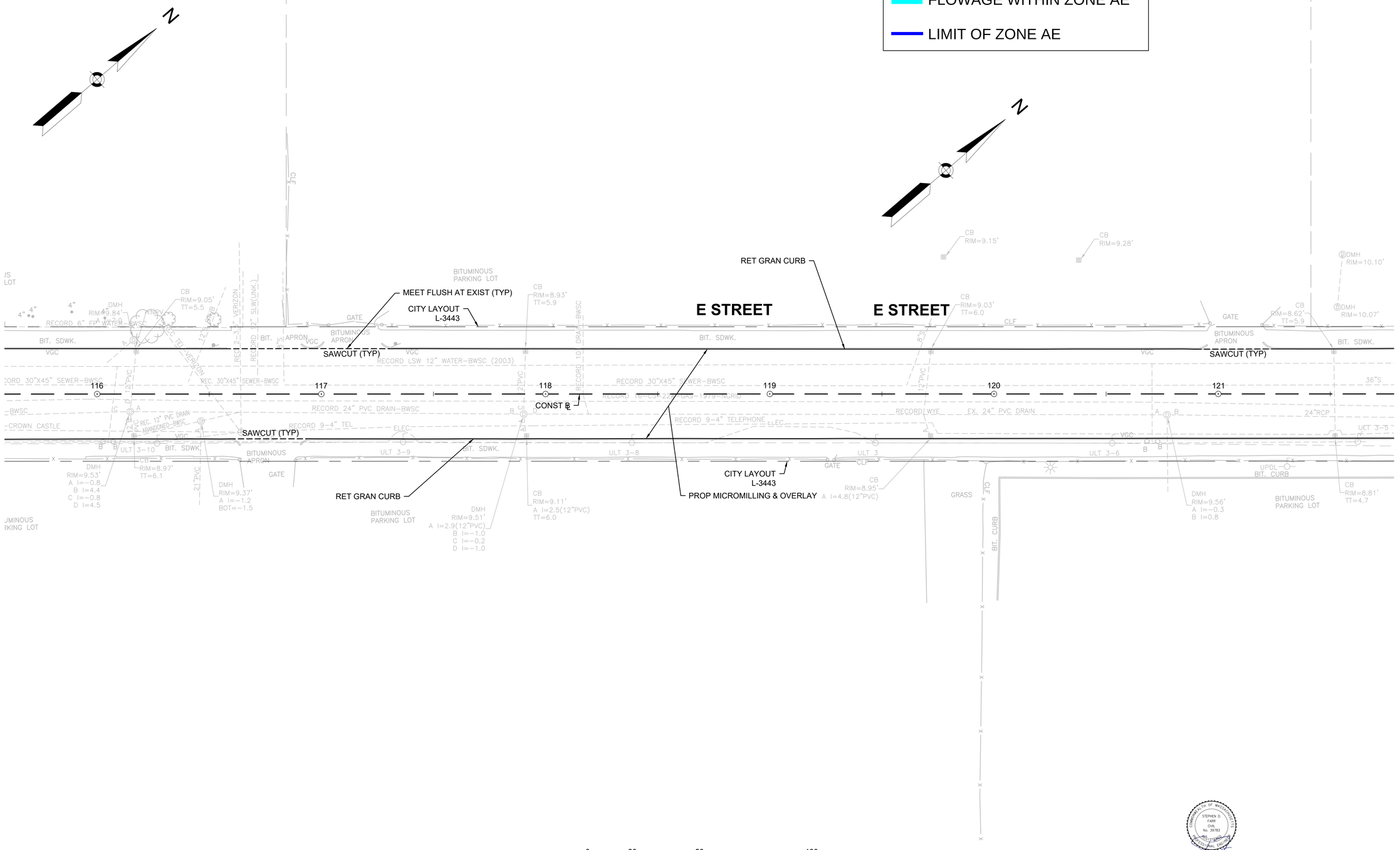
LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	165
PROJECT FILE NO.	608807		

CONSTRUCTION PLANS



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SCALE: 1" = 20'

COMMONWEALTH OF MASSACHUSETTS
STEPHEN D. FARR
CIVIL
No. 39783
REGISTERED PROFESSIONAL ENGINEER

11-30-2021

HIGHWAY GUARD DETAILS

NONE

CONSTRUCTION PLAN NOTES

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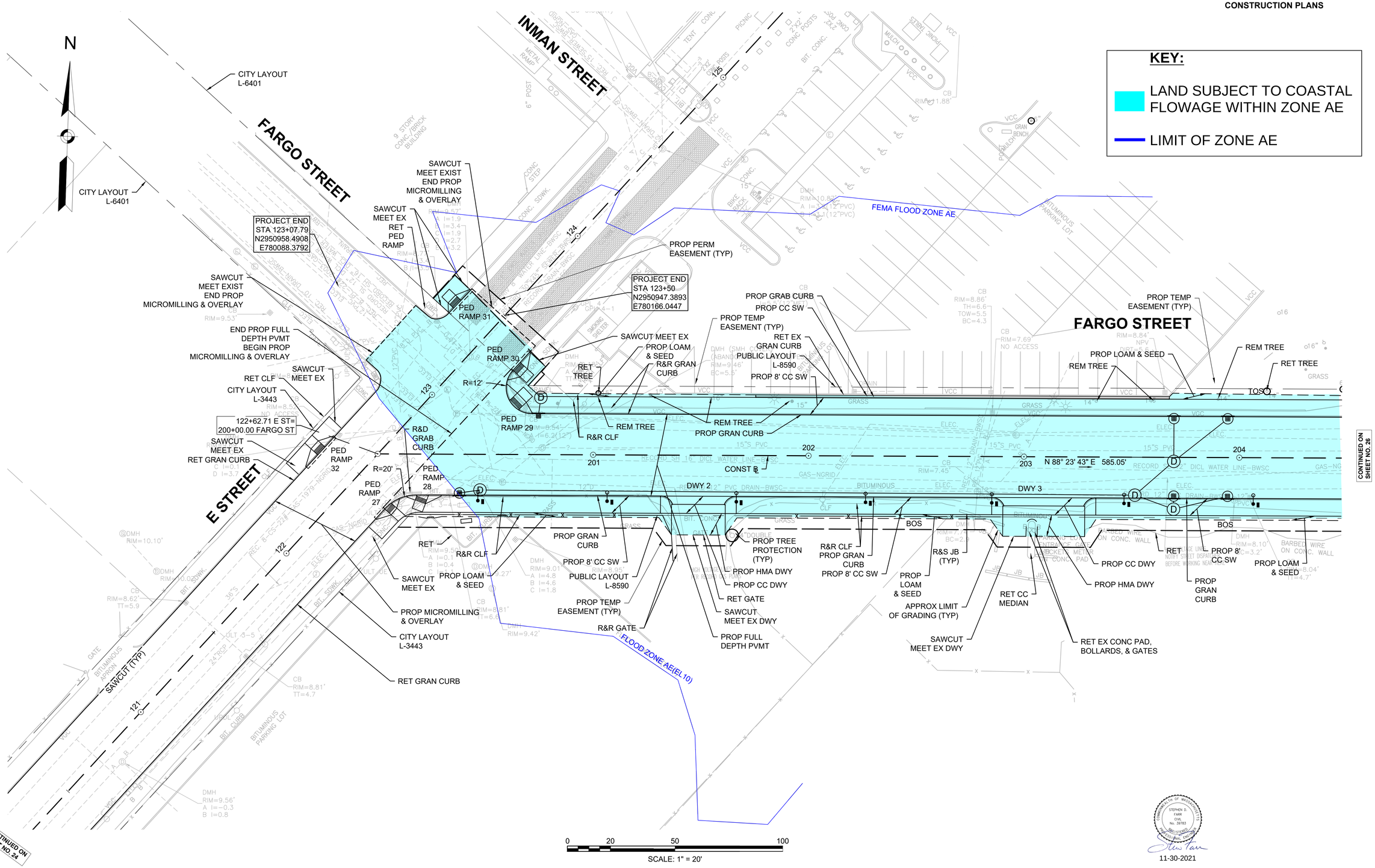
BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	25	165
PROJECT FILE NO.	608807		

CONSTRUCTION PLANS



HIGHWAY GUARD DETAILS

NONE

CONSTRUCTION PLAN NOTES

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BOSTON
CYPHER STREET

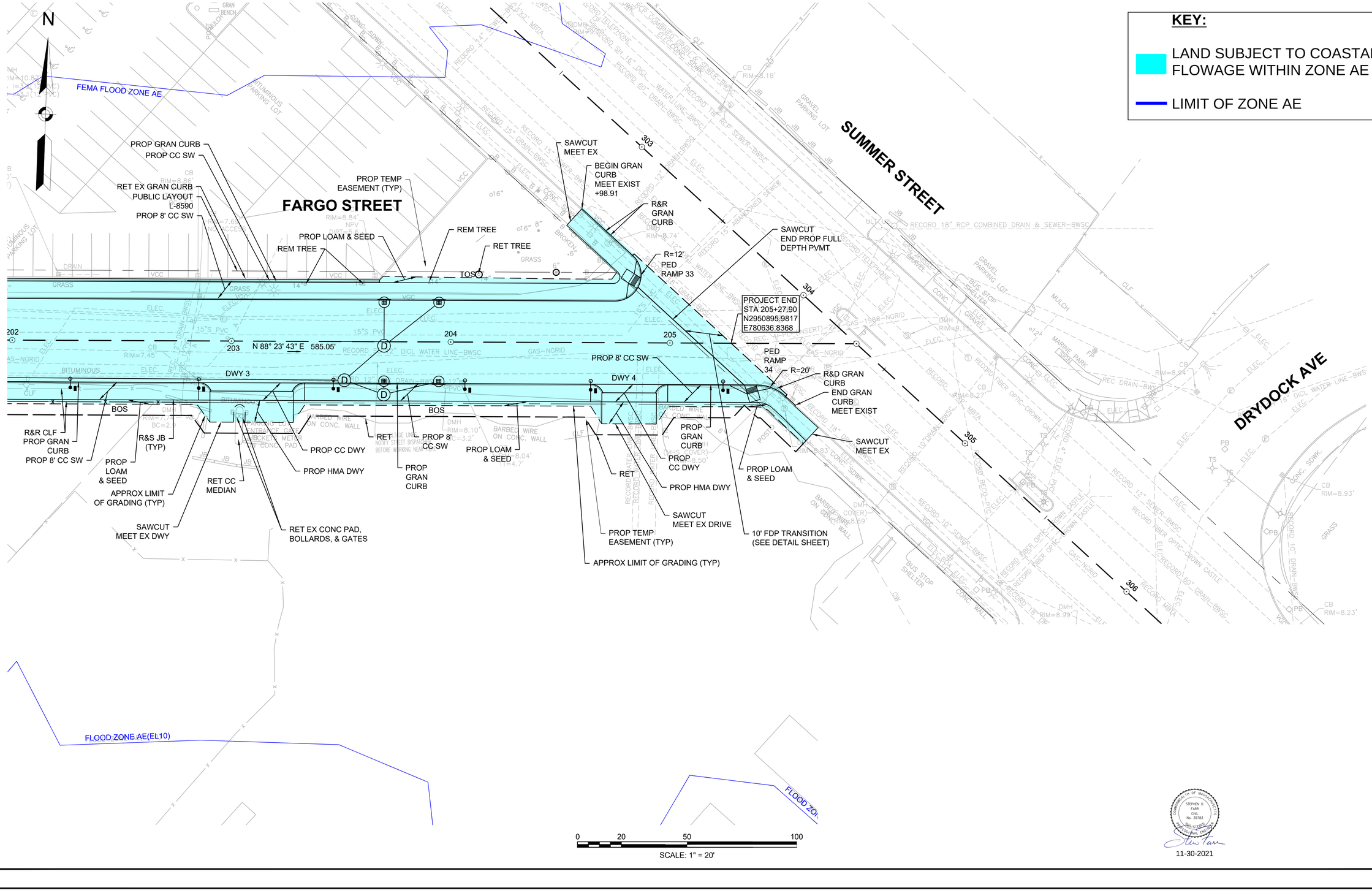
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	26	165
PROJECT FILE NO.	608807		

CONSTRUCTION PLANS

KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE



11-30-2021

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Nitsch Engineering

STORMWATER REPORT

Complies with Department of Environmental Protection Stormwater Standards

NITSCH PROJECT #9720.17

Project Name:	Cypher Street Reconstruction
Project Location:	Cypher Street, E Street, Fargo Street, Summer Street South Boston Bypass Road – Boston, MA
Prepared for:	City of Boston
MassDOT Project #:	#608807
Nitsch Project #:	9720.17
Date Prepared:	November 11, 2021

COMMONWEALTH OF MASSACHUSETTS
MATTHEW J. SOLTYS
CIVIL
No. 53326
REGISTERED PROFESSIONAL ENGINEER
11/12/2021

ATTACHMENTS

Attachment A: **Precipitation and Stormwater Management Standards Documentation**

MassDEP Checklist for Stormwater Report
Standard 10: Illicit Discharge Compliance Statement

Attachment B: **Closed Drainage System Design**
Drainage Plans & Catchment Areas – Cypher St Extension
Drainage Analyses
TSS Removal Calculation Worksheets (Form S4-C)

Attachment C: **Long-Term Pollution Prevention-Stormwater Operation and Maintenance Plan**

Attachment D: **Soil Investigations - NRCS Soil Maps and Descriptions**
Boring Logs

Introduction:	Nitsch Engineering has prepared this Stormwater Report to support the Notice of Intent application for Roadway Improvements along Richards Street, South Boston Bypass, Cypher Street, D Street, E Street, and Fargo Street, with a new extension for Cypher Street (the Project) in Boston, MA. The scope of work within the project's limits will consist of roadway reconstruction which includes replacing existing pavement, installing bicycle facilities, signage, and sidewalks, and upgrading/modifying existing drainage and electric. The project is considered to be a redevelopment project under Standard 7 of the Stormwater Standards. The project will be modifying the existing roadway to improve safety by adding bicycle lanes and new sidewalks within the project limits. A portion of the project is also considered a limited project under the Wetlands Protection Act (maintenance and improvement of existing public roadways).
EXISTING STORMWATER CONDITIONS	
Existing Drainage Infra-structure:	The existing drainage system along Cypher Street is a closed drainage system that collects runoff from the roadway into a series of catch basins. From the intersection with C Street and Cypher Street to the intersection of D Street and Cypher Street, runoff is collected in a series of catch basins that outlet to Boston Harbor. E Street also has a closed drainage system that collects runoff from the roadway into a series of catch basins that outlet to Boston Harbor. Currently there are no water quality BMPs or Water Quality Structures on the site other than deep sumps in some of the existing structures. Most of the existing drainage structures do not have deep sumps/hoods. Along the existing land that is proposed to be Cypher Street Extension, stormwater sheet flows along the existing gravel/dirt lot. There is no closed drainage system or BMPs.
On-site Soil Investigations	Soil Testing has been completed for traffic mast arms in the project area. Borings logs are attached. (Attachment D) Boring logs typically found the soils to be urban fill to a depth of about 10-14 feet over clay soils. Groundwater is typically found at a depth of 8-feet. TetraTech conducted a soil report for the Project site in September 2019 that found potential hazardous soil along the length of the Project. To prevent further contamination, excavation of the existing soil will be limited during construction.
NRSC Soils:	Based on NRCS information, hydraulic soil information was not available. The soils were classified by NRCS as: • Urban land, wet substratum – 77% of project area • Udorthents, wet substratum – 23% of project area See **Attachment D** for locations of soil on the site.
FEMA Flood Zone:	Based on the FEMA Flood Insurance Rate Maps for Boston (Community Panel Numbers 25025C0081J and 25025C0083J), part of the Project site is located within Land Subject to Coastal Storm Flowage including the 100-year floodplain with a flood elevation of Elevation 10 NAVD (16.46 BCB). The two areas within Land Subject to Coastal Storm Flowage are Richards Street, S Boston Bypass, the western end of Cypher Street, and Fargo Street. The total area disturbed within Land Subject to Coastal Flowage is 125,840 SF.

Wetland Resource Areas:	The project area limits do not encroach upon any wetland resource areas other than floodplain. A Notice of Intent is being filed with the Boston Conservation Commission for work within Land Subject to Coastal Storm Flowage associated with the FEMA Zone AE.
Proposed Conditions	
Project Description:	The project's purpose is to enhance safety and mobility for all modes of transportation. The Massachusetts Department of Transportation (MassDOT) is proposing vehicular safety and mobility improvements along Richards Street, South Boston Bypass, Cypher Street, D Street, E Street, and Fargo Street. New sidewalks and bicycle accommodations are proposed along Cypher Street. Full depth pavement reconstruction is proposed for Cypher Street and its extension. Richards Street, South Boston Bypass, D Street, E Street, and Fargo Street are proposed to be milled and overlayed. Drainage and electric modifications are also proposed within the project limits. The proposed project improvements include the following: • Reconstruct roadways with a new full depth pavement structure on Cypher Street and resurfacing the rest of the Project • Minor widening along roadways as necessary to provide bicycle accommodations • Resurface the roadway, reset curb, modify drainage and electric infrastructure within the Project limits • Construct Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) compliant accessible sidewalks and pedestrian ramps to improve pedestrian accommodations along the Project • Restored vegetated areas with loam and seed mix. • Install new traffic signage & striping • Extension of Cypher Street via a new full depth roadway to connect D Street and E Street • Raised planter beds along Cypher Street, where applicable The existing drainage system is being retained and modified to accommodate the proposed improvements. Existing catch basins will be adjusted to meet the roadway edge or replaced with a new catch basin. Existing catch basin to catch basin connections are proposed to be removed where new drainage structures are proposed to improve water quality. Deep sump catch basins with hoods are proposed for all new structures and will replace all existing catch basins being removed along the project.
Land Use Table:	The Project proposes roadway reconstruction to Cypher Street, E Street, South Boston Bypass Road, Fargo Street, and Summer Street including new hot mix asphalt and minor widening. To comply with MassDOT Healthy Transportation initiatives, new sidewalks and bicycle accommodations are proposed throughout the project limits. Along the majority of the project limits there are no existing pedestrian or bicycle accommodations. As shown in Table 1, there is a decrease in the total pervious area of ~19% of the total project area. The decrease is primarily from two major improvements: the construction of Cypher Street Extension, and roadway widening and sidewalk construction. The project proposes consistent lane and shoulder widths to provide a consistent cross section. The Project also proposes new sidewalks and bicycle accommodations. These geometric changes to Cypher Street, E Street, South Boston

Land Use Table: (Continued)

Bypass Road, Fargo Street, and Summer Street result in the increase in impervious areas, as shown in Table 3. The total roadway reconstruction length is ~4,700 feet. The average increase due to the widened width for roadway, sidewalks, and bicycle lanes is 4-feet.

Cypher Street Extension is a new proposed roadway over an existing dirt/gravel area. The decrease in pervious area for the entire project is mostly due to the addition of ~500 feet of Cypher Street Extension. Cypher Street Extension is currently a gravel/dirt parking lot area, considered to be pervious area. The land cover change for Cypher Street Extension is shown in Table 2.

Table 1. Existing and proposed land cover type for the Project

Land Use	Existing (SF)	Proposed (SF)	Change
Site Pervious Area	83,729	19,602	-64,127
Site Impervious Area	254,028	318,155	64,127
Total	337,757	337,757	---

Table 2. Existing and proposed land cover type for Cypher Street Extension

Land Use	Existing (SF)	Proposed (SF)	Change
Impervious	12,370	26,170	+13,800
Pervious	21,362	7,562	-13,800
Total	33,732	33,732	---

Table 3. Proposed change in impervious land cover for the Project

Land Use	Proposed (SF)
Roadway/Sidewalk	50,327
Cypher St Extension	13,800
Total Increase in Impervious Area	64,127

Stormwater Management System

Minor drainage improvements are proposed throughout the project to accommodate the new roadway alignment. New catch basins are proposed along the proposed roadway edges that will connect to the existing closed drainage system. Existing structures are proposed to be maintained where feasible. Deep sump catch basins are proposed for new inlet structures.

Deep Sump Catch Basins

Deep sump basins are proposed at various locations to provide pretreatment in the impervious areas of the roadway. Stormwater captured in the catch basins along the Project will be directed to the existing closed drainage system. Catch basins are proposed along Cypher Street Extension, connecting the existing closed drainage system at E Street.

Stormwater Management During Construction	The Contractor will be responsible for stormwater management of the active construction site and is required to adhere to the conditions of the 2017 Construction General Permit under the Environmental Protection Agency (through the preparation and implementation of a SWPPP).

Stormwater Management Analysis

Stormwater Analysis	The proposed improvements provide an opportunity to improve the stormwater management system, where feasible, to meet the MassDEP Stormwater Management Standards to the maximum extent practicable Although there is an increase in impervious area due to construction of Cypher Street Extension and roadway widening/sidewalks, the Project proposes to improve the overall drainage system by installing new deep sump catch basins. The project is considered to be a redevelopment project under Standard 7 of the Stormwater Standards. The project will be modifying the existing roadway to improve safety by adding bicycle lanes and new sidewalks within the project limits The Project is constrained by lack of space (existing ROW, close proximity of buildings, urban context, flat topography), urban soils, hazardous soils, and existing utilities within the roadway.
Closed Drainage System:	The proposed closed drainage system consists of deep sump catch basins and drainage manholes, connected with reinforced concrete pipe. Minor drainage improvements are proposed throughout the project to accommodate the new roadway alignment. New catch basins are proposed along the proposed roadway edges that will connect to the existing closed drainage system. Existing structures are proposed to be maintained where feasible. Additional catch basins are provided at low points and at on-grade locations to improve drainage patterns. Deep sump catch basins are proposed for new inlet structures. The new roadway being built as Cypher Street Extension is proposed to have a new closed drainage system that flows southerly to E Street. The closed drainage system is proposed to tie into the existing 36-inch drainage pipe within E Street at an existing manhole structure. The closed drainage system along Cypher Street Extension was designed to convey the 10-year storm event using the Rational method, as required by MassDOT. The new roadway will add the following peak rates to the closed drainage system at E Street: Table 4. Proposed peak rates in cubic feet per second (cfs) for Cypher Street Extension

Storm Event	Proposed Peak Flow (cfs)
10-Year	2.95
25-Year	3.23
100-Year	3.99

The existing closed drainage system on E Street is a 36-inch pipe that has a peak rate capacity of ~40 CFS, equating to a ~10% increase in the peak flow under the 100-year storm event.

<table>
<tr><th colspan="2">MASSDEP Stormwater Management Standards</th></tr>
<tr><td>Standard 1</td><td>No New Untreated Discharges: The Project will not create any new untreated outfalls as part of the proposed improvements. Stormwater from the Site will be collected and treated to the maximum extent practicable.</td></tr>
<tr><td>Standard 2</td><td>Peak Rate Attenuation: The proposed stormwater management system was designed to limit peak attenuation rate, however, due to increase in impervious areas the post-development peak discharge rates do exceed pre-development peak discharge rates for the project.

In addition, the stormwater ultimately discharges to Land Subject to Coastal Storm Flowage, and therefore, this Standard may be waived.

The project proposes to restore the natural vegetation with new loam and seed areas, where feasible. Raised planter beds are proposed along Cypher Street, where feasible. The project proposes to enhance the existing roadway by providing new pavement structure including new gravel base, and new hot mix asphalt. The existing roadway is in poor condition and in locations has no proper shoulders/edge. The Project proposes to establish a well-defined shoulder and install curb where appropriate. The Project also proposes new sidewalks and bicycle lanes to comply with MassDOT’s Healthy Transportation Initiatives. Portions of the project limits currently have no pedestrian/bicycle accommodations. These proposed accommodations also contribute to the increase in impervious area. Refer to the table below for a pre- and post-development peak runoff rate comparison. From the tables, the overall project peak rate is being increased by ~12% (100-year storm), which is due to the increase in impervious area from the additional sidewalks/roadway. Per Standard 7, this project shall comply with this standard to the maximum extent practicable.

Table 5. Proposed vs Existing peak rates in cubic feet per second (cfs) for entire project area

<table>
<tr><th>Storm Event</th><th>Existing (cfs)</th><th>Proposed (cfs)</th></tr>
<tr><td>2-Year</td><td>21.68</td><td>32.55</td></tr>
<tr><td>10-Year</td><td>42.53</td><td>53.29</td></tr>
<tr><td>100-Year</td><td>76.30</td><td>85.81</td></tr>
</table>

Cypher Street Extension is a proposed new roadway in an existing gravel/dirt area. The peak attenuation rates are shown in Table 6 below. There is no increase in the peak rate attenuation for the new roadway being constructed as Cypher Street Extension, as the existing compacted gravel area has a high runoff coefficient. This complies with Standard 2. Additional closed drainage analyses were also performed for Cypher Street Extension to verify pipe sizes.</td></tr>
</table>

<table>
<tr><td>Standard 2 (Continued)</td><td>Table 6. Proposed vs Existing peak rates for Cypher Street Extension in cubic feet per second (cfs)
<table><tr><th>Storm Event</th><th>Existing (cfs)</th><th>Proposed (cfs)</th></tr><tr><td>2-Year</td><td>2.53</td><td>2.34</td></tr><tr><td>10-Year</td><td>4.64</td><td>4.44</td></tr><tr><td>100-Year</td><td>7.98</td><td>7.79</td></tr></table></td></tr>
<tr><td>Standard 3</td><td>Groundwater Recharge: The project will meet Standard 3 to the Maximum Extent Practicable. Since this is a redevelopment project, the project will maintain the existing closed drainage system with new deep sump catch basins. Due to existing flat topography, proximity of adjacent buildings, urban context, and other existing features, no new groundwater recharge is proposed. The Project proposes to enhance the natural vegetation with establishment of loam and seed areas, where feasible. BMPs were evaluated during design but due to site constraints, urban context, hazardous soils, flat topography, including Right-Of-Way, they are not feasible. The project proposes to limit the amount of excavation to reduce the impact to hazardous soils. The project proposes to construct raised planter beds along the edge of Cypher Street to promote landscaping.</td></tr>
<tr><td>Standard 4</td><td>Water Quality Treatment:
The project will meet Standard 4 to the maximum extent practicable. Due to existing urban flat topography, proximity to buildings, hazardous soils, urban fill, elevation of groundwater, and other existing features, new water quality treatment opportunities are limited. Pretreatment will be provided using deep sump catch basins (25% TSS removal). The closed drainage system along the Site is being pretreated by deep sump catch basins prior to its outlet locations. The 31 proposed deep sump catch basins provide 25% TSS Removal. Water Quality Devices were evaluated during design but due to available Right of Way, flat topography, groundwater levels, hazardous soils, urban fill, and urban context, they are not feasible. The project proposes an improvement in water quality over the existing condition which is sheet flow over the dirt/gravel lot. A grass swale is proposed at the northwest corner of Cypher Street Extension and E street to capture overland sheet flow from the adjacent properties. This swale will only capture runoff from the adjacent land and due to elevations, and high groundwater, is not feasible for a pre-treatment of roadway runoff.

Source control and pollution prevention measures are included in the Long-Term Pollution Prevention Plan and Operation and Maintenance Plan (Attachment C).

Per Standard 7, this project shall comply with this standard to the maximum extent practicable.

MassDEP Standard 4 Form S4-C TSS Calculation Sheet is included within Attachment B.</td></tr>
<tr><td>Standard 5</td><td>Water Quality Treatment - Land Uses with Higher Potential Pollutant Loads (LUHPPLs): The project is not considered a LUHPPL (>1000 trips per day) since it is a roadway reconstruction project. This standard does not apply to this project.</td></tr>
<tr><td>Standard 6</td><td>Critical Areas: There are no critical areas adjacent to the project; therefore, Standard 6 does not apply to this project.</td></tr>
</table>

Standard 7	**Redevelopments:** The Project is considered to be a redevelopment under the MassDEP Stormwater Management Standards, since it is an improvement of an existing roadway that does not widen more than a lane, adds shoulders, and improves the existing drainage system. Therefore, the Project proposes to meet standards to the maximum extent practicable.
Standard 8	**Construction Period Pollution Prevention and Sedimentation Control:** The Project Contractor will be responsible for stormwater management of the active construction site and is required to adhere to the conditions of the 2017 Construction General Permit under the Environmental Protection Agency (through the preparation and implementation of a SWPPP). The SWPPP, which is to be kept on site, includes erosion and sediment controls (stabilization practices and structural practices), temporary and permanent stormwater management measures, Contractor inspection schedules and reporting of all SWPPP features, materials management, waste disposal, off-site vehicle tracking, spill prevention and response, sanitation, and non-stormwater discharges. A draft SWPPP will be submitted to the Commission prior to the start of construction.
Standard 9	**Operation and Maintenance Plan:** A post-construction operation and maintenance plan has been prepared and will be implemented to ensure that stormwater management systems function as designed. Source control and stormwater BMP operation requirements for the Site are summarized in the Long-Term Pollution Prevention Plan and Operation and Maintenance Plan provided in **Attachment C**.
Standard 10	**Prohibition of Illicit Discharges:** There will be no illicit discharges to the stormwater management system associated with the Project. An Illicit Discharge Compliance Statement is provided in **Attachment A**.

Conclusion

In conclusion, the Project's stormwater management system will improve the water quality of stormwater being discharged from the Site to maximum extent practicable. The project proposes to add a significant number of new drainage structures and to capture and treat stormwater runoff. The Project is being designed to meet the MassDEP Stormwater Management Standards to the maximum extent practicable.

ATTACHMENT A

Stormwater Management Standards Documentation

MassDEP Checklist for Stormwater Report

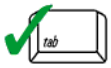
Standard 10: Illicit Discharge Compliance Statement

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

---

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature

11-12-2021

Signature and Date

Checklist

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

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

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

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

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

Standard 9: Operation and Maintenance Plan

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

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

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

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

Standard 10: Prohibition of Illicit Discharges

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

☒ An Illicit Discharge Compliance Statement is attached;

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

Nitsch Engineering

2 Center Plaza, Suite 430
Boston, MA 02108-1928
T: 617-338-0063
F: 617-338-6472
www.nitscheng.com

STANDARD 10: Illicit Discharge Compliance Statement

Project Name: Cypher Street Roadway Improvements Project	Nitsch Project #: 9720.17
Location: Cypher Street, E Street, Fargo Street, Summer Street – Boston, MA	MassDOT Project #: 608807
Prepared by: MJS	Sheet No. 1 of 1
Date: November 12, 2021	

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

This is to verify:

1. Based on the information available there are no known or suspected illicit discharges to the stormwater management system on Cypher Street, E Street, Fargo Street, or Summer Street as defined in the MassDEP Stormwater Handbook.

2. The design of the stormwater system includes no proposed illicit discharges.

Matthew Soltys, PE, ENV SP, RSP

11-12-2021
Date

ATTACHMENT B

Closed Drainage System Design

Drainage Plans
HydroCAD Analyses

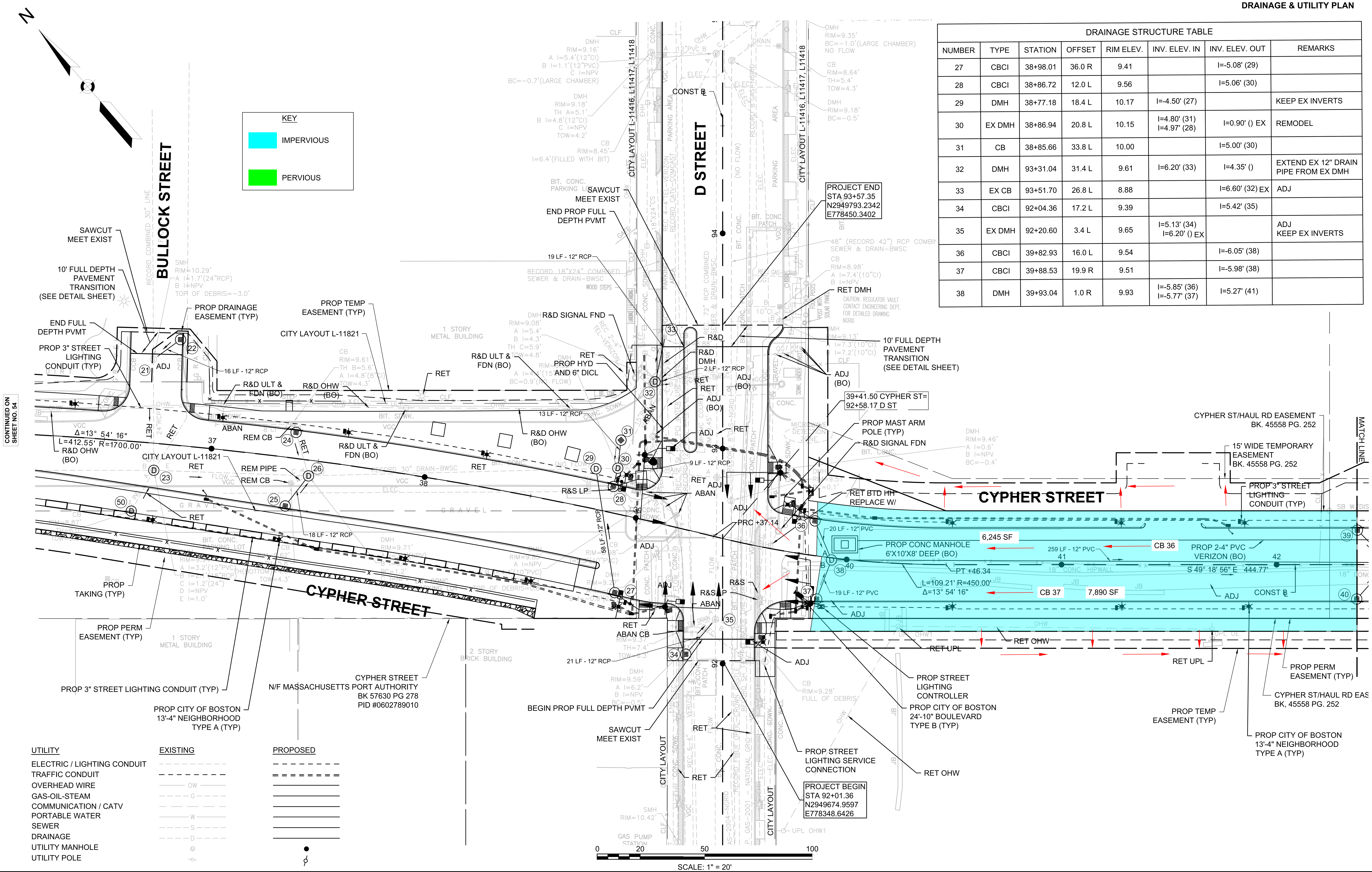
BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	55	139
PROJECT FILE NO.		608807	

DRAINAGE & UTILITY PLAN

DRAINAGE STRUCTURE TABLE

NUMBER	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
27	CBCI	38+98.01	36.0 R	9.41		I=-5.08' (29)	
28	CBCI	38+86.72	12.0 L	9.56		I=5.06' (30)	
29	DMH	38+77.18	18.4 L	10.17	I=-4.50' (27)		KEEP EX INVERTS
30	EX DMH	38+86.94	20.8 L	10.15	I=4.80' (31) I=4.97' (28)	I=0.90' () EX	REMODEL
31	CB	38+85.66	33.8 L	10.00		I=5.00' (30)	
32	DMH	93+31.04	31.4 L	9.61	I=6.20' (33)	I=4.35' ()	EXTEND EX 12" DRAIN PIPE FROM EX DMH
33	EX CB	93+51.70	26.8 L	8.88		I=6.60' (32) EX	ADJ
34	CBCI	92+04.36	17.2 L	9.39		I=5.42' (35)	
35	EX DMH	92+20.60	3.4 L	9.65	I=5.13' (34) I=6.20' () EX		ADJ KEEP EX INVERTS
36	CBCI	39+82.93	16.0 L	9.54		I=-6.05' (38)	
37	CBCI	39+88.53	19.9 R	9.51		I=-5.98' (38)	
38	DMH	39+93.04	1.0 R	9.93	I=-5.85' (36) I=-5.77' (37)	I=5.27' (41)	

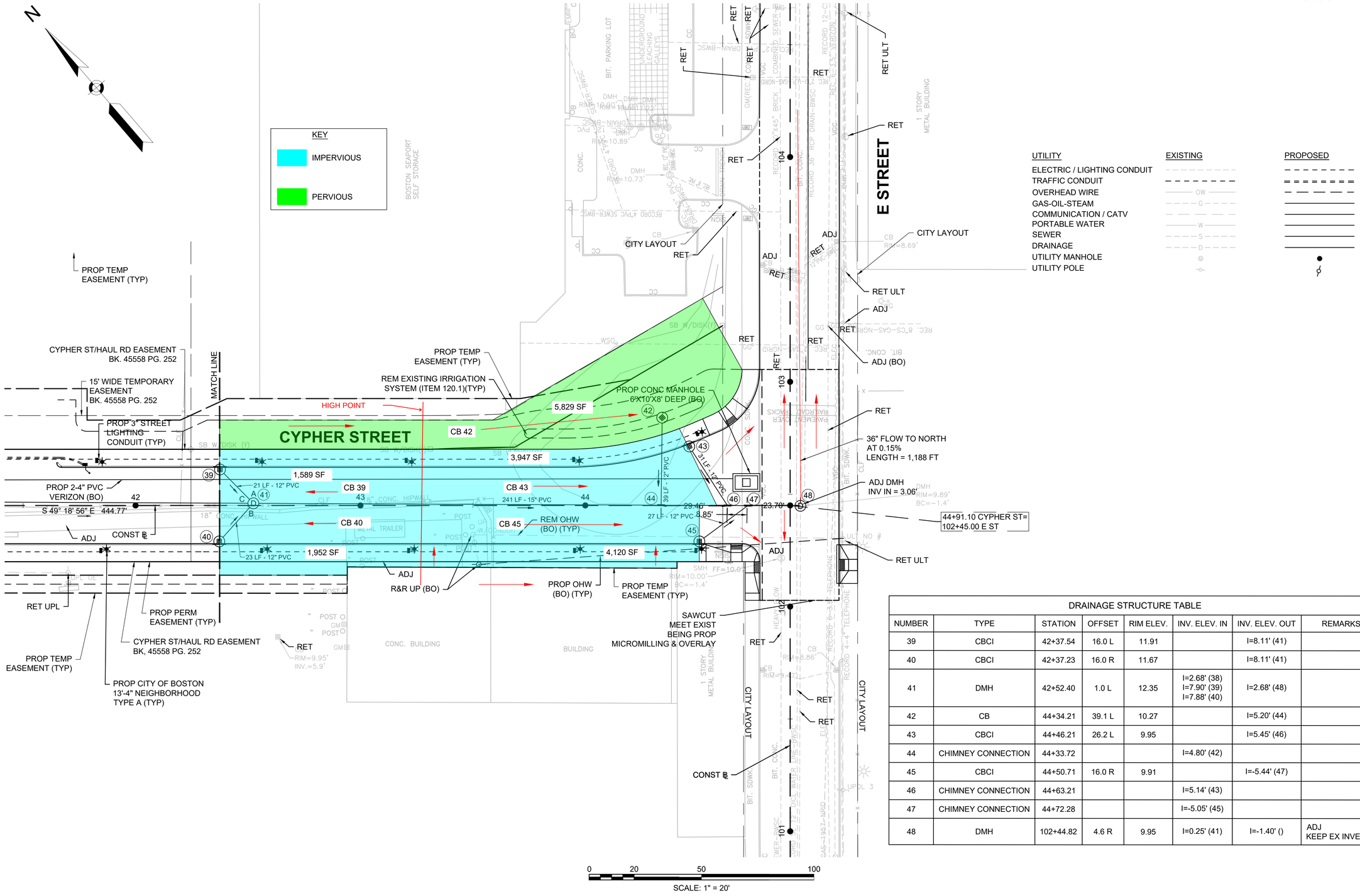


KEY
IMPERVIOUS
PERVIOUS
BULLOCK STREET
D STREET
CYPHER STREET
CITY LAYOUT L-11821
CITY LAYOUT L-11416, L11417, L11418
PROJECT END STA 93+57.35 N2949793.2342 E778450.3402
PROJECT BEGIN STA 92+01.36 N2949674.9597 E778348.6426
39+41.50 CYPHER ST= 92+58.17 D ST
6,245 SF
7,890 SF
CB 36
CB 37
PROP CONC MANHOLE 6'X10'X8' DEEP (BO)
PROP 2-4" PVC VERIZON (BO)
259 LF - 12" PVC
S 49° 18' 56" E 444.77'
L=109.21' R=450.00' Δ=13° 54' 16"
Δ=13° 54' 16" L=412.55' R=1700.00'
CYPHER ST/HAUL RD EASEMENT BK. 45558 PG. 252
15' WIDE TEMPORARY EASEMENT BK. 45558 PG. 252
CYPHER STREET N/F MASSACHUSETTS PORT AUTHORITY BK 57630 PG 278 PID #0602789010
PROP CITY OF BOSTON 13'-4" NEIGHBORHOOD TYPE A (TYP)
PROP CITY OF BOSTON 24'-10" BOULEVARD TYPE B (TYP)
PROP 3" STREET LIGHTING CONDUIT (TYP)
10' FULL DEPTH PAVEMENT TRANSITION (SEE DETAIL SHEET)
SAWCUT MEET EXIST
END PROP FULL DEPTH PVMT
BEGIN PROP FULL DEPTH PVMT
PROP DRAINAGE EASEMENT (TYP)
PROP TEMP EASEMENT (TYP)
PROP PERM EASEMENT (TYP)
PROP TAKING (TYP)
PROP STREET LIGHTING CONTROLLER
PROP STREET LIGHTING SERVICE CONNECTION
PROP MAST ARM POLE (TYP)
MATCH LINE
CONTINUED ON SHEET NO. 54
CONTINUED ON SHEET NO. 56
UTILITY
EXISTING
PROPOSED
ELECTRIC / LIGHTING CONDUIT
TRAFFIC CONDUIT
OVERHEAD WIRE
GAS-OIL-STEAM
COMMUNICATION / CATV
PORTABLE WATER
SEWER
DRAINAGE
UTILITY MANHOLE
UTILITY POLE
SCALE: 1" = 20'

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	56	139
PROJECT FILE NO.	608807		

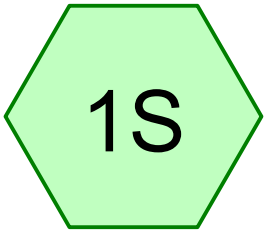
DRAINAGE & UTILITY PLAN



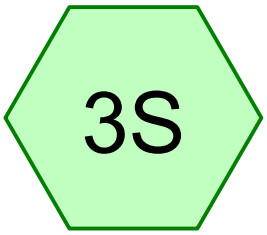
UTILITY	EXISTING	PROPOSED
ELECTRIC / LIGHTING CONDUIT		
TRAFFIC CONDUIT		
OVERHEAD WIRE	OW	
GAS-OIL-STEAM	G	
COMMUNICATION / CATV		
PORTABLE WATER	W	
SEWER	S	
DRAINAGE	D	
UTILITY MANHOLE		
UTILITY POLE		

DRAINAGE STRUCTURE TABLE

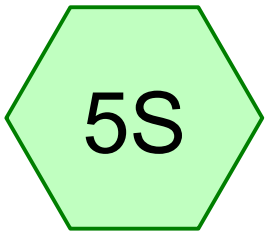
NUMBER	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
39	CBCI	42+37.54	16.0 L	11.91		I=8.11' (41)	
40	CBCI	42+37.23	16.0 R	11.67		I=8.11' (41)	
41	DMH	42+52.40	1.0 L	12.35	I=2.68' (38) I=7.90' (39) I=7.88' (40)	I=2.68' (48)	
42	CB	44+34.21	39.1 L	10.27		I=5.20' (44)	
43	CBCI	44+46.21	26.2 L	9.95		I=5.45' (46)	
44	CHIMNEY CONNECTION	44+33.72			I=4.80' (42)		
45	CBCI	44+50.71	16.0 R	9.91		I=-5.44' (47)	
46	CHIMNEY CONNECTION	44+63.21			I=5.14' (43)		
47	CHIMNEY CONNECTION	44+72.28			I=-5.05' (45)		
48	DMH	102+44.82	4.6 R	9.95	I=0.25' (41)	I=-1.40' ()	ADJ KEEP EX INVERTS



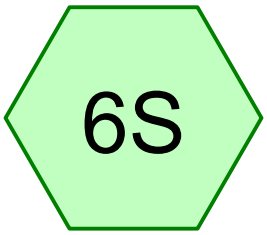
EXIST-SITE



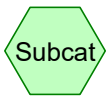
EXIST-CYPHER EXT

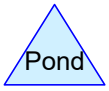


PROP SITE



PROP CYPHER EXT





Routing Diagram for PEAK RATES
Prepared by NITSCH ENGINEERING, Printed 11/11/2021

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 YEAR	Type II 24-hr		Default	24.00	1	3.22	2
2	10 YEAR	Type II 24-hr		Default	24.00	1	5.09	2
3	100 YEAR	Type II 24-hr		Default	24.00	1	8.06	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.540	39	>75% Grass cover, Good, HSG A (1S, 5S, 6S)
0.770	87	Dirt roads, HSG C (3S)
13.730	98	Paved roads w/curbs & sewers, HSG A (1S, 5S, 6S)
17.040	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
16.270	HSG A	1S, 5S, 6S
0.000	HSG B	
0.770	HSG C	3S
0.000	HSG D	
0.000	Other	
17.040		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
2.540	0.000	0.000	0.000	0.000	2.540	>75% Grass cover, Good	1S, 5S, 6S
0.000	0.000	0.770	0.000	0.000	0.770	Dirt roads	3S
13.730	0.000	0.000	0.000	0.000	13.730	Paved roads w/curbs & sewers	1S, 5S, 6S
16.270	**0.000**	**0.770**	**0.000**	**0.000**	**17.040**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EXIST-SITE Runoff Area=7.750 ac 75.23% Impervious Runoff Depth>1.50"
Tc=6.0 min CN=83 Runoff=21.68 cfs 0.967 af

Subcatchment3S: EXIST-CYPHER EXT Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>1.79"
Tc=6.0 min CN=87 Runoff=2.53 cfs 0.115 af

Subcatchment5S: PROP SITE Runoff Area=7.750 ac 94.19% Impervious Runoff Depth>2.50"
Tc=6.0 min CN=95 Runoff=32.55 cfs 1.613 af

Subcatchment6S: PROP CYPHER EXT Runoff Area=0.770 ac 77.92% Impervious Runoff Depth>1.64"
Tc=6.0 min CN=85 Runoff=2.34 cfs 0.105 af

Total Runoff Area = 17.040 ac Runoff Volume = 2.800 af Average Runoff Depth = 1.97"
19.42% Pervious = 3.310 ac 80.58% Impervious = 13.730 ac

Summary for Subcatchment 1S: EXIST-SITE

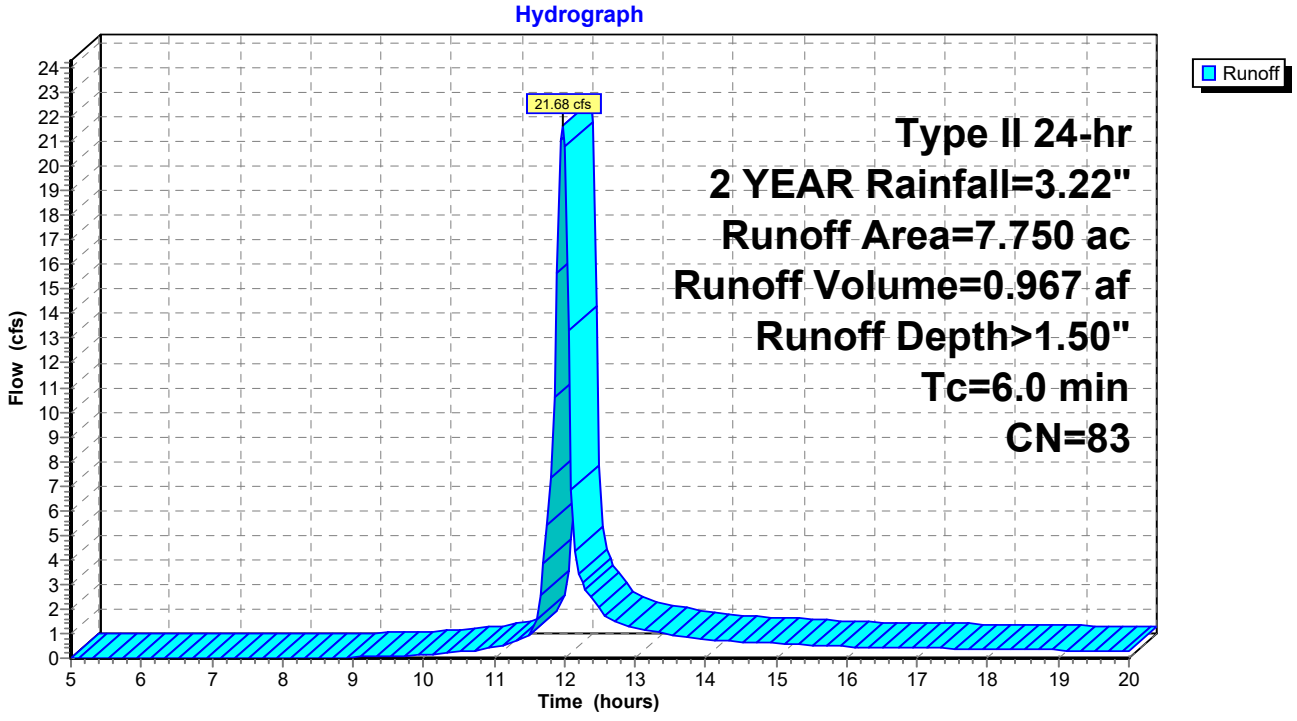
Runoff = 21.68 cfs @ 11.97 hrs, Volume= 0.967 af, Depth> 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=3.22"

Area (ac)	CN	Description
1.920	39	>75% Grass cover, Good, HSG A
5.830	98	Paved roads w/curbs & sewers, HSG A
7.750	83	Weighted Average
1.920		24.77% Pervious Area
5.830		75.23% Impervious Area

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

Subcatchment 1S: EXIST-SITE



Summary for Subcatchment 3S: EXIST-CYPHER EXT

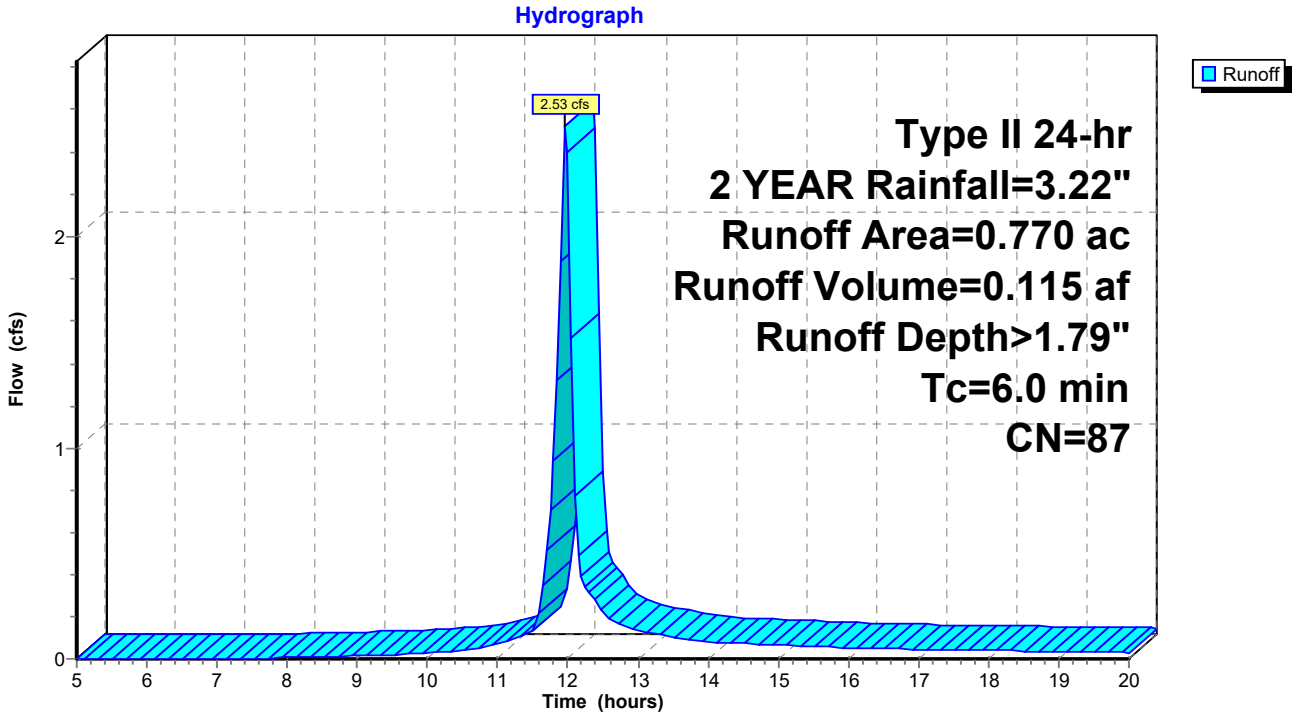
Runoff = 2.53 cfs @ 11.97 hrs, Volume= 0.115 af, Depth> 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=3.22"

Area (ac)	CN	Description
0.770	87	Dirt roads, HSG C
0.770		100.00% Pervious Area

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

Subcatchment 3S: EXIST-CYPHER EXT



Summary for Subcatchment 5S: PROP SITE

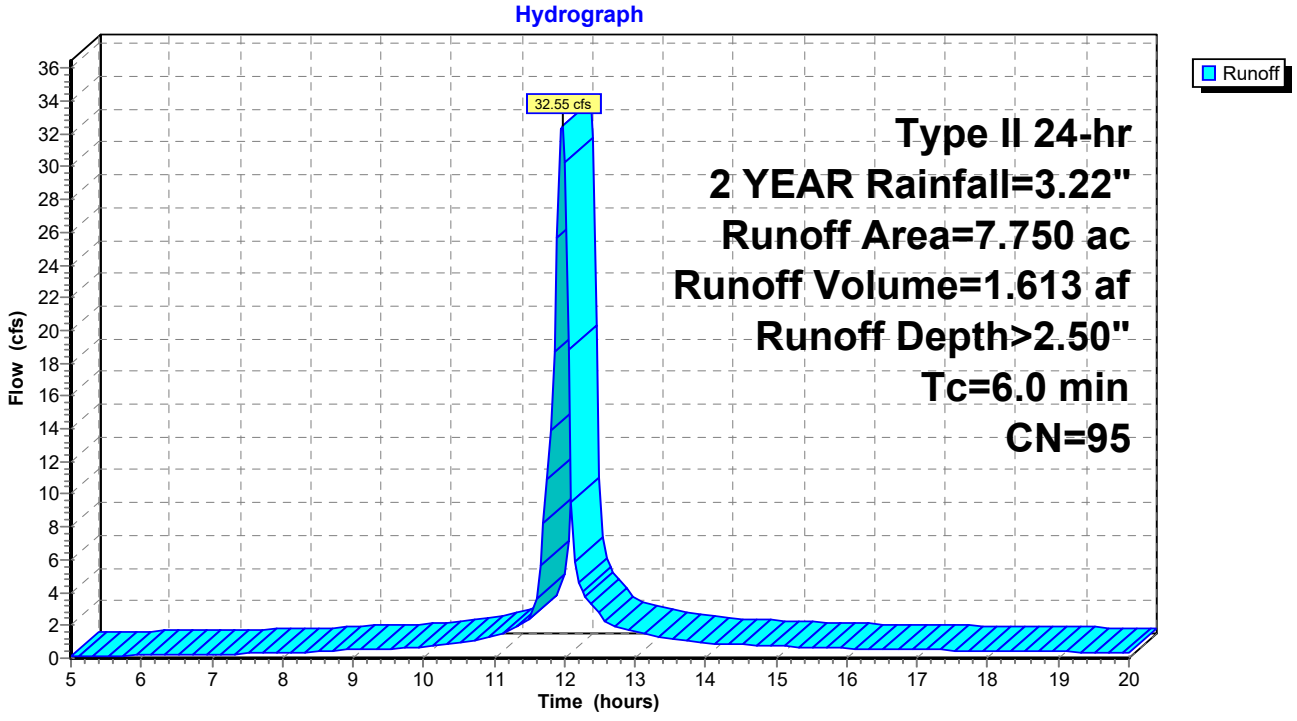
Runoff = 32.55 cfs @ 11.96 hrs, Volume= 1.613 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=3.22"

Area (ac)	CN	Description
0.450	39	>75% Grass cover, Good, HSG A
7.300	98	Paved roads w/curbs & sewers, HSG A
7.750	95	Weighted Average
0.450		5.81% Pervious Area
7.300		94.19% Impervious Area

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

Subcatchment 5S: PROP SITE



Summary for Subcatchment 6S: PROP CYPHER EXT

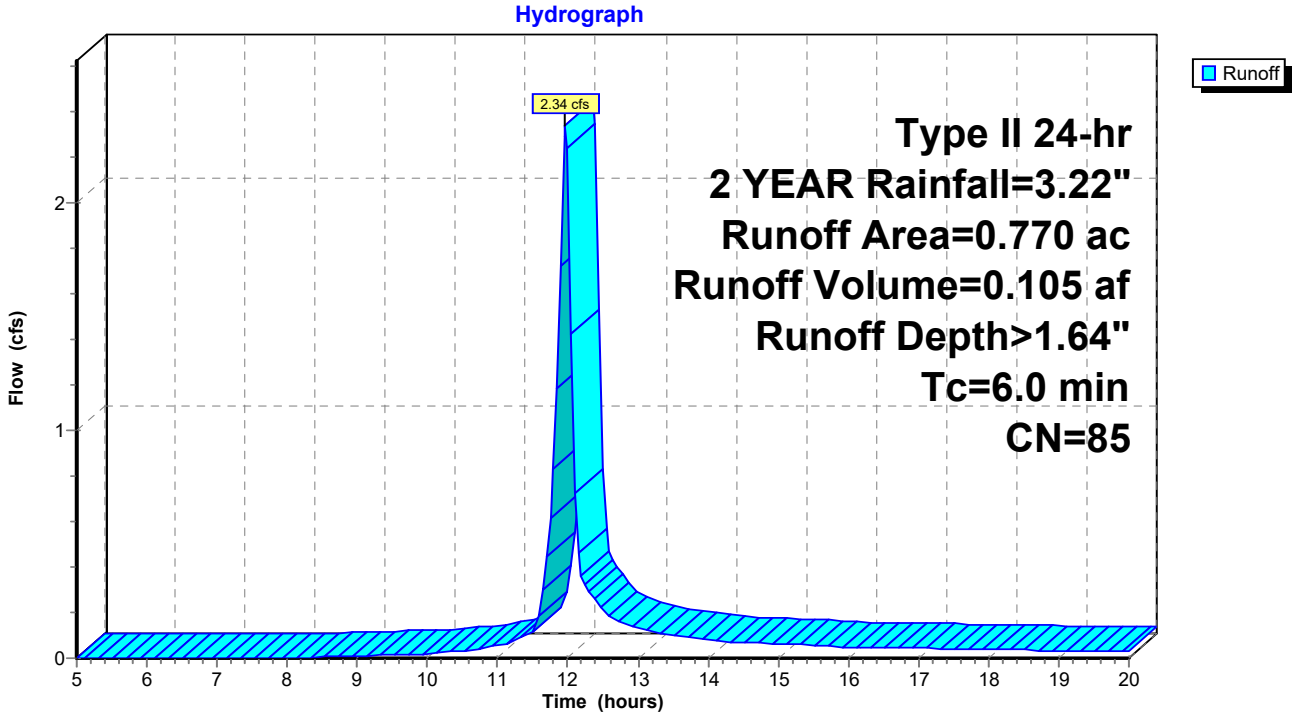
Runoff = 2.34 cfs @ 11.97 hrs, Volume= 0.105 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 YEAR Rainfall=3.22"

Area (ac)	CN	Description
0.600	98	Paved roads w/curbs & sewers, HSG A
0.170	39	>75% Grass cover, Good, HSG A
0.770	85	Weighted Average
0.170		22.08% Pervious Area
0.600		77.92% Impervious Area

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

Subcatchment 6S: PROP CYPHER EXT



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EXIST-SITE Runoff Area=7.750 ac 75.23% Impervious Runoff Depth>3.03"
Tc=6.0 min CN=83 Runoff=42.53 cfs 1.957 af

Subcatchment3S: EXIST-CYPHER EXT Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>3.42"
Tc=6.0 min CN=87 Runoff=4.64 cfs 0.219 af

Subcatchment5S: PROP SITE Runoff Area=7.750 ac 94.19% Impervious Runoff Depth>4.20"
Tc=6.0 min CN=95 Runoff=53.29 cfs 2.715 af

Subcatchment6S: PROP CYPHER EXT Runoff Area=0.770 ac 77.92% Impervious Runoff Depth>3.22"
Tc=6.0 min CN=85 Runoff=4.44 cfs 0.207 af

Total Runoff Area = 17.040 ac Runoff Volume = 5.099 af Average Runoff Depth = 3.59"
19.42% Pervious = 3.310 ac 80.58% Impervious = 13.730 ac

Summary for Subcatchment 1S: EXIST-SITE

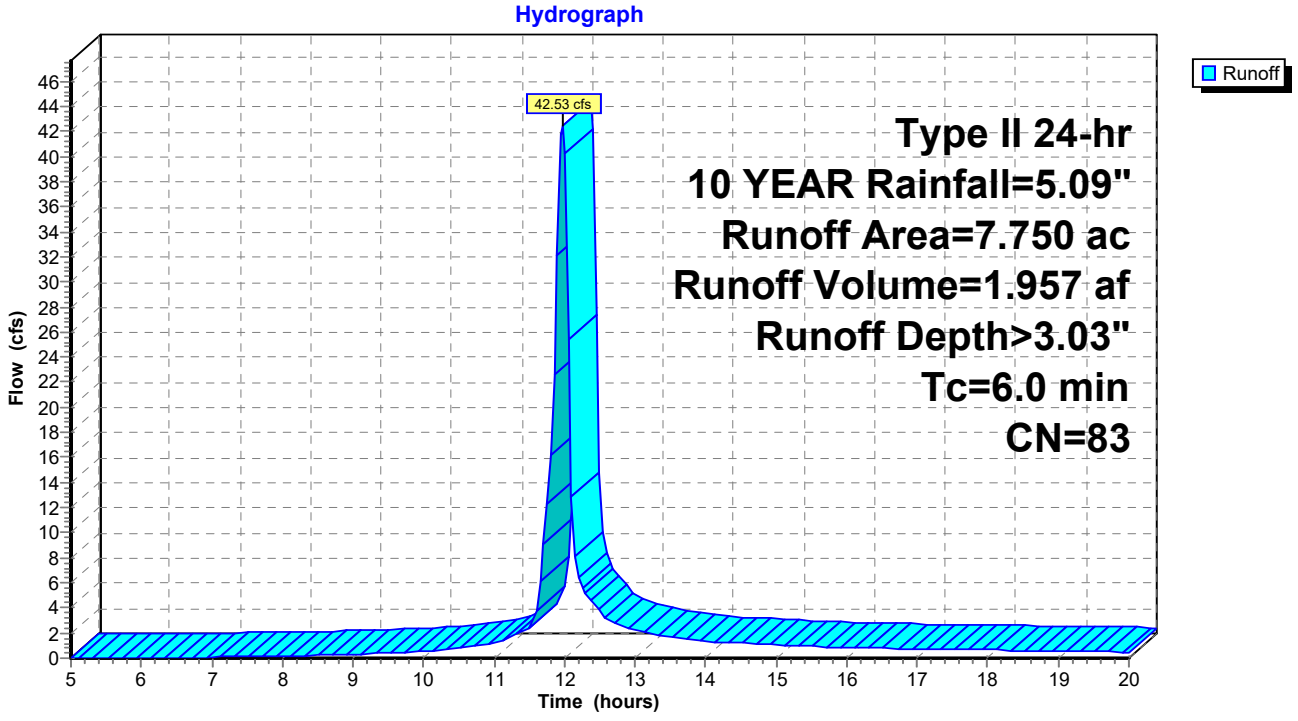
Runoff = 42.53 cfs @ 11.97 hrs, Volume= 1.957 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=5.09"

Area (ac)	CN	Description
1.920	39	>75% Grass cover, Good, HSG A
5.830	98	Paved roads w/curbs & sewers, HSG A
7.750	83	Weighted Average
1.920		24.77% Pervious Area
5.830		75.23% Impervious Area

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

Subcatchment 1S: EXIST-SITE



Summary for Subcatchment 3S: EXIST-CYPHER EXT

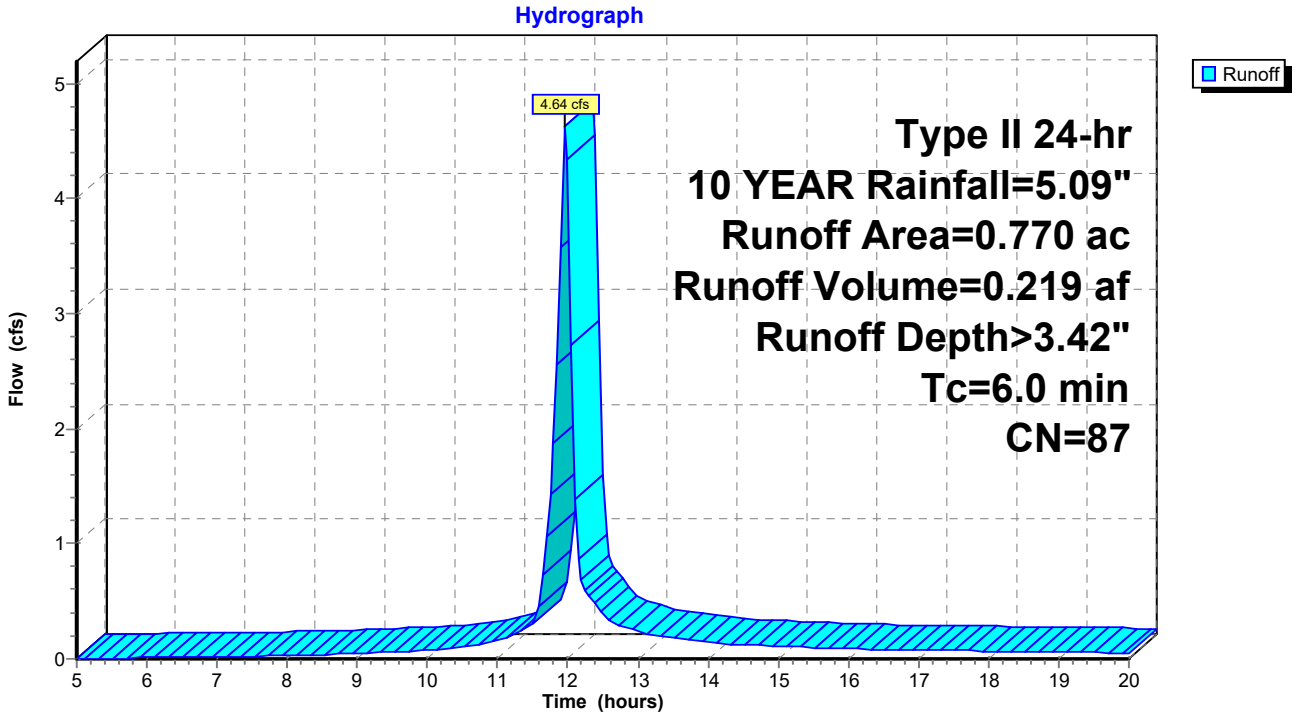
Runoff = 4.64 cfs @ 11.97 hrs, Volume= 0.219 af, Depth> 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=5.09"

Area (ac)	CN	Description
0.770	87	Dirt roads, HSG C
0.770		100.00% Pervious Area

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

Subcatchment 3S: EXIST-CYPHER EXT



Summary for Subcatchment 5S: PROP SITE

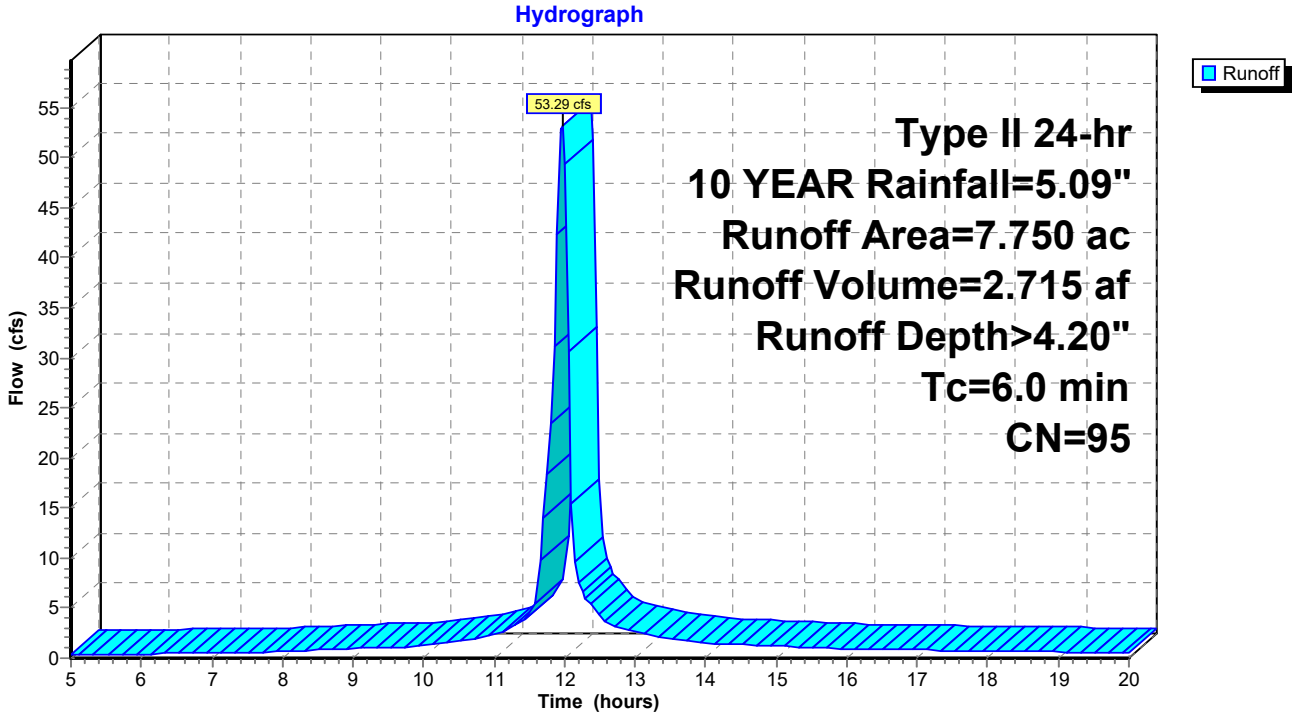
Runoff = 53.29 cfs @ 11.96 hrs, Volume= 2.715 af, Depth> 4.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=5.09"

Area (ac)	CN	Description
0.450	39	>75% Grass cover, Good, HSG A
7.300	98	Paved roads w/curbs & sewers, HSG A
7.750	95	Weighted Average
0.450		5.81% Pervious Area
7.300		94.19% Impervious Area

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

Subcatchment 5S: PROP SITE



Summary for Subcatchment 6S: PROP CYPHER EXT

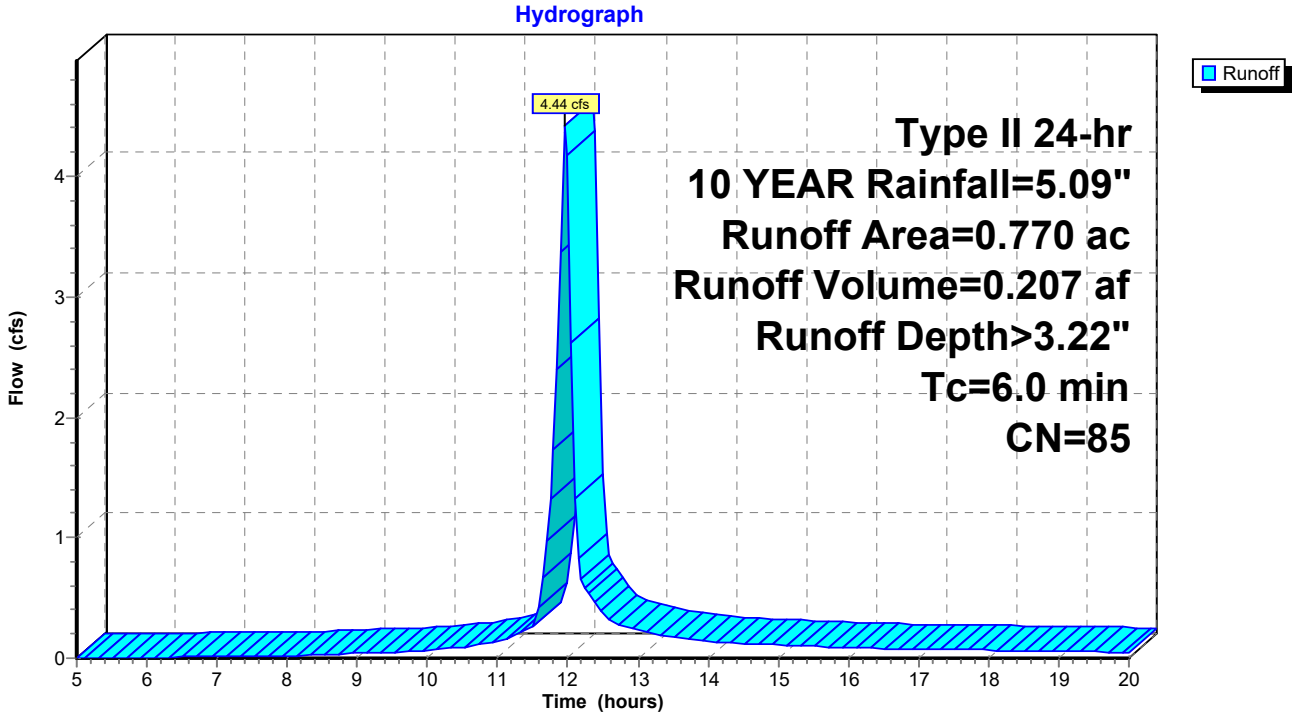
Runoff = 4.44 cfs @ 11.97 hrs, Volume= 0.207 af, Depth> 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 YEAR Rainfall=5.09"

Area (ac)	CN	Description
0.600	98	Paved roads w/curbs & sewers, HSG A
0.170	39	>75% Grass cover, Good, HSG A
0.770	85	Weighted Average
0.170		22.08% Pervious Area
0.600		77.92% Impervious Area

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

Subcatchment 6S: PROP CYPHER EXT



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: EXIST-SITE Runoff Area=7.750 ac 75.23% Impervious Runoff Depth>5.66"
Tc=6.0 min CN=83 Runoff=76.30 cfs 3.653 af

Subcatchment3S: EXIST-CYPHER EXT Runoff Area=0.770 ac 0.00% Impervious Runoff Depth>6.10"
Tc=6.0 min CN=87 Runoff=7.98 cfs 0.392 af

Subcatchment5S: PROP SITE Runoff Area=7.750 ac 94.19% Impervious Runoff Depth>6.90"
Tc=6.0 min CN=95 Runoff=85.81 cfs 4.459 af

Subcatchment6S: PROP CYPHER EXT Runoff Area=0.770 ac 77.92% Impervious Runoff Depth>5.88"
Tc=6.0 min CN=85 Runoff=7.79 cfs 0.377 af

Total Runoff Area = 17.040 ac Runoff Volume = 8.881 af Average Runoff Depth = 6.25"
19.42% Pervious = 3.310 ac 80.58% Impervious = 13.730 ac

Summary for Subcatchment 1S: EXIST-SITE

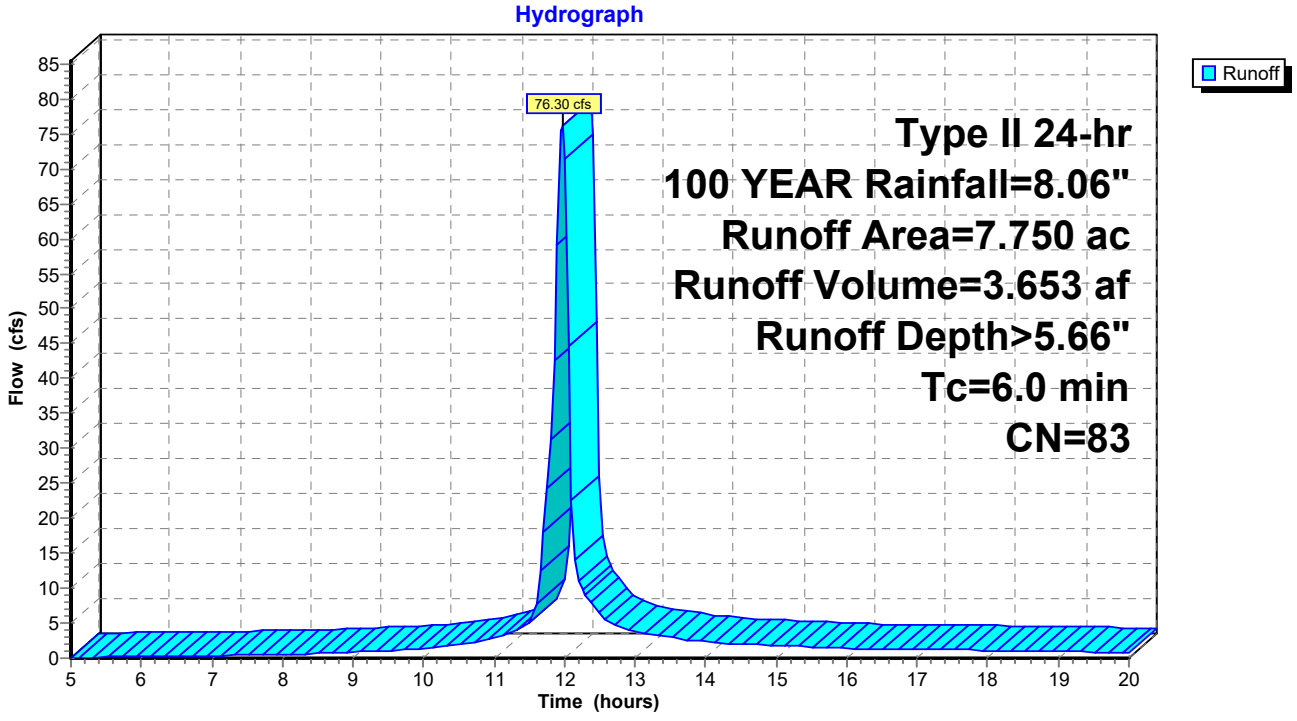
Runoff = 76.30 cfs @ 11.96 hrs, Volume= 3.653 af, Depth> 5.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YEAR Rainfall=8.06"

Area (ac)	CN	Description
1.920	39	>75% Grass cover, Good, HSG A
5.830	98	Paved roads w/curbs & sewers, HSG A
7.750	83	Weighted Average
1.920		24.77% Pervious Area
5.830		75.23% Impervious Area

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

Subcatchment 1S: EXIST-SITE



Summary for Subcatchment 3S: EXIST-CYPHER EXT

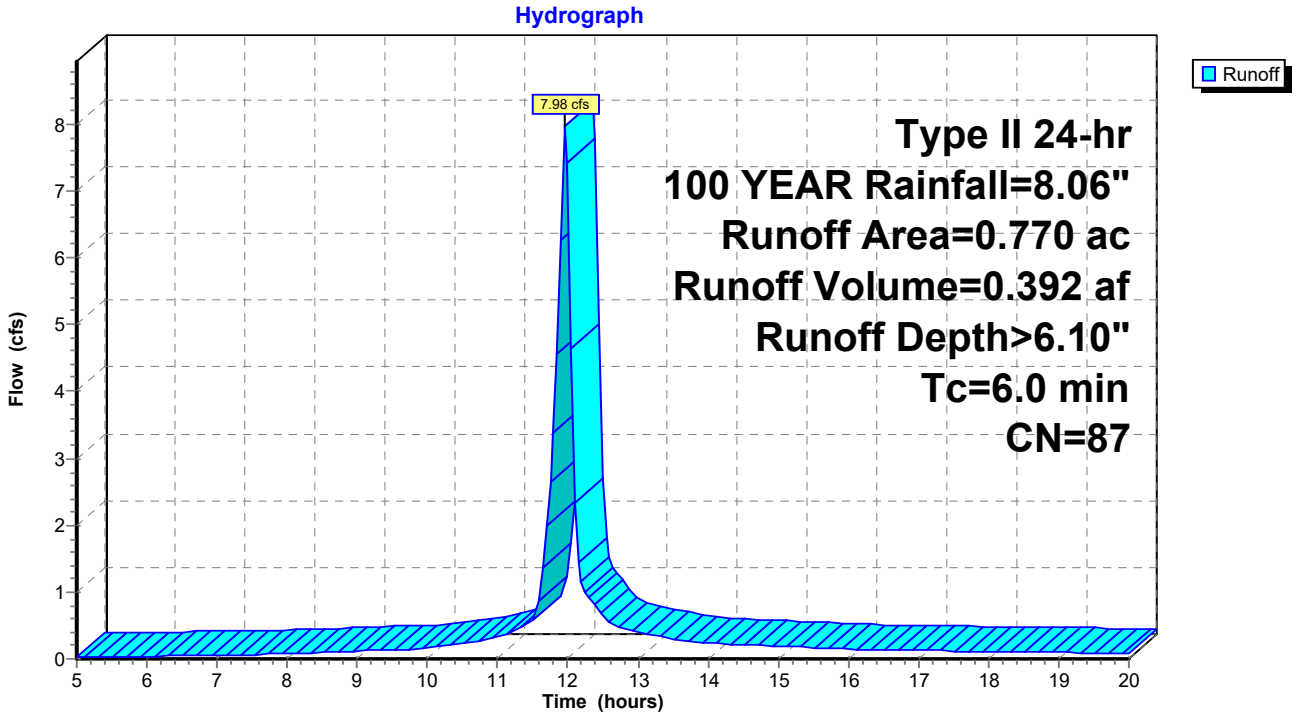
Runoff = 7.98 cfs @ 11.96 hrs, Volume= 0.392 af, Depth> 6.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YEAR Rainfall=8.06"

Area (ac)	CN	Description
0.770	87	Dirt roads, HSG C
0.770		100.00% Pervious Area

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

Subcatchment 3S: EXIST-CYPHER EXT



Summary for Subcatchment 5S: PROP SITE

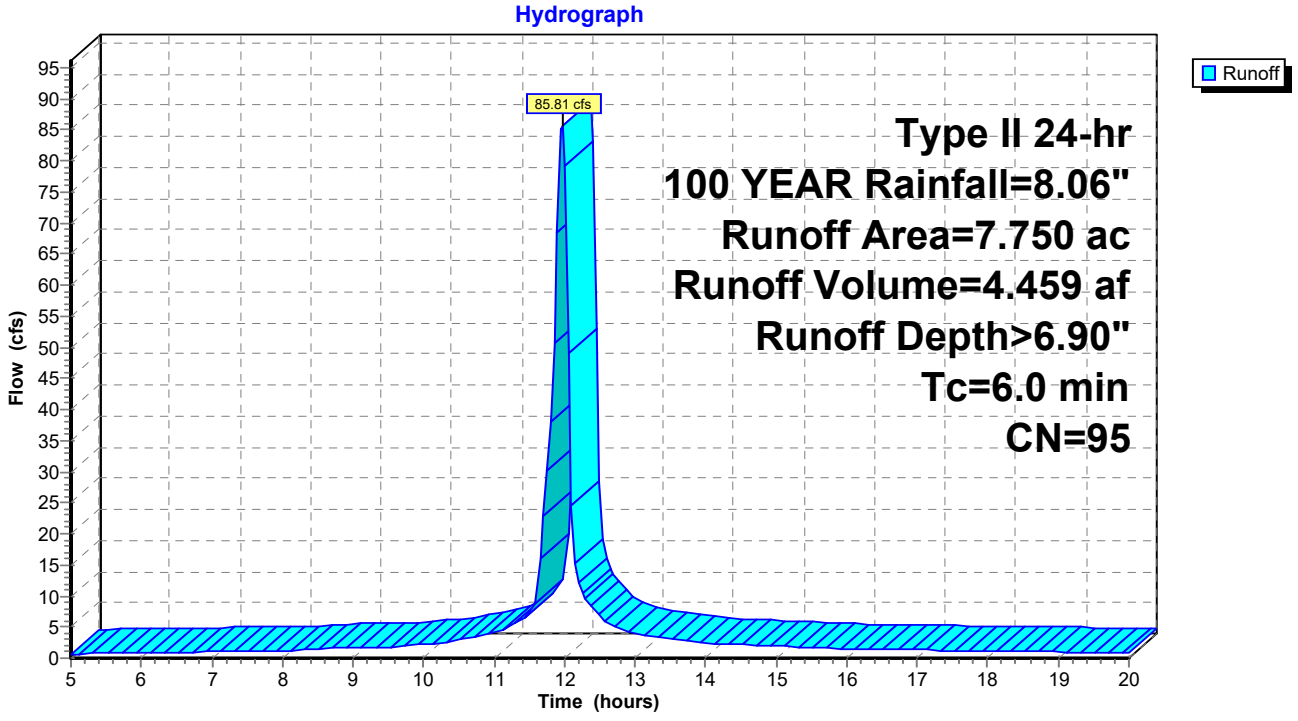
Runoff = 85.81 cfs @ 11.96 hrs, Volume= 4.459 af, Depth> 6.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YEAR Rainfall=8.06"

Area (ac)	CN	Description
0.450	39	>75% Grass cover, Good, HSG A
7.300	98	Paved roads w/curbs & sewers, HSG A
7.750	95	Weighted Average
0.450		5.81% Pervious Area
7.300		94.19% Impervious Area

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

Subcatchment 5S: PROP SITE



Summary for Subcatchment 6S: PROP CYPHER EXT

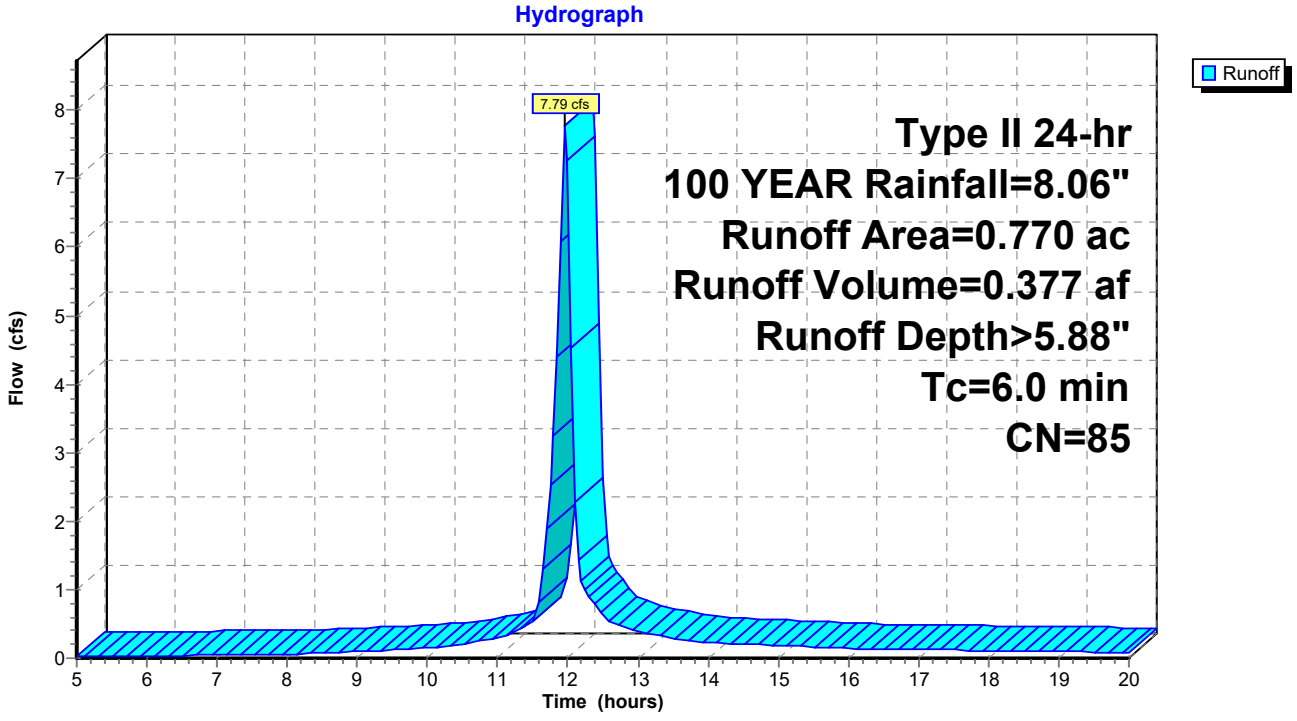
Runoff = 7.79 cfs @ 11.96 hrs, Volume= 0.377 af, Depth> 5.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YEAR Rainfall=8.06"

Area (ac)	CN	Description
0.600	98	Paved roads w/curbs & sewers, HSG A
0.170	39	>75% Grass cover, Good, HSG A
0.770	85	Weighted Average
0.170		22.08% Pervious Area
0.600		77.92% Impervious Area

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

Subcatchment 6S: PROP CYPHER EXT



Project Description

File Name	CYPHER ST EXT - PR.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Jul 22, 2021	00:00:00
End Analysis On	Jul 22, 2021	01:00:00
Start Reporting On	Jul 22, 2021	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	7
Nodes	14
Junctions	6
Outfalls	1
Flow Diversions	0
Inlets	7
Storage Nodes	0
Links	13
Channels	0
Pipes	13
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	10 year(s)

Subbasin Summary

Subbasin Name	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ft^3)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-36	0.14	0.90	0.59	0.53	274	0.75	0 00:06:00
Sub-37	0.18	0.90	0.59	0.53	346	0.96	0 00:06:00
Sub-39	0.04	0.90	0.59	0.53	69	0.19	0 00:06:00
Sub-40	0.05	0.90	0.59	0.53	86	0.24	0 00:06:00
Sub-42	0.13	0.30	0.59	0.18	86	0.24	0 00:06:00
Sub-43	0.09	0.90	0.59	0.53	174	0.48	0 00:06:00
Sub-45	0.10	0.90	0.59	0.53	182	0.50	0 00:06:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	38	Junction	5.27	9.93	5.27	9.93	10.00	1.69	5.75	0.00	4.18	0 00:00	0.00	0.00
2	41	Junction	2.68	12.35	2.68	12.35	10.00	2.06	3.15	0.00	9.20	0 00:00	0.00	0.00
3	44	Junction	0.88	11.40	0.00	0.00	0.00	2.23	1.56	0.00	9.84	0 00:00	0.00	0.00
4	46	Junction	0.58	11.40	0.00	0.00	0.00	2.55	1.42	0.00	9.98	0 00:00	0.00	0.00
5	47	Junction	0.49	11.40	0.00	0.00	0.00	2.95	1.22	0.00	10.18	0 00:00	0.00	0.00
6	48	Junction	-1.40	9.95	-1.40	9.95	0.00	2.95	-0.47	0.00	10.42	0 00:00	0.00	0.00
7	EX_36-E_ST	Outfall	-1.00					0.68	-0.75					

Link Summary

Pipe Name	From (Inlet) Node	Inlet Invert Elevation	To (Outlet) Node	Outlet Invert Elevation	Pipe Length	Pipe Slope	Pipe Diameter	Manning's Roughness	Peak Flow Q	Peak Flow Velocity	Pipe Design Capacity Qf	Q/Qf Ratio
		(ft)		(ft)	(ft)	(%)	(in)		(cfs)	(ft/sec)	(cfs)	
Link-01	41	2.68	44	0.88	181	0.99	15	0.0120	2.02	3.74	6.97	0.29
Link-02	44	0.88	46	0.58	29	1.02	15	0.0120	2.17	2.76	7.07	0.31
Link-03	46	0.58	47	0.49	9	0.99	15	0.0120	2.55	3.14	6.97	0.37
Link-04	47	0.49	48	0.25	23	1.03	15	0.0120	2.95	4.61	7.09	0.42
P-31	36	6.05	38	5.85	20	1.00	12	0.0120	0.75	3.31	3.86	0.19
P-32	37	5.98	38	5.77	19	1.08	12	0.0120	0.94	3.59	4.01	0.24
P-33	38	5.27	41	2.68	259	1.00	12	0.0120	1.65	4.55	3.86	0.43
P-34	39	8.11	41	7.90	21	1.00	12	0.0120	0.19	2.35	3.86	0.05
P-35	40	8.11	41	7.88	23	1.00	12	0.0120	0.23	2.49	3.86	0.06
P-37	42	5.20	44	4.80	39	1.03	12	0.0120	0.23	2.58	3.91	0.06
P-38	43	5.45	46	5.14	31	1.00	12	0.0120	0.47	3.05	3.86	0.12
P-39	45	5.44	47	5.05	27	1.45	12	0.0120	0.49	3.49	4.65	0.11
P-87	48	-1.40	EX_36-E_ST	-1.20	1188	-0.02	36	0.0150	0.68	0.70	40.87	0.02

Inlet Summary

SN ID	Element Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft^2)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1 36	FHWA HEC-22 GENERIC	N/A	On Sag	1	6.05	9.54	6.05	10.00	0.75	N/A	N/A	N/A	7.00	4.65	9.69
2 37	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.98	9.51	5.98	10.00	0.95	N/A	N/A	N/A	7.00	5.89	9.70
3 39	FHWA HEC-22 GENERIC	N/A	On Sag	1	8.11	11.91	8.11	10.00	0.19	N/A	N/A	N/A	7.00	1.17	11.95
4 40	FHWA HEC-22 GENERIC	N/A	On Sag	1	8.11	11.67	8.11	10.00	0.24	N/A	N/A	N/A	7.00	1.46	11.72
5 42	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.20	10.27	5.20	10.00	0.24	N/A	N/A	N/A	7.00	1.45	10.31
6 43	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.45	9.95	5.45	10.00	0.48	N/A	N/A	N/A	7.00	2.96	10.05
7 45	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.44	9.91	5.44	10.00	0.50	N/A	N/A	N/A	7.00	3.09	10.01

Subbasin Hydrology

Subbasin : Sub-36

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.14	-	0.90
Composite Area & Weighted Runoff Coeff.	0.14		0.90

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

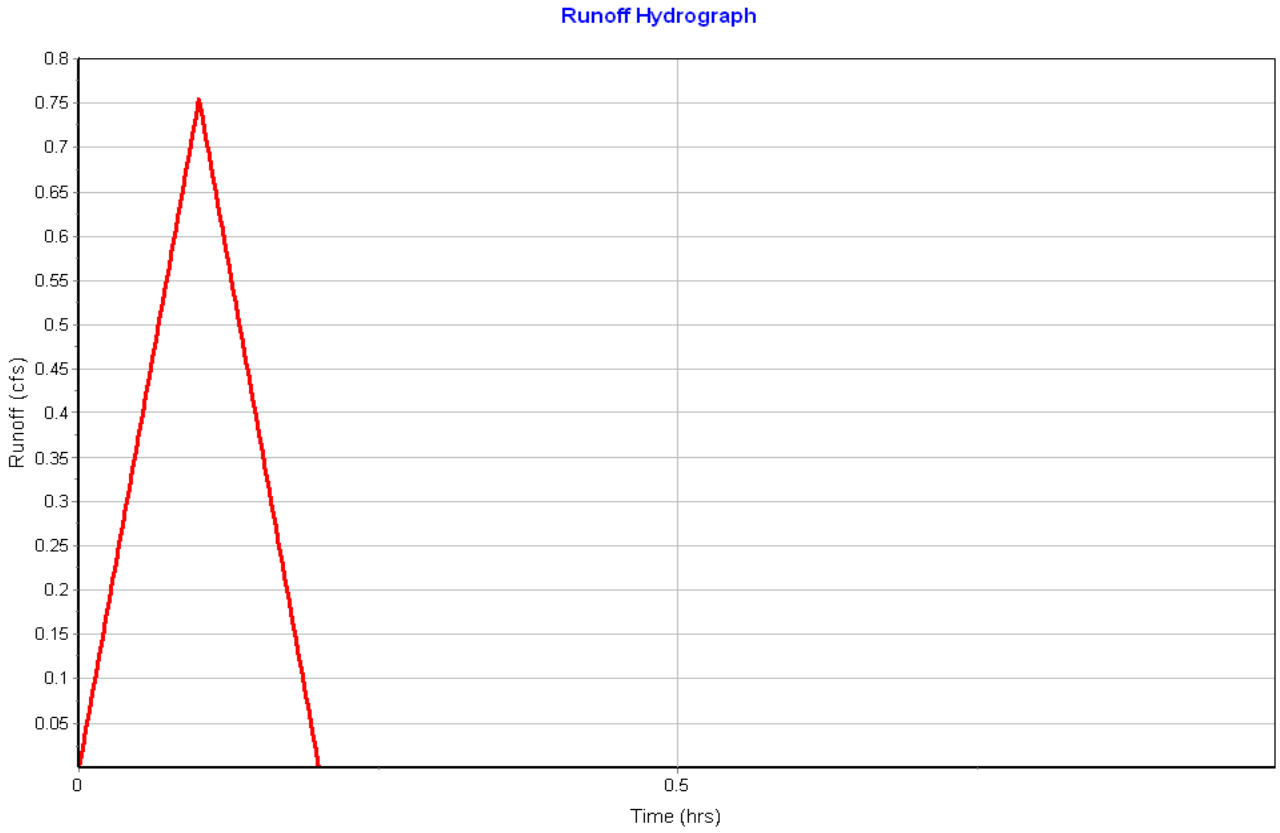
Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Subbasin Runoff Results

Total Rainfall (in)	0.59
Total Runoff (in)	0.53
Peak Runoff (cfs)	0.75
Rainfall Intensity	5.860
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-36



Subbasin : Sub-37

Input Data

Area (ac)	0.18
Weighted Runoff Coefficient	0.9000

Runoff Coefficient

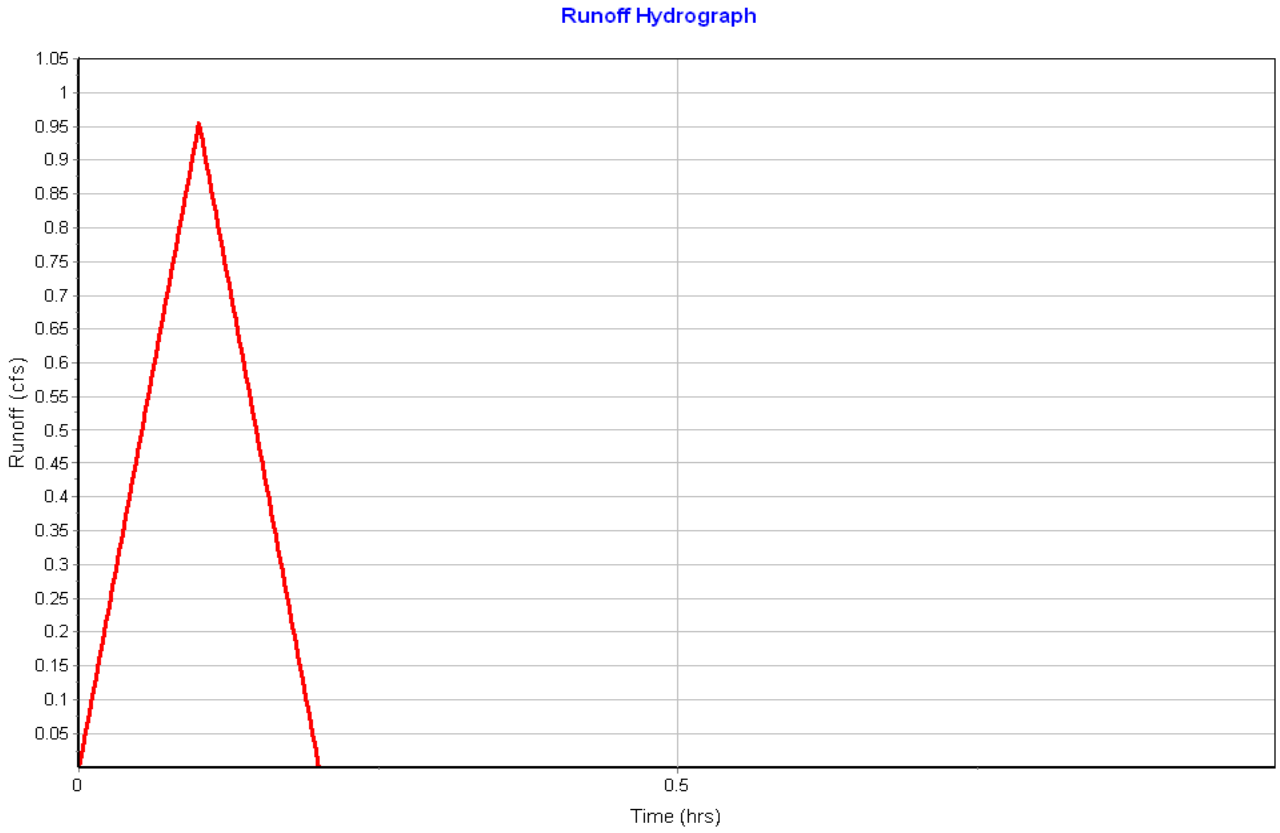
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.18	-	0.90
Composite Area & Weighted Runoff Coeff.	0.18		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in)	0.59
Total Runoff (in)	0.53
Peak Runoff (cfs)	0.96
Rainfall Intensity	5.860
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-37



Subbasin : Sub-39

Input Data

Area (ac) 0.04
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

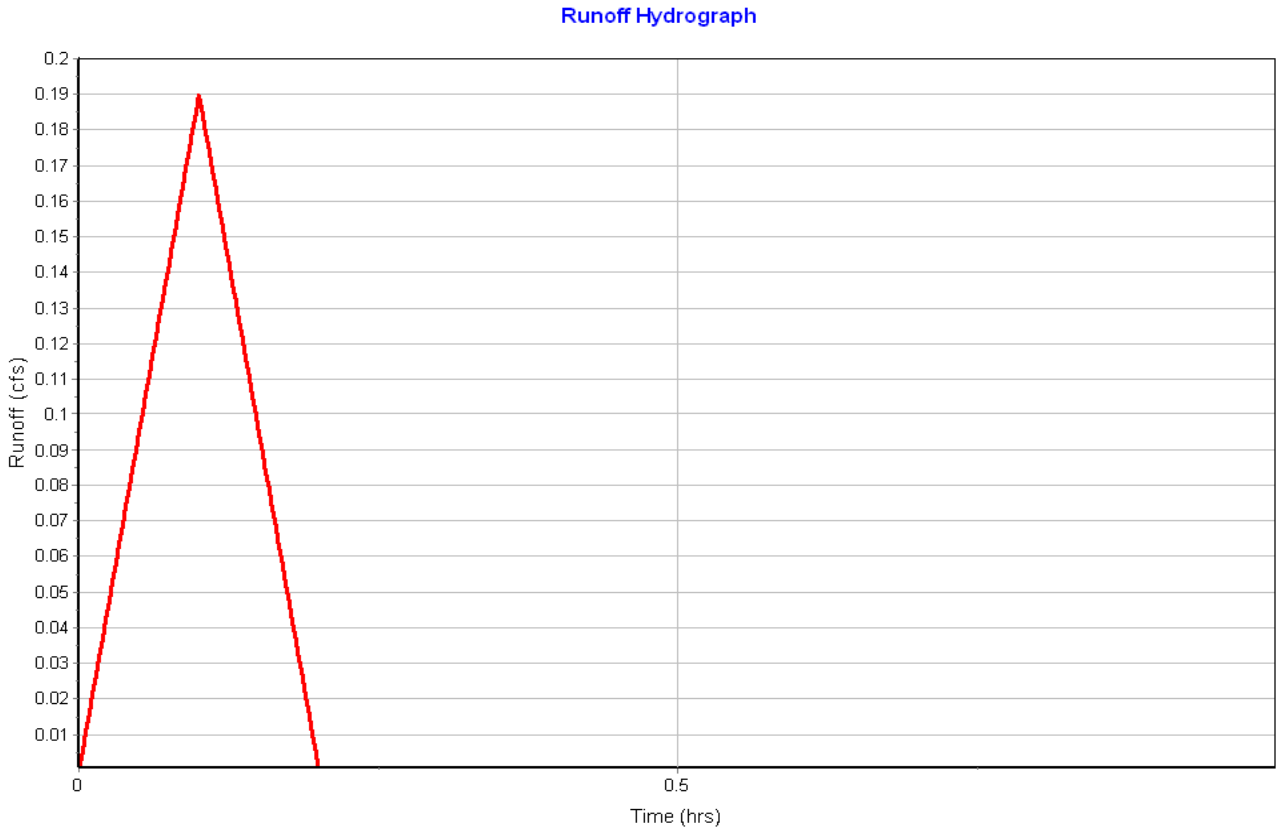
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.04	-	0.90
Composite Area & Weighted Runoff Coeff.	0.04		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in) 0.59
Total Runoff (in) 0.53
Peak Runoff (cfs) 0.19
Rainfall Intensity 5.860
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:00:00

Subbasin : Sub-39



Subbasin : Sub-40

Input Data

Area (ac) 0.05
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

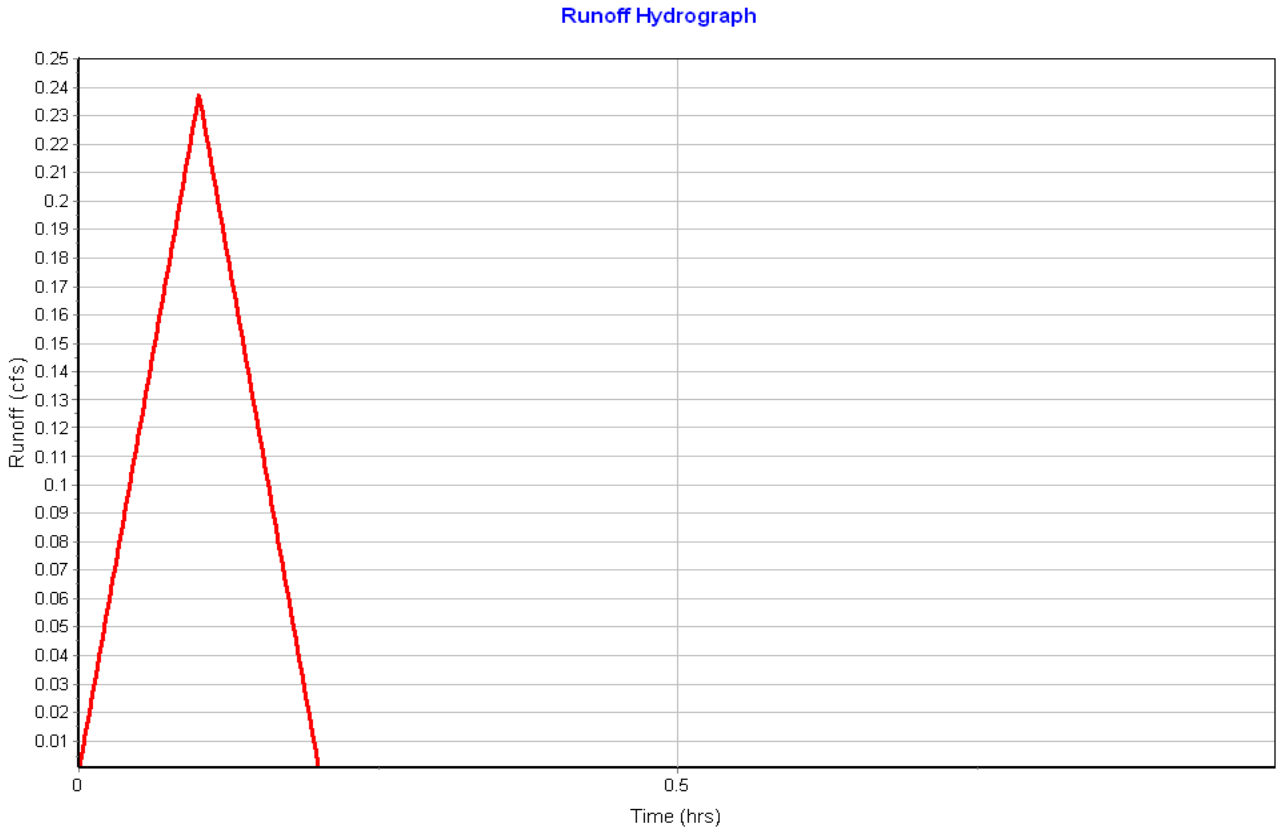
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.05	-	0.90
Composite Area & Weighted Runoff Coeff.	0.05		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in) 0.59
Total Runoff (in) 0.53
Peak Runoff (cfs) 0.24
Rainfall Intensity 5.860
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:00:00

Subbasin : Sub-40



Subbasin : Sub-42

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.3000

Runoff Coefficient

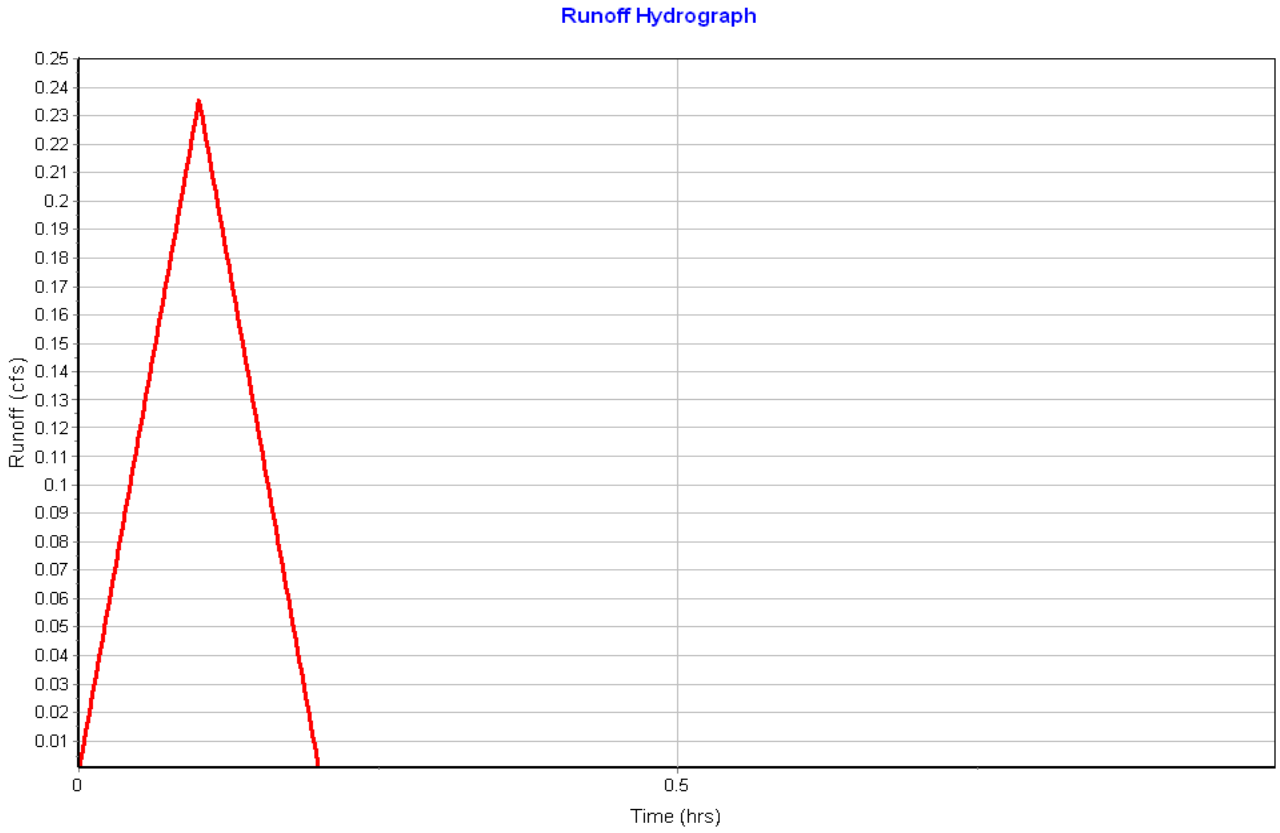
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.13	-	0.30
Composite Area & Weighted Runoff Coeff.	0.13		0.30

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in) 0.59
Total Runoff (in) 0.18
Peak Runoff (cfs) 0.24
Rainfall Intensity 5.860
Weighted Runoff Coefficient 0.3000
Time of Concentration (days hh:mm:ss) 0 00:00:00

Subbasin : Sub-42



Subbasin : Sub-43

Input Data

Area (ac)	0.09
Weighted Runoff Coefficient	0.9000

Runoff Coefficient

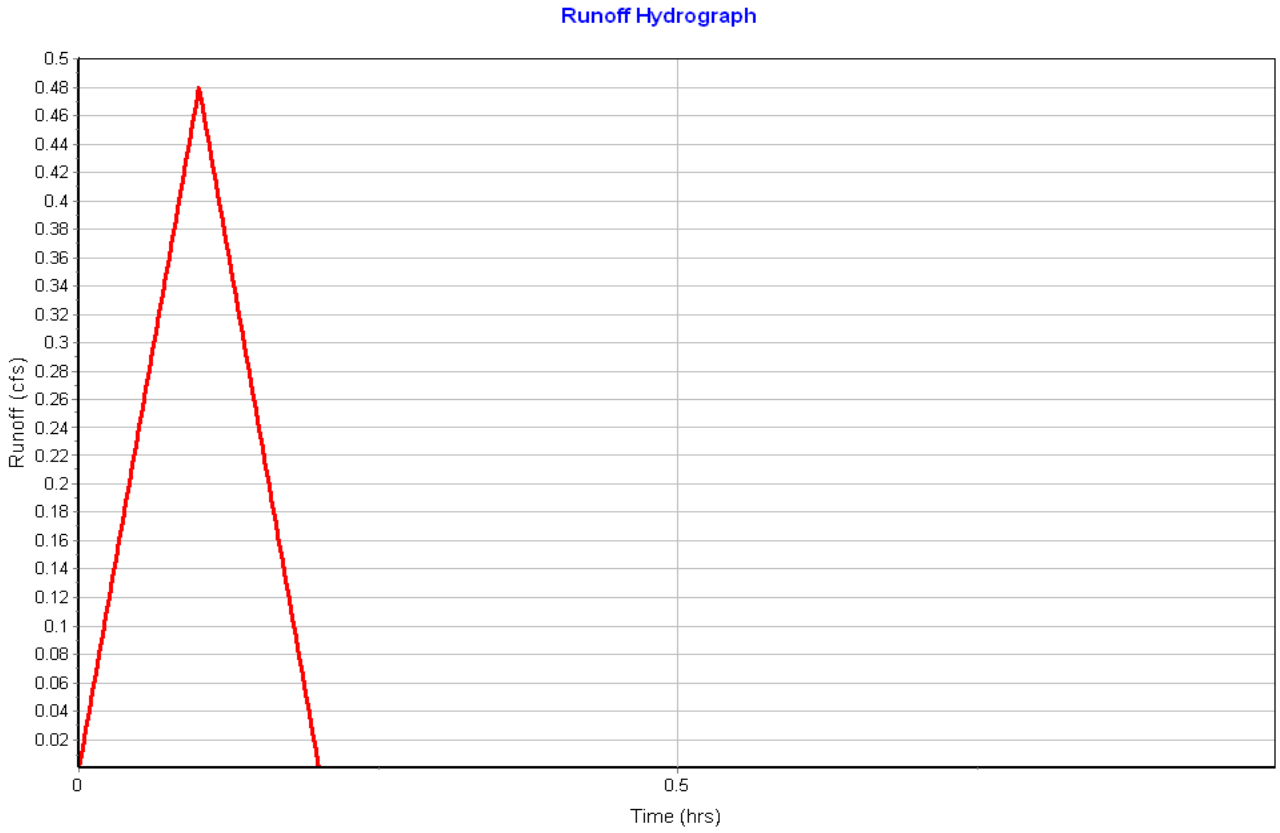
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.09	-	0.90
Composite Area & Weighted Runoff Coeff.	0.09		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in)	0.59
Total Runoff (in)	0.53
Peak Runoff (cfs)	0.48
Rainfall Intensity	5.860
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-43



Subbasin : Sub-45

Input Data

Area (ac)	0.10
Weighted Runoff Coefficient	0.9000

Runoff Coefficient

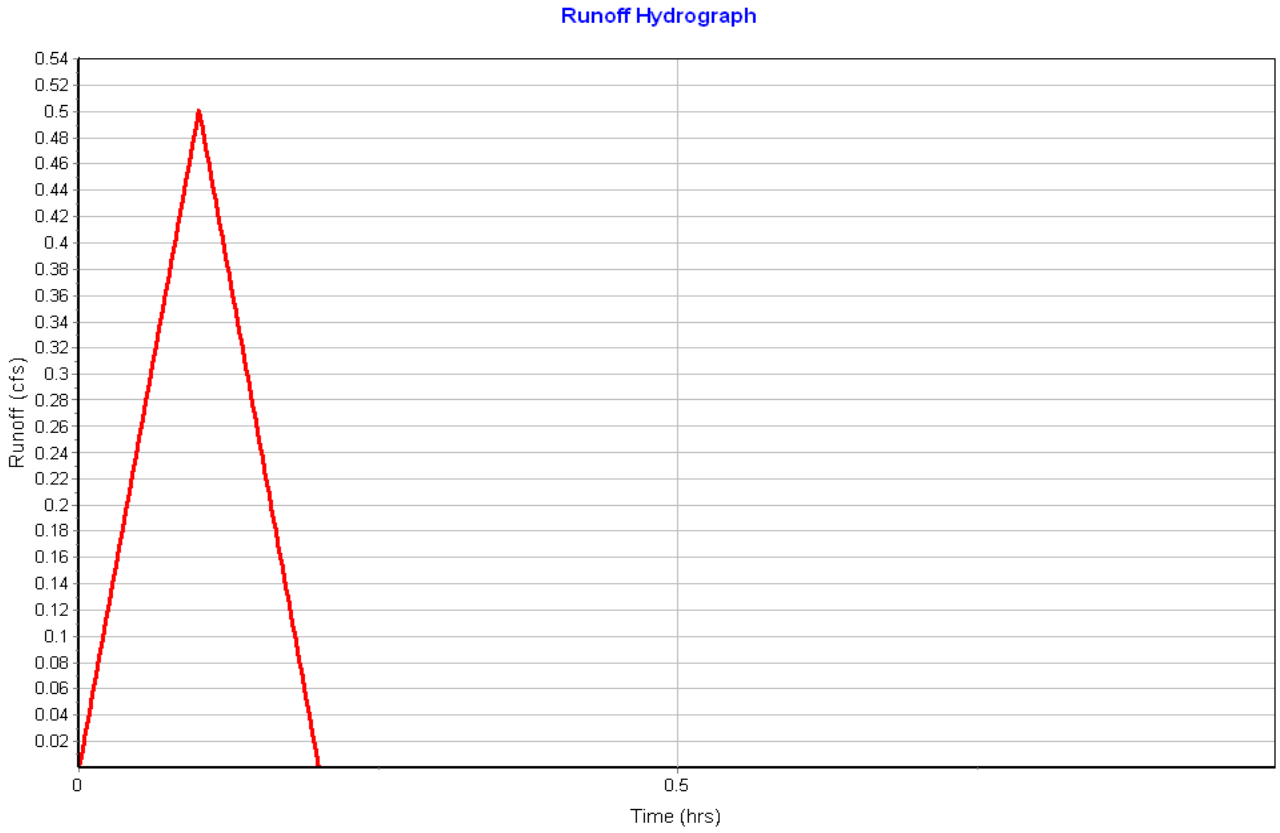
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.10	-	0.90
Composite Area & Weighted Runoff Coeff.	0.10		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in)	0.59
Total Runoff (in)	0.53
Peak Runoff (cfs)	0.50
Rainfall Intensity	5.860
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-45



Junction Input

Juntion Name	Invert Elevation (ft)	Rim Elevation (ft)
38	5.27	9.93
41	2.68	12.35
44	0.88	11.40
46	0.58	11.40
47	0.49	11.40
48	-1.40	9.95

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	38	1.69	0.00	5.75	0.48	0.00	4.18	5.34	0.07	0 00:06	0 00:00	0.00	0.00
2	41	2.06	0.00	3.15	0.47	0.00	9.20	2.76	0.08	0 00:07	0 00:00	0.00	0.00
3	44	2.23	0.00	1.56	0.68	0.00	9.84	0.98	0.10	0 00:07	0 00:00	0.00	0.00
4	46	2.55	0.00	1.42	0.84	0.00	9.98	0.71	0.13	0 00:07	0 00:00	0.00	0.00
5	47	2.95	0.00	1.22	0.73	0.00	10.18	0.61	0.12	0 00:07	0 00:00	0.00	0.00
6	48	2.95	0.00	-0.47	0.93	0.00	10.42	-0.79	0.61	0 00:12	0 00:00	0.00	0.00

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-01	2.02	0 00:07	6.97	0.29	3.74	0.81	0.57	0.46	0.00		Calculated
2	Link-02	2.17	0 00:07	7.07	0.31	2.76	0.18	0.76	0.61	0.00		Calculated
3	Link-03	2.55	0 00:07	6.97	0.37	3.14	0.05	0.79	0.63	0.00		Calculated
4	Link-04	2.95	0 00:07	7.09	0.42	4.61	0.08	0.65	0.52	0.00		Calculated
5	P-31	0.75	0 00:06	3.86	0.19	3.31	0.10	0.33	0.33	0.00		Calculated
6	P-32	0.94	0 00:06	4.01	0.24	3.59	0.09	0.37	0.37	0.00		Calculated
7	P-33	1.65	0 00:06	3.86	0.43	4.55	0.95	0.47	0.47	0.00		Calculated
8	P-34	0.19	0 00:06	3.86	0.05	2.35	0.15	0.16	0.16	0.00		Calculated
9	P-35	0.23	0 00:06	3.86	0.06	2.49	0.15	0.18	0.18	0.00		Calculated
10	P-37	0.23	0 00:06	3.91	0.06	2.58	0.25	0.17	0.17	0.00		Calculated
11	P-38	0.47	0 00:06	3.86	0.12	3.05	0.17	0.25	0.25	0.00		Calculated
12	P-39	0.49	0 00:06	4.65	0.11	3.49	0.13	0.24	0.24	0.00		Calculated
13	P-87	0.68	0 00:13	40.87	0.02	0.70	28.29	0.59	0.20	0.00		Calculated

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	36	0.75	0.75	N/A	N/A	N/A	4.65	9.69	0.16	0 00:06	0.00	0.00
2	37	0.95	0.95	N/A	N/A	N/A	5.89	9.70	0.20	0 00:06	0.00	0.00
3	39	0.19	0.19	N/A	N/A	N/A	1.17	11.95	0.04	0 00:06	0.00	0.00
4	40	0.24	0.24	N/A	N/A	N/A	1.46	11.72	0.05	0 00:06	0.00	0.00
5	42	0.24	0.24	N/A	N/A	N/A	1.45	10.31	0.05	0 00:06	0.00	0.00
6	43	0.48	0.48	N/A	N/A	N/A	2.96	10.05	0.10	0 00:06	0.00	0.00
7	45	0.50	0.50	N/A	N/A	N/A	3.09	10.01	0.10	0 00:06	0.00	0.00

Project Description

File Name	CYPHER ST EXT - PR.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Jul 22, 2021	00:00:00
End Analysis On	Jul 22, 2021	01:00:00
Start Reporting On	Jul 22, 2021	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	7
Nodes	14
Junctions	6
Outfalls	1
Flow Diversions	0
Inlets	7
Storage Nodes	0
Links	13
Channels	0
Pipes	13
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	25 year(s)

Subbasin Summary

Subbasin Name	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ft^3)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-36	0.14	0.90	0.64	0.58	298	0.82	0 00:06:00
Sub-37	0.18	0.90	0.64	0.58	378	1.04	0 00:06:00
Sub-39	0.04	0.90	0.64	0.58	75	0.21	0 00:06:00
Sub-40	0.05	0.90	0.64	0.58	94	0.26	0 00:06:00
Sub-42	0.13	0.30	0.64	0.19	93	0.26	0 00:06:00
Sub-43	0.09	0.90	0.64	0.58	190	0.52	0 00:06:00
Sub-45	0.10	0.90	0.64	0.58	198	0.55	0 00:06:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	38	Junction	5.27	9.93	5.27	9.93	10.00	1.84	5.77	0.00	4.15	0 00:00	0.00	0.00
2	41	Junction	2.68	12.35	2.68	12.35	10.00	2.25	3.17	0.00	9.18	0 00:00	0.00	0.00
3	44	Junction	0.88	11.40	0.00	0.00	0.00	2.46	1.62	0.00	9.78	0 00:00	0.00	0.00
4	46	Junction	0.58	11.40	0.00	0.00	0.00	2.80	1.48	0.00	9.92	0 00:00	0.00	0.00
5	47	Junction	0.49	11.40	0.00	0.00	0.00	3.23	1.26	0.00	10.14	0 00:00	0.00	0.00
6	48	Junction	-1.40	9.95	-1.40	9.95	0.00	3.23	-0.42	0.00	10.37	0 00:00	0.00	0.00
7	EX_36-E_ST	Outfall	-1.00					0.80	-0.73					

Link Summary

Pipe Name	From (Inlet) Node	Inlet Invert Elevation	To (Outlet) Node	Outlet Invert Elevation	Pipe Length	Pipe Slope	Pipe Diameter	Manning's Roughness	Peak Flow Q	Peak Flow Velocity	Pipe Design Capacity Qf	Q/Qf Ratio
		(ft)		(ft)	(ft)	(%)	(in)		(cfs)	(ft/sec)	(cfs)	
Link-01	41	2.68	44	0.88	181	0.99	15	0.0120	2.23	3.78	6.97	0.32
Link-02	44	0.88	46	0.58	29	1.02	15	0.0120	2.37	2.79	7.07	0.34
Link-03	46	0.58	47	0.49	9	0.99	15	0.0120	2.79	3.20	6.97	0.40
Link-04	47	0.49	48	0.25	23	1.03	15	0.0120	3.23	4.71	7.09	0.46
P-31	36	6.05	38	5.85	20	1.00	12	0.0120	0.81	3.38	3.86	0.21
P-32	37	5.98	38	5.77	19	1.08	12	0.0120	1.03	3.67	4.01	0.26
P-33	38	5.27	41	2.68	259	1.00	12	0.0120	1.80	4.64	3.86	0.47
P-34	39	8.11	41	7.90	21	1.00	12	0.0120	0.20	2.40	3.86	0.05
P-35	40	8.11	41	7.88	23	1.00	12	0.0120	0.25	2.54	3.86	0.07
P-37	42	5.20	44	4.80	39	1.03	12	0.0120	0.25	2.64	3.91	0.06
P-38	43	5.45	46	5.14	31	1.00	12	0.0120	0.51	3.12	3.86	0.13
P-39	45	5.44	47	5.05	27	1.45	12	0.0120	0.54	3.56	4.65	0.12
P-87	48	-1.40	EX_36-E_ST	-1.20	1188	-0.02	36	0.0150	0.80	0.76	40.87	0.02

Inlet Summary

SN ID	Element	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	36	FHWA HEC-22 GENERIC	N/A	On Sag	1	6.05	9.54	6.05	10.00	0.82	N/A	N/A	N/A	7.00	5.07	9.71
2	37	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.98	9.51	5.98	10.00	1.04	N/A	N/A	N/A	7.00	6.34	9.72
3	39	FHWA HEC-22 GENERIC	N/A	On Sag	1	8.11	11.91	8.11	10.00	0.21	N/A	N/A	N/A	7.00	1.28	11.95
4	40	FHWA HEC-22 GENERIC	N/A	On Sag	1	8.11	11.67	8.11	10.00	0.26	N/A	N/A	N/A	7.00	1.60	11.72
5	42	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.20	10.27	5.20	10.00	0.26	N/A	N/A	N/A	7.00	1.58	10.32
6	43	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.45	9.95	5.45	10.00	0.52	N/A	N/A	N/A	7.00	3.23	10.06
7	45	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.44	9.91	5.44	10.00	0.55	N/A	N/A	N/A	7.00	3.37	10.02

Subbasin Hydrology

Subbasin : Sub-36

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.14	-	0.90
Composite Area & Weighted Runoff Coeff.	0.14		0.90

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

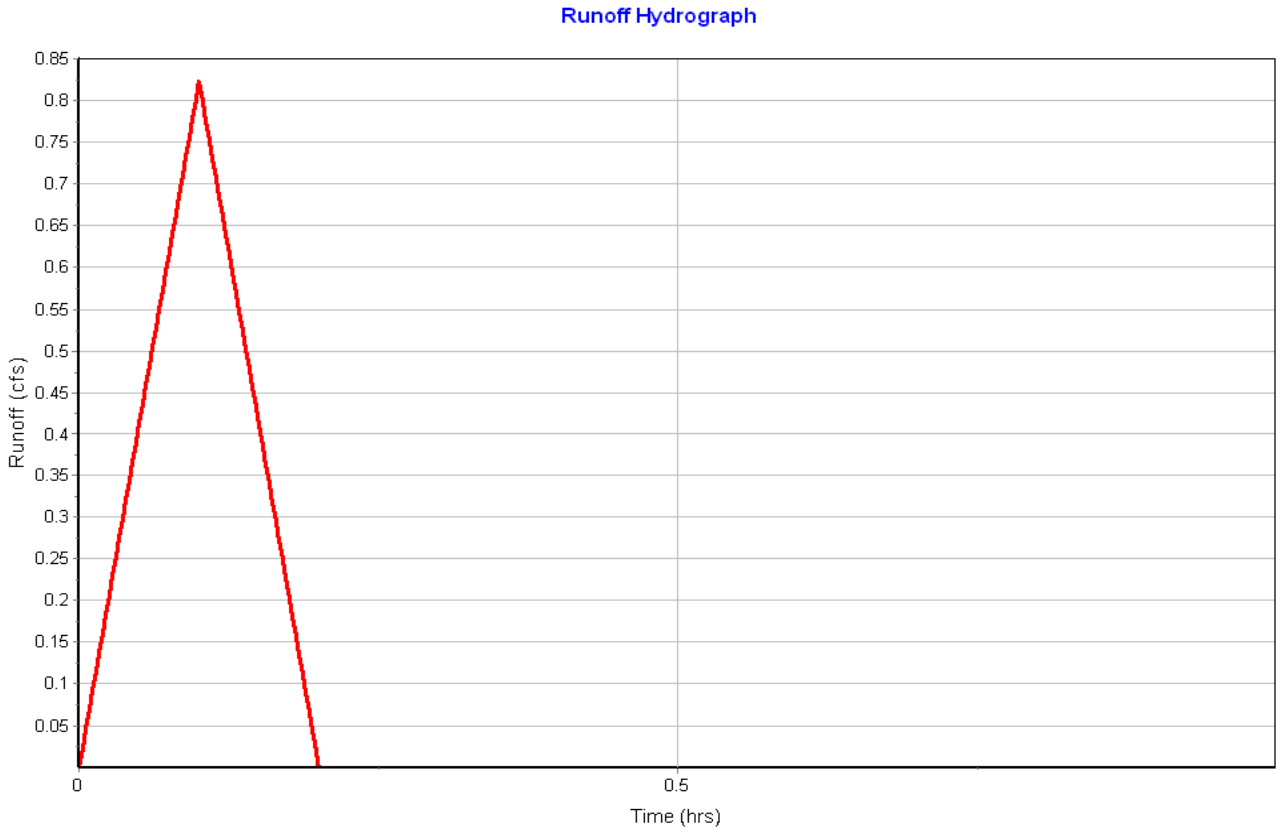
Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Subbasin Runoff Results

Total Rainfall (in)	0.64
Total Runoff (in)	0.58
Peak Runoff (cfs)	0.82
Rainfall Intensity	6.390
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-36



Subbasin : Sub-37

Input Data

Area (ac)	0.18
Weighted Runoff Coefficient	0.9000

Runoff Coefficient

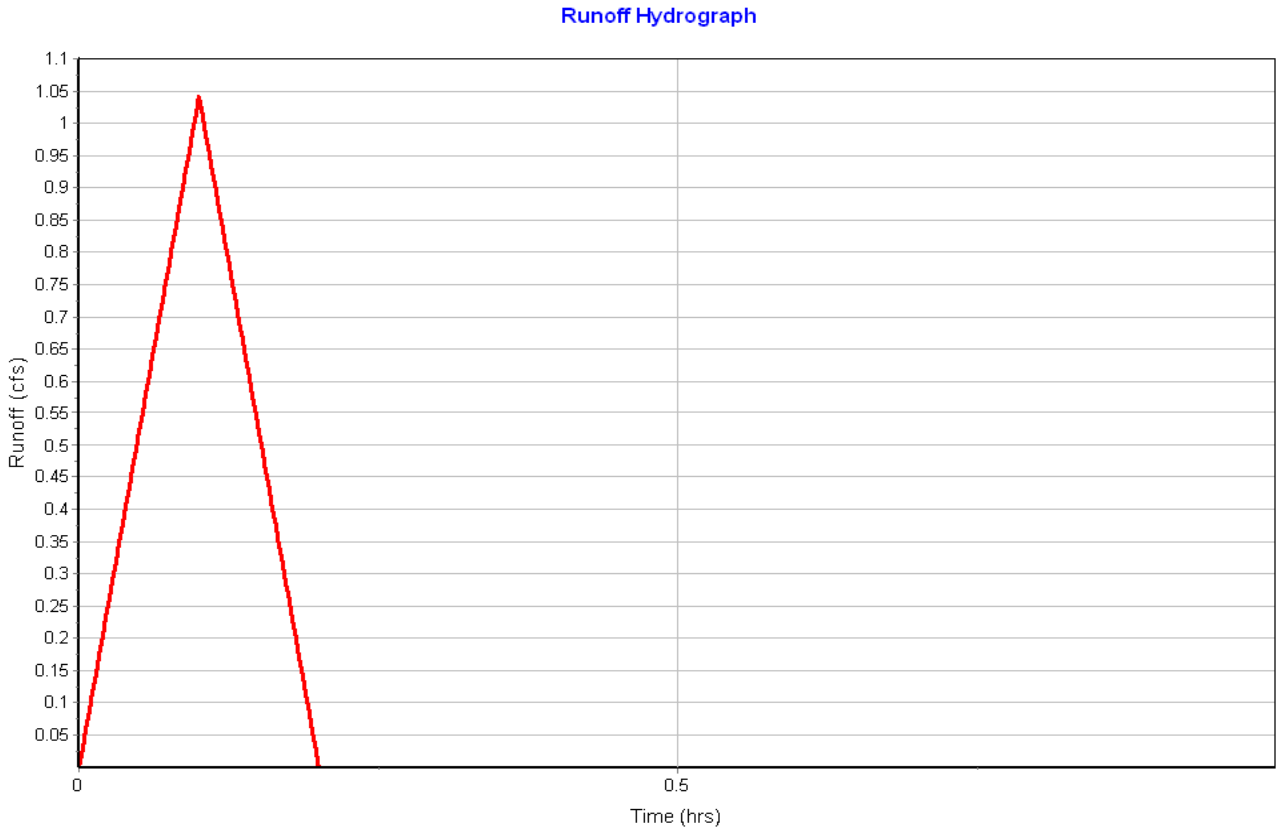
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.18	-	0.90
Composite Area & Weighted Runoff Coeff.	0.18		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in)	0.64
Total Runoff (in)	0.58
Peak Runoff (cfs)	1.04
Rainfall Intensity	6.390
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-37



Subbasin : Sub-39

Input Data

Area (ac)	0.04
Weighted Runoff Coefficient	0.9000

Runoff Coefficient

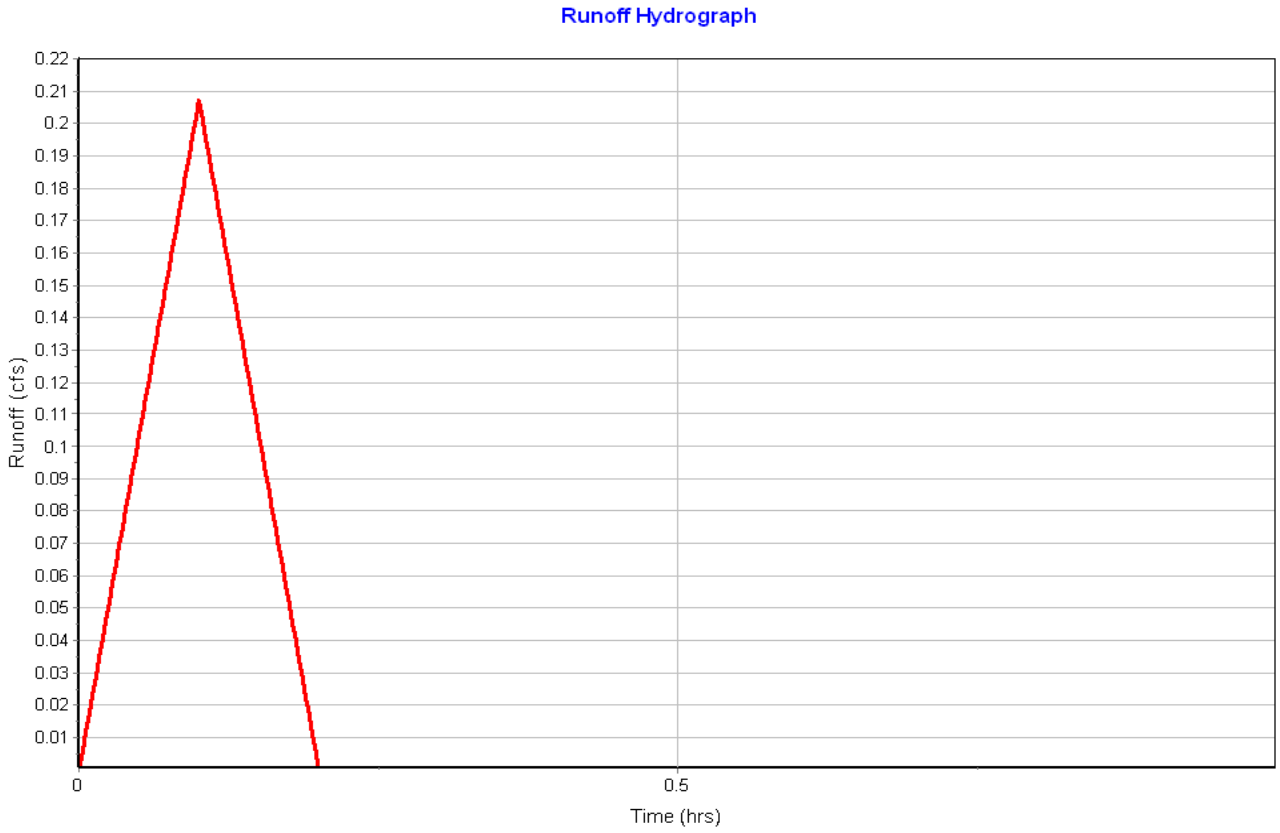
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.04	-	0.90
Composite Area & Weighted Runoff Coeff.	0.04		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in)	0.64
Total Runoff (in)	0.58
Peak Runoff (cfs)	0.21
Rainfall Intensity	6.390
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-39



Subbasin : Sub-40

Input Data

Area (ac) 0.05
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

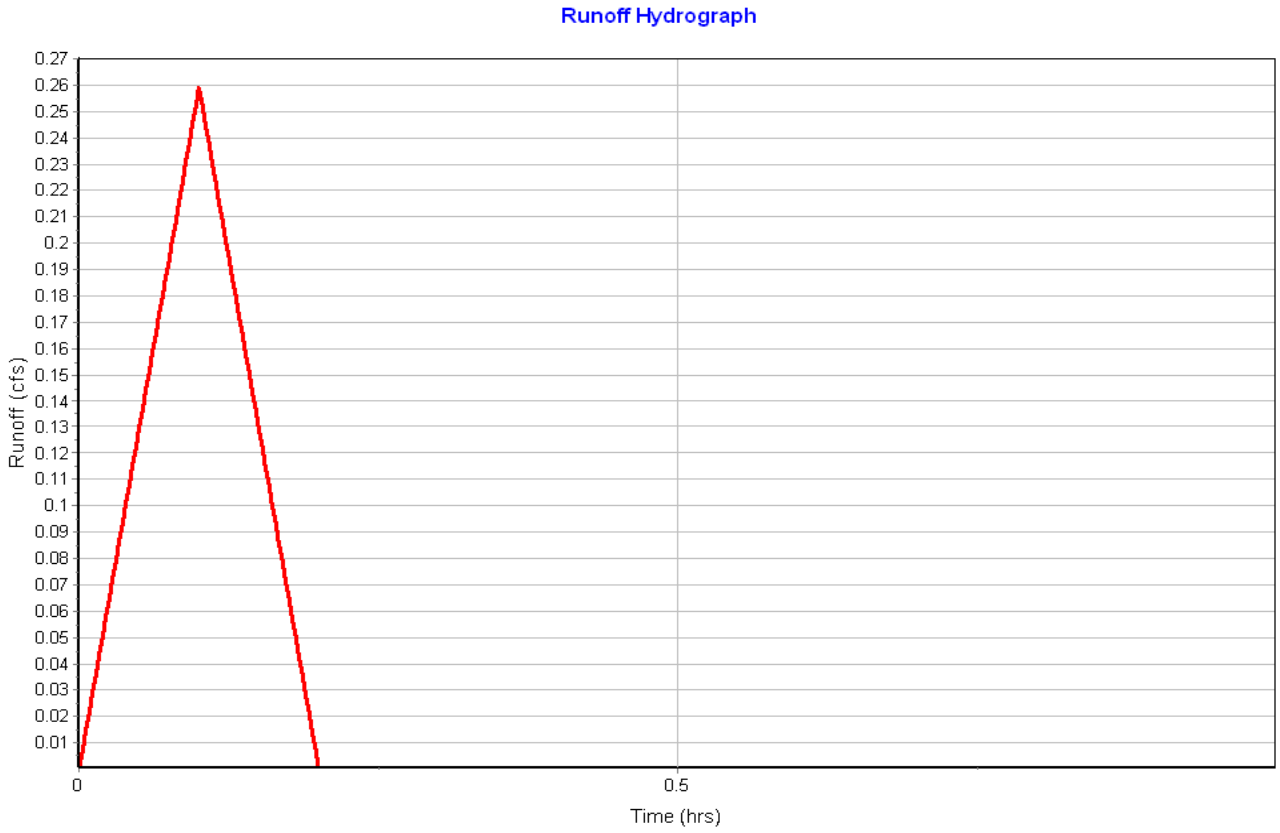
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.05	-	0.90
Composite Area & Weighted Runoff Coeff.	0.05		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in) 0.64
Total Runoff (in) 0.58
Peak Runoff (cfs) 0.26
Rainfall Intensity 6.390
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:00:00

Subbasin : Sub-40



Subbasin : Sub-42

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.3000

Runoff Coefficient

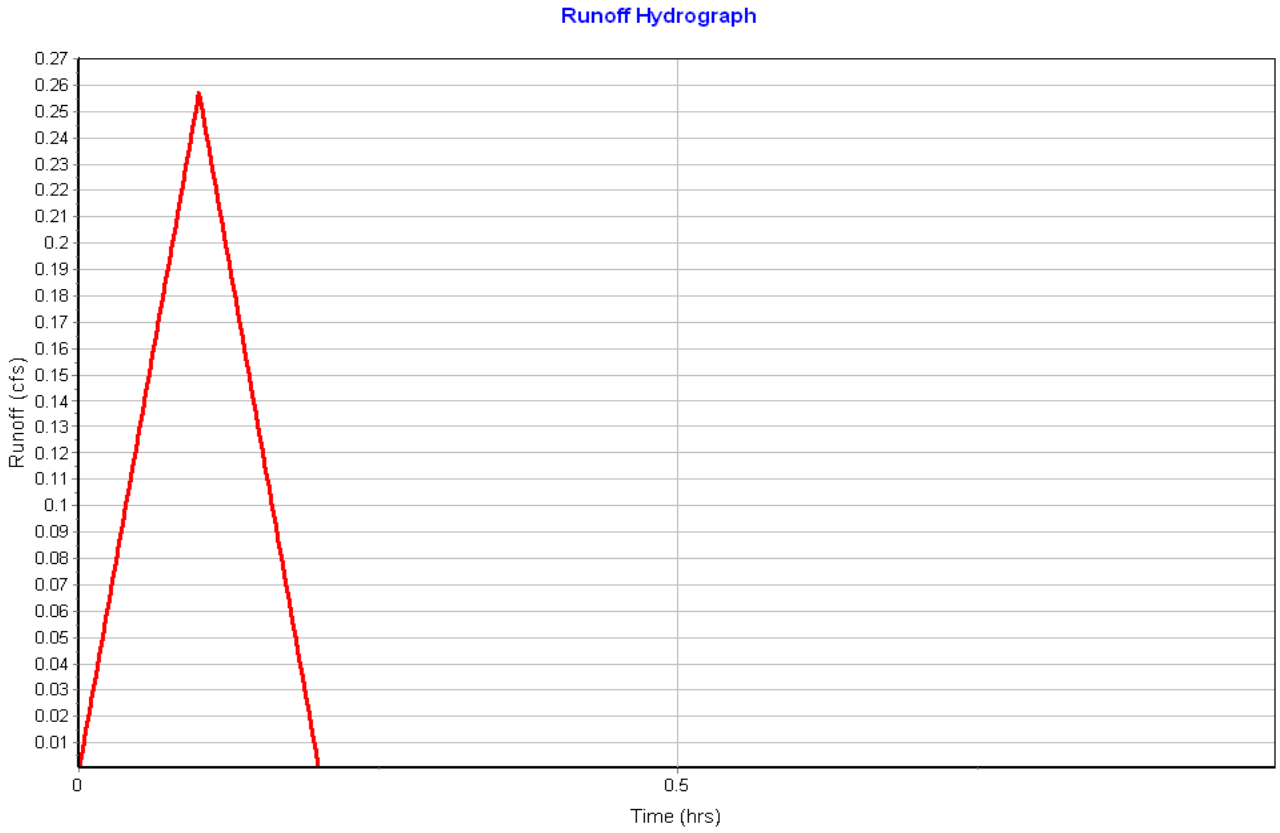
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.13	-	0.30
Composite Area & Weighted Runoff Coeff.	0.13		0.30

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in) 0.64
Total Runoff (in) 0.19
Peak Runoff (cfs) 0.26
Rainfall Intensity 6.390
Weighted Runoff Coefficient 0.3000
Time of Concentration (days hh:mm:ss) 0 00:00:00

Subbasin : Sub-42



Subbasin : Sub-43

Input Data

Area (ac)	0.09
Weighted Runoff Coefficient	0.9000

Runoff Coefficient

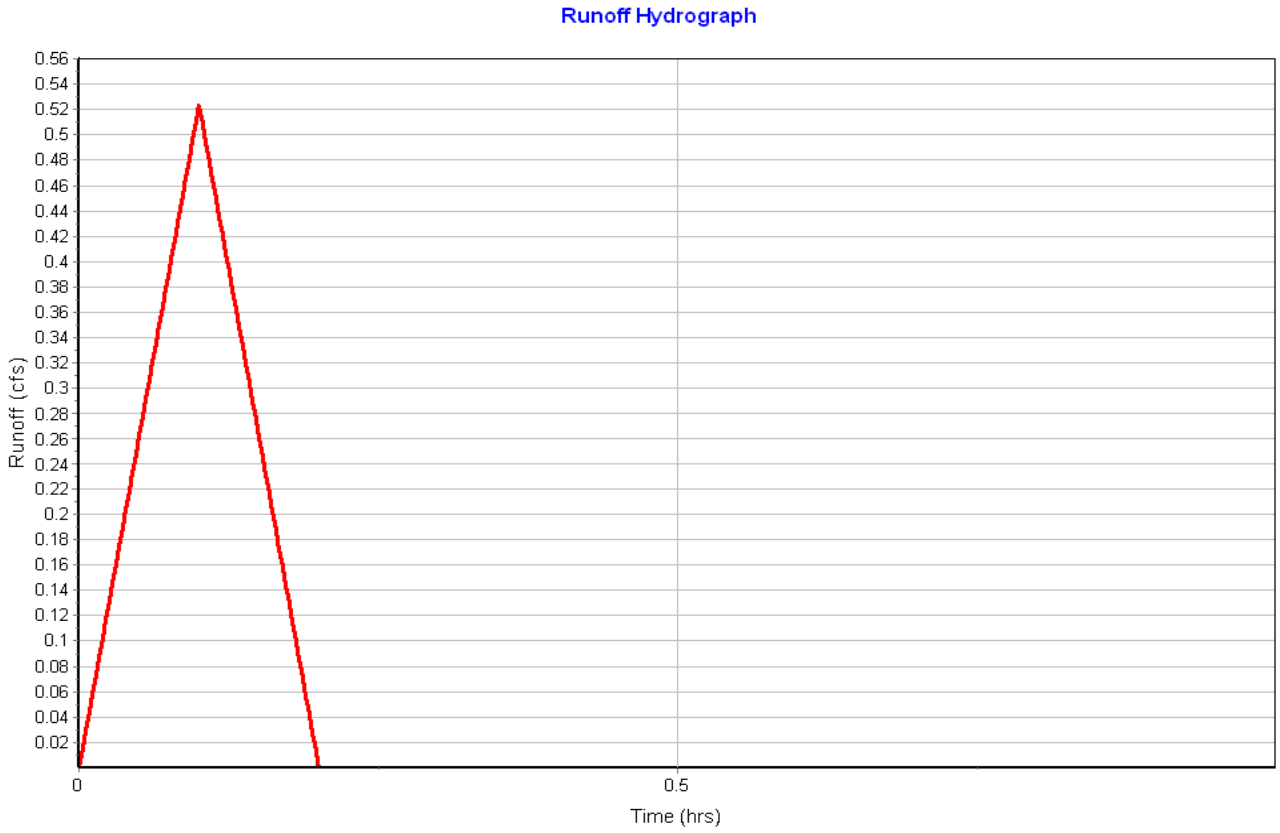
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.09	-	0.90
Composite Area & Weighted Runoff Coeff.	0.09		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in)	0.64
Total Runoff (in)	0.58
Peak Runoff (cfs)	0.52
Rainfall Intensity	6.390
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-43



Subbasin : Sub-45

Input Data

Area (ac) 0.10
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

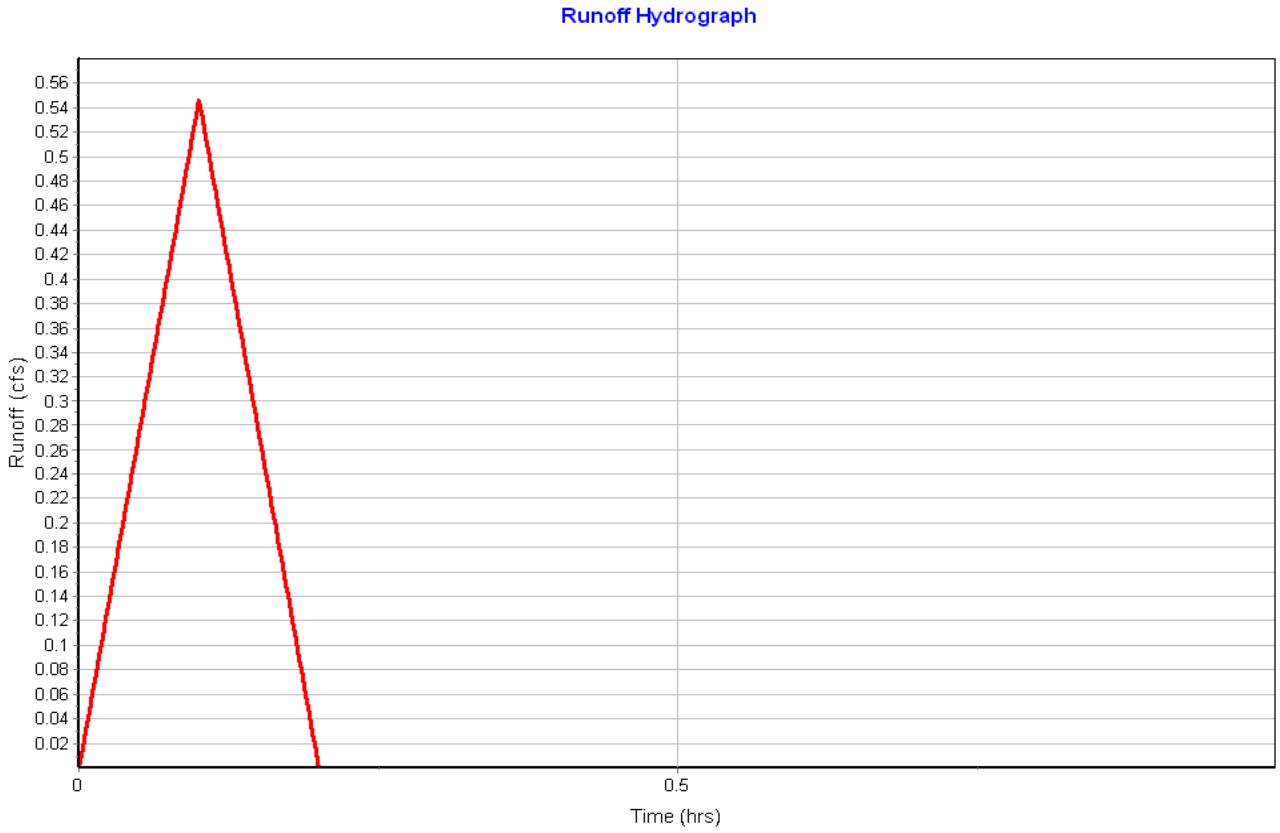
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.10	-	0.90
Composite Area & Weighted Runoff Coeff.	0.10		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in) 0.64
Total Runoff (in) 0.58
Peak Runoff (cfs) 0.55
Rainfall Intensity 6.390
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:00:00

Subbasin : Sub-45



Junction Input

Juntion Name	Invert Elevation (ft)	Rim Elevation (ft)
38	5.27	9.93
41	2.68	12.35
44	0.88	11.40
46	0.58	11.40
47	0.49	11.40
48	-1.40	9.95

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	38	1.84	0.00	5.77	0.50	0.00	4.15	5.35	0.08	0 00:06	0 00:00	0.00	0.00
2	41	2.25	0.00	3.17	0.49	0.00	9.18	2.76	0.08	0 00:06	0 00:00	0.00	0.00
3	44	2.46	0.00	1.62	0.74	0.00	9.78	0.99	0.11	0 00:07	0 00:00	0.00	0.00
4	46	2.80	0.00	1.48	0.90	0.00	9.92	0.72	0.14	0 00:07	0 00:00	0.00	0.00
5	47	3.23	0.00	1.26	0.77	0.00	10.14	0.62	0.13	0 00:07	0 00:00	0.00	0.00
6	48	3.23	0.00	-0.42	0.98	0.00	10.37	-0.77	0.63	0 00:12	0 00:00	0.00	0.00

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-01	2.23	0 00:07	6.97	0.32	3.78	0.80	0.61	0.49	0.00		Calculated
2	Link-02	2.37	0 00:07	7.07	0.34	2.79	0.18	0.82	0.65	0.00		Calculated
3	Link-03	2.79	0 00:07	6.97	0.40	3.20	0.05	0.84	0.67	0.00		Calculated
4	Link-04	3.23	0 00:07	7.09	0.46	4.71	0.08	0.68	0.55	0.00		Calculated
5	P-31	0.81	0 00:06	3.86	0.21	3.38	0.10	0.35	0.35	0.00		Calculated
6	P-32	1.03	0 00:06	4.01	0.26	3.67	0.09	0.39	0.39	0.00		Calculated
7	P-33	1.80	0 00:06	3.86	0.47	4.64	0.93	0.50	0.50	0.00		Calculated
8	P-34	0.20	0 00:06	3.86	0.05	2.40	0.15	0.16	0.16	0.00		Calculated
9	P-35	0.25	0 00:06	3.86	0.07	2.54	0.15	0.19	0.19	0.00		Calculated
10	P-37	0.25	0 00:06	3.91	0.06	2.64	0.25	0.18	0.18	0.00		Calculated
11	P-38	0.51	0 00:06	3.86	0.13	3.12	0.17	0.26	0.26	0.00		Calculated
12	P-39	0.54	0 00:06	4.65	0.12	3.56	0.13	0.25	0.25	0.00		Calculated
13	P-87	0.80	0 00:12	40.87	0.02	0.76	26.05	0.62	0.21	0.00		Calculated

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	36	0.82	0.82	N/A	N/A	N/A	5.07	9.71	0.17	0 00:06	0.00	0.00
2	37	1.04	1.04	N/A	N/A	N/A	6.34	9.72	0.21	0 00:06	0.00	0.00
3	39	0.21	0.21	N/A	N/A	N/A	1.28	11.95	0.04	0 00:06	0.00	0.00
4	40	0.26	0.26	N/A	N/A	N/A	1.60	11.72	0.05	0 00:06	0.00	0.00
5	42	0.26	0.26	N/A	N/A	N/A	1.58	10.32	0.05	0 00:06	0.00	0.00
6	43	0.52	0.52	N/A	N/A	N/A	3.23	10.06	0.11	0 00:06	0.00	0.00
7	45	0.55	0.55	N/A	N/A	N/A	3.37	10.02	0.11	0 00:06	0.00	0.00

Project Description

File Name	CYPHER ST EXT - PR.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Jul 22, 2021	00:00:00
End Analysis On	Jul 22, 2021	01:00:00
Start Reporting On	Jul 22, 2021	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	7
Nodes	14
Junctions	6
Outfalls	1
Flow Diversions	0
Inlets	7
Storage Nodes	0
Links	13
Channels	0
Pipes	13
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	100 year(s)

Subbasin Summary

Subbasin Name	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ft^3)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
Sub-36	0.14	0.90	0.78	0.71	366	1.01	0 00:06:00
Sub-37	0.18	0.90	0.78	0.71	464	1.28	0 00:06:00
Sub-39	0.04	0.90	0.78	0.71	92	0.25	0 00:06:00
Sub-40	0.05	0.90	0.78	0.71	115	0.32	0 00:06:00
Sub-42	0.13	0.30	0.78	0.24	114	0.32	0 00:06:00
Sub-43	0.09	0.90	0.78	0.71	233	0.64	0 00:06:00
Sub-45	0.10	0.90	0.78	0.71	243	0.67	0 00:06:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	38	Junction	5.27	9.93	5.27	9.93	10.00	2.26	5.84	0.00	4.08	0 00:00	0.00	0.00
2	41	Junction	2.68	12.35	2.68	12.35	10.00	2.76	3.23	0.00	9.12	0 00:00	0.00	0.00
3	44	Junction	0.88	11.40	0.00	0.00	0.00	3.04	1.77	0.00	9.63	0 00:00	0.00	0.00
4	46	Junction	0.58	11.40	0.00	0.00	0.00	3.44	1.62	0.00	9.78	0 00:00	0.00	0.00
5	47	Junction	0.49	11.40	0.00	0.00	0.00	3.99	1.38	0.00	10.02	0 00:00	0.00	0.00
6	48	Junction	-1.40	9.95	-1.40	9.95	0.00	3.99	-0.30	0.00	10.25	0 00:00	0.00	0.00
7	EX_36-E_ST	Outfall	-1.00					1.16	-0.67					

Link Summary

Pipe Name	From (Inlet) Node	Inlet Invert Elevation	To (Outlet) Node	Outlet Invert Elevation	Pipe Length	Pipe Slope	Pipe Diameter	Manning's Roughness	Peak Flow Q	Peak Flow Velocity	Pipe Design Capacity Qf	Q/Qf Ratio
		(ft)		(ft)	(ft)	(%)	(in)		(cfs)	(ft/sec)	(cfs)	
Link-01	41	2.68	44	0.88	181	0.99	15	0.0120	2.75	3.89	6.97	0.39
Link-02	44	0.88	46	0.58	29	1.02	15	0.0120	2.90	2.86	7.07	0.41
Link-03	46	0.58	47	0.49	9	0.99	15	0.0120	3.43	3.38	6.97	0.49
Link-04	47	0.49	48	0.25	23	1.03	15	0.0120	3.99	4.95	7.09	0.56
P-31	36	6.05	38	5.85	20	1.00	12	0.0120	1.00	3.55	3.86	0.26
P-32	37	5.98	38	5.77	19	1.08	12	0.0120	1.27	3.85	4.01	0.32
P-33	38	5.27	41	2.68	259	1.00	12	0.0120	2.21	4.91	3.86	0.57
P-34	39	8.11	41	7.90	21	1.00	12	0.0120	0.25	2.52	3.86	0.06
P-35	40	8.11	41	7.88	23	1.00	12	0.0120	0.31	2.70	3.86	0.08
P-37	42	5.20	44	4.80	39	1.03	12	0.0120	0.31	2.80	3.91	0.08
P-38	43	5.45	46	5.14	31	1.00	12	0.0120	0.63	3.28	3.86	0.16
P-39	45	5.44	47	5.05	27	1.45	12	0.0120	0.66	3.75	4.65	0.14
P-87	48	-1.40	EX_36-E_ST	-1.20	1188	-0.02	36	0.0150	1.16	0.90	40.87	0.03

Inlet Summary

SN ID	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft^2)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	36	FHWA HEC-22 GENERIC	N/A	On Sag	1	6.05	9.54	6.05	10.00	1.01	N/A	N/A	N/A	7.00	6.21	9.74
2	37	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.98	9.51	5.98	10.00	1.28	N/A	N/A	N/A	7.00	7.36	9.74
3	39	FHWA HEC-22 GENERIC	N/A	On Sag	1	8.11	11.91	8.11	10.00	0.25	N/A	N/A	N/A	7.00	1.57	11.96
4	40	FHWA HEC-22 GENERIC	N/A	On Sag	1	8.11	11.67	8.11	10.00	0.32	N/A	N/A	N/A	7.00	1.96	11.73
5	42	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.20	10.27	5.20	10.00	0.32	N/A	N/A	N/A	7.00	1.95	10.33
6	43	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.45	9.95	5.45	10.00	0.64	N/A	N/A	N/A	7.00	3.96	10.08
7	45	FHWA HEC-22 GENERIC	N/A	On Sag	1	5.44	9.91	5.44	10.00	0.67	N/A	N/A	N/A	7.00	4.14	10.04

Subbasin Hydrology

Subbasin : Sub-36

Input Data

Area (ac) 0.14
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.14	-	0.90
Composite Area & Weighted Runoff Coeff.	0.14		0.90

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

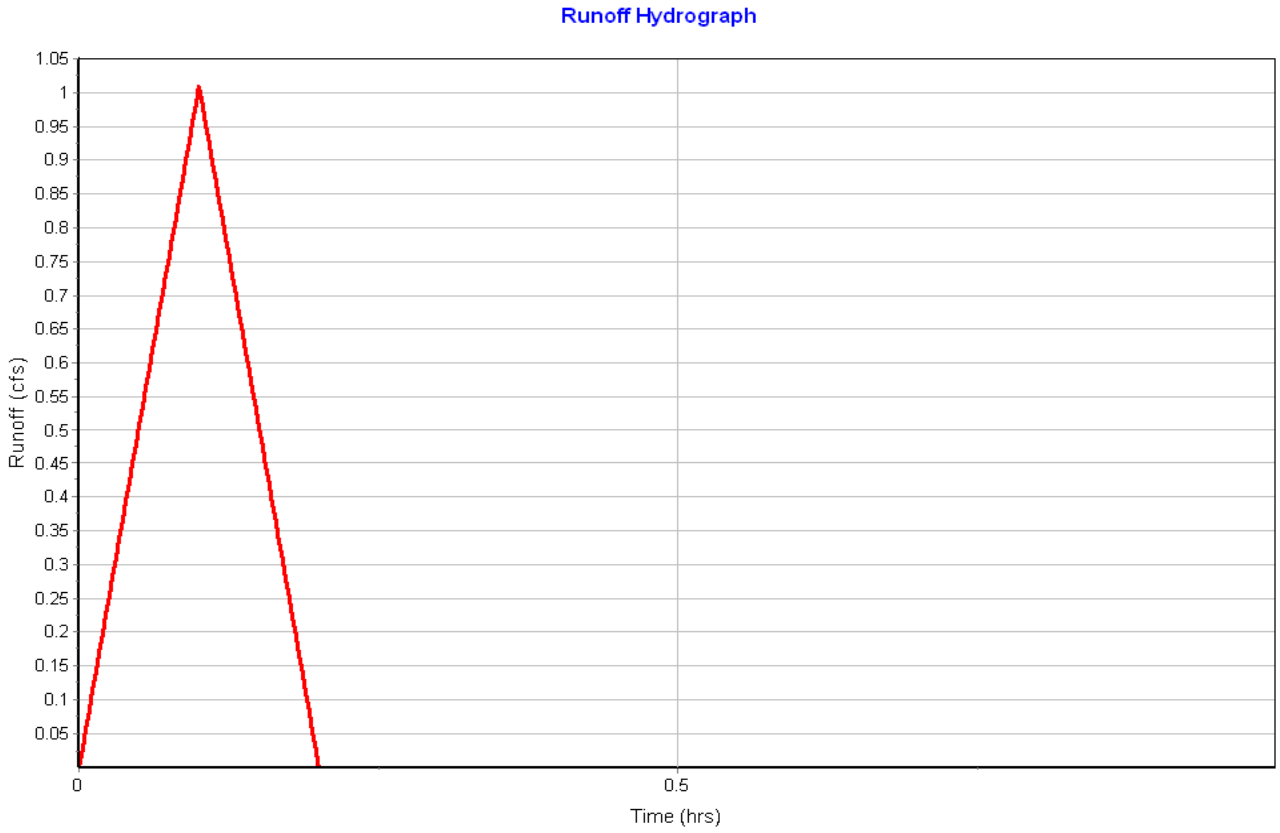
Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Subbasin Runoff Results

Total Rainfall (in)	0.78
Total Runoff (in)	0.71
Peak Runoff (cfs)	1.01
Rainfall Intensity	7.840
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-36



Subbasin : Sub-37

Input Data

Area (ac)	0.18
Weighted Runoff Coefficient	0.9000

Runoff Coefficient

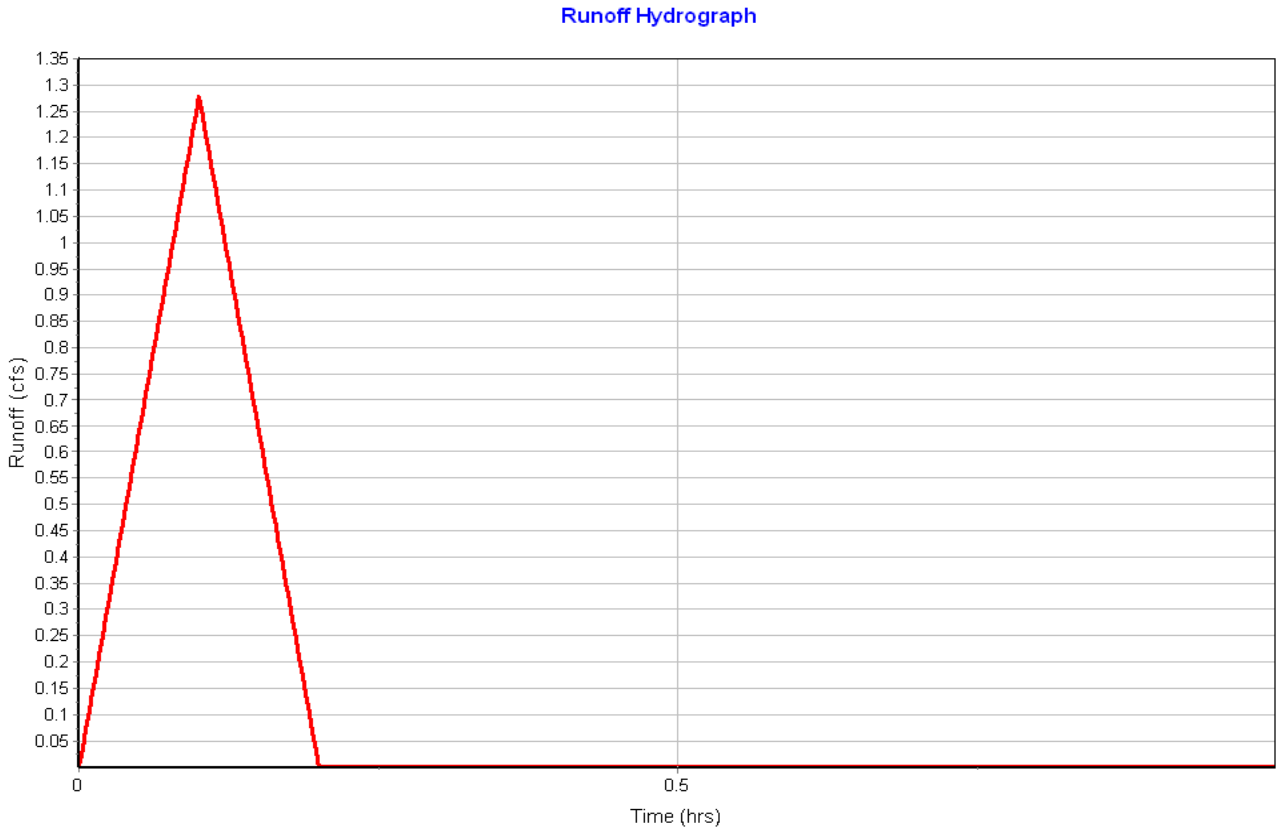
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.18	-	0.90
Composite Area & Weighted Runoff Coeff.	0.18		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in)	0.78
Total Runoff (in)	0.71
Peak Runoff (cfs)	1.28
Rainfall Intensity	7.840
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-37



Subbasin : Sub-39

Input Data

Area (ac)	0.04
Weighted Runoff Coefficient	0.9000

Runoff Coefficient

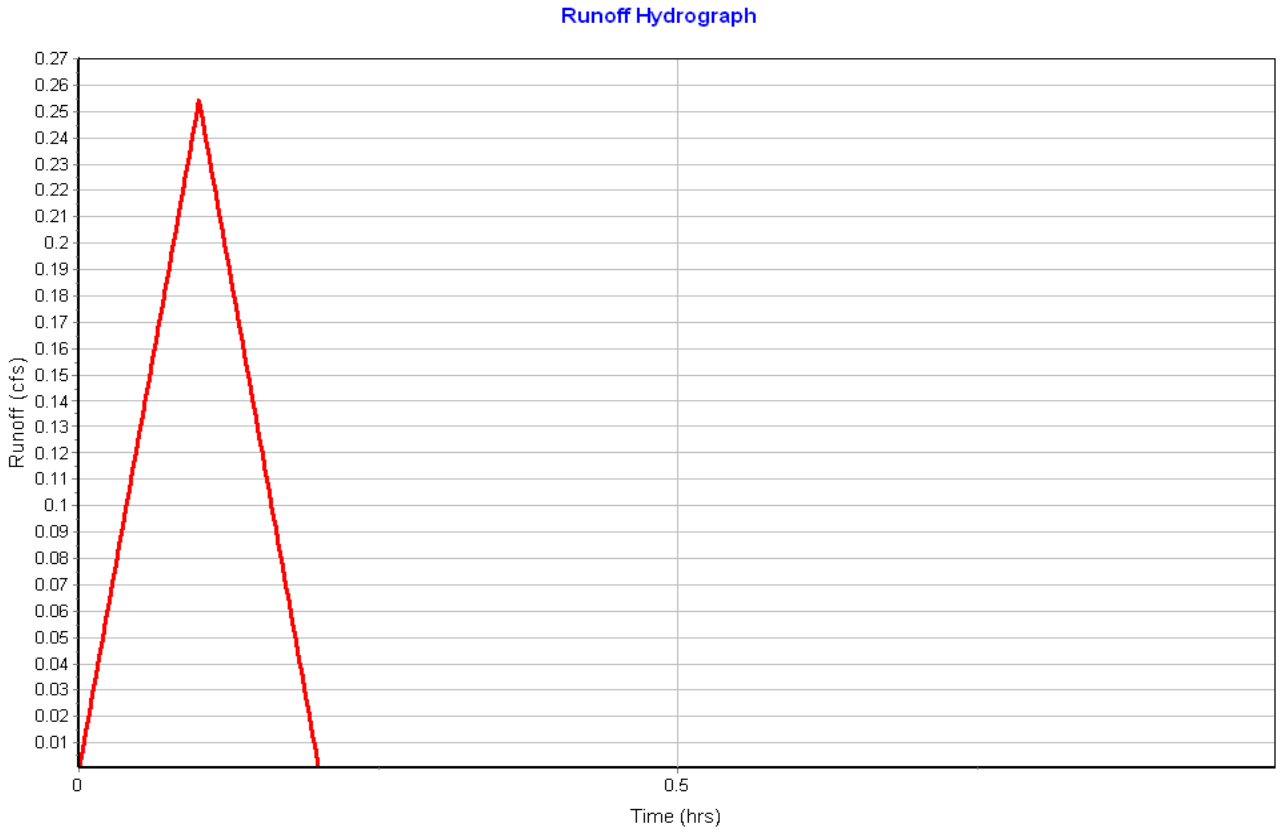
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.04	-	0.90
Composite Area & Weighted Runoff Coeff.	0.04		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in)	0.78
Total Runoff (in)	0.71
Peak Runoff (cfs)	0.25
Rainfall Intensity	7.840
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-39



Subbasin : Sub-40

Input Data

Area (ac) 0.05
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

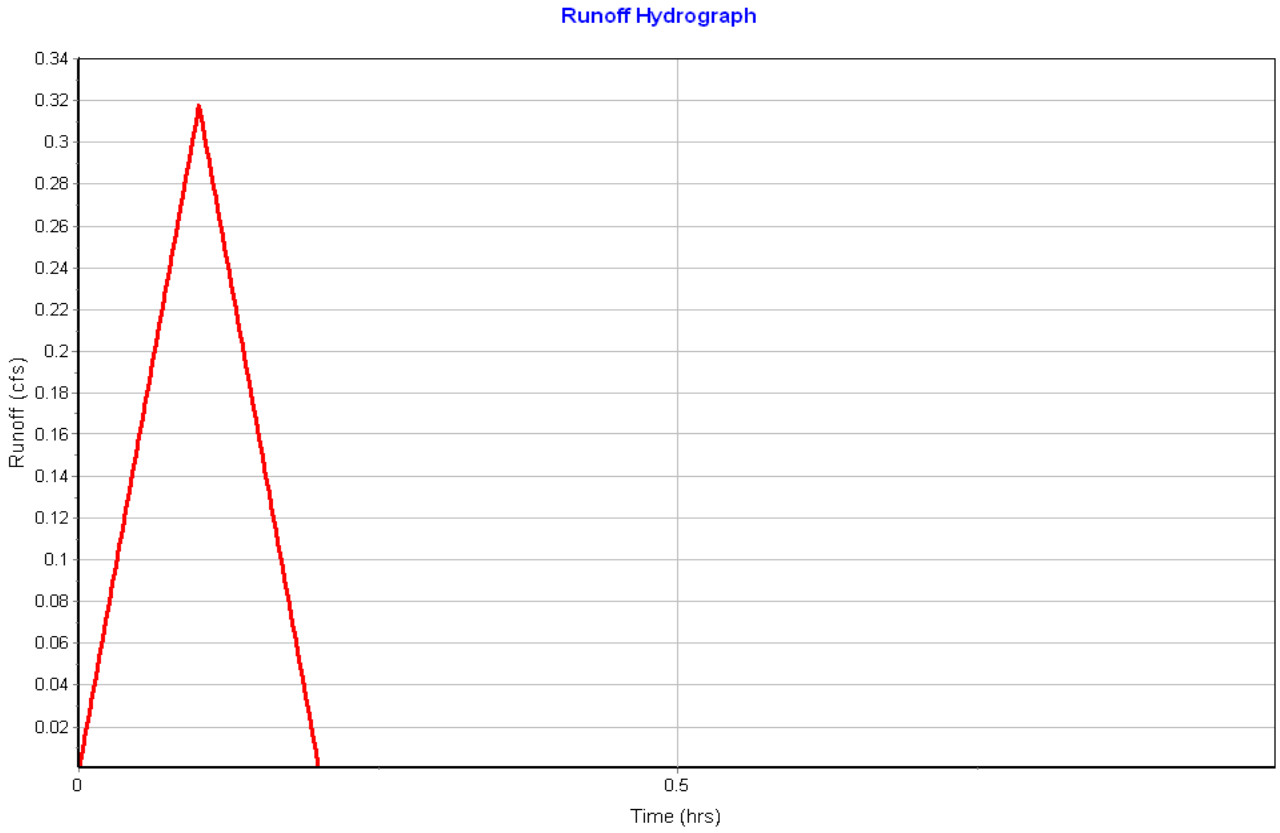
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.05	-	0.90
Composite Area & Weighted Runoff Coeff.	0.05		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in) 0.78
Total Runoff (in) 0.71
Peak Runoff (cfs) 0.32
Rainfall Intensity 7.840
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:00:00

Subbasin : Sub-40



Subbasin : Sub-42

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.3000

Runoff Coefficient

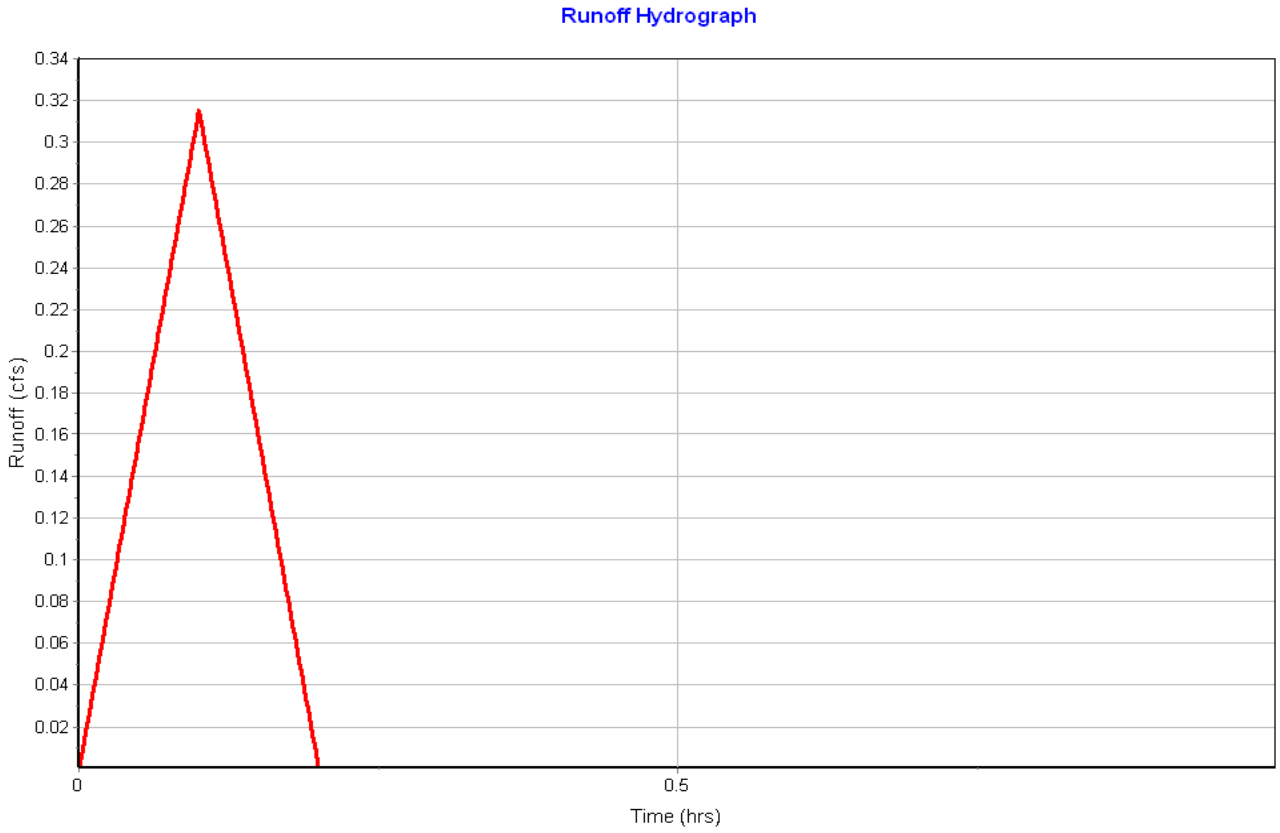
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.13	-	0.30
Composite Area & Weighted Runoff Coeff.	0.13		0.30

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in) 0.78
Total Runoff (in) 0.24
Peak Runoff (cfs) 0.32
Rainfall Intensity 7.840
Weighted Runoff Coefficient 0.3000
Time of Concentration (days hh:mm:ss) 0 00:00:00

Subbasin : Sub-42



Subbasin : Sub-43

Input Data

Area (ac)	0.09
Weighted Runoff Coefficient	0.9000

Runoff Coefficient

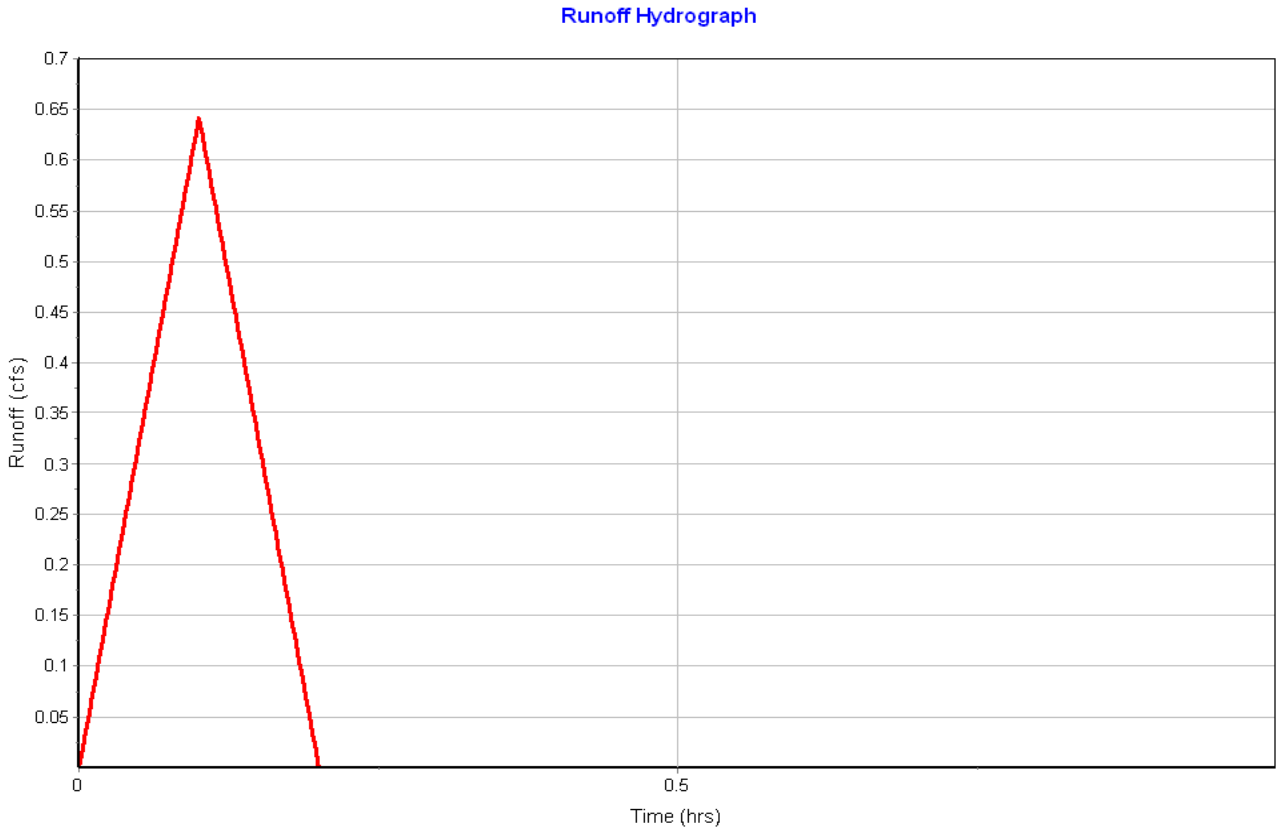
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.09	-	0.90
Composite Area & Weighted Runoff Coeff.	0.09		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in)	0.78
Total Runoff (in)	0.71
Peak Runoff (cfs)	0.64
Rainfall Intensity	7.840
Weighted Runoff Coefficient	0.9000
Time of Concentration (days hh:mm:ss)	0 00:00:00

Subbasin : Sub-43



Subbasin : Sub-45

Input Data

Area (ac) 0.10
Weighted Runoff Coefficient 0.9000

Runoff Coefficient

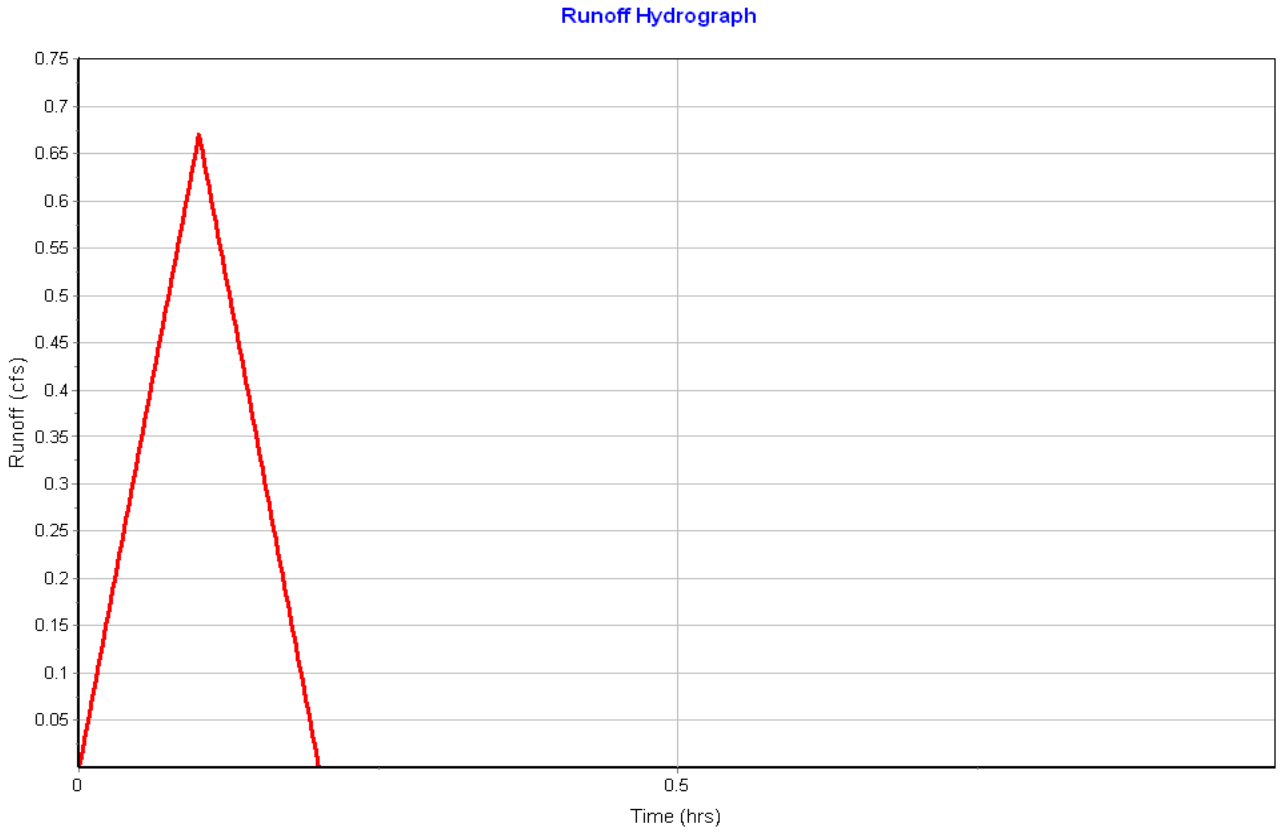
Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	0.10	-	0.90
Composite Area & Weighted Runoff Coeff.	0.10		0.90

Time of Concentration

Subbasin Runoff Results

Total Rainfall (in) 0.78
Total Runoff (in) 0.71
Peak Runoff (cfs) 0.67
Rainfall Intensity 7.840
Weighted Runoff Coefficient 0.9000
Time of Concentration (days hh:mm:ss) 0 00:00:00

Subbasin : Sub-45



Junction Input

Juntion Name	Invert Elevation (ft)	Rim Elevation (ft)
38	5.27	9.93
41	2.68	12.35
44	0.88	11.40
46	0.58	11.40
47	0.49	11.40
48	-1.40	9.95

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	38	2.26	0.00	5.84	0.57	0.00	4.08	5.36	0.09	0 00:06	0 00:00	0.00	0.00
2	41	2.76	0.00	3.23	0.55	0.00	9.12	2.78	0.10	0 00:06	0 00:00	0.00	0.00
3	44	3.04	0.00	1.77	0.89	0.00	9.63	1.01	0.13	0 00:07	0 00:00	0.00	0.00
4	46	3.44	0.00	1.62	1.04	0.00	9.78	0.75	0.17	0 00:07	0 00:00	0.00	0.00
5	47	3.99	0.00	1.38	0.89	0.00	10.02	0.64	0.15	0 00:07	0 00:00	0.00	0.00
6	48	3.99	0.00	-0.30	1.10	0.00	10.25	-0.73	0.67	0 00:12	0 00:00	0.00	0.00

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-01	2.75	0 00:06	6.97	0.39	3.89	0.78	0.71	0.57	0.00		Calculated
2	Link-02	2.90	0 00:07	7.07	0.41	2.86	0.17	0.97	0.77	0.00		Calculated
3	Link-03	3.43	0 00:07	6.97	0.49	3.38	0.04	0.97	0.77	0.00		Calculated
4	Link-04	3.99	0 00:07	7.09	0.56	4.95	0.08	0.78	0.62	0.00		Calculated
5	P-31	1.00	0 00:06	3.86	0.26	3.55	0.09	0.39	0.39	0.00		Calculated
6	P-32	1.27	0 00:06	4.01	0.32	3.85	0.08	0.44	0.44	0.00		Calculated
7	P-33	2.21	0 00:06	3.86	0.57	4.91	0.88	0.56	0.56	0.00		Calculated
8	P-34	0.25	0 00:06	3.86	0.06	2.52	0.14	0.18	0.18	0.00		Calculated
9	P-35	0.31	0 00:06	3.86	0.08	2.70	0.14	0.21	0.21	0.00		Calculated
10	P-37	0.31	0 00:06	3.91	0.08	2.80	0.23	0.20	0.20	0.00		Calculated
11	P-38	0.63	0 00:06	3.86	0.16	3.28	0.16	0.29	0.29	0.00		Calculated
12	P-39	0.66	0 00:06	4.65	0.14	3.75	0.12	0.28	0.28	0.00		Calculated
13	P-87	1.16	0 00:12	40.87	0.03	0.90	22.00	0.72	0.24	0.00		Calculated

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	36	1.01	1.01	N/A	N/A	N/A	6.21	9.74	0.21	0 00:06	0.00	0.00
2	37	1.28	1.28	N/A	N/A	N/A	7.36	9.74	0.23	0 00:06	0.00	0.00
3	39	0.25	0.25	N/A	N/A	N/A	1.57	11.96	0.05	0 00:06	0.00	0.00
4	40	0.32	0.32	N/A	N/A	N/A	1.96	11.73	0.07	0 00:06	0.00	0.00
5	42	0.32	0.32	N/A	N/A	N/A	1.95	10.33	0.07	0 00:06	0.00	0.00
6	43	0.64	0.64	N/A	N/A	N/A	3.96	10.08	0.13	0 00:06	0.00	0.00
7	45	0.67	0.67	N/A	N/A	N/A	4.14	10.04	0.14	0 00:06	0.00	0.00

Nitsch Engineering

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Form S4-C: Standard 4 – Water Quality
TSS Worksheet

Project Name: Cypher Street Reconstruction Project	Nitsch Project #: 9720.17
Location: Cypher Street, E Street, Fargo Street, Summer Street - Boston, MA	Checked by: MC
Prepared by: MJS	Sheet No. 1 of 1
Date: 7/23/21	

Closed Drainage System

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
	0.00	0.75	0.00	0.75
	0.00	0.75	0.00	0.75
	0.00	0.75	0.00	0.75
	0.00	0.75	0.00	0.75

Total TSS Removal = 25%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 608807
Prepared By: MJS
Date: 7/23/2021

*Equals remaining load from previous BMP (E) which enters the BMP

BMP List	Design Rate
Bioretention Area	90%

TSS WORKSHEET *from Volume 2, Chapter 3, Table 4, TSS Removal*

ATTACHMENT C

Long-Term Pollution Prevention-Stormwater Operation and Maintenance Plan

LONG-TERM POLLUTION PREVENTION PLAN AND STORMWATER OPERATION AND MAINTENANCE PLAN

Cypher Street Roadway Reconstruction Project
Boston, MA

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this document is to specify the pollution prevention measures and stormwater management system operation and maintenance for the Cypher Street Reconstruction Project. The Responsible Party indicated below shall implement the management practices outlined in this document and proactively conduct operations at the project site in an environmentally responsible manner. Compliance with this Manual does not in any way dismiss the responsible party, owner, property manager, or occupants from compliance with other applicable federal, state or local laws.

Owner: City of Boston (Cypher St, E Street, D Street, Fargo Street, Richards Street)
MassDOT (South Boston Bypass)

This Document has been prepared in compliance with Standards 4 and 9 of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards, which state:

Standard 4:
The Long Term Pollution Prevention Plan shall include the proper procedures for the following:

- Good housekeeping
- Storing materials and waste products inside or under cover
- Vehicle washing
- Routine inspections of stormwater best management practices
- Spill prevention and response
- Maintenance of lawns, gardens, and other landscaped areas
- Pet waste management
- Operation and management of septic systems
- Proper management of deicing chemicals and snow

Standard 9:
The Long-Term Operation and Maintenance Plan shall at a minimum include:

- Stormwater management system(s) owner(s)
- The party or parties responsible for operation and maintenance, including how future property owners shall be notified of the presence of the stormwater management system and the requirement for operation and maintenance
- The routine and non-routine maintenance tasks to be undertaken after construction is complete and a schedule for implementing those tasks
- A plan that is drawn to scale and shows the location of all stormwater BMPs in each treatment train along with the discharge point
- A description of public safety features
- An estimated operations and maintenance budget

2.0 LONG-TERM POLLUTION PREVENTION PLAN

The Responsible Party shall implement the following good housekeeping procedures at the project site to reduce the possibility of accidental releases and to reduce safety hazards. Refer also to the Boston Water and Sewer Hazard Response Plan.

2.1 Spill Prevention and Response

Implement spill response procedures for releases of significant materials such as fuels, oils, or chemical materials onto the ground or other area that could reasonably be expected to discharge to surface or groundwater.

- Immediately contact applicable Federal, State, and local agencies for reportable quantities as required by law.
- Immediately perform applicable containment and cleanup procedures following a spill release.
- Promptly remove and dispose of all material collected during the response in accordance with Federal, State and local requirements. A licensed emergency response contractor may be required to assist in cleanup of releases depending on the amount of the release, and the ability of the Contractor to perform the required response.
- Reportable quantities of chemicals, fuels, or oils are established under the Clean Water Act and enforced through MassDEP

2.2 Minimize Soil Erosion

Soil erosion facilitates mechanical transport of nutrients, pathogens, and organic matter to surface water bodies. Repair all areas where erosion is occurring throughout the project area. Stabilize bare soil with riprap, seed, mulch, or vegetation.

2.3 Maintenance of Lawns, Gardens, and other Landscaped Areas

Pesticides and fertilizers shall not be used in the landscaped areas associated with the project site and shall not be stored on-site. Dumping of lawn wastes, brush or leaves or other materials or debris is not permitted in any Resource Area. Grass clippings, pruned branches and any other landscaped waste should be disposed of or composted in an appropriate location. No irrigation shall be used in the landscaped areas for this project.

2.4 Management of Deicing Chemicals and Snow

Snow removal is handled by the City of Boston contractors. The Contractor shall be made fully aware of the requirements of this section.

During typical snow plowing operations, snow shall be pushed to appropriate snow removal/storage areas. Snow shall not be stockpiled on catch basins. In severe conditions where snow cannot be stockpiled on site, the snow shall be removed from the site and properly disposed of in accordance with MassDEP Guideline BWR G2015-01.

Use of sand is permitted.

Before winter begins, the City and the contractor shall review snow plowing, deicing, and stockpiling procedures. Areas designated for stockpiling should be cleaned of any debris. Street sweeping should be followed in accordance with the Operation and Maintenance Plan.

2.5 Coordination with other Permits and Requirements

Certain conditions of other approvals affecting the long term management of the property shall be considered part of this Long Term Pollution Prevention Plan. The Owner shall become familiar with those documents and comply with the guidelines set forth in those documents.

3.0 STORMWATER MANAGEMENT SYSTEM OPERATION AND MAINTENANCE PLAN

3.1 Introduction

This Operation and Maintenance Plan (O&M Plan) for the Cypher Street Reconstruction Project is required under Standard 9 of the 2008 MassDEP Stormwater Handbook to provide best management practices for implementing maintenance activities for the stormwater management system in a manner that minimizes impacts to wetland resource areas.

The Owner shall implement this O&M Plan and proactively conduct operations at the site in an environmentally responsible manner. Compliance with this O&M Plan does not in any way dismiss the Owner from compliance with other applicable Federal, State or local laws.

Routine maintenance during construction and post-development phases of the project, as defined in the Operation and Maintenance Plan, shall be permitted without amendment to the Order of Conditions. A continuing condition in the Certificate of Compliance shall ensure that maintenance can be performed without triggering further filings under the Wetlands Protection Act.

All stormwater best management practices (BMPs) shall be operated and maintained in accordance with the design plans and the Operation and Maintenance Plan approved by the issuing authority. The Owner shall:

a. Maintain an operation and maintenance log for the last three years, including inspections, repairs, replacement and disposal (for disposal the log shall indicate the type of material and the disposal location). This is a rolling log in which the responsible party records all operation and maintenance activities for the past three years.

b. Make this log available to MassDEP and the Conservation Commission upon request; and

c. Allow members and agents of the MassDEP and the Conservation Commission to enter and inspect the premises to evaluate and ensure that the Owner complies with the Operation and Maintenance requirements for each BMP.

3.2 Stormwater Operation and Maintenance Requirements

Inspect and maintain the stormwater management system as directed below. Repairs to any component of the system shall be made as soon as possible to prevent any potential pollutants (including silt) from entering the resource areas.

<u>Deep Sump and Hooded Catch Basins</u>

Inspect catch basins annually. Other inspection and maintenance requirements include:

- Remove organic material, sediment and hydrocarbons four times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin.
- Always clean out structures after street sweeping. If any evidence of hydrocarbons is found during inspection, the material immediately remove using absorbent pads or other suitable measures and dispose of legally. Remove other accumulated debris as necessary.
- Transport and disposal of accumulated sediment off-site shall be in accordance with applicable local, state and federal guidelines and regulations.

Vegetated Swales

Vegetated swales shall be inspected twice per year during the first year after construction. In subsequent years, the swales shall be inspected annually and after rain events greater than 3 inches in 24 hours. Inspection and maintenance procedures for drainage channels are provided below:

- Inspect the riprap on the channel bottom and side slopes for signs of erosion and formation of rills and gullies. Replace riprap as necessary.
- Inspect channels the first few months after construction and twice per year thereafter to make sure vegetation is adequate and for signs of rilling and gullying. Repair any rills or gullies. Replace dead vegetation.
- Remove accumulated trash and debris annually.
- Remove sediment as needed at least once per year. Use hand methods (i.e. a person with a shovel) when cleaning to minimize disturbance to vegetation and underlying soils.
- Mow as necessary. Grass height shall be between 3 and 6 inches.
- Reseed as necessary
- Check Dams: Inspect check dams after every significant rainfall event. Repair damage as needed. Remove sediment as needed.

3.3 Street Sweeping

Perform street sweeping according to the City of Boston's street sweeping schedule, and whenever there is significant debris present on roads. Sweepings must be handled and disposed of properly according to the City of Boston Conservation Commission.

3.4 Repair of the Stormwater Management System

The stormwater management system shall be maintained. The repair of any component of the system shall be made as soon as possible to prevent any potential pollutants including silt from entering the resource areas or the existing closed drainage system.

3.5 Reporting

The Owner shall maintain a record of drainage system inspections and maintenance (per this Plan) and submit a yearly report to the City of Boston/MassDOT.

INSPECTION CHECKLIST (DEEP SUMP AND HOODED CATCH BASINS – City of Boston)			
Location: **Date:** **Time:** **Date Since Last Rain Event:**			**Inspector:** **Site Conditions:**
Inspection Items	**Satisfactory (S) or Unsatisfactory (U)**		**Comments/Corrective Action**
Visual evidence of trash, debris or dumping	S	U	
Dead animals or vegetation that could generate odors or gases and could cause complaints	S	U	
Evidence of oil, gasoline, contaminants, or other pollutants	S	U	
Condition of basin. Is there a safety, function, or design problem (need for repair)	S	U	
Vegetation blocking more than 10% of the basin opening (lawn areas)	S	U	
Trash and debris blocking more than 20% of grate surface inlet capacity	S	U	
Missing grate, missing or broken grate members	S	U	
Grout fillet is separated or cracked wider than ½ inch and longer than 1 foot at the joint of outlet pipe; evidence of soil entering through cracks	S	U	
Trash or debris in the basin exceeds 50% of the sump depth from the bottom of basin to invert of the outlet pipe; less than 6 inches clearance from the debris surface to the invert of the outlet pipe	S	U	
Sediment in the basin exceeds 50% of the sump depth from the bottom of basin to invert of the outlet pipe; less than 6 inches clearance from the debris surface to the invert of the outlet pipe	S	U	
Trash or debris blocking outlet pipe	S	U	
Debris Cleanup			
Remove and legally dispose sediment, trash, and debris	S	U	
Remove and legally dispose contaminants or pollutants	S	U	
Repair catch basin (as necessary)	S	U	
Replace catch basin castings (as necessary)			
Controlling Run-On			
Adjacent vegetated areas show no signs of erosion and run-on to catch basin	S	U	
Corrective Action Needed			**Due Date**
1.			
2.			
3.			
4.			

INSPECTION CHECKLIST (DEEP SUMP AND HOODED CATCH BASINS – MassDOT)			
Location: **Date:** **Time:** **Date Since Last Rain Event:**			**Inspector:** **Site Conditions:**
Inspection Items	**Satisfactory (S) or Unsatisfactory (U)**		**Comments/Corrective Action**
Visual evidence of trash, debris or dumping	S	U	
Dead animals or vegetation that could generate odors or gases and could cause complaints	S	U	
Evidence of oil, gasoline, contaminants, or other pollutants	S	U	
Condition of basin. Is there a safety, function, or design problem (need for repair)	S	U	
Vegetation blocking more than 10% of the basin opening (lawn areas)	S	U	
Trash and debris blocking more than 20% of grate surface inlet capacity	S	U	
Missing grate, missing or broken grate members	S	U	
Grout fillet is separated or cracked wider than ½ inch and longer than 1 foot at the joint of outlet pipe; evidence of soil entering through cracks	S	U	
Trash or debris in the basin exceeds 50% of the sump depth from the bottom of basin to invert of the outlet pipe; less than 6 inches clearance from the debris surface to the invert of the outlet pipe	S	U	
Sediment in the basin exceeds 50% of the sump depth from the bottom of basin to invert of the outlet pipe; less than 6 inches clearance from the debris surface to the invert of the outlet pipe	S	U	
Trash or debris blocking outlet pipe	S	U	
Debris Cleanup			
Remove and legally dispose sediment, trash, and debris	S	U	
Remove and legally dispose contaminants or pollutants	S	U	
Repair catch basin (as necessary)	S	U	
Replace catch basin castings (as necessary)			
Controlling Run-On			
Adjacent vegetated areas show no signs of erosion and run-on to catch basin	S	U	
Corrective Action Needed			**Due Date**
1.			
2.			
3.			
4.			

INSPECTION CHECKLIST (VEGETATED SWALES)		
Location: **Date:** **Time:** **Date Since Last Rain Event:**		**Inspector:** **Site Conditions:**
Inspection Items	**Satisfactory (S) or Unsatisfactory (U)**	**Comments/Corrective Action**
Inspect the riprap on the channel bottom and side slopes for signs of erosion and formation of rills and gullies. Replace riprap as necessary.	S U	
Visual evidence of trash, debris or dumping	S U	
Inspect check dams after every significant rainfall event. Repair damage as needed. Remove sediment as needed.	S U	
Maintenance		
Remove and legally dispose sediment, trash, and debris	S U	
Remove and legally dispose contaminants or pollutants	S U	
Corrective Action Needed		**Due Date**
1.		
2.		
3.		
4.		

MassDOT Operation and Maintenance Schedule for Stormwater Infrastructure

Stormwater Control Measures (SCMs)	Activity Schedule				
	Mow	Sweep	Inspect	Clean	Maintain/ Repair
Pretreatment SCMs					
Deep-Sump Catch Basins	--	--	Annually	ANI	ANI
Sediment Forebays	--	--	Annually	ANI	ANI
Open-Graded Friction Course	--	Annually	Annually	ANI	ANI
Infiltration SCMs					
Pavement Disconnection (Qualifying Pervious Area or Vegetated Filter Strip)	Annually	--	Annually	ANI	ANI
Infiltration Basin and Infiltration Linear Practice	Annually	--	Annually	ANI	ANI
Leaching Basin	--		Annually	ANI	ANI
Subsurface Infiltration System	--	--	Annually	ANI	ANI
Porous Pavement	--	Annually	Annually	ANI	ANI
Stormwater Wetland SCMs					
Constructed Stormwater Wetland	--	--	Annually	ANI	ANI
Gravel Wetland	--	--	Annually	ANI	ANI
Bioretention SCMs					
Bioretention Area and Bioretention Linear Practice	--	--	Annually	ANI	ANI
Other SCMs					
Extended Dry Detention Basins	Annually	--	Annually	ANI	ANI
Wet Basin and Wet Linear Practice	--	--	Annually	ANI	ANI
Vegetated Riprap	--	--	Annually	ANI	ANI
Other	--	--	Annually	ANI	ANI

ATTACHMENT D

Soil Investigations – NRCS Soil Maps and Descriptions


71° 3' 10" W
71° 2' 15" W
42° 20' 47" N
42° 20' 20" N
331000
331100
331200
331300
331400
331500
331600
331700
331800
331900
332000
332100
330900
4690200
4690100
4690000
4689900
4689800
4689700
4689600
4689500
Summer
Massport Haul
Boston Bypass
Claflin St
D
Fargo St
Pappas Way
C St
D St
E St
2nd
W 1st St
Driveway
603
655
Soil Map may not be valid at this scale.
Map Scale: 1:5,770 if printed on A landscape (11" x 8.5") sheet.
Meters
0 50 100 200 300
Feet
0 250 500 1000 1500
N
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 16, Jun 11, 2020

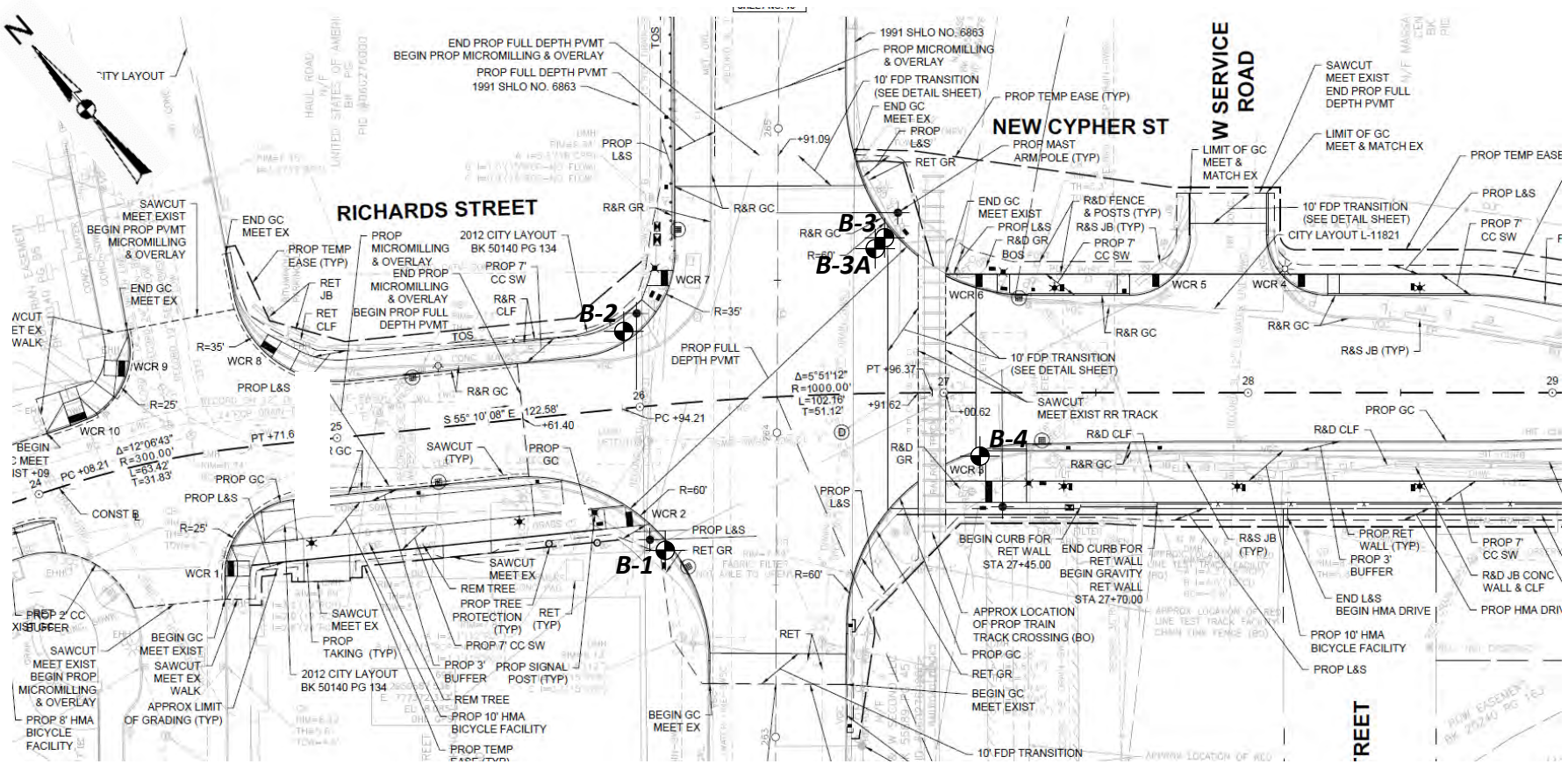
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
603	Urban land, wet substratum, 0 to 3 percent slopes	11.0	77.4%
655	Udorthents, wet substratum	3.2	22.6%
Totals for Area of Interest		**14.2**	**100.0%**



Legend:

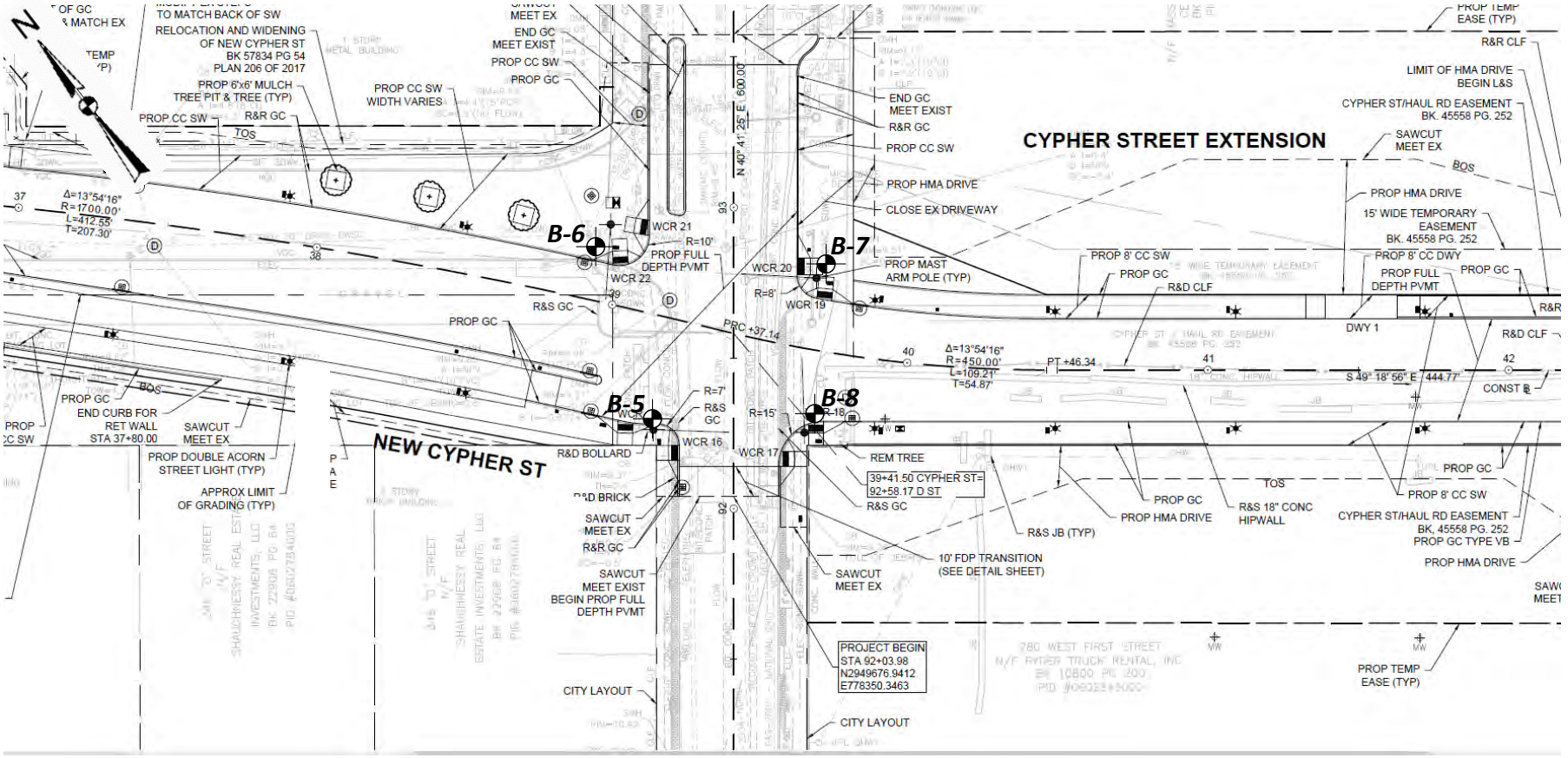
Approximate location of boring advanced by Northern Drill Service, Inc., of, MA between June 12, 2019 and June 28, 2019 and observed by LGCI.

Approximate Scale (feet)

0 50 100

Note:
Figure based on drawing titled: "Boston Cypher Street Construction Plans," prepared by Nitsch Engineering, Inc., dated August 15, 2018, and provided to LGCI by Nitsch Engineering, Inc. via e-mail on May 02, 2019.

Client: Nitsch Engineering, Inc.	Project: Proposed Cypher Street Mast Arms	Figure 3A – Boring Location plan (B-1 to B-4)	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Boston, MA	LGCI Project No.: 1909	Date: Feb. 2020



Legend:

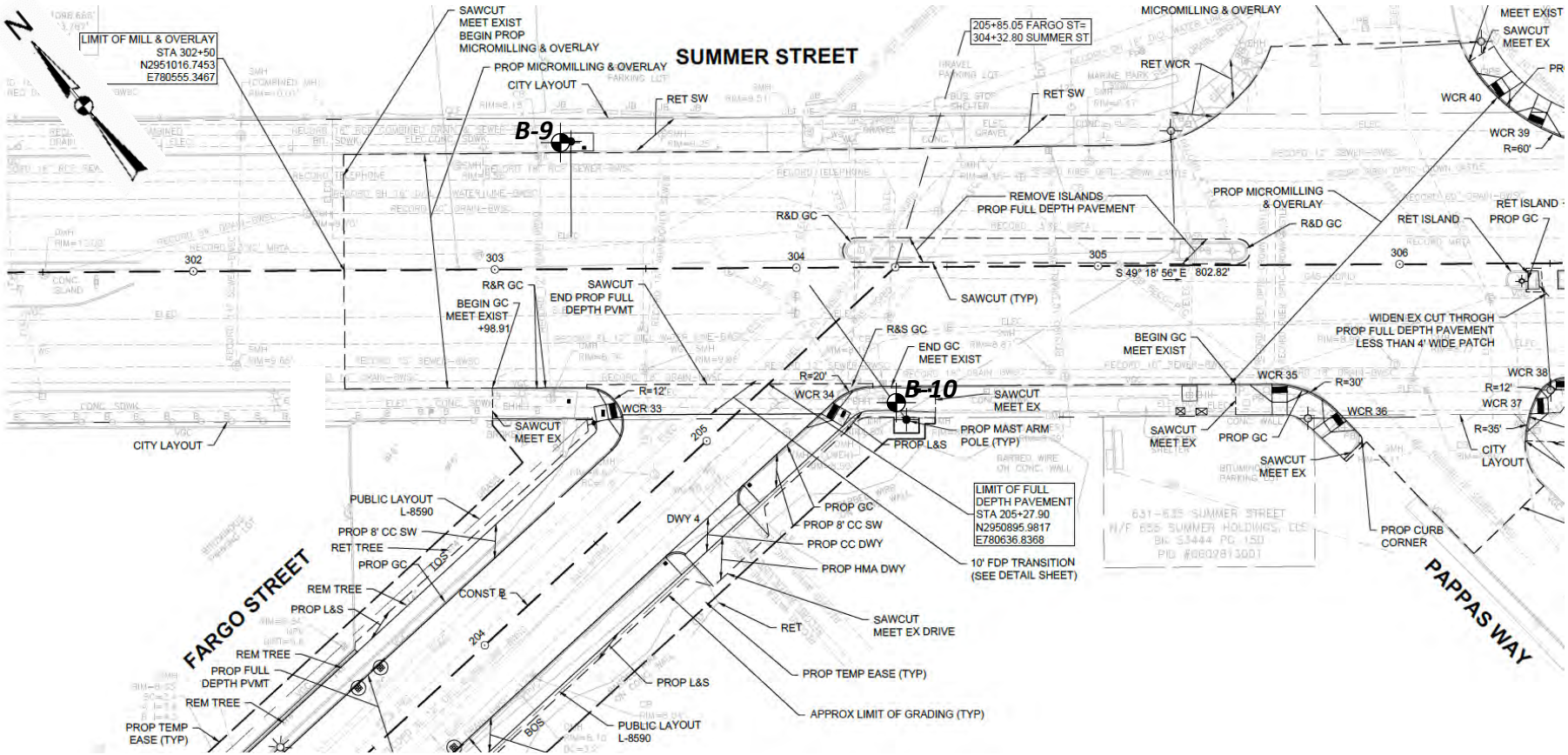
Approximate location of boring advanced by Northern Drill Service, Inc., of, MA between June 12, 2019 and June 28, 2019 and observed by LGCI.

Approximate Scale (feet)

0 50 100

Note:
Figure based on drawing titled: "Boston Cypher Street Construction Plans," prepared by Nitsch Engineering, Inc., dated August 15, 2018, and provided to LGCI by Nitsch Engineering, Inc. via e-mail on May 02, 2019.

Client:	Project:	Figure 3B – Boring Location Plan (B-5 to B-8)	
Nitsch Engineering, Inc.	Proposed Cypher Street Mast Arms		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Boston, MA	LGCI Project No.: 1909	Date: Feb. 2020



Legend:

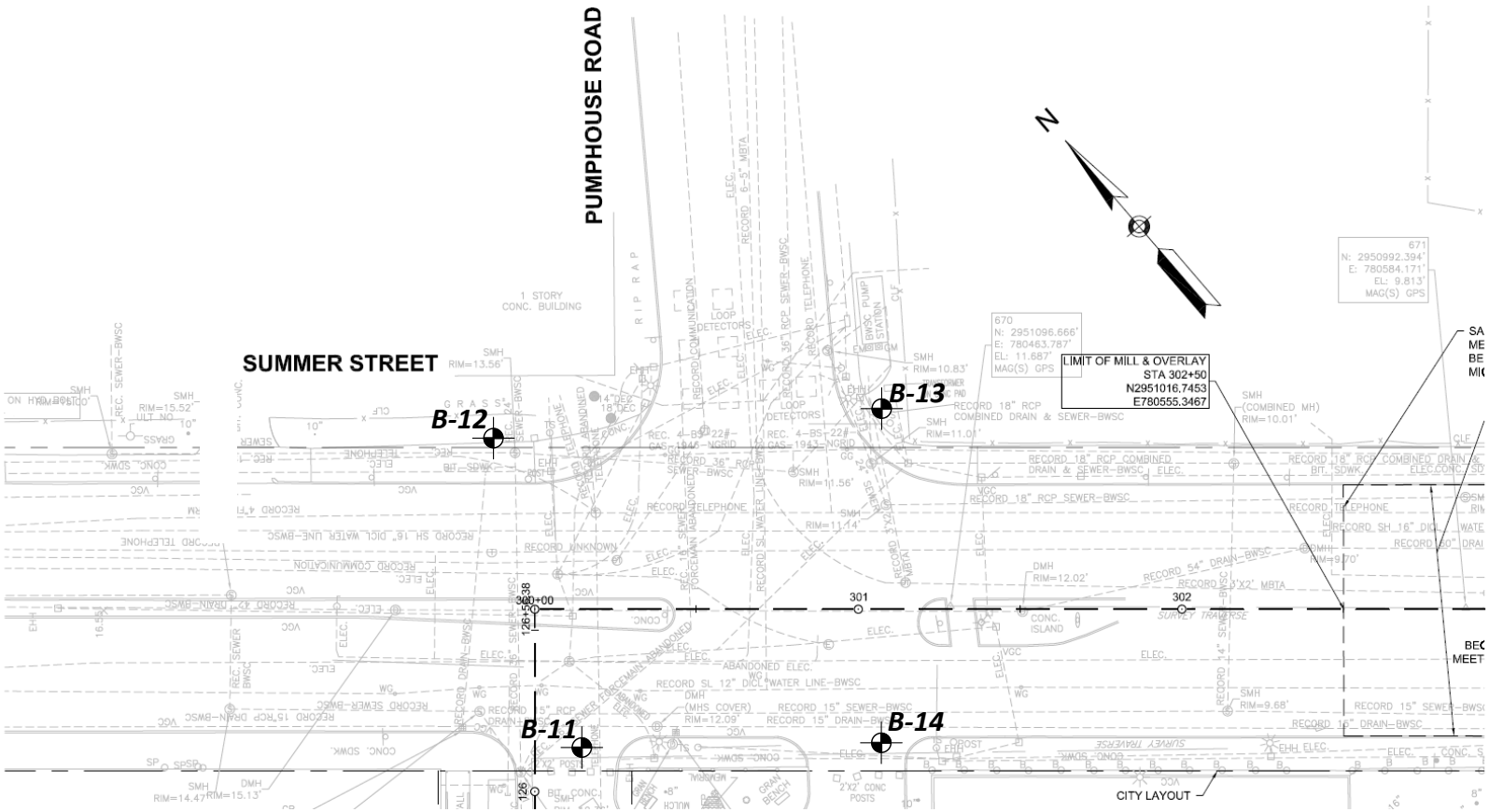
Approximate location of boring advanced by Northern Drill Service, Inc., of, MA between June 12, 2019 and June 28, 2019 and observed by LGCI.

Approximate Scale (feet)

0 50 100

Note:
Figure based on drawing titled: "Boston Cypher Street Construction Plans," prepared by Nitsch Engineering, Inc., dated August 15, 2018, and provided to LGCI by Nitsch Engineering, Inc. via e-mail on May 02, 2019.

Client:	Project:	Figure 3C – Boring Location Plan (B-9 to B-10)	
Nitsch Engineering, Inc.	Proposed Cypher Street Mast Arms		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Boston, MA	LGCI Project No.: 1909	Date: Feb. 2020



Approximate Scale (feet)

0 50 100

Legend:

Approximate location of boring advanced by Northern Drill Service, Inc., of, MA between June 12, 2019 and June 28, 2019 and observed by LGCI.

Note:
Figure based on an untitled progress drawing, prepared by Nitsch Engineering, and provided to LGCI by Nitsch Engineering, Inc. via e-mail on May 02, 2019.

Client:	Project:	Figure 3D – Boring Location Plan (B-11 to B-12)	
Nitsch Engineering, Inc.	Proposed Cypher Street Mast Arms		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Boston, MA	LGCI Project No.: 1909	Date: Feb. 2020

Attachment A – Boring Logs

LGCI Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd
North Billerica/MA 01862

BORING LOG

B-1
PAGE 1 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/18/19 **DATE COMPLETED:** 6/21/19
BORING LOCATION: SW corner of Richards St. & South Boston Bypass Rd.
COORDINATES: NA
SURFACE El.: 8 ft. (see note 1) **TOTAL DEPTH:** 29 ft.
WEATHER: 70's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 8.0 ft. / El. 0.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	G1				Topsoil	1.0 / 7.0	G1 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, 5-10% fine subangular to angular gravel, organic soil, roots, brown, moist
		1							G2 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 20-25% fines, 30-35% fine to medium sand, organic soil, wood, roots, brown to black, moist
	5.0		G2						
5		5	S1	2-2-1-6 (3)	24/2				S1 - Silty GRAVEL (GM), fine to coarse, subrounded to angular, 15-20% fines, 10-15% fine to medium sand, wood, brown, moist
		7	S2	7-6-6-8 (12)	24/12		Fill		S2 - Top 8": Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 20-25% fines, 30-35% fine to coarse sand, wood, brown to black, moist Bot. 4": Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, ~5% fine subrounded gravel, light brown, moist
	0.0								
10		9	S3	7-11-12-10 (23)	24/11	1			S3 - Top 4": Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, 10-15% fine subrounded gravel, light brown, moist Bot. 7": Silty SAND with Gravel (SM), fine to medium, trace coarse, 15-20% fines, 25-30% fine to coarse gravel, trace organic soil, brown to black, moist REMARK 1: Auger chattering.
		11	S4	8-8-11-7 (19)	24/12				S4 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 15-20% fines, 35-40% fine to coarse subrounded gravel, brown, moist
	-5.0	13	S5	8-7-7-3 (14)	24/6				S5 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 15-20% fines, 30-35% fine to coarse sand, gray, wet
15		15	S6	2-1-1-1 (2)	24/12		Buried Organic Soil	15.0 / 15.2 / -7.2	S6 - Top 2": ORGANIC Soil (OL), slightly plastic, gray to black, moist Bot. 10": SILT with Sand (ML), slightly plastic, 15-20% fine sand, shells, olive gray, moist
		17	S7	1-1-1-1 (2)	24/24				S7 - Similar to Bot. 10" of S6
	-10.0	19	S8	1-1-1-1 (2)	24/24		Silt		S8 - Similar to Bot. 10" of S6
20		21							
	-15.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and emailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd
North Billerica/MA 01862

BORING LOG

B-1

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		25	S9	0-1-1-0 (2)	24/24		Silt	-7.2	S9 - Similar to Bot. 10" of S6
	-20.0	27	S10	0-1-2-2 (3)	24/24				S10 - Similar to Bot. 10" of S6
		29						29.0	Bottom of borehole at 29.0 feet. Boring backfilled with drill cuttings, 5 bags of gravel and 1 bag of concrete.
30									
	-25.0								
35									
	-30.0								
40									
	-35.0								
45									
	-40.0								
50									
	-45.0								
55									
	-50.0								
60									

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100 Chelmsford Rd
North Billerica/MA 01862

BORING LOG

B-2
PAGE 1 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/18/19 **DATE COMPLETED:** 6/21/19
BORING LOCATION: NW corner of Richards St. & South Boston Bypass Rd
COORDINATES: NA
SURFACE El.: 8.5 ft. (see note 1) **TOTAL DEPTH:** 29 ft.
WEATHER: 70's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 7.2 ft. / El. 1.3 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.7	G1				Asphalt	0.7	G1 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 10-15% fines, 15-20% fine subrounded to angular gravel, ~5% cobbles up to 5" in size, asphalt, brown, moist
	5.0	5	S1	4-5-4-5 (9)	24/6	1	Fill		S1 - Silty SAND (SM), fine to medium, trace coarse, 20-25% organic fines, 10-15% fine to coarse subrounded gravel, moist REMARK 1: Advanced air rod to 6'.
5		7	S2	12-13-12-10 (25)	24/11				S2 - Top 5": Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 15-20% fines, 35-40% fine to coarse sand, gray, wet Bot. 6": Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, ~10% fine subrounded gravel, light brown, moist
	0.0	9	S3	9-6-5-7 (11)	24/0				S3 - No recovery, pushed 3" split spoon sampler and recovered 5": Poorly Graded SAND (SP), fine to medium, trace coarse, <5% fines, light brown, wet
10		11	S4	5-9-11-11 (20)	24/8				S4 - Top 5": Poorly Graded SAND (SP), fine to medium, trace coarse, <5% fines, light brown, wet Bot. 3": Silty GRAVEL with Sand (GM), fine, subrounded, 15-20% fines, 35-40% medium to coarse sand, gray, wet
	-5.0	13	S5	4-6-4-5 (10)	24/9				S5 - Top 3": Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, ~10% fine subangular gravel, trace organic soil, gray, wet Mid. 1": Silty SAND (SM), fine to medium, trace coarse, 15-20% organic fines, black, wet Bot. 5": Silty SAND (SM), fine to medium, trace coarse, 15-20% fines, ~10% fine subrounded gravel, gray, wet
15		15	S6	10-5-4-4 (9)	24/0				S6 - No recovery, pushed 3" split spoon sampler and had no recovery
	-10.0	17	S7	3-1-2-3 (3)	24/18			17.5	S7 - Top 6": Silty SAND (SM), fine to medium, trace coarse, 15-20% fines, ~5% fine subrounded gravel, brown, wet Bot. 12": SILT with Sand (ML), slightly plastic to plastic, 15-20% fine sand, trace organic soil, olive gray, wet
20		19	S8	1-0-1-0 (1)	24/24				S8 - Similar to Bot. 12" of S7, no organic soil
	-15.0	21	S9	2-1-1-2 (2)	24/24		Silt		S9 - Similar to S8, stratified layers of fine sand
25		23							

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd
North Billerica/MA 01862

BORING LOG

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		25	S10	0-1-0-1 (1)	24/24		Silt		S10 - Similar to S8
		27	S11	0-0-1-0 (1)	24/24				S11 - Similar to S8
	-20.0	29						29.0	Bottom of borehole at 29.0 feet. Boring backfilled with drill cuttings and 1.5 bags of concrete and the ground surface was restored with 1.5 bags of cold patch asphalt.
30									
	-25.0								
35									
	-30.0								
40									
	-35.0								
45									
	-40.0								
50									
	-45.0								
55									
	-50.0								
60									

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100 Chelmsford Rd
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BORING LOG

B-3
PAGE 1 OF 1

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/18/19 **DATE COMPLETED:** 6/18/19
BORING LOCATION: NE corner of New Cypher St. & South Boston Bypass Road
COORDINATES: NA
SURFACE El.: 8.5 ft. (see note 1) **TOTAL DEPTH:** 4 ft.
WEATHER: 60's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: -
OTHER: N/E

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Zac Nader
DRILLING METHOD:
DRILL RIG TYPE/MODEL: Vacuum Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		1.3	G1				Asphalt	1.3	
		1.9	G2				Fill		G1 - Well Graded GRAVEL with Sand (GW), fine to coarse, subangular to angular, <5% fines, 15-20% fines to coarse sand, gray, moist G2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 5-10% fines, ~15% subrounded to angular gravel, light brown, moist
	5.0	4				1		4.0	REMARK 1: Abandoned borehole at 4 feet due to geotextile followed by crushed stone Bottom of borehole at 4.0 feet. Boring backfilled with drill cuttings and ground surface restored with 0.5 bag of cold patch asphalt
5	0.0								
10	-5.0								
15	-10.0								
20	-15.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.

LGCI Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd
North Billerica/MA 01862

BORING LOG

B-3A
PAGE 1 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/18/19 **DATE COMPLETED:** 9/4/19
BORING LOCATION: NE corner of New Cypher St. & South Boston Bypass Road
COORDINATES: NA
SURFACE El.: 8.5 ft. (see note 1) **TOTAL DEPTH:** 31 ft.
WEATHER: 70's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: N/E
OTHER: 9.5 ft. / El. -1.0 ft.

DRILLING SUBCONTRACTOR: New England Boring Contractors
DRILLING FOREMAN: Pete Labossiere
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Stratastar 15
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** BM

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
							Asphalt	1.3 7.2	
		1.3–1.7	G1				Fill		G1 - Well Graded GRAVEL (GW), fine to coarse, subrounded to angular, <5% fines, ~5% fine to medium sand, gray, moist
			G2						G2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 5-10% fines, ~15% subrounded to angular gravel, light brown, moist
	5.0	3.5–4	S1	8-6-5-5 (11)	24/11				S1 - Silty SAND (SM), fine to medium, 35-40% fines, 5-10% fine subrounded gravel, coal, brown, moist
5		6	S2	8-5-8-11 (13)	24/12				S2 - Top 9": Silty SAND (SM), fine to medium, 35-40% fines, ~5% fine subrounded gravel, trace organic soil, trace clay, brown, wet Bottom 3": Silty SAND with Gravel (SM), fine, trace medium, 25-30% fines, 15-20% fine subrounded gravel, brown, moist
	0.0	8	S3	23-11-12-10 (23)	24/6				S3 - Silty SAND (SM), fine to medium, 30-35% fines, ~5% fine subrounded gravel, brown, wet
10		10	S4	12-10-8-15 (18)	24/8				S4 - Silty SAND (SM), fine to medium, 15-20% fines, 10-15% fine subrounded to angular gravel, brown, wet
	-5.0	12	S5	18-10-9-10 (19)	24/10				S5 - Poorly Graded SAND (SP), fine to medium, 5-10% fines, ~10% fine subrounded gravel, brown, moist
15		14	S6	18-11-19-19 (30)	24/6				S6 - Similar to S5, 10-15% fines
		16	S7	32-15-11-15 (26)	24/5				S7 - Silty SAND (SM), fine, trace medium, 30-35% fines, 5-10% fine subrounded gravel, gray, wet
	-10.0	18	S8	44-29-10-9 (39)	24/0				S8 - No recovery
20		20	S9	8-7-7-9 (14)	24/6				S9 - Silty GRAVEL with Sand (GM), fine to coarse, 20-25% fines, 25-30% fine to coarse sand, gray, wet
	-15.0	22	S10	1-1-2-3 (3)	24/17		Silt	22.0 -13.5	S10 - SILT (ML), plastic, 5-10% fine sand, trace shells, gray, wet
25		24		1-0-1-1					S11 - Similar to S10, no shells

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.
2. Moved boring location 3' SW due to geotextile and crushed stone found in B-3.

LGCI
Lahlaf Geotechnical Consulting, Inc.

100 Chelmsford Rd
North Billerica/MA 01862

BORING LOG

B-3A
PAGE 2 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		24	S11	(1)	24/4			-13.5	
		26					Silt		
	-20.0								
		29	S12	0-0-0-3 (0)	24/24				S12 - Top 21": Similar to S11
30		31						31.0	Bottom 3": PEAT (PT), fibrous, 0-5% fine sand, brown, wet
									Bottom of borehole at 31.0 feet. Boring backfilled with drill cuttings and two bags of concrete.
	-25.0								
35									
	-30.0								
40									
	-35.0								
45									
	-40.0								
50									
	-45.0								
55									
	-50.0								
60									

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BORING LOG

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PAGE 1 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/18/19 **DATE COMPLETED:** 9/4/19
BORING LOCATION: SE Corner of New Cypher St. & South Boston Haul Road
COORDINATES: NA
SURFACE El.: 9 ft. (see note 1) **TOTAL DEPTH:** 31 ft.
WEATHER: 70's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 9
OTHER: -

DRILLING SUBCONTRACTOR: New England Boring Contractors
DRILLING FOREMAN: Pete Labossiere
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Stratastar 15
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** BM

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	G1				Topsoil	0.8	G1 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, 10-15% fine to coarse subangular to angular gravel, roots, brown, moist
		0.8	G2				Fill		G2 - Silty GRAVEL (GM), fine to coarse, subrounded to angular, 25-30% fines, 10-15% fine sand, brownish black, moist
	5.0	4.5							
5		7	S1	4-1-1-1 (2)	24/5	1	Buried Organic Soil	7.0	REMARK 1: Moved boring 4.5' NW due to geotextile followed by crushed stone. Samples G1 and G2 are grab samples. Tetratech pre-cleared new borehole to 6 feet and started sampling at sampling at 7'.
	0.0	9	S2	1-0-0-0 (0)	24/1				S1 - ORGANIC SOIL (OL), non-plastic, 10-15% fine to medium sand, wood, black, wet S2 - ORGANIC SOIL with Sand (OL), non-plastic, 30-35% fine sand, black, wood, wet
10		11	S3	0-0-1-2 (1)	24/14			11.4	S3 - Top 4": Similar to S2, no wood Bottom 10": SILT (ML), plastic, 0-5% fine sand, wood, trace organic soil, gray, wet
	-5.0	13					Silt		
15		14	S4	0-0-0-1 (0)	24/24				S4 - SILT (ML), plastic, 5-10% fine sand, trace organic soil, shells, gray, wet
	-10.0	16							
20		19	S5	0-0-0-0 (0)	24/11				S5 - Similar to S4, no organic soil
		21							
	-15.0	24							
25				0-0-0-0					S6 - SILT (ML), plastic, 5-10% fine sand, gray, wet

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.

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BORING LOG

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		24	S6	(0)	24/24		Silt		
		26							
	-20.0								
		29							S7 - Similar to S6, shells
30			S7	0-0-0-0 (0)	24/24				
		31						31.0	
									Bottom of borehole at 31.0 feet. Backfilled to 20 feet and installed temporary ground water observation well.
	-25.0								
35									
	-30.0								
40									
	-35.0								
45									
	-40.0								
50									
	-45.0								
55									
	-50.0								
60									

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BORING LOG

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PAGE 1 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/12/19 **DATE COMPLETED:** 6/19/19
BORING LOCATION: SW corner of proposed D St & Cypher St.
COORDINATES: NA
SURFACE El.: 10 ft. (see note 1) **TOTAL DEPTH:** 29 ft.
WEATHER: 60's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 7.5 ft. / El. 2.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.4					Asphalt	0.4	
		1	G1						G1 - Silty SAND with Gravel (SM), fine to medium, 30-35% fines, ~15% fine subrounded gravel, brick, metal, brown, moist
		1.2	G2						G2 - Silty SAND (SM), fine to medium, trace coarse, 30-35% organic fines, ~5% fine subrounded gravel, light brown with black mottles, moist
		1.5	G3						G3 - SLAG (OL), non fibrous, 40-45% fine to medium sand, coal ash, black, wet
			G4						G4 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 25-30% fines, 10-15% fine to coarse gravel, metal, brown, wet
		3.1							G5 - SILT with Sand and Gravel (ML), slightly plastic, 15-20% fine sand, 25-30% coarse gravel, brick, metal, brown, wet
5	5.0		G5						
		6	S1	2-1-1-1 (2)	24/8		Fill		S1 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 30-35% fines, ~15% fine subangular gravel, brown, moist
		8	S2	2-1-1-1 (2)	24/4				S2 - Silty GRAVEL with Sand (GM), fine, subrounded to angular, 15-20% fines, 20-25% fine to coarse sand, brick, brown to black, wet
10	0.0	10	S3	2-1-0-1 (1)	24/2				S3 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 20-25% fines, 35-40% fine to coarse sand, trace organic soil, glass, wood, black, wet
		12	S4	1-2-4-1 (6)	24/5				S4 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 20-25% fines, 35-40% fine to coarse sand, trace organic soil, black, wet
		14	S5	1-0-1-1 (1)	24/21			14.0	
15	-5.0						Buried Organic Soil	15.3	S5 - Top 16": ORGANIC Soil (OL), slightly plastic, 10-15% fine sand, gray to black, wet
		16	S6	1-3-2-4 (5)	24/17				Bot. 5": Lean CLAY (CL), plastic, gray, wet S6 - Similar to Bot. 5" of S5
		18	S7	1-2-3-4 (5)	24/24				S7 - Similar to Bot. 5" of S5
20	-10.0	20	S8	4-3-3-2 (6)	24/16		Clay		S8 - Similar to Bot. 5" of S5
		22							
25	-15.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and emailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.
2. Moved boring location 7 feet NW due to sewer and water lines.

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BORING LOG

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		25	S9	1-1-1-1 (2)	24/24		Clay		S9 - Similar to Bot. 5" of S5
		27	S10	2-1-2-3 (3)	24/17				S10 - Similar to Bot. 5" of S5
		29						29.0	
30	-20.0								Bottom of borehole at 29.0 feet. Boring backfilled with drill cuttings, 1 bag of gravel and 1 bag of concrete and the ground surface was restored with 1.5 bags of cold patch asphalt.
35	-25.0								
40	-30.0								
45	-35.0								
50	-40.0								
55	-45.0								
60	-50.0								

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BORING LOG

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PAGE 1 OF 1

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/20/19 **DATE COMPLETED:** 6/20/19
BORING LOCATION: S corner of proposed D St & Cypher St.
COORDINATES: NA
SURFACE El.: 9.5 ft. (see note 1) **TOTAL DEPTH:** 24 ft.
WEATHER: 60's / Rainy
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: -
OTHER: 5.4 ft. / El. 4.1 ft.

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: BM **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
							Asphalt	1.3	
		1.3	G1				Fill		G1 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, <5% subangular gravel, light brown, moist
		3	G2						G2 - Silty GRAVEL (GM), coarse, 20-25% fines, <5% fine sand, cobbles up to 5.5" in size, dark brown, moist
5	5.0								
		6	S1	3-3-2-2 (5)	24/0				S1 - No recovery
		8	S2	2-2-1-1 (3)	24/2				S2 - Silty SAND with Gravel (SM), fine, trace medium, 30-35% fines, 20-25% subangular gravel, brown to gray, moist
10	0.0	10	S3	2-1-1-1 (2)	24/1				S3 - Silty GRAVEL (GM), fine to coarse, 30-35% fines, <5% coarse sand, trace organic soil, black, wet
		12	S4	1-0-1-1 (1)	24/5			12.0	
							Buried Organic Soil	12.2	S4 - Top 2": ORGANIC Soil with Gravel (OL), slightly plastic, ~5% coarse sand, 20-25% subangular gravel, black, wet
							Clay	14.0	Bot. 3": Lean CLAY (CL), plastic, gray, moist
15	-5.0	14	S5	1-1-1-2 (2)	24/11		Silt	16.0	S5 - SILT (ML), plastic, <5% fine sand, trace organic soil, gray, moist
		16	S6	4-6-5-7 (11)	24/19		Clay		S6 - Lean CLAY (CL), plastic, gray, moist
		18	S7	2-2-3-2 (5)	24/24				S7 - Similar to S6
20	-10.0	20	S8	3-3-2-1 (5)	24/24				S8 - Similar to S6
		22	S9	1-2-2-5 (4)	24/24				S9 - Similar to S6
		24						24.0	
25	-15.0								Bottom of borehole at 24.0 feet. Boring backfilled with drill cuttings and 2 bags of gravel and the ground surface was restored with cold patch asphalt.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.
2. Moved boring location 1.5 feet SW.

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BORING LOG

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PAGE 1 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/12/19 **DATE COMPLETED:** 6/24/19
BORING LOCATION: NW corner of proposed D St & Cypher St.
COORDINATES: NA
SURFACE El.: 10 ft. (see note 1) **TOTAL DEPTH:** 29 ft.
WEATHER: 60's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 7.5 ft. / El. 2.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.7	G1				Concrete	0.7	
5	5.0						Fill	9.3	G1 - Silty SAND with Gravel (SM), fine to medium, 20-25% fines, 25-30% subangular gravel, cobbles up to 10" in size, brown, moist
		6	S1	1-1-1-1 (2)	24/5				S1 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 30-35% fine to coarse subrounded to angular gravel, brown, moist
		8	S2	3-1-1-2 (2)	24/2				S2 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 30-35% fine to coarse subrounded to angular gravel, glass, gray, moist
10	0.0	10	S3	2-1-1-1 (2)	24/6				S3 - Poorly Graded GRAVEL (GP), fine, trace coarse, subangular, <5% fines, coal ash, glass, black, moist
		12	S4	1-2-1-1 (3)	24/0				S4 - (No recovery, pushed 3" split spoon sampler and recovered 4"), Silty GRAVEl with Sand (GM), fine to coarse, subrounded to angular, 35-40% fines, 15-20% medium to coarse sand, wood, brick, coal, ceramic, black to gray, moist
		14						14.0	
15	-5.0		S5	1-0-1-2 (1)	24/23		Clay	15.0	S5 - Top 12": Lean CLAY (CL), plastic, 5-10% fine sand, gray, moist
		16	S6	2-2-3-4 (5)	24/20		Buried Organic Soil	15.5	Mid. 6": ORGANIC Soil with Sand (OL), slightly plastic to plastic, 15-20% fine sand, organic soil, black to gray, moist
								16.0	Bot. 5": Lean CLAY (CL), plastic, 10-15% fine sand, gray, moist
							Clay	16.3	S6 - Top 3": ORGANIC Soil (OL), slightly plastic to plastic, 5-10% fine to coarse sand, organic soil, black, moist
		18					Buried Organic Soil	-6.3	Bot. 17": Lean CLAY (CL), plastic, olive gray, moist
		19	S7	1-0-1-2 (1)	24/24				S7 - Similar to Bot. 17" of S6
20	-10.0						Clay		
		21	S8	0-2-2-3 (4)	24/24				S8 - Similar to Bot. 17" of S6
		23							
25	-15.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.
2. Moved boring location 5.1 feet SE due to overhead wires.

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BORING LOG

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		25	S9	1-1-2-2 (3)	24/24		Clay	-6.3	S9 - Similar to Bot. 17" of S6
		27	S10	1-2-3-4 (5)	24/24				S10 - Similar to Bot. 17" of S6
		29						29.0	Bottom of borehole at 29.0 feet. Boring backfilled with drill cuttings and 0.5 bags of gravel and the ground surface was restored with 1 bag of concrete.
30	-20.0								
35	-25.0								
40	-30.0								
45	-35.0								
50	-40.0								
55	-45.0								
60	-50.0								

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BORING LOG

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CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/12/19 **DATE COMPLETED:** 6/20/19
BORING LOCATION: SE corner of proposed D St & Cypher St.
COORDINATES: NA
SURFACE El.: 11 ft. (see note 1) **TOTAL DEPTH:** 29 ft.
WEATHER: 60's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 10.9 ft. / El. 0.1 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA / BM **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark
	10.0	0.5 / 0.8	G1			
			G2			
		2				
5			G3			
	5.0	6	S1	4-4-2-0 (6)	24/8	
		8	S2	1-1-0-1 (1)	24/5	
10		10	S3	1-1-1-0 (2)	24/2	
	0.0	12	S4	0-1-1-1 (2)	24/9	
		14	S5	1-0-1-1 (1)	24/11	
15	-5.0	16	S6	1-1-1-2 (2)	24/19	
		18	S7	2-2-2-4 (4)	24/18	
20	-10.0	20	S8	2-3-4-4 (7)	24/10	
		22				
25						

Strata	Depth El.(ft.)	Material Description
Concrete	0.5	
Fill		G1 - Poorly Graded SAND with Gravel (SP), fine to medium, trace coarse, <5% fines, 20-25% fine subrounded gravel, roots, trace organic soil, light brown, moist G2 - Poorly Graded GRAVEL with Sand (GP), coarse, subrounded to angular, <5% fines, 40-45% fine to medium sand, light brown, moist G3 - Silty SAND with Gravel (SM), fine to medium, 20-25% fines, 25-30% fine to coarse subangular gravel, cobbles up to 10" in size, bricks, brown, moist S1 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 35-40% fines, ~15% fine to coarse angular gravel, wood, brick, brown to black, moist S2 - Silty GRAVEL (GM), fine to coarse, subrounded to angular, 20-25% fines, 15-20% medium to coarse sand, glass, brown to black, moist S3 - Poorly Graded GRAVEL (GP), fine, subangular, <5% fines, 10-15% medium to coarse sand, glass, black, moist
	12.6	S4 - Top 7": Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 20-25% fines, 35-40% medium to coarse sand, wood, glass, brown to black, wet
Buried Organic Soil		Bot. 2": ORGANIC Soil with Gravel (OL), slightly plastic, 10-15% fine sand, 15-20% fine subrounded to angular gravel, black, wet
	14.4	S5 - Top 5": ORGANIC Soil (OL), non plastic to slightly plastic, organic soil, black to gray, wet
Clay		Bot. 6": Lean CLAY (CL), slightly plastic to plastic, gray, wet
	16.0	
Buried Organic Soil	16.5	S6 - Top 6": ORGANIC Soil (OL), slightly plastic, 5-10% fine sand, black, wet
		Bot. 13": Lean CLAY (CL), plastic, 10-15% fine gravel, gray, wet
Clay		S7 - Lean CLAY (CL), plastic, gray, wet S8 - Similar to S7

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.
2. Moved boring location 5 feet SW due to access.

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BORING LOG

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	-15.0	25	S9	1-1-2-3 (3)	24/22		Clay		S9 - Similar to S7
		27	S10	1-2-3-3 (5)	24/24				S10 - Similar to S7
30		29						29.0	Bottom of borehole at 29.0 feet. Boring backfilled with drill cuttings and 4 bags of gravel.
	-20.0								
35									
	-25.0								
40									
	-30.0								
45									
	-35.0								
50									
	-40.0								
55									
	-45.0								
60									

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BORING LOG

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CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/13/19 **DATE COMPLETED:** 6/27/19
BORING LOCATION: NE corner of Fargo St. & Summer St.
COORDINATES: NA
SURFACE El.: 9 ft. (see note 1) **TOTAL DEPTH:** 30 ft.
WEATHER: 50's / Rainy
GROUNDWATER LEVELS:
DURING DRILLING: 5.2 ft. / El. 3.8 ft.
AT END OF DRILLING: 6.5 ft. / El. 2.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
							Concrete	0.5	
		0.5	G1				Fill		G1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded gravel, brown, moist
		1.5	G2						G2 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 30-35% fines, 15-20% fine to coarse sand, ~5% cobbles up to 7" in size, black to brown, moist
	5.0								
5		5.2						▽	
		6	S1	3-2-1-1 (3)	24/9			▼	S1 - Lean CLAY with Sand (CL), plastic, 15-20% fine sand, ~5% fine subrounded gravel, brick, gray, moist
		8	S2	2-2-1-1 (3)	24/9			8.0	S2 - Lean CLAY with Sand (CL), plastic, 15-20% fine sand, ~10% fine subrounded gravel, stratified layers of fine sand, gray, wet
	0.0								
10		10	S3	2-0-1-2 (1)	24/13				S3 - Lean CLAY (CL), plastic, <5% fine sand, spots of fine to medium sand, gray, wet
		12	S4	1-2-2-3 (4)	24/24				S4 - Top 19": Lean CLAY with Sand (CL), plastic, 15-20% fine to medium sand, gray, wet
	-5.0								
		14	S5	1-2-2-1 (4)	24/4		Clay		Bot. 5": SILT with Sand (ML), non plastic, 35-40% fine to coarse sand, gray to black, wet
15									S5 - Lean CLAY with Sand (CL), plastic, 15-20% fine to medium sand, shells, gray, wet
		16	S6	0-1-2-2 (3)	24/24				S6 - Lean CLAY (CL), plastic, 5-10% fine sand, gray, wet
		18	S7	0-1-2-2 (3)	24/24				S7 - Lean CLAY (CL), plastic, <5% fine sand, gray, wet
	-10.0								
20		20	S8	3-2-2-2 (4)	24/24				S8 - Top 19": Similar to S7
								21.6	
		22	S9	0-1-2-1 (3)	24/24		Buried Organic Soil	22.0	Bot. 5": ORGANIC Soil (OL), plastic, <5% fine sand, organic soil, gray to black, wet
	-15.0						Silt		S9 - Top 2": SILT with Sand (ML), slightly plastic, 15-20% fine sand, gray, wet Bot. 22": SILT with Sand (ML), plastic, <5% fine sand, gray, wet
		24							S10 - SILT with Sand (ML), plastic, 15-20% fine sand, shells, gray, wet
25				0-2-0-1					

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.

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BORING LOG

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		24	S10	(2)	24/24		Silt		
		26	S11	1-3-3-5 (6)	24/24		Silt	26.8	S11 - Top 9": SILT with Sand (ML), plastic, 15-20% fine sand, shells, gray, wet
							Peat	27.8	Mid. 12":PEAT (PT), fibrous, <5% fine sand, organic odor, gray to black, wet
		28	S12	2-7-13-16 (20)	24/24		Clay	-18.8	Bot. 3": Lean CLAY (CL), plastic, trace organic soil, gray, wet S12 - Lean CLAY (CL), plastic, <5% fine sand, gray, wet
	-20.0	30						30.0	
30									Bottom of borehole at 30.0 feet. Boring backfilled with drill cuttings and 3 bags of gravel and the ground surface was restored with 1 bag of concrete.
	-25.0								
35									
	-30.0								
40									
	-35.0								
45									
	-40.0								
50									
	-45.0								
55									
	-50.0								
60									

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BORING LOG

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PAGE 1 OF 1

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/17/19 **DATE COMPLETED:** 6/26/19
BORING LOCATION: SE corner of Fargo St. & Summer St.
COORDINATES: NA
SURFACE El.: 9 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 70's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 7.0 ft. / El. 2.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.3	G1				Concrete	0.3	G1 - Sandy SILT with Gravel (ML), nonplastic, 25-30% fine to medium sand, ~20% fine to coarse subangular gravel, ~10% cobbles up to 7" in size, brown, wet
	5.0	5	G2						G2 - SILT with Sand (ML), nonplastic, 20-25% fine to medium sand, 10-15% fine to coarse subrounded gravel, ~5% cobbles up to 5" in size, brown, wet
5		6	S1	1-0-0-0 (0)	24/0		Fill		S1 - No recovery
	0.0	8	S2	1-1-15	18/4	1			S2 - Top 3": Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 15-20% fine to coarse subrounded gravel, brown, wet Bot. 1": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subrounded to angular gravel, brown, wet REMARK 1: Drill chattering at ~9.3' and 4" casing refusal
10		9.5 10	S3	3-8-15-24 (23)	24/6	2			S3 - Top 3" Silty Gravel (GM), coarse, trace fine, 35-40% organic fines, <5% fine sand, brick, black, wet Bot. 2": Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, 10-15% fine to coarse, subrounded gravel, light brown, wet REMARK 2: Drill chattering at ~11'
		12	S4	12-5-3-3 (8)	24/10				S4 - Top 6": Silty GRAVEL (GM), fine to coarse, 35-40% organic fines, 5-10% fine to medium sand, black, wet Bot. 4": Silty SAND (SM), fine to medium, 30-35% fines, 5-10% subrounded gravel, gray, wet
	-5.0	14						14.0	
15		16	S5	0-1-0-1 (1)	24/24		Buried Organic Soil	16.0	S5 - ORGANIC Soil with Sand (OL), slightly plastic, 25-30% fine to coarse sand, organic smell, gray, wet
			S6	0-1-1-0 (2)	24/24		Silt	18.0	S6 - SILT with Sand (ML), nonplastic, 25-30% fine to coarse sand, trace organic soil, gray, wet
	-10.0	18	S7	2-0-1-2 (1)	24/10		Clay		S7 - Lean CLAY (CL), plastic, 5-10% fine sand, gray, wet
20		20	S8	0-1-1-0 (2)	24/24				S8 - Lean CLAY (CL), plastic, 10-15% fine to medium sand, gray, wet
		22						22.0	Bottom of borehole at 22.0 feet. Boring backfilled with drill cuttings and 4 bags of gravel and the ground surface was restored with 1.5 bag of concrete.
	-15.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.
2. Moved boring location 5.3 feet NE due to access.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/17/19 **DATE COMPLETED:** 6/26/19
BORING LOCATION: SW corner of Pumphouse Road & Summer St.
COORDINATES: NA
SURFACE El.: 12 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 70's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 5.8 ft. / El. 6.2 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.9					Asphalt	0.9	
	10.0		G1				Fill	11.1	G1 - Poorly Graded SAND with Gravel (SP) fine to medium, trace coarse, <5% fines, 15-20% fine to coarse subrounded gravel, asphalt, ~10% cobbles and boulders up to 1.5 feet in size, light brown, moist
5		6	S1	2-3-1-2 (4)	24/4				S1 - Lean CLAY with Sand (CL), slightly plastic, 30-35% fine to coarse sand, ~10% coarse subrounded gravel, brown, wet
	5.0	8	S2	1-1-1-1 (2)	24/16				S2 - Top 6": Lean CLAY with Sand (CL), slightly plastic, 25-30% fine to medium sand, brown, wet Bot. 10": Lean CLAY (CL), plastic, 5-10% fine sand, 5-10% fine subrounded gravel, gray, wet
10		10	S3	2-0-1-1 (1)	24/18				S3 - Lean CLAY (CL), plastic, 10-15% fine to medium sand, gray, wet
	0.0	12	S4	2-2-2-5 (4)	24/7				S4 - Lean CLAY (CL), plastic, 5-10% fine to medium sand, wood, gray, wet
		14	S5	3-2-2-3 (4)	24/13		Clay	14.0 -2.0	S5 - Top 5": Lean CLAY (CL), plastic, <5% fine sand, gray, wet Bot. 7": Lean CLAY with SAND (CL), slightly plastic, 15-20% fine sand, gray, wet
15		16	S6	2-1-1-1 (2)	24/23				S6 - SILT with SAND (ML), slightly plastic, 15-20% fine sand, gray, wet
	-5.0	18	S7	1-1-1-2 (2)	24/0				S7 - No recovery
20		20	S8	2-1-1-3 (2)	24/16				S8 - Lean CLAY with Sand and Gravel (CL), slightly plastic, 15-20% fine sand, ~15% fine subrounded gravel, gray, wet
	-10.0	22						22.0	
25									Bottom of borehole at 22.0 feet. Boring backfilled with drill cuttings, 3 bags of gravel, and 1 bag of concrete and the ground surface was restored with 1 bag of concrete.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.
2. Moved boring location 29 feet N due to private property and then due to access.

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BORING LOG

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PAGE 1 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/12/19 **DATE COMPLETED:** 6/25/19
BORING LOCATION: NW corner of Pumphouse Road & Summer St.
COORDINATES: NA
SURFACE El.: 13.5 ft. (see note 1) **TOTAL DEPTH:** 29 ft.
WEATHER: 70's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 4.5 ft. / El. 9.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
0		0.5	G1				Topsoil	0.3	G1 - Topsoil
			G2					13.2	G2 - Poorly Graded GRAVEL with Sand (GP), coarse, <5% fines, 40-45% fine sand, roots, light brown, moist
		1.7							G3 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 15-20% fines, 20-25% coarse subangular gravel, ~10% cobbles up to 8" in size, bricks, asphalt, brown, moist
	10.0		G3						
5		6	S1	5-4-3-6 (7)	24/6		Fill		S1 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 25-30% fines, 25-30% fine to coarse sand, brick, brown, wet
	5.0	8	S2	4-4-3-2 (7)	24/8				S2 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 30-35% fines, 15-20% fine subrounded gravel, brown, wet
10		10	S3	6-5-1-2 (6)	24/10				S3 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, 15-20% fine subrounded gravel, brick, brown, wet
		12	S4	2-2-2-3 (4)	24/12			12.0	
	0.0						Clay	12.3	S4 - Top 3": Lean CLAY with Sand (CL), slightly plastic, 20-25% fine to medium sand, ~5% fine to coarse subrounded gravel, trace organic soil, gray, wet
							Buried Organic Soil	12.8	Mid. 6": ORGANIC Soil with sand (OL), nonplastic to slightly plastic, 25-30% fine to medium sand, 10-15% fine to coarse subrounded to angular gravel, black, wet
		14	S5	1-1-0-2 (1)	24/22		Clay	0.7	
15								14.0	Bot. 3": Lean CLAY (CL), slightly plastic, 10-15% fine to medium sand, trace organic soil, gray, wet
								-0.5	
							Silt		S5 - Top 10": SILT (ML), slightly plastic, 10-15% fine to medium sand, trace organic soil, gray, wet
		16	S6	0-1-5-2 (6)	24/15				Mid. 4": SILT (ML), nonplastic, 10-15% fine sand, trace organic soil, gray to black, wet
								17.1	
							Buried Organic Soil		Bot. 10": SILT with Sand (ML), nonplastic, 25-30% fine sand, ~5% angular gravel, gray, wet
	-5.0	18	S7	1-3-3-5 (6)	24/19			18.0	S6 - Top 13": Similar to bot. 10" of S5, ~10% fine subrounded gravel
								-4.5	Bot. 2": ORGANIC Soil (OL), slightly plastic, 20-25% fine sand, black, wet
20							Clay		S7 - Top 10": Lean CLAY with Gravel (CL), plastic, 10-15% fine sand, 15-20% fine to coarse subrounded gravel, gray, wet
		20	S8	1-3-2-2 (5)	24/16			20.4	Bot. 9": Clayey SAND (SC), fine to medium, trace coarse, 20-25% fines, 10-15% fine to coarse subrounded gravel, gray, wet
							Buried Organic Soil	20.5	S8 - Top 5": Clayey SAND (SC), fine to medium, trace coarse, 20-25% fines, ~15% fine to coarse subrounded gravel, blackish gray, wet
								-7.0	Mid. 1": ORGANIC Soil (OL), slightly plastic, <5% fine sand, black, wet
		22					Clay		Bot. 10": Lean CLAY (CL), plastic, <5% fine sand, olive gray, wet
	-10.0								
25								25.0	

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.

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BORING LOG

B-12

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		25	S9	3-2-1-2 (3)	24/22		Silt	-11.5	S9 - SILT (ML), plastic, <5% fine sand, trace organic soil, gray, wet
		27	S10	0-0-1-1 (1)	24/19				S10 - SILT (ML), plastic, <5% fine sand, trace organic soil, gray, wet
	-15.0	29						29.0	
30									Bottom of borehole at 29.0 feet. Boring backfilled with drill cuttings and 3.5 bags of gravel
	-20.0								
35									
	-25.0								
40									
	-30.0								
45									
	-35.0								
50									
	-40.0								
55									
	-45.0								
60									

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BORING LOG

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PAGE 1 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/16/19 **DATE COMPLETED:** 6/28/19
BORING LOCATION: NE Corner of Pumphouse Road & Summer St.
COORDINATES: NA
SURFACE El.: 11.5 ft. (see note 1) **TOTAL DEPTH:** 32 ft.
WEATHER: 70's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 4.0 ft. / El. 7.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Zac Nader
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Deidrich D-25 Track Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	G1				Topsoil	0.5	G1 - Topsoil
	10.0	0.5	G2				Fill		G2 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, 15-20% gravel, brown, wet
		2	G3						G3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, orange brown, moist
5		3.5	G4						▼ G4 - Lean CLAY with SAND (CL), slightly plastic, 15-20% fine sand, 10-15% rounded gravel, ~10% cobbles up to 9" in size, brown to gray, wet
	5.0	6	S1	13-4-4-3 (8)	24/9		Clay	6.0	S1 - Lean CLAY with Sand and Gravel (CL), slightly plastic, 20-25% fine to coarse sand, 15-20% fine to coarse subrounded to angular gravel, brown, wet
		8	S2	2-2-1-3 (3)	24/16				S2 - Lean CLAY (CL), plastic, 10-15% fine sand, gray wet
10		10	S3	1-1-2-2 (3)	24/24				S3 - Lean CLAY (CL), plastic, 5-10% fine sand, gray wet
	0.0	12	S4	3-2-3-3 (5)	24/24				S4 - Lean CLAY with Sand (CL), plastic, 15-20% fine to coarse sand, <5% subrounded gravel, gray, wet
15		14	S5	3-2-1-1 (3)	24/3				S5 - Lean CLAY with Sand (CL), plastic, 15-20% fine to coarse sand, metal, gray, wet
	-5.0	16	S6	2-1-3-3 (4)	24/13				S6 - Top 4": Lean CLAY with Sand (CL), slightly plastic, 35-40% fine to medium sand, grayish black, wet Bot. 9": Lean CLAY with Sand (CL), slightly plastic, 25-30% fine to coarse sand, gray, wet
		18	S7	2-2-2-2 (4)	24/24		Buried Organic Soil	18.0 20.0	S7 - ORGANIC Soil (OL), plastic, 15-20% fine to medium sand, shells, organic odor, black, wet
20		20	S8	2-2-2-4 (4)	24/24		Clay	21.7	S8 - Top 20": Lean CLAY (CL), plastic, 10-15% fine to mediums sand, gray, wet
	-10.0	22	S9	1-2-2-3 (4)	24/4		Buried Organic Soil	22.0	Bot. 4": ORGANIC Soil (OL), plastic, <5% fine sand, black, wet
		24					Clay		S9 - Lean CLAY with SAND (CL), plastic 25-30% fine to coarse sand, gray, wet
25				2-2-2-3					S10 - Lean CLAY (CL), plastic 10-15% fine sand, shells, gray, wet

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.

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BORING LOG

B-13

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		24	S10	(4)	24/24		Clay	26.0	
	-15.0	26	S11	2-1-1-2 (2)	24/24			-14.5	S11 - SILT (ML), plastic, <5% fine sand, shells, gray, wet
		28	S12	0-1-1-1 (2)	24/24		Silt		S12 - SILT (ML), plastic, <5% fine sand, shells, gray, wet
30		30	S13	0-2-1-2 (3)	24/24				S13 - Similar to S12
	-20.0	32						32.0	
									Bottom of borehole at 32.0 feet. Boring backfilled with drill cuttings and 4 bags of gravel
35									
	-25.0								
40									
	-30.0								
45									
	-35.0								
50									
	-40.0								
55									
	-45.0								
60									

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BORING LOG

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PAGE 1 OF 2

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

DATE STARTED: 6/17/19 **DATE COMPLETED:** 6/25/19
BORING LOCATION: SW corner of Pumphouse Road & Summer St.
COORDINATES: NA
SURFACE El.: 11 ft. (see note 1) **TOTAL DEPTH:** 26 ft.
WEATHER: 70's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: -
AT END OF DRILLING: 6.0 ft. / El. 5.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Carl Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-57 Truck Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HA **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
							Asphalt	0.5	
	10.0	0.5	G1				Fill		G1 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 15-20% fines, 15-20% fine to coarse sand, brown, moist
		1.3	G2						G2 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 20-25% fines, 25-30% fine to coarse sand, 15-20% cobbles and boulders up to 1.3' in size, brown, moist
		2.2	G3						G3 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 10-15% fines, ~15% fine to coarse subangular gravel, 5-10% cobbles up to 11" in size, brown, moist
5									
	5.0	6	S1	3-2-1-8 (3)	24/3				S1 - Lean CLAY with Sand (CL), slightly plastic, 30-35% fines to coarse sand, ~15% fine subangular gravel, brick, brown, wet
		8	S2	1-2-2-2 (4)	24/9		Clay	8.0	S2 - Lean CLAY (CL), plastic, <5% fine sand, shells, olive gray, wet
10		10	S3	1-2-2-2 (4)	24/1				S3 - Lean CLAY (CL), plastic, 5-10% fine sand, ~5% subrounded gravel, gray, wet
	0.0	12	S4	1-3-3-2 (6)	24/17			12.9	S4 - Top 11": Similar to S3
		14	S5	1-1-1-2 (2)	24/22		Silt	16.0	Bot. 6": SILT with Sand (ML), fine to medium, 30-35 fine to medium sand, gray, wet S5 - SILT with Sand (ML), nonplastic, 30-35% fine sand, dark gray, wet
15									
	-5.0	16	S6	1-1-1-1 (2)	24/16		Buried Organic Soil	16.2	S6 - Top 2": ORGANIC Clay: (OL), plastic, 5-10% fine sand, black, wet
							Silt	18.0	Bot. 14": SILT with Sand (ML), nonplastic, 30-35% fine sand, dark gray, wet
		18	S7	1-3-3-2 (6)	24/17		Clay		S7 - Lean CLAY (CL), slightly plastic, 10-15% fine sand, olive gray, wet
20		20	S8	1-2-1-13 (3)	24/15			20.8	S8 - Top 10": Similar to S7
	-10.0						Buried Organic Soil		Bot. 5": ORGANIC Soil (OL), plastic, 5-10% fine sand, organic odor, black, wet
		22	S9	5-3-5-5 (8)	24/24			23.0	S9 - Top 12": Similar to bot. 5" of S8
		24					Silt		Bot. 12": SILT (ML), plastic, 5-10% fine sand, olive gray, wet
25				3-1-1-1					S10 - SILT with Sand (ML), slightly plastic, 25-30% fine sand, shells, olive gray, wet

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from the progress drawing titled: "Plan of Topographic Survey of Cypher Street and E Street in the (T/C) of Boston," and e-mailed to LGCI by Nitsch Engineering, Inc. on July 19, 2019.
2. Moved boring location 28.4 N feet due to private property and then due to access.

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd
North Billerica/MA 01862

BORING LOG

B-14

CLIENT: Nitsch Engineering, Inc.
PROJECT NAME: Proposed Cypher Street Mast Arms
LGCI PROJECT NUMBER: 1909
PROJECT LOCATION: Boston, MA

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		24	S10	(2)	24/20		Silt	26.0	
	-15.0	26							Bottom of borehole at 26.0 feet. Boring backfilled with drill cuttings, 3 bags of gravel, and 1 bag of concrete and ground surface restored with 1 bag of cold patch asphalt
30	-20.0								
35	-25.0								
40	-30.0								
45	-35.0								
50	-40.0								
55	-45.0								
60									

Nitsch Engineering

2 Center Plaza, Suite 430
Boston, MA 02108-1928
T: 617-338-0063
F: 617-338-6472
www.nitscheng.com

May 3, 2022

Mr. Nicholas Moreno
City of Boston Conservation Commission
Boston City Hall
One City Hall Square, Room 709
Boston, MA 02201

RE: Nitsch Project #9720.17
MassDOT Project #608807
Cypher Street
Notice of Intent
Boston, MA

Dear Mr. Moreno:

On behalf of the Applicant, the Massachusetts Department of Transportation (MassDOT), Nitsch Engineering, Inc. is responding to the additional questions received via email on Friday, April 22nd regarding the Notice of Intent (NOI) submitted to the Boston Conservation Commission for the proposed construction improvements on Cypher Street in Boston, Massachusetts. The following information was requested:

1. We will need a revised narrative detailing the amount of fill proposed within LSCSF, what the sequencing of the work will be, what the means and methods will be to prevent the excavation of contaminated soils, and a discussion on how the project meets the definition of the limited project at 310 CMR 10.24(7)(c).

   Attached to this memo is an earthwork analysis based upon proposed cross sections of the roadway at 50-foot intervals. The analysis calculates the fill quantity within the LSCSF along within New Cypher Street to be approximately 327 cubic yards. Please note that Richard Street within the LSCSF is proposed to be repaved only with no significant fill areas. Fargo Street within the LSCSF is actually being lowered slightly to improve drainage along the roadway.

   The project bid documents and specifications require the Contractor to adhere to all state and federal requirements related to proper excavation, handling, and disposal of contaminated soils. The exact means and methods will be determined by the Contractor and approved by MassDOT prior to the work commencing. Attached is draft document that will be finalized in the next few months and will be included in the contract documents.

   A portion of the project is considered a limited project under the Wetlands Protection Act. According to Section 10.24(7)(c), maintenance, repair, and improvement of existing public roadways, limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving drainage systems, can be permitted as a limited project. The work at the intersection of Richards Street, S Boston Bypass Road, and Cypher Street falls under Land Subject to Coastal Storm Flowage and includes existing roadway improvements, intersection improvements, and an improved drainage system.

2. Is any landscaping proposed within LSCSF?

   The designers have excluded plantings along New Cypher Street due to the presence of contaminated soil beneath the project. Since the original NOI submittal, the Boston Parks and Recreation Department (BPRD) has commented that all raised planters within the project limits should be removed as they will not support and maintain these features.

3. We will need an existing conditions plan for the roadways within LSCSF and the sheets should detail existing grades vs. proposed grades to indicate the change in elevation due to the placement of fill.

   Attached to this memo is a detailed grading plan showing existing grades and surface features (shown faded) and proposed grades and features (shown bold) within LSCSF.

Please call with any questions at (857) 206-8744.

Very truly yours,

Nitsch Engineering, Inc.

Stephen Farr, PE, ENV SP, LEED Green Associate
Vice President, Deputy Director of Transportation Engineering

SF/mjs/ajc

Enclosures: Existing Grades vs. Proposed Grades Plan
Generic Soil Management Plan

Cc: L. Cash, MassDOT Project Management
M. Lenker, MassDOT Environmental Services

P:\08000-09999\9720.17 Cypher St Bos\Transportation\Project Data\NOI\Response Memo.doc

EARTHWORK ANALYSIS

Nitsch Engineering

Civil Engineering • Transportation Engineering • Structural Engineering • Land Surveying • Green Infrastructure • Planning • GIS

2 Center Plaza • Suite 430 • Boston, MA 021108• 617-338-0063 • Fax 617-338-6472 • E-mail info@nitscheng.com

Client:	MassDOT		
Project:	Cypher Street Reconstruction		
Location:	Boston, MA		
Nitsch Project Number	9720.17		
MassDOT Project Number	608807	Computed by:	FFB
Date	4/29/2022	Checked by:	SF
Department	Transportation		

CALCULATION SHEET

EARTHWORK QUANTITY SHEET - NOI LSCSF Fill Quantity
Richards Street / New Cypher Street, Boston, MA

Station	Length (ft)		Cut Area (sf)	Avg Cut Area (sf)	Cut Vol (CY)		Fill Area (sf)	Avg Fill Area (sf)	Fill Volume (CY)
20+78							0.00		
21+00	22			0.00	0.00		0.00	0.00	0.00
21+50	50			0.00	0.00		0.00	0.00	0.00
21+75	25			0.00	0.00		0.00	0.00	0.00
22+00	25			0.00	0.00		0.00	0.00	0.00
22+50	50			0.00	0.00		0.00	0.00	0.00
23+00	50			0.00	0.00		0.00	0.00	0.00
23+50	50			0.00	0.00		0.00	0.00	0.00
24+00	50			0.00	0.00		0.00	0.00	0.00
24+08	8			0.00	0.00		6.58	3.29	1.00
24+40	32			0.00	0.00		0.00	3.29	3.86
24+50	10			0.00	0.00		0.00	0.00	0.00
24+72	22			0.00	0.00		0.00	0.00	0.00
25+00	28			0.00	0.00		0.00	0.00	0.00
25+50	50			0.00	0.00		0.00	0.00	0.00
26+00	50			0.00	0.00		0.00	0.00	0.00
26+45	45			0.00	0.00		0.00	0.00	0.00
26+50	5			0.00	0.00		0.00	0.00	0.00
26+96	46			0.00	0.00		0.00	0.00	0.00
27+00	4			0.00	0.00		0.00	0.00	0.00
27+50	50			0.00	0.00		11.00	5.50	10.19
28+00	50			0.00	0.00		18.57	14.79	27.38
28+50	50			0.00	0.00		25.90	22.24	41.18
29+00	50			0.00	0.00		35.66	30.78	57.00
29+50	50			0.00	0.00		45.90	40.78	75.52
30+00	50			0.00	0.00		36.90	41.40	76.67
30+50	50			0.00	0.00		0.00	18.45	34.17
				TOTAL:	**0.00**			TOTAL:	**326.96**

DRAFT

Release Abatement Measure Plan

Cypher Street Improvements
MassDEP RTN 3-XXXXXXX

Submitted to:

Massachusetts Department of Environmental Protection

Date

TETRA TECH

Date

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
Northeast Regional Office
205B Lowell Street
Wilmington, Massachusetts 01887

Re: Release Abatement Measure
Cypher Street Improvements
Boston, Massachusetts
RTN 3-*XXXXXXX*
Disposal Site Name

Dear Sir or Madam:

Tetra Tech, Inc., on behalf of the Massachusetts Department of Transportation (MASDOT), Tetra Tech has prepared this Release Abatement Measure (RAM) Plan for planned excavation work at the referenced Massachusetts Contingency Plan (MCP) Disposal Site to support roadway improvements in Cypher Street, Boston Massachusetts. This plan presents requirements for soil management during implementation of the roadway improvements within the Disposal Site tracked under the referenced Release Tracking Number (RTN).

Please call us at 508-786-2200 if you have any questions.

Very truly yours,

William C. Phelps
Senior Project Manager

Michael E. Billa P.E., L.S.P.
Senior Environmental Consultant

P:\278997\143-278997-19001\DOCS\REPORTS\RAM PLANS 2021\COMMON DOCS\CYPHER RAM PLANS TEMPLATE_2021-08-24 NO TRACK V02.DOCX

Marlborough Technology Park
100 Nickerson Road, Marlborough, MA 01752
Tel 508.786.2200 Fax 508.786.2201 tetratech.com

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1.0 INTRODUCTION

On behalf of the Massachusetts Department of Transportation (MASDOT), Tetra Tech has prepared this Release Abatement Measure (RAM) Plan to provide guidance for soil management during anticipated soil excavation activities associated with roadway improvements at Cypher Street, Boston, Massachusetts (the Project). The Project Area comprises a section of Richards and Cypher Streets located between A and E Streets in Boston and consists primarily of existing asphalt paved roadway and concrete sidewalk. Proposed improvements in the Project Area include the construction of new roadway on Cypher Street, resurfacing of existing pavement and street widening to provide improved access and usability by pedestrian and bicycle traffic, new curbing and sidewalks, the installation of a redesigned drainage system, new signing, pavement markings, and loam and seeding disturbed areas. The area specific to this RAM Plan is the portion of the current Project Area that overlaps the Disposal Site that is tracked under the RTN under which this RAM Plan is being filed.

This RAM Plan presents soil management, characterization and handling procedures in the event OHM impacts are encountered during the Site renovation activities. The RAM Plan was prepared in accordance with the MCP under 310 CMR 40.0444. The material facts and opinions of the Licensed Site Professional (LSP) for the RAM Plan are subject to the limitations and conditions presented in Appendix A. This submittal is appended to the transmittal form BWSC-106 established by the Massachusetts Department of Environmental Protection (MassDEP) and is submitted in electronic format via eDEP.

Figure 1 is a locus map of the Project Area. Figure 2 is an aerial site plan of an earlier version of the Project Area. Note that Figure 2 shows the Project Area extending northeast along E and Fargo Streets; these streets have since been eliminated from the Project Area, which now runs along Richards and Cypher Streets only. However, results of the preliminary research on these areas have been retained in the RAM Plan as is the initial extent of the Project Area in Figures 2 through 4, as they may be relevant to current and future improvements in the area.

Under contract to the Massachusetts Department of Transportation (MassDOT), Nitsch Engineering, Inc. has developed 100% plans for improvements to Cypher Street in Boston. Subcontracted to Nitsch, Tetra Tech has completed a preliminary environmental assessment for MassDOT. Information relevant to environmental conditions in the vicinity of the Project are presented in Figures 3 and 4 and summarized in Tables 1 and 2 of this RAM Plan. Tetra Tech also conducted a follow up limited subsurface investigation intended to inform decisions on soil disposal options for the Project. The results of this subsurface investigation have been compiled in a report titled *Field Investigation Report, Cypher Street Improvement Project, South Boston, Massachusetts,* Tetra Tech, Inc., October 7, 2019. This report is discussed further below and is also attached to this RAM Plan as Appendix B. As noted above, the initial Project Area included sections of E and Fargo Streets, and review of these areas is included in our preliminary environmental assessment, which was begun in 2017. Since these streets were eliminated from the Project Area prior to the field investigation, they are not discussed in the Field Investigation Report.

The Contractor performing the roadway improvements and his environmental consultant should be familiar with all the reports attached to the Project Contract documents and this RAM Plan, as well as applicable regulatory documents incorporated by reference, as they are key to proper management of excavated soils that are excess to the project.

1.1 REGULATORY CONTEXT

There are at least 10 Massachusetts Contingency Plan (MCP) Disposal Sites that either overlap or are adjacent to the Project Area. At least 6 of these have deed restrictions in the form of Activity and Use Limitations (AULs). In addition, there have been multiple response actions under both the Massachusetts Department of Environmental Protection (DEP) and the US Environmental Protection Agency (EPA) related to historic conditions on property owned by the Massachusetts Convention Center Authority (MCCA).

Regarding management of media sourced from MCP Disposal Sites with Permanent or Temporary Solutions with AULs, the MCP states:

- in 310 CMR 40.1067(4): *"For remedial actions conducted within an area subject to an Activity and Use Limitation after the submittal of a Permanent Solution with Conditions to the Department, the following requirements shall apply:*
    - *(a) Limited soil excavation may be undertaken without the need to notify the Department and public involvement activities …provided:*
        - *1. Such soil excavation is not prohibited by the AUL,*
        - *2. Except as provided in 310 CMR 40.1067(4)(b), such soil excavation does not result in the excavation of more than 100 cubic yards of Remediation Waste contaminated solely by oil or waste oil, or 20 cubic yards of Remediation Waste contaminated by hazardous material or mixture of oil or waste oil and hazardous material."*
- 310 CMR 40.1067(4)(b) states that *"Remedial actions that exceed the scope of the limited soil excavation activities outlined in 310 CMR 40.1067(4)(a), … shall be conducted as Release Abatement Measures, provided such remedial actions do not exceed the scope of Release Abatement Measures as described in 310 CMR 40.0442".*

Regarding management of media sourced from MCP Disposal Sites with Permanent or Temporary Solutions without AULs, the MCP states:

- 310 CMR 40.1067(3) states that *"For remedial actions conducted after the submittal of a Permanent Solution with No Conditions the following requirements shall apply:*
    - *(b) unless otherwise specified by the Department, no documentation, including a revised Permanent Solution Statement, is required to be maintained … or submitted to the Department;*
    - *(c) all excavated Remediation Waste is managed in accordance with the provisions of 310 CMR 40.0030…"*

This RAM Plan has been developed for the portion of the Project Area that falls within the referenced Disposal Site (which does have an AUL) due to the possibility that soil excavation may encounter OHM-impacted soil. Although the Remedial Waste volumes generated in this Disposal Site *may not* exceed the limits noted above, we are filing this RAM Plan as a precaution to mitigate work stoppages due to MCP requirements. This RAM is intended to assist the Contractor and his/her environmental consultant in developing plans relative to appropriate soil excavation, handling, and management.

Select documentation for this Disposal Site, including the AUL, are attached as Appendix C.

1.2 RELATIONSHIP OF PERSON CONDUCTING RAM ACTIVITIES TO THE SITE

MassDOT is conducting the response actions to facilitate improvements to Cypher Street. This project does not precipitate a change in the status of the Primary Responsible Party for the referenced Disposal Site. MassDOT is implementing this RAM Plan with the services of an LSP contracted directly to MassDOT. However, the Contractor is performing the actual excavation and media management with the services of an LSP contracted to him/her. The Contractor and his/her environmental consultant is responsible for developing and implementing a detailed Soil Management Plan (SMP) consistent with the relevant AUL, regulations, and policies, including soil and groundwater management, monitoring, testing, waste profile characterization, disposal and tracking.

1.3 SITE CONTACTS

The contact information for the parties involved in this RAM is provided below.

Person Conducting RAM	**Licensed Site Professional**
Insert appropriate MassDOT representative Insert address & contact info for DOT representative	Mr. Michael E. Billa, LSP, PE Tetra Tech, Inc. 100 Nickerson Road Marlborough, MA 01752 (508) 786-2200

2.0 SITE BACKGROUND AND GENERAL SITE INFORMATION

Historic maps indicate that the northern portion of South Boston was once tidal flats, sometimes referred to as the Dorchester Flats, and a portion of Boston Harbor. Various historic maps indicate that the northern portion of South Boston was filled to create land between the 1830s until the 1940s. The land was filled primarily with dredged silt and clay, and finally with granular fill containing some anthropogenic debris such as coal, ash, and brick. This filled land is mostly covered throughout the northern portion of South Boston with semi-permanent features such as buildings, concrete pads, and asphalt pavement.

The area around the Project Area was developed shortly after the land became available beginning in the mid-1800s, with continued development and redevelopment through to the present. Most of the area was developed as commercial and industrial properties around a large rail yard, with spurs connecting to the vicinity of most of the properties. Many of the properties in the area included manufacturing and metalworking. Cypher Street (Old Cypher Street) was one of the planned gridded horizontal streets (paper streets) of the newly filled area, but eventually became a series of connected alleyways that included railroad spurs, which terminated at the rail yard to the northwest. The section of the Project Area that is currently Richards Street was also an alleyway that was completed as an extension of historic Richards Street between 2013 and 2014. The area east of Fargo Street and E Street was filled and constructed for the use of the United States Armed Forces during the approximate timeframe of World War II. The United States Navy and the United States Army have occupied much of the property from the mid-1940s until the present, having relinquished some portions of the land to private parties and the Massachusetts Port Authority since approximately the 1980s.

One of the notable former industrial operations in the vicinity of the Project Area was the area surrounding two railroad spurs that separated at the northern extent of Cypher Street, which was used as a junkyard (Boston Junk / SAK, and others). What appears to be metal scrap can be seen in piles in this area in historic photographs between the 1950s and the 1990s. According to various Massachusetts Department

of Environmental Protection (MassDEP) documents, the junkyard was operated as The Boston Junk Company between 1947 and 1985. The property was purchased by SAK Recycling Corporation in 1992 and continued to be operated as a junkyard until 1996. According to the documentation, the storage and use of OHM at the junkyard have resulted in releases to the environment, including portions of northern Cypher Street. Additional details are included in subsequent sections of this memorandum.

The known releases of OHM in the area have had multiple sources including bulk fuel handling, urban fill, use of solvents for commercial applications, and operation of a junk yard. Chemicals of Concern (COCs) include petroleum compounds, metals, polycyclic aromatic compounds (PAHs), volatile organic compounds (VOCs) including chlorinated compounds, and polychlorinated biphenyl compounds (PCBs). Waste disposal options may include standard in-state lined or unlined landfilling; out of state landfill; asphalt batching; characteristic and listed hazardous waste management for leachable lead and chlorinated VOCs, respectively; and TSCA Remediation Waste management for a historic PCB release.

2.1 MCP REGULATED AREAS AND RESPONSE ACTIONS

In general, all areas of the Project Area will likely contain some amount of urban fill in the subsurface below the roadway. The general area around the Project Area is made land, and the shallow fill material used throughout Boston contains anthropogenic debris, including coal, ash, and brick. Metals, most notably lead and arsenic, are often identified at concentrations above applicable MCP reportable concentration values in this material.

2.1.1 RTN 3-XXXXX <Name of Site specific to this RAM>

Here copy and insert the entire section from the ESA Section 3.2 for this specific RAM. There should be a section for each required RAM. In some cases, there may be more than one section in the ESA for a given RAM – In this case you may have to combine/rewrite language from the ESA.

In the above info, make sure you reference the MCP documents prepared by others, including the PSS and AUL, and provide reference to which Appendix you attach them to.

Tetra Tech conducted a limited subsurface investigation within the Project Area, including advancement of soil borings and completion of select borings as wells. Overall, twenty borings were advanced within the Project Area, XXX of which were borings were advanced within the Disposal Site tracked by RTN 3-XXXXX. As noted above, the results of this investigation are presented in the *Field Investigation Report, Cypher Street Improvement Project, South Boston, Massachusetts,* Tetra Tech, Inc., October 7, 2019 (Field Investigation Report). This report is attached to this RAM Plan as Appendix B. For ease of review, we have also attached the field investigation boring plan, which shows boring locations keyed to specific RTNs, as Figure 5. Figure 5 boring locations and RTN boundaries are superimposed on Drainage and Utility Plan sheets 30 through 36. The borings that are most relevant to this RAM are XXXXXXXXXXXXXXX. Boring logs and laboratory analytical results are provided in the Field Investigation Report in Appendix B.

2.2 SURROUNDING AREA

The Project Area is generally surrounded by commercial and industrial properties. The area north of the Project Area includes the Boston Convention and Exhibition Center (BCEC) and the recent improvements in support of the BCEC, such as hotels, apartments, and retail/restaurant space. The Project Area was

historically a passage in and around the commercial/industrial and railroad properties of north/central South Boston. The passage currently circumvents the BCEC through the remaining commercial/industrial properties south of Summer Street and north of residential South Boston.

As noted above, Tables 1 and 2 and Figures 3 and 4 summarize key findings of previous investigations of relevant MCP Disposal Sites and EPA TSCA Investigations on parcels adjacent to and nearby the Disposal Site that is the subject of this RAM Plan.

2.3 NATURAL RESOURCE AREAS

The Site is located within reclaimed tidal wetlands and is not considered to be a potential source of potable water supply. The Site is located within an urban area, and much of the Site is covered with impervious to semi-impervious surfaces which pose limited potential for exposure to environmental receptors. Therefore, we have not identified environmental receptors at the Site. The nearest surface water bodies are the Fort Point Channel located approximately 1,000 feet west of the Project Area and the Reserved Channel, located approximately 1,000 feet east of the Project Area.

3.0 SUPPLEMENTAL SITE CHARACTERIZATION ACTIVITIES

In 2019 Tetra Tech implemented a field investigation program to further evaluate current soil conditions within the Project Area in areas likely to be disturbed by the proposed Cypher Street improvements. The approximate limits of work are shown on Figure 1. This investigation included the advancement and sampling of twenty soil borings and two temporary monitoring wells. Borings TT-4 and TT-5 were also performed to inform geotechnical investigations relative to proposed signal mast arm foundations. Soil and groundwater data were compared to existing data for the known Disposal Sites and current regulatory standards under the Massachusetts Contingency Plan (MCP). The resulting evaluation is intended to inform management, handling, and disposal requirements for segments of the roadway reconstruction project. Note that the results are intended for use in preliminary evaluation only. Due to the length of time between the field investigation and construction phase, these data will not be viable for waste profile characterization. New sample collection and analysis, waste profile characterization, and materials handling protocols will be developed and performed by the Contractor.

The reader is referred to the full Field Investigation Report, Appendix B, for details regarding boring placement, boring logs, sampling protocols, tabulated results, and laboratory certificates of analysis.

4.0 PROPOSED RAM ACTIVITIES

The purpose and objectives of the RAM are to evaluate existing Site soils and groundwater in areas subject to disturbance by the Project for evidence of OHM impacts. Proposed activities include development of a Materials Management Plan (MMP), or equivalent, to outline protocols for materials excavation, handling and management, testing, monitoring, and waste disposal in a manner consistent with the MCP and the AUL filed for this MCP Disposal Site. This section of the RAM Plan references general MCP compliant provisions. To allow greater flexibility in construction means and methods, this RAM Plan is not prescribing detailed materials handling protocols beyond requiring knowledge of and compliance with relevant regulatory framework, including the AUL, MCP, and related policies. Upon being awarded the Project, the Contractor is responsible for developing and implementing the detailed MMP or equivalent for submittal to MassDOT. The Contractor is also responsible for preparing a Health

and Safety Plan (HASP) for Site workers and submitting it to MassDOT. As is typical with MassDOT construction projects, the Contractor and his/her environmental consultant is responsible for materials management, testing and waste characterization, shipping, disposal, and tracking. MassDOT will review paperwork relevant to shipping and sign as the generator of excavated material that is excess to the Project and will file the RAM Status Reports and Completion Statement.

Project construction activities are subject to the conditions in the AUL filed for the portion of the Project Area that is coincident with the Disposal Site tracked under the referenced RTN. The AUL and the Permanente Solution it supports are included in Appendix C, and the Contractor and his/her agents are expected to be familiar with, and compliant with, the constraints and obligations described there.

The following are the general requirements that apply to excavation work at the Site.

4.1 HEALTH AND SAFETY

The Contractor shall prepare and submit to MassDOT a Site-Specific Health and Safety Plan (HASP) for all Contractor employees and subs working on the area covered under this RAM, prepared by a qualified environmental professional (QEP) familiar with the applicable regulatory framework and site-specific conditions. This may be part of a larger Project-wide HASP as long as it addresses issues specific to this RAM Plan. The HASP shall follow the guidelines of the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), under 29 CFR Part 1910(I)(2). The HASP shall detail the requisite measures to protect workers and the public from exposure to OHM that may be present in environmental media at the Site. In the event impacted media are encountered, the health and safety procedures of the MCP under 310 CMR 40.0018 shall be followed during work at the Site.

We note that the AUL and MCP submittals in Appendix C provide information regarding environmental conditions at the Disposal Site covered under this RAM Plan, as developed by the LSP of Record for this RTN. The QEP developing that HASP should be informed by that information and use it in developing worker health and safety protocols relative to materials management, dust mitigation, monitoring, and disposal.

4.2 PERSONNEL TRAINING

In addition to general construction-related and MassDOT-specific training requirements, or other obligations specifically called out in a given deed restriction, personnel that manage or encounter OHM-impacted media may require specific training. In general, the following considerations, at a minimum, may need to be addressed regarding worker training:

- In the event OHM-impacted soils subject to the provisions of the MCP are encountered, additional training including HAZWOPER 40-hour certification (40 CFR 1910.120), may be required for Site personnel who may be exposed to OHM impacted soils.

- Additional training requirements under RCRA are required for personnel involved in the management of hazardous waste, if warranted. This training may include what is specified under 40 CFR 265.16(a)(2).

- Other regulations as deemed appropriate by the QEP preparing the HASP.

4.3 SITE ACCESS CONTROL AND WORK ZONE SECURITY

Access to the work zone should be restricted to authorized personnel involved in the construction including: Contractor personnel, sub-contractors, and personnel of the Owner, Engineer and/or Architect. The Contractor's environmental consultant preparing the MMP should evaluate the general construction site security plan in the context of adequacy for RAM Plan purposes, including uncontrolled access to the RAM work zone and Remediation Waste and add provisions to the MMP if warranted.

4.4 DUST, VAPOR, ODOR AND NOISE CONTROL

The National Ambient Air Quality Standards (NAAQS) and the Massachusetts Air Pollution Control Regulations (310 CMR 7.00) regulate nuisance dust, noise and vapors that may be generated by construction activities. If applicable, building construction or demolition requires notifications to be filed with MassDEP under 310 CMR 7.00. The work shall be performed in a manner to control dust, vapor, odor, and noise to comply with applicable federal, state, and local regulations. The Contractor or his/her consultant must evaluate the need for air monitoring beyond what may be required under general construction requirements, and stipulate additional measures as warranted. Dust suppression and monitoring must be addressed in the MMP.

4.5 GROUNDWATER MANAGEMENT

The proposed work may involve the management of groundwater and/or stormwater generated from the dewatering of the excavations or management of runoff. It may be necessary to temporarily divert stormwater and/or groundwater into or away from excavations. During water management activities, a representative of the LSP for this RAM shall be on-site to observe the recovered water for evidence of OHM impact. Sampling will be required for off-site discharge.

To the extent feasible, recovered waters that do not display evidence of OHM impact shall be recharged on-site proximate to excavation areas. The MMP should anticipate the likelihood of encountering groundwater and address steps to manage recovered water. Steps should be taken to minimize water recovery and maximize on-site recharge. Where infeasible, the MMP should consider alternative management options, including treatment and discharge to surface water and off-site disposal, if warranted. The management of OHM impacted groundwater may require additional authorizations under the MCP. Stormwater and groundwater management that involves discharge to the local storm drainage system, if necessary, during the project, may require local dewatering authorization from the City of Boston and may require obtaining a NPDES Remediation General Permit. Groundwater dewatering shall be conducted in accordance with all local State and Federal permits and authorizations. Should dewatering effluent require treatment or disposal, MassDOT approval is required prior to implementing.

4.6 DECONTAMINATION

Decontamination of construction equipment, tools and materials is required when personnel, equipment or materials have come into contact with OHM impacted soils. Where excavation equipment is used to excavate and manage OHM impacted soil, the portion of the equipment in contact with soils will be cleaned over the stockpile or waste container to the extent feasible, so that residues are co-managed with soil.

Truck tires and equipment that is in contact with OHM and that are leaving the Site will be cleaned as necessary to prevent tracking of contaminated materials off-site. Residues from decontamination may be co-managed with like soils generated from the Site or must be returned to the excavation from which they were generated. If extensive management of contaminated soils with large equipment is required, a decontamination pad may be necessary. The MMP must address decontamination location and process.

Residues that cannot be co-managed with like soils or liquid decontamination residues other than clean water (i.e., if detergents are utilized) shall be considered and addressed in the MMP if anticipated. At a minimum, the waste shall be characterized in accordance with the applicable MCP Remediation Waste Management protocols (310 CMR 40.0030). Massachusetts hazardous waste regulations (310 CMR 30.000) and/or Federal regulations (40 CFR 260-263, 268, 270-272), and local requirements may also apply.

4.7 SOIL SEGREGATION AND HANDLING DURING EXCAVATION

During excavation, soils displaying a dark or discolored appearance, staining, oily or cohesive texture and/or odor will be considered as suspect OHM and will be segregated from non-impacted soils for further evaluation. Field screening devices such as photoionization detectors (PIDs) will also be used to aid in segregation of suspect impacted soils. Excavated soils with suspected OHM impacts that cannot be reused within the immediate excavation will be placed upon an impermeable material (i.e., asphalt pavement, concrete, minimum 6-mil polyethylene sheeting or equivalent material), or other option deemed appropriate by the Contractor and his/her environmental consultant, as approved by MassDOT.

If soils are temporarily managed in stockpiles, stockpiles shall be maintained with positive drainage to convey water away from the stockpiled materials and toward on-site recharge as feasible. Stockpiles shall be surrounded by erosion and sediment control barriers (i.e., berms, haybales and silt fence or approved equivalent). The contractor shall inspect and maintain erosion controls around stockpiles throughout the duration of temporary storage. Alternatively, soils may be stored within water-tight containers appropriate to the media being stored (e.g., roll-off containers, drums, totes, etc.), as approved by MassDOT. We note that if excavated soils that ultimately meet hazardous waste criteria are containerized, they are no longer eligible for on-site treatment such as stabilization for TCLP failure and must be disposed as hazardous waste if excess to the Project. Location and maintenance of temporary soil storage must comply with the MCP and other applicable regulations and must be addressed in the MMP.

When not being actively managed, all stockpiled soils or containers shall be covered by an impermeable material such as minimum 6-mil polyethylene sheeting or equivalent. The covers will be secured to resist dislodging or tearing by the wind and will be inspected periodically throughout the duration of storage. or Covers will be repaired or replaced whenever damaged or dislodged.

In the event OHM impacted soils are encountered, federal and state regulations prohibit the mixing/comingling of non-OHM impacted (clean) soil with OHM-impacted soil (no dilution).

4.8 REGULATIONS ASSOCIATED WITH MANAGEMENT OF SURPLUS SOILS

Surplus soils are classified as those that cannot be reused on Site. This determination may be due to physical constraints and/or evidence of OHM impacts. Since the RAM Plan area is a Disposal Site under the MCP, surplus soils generated from the Site are subject to certain state and federal regulations.

Soils that have been affected by a release of OHM are regulated under the MCP.

- Contaminated Media contain one or more OHM at levels equal to or greater than an applicable MCP Reportable Concentration. These soils are subject to MCP regulation as Contaminated Media under 310 CMR 40.0032(1) and (2). Contaminated Media managed pursuant to 310 CMR 40.0030 is MCP Remediation Waste. For the purpose of this RAM Plan, any soils exhibiting visual or olfactory evidence of OHM impacts are considered Contaminated Media, until confirmed otherwise via sampling and laboratory analysis. Soils that are characterized as non-hazardous MCP Contaminated Soil Remediation Waste will be evaluated by the LSP for this RAM for potential re-use on Site. If Contaminated Soil cannot be reused within the source Disposal Site (the area within the boundaries of the source RTN) it is deemed Remediation Waste under the MCP and must be managed under the MCP Bill-of-Lading (BOL) process. Soils that are characterized as hazardous waste are subject to additional regulation as described below.

- For surplus soils that are characterized as hazardous waste, management shall be in accordance with applicable Massachusetts regulations (310 CMR 30.000) and/or Federal regulations (40 CFR 260-263, 268, 270-272), and may also be subject to certain local requirements.

- Soils sourced from within an MCP Disposal Site that contain OHM at concentrations less than then otherwise applicable MCP soil category S-1 (RCS-1) but above background still require proper management. These soils may be reused within the area covered under this RAM with no restrictions. If surplus soils are generated, these soils are subject to regulation under 310 CMR 40.0032(3) and may be transported from the Site without notice to or approval from MassDEP provided that such soils:

    - Are not disposed or reused at locations where the concentrations of OHM in the soil would be in excess of a Release Notification threshold applicable at the receiving site.

    - Are not disposed or reused at locations where existing concentrations of OHM at the receiving site are significantly lower than the levels of those OHM present in the soil being disposed or reused.

All material exported from the Project Area must be approved by the MassDOT prior to shipping.

4.9 CHARACTERIZATION OF SURPLUS SOILS

Soils exhibiting evidence of OHM impacts that are surplus to the project will be characterized prior to off-site reuse or disposal. The frequency of soil sampling and laboratory analysis shall be determined based on the requirements of the anticipated receiving facility.

The parameters to be analyzed will also be dictated by the requirements of the anticipated receiving facility, the presence of known OHM impacts, and/or prior investigations. The samples shall be analyzed at a Massachusetts-certified analytical testing laboratory in accordance with the most recent methods under the Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols (the CAM). At a minimum, the soils requiring sampling shall be analyzed for: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), RCRA 5 metals, total petroleum hydrocarbons (TPH), reactivity, flashpoint/ignitability, and pH.

Soil Sampling Parameters for Export Off-Site

Parameter	Reference Method	Alternative Parameter(s)
Total Petroleum Hydrocarbons	EPA Method 8100M	MADEP Extractable Petroleum Hydrocarbons, MADEP Volatile Petroleum Hydrocarbons
Volatile Organic Compounds	EPA Method 8260	
Semi-Volatile Organic Compounds	EPA Method 8270	
MCP 14 Metals	EPA Method 6010	EPA 200.7, 6020
Polychlorinated Biphenyls (PCBs)	EPA Method 8082	
Reactivity	EPA SW-846 Ch.7	
Flashpoint/ignitability	EPA Method 1010/1030	
pH	EPA Method 9045C	

Based on the results of the above analysis, it may be necessary to perform additional testing for Toxicity Characterization Leaching Procedure (TCLP) if the initial testing results indicate that the waste may be a hazardous waste, or to test for additional target analytes relevant to the conditions cited in the AUL that may not otherwise exist on the target list. Additional analyses may also be required for specific facilities, or at the request of MassDOT.

4.10 SOIL MANAGEMENT

Following characterization, options for soil management/disposition can be developed. The following sections describe the various alternatives for the management of soils during this project.

4.10.1 On-Site Soil Reuse

To the extent feasible and appropriate based on soil observations/screening and structural suitability, soils that are not adversely impacted by OHM shall remain at the Site and shall be reused as backfill or for general grading pending approval by MassDOT or its designated agents.

Soils that exhibit evidence of OHM impacts or soils generated from a location where OHM impacts are known may be reused at similar depths within the are covered under this RAM, if consistent with the AUL.

Soils from within the limits of the Disposal Site may not be reused at areas beyond the limits of the Disposal Site or at other properties without review, characterization, and possible further assessment of the soils by MassDOT's agents.

4.10.2 Off-Site Disposal - Non-MCP Remediation Waste Soil

Management of soils with concentrations of OHM below the MCP Reportable Concentrations does not require approval of MassDEP. These soils may be stored on-site subject to requirements of the NPDES Construction General Permit and site-specific SWPPP, as appropriate. The storage/stockpiling requirements in Section 4.2 are generally sufficient to comply with these requirements.

Surplus soils that are not regulated under the MCP may be transported off-site without approval from MassDEP to appropriate off-site facilities using Material Shipping Record & Log Forms (MSRs), subject to the MCP anti-degradation provisions and *Similar Soils policy* and related policies and approval by MassDOT.

4.10.3 Off-Site Disposal - MCP Remediation Waste

In the event characterization indicates presence of OHM at concentrations above applicable MCP Standards in soils that are excess to the Project, these soils will be classified as a MCP Remediation Waste and are regulated under the MCP, 310 CMR 40.0032, 40.0033, 40.0034, 40.0035 and 40.0036. MCP Remediation Waste soils are transported using an MCP Bill of Lading (BOL). Also, there are specific management requirements for the storage of Remediation Waste on-site. The procedures outlined in Section 4.2 comply with MCP requirements. Lastly, Remediation Waste may be stored on-site for up to 120 days following its initial excavation and placement in a stockpile or other container.

We note that soils that are characterized as hazardous waste pursuant to 310 CMR 30.000 and/or the Resource Conservation Recovery Act (RCRA) 40 CFR 239-282 require additional specific management protocols. Management, potential treatment (such as stabilization for soils characterized as hazardous waste due to failing the TCLP leachability test), and disposal of such soils must be addressed in the MMP. If hazardous waste is generated, these wastes shall be transported off-site using a Uniform Hazardous Waste Manifests within 90 days.

4.11 FOCUSED FEASIBILITY AND RISK EVALUATION

The proposed RAM has been prepared to facilitate management of excess soils on a roadway improvement project. The Project will not change the nature of the current use of the Project Area and will not entail construction of a structure that could prevent or impede the implementation of likely response actions in the future. Since this section of the Project Area is subject to a Permanent Solution, a risk characterization and feasibility evaluation have been conducted by the LSP of Record for the Disposal Site tracked under this RTN. The current deed restriction will remain in place without amendment. Therefore, the RAM requirements for development of a risk characterization and feasibility evaluation under 310 CMR 40,0442(3)(b) & (c) are not applicable to this RAM.

4.12 PERMIT REQUIREMENTS

Site renovations and construction activities are being implemented under permits and approvals issued by the City of Boston. We are not aware of additional permits required to implement this RAM Plan.

4.13 FINANCIAL CERTIFICATION

It is currently estimated that less than 1,500 cubic yards of remediation waste may be generated during this RAM. Therefore, certification under 310 CMR 40.0442(5) is not necessary.

4.14 RAM SCHEDULE

It is currently anticipated that implementation of the Project, which includes this RAM, will begin in Summer 2021 or Spring 2022, pending MassDOT project sequencing. It is anticipated that the Project may take up to 6 months to complete. Surplus soils that are characterized as Remediation Waste will be removed from the Site within 120 days of generation; surplus oils that are characterized as hazardous waste will be removed from the site within 90 days of generation.

5.0 PUBLIC NOTIFICATIONS

In accordance with the MCP, public notification shall be made *within* the 20 days prior to the implementation of the RAM. This notification shall include information on the purpose, nature and expected duration of RAM activities and will be submitted to the Chief Municipal Officer and Board of Health for the Town of Weymouth. Copies of the public notification documents are included in Appendix D.

Appendix A

LSP Statement of Limitations

Appendix B

Field Investigation Report

Appendix C

Disposal Site Documentation including AUL

Appendix D

Public Notifications

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	165
PROJECT FILE NO.	608807		

EXISTING CONDITIONS PLANS

KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE

N

A STREET

RICHARDS STREET

RICHARDS STREET

FORMERLY SOBIN PARK

MEDALLION AVE.

CITY LAYOUT - L-12424

CITY LAYOUT - L-12422

CITY LAYOUT - L-13343

2016 CITY LAYOUT -L-13343

CITY LAYOUT

CITY LAYOUT

LIMIT OF PROP MICROMILLING & OVERLAY I=3.0'(12"RCP)

1991 SHLO NO. 6863

NSTAR EASEMENT BK 51463 PG 21

PEDESTRIAN EASEMENT BK 50140 PG 86

EASEMENT

N/F ONE CHANNEL CENTER, L.P. BK 55422 PG 327 PLAN 168 OF 2012 1 IRON STREET PID #0602750011

N/F UNITED STATES POSTAL SERVICE BK 50139 PG 149

N/F UNITED STATES POSTAL BK 9130 PG 55 HAUL ROAD PID #0602760O

N/F GILLETTE MANUFACTURING (USA), INC. BK. 19947 PG. 59 A STREET PID #0602745000

N/F THE GILLETTE COMPANY LLC BK/PG 36614/180

N/F GILLETTE MANUFACTURING (USA), INC. L.C.C. No. 340051A (LOT) CERT. NO. 109202 DOC. NO. 522199 (SEE PLAN 221 OF 2020) SOBIN PARK PID #0601169001

N/F CITY OF BOSTON "CHANNEL CENTER PARK" BK 57066 PG 34 PLAN 476 OF 2016 141 A STREET PID #0602749020

N/F ONE CHANNEL CENTER PARKING, LLC BK 55422 PG 330 116 WEST FIRST STREET PID #0602749050

PROJECT BEGIN
STA 20+05
N2950884.3044
E776869.0209

S 67° 16' 51" E 408.21'

S 55° 10' 08" E 122.58'

PC +08.21
R=300.00'
L=63.42'
T=31.83'

PT +71.63

+61.40

BC 7.80 (HP)
TC 8.30

BC 7.62
TC 8.12

BC 7.56
TC 8.31
(9" REVEAL)

BC 7.63
TC 8.38
(9" REVEAL)

BC 7.71
TC 8.46
(9"REVEAL)

RIM = 7.29 (LP)

RIM = 7.47 (LP)

RIM = 7.89

RIM=7.95

8.10(EX)

8.49(EX)

8.06

8.03

7.78

7.85

8.22

8.15

7.67

8.30

7.82

8.42

7.93

BC 9.13
TC 9.53

BC 8.09
TC 9.59

BC 8.77
TC 9.38

BC 9.26
TC 9.66

BC 9.18
TC 9.60

BC 8.38
TC 8.91

9.35 (EX)

9.42 (EX)

9.52(EX)

9.21 (EX)

8.23 (EX)

RIM 7.93 (LP)

8.99 (EX)

8.03 (EX)

8.52 (EX)

BC 8.20
TC 8.70

BC 8.65
TC 9.16

BC=TC= 8.03 (EX)

RIM = 7.91

BC=TC=7.86

BC 7.47
TC 7.97

7.43

BC 7.31 (LP)
TC 7.64 (4" REVEAL)

BC 7.16
TC 7.66

BC 7.37 (HP)
TC 7.78 (5" REVEAL)

BC 7.29 (HP)
TC 7.79

7.31

7.30 (EX)

BC 7.35 (HP)
TC 7.85

BC 7.48
TC 7.98

BC 7.73
TC 8.21

BC 7.44
TC 7.94

BC 7.10
TC 7.60

BC 7.09
TC 7.59

BC 7.16
TC 7.66

7.21

PROP GUTTER
LINE 0.5%

RIM=7.17 (LP)

RIM = 7.12

RIM=7.40

7.24 (LP)

RIM =7.02 (LP)

RIM=7.12

RIM=7.60

7.60 (EX)

6.97 (EX)
RIM=6.95

RIM=7.11 (LP)

7.41

7.19

7.44

7.22

7.34

7.20 (EX)

7.48 (EX)

RIM=7.15 (LP)

22

21

23

24

25

0 20 50 100

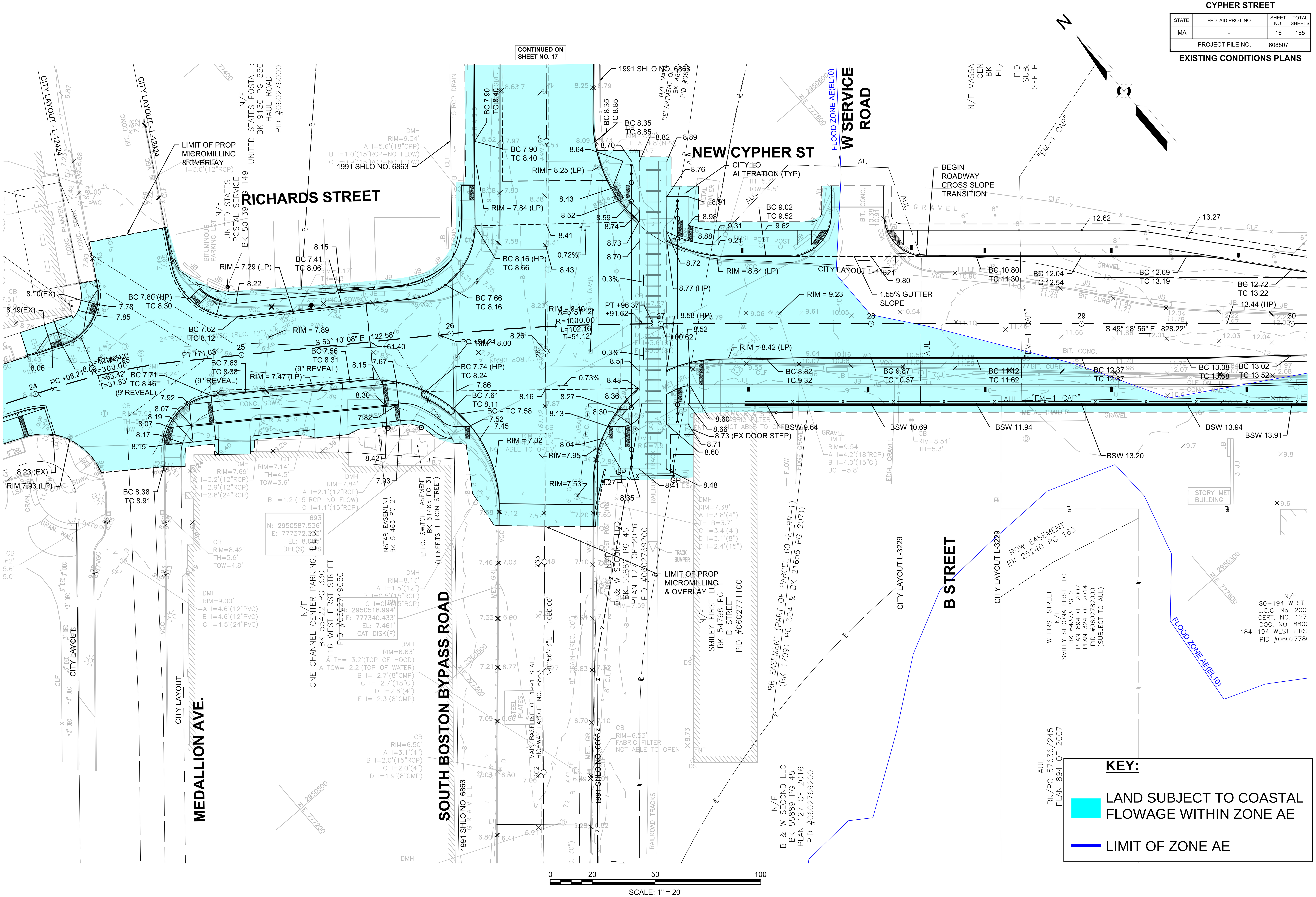
SCALE: 1" = 20'

CONTINUED ON SHEET NO.16

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	16	165
PROJECT FILE NO.		608807	

EXISTING CONDITIONS PLANS



CONTINUED ON SHEET NO. 17
CONTINUED ON SHEET NO. 15
CONTINUED ON SHEET NO. 18
RICHARDS STREET
NEW CYPHER ST
W SERVICE ROAD
SOUTH BOSTON BYPASS ROAD
MEDALLION AVE.
B STREET
FLOOD ZONE AE(EL10)
LIMIT OF PROP MICROMILLING & OVERLAY
BEGIN ROADWAY CROSS SLOPE TRANSITION
CITY LO ALTERATION (TYP)
1.55% GUTTER SLOPE
1991 SHLO NO. 6863
CITY LAYOUT L-12424
CITY LAYOUT L-11821
CITY LAYOUT L-3229
N/F UNITED STATES POSTAL SERVICE BK 50139 PG 149
N/F UNITED STATES POSTAL SERVICE BK 9130 PG 55C HAUL ROAD PID #060276000
N/F ONE CHANNEL CENTER PARKING, LLC BK 55422 PG 330 116 WEST FIRST STREET PID #0602749050
N/F SMILEY FIRST LLC BK 54798 PG B STREET PID #0602771100
N/F B & W SECOND LLC BK 55889 PG 45 PLAN 127 OF 2016 PID #0602769200
RR EASEMENT (PART OF PARCEL 60-E-RR-1) (BK 17091 PG 304 & BK 21655 PG 207)
ROW EASEMENT BK 25240 PG 163
NSTAR EASEMENT BK 51463 PG 21
ELEC. SWITCH EASEMENT BK 51463 PG 31 (BENEFITS 1 IRON STREET)
W FIRST STREET N/F SMILEY SEDONA FIRST LLC BK 64373 PG 2 PLAN 894 OF 2007 PLAN 324 OF 2014 PID #0602782000 (SUBJECT TO AUL)
S 55° 10' 08" E 122.58'
S 49° 18' 56" E 828.22'
MAIN BASELINE OF 1991 STATE HIGHWAY LAYOUT NO. 6863
0 20 50 100
SCALE: 1" = 20'
KEY:
LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE
LIMIT OF ZONE AE

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BOSTON
CYPHER STREET

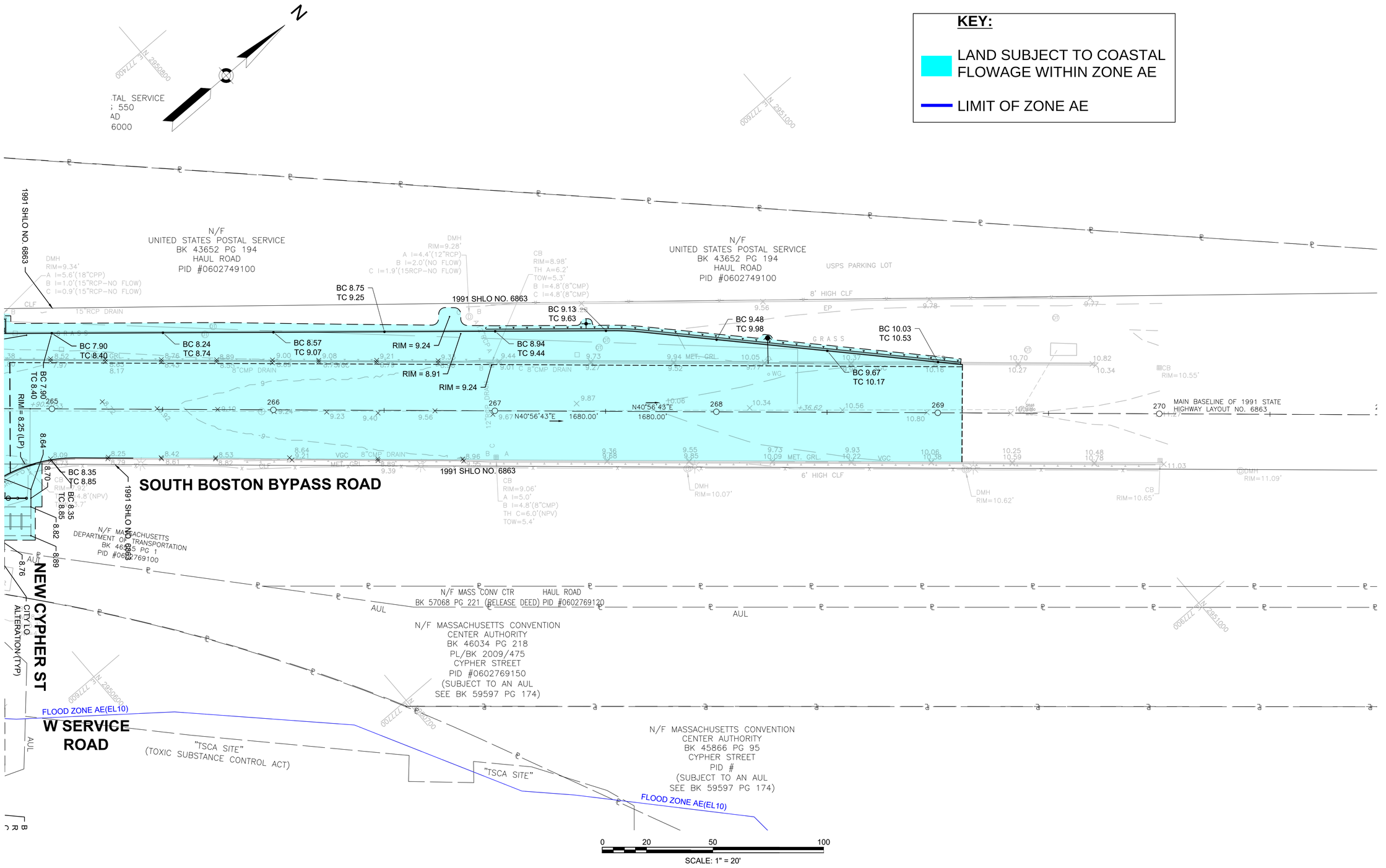
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	17	165
PROJECT FILE NO.		608807	

CONSTRUCTION PLANS

KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE



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BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	18	165
PROJECT FILE NO.		608807	

EXISTING CONDITIONS PLANS

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KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE

CONTINUED ON SHEET NO. 16

CONTINUED ON SHEET NO. 19

W SERVICE ROAD

FLOOD ZONE AE(EL10)

"TSCA SITE" (TOXIC SUBSTANCE CONTROL ACT)

N/F MASSACHUSETTS CONVENTION CENTER AUTHORITY BK 34983 PG 27 PL/BK 34983/27 D STREET PID #0602774010 SUBJECT TO AN AUL SEE BK 59597 PG 174

"EM-1 CAP"

AUL

BEGIN ROADWAY CROSS SLOPE TRANSITION

CITY LAYOUT L-11821

1.55% GUTTER SLOPE

9.80

M = 9.23

S 49° 18' 56" E 828.22'

28 29 30 31 32 33

BC 10.80 TC 11.30

BC 12.04 TC 12.54

BC 12.69 TC 13.19

BC 12.72 TC 13.22

13.44 (HP)

BC 12.62 TC 13.12

BC 12.71 TC 13.21

BC 12.38 TC 12.88

BC 12.05 TC 12.55

BC 12.38 TC 12.88

BC 12.05 TC 13.55

BC 11.72 TC 12.22

BC 11.39 TC 11.89

BC 11.06 TC 11.56

BC 10.73 TC 11.23

BC 10.92 TC 10.67 (3" REVEAM)

RIM = 10.65

RIM = 11.91

RIM = 12.04

12.62

13.27

13.30

13.20

BC 9.87 TC 10.37

BC 11.12 TC 11.62

BC 12.37 TC 12.87

BC 13.08 TC 13.58

BC 13.02 TC 13.52

BSW 10.69

BSW 11.94

BSW 13.20

BSW 13.94

BSW 13.91

BSW 13.58

BSW 13.25

BSW 12.92

BSW 12.59

BSW 12.26

BSW 11.93

BSW 11.60

BSW 11.17

NEW CYPHER STREET

CYPHER STREET

690
N: 2950239.995'
E: 777861.098'
EL: 11.160'
MAG(S) GPS

N/F MASSACHUSETTS CONVENTION CENTER AUTHORITY BK 34983 PG 27 D STREET PID #0602774010

"TSCA SITE" (TOXIC SUBSTANCE CONTROL ACT)

"EM-1 CAP"

SMH (DMH COVER) RIM=10.31' A I=7.3'(8"CI) B I=5.2'(12"RCP) TH=5.2' TOW=4.5'

CB RIM=9.63'

BC 10.71 TC 11.21

AUL & "EM-1 CAP"

DMH RIM=9.54' A I=4.2'(18"RCP) B I=4.0'(15"CI) BC=-5.8'

CB RIM=8.54' TH=5.3'

DMH RIM=10.00' BC=5.2'(NO FLOW)

N/F MASS PORT AUTHORITY ENABLING ACT CHAPTER 465 OF 1956 PID #0602782010

1 STORY BUILDING

CONCRETE

GRAVEL

CLF ON JB

CONC. WALL

METAL TRAILER

EDGE GRAVEL

3 JB

B STREET

C STREET

CITY LAYOUT L-3229

ROW EASEMENT BK 25240 PG 163

W FIRST STREET N/F SMILEY SEDONA FIRST LLC BK 64373 PG 2 PLAN 894 OF 2007 PLAN 324 OF 2014 PID #0602782000 (SUBJECT TO AUL)

FLOOD ZONE AE(EL10)

N/F 180-194 WFST, LLC L.C.C. No. 20091A CERT. NO. 127250 DOC. NO. 880014 184-194 WEST FIRST STREET PID #0602778000

N/F GABRIEL TUTUNJIAN, VACHE TUTUNJIAN AND ROTA TUTUNJIAN BK 61647 PG 36 330 "C" STREET PID #0602776000

CITY LAYOUT

N. 2950300 E. 777600

0 20 50 100

SCALE: 1" = 20'

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	19	165
PROJECT FILE NO.	608807		

EXISTING CONDITIONS PLANS

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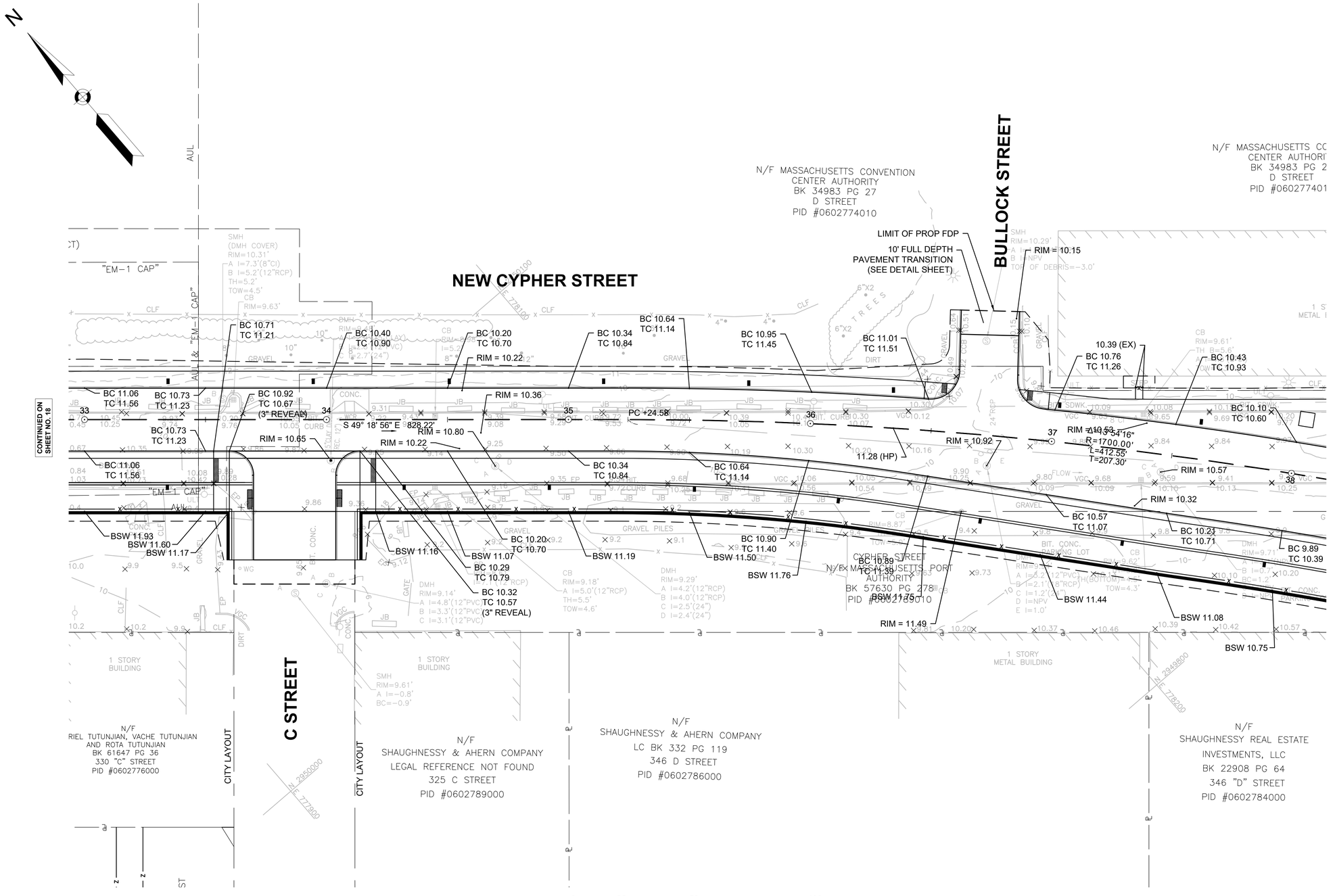
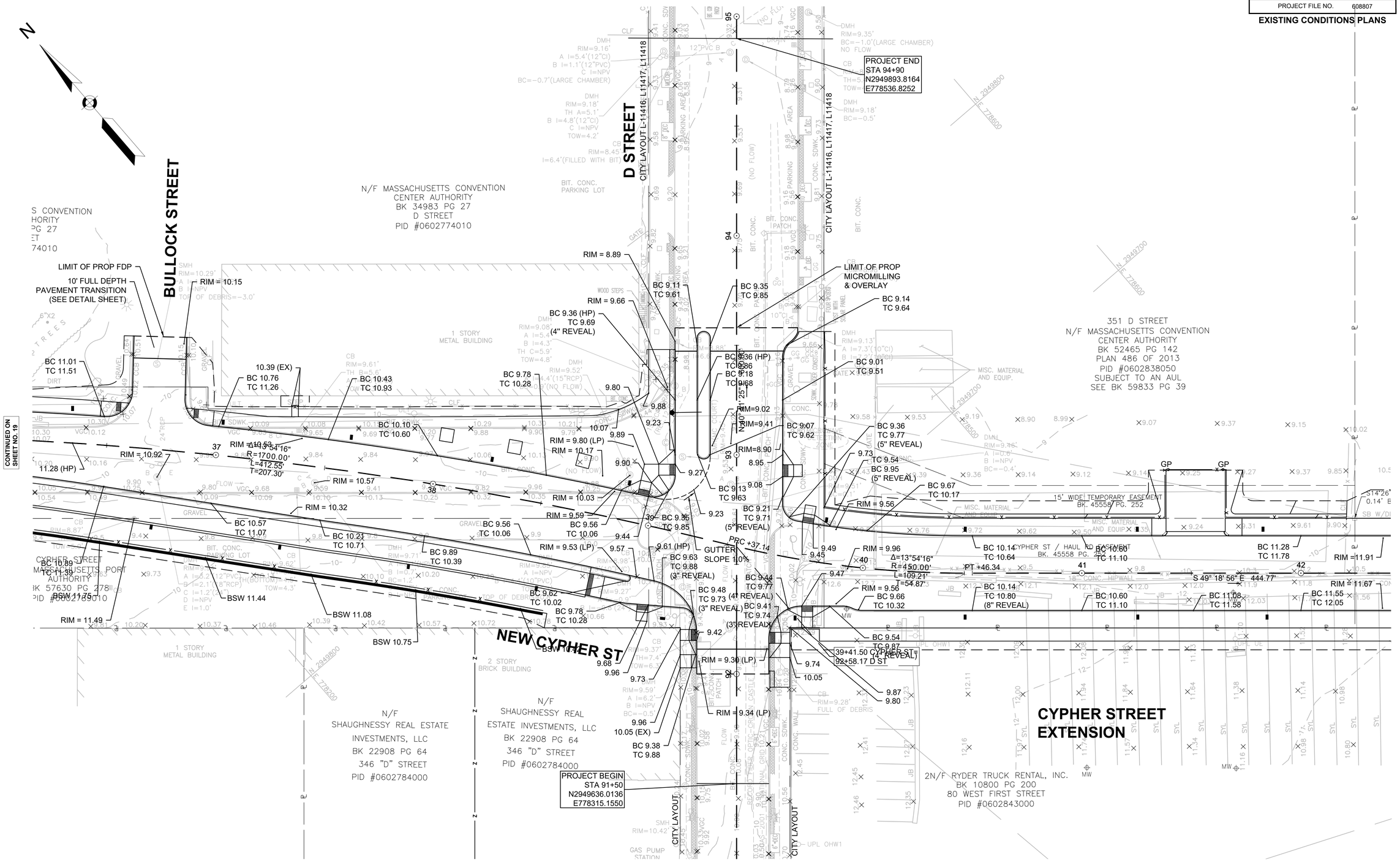


BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	20	165
PROJECT FILE NO.	608807		

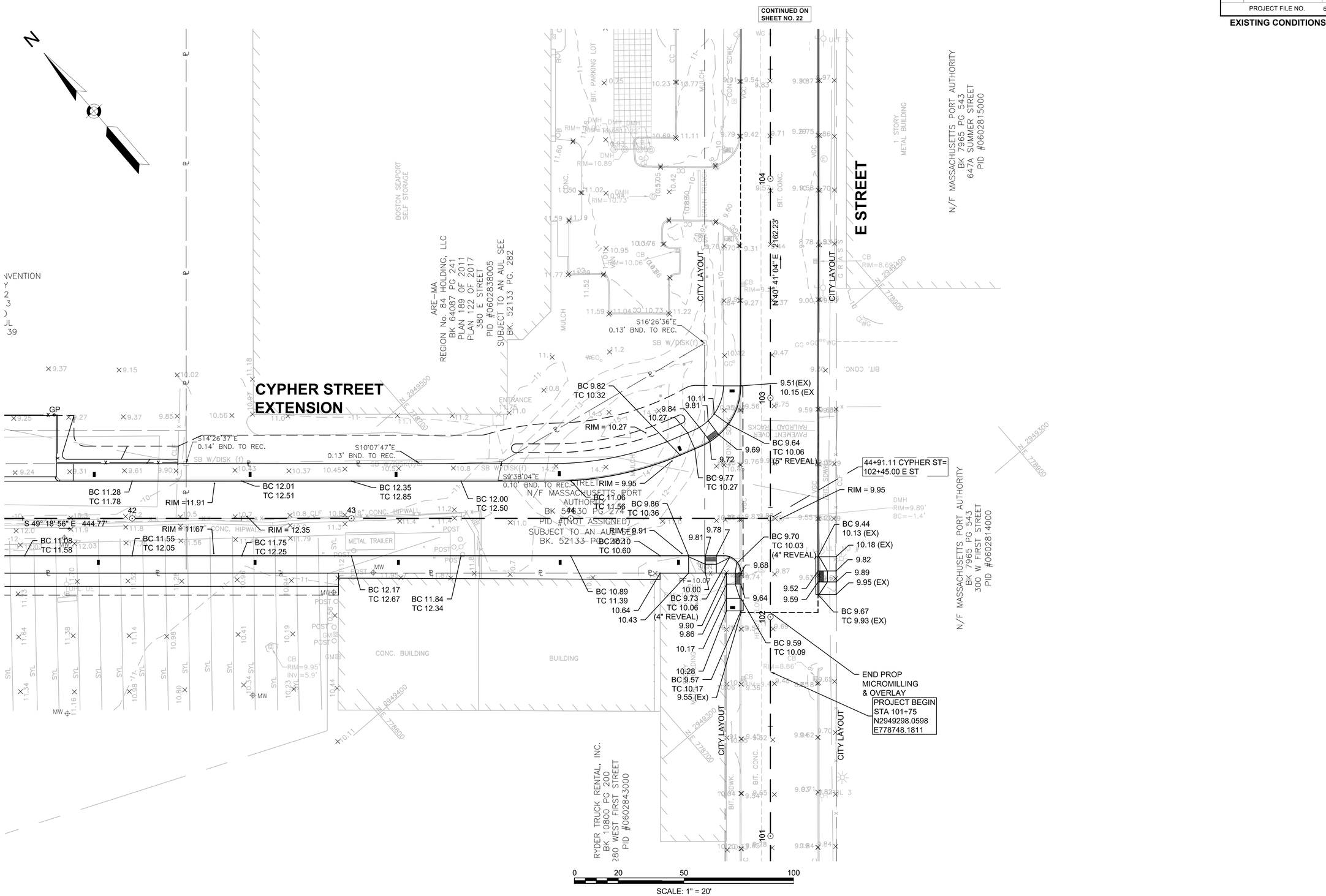
EXISTING CONDITIONS PLANS



BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	165
PROJECT FILE NO.	608807		

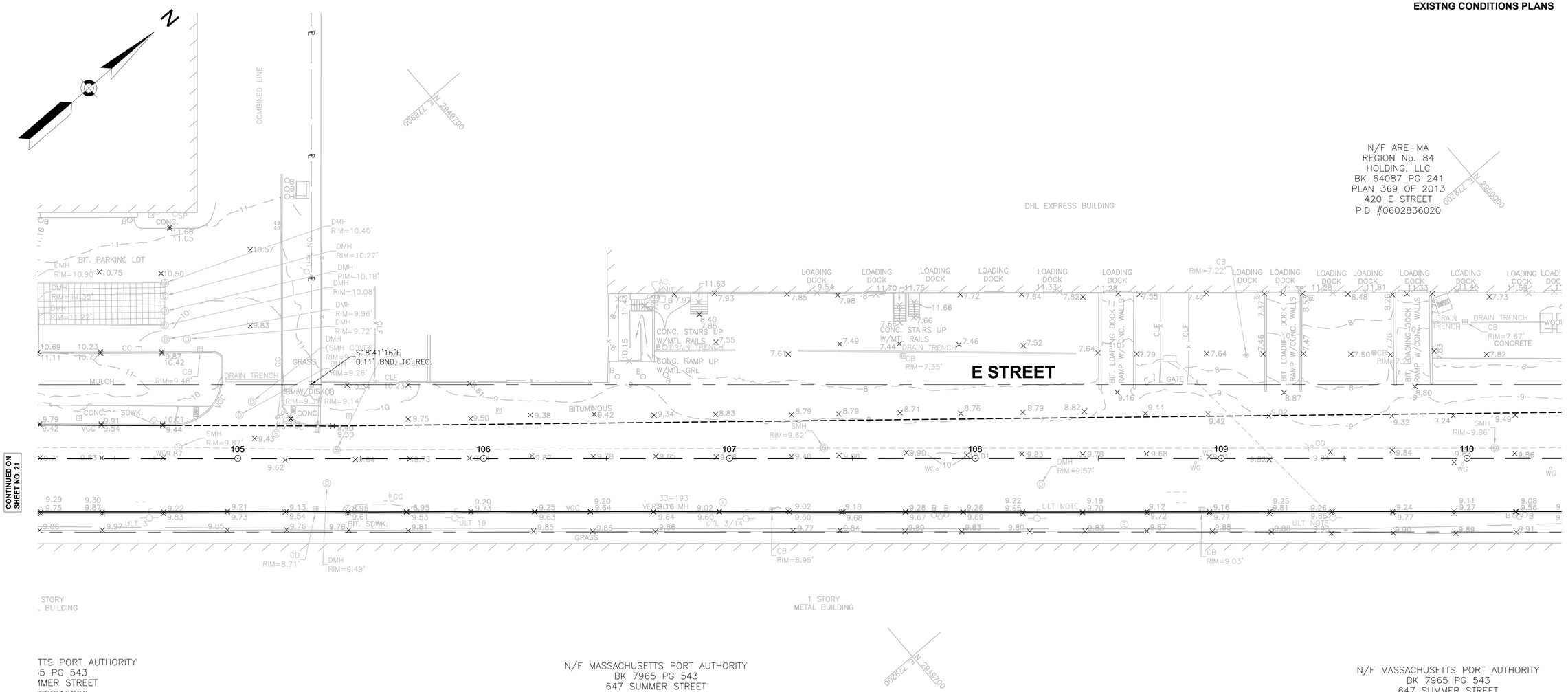
EXISTING CONDITIONS PLANS



BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	22	165
PROJECT FILE NO.	608807		

EXISTNG CONDITIONS PLANS



BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	23	165
PROJECT FILE NO.	608807		

EXISTING CONDITIONS PLANS

410–520 E STREET
N/F MASSACHUSETTS CONVENTION CENTER AUTHORITY
BK 52350 PG 251
PLAN 369 OF 2013
PID #0602836010

E STREET

N40°41'04"E 2,063.35'

N40° 41' 04" E 2162.23'

S40°41'04"W 2,252.15'

CONTINUED ON SHEET NO. 22

CONTINUED ON SHEET NO. 24

:TTS PORT AUTHORITY
35 PG 543
IMER STREET
602814003

N/F MASSACHUSETTS PORT AUTHORITY
BK 7965 PG 543
647 SUMMER STREET
PID #0602814003

N/F UNITED STATES OF AMERICA
BK 6975 PG 560
525 E STREET
PID #0602812100

0 20 50 100
SCALE: 1" = 20'

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	165
PROJECT FILE NO.	608807		

EXISTING CONDITIONS PLANS

E STREET
ETTS CONVENTION
AUTHORITY
0 PG 251
OF 2013
02836010

N/F UNITED STATES OF AMERICA
BK 7965 PG 543
560 E STREET
PID #0602835000

E STREET

E STREET

N40°41'04"E 2,063.35'

S40°41'04"W 2,252.15'

2,063.35'

2,252.15'

CONTINUED ON SHEET NO. 23

CONTINUED ON SHEET NO. 25

TATES OF AMERICA
75 PG 560
E STREET
0602812100

N/F UNITED STATES OF AMERICA
BK 6975 PG 560
525 E STREET
PID #0602812100

N/F UNITED STATES OF AMERICA
BK 6975 PG 560
525 E STREET
PID #0602812100

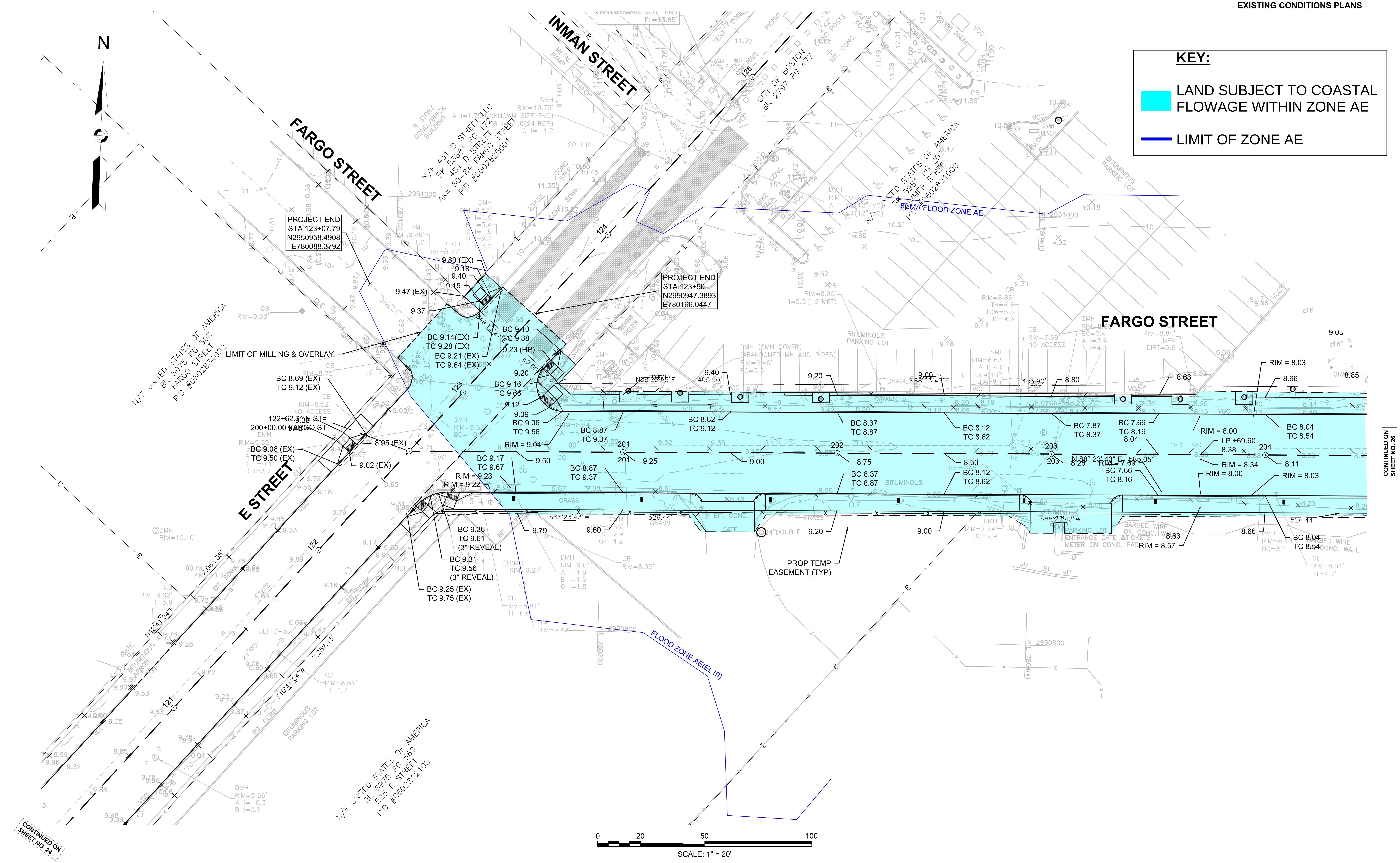
SCALE: 1" = 20'

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	25	165
PROJECT FILE NO.		608807	

EXISTING CONDITIONS PLANS

Plotted on 2-May-2022 2:00 PM
608807_HD(EX COND).DWG



KEY:
LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE
LIMIT OF ZONE AE
N
INMAN STREET
FARGO STREET
FARGO STREET
E STREET
CITY OF BOSTON BK 2797 PG 477
N/F 451 D STREET LLC BK 53681 PG 172 451 D STREET AKA 60-84 FARGO STREET PID #0602825001
N/F UNITED STATES OF AMERICA BK 5981 PG 202 SUMMER STREET PID #0602831000
N/F UNITED STATES OF AMERICA BK 6975 PG 560 FARGO STREET PID #0602834002
N/F UNITED STATES OF AMERICA BK 6975 PG 560 525 E STREET PID #0602812100
PROJECT END STA 123+07.79 N2950958.4908 E780088.3792
PROJECT END STA 123+50 N2950947.3893 E780166.0447
LIMIT OF MILLING & OVERLAY
FEMA FLOOD ZONE AE
FLOOD ZONE AE(EL10)
PROP TEMP EASEMENT (TYP)
BITUMINOUS PARKING LOT
CONTINUED ON SHEET NO. 24
CONTINUED ON SHEET NO. 26
0 20 50 100
SCALE: 1" = 20'

Nitsch – P:\08000-09999\9720.17 Cypher St Bos\Transportation\Project Data\NO\608807_HD(EX COND).dwg May 2, 2022 2:00 PM

BOSTON
CYPHER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	26	165
PROJECT FILE NO.	608807		

EXISTING CONDITIONS PLANS

KEY:

LAND SUBJECT TO COASTAL FLOWAGE WITHIN ZONE AE

LIMIT OF ZONE AE