



NOI APPLICATION NARRATIVE

City Point Liverpool, LLC

151-153 Liverpool Street

East Boston, MA

September 5, 2018

eDEP Transaction #1036331

1.0 INTRODUCTION

The purpose of this revised Notice of Intent is to request an Order of Conditions for the demolition of a building and the remediation of soil at 151 - 153 Liverpool Street, in East Boston, Massachusetts. According to FEMA Panel 0081J, Map 25025C0081, the property is located within a Special Flood Hazard Area subject to inundation by the 1% annual chance flood, or Zone AE.

The property at 151- 153 Liverpool Street is generally flat and is developed with a three-story brick building that covers the entire 8,720 square foot area of the lot. The plan is to demolish the building and excavate oil and metals-contaminated soil. At a later date, the owners plan to construct a new multi-story residential apartment structure on the property.

The property at 151- 153 Liverpool Street is located in a commercial and residential neighborhood. An automotive body shop abuts the property to the northeast, a church and residential properties abut the property to the southeast, a parking lot abuts the property to the southwest and Liverpool Street abuts the property to the northwest. Across Liverpool Street are commercial and residential properties. Please see **Figure 1**, Site Locus Map, for the location of the property. A copy of the property survey, titled Site Plan of Land, dated August 24, 2018, and Job #14-00705 is attached to provide existing conditions. According to FEMA Panel 0081J, Map 25025C0081, the property is located within a Special Flood Hazard Area subject to inundation by the 1% annual chance flood, or Zone AE. A copy of the FEMA Panel 0081J, Map 25025C0081 is attached as NFIP FIRM Map No 25025C0081J, Panel 81.

In 2014, an underground storage tank, used to store waste oil, and some soil impacted by a release of oil were removed from below the floor inside the building. Due to structural constraints, the prior owner left an estimated volume of 20 cubic yards of oil and metals contaminated soil in place below the floor and below approximately 6 feet of clean backfill. That owner also had a deed restriction, in the form of an Activity and Use Limitations, placed on the property. The release of oil was closed with the Massachusetts Department of Environmental Protection (MassDEP) in 2014. City Point Liverpool LLC intends to remove the building and floor. Once the floor has been removed, the plan is to excavate the remaining contaminated soil and recycle the soil at an asphalt batching plant. After soil testing documents the impacted soil has been removed, the Activity and Use Limitations will be removed from the deed.

This NOI is presented for the demolition of the building and the excavation of impacted soil. Construction of the building will follow under a separate NOI. Please note that a survey has been completed and a Letter of Map Amendment (LOMA) will be submitted to FEMA to request a change in the flood zone designation for the property.

2.0 DEMOLITION

In preparation of the demolition, the hazardous materials (asbestos-containing materials, lights, ballasts, and other containers of waste left by occupants) have been removed. Prior to demolition, a site fence will be set up at the curb line on Liverpool Street and return to the building on both ends. The demolition contractor, J.R. Vinagro Corporation (JRV), will use a CAT 330 High Reach Excavator with multiple attachments to disassemble the building and a CAT 335 Excavator to assist in the clean-up and load out of material. JRV will start at the parking lot side and systematically dismantle the building leaving the front until last. The stability of removed individual pieces and the partially demolished existing structure, in whole or in part, will be investigated on an as-needed and on-call basis by a professional engineer engaged by JRV, for any unanticipated circumstances developing during demolition that may appear unstable.

As Sections of the exterior walls and footings are removed, the disturbed soil in those areas will be smoothed out and graded to drain toward the center of the property. As sections of the perimeter foundation walls are removed, sections of wattles will be staked in place to minimize the potential for migration of soil to run off the property. Please refer to the attached Wattle Installation Specification to be followed.

3.0 REMEDIATION

As required under 310 CMR 40.0440, a Release Abatement Measure Plan will be completed and submitted to the Massachusetts Department of Environmental Protection. The remediation portion of this project would qualify as a "Limited Project" per 310 CMR 10.24(7)(c)(6). The following describes the oil and metals-impacted area and the Response Actions to be followed to remove and recycle that impacted soil.

3.1 Soil Excavation

The Disposal Site was determined to be an area that is approximately 25 feet wide by 45 feet long and below the floor near the center of the building or property, as shown on **Figure 2**, the Disposal Site Plan. However, the oil and metal impacted soil was reported by others as an area approximately 10 wide by 20 feet long. Because the UST and some impacted soil have been removed, contaminated soil remaining is believed to be located from six to nine feet below grade, or have an estimated thickness of three feet. Therefore, the volume of waste oil contaminated soil is estimated at approximately 20 cubic yards. Because there is the potential for more impacted soil, the volume to be excavated and disposed of from this area has been estimated at between 20 and 40 cubic yards. As required by 310 CMR 40.0440, soil excavation will be performed under a Release Abatement Measure (RAM) Plan that has been submitted to the Massachusetts Department of Environmental Protection.

As per the RAM Plan, Edge Environmental LLC (Edge) will direct the excavation of soil from the former area of the UST. The overburden from above the former UST location, including an area approximately 35 feet long by 25 feet wide and 6 feet deep, will be removed and stockpiled to the northeast and southeast of the excavation. If evidence of oil is found, the soil will be placed in the oily soil stockpile area that is located to the southwest of the former UST area. Then the oil-impacted soil will be removed from an area estimated to be approximately 20 feet long by 10 feet wide to 25 feet long by 15 feet wide and from 6 to 9 feet below grade. Refer to **Figure 3**, The Soil Excavation Plan, for a site plan depicting the approximate size and location of the proposed excavation and stockpiling. Edge will screen soil samples, collected from the sidewalls and the bottom of the excavation, with a PID using the headspace method. Excavation will continue until headspace screening and visual observations indicate that excavation of contaminated soil is complete.

Wattling will be staked around the overburden pile to minimize the potential for runoff from the pile.

Once excavation activities are believed to be complete, soil samples will be collected from the sidewalls and the bottom of the excavation for analysis for Extractable Petroleum Hydrocarbons (EPH) plus polyaromatic hydrocarbons (PAH) as well as lead and antimony. These chemicals, hydrocarbon fractions and metals are the contaminants of concern included in a 2014 closure report or Response Action Outcome.

The oil-impacted soil will be staged on and covered with poly sheeting. The sheeting will be secured beyond the edges of the pile with weights. The plan is to store the soil on-site for a period of 7 to 14 days while waiting for analytical results for the composite sample and the acceptance of the soil at a recycling facility. While waiting for analytical results and determination of soil disposal options, the soil cover will be inspected and maintained to keep the pile covered. The soil will be loaded into trucks for transportation to the designated disposal facility.

To eliminate the potential for the soil to collapse or someone being trapped in the open excavation, the overburden soil, removed from the first 6 feet below grade, will be placed back in the open excavation as backfill. Additionally, clean gravel will be imported and used to fill the excavation to pre-excavation grade. To meet the stormwater management standards, a slight gradient, down to the area where the excavation had been performed is proposed. This slight topographic low will allow for stormwater retention and, as the entire site will be pervious, infiltration of stormwater.

3.2 Soil Management

This soil management plan addresses the removal of a small volume of soil to be excavated from the former location of the UST.

General practices:

- The oil-impacted soil will be staged on and covered with poly sheeting. The sheeting will be secured beyond the edges of the pile with weights.
- Excavation and soil loadout will take place between the hours of 7:00 AM and 7:00 PM Monday through Friday;
- The Site Operator will provide an MSR, BOL or Uniform Hazardous Waste manifest to the driver, record the name of the trucking company, and verify the source of the material;
- The Owner will utilize the following measures to control fugitive dust and sediment associated with loading and transporting soil from the Site: Operations shall be suspended when wind speeds exceed 40 miles per hour, or when wind carries dust beyond the property line despite implementation of dust control measures. A water truck will be utilized, as needed, to apply water to surface soil to control dust and to prevent visible dust emissions and offsite dust impacts.
- Truck and trailer loading of soil will be conducted in a manner to minimize fugitive dust generation.
- A gravel tracking pad will be constructed, as appropriate, at equipment/vehicle site exit points to remove soil buildup from wheels and tracks and to assist in minimizing track-out onto Liverpool Street. The gravel tracking pad will be located on the southwest side of the property, exiting onto the neighboring asphalt parking lot. Use of the lot has been secured for the project.
- Liverpool Street, adjacent to the Site, will be swept as needed to control fugitive dust and the tracking of soil away from the Site.

3.3 Site Elevations

Existing elevations are provided on a plan titled "Site Plan of Land" and dated August 24, 2018. The existing and proposed elevations can be found on Figure 3, Soil Excavation and Storage Plan.

4.0 STORMWATER MANAGEMENT

An August 24, 2018 report prepared by Columbia Design Group and titled “*Storm Drainage Report*” is attached. The Storm Drainage Report includes a Stormwater Management Plan, the Associated Stormwater Checklist and pre and post-development HydroCAD reports. The HydroCAD reports indicate a net decrease in both peak flow and volume for all storm events.

5.0 IMPACT TO RESOURCE AREA

The Resource Area is a level, 8,270 square foot property in a developed urban area of Boston that is completely covered by a building. The full scope of this project includes the removal and replacement of the building. This NOI addresses the demolition of the building and excavation of oil impacted soil that is located below the building.

In 1910, the property was so extensively altered by human activity, that the importance of the property to wildlife habitat functions were effectively eliminated. In the Site’s present configuration, it provides no storage area or retention for storm or flood waters.

The demolition of the building and planned excavation of oil-impacted soil will improve the resource area. On a temporary basis, in the absence of the building, the porous nature of the exposed soil will allow flood and storm waters to infiltrate into the underlying formation. The removal of the oil impacted soil from the underlying formation will eliminate the potential for the oil to migrate with groundwater. In addition, as indicated in Section 3.1, the lot is basically flat and erosion control measures will be implemented to retain soil on site.

Over the longer term, the new building and associated stormwater management system will improve the resource for two reasons. The first is that the building’s present foot print encroaches on two neighboring properties. The new building foot print will be smaller, resulting in more area for flood waters proximal to the building. The second reason is because stormwater will be captured, retained and slowly discharged into the formation below the new building. This will improve the Resource area via recharge to groundwater.

Attachments:

Mass eDEP Transaction Copy w/ID#
Mass DEP WPA Form 3 – Notice of Intent w/signature page
Mass DEP NOI Wetland Fee Transmittal Form
Stormwater Report (Stormwater Drainage Report (Rev. I) & Checklist for Stormwater Report)
Site Plan of Land, dated August 24, 2018, and Job #14-00705
Civil Site Plan, dated 7-14-17
Figure 1 Site Locus Map
Figure 2, Disposal Site Plan – dated 8-24-18
Figure 3, Soil Excavation & Storage Plan – dated 8-24-18
NFIP FIRM Map No 25025C0081J, Panel 81
Wattle Installation Specification
Wheel Wash Specification
Vehicle Tracking Pad Specification
Transmittal Receipts– Mass DEP & Boston Conservation Commission



Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username: **LSPEJOHNSON**

Transaction ID: **1036331**

Document: **WPA Form 3 - NOI**

Size of File: **250.77K**

Status of Transaction: **In Process**

Date and Time Created: **8/22/2018:12:56:42 PM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to "Download a Copy" from the Current Submittals page.

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 #:

eDEP Transaction #:1036331

City/Town:BOSTON

A.General Information

1. Project Location:

a. Street Address	151-153 LIVERPOOL STREET		
b. City/Town	BOSTON	c. Zip Code	02128-1908
d. Latitude	42.37348N	e. Longitude	71.03976W
f. Map/Plat #	0105462000	g.Parcel/Lot #	0105462000

2. Applicant:

Individual Organization

a. First Name	JOHN	b.Last Name	SAMBUCCI		
c. Organization	CITY POINT LIVERPOOL LLC				
d. Mailing Address	1 GATEWAY CENTER, STE. 613				
e. City/Town	NEWTON	f. State	MA	g. Zip Code	02458
h. Phone Number	617-244-4599	i. Fax	617-244-4622	j. Email	JOHN.SAMBUCCI@GMAIL.COM

3. Property Owner:

more than one owner

a. First Name	JOHN	b. Last Name	SAMBUCCI		
c. Organization	CITY POINT LIVERPOOL LLC				
d. Mailing Address	1 GATEWAY CENTER, STE. 613				
e. City/Town	NEWTON	f.State	MA	g. Zip Code	02458
h. Phone Number	617-244-4599	i. Fax	617-244-4622	j.Email	JOHN.SAMBUCCI@GMAIL.COM

4.Representative:

a. First Name	ERIC	b. Last Name	JOHNSON		
c. Organization	EDGE ENVIRONMENTAL LLC				
d. Mailing Address	PO BOX 5262				
e. City/Town	MANCHESTER	f. State	NH	g. Zip Code	03108
h.Phone Number	603-717-8808	i.Fax		j.Email	ejohnson@edgeenvirollc.com

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

a.Total Fee Paid	2,500.00	b.State Fee Paid	1,237.50	c.City/Town Fee Paid	1,262.50
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6.General Project Description:

THE PLAN IS TO DEMOLISH THE EXISTING BUILDING AND EXCAVATE 20 TO 40 CUBIC YARDS OF OIL IMPACTED SOIL. THE REMOVAL OF THE SOIL WILL SUPPORT THE REMOVAL OF A DEED RESTRICTION ON THE PROPERTY. THEN A NEW BUILDING WILL BE CONSTRUCTED. THIS NOI IS FOR THE DEMOLITION AND EXCAVATION.

7a.Project Type:

- | | |
|---|--|
| 1. <input type="checkbox"/> Single Family Home | 2. <input type="checkbox"/> Residential Subdivision |
| 3. <input type="checkbox"/> Limited Project Driveway Crossing | 4. <input type="checkbox"/> Commercial/Industrial |
| 5. <input type="checkbox"/> Dock/Pier | 6. <input type="checkbox"/> Utilities |
| 7. <input type="checkbox"/> Coastal Engineering Structure | 8. <input type="checkbox"/> Agriculture (eg., cranberries, forestry) |

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9. Transportation 10. Other

7b. Is any portion of the proposed activity eligible to be treated as a 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:
 2. Limited Project

8. Property recorded at the Registry of Deeds for:

a. County:	b. Certificate:	c. Book:	d. Page:
SUFFOLK		55798	306

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

1. Buffer Zone & Resource Area Impacts (temporary & permanent):

This is a Buffer Zone only project - 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)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
---------------	-----------------------------	-------------------------------

- | | | |
|--|---|------------------------|
| a. <input type="checkbox"/> Bank | 1. linear feet | 2. linear feet |
| b. <input type="checkbox"/> Bordering Vegetated Wetland | 1. square feet | 2. square feet |
| c. <input type="checkbox"/> Land under Waterbodies and Waterways | 1. Square feet | 2. square feet |
| | 3. cubic yards dredged | |
| d. <input type="checkbox"/> Bordering Land Subject to Flooding | 1. square feet | 2. square feet |
| | 3. cubic feet of flood storage lost | 4. cubic feet replaced |
| e. <input type="checkbox"/> Isolated Land Subject to Flooding | 1. square feet | |
| | 2. cubic feet of flood storage lost | 3. cubic feet replaced |
| f. <input type="checkbox"/> Riverfront Area | 1. Name of Waterway (if any) | |
| 2. Width of Riverfront Area (check one) | <input type="checkbox"/> 25 ft. - Designated Densely Developed Areas only | |
| | <input type="checkbox"/> 100 ft. - New agricultural projects only | |
| | <input type="checkbox"/> 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: | | |

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- 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)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
---------------	-----------------------------	-------------------------------

a. <input type="checkbox"/> Designated Port Areas	Indicate size under	Land under the ocean below,
b. <input type="checkbox"/> Land Under the Ocean	1. square feet	
	2. cubic yards dredged	
c. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes, below	
d. <input type="checkbox"/> Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. <input type="checkbox"/> Coastal Dunes	1. square feet	2. cubic yards dune nourishment
f. <input type="checkbox"/> Coastal Banks	1. linear feet	
g. <input type="checkbox"/> Rocky Intertidal Shores	1. square feet	
h. <input type="checkbox"/> Salt Marshes	1. square feet	2. sq ft restoration, rehab, crea.
i. <input type="checkbox"/> Land Under Salt Ponds	1. square feet	
	2. cubic yards dredged	
j. <input type="checkbox"/> Land Containing Shellfish	1. square feet	
k. <input type="checkbox"/> 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. <input checked="" type="checkbox"/> Land Subject to Coastal Storm Flowage	8,720	
	1. square feet	

4. Restoration/Enhancement

Restoration/Replacement

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 entered the additional amount here.

- a. square feet of BVW b. square feet of Salt Marsh

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5. Projects Involves Stream Crossings

Project Involves Streams Crossings

If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings

b. number of replacement stream crossings

C. Other Applicable Standards and Requirements

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 of Endangered Species program (NHESP)?

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

b. Date of map: 7-31-18

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

c. Submit Supplemental Information for Endangered Species Review * (Check boxes as they apply)

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

3. Project plans for entire project site, including wetland resource areas and areas outside of wetland 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

c. MESA filing fee (fee information available at: <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa/mesa-fee-schedule.html>)

Make check payable to "Natural Heritage & Endangered Species Fund" 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

d. OR Check One of the following

1. Project is exempt from MESA review. Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, <http://www.mass.gov/eea/agencies/dfg/dfw/laws-regulations/cmr/321-cmr-1000-massachusetts-endangered-species-act.html#10.14>; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

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2. Separate MESA review ongoing.

a. NHESP Tracking Number

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.

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review...

2. For coastal projects only, is any portion of the proposed project located below the mean high waterline or in a fish run?

a. Not applicable - project is in inland resource area only

b. Yes No

If yes, include proof of mailing or hand delivery of NOI to either:

South Shore - Cohasset to Rhode Island,
and the Cape & Islands:

North Shore - Hull to
New Hampshire:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
1213 Purchase street - 3rd floor
New Bedford, MA 02740-6694

Division of Marine
Fisheries -
North Shore Office
Attn: Environmental
Reviewer
30 Emerson Avenue
Gloucester, MA 01930

If yes, it 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.

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

Yes No

If yes, provide name of ACEC (see instructions to WPA Form 3 or DEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC Name

4. 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

5. 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

6. 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

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b. No, Explain why the project is exempt:

1. Single Family Home

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

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 by regular mail delivery.

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.
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.

a. Plan Title: b. Plan Prepared By: c. Plan Signed/Stamped By: d. Revised Final Date: e. Scale:

NOI NARRATIVE, STORMWATER PLAN, LIST OF ATTACHMENTS AND WATTLING SPECIFICATION	EDGE ENVIRONMENTAL LLC	ERIC M JOHNSON	8/22/18	
FIGURE 2, DISPOSAL SITE PLAN	EDGE ENVIRONMENTAL LLC	ERIC M JOHNSON	8/15/18	
FIGURE 3, SOIL EXCAVATION & STORAGE PLAN	EDGE ENVIRONMENTAL LLC	ERIC JOHNSON	8/15/18	
ALTA/ACSM LAND TITLE SURVEY	BOSTON SURVEY, INC.	GEORGE C COLLINS	1/15/16	
CIVIL SITE PLAN	COLUMBIA DESIGN GROUP, LLC	PETER GAMMIE	7/14/17	
NFIP FIRM MAP NO 25025C0081J, PANEL 81	FEMA	PRINTED 8/21/18	3/16/16	

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.

**Massachusetts Department of Environmental
Protection**

Bureau of Resource Protection - Wetlands

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- 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.

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 #:
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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.

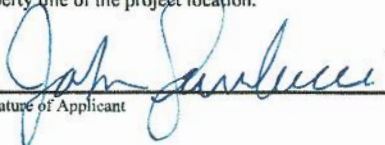
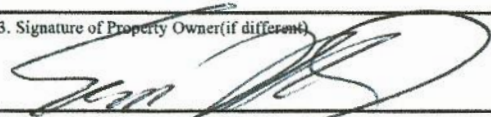
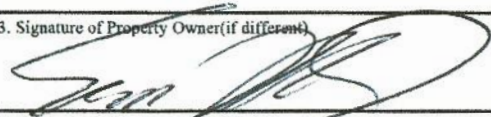
Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

<u>1126</u>	<u>8/22/18</u>
2. Municipal Check Number	3. Check date
<u>1127</u>	<u>8/22/18</u>
4. State Check Number	5. Check date
<u>John</u>	<u>Sambucci</u>
6. Payer name on check: First Name	7. Payer name on check: Last Name

F. Signatures and Submittal Requirements

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

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

<u></u>	<u>8/30/18</u>
1. Signature of Applicant	2. Date
<u></u>	<u>8/30/18</u>
3. Signature of Property Owner (if different)	4. Date
<u></u>	<u>8/30/18</u>
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 Section C, Items 1-3, above, refer to that section and the Instructions for additional submittal requirements.

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



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Wetlands
NOI Wetland Fee Transmittal Form
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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



A. Applicant Information

1. Location of Project:

<u>151 - 153 Liverpool Street</u>	<u>East Boston</u>
a. Street Address	b. City/Town
<u>1127</u>	<u>1237.50</u>
c. Check number	d. Fee amount

2. Applicant Mailing Address:

<u>John</u>	<u>Sambucci</u>	
a. First Name	b. Last Name	
<u>City Point Liverpool LLC</u>		
c. Organization		
<u>1 Gateway Center, Ste 613</u>		
d. Mailing Address		
<u>Newton</u>	<u>MA</u>	<u>02458</u>
e. City/Town	f. State	g. Zip Code
<u>6172444599</u>	<u>6172444622</u>	<u>john.sambucci@gmail.com</u>
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

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

B. Fees

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

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

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

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

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

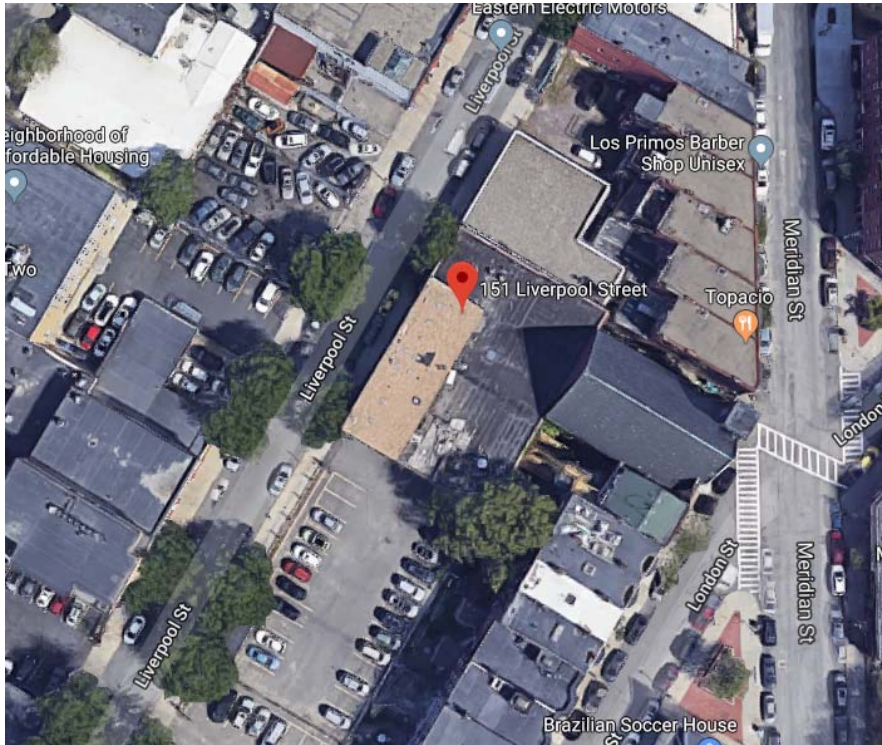
Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

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

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

Storm Drainage Report

For
151 Liverpool St., East Boston, MA



Applicant: City Point Liverpool, LLC C/O
Michael O'Malley
151 Liverpool St.
East Boston, MA 02127

August 24, 2018 (Rev. I, 9/6/18)

By: *Peter Gammie, P.E.*
Columbia Design Group, LLC



Introduction

This report discusses the stormwater management system and analysis for the proposed redevelopment at 151 Liverpool St., East Boston, MA. It also contains documentation of compliance with the MassDEP Stormwater Standards, the Erosion and Sediment Control Report, and an Operations and Maintenance Plan.

The proposed redevelopment includes the razing of the existing commercial buildings and construction of a new multiunit residential facility with parking below grade. The existing building covers the entire foot print of the lot, approximately 8,720 sf and is relatively flat on each side. Total disturbance is less than one acre, therefore the NPDES General Permit is not required.

Stormwater Management Plan Report

The Site is approximate 0.2 acres and identified as Assessor's Ward 01 Parcel 05462000. The only disturbance outside the project site is the public sidewalk running in front of the facility which will be reconstructed. There are no known environmental resource other than the site being located within the 100 Year flood plain.

The topography is flat with either existing buildings or paved surfaces on all sides. There are no pervious areas on the site today and after construction the entire site will be covered by the new building. The proposed stormwater management for this site includes Best Management Practices that address the pre- versus post- development runoff volumes and peak flow, TSS removal and recharge to groundwater. The proposed stormwater management plan consists of a large storage tank to be located in the lower garage area with connections via vertical holes in the bottom of the tank that allow for the movement of runoff through a large crushed stone bed below the basement slab. The HydroCAD model demonstrates a net decrease in both peak flow and volume for all storm events.

Temporary, interim period prior to the construction of the new building - As Sections of the exterior walls and footings are removed, the disturbed soil in those areas will be smoothed out and graded to allow for drainage to flow on to the property. As sections of the perimeter foundation walls are removed, sections of wattles will be staked in place to minimize the potential for migration of soil to run off the property. This configuration will minimize stormwater and flood water runoff, improve retention, and allow for infiltration of storm and flood water.

After the remediation has been completed, and to continue to meet the stormwater management standards, a slight gradient, down to the area where the excavation had been performed is proposed. This slight topographic low will allow for stormwater retention and, as the entire site will be pervious, infiltration of stormwater. The sections of staked wattles will be maintained in place to minimize the potential for migration of soil to run off the property.

See HydroCad reports.

Design Point #1

Table 2 Volume of Discharge (cf)

Design Storm	Design Point 1	
	Pre-	Post-
2 year, 3.2"	2082	1427
10 year, 4.7"	3096	2440
100 year, 8.5"	4547	3689

Table 3 Peak Rate of Discharge (cfs)

Design Storm	Design Point 1	
	Pre-	Post-
2 year, 3.2"	0.61	0.59
10 year, 4.7"	0.89	0.84
100 year, 8.5"	1.28	1.17

Soils

Soils Information obtained from Geotechnical Report

Erosion and Sediment Control Report

Elements of erosion control consist of wattles placed around the entire construction site, protection of the proposed infiltration systems during construction, truck wash-off area and street sweeping (See Civil Site Plan). In addition, the proposed development has taken into consideration:

- Minimize total area of disturbance and minimize unnecessary clearing and grading
- Estimates of the total area expected to be disturbed by excavation, grading, less than 40,000 SF
- All erosion control will be inspected and maintained on a daily basis
- All stockpiling of materials on site will be surrounded with erosion control barrier

Multiple erosion and sedimentation control devices will be implemented to prevent erosion during and after construction. The following erosion and sediment controls will be installed as necessary for this project:

- Initially, an erosion control barrier consisting of wattles will be installed at the limit of work along the down gradient site borders.
- Construction entrance apron pads will be constructed at the main site access to prevent the tracking of sediment on vehicle tires from transport onto adjacent streets.

Operation and Maintenance Plan

The Operations and Maintenance Plan is attached, see Appendix A

Documenting Compliance

The proposed stormwater management system complies with the ten standards of the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Policy. This report was prepared under the direction of Peter Gammie, a Registered Professional Engineer (RPE) licensed to do business in the Commonwealth pursuant to MGL Chapter 112 Section 81R.

This section of the Stormwater Report includes the computations required to document compliance with the following standards:

- Standard 1 – No new untreated discharges.
- Standard 2 - Peak Rate Attenuation.
- Standard 3 - Recharge
- Standard 4 - Required Water Quality Volume.
- Standard 5 – 6: Computations used to demonstrate compliance with Standard 4.
- Standard 7: Computations demonstrating that peak rate attenuation, recharge, and water quality treatment is provided to maximum extent practicable
- Standard 8: Computations related to sizing of erosion and sediment controls
- Standard 9: Operation And Maintenance Plan
- Standard 10: Illicit Discharges to Drainage System

STANDARD 1. NO UNTREATED DISCHARGES

There are no new untreated discharges. Roof runoff is directed to infiltration system located in the basement.

STANDARD 2. PEAK RATE ATTENUATION

As per DEP regulations, the stormwater analysis was developed for the 2-, 10-, and 100-year, 24-hour storm events. As noted above, there is no increase in the rate of runoff for any event. See HydroCad reports.

STANDARD 3. RECHARGE

The proposed on-site subsurface infiltration systems will increase recharge to groundwater.

Existing Soils Evaluation

Soil conditions from the Geotechnical report indicate a sandy loam soil.

NRCS HYDROLOGIC SOIL TYPE	APPROX. SOIL TEXTURE	TARGET DEPTH FACTOR (F)
A	sand	0.6-inch
B	loam	0.35-inch

Recharge Target Depth by Hydrologic Soil Group

Rawls Rates

Texture Class	NRCS Hydrologic Soil Group (HSG)	Infiltration Rate Inches/Hour
Sand	A	8.27
Loamy Sand	A	2.41
Sandy Loam	B	1.02
Loam	B	0.52
Silt Loam	C	0.27
Sandy Clay Loam	C	0.17
Clay Loam	D	0.09
Silty Clay Loam	D	0.06
Sandy Clay	D	0.05
Silty Clay	D	0.04
Clay	D	0.02

Required Recharge Volume

Using the recharge requirements established by the DEP, the following calculations are provided:

$$Rv = F \times \text{impervious area}$$

Rv = Required Recharge Volume, expressed in Ft³, cubic yards, or acre-feet

F = Target Depth Factor associated with each Hydrologic Soil Group

Impervious Area = pavement area on site

This site: $Rv = 0.35 * 8350 \text{ sf} / 12 = 243.5 \text{ CF}$ Required Recharge

The DEP stormwater requirements include an analysis as to any negative impacts on where the recharge volume is directed. The recharge on this site, as an infiltration BMP measure, will not alter or cause changes to the hydrologic regime.

Proposed Recharge Volume

To comply with MassDEP, without taking into account the existing impervious area, the site requires a total recharge volume of 243.5 cubic feet. The proposed on-site infiltration system exceeds this volume as it provides approximately 715 cubic feet (see HydroCad calculations). The site complies with the regulations relative to recharge to groundwater.

Drawdown within 72 hours

DEP Stormwater Handbook requires an analysis to show that the *Required Recharge Volume* will drain down in less than 72 hours in order to provide infiltration volume for subsequent rainfall events. To determine the ability to drawdown within 72 hours, we are using an infiltration rate of 1.02 in/hr (Rawls Rates), the storage volume, the bottom area and the “Static” method formula:

$$\begin{aligned} \text{Time}_{\text{drawdown}} &= \frac{Rv}{(K)(\text{Bottom Area})} \\ &= 243.5 / (1.02 \text{ in/hr}) (1 \text{ ft} / 12 \text{ in}) (100' \times 10') = 2.86 \text{ hrs} \end{aligned}$$

Where:

Rv = Storage Volume

K = Saturated Hydraulic Conductivity For “Static” and “Simple Dynamic” Methods, use Rawls Rate (see Table 2.3.3).

Bottom Area = Bottom Area of Recharge Structure

The system will drain down in less than the required 72 hour maximum.

STANDARD 4. WATER QUALITY

The stormwater management design for this site complies with the required 80 percent total suspended solids (TSS) removal as the first inch of runoff is treated and infiltrated. All runoff from this site is roof runoff and considered clean.

STANDARD 5. LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS

This site is not a LUHPPL. The site usage is proposed to change from an automotive services to residential use. Additionally, the impacted soil will be removed. These two changes will result in a lower potential pollution load.

STANDARD 6. CRITICAL AREAS

The project site is not located within a Zone II or Interim Wellhead Protection area of a public water supply or any other critical area.

STANDARD 7. REDEVELOPMENT

This project is considered a redevelopment.

STANDARD 8. CONSTRUCTION PERIOD CONTROLS

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan will be implemented generally as follows.

Narrative: Multiple erosion and sedimentation control devices will be implemented to prevent erosion during and after construction. The following erosion and sediment controls will be installed for this project:

- Initially, an erosion control will be installed at the limit of work along the down gradient site borders.
- Construction entrance apron pads may be constructed at the main site access to prevent the tracking of sediment on vehicle tires from transport onto adjacent streets if this becomes an issue or problem.
- There are no, cut and fill slopes on site, so erosion is unlikely.

Construction Period Operation and Maintenance Plan: The O & M Plan provided will be modified accordingly and used during construction period.

Names of Persons or Entity Responsible for Plan Compliance: As part of the Submittal Process, the General Contractor shall submit the names of responsible parties.

Construction Period Pollution Prevention Measures: Erosion control measures as shown on the plan and/or as are standard practice shall be installed accordingly. Best Management Practices shall be implemented such as the locations for vehicle maintenance and refueling, storage of supplies, and refuse disposal.

Drawings and specifications for erosion control BMPs: Contractor shall submit his plan for proposed sequencing of the work and the associated locations for diversion swales, erosion control dikes and berms, and/or temporary sedimentation basins.

Operation and Maintenance of Erosion and Sedimentation Controls: Contractor shall submit his plan for proposed sequencing of the work and the associated locations for diversion swales, erosion control dikes and berms, and temporary sedimentation basins.

STANDARD 9. OPERATION AND MAINTENANCE PLAN

A stormwater operation and maintenance plan is included in Appendix A.

STANDARD 10. PROHIBITION OF ILLICIT DISCHARGES

There are no illicit discharges proposed. An Illicit Discharge Compliance Statement will be submitted prior to the discharge of any stormwater to post-construction BMP's.

Appendix 'A'

OPERATION AND MAINTENANCE PLAN/Long Term Pollution Prevention Plan

for

151 Liverpool St., East Boston, MA

The proponent/owner is responsible for the operation and maintenance of the proposed stormwater management system as follows:

Stormwater Management System Owners: _____

Party Responsible for the O & M: owner

Schedule for Implementation: see O & M Schedule

Plan Showing the location of all Stormwater BMPs: See Site Plan Titled – Civil Site Plan,

Public Safety Features: Not Applicable.

Estimated Budget: To be determined.

Log Form: See below.

Description of proposed O & M:

After construction and site is stabilized, the site will be inspected to assure that all exposed surfaces are clean of debris and that the surrounding walkways, alleys and streets adjacent to the project are clean.

The proposed storage tank and underground infiltration system shall be inspected to determine if any excessive buildup of sediments is present. Inspections to be performed as noted in the following schedule. Removal of sediment, if required, to be performed by a maintenance company familiar with the system design.

Other site areas, including the overflow outlet, to be inspected to ensure proper function and any repairs implemented as needed and with the frequency shown in the schedule.

Accepted By: _____ Date:

Stormwater Management Operation and Maintenance Schedule

Property: _____

Date: _____

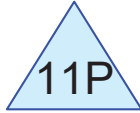
BMP	Frequency	Date Performed	Comments	Cleaning/ Repair Needed? Yes/No	Date of Cleaning/ Repair	Performed By
<u>Subsurface Infiltration System</u> Inspect for proper functioning	Once at the end of construction and then video inspected every 5 years.					
<u>Stormwater Tank</u> – located in the basement	Once at the end of construction and then inspected every year. Any debris or sediments removed					
<u>Roof Drains</u> Inspect for proper functioning	Once at the end of construction and then every spring and fall. Roof area drains must be kept clear of ice and snow.					

Appendix 'B'

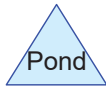
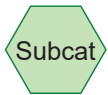
HydroCad Calculations



Ex. Roof



Street



151 Liverpool System

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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
8,720	98	roof (12S)
8,720	98	TOTAL AREA

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Type III 24-hr 2-Year Rainfall=3.10"

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Page 3

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

Subcatchment 12S: Ex. Roof

Runoff Area=8,720 sf 100.00% Impervious Runoff Depth>2.87"
Tc=5.0 min CN=98 Runoff=0.61 cfs 2,083 cf

Pond 11P: Street

Peak Elev=17.50' Storage=2,082 cf Inflow=0.61 cfs 2,083 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 8,720 sf Runoff Volume = 2,083 cf Average Runoff Depth = 2.87"
0.00% Pervious = 0 sf 100.00% Impervious = 8,720 sf

151 Liverpool System

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Type III 24-hr 2-Year Rainfall=3.10"

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Summary for Subcatchment 12S: Ex. Roof

Runoff = 0.61 cfs @ 12.07 hrs, Volume= 2,083 cf, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.10"

Area (sf)	CN	Description
* 8,720	98	roof
8,720		100.00% Impervious Area

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

Summary for Pond 11P: Street

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 2.87" for 2-Year event

Inflow = 0.61 cfs @ 12.07 hrs, Volume= 2,083 cf

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

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

Peak Elev= 17.50' @ 24.00 hrs Surf.Area= 1,000,000 sf Storage= 2,082 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	500,000 cf	1,000.00'W x 1,000.00'L x 0.50'H Street & Municipal drain

151 Liverpool System

Type III 24-hr 10-Year Rainfall=4.50"

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

Subcatchment 12S: Ex. Roof

Runoff Area=8,720 sf 100.00% Impervious Runoff Depth>4.26"
Tc=5.0 min CN=98 Runoff=0.89 cfs 3,097 cf

Pond 11P: Street

Peak Elev=17.50' Storage=3,096 cf Inflow=0.89 cfs 3,097 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 8,720 sf Runoff Volume = 3,097 cf Average Runoff Depth = 4.26"
0.00% Pervious = 0 sf 100.00% Impervious = 8,720 sf

151 Liverpool System

Type III 24-hr 10-Year Rainfall=4.50"

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Summary for Subcatchment 12S: Ex. Roof

Runoff = 0.89 cfs @ 12.07 hrs, Volume= 3,097 cf, Depth> 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
* 8,720	98	roof
8,720		100.00% Impervious Area

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

Summary for Pond 11P: Street

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 4.26" for 10-Year event

Inflow = 0.89 cfs @ 12.07 hrs, Volume= 3,097 cf

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

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

Peak Elev= 17.50' @ 24.00 hrs Surf.Area= 1,000,000 sf Storage= 3,096 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	500,000 cf	1,000.00'W x 1,000.00'L x 0.50'H Street & Municipal drain

151 Liverpool System

Type III 24-hr 50-Year Rainfall=5.90"

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

Subcatchment 12S: Ex. Roof

Runoff Area=8,720 sf 100.00% Impervious Runoff Depth>5.66"
Tc=5.0 min CN=98 Runoff=1.16 cfs 4,112 cf

Pond 11P: Street

Peak Elev=17.50' Storage=4,112 cf Inflow=1.16 cfs 4,112 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 8,720 sf Runoff Volume = 4,112 cf Average Runoff Depth = 5.66"
0.00% Pervious = 0 sf 100.00% Impervious = 8,720 sf

151 Liverpool System

Type III 24-hr 50-Year Rainfall=5.90"

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Summary for Subcatchment 12S: Ex. Roof

Runoff = 1.16 cfs @ 12.07 hrs, Volume= 4,112 cf, Depth> 5.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=5.90"

Area (sf)	CN	Description
* 8,720	98	roof
8,720		100.00% Impervious Area

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

Summary for Pond 11P: Street

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 5.66" for 50-Year event

Inflow = 1.16 cfs @ 12.07 hrs, Volume= 4,112 cf

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

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

Peak Elev= 17.50' @ 24.00 hrs Surf.Area= 1,000,000 sf Storage= 4,112 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	500,000 cf	1,000.00'W x 1,000.00'L x 0.50'H Street & Municipal drain

151 Liverpool System

Type III 24-hr 100-Year Rainfall=6.50"

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

Subcatchment 12S: Ex. Roof

Runoff Area=8,720 sf 100.00% Impervious Runoff Depth>6.26"
Tc=5.0 min CN=98 Runoff=1.28 cfs 4,548 cf

Pond 11P: Street

Peak Elev=17.50' Storage=4,547 cf Inflow=1.28 cfs 4,548 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 8,720 sf Runoff Volume = 4,548 cf Average Runoff Depth = 6.26"
0.00% Pervious = 0 sf 100.00% Impervious = 8,720 sf

151 Liverpool System

Type III 24-hr 100-Year Rainfall=6.50"

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Summary for Subcatchment 12S: Ex. Roof

Runoff = 1.28 cfs @ 12.07 hrs, Volume= 4,548 cf, Depth> 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
* 8,720	98	roof
8,720		100.00% Impervious Area

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

Summary for Pond 11P: Street

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 6.26" for 100-Year event

Inflow = 1.28 cfs @ 12.07 hrs, Volume= 4,548 cf

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

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

Peak Elev= 17.50' @ 24.00 hrs Surf.Area= 1,000,000 sf Storage= 4,547 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	500,000 cf	1,000.00'W x 1,000.00'L x 0.50'H Street & Municipal drain



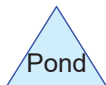
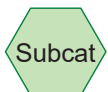
Prop Roof



Tank in Basement



Municipal Drain



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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
8,720	98	roof (13S)
8,720	98	TOTAL AREA

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Type III 24-hr 2-Year Rainfall=3.10"

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

Subcatchment 13S: Prop Roof

Runoff Area=8,720 sf 100.00% Impervious Runoff Depth>2.87"
Tc=5.0 min CN=98 Runoff=0.61 cfs 2,083 cf

Pond 14P: Tank in Basement

Peak Elev=14.03' Storage=719 cf Inflow=0.61 cfs 2,083 cf
8.0" Round Culvert n=0.010 L=25.0' S=0.2720 '/' Outflow=0.59 cfs 1,428 cf

Pond 16P: Municipal Drain

Peak Elev=6.70' Storage=1,427 cf Inflow=0.59 cfs 1,428 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 8,720 sf Runoff Volume = 2,083 cf Average Runoff Depth = 2.87"
0.00% Pervious = 0 sf 100.00% Impervious = 8,720 sf

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Type III 24-hr 2-Year Rainfall=3.10"

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Summary for Subcatchment 13S: Prop Roof

Runoff = 0.61 cfs @ 12.07 hrs, Volume= 2,083 cf, Depth > 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.10"

Area (sf)	CN	Description
* 8,720	98	roof
8,720		100.00% Impervious Area

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

Summary for Pond 14P: Tank in Basement

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 2.87" for 2-Year event
 Inflow = 0.61 cfs @ 12.07 hrs, Volume= 2,083 cf
 Outflow = 0.59 cfs @ 12.10 hrs, Volume= 1,428 cf, Atten= 3%, Lag= 1.5 min
 Primary = 0.59 cfs @ 12.10 hrs, Volume= 1,428 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 14.03' @ 12.10 hrs Surf.Area= 130 sf Storage= 719 cf

Plug-Flow detention time= 177.7 min calculated for 1,425 cf (68% of inflow)
Center-of-Mass det. time= 83.8 min (839.6 - 755.8)

Volume	Invert	Avail.Storage	Storage Description
#1	8.50'	910 cf	10.00'W x 13.00'L x 7.00'H Tank in Basement

Device	Routing	Invert	Outlet Devices
#1	Primary	13.50'	8.0" Round Culvert L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.50' / 6.70' S= 0.2720 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.58 cfs @ 12.10 hrs HW=14.03' (Free Discharge)
↑**1=Culvert** (Inlet Controls 0.58 cfs @ 1.96 fps)

Summary for Pond 16P: Municipal Drain

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 1.96" for 2-Year event
 Inflow = 0.59 cfs @ 12.10 hrs, Volume= 1,428 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.70' @ 24.00 hrs Surf.Area= 1,000,000 sf Storage= 1,427 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

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Type III 24-hr 2-Year Rainfall=3.10"

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Volume	Invert	Avail.Storage	Storage Description
#1	6.70'	1,000,000 cf	1,000.00'W x 1,000.00'L x 1.00'H Street & Municipal drain

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Type III 24-hr 10-Year Rainfall=4.50"

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

Subcatchment 13S: Prop Roof

Runoff Area=8,720 sf 100.00% Impervious Runoff Depth>4.26"
Tc=5.0 min CN=98 Runoff=0.89 cfs 3,097 cf

Pond 14P: Tank in Basement

Peak Elev=14.23' Storage=745 cf Inflow=0.89 cfs 3,097 cf
8.0" Round Culvert n=0.010 L=25.0' S=0.2720 '/' Outflow=0.84 cfs 2,441 cf

Pond 16P: Municipal Drain

Peak Elev=6.70' Storage=2,440 cf Inflow=0.84 cfs 2,441 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 8,720 sf Runoff Volume = 3,097 cf Average Runoff Depth = 4.26"
0.00% Pervious = 0 sf 100.00% Impervious = 8,720 sf

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Type III 24-hr 10-Year Rainfall=4.50"

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Summary for Subcatchment 13S: Prop Roof

Runoff = 0.89 cfs @ 12.07 hrs, Volume= 3,097 cf, Depth> 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.50"

Area (sf)	CN	Description
* 8,720	98	roof
8,720		100.00% Impervious Area

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

Summary for Pond 14P: Tank in Basement

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 4.26" for 10-Year event
 Inflow = 0.89 cfs @ 12.07 hrs, Volume= 3,097 cf
 Outflow = 0.84 cfs @ 12.10 hrs, Volume= 2,441 cf, Atten= 6%, Lag= 1.8 min
 Primary = 0.84 cfs @ 12.10 hrs, Volume= 2,441 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 14.23' @ 12.10 hrs Surf.Area= 130 sf Storage= 745 cf

Plug-Flow detention time= 147.1 min calculated for 2,436 cf (79% of inflow)
Center-of-Mass det. time= 69.5 min (818.0 - 748.6)

Volume	Invert	Avail.Storage	Storage Description
#1	8.50'	910 cf	10.00'W x 13.00'L x 7.00'H Tank in Basement

Device	Routing	Invert	Outlet Devices
#1	Primary	13.50'	8.0" Round Culvert L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.50' / 6.70' S= 0.2720 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.84 cfs @ 12.10 hrs HW=14.23' (Free Discharge)
↑**1=Culvert** (Inlet Controls 0.84 cfs @ 2.40 fps)

Summary for Pond 16P: Municipal Drain

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 3.36" for 10-Year event
 Inflow = 0.84 cfs @ 12.10 hrs, Volume= 2,441 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.70' @ 24.00 hrs Surf.Area= 1,000,000 sf Storage= 2,440 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

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Type III 24-hr 10-Year Rainfall=4.50"

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Volume	Invert	Avail.Storage	Storage Description
#1	6.70'	1,000,000 cf	1,000.00'W x 1,000.00'L x 1.00'H Street & Municipal drain

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Type III 24-hr 50-Year Rainfall=5.90"

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

Subcatchment 13S: Prop Roof

Runoff Area=8,720 sf 100.00% Impervious Runoff Depth>5.66"
Tc=5.0 min CN=98 Runoff=1.16 cfs 4,112 cf

Pond 14P: Tank in Basement

Peak Elev=14.49' Storage=779 cf Inflow=1.16 cfs 4,112 cf
8.0" Round Culvert n=0.010 L=25.0' S=0.2720 '/' Outflow=1.08 cfs 3,455 cf

Pond 16P: Municipal Drain

Peak Elev=6.70' Storage=3,455 cf Inflow=1.08 cfs 3,455 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 8,720 sf Runoff Volume = 4,112 cf Average Runoff Depth = 5.66"
0.00% Pervious = 0 sf 100.00% Impervious = 8,720 sf

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Type III 24-hr 50-Year Rainfall=5.90"

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Summary for Subcatchment 13S: Prop Roof

Runoff = 1.16 cfs @ 12.07 hrs, Volume= 4,112 cf, Depth> 5.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=5.90"

Area (sf)	CN	Description
* 8,720	98	roof
8,720		100.00% Impervious Area

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

Summary for Pond 14P: Tank in Basement

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 5.66" for 50-Year event
 Inflow = 1.16 cfs @ 12.07 hrs, Volume= 4,112 cf
 Outflow = 1.08 cfs @ 12.11 hrs, Volume= 3,455 cf, Atten= 8%, Lag= 2.1 min
 Primary = 1.08 cfs @ 12.11 hrs, Volume= 3,455 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 14.49' @ 12.11 hrs Surf.Area= 130 sf Storage= 779 cf

Plug-Flow detention time= 127.9 min calculated for 3,455 cf (84% of inflow)
Center-of-Mass det. time= 60.8 min (804.9 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1	8.50'	910 cf	10.00'W x 13.00'L x 7.00'H Tank in Basement

Device	Routing	Invert	Outlet Devices
#1	Primary	13.50'	8.0" Round Culvert L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.50' / 6.70' S= 0.2720 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.06 cfs @ 12.11 hrs HW=14.48' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.06 cfs @ 3.05 fps)

Summary for Pond 16P: Municipal Drain

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 4.76" for 50-Year event
 Inflow = 1.08 cfs @ 12.11 hrs, Volume= 3,455 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.70' @ 24.00 hrs Surf.Area= 1,000,000 sf Storage= 3,455 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

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Type III 24-hr 50-Year Rainfall=5.90"

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Volume	Invert	Avail.Storage	Storage Description
#1	6.70'	1,000,000 cf	1,000.00'W x 1,000.00'L x 1.00'H Street & Municipal drain

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Type III 24-hr 100-Year Rainfall=6.50"

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

Subcatchment 13S: Prop Roof

Runoff Area=8,720 sf 100.00% Impervious Runoff Depth>6.26"
Tc=5.0 min CN=98 Runoff=1.28 cfs 4,548 cf

Pond 14P: Tank in Basement

Peak Elev=14.62' Storage=795 cf Inflow=1.28 cfs 4,548 cf
8.0" Round Culvert n=0.010 L=25.0' S=0.2720 '/' Outflow=1.17 cfs 3,890 cf

Pond 16P: Municipal Drain

Peak Elev=6.70' Storage=3,889 cf Inflow=1.17 cfs 3,890 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 8,720 sf Runoff Volume = 4,548 cf Average Runoff Depth = 6.26"
0.00% Pervious = 0 sf 100.00% Impervious = 8,720 sf

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Type III 24-hr 100-Year Rainfall=6.50"

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Summary for Subcatchment 13S: Prop Roof

Runoff = 1.28 cfs @ 12.07 hrs, Volume= 4,548 cf, Depth> 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
* 8,720	98	roof
8,720		100.00% Impervious Area

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

Summary for Pond 14P: Tank in Basement

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 6.26" for 100-Year event
 Inflow = 1.28 cfs @ 12.07 hrs, Volume= 4,548 cf
 Outflow = 1.17 cfs @ 12.11 hrs, Volume= 3,890 cf, Atten= 9%, Lag= 2.2 min
 Primary = 1.17 cfs @ 12.11 hrs, Volume= 3,890 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 14.62' @ 12.11 hrs Surf.Area= 130 sf Storage= 795 cf

Plug-Flow detention time= 120.2 min calculated for 3,882 cf (85% of inflow)
Center-of-Mass det. time= 57.8 min (800.5 - 742.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.50'	910 cf	10.00'W x 13.00'L x 7.00'H Tank in Basement

Device	Routing	Invert	Outlet Devices
#1	Primary	13.50'	8.0" Round Culvert L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 13.50' / 6.70' S= 0.2720 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.16 cfs @ 12.11 hrs HW=14.60' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.16 cfs @ 3.32 fps)

Summary for Pond 16P: Municipal Drain

Inflow Area = 8,720 sf, 100.00% Impervious, Inflow Depth > 5.35" for 100-Year event
 Inflow = 1.17 cfs @ 12.11 hrs, Volume= 3,890 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 6.70' @ 24.00 hrs Surf.Area= 1,000,000 sf Storage= 3,889 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

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Type III 24-hr 100-Year Rainfall=6.50"

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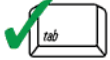
Volume	Invert	Avail.Storage	Storage Description
#1	6.70'	1,000,000 cf	1,000.00'W x 1,000.00'L x 1.00'H Street & Municipal drain



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 8²
- Operation and Maintenance Plan required by Standard 9

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

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

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

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

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



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

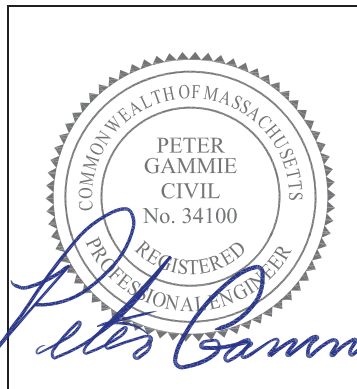
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



Peter Gammie, P.E. #34100, 8-24-2018

Signature and Date

Checklist

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

- New development
- Redevelopment
- Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - Static
 - Simple Dynamic
 - Dynamic Field¹
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - Site is comprised solely of C and D soils and/or bedrock at the land surface
 - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - Solid Waste Landfill pursuant to 310 CMR 19.000
 - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

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

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - is within the Zone II or Interim Wellhead Protection Area
 - is near or to other critical areas
 - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - involves runoff from land uses with higher potential pollutant loads.
 - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
 - The ½" or 1" Water Quality Volume or
 - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

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

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

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

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - Limited Project
 - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - Bike Path and/or Foot Path
 - Redevelopment Project
 - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

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

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

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

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

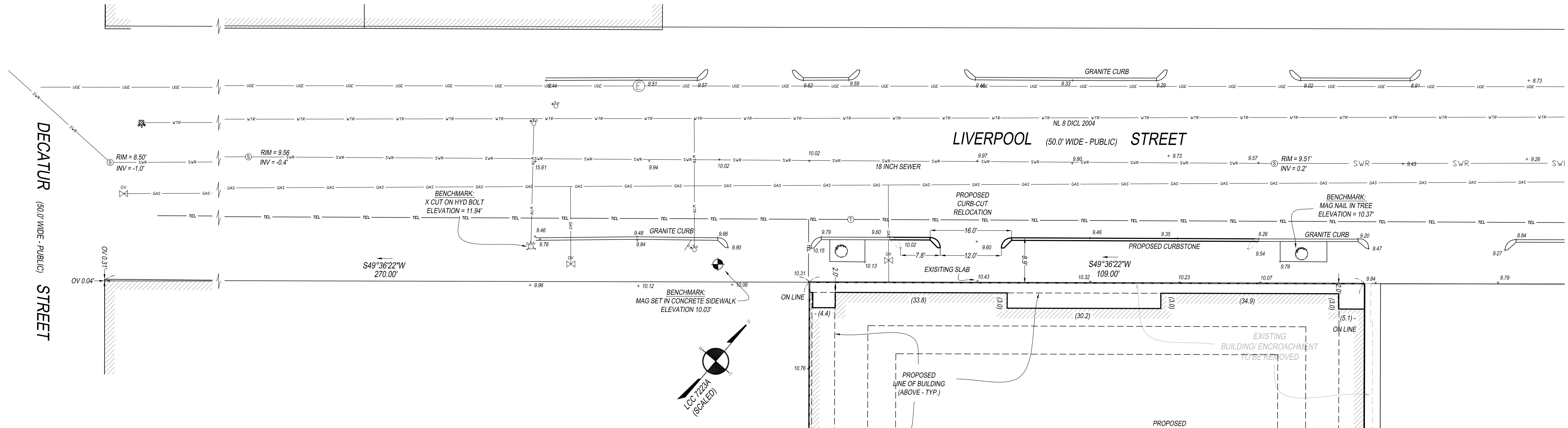
- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance tasks;
 - Plan showing the location of all stormwater BMPs maintenance access areas;
 - Description and delineation of public safety features;
 - Estimated operation and maintenance budget; and
 - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.



I CERTIFY THAT THIS PLAN WAS MADE FROM AN INSTRUMENT SURVEY ON THE GROUND BETWEEN ON THE DATES OF JUNE 21 & 22, 2012 AND ALL STRUCTURES ARE LOCATED AS SHOWN HEREON.

I HEREBY CERTIFY THAT THE PROPERTY LINES SHOWN ARE LINES DIVIDING EXISTING OWNERSHIP AND THE LINES OF STREETS AND WAYS ALREADY ESTABLISHED AND THAT NO NEW LINES FOR THE DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.

ABUTTERS' NAMES REFER TO CURRENT CITY OF BOSTON ASSESSOR'S RECORDS AND/OR CURRENT RECORDS AVAILABLE AT THE REGISTRY OF DEEDS.

THE ELEVATIONS SHOWN ON THIS PLAN ARE RELATIVE TO NORTH AMERICAN VERTICAL DATUM (N.A.V.D. 88) AND WERE DETERMINED FROM A GPS OBSERVATION.

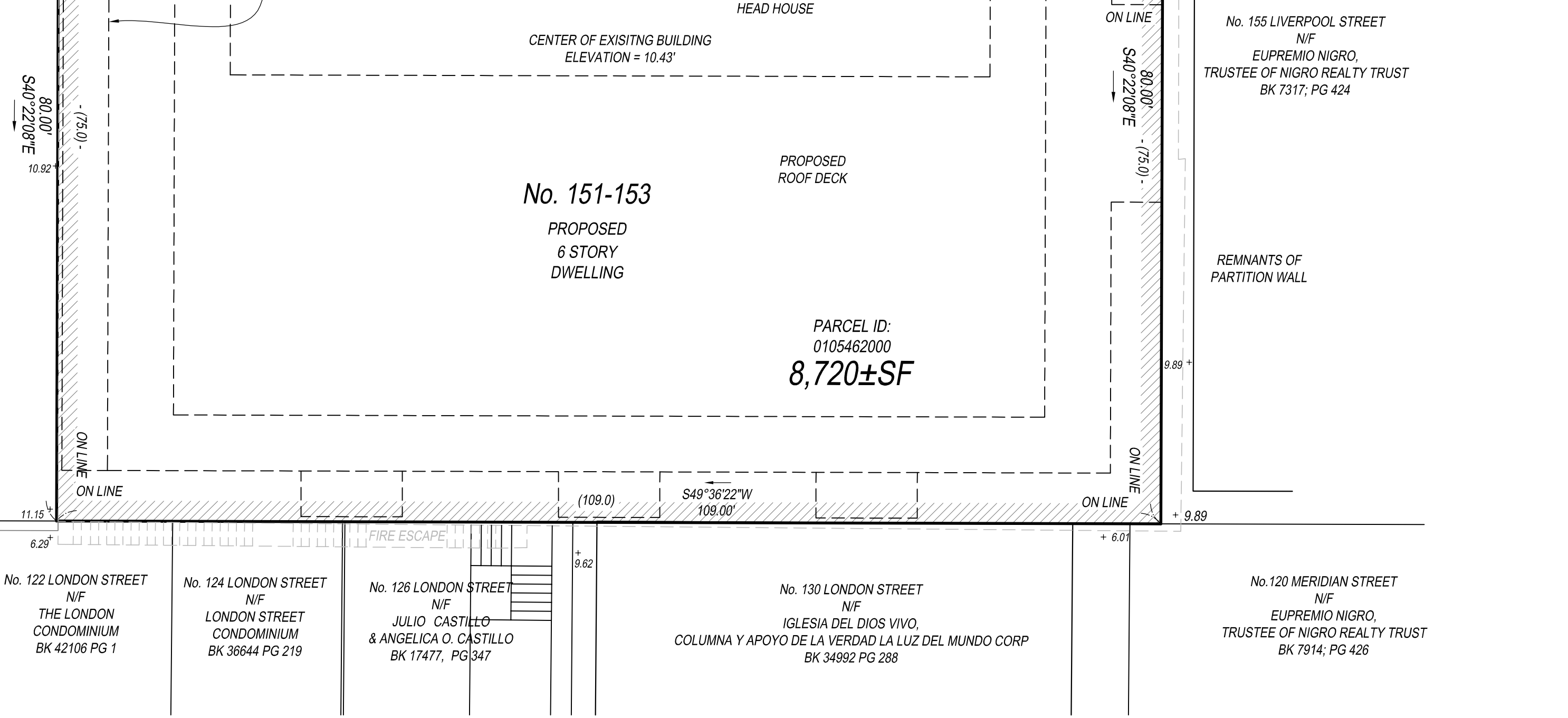
- BENCHMARK**
- 1) X CUT ON HYDRANT BOLT; ELEVATION = 11.34'
 - 2) MAG SET IN CONCRETE SIDE WALK; ELEVATION = 10.03'
 - 3) MAG SET IN TREE; ELEVATION = 10.37'

UNDERGROUND UTILITIES ARE BASED UPON AN ACTUAL FIELD SURVEY AND INFORMATION OF RECORD. IT IS NOT WARRANTED THAT THEY ARE EXACTLY LOCATED, NOR THAT ALL UNDERGROUND CONDUITS OR OTHER STRUCTURES ARE SHOWN ON THIS PLAN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY DIG SAFE PRIOR TO ANY EXCAVATIONS.

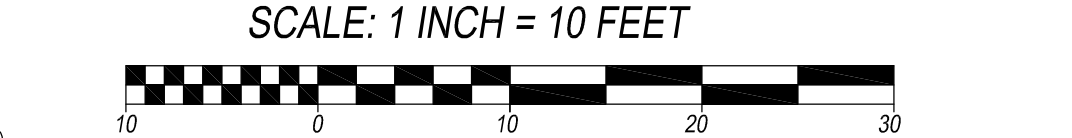
ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (F.E.M.A.) MAPS, THE MAJOR IMPROVEMENTS ON THIS PROPERTY FALL IN AN AREA DESIGNATED AS
 ZONE: X
 COMMUNITY PANEL: 25025C0081J
 EFFECTIVE DATE: MARCH 16, 2016

- LEGEND:**
- ⊗ BWSC HANDHOLE
 - ⊠ CATCH BASIN
 - ⊙ DRAIN MANHOLE
 - ⊕ ELECTRIC MANHOLE
 - ⊞ ELECTRIC HANDHOLE
 - ⊗ GAS GATE
 - ⊕ HYDRANT
 - ⊙ LIGHT POLE
 - ⊕ SEWER MANHOLE
 - ⊙ UTILITY POLE
 - ⊞ WATER GATE
 - BB BOTTOM BELL
 - DH DRILL HOLE
 - FND FOUND
 - I INVERT
 - M MAPLE
 - O OAK
 - R RIM
 - SB STONE BOUND
 - VGC VERTICAL GRANITE CURB

No. 111-123 LIVERPOOL STREET
 N/F
 BRUCE SHULMAN
 TRUSTEE OF THE BOSTON INDUSTRIAL
 GROUP REALTY TRUST
 BK 33702, PG 128



DRAFTSMAN: JJH	REVIEWED BY: GCC
SITE PLAN	09/22/14
ADDED UTILITIES & TOPO	10/01/14
PROPOSED CONDITIONS	12/09/14
PROPOSED CONDITIONS; SCHEME 2	12/09/14
PROPOSED CONDITIONS; SCHEME 3	11/16/16
REVISE DATUM	08/24/18



REFERENCES:
 DEED: BK 55798; PG 307
 PLAN: BK 443 ; PG END
 LCC 7223-A

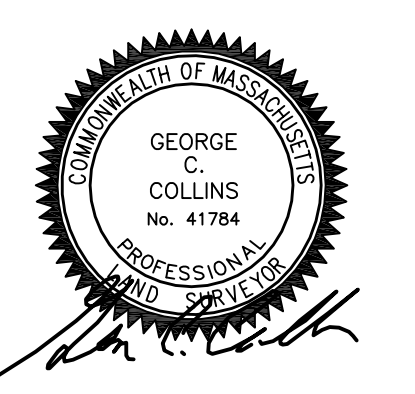
CITY OF BOSTON
 FB 723; PGS 108-111
 FB 822; PGS 108-111
 FB 794; PGS 40-41
 FB 528; PGS 114-115, 126-127

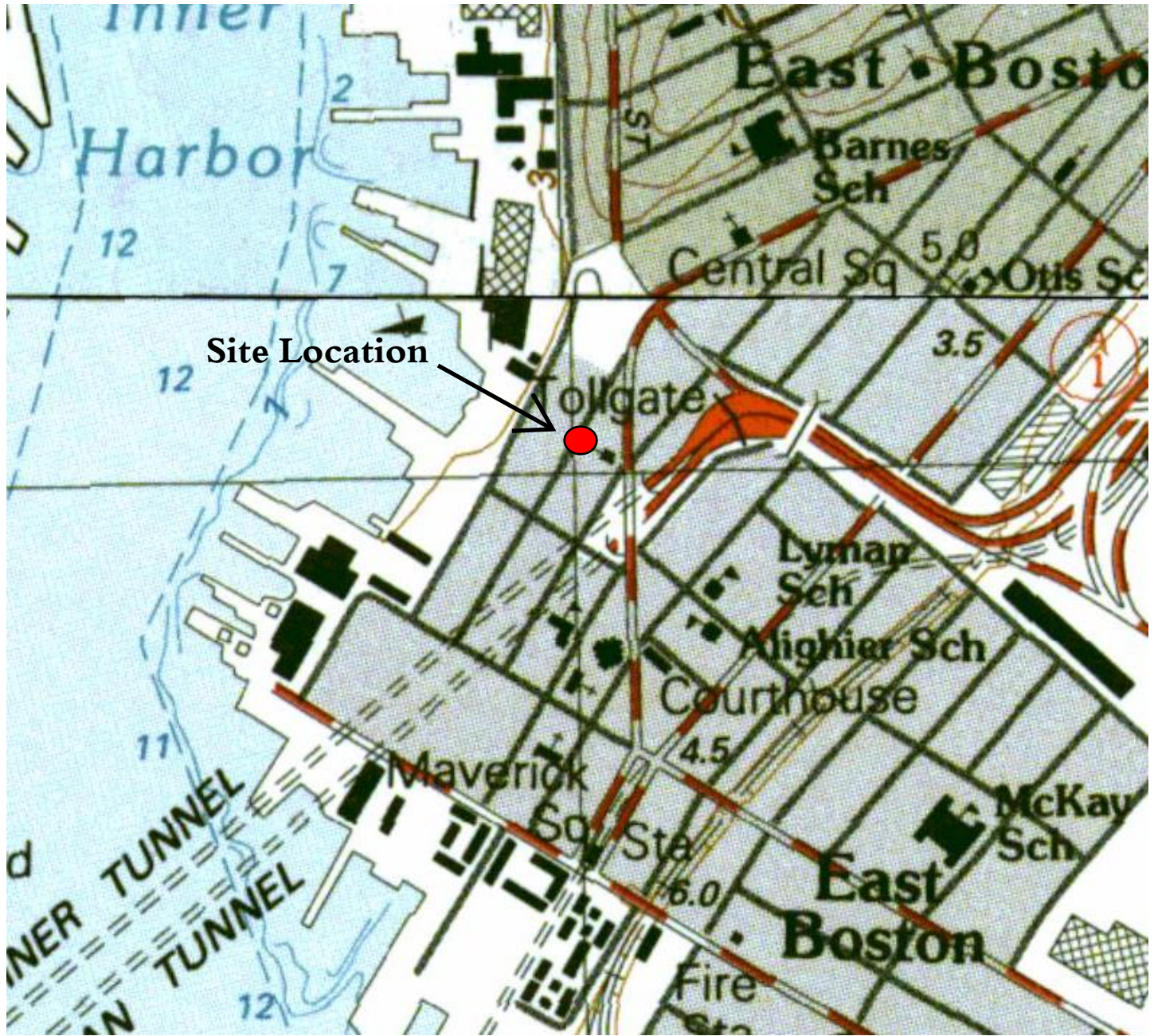
SITE PLAN OF LAND

LOCATED AT
 151 LIVERPOOL STREET
 EAST BOSTON, MA

PREPARED FOR:
 CITY POINT LIVERPOOL, LLC
 1 GATEWAY CENTER, SUITE 613
 NEWTON, MA 02458

BOSTON SURVEY, INC.
 UNIT C-4 SHIPWAYS PLACE
 CHARLESTOWN, MA. 02129
 (617) 242-1313
 www.bostonsurveyinc.com





DRAWING NOT TO SCALE

Site Locus Map

N↑



Edge Environmental
 Consulting and Engineering
 PO Box 5262
 Manchester, NH 03108
 603-717-8808

Client: City Point Liverpool LLC

Project: 151-153 Liverpool St.
 Boston, Massachusetts

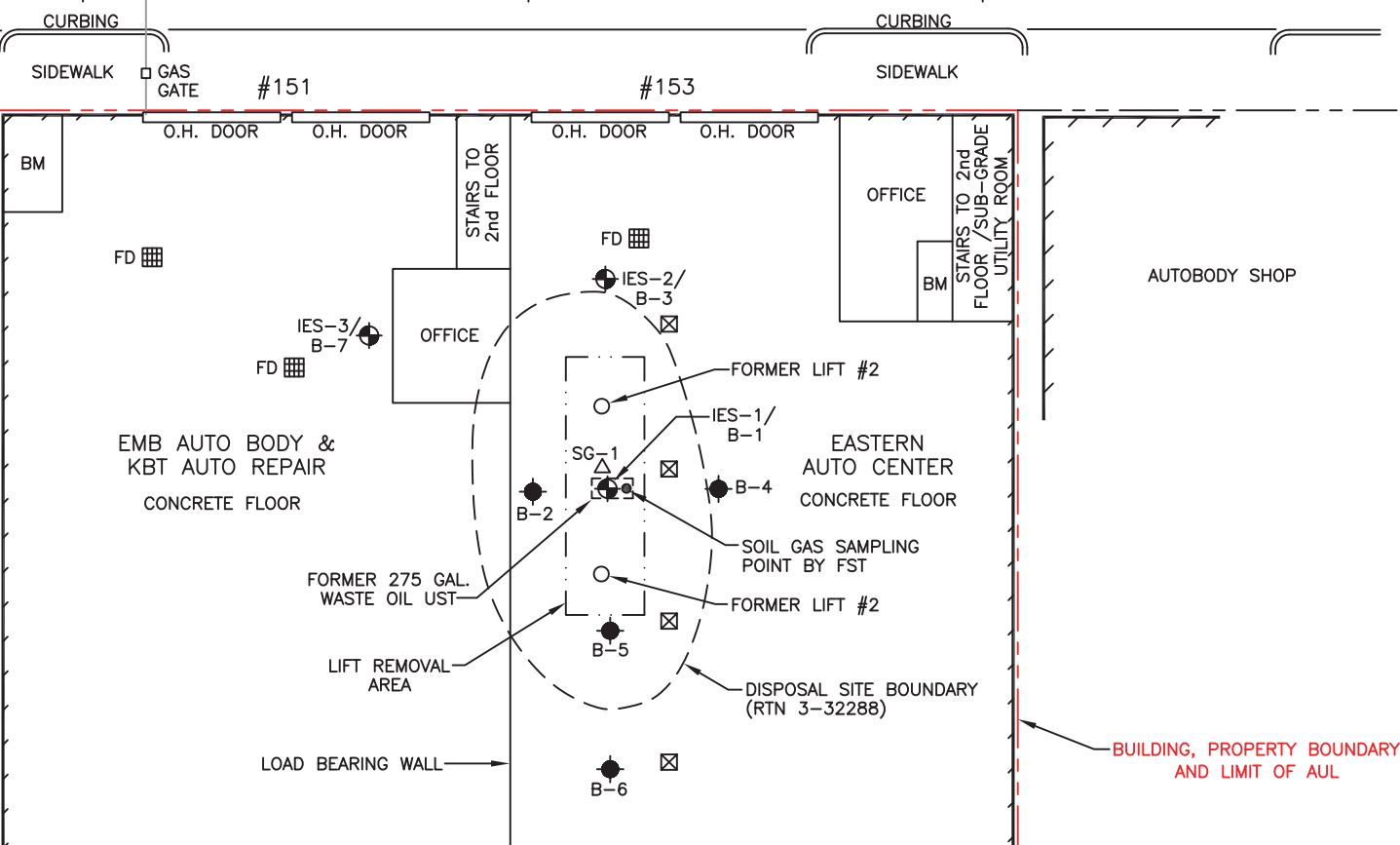
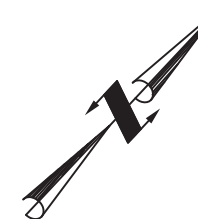
Project Number: 2015.24

Figure No. 1

COMMERCIAL



LIVERPOOL STREET



NOTE: The purpose of this plan is to depict environmental response actions as planned by LSP Eric M. Johnson, #5723. Response actions include: The excavation of oil impacted soil and backfilling that area. Soil to be managed per 310 CMR 40.0034 (Bill of Lading Process) and 0.0440 (Release Abatement Measures).

KEY

- FD - FLOOR DRAIN
- UE— - UNDERGROUND ELECTRIC
- W— - WATER LINE
- S— - SEWER LINE
- G— - GAS LINE
- UT— - UNDERGROUND TELEPHONE
- IES-3/B-7 - MONITORING WELL
- B-6 - SOIL BORING
- SG-1 - SOIL SAMPLE BY IES
- - SOIL GAS SAMPLING POINT BY FST
- ⊠ - LOAD BEARING POST
- RES -- RESIDENTIAL

PAVED PARKING AREA

RES

RES

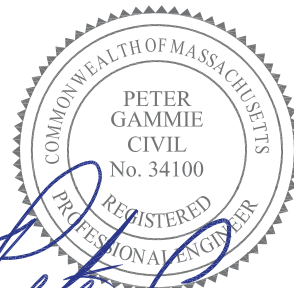
RES

RES

CHURCH

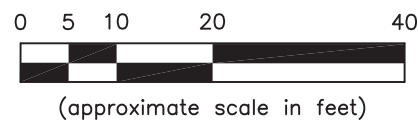
COMERCIAL / RES

- NOTES: - ALL UTILITY LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
 - PLAN BASED ON SEPTEMBER 2014 PLAN BY BOSTON SURVEY, INC. AND OCTOBER 2014 PLAN BY FAY, SPOFFORD & THORNDIKE, INC. AND PROPERTY MEASUREMENTS AND FIELD OBSERVATIONS BY EDGE ENVIRONMENTAL, LLC.



P.E. Certification does not pertain to Environmental Response Action Plan

SCALE



JOB NO. 2015.24

DATE: 8/24/18

SCALE: AS SHOWN

DWG. BY: H.C.

CHK'D BY: E.J.

FIGURE 2
DISPOSAL SITE PLAN

151-153 LIVERPOOL STREET
EAST BOSTON, MASSACHUSETTS

EDGE ENVIRONMENTAL LLC
Environmental Consultants and Engineers
PO Box 5262 Manchester, NH
(603) 717-8808

COMMERCIAL

LIVERPOOL STREET

STOCKPILE FROM SELECTIVE EXCAVATION, PILE ON AND COVER WITH POLY SHEETING.

SELECTIVE EXCAVATION OF SOIL FROM 6 TO 9' BELOW GRADE.

EXCAVATION ORDER:

- 1. STRIP FIRST 6 FEET OF OVERBURDEN; AREA = 25' x 35'.
- 2. SELECTIVE EXCAVATION 6' - 9' BELOWGRADE OVER AN AREA 15'x 25' x 3'.

WATTLING INSTALLATION: SET WATTLING END TO END ALONG THE PEREMETER OF THE PROPRETY LINE FROM WALL TO WALL. STAKE EACH END AND EVERY 5 FEET.

NOTE: The Purpose of this plan is to depict environmental response actions as planned by LSP Eric M. Johnson, #5723. Response actions include: the excavation of oil impacted soil and backfilling that area. Soil to be managed per 310 CMR 40.0034 (Bill of Lading Process) and 40.0440 (Release Abatement Measures).

[10.31']
{10.31'}

[9.84']
{9.84'}

Elevation at Center of Existing Building: 10.43'
Proposed Elevation 10.43'

PAVED PARKING AREA

AUTOBODY SHOP

OVER-BURDEN SOIL STOCK-PILE

Note: All excavated materials to be used as backfill. Clean gravel to be imported for additional backfill to original grades.

FORMER 275 GAL WASTE OIL UST

DISPOSAL SITE BOUNDARY (RTN 3-32288)

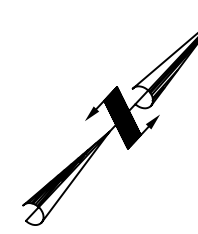
STRIP FIRST 6 FEET OF OVERBURDEN

BUILDING, PROPERTY BOUNDARY AND LIMIT OF AUL

[11.15']
{11.15'}

[9.89']
{9.89'}

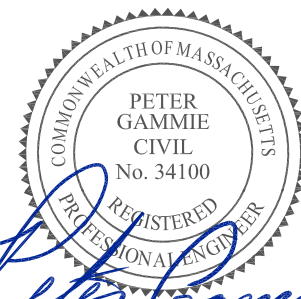
RESIDENTIAL APARTMENT BUILDINGS



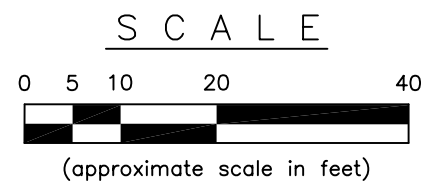
KEY

- FD [grid symbol] - FLOOR DRAIN
- UE— - UNDERGROUND ELECTRIC
- W— - WATER LINE
- S— - SEWER LINE
- G— - GAS LINE
- UT— - UNDERGROUND TELEPHONE
- IES-3/B-7 [circle with crosshair] - MONITORING WELL
- B-6 [circle with dot] - SOIL BORING
- SG-1Δ [triangle] - SOIL SAMPLE BY IES
- [circle with dot] - SOIL GAS SAMPLING POINT BY FST
- [square with cross] - LOAD BEARING POST
- [dashed line] --- STAKED 5-INCH WATTLING
- [xx.x] Pre-excavation site elevations
- {xx.x} Proposed elevations after excavation and backfill.

NOTES: - ALL UTILITY LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- PLAN BASED ON SEPTEMBER 2014 PLAN BY BOSTON SURVEY, INC. AND OCTOBER 2014 PLAN BY FAY, SPOFFORD & THORNDIKE, INC. AND PROPERTY MEASUREMENTS AND FIELD OBSERVATIONS BY EDGE ENVIRONMENTAL, LLC.



P.E. Certification does not pertain to Environmental Response Action Plan



JOB NO. 2015.24
 DATE: 8-24-18
 SCALE: AS SHOWN
 DWG. BY: H.C.
 CHK'D BY: E.J.

FIGURE 3 SOIL EXCAVATION & STORAGE PLAN

151-153 LIVERPOOL STREET EAST BOSTON, MASSACHUSETTS

EDGE ENVIRONMENTAL LLC
Environmental Consultants and Engineers
PO Box 5262 Manchester, NH
(603) 717-8808

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 9.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LMWA)**. The LMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LMWA are between this shoreline and the LMWA for areas where VE Zones are not identified will be similar to, but less severe than those in the VE Zone.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Massachusetts State Plane Meters Zone (FIPS zone 2001). The horizontal datum was NAD 83 GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, consult the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
 NOAA/NHCS12
 National Geodetic Survey
 SPM-C-3, #0202
 1215 East-West Highway
 Silver Spring, Maryland 20910-0282
 (301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (603) 733-3342, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM is derived from Massachusetts Geographic Information System (MassGIS) digital ortho-photography produced at 40 centimeter (2005) and 30 centimeter (2008) resolution. Aerial photography is dated Spring 2005 and Spring 2008.

The **profile baselines** depicted on this map represent the hydraulic modeling baseline that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date stream channel configurations and floodplain delineations than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data Tables for multiple streams in the Flood Insurance Study Report, which contain authoritative hydraulic data, may reflect stream channel distances that differ from what is shown on the map. Also, the ratio to floodplain relationships for unretained streams may differ from what is shown on previous maps.

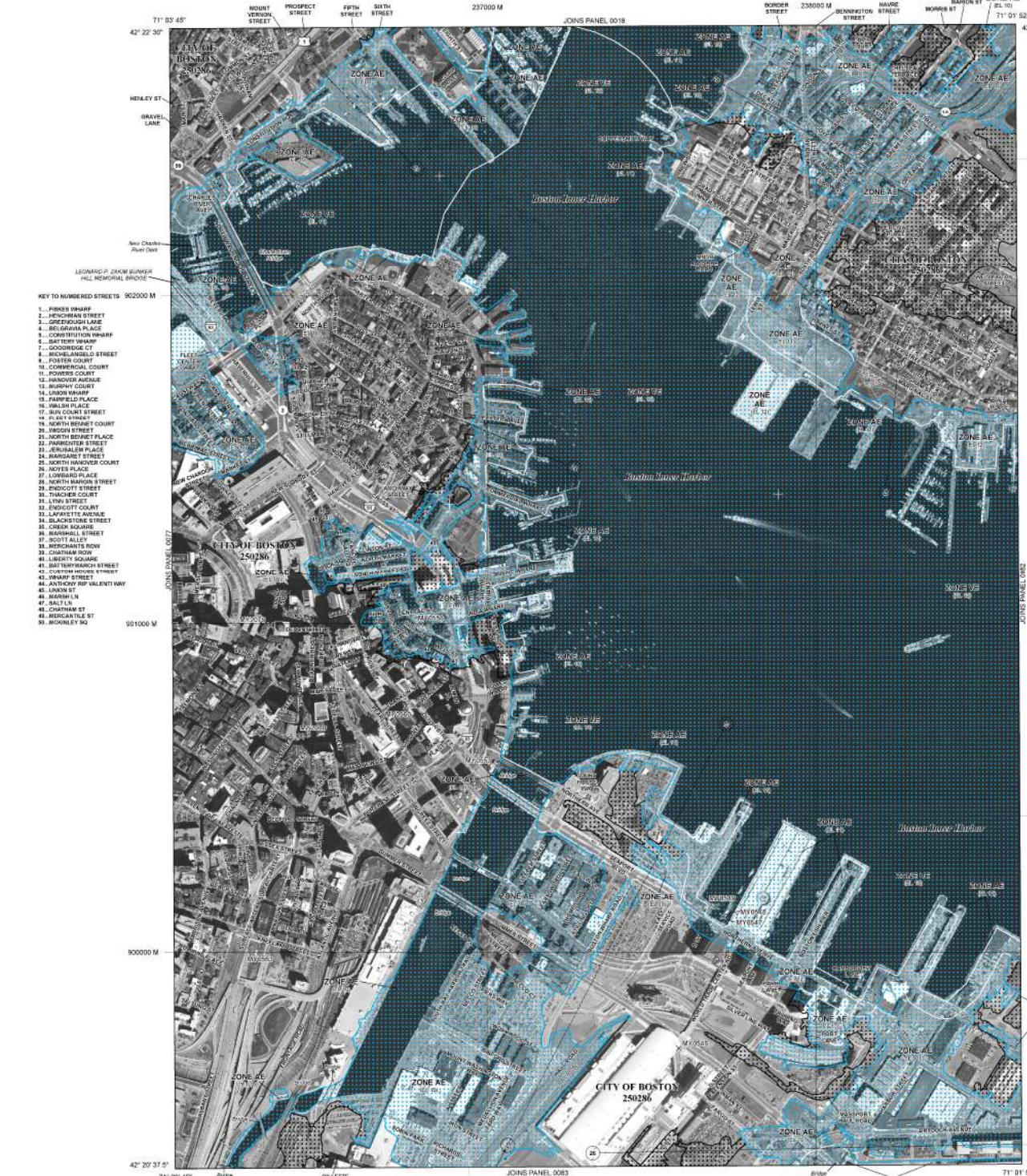
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information Exchange (MIEX)** at 1-877-FEMA-MAP (1-877-336-2672) or visit the FEMA website at <http://www.fema.gov>.

Only coastal structures that are certified to provide protection from the 1-percent-annual chance flood are shown on this panel. However, all structures taken into consideration for the purpose of coastal flood hazard analysis and mapping are present in the DFIRM database in S_Gen_Struct.



- KEY TO NUMBERED STREETS**
1. FISHER WHARF
 2. HICKMAN STREET
 3. GREENOUGH LAKE
 4. BRIGGS PLACE
 5. CONSTITUTION WHARF
 6. DARTMOUTH WHARF
 7. GOODRIDGE CT
 8. MICHELLEFIELD STREET
 9. FOSTER COURT
 10. COMMERCIAL COURT
 11. POWERS COURT
 12. HANCOCK AVENUE
 13. BURNHAY COURT
 14. LINCOLN STREET
 15. FAIRFIELD PLACE
 16. WALKER PLACE
 17. SHAW COURT STREET
 18. 501 AVENUE
 19. NORTH BENNET COURT
 20. WOOD STREET
 21. NORTH BENNET PLACE
 22. PARKER STREET
 23. ARBUTHNOT PLACE
 24. BARNARD STREET
 25. NORTH HANCOCK COURT
 26. NOTES PLACE
 27. LOWRISE PLACE
 28. NORTH MARION STREET
 29. ENDICOTT STREET
 30. TRACER COURT
 31. LYNN STREET
 32. ENRIGHT COURT
 33. LAVETTE AVENUE
 34. BLACKSTONE STREET
 35. GREEN SQUARE
 36. SCOTT ALLEY
 37. SCOTT ALLEY
 38. CHATHAM ROW
 39. LEWIS SQUARE
 40. BAY TERMARCH STREET
 41. CHATHAM STREET
 42. WIMBURY STREET
 43. ANTHONY MCKEENE WAY
 44. LAMON ST
 45. BARNUM LN
 46. SALT LN
 47. CHATHAM ST
 48. MERCANTILE ST
 49. BOWENLEY SQ

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO FLOODING BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, AR, AV, VE, and VZ. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A
 No Base Flood Elevations determined.
 Base Flood Elevations determined.

ZONE AE
 Flood depths of 1 to 3 feet (usually about flow on existing roads); average depths determined. For areas of about 100 ft. floodway, velocities also determined.

ZONE AH
 Flood depths of 1 to 3 feet (usually about flow on existing roads); average depths determined. For areas of about 100 ft. floodway, velocities also determined.

ZONE AO
 Flood depths of 1 to 3 feet (usually about flow on existing roads); average depths determined. For areas of about 100 ft. floodway, velocities also determined.

ZONE AR
 Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently abandoned. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE AV
 Areas to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined. Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

ZONE VE
 Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X
 Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from the 1% annual chance flood.

OTHER AREAS

ZONE B
 Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D
 Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHER PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
 0.2% Annual Chance Floodplain Boundary
 Floodway Boundary
 Zone A Boundary
 CBRS and OPA Boundary

Boundary defining Special Flood Hazard Area Zones and boundary defining Special Flood Hazard Areas or return to base flow streambeds, flood depths, or flood velocities.
 Limit of Moderate Wave Action
 Limit of Moderate Wave Action coincident with Zone A/B

Base Flood Elevation line and water elevation in feet
 Base Flood Elevation where water elevation within zone; elevation in feet

Referenced to the North American Vertical Datum of 1988

Cross section line
 Culvert
 Trench
 Canal
 Bridge

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
 1000 meter grid; Massachusetts State Plane Meters Zone of FIPS Zone 2001; Universal Transverse Mercator tick values; zone 18N
 Search mark: One separation in Notes to Users section of this FISB panel

MAP REVISIONS
 Refer to Map Repository and/or Map Index
 EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP: September 20, 2008

EFFECTIVE DATES OF REVISIONS TO THIS PANEL
 March 16, 2016 - to change Base Flood Elevations and Special Flood Hazard Areas to change data interpretations, to update the effects of wave action, to update corporate limits, to add roads and road names, to incorporate previously issued Letters of Map Change and to modify Coastal Barrier Resource System units.

For community map repository prior to community mapping, refer to the Community Map Repository table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-338-6020



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0081J

FIRM
FLOOD INSURANCE RATE MAP
SUFFOLK COUNTY,
MASSACHUSETTS
(ALL JURISDICTIONS)

PANEL 81 OF 176
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
 COMMUNITY NUMBER: 25025C
 PANEL SUFFIX: 0081J

Notice to User: The **Map Number** shown below should be used when placing map orders. The **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
 25025C0081J
MAP REVISED
 MARCH 16, 2016

Federal Emergency Management Agency

INSTALLATION GUIDELINES

Straw Wattles

Nilex Straw Wattles shall be installed on slopes or in channels to intercept water flow and collect sediment on site.

Wattles are typically installed in a 5 - 7.5 cm (2" - 3") deep trench that is constructed along the contour, perpendicular to the slope or direction of flow. Ends of the wattles shall be turned up the slope, so as to retain water and prevent it from flowing around the end of the wattle.

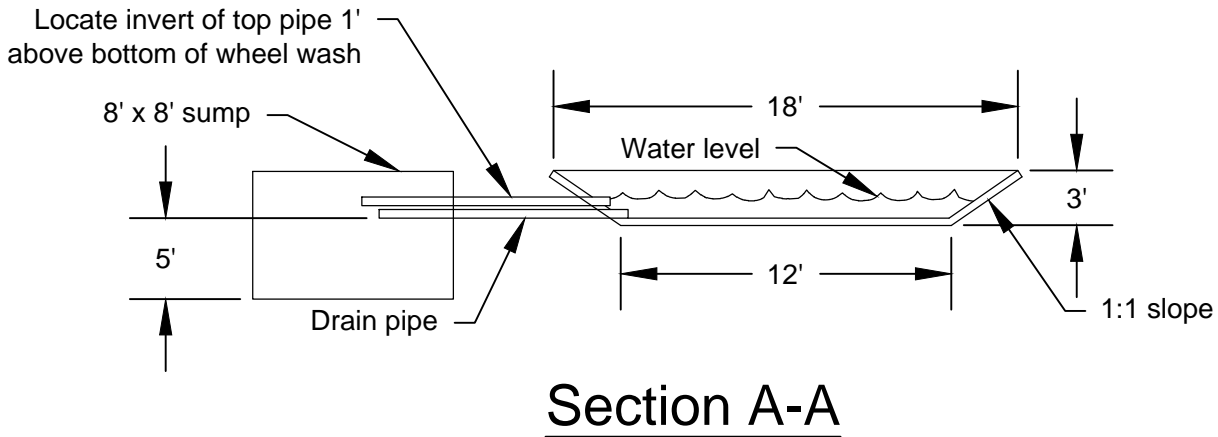
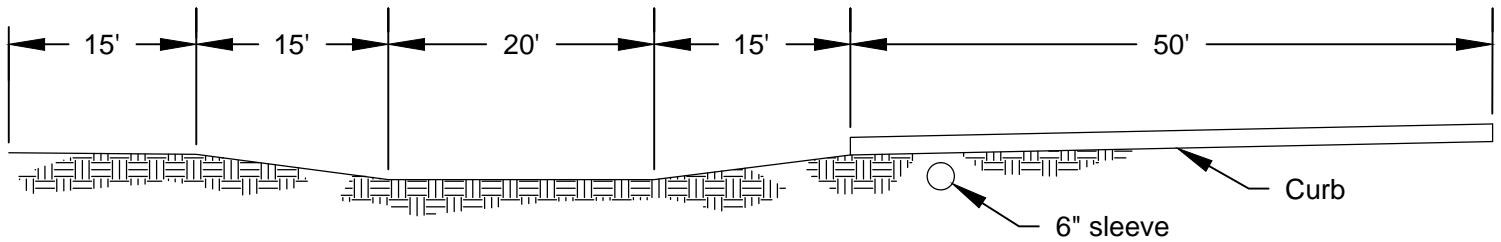
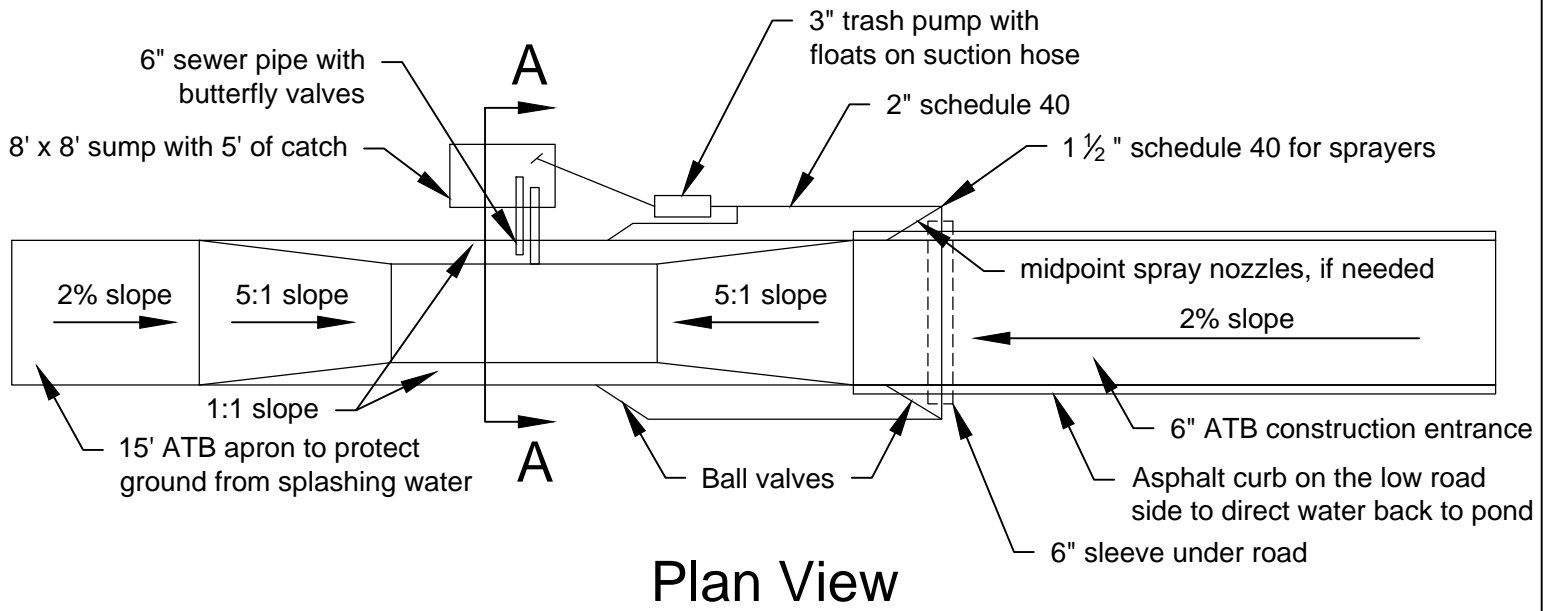
Wattles shall be secured to the subgrade by wooden stakes spaced every 0.9 - 1.2 m (3' - 4') lineal feet across the length of the wattle. Stakes 45.7 - 61 cm (18" - 24") shall be driven through the center of the wattle and into the ground with approximately 5 cm (2") projecting above the top of the wattle. A stake shall be placed within 5 - 15 cm (2" - 6") of the end of the wattle. When joining two wattles, tightly abut both ends or overlap the wattles approximately 15 cm (6").

When installing wattles in a channel bottom, the wattle installation shall extend up the side slope 0.9 m (3') above the anticipated high water mark.

Project specifications should be reviewed for any unique installation requirements.



Disclaimer: Nilex straw wattles are a system for sediment control in channels and on slopes. Nilex believes that the information contained herein to be reliable and accurate for use in sediment control applications. However, since physical conditions vary from job site to job site and even within a given job site, Nilex makes no performance guarantees and assumes no obligation or liability for the reliability or accuracy of information contained herein, for the results, safety, or suitability of using wattles, or for damages occurring in connection with the installation of any erosion control product whether or not purchased by Nilex or its affiliates. These guidelines are subject to change without notice.



Notes:

1. Build 8' x 8' sump to accommodate cleaning by trackhoe.

NOT TO SCALE



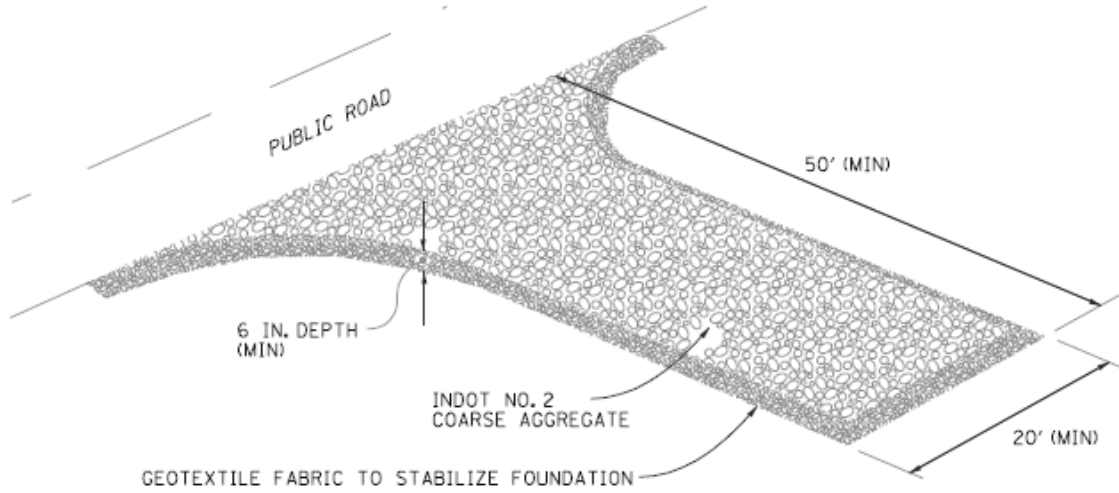
Wheel Wash

Revised June 2016

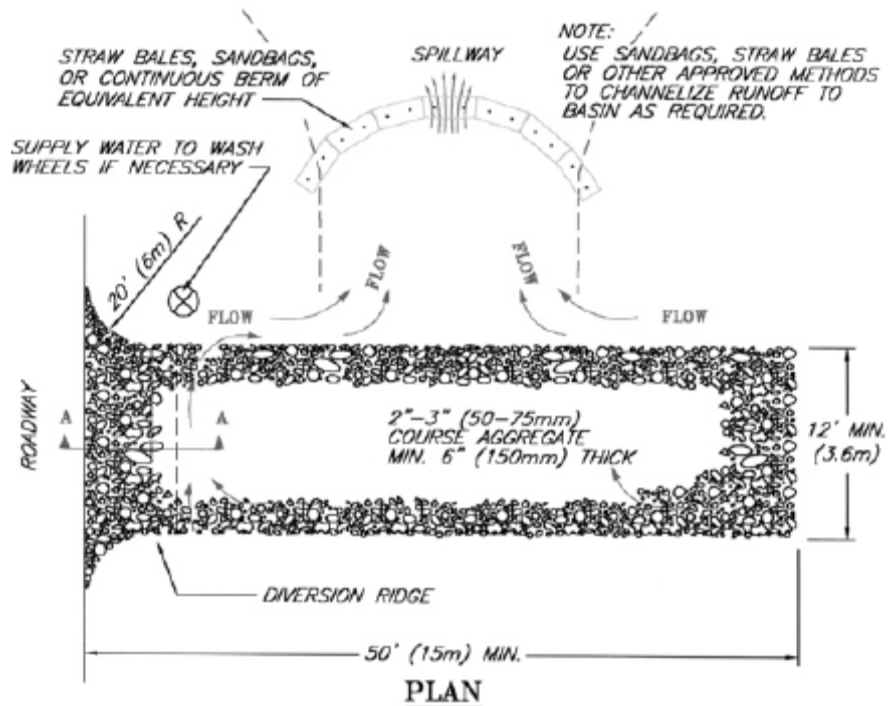
Please see <http://www.ecy.wa.gov/copyright.html> for copyright notice including permissions, limitation of liability, and disclaimer.

Vehicle Tracking Pads

Drawings:



Vehicle Tracking Pad – Isometric View



Vehicle Tracking Pad with Water Bar Diversion

Edge Environmental LLC
 PO Box 5262, Manchester, NH 03108
 Phone (603) 717-8808
 FAX: (603) 463-9970

Date: 9-5-2018	Edge PN: 2015.24
Attention: MassDEP	
RE: 151-153 Liverpool St., E. Boston MA 02128	
eDEP Trans. #: 1036331	

Letter of Transmittal

To MassDEP
205 Lowell St
Wilmington, MA 01887

VIA: Standard Mail
 Priority Mail
 Hand Delivered
 Fax No: _____

We are sending you:

Plans Report Copy of Letter Application

Other: Updated Information for Trans. #: 1036331-

Copies	Date:	No.	Description
1	9-5-18	1	WPA Form 3 – NOI- already submitted electronically & hardcopy
1	9-5-18	2	WPA – Form 3 Pg 8 – Signature Page - copy
1	9-5-18	3	Updated NOI Application Narrative
1	9-5-18	4	Stormwater Checklist
1	9-5-18	5	Stormwater Report with Appendices
1	9-5-18	6	Stamped Site Plan of Land – with existing, proposed & spot elevations
1	9-5-18	7	Updated, Stamped & Signed Figure 2
1	9-5-18	8	Updated, Stamped & Signed Figure 3
1	9-5-18	9	FEMA FIRM
1	9-5-18	10	Wattle Installation

Purpose:

As requested For your use For review and comment For Approval

As requested by Boston Ma Conservation Commission

Signed:

Eric M. Johnson

RECEIVED

SEP 05 2018

Mass DEP NERO

Edge Environmental LLC
 PO Box 5262, Manchester, NH 03108
 Phone (603) 717-8808
 FAX: (603) 463-9970

Date: 9-7-2018	Edge PN: 2015.24
Attention: Boston Ma Conservation Commission	
RE: 151-153 Liverpool St., E. Boston MA 02128	
eDEP Trans. #: 1036331	

Letter of Transmittal

To Amelia Croteau
Boston Ma Conservation
Commission
1 City Hall Square, Room 709
Boston MA 02201

VIA: Standard Mail
 Priority Mail
 Hand Delivered
 Fax No: _____

We are sending you:

- Plan Report Copy of Letter Application
 Other: _____

Copies	Date:	No.	Description
8	9-7-18	-1	FIG 3 Soil Excavation & Storage Plan (with elevations)
8	9-7-18	2	Updated Storm Drainage Report (Drainage Report Rev I - 151 Liverpool)
8	9-7-18	3	Wheel Wash
8	9-7-18	4	Vehicle Tracking Pads

Purpose:

- As requested For your use For review and comment For Approval

As requested by Boston Ma Conservation Commission

Signed:

Eric M. Johnson

2018 SEP - 7 PM 12: 57
 COB ENVIRONMENT DEPT
 RECEIVED

Edge Environmental LLC
 ENVIRONMENT DEPT
 PO Box 5262, Manchester, NH 03108

Phone (603) 717-8808
 FAX: (603) 463-9970

2018 SEP -5 PM 12:34

Date: 9-5-2018	Edge PN: 2015.24
Attention: Boston Ma Conservation Commission	
RE: 151-153 Liverpool St., E. Boston MA 02128	
eDEP Trans. #: 1036331	

Letter of Transmittal

To Amelia Croteau
Boston Ma Conservation
Commission
1 City Hall Square, Room 709
Boston MA 02201

VIA: Standard Mail
 Priority Mail
 Hand Delivered
 Fax No: _____

We are sending you:

- Plans Report Copy of Letter Application
 Other: _____

Copies	Date:	No.	Description
1	9-5-18	1	WPA – Page 8 – Signature Page - Original
8	9-5-18	2	WPA – Page 8 – Signature Page - copies
8	9-5-18	3	Updated NOI Application Narrative
8	9-5-18	4	Stormwater Checklist
2	9-5-18	5	Stormwater Report (with Appendices)
8	9-5-18	6	Stamped Site Plan of Land – with existing, proposed & spot elevations
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8	9-5-18	8	Updated, Stamped & Signed Figure 3
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8	9-5-18	10	Wattle Installation

Purpose:

- As requested For your use For review and comment For Approval

As requested by Boston Ma Conservation Commission

Signed:

Eric M. Johnson