Narragansett Engineering Inc.
Civil • Survey • Structural • Environmental • Design
3102 East Main Road, Portsmouth RI 02871
Tel. 401.683.6630 www.nei-cds.com

Letter of Transmittal

November 25, 2025

To:
Brad Holmes
26 Union Street
Plymouth, MA, 02361

Clients contact Information:
Sagamore
President: Joe Harold
(617) 365-1600
Cc: Jason Earls, Connor Johnson

RE: Derby Academy, 56 Burditt Ave, Hingham MA, 02043
Notice of Intent Application R3 11-25-25 eDEP Transaction #1932147
Cover Letter for Conservation Commission
"AIR HANDLER" + Associated Retaining Wall

Prior DEP File #s: DEP 034-421, DEP 034-432, DEP 034-513.

Fees:

- Check #_____$_____ MA Department of Environmental Protection – By ECR
- Check #_____$_____ Hingham Wetlands Protection Bylaw – By ECR

Contents:

- Revised WPA Form 3 – Notice of Intent (8 pages – 8.5"x11")
- Response to DEP comments (Dated 11-14-25) – By ECR
- Mitigation Proposal (Dated 11-14-25) – By ECR
- Drainage Memo and all Appendix (60 pages – 8.5"x11")
- MA DEP SW Checklist (8 pages – 8.5"x11")
- NOI Wetland Fee Transmittal Form (2 pages – 8.5"x11")
- Site Plans, Derby Academy, 56 Burditt Ave (Existing Conditions, Site Layout, Cross Section, Retaining Wall) by Narragansett Engineering Inc. Dated 9/16/25 – **Derby Academy, 56 Burditt Ave (R3 NOI SUBMISSION)**

Delivery method / by whom:

EB to submit digital copy to ERC on 11/25/25, ERC to Submit to Conservation Commission and MA Department of Environmental Protection (DEP), Southeast Regional Office, cc'ing Town of Hingham

PM / Signoff:_____

Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for yourrecords.

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

Username:	NEI-CDS
Transaction ID:	1932147
Document:Size	WPA Form 3 - NOI184.62K
of File:	In Process
Status of Transaction:	9/19/2025:2:43:48 PM
Date and Time Created:	

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 EnvironmentalProtection
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice ofIntent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:MassDEP File #: eDEP Transaction #:1932147City/Town:HINGH

A. General Information

1. Project Location:

a. Street Address	56 BURDITT AVENUE		
b. City/Town	HINGHAM	c. Zip Code	02043
d. Latitude	42.24897N	e. Longitude	70.89481W
f. Map/Plat #	49	g.Parcel/Lot #	57

2. Applicant:

☐ Individual ☑ Organization

a. First Name	JOE		b.Last Name	HAROLD	
c. Organization	SAGAMORE				
d. Mailing Address	75 RESEARCH ROAD				
e. City/Town	HINGHAM	f. State	MA	g. Zip Code	02043
h. Phone Number	617-365-1600	i. Fax		j. Email	JHarold@sagamore.com

3. Property Owner:

☐ more than one owner

a. First Name	TRUSTEES OF DERBY ACADEMY		b. Last Name	C/O JEFFREY CAMUSO	
c. Organization	TRUSTEES OF DERBY ACADEMY				
d. Mailing Address	56 BURDITT AVENUE				
e. City/Town	HINGHAM	f.State	MA	g. Zip Code	02043
h. Phone Number	781-749-0746	i. Fax		j.Email	

4. Representative:

a. First Name	JOE		b. Last Name	HAROLD	
c. Organization	SAGAMORE				
d. Mailing Address	75 RESEARCH ROAD				
e. City/Town	HINGHAM	f. State	MA	g. Zip Code	02043
h.Phone Number	617-365-1600	i.Fax		j.Email	JHarold@sagamore.com

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

a.Total Fee Paid b.State Fee Paid

c.City/Town Fee Paid

6. General Project Description:

DERBY ACADEMY REQUIRED AN AIR HANDLER FOR AIR CONDITIONING. THE GYM WAS NOT USABLE IN THESUMMER MONTHS DUE TO THE TEMPERATURE. AN AC SYSTEM (70 TON), WAS REQUIRED TO BE INSTALLED, AS LABELED ON THE ATTACHED PLANS AS ?AIR HANDLER? THE UNIT WAS REQUIRED TO BE PLACED IN THELOCATION SHOWN, WITHIN THE BUFFER ZONE BECAUSE IT WAS THE ONLY POSSIBLE LOCATION TO INSTALL DUCTWORK IN THE GYM. THIS IS AN AFTER THE FACT FILING FOR WORK WITHIN THE BUFFERZONE. OTHER AREAS WERE INVESTIGATED, E.G., THOSE FURTHER FROM THE RESOURCE AREA, BUT DUE TOMECHANICAL ENGINEERING CONSTRAINTS WITH RESPECT TO THE LENGTH OF DUCTWORK, THEY WERE NOT SUITABLE. THE COMPLETED WORK ALSO INCLUDED THE CONSTRUCTION OF A ~7?-5" RETAINING WALL (MODULAR BLOCK UNITS) TO ALLOW THE AIR HANDLER TO BE SET ON A LEVEL, STABLE PAD.DETAILS OF THE DESIGN ARE INCLUDED ON THE ATTACHED PLANS

7a.Project Type:

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Limited Project Driveway Crossing
4. ☑ Commercial/Industrial
5. ☐ Dock/Pier
6. ☐ Utilities
7. ☐ Coastal Engineering Structure
8. ☐ Agriculture (eg., cranberries, forestry)
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 310CMR 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:
PLYMOUTH		1460	155

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.☐ ınk	1. linear feet	2. linear feet
b.☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c.☐ .and under Waterbodies and Waterways	1. Square feet	2. square feet
	3. cubic yards dredged	
d.☐ Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e.☐ ısolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced

f.☐ Riverfront Area

1. Name of Waterway (if any)

2. Width of Riverfront Area (check one)

☐ 25 ft. - Designated Densely Developed Areas only
☐ 100 ft. - New agricultural projects only

3. Total area of Riverfront Area on the site of the proposed project squarefeet

4. Proposed Alteration of the Riverfront Area:

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

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

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

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

ResourceArea	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under	Land under the ocean below,
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ rrier Beaches	Indicate size under Coastal Beaches and/or Coatstal Dunes, below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ astal Dunes	1. square feet	2. cubic yards dune nourishment
f. ☑ Coastal Banks	0 1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ alt Marshes	1. square feet	2. sq ft restoration, rehab, crea.
i. ☐ and Under Salt Ponds	1. square feet	
	2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ ish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland LandUnder Waterbodies and Waterways, above	
	1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4.Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has beenentered 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

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 recentEstimated 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 Wildlife1
   Rabbit Hill Road
   Westborough, MA 01581

   b. Date of map:FROM MAP VIEWER

   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, showingexisting 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

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.)

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:

Division of Marine Fisheries -
Southeast Marine Fisheries
StationAttn: Environmental
Reviewer
836 S. Rodney French Blvd New
Bedford, MA 02744

North Shore - Hull to New Hampshire:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental
Reviewer30 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)?

a. ☐ Yes ☑ No

If yes, provide name of ACEC (see instructions to WPAForm 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 theMassachusetts 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 CMR10.05(6)(k)-(q) and check if:

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

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 yousubmit 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:	c. Revised Final Date:	e. Scale:
DERBY ACADEMY, 56BURDITT AVEEXISTING CONDITIONS & DEMO PLAN BYNARRAGANSETTEN GINEERING INC.	CB	JOE MALO	Revison 3 9/17/25	

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.
6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.
7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.
8. ☑ Attach NOI Wetland Fee Transmittal Form.
9. ☑ Attach Stormwater Report, if needed.

E. Fees

I.

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 I and 2 oftbe NOi Wetland Fee Transmittal Form) to confirm fee payment:

11532	9/4125
2. Municipal Check Nwnber	3. Check date
111533	9/4/25
4. Stale Check Number	5. Check date
Joe	Harold (Sagomo're)
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 ofmy 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 J0.05(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 I00 feet of the property line of the project location.

Joseph R. Harold AAA	9/8/25
I. Signature of Applicant	2. Date
Kamsa	9/8/25
3. Signature of Property Owner(if different)	4. Date
Joseph R. Harold AAA	9/8/25
5, sfgnnrurc ofRcprcsentalivc (if any)	6. Date

For Conservation Commission:

Two copies of the completed Notice oflntent (Fonn 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 acopyof the state foe 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.

November 19, 2025

To: Massachusetts Association of Conservation Commissions
10 Juniper Road
Belmont, MA 02478
T. 617-489-3930

Subject: Derby Academy - Drainage Memo

Location: 56 Burditt Ave, Hingham, MA 02043

Narragansett Engineering Inc.
nei-cds.com
Civil ▫ Survey ▫ Structural ▫ Environmental ▫ Design
3102 East Main Road, Portsmouth RI 02871
Tel. 401.683.6630 www.nei-cds.com
Broad Perspective, Exact Execution.

Drainage Memo

This drainage memo has been prepared in reference to the proposed air handler for Derby Academy located at 56 Burditt Ave, Hingham MA. The purpose of this memorandum is to document existing and proposed drainage conditions within the project area and satisfy stormwater requirements as applicable.

In the existing condition, the project area is comprised of maintained lawn and a paved walkway immediately northeast of the existing Derby Academy Gymnasium. Runoff from this area flows overland past moderate slopes north to Broad Cove. The project area has been conglomerated into a single watershed consistent with the terminus flow patterns of the subwatershed. According to the USDA web soil survey accessed October 6th 2025, soils in the general area are classified as a gravelly fine sandy loam with a depth to water table at 80 inches below original grade and infiltration rate of 5.95 in/hr. The soils shall be verified onsite and a soil evaluation and perk test are pending. Based on FEMA FIRMette accessed September 3rd, 2025, the project is not located within a flood zone. See the attached plans and FIRMette attachment.

Under proposed conditions, the air handler on top of a concrete pad, associated maintenance access on all sides of the air handler and the retaining wall make up the first subwatershed. The remainder of the site retains its maintained lawn pervious coverage and is designated in separate subwatersheds. Within the elevated air handler pad site is a crushed stone bed with perforated subdrain to collect runoff from the impervious areas of the subwatershed. This crushed stone bed is designed to provide pretreatment and discharge to a system of Cultec Infiltrators. The infiltration system is designed to store and infiltrate the flow to the system with an overflow upstream the system to provide relief during larger sized storm events. This overflow outlet has been designed to ensure no hydrostatic pressure builds up behind the proposed retaining wall. The infiltration system has been properly sized to ensure proposed conditions satisfy the water quality treatment requirement of Massachusetts Stormwater Handbook Standard 1.

The Massachusetts Stormwater Handbook, specifically Volume 1 Standard 2, states that the post-development peak discharge rates being equal or lesser than pre-development rates may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04. Since the site discharges directly to Broad Cove, this standard has been considered waived for the design of this project. Even though the standard is waived and the peak flows are required to be reduced, as seen below, the runoff volume is reduced in all storm events and there is only a minor increase in the peak flows.

Design Point 1L - Overland Flow			
Peak Flow Rate (cfs)			
Design Storm	Existing	Proposed	Change
WQ Storm (1")	0.00	0.00	0.00
1 - Year	0.00	0.00	0.00
2 - Year	0.01	0.00	-0.01
10 - Year	0.08	0.10	0.02
25 - Year	0.14	0.19	0.05
100 - Year	0.25	0.29	0.04
Peak Volume (cf)			
Design Storm	Existing	Proposed	Change
WQ Storm (1")	0	0	0
1 - Year	40	0	-40
2 - Year	87	0	-87
10 - Year	307	96	-211
25 - Year	487	223	-264
100 - Year	807	440	-367

Standard 3 – groundwater recharge, has been satisfied based on the water quality calculations of the proposed infiltration best management practice (BMP) as found attached. The crushed stone bed providing pretreatment to the infiltration system is best classified as an infiltration trench. A Total Suspended Solids (TSS) removal calc can be found attached displaying compliance with Standard 4.

The site, the rear facing façade of a primary educational facility, does not qualify as a land use with higher potential pollutant loads (LUHPPL) and thus Standard 5 is not applicable. Broad Cove does not contain any critical resource as defined under Standard 6 and so is not applicable to this project. The nature of the proposed project is an expansion of previously developed land. As such, this site classifies as a redevelopment project. As described herewithin, the applicable standards have been meet or exceeded conforming to the requirements of Standard 7 – Redevelopment.

Erosion and sediment control measures have been developed for this project and are included in the construction drawings as attached. These plans show the proposed locations for erosion control devices. The following supplemental provisions are also a part of this plan. Erosion and sedimentation control measures which are proposed to be implemented during construction and include the installation of silt socks and silt fencing which has the bottom 6 inches buried in the ground. All exposed construction areas will be stabilized upon completion in order to minimize the time that these areas are not stabilized. With the full impact of the measures presented on the Erosion and Sedimentation Control Plans, Standard 8 will be satisfied.

A Long Term Operation and Maintenance Plan (O&M Plan) has been attached to satisfy the requirements set forth in Standard 9. Likewise, an illicit discharge statement has been included to satisfy Standard 10.

A hydrological analysis has been conducted to determine the infiltrator size required to provide water quality volume for the new impervious the project provides. The subwatersheds as described above was entered into HydroCAD Version 10.20-5c to calculate the post-runoff rates and size an appropriate system. The required water quality volume is 208 cubic foot of runoff as calculated in the attached water quality volume

spreadsheet. The infiltration system has been designed to treat 210 cubic feet of runoff, satisfying this requirement. The pre and post HydroCAD analysis can be found attached to this memorandum.

In summary, the proposed condition yields a net increase in impervious area which is designed to be treated by the crushed stone bed with pipe conveyance and Cultec infiltration system as deigned in the attached supporting documentation. The design and configuration of the gravel trench subdrain and stormwater infiltration practices provide a defined path for runoff treatment and management.

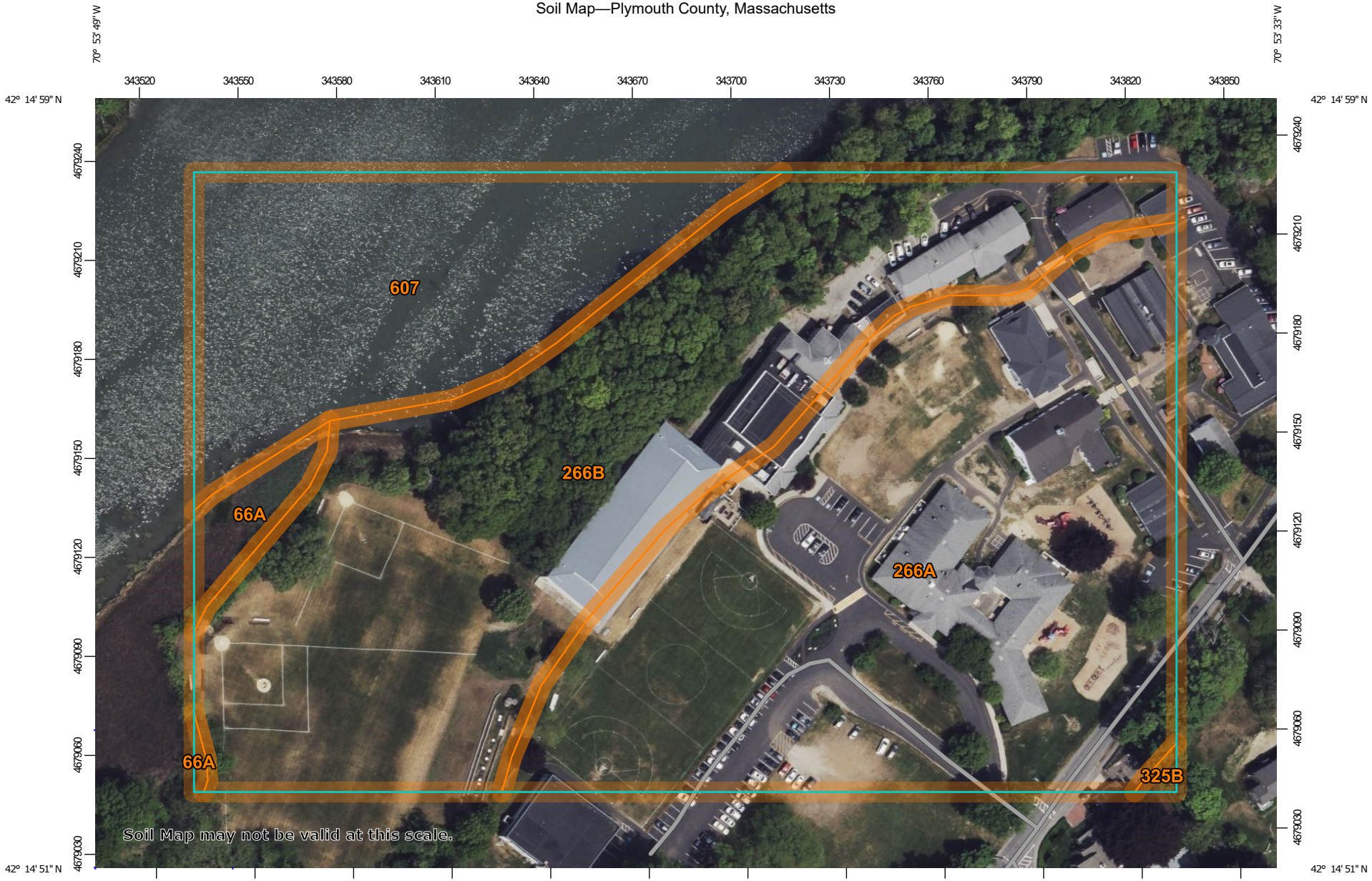
Should you have any questions or comments, please do not hesitate to reach out to my office (401.683.6630) or email me at ebuzzi@nei-cds.com

Sincerely,

Joe Malo, PE
VP (Narragansett Engineering Inc)

ATTACHEMENTS:

Soil Map and Description
FIRMette
Stormwater Calculations
HydroCAD Analysis
TSS Removal Calculations
O & M Report
Illicit Discharge Compliance Statement



Map Scale: 1:1,640 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 18, Sep 5, 2025

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
66A	Ipswich - Pawcatuck - Matunuck complex, 0 to 2 percent slopes, very frequently flooded	0.3	1.8%
266A	Warwick fine sandy loam, 0 to 3 percent slopes	5.8	41.9%
266B	Warwick fine sandy loam, 3 to 8 percent slopes	5.3	38.3%
325B	Newport loam, 3 to 8 percent slopes	0.0	0.2%
607	Water, saline	2.5	17.8%
Totals for Area of Interest		**13.9**	**100.0%**

Plymouth County, Massachusetts

266B—Warwick fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: v8b2
Elevation: 10 to 300 feet
Mean annual precipitation: 41 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Warwick and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Warwick

Setting

Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
Ap - 3 to 8 inches: gravelly fine sandy loam
Bw1 - 8 to 13 inches: very gravelly fine sandy loam
Bw2 - 13 to 17 inches: extremely gravelly fine sandy loam
BC - 17 to 27 inches: extremely gravelly sandy loam
2C - 27 to 63 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Quonset

Percent of map unit: 10 percent
Landform: Eskers, terraces, deltas, kames, outwash plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Merrimac

Percent of map unit: 10 percent
Landform: Terraces, kames, outwash plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Plymouth County, Massachusetts
Survey Area Data: Version 18, Sep 5, 2025

National Flood Hazard Layer FIRMette

FEMA

70°53'57"W 42°15'9"N

70°53'20"W 42°14'43"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

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

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

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

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

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

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

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/3/2025 at 3:15 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

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Civil • Survey • Structural • Environmental • Design
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Tel. 401.683.6630 www.nei-cds.com

PROJECT Sagamore PROJECT NUMBER 25.0126

SUBJECT Underground Infiltration - Cultec

COMPUTATIONS BY EB DATE 11/19/2025

CHECK BY JM DATE 11/19/2025

Cultec System Calculations

Site

Total Area to PDA-1 =	2,737	SF
Total Impervious Area =	2,492	SF
Total Area Requiring Treatment	2,492	SF

Cell Volume shall be larger of Recharge Volume and Water Quality Volume

Recharge Volume - Rev

Total Impervious Area within Hydrologic Group "A" Soils =	2,492	SF
F (from page 6 of massachusetts stormwater standards - volume 1) =	0.60	inches
Required Recharge Volume =	125	CF

Water Quality Volume (WQV)

WQV = Total Impervious Area x 1 inch =	208	CF
Required WQV Volume =	**208**	**CF**
Provided Water Quality Volume =	**210**	**210 sq ft provided at lowest outlet elevation from hydroCAD (el. 12.3)**

210>208ok

Filter Bed Area

A_f= (WQv)/[(dt)+(k*tf)]

Where :

A_f = Surface area of filter bed (ft^2)
d_f = Filter bed depth (ft)
k = Saturated hydraulic conductivity (ft/day)
t_f = Allowable Drawdown (hours)

PDA -1 Water Quality Volume (WQV) =	208	cf
d_t=	1.5	ft
k=	5.95	inches/hour
t_f=	2.0	hours
A_f =	**15**	**SF**
Provided Surface Area =	**325**	**SF**

Area of System from HydroCAD

Pretreatment Volume

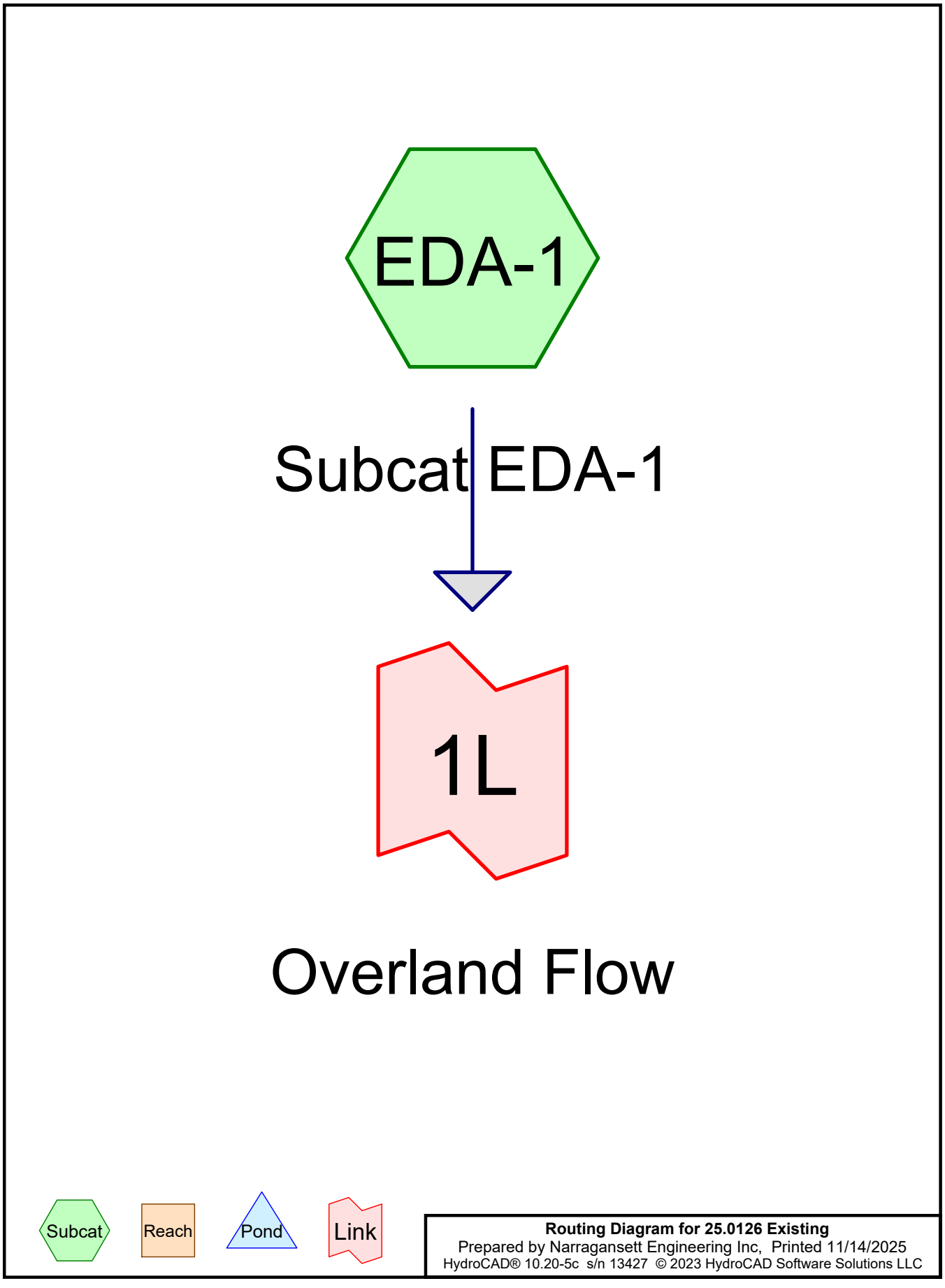
Water Quality Volume (WQV)

WQV = Impervious Area (Pavement) treated by Sediment Forebay x 1 inches =	208	CF	Store 10% of water quality volume
Pretreatment Volume = 10% WQV =	21	CF	
Pretreatment Volume Provided =	**820**	**CF**	164 SF x 5 (ave height of wall) Stone filter Strip

Drawdown within 72 hours

Time = (Provided Volume) / (K x Bottom Area)

Provided Volume =	**210**	**CF**	
K = saturated hydraulic conductivity =	**5.95**	**inches/hour (from NRCS WSS Online Database)**	
Bottom Area (Average) =	**325**	**SF**	
Time (hrs) =	**0**	**hrs**	**< 72 hrs**



Routing Diagram for 25.0126 Existing
Prepared by Narragansett Engineering Inc, Printed 11/14/2025

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	WQv	Type III 24-hr		Default	24.00	1	1.20	2	3.40
2	1-Year	Type III 24-hr		Default	24.00	1	2.79	2	3.40
3	2-Year	Type III 24-hr		Default	24.00	1	3.40	2	3.40
4	10-Year	Type III 24-hr		Default	24.00	1	5.24	2	3.40
5	25-Year	Type III 24-hr		Default	24.00	1	6.39	2	3.40
6	100-Year	Type III 24-hr		Default	24.00	1	8.16	2	3.40

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,445	39	>75% Grass cover, Good, HSG A (EDA-1)
906	98	Paved parking, HSG A (EDA-1)
3,351	**55**	**TOTAL AREA**

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

Subcatchment EDA-1: Subcat EDA-1 Runoff Area=3,351 sf 27.04% Impervious Runoff Depth=0.00"
Flow Length=54' Tc=6.0 min CN=55 Runoff=0.00 cfs 0 cf

Link 1L: Overland Flow Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 3,351 sf Runoff Volume = 0 cf Average Runoff Depth = 0.00"
72.96% Pervious = 2,445 sf 27.04% Impervious = 906 sf

Summary for Subcatchment EDA-1: Subcat EDA-1

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : Overland Flow

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 WQv Rainfall=1.20", P2=3.40"

Area (sf)	CN	Description
2,430	39	>75% Grass cover, Good, HSG A
15	39	>75% Grass cover, Good, HSG A
906	98	Paved parking, HSG A
3,351	55	Weighted Average
2,445		72.96% Pervious Area
906		27.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.1000	1.70		**Sheet Flow, Sheet Flow - Paved** Smooth surfaces n= 0.011 P2= 3.40"
1.8	44	0.2432	0.40		**Sheet Flow, Sheet Flow - Grass** Grass: Short n= 0.150 P2= 3.40"
4.1					**Direct Entry, Direct (Less than 6 mins.)**
6.0	54	Total			

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 27.04% Impervious, Inflow Depth = 0.00" for WQv event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 EDA-1: Subcat EDA-1 Runoff Area=3,351 sf 27.04% Impervious Runoff Depth>0.14"
Flow Length=54' Tc=6.0 min CN=55 Runoff=0.00 cfs 40 cf

Link 1L: Overland Flow Inflow=0.00 cfs 40 cf
Primary=0.00 cfs 40 cf

Total Runoff Area = 3,351 sf Runoff Volume = 40 cf Average Runoff Depth = 0.14"
72.96% Pervious = 2,445 sf 27.04% Impervious = 906 sf

Summary for Subcatchment EDA-1: Subcat EDA-1

Runoff = 0.00 cfs @ 12.42 hrs, Volume= 40 cf, Depth> 0.14"
Routed to Link 1L : Overland Flow

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 1-Year Rainfall=2.79", P2=3.40"

Area (sf)	CN	Description
2,430	39	>75% Grass cover, Good, HSG A
15	39	>75% Grass cover, Good, HSG A
906	98	Paved parking, HSG A
3,351	55	Weighted Average
2,445		72.96% Pervious Area
906		27.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.1000	1.70		**Sheet Flow, Sheet Flow - Paved** Smooth surfaces n= 0.011 P2= 3.40"
1.8	44	0.2432	0.40		**Sheet Flow, Sheet Flow - Grass** Grass: Short n= 0.150 P2= 3.40"
4.1					**Direct Entry, Direct (Less than 6 mins.)**
6.0	54	Total			

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 27.04% Impervious, Inflow Depth > 0.14" for 1-Year event
Inflow = 0.00 cfs @ 12.42 hrs, Volume= 40 cf
Primary = 0.00 cfs @ 12.42 hrs, Volume= 40 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 EDA-1: Subcat EDA-1 Runoff Area=3,351 sf 27.04% Impervious Runoff Depth>0.31"
Flow Length=54' Tc=6.0 min CN=55 Runoff=0.01 cfs 87 cf

Link 1L: Overland Flow Inflow=0.01 cfs 87 cf
Primary=0.01 cfs 87 cf

Total Runoff Area = 3,351 sf Runoff Volume = 87 cf Average Runoff Depth = 0.31"
72.96% Pervious = 2,445 sf 27.04% Impervious = 906 sf

Summary for Subcatchment EDA-1: Subcat EDA-1

Runoff = 0.01 cfs @ 12.29 hrs, Volume= 87 cf, Depth> 0.31"
Routed to Link 1L : Overland Flow

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=3.40", P2=3.40"

Area (sf)	CN	Description
2,430	39	>75% Grass cover, Good, HSG A
15	39	>75% Grass cover, Good, HSG A
906	98	Paved parking, HSG A
3,351	55	Weighted Average
2,445		72.96% Pervious Area
906		27.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.1000	1.70		**Sheet Flow, Sheet Flow - Paved** Smooth surfaces n= 0.011 P2= 3.40"
1.8	44	0.2432	0.40		**Sheet Flow, Sheet Flow - Grass** Grass: Short n= 0.150 P2= 3.40"
4.1					**Direct Entry, Direct (Less than 6 mins.)**
6.0	54	Total			

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 27.04% Impervious, Inflow Depth > 0.31" for 2-Year event
Inflow = 0.01 cfs @ 12.29 hrs, Volume= 87 cf
Primary = 0.01 cfs @ 12.29 hrs, Volume= 87 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 EDA-1: Subcat EDA-1 Runoff Area=3,351 sf 27.04% Impervious Runoff Depth>1.10"
Flow Length=54' Tc=6.0 min CN=55 Runoff=0.08 cfs 307 cf

Link 1L: Overland Flow Inflow=0.08 cfs 307 cf
Primary=0.08 cfs 307 cf

Total Runoff Area = 3,351 sf Runoff Volume = 307 cf Average Runoff Depth = 1.10"
72.96% Pervious = 2,445 sf 27.04% Impervious = 906 sf

Summary for Subcatchment EDA-1: Subcat EDA-1

Runoff = 0.08 cfs @ 12.11 hrs, Volume= 307 cf, Depth> 1.10"
Routed to Link 1L : Overland Flow

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=5.24", P2=3.40"

Area (sf)	CN	Description
2,430	39	>75% Grass cover, Good, HSG A
15	39	>75% Grass cover, Good, HSG A
906	98	Paved parking, HSG A
3,351	55	Weighted Average
2,445		72.96% Pervious Area
906		27.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.1000	1.70		**Sheet Flow, Sheet Flow - Paved** Smooth surfaces n= 0.011 P2= 3.40"
1.8	44	0.2432	0.40		**Sheet Flow, Sheet Flow - Grass** Grass: Short n= 0.150 P2= 3.40"
4.1					**Direct Entry, Direct (Less than 6 mins.)**
6.0	54	Total			

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 27.04% Impervious, Inflow Depth > 1.10" for 10-Year event
Inflow = 0.08 cfs @ 12.11 hrs, Volume= 307 cf
Primary = 0.08 cfs @ 12.11 hrs, Volume= 307 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 EDA-1: Subcat EDA-1 Runoff Area=3,351 sf 27.04% Impervious Runoff Depth>1.74"
Flow Length=54' Tc=6.0 min CN=55 Runoff=0.14 cfs 487 cf

Link 1L: Overland Flow Inflow=0.14 cfs 487 cf
Primary=0.14 cfs 487 cf

Total Runoff Area = 3,351 sf Runoff Volume = 487 cf Average Runoff Depth = 1.74"
72.96% Pervious = 2,445 sf 27.04% Impervious = 906 sf

Summary for Subcatchment EDA-1: Subcat EDA-1

Runoff = 0.14 cfs @ 12.10 hrs, Volume= 487 cf, Depth> 1.74"
Routed to Link 1L : Overland Flow

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 25-Year Rainfall=6.39", P2=3.40"

Area (sf)	CN	Description
2,430	39	>75% Grass cover, Good, HSG A
15	39	>75% Grass cover, Good, HSG A
906	98	Paved parking, HSG A
3,351	55	Weighted Average
2,445		72.96% Pervious Area
906		27.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.1000	1.70		**Sheet Flow, Sheet Flow - Paved** Smooth surfaces n= 0.011 P2= 3.40"
1.8	44	0.2432	0.40		**Sheet Flow, Sheet Flow - Grass** Grass: Short n= 0.150 P2= 3.40"
4.1					**Direct Entry, Direct (Less than 6 mins.)**
6.0	54	Total			

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 27.04% Impervious, Inflow Depth > 1.74" for 25-Year event
Inflow = 0.14 cfs @ 12.10 hrs, Volume= 487 cf
Primary = 0.14 cfs @ 12.10 hrs, Volume= 487 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 EDA-1: Subcat EDA-1 Runoff Area=3,351 sf 27.04% Impervious Runoff Depth>2.89"
Flow Length=54' Tc=6.0 min CN=55 Runoff=0.25 cfs 807 cf

Link 1L: Overland Flow Inflow=0.25 cfs 807 cf
Primary=0.25 cfs 807 cf

Total Runoff Area = 3,351 sf Runoff Volume = 807 cf Average Runoff Depth = 2.89"
72.96% Pervious = 2,445 sf 27.04% Impervious = 906 sf

Summary for Subcatchment EDA-1: Subcat EDA-1

Runoff = 0.25 cfs @ 12.10 hrs, Volume= 807 cf, Depth> 2.89"
Routed to Link 1L : Overland Flow

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=8.16", P2=3.40"

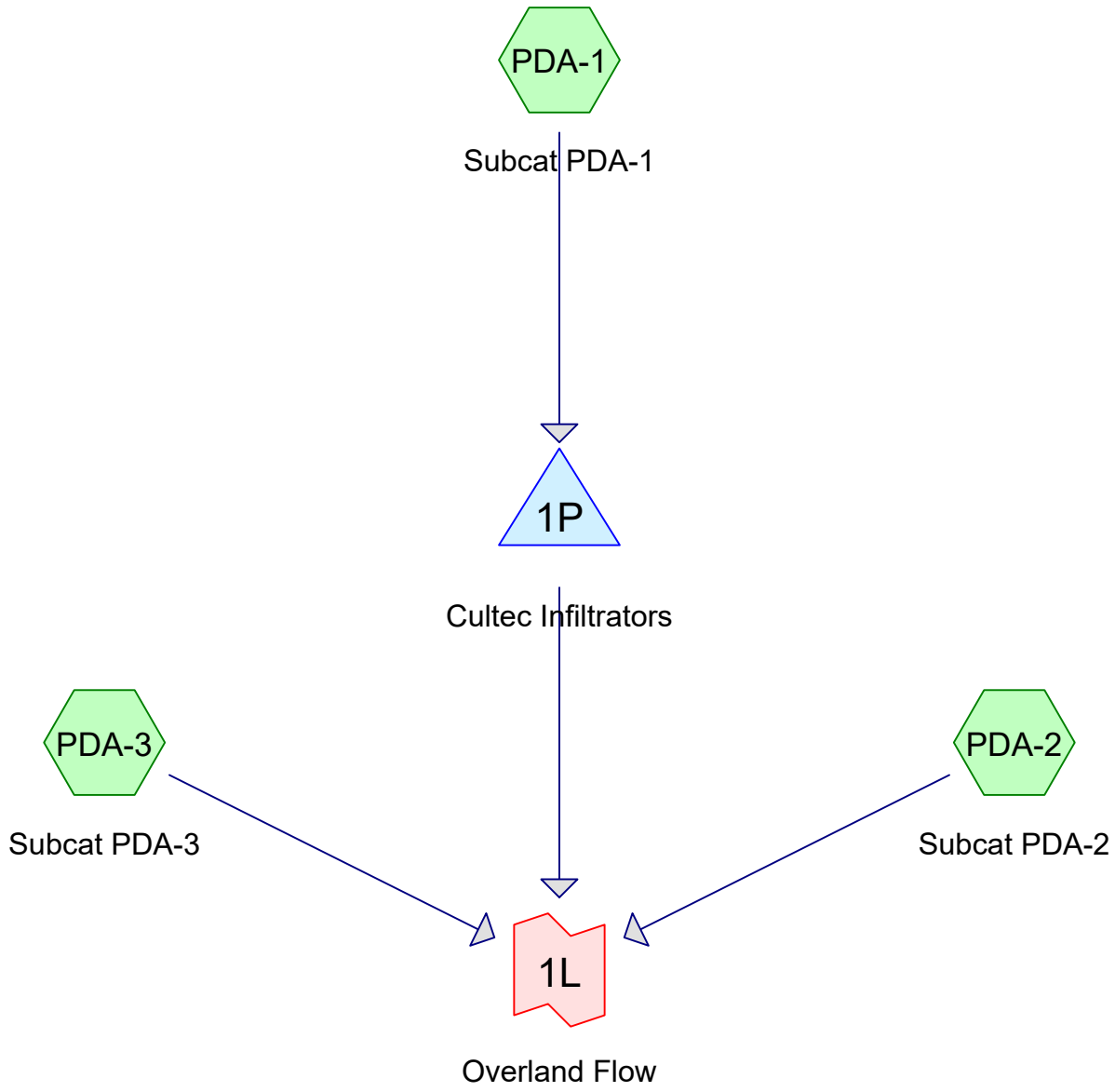
Area (sf)	CN	Description
2,430	39	>75% Grass cover, Good, HSG A
15	39	>75% Grass cover, Good, HSG A
906	98	Paved parking, HSG A
3,351	55	Weighted Average
2,445		72.96% Pervious Area
906		27.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.1000	1.70		**Sheet Flow, Sheet Flow - Paved** Smooth surfaces n= 0.011 P2= 3.40"
1.8	44	0.2432	0.40		**Sheet Flow, Sheet Flow - Grass** Grass: Short n= 0.150 P2= 3.40"
4.1					**Direct Entry, Direct (Less than 6 mins.)**
6.0	54	Total			

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 27.04% Impervious, Inflow Depth > 2.89" for 100-Year event
Inflow = 0.25 cfs @ 12.10 hrs, Volume= 807 cf
Primary = 0.25 cfs @ 12.10 hrs, Volume= 807 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs



Subcat Reach Pond Link

Routing Diagram for 25.0126 Proposed
Prepared by Narragansett Engineering Inc, Printed 11/14/2025

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC	P2 (inches)
1	WQv	Type III 24-hr		Default	24.00	1	1.20	2	3.40
2	1-Year	Type III 24-hr		Default	24.00	1	2.79	2	3.40
3	2-Year	Type III 24-hr		Default	24.00	1	3.40	2	3.40
4	10-Year	Type III 24-hr		Default	24.00	1	5.24	2	3.40
5	25-Year	Type III 24-hr		Default	24.00	1	6.39	2	3.40
6	100-Year	Type III 24-hr		Default	24.00	1	8.16	2	3.40

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
860	39	>75% Grass cover, Good, HSG A (PDA-1, PDA-2, PDA-3)
2,492	98	Paved parking, HSG A (PDA-1, PDA-2)
3,351	**83**	**TOTAL AREA**

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

Subcatchment PDA-1: Subcat PDA-1 Runoff Area=2,736 sf 91.05% Impervious Runoff Depth>0.61"
Tc=6.0 min CN=93 Runoff=0.04 cfs 139 cf

Subcatchment PDA-2: Subcat PDA-2 Runoff Area=462 sf 0.03% Impervious Runoff Depth=0.00"
Tc=0.0 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment PDA-3: Subcat PDA-3 Runoff Area=153 sf 0.00% Impervious Runoff Depth=0.00"
Tc=0.0 min CN=39 Runoff=0.00 cfs 0 cf

Pond 1P: Cultec Infiltrators Peak Elev=11.04' Storage=4 cf Inflow=0.04 cfs 139 cf
Discarded=0.04 cfs 139 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 139 cf

Link 1L: Overland Flow Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 3,351 sf Runoff Volume = 139 cf Average Runoff Depth = 0.50"
25.65% Pervious = 860 sf 74.35% Impervious = 2,492 sf

Summary for Subcatchment PDA-1: Subcat PDA-1

Runoff = 0.04 cfs @ 12.09 hrs, Volume= 139 cf, Depth> 0.61"
Routed to Pond 1P : Cultec Infiltrators

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 WQv Rainfall=1.20", P2=3.40"

Area (sf)	CN	Description
245	39	>75% Grass cover, Good, HSG A
2,492	98	Paved parking, HSG A
2,736	93	Weighted Average
245		8.95% Pervious Area
2,492		91.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct (Less than 6 mins)**

Summary for Subcatchment PDA-2: Subcat PDA-2

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : Overland Flow

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 WQv Rainfall=1.20", P2=3.40"

Area (sf)	CN	Description
462	39	>75% Grass cover, Good, HSG A
0	98	Paved parking, HSG A
462	39	Weighted Average
462		99.97% Pervious Area
0		0.03% Impervious Area

Summary for Subcatchment PDA-3: Subcat PDA-3

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : Overland Flow

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 WQv Rainfall=1.20", P2=3.40"

Area (sf)	CN	Description
153	39	>75% Grass cover, Good, HSG A
153		100.00% Pervious Area

Summary for Pond 1P: Cultec Infiltrators

Inflow Area = 2,736 sf, 91.05% Impervious, Inflow Depth > 0.61" for WQv event
Inflow = 0.04 cfs @ 12.09 hrs, Volume= 139 cf
Outflow = 0.04 cfs @ 12.12 hrs, Volume= 139 cf, Atten= 5%, Lag= 1.5 min
Discarded = 0.04 cfs @ 12.12 hrs, Volume= 139 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : Overland Flow

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 11.04' @ 12.12 hrs Surf.Area= 325 sf Storage= 4 cf

Plug-Flow detention time= 1.6 min calculated for 139 cf (100% of inflow)
Center-of-Mass det. time= 1.4 min (832.8 - 831.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.00'	331 cf	**37.50'W x 8.67'L x 4.00'H Field A** 1,300 cf Overall - 297 cf Embedded = 1,003 cf x 33.0% Voids
#2A	11.50'	297 cf	**Cultec R-360HD** x 6 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 6 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		628 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	15.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	11.00'	**5.950 in/hr Exfiltration over Surface area**
#2	Primary	12.30'	**4.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 12.12 hrs HW=11.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=11.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 74.35% Impervious, Inflow Depth = 0.00" for WQv event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 PDA-1: Subcat PDA-1 Runoff Area=2,736 sf 91.05% Impervious Runoff Depth>2.05"
Tc=6.0 min CN=93 Runoff=0.14 cfs 468 cf

Subcatchment PDA-2: Subcat PDA-2 Runoff Area=462 sf 0.03% Impervious Runoff Depth=0.00"
Tc=0.0 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment PDA-3: Subcat PDA-3 Runoff Area=153 sf 0.00% Impervious Runoff Depth=0.00"
Tc=0.0 min CN=39 Runoff=0.00 cfs 0 cf

Pond 1P: Cultec Infiltrators Peak Elev=11.64' Storage=80 cf Inflow=0.14 cfs 468 cf
Discarded=0.04 cfs 468 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 468 cf

Link 1L: Overland Flow Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 3,351 sf Runoff Volume = 468 cf Average Runoff Depth = 1.68"
25.65% Pervious = 860 sf 74.35% Impervious = 2,492 sf

Summary for Subcatchment PDA-1: Subcat PDA-1

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 468 cf, Depth> 2.05"
Routed to Pond 1P : Cultec Infiltrators

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 1-Year Rainfall=2.79", P2=3.40"

Area (sf)	CN	Description
245	39	>75% Grass cover, Good, HSG A
2,492	98	Paved parking, HSG A
2,736	93	Weighted Average
245		8.95% Pervious Area
2,492		91.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct (Less than 6 mins)**

Summary for Subcatchment PDA-2: Subcat PDA-2

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : Overland Flow

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 1-Year Rainfall=2.79", P2=3.40"

Area (sf)	CN	Description
462	39	>75% Grass cover, Good, HSG A
0	98	Paved parking, HSG A
462	39	Weighted Average
462		99.97% Pervious Area
0		0.03% Impervious Area

Summary for Subcatchment PDA-3: Subcat PDA-3

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
Routed to Link 1L : Overland Flow

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 1-Year Rainfall=2.79", P2=3.40"

Area (sf)	CN	Description
153	39	>75% Grass cover, Good, HSG A
153		100.00% Pervious Area

Summary for Pond 1P: Cultec Infiltrators

Inflow Area = 2,736 sf, 91.05% Impervious, Inflow Depth > 2.05" for 1-Year event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 468 cf
Outflow = 0.04 cfs @ 11.90 hrs, Volume= 468 cf, Atten= 69%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.90 hrs, Volume= 468 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : Overland Flow

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 11.64' @ 12.41 hrs Surf.Area= 325 sf Storage= 80 cf

Plug-Flow detention time= 9.2 min calculated for 468 cf (100% of inflow)
Center-of-Mass det. time= 9.0 min (806.0 - 797.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.00'	331 cf	**37.50'W x 8.67'L x 4.00'H Field A** 1,300 cf Overall - 297 cf Embedded = 1,003 cf x 33.0% Voids
#2A	11.50'	297 cf	**Cultec R-360HD** x 6 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 6 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		628 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	15.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	11.00'	**5.950 in/hr Exfiltration over Surface area**
#2	Primary	12.30'	**4.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.90 hrs HW=11.05' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=11.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 74.35% Impervious, Inflow Depth = 0.00" for 1-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 PDA-1: Subcat PDA-1 Runoff Area=2,736 sf 91.05% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=93 Runoff=0.18 cfs 601 cf

Subcatchment PDA-2: Subcat PDA-2 Runoff Area=462 sf 0.03% Impervious Runoff Depth>0.00"
Tc=0.0 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment PDA-3: Subcat PDA-3 Runoff Area=153 sf 0.00% Impervious Runoff Depth>0.00"
Tc=0.0 min CN=39 Runoff=0.00 cfs 0 cf

Pond 1P: Cultec Infiltrators Peak Elev=11.88' Storage=130 cf Inflow=0.18 cfs 601 cf
Discarded=0.04 cfs 601 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 601 cf

Link 1L: Overland Flow Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 3,351 sf Runoff Volume = 601 cf Average Runoff Depth = 2.15"
25.65% Pervious = 860 sf 74.35% Impervious = 2,492 sf

Summary for Subcatchment PDA-1: Subcat PDA-1

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 601 cf, Depth> 2.64"
Routed to Pond 1P : Cultec Infiltrators

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=3.40", P2=3.40"

Area (sf)	CN	Description
245	39	>75% Grass cover, Good, HSG A
2,492	98	Paved parking, HSG A
2,736	93	Weighted Average
245		8.95% Pervious Area
2,492		91.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct (Less than 6 mins)**

Summary for Subcatchment PDA-2: Subcat PDA-2

Runoff = 0.00 cfs @ 23.34 hrs, Volume= 0 cf, Depth> 0.00"
Routed to Link 1L : Overland Flow

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=3.40", P2=3.40"

Area (sf)	CN	Description
462	39	>75% Grass cover, Good, HSG A
0	98	Paved parking, HSG A
462	39	Weighted Average
462		99.97% Pervious Area
0		0.03% Impervious Area

Summary for Subcatchment PDA-3: Subcat PDA-3

Runoff = 0.00 cfs @ 23.34 hrs, Volume= 0 cf, Depth> 0.00"
Routed to Link 1L : Overland Flow

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=3.40", P2=3.40"

Area (sf)	CN	Description
153	39	>75% Grass cover, Good, HSG A
153		100.00% Pervious Area

Summary for Pond 1P: Cultec Infiltrators

Inflow Area = 2,736 sf, 91.05% Impervious, Inflow Depth > 2.64" for 2-Year event
Inflow = 0.18 cfs @ 12.09 hrs, Volume= 601 cf
Outflow = 0.04 cfs @ 11.80 hrs, Volume= 601 cf, Atten= 76%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.80 hrs, Volume= 601 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link 1L : Overland Flow

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 11.88' @ 12.47 hrs Surf.Area= 325 sf Storage= 130 cf

Plug-Flow detention time= 15.3 min calculated for 601 cf (100% of inflow)
Center-of-Mass det. time= 15.1 min (805.2 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.00'	331 cf	**37.50'W x 8.67'L x 4.00'H Field A** 1,300 cf Overall - 297 cf Embedded = 1,003 cf x 33.0% Voids
#2A	11.50'	297 cf	**Cultec R-360HD** x 6 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 6 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		628 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	15.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	11.00'	**5.950 in/hr Exfiltration over Surface area**
#2	Primary	12.30'	**4.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.80 hrs HW=11.05' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=11.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 74.35% Impervious, Inflow Depth > 0.00" for 2-Year event
Inflow = 0.00 cfs @ 23.34 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 23.34 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 PDA-1: Subcat PDA-1 Runoff Area=2,736 sf 91.05% Impervious Runoff Depth>4.43"
Tc=6.0 min CN=93 Runoff=0.30 cfs 1,010 cf

Subcatchment PDA-2: Subcat PDA-2 Runoff Area=462 sf 0.03% Impervious Runoff Depth>0.25"
Tc=0.0 min CN=39 Runoff=0.00 cfs 10 cf

Subcatchment PDA-3: Subcat PDA-3 Runoff Area=153 sf 0.00% Impervious Runoff Depth>0.25"
Tc=0.0 min CN=39 Runoff=0.00 cfs 3 cf

Pond 1P: Cultec Infiltrators Peak Elev=12.39' Storage=228 cf Inflow=0.30 cfs 1,010 cf
Discarded=0.04 cfs 927 cf Primary=0.10 cfs 83 cf Outflow=0.15 cfs 1,010 cf

Link 1L: Overland Flow Inflow=0.10 cfs 96 cf
Primary=0.10 cfs 96 cf

Total Runoff Area = 3,351 sf Runoff Volume = 1,023 cf Average Runoff Depth = 3.66"
25.65% Pervious = 860 sf 74.35% Impervious = 2,492 sf

Summary for Subcatchment PDA-1: Subcat PDA-1

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 1,010 cf, Depth> 4.43"
Routed to Pond 1P : Cultec Infiltrators

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=5.24", P2=3.40"

Area (sf)	CN	Description
245	39	>75% Grass cover, Good, HSG A
2,492	98	Paved parking, HSG A
2,736	93	Weighted Average
245		8.95% Pervious Area
2,492		91.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct (Less than 6 mins)**

Summary for Subcatchment PDA-2: Subcat PDA-2

Runoff = 0.00 cfs @ 12.34 hrs, Volume= 10 cf, Depth> 0.25"
Routed to Link 1L : Overland Flow

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=5.24", P2=3.40"

Area (sf)	CN	Description
462	39	>75% Grass cover, Good, HSG A
0	98	Paved parking, HSG A
462	39	Weighted Average
462		99.97% Pervious Area
0		0.03% Impervious Area

Summary for Subcatchment PDA-3: Subcat PDA-3

Runoff = 0.00 cfs @ 12.34 hrs, Volume= 3 cf, Depth> 0.25"
Routed to Link 1L : Overland Flow

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=5.24", P2=3.40"

Area (sf)	CN	Description
153	39	>75% Grass cover, Good, HSG A
153		100.00% Pervious Area

Summary for Pond 1P: Cultec Infiltrators

Inflow Area = 2,736 sf, 91.05% Impervious, Inflow Depth > 4.43" for 10-Year event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 1,010 cf
Outflow = 0.15 cfs @ 12.27 hrs, Volume= 1,010 cf, Atten= 51%, Lag= 11.0 min
Discarded = 0.04 cfs @ 11.65 hrs, Volume= 927 cf
Primary = 0.10 cfs @ 12.27 hrs, Volume= 83 cf
Routed to Link 1L : Overland Flow

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 12.39' @ 12.27 hrs Surf.Area= 325 sf Storage= 228 cf

Plug-Flow detention time= 25.5 min calculated for 1,008 cf (100% of inflow)
Center-of-Mass det. time= 25.3 min (801.7 - 776.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.00'	331 cf	**37.50'W x 8.67'L x 4.00'H Field A** 1,300 cf Overall - 297 cf Embedded = 1,003 cf x 33.0% Voids
#2A	11.50'	297 cf	**Cultec R-360HD** x 6 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 6 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		628 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	15.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	11.00'	**5.950 in/hr Exfiltration over Surface area**
#2	Primary	12.30'	**4.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.65 hrs HW=11.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.09 cfs @ 12.27 hrs HW=12.39' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.09 cfs @ 0.97 fps)

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 74.35% Impervious, Inflow Depth > 0.34" for 10-Year event
Inflow = 0.10 cfs @ 12.27 hrs, Volume= 96 cf
Primary = 0.10 cfs @ 12.27 hrs, Volume= 96 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 PDA-1: Subcat PDA-1 Runoff Area=2,736 sf 91.05% Impervious Runoff Depth>5.56"
Tc=6.0 min CN=93 Runoff=0.37 cfs 1,269 cf

Subcatchment PDA-2: Subcat PDA-2 Runoff Area=462 sf 0.03% Impervious Runoff Depth>0.56"
Tc=0.0 min CN=39 Runoff=0.00 cfs 22 cf

Subcatchment PDA-3: Subcat PDA-3 Runoff Area=153 sf 0.00% Impervious Runoff Depth>0.56"
Tc=0.0 min CN=39 Runoff=0.00 cfs 7 cf

Pond 1P: Cultec Infiltrators Peak Elev=12.51' Storage=249 cf Inflow=0.37 cfs 1,269 cf
Discarded=0.04 cfs 1,075 cf Primary=0.19 cfs 194 cf Outflow=0.24 cfs 1,269 cf

Link 1L: Overland Flow Inflow=0.19 cfs 223 cf
Primary=0.19 cfs 223 cf

Total Runoff Area = 3,351 sf Runoff Volume = 1,298 cf Average Runoff Depth = 4.65"
25.65% Pervious = 860 sf 74.35% Impervious = 2,492 sf

Summary for Subcatchment PDA-1: Subcat PDA-1

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 1,269 cf, Depth> 5.56"
Routed to Pond 1P : Cultec Infiltrators

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 25-Year Rainfall=6.39", P2=3.40"

Area (sf)	CN	Description
245	39	>75% Grass cover, Good, HSG A
2,492	98	Paved parking, HSG A
2,736	93	Weighted Average
245		8.95% Pervious Area
2,492		91.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct (Less than 6 mins)**

Summary for Subcatchment PDA-2: Subcat PDA-2

Runoff = 0.00 cfs @ 12.22 hrs, Volume= 22 cf, Depth> 0.56"
Routed to Link 1L : Overland Flow

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 25-Year Rainfall=6.39", P2=3.40"

Area (sf)	CN	Description
462	39	>75% Grass cover, Good, HSG A
0	98	Paved parking, HSG A
462	39	Weighted Average
462		99.97% Pervious Area
0		0.03% Impervious Area

Summary for Subcatchment PDA-3: Subcat PDA-3

Runoff = 0.00 cfs @ 12.22 hrs, Volume= 7 cf, Depth> 0.56"
Routed to Link 1L : Overland Flow

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 25-Year Rainfall=6.39", P2=3.40"

Area (sf)	CN	Description
153	39	>75% Grass cover, Good, HSG A
153		100.00% Pervious Area

Summary for Pond 1P: Cultec Infiltrators

Inflow Area = 2,736 sf, 91.05% Impervious, Inflow Depth > 5.56" for 25-Year event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 1,269 cf
Outflow = 0.24 cfs @ 12.19 hrs, Volume= 1,269 cf, Atten= 37%, Lag= 6.4 min
Discarded = 0.04 cfs @ 11.60 hrs, Volume= 1,075 cf
Primary = 0.19 cfs @ 12.19 hrs, Volume= 194 cf
Routed to Link 1L : Overland Flow

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 12.51' @ 12.19 hrs Surf.Area= 325 sf Storage= 249 cf

Plug-Flow detention time= 24.1 min calculated for 1,266 cf (100% of inflow)
Center-of-Mass det. time= 23.8 min (794.7 - 770.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.00'	331 cf	**37.50'W x 8.67'L x 4.00'H Field A** 1,300 cf Overall - 297 cf Embedded = 1,003 cf x 33.0% Voids
#2A	11.50'	297 cf	**Cultec R-360HD** x 6 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 6 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		628 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	15.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	11.00'	**5.950 in/hr Exfiltration over Surface area**
#2	Primary	12.30'	**4.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.60 hrs HW=11.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.19 cfs @ 12.19 hrs HW=12.50' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.19 cfs @ 2.17 fps)

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 74.35% Impervious, Inflow Depth > 0.80" for 25-Year event
Inflow = 0.19 cfs @ 12.19 hrs, Volume= 223 cf
Primary = 0.19 cfs @ 12.19 hrs, Volume= 223 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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 PDA-1: Subcat PDA-1 Runoff Area=2,736 sf 91.05% Impervious Runoff Depth>7.32"
Tc=6.0 min CN=93 Runoff=0.48 cfs 1,668 cf

Subcatchment PDA-2: Subcat PDA-2 Runoff Area=462 sf 0.03% Impervious Runoff Depth>1.22"
Tc=0.0 min CN=39 Runoff=0.01 cfs 47 cf

Subcatchment PDA-3: Subcat PDA-3 Runoff Area=153 sf 0.00% Impervious Runoff Depth>1.22"
Tc=0.0 min CN=39 Runoff=0.00 cfs 16 cf

Pond 1P: Cultec Infiltrators Peak Elev=12.75' Storage=295 cf Inflow=0.48 cfs 1,668 cf
Discarded=0.04 cfs 1,291 cf Primary=0.28 cfs 377 cf Outflow=0.33 cfs 1,668 cf

Link 1L: Overland Flow Inflow=0.29 cfs 440 cf
Primary=0.29 cfs 440 cf

Total Runoff Area = 3,351 sf Runoff Volume = 1,731 cf Average Runoff Depth = 6.20"
25.65% Pervious = 860 sf 74.35% Impervious = 2,492 sf

Summary for Subcatchment PDA-1: Subcat PDA-1

Runoff = 0.48 cfs @ 12.09 hrs, Volume= 1,668 cf, Depth> 7.32"
Routed to Pond 1P : Cultec Infiltrators

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=8.16", P2=3.40"

Area (sf)	CN	Description
245	39	>75% Grass cover, Good, HSG A
2,492	98	Paved parking, HSG A
2,736	93	Weighted Average
245		8.95% Pervious Area
2,492		91.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct (Less than 6 mins)**

Summary for Subcatchment PDA-2: Subcat PDA-2

Runoff = 0.01 cfs @ 12.03 hrs, Volume= 47 cf, Depth> 1.22"
Routed to Link 1L : Overland Flow

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=8.16", P2=3.40"

Area (sf)	CN	Description
462	39	>75% Grass cover, Good, HSG A
0	98	Paved parking, HSG A
462	39	Weighted Average
462		99.97% Pervious Area
0		0.03% Impervious Area

Summary for Subcatchment PDA-3: Subcat PDA-3

Runoff = 0.00 cfs @ 12.03 hrs, Volume= 16 cf, Depth> 1.22"
Routed to Link 1L : Overland Flow

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=8.16", P2=3.40"

Area (sf)	CN	Description
153	39	>75% Grass cover, Good, HSG A
153		100.00% Pervious Area

Summary for Pond 1P: Cultec Infiltrators

Inflow Area = 2,736 sf, 91.05% Impervious, Inflow Depth > 7.32" for 100-Year event
Inflow = 0.48 cfs @ 12.09 hrs, Volume= 1,668 cf
Outflow = 0.33 cfs @ 12.18 hrs, Volume= 1,668 cf, Atten= 32%, Lag= 5.4 min
Discarded = 0.04 cfs @ 11.35 hrs, Volume= 1,291 cf
Primary = 0.28 cfs @ 12.18 hrs, Volume= 377 cf
Routed to Link 1L : Overland Flow

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 12.75' @ 12.18 hrs Surf.Area= 325 sf Storage= 295 cf

Plug-Flow detention time= 23.0 min calculated for 1,668 cf (100% of inflow)
Center-of-Mass det. time= 22.8 min (787.3 - 764.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.00'	331 cf	**37.50'W x 8.67'L x 4.00'H Field A** 1,300 cf Overall - 297 cf Embedded = 1,003 cf x 33.0% Voids
#2A	11.50'	297 cf	**Cultec R-360HD** x 6 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 6 Chambers in 6 Rows Cap Storage= 6.5 cf x 2 x 6 rows = 77.5 cf
		628 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#0	Primary	15.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	11.00'	**5.950 in/hr Exfiltration over Surface area**
#2	Primary	12.30'	**4.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.35 hrs HW=11.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.28 cfs @ 12.18 hrs HW=12.74' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 3.19 fps)

Summary for Link 1L: Overland Flow

Inflow Area = 3,351 sf, 74.35% Impervious, Inflow Depth > 1.58" for 100-Year event
Inflow = 0.29 cfs @ 12.18 hrs, Volume= 440 cf
Primary = 0.29 cfs @ 12.18 hrs, Volume= 440 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: Derby Academy 56 Burditt Ave, Hingham MA 02043

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Infiltration Trench	0.80	1.00	0.80	0.20
	0.00	0.20	0.00	0.20
	0.00	0.20	0.00	0.20
	0.00	0.20	0.00	0.20
	0.00	0.20	0.00	0.20

Total TSS Removal = 80%

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

Project: 25.0126 Sagamore

Prepared By: EB

Date: 11/13/2025

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

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

Non-automated TSS Calculation Sheet
must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

STORMWATER O&M Plan

Narragansett Engineering Inc.
nei-cds.com
Civil • Survey • Structural • Environmental • Design
3102 East Main Road, Portsmouth RI 02871
Tel. 401.683.6630 www.nei-cds.com

Proposed Development Project
Derby Academy

56 Burditt Ave
Hingham MA 02043

Assessors Plat 49, Lot 57
Zoned RA
Issued 11/19/25

Property Owner:
Trustees of Derby Academy
56 Burditt Ave
Hingham MA 02043

Applicant/Operator:
Collene Ramsden
56 Burditt Ave
Higham MA 02043
E: cramsden@derbyacademy.org

Prepared by Joe Malo, PE

NEI Job Number: 25.0126

SITE OVERVIEW

Under existing conditions, the Area of Concern (AOC) includes a small underground infiltration system for the roof and walkways around the existing building. BMPs proposed for the project include a crushed stone bed and Cultech underground infiltrator units. The AOC includes a proposed air handler unit with retaining wall along the north of the AOC.

Short-term Requirements

Once construction has been completed, more frequent inspections and required maintenance shall be performed during the first growing season. These inspections shall be performed weekly during the first month after construction is completed and monthly for the remainder of the first growing season. The goal of these inspections is to ensure that no erosion of the partially stabilized soils is occurring. Any erosion that is observed shall be remedied quickly by repairing and reseeding as necessary

OPERATION AND MAINTENANCE PLAN

The stormwater management system, including all structural stormwater controls and conveyances, must have an operation and management plan to ensure that it continues to function as designed. The plan shall identify measures for implementing maintenance activities in a manner that minimizes stormwater runoff impacts. The owners of the lot will be responsible for the operation and maintenance of the site, the estimated budget, and the funding for the activities and equipment required. A legally binding and enforceable maintenance agreement shall be executed between the facility owner and the responsible authority to ensure the following:

REQUIRED ELEMENTS

Drainage Structures:

The drainage structures preceding the crushed stone bed will need inspection and cleaning as sediment reaches a depth of 6 inches.

Crushed Stone Bed:

The crushed stone bed shall remain free of debris, visually inspected and cleaned in conjunction with the underground infiltration system inspections.

Underground Infiltration System:

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices. At a minimum, it is recommended to perform annual inspections. Initially, the system should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

If inspection indicates the potential need for maintenance, access is provided via inspection ports. Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back for vacuuming. Most sewer and pipe

maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Please see the Cultec Product catalog for more information.

DESIGN GUIDANCE

Snow Disposal: Snow shall be removed from the crushed stone bed when an accumulation of snow occurs. Snow shall also be removed from all access drives and sidewalks whenever an accumulation of snow occurs by the owner/operator or a private licensed subcontractor. No snow shall be plowed in or adjacent to catch basins or stormwater areas.

Lawn and Landscape Management: The Owner shall mow to a height of no less than two inches during the growing season. Landscaping and landscaping maintenance shall be performed by a licensed subcontractor or property owner and all materials removed from the premises shall be in conformance with all applicable regulatory standards.

OWNER INFORMATION
Trustees of Derby Academy
56 Burditt Ave
Hingham MA 02043

OPERATOR
Collene Ramsden
T: 781-749-0746
E: cramsden@derbyacademy.org

Comments:

Actions to be Taken:

Underground Infiltration System

Project:

Location:

Site Status:

Date:

Time:

Inspector:

	Frequency	Action
Inlets and Outlets	Every 3 years	• Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	• Check inlet and outlets for clogging and remove any debris as required. •
Cultec Stormwater Chambers	2 years after commissioning	• Inspect the interior of the infiltration structure closely looking for settling, stained sand surface, and lack of draining. • Clean out sediment and debris if practice is not draining with 48 hours of a major storm event
	Spring and Fall	• Clean stormwater management forebay and all CB's
Surrounding Site	Monthly in 1st year	• Check for depressions in impervious areas over and surrounding the CB's and Collection system.
	Spring and Fall	• Check for depressions in areas over and surrounding the infiltration practice.
	Yearly	• Confirm that no unauthorized modifications have been performed to the site.

5.1 Minor Maintenance Log

Frequency		Action
Monthly in first year		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Month 1	Date:	
□ Month 2	Date:	
□ Month 3	Date:	
□ Month 4	Date	
□ Month 5	Date:	
□ Month 6	Date:	
□ Month 7	Date:	
□ Month 8	Date:	
□ Month 9	Date:	
□ Month 10	Date:	
□ Month 11	Date:	
□ Month 12	Date:	
Spring and Fall		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
One year after commissioning		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Year 1	Date:	
□ Year 4	Date:	
□ Year 7	Date:	
□ Year 10	Date:	
□ Year 13	Date:	
□ Year 16	Date:	
□ Year 19	Date:	
□ Year 22	Date:	

	Frequency		Action
Surrounding Site	**Monthly in 1st year**		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Month 1	Date:	
	□ Month 2	Date:	
	□ Month 3	Date:	
	□ Month 4	Date:	
	□ Month 5	Date:	
	□ Month 6	Date:	
	□ Month 7	Date:	
	□ Month 8	Date:	
	□ Month 9	Date:	
	□ Month 10	Date:	
	□ Month 11	Date:	
	□ Month 12	Date:	
	Spring and Fall		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	Yearly		□ Confirm that no unauthorized modifications have been performed to the site.
			Notes
	□ Year 1	Date:	
	□ Year 2	Date:	
	□ Year 3	Date:	
	□ Year 4	Date:	
	□ Year 5	Date:	
	□ Year 6	Date:	
	□ Year 7	Date:	

The projected O&M budget for the attached project includes

25.0126 Estimate of Yearly O&M Costs				
Item	Description	Yearly Frequency	Estimated Cost	Yearly Cost
1	Erosion Repairs	0.5	500	$ 250.00
2	Mowing	3	100	$ 300.00
3	Outlet Maint	0.25	600	$ 150.00
			Expected Yearly Budget	$ 700.00

Stormwater Facility Maintenance Agreement

THIS AGREEMENT, made and entered into this___ day of_____, 20__, by and between_____hereinafter called the "Landowner", and the Town of Hingham, hereinafter called the "Town".
WITNESSETH, that WHEREAS, the Landowner is the owner of certain real property described as_____, as recorded by deed in the land records of_____, Deed Book_____, Page_____hereinafter called the "Property".

WHEREAS, the Landowner is proceeding to build on and develop the property; and

WHEREAS, the Site Plan/Subdivision Plan known as _____, hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by the Town, provides for detention of stormwater within the confines of the property; and

WHEREAS, the Town and the Landowner, its successors and assigns, agree that the health, safety, and welfare of the residents of the Town require that on-site stormwater management facilities be constructed and maintained on the Property; and

WHEREAS, the Town requires that on-site stormwater management facilities as shown on the Plan be constructed and adequately maintained by the Landowner, its successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management facilities shall be constructed by the Landowner, its successors and assigns, in accordance with the plans and specifications identified in the Plan.
2. The Landowner, its successors and assigns, shall adequately maintain the stormwater management facilities in accordance with the required Operation and Maintenance Plan. This includes all pipes, channels or other conveyances built to convey stormwater to the facility, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. Adequate maintenance is herein defined as good working condition so that these facilities are performing their design functions. The Stormwater Best Management Practices Operation, Maintenance and Management Checklists are to be used to establish what good working condition is acceptable to the Town.

3. The Landowner, its successors and assigns, shall inspect the stormwater management facility as required in the Operation and Maintenance Plan. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structures, basin areas, access roads, etc. Deficiencies shall be noted in an inspection report.
4. The Landowner, its successors and assigns, hereby grant permission to the Town, its authorized agents and employees, to enter upon the Property and to inspect the stormwater management facilities whenever the Town deems necessary upon 48-hours's notice by the Town. The purpose of inspection is to follow-up on reported deficiencies and/or to respond to citizen complaints. The Town shall provide the Landowner, its successors and assigns, copies of the inspection findings and a directive to commence with the repairs if necessary.
5. In the event the Landowner, its successors and assigns, fails to maintain the stormwater management facilities in good working condition acceptable to the Town, upon 72 hours' notice the Town may enter upon the Property and take whatever steps necessary to correct deficiencies identified in the inspection report and to charge the costs of such repairs to the Landowner, its successors and assigns. This provision shall not be construed to allow the Town to erect any structure of permanent nature on the land of the Landowner outside of the easement for the stormwater management facilities. It is expressly understood and agreed that the Town is under no obligation to routinely maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Town.
6. The Landowner, its successors and assigns, will perform the work necessary to keep these facilities in good working order as appropriate. In the event a maintenance schedule for the stormwater management facilities (including sediment removal) is outlined on the approved plans, the schedule will be followed.
7. In the event the Town pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner, its successors and assigns, shall reimburse the Town upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the Town hereunder.
8. This Agreement imposes no liability of any kind whatsoever on the Town and the Landowner agrees to hold the Town harmless from any liability in the event the stormwater management facilities fail to operate properly.
9. This Agreement shall be recorded among the land records of the Town and shall constitute a covenant running with the land, and shall be binding on the Landowner, its administrators, executors, assigns, heirs and any other successors in interests.

WITNESS the following signatures and seals:

_____
Company/Corporation/Partnership Name (Seal)

By:_____

_____
(Type Name and Title)

The foregoing Agreement was acknowledged before me this_____day of _____, 20___, by

_____

_____
NOTARY PUBLIC
My Commission Expires:_____ By: _____

_____
(Type Name and Title)

The foregoing Agreement was acknowledged before me this_____day of _____, 20___, by

_____

_____
NOTARY PUBLIC
My Commission Expires: _____

Approved as to Form:

_____ _____
[Town/City] Attorney Date

Illicit Discharge Compliance Statement

Responsibility:

The Owner is responsible for ultimate compliance with all provisions of the Massachusetts Stormwater Management Policy, the USEPA NPDES Construction General Permit and responsible for identifying and eliminating illicit discharges (as defined by the USEPA).

OWNER NAME: Collene Ramsden

ADDRESS: 56 Burditt Ave
Hingham, MA 02043

TEL. NUMBER: 781-749-0746

Engineer's Compliance Statement:

To the best of my knowledge, the attached plans, computations and specifications meet the requirements of Standard 10 of the Massachusetts Stormwater Handbook regarding illicit discharges to the stormwater management system and that no detectable illicit discharges exist on the site. All documents and attachments were prepared under my direction and qualified personnel properly gathered and evaluated the information submitted, to the best of my knowledge.

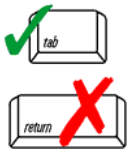
Included with this statement are site plans, drawn to scale, that identify the location of systems for conveying stormwater on the site and show that these systems do not allow the entry of any illicit discharges into the stormwater management system. The plans also show any systems for conveying wastewater and/or groundwater on the site and show that there are no connections between the stormwater and wastewater systems.

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature

11/25/25

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): Propiratary Underground Infiltration System

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☐ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

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;

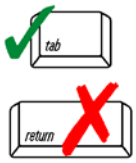
☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

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:

56 Burditt Avenue	Hingham, MA, 02043
a. Street Address	b. City/Town
111533	$362.50
c. Check number	d. Fee amount

2. Applicant Mailing Address: 75 Research Road, Hingham, MA, 02043

Joe	Harold	
a. First Name	b. Last Name	
Sagamore		
c. Organization		
75 Research Road		
d. Mailing Address		
Hingham	MA	02043
e. City/Town	f. State	g. Zip Code
6173651600		JHarold@sagamore.com
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

TRUSTEES OF DERBY ACADEMY	C/O JEFFREY CAMUSO	
a. First Name	b. Last Name	
TRUSTEES OF DERBY ACADEMY		
c. Organization		
56 BURDITT AVENUE		
d. Mailing Address		
Hingham	MA	02043
e. City/Town	f. State	g. Zip Code
7817490746		
h. Phone Number	i. Fax Number	j. Email Address

B. Fees

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

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

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

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

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

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Install a rooftop AC unit (RTU) and a 7'-5" retaining wall to allow the RTU to be set on a level stable pad	One	$500 (2J)	$500x1.5 = $750

Step 5/Total Project Fee: $750

State Share: ($750/2) - $12.50 = $362.50

Step 6/Fee Payments:

City/town Share:($750/2) + $12.50 = $387.50

Total Project Fee: $750
a. Total Fee from Step 5

State share of filing Fee: $362.50
b. 1/2 Total Fee **less $**12.50

City/Town share of filling Fee: $387.50
c. 1/2 Total Fee **plus** $12.50

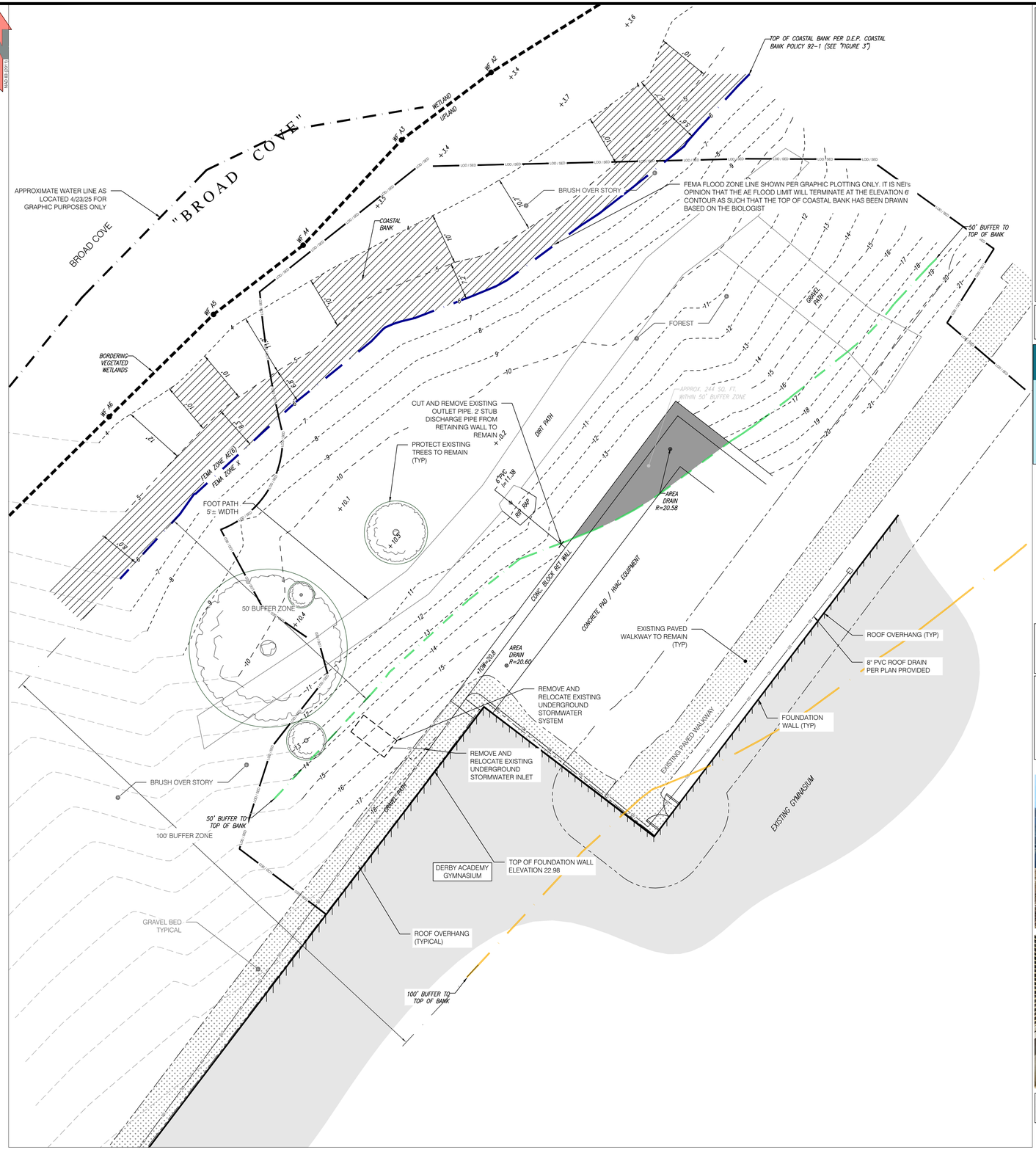
C. Submittal Requirements

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

Department of Environmental Protection
Box 4062
Boston, MA 02211

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

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



NEI SV-100

EXISTING CONDITIONS AND DEMO PLAN

Scale: 1" = 10'

0 10 15 20 30 50

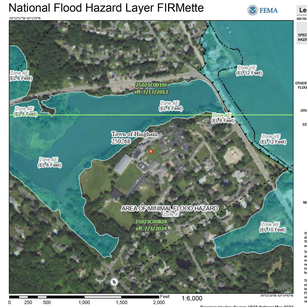
SURVEY NOTES:

1. ZONING INFORMATION SHOW FROM RECORD INFORMATION, MAPS AND / OR GIS. ZONING DATA MAY VARY BASED ON USE, LOT SIZE, ORIENTATION AND OTHER FACTORS AND IS SHOWN FOR REFERENCE INFORMATION ONLY.
2. ZONING DATA MUST BE CONFIRMED WITH ZONING OFFICIAL AND / OR LEGAL COUNSEL FOR USE IN DESIGN OR PERMITTING.
3. COORDINATE SYSTEM IS NAD83 MASSACHUSETTS STATE PLANE (MA83F)
4. PLAN ELEMENTS ARE IN U.S SURVEY FEET
5. TOPOGRAPHY AND COASTAL FEATURES SURVEYED ON 10-25 BY MERRILL ENGINEERS AND LAND SURVEYORS
6. ELEVATIONS & LOCATION SHOWN WITH * PER GIS OR UAV DATA
7. ALL PROPOSED ITEMS MUST BE LAID OUT BY REGISTERED SURVEYOR AS NOTED.
8. PLAN IS NOT AS-BUILT UTILITY PLAN.
9. ABUTTING PROPERTY LINES SHOWN APPROXIMATELY PER TOWN GIS OR BEST AVAILABLE INFORMATION
10. FLOOD ZONE LINE IS SHOWN PER GRAPHIC PLOTTING ONLY, UNLESS OTHERWISE NOTED ON PLAN.
11. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT OF PROBATE SEARCH, AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN.
12. LOCATION OF SUBSURFACE MAINS, SURFACE FEATURES, AND LATERALS ARE OMITTED. CONTRACTOR TO CALL DIG SAFE AND/OR APPLICABLE UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION. DIG SAFE TEL.#:1-800-344-7233 (1-800-DIG-SAFE).
    A. WATER - OMITTED FROM PLAN
    B. SEPTIC - OMITTED FROM PLAN
    C. GAS -OMITTED FROM PLAN
    D. ELECTRIC - OMITTED FROM PLAN
    E. STORM DRAIN - PER FIELD DATA AND REFERENCE PLAN

ALL UTILITIES DEPICTED AT ASCE QUALITY LEVEL D.

ALL POST-CONSTRUCTION CORRECTIVE WORK, WARRANTY, REPAIRS, OR MAINTENANCE PROVISIONS SHALL BE NOTED IN CONTRACT DOCUMENTS BETWEEN CLIENT AND CONTRACTOR(S). NO PROVISION ARE MADE IN THE PLANS UNLESS NOTED.

National Flood Hazard Layer FIRMette



BENCHMARK NOTE:
NEI WILL ALWAYS PROVIDE A MINIMUM OF TWO SITE BENCHMARKS. CONTRACTOR TO VERIFY ALL BENCHMARKS EXIST PRIOR TO CONSTRUCTION. ELEVATIONS OF ALL BENCHMARKS TO BE SHOT IN FIELD (WITH SUITABLE EQUIPMENT) AND DIFFERENTIAL TO BE VERIFIED, IF VERTICAL DIFFERENTIAL EXCEEDS 0.05' IT SHALL BE IMMEDIATELY REPORTED TO NEI. DIFFERENTIAL IN EXCESS OF 0.05' INDICATES THAT BENCHMARKS MAY HAVE BEEN DISTURBED AND ARE NOT SUITABLE FOR USE.

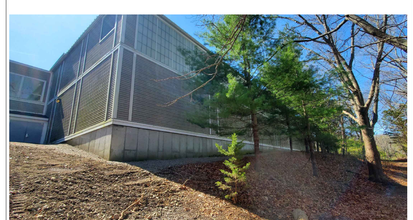
Delineation Flagging	Classification	Regulatory Setback
TCBa-1 – TCBa11	Coastal Bank (10.30) The seaward face or side of any elevated landform, other than a coastal dune, which lies at the landward edge of a coastal beach, land subject to tidal action, or other wetland.	100-foot Buffer Zone

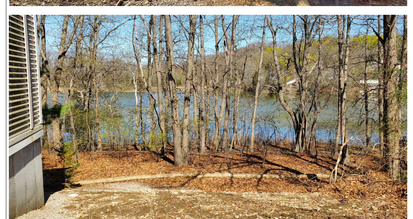
WETLAND NOTE:
ECR LLC HAS ESTABLISHED FLAGGING GENERALLY CONSISTENT WITH FIGURES 2 AND 6 OF THE WETLANDS PROGRAM POLICY 92-1: COASTAL BANKS CONSISTENT WITH TOWN OF HINGHAM REGULATIONS. FLOOD LINE DRAW FROM GRAPHIC PLOTTING ONLY IT IS NEI'S OPINION THAT THE AE FLOOD LIMIT WILL TERMINATE AT THE ELEVATION 6 CONTOUR AS SUCH THAT THE TOP OF COASTAL BANK HAS BEEN DRAWN BASED ON THE BIOLOGIST

WETLAND FLAGGING:

PERFORMED BY ENVIRONMENTAL CONSULTING AND RESTORATION LLC OCTOBER 2025 AND FIELD LOCATED BY MERRILL ENGINEERS AND LAND SURVEYORS.
FLAG LINES: A1 - A7 (TOP OF COASTAL BANK)

310 CODE OF MASSACHUSETTS REGULATIONS, SECTION 10.00, THE WETLANDS PROTECTION ACT (AUGUST 27, 2017) (WPA)





PLAN REFERENCE:
SITE PLANS (EXISTING CONDITIONS, DEMO, RETAINING WALL BY NARRAGANSETT ENGINEERING INC. DATED 4/24/25 REVISION 2 DATED 9/3/25

WETLAND KEY

- COASTAL BANK
- 50' BUFFER ZONE
- 100' BUFFER ZONE

LEGEND

100.00'	DIMENSION - EXISTING
100.00'	DIMENSION - PROPOSED
100.00' (D)	PLAN / DEED DIMENSION
100.00' (S)	SURVEY DIMENSION
	PROPERTY LINE - ABUTTING
	PROPERTY LINE - EXISTING
	PROPERTY LINE - PROPOSED
	SETBACKS
100.00	GRADE CONTOUR - EXISTING
100.00	GRADE CONTOUR - PROPOSED
OHE	ELECTRIC - OVERHEAD (OHE)
ETC	ELECTRIC - TELEPHONE - CABLE (ETC)
UGE	ELECTRIC - UNDERGROUND (UGE)
GAS	GAS (G)
SAN	SANITARY SEWER (S)
SD	STORM DRAIN (SD)
W	WATER
LOD	LIMIT OF DISTURBANCE (LOD)
SED	SEDIMENT CONTROL (SED)
LOD / SED	LOD / SED
	EDGE OF PAVEMENT - EXISTING
	FENCE - METAL
	FENCE - WOOD
	STONE WALL
	BRUSH LINE (APPROXIMATE)
	WETLAND LIMIT
CB	CATCH BASIN
DMH	DRAINAGE MANHOLE
SMH	SANITARY MANHOLE
EMH	ELECTRICAL MANHOLE
TMH	TELEPHONE MANHOLE
W	WELL
	GATE VALVE
WSO	WATER SHUT OFF
	FIRE HYDRANT
E	ELECTRIC BOX (ETC)
	UTILITY POLE
DS	DOWNSPOUT
	BENCHMARK
1 C-100	
	STRUCTURE, EXISTING
	STRUCTURE, PROPOSED
4.24	SPOT GRADE - EXISTING
4.24	SPOT GRADE - PROPOSED
	GROUND CONTROL POINT
	DRILL HOLE
	GRANITE BOUND
	REBAR / STEEL PIPE FOUND
	SPIKE
	WETLAND FLAG
	COASTAL FEATURE FLAG
	COASTAL BUFFER POST
	FLOW ARROW
TH No. 48" SHOWT 80" LEDGE	SOIL EVALUATION

NEI Narragansett Engineering Inc.
nei-cds.com
Civil • Survey Structural Environmental Design
3102 East Main Road, Portsmouth RI 02871
Tel. 401.683.6630 www.nei-cds.com

SHEET TITLE
EXISTING CONDITIONS PLAN & DEMO PLAN

DERBY ACADEMY 56 BURDITT AVE, HINGHAM, MA 02043
PROPERTY RECORD
56 BURDITT AVENUE
HINGHAM, MA 02043
[PLAT:49 LOT:57, ZONE: RA, AREA: 21.6 ACRES]
N/F: TRUSTEES OF DERBY ACADEMY

C/O
JASON EARLS
SAGAMORE
75 RESEARCH RD
HINGHAM, MA 02043
T. (781) 531-9466
E. JEARLS@SAGAMORE.COM

PROJECT NO.	DATE	BY
25.0126	9/16/25	AS

DRAWING ISSUE:
- ☐ CONCEPT / DISCUSSION
- ☒ PERMITTING
- ☐ CONSTRUCTION
- ☐ AS-BUILT
- ☐ OTHER

ONLY PLANS ISSUED FOR CONSTRUCTION SHALL BE USED FOR CONSTRUCTION

SCOPE:
RETAINING WALL DESIGN TO ACCOMMODATE MECH AIR HANDLER
SITE GRADING UTILITY RECONFIGURATION LIMIT OF DISTURBANCE, SESC AND RELATED SITE CIVIL WORK

PRIOR DEP PERMITS:
DEP 034-421, DEP 034-432, DEP 034-513.

COMMONWEALTH OF MASSACHUSETTS
JOSEPH W. MALO
CIVIL
NO. 51565
REGISTERED
PROFESSIONAL ENGINEER
11/25/25

FORMAL PLAN REVISIONS

No	DATE	STAGE/DESCRIPTION	BY

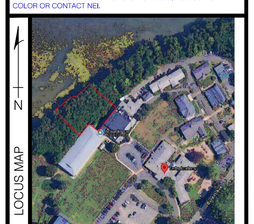
INTERNAL REVIEW

No	CHECK	CAD	DESCRIPTION/NOTES
1	JM	EB	PRELIMINARY STORMWATER
	10/7/25	10/6/25	DESIGN, SURFACE GRADES
			AROUND SYSTEM
2	JM	EB	REVISION OF STORMWATER
	11/4/25	11/3/25	AND GRADING BASED ON
			REVISED TOP OF COASTAL
			BANK AND BUFFER ZONES
3	JM	EB	UPDATED LOD AND DETAIL
	11/20/25	11/19/25	SHEETS, ADDED MITIGATION
			AREAS

nei-cds.com

DRAWINGS MUST BE PRINTED IN COLOR TO BE VALID. THIS NOTE SHOULD BE BLUE. IF THIS NOTE IS NOT BLUE, PLEASE REPRINT IN COLOR OR CONTACT NEI.

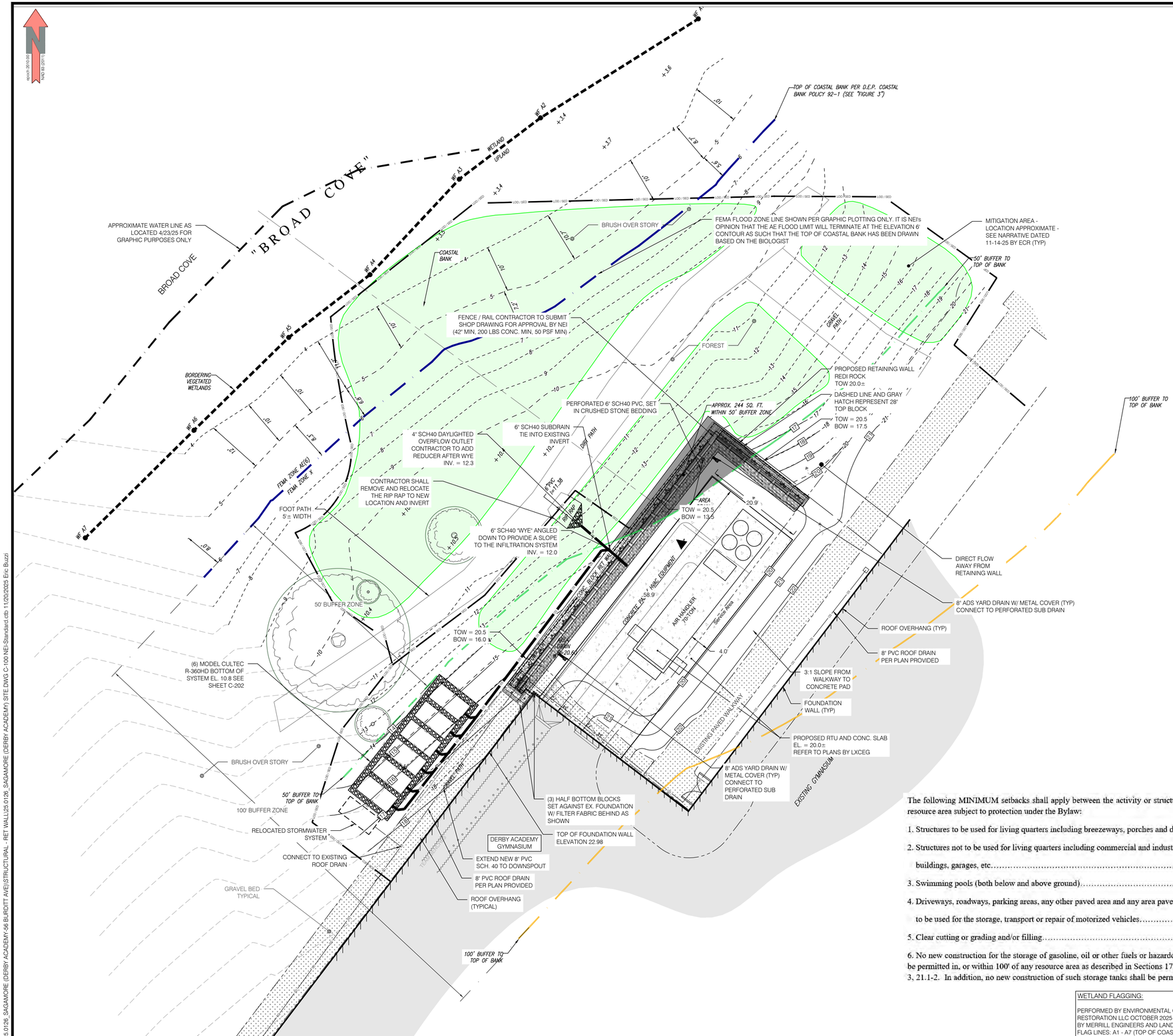
LOCUS MAP



SCALE 1" = 10'

SV-100

N:\PROJECTS\25.0126_SAGAMORE (DERBY ACADEMY-56 BURDITT AVE)\STRUCTURAL - RET WALL\25.0126_SAGAMORE (DERBY ACADEMY) SITE.DWG SV-100 NEI-Standard.ctb 11/20/2025 Eric Buzzi



The following MINIMUM setbacks shall apply between the activity or structure listed and any resource area subject to protection under the Bylaw:

1. Structures to be used for living quarters including breezeways, porches and decks.....50'
2. Structures not to be used for living quarters including commercial and industrial buildings, garages, etc.....50'
3. Swimming pools (both below and above ground).....50'
4. Driveways, roadways, parking areas, any other paved area and any area paved or gravel to be used for the storage, transport or repair of motorized vehicles.....50'
5. Clear cutting or grading and/or filling.....50'
6. No new construction for the storage of gasoline, oil or other fuels or hazardous materials shall be permitted in, or within 100' of any resource area as described in Sections 17.1-3, 18.1-5, 19.2-3, 21.1-2. In addition, no new construction of such storage tanks shall be permitted within flood

WETLAND FLAGGING:

PERFORMED BY ENVIRONMENTAL CONSULTING AND RESTORATION LLC OCTOBER 2025 AND FIELD LOCATED BY MERRILL ENGINEERS AND LAND SURVEYORS.
FLAG LINES: A1 - A7 (TOP OF COASTAL BANK)

310 CODE OF MASSACHUSETTS REGULATIONS, SECTION 10.00, THE WETLANDS PROTECTION ACT (AUGUST 27, 2017) (WPA)

LOAM & SEED NOTE:
ANY SEED MIX APPLIED WITHIN THE 50' BUFFER ZONE SHOULD BE NATIVE
NEW ENGLAND CONSERVATION/WILDLIFE MIX FROM NEW ENGLAND WETLAND PLANTS, INC. SEED MIX IS SUGGESTED, RECOMMENDED BY PWS, ED AVIZINIS TO BE SET LANDWARDS OF THE TOP-OF-BANK FOR ENVIRONMENTALLY SENSITIVE UPLAND SITES.
*SEED MIX SELECTION PENDING CONSERVATION COMMISSION APPROVAL
HTTPS://NEWP.COM/PRODUCT/NEW-ENGLAND-CONSERVATION-WILDLIFE-MIX/

STORMWATER NOTES:
1. CONTRACTOR TO VERIFY DEPTH TO WATER TABLE IN FIELD BY TEST PIT. SHOULD CONDITIONS VARY FROM DESIGN, CONTRACTOR TO COORDINATE WITH NEI.

NOTES:
1. REFER TO NARRATIVE DATED 11-14-25 BY ECR FOR ALL LANDSCAPE ELEMENTS AND MITIGATION AREAS

HATCH LEGEND
PROPOSED MITIGATION AREAS

WETLAND KEY
COASTAL BANK
50' BUFFER ZONE
100' BUFFER ZONE

LEGEND

100.00'	DIMENSION - EXISTING
100.00'	DIMENSION - PROPOSED
100.00' (D)	PLAN / DEED DIMENSION
100.00' (S)	SURVEY DIMENSION
	PROPERTY LINE - ABUTTING
	PROPERTY LINE - EXISTING
	PROPERTY LINE - PROPOSED
	SETBACKS
100.00	GRADE CONTOUR - EXISTING
100.00	GRADE CONTOUR - PROPOSED
OHE	ELECTRIC - OVERHEAD (OHE)
ETC	ELECTRIC - TELEPHONE - CABLE (ETC)
UGE	ELECTRIC - UNDERGROUND (UGE)
GAS	GAS (G)
SAN	SANITARY SEWER (S)
SD	STORM DRAIN (SD)
W	WATER
LOD	LIMIT OF DISTURBANCE (LOD)
SED	SEDIMENT CONTROL (SED)
LOD / SED	LOD / SED
	EDGE OF PAVEMENT - EXISTING
	FENCE - METAL
	FENCE - WOOD
	STONE WALL
	BRUSH LINE (APPROXIMATE)
	WETLAND LIMIT
CB	CATCH BASIN
D	DRAINAGE MANHOLE
S	SANITARY MANHOLE
E	ELECTRICAL MANHOLE
T	TELEPHONE MANHOLE
W	WELL
	GATE VALVE
WSO	WATER SHUT OFF
	FIRE HYDRANT
E	ELECTRIC BOX (ETC)
	UTILITY POLE
DS	DOWNSPOUT
	BENCHMARK
1 C-100	DETAIL REFERENCE
	STRUCTURE, EXISTING
	STRUCTURE, PROPOSED
4.24	SPOT GRADE - EXISTING
4.24	SPOT GRADE - PROPOSED
	GROUND CONTROL POINT
	DRILL HOLE
	GRANITE BOUND
	REBAR / STEEL PIPE FOUND
	SPIKE
	WETLAND FLAG
	COASTAL FEATURE FLAG
	COASTAL BUFFER POST
	FLOW ARROW
TH No. 48" SHGWT 80" LEDGE	SOIL EVALUATION

Narragansett Engineering Inc.
Civil • Survey Structural Environmental Design
3102 East Main Road, Portsmouth RI 02871
Tel. 401.683.6630 www.nei-cds.com

SHEET TITLE
SITE LAYOUT PLAN

DERBY ACADEMY 56 BURDITT AVE, HINGHAM, MA 02043
PROPERTY RECORD
56 BURDITT AVENUE
HINGHAM, MA 02043
[PLAT:49 LOT:57, ZONE: RA, AREA: 21.6 ACRES]
N/F: TRUSTEES OF DERBY ACADEMY

C/O
JASON EARLS
SAGAMORE
75 RESEARCH RD
HINGHAM, MA 02043
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E. JEARLS@SAGAMORE.COM

PROJECT NO.	DATE	BY
25.0126	9/16/25	AS

DRAWING ISSUE:
- ☐ CONCEPT / DISCUSSION
- ☒ PERMITTING
- ☐ CONSTRUCTION
- ☐ AS-BUILT
- ☐ OTHER

ONLY PLANS ISSUED FOR CONSTRUCTION SHALL BE USED FOR CONSTRUCTION

CIVIL PE STAMP FOR SITE ELEMENTS ONLY (DOES NOT INCLUDE STRUCTURAL COMPONENTS)

COMMONWEALTH OF MASSACHUSETTS
JOSEPH W. MALO
CIVIL
NO. 51565
REGISTERED PROFESSIONAL ENGINEER
11/25/25

FORMAL PLAN REVISIONS

No	DATE	STAGE/DESCRIPTION	BY

INTERNAL REVIEW

No	CHECK	CAD	DESCRIPTION/NOTES
1	JM	EB	PRELIMINARY STORMWATER
	10/7/25	10/6/25	DESIGN, SURFACE GRADES
			AROUND SYSTEM
2	JM	EB	REVISION OF STORMWATER
	11/4/25	11/3/25	AND GRADING BASED ON
			REVISED TOP OF COASTAL
			BANK AND BUFFER ZONES
3	JM	EB	UPDATED LOD AND DETAIL
	11/20/25	11/19/25	SHEETS, ADDED MITIGATION
			AREAS

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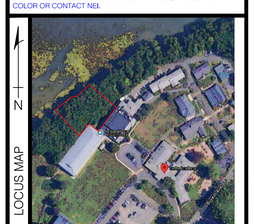
LOCUS MAP


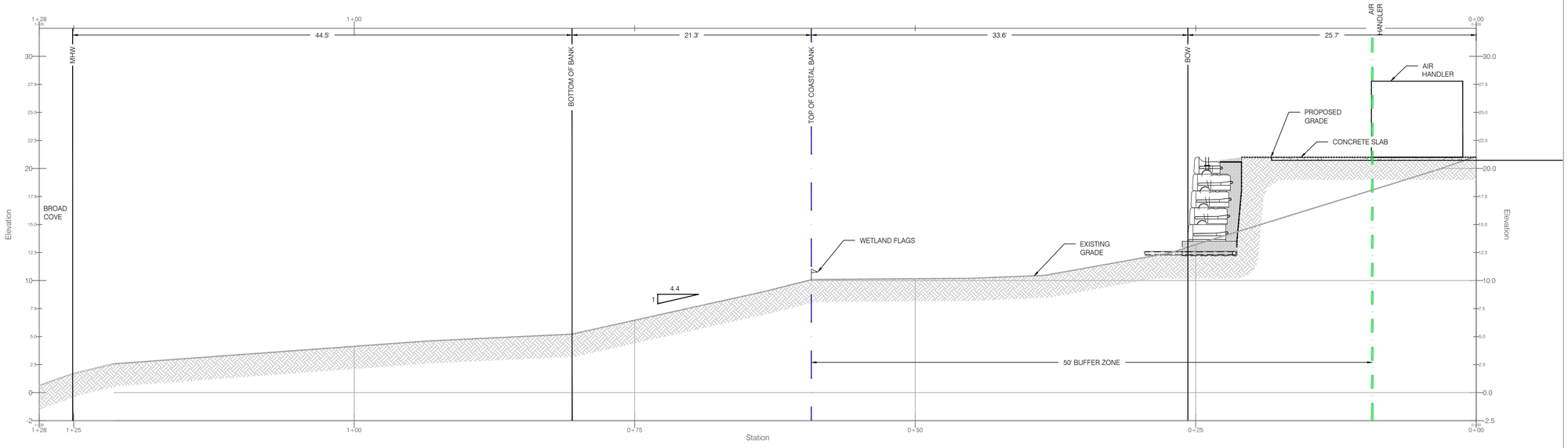
SCALE 1" = 10'

C-100

NEI C-100 SITE LAYOUT PLAN
Scale: 1" = 10'
0 10 15 20 30 50

N:\PROJECTS\25.0126_SAGAMORE (DERBY ACADEMY-56 BURDITT AVE)\STRUCTURAL - RET WALL\25.0126_SAGAMORE (DERBY ACADEMY) SITE.DWG C-100 NEI Standard.ctb 11/20/2025 Eric Buzzi

ELEVATION VIEW



NEI C-101 CROSS SECTION PLAN

Scale: 1" = 5'

0 5 7.5 10 15 25

NOTE:
SECTION PREPARED FOR USE IN A CONSERVATION COMMISSION APPLICATION ONLY. REFER TO C-200 FOR STRUCTURAL CROSS SECTIONS

RETAINING WALL NOTES:

1. STRIP ALL VEGETATION, ORGANIC SOILS AND UNSUITABLE FILL SOILS FROM THE WALL AND GRID ALIGNMENT AREA.
2. BENCH CUT ALL EXCAVATED SLOPES.
3. DO NOT OVER EXCAVATE UNLESS DIRECTED TO DO SO BY THE OWNERS SITE REPRESENTATIVE IN ORDER TO REMOVE UNSUITABLE SOIL IF OVER EXCAVATING IN ORDER TO IMPROVE BEARING CAPACITY, THE EXCAVATION SHALL EXTEND AT 1H:1V (FROM THE WALL BASE UNIT) IN FRONT OF THE WALL FACE AND AT LEAST AS FAR BEHIND THE WALL AS THE LONGEST GEOGRID LENGTH.
4. THE OWNER'S SITE REPRESENTATIVE SHALL VERIFY FOUNDATION SOILS AS BEING COMPETENT PER THE DESIGN STANDARDS AND PARAMETERS.
5. LEVELING PAD SHALL CONSIST OF 3/ 4" CRUSHED STONE OR COMPACTED GRAVEL, MINIMUM 6" DEPTH. A THIN PAD (MAX. 3" THICK) OF MAX. 2000 psf UNREINFORCED CONCRETE MAY BE SUBSTITUTED. IN EITHER CASE THE SUBGRADE MUST BE COMPACTED PRIOR TO PLACING THE CONCRETE.
6. EMBEDMENT OF WALL BELOW FINISH GRADE SHALL BE AS INDICATED ON THE WALL FACE DRAWING(S.)
7. FOLLOW APPLICABLE PROVISIONS OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS, ESPECIALLY WITH REGARDS TO LEVELING OF BLOCKS AND BASE.
8. DRAINAGE FILL MIN. 12" THICK SHALL BE INSTALLED BEHIND THE WALL. THIS MATERIAL SHALL BE CLEAN 3/4" CRUSHED STONE.
9. WHERE PERFORATED HOLE DRAINS ARE USED, PROVIDE OUTLETS AT THE ENDS OF THE WALL AND AT 40' INTERVALS, OR TIE TO A CLOSED DRAINAGE SYSTEM. (ALTERNATE OUTLET METHODS MAY BE APPROVED BY THE DESIGN ENGINEER.)
10. BACKFILL AND COMPACT THE FILL MATERIAL BEHIND THE WALL AS THE WALL IS INSTALLED.
11. COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED. THE MINIMUM NUMBER OF TESTS SHALL BE DETERMINED BY THE OWNER'S SITE REPRESENTATIVE.
12. COMPACTION SHALL BE TO 95% OF MAXIMUM STANDARD PROCTOR DENSITY (92% MODIFIED, ASTM D-1557) OF THE FILL MATERIAL.
13. GEOGRID CUT LENGTHS AS SHOWN ON THE WALL FACE DRAWING(S) ARE MEASURED FROM THE FRONT FACE OF THE WALL.
14. ROLL GEOGRID OUT FROM THE WALL FACE AND PULL GEOGRID TIGHT PRIOR TO BACKFILLING.
15. THE PREFERRED LOCATION FOR GUARDRAIL/FENCE INSTALLATION IS BEYOND THE LENGTH OF THE GEOGRID. WHERE THIS CANNOT BE ACCOMPLISHED, THE FOLLOWING ALTERNATIVES ARE AVAILABLE FOR POST INSTALLATION:
    15.1. ALTERNATIVE # 1: FOR FENCE POSTS LOCATED LESS THAN 3 FEET FROM THE REAR OF THE WALL BLOCK USE THE "SLEEVE-IT" FENCE POST INSTALLATION SYSTEM (CONTACT AT 1-603-883-3042). THIS PROCEDURE INVOLVES THE USE OF THE "SLEEVE-IT" POST RISER AND SUPPORT STRUTS AND IS INSTALLED WHEN THE WALL IS APPROX. 24' BELOW ITS FINISHED GRADE.
    15.2. ALTERNATIVE #2:
        15.2.1 FOR GUARDRAILS/FENCES INSTALLED WHERE GEOGRID IS LESS THAN 19" FROM THE SURFACE, THE SOIL ABOVE THE GEOGRID IS TO BE EXCAVATED AND THE GEOGRID HAND-CUT. THE HOLE CUT IN THE GRID IS TO BE JUST LARGE ENOUGH FOR THE POST INSTALLATION. IF THE POST EXTENDS THROUGH FURTHER GRID LAYERS, IT MAY BE DRIVEN THROUGH ADDITIONAL LAYERS, PROVIDED THE DRIVEN END IS TAPERED IN SOME FORM TO PROVIDE A POINT. SQUARE-EDGE POSTS SHALL NOT BE DRIVEN THROUGH GEOGRID LAYERS. DRIVING WOOD POSTS IN CLOSE PROXIMITY TO THE REAR OF THE WALL MAY PUSH THE WALL FACE OUTWARD DUE TO DISPLACED SOIL;
        15.2.2 FOR GUARDRAILS/FENCES INSTALLED WHERE GEOGRID IS MORE THAN 19" FROM THE SURFACE, THE POST MAY BE DRIVEN THROUGH THE GRID LAYER(S), PROVIDED THE DRIVEN END IS TAPERED IN SOME FORM TO PROVIDE A POINT. SQUARE-EDGE POSTS SHALL NOT BE DRIVEN THROUGH GEOGRID LAYERS. DRIVING WOOD POSTS IN CLOSE PROXIMITY TO THE REAR OF THE WALL MAY PUSH THE WALL FACE OUTWARD DUE TO DISPLACED SOIL; AUGERING OF POST HOLES IS ACCEPTABLE, PROVIDED GEOGRID LAYERS WITHIN 19" OF THE SURFACE ARE HAND-CUT PRIOR TO AUGERING THE HOLE. IF THE POSTS ARE TO BE SLEEVED AND SET IN CONCRETE, ALL GRID LAYERS MUST BE HAND CUT, WITH THE CUT HOLES JUST LARGE ENOUGH TO PROVIDE ROOM FOR THE SLEEVE. USE OF A HAND-OPERATED POST -HOLE SHOVEL TO CUT THROUGH GEOGRID IS ACCEPTABLE FOR GRID LAYERS DEEPER THAN 15" FROM THE SURFACE. THE PREFERRED MINIMUM DISTANCE FROM THE BACK OF THE WALL TO A GUARDRAIL POST IS 2 FEET, UTILIZING A 6-FOOT POST DEPTH. IF THE GUARDRAIL MUST BE CLOSER THAN 2 FEET FROM THE BACK OF THE WALL, SIGNIFICANTLY DEEPER POST DEPTHS AND/OR ALTERNATIVE METHODS OF INSTALLATION MAY BE REQUIRED. EVALUATION OF THE STRUCTURAL CAPABILITIES OF ANY GUARDRAIL OR FENCE SYSTEM INSTALLED AT THIS SITE WAS NOT PART OF THIS DESIGN.
16. PROVIDE LATERAL DRAINAGE SWALES TO DIRECT FLOWS AROUND THE ENDS OF THE WALL AND AWAY FROM THE WALL DURING CONSTRUCTION. DO NOT CONSTRUCT SWALE BEHIND WALLS AS PART OF FINISHED CONSTRUCTION. GRADE TO ALLOW WATER TO FLOW OVER WALL FACE (OR TO A POINT MORE THAN 10 FEET BEYOND THE LONGEST GEOGRID LENGTH).
17. TURF, OR SOME ACCEPTABLE FORM OF SOIL EROSION PROTECTION, SHOULD BE ESTABLISHED AT THE TOP OF THE WALL AS SOON AS POSSIBLE AFTER THE WALL HAS BEEN COMPLETED.
18. FINAL WALL ALIGNMENT SHALL BE LOCATED IN THE FIELD BY THE OWNER'S SITE REPRESENTATIVE.
19. RECOMMENDED COMPACTION EQUIPMENT WITHIN 15 FEET OF THE BACK OF THE WALL IS AS FOLLOWS:
    0 - 4 FEET HAND TAMP OR VIBRATORY PLATE COMPACTOR
    4 - 15 FEET NOTHING LARGER THAN TWO-DRUM, WALK-BEHIND VIBRATORY ROLLER
    (LARGER ROLLERS CAN BE USED STATICALLY, PROVIDED LIFT SIZE DOES NOT COMPROMISE ACHIEVEMENT OF NECESSARY COMPACTION RATES.)
20. WHERE CATCH BASINS ARE PLACED IN CLOSE PROXIMITY TO THE WALL, THE CONTRACTOR SHOULD CONSIDER THE USE OF ECCENTRIC CONES IN ORDER TO MINIMIZE THE POSSIBLE IMPACT OF THE STRUCTURE ON THE WALL AND THE GEOGRID LAYERS.
21. ANY PLANTINGS SET BEHIND THE WALLS SHALL BE PLACED WITHOUT CUTTING OF THE GEOGRID REINFORCEMENT LAYERS. THIS CAN BE ACCOMPLISHED BY SETTING PLANTINGS ABOVE THE GEOGRID LAYERS OR BEYOND THE LIMITS OF THE GEOGRID LAYERS.
22. WHERE ANGLES IN THE RETAINING WALL ARE SHOWN, THE CONTRACTOR MAY CHOOSE TO CONSTRUCT THE WALL USING A CURVED FACE (AS DETAILED ON SHEET 1) AS OPPOSED TO THE SHARP ANGLE DEPICTED IN THE PLAN VIEW DRAWING. CURVES IN SEGMENTAL RETAINING WALLS REQUIRE LESS CUTTING OF BLOCK DURING CONSTRUCTION. USE OF CURVES IN PLACE OF SHARP ANGLES MUST BE APPROVED BY THE OWNER'S SITE REPRESENTATIVE.
23. FOR PIPES WHICH OUTLET THROUGH THE WALL, THE SPACE NEEDED TO SQUARE-OFF THE PIPE TO THE WALL MAY BE FILLED WITH NON-SHRINK MORTAR, BLOCKS CUT TO SIZE OR OTHER APPROVED SEALANT METHOD TO PREVENT MIGRATION OF FINES THROUGH GAPS AROUND THE PIPE. A GRANITE OR CONCRETE LINTEL IS AN APPROVED METHOD OF SPANNING THE PIPE FOR SUPPORT OF THE WALL ABOVE.
24. ANY UTILITY LINE HAVING A DIAMETER GREATER THAN 4" AND PASSING UNDER A RETAINING WALL MUST HAVE A MINIMUM CLEARANCE OF 24" BETWEEN THE WALL BASE COURSE AND THE CROWN OF THE UTILITY LINE. WHERE THIS MINIMUM CLEARANCE CANNOT BE ACHIEVED, A GRANITE OR CONCRETE HEADER SHALL BE INSTALLED OVER THE PIPE. THIS HEADER SHALL EXTEND AT LEAST 24" BEYOND BOTH SIDES OF THE PIPE, RUNNING ALONG THE WALL BASE. THE HEADER SHALL BE AT LEAST 12" DEEP (TO MATCH THE WALL DEPTH) AND BE CENTERED BENEATH THE WALL BASE. THE HEADER SHALL BE BAT LEAST 6" IN HEIGHT.
25. THE LOCATIONS, SIZES AND HEADWALL CONFIGURATIONS OF ANY PIPE/CULVERT SHOWN ON THESE DRAWINGS WERE TAKEN FROM INFORMATION SUPPLIED BY OTHERS. THE CONTRACTOR SHALL REFER TO DRAWINGS PREPARED BY THE SITE DESIGN ENGINEER FOR SPECIFIC SIZE, LOCATION AND CONFIGURATION INFORMATION OF ALL SITE UTILITIES.
26. THESE WALLS HAVE BEEN DESIGNED WITH CONSIDERATION OF SEISMIC LOADINGS.
27. WALL MUST BE INSTALLED BY QUALIFIED CONTRACTOR WITH EXPERIENCE IN AT LEAST 5 PROJECTS USING REDI ROCK WALLS OF SIMILAR HEIGHT AND SCALE
28. WALLS SHALL CONFORM ALL MANUFACTURER REQUIREMENTS AN INSTALLATION PROCEDURES

MADOT AGGREGATE NOTES:

GRAVEL BORROW. GRAVEL BORROW SHALL CONSIST OF BANK RUN SAND AND GRAVEL OR PLANT PROCESSED, CRUSHED OR UNCRUSHED GRAVEL WITH FINE AGGREGATE ADDED AS FILLER. ALTERNATIVELY, GRAVEL BORROW MAY CONSIST OF SELECTED MATERIALS WHICH HAVE BEEN RECLAIMED FROM WITHIN PROJECT LIMITS, ARE PROPORTIONED AND PROCESSED TO PRODUCE GRANULAR MATERIAL FOR REUSE AS GRAVEL BORROW WITHIN THE SOURCE PROJECT LIMITS. GRAVEL BORROW, WHETHER CONSISTING OF BANK RUN OR PLANT PROCESSED SAND AND GRAVEL, OR RECLAIMED AND PROCESSED GRANULAR MATERIAL, SHALL CONSIST OF SOUND, DURABLE PARTICLES FREE FROM LOAM, CLAY, ORGANIC SOIL, VEGETATIVE MATTER, SOFT AND ELONGATE PARTICLES.
GRAVEL BORROW SHALL CONFORM TO ALL APPLICABLE SPECIFICATION REQUIREMENTS PRIOR TO ITS FINAL PLACEMENT ON THE PROJECT. THE PRACTICE OF CULLING DELETERIOUS OR OUT OF SPECIFICATION MATERIAL AFTER PLACEMENT AND/OR GRADING IN-PLACE WILL NOT BE ALLOWED

BANK RUN OR PLANT-PROCESSED SAND AND GRAVEL. BANK RUN OR PLANT-PROCESSED SAND AND GRAVEL PROPOSED FOR GRAVEL BORROW SHALL BE WELL-GRADED AND MEET THE GRADATION REQUIREMENTS SPECIFIED IN MADOT M1.03.30. IN ADDITION, THE MAXIMUM PARTICLE SIZE SHALL NOT EXCEED 9 INCHES OR THREE-FOURTHS OF THE LOOSE LIFT THICKNESS, WHICHEVER IS SMALLER

ALL POST-CONSTRUCTION CORRECTIVE WORK, WARRANTY, REPAIRS, OR MAINTENANCE PROVISIONS SHALL BE NOTED IN CONTRACT DOCUMENTS BETWEEN CLIENT AND CONTRACTOR(S). NO PROVISION ARE MADE IN THE PLANS UNLESS NOTED.

WETLAND KEY
- COASTAL BANK
- 50' BUFFER ZONE
- 100' BUFFER ZONE

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SHEET TITLE
CROSS SECTION AND CIVIL NOTES

DERBY ACADEMY,56 BURDITT AVE, HINGHAM, MA 02043
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[PLAT:49 LOT:57, ZONE: RA, AREA: 21.6 ACRES]
N/F: TRUSTEES OF DERBY ACADEMY

C/O
JASON EARLS
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75 RESEARCH RD
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CIVIL PE STAMP FOR SITE ELEMENTS ONLY (DOES NOT INCLUDE STRUCTURAL COMPONENTS)

COMMONWEALTH OF MASSACHUSETTS
JOSEPH W. MALO
CIVIL
NO. 51565
REGISTERED
PROFESSIONAL ENGINEER
11/25/25

FORMAL PLAN REVISIONS

No	DATE	STAGE/DESCRIPTION	BY

INTERNAL REVIEW

No	CHECK	CAD	DESCRIPTION/NOTES
1	JM	EB	PRELIMINARY STORMWATER
	10/7/25	10/8/25	DESIGN, SURFACE GRADES
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	11/20/25	11/19/25	SHEETS, ADDED MITIGATION
			AREAS

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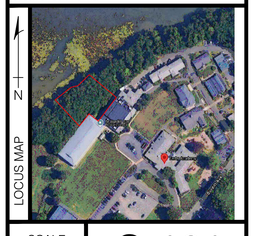
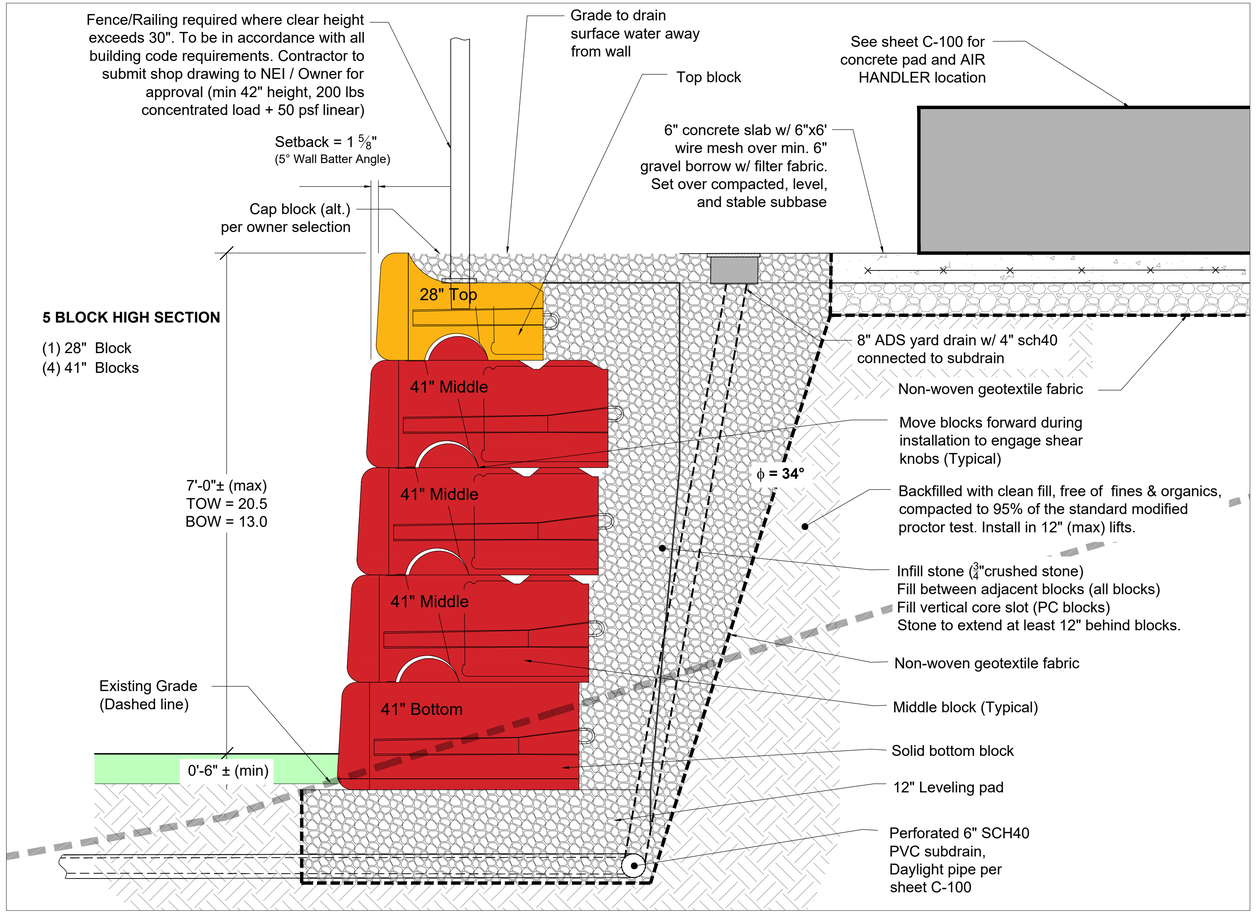
LOCUS MAP



SCALE AS INDICATED

C-101

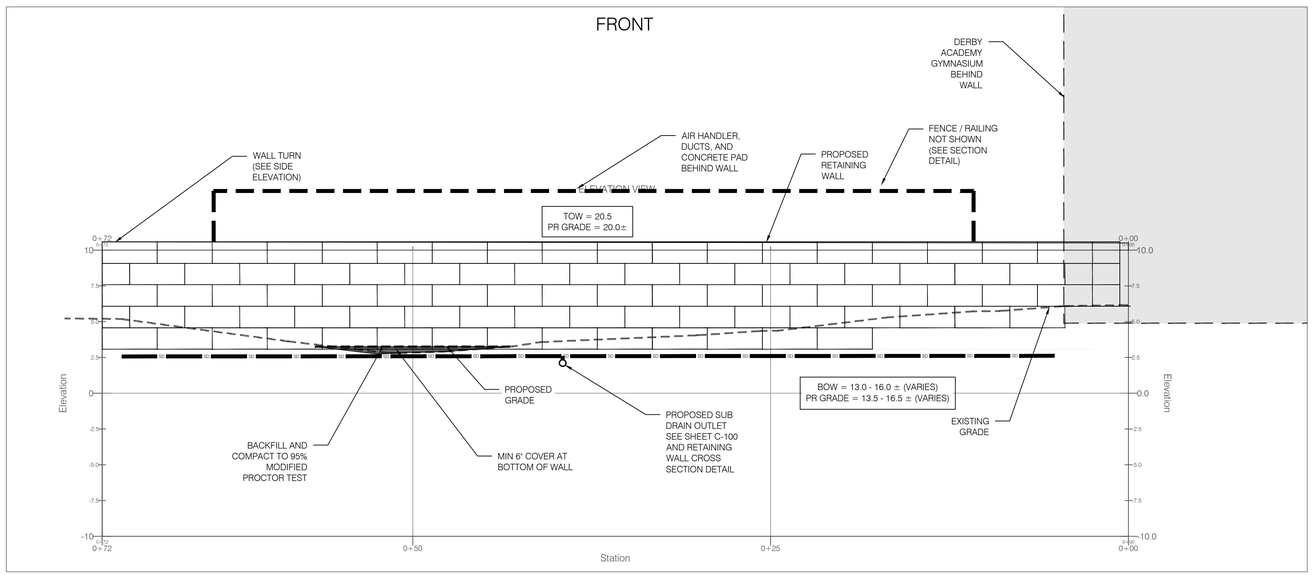
N:\PROJECTS\25.0126_SAGAMORE (DERBY ACADEMY-56 BURDITT AVE)\STRUCTURAL - RET WALL\25.0126_SAGAMORE (DERBY ACADEMY) SITE.DWG C-101 NEI-Standard.ctb 11/20/2025 Eric Buzzi



A / C-200 RETAINING WALL SECTION

Scale: 1" = 1'

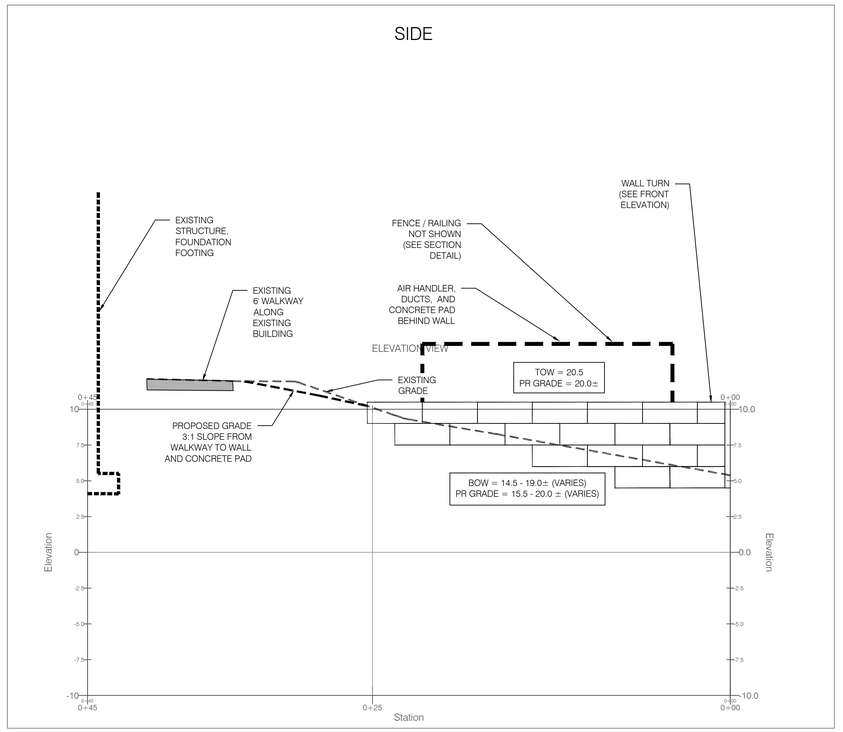
0 1 1.5 2 3 5



1 / C-200 RETAINING WALL FRONT ELEVATION

Scale: 1" = 5'

0 5 7.5 10 15 25



2 / C-200 RETAINING WALL SIDE ELEVATION

Scale: 1" = 5'

0 5 7.5 10 15 25

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SHEET TITLE

DETAILS AND NOTES

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SCOPE:
RETAINING WALL DESIGN TO ACCOMMODATE MECH AIR HANDLER
SITE GRADING UTILITY RECONFIGURATION LIMIT OF DISTURBANCE, SESC AND RELATED SITE CIVIL WORK

COMMONWEALTH OF MASSACHUSETTS
MICHAEL E. MARTEL
STRUCTURAL
No. 41674
REGISTERED PROFESSIONAL ENGINEER
11/25/2025

FORMAL PLAN REVISIONS

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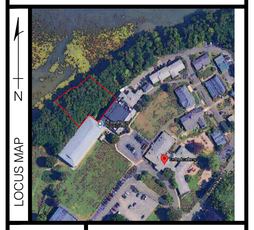

SCALE N/A

C-200

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EROSION AND SEDIMENT CONTROL NOTES:

1. ALL EROSION CONTROL SHALL BE IN ACCORDANCE WITH MASSACHUSETTS SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST REVISION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION AND MAINTENANCE OF ALL SEDIMENT AND EROSION CONTROL MEASURES SHOWN ON THESE PLANS.
3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED ONCE WEEKLY OR AFTER EVERY RAINFALL EVENT GREATER THAN 0.25 INCHES.
4. SEDIMENT BUILD UP GREATER THAN ONE-HALF THE BARRIER HEIGHT SHALL BE REMOVED AND DISPOSED OF PROPERLY AS REQUIRED. ANY SEDIMENT BUILD UP OUTSIDE OF THE SEDIMENT BARRIER SHALL BE REMOVED IMMEDIATELY.
5. CONTRACTOR SHALL MAINTAIN A RESERVE OF EROSION CONTROL MATERIALS FOR EMERGENCY USE AND ROUTINE MAINTENANCE.
6. THE CONTROLS SHOWN ON THESE PLANS ARE INTENDED AS MINIMUM MEASURES. ADDITIONAL MEASURES MAY BE REQUIRED AND SHALL BE IMPLEMENTED BY THE CONTRACTOR IF WARRANTED OR REQUESTED BY THE OWNER, OWNERS REPRESENTATIVE, ENGINEER, OR ANY APPLICABLE REGULATING AGENCY.
7. PRIOR TO THE START OF ANY LAND CLEARING / GRUBING OR OTHER CONSTRUCTION ACTIVITY THE PERIMETER CONTROLS SHALL BE PLACED, PROPERLY CONSTRUCTED AND CLEARLY VISIBLE. THESE CONTROLS SHALL REPRESENT THE LIMITS OF WORK AND WORKERS SHALL BE NOTIFIED THAT NO CONSTRUCTION ACTIVITY IS ALLOWED BEYOND THESE CONTROLS.
8. IF OR AS POSSIBLE CONSTRUCTION SHALL BE PHASED TO LIMIT TO THE MAXIMUM EXTENT PRACTICABLE THE AMOUNT OF EXPOSED SOILS. ALL DISTURBED AREAS SHALL BE TEMPORARILY OR PERMANENTLY STABILIZED WITHIN 14 DAYS OF COMPLETION OF GRADING ACTIVITIES.
9. THE CONTRACTOR SHALL SCHEDULE WORK IN A WAY TO ALLOW POSITIVE DRAINAGE OF SUBGRADE THROUGHOUT CONSTRUCTION.
10. CONSTRUCTION ENTRANCES PER RIDOT STANDARD DETAIL 9.9.0 SHALL BE EMPLOYED AT ALL POINTS OF INGRESS AND EGRESS FROM THE SITE.
11. TEMPORARY DIVERSIONS, SEDIMENT BASINS, AND TEMPORARY SWALES MAY BE USED AND SHALL BE SIZED ACCORDING TO THE MASSACHUSETTS SOIL EROSION AND SEDIMENT CONTROL HANDBOOK.
12. CATCH BASINS AND STORM DRAINS SHALL BE PROTECTED PER RIDOT STANDARD DETAIL 9.8.0 IN GRASSED AREAS OR SEDIMENT BAGS IN PAVED AREAS.
13. TEMPORARY SEDIMENT STOCK PILES SHALL BE KEPT MOIST AND COVERED AT ALL TIMES. CALCIUM CHLORIDE SHALL ONLY BE USED IF AN APPROVAL FROM THE TOWN/CITY OR OTHER APPLICABLE AGENCY HAS BEEN GRANTED.
14. DEWATERING FROM EXCAVATIONS WILL BE CONVEYED BY HOSE TO AN UPLAND AREAS AND DISCHARGED INTO A DEWATERING BASIN PER RIDOT STANDARD 9.7.0, HAYBALE CORRALS, OR SEDIMENTATION BAGS. THE CONTRACTOR SHALL ENSURE THAT NO CONTAMINATE IS PRESENT IN ANY WATERS PRIOR TO DISCHARGE FROM SITE AND IS RESPONSIBLE FOR ALL ENGINEERING, EQUIPMENT, MATERIAL AND LABOR REQUIRED FOR THE SITE WATER REMOVAL DURING CONSTRUCTION.
15. CONSTRUCTION WASTE MATERIALS SHALL BE KEPT ON-SITE AND DISPOSED OF IN AN APPROVED AND APPROPRIATE MANNER IN ACCORDANCE WITH ALL APPLICABLE REGULATORY AGENCIES.
16. RIPRAP SHALL BE USED WHERE NECESSARY TO CONTROL EXIT VELOCITIES.
17. NON MOBILE (I.E. TRACKED MACHINERY) SHALL BE MAINTAINED WITHIN THE LIMIT OF DISTURBANCE DEFINED BY SEDIMENT BARRIER.
18. NEWLY VEGETATED AREAS SHALL BE REGULARLY INSPECTED AND MAINTAINED TO ENSURE ESTABLISHMENT OF APPROPRIATE VEGETATION.
19. THE CONTRACTOR SHALL NOT REMOVE ANY EROSION AND SEDIMENTATION CONTROL MEASURES UNTIL FINAL ACCEPTANCE OF THE SITE HAS OCCURRED.
20. ALL DRAINAGE STRUCTURES SHALL BE CLEARED OF ACCUMULATED SEDIMENT PRIOR TO THE FINAL SITE ACCEPTANCE.
21. TEMPORARY VEGETATIVE COVER SHALL BE APPLIED TO ANY DISTURBED AREAS (INCLUDING SOIL STOCKPILE AREAS) THAT HAVE NOT YET REACHED FINISH GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS A TEMPORARY ASSIST UNLESS THE ACTIVITY IS TO RESUME WITHIN 21 DAYS. THE RECOMMENDED TEMPORARY SEATING DATES ARE MARCH 15 TO NOVEMBER 15 WITH THE APPROVAL OF THE ENGINEER.THIS TEMPORARY VEGETATIVE COVER SHALL CONSIST OF 60% OF ANNUAL OR PERENNIAL RYEGRASS AND 40% OF MULLET OR SUDAN GRASS OR 100% OF WINTER RYE. ANNUAL OR PERENNIAL RYEGRASS SHALL BE PLANTED AT THE RATE OF 1.5 POUNDS PER 1000 FT.^{2}, WINTERIZE SHALL BE PLANTED AT A RATE OF 2.5 POUNDS PER 1000 FT.^{2}, AND MILLET OR SUDAN GRASS SHALL BE PLANTED AT A RATE OF 1 POUND PER 1000 FT.^{2}

LIMESTONE AND FERTILIZER SHALL BE APPLIED ACCORDING TO SOIL TEST RECOMMENDATIONS OFFERED BY THE UNIVERSITY OF MASSACHUSETTS SOIL TESTING LABORATORY. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 300 POUNDS PER ACRE OR 7 1/2 POUNDS PER 1000 FT.^{2} OF 10 – 10–10 OR EQUIVALENT. APPLY LIMESTONE EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE AS FOLLOWS: (1) 3 TONS PER ACRE OR 135 POUNDS FOR 1000 FT.^{2} FOR CLAY, CLAY LOAM, AND HIGH ORGANIC SOIL (2) 2 TONS PER ACRE OR 90 POUNDS FOR 1000 FT.^{2} FOR SANDY LOAM, LOAM, SILTY LOAM, AND (3) 1 TON PER ACRE OR 45 POUNDS PER 1000 FT.^{2} LOAMY SAND OR SAND. TEMPORARY VEGETATIVE COVER SHALL BE INSTALLED AS OUTLINED IN THE MASSACHUSETTS SOIL EROSION AND SEDIMENT CONTROL HANDBOOK.

22. PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO ALL DISTURBED AREAS THAT HAVE REACHED FINISH GRADE AS SOON AS POSSIBLE, BUT NO MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS PERMANENTLY CEASED. THE RECOMMENDED PERMANENT SEATING DATES ARE APRIL 1 TO MAY 31 AND AUGUST 15 TO OCTOBER 15. PERMANENT VEGETATIVE COVER OUTSIDE OF DETENTION BASINS, IMPERVIOUS SURFACES, OR NOT OTHERWISE SPECIFIED ON THE LANDSCAPE PLANS SHALL RECEIVE THE FOLLOWING SEED MIXTURE ALSO KNOWN AS PARK SEED MIXTURE.

75% OF RED FESCUE	APPLICATION RATE: 1.75 LBS/ 1,000 SF
15% OF KENTUCKY BLUEGRASS	APPLICATION RATE: 0.35 LBS/ 1,000 SF
5% COLONIAL BENTGRASS	APPLICATION RATE: 0.11 LBS/ 1,000 SF
5% OF PERENNIAL RYEGRASS	APPLICATION RATE: 0.11 LBS/ 1,000 SF

LIMESTONE AND FERTILIZER SHALL BE APPLIED ACCORDING TO SOIL TEST RECOMMENDATIONS OFFERED BY THE UNIVERSITY OF MASSACHUSETTS SOIL TESTING LABORATORY. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT A RATE OF 500 POUNDS PER ACRE OR 11.5 POUNDS PER 1000 FT.^{2} OF 10–20 DASH 20 OR EQUIVALENT. APPLY LIMESTONE EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE AS FOLLOWS: 4 TONS PER ACRE OR 180 POUNDS PER 1000 FT.^{2} FOR CLAY, CLAY LOAM, AND HIGH ORGANIC SOIL: 3 TONS PER ACRE OR 135 POUNDS PER 1000 FT.^{2} FOR SANDY LOAM, LOAM, OR SILT LOAM: AND 2 TONS PER ACRE OR 90 POUNDS PER 1000 FT.^{2} LET ME SAND OR SAND.

NOTE:
THE USE OF HAY IS NOT ALLOWED. ALL REFERENCES TO HAY, SHALL BE TAKEN TO MEAN STRAW.

DEMOLITION NOTES:

1. THE CONTRACTOR SHALL COORDINATE ALL DEMOLITION OF STRUCTURES, PAVEMENT, CONCRETE MATERIALS AND UTILITIES WITH THE PROPOSED SITE, UTILITY, LANDSCAPING, AND ARCHITECTURAL DRAWINGS
2. ALL NOTED UTILITIES TO BE REMOVED AND DISPOSED OF, RELOCATED OR CAPPED REPRESENT ALL KNOWN SITE CONDITIONS TO BE DEMOLISHED. CONTRACTOR SHALL COORDINATE ALL UNFORESEEN CONDITIONS WITH THE PROJECT ENGINEER, ARCHITECT, OWNER REPRESENTATIVE AND/OR AFFECTED UTILITIES COMPANY
3. THERE SHALL BE NO INTERRUPTION OF UTILITY SERVICE DURING THE CONSTRUCTION PROCESS WITHOUT THE WRITTEN PERMISSION OF THE OWNER OR OWNERS REPRESENTATIVE
4. WATER, SEWER, DRAINAGE AND OTHER SITE UTILITIES SERVICING THE EXITING FACILITIES ARE TO REMAIN ACTIVE UNTIL PROPOSED IMPROVEMENTS ARE CONSTRUCTED AND ONLINE. WHEN CONNECTION TO ACTIVE OR RELOCATED UTILITIES, SHUTDOWNS SHALL BE MINIMIZED AND COMPLETED OFF HOURS AND COORDINATED WITH THE OWNER OR OWNER REPRESENTATIVE.

GENERAL NOTES:

1. THE STATE OF MASSACHUSETTS STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2004 EDITION, AND THE MASSACHUSETTS STANDARD DETAILS ARE MADE A PART HEREOF AS FULLY AND COMPLETELY AS IF ATTACHED HERETO. ALL WORK SHALL CONFORM TO MASSACHUSETTS STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION 2004 EDITION OR LATEST REVISION. THE 2004 EDITION OF THE STANDARD SPECIFICATION MAY BE OBTAINED AT THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION.
2. IT SHALL BE THE CONTRACTORS SOLE RESPONSIBILITY TO APPLY FOR AND OBTAIN ANY AND ALL NECESSARY PERMITS, PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE SAME, AND COORDINATE WITH ARCHITECT OR ENGINEER AS NECESSARY
3. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE SAFETY OF THE JOB SITE. THE CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AND/OR BARRIERS AROUND ANY EXPOSED EXCAVATED AREAS IN ACCORDANCE WITH OSHA STANDARDS.
4. IN THE CASE THAT ANY DEVIATION / ALTERATION / OR IMPROVEMENT FROM THE APPROVED PLANS IS NECESSARY THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE ENGINEER AND OWNER PRIOR TO OCCURRENCE OF DEVIATION
5. ALL WORK SHALL BE LIMITED TO THE AREAS WITHIN THE LIMIT OF DISTURBANCE DISPLAYED ON THESE PLANS OR PROPERTY LINE IF LIMIT OF DISTURBANCE IS UNCLEAR. ANY AREA DISTURBED OUTSIDE OF THE LIMIT OF DISTURBANCE SHALL BE REPAIRED AND RESTORED TO ITS ORIGINAL CONDITION AT NO COST TO THE OWNER OR ENGINEER, AND PREFORMED TO THE ENGINEERS SATISFACTION
6. ALL SITE WORK SHALL MEET OR EXCEED THE SITE WORK SPECIFICATION SHOWN ON THESE PLANS AND/OR ACCOMPANYING SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING IF ANY CONFLICTS WITH EXISTING CONDITIONS OR PROPOSED CONDITIONS EXIST. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK THAT WOULD BE AFFECTED
7. EXCAVATED ROCK SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF UNLESS OTHER ARRANGEMENTS ARE MADE WITH THE OWNER. SUITABLE ROCK MAY BE UTILIZED IN FILL AREAS WITH WRITTEN PERMISSION OF THE OWNERS REPRESENTATIVES
8. DEBRIS, ORGANICS AND OTHER UNSUITABLE MATERIALS UNCOVERED DURING THE COURSE OF SITE EXCAVATION SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY
9. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF ALL EXISTING UTILITIES THAT SERVICE THE SITE AND NEIGHBORING AREAS. IF ANY DAMAGE OCCURS TO EXISTING UTILITIES IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PAY ALL COSTS ASSOCIATED WITH REPAIR OF UTILITIES AS DIRECTED BY THE ENGINEER, UTILITY OWNER, OR GOVERNING AGENCY
10. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR QUANTITY TAKE-OFF IN COMPUTING ANY ESTIMATES
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL TEMPORARY SEDIMENTATION AND EROSION CONTROLS.
12. THE LOCATION OF EXISTING UTILITIES AS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR. "DIG SAFE" SHALL BE CONTACTED BY THE CONTRACTOR AS PART OF THIS VERIFICATION
13. NO EXCAVATION SHALL PROCEED UNTIL UTILITY COMPANIES ARE NOTIFIED IN ADVANCE
14. ALL TREE PROTECTION BY OTHERS UNLESS OTHERWISE NOTED
15. CONTRACTOR TO LOAM AND SEED ALL DISTURBED AREAS WITH APPROPRIATE SEED MIXTURES

GRADING AND UTILITIES NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED WORK SHOWN ON THESE PLANS DO NOT CONFLICT WITH ANY EXISTING CONDITIONS OR OTHER PROPOSED WORK. IF CONFLICTS ARISE, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK WHICH WOULD BE AFFECTED. NO FIELD ADJUSTMENTS IN THE LOCATION OF SITE ELEMENTS SHALL BE MADE WITHOUT THE ENGINEERS APPROVAL
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH WORK, THE LOCATION, ELEVATION, SIZE AND MATERIAL SHALL BE ACCURATELY DETERMINED BY THE CONTRACTOR IMMEDIATELY AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION. THE CONTRACTOR SHALL NOT CONTINUE WORK ON AFFECTED UTILITIES UNTIL THE CONFLICT IS RESOLVED
3. ALL WORK PERFORMED AND ALL MATERIALS FURNISHED SHALL CONFORM WITH THE LINE AND GRADES ON THE PLANS AND SITE WORK SPECIFICATIONS
4. AT ALL LOCATIONS WHERE EXITING CURBING OR PAVEMENT ABUT NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAW CUT TO A CLEAN, SMOOTH EDGE. BLEND NEW PAVEMENT AND CURBS SMOOTHLY INTO EXISTING BY MATCHING LINES, GRADES AND JOINTS
5. ALL UTILITY COVERS, GRATES, AND THE LIKE SHALL BE BE FLUSH WITH THE SURROUNDING SURFACE OR PAVEMENT FINISH. RIM ELEVATIONS ARE APPROXIMATE AND FINAL ELEVATIONS ARE TO BE SET FLUSH AND CONSISTENT WITH GRADING
6. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION OF PRIVATE UTILITIES BY THE UTILITY COMPANY, AS REQUIRED.
7. THE CONTRACTOR SHALL PROTECT ALL UNDERGROUND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADING. ANY DAMAGE RESULTING TO THESE FACILITIES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THE CONTRACTORS EXPENSE
8. ALL WATER WORKS SHALL HAVE 5 FEET OF COVER
9. GAS, ELECTRIC, AND COMMUNICATIONS ROUTING ARE SUBJECT TO REVIEW AND APPROVAL BY UTILITY COMPANY
10. DURING CONSTRUCTION CONTRACTOR SHALL PROTECT EXITING UTILITIES BY PROVIDING TEMPORARY SUPPORTS OR SHEETING AS REQUIRED AT NOT ADDITIONAL COST TO THE OWNER
11. EXCAVATION REQUIRED WITHIN THE PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINE OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATION AT NO COST TO THE OWNER
12. PITCH EVENLY BETWEEN ALL SPOT GRADES.
13. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ANY, ROCKS, DEBRIS, ORGANICS, OR THE LIKE UNCOVERED IN THE COURSE OF WORK

LOAM AND SEED:

GENERAL:
1. ALL DISTURBED AREAS TO BE LOAMED AND SEEDED PER "MASSACHUSETTS SOIL EROSION AND SEDIMENT CONTROL HANDBOOK" AS AMENDED OR REVISED
2. FOR NON-NATIVE PLANTING SEEDING DATES ARE APRIL 1 THROUGH JUNE 15 AND AUGUST 15 THROUGH SEPTEMBER 30, DATE MAY BE EXTENDED 15 DAYS IN NEWPORT COUNTY
3. FOR NATIVE PLANING SEEDING DATES ARE BETWEEN AUGUST AND SEPTEMBER

SEED BED PREPARATION:
1. LOOSEN SOIL TO A DEPTH OF FIVE INCHES BY RAKING, DISCING, DRAGGING OR TRAVERSING WITH TRACKED MACHINERY. OVER COMPACTION SHALL BE AVOIDED CLEAT MARKS SHALL BE PERPENDICULAR TO ANTICIPATED DIRECTION OF SURFACE WATER FLOW
2. APPLY TOPSOIL IF NECESSARY
3. APPLY SLOW RELEASE FERTILIZER NOT TO EXCEED 1500 LBS PER ACRE OR 36 LBS PER 1,000 SF USING THE FOLLOWING PERCENTAGES BY WEIGHT
   - 10% AVAILABLE NITROGEN (N)
   - 20% AVAILABLE PHOSPHORIC ACID (P)
   - 20% AVAILABLE POTASSIUM (K)
4. REMOVE FROM SURFACE ALL STONES LARGER THAN 2" IN DIAMETER, ALL DEBRIS, TREE ROOTS OR OTHER UNSUITABLE MATERIAL
5. INSPECT AREA TO BE SEEDED IMMEDIATELY PRIOR TO SEEDING FOR ANY COMPACTED AREAS, IF COMPACTED AREAS EXIST SCARIFY PRIOR TO COMMENCING SEEDING

SEEDING:
1. APPLY SELECTED SEED AT RATES PROVIDED UNIFORMLY MY HAND, CYCLONE SEEDER, DRILL, CULTIPACKER TYPE SEEDER OR HYDROSEEDER
2. NORMAL SEEDING DEPTH IS .25 TO .5 INCH. HYDROSEEDINGS MAY BE LEFT ON THE SOIL SURFACE
3. WHERE FEASIBLE, EXCEPT WHERE EITHER CULTIPACKER TYPE SEEDER OR HYDROSEEDER IS USED, FIRM THE SEEDBED FOLLOWING SEEDING OPERATION WITH ROLLER, OR LIGHT DRAG.
4. SEEDING RATES SHALL BE INCREASED BY 10% WHEN USING HYDROSEEDING
5. USE OF STRAW MULCH HELD WITH ADHESIVE MATERIALS OR 500 LBS PER ACRE OF WOOD FIBER MULCH IS RECOMMENDED FOR PROTECTION FROM SOIL EROSION.
6. IF SEEDING CAN NOT BE COMPLETED WITHIN SEEDING DATES USE MULCHING TO PROTECT SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.

RECOMMENDED SEEDING:
SEED MIXTURE NO. 1

• KENTUCKY BLUE GRASS	22.5 LBS/AC	0.5 LBS/1000 SF
• CREEPING RED FESCUE	105 LBS/AC	2.5 LBS/1000 SF
• PERENNIAL RYEGRASS	22.5 LBS/AC	0.5 LBS/1000 SF

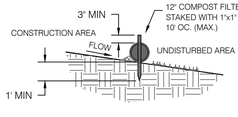
NOTES: WHERE CONFUSION OR UNCERTAINTY EXISTS IN LOAMING AND SEEDING CONSULT THE "MASSACHUSETTS SOIL EROSION AND SEDIMENT CONTROL HANDBOOK" AS AMENDED OR REVISED, ENGINEER, LANDSCAPE ARCHITECT

COMPOST FILTER SOCK DETAIL

N.T.S.

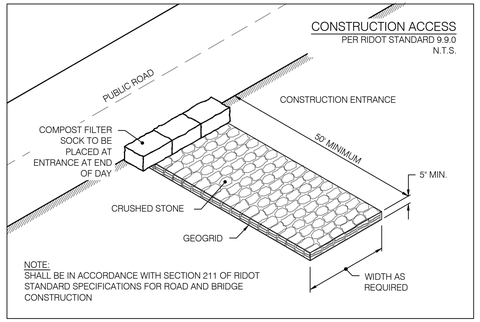
A. INSTALLATION. COMPOST FILTER SOCKS SHALL BE CONSTRUCTED AT THE LOCATIONS, AND IN ACCORDANCE WITH THE DETAILS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER. THE FOLLOWING STIPULATIONS ALSO APPLY:
1. COMPOST FILTER SOCKS MAY BE EITHER FABRICATED ON SITE OR DELIVERED TO THE SITE.
2. COMPOST MEDIA SHALL CONFORM TO AASHTO MP 9-06
3. TRENCHING IS NOT REQUIRED. COMPOST FILTER SOCKS SHALL BE PLACED OVER THE TOP OF GROUND, WOODEN STAKES SHALL BE DRIVEN THROUGH THE CENTER OF THE FILTER SOCKS TO ANCHOR THEM TO THE GROUND. TO ENSURE OPTIMUM PERFORMANCE, HEAVY VEGETATION SHALL BE CUT DOWN OR REMOVED, AND EXTREMELY UNEVEN SURFACES SHALL BE GRADED TO ENSURE THAT THE COMPOST FILTER SOCK UNIFORMLY CONTACTS THE GROUND SURFACE.
4. FILTER SOCKS SHALL BE PLACED IN A CONTINUOUS LINE. WHERE ENDS INTERSECT THEY SHALL BE SLEEVED TO CREATE AN INTERLOCK WITH A TWO (2) FOOT OVERLAP. AFTER ONE SECTION IS FILLED AND THE ENDS TIED OFF, THE NEXT SECTION SHALL BE PULLED OVER THE TIED OFF END OF THE PREVIOUS SECTION, TO CREATE A 2 FOOT OVERLAP. THE OVERLAP SHALL BE STAKED. THE INTERSECTING OVERLAPS SHALL BE CONSTRUCTED TO ENSURE THAT STORMWATER DOES NOT BREAK THROUGH AT THESE INTERSECTION POINTS.

B. REMOVAL. THIS WORK, IF REQUIRED, SHALL INCLUDE THE REMOVAL OF THE COMPOST FILTER SOCK AND STAKES. UNLESS BIODEGRADABLE, THE MESH FILTER SOCK MATERIAL SHALL BE CUT OPEN AND THE MESH REMOVED. IN GENERAL, THE COMPOST FILTER MATERIAL MAY BE LEFT IN PLACE, HOWEVER THE MATERIAL WILL BE RAKED OUT LEVELED TO SURROUNDING GRADES, THEN SEEDED. PRIOR TO SUCH REMOVAL, HOWEVER, ALL SILT, MUD AND DEBRIS ENTRAPPED OUTSIDE OF THE COMPOST FILTER SOCK SHALL BE REMOVED AND THE AREA CLEANED UP.



CONSTRUCTION ACCESS

PER RIDOT STANDARD 9.9.0
N.T.S.

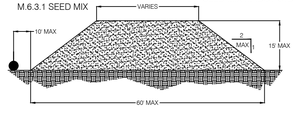


NOTE:
SHALL BE IN ACCORDANCE WITH SECTION 211 OF RIDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION

TEMPORARY SEDIMENT STOCKPILE

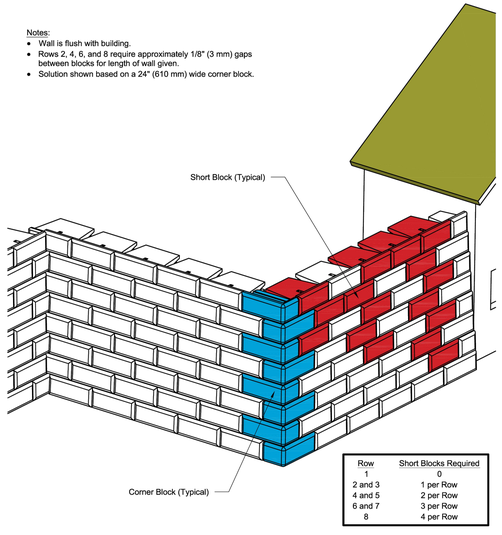
N.T.S.

NOTES:
1. PRIOR TO CONSTRUCTION CONTRACTOR SHALL PREPARE PLAN INDICATING LOCATIONS OF SEDIMENT STOCKPILES FOR APPROVAL BY THE ENGINEER OR APPROPRIATE REGULATORY AUTHORITY
2. STOCKPILE SHALL NOT EXCEED GIVEN DIMENSIONS WITH OUT APPROVAL BY ENGINEER OR APPROPRIATE REGULATORY AUTHORITY
3. STOCKPILED MATERIAL NOT TO BE USED WITHIN 14 CALENDAR DAYS SHALL BE PLANTED WITH TEMPORARY SEED MIX MADOT STD M.6.3.1 SEED MIX



90° Battered Corner - Flush End

Notes:
- Wall is flush with building.
- Rows 2, 4, 6, and 8 require approximately 1/8" (3 mm) gaps between blocks for length of wall given.
- Solution shown based on a 24" (610 mm) wide corner block.



Row	Short Blocks Required
1	0
2 and 3	1 per Row
4 and 5	2 per Row
6 and 7	3 per Row
8	4 per Row

This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer using the actual conditions of the proposed site.

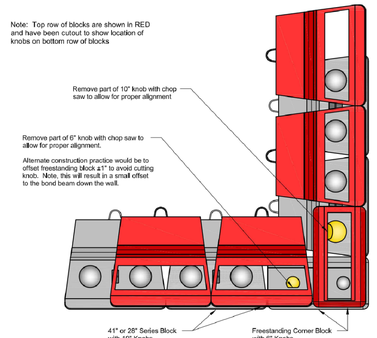
DRAWN BY:	JRJ	TITLE:	90° Battered Corner - Flush End
APPROVED BY:	JRJ		
DATE:	06-22-2015		
SHEET:	1 of 1	FILE:	10 90deg Battered Corner - Flush End 062215.dwg

REDI-ROCK
05481 US 31 SOUTH, CHARLEVOIX, MI 49720
(866) 222-6400 ext 3010 • engineering@redi-rock.com
www.redi-rock.com

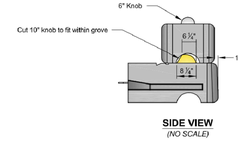
90° OUTSIDE CORNER DETAIL

(41" AND 28" SERIES)

Note: Top row of blocks are shown in RED and have been cutout to show location of knobs on bottom row of blocks



TOP VIEW
(NO SCALE)



SIDE VIEW
(NO SCALE)

DRAWN BY:	JRJ	TITLE:	90° Outside Corner Detail Trimmed Knob Option
APPROVED BY:	JRJ		
DATE:	06-22-2015		
SHEET:	1 of 1	FILE:	2 90deg Outside Corner Detail - Trimmed Knob 062215.dwg

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Narragansett Engineering Inc.
Civil • Survey Structural Environmental Design
3102 East Main Road, Portsmouth RI 02871
Tel. 401.683.6630 www.nei-cds.com

SHEET TITLE
DETAILS AND NOTES

DERBY ACADEMY 56 BURDITT AVE, HINGHAM, MA 02043
PROPERTY RECORD
56 BURDITT AVENUE
HINGHAM, MA 02043
[PLAT:49 LOT:57, ZONE: RA, AREA: 21.6 ACRES]
N/F: TRUSTEES OF DERBY ACADEMY

C/O
JASON EARLS
SAGAMORE
75 RESEARCH RD
HINGHAM, MA 02043
T. (781) 531-9466
E. JEARLS@SAGAMORE.COM

PROJECT NO.	DATE	BY
25.0126	9/16/25	AS

DRAWING ISSUE:
- ☐ CONCEPT / DISCUSSION
- ☒ PERMITTING
- ☐ CONSTRUCTION
- ☐ AS-BUILT
- ☐ OTHER

ONLY PLANS ISSUED FOR CONSTRUCTION SHALL BE USED FOR CONSTRUCTION

SCOPE:
RETAINING WALL DESIGN TO ACCOMMODATE MECH AIR HANDLER
SITE GRADING UTILITY RECONFIGURATION LIMIT OF DISTURBANCE, SESC AND RELATED SITE CIVIL WORK

COMMONWEALTH OF MASSACHUSETTS
MICHAEL E. MARTEL
STRUCTURAL
No. 41674
REGISTERED
PROFESSIONAL ENGINEER
11/25/2025

FORMAL PLAN REVISIONS

No	DATE	STAGE/DESCRIPTION	BY

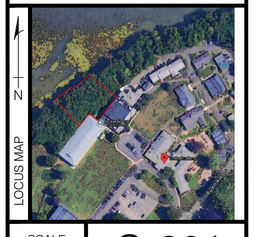
INTERNAL REVIEW

No	CHECK	CAD	DESCRIPTION/NOTES
1	JM	EB	PRELIMINARY STORMWATER
	10/7/25	10/6/25	DESIGN, SURFACE GRADES
			AROUND SYSTEM
2	JM	EB	REVISION OF STORMWATER
	11/4/25	11/3/25	AND GRADING BASED ON
			REVISED TOP OF COASTAL
			BANK AND BUFFER ZONES
3	JM	EB	UPDATED LOD AND DETAIL
	11/20/25	11/19/25	SHEETS, ADDED MITIGATION
			AREAS

nei-cds.com

DRAWINGS MUST BE PRINTED IN COLOR TO BE VALID. THIS NOTE SHOULD BE BLUE. IF THIS NOTE IS NOT BLUE, PLEASE REPRINT IN COLOR OR CONTACT NEI.

LOCUS MAP



SCALE
N/A

C-201

N:\PROJECTS\25.0126_SAGAMORE (DERBY ACADEMY-56 BURDITT AVE)\STRUCTURAL - RET WALL\25.0126_SAGAMORE (DERBY ACADEMY) SITE DWG C-201 NEI-Standard.ctb 11/20/2025 Eric Buzzi

CULTEC RECHARGER® 360HD PRODUCT SPECIFICATIONS

GENERAL

CULTEC RECHARGER® 360HD CHAMBERS ARE DESIGNED FOR UNDERGROUND STORMWATER MANAGEMENT. THE CHAMBERS MAY BE USED FOR RETENTION, RECHARGING, DETENTION OR CONTROLLING THE FLOW OF ON-SITE STORMWATER RUNOFF.

CHAMBER PARAMETERS

1. THE CHAMBERS SHALL BE MANUFACTURED IN THE U.S.A. BY CULTEC, OF BROOKFIELD, CT (CULTEC.COM, 203-775-4416).
2. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". THE LOAD CONFIGURATION SHALL INCLUDE:
   A. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   B. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   C. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
3. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   A. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   B. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   C. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95
5. THE INSTALLED CHAMBER SYSTEM SHALL BE STRUCTURALLY DESIGNED TO PROVIDE RESISTANCE TO LIVE LOADS AS DEFINED BY THE AASHTO H-20/HL-93 SPECIFICATION WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
6. THE CHAMBER SHALL BE STRUCTURAL FOAM INJECTION MOLDED OF BLUE VIRGIN HIGH MOLECULAR WEIGHT IMPACT-MODIFIED POLYPROPYLENE.
7. THE CHAMBER SHALL BE ARCHED IN SHAPE.
8. THE CHAMBER SHALL BE OPEN-BOTTOMED.
9. THE CHAMBER SHALL BE JOINED USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS.
10. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC RECHARGER®360HD SHALL BE 36 INCHES (914 MM) TALL, 60 INCHES (1525 MM) WIDE AND 50 INCHES (1275 MM) LONG. THE INSTALLED LENGTH OF A JOINED RECHARGER 360HD SHALL BE 3.67 FEET (1.12 M).
11. MULTIPLE CHAMBERS MAY BE CONNECTED TO FORM DIFFERENT LENGTH ROWS. EACH ROW SHALL BEGIN AND END WITH A SEPARATELY FORMED CULTEC RECHARGER® 360HD END CAP. MAXIMUM INLET OPENING ON THE END CAP IS 24 INCHES (600 MM) HDPE OR 30 INCHES (750 MM) PVC.
12. THE CHAMBER SHALL HAVE TWO SIDE PORTALS TO ACCEPT CULTEC HVLV™ FC-48 FEED CONNECTORS TO CREATE AN INTERNAL MANIFOLD. MAXIMUM ALLOWABLE PIPE SIZE IN THE SIDE PORTAL IS 10 INCHES (250 MM) HDPE AND 12 INCHES (300 MM) PVC.
13. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV™ FC-48 FEED CONNECTOR SHALL BE 12 INCHES (305 MM) TALL, 16 INCHES (406 MM) WIDE AND 49 INCHES (1245 MM) LONG.
14. THE NOMINAL STORAGE VOLUME OF THE RECHARGER 360HD CHAMBER SHALL BE 10.0 FT^3/ FT (.928 M^3 / M) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF A JOINED RECHARGER 360HD SHALL BE 36.67 FT^3 / UNIT (1.038 M^3 / UNIT) - WITHOUT STONE.
15. THE NOMINAL STORAGE VOLUME OF THE HVLV™ FC-48 FEED CONNECTOR SHALL BE 0.913 FT^3 / FT (0.085 M^3 / M) - WITHOUT STONE.
16. THE RECHARGER 360HD CHAMBER SHALL HAVE 7 CORRUGATIONS.
17. THE CHAMBER SHALL BE CAPABLE OF ACCEPTING A 6 INCH (150 MM) INSPECTION PORT OPENING AT THE TOP CENTER OF EACH CHAMBER, CENTERED ON THE CORRUGATION CREST.
18. THE UNITS MAY BE TRIMMED TO CUSTOM LENGTHS BY CUTTING BACK TO ANY CORRUGATION.
19. THE CHAMBER SHALL BE MANUFACTURED IN A FACILITY EMPLOYING CULTEC'S QUALITY CONTROL AND ASSURANCE PROCEDURES.
20. MAXIMUM ALLOWABLE COVER OVER THE TOP OF THE CHAMBER SHALL BE 12.0 FEET (3.66 M).

END CAP PARAMETERS

1. THE CULTEC RECHARGER® 360HD END CAP (REFERRED TO AS 'END CAP') SHALL BE MANUFACTURED IN THE U.S.A. BY CULTEC, OF BROOKFIELD, CT (CULTEC.COM, 203-775-4416).
2. THE END CAP SHALL BE STRUCTURAL FOAM INJECTION MOLDED OF BLUE VIRGIN HIGH MOLECULAR WEIGHT IMPACT-MODIFIED POLYPROPYLENE.
3. THE END CAP SHALL BE ARCHED IN SHAPE.
4. THE END CAP SHALL BE JOINED AT THE BEGINNING AND END OF EACH ROW OF CHAMBERS USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS.
5. THE END CAP SHALL HAVE 5 CORRUGATIONS.
6. THE NOMINAL DIMENSIONS OF THE END CAP SHALL BE 36.5 INCHES (927 MM) TALL, 60 INCHES (1525 MM) WIDE AND 18 INCHES (457 MM) LONG. WHEN JOINED WITH A RECHARGER 360HD CHAMBER, THE INSTALLED LENGTH OF THE END CAP SHALL BE 15 INCHES (381 MM).
7. THE NOMINAL STORAGE VOLUME OF THE END CAP SHALL BE 5.17 FT^3/ FT (0.48 M^3 / M) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF AN INTERLOCKED END CAP SHALL BE 6.46 FT^3 / UNIT (0.183 M^3 / UNIT) - WITHOUT STONE.
8. MAXIMUM INLET OPENING ON THE END CAP IS 24 INCHES (600 MM) HDPE OR 30 INCHES (750 MM) PVC.
9. THE END CAP SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12.

CULTEC HVLV FC-48 FEED CONNECTOR PRODUCT SPECIFICATIONS

GENERAL

CULTEC HVLV FC-48 FEED CONNECTORS ARE DESIGNED TO CREATE AN INTERNAL MANIFOLD FOR CULTEC RECHARGER MODEL 360HD STORMWATER CHAMBERS.

FEED CONNECTOR PARAMETERS

1. THE FEED CONNECTOR SHALL BE MANUFACTURED BY CULTEC, OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE FEED CONNECTOR SHALL BE VACUUM THERMOFORMED OF HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE) WITH A BLACK INTERIOR AND BLUE EXTERIOR.
3. THE FEED CONNECTOR SHALL BE ARCHED IN SHAPE.
4. THE FEED CONNECTOR SHALL BE OPEN-BOTTOMED.
5. THE NOMINAL DIMENSIONS OF THE CULTEC HVLV FC-48 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 49 INCHES (1245 mm) LONG.
6. THE NOMINAL STORAGE VOLUME OF THE HVLV FC-48 FEED CONNECTOR SHALL BE 0.913 FT^3 / FT (0.085 m^3 / m) - WITHOUT STONE.
7. THE HVLV FC-48 FEED CONNECTOR SHALL HAVE 4 CORRUGATIONS.
8. THE HVLV FC-48 FEED CONNECTOR MUST BE FORMED AS A WHOLE UNIT HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT SHALL FIT INTO THE SIDE PORTALS OF THE CULTEC RECHARGER STORMWATER CHAMBER AND ACT AS CROSS FEED CONNECTIONS CREATING AN INTERNAL MANIFOLD.
9. THE FEED CONNECTOR SHALL BE DESIGNED TO WITHSTAND AASHTO HS-25 DEFINED LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
10. THE FEED CONNECTOR SHALL BE MANUFACTURED IN AN ISO 9001:2008 CERTIFIED FACILITY.

CULTEC NO. 410™ NON-WOVEN GEOTEXTILE

CULTEC NO. 410™ NON-WOVEN GEOTEXTILE MAY BE USED WITH CULTEC CONTACTOR® AND RECHARGER® STORMWATER INSTALLATIONS TO PROVIDE A BARRIER THAT PREVENTS SOIL INTRUSION INTO THE STONE.

GEOTEXTILE PARAMETERS

1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TYPICAL WEIGHT OF 4.5 OZ/SY (142 G/M).
4. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH VALUE OF 120 LBS (533 N) PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE AN ELONGATION @ BREAK VALUE OF 50% PER ASTM D4632 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A MULLEN BURST VALUE OF 225 PSI (1551 KPA) PER ASTM D3786 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A PUNCTURE STRENGTH VALUE OF 65 LBS (289 N) PER ASTM D4833 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE VALUE OF 340 LBS (1513 N) PER ASTM D6241 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A TRAPEZOID TEAR VALUE OF 50 LBS (222 N) PER ASTM D4533 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A AOS VALUE OF 70 U.S. SIEVE (0.212 MM) PER ASTM D4751 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY VALUE OF 1.7 SEC-1 PER ASTM D4491 TESTING METHOD.
12. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATE VALUE OF 135 GAL/MIN/SF (5500 L/MIN/SM) PER ASTM D4491 TESTING METHOD.
13. THE GEOTEXTILE SHALL HAVE A UV STABILITY @ 500 HOURS VALUE OF 70% PER ASTM D4355 TESTING METHOD.

CULTEC AFAB-HPF™ WOVEN GEOTEXTILE

CULTEC AFAB-HPF WOVEN GEOTEXTILE IS DESIGNED AS A UNDERLAYMENT TO PREVENT SCOURING CAUSED BY WATER MOVEMENT WITHIN THE CULTEC CHAMBERS AND FEED CONNECTORS UTILIZING THE CULTEC MANIFOLD FEATURE. IT MAY ALSO BE USED AS A COMPONENT OF THE CULTEC SEPARATOR ROW TO ACT AS A BARRIER TO PREVENT SOIL/CONTAMINANT INTRUSION INTO THE STONE WHILE ALLOWING FOR MAINTENANCE.

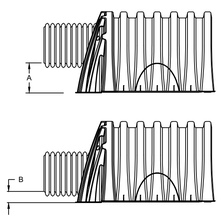
GEOTEXTILE PARAMETERS

1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH OF 320 X 320 LBS (1,420 X 1,420 N) PER ASTM D4632 TESTING METHOD.
4. THE GEOTEXTILE SHALL HAVE A ELONGATION @ BREAK RESISTANCE OF 15 X 15% PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE OF 3,563 X 3,563 LBS/FT (52 X 52 KN/M) PER ASTM D4595 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE RESISTANCE OF 1,500 LBS (6,670 N) PER ASTM D6241 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A TRAPEZOIDAL TEAR RESISTANCE OF 120 X 120 LBS (540 X 540 N) PER ASTM D4533 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE AN APPARENT OPENING SIZE OF 30 US STD. SIEVE (0.60 MM) PER ASTM D4751 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY RATING OF 0.2 SEC-1 PER ASTM D4491 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATING OF 22 GPM/FT2 (900 LPM/M2) PER ASTM D4491 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE A UV RESISTANCE OF 70% @ 500 HRS. PER ASTM D4355 TESTING METHOD.

GENERAL NOTES

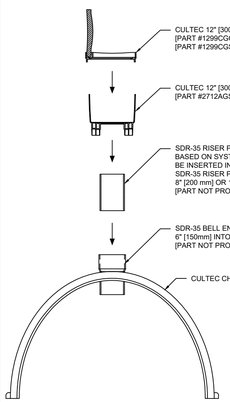
PIPE	A	B
6" [150 mm]	26.50" [673 mm]	1.00" [25 mm]
8" [200 mm]	24.50" [622 mm]	1.00" [25 mm]
10" [250 mm]	22.25" [565 mm]	1.25" [32 mm]
12" [300 mm]	19.75" [502 mm]	1.75" [45 mm]
15" [375 mm]	16.50" [419 mm]	2.00" [50 mm]
18" [450 mm]	13.00" [330 mm]	2.50" [64 mm]
21" [525 mm]	10.00" [254 mm]	2.50" [64 mm]
24" [600 mm]	7.00" [178 mm]	2.50" [64 mm]
30" [750 mm]	N/A	3.50" [89 mm]

*THE TYPICAL INVERT TABLE ABOVE IS BASED ON THE INSIDE DIAMETER OF STANDARD CORRUGATED PLASTIC PIPE. THE HEAVY DUTY END CAP HAS PRE-MARKED TRIM LINES FOR PIPE DIAMETERS 12" (300mm), 15" (375mm), 18" (450mm) AND 24" (600mm). PIPES OF ANY SIZE AND MATERIAL UP TO 24" (600mm) MAY BE PLACED AT CUSTOM LOCATIONS AND CUSTOM INVERTS. 30" (750 mm) SMOOTH-WALL SDR-35 PVC PIPE MAY BE USED AT THE BOTTOM OF THE END CAP. THE CROWN OF THE PIPE MUST REMAIN A MINIMUM OF 3" (75mm) FROM THE EDGE OF THE HEAVY DUTY END CAP.

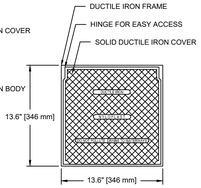


CULTEC RECHARGER 360HD TYPICAL PIPE INVERTS

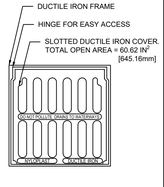
FINAL ASSEMBLY



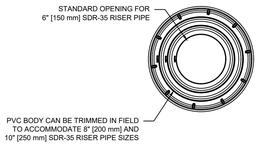
SOLID COVER OPTION



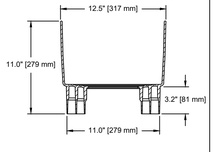
SLOTTED COVER OPTION



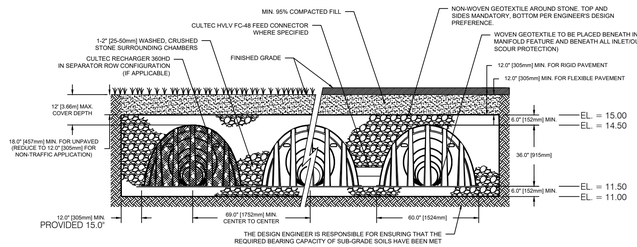
PVC BODY PLAN VIEW



PVC BODY ELEVATION VIEW

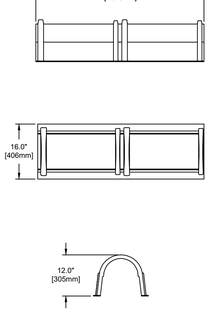


CULTEC UNIVERSAL INSPECTION PORT KIT DETAIL

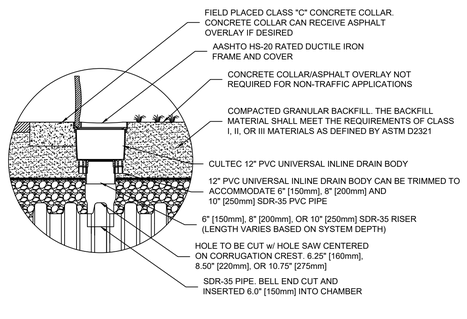


NOTES:
1. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THE LOAD CONFIGURATION SHALL INCLUDE:
   1.a. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   1.b. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   1.c. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
2. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
3. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   3.a. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   3.b. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   3.c. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95

CULTEC RECHARGER 360HD CROSS SECTION

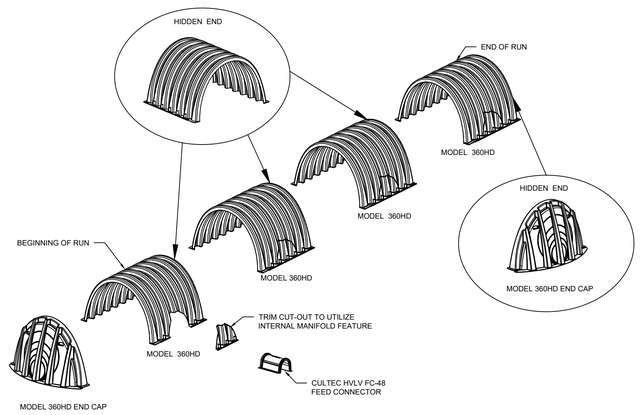


CULTEC HVLV FC-48 FEED CONNECTOR THREE VIEW

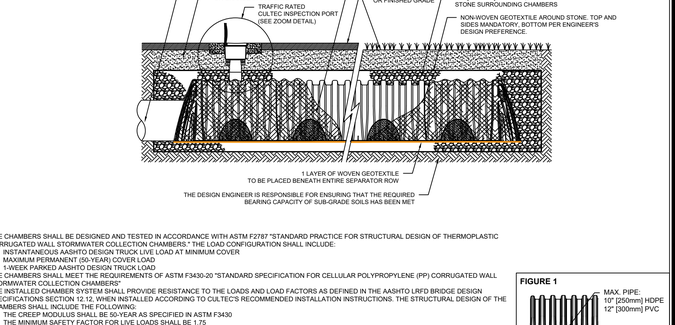


OPTIONAL CULTEC INSPECTION PORT - ZOOM DETAIL

CULTEC RECHARGER 360HD HEAVY DUTY THREE VIEW

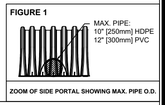


CULTEC RECHARGER 360HD HEAVY DUTY TYPICAL INTERLOCK



NOTES:
1. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THE LOAD CONFIGURATION SHALL INCLUDE:
   1.a. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   1.b. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   1.c. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
2. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
3. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   3.a. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   3.b. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   3.c. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95

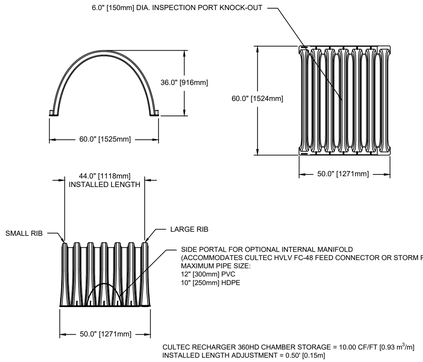
FIGURE 1



ZOOM OF SIDE PORTAL SHOWING MAX. PIPE O.D.

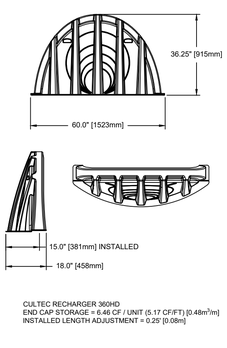
CULTEC SEPARATOR ROW - CULTEC INSPECTION PORT DETAIL (IF APPLICABLE)

CULTEC RECHARGER 360HD CHAMBER STORAGE



CULTEC RECHARGER 360HD CHAMBER STORAGE = 10.00 CF/FT [0.93 m^3/m]
INSTALLED LENGTH ADJUSTMENT = 0.50' [0.15m]

CULTEC RECHARGER 360HD HEAVY DUTY END CAP THREE VIEW



CULTEC RECHARGER 360HD
END CAP STORAGE = 6.46 CF / UNIT (5.17 CF/FT) [0.48 m^3/m]
INSTALLED LENGTH ADJUSTMENT = 0.25' [0.08m]

NEI Narragansett Engineering Inc.
Civil • Survey Structural Environmental Design
3102 East Main Road, Portsmouth RI 02871
Tel. 401.683.6630 www.nei-cds.com

SHEET TITLE
DETAILS AND NOTES

DERBY ACADEMY 56 BURDITT AVE, HINGHAM, MA 02043
PROPERTY RECORD
56 BURDITT AVENUE
HINGHAM, MA 02043
[PLAT:49 LOT:57, ZONE: RA, AREA: 21.6 ACRES]
N/F: TRUSTEES OF DERBY ACADEMY

C/O
JASON EARLS
SAGAMORE
75 RESEARCH RD
HINGHAM, MA 02043
T. (781) 531-9466
E. JEARLS@SAGAMORE.COM

PROJECT NO.	DATE	BY
25.0126	9/16/25	AS

DRAWING ISSUE:
- ☐ CONCEPT / DISCUSSION
- ☒ PERMITTING
- ☐ CONSTRUCTION
- ☐ AS-BUILT
- ☐ OTHER

ONLY PLANS ISSUED FOR CONSTRUCTION SHALL BE USED FOR CONSTRUCTION

SCOPE:
RETAINING WALL DESIGN TO ACCOMMODATE MECH AIR HANDLER
SITE GRADING UTILITY RECONFIGURATION LIMIT OF DISTURBANCE, SESC AND RELATED SITE CIVIL WORK

COMMONWEALTH OF MASSACHUSETTS
JOSEPH W. MALO
CIVIL
NO. 51565
REGISTERED
PROFESSIONAL ENGINEER
9/16/25

FORMAL PLAN REVISIONS

No	DATE	STAGE/DESCRIPTION	BY

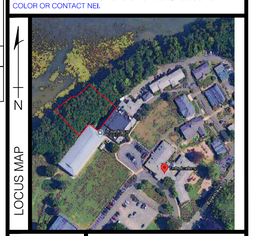
INTERNAL REVIEW

No	CHECK	CAD	DESCRIPTION/NOTES
1	JM	EB	PRELIMINARY STORMWATER
	10/7/25	10/6/25	DESIGN, SURFACE GRADES
			AROUND SYSTEM
2	JM	EB	REVISION OF STORMWATER
	11/4/25	11/3/25	AND GRADING BASED ON
			REVISED TOP OF COASTAL
			BANK AND BUFFER ZONES
3	JM	EB	UPDATED LOD AND DETAIL
	11/20/25	11/19/25	SHEETS, ADDED MITIGATION
			AREAS

nei-cds.com

DRAWINGS MUST BE PRINTED IN COLOR TO BE VALID. THIS NOTE SHOULD BE BLUE. IF THIS NOTE IS NOT BLUE, PLEASE REPRINT IN COLOR OR CONTACT NEI.

LOCUS MAP



SCALE
N/A

C-202

N:\PROJECTS\25.0126_SAGAMORE (DERBY ACADEMY-56 BURDITT AVE)\STRUCTURAL - RET WALL\25.0126_SAGAMORE (DERBY ACADEMY) SITE.DWG C-202 NEI-Standard.ctb 11/20/2025 Eric Buzzi