

HUGHES ENVIRONMENTAL CONSULTING

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PHONE/FAX 978.369.2100

BRP WPA Form 3 – Notice of Intent

(M.G.L. c. 131, §40 and Boxford Wetlands Protection Bylaw, Chapter 196)

Camp Rotary, Boxford MA



Submitted to:

Boxford Conservation Commission
7A Spofford Road
Boxford, MA 01921

Prepared by:

Hughes Environmental Consulting
44 Merrimac Street
Newburyport, MA 01950

Copies to:

MassDEP NERO
205B Lowell Street
Wilmington, MA 01887

On behalf of:

Camp Rotary, Inc.
PO Box 375
Boxford, MA 01921

May 16, 2019

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Application Contents:

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- 7. Site Photos**
- 8. Abutters List and copy of Abutter Notice**
- 9. DEP Fee Transmittal form**
- 10. Site Plan Set, 4 sheets, prepared by Hancock Associates, dated May 16, 2019**

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PROJECT NARRATIVE
to accompany a
NOTICE OF INTENT
For
Camp Rotary, Inc.
Dining Hall Renovations
Boxford, MA
May 16, 2019

Overview

In 2018, Camp Rotary received approval under DEP file number 114-1264 to repair the dining hall, involving reconstruction of the foundation and levelling of the floors. The project relied on constructing an access road on the wooded slope adjacent to the hall in order to access the primary work area, which was the foundation on the downslope side of the building. When the camp went to contract to do the work, the prices were prohibitive to do the work and other issues related to potential damage to the roof and overall structure were raised as possible unintended consequences of trying to repair the decapitated parts of the structure. This approach that was previously permitted would have left the Camp with an undersized facility at enormous cost.

It became apparent that a new approach that eliminated the need for the access road and expanded the footprint was necessary. This new approach involves removal of additions that were added on to the original 1921 dining hall and substantially renovating and rebuilding the original hall. A new expansion will be added as part of anticipated renovations of the interior of the hall. The project as currently proposed will allow the camp to have a dining hall and kitchen that meets current standards. Upon approval and after the appeal period expires (and prior to construction) the Camp will close the outstanding order of conditions.

Current Site Conditions

The dining hall at Camp Rotary is located on a hillside overlooking Stiles Pond. The camp is seasonal, and is used intensively for the summer. During the remainder of the year, use is generally related to maintenance and training to support the summer camp. Buildings within the camp constitute structures for seasonal use, which are defined in the regulations as “Structures intended for intensive use for no more than 18 consecutive weeks per year (e.g., summer camps), in addition to incidental use other times of year.”

At its closest, the dining hall is located a little over 41 feet from the pond. The pond shoreline is developed with docks and a maintained beach. The resource boundaries as shown on the plan were located during the Request for Determination of Applicability process in 2016. There is a slight shelf, a little over 10 feet wide of relatively flat area in the back of the dining hall at the northern end near a set of concrete stairs that accesses the lake. This shelf disappears as you go along the dining hall to the south.

The existing dining hall structure is supported on a hodge podge of concrete, stone, and stumps.

Proposed Project:

The proposed project involves the partial demolition of the dining hall and construction of a new 8,690+/- S.F. dining hall in the same general area. A portion of the new dining hall will share the footprint with the original 1921 dining hall and make use of the useable foundation under that portion of the existing dining hall. Associated site improvements will include a patio, balcony, retaining walls and a new path down to Stiles Pond. A new fenced in dumpster pad, a transformer, generator and propane tank will be

installed on the west side of the dining hall. A new grease trap will be located north east of the building. A 25,000 gallon fire protection tank will be located under the building. The project will result in the removal of 12 trees within the buffer zone to Stiles Pond.

	EXISTING WITHIN 75' ZONE	EXISTING BETWEEN 75' AND 100'	PROPOSED WITHIN 75' ZONE	PROPOSED BETWEEN 75' AND 100'
BUILDING	1601 SF	2235 SF	732 SF	3168 SF
BALCONY/DECK/PORCH	24 SF	96 SF	716 SF	205 SF
WALKWAY/STAIRS	361 SF	95 SF	502 SF	129 SF
CONCRETE DOCK	1581 SF	0 SF	1581 SF	0 SF
OUTBUILDINGS	100 SF	230 SF	100 SF	230 SF
TOTAL	3667 SF	2656 SF	3631 SF	3732 SF

EXISTING BUILDING IS 41' FROM THE RESOURCE AREA. NEW BUILDING IS 58' FROM THE RESOURCE AREA. NEW BALCONY IS 56' FROM RESOURCE AREA

The proposed project generally moves buildings and impacts to the buffer zone further away from Stiles Pond. The project also re-orienta a pathway in a manner that removes a problematic direct route for runoff to the lake. Stormwater will be managed as described in the attached stormwater report. Key highlights of the stormwater management system include:

- An infiltration chamber system is proposed to capture the roof runoff from the southeast facing side and roof of the building through a system of gutters, downspouts and roof drains.
- Roof runoff infiltration chambers at the roof drip line will be utilized for the northwest facing side of the building and along the relocated path to the pond.
- The proposed patio will have a pervious surface consisting of pavers underlain by crushed stone (or alternatively will consist of gravel).
- The path will consist of a gravel walk and infiltration trench.

In addition, the applicant will plant 24 native saplings (New England Wetland Plants 4 - 6 foot) in areas of the buffer zone. The locations will be field identified upon completion of work.

Wetland Protection Act Regulations

10 CMR 10.00 et seq. Wetlands Protection Act Regulations

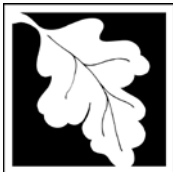
The project is located in the buffer zone only, and erosion controls will prevent any impact to the pond. The project also complies with the stormwater regulations. See the attached stormwater report.

Town of Boxford Bylaw and Regulations

The Town of Boxford has a setback within its regulations for structures near Stiles Pond of 100 feet. In this case, the dining hall pre-dates the bylaw and regulations. Due to the seasonal nature of the dining

hall use, the regulations, provide flexibility when the structure pre-dates the bylaw. See sections 375-3 C. and 375-98 B(2). Given that the project improves the environmental conditions by moving the existing building farther from the pond, provides stormwater treatment, and mitigates a problematic access stairway to the lake, we ask the Commission consider the improvements and approve this project.

We look forward to presenting the project to the Commission and ask the Commission to issue an Order of Conditions allowing the project to proceed.



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Boxford

City/Town

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



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

A. General Information

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

<u>372 Ipswich Rd</u>	<u>Boxford</u>	<u>01921</u>
a. Street Address	b. City/Town	c. Zip Code
Latitude and Longitude:		
<u>18</u>	<u>N42° 41' 24.9318"</u>	<u>W71° 1' 50.7246"</u>
f. Assessors Map/Plat Number	d. Latitude	e. Longitude
	<u>2-4</u>	
	g. Parcel /Lot Number	

2. Applicant:

<u>Richard</u>	<u>Boldi</u>	
a. First Name	b. Last Name	
<u>Camp Rotary, Inc.</u>		
c. Organization		
<u>PO Box 375</u>		
d. Street Address		
<u>Boxford</u>	<u>MA</u>	<u>01921</u>
e. City/Town	f. State	g. Zip Code
<u></u>	<u></u>	<u></u>
h. Phone Number	i. Fax Number	j. Email Address

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

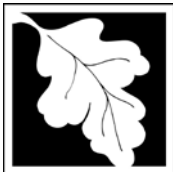
<u></u>	<u></u>	
a. First Name	b. Last Name	
<u>Camp Rotary, Inc.</u>		
c. Organization		
<u>PO Box 270</u>		
d. Street Address		
<u>Boxford</u>	<u>MA</u>	<u>01921</u>
e. City/Town	f. State	g. Zip Code
<u></u>	<u></u>	<u></u>
h. Phone Number	i. Fax Number	j. Email address

4. Representative (if any):

<u>Tom</u>	<u>Hughes</u>	
a. First Name	b. Last Name	
<u>Hughes Environmental Consulting</u>		
c. Company		
<u>44 Merrimac Street</u>		
d. Street Address		
<u>Newburyport</u>	<u>MA</u>	<u>01950</u>
e. City/Town	f. State	g. Zip Code
<u>978-465-5400</u>	<u>978-465-8100</u>	<u>thughes@hughesenvr.com</u>
h. Phone Number	i. Fax Number	j. Email address

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

<u>500.00</u>	<u>237.50</u>	<u>262.50</u>
a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid



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A. General Information (continued)

6. General Project Description:

Renovate, reconstruct and expand existing Dining Hall in the buffer zone to Stiles Pond. Includes re-construction of path to pond and new stormwater management.

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

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

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

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

2. Limited Project Type

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

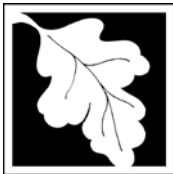
8. Property recorded at the Registry of Deeds for:

Essex South	
a. County	b. Certificate # (if registered land)
2836	494
c. Book	d. Page Number

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

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

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



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

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input type="checkbox"/> Bank	1. linear feet	2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	1. square feet	2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	1. square feet	2. square feet
	3. cubic yards dredged	

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. <input type="checkbox"/> Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced
f. <input type="checkbox"/> Riverfront Area	1. Name of Waterway (if available) - specify coastal or inland	

2. Width of Riverfront Area (check one):

- 25 ft. - Designated Densely Developed Areas only
- 100 ft. - New agricultural projects only
- 200 ft. - All other projects

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

4. Proposed alteration of the Riverfront Area:

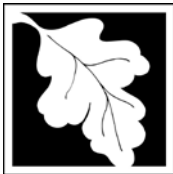
a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
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5. Has an alternatives analysis been done and is it attached to this NOI? Yes No

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

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

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



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

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

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

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	_____	
	1. square feet	

	2. cubic yards dredged	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	_____	_____
	1. square feet	2. cubic yards beach nourishment
e. <input type="checkbox"/> Coastal Dunes	_____	_____
	1. square feet	2. cubic yards dune nourishment

	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	_____	
	1. linear feet	
g. <input type="checkbox"/> Rocky Intertidal Shores	_____	
	1. square feet	
h. <input type="checkbox"/> Salt Marshes	_____	_____
	1. square feet	2. sq ft restoration, rehab., creation
i. <input type="checkbox"/> Land Under Salt Ponds	_____	
	1. square feet	

	2. cubic yards dredged	
j. <input type="checkbox"/> Land Containing Shellfish	_____	
	1. square feet	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	

	1. cubic yards dredged	
l. <input type="checkbox"/> 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 been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings



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C. Other Applicable Standards and Requirements

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

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

- a. Yes No **If yes, include proof of mailing or hand delivery of NOI to:**

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

- August 1, 2017
b. Date of map

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

- c. Submit Supplemental Information for Endangered Species Review*

1. Percentage/acreage of property to be altered:
 - (a) within wetland Resource Area _____ percentage/acreage
 - (b) outside Resource Area _____ percentage/acreage
2. Assessor's Map or right-of-way plan of site

2. Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **
 - (a) Project description (including description of impacts outside of wetland resource area & buffer zone)
 - (b) Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

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



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

- (c) MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

Projects altering 10 or more acres of land, also submit:

- (d) Vegetation cover type map of site
- (e) Project plans showing Priority & Estimated Habitat boundaries
- (f) OR Check One of the Following
1. Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)
 2. Separate MESA review ongoing. _____ a. NHESP Tracking # _____ b. Date submitted to NHESP
 3. Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.
3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?
- a. Not applicable – project is in inland resource area only b. Yes No

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

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

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

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



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

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
- a. Yes No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
- b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
- a. Yes No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
- a. Yes No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
- a. Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
1. Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
 2. A portion of the site constitutes redevelopment
 3. Proprietary BMPs are included in the Stormwater Management System.
- b. No. Check why the project is exempt:
1. Single-family house
 2. Emergency road repair
 3. Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

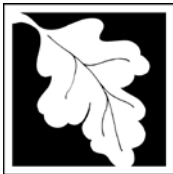
- This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

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

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

1. USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

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



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D. Additional Information (cont'd)

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

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

Site Plan Set in Boxford, MA property of Camp Rotary, Inc., 4 Sheets

a. Plan Title

Hancock Associates

PVaclav V. Talacko, PE

b. Prepared By

c. Signed and Stamped by

May 16, 2019

1" = 20'

d. Final Revision Date

e. Scale

Stormwater Report

5/16/2019

f. Additional Plan or Document Title

g. Date

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

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

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

8. Attach NOI Wetland Fee Transmittal Form

9. Attach Stormwater Report, if needed.

E. Fees

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

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

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

Richard A.

Boldi

6. Payor name on check: First Name

7. Payor name on check: Last Name



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F. Signatures and Submittal Requirements

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

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

1. Signature of Applicant *Richard A. Belli*

2. Date 5-16-2019

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

6. Date 5-16-2019

For Conservation Commission:

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

For MassDEP:

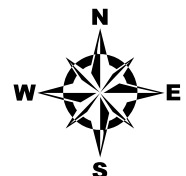
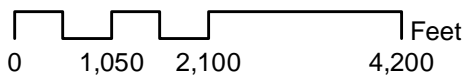
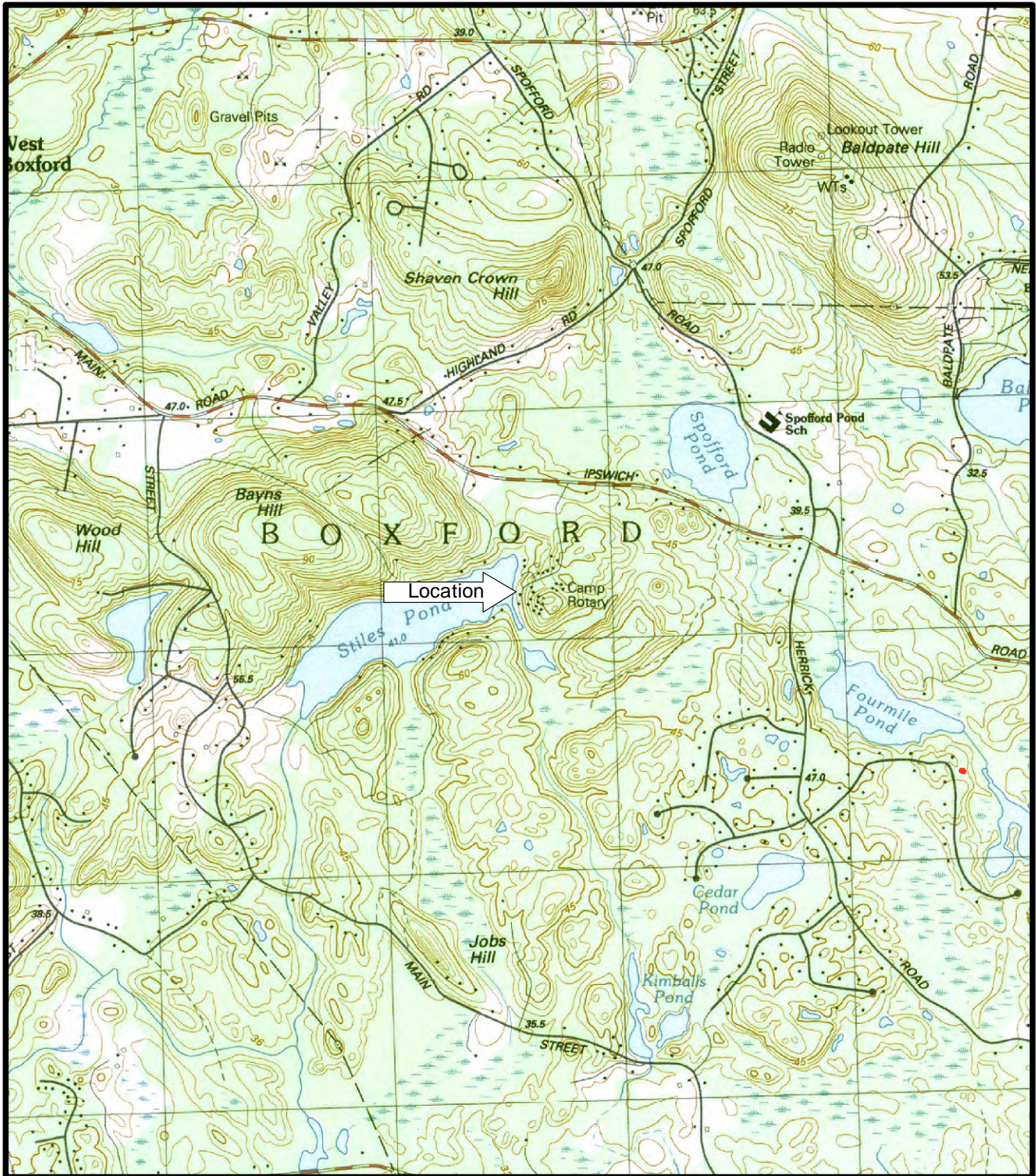
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

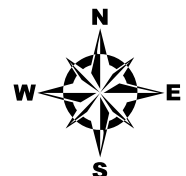
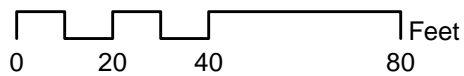
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

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

Camp Rotary, Dining Hall Repair Boxford MA USGS Location Map



Camp Rotary, Dining Hall Repair Boxford MA 2013 Orthophoto



Camp Rotary Dining Hall View from the North



© 2017 Pictometry

Camp Rotary Dining Hall View from the West



© 2017 Pictometry

Camp Rotary Dining Hall - Site Photos



View towards sloped buffer and pond from back of existing hall



View along back of dining hall which will be removed



Picture shortly after original dining hall was built



View of existing hall



Side of hall towards lake



Current view of dining hall.

TOWN OF BOXFORD
ABUTTER LIST

PARCEL # 18-02-04 + #18-1 - 372 IPSWICH ROAD - CONSERVATION COMMISSION 250' PLUS STILES POND ABUTTERS

PARCEL ID	PROPERTY ADDRESS	OWNER 1	OWNER 2	MAILING ADDRESS	CITY/TOWN	STATE	ZIP CODE
14-02-10	357 IPSWICH RD	KILLAM CHARLES E TE	HELEN D KILLAM	BOX 202	BOXFORD	MA	01921
14-02-11-4	377 IPSWICH RD	GREEN CHRISTOPHER TE	GREEN ANDREA B	377 IPSWICH RD	BOXFORD	MA	01921
14-02-11-5	375 IPSWICH RD	GOUDIE DOUGLAS		375 IPSWICH RD	BOXFORD	MA	01921
14-02-11-6	373 IPSWICH RD	FLYNN BRIAN D TE	FLYNN JENNIFER L	373 IPSWICH RD	BOXFORD	MA	01921
14-02-11	395C IPSWICH RD	BARBIERI BRUCE R	BARBIERI ANNA M	395C IPSWICH RD	BOXFORD	MA	01921
14-02-33	395B IPSWICH RD	FISHMAN JAYME M	FISHMAN GRETCHEN	395B IPSWICH RD	BOXFORD	MA	01921
14-02-41	IPSWICH RD	KILLAM CHARLES E	KILLAM HELEN D	PO BOX 202	BOXFORD	MA	01921
18-01-01	81C STILES POND RD SOUTH	MUTO VICTOR L TE	CHRISTINE R MUTO	P O BOX 511	W BOXFORD	MA	01885
18-01-02	81B STILES POND RD SOUTH	DOTY DOUGLAS P	SANDRA J DOTY	6 ELM ST	N READING	MA	01864
18-01-03	114 STILES POND RD	KREINER DANIEL TE	KREINER ANITA P	114 STILES POND RD	BOXFORD	MA	01921
18-01-31-1	CHANDLER RD	TOWN OF BOXFORD		7A SPOFFORD RD	BOXFORD	MA	01921
18-01-33	22B CHANDLER RD	JENKINSON JOSEPH W T	THEAR E JENKINSON	22B CHANDLER RD	BOXFORD	MA	01921
18-01-34	22A CHANDLER RD	BEAULIEU ALAN P TE	BEAULIEU NANCY D	22A CHANDLER RD	BOXFORD	MA	01921
18-01-39	11 CHANDLER RD	DOTOLO CAROLINE	WATTS JUSTIN	11 CHANDLER RD	BOXFORD	MA	01921
18-01-40	25 CHANDLER RD	MURPHY KATHLEEN S		25 CHANDLER RD	BOXFORD	MA	01921
18-01-45	24 CHANDLER RD	CELESTIN NATHALIE M		24 CHANDLER RD	BOXFORD	MA	01921
18-02-02	376 IPSWICH RD	CARLSON RYAN	CARLSON JENNIFER	376 IPSWICH RD	BOXFORD	MA	01921
18-02-03	370 IPSWICH RD	BANKS DOUGLAS J	LANGLOIS KAREN M	4 DEVONSHIRE RD	ATKINSON	NH	03811-2502
18-02-04	372 IPSWICH RD	LYNN CAMP ROTARY		P O BOX 270	BOXFORD	MA	01921
18-02-05-1	350A IPSWICH RD	BAROUS FRANCIS A TE	CARMEN L BAROUS	350 A IPSWICH RD	BOXFORD	MA	01921
18-02-05-2	350B IPSWICH RD	GRAFFEO ANDREW M	GRAFFEO LORELEE G	350B IPSWICH RD	BOXFORD	MA	01921
18-02-05-3	350C IPSWICH RD	SIMMONDS ROBERT C III	SIMMONDS CYNTHIA	350 C IPSWICH RD	BOXFORD	MA	01921
18-02-05	352 IPSWICH RD	FOSTER ROBERT W TE	FOSTER CYNTHIA M	352 IPSWICH RD	BOXFORD	MA	01921
18-02-11	IPSWICH RD	TOWN OF BOXFORD	WILDCAT RESERVATION	7A SPOFFORD RD	BOXFORD	MA	01921
18-02-21	378 IPSWICH RD	STEPHAN GREGORY D	STEPHAN KRISTIN	378 IPSWICH RD	BOXFORD	MA	01921
18-02-31	B2 CHANDLER RD	BOURGEOIS HENRIETTA B		1340 WEST VIA TIERRA	TUSCON	AZ	85704

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March 19, 2019

Jan Stiller

TOWN OF BOXFORD
ABUTTER LIST

PARCEL # 18-02-04 + #18-1 - 372 IPSWICH ROAD - CONSERVATION COMMISSION 250' PLUS STILES POND ABUTTERS

PARCEL # 18-1 STILES POND DIRECT ABUTTERS

17-02-27-1	STILES POND	TOWN OF BOXFORD		7A SPOFFORD RD	BOXFORD	MA	01921
17-02-29	4A STILES POND	DANVERS COMMUNITY Y.M.C.A.		34 PICKERING ST	DANVERS	MA	01923
17-02-31	4B STILES POND	TOWN OF BOXFORD		7A SPOFFORD RD	BOXFORD	MA	01921
17-02-32-12	27A BAYNS HILL RD	ROBIDOUX ANDREA L		27A BAYNS HILL RD	BOXFORD	MA	01921
17-02-32-13	27B BAYNS HILL RD	ARNOLD RYAN P	ARNOLD JENNIFER	27B BAYNS HILL RD	BOXFORD	MA	01921
17-02-32-8	27C BAYNS HILL RD	KLANDERMAN GREGORY A	KLANDERMAN BARBARA J	27C BAYNS HILL RD	BOXFORD	MA	01921
18-01-01	81C STILES POND RD SOUTH	MUTO VICTOR L TE	CHRISTINE R MUTO	P O BOX 511	W BOXFORD	MA	01885
18-01-02	81B STILES POND RD SOUTH	DOTY DOUGLAS P	SANDRA J DOTY	6 ELM ST	N READING	MA	01864
18-01-03	114 STILES POND RD	KREINER DANIEL TE	KREINER ANITA P	114 STILES POND RD	BOXFORD	MA	01921
18-01-04	81A STILES POND RD	SULLIVAN GILBERT J	SULLIVAN SHIRLEY	81A STILES POND RD	BOXFORD	MA	01921
18-01-06-A	116 STILES POND RD	KAGAN J P TR	W & B KAGAN FAM TR	P O BOX 408	WEST BOXFOR	MA	01885
18-01-06	118 STILES POND SOUTH	ESTATE OF PATRICIA A STICKNEY	STICKNEY STEPHEN A	118 STILES POND SOUTH	BOXFORD	MA	01921
18-01-07	114 STILES POND RD MIDDLE	KREINER ANITA P TE	KREINER DANIEL	114 STILES POND RD	BOXFORD	MA	01921
18-01-08	112 STILES POND RD	CUNNINGHAM JOSEPH		39 PLEASANT ST	STONEHAM	MA	02180
18-01-11	110 STILES POND RD	PARKE BARBARA G TR		110 STILES POND RD	BOXFORD	MA	01921
18-01-13-A	108 STILES POND RD	ETHIER ALBERT E TE	ETHIER ANN F	337 WOBURN STREET	WILMINGTON	MA	01887
18-01-13	108 STILES POND RD MIDDLE	ETHIER ALBERT E TE	ETHIER ANN F	337 WOBURN STREET	WILMINGTON	MA	01887
18-01-14	106 STILES POND RD	DOLAN DOUGLAS		106 STILES POND RD	BOXFORD	MA	01921
18-01-15	104 STILES POND RD MIDDLE	BOYLE JOSEPH G TE	COLLEEN BOYLE	P O BOX 16	W BOXFORD	MA	01885-0016
18-01-16	STILES POND RD	AUTIELLO RAYMOND G JR TR	AUTIELLO FAMILY REAL ESTATE TRUST	P O BOX 263	WEST BOXFOR	MA	01885
18-01-17	102 STILES POND RD MIDDLE	AUTIELLO RAYMOND G JR TR	AUTIELLO FAMILY REAL ESTATE TRUST	PO BOX 263	W BOXFORD	MA	01885
18-01-21	98 STILES POND RD	BUSBY PHILIP A JR	BUSBY VIRGINIA A	9 POND LANE	ATKINSON	NH	03811
18-01-23-C	96 STILES POND RD	CUNNINGHAM JOSEPH W		39 PLEASANT ST	STONEHAM	MA	02180
18-01-24	20A+B STILES POND RD SOUTH	ROHR KENNETH R TE	FRANCES J ROHR	PO BOX 462	W BOXFORD	MA	01885
18-01-26	18 STILES POND RD	CUNNINGHAM JOSEPH W	CYNTHIA CUNNINGHAM	39 PLEASANT ST	STONEHAM	MA	02180

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page 2 of 3

March 19, 2019

Jan Miller

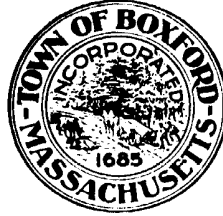
**TOWN OF BOXFORD
ABUTTER LIST**

PARCEL # 18-02-04 + #18-1 - 372 IPSWICH ROAD - CONSERVATION COMMISSION 250' PLUS STILES POND ABUTTERS

18-01-27-1	4C STILES POND RD	GAR SIDE HARD E TRUSTEE	GAR SIDE MARIA IDILIA MENDONCA TR	PO BOX 44	BOXFORD	MA	01921
18-01-30	443 MAIN ST	YMCA OF GREATER BOSTON	CAMP WAKANDA	316 HUNTINGTON AVE	BOSTON	MA	02115
18-01-32	22C CHANDLER RD	LITTLEFIELD KENNETH E	LITTLEFIELD JANE E	22C CHANDLER RD	BOXFORD	MA	01921
18-01-33	22B CHANDLER RD	JENKINSON JOSEPH W T	THEAR E JENKINSON	22B CHANDLER RD	BOXFORD	MA	01921
18-01-34	22A CHANDLER RD	BEAULIEU ALAN P TE	BEAULIEU NANCY D	22A CHANDLER RD	BOXFORD	MA	01921
18-01-35	20C STILES POND RD SOUTH	KRESS DAVID W	KRESS LOUISE R BALWIT	PO BOX 83	WEST BOXFOR	MA	01885
18-01-43	32 CHANDLER RD	WEISENHOF SCOTT M TR	WEISENHOF ALESSANDRA C TR	32 CHANDLER RD	BOXFORD	MA	01921
18-01-44	30 CHANDLER RD	ROBERTSON DAVID H TE	ROBERTSON KIMBERLY K	30 CHANDLER RD	BOXFORD	MA	01921
18-02-04	372 IPSWICH RD	LYNN CAMP ROTARY		P O BOX 270	BOXFORD	MA	01921

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Janet Silver
Page 3 of 3



TOWN OF BOXFORD
MASSACHUSETTS
01921

BOXFORD CONSERVATION COMMISSION

NOTICE OF PUBLIC HEARING

You are hereby notified that a **Public Hearing** will be held at the Town Hall, 7A Spofford Road on **June 6, 2019** at 7:30 or such other time when posted to consider the

Notice of Intent

By Applicant: **Richard Boldi**
for the property located at: **Camp Rotary on Ipswich Road, Assessor's Map 18, Block 2, Lot 4**

To partially demolish the existing dining hall structure and renovate, reconstruct and expand the dining hall structure within 100-feet of Stiles Pond and Bordering Vegetated Wetland, and make associated improvements.

This is a joint hearing under the requirements of MGL Ch. 131, Sec. 40, as amended, and Boxford's Wetlands Protection Bylaw and Regulations. Plans are available at the Commission's office at 7A Spofford Road from 9am-1pm Mon.-Thur. For accommodations call (978) 887-6000, ext. 506.

For the Commission,
Ross Povenmire, Conservation Director



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:

372 Ipswich Road Boxford
 a. Street Address b. City/Town
 _____ 237.50
 c. Check number d. Fee amount

2. Applicant Mailing Address:

Richard Boldi
 a. First Name b. Last Name
 Camp Rotary, Inc.
 c. Organization
 PO Box 375
 d. Mailing Address
 Boxford MA 01921
 e. City/Town f. State g. Zip Code

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

3. Property Owner (if different):

_____ _____
 a. First Name b. Last Name
 Camp Rotary, Inc.
 c. Organization
 PO Box 270
 d. Mailing Address
 Boxford MA 01921
 e. City/Town f. State g. Zip Code

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

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

B. Fees

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

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

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

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

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

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

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



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
Category 2, Other	1	500.00	500.00
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Step 5/Total Project Fee:			500.00
Step 6/Fee Payments:			
Total Project Fee:			500.00
State share of filing Fee:			237.50
City/Town share of filing Fee:			262.50
			a. Total Fee from Step 5
			b. 1/2 Total Fee less \$12.50
			c. 1/2 Total Fee plus \$12.50

C. Submittal Requirements

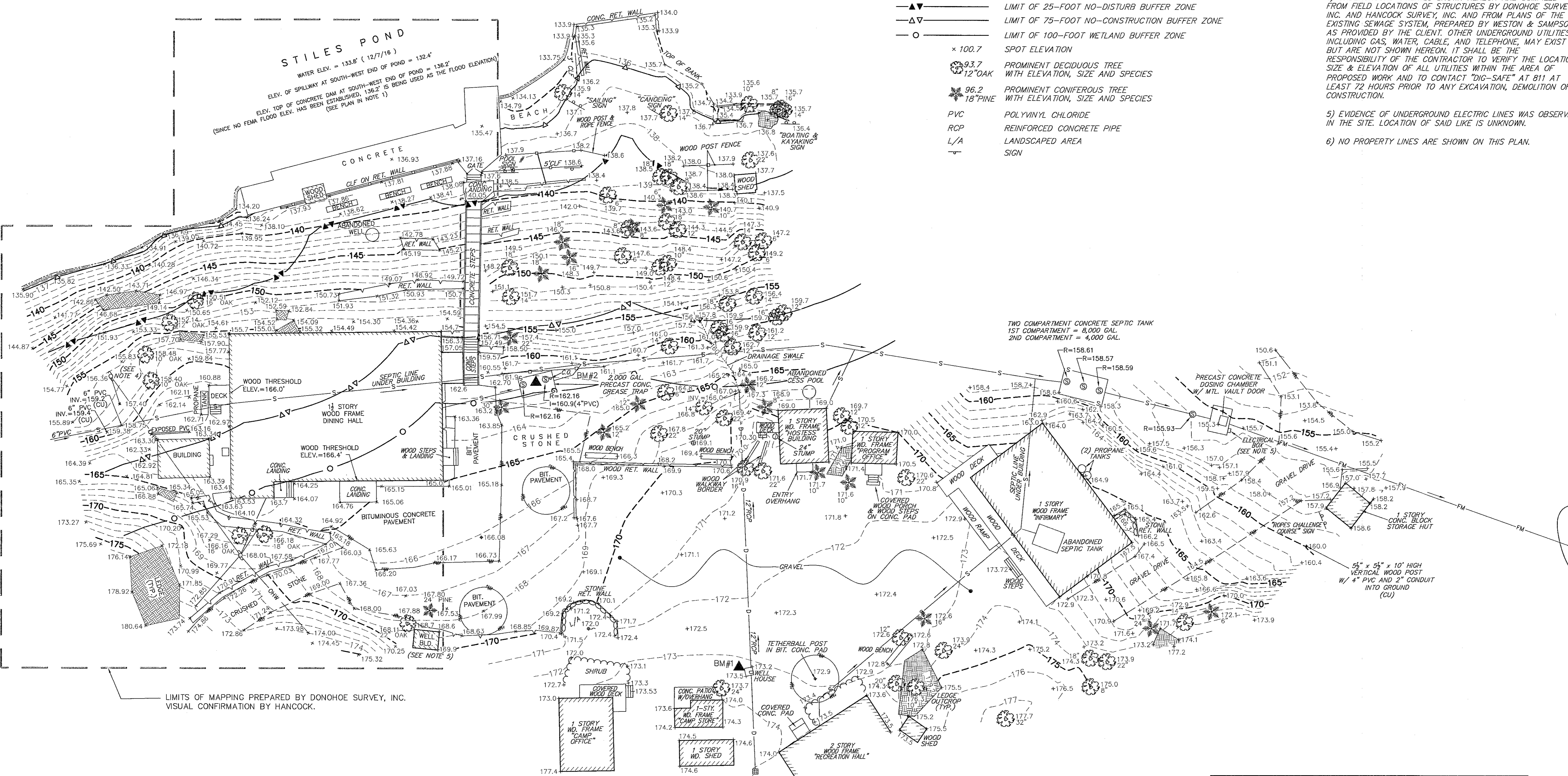
- a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

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.)

MERIDIAN FROM PLAN REFERENCED IN NOTE 1



LIMITS OF MAPPING PREPARED BY DONOHOE SURVEY, INC. VISUAL CONFIRMATION BY HANCOCK.

LEGEND

- 102--- SURFACE CONTOUR
- EDGE OF GRAVEL ROAD
- EDGE OF PAVEMENT
- 98.8
93.2 RETAINING WALL WITH TOP AND BOTTOM ELEVATIONS
- x x x CHAIN LINK FENCE
- o o o WOOD FENCE
- TOP OF BANK
- 8" CI SEWERLINE & MANHOLE WITH PIPE SIZE, MATERIAL & FLOW DIRECTION
- FM SEWERLINE & MANHOLE WITH PIPE
- 12" RCP DRAINLINE WITH PIPE SIZE, MATERIAL, FLOW DIRECTION, & CATCHBASIN
- OHW UTILITY POLE WITH OVERHEAD WIRES AND GUY POLE
- EDGE OF LEDGE OUTCROP
- LIMIT OF RESOURCE AREA (SEE NOTE 3)
- LIMIT OF 25-FOOT NO-DISTURB BUFFER ZONE
- LIMIT OF 75-FOOT NO-CONSTRUCTION BUFFER ZONE
- LIMIT OF 100-FOOT WETLAND BUFFER ZONE
- x 100.7 SPOT ELEVATION
- 93.7
12" OAK PROMINENT DECIDUOUS TREE WITH ELEVATION, SIZE AND SPECIES
- 96.2
18" PINE PROMINENT CONIFEROUS TREE WITH ELEVATION, SIZE AND SPECIES
- PVC POLYVINYL CHLORIDE
- RCP REINFORCED CONCRETE PIPE
- L/A LANDSCAPED AREA
- SIGN

NOTES:

- 1) ELEVATIONS SHOWN HEREON REFER TO THE NORTH AMERICAN VERTICAL DATUM ON 1988 (NAVD88). REFERENCE IS MADE TO PLAN ENTITLED "SITE PLAN IN BOXFORD, MA PROPERTY OF CAMP ROTARY", REVISED 7/17/18, PREPARED BY DONOHOE SURVEY, INC. SAID PLAN USED WITH PERMISSION FROM DONOHOE. SITE FEATURES CONFIRMED FROM VISUAL INSPECTION BY HANCOCK.
- 2) A PORTION OF THE MAPPING SHOWN HEREON BASED UPON SAID PLAN BY DONOHOE SURVEY, INC. (SEE NOTE 1) AND SUPPLEMENTED & EXPANDED BY SURVEY PERFORMED BY HANCOCK ASSOCIATES, BETWEEN MARCH 14 AND 18, 2019. SNOW COVERAGE WAS OBSERVED AT THE TIME OF THE SURVEY AND MAY HAVE OBSCURED SOME SITE FEATURES.
- 3) RESOURCE AREA LOCATION (ELEV.=136.2') AND ASSOCIATED BUFFER ZONES SHOWN HEREON WERE ESTABLISHED BY HUGHES ENVIRONMENTAL CONSULTING. REFERENCE TO SAID PLAN BY DONOHOE SURVEY INC. (SEE NOTE 1).
- 4) UNDERGROUND UTILITIES SHOWN HEREON ARE COMPILED FROM FIELD LOCATIONS OF STRUCTURES BY DONOHOE SURVEY, INC. AND HANCOCK SURVEY, INC. AND FROM PLANS OF THE EXISTING SEWAGE SYSTEM, PREPARED BY WESTON & SAMPPSON, AS PROVIDED BY THE CLIENT. OTHER UNDERGROUND UTILITIES, INCLUDING GAS, WATER, CABLE, AND TELEPHONE, MAY EXIST BUT ARE NOT SHOWN HEREON. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION, SIZE & ELEVATION OF ALL UTILITIES WITHIN THE AREA OF PROPOSED WORK AND TO CONTACT "DIG-SAFE" AT 811 AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION, DEMOLITION OR CONSTRUCTION.
- 5) EVIDENCE OF UNDERGROUND ELECTRIC LINES WAS OBSERVED IN THE SITE. LOCATION OF SAID LIKE IS UNKNOWN.
- 6) NO PROPERTY LINES ARE SHOWN ON THIS PLAN.

CAMP ROTARY DINING HALL

372 Ipswich Road
Boxford, MA 01921

PREPARED FOR:

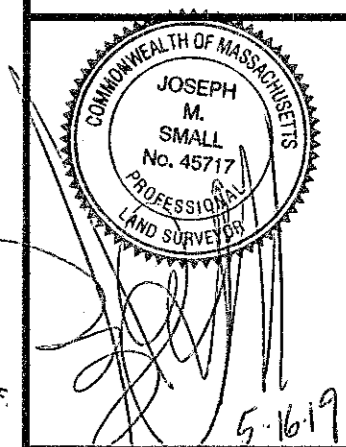
Gienapp Architects, LLC

20 Conant Street
Danvers, Massachusetts 01923

HANCOCK ASSOCIATES

Civil Engineers
Land Surveyors
Wetland Scientists

185 CENTRE STREET, DANVERS, MA 01923
VOICE (978) 777-3050, FAX (978) 774-7816
WWW.HANCOCKASSOCIATES.COM



NO.	BY	APP	DATE	ISSUE/REVISION	DESCRIPTION

DATE: 5/16/19 DRAWN BY: PLP/EME
SCALE: 1"=20' CHECK BY: PLP/JMS

ELEVATION BENCH MARKS		
▲ DATUM: NAVD 88		
NO.	DESCRIPTION	ELEV.
1.	WELL HEAD - TOP EASTERLY BOLT	175.14
2.	TOP OF PVC CLEANOUT, 0.3' A.G.	162.36
3.		

SCALE: 1" = 20'

PARTIAL EXISTING CONDITIONS PLAN OF LAND IN BOXFORD, MA

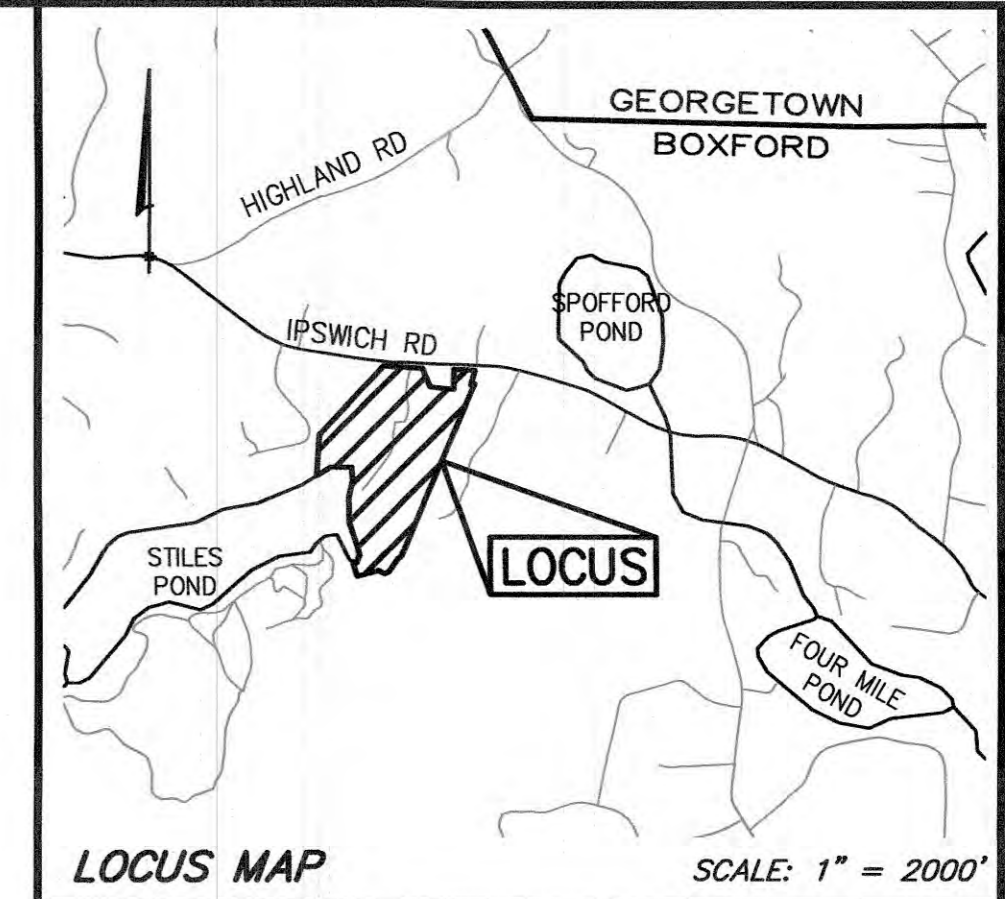
PLT DATE: May 16, 2019 9:19 am
PATH: F:\Civil 3D Projects\22275 - Camp Rotary Gienapp - Buxford\DWG\ DWG: 22275SV-2.dwg
LAYOUT: EC
SHEET: 1 OF 4
PROJECT NO.: 22275

CONSTRUCTION KEY NOTES:
(NOT A CONSTRUCTION SEQUENCE)

- 1 INSTALL 5,000 GALLON GREASE TRAP AND CONNECT TO EXISTING SEWER LINE
INVERT IN=160.5
INVERT OUT=160.3
- 2 INSTALL PERMEABLE PAVER PATIO
- 3 INSTALL 4" ROOF DRAIN HEADER AND CONNECTING PIPE TO INFILTRATION CHAMBER SYSTEM
- 4 INSTALL STORMTANK INFILTRATION CHAMBER SYSTEM
TOTAL CHAMBERS=168 30" UNITS (10x13 UNITS)
SEE PLAN FOR LAYOUT
E.S.H.G.W.=158.5
BOTTOM OF CHAMBERS=162.5
TOP OF CHAMBERS=165.0
FINISH GRADE EL.=167.5-168.7
INLET INVERT=163.2
- 5 INSTALL 8" INSPECTION PORTS IN INFILTRATION CHAMBER SYSTEM
- 6 INSTALL ROOF RUNOFF INFILTRATION TRENCH
- 7 INSTALL HAYBALE AND SILT FENCE SILTATION BARRIER
- 8 RELOCATE EXISTING DRAIN OUTLET AS NEEDED FOR RETAINING WALL CONSTRUCTION.
- 9 INSTALL PROPANE TANK ON CONCRETE PAD
- 10 INSTALL GENERATOR ON CONCRETE PAD
- 11 INSTALL TRANSFORMER ON CONCRETE PAD
- 12 INSTALL CONCRETE PAD, DUMPSTER, FENCE, & GATE
- 13 INSTALL RETAINING WALL AS NEEDED, TO BE DESIGNED BY STRUCTURAL ENGINEER.
- 14 RELOCATE WATER SERVICE AS NEEDED
- 15 INSTALL GRAVEL WALK & INFILTRATION TRENCH
- 16 EXISTING DINING HALL TO BE REMOVED
- 17 REMOVE EXISTING WALK
- 18 TO BE PUMPED AND REMOVED

LEGEND

	SEWER SERVICE		PROPOSED SS
	WATER SERVICE AND VALVE		
	DRAIN LINE WITH CATCH BASIN		
	STONE WALL		
	RETAINING WALL		
	BUILDING, LIGHT, STEPS & OVERHANG		
	SPOT ELEVATION		ELEVATION CONTOUR
	ROOF DRAIN		
	LIMIT OF 25-FOOT NO-DISTURB ZONE		
	LIMIT OF 75-FOOT NO-CONSTRUCTION ZONE		
	LIMIT OF 100-FOOT WETLAND BUFFER ZONE		
	INFILTRATION TRENCH		
	EDGE OF GRAVEL ROAD		
	EDGE OF PAVEMENT		
	CHAIN LINK FENCE		
	WOOD FENCE		
	SEWERLINE & MANHOLE WITH PIPE SIZE, MATERIAL & FLOW DIRECTION		
	DRAINLINE WITH PIPE SIZE, MATERIAL, FLOW DIRECTION, & CATCHBASIN		
	UTILITY POLE WITH OVERHEAD WIRES AND GUY POLE		
	EDGE OF LEDGE OUTCROP		
	PROMINENT DECIDUOUS TREE WITH ELEVATION, SIZE AND SPECIES		
	PROMINENT CONIFEROUS TREE WITH ELEVATION, SIZE AND SPECIES		
	POLYVINYL CHLORIDE REINFORCED CONCRETE PIPE		
	GRAVEL PATIO		
	SILTATION BARRIER		
	TREE TO BE REMOVED		



CAMP ROTARY DINING HALL

372 Ipswich Road
Boxford, MA 01921

PLAN INTENT

THESE DRAWINGS ARE INTENDED TO SHOW CONSTRUCTION REQUIREMENTS FOR A DINING HALL AND ASSOCIATED DRAINAGE IMPROVEMENTS.

SOIL TEST DATA

EVALUATOR: VACLAV TALACKO

T-1
0-10" A FILL
10-20" Ab SANDY LOAM
20-30" Bw SANDY LOAM
30-50" C1 SANDY LOAM, ROOTS
REDOX @ 50"
NO OBSERVED GROUNDWATER

T-2
0-4" A FILL
4-20" Bw LOAM
20-32" Bc SANDY LOAM
32-112" C1 SANDY LOAM
WEEPING @ 102"
E.S.H.G.W. @ 102"

T-3
0-18" A FILL
18-30" Bw SANDY LOAM
REDOX @ 30"

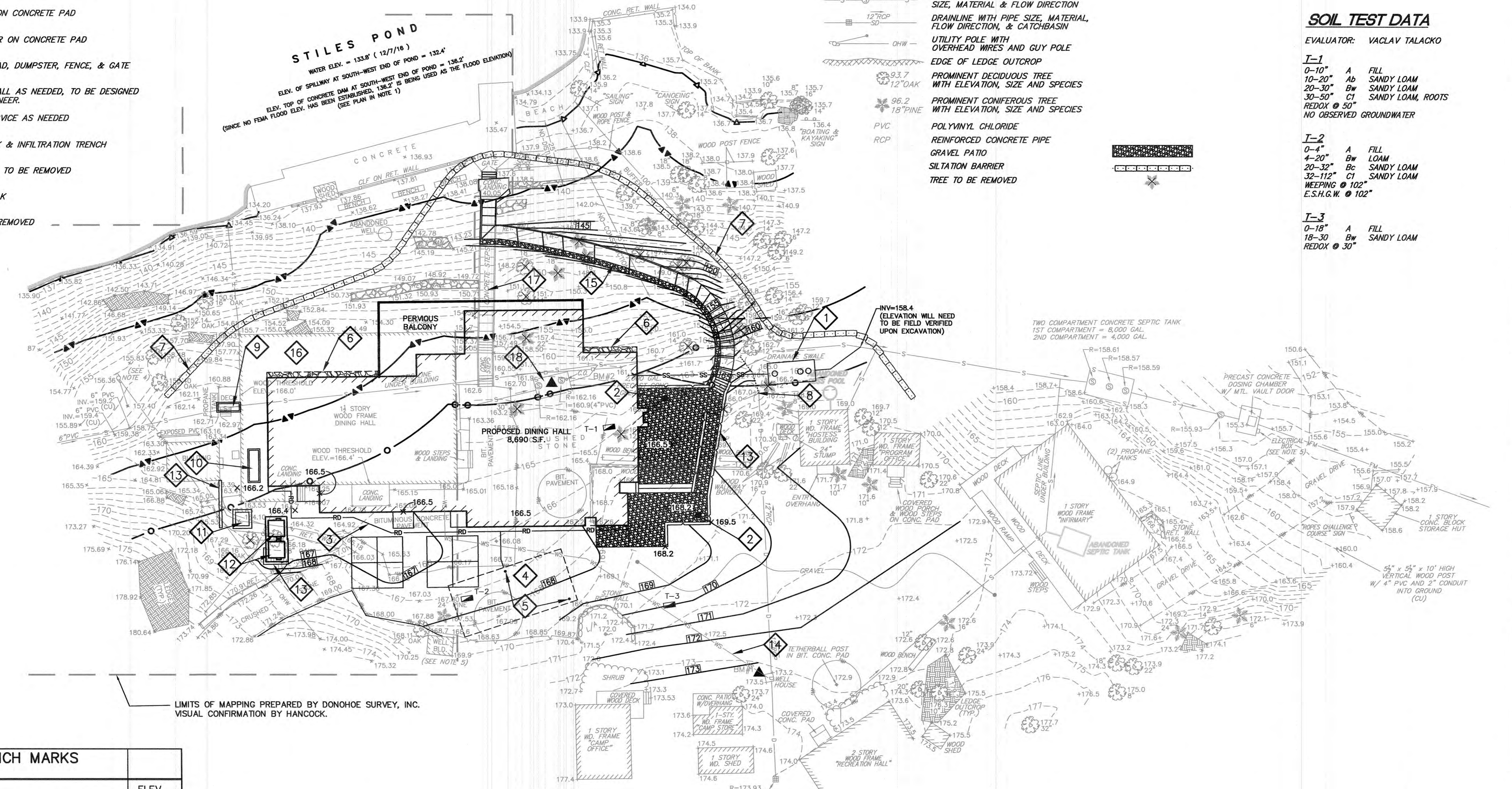
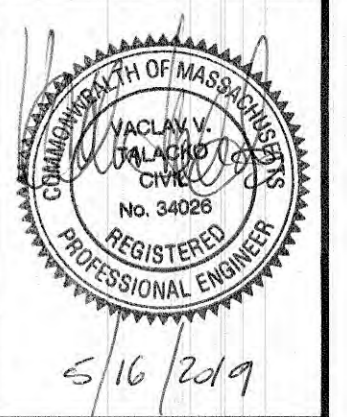
PREPARED FOR:
Gienapp Architects, LLC

20 Conant Street
Danvers, Massachusetts 01923

HANCOCK ASSOCIATES

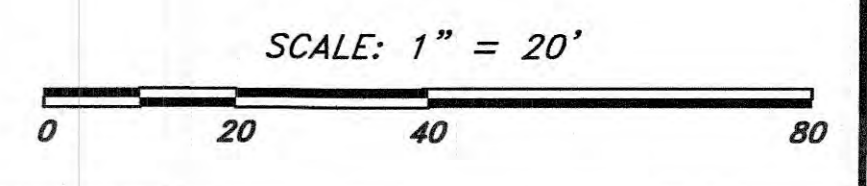
Civil Engineers
Land Surveyors
Wetland Scientists

185 CENTRE STREET, DANVERS, MA 01923
VOICE (978) 777-3050, FAX (978) 774-7816
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ELEVATION BENCH MARKS
DATUM: NAVD 88

NO.	DESCRIPTION	ELEV.
1.	WELL HEAD - TOP EASTERLY BOLT	175.14
2.	TOP OF PVC CLEANOUT; 0.3' A.G.	162.36
3.		



SITE PLAN OF LAND IN BOXFORD, MA

DATE: 4/8/19 DRAWN BY: JPC
SCALE: AS SHOWN CHECK BY: VVT

2	TJR	WT	5/16/19	CON. COM. SET
1	JPC	WT	4/12/19	DD SET
NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION

DWG: 22275 ps.dwg
LAYOUT: PS
SHEET: 2 OF 4
PROJECT NO.: 22275

GENERAL NOTES

- ELEVATIONS SHOWN HEREON REFER TO THE NATIONAL GEODESIC VERTICAL DATUM OF 1929.
- THE CONTRACTOR SHALL VERIFY THE LOCATION AND RELATIVE ELEVATION OF BENCH MARKS PRIOR TO COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCY SHALL BE REPORTED TO THE ENGINEER.
- CONTRACTOR SHALL FURNISH CONSTRUCTION LAYOUT OF BUILDING AND SITE IMPROVEMENTS. THIS WORK SHALL BE PERFORMED BY A PROFESSIONAL LAND SURVEYOR.
- SAFETY MEASURES, CONSTRUCTION METHODS AND CONTROL OF WORK SHALL BE RESPONSIBILITY OF THE CONTRACTOR.
- ALL SITE CONSTRUCTION SHALL COMPLY WITH THE BOXFORD DEPARTMENT OF PUBLIC WORK STANDARDS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR AND/OR REPLACEMENT OF ANY EXISTING IMPROVEMENTS DAMAGED DURING CONSTRUCTION THAT ARE NOT DESIGNATED FOR DEMOLITION AND / OR REMOVAL HEREON. DAMAGED IMPROVEMENTS SHALL BE REPAIRED TO THE SATISFACTION OF THEIR RESPECTIVE OWNERS.
- ANY INTENDED REVISION OF THE HORIZONTAL AND/OR VERTICAL LOCATION OF IMPROVEMENTS TO BE CONSTRUCTED AS SHOWN HEREON SHALL BE REVIEWED AND APPROVED BY ENGINEER PRIOR TO IMPLEMENTATION.
- THIS PLAN IS NOT INTENDED TO SHOW AN ENGINEERED BUILDING FOUNDATION DESIGN, WHICH WOULD INCLUDE DETAILS AND FINAL ELEVATIONS OF FOOTINGS, WALLS AND SUBSURFACE DRAINAGE TO PREVENT INTERIOR FLOODING. SEE ARCHITECTURAL AND/OR STRUCTURAL DRAWINGS.
- PROPOSED BUILDING FOUNDATION CONFIGURATION AND LOCATION ON THE LOT AS SHOWN ARE CONCEPTUAL AND SHALL BE VERIFIED AS TO CONFORMANCE WITH FINAL ARCHITECTURAL PLANS AND ZONING ORDINANCES PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING HORIZONTAL AND VERTICAL MEASUREMENTS FOR ALL SUBSURFACE STRUCTURES. THIS INFORMATION SHALL BE REPORTED TO THE ENGINEER.

REGULATORY NOTES

- CONTRACTOR SHALL CONTACT "DIG-SAFE" FOR AN UNDERGROUND UTILITY MARKING AT 811 AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK.
- CONTRACTOR SHALL MAKE HIMSELF AWARE OF ALL CONSTRUCTION REQUIREMENTS, CONDITIONS AND LIMITATIONS IMPOSED BY PERMITS AND APPROVALS ISSUED BY REGULATORY AUTHORITIES PRIOR TO THE COMMENCEMENT OF ANY WORK. CONTRACTOR SHALL COORDINATE AND OBTAIN ALL CONSTRUCTION PERMITS REQUIRED BY REGULATORY AUTHORITIES.
- ALL WORK OUTSIDE OF THE BUILDING THAT IS LESS THAN 10 FEET FROM THE INSIDE FACE OF THE BUILDING FOUNDATION SHALL CONFORM WITH THE UNIFORM STATE PLUMBING CODE OF MASSACHUSETTS, 248 CMR 2.00.
- CONSTRUCTION ACTIVITIES SHALL CONFORM TO THE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

GRADING AND UTILITY PLAN NOTES

- LOCATIONS OF EXISTING UNDERGROUND UTILITIES/OBSTRUCTIONS/SYSTEMS SHOWN HEREON ARE APPROXIMATE ONLY. ALL UTILITIES/OBSTRUCTIONS/SYSTEMS MAY NOT BE SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND UTILITIES/OBSTRUCTIONS/SYSTEMS, WHETHER OR NOT SHOWN HEREON.
- UNLESS OTHERWISE SHOWN, ALL NEW UTILITIES SHALL BE UNDERGROUND.
- RIM ELEVATIONS SHOWN FOR NEW STRUCTURES ARE APPROXIMATE AND ARE PROVIDED TO ASSIST CONTRACTOR WITH MATERIAL TAKEOFFS. FINISH RIM ELEVATIONS SHOULD MATCH PAVEMENT, GRADING OR LANDSCAPING, UNLESS SPECIFICALLY INDICATED OTHERWISE.
- WHERE EXISTING UTILITY LINES/STRUCTURES ARE TO BE CUT/BROKEN DOWN/ ABANDONED, LINES/STRUCTURES SHALL BE PLUGGED/CAPPED/FILLED IN ACCORDANCE WITH OWNER REQUIREMENTS.
- STRUCTURE DETAILS FROM INDEPENDENT VENDORS ARE CONSTANTLY CHANGING. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THAT DETAILS SHOWN MATCH CURRENT DETAILS AND SPECIFICATIONS FROM VENDORS.
- CONTRACTOR SHALL INSTALL ALL PARKING AREAS AND WALKWAYS IN ACCORDANCE WITH APPLICABLE ADA AND MAAB REQUIREMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - HANDICAPPED SPACES AND STRIPED AREA SLOPES SHALL NOT EXCEED 2% IN ANY DIRECTION.
 - HANDICAPPED RAMPS SHALL NOT EXCEED 8% FOR A MAXIMUM VERTICAL DISTANCE OF 6 INCHES.
 - SIDEWALKS SHALL HAVE A MAXIMUM SLOPE IN THE PATH OF TRAVEL OF 5% AND A MAXIMUM CROSS SLOPE OF 2%. CONTRACTOR SHOULD NOT LAYOUT SLOPES EXCEEDING 4.5% AND 1.5% RESPECTIVELY TO ALLOW FOR CONSTRUCTION TOLERANCES. IF THE CONTRACTOR DETERMINES THAT THE REQUIRED SLOPES CANNOT BE ACHIEVED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPORTING THE INFORMATION TO THE ENGINEER FOR RESOLUTION.
- WHERE NEW PAVING MEETS EXISTING PAVING, MEET LINE AND GRADE OF EXISTING WITH NEW PAVING.
- AT LOCATIONS WHERE EXISTING PAVEMENT ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING PAVEMENT SHALL BE SAWCUT TO A CLEAN, SMOOTH EDGE.
- EXCAVATION REQUIRED WITHIN PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO ADDITIONAL COST TO THE OWNER.
- ALL DISTURBED AREAS NOT COVERED WITH PAVEMENT, STRUCTURES, INDIVIDUAL PLANTINGS, OR MULCH SHALL HAVE LOAM AND SOIL, OR LOAM AND SEED AS SHOWN ON THE LANDSCAPE PLANS OR AS DIRECTED BY THE ENGINEER.
- ALL UNDERGROUND STRUCTURES AND UTILITIES SHALL BE CAPABLE OF WITHSTANDING H2O WHEEL LOADS.
- THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION, SIZE, INVERTS AND TYPES OF EXISTING PIPES AT ALL PROPOSED POINTS OF CONNECTION PRIOR TO ORDERING MATERIALS. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY AT NO ADDITIONAL COST BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT.
- SILT FENCE AND/OR HAYBALES SHOWN HEREON SHALL BE INSTALLED BEFORE EARTH DISTURBANCE OCCURS WITHIN BUFFER ZONE, AND SHALL SERVE AS THE LIMIT OF WORK.
- CONTRACTOR SHALL PROVIDE DUST CONTROL FOR CONSTRUCTION OPERATIONS AS APPROVED BY THE ENGINEER.
- ALL POINTS OF CONSTRUCTION EGRESSOR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ON TO PUBLIC ROADS.
- APPROXIMATELY 20 TREES WILL BE REMOVED. (10 INSIDE 100' BUFFER ZONE)
- THE CONTRACTOR SHALL VERIFY THE LOCATION AND INVERT OF THE EXISTING SEWER PRIOR TO GREASE TRAP INSTALLATION AND REPORT TO ENGINEER.

SHEA New England's Premier Precaster
CONCRETE PRODUCTS
BILLING ADDRESS: 87 HAVERHILL RD, AMESBURY MA 01913

COMMERCIAL LINE TANK
4000 TO 12000 GALLON

NOTES:

- CONCRETE, 5,000 PSI MINIMUM AFTER 28 DAYS.
- DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS, FOR SEPTIC TANKS.
- ALL REINFORCEMENT PER ASTM C1227.
- DESIGNED FOR ASH TO HS-20 LOADING. COVER 1-5 FEET.
- TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN. INLET HEIGHT MAY INCREASE SLIGHTLY DUE TO THE BUTYL RESIN USED.
- TEES AND BAFFLES SOLD SEPARATELY.
- SPANNERS USED IN CENTER SECTIONS FOR TANKS GREATER THAN 7000 GALLONS.

PLAN VIEW: 17'-0" x 10'-0" with 24" DIA CLEANOUT COVER (3 PLACES)

SECTION VIEW: 8" DIA INLET, 8" DIA OUTLET, 1'-0" LIQUID LEVEL, SEE NOTE 7, SEE NOTE 5, SHEA

GALLONS	A (HEIGHT)	B (INLET)	C (LIQUID)	TOTAL WEIGHT	RISER 1 SIZE	RISER 2 SIZE	RISER 3 SIZE	ITEM NO.
4,000	76"	58"	48"	51,909	48"	0"	0"	10X17-40
5,000	88"	70"	60"	53,679	30"	30"	0"	10X17-50
5,500	92"	74"	64"	56,836	30"	34"	0"	10X17-55
6,000	96"	78"	68"	58,193	34"	34"	0"	10X17-60
6,500	100"	82"	72"	59,449	30"	42"	0"	10X17-65
7,000	106"	88"	78"	61,334	30"	48"	0"	10X17-70
7,500	112"	94"	84"	65,586	42"	42"	0"	10X17-75
8,000	118"	100"	90"	67,810	42"	48"	0"	10X17-80
8,500	124"	106"	96"	69,695	48"	48"	0"	10X17-85
9,000	130"	112"	102"	72,932	30"	30"	W/SPAN	10X17-90
9,500	136"	118"	108"	75,156	30"	30"	W/SPAN	10X17-95
10,000	140"	122"	112"	76,640	30"	34"	W/SPAN	10X17-100
10,500	146"	128"	118"	78,635	34"	42"	W/SPAN	10X17-105
11,000	152"	134"	124"	80,558	34"	48"	W/SPAN	10X17-110
11,500	158"	140"	130"	83,083	34"	48"	W/SPAN	10X17-115
12,000	162"	144"	134"	84,341	38"	48"	W/SPAN	10X17-120

ITEM SIZE	WEIGHT
8" TOP	16,312#
21" BOTTOM	20,517#
30" RISER	8,425#
30" RIS + SPAN	11,116#
34" RISER	10,682#
34" RIS + SPAN	12,600#
38" RISER	11,940#
38" RIS + SPAN	14,080#
42" RISER	13,195#
42" RIS + SPAN	15,562#
48" RISER	15,080#
48" RIS + SPAN	17,786#

SHEA PRODUCT ID: SEE TABLE PREPARED FOR: FILE NAME: ctk10x17.dwg

WEIGHT (LBS): SEE TABLE DRAWN BY: ARO DATE: 03/01/2018 PAGE: 18.1

773 Salem Street-Wilmington, MA | 153 Cranberry Hwy-Rochester, MA | 87 Haverhill Road-Amesbury, MA | 160 Old Turnpike Rd-Nortingham, NH

Specifications subject to change without notice

5,000 GALLON GREASE TRAP

NOTES: 1. INLET TEE SHALL EXTEND TO 3" BELOW INVERT
2. OUTLET TEE SHALL EXTEND TO 12" ABOVE TANK BOTTOM

3'-0" (914 MM) TOP
1'-6" (457 MM) ISOMETRIC VIEW
FRONT
SIDE

STORMTANK MODULES					
DESCRIPTION	HEIGHT (IN)	CAPACITY (CU. FT.)	NOMINAL VOID RATIO (%)	WEIGHT (LBS.)	WEIGHT (KG.)
ST-18	18 (457)	8.436 (0.19)	96.5%	22.7 (10)	
ST-24	24 (610)	8.656 (0.25)	96.0%	26.3 (12)	
ST-30	30 (762)	10.876 (0.31)	96.5%	29.5 (13)	
ST-36	36 (914)	13.096 (0.37)	97.0%	33.1 (15)	

STEP 1: LAYOUT & CUT OPENING INTO THE CENTER OF THE TOP PLATEN FOR BRENTWOOD OBSERVATION PORT.

STEP 2: INSTALL OBSERVATION PORT.

STEP 3: LOCATE AND MARK OPENING.

STEP 4: MARK & CUT FLANGE PLATE POSITION WITH MODULE SIDE "WHEN MODULE IS ON THE PERIMETER OF THE SYSTEM".

STEP 5: INSTALL GEOTEXTILE: WRAP SPECIFIED GEOTEXTILE FABRIC AROUND ENTIRE INSTALLATION OF STORMTANK MODULES. CUT "X" PATTERN INTO GEOTEXTILE FABRIC AT OBSERVATION PORT AND PEEL EDGES OUT.

STEP 6: SEAL FABRIC TO OBSERVATION PORT.

STEP 7: REMOVE SIDE PANELS FROM MODULES AND CUT OPENING.

STEP 8: REINSTALL SIDE PANELS.

STEP 9: INSTALL PIPE (SULP FIT).

DETAIL: 1"-5" MAX. TOP PLATEN, SIDE PANEL, INLET PIPE (BY OTHERS), COLUMN.

STEP 5: WRAP AND SECURE GEOTEXTILE.

CROSS SECTION

FINISHED IMPERVIOUS SURFACE (DESIGN BY ENGINEER OF RECORD)

VEGETATED AREA TO BE DESIGNED WITH ADEQUATE COMPACTED FILL FOR DESIGNED LOAD RATING (DESIGN BY ENGINEER OF RECORD)

SUITABLE COMPACTABLE FILL (AS NECESSARY - DESIGN BY ENGINEER OF RECORD)

PROPEX GEOTEX 601

NON-WOVEN GEOTEXTILE FABRIC (PROPEX GEOTEX 601 OR APPROVED EQUAL)

NON-WOVEN GEOTEXTILE FABRIC (PROPEX GEOTEX 601 OR APPROVED EQUAL) SURROUNDING MODULES AND STONE/SOIL INTERFACE

3/4" (19 MM) ANGULAR STONE

DEPTH SPECIFIED BY ENGINEER OF RECORD

MIN. 1'-0" (305 MM)

ENGINEER OF RECORD RESPONSIBLE FOR ENSURING SUBGRADE SOILS MEET BEARING AND SETTLING REQUIREMENTS

NOTES:

- INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
- DO NOT SCALE DRAWING.
- THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
- ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
- CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 4907-008.

NOTES:

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- CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 4907-010.

NOTES:

- SIDE PANELS TO BE INSTALLED ALONG SYSTEM PERIMETER, UNLESS OTHERWISE SPECIFIED.
- ALL HEIGHTS TO BE CUT FROM A 3/8" (9.14 MM) SIDE PANEL AT PRE-SCRIBED LOCATIONS.
- INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
- DO NOT SCALE DRAWING.
- THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
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- CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 4907-018.

STORMTANK MODULE
DETAIL

STORMTANK MODULE
OBSERVATION PORT INSTALLATION DETAIL

STORMTANK MODULE
SMALL DIAMETER PIPE CONNECTION DETAIL

STORMTANK MODULE
SINGLE-STACK INFILTRATION BASIN CROSS-SECTION DETAIL

CAMP ROTARY DINING HALL

372 Ipswich Road
Boxford, MA 01921

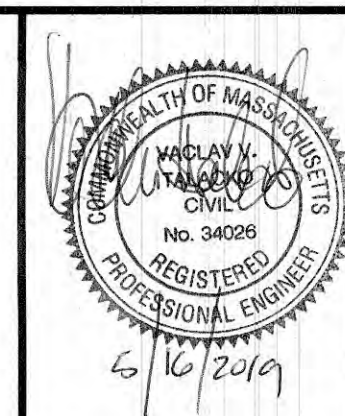
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HANCOCK ASSOCIATES

Civil Engineers
Land Surveyors
Wetland Scientists

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WWW.HANCOCKASSOCIATES.COM



NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION
2	JPC	WT	5/16/19	CON. COM. SET
1	JPC	WT	4/12/19	DD SET

DATE: 4/8/19 DRAWN BY: JPC
SCALE: AS SHOWN CHECK BY: VVT

DETAILS

DWG: 22275 ps.dwg
LAYOUT: DET
SHEET: 3 OF 4
PROJECT NO.: 22275

CAMP ROTARY DINING HALL

372 Ipswich Road
Boxford, MA 01921

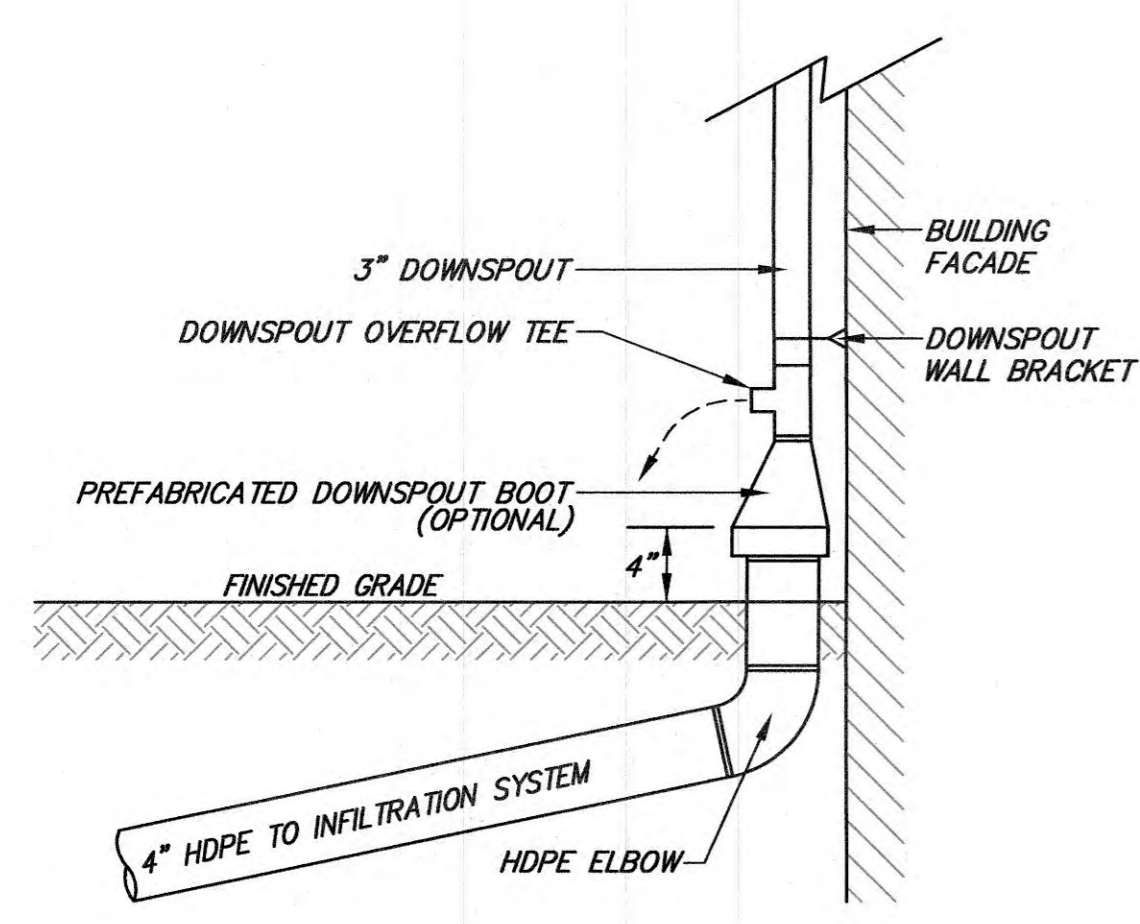
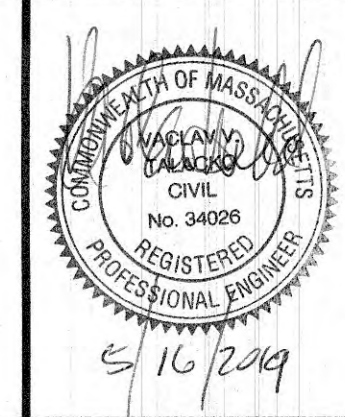
PREPARED FOR:
Gienapp Architects, LLC

20 Conant Street
Danvers, Massachusetts 01923

HANCOCK ASSOCIATES

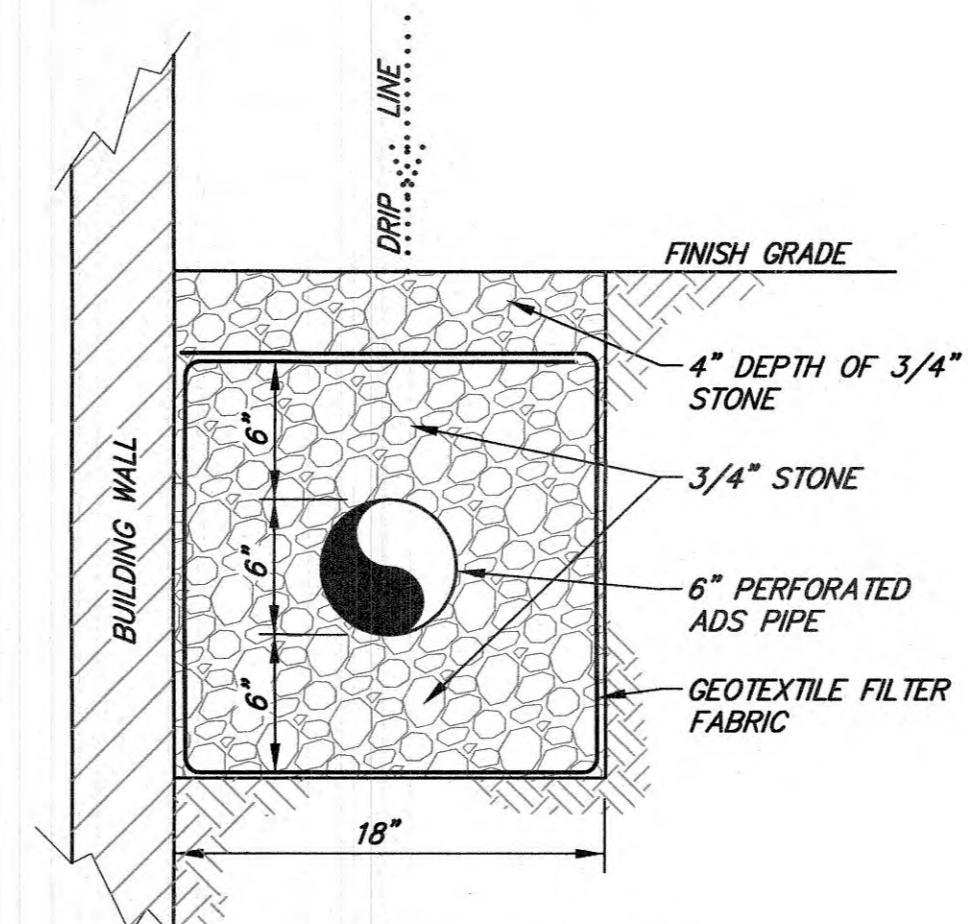
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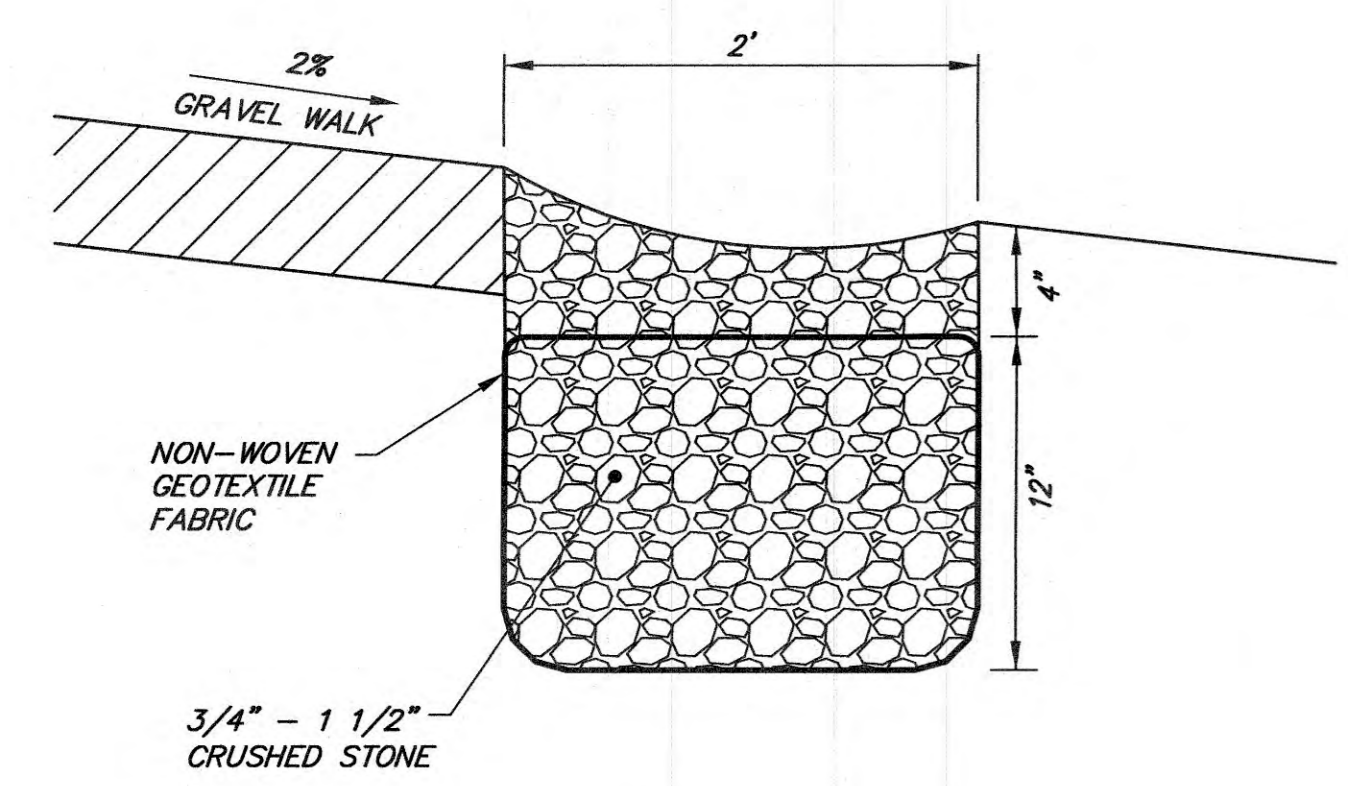


NOTES:
1. COORDINATE ALL ROOF DRAIN DOWNSPOUTS WITH ARCHITECTURAL DRAWINGS.

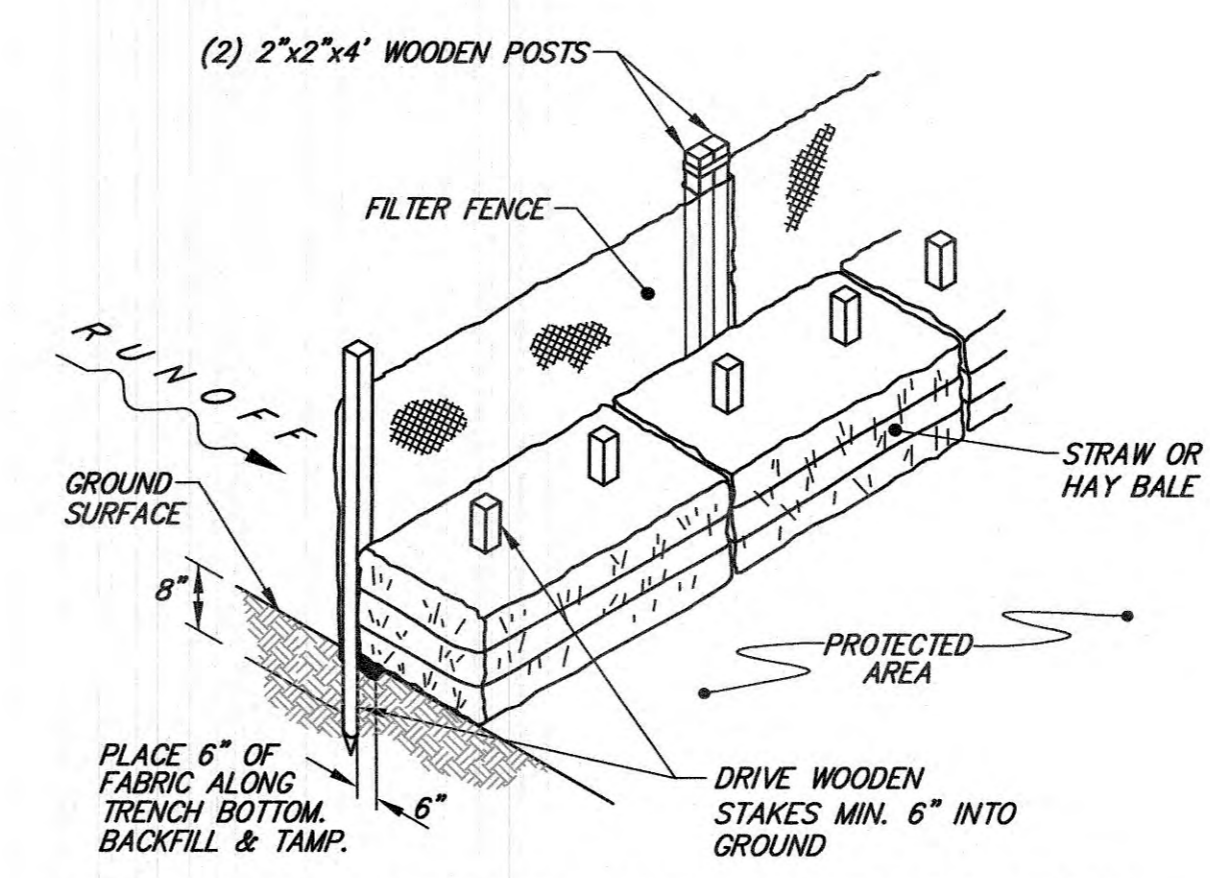
ROOF DRAIN CONNECTION
NOT TO SCALE



ROOF RUN-OFF INFILTRATION TRENCH
NOT TO SCALE



INFILTRATION TRENCH
NOT TO SCALE



HAY BALE AND SILT FENCE BARRIER
ISOMETRIC VIEW
NOT TO SCALE

NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION
2	TJR	VVT	5/16/19	CON. COM. SET
1	JPC	VVT	4/12/19	DD SET

DATE: 4/8/19 DRAWN BY: JPC
SCALE: AS SHOWN CHECK BY: VVT

DETAILS 2

PLOT DATE: May 16, 2019 8:13 am
PATH: F:\CH4 30 Projects\22275 -Camp Rotary Gienapp - Boxford\

DWG: 22275 ps.dwg	
LAYOUT: DET 2	
SHEET: 4 OF 4	
PROJECT NO.:	22275

HANCOCK ASSOCIATES

Stormwater Report *In Support of*

Site Plan Review Application *for* **Camp Rotary** *372 Ipswich Road* *Boxford, MA*



Prepared By:
Hancock Associates
#22275

Prepared For:
Gienapp Architects, LLC

May, 2019

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Salem, NH 03079
Phone: 603-898-4701

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Standard 2: Peak Rate Attenuation

Standard 3: Recharge

Standard 4: Water Quality

Standard 5: Land Uses with Higher Potential Pollutant Loads

Standard 6: Critical Areas

Standard 7: Redevelopment

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

Standard 9: Operations and Maintenance Plan

Standard 10: Prohibition of Illicit Discharges

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- I. Stormwater Checklist
- II. NRCS Soils Map
- III. Soil Logs
- IV. Existing and Proposed Drainage Figures
- V. Hydrocad Output
- VI. Operations and Maintenance Log

Introduction

Existing Conditions

The property is located on the south side of Ipswich Road in Boxford, Massachusetts. The parcel contains 48 acres occupied by the Camp Rotary summer camp. The property is scattered with various wood frame buildings serving the camp including sleeping cabins, a dining hall, an infirmary and a recreational building. The majority of the site is covered hard wood woodlands as well as various athletic fields and ranges. The land rises from Ipswich Road to the south to a high point in the south east corner. Stiles Pond is situated on the southwestern boundary of the property.

Proposed Conditions

Gienapp Architects, LLC proposes demolish the existing dining hall and to construct a new 8,690+/- S.F. dining hall in the same general area. Associated site improvements will include a large patio, balcony, retaining walls and a new path down to Stiles Pond. New fenced in dumpster pad, a transformer, Generator and propane tank will be installed on the west side of the dining hall. A new grease trap will be located north east of the building. A 25,000 gallon fire protection tank will be located under the building. There is no new parking proposed.

Stormwater runoff in the vicinity of the project follows the existing topography over-land to Stiles Pond to the west. An infiltration chamber system is proposed to capture the roof runoff from the southeast facing side and roof of the building through a system of gutters, downspouts and roof drains. Roof runoff infiltration chambers at the roof drip line will be utilized for the northwest facing side of the building and along the relocated path to the pond. The infiltration chamber system is designed to infiltrate the entire 100-year storm. The proposed patio will have a pervious surface consisting of pavers underlain by crushed stone. All other stormwater runoff on site will continue to drain over land to Stiles Pond.

The stormwater system has been designed to meet the standards described in the "Massachusetts Stormwater Handbook." The report is organized into sections that correspond to the categories listed in the "Massachusetts Stormwater Report Checklist."

Standard 1: No New Untreated Discharges

The Massachusetts Stormwater Handbook states that no new stormwater conveyances may discharge untreated stormwater directly to or cause erosions in wetlands or waters of the Commonwealth. The project will not include untreated stormwater discharges.

Standard 2: Peak Rate Attenuation

The Massachusetts Stormwater Handbook states that stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. A summary of the existing and proposed discharge rates follows. The proposed condition discharge rates of runoff are at or below the existing rates to the same discharge points. Please see the attached "Existing Drainage Areas" and "Proposed Drainage Areas" figures (Appendix IV) and Hydrocad summary (Appendix V) for more information.

The Natural Resources Conservation Service (NRCS) Web Soil Survey of Essex County defines soils in the project area as the following:

- 51A, Swansea muck, 0 to 1 percent slopes (Hydrologic Soil Group B/D)

- 73A, Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony (Hydrologic Soil Group D)
- 710E, Canton and Charlton fine sandy loams, 15 to 35 percent slopes (Hydrologic Soil Group B)
- 717C, Rock outcrop-Charlton-Hollis complex, 3 to 15 percent slopes (Hydrologic Soil Group D)
- 717E, Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes (Hydrologic Soil Group D)

Please see the attached NRCS Web Soil Summary (Appendix II).

One drainage area has been modeled to represent the existing conditions within the project area. The following is a description of the existing drainage area:

- *Drainage Area EX1 Contains proposed activities*
Drainage Area EX1 is 196,350 square feet and drains over land to the Stiles Pond on the southwestern edge of the property. Stiles Pond is represented as the discharge point DP1 for the purpose of these calculations. The existing watershed consists almost entirely of wooded area and several existing wooden structures as well as paved vehicular access areas.

Two drainage areas have been modeled to represent the proposed conditions. The following is a description of the proposed drainage areas:

- *Drainage Area PR1 Area does not include building roof to be infiltrated*
Drainage Area PR1 is 191,748 square feet and consists mainly of wooded area, several existing wooden structures and a large portion of the proposed dining hall and patio. Stormwater runoff from PR1 drains over land to Stiles Pond, discharge point DP1.
- *Drainage Area PR2 Roof area to be infiltrated*
Drainage Area PR2 is 4,602 square feet and consists of the southwestern section of the proposed dining hall roof. This section of the proposed roof drains via downspouts to a Stormtank infiltration chamber system. The chamber system is designed to infiltrate the entire 100 year storm. The roof downspouts are affixed with an outlet tee to act as an emergency overflow outlet.

A subsurface soil investigation was performed at the infiltration basin location. Soils at the infiltration basin location was found to be sandy loam. Groundwater was not observed in this investigation. For the purpose of these calculations, the Rawls's rate corresponding to sandy loam (1.02 inches per hour) was used as an exfiltration rate for the infiltration basin.

The following table compares the peak rates and volumes of runoff under the existing and proposed conditions:

Discharge Point	2-Year Storm (3.25" Rainfall Depth)		10-Year Storm (5.10" Rainfall Depth)		25-Year Storm (6.25" Rainfall Depth)		100-Year Storm (8.0" Rainfall Depth)	
	Existing (cfs)	Proposed (cfs)	Existing (cfs)	Proposed (cfs)	Existing (cfs)	Proposed (cfs)	Existing (cfs)	Proposed (cfs)
Peak Rate (cfs)	3.85	3.58	7.62	7.24	10.04	9.59	13.73	13.19
Volume (ac-ft)	0.61	0.57	1.21	1.15	1.61	1.53	2.23	2.13

cfs - Cubic Feet per Second

Standard 3: Recharge

The Massachusetts Stormwater Handbook states that loss of annual recharge to groundwater shall be eliminated or minimized. The annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions based on soil type. Recharge volumes are provided for all of the proposed impervious areas. For the purpose of these calculations, all of the project areas are considered to be Hydrologic Soil Group B. The required recharge volume is 0.35” multiplied by the area of impervious surfaces. Please see the attached HydroCAD summary for the recharge volume provided within the infiltration basin (Appendix VI). Since this is a redevelopment project, much of the proposed impervious is replacing existing impervious. Therefore, there is only a net increase in impervious area of 1,732 S.F. The recharge volumes are as follows:

Required Recharge Volume, HSG B = Target Depth * Impervious Area = 0.35” * 1,732 SF = 51 CF

The recharge volume provided is the volume within the subsurface system of chambers. The total recharge volume provided is 1,561 CF. Since the recharge volume provided is greater than the required recharge volume, the standard is met for the project area.

The Massachusetts Stormwater Handbook states that the recharge volume must drain within 72 hours. The following "drawdown" calculations assumes a Rawl's Rate associated with the texture class and Hydrologic Soil Group of the soils in the area of the recharge volume. These rates are listed in Table 2.3.3. of Volume 3, Chapter 1 of the Massachusetts Stormwater Handbook. The drawdown time is calculated using the following equation:

Drawdown Time = Storage Volume / (Rawl's Rate * Bottom Area)

Drawdown times for the recharge volumes are listed below:

Recharge BMP	Recharge Volume (Cubic Feet)	Bottom Area (Square Feet)	Rawl's Rate Sandy Loam (Inches/Hour)	Drawdown Time (Hours)
Infiltration Basin	2,200	880	1.02	30

Since the drawdown times are less than 72 hours, the requirement is met.

Standard 4: Water Quality

The only stormwater management system being proposed for this project is the subsurface infiltration chamber system. The watershed flowing to the chamber system is comprised entirely of roof runoff and is not subject to TSS removal standards.

Standard 5: Land Uses with Higher Potential Pollutant Loads

The project site is not considered a Land Use with Higher Potential Pollutant Load (LUHPPL). Therefore, this standard is not applicable.

Standard 6: Critical Areas

The proposed project is not in a critical area. Therefore, this standard is not applicable.

Standard 7: Redevelopment

The proposed redevelopment project shall comply with all requirements of the Stormwater Management Standards and improve existing conditions. This project is not designed as redevelopment

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

Best management practices (BMP) for erosion and sedimentation control consist of siltation barriers, such as straw bales and silt fence, and mulching. Many stormwater BMP technologies (e.g., infiltration technologies) are not designed to handle the high concentrations of sediments typically found in construction runoff and must be protected from construction-related sediment loadings. Construction BMPs **must** be maintained.

In developing the proposed project certain measures will be implemented to minimize impacts erosion and sedimentation could have on the surrounding resource areas. This section addresses items that involve proper construction techniques, close surveillance of workmanship, and immediate response to emergency situations. The contractor must be prepared to provide whatever reasonable measures are necessary to protect the environment during construction and to stabilize all disturbed areas as soon as construction ends.

Pre-Construction

1. The contractor shall install a siltation barrier as approved by the City of Boxford Conservation Commission.
2. The contractor shall comply with the requirements of the Order of Conditions.
3. The contractor shall have a stockpile of materials required to control erosion on-site to be used to supplement or repair erosion control devices. These materials shall include, but are not limited to, crushed stone, straw wattles and silt fencing.
4. The contractor is responsible for erosion control on site and shall utilize erosion control measures where needed, regardless of whether the measures are specified on the plan or in the order of conditions. The contractor shall inspect the site daily for any erosion or unstable slopes and initiate repairs immediately.

Preliminary Site Work

1. Excavated materials shall be stockpiled, separating the topsoil for future use on the site. All stockpiled materials shall be located outside of the 100ft buffer zone and be surrounded by siltation barriers. Any soil stockpiles shall be seeded if left for more than 14 days.
2. If intense rainfall is anticipated, the installation of supplemental filter socks, hay bale dikes, silt fences, or armored dikes shall be considered.
3. Unsuitable excavated material shall be removed from the site.

Ongoing Site Work

1. Erosion control measures shall be regularly inspected daily and replaced as needed.

2. Any dewatering shall be done in a manner so as not to transmit silt, sand or particulate matter to the receiving water or existing drainage system.

Landscaping

1. Planting shall occur as soon as possible to provide permanent stabilization of disturbed surfaces.
2. If the season or adverse weather conditions do not allow the establishment of vegetation, temporary mulching with straw, wood chips weighted with snow fence or branches, or other methods shall be installed.
3. A minimum of 4 inches of topsoil shall be placed and its surface smoothed to the specified grades.
4. The use of herbicides is strongly discouraged.
5. Hydro seeding is encouraged for steep slopes. Application rates on slopes greater than 3:1 shall have a minimum seeding rate of 5-lbs/1000 SF. A latex or fiber tackifier shall be used on these slopes at a minimum rate of 50 lbs. of tackifier per 500 gallons of water used.

Standard 9: Operations and Maintenance Plan

The information provided herein is intended to provide the base information for operation and maintenance of the site in perpetuity subject to updates and revisions as required at a future date. As such all future property owners must be notified in writing of the this plan and be provided with a copy of this plan, a complete set of the design drawings and/or a completed as-built plan showing all the drainage features as they were constructed, which are considered part of this document. Please see the attached Operations and Maintenance Log (Appendix VII).

Stormwater management system owner: Property Owner
The party responsible for operation and maintenance: Property Owner

Illicit Discharge - Practices to Minimize Storm Water Contamination

- All waste materials will be collected and stored in a securely lidded metal dumpster.
- All trash and debris from the site will be deposited in the dumpster. The dumpster will be emptied on a regular schedule prior to being over full.
- All personnel will be instructed regarding the correct procedure for waste disposal.
- Good housekeeping and spill control practices will be followed to minimize storm water contamination from petroleum products, paints, and cleaning products.
- All site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage.
- Spill kits will be provided with any activity that could provide contamination.
- All paint containers and curing compounds will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewers, but will be properly disposed according to the manufacturer's instructions.
- All spills will be cleaned up immediately upon discovery. Spills large enough to reach the storm sewers will be reported to the Massachusetts Department of Environmental Protection Northeast Regional Office at 1-888-304-1133.

Infiltration BMP

The infiltration BMP (subsurface chamber system) shall be inspected after every major storm for the first few months to ensure it is stabilized and functioning properly. If necessary, corrective action shall be taken until the system functions properly. Inspectors should note how long water remains standing in the inspection port after a storm; standing water within the basin 48 to 72 hours after a storm indicates that the infiltration capacity may have been overestimated. If the ponding is due to clogging, immediately address the reasons for the clogging. Thereafter, inspect the infiltration BMP at least twice per year.

Roof Drain Leaders

Routine roof inspections shall be performed two times per year in the late Fall and early Spring. The roof shall be kept clean and free of debris, and the roof drainage systems shall be kept clear. Gutters and downspouts shall be cleaned at least twice per year, in late Fall and in the Spring, or more frequently as necessary.

Vegetated Areas Maintenance

Although not a structural component of the drainage system, the maintenance of vegetated areas may affect the functioning of stormwater management practices. This includes the health/density of vegetative cover and activities such as the application and disposal of lawn and garden care products, disposal of leaves and yard trimmings.

Initial Post-Construction Inspection

During the initial period of vegetation establishment pruning and weeding are required twice in first year by contractor or owner. Any dead vegetation/plantings found after the first year will be replaced. Proper mulching is mandatory and regular watering may be required initially to ensure proper establishment of new vegetation.

Long-Term Maintenance

The planted areas shall be inspected on a semi-annual basis and any litter removed. Weeds and invasive plant species shall be removed by hand. Maintain planted areas adjacent to pavement to prevent soil washout. Immediately clean any soil deposits on pavement. Leaf litter and other detritus shall be removed twice per year. If needed to maintain aesthetic appearance, perennial plantings may be trimmed at the end of the growing season.

Trees and shrubs shall be inspected twice per year to evaluate health and attended to as necessary. Seeded ground cover or grass areas shall not receive mulching. Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming. Plant alternative mixtures of grass species in the event of unsuccessful establishment. The grass vegetation should not be cut to a height less than four inches.

Pesticide/Herbicide Usage

No pesticides are to be used unless a single spot treatment is required for a specific control application.

Standard 10: Prohibition of Illicit Discharges

Illicit Discharge Compliance Statement

To the best of my knowledge no illicit discharges currently exist on the site and no future illicit discharge will be allowed, including wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

Signed by

Stormwater System Owner

Date

Rehul A. Balde 5/15/2019

CAMP ROTARY CAMP MANAGER

Appendix I. Stormwater Checklist



Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

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

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

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

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

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



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



5/16/2019

Signature and Date

Checklist

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

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



Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

Standard 3: Recharge

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

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



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

Standard 4: Water Quality

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

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



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
 - The ½" or 1" Water Quality Volume or
 - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the proprietary 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

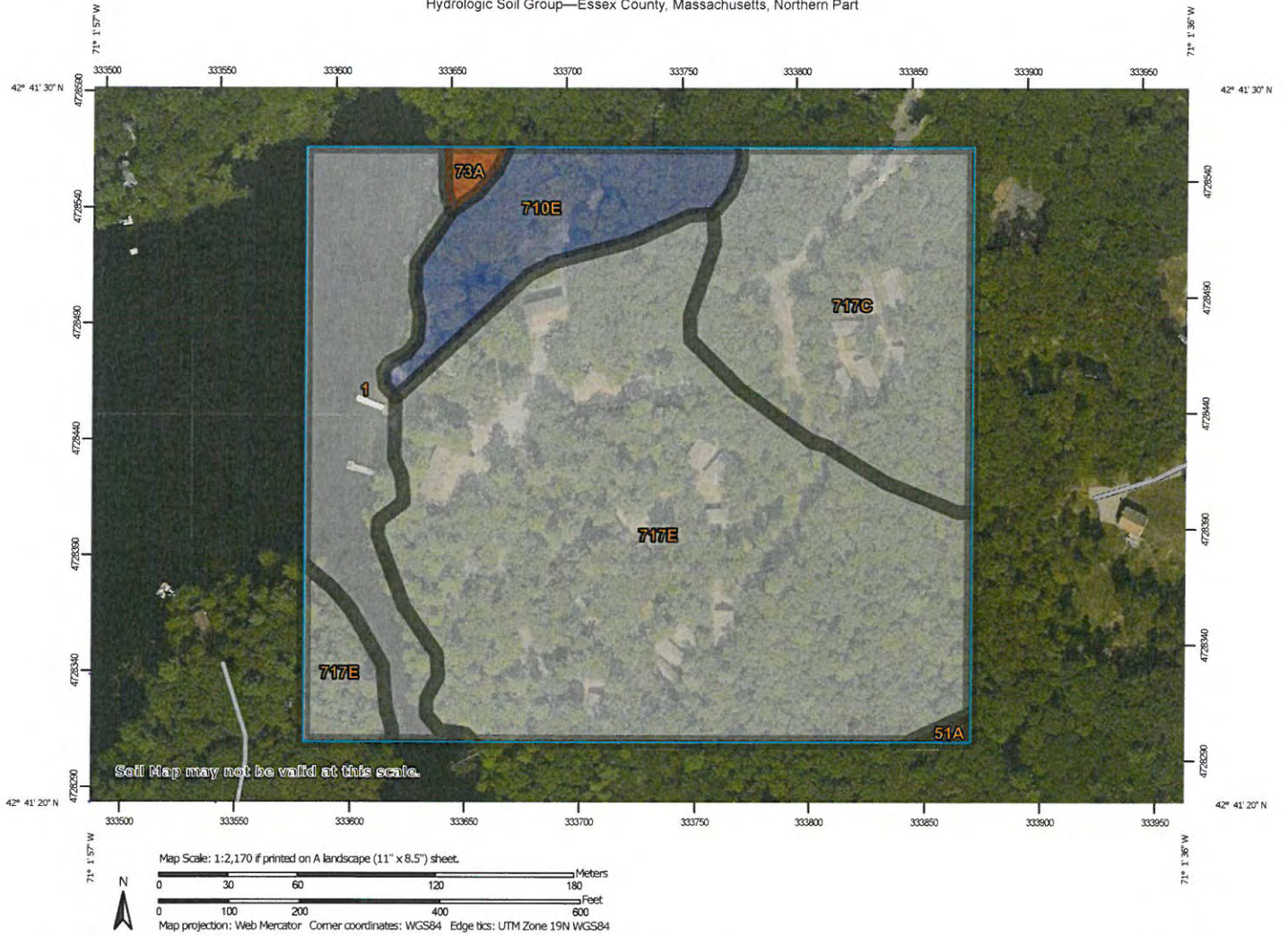
- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance 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.

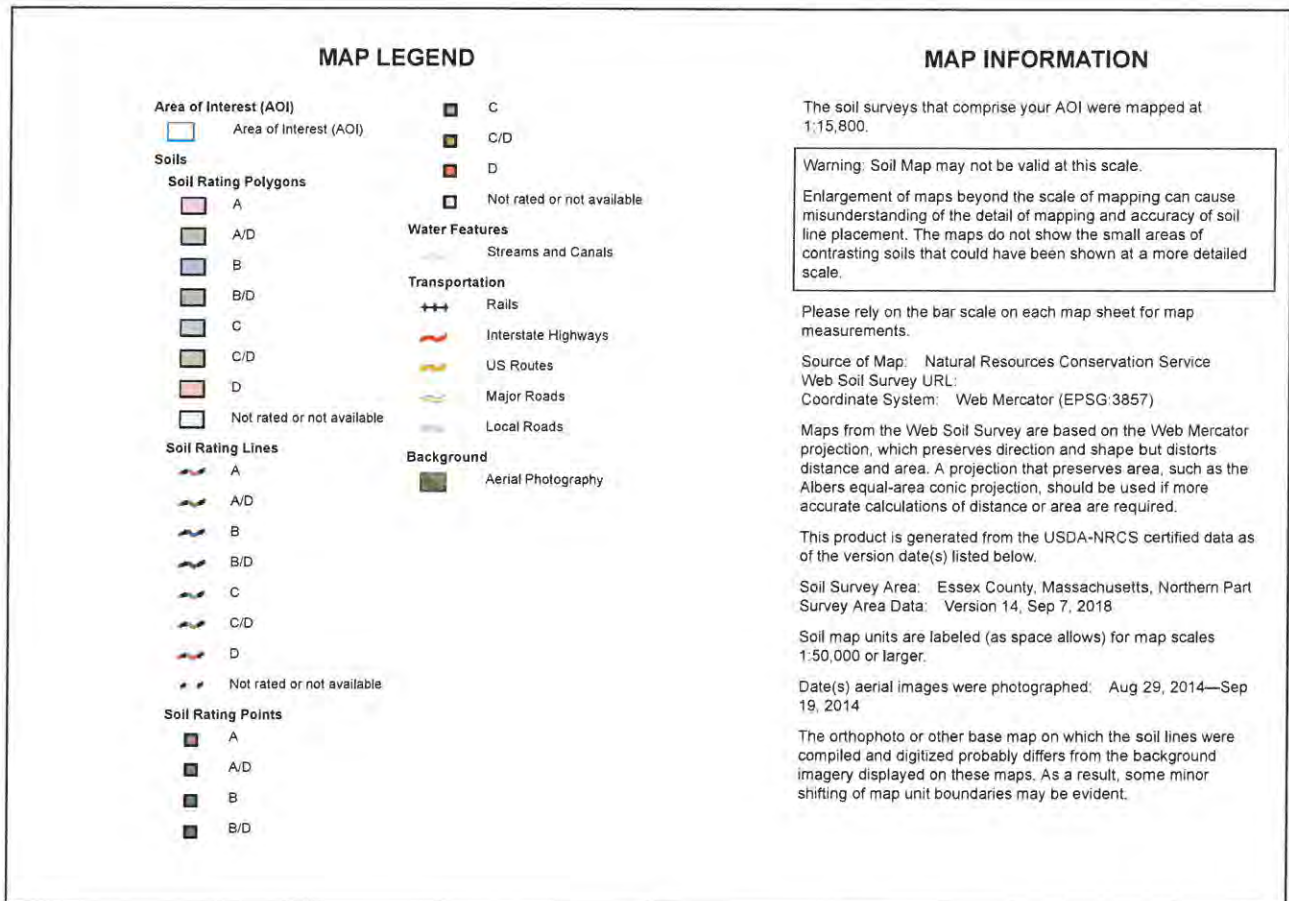
Standard 10: Prohibition of Illicit Discharges

- 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.

Appendix II. NRCS Soils Map

Hydrologic Soil Group—Essex County, Massachusetts, Northern Part





Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		2.5	13.6%
51A	Swansea muck, 0 to 1 percent slopes	B/D	0.0	0.2%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	D	0.1	0.7%
710E	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	B	1.6	8.7%
717C	Rock outcrop-Charlton-Hollis complex, 3 to 15 percent slopes		3.7	20.1%
717E	Rock outcrop-Charlton-Hollis complex, 15 to 35 percent slopes		10.5	56.7%
Totals for Area of Interest			18.5	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix III. Soil Logs

*See sheet 2 of the plan set.

Appendix IV. Existing and Proposed Drainage Figures

**CAMP ROTARY
DINING HALL**

372 Ipswich Road
Barnard, MA 01921

PREPARED FOR
**Gienapp
Architects, LLC**

20 Conant Street
Barnard, Massachusetts 01923

**HANCOCK
ASSOCIATES**

Civil Engineers
Land Surveyors
Wetland Scientists

180 GARDEN STREET, BARNARD, MA 01923
VOICE: 978/460-0200 FAX: 978/460-0204
WWW.HANCOCKASSOCIATES.COM

NO.	DATE	DESCRIPTION
1	4/12/18	ISSUE FOR PERMIT
2	5/15/18	ISSUE FOR PERMIT
3	6/12/18	ISSUE FOR PERMIT
4	7/12/18	ISSUE FOR PERMIT
5	8/12/18	ISSUE FOR PERMIT
6	9/12/18	ISSUE FOR PERMIT
7	10/12/18	ISSUE FOR PERMIT
8	11/12/18	ISSUE FOR PERMIT
9	12/12/18	ISSUE FOR PERMIT
10	1/12/19	ISSUE FOR PERMIT
11	2/12/19	ISSUE FOR PERMIT
12	3/12/19	ISSUE FOR PERMIT
13	4/12/19	ISSUE FOR PERMIT
14	5/12/19	ISSUE FOR PERMIT
15	6/12/19	ISSUE FOR PERMIT
16	7/12/19	ISSUE FOR PERMIT
17	8/12/19	ISSUE FOR PERMIT
18	9/12/19	ISSUE FOR PERMIT
19	10/12/19	ISSUE FOR PERMIT
20	11/12/19	ISSUE FOR PERMIT
21	12/12/19	ISSUE FOR PERMIT
22	1/12/20	ISSUE FOR PERMIT
23	2/12/20	ISSUE FOR PERMIT
24	3/12/20	ISSUE FOR PERMIT
25	4/12/20	ISSUE FOR PERMIT
26	5/12/20	ISSUE FOR PERMIT
27	6/12/20	ISSUE FOR PERMIT
28	7/12/20	ISSUE FOR PERMIT
29	8/12/20	ISSUE FOR PERMIT
30	9/12/20	ISSUE FOR PERMIT
31	10/12/20	ISSUE FOR PERMIT
32	11/12/20	ISSUE FOR PERMIT
33	12/12/20	ISSUE FOR PERMIT
34	1/12/21	ISSUE FOR PERMIT
35	2/12/21	ISSUE FOR PERMIT
36	3/12/21	ISSUE FOR PERMIT
37	4/12/21	ISSUE FOR PERMIT
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92	11/12/25	ISSUE FOR PERMIT
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94	1/12/26	ISSUE FOR PERMIT
95	2/12/26	ISSUE FOR PERMIT
96	3/12/26	ISSUE FOR PERMIT
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100	7/12/26	ISSUE FOR PERMIT

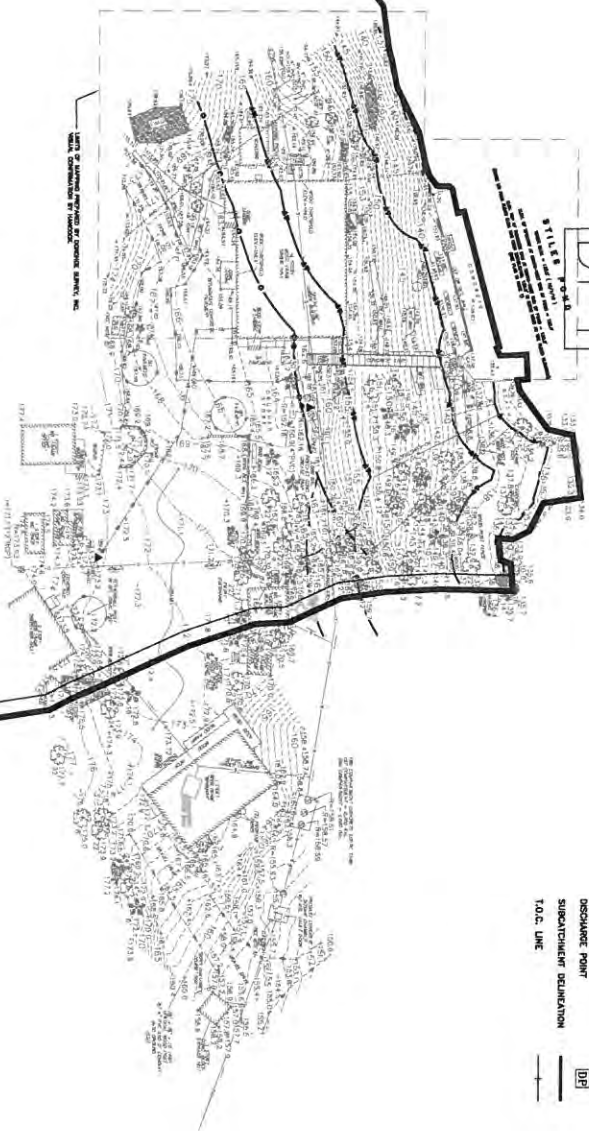
**EXISTING
WATERSHED
PLAN**

DATE: 04/12/23
DRAWN BY: J. HANCOCK
CHECKED BY: J. HANCOCK
SCALE: AS SHOWN

PROJECT NO.: 22275

SHEET: 1 OF 1

LEGEND
 SUBSTANTMENT (EX)
 DISCHARGE POINT (DP)
 SUBSTANTMENT DELINEATION (DP)
 T.O.C. LINE



EX1

NOTE:
BOUNDARY OF WATERSHED OUTLINE LIMIT OF SURVEY WAS
SCALED FROM MASS GIS TOPOGRAPHIC MAP.



**CAMP ROTARY
DINING HALL**

372 Ipswich Road
Boxford, MA 01921

PREPARED BY
Gienapp
Architects, LLC

201 Conant Street
Danvers, Massachusetts 01923

**HANCOCK
ASSOCIATES**

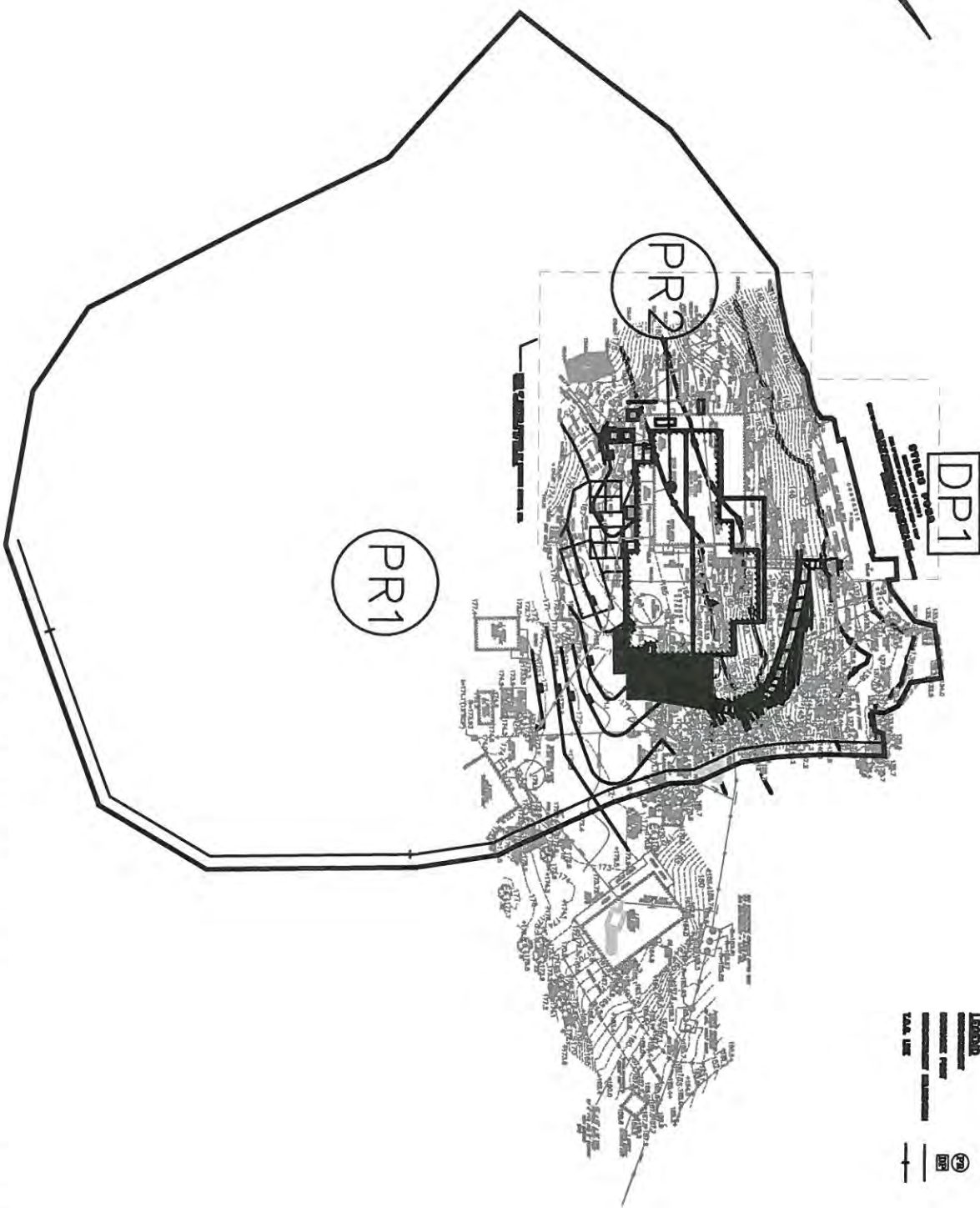
Civil Engineers
Land Surveyors
Wetland Scientists

180 CHURCH STREET, DANVERS, MA 01923
PHONE: (978) 752-1100
FAX: (978) 752-1101
WWW.HANCOCKASSOCIATES.COM

NO.	DATE	DESCRIPTION	BY	CHKD.
1	08/14/13	ISSUED FOR PERMITS	AG	
2	08/14/13	REVISED PER COMMENTS	AG	
3	08/14/13	REVISED PER COMMENTS	AG	
4	08/14/13	REVISED PER COMMENTS	AG	
5	08/14/13	REVISED PER COMMENTS	AG	
6	08/14/13	REVISED PER COMMENTS	AG	
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11	08/14/13	REVISED PER COMMENTS	AG	
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16	08/14/13	REVISED PER COMMENTS	AG	
17	08/14/13	REVISED PER COMMENTS	AG	
18	08/14/13	REVISED PER COMMENTS	AG	
19	08/14/13	REVISED PER COMMENTS	AG	
20	08/14/13	REVISED PER COMMENTS	AG	

**PROFESSOR
EMERITUS
PLM**

DATE: 08/14/13
DRAWN BY: PLM
CHECKED BY: PLM
SCALE: AS SHOWN
SHEET 1 OF 1
PROJECT NO.: 201270



- LEGEND**
- EXISTING BUILDING FOOTPRINT
 - PROPOSED BUILDING FOOTPRINT
 - EXISTING PAVEMENT
 - PROPOSED PAVEMENT
 - EXISTING DRIVE
 - PROPOSED DRIVE
 - EXISTING UTILITY
 - PROPOSED UTILITY
 - EXISTING FENCE
 - PROPOSED FENCE
 - EXISTING EASEMENT
 - PROPOSED EASEMENT
 - EXISTING RIGHT-OF-WAY
 - PROPOSED RIGHT-OF-WAY
 - EXISTING PROPERTY LINE
 - PROPOSED PROPERTY LINE
 - EXISTING ADJACENT PROPERTY
 - PROPOSED ADJACENT PROPERTY
 - EXISTING ADJACENT ROAD
 - PROPOSED ADJACENT ROAD
 - EXISTING ADJACENT LOT
 - PROPOSED ADJACENT LOT
 - EXISTING ADJACENT ZONE
 - PROPOSED ADJACENT ZONE
 - EXISTING ADJACENT DISTRICT
 - PROPOSED ADJACENT DISTRICT
 - EXISTING ADJACENT TOWN
 - PROPOSED ADJACENT TOWN
 - EXISTING ADJACENT COUNTY
 - PROPOSED ADJACENT COUNTY
 - EXISTING ADJACENT STATE
 - PROPOSED ADJACENT STATE
 - EXISTING ADJACENT FEDERAL
 - PROPOSED ADJACENT FEDERAL

DATE OF REVISION: 08/14/13
DRAWN BY: PLM
CHECKED BY: PLM
SCALE: AS SHOWN
SHEET 1 OF 1
PROJECT NO.: 201270



Appendix V. Hydrocad Output



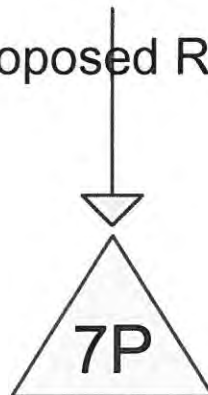
Existing Watershed



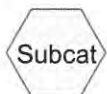
Proposed Watershed



Proposed Roof



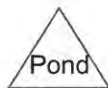
30" Brentwood
Stormtank Chambers



Subcat



Reach



Pond



Link

Routing Diagram for 22275 HydroCAD

Prepared by Hancock Associates, Inc., Printed 5/16/2019
HydroCAD® 10.00-22 s/n 00821 © 2018 HydroCAD Software Solutions LLC

Summary for Subcatchment EX1: Existing Watershed

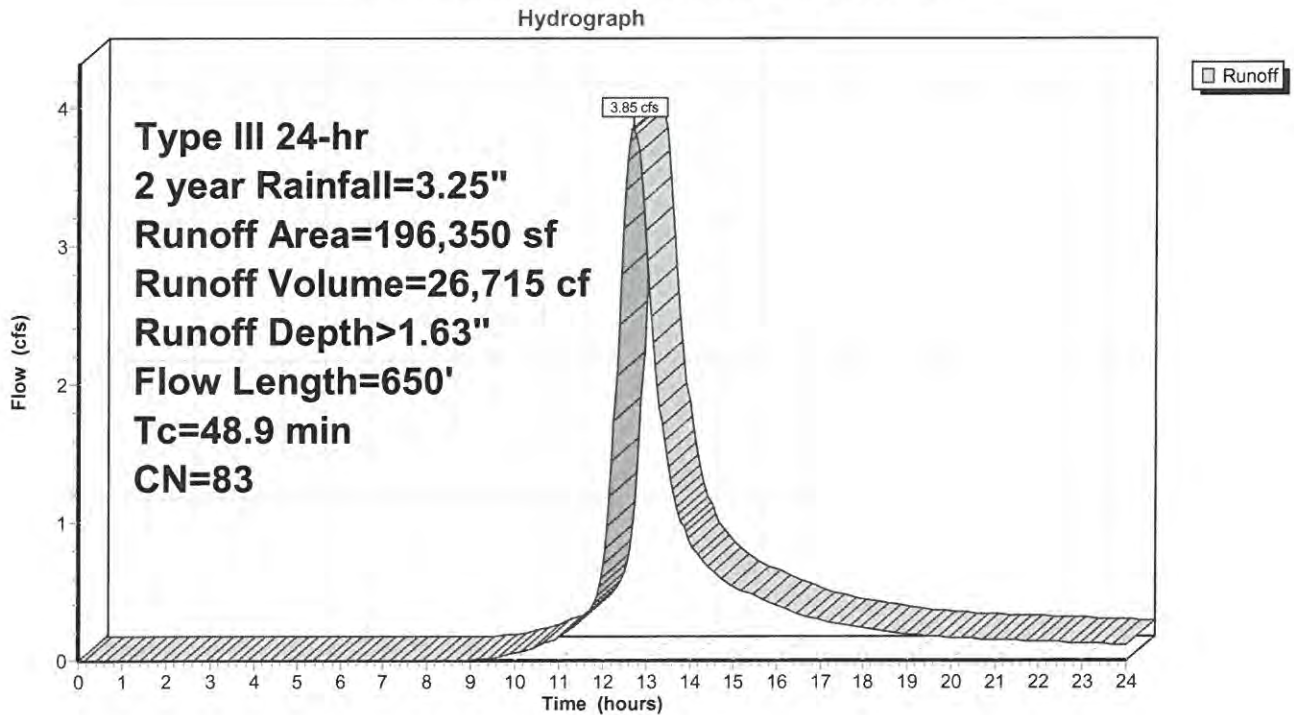
Runoff = 3.85 cfs @ 12.67 hrs, Volume= 26,715 cf, Depth> 1.63"

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=3.25"

Area (sf)	CN	Description
36,500	98	Paved parking, HSG D
159,850	79	Woods, Fair, HSG D
196,350	83	Weighted Average
159,850		81.41% Pervious Area
36,500		18.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.2000	2.24		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
20.9	300	0.2000	0.24		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
27.6	300	0.1000	0.18		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
48.9	650	Total			

Subcatchment EX1: Existing Watershed



Summary for Subcatchment PR1: Proposed Watershed

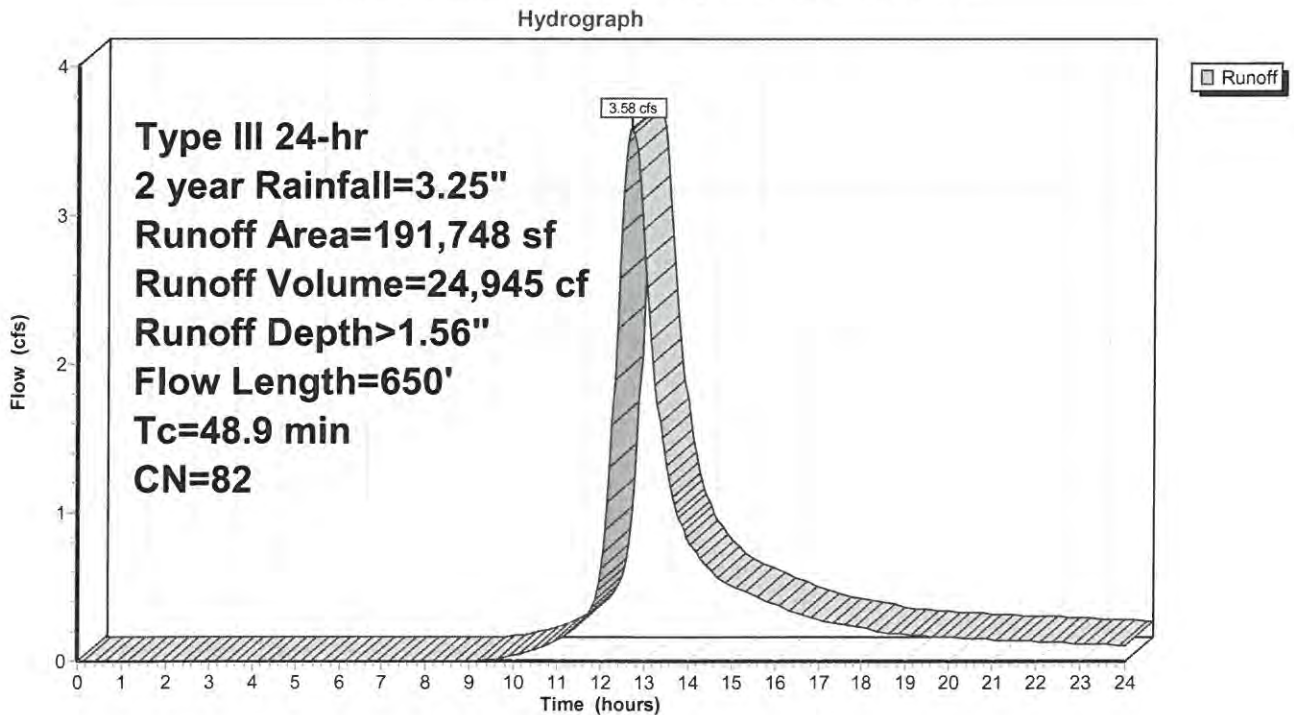
Runoff = 3.58 cfs @ 12.68 hrs, Volume= 24,945 cf, Depth> 1.56"

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=3.25"

Area (sf)	CN	Description
33,580	98	Paved parking, HSG D
158,168	79	Woods, Fair, HSG D
191,748	82	Weighted Average
158,168		82.49% Pervious Area
33,580		17.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.2000	2.24		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
20.9	300	0.2000	0.24		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
27.6	300	0.1000	0.18		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
48.9	650	Total			

Subcatchment PR1: Proposed Watershed



Summary for Subcatchment PR2: Proposed Roof

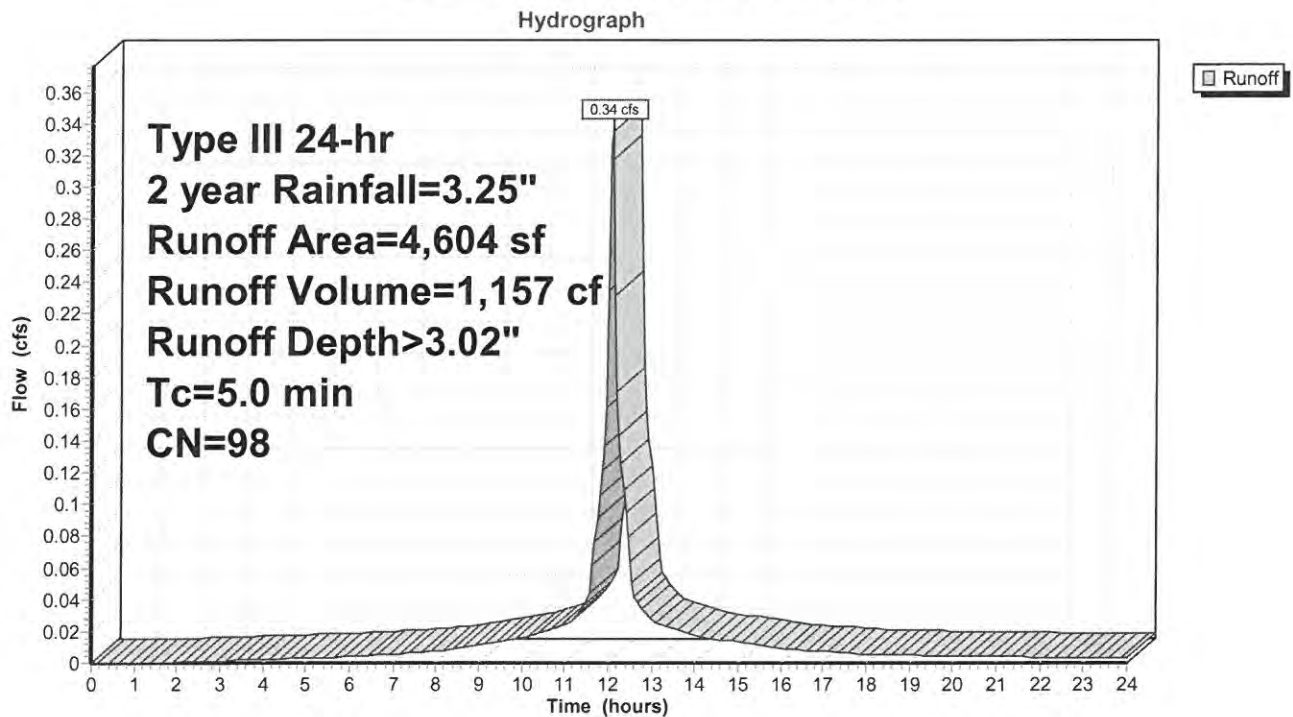
Runoff = 0.34 cfs @ 12.07 hrs, Volume= 1,157 cf, Depth> 3.02"

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=3.25"

Area (sf)	CN	Description
4,604	98	Roofs, HSG A
4,604		100.00% Impervious Area

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

Subcatchment PR2: Proposed Roof



Summary for Pond 7P: 30" Brentwood Stormtank Chambers

Inflow Area = 4,604 sf, 100.00% Impervious, Inflow Depth > 3.02" for 2 year event
 Inflow = 0.34 cfs @ 12.07 hrs, Volume= 1,157 cf
 Outflow = 0.02 cfs @ 10.95 hrs, Volume= 1,153 cf, Atten= 94%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 10.95 hrs, Volume= 1,153 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 0.63' @ 13.61 hrs Surf.Area= 880 sf Storage= 489 cf

Plug-Flow detention time= 191.9 min calculated for 1,151 cf (99% of inflow)
 Center-of-Mass det. time= 189.2 min (944.0 - 754.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	124 cf	20.00'W x 44.00'L x 2.50'H Field A 2,200 cf Overall - 1,890 cf Embedded = 310 cf x 40.0% Voids
#2A	0.00'	1,827 cf	Brentwood StormTank 30" x 168 Inside #1 Inside= 18.0"W x 30.0"H => 3.63 sf x 3.00'L = 10.9 cf Outside= 18.0"W x 30.0"H => 3.75 sf x 3.00'L = 11.3 cf 12 Rows of 14 Chambers
		1,951 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	1.020 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 10.95 hrs HW=0.03' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Pond 7P: 30" Brentwood Stormtank Chambers - Chamber Wizard Field A

Chamber Model = Brentwood StormTank 30" (Brentwood Industries StormTank)

Inside= 18.0"W x 30.0"H => 3.63 sf x 3.00'L = 10.9 cf

Outside= 18.0"W x 30.0"H => 3.75 sf x 3.00'L = 11.3 cf

14 Chambers/Row x 3.00' Long = 42.00' Row Length +12.0" End Stone x 2 = 44.00' Base Length

12 Rows x 18.0" Wide + 12.0" Side Stone x 2 = 20.00' Base Width

30.0" Chamber Height = 2.50' Field Height

168 Chambers x 10.9 cf = 1,827.2 cf Chamber Storage

168 Chambers x 11.3 cf = 1,890.0 cf Displacement

2,200.0 cf Field - 1,890.0 cf Chambers = 310.0 cf Stone x 40.0% Voids = 124.0 cf Stone Storage

Chamber Storage + Stone Storage = 1,951.2 cf = 0.045 af

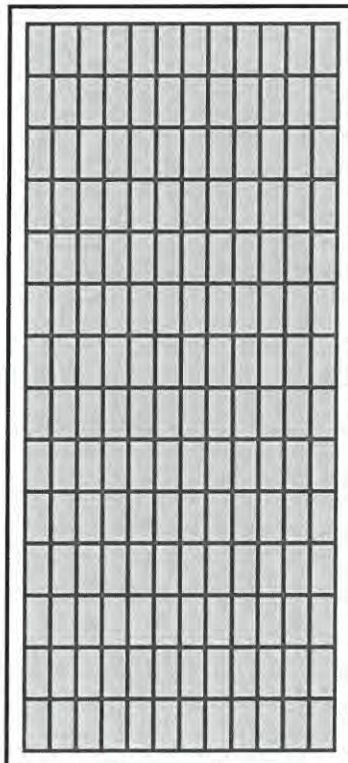
Overall Storage Efficiency = 88.7%

Overall System Size = 44.00' x 20.00' x 2.50'

168 Chambers

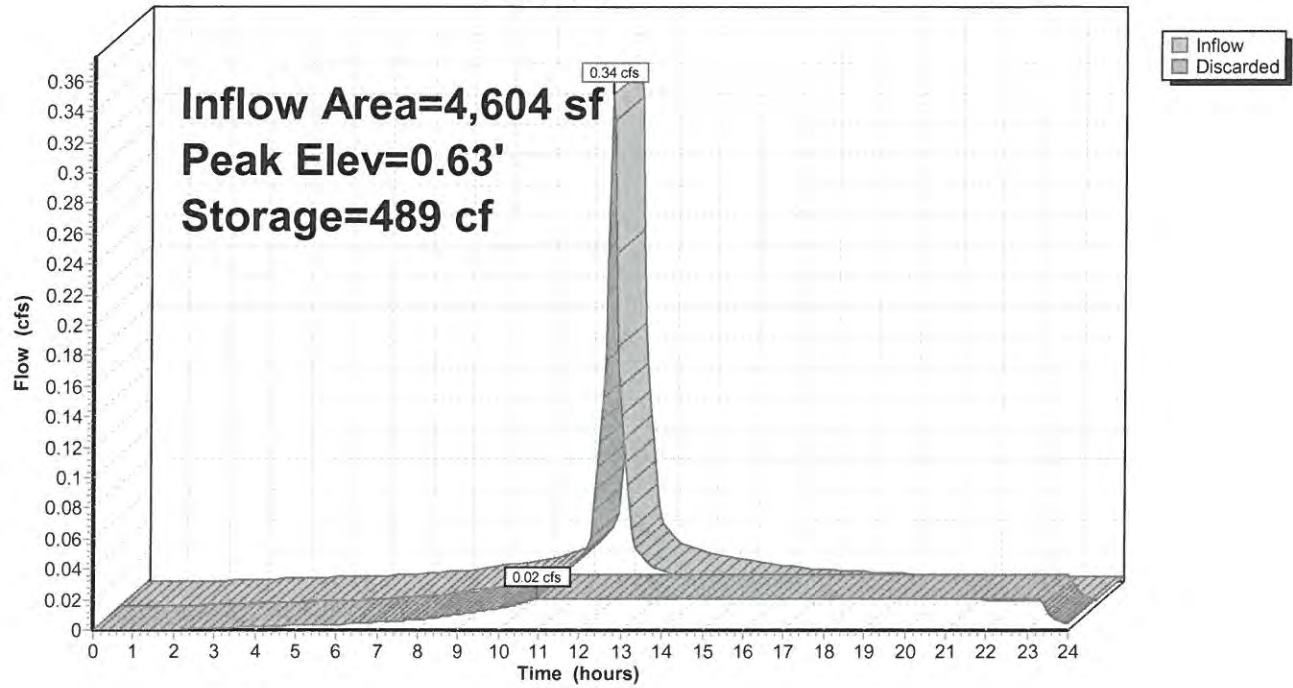
81.5 cy Field

11.5 cy Stone



Pond 7P: 30" Brentwood Stormtank Chambers

Hydrograph



Summary for Subcatchment EX1: Existing Watershed

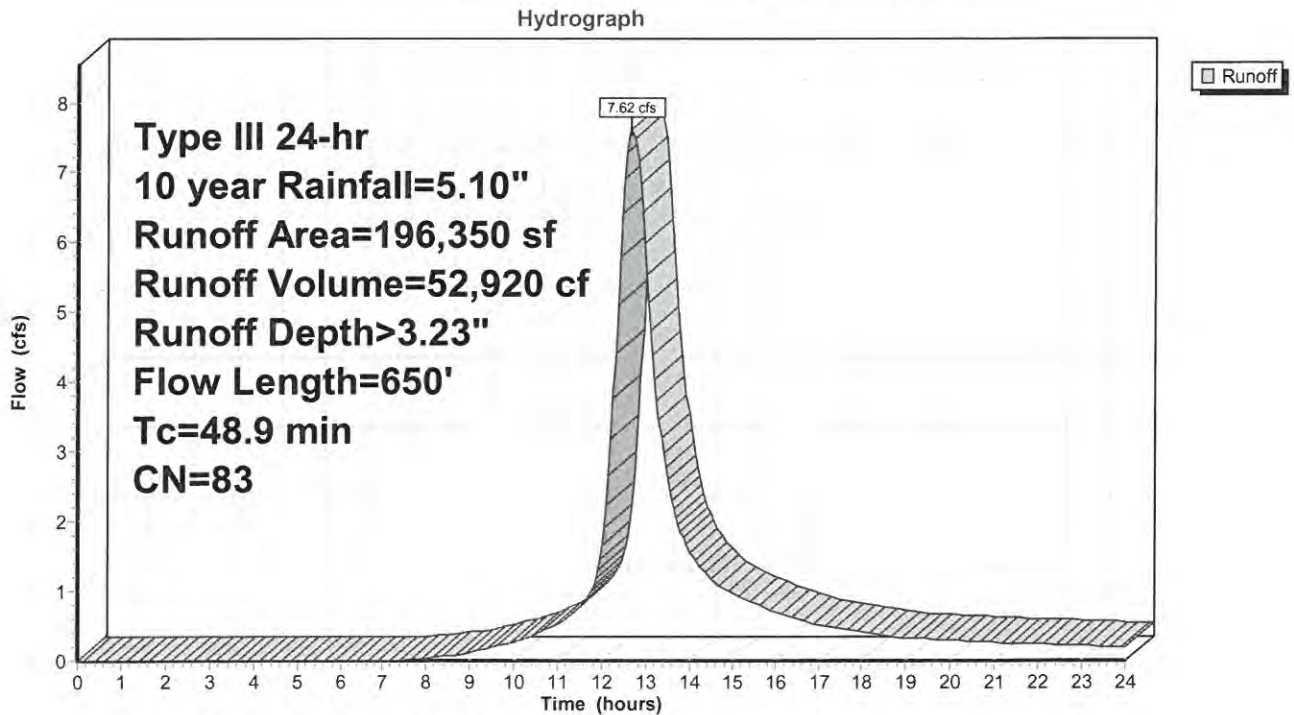
Runoff = 7.62 cfs @ 12.66 hrs, Volume= 52,920 cf, Depth> 3.23"

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=5.10"

Area (sf)	CN	Description
36,500	98	Paved parking, HSG D
159,850	79	Woods, Fair, HSG D
196,350	83	Weighted Average
159,850		81.41% Pervious Area
36,500		18.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.2000	2.24		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
20.9	300	0.2000	0.24		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
27.6	300	0.1000	0.18		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
48.9	650	Total			

Subcatchment EX1: Existing Watershed



Summary for Subcatchment PR1: Proposed Watershed

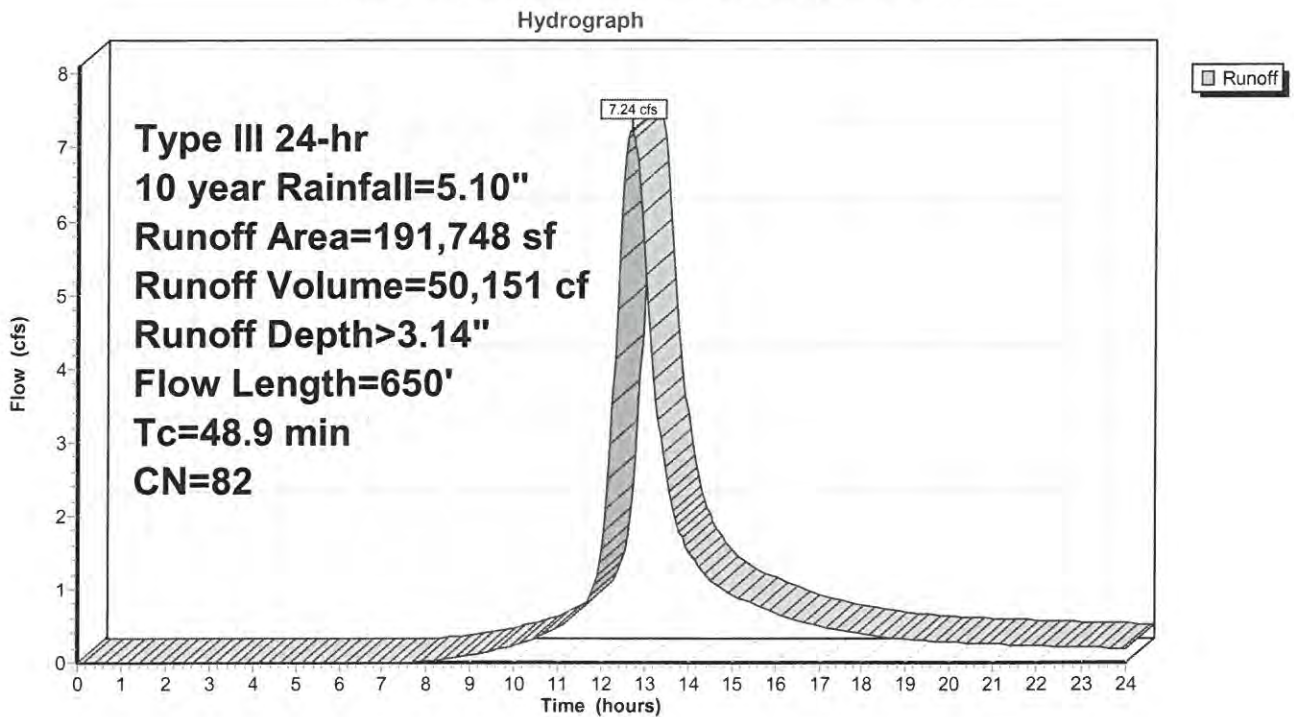
Runoff = 7.24 cfs @ 12.66 hrs, Volume= 50,151 cf, Depth> 3.14"

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=5.10"

Area (sf)	CN	Description
33,580	98	Paved parking, HSG D
158,168	79	Woods, Fair, HSG D
191,748	82	Weighted Average
158,168		82.49% Pervious Area
33,580		17.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.2000	2.24		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
20.9	300	0.2000	0.24		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
27.6	300	0.1000	0.18		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
48.9	650	Total			

Subcatchment PR1: Proposed Watershed



Summary for Subcatchment PR2: Proposed Roof

Runoff = 0.53 cfs @ 12.07 hrs, Volume= 1,865 cf, Depth> 4.86"

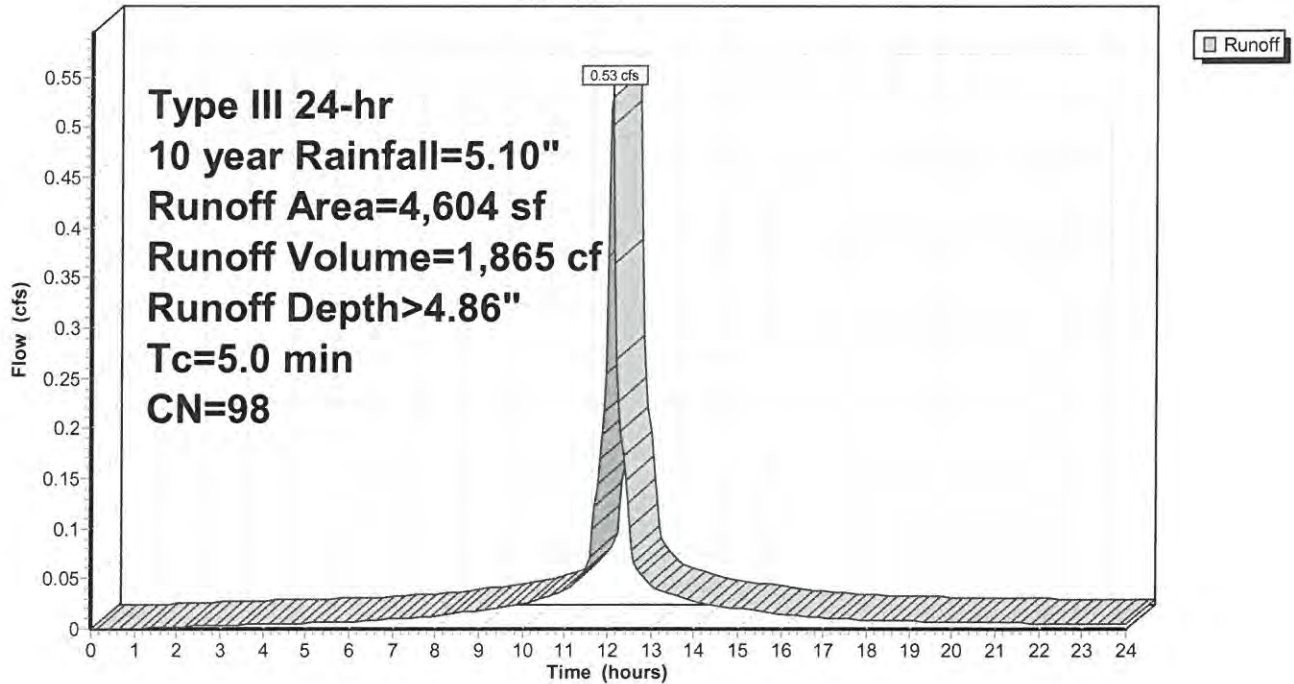
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10 year Rainfall=5.10"

Area (sf)	CN	Description
4,604	98	Roofs, HSG A
4,604		100.00% Impervious Area

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

Subcatchment PR2: Proposed Roof

Hydrograph



Summary for Pond 7P: 30" Brentwood Stormtank Chambers

Inflow Area = 4,604 sf, 100.00% Impervious, Inflow Depth > 4.86" for 10 year event
 Inflow = 0.53 cfs @ 12.07 hrs, Volume= 1,865 cf
 Outflow = 0.02 cfs @ 9.60 hrs, Volume= 1,308 cf, Atten= 96%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 9.60 hrs, Volume= 1,308 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 1.21' @ 15.01 hrs Surf.Area= 880 sf Storage= 943 cf

Plug-Flow detention time= 254.0 min calculated for 1,308 cf (70% of inflow)
 Center-of-Mass det. time= 159.1 min (905.5 - 746.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	124 cf	20.00'W x 44.00'L x 2.50'H Field A 2,200 cf Overall - 1,890 cf Embedded = 310 cf x 40.0% Voids
#2A	0.00'	1,827 cf	Brentwood StormTank 30" x 168 Inside #1 Inside= 18.0"W x 30.0"H => 3.63 sf x 3.00'L = 10.9 cf Outside= 18.0"W x 30.0"H => 3.75 sf x 3.00'L = 11.3 cf 12 Rows of 14 Chambers
		1,951 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	1.020 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 9.60 hrs HW=0.03' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 7P: 30" Brentwood Stormtank Chambers - Chamber Wizard Field A

Chamber Model = Brentwood StormTank 30" (Brentwood Industries StormTank)

Inside= 18.0"W x 30.0"H => 3.63 sf x 3.00'L = 10.9 cf

Outside= 18.0"W x 30.0"H => 3.75 sf x 3.00'L = 11.3 cf

14 Chambers/Row x 3.00' Long = 42.00' Row Length +12.0" End Stone x 2 = 44.00' Base Length

12 Rows x 18.0" Wide + 12.0" Side Stone x 2 = 20.00' Base Width

30.0" Chamber Height = 2.50' Field Height

168 Chambers x 10.9 cf = 1,827.2 cf Chamber Storage

168 Chambers x 11.3 cf = 1,890.0 cf Displacement

2,200.0 cf Field - 1,890.0 cf Chambers = 310.0 cf Stone x 40.0% Voids = 124.0 cf Stone Storage

Chamber Storage + Stone Storage = 1,951.2 cf = 0.045 af

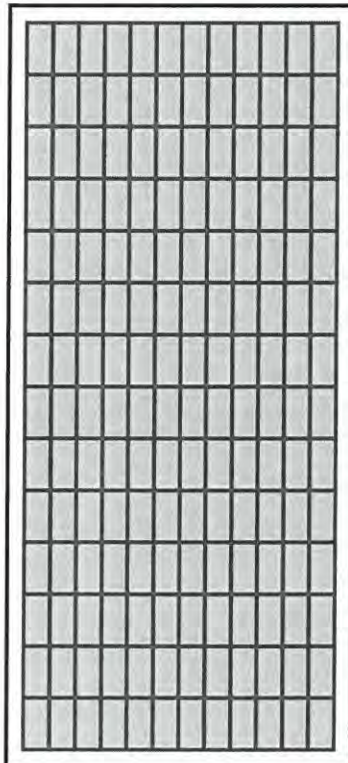
Overall Storage Efficiency = 88.7%

Overall System Size = 44.00' x 20.00' x 2.50'

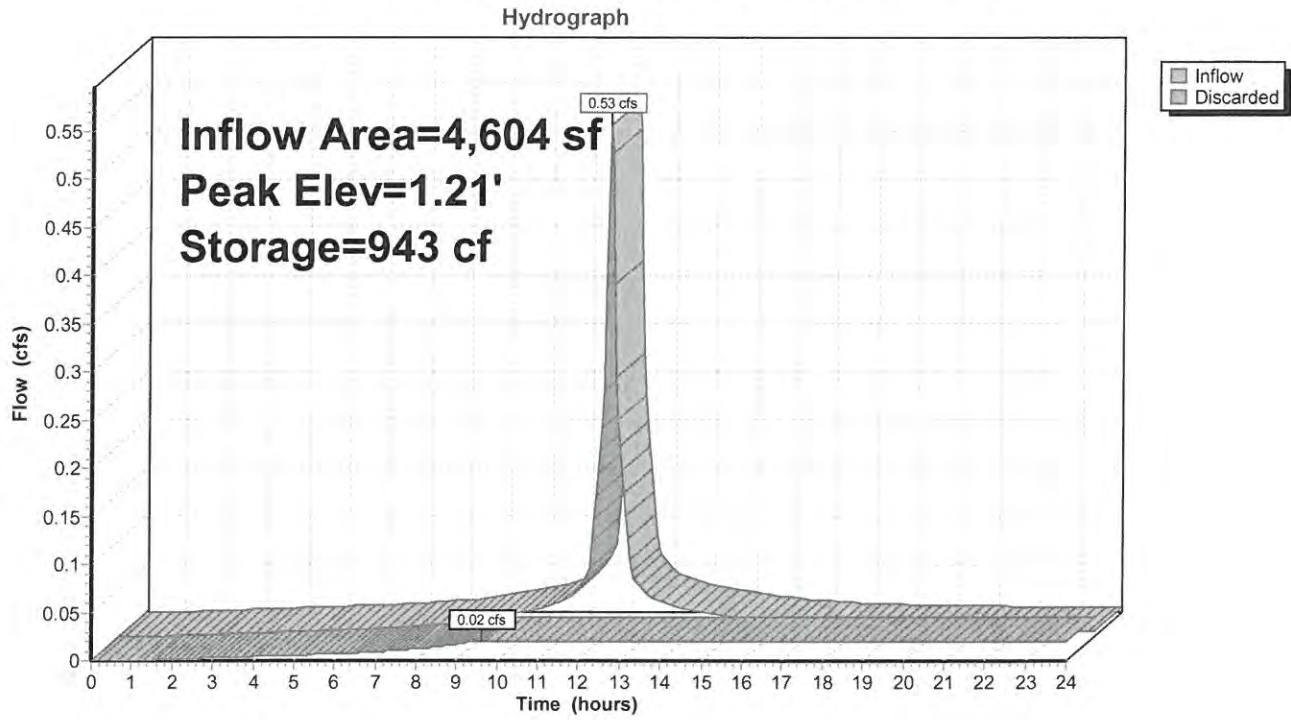
168 Chambers

81.5 cy Field

11.5 cy Stone



Pond 7P: 30" Brentwood Stormtank Chambers



Summary for Subcatchment EX1: Existing Watershed

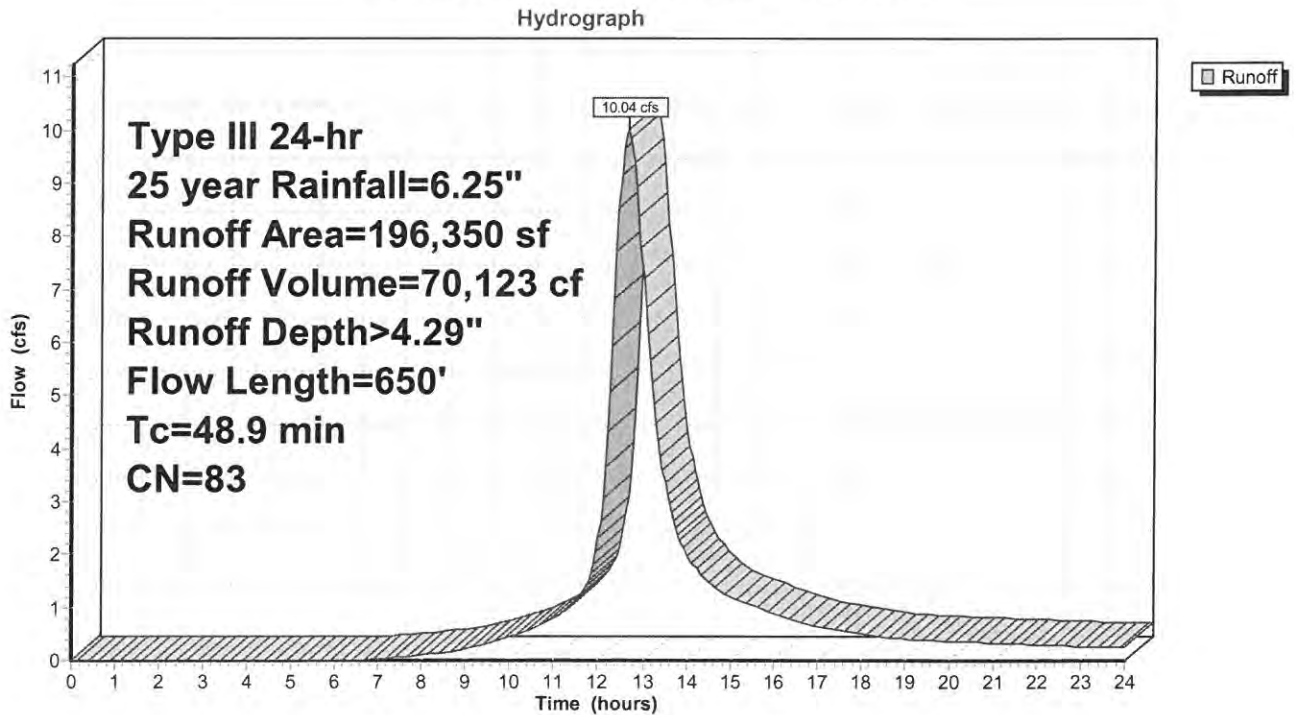
Runoff = 10.04 cfs @ 12.65 hrs, Volume= 70,123 cf, Depth> 4.29"

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=6.25"

Area (sf)	CN	Description
36,500	98	Paved parking, HSG D
159,850	79	Woods, Fair, HSG D
196,350	83	Weighted Average
159,850		81.41% Pervious Area
36,500		18.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.2000	2.24		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
20.9	300	0.2000	0.24		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
27.6	300	0.1000	0.18		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
48.9	650	Total			

Subcatchment EX1: Existing Watershed



Summary for Subcatchment PR1: Proposed Watershed

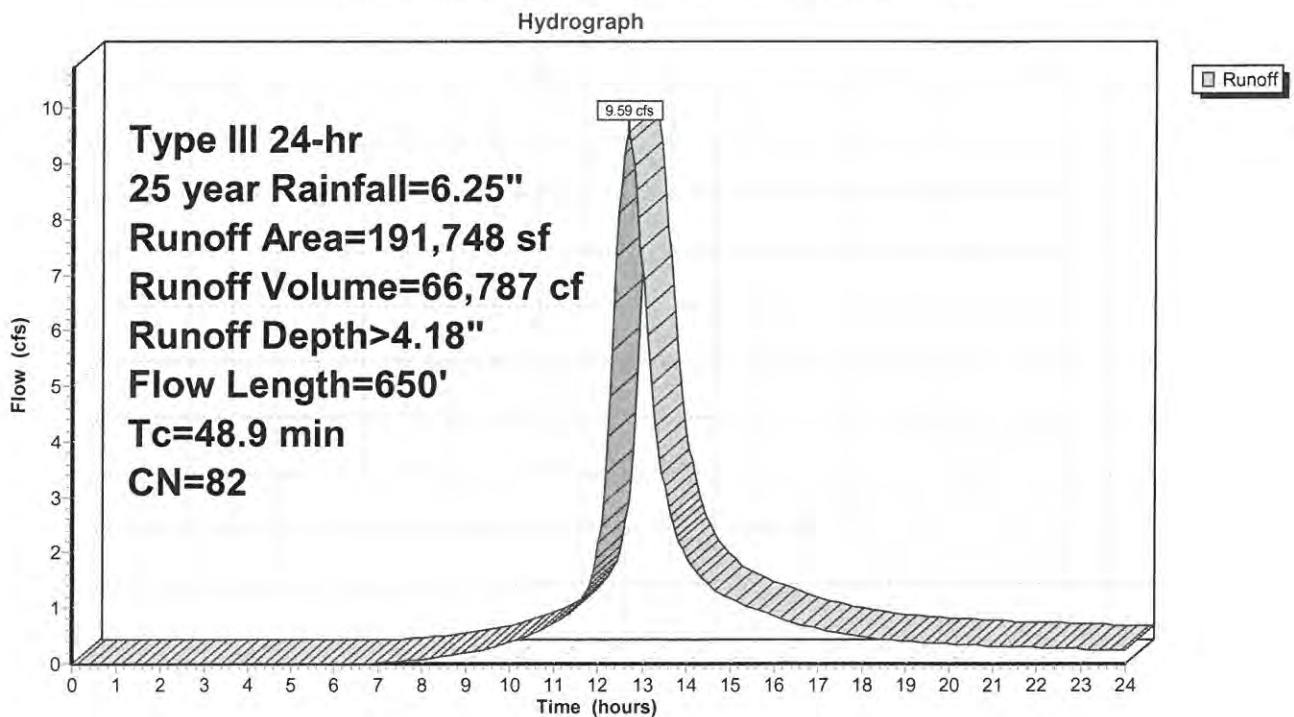
Runoff = 9.59 cfs @ 12.66 hrs, Volume= 66,787 cf, Depth> 4.18"

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=6.25"

Area (sf)	CN	Description
33,580	98	Paved parking, HSG D
158,168	79	Woods, Fair, HSG D
191,748	82	Weighted Average
158,168		82.49% Pervious Area
33,580		17.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.2000	2.24		Shallow Concentrated Flow, shallow Woodland Kv= 5.0 fps
20.9	300	0.2000	0.24		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
27.6	300	0.1000	0.18		Sheet Flow, sheet Woods: Light underbrush n= 0.400 P2= 3.10"
48.9	650	Total			

Subcatchment PR1: Proposed Watershed



Summary for Subcatchment PR2: Proposed Roof

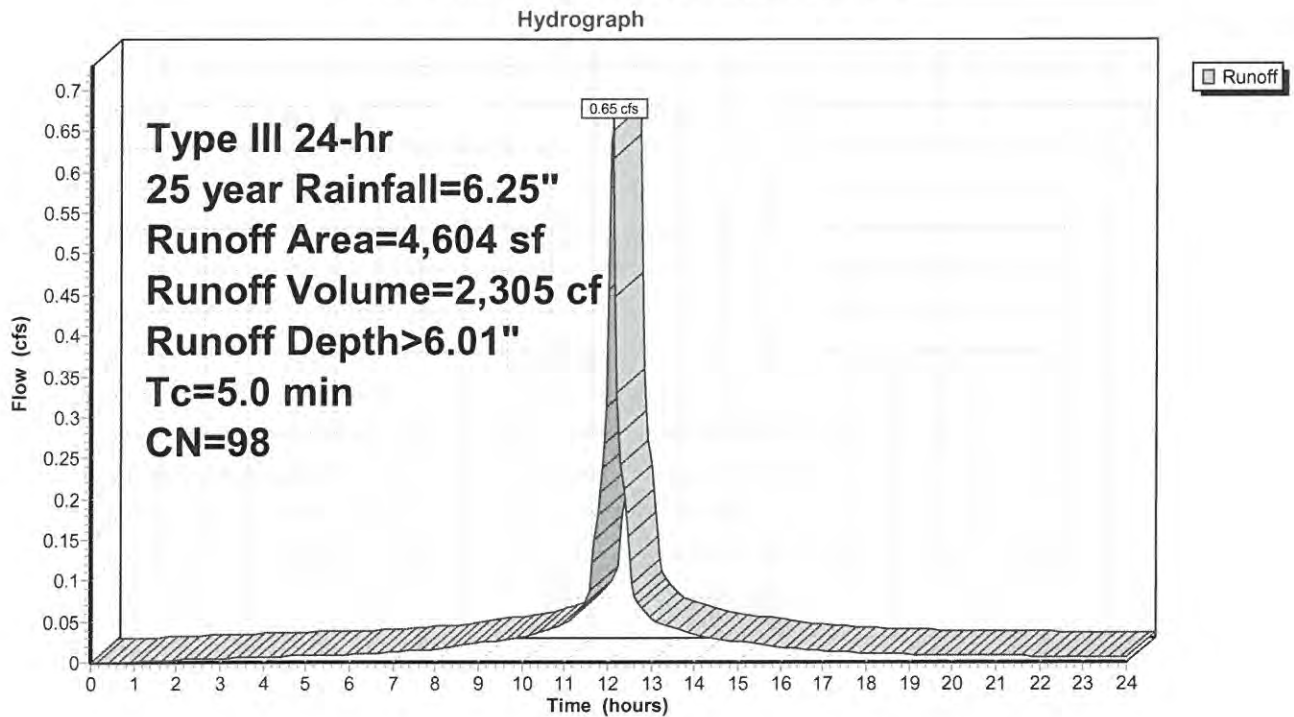
Runoff = 0.65 cfs @ 12.07 hrs, Volume= 2,305 cf, Depth> 6.01"

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=6.25"

Area (sf)	CN	Description
4,604	98	Roofs, HSG A
4,604		100.00% Impervious Area

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

Subcatchment PR2: Proposed Roof



Summary for Pond 7P: 30" Brentwood Stormtank Chambers

Inflow Area = 4,604 sf, 100.00% Impervious, Inflow Depth > 6.01" for 25 year event
 Inflow = 0.65 cfs @ 12.07 hrs, Volume= 2,305 cf
 Outflow = 0.02 cfs @ 8.95 hrs, Volume= 1,367 cf, Atten= 97%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 8.95 hrs, Volume= 1,367 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 1.62' @ 15.62 hrs Surf.Area= 880 sf Storage= 1,263 cf

Plug-Flow detention time= 250.9 min calculated for 1,365 cf (59% of inflow)
 Center-of-Mass det. time= 138.9 min (882.2 - 743.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	0.00'	124 cf	20.00"W x 44.00"L x 2.50'H Field A 2,200 cf Overall - 1,890 cf Embedded = 310 cf x 40.0% Voids
#2A	0.00'	1,827 cf	Brentwood StormTank 30" x 168 Inside #1 Inside= 18.0"W x 30.0"H => 3.63 sf x 3.00'L = 10.9 cf Outside= 18.0"W x 30.0"H => 3.75 sf x 3.00'L = 11.3 cf 12 Rows of 14 Chambers
		1,951 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	1.020 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 8.95 hrs HW=0.03' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Pond 7P: 30" Brentwood Stormtank Chambers - Chamber Wizard Field A

Chamber Model = Brentwood StormTank 30" (Brentwood Industries StormTank)

Inside= 18.0"W x 30.0"H => 3.63 sf x 3.00'L = 10.9 cf

Outside= 18.0"W x 30.0"H => 3.75 sf x 3.00'L = 11.3 cf

14 Chambers/Row x 3.00' Long = 42.00' Row Length +12.0" End Stone x 2 = 44.00' Base Length

12 Rows x 18.0" Wide + 12.0" Side Stone x 2 = 20.00' Base Width

30.0" Chamber Height = 2.50' Field Height

168 Chambers x 10.9 cf = 1,827.2 cf Chamber Storage

168 Chambers x 11.3 cf = 1,890.0 cf Displacement

2,200.0 cf Field - 1,890.0 cf Chambers = 310.0 cf Stone x 40.0% Voids = 124.0 cf Stone Storage

Chamber Storage + Stone Storage = 1,951.2 cf = 0.045 af

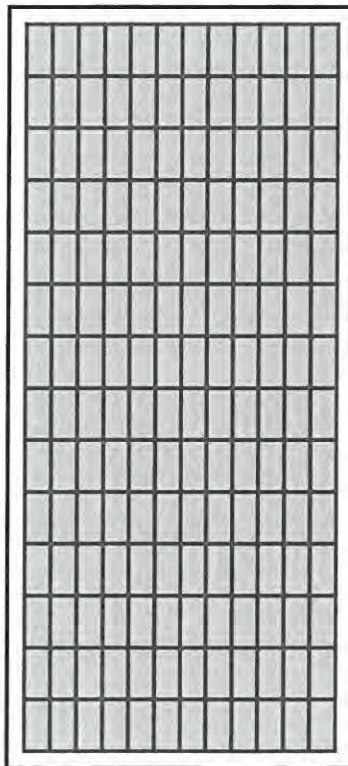
Overall Storage Efficiency = 88.7%

Overall System Size = 44.00' x 20.00' x 2.50'

168 Chambers

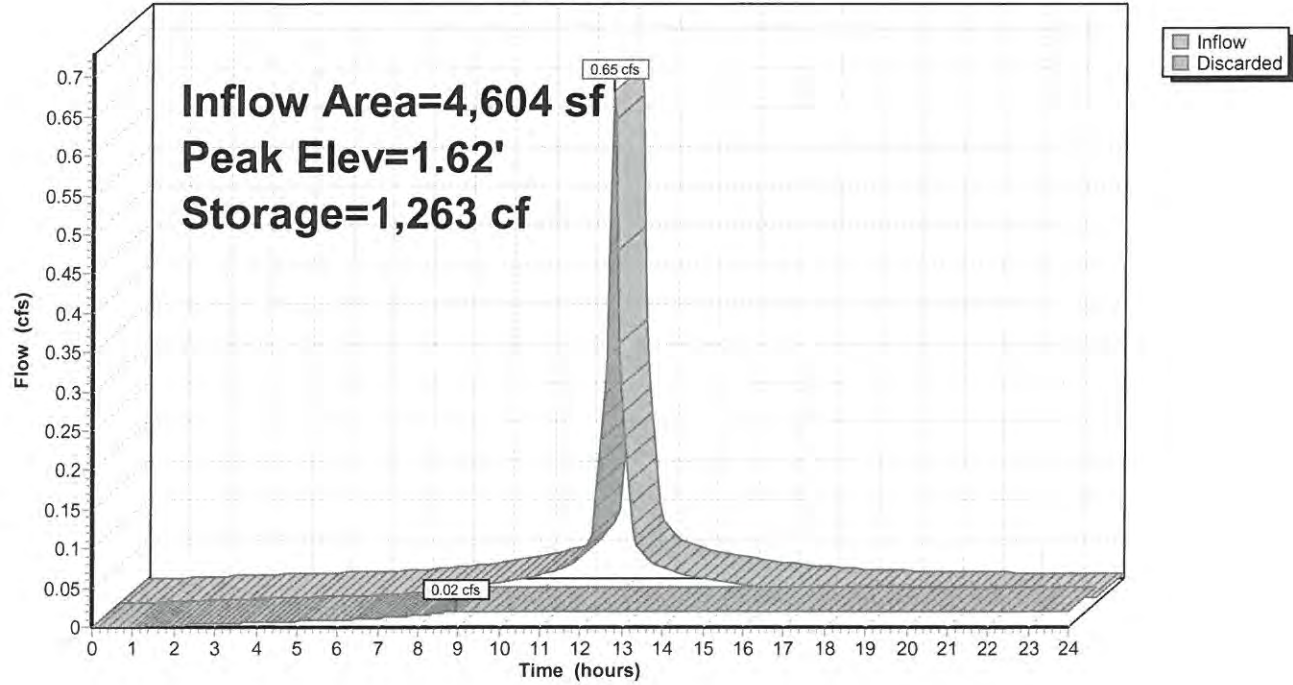
81.5 cy Field

11.5 cy Stone



Pond 7P: 30" Brentwood Stormtank Chambers

Hydrograph



Appendix VI. Operations and Maintenance Log

Camp Rotary, 372 Ipswich Rd Boxford, Ma

Operation and Maintenance Log

Inspections for Year: _____

Structural Best Management Practice	Action	Date Completed	Completed By	Comments
Subsurface Chambers – Inspect twice per year. Clean as required	Inspect			
	Inspect			
Roof Drain Leaders – Inspect/clean twice per year.	Inspect/Clean			
	Inspect/Clean			
Vegetated Areas Maintenance – Inspect twice per year. Maintain as required.	Inspect			
	Inspect			

NOTE: See Operations and Maintenance Plan for details of inspection requirements.