TOWN OF WAYLAND - TOWN CLERK'S OFFICE
NOTICE OF MEETINGS OF TOWN BOARDS/COMMITTEES/COMMISSIONS

Posted in accordance with the provisions of the Open Meeting Law

NAME OF BOARD/COMM:	Conservation Commission
FILED BY:	Linda Hansen, Conservation Administrator
DATE OF MEETING:	Wednesday, February 10, 2021
TIME OF MEETING:	6:30 pm
PLACE OF RECORDING:	Wayland Town Building (Council on Aging) – 41 Cochituate Rd.

NOTE: Notices and agendas are to be posted at least 48 hours in advance of the meetings excluding Saturdays, Sundays, and legal holidays.

***In compliance with the revised Open Meeting Law requirements, we will live stream the meeting via Zoom as well as WayCAM. The Zoom meeting can be entered using the following link: https://zoom.us/j/95997239054?pwd=Mkhqd3Q0RlJ3Mm9mbU8rd0p2c0FFUT09**

Password: 465156

The meeting may be viewed live on the WayCam Government Channel (Comcast 9, Verizon 38).

Public Comment will be received either through Zoom or by phone at 508-358-6812 for this meeting. The phone number will be active during the public comment portion of the meeting. Thank you in advance for your patience; we intend to address all calls that come in during the Public Comment period.**

In addition to being live streamed, WayCam will record the meeting and this recording will be made available to the public as soon after the meeting as is practicable. No in-person attendance of members of the public will be permitted, but every effort will be made to ensure that the public can adequately access the proceedings.

****To make a public comment via Zoom, perform a virtual "hand raise". The meeting moderator will contact you via a chat message to acknowledge your request and will inform the chair of your request to comment. Instructions for performing a virtual "hand raise" can be found at https://support.zoom.us/hc/en-us/articles/205566129-Raising-your-hand-In-a-webinar**

Proposed Meeting Agenda – Wednesday, February 10, 2021

Items without a specific time noted may be taken out of order at any time during the meeting.

1. **Public Hearings/Public Meetings**
    a. **6:30PM – 6 Springhill Road DEP File # 322-XXX – Continued Public Hearing, Notice of Intent** filed pursuant to the Wetland Protection Act (310 CMR 10.0) and a Chapter 194 application filed pursuant to Wayland's Wetlands and Water Resource Protection Bylaw, submitted by Hanbeeth Kim for the installation of the a 12 x 16 foot shed in the rear yard at 6 Springhill Road in Wayland, MA. The proposed work is within the 100-foot wetland buffer zone. Property is shown on Assessor's Map 24, Parcel 043.

b. **6:35PM – 14 Rich Valley Road – DEP File # 322-966 – Public Hearing,** Request for Determination filed pursuant to Wayland's Wetlands and Water Resource Protection Bylaw (Chapter 194) and the Wetlands Protection Act (310 CMR 10.0), submitted by Sean Ryan for the removal of existing structures, installation of a patio, and replacement of mitigation plantings at 14 Rich Valley Road in Wayland, MA. Property is shown on Assessor's Map 25, Parcel 2.
c. **7:05PM – 53 Concord Road DEP File # 322-967 – Public Hearing**, Notice of Intent filed pursuant to Wayland's Wetlands and Water Resource Protection Bylaw (Chapter 194) and the Wetlands Protection Act (310 CMR 10.0), submitted by Mohammad Bilal for the paving of an existing gravel driveway and installation of culverts within the Buffer Zone and Riverfront Area at 53 Concord Road in Wayland, MA. Property is shown on Assessor's Map 18, Parcel 86.
d. **7:35PM – 16 Linn Lane D-969 – Public Meeting,** Request for Determination filed pursuant to Wayland's Wetlands and Water Resource Protection Bylaw (Chapter 194) and the Wetlands Protection Act (310 CMR 10.0), submitted by Robert McInturff for the replacement of a failed septic system at 16 Linn Lane in Wayland, MA. Property is shown on Assessor's Map 49 Parcel 17.
e. **8:00PM – 24 School Street DEP File # 322-965 – Public Hearing,** Notice of Intent filed pursuant to the Wetlands Protection Act (310 CMR 10.0), submitted by Chris D'Antonio for the construction of twelve new townhouses, driveway and parking areas, subsurface sewage disposal system, stormwater management system, and supporting utilities at 24 School Street in Wayland, MA. Property is shown on Assessor's Map 52, Parcel 189. Specific items for discussion:
   i. **Presentation by applicant regarding any new material since previous hearing**
   ii. **Select a peer reviewer for the MODFLOW modeling analysis**

2. **Stormwater and Land Disturbance Permit Applications**
   a. Five Paths subdivision, 57A Shaw Drive (Map 39, Parcel 15A)
   b. 3 Amey Road, (Map 50, Parcel 025), renovations to house and bungalow, new septic.
3. **Certificate of Compliance Request**
   a. 19 Charena Road, D-927
4. **Other:**
   a. Request to extend permit for Dudley Pond invasive plant removal, DEP File No. 322-859
   b. Approve an increase the Community Garden rental fees for 2021
   c. Topics not reasonably anticipated by the Chair 48 hours in advance of the meeting
5. **Public Comment**
6. **Approve Minutes:**
   a. 01.27.2021
7. **Adjournment**

The next **Scheduled** Conservation Commission Meeting is tentatively scheduled for March 3, 2021.

NOTE: Per changes to the Open Meeting Law, notice of any meeting of a public body shall include "A listing of topics that the chair reasonably anticipates will be discussed at the meeting". AG's Office guidelines state that the list of topics shall have sufficient specificity to reasonably advise the public of the issue to be discussed.

Ryan Family | 14 Rich Valley Rd

January 11, 2021

Wayland Conservation Commission
Town Building
41 Cochituate Road
Wayland, MA 01778

ATTENTION: Linda Hansen, Conservation Administrator

SUBJECT: Notice of Intent and Chapter 194 Application
14 Rich Valley Rd - Back Patio Improvement

Dear Linda Hansen:

We are pleased to submit this Notice of Intent and Application for Chapter 194 permit related to the above referenced project. Please find enclosed.

1. Original and one (1) copy of the application package, which includes:
   - Completed WPA Form 3 Notice of Intent and Wetland Transmittal Fee
   - Completed Chapter 194 Application & Checklist
   - Certified list of abutters and notification forms
   - Wetland Delineation Report, by Three Oaks Environmental from septic installation
   - Locus Maps
   - Tree & Shrub Listing
2. One (1) colored and one (1) copy of the **Proposed Back Patio Improvement Site Plan for 14 Rich Valley Rd** prepared by homeowner Sean Patrick Ryan dated 01/11/2021.
3. Checks in the amount of $200 (Chapter 194 Application), and $67.50 (town's share of NOI fee). The State's share of fees ($42.50) has been paid online at eDEP.mass.gov.

Project Summary:

PS1: Proposed Work: The proposed project is a removal of old patio and installation of new patio and landscaping per the specs on the site plan.

PS2: Wetland Resources: Regulated wetland resource areas are located along the rear of the site and include bordering vegetated wetlands and an intermittent stream. Under the local bylaw, all streams are considered perennial unless otherwise proven. Therefore, the stream has been shown as perennial with associated riverfront area under the local Chapter 194 Application only. The delineation was performed by Three Oaks Environmental on March 16, 2018 and survey located in the field. The site does not contain areas within the 100-year flood plain as shown on the most recent FEMA mapping.

PS3: Impact Improvements: The proposed plan will minimize impact and provide improvements to the wetland resources by the following:

- Reducing total square footage of impervious surface by over 50%, from approx. 1500 sqft to 725sqft.
- Old impervious surface was set on a very thick concert base. The majority of the new surface will be set on open gravel base.
- Removal of all old impervious surfaces, some of which encroached the 15' buffer zone.
- New impervious surface will be outside the 30' buffer zone and built as permeable as possible to limit water runoff to almost zero by using using a commercial grade polymeric joint infill by the name of EasyJoint.
- New impervious surface will be pitched to move any run off water to the North and South sides.
- Planting of mitigation/screening privacy trees along the 15' buffer zone to create a definitive separation of the protected BVW and the lawn. The current 15' buffer is encroached by preexisting lawn a without definitive line of separation.
- Wildflower seeding of improved 15' buffer zone.
- Temporary controls have been installed including a silt fence located along the 15' buffer zone line, which are appropriate for the drainage area and site conditions.

PS4: Justification: Not altering the old patio would continue to push more runoff into the wetlands than compared to the improvements in this project. The old patio was dilapidated to the point that it was almost unusable and presented risks of injury for us as homeowners, especially our child when playing on it.

Sincerely,

Sean Patrick Ryan

Sean Patrick Ryan
Homeowner

RYAN FAMILY | 14 RICH VALLEY RD | +1 (850) 980-2742 | RYANFAMILY16@ICLOUD.COM

Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

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

Username:	**RYANFAMILYDEP**
Transaction ID:	**1245045**
Document:	**WPA Form 3 - NOI**
Size of File:	**246.77K**
Status of Transaction:	**In Process**
Date and Time Created:	**1/11/2021:4:27:04 PM**

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

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

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1245045
City/Town:WAYLAND

A.General Information

1. Project Location:

a. Street Address	14 RICH VALLEY RD		
b. City/Town	WAYLAND	c. Zip Code	01778
d. Latitude	42.36210N	e. Longitude	71.34200W
f. Map/Plat #	25	g.Parcel/Lot #	2

2. Applicant:

☑ Individual ☐ Organization

a. First Name	SEAN		b.Last Name	RYAN	
c. Organization					
d. Mailing Address	14 RICH VALLEY RD				
e. City/Town	WAYLAND	f. State	MA	g. Zip Code	01778
h. Phone Number	850-980-2742	i. Fax		j. Email	

3.Property Owner:

☑ more than one owner

a. First Name	SEAN		b. Last Name	RYAN	
c. Organization					
d. Mailing Address	14 RICH VALLEY RD				
e. City/Town	WAYLAND	f.State	MA	g. Zip Code	01778
h. Phone Number	850-980-2742	i. Fax		j.Email	

4.Representative:

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

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

a.Total Fee Paid	110.00	b.State Fee Paid	42.50	c.City/Town Fee Paid	67.50

check #3198

6.General Project Description:
REMOVAL OF EXISTING STRUCTURES, INSTALLATION OF A PATIO, AND REPLACEMENT OF MITIGATION PLANTS AND SHRUBS FOR THE CREATION OF A 15-FOOT VEGETATED BUFFER TO THE TRIBUTARY.

7a.Project Type:

1. ☑ Single Family Home	2. ☐ Residential Subdivision
3. ☐ Limited Project Driveway Crossing	4. ☐ Commercial/Industrial
5. ☐ Dock/Pier	6. ☐ Utilities
7. ☐ Coastal Engineering Structure	8. ☐ Agriculture (eg., cranberries, forestry)
9. ☐ Transportation	10. ☐ Other

7b.Is any portion of the proposed activity eligible to be treated as a limited project subject to 310 CMR 10.24 (coastal) or 310

CMR 10.53 (inland)?

1. ☐ Yes ☑ No If yes, describe which limited project applies to this project:
2. Limited Project

8.Property recorded at the Registry of Deeds for:

a.County:	b.Certificate:	c.Book:	d.Page:
SOUTHERN MIDDLESEX		44701	397

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

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

☑ This is a Buffer Zone only project - Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.

2.Inland Resource Areas: (See 310 CMR 10.54 - 10.58, if not applicable, go to Section B.3. Coastal Resource Areas)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a.☐ Bank	1. linear feet	2. linear feet
b.☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c.☐ Land under Waterbodies and Waterways	1. Square feet	2. square feet
	3. cubic yards dredged	
d.☐ Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e.☐ Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced
f.☐ Riverfront Area	1. Name of Waterway (if any)	
2. Width of Riverfront Area (check one)	☐ 25 ft. - Designated Densely Developed Areas only ☐ 100 ft. - New agricultural projects only ☐ 200 ft. - All other projects	
3. Total area of Riverfront Area on the site of the proposed project		square feet

4. Proposed Alteration of the Riverfront Area:

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

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

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

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

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

4.Restoration/Enhancement

☐ Restoration/Replacement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please entered the additional amount here.

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

5.Projects Involves Stream Crossings

☐ Project Involves Streams Crossings

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

a. number of new stream crossings b. number of replacement stream crossings

C. Other Applicable Standards and Requirements

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage of Endangered Species program (NHESP)?

a. ☐ Yes ☑ No

If yes, include proof of mailing or hand delivery of NOI to:
Natural Heritage and Endangered Species
Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

b. Date of map:FROM MAP VIEWER

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

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

1.☐ Percentage/acreage of property to be altered:

(a) within Wetland Resource Area percentage/acreage

(b) outside Resource Area percentage/acreage

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

3.☐ Project plans for entire project site, including wetland resource areas and areas outside of wetland jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

a.☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

b.☐ Photographs representative of the site

c.☐ MESA filing fee (fee information available at: http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa/mesa-fee-schedule.html)
Make check payable to "Natural Heritage & Endangered Species Fund" and **mail to NHESP** at above address

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

d.☐ Vegetation cover type map of site

e.☐ Project plans showing Priority & Estimated Habitat boundaries

d. OR Check One of the following

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

2.☐ Separate MESA review ongoing.

a. NHESP Tracking Number

b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

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

2. For coastal projects only, is any portion of the proposed project located below the mean high waterline or in a fish run?
a. ☑ Not applicable - project is in inland resource area only
b. ☐ Yes ☐ No

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

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

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

North Shore - Hull to New Hampshire:

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

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

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

a. ☐ Yes ☑ No

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

b. ACEC Name

4. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
a. ☐ Yes ☑ No

5. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L.c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L.c. 130, § 105)?
a. ☐ Yes ☑ No

6. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
a. ☐ Yes, Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol.2, Chapter 3)
2. ☐ A portion of the site constitutes redevelopment
3. ☐ Proprietary BMPs are included in the Stormwater Management System

b. ☑ No, Explain why the project is exempt:
1. ☑ Single Family Home

2. ☐ Emergency Road Repair

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

D. Additional Information

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

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

1. USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the
☑ Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland
☑ [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.
3. Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s).
☑ Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.
4. List the titles and dates for all plans and other materials submitted with this NOI.
☑

a. Plan Title:	b. Plan Prepared By:	c. Plan Signed/Stamped By:	c. Revised Final Date:	e. Scale:
PROPOSED BACK PATIO IMPROVEMENT SITE PLAN FOR 14 RICH VALLEY RD	SEAN PATRICK RYAN	SEAN PATRICK RYAN	01/11/2021	1":20'

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
6. Payer name on check: First Name	7. Payer name on check: Last Name

F. Signatures and Submittal Requirements

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

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

Sean Patrick Ryan	1/11/2021
1. Signature of Applicant	2. Date
Sean Patrick Ryan	1/11/2021
3. Signature of Property Owner(if different)	4. Date
5. Signature of Representative (if any)	6. Date

For Conservation Commission:

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

For MassDEP:

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

Other:

If the applicant has checked the "yes" box in Section C, Items 1-3, above, refer to that section and the Instructions for additional submittal requirements.

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Wetland FeeTransmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1245045
City/Town:WAYLAND

A. Applicant Information

1. Applicant:

a. First Name	SEAN		b.Last Name	RYAN	
c. Organization					
d. Mailing Address	14 RICH VALLEY RD				
e. City/Town	WAYLAND	f. State	MA	g. Zip Code	01778
h. Phone Number	8509802742	i. Fax		j. Email	

2.Property Owner:(if different)

a. First Name	SEAN		b. Last Name	RYAN	
c. Organization					
d. Mailing Address	14 RICH VALLEY RD				
e. City/Town	WAYLAND	f.State	MA	g. Zip Code	01778
h. Phone Number	8509802742	i. Fax		j.Email	

3. Project Location:

a. Street Address	14 RICH VALLEY RD	b. City/Town	WAYLAND

Are you exempted from Fee? ☐ (YOU HAVE SELECTED 'NO')

Note: Fee will be exempted if you are one of the following:

- City/Town/County/District
- Municipal Housing Authority
- Indian Tribe Housing Authority
- MBTA

State agencies are only exempt if the fee is less than $100

B. Fees

Activity Type	Activity Number	Activity Fee	RF Multiplier	Sub Total
A.) WORK ON SINGLE FAMILY LOT; ADDITION, POOL, ETC.;	1	110.00		110.00

City/Town share of filling fee	State share of filing fee	Total Project Fee
$67.50	$42.50	$110.00

Wayland Wetlands and Water Resources Bylaw, Chapter 194 Application

1. **Applicant:**

Sean Patrick Ryan			ryanfamily16@icloud.com
Name (PLEASE PRINT)			Email Address (if applicable)
14 Rich Valley Rd	Wayland	MA	01778
Mailing Address	City/Town	State	Zip Code
850-980-2742			
Phone Number			Fax Number (if applicable)

2. **Representative:**

Same as applicant			
Firm/Business Name			Contact Name
Mailing Address	City/Town	State	Zip Code
Phone Number			Fax Number (if applicable)

3. **Property Owner(s)**

Same as applicant			
Property Owner (PLEASE PRINT)			Email Address (if applicable)
Address	City/Town	State	Zip Code
Phone Number			Fax Number (if applicable)

4. **Type of Application**

- [ ] Request for a Determination of Applicability (RDA)
- [ ] Abbreviated NOI
- [ ] Notice of Resource Area Delineation
- [ ] After the Fact Amendment (AFA)
- [ ] Amendment to Order of Conditions
- [X] Notice of Intent (NOI)
- [ ] Extension of O.O.C.
- [ ] Certificate of Compliance
- [ ] After the Fact Filing (AFF)

5. **Project**

14 Rich Valley Rd	25	2
Location Address	Assessors Map(s)	Parcel(s)

Project Description (PLEASE PRINT):
Removal of existing structures, installation of a patio, and replacement of mitigation plants and shrubs for the creation of a 15-foot vegetated buffer to the tributary.

6. **Title/Date of Plan(s)** Proposed Back Patio Improvement Site Plan for 14 Rich Valley Rd
January 11, 2021

7. **Bylaw Application Fee:** $ 200.00

check # 3197

8. **Application filed pursuant to MGL Chapter 131, Section 40** [ ] Yes [ ] No

9. **Signature of Applicant** Sean Patrick Ryan Date 01/11/2021

Signature of Property Owner Sean Patrick Ryan Date 01/11/2021

(NOTE: This application shall be signed by the property owner as well as the applicant. Signature of the property owner on this application shall be deemed permission granted to the Conservation Commission and their agents to go upon the subject property.)

TOWN OF WAYLAND
Conservation Commission
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

CHAPTER 194 Submittal Requirements

Upon submittal of any Bylaw application the applicant(s), property owner (if different), and their representative(s) must sign this checklist.

- [X] Original and one copy of the MA Wetlands Protection Act ("WPA") application and Chapter 194 Bylaw application, including owner(s) signature, the applicant(s) signature, site plan(s), narrative, etc. *

  NOTE: If a WPA Application is not filed, a copy of either a statement as to not applicable (limited generally to buffer zone or bordering land subject to flooding) or a valid Order of Resource Area Determination (ORAD) must be provided with copies.

- [X] A separate check for all applicable Wetlands Act fees.

- [X] A separate check for all applicable Chapter 194 Bylaw fees.

- [X] A list of the 100' Abutters, certified by the Assessors Office.

n/a [ ] Evidence of Board of Health receipt of application or approval for all applications with septic work or home renovations.

*A copy of all documents submitted should be provided electronically to conservation@wayland.ma.us

Project Summary

PS1 [X] A narrative statement describing all of the activities proposed. If work is omitted from the narrative it may not be permitted.

PS2 [X] A narrative summary description of the types of resource areas on or near the site. Omission of resource areas is a basis for denial of the project as being incomplete.

PS3 [X] A narrative discussion how the project has been designed to minimize impacts to resource areas and how any mitigation has been proposed to better protect or enhance the resource areas during and after construction.

The Conservation Commission will evaluate the application based on the scope of the project and the potential impacts on the resource area (e.g. a wetland, pond, vernal pool, riverfront area, etc.) The Commission's priorities for project assessment are avoidance, minimization, and mitigation of impacts to resource area/s in that order. If mitigation is proposed, the Commission will require a 1:1.5 ratio of replication for impacts to wetlands and for buffer zones. The narrative should clearly address these priorities.

PS4 [X] A narrative discussion that presents justification, based on factors of technical or economic feasibility, why alternatives that might minimize or completely avoid adverse impact to the Riverfront Area, Floodplain, the Buffer Zone, and/or any other resource area are not being proposed. At a minimum there must be discussion of the alternative for no alteration.

The following items are required for Site Plans submitted with a Bylaw application; however, if the Applicant considers that the information is not relevant to the scope or scale of the proposed project, a Waiver(s) of requirements must be requested at the time of filing the application with the Conservation Commission.

TOWN OF WAYLAND
Conservation Commission
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

Site Plan Minimum Requirements

The following shall be included on the Site Plan:

n/a 1. ☐ Stamp of a Professional Engineer (P.E.) and/or a Professional Land Surveyor (P.L.S.) depending upon proximity to lot lines or project complexity.

OR

☐ Stamp of a Registered Sanitarian (R.S.) is acceptable for designs of septic systems handling less than 2,000 gallons per day, with incidental site work.

n/a 2. ☐ Grade elevations based on National Geodetic Vertical Datum (NGVD). Grade contours in the area of work shall be provided with at least 1-foot intervals.

☒ Plan Scale: 1 inch = 10 feet or 1 inch = 20 feet.

☒ Wetlands flagging with letters and/or numbers as defined in the field.

☒ Date that wetlands flagging was done and name of the wetland delineator (if GIS was used to wetlands, then include the GIS source.)

☒ Site Plans must clearly show existing conditions and proposed conditions, utilities, impervious surfaces, limit of lawn, trees greater than 6 inches in diameter proposed for removal, significant land features such as rock outcroppings, all Resource Areas (differentiate each) including Buffer Zone. *Note: It may be more comprehensible to submit two plans: an existing conditions plan and a proposed conditions plan.*

☒ Site plans must detail the permanent demarcation of the limit of lawn with minimum 30' offset from resource area for new construction, and minimum average 15' offset for existing dwellings.

n/a 8. ☐ Locations and identifiers for all test pit locations.

n/a 9. ☐ A cross-section of grading and profile for proposed septic systems.

☒ Locations for temporary stockpiles or storage of soils or demolition debris during construction.

☒ Access route for construction equipment and construction entrance location details.

☒ Location of erosion control barrier(s).

☒ Detail for installation of erosion control barrier(s).

n/a 14. ☐ Location for refueling of equipment. (Outside buffer zone strongly preferred)

n/a 15. ☐ Locations designated for snow storage, if necessary.

☒ Pre/Post-Construction Lot Coverage Summary for areas within by-law jurisdiction: a) Total lot area; b) total impervious area **(Note: impervious areas shall include, but are not limited to, roofs, decks, walks, and driveways)**; c) total landscaped/lawn area; and d) total area altered during construction (including temporary impacts).

TOWN OF WAYLAND
Conservation Commission
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

Drainage Requirements

The Commission seeks to protect water quality of surface waters and groundwater, and to limit any increase in the rate or quantity of runoff of storm water from the property.

☐ For projects adding less than or equal to 500 square feet of impervious area, a narrative description of specific measures used to provide for infiltration of runoff equivalent to runoff this additional impervious area. Those measures must be clearly depicted on the Site Plan as a specification.

OR

2. ☒ For projects adding more than 500 square feet of impervious area,

n/a ☐ A narrative discussion of the methods and all assumptions used in the drainage calculations

n/a ☐ A plan showing drainage catchment areas

n/a ☐ Supporting calculations (i.e. HydroCAD) stamped by a P.E.

n/a ☐ Summary tables presenting Pre/Post Construction Storm Water Runoff Rates and Volumes for a 1-inch storm event, a 10-year, and a 100-year storm events. Note: Rainfall of at least 8 inches in 24 hours must be used for 100-year storm event.

n/a ☐ Compliance with DEP's Stormwater Management Standards.

n/a 3. ☐ Narrative description of structural and non-structural best management practice (BMP) (See "Definitions), controls for storm water management for the project during construction phases and for long term site management:

n/a ☐ Evaluation of BMP selection and factors of site suitability including: soils, drainage area, depth to water table, depth to bedrock, slopes and proximity to wells and foundations

n/a ☐ Discussion of construction phasing

n/a ☐ Relevant site characterization data for design

n/a ☐ Water quality calculations for total suspended solids (TSS) removal

n/a ☐ Calculated storm water recharge rate

n/a ☐ Calculated peak discharge rate

n/a 4. ☐ Maintenance requirements and site inspections templates for BMPs must be specified. Operation and Maintenance (O&M) plans for Stormwater shall be submitted with the application describing short-term BMPs (during construction) and long-term BMPs (post-construction) for management of the drainage structures, roadway and/or parking lot (as applicable) including but not limited to sweeping; catch basin cleaning; snow storage and erosion controls, such as hay bales or sediment fences. The drainage components (Best Management Practice – BMP) shall be as described using terminology in the most recent version of the DEP Storm water Technical Handbook, March 1997. A Plan for protecting the post-construction BMPs during construction shall be include in the O&M Plan.

n/a 5. ☐ Aquifer Protection District – if the project is within this area, a narrative description of how the project complies with aquifer protection requirements.

TOWN OF WAYLAND
Conservation Commission
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

Soils Information

n/a 1. ☐ Septic Systems or Drainage BMPs (where applicable) - Clear statement of how many test pits or borings were conducted for the project planning and engineering evaluations and what number and types of analytical methods may have been applied for soils characterization including visual evaluation, percolation tests, field screening, and laboratory analyses.

n/a 2. ☐ Septic Systems and/or applicable drainage BMP - Copies of all soil data including boring and/or test pit logs.

n/a 3. ☐ Wetland field data forms that document observations made during the wetland delineation including soil or test pit logs.

Waivers

In the event that Applicant considers certain required information to be, in their opinion, not relevant to the scope or scale of the proposed project Applicant may request a Waiver of the requirements with this application to the Conservation Commission. Indicate all provisions requested for Waiver below designating the specific paragraph number/letter designation.

Site Plan Minimum Requirement Waiver(s)	☐ None ☒ List	1,2,8,9,12,15: Outside of project scope/complexity
Drainage Requirement Waiver(s)	☐ None ☒ List	2,3,4,5: Outside of project scope/complexity
Soils Information Waiver(s)	☐ None ☒ List	1,2,3: Linda Hansen confirmed this is not required for this project.

If applicable, attach a statement for justification of the requested waivers.

In the event that any requested Waiver is not granted by the Commission or the application is otherwise found to be deficient in providing required information the hearing may at the discretion of the Commission either be closed and denied for the lack of information or continued for a specific timeframe approved by the Commission for the Applicant to submit the required information.

The Commission has authorized its Administrator to review projects and to not accept project applications under the Bylaw that have apparent deficiencies to meeting the above requirements. Notwithstanding that authority, acceptance of an application by the Administrator does not represent a decision that the application is fully complete. Deficiencies identified by the Administrator will be report to the applicant and the Commission during the hearing.

The property owner, as well as the applicant and/or representative (if different from owner) must sign this checklist and all other applicable applications. The property owner, by signing this checklist and the applications, acknowledges that the Commission and Staff may enter the property to inspect the premises as part of the assessment of the application.

Sean Patrick Ryan — Property Owner's Name (Print)

Sean Patrick Ryan — Property Owner's Signature — 01/11/2021 — Date

I certify under penalty of law that this document and all its attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sean Patrick Ryan — Applicant's Name (Print)

Sean Patrick Ryan — Applicant's Signature — 01/11/2021 — Date

Town of Wayland
Assessing Department
41 COCHITUATE ROAD
WAYLAND MASSACHUSETTS 01778
www.wayland.ma.us TEL. 508-358-3788

OFFICE STAFF
Ellen M. Brideau, MAA, Director of Assessing
Don Clarke, MAA, Assistant Assessor
Jessica Marchant, MAA, Administrative Assessor
Savitri Ramgoolam, Department Assistant

BOARD OF ASSESSORS
Susan M. Rufo, Chair
Jayson Brodie, Vice Chair
Zachariah L. Ventress

Certification of Abutters

Date of request 12.15.2020

Please plan your submission accordingly. The Assessors' office has 10 business days to certify an abutters list Per MGL Ch. 66, S.10

Address to be certified 14 Rich Valley Road Parcel ID 25/002 (Map/Lot)

Owner's Name (PLEASE PRINT) Sean Patrick Ryan

Owner's Mailing Address 14 Rich Valley Road

Name of Applicant (PLEASE PRINT) Sean Patrick Ryan Telephone: 850-980-2742

14 Rich Valley Road Wayland MA 01778
Mailing Address of Applicant / City/Town / State / Zip

Signature of Applicant

Reason for List (check one) ☉ Conservation ☐ Health ☐ Planning ☐ Zoning

****Please check with the Board/Commission for their guidelines regarding the number of feet required for notification. Each Board/Commission has its own regulations for their abutters listing. There's no fee for certification, however the list/s of abutters must be provided by the person or company requesting certification. Please submit by mail, in person or fax to 508 358 0061.**

For use by Assessors

This is to certify that at the time of the last assessment for taxation made by the Town of Wayland, the names and addresses are the assessed owners to these parcels.

Certified By: Mary Lou Wohlfarth Date: 12/15/20

CC: ☑ Conservation ☐ Health ☐ Planning ☐ Zoning

Abutterrequestform.doc

100 foot Abutters List Report

Wayland, MA
December 15, 2020

Subject Property:

Parcel Number:	25-002	Mailing Address:	RYAN, SEAN PATRICK RYAN, RACHEL R
CAMA Number:	25-002		14 RICH VALLEY ROAD
Property Address:	14 RICH VALLEY RD		WAYLAND, MA 01778

Abutters:

Parcel Number:	25-001	Mailing Address:	MINTY KENNETH G
CAMA Number:	25-001		12 RICH VALLEY RD
Property Address:	12 RICH VALLEY RD		WAYLAND, MA 01778
Parcel Number:	25-003	Mailing Address:	MACKENZIE MILDRED J
CAMA Number:	25-003		72 FAIR OAKS AVE
Property Address:	128 BOSTON POST RD		NEWTONVILLE, MA 02460
Parcel Number:	25-004	Mailing Address:	RJANIKOV ROMAN RJANIKOV BRITT T/E
CAMA Number:	25-004		18 RICH VALLEY RD
Property Address:	18 RICH VALLEY RD		WAYLAND, MA 01778
Parcel Number:	25-030	Mailing Address:	STEVENS LORING L
CAMA Number:	25-030		985 MEMORIAL DR UNIT 101
Property Address:	17 RICH VALLEY RD		CAMBRIDGE, MA 02138
Parcel Number:	25-031	Mailing Address:	SCHOLZ, CYNTHIA A., TR. F. I. SMYLE REALTY TRUST
CAMA Number:	25-031		13 RICH VALLEY RD.
Property Address:	13 RICH VALLEY RD		WAYLAND, MA 01778
Parcel Number:	25-032	Mailing Address:	MARTIN, CORNELIA E
CAMA Number:	25-032		11 RICH VALLEY RD
Property Address:	11 RICH VALLEY RD		WAYLAND, MA 01778
Parcel Number:	94-001	Mailing Address:	COMMONWEALTH OF MASS -- MWRA
CAMA Number:	94-001		100 FIRST AVE CHARLESTOWN NAVY YARD
Property Address:	ACROSS TOWN		BOSTON, MA 02129

Dilbarian 14 Rich Valley Rd. Wayland

Wayland, MA

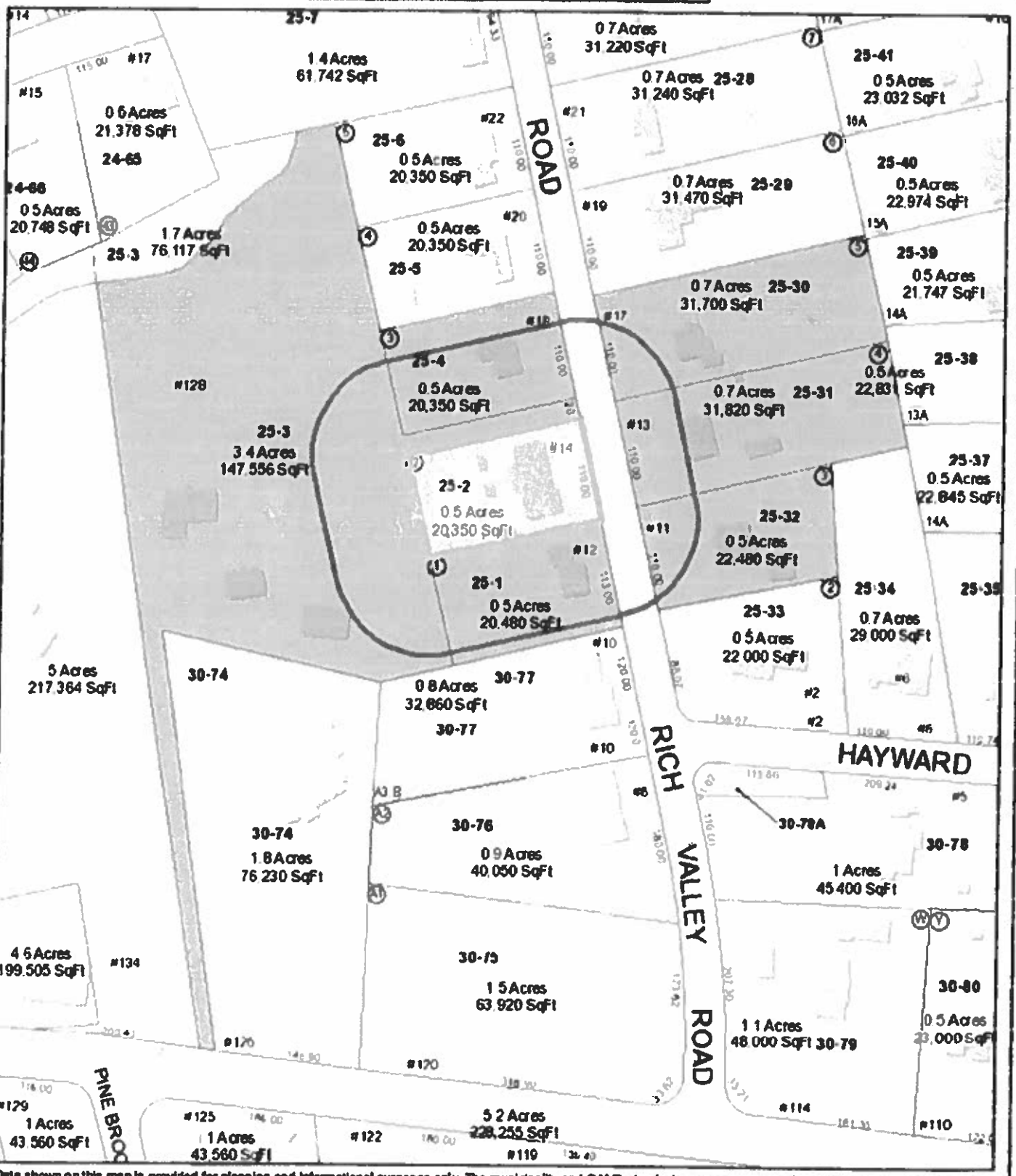
1 Inch = 134 Feet

May 3, 2018

0 134 268 403

CAI Technologies

www.cai-tech.com



Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.

Notification to Abutters
Under the Wayland Wetlands and Water Resources Protection Bylaw

In accordance with Chapter 194 of the Town of Wayland Bylaws, you are hereby notified of the following:

A. The name of the **Applicant** is Sean Patrick Ryan

B. The Applicant has filed a Chapter 194 application with the Wayland Conservation Commission for permission to remove, fill, dredge, or alter an Area Subject to Protection (Wetland Resource Area and/or Buffer Zone) Under the Wayland Wetlands and Water Resources Protection Bylaw (Chapter 194).

C. The **address** of the lot where the activity is proposed: 14 Rich Valley Rd, Wayland, MA 01778
Map: 25 Lot: 2

D. The **proposed activity** is:

REMOVAL OF EXISTING STRUCTURES, INSTALLATION OF A PATIO, AND REPLACEMENT OF MITIGATION PLANTS AND SHRUBS FOR THE CREATION OF A 15 FOOT VEGETATED BUFFER TO THE TRIBUTARY.

D. A **Public Hearing** regarding this application will be held on:

☐ , Feb 10th at TBD PM at Town Hall (41 Cochituate Road, Wayland).

☐ Information regarding the date, time, and place of the public hearing may be obtained from the applicant or the Wayland Conservation Commission (check website).

E. Copies of the Chapter 194 may be examined at **THE WAYLAND CONSERVATION COMMISSION OFFICE** at Wayland Town Hall between the hours of 8:00 A.M. & 4:00 P.M. Monday – Thursday and 8:00 A.M. & 12:30 P.M Friday. For more information, call: 508-358-6339.

F. Copies of the Chapter 194 application may be obtained from either:

☐ The Applicant, or the Applicant's representative Sean Patrick Ryan, by calling this telephone number: 850-980-2742 between the hours of 10am to 4pm on the following days of the week: Monday thru Friday.

Note: Public Hearing Notice, including its date, time, and place, will be published at least 5 days in advance in the **Wayland Town Crier or MetroWest Daily News** (at the applicant's expense).

Since you are receiving this notice, you may have wetland or riverfront resource areas on your property.
Therefore, construction, cutting, clearing, or grading may require a permit. For clarification or for more information, call the Conservation office 508-358-3669 or visit our web site: http://www.wayland.ma.us/Pages/WaylandMA_Conservation/index

Three Oaks Environmental
P.O. Box 404
Hubbardston, MA 01452
(978) 855-3180

March 19, 2018

Mike Sullivan
Sullivan, Connors & Associates
121 Boston Post Rd.
Wayland, MA 01778
mjs@csei.net

re: 14 Rich Valley Rd. Wayland
delineation report from
3/16/18. Cloudy, 34°F

On March 16, 2018 I inspected the above-referenced parcel for the presence of wetland resource areas to plan for a future septic system replacement I observed a vegetated wetland (BVW) bordering on an intermittent stream tributary to Hayward Brook. The BVW is subject to jurisdiction under the Wetlands Protection Act, M.G.L. Ch.131 §40. Hayward Brook is located more than 200 feet from the property at 14 Rich Valley Road so that there is no Riverfront Area on the property. Therefore, I flagged the bank of the intermittent stream and the limits of the BVW where vegetation occurred above the bank.

Blue flags numbered A-1 to A-10 mark the limits of the resource areas. Flag A-1 was placed on the wetland boundary on the abutting parcel to the south. Flag A-10 was hung on the boundary behind the abutting parcel to the north. There is a 100-foot Buffer Zone that extends out from this wetlands line which is also subject to jurisdiction under the Wetlands Act.

I based the wetlands line on the vegetation present and the obvious topographical changes. Though there was snow on the ground, there was sufficient vegetation visible to make an accurate assessment of the boundary.

Plants observed in the upland include: japanese yew, oriental bittersweet, white pine, sugar maple, multiflora rose, grape vine arbor, and lawn grasses.

Plants observed within the wetland include: red maple, american elm, common elderberry, skunk cabbage, and sensitive fern.

Examination of MassGIS data layers reveals that there are no certified vernal pools, rare species habitat, Outstanding Resource Waters, ACEC's or 100-year floodplain on the site (see attached MassGIS maps). The NRCS soils map of the area shows the wetland soil to be Freetown Muck and the upland soil is Haven silt loam in the Haven-Urban Complex (see attached).

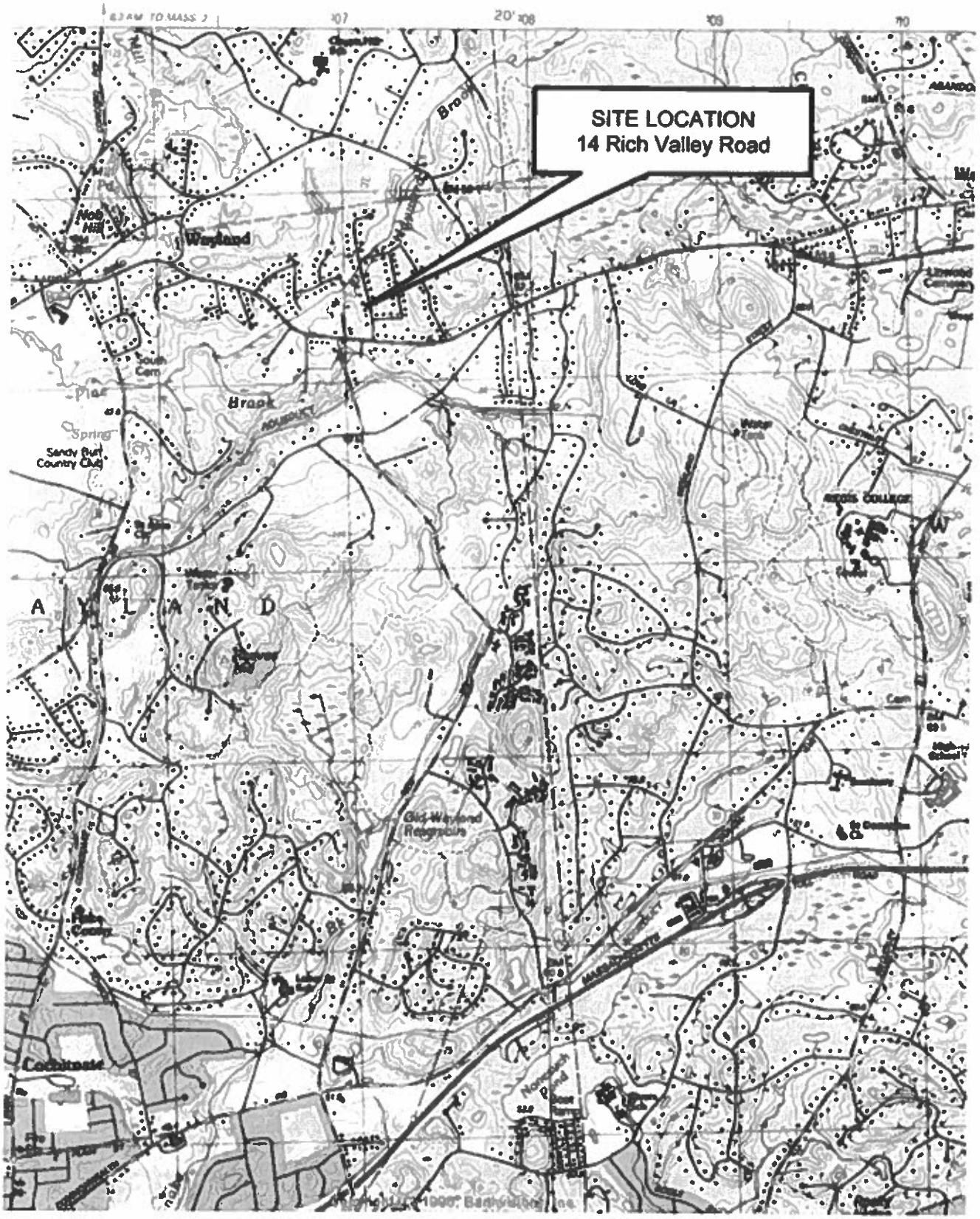
Please feel free to contact me if you have any questions regarding this report.

Sincerely,

MaryAnn DiPinto

MaryAnn DiPinto, PWS #0227
threeoaksenvironmental@gmail.com

LOCUS MAP (USGS)



14 Rich Valley Road

Wayland, MA

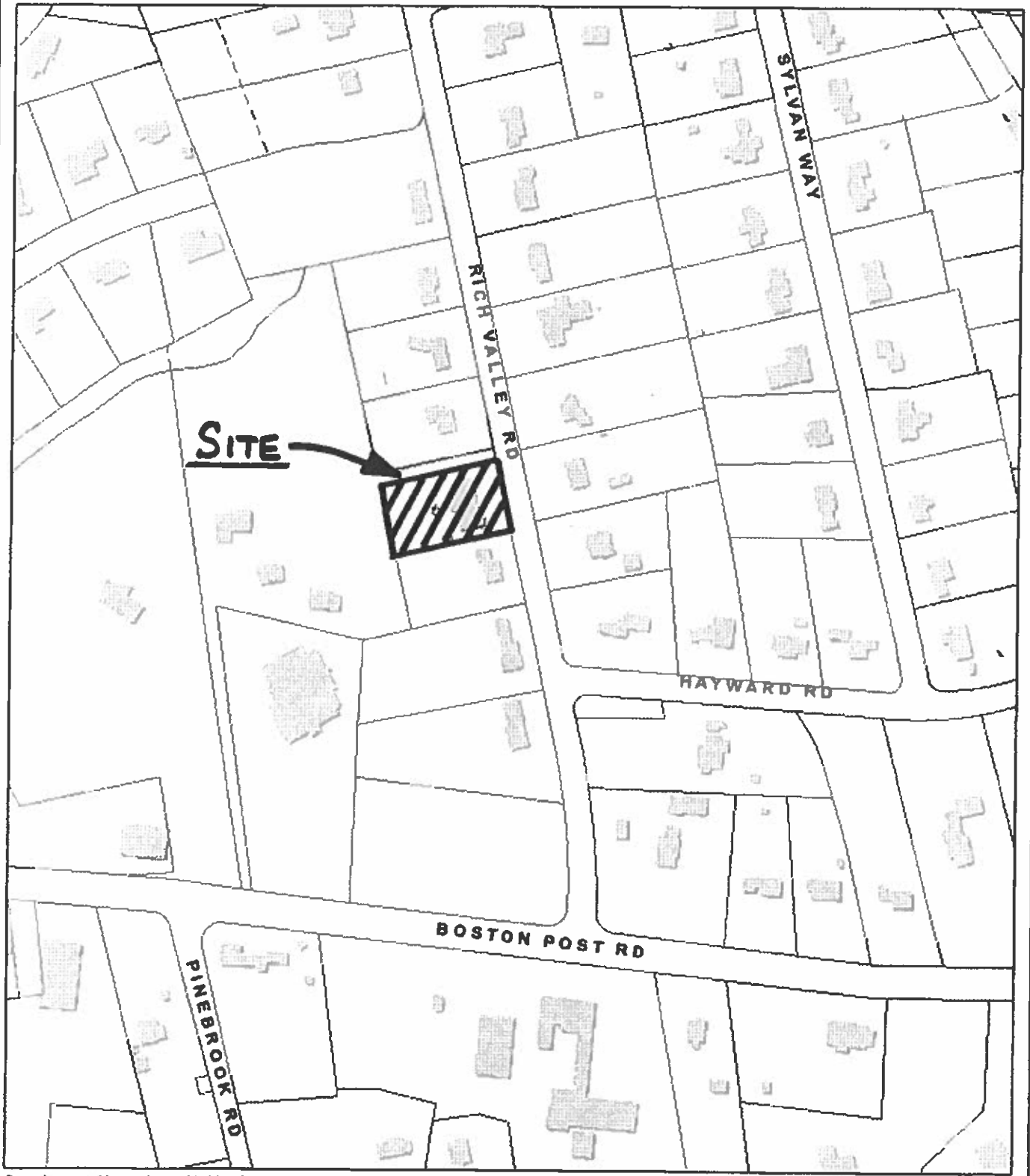
1 inch = 200 Feet

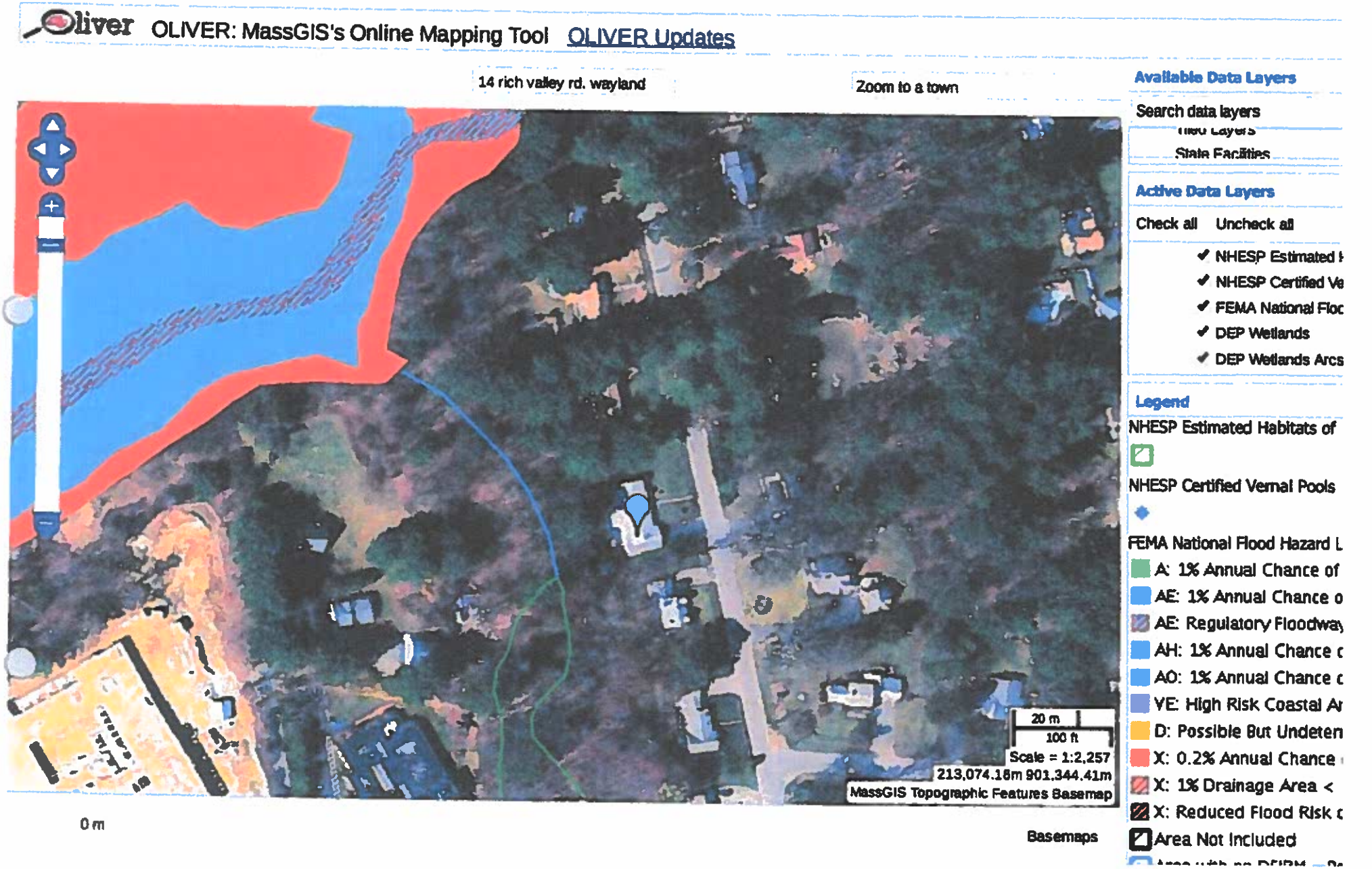
0 200 400 600

May 3, 2018

CAI Technologies

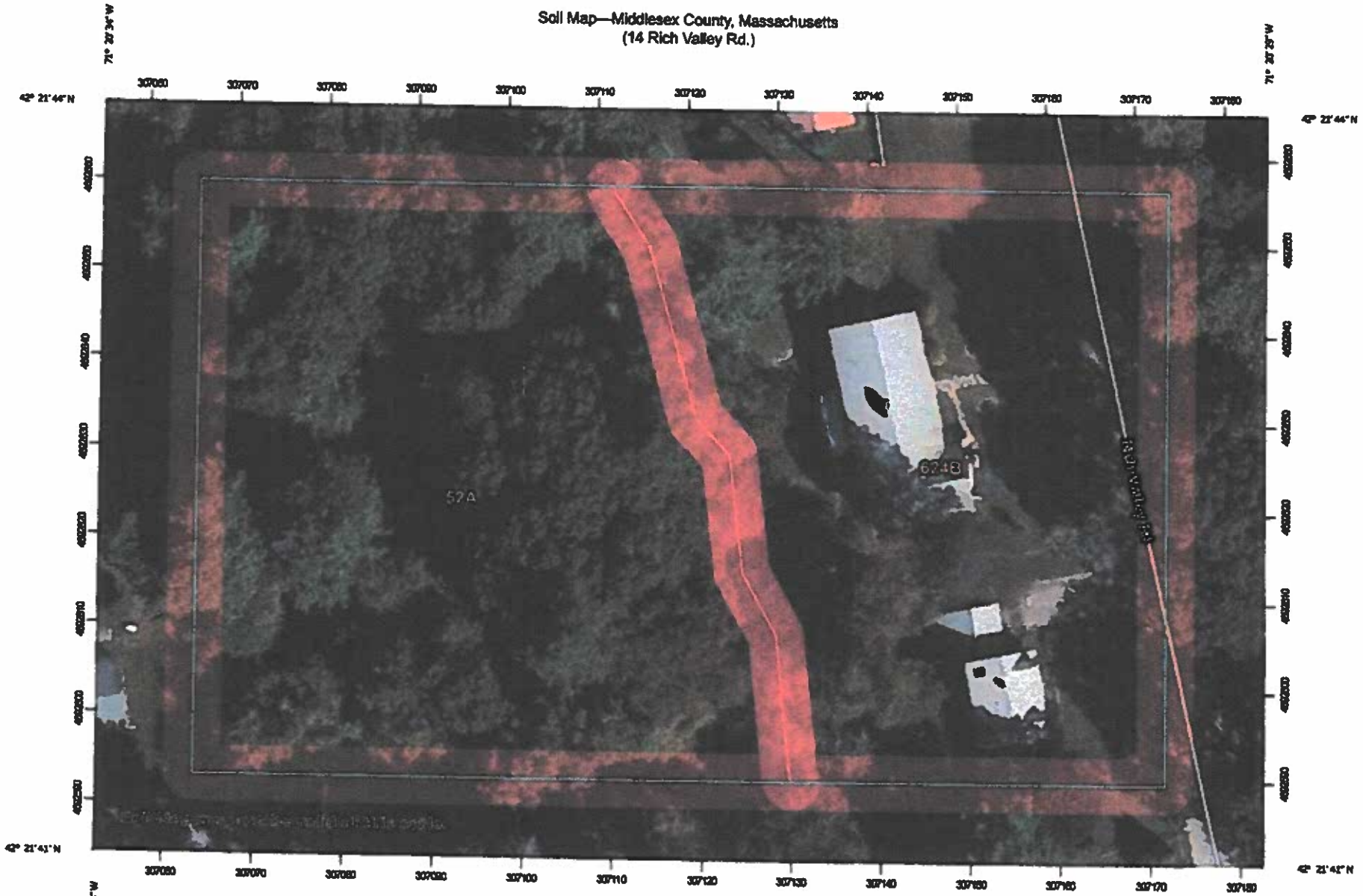
www.cai-tech.com





NHESP Data
Floodplain - FEMA

Soil Map—Middlesex County, Massachusetts
(14 Rich Valley Rd.)



Map Scale: 1:594 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 5 10 20 30

Feet: 0 25 50 100 150

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

Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

Map Unit Legend

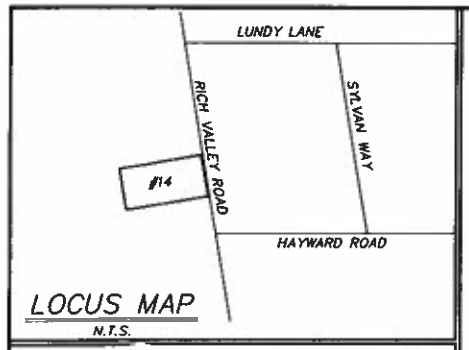
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
52A	Freetown muck, 0 to 1 percent slopes	1.0	53.9%
624B	Haven-Urban land complex, 0 to 8 percent slopes	0.8	46.1%
Totals for Area of Interest		1.8	100.0%

Tree & Shrub Listing

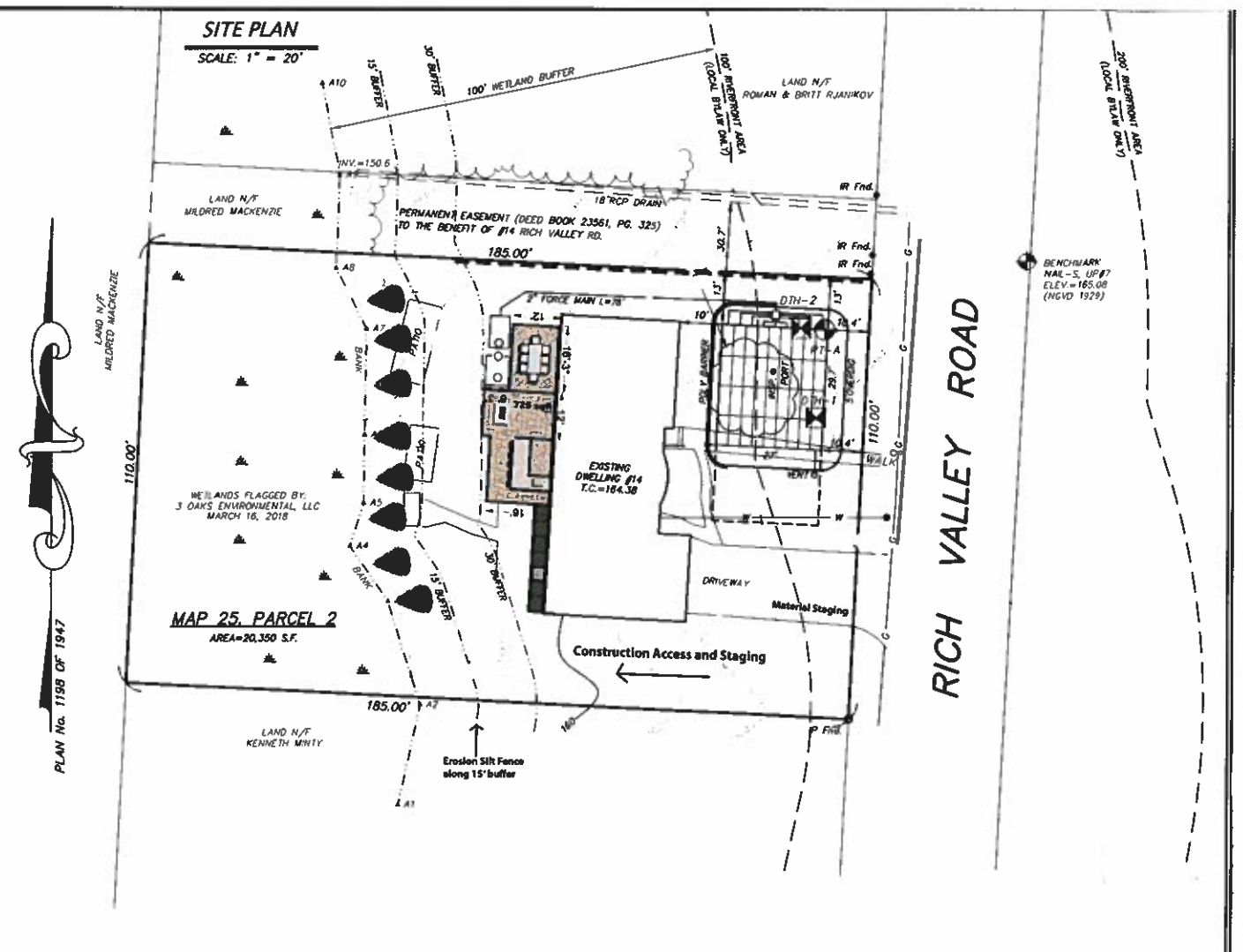
- **Screen Privacy Trees located inside 15' buffer zone**
  - Eight to ten (8 to 10) Juniperus Virginiana (Eastern Red Cedar) trees - 10' to15' tall and wide at maturity.

- **Patio Shrubs located against the home**
  - Six (6) Virginia Sweetspire shrubs - 2 to 5' tall and wide at maturity

Proposed Back Patio Improvement Site Plan for 14 Rich Valley Rd



EROSION CONTROL NOTES
- All work shall be in accordance with the Order Of Conditions and Chapter 194 Permit.
- A silt fence erosion barrier shall be installed along the 15' buffer line as indicated on the Site Plan.
- The silt fence will be set below ground level with soil anchors the inside bottom to close any gaps.
- All materials not being currently installed will be staged in the driveway, as indicated on the Site Plan.
- All contruction equipment will be staged on the North side of the dwelling while not in use, as indicated on the Site Plan.



BUFFER VEGETATED WETLANDS IMPROVEMENT NOTES
- Reducing square footage of impervious surface from approx. 1500 to 725.
- Previous impervious surface was set on thick concert base. Majority of the new surface will be set on open gravel base.
- Removal of all old impervious surfaces that encroached the 15' buffer zone.
- New impervious surface built as permeable as possible to limit water runoff to almost zero by using using a commercial grade polymeric joint infill by the name of EasyJoint.
- New impervious surface will be pitched to move any run off water to the North and South sides.
- Planting of migitiation/screen shrubs along the 15' buffer zone to create a definitive separation of the protected BVW and the lawn. The current 15' buffer is encroached by preexisting lawn without definitive line of separation.

MASS HARDSCAPES WORK PROPOSAL

DEMO/JOB CLEANUP
- Removal and disposal of existing flagstone patio and walkways.
- Removal and disposal of existing fireplace.
- Removal and disposal of existing steel structure.
- Loaming and seeding of all lawn areas disturbed due to job construction outside 15' buffer zone.

PAVER WORK
- Installation of 725 sq. ft. paver patio using Unilock Umbriano slabs (Winter Marvel) with single soldier course border using Unilock Copthorne pavers (Basalt). (Both pavers are factory sealed products.)
- Installation of edge restraint and commercial grade polymeric joint sand.

KITCHEN/BAR
- Installation of 6" thick concrete foundation.
- Installation of bar/kitchen area using Unilock Estate Wall 3" and 6" block (Granite).
- Installation of 2" thick natural granite counter top with overhang (Blue Mist).
- Installation of 32" Blaze LTE gas grill head.
- Installation of 32" stainless double access doors.
- Installation of 14x20" stainless single access door.
- Installation of stainless single trash drawer.

FIRE PIT
- Installation of custom sized Unilock Roman Stack fire pit kit (Granite).
- Installation of steel insert.
- Installation of radius cut custom granite caps (Blue Mist).

LIGHTING
- All lighting will be Dark Sky Compliant.
- Installation of 3 Zone Bluetooth controlled smart transformer.
- Installation of 2 In-Lite Evo Hyde 550 LED under cap lights in bar.
- Installation of 7 In-Lite Evo Hyde 180 LED under cap lights in bar and fire pit.
- Installation of 3 In-Lite Liv Low LED path lights along patio.

PATIO LANDSCAPING
- Edging and prepping of new bed areas.
- Installation of plants. (Refer to shrub list)
- Mulching of bed areas.

SCREEN PLANTINGS
- Installation of trees inside 15' buffer zone. Refer to site plan for estimated placement.
- 8 to 10 Juniperus Virginiana (Eastern Red Cedar) trees - 10' to15' tall and wide at maturity.

SHRUB LIST
- 6 Virginia Sweetspire shrubs - 2 to 5' tall and wide at maturity

OWNER/APPLICANT	LOCATION
Ryan, Sean Patrick DEED BK. , PG.	14 RICH VALLEY ROAD WAYLAND, MA ASSESSORS MAP 25 & PARCEL 2

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES
102 Grove Street
Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

January 21, 2021

Wayland Conservation Commission
41 Cochituate Road
Wayland, MA 01778

Re: Notice of Intent (NOI) Filing – 53 Concord Road
Applicant/Owner: Mohammad Bilal Kaleem

Dear Commission Members:

Enclosed please find two (2) copies of the WPA – NOI Form with required attachments and three (3) copies of supporting plans filed under the Massachusetts Wetlands Protection Act and the Wayland Wetland and Water Resources Bylaw on behalf of the Applicant and Owner for the above referenced property. The applicant is seeking an Order of Conditions to allow for the paving of an existing degraded gravel driveway, replacement of an equilibrium culvert, and the installation of two equilibrium culverts along the driveway.

The filing is comprised of:

1. The WPA Form 3 -NOI Form with required attachments;
2. The NOI Wetland Fee Transmittal Form and photocopy of checks;
3. The Wayland Wetlands and Water Resources Bylaw, Chapter 194 Application;
4. The Town of Wayland Conservation Commission Chapter 194 Submittal Requirements form;
5. Notification to Abutters letter and Wayland Abutter list;
6. WPA filing fee check to the Town of Wayland in the amount of $95.00;
7. Bylaw filing fee to Town of Wayland in the amount of $401.00;
8. Riverfront Area Alternatives Analysis & Project Narrative prepared by EcoTec, Inc.;
9. #53 Concord Road Stormwater Narrative prepared by Quinn Engineering, Inc.;
10. Wetland Resource Evaluation, 53 Concord Road, Wayland, MA, prepared by EcoTec, Inc., dated 1/13/2021. Includes USGS Locus Map, BVW forms, Flood Map and NHESP map;
11. Site Plans prepared by Quinn Engineering, Inc., dated 1/15/2021;

One (1) copy of the filing has also been sent certified mail/return receipt to the DEP Northeast Regional Office.

We look forward to discussing this project with the Commission at the public hearing to be held on February 10, 2021. If you have any questions, please feel free to contact me at any time.

Sincerely,

Scott Jordan

Scott Jordan
Senior Environmental Scientist

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
Wayland
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):

53 Concord Road — a. Street Address
Wayland — b. City/Town
01778 — c. Zip Code

Latitude and Longitude:
42 22' 17.88"N — d. Latitude
71 21' 31.40"W — e. Longitude

18 — f. Assessors Map/Plat Number
86 — g. Parcel /Lot Number

2. Applicant:

Mohammad Bilal — a. First Name
Kaleem — b. Last Name
c. Organization
53 Concord Road — d. Street Address
Wayland — e. City/Town
MA — f. State
01778 — g. Zip Code
617-429-3237 — h. Phone Number
i. Fax Number
bilalkaleem@gmail.com — j. Email Address

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

Same — a. First Name
b. Last Name
c. Organization
d. Street Address
e. City/Town
f. State
g. Zip Code
h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Scott — a. First Name
Jordan — b. Last Name
EcoTec, Inc. — c. Company
102 Grove Street — d. Street Address
Worcester — e. City/Town
MA — f. State
01605 — g. Zip Code
508-752-9666 x226 — h. Phone Number
i. Fax Number
sjordan@ecotecinc.com — j. Email address

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

$165 — a. Total Fee Paid
$70 — b. State Fee Paid
$95 — c. City/Town Fee Paid

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

Wayland
City/Town

A. General Information (continued)

6. General Project Description:

Proposed paving of an exsiting, degraded gravel driveway within the Buffer Zone and Riverfront Area, an exempt activity under 310 CMR 10.02(2)(b)2.q. Proposed replacement of existing, damaged equilibrium culvert and installation of two new equilibrium culverts under the driveway at the request of the Wayland Conservation Commission.

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:

a. County	b. Certificate # (if registered land)
Middlesex	
c. Book	**d. Page Number**
66695	517

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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Bureau of Resource Protection - Wetlands

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

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☒ Bordering Vegetated Wetland	+/-2 sf (temporary for silt fence) 1. square feet	+/- 2 sf 2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☒ Riverfront Area	Mill Brook 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: 38,196 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.
4,711 (pave extg gravel drive)	1,930	2,781

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

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

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

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

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

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

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

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

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

   10/23/2020
   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

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* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review).
Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

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

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

(c) ☐ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

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

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

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

a. ☐ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

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

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

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: dmf.envreview-south@mass.gov

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: dmf.envreview-north@mass.gov

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

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

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

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

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

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

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

b. ACEC

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

a. ☐ Yes ☒ No

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

a. ☐ Yes ☒ No

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

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

1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
2. ☐ A portion of the site constitutes redevelopment
3. ☐ Proprietary BMPs are included in the Stormwater Management System.

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

1. ☒ Single-family house
2. ☐ Emergency road repair
3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

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

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

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

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

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

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Bureau of Resource Protection - Wetlands

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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.

Proposed Driveway Improvement Plan in Wayland, Mass. #53 Concord Road
a. Plan Title

Quinn Engineering, Inc.
b. Prepared By

Kevin J. Quinn
c. Signed and Stamped by

January 15, 2021
d. Final Revision Date

20
e. Scale

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:

20660
2. Municipal Check Number

1/21/2021
3. Check date

20661
4. State Check Number

1/21/2021
5. Check date

EcoTec, Inc.
6. Payor name on check: First Name

7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Wayland
City/Town

F. Signatures and Submittal Requirements

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

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

Mirai Cabe — 1/19/2021

1. Signature of Applicant — 2. Date

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

Scott Gordon, Executive — 1/21/21

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

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

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

A. Applicant Information

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

1. Location of Project:

53 Concord Road a. Street Address	Wayland b. City/Town
20661 (state check) c. Check number	$70 (state fee) d. Fee amount

2. Applicant Mailing Address:

Mohammad Bilal a. First Name	Kaleem b. Last Name

c. Organization

53 Concord Road
d. Mailing Address

Wayland e. City/Town	MA f. State	01778 g. Zip Code

617-429-3237 h. Phone Number	i. Fax Number	bilalkaleem@gmail.com j. Email Address

3. Property Owner (if different):

Same a. First Name	b. Last Name

c. Organization

d. Mailing Address

e. City/Town	f. State	g. Zip Code

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

B. Fees

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

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

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

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

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

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 1.a.	1	$110	$165

Step 5/Total Project Fee: $165

Step 6/Fee Payments:

Total Project Fee:	$165 (a. Total Fee from Step 5)
State share of filing Fee:	$70 (b. 1/2 Total Fee **less** $12.50)
City/Town share of filling Fee:	$95 (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.)

Wayland Wetlands and Water Resources Bylaw, Chapter 194 Application

1. **Applicant:**

Mohammad Bilal Kaleem — bilalKaleem@gmail.com
Name (PLEASE PRINT) — Email Address (if applicable)

53 Concord Rd — Wayland — MA — 01778
Mailing Address — City/Town — State — Zip Code

617-429-3237 — Fax Number (if applicable)
Phone Number

2. **Representative:**

Eisler, Inc. — Scott Jordan
Firm/Business Name — Contact Name

102 Grove St. — Worcester — MA — 01605
Mailing Address — City/Town — State — Zip Code

508-752-9666 x226 — Fax Number (if applicable)
Phone Number

3. **Property Owner(s)**

Same — Email Address (if applicable)
Property Owner (PLEASE PRINT)

Address — City/Town — State — Zip Code

Phone Number — Fax Number (if applicable)

4. **Type of Application**

[ ] Request for a Determination of Applicability (RDA)
[ ] Abbreviated NOI
[ ] Notice of Resource Area Delineation
[ ] After the Fact Amendment (AFA)
[ ] Amendment to Order of Conditions
[✓] Notice of Intent (NOI)
[ ] Extension of O.O.C.
[ ] Certificate of Compliance
[ ] After the Fact Filing (AFF)

5. **Project**

53 Concord Rd. — 18 — 96
Location Address — Assessors Map(s) — Parcel(s)

Project Description (PLEASE PRINT): Pave gravel driveway. Replace damaged culvert. Install 2 equilibrium culverts.

6. **Title/Date of Plan(s)** Proposed Driveway Improvement Plan in Wayland, MA #53 Concord Rd.

7. **Bylaw Application Fee:** $406.00

8. **Application filed pursuant to MGL Chapter 131, Section 40** [✓] Yes [ ] No

9. **Signature of Applicant** Mohd Kaleem — Date 1/19/2021

Signature of Property Owner Mohd Kaleem — Date 1/19/2021

(NOTE: This application shall be signed by the property owner as well as the applicant. Signature of the property owner on this application shall be deemed permission granted to the Conservation Commission and their agents to go upon the subject property.)

TOWN OF WAYLAND
Conservation Commission
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

CHAPTER 194 Submittal Requirements

Upon submittal of any Bylaw application the applicant(s), property owner (if different), and their representative(s) must sign this checklist.

☑ Original and one copy of the MA Wetlands Protection Act ("WPA") application and Chapter 194 Bylaw application, including owner(s) signature, the applicant(s) signature, site plan(s), narrative, etc. *

NOTE: If a WPA Application is not filed, a copy of either a statement as to not applicable (limited generally to buffer zone or bordering land subject to flooding) or a valid Order of Resource Area Determination (ORAD) must be provided with copies.

☑ A separate check for all applicable Wetlands Act fees.

☑ A separate check for all applicable Chapter 194 Bylaw fees.

☑ A list of the 100' Abutters, certified by the Assessors Office.

☐ Evidence of Board of Health receipt of application or approval for all applications with septic work or home renovations.

*A copy of all documents submitted should be provided electronically to conservation@wayland.ma.us

Project Summary

☑ A narrative statement describing all of the activities proposed. If work is omitted from the narrative it may not be permitted.

☑ A narrative summary description of the types of resource areas on or near the site. Omission of resource areas is a basis for denial of the project as being incomplete.

☑ A narrative discussion how the project has been designed to minimize impacts to resource areas and how any mitigation has been proposed to better protect or enhance the resource areas during and after construction.

The Conservation Commission will evaluate the application based on the scope of the project and the potential impacts on the resource area (e.g. a wetland, pond, vernal pool, riverfront area, etc.) The Commission's priorities for project assessment are avoidance, minimization, and mitigation of impacts to resource area/s in that order. If mitigation is proposed, the Commission will require a 1:1.5 ratio of replication for impacts to wetlands and for buffer zones. The narrative should clearly address these priorities.

☑ A narrative discussion that presents justification, based on factors of technical or economic feasibility, why alternatives that might minimize or completely avoid adverse impact to the Riverfront Area, Floodplain, the Buffer Zone, and/or any other resource area are not being proposed. At a minimum there must be discussion of the alternative for no alteration.

The following items are required for Site Plans submitted with a Bylaw application; however, if the Applicant considers that the information is not relevant to the scope or scale of the proposed project, a Waiver(s) of
time of filing the application with the Conservation Commission.

TOWN OF WAYLAND
Conservation Commission
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

Site Plan Minimum Requirements

The following shall be included on the Site Plan:

- ☑ Stamp of a Professional Engineer (P.E.) and/or a Professional Land Surveyor (P.L.S.) depending upon proximity to lot lines or project complexity.
  OR
- ☐ Stamp of a Registered Sanitarian (R.S.) is acceptable for designs of septic systems handling less than 2,000 gallons per day, with incidental site work.

- ☑ Grade elevations based on National Geodetic Vertical Datum (NGVD). Grade contours in the area of work shall be provided with at least 1-foot intervals.

- ☑ Plan Scale: 1 inch = 10 feet or 1 inch = 20 feet.

- ☑ Wetlands flagging with letters and/or numbers as defined in the field.

- ☑ Date that wetlands flagging was done and name of the wetland delineator (if GIS was used to wetlands, then include the GIS source.)

- ☑ Site Plans must clearly show existing conditions and proposed conditions, utilities, impervious surfaces, limit of lawn, trees greater than 6 inches in diameter proposed for removal, significant land features such as rock outcroppings, all Resource Areas (differentiate each) including Buffer Zone. *Note: It may be more comprehensible to submit two plans: an existing conditions plan and a proposed conditions plan.*

- ☐ Site plans must detail the permanent demarcation of the limit of lawn with minimum 30' offset from resource area for new construction, and minimum average 15' offset for existing dwellings.

- ☐ Locations and identifiers for all test pit locations.

- ☐ A cross-section of grading and profile for proposed septic systems.

- ☐ Locations for temporary stockpiles or storage of soils or demolition debris during construction.

- ☑ Access route for construction equipment and construction entrance location details.

- ☑ Location of erosion control barrier(s).

- ☑ Detail for installation of erosion control barrier(s).

- ☐ Location for refueling of equipment. (Outside buffer zone strongly preferred)

- ☑ Locations designated for snow storage, if necessary.

- ☑ Pre/Post-Construction Lot Coverage Summary for areas within by-law jurisdiction: a) Total lot area; b) total impervious area **(Note: impervious areas shall include, but are not limited to, roofs, decks, walks, and driveways)**; c) total landscaped/lawn area; and d) total area altered during construction (including temporary impacts).

TOWN OF WAYLAND
Conservation Commission
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

Drainage Requirements

The Commission seeks to protect water quality of surface waters and groundwater, and to limit any increase in the rate or quantity of runoff of storm water from the property.

☐ For projects adding less than or equal to 500 square feet of impervious area, a narrative description of specific measures used to provide for infiltration of runoff equivalent to runoff this additional impervious area. Those measures must be clearly depicted on the Site Plan as a specification.

OR

☐ For projects adding more than 500 square feet of impervious area,

- ☐ A narrative discussion of the methods and all assumptions used in the drainage calculations
- ☐ A plan showing drainage catchment areas
- ☐ Supporting calculations (i.e. HydroCAD) stamped by a P.E.
- ☐ Summary tables presenting Pre/Post Construction Storm Water Runoff Rates and Volumes for a 1-inch storm event, a 10-year, and a 100-year storm events. Note: Rainfall of at least 8 inches in 24 hours must be used for 100-year storm event.
- ☐ Compliance with DEP's Stormwater Management Standards.

☑ Narrative description of structural and non-structural best management practice (BMP) (See "Definitions), controls for storm water management for the project **during construction phases and for long term site management**:

- ☐ Evaluation of BMP selection and factors of site suitability including: soils, drainage area, depth to water table, depth to bedrock, slopes and proximity to wells and foundations
- ☐ Discussion of construction phasing
- ☐ Relevant site characterization data for design
- ☐ Water quality calculations for total suspended solids (TSS) removal
- ☐ Calculated storm water recharge rate
- ☐ Calculated peak discharge rate

☐ Maintenance requirements and site inspections templates for BMPs must be specified. Operation and Maintenance (O&M) plans for Stormwater shall be submitted with the application describing short-term BMPs (during construction) and long-term BMPs (post-construction) for management of the drainage structures, roadway and/or parking lot (as applicable) including but not limited to sweeping; catch basin cleaning; snow storage and erosion controls, such as hay bales or sediment fences. The drainage components (Best Management Practice – BMP) shall be as described using terminology in the most recent version of the DEP Storm water Technical Handbook, March 1997. A Plan for protecting the post-construction BMPs during construction shall be include in the O&M Plan.

☐ Aquifer Protection District – If the project is within this area, a narrative description of how the project complies with aquifer protection requirements.

TOWN OF WAYLAND
Conservation Commission
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

Soils Information

☐ Septic Systems or Drainage BMPs (where applicable) - Clear statement of how many test pits or borings were conducted for the project planning and engineering evaluations and what number and types of analytical methods may have been applied for soils characterization including visual evaluation, percolation tests, field screening, and laboratory analyses.

☐ Septic Systems and/or applicable drainage BMP - Copies of all soil data including boring and/or test pit logs.

☑ Wetland field data forms that document observations made during the wetland delineation including soil or test pit logs

Waivers

In the event that Applicant considers certain required information to be, in their opinion, not relevant to the scope or scale of the proposed project Applicant may request a Waiver of the requirements with this application to the Conservation Commission. Indicate all provisions requested for Waiver below designating the specific paragraph number/letter designation.

Site Plan Minimum Requirement Waiver(s)	☐ None ☐ List	
Drainage Requirement Waiver(s)	☐ None ☑ List	Stormwater management
Soils Information Waiver(s)	☐ None ☑ List	

If applicable, attach a statement for justification of the requested waivers.

In the event that any requested Waiver is not granted by the Commission or the application is otherwise found to be deficient in providing required information the hearing may at the discretion of the Commission either be closed and denied for the lack of information or continued for a specific timeframe approved by the Commission for the Applicant to submit the required information.

The Commission has authorized its Administrator to review projects and to not accept project applications under the Bylaw that have apparent deficiencies to meeting the above requirements. Notwithstanding that authority, acceptance of an application by the Administrator does not represent a decision that the application is fully complete. Deficiencies identified by the Administrator will be report to the applicant and the Commission during the hearing.

The property owner, as well as the applicant and/or representative (if different from owner) must sign this checklist and all other applicable applications. The property owner, by signing this checklist and the applications, acknowledges that the Commission and Staff may enter the property to inspect the premises as part of the assessment of the application.

MOHAMMAD BILAL KALEEM — Property Owner's Name (Print)

Mohd Kaleem — Property Owner's Signature — 1/19/2021 — Date

I certify under penalty of law that this document and all its attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

MOHAMMAD BILAL KALEEM — Applicant's Name (Print)

Mohd Kaleem — Applicant's Signature — 1/19/2021 — Date

Notification to Abutters
Under the Wayland Wetlands and Water Resources Protection Bylaw

In accordance with Chapter 194 of the Town of Wayland Bylaws, you are hereby notified of the following:

A. The name of the **Applicant** is Mohammad Bilal Kaleem

B. The Applicant has filed a Chapter 194 application with the Wayland Conservation Commission for permission to remove, fill, dredge, or alter an Area Subject to Protection (Wetland Resource Area and/or Buffer Zone) Under the Wayland Wetlands and Water Resources Protection Bylaw (Chapter 194).

C. The **address** of the lot where the activity is proposed: 53 Concord Road
Map: 18 Lot: 86

D. The **proposed activity** is: Driveway paving. Culvert replacement. Installation of two hydrologic equilibrium culverts.

D. A **Public Hearing** regarding this application will be held on:
☐ Feb. 10, 2021 at 6:30 PM at Town Hall (41 Cochituate Road, Wayland).
☐ Information regarding the date, time, and place of the public hearing may be obtained from the applicant or the Wayland Conservation Commission (check website).

E. Copies of the Chapter 194 may be examined at **THE WAYLAND CONSERVATION COMMISSION OFFICE** at Wayland Town Hall between the hours of 8:00 A.M. & 4:00 P.M. Monday – Thursday and 8:00 A.M. & 12:30 P.M Friday. For more information, call: 508-358-6339.

F. Copies of the Chapter 194 application may be obtained from either:
☐ The Applicant, or the Applicant's representative Scott Jordan, Ecotec, Inc., by calling this telephone number: 508-752-9666 x226 between the hours of 9-5 on the following days of the week: M - Fri.

Note: Public Hearing Notice, including its date, time, and place, will be published at least 5 days in advance in the **Wayland Town Crier or MetroWest Daily News** (at the applicant's expense).

Since you are receiving this notice, you may have wetland or riverfront resource areas on your property.
Therefore, construction, cutting, clearing, or grading may require a permit. For clarification or for more information, call the Conservation office 508-358-3669 or visit our web site: http://www.wayland.ma.us/Pages/WaylandMA_Conservation/index

Town of Wayland

41 COCHITUATE ROAD
WAYLAND MASSACHUSETTS 01778
www.wayland.ma.us TEL. 508-358-3788

OFFICE STAFF
Bruce Morgan MAA, Director of Assessing
Matthew Lanefski, MAA, Assistant Assessor
Mary-Ann Wohlfarth, Sr. Admin. Coordinator

BOARD OF ASSESSORS
Jayson Brodie, Chair
Zachariah Ventress, Vice Chair
John A. Todd
Molly Upton

Certification of Abutters

Date of request 12/8/20

Please plan your submission accordingly. The Assessors' office has 10 business days to certify an abutters list Per MGL Ch. 66, S.10

Address to be certified 53 Concord Road Parcel ID 18//086// (Map/Lot)

Owner's Name (PLEASE PRINT) Bilal Kaleem Mohammad

Owner's Mailing Address 53 Concord Rd.

Name of Applicant (PLEASE PRINT) EcoTec, Inc. Telephone: 508-752-9666

102 Grove Street (Mailing Address of Applicant) Worcester (City/Town) MA (State) 01605 (Zip)

Signature of Applicant

Reason for List (check one) ☒Conservation ☐Health ☐Planning ☐Zoning ☐Board of Selectmen

**Please check with the Board/Commission for their guidelines regarding the number of feet required for notification. Each Board/Commission has its own regulations for their abutters listing. There's no fee for certification, however the list/s of abutters must be provided by the person or company requesting certification.

For use by Assessors

This is to certify that at the time of the last assessment for taxation made by the Town of Wayland, the names and addresses are the assessed owners to these parcels.

Certified By: Date: 12-8-2020

CC: ☒Conservation ☐Health ☐Planning ☐ Zoning ☐Board of Selectmen

Abutterrequestform.doc

COMMONWEALTH OF MASS -- M
100 FIRST AVE
CHARLESTOWN NAVY YARD
BOSTON, MA 02129

EAST BEIT OLAM CEMETERY C
189 WELLS AVE
NEWTON, MA 02459

FOGG JEFFREY
FOGG JEANETTE L T/E
57 CONCORD RD
WAYLAND, MA 01778

GOLDNER DAVID R TRUSTEE
HOLIDAY REALTY TRUST
12 HOLIDAY RD
WAYLAND, MA 01778

HARRIS GEORGE H
BARBARA R HARRIS
8 HOLIDAY RD.
WAYLAND, MA 01778

HILLS RUSSELL M JR
HILLS ALEXANDRA T
41 CONCORD RD
WAYLAND, MA 01778

HILLS RUSSELL M JR
ALEXANDRA T HILLS
41 CONCORD RD
WAYLAND, MA 01778

LALA JAMES
DAWSON KATHERINE T/E
63 CONCORD RD
WAYLAND, MA 01778

NOSS ROGER C
WILSON KIM A T/C
63 CLAYPIT HILL RD
WAYLAND, MA 01778

PETTY ROSS D
MCDONALD BEVERLY A
20 HOLIDAY RD
WAYLAND, MA 01778

SECORD ALEXANDRA E
GORDON ZACHARY R
47 CONCORD RD
WAYLAND, MA 01778

SHEPARD MARK
SHEPARD SUZANNE MARIE ESTAT
8 PLAIN ROAD
WAYLAND, MA 01778

~~SHEPARD MARK~~
~~EFFIE G SHEPARD~~
~~8 PLAIN RD~~
~~WAYLAND, MA 01778~~

TOWN OF WAYLAND
PARK & REC
41 COCHITUATE ROAD
WAYLAND, MA 01778

TOWN OF WAYLAND
CONSERVATION COMMISSION
41 COCHITUATE RD
WAYLAND, MA 01778

EcoTec, Inc.
ENVIRONMENTAL CONSULTING SERVICES
102 Grove Street
Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

Riverfront Area Alternatives Analysis
&
Project Narrative

Proposed: Driveway Improvement Project

53 Concord Road
Wayland, MA

The following Alternatives Analysis has been prepared to supplement the Notice of Intent filed on behalf of the applicant under the Town of Wayland Wetland & Water Resources Bylaw and the Massachusetts Wetlands Protection Act (WPA). The proposed project includes the paving of a degraded, gravel driveway within the Riverfront Area and 100-foot Buffer Zone; and the replacement of a damaged equilibrium culvert, and installation of two equilibrium culverts within the Buffer Zone, as requested by the Wayland Conservation Commission.

Site Description
On October 23, 2020, EcoTec, Inc. inspected the above-referenced property for the presence of wetland resources as defined by: (1) the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40; the "Act") and its implementing regulations (310 CMR 10.00 *et seq.*; the "Regulations"); (2) the Town of Wayland Wetland & Water Resources Bylaw and its implementing regulations; and (3) the U.S. Clean Water Act (i.e., Section 404 and 401 wetlands). Scott Jordan, CPESC conducted the inspection.

The subject site consists of the area within the vicinity of a proposed driveway paving project located at 53 Concord Road in Wayland. The upland portions of the site consist of an existing single-family home with associated gravel driveway and maintained lawn. The project site consists of the A-series Bordering Vegetated Wetland (BVW) located along the northerly side of an existing gravel/pea stone driveway and the B-series BVW located along the southern side of the driveway. The Mean Annual High-Water Line of Mill Brook was delineated just off site to the east and a 200-foot Riverfront Area projects onto the eastern portion of the site.

Project Description
The existing gravel driveway on the site contains numerous potholes (see photo 1 below) and a damaged 15-inch corrugated plastic equilibrium culvert which requires replacement (see photo 2 below). The driveway consists of compacted gravel with a pea stone finish and is essentially impervious and may be subject to erosion during rain events and gravel displacement during plowing. The project shall provide for a stable driveway and repair hydrologic conductivity between the wetland areas on each side of the driveway. The proposed culvert replacement and installation shall be performed during a dry period and a silt fence sediment control barrier is proposed along the limit of work. It is estimated that 2+/- square feet of

temporary BVW impact may occur in the vicinity of flags B10 to B11 upon the installation and removal of the silt fence at the southerly end of the culvert replacement area. This BVW area shall be restored upon removal of the silt fence via tamping the excavates within the silt fence trench. The site contains approximately 38,196 square feet of Riverfront Area associated with Mill Brook, located off site to the north. Approximately 4,711 square feet of the proposed driveway paving will occur within the Riverfront Area, including 1,930 square feet of the inner riparian zone and 2,781 square feet of the outer riparian zone. The total existing gravel driveway comprises approximately 8,379 square feet and the proposed paved driveway shall comprise approximately 8,026 square feet, a reduction of 353 square feet. The driveway paving project is exempt from the requirements of the Regulations at 310 CMR 10.02(2)(b)2.q. which states that:

2. The following minor activities, provided that they comply with 310 CMR 10.02(2)(b)1., are not otherwise subject to regulation under M.G.L. c. 131, § 40:

q. The repair or replacement of an existing and lawfully located driveway servicing not more than two dwelling units provided that all work remains within the existing limits of the driveway and all surfaces are permanently stabilized within 14 days of final grade.

Photo 1…Easterly view showing pot-holes in gravel driveway.

Due to the limited upland area on the driveway shoulder, the relatively high ground water elevation on the site, and the lack of elevation relief across the property, there are no feasible options to install a new stormwater BMP that will treat any significant amounts of runoff from the driveway. In lieu of proposing a stormwater BMP, other improvements are proposed, specifically:

- Removal of existing sediment/pea stone from the BVW near flags A-12, A-13 and A-14.
- Removal of existing pea stone and crushed stone from the driveway shoulders (outside of the proposed driveway).

- Installation of additional culverts to increase the hydrologic conductivity and equilibrium between the A-series and B-series BVW, as requested by the Wayland Conservation Commission.

It should be noted that due to site constraints, including the lack of elevation relief across the flat driveway, the proposed culvert replacement shall be of the same size, but consist of a reinforced concrete pipe for additional strength with minimal cover. The project engineer has determined that there is no opportunity to install a larger culvert under the driveway.

Photo 2…Westerly view showing crushed corrugated plastic pipe in driveway.

Alternatives Analysis

The project purpose is to provide a safe and non-erodible driveway surface for the existing compacted gravel and pea stone driveway and to replace a crushed equilibrium culvert.

The proposed project alternative consists of the paving of the driveway which shall provide a safe, stable driveway surface which shall eliminate the potential for erosion and sedimentation within the adjacent BVW and eliminate the displacement of sediment and pea stone during plowing. Additionally, replacement of the damaged culvert is necessary to maintain the hydrologic connection between he northerly and southerly BVW areas.

Upon evaluation, it has been determined that there is no other feasible alternative to the proposed project which would meet the project purpose.

QUINN ENGINEERING, INC.

PO BOX 107
Paxton, Massachusetts 01612
Phone: (508) 753-7999
Fax: (508) 795-0939

January 18, 2021

Wayland Conservation Commission
41 Cochituate Road
Wayland, MA 01778

Re: #53 Concord Road
Stormwater Narrative

To the Commission,

The following narrative is respectfully submitted for the Commission's review as part of the Notice of Intent application for the property located at #53 Concord Road.

The existing driveway serving #53 Concord Road consists of a gravel/pea stone finish and is located between two BVW bodies, designated by the A series and B series flags on the enclosed plan. The existing driveway is assumed to be impervious due to compaction by vehicle traffic. An existing 15 inch corrugated plastic pipe is located below the driveway and links the BVW bodies. The crown of the existing culvert is exposed and is broken and deteriorating. A photo of the existing driveway can be seen in Figure 1 below.

Figure 1. Existing Driveway Photo

The existing stone/gravel driveway surface is unstable and has resulted in several pot holes and portions of the surface material being deposited in/near the BVW. The owners proposed to pave the

existing driveway and replace the existing broken culvert. The proposed paving and culvert replacement will stabilize the existing driveway surface and repair the hydrologic conductivity between the BVW bodies. A summary of the existing and proposed driveway area can be seen in Table 1 below.

#53 CONCORD ROAD	
EXISTING DRIVEWAY ($ft.^2$):	8,379
PROPOSED DRIVEWAY($ft.^2$):	8,026

Table 1. Driveway Area Summary.

The proposed work results in a reduction in driveway area, and since the existing driveway is assumed to be impervious, results in a reduction in impervious area.

Due to the limited upland area on the driveway shoulder, the presence of standing water in the BVW and the lack of elevation relief across the property, there are no feasible options to install a new stormwater BMP that will treat any significant amounts of runoff from the driveway. In lieu of proposing a stormwater BMP, other improvements are proposed, specifically:

- Removal of existing sediment/stone from the BVW near flags A-12, A-13 and A-14.
- Removal of existing pea stone and crushed stone from the driveway shoulders (outside of the proposed driveway area).
- Installation of additional culverts to increase the hydrologic conductivity and equilibrium between the A-series and B-series BVW.

These proposed improvements along with stabilizing the driveway surface and reducing the overall driveway footprint are expected to positively impact the BVW.

The property lies within the Aquifer Protection District. The proposed use is not listed under section 198-1603.2 Prohibited Uses and is not listed under section 198-1603.3 Special Permit uses. Therefore, a special permit is not required.

Please do not hesitate to call if you have any questions or comments.

Sincerely,
QUINN ENGINEERING

Carl Hultgren

Carl Hultgren, PE
Senior Engineer

CC: File

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES
102 Grove Street
Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

January 13, 2021

Bilal Kaleem Mohammad
53 Concord Road
Wayland, MA 01778

RE: Wetland Resource Evaluation, 53 Concord Road, Wayland, Massachusetts

Dear Mr. Mohammad:

On October 23, 2020, EcoTec, Inc. inspected the above-referenced property for the presence of wetland resources as defined by: (1) the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40; the "Act") and its implementing regulations (310 CMR 10.00 *et seq.*; the "Regulations"); (2) the Town of Wayland Wetland & Water Resources Bylaw and its implementing regulations; and (3) the U.S. Clean Water Act (i.e., Section 404 and 401 wetlands). Scott Jordan, CPESC conducted the inspection.

The subject site consists of the area within the vicinity of a proposed driveway paving project located at 53 Concord Road in Wayland. The upland portions of the site consist of an existing single-family home with associated gravel driveway and maintained lawn. The wetland resources observed on the site are described below.

Methodology

The site was inspected, and areas suspected to qualify as wetland resources were identified. The boundary of Bordering Vegetated Wetlands was delineated in the field in accordance with the definition set forth in the regulations at 310 CMR 10.55(2)(c). Section 10.55(2)(c) states that "The boundary of Bordering Vegetated Wetlands is the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist." The methodology used to delineate Bordering Vegetated Wetlands is further described in: (1) the BVW Policy "*BVW: Bordering Vegetated Wetlands Delineation Criteria and Methodology*," issued March 1, 1995; and (2) "*Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act: A Handbook*," produced by the Massachusetts Department of Environmental Protection, dated March 1995. The plant taxonomy used in this report is based on the *National List of Plant Species that Occur in Wetlands: Massachusetts* (Fish and Wildlife Service, U.S. Department of the Interior, 1988). Federal wetlands were presumed to have boundaries conterminous with the delineated Bordering Vegetated Wetlands. One set of DEP Bordering Vegetated Wetland Delineation Field Data Forms completed for observation plots located in the wetlands and uplands near flag A3 is attached. The table below provides the Flag Numbers, Flag Type, and Wetland Types and Locations for the delineated wetland resources.

Flag Numbers	Flag Type	Wetland Types and Locations
Start A1 to A30 Stop	Blue Flags	Boundary of Bordering Vegetated Wetlands located along the eastern and northern portions of the site that is associated with a perennial stream and an intermittent stream.
Start C1 to C13 Stop	Red Flags	Mean Annual High-water Line (MAHWL) of Mill Brook located off site to the east.
Start B1 to B23 Stop	Blue Flags	Boundary of Bordering Vegetated Wetlands located along the southerly portion of the driveway that is associated with an intermittent stream.

Findings

Wetland A (i.e., flags A1 to A6) consists of a wooded/shrub swamp located off site to the north that is associated with a perennial stream (Mill Brook). Plant species observed include red maple (*Acer rubrum*) trees and/or saplings; highbush blueberry (*Vaccinium corymbosum*), and glossy buckthorn (*Rhamnus frangula*) shrubs; and cinnamon fern (*Osmunda cinnamomea*) ground cover. Evidence of wetland hydrology, including hydric soils, saturated soils, and evidence of flooding, was observed within the delineated wetland. This vegetated wetland borders a perennial stream; accordingly, the vegetated wetlands would be regulated as Bordering Vegetated Wetlands and the perennial stream would be regulated as Bank and Land Under Water Bodies and Waterways under the Act and Bylaw. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands under the Act and Bylaw.

Wetland A / B (i.e., flags A6 to A30 and B1 to B23) consists of a wooded/shrub swamp located in the eastern and western portions of the site that is associated with an intermittent stream. Plant species observed include red maple (*Acer rubrum*) and American elm (*Ulmus americana*) trees and/or saplings; highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), arrow-wood (*Viburnum dentatum*), and glossy buckthorn (*Rhamnus frangula*) shrubs; and cinnamon fern (*Osmunda cinnamomea*), and sensitive fern (*Onoclea sensibilis*) ground cover. Evidence of wetland hydrology, including hydric soils, saturated soils, and evidence of flooding, was observed within the delineated wetland. This vegetated wetland borders an intermittent stream; accordingly, the vegetated wetlands would be regulated as Bordering Vegetated Wetlands and the intermittent stream would be regulated as Bank under the Act and Bylaw. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands under the Act and Bylaw.

Bordering Land Subject to Flooding is an area that floods due to a rise in floodwaters from a bordering waterway or water body. Where flood studies have been completed, the boundary of Bordering Land Subject to Flooding is based upon flood profile data prepared by the National Flood Insurance Program. Section 10.57(2)(a)3. states that "The boundary of Bordering Land Subject to Flooding is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm." The project engineer should evaluate the most recent National Flood Insurance Program flood profile data to determine if Bordering Land Subject to Flooding occurs on the site. Bordering Land Subject to Flooding would occur in areas where the 100-year flood elevation is located outside of or upgradient of the delineated Bordering Vegetated Wetlands boundary. Bordering Land Subject to Flooding does not have a Buffer Zone under the Act.

The Massachusetts Rivers Protection Act amended the Act to establish an additional wetland resource area: Riverfront Area. Based upon a review of the current USGS Map (i.e., Framingham Quadrangle, dated 1987, attached), a stream (Mill Brook) that is shown as perennial is located off site to the north.

Streams that are shown as perennial on the current USGS map are designated perennial under the Massachusetts Wetlands Protection Act regulations. Unless this perennial designation is overcome, Riverfront Area is presumed to extend 200 feet horizontally upgradient from the mean annual high-water line of the stream. Section 10.58(2)(a)2. states that the "Mean annual high-water line of a river is the line that is apparent from visible markings or changes in the character of soils or vegetation due to prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. Field indicators of bankfull conditions shall be used to determine the mean annual high-water line. Bankfull field indicators include but are not limited to: changes in slope, changes in vegetation, stain lines, top of pointbars, changes in bank materials, or bank undercuts." Section 10.58(2)(a)2.a. states that "In most rivers, the first observable break in slope is coincident with bankfull conditions and the mean annual high-water line." The mean annual high-water line of the stream was delineated in the field with flags C1 to C13 based upon the above-referenced regulation. Furthermore, based upon a review of the current USGS Map and observations made during the site inspection, and observations made during the site inspection, a stream that is not shown on the USGS Map is located in the northwestern portion of the site. The watershed area for this stream at the site was determined to be 0.19 square miles, which is less than 0.5 square miles (see attached watershed calculations). As such, the stream would be designated intermittent under the Massachusetts Wetlands Protection Act regulations. Accordingly, except as noted above, Riverfront Area would not occur on the site. Riverfront Area does not have a Buffer Zone under the Act, but may overlap other wetland resources and their Buffer Zones.

The Regulations require that no project may be permitted that will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures set forth at 310 CMR 10.59. Based upon a review of the *Massachusetts Natural Heritage Atlas*, 14th edition, Priority Habitats and Estimated Habitats from the NHESP Interactive Viewer, valid from 10/23/2020, and Certified Vernal Pools from MassGIS, there are no Estimated Habitats [for use with the Act and Regulations (310 CMR 10.00 *et seq.*)], Priority Habitats [for use with Massachusetts Endangered Species Act (M.G.L. Ch. 131A; "MESA") and MESA Regulations (321 CMR 10.00 *et seq.*)], or Certified Vernal Pools on or in the immediate vicinity of the site. A copy of this map is attached.

The reader should be aware that the regulatory authority for determining wetland jurisdiction rests with local, state, and federal authorities. A brief description of my experience and qualifications is attached. If you have any questions, please feel free to contact me at any time.

Cordially,
ECOTEC, INC.

Scott Jordan

Scott Jordan, CPESC
Senior Environmental Scientist

Attachments (9 pages)

11/W/WaylandConcordRd53Report

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: 53 Concord Road, Wayland | DEP File #

Section I. Vegetation | Number: TPU @ A3 | Transect # Upland | Date of Delin: 10/23/2020

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	White pine	Pinus strobus	35	41.2	YES	FACU	
	Red maple	Acer rubrum	15	17.6	YES	FAC	*
	Red oak	Quercus rubra	30	35.3	YES	FACU-	
	American elm	Ulmus americana	5	5.9	NO	FACW-	*
Sapling	None						
Shrub	Highbush blueberry	Vaccinium corymbosum	5	11.1	YES	FACW-	*
	Glossy buckthorn	Rhamnus frangula	40	88.9	YES	FAC	*
Ground	None						
Vine	None						

Vegetation Conclusions

Number of dominant wetland indicator plants **3** | Number of dominant non-wetland indicator plants **2**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? Yes

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: 53 Concord Road, Wayland | DEP File #

Section II. Indicators of Hydrology | Number: TPU @ A3 | Transect # Upland | Date of Delin: 10/232020

1. Soil Survey

Is there a published soil survey for this site?

title/date

map number

soil type mapped

hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
Litter	1		
O	1-0		
A	0-5	10YR 3/2	
Bw	5-12+	10YR 4/4	

Remarks stony fine sandy loam

3. Other

Conclusion: Is the soil hydric? No

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☐ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☑	☐
Wetland hydrology present:		
Hydric soil present	☐	☑
Other indicators of hydrology present	☐	☑
Sample Location is in a BVW	☐	☑

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: 53 Concord Road, Wayland | DEP File #

Section I. Vegetation | Number: TPW @ A3 | Transect # Wetland | Date of Delin: 10/23/2020

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	White pine	Pinus strobus	30	33.3	YES	FACU	
	Red maple	Acer rubrum	20	22.2	YES	FAC	*
	Red oak	Quercus rubra	30	33.3	YES	FACU-	
	American elm	Ulmus americana	10	11.1	NO	FACW-	*
Sapling	None						
Shrub	Highbush blueberry	Vaccinium corymbosum	20	22.2	YES	FACW-	*
	Glossy buckthorn	Rhamnus frangula	70	77.8	YES	FAC	*
Ground	Starflower	Trientalis borealis	5	100.0	YES	FAC	*
Vine	None						

Vegetation Conclusions

Number of dominant wetland indicator plants: 4

Number of dominant non-wetland indicator plants: 2

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? Yes

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: 53 Concord Road, Wayland | DEP File #

Section II. Indicators of Hydrology | Number: TPW @ A3 | Transect # Wetland | Date of Delin: 10/232020

1. Soil Survey

Is there a published soil survey for this site?

title/date

map number

soil type mapped

hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
Litter	1		
Oa	0-16+	10YR 2/1	

Remarks Mucky loam

3. Other

Conclusion: Is the soil hydric? Yes

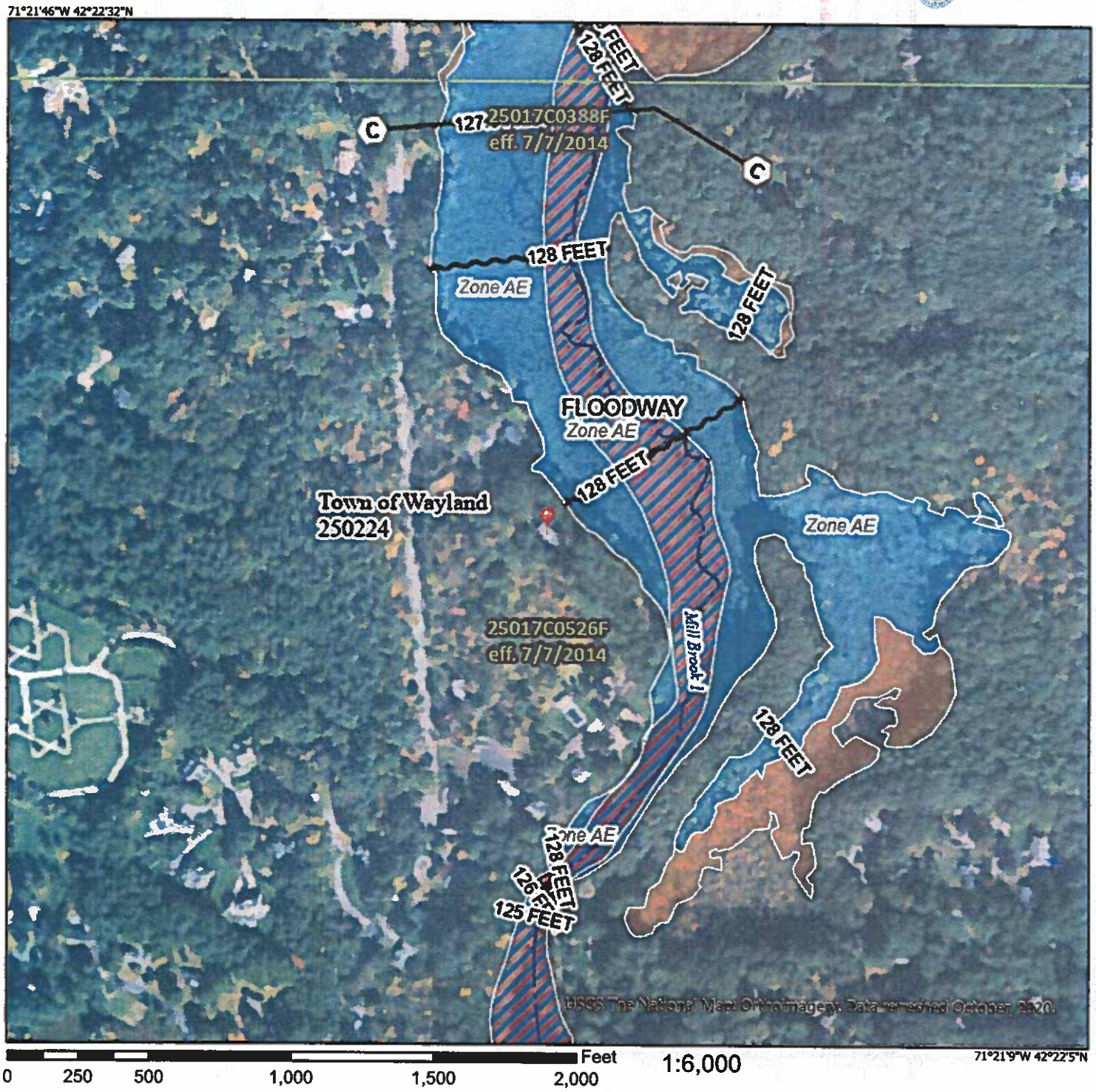
Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☑ Depth to soil saturation in observation hole surface
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☑	☐
Wetland hydrology present:		
Hydric soil present	☑	☐
Other indicators of hydrology present	☑	☐
Sample Location is in a BVW	☑	☐

National Flood Hazard Layer FIRMette



FEMA

Legend

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

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

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

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

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

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

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

N

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

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

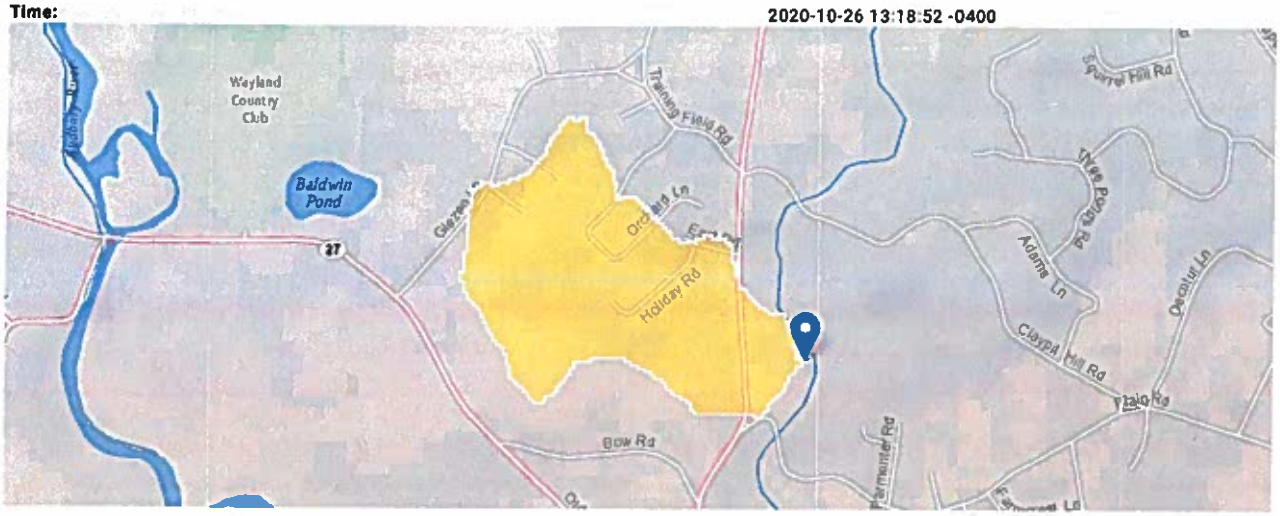
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/26/2020 at 1:27 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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


THE SITE
MAYNARD 8.9 KM.
SUDBURY 3.6 KM.
22' 30"
305
8.3 KM. TO MASS. 2
307
20'
308
Clayp't. Hill Sch
North Cem
Mill Pd
Nob Hill
Radio Towers
Wayland
Gravel Pit
BOSTON
POST
BM 37.2
BM 52.7
South Cem
Pine Brook
AQUEDUCT
Spring
Sandy Butt
GREAT MEADOWS NATIONAL WILDLIFE REFUGE
Heard Pond
Pelham Island
SUDBURY RIVER
GREAT MEADOWS
USGS TOPOGRAPHIC MAP
FRAMINGHAM QUADRANGLE
1:25,000 Scale, Metric, 1987
Reeves Hill
Wayland High Sch
Gravel Pit
Happy Hol Sch
Old Wayland Reservoirs
Pod Meadow
AQUEDUCT
Dudley Pond
Wells
Flake Corner
Cochituate
St Zephyrin's Cem
Fire Sta
Nonesuch Pond
Boat Ramp

StreamStats Report

Region ID:	MA
Workspace ID:	MA20201026172249835000
Clicked Point (Latitude, Longitude):	42.37107, -71.35667
Time:	2020-10-26 13:18:52 -0400



53 Concord Road, Wayland

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.19	square miles
DRFTPERSTR	Area of stratified drift per unit of stream length	-100000	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless
BSLDEM250	Mean basin slope computed from 1:250K DEM	0.208	percent

Flow-Duration Statistics Parameters[Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.19	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	-100000	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	0.208	percent	0.32	24.6

Flow-Duration Statistics Flow Report[Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

Flow-Duration Statistics Citations

Sauer, Vernon B.; Thomas, W. O., Jr.; Stricker, V. A.; Wilson, K. V.,1983, Flood characteristics of urban watersheds in the United States: U.S. Geological Survey Water-Supply Paper 2207, 63 p. (http://pubs.er.usgs.gov/publication/wsp2207)

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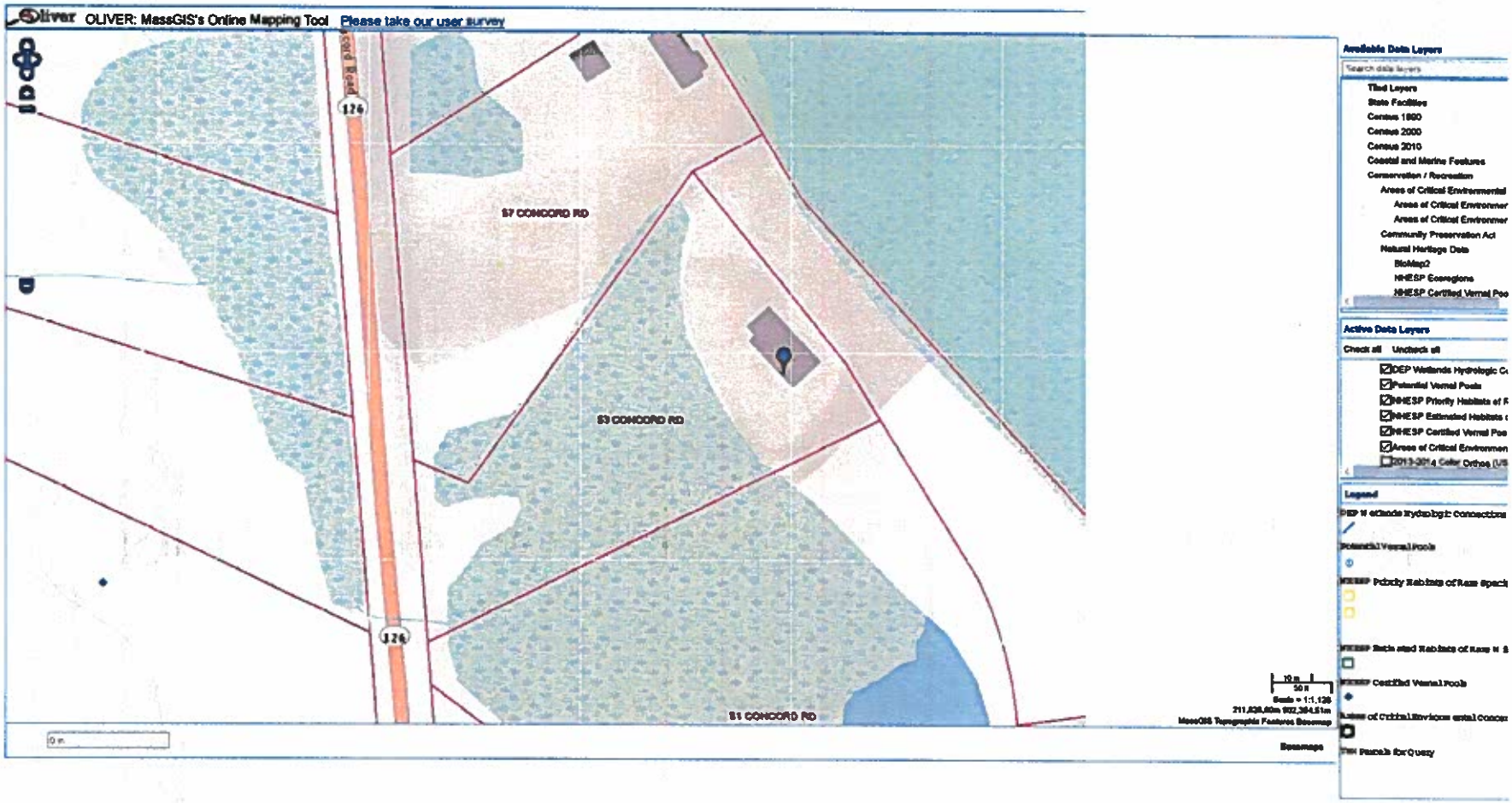
Anderson, B.T.,2020, Magnitude and frequency of floods in Alabama, 2015: U.S. Geological Survey Scientific Investigations Report 2020-5032, 148 p. (https://doi.org/10.3133/sir20205032)

Hedgecock, T.S.,2004, Magnitude and Frequency of Floods on Small Rural Streams in Alabama: U. S. Geological Survey Scientific Investigations Report 2004-5135, 10 p. (http://pubs.usgs.gov/sir/2004/5135/)

Hedgecock, T.S.,2010, Magnitude and Frequency of Floods for Urban Streams in Alabama, 2007: U.S Geological Survey Scientific Investigations Report 2010-5012, 17p. (https://pubs.usgs.gov/sir/2010/5012/)



Natural Heritage Atlas Online Data Viewer Output 10/23/2020

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES
102 Grove Street
Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

Scott Jordan, CPESC
Senior Environmental Scientist

Scott Jordan is an Environmental Scientist with EcoTec, Inc. Since joining EcoTec in 2000, Mr. Jordan's duties have included wetland resource evaluation and delineation; erosion and sediment control planning and monitoring, environmental monitoring, including water quality analysis, sediment analysis and wildlife habitat impact analysis; environmental permitting at local, state, and federal level; pond and stream evaluation; wildlife habitat evaluation, vernal pool evaluation; and wetland restoration and replication design and oversight. He has served as an environmental consultant to the development community, engineering firms, municipalities, and conservation commissions. Prior to joining EcoTec, Mr. Jordan was the Senior Laboratory Technician for GeoComp Corporation where he performed numerous physical properties analysis of soils and geosynthetic materials in accordance with ASTM, and AASHTO specifications. His approximately seven years experience evaluating New England soils includes soil analysis and classification of site-remediated soils with oil and hazardous material contamination. His educational background includes courses in organic and inorganic chemistry, biology, botany and comparative vertebrate physiology, with extensive coursework in ecology and wildlife biology; and he has completed several professional training seminars including erosion and sediment control, soil evaluation, wildlife habitat evaluation, wetland mitigation, vernal pool evaluation, water quality assessment using macro-invertebrates, and river morphology and functions. He has participated in several rare species and wildlife monitoring and inventory projects, including marsh bird surveys, marbled salamander (*Ambystoma opacum*) survey, great laurel (*Rhododendron maximum*) survey, wood turtle (*Glyptemys insculpta*) habitat assessments and sweeps, eastern box turtle (*Terrapene carolina*) habitat assessments, and greater black-backed gull (*Larus marinus*) inventory. His prior research experience includes behavioral and acoustic studies of the common loon (*Gavia immer*) in northwestern Maine.

Education: Bachelor of Science: Biology - Wildlife and Environmental, *Cum Laude*
Framingham State College, 2000
Biotechnology Certificate
Middlesex Community College, 1994

Professional Affiliations:
Certified Professional in Erosion and Sediment Control (Cert. #3644)
Massachusetts Association of Conservation Commissioners
Association of Massachusetts Wetland Scientists
Society of Wetland Scientists
Society of Soil Scientists of Southern New England

CONCORD ROAD

RECEIVED
JAN 21 2021
WAYLAND CONSERVATION COMMISSION

EXISTING CONDITIONS
SCALE: 1"=20'-0"

LOCUS PLAN
SCALE: 1"=800'-0"

MILL BROOK

PROPOSED DRIVEWAY IMPROVEMENT PLAN
IN WAYLAND, MASSACHUSETTS
#53 CONCORD ROAD

SCALE: 1"=20'

OWNER/APPLICANT:
MOHAMMED BILAL KALEEM
NAJIBA AKBAR
53 CONCORD ROAD
WAYLAND, MA 01778

KEVIN J. QUINN CIVIL #53922

NO.	REVISION	DATE

DIG SAFE 1-8-DIAL

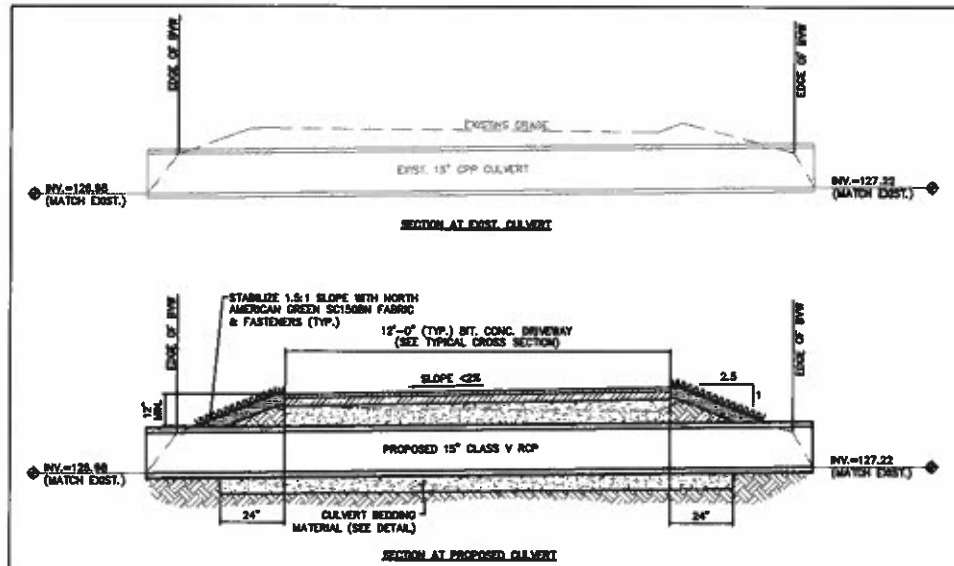
SHEET 1

EXISTING CONDITIONS

DATE: JANUARY 15, 2021

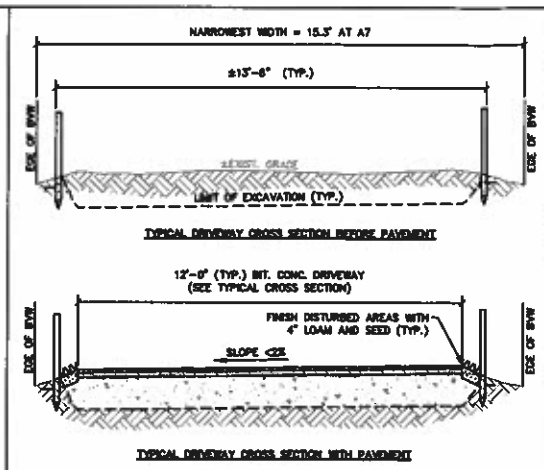
QUINN ENGINEERING, INC.
P.O. Box 107
Paxton, Massachusetts 01612
(508)753-7999 Fax:(508)795-0939

20GCC01



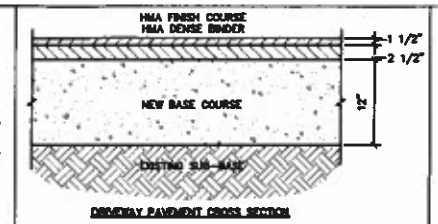
EXIST. & PROPOSED DRIVEWAY CROSS SECTION AT PROP. CULVERT REPLACEMENT

SCALE: 3/8"=1'-0"



PROPOSED TYPICAL DRIVEWAY CROSS SECTIONS

SCALE: 3/8"=1'-0"



NOTES:
1. IMPORTED GRAVEL USED AS BASE MATERIAL SHALL CONFORM TO MA DOT STANDARD SPECIFICATION M1.03.0 TYPE b.
2. GRAVEL BASE SHALL CONSIST OF INERT MATERIAL THAT IS HARD, DURABLE STONE AND COARSE SAND, FREE FROM LOAM AND CLAY, SURFACE COATINGS, AND DELETERIOUS MATERIALS.
3. GRADATION REQUIREMENTS FOR IMPORTED GRAVEL SHALL BE DETERMINED BY AASHTO-T11 AND T27 AND SHALL CONFORM TO THE FOLLOWING:

SIEVE DESIGNATION:	% PASSING:
1/2 IN.	50-85
NO. 4	40-75
NO. 50	8-28
NO. 200	0-10

4. THE MAXIMUM SIZE OF STONE IN GRAVEL SHALL BE 3" LARGEST DIMENSION FOR M1.03.0 TYPE b.
5. ALL PAVEMENT SHALL HAVE A CONTINUOUS LONGITUDINAL SLOPE OR SHALL BE CROSS PITCHED TO ADEQUATELY SHED SURFACE WATER.

TYPICAL NEW BITUMINOUS PAVEMENT CROSS SECTION

SCALE: 1"=1'-0"

SITE NOTES:
1. PROPERTY INFORMATION:
   STREET ADDRESS: #53 CONCORD ROAD
   DEED REF.: BOOK 69985 PAGE 518
   ASSESSORS REF.: 16-086
   ZONING DISTRICT: R40
   AQUIFER PROTECTION DISTRICT
   USE: SINGLE FAMILY
2. A PORTION OF THE SITE LIES WITHIN A MAPPED ZONE II GROUNDWATER SUPPLY PROTECTION AREA SHOWN ON THE TOWN OF WAYLAND WATER RESOURCES MAP, TOWN OF WAYLAND WATER RESOURCE PROTECTION DISTRICTS AND MAPPED BY MA DEP.
3. THE SITE DOES NOT LIE WITHIN A MAPPED ESTIMATED HABITAT OF RARE WILDLIFE OR PRIORITY HABITAT OF RARE SPECIES.
4. THE SITE DOES NOT LIE WITHIN A FLOOD HAZARD ZONE AE AS DEPICTED ON FEMA FIRM MAP FM25017C0528F.
5. WETLAND RESOURCE AREAS WERE DELINEATED BY SCOTT JORDAN OF EDOTEC, INC. ON OCTOBER 23, 2020.
6. EXISTING CONDITIONS WERE PROVIDED BY JARVIS LAND SURVEY, INC. UNLESS OTHERWISE NOTED AS APPROXIMATE OR WITH *.
7. EXISTING UTILITIES HAVE BEEN DEPICTED IN A GENERAL MANNER AND ARE NOT WARRANTED AS ACCURATE.
8. THE EXISTING LEACHING AREA, RESERVE AREA AND COMPONENTS HAVE BEEN DEPICTED APPROXIMATELY BASED ON RECORDS OBTAINED FROM THE WAYLAND BOARD OF HEALTH.
9. A STORMWATER MANAGEMENT AND LAND DISTURBANCE PERMIT IS NOT REQUIRED UNDER SECTION 193-4.8.(5) BECAUSE THE PROJECT IS WHOLLY WITHIN THE JURISDICTION OF THE WAYLAND CONSERVATION COMMISSION AND REQUIRES AND ORDER OF CONDITIONS.
10. AQUIFER PROTECTION DISTRICT INFO.

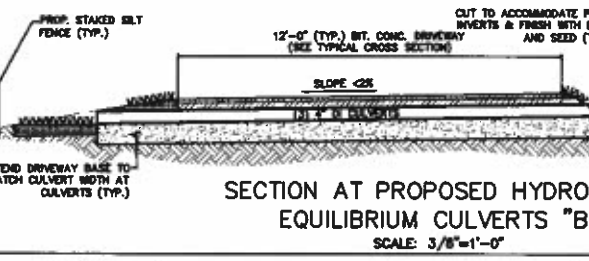
THE PROPOSED USE IS NOT LISTED UNDER SECTION 198-1803.2 PROHIBITED USES AND IS NOT LISTED UNDER SECTION 198-1803.3 SPECIAL PERMIT USES. THEREFORE, A SPECIAL PERMIT IS NOTE REQUIRED.

EXISTING UPLAND AREA: ±32,351 S.F.
THE EXISTING GRAVEL DRIVEWAY IS ASSUMED TO BE IMPERVIOUS.

EXIST. IMPERVIOUS AREA: ±8,379 S.F. (±25.6% OF UPLAND AREA) (±10.0% OF THE LOT)

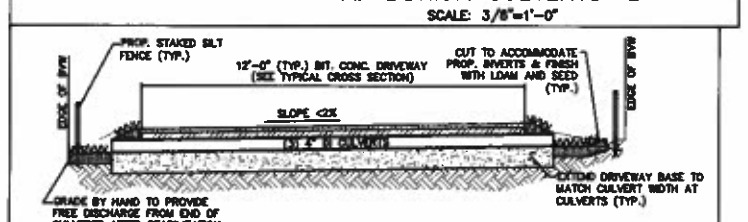
PROPOSED IMPERVIOUS AREA: ±8,028 S.F. (±24.8% OF UPLAND AREA) (±10.5% OF THE LOT)

SITE PLAN APPROVAL IS NOT REQUIRED UNDER SECTION 198-1804.2



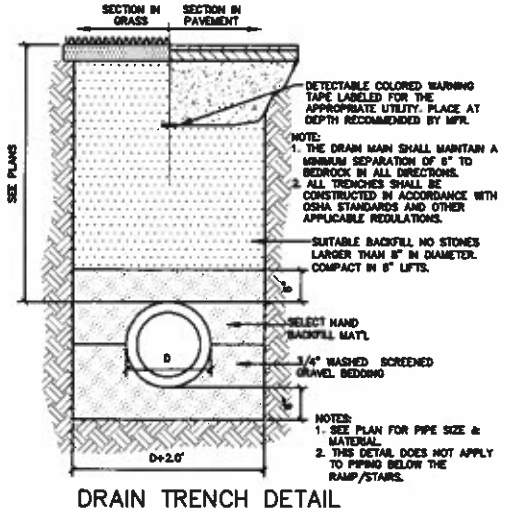
SECTION AT PROPOSED HYDROLOGIC EQUILIBRIUM CULVERTS "B"

SCALE: 3/8"=1'-0"



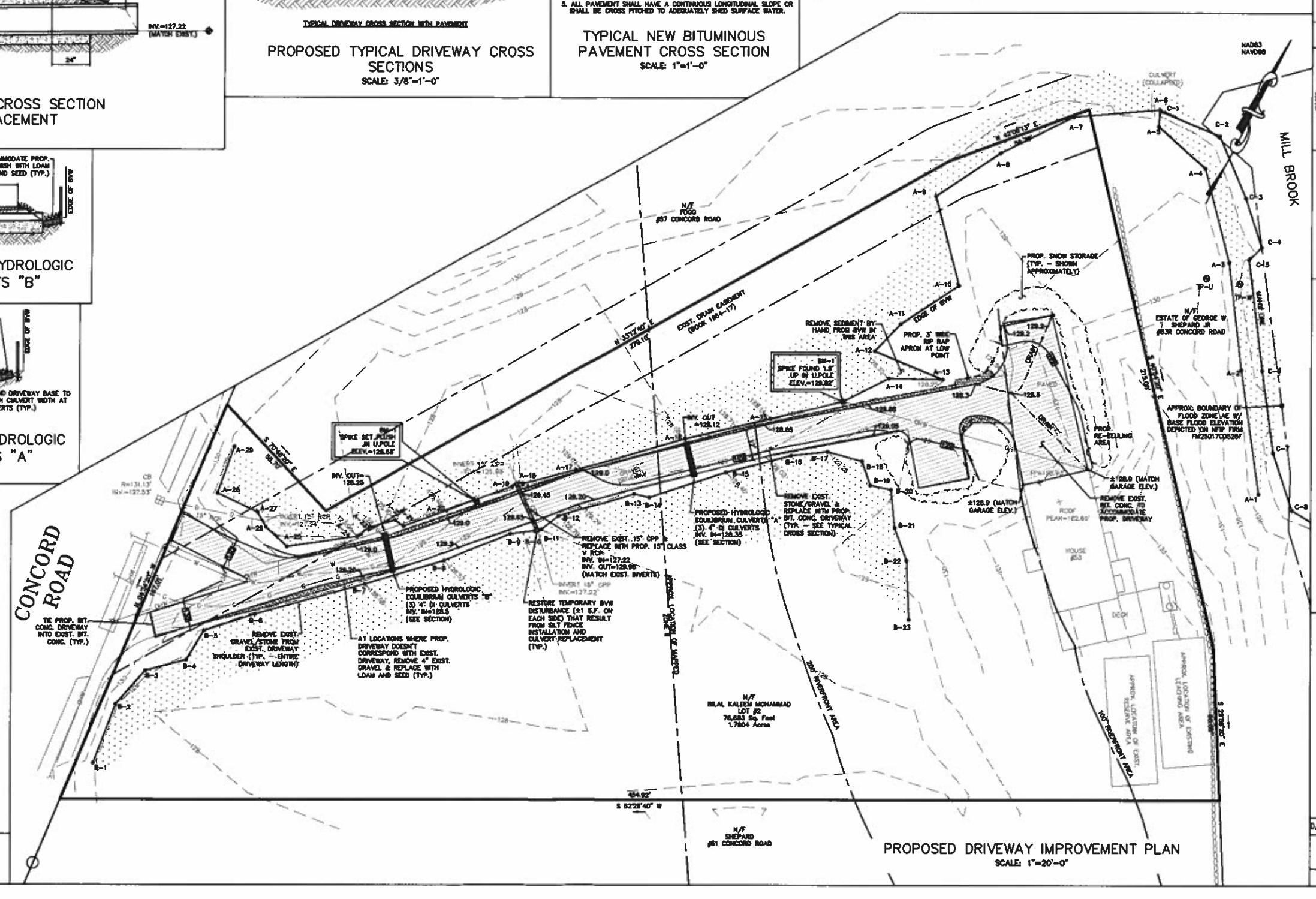
SECTION AT PROPOSED HYDROLOGIC EQUILIBRIUM CULVERTS "A"

SCALE: 3/8"=1'-0"



DRAIN TRENCH DETAIL

SCALE: 3/4"=1'-0"



PROPOSED DRIVEWAY IMPROVEMENT PLAN

SCALE: 1"=20'-0"

DIG SAFE DIAL-811

NO.	REVISION	DATE

PROPOSED DRIVEWAY IMPROVEMENT PLAN IN WAYLAND, MASSACHUSETTS

#53 CONCORD ROAD

SCALE: 1"=20'

OWNER/APPLICANT:
MOHAMMED BILAL KALEEM
#53 CONCORD ROAD
WAYLAND, MA 01778

QUINN ENGINEERING, INC.
P.O. Box 107
Paxton, Massachusetts 01612
(508)753-7999 Fax:(508)795-0939

DATE: JANUARY 15, 2021

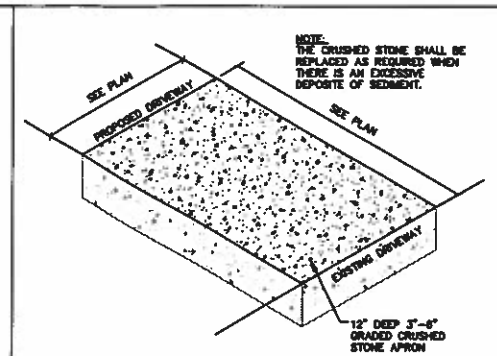
PROP. DRIVEWAY IMPROVEMENT PLAN & DETAILS

SHEET 2

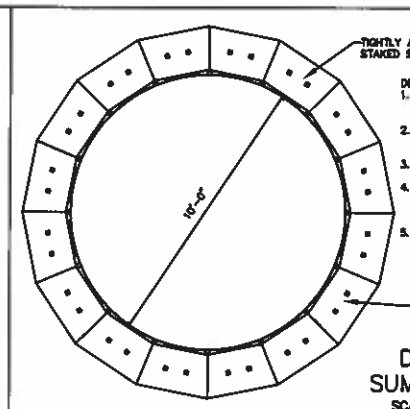
20CC01

GENERAL NOTES

1. SEVENTY TWO HOURS PRIOR TO COMMENCING ANY EXCAVATION, THE CONTRACTOR SHALL NOTIFY DIG AT (811). THE CONTRACTOR SHALL COORDINATE INSTALLATION OF NEW UTILITIES WITH THE VICINITY OF EXISTING UTILITIES UNDERGROUND (AND OVERHEAD) WITH THE APPROPRIATE UTILITY PROVIDER/DIGSAFE/PRIVATE LOCATING SERVICE.
2. THE CONTRACTOR SHALL:
   A. BE RESPONSIBLE TO COORDINATE HIS WORK WITH MUNICIPALITY TO LIMIT THE POTENTIAL DISRUPTIONS TO THE THE GENERAL PUBLIC.
   B. EMPLOY DUE CARE AND CAUTION TO PROTECT THE PUBLIC FROM DANGERS ASSOCIATED WITH THE OPERATION.
   C. INSTALL TEMPORARY FENCES, BARRICADES AND SIGNAGE TO ENSURE THAT NO PERSONS ENTER THE WORK AREA.
   D. CONTRACTOR SHALL COORDINATE POLICE DETAILS AS REQUIRED FOR WORK TO BE CONDUCTED IN THE STREET.
   E. EMPLOY DUE CARE WHEN WORKING AROUND PEDESTRIAN AND VEHICLE TRAFFIC.
3. THE CONTRACTOR SHALL RECORD AND PROVIDE THE OWNER WITH AS-BUILT LOCATIONS OF ALL UTILITIES INSTALLED AS PART OF HIS/HER WORK, INCLUDING UTILITIES NOT INDICATED ON PLAN (I.E. GAS, CABLE TV, TELEPHONE, ELECTRIC, ETC.).
4. CONTRACTOR SHALL CONTROL AIRBORNE DUST WITH USE OF SPRAYED WATER AS REQUIRED TO MINIMIZE IMPACT ON NEIGHBORING PROPERTIES. USE OF CALCIUM CHLORIDE OR OTHER CHEMICALS IS NOT PERMITTED.
5. CONTRACTOR SHALL RETAIN A LICENSED SURVEYOR TO LAY OUT THE SITE CONSTRUCTION, WHO SHALL CERTIFY THAT ALL LOCATIONS ARE AS PER PLAN.
6. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT THE PROPOSED CONSTRUCTION ACTIVITIES DO NOT DAMAGE OR UNDERMINE EXISTING SLOPES, BUILDINGS, WALLS, STRUCTURES, ETC. IN THE AREA AROUND THE CONSTRUCTION. REPAIR OF EXISTING SLOPES, BUILDINGS, WALLS, STRUCTURES, ETC. THAT ARE DAMAGED OR UNDERMINED BY THE CONTRACTORS WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. EXISTING UTILITY LOCATIONS ARE APPROXIMATE ARE TO BE FIELD VERIFIED. QUINN ENGINEERING, INC. DOES NOT WARRANT THAT ALL EXISTING UTILITIES HAVE BEEN INDICATED. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE EXISTING UTILITY LOCATIONS AND ENSURING THAT THE PROPOSED WORK DOES NOT CONFLICT WITH THE EXISTING UTILITIES NOT SHOWN.
8. THE CONTRACTOR SHALL REMOVE ALL TOPSOIL, SUBSOIL, AND UNSUITABLE MATERIAL PRIOR TO PLACING ANY FILL ON SITE. WHERE GRAVEL IS CALLED FOR ON-SITE, CONTRACTOR MAY UTILIZE ON-SITE MATERIALS IF APPROVED BY THE OWNER.
9. ALL REQUIRED PERMITS SHALL BE SECURED PRIOR TO COMMENCING WORK. PRIOR TO COMMENCING ANY WORK ON SITE, THE CONTRACTOR SHALL NOTIFY THE MUNICIPAL CONSERVATION COMMISSION.
10. ALL WORK SHALL CONFORM TO THE MUNICIPAL ZONING BY-LAW, CONSERVATION COMMISSION LOCAL BY-LAW OR OTHER REGULATIONS AS APPLICABLE. ALL REQUIREMENTS OF THE WORCESTER PLANNING BOARD AND CONSERVATION COMMISSION ORDER OF CONDITIONS ARE HEREBY MADE CONDITIONS OF THIS WORK.
11. ALL AREAS DISTURBED BY THE PROPOSED WORK SHALL BE STABILIZED PER THE CONSTRUCTION DRAWING AND SPECIFICATIONS. IF NOT SPECIFIED, THE CONTRACTOR SHALL PLACE A MINIMUM OF 4" LOAM AND GRASS SEED.
12. ALL SLOPES INDICATED ON PLAN AS STEEPER THAN 3:1 SHALL BE STABILIZED WITH NORTH AMERICAN GREEN S150 EROSION CONTROL BLANKET. BLANKET SHALL BE INSTALLED PER THE MANUFACTURER'S SPECIFICATION UNLESS OTHERWISE SPECIFIED ON PLAN.
13. THE GROUND IMMEDIATELY ADJACENT TO FOUNDATIONS SHALL BE SLOPED AWAY FROM THE BUILDING, IN ACCORDANCE WITH THE MA STATE BUILDING CODE.
14. SUITABLE FILL SHALL CONSIST OF MATERIAL SOIL FREE OF ORGANIC MATERIALS, LOAM, AND ANY DELETERIOUS MATERIALS. SUITABLE FILL SHALL NOT CONTAIN STONES LARGER THAN 10" IN ANY DIMENSION, AND SHALL HAVE LESS THAN 75% PASSING THE NO. 4 SIEVE AND A MAXIMUM OF 20% PASSING THE NO. 200 SIEVE. SUITABLE FILL SHALL NOT CONTAIN ANY BUILDING RUBBLE, GRANITE, OR CONCRETE BLOCK, ROOFING MATERIALS, OR OTHER CONSTRUCTION REFUSE. AT THE TIME OF PLACEMENT SUITABLE FILL SHALL NOT CONTAIN FROST, SNOW, OR ICE AND SHALL NOT CONTAIN WATER GREATER THAN THE OPTIMAL MOISTURE CONTENT.
15. ANY CONDITIONS RENDERED BY THE PLANNING BOARD, CONSERVATION COMMISSION, OR ZONING BOARD OF APPEALS IN THE APPROVAL PROCESS ARE HEARBY MADE PART OF THIS WORK.

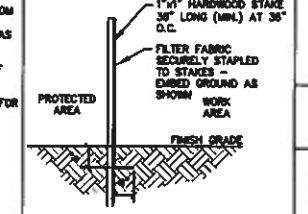


CRUSHED STONE CONSTRUCTION ENTRNACE DETAIL
SCALE: NOT TO SCALE



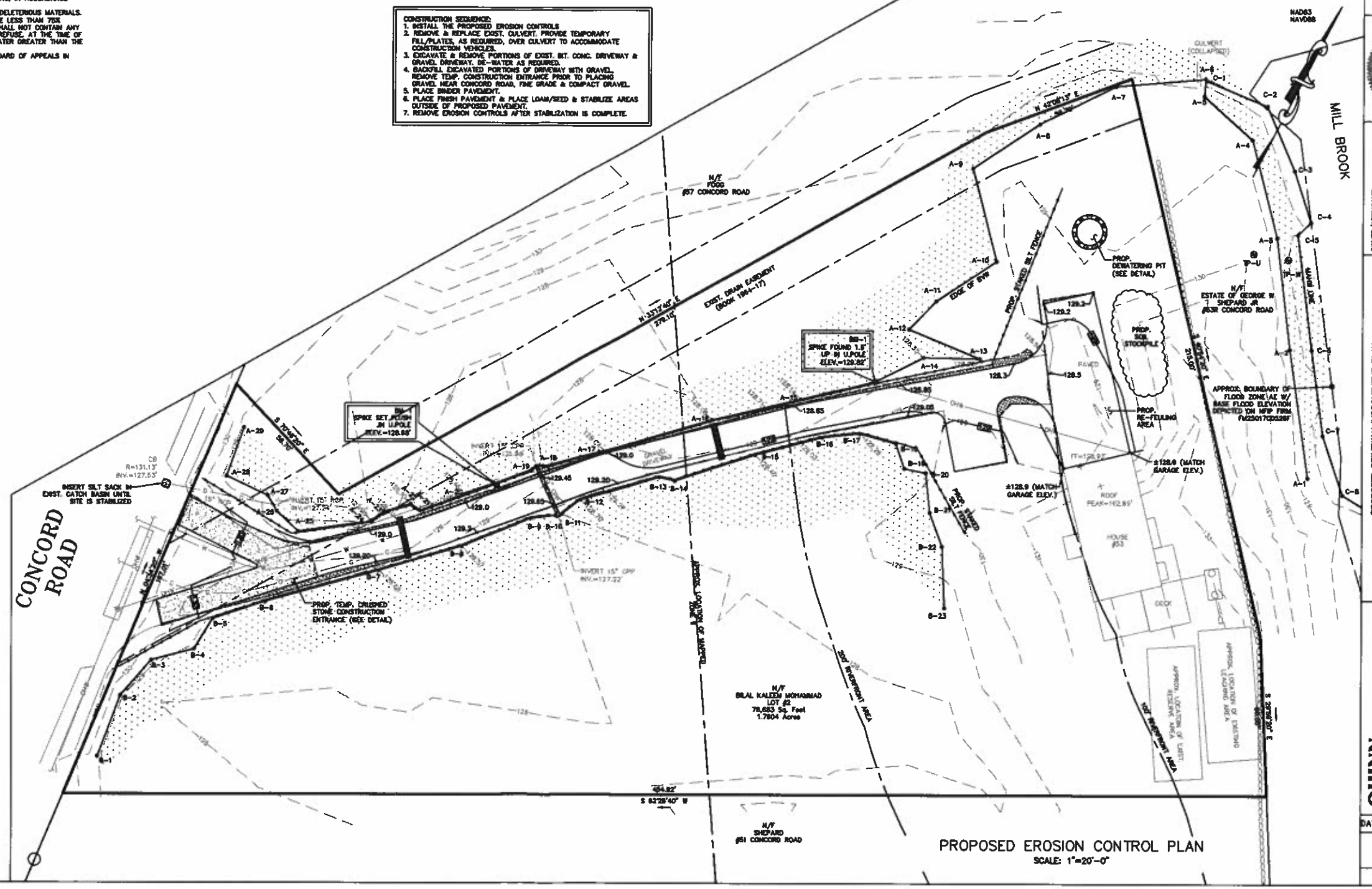
DEWATERING DISCHARGE NOTES:
1. DO NOT ALLOW DISCHARGE FLOATING SOLIDS OR FOAM FROM THE SUMP/PIT.
2. USE VEGETATED, UPLAND AREAS OF THE SITE TO INFILTRATE OUTFLOW.
3. DISCHARGE WITHIN 30 FEET OF THE BVW IS PROHIBITED.
4. AT DISCHARGE LOCATIONS, PROVIDE ADDITIONAL RIP RAP FOR VELOCITY DISSIPATION IF NEDESSARY.
5. REMOVE SEDIMENT WHEN SEDIMENT DEPTH IS 1/2 THE HEIGHT OF THE HAY BALES.

DEWATERING SUMP PIT DETAIL
SCALE: NOT TO SCALE



SILT FENCE DETAIL
SCALE: 1"=3/4'-0"

CONSTRUCTION SEQUENCE:
1. INSTALL THE PROPOSED EROSION CONTROLS
2. REMOVE & REPLACE EXIST. CULVERT. PROVIDE TEMPORARY FILL/PLATES, AS REQUIRED, OVER CULVERT TO ACCOMMODATE CONSTRUCTION VEHICLES.
3. EXCAVATE & REMOVE PORTIONS OF EXIST. BIT. CONC. DRIVEWAY & GRAVEL DRIVEWAY, DE-WATER AS REQUIRED.
4. BACKFILL EXCAVATED PORTIONS OF DRIVEWAY WITH GRAVEL. REMOVE TEMP. CONSTRUCTION ENTRANCE PRIOR TO PLACING GRAVEL NEAR CONCORD ROAD, FINE GRADE & COMPACT GRAVEL.
5. PLACE BINDER PAVEMENT.
6. PLACE FINISH PAVEMENT & PLACE LOAM/SEED & STABILIZE AREAS OUTSIDE OF PROPOSED PAVEMENT.
7. REMOVE EROSION CONTROLS AFTER STABILIZATION IS COMPLETE.



PROPOSED EROSION CONTROL PLAN
SCALE: 1"=20'-0"

DIG SAFE DIAL-811

NO.	REVISION	DATE

OWNER/APPLICANT:
MOHAMMED BILAL KALEEM
53 CONCORD ROAD
WAYLAND, MA 01778

PROPOSED DRIVEWAY IMPROVEMENT PLAN
IN WAYLAND, MASSACHUSETTS
#53 CONCORD ROAD

SCALE: 1"=20'

QUINN ENGINEERING, INC.
P.O. Box 107
Paxton, Massachusetts 01612
(508)753-7999 Fax:(508)795-0939

DATE: JANUARY 15, 2021

PROP. EROSION CONTROL PLAN & DETAILS

SHEET 3

2000C01

M.E.S.S.
McIntyre Engineering & Septic Services, Inc.
30 Elm Street Hopkinton, MA 01748
508-497-2374

Linda Hansen
Wayland Conservation Commission
41 Cochituate Road
Wayland, MA 01778

January 16, 2021

Subject: Septic System Replacement
16 Linn Lane

Dear Ms. Hansen:

Attached please find a Request for Determination (RDA) being filed on behalf of the owners of 16 Linn Lane. The RDA is for construction to replace an existing failed septic system.

The following information is included for your use:

WPA Form 1
Chapter 194 Application
Chapter 194 Application Fee ($100)
Narrative
Locus Map
List of Abutters
Septic Design Plan dated January 14, 2021

The existing system has failed a Title 5 inspection and will be replaced in essentially the same location. All work is in previously disturbed buffer zone.

Should you have any questions, do not hesitate to contact me at (508) 497-2374.

Sincerely,

Daniel McIntyre

Daniel McIntyre, P.E.

cc: Robert McInturff, Owner
MA DEP Northeast Region
Wayland Board of Health

RECEIVED
JAN 22 2021
WAYLAND CONSERVATION COMMISSION

M.E.S.S.
McIntyre Engineering & Septic Services, Inc.
30 Elm Street Hopkinton, MA 01748
508-497-2374

Darren MacCaughey, R.S., Agent
Wayland Board of Health
41 Cochituate Road
Wayland, MA 01778

January 16, 2020

Dear Mr. MacCaughey:

Enclosed please find the following information for a proposed system replacement at 16 Linn Lane, submitted on behalf of the homeowner.

- Permit Application
- Application Fee ($100 + $50 variance fee)
- Local Upgrade Request Form 9A
- Variance Request Form
- Septic System Design Plan (4 copies)
- Design Calculations with Soils Report

The following variance to the Wayland Board of Health regulations and Title 5 Local Upgrade Waivers are requested for the replacement of a failed system.

Wayland Variance Request

Section II D. 1. Wetland offset to be 75 feet (59' provided). Meets Title 5.

Rationale: A setback of 59 feet is the maximum practical offset provided due to the shape of the lot, topography along the front property line and location of street drainage. The existing system has similar setbacks but the new system is an improvement in that the full 5 foot groundwater offset is maintained.

Title 5 Local Upgrade Waivers

15.405 (1)(f) Reduce 50 foot offset to subsurface drain that intercepts groundwater. (31 feet provided).

Rationale: The available space suitable for the leach area is limited to the front yard due to the wetlands and location of house on the lot. No reduction in groundwater separation is required.

15.405 (1)(i) Use of sieve test in lieu of percolation test.

Rationale: Depth of fill and high groundwater conditions prevented a percolation test in the native "C" soil. Sieve test performed per DEP Policy BRP/DWM/PeP-P00-1.

Should you have any questions, do not hesitate to contact me at (508) 497-2374.

Sincerely,

Daniel McIntyre

Daniel McIntyre, P.E.

cc: Robert McInturff, homeowner
Wayland Conservation Commission

Wayland Wetlands and Water Resources Bylaw, Chapter 194 Application

1. **Applicant:** Robert McInturff — mcihome16@gmail.com
   Name (PLEASE PRINT) — Email Address (if applicable)
   16 Linn Lane Wayland, MA 01778
   Mailing Address — City/Town — State — Zip Code
   508-651-2583
   Phone Number — Fax Number (if applicable)

2. **Representative:** McIntyre Engineering — Daniel McIntyre
   Firm/Business Name — Contact Name
   30 Elm Street Hopkinton, MA 01748
   Mailing Address — City/Town — State — Zip Code
   508-497-2374 messcorp@aol.com
   Phone Number — Fax Number (if applicable)

3. **Property Owner(s)**
   Same
   Property Owner (PLEASE PRINT) — Email Address (if applicable)
   Address — City/Town — State — Zip Code
   Phone Number — Fax Number (if applicable)

4. **Type of Application**

   [x] Request for a Determination of Applicability (RDA)
   [ ] Abbreviated NOI
   [ ] Notice of Resource Area Delineation
   [ ] After the Fact Amendment (AFA)
   [ ] Amendment to Order of Conditions
   [ ] Notice of Intent (NOI)
   [ ] Extension of O.O.C.
   [ ] Certificate of Compliance
   [ ] After the Fact Filing (AFF)

5. **Project** 16 Linn Lane — 49 — 17
   Location Address — Assessors Map(s) — Parcel(s)

   Project Description (PLEASE PRINT): Replace failed septic system

6. **Title/Date of Plan(s)** Septic System Design Plan - 16 Linn Lane dated January 14, 2021

7. **Bylaw Application Fee:** $ 100 — check # 4000

8. **Application filed pursuant to MGL Chapter 131, Section 40** [x] Yes [ ] No

9. **Signature of Applicant** — Date 1/21/2021

   Signature of Property Owner — Date 1/21/2021

(NOTE: This application shall be signed by the property owner as well as the applicant. Signature of the property owner on this application shall be deemed permission granted to the Conservation Commission and their agents to go upon the subject property.)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Wayland
City/Town

WPA Form 1- Request for Determination of Applicability

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

A. General Information

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

1. Applicant:

Robert McInturff — Name
mcihome16@gmail.com — E-Mail Address
16 Linn Lane — Mailing Address
Wayland — City/Town
MA — State
01778 — Zip Code
508-651-2583 — Phone Number
Fax Number (if applicable)

2. Representative (if any):

McIntyre Engineering & Septic Service, Inc. — Firm
Daniel McIntyre — Contact Name
messcorp@aol.com — E-Mail Address
30 Elm Street — Mailing Address
Hopkinton — City/Town
MA — State
01748 — Zip Code
508-497-2374 — Phone Number
Fax Number (if applicable)

B. Determinations

1. I request the Wayland (Conservation Commission) make the following determination(s). Check any that apply:

☒ a. whether the **area** depicted on plan(s) and/or map(s) referenced below is an area subject to jurisdiction of the Wetlands Protection Act.

☐ b. whether the **boundaries** of resource area(s) depicted on plan(s) and/or map(s) referenced below are accurately delineated.

☒ c. whether the **work** depicted on plan(s) referenced below is subject to the Wetlands Protection Act.

☒ d. whether the area and/or work depicted on plan(s) referenced below is subject to the jurisdiction of any **municipal wetlands ordinance** or **bylaw** of:

Wayland
Name of Municipality

☐ e. whether the following **scope of alternatives** is adequate for work in the Riverfront Area as depicted on referenced plan(s).

C. Project Description

1. a. Project Location (use maps and plans to identify the location of the area subject to this request):

16 Linn Lane	Wayland
Street Address	City/Town
49	17
Assessors Map/Plat Number	Parcel/Lot Number

b. Area Description (use additional paper, if necessary):

Site is a 1.05 acre lot with a single family home constructed in circa 1968. Wetlands were delineated by Williams & Sparages in December of 2020. The 100 foot buffer zone covers all of the lot and is mostly disturbed. The house is served by a septic system located in the front yard.

c. Plan and/or Map Reference(s):

Septic System Design Plan	1-14-2021
Title	Date
Title	Date
Title	Date

2. a. Work Description (use additional paper and/or provide plan(s) of work, if necessary):

The existing system will be rep[laced in the same location in an effort to maximize offset to wetlands. The system will be in the 50 to 100 foot buffer area which is currently lawn. One tree is proposed to be removed.

All of the work will occur within previously disturbed buffer zone. The disturbed areas are currently mowed lawn. All disturbed areas will be restored to match existing conditions and no grade changes are required.

C. Project Description (cont.)

b. Identify provisions of the Wetlands Protection Act or regulations which may exempt the applicant from having to file a Notice of Intent for all or part of the described work (use additional paper, if necessary).

3. a. If this application is a Request for Determination of Scope of Alternatives for work in the Riverfront Area, indicate the one classification below that best describes the project.

- ☐ Single family house on a lot recorded on or before 8/1/96
- ☐ Single family house on a lot recorded after 8/1/96
- ☐ Expansion of an existing structure on a lot recorded after 8/1/96
- ☐ Project, other than a single family house or public project, where the applicant owned the lot before 8/7/96
- ☐ New agriculture or aquaculture project
- ☐ Public project where funds were appropriated prior to 8/7/96
- ☐ Project on a lot shown on an approved, definitive subdivision plan where there is a recorded deed restriction limiting total alteration of the Riverfront Area for the entire subdivision
- ☐ Residential subdivision; institutional, industrial, or commercial project
- ☐ Municipal project
- ☐ District, county, state, or federal government project
- ☐ Project required to evaluate off-site alternatives in more than one municipality in an Environmental Impact Report under MEPA or in an alternatives analysis pursuant to an application for a 404 permit from the U.S. Army Corps of Engineers or 401 Water Quality Certification from the Department of Environmental Protection.

b. Provide evidence (e.g., record of date subdivision lot was recorded) supporting the classification above (use additional paper and/or attach appropriate documents, if necessary.)

D. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Request for Determination of Applicability and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge.

I further certify that the property owner, if different from the applicant, and the appropriate DEP Regional Office were sent a complete copy of this Request (including all appropriate documentation) simultaneously with the submittal of this Request to the Conservation Commission.

Failure by the applicant to send copies in a timely manner may result in dismissal of the Request for Determination of Applicability.

Name and address of the property owner:

Robert McInturff
Name

16 Linn Lane
Mailing Address

Wayland
City/Town

MA
State

01778
Zip Code

Signatures:

I also understand that notification of this Request will be placed in a local newspaper at my expense in accordance with Section 10.05(3)(b)(1) of the Wetlands Protection Act regulations.

R E McInturff
Signature of Applicant

1/13/2021
Date

Daniel Melby
Signature of Representative (if any)

1-13-2021
Date

16 LINN LANE WAYLAND, MA
REQUEST FOR DETERMINATION

PROJECT NARRATIVE

1.0 Introduction

This Request for Determination of Applicability (RDA) for a replacement of a septic system at a residential property is being filed on behalf of the property owner, Robert McInturff, pursuant to Massachusetts Wetlands Protection Act (MWPA, M.G.L. Chapter 131, and Section 40) and the Town of Wayland Wetlands Protection Bylaw. The work is within the 100 foot buffer of a bordering vegetated wetland (BVW).

2.0 Existing Conditions

2.1 Existing Conditions

The site contains approximately 1.05 acres located at 16 Linn Lane and was developed as a single family house, driveway and lawn in circa 1968. The failed septic system is located in the front yard and is within the 100 foot buffer zone of the wetlands.

2.2 Resource Areas

A Bordering Vegetated Wetland (BVW) was identified within 100 feet of the proposed work. These resource areas were delineated by Williams & Sparages in December 2020. There are no Outstanding Resource Waters or estimated wildlife habitat within the work area.

3.0 Project Work Description

The proposed work consists of replacing a failed septic system as shown on the plan entitled Septic System Design Plan dated January 14, 2021.

Due to location of the house on the lot, shape of the lot and wetland locations, the available area for a septic system is limited. Replacing the system in the same location will maximize offset to wetlands and minimize buffer zone impacts. One tree is proposed to be removed to eliminate root infiltration into the system.

All of the work will occur within previously disturbed buffer zone. The disturbed areas are currently mowed lawn and will be restored to match existing conditions.

4.0 Potential Impacts and Mitigation Measures

4.1 Potential Impacts

All potential impacts of the work are related to soil disturbance from the septic system construction.

4.2 Mitigation and Minimization Measures

Erosion and sedimentation control measures, as shown on the project plans, will be placed in specific areas to trap potential sediments from leaving the work area.

5.0 Conclusions

It is believed that the proposed work can be accomplished within the interests of the Wetlands Protection Act and Ashland Wetlands Bylaw based on the following.

- All works areas are previously disturbed.
- The septic system meets the Title 5 required setbacks to the wetlands.
- Erosion control barriers will be used to trap sediment during construction.
- The new septic system will replace an existing failed septic and will have an increased offset to seasonal high groundwater.
- No increase in impervious area.

ATTACHMENTS

Septic System Design Plan dated January 14, 2021

16 Linn Lane

Wayland, MA

1 inch = 100 Feet

0 100 200 300

January 17, 2021

Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.

100 foot Abutters List Report

Wayland, MA
January 16, 2021

Subject Property:

Parcel Number:	49-017	Mailing Address:	MCINTURFF ROBERT E MCINTURFF JOAN S 16 LINN LN WAYLAND, MA 01778
CAMA Number:	49-017		
Property Address:	16 LINN LN		

Abutters:

Parcel Number:	49-016	Mailing Address:	ODONNELL NICHOLAS M & AMY B TRUSTEES NICHOLAS M ODONNELL TRUST 10 LINN LN WAYLAND, MA 01778
CAMA Number:	49-016		
Property Address:	10 LINN LN		
Parcel Number:	49-018	Mailing Address:	DRETLER THOMAS D CORRIE M DRETLER 15 LINN LN WAYLAND, MA 01778
CAMA Number:	49-018		
Property Address:	15 LINN LN		
Parcel Number:	49-019	Mailing Address:	ADELMAN, STACEY R 9 LINN LN WAYLAND, MA 01778
CAMA Number:	49-019		
Property Address:	9 LINN LN		
Parcel Number:	49-028	Mailing Address:	KEENAN EDWARD C JR KEENAN KARIN T/E 22 CLUBHOUSE LN WAYLAND, MA 01778
CAMA Number:	49-028		
Property Address:	22 CLUBHOUSE LN		
Parcel Number:	49-029	Mailing Address:	BORTMAN ALAN 28 CLUBHOUSE LANE WAYLAND, MA 01778
CAMA Number:	49-029		
Property Address:	28 CLUBHOUSE LN		
Parcel Number:	49-030	Mailing Address:	VOLNOVA YELENA T/E VOLNOVA VYACHESLAV 32 CLUBHOUSE LN WAYLAND, MA 01778
CAMA Number:	49-030		
Property Address:	32 CLUBHOUSE LN		
Parcel Number:	49-031	Mailing Address:	DIMOV SERGEY DIMOV TATYANA T/E 34 CLUBHOUSE LN WAYLAND, MA 01778
CAMA Number:	49-031		
Property Address:	34 CLUBHOUSE LN		
Parcel Number:	49-032	Mailing Address:	MACINTOSH DAVID W &CHRISTINE E TRUSTEE CHRISTINE E MACINTOSH REVOCABLE TRUST 38 CLUBHOUSE LN WAYLAND, MA 01778
CAMA Number:	49-032		
Property Address:	38 CLUBHOUSE LN		
Parcel Number:	49-034	Mailing Address:	BARRIS CHRIS E BARRIS VASILIA T/E 54 CLUBHOUSE LN WAYLAND, MA 01778
CAMA Number:	49-034		
Property Address:	54 CLUBHOUSE LN		

100 foot Abutters List Report

Wayland, MA
January 16, 2021

Parcel Number:	49-035	Mailing Address:	KAYE JAMES S & MERYL 58 CLUBHOUSE LN WAYLAND, MA 01778
CAMA Number:	49-035		
Property Address:	58 CLUBHOUSE LN		
Parcel Number:	49-036	Mailing Address:	TERRANOVA ANTHONY P TERRANOVA MARY S 60 CLUBHOUSE LN WAYLAND, MA 01778
CAMA Number:	49-036		
Property Address:	60 CLUBHOUSE LN		
Parcel Number:	94-001	Mailing Address:	COMMONWEALTH OF MASS -- MWRA 100 FIRST AVE CHARLESTOWN NAVY YARD BOSTON, MA 02129
CAMA Number:	94-001		
Property Address:	ACROSS TOWN		

DEEP HOLE NO. 1 LOG
ELEVATION 99.5

Date: December 4, 2020
Evaluator: Daniel McIntyre, P.E.
Witness: D. MacCaughey, BOH Agent

Depth from Surface (inches)	Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Modifiers	Consistence	General Description
0 - 48"	AC	HTM				Topsoil on fill
48" - 72"	A	Silt Loam	10YR 4/1		Friable	Buried A layer
72" - 120"	C	Sand	2.5Y 5/2		Loose	Coarse sand
No Refusal						
Collapsing						

Seasonal High Water: 72" — Observed Mottles: None — Redoximorphic Features: None — Restrictive Layer: None — Depth: 72" — Material: Coarse sand — Percolation Rate: N/A (USGS well) — Depth: 120" — Elevation: 93.5

Notes: Sample taken at 90"for sieve test for perc rate

DEEP HOLE NO. 2 LOG
ELEVATION 100.0

Date: December 4, 2020
Evaluator: Daniel McIntyre, P.E.
Witness: D. MacCaughey, BOH Agent

Depth from Surface (inches)	Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Modifiers	Consistence	General Description
0 - 4"	AC	HTM				Imported topsoil
4" - 100"	C	HTM/Sand (1)	2.5Y 5/2		Friable	Coarse sand
No Refusal	(1) Could not make distinction between strata change between imported fill and native 'C' layer					
Collapsing						

Groundwater Mottles: 80" — Depth: 80" — Redoximorphic Features: None — Restrictive Layer: None — Depth: 80" — Material: Coarse sand — Percolation Rate: N/A (USGS Well) — Depth: 93.5

Notes: Sample taken at 80"for sieve test for sand re-use

DEEP HOLE NO. 3 LOG
ELEVATION 95.5

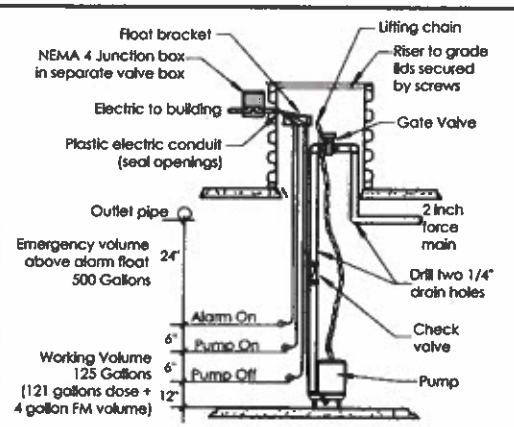
Date: December 4, 2020
Evaluator: Daniel McIntyre, P.E.
Witness: D. MacCaughey, BOH Agent

Depth from Surface (inches)	Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Modifiers	Consistence	General Description
0 - 30"	AC	HTM		24"		Disturbed/fill
30" -80"	C	Sand	2.5Y 5/2	10YR 5/8	Loose	Coarse grained

Standing Water: None — Observed Mottles: 24" — Depth: 93.5
Seepage: None — Redoximorphic Features: N/A — Material: USGS Well
Perched: None — Perc Rate Evaluation: 24" — Elevation: 93.5

Notes: Test pit adjacent to wetlands

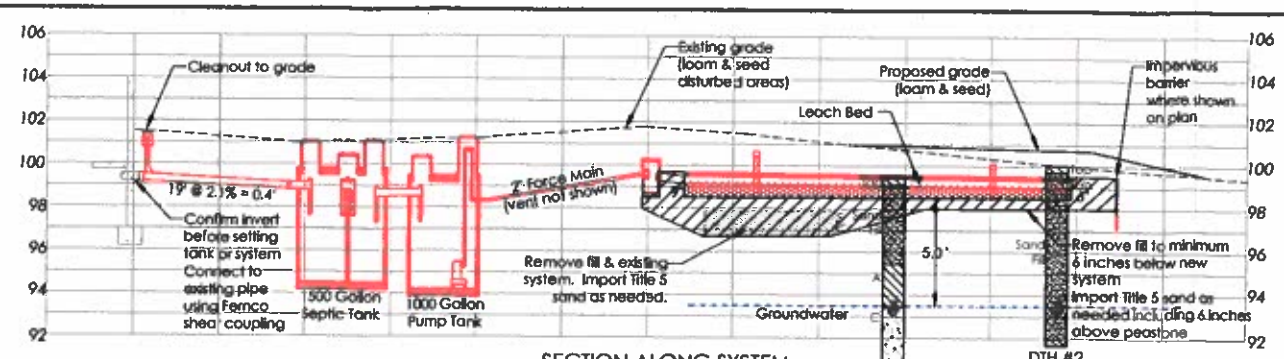
EROSION CONTROL DETAIL
NO SCALE



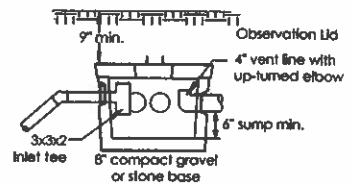
PUMP NOTES

1. Pump system shall be a complete package consisting of a submersible pump and motor, level switch controls, high water alarm, control panel with operation counter and any other equipment required for a safe operation.
2. Equipment to be installed per Manufacturer's specifications and in conformance with the Massachusetts Electric Code.
3. Pump system to be hard wired to buildings main electrical panel. High level alarm to be equipped with a visual light indicator and audible alarm with silencer switch. Alarm to be powered from separate circuit breaker than pump motor.

1000 GALLON PUMP CHAMBER
NO SCALE

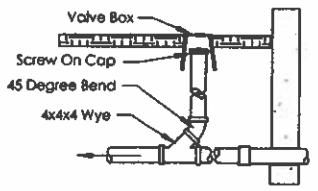


SECTION ALONG SYSTEM
HORZ. 1" = 10'
VERT. 1" = 4'

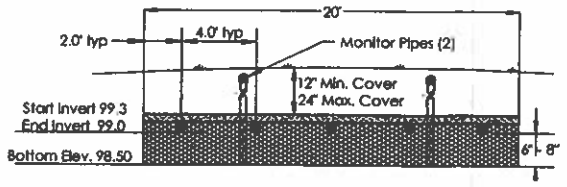


1. Box to be H-20 rated with inspection lid.
2. Force main to have inlet tee (3" x 3" x 2")
3. Vent to have inverted elbow to prevent flowback.
4. All openings to be sealed with hydraulic cement.

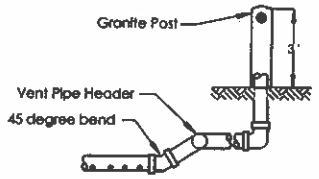
D-BOX SECTION
NO SCALE



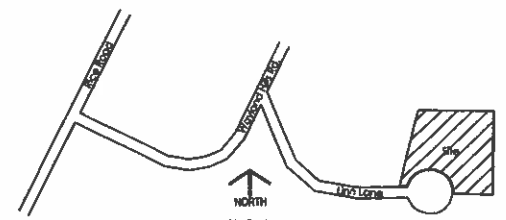
CLEANOUT DETAIL
NO SCALE



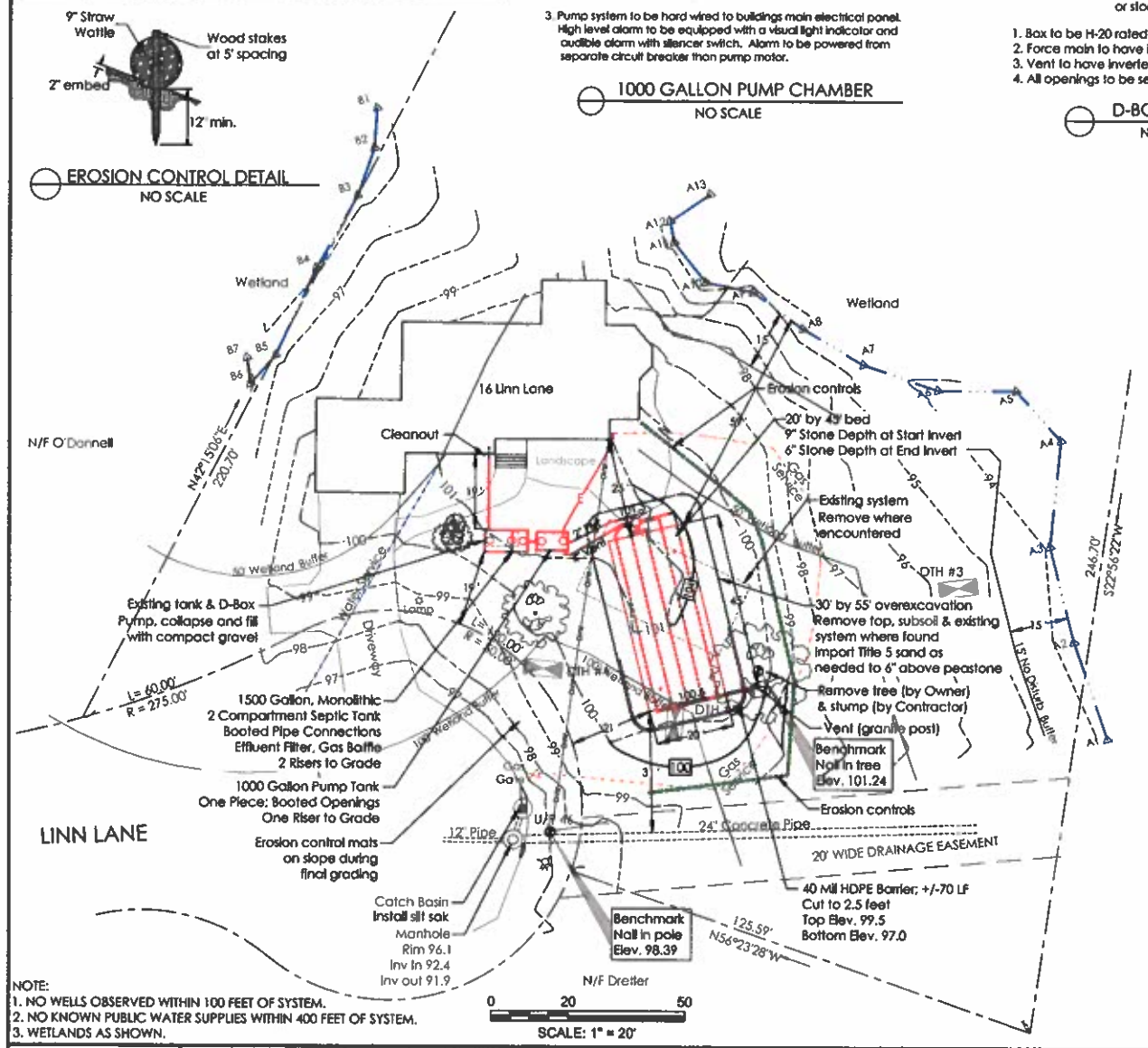
BED SECTION
NO SCALE



SYSTEM VENT DETAIL
NO SCALE



LOCUS MAP



NOTE:
1. NO WELLS OBSERVED WITHIN 100 FEET OF SYSTEM.
2. NO KNOWN PUBLIC WATER SUPPLIES WITHIN 400 FEET OF SYSTEM.
3. WETLANDS AS SHOWN.

MATERIAL SPECIFICATIONS

Sewer Pipe	4 inch solid P.V.C. Schedule 40
Distribution Pipe	4 inch Perforated P.V.C. Schedule 40
Force Main	SDR 21 PVC
Base Aggregate	¾" to 1½" Double Washed Stone per Title 5 Section 15.247 (1)
Filter Aggregate	1/8" to 1/2" Double Washed Stone per Title 5 Section15.247 (2)
Septic Tank	Precast concrete, 1500 gallon, 2 compartment, monolithic tank, with rubber booted connections (Shea M-1500-2C or equal)
Pump Tank	Precast concrete 1000 gallon monolithic tank with rubber booted connections (Shea M-1000 or equal)
Distribution Box	Precast concrete, H-20 rated Cover to have inspection lid
Tank Risers	24 inch diameter H.D.P.E. covers screwed onto 24 inch diameter corrugated H.D.P.E. pipe. Risers to be watertight to tank.
Outlet Tee Filter	Zabel Model A1800
Outlet Tee Baffle	"Tuf-Tite" Model "G8-1"
Septic Sand	Clean Coarse Sandy Gravel per Title 5

Sieve No.	% Passing
No. 4	100%
No. 50	10% - 100%
No. 100	0% - 20%
No. 200	0% - 5%

Pump System	Single Pump System and Controls by Myers or equal
Manufacturer	Myers
Model	SRM-4
Rated Capacity	56 GPM
Total Dynamic Head	11 Feet
Impervious barrier	40 mil HDPE
Erosion Blanket	DS 75 by North American Green Photodegradable straw blanket
Vent	Granite Post

CONSTRUCTION SPECIFICATIONS

1. Leaching area shall be flagged from start of construction until certificate of compliance is issued. Parking of vehicles/equipment and stockpiling materials over leach area is prohibited.
2. Sewer pipe at foundation to be verified by Contractor prior to setting any tanks. If any discrepancies, contact Engineer. Piping to be set to ensure a minimum 2% pipe slope (¼ inch drop per foot of pipe).
3. Existing septic tank to be pumped and filled.
4. Leach system construction procedures:
   - Remove topsoil, subsoil and existing system to 5 feet around new system. Existing sand may remain if not contaminated but must be removed to a minimum of 6 inches below bottom of system. Replace with Title 5 sand as required to top of peastone.
   - Excavate 20 foot by 45 foot bed. Rake and level bottom.
   - Install ¾" – 1½" double washed base aggregate up to bottom of 4 inch perforated pipe.
   - Install perforated pipe along length of bed and cover to top with ¾" – 1½" double washed base aggregate.
   - Install two observation pipes in bed. Wrap with magnetic marking tape. Pipes to have screw on caps and buried 4 to 6 inches below final grade.
   - Cover bed with 2 inch layer of double washed filter pea stone. Cover bed with a minimum of 6 inches of sand before final grading with ordinary fill and 4 to 6 inches of screened topsoil. Cover over top of system to be at least 12 inches but no more than 24 inches. System to be backfilled without driving heavy equipment over leach area.
   - Seed to establish grass in all disturbed areas.
5. Tank and distribution box to be set on a minimum 8 inch layer of compact gravel or stone to prevent settlement.
6. Tanks to be backfilled to minimize settlement. Settled areas to be restored by Contractor.
7. Solid piping to be set in compacted sand bedding. All joints to be glued.
8. Pipe penetrations in tanks (unless specified to have rubber boot connections) and distribution box, including un-used knockouts, shall be sealed with hydraulic cement and made watertight.
9. Install magnetic marking tape over piping and all system components (tank, piping, D-box and leach system).

INSPECTIONS & AS-BUILT PLANS

1. The following inspections shall be done by the design engineer and Board of Health. The Board of Health may require additional inspections. No system component to be concealed without inspection.
   A. Bottom of over-excavation prior to placing any Title 5 sand backfill.
   B. Leaching system, piping, septic tank, pump operation and d-box prior to covering.
   C. Final grading.
2. Contractor and engineer to sign construction certification.
3. Design Engineer to sign certification and prepare and submit as-built plan.

CAPACITY:

Facility Use:	Residential
No. of Bedrooms:	4 (Assessor's record)
No. of Rooms:	10
Garbage Grinder:	Yes (not recommended)
Flow Title 5:	110 GPD x 4 = 440 GPD
Flow Wayland:	165 GPD x 4 = 660 GPD

SOIL TESTING:

USDA Type:	Sand
Title 5 Class:	I
Perc #'s:	N/A (high groundwater)

LTAR = 0.74 GPD/SF per DEP sieve test policy dated May 3, 2006

SOIL ABSORPTION DESIGN CRITERIA

Soil Classification:	I
LTAR per Title 5:	0.74 gpd/sq. ft.
Leaching Area Req'd.:	892 Square Feet (440 GPD x 1.5)/0.74
Town Minimum Area:	900 Square Feet
Garbage Grinder:	Yes
Groundwater Offset:	5 feet (Title 5)

SOIL ABSORPTION AREA DESCRIPTION

Use stone and pipe in a bed design.

SOIL ABSORPTION AREA SIZING:

Bed Width:	20.0 feet
Bed Length:	45.0 feet
Leaching Area:	900 SF

Area provided = 900 SF = 900 SF required -O.K.-

GROUNDWATER

DTH No.	Surface Grade	Hole Depth	Refusal	Weeps	Mottles	Estimated Seasonal High Groundwater
1	El. 99.5	120"	None	72"	None	El. 93.5 (weeps)
2	El. 100.0	100"	None	80"	None	El. 93.4 (weeps)
3	El. 95.5	80"	None	24"	24"	El. 93.5 (mottles)

Use level of weeps as seasonal high groundwater based on no evidence of redox above weeps and USGS Wayland well being above normal during testing period

Bed	E.S.H.G	System Bottom	E.S.H.G. Offset	Breakout (top peastone)	Finish Grade	System Cover
1	El. 93.5	El. 98.5	5.0'	El. 99.5 - 99.8	El. 100.6 to 101.3	1.5' to 1.8'

SEPTIC TANK SIZING

Use 1500 gallon: 2 compartment tank

First Compart.: 200% of Design Flow 1000 gallons provided > 880 gallons

Second Compart.: 100% of Design Flow 500 gallons provided > 440 gallons

NITROGEN LOADING LIMITATIONS

Lot is served by town water and is not in a Nitrogen Sensitive Area.

LOCAL UPGRADE WAIVER REQUESTS (TITLE 5)

15.405 (1)(f) Drain separation reduced from 50' to 31'
15.405 (1)(i) Use of sieve test in lieu of perc test

TOWN VARIANCE REQUESTS

Section II D. 1. - 75 foot offset to wetlands (59 feet provided)

SPECIAL REQUIREMENTS

None

GENERAL NOTES:

1. All construction to conform to Title 5 of the State Environmental Code and local Board of Health Regulations.
2. The system installer shall be licensed by the Town and obtain all permits (trench, plumbing, electrical) as necessary prior to construction.
3. Installer shall verify existing conditions and immediately report any discrepancies to the Engineer. No change in plan elevations, locations or materials shall be done without approval of the Engineer and Board of Health Agent.
4. Prior to any excavation, Contractor to notify utility companies by calling Dig-Safe at 1-888-344-7233. Certain utilities such as municipal water suppliers are not part of Dig-Safe and must be notified by the Contractor separately. Underground utilities shown on the plan are approximate only.
5. Soil quantity estimates are approximate and can vary depending on site conditions and size and/or depth of existing system being removed.

REFERENCE NOTES:

1. Property lines and topography by Tauper Land Survey dated January 2021. This septic design plan not to be relied on to stake property lines.
2. Wetlands delineated by Williams & Sparages.
3. Soil testing by Daniel McIntyre, P.E., (SE #1562) dated December 4, 2020.

Call DIGSAFE, 1-888-344-7233, for location and marking of all utilities prior to any excavation. Private utilities may require additional marking and investigation.

LEGEND
- Existing Grades
- Proposed Grades
- Deep Hole Test Pit
- Perc Tests
- 100.0 Finish Spot Grade
- Overexcavation
- Trees
- Stone Wall

AS-BUILT TIES

	④	⑫
TANK INLET		
TANK OUTLET		
PUMP		
D- BOX		
OBS. PIPE 1		
OBS. PIPE 2		

AS-BUILT	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5
BOTTOM STONE					
INVERT END					
INVERT START					
D-BOX OUTLET					
D-BOX INLET					
PUMP OUT					
PUMP IN					
SEPTIC TANK OUT					
SEPTIC TANK IN					
FOUNDATION					

DESIGN INV.	Bed
BOTTOM STONE	98.50
INVERT END	99.00
INVERT START	99.30
D-BOX OUTLET	99.53
D-BOX INLET	99.70
PUMP OUT	98.25
PUMP IN	98.50
SEPTIC TANK OUT	98.55
SEPTIC TANK IN	98.80
FOUNDATION	99.24+/-

2' @ 2.5% = 0.05'

19' @ 2.1% = 0.4'
Confirm invert before setting tank

ADVICE TO OCCUPANTS

1. System is designed for domestic sanitary sewage only.
2. An annual inspection of the septic tank by a qualified service provider is recommended.
3. Septic tank has 2 compartments which both need pumping.
4. The septic tank is equipped with an outlet tee filter that requires regular cleaning by a qualified septic tank pumper.
5. System is equipped with and effluent pump and alarm. If alarm sounds or lights up, system should be inspected immediately by a qualified septic contractor.
6. The leaching system is NOT sized for a garbage grinder and it's installation and use is prohibited.
7. Washing machine must discharge to septic system.
8. No trees should be planted over or near the septic system.
9. If water softener installed, it cannot discharge to system.

I certify that on July 27, 1995, I passed the examination approved by the Department of Environmental Protection and that the above analysis was performed by me consistent with the training, expertise and experience described in 310 CMR 15.017.

Daniel McIntyre SE #1562

REV	DATE	DESCRIPTION

COMMONWEALTH OF MASSACHUSETTS — DANIEL MCINTYRE, P.E. No. 53854 CIVIL — REGISTERED PROFESSIONAL ENGINEER

1-14-2021

TITLE: SEPTIC SYSTEM DESIGN PLAN

PROJECT: 16 LINN LANE
Applicant
MCINTURFF

TOWN WAYLAND, MA | MAP 49 | BLOCK 0 | LOT 17
SCALE 1" = 20'
DATE 1/14/2021
SHEET 1 of 1

MCINTYRE ENGINEERING & SEPTIC SERVICES, INC.
30 Elm Street
Hopkinton, Massachusetts 01748
508-497-2374

Letter of Transmittal

GPR

Goldsmith, Prest & Ringwall, Inc.
Civil Engineering ◦ Land Surveying ◦ Land Planning

39 Main Street, Suite 301, Ayer, MA 01432
T (978) 772-1590
F (978) 772-1591

info@gpr-inc.com
www.gpr-inc.com

To: Wayland Conservation Commission
41 Cochituate Road
Wayland, MA 01778-2614

Attention: Linda Hanson, Conservation Administrator

Date: January 29, 2021
Job No: 171053
Subject: Five Paths SMLDP Application
Shaw Drive Assessors Map 39 Parcel 15A

We Are Sending You: X Attached — Under separate cover

Via hand — mail — FEDEX — AM — PM

The Following Items:

COPIES	DATE	AMT	DESCRIPTION	SIZE	FOR
1			**SMLDP $100.00 Application Fee Check (#1721)**		
1	Jan. 2021		ORIGINAL SMLDP Checklist & Application Forms		
2	Jan. 2021		SMLDP Application Packets (Narrative, Waiver Request, PB Decision)		
1	Jan. 2021		Five Paths (DRAFT) Stormwater Pollution Prevention Plan (SWPPP)		
1	July 2020		Five Paths Long Term Pollution Prevention & Stormwater System Operation and Maintenance Plan (O&M Plan)-REVISION #1		
1	July 2020		Five Paths Stormwater Management Report-REVISION #1		
1	Jan. 2021		Five Paths SMLDP Tree Removal Plan (1 Sheet attached to Endorsed Set)	24" x 36"	
1	Nov. 2021		Five Paths Definitive Subdivision ENDORSED PLAN SET (13 sheets)	24" x 36"	
2	Jan. 2021		Five Paths SMLDP Tree Removal Plan (1 Sheet attached to Endorsed Set)	11" x 17"	
2	Nov. 2021		Five Paths Definitive Subdivision ENDORSED PLAN SET (13 sheets)	11" x 17"	

Disposition:

X For approval	For bids due
For your use	Approved as noted
For review and comment	Returned after loan to us
Please contact me if questions	Returned as requested
I will contact you	As requested

Remarks: Please find attached a complete SMLDP Application for Chapter 193 to be on the 2/10/2021 Conservation Commission Agenda.

Electronic PDF of all materials listed above (other than the fee check) are being transmitted directly to Lhansen@wayland.ma.us, rbrown@wayland.ma.us and conservation@wayland.ma.us on 1/29/2021.

Please let me know if you have any questions.

Thank you.

Signed: Kyle Burchard, P.E.

Copy To: file

Stormwater Management Land Disturbance Permit (SMLDP) Application

Five Paths
Tax Map 39, Parcel 15A
Wayland, MA

January 2021

Submitted to:
Wayland Conservation Commission
41 Cochituate Road
Wayland, MA 01778

Submitted by:
Ross C. Wilkinson, Personal Representative,
Estate of Paula D. Wilkinson
P.O. Box 98
Wilton, NH 03086

Prepared by:
Goldsmith, Prest & Ringwall, Inc.
39 Main Street, Suite 301
Ayer, MA 01432

Project No:
171053

GPR Engineering Solutions for Land & Structures

SMLDP Application Contents

Title

SMLDP Checklist

SMLDP Application

Agent Authorization Letter

SMLDP Application Narrative & Waiver Request
SMLDP Open Space Offering to SMLDP Vicinity Map

Planning Board Decision Letter

Attachments

"Residential Subdivision - SMLDP Tree Removal Plan"
Dated January 2021.

"Residential Subdivision - Definitive Plan - Five Paths Tax Map #39, Parcel 15A"
prepared for Ross C. Wilkinson Personal Representative, Estate of Paula D. Wilkinson.
Dated July 2019. Last revised November 4, 2020.

Stormwater Management Report, Dated July 2019. Last revised July 14, 2020.

TOWN OF WAYLAND
41 COCHITUATE ROAD

WAYLAND, MASSACHUSETTS 01778

CHAPTER 193 APPLICATION
Stormwater Management and Land Disturbance Bylaw Checklist

Submittal Requirements:

The applicant shall file eight copies of the completed application package to the Conservation Commission for a Stormwater Management and Land Disturbance Permit. The application package shall include:

☒ Application form with original signatures of all owners and representatives.

Two copies of the completed application form

Two copies of 11x17 size site plans

One copy of a full size site plan.

All documents emailed to lhansen@wayland.ma.us

☒Number and size (dbh) of proposed trees to be removed. Replanting will be based on Replacement Tree and Shrub Schedule. (See Waiver Request)

☒Locus map showing location of the property.

☒Any and all applications fees ($100 transmittal fee)

☒Stormwater Management and Land Disturbance Plan (per the Massachusetts Stormwater Management Regulations and Massachusetts Stormwater Management handbook as applicable for the scope of the project.)

☒Supporting Stormwater Management Report and engineering calculations (per the Massachusetts Stormwater Management Regulations and Massachusetts Stormwater Management handbook as applicable for the scope of the project.) The report must contain a narrative describing the project and how the project will comply with the Wayland Stormwater Management and Land Disturbance Bylaw. List any requested waivers and the reasons the standards cannot be met.

☒Stormwater Pollution Preventative Plan (SWPPP) if coverage is required under the U.S. EPA Construction General Permit, Multi-Sector Permit or an individual permit under the NPDES Phase II requirements.

☒Long-term Pollution Prevention Plan

☒Erosion and Sediment Control Plan

☒Stormwater System Operation and Maintenance Plan

The property owner, as well as the applicant and/or representative (if different from owner) must sign this checklist and all other applicable applications. The property owner, by signing this checklist and the applications, acknowledges that the Commission and Staff may enter the property to inspect the premises as part of the assessment of the application.

Signature of Property Owner

1-5-21

Date

I certify under penalty of law that this document and all its attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature of Applicant

Date

TOWN OF WAYLAND
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

CHAPTER 193 APPLICATION
Stormwater Management and Land Disturbance Bylaw

A. General Information

1. Project Location

ASSESSORS MAP 39 PARCEL 15A — a. Street Address
WAYLAND — b. City/Town
01778 — c. Zip code
15A — d. Parcel/ Lot Number

2. Applicant:

ROSS C. — a. First Name
WILKINSON — b. Last Name
P.O. BOX 98 — c. Street Address
WILTON — e. State
NEW HAMPSHIRE — f. Zip Code
03068 — d. City
415-334-5460 — g. Work/ Cell Phone #
r_wilkinson@sbcglobal.net — h. Email Address

3. Property Owner (required if different from applicant):

FLOYD, PAULA & ROSS — a. First Name
WILKINSON — b. Last Name
P.O. BOX 98 — c. Street Address
WILTON — e. State
NEW HAMPSHIRE — f. Zip Code
03068 — d.City
g. Work/ Cell Phone #
h. Email Address

4. Representative (if any):

KYLE F. — a. First Name
BURCHARD — b. Last Name

CHAPTER 193 APPLICATION
Stormwater Management and Land Disturbance Bylaw

GRP, INC.

c. Company

39 MAIN STREET, SUITE 301

c. Street Address

AYER MASSACHUSETTS 01432 978-772-1590

e. State f. Zip Code d.City g. Work/ Cell Phone #

kburchard@gpr-inc.com

h. Email Address

5a. Project Type Checklist (check all that applies):

1. ☒ Creation of new or increasing existing impervious surface of 500 sq. ft. or more.

   Impervious Surface: Is any material or structure on or above the ground that prevents water infiltration to the underlying soils. Impervious surface includes without limitation roads, paved parking lots, sidewalks, stone patios, decking, and rooftops.

2. ☒ Alteration and/or land disturbance of at least 5,000 sq. ft. or 10% of the parcel; whichever is less.

   Alteration and/or land disturbance as defined in Chapter 193 Bylaw.

5b. General Project Description:

Construction of a 3 lot subdivision, including tree clearing, new road and driveway pavements, utility mains and service connections, soil erosion controls and stabilization and a complete stormwater management system designed in accordance with Massachusetts Stormwater Handbook and Wayland Chapter 193 requirements that has been peer-reviewed and approved by the Wayland Planning Board. **See Cover Letter Narrative and Waiver Request in this application packet.**

B. Additional Information

By submitting an application for coverage under the Stormwater Management and Land Disturbance Permit, the Applicant agrees to the following:

1. At a minimum, the proposed project complies with the performance standards of the most recent version of the Massachusetts Stormwater Management Handbook including but not limited to:

   a. Employing environmentally sensitive site design
   b. Evaluation of Low Impact Development practices
   c. Incorporation of source controls of contaminants and employing BMPs to minimize stormwater pollution
   d. Sizing of water quality volume of BMPs are based on 1-inch of runoff
   e. Methodology for hydrologic analyses (if necessary) is based on TR-55/TR-20 methodology
   f. Designing redevelopment of existing sites must provide a net improvement to stormwater conditions at the site.

2. The activity shall not increase either the rate or volume of stormwater runoff leaving the site, nor shall it alter stormwater flow to any adjoining properties, public ways, or any wetland resource areas, unless otherwise permitted based on improvements over existing conditions.

Please check all that apply to this project:

- [X] Roof drains emptying into dry wells/recharge basins
- [ ] Grassed swales constructed
- [ ] Porous pavement installed; _____ sq. ft.
- [X] Water quality swale
- [ ] Rain barrels/cisterns for irrigation
- [X] Other methods (please list/describe): See Application Narrative and Stormwater Management Report

3. The Applicant shall provide and maintain Erosion and Sedimentation controls as necessary until the site is permanently stabilized. BMP's selected for erosion controls shall be chosen to minimize site disturbance from erosion control installation. As soon as the site is stabilized, such measures shall be removed.

   Please check all that apply to this project:

   - [X] Sediment filter fence with either hay bales or straw wattles
   - [ ] Mulch filled fabric sock
   - [X] Construction entrance
   - [X] Temporary vegetative cover – mulch, netting
   - [X] Permanent vegetative cover – hydro seeding, seeding, sodding
   - [X] Slope stabilization
   - [X] Retaining Walls
   - [ ] Slope drains
   - [X] Other methods (please list/describe): See Application Narrative and Stormwater Management Report

4. The Applicant shall ensure that the site and stormwater management systems are perpetually inspected and maintained to function as designed.

   Please check all that apply to this project:

   - [X] Visual inspections by contractor
   - [X] Visual inspections by homeowner
   - [X] Operation and Maintenance Plan
   - [X] Maintenance contract for stormwater components
   - [ ] Other methods (please list/describe): _____

5. Other Jurisdiction

   - [ ] Massachusetts Wetlands Protection Act (310 CMR 10.00) and it's implementing Regulations
   - [ ] Wayland's Wetlands and Water Resource Protection Bylaw – Chapter 194

CHAPTER 193 APPLICATION
Stormwater Management and Land Disturbance Bylaw

☒ Subdivision Approval

☒ Board of Health Permit

☐ Special Permit or Site Plan Review

☒ Building Permit

C. Fees

Applicants must submit a $100 application fee.

D. Signatures and Submittal Requirements

I certify that I have reviewed the design standards above and the information contained herein, including all attachments, is true, accurate, and complete to the best of my knowledge. Further, I grant the Wayland Conservation Commission and its authorized Agents permission to enter the property to review this application and make inspections before, during and after construction. **I have included a check for the application fee of $100.**

Signature of Applicant — Date: 1-5-21

Signature of Property Owner (if different) — Date

Signature of Representative (if any) — Date: 1-29-2021

For Conservation Commission:
Two copies of the completed Stormwater Management and Land Disturbance Bylaw (Chapter 193), including plans and documents, and the bylaw fee payment, to the Conservation Commission by mail or hand delivery.

July 22, 2019

Subject: **Wilkinson Property off Shaw Drive, Wayland, MA**
Town of Wayland Assessor Tax Map 39, Parcel ID 039-15A

To Whom It May Concern:

I hereby authorize Goldsmith, Prest & Ringwall, Inc., 39 Main Street, Suite 301, Ayer, MA, 978.772.1590, to act as my agent in administrative and civil engineering matters pertaining to the proposed Definitive Subdivision, Subsurface Sewage Disposal Systems, and Land Disturbance at the subject site. This authorization covers the execution of application forms, presentation of plans and designs, and communication with involved parties.

Respectfully,

Ross Wilkinson
695 John Muir Drive, F416
San Francisco, CA 94132

Copy: Goldsmith, Prest & Ringwall, Inc.
File #171053

GPR
Civil Engineering • Land Planning • Land Surveying

Engineering Solutions
for Land & Structures

January 29, 2021

Wayland Conservation Commission
41 Cochituate Road
Wayland, MA 01778

Subject: **Assessors Map #39 Parcel 15A, Wayland, MA**
Stormwater Management & Land Disturbance Permit (SMLDP) Application
SMLDP Application Narrative
Replacement Tree and Shrub Waiver Request

Dear Commission Members:

On behalf of the Applicant, Ross C. Wilkinson, Personal Representative of the Paula D. Wilkinson Estate, Goldsmith, Prest & Ringwall, Inc. (GPR) respectfully requests the issuance of a Chapter 193 Stormwater Management & Land Disturbance Permit (SMLDP) for the above referenced property under the Five Paths Definitive Subdivision development as approved by the Wayland Planning Board on 9/17/2020. The endorsed plan sheets from the Planning Board are included as part of this SMLDP application.

Introduction

The subject property is a 13.7± acre parcel identified on Wayland Assessor's Map 39, Parcel 015A. The proposed development consists of a privately maintained roadway serving three (3) single-family residential lots located south of Shaw Drive at the intersection of Shaw Drive and Deer Run. The proposed private roadway is aligned with Deer Run at Shaw Drive. The lots are served by public potable water supply, and individual septic systems.

Chapter 193 Bylaw Compliance

The purpose of this SMLDP application is to provide direct reference to Bylaw compliance in the Five Paths Definitive Subdivision plans, reports and documents approved by the Wayland Planning Board, as well as a waiver request and justification of replacement trees and shrubs. The Chapter 193 Application and Checklist documents included provide an outline of compliance. A list of specific compliance citations for each Bylaw section is as follows:

- §193-1 A.(1): See recharge and water quality calculations at the very end of the *Stormwater Management Report.*

- §193-1 A.(2): No fisheries or other designated outstanding water resources are near the property, and not toxic pollutants or nutrients are to be discharged anyway.

- §193-1 A.(3): Woodland Preservation Areas and Open Space Preservation amounting to 61% of the subject property are proposed to protect wildlife habitat.

- §193-1 A.(4): See the *Stormwater Management Report Hydrology Summary for 24-hour Storm* as well as the drainage narrative to describe no adverse impact to private property from floods or flow patterns. The project provides stormwater mitigation to reduce or maintain existing drainage patterns, flows and volumes at each point of discharge to adjacent properties. Receiving streams or rivers are far away from the property so as to not be affected by the proposed development.

- §193-1 B.(1): See **Drainage Design Standards** heading below.

- §193-1 B.(2): See **Peer Reviewed and Planning Board Approved Drainage Design** heading and referenced documents below. Non-structural stormwater management practices have been employed to the extents practicable given the constraints of topography, soils, lot shape and road standards. The Planning Board requested, and the approved design provides, underground stormwater retention/detention facilities in order to help minimize disturbance. The Planning Board approval includes an Operations and Maintenance Plan for Stormwater BMPs that requires regular maintenance of stormwater facilities to ensure they continue to function as designed and pose no threat to public safety.

- §193-1 B.(3): See **Soil Erosion Control** heading and referenced documents below.

- §193-1 B.(4): See the *Introduction and Methodology* and *Hydrology Summary for 24-Hour Storm* sections of the *Stormwater Management Report.*

- §193-1 B.(5) through B.(8): See **Drainage Design Standards** heading below, as well as the *Introduction and Methodology* and the *Hydrology Summary for 24-Hour Storm* sections of the *Stormwater Management Report*

- §193-1 B.(9): See *Endorsed Subdivision Plans* Sheet C4.4 for controlled outlet locations, and *Pipe End Structure* detail on Sheet C7.2.

- §193-1 B.(10): See §193-1 B.(2) above regarding non-structural stormwater management. Low-impact site design was accomplished in three ways; 1) reduced pavement width (See *PB Decision III.B.6.c*. and *Special Condition A.19*), 2) 1.10± acres of Woodland Preservation Area restrictions on the proposed lots, and 3) 7.27± acres of Open Space Offering (See *PB Decision III.B.4. & 5*., and *Special Condition A.18*)

- §193-1 B.(11): See the DRAFT *Stormwater Pollution Prevention Plan (SWPPP),* that shall govern construction phase practices within the NPDES Construction General Permit (CGP).

- §193-1 B.(12): At a minimum, *PB Decision General Conditions B.2, B.5, B.6, B.7 and B.11* require construction compliance with Bylaws and approvals through inspection, monitoring and enforcement.

- §193-1 B.(13): See requirements of *PB Decision Special Conditions A.4, A.6 and A.8*, establishing provisions to ensure adequate funding mechanisms for the proper review, inspection and long-term maintenance of stormwater facilities.

- §193-1 B.(14): See the *Long Term Pollution Prevention & Stormwater System Operations and Maintenance Plan* (LTPPP and O&M combined into a single document) describing ongoing inspections and long-term maintenance for stormwater facilities funded by mechanisms identified in §193-1 B.(13) above.

Drainage Design Standards

The drainage design was completed in accordance with requirements of the Massachusetts Stormwater Management Handbook and Wayland Bylaw Chapter 193. The drainage has also been designed in conformance with Massachusetts Title 5 (310 CMR 15.000) for appropriate separations between all drainage system components and all septic system components. The Chapter 193 (DRAFT) Regulations (dated 12/4/2019) have been used as guidelines where practicable to improve the design, though these regulations are not yet approved.
This SMLDP application complies with the Chapter 193 Bylaw.

Soil Erosion Control

The drainage design includes construction phase best management practices for soil erosion control measures as well as permanent stabilization, and controls for mitigation of stormwater quality, peak rates and total volume in accordance with all current regulations listed above. More detail about the proposed mitigation measures are on the *Endorsed Subdivision Plans,* Sheets C4.1, C4.4, C4.5, C6.1, C7.1 and C7.2, as well as the *Stormwater Management Report* included as part of this SMLDP application.

Peer Reviewed and Planning Board Approved Drainage Design

The drainage design for this project was peer reviewed during the subdivision review process by Mr. Frank DiPietro, P.E. of BSC Group and through a series of responses and revisions, the final drainage design satisfied all peer review comments in order to obtain approval from the Wayland Planning Board, which also required concurrence from the Wayland Board of Health with respect to appropriate drainage design and mitigation. The approved *Stormwater Management Report* and *Long Term Pollution Prevention & Stormwater System Operations and Maintenance Plan* (LTPPP and O&M combined into a single document) is attached as part of this SMLDP application.

Construction Phase EPA Permitting Required

A Construction General Permit (CGP) that includes a *Storm Water Pollution Prevention Plan (SWPPP)* is required to be filed with the EPA for construction and shall be filed by the construction contractor at least two weeks prior to the start of construction. A draft of the *SWPPP*, pending the chosen contractor information, is attached as part of this SMLDP application.

Tree and Shrub Replacement Waiver Request

The Wayland Planning Board encouraged ecological stewardship measures in the Five Paths Definitive Subdivision approval that include open space preservation, minimization of tree clearing and minimization of impervious area.

Open space preservation consists of "Woodland Preservation Areas" deeded within the three (3) subdivision lots, and the gifting of $2,500 as well as 7.27 acres of undeveloped land to the Sudbury Valley Trustees (SVT). The overall land usage configuration approved by the Planning Board consists of the following:

Designation	Area	Land Use	Percentage of Total Tract
SVT Gift	7.27± acres	Open Space	53%±
----------(Within three (3) Subdivision Lots)----------			
Woodland Preservation	1.10± acres	Open Space	8%±
Cleared/Developed	2.60± acres	Residential	19%±
Uncleared/Undeveloped	2.73± acres	Residential	20%±
Totals	13.7± acres		100%

An extensive site topographic and tree survey of the property was conducted, and a tabulation of trees with trunks 6" DBH and greater to be removed for the development is included on the "SMLDP Tree Removal Plan" submitted with this SMLDP application. The *Wayland Conservation Commission Replacement Tree and Shrub Schedule* reads as if it applies only to trees removed from jurisdictional buffer areas of Chapter 194 or the Wetland Protection Act. No jurisdictional resource areas or buffers subject to Wayland Bylaw Chapter 194 or the Massachusetts Wetland Protection Act exist on the property.

The significant open space preservation provided by the Five Paths development was found by the Planning Board to be in the public interest (see *PB Decision III.B.5.).* Further, the Woodland Preservation Areas have specific stewardship criteria in *PB Decision Special Condition A.19* for dead, diseased and dying tree removal with native re-plantings as appropriate, over time. Over time, responsible re-planting will be done.

The overall minimization of tree clearing and new impervious areas approved by the Planning Board makes replacement plantings within these areas impractical. Over 60% of the land is being preserved as perpetual open space under stewardship of Sudbury Valley Trustees. Provisions are in place to enhance Woodland Preservation Areas on each lot, with long term replanting guidelines in effect. We believe these extensive woodland preservation measures warrant a waiver from the Replacement Tree and Shrub Schedule for the Five Paths Definitive Subdivision. We respectfully ask that you please approve this waiver.

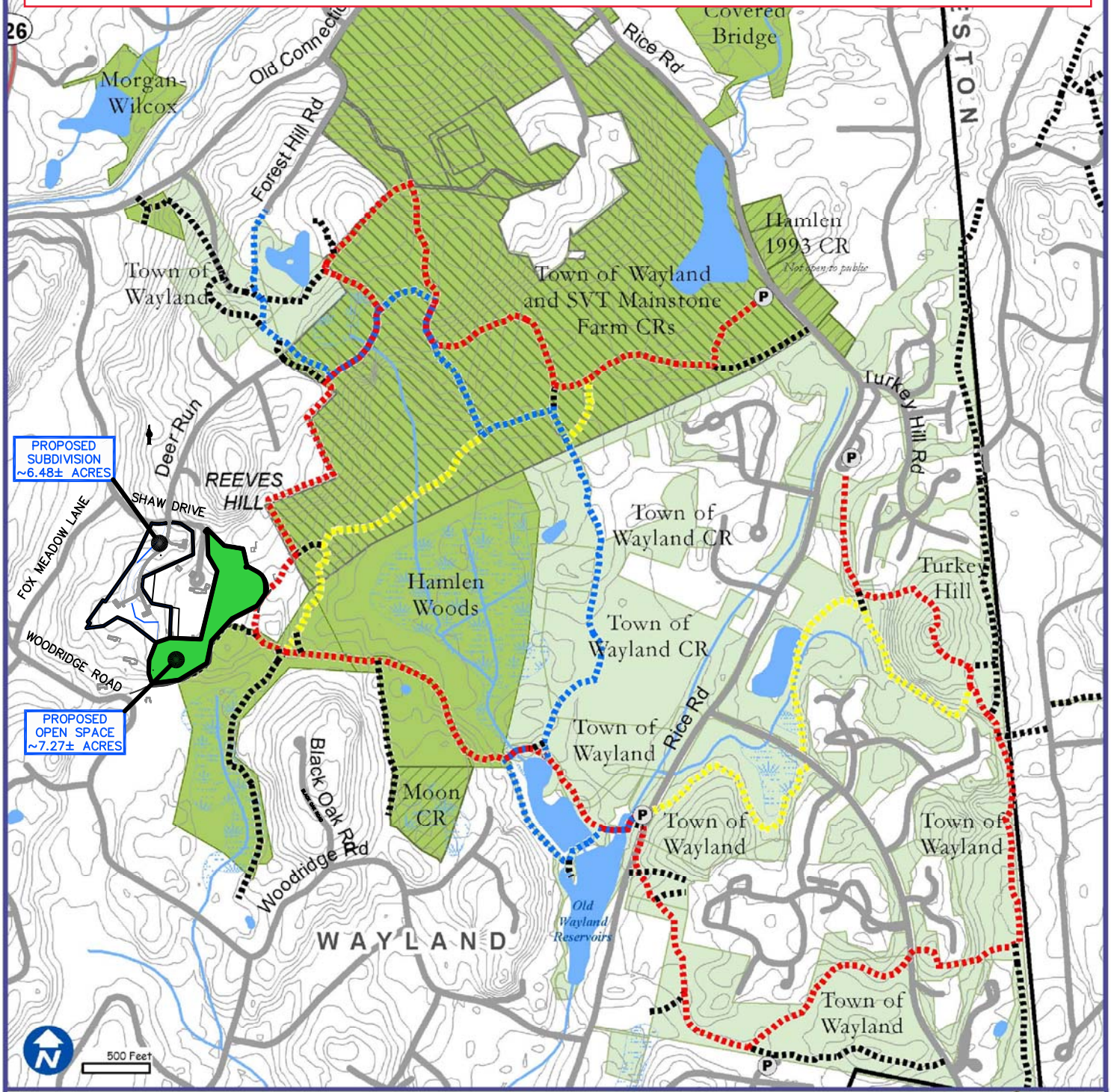
We look forward to reviewing this application with the Commission and request that you reach out with any questions about the documentation or materials provided within this application.

Respectfully,
Goldsmith, Prest & Ringwall, Inc.

Kyle Burchard, P.E.
Project Manager

MAINSTONE FARM & HAMLEN WOODS

Five Paths Definitive Subdivision
SMLDP OPEN SPACE OFFERING TO SVT



P Parking | Water Body | SVT | Mainstone Farm | Red Trail | Blue Trail

Road | Wetland | SVT CR | Town of Wayland | Yellow Trail | Unmarked Trail

How to Get Here

Love open spaces? Support SVT!

Sudbury Valley Trustees is a nonprofit conservation organization that protects land for the benefit of people and wildlife. Help us keep these trails open for all to enjoy. **Join or Donate today! www.svtweb.org**

Map produced by Sudbury Valley Trustees. Data Provided by Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs. This Map should be used for reference only. Boundary lines are approximate.

TOWN OF WAYLAND
MASSACHUSETTS
01778
PLANNING DEPARTMENT

Sarkis Sarkisian
Wayland Town Planner

TOWN BUILDING
41 COCHITUATE ROAD
TELEPHONE: (508) 358-3615
FAX: (508) 358-3606

MEMO

DATE: September 17, 2020

TO: Town Clerk, Applicant

FROM: Sarkis Sarkisian, Town Planner

SUBJECT: Certification of Planning Board Action on Five Paths Residential Subdivision
Map 39, Parcel 039-15A

As required by MGL Ch. 41, s. 81-U, this memo certifies the attached Notice of Action, namely, that on September 15, 2020 the Planning Board voted to approve with conditions the application for the Definitive Subdivision Approval submitted by Ross C. Wilkinson. This decision may be appealed in accordance with MGL Ch. 41, s. 81-BB, that is within twenty (20) calendar days of the filing of this decision at the office of the Wayland Town Clerk.

TOWN OF WAYLAND
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

PLANNING BOARD

Notice of Action

RE: **Application for Definitive Subdivision Approval**
Ross C. Wilkinson, Personal Representative of the Estate of Paula D. Wilkinson (Applicant)

Location: **Five Paths Residential Subdivision Map 39, Parcel 039-15A (the "Project Site")**

Date: **September 15, 2020**

I) Procedural History

A) The applicant Ross C. Wilkinson, Personal Representative of the Estate of Paula D. Wilkinson ("Applicant") filed an application for preliminary subdivision approval on December 20, 2018. The Planning Board ("Board") met on January 8, 2019 to review and discuss the submission and continued the discussion to January 22, 2019 at which time the Board did not take a formal vote. The Applicant submitted three concepts all of which required waivers from the Board's Subdivision Rules and Regulations (the "Subdivision Rules"). In waiving strict compliance with the Subdivision Rules, the Planning Board may require such alternative conditions as will serve substantially the same objective as the standard or regulations waived. The Board encourages waivers in the public interest when such waivers will result in better design or improved protection of natural and scenic resources or will otherwise further public interest.

B) A Definitive Subdivision Application was filed with the Board on July 26, 2019.

C) Notice of the public hearing appeared in the *Wayland Town Crier* on August 15, 2019 and August 22, 2019. A second revised notice appeared in the *Wayland Town Crier* on July 16, 2020 and July 23, 2020.

D) A public hearing on the Definitive Subdivision Application was opened on September 3, 2019 and was continued to: September 24, 2019; October 17, 2019; December 10, 2019; January 21, 2020 March 10, 2020; April 29, 2020; May 5, 2020; May 19, 2020; May 26, 2020; July 7, 2020; August 4, 2020; August 18, 2020; and September 15, 2020 at the conclusion of which the Board closed the public hearing.

E) Board members conducted site visits on January 12, 2019 and September 6, 2019.

F) On August 24, 2020, the Board of Health voted unanimously to approve the Definitive Plans (as defined below).

G) Signed agreements for extensions of time were granted to the following dates: May 29, 2019,

January 31, 2020, March 10, 2020, August 31, 2020 and September 30, 2020.

H) In accordance with Massachusetts General Laws Chapter 30 §23D, Jennifer Steel and Kevin Murphy, as members of the Wayland Planning Board, certified on October 12, 2019 that they examined all evidence received at the missed session of the 57 Shaw Drive Subdivision Application that was held on September 3, 2019. Andrew Reck missed the August 18, 2020 Planning Board meeting.

I) The Plans and other submission materials were reviewed by the Board and its consulting engineer, BSC Group, and KP Law, Town Counsel for the Town of Wayland. Throughout its deliberations, the Board took into consideration the statements of the Applicant and its representatives, and the comments of the parties in interest and the general public, all as made either at the public hearing or in written submissions to the Board while the hearing record was open.

II) Application Submittals and Related Documents

The following documents were submitted to the Board in connection with the above referenced Application for Definitive Subdivision Approval:

A) Application Submittals

1. Five Paths Residential Definitive Subdivision Application for Owner & Applicant Ross C. Wilkinson, Personal Representative, Estate of Paula D. Wilkinson P.O box 98 Wilton, NH 03086 dated July 2019. 2 titled
    - Application Transmittal cover sheet by Goldsmith, Prest & Ringwall, Inc. 39 Main Street, Suite 301 Ayer Ma 0143
    - Letters of Authority for Personal Representative
    - GPR Agent Authorization Letter
    - Certified Abutter's List
    - Narratives
    - Rights of Way from Applicant's Property to Woodridge Road
        - Exhibit A: Bk 11761, Pg. 265
        - Exhibit B: 739 of 1951
        - Exhibit C: 740 of 1951
        - Exhibit D: 1186 of 1969
    - Form O: Environmental Data Form
    - Traffic Analysis
    - Plan for Obtaining Local, State and Federal Permits
    - Drainage Analysis & Calculations
        - Drainage Narrative
        - Peak Flow & Volumetric Discharge Summary Tables
        - Pre-Dev Drainage Map & Model Diagram
        - Post-Dev Definitive Plan Drainage Map & Model Diagram
        - Post-Dev ALTERNATE Plan Culvert Calculations
        - Post-Dev Alternate Plan Drainage Map & Model Diagram
        - Post-Dev ALTERNATE Plan Culvert Calculations
        - Soil Investigation Data
2. "Definitive Residential Subdivision Plan Five Paths" prepared by Goldsmith, Prest & Ringwall, Inc. 39 Main Street, Suite 301 Ayer Ma 01432 comprised of seventeen (17) sheets dated July 2019 and revised July 14, 2020:

- C1.1 Title sheet
- C2.1 Existing Conditions
- C3.1 Lotting Plan
- C4.1 Land Disturbance Plan
- C4.2 Site Layout and Utilities Plan
- C4.3 Grading and Paving Plan
- C4.4 Drainage Plan
- C5.1 Roadway Plan and Profiles
- C6.1 Erosion and Sediment Control Plan
- C7.1 Construction Details
- C8.1 Construction Details
- C9.1 Alternate Lotting Plan
- C9.2 Alternate Land Disturbance Plan
- C9.3 Alternate Site Layout and Utilities
- C9.4 Alternate Grading and Paving Plan
- C9.5 Alternate Drainage Plan
- C9.6 Alternate Driveway Sight Distance

The plans referenced in paragraph 2 above are hereafter collectively referred to as "the Plans".

3. Form C Application for Approval of Definitive Plan- dated July 26, 2019

4. Form D Designers Certificate dated July 26, 2019

5. Form K Board of Health Application – received by Board of Health on August 14, 2019

6. Stormwater Management Report entitled "Five Paths" dated July 2019 and a revised drainage report entitled "Five Paths" dated July 14, 2020 both reports prepared by GPR Engineering.

7. Long Term Pollution Prevention & Stormwater System Operation and Maintenance Plan (O&M Plan) Revision dated July 2019 and revised #1 dated July 14, 2020.

8. Environmental Data Form O dated July 2019

9. Certified List of Abutters Within 300' dated December 6, 2018

10. $2,000.00 Filing Fee Check by GPR.

B) Documents including memos, letters, reviews and others information regarding the application for Definitive Subdivision Approval.

1. Memo dated August 5, 2019 from Town Planner, Sarkis Sarkisian, to Town Clerk, regarding filing and completeness of the application.
2. Definitive Plan Submission Requirements Checklist completed by the Town Planner on August 5, 2019.
3. Email dated September 3, 2019 from Director of Public Health, Julia Junghanns, to Town Planner, Sarkis Sarkisian, regarding receiving the Drainage Report.
4. Peer review report dated September 16, 2019 by BSC Group regarding the Stormwater Management Design.

5. Memo dated September 23, 2019 from Fire Chief, Neil McPherson, to Town Planner, Sarkis Sarkisian, regarding Five Paths Subdivision.
6. Memo dated September 23, 2019 from Conservation Administrator, Linda Hansen, to Planning Board regarding Five Paths Subdivision.
7. Power Point Presentation dated September 23, 2019 by Town Planner, Sarkis Sarkisian, for the Planning Board with a sketch plan showing a Conservation Cluster Development.
8. Memo dated September 24, 2019 from Town Planner, Sarkis Sarkisian, to Planning Board regarding the Application.
9. Memo dated September 24, 2019 from Director of Public Health to Planning Board regarding Definitive Subdivision comments.
10. Letter dated September 24, 2019 from Robert Castle, direct abutter, with remarks regarding the petition.
11. Memorandum dated October 4, 2019 from Brian Levey, Esq., Counsel to Applicant, with respect to the use of the Right of Way ("ROW A") and Right of Way B ("ROW B") for access to and from the subdivision and Woodridge Road.
12. Memo dated October 10, 2019 from Department of Public Works Town Engineer Paul Brinkman regarding the Application.
13. Memo dated October 17, 2019 from Town Planner, Sarkis Sarkisian, to the Planning Board regarding 57 Shaw Drive Subdivision waivers.
14. Letter dated December 13, 2019 from Jeffrey L. Ontell Esq. of Marsh, Moriarty, Ontell & Golder,P.C. to Katharine Lord Klein, KP/Law regarding the Five Paths Subdivision Right of Ways.
15. Letter dated December 31, 2019 from Jeffrey L. Ontell Esq. of Marsh, Moriarty, Ontell & Golder,P.C. to Katharine Lord Klein, KP/Law supplementing report regarding the Five Paths Subdivision Right of Ways.
16. Letter dated January 3, 2020 from KP Law Wayland Town Counsel to the Planning Board regarding the Five Paths Subdivision Easement Rights.
17. Proposed Five Paths scheme's A, B, C, and D Land Disturbance Options dated January 14, 2020 by GPR, Inc.
18. Memorandum dated May 13, 2020 from, Brian Levey, Esq., Counsel to Applicant, to the Planning Board regarding Five Paths Definitive Subdivision Plan Application Open Space Proposal.
19. Memo dated July 27, 2020 from Town Engineer, Paul Brinkman, to Town Planner, Sarkis Sarkisian, regarding Five Paths Application Revision #1.
20. Memo dated July 28, 2020 from Town Planner, Sarkis Sarkisian, to the Planning Board regarding Definitive Plan for Five Paths.
21. Letter dated July 30, 2020 from the BSC Group to the Planning Board and Town Planner regarding the Definitive Subdivision and Stormwater Management Design Peer Review.
22. Email dated July 30, 2020 from Fire Chief Neil McPherson regarding the proposed 40' curb radius circular turnaround.
23. Letter dated July 31, 2020 from Phillip l. Radoff of 21 Fox Meadow Lane.
24. Memo dated August 12, 2020 from Brian Levey, Esq., Counsel to Applicant, to the Planning Board responding to Planning Board Comments and Questions received August 11, 2020.
25. Letter from the Sudbury Valley Trustees Director of Land Protection Christa Collins to Chair Ira Montague of the Planning Board regarding accepting the seven acres of land at the end of Shaw Drive.
26. Memo dated August 13, 2020 from Town Engineer Paul Brinkman regarding the Five Paths Residential Development Revision #1.
27. Applicant's "Five Paths Requested Waivers from Subdivision Rules and Regulations" submitted August 5, 2020.

28. Exhibits A, B, C1 and D submitted by GPR, Inc. regarding the Fire Truck Turnaround and the Site Stabilization Plan.

III) Findings

A) Project Site

1. The Project Site is located in the R60 zoning district. The minimum lot area in the district is 60,000 square feet. The minimum frontage is 210 feet.
2. The Project Site consists of 13.74 acres and has 216.52 feet of frontage on Shaw Drive.
3. The Project Site does not contain Wetlands, is not in a Floodplain and is not in a Zone 1 Protective area.
4. The Project Site consists of undeveloped woodlands.

B) Application History

1. Over the course of the public hearing, the Applicant presented four potential options for the development of three lots. The first option, the original Definitive Subdivision Plan, resulted in the largest disturbance and the largest area of impervious surface. The second and third options required using the Applicant's two rights of way to/from Woodridge Road (the "Private ROWs") to access the Project Site and would have required the improvement and use of a private way through existing residences off Woodridge Road. The fourth option involved a private way (effectively a shared driveway) instead of a full-scale subdivision street and resulted in the least disturbance and impervious surface area and required various waivers discussed below.

2. During the public hearing, the initial sessions focused on reviewing the second and third options, including securing an opinion from Town Counsel regarding the Applicant's right to use the Private ROW. The Board members also expressed their preference for a layout that allowed the maximum area of existing vegetation to remain in its natural state. The Board also noted concerns about disturbing the existing residences on Woodridge Road and traffic issues, such as sight distances at the proposed private way/Woodridge Road intersection.

3. The focus then turned to the fourth option, key components of which were: (i) creating only one new private way off Shaw Drive instead of a full-scale subdivision street; (ii) limiting utilities and access only to/from Shaw Drive (with no such use of the Private ROWs to/from Woodridge Road); and (iii) reducing areas of pavement and disturbance.

4. During the public hearing, the Board indicated that the Applicant needed to justify the requested waivers. Ultimately, in support of the waivers, the Applicant offered to advance the public interest by: (i) dedicating 7.27 acres or 53% of his land to Open Space, (ii) creating ±1 acres of Woodland Preserve Area within the non-Open Space portion of the lot, and (iii) making a $2,500.00 donation for access-related support to the grantee of 7.27 acres. Collectively, these proposals are known as the "Open Space Offer".

5. The Open Space Offer promotes the public interest by: (i) enlarging the sizable, contiguous open space land holdings of Sudbury Valley Trustees, (ii) protects woodlands and animal habitats, (iii) augments the existing trail system by including an existing direct connection from Shaw Drive to the Mainstone trails for the public's use and enjoyment, and (iv) eliminates potential development of 7.27 acres after the Deed Restriction on the subdivision land expires in June, 2022.

6. The main waivers from the Subdivision Rules required for the fourth option were as follows.

    a. Pinch Point – Reduce the separation of the right of way (within which the private way would be located) from the property boundaries on either side of this ROW from the required 50 feet (§ IV.B.1.D). The 50' setback was respected as much as possible by providing 38.7± feet between the subdivision road ROW and the westerly subdivision boundary and 43.9± feet between the subdivision road ROW and easterly subdivision boundary. As a result of the public hearing and peer review process, the private way pavement was positioned to be greater than 50' from the both of the adjacent boundaries.

    b. Maximum Length of Dead End Street Combinations – Allow longer than the maximum allowed length from the combination of Five Paths Court and Shaw Drive to the nearest through street. The proposed dead end street combination will be shorter than several other dead end street combinations in the neighborhood (§ IV.B.1.D). As a result of the public hearing and peer review process, the length of Five Paths Court/Shaw Drive dead end street combination is 1,135'± from sideline of Fox Meadow Lane to the cul-de-sac center point and an overall length of 1,195'+ to the end of the circle. This compares favorably to the nearby combined dead end street lengths of Shaw Drive/Deer Run (2150'), Shaw Drive/Deer Run/Poet's Path (2280') and Shaw Drive/Deer Run/Bridle Path (2516')." (The length of Five Paths Court by itself from the sideline of Shaw Drive to the center of the circle is 668.85')

    c. Road Construction – Allow the construction of a private way rather than a street (§ V.B.2.A) to reduce disturbance, impervious surfaces, and drainage. As a result of the public hearing and peer review process, among other things, the private way was relocated within the street ROW, the private way placement was improved, all retaining walls for the private way were eliminated, and the paved surface of the private way was reduced from the required 22 feet to 18 feet with a 2-foot wide gravel shoulder on the east side and vertical granite curbing on the west side to control runoff.

7. After hearing the concerns of the Board, municipal staff, and residents at the public hearings, the Applicant made the following concessions or changes to the project: (i) enlarged the private way turnaround for emergency vehicles, (ii) expanded erosion controls during construction, (iii) extended guard rails along the private way, (iv) agreed to delay for one year any hook ups of each lot's private irrigation system to allow for the Town's installation of a booster pump, (v) extended the Woodland Preserve Area, (vi) added an additional silt fence downstream of the proposed subsurface infiltration system, (vii) agreed to connect the roof runoff to the underground stormwater management system for Lot 3, (viii) agreed to no further subdivision of the land and no extension of the private way to abutting land, (ix) reduced land disturbance to approximately 2.6 acres through a variety of techniques including re-aligning the private way to better match the contour of the natural landscape, (x) provided fire hydrants at both ends of the private way, (xi) agreed to privately maintain the private way and stormwater management system in perpetuity, and (xii) roughly balanced the cuts and fills on the site.

IV) Decision

Based on the aforementioned findings, application submittals, public comment, comments from Boards and Commissions, Land Use meetings, comments of Town Consultants, and the information submitted at the hearing or in written submissions to the Planning Board while the hearing record was open, the

Planning Board hereby approves said Application for the Definitive Subdivision Plan Approval, subject to the following conditions.

A) Special Conditions

A.1 The Project shall be built in conformity, and shall be in compliance, with the Plans, as may be modified by the conditions set forth in this Decision, all of which shall appear on the final endorsed Mylar plans. Failure to so comply shall be cause for rescission of this Decision. All references to specific lots shall coincide with the designated numbers as shown on the Plans.

A.2 If there is no appeal of this Decision, a reproducible set of the plans shall be revised incorporating the conditions of this Decision, and returned to the Planning Board within forty-five (45) calendar days of the expiration of the appeal period and notification to the Planning Board by the Town Clerk that no appeal has been filed. If there is an appeal, the Applicant shall consult with the Planning Board regarding the resolution of the appeal and relevant timetables. The revised reproducible plans shall be endorsed by the Planning Board if the Board determines that the plans comply with this Decision.

A.3 The Plans shall be revised to incorporate the following changes (i) enlarged private way turnaround for emergency vehicles as shown on the plan entitled "Fire Truck Turnaround at Lots 2 & 3" and labeled as Exhibit C1 and dated 8/13/20, (ii) expanded erosion controls during construction per Subdivision Plan Sheet C4.5 last revised 8/12/20 (the "Revision Plan") and for erosion controls needed for Exhibit C1 above, (iii) extended guard rails along the subdivision road per the Revision Plan, (iv) extended Woodland Preserve Area per the Revision Plan, (v) additional silt fence downstream of the proposed subsurface infiltration system per the Revision Plan, (vi) fire hydrants at both ends of the private way, and (vii) connected roof runoff to the underground stormwater management system for Lot 3.

A.4 A properly executed Form I, Approval with Covenant Contract, or its equivalent shall be submitted in a form acceptable to the Planning Board prior to the release of any lots.

A.5 This Decision and the revised and endorsed plans, and the Form I, Approval with Covenant Contract, or its equivalent, if applicable, all properly executed, shall be recorded or registered, as appropriate, at the Middlesex South District Registry of Deeds within ninety (90) calendar days of the endorsement of the revised plans by the Planning Board; and within the same ninety (90)-day period, one reproducible set and four (4) sets of plans of the fully endorsed revised plans, plus a copy of the layout plan in electronic form suitable for use by the Town Surveyor, shall be returned to the Planning Board, together with documentation verifying that said recording(s) have been completed, noting the specific location (referenced by deed book and page, etc.) where said document(s) and plans have been recorded, and the date of recording; all recording information shall be attached to said notification. Neither the entire subdivision, nor any portion thereof, to include any lot or lots, shall be sold or offered for sale until said notification occurs.

A.6 The owners of Lots 1, 2 and 3 shall be jointly and severally responsible and liable for the costs of the construction, maintenance, snow plowing, and repairs of the private way serving those lots, and, to the extent applicable, of all common utilities, the installation of which are required in connection with this approval, or which may be installed at any time, including, without limitation, water, stormwater management system, and other utilities,

and including all actions of any kind or nature necessary or appropriate in order to maintain the roadway in a good safe and passable condition, providing access from each lot to Shaw Drive. For purposes hereof, "owner" shall mean the record owner of the said lot or lots as of the date that maintenance, repair or reconstruction work, as the case may be, is begun. All such maintenance, etc. shall be done under the supervision of the appropriate Town department if applicable, and shall comply with and conform to all requirements of the Town of Wayland and other requirements imposed by law or governmental authority except as waived herein.

A.7 The appropriate Town officials, employees, agents and contractors and their designees shall have the right to enter upon the private way for all purposes for which ways are used in the Town of Wayland.

A.8 The Applicant shall establish a homeowners association and execute and record a declaration of covenants and easements ("Declaration") to govern the private way and the stormwater management system and each lot owner's rights and responsibilities in the same. The Declaration shall include a snow and ice removal plan that does not rely on salt treatment. A copy of the draft Declaration shall be provided to the Town Planner and the Planning Board for review and comment prior to the recording of the same.

A.9 The private way shall not be eligible for acceptance by the Town of Wayland as a public way, and the Applicant and its successors-in-title shall never petition the Town of Wayland, whether through town meeting or otherwise, for public acceptance of the private way as a public way.

A.10 With the exception of initial development and construction activities, the owners of Lots 1, 2 and 3 shall not use or permit the use of the private way for any purpose other than utilities and ingress and egress from the lots by the residents of the lots and their guests and invitees, such use to be limited to pedestrian and private passenger vehicular traffic, delivery or customary and usual household services incidental to residential uses, and vehicles or equipment in connection with the maintenance, repair or reconstruction of the private way and any utilities installed thereon and thereunder. No owner or owners shall park or cause to be parked any motor vehicle on the private way, except for occasional, temporary and non-overnight parking that does not impede access to any all of the other lots.

A.11 All easements, including the Declaration of Covenants and Easements for the private way, shall be reviewed and approved by the Planning Board prior to recording with the Middlesex South Registry of Deeds, and prior to the issuance of Certificate of Occupancy for Lots 1, 2 and/or 3. All easements, if any, shall be referenced in the deeds for the lots encumbered by and/or benefiting from said easements. Copies of said deeds shall be submitted to the Planning Board.

A.12 In any sale or transfer by the owner or any successor owner of the lots, the deed or other instrument of conveyance shall reference this Decision and its recording book and page.

A.13 No lot shall be further divided so as to create additional lots and the subdivision private way shall not connect to any other properties. These restrictions shall be noted on the recorded plans and shall be incorporated into the Declaration of Covenants and Easements governing the private way. This Declaration shall be in a form acceptable to the Board to render it enforceable in perpetuity, or for the longest period allowed by law, and shall be

recorded in the Registry of Deeds ahead of any transfer of title or lien, voluntary or involuntary, of or on the subdivision land or any portion thereof by the Applicant, unless a subordination agreement is obtained from all parties who hold existing title interests (i.e., a construction financing mortgagee).

A.14 Any fill that is imported to the site shall be clean and any debris found within the fill, such as but not limited to asphalt, metal, and wood shall be removed and disposed of properly.

A.15 The base coat of the roadway shall be constructed and capable of providing safe vehicular access to Lots 1, 2 and 3 prior to the commencement of construction of the homes.

A.16 The limit of clearing and driveway location shown on the Plans for Lot 3 represents the area within which the single-family residential structure may be built on said lot. Any deviation from the plan will require Planning Board approval.

A.17 A permit to construct an individual sewage disposal system for sanitary wastewater disposal shall be obtained from the Wayland Board of Health for each individual lot prior to the issuance of a building permit for that lot.

A.18 The Applicant has voluntarily agreed that a 7.27-acre open space parcel of the subdivision land shall be gifted for open space, conservation and recreational purposes in perpetuity, if and when the subdivision is to actually be constructed, prior to the issuance of any Building Permit for the construction of a residence on either Lot 1, Lot 2 or Lot 3. Transferees of the open space parcel shall be one of the following:

a. Town or Wayland Conservation Commission, but only if the Town or Conservation Commission agrees to accept title to the Open Land; or
b. Sudbury Valley Trustees or another nonprofit conservation organization approved by the Planning Board.
c. If neither the Town, the Wayland Conservation Commission, Sudbury Valley Trustees, nor another conservation non-profit is willing or able to receive said Open Space, then the Open Space may be conveyed to a corporation, trust or association owned, or to be owned, by the owners of lots or residential units within the subdivision.

A.19 The Woodland Preservation Area is that portion of Lots 1, 2 and 3 over which tree removal is limited to dead, diseased or dying trees. Native shrubs may be planted individually (no beds of multiple shrubs) and spaced no less than ten (10) feet apart. Native trees may be planted no less than 20 feet apart. Non-native invasive trees (e.g., Ailanthus), shrubs (e.g. Autumn Olive), plants (e.g., Ajuga Reptans aka Bugleweed) and vines (e.g., Oriental Bittersweet) may be eradicated.

A.20 Any and all irrigation connections shall be subject to the explicit permission from the Board of Public Works.

A.21 In the event that it is determined that blasting is required for construction of project, such blasting shall comply, in all respects, with all applicable laws, regulations and rules including, but not limited to, 527 CMR 1.00, the Massachusetts Comprehensive Fire Safety Code which governs the " keeping, storage, use, manufacture, sale, handling, and transportation... of...[a]ny explosives...."

B) General Conditions

B.1 The Planning Board hereby grants the following waivers from the Subdivision Rules and Regulations as part of its approval and finds that granting the following waivers is in the public interest and not inconsistent with the purpose of the Subdivision Control Law.

B.2 All drainage and access easements shall be reviewed and approved by the Planning Board and shall be recorded with the Middlesex South Registry of Deeds, prior to the recording with the Plan. All such easements shall be referenced in the deeds for the lots encumbered by and/or benefiting from said easements. Copies of said deeds shall be submitted to the Planning Board.

B.3 No fill material or any products of excavation or erosion resulting from or arising in connection with such work shall be discharged into the storm drainage system, or abutting properties. Soil and other materials or debris shall be removed from the site only to the extent necessary in connection with the construction of the subdivision and shall be subject to any other by-laws regulating the same and shall be subject to the Town's earth movement by-law, if applicable.

B.4. The construction of all ways and installation of all associated municipal services and utilities shall be completed within two (2) years from the date of this Approval with Conditions unless a request for an extension thereof is filed with, and approved by, the Planning Board. Failure to so complete the ways, municipal services and utilities may result in the rescission of this Definitive Subdivision Plan Approval with Conditions. Prior to the commencement of construction, all applicable approvals for the private way, from, but not limited to, the Conservation Commission, Board of Public Works, and Water Department, shall be obtained.

B.5 At least one (1) week prior to construction of the right-of-way and associated utilities, the Planning Board, Highway Department, Conservation Commission, Board of Health, Fire Department, Water Department, Building Department, and Wayland's Engineering Consultant shall be notified in writing of the construction commencement date and schedule, so that pre-construction conferences between the developer, his engineers and contractors, and all involved town agencies can be scheduled to discuss construction schedules, standards, and compliance with Town regulations. The Town Planner must be contacted for the required inspections throughout the development of the project.

B.6 The water distribution system shall be installed in accordance with the requirements of the Town's Water Department. One (1) week's prior notice shall be given to the Town's Water Department before work on the ground commences. Specific pipe size specifications will be determined at the time of construction. Upon completion of the work, the connections shall be chlorinated and pressure tested at one hundred fifty (150) pounds for thirty (30) minutes. Samples for coliform bacteria must pass state (DEP) standards before any connections are made.

B.7 Prior to final release of the lots shown on the Plan, or, if appropriate other security has already resulted in the release of said lots, prior to the release of such other remaining security, one reproducible copy, ten (10) blue line print copies, and an electronic copy (AutoCAD File Format) of an "as built" plan shall be submitted to the Planning Board or its agent. Said "as built" plan shall be suitable for locating all subdivision infrastructure required by this decision, both above and below ground. Said plan shall include sufficient elevations, tied to the NGVD Datum, so that the Town can verify that all infrastructures

will perform as designed and approved. Said plan shall clearly indicate all deviations from the approved Plan. No deviations from the approved Plan shall be allowed or commenced without prior written approval from the Planning Board or its agent. All such deviations shall be requested in writing, clearly citing justifications for said deviations.

B.8 All utilities within the subdivision shall be installed underground. Utilities shall be provided to the site underground. This condition can only be modified by the Planning Board acting pursuant to M.G.L. c. 41, §81W.

B.9 In any sale or transfer by the owner or any successor owner of the lots, the deed or other instrument of conveyance shall refer to and incorporate by reference all conditions set forth herein.

B.10 Prior to clearing and grading activity, perimeter erosion and sediment control measures shown on the Plans shall be installed along the area of planned earth movement activities.

B.11 The Applicant shall notify the Planning Board and its agent to schedule an inspection of the site prior to the clearing of land. No trees beyond the limit of clearing as delineated on the Plan shall be disturbed until the last Certificate of Occupancy for residential structures within the Subdivision is issued.

B.12 Prior to the commencement of construction, any revisions to the Stormwater Drain System Operation and Maintenance Plan shall be submitted to the Planning Board for review and approval. The Operation and Maintenance Plan shall be recorded with the Middlesex South Registry of Deeds and shall be referenced in each deed or other instrument of conveyance for lots on the new public way.

C) Waivers Granted

Waiver No.	Regulation	Description/Request
1	IV.B.1.d Street Length and Pinch Point	"No dead-end street shall be more than six hundred ninety (690) feet in length to the cul-de-sac centerpoint … [with an] overall length [of] no more than seven hundred fifty (750) feet)…[and a] minimum separation of fifty (50) feet from the subdivision boundary to the right-of-way shall be required." **Waived** to allow longer than the maximum allowed length from the combination of Five Paths Court and Shaw Drive to the nearest Through Street, which will be less than several other Dead End Street combinations in the neighborhood (§ IV.B.1.D). Specifically, the length of Five Paths Court/Shaw Drive may be set at 1,135'± from sideline of Fox Meadow Lane to the cul-de-sac center point and an overall length of 1,195'+ to the end of the circle. The length of Five Paths Court by itself from the sideline of Shaw Drive to the center of the circle is 668.85'. This compares favorably to the nearby combined street lengths of Shaw Drive/Deer Run (2150'), Shaw Drive/Deer Run/Poet's Path (2280') and Shaw Drive/Deer Run/Bridle Path (2516')."

		Waived to allow a minimum separation of 38.7± feet and 43.9± feet between the right of way and, respectively, the westerly and easterly subdivision boundaries. Public Interest: In addition to the Applicant's advancing the public interest by dedicating 7.27 acres or 53% of his land to Open Space, limiting tree cutting in the ±1 acre Woodland Preserve Area, and making a $2.5K donation for access-related purposes (the "Open Space Offer"), the ROW has been re-designed and the actual private way pavement relocated in order to maximize the distance between the traveled private way and the abutting property lines (51.4± feet and 54.1± feet from, respectively, the nearest westerly and easterly property lines).
2	IV.B.2 Overall Waiver from Street Construction (Design Standards)	"Right-of-Way Width and Street Design Standards" chart requires 22' pavement width and 290' minimum centerline Radius of Curvature. **Waived** to 18' wide pavement plus 2' gravel shoulder on one side, and 160' radius of curvature for Five Paths Court right-of-way. Public Interest: This waiver promotes the public interest by allowing better private way placement on the site and reducing overall disturbance.
3	IV.B.1.c Tangent	"A minimum 200-foot length tangent shall be provided (between PT and PC of curves)." **Waived** to allow no tangent between curves. Public Interest: This waiver promotes the public interest by reducing the volume of fill needed to bring the private way in from the Shaw Drive/Deer Run intersection, allowing the private way to better follow the natural curvature of the existing grade, and increasing the size of the undisturbed Woodland Preservation Area.
4	IV.D Pedestrian Ways	"Pedestrian ways or foot paths will normally be required…with an easement of at least 20 feet." **Waived** so as not to require pedestrian ways or easements on Five Paths Court. Public Interest: This waiver promotes the public interest by allowing improved private way placement on the site and reducing overall disturbance.
5	V.B.2.b. Clearing	"Right of way to be cleared according to standard road cross-section." **Waived** to allow clearing according to private way clearing limits depicted on the plans. Public Interest: This waiver promotes the public interest by allowing improved private way placement on the site and reducing overall disturbance.
6	V.B.3 Curbs and Berms	"Curbs and Berms, Residential and Limited Residential Streets" section states, "Bituminous concrete berms shall be required on all finished grades over 5%."

		Waived to allow open drainage on the east side of the private way without curbing. Public Interest: This waiver promotes the public interest by allowing the proposed stormwater management system to properly function as designed in accordance with MassDEP stormwater standards.
7	V.B.4 Walkways	"Five foot width walkways shall be installed wherever required." **Waived** to require no walkways. Public Interest: This waiver promotes the public interest by enabling the project to be in keeping with the neighborhood where there are very few sidewalks.
8	V.B.13 Lighting	"Street lights shall be installed as recommended by the Planning Board…" **Waived** not to require street lights. Public Interest: This waiver promotes the public interest by enabling the project to be in keeping with a rural neighborhood by not requiring lights on a private way.

V. Vote

Constituting a majority of the Planning Board, on September 15, 2020, the following members voted to approve the application for Definitive Subdivision Approval with revised Plans all as subject to a written decision with findings and conditions: Ira Montague, Andrew Reck, Kevin Murphy, and Jennifer Steel.

DATE OF FILING OF DECISION:

9-17-2020
Date

BY ORDER OF THE BOARD

Ira Montague, Chair

CERTIFICATION:

The Planning Board, by delivery of a copy of this Decision to the Applicant Ross Wilkinson does hereby certify that a copy of this Decision has been filed with the Town Clerk of the Town of **Wayland on September 17, 2020.**

Long Term Pollution Prevention & Stormwater System Operation and Maintenance Plan

Five Paths
Tax Map 39, Parcel 15A
Wayland, MA

July 2019
Rev 1 – 7/14/2020

Submitted to:
Wayland Planning Board
41 Cochituate Road
Wayland, MA 01778

Submitted by:
Ross C. Wilkinson, Personal Representative,
Estate of Paula D. Wilkinson
P.O. Box 98
Wilton, NH 03086

Prepared by:
Goldsmith, Prest & Ringwall, Inc.
39 Main Street, Suite 301
Ayer, MA 01432

Project No:
171053

GPR Engineering Solutions for Land & Structures

LONG TERM POLLUTION PREVENTION AND STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Preface:

The goal of this manual is to improve water quality by initiating performance standards for the operation and maintenance of stormwater management structures, facilities, and recognized practices. The stormwater performance standards are set up to meet the statutory and regulatory authorities of the Department of Environmental Protection, including the Wetland Protection Act, surface water discharge permits under the Clean Waters Act, the 401 certification program for fill in wetlands, and the 401 certification of federal permits based on the water quality standards.

The local Conservation Commission and the Department of Environmental Protection are responsible for ensuring the protection of wetlands through the issuance of permits for activities in flood plains and in or near wetlands, as per the Wetlands Protection Act, MGL c.131 s. 40. Proposed work within a resource area or a one hundred (100') foot buffer zone requires an order of conditions.

Resource areas include freshwater and coastal wetlands, banks, beaches, and dunes bordering on estuaries, streams, riverfront, ponds, lakes, or the ocean; lands under any of these bodies of water; land subject to tidal action, coastal storm flowage, or flooding.

The discharge of pollutants to water of the Commonwealth without a permit is prohibited under the state Clean Waters Act, MGL c. 21, ss 26-53. Stormwater discharges are subject to regulations when two criteria are met under 314 CMR 3.04(2). First, there must be "conveyance or system of conveyances (including pipes, ditches, and channels) primarily used for collecting and conveying stormwater runoff." 314 CMR 3.04(2)(a). Second, the stormwater runoff must be "contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, or oil and grease," or, be designated on a case-by-case basis. Such designations must be made when the "stormwater discharge" is subject to effluent or toxic pollutant limitations, is located in an industrial plant area, or may be a significant contributor of pollutants to waters of the Commonwealth. Any activity resulting in a discharge to waters of the United States must comply with Section 401 of the Federal Clean Water Act and comply with state water quality standards. All stormwater discharges must be set back from the receiving waters or wetlands and best management practices (BMP) must be implemented. A permit is required for any stormwater discharge to an Outstanding Resource Water (ORW) which meets the regulatory definition in 314 CMR 3.04(2). Outstanding Resource Waters are defined under Surface Water Quality Standards 314 CMR 4.06 and include public surface water supplies, coastal and some inland Areas of Critical Environmental Concern (ACECs), and certified vernal pools.

This manual is set up to explain how to operate and maintain Best Management Practices that control erosion and minimize delivery of sediment and other pollutants to surrounding water and air.

Chapter 1 is an introduction to the site and describes the Best Management Practices used on this site.

Chapter 2 outlines the inspection and maintenance schedules for the site.

Chapter 3 shows the location of the Best Management Practices used on-site.

Chapter 4 outlines the operation and function of the Best Management Practices.

Chapter 5 describes how and when the Best Management Practices should be inspected and how frequently they must be maintained and cleaned.

1. Introduction:

This purpose of this project is to create a residential subdivision with 3 lots. Lot 1 shall be noted as the lot located on the northeastern portion of the project site adjacent to Shaw Drive. Lot 2 shall be noted as the lot located at the southwestern portion of the project site. Lot 3 shall be noted as the lot located at the south eastern portion of the project site. Each lot will be serviced by an onsite subsurface sewage disposal system and a public water supply. The development includes the construction of the three (3) 5-bedroom single-family dwellings, supporting utilities, stormwater management system, and associated clearing, grading, and grubbing. A proposed roadway “Five Paths Court” will provide access to each of the residential dwelling within the right of way.

The on-site stormwater runoff generated by the proposed impervious area (Pavement & roof) is to be collected and pre-treated prior to entering the two proposed Infiltration Chambers (IC) system. The Infiltration Chambers will provide sufficient stormwater infiltration and retention to mitigate the increase in overall impervious area from the proposed development per Massachusetts Stormwater Handbook.

To control erosion and minimize delivery of sediment and other pollutants into the atmosphere and adjacent wetlands, Best Management Practice (BMP) has been provided within the site’s stormwater management system. These practices include but are not limited to:

- Deep Sump Hooded Catch Basin
- Drainage Channel
- Infiltration Chamber
- Stone Diaphragm

This manual is designed to help responsible parties become aware of urban non-point pollution problems and to provide detailed information about operating and maintaining stormwater management practices. The success of the Best Management Practices is dependent on their continued operations and maintenance.

2. Maintenance Requirements:

BMP's Owners:

- The OWNERS of the BMP's shall be the person, persons, trust, corporation, etc., or their successors who have title to the land on which the BMP is located. It is anticipated that all BMP's will be owned and maintained by the owners of the subdivision. Should the title of land upon which they are located is transferred the purchaser of the property, at that time, will assume all responsibilities set forth within this document.

Operation and Maintenance Responsibilities:

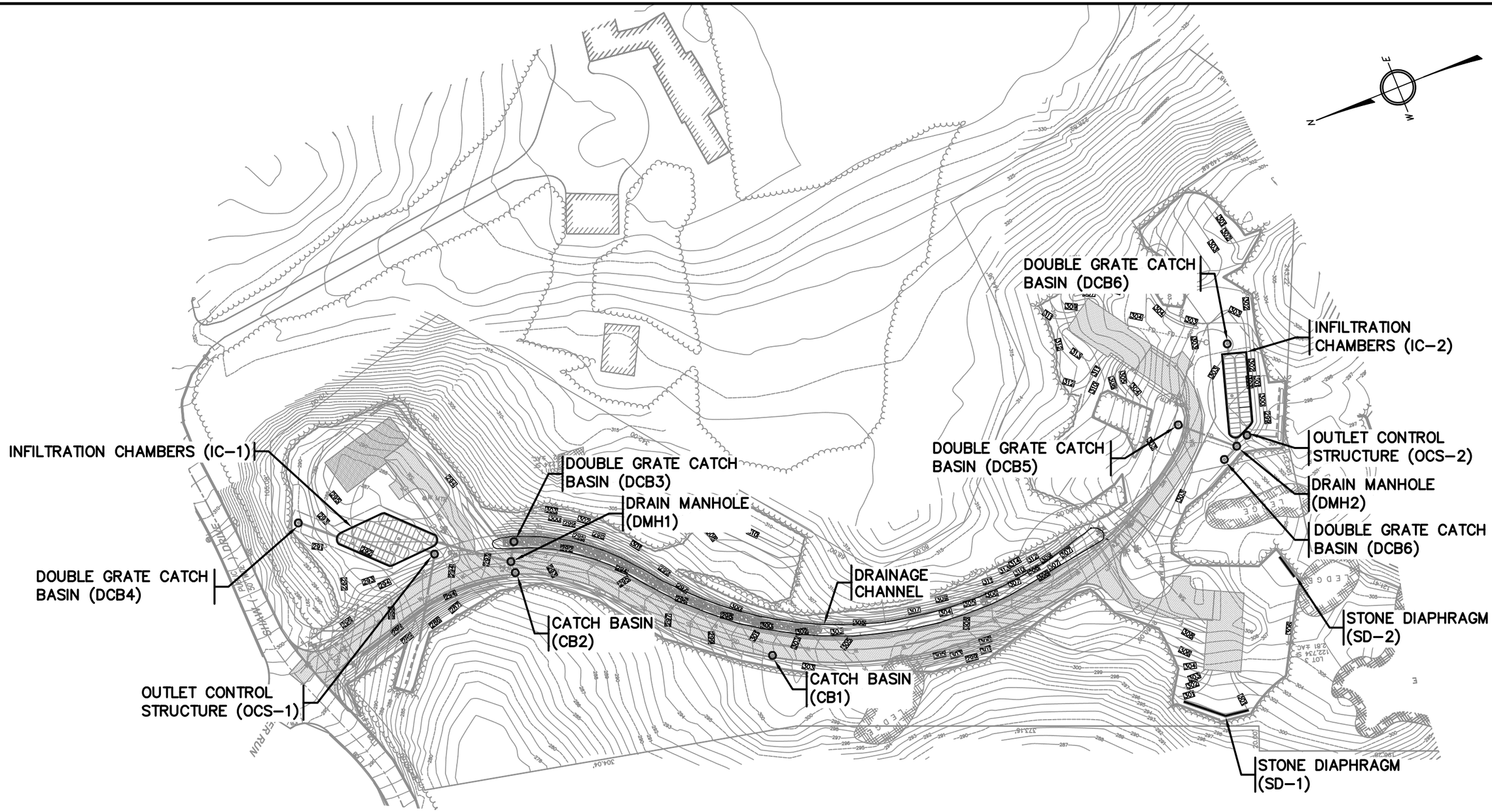
- The party or parties responsible for the funding, operation and maintenance of the BMP's shall be the OWNER or their designees.
- BMP's each have specific maintenance requirements to ensure long-term effectiveness. These stormwater management systems will be operated, inspected and maintained on a regular basis **by a qualified professional with expertise in inspecting drainage system components**. All of the stormwater BMP's shall be kept in good working order at all times.
- A maintenance agreement providing for the funding, operation and maintenance of all the stormwater management BMP's shall be provided.

Source of Funding for Operation and Maintenance:

- The party or parties responsible for the funding, operation and maintenance of the BMP's shall be the OWNER or their designees.
- A maintenance agreement providing for the funding, operation and maintenance of all the stormwater management BMP's shall be provided.
- Approximate estimated annual maintenance costs for the site are:
  - Deep Sump Hooded Catch Basins $250
  - Drainage Channel $250
  - Stone Diaphragm $500
  - Infiltration Chambers See manufacturer's manual

Schedule for Inspection and Maintenance:

* BMP's each have specific maintenance requirements to ensure long-term effectiveness. These stormwater management systems will be operated, inspected and maintained on a regular basis in accordance with this manual. All of the stormwater BMP's shall be kept in good working order at all times.
* As a minimum, the OWNER shall follow the general guidelines outlined herein for the BMP's provided on this site.
* An Operation and Maintenance log must be maintained for the last three years, outlining inspections, repairs, replacement and disposal for each Best Management Practice (BMP). In the case of disposal, the log shall indicate the type and material and the disposal location. This rolling log shall be made available to the Mass DEP and/or the Wayland Conservation Commission upon request.



GRAPHIC SCALE

80 0 40 80 160

(IN FEET)

1 INCH = 80 FEET

GPR

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CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING

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www.gpr-inc.com

PREPARED FOR:

ROSS C. WILKINSON, PERSONAL REP.,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DESIGNED BY: LT | CHECKED BY: KFB

DATE: REV 2 – JULY 13, 2020

BEST MANAGEMENT PRACTICES (BMP) LOCUS

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

PROJECT: 171053

P:\17---\171053\DWG\PERMIT\DEF SUB2 DRAINAGE.DWG 07-13-20 11:57:07 AM – LAYOUT BMP

4. Operation of Best Management Practices:

Deep Sump Hooded Catch Basins – are underground concrete structures which are designed to retain removed trash, debris and coarse sediment from stormwater runoff and serve as temporary spill containment devices for floatables such as oil and greases prior to discharge into a storm sewer pipe. The functions of a deep sump hooded catch basin include:

- A grate and/or vertical notch found in the curbing, that allow stormwater to enter the structure while filtering out larger objects such as trash and leaves;
- A four-foot (minimum) sump below the invert of the storm sewer pipe provides an area for detention time which allows sands and other sediments to settle out of the runoff prior to discharge.

Drainage Channel – are traditional vegetated open channels that are designed to provide for non-erosive conveyance of stormwater runoff. The functions of the drainage channels include:

- Vegetated, stormwater conveyance;
- Compatible with LID design practices and accents landscaping;

Infiltration Chambers – are subsurface plastic chambers with an open bottom and laid over a field of crushed stone bed which allow for the recharge of treated runoff into the groundwater. The functions of the infiltration chambers include:

- Provide groundwater recharge;
- Reduce local flooding;
- Preserve the natural water balance of the site

Stone Diaphragm – is a crushed stone trench that is open to the surface that collects stormwater runoff from lawn area and other “clean” runoff. The stone trench will allow stormwater to infiltration into the groundwater prior to filling up and overflowing. The functions of Stone Diaphragm include:

- Provide some groundwater recharge;
- Provide some stormwater retention;

5. Inspection and Maintenance of Best Management Practices:

Deep Sump Hooded Catch Basins and Drain Manholes - at a minimum, deep sump hooded catch basins and drain manholes shall be inspected four times per year. Ideally, inspection should be conducted at the end of the foliage and snow removal seasons, with remaining inspections at regular intervals between these times. Each structure should be cleaned whenever the depth of sediment deposits is greater than or equal to one half the depth of the sump from the bottom of the structure to the bottom of the lowest pipe invert, or at a minimum once per year. Structures shall be inspected for a buildup of sediments, oils and debris, cracks, breaks, or deformations. Any function of the catch basin and drain manhole that is not in working order will be replaced with similar materials, as per the detail, to prevent the storm sewer system from failing.

The catch basins and drain manholes shall be cleaned by means of hand held shovels, scallop

shovel and/or vactor truck. The grate opening shall be clear of any foreign or lodged object. Sands and salts used in the winter will be removed from the catch basin sumps in the early spring. Leaves, pine needles, and branches brought down by autumn winds, rain, and cold weather will be removed from the catch basin and drain manhole sumps in the late fall.

Collected sediment and debris will be properly disposed of per local, state and federal requirements. Any sediment and debris removed from a catch basin deemed to be contaminated must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

Drainage Channels - At a minimum, the drainage channel shall be inspected after every major storm event (1-inch of rain or greater) for the first six (6) months and twice per year thereafter. Sediment and debris shall be removed from the drainage channel once per year. Sediment should be removed from the channel by hand methods in a manner to limit the disturbance of vegetation and underlying soils. Grass within the channel shall be mowed as necessary to maintain the grass height between three (3) and six (6) inches. Remove grass clippings and inspect for signs of erosion and the formation of rills and/or gullies. Reseed or re-sod with an alternative grass species if the original grass cover is not successfully established. When reseeding, incorporate practices such as hydroseeding with a tackifier, blanket or similar practice to ensure that no scour occurs in the drainage channel, while the seeds germinate and develop roots.

Collected sediment and debris will be properly disposed of per local, state and federal requirements. Any sediment and debris removed from the drainage channel deemed to be contaminated must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

Infiltration Chambers – At a minimum shall be inspected after every major storm event (1-inch of rain or greater) for the first six (6) months, then in the spring and fall of every year, thereafter. Note how long water remains standing in basin after a storm; standing water within the basin >72 hours after storm events suggests potential clogging and should be immediately addressed. Also, check for signs of differential settlement, cracking, erosion, leakage in embankments, tree growth in embankments, condition of riprap, sediment accumulation and the health of the turf.

Infiltration basins shall be mowed a minimum of twice per year. Grass clippings and accumulated organic matter should be removed to a non-sensitive area. Repairs and reseeding should be done as required. Sediment and debris should be removed manually when infiltration basin is thoroughly dry, a minimum of once per year or when the sediment level reaches a depth of 3”.

Collected sediment and debris will be properly disposed of per local, state and federal requirements. Any sediment and debris removed from the infiltration basin deemed to be contaminated must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

Stone Diaphragm – inspect the stone diaphragm after the major storms and every 6 months. Remove any debris that may clog the surface of the stone diaphragm. Water ponding up inside the stone trench may indicate that the bottom of the stone diaphragm has failed. To rehabilitate a fail trench, all accumulated sediment must be stripped from the bottom, the bottom of the trench must be scarified and tilled to induce infiltration and all stone aggregate and filter fabric must be removed and replaced.

Collected sediment and debris will be properly disposed of per local, state and federal requirements. Any sediment and debris removed from the constructed stormwater wetlands deemed to be contaminated must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

MC-4500 CHAMBER

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

STORMTECH MC-4500 CHAMBER
(not to scale)

Nominal Chamber Specifications

Size (L x W x H)
52” x 100” x 60”
1321 mm x 2540 mm x 1524 mm

Chamber Storage
106.5 ft^3 (3.01 m^3)

Min. Installed Storage*
162.6 ft^3 (4.60 m^3)

Weight
Nominal 125 lbs (56.7 kg)

Shipping
7 chambers/pallet
5 end caps/pallet
11 pallets/truck

*Assumes a minimum of 12” (300 mm) of stone above, 9” (230 mm) of stone below chambers, 9” (230 mm) of stone between chambers/end caps and 40% stone porosity.

STORMTECH MC-4500 END CAP
(not to scale)

Nominal End Cap Specifications

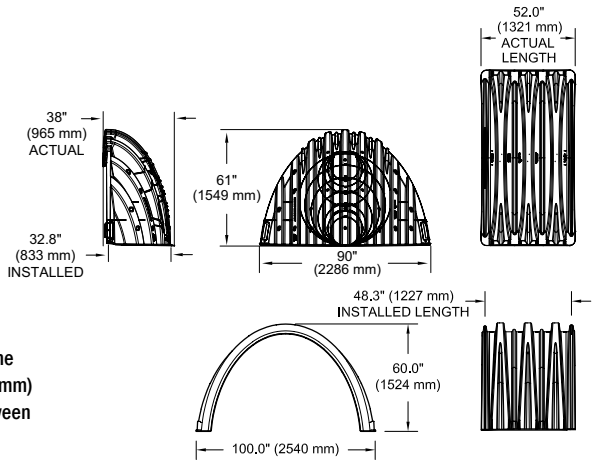
Size (L x W x H)
38” x 90” x 61”
965 mm x 2286 mm x 1549 mm

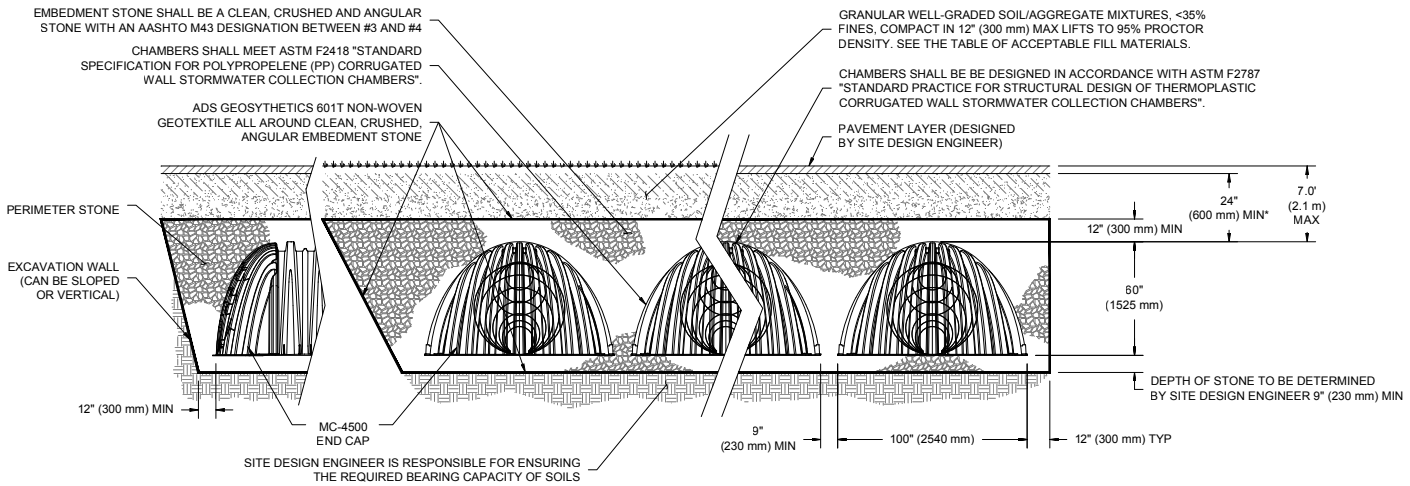
End Cap Storage
39.5 ft^3 (1.12 m^3)

Min. Installed Storage*
115.3 ft^3 (3.26 m^3)

Weight
Nominal 90.0 lbs (40.8 kg)

*Assumes a minimum of 12” (300 mm) of stone above, 9” (230 mm) of stone below, 12” (300 mm) of stone perimeter, 9” (230 mm) of stone between chambers/end caps and 40% stone porosity.





*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

MC-4500 CHAMBER SPECIFICATIONS

STORAGE VOLUME PER CHAMBER FT³ (M³)

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)			
		9" (230 mm)	12" (300 mm)	15" (375 mm)	18" (450 mm)
MC-4500 Chamber	106.5 (3.01)	162.6 (4.60)	166.3 (4.71)	169.9 (4.81)	173.6 (4.91)
MC-4500 End Cap	39.5 (1.12)	115.3 (3.26)	118.6 (3.36)	121.9 (3.45)	125.2 (3.54)

Note: Assumes 9" (230 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume. End cap volume assumes 12" (300 mm) stone perimeter in front of end cap.

AMOUNT OF STONE PER CHAMBER

ENGLISH TONS (yds³)	Stone Foundation Depth			
	9"	12"	15"	18"
MC-4500 Chamber	7.4 (5.2)	7.8 (5.5)	8.3 (5.9)	8.8 (6.2)
MC-4500 End Cap	9.8 (7.0)	10.2 (7.3)	10.6 (7.6)	11.1 (7.9)
METRIC KILOGRAMS (m³)	230 mm	300 mm	375 mm	450 mm
MC-4500 Chamber	6713 (4.0)	7076 (4.2)	7529 (4.5)	7983 (4.7)
MC-4500 End Cap	8890 (5.3)	9253 (5.5)	9616 (5.8)	10069 (6.0)

Note: Assumes 12" (300 mm) of stone above and 9" (230 mm) row spacing and 12" (300 mm) of perimeter stone in front of end caps.

VOLUME EXCAVATION PER CHAMBER YD³ (M³)

	Stone Foundation Depth			
	9" (230 mm)	12" (300 mm)	15" (375mm)	18" (450 mm)
MC-4500 Chamber	10.5 (8.0)	10.8 (8.3)	11.2 (8.5)	11.5 (8.8)
MC-4500 End Cap	9.7 (7.4)	10.0 (7.6)	10.3 (7.9)	10.6 (8.1)

Note: Assumes 9" (230 mm) of separation between chamber rows, 12" (300 mm) of perimeter in front of the end caps, and 24" (600 mm) of cover. The volume of excavation will vary as depth of cover increases.

Working on a project?
Visit us at www.stormtech.com
and utilize the StormTech Design Tool

For more information on the StormTech MC-4500 Chamber and other ADS products, please contact our Customer Service Representatives at 1-800-821-6710

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1-800-821-6710 www.ads-pipe.com

Best Management Practices (BMP) Inspection Log

General Information			
Project Name	Five Path		
Location	Tax Map 39, Parcel 15A, Wayland, MA		
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			
Type of Inspection: ❑ Regular ❑ Emergency			
Weather Information			
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds ❑ Other: Temperature:			
Are there any discharges at the time of inspection? ❑Yes ❑No **If yes, describe:**			

Site-specific BMPs

- *The structural BMPs are identified on the BEST MANAGEMENT PRACTICES LOCUS included within the LONG TERM POLLUTION PREVENTION & STORMWATER SYSTEM OPERATION & MAINTENANCE PLAN. Carry a copy of the Locus map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.*
- *Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		❑Yes ❑No	❑Yes ❑No	
2		❑Yes ❑No	❑Yes ❑No	
3		❑Yes ❑No	❑Yes ❑No	
4		❑Yes ❑No	❑Yes ❑No	
5		❑Yes ❑No	❑Yes ❑No	
6		❑Yes ❑No	❑Yes ❑No	
7		❑Yes ❑No	❑Yes ❑No	
8		❑Yes ❑No	❑Yes ❑No	
9		❑Yes ❑No	❑Yes ❑No	
10		❑Yes ❑No	❑Yes ❑No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are discharge points and receiving waters free of any sediment deposits?	❑Yes ❑No	❑Yes ❑No	
2	Are storm drain inlets properly working?	❑Yes ❑No	❑Yes ❑No	
3	Is trash/litter from site areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No	
4	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No	
5	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No	
5	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No	
6	(Other)	❑Yes ❑No	❑Yes ❑No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

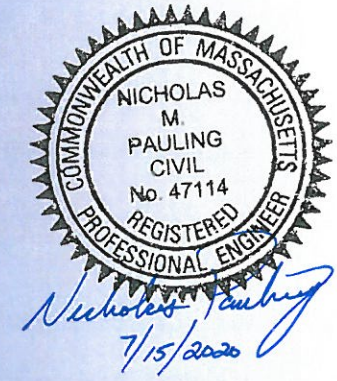
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Signature:_____ Date:_____

Stormwater Management Report

Five Paths
Tax Map 39, Parcel 15A
Wayland, MA



July 2019
Rev 1 – July 14, 2020

Submitted to:
Wayland Planning Board
41 Cochituate Road
Wayland, MA 01778

Submitted by:
Ross C. Wilkinson, Personal Representative,
Estate of Paula D. Wilkinson
P.O. Box 98
Wilton, NH 03086

Prepared by:
Goldsmith, Prest & Ringwall, Inc.
39 Main Street, Suite 301
Ayer, MA 01432

Project No:
171053

GPR Engineering Solutions for Land & Structures

Table of Contents

Attachments

"Residential Subdivision - Definitive Plan - Five Paths Tax Map #39, Parcel 15A"
prepared for Ross C. Wilkinson Personal Representative, Estate of Paula D. Wilkinson.
Dated July 2019. Last revised July 14, 2020.

Long-Term Pollution Prevention Plan & Stormwater System Operation and Maintenance Plan,
Dated July 2019. Last revised July 14, 2020.

Introduction and Methodology

This drainage narrative is intended to accompany plans for the proposed residential subdivision named Five Paths, located between Shaw Drive and Woodridge Road in Wayland, MA. Drainage has been evaluated to comply with the Massachusetts Stormwater Management Handbook and the Town of Wayland Bylaws. Site specific information has been evaluated under two scenarios, "pre-development" and "post-development" to match the Definitive Subdivision Plan as designed on the accompanying drawings.

Evaluations of these conditions have been done so that potential impacts due to the project can be identified, quantified, and mitigated to the extents practicable. Summary data and calculations are provided herein and on drawing entitled "Drainage Plan" reflecting the hydrologic and hydraulic modeling of the stormwater management system that has been completed for the project.

The final design intent seeks to meet the following interrelated goals:

1. Limit stormwater runoff rates for the 0.5", 1.0", 2-, 10-, 25- and 100-year storm events to existing (pre-development) levels;

2. Limit post-development peak stormwater runoff volumes for the 2-year, 10-year storm, 25-year, and 100-year storm events to existing (pre-development) levels.

3. Evaluate potential on- and off-site flooding during the 100-year storm event due to proposed development;

4. Maintain or increase the volume of stormwater recharged per storm event to those of existing (pre-development) levels;

5. Prevent appreciable sediment and other suspended solids and contaminants transport by trapping them on site via Best Management Practices;

6. Provide adequate drainage for new surfaces;

7. Maintain existing drainage patterns while providing a cost-effective engineering solution that addresses regulatory as well as real-world constraints.

8. Protect final graded surfaces and outfalls with adequate energy dissipation and erosion control.

Site Description

This proposed residential subdivision is located off Shaw Drive in southern Wayland. The project site area is a 6.5± acre portion of a 13.7± acre parcel currently identified on Wayland Assessor's Map 39, Parcel 015A. The 7.2± acres of Parcel 39-015A not being developed for subdivision are designated as "Remaining Lands of Wilkinson." None of Parcel 39-15A is currently developed, and

the parcel consists primarily of mixed evergreen and deciduous forest with some large rock outcrops.

The site is located on rolling terrain, rising in elevation 54± vertical feet from the lowest point in the northwest corner at Shaw Drive to the highest point at the southern limit of the subdivision. The land has a primary ridge running from southwest to northeast, splitting into two main watersheds draining generally west and south. A topographic saddle point at the southern end of the subject property, along with some bedrock ledge outcrops, creates several smaller sub-watersheds. The land typically slopes at approximately 10% to 16%, with internal undulations creating some leveling areas containing lesser slopes ranging between 3% to 5%.

Available NRCS soils mapping for the project and surrounding areas shows consistent soils, ranging from Hydrologic Soil Group (HSG) A & D. 45% of the soils consists of gravelly Narragansett loamy sand, which has a Hydraulic soil group of A. The remainder of the is a mixture of Hollis rock complex and ledge, both classified as a HSG D. Onsite soil evaluations done during subsurface sewage design were comprised of a gravelly sandy loam and loamy sand base with less than 15% cobble and boulders. These soil classifications, along with other listed characteristics in the logs reveal that the overall mapping is consistent with the field evaluation.

When determining the most appropriate HSG for overall hydrologic analysis, HSG C was selected on the basis that the results be conservative in nature yet provide as realistic a characterization of the hydraulic conductivity of the soils as possible. The NRCS soil map unit data was considered along with the Part 630, Chapter 7 “Hydrologic Soil Groups” of the National Engineering Handbook (NEH). According to this handbook, the range of saturated hydraulic conductivity of the least impermeable layer placed the soil map’s conductivity range between HSG B and HSG C. Since the lower end of the Narragansett’s conductivity range is less than the lower limit of the HSG B from the NEH, and the fact that there was a noticeable amount of cobbles and boulders, HSG C was selected for analysis.

Test holes dug in stormwater retention and infiltration basins revealed deeper sand and loamy sand deposits that are more consistent the HSG A characteristics of Narragansett. The localized pockets of HSG A soils are consistent with an overall HSG C for the whole site due to the other aspects observed. HSG A infiltration rate of 2.41 in/hr per the Rawl’s Chart for drainage have therefore been applied within stormwater infiltration areas.

To evaluate the site drainage conditions from pre-development to post-development, the project site has been divided into four subcatchment areas (SC1.0, SC2.0, SC3.0 and SC4.0) and their associated analysis point (AP1, AP2, AP3 and AP4) under the pre-development scenario, as shown on the plan entitled “WATERSHED MAP – EXISTING CONDITIONS”, see attached.

SC1.0 outlines a subcatchment area located on the north portion of the project site adjacent to Shaw Drive. SC1.0 generally flows north and west towards a low point located at the northwestern corner of the project site and shall be noted as AP1.

SC2.0 outlines a subcatchment area located at the southwestern portion of the project site and generally flows west onto the adjacent property and shall be noted as AP2.

SC3.0 outlines a subcatchment area located on the southeastern portion of the project site and generally flows south onto the adjacent property and shall be noted as AP3.

SC4.0 outlines a subcatchment area located on the southern portion of the project site between SC2.0 and SC3.0, and generally flows south onto the adjacent property and shall be noted as AP4.

Project Description

This purpose of this project is to create a residential subdivision with 3 lots. Lot 1 shall be noted as the lot located on the northeastern portion of the project site adjacent to Shaw Drive. Lot 2 shall be noted as the lot located at the southwestern portion of the project site. Lot 3 shall be noted as the lot located at the south eastern portion of the project site. Each lot will be serviced by an onsite subsurface sewage disposal system and municipal service connection. The development includes the construction of the three (3) 5-bedroom single-family dwellings, supporting utilities, stormwater management system, and associated clearing, grading and grubbing. A proposed roadway “Five Paths Court” will provide access to each of the residential dwelling within the right of way.

The on-site stormwater runoff generated by the proposed impervious area (Pavement & roof) is to be collected and pre-treated prior to entering the two proposed Infiltration Chambers (IC) system. The Infiltration Chambers will provide sufficient stormwater infiltration and retention to mitigate the increase in overall impervious area from the proposed development per Massachusetts Stormwater Handbook.

Under the post-development scenario, the project has been divided into (14) subcatchment areas shown on the plan entitled “WATERSHED MAP – PROPOSED CONDITIONS”, see attached.

SC1.1 outlines an area draining into a double grate catch basin (DCB4), which will drain directly into the Infiltration Chambers (IC-1) located on Lot 1. SC1.1 will capture a portion of the existing pavement and wooded area from the adjacent property east of the project site, proposed roof runoff and a portion of the proposed paved driveway of the proposed single-family dwelling on Lot 1.

SC1.2 outlines an area consisting of a portion of the existing paved driveway and roof runoff from the adjacent property, a portion of the proposed driveway from Lot 1, grass and wooded area, and a portion of the proposed roadway. SC1.2 will be collected by a double grate catch basin (DCB3) and continue to flow into a drain manhole (DMH1) which will ultimately flow into IC-1.

SC1.3 and SC1.4 outline a portion of the proposed roadway to be collected by two catch basins located on the proposed roadway (CB2 and CB1 respectively). Both catch basins will flow into DMH1 similar to DCB3.

SC1.5 outlines an area that is mostly undisturbed except for tree clearing as required to construct the proposed roadway and Pipe End Structure (PES-1). The Pipe End Structure is an overflow outlet structure for IC-1, which will allow any overflow out of IC-1 to continue to flow towards AP1.

SC1.6 outlines an area of the proposed roadway coming off the edge of pavement of Shaw Drive. Stormwater runoff from SC1.6 is separated from the rest of the other subcatchments by a high point on Five Paths Court, in order to keep stormwater runoff the development separate from Shaw Drive. Stormwater runoff from SC1.6 is limited to approximately 622± sq. ft. of untreated pavement runoff.

SC2.1 outlines an area consisting of the proposed roof runoff from the proposed building on Lot 2 and a portion of the lawn that will get collected by a stone diaphragm (SD-1). SD-1 is a shallow structure that can retain stormwater runoff prior to overflowing and allowing runoff to continue downhill and into AP2.

SC2.2 outlines an area outside of SC2.1, consisting of existing wooded area and lawn area of the proposed residential building of Lot 2. SC2.2 will remain mostly undisturbed except for tree clearing for the lawn area and will continue to flow into AP2 similar to pre-development.

SC3.1 outlines an area consisting of the existing roof runoff, lawn area, and wooded area from the adjacent property east of the project site, as well as a portion of the roof runoff from the proposed building on Lot 3 and lawn area. Runoff from SC3.1 will be collected by a double grate catch basin (DCB5) and continue into a drain manhole (DMH2), which will ultimately discharge into an Infiltration Chamber system (IC-2) located south of the proposed building on Lot 3.

SC3.2 outlines an area consisting of wooded area, lawn area and a portion of the proposed building roof on Lot 3. Runoff from SC3.2 will get collected by a double grate catch basin (DCB7) and flowing directly into the Infiltration chambers (IC-2).

SC3.3 outlines an area that is mostly undisturbed with the exception for tree clearing as needed for the construction of the proposed onsite septic leaching area and Infiltration Chambers (IC-2) near the proposed building of Lot 3. SC3.3 will continue to flow into AP3 similar to pre-development.

SC3.4 outlines an area that that is mostly lawn area and a portion of the driveway runoff from Lot 2. Runoff from SC3.4 will get collected by a double grate catch basin (DCB6) and flow into a drain manhole (DMH2), similar to SC3.1.

SC4.1 outlines the lawn area for Lot 2 that will get collected by a stone diaphragm (SD-2) to retain the stormwater runoff generated by the tree clearing. SD-2 will overflow and allow runoff to continue downhill and into AP4.

SC4.2 outlines an area that is mostly undisturbed that will continue to flow into AP4 similar to pre-development.

The proposed BMP’s have been designed in accordance with the Massachusetts Stormwater Standards, and the Town of Wayland Bylaws Chapter 193 to attenuate peak flows, retain runoff volumes, treat runoff from impervious surfaces and maintain groundwater recharge to predevelopment conditions.

Hydrologic and Hydraulic Computation Methodology

Runoff rates and volume were computed using the Soil Conservation Service TR-20 Method entitled “Urban Hydrology for Small Watersheds”. The following 24-hour rainfall events were analyzed:

Frequency: 0.5”, 1.0”, 2-yr, 10-yr, 25-yr and 100-yr

The rainfall depths for each storm were taken from the latest available updates from the Northeast Regional Climate Center (NRCC).

As outlined above, runoff from the site has been analyzed at four points under the pre-development and post-development conditions. As a standard for comparison, AP1, AP2, AP3 and AP4 are represented in both the pre and the post development cases.

Summary of Results

Peak discharge rates and volumes of the calculated runoff for both conditions analyzed are displayed in the HYDROLOGY SUMMARY that follows. As shown within the summary, the peak discharge rates at all four analysis points for all analyzed storm events are less than or equal to those under pre-development conditions with the exception for the peak discharge volume of the 0.5” and 1” storm events for AP1, AP2 and AP4.

The deep sump hooded catch basins, stone diaphragms and infiltration chambers work together to provide an expected site wide Total Suspended Solids (TSS) removal of 84%.

The infiltration chambers retain and infiltrate 6,481 cubic feet of runoff prior to discharging, well in excess of the minimum required 544 cubic feet occurring under existing conditions and displaced by the proposed development.

The proposed development meets the MADEP Stormwater Management Standards through the use of Best Management Practices that address groundwater recharge, water quality (first flush) retention, and suspended solids removal within sustainable BMP’s. See Appendix for computed solids quantities / removal process trains, and water quality runoff volumes.

HYDROLOGY SUMMARY FOR 24-HOUR STORM

Five Paths
Wayland, MA
Project No. 171053

PEAK DISCHARGE RATE

Pre-Development (cfs)

Analysis Point	.5"	1"	2-YR	10-YR	25-YR	100-YR
AP1	0.0	0.0	4.5	10.5	15.8	27.2
AP2	0.0	0.0	1.1	2.6	3.8	6.6
AP3	0.0	0.0	3.0	7.4	11.3	19.7
AP4	0.0	0.0	0.5	1.0	1.4	2.2

Development (cfs)

Analysis Point	.5"	1"	2-YR	10-YR	25-YR	100-YR
AP1	0.0	0.0	2.1	10.0	15.5	26.1
AP2	0.0	0.0	1.1	2.4	3.5	5.8
AP3	0.0	0.0	2.7	7.3	11.3	19.6
AP4	0.0	0.0	0.4	0.8	1.1	1.8

Pre-Development vs. Developed (cfs)

Analysis Point	.5"	1"	2-YR	10-YR	25-YR	100-YR
AP1	**0.0**	**0.0**	**-2.4**	**-0.5**	**-0.3**	**-1.1**
AP2	**0.0**	**0.0**	**0.0**	**-0.2**	**-0.3**	**-0.8**
AP3	**0.0**	**0.0**	**-0.3**	**-0.1**	**0.0**	**-0.1**
AP4	**0.0**	**0.0**	**-0.1**	**-0.2**	**-0.3**	**-0.4**

PEAK DISCHARGE VOLUME

Pre-Development (Cubic feet)

Analysis Point	**.5"**	**1"**	**2-YR**	**10-YR**	**25-YR**	**100-YR**
AP1	0	213	16,177	36,167	53,979	93,791
AP2	0	53	3,992	8,924	13,319	23,144
AP3	0	124	13,814	31,474	47,335	82,984
AP4	0	122	1,798	3,482	4,894	7,922

Development (Cubic feet)

Analysis Point	**.5"**	**1"**	**2-YR**	**10-YR**	**25-YR**	**100-YR**
AP1	16	71	9,137	30,413	49,176	90,983
AP2	0	74	3,456	7,554	11,176	19,178
AP3	0	40	9,469	27,435	43,464	79,448
AP4	14	165	1,768	3,412	4,783	7,719

Pre-Development vs. Developed (Cubic feet)

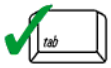
Analysis Point	.5"	1"	2-YR	10-YR	25-YR	100-YR
AP1	**16**	**-142**	**-7,040**	**-5,754**	**-4,803**	**-2,808**
AP2	**0**	**21**	**-536**	**-1,370**	**-2,143**	**-3,966**
AP3	**0**	**-84**	**-4,345**	**-4,039**	**-3,871**	**-3,536**
AP4	**14**	**43**	**-30**	**-70**	**-111**	**-203**

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

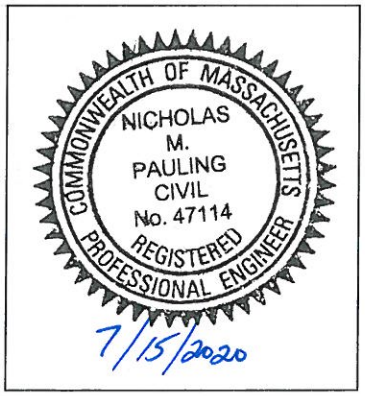
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



Nicholas Pauling 7/15/2020
Signature and Date

Checklist

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

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

☒ No disturbance to any Wetland Resource Areas

☒ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☒ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

Standard 9: Operation and Maintenance Plan

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

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

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

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

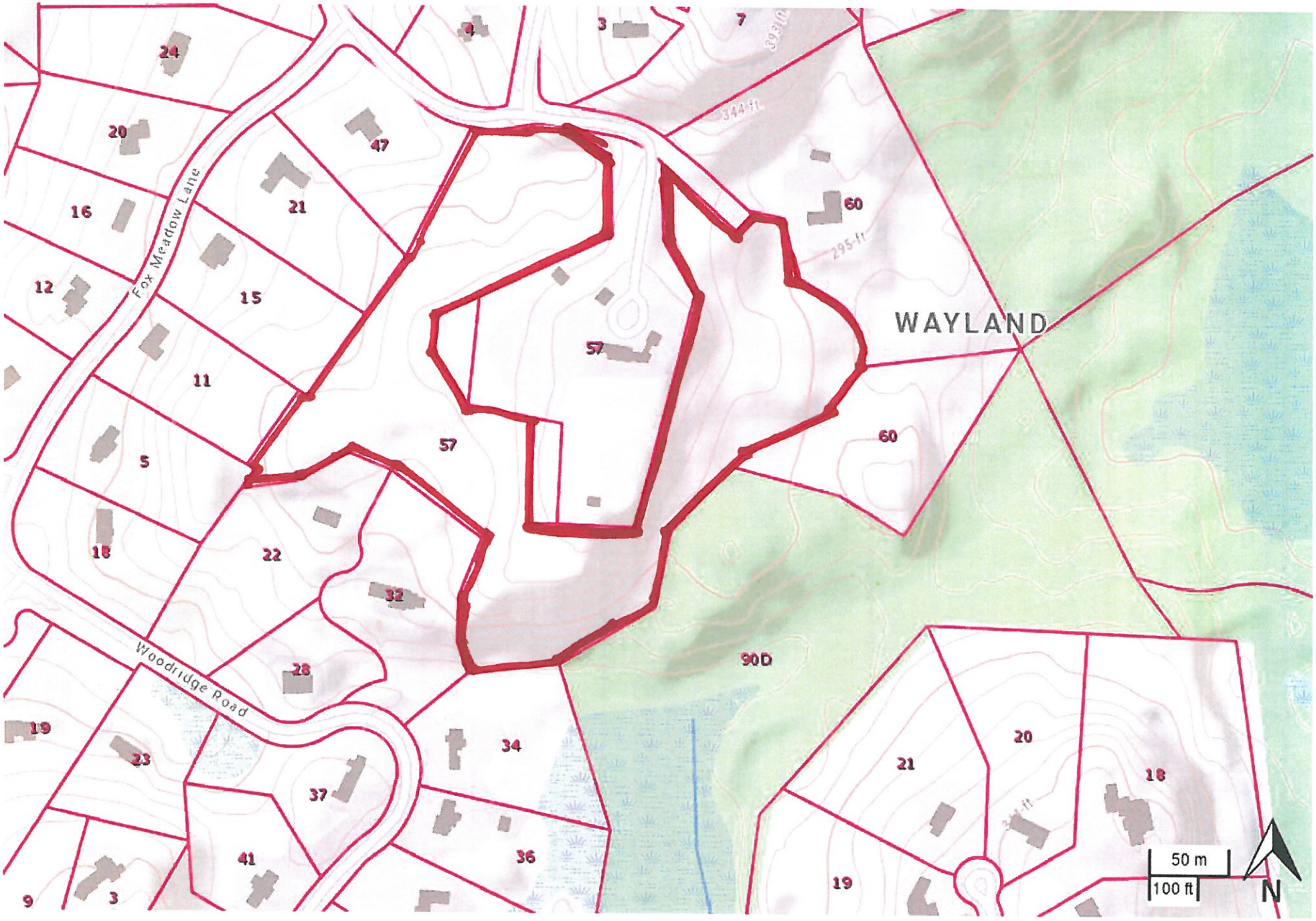
Standard 10: Prohibition of Illicit Discharges

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

☐ An Illicit Discharge Compliance Statement is attached;

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

ASSESSORS MAP



Custom Soil Resource Report
Soil Map

Map Scale: 1:3,680 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 19, Sep 12, 2019

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

Date(s) aerial images were photographed: Jul 28, 2019—Aug 15, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	0.2	0.4%
106C	Narragansett-Hollis-Rock outcrop complex, 3 to 15 percent slopes	25.2	43.7%
106D	Narragansett-Hollis-Rock outcrop complex, 15 to 25 percent slopes	29.5	51.1%
251B	Haven silt loam, 3 to 8 percent slopes	2.7	4.8%
Totals for Area of Interest		**57.6**	**100.0%**

FORM 11 - SOIL EVALUATOR FORM

No. 171053 Date: 8/31/18

Commonwealth of Massachusetts
Wayland Massachusetts

Soil Suitability Assessment for On-Site Sewage Disposal

Performed by: Jude Gauvin, GPR Date: 4/26/18
Witnessed by: Darren MacCaughney, RS, WBOH

Location Address:	Owner's Name: Ross Wilkinson
or Lot No. 57 Shaw Dr Wayland, MA	Address: 29 Collins Rd Wilton, NH 03086
	Telephone No.

New Construction ☑ Upgrade ☐ Repair ☐

Office Review

Published Soil Survey Available: No ☑ Yes ☐

Year Published Internet Publication Scale na Soil Map Unit 106 C/D
Soil Name Narragansett-Hollis-rock-outcrop Soil Limitations Depth to restrictive features, well drained
Soil Name Soil Limitations
Soil Name Soil Limitations

Surficial Geologic Report Available: No ☑ Yes ☐

Year Published MASS GIS Publication Scale
Geologic Material(Map Unit) Glacial Till
Landform Ground Morraine

Flood Insurance Rate Map: 25017C0528F

Above 500 Year Flood Boundary	No ☐	Yes ☑
Within 500 Year Flood Boundary	No ☑	Yes ☐
Within 100 Year Flood Boundary	No ☑	Yes ☐
Within Velocity Zone	No ☑	Yes ☐

Wetland Area:

National Wetlands Inventory Map (map unit) N/A
Wetlands Conservancy Program Map (map unit) N/A

Current Water Resource Conditions (USGS): Month May

Range: Above Normal ☐ Normal ☑ Below Normal ☐
Other Reference Reviewed USGS

Site Info.

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-1 Date: 04/26/18 Time: 8:30 AM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-1 NB 30/18 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-32	B	ls	10YR 5/6		roots, abk
32-88	C1	fsl	10YR 6/1	None	roots, loose
88-108	C2	ls	10YR5/4	@90	abk, mvfr

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >108"
Depth to Groundwater: Standing Water in the Hole 98" Weeping from Pit Face: 90"
Estimated Seasonal High Groundwater in the Hole 90"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-2 Date: 04/26/18 Time: 9:00 AM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-2 NB 30/18 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-24	B	ls	10YR 5/6		roots, abk
24-62	C1	fsl	10YR 6/1	None	roots, loose
62-112	C2	ls	10YR5/4	>112"	abk, mvfr

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >112"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >112"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-3 Date: 04/26/18 Time: 10:45 AM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-3 NB 30/18 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-34	B	ls	10YR 5/6	@116	mvfr, roots, abk
34-116	C	ls	10YR 5/4		mvfr, abk

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: 116"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole 116"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-4 Date: 04/26/18 Time: 10:30 AM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-4 NB 30/20 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-28	B	ls	10YR 5/6		roots, abk
28-56	C1	fsl	10YR 6/1		roots, loose
56-120	C2	ls	10YR5/4	@120	abk, mvfr

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: 120"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole 120"
Additional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-5 Date: 04/26/18 Time: 2:15 PM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-5 NB 30/20 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-28	B	ls	10YR 5/6		roots, mvfr
28-96	C	ls	10YR 5/4	@80"	mfr, 10% gravel

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >96"
Depth to Groundwater: Standing Water in the Hole 92" Weeping from Pit Face: 92"
Estimated Seasonal High Groundwater in the Hole 80"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-6 Date: 04/26/18 Time: 2:15 PM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-6 NB 30/20 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-6	A	sl	10YR 3/2		loose, cr, roots
6-22	B	ls	10YR 5/6		roots, mvfr
22-96	C	ls	10YR 5/4	@80"	mfr, 10% gravel

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >96"
Depth to Groundwater: Standing Water in the Hole 92" Weeping from Pit Face: 92"
Estimated Seasonal High Groundwater in the Hole 80"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-7 Date: 04/26/18 Time: 2:15 PM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-7 NB 30/20 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-6	A	sl	10YR 3/2		loose, cr, roots
6-24	B	ls	10YR 5/6		roots, mvfr
24-78	C	ls	10YR 5/4	@50"	mfr, 10% gravel

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >78"
Depth to Groundwater: Standing Water in the Hole 56" Weeping from Pit Face: 56"
Estimated Seasonal High Groundwater in the Hole 80"
Additional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-8 Date: 04/26/18 Time: 2:15 PM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-8 NB 30/20 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-48	B	ls	10YR 5/6		roots, mvfr
48-98	C	ls	10YR 5/4	@50"	mfr, 10% gravel

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >98"
Depth to Groundwater: Standing Water in the Hole 62" Weeping from Pit Face: 62"
Estimated Seasonal High Groundwater in the Hole 50"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-9 Date: 04/26/18 Time: 2:15 PM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-9 NB 30/20 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-34	B	ls	10YR 5/6		roots, mvfr
34-84	C	ls	10YR 5/4	@50"	mfr, 10% gravel

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: 84"
Depth to Groundwater: Standing Water in the Hole 76" Weeping from Pit Face: 76"
Estimated Seasonal High Groundwater in the Hole 50"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 418-10 Date: 04/26/18 Time: 2:15 PM Weather: Sunny 60°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 418-10 NB 30/20 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-34	B	ls	10YR 5/6		roots, mvfr
34-64	C	ls	10YR 5/4	@50"	mfr, 10% gravel

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: 64"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole 50"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot#: 57 Shaw Dr
Wayland, MA

Determination for Seasonal High Water Table

Method Used:

- ☐ Depth observed standing in observation hole ____ inches ____
- ☐ Depth weeping from side of observation hole ____ inches ____
- ☑ Depth to soil mottles * inches See individual Reports
- ☐ Ground water adjustment ____ feet ____

Index Well Number ____ Reading Date ____ Index Well Level ____

Adjustment Factor ____ Adjusted Ground Water Level ____

Depth of Naturally Occuring Pervious Material

Does at least four feet of naturally occuring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes

If not, what is the depth of naturally occuring pervious material? ____ Feet

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated, on the attached soil evaluation form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature [signature] Date 8/31/18

Notes: ____

Signature

FORM 12 - PERCOLATION TEST

Location Address:	Owner's Name: Ross Wilkinson
or Lot # 57 Shaw Dr Wayland, MA	Address: 29 Collins Rd Wilton, NH 03086
	Telephone No.

	04/26/18 (Date) 1:51 PM (Time)	04/26/18 (Date) 1:52 PM (Time)
Observation Hole #	418-A	418-B
Depth of Perc	46"	46"
Start Pre-Soak	1:51 PM	1:52 PM
End Pre-Soak	2:06 PM	2:07 PM
Time @ 12"	2:06 PM	2:07 PM
Time @ 9"	2:16 PM	2:29 PM
Time @ 6"	2:23 PM	2:48 PM
Time (9"-6")	7	19
Rate (Min./Inch)	3	7
	Test Passed: ☑ Test Failed: ☐	Test Passed: ☑ Test Failed: ☐

Test performed By: Jude Gauvin, GPR

Witnessed By: Darren MacCaughney, RS WBOH

Comments:

418-AB

FORM 12 - PERCOLATION TEST

Location Address:	Owner's Name: Ross Wilkinson
or Lot # 57 Shaw Dr Wayland, MA	Address: 29 Collins Rd Wilton, NH 03086
	Telephone No.

	04/26/18 (Date)	2:41 PM (Time)	04/27/18 (Date)	10:40 AM (Time)
Observation Hole #	418-C		418-D	
Depth of Perc	44"		58"	
Start Pre-Soak	2:41 PM		10:40 AM	
End Pre-Soak	2:56 PM		10:57 PM	
Time @ 12"	2:56 PM		10:57 PM	
Time @ 9"	3:15 PM		11:21 AM	
Time @ 6"	3:40 PM		11:51 AM	
Time (9"-6")	25		30	
Rate (Min./Inch)	9		10	
	Test Passed: ☑		Test Passed: ☑	
	Test Failed: ☐		Test Failed: ☐	

Test performed By: Jude Gauvin, GPR

Witnessed By: Darren MacCaughney, RS WBOH

Comments:

FORM 11 - SOIL EVALUATOR FORM

No. 171053 Date: 8/31/18

Commonwealth of Massachusetts
Wayland Massachusetts

Soil Suitability Assessment for On-Site Sewage Disposal

Performed by: Jude Gauvin, GPR Date: 5/31/18
Witnessed by: Darren MacCaughney, RS, WBOH

Location Address:	Owner's Name: Ross Wilkinson
or Lot No. 57 Shaw Dr Wayland, MA	Address: 29 Collins Rd Wilton, NH 03086
	Telephone No.

New Construction ☑ Upgrade ☐ Repair ☐

Office Review

Published Soil Survey Available: No ☑ Yes ☐
Year Published Internet Publication Scale na Soil Map Unit 106 C/D
Soil Name Narragansett-Hollis-rock-outcrop Soil Limitations Depth to restrictive features, well drained
Soil Name Soil Limitations
Soil Name Soil Limitations
Surficial Geologic Report Available: No ☑ Yes ☐
Year Published MASS GIS Publication Scale
Geologic Material(Map Unit) Glacial Till
Landform Ground Morraine

Flood Insurance Rate Map: 25017C0528F

Above 500 Year Flood Boundary	No ☐	Yes ☑
Within 500 Year Flood Boundary	No ☑	Yes ☐
Within 100 Year Flood Boundary	No ☑	Yes ☐
Within Velocity Zone	No ☑	Yes ☐

Wetland Area:
National Wetlands Inventory Map (map unit) N/A
Wetlands Conservancy Program Map (map unit) N/A

Current Water Resource Conditions (USGS): Month May
Range: Above Normal ☐ Normal ☑ Below Normal ☐
Other Reference Reviewed USGS

Site Info.

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 518-1 Date: 05/31/18 Time: 8:30 AM Weather: Sunny 76°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 518-1 NB 30/18 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-3	A	sl	10YR 3/2		loose, cr, roots
3-30	B	ls	10YR 5/6		mvfr, roots
30-92	C	ls	10YR 5/4		sabk, 20% gravel, vfirm

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >92"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >92"
Additional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 518-2 Date: 05/31/18 Time: 9:00 AM Weather: Sunny 76°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body >100 feet
Possible Wet Area >100 feet
Drinking Water Well >100 feet
Drainage Way >100 feet
Property Line >50 feet
Other:
feet

Deep Observation Hole Log

Hole # 518-2 NB 30/18 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-3	A	sl	10YR 3/2		loose, cr, roots
3-30	B	ls	10YR 5/6		mvfr, roots
30-99	C	ls	10YR 5/4		sabk, 20% gravel, vfirm

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >99"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >99"
Additional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 518-3 Date: 05/31/18 Time: 10:45 AM Weather: Sunny 76°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 518-3 NB 30/18 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-3	A	sl	10YR 3/2		loose, cr, roots
3-30	B	ls	10YR 5/6		mvfr, roots
30-102	C	ls	10YR 5/4		sabk, 20% gravel, vfirm

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >102"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >102"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 518-4 Date: 05/31/18 Time: 12:00 PM Weather: Sunny 76°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 518-4 NB 30/20 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-3	A	sl	10YR 3/2		loose, cr, roots
3-36	B	ls	10YR 5/6		mvfr, roots
36-108	C	ls	10YR 5/4		sabk, 20% gravel, vfirm

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >108"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >108"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 518-5 Date: 05/31/18 Time: 2:15 PM Weather: Sunny 76°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 518-5 NB 30/20 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-3	A	sl	10YR 3/2		loose, cr, roots
3-20	B	ls	10YR 5/6		roots, mfr, abk
20-62	C1	fs	10YR 6/1		loose, roots
62-100	C2	ls	10YR 5/4	@66"	sabk, 20% gravel, vfirm

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >100"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole 66"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot#: 57 Shaw Dr
Wayland, MA

Determination for Seasonal High Water Table

Method Used:

- ☐ Depth observed standing in observation hole ____ inches ____
- ☐ Depth weeping from side of observation hole ____ inches ____
- ☑ Depth to soil mottles * inches See individual Reports
- ☐ Ground water adjustment ____ feet ____

Index Well Number ____ Reading Date ____ Index Well Level ____

Adjustment Factor ____ Adjusted Ground Water Level ____

Depth of Naturally Occuring Pervious Material

Does at least four feet of naturally occuring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes

If not, what is the depth of naturally occuring pervious material? ____ Feet

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated, on the attached soil evaluation form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature _____ Date 8/31/18

Notes: _____

Signature

FORM 12 - PERCOLATION TEST

Location Address: or Lot # 57 Shaw Dr Wayland, MA	Owner's Name: Ross Wilkinson Address: 29 Collins Rd Wilton, NH 03086 Telephone No.

	5/31/18 Date / 12:51 PM Time	5/31/18 Date / 12:58 PM Time
Observation Hole #	518-A	518-B
Depth of Perc	53"	46"
Start Pre-Soak	12:51 PM	12:52 PM
End Pre-Soak	1:06 PM	1:07 PM
Time @ 12"	1:06 PM	1:07 PM
Time @ 9"	1:11 PM	1:12 PM
Time @ 6"	1:23 PM	1:19 PM
Time (9"-6")	12	7
Rate (Min./Inch)	4	3
	Test Passed: ☑ Test Failed: ☐	Test Passed: ☑ Test Failed: ☐

Test performed By: Jude Gauvin, GPR

Witnessed By: Darren MacCaughney, RS WBOH

Comments:

FORM 11 - SOIL EVALUATOR FORM

No. 171053 Date: 6/17/19

Commonwealth of Massachusetts
Wayland Massachusetts

Soil Suitability Assessment for On-Site Sewage Disposal

Performed by: Jude Gauvin, GPR Date: 6/12/19.
Witnessed by: Darren MacCaughney, RS, WBOH

Location Address:	Owner's Name: Ross Wilkinson
or Lot No. 57 Shaw Dr Wayland, MA	Address: 29 Collins Rd Wilton, NH 03086
	Telephone No.

New Construction ☑ Upgrade ☐ Repair ☐

Office Review

Published Soil Survey Available: No ☑ Yes ☐

Year Published Internet Publication Scale na Soil Map Unit 106 C/D

Soil Name Narragansett-Hollis-rock-outcrop Soil Limitations Depth to restrictive features, well drained

Soil Name _____ Soil Limitations _____

Soil Name _____ Soil Limitations _____

Surficial Geologic Report Available: No ☑ Yes ☐

Year Published MASS GIS Publication Scale _____

Geologic Material(Map Unit) Glacial Till

Landform Ground Morraine

Flood Insurance Rate Map: 25017C0528F

Above 500 Year Flood Boundary	No ☐	Yes ☑
Within 500 Year Flood Boundary	No ☑	Yes ☐
Within 100 Year Flood Boundary	No ☑	Yes ☐
Within Velocity Zone	No ☑	Yes ☐

Wetland Area:

National Wetlands Inventory Map (map unit) N/A

Wetlands Conservancy Program Map (map unit) N/A

Current Water Resource Conditions (USGS): Month June

Range: Above Normal ☐ Normal ☑ Below Normal ☐

Other Reference Reviewed USGS

Site Info.

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 619-1 Date: 06/12/19 Time: 9:00 AM Weather: Sunny 70°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc...)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body >100 feet
Possible Wet Area >100 feet
Drinking Water Well >100 feet
Drainage Way >100 feet
Property Line >50 feet
Other:
feet

Deep Observation Hole Log

Hole # 619-1 NB 30/108 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-31	B	sl	10YR 5/6		mvfr, roots
31-83	C	ls	10YR 5/4		sabk, 10% gravel, mvfr

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >83"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >83"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 619-2 Date: 06/12/19 Time: 9:30 AM Weather: Sunny 70°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 619-2 NB 30/108 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-30	B	sl	10YR 5/6		mvfr, roots
30-82	C	ls	10YR 5/4		sabk, 10% gravel, mvfr

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >82"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >82"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 619-3 Date: 06/12/19 Time: 10:00 AM Weather: Sunny 70°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 619-3 NB 30/110 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-26	B	sl	10YR 5/6		mvfr, roots
26-120	C	ls	10YR 5/4		sabk, 10% gravel, mvfr

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >120"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >120"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 619-4 Date: 06/12/19 Time: 10:30 AM Weather: Sunny 70°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 619-4 NB 30/110 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-25	B	sl	10YR 5/6		mvfr, roots
25-85	C	ls	10YR 5/4		sabk, 10% gravel, mvfr

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >85"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >85"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 619-5 Date: 06/12/19 Time: 11:00 AM Weather: Sunny 70°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc…)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body >100 feet
Possible Wet Area >100 feet
Drinking Water Well >100 feet
Drainage Way >100 feet
Property Line >50 feet
Other: feet

Deep Observation Hole Log

Hole # 619-5 NB 30/111 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-26	B	sl	10YR 5/6		mvfr, roots
26-90	C	ls	10YR 5/4		sabk, 10% gravel, mvfr

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >90"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >90"
Aditional Notes B horizon had pockets of fls 2.5Y 7/3

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot #: 57 Shaw Dr
Wayland, MA

On-Site Review

Deep Hole #: 619-6 Date: 06/12/19 Time: 11:30 AM Weather: Sunny 70°
Location (identify on site plan) See Attached Sketch
Land Use Woodland Slope (%) 2%-6% Surfaces Stones none
(eg woodland, agricultural field, vacant lot etc...)
Vegatation mixed hardwoods and pines
Landform Ground Morraine
Position on landscape See attached Sketch
Distances from:

Open Water Body	>100 feet	Drainage Way	>100 feet
Possible Wet Area	>100 feet	Property Line	>50 feet
Drinking Water Well	>100 feet	Other:	
			feet

Deep Observation Hole Log

Hole # 619-6 NB 30/111 Suface El.

Depth from Surface (inches)	Soil Horizon	Soil Texture (USDA)	Soil Color (MUNSELL)	Soil Mottling	Other (Stucture, Stones, Boulders, Consistency, % Gravel)
0-4	A	sl	10YR 3/2		loose, cr, roots
4-30	B	ls	10YR 5/6		mvfr, roots
30-90	C	ls	10YR 5/4		sabk, 10% gravel, mvfr

*MINIMUM OF 2 HOLES REQUIRED AT EVERY PROPOSED DISPOSAL AREA

Parent Material (geologic) Glacial Till Depth to Bedrock: >90"
Depth to Groundwater: Standing Water in the Hole None Weeping from Pit Face: None
Estimated Seasonal High Groundwater in the Hole >90"
Aditional Notes

FORM 11 - SOIL EVALUATOR FORM

Location Address or Lot#: 57 Shaw Dr
Wayland, MA

Determination for Seasonal High Water Table

Method Used:

- ☐ Depth observed standing in observation hole ____ inches ____
- ☐ Depth weeping from side of observation hole ____ inches ____
- ☑ Depth to soil mottles * inches See individual Reports
- ☐ Ground water adjustment ____ feet ____

Index Well Number ____ Reading Date ____ Index Well Level ____

Adjustment Factor ____ Adjusted Ground Water Level ____

Depth of Naturally Occuring Pervious Material

Does at least four feet of naturally occuring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes

If not, what is the depth of naturally occuring pervious material? ____ Feet

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated, on the attached soil evaluation form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature _____ Date 6/17/19

Notes: _____

Signature

FORM 12 - PERCOLATION TEST

Location Address: or Lot # 57 Shaw Dr Wayland, MA	Owner's Name: Ross Wilkinson Address: 29 Collins Rd Wilton, NH 03086 Telephone No.

	6/12/19 Date / 12:35 PM Time	6/12/19 Date / 12:36 PM Time
Observation Hole #	619-A	619-B
Depth of Perc	52"	52"
Start Pre-Soak	12:35 PM	12:36 PM
End Pre-Soak	12:50 PM	12:51 PM
Time @ 12"	12:50 PM	12:51 PM
Time @ 9"	12:53 PM	1:39 PM
Time @ 6"	12:58 PM	2:32 PM
Time (9"-6")	5	53
Rate (Min./Inch)	<2	18
	Test Passed: ☑ Test Failed: ☐	Test Passed: ☑ Test Failed: ☐

Test performed By: Jude Gauvin, GPR

Witnessed By: Darren MacCaughney, RS WBOH

Comments:

* over 24 gallons applied unable to soak

National Flood Hazard Layer FIRMette

FEMA

71°21'25"W 42°20'50"N

71°20'47"W 42°20'23"N

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

1:6,000

Legend

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

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

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

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

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

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

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

N

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

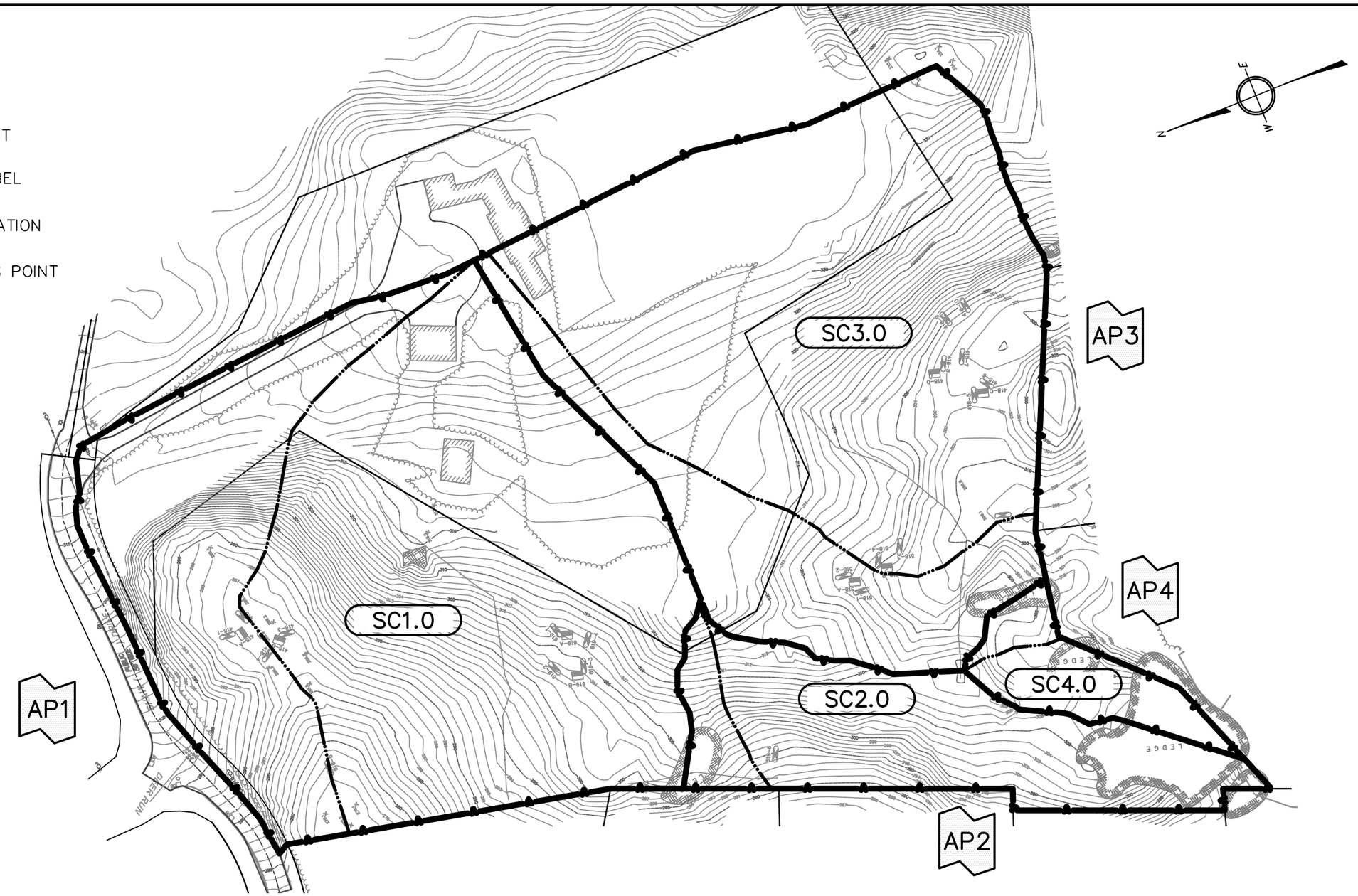
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/22/2020 at 3:53 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

LEGEND:

- DRAINAGE ARROW
- SUBCATCHMENT LIMIT
- SC–1 SUBCATCHMENT LABEL
- TIME OF CONCENTRATION
- AP1 DRAINAGE ANALYSIS POINT



GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

1 INCH = 100 FEET

GPR

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39 MAIN ST., SUITE 301, AYER, MA 01432

CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING

VOICE: 978.772.1590 FAX: 978.772.1591

www.gpr-inc.com

PREPARED FOR:

ROSS C. WILKINSON, PERSONAL REP.,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

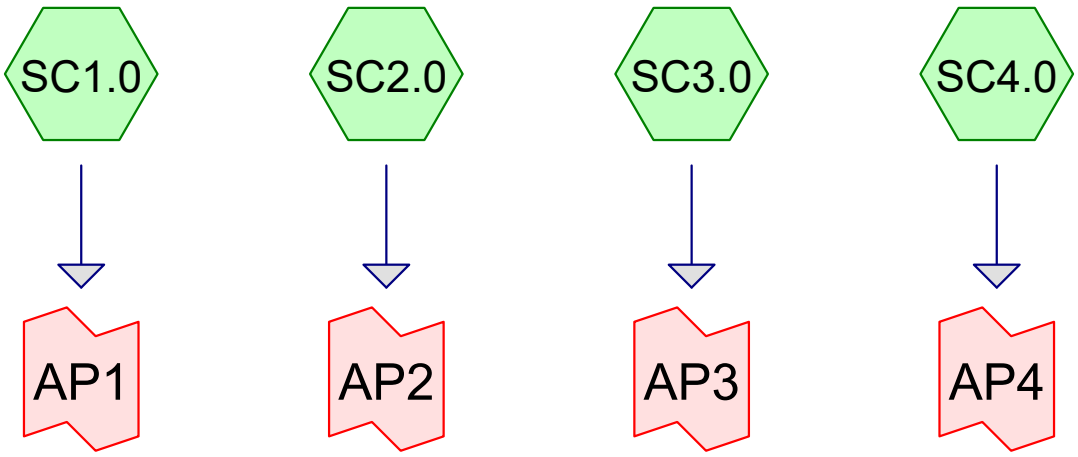
DESIGNED BY: LT | CHECKED BY: KFB

DATE: REV 1 – JUNE 25, 2020

WATERSHED MAP
EXISTING CONDITIONS

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

PROJECT: 171053 | 1 OF 1



Subcat Reach Pond Link

Routing Diagram for Pre-Dev
Prepared by Goldsmith, Prest & Ringwall, Inc., Printed 6/23/2020

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
63,276	74	>75% Grass cover, Good, HSG C (SC1.0, SC3.0)
7,450	98	Paved parking, HSG C (SC1.0, SC3.0)
3,874	98	Roofs, HSG C (SC1.0, SC3.0)
16,501	98	Unconnected pavement, HSG C (SC1.0, SC2.0, SC3.0, SC4.0)
387,184	70	Woods, Good, HSG C (SC1.0, SC2.0, SC3.0, SC4.0)
478,286	**72**	**TOTAL AREA**

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

Subcatchment SC1.0: Runoff Area=215,046 sf 4.94% Impervious Runoff Depth=0.00"
Flow Length=646' Tc=6.7 min CN=72 Runoff=0.0 cfs 0 cf

Subcatchment SC2.0: Runoff Area=53,073 sf 16.30% Impervious Runoff Depth=0.00"
Flow Length=190' Tc=7.2 min UI Adjusted CN=72 Runoff=0.0 cfs 0 cf

Subcatchment SC3.0: Runoff Area=195,127 sf 1.28% Impervious Runoff Depth=0.00"
Flow Length=642' Tc=12.6 min CN=71 Runoff=0.0 cfs 0 cf

Subcatchment SC4.0: Runoff Area=15,041 sf 40.25% Impervious Runoff Depth>0.00"
Flow Length=98' Tc=6.8 min CN=81 Runoff=0.0 cfs 0 cf

Link AP1: Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link AP2: Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link AP3: Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link AP4: Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Total Runoff Area = 478,286 sf Runoff Volume = 0 cf Average Runoff Depth = 0.00"
94.18% Pervious = 450,461 sf 5.82% Impervious = 27,826 sf

Summary for Subcatchment SC1.0:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
165,508	70	Woods, Good, HSG C
38,916	74	>75% Grass cover, Good, HSG C
778	98	Unconnected pavement, HSG C
7,395	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
215,046	72	Weighted Average
204,424		95.06% Pervious Area
10,622		4.94% Impervious Area
778		7.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.19		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.8	564	0.1046	1.62		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	646	Total			

Summary for Subcatchment SC2.0:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Adj	Description
8,651	98		Unconnected pavement, HSG C
44,422	70		Woods, Good, HSG C
53,073	75	72	Weighted Average, UI Adjusted
44,422			83.70% Pervious Area
8,651			16.30% Impervious Area
8,651			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.1	140	0.1714	2.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.2	190	Total			

Summary for Subcatchment SC3.0:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
168,267	70	Woods, Good, HSG C
24,360	74	>75% Grass cover, Good, HSG C
55	98	Paved parking, HSG C
1,425	98	Roofs, HSG C
1,019	98	Unconnected pavement, HSG C
195,127	71	Weighted Average
192,627		98.72% Pervious Area
2,499		1.28% Impervious Area
1,019		40.77% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.9	225	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.0	367	0.0599	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	642	Total			

Summary for Subcatchment SC4.0:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 0 cf, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
6,053	98	Unconnected pavement, HSG C
8,988	70	Woods, Good, HSG C
15,041	81	Weighted Average
8,988		59.75% Pervious Area
6,053		40.25% Impervious Area
6,053		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.7	48	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	98	Total			

Summary for Link AP1:

Inflow Area = 215,046 sf, 4.94% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP2:

Inflow Area = 53,073 sf, 16.30% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP3:

Inflow Area = 195,127 sf, 1.28% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP4:

Inflow Area = 15,041 sf, 40.25% Impervious, Inflow Depth > 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 24.00 hrs, Volume= 0 cf
Primary = 0.0 cfs @ 24.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment SC1.0: Runoff Area=215,046 sf 4.94% Impervious Runoff Depth>0.01"
Flow Length=646' Tc=6.7 min CN=72 Runoff=0.0 cfs 213 cf

Subcatchment SC2.0: Runoff Area=53,073 sf 16.30% Impervious Runoff Depth>0.01"
Flow Length=190' Tc=7.2 min UI Adjusted CN=72 Runoff=0.0 cfs 53 cf

Subcatchment SC3.0: Runoff Area=195,127 sf 1.28% Impervious Runoff Depth>0.01"
Flow Length=642' Tc=12.6 min CN=71 Runoff=0.0 cfs 124 cf

Subcatchment SC4.0: Runoff Area=15,041 sf 40.25% Impervious Runoff Depth>0.10"
Flow Length=98' Tc=6.8 min CN=81 Runoff=0.0 cfs 122 cf

Link AP1: Inflow=0.0 cfs 213 cf
Primary=0.0 cfs 213 cf

Link AP2: Inflow=0.0 cfs 53 cf
Primary=0.0 cfs 53 cf

Link AP3: Inflow=0.0 cfs 124 cf
Primary=0.0 cfs 124 cf

Link AP4: Inflow=0.0 cfs 122 cf
Primary=0.0 cfs 122 cf

Total Runoff Area = 478,286 sf Runoff Volume = 512 cf Average Runoff Depth = 0.01"
94.18% Pervious = 450,461 sf 5.82% Impervious = 27,826 sf

Summary for Subcatchment SC1.0:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 213 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
165,508	70	Woods, Good, HSG C
38,916	74	>75% Grass cover, Good, HSG C
778	98	Unconnected pavement, HSG C
7,395	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
215,046	72	Weighted Average
204,424		95.06% Pervious Area
10,622		4.94% Impervious Area
778		7.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.19		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.8	564	0.1046	1.62		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	646	Total			

Summary for Subcatchment SC2.0:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 53 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Adj	Description
8,651	98		Unconnected pavement, HSG C
44,422	70		Woods, Good, HSG C
53,073	75	72	Weighted Average, UI Adjusted
44,422			83.70% Pervious Area
8,651			16.30% Impervious Area
8,651			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.1	140	0.1714	2.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.2	190	Total			

Summary for Subcatchment SC3.0:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 124 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
168,267	70	Woods, Good, HSG C
24,360	74	>75% Grass cover, Good, HSG C
55	98	Paved parking, HSG C
1,425	98	Roofs, HSG C
1,019	98	Unconnected pavement, HSG C
195,127	71	Weighted Average
192,627		98.72% Pervious Area
2,499		1.28% Impervious Area
1,019		40.77% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.9	225	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.0	367	0.0599	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	642	Total			

Summary for Subcatchment SC4.0:

Runoff = 0.0 cfs @ 12.18 hrs, Volume= 122 cf, Depth> 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
6,053	98	Unconnected pavement, HSG C
8,988	70	Woods, Good, HSG C
15,041	81	Weighted Average
8,988		59.75% Pervious Area
6,053		40.25% Impervious Area
6,053		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.7	48	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	98	Total			

Summary for Link AP1:

Inflow Area = 215,046 sf, 4.94% Impervious, Inflow Depth > 0.01" for 1 Inch event
Inflow = 0.0 cfs @ 24.00 hrs, Volume= 213 cf
Primary = 0.0 cfs @ 24.00 hrs, Volume= 213 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP2:

Inflow Area = 53,073 sf, 16.30% Impervious, Inflow Depth > 0.01" for 1 Inch event
Inflow = 0.0 cfs @ 24.00 hrs, Volume= 53 cf
Primary = 0.0 cfs @ 24.00 hrs, Volume= 53 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP3:

Inflow Area = 195,127 sf, 1.28% Impervious, Inflow Depth > 0.01" for 1 Inch event
Inflow = 0.0 cfs @ 24.00 hrs, Volume= 124 cf
Primary = 0.0 cfs @ 24.00 hrs, Volume= 124 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP4:

Inflow Area = 15,041 sf, 40.25% Impervious, Inflow Depth > 0.10" for 1 Inch event
Inflow = 0.0 cfs @ 12.18 hrs, Volume= 122 cf
Primary = 0.0 cfs @ 12.18 hrs, Volume= 122 cf, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment SC1.0: Runoff Area=215,046 sf 4.94% Impervious Runoff Depth>0.90"
Flow Length=646' Tc=6.7 min CN=72 Runoff=4.5 cfs 16,177 cf

Subcatchment SC2.0: Runoff Area=53,073 sf 16.30% Impervious Runoff Depth>0.90"
Flow Length=190' Tc=7.2 min UI Adjusted CN=72 Runoff=1.1 cfs 3,992 cf

Subcatchment SC3.0: Runoff Area=195,127 sf 1.28% Impervious Runoff Depth>0.85"
Flow Length=642' Tc=12.6 min CN=71 Runoff=3.0 cfs 13,814 cf

Subcatchment SC4.0: Runoff Area=15,041 sf 40.25% Impervious Runoff Depth>1.43"
Flow Length=98' Tc=6.8 min CN=81 Runoff=0.5 cfs 1,798 cf

Link AP1: Inflow=4.5 cfs 16,177 cf
Primary=4.5 cfs 16,177 cf

Link AP2: Inflow=1.1 cfs 3,992 cf
Primary=1.1 cfs 3,992 cf

Link AP3: Inflow=3.0 cfs 13,814 cf
Primary=3.0 cfs 13,814 cf

Link AP4: Inflow=0.5 cfs 1,798 cf
Primary=0.5 cfs 1,798 cf

Total Runoff Area = 478,286 sf Runoff Volume = 35,781 cf Average Runoff Depth = 0.90"
94.18% Pervious = 450,461 sf 5.82% Impervious = 27,826 sf

Summary for Subcatchment SC1.0:

Runoff = 4.5 cfs @ 12.14 hrs, Volume= 16,177 cf, Depth> 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
165,508	70	Woods, Good, HSG C
38,916	74	>75% Grass cover, Good, HSG C
778	98	Unconnected pavement, HSG C
7,395	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
215,046	72	Weighted Average
204,424		95.06% Pervious Area
10,622		4.94% Impervious Area
778		7.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.19		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.8	564	0.1046	1.62		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	646	Total			

Summary for Subcatchment SC2.0:

Runoff = 1.1 cfs @ 12.15 hrs, Volume= 3,992 cf, Depth> 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Adj	Description
8,651	98		Unconnected pavement, HSG C
44,422	70		Woods, Good, HSG C
53,073	75	72	Weighted Average, UI Adjusted
44,422			83.70% Pervious Area
8,651			16.30% Impervious Area
8,651			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.1	140	0.1714	2.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.2	190	Total			

Summary for Subcatchment SC3.0:

Runoff = 3.0 cfs @ 12.22 hrs, Volume= 13,814 cf, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
168,267	70	Woods, Good, HSG C
24,360	74	>75% Grass cover, Good, HSG C
55	98	Paved parking, HSG C
1,425	98	Roofs, HSG C
1,019	98	Unconnected pavement, HSG C
195,127	71	Weighted Average
192,627		98.72% Pervious Area
2,499		1.28% Impervious Area
1,019		40.77% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.9	225	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.0	367	0.0599	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	642	Total			

Summary for Subcatchment SC4.0:

Runoff = 0.5 cfs @ 12.14 hrs, Volume= 1,798 cf, Depth> 1.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
6,053	98	Unconnected pavement, HSG C
8,988	70	Woods, Good, HSG C
15,041	81	Weighted Average
8,988		59.75% Pervious Area
6,053		40.25% Impervious Area
6,053		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.7	48	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	98	Total			

Summary for Link AP1:

Inflow Area = 215,046 sf, 4.94% Impervious, Inflow Depth > 0.90" for 2-Year event
Inflow = 4.5 cfs @ 12.14 hrs, Volume= 16,177 cf
Primary = 4.5 cfs @ 12.14 hrs, Volume= 16,177 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP2:

Inflow Area = 53,073 sf, 16.30% Impervious, Inflow Depth > 0.90" for 2-Year event
Inflow = 1.1 cfs @ 12.15 hrs, Volume= 3,992 cf
Primary = 1.1 cfs @ 12.15 hrs, Volume= 3,992 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP3:

Inflow Area = 195,127 sf, 1.28% Impervious, Inflow Depth > 0.85" for 2-Year event
Inflow = 3.0 cfs @ 12.22 hrs, Volume= 13,814 cf
Primary = 3.0 cfs @ 12.22 hrs, Volume= 13,814 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP4:

Inflow Area = 15,041 sf, 40.25% Impervious, Inflow Depth > 1.43" for 2-Year event
Inflow = 0.5 cfs @ 12.14 hrs, Volume= 1,798 cf
Primary = 0.5 cfs @ 12.14 hrs, Volume= 1,798 cf, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment SC1.0: Runoff Area=215,046 sf 4.94% Impervious Runoff Depth>2.02"
Flow Length=646' Tc=6.7 min CN=72 Runoff=10.5 cfs 36,167 cf

Subcatchment SC2.0: Runoff Area=53,073 sf 16.30% Impervious Runoff Depth>2.02"
Flow Length=190' Tc=7.2 min UI Adjusted CN=72 Runoff=2.6 cfs 8,924 cf

Subcatchment SC3.0: Runoff Area=195,127 sf 1.28% Impervious Runoff Depth>1.94"
Flow Length=642' Tc=12.6 min CN=71 Runoff=7.4 cfs 31,474 cf

Subcatchment SC4.0: Runoff Area=15,041 sf 40.25% Impervious Runoff Depth>2.78"
Flow Length=98' Tc=6.8 min CN=81 Runoff=1.0 cfs 3,482 cf

Link AP1: Inflow=10.5 cfs 36,167 cf
Primary=10.5 cfs 36,167 cf

Link AP2: Inflow=2.6 cfs 8,924 cf
Primary=2.6 cfs 8,924 cf

Link AP3: Inflow=7.4 cfs 31,474 cf
Primary=7.4 cfs 31,474 cf

Link AP4: Inflow=1.0 cfs 3,482 cf
Primary=1.0 cfs 3,482 cf

Total Runoff Area = 478,286 sf Runoff Volume = 80,046 cf Average Runoff Depth = 2.01"
94.18% Pervious = 450,461 sf 5.82% Impervious = 27,826 sf

Summary for Subcatchment SC1.0:

Runoff = 10.5 cfs @ 12.14 hrs, Volume= 36,167 cf, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
165,508	70	Woods, Good, HSG C
38,916	74	>75% Grass cover, Good, HSG C
778	98	Unconnected pavement, HSG C
7,395	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
215,046	72	Weighted Average
204,424		95.06% Pervious Area
10,622		4.94% Impervious Area
778		7.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.19		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.8	564	0.1046	1.62		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	646	Total			

Summary for Subcatchment SC2.0:

Runoff = 2.6 cfs @ 12.15 hrs, Volume= 8,924 cf, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Adj	Description
8,651	98		Unconnected pavement, HSG C
44,422	70		Woods, Good, HSG C
53,073	75	72	Weighted Average, UI Adjusted
44,422			83.70% Pervious Area
8,651			16.30% Impervious Area
8,651			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.1	140	0.1714	2.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.2	190	Total			

Summary for Subcatchment SC3.0:

Runoff = 7.4 cfs @ 12.21 hrs, Volume= 31,474 cf, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
168,267	70	Woods, Good, HSG C
24,360	74	>75% Grass cover, Good, HSG C
55	98	Paved parking, HSG C
1,425	98	Roofs, HSG C
1,019	98	Unconnected pavement, HSG C
195,127	71	Weighted Average
192,627		98.72% Pervious Area
2,499		1.28% Impervious Area
1,019		40.77% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.9	225	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.0	367	0.0599	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	642	Total			

Summary for Subcatchment SC4.0:

Runoff = 1.0 cfs @ 12.14 hrs, Volume= 3,482 cf, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
6,053	98	Unconnected pavement, HSG C
8,988	70	Woods, Good, HSG C
15,041	81	Weighted Average
8,988		59.75% Pervious Area
6,053		40.25% Impervious Area
6,053		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.7	48	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	98	Total			

Summary for Link AP1:

Inflow Area = 215,046 sf, 4.94% Impervious, Inflow Depth > 2.02" for 10-Year event
Inflow = 10.5 cfs @ 12.14 hrs, Volume= 36,167 cf
Primary = 10.5 cfs @ 12.14 hrs, Volume= 36,167 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP2:

Inflow Area = 53,073 sf, 16.30% Impervious, Inflow Depth > 2.02" for 10-Year event
Inflow = 2.6 cfs @ 12.15 hrs, Volume= 8,924 cf
Primary = 2.6 cfs @ 12.15 hrs, Volume= 8,924 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP3:

Inflow Area = 195,127 sf, 1.28% Impervious, Inflow Depth > 1.94" for 10-Year event
Inflow = 7.4 cfs @ 12.21 hrs, Volume= 31,474 cf
Primary = 7.4 cfs @ 12.21 hrs, Volume= 31,474 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP4:

Inflow Area = 15,041 sf, 40.25% Impervious, Inflow Depth > 2.78" for 10-Year event
Inflow = 1.0 cfs @ 12.14 hrs, Volume= 3,482 cf
Primary = 1.0 cfs @ 12.14 hrs, Volume= 3,482 cf, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment SC1.0: Runoff Area=215,046 sf 4.94% Impervious Runoff Depth>3.01"
Flow Length=646' Tc=6.7 min CN=72 Runoff=15.8 cfs 53,979 cf

Subcatchment SC2.0: Runoff Area=53,073 sf 16.30% Impervious Runoff Depth>3.01"
Flow Length=190' Tc=7.2 min UI Adjusted CN=72 Runoff=3.8 cfs 13,319 cf

Subcatchment SC3.0: Runoff Area=195,127 sf 1.28% Impervious Runoff Depth>2.91"
Flow Length=642' Tc=12.6 min CN=71 Runoff=11.3 cfs 47,335 cf

Subcatchment SC4.0: Runoff Area=15,041 sf 40.25% Impervious Runoff Depth>3.90"
Flow Length=98' Tc=6.8 min CN=81 Runoff=1.4 cfs 4,894 cf

Link AP1: Inflow=15.8 cfs 53,979 cf
Primary=15.8 cfs 53,979 cf

Link AP2: Inflow=3.8 cfs 13,319 cf
Primary=3.8 cfs 13,319 cf

Link AP3: Inflow=11.3 cfs 47,335 cf
Primary=11.3 cfs 47,335 cf

Link AP4: Inflow=1.4 cfs 4,894 cf
Primary=1.4 cfs 4,894 cf

Total Runoff Area = 478,286 sf Runoff Volume = 119,528 cf Average Runoff Depth = 3.00"
94.18% Pervious = 450,461 sf 5.82% Impervious = 27,826 sf

Summary for Subcatchment SC1.0:

Runoff = 15.8 cfs @ 12.14 hrs, Volume= 53,979 cf, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
165,508	70	Woods, Good, HSG C
38,916	74	>75% Grass cover, Good, HSG C
778	98	Unconnected pavement, HSG C
7,395	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
215,046	72	Weighted Average
204,424		95.06% Pervious Area
10,622		4.94% Impervious Area
778		7.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.19		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.8	564	0.1046	1.62		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	646	Total			

Summary for Subcatchment SC2.0:

Runoff = 3.8 cfs @ 12.14 hrs, Volume= 13,319 cf, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Adj	Description
8,651	98		Unconnected pavement, HSG C
44,422	70		Woods, Good, HSG C
53,073	75	72	Weighted Average, UI Adjusted
44,422			83.70% Pervious Area
8,651			16.30% Impervious Area
8,651			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.1	140	0.1714	2.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.2	190	Total			

Summary for Subcatchment SC3.0:

Runoff = 11.3 cfs @ 12.21 hrs, Volume= 47,335 cf, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
168,267	70	Woods, Good, HSG C
24,360	74	>75% Grass cover, Good, HSG C
55	98	Paved parking, HSG C
1,425	98	Roofs, HSG C
1,019	98	Unconnected pavement, HSG C
195,127	71	Weighted Average
192,627		98.72% Pervious Area
2,499		1.28% Impervious Area
1,019		40.77% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.9	225	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.0	367	0.0599	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	642	Total			

Summary for Subcatchment SC4.0:

Runoff = 1.4 cfs @ 12.14 hrs, Volume= 4,894 cf, Depth> 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
6,053	98	Unconnected pavement, HSG C
8,988	70	Woods, Good, HSG C
15,041	81	Weighted Average
8,988		59.75% Pervious Area
6,053		40.25% Impervious Area
6,053		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.7	48	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	98	Total			

Summary for Link AP1:

Inflow Area = 215,046 sf, 4.94% Impervious, Inflow Depth > 3.01" for 25-Year event
Inflow = 15.8 cfs @ 12.14 hrs, Volume= 53,979 cf
Primary = 15.8 cfs @ 12.14 hrs, Volume= 53,979 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP2:

Inflow Area = 53,073 sf, 16.30% Impervious, Inflow Depth > 3.01" for 25-Year event
Inflow = 3.8 cfs @ 12.14 hrs, Volume= 13,319 cf
Primary = 3.8 cfs @ 12.14 hrs, Volume= 13,319 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP3:

Inflow Area = 195,127 sf, 1.28% Impervious, Inflow Depth > 2.91" for 25-Year event
Inflow = 11.3 cfs @ 12.21 hrs, Volume= 47,335 cf
Primary = 11.3 cfs @ 12.21 hrs, Volume= 47,335 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP4:

Inflow Area = 15,041 sf, 40.25% Impervious, Inflow Depth > 3.90" for 25-Year event
Inflow = 1.4 cfs @ 12.14 hrs, Volume= 4,894 cf
Primary = 1.4 cfs @ 12.14 hrs, Volume= 4,894 cf, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment SC1.0: Runoff Area=215,046 sf 4.94% Impervious Runoff Depth>5.23"
Flow Length=646' Tc=6.7 min CN=72 Runoff=27.2 cfs 93,791 cf

Subcatchment SC2.0: Runoff Area=53,073 sf 16.30% Impervious Runoff Depth>5.23"
Flow Length=190' Tc=7.2 min UI Adjusted CN=72 Runoff=6.6 cfs 23,144 cf

Subcatchment SC3.0: Runoff Area=195,127 sf 1.28% Impervious Runoff Depth>5.10"
Flow Length=642' Tc=12.6 min CN=71 Runoff=19.7 cfs 82,984 cf

Subcatchment SC4.0: Runoff Area=15,041 sf 40.25% Impervious Runoff Depth>6.32"
Flow Length=98' Tc=6.8 min CN=81 Runoff=2.2 cfs 7,922 cf

Link AP1: Inflow=27.2 cfs 93,791 cf
Primary=27.2 cfs 93,791 cf

Link AP2: Inflow=6.6 cfs 23,144 cf
Primary=6.6 cfs 23,144 cf

Link AP3: Inflow=19.7 cfs 82,984 cf
Primary=19.7 cfs 82,984 cf

Link AP4: Inflow=2.2 cfs 7,922 cf
Primary=2.2 cfs 7,922 cf

Total Runoff Area = 478,286 sf Runoff Volume = 207,841 cf Average Runoff Depth = 5.21"
94.18% Pervious = 450,461 sf 5.82% Impervious = 27,826 sf

Summary for Subcatchment SC1.0:

Runoff = 27.2 cfs @ 12.14 hrs, Volume= 93,791 cf, Depth> 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
165,508	70	Woods, Good, HSG C
38,916	74	>75% Grass cover, Good, HSG C
778	98	Unconnected pavement, HSG C
7,395	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
215,046	72	Weighted Average
204,424		95.06% Pervious Area
10,622		4.94% Impervious Area
778		7.32% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.19		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	32	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.8	564	0.1046	1.62		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	646	Total			

Summary for Subcatchment SC2.0:

Runoff = 6.6 cfs @ 12.14 hrs, Volume= 23,144 cf, Depth> 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Adj	Description
8,651	98		Unconnected pavement, HSG C
44,422	70		Woods, Good, HSG C
53,073	75	72	Weighted Average, UI Adjusted
44,422			83.70% Pervious Area
8,651			16.30% Impervious Area
8,651			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.1	140	0.1714	2.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.2	190	Total			

Summary for Subcatchment SC3.0:

Runoff = 19.7 cfs @ 12.20 hrs, Volume= 82,984 cf, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
168,267	70	Woods, Good, HSG C
24,360	74	>75% Grass cover, Good, HSG C
55	98	Paved parking, HSG C
1,425	98	Roofs, HSG C
1,019	98	Unconnected pavement, HSG C
195,127	71	Weighted Average
192,627		98.72% Pervious Area
2,499		1.28% Impervious Area
1,019		40.77% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.9	225	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.0	367	0.0599	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.6	642	Total			

Summary for Subcatchment SC4.0:

Runoff = 2.2 cfs @ 12.14 hrs, Volume= 7,922 cf, Depth> 6.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
6,053	98	Unconnected pavement, HSG C
8,988	70	Woods, Good, HSG C
15,041	81	Weighted Average
8,988		59.75% Pervious Area
6,053		40.25% Impervious Area
6,053		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.7	48	0.0520	1.14		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	98	Total			

Summary for Link AP1:

Inflow Area = 215,046 sf, 4.94% Impervious, Inflow Depth > 5.23" for 100-Year event
Inflow = 27.2 cfs @ 12.14 hrs, Volume= 93,791 cf
Primary = 27.2 cfs @ 12.14 hrs, Volume= 93,791 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP2:

Inflow Area = 53,073 sf, 16.30% Impervious, Inflow Depth > 5.23" for 100-Year event
Inflow = 6.6 cfs @ 12.14 hrs, Volume= 23,144 cf
Primary = 6.6 cfs @ 12.14 hrs, Volume= 23,144 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Link AP3:

Inflow Area = 195,127 sf, 1.28% Impervious, Inflow Depth > 5.10" for 100-Year event
Inflow = 19.7 cfs @ 12.20 hrs, Volume= 82,984 cf
Primary = 19.7 cfs @ 12.20 hrs, Volume= 82,984 cf, Atten= 0%, Lag= 0.0 min

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

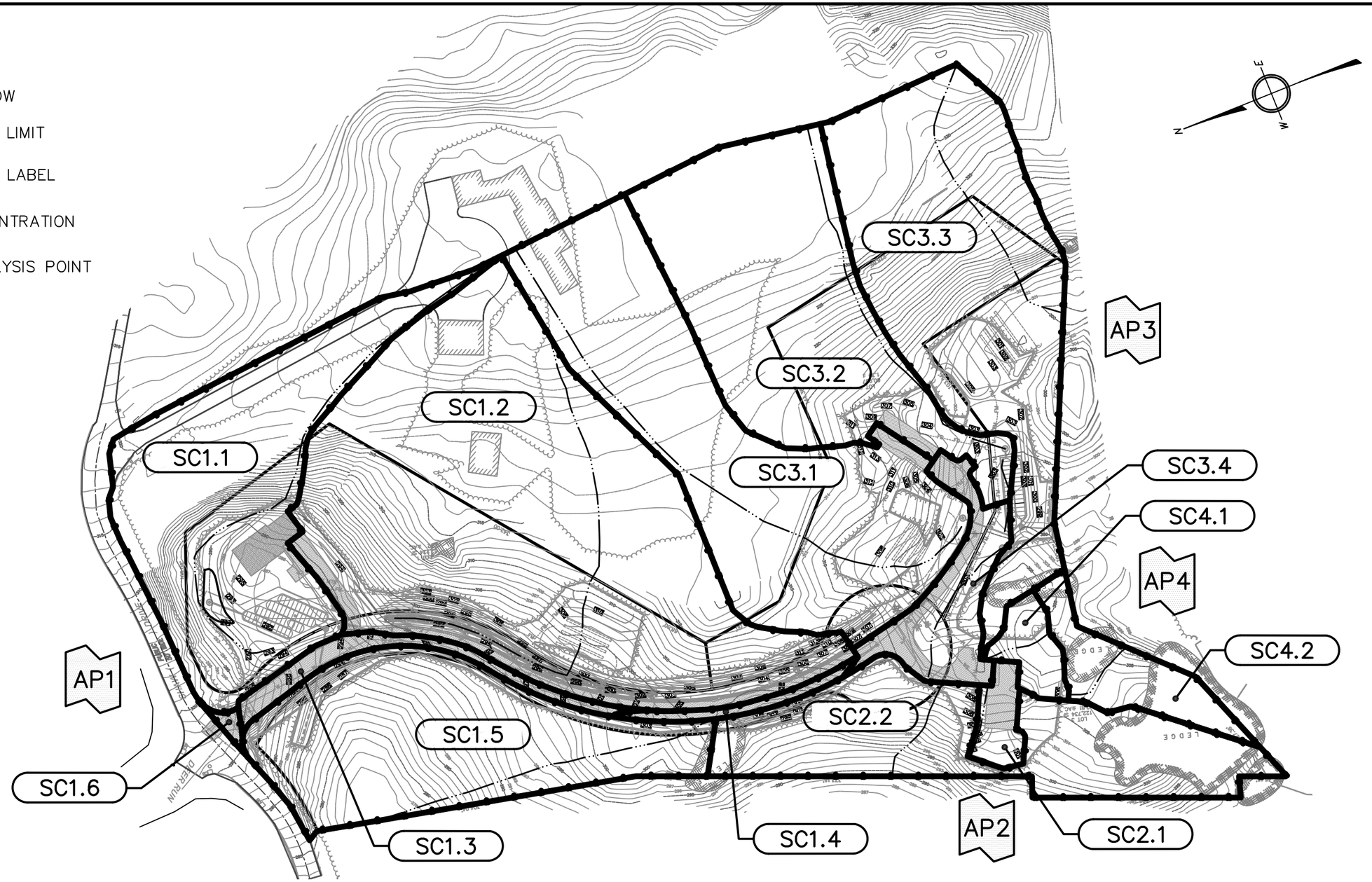
Summary for Link AP4:

Inflow Area = 15,041 sf, 40.25% Impervious, Inflow Depth > 6.32" for 100-Year event
Inflow = 2.2 cfs @ 12.14 hrs, Volume= 7,922 cf
Primary = 2.2 cfs @ 12.14 hrs, Volume= 7,922 cf, Atten= 0%, Lag= 0.0 min

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

LEGEND:

- DRAINAGE ARROW
- SUBCATCHMENT LIMIT
- SC–1 — SUBCATCHMENT LABEL
- TIME OF CONCENTRATION
- AP1 — DRAINAGE ANALYSIS POINT



GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

1 INCH = 100 FEET

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DESIGNED BY: LT | CHECKED BY: KFB

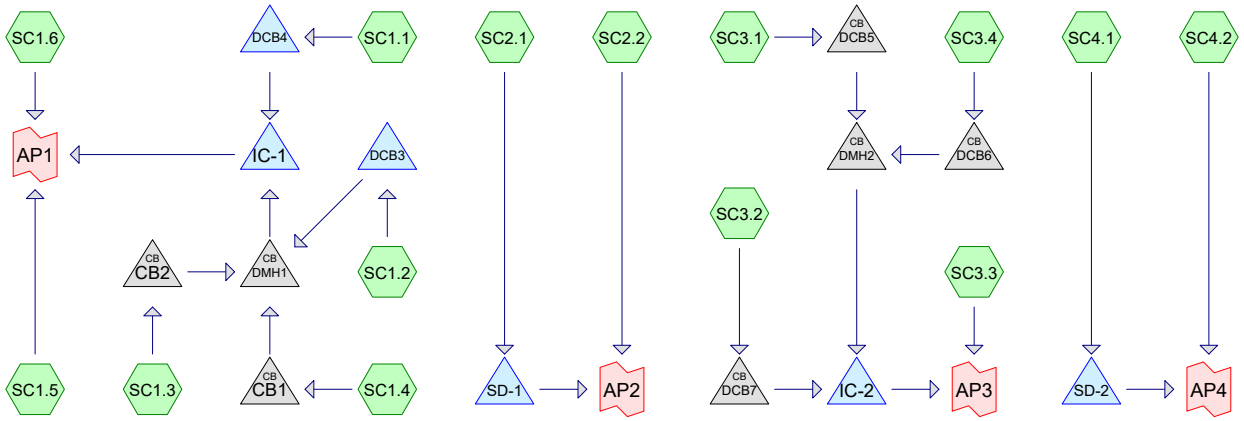
DATE: REV 2 – JULY 13, 2020

WATERSHED MAP PROPOSED CONDITIONS

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

PROJECT: 171053

P:\17---\171053\DWG\PERMIT\DEF SUB2 DRAINAGE.DWG 07-10-20 4:09:05 PM – LAYOUT POST



Subcat Reach Pond Link

Routing Diagram for Post-Dev Rev 2
Prepared by Goldsmith, Prest & Ringwall, Inc., Printed 7/14/2020

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
156,005	74	>75% Grass cover, Good, HSG C (SC1.1, SC1.2, SC1.3, SC1.5, SC2.1, SC2.2, SC3.1, SC3.2, SC3.3, SC3.4, SC4.1, SC4.2)
1,665	89	Gravel roads, HSG C (SC1.1, SC1.2, SC1.3, SC3.1, SC3.4)
27,894	98	Paved parking, HSG C (SC1.1, SC1.2, SC1.3, SC1.4, SC1.6, SC3.1, SC3.4)
9,202	98	Roofs, HSG C (SC1.1, SC1.2, SC2.1, SC3.1, SC3.2)
16,818	98	Unconnected pavement, HSG C (SC1.2, SC1.5, SC2.2, SC3.3, SC4.1, SC4.2)
266,702	70	Woods, Good, HSG C (SC1.1, SC1.2, SC1.5, SC2.2, SC3.1, SC3.2, SC3.3, SC3.4, SC4.1, SC4.2)
478,286	**75**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: Runoff Area=54,522 sf 14.68% Impervious Runoff Depth=0.00"
Flow Length=549' Tc=7.5 min CN=76 Runoff=0.0 cfs 0 cf

Subcatchment SC1.2: Runoff Area=115,523 sf 8.76% Impervious Runoff Depth=0.00"
Flow Length=510' Tc=6.7 min CN=74 Runoff=0.0 cfs 0 cf

Subcatchment SC1.3: Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>0.26"
Tc=5.0 min CN=97 Runoff=0.0 cfs 120 cf

Subcatchment SC1.4: Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>0.32"
Tc=5.0 min CN=98 Runoff=0.0 cfs 58 cf

Subcatchment SC1.5: Runoff Area=46,238 sf 0.95% Impervious Runoff Depth=0.00"
Flow Length=337' Tc=6.4 min CN=71 Runoff=0.0 cfs 0 cf

Subcatchment SC1.6: Runoff Area=622 sf 100.00% Impervious Runoff Depth>0.32"
Tc=5.0 min CN=98 Runoff=0.0 cfs 16 cf

Subcatchment SC2.1: Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>0.01"
Flow Length=68' Tc=5.0 min CN=85 Runoff=0.0 cfs 3 cf

Subcatchment SC2.2: Runoff Area=38,441 sf 23.39% Impervious Runoff Depth=0.00"
Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=0.0 cfs 0 cf

Subcatchment SC3.1: Runoff Area=66,880 sf 3.55% Impervious Runoff Depth=0.00"
Flow Length=564' Tc=10.4 min CN=73 Runoff=0.0 cfs 0 cf

Subcatchment SC3.2: Runoff Area=55,060 sf 1.60% Impervious Runoff Depth=0.00"
Flow Length=378' Tc=10.1 min CN=71 Runoff=0.0 cfs 0 cf

Subcatchment SC3.3: Runoff Area=62,459 sf 1.63% Impervious Runoff Depth=0.00"
Flow Length=287' Tc=10.8 min CN=71 Runoff=0.0 cfs 0 cf

Subcatchment SC3.4: Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>0.02"
Flow Length=246' Tc=5.0 min CN=86 Runoff=0.0 cfs 17 cf

Subcatchment SC4.1: Runoff Area=4,504 sf 4.43% Impervious Runoff Depth=0.00"
Flow Length=64' Tc=5.0 min CN=74 Runoff=0.0 cfs 0 cf

Subcatchment SC4.2: Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>0.02"
Flow Length=75' Tc=12.7 min CN=86 Runoff=0.0 cfs 14 cf

Pond CB1: Peak Elev=298.07' Inflow=0.0 cfs 58 cf
12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.0 cfs 58 cf

Pond CB2: Peak Elev=288.31' Inflow=0.0 cfs 120 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.0 cfs 120 cf

Pond DCB3: Peak Elev=287.00' Storage=0 cf Inflow=0.0 cfs 0 cf
24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=0.0 cfs 0 cf

Pond DCB4: Peak Elev=287.00' Storage=0 cf Inflow=0.0 cfs 0 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.0 cfs 0 cf

Pond DCB5: Peak Elev=297.42' Inflow=0.0 cfs 0 cf
21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=0.0 cfs 0 cf

Pond DCB6: Peak Elev=297.02' Inflow=0.0 cfs 17 cf
21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.0 cfs 17 cf

Pond DCB7: Peak Elev=297.01' Inflow=0.0 cfs 0 cf
18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.0 cfs 0 cf

Pond DMH1: Peak Elev=287.11' Inflow=0.1 cfs 179 cf
24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=0.1 cfs 179 cf

Pond DMH2: Peak Elev=296.86' Inflow=0.0 cfs 17 cf
30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.0 cfs 17 cf

Pond IC-1: Peak Elev=282.40' Storage=0 cf Inflow=0.1 cfs 179 cf
Discarded=0.1 cfs 179 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 179 cf

Pond IC-2: Peak Elev=295.80' Storage=0 cf Inflow=0.0 cfs 17 cf
Discarded=0.0 cfs 17 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 17 cf

Pond SD-1: Peak Elev=300.00' Storage=0 cf Inflow=0.0 cfs 3 cf
Discarded=0.0 cfs 3 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 3 cf

Pond SD-2: Peak Elev=302.50' Storage=0 cf Inflow=0.0 cfs 0 cf
Discarded=0.0 cfs 0 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 0 cf

Link AP1: Inflow=0.0 cfs 16 cf
Primary=0.0 cfs 16 cf

Link AP2: Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link AP3: Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link AP4: Inflow=0.0 cfs 14 cf
Primary=0.0 cfs 14 cf

Total Runoff Area = 478,286 sf Runoff Volume = 230 cf Average Runoff Depth = 0.01"
88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

Summary for Subcatchment SC1.1:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
24,785	74	>75% Grass cover, Good, HSG C
21,721	70	Woods, Good, HSG C
14	89	Gravel roads, HSG C
6,226	98	Paved parking, HSG C
1,776	98	Roofs, HSG C
54,522	76	Weighted Average
46,520		85.32% Pervious Area
8,002		14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	35	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	50	0.0345	1.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	180	0.1550	1.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	234	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.5	549	Total			

Summary for Subcatchment SC1.2:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
46,703	74	>75% Grass cover, Good, HSG C
57,729	70	Woods, Good, HSG C
967	89	Gravel roads, HSG C
313	98	Unconnected pavement, HSG C
7,362	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
115,523	74	Weighted Average
105,398		91.24% Pervious Area
10,124		8.76% Impervious Area
313		3.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.3	167	0.0988	2.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	117	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	176	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.7	510	Total			

Summary for Subcatchment SC1.3:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 120 cf, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
162	74	>75% Grass cover, Good, HSG C
243	89	Gravel roads, HSG C
5,233	98	Paved parking, HSG C
5,639	97	Weighted Average
405		7.19% Pervious Area
5,233		92.81% Impervious Area

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

Summary for Subcatchment SC1.4:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 58 cf, Depth> 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
2,208	98	Paved parking, HSG C
2,208		100.00% Impervious Area

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

Summary for Subcatchment SC1.5:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
37,139	70	Woods, Good, HSG C
441	98	Unconnected pavement, HSG C
8,658	74	>75% Grass cover, Good, HSG C
46,238	71	Weighted Average
45,797		99.05% Pervious Area
441		0.95% Impervious Area
441		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
3.1	287	0.0941	1.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	337	Total			

Summary for Subcatchment SC1.6:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 16 cf, Depth> 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
622	98	Paved parking, HSG C
622		100.00% Impervious Area

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

Summary for Subcatchment SC2.1:

Runoff = 0.0 cfs @ 16.53 hrs, Volume= 3 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
1,953	74	>75% Grass cover, Good, HSG C
1,776	98	Roofs, HSG C
3,729	85	Weighted Average
1,953		52.37% Pervious Area
1,776		47.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	68	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC2.2:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Adj	Description
7,180	74		>75% Grass cover, Good, HSG C
22,269	70		Woods, Good, HSG C
8,992	98		Unconnected pavement, HSG C
38,441	77	74	Weighted Average, UI Adjusted
29,449			76.61% Pervious Area
8,992			23.39% Impervious Area
8,992			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	29	0.1700	2.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	61	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	140	Total			

Summary for Subcatchment SC3.1:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
32,168	74	>75% Grass cover, Good, HSG C
31,971	70	Woods, Good, HSG C
364	89	Gravel roads, HSG C
55	98	Paved parking, HSG C
2,321	98	Roofs, HSG C
66,880	73	Weighted Average
64,504		96.45% Pervious Area
2,376		3.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
2.1	247	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	133	0.0830	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	134	0.0820	2.00		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	564	Total			

Summary for Subcatchment SC3.2:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
12,832	74	>75% Grass cover, Good, HSG C
880	98	Roofs, HSG C
41,349	70	Woods, Good, HSG C
55,060	71	Weighted Average
54,180		98.40% Pervious Area
880		1.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.7	204	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	124	0.0530	1.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	378	Total			

Summary for Subcatchment SC3.3:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
12,393	74	>75% Grass cover, Good, HSG C
49,047	70	Woods, Good, HSG C
1,019	98	Unconnected pavement, HSG C
62,459	71	Weighted Average
61,440		98.37% Pervious Area
1,019		1.63% Impervious Area
1,019		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.2	237	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.8	287	Total			

Summary for Subcatchment SC3.4:

Runoff = 0.0 cfs @ 14.24 hrs, Volume= 17 cf, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
5,554	74	>75% Grass cover, Good, HSG C
529	70	Woods, Good, HSG C
76	89	Gravel roads, HSG C
6,187	98	Paved parking, HSG C
12,347	86	Weighted Average
6,159		49.89% Pervious Area
6,187		50.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	113	0.0200	1.40		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
2.4	38	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.9	95	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	246	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.1:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
1,020	70	Woods, Good, HSG C
200	98	Unconnected pavement, HSG C
3,285	74	>75% Grass cover, Good, HSG C
4,504	74	Weighted Average
4,305		95.57% Pervious Area
200		4.43% Impervious Area
200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	14	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	64	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.2:

Runoff = 0.0 cfs @ 14.38 hrs, Volume= 14 cf, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 0.5 Inch Rainfall=0.50"

Area (sf)	CN	Description
3,927	70	Woods, Good, HSG C
5,854	98	Unconnected pavement, HSG C
333	74	>75% Grass cover, Good, HSG C
10,114	86	Weighted Average
4,260		42.12% Pervious Area
5,854		57.88% Impervious Area
5,854		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	25	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.7	75	Total			

Summary for Pond CB1:

Inflow Area = 2,208 sf,100.00% Impervious, Inflow Depth > 0.32" for 0.5 Inch event
Inflow = 0.0 cfs @ 12.12 hrs, Volume= 58 cf
Outflow = 0.0 cfs @ 12.12 hrs, Volume= 58 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 12.12 hrs, Volume= 58 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.07' @ 12.12 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.00'	**12.0" Round Culvert** L= 220.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=298.07' TW=287.11' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.0 cfs @ 0.72 fps)

Summary for Pond CB2:

Inflow Area = 5,639 sf, 92.81% Impervious, Inflow Depth > 0.26" for 0.5 Inch event
Inflow = 0.0 cfs @ 12.12 hrs, Volume= 120 cf
Outflow = 0.0 cfs @ 12.12 hrs, Volume= 120 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 12.12 hrs, Volume= 120 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.31' @ 12.12 hrs
Flood Elev= 292.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.20'	**12.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=288.31' TW=287.11' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.0 cfs @ 0.87 fps)

Summary for Pond DCB3:

Inflow Area = 115,523 sf, 8.76% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 287.00' @ 0.00 hrs Surf.Area= 1 sf Storage= 0 cf
Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	89	87.5	33	36	615
292.00	519	180.8	274	310	2,611

Device	Routing	Invert	Outlet Devices
#1	Primary	287.34'	**24.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.34' / 287.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=287.00' TW=287.00' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.0 cfs)

Summary for Pond DCB4:

Inflow Area = 54,522 sf, 14.68% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 287.00' @ 0.00 hrs Surf.Area= 1 sf Storage= 0 cf
Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	250 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	714	132.0	247	250	1,392

Device	Routing	Invert	Outlet Devices
#1	Primary	287.25'	**15.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=287.00' TW=282.40' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.0 cfs)

Summary for Pond DCB5:

Inflow Area = 66,880 sf, 3.55% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 297.42' @ 0.00 hrs
Flood Elev= 302.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.42'	**21.0" Round Culvert** L= 47.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=297.42' TW=296.85' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.0 cfs)

Summary for Pond DCB6:

Inflow Area = 12,347 sf, 50.11% Impervious, Inflow Depth > 0.02" for 0.5 Inch event
Inflow = 0.0 cfs @ 14.24 hrs, Volume= 17 cf
Outflow = 0.0 cfs @ 14.24 hrs, Volume= 17 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 14.24 hrs, Volume= 17 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 297.02' @ 14.24 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**21.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.0 cfs @ 14.24 hrs HW=297.02' TW=296.86' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.0 cfs @ 0.36 fps)

Summary for Pond DCB7:

Inflow Area = 55,060 sf, 1.60% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 297.01' @ 0.00 hrs
Flood Elev= 302.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**18.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=297.01' TW=295.80' (Dynamic Tailwater)
1=Culvert (Controls 0.0 cfs)

Summary for Pond DMH1:

Inflow Area = 123,370 sf, 14.24% Impervious, Inflow Depth > 0.02" for 0.5 Inch event
Inflow = 0.1 cfs @ 12.12 hrs, Volume= 179 cf
Outflow = 0.1 cfs @ 12.12 hrs, Volume= 179 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 12.12 hrs, Volume= 179 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 287.11' @ 12.12 hrs
Flood Elev= 292.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	287.00'	**24.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=287.11' TW=282.40' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.1 cfs @ 0.88 fps)

Summary for Pond DMH2:

Inflow Area = 79,226 sf, 10.81% Impervious, Inflow Depth > 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 14.24 hrs, Volume= 17 cf
Outflow = 0.0 cfs @ 14.24 hrs, Volume= 17 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 14.24 hrs, Volume= 17 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 296.86' @ 14.24 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	296.85'	**30.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=0.0 cfs @ 14.24 hrs HW=296.86' TW=295.80' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.0 cfs @ 0.34 fps)

Summary for Pond IC-1:

Inflow Area = 177,892 sf, 14.37% Impervious, Inflow Depth > 0.01" for 0.5 Inch event
Inflow = 0.1 cfs @ 12.12 hrs, Volume= 179 cf
Outflow = 0.1 cfs @ 12.12 hrs, Volume= 179 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.1 cfs @ 12.12 hrs, Volume= 179 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 282.40' @ 12.12 hrs Surf.Area= 2,021 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	282.40'	3,658 cf	**IC-1 Stone bed (Irregular)**Listed below (Recalc) 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids
#2	283.40'	5,002 cf	**ADS_StormTech MC-4500 b +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf
#3	283.00'	200 cf	**PES-1 Stone bed (Pyramidal)**Listed below (Recalc) 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids
#4	283.00'	126 cf	**24.0" Round Pipe Storage** Inside #3 L= 40.0'
		8,985 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
282.40	2,021	188.0	0	0	2,021
283.00	2,021	188.0	1,213	1,213	2,134
284.00	2,021	188.0	2,021	3,234	2,322
285.00	2,021	188.0	2,021	5,255	2,510
286.00	2,021	188.0	2,021	7,276	2,698
287.00	2,021	188.0	2,021	9,297	2,886
288.00	2,021	188.0	2,021	11,318	3,074
289.00	2,021	188.0	2,021	13,339	3,262
289.40	2,021	188.0	808	14,147	3,337

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
283.00	250	0	0	250
284.00	250	250	250	313
285.00	250	250	500	376
285.50	250	125	625	408

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.40'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	285.50'	**50.0' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32
#3	Device 2	284.10'	**24.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	284.10'	**20.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	287.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 12.12 hrs HW=282.40' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=282.40' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
└**3=Culvert** (Controls 0.0 cfs)
└**4=Orifice/Grate** (Controls 0.0 cfs)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.0 cfs)

Summary for Pond IC-2:

Inflow Area = 134,287 sf, 7.03% Impervious, Inflow Depth > 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 14.24 hrs, Volume= 17 cf
Outflow = 0.0 cfs @ 14.24 hrs, Volume= 17 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 14.24 hrs, Volume= 17 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 295.80' @ 0.00 hrs Surf.Area= 1,247 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,085.0 - 1,085.0)

Volume	Invert	Avail.Storage	Storage Description
#1	295.80'	2,234 cf	**IC-2 Stone bed (Irregular)**Listed below (Recalc) 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids
#2	296.80'	3,143 cf	**ADS_StormTech MC-4500 b +Cap @ 4.03' L** x 28 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 28 Chambers in 2 Rows Cap Storage= +39.5 cf x 2 x 2 rows = 158.0 cf
#3	296.00'	172 cf	**PES-2 Stone bed (Pyramidal)**Listed below (Recalc) 500 cf Overall - 71 cf Embedded = 429 cf x 40.0% Voids
#4	296.00'	71 cf	**18.0" Round Pipe Storage** Inside #3 L= 40.0'
		5,620 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
295.80	1,247	165.0	0	0	1,247
296.00	1,247	165.0	249	249	1,280
297.00	1,247	165.0	1,247	1,496	1,445
298.00	1,247	165.0	1,247	2,743	1,610
299.00	1,247	165.0	1,247	3,990	1,775
300.00	1,247	165.0	1,247	5,237	1,940
301.00	1,247	165.0	1,247	6,484	2,105
302.00	1,247	165.0	1,247	7,731	2,270
302.80	1,247	165.0	998	8,729	2,402

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
296.00	250	0	0	250
297.00	250	250	250	313
298.00	250	250	500	376

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	298.00'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 2	296.50'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.50' / 296.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	296.50'	**23.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	299.90'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.0 cfs @ 14.24 hrs HW=295.80' (Free Discharge)
└**1=Exfiltration** (Passes 0.0 cfs of 0.1 cfs potential flow)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=295.80' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
└**3=Culvert** (Controls 0.0 cfs)
└**4=Orifice/Grate** (Controls 0.0 cfs)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.0 cfs)

Summary for Pond SD-1:

Inflow Area = 3,729 sf, 47.63% Impervious, Inflow Depth > 0.01" for 0.5 Inch event
Inflow = 0.0 cfs @ 16.53 hrs, Volume= 3 cf
Outflow = 0.0 cfs @ 16.53 hrs, Volume= 3 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 16.53 hrs, Volume= 3 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.00' @ 0.00 hrs Surf.Area= 109 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	300.00'	44 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 109 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
300.00	109	113.3	0	0	109
301.00	109	113.3	109	109	222

Device	Routing	Invert	Outlet Devices
#1	Discarded	300.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	300.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 16.53 hrs HW=300.00' (Free Discharge)
└**1=Exfiltration** (Passes 0.0 cfs of 0.0 cfs potential flow)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=300.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond SD-2:

Inflow Area = 4,504 sf, 4.43% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 302.50' @ 0.00 hrs Surf.Area= 40 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	302.50'	16 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 40 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
302.50	40	44.0	0	0	40
303.50	40	44.0	40	40	84

Device	Routing	Invert	Outlet Devices
#1	Discarded	302.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	303.40'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 0.00 hrs HW=302.50' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.0 cfs of 0.0 cfs potential flow)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=302.50' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Link AP1:

Inflow Area = 224,752 sf, 11.85% Impervious, Inflow Depth > 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 12.12 hrs, Volume= 16 cf
Primary = 0.0 cfs @ 12.12 hrs, Volume= 16 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP2:

Inflow Area = 42,170 sf, 25.53% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP3:

Inflow Area = 196,746 sf, 5.32% Impervious, Inflow Depth = 0.00" for 0.5 Inch event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP4:

Inflow Area = 14,618 sf, 41.41% Impervious, Inflow Depth > 0.01" for 0.5 Inch event
Inflow = 0.0 cfs @ 14.38 hrs, Volume= 14 cf
Primary = 0.0 cfs @ 14.38 hrs, Volume= 14 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: Runoff Area=54,522 sf 14.68% Impervious Runoff Depth>0.04"
Flow Length=549' Tc=7.5 min CN=76 Runoff=0.0 cfs 174 cf

Subcatchment SC1.2: Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>0.02"
Flow Length=510' Tc=6.7 min CN=74 Runoff=0.0 cfs 221 cf

Subcatchment SC1.3: Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>0.70"
Tc=5.0 min CN=97 Runoff=0.1 cfs 331 cf

Subcatchment SC1.4: Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>0.79"
Tc=5.0 min CN=98 Runoff=0.0 cfs 145 cf

Subcatchment SC1.5: Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>0.01"
Flow Length=337' Tc=6.4 min CN=71 Runoff=0.0 cfs 30 cf

Subcatchment SC1.6: Runoff Area=622 sf 100.00% Impervious Runoff Depth>0.79"
Tc=5.0 min CN=98 Runoff=0.0 cfs 41 cf

Subcatchment SC2.1: Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>0.17"
Flow Length=68' Tc=5.0 min CN=85 Runoff=0.0 cfs 54 cf

Subcatchment SC2.2: Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>0.02"
Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=0.0 cfs 74 cf

Subcatchment SC3.1: Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>0.02"
Flow Length=564' Tc=10.4 min CN=73 Runoff=0.0 cfs 94 cf

Subcatchment SC3.2: Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>0.01"
Flow Length=378' Tc=10.1 min CN=71 Runoff=0.0 cfs 35 cf

Subcatchment SC3.3: Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>0.01"
Flow Length=287' Tc=10.8 min CN=71 Runoff=0.0 cfs 40 cf

Subcatchment SC3.4: Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>0.20"
Flow Length=246' Tc=5.0 min CN=86 Runoff=0.1 cfs 203 cf

Subcatchment SC4.1: Runoff Area=4,504 sf 4.43% Impervious Runoff Depth>0.02"
Flow Length=64' Tc=5.0 min CN=74 Runoff=0.0 cfs 9 cf

Subcatchment SC4.2: Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>0.20"
Flow Length=75' Tc=12.7 min CN=86 Runoff=0.0 cfs 165 cf

Pond CB1: Peak Elev=298.11' Inflow=0.0 cfs 145 cf
12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.0 cfs 145 cf

Pond CB2: Peak Elev=288.37' Inflow=0.1 cfs 331 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.1 cfs 331 cf

Pond DCB3: Peak Elev=287.37' Storage=0 cf Inflow=0.0 cfs 221 cf
24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=0.0 cfs 221 cf

Pond DCB4: Peak Elev=287.29' Storage=0 cf Inflow=0.0 cfs 174 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.0 cfs 173 cf

Pond DCB5: Peak Elev=297.45' Inflow=0.0 cfs 94 cf
21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=0.0 cfs 94 cf

Pond DCB6: Peak Elev=297.12' Inflow=0.1 cfs 203 cf
21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.1 cfs 203 cf

Pond DCB7: Peak Elev=297.03' Inflow=0.0 cfs 35 cf
18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.0 cfs 35 cf

Pond DMH1: Peak Elev=287.17' Inflow=0.1 cfs 697 cf
24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=0.1 cfs 697 cf

Pond DMH2: Peak Elev=296.95' Inflow=0.1 cfs 297 cf
30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.1 cfs 297 cf

Pond IC-1: Peak Elev=282.41' Storage=8 cf Inflow=0.1 cfs 871 cf
Discarded=0.1 cfs 870 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 870 cf

Pond IC-2: Peak Elev=295.80' Storage=0 cf Inflow=0.1 cfs 332 cf
Discarded=0.1 cfs 332 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 332 cf

Pond SD-1: Peak Elev=300.07' Storage=3 cf Inflow=0.0 cfs 54 cf
Discarded=0.0 cfs 54 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 54 cf

Pond SD-2: Peak Elev=302.50' Storage=0 cf Inflow=0.0 cfs 9 cf
Discarded=0.0 cfs 9 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 9 cf

Link AP1: Inflow=0.0 cfs 71 cf
Primary=0.0 cfs 71 cf

Link AP2: Inflow=0.0 cfs 74 cf
Primary=0.0 cfs 74 cf

Link AP3: Inflow=0.0 cfs 40 cf
Primary=0.0 cfs 40 cf

Link AP4: Inflow=0.0 cfs 165 cf
Primary=0.0 cfs 165 cf

Total Runoff Area = 478,286 sf Runoff Volume = 1,615 cf Average Runoff Depth = 0.04"
88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

Summary for Subcatchment SC1.1:

Runoff = 0.0 cfs @ 13.27 hrs, Volume= 174 cf, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
24,785	74	>75% Grass cover, Good, HSG C
21,721	70	Woods, Good, HSG C
14	89	Gravel roads, HSG C
6,226	98	Paved parking, HSG C
1,776	98	Roofs, HSG C
54,522	76	Weighted Average
46,520		85.32% Pervious Area
8,002		14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	35	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	50	0.0345	1.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	180	0.1550	1.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	234	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.5	549	Total			

Summary for Subcatchment SC1.2:

Runoff = 0.0 cfs @ 16.55 hrs, Volume= 221 cf, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
46,703	74	>75% Grass cover, Good, HSG C
57,729	70	Woods, Good, HSG C
967	89	Gravel roads, HSG C
313	98	Unconnected pavement, HSG C
7,362	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
115,523	74	Weighted Average
105,398		91.24% Pervious Area
10,124		8.76% Impervious Area
313		3.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.3	167	0.0988	2.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	117	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	176	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.7	510	Total			

Summary for Subcatchment SC1.3:

Runoff = 0.1 cfs @ 12.12 hrs, Volume= 331 cf, Depth> 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
162	74	>75% Grass cover, Good, HSG C
243	89	Gravel roads, HSG C
5,233	98	Paved parking, HSG C
5,639	97	Weighted Average
405		7.19% Pervious Area
5,233		92.81% Impervious Area

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

Summary for Subcatchment SC1.4:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 145 cf, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
2,208	98	Paved parking, HSG C
2,208		100.00% Impervious Area

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

Summary for Subcatchment SC1.5:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 30 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
37,139	70	Woods, Good, HSG C
441	98	Unconnected pavement, HSG C
8,658	74	>75% Grass cover, Good, HSG C
46,238	71	Weighted Average
45,797		99.05% Pervious Area
441		0.95% Impervious Area
441		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
3.1	287	0.0941	1.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	337	Total			

Summary for Subcatchment SC1.6:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 41 cf, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
622	98	Paved parking, HSG C
622		100.00% Impervious Area

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

Summary for Subcatchment SC2.1:

Runoff = 0.0 cfs @ 12.13 hrs, Volume= 54 cf, Depth> 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
1,953	74	>75% Grass cover, Good, HSG C
1,776	98	Roofs, HSG C
3,729	85	Weighted Average
1,953		52.37% Pervious Area
1,776		47.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	68	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC2.2:

Runoff = 0.0 cfs @ 16.54 hrs, Volume= 74 cf, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Adj	Description
7,180	74		>75% Grass cover, Good, HSG C
22,269	70		Woods, Good, HSG C
8,992	98		Unconnected pavement, HSG C
38,441	77	74	Weighted Average, UI Adjusted
29,449			76.61% Pervious Area
8,992			23.39% Impervious Area
8,992			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	29	0.1700	2.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	61	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	140	Total			

Summary for Subcatchment SC3.1:

Runoff = 0.0 cfs @ 22.27 hrs, Volume= 94 cf, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
32,168	74	>75% Grass cover, Good, HSG C
31,971	70	Woods, Good, HSG C
364	89	Gravel roads, HSG C
55	98	Paved parking, HSG C
2,321	98	Roofs, HSG C
66,880	73	Weighted Average
64,504		96.45% Pervious Area
2,376		3.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
2.1	247	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	133	0.0830	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	134	0.0820	2.00		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	564	Total			

Summary for Subcatchment SC3.2:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 35 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
12,832	74	>75% Grass cover, Good, HSG C
880	98	Roofs, HSG C
41,349	70	Woods, Good, HSG C
55,060	71	Weighted Average
54,180		98.40% Pervious Area
880		1.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.7	204	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	124	0.0530	1.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	378	Total			

Summary for Subcatchment SC3.3:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 40 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
12,393	74	>75% Grass cover, Good, HSG C
49,047	70	Woods, Good, HSG C
1,019	98	Unconnected pavement, HSG C
62,459	71	Weighted Average
61,440		98.37% Pervious Area
1,019		1.63% Impervious Area
1,019		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.2	237	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.8	287	Total			

Summary for Subcatchment SC3.4:

Runoff = 0.1 cfs @ 12.13 hrs, Volume= 203 cf, Depth> 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
5,554	74	>75% Grass cover, Good, HSG C
529	70	Woods, Good, HSG C
76	89	Gravel roads, HSG C
6,187	98	Paved parking, HSG C
12,347	86	Weighted Average
6,159		49.89% Pervious Area
6,187		50.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	113	0.0200	1.40		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
2.4	38	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.9	95	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	246	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.1:

Runoff = 0.0 cfs @ 16.53 hrs, Volume= 9 cf, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
1,020	70	Woods, Good, HSG C
200	98	Unconnected pavement, HSG C
3,285	74	>75% Grass cover, Good, HSG C
4,504	74	Weighted Average
4,305		95.57% Pervious Area
200		4.43% Impervious Area
200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	14	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	64	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.2:

Runoff = 0.0 cfs @ 12.22 hrs, Volume= 165 cf, Depth> 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 1 Inch Rainfall=1.00"

Area (sf)	CN	Description
3,927	70	Woods, Good, HSG C
5,854	98	Unconnected pavement, HSG C
333	74	>75% Grass cover, Good, HSG C
10,114	86	Weighted Average
4,260		42.12% Pervious Area
5,854		57.88% Impervious Area
5,854		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	25	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.7	75	Total			

Summary for Pond CB1:

Inflow Area = 2,208 sf,100.00% Impervious, Inflow Depth > 0.79" for 1 Inch event
Inflow = 0.0 cfs @ 12.12 hrs, Volume= 145 cf
Outflow = 0.0 cfs @ 12.12 hrs, Volume= 145 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 12.12 hrs, Volume= 145 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.11' @ 12.12 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.00'	**12.0" Round Culvert** L= 220.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=298.11' TW=287.17' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.0 cfs @ 0.90 fps)

Summary for Pond CB2:

Inflow Area = 5,639 sf, 92.81% Impervious, Inflow Depth > 0.70" for 1 Inch event
Inflow = 0.1 cfs @ 12.12 hrs, Volume= 331 cf
Outflow = 0.1 cfs @ 12.12 hrs, Volume= 331 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 12.12 hrs, Volume= 331 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.37' @ 12.12 hrs
Flood Elev= 292.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.20'	**12.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=288.37' TW=287.17' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.1 cfs @ 1.12 fps)

Summary for Pond DCB3:

Inflow Area = 115,523 sf, 8.76% Impervious, Inflow Depth > 0.02" for 1 Inch event
Inflow = 0.0 cfs @ 16.55 hrs, Volume= 221 cf
Outflow = 0.0 cfs @ 16.55 hrs, Volume= 221 cf, Atten= 0%, Lag= 0.1 min
Primary = 0.0 cfs @ 16.55 hrs, Volume= 221 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 287.37' @ 16.55 hrs Surf.Area= 1 sf Storage= 0 cf
Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= 1.1 min calculated for 221 cf (100% of inflow)
Center-of-Mass det. time= 0.6 min (1,123.6 - 1,123.0)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	89	87.5	33	36	615
292.00	519	180.8	274	310	2,611

Device	Routing	Invert	Outlet Devices
#1	Primary	287.34'	**24.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.34' / 287.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.0 cfs @ 16.55 hrs HW=287.37' TW=287.05' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.0 cfs @ 0.50 fps)

Summary for Pond DCB4:

Inflow Area = 54,522 sf, 14.68% Impervious, Inflow Depth > 0.04" for 1 Inch event
Inflow = 0.0 cfs @ 13.27 hrs, Volume= 174 cf
Outflow = 0.0 cfs @ 13.27 hrs, Volume= 173 cf, Atten= 0%, Lag= 0.1 min
Primary = 0.0 cfs @ 13.27 hrs, Volume= 173 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 287.29' @ 13.27 hrs Surf.Area= 1 sf Storage= 0 cf
Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= 1.1 min calculated for 173 cf (100% of inflow)
Center-of-Mass det. time= 0.5 min (1,073.9 - 1,073.4)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	250 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	714	132.0	247	250	1,392

Device	Routing	Invert	Outlet Devices
#1	Primary	287.25'	**15.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.0 cfs @ 13.27 hrs HW=287.29' TW=282.40' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.0 cfs @ 0.77 fps)

Summary for Pond DCB5:

Inflow Area = 66,880 sf, 3.55% Impervious, Inflow Depth > 0.02" for 1 Inch event
Inflow = 0.0 cfs @ 22.27 hrs, Volume= 94 cf
Outflow = 0.0 cfs @ 22.27 hrs, Volume= 94 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 22.27 hrs, Volume= 94 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 297.45' @ 22.27 hrs
Flood Elev= 302.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.42'	**21.0" Round Culvert** L= 47.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.0 cfs @ 22.27 hrs HW=297.45' TW=296.88' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.0 cfs @ 0.62 fps)

Summary for Pond DCB6:

Inflow Area = 12,347 sf, 50.11% Impervious, Inflow Depth > 0.20" for 1 Inch event
Inflow = 0.1 cfs @ 12.13 hrs, Volume= 203 cf
Outflow = 0.1 cfs @ 12.13 hrs, Volume= 203 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 12.13 hrs, Volume= 203 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 297.12' @ 12.13 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**21.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.1 cfs @ 12.13 hrs HW=297.12' TW=296.95' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.1 cfs @ 1.31 fps)

Summary for Pond DCB7:

Inflow Area = 55,060 sf, 1.60% Impervious, Inflow Depth > 0.01" for 1 Inch event
Inflow = 0.0 cfs @ 24.00 hrs, Volume= 35 cf
Outflow = 0.0 cfs @ 24.00 hrs, Volume= 35 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 24.00 hrs, Volume= 35 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 297.03' @ 24.00 hrs
Flood Elev= 302.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**18.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.0 cfs @ 24.00 hrs HW=297.03' TW=295.80' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.0 cfs @ 0.51 fps)

Summary for Pond DMH1:

Inflow Area = 123,370 sf, 14.24% Impervious, Inflow Depth > 0.07" for 1 Inch event
Inflow = 0.1 cfs @ 12.12 hrs, Volume= 697 cf
Outflow = 0.1 cfs @ 12.12 hrs, Volume= 697 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 12.12 hrs, Volume= 697 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 287.17' @ 12.12 hrs
Flood Elev= 292.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	287.00'	**24.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=287.17' TW=282.41' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.1 cfs @ 1.11 fps)

Summary for Pond DMH2:

Inflow Area = 79,226 sf, 10.81% Impervious, Inflow Depth > 0.04" for 1 Inch event
Inflow = 0.1 cfs @ 12.13 hrs, Volume= 297 cf
Outflow = 0.1 cfs @ 12.13 hrs, Volume= 297 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 12.13 hrs, Volume= 297 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 296.95' @ 12.13 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	296.85'	**30.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=0.1 cfs @ 12.13 hrs HW=296.95' TW=295.80' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.1 cfs @ 1.23 fps)

Summary for Pond IC-1:

Inflow Area = 177,892 sf, 14.37% Impervious, Inflow Depth > 0.06" for 1 Inch event
Inflow = 0.1 cfs @ 12.12 hrs, Volume= 871 cf
Outflow = 0.1 cfs @ 12.12 hrs, Volume= 870 cf, Atten= 23%, Lag= 0.0 min
Discarded = 0.1 cfs @ 12.12 hrs, Volume= 870 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 282.41' @ 12.16 hrs Surf.Area= 2,021 sf Storage= 8 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	282.40'	3,658 cf	**IC-1 Stone bed (Irregular)**Listed below (Recalc) 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids
#2	283.40'	5,002 cf	**ADS_StormTech MC-4500 b +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf
#3	283.00'	200 cf	**PES-1 Stone bed (Pyramidal)**Listed below (Recalc) 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids
#4	283.00'	126 cf	**24.0" Round Pipe Storage** Inside #3 L= 40.0'
		8,985 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
282.40	2,021	188.0	0	0	2,021
283.00	2,021	188.0	1,213	1,213	2,134
284.00	2,021	188.0	2,021	3,234	2,322
285.00	2,021	188.0	2,021	5,255	2,510
286.00	2,021	188.0	2,021	7,276	2,698
287.00	2,021	188.0	2,021	9,297	2,886
288.00	2,021	188.0	2,021	11,318	3,074
289.00	2,021	188.0	2,021	13,339	3,262
289.40	2,021	188.0	808	14,147	3,337

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
283.00	250	0	0	250
284.00	250	250	250	313
285.00	250	250	500	376
285.50	250	125	625	408

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.40'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	285.50'	**50.0' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32
#3	Device 2	284.10'	**24.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	284.10'	**20.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	287.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 12.12 hrs HW=282.41' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=282.40' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
└**3=Culvert** (Controls 0.0 cfs)
└**4=Orifice/Grate** (Controls 0.0 cfs)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.0 cfs)

Summary for Pond IC-2:

Inflow Area = 134,287 sf, 7.03% Impervious, Inflow Depth > 0.03" for 1 Inch event
Inflow = 0.1 cfs @ 12.13 hrs, Volume= 332 cf
Outflow = 0.1 cfs @ 12.13 hrs, Volume= 332 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.1 cfs @ 12.13 hrs, Volume= 332 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 295.80' @ 12.13 hrs Surf.Area= 1,247 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,024.6 - 1,024.6)

Volume	Invert	Avail.Storage	Storage Description
#1	295.80'	2,234 cf	**IC-2 Stone bed (Irregular)**Listed below (Recalc) 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids
#2	296.80'	3,143 cf	**ADS_StormTech MC-4500 b +Cap @ 4.03' L** x 28 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 28 Chambers in 2 Rows Cap Storage= +39.5 cf x 2 x 2 rows = 158.0 cf
#3	296.00'	172 cf	**PES-2 Stone bed (Pyramidal)**Listed below (Recalc) 500 cf Overall - 71 cf Embedded = 429 cf x 40.0% Voids
#4	296.00'	71 cf	**18.0" Round Pipe Storage** Inside #3 L= 40.0'
		5,620 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
295.80	1,247	165.0	0	0	1,247
296.00	1,247	165.0	249	249	1,280
297.00	1,247	165.0	1,247	1,496	1,445
298.00	1,247	165.0	1,247	2,743	1,610
299.00	1,247	165.0	1,247	3,990	1,775
300.00	1,247	165.0	1,247	5,237	1,940
301.00	1,247	165.0	1,247	6,484	2,105
302.00	1,247	165.0	1,247	7,731	2,270
302.80	1,247	165.0	998	8,729	2,402

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
296.00	250	0	0	250
297.00	250	250	250	313
298.00	250	250	500	376

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	298.00'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 2	296.50'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.50' / 296.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	296.50'	**23.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	299.90'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 12.13 hrs HW=295.80' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=295.80' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
└**3=Culvert** (Controls 0.0 cfs)
└**4=Orifice/Grate** (Controls 0.0 cfs)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.0 cfs)

Summary for Pond SD-1:

Inflow Area = 3,729 sf, 47.63% Impervious, Inflow Depth > 0.17" for 1 Inch event
Inflow = 0.0 cfs @ 12.13 hrs, Volume= 54 cf
Outflow = 0.0 cfs @ 12.10 hrs, Volume= 54 cf, Atten= 57%, Lag= 0.0 min
Discarded = 0.0 cfs @ 12.10 hrs, Volume= 54 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.07' @ 12.26 hrs Surf.Area= 109 sf Storage= 3 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.1 min (940.5 - 939.5)

Volume	Invert	Avail.Storage	Storage Description
#1	300.00'	44 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 109 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
300.00	109	113.3	0	0	109
301.00	109	113.3	109	109	222

Device	Routing	Invert	Outlet Devices
#1	Discarded	300.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	300.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 12.10 hrs HW=300.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=300.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond SD-2:

Inflow Area = 4,504 sf, 4.43% Impervious, Inflow Depth > 0.02" for 1 Inch event
Inflow = 0.0 cfs @ 16.53 hrs, Volume= 9 cf
Outflow = 0.0 cfs @ 16.53 hrs, Volume= 9 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 16.53 hrs, Volume= 9 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 302.50' @ 0.00 hrs Surf.Area= 40 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,122.2 - 1,122.2)

Volume	Invert	Avail.Storage	Storage Description
#1	302.50'	16 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 40 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
302.50	40	44.0	0	0	40
303.50	40	44.0	40	40	84

Device	Routing	Invert	Outlet Devices
#1	Discarded	302.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	303.40'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 16.53 hrs HW=302.50' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.0 cfs of 0.0 cfs potential flow)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=302.50' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Link AP1:

Inflow Area = 224,752 sf, 11.85% Impervious, Inflow Depth > 0.00" for 1 Inch event
Inflow = 0.0 cfs @ 12.12 hrs, Volume= 71 cf
Primary = 0.0 cfs @ 12.12 hrs, Volume= 71 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP2:

Inflow Area = 42,170 sf, 25.53% Impervious, Inflow Depth > 0.02" for 1 Inch event
Inflow = 0.0 cfs @ 16.54 hrs, Volume= 74 cf
Primary = 0.0 cfs @ 16.54 hrs, Volume= 74 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP3:

Inflow Area = 196,746 sf, 5.32% Impervious, Inflow Depth > 0.00" for 1 Inch event
Inflow = 0.0 cfs @ 24.00 hrs, Volume= 40 cf
Primary = 0.0 cfs @ 24.00 hrs, Volume= 40 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP4:

Inflow Area = 14,618 sf, 41.41% Impervious, Inflow Depth > 0.14" for 1 Inch event
Inflow = 0.0 cfs @ 12.22 hrs, Volume= 165 cf
Primary = 0.0 cfs @ 12.22 hrs, Volume= 165 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: Runoff Area=54,522 sf 14.68% Impervious Runoff Depth>1.12"
Flow Length=549' Tc=7.5 min CN=76 Runoff=1.5 cfs 5,093 cf

Subcatchment SC1.2: Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>1.01"
Flow Length=510' Tc=6.7 min CN=74 Runoff=2.8 cfs 9,709 cf

Subcatchment SC1.3: Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>2.81"
Tc=5.0 min CN=97 Runoff=0.4 cfs 1,322 cf

Subcatchment SC1.4: Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>2.92"
Tc=5.0 min CN=98 Runoff=0.1 cfs 538 cf

Subcatchment SC1.5: Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>0.85"
Flow Length=337' Tc=6.4 min CN=71 Runoff=0.9 cfs 3,282 cf

Subcatchment SC1.6: Runoff Area=622 sf 100.00% Impervious Runoff Depth>2.92"
Tc=5.0 min CN=98 Runoff=0.0 cfs 152 cf

Subcatchment SC2.1: Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>1.72"
Flow Length=68' Tc=5.0 min CN=85 Runoff=0.2 cfs 535 cf

Subcatchment SC2.2: Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>1.01"
Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=0.9 cfs 3,231 cf

Subcatchment SC3.1: Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>0.95"
Flow Length=564' Tc=10.4 min CN=73 Runoff=1.3 cfs 5,311 cf

Subcatchment SC3.2: Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>0.85"
Flow Length=378' Tc=10.1 min CN=71 Runoff=0.9 cfs 3,901 cf

Subcatchment SC3.3: Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>0.85"
Flow Length=287' Tc=10.8 min CN=71 Runoff=1.0 cfs 4,424 cf

Subcatchment SC3.4: Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>1.80"
Flow Length=246' Tc=5.0 min CN=86 Runoff=0.6 cfs 1,850 cf

Subcatchment SC4.1: Runoff Area=4,504 sf 4.43% Impervious Runoff Depth>1.01"
Flow Length=64' Tc=5.0 min CN=74 Runoff=0.1 cfs 379 cf

Subcatchment SC4.2: Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>1.79"
Flow Length=75' Tc=12.7 min CN=86 Runoff=0.4 cfs 1,511 cf

Pond CB1: Peak Elev=298.21' Inflow=0.1 cfs 538 cf
12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.1 cfs 538 cf

Pond CB2: Peak Elev=288.54' Inflow=0.4 cfs 1,322 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.4 cfs 1,322 cf

Pond DCB3: Peak Elev=288.21' Storage=1 cf Inflow=2.8 cfs 9,709 cf
24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=2.8 cfs 9,708 cf

Pond DCB4: Peak Elev=287.97' Storage=1 cf Inflow=1.5 cfs 5,093 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=1.5 cfs 5,093 cf

Pond DCB5: Peak Elev=298.25' Inflow=1.3 cfs 5,311 cf
21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=1.3 cfs 5,311 cf

Pond DCB6: Peak Elev=298.17' Inflow=0.6 cfs 1,850 cf
21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.6 cfs 1,849 cf

Pond DCB7: Peak Elev=298.18' Inflow=0.9 cfs 3,901 cf
18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.9 cfs 3,901 cf

Pond DMH1: Peak Elev=287.87' Inflow=3.3 cfs 11,569 cf
24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=3.3 cfs 11,569 cf

Pond DMH2: Peak Elev=298.18' Inflow=1.7 cfs 7,160 cf
30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=1.7 cfs 7,160 cf

Pond IC-1: Peak Elev=285.56' Storage=4,603 cf Inflow=4.7 cfs 16,661 cf
Discarded=0.1 cfs 6,442 cf Primary=1.7 cfs 5,704 cf Outflow=1.8 cfs 12,146 cf

Pond IC-2: Peak Elev=298.16' Storage=2,126 cf Inflow=2.6 cfs 11,061 cf
Discarded=0.1 cfs 4,048 cf Primary=1.9 cfs 5,046 cf Outflow=1.9 cfs 9,094 cf

Pond SD-1: Peak Elev=300.91' Storage=40 cf Inflow=0.2 cfs 535 cf
Discarded=0.0 cfs 310 cf Primary=0.2 cfs 225 cf Outflow=0.2 cfs 535 cf

Pond SD-2: Peak Elev=303.42' Storage=15 cf Inflow=0.1 cfs 379 cf
Discarded=0.0 cfs 108 cf Primary=0.1 cfs 257 cf Outflow=0.1 cfs 364 cf

Link AP1: Inflow=2.1 cfs 9,137 cf
Primary=2.1 cfs 9,137 cf

Link AP2: Inflow=1.1 cfs 3,456 cf
Primary=1.1 cfs 3,456 cf

Link AP3: Inflow=2.7 cfs 9,469 cf
Primary=2.7 cfs 9,469 cf

Link AP4: Inflow=0.4 cfs 1,768 cf
Primary=0.4 cfs 1,768 cf

Total Runoff Area = 478,286 sf Runoff Volume = 41,236 cf Average Runoff Depth = 1.03"
88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

Summary for Subcatchment SC1.1:

Runoff = 1.5 cfs @ 12.15 hrs, Volume= 5,093 cf, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
24,785	74	>75% Grass cover, Good, HSG C
21,721	70	Woods, Good, HSG C
14	89	Gravel roads, HSG C
6,226	98	Paved parking, HSG C
1,776	98	Roofs, HSG C
54,522	76	Weighted Average
46,520		85.32% Pervious Area
8,002		14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	35	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	50	0.0345	1.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	180	0.1550	1.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	234	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.5	549	Total			

Summary for Subcatchment SC1.2:

Runoff = 2.8 cfs @ 12.14 hrs, Volume= 9,709 cf, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
46,703	74	>75% Grass cover, Good, HSG C
57,729	70	Woods, Good, HSG C
967	89	Gravel roads, HSG C
313	98	Unconnected pavement, HSG C
7,362	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
115,523	74	Weighted Average
105,398		91.24% Pervious Area
10,124		8.76% Impervious Area
313		3.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.3	167	0.0988	2.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	117	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	176	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.7	510	Total			

Summary for Subcatchment SC1.3:

Runoff = 0.4 cfs @ 12.12 hrs, Volume= 1,322 cf, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
162	74	>75% Grass cover, Good, HSG C
243	89	Gravel roads, HSG C
5,233	98	Paved parking, HSG C
5,639	97	Weighted Average
405		7.19% Pervious Area
5,233		92.81% Impervious Area

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

Summary for Subcatchment SC1.4:

Runoff = 0.1 cfs @ 12.12 hrs, Volume= 538 cf, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
2,208	98	Paved parking, HSG C
2,208		100.00% Impervious Area

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

Summary for Subcatchment SC1.5:

Runoff = 0.9 cfs @ 12.14 hrs, Volume= 3,282 cf, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
37,139	70	Woods, Good, HSG C
441	98	Unconnected pavement, HSG C
8,658	74	>75% Grass cover, Good, HSG C
46,238	71	Weighted Average
45,797		99.05% Pervious Area
441		0.95% Impervious Area
441		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
3.1	287	0.0941	1.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	337	Total			

Summary for Subcatchment SC1.6:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 152 cf, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
622	98	Paved parking, HSG C
622		100.00% Impervious Area

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

Summary for Subcatchment SC2.1:

Runoff = 0.2 cfs @ 12.12 hrs, Volume= 535 cf, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
1,953	74	>75% Grass cover, Good, HSG C
1,776	98	Roofs, HSG C
3,729	85	Weighted Average
1,953		52.37% Pervious Area
1,776		47.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	68	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC2.2:

Runoff = 0.9 cfs @ 12.14 hrs, Volume= 3,231 cf, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Adj	Description
7,180	74		>75% Grass cover, Good, HSG C
22,269	70		Woods, Good, HSG C
8,992	98		Unconnected pavement, HSG C
38,441	77	74	Weighted Average, UI Adjusted
29,449			76.61% Pervious Area
8,992			23.39% Impervious Area
8,992			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	29	0.1700	2.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	61	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	140	Total			

Summary for Subcatchment SC3.1:

Runoff = 1.3 cfs @ 12.19 hrs, Volume= 5,311 cf, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
32,168	74	>75% Grass cover, Good, HSG C
31,971	70	Woods, Good, HSG C
364	89	Gravel roads, HSG C
55	98	Paved parking, HSG C
2,321	98	Roofs, HSG C
66,880	73	Weighted Average
64,504		96.45% Pervious Area
2,376		3.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
2.1	247	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	133	0.0830	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	134	0.0820	2.00		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	564	Total			

Summary for Subcatchment SC3.2:

Runoff = 0.9 cfs @ 12.18 hrs, Volume= 3,901 cf, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
12,832	74	>75% Grass cover, Good, HSG C
880	98	Roofs, HSG C
41,349	70	Woods, Good, HSG C
55,060	71	Weighted Average
54,180		98.40% Pervious Area
880		1.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.7	204	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	124	0.0530	1.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	378	Total			

Summary for Subcatchment SC3.3:

Runoff = 1.0 cfs @ 12.19 hrs, Volume= 4,424 cf, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
12,393	74	>75% Grass cover, Good, HSG C
49,047	70	Woods, Good, HSG C
1,019	98	Unconnected pavement, HSG C
62,459	71	Weighted Average
61,440		98.37% Pervious Area
1,019		1.63% Impervious Area
1,019		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.2	237	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.8	287	Total			

Summary for Subcatchment SC3.4:

Runoff = 0.6 cfs @ 12.12 hrs, Volume= 1,850 cf, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
5,554	74	>75% Grass cover, Good, HSG C
529	70	Woods, Good, HSG C
76	89	Gravel roads, HSG C
6,187	98	Paved parking, HSG C
12,347	86	Weighted Average
6,159		49.89% Pervious Area
6,187		50.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	113	0.0200	1.40		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
2.4	38	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.9	95	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	246	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.1:

Runoff = 0.1 cfs @ 12.13 hrs, Volume= 379 cf, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
1,020	70	Woods, Good, HSG C
200	98	Unconnected pavement, HSG C
3,285	74	>75% Grass cover, Good, HSG C
4,504	74	Weighted Average
4,305		95.57% Pervious Area
200		4.43% Impervious Area
200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	14	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	64	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.2:

Runoff = 0.4 cfs @ 12.20 hrs, Volume= 1,511 cf, Depth> 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

Area (sf)	CN	Description
3,927	70	Woods, Good, HSG C
5,854	98	Unconnected pavement, HSG C
333	74	>75% Grass cover, Good, HSG C
10,114	86	Weighted Average
4,260		42.12% Pervious Area
5,854		57.88% Impervious Area
5,854		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	25	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.7	75	Total			

Summary for Pond CB1:

Inflow Area = 2,208 sf,100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
Inflow = 0.1 cfs @ 12.12 hrs, Volume= 538 cf
Outflow = 0.1 cfs @ 12.12 hrs, Volume= 538 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 12.12 hrs, Volume= 538 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.21' @ 12.12 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.00'	**12.0" Round Culvert** L= 220.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=298.21' TW=287.85' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.1 cfs @ 1.23 fps)

Summary for Pond CB2:

Inflow Area = 5,639 sf, 92.81% Impervious, Inflow Depth > 2.81" for 2-Year event
Inflow = 0.4 cfs @ 12.12 hrs, Volume= 1,322 cf
Outflow = 0.4 cfs @ 12.12 hrs, Volume= 1,322 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.12 hrs, Volume= 1,322 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.54' @ 12.12 hrs
Flood Elev= 292.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.20'	**12.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=288.54' TW=287.85' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.4 cfs @ 2.33 fps)

Summary for Pond DCB3:

Inflow Area = 115,523 sf, 8.76% Impervious, Inflow Depth > 1.01" for 2-Year event
Inflow = 2.8 cfs @ 12.14 hrs, Volume= 9,709 cf
Outflow = 2.8 cfs @ 12.14 hrs, Volume= 9,708 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.8 cfs @ 12.14 hrs, Volume= 9,708 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 288.21' @ 12.14 hrs Surf.Area= 1 sf Storage= 1 cf
Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= 0.0 min calculated for 9,708 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (895.0 - 895.0)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	89	87.5	33	36	615
292.00	519	180.8	274	310	2,611

Device	Routing	Invert	Outlet Devices
#1	Primary	287.34'	**24.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.34' / 287.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.8 cfs @ 12.14 hrs HW=288.20' TW=287.87' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 2.8 cfs @ 3.18 fps)

Summary for Pond DCB4:

Inflow Area = 54,522 sf, 14.68% Impervious, Inflow Depth > 1.12" for 2-Year event
Inflow = 1.5 cfs @ 12.15 hrs, Volume= 5,093 cf
Outflow = 1.5 cfs @ 12.15 hrs, Volume= 5,093 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.5 cfs @ 12.15 hrs, Volume= 5,093 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 287.97' @ 12.15 hrs Surf.Area= 1 sf Storage= 1 cf
Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= 0.1 min calculated for 5,088 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (887.4 - 887.4)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	250 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	714	132.0	247	250	1,392

Device	Routing	Invert	Outlet Devices
#1	Primary	287.25'	**15.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.4 cfs @ 12.15 hrs HW=287.96' TW=284.63' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 1.4 cfs @ 2.87 fps)

Summary for Pond DCB5:

Inflow Area = 66,880 sf, 3.55% Impervious, Inflow Depth > 0.95" for 2-Year event
Inflow = 1.3 cfs @ 12.19 hrs, Volume= 5,311 cf
Outflow = 1.3 cfs @ 12.19 hrs, Volume= 5,311 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.3 cfs @ 12.19 hrs, Volume= 5,311 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.25' @ 12.26 hrs
Flood Elev= 302.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.42'	**21.0" Round Culvert** L= 47.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.9 cfs @ 12.19 hrs HW=298.07' TW=297.93' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.9 cfs @ 1.69 fps)

Summary for Pond DCB6:

Inflow Area = 12,347 sf, 50.11% Impervious, Inflow Depth > 1.80" for 2-Year event
Inflow = 0.6 cfs @ 12.12 hrs, Volume= 1,850 cf
Outflow = 0.6 cfs @ 12.12 hrs, Volume= 1,849 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.6 cfs @ 12.12 hrs, Volume= 1,849 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.17' @ 12.28 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**21.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.3 cfs @ 12.12 hrs HW=297.54' TW=297.53' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.3 cfs @ 0.66 fps)

Summary for Pond DCB7:

Inflow Area = 55,060 sf, 1.60% Impervious, Inflow Depth > 0.85" for 2-Year event
Inflow = 0.9 cfs @ 12.18 hrs, Volume= 3,901 cf
Outflow = 0.9 cfs @ 12.18 hrs, Volume= 3,901 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.9 cfs @ 12.18 hrs, Volume= 3,901 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.18' @ 12.26 hrs
Flood Elev= 302.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**18.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.0 cfs @ 12.18 hrs HW=297.91' TW=297.86' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.0 cfs @ 0.86 fps)

Summary for Pond DMH1:

Inflow Area = 123,370 sf, 14.24% Impervious, Inflow Depth > 1.13" for 2-Year event
Inflow = 3.3 cfs @ 12.14 hrs, Volume= 11,569 cf
Outflow = 3.3 cfs @ 12.14 hrs, Volume= 11,569 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.3 cfs @ 12.14 hrs, Volume= 11,569 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 287.87' @ 12.14 hrs
Flood Elev= 292.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	287.00'	**24.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.3 cfs @ 12.14 hrs HW=287.87' TW=284.51' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.3 cfs @ 2.51 fps)

Summary for Pond DMH2:

Inflow Area = 79,226 sf, 10.81% Impervious, Inflow Depth > 1.08" for 2-Year event
Inflow = 1.7 cfs @ 12.15 hrs, Volume= 7,160 cf
Outflow = 1.7 cfs @ 12.15 hrs, Volume= 7,160 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.7 cfs @ 12.15 hrs, Volume= 7,160 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 298.18' @ 12.26 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	296.85'	**30.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=1.7 cfs @ 12.15 hrs HW=297.71' TW=297.62' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.7 cfs @ 1.16 fps)

Summary for Pond IC-1:

Inflow Area = 177,892 sf, 14.37% Impervious, Inflow Depth > 1.12" for 2-Year event
Inflow = 4.7 cfs @ 12.14 hrs, Volume= 16,661 cf
Outflow = 1.8 cfs @ 12.32 hrs, Volume= 12,146 cf, Atten= 61%, Lag= 11.0 min
Discarded = 0.1 cfs @ 11.76 hrs, Volume= 6,442 cf
Primary = 1.7 cfs @ 12.32 hrs, Volume= 5,704 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 285.56' @ 12.32 hrs Surf.Area= 2,271 sf Storage= 4,603 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 59.0 min (937.4 - 878.5)

Volume	Invert	Avail.Storage	Storage Description
#1	282.40'	3,658 cf	**IC-1 Stone bed (Irregular)**Listed below (Recalc) 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids
#2	283.40'	5,002 cf	**ADS_StormTech MC-4500 b +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf
#3	283.00'	200 cf	**PES-1 Stone bed (Pyramidal)**Listed below (Recalc) 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids
#4	283.00'	126 cf	**24.0" Round Pipe Storage** Inside #3 L= 40.0'
		8,985 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
282.40	2,021	188.0	0	0	2,021
283.00	2,021	188.0	1,213	1,213	2,134
284.00	2,021	188.0	2,021	3,234	2,322
285.00	2,021	188.0	2,021	5,255	2,510
286.00	2,021	188.0	2,021	7,276	2,698
287.00	2,021	188.0	2,021	9,297	2,886
288.00	2,021	188.0	2,021	11,318	3,074
289.00	2,021	188.0	2,021	13,339	3,262
289.40	2,021	188.0	808	14,147	3,337

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
283.00	250	0	0	250
284.00	250	250	250	313
285.00	250	250	500	376
285.50	250	125	625	408

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.40'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	285.50'	**50.0' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32
#3	Device 2	284.10'	**24.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	284.10'	**20.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	287.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 11.76 hrs HW=283.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=1.7 cfs @ 12.32 hrs HW=285.56' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.7 cfs @ 0.59 fps)
└**3=Culvert** (Passes 1.7 cfs of 2.0 cfs potential flow)
└**4=Orifice/Grate** (Passes 1.7 cfs of 1.9 cfs potential flow)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.0 cfs)

Summary for Pond IC-2:

Inflow Area = 134,287 sf, 7.03% Impervious, Inflow Depth > 0.99" for 2-Year event
Inflow = 2.6 cfs @ 12.17 hrs, Volume= 11,061 cf
Outflow = 1.9 cfs @ 12.26 hrs, Volume= 9,094 cf, Atten= 27%, Lag= 5.9 min
Discarded = 0.1 cfs @ 11.60 hrs, Volume= 4,048 cf
Primary = 1.9 cfs @ 12.26 hrs, Volume= 5,046 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.16' @ 12.26 hrs Surf.Area= 1,497 sf Storage= 2,126 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 38.2 min (933.0 - 894.8)

Volume	Invert	Avail.Storage	Storage Description
#1	295.80'	2,234 cf	**IC-2 Stone bed (Irregular)**Listed below (Recalc) 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids
#2	296.80'	3,143 cf	**ADS_StormTech MC-4500 b +Cap @ 4.03' L** x 28 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 28 Chambers in 2 Rows Cap Storage= +39.5 cf x 2 x 2 rows = 158.0 cf
#3	296.00'	172 cf	**PES-2 Stone bed (Pyramidal)**Listed below (Recalc) 500 cf Overall - 71 cf Embedded = 429 cf x 40.0% Voids
#4	296.00'	71 cf	**18.0" Round Pipe Storage** Inside #3 L= 40.0'
		5,620 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
295.80	1,247	165.0	0	0	1,247
296.00	1,247	165.0	249	249	1,280
297.00	1,247	165.0	1,247	1,496	1,445
298.00	1,247	165.0	1,247	2,743	1,610
299.00	1,247	165.0	1,247	3,990	1,775
300.00	1,247	165.0	1,247	5,237	1,940
301.00	1,247	165.0	1,247	6,484	2,105
302.00	1,247	165.0	1,247	7,731	2,270
302.80	1,247	165.0	998	8,729	2,402

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
296.00	250	0	0	250
297.00	250	250	250	313
298.00	250	250	500	376

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	298.00'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 2	296.50'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.50' / 296.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	296.50'	**23.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	299.90'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 11.60 hrs HW=296.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=1.8 cfs @ 12.26 hrs HW=298.16' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Passes 1.8 cfs of 8.1 cfs potential flow)
└**3=Culvert** (Passes 1.8 cfs of 2.7 cfs potential flow)
└**4=Orifice/Grate** (Orifice Controls 1.8 cfs @ 1.92 fps)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.0 cfs)

Summary for Pond SD-1:

Inflow Area = 3,729 sf, 47.63% Impervious, Inflow Depth > 1.72" for 2-Year event
Inflow = 0.2 cfs @ 12.12 hrs, Volume= 535 cf
Outflow = 0.2 cfs @ 12.12 hrs, Volume= 535 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 10.86 hrs, Volume= 310 cf
Primary = 0.2 cfs @ 12.12 hrs, Volume= 225 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.91' @ 12.12 hrs Surf.Area= 109 sf Storage= 40 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 38.6 min (886.6 - 848.0)

Volume	Invert	Avail.Storage	Storage Description
#1	300.00'	44 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 109 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
300.00	109	113.3	0	0	109
301.00	109	113.3	109	109	222

Device	Routing	Invert	Outlet Devices
#1	Discarded	300.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	300.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 10.86 hrs HW=300.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.2 cfs @ 12.12 hrs HW=300.91' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.2 cfs @ 0.26 fps)

Summary for Pond SD-2:

Inflow Area = 4,504 sf, 4.43% Impervious, Inflow Depth > 1.01" for 2-Year event
Inflow = 0.1 cfs @ 12.13 hrs, Volume= 379 cf
Outflow = 0.1 cfs @ 12.12 hrs, Volume= 364 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 11.12 hrs, Volume= 108 cf
Primary = 0.1 cfs @ 12.12 hrs, Volume= 257 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 303.42' @ 12.12 hrs Surf.Area= 40 sf Storage= 15 cf

Plug-Flow detention time= 27.9 min calculated for 364 cf (96% of inflow)
Center-of-Mass det. time= 7.8 min (901.7 - 893.8)

Volume	Invert	Avail.Storage	Storage Description
#1	302.50'	16 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 40 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
302.50	40	44.0	0	0	40
303.50	40	44.0	40	40	84

Device	Routing	Invert	Outlet Devices
#1	Discarded	302.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	303.40'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 11.12 hrs HW=302.51' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=303.42' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.1 cfs @ 0.32 fps)

Summary for Link AP1:

Inflow Area = 224,752 sf, 11.85% Impervious, Inflow Depth > 0.49" for 2-Year event
Inflow = 2.1 cfs @ 12.32 hrs, Volume= 9,137 cf
Primary = 2.1 cfs @ 12.32 hrs, Volume= 9,137 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP2:

Inflow Area = 42,170 sf, 25.53% Impervious, Inflow Depth > 0.98" for 2-Year event
Inflow = 1.1 cfs @ 12.14 hrs, Volume= 3,456 cf
Primary = 1.1 cfs @ 12.14 hrs, Volume= 3,456 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP3:

Inflow Area = 196,746 sf, 5.32% Impervious, Inflow Depth > 0.58" for 2-Year event
Inflow = 2.7 cfs @ 12.25 hrs, Volume= 9,469 cf
Primary = 2.7 cfs @ 12.25 hrs, Volume= 9,469 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP4:

Inflow Area = 14,618 sf, 41.41% Impervious, Inflow Depth > 1.45" for 2-Year event
Inflow = 0.4 cfs @ 12.17 hrs, Volume= 1,768 cf
Primary = 0.4 cfs @ 12.17 hrs, Volume= 1,768 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: Runoff Area=54,522 sf 14.68% Impervious Runoff Depth>2.34"
Flow Length=549' Tc=7.5 min CN=76 Runoff=3.1 cfs 10,638 cf

Subcatchment SC1.2: Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>2.18"
Flow Length=510' Tc=6.7 min CN=74 Runoff=6.3 cfs 20,959 cf

Subcatchment SC1.3: Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>4.41"
Tc=5.0 min CN=97 Runoff=0.6 cfs 2,074 cf

Subcatchment SC1.4: Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>4.53"
Tc=5.0 min CN=98 Runoff=0.2 cfs 833 cf

Subcatchment SC1.5: Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>1.94"
Flow Length=337' Tc=6.4 min CN=71 Runoff=2.2 cfs 7,474 cf

Subcatchment SC1.6: Runoff Area=622 sf 100.00% Impervious Runoff Depth>4.53"
Tc=5.0 min CN=98 Runoff=0.1 cfs 235 cf

Subcatchment SC2.1: Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>3.15"
Flow Length=68' Tc=5.0 min CN=85 Runoff=0.3 cfs 979 cf

Subcatchment SC2.2: Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>2.18"
Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=2.1 cfs 6,975 cf

Subcatchment SC3.1: Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>2.09"
Flow Length=564' Tc=10.4 min CN=73 Runoff=3.0 cfs 11,668 cf

Subcatchment SC3.2: Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>1.94"
Flow Length=378' Tc=10.1 min CN=71 Runoff=2.3 cfs 8,887 cf

Subcatchment SC3.3: Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>1.94"
Flow Length=287' Tc=10.8 min CN=71 Runoff=2.6 cfs 10,078 cf

Subcatchment SC3.4: Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>3.25"
Flow Length=246' Tc=5.0 min CN=86 Runoff=1.0 cfs 3,342 cf

Subcatchment SC4.1: Runoff Area=4,504 sf 4.43% Impervious Runoff Depth>2.18"
Flow Length=64' Tc=5.0 min CN=74 Runoff=0.3 cfs 818 cf

Subcatchment SC4.2: Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>3.24"
Flow Length=75' Tc=12.7 min CN=86 Runoff=0.6 cfs 2,732 cf

Pond CB1: Peak Elev=298.26' Inflow=0.2 cfs 833 cf
12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.2 cfs 833 cf

Pond CB2: Peak Elev=288.64' Inflow=0.6 cfs 2,074 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.6 cfs 2,074 cf

Pond DCB3: Peak Elev=288.80' Storage=2 cf Inflow=6.3 cfs 20,959 cf
24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=6.3 cfs 20,958 cf

Pond DCB4: Peak Elev=288.39' Storage=1 cf Inflow=3.1 cfs 10,638 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=3.1 cfs 10,637 cf

Pond DCB5: Peak Elev=299.21' Inflow=3.0 cfs 11,668 cf
21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=3.0 cfs 11,668 cf

Pond DCB6: Peak Elev=299.14' Inflow=1.0 cfs 3,342 cf
21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=1.0 cfs 3,342 cf

Pond DCB7: Peak Elev=299.21' Inflow=2.3 cfs 8,887 cf
18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=2.3 cfs 8,887 cf

Pond DMH1: Peak Elev=288.35' Inflow=7.0 cfs 23,866 cf
24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=7.0 cfs 23,866 cf

Pond DMH2: Peak Elev=299.15' Inflow=3.8 cfs 15,011 cf
30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=3.8 cfs 15,011 cf

Pond IC-1: Peak Elev=286.50' Storage=5,991 cf Inflow=10.1 cfs 34,503 cf
Discarded=0.1 cfs 7,270 cf Primary=8.0 cfs 22,704 cf Outflow=8.2 cfs 29,975 cf

Pond IC-2: Peak Elev=299.12' Storage=3,055 cf Inflow=6.0 cfs 23,897 cf
Discarded=0.1 cfs 4,567 cf Primary=4.9 cfs 17,357 cf Outflow=5.0 cfs 21,924 cf

Pond SD-1: Peak Elev=300.92' Storage=40 cf Inflow=0.3 cfs 979 cf
Discarded=0.0 cfs 364 cf Primary=0.3 cfs 579 cf Outflow=0.3 cfs 943 cf

Pond SD-2: Peak Elev=303.43' Storage=15 cf Inflow=0.3 cfs 818 cf
Discarded=0.0 cfs 123 cf Primary=0.3 cfs 681 cf Outflow=0.3 cfs 803 cf

Link AP1: Inflow=10.0 cfs 30,413 cf
Primary=10.0 cfs 30,413 cf

Link AP2: Inflow=2.4 cfs 7,554 cf
Primary=2.4 cfs 7,554 cf

Link AP3: Inflow=7.3 cfs 27,435 cf
Primary=7.3 cfs 27,435 cf

Link AP4: Inflow=0.8 cfs 3,412 cf
Primary=0.8 cfs 3,412 cf

Total Runoff Area = 478,286 sf Runoff Volume = 87,692 cf Average Runoff Depth = 2.20"
88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

Summary for Subcatchment SC1.1:

Runoff = 3.1 cfs @ 12.15 hrs, Volume= 10,638 cf, Depth> 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
24,785	74	>75% Grass cover, Good, HSG C
21,721	70	Woods, Good, HSG C
14	89	Gravel roads, HSG C
6,226	98	Paved parking, HSG C
1,776	98	Roofs, HSG C
54,522	76	Weighted Average
46,520		85.32% Pervious Area
8,002		14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	35	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	50	0.0345	1.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	180	0.1550	1.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	234	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.5	549	Total			

Summary for Subcatchment SC1.2:

Runoff = 6.3 cfs @ 12.14 hrs, Volume= 20,959 cf, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
46,703	74	>75% Grass cover, Good, HSG C
57,729	70	Woods, Good, HSG C
967	89	Gravel roads, HSG C
313	98	Unconnected pavement, HSG C
7,362	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
115,523	74	Weighted Average
105,398		91.24% Pervious Area
10,124		8.76% Impervious Area
313		3.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.3	167	0.0988	2.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	117	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	176	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.7	510	Total			

Summary for Subcatchment SC1.3:

Runoff = 0.6 cfs @ 12.12 hrs, Volume= 2,074 cf, Depth> 4.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
162	74	>75% Grass cover, Good, HSG C
243	89	Gravel roads, HSG C
5,233	98	Paved parking, HSG C
5,639	97	Weighted Average
405		7.19% Pervious Area
5,233		92.81% Impervious Area

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

Summary for Subcatchment SC1.4:

Runoff = 0.2 cfs @ 12.12 hrs, Volume= 833 cf, Depth> 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
2,208	98	Paved parking, HSG C
2,208		100.00% Impervious Area

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

Summary for Subcatchment SC1.5:

Runoff = 2.2 cfs @ 12.14 hrs, Volume= 7,474 cf, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
37,139	70	Woods, Good, HSG C
441	98	Unconnected pavement, HSG C
8,658	74	>75% Grass cover, Good, HSG C
46,238	71	Weighted Average
45,797		99.05% Pervious Area
441		0.95% Impervious Area
441		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
3.1	287	0.0941	1.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	337	Total			

Summary for Subcatchment SC1.6:

Runoff = 0.1 cfs @ 12.12 hrs, Volume= 235 cf, Depth> 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
622	98	Paved parking, HSG C
622		100.00% Impervious Area

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

Summary for Subcatchment SC2.1:

Runoff = 0.3 cfs @ 12.12 hrs, Volume= 979 cf, Depth> 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
1,953	74	>75% Grass cover, Good, HSG C
1,776	98	Roofs, HSG C
3,729	85	Weighted Average
1,953		52.37% Pervious Area
1,776		47.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	68	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC2.2:

Runoff = 2.1 cfs @ 12.14 hrs, Volume= 6,975 cf, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Adj	Description
7,180	74		>75% Grass cover, Good, HSG C
22,269	70		Woods, Good, HSG C
8,992	98		Unconnected pavement, HSG C
38,441	77	74	Weighted Average, UI Adjusted
29,449			76.61% Pervious Area
8,992			23.39% Impervious Area
8,992			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	29	0.1700	2.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	61	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	140	Total			

Summary for Subcatchment SC3.1:

Runoff = 3.0 cfs @ 12.18 hrs, Volume= 11,668 cf, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
32,168	74	>75% Grass cover, Good, HSG C
31,971	70	Woods, Good, HSG C
364	89	Gravel roads, HSG C
55	98	Paved parking, HSG C
2,321	98	Roofs, HSG C
66,880	73	Weighted Average
64,504		96.45% Pervious Area
2,376		3.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
2.1	247	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	133	0.0830	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	134	0.0820	2.00		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	564	Total			

Summary for Subcatchment SC3.2:

Runoff = 2.3 cfs @ 12.18 hrs, Volume= 8,887 cf, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
12,832	74	>75% Grass cover, Good, HSG C
880	98	Roofs, HSG C
41,349	70	Woods, Good, HSG C
55,060	71	Weighted Average
54,180		98.40% Pervious Area
880		1.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.7	204	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	124	0.0530	1.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	378	Total			

Summary for Subcatchment SC3.3:

Runoff = 2.6 cfs @ 12.19 hrs, Volume= 10,078 cf, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
12,393	74	>75% Grass cover, Good, HSG C
49,047	70	Woods, Good, HSG C
1,019	98	Unconnected pavement, HSG C
62,459	71	Weighted Average
61,440		98.37% Pervious Area
1,019		1.63% Impervious Area
1,019		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.2	237	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.8	287	Total			

Summary for Subcatchment SC3.4:

Runoff = 1.0 cfs @ 12.12 hrs, Volume= 3,342 cf, Depth> 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
5,554	74	>75% Grass cover, Good, HSG C
529	70	Woods, Good, HSG C
76	89	Gravel roads, HSG C
6,187	98	Paved parking, HSG C
12,347	86	Weighted Average
6,159		49.89% Pervious Area
6,187		50.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	113	0.0200	1.40		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
2.4	38	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.9	95	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	246	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.1:

Runoff = 0.3 cfs @ 12.12 hrs, Volume= 818 cf, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
1,020	70	Woods, Good, HSG C
200	98	Unconnected pavement, HSG C
3,285	74	>75% Grass cover, Good, HSG C
4,504	74	Weighted Average
4,305		95.57% Pervious Area
200		4.43% Impervious Area
200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	14	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	64	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.2:

Runoff = 0.6 cfs @ 12.20 hrs, Volume= 2,732 cf, Depth> 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
3,927	70	Woods, Good, HSG C
5,854	98	Unconnected pavement, HSG C
333	74	>75% Grass cover, Good, HSG C
10,114	86	Weighted Average
4,260		42.12% Pervious Area
5,854		57.88% Impervious Area
5,854		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	25	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.7	75	Total			

Summary for Pond CB1:

Inflow Area = 2,208 sf,100.00% Impervious, Inflow Depth > 4.53" for 10-Year event
Inflow = 0.2 cfs @ 12.12 hrs, Volume= 833 cf
Outflow = 0.2 cfs @ 12.12 hrs, Volume= 833 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.2 cfs @ 12.12 hrs, Volume= 833 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.26' @ 12.12 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.00'	**12.0" Round Culvert** L= 220.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.2 cfs @ 12.12 hrs HW=298.26' TW=288.31' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.2 cfs @ 1.38 fps)

Summary for Pond CB2:

Inflow Area = 5,639 sf, 92.81% Impervious, Inflow Depth > 4.41" for 10-Year event
Inflow = 0.6 cfs @ 12.12 hrs, Volume= 2,074 cf
Outflow = 0.6 cfs @ 12.12 hrs, Volume= 2,074 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.6 cfs @ 12.12 hrs, Volume= 2,074 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.64' @ 12.12 hrs
Flood Elev= 292.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.20'	**12.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.6 cfs @ 12.12 hrs HW=288.64' TW=288.31' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.6 cfs @ 2.52 fps)

Summary for Pond DCB3:

Inflow Area = 115,523 sf, 8.76% Impervious, Inflow Depth > 2.18" for 10-Year event
Inflow = 6.3 cfs @ 12.14 hrs, Volume= 20,959 cf
Outflow = 6.3 cfs @ 12.14 hrs, Volume= 20,958 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.3 cfs @ 12.14 hrs, Volume= 20,958 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 288.80' @ 12.14 hrs Surf.Area= 1 sf Storage= 2 cf
Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= 0.0 min calculated for 20,958 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (866.0 - 866.0)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	89	87.5	33	36	615
292.00	519	180.8	274	310	2,611

Device	Routing	Invert	Outlet Devices
#1	Primary	287.34'	**24.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.34' / 287.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=6.3 cfs @ 12.14 hrs HW=288.80' TW=288.35' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 6.3 cfs @ 2.55 fps)

Summary for Pond DCB4:

Inflow Area = 54,522 sf, 14.68% Impervious, Inflow Depth > 2.34" for 10-Year event
Inflow = 3.1 cfs @ 12.15 hrs, Volume= 10,638 cf
Outflow = 3.1 cfs @ 12.15 hrs, Volume= 10,637 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.1 cfs @ 12.15 hrs, Volume= 10,637 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.39' @ 12.15 hrs Surf.Area= 1 sf Storage= 1 cf
Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= 0.0 min calculated for 10,629 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (860.0 - 859.9)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	250 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	714	132.0	247	250	1,392

Device	Routing	Invert	Outlet Devices
#1	Primary	287.25'	**15.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.1 cfs @ 12.15 hrs HW=288.39' TW=286.37' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 3.1 cfs @ 3.44 fps)

Summary for Pond DCB5:

Inflow Area = 66,880 sf, 3.55% Impervious, Inflow Depth > 2.09" for 10-Year event
Inflow = 3.0 cfs @ 12.18 hrs, Volume= 11,668 cf
Outflow = 3.0 cfs @ 12.18 hrs, Volume= 11,668 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.0 cfs @ 12.18 hrs, Volume= 11,668 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 299.21' @ 12.24 hrs
Flood Elev= 302.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.42'	**21.0" Round Culvert** L= 47.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.9 cfs @ 12.18 hrs HW=299.04' TW=299.03' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.9 cfs @ 0.38 fps)

Summary for Pond DCB6:

Inflow Area = 12,347 sf, 50.11% Impervious, Inflow Depth > 3.25" for 10-Year event
Inflow = 1.0 cfs @ 12.12 hrs, Volume= 3,342 cf
Outflow = 1.0 cfs @ 12.12 hrs, Volume= 3,342 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.0 cfs @ 12.12 hrs, Volume= 3,342 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 299.14' @ 12.25 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**21.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=298.58' TW=298.67' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.0 cfs)

Summary for Pond DCB7:

Inflow Area = 55,060 sf, 1.60% Impervious, Inflow Depth > 1.94" for 10-Year event
Inflow = 2.3 cfs @ 12.18 hrs, Volume= 8,887 cf
Outflow = 2.3 cfs @ 12.18 hrs, Volume= 8,887 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.3 cfs @ 12.18 hrs, Volume= 8,887 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 299.21' @ 12.23 hrs
Flood Elev= 302.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**18.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.3 cfs @ 12.18 hrs HW=299.09' TW=298.97' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.3 cfs @ 1.30 fps)

Summary for Pond DMH1:

Inflow Area = 123,370 sf, 14.24% Impervious, Inflow Depth > 2.32" for 10-Year event
Inflow = 7.0 cfs @ 12.14 hrs, Volume= 23,866 cf
Outflow = 7.0 cfs @ 12.14 hrs, Volume= 23,866 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.0 cfs @ 12.14 hrs, Volume= 23,866 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.35' @ 12.14 hrs
Flood Elev= 292.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	287.00'	**24.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.0 cfs @ 12.14 hrs HW=288.34' TW=286.31' (Dynamic Tailwater)
1=Culvert (Inlet Controls 7.0 cfs @ 3.12 fps)

Summary for Pond DMH2:

Inflow Area = 79,226 sf, 10.81% Impervious, Inflow Depth > 2.27" for 10-Year event
Inflow = 3.8 cfs @ 12.16 hrs, Volume= 15,011 cf
Outflow = 3.8 cfs @ 12.16 hrs, Volume= 15,011 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.8 cfs @ 12.16 hrs, Volume= 15,011 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 299.15' @ 12.23 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	296.85'	**30.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=3.8 cfs @ 12.16 hrs HW=298.89' TW=298.84' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 3.8 cfs @ 0.87 fps)

Summary for Pond IC-1:

Inflow Area = 177,892 sf, 14.37% Impervious, Inflow Depth > 2.33" for 10-Year event
Inflow = 10.1 cfs @ 12.14 hrs, Volume= 34,503 cf
Outflow = 8.2 cfs @ 12.19 hrs, Volume= 29,975 cf, Atten= 19%, Lag= 2.9 min
Discarded = 0.1 cfs @ 10.72 hrs, Volume= 7,270 cf
Primary = 8.0 cfs @ 12.19 hrs, Volume= 22,704 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 286.50' @ 12.19 hrs Surf.Area= 2,271 sf Storage= 5,991 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 26.2 min (881.1 - 854.9)

Volume	Invert	Avail.Storage	Storage Description
#1	282.40'	3,658 cf	**IC-1 Stone bed (Irregular)**Listed below (Recalc) 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids
#2	283.40'	5,002 cf	**ADS_StormTech MC-4500 b +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf
#3	283.00'	200 cf	**PES-1 Stone bed (Pyramidal)**Listed below (Recalc) 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids
#4	283.00'	126 cf	**24.0" Round Pipe Storage** Inside #3 L= 40.0'
		8,985 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
282.40	2,021	188.0	0	0	2,021
283.00	2,021	188.0	1,213	1,213	2,134
284.00	2,021	188.0	2,021	3,234	2,322
285.00	2,021	188.0	2,021	5,255	2,510
286.00	2,021	188.0	2,021	7,276	2,698
287.00	2,021	188.0	2,021	9,297	2,886
288.00	2,021	188.0	2,021	11,318	3,074
289.00	2,021	188.0	2,021	13,339	3,262
289.40	2,021	188.0	808	14,147	3,337

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
283.00	250	0	0	250
284.00	250	250	250	313
285.00	250	250	500	376
285.50	250	125	625	408

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.40'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	285.50'	**50.0' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32
#3	Device 2	284.10'	**24.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	284.10'	**20.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	287.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 10.72 hrs HW=283.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=8.0 cfs @ 12.19 hrs HW=286.49' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Passes 8.0 cfs of 130.8 cfs potential flow)
└**3=Culvert** (Passes 8.0 cfs of 11.9 cfs potential flow)
├**4=Orifice/Grate** (Orifice Controls 8.0 cfs @ 4.80 fps)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.0 cfs)

Summary for Pond IC-2:

Inflow Area = 134,287 sf, 7.03% Impervious, Inflow Depth > 2.14" for 10-Year event
Inflow = 6.0 cfs @ 12.17 hrs, Volume= 23,897 cf
Outflow = 5.0 cfs @ 12.24 hrs, Volume= 21,924 cf, Atten= 18%, Lag= 4.2 min
Discarded = 0.1 cfs @ 10.36 hrs, Volume= 4,567 cf
Primary = 4.9 cfs @ 12.24 hrs, Volume= 17,357 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 299.12' @ 12.24 hrs Surf.Area= 1,497 sf Storage= 3,055 cf

Plug-Flow detention time= 60.9 min calculated for 21,924 cf (92% of inflow)
Center-of-Mass det. time= 17.8 min (885.1 - 867.3)

Volume	Invert	Avail.Storage	Storage Description
#1	295.80'	2,234 cf	**IC-2 Stone bed (Irregular)**Listed below (Recalc) 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids
#2	296.80'	3,143 cf	**ADS_StormTech MC-4500 b +Cap @ 4.03' L** x 28 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 28 Chambers in 2 Rows Cap Storage= +39.5 cf x 2 x 2 rows = 158.0 cf
#3	296.00'	172 cf	**PES-2 Stone bed (Pyramidal)**Listed below (Recalc) 500 cf Overall - 71 cf Embedded = 429 cf x 40.0% Voids
#4	296.00'	71 cf	**18.0" Round Pipe Storage** Inside #3 L= 40.0'
		5,620 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
295.80	1,247	165.0	0	0	1,247
296.00	1,247	165.0	249	249	1,280
297.00	1,247	165.0	1,247	1,496	1,445
298.00	1,247	165.0	1,247	2,743	1,610
299.00	1,247	165.0	1,247	3,990	1,775
300.00	1,247	165.0	1,247	5,237	1,940
301.00	1,247	165.0	1,247	6,484	2,105
302.00	1,247	165.0	1,247	7,731	2,270
302.80	1,247	165.0	998	8,729	2,402

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
296.00	250	0	0	250
297.00	250	250	250	313
298.00	250	250	500	376

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	298.00'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 2	296.50'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.50' / 296.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	296.50'	**23.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	299.90'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 10.36 hrs HW=296.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=4.9 cfs @ 12.24 hrs HW=299.12' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Passes 4.9 cfs of 158.3 cfs potential flow)
└**3=Culvert** (Passes 4.9 cfs of 7.1 cfs potential flow)
└**4=Orifice/Grate** (Orifice Controls 4.9 cfs @ 5.09 fps)
└**5=Sharp-Crested Vee/Trap Weir** (Controls 0.0 cfs)

Summary for Pond SD-1:

Inflow Area = 3,729 sf, 47.63% Impervious, Inflow Depth > 3.15" for 10-Year event
Inflow = 0.3 cfs @ 12.12 hrs, Volume= 979 cf
Outflow = 0.3 cfs @ 12.12 hrs, Volume= 943 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 9.46 hrs, Volume= 364 cf
Primary = 0.3 cfs @ 12.12 hrs, Volume= 579 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.92' @ 12.12 hrs Surf.Area= 109 sf Storage= 40 cf

Plug-Flow detention time= 31.2 min calculated for 943 cf (96% of inflow)
Center-of-Mass det. time= 9.5 min (835.2 - 825.7)

Volume	Invert	Avail.Storage	Storage Description
#1	300.00'	44 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 109 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
300.00	109	113.3	0	0	109
301.00	109	113.3	109	109	222

Device	Routing	Invert	Outlet Devices
#1	Discarded	300.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	300.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 9.46 hrs HW=300.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.3 cfs @ 12.12 hrs HW=300.92' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.3 cfs @ 0.31 fps)

Summary for Pond SD-2:

Inflow Area = 4,504 sf, 4.43% Impervious, Inflow Depth > 2.18" for 10-Year event
Inflow = 0.3 cfs @ 12.12 hrs, Volume= 818 cf
Outflow = 0.3 cfs @ 12.12 hrs, Volume= 803 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 9.58 hrs, Volume= 123 cf
Primary = 0.3 cfs @ 12.12 hrs, Volume= 681 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 303.43' @ 12.12 hrs Surf.Area= 40 sf Storage= 15 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.3 min (869.1 - 864.8)

Volume	Invert	Avail.Storage	Storage Description
#1	302.50'	16 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 40 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
302.50	40	44.0	0	0	40
303.50	40	44.0	40	40	84

Device	Routing	Invert	Outlet Devices
#1	Discarded	302.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	303.40'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 9.58 hrs HW=302.51' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.3 cfs @ 12.12 hrs HW=303.43' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.3 cfs @ 0.42 fps)

Summary for Link AP1:

Inflow Area = 224,752 sf, 11.85% Impervious, Inflow Depth > 1.62" for 10-Year event
Inflow = 10.0 cfs @ 12.17 hrs, Volume= 30,413 cf
Primary = 10.0 cfs @ 12.17 hrs, Volume= 30,413 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP2:

Inflow Area = 42,170 sf, 25.53% Impervious, Inflow Depth > 2.15" for 10-Year event
Inflow = 2.4 cfs @ 12.13 hrs, Volume= 7,554 cf
Primary = 2.4 cfs @ 12.13 hrs, Volume= 7,554 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP3:

Inflow Area = 196,746 sf, 5.32% Impervious, Inflow Depth > 1.67" for 10-Year event
Inflow = 7.3 cfs @ 12.21 hrs, Volume= 27,435 cf
Primary = 7.3 cfs @ 12.21 hrs, Volume= 27,435 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP4:

Inflow Area = 14,618 sf, 41.41% Impervious, Inflow Depth > 2.80" for 10-Year event
Inflow = 0.8 cfs @ 12.16 hrs, Volume= 3,412 cf
Primary = 0.8 cfs @ 12.16 hrs, Volume= 3,412 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: Runoff Area=54,522 sf 14.68% Impervious Runoff Depth>3.40"
Flow Length=549' Tc=7.5 min CN=76 Runoff=4.5 cfs 15,439 cf

Subcatchment SC1.2: Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>3.20"
Flow Length=510' Tc=6.7 min CN=74 Runoff=9.2 cfs 30,837 cf

Subcatchment SC1.3: Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>5.67"
Tc=5.0 min CN=97 Runoff=0.7 cfs 2,663 cf

Subcatchment SC1.4: Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>5.79"
Tc=5.0 min CN=98 Runoff=0.3 cfs 1,065 cf

Subcatchment SC1.5: Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>2.92"
Flow Length=337' Tc=6.4 min CN=71 Runoff=3.4 cfs 11,238 cf

Subcatchment SC1.6: Runoff Area=622 sf 100.00% Impervious Runoff Depth>5.79"
Tc=5.0 min CN=98 Runoff=0.1 cfs 300 cf

Subcatchment SC2.1: Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>4.33"
Flow Length=68' Tc=5.0 min CN=85 Runoff=0.4 cfs 1,344 cf

Subcatchment SC2.2: Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>3.20"
Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=3.1 cfs 10,262 cf

Subcatchment SC3.1: Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>3.10"
Flow Length=564' Tc=10.4 min CN=73 Runoff=4.5 cfs 17,292 cf

Subcatchment SC3.2: Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>2.91"
Flow Length=378' Tc=10.1 min CN=71 Runoff=3.5 cfs 13,364 cf

Subcatchment SC3.3: Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>2.91"
Flow Length=287' Tc=10.8 min CN=71 Runoff=3.9 cfs 15,156 cf

Subcatchment SC3.4: Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>4.43"
Flow Length=246' Tc=5.0 min CN=86 Runoff=1.4 cfs 4,560 cf

Subcatchment SC4.1: Runoff Area=4,504 sf 4.43% Impervious Runoff Depth>3.21"
Flow Length=64' Tc=5.0 min CN=74 Runoff=0.4 cfs 1,203 cf

Subcatchment SC4.2: Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>4.42"
Flow Length=75' Tc=12.7 min CN=86 Runoff=0.9 cfs 3,727 cf

Pond CB1: Peak Elev=298.30' Inflow=0.3 cfs 1,065 cf
12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.3 cfs 1,065 cf

Pond CB2: Peak Elev=288.85' Inflow=0.7 cfs 2,663 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.7 cfs 2,663 cf

Pond DCB3: Peak Elev=289.32' Storage=2 cf Inflow=9.2 cfs 30,837 cf
24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=9.2 cfs 30,837 cf

Pond DCB4: Peak Elev=288.79' Storage=2 cf Inflow=4.5 cfs 15,439 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=4.5 cfs 15,439 cf

Pond DCB5: Peak Elev=300.30' Inflow=4.5 cfs 17,292 cf
21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=4.5 cfs 17,292 cf

Pond DCB6: Peak Elev=300.14' Inflow=1.4 cfs 4,560 cf
21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=1.4 cfs 4,560 cf

Pond DCB7: Peak Elev=300.30' Inflow=3.5 cfs 13,364 cf
18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=3.5 cfs 13,364 cf

Pond DMH1: Peak Elev=288.73' Inflow=10.2 cfs 34,565 cf
24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=10.2 cfs 34,565 cf

Pond DMH2: Peak Elev=300.14' Inflow=5.5 cfs 21,852 cf
30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=5.5 cfs 21,852 cf

Pond IC-1: Peak Elev=287.27' Storage=7,020 cf Inflow=14.6 cfs 50,003 cf
Discarded=0.1 cfs 7,831 cf Primary=12.6 cfs 37,638 cf Outflow=12.7 cfs 45,469 cf

Pond IC-2: Peak Elev=300.08' Storage=3,920 cf Inflow=8.9 cfs 35,217 cf
Discarded=0.1 cfs 4,932 cf Primary=7.7 cfs 28,308 cf Outflow=7.8 cfs 33,240 cf

Pond SD-1: Peak Elev=300.92' Storage=40 cf Inflow=0.4 cfs 1,344 cf
Discarded=0.0 cfs 391 cf Primary=0.4 cfs 913 cf Outflow=0.4 cfs 1,305 cf

Pond SD-2: Peak Elev=303.44' Storage=15 cf Inflow=0.4 cfs 1,203 cf
Discarded=0.0 cfs 133 cf Primary=0.4 cfs 1,056 cf Outflow=0.4 cfs 1,189 cf

Link AP1: Inflow=15.5 cfs 49,176 cf
Primary=15.5 cfs 49,176 cf

Link AP2: Inflow=3.5 cfs 11,176 cf
Primary=3.5 cfs 11,176 cf

Link AP3: Inflow=11.3 cfs 43,464 cf
Primary=11.3 cfs 43,464 cf

Link AP4: Inflow=1.1 cfs 4,783 cf
Primary=1.1 cfs 4,783 cf

Total Runoff Area = 478,286 sf Runoff Volume = 128,452 cf Average Runoff Depth = 3.22"
88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

Summary for Subcatchment SC1.1:

Runoff = 4.5 cfs @ 12.15 hrs, Volume= 15,439 cf, Depth> 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
24,785	74	>75% Grass cover, Good, HSG C
21,721	70	Woods, Good, HSG C
14	89	Gravel roads, HSG C
6,226	98	Paved parking, HSG C
1,776	98	Roofs, HSG C
54,522	76	Weighted Average
46,520		85.32% Pervious Area
8,002		14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	35	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	50	0.0345	1.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	180	0.1550	1.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	234	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.5	549	Total			

Summary for Subcatchment SC1.2:

Runoff = 9.2 cfs @ 12.14 hrs, Volume= 30,837 cf, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
46,703	74	>75% Grass cover, Good, HSG C
57,729	70	Woods, Good, HSG C
967	89	Gravel roads, HSG C
313	98	Unconnected pavement, HSG C
7,362	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
115,523	74	Weighted Average
105,398		91.24% Pervious Area
10,124		8.76% Impervious Area
313		3.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.3	167	0.0988	2.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	117	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	176	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.7	510	Total			

Summary for Subcatchment SC1.3:

Runoff = 0.7 cfs @ 12.12 hrs, Volume= 2,663 cf, Depth> 5.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
162	74	>75% Grass cover, Good, HSG C
243	89	Gravel roads, HSG C
5,233	98	Paved parking, HSG C
5,639	97	Weighted Average
405		7.19% Pervious Area
5,233		92.81% Impervious Area

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

Summary for Subcatchment SC1.4:

Runoff = 0.3 cfs @ 12.12 hrs, Volume= 1,065 cf, Depth> 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
2,208	98	Paved parking, HSG C
2,208		100.00% Impervious Area

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

Summary for Subcatchment SC1.5:

Runoff = 3.4 cfs @ 12.14 hrs, Volume= 11,238 cf, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
37,139	70	Woods, Good, HSG C
441	98	Unconnected pavement, HSG C
8,658	74	>75% Grass cover, Good, HSG C
46,238	71	Weighted Average
45,797		99.05% Pervious Area
441		0.95% Impervious Area
441		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
3.1	287	0.0941	1.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	337	Total			

Summary for Subcatchment SC1.6:

Runoff = 0.1 cfs @ 12.12 hrs, Volume= 300 cf, Depth> 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
622	98	Paved parking, HSG C
622		100.00% Impervious Area

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

Summary for Subcatchment SC2.1:

Runoff = 0.4 cfs @ 12.12 hrs, Volume= 1,344 cf, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
1,953	74	>75% Grass cover, Good, HSG C
1,776	98	Roofs, HSG C
3,729	85	Weighted Average
1,953		52.37% Pervious Area
1,776		47.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	68	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC2.2:

Runoff = 3.1 cfs @ 12.14 hrs, Volume= 10,262 cf, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Adj	Description
7,180	74		>75% Grass cover, Good, HSG C
22,269	70		Woods, Good, HSG C
8,992	98		Unconnected pavement, HSG C
38,441	77	74	Weighted Average, UI Adjusted
29,449			76.61% Pervious Area
8,992			23.39% Impervious Area
8,992			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	29	0.1700	2.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	61	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	140	Total			

Summary for Subcatchment SC3.1:

Runoff = 4.5 cfs @ 12.18 hrs, Volume= 17,292 cf, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
32,168	74	>75% Grass cover, Good, HSG C
31,971	70	Woods, Good, HSG C
364	89	Gravel roads, HSG C
55	98	Paved parking, HSG C
2,321	98	Roofs, HSG C
66,880	73	Weighted Average
64,504		96.45% Pervious Area
2,376		3.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
2.1	247	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	133	0.0830	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	134	0.0820	2.00		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	564	Total			

Summary for Subcatchment SC3.2:

Runoff = 3.5 cfs @ 12.18 hrs, Volume= 13,364 cf, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
12,832	74	>75% Grass cover, Good, HSG C
880	98	Roofs, HSG C
41,349	70	Woods, Good, HSG C
55,060	71	Weighted Average
54,180		98.40% Pervious Area
880		1.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.7	204	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	124	0.0530	1.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	378	Total			

Summary for Subcatchment SC3.3:

Runoff = 3.9 cfs @ 12.18 hrs, Volume= 15,156 cf, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
12,393	74	>75% Grass cover, Good, HSG C
49,047	70	Woods, Good, HSG C
1,019	98	Unconnected pavement, HSG C
62,459	71	Weighted Average
61,440		98.37% Pervious Area
1,019		1.63% Impervious Area
1,019		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.2	237	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.8	287	Total			

Summary for Subcatchment SC3.4:

Runoff = 1.4 cfs @ 12.12 hrs, Volume= 4,560 cf, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
5,554	74	>75% Grass cover, Good, HSG C
529	70	Woods, Good, HSG C
76	89	Gravel roads, HSG C
6,187	98	Paved parking, HSG C
12,347	86	Weighted Average
6,159		49.89% Pervious Area
6,187		50.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	113	0.0200	1.40		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
2.4	38	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.9	95	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	246	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.1:

Runoff = 0.4 cfs @ 12.12 hrs, Volume= 1,203 cf, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
1,020	70	Woods, Good, HSG C
200	98	Unconnected pavement, HSG C
3,285	74	>75% Grass cover, Good, HSG C
4,504	74	Weighted Average
4,305		95.57% Pervious Area
200		4.43% Impervious Area
200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	14	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	64	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.2:

Runoff = 0.9 cfs @ 12.20 hrs, Volume= 3,727 cf, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

Area (sf)	CN	Description
3,927	70	Woods, Good, HSG C
5,854	98	Unconnected pavement, HSG C
333	74	>75% Grass cover, Good, HSG C
10,114	86	Weighted Average
4,260		42.12% Pervious Area
5,854		57.88% Impervious Area
5,854		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	25	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.7	75	Total			

Summary for Pond CB1:

Inflow Area = 2,208 sf,100.00% Impervious, Inflow Depth > 5.79" for 25-Year event
Inflow = 0.3 cfs @ 12.12 hrs, Volume= 1,065 cf
Outflow = 0.3 cfs @ 12.12 hrs, Volume= 1,065 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.3 cfs @ 12.12 hrs, Volume= 1,065 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.30' @ 12.12 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.00'	**12.0" Round Culvert** L= 220.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.3 cfs @ 12.12 hrs HW=298.30' TW=288.68' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.3 cfs @ 1.46 fps)

Summary for Pond CB2:

Inflow Area = 5,639 sf, 92.81% Impervious, Inflow Depth > 5.67" for 25-Year event
Inflow = 0.7 cfs @ 12.12 hrs, Volume= 2,663 cf
Outflow = 0.7 cfs @ 12.12 hrs, Volume= 2,663 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.7 cfs @ 12.12 hrs, Volume= 2,663 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.85' @ 12.13 hrs
Flood Elev= 292.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.20'	**12.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.7 cfs @ 12.12 hrs HW=288.82' TW=288.68' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.7 cfs @ 1.42 fps)

Summary for Pond DCB3:

Inflow Area = 115,523 sf, 8.76% Impervious, Inflow Depth > 3.20" for 25-Year event
Inflow = 9.2 cfs @ 12.14 hrs, Volume= 30,837 cf
Outflow = 9.2 cfs @ 12.14 hrs, Volume= 30,837 cf, Atten= 0%, Lag= 0.0 min
Primary = 9.2 cfs @ 12.14 hrs, Volume= 30,837 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 289.32' @ 12.14 hrs Surf.Area= 1 sf Storage= 2 cf
Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= 0.0 min calculated for 30,811 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (851.7 - 851.7)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	89	87.5	33	36	615
292.00	519	180.8	274	310	2,611

Device	Routing	Invert	Outlet Devices
#1	Primary	287.34'	**24.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.34' / 287.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=9.2 cfs @ 12.14 hrs HW=289.32' TW=288.72' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 9.2 cfs @ 2.93 fps)

Summary for Pond DCB4:

Inflow Area = 54,522 sf, 14.68% Impervious, Inflow Depth > 3.40" for 25-Year event
Inflow = 4.5 cfs @ 12.15 hrs, Volume= 15,439 cf
Outflow = 4.5 cfs @ 12.15 hrs, Volume= 15,439 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.5 cfs @ 12.15 hrs, Volume= 15,439 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.79' @ 12.15 hrs Surf.Area= 1 sf Storage= 2 cf
Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= 0.0 min calculated for 15,439 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (846.2 - 846.2)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	250 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	714	132.0	247	250	1,392

Device	Routing	Invert	Outlet Devices
#1	Primary	287.25'	**15.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.4 cfs @ 12.15 hrs HW=288.78' TW=287.11' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 4.4 cfs @ 3.62 fps)

Summary for Pond DCB5:

Inflow Area = 66,880 sf, 3.55% Impervious, Inflow Depth > 3.10" for 25-Year event
Inflow = 4.5 cfs @ 12.18 hrs, Volume= 17,292 cf
Outflow = 4.5 cfs @ 12.18 hrs, Volume= 17,292 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.5 cfs @ 12.18 hrs, Volume= 17,292 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.30' @ 12.23 hrs
Flood Elev= 302.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.42'	**21.0" Round Culvert** L= 47.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=1.3 cfs @ 12.18 hrs HW=299.96' TW=299.94' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 1.3 cfs @ 0.54 fps)

Summary for Pond DCB6:

Inflow Area = 12,347 sf, 50.11% Impervious, Inflow Depth > 4.43" for 25-Year event
Inflow = 1.4 cfs @ 12.12 hrs, Volume= 4,560 cf
Outflow = 1.4 cfs @ 12.12 hrs, Volume= 4,560 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.4 cfs @ 12.12 hrs, Volume= 4,560 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.14' @ 12.24 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**21.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=299.07' TW=299.25' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.0 cfs)

Summary for Pond DCB7:

Inflow Area = 55,060 sf, 1.60% Impervious, Inflow Depth > 2.91" for 25-Year event
Inflow = 3.5 cfs @ 12.18 hrs, Volume= 13,364 cf
Outflow = 3.5 cfs @ 12.18 hrs, Volume= 13,364 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.5 cfs @ 12.18 hrs, Volume= 13,364 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.30' @ 12.22 hrs
Flood Elev= 302.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**18.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.5 cfs @ 12.18 hrs HW=300.10' TW=299.83' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.5 cfs @ 1.97 fps)

Summary for Pond DMH1:

Inflow Area = 123,370 sf, 14.24% Impervious, Inflow Depth > 3.36" for 25-Year event
Inflow = 10.2 cfs @ 12.14 hrs, Volume= 34,565 cf
Outflow = 10.2 cfs @ 12.14 hrs, Volume= 34,565 cf, Atten= 0%, Lag= 0.0 min
Primary = 10.2 cfs @ 12.14 hrs, Volume= 34,565 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.73' @ 12.14 hrs
Flood Elev= 292.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	287.00'	**24.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=10.1 cfs @ 12.14 hrs HW=288.72' TW=287.01' (Dynamic Tailwater)
1=Culvert (Inlet Controls 10.1 cfs @ 3.52 fps)

Summary for Pond DMH2:

Inflow Area = 79,226 sf, 10.81% Impervious, Inflow Depth > 3.31" for 25-Year event
Inflow = 5.5 cfs @ 12.16 hrs, Volume= 21,852 cf
Outflow = 5.5 cfs @ 12.16 hrs, Volume= 21,852 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.5 cfs @ 12.16 hrs, Volume= 21,852 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 300.14' @ 12.22 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	296.85'	**30.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=5.5 cfs @ 12.16 hrs HW=299.69' TW=299.60' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 5.5 cfs @ 1.11 fps)

Summary for Pond IC-1:

Inflow Area = 177,892 sf, 14.37% Impervious, Inflow Depth > 3.37" for 25-Year event
Inflow = 14.6 cfs @ 12.14 hrs, Volume= 50,003 cf
Outflow = 12.7 cfs @ 12.18 hrs, Volume= 45,469 cf, Atten= 13%, Lag= 2.4 min
Discarded = 0.1 cfs @ 9.74 hrs, Volume= 7,831 cf
Primary = 12.6 cfs @ 12.18 hrs, Volume= 37,638 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 287.27' @ 12.18 hrs Surf.Area= 2,271 sf Storage= 7,020 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 20.6 min (863.1 - 842.5)

Volume	Invert	Avail.Storage	Storage Description
#1	282.40'	3,658 cf	**IC-1 Stone bed (Irregular)**Listed below (Recalc) 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids
#2	283.40'	5,002 cf	**ADS_StormTech MC-4500 b +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf
#3	283.00'	200 cf	**PES-1 Stone bed (Pyramidal)**Listed below (Recalc) 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids
#4	283.00'	126 cf	**24.0" Round Pipe Storage** Inside #3 L= 40.0'
		8,985 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
282.40	2,021	188.0	0	0	2,021
283.00	2,021	188.0	1,213	1,213	2,134
284.00	2,021	188.0	2,021	3,234	2,322
285.00	2,021	188.0	2,021	5,255	2,510
286.00	2,021	188.0	2,021	7,276	2,698
287.00	2,021	188.0	2,021	9,297	2,886
288.00	2,021	188.0	2,021	11,318	3,074
289.00	2,021	188.0	2,021	13,339	3,262
289.40	2,021	188.0	808	14,147	3,337

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
283.00	250	0	0	250
284.00	250	250	250	313
285.00	250	250	500	376
285.50	250	125	625	408

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.40'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	285.50'	**50.0' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32
#3	Device 2	284.10'	**24.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	284.10'	**20.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	287.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 9.74 hrs HW=283.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=12.6 cfs @ 12.18 hrs HW=287.27' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Passes 12.6 cfs of 323.8 cfs potential flow)
  └**3=Culvert** (Passes 12.6 cfs of 15.9 cfs potential flow)
    └**4=Orifice/Grate** (Orifice Controls 10.7 cfs @ 6.41 fps)
    └**5=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.9 cfs @ 1.71 fps)

Summary for Pond IC-2:

Inflow Area = 134,287 sf, 7.03% Impervious, Inflow Depth > 3.15" for 25-Year event
Inflow = 8.9 cfs @ 12.17 hrs, Volume= 35,217 cf
Outflow = 7.8 cfs @ 12.23 hrs, Volume= 33,240 cf, Atten= 13%, Lag= 3.6 min
Discarded = 0.1 cfs @ 9.32 hrs, Volume= 4,932 cf
Primary = 7.7 cfs @ 12.23 hrs, Volume= 28,308 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.08' @ 12.23 hrs Surf.Area= 1,497 sf Storage= 3,920 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.3 min (867.8 - 853.5)

Volume	Invert	Avail.Storage	Storage Description
#1	295.80'	2,234 cf	**IC-2 Stone bed (Irregular)**Listed below (Recalc) 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids
#2	296.80'	3,143 cf	**ADS_StormTech MC-4500 b +Cap @ 4.03' L** x 28 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 28 Chambers in 2 Rows Cap Storage= +39.5 cf x 2 x 2 rows = 158.0 cf
#3	296.00'	172 cf	**PES-2 Stone bed (Pyramidal)**Listed below (Recalc) 500 cf Overall - 71 cf Embedded = 429 cf x 40.0% Voids
#4	296.00'	71 cf	**18.0" Round Pipe Storage** Inside #3 L= 40.0'
		5,620 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
295.80	1,247	165.0	0	0	1,247
296.00	1,247	165.0	249	249	1,280
297.00	1,247	165.0	1,247	1,496	1,445
298.00	1,247	165.0	1,247	2,743	1,610
299.00	1,247	165.0	1,247	3,990	1,775
300.00	1,247	165.0	1,247	5,237	1,940
301.00	1,247	165.0	1,247	6,484	2,105
302.00	1,247	165.0	1,247	7,731	2,270
302.80	1,247	165.0	998	8,729	2,402

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
296.00	250	0	0	250
297.00	250	250	250	313
298.00	250	250	500	376

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	298.00'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 2	296.50'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.50' / 296.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	296.50'	**23.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	299.90'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 9.32 hrs HW=296.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=7.6 cfs @ 12.23 hrs HW=300.07' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Passes 7.6 cfs of 430.5 cfs potential flow)
└**3=Culvert** (Passes 7.6 cfs of 9.7 cfs potential flow)
└**4=Orifice/Grate** (Orifice Controls 6.6 cfs @ 6.93 fps)
└**5=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.0 cfs @ 1.37 fps)

Summary for Pond SD-1:

Inflow Area = 3,729 sf, 47.63% Impervious, Inflow Depth > 4.33" for 25-Year event
Inflow = 0.4 cfs @ 12.12 hrs, Volume= 1,344 cf
Outflow = 0.4 cfs @ 12.12 hrs, Volume= 1,305 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 8.24 hrs, Volume= 391 cf
Primary = 0.4 cfs @ 12.12 hrs, Volume= 913 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.92' @ 12.12 hrs Surf.Area= 109 sf Storage= 40 cf

Plug-Flow detention time= 24.4 min calculated for 1,304 cf (97% of inflow)
Center-of-Mass det. time= 7.0 min (821.1 - 814.1)

Volume	Invert	Avail.Storage	Storage Description
#1	300.00'	44 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 109 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
300.00	109	113.3	0	0	109
301.00	109	113.3	109	109	222

Device	Routing	Invert	Outlet Devices
#1	Discarded	300.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	300.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 8.24 hrs HW=300.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=300.92' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.4 cfs @ 0.35 fps)

Summary for Pond SD-2:

Inflow Area = 4,504 sf, 4.43% Impervious, Inflow Depth > 3.21" for 25-Year event
Inflow = 0.4 cfs @ 12.12 hrs, Volume= 1,203 cf
Outflow = 0.4 cfs @ 12.12 hrs, Volume= 1,189 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 8.40 hrs, Volume= 133 cf
Primary = 0.4 cfs @ 12.12 hrs, Volume= 1,056 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 303.44' @ 12.12 hrs Surf.Area= 40 sf Storage= 15 cf

Plug-Flow detention time= 10.5 min calculated for 1,189 cf (99% of inflow)
Center-of-Mass det. time= 3.5 min (854.0 - 850.5)

Volume	Invert	Avail.Storage	Storage Description
#1	302.50'	16 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 40 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
302.50	40	44.0	0	0	40
303.50	40	44.0	40	40	84

Device	Routing	Invert	Outlet Devices
#1	Discarded	302.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	303.40'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 8.40 hrs HW=302.51' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=303.44' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.4 cfs @ 0.48 fps)

Summary for Link AP1:

Inflow Area = 224,752 sf, 11.85% Impervious, Inflow Depth > 2.63" for 25-Year event
Inflow = 15.5 cfs @ 12.17 hrs, Volume= 49,176 cf
Primary = 15.5 cfs @ 12.17 hrs, Volume= 49,176 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP2:

Inflow Area = 42,170 sf, 25.53% Impervious, Inflow Depth > 3.18" for 25-Year event
Inflow = 3.5 cfs @ 12.13 hrs, Volume= 11,176 cf
Primary = 3.5 cfs @ 12.13 hrs, Volume= 11,176 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP3:

Inflow Area = 196,746 sf, 5.32% Impervious, Inflow Depth > 2.65" for 25-Year event
Inflow = 11.3 cfs @ 12.22 hrs, Volume= 43,464 cf
Primary = 11.3 cfs @ 12.22 hrs, Volume= 43,464 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP4:

Inflow Area = 14,618 sf, 41.41% Impervious, Inflow Depth > 3.93" for 25-Year event
Inflow = 1.1 cfs @ 12.15 hrs, Volume= 4,783 cf
Primary = 1.1 cfs @ 12.15 hrs, Volume= 4,783 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment SC1.1: Runoff Area=54,522 sf 14.68% Impervious Runoff Depth>5.71"
Flow Length=549' Tc=7.5 min CN=76 Runoff=7.4 cfs 25,957 cf

Subcatchment SC1.2: Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>5.47"
Flow Length=510' Tc=6.7 min CN=74 Runoff=15.5 cfs 52,689 cf

Subcatchment SC1.3: Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>8.25"
Tc=5.0 min CN=97 Runoff=1.0 cfs 3,877 cf

Subcatchment SC1.4: Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>8.37"
Tc=5.0 min CN=98 Runoff=0.4 cfs 1,540 cf

Subcatchment SC1.5: Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>5.11"
Flow Length=337' Tc=6.4 min CN=71 Runoff=5.9 cfs 19,698 cf

Subcatchment SC1.6: Runoff Area=622 sf 100.00% Impervious Runoff Depth>8.37"
Tc=5.0 min CN=98 Runoff=0.1 cfs 434 cf

Subcatchment SC2.1: Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>6.80"
Flow Length=68' Tc=5.0 min CN=85 Runoff=0.6 cfs 2,115 cf

Subcatchment SC2.2: Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>5.47"
Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=5.2 cfs 17,534 cf

Subcatchment SC3.1: Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>5.35"
Flow Length=564' Tc=10.4 min CN=73 Runoff=7.6 cfs 29,796 cf

Subcatchment SC3.2: Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>5.11"
Flow Length=378' Tc=10.1 min CN=71 Runoff=6.1 cfs 23,428 cf

Subcatchment SC3.3: Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>5.10"
Flow Length=287' Tc=10.8 min CN=71 Runoff=6.8 cfs 26,570 cf

Subcatchment SC3.4: Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>6.93"
Flow Length=246' Tc=5.0 min CN=86 Runoff=2.1 cfs 7,125 cf

Subcatchment SC4.1: Runoff Area=4,504 sf 4.43% Impervious Runoff Depth>5.48"
Flow Length=64' Tc=5.0 min CN=74 Runoff=0.6 cfs 2,055 cf

Subcatchment SC4.2: Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>6.91"
Flow Length=75' Tc=12.7 min CN=86 Runoff=1.3 cfs 5,825 cf

Pond CB1: Peak Elev=298.36' Inflow=0.4 cfs 1,540 cf
12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.4 cfs 1,540 cf

Pond CB2: Peak Elev=290.16' Inflow=1.0 cfs 3,877 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=1.0 cfs 3,877 cf

Pond DCB3: Peak Elev=291.63' Storage=159 cf Inflow=15.5 cfs 52,689 cf
24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=15.1 cfs 52,689 cf

Pond DCB4: Peak Elev=290.64' Storage=71 cf Inflow=7.4 cfs 25,957 cf
15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=7.0 cfs 25,957 cf

Pond DCB5: Peak Elev=302.48' Inflow=7.6 cfs 29,796 cf
21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=7.6 cfs 29,796 cf

Pond DCB6: Peak Elev=301.98' Inflow=2.1 cfs 7,125 cf
21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=2.1 cfs 7,125 cf

Pond DCB7: Peak Elev=302.51' Inflow=6.1 cfs 23,428 cf
18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=6.1 cfs 23,428 cf

Pond DMH1: Peak Elev=290.31' Inflow=16.3 cfs 58,106 cf
24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=16.3 cfs 58,106 cf

Pond DMH2: Peak Elev=302.00' Inflow=9.2 cfs 36,922 cf
30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=9.2 cfs 36,922 cf

Pond IC-1: Peak Elev=288.60' Storage=8,338 cf Inflow=23.2 cfs 84,063 cf
Discarded=0.1 cfs 8,667 cf Primary=21.0 cfs 70,851 cf Outflow=21.2 cfs 79,518 cf

Pond IC-2: Peak Elev=301.82' Storage=5,132 cf Inflow=15.2 cfs 60,350 cf
Discarded=0.1 cfs 5,490 cf Primary=13.1 cfs 52,878 cf Outflow=13.2 cfs 58,368 cf

Pond SD-1: Peak Elev=300.93' Storage=40 cf Inflow=0.6 cfs 2,115 cf
Discarded=0.0 cfs 431 cf Primary=0.6 cfs 1,644 cf Outflow=0.6 cfs 2,075 cf

Pond SD-2: Peak Elev=303.46' Storage=15 cf Inflow=0.6 cfs 2,055 cf
Discarded=0.0 cfs 147 cf Primary=0.6 cfs 1,894 cf Outflow=0.6 cfs 2,041 cf

Link AP1: Inflow=26.1 cfs 90,983 cf
Primary=26.1 cfs 90,983 cf

Link AP2: Inflow=5.8 cfs 19,178 cf
Primary=5.8 cfs 19,178 cf

Link AP3: Inflow=19.6 cfs 79,448 cf
Primary=19.6 cfs 79,448 cf

Link AP4: Inflow=1.8 cfs 7,719 cf
Primary=1.8 cfs 7,719 cf

Total Runoff Area = 478,286 sf Runoff Volume = 218,645 cf Average Runoff Depth = 5.49"
88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

Summary for Subcatchment SC1.1:

Runoff = 7.4 cfs @ 12.15 hrs, Volume= 25,957 cf, Depth> 5.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
24,785	74	>75% Grass cover, Good, HSG C
21,721	70	Woods, Good, HSG C
14	89	Gravel roads, HSG C
6,226	98	Paved parking, HSG C
1,776	98	Roofs, HSG C
54,522	76	Weighted Average
46,520		85.32% Pervious Area
8,002		14.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.90		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
0.2	35	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.6	50	0.0345	1.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	180	0.1550	1.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	234	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.5	549	Total			

Summary for Subcatchment SC1.2:

Runoff = 15.5 cfs @ 12.14 hrs, Volume= 52,689 cf, Depth> 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
46,703	74	>75% Grass cover, Good, HSG C
57,729	70	Woods, Good, HSG C
967	89	Gravel roads, HSG C
313	98	Unconnected pavement, HSG C
7,362	98	Paved parking, HSG C
2,449	98	Roofs, HSG C
115,523	74	Weighted Average
105,398		91.24% Pervious Area
10,124		8.76% Impervious Area
313		3.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
1.3	167	0.0988	2.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	117	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	176	0.0400	3.00		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
6.7	510	Total			

Summary for Subcatchment SC1.3:

Runoff = 1.0 cfs @ 12.12 hrs, Volume= 3,877 cf, Depth> 8.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
162	74	>75% Grass cover, Good, HSG C
243	89	Gravel roads, HSG C
5,233	98	Paved parking, HSG C
5,639	97	Weighted Average
405		7.19% Pervious Area
5,233		92.81% Impervious Area

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

Summary for Subcatchment SC1.4:

Runoff = 0.4 cfs @ 12.12 hrs, Volume= 1,540 cf, Depth> 8.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
2,208	98	Paved parking, HSG C
2,208		100.00% Impervious Area

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

Summary for Subcatchment SC1.5:

Runoff = 5.9 cfs @ 12.14 hrs, Volume= 19,698 cf, Depth> 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
37,139	70	Woods, Good, HSG C
441	98	Unconnected pavement, HSG C
8,658	74	>75% Grass cover, Good, HSG C
46,238	71	Weighted Average
45,797		99.05% Pervious Area
441		0.95% Impervious Area
441		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0800	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
3.1	287	0.0941	1.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	337	Total			

Summary for Subcatchment SC1.6:

Runoff = 0.1 cfs @ 12.12 hrs, Volume= 434 cf, Depth> 8.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
622	98	Paved parking, HSG C
622		100.00% Impervious Area

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

Summary for Subcatchment SC2.1:

Runoff = 0.6 cfs @ 12.12 hrs, Volume= 2,115 cf, Depth> 6.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
1,953	74	>75% Grass cover, Good, HSG C
1,776	98	Roofs, HSG C
3,729	85	Weighted Average
1,953		52.37% Pervious Area
1,776		47.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	18	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.5	68	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC2.2:

Runoff = 5.2 cfs @ 12.13 hrs, Volume= 17,534 cf, Depth> 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Adj	Description
7,180	74		>75% Grass cover, Good, HSG C
22,269	70		Woods, Good, HSG C
8,992	98		Unconnected pavement, HSG C
38,441	77	74	Weighted Average, UI Adjusted
29,449			76.61% Pervious Area
8,992			23.39% Impervious Area
8,992			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	29	0.1700	2.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	61	0.1800	2.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	140	Total			

Summary for Subcatchment SC3.1:

Runoff = 7.6 cfs @ 12.18 hrs, Volume= 29,796 cf, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
32,168	74	>75% Grass cover, Good, HSG C
31,971	70	Woods, Good, HSG C
364	89	Gravel roads, HSG C
55	98	Paved parking, HSG C
2,321	98	Roofs, HSG C
66,880	73	Weighted Average
64,504		96.45% Pervious Area
2,376		3.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
2.1	247	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	133	0.0830	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	134	0.0820	2.00		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.4	564	Total			

Summary for Subcatchment SC3.2:

Runoff = 6.1 cfs @ 12.17 hrs, Volume= 23,428 cf, Depth> 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
12,832	74	>75% Grass cover, Good, HSG C
880	98	Roofs, HSG C
41,349	70	Woods, Good, HSG C
55,060	71	Weighted Average
54,180		98.40% Pervious Area
880		1.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
1.7	204	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.3	124	0.0530	1.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.1	378	Total			

Summary for Subcatchment SC3.3:

Runoff = 6.8 cfs @ 12.18 hrs, Volume= 26,570 cf, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
12,393	74	>75% Grass cover, Good, HSG C
49,047	70	Woods, Good, HSG C
1,019	98	Unconnected pavement, HSG C
62,459	71	Weighted Average
61,440		98.37% Pervious Area
1,019		1.63% Impervious Area
1,019		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
2.2	237	0.1350	1.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.8	287	Total			

Summary for Subcatchment SC3.4:

Runoff = 2.1 cfs @ 12.12 hrs, Volume= 7,125 cf, Depth> 6.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
5,554	74	>75% Grass cover, Good, HSG C
529	70	Woods, Good, HSG C
76	89	Gravel roads, HSG C
6,187	98	Paved parking, HSG C
12,347	86	Weighted Average
6,159		49.89% Pervious Area
6,187		50.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	113	0.0200	1.40		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.16"
2.4	38	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.9	95	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.6	246	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.1:

Runoff = 0.6 cfs @ 12.12 hrs, Volume= 2,055 cf, Depth> 5.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
1,020	70	Woods, Good, HSG C
200	98	Unconnected pavement, HSG C
3,285	74	>75% Grass cover, Good, HSG C
4,504	74	Weighted Average
4,305		95.57% Pervious Area
200		4.43% Impervious Area
200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.16"
0.2	14	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.8	64	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment SC4.2:

Runoff = 1.3 cfs @ 12.20 hrs, Volume= 5,825 cf, Depth> 6.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

Area (sf)	CN	Description
3,927	70	Woods, Good, HSG C
5,854	98	Unconnected pavement, HSG C
333	74	>75% Grass cover, Good, HSG C
10,114	86	Weighted Average
4,260		42.12% Pervious Area
5,854		57.88% Impervious Area
5,854		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	25	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.7	75	Total			

Summary for Pond CB1:

Inflow Area = 2,208 sf,100.00% Impervious, Inflow Depth > 8.37" for 100-Year event
Inflow = 0.4 cfs @ 12.12 hrs, Volume= 1,540 cf
Outflow = 0.4 cfs @ 12.12 hrs, Volume= 1,540 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.12 hrs, Volume= 1,540 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 298.36' @ 12.12 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	298.00'	**12.0" Round Culvert** L= 220.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=298.36' TW=289.68' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.4 cfs @ 1.61 fps)

Summary for Pond CB2:

Inflow Area = 5,639 sf, 92.81% Impervious, Inflow Depth > 8.25" for 100-Year event
Inflow = 1.0 cfs @ 12.12 hrs, Volume= 3,877 cf
Outflow = 1.0 cfs @ 12.12 hrs, Volume= 3,877 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.0 cfs @ 12.12 hrs, Volume= 3,877 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 290.16' @ 12.14 hrs
Flood Elev= 292.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	288.20'	**12.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.6 cfs @ 12.12 hrs HW=289.98' TW=289.68' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.6 cfs @ 2.06 fps)

Summary for Pond DCB3:

Inflow Area = 115,523 sf, 8.76% Impervious, Inflow Depth > 5.47" for 100-Year event
Inflow = 15.5 cfs @ 12.14 hrs, Volume= 52,689 cf
Outflow = 15.1 cfs @ 12.16 hrs, Volume= 52,689 cf, Atten= 3%, Lag= 1.3 min
Primary = 15.1 cfs @ 12.16 hrs, Volume= 52,689 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 291.63' @ 12.15 hrs Surf.Area= 321 sf Storage= 159 cf
Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (832.0 - 832.0)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	89	87.5	33	36	615
292.00	519	180.8	274	310	2,611

Device	Routing	Invert	Outlet Devices
#1	Primary	287.34'	**24.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.34' / 287.10' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=13.8 cfs @ 12.16 hrs HW=291.61' TW=290.28' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 13.8 cfs @ 4.39 fps)

Summary for Pond DCB4:

Inflow Area = 54,522 sf, 14.68% Impervious, Inflow Depth > 5.71" for 100-Year event
Inflow = 7.4 cfs @ 12.15 hrs, Volume= 25,957 cf
Outflow = 7.0 cfs @ 12.13 hrs, Volume= 25,957 cf, Atten= 5%, Lag= 0.0 min
Primary = 7.0 cfs @ 12.13 hrs, Volume= 25,957 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 290.64' @ 12.18 hrs Surf.Area= 302 sf Storage= 71 cf
Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (827.1 - 827.0)

Volume	Invert	Avail.Storage	Storage Description
#1	287.00'	250 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
287.00	1	1.0	0	0	1
288.00	1	1.0	1	1	2
289.00	1	1.0	1	2	3
290.00	1	1.0	1	3	4
291.00	714	132.0	247	250	1,392

Device	Routing	Invert	Outlet Devices
#1	Primary	287.25'	**15.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=7.0 cfs @ 12.13 hrs HW=290.26' TW=288.01' (Dynamic Tailwater)
1=Culvert (Inlet Controls 7.0 cfs @ 5.69 fps)

Summary for Pond DCB5:

Inflow Area = 66,880 sf, 3.55% Impervious, Inflow Depth > 5.35" for 100-Year event
Inflow = 7.6 cfs @ 12.18 hrs, Volume= 29,796 cf
Outflow = 7.6 cfs @ 12.18 hrs, Volume= 29,796 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.6 cfs @ 12.18 hrs, Volume= 29,796 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 302.48' @ 12.23 hrs
Flood Elev= 302.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.42'	**21.0" Round Culvert** L= 47.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=5.5 cfs @ 12.18 hrs HW=302.02' TW=301.66' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.5 cfs @ 2.28 fps)

Summary for Pond DCB6:

Inflow Area = 12,347 sf, 50.11% Impervious, Inflow Depth > 6.93" for 100-Year event
Inflow = 2.1 cfs @ 12.12 hrs, Volume= 7,125 cf
Outflow = 2.1 cfs @ 12.12 hrs, Volume= 7,125 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.1 cfs @ 12.12 hrs, Volume= 7,125 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 301.98' @ 12.24 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**21.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=300.49' TW=300.69' (Dynamic Tailwater)
1=Culvert (Controls 0.0 cfs)

Summary for Pond DCB7:

Inflow Area = 55,060 sf, 1.60% Impervious, Inflow Depth > 5.11" for 100-Year event
Inflow = 6.1 cfs @ 12.17 hrs, Volume= 23,428 cf
Outflow = 6.1 cfs @ 12.17 hrs, Volume= 23,428 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.1 cfs @ 12.17 hrs, Volume= 23,428 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 302.51' @ 12.21 hrs
Flood Elev= 302.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	297.01'	**18.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.1 cfs @ 12.17 hrs HW=302.20' TW=301.38' (Dynamic Tailwater)
1=Culvert (Inlet Controls 6.1 cfs @ 3.44 fps)

Summary for Pond DMH1:

Inflow Area = 123,370 sf, 14.24% Impervious, Inflow Depth > 5.65" for 100-Year event
Inflow = 16.3 cfs @ 12.15 hrs, Volume= 58,106 cf
Outflow = 16.3 cfs @ 12.15 hrs, Volume= 58,106 cf, Atten= 0%, Lag= 0.0 min
Primary = 16.3 cfs @ 12.15 hrs, Volume= 58,106 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 290.31' @ 12.17 hrs
Flood Elev= 292.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	287.00'	**24.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=16.3 cfs @ 12.15 hrs HW=290.21' TW=288.35' (Dynamic Tailwater)
1=Culvert (Inlet Controls 16.3 cfs @ 5.19 fps)

Summary for Pond DMH2:

Inflow Area = 79,226 sf, 10.81% Impervious, Inflow Depth > 5.59" for 100-Year event
Inflow = 9.2 cfs @ 12.16 hrs, Volume= 36,922 cf
Outflow = 9.2 cfs @ 12.16 hrs, Volume= 36,922 cf, Atten= 0%, Lag= 0.0 min
Primary = 9.2 cfs @ 12.16 hrs, Volume= 36,922 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 302.00' @ 12.22 hrs
Flood Elev= 302.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	296.85'	**30.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=9.2 cfs @ 12.16 hrs HW=301.31' TW=301.07' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 9.2 cfs @ 1.87 fps)

Summary for Pond IC-1:

Inflow Area = 177,892 sf, 14.37% Impervious, Inflow Depth > 5.67" for 100-Year event
Inflow = 23.2 cfs @ 12.15 hrs, Volume= 84,063 cf
Outflow = 21.2 cfs @ 12.19 hrs, Volume= 79,518 cf, Atten= 9%, Lag= 2.0 min
Discarded = 0.1 cfs @ 7.80 hrs, Volume= 8,667 cf
Primary = 21.0 cfs @ 12.19 hrs, Volume= 70,851 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 288.60' @ 12.19 hrs Surf.Area= 2,271 sf Storage= 8,338 cf

Plug-Flow detention time= 47.5 min calculated for 79,518 cf (95% of inflow)
Center-of-Mass det. time= 16.8 min (841.6 - 824.8)

Volume	Invert	Avail.Storage	Storage Description
#1	282.40'	3,658 cf	**IC-1 Stone bed (Irregular)**Listed below (Recalc) 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids
#2	283.40'	5,002 cf	**ADS_StormTech MC-4500 b +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf
#3	283.00'	200 cf	**PES-1 Stone bed (Pyramidal)**Listed below (Recalc) 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids
#4	283.00'	126 cf	**24.0" Round Pipe Storage** Inside #3 L= 40.0'
		8,985 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
282.40	2,021	188.0	0	0	2,021
283.00	2,021	188.0	1,213	1,213	2,134
284.00	2,021	188.0	2,021	3,234	2,322
285.00	2,021	188.0	2,021	5,255	2,510
286.00	2,021	188.0	2,021	7,276	2,698
287.00	2,021	188.0	2,021	9,297	2,886
288.00	2,021	188.0	2,021	11,318	3,074
289.00	2,021	188.0	2,021	13,339	3,262
289.40	2,021	188.0	808	14,147	3,337

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
283.00	250	0	0	250
284.00	250	250	250	313
285.00	250	250	500	376
285.50	250	125	625	408

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.40'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	285.50'	**50.0' long x 2.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32
#3	Device 2	284.10'	**24.0" Round Culvert** L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 3	284.10'	**20.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	287.00'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 7.80 hrs HW=283.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=21.0 cfs @ 12.19 hrs HW=288.58' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Passes 21.0 cfs of 829.7 cfs potential flow)
└**3=Culvert** (Inlet Controls 21.0 cfs @ 6.67 fps)
└**4=Orifice/Grate** (Passes < 14.1 cfs potential flow)
└**5=Sharp-Crested Vee/Trap Weir** (Passes < 26.0 cfs potential flow)

Summary for Pond IC-2:

Inflow Area = 134,287 sf, 7.03% Impervious, Inflow Depth > 5.39" for 100-Year event
Inflow = 15.2 cfs @ 12.16 hrs, Volume= 60,350 cf
Outflow = 13.2 cfs @ 12.22 hrs, Volume= 58,368 cf, Atten= 13%, Lag= 3.4 min
Discarded = 0.1 cfs @ 7.36 hrs, Volume= 5,490 cf
Primary = 13.1 cfs @ 12.22 hrs, Volume= 52,878 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 301.82' @ 12.22 hrs Surf.Area= 1,497 sf Storage= 5,132 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 11.8 min (846.1 - 834.3)

Volume	Invert	Avail.Storage	Storage Description
#1	295.80'	2,234 cf	**IC-2 Stone bed (Irregular)**Listed below (Recalc) 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids
#2	296.80'	3,143 cf	**ADS_StormTech MC-4500 b +Cap @ 4.03' L** x 28 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 28 Chambers in 2 Rows Cap Storage= +39.5 cf x 2 x 2 rows = 158.0 cf
#3	296.00'	172 cf	**PES-2 Stone bed (Pyramidal)**Listed below (Recalc) 500 cf Overall - 71 cf Embedded = 429 cf x 40.0% Voids
#4	296.00'	71 cf	**18.0" Round Pipe Storage** Inside #3 L= 40.0'
		5,620 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
295.80	1,247	165.0	0	0	1,247
296.00	1,247	165.0	249	249	1,280
297.00	1,247	165.0	1,247	1,496	1,445
298.00	1,247	165.0	1,247	2,743	1,610
299.00	1,247	165.0	1,247	3,990	1,775
300.00	1,247	165.0	1,247	5,237	1,940
301.00	1,247	165.0	1,247	6,484	2,105
302.00	1,247	165.0	1,247	7,731	2,270
302.80	1,247	165.0	998	8,729	2,402

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
296.00	250	0	0	250
297.00	250	250	250	313
298.00	250	250	500	376

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	298.00'	**50.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Device 2	296.50'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 296.50' / 296.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	296.50'	**23.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 3	299.90'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=0.1 cfs @ 7.36 hrs HW=296.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=13.1 cfs @ 12.22 hrs HW=301.81' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Passes 13.1 cfs of 1,236.5 cfs potential flow)
└**3=Culvert** (Inlet Controls 13.1 cfs @ 7.42 fps)
└**4=Orifice/Grate** (Passes < 9.0 cfs potential flow)
└**5=Sharp-Crested Vee/Trap Weir** (Passes < 34.7 cfs potential flow)

Summary for Pond SD-1:

Inflow Area = 3,729 sf, 47.63% Impervious, Inflow Depth > 6.80" for 100-Year event
Inflow = 0.6 cfs @ 12.12 hrs, Volume= 2,115 cf
Outflow = 0.6 cfs @ 12.12 hrs, Volume= 2,075 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 6.30 hrs, Volume= 431 cf
Primary = 0.6 cfs @ 12.12 hrs, Volume= 1,644 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 300.93' @ 12.12 hrs Surf.Area= 109 sf Storage= 40 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 6.3 min (804.4 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	300.00'	44 cf	**Custom Stage Data (Irregular)** Listed below (Recalc) 109 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
300.00	109	113.3	0	0	109
301.00	109	113.3	109	109	222

Device	Routing	Invert	Outlet Devices
#1	Discarded	300.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	300.90'	**55.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 6.30 hrs HW=300.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.6 cfs @ 12.12 hrs HW=300.93' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.6 cfs @ 0.40 fps)

Summary for Pond SD-2:

Inflow Area = 4,504 sf, 4.43% Impervious, Inflow Depth > 5.48" for 100-Year event
Inflow = 0.6 cfs @ 12.12 hrs, Volume= 2,055 cf
Outflow = 0.6 cfs @ 12.12 hrs, Volume= 2,041 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.0 cfs @ 6.50 hrs, Volume= 147 cf
Primary = 0.6 cfs @ 12.12 hrs, Volume= 1,894 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 303.46' @ 12.12 hrs Surf.Area= 40 sf Storage= 15 cf

Plug-Flow detention time= 7.0 min calculated for 2,041 cf (99% of inflow)
Center-of-Mass det. time= 2.7 min (833.4 - 830.7)

Volume	Invert	Avail.Storage	Storage Description
#1	302.50'	16 cf	**Custom Stage Data (Irregular)**Listed below (Recalc) 40 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
302.50	40	44.0	0	0	40
303.50	40	44.0	40	40	84

Device	Routing	Invert	Outlet Devices
#1	Discarded	302.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	303.40'	**20.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 6.50 hrs HW=302.51' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.6 cfs @ 12.12 hrs HW=303.46' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.6 cfs @ 0.57 fps)

Summary for Link AP1:

Inflow Area = 224,752 sf, 11.85% Impervious, Inflow Depth > 4.86" for 100-Year event
Inflow = 26.1 cfs @ 12.16 hrs, Volume= 90,983 cf
Primary = 26.1 cfs @ 12.16 hrs, Volume= 90,983 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP2:

Inflow Area = 42,170 sf, 25.53% Impervious, Inflow Depth > 5.46" for 100-Year event
Inflow = 5.8 cfs @ 12.13 hrs, Volume= 19,178 cf
Primary = 5.8 cfs @ 12.13 hrs, Volume= 19,178 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP3:

Inflow Area = 196,746 sf, 5.32% Impervious, Inflow Depth > 4.85" for 100-Year event
Inflow = 19.6 cfs @ 12.20 hrs, Volume= 79,448 cf
Primary = 19.6 cfs @ 12.20 hrs, Volume= 79,448 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Summary for Link AP4:

Inflow Area = 14,618 sf, 41.41% Impervious, Inflow Depth > 6.34" for 100-Year event
Inflow = 1.8 cfs @ 12.15 hrs, Volume= 7,719 cf
Primary = 1.8 cfs @ 12.15 hrs, Volume= 7,719 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Stormwater Management Standard 3
GROUNDWATER RECHARGE

Pre-Development Conditions

Five Paths
Wayland, MA
Project No. 171053

		Area (sf)	Area (Ac)
Total Subcatchment Areas		478,286	11.0
Total Subcatchment Areas On-Site		478,286	11.0
Total Area of Hydrolic Soil Groups On-Site		478,286	11.0
	C	478,286	11.0

Surface Type Areas

>75% Grass cover, Good	C	63,276	1.5
Pavement	C	7,450	0.2
Roofs	C	3,874	0.1
Unconnected pavement	C	16,501	0.4
Woods, Good	C	387,185	8.9
TOTAL AREA		478,286	11.0
Total Impervious Area		27,825	0.6

Infiltration Volume

Inches of Recharge per Storm Event	A	0.60
	B	0.35
	C	0.25
	D	0.10

Infiltration Volume =∑ {[(Total Subcatchment Area within HSG) - (Total Impervious Area within HSG)]
x (inches of Recharge Per Storm)}

Infiltration Volume	**9,385**	**CF**

Stormwater Management Standard 3
GROUNDWATER RECHARGE

Post Development Conditions

Five Paths
Wayland, MA
Project No. 171053

		Area (sf)	Area (Ac)
Total Subcatchment Areas		478,286	11.0
Total Subcatchment Areas On-Site		478,286	11.0
Total Area of Hydrolic Soil Groups On-Site		478,286	11.0
	C	478,286	11.0
Surface Type Areas			
>75% Grass cover, Good	C	156,005	3.6
Gravel	C	1,665	0.0
Pavement	C	27,894	0.6
Roofs	C	9,202	0.2
Unconnected pavement	C	16,818	0.4
Woods, Good	C	266,702	6.1
TOTAL AREA		478,286	11.0
Total Impervious Area		53,914	1.2

Infiltration Volume

Inches of Recharge per Storm Event	A	0.60
	B	0.35
	C	0.25
	D	0.10

Infiltration Volume = ∑ {[(Total Subcatchment Area within HSG) - (Total Impervious Area within HSG)] x (inches of Recharge Per Storm)}

Natural Infiltration Volume	8,841	CF	
Pre-Development Infiltration Volume	9,385	CF	
Required Infiltration Volume	**544**	**CF**	

Provided Infiltration Volume

Infilration Chambers (IC-1)	4,515	CF	Storage below outlet Elev. 285.50
Infilration Chambers (IC-2)	1,966	CF	Storage below outlet Elev. 298.00
Total Provided Iniltration Volume	**6,481**	**CF**	

Stormwater Management Standard 3
GROUNDWATER RECHARGE

Infiltration Area Requirements

Five Paths
Wayland, MA
Project No. 171053

Drawdown Time

(Per Massachusetts Stormwater regulations, infiltration areas must completely drain within 72 hours)

		IC-1	IC-2
Infiltration Area Storage Volume	cf	4,515	1,966
Design infiltration Rate	in/hr	2.41	2.41
Infiltration Bottom Area	sf	2021	1247

Drawdown Time = Infiltration Area Storage Volume / [Design Infiltration Rate x Infiltration Area Bottom Area]

Drawdown Time (Hrs)	**11.1**	**7.9**

Mounding Analysis

Per the Massachusetts Stormwater Handbook, mounding analysis is required when ".. The vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four feet and the recharge system is proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm." The mounding analysis "... must show that the REQUIRED RECHARGE VOLUME is fully dewatered within 72 hours..."

		IC-1	IC-2
Hydraulic Conductivity	ft/day	16	16
		Lower Range Standard Value for "Medium Sand" material	
Specific Yield		0.28	0.28
		Standard Value for "Medium Sand" material	
Initial Saturated Thickness	ft	10	10
		Depth to bedrock	
Design Recharge Rate	ft/day	4.82	4.82
		infiltration rate	
Time	days	3	3
		Minimum 72 hr evaluation period	
Bottom Infiltrating Area	sf	2,021	1,247
Length of Infiltration Area	ft	55.8	79.9
Width of Infiltration Area	ft	36.2	15.6
Time when Infiltration Stops	days	0.46	0.33
		Calculated Drawdown Time (see Above)	
Maximum Water table rise at 72 hours [1]	**ft**	**0.77**	**0.40**
	in	**9 1/4**	**4 3/4**

- Resulting mound will not interfere with the full draining of the infiltration area in accordance with Mass Stormwater Standards -

[1] - mounding analysis calculated using the MOUNDSOLV Wizaard, Groundwater Mounding Analysis For A Sloping Water-Table Aquifer, Zlotnik Et Al. (2017) Solution.

Stormwater Management Standard 4
WATER QUALITY RETENTION VOLUME

Five Paths
Wayland, MA
Project No. 171053

Parameter	Unit	Quantity	Remarks
Watershed area	sf	478,286	
Predevelopment impervious area	sf	27,825	
Total impervious area added	sf	26,089	
Total impervious area	sf	53,914	
Total impervious area required for retention	sf	26,089	
Runoff depth over impervious area	IN	0.5	
Required Water Quality Volume	**CF**	**1,087**	

Provided Water Quality Volume

Infilration Chambers (IC-1)		4,515	CF	Storage below outlet Elev. 285.50
Infilration Chambers (IC-2)		1,966	CF	Storage below outlet Elev. 298.00
DESIGN VOLUME PROVIDED	**CF**	**6,481**		

Stormwater Management Standard 4
TSS REMOVAL

Five Paths
Wayland, MA
Project No. 171053

Process Train No.	Impervious Area (SF)	BMP Type	TSS Removal Rate	TSS Remaining at Discharge	TSS Removed at Discharge
SC1.1, SC1.2, SC1.3 & SC1.4	25,567	CB	25%	75%	25%
		IC	80%	15%	**85%**
SC1.6	622	Untreated	0%	100%	**0%**
SC2.1	1,776	Clean roof	100%	0%	**100%**
SC3.1, SC3.2 & SC3.4	9,444	CB	25%	75%	25%
		IC	80%	15%	**85%**

Total Development Weighted Average **84%**

ABBREVIATIONS:
TSS=total suspended solids; SF=square feet; SC=subcatchment; GC=grassed channel; BMP=best management practices; CB=deep sump hooded catch basin; FB = Sediment Forebay; INF=infiltration basin; WB=wet basin; SP=Silt Prison Catch Basin; DW=drywell

Stormwater Pollution Prevention Plan (SWPPP)

Project:

Five Paths
Tax Map 39, Parcel 15A
Wayland, MA 01778
GPR#171053

Owner:

Floyd, Paula & Ross Wilkinson
P.O. Box 98
Wilton, NH 03086

Operator:

Operator to be determined prior to construction

SWPPP Contact:

GPR Engineering Solutions for Land & Structures

39 Main Street, Suite 301
Ayer, MA 01432
P 978-772-1590 F 978-772-1591

SWPPP Preparation Date:

October 2020

Estimated Project Dates:

Project Start Date: March 1, 2021
Project Completion Date: March 1, 2022

Contents

SWPPP APPENDICES

SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Operator(s) / Subcontractor(s)

Operator(s):

Operator to be determined prior to construction

General Contractor

General Contractor to be determined prior to construction

Subcontractor(s):

Insert Company or Organization Name: _____
Insert Name: _____
Insert Address: _____
Insert City, State, Zip Code: _____
Insert Telephone Number: _____
Insert Fax/Email: _____
Insert area of control (if more than one operator at site): _____

Insert Company or Organization Name: _____
Insert Name: _____
Insert Address: _____
Insert City, State, Zip Code: _____
Insert Telephone Number: _____
Insert Fax/Email: _____
Insert area of control (if more than one operator at site): _____

Engineer:

Insert Company or Organization Name: GPR, Inc.
Insert Name: Kyle F. Burchard, PE
Insert Address: 39 Main Street
Insert City, State, Zip Code: Ayer, MA, 01432
Insert Telephone Number: 978-772-1590
Insert Fax/Email: kburchard@gpr-inc.com

Emergency 24-Hour Contact:

To be determined prior to construction

1.2 Stormwater Team

Responsibility: Overseeing the development of the SWPPP
Goldsmith, Prest & Ringwall, Inc.
Kyle F. Burchard
978-772-1590
kburchard@gpr-inc.com

Responsibility: General Contractor
General Contractor to be determined at later date

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Project/Site Information

Project Name and Address

Project/Site Name: Five Paths Definitive Subdivision
Project Street/Location: Map 39/Parcel 15A
City: Wayland
State: MA
ZIP Code: 01778
County: Middlesex

Project Latitude/Longitude

Latitude:
42 º 20 ' 35.55" N

Longitude:
71º 21' 12.27" W

Method for determining latitude/longitude:
☐ USGS topographic map ☐ EPA Web ☒ GPS

☐ Other (please specify):

Horizontal Reference Datum:
☐ NAD 27 ☐ NAD 83 or WGS 84 ☒ NAVD 88 ☐ Unknown

If you used a U.S.G.S topographic map, what was the scale? _____

Additional Project Information

Is the project/site located on Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ Yes ☒ No

If yes, provide the name of the Indian tribe associated with the area of Indian country (including the name of Indian reservation if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property: N/A

If you are conducting earth-disturbing activities in response to a public emergency, document the cause of the public emergency *(e.g., natural disaster, extreme flooding conditions)*, information substantiating its occurrence *(e.g., state disaster declaration)*, and a description of the construction necessary to reestablish effective public services: N/A

Are you applying for permit coverage as a "federal operator" as defined in Appendix A of the 2017 CGP?
☐ Yes ☒ No

2.2 Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ Yes ☒ No

Are there any surface waters that are located within 50 feet of your construction disturbances?
☐ Yes ☒ No

Table 1 – Names of Receiving Waters

Name(s) of the first surface water that receives stormwater directly from your site and/or from the MS4 (note: multiple rows provided where your site has more than one point of discharge that flows to different surface waters)
1.
2.
3.
4.
5.
6.

Table 2 – Impaired Waters / TMDLs (Answer the following for each surface water listed in Table 1 above)

	Is this surface water listed as "impaired"?	If you answered yes, then answer the following:			
		What pollutant(s) are causing the impairment?	Has a TMDL been completed?	Title of the TMDL document	Pollutant(s) for which there is a TMDL
1.	☐ YES ☒ NO	n/a	☐ YES ☒ NO	n/a	n/a
2.	☐ YES ☐ NO		☐ YES ☐ NO		
3.	☐ YES ☐ NO		☐ YES ☐ NO		
4.	☐ YES ☐ NO		☐ YES ☐ NO		
5.	☐ YES ☐ NO		☐ YES ☐ NO		
6.	☐ YES ☐ NO		☐ YES ☐ NO		

Describe the method(s) you used to determine whether or not your project/site discharges to an impaired water:
Available MA DEP Data

Table 3 – Tier 2, 2.5, or 3 Waters (Answer the following for each surface water listed in Table 1 above)

	Is this surface water designated as a Tier 2, Tier 2.5, or Tier 3 water? (see Appendix F)	If you answered yes, specify which Tier (2, 2.5, or 3) the surface water is designated as?
1.	☐ YES ☒ NO	n/a
2.	☐ YES ☐ NO	
3.	☐ YES ☐ NO	
4.	☐ YES ☐ NO	
5.	☐ YES ☐ NO	
6.	☐ YES ☐ NO	

2.3 Nature of the Construction Activity

General Description of Project

This proposed residential subdivision is located off Shaw Drive in southern Wayland. The proposed subdivision will have (3) proposed lots, on a 700' long road (Five Paths Court), which will provide frontage and access from the existing Shaw Drive. The proposed subdivision will construct (3) single family dwellings as part of the residential subdivision. The development will include the construction of an eighteen-foot-wide asphalt paved road (Five Paths Court) leading down to a cul-de-sac, utilities, stormwater management system, and associated clearing, grubbing, and grading. The proposed road will provide access to all proposed dwellings. To collect and treat stormwater runoff, Best Management Practices are proposed. Captured stormwater will be conveyed to infiltration chambers. The proposed BMP's have been designed in accordance with the Massachusetts Stormwater Standards and local Wayland, MA Bylaws to attenuate peak flows, treat runoff from impervious surfaces and maintain groundwater recharge and volumetric discharges to pre-development conditions. The proposed project will require clearing or grading more than 10,000 sq. ft. of land.

Size of Construction Project

What is the size of the property (in acres), the total area expected to be disturbed by the construction activities (in acres), and the maximum area expected to be disturbed at any one time?

PROPERTY SIZE: 13.7 ± acres

TOTAL AREA OF CONSTRUCTION DISTURBANCE: 2.6± acres

MAXIMUM AREA TO BE DISTURBED AT ANY ONE TIME: 2.6± acres

Construction Support Activities

Describe any construction support activities for the project (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas): The construction will utilize combined staging areas.

2.4 Sequence and Estimated Dates of Construction Activities

The order of construction sequencing shown below is to be followed, and phases may overlap.

Within each phase of construction, contractor shall:

Perform site work in accordance with "Definitive Residential Subdivision Plan – Assessors Map #39 Parcel 15A, Wayland MA" prepared for Ross C. Wilkinson by Goldsmith, Prest and Ringwall, Inc. dated July 2019, revised through September 2020. Job number 171053.

The development will be implemented following the sequence of activities below for major construction activities and Best Management Practices (BMP's) installation:

Before any grading activities begin:

1. Define limits of clearing/work associated with subdivision and stormwater BMP's construction.
2. Install straw wattles, silt fencing, and straw bales associated with subdivision and stormwater BMP's construction.
3. Construct stabilized construction entrance / exit from site.

Site Grading:

1. Begin clearing and grubbing operations within limits of work.
2. Begin rough grading and topsoil stripping within entire limit of clearing/work
3. Establish topsoil stockpiles .
4. Install straw wattles around stockpiles and temporarily stabilize the stockpiles with erosion controls.
5. Disturbed areas where construction will cease for more than 14 days will be stabilized with erosion controls.

Infrastructure (roads, utilities, etc.):

1. Construct combined staging and materials storage areas.
2. Construct stormwater BMP's and bypass flow away from infiltration chamber areas.
3. Install stormwater collection system (catch basins, manholes, etc.) and bypass flow away from infiltration chamber areas.
4. Begin installation of underground utilities (electric and communications, water, sewer (force mains)). Extend electric and communications, water, and sewer to proposed property lines. Protect ends of extended utility lines until connection.
5. Prepare roadway pavement subgrade and base materials.
6. Install binder course of bituminous concrete pavement within subdivision roadway and remove bypasses to connect runoff to infiltration chambers.
7. Install, relocate material storage areas as needed.

Dwelling construction:

1. Complete additional clearing and grubbing operations for residential dwellings (as needed).
2. Begin additional rough lot grading and topsoil stripping (as needed).
3. Install straw wattles around stockpiles and temporarily stabilize the stockpiles with erosion controls.
4. Construct or adjust staging and material storage areas (as needed).
5. Construct temporary concrete washout areas.
6. Install dwelling foundations.
7. Complete service connections to utilities at edge of roadway right of way.

8. Stabilize disturbed areas where construction will cease for more than 14 days with erosion controls.

Final stabilization:

1. Complete final grading of road right-of-way and lots (Remove any BMP's from catch basin inlets to finalize pavement activities).
2. Remove all temporary control BMP's and stabilize any area disturbed by their removal with erosion controls.
3. Prepare road right-of –way and lot for final seeding and landscaping.
4. Monitor stabilized areas until final stabilization is achieved.
5. Install finish course of bituminous concrete pavement for dwellings and subdivision roadway.

2.5 Allowable Non-Stormwater Discharges

List of Allowable Non-Stormwater Discharges Present at the Site

Type of Allowable Non-Stormwater Discharge	**Likely to be Present at Your Site?**
Discharges from emergency fire-fighting activities	☐ YES ☒ NO
Fire hydrant flushings	☒ YES ☐ NO
Landscape irrigation	☐YES ☒NO
Waters used to wash vehicles and equipment	☐ YES ☒ NO
Water used to control dust	☐ YES ☒ NO
Potable water including uncontaminated water line flushings	☒ YES ☐ NO
Routine external building wash down	☐ YES ☒ NO
Pavement wash waters	☐ YES ☒ NO
Uncontaminated air conditioning or compressor condensate	☒ YES ☐ NO
Uncontaminated, non-turbid discharges of ground water or spring water	☒ YES ☐ NO
Foundation or footing drains	☒YES ☐NO
Construction dewatering water	☒ YES ☐ NO

2.6 Site Maps

See Appendix A & B

SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

3.1 Endangered Species Protection

Eligibility Criterion

Under which criterion listed in Appendix D are you eligible for coverage under this permit?

☒ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E**

For reference purposes, the eligibility criteria listed in Appendix D are as follows:

Criterion A. No federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's "action area" as defined in Appendix A of this permit.

Criterion B. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your action area under eligibility Criterion A, C, D, E, or F and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the "action area". To certify your eligibility under this Criterion, there must be no lapse of NPDES permit coverage in the other operator's certification. By certifying eligibility under this Criterion, you agree to comply with any effluent limitations or conditions upon which the other operator's certification was based. You must include in your NOI the tracking number from the other operator's notification of authorization under this permit. If your certification is based on another operator's certification under Criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C in your NOI form.

Criterion C. Federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in or near your site's "action area," and your site's discharges and discharge-related activities are not likely to adversely affect listed threatened or endangered species or critical habitat. This determination may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect listed species and critical habitat. To make this certification, you must include the following in your NOI: 1) any federally listed species and/or designated habitat located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also include a copy of your site map with your NOI.

Criterion D. Coordination between you and the Services has been concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion E. Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat. The result of this consultation must be either:

i. a biological opinion that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

ii. written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated habitat.

You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion F. Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Supporting Documentation

Provide documentation for the applicable eligibility criterion you select in Appendix D, as follows:

For criterion A, indicate the basis for your determination that no federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's action area (as defined in Appendix A of the permit). Check the applicable source of information you relied upon:

☐ Specific communication with staff of the U.S. Fish & Wildlife Service or National Marine Fisheries Service.

☒ Publicly available species list. NHSEP 2008 Priority & Estimated Habitat layer on MassGIS http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm
☐ Other source:

For criterion B, provide the Tracking Number from the other operator's notification of permit authorization:
Provide a brief summary of the basis used by the other operator for selecting criterion A, B, C, D, E, or F:

For criterion C, provide the following information:
Also, provide a brief summary of the basis used for determining that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat:

For criterion D, E, or F, attach copies of any letters or other communication between you and the U.S. Fish & Wildlife Service or National Marine Fisheries Service concluding consultation or coordination activities.

3.2 Historic Preservation

Appendix E, Step 1
Do you plan on installing any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

☐ Dike
☐ Berm
☒ Catch Basin
☐ Pond
☒ Stormwater Conveyance Channel (e.g., ditch, trench, perimeter drain, swale, etc.)
☒ Culvert
☒ Other type of ground-disturbing stormwater control: Infiltration Chamber System

Appendix E, Step 2
If you answered yes in Step 1, have prior surveys or evaluations conducted on the site already determined that historic properties do not exist, or that prior disturbances at the site have precluded the existence of historic properties? ☒ YES ☐ NO

- If yes, no further documentation is required for Section 3.2.
- If no, proceed to Appendix E, Step 3.

Appendix E, Step 3

If you answered no in Step 2, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? ☐ YES ☐ NO

If yes, provide documentation of the basis for your determination.
If no, proceed to Appendix E, Step 4.

Appendix E, Step 4
If you answered no in Step 3, did the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Office (THPO), or other tribal representative (whichever applies) respond to you within 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties? ☐ YES ☐ NO

If no, no further documentation is required for Section 3.2 of the Template.

If yes, describe the nature of their response:

☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions.

☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls.

☐ Other:

3.3 Safe Drinking Water Act Underground Injection Control Requirements

Do you plan to install any of the following controls? Check all that apply below.

☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

☒ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow (See Stormwater Management Report)

☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

If yes, insert copies of letters, emails, or other communication between you and the state agency or epa regional office

SECTION 4: EROSION AND SEDIMENT CONTROLS

4.1 Natural Buffers or Equivalent Sediment Controls

Buffer Compliance Alternatives

Are there any surface waters within 50 feet of your project's earth disturbances? ☐ YES ☒ NO

Check the compliance alternative that you have chosen:

☐ I will provide and maintain a 50-foot undisturbed natural buffer.

☐ I will provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

☐ It is infeasible to provide and maintain an undisturbed natural buffer of any size, therefore I will implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

☐ I qualify for one of the exceptions in Part 2.1.2.1.e. (If you have checked this box, provide information on the applicable buffer exception that applies, below.)

Buffer Exceptions

Which of the following exceptions to the buffer requirements applies to your site?

☒ There is no discharge of stormwater to the surface water that is located 50 feet from my construction disturbances.

☐ No natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for this project.

☐ For a "linear project" (defined in Appendix A), site constraints (e.g., limited right-of-way) make it infeasible for me to meet any of the CGP Part 2.1.2.1.a compliance alternatives.

☐ The project qualifies as "small residential lot" construction (defined in Part 2.1.2.1.e.iv and in Appendix A).

☐ Buffer disturbances are authorized under a CWA Section 404 permit.

☐ Buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail).

4.2 Perimeter Controls

General

- The limit of work will be delineated by the straw wattle / silt fence barrier and construction safety fence

Specific Perimeter Controls

Straw Wattle / Silt Fence Barrier	
***BMP Description*:** Straw wattles consist of a rolled tube of straw (minimum diameter 8 inches). The straw wattles should be composed entirely of vegetative matter except for the binding material. Wattles should be bound by polypropylene netting. When rolls are to be placed around storm drain inlets, place rolls 1 to 1 ½ feet from the inlet. Wood stakes should be commercial quality lumber that is free from decay, splits, or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause them to be structurally unsuitable. Wood stake reinforcement should be used. End protection should be provided for any exposed bar reinforcement. Silt fence to be filter fabric.	
***Installation Schedule*:**	The straw wattle / silt fence barrier will be installed before construction begins within the project area, as necessary around topsoil stockpiles once they have been established, and as necessary to protect the stormwater collection system and stormwater basins.
***Maintenance and Inspection*:**	Inspect straw wattle / silt fence barriers regularly and after rain events. Sediment deposits should be removed when they reach half the height of the straw wattle. Replace if rolls/fabric become ripped, rotted, sediment clogged or otherwise become ineffective at trapping sediment. If flow is evident around the edges of the installed straw wattle / silt fence barriers, extend the barriers or evaluate replacing them with temporary check dams. If there is erosion or undercutting at the base or sides of the straw wattle / silt fence barriers, or large volumes of water are being impounded behind the straw wattles, the straw wattle / silt fence barrier may be reinforced with an additional sediment control measure such as a temporary rock check dam. If straw wattle / silt fence barriers require frequent repair or replacement, reevaluate the material you selected and consider choosing a different product or technique for the location/intended function.

4.3 Sediment Track-Out

Specific Track-Out Controls

Construction Entrance / Exit	
BMP Description: Stone anti-tracking pads will be installed at the project site entrance / exit to prevent the off-site transport of sediment by construction vehicles. The stabilized entrance / exit will be a least 30 feet long, a minimum of 10 feet wide, flared at the end closest to the paved road, and will consist of a 6–inch-thick layer of crushed stone (2 to 3 inches in diameter). The crushed stone will be placed over a layer of geotextile filter fabric to reduce the mitigation of sediment from the underlying soil. Orange-colored plastic mesh fence will be installed along the length of the construction exit to keep construction vehicles and equipment on the stone anti-tracking pads.	
Installation Schedule:	The stabilized entrance / exit will be installed before construction begins on the site. The stone anti-tracking pads will remain in place until the site construction is complete.
Maintenance and Inspection:	The stabilized entrance / exit will be inspected weekly and after storm events or heavy use. The entrance / exit to the site will be maintained in a condition that will prevent sediment tracking off-site. This could require adding additional crushed stone to the entrance / exit. All sediment tracked, spilled, dropped or washed onto the road will be swept up immediately and hauled off-site for proper disposal. Once sediment clogs the voids in the crushed stone and the effectiveness of the anti-tracking pad is no longer keeping sediment on the site, the pad will be top dressed with new crushed stone. Replacement of the entire pad might be necessary when the pad becomes completely filled with sediment. The pad will be reshaped as needed for drainage and runoff control. Broken road pavement as a result of construction activities on roadways immediately adjacent to the project site will be repaired at the time of completion of construction. The stone anti-tracking pad will be removed upon the completion of construction. The removed stone and sediment from the pad will be hauled off-site and properly disposed of. Any sediment that has been tracked-out from the site onto the surface of off-site streets, other paved areas, and sidewalks must be removed by the end of the same work day in which the track-out occurs or by the end of the next work day if track-out occurs on a non-work day. The track-out must be removed by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. Hosing or sweeping tracked-out sediment into any storm drain inlet, surface water or stormwater conveyance is prohibited (unless it is connected to a sediment basin, sediment trap, or similarly effective control).

4.4 Stockpiled Sediment or Soil

Stockpiles	
***BMP Description*:** Stockpiled materials will be done in locations shown on the attached plan. The stockpiles will be in areas that will not interfere with construction and at least 15 feet away from areas of concentrated flows or pavement. The slopes of the stockpile will be roughened by equipment tracking and will not exceed 2:1 to prevent erosion. A straw wattle / silt fence barrier will be installed around the perimeter of each stockpile, in accordance with the straw wattle / silt fence barrier design specifications.	
***Installation Schedule*:**	Topsoil will be established during grading activities. The straw wattle / silt fence barrier and temporary erosion controls will be installed immediately after the stockpile has been established.
***Maintenance and Inspection*:**	The area will be inspected weekly for erosion and immediately after storm events. Areas on or around the stockpile that have eroded will be stabilized immediately with erosion controls. At a minimum, you must comply with following requirement in CGP Part 2.1.2.4.d: Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water.)

4.5 Minimize Dust

Dust Control	
BMP Description: Dust from the site will be controlled by using a drip application type water truck to apply potable water to disturbed areas. The mobile unit will apply water at a rate of 300 gallons per acre and minimized as necessary to prevent runoff and ponding.	
Installation Schedule:	Dust control will be implemented as needed once site grading has been initiated and during windy conditions (forecasted or actual wind conditions of 20 mph or greater) while site grading is occurring. Spraying of potable water will be performed no more than three times a day during the months of May – September and once per day during the months of October – April or whenever the dryness of the soil warrants it. Dust control will primarily be needed on the gravel access road.
Maintenance and Inspection:	At least one mobile unit will be available at all times to distribute potable water to control dust on the project area. Each mobile unit will be equipped with a positive shutoff valve to prevent over watering of the disturbed area.

4.6 Minimize the Disturbance of Steep Slopes

General : The Project will require the disturbance and re-grading of steep slopes on-site. Where steep slopes are required to be disturbed or re-graded, they shall be stabalized as quickly as practicable. The disturbance of steep slopes outside of the limit of grading shall be avoided whereever possible.

4.7 Topsoil

Topsoil	
***BMP Description*:** Topsoil stripped from the immediate construction area will be stockpiled as identified on the site map (See Appendix A). The stockpiles will be in areas that will not interfere with construction phases and at least 15 feet away from areas of concentrated flows or pavement. The slopes of the stockpile will be roughened by equipment tracking and will not exceed 2:1 to prevent erosion. A straw / hay bale barrier will be installed around the perimeter of each stockpile.	
***Installation Schedule*:**	Topsoil will be established during grading activities. The straw / hay bale barrier and temporary erosion controls will be installed immediately after the stockpile has been established.
***Maintenance and Inspection*:**	The area will be inspected weekly for erosion and immediately after storm events. Areas on or around the stockpile that have eroded will be stabilized immediately with erosion controls.

4.8 Soil Compaction

*Due to the general proposed flow of construction of the development, a*reas which have finalized gradeing, and had final vegetative stabilization installed will be removed from the active construction area, therefore no additional means or methods of restricting vehicle access is needed.	
***Maintenance and Inspection*:**	Any previously stabilized areas found to be eroded or damaged will be immediately re-graded, re-seeded and stabilized.

4.9 Storm Drain Inlets

Catch Basin Inlet Protection – Filter Bag	
***BMP Description*:** Temporary devices placed around and within existing catch basin inlets to protect the stormwater management system from high sediment loads and high velocities, while disturbance due to construction is occurring in the drainage area.	
***Installation Schedule*:**	Several trademarked/name brand filter/silt bags exist and should be installed per the manufacturer's instructions. Almost all consist of a porous fabric bag which is fitted under the catch basin grate. Sediments are filtered out of the stormwater and accumulate in the bag.
***Maintenance and Inspection*:**	Inspect inlet and fabric weekly and after each major rain event.

	Remove sediment when the bag is halfway full. Replace bags when wear becomes evident to avoid ripping.

4.10 Sediment Basins

4.1 Sediment Basins (Sediment Forebay, Infiltration Basin & Water Quality Swale)

General:
The infiltration basin and water quality swale will be constructed during the initial phase of the development. Final configuration of the infiltration basin includes a sediment forebay adjacent to the inlet to capture sediment, debris and provide pretreatment of stormwater before releasing the runoff into the main pool of the infiltration basin. The sediment forebay will be created by a riprap check dam and earthen berm.

The infiltration basin is located northeast of the proposed work and will contain a riprap spillway which discharges into the locally jurisdictional wetland north west of the proposed work. The drainage channel is located to the south east of the sediment forebay.

Schedule:
The basins will be installed during the initial phases of construction.

Maintenance & Inspection:
The infiltration basin, sediment forebay, and drainage channel will be inspected weekly and after storm events. During inspection, note the presence of differential settlement, cracking, erosion, and leakage in the embankments, tree growth on the embankments, condition of riprap spillway, sediment accumulation and the condition of the grass turf.

The infiltration basin and sediment forebay will be cleaned, at a minimum, once every two months during construction prior to the binder course of pavement being installed. After installation of the binder course the infiltration basin and sediment forebay will be cleaned a minimum of once a year until final stabilization. The basin may be cleaned more frequently if inspections show the infiltration basin and sediment forebay is not working as intended.

During cleaning, remove all debris, leaves and twigs from infiltration basin / sediment forebay bottom and side slopes. Remove sand and silt using hand tools, or other measures that will not disturb established vegetative ground cover. Replace any vegetation damaged during cleaning with erosion controls. Nip tree saplings at or near ground level in areas where trees will interfere with stormwater flow, storage, system access, or maintenance. Properly dispose of all vegetative waste. Do not dispose of vegetative waste in basins, woodlands, or any other unauthorized areas. Remove all debris, leaves and twigs from pipe ends. Remove sand and silt from pipe openings using hand tools, or other measures that will not disturb established vegetative ground cover. Prior to final stabilization, deep till the bottom of the basins and stabilize in accordance with Section 4.13. Do not remove accumulated sediment or other debris while basin is wet.

4.11 Chemical Treatment

There is no proposed or intended use of polymers, flocculants, and other treatment chemicals to the soils within this project.

4.12 Site Stabilization

Temporary Stabilization	
BMP Description: Temporary vegetative cover will be established using hydroseeding for areas of exposed soil (including stockpiles) where construction will cease for more than 14 days. Hydroseeding will consist of wood fibers seed, fertilizer and stabilizing emulsion and applied at a minimum rate of 8 pounds per acre. Seeding will be conducted during periods of the year when vegetation is more likely to be established.	
Installation Schedule:	Temporary stabilization measures will be applied to portions of the site where construction activities will temporarily cease for more than 14 days.
Maintenance and Inspection:	Stabilized area will be inspected weekly and after storm events until a dense cover of vegetation has become established. If failure is noticed at the seeded area, the area will be reseeded, fertilized, and mulched immediately.

SECTION 5: POLLUTION PREVENTION STANDARDS

5.1 Potential Sources of Pollution

Potential sources of sediment to stormwater runoff:

- Clearing and grubbing operation
- Grading and site excavation operations
- Vehicle tracking
- Topsoil stripping and stockpiling
- Landscaping operations

Potential pollutants and sources, other than sediment, to stormwater runoff:

- Combined Staging Area – small fueling activities, minor equipment maintenance, sanitary facilities, and hazardous waste storage.
- Materials Storage Areas – general building materials, solvents, adhesives, paving materials, paints, aggregates, trash, etc.
- Construction Activities – paving, curbing installation, concrete pouring / moter / stucco, and dwelling construction

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (that could be discharged if exposed to stormwater)	**Location on Site** (or reference SWPPP site map where this is shown)
Pesticides (insecticides, fungicides, herbicides, rodenticides)	Chlorinated hydrocarbons, organophosphates, carbamates, arsenic	Herbicides used for noxious weed control
Fertilizer	Nitrogen, phosphorous	Newly seeded areas
Cleaning solvents	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	No equipment cleaning allowed in project limits.
Asphalt	Oil, petroleum distillates	Streets and roofing
Hydraulic oil/fluids	Mineral oil	Leaks or broken hoses from equipment
Gasoline	Benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment/staging area
Diesel Fuel	Petroleum distillate, oil & grease, naphthalene, xylenes	Secondary containment/staging area
Kerosene	Coal oil, petroleum distillates	Secondary containment/staging area

5.2 Spill Prevention and Response

Spill Prevention and Control Procedures

BMP Description:

i- Employee training: All employees on the general and sub-contractors will be briefed of all required procedures for the proper handling and disposal of materials on-site by the person in charge of day-to-day operations of the site.

ii- Vehicle Maintenance: Vehicles and equipment will be maintained off-site. All vehicles and equipment including subcontractor vehicles will be checked for leaking oil and fluids. Vehicles leaking fluids will not be allowed on-site.

iii- Hazardous Materials Storage: Hazardous materials will be stored in accordance with this document and federal, state and municipal regulations.

iv- Spill Kits: Spill kits will be within the materials storage area and concrete washout areas.

v- Spills: All spills will be cleaned up immediately upon discovery. Spent absorbent materials and rags will be hauled off-site immediately after the spill is cleaned up for disposal. Spills large enough to discharge to surface water will be reported to the National Response Center at 1-800-424-8802.

vi- Material safety data sheets, a material inventory and emergency contact information will be maintained at the on-site project trailer.

Installation Schedule:	The spill prevention and control procedures will be implemented once construction begins on-site.
Maintenance and Inspection:	All personal will be instructed regarding the correct procedures for spill prevention and control. Notices that state these procedures will be posted in the office trailer, and the individual who manages day-to-day operations will be responsible for seeing that these procedures are followed.

5.3 Fueling and Maintenance of Equipment or Vehicles

Vehicle / Equipment Fueling and Maintenance

BMP Description: Several types of vehicles and equipment will be used on-site throughout the project, including excavators, loaders, rollers, trucks and trailers, backhoes, and forklifts. All major equipment/vehicle fueling and maintenance will be performed outside out of any wetland buffer zone. When vehicle fueling must occur on-site, the fueling activity will occur in the staging area. Only minor equipment maintenance will occur on-site. All equipment fluids generated from maintenance activities will be disposed of into designated drums stored on spill pallets in accordance with Section 5, Part 5.5.4. Absorbent, spill-cleanup materials, and spill kits will be available at the combined staging and materials storage area.

Installation Schedule:	Equipment and vehicle maintenance and fueling practices will be implemented at the beginning of construction on-site.
Maintenance and Inspection:	Inspect equipment/vehicle storage areas and fuel tank weekly and after storm events. Vehicles and equipment will be inspected on each day of use. Leaks will be repaired immediately, or the problem vehicle(s) or equipment will be removed from the project site. Keep ample supply of spill-cleanup materials on-site and immediately clean up spills and dispose of materials properly.

5.4 Washing of Equipment and Vehicles

All equipment and vehicle washing will be performed off-site or in a designated, controlled area.

5.5 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

5.5.1 Building Products

Combined Staging Area	
BMP Description: Construction equipment and maintenance materials will be stored at the combined staging area and materials storage areas. Straw wattle / silt fence barrier or acceptable alternative will be installed around the perimeter to designate the staging and materials storage area. Nonhazardous building materials such as packing material (wood, plastic and glass) and construction scrap material (brick, wood, steel, metal scraps and pipe cuttings) will be stored in a separate covered storage facility adjacent to the shipping container. All hazardous waste materials such as oil filters, petroleum products, paint and equipment maintenance fluids will be stored in accordance with procedures outlined in Section 5.5.4 Large items, such as framing materials and stockpiled lumber will be stored in the open in the storage area. Such materials will be elevated on wood blocks to minimize contact with runoff.	
Installation Schedule:	The combined staging and materials storage area will be installed after grading and before any infrastructure is constructed at the site. The material storage areas for individual lots will be installed before construction begins on each dwelling.
Maintenance and Inspection:	Storage areas will be inspected weekly and after storm events. Storage areas will be kept clean, well-organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers and liners will be repaired or replaced as needed to maintain proper function.

5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

See Combined Staging Area requirements in Section 5.5.1

5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

There is to be no storage of diesel fuel, oil, hydraulic fluids, other petroleum products or other chemicals on this site.

5.5.4 Hazardous or Toxic Waste

See Combined Staging Area requirements in Section 5.5.1

5.5.5 Construction and Domestic Waste

Waste Materials	
BMP Description: All waste materials will be collected and disposed of into a metal trash dumpster in the combined staging area. Dumpsters will have a secure watertight lid, be placed away from stormwater conveyances and drains, and meet all local and state solid-waste management regulations. Only trash and construction debris from the site will be deposited in the dumpsters. All personnel will be instructed regarding the correct procedure for disposal of trash and construction debris. Notices that state these practices will be posted in the office trailer and the individual who manages day-to-day site operations will be responsible for seeing that these practices are followed.	
Installation Schedule:	Trash dumpsters will be installed once the combined staging area has been established.
Maintenance and Inspection:	The dumpster will be inspected weekly and immediately after storm events. The contents of the dumpster will be emptied weekly, hauled off-site and properly disposed of. If trash and construction debris are exceeding the dumpsters capacity, the dumpster will be emptied more frequently.

5.6 Washing of Applicators and Containers used for Paint, Concrete or Other Materials

Concrete Washout	
BMP Description: Designated temporary, below existing ground level concrete washout areas will be provided on the site. The temporary below grade washout areas will be constructed with sufficient quantity and volume to contain all liquid and concrete waste generated, with a minimum length and width of 10 feet. Each washout area will be a minimum of 50 feet from a possible receiving storm drain inlet. Signs will be posted marking the location of the washout area to ensure that concrete equipment operators use the proper facility. Concrete pours will not be conducted during or before an anticipated storm event. All excess concrete and concrete washout slurries from the concrete mixer trucks and chutes will be discharged to the washout area or hauled off-site for disposal. When the temporary washout areas are no longer needed for the construction project, the hardened concrete and materials used to construct the areas will be removed and disposed of according to the maintenance section below and the washout areas will be backfilled, graded and stabilized with erosion controls.	
Installation Schedule:	The washout areas will be constructed before the active construction of the individual dwellings.
Maintenance and Inspection:	The washout areas will be inspected daily to ensure that all concrete washing is being discharged into the washout area, no leaks are present and to identify when concrete wastes need to be removed. The washout areas will be cleaned out once the area is 75 percent of the holding capacity. Once the area's holding capacity has been reached the concrete wastes will be allowed to harden, the concrete will be broken up, removed, and hauled off-site for proper disposal.

.7 Fertilizers

There is no proposed storage of fertilizer on this project. Fertilizers used shall be slow release, low-nitrogen, low phosphorous types (<5%), and shall not be used within 50 feet of a resource area.

Additionally, the use of fertilizers shall be done in accordance with the following:

- Apply at a rate and in amounts consistent with the manufacture's specifications;
- Apply at the appropriate time of year for the location of the development and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth;
- Avoid applying before heavy rains that could cause excess nutrients to be discharged;
- Never apply to frozen ground;
- Never apply to stormwater conveyance channels with flowing water; and
- Follow all other federal, state, tribal and local requirements regarding fertilizer application.

5.8 Other Pollution Prevention Practices

- N/A

SECTION 6: INSPECTION AND CORRECTIVE ACTION

6.1 Inspection Personnel and Procedures

Personnel Responsible for Inspections

(INSERT NAMES OF PERSONNEL WHO WILL BE CONDUCTING SITE INSPECTIONS)

Operator to be determined prior to construction	
[name]	[company]
Inspection Area:	
[name]	[company]
Inspection Area:	
[name]	[company]
Inspection Area:	

Note: All personnel conducting inspections must be considered a "qualified person." CGP Part 4.1.1 clarifies that a "qualified person" is a person knowledgeable in the principles and practices of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Inspection Schedule

Specific Inspection Frequency

At a minimum, site inspections shall be done in compliance with one of the two schedules listed below:

i. At least once every 7 calendar days; or

ii. Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches or greater.

Reductions in Inspection Frequency (if applicable)

A reduction in the inspection frequency schedule may be available for areas that have been permanently stabilized and / or areas that earth work has been suspended due to frozen conditions. See Section 4.1.4.1 and 4.1.4.3 within the Construction General Permit (CGP) within Appendix B for complete conditions and requirements.

Inspection Report Form

See Appendix F for copies of the Inspection Report Form

6.2 Corrective Action

Personnel Responsible for Corrective Actions

Excavation contractor, erosion control contractor or site supervisor.

Corrective Actions Form

See Appendix G for copies of the Corrective Action Form

6.3 Delegation of Authority

Duly Authorized Representative(s) or Position(s):

Name of Company or Organization: Contractor/Operator to be determined prior to construction
Name:
Position:
Address:
City, State, Zip Code:
Telephone Number:
Fax/Email:

SECTION 7: TRAINING

Instructions (see CGP Part 6 and 7.2.13):

- Complete the table below to provide documentation that the personnel required to be trained in CGP Part 6 completed the appropriate training
- If personnel will be taking course training (which is not required as part of the CGP), consider using Appendix I to track completion of this training
- The following personnel, at a minimum, must be receive training, and therefore should be listed out individually in the table below:
  - ✓ Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention measures);
  - ✓ Personnel responsible for the application and storage of treatment chemicals (if applicable);
  - ✓ Personnel who are responsible for conducting inspections as required in Part 4.1.1; and
  - ✓ Personnel who are responsible for taking corrective actions as required in Part 5.
- CGP Part 6 requires that the required personnel must be trained to understand the following if related to the scope of their job duties:
  - ✓ The location of all stormwater controls on the site required by this permit, and how they are to be maintained;
  - ✓ The proper procedures to follow with respect to the permit's pollution prevention requirements; and
  - ✓ When and how to conduct inspections, record applicable findings, and take corrective actions.

See Appendix I- SWPPP for Training Logs

SECTION 8: CERTIFICATION AND NOTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Kyle F. Burchard, GPR Inc. Title: Professional Engineer

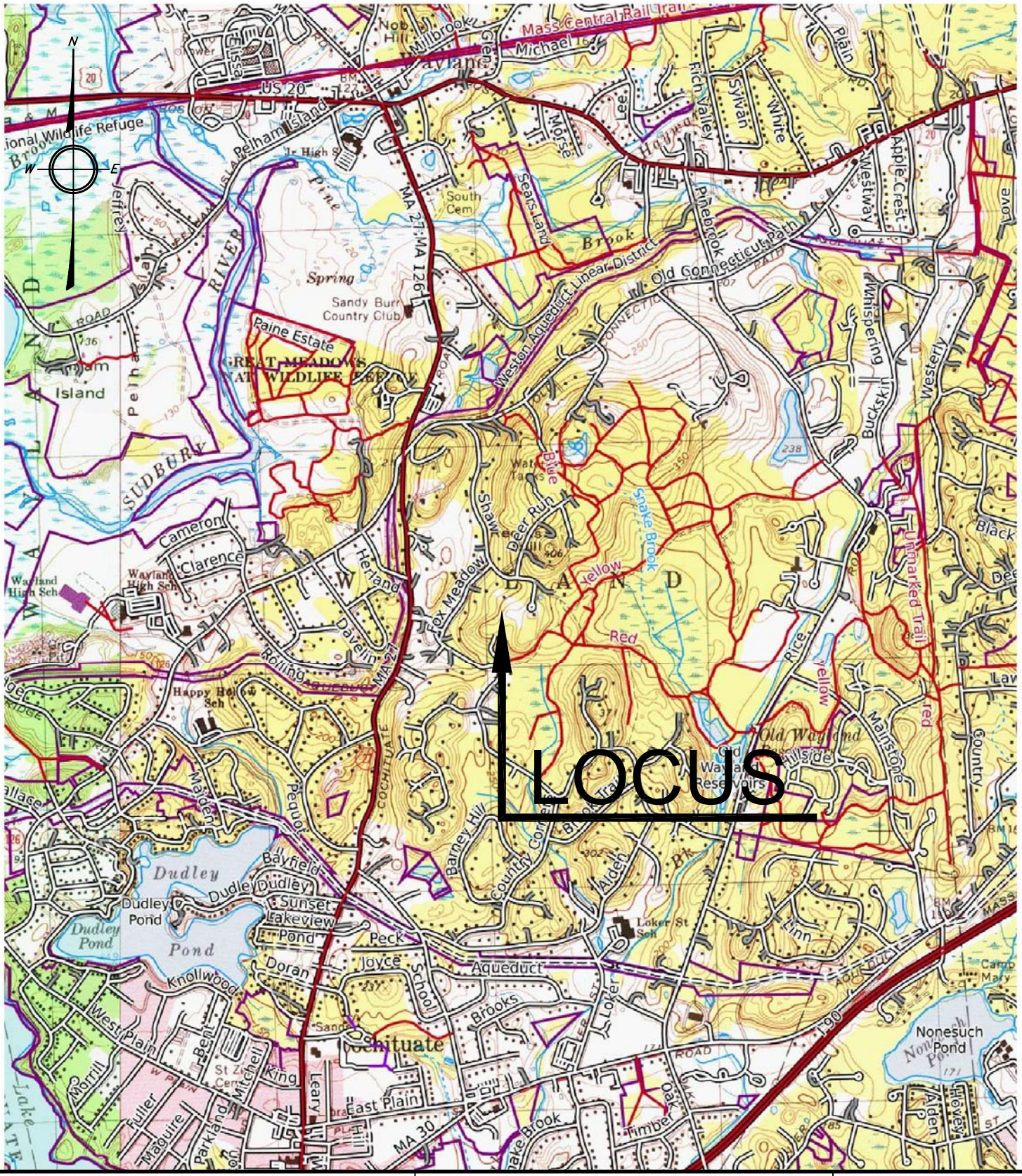
Signature: _____ Date: _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ Title: _____

Signature: _____ Date: _____

Appendix A – General Location Map



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Engineering Solutions for Land & Structures

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www.gpr-inc.com

FIVE PATHS DEFINITIVE SUBDIVISION
WAYLAND, MASSACHUSETTS

JOB: 171053
BY: JFB | CHK: KFB
DATE: 1/26/21

LOCUS PLAN

FIGURE A

Appendix B – Site Maps

DEFINITIVE RESIDENTIAL SUBDIVISION PLAN

FIVE PATHS

ASSESSORS MAP #39 PARCEL 15A

WAYLAND, MA

SITE DATA

LOT AREA:	13.74± AC. (598,679 ±SF)
WATER SUPPLY:	MUNICIPAL
SEWAGE DISPOSAL:	INDIVIDUAL ONSITE SEWAGE DISPOSAL SYSTEMS

ASSESSORS REFERENCE

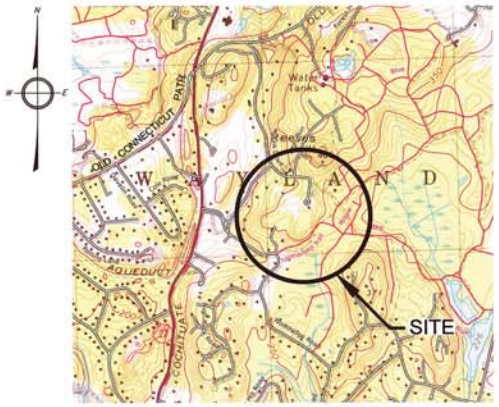
ASSESSORS MAP 39, PARCEL ID 15A
OWNER: W. FLOYD & PAULA D. WILKINSON
SUBDIVISION: LOT 1, 2, 3, REMAINING LAND OF PARCEL 15A & FIVE PATHS COURT RIGHT-OF-WAY

GENERAL NOTES

1. 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.
2. UNLESS OTHERWISE SHOWN, ALL NEW UTILITIES SHALL BE UNDERGROUND.
3. BURIED UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THEIR RESPECTIVE COMPANY SPECIFICATIONS.
4. CONSTRUCTION LAYOUT OF BUILDING AND SITE IMPROVEMENTS SHALL BE PERFORMED BY A LICENSED PROFESSIONAL LAND SURVEYOR. LOCATIONS OF EXISTING FEATURES OR PROPOSED IMPROVEMENTS DERIVED BY SCALING DRAWINGS MAY NOT BE ACCURATE. PROPERTY LINES SHOWN HEREON ARE APPROXIMATE. SEE PLAN REFERENCE HEREON.
5. SAFETY MEASURES, CONSTRUCTION METHODS, AND CONTROL OF WORK SHALL BE RESPONSIBILITY OF CONTRACTOR.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR AND/OR REPLACEMENT OF ANY EXISTING UTILITY OR STRUCTURE DAMAGED DURING CONSTRUCTION THAT ARE NOT DESIGNATED FOR DEMOLITION AND/OR REMOVAL HEREON. DAMAGED UTILITY OR STRUCTURE SHALL BE REPAIRED TO THE SATISFACTION OF THEIR RESPECTIVE OWNERS.
7. 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.
8. CONTRACTOR SHALL NOTIFY ENGINEER UPON COMMENCEMENT OF CONSTRUCTION IN ORDER TO ENSURE THAT REQUIRED INSPECTIONS ARE PERFORMED IN A TIMELY AND EFFICIENT MANNER.
9. CONTRACTOR SHALL PROMPTLY NOTIFY ENGINEER UPON DISCOVERY OF ANY UNFORESEEN SURFACE OR SUBSURFACE CONDITIONS THAT MAY IMPACT SITE CONSTRUCTION.
10. FINISH RIM ELEVATIONS SHOULD MATCH PAVEMENT, GRADING OR LANDSCAPING, UNLESS SPECIFICALLY INDICATED OTHERWISE.
11. WHERE EXISTING UTILITY LINES/STRUCTURES ARE TO BE CUT/BROKEN DOWN/ABANDONED, LINES/STRUCTURES SHALL BE PLUGGED/CAPPED/FILLED IN ACCORDANCE WITH UTILITY OWNER REQUIREMENTS.
12. EROSION CONTROL MEASURES, SUCH AS SILT FENCE OR STRAW BALES AS MAY BE SHOWN HEREON, SHALL BE INSTALLED BEFORE EARTH DISTURBANCE OCCURS WITHIN BUFFER ZONE, AND SHALL SERVE AS THE LIMIT OF WORK.
13. WHERE THE WORD "INSTALL" IS USED HEREIN, IT IS INTENDED TO DIRECT CONTRACTOR TO "FURNISH, INSTALL, AND PLACE IN OPERATION" THE COMPONENT REFERRED TO.
14. ALL STORM DRAIN PIPE TO BE SMOOTH INTERIOR HDP PIPE, 2.0 PSI GASKETED JOINT, UNLESS OTHERWISE NOTED.
15. WHERE SHOWN, CONSTRUCTION NOTES ARE INTENDED TO SUMMARIZE AND CLARIFY MAJOR ITEMS OF WORK. THESE NOTES SHOULD NOT BE CONSTRUED AS AN EXHAUSTIVE LISTING OF ALL WORK REQUIRED. CONTRACTOR SHOULD CONTACT ENGINEER WHEN FURTHER CLARIFICATION OF DEPICTED WORK IS DESIRED.
16. CONSTRUCTION OF FIRE AND DOMESTIC WATER SUPPLY IMPROVEMENTS SHALL CONFORM TO TOWN OF WAYLAND REQUIREMENTS.
17. WHERE DIMENSIONS INVOLVE CURB, DIMENSIONS ARE TO FACE OF CURB. WHERE SLOPED GRANITE CURB OR CAPE COD BERM SPECIFIED, FACE OF CURB IS EDGE OF FINISH PAVEMENT AT TOE OF CURB.
18. NO DEBRIS, JUNK, RUBBISH OR OTHER NON-BIODEGRADABLE MATERIALS, FILL CONTAINING HAZARDOUS MATERIALS OR WASTES, OR STUMPS SHALL BE BURIED ON ANY LAND ON THIS SITE, OR LEFT ON ANY LOT OR ON THE STREET RIGHT OF WAY.
19. EXISTING CONDITION INFORMATION BASED ON AN ON-THE-GROUND TOPOGRAPHIC AND BOUNDARY SURVEY PERFORMED BY GOLDSMITH, PREST & RINGWALL, INC. IN MAY AND JULY 2019.
20. FIRE BOXES TO BE PROVIDED AS REQUIRED BY THE TOWN OF WAYLAND FIRE DEPARTMENT.

REGULATORY NOTES

1. CONTRACTOR SHALL CONTACT DIG-SAFE FOR UNDERGROUND UTILITY MARKING AT 888.344.7233 AT LEAST 72 HOURS PRIOR TO COMMENCEMENT OF ANY WORK. CONTRACTOR SHALL GIVE TWENTY-FOUR (24)-HOUR NOTICE TO PERTINENT TOWN DEPARTMENTS BEFORE COMMENCING ANY WORK IN THE FIELD.
2. CONTRACTOR SHALL COORDINATE AND OBTAIN ALL CONSTRUCTION PERMITS REQUIRED BY REGULATORY AUTHORITIES.
3. CONTRACTOR SHALL BE AWARE OF ALL CONSTRUCTION REQUIREMENTS, CONDITIONS, AND LIMITATIONS IMPOSED BY PERMITS AND APPROVALS ISSUED BY REGULATORY AUTHORITIES PRIOR TO COMMENCEMENT OF ANY WORK.
4. GENERAL COMPLIANCE WITH 28 CFR PART 36 – 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN AND 521 CMR PART C, EXTERIOR OF THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD REGULATIONS IS INTENDED. CONTRACTOR SHALL VERIFY COMPLIANCE DURING CONSTRUCTION AND SHALL NOTIFY THE OWNER OF ANY NON-COMPLIANCE ISSUES AS SOON AS DISCOVERED.



KEY PLAN
SCALE: 1" = 1000' ±

INDEX PLAN
SCALE: 1" = 200'

ZONING

Parameter	Section [1]	Required	Proposed
Zoning District	Zoning Map	R-60 (60,000 sf lots)	Complies
Overlay District	Overlay Map	Aquifer Protection	Project partially located in overlay district and complies with overlay district requirements.
Proposed Use	198-1603.1 (e)	Residential	Allowed
Lot Area [see Note 2]	198 Attachment 1	60,000 SF	Complies
Frontage [see Note 2]	198 Attachment 1	210 FT	Complies
Lot Width [see Note 2]	198-705.1.8	100 Ft circle	Complies
Wetlands Setback	–	None on site	N/A
MDEP Riverfront Area	–	None on site	N/A
FEMA Floodplain	–	None on site	N/A
ACEC	–	None on site	N/A
Zone 1 Protective Radius	–	None on site	N/A
Mapped Zone 2	–	None on site	N/A
IWPA	–	None on site	N/A

NOTES:
[1] Reference to section of Town of Wayland Zoning Bylaw as adopted on April 29, 2019.
[2] Residence Zone 60,000 square feet - 210 feet frontage, no building lot may be laid out and no dwelling may be erected on a lot unless the center of a circle 100 feet in diameter can be passed along a continuous line from the side line of the street along which the frontage of the lot is measured to any point of the dwelling, or proposed dwelling, on the lot without the circumference intersecting any side lot lines.

ABBREVIATIONS:
SF=square feet; CF=cubic feet; FT=feet; GFA=gross floor area; AC=acres; PB=Planning Board; ZBA=Zoning Board of Appeals; IWPA=Interim wellhead protection area; ACEC=Area of Critical Environmental Concern; FIRM=Flood Insurance Rate Map; MDEP=Massachusetts Dept of Environmental Protection

REFERENCES

1. "SUBSURFACE SEWAGE DISPOSAL SYSTEM – NEW CONSTRUCTION – FIVE PATHS COURT, WAYLAND, MA" PREPARED FOR ROSS C. WILKINSON, AND ESTATE OF PAULA D. WILKINSON BY GOLDSMITH, PREST & RINGWALL, INC. DATED OCTOBER 2020. JOB NO. 171053.
2. "CERTIFICATION OF PLANNING BOARD ACTION ON FIVE PATHS RESIDENTIAL SUBDIVISION MEMO, MAP 39, PARCEL 039-15A" AS ISSUED BY THE TOWN OF WAYLAND PLANNING DEPARTMENT, DATED SEPTEMBER 17, 2020.

APPROVED WAIVERS (SEE REFERENCE NO. 2)

(FROM THE "THE TOWN OF WAYLAND MASSACHUSETTS SUBDIVISION RULES AND REGULATIONS," ADOPTED OCTOBER, 1968, REVISED SEPTEMBER 4, 2001 AND AUGUST 18, 2015, AS ALLOWED PER SECTION V(B))

SECTION IV.B.1.D: DESIGN STANDARDS – STREETS – LOCATION AND ALIGNMENT

REQUIREMENT: A MINIMUM SEPARATION OF FIFTY (50) FEET FROM THE SUBDIVISION BOUNDARY TO THE RIGHT-OF-WAY.

GRANTED: ALLOW A MINIMUM SEPARATION OF 38.7± FEET AND 43.9± FEET BETWEEN THE RIGHT OF WAY AND RESPECTIVELY, THE WESTERLY AND EASTERLY SUBDIVISION BOUNDARIES.

REQUIREMENT: NO DEAD-END STREET SHALL BE MORE THAN SIX HUNDRED NINETY (690) FEET IN LENGTH, AS MEASURED ALONG ITS CENTER LINE FROM ITS INTERSECTION WITH THE SIDELINE OF THE RIGHT-OF-WAY OF THE THROUGH STREET TO THE CENTER POINT OF THE CIRCULAR TURN-AROUND (MAKING THE OVERALL LENGTH NO MORE THAN SEVEN HUNDRED FIFTY (750) FEET).

GRANTED: ALLOW FIVE PATHS COURT DEAD-END STREET RIGHT-OF-WAY CENTERLINE LENGTH OF 1,135'± FROM SIDELINE OF FOX MEADOW DRIVE (NEAREST THROUGH STREET) TO CUL-DE-SAC CENTERPOINT, FOR OVERALL LENGTH OF 1,195'±.

SECTION V.B.2.A: REQUIRED IMPROVEMENTS – ROADWAY

REQUIREMENT: EACH STREET OR PORTION THEREOF NECESSARY TO SERVE EACH LOT IN A SUBDIVISION SHALL BE CONSTRUCTED AND BROUGHT TO FINISH GRADE AS INDICATED ON THE APPROVED DEFINITIVE PLAN AND IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.

GRANTED: ALLOW THE CONSTRUCTION OF A DRIVEWAY INSTEAD OF A SUBDIVISION STREET, WITHIN THE RIGHT-OF-WAY SHOWN IN THE APPROVED DEFINITIVE PLAN.

SECTION IV.B.2: DESIGN STANDARDS – STREETS – RIGHT OF WAY WIDTH AND STREET DESIGN STANDARDS

REQUIREMENT: MINIMUM 290' RADIUS OF CURVE FOR LIMITED RESIDENTIAL STREETS.

GRANTED: ALLOW 18-FEET WIDE PAVEMENT PLUS 2-FEET GRAVEL SHOULDER ON ONE SIDE, AND 160-FEET RADIUS OF CURVATURE FOR FIVE PATHS COURT RIGHT-OF-WAY.

SECTION IV.B.1.C: DESIGN STANDARDS – STREETS – LOCATION AND ALIGNMENT

REQUIREMENT: A MINIMUM 200-FOOT LENGTH TANGENT SHALL BE PROVIDED BETWEEN THE POINT OF TANGENCY (PT, THE END) OF ONE CURVE AND THE POINT OF CURVATURE (PC, THE BEGINNING) OF ANY FOLLOWING CURVE.

GRANTED: ALLOW NO TANGENT BETWEEN CURVES.

SHEET INDEX

APPROVED BY THE WAYLAND PLANNING BOARD

CHAIR

APPLICATION FILED 7-26-19

HEARING DATE

PLAN APPROVED 9-15-20

12-14-2020

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION
■ PERMIT ☐ CONSTRUCTION RECORD

THIS DRAWING MAY NOT SHOW CONSTRUCTION DETAILS AND SPECIFICATIONS FOR ALL PROPOSED IMPROVEMENTS, AND MAY NOT IDENTIFY ALL CONSTRUCTION WORK ITEMS/AREAS OF CONTRACTOR JURISDICTION.

PER 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEER'S RESPONSIBILITY: ALL BOUNDARY INFORMATION; LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES; DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE GENERAL NOTES #19.

NO.	DATE	BY	APP.	REVISION DESCRIPTION
2	11/30/20	LT/KFB	KFB	DRIVEWAY TURNAROUND REVISION
1	7/14/20	LT/KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

GPR Engineering Solutions for Land & Structures

GOLDSMITH, PREST & RINGWALL, INC.
39 MAIN STREET, SUITE 301, AYER, MA 01432
CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING
VOICE: 978.772.1590 FAX: 978.772.1591
www.gpr-inc.com

RESIDENTIAL SUBDIVISION DEFINITIVE PLAN

TITLE SHEET

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DES. BY: KFB	DATE: JULY 2019	JOB 171053	C1.1
CHK. BY: NMP			

P:\17---\171053\GWO\PERMIT\DEFSUB_TITLE C1.1.DWG 11-30-20 11:30:46 AM – LAYOUT C1.1–TITLE

Appendix C – Order of Conditions (N/A)

Appendix D – Copy of 2017 CGP
(to be provided by Contractor prior to construction)

Appendix E – Copy of NOI and EPA Authorization Email (to be provided by Contractor prior to construction)

Appendix F – Inspection Forms

Stormwater Construction Site Inspection Report

General Information			
Project Name	Five Paths		
NPDES Tracking No.		**Location**	Map 39 Parcel 15A Wayland, MA 01778
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications	See Section 5, Part 5.1 of the SWPPP		
Describe present phase of construction			
Type of Inspection: ❑ Regular ❑ Pre-storm event ❑ During storm event ❑ Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? ❑Yes ❑No **If yes, provide:** Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds ❑ Other: Temperature:			
Have any discharges occurred since the last inspection? ❑Yes ❑No **If yes, describe:**			
Are there any discharges at the time of inspection? ❑Yes ❑No **If yes, describe:**			

Site-specific BMPs

- *Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.*
- *Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1	CB1	❑Yes ❑No	❑Yes ❑No	
2	CB2	❑Yes ❑No	❑Yes ❑No	
3	DCB3	❑Yes ❑No	❑Yes ❑No	
4	DCB4	❑Yes ❑No	❑Yes ❑No	
5	DCB5	❑Yes ❑No	❑Yes ❑No	
6	DCB6	❑Yes ❑No	❑Yes ❑No	
7	DCB7	❑Yes ❑No	❑Yes ❑No	
8	DMH1	❑Yes ❑No	❑Yes ❑No	
9	DMH2	❑Yes ❑No	❑Yes ❑No	
10	DMH3	❑Yes ❑No	❑Yes ❑No	
11	OCS-1	❑Yes ❑No	❑Yes ❑No	
12	OCS-2	❑Yes ❑No	❑Yes ❑No	
13	IC1	❑Yes ❑No	❑Yes ❑No	

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
14	IC2	❑Yes ❑No	❑Yes ❑No	
15	PES-1	❑Yes ❑No	❑Yes ❑No	
16	PES-2	❑Yes ❑No	❑Yes ❑No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No	❑Yes ❑No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No	
4	Are discharge points and receiving waters free of any sediment deposits?	❑Yes ❑No	❑Yes ❑No	
5	Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No	
6	Is the construction exit preventing sediment from being tracked into the street?	❑Yes ❑No	❑Yes ❑No	
7	Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ❑No	❑Yes ❑No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No	
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No	
12	(Other)	❑Yes ❑No	❑Yes ❑No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Signature:_____ Date:_____

Appendix G –Corrective Action Form

Corrective Action Log

Project Name: Five Paths – Map 39 Parcel 15A, Wayland MA

Inspection Date	Inspector Name(s)	Description of BMP Deficiency	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible person

Appendix H –SWPPP Amendment Log

SWPPP Amendment Log

Project Name: Five Paths – Map 39 Parcel 15A, Wayland MA

Amendment No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

Appendix I – Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: 171053

Project Title: Five Paths

Operator(s): To be determined at later date

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____

Date: _____

Appendix J – Grading and Stabilization Activities Log

SWPPP Grading and Stabilization Activities Log

Project Name: Five Paths – Map 39 Parcel 15A, Wayland MA

Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** (Indicate Temporary or Permanent)	**Date When Stabilization Measures Initiated**

Appendix K –SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name: **Five Paths**

Project Location: **Map 39 Parcel 15A, Wayland, MA 01778**

Instructor's Name(s):

Instructor's Title(s):

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

- ❑ **Sediment and Erosion Controls**
- ❑ **Emergency Procedures**
- ❑ **Stabilization Controls**
- ❑ **Inspections/Corrective Actions**
- ❑ **Pollution Prevention Measures**

Specific Training Objective:_____

_____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		

Appendix L – Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the Five Paths Subdivision construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix I of EPA's Construction General Permit (CGP), and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix I.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

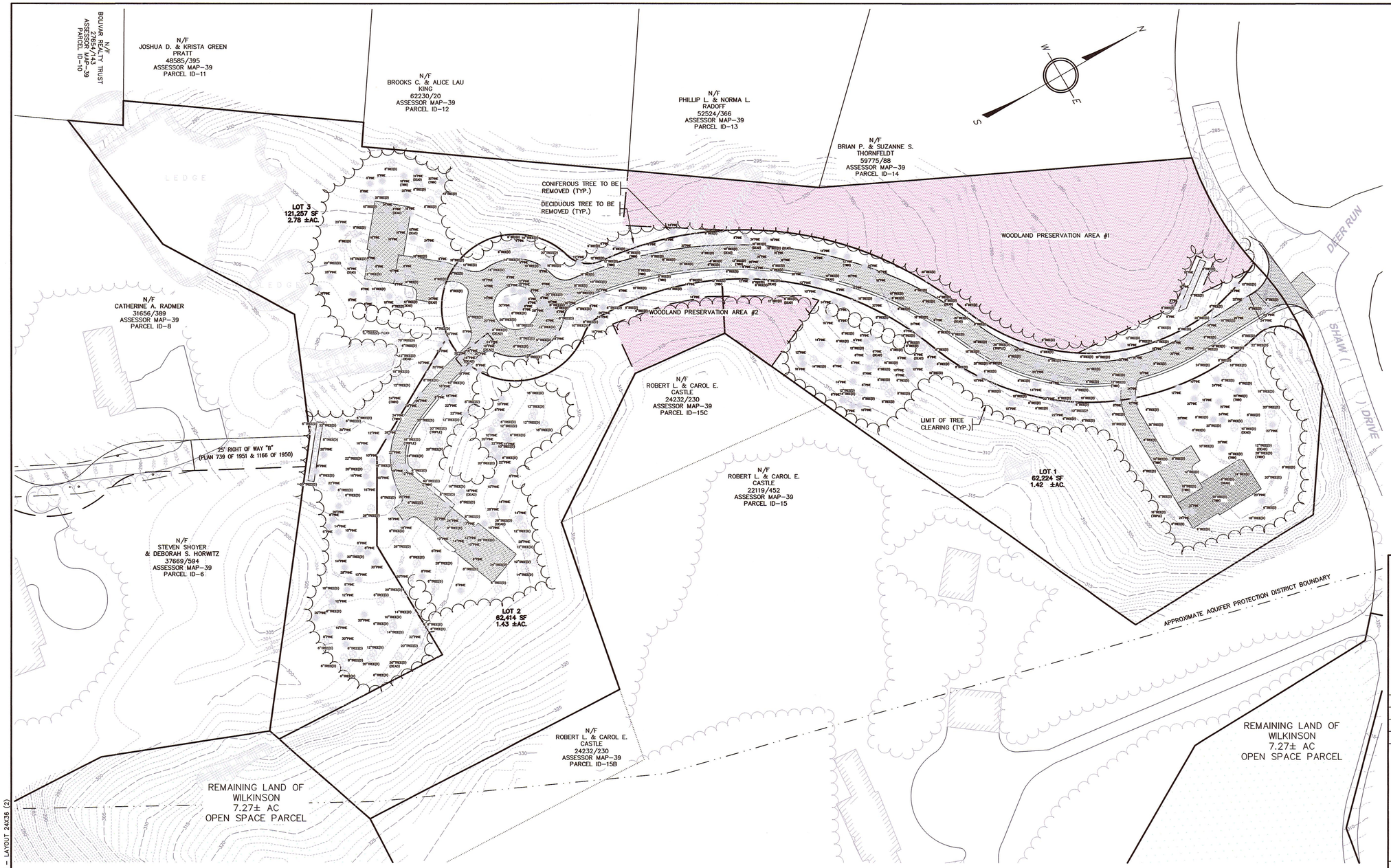
Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____



PLAN REFERENCES

1. "DEFINITIVE RESIDENTIAL SUBDIVISION PLAN–FIVE PATHS–ASSESSORS MAP #39 PARCEL 15A–WAYLAND, MA" PREPARED FOR ROSS C. WILKINSON, PERSONAL REPRESENTATIVE, ESTATE OF PAULA D. WILKINSON BY GPR, INC.. DATED JULY 2019, REVISIONS THROUGH NOVEMBER 2020. JOB NO. 171053. ENDORSED BY WAYLAND PLANNING BOARD, DECEMBER 2020

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION
■ PERMIT ☐ CONSTRUCTION RECORD

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COMMONWEALTH OF MASSACHUSETTS
NICHOLAS M. PAULING
CIVIL
No. 47114
REGISTERED PROFESSIONAL ENGINEER
1/29/2021

PER 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEER'S RESPONSIBILITY: ALL BOUNDARY INFORMATION; LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES; DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE PLAN REF. 1 GENERAL NOTES #19.

NO.	DATE	BY	APP.	REVISION DESCRIPTION

GPR Engineering Solutions for Land & Structures

GOLDSMITH, PREST & RINGWALL, INC.
39 MAIN STREET, SUITE 301. AYER, MA 01432
CIVIL ENGINEERING • LAND SURVEYING & LAND PLANNING
VOICE: 978.772.1590 FAX: 978.772.1591
www.gpr-inc.com

RESIDENTIAL SUBDIVISION SMLDP

TREE REMOVAL PLAN

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03068

DES. BY: JFB	DATE: JANUARY 2021	JOB 171053	1 OF 1
CHK. BY: KFB			

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 INCH = 40 FEET

STORMWATER MANAGEMENT AND LAND DEVELOPMENT PLAN

FIVE PATHS DEFINITIVE SUBDIVISION TREE REMOVAL TABULATION SUMMARY

CONIFEROUS

	SINGLE	TWIN	TRIPLE	DEAD	TOTALS
6" TO < 12"	98	0	0	5	**103**
12" TO < 18"	56	1	0	2	**59**
18" TO < 24"	57	3	0	1	**61**
24"	13	2	0	2	**17**
26"	2	0	0	0	**2**
28"	5	0	0	0	**5**
30"	5	0	0	0	**5**
32"	1	0	0	0	**1**
34"	0	0	0	0	**0**
36"	0	0	0	0	**0**
38"	0	0	0	0	**0**
40"	0	0	0	0	**0**
TOTALS	**237**	**6**	**0**	**10**	**253**

STORMWATER MANAGEMENT AND LAND DEVELOPMENT PLAN

FIVE PATHS DEFINITIVE SUBDIVISION TREE REMOVAL TABULATION SUMMARY

DECIDUOUS

	SINGLE	TWIN	TRIPLE	DEAD	TOTALS
6" TO < 12"	161	3	0	10	**174**
12" TO < 18"	46	6	1	3	**56**
18" TO < 24"	38	2	2	3	**45**
24"	6	0	0	0	**6**
26"	3	0	0	0	**3**
28"	1	1	0	1	**3**
30"	0	0	0	0	**0**
32"	0	0	0	0	**0**
34"	0	0	0	0	**0**
36"	1	0	1	0	**2**
38"	0	0	0	0	**0**
40"	0	1	0	0	**1**
TOTALS	**256**	**13**	**4**	**17**	**290**

TREE REMOVAL TABULATION NOTES

1. TREE DIAMETER SURVEYED AT NORMAL BREAST HEIGHT (DIAMETER BREAST HEIGHT – DBH).
2. TREES 10" DIAMETER AND LARGER WERE DEPICTED ON PLANNING BOARD ENDORSED TREE REMOVAL PLAN, SHEET C4.6, SEE PLAN REF. 1, IN ACCORDANCE WITH PLANNING BOARD REGULATIONS. THIS SMLDP TREE REMOVAL PLAN TABULATES TREES OF 6" DBH AND GREATER TO BE REMOVED PER WAYLAND BYLAW CHAPTER 193.
3. TWIN AND TRIPLE TREE CLUSTERS ARE COUNTED ONLY ONCE IN THE TOTALS.
4. DEAD TREES ARE INCLUDED IN THE TOTALS.
5. PLANNING BOARD REVIEW PROCESS REQUIRED OPTIMIZED DESIGN FOR MINIMIZED CLEARING AND IMPERVIOUS AREAS SUCH THAT RE–PLANTING ACCORDING TO THE WAYLAND CONSERVATION COMMISSION STANDARD REPLACEMENT TREE AND SHRUB GUIDELINES IS NOT PRACTICABLE WITHIN THE CLEARING LIMITS. SUBSTANTIAL MITIGATION IS PROVIDED IN OPEN SPACE AND WOODLAND PRESERVATION AREAS – SEE WAIVER REQUEST WITH APPLICATION DOCUMENTS.

P:\17-\171053\DWG\PERMIT\SMLDP-TRP.DWG 01-29-21 8:50:58 AM - LAYOUT 24X36 (2)

DEFINITIVE RESIDENTIAL SUBDIVISION PLAN

FIVE PATHS

ASSESSORS MAP #39 PARCEL 15A

WAYLAND, MA

SITE DATA

LOT AREA:	13.74± AC. (598,679 ±SF)
WATER SUPPLY:	MUNICIPAL
SEWAGE DISPOSAL:	INDIVIDUAL ONSITE SEWAGE DISPOSAL SYSTEMS

ASSESSORS REFERENCE

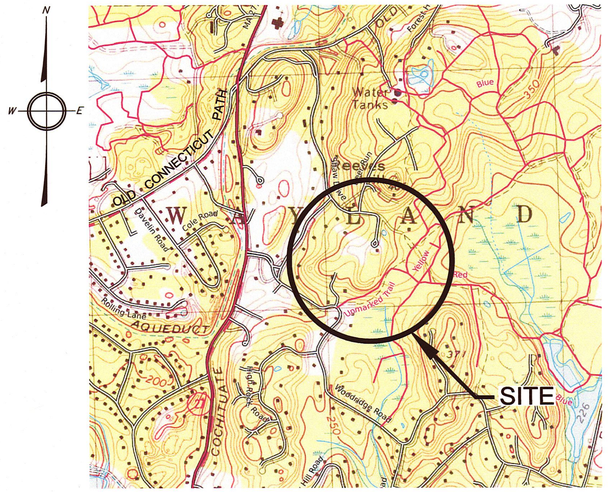
ASSESSORS MAP 39, PARCEL ID 15A
OWNER: W. FLOYD & PAULA D. WILKINSON
SUBDIVISION: LOT 1, 2, 3, REMAINING LAND OF PARCEL 15A & FIVE PATHS COURT RIGHT-OF-WAY

GENERAL NOTES

1. 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.
2. UNLESS OTHERWISE SHOWN, ALL NEW UTILITIES SHALL BE UNDERGROUND.
3. BURIED UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THEIR RESPECTIVE COMPANY SPECIFICATIONS.
4. CONSTRUCTION LAYOUT OF BUILDING AND SITE IMPROVEMENTS SHALL BE PERFORMED BY A LICENSED PROFESSIONAL LAND SURVEYOR. LOCATIONS OF EXISTING FEATURES OR PROPOSED IMPROVEMENTS DERIVED BY SCALING DRAWINGS MAY NOT BE ACCURATE. PROPERTY LINES SHOWN HEREON ARE APPROXIMATE. SEE PLAN REFERENCE HEREON.
5. SAFETY MEASURES, CONSTRUCTION METHODS, AND CONTROL OF WORK SHALL BE RESPONSIBILITY OF CONTRACTOR.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR AND/OR REPLACEMENT OF ANY EXISTING UTILITY OR STRUCTURE DAMAGED DURING CONSTRUCTION THAT ARE NOT DESIGNATED FOR DEMOLITION AND/OR REMOVAL HEREON. DAMAGED UTILITY OR STRUCTURE SHALL BE REPAIRED TO THE SATISFACTION OF THEIR RESPECTIVE OWNERS.
7. 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.
8. CONTRACTOR SHALL NOTIFY ENGINEER UPON COMMENCEMENT OF CONSTRUCTION IN ORDER TO ENSURE THAT REQUIRED INSPECTIONS ARE PERFORMED IN A TIMELY AND EFFICIENT MANNER.
9. CONTRACTOR SHALL PROMPTLY NOTIFY ENGINEER UPON DISCOVERY OF ANY UNFORESEEN SURFACE OR SUBSURFACE CONDITIONS THAT MAY IMPACT SITE CONSTRUCTION.
10. FINISH RIM ELEVATIONS SHOULD MATCH PAVEMENT, GRADING OR LANDSCAPING, UNLESS SPECIFICALLY INDICATED OTHERWISE.
11. WHERE EXISTING UTILITY LINES/STRUCTURES ARE TO BE CUT/BROKEN DOWN/ABANDONED, LINES/STRUCTURES SHALL BE PLUGGED/CAPPED/FILLED IN ACCORDANCE WITH UTILITY OWNER REQUIREMENTS.
12. EROSION CONTROL MEASURES, SUCH AS SILT FENCE OR STRAW BALES AS MAY BE SHOWN HEREON, SHALL BE INSTALLED BEFORE EARTH DISTURBANCE OCCURS WITHIN BUFFER ZONE, AND SHALL SERVE AS THE LIMIT OF WORK.
13. WHERE THE WORD "INSTALL" IS USED HEREIN, IT IS INTENDED TO DIRECT CONTRACTOR TO "FURNISH, INSTALL, AND PLACE IN OPERATION" THE COMPONENT REFERRED TO.
14. ALL STORM DRAIN PIPE TO BE SMOOTH INTERIOR HDP PIPE, 2.0 PSI GASKETED JOINT, UNLESS OTHERWISE NOTED.
15. WHERE SHOWN, CONSTRUCTION NOTES ARE INTENDED TO SUMMARIZE AND CLARIFY MAJOR ITEMS OF WORK. THESE NOTES SHOULD NOT BE CONSTRUED AS AN EXHAUSTIVE LISTING OF ALL WORK REQUIRED. CONTRACTOR SHOULD CONTACT ENGINEER WHEN FURTHER CLARIFICATION OF DEPICTED WORK IS DESIRED.
16. CONSTRUCTION OF FIRE AND DOMESTIC WATER SUPPLY IMPROVEMENTS SHALL CONFORM TO TOWN OF WAYLAND REQUIREMENTS.
17. WHERE DIMENSIONS INVOLVE CURB, DIMENSIONS ARE TO FACE OF CURB. WHERE SLOPED GRANITE CURB OR CAPE COD BERM SPECIFIED, FACE OF CURB IS EDGE OF FINISH PAVEMENT AT TOE OF CURB.
18. NO DEBRIS, JUNK, RUBBISH OR OTHER NON-BIODEGRADABLE MATERIALS, FILL CONTAINING HAZARDOUS MATERIALS OR WASTES, OR STUMPS SHALL BE BURIED ON ANY LAND ON THIS SITE, OR LEFT ON ANY LOT OR ON THE STREET RIGHT OF WAY.
19. EXISTING CONDITION INFORMATION BASED ON AN ON-THE-GROUND TOPOGRAPHIC AND BOUNDARY SURVEY PERFORMED BY GOLDSMITH, PREST & RINGWALL, INC. IN MAY AND JULY 2019.
20. FIRE BOXES TO BE PROVIDED AS REQUIRED BY THE TOWN OF WAYLAND FIRE DEPARTMENT.

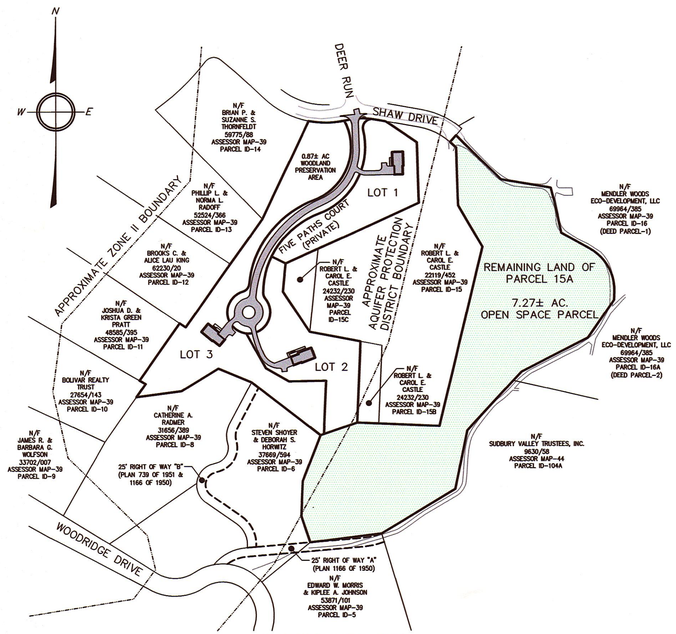
REGULATORY NOTES

1. CONTRACTOR SHALL CONTACT DIG-SAFE FOR UNDERGROUND UTILITY MARKING AT 888.344.7233 AT LEAST 72 HOURS PRIOR TO COMMENCEMENT OF ANY WORK. CONTRACTOR SHALL GIVE TWENTY-FOUR (24)-HOUR NOTICE TO PERTINENT TOWN DEPARTMENTS BEFORE COMMENCING ANY WORK IN THE FIELD.
2. CONTRACTOR SHALL COORDINATE AND OBTAIN ALL CONSTRUCTION PERMITS REQUIRED BY REGULATORY AUTHORITIES.
3. CONTRACTOR SHALL BE AWARE OF ALL CONSTRUCTION REQUIREMENTS, CONDITIONS, AND LIMITATIONS IMPOSED BY PERMITS AND APPROVALS ISSUED BY REGULATORY AUTHORITIES PRIOR TO COMMENCEMENT OF ANY WORK.
4. GENERAL COMPLIANCE WITH 28 CFR PART 36 – 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN AND 521 CMR PART C, EXTERIOR OF THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD REGULATIONS IS INTENDED. CONTRACTOR SHALL VERIFY COMPLIANCE DURING CONSTRUCTION AND SHALL NOTIFY THE OWNER OF ANY NON-COMPLIANCE ISSUES AS SOON AS DISCOVERED.



KEY PLAN

SCALE: 1" = 1000' ±



INDEX PLAN

SCALE: 1" = 200'

ZONING

Parameter	Section [1]	Required	Proposed
Zoning District	Zoning Map	R-60 (60,000 sf lots)	Complies
Overlay District	Overlay Map	Aquifer Protection	Project partially located in overlay district and complies
			with overlay district requirements.
Proposed Use	198-1603.1 (4)	Residential	Allowed
Lot Area [see Note 2]	198 Attachment 1	60,000 SF	Complies
Frontage [see Note 2]	198 Attachment 1	210 FT	Complies
Lot Width [see Note 2]	198-705.1.8	100 Ft circle	Complies
Wetlands Setback	--	None on site	N/A
MDEP Riverfront Area	--	None on site	N/A
FEMA Floodplain	--	None on site	N/A
ACEC	--	None on site	N/A
Zone 1 Protective Radius	--	None on site	N/A
Mapped Zone 2	--	None on site	N/A
IWPA	--	None on site	N/A

NOTES:
[1] Reference to section of Town of Wayland Zoning Bylaw as adopted on April 29, 2019.
[2] Residence Zone 60,000 square feet - 210 feet frontage, no building lot may be laid out and no dwelling may be erected on a lot unless the center of a circle 100 feet in diameter can be passed along a continuous line from the side line of the street along which the frontage of the lot is measured to any point of the dwelling, or proposed dwelling, on the lot without the circumference intersecting any side lot lines.

ABBREVIATIONS:
SF=square feet; CF=cubic feet; FT=feet; GFA=gross floor area; AC=acres; PB=Planning Board; ZBA=Zoning Board of Appeals; IWPA=interim wellhead protection area; ACEC=Area of Critical Environmental Concern; FIRM=Flood Insurance Rate Map; MDEP=Massachusetts Dept of Environmental Protection

REFERENCES

1. "SUBSURFACE SEWAGE DISPOSAL SYSTEM – NEW CONSTRUCTION – FIVE PATHS COURT, WAYLAND, MA" PREPARED FOR ROSS C. WILKINSON, AND ESTATE OF PAULA D. WILKINSON BY GOLDSMITH, PREST & RINGWALL, INC. DATED OCTOBER 2020. JOB NO. 171053.
2. "CERTIFICATION OF PLANNING BOARD ACTION ON FIVE PATHS RESIDENTIAL SUBDIVISION MEMO, MAP 39, PARCEL 039-15A" AS ISSUED BY THE TOWN OF WAYLAND PLANNING DEPARTMENT. DATED SEPTEMBER 17, 2020.

APPROVED WAIVERS (SEE REFERENCE NO. 2)

(FROM THE "THE TOWN OF WAYLAND MASSACHUSETTS SUBDIVISION RULES AND REGULATIONS," ADOPTED OCTOBER, 1968, REVISED SEPTEMBER 4, 2001 AND AUGUST 18, 2015, AS ALLOWED PER SECTION V(B))

SECTION IV.B.1.D: DESIGN STANDARDS – STREETS – LOCATION AND ALIGNMENT

REQUIREMENT: A MINIMUM SEPARATION OF FIFTY (50) FEET FROM THE SUBDIVISION BOUNDARY TO THE RIGHT-OF-WAY.

GRANTED: ALLOW A MINIMUM SEPARATION OF 38.7± FEET AND 43.9± FEET BETWEEN THE RIGHT OF WAY AND RESPECTIVELY, THE WESTERLY AND EASTERLY SUBDIVISION BOUNDARIES.

REQUIREMENT: NO DEAD-END STREET SHALL BE MORE THAN SIX HUNDRED NINETY (690) FEET IN LENGTH, AS MEASURED ALONG ITS CENTER LINE FROM ITS INTERSECTION WITH THE SIDELINE OF THE RIGHT-OF-WAY OF THE THROUGH STREET TO THE CENTER POINT OF THE CIRCULAR TURN-AROUND (MAKING THE OVERALL LENGTH NO MORE THAN SEVEN HUNDRED FIFTY (750) FEET).

GRANTED: ALLOW FIVE PATHS COURT DEAD-END STREET RIGHT-OF-WAY CENTERLINE LENGTH OF 1,135'± FROM SIDELINE OF FOX MEADOW DRIVE (NEAREST THROUGH STREET) TO CUL-DE-SAC CENTERPOINT, FOR OVERALL LENGTH OF 1,195'±.

SECTION V.B.2.A: REQUIRED IMPROVEMENTS – ROADWAY

REQUIREMENT: EACH STREET OR PORTION THEREOF NECESSARY TO SERVE EACH LOT IN A SUBDIVISION SHALL BE CONSTRUCTED AND BROUGHT TO FINISH GRADE AS INDICATED ON THE APPROVED DEFINITIVE PLAN AND IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.

GRANTED: ALLOW THE CONSTRUCTION OF A DRIVEWAY INSTEAD OF A SUBDIVISION STREET, WITHIN THE RIGHT-OF-WAY SHOWN IN THE APPROVED DEFINITIVE PLAN.

SECTION IV.B.2: DESIGN STANDARDS – STREETS – RIGHT OF WAY WIDTH AND STREET DESIGN STANDARDS

REQUIREMENT: MINIMUM 290' RADIUS OF CURVE FOR LIMITED RESIDENTIAL STREETS.

GRANTED: ALLOW 18-FEET WIDE PAVEMENT PLUS 2-FEET GRAVEL SHOULDER ON ONE SIDE, AND 160-FEET RADIUS OF CURVATURE FOR FIVE PATHS COURT RIGHT-OF-WAY.

SECTION IV.B.1.C: DESIGN STANDARDS – STREETS – LOCATION AND ALIGNMENT

REQUIREMENT: A MINIMUM 200-FOOT LENGTH TANGENT SHALL BE PROVIDED BETWEEN THE POINT OF TANGENCY (PT, THE END) OF ONE CURVE AND THE POINT OF CURVATURE (PC, THE BEGINNING) OF ANY FOLLOWING CURVE.

GRANTED: ALLOW NO TANGENT BETWEEN CURVES.

SHEET INDEX

APPROVED BY THE
WAYLAND PLANNING BOARD

_____ CHAIR
_____ APPLICATION FILED 7-26-19
_____ HEARING DATE _____
_____ PLAN APPROVED 9-15-20
12-14-2020

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION
■ PERMIT ☐ CONSTRUCTION RECORD

THIS DRAWING MAY NOT SHOW CONSTRUCTION DETAILS AND SPECIFICATIONS FOR ALL PROPOSED IMPROVEMENTS, AND MAY NOT IDENTIFY ALL CONSTRUCTION WORK ITEMS/AREAS OF CONTRACTOR JURISDICTION.

COMMONWEALTH OF MASSACHUSETTS
NICHOLAS M. PAULING
CIVIL
No. 47114
REGISTERED PROFESSIONAL ENGINEER
11/30/2020

PER 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEER'S RESPONSIBILITY: ALL BOUNDARY INFORMATION; LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES; DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE GENERAL NOTES #19.

NO.	DATE	BY	APP.	
2	11/30/20	LT/KFB	KFB	DRIVEWAY TURNAROUND REVISION
1	7/14/20	LT/KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

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CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING
VOICE: 978.772.1590 FAX: 978.772.1591
www.gpr-inc.com

RESIDENTIAL SUBDIVISION
DEFINITIVE PLAN

TITLE SHEET

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DES. BY: KFB	DATE: JULY 2019	JOB 171053	C1.1
CHK. BY: NMP			

P:\17----\171053\DWG\PERMIT\DEFSUB_TITLE C1.1.DWG 11-30-20 11:30:46 AM - LAYOUT C1.1-TITLE

N/F
BOLIVAR REALTY TRUST
27654/143
ASSESSOR MAP-39
PARCEL ID-10

N/F
JOSHUA D. & KRISTA GREEN PRATT
48585/395
ASSESSOR MAP-39
PARCEL ID-11

N/F
BROOKS C. & ALICE LAU KING
62230/20
ASSESSOR MAP-39
PARCEL ID-12

N/F
PHILLIP L & NORMA L. RADOFF
52524/366
ASSESSOR MAP-39
PARCEL ID-13

N/F
BRIAN P. & SUZANNE S. THORNFELDT
59775/88
ASSESSOR MAP-39
PARCEL ID-14

N/F
CATHERINE A. RADMER
31656/389
ASSESSOR MAP-39
PARCEL ID-8

N/F
STEVEN SHOYER & DEBORAH S. HORWITZ
37669/594
ASSESSOR MAP-39
PARCEL ID-6

N/F
ROBERT L. & CAROL E. CASTLE
22119/452, 24232/230
ASSESSOR MAP-39
PARCEL ID-15, 15B, & 15C

N/F
W. FLOYD & PAULA D. WILKINSON
17629/27
ASSESSOR MAP-39
PARCEL ID-15A
AREA=13.74 ACRES

REMAINING LAND OF
W. FLOYD & PAULA D. WILKINSON
17629/27
ASSESSOR MAP-39
PARCEL ID-15A
AREA=7.27 ACRES

REMAINING LAND OF
W. FLOYD & PAULA D. WILKINSON
17629/27
ASSESSOR MAP-39
PARCEL ID-15A
AREA=7.27 ACRES

B.M. NO 1
MAG(S) IN 14" OAK
EL. 300.83

B.M. NO 2
MAG/S (V) IN 14" PINE
EL. 300.71

B.M. NO 3
MAG/S (V) IN 18" PINE
EL. 304.72

B.M. NO. 4
MAG/S (V) IN 18" PINE
EL. 314.94

B.M. NO. 5
MAG(S) IN 18" PINE
EL. 298.44

B.M. NO. 6
MAG/S (V) 20" TWIN TREE-D
EL. 303.69

B.M. NO. 7
MAG(S) IN UP-18
EL. 292.88

B.M. NO 210
MAG(S) IN 14" OAK
EL. 325.00

SHAW (PUBLIC / PRIVATE) DRIVE
50' WIDE

IP(F)

SB/DH(F)

CB/DH(F)

LEDGE

20.00' 45.15' 196.28' 300.00' 373.15' 304.04' R=250.00' L=105.91' R=93.74' L=75.48' L=3.37' 127.36' 121.41' 100.00' 60.00' 138.34' 410.00' 170.00' 243.22' 344.36' 98.50' 138.74' 228.82' 200.00' 25.00' 162.83' 176.45' 1,355.00' 141.16' 518.60' 38.00'

PARCEL ID-15C
PARCEL ID- 15

PARCEL ID-15B
PARCEL ID- 15

GRAPHIC SCALE
60 0 30 60 120
(IN FEET)
1 INCH = 60 FEET

THIS LAND MAY BE SUBJECT TO EASEMENTS, RIGHTS-OF-WAY, RESTRICTIONS, COVENANTS, OR OTHER LIMITATIONS WHICH MAY BE DISCLOSED BY A TITLE EXAMINATION.

P:\17-----\171053\DWG\SURVEY DWG\FINAL\171053_DSUP_EC_1A.DWG 07-15-20 9:51:08 AM - LAYOUT EC

ELEVATION DATUM

DATUM: NAVD 88

B.M. NO.1

TREE-CONIFEROUS (10">)

TREE-DECIDUOUS (10">)
(SEE NOTE 3)

GENERAL/SURVEY NOTES:

1. EXISTING CONDITION INFORMATION BASED ON AN ON-THE-GROUND TOPOGRAPHIC AND BOUNDARY SURVEY PERFORMED BY GOLDSMITH, PREST & RINGWALL, INC. BETWEEN MAY 2018 TO JULY 2019, WITH TREE LOCATION UPDATES MADE DURING YEAR 2020..

2. SEE SHEET C3.1 FOR ADDITIONAL NOTES & REFERENCES.

3. THE TREE SURVEY, AS IDENTIFIED HEREON, IS NOT TO BE CONSIDERED COMPLETE FOR MAPPING COVERAGE OF ALL TREES LOCATED ON THE SUBJECT PROPERTY, AND HAS BEEN LIMITED TO MAPPING WITHIN DEVELOPMENT LIMIT OF DISTURBANCE.

ASSESSORS REFERENCE:

ASSESSORS MAP 39, LOT 15A, (13.74 ACRES)

DRAWING ISSUED FOR:

- ☐ CONCEPT
- ■ PERMIT
- ☐ CONSTRUCTION
- ☐ CONSTRUCTION RECORD

COMMONWEALTH OF MASSACHUSETTS
DAVID J. DeBAY
33857
REGISTERED PROFESSIONAL SURVEYOR
7/14/2020

NO.	DATE	BY	APP.	REVISION DESCRIPTION
2	11/30/20	---	---	NO CHANGES ON THIS SHEET
1	7/14/20	DSB	KB	ADDITIONAL TREE LOCATIONS ADDED

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RESIDENTIAL SUBDIVISION
DEFINITIVE PLAN

EXISTING CONDITION PLAN

FIVE PATHS
ASSESSORS MAP 39 – PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DESIGN: MPB/KFB			
SURVEY: AMB	DATE: JULY 2019	JOB 171053	C2.1
CALC.BY: DSB			

PLANS ON FILE AT THE MIDDLESEX SOUTH DISTRICT REGISTRY OF DEEDS

2) PLAN 82 OF 1994
3) PLAN 471 OF 1992
4) PLAN 1186 OF 1969
5) PLAN 1625 OF 1955
6) PLAN 451 OF 1951
7) PLAN 739 OF 1951
8) PLAN 740 OF 1951
9) PLAN 2026 OF 1950
10) PLAN 1166 OF 1950
11) PLAN 830 OF 1950

FOR REGISTRY USE ONLY

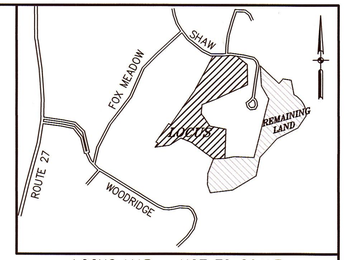
PLAN REFERENCES:

1) UNRECORDED PLAN TITLED: "PERIMETER PLAN, WILKINSON PROPERTY, 57R SHAW DRIVE, WAYLAND, MA 01778" PREPARED BY COLER & COLANTONIO, DATED: JULY 11, 2000.

NOTES:

1) BASIS OF BEARINGS SHOWN ARE REFERENCE TO MASS MAINLAND GRID, OBTAINED BY GPS MEASUREMENTS BY THIS OFFICE.

2) ZONING DISTRICT: SINGLE RESIDENTIAL



LOCUS MAP ~ NOT TO SCALE

LEGEND

N/F	NOW OR FORMERLY	CTR	CENTER
1111/111	DEED BOOK/PAGE	DH	DRILL HOLE
(F)	FOUND	○	PIPE/ROD
(S)	SET	⊡	STONE BOUND
IP	IRON/STEEL PIPE	◉	DRILL HOLE
SB	STONE BOUND	○○○○	STONE WALL
HOA	HOME OWNERS ASSOCIATION		

N/F
BOLIVAR REALTY TRUST
27654/143
ASSESSOR MAP-39
PARCEL ID-10

N/F
JOSHUA D. & KRISTA GREEN PRATT
48585/395
ASSESSOR MAP-39
PARCEL ID-11

N/F
BROOKS C. & ALICE LAU KING
62230/20
ASSESSOR MAP-39
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PHILLIP L. & NORMA L RADOFF
52524/366
ASSESSOR MAP-39
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BRIAN P. & SUZANNE S. THORNFELDT
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CATHERINE A. RADMER
31656/389
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STEVEN SHOYER & DEBORAH S. HORWITZ
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ASSESSOR MAP-39
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17629/27
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PARCEL ID-15A
AREA=13.74 ACRES

N/F
ROBERT L. & CAROL E. CASTLE
22119/452, 24232/230
ASSESSOR MAP-39
PARCEL ID-15, 15B, & 15C

REMAINING LAND OF
W. FLOYD & PAULA D. WILKINSON
17629/27
ASSESSOR MAP-39
PARCEL ID-15A
AREA=7.27 ACRES

REMAINING LAND OF
W. FLOYD & PAULA D. WILKINSON
17629/27
ASSESSOR MAP-39
PARCEL ID-15A
AREA=7.27 ACRES

LOT 3
AREA = 121,257±S.F.
(2.78±ACRES)

LOT 2
AREA = 62,414±S.F.
(1.43±ACRES)

LOT 1
AREA = 62,224±S.F.
(1.42±ACRES)

"HOA" ACCESS &MAINTENANCE EASEMENT "2"
AREA = 126± S.F

"HOA" ACCESS &MAINTENANCE EASEMENT "1"
AREA = 525± S.F

"HOA" ACCESS, MAINT. & SEPTIC EASEMENT
AREA = 4,290± S.F

"HOA" ACCESS & MAINTENANCE EASEMENT "3"
AREA = 6,148± S.F

"HOA" ACCESS & MAINTENANCE EASEMENT
AREA = 3,700± S.F

WOODLAND PRESERVATION AREA-1
AREA = 2,845± S.F

WOODLAND PRESERVATION AREA-2
AREA = 3,403± S.F

WOODLAND PRESERVATION AREA-3
AREA = 41,736± S.F

DRAINAGE EASEMENT
AREA = 2,637± S.F

25' RIGHT OF WAY (SEE PLAN REF: 2 & 3)

SHAW (PUBLIC 50' WIDE) DRIVE

FIVE PATHS COURT

PARCEL ID-15C
PARCEL ID- 15

PARCEL ID-15B
PARCEL ID- 15

LINE TABLE		
LINE	LENGTH	BEARING
L1	15.00	S44°53'11"W
L2	63.56	S29°15'26"W
L3	12.28	S29°15'26"W
L4	35.92	S19°07'20"W
L5	44.85	S09°42'10"W
L6	3.81	N63°01'18"W
L7	30.06	N63°01'18"W

CURVE TABLE		
CURVE	LENGTH	RADIUS
C1	58.70	298.00
C2	59.18	240.00
C3	150.48	240.00
C4	148.51	298.00

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 INCH = 40 FEET

APPROVAL IS REQUIRED UNDER THE SUBDIVISION CONTROL LAW
WAYLAND PLANNING BOARD

BEING A MAJORITY
DATE APPROVED: 9.15.20
DATE ENDORSED: 12-11-2020

I _____, CLERK OF THE TOWN OF WAYLAND, HEREBY CERTIFY THAT THE NOTICE OF THE APPROVAL OF THIS PLAN BY THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED BY THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE 20 DAYS NEXT AFTER RECEIPT AND RECORDING OF SAID NOTICE.

12-11-2020
WAYLAND TOWN CLERK DATE

THIS LAND MAY BE SUBJECT TO EASEMENTS, RIGHTS-OF-WAY, RESTRICTIONS, COVENANTS, OR OTHER LIMITATIONS WHICH MAY BE DISCLOSED BY A TITLE EXAMINATION.

THE ACTUAL SURVEY OF BOUNDARY LINES OF THIS TRACT OF LAND WAS MADE ON THE GROUND IN ACCORDANCE WITH THE BOARD OF REGISTRATION OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS (SEE 250CMR 6.00, PROCEDURAL AND TECHNICAL STANDARDS FOR THE PRACTICE OF LAND SURVEYING).

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTRY OF DEEDS.

COMMONWEALTH OF MASSACHUSETTS
DAVID J. DeBAY
33887
REGISTERED PROFESSIONAL LAND SURVEYOR

11/30/2020

DAVID J. DeBAY, PLS# 33887 DATE:

DRAWING ISSUED FOR:

- ☐ CONCEPT
- ☐ CONSTRUCTION
- ■ PERMIT
- ☐ CONSTRUCTION RECORD

NO.	DATE	BY	APP.	REVISION DESCRIPTION
2	11/30/20	DSB	KB	PRESERVATION AREAS
1	7/14/20	DSB	DJD	DRIVEWAY/DRAINAGE COMMENTS

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RESIDENTIAL SUBDIVISION
DEFINITIVE PLAN

LOTTING PLAN

FIVE PATHS
ASSESSORS MAP 39 – PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DESIGN: MPB/KFB			
SURVEY: AMB	DATE: JULY 2019	JOB 171053	C3.1
CALC.BY: DSB			

P:\17---\171053\DWG\SURVEY DWG\FINAL\171053_DSLP_14.DWG 11-30-20 11:52:10 AM -- LAYOUT LOTTING PLAN

LAND DISTURBANCE NOTES

[1] PRIOR TO ANY LAND CLEARING, A STORMWATER MANAGEMENT AND LAND DISTURBANCE PERMIT (SMLDP) MUST BE APPROVED BY THE WAYLAND CONSERVATION COMMISSION.

[2] IF ROCK BLASTING ACTIVITIES ARE REQUIRED, THE WAYLAND FIRE DEPARTMENT SHALL BE NOTIFIED AND A FIRE DEPARTMENT DETAIL SHALL BE PRESENT DURING ALL BLASTING ACTIVITIES.

[3] LIMITS OF DISTURBANCE SHALL BE REDUCED IF ROCK PROFILE ALLOWS FOR STABLE, STEEPER RIPPED, RAMMED OR BLASTED FACE. PRIMARY OPPORTUNITIES FOR SUCH TREATMENT ARE ANTICIPATED EAST OF THE COMMON DRIVE DRAINAGE DITCH.

[4] ALL STUMPS ARE TO BE REMOVED FROM THE PROPERTY AND PROPERLY DISPOSED OF.

[5] ALL DISTURBANCE IS WITHIN AQUIFER PROTECTION OVERLAY AND OUTSIDE ZONE 2 WELLHEAD PROTECTION DISTRICT.

[6] NO JURISDICTIONAL AREAS PER THE 310 CMR 10 (MASSACHUSETTS WETLAND PROTECTION ACT) EXIST ON THE SITE.

[6] NO NHESP ENDANGERED SPECIES HABITAT HAS BEEN IDENTIFIED ON THE SITE.

[7] NO FLOODPLAINS ARE MAPPED ON THE SITE.

[8] DISTURBANCE LIMITS MAY ADJUST TO ACCOMMODATE FINAL ARCHITECTURAL FOOTPRINTS, ACCESS, DRIVEWAYS, EXITS OR SITING.

[9] TOTAL APPROXIMATE LIMIT OF WORK IS 3.20± ACRE.

N/F
BOLIVAR REALTY TRUST
75564/144
ASSESSOR MAP-39
PARCEL ID-10

N/F
JOSHUA D. & KRISTA GREEN PRATT
48585/395
ASSESSOR MAP-39
PARCEL ID-11

N/F
BROOKS C. & ALICE LAU KING
62230/20
ASSESSOR MAP-39
PARCEL ID-12

N/F
PHILLIP L. & NORMA L. RADOFF
52524/366
ASSESSOR MAP-39
PARCEL ID-13

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BRIAN P. & SUZANNE S. THORNFELDT
59775/88
ASSESSOR MAP-39
PARCEL ID-14

N/F
CATHERINE A. RADMER
31656/389
ASSESSOR MAP-39
PARCEL ID-8

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ROBERT L. & CAROL E. CASTLE
24232/230
ASSESSOR MAP-39
PARCEL ID-15C

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37669/594
ASSESSOR MAP-39
PARCEL ID-6

N/F
ROBERT L. & CAROL E. CASTLE
24232/230
ASSESSOR MAP-39
PARCEL ID-15B

LOT 3
121,257 SF
2.78 ±AC.

LOT 2
62,414 SF
1.43 ±AC.

LOT 1
62,224 SF
1.42 ±AC.

LIMITS OF ROADWAY CUT TO BE REDUCED IF ROCK PROFILE ALLOWS (TYP.) [2,3]

25' RIGHT OF WAY "B" (PLAN 739 OF 1951 & 1166 OF 1950)

DEER RUN

SHAW (PUBLIC 50' WIDE) DRIVE

APPROXIMATE AQUIFER PROTECTION DISTRICT BOUNDARY

REMAINING LAND OF WILKINSON
7.27± AC
OPEN SPACE PARCEL

REMAINING LAND OF WILKINSON
7.27± AC
OPEN SPACE PARCEL

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 INCH = 40 FEET

EARTHWORKS EXECUTIVE SUMMARY:

RAW EARTHWORK CALCULATIONS COMPARING THE FINISHED GRADES WITH EXISTING GRADES AND NO FACTORING FOR SHRINK/SWELL YIELDS AN AVERAGE OF
4,400 CUBIC YARDS OF RAW CUT AND
6,700 CUBIC YARDS OF RAW FILL, FOR APPROXIMATE RAW IMBALANCE OF
2,300 CUBIC YARDS OF RAW NET FILL MATERIAL REQUIRED TO BE HAULED INTO THE SITE.

OFFSETTING PROJECT VOLUMES OF HAULED IN MATERIALS:
VOLUME OF PAVEMENT = 22,245± SF X 19" DEPTH = 1,304 CY (HAUL IN FILL)
VOLUME OF IC-1 + IC-2 STONE = 9,644 CF + 6,186 CF = 586 CY (HAUL IN FILL)
VOLUME OF IC-1 + IC-2 CHAMBERS = 5,002 CF + 3,672 CF = 321 CY (HAUL IN FILL)

Site Volume Table: Unadjusted

Site	Stratum	Surf1	Surf2	Cut yards	Fill yards	Net yards	Method
FIVE PATHS							
	d2f	ex_cond	NAVD88	defsub3finish			
				4453	6649	2196 (F)	Grid
				4421	6730	2309 (F)	Composite

LAND DISTURBANCE LEGEND

- GENERALLY DEEP CUTS, MAY INCLUDE AREAS OF ROCK REMOVAL
- GENERALLY SHALLOW CUTS
- GENERAL AREAS OF SOIL FILLING (FILL)
- EXISTING TREELINE
- PROPOSED TREELINE (LIMITS OF TREE CLEARING)
- LIMITS OF WORK

APPROVED BY THE
WAYLAND PLANNING BOARD

_____ CHAIR
_____ APPLICATION FILED 7.26.19
_____ HEARING DATE _____
_____ PLAN APPROVED 9.15.20
12-11-2020

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION
■ PERMIT ☐ CONSTRUCTION RECORD

THIS DRAWING MAY NOT SHOW CONSTRUCTION DETAILS AND SPECIFICATIONS FOR ALL PROPOSED IMPROVEMENTS, AND MAY NOT IDENTIFY ALL CONSTRUCTION WORK ITEMS/AREAS OF CONTRACTOR JURISDICTION.

COMMONWEALTH OF MASSACHUSETTS
NICHOLAS M. PAULING
CIVIL
No. 47114
REGISTERED PROFESSIONAL ENGINEER
11/30/2020

PER 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEER'S RESPONSIBILITY: ALL BOUNDARY INFORMATION; LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES; DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE GENERAL NOTES #19.

NO.	DATE	BY	APP.	REVISION DESCRIPTION
2	11/30/20	LT/KFB	KFB	DRIVEWAY TURNAROUND REVISION
1	7/14/20	LT/KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

GPR Engineering Solutions for Land & Structures
GOLDSMITH, PREST & RINGWALL, INC.
39 MAIN STREET, SUITE 301. AYER, MA 01432
CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING
VOICE: 978.772.1590 FAX: 978.772.1591
www.gpr-inc.com

RESIDENTIAL SUBDIVISION DEFINITIVE PLAN

LAND DISTURBANCE PLAN

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03068

DES. BY: MPB	DATE: JULY 2019	JOB 171053	C4.1
CHK. BY: KFB			

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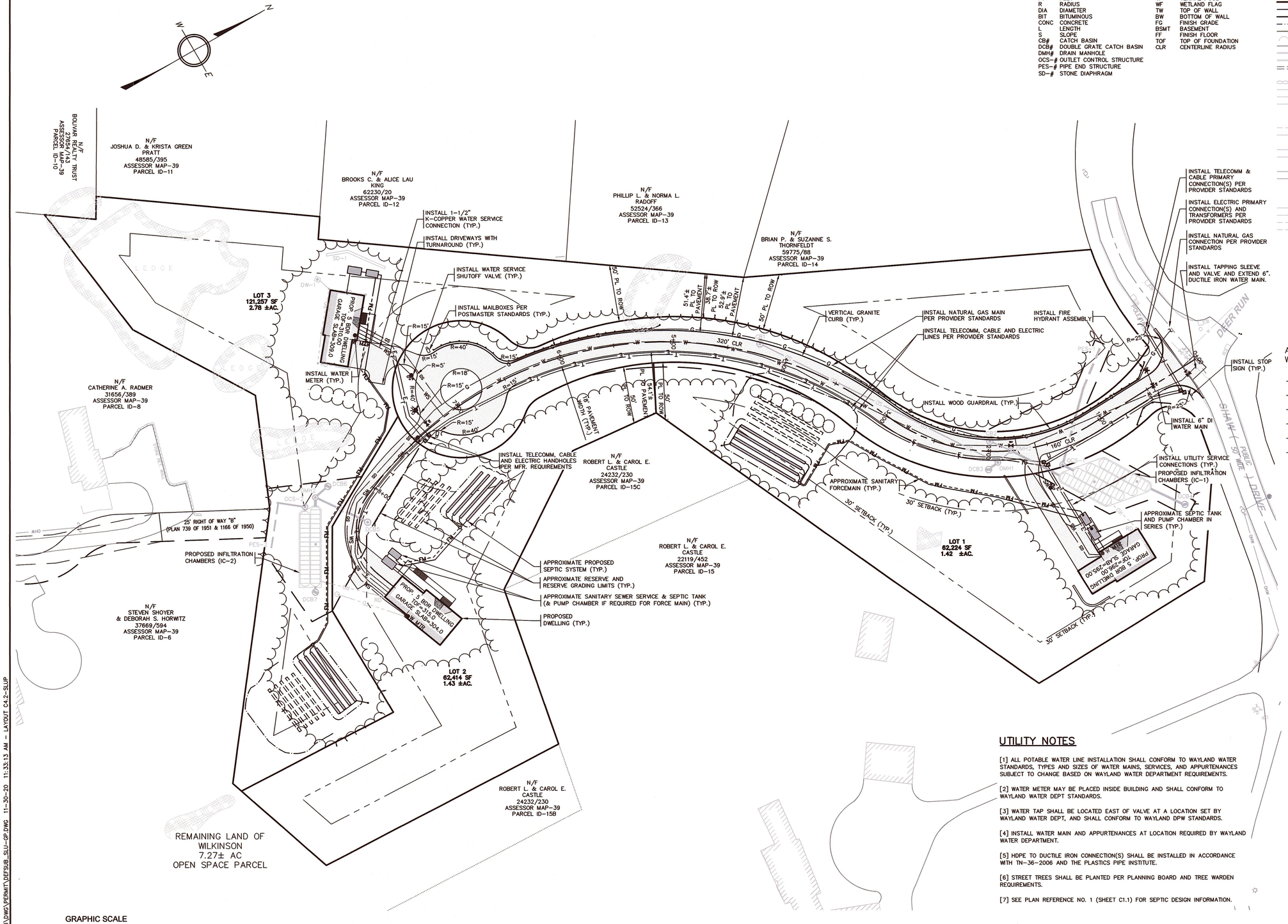
ABBREVIATIONS

EL	ELEVATION	HDPE	HIGH DENSITY POLYETHYLENE
INV	INVERT	PVC	POLYVINYL CHLORIDE
SF	SQUARE FEET	RCP	REINFORCED CONCRETE PIPE
AC	ACRES	N/F	NOW OR FORMERLY
FT	FEET	VP	VERNAL POOL
R	RADIUS	WF	WETLAND FLAG
DIA	DIAMETER	TW	TOP OF WALL
BIT	BITUMINOUS	BW	BOTTOM OF WALL
CONC	CONCRETE	FG	FINISH GRADE
L	LENGTH	BSMT	BASEMENT
S	SLOPE	FF	FINISH FLOOR
CB#	CATCH BASIN	TOF	TOP OF FOUNDATION
DCB#	DOUBLE GRATE CATCH BASIN	CLR	CENTERLINE RADIUS
DMH#	DRAIN MANHOLE		
OCS–#	OUTLET CONTROL STRUCTURE		
PES–#	PIPE END STRUCTURE		
SD–#	STONE DIAPHRAGM		

LEGEND

EXISTING		PROPOSED
100	ELEVATION CONTOUR	100
X100.0	SPOT GRADE	100.0 FG
	PROPERTY LINE	
	APPROXIMATE AQUIFER PROTECTION DISTRICT BOUNDARY	
	LIMIT OF WORK	
106D	USDA SOIL CLASSIFICATION	
	EASEMENT	
	TREE LINE / EDGE OF VEGETATION	
	EDGE OF PAVEMENT	
	CAPE COD BERM CURBING	
	GRANITE CURBING	
	GRAVEL/DIRT ROAD	
	STOCKADE FENCE	
	STONE WALL	
W	WATER MAIN	W
WS	WATER SERVICE	WS
FS	FIRE SERVICE	FS
WV	WATER VALVE	WV
	FIRE HYDRANT	
FM	FORCE MAIN	FM
SS	GRAVITY SEWER LINE	SS
S	SEWER MANHOLE	SMH
G	GAS LINE	
GS	GAS SERVICE	GS
GV	GAS VALVE	
E	BURIED POWER LINE	E
OHW	OVERHEAD POWER LINE	OHW
	UTILITY POLE	
	GUY WIRE	
E	ELECTRIC BOX	E
SD	STORM DRAIN	SD
UD	UNDERDRAIN	UD
RD	ROOF DRAIN	RD
FD	FOUNDATION DRAIN	FD
CB	CATCH BASIN	
DMH	DRAIN MANHOLE	
	SILT FENCE BARRIER	
	STRAW BALES	
199–1	DEEP SOIL OBSERVATION HOLE	
	SITE LUMINAIRE	
	SIGN	
	SURFACE RUNOFF DIRECTION	
	STONE BOUND	
	DRILL HOLE	
	IRON ROD	



GRAPHIC SCALE

40 0 20 40 80

(IN FEET)

1 INCH = 40 FEET

APPROVED BY THE WAYLAND PLANNING BOARD

CHAIR

APPLICATION FILED 7.26.19

HEARING DATE

PLAN APPROVED 9.15.20

12-11-2020

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION

■ PERMIT ☐ CONSTRUCTION RECORD

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COMMONWEALTH OF MASSACHUSETTS NICHOLAS M. PAULING CIVIL No. 47114 REGISTERED PROFESSIONAL ENGINEER 11/30/2020

PER 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEER'S RESPONSIBILITY: ALL BOUNDARY INFORMATION; LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES; DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE GENERAL NOTE #19.

NO.	DATE	BY	APP.	REVISION DESCRIPTION
2	11/30/20	LT/KFB	KFB	DRIVEWAY TURNAROUND REVISION
1	7/14/20	LT/KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

UTILITY NOTES

[1] ALL POTABLE WATER LINE INSTALLATION SHALL CONFORM TO WAYLAND WATER STANDARDS, TYPES AND SIZES OF WATER MAINS, SERVICES, AND APPURTENANCES SUBJECT TO CHANGE BASED ON WAYLAND WATER DEPARTMENT REQUIREMENTS.

[2] WATER METER MAY BE PLACED INSIDE BUILDING AND SHALL CONFORM TO WAYLAND WATER DEPT STANDARDS.

[3] WATER TAP SHALL BE LOCATED EAST OF VALVE AT A LOCATION SET BY WAYLAND WATER DEPT, AND SHALL CONFORM TO WAYLAND DPW STANDARDS.

[4] INSTALL WATER MAIN AND APPURTENANCES AT LOCATION REQUIRED BY WAYLAND WATER DEPARTMENT.

[5] HDPE TO DUCTILE IRON CONNECTION(S) SHALL BE INSTALLED IN ACCORDANCE WITH TN–36–2006 AND THE PLASTICS PIPE INSTITUTE.

[6] STREET TREES SHALL BE PLANTED PER PLANNING BOARD AND TREE WARDEN REQUIREMENTS.

[7] SEE PLAN REFERENCE NO. 1 (SHEET C1.1) FOR SEPTIC DESIGN INFORMATION.

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RESIDENTIAL SUBDIVISION DEFINITIVE PLAN

SITE LAYOUT AND UTILITIES PLAN

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DES. BY: KFB	DATE: JULY 2019	JOB 171053	C4.2
CHK. BY: NMP			

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ABBREVIATIONS

EL	ELEVATION	HDPE	HIGH DENSITY POLYETHYLENE
INV	INVERT	PVC	POLYVINYL CHLORIDE
SF	SQUARE FEET	RCP	REINFORCED CONCRETE PIPE
AC	ACRES	N/F	NOW OR FORMERLY
FT	FEET	VP	VERNAL POOL
R	RADIUS	WF	WETLAND FLAG
DIA	DIAMETER	TW	TOP OF WALL
BIT	BITUMINOUS	BW	BOTTOM OF WALL
CONC	CONCRETE	FG	FINISH GRADE
L	LENGTH	BSMT	BASEMENT
S	SLOPE	FF	FINISH FLOOR

LEGEND

EXISTING		PROPOSED
x100	ELEVATION CONTOUR	100
x100.0	SPOT GRADE	100.0 FG
	PROPERTY LINE	
	APPROXIMATE AQUIFER PROTECTION DISTRICT BOUNDARY	
	LIMIT OF WORK	
106D	USDA SOIL CLASSIFICATION	
	EASEMENT	
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	EDGE OF PAVEMENT	
	CAPE COD BERM CURBING	
	GRANITE CURBING	
	GRAVEL/DIRT ROAD	
	STOCKADE FENCE	
	STONE WALL	
W	WATER MAIN	W
WS	WATER SERVICE	WS
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OHW	OVERHEAD POWER LINE	OHW
	UTILITY POLE	
	GUY WIRE	
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FD	FOUNDATION DRAIN	FD
CB	CATCH BASIN	
DMH	DRAIN MANHOLE	
	SILT FENCE BARRIER	
	STRAW BALES	
199-1	DEEP SOIL OBSERVATION HOLE	
	SITE LUMINAIRE	
	SIGN	
	SURFACE RUNOFF DIRECTION	
	STONE BOUND	
	DRILL HOLE	
	IRON ROD	

N/F BOLIVAR REALTY TRUST 52524/366 ASSESSOR MAP-39 PARCEL ID-10

N/F JOSHUA D. & KRISTA GREEN PRATT 48585/395 ASSESSOR MAP-39 PARCEL ID-11

N/F BROOKS C. & ALICE LAU KING 62230/20 ASSESSOR MAP-39 PARCEL ID-12

N/F PHILLIP L. & NORMA L. RADOFF 52524/366 ASSESSOR MAP-39 PARCEL ID-13

N/F BRIAN P. & SUZANNE S. THORNFELDT 59775/88 ASSESSOR MAP-39 PARCEL ID-14

N/F CATHERINE A. RADMER 31656/389 ASSESSOR MAP-39 PARCEL ID-8

N/F ROBERT L. & CAROL E. CASTLE 24232/230 ASSESSOR MAP-39 PARCEL ID-15C

N/F ROBERT L. & CAROL E. CASTLE 22119/452 ASSESSOR MAP-39 PARCEL ID-15

N/F STEVEN SHOYER & DEBORAH S. HORWITZ 37669/594 ASSESSOR MAP-39 PARCEL ID-6

N/F ROBERT L. & CAROL E. CASTLE 24232/230 ASSESSOR MAP-39 PARCEL ID-15B

LOT 3 121,257 SF 2.78 ±AC.

LOT 2 82,414 SF 1.43 ±AC.

LOT 1 62,224 SF 1.42 ±AC.

PROP. 5 BDR DWELLING GARAGE SLAB=310.0

PROP. 5 BDR DWELLING GARAGE SLAB=306.0

PROP. 5 BDR DWELLING GARAGE SLAB=296.50

INSTALL BIT. CONC. DRIVEWAY (TYP. OF 3)

INSTALL BIT. CONC. TURNAROUND

INSTALL VERTICAL GRANITE CURB (TYP.)

INSTALL BIT. CONC. PAVEMENT (TYP.)

REMOVE SECTION OF EXISTING CURB AND INSTALL GRANITE CURB ON CONNECTING RADII FROM SHAW DRIVE (TYP. BOTH SIDES)

PROPOSED DWELLING (TYP.)

HOA DRAINAGE EASEMENT

HOA DRAINAGE EASEMENT & LOT 3 SEPTIC ACCESS EASEMENT

25' RIGHT OF WAY "B" (PLAN 739 OF 1951 & 1166 OF 1950)

APPROXIMATE LIMIT OF SEPTIC RESERVE FILL (TYP.)

TW=303.00 BW=300.00 EG=301.8±

TW=300.00 BW=297.20 EG=300.1±

TW=295.00 BW=293.00 EG=295.0±

TW=294.50 BW=294.00 EG=294.0±

TW=296.00 BW=295.00 EG=295.0±

TW=300.50 BW=295.50 EG=300.5±

TW=296.00 BW=295.00 EG=295.0±

REMAINING LAND OF WILKINSON 7.27± AC OPEN SPACE PARCEL

REMAINING LAND OF WILKINSON 7.27± AC OPEN SPACE PARCEL

DEER RUN

SHAW DRIVE (50' WIDE PUBLIC WAY)

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)

1 INCH = 40 FEET

APPROVED BY THE WAYLAND PLANNING BOARD

CHAIR

APPLICATION FILED 7·26·19

HEARING DATE

PLAN APPROVED 9·15·20

12-16-2020

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION

■ PERMIT ☐ CONSTRUCTION RECORD

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COMMONWEALTH OF MASSACHUSETTS NICHOLAS M. PAULING CIVIL No. 47114 REGISTERED PROFESSIONAL ENGINEER

11/30/2020

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1	7/14/20	LT/KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

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RESIDENTIAL SUBDIVISION DEFINITIVE PLAN

GRADING AND PAVING PLAN

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DES. BY: KFB	DATE: JULY 2019	JOB 171053	C4.3
CHK. BY: NMP			

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ABBREVIATIONS

EL	ELEVATION	HDPE	HIGH DENSITY POLYETHYLENE
INV	INVERT	PVC	POLYVINYL CHLORIDE
SF	SQUARE FEET	RCP	REINFORCED CONCRETE PIPE
AC	ACRES	N/F	NOW OR FORMERLY
FT	FEET	VP	VERNAL POOL
R	RADIUS	WF	WETLAND FLAG
DIA	DIAMETER	TW	TOP OF WALL
BIT	BITUMINOUS	BW	BOTTOM OF WALL
CONC	CONCRETE	FG	FINISH GRADE
L	LENGTH	BSMT	BASEMENT
S	SLOPE	FF	FINISH FLOOR

LEGEND

EXISTING		PROPOSED
100	ELEVATION CONTOUR	100
X100.0	SPOT GRADE	100.0 FG
	PROPERTY LINE	
	APPROXIMATE AQUIFER PROTECTION DISTRICT BOUNDARY	
	LIMIT OF WORK	
106D	USDA SOIL CLASSIFICATION	
	EASEMENT	
	TREE LINE / EDGE OF VEGETATION	
	EDGE OF PAVEMENT	
	CAPE COD BERM CURBING	
	GRANITE CURBING	
	GRAVEL/DIRT ROAD	
	STOCKADE FENCE	
	STONE WALL	
W	WATER MAIN	W
WS	WATER SERVICE	WS
FS	FIRE SERVICE	FS
WV	WATER VALVE	WV
	FIRE HYDRANT	
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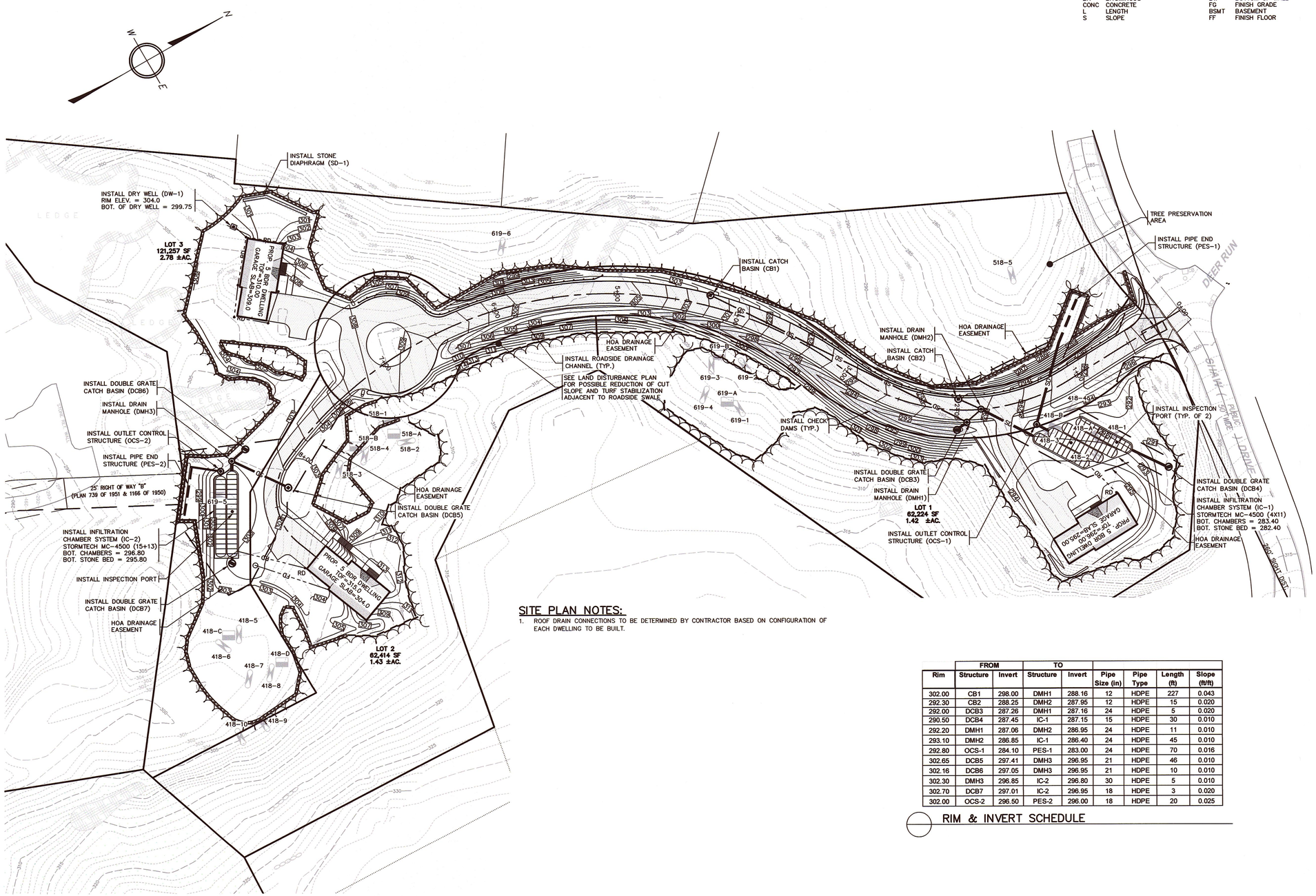
OHW	OVERHEAD POWER LINE	OHW
	UTILITY POLE	
	GUY WIRE	
E	ELECTRIC BOX	
SD	STORM DRAIN	SD
UD	UNDERDRAIN	UD
RD	ROOF DRAIN	RD
FD	FOUNDATION DRAIN	FD
CB	CATCH BASIN	
DMH	DRAIN MANHOLE	
	SILT FENCE BARRIER	
	STRAW WATTLES	
199-1	DEEP SOIL OBSERVATION HOLE	
	SITE LUMINAIRE	
	SIGN	
	SURFACE RUNOFF DIRECTION	
	STONE BOUND	
	DRILL HOLE	
	IRON ROD	



SITE PLAN NOTES:

1. ROOF DRAIN CONNECTIONS TO BE DETERMINED BY CONTRACTOR BASED ON CONFIGURATION OF EACH DWELLING TO BE BUILT.

	FROM		TO					
Rim	Structure	Invert	Structure	Invert	Pipe Size (in)	Pipe Type	Length (ft)	Slope (ft/ft)
302.00	CB1	298.00	DMH1	288.16	12	HDPE	227	0.043
292.30	CB2	288.25	DMH2	287.95	12	HDPE	15	0.020
292.00	DCB3	287.26	DMH1	287.16	24	HDPE	5	0.020
290.50	DCB4	287.45	IC-1	287.15	15	HDPE	30	0.010
292.20	DMH1	287.06	DMH2	286.95	24	HDPE	11	0.010
293.10	DMH2	286.85	IC-1	286.40	24	HDPE	45	0.010
292.80	OCS-1	284.10	PES-1	283.00	24	HDPE	70	0.016
302.65	DCB5	297.41	DMH3	296.95	21	HDPE	46	0.010
302.16	DCB6	297.05	DMH3	296.95	21	HDPE	10	0.010
302.30	DMH3	296.85	IC-2	296.80	30	HDPE	5	0.010
302.70	DCB7	297.01	IC-2	296.95	18	HDPE	3	0.020
302.00	OCS-2	296.50	PES-2	296.00	18	HDPE	20	0.025

RIM & INVERT SCHEDULE

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)

1 INCH = 40 FEET

APPROVED BY THE WAYLAND PLANNING BOARD

CHAIR

APPLICATION FILED 7.26.19

HEARING DATE

PLAN APPROVED 9.15.20

12/1/2020

DRAWING ISSUED FOR:

- ☐ CONCEPT
- ☐ CONSTRUCTION
- ■ PERMIT
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COMMONWEALTH OF MASSACHUSETTS — NICHOLAS M. PAULING — CIVIL — NO. 47114 — REGISTERED PROFESSIONAL ENGINEER

11/30/2020

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1	7/14/20	LT/KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

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RESIDENTIAL SUBDIVISION DEFINITIVE PLAN

DRAINAGE PLAN

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DES. BY: KFB	DATE: JULY 2019	JOB 171053	C4.4
CHK. BY: NMP			

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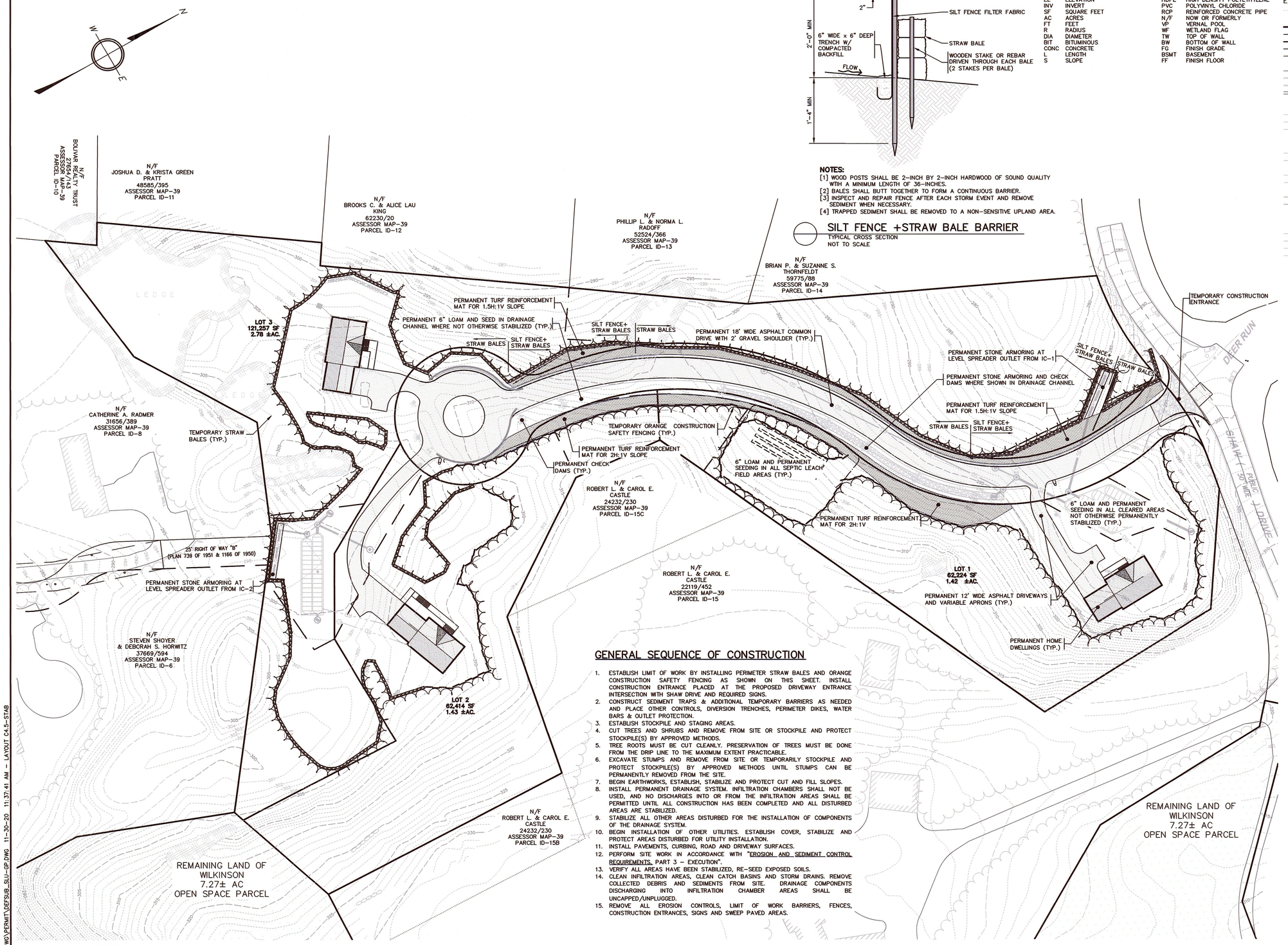

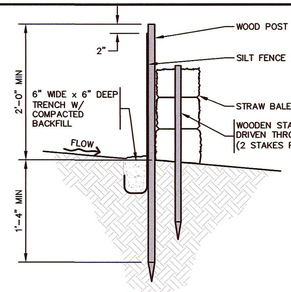

NOTES:
[1] WOOD POSTS SHALL BE 2-INCH BY 2-INCH HARDWOOD OF SOUND QUALITY WITH A MINIMUM LENGTH OF 36-INCHES.
[2] BALES SHALL BUTT TOGETHER TO FORM A CONTINUOUS BARRIER.
[3] INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
[4] TRAPPED SEDIMENT SHALL BE REMOVED TO A NON-SENSITIVE UPLAND AREA.

SILT FENCE +STRAW BALE BARRIER
TYPICAL CROSS SECTION
NOT TO SCALE

ABBREVIATIONS

EL	ELEVATION	HDPE	HIGH DENSITY POLYETHYLENE
INV	INVERT	PVC	POLYVINYL CHLORIDE
SF	SQUARE FEET	RCP	REINFORCED CONCRETE PIPE
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LEGEND

EXISTING		PROPOSED
100	ELEVATION CONTOUR	100
X100.0	SPOT GRADE	100.0 FG
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	GRANITE CURBING	
	GRAVEL/DIRT ROAD	
	STOCKADE FENCE	
	STONE WALL	
W	WATER MAIN	W
WS	WATER SERVICE	WS
FS	FIRE SERVICE	FS
WV	WATER VALVE	WV
	FIRE HYDRANT	
FM	FORCE MAIN	FM
SS	GRAVITY SEWER LINE	SS
S	SEWER MANHOLE	SMH
G	GAS LINE	
GS	GAS SERVICE	GS
GV	GAS VALVE	
E	BURIED POWER LINE	E
OHW	OVERHEAD POWER LINE	OHW
	UTILITY POLE	
	GUY WIRE	
E	ELECTRIC BOX	E
SD	STORM DRAIN	SD
UD	UNDERDRAIN	UD
RD	ROOF DRAIN	RD
FD	FOUNDATION DRAIN	FD
CB	CATCH BASIN	
DMH	DRAIN MANHOLE	
	SILT FENCE BARRIER	
	STRAW BALES	
199-1	DEEP SOIL OBSERVATION HOLE	
	SITE LUMINAIRE	
	SIGN	
	SURFACE RUNOFF DIRECTION	
	STONE BOUND	
	DRILL HOLE	
	IRON ROD	

GENERAL SEQUENCE OF CONSTRUCTION

1. ESTABLISH LIMIT OF WORK BY INSTALLING PERIMETER STRAW BALES AND ORANGE CONSTRUCTION SAFETY FENCING AS SHOWN ON THIS SHEET. INSTALL CONSTRUCTION ENTRANCE PLACED AT THE PROPOSED DRIVEWAY ENTRANCE INTERSECTION WITH SHAW DRIVE AND REQUIRED SIGNS.
2. CONSTRUCT SEDIMENT TRAPS & ADDITIONAL TEMPORARY BARRIERS AS NEEDED AND PLACE OTHER CONTROLS, DIVERSION TRENCHES, PERIMETER DIKES, WATER BARS & OUTLET PROTECTION.
3. ESTABLISH STOCKPILE AND STAGING AREAS.
4. CUT TREES AND SHRUBS AND REMOVE FROM SITE OR STOCKPILE AND PROTECT STOCKPILE(S) BY APPROVED METHODS.
5. TREE ROOTS MUST BE CUT CLEANLY. PRESERVATION OF TREES MUST BE DONE FROM THE DRIP LINE TO THE MAXIMUM EXTENT PRACTICABLE.
6. EXCAVATE STUMPS AND REMOVE FROM SITE OR TEMPORARILY STOCKPILE AND PROTECT STOCKPILE(S) BY APPROVED METHODS UNTIL STUMPS CAN BE PERMANENTLY REMOVED FROM THE SITE.
7. BEGIN EARTHWORKS, ESTABLISH, STABILIZE AND PROTECT CUT AND FILL SLOPES.
8. INSTALL PERMANENT DRAINAGE SYSTEM. INFILTRATION CHAMBERS SHALL NOT BE USED, AND NO DISCHARGES INTO OR FROM THE INFILTRATION AREAS SHALL BE PERMITTED UNTIL ALL CONSTRUCTION HAS BEEN COMPLETED AND ALL DISTURBED AREAS ARE STABILIZED.
9. STABILIZE ALL OTHER AREAS DISTURBED FOR THE INSTALLATION OF COMPONENTS OF THE DRAINAGE SYSTEM.
10. BEGIN INSTALLATION OF OTHER UTILITIES. ESTABLISH COVER, STABILIZE AND PROTECT AREAS DISTURBED FOR UTILITY INSTALLATION.
11. INSTALL PAVEMENTS, CURBING, ROAD AND DRIVEWAY SURFACES.
12. PERFORM SITE WORK IN ACCORDANCE WITH "EROSION AND SEDIMENT CONTROL REQUIREMENTS, PART 3 – EXECUTION".
13. VERIFY ALL AREAS HAVE BEEN STABILIZED, RE-SEED EXPOSED SOILS.
14. CLEAN INFILTRATION AREAS, CLEAN CATCH BASINS AND STORM DRAINS. REMOVE COLLECTED DEBRIS AND SEDIMENTS FROM SITE. DRAINAGE COMPONENTS DISCHARGING INTO INFILTRATION CHAMBER AREAS SHALL BE UNCAPPED/UNPLUGGED.
15. REMOVE ALL EROSION CONTROLS, LIMIT OF WORK BARRIERS, FENCES, CONSTRUCTION ENTRANCES, SIGNS AND SWEEP PAVED AREAS.

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 INCH = 40 FEET

APPROVED BY THE
WAYLAND PLANNING BOARD

_____ CHAIR
_____ APPLICATION FILED 7.26.19
_____ HEARING DATE _____
_____ PLAN APPROVED 9.15.20
12-11-2020

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION
■ PERMIT ☐ CONSTRUCTION RECORD

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COMMONWEALTH OF MASSACHUSETTS
NICHOLAS M. PAULING
CIVIL
No. 47334
REGISTERED PROFESSIONAL ENGINEER
11/30/2020

PER 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEER'S RESPONSIBILITY: ALL BOUNDARY INFORMATION; LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES; DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE GENERAL NOTE #19.

NO.	DATE	BY	APP.	REVISION DESCRIPTION
2	11/30/20	LT/KFB	KFB	DRIVEWAY TURNAROUND REVISION
1	7/14/20	LT/KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

GPR Engineering Solutions for Land & Structures
GOLDSMITH, PREST & RINGWALL, INC.
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CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING
VOICE: 978.772.1590 FAX: 978.772.1591
www.gpr-inc.com

RESIDENTIAL SUBDIVISION DEFINITIVE PLAN

SITE STABILIZATION PLAN

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DES. BY: KFB			
CHK. BY: NMP	DATE: JULY 2019	JOB 171053	C4.5

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N/F
BOLIVAR REALTY TRUST
27554/143
ASSESSOR MAP-39
PARCEL ID-10

N/F
JOSHUA D. & KRISTA GREEN
PRATT
48585/395
ASSESSOR MAP-39
PARCEL ID-11

N/F
BROOKS C. & ALICE LAU
KING
62230/20
ASSESSOR MAP-39
PARCEL ID-12

N/F
PHILLIP L. & NORMA L.
RADOFF
52524/366
ASSESSOR MAP-39
PARCEL ID-13

N/F
BRIAN P. & SUZANNE S.
THORNFELDT
59775/88
ASSESSOR MAP-39
PARCEL ID-14

N/F
CATHERINE A. RADMER
31656/389
ASSESSOR MAP-39
PARCEL ID-8

N/F
STEVEN SHOYER
& DEBORAH S. HORWITZ
37669/594
ASSESSOR MAP-39
PARCEL ID-6

N/F
ROBERT L. & CAROL E.
CASTLE
24232/230
ASSESSOR MAP-39
PARCEL ID-15C

N/F
ROBERT L. & CAROL E.
CASTLE
22119/452
ASSESSOR MAP-39
PARCEL ID-15

N/F
ROBERT L. & CAROL E.
CASTLE
24232/230
ASSESSOR MAP-39
PARCEL ID-15B

TREE TO BE REMOVED (TYP.)

WOODLAND PRESERVATION AREA #1

WOODLAND PRESERVATION AREA #2

LIMIT OF TREE CLEARING (TYP.)

25' RIGHT OF WAY "B"
(PLAN 739 OF 1951 & 1166 OF 1950)

DEER RUN

SHAW (PUBLIC 50' WIDE) DRIVE

APPROXIMATE AQUIFER PROTECTION DISTRICT BOUNDARY

REMAINING LAND OF
WILKINSON
7.27± AC
OPEN SPACE PARCEL

REMAINING LAND OF
WILKINSON
7.27± AC
OPEN SPACE PARCEL

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 INCH = 40 FEET

FIVE PATHS DEFINITIVE SUBDIVISION TREE REMOVAL TABULATION SUMMARY

PINE/EVERGREEN	SINGLE	TWIN	TRIPLE	DEAD	TOTALS
10"-11"	35	0	0	2	37
12"-17"	51	1	0	2	54
18"-23"	52	2	0	1	55
24" AND GREATER	25	2	0	2	29
TOTALS	**163**	**5**	**0**	**7**	**175**

DECIDUOUS	SINGLE	TWIN	TRIPLE	DEAD	TOTALS
10"-11"	16	1	0	7	24
12"-17"	42	6	1	2	51
18"-23"	34	2	2	2	40
24" AND GREATER	11	2	1	1	15
TOTALS	103	11	4	12	**130**

TREE REMOVAL TABULATION NOTES

1. TREE DIAMETER SURVEYED AT NORMAL BREAST HEIGHT (DIAMETER BREAST HEIGHT – DBH).
2. TREES 10" DIAMETER AND LARGER TO BE REMOVED ARE SHOWN PER WAYLAND SUBDIVISION RULES AND REGULATIONS.
3. TWIN AND TRIPLE TREE CLUSTERS ARE COUNTED ONLY ONCE IN THE TOTALS.
4. DEAD TREES ARE INCLUDED IN THE TOTALS.

APPROVED BY THE
WAYLAND PLANNING BOARD

_____ CHAIR

_____ APPLICATION FILED 7-26-19

_____ HEARING DATE _____

_____ PLAN APPROVED 9-15-20

12-11-2020

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COMMONWEALTH OF MASSACHUSETTS
NICHOLAS M. PAULING
CIVIL
No. 47414
REGISTERED PROFESSIONAL ENGINEER
11/30/2020

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RESIDENTIAL SUBDIVISION DEFINITIVE PLAN

TREE REMOVAL PLAN

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03068

DES. BY: LT	DATE: JULY 2019	JOB 171053	C4.6
CHK. BY: KFB			

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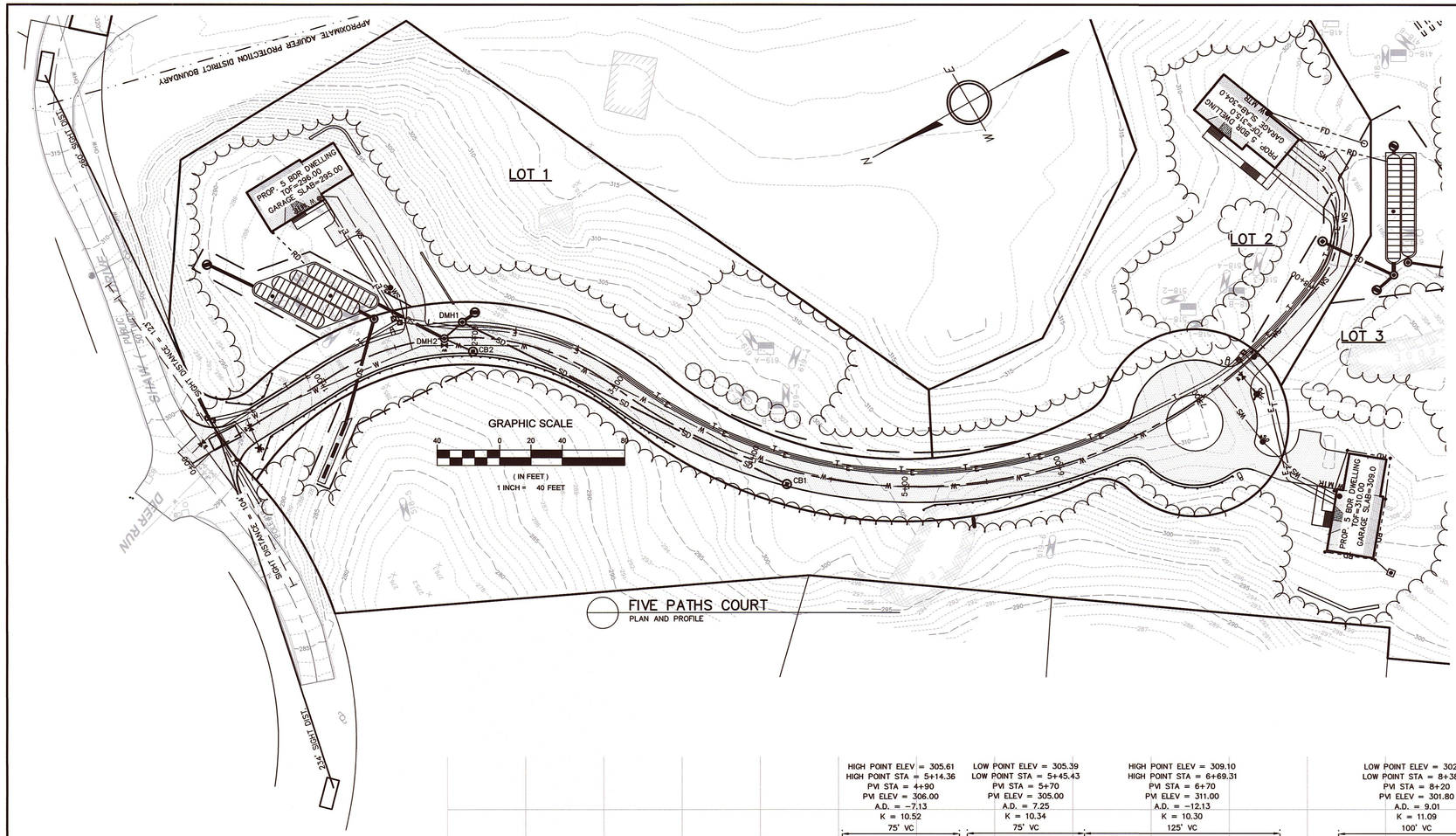
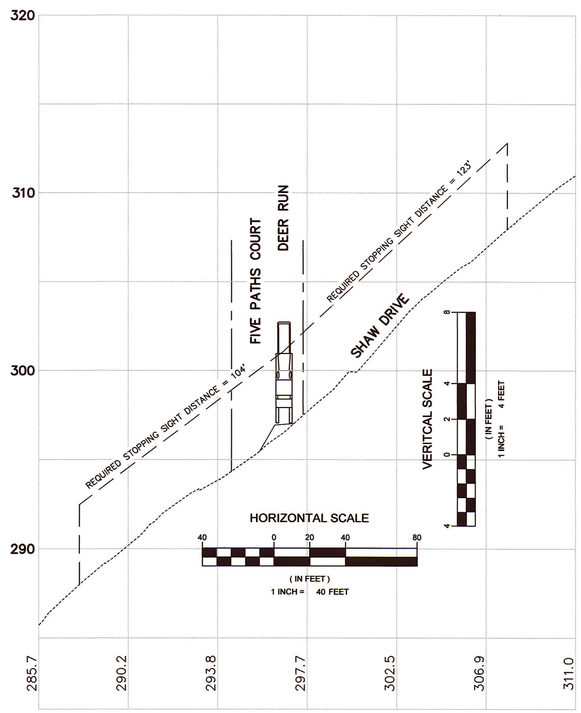
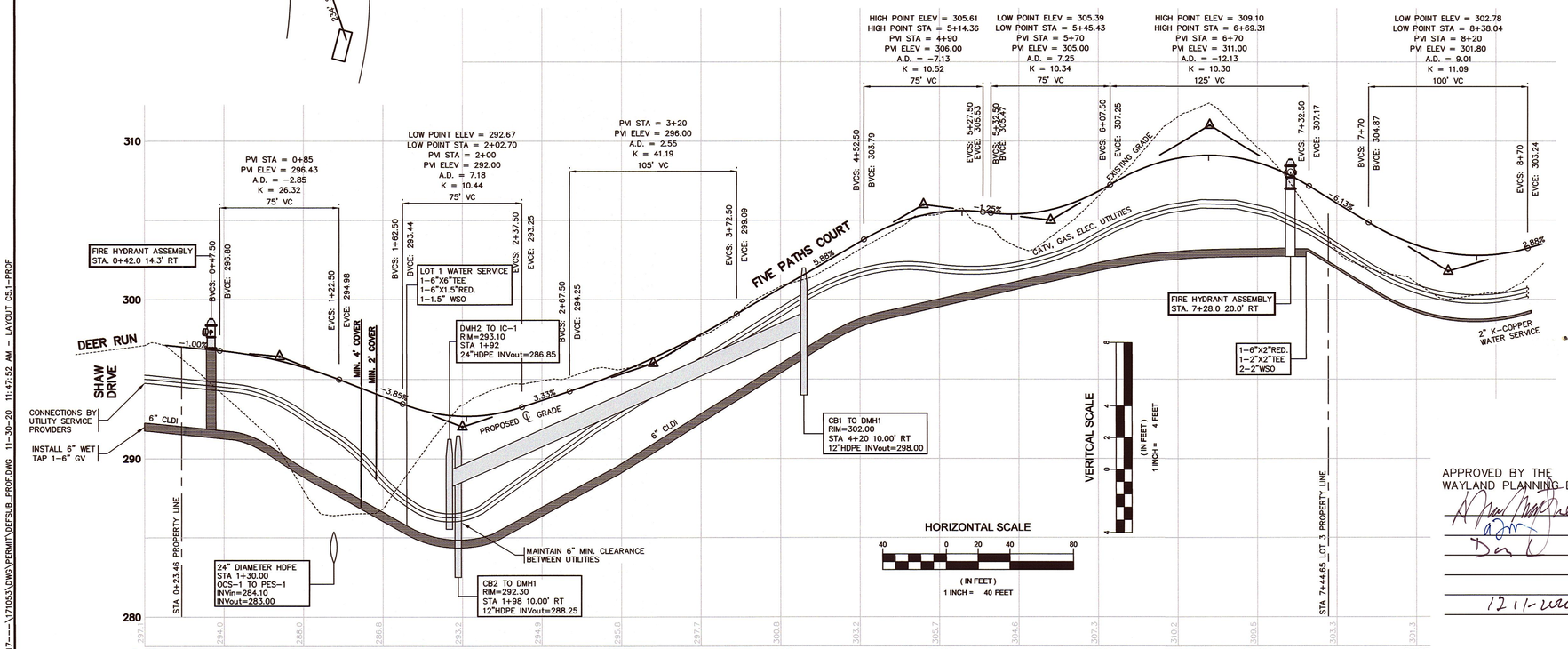




STOPPING SIGHT DISTANCE
PROFILE VIEW



APPROVED BY THE WAYLAND PLANNING BOARD

CHAIR

APPLICATION FILED 9.26.19

HEARING DATE

PLAN APPROVED 9.15.20

12/1/2020

DRAWING ISSUED FOR:

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COMMONWEALTH OF MASSACHUSETTS — NICHOLAS M. PAULING — CIVIL — No. 47114 — REGISTERED PROFESSIONAL ENGINEER

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RESIDENTIAL SUBDIVISION DEFINITIVE PLAN

ROADWAY PLAN AND PROFILE

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE,
ESTATE OF PAULA D. WILKINSON
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WILTON, NH 03086

DES. BY: KFB	DATE: JULY 2019	JOB 171053	C5.1
CHK. BY: KFB			

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EROSION AND SEDIMENT CONTROL REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. FURNISH, INSTALL, AND MAINTAIN TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES, SUCH AS, BUT NOT NECESSARILY LIMITED TO, HAY BALE AND SILT FENCE BARRIERS, RIPRAP, DIVERSION CHANNELS AND BERMS, CHECK DAMS, STRATEGICALLY LOCATED STOCKPILES, SEDIMENT BASINS, MULCH, AND SEED MIX (HEREINAFTER "CONTROL MEASURES") ADEQUATE TO PREVENT THE CONVEYANCE OF EROSION PRODUCTS (E.G. SOIL, MULCH, SOD) OFF SITE, OR INTO ENVIRONMENTALLY SENSITIVE AREAS, OR INTO AREAS WHERE WORK WILL BE ADVERSELY IMPACTED. ENVIRONMENTALLY SENSITIVE AREAS INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, WETLANDS, TRIBUTARIES TO WETLANDS, WETLAND BUFFER ZONES, INTERMITTENT AND PERENNIAL STREAMS / RIVERS, AND THEIR ATTENDANT BUFFER ZONES.

1. REFER TO DRAWINGS FOR LOCATION AND DETAILS OF CONTROL MEASURES REQUIRED TO COMMENCE WORK. THESE CONTROL MEASURES WILL BE ADEQUATE ONLY FOR VEGETATION CLEARING. THE DRAWINGS ARE NOT INTENDED TO GRAPHICALLY DEPICT ALL CONTROL MEASURES THAT WILL BE REQUIRED TO MEET THE REQUIREMENTS DESCRIBED IN 1.01.A.
2. DEVISE AND EMPLOY CONTROL MEASURES THROUGHOUT THE DURATION OF PROJECT, OVER ALL AREAS DISTURBED OR UNDISTURBED BY CONSTRUCTION, AS NECESSARY TO MEET THE REQUIREMENTS DESCRIBED IN 1.01.A.
3. DEVISE AND EMPLOY TEMPORARY CONTROL MEASURES AS NECESSARY TO MEET THE REQUIREMENTS DESCRIBED IN 1.01.A, WHILE ALLOWING WORK TO PROCEED IN AN EFFICIENT, COST EFFECTIVE MANNER.
4. DEVISE, EMPLOY AND MAINTAIN CONTROL MEASURES UNTIL SUCH TIME AS THE ENTIRE SITE IS PERMANENTLY STABILIZED BY ESTABLISHED VEGETATION, FINISH LANDSCAPE MATERIALS, PAVED SURFACES, AND/OR ROOF AREA.
5. ONCE THE SITE IS PERMANENTLY STABILIZED AND CERTIFIED AS SUCH BY ENGINEER, REMOVE TEMPORARY CONTROL MEASURES WHILE PROTECTING STABILIZED SURFACES.

1.02 SUBMITTALS

A. SUBMIT PRODUCT DATA, WARRANTY, AND TEST REPORTS AS INDICATED ON THE DRAWINGS.

1.03 QUALITY ASSURANCE

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS FROM ACCEPTABLE MANUFACTURERS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. CONFORM TO CONDITIONS OF APPROVAL ISSUED BY REGULATORY AGENCIES INCLUDING, BUT NOT NECESSARILY LIMITED TO, LOCAL PLANNING BOARD, CONSERVATION COMMISSION, BOARD OF SELECTMEN, BOARD OF HEALTH, PUBLIC WORKS / HIGHWAY DEPARTMENT, STATE ENVIRONMENTAL PROTECTION DEPARTMENT, AND U.S. GOVERNMENT, ENVIRONMENTAL PROTECTION AGENCY. WHERE CONDITIONS OF REGULATORY APPROVAL DIFFER FROM REQUIREMENTS CONTAINED HEREIN OR ON THE DRAWINGS, COMPLY WITH THE MORE STRINGENT REQUIREMENT.

PART 2 – PRODUCTS

2.01 MATERIALS

A. STRAW BALES: DRY GRASS OR STRAW, MACHINE BOUND WITH JUTE OR WIRE, APPROXIMATE SIZE EACH BALE 42" X 16" X 16".

B. SILT FENCE: NON–WOVEN, UV–RESISTANT, POLYPROPYLENE FABRIC, FLOW RATED AT 10 GPM/SF MINIMUM, GRAB TENSILE RATED AT 124 POUNDS MINIMUM, WITH INTEGRAL STAKE LOOPS, AND HARDWOOD STAKES. USE NO. 2130 BY AMOCO FABRICS & FIBERS, OR APPROVED EQUAL.

C. STRAW WATTLES: 100% WHEAT STRAW WITH NATURAL BIO–DEGRADABLE JUTE NETTING. MINIMUM 9–INCH DIAMETER AND 10 FEET LONG. USE DIAMETER 12–INCH OR 20–INCH DIAMETER WATTLES TO PROTECT LARGER UNSTABLE AREAS.

D. MULCH: ORGANICS INCLUDING HAY, PROCESSED PINE / HEMLOCK TWIGS AND NEEDLES.

E. SEED MIXES: PERENNIAL RYEGRASS, KENTUCKY BLUEGRASS, AND / OR FINE FESCUE, DISEASE RESISTANT. NON–MAINTAINED AREA OPTION – ANNUAL RYEGRASS COMBINED WITH MEDIUM RED CLOVER.

F. EXCELSIOR BLANKET: CURLED WOOD FIBER ON PHOTODEGRADABLE EXTRUDED PLASTIC MATRIX, 80% OF FIBERS 6–INCHES LONG OR LONGER, WEIGHT 0.975 POUNDS / SY, CONTAINING NO CHEMICAL ADDITIVES. USE CURLEX I BLANKET BY AMERICAN EXCELSIOR COMPANY, OR APPROVED EQUAL.

G. ROCK RIPRAP: SOUND, ANGULAR, 6–INCH MINUS PROCESSED ROCK, BLAST ROCK, OR TAILINGS.

G. CRUSHED STONE: SOUND, ANGULAR, 2–INCH MINUS PROCESSED CRUSHED STONE

PART 3 – EXECUTION

3.01 THROUGHOUT CONSTRUCTION

A. DEVISE WORK SEQUENCE SO AS TO LIMIT DRAINAGE AREA THAT IS TRIBUTARY TO DISTURBED AREAS. DEVISE, EMPLOY, AND MAINTAIN CONTROL MEASURES SUCH AS DIVERSION CHANNELS AND BERMS, STRATEGICALLY LOCATED STOCKPILES, AND SEDIMENT BASINS TO SUBDIVIDE DRAINAGE AREAS INTO SMALL, MANAGEABLE SUBAREAS, THEREBY MINIMIZING RUNOFF AND THE POTENTIAL FOR EROSION.

B. MAINTAIN BARRIER AT LIMIT OF WORK AND PROTECT EXISTING VEGETATION / FACILITIES OUTSIDE OF LIMIT OF WORK.

C. MAINTAIN SPARE MATERIAL STOCKPILES FOR IMMEDIATE EMPLOYMENT / REPAIR / EXPANSION OF CONTROL MEASURES. AT A MINIMUM, SUCH MATERIALS SHALL INCLUDE HAY BALES, SILT FENCE AND STAKES, AND CRUSHED STONE.

D. INSPECT AND MAINTAIN EFFECTIVENESS OF CONTROL MEASURES BY REPAIRING AS NECESSARY TO ENSURE INTENDED FUNCTION; BY SUPPLEMENTING AS NECESSARY FOR ADEQUATE EXTENT; BY REMOVING TRAPPED PRODUCTS OF EROSION AS NECESSARY TO MAINTAIN EFFECTIVE TRAP VOLUME.

E. LIMIT EXTENT OF WORK AREA SO THAT ALL DISTURBED AREAS CAN BE STABILIZED WITH CONTROL MEASURES WITHIN A 24–HOUR PERIOD.

F. INSTALL CONTROL MEASURES AS SOON AS PRACTICABLE AFTER EACH MANAGEABLE PORTION OF EARTHWORK IS COMPLETE. EMPLOY TEMPORARY MEASURES AS NECESSARY TO STABILIZE DISTURBED AREAS, EVEN WHERE SUBSEQUENT CONSTRUCTION OPERATIONS MAY REQUIRE RE–DISTURBANCE.

G. WHEN INTENSE RAINFALL IS EXPECTED, CONSIDER, DEVISE, AND EMPLOY REINFORCING CONTROL MEASURES PRIOR TO THE RAINFALL EVENT TO MEET THE REQUIREMENTS DESCRIBED IN 1.01.A. IF NECESSARY, EMPLOY TEMPORARY CONTROL MEASURES ON MATERIAL STOCKPILES TO COUNTERACT POTENTIAL SEDIMENT TRANSPORT DURING INTENSE RAINFALL.

H. WHEN VEHICLE REFUELING IS REQUIRED ON SITE, CONDUCT REFUELING OPERATIONS OUTSIDE OF ENVIRONMENTALLY SENSITIVE AREAS.

I. PROPERLY DISPOSE OF DEBRIS, SOLID WASTE, TRASH, AND CONSTRUCTION WASTE / BYPRODUCTS OFF SITE.

J. SWEEP ON–SITE PAVED AREAS AND OFF–SITE STREETS AS NECESSARY TO PREVENT SILT AND DEBRIS ORIGINATING ON SITE FROM ENTERING CLOSED DRAINAGE SYSTEMS AND / OR ENVIRONMENTALLY SENSITIVE AREAS.

3.02 SITE PREPARATION AND ACCESS

A. WALK SITE AND IDENTIFY LOCATIONS OF LIMIT OF WORK AND ENVIRONMENTALLY SENSITIVE AREAS. ESTABLISH CONSTRUCTION STAGING AREA, LOCATED BEYOND ENVIRONMENTALLY SENSITIVE AREAS.

B. INSTALL CONTROL MEASURES AS SHOWN ON THE DRAWINGS, INCLUDING THOSE DEFINING THE LIMIT OF WORK.

C. LIMIT VEHICULAR TRAFFIC TO AND FROM SITE TO MINIMIZE TRANSPORT OF SEDIMENT.

3.03 CLEARING, GRUBBING, AND STRIPPING

A. SCHEDULE GRUBBING AND STRIPPING TO OCCUR IMMEDIATELY PRIOR TO EARTH DISTURBANCE, DEPENDING ON SITE AREA, CONSIDER MULTIPLE GRUBBING PHASES, SEQUENCED TO TAKE ADVANTAGE OF THE EROSION PREVENTION POTENTIAL OF EXISTING VEGETATIVE COVER.

B. MINIMIZE THE AREA OF EXISTING VEGETATION REMOVED WHEREVER POSSIBLE.

C. LOCATE AND SIZE STOCKPILES TO MINIMIZE EROSION POTENTIAL, TAKING ADVANTAGE OF TERRAIN SLOPE AND ASPECT, WHERE APPROPRIATE.

D. PROTECT VEGETATION, INCLUDING ROOT SYSTEMS, BEYOND LIMIT OF CLEARING.

E. PROCESS TIMBER, STUMPS, SLASH, AND BRUSH SO AS TO PROTECT ENVIRONMENTALLY SENSITIVE AREAS AND INSTALLED CONTROL MEASURES. PROPERLY DISPOSE OF EXCESS OFF SITE. BURIAL OF STUMPS ON SITE IS PROHIBITED.

3.04 EXCAVATION FOR BUILDING FOUNDATIONS AND UTILITIES

A. DEVISE AND INSTALL CONTROL MEASURES ADEQUATE TO HANDLE DISCHARGES AND TRAP SEDIMENT FROM FOOTING SUMP AND WELL POINT PUMPS PRIOR TO EXCAVATION.

B. ARMOR SUMP PUMP DISCHARGE LOCATIONS TO PREVENT EROSION AT POINT OF DISCHARGE AND AREAS DOWNSTREAM.

C. IF FOUNDATION EXCAVATIONS GRADE TO DAYLIGHT ON THE LOW SIDE, DEVISE AND INSTALL CONTROL MEASURES TO HANDLE SURFACE AND GROUNDWATER FLOW FROM EXCAVATION LOW POINT.

D. STOCKPILE EXCAVATED MATERIALS TO BAFFLE OVERLAND RUNOFF, AVOIDING THE CREATION OF LENGTHY PATHS OF CONCENTRATED RUNOFF.

E. BACKFILL UTILITY TRENCHES AS SOON AS PRACTICABLE TO PREVENT FLOODING, SLOUGHING, POTENTIAL OVERFLOW, AND REPETITIVE EARTH DISTURBANCE.

3.05 SITE GRADING

A. WHERE APPLICABLE, FOLLOW EXCAVATION AND FILL PRACTICES SHOWN ON DRAWINGS TO LOCALIZE AND MINIMIZE EROSION.

B. MONITOR SEDIMENT VOLUME IN TEMPORARY SEDIMENT BASINS AND AT DIVERSION BERMS AND CHECK DAMS. IN ALL AREAS EXCEPT THOSE THAT DO NOT PRESENT POTENTIAL PROBLEMS WITH REGARD TO FUTURE SOIL STABILITY, DRAINAGE, OR BEARING CAPACITY, REMOVE AND PROPERLY DISPOSE OF TRAPPED SEDIMENT BEFORE BRINGING SITE TO FINAL SUBGRADE.

3.06 STORMWATER MANAGEMENT SYSTEM

A. THE STORMWATER MANAGEMENT SYSTEM INCLUDES, BUT IS NOT NECESSARILY LIMITED TO, ALL PERMANENT DETENTION / RETENTION BASINS, DISCHARGE STRUCTURES / WEIRS, CULVERTS, OPEN CHANNELS, CURBS, GUTTERS, PAVED SWALES, CATCH BASINS, DRAIN MANHOLES, DRAINAGE PIPES, ROOF DRAIN MANIFOLDS, WATER QUALITY SWALES, SEPARATORS, AND SIMILAR STORMWATER RUNOFF CONVEYANCE, TREATMENT, AND STORAGE FACILITIES.

B. INSTALL STORMWATER MANAGEMENT SYSTEM COMPONENTS STARTING AT THE DOWNSTREAM END AND PROCEED UPSTREAM. WHERE POSSIBLE, COMPLETE INSTALLATION OF PERMANENT DETENTION / RETENTION BASINS PRIOR TO BEGINNING WORK ON UPSTREAM SYSTEM COMPONENTS.

C. INSTALL CONTROL MEASURES AT FINISHED UPSTREAM AND DOWNSTREAM PIPE ENDS AS SOON AS POSSIBLE AFTER COMPLETION OF PIPE RUN. SUCH MEASURES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, RIPRAP, CHECK DAMS, HAY BALE / SILT FENCE BARRIERS, AND VELOCITY DISSIPATORS.

D. AT THE END OF EACH DAY OR WHEN RAINFALL IS EXPECTED, PLUG UPSTREAM END OF PIPES / DAM OPEN CHANNELS OR OTHERWISE REDIRECT POTENTIAL RUNOFF AND PREVENT FLOW FROM ENTERING PARTIALLY COMPLETED SYSTEM / SYSTEM COMPONENTS.

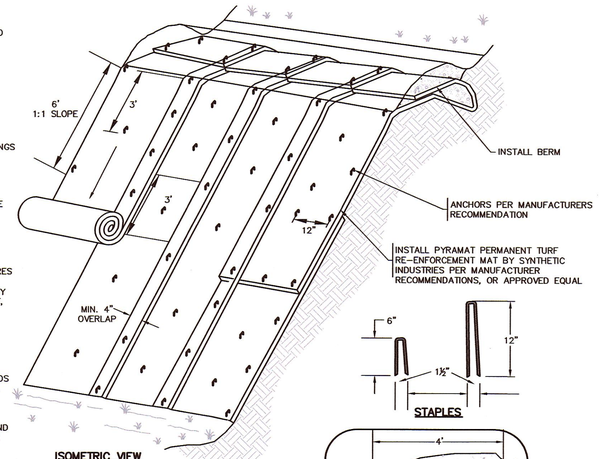
E. WHERE PORTIONS OF A NEW SYSTEM ARE TO BE ACTIVATED PRIOR TO COMPLETION OF THE ENTIRE SYSTEM, EMPLOY CONTROL MEASURES TO PREVENT SILT AND DEBRIS FROM ENTERING THE SYSTEM. EMPLOY SILT SACKS OR FABRIC ON CATCH BASIN INLETS, AND PIPE AND CULVERT OPENINGS. EMPLOY CHECK DAMS AND TEMPORARY SEDIMENT BASINS UPSTREAM OF AND ALONG OPEN CHANNELS, SWALES, AND DITCHES TO TRAP SEDIMENT UPGRADIENT OF ENVIRONMENTALLY SENSITIVE AREAS.

F. REMOVE TRAPPED SEDIMENT AND DEBRIS FROM ALL SYSTEM COMPONENTS AFTER COMPLETION OF INSTALLATION, AND AGAIN AFTER THE ENTIRE SITE IS PERMANENTLY STABILIZED BY ESTABLISHED VEGETATION, FINISH LANDSCAPE MATERIALS, PAVED SURFACES, AND/OR ROOF AREA. REMOVE TRAPPED SEDIMENT AND DEBRIS FROM DETENTION / RETENTION BASIN BOTTOMS SO THAT FINISH BOTTOM MATERIALS / INFILTRATION FUNCTION CONFORM TO DESIGN.

3.07 LANDSCAPING

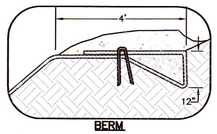
A. COMPLETE LANDSCAPING AS SOON AS POSSIBLE AFTER COMPLETION OF FINAL SUBGRADE.

B. IMMEDIATELY AFTER PLACEMENT OF TOPSOIL, STABILIZE WITH CONTROL MEASURES INCLUDING, BUT NOT NECESSARILY LIMITED TO, SEED MIX, MULCH, AND / OR BLANKET.



ISOMETRIC VIEW

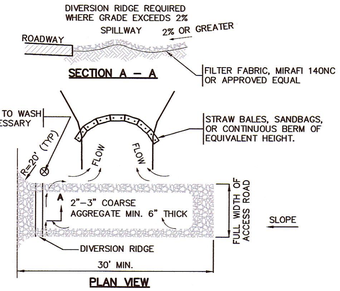
STAPLES



BERM

NOTES:
[1] SLOPE SURFACE SHALL BE FREE OF ROCK, CLODS, STICKS AND GRASS, MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT
[2] APPLY PERMANENT SEEDING PER MHD M6.03.1 EROSION SEED PRIOR TO PLACING MATS.
[3] LAY MATS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH
[4] MATS/BLANKETS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE
[5] TAMP SOIL OVER MAT/BLANKET

TURF REINFORCEMENT MAT
NOT TO SCALE

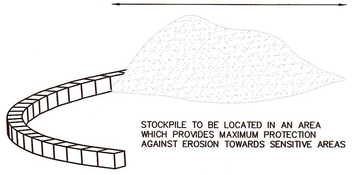


SECTION A – A

PLAN VIEW

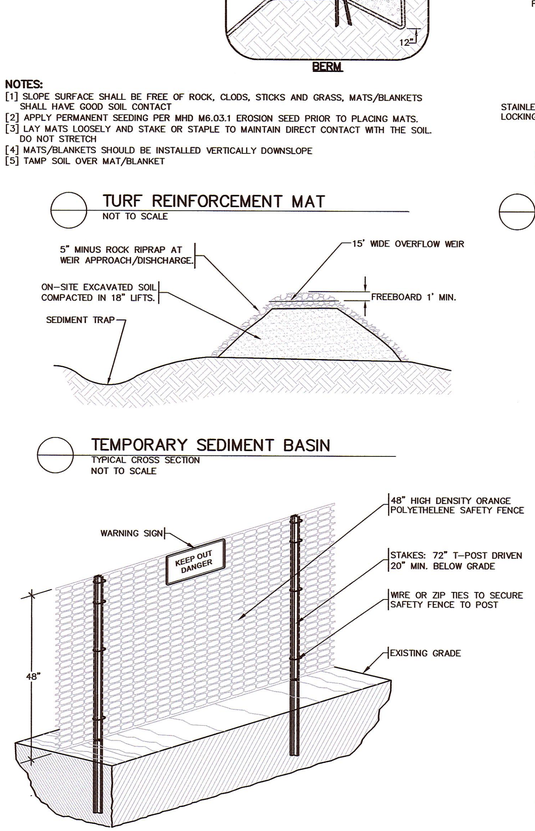
NOTES:
[1] THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
[2] WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.
[3] WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
[4] USE SANDBAGS, HAY BALES OR OTHER APPROVED METHODS TO CHANNELIZE RUNOFF TO BASIN AS REQUIRED.

CONSTRUCTION ENTRANCE
NOT TO SCALE



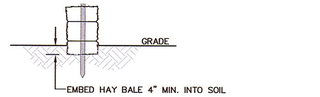
TEMPORARY STOCKPILE
ISOMETRIC VIEW
NOT TO SCALE

TEMPORARY SEDIMENT BASIN
TYPICAL CROSS SECTION
NOT TO SCALE

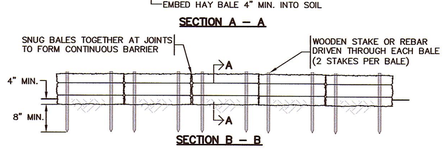


[1] ALL ACTIVE CONSTRUCTION AREAS SHALL BE PROTECTED AS PER PLAN.
[2] SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE T–POSTS.
[3] THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.
[4] "DANGER KEEP OUT" SIGNS TO BE SPACED AT 100 FT INTERVALS.

ORANGE CONSTRUCTION SAFETY FENCE
TYPICAL CROSS SECTION
NOT TO SCALE



SECTION A – A

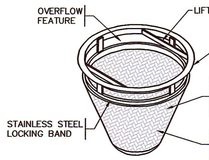


SECTION B – B

PLAN VIEW

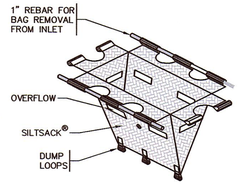
NOTES:
[1] INSPECT AND REPAIR BARRIER AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
[2] REMOVED SEDIMENT SHALL BE DEPOSITED TO NON–SENSITIVE UPLAND AREA.

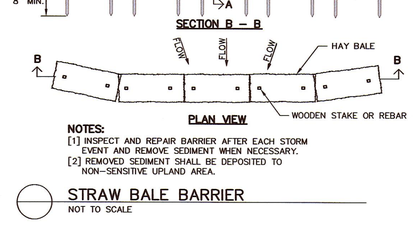
STRAW BALE BARRIER
NOT TO SCALE



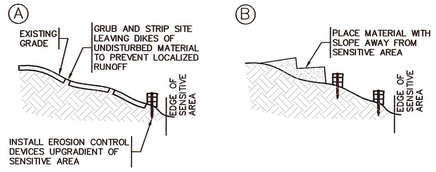
NOTES:
[1] CLEAN INLET PROTECTION WHEN 30% FULL
[2] BURLAP IS NOT AN ACCEPTABLE GEOTEXTILE

INLET PROTECTION
TYPICAL CROSS SECTION
NOT TO SCALE

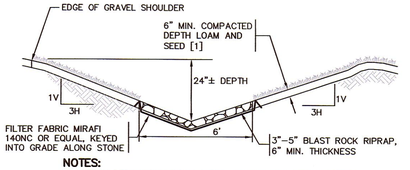




EXCAVATION PROCEDURE
TYPICAL CROSS SECTION
NOT TO SCALE

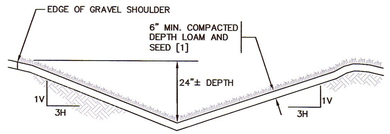


FILL PROCEDURE
SLOPE PROFILES
NOT TO SCALE



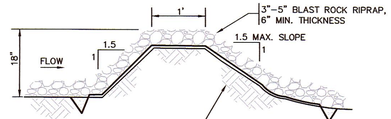
NOTES:
[1] APPLY PERMANENT SEEDING PER MHD M6.03.1 EROSION SEED

ARMORED DRAINAGE CHANNEL
TYPICAL CROSS SECTION
NOT TO SCALE



NOTES:
[1] APPLY PERMANENT SEEDING PER MHD M6.03.1 EROSION SEED

GRASSED DRAINAGE CHANNEL
TYPICAL CROSS SECTION
NOT TO SCALE



CHECK DAM
TYPICAL CROSS SECTION
NOT TO SCALE

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION
■ PERMIT ☐ CONSTRUCTION RECORD

THIS DRAWING MAY NOT SHOW CONSTRUCTION DETAILS AND SPECIFICATIONS FOR ALL PROPOSED IMPROVEMENTS, AND MAY NOT IDENTIFY ALL CONSTRUCTION WORK ITEMS/AREAS OF CONTRACTOR JURISDICTION.

PER 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEER'S RESPONSIBILITY: ALL BOUNDARY INFORMATION; LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES; DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE GENERAL NOTE #19.

NO.	DATE	BY	APP.	REVISION DESCRIPTION
2	11/30/20	---	---	NO CHANGES ON THIS SHEET
1	7/14/20	LT./KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

COMMONWEALTH OF MASSACHUSETTS
NICHOLAS M. PAULING
CIVIL
No. 47114
REGISTERED PROFESSIONAL ENGINEER

GPR Engineering Solutions for Land & Structures

GOLDSMITH, PREST & RINGWALL, INC.
39 MAIN STREET, SUITE 301. AYER, MA 01432
CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING
VOICE: 978.772.1590 FAX: 978.772.1591
www.gpr-inc.com

RESIDENTIAL SUBDIVISION
DEFINITIVE PLAN

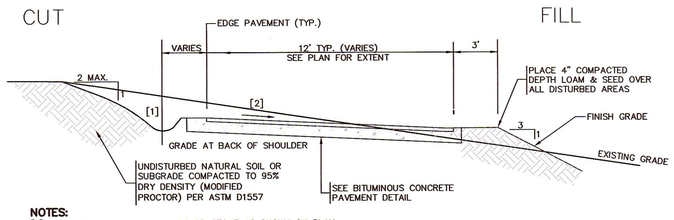
EROSION AND SEDIMENT CONTROL PLAN

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

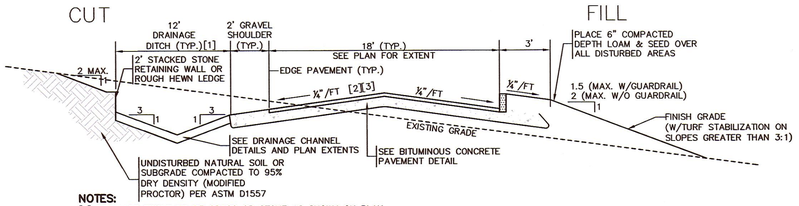
DES. BY: MPB	DATE: JULY 2019	JOB 171053	C6.1
CHK. BY: KFB			

P:\17----\171053\DWG\PERMIT\DESUB_CD.DWG 11-30-20 10:38:22 AM - LAYOUT C6.1-ESC



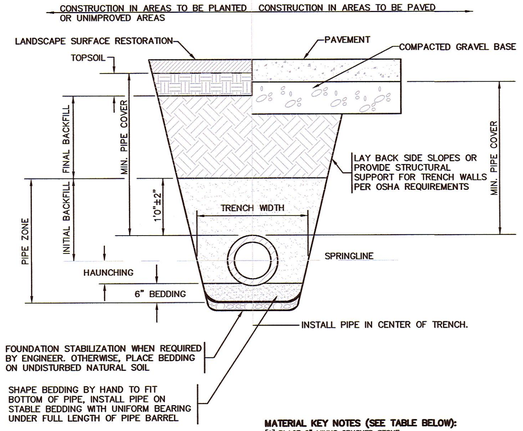
NOTES:
[1] DRAINAGE SWALE TO BE GRASS OR STONE AS SHOWN ON PLAN.
[2] DRIVEWAY TO BE CROSS-SLOPED AT 2% MIN. (5% MAX.) SWALE NOT INTENDED TO CONVEY PAVEMENT STORMWATER RUNOFF.

DRIVEWAY
TYPICAL CROSS SECTION
NOT TO SCALE



NOTES:
[1] DRAINAGE SWALE TO BE GRASS OR STONE AS SHOWN ON PLAN.
[2] DRIVEWAY TO BE CROWNED AT ⅜"/FT WHERE CROSS-SLOPE OF SURROUNDING EXISTING GRADE EXCEEDS 7%. OTHERWISE, DRIVEWAY MAY BE SUPERELEVATED PARALLEL TO NATURAL SLOPE AT ⅜" /FT ACROSS FULL WIDTH OF DRIVE.
[3] DRIVEWAY IS SUPERELEVATED FROM SHAW DRIVE TO STA. 1+80 AND TRANSITIONS TO CROWN BY STA. 2+25.

COMMON DRIVEWAY
TYPICAL CROSS SECTION
NOT TO SCALE



TRENCH WIDTH:
[1] MINIMUM WIDTH OF TRENCH MEASURED AT SPRINGLINE OF PIPE, INCLUDING ANY NECESSARY SHEATHING:

PIPE I.D.	WIDTH
LESS THAN 21"	O.D. + 12"
21" TO 42"	O.D. + 24"
GREATER THEN 42"	O.D. + 30"

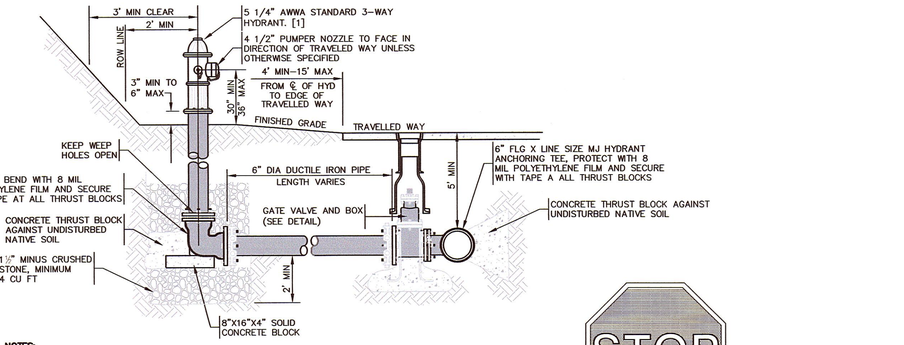
MINIMUM PIPE COVER:
[1] MINIMUM SOIL COVER OVER TOP OF PIPE.

PIPE MATERIAL	HDPE, PVC	RC, DI
WATER	5' – 0"	5' – 0"
SEWER	4' – 0"	4' – 0"
DRAIN	2' – 0"	1' –0"

MATERIAL KEY NOTES (SEE TABLE BELOW):
[1] PLACE 2" MINUS CRUSHED STONE.
[2] PLACE 1/2" MINUS SAND BORROW (MHD M1.04.1), AT OPTIMUM MOISTURE IN HORIZONTAL 8" DEEP LOOSE LAYERS, COMPACT TO 95% PER ASTM D-1557 MODIFIED PROCTOR METHOD.
[3] IN PLANTED OR UNIMPROVED AREAS, USE 2-INCH MINUS ON-SITE EXCAVATED MATERIAL. COMPACT TO 80% PER ASTM D-1557. IN PAVED AREAS, OBTAIN ENGINEER APPROVAL OF 2-INCH MINUS ON-SITE EXCAVATED MATERIALS.

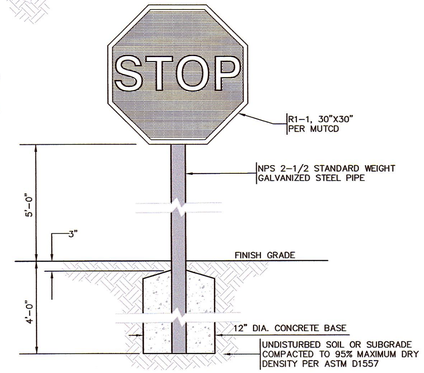
FOUNDATION, BEDDING AND BACKFILL MATERIALS		
PIPE MATERIAL	HDP, PVC	RC, DI
FOUNDATION STABILIZATION	[NOTE 1]	[NOTE 1]
BEDDING	[NOTE 2]	[NOTE 2]
HAUNCHING	[NOTE 2]	[NOTE 2]
INITIAL BACKFILL	[NOTE 2]	[NOTE 2]
FINAL BACKFILL	[NOTE 3]	[NOTE 3]

PIPE TRENCH
TYPICAL CROSS SECTION
NOT TO SCALE

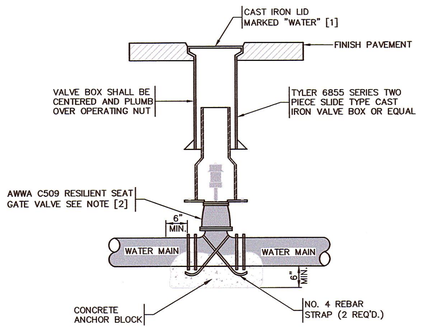


NOTES:
[1] HYDRANT SHALL MEET ALL TOWN AND AWWA STANDARDS AND BE UL/FM APPROVED AND EQUIPPED WITH (1) 4 1/2" PUMPER NOZZLE AND (2) 2 1/2" HOSE NOZZLES.
[2] HYDRANT SHALL OPEN IN DIRECTION AS SPECIFIED BY THE LOCAL FIRE DEPARTMENT.
[3] WHERE HYDRANT IS SHOWN BEHIND SIDEWALK, SET CENTER OF HYDRANT 2-FEET BEHIND SIDEWALK.

FIRE HYDRANT ASSEMBLY
TYPICAL CROSS SECTION
NOT TO SCALE

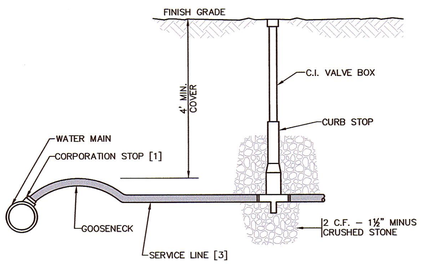


STOP SIGN
NOT TO SCALE



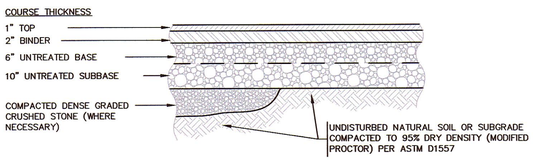
NOTES:
[1] SET LID AND CONCRETE COLLAR 1/4" TO 1/2" BELOW GRADE IN PAVEMENT OR OTHER AREAS TO BE PLOWED. SET LID 3" ABOVE FINISHED GRADE ELSEWHERE.
[2] VALVE SHALL OPEN IN DIRECTION AS SPECIFIED BY THE LOCAL WATER DEPARTMENT.

GATE VALVE
TYPICAL CROSS SECTION
NOT TO SCALE



NOTES:
[1] WATER SERVICES LARGER THAN 1" ARE TO BE RESTRAINED TO MAIN WITH APPROVED SADDLE.
[2] COORDINATE BUILDING CONNECTION WITH PLUMBING DRAWINGS.
[3] ALL MATERIALS PER MUNICIPAL STANDARDS.

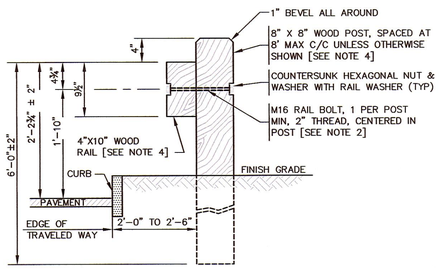
WATER SERVICE
TYPICAL CROSS SECTION
NOT TO SCALE



COURSE	MATERIAL	SPECIFICATION PER MASS HIGHWAY DEPARTMENT (MHD)	MAX AGG. SIZE (INCH)	COMPACTION REQUIREMENTS	
				COMPACTION	TEST DESIGNATION
TOP	BITUMINOUS CONCRETE	M3.11.03 CLASS I, TYPE I–1	1/2	[NOTE 1]	AASHTO–T166
BINDER	BITUMINOUS CONCRETE	M3.11.03 CLASS I, TYPE I–1	3/4	[NOTE 1]	AASHTO–T166
BASE	GRAVEL BORROW	M1.03.0 TYPE C	2	95% [NOTE 3]	ASTM D1557/AASHTO–T99
SUBBASE	GRAVEL BORROW	M1.03.0 TYPE B	3	95% [NOTE 3]	ASTM D1557/AASHTO–T99
SUBGRADE	ORDINARY BORROW	M1.01.0 [SEE NOTE 2]	8	95% [NOTE 3]	ASTM D1557/AASHTO–T99

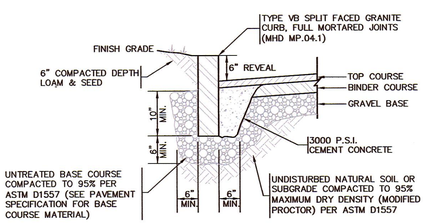
NOTES:
[1] COMPACT TO TEST AVERAGE OF 95%. TEST SHALL NOT BE LOWER THAN 93%.
[2] UNSUITABLE MATERIAL IN THE SUBGRADE SHALL BE REMOVED AND REPLACED WITH AN ACCEPTABLE SUBSTITUTE MATERIAL: 3/4" MINUS DENSE GRADED CRUSHED STONE.
[3] MATERIAL SHALL BE SPREAD AND COMPACTED IN LAYERS NOT EXCEEDING 8-INCHES IN DEPTH, COMPACTED MEASUREMENT; LAST LAYER OF MATERIAL SHALL NOT EXCEED 4-INCHES IN DEPTH, COMPACTED MEASUREMENT.

BITUMINOUS CONCRETE PAVEMENT
TYPICAL CROSS SECTION
NOT TO SCALE



NOTES:
[1] ALL NUTS, BOLTS & WASHERS ARE TO BE HIGH STRENGTH GALVANIZED STEEL.
[2] ALL SPLICES ARE TO BE MADE AT POST; FOUR (4) BOLTS EACH SPLICE.
[3] BACK-UP PLATE IS TO BE PLACED BEHIND RAIL ELEMENTS AT NON SPLICE LOCATIONS (INTERMEDIATE POSTS).
[4] WOOD AND WOOD TREATMENT SHALL COMPLY WITH MASSACHUSETTS HIGHWAY DEPARTMENT SPECIFICATIONS AND STANDARDS.
[5] TERMINAL SECTIONS SHALL BE IN ACCORDANCE WITH MASSACHUSETTS HIGHWAY DEPARTMENT SPECIFICATIONS AND STANDARDS.

WOOD GUARDRAIL
TYPICAL CROSS SECTION
NOT TO SCALE



VERTICAL GRANITE CURB
TYPICAL CROSS SECTION
NOT TO SCALE

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION
■ PERMIT ☐ CONSTRUCTION RECORD

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COMMONWEALTH OF MASSACHUSETTS — NICHOLAS M. PAULING — CIVIL — No. 47114 — REGISTERED PROFESSIONAL ENGINEER — 11/30/2020

PER 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEER'S RESPONSIBILITY: ALL BOUNDARY INFORMATION; LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES; DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE GENERAL NOTE #19.

NO.	DATE	BY	APP.	REVISION DESCRIPTION
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1	7/14/20	LT/KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

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www.gpr-inc.com

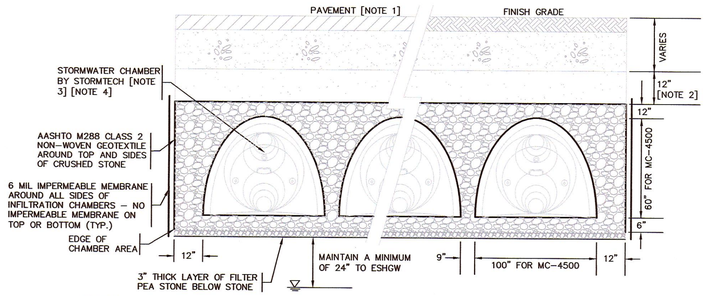
RESIDENTIAL SUBDIVISION DEFINITIVE PLAN

CONSTRUCTION DETAILS

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

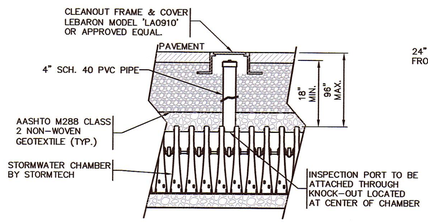
RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DES. BY: MPB	DATE: JULY 2019	JOB 171053	C7.1
CHK. BY: KFB			

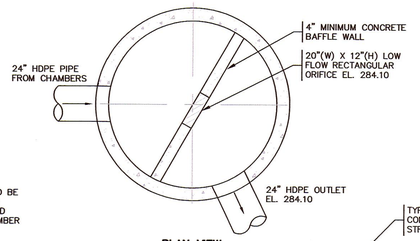


NOTES:
[1] SEE BITUMINOUS CONCRETE PAVEMENT DETAIL FOR MATERIALS AND SPECIFICATIONS
[2] GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES. COMPACT IN 6" LIFTS TO MINIMUM 95% STANDARD PROCTOR DENSITY.
[3] SEE STORMTECH CHAMBER SYSTEMS DESIGN MANUAL FOR MANUFACTURERS SPECIFICATIONS AND MATERIAL SPECIFICATIONS.
[4] ALL CHAMBERS MAY NOT BE SHOWN, SEE SITE PLAN FOR NUMBER AND CONFIGURATION.

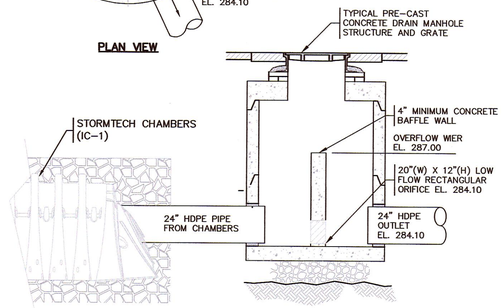
STORMWATER CHAMBER SYSTEM
TYPICAL CROSS SECTION
NOT TO SCALE



INSPECTION PORT
TYPICAL CROSS SECTION
NOT TO SCALE
Inspection_Port.DWG 2/8/08

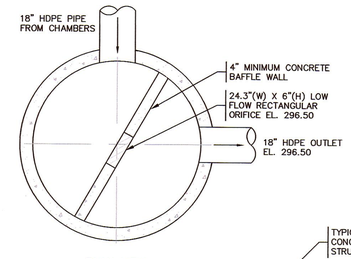


PLAN VIEW

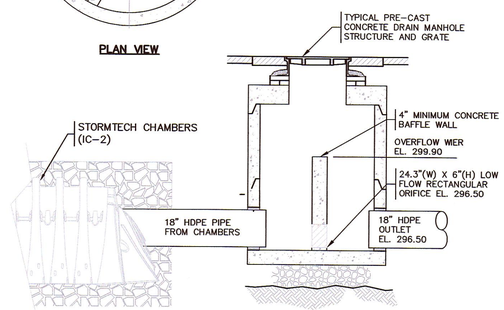


NOTES:
[1] 4,000 PSI PRECAST CONCRETE AT 28 DAYS CONFORMING WITH LATEST ASTM C478.
[2] REINFORCING PER LATEST ASTM A185.
[3] STRUCTURE SHALL BE RATED FOR H-20 LOADING UNLESS SPECIFIED OTHERWISE.

OUTLET CONTROL STRUCTURE (OCS-1)
TYPICAL CROSS SECTION
NOT TO SCALE

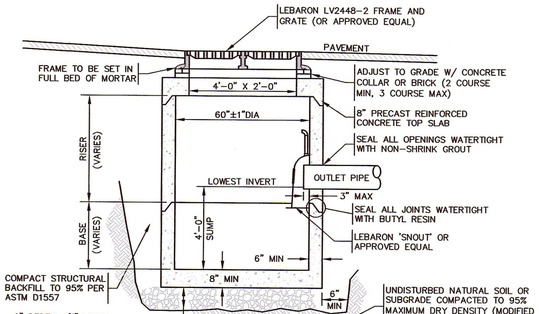


PLAN VIEW



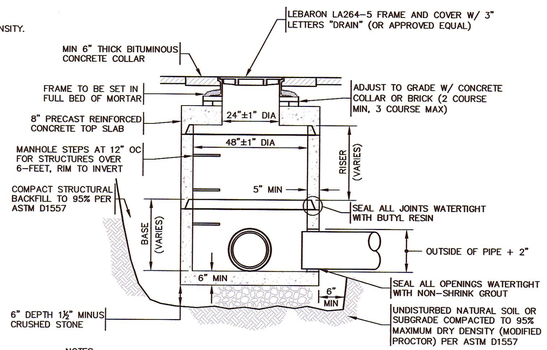
NOTES:
[1] 4,000 PSI PRECAST CONCRETE AT 28 DAYS CONFORMING WITH LATEST ASTM C478.
[2] REINFORCING PER LATEST ASTM A185.
[3] STRUCTURE SHALL BE RATED FOR H-20 LOADING UNLESS SPECIFIED OTHERWISE.

OUTLET CONTROL STRUCTURE (OCS-2)
TYPICAL CROSS SECTION
NOT TO SCALE



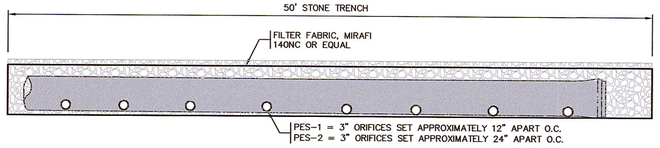
NOTES:
[1] 4,000 PSI PRECAST CONCRETE AT 28 DAYS CONFORMING WITH LATEST ASTM C478.
[2] REINFORCING PER LATEST ASTM A185.
[3] STRUCTURE SHALL BE RATED FOR H-20 LOADING UNLESS SPECIFIED OTHERWISE.

DOUBLE GRATE CATCH BASIN (DCB)
TYPICAL CROSS SECTION
NOT TO SCALE

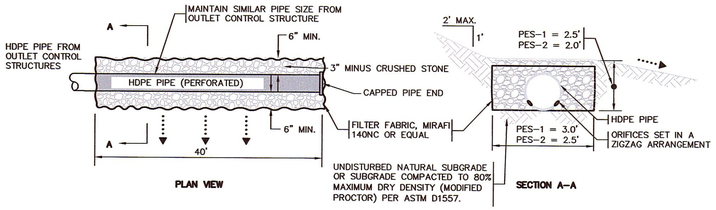


NOTES:
[1] 4,000 PSI PRECAST CONCRETE AT 28 DAYS CONFORMING WITH LATEST ASTM C478.
[2] REINFORCING PER LATEST ASTM A185.
[3] STRUCTURE SHALL BE RATED FOR H-20 LOADING UNLESS SPECIFIED OTHERWISE.

DRAIN MANHOLE (DMH)
TYPICAL CROSS SECTION
NOT TO SCALE

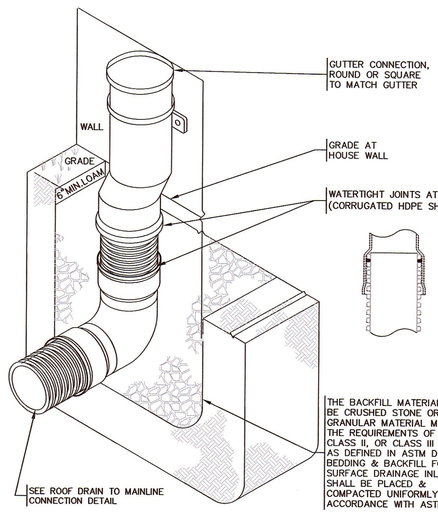


PROFILE VIEW

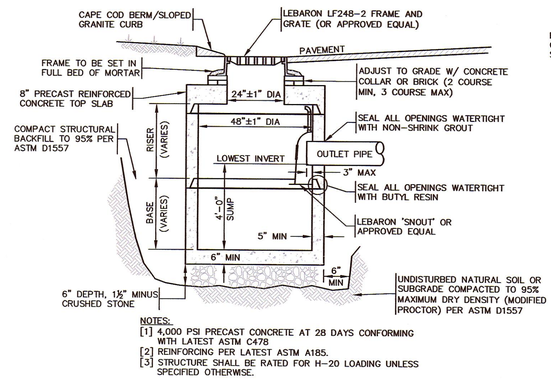


PLAN VIEW
SECTION A-A

PIPE END STRUCTURE (PES)
NOT TO SCALE

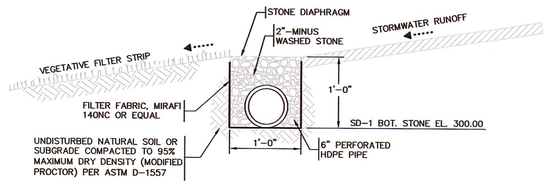


DOWNSPOUT BOOT DETAIL
TYPICAL ISO VIEW
NOT TO SCALE

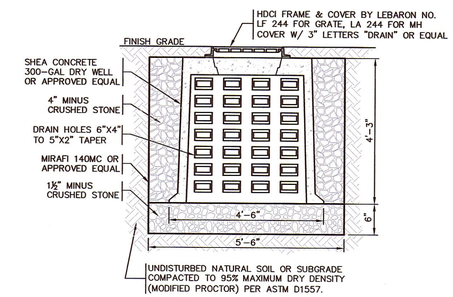


NOTES:
[1] 4,000 PSI PRECAST CONCRETE AT 28 DAYS CONFORMING WITH LATEST ASTM C478
[2] REINFORCING PER LATEST ASTM A185.
[3] STRUCTURE SHALL BE RATED FOR H-20 LOADING UNLESS SPECIFIED OTHERWISE.

CATCH BASIN (CB)
TYPICAL CROSS SECTION
NOT TO SCALE



STONE DIAPHRAGM (SD)
TYPICAL CROSS SECTION
NOT TO SCALE



DRY WELL (DW)
NOT TO SCALE

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION
■ PERMIT ☐ CONSTRUCTION RECORD

THIS DRAWING MAY NOT SHOW CONSTRUCTION DETAILS AND SPECIFICATIONS FOR ALL PROPOSED IMPROVEMENTS, AND MAY NOT IDENTIFY ALL CONSTRUCTION WORK ITEMS/AREAS OF CONTRACTOR JURISDICTION.

PER 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEER'S RESPONSIBILITY: ALL BOUNDARY INFORMATION; LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES; DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE GENERAL NOTE #19.

COMMONWEALTH OF MASSACHUSETTS — NICHOLAS M PAULING — CIVIL — No. 47114 — REGISTERED PROFESSIONAL ENGINEER — 11/30/2020

NO.	DATE	BY	APP.	REVISION DESCRIPTION
2	11/30/20	LT/KFB	KFB	DRIVEWAY TURNAROUND REVISION
1	7/14/20	LT/KFB	KFB	DRIVEWAY/DRAINAGE COMMENTS

GPR Engineering Solutions for Land & Structures
GOLDSMITH, PREST & RINGWALL, INC.
39 MAIN STREET, SUITE 301. AYER, MA 01432
CIVIL ENGINEERING • LAND SURVEYING • LAND PLANNING
VOICE: 978.772.1590 FAX: 978.772.1591
www.gpr-inc.com

RESIDENTIAL SUBDIVISION
DEFINITIVE PLAN

CONSTRUCTION DETAILS

FIVE PATHS
ASSESSORS MAP#39 PARCEL 15A
WAYLAND, MA

RECORD OWNER & APPLICANT:
ROSS C. WILKINSON, PERSONAL REPRESENTATIVE,
ESTATE OF PAULA D. WILKINSON
PO BOX 98
WILTON, NH 03086

DES. BY: MPB	DATE: JULY 2019	JOB 171053	C7.2
CHK. BY: KFB			

P:\17----\171053\DWG\PERMIT\DETSUB_CD.DWG 11-30-20 10:40:41 AM - LAYOUT C7.2-CO2

GRADY CONSULTING, L.L.C.
Civil Engineers ♦ Land Surveyors ♦ Landscape Architects

February 3, 2021

Conservation Commission
41 Cochituate Road
Wayland, MA 01778

RE: #3 Amey Road, Chapter 193 Application
Applicant – Alicia and John Warren C/O Bill Rodenhiser

Dear Commission Members:

On behalf of the applicant, we hereby submit this Chapter 193 Application for the above referenced address. The applicant proposes to build an addition onto an existing dwelling, raze & rebuild an existing detached cottage, install a 3000 gallon 2-compartment septic tank, a distribution box and 3-55' long x 3' wide x 24" deep leaching trench system. Enclosed please find the following:

1. 1 original copy of the Site Plan, dated February 3, 2021.
2. 2 copies of 11"x17" size Site Plans.
3. 2 copies of the Chapter 193 Bylaw application.
4. 1 copy of the USGS map.
5. Check for $100.00 (Chapter 193 Town bylaw fee) payable to the Town of Wayland.

If you have any questions please do not hesitate to call.

Sincerely,

GRADY CONSULTING, L.L.C.

Robert Carlezon

Robert Carlezon
Project Designer

Cc: John Warren
C/O Bill Rodenhiser
Rodenhiser Excavating
70 Bartzak Drive
Holliston, MA 01746

J:\2020\20-363\Stormwater\ConCom Chapter 193 cover letter.docx

TOWN OF WAYLAND

41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

CHAPTER 193 APPLICATION
Stormwater Management and Land Disturbance Bylaw

A. General Information

1. Project Location

3 Amey Rd — a. Street Address
Wayland, MA — b. City/Town
01778 — c. Zip code
50/025 — d. Parcel/ Lot Number

2. Applicant:

John — a. First Name
Warren — b. Last Name
3 Amey Rd — c. Street Address
MA — e. State
01778 — f. Zip Code
Wayland — d. City
g. Work/ Cell Phone #
h. Email Address

3. Property Owner (required if different from applicant):

a. First Name
b. Last Name
c. Street Address
e. State
f. Zip Code
d.City
g. Work/ Cell Phone #
h. Email Address

4. Representative (if any):

Bill — a. First Name
Rodenhiser — b. Last Name

CHAPTER 193 APPLICATION
Stormwater Management and Land Disturbance Bylaw

Rodenhiser Excavating dba Rodenhiser Builders
c. Company

70 Bartzak Dr
c. Street Address

MA 01746 Hollliston
e. State f. Zip Code d.City

g. Work/ Cell Phone # c: 5085098830
w: 508-429-9553

bill@rodenhiser.biz
h. Email Address

5a. Project Type Checklist (check all that applies):

1. ☐ Creation of new or increasing existing impervious surface of 500 sq. ft. or more.

   Impervious Surface: Is any material or structure on or above the ground that prevents water infiltration to the underlying soils. Impervious surface includes without limitation roads, paved parking lots, sidewalks, stone patios, decking, and rooftops.

2. ☑ Alteration and/or land disturbance of at least 5,000 sq. ft. or 10% of the parcel; whichever is less.

   Alteration and/or land disturbance as defined in Chapter 193 Bylaw.

5b. General Project Description:

Renovations/remodeling of existing main house and Bungalow including: replacement of septic system, addition with garage and driveway to main house, removal and re-building of Bungalow and new landscaping including tree clearing and replacement of trees greater than 6" diameter.

B. Additional Information

By submitting an application for coverage under the Stormwater Management and Land Disturbance Permit, the Applicant agrees to the following:

1. **At a minimum, the proposed project complies with the performance standards of the most recent version of the Massachusetts Stormwater Management Handbook including but not limited to:**
   a. **Employing environmentally sensitive site design**
   b. **Evaluation of Low Impact Development practices**
   c. **Incorporation of source controls of contaminants and employing BMPs to minimize stormwater pollution**
   d. **Sizing of water quality volume of BMPs are based on 1-inch of runoff**
   e. **Methodology for hydrologic analyses (if necessary) is based on TR-55/TR-20 methodology**
   f. **Designing redevelopment of existing sites must provide a net improvement to stormwater conditions at the site.**

2. **The activity shall not increase either the rate or volume of stormwater runoff leaving the site, nor shall it alter stormwater flow to any adjoining properties, public ways, or any wetland resource areas, unless otherwise permitted based on improvements over existing conditions.**

Please check all that apply to this project:

- [x] Roof drains emptying into dry wells/recharge basins
- [ ] Grassed swales constructed
- [ ] Porous pavement installed; _____ sq. ft.
- [ ] Water quality swale
- [ ] Rain barrels/cisterns for irrigation
- [ ] Other methods (please list/describe): _____

3. The Applicant shall provide and maintain Erosion and Sedimentation controls as necessary until the site is permanently stabilized. BMP's selected for erosion controls shall be chosen to minimize site disturbance from erosion control installation. As soon as the site is stabilized, such measures shall be removed.

   Please check all that apply to this project:

   - [ ] Sediment filter fence with either hay bales or straw wattles
   - [ ] Mulch filled fabric sock
   - [x] Construction entrance
   - [ ] Temporary vegetative cover – mulch, netting
   - [x] Permanent vegetative cover – hydro seeding, seeding, sodding
   - [ ] Slope stabilization
   - [ ] Retaining Walls
   - [ ] Slope drains
   - [ ] Other methods (please list/describe): _____

4. The Applicant shall ensure that the site and stormwater management systems are perpetually inspected and maintained to function as designed.

   Please check all that apply to this project:

   - [ ] Visual inspections by contractor
   - [x] Visual inspections by homeowner
   - [ ] Operation and Maintenance Plan
   - [ ] Maintenance contract for stormwater components
   - [ ] Other methods (please list/describe): _____

5. Other Jurisdiction

   - [ ] Massachusetts Wetlands Protection Act (310 CMR 10.00) and it's Implementing Regulations
   - [ ] Wayland's Wetlands and Water Resource Protection Bylaw – Chapter 194

CHAPTER 193 APPLICATION
Stormwater Management and Land Disturbance Bylaw

- ☐ Subdivision Approval
- ☐ Board of Health Permit
- ☐ Special Permit or Site Plan Review
- ☑ Building Permit

C. Fees

Applicants must submit a $100 application fee.

D. Signatures and Submittal Requirements

I certify that I have reviewed the design standards above and the information contained herein, including all attachments, is true, accurate, and complete to the best of my knowledge. Further, I grant the Wayland Conservation Commission and its authorized Agents permission to enter the property to review this application and make inspections before, during and after construction. I have included a check for the application fee of $100.

Signature of Applicant — Date: 1/29/21

Signature of Property Owner (if different) — Date

Signature of Representative (if any): GRADY CONSULTING LLC — Date: 2/3/2021

For Conservation Commission:
Two copies of the completed Stormwater Management and Land Disturbance Bylaw (Chapter 193), including plans and documents, and the bylaw fee payment, to the Conservation Commission by mail or hand delivery.

TOWN OF WAYLAND
41 COCHITUATE ROAD

WAYLAND, MASSACHUSETTS 01778

CHAPTER 193 APPLICATION
Stormwater Management and Land Disturbance Bylaw Checklist

Submittal Requirements:

The applicant shall file eight copies of the completed application package to the Conservation Commission for a Stormwater Management and Land Disturbance Permit. The application package shall include:

☑ Application form with original signatures of all owners and representatives.

Two copies of the completed application form

Two copies of 11x17 size site plans

One copy of a full size site plan.

All documents emailed to nthomson@wayland.ma.us

☑ Number and size (dbh) of proposed trees to be removed. Replanting will be based on Replacement Tree and Shrub Schedule.

☑ Locus map showing location of the property.

☑ Any and all applications fees ($100 transmittal fee)

N/A ☒ Stormwater Management and Land Disturbance Plan (per the Massachusetts Stormwater Management Regulations and Massachusetts Stormwater Management handbook as applicable for the scope of the project.)

☐ Supporting Stormwater Management Report and engineering calculations (per the Massachusetts Stormwater Management Regulations and Massachusetts Stormwater Management handbook as applicable for the scope of the project.) The report must contain a narrative describing the project and how the project will comply with the Wayland Stormwater Management and Land Disturbance Bylaw. List any requested waivers and the reasons the standards cannot be met.

N/A ☒ Stormwater Pollution Preventative Plan (SWPPP) if coverage is required under the U.S. EPA Construction General Permit, Multi-Sector Permit or an individual permit under the NPDES Phase II requirements.

N/A ☒ Long-term Pollution Prevention Plan

N/A ☒ Erosion and Sediment Control Plan

The property owner, as well as the applicant and/or representative (if different from owner) must sign this checklist and all other applicable applications. The property owner, by signing this checklist and the applications, acknowledges that the Commission and Staff may enter the property to inspect the premises as part of the assessment of the application.

Signature of Property Owner

Date

I certify under penalty of law that this document and all its attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Grady Consulting, LLC

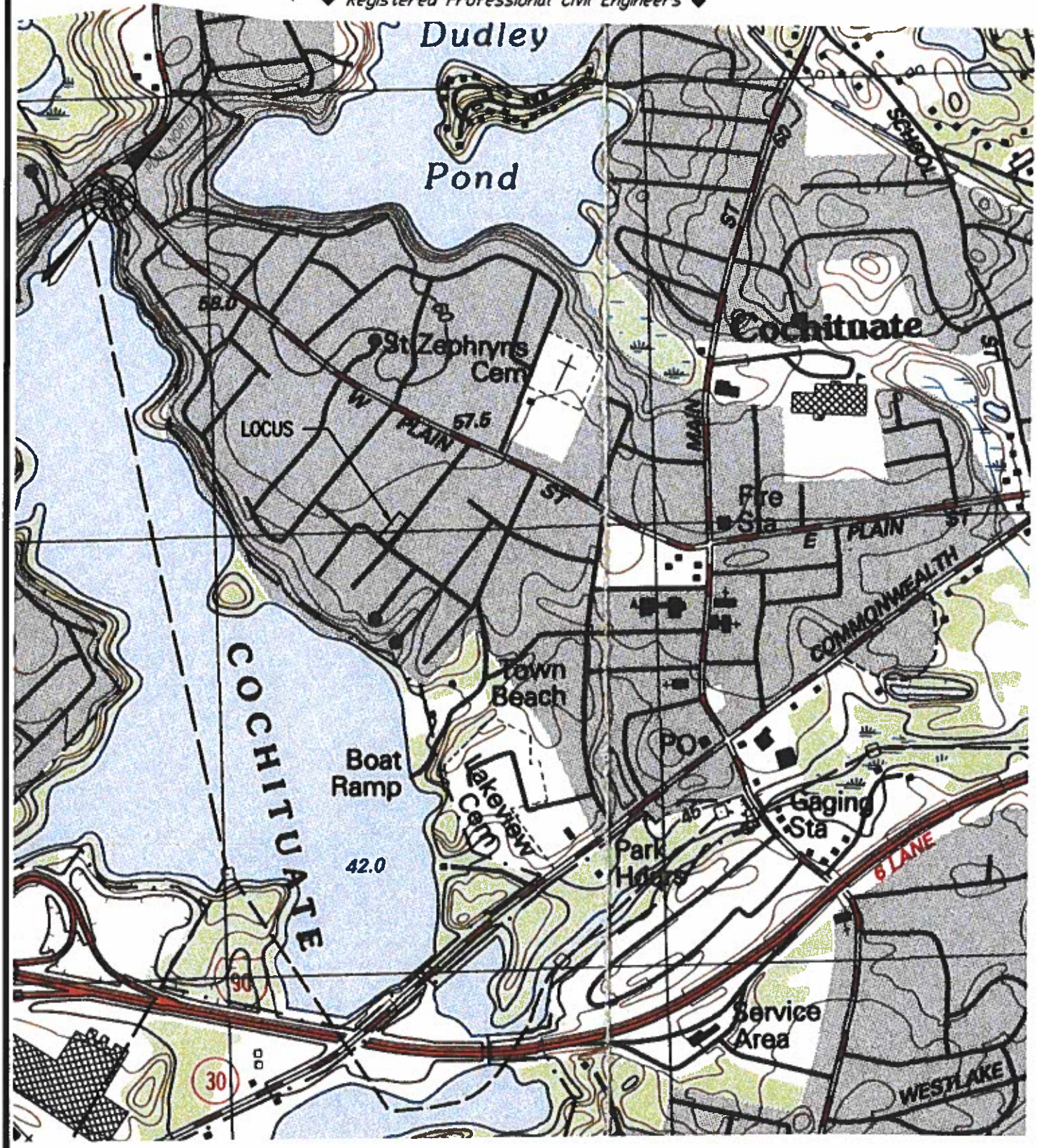
Signature of Applicant

2/3/2021

Date

GRADY CONSULTING, L.L.C.

◆ *Registered Professional Civil Engineers* ◆



3 AMEY ROAD,
WAYLAND

FEBRUARY 3, 2021
JOB NO. 20-363
1" = 1000'

ZONING DATA

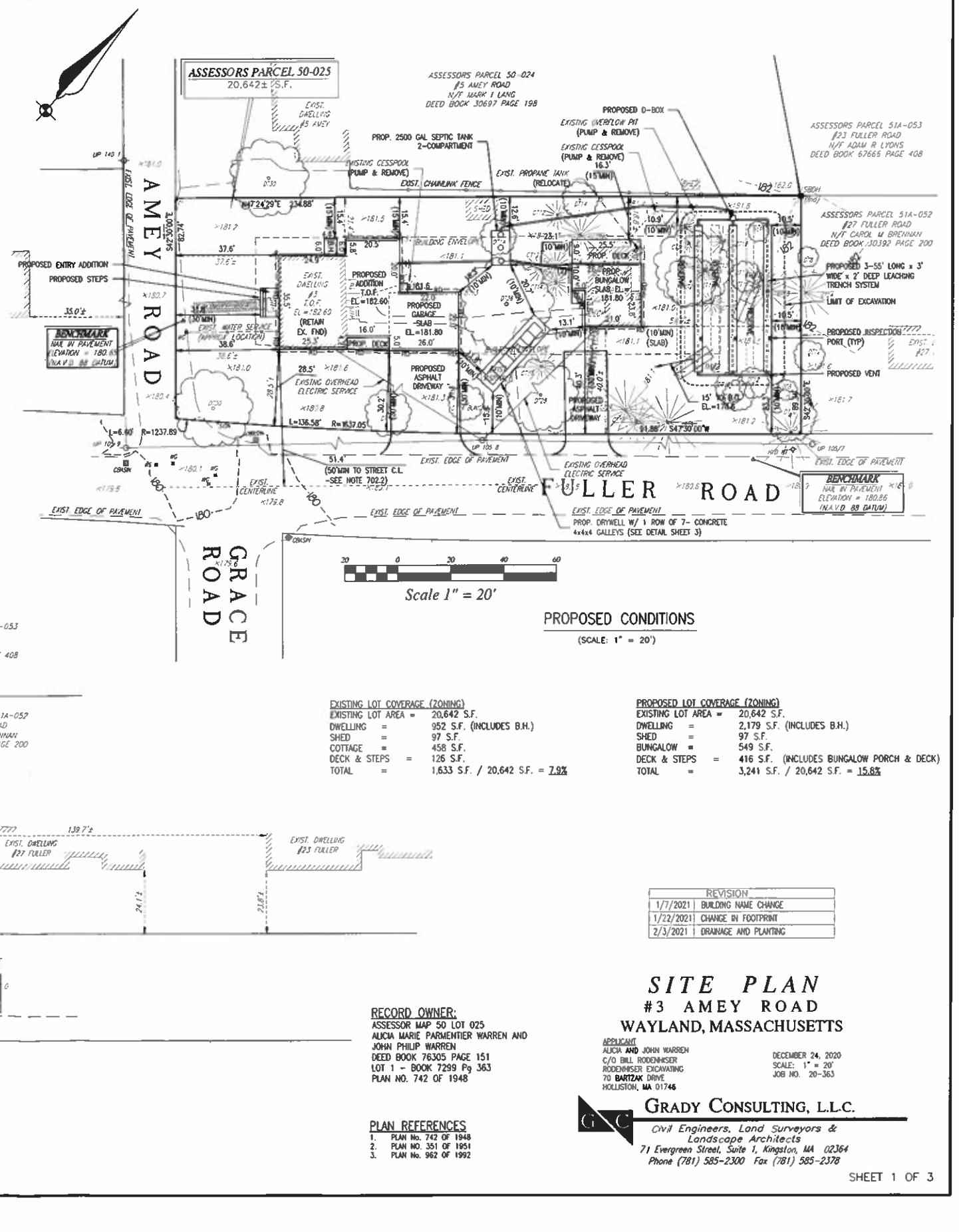
DISTRICT: R20-SINGLE MIN. 20,000FT AREA 120FT FRONTAGE

MINIMUM REQUIREMENTS:	
LOT AREA	20,000 S.F.
LOT FRONTAGE	120 FT
MAX LOT COVERAGE	20%
FRONT YARD	30 FT
SIDE YARD	15 FT
REAR YARD	30 FT
MAX HEIGHT	35 FT/2.5 STORIES

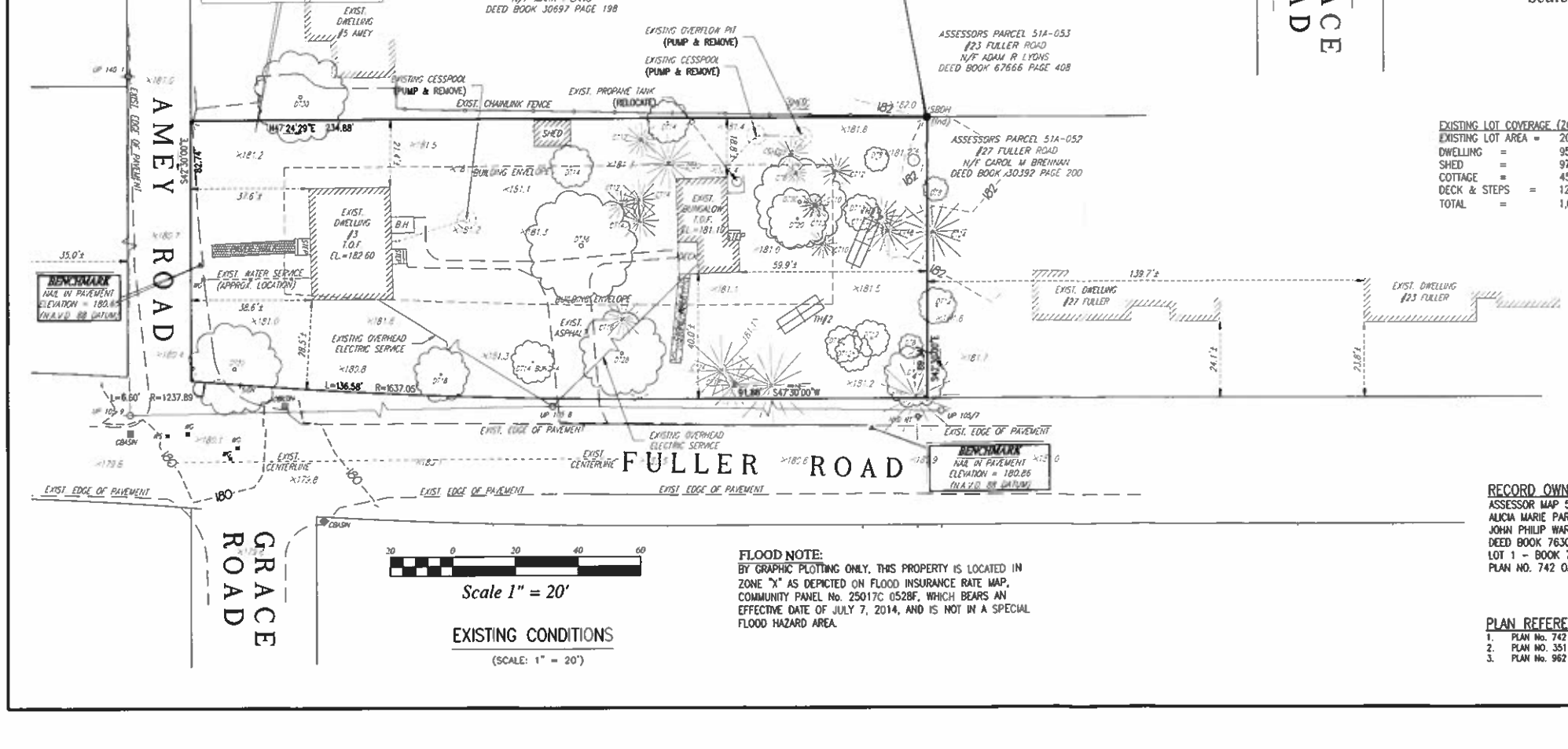
CHAPTER 198 ZONING ARTICLE 7 (198-702.2)
A BUILDING OR STRUCTURE IN EXISTENCE ON MARCH 1, 1960, MAY EXTEND WITHIN 50 FEET OF ANY CENTER LINE OF THE STREET; A PORCH ATTACHED THEREON MAY EXTEND WITHIN 20 FEET OF ANY STREET LOT LINE, AND A TWO-STORY PORCH THAT IS NOT ENCLOSED AT LEAST ½ OF THE YEAR MAY PROJECT SIX FEET INTO THE FRONT YARD. [AMENDED 5-5-1999 STM BY ART. 11]

RICHARD J. GRADY No 28572 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

Richard Grady
Digitally signed by Richard Grady
Date: 2021.02.04 06:20:24 -05'00'



PROPOSED CONDITIONS
(SCALE: 1" = 20')



EXISTING CONDITIONS
(SCALE: 1" = 20')

FLOOD NOTE:
BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS LOCATED IN ZONE "X" AS DEPICTED ON FLOOD INSURANCE RATE MAP, COMMUNITY PANEL No. 25017C 0528F, WHICH BEARS AN EFFECTIVE DATE OF JULY 7, 2014, AND IS NOT IN A SPECIAL FLOOD HAZARD AREA.

EXISTING LOT COVERAGE (ZONING)

EXISTING LOT AREA	=	20,642 S.F.
DWELLING	=	952 S.F. (INCLUDES B.H.)
SHED	=	97 S.F.
COTTAGE	=	458 S.F.
DECK & STEPS	=	126 S.F.
TOTAL	=	1,633 S.F. / 20,642 S.F. = 7.9%

PROPOSED LOT COVERAGE (ZONING)

EXISTING LOT AREA	=	20,642 S.F.
DWELLING	=	2,179 S.F. (INCLUDES B.H.)
SHED	=	97 S.F.
BUNGALOW	=	549 S.F.
DECK & STEPS	=	416 S.F. (INCLUDES BUNGALOW PORCH & DECK)
TOTAL	=	3,241 S.F. / 20,642 S.F. = 15.8%

REVISION	
1/7/2021	BUILDING NAME CHANGE
1/22/2021	CHANGE IN FOOTPRINT
2/3/2021	DRAINAGE AND PLANTING

RECORD OWNER:
ASSESSOR MAP 50 LOT 025
ALICIA MARIE PARMENTIER WARREN AND JOHAN PHILIP WARREN
DEED BOOK 76305 PAGE 151
LOT 1 - BOOK 7299 Pg 363
PLAN NO. 742 OF 1948

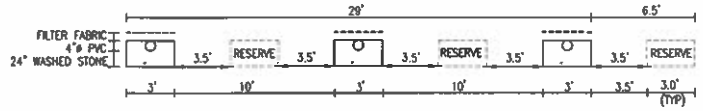
PLAN REFERENCES
1. PLAN No. 742 OF 1948
2. PLAN NO. 351 OF 1951
3. PLAN No. 962 OF 1992

SITE PLAN
#3 AMEY ROAD
WAYLAND, MASSACHUSETTS

APPLICANT
ALICIA AND JOHAN WARREN
C/O BILL RODENHISER
RODENHISER EXCAVATING
70 BARTZAK DRIVE
HOLLISTON, MA 01746

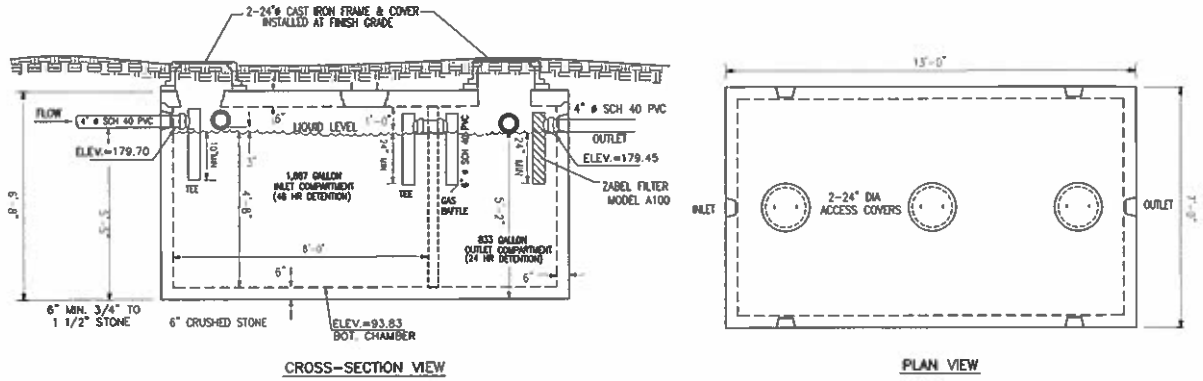
DECEMBER 24, 2020
SCALE: 1" = 20'
JOB NO. 20-363

GRADY CONSULTING, L.L.C.
Civil Engineers, Land Surveyors & Landscape Architects
71 Evergreen Street, Suite 1, Kingston, MA 02364
Phone (781) 585-2300 Fax (781) 585-2378



LEACHING TRENCHES X-SECTION

(NOT TO SCALE)

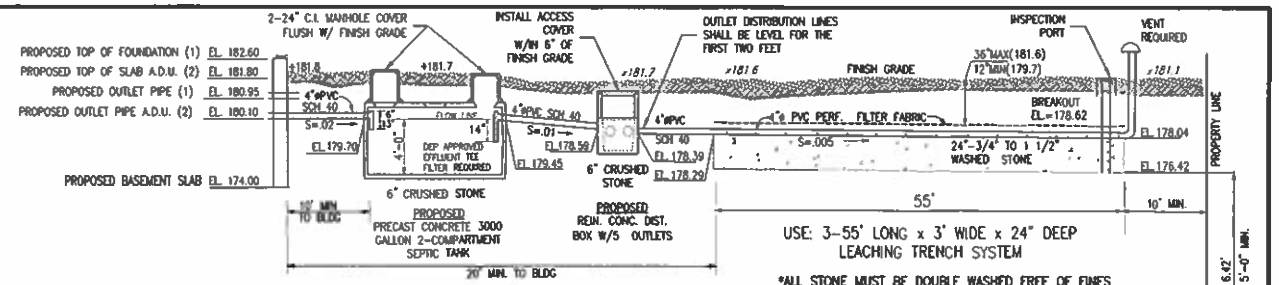


CROSS-SECTION VIEW

PLAN VIEW

2500 GALLON 2-COMPARTMENT SEPTIC TANK

(NOT TO SCALE)



USE: 3-55' LONG x 3' WIDE x 24" DEEP LEACHING TRENCH SYSTEM

*ALL STONE MUST BE DOUBLE WASHED FREE OF FINES

SUBSURFACE SEWAGE DISPOSAL SYSTEM

(NOT TO SCALE)

GROUNDWATER EL. 170.00

(T.H.#2 ASSUMED NO WATER ENCOUNTERED)

SEPTIC DESIGN (NOT DESIGNED FOR GARBAGE GRINDER)

1. DESIGN DAILY FLOW: 5 BR. x 165 GPD = 825 GPD
2. SEPTIC TANK: 825 GPD x 2 = 1650 GAL. USE: 2,500 GAL (MIN)
3. LEACHING CHAMBERS: P.R. <2 MIN/IN CLASS I

USE: 3-55' LONG x 3' WIDE x 2 DEEP LEACHING TRENCHES

TITLE 5

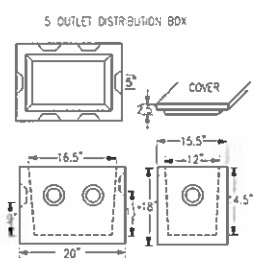
EFFECTIVE LEACHING AREA = 7 SF/LF

PROPOSED AREA: 165 LF x 7 SF/LF = 1155 S.F. (1000 S.F. MIN 5-BR)
CAPACITY: 1155 S.F. x 0.74 GPD/S.F. = 854 > 825 GPD(D.D.F.)

SEPTIC NOTES

1. PROPERTY LINE DATA FROM "PLAN OF LAND, WAYLAND, MASS." OWNED BY KATHERINE L. FLANDERS, PREPARED BY EDWARD F. MCGEE, REGISTERED ENGINEER, FROM SURVEY BY F.R. GLADU, G.E., JUNE 1948. RECORDED WITH THE MIDDLESEX SOUTH COUNTY REGISTRY OF DEEDS AS PLAN No. 742 OF 1948. ADDITIONAL PROPERTY LINE DATA FROM PLAN ENTITLED " PLAN AND PROFILE OF FULLER ROAD IN WAYLAND, MASS." RECORDED WITH MIDDLESEX SOUTH COUNTY REGISTRY OF DEEDS AS PLAN No. 351 OF 1951.
2. TOPOGRAPHIC SURVEY FROM GRADY CONSULTING SEPTEMBER 28, 2020.
3. SOILS TESTING BY RICHARD GRADY, GRADY CONSULTING, LLC WITNESSED BY DARREN MCCAUGHEY SEPTEMBER 28, 2020.
4. CALL DIG SAFE 1-888-344-7233 AT LEAST 4 DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
5. NOTIFY TOWN AND GRADY CONSULTING PRIOR TO BACKFILLING OF SYSTEM.
6. NO KNOWN WELLS EXIST WITHIN 200' OF THE PROPOSED SYSTEM
7. THE SITE IS NOT LOCATED IN AN AQUIFER PROTECTION ZONE II.
8. ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM ONCE BURIED (310 CMR 15.221(12))
9. NO STREAMS, SURFACE & SUBSURFACE DRAINS AND WETLANDS EXIST WITHIN 100 FT OF THE PROPOSED SYSTEM, EXCEPT AS SHOWN.
10. THE SITE IS NOT LOCATED IN A FLOOD PLAIN DISTRICT.
11. NO KNOWN EASEMENTS ARE IN THE AREA OF THE PROPOSED SYSTEM.
12. EXCAVATE ALL MATERIAL (A,B, C1 LAYERS) TO SANDY LOAM C2 LAYER (95"), 5' AROUND SYSTEM. REPLACE WITH CLEAN COURSE SAND IN ACCORDANCE WITH 310 CMR 15.255 (3). EXCAVATION TO BE INSPECTED BY GRADY CONSULTING L.L.C. AND TOWN PRIOR TO SOIL REPLACEMENT

APPROXIMATE PERC SAND VOLUME = 65 X 39 X (178.6 - 178.0) / 27 + 20% = 68± C.Y.

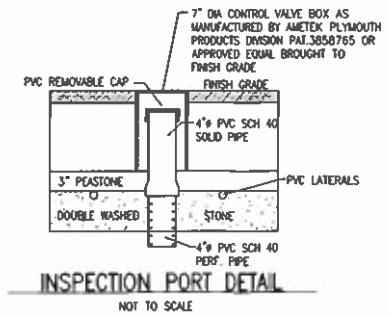


DESIGN NOTES

1. 4,000 P.S.I. CONCRETE @ 28 DAYS
2. KNOCK-OUT OPENINGS FOR 4" PVC
3. PRODUCT WEIGHT = 220 LBS.
4. 12" RISER SECTION AVAILABLE

D-BOX DETAIL

(NOT TO SCALE)



INSPECTION PORT DETAIL

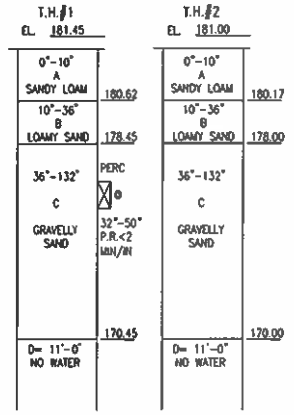
NOT TO SCALE

REQUIRED INSPECTIONS

1. AFTER EXCAVATION OF LEACHING AREA PRIOR TO INSTALLING SAND.
2. AFTER SYSTEM CONSTRUCTION PRIOR TO BACKFILLING.
3. AFTER FINAL GRADING IS COMPLETED.

(ADDITIONAL INSPECTIONS MAY BE REQUIRED BY THE BOARD OF HEALTH)

SOIL LOGS



COMMONWEALTH OF MASSACHUSETTS
RICHARD J. GRADY No. 36072
REGISTERED PROFESSIONAL ENGINEER

Richard Grady

Digitally signed by Richard Grady
Date: 2021.02.04 06:22:05 -05'00'

REVISION	
1/7/2021	BUILDING NAME CHANGE
1/22/2021	CHANGE IN FOOTPRINT
2/3/2021	DRAINAGE AND PLANTING

SITE PLAN

#3 AMEY ROAD

WAYLAND, MASSACHUSETTS

APPLICANT
ALICIA AND JOHN WARREN
C/O BILL RODENHISER
RODENHISER EXCAVATING
70 BARTJAK DRIVE
HOLLISTON, MA 01746

DECEMBER 24, 2020
SCALE: 1" = 20'
JOB NO. 20-363

GRADY CONSULTING, L.L.C.
Civil Engineers, Land Surveyors & Landscape Architects
71 Evergreen Street, Suite 1, Kingston, MA 02364
Phone (781) 585-2300 Fax (781) 585-2378

LOCATION MAP (1"=2000'±)

ZONING DATA

DISTRICT: R20-SINGLE MIN.
20,000FT AREA 120FT FRONTAGE

MINIMUM REQUIREMENTS:

LOT AREA	20,000 S.F.
LOT FRONTAGE	120 FT
MAX LOT COVERAGE	20%
FRONT YARD	30 FT
SIDE YARD	15 FT
REAR YARD	30 FT
MAX HEIGHT	35 FT/2.5 STORIES

CHAPTER 198 ZONING ARTICLE 7 (198-702.2)
A BUILDING OR STRUCTURE IN EXISTENCE ON MARCH 1, 1960, MAY EXTEND WITHIN 50 FEET OF ANY CENTER LINE OF THE STREET; A PORCH ATTACHED THEREON MAY EXTEND WITHIN 20 FEET OF ANY STREET LOT LINE; AND A TWO-STORY PORCH THAT IS NOT ENCLOSED AT LEAST ⅓ OF THE YEAR MAY PROJECT SIX FEET INTO THE FRONT YARD. [AMENDED 5-5-1999 STM BY ART. 11]

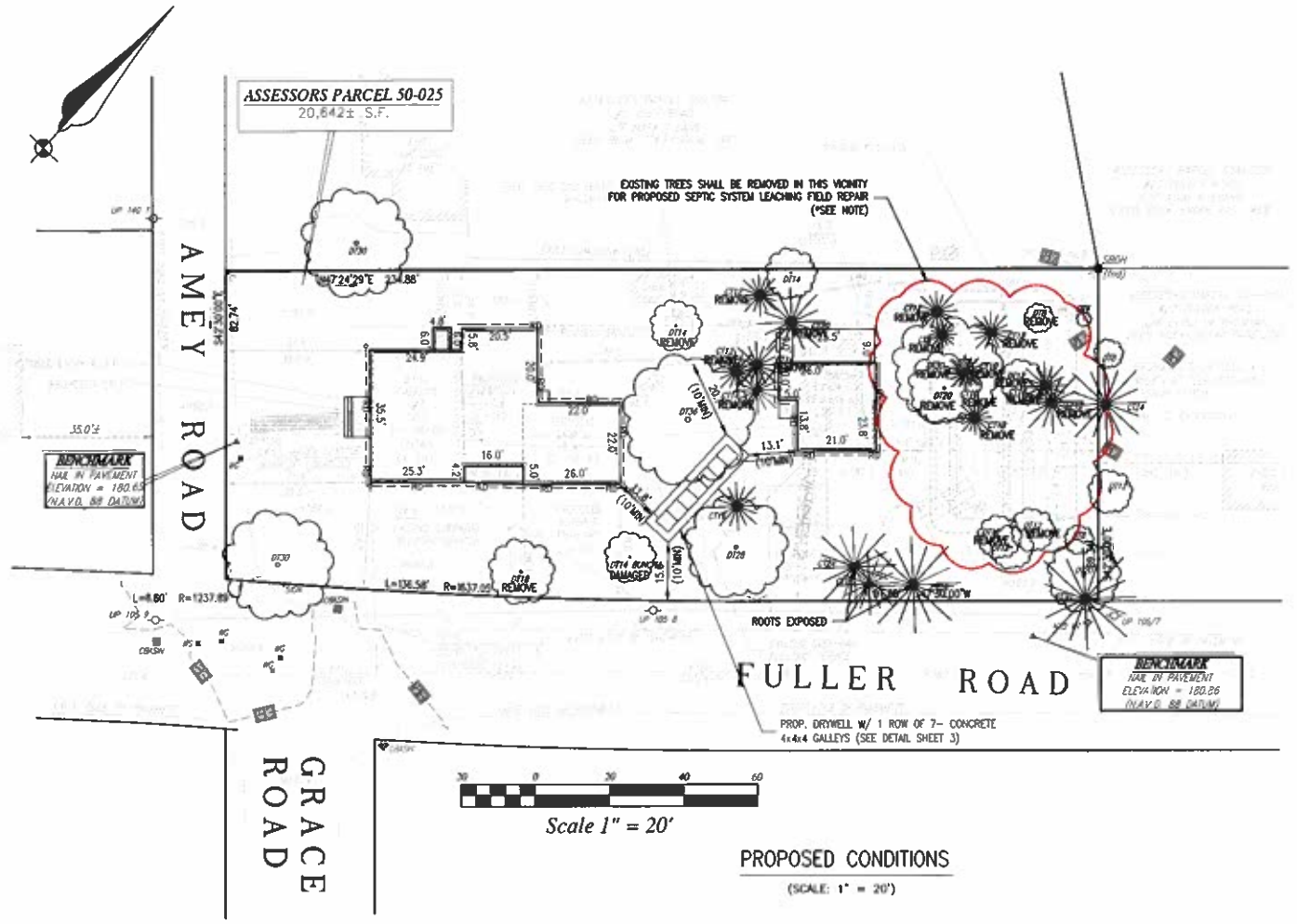
EXISTING IMPERVIOUS SURFACE CALCULATION (DRAINAGE)

DWELLING	=	952 S.F (INCLUDES B.H.)
SHED	=	97 S.F.
COTTAGE	=	458 S.F.
DECK & STEPS	=	126 S.F.
EXISTING ASPHALT DRIVE & WALKS	=	918 S.F.
COTTAGE STONE WALK	=	94 S.F.
TOTAL	=	2,645 S.F.

PROPOSED IMPERVIOUS SURFACE CALCULATION (DRAINAGE)

DWELLING	=	2,179 S.F. (INCLUDES B.H.)
SHED	=	97 S.F.
COTTAGE	=	549 S.F.
DECK & STEPS	=	416 S.F. (INCLUDES COTTAGE PORCH & DECK)
(2) ASPHALT DRIVEWAYS	=	1,300 S.F.
TOTAL	=	4,541 S.F.

PROPOSED TOTAL INCREASE IN IMPERVIOUS SURFACE FOR DRAINAGE CALCULATION
4,541 S.F. - 2,645 S.F. = 1,896 S.F. INCREASE

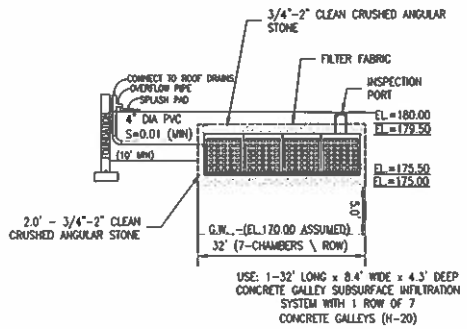


PROPOSED CONDITIONS
(SCALE: 1" = 20')

*WAYLAND CHAPTER 193 STORMWATER AND LAND DISTURBANCE

CHAPTER 193-4.B. EXEMPTIONS
(4) CONSTRUCTION AND REPAIR OF SEPTIC SYSTEMS WHEN REQUIRED AND APPROVED BY THE BOARD OF HEALTH FOR THE PROTECTION OF PUBLIC HEALTH AND IN COMPLIANCE WITH MASSACHUSETTS TITLE 5 REQUIREMENTS, PROVIDING NO OTHER LOCAL PERMIT IS NEEDED AND THE APPLICANT HAS IMPLEMENTED A SOIL EROSION PLAN THAT INCLUDES THE USE OF SEDIMENT BARRIERS, TEMPORARY AND PERMANENT SOIL STABILIZATION SPECIFICATIONS, AND CONTAINMENT OF ERODIBLE MATERIALS.

*EXISTING TREES TO BE REMOVED IN THE VICINITY OF THE PROPOSED REPAIRED LEACHING FIELD AREA ARE EXEMPT FROM REPLACEMENT PURSUANT TO CHAPTER 193-4.B.



DRYWELL DETAIL
(NOT TO SCALE)

100 YR STORM EL.=179.00
25 YR STORM EL.=177.93
10 YR STORM EL.=177.29
2 YR STORM EL.=176.40

Event	Rainfall (inches)	Runoff (cfs)
1-year	2.50	0.00
2-Year	3.40	0.05
10-Year	4.70	0.10
25-Year	5.80	0.27
100-Year	7.00	0.66

PRE DEVELOPMENT

Event	Rainfall (inches)	Runoff (cfs)
1-year	2.50	0.00
2-Year	3.40	0.00
10-Year	4.70	0.04
25-Year	5.60	0.10
100-Year	7.00	0.38

POST DEVELOPMENT

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. GRADY No. 38072
REGISTERED PROFESSIONAL ENGINEER

Richard Grady
Digitally signed by Richard Grady
Date: 2021.02.04 06:23:10 -05'00'

REVISION	
1/7/2021	BUILDING NAME CHANGE
1/22/2021	CHANGE IN FOOTPRINT
2/3/2021	DRAINAGE AND PLANTING

SITE PLAN
#3 AMEY ROAD
WAYLAND, MASSACHUSETTS

APPLICANT
ALICIA AND JOHN WARREN
C/O BILL RODENHISER
RODENHISER EXCAVATING
70 BARTZAK DRIVE
HOLLISTON, MA 01746

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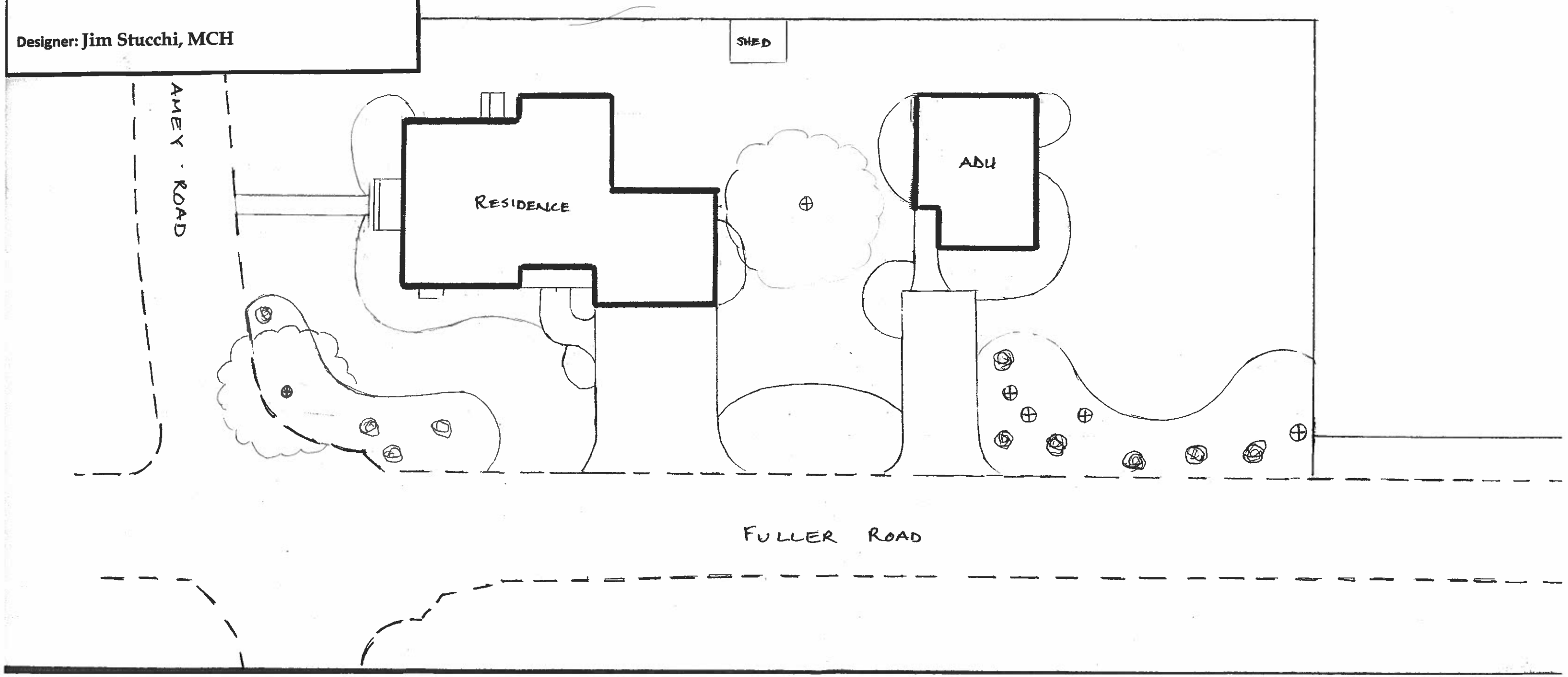
STUCCHI
LANDSCAPE & DESIGN

Name: Amey Road Project

Date: 2/2021

Scale: 1" = 20'

Designer: Jim Stucchi, MCH

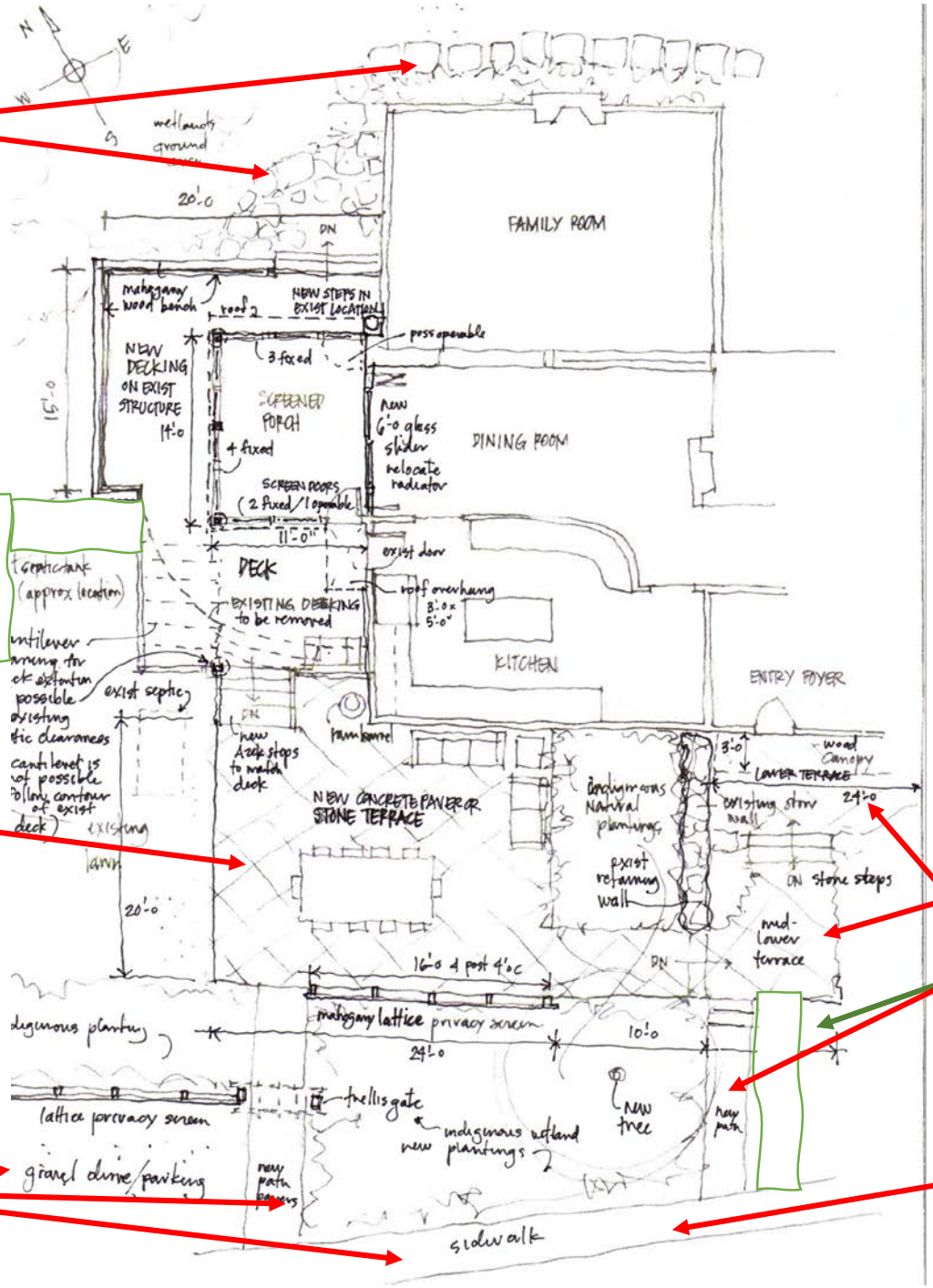


No paving, peastone

16’x20’ + 10’x4’ patio
Moved and reduced to
12’x18’ + 5’x4’

Plantings instead of screen

Removed sidewalks
and drive



Removed lower terraces, replaced existing sidewalk and shifted new sidewalk extension to be a straight line to street

About 800sf less impervious area than proposed, even without this sidewalk

41,431 SF

367.00'

NEW PLANTINGS

NEW TREES

12'X18' PATIO

PROPOSED STONE LANDING

PROPOSED DECK RECONSTRUCTION

EXISTING DECK TO BE RAZED

LIMIT OF EXISTING LAWN

VENT

PROPOSED WALK RELOCATION

PROPOSED PATIO

PROPOSED SCREENED PORCH 72.3'

EXISTING TWO STORY WOOD FRAME #19

PROPOSED PLANTINGS

PROPOSED CANOPY

REPLACED SIDEWALK

WF#1 WF#2 WF#3 WF#4 WF#5 WF#6 WF#7 WF#8 WF#9 WF#10 WF#11 WF#12

LIMIT OF EXISTING LAWN

LIMIT OF EXISTING LAWN

33.91'

30' NO DISTURB

50' BUFFER

100' BUFFER

174.93'

L=5.07'

R=343.34'

25.50'

44.00'

CHARENA ROAD

RAINGARDEN

REMOVED DRIVEWAY + SIDEWALKS

ADDED PLANTINGS

NEW SIDEWALK (EXTENDED EXISTING)

CERTIFIED PLOT PLAN
SHOWING PROPOSED ADDITIONS

19 CHARENA ROAD

WAYLAND, MASS

OTES:

IMPERVIOUS AREAS

EXISTING = 3,132 SF

PROPOSED=3,771 SF

CONTOUR INTERVAL EQUALS ONE (1) FOOT.

Field Resources, Inc

LAND SURVEYORS

Wayland Wetlands and Water Resources Bylaw, Chapter 194 Application

1. Applicant:

CONNIE + DONALD ASKIN — ASKIN.CONNIE@GMAIL.COM
Name (PLEASE PRINT) — Email Address (if applicable)

19 CHAREVA ROAD — WAYLAND — MA — 01778
Mailing Address — City/Town — State — Zip Code

617 417 6047
Phone Number — Fax Number (if applicable)

2. Representative:

Firm/Business Name — Contact Name

Mailing Address — City/Town — State — Zip Code

Phone Number — Fax Number (if applicable)

3. Property Owner(s)

CONNIE + DONALD ASKIN — "
Property Owner (PLEASE PRINT) — Email Address (if applicable)

19 CHAREVA ROAD — WAYLAND — MA — 01778
Address — City/Town — State — Zip Code

617 417 6047
Phone Number — Fax Number (if applicable)

4. Type of Application

[ ] Request for a Determination of Applicability (RDA)
[ ] Abbreviated NOI
[ ] Notice of Resource Area Delineation
[ ] After the Fact Amendment (AFA)
[ ] Amendment to Order of Conditions
[ ] Notice of Intent (NOI)
[ ] Extension of O.O.C.
[X] Certificate of Compliance
[ ] After the Fact Filing (AFF)

5. Project

19 CHAREVA ROAD — BOOK 69453 — PAGE 247
Location Address — Assessors Map(s) 38 — Parcel(s) 155

Project Description (PLEASE PRINT): ADD SCREENED PORCH, REBUILD DECK, INSTALL STONE PATIO

6. Title/Date of Plan(s)

7. Bylaw Application Fee: $

8. Application filed pursuant to MGL Chapter 131, Section 40 [ ] Yes [ ] No

9. Signature of Applicant — Date 11/30/2020

Signature of Property Owner — Date 11/30/2020

(NOTE: This application shall be signed by the property owner as well as the applicant. Signature of the property owner on this application shall be deemed permission granted to the Conservation Commission and their agents to go upon the subject property.)

Wayland Conservation Commission Meeting Minutes

Wednesday January 27, 2021
Approved:

Location: Commission members participated remotely
Present: Sean Fair (Chair), Barbara Howell (Vice Chair), J. Sullivan, Kathy Schreiber, Tom Davidson, Joanne Barnett, Luke Legere, and Linda Hansen (Conservation Department Director)
Minutes: Ryan Brown

S. Fair opened the meeting at 6:30PM, noting that the meeting was being recorded by WayCam and a quorum was present consisting of Sean Fair, Barbara Howell, Tom Davidson, John Sullivan, Kathy Schreiber, Joanne Barnett, and Luke Legere.

6 Springhill Road DEP File # 322-XXX – Continued Public Hearing, Notice of Intent filed pursuant to the Wetland Protection Act (310 CMR 10.0) and a Chapter 194 application filed pursuant to Wayland's Wetlands and Water Resource Protection Bylaw, submitted by Hanbeeth Kim for the installation of the a 12 x 16 foot shed in the rear yard at 6 Springhill Road in Wayland, MA. The proposed work is within the 100-foot wetland buffer zone. Property is shown on Assessor's Map 24, Parcel 043.

No DEP File Number has been issued to this project at the time of this hearing. Applicant will resubmit application to DEP.

B. Howell moved, J. Barnett seconded the motion to continue the hearing to February 10, 2021 at 6:30PM under the Wetland Protection Act and Chapter 194. S. Fair initiated a roll call vote. All in favor 7-0.

61A Lincoln Road D-966 – Public Meeting, Request for Determination filed pursuant to Wayland's Wetlands and Water Resource Protection Bylaw (Chapter 194) and the Wetlands Protection Act (310 CMR 10.0), submitted by Sudbury Valley Trustees for the installation of a boardwalk at 61A Lincoln Road in Wayland, MA. Property is shown on Assessor's Map 08, Parcel 004.

Thomas Creavin, Eagle Scout, presented the proposed project to the Commission. Project will involve installing a 72ft boardwalk along a section of trail at Hazel Brook Conservation Area. Section of trail is consistently wet and rocky, proposed boardwalk will prevent further erosion of the trail and surrounding area. Boardwalk to include access ramp. T. Creavin stated that materials will be walked into the site. Project to take two to three days to complete during the summer, either June or July.

B. Howell moved, J. Sullivan seconded the motion to issue a negative determination under the Wetland Protection Act and to issue a permit under Chapter 194. S. Fair initiated a roll call vote. 6 in favor – 1 abstained (S. Fair) – 0 against.

Reminder – Conflict of Interest Training

L. Hansen reminded the Commission to take the Conflict of Interest Training.

Approve Minutes

J. Barnett moved, L. Legere seconded the motion to approve the meeting minutes from January 6th, 2021 as amended by L. Hansen and B. Howell. S. Fair initiated a roll call vote. All in favor 7-0.

Discuss Community Garden Rental Fees For 2021

L. Hansen noted that the rental fees for the gardens have not been changed in many years. L. Hansen stated that the increase in rental fees would go toward additional projects in the Community Gardens, such as removing garden related trash, reseeding fallow garden plots, additional tools, and access road maintenance. L. Hansen is proposing increasing the senior resident rental fee from $12.00 to $15.00, increasing the non-senior resident rental from $16.00 to either $20 or $25, and increasing the non-resident senior fee to $20, and the non-resident non-senior fee to $30 or $35. L. Hansen noted that this increase is similar to what neighboring communities are charging for community garden plots. Some communities also ask for a deposit for a clean-up fee that would be returned to the renter after successfully cleaning their plot at the end of the year. L. Hansen stated that the Commission doesn't have to decide on this fee increase tonight .

3 Water Row D-967 – Public Meeting, Request for Determination filed pursuant to Wayland's Wetlands and Water Resource Protection Bylaw (Chapter 194) and the Wetlands Protection Act (310 CMR 10.0), submitted by Mark Fried for tree removal and construction of a small bump-out to a carport at 3 Water Row in Wayland, MA. Property is shown on Assessor's Map 17, Parcel 010.

Mark Fried was present and described the project to the Commission. M. Fried stated that the existing carport concrete pad was being eroded by the roots of a nearby tree. To simply re-pour the concrete pad would only result in the same rate of enhanced erosion by the tree roots. M. Fried stated that the tree would have to be removed. All work to take place on existing lawn space. M. Fried stated desire to replant to compensate for the removal of the one tree and remove the existing wire fence.

B. Howell moved, J. Barnett seconded the motion to issue a negative determination under the Wetland Protection Act and to issue a permit with conditions under Chapter 194. S. Fair initiate a roll call vote. All in favor 7-0.

Request For Certification of Compliance: 21 Snake Brook Road, DEP File # 322-764

B. Howell moved, L. Legere seconded the motion to issue a Certificate of Compliance for 21 Snake Brook Road DEP File #322-764 under the Wetland Protection Act and Chapter 194. S. Fair initiated a roll call vote. All in favor 7-0.

24 School Street DEP File # 322-965 – Public Hearing, Notice of Intent filed pursuant to the Wetlands Protection Act (310 CMR 10.0), submitted by Chris D'Antonio for the construction of twelve new townhouses, driveway and parking areas, subsurface sewage disposal system, stormwater management system, and supporting utilities at 24 School Street in Wayland, MA. Property is shown on Assessor's Map 52, Parcel 189.

Brian Nelson from Metro West Engineering was present and provided an overview of the project to the Commission. B. Nelson stated that the existing structures on the property will be removed and two new townhouse buildings will be constructed consisting of 12 units. The units will be accessed from School Street with emergency access off of East Plain Street. The septic system will be located underneath the guest parking area located at the northern edge of the property. Runoff from the impervious surfaces will be captured and treated on site before being discharged to a subsurface stormwater management system located underneath the parking area between the two blocks of townhouses, with some of the

captured roof runoff from the units closest to School Street being diverted into a raingarden located in the south eastern corner of the property.

B. Nelson stated that the results from the MODFLOW analysis indicated adjusting the position of leaching lines closest to the wetlands. Details of the raingarden have also been adjusted to conform to DEP specifications. The overall proposed site layout remains the same as the original submittal.

Michello O'Brien, attorney for the applicant, stated that this NOI was submitted in order to resolve an appeal from DEP regarding the previous filing of the project submitted in 2017. Project was denied by Commission in 2018. DEP affirmed the Commission's decision in 2019. Applicant appealed the decision and DEP decided to remand the decision back to the Commission.

Chris D'Antonio stated that the Board of Health approved the proposed septic conditions after the denial was issued by the Commission. The Zoning Board of Appeals also approved the project after the denial was issued by the Commission. The proposed project has been reviewed by three different peer review consultants.

M. O'Brien noted that this project should only be filed under the Wetland Protection Act and not Chapter 194, as the project is considered a 40B project.

L. Legere inquired about the validity of the ORAD, specifically when was it issued. L. Hansen noted that it was issued November 25th, 2015 and valid for three years. L. Legere also noted that the ORAD is associated with the previous filing. L. Hansen read a statement from DEP, stating that "unless the ORAD was extended, the wetland delineation has expired. Therefore subject to review. There is no active permit that could hold the delineation. "

Amy Kwesell stated that she agrees with DEP and L. Legere's statement. Also noting that a denial was issued and not an order of conditions. A. Kwesell stated that the applicant should have sought an extension of the ORAD back in 2018.

Scott Horsley, representing the abutters to 24 School Street, shared with the Commission the comment letter that he submitted regarding the current filing. S. Horsley summarized four points that he addressed in the comment letter. S. Horsely spoke to the perennial status of the stream, noting that it is a headwater stream that is of special concern regarding nutrient pollution and the impact to downstream resources. The stream behind 24 School Stream is identified as perennial according to the 1970 USGS Topographic Map. S. Horsley identified another perennial stream on the map, noting the similarities between watershed size and the source of water being a small pond with the stream in question. Small ponds at the headwaters of streams help maintain the perennial status.

S. Horsely noted that when the observations were made for the ANRAD application, the applicant did not take into account that the area is subject to well withdrawal. S. Horsely sites a USGS study indicating a 31% reduction in surface water in the Sudbury River watershed in areas subject to well withdrawal. S. Horsely stated that the observed four days of no flow in an area subject to well withdrawal would not indicate that the stream is intermittent. S. Horsely stated that the USGS study on the impact of well withdrawal on surface water was not included in the applicant's submittal.

S. Horsely moved onto his second comment regarding groundwater levels. S. Horsely noted that all of the modeling for this project is based on assumed seasonal high groundwater data and does not take into account groundwater levels recorded by an index well in Wayland maintained by the USGS. Data from this index well was not taken into account when designing models for this project. S. Horsely noted that there is a 1.4 foot difference between what the applicant established as a baseline and what the index well recorded. S. Horsely suggested a conservative baseline be used using the USGS data given the proposed scope of the project at 24 School Street.

S. Horsely discussed his third comment regarding the groundwater model MODFLOW. The model was created by the USGS and was recommended for the project to evaluate the impact of the wastewater and stormwater discharges on groundwater levels and the adjacent wetlands. Horsely noted that the applicant's model only simulated groundwater levels at one time -- 72 hours following a 100 year storm event. S. Horsely noted that the model should be more comprehensive with analysis within the 72 hours and at different locations on the property.

S. Horsely discussed his fourth comment that speaks to the impact to water quality. S. Horsely noted Wayland Board of Health Regulations that would negate the Title 5 presumption and require a water quality impact assessment to determine the impacts to the proposed wastewater discharge on wetland resources under the Wetlands Protection Act Regulations. S. Horsely provided a nutrient loading assessment and determined a predicted concentration of phosphorus and nitrogen much greater than EPA's recommended threshold concentrations.

L. Hansen read comments from a letter written by Molly Upton. L. Hansen stated that she will share this comment letter with the applicant.

"Where does the Mass DEP state that the applicant could use the old borings done nearly 7 years ago – IN AUGUST as the Modflow basis? I find this hard to believe. The developer makes this assertion."

"The developer says it used the same borings, but did it? In the previous reports, I recall seeing that one of the borings hit resistance. The new report says there was no resistance."

"Please examine the application closely as it is a new application. It could be that some items from previous filings have been omitted."

"I believe there is a regulation against discharging to bordering waters? Certainly Point D on the plans should be examined. And converting cfs to gallons yields an incredible volume of subsurface water to be dealt with."

"I question the determination of existing impervious surface (esp. the paver driveways) and hence the claims that drainage will be improved. I visited the site during a very heavy rainstorm and looked in vain to find any runoff onto East Plain Street."

B. Howell stated that the stream's status should be determined first, as the stream's status would dictate what could be done on the site, potentially invalidating the need to have a peer review of the MODFLOW.

Chris D'Antonio stated that he and his team would like to review the comment letters and the proposed scope of work as prepared by L. Hansen for the peer review before making a decision on whether or not to proceed with the peer review and ANRAD.

J. Sullivan moved, J. Barnett seconded the motion to hire a peer review consultant to review the MODFLOW modeling analysis. S. Fair initiated a roll call vote. All in favor 7-0.

B. Howell moved, J. Barnett seconded the motion to require the applicant to file a new wetland and stream status determination. S Fair initiated a roll call vote. All in favor 7-0.

B. Howell moved, K. Schreiber seconded the motion to continue the hearing under the Wetland Protection Act to a time after 7:00PM on February 10th, 2021. S. Fair initiated a roll call vote. All in favor 7-0.

149 Concord Road D-968 – Public Meeting, Request for Determination filed pursuant to Wayland's Wetlands and Water Resource Protection Bylaw (Chapter 194) and the Wetlands Protection Act (310 CMR 10.0), submitted by Qifeng Wei for tree removal within 30 feet of bordering vegetated wetlands at 149 Concord Road in Wayland, MA. Property is shown on Assessor's Map 11, Parcel 095.

Qifeng Wei was present and described the proposed work to the Commission. Q. Wei is proposing to remove a number of trees from his property for safety reasons.

L. Hansen stated she would like to make a site visit to observe the trees in question before issuing a permit.

B. Howell moved, J. Barnett seconded the motion to issue a negative determination under the Wetland Protection Act and to issue a permit under Chapter 194. S. Fair initiated a roll call vote. All in favor 6-0.

Request For Certification of Compliance: 30 Lakeshore Drive, DEP File #322-451 & D-794

B. Howell moved, K. Schreiber seconded the motion to issue a Certificate of Compliance under the Wetland Protection Act for DEP File# 322-451. S. Fair initiated a roll call vote. All in favor 6-0.

B. Howell moved, L. Legere seconded the motion to issue a Certificate of Compliance under Chapter 194 for D-794. S. Fair initiated a roll call vote. All in favor 6-0.

Adjournment

L. Legere moved, K. Schreiber seconded the motion to adjourn the meeting at 8:11PM. S. Fair initiated a roll call vote. All in favor 6-0.

The next meeting of the Wayland Conservation Commission is scheduled for Wednesday February 10th, 2021 at 6:30PM.