NOTICE OF INTENT

Map 18, Lot 105-0
Chandler Street
Burlington, MA
Project Narrative

The existing site located on Chandler Road in Burlington, MA. The land is undeveloped and abuts the Mill Pond Conservation Area. The applicant proposes to construct a three lot single-family development with associated utilities and drainage design. It is the intent of the applicant to donate Lot 4 to the Town of Burlington and work with the Town to provide access to the Mill Pond Area.

The applicant has received an Order of Resource Delineation that is included in this Notice of Intent. There are bordering vegetated wetlands and a vernal pool located on the site.

As a four-lot subdivision, (three homes/one donated) the project is exempt the Commonwealth of Massachusetts Stormwater Management Guidelines. However, the project is subject to the Town of Burlington Stormwater By-Laws. As such, it has been designed in full compliance with the Massachusetts Stormwater Regulations.

The applicant is requesting relief from the Conservation Commission Policy of providing a no-clear zone within 20’ of a resource area and the no-construction zone within 40’ of a resource area for Lot 2. The home will be 121’ from the vernal pool edge and the land will be cleared within 102’ of the vernal pool. The edge of the resource area for the vernal pool is considered 100’ from the vernal pool.

The drainage system design consists of a single catch basin located in the low point of the roadway. The catch basin drains to a forebay, in compliance with the regulations which, in turn, flows via a field grate to an infiltration structure, as dictated by the Board of Health Regulations. The large infiltration structure consists of 60 Stormtech SC-740 units and crushed stone, the infiltration system will discharge via a 12” culvert, as well as exfiltration.

Furthermore, stone aprons are provided around the house and along the driveways to convey stormwater to infiltration structures that will provide groundwater discharge and stormwater attenuation.

Predevelopment

The majority of the future developed area consists of a wooded area. There is also a portion of the easterly abutting lot that flows toward the project. Based upon SCS Soils Maps and on-site observation it was determined that HSG B would be used for the HydroCad Calculations. The wooded area contains 156,736 SF and the abutting lots (1/2 acre lot) contributed 18,000 SF to the predevelopment subcatchment.
Postdevelopment Drainage System

The applicant proposes to construct a 24’ wide road with a 40’ radius cul-de-sac, in line with Burlington Subdivision Regulations. The roadway will service three single-family lots with driveways and utilities. The roadway runoff is directed to a catch basin at the low point of the road. The runoff is then piped to a forebay which flows to an infiltration basin at the rear of Lot 1.

Each house will provide groundwater recharge and stormwater attenuation through the use of stone aprons along the foundations that drain to subsurface infiltration structures. All roof runoff from the front of the homes will be infiltrated. The rear of the homes will flow to infiltration structures that will discharge stormwater to the surface during large storms. The roadway and other portions of the site direct stormwater to an infiltration basin to the rear of Lot 1.

The HydroCad Calculations have been provided in three separate reports.

The first shows predevelopment flows (1S)

The second shows the front of the houses on Lots 1 and 2. These flows (Po-11 and Po-21) are directed through the stone aprons (IT-11 and IT-21) to infiltration structures (IS-11 and IS21) which contain the 100-year storm in its entirety.

The third HydroCad Report shows all other drainage. The roadway and easterly contributing areas, as well as a portion of the rear of the house on Lot2 (Po-IB), flow to the Infiltration Structure (IS-1), as shown. The stormwater from the rear of the house and the driveway on Lot 1 (Po-12) are directed through the stone trench (IT-12) to an infiltration structure (IS-12). In large storms, flow from IS-12 will overflow the structure at a granite weir and flow to IB-1.

Furthermore, the stormwater runoff from portions of the house, overland flow and the entire driveway on Lot 2 (Po-22 and Po-23) are directed through the stone trenches (IT-22 and IT-23) to an infiltration structure (IS-22). In large storms, flow from IS-22 will overflow the structure at a granite weir and flow overland to the wetland area.

Finally, the stormwater runoff from the house, overland flow and the entire driveway on Lot 3 (Po-31 and Po-32) are directed through the stone trenches (IT-31 and IT-32) to infiltration structures (IS-31 and IS-32). In large storms, flow from IS-32 will overflow the structure at a granite weir and flow overland to the wetland area.

There will be a reduction in runoff rate and volume for 2-, 10-, and 100-year storm events.
NOI FORM 3
NOTICE OF INTENT
A. General Information

1. Project Location (Note: electronic filers will click on button to locate project site):
   Chandler Rd
   a. Street Address
   Burlington
   b. City/Town
   01803
   c. Zip Code
   42.515
   d. Latitude
   -71.185
e. Longitude
   105-0
   f. Assessors Map/Plat Number
   g. Parcel/Lot Number

2. Applicant:

   a. First Name
   GTH Homes, LLC
   b. Last Name
   c. Organization
   11 Bedford Street
   d. Street Address
   Burlington
   e. City/Town
   MA
   f. State
   01803
g. Zip Code
   781-354-0031
   h. Phone Number
   i. Fax Number
   j. Email Address

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

   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):

   a. First Name
   Dresser, Williams & Way, Inc.
b. Last Name
   c. Company
   572 Boston Rd - Unit 5
d. Street Address
   Billerica
   e. City/Town
   MA
   f. State
   01821
g. Zip Code
   978-663-5410
   h. Phone Number
   i. Fax Number
   j. Email address

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

   $1,050.00
   a. Total Fee Paid
   $512.50
   b. State Fee Paid
   $537.50
   c. City/Town Fee Paid
6. General Project Description:
   Project involves demolition of the existing structure and construction of a single family house within
   100 feet of bordering vegetated wetlands.

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:
   Middlesex
   a. County
   74163
   b. Certificate # (if registered land)
   312
c. Book
   d. Page Number

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

   Check all that apply below. Attach narrative and any supporting documentation describing how the
   project will meet all performance standards for each of the resource areas altered, including
   standards requiring consideration of alternative project design or location.
# B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Size of Proposed Alteration</th>
<th>Proposed Replacement (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. □ Bank</td>
<td>1. linear feet</td>
<td>2. linear feet</td>
</tr>
<tr>
<td>b. □ Bordering Vegetated Wetland</td>
<td>1. square feet</td>
<td>2. square feet</td>
</tr>
<tr>
<td>c. □ Land Under Waterbodies and Waterways</td>
<td>1. square feet</td>
<td>2. square feet</td>
</tr>
<tr>
<td></td>
<td>3. cubic yards dredged</td>
<td></td>
</tr>
<tr>
<td>Resource Area</td>
<td>Size of Proposed Alteration</td>
<td>Proposed Replacement (if any)</td>
</tr>
<tr>
<td>d. □ Bordering Land Subject to Flooding</td>
<td>1. square feet</td>
<td>2. square feet</td>
</tr>
<tr>
<td>e. □ Isolated Land Subject to Flooding</td>
<td>3. cubic feet of flood storage lost</td>
<td>4. cubic feet replaced</td>
</tr>
<tr>
<td>f. □ Riverfront Area</td>
<td>1. square feet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. cubic feet of flood storage lost</td>
<td>3. cubic feet replaced</td>
</tr>
<tr>
<td>1. Name of Waterway (if available) - specify coastal or inland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Width of Riverfront Area (check one):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ 25 ft. - Designated Densely Developed Areas only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ 100 ft. - New agricultural projects only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ 200 ft. - All other projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Total area of Riverfront Area on the site of the proposed project:</td>
<td></td>
<td>square feet</td>
</tr>
<tr>
<td>4. Proposed alteration of the Riverfront Area:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. total square feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. square feet within 100 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. square feet between 100 ft. and 200 ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Has an alternatives analysis been done and is it attached to this NOI?</td>
<td>□ Yes □ No</td>
<td></td>
</tr>
<tr>
<td>6. Was the lot where the activity is proposed created prior to August 1, 1996?</td>
<td>□ Yes □ No</td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Size of Proposed Alteration</th>
<th>Proposed Replacement (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Designated Port Areas</td>
<td>Indicate size under Land Under the Ocean, below</td>
<td></td>
</tr>
<tr>
<td>b. Land Under the Ocean</td>
<td>1. square feet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. cubic yards dredged</td>
<td></td>
</tr>
<tr>
<td>c. Barrier Beach</td>
<td>Indicate size under Coastal Beaches and/or Coastal Dunes below</td>
<td></td>
</tr>
<tr>
<td>d. Coastal Beaches</td>
<td>1. square feet</td>
<td></td>
</tr>
<tr>
<td>e. Coastal Dunes</td>
<td>1. square feet</td>
<td>2. cubic yards beach nourishment</td>
</tr>
<tr>
<td>f. Coastal Banks</td>
<td>1. linear feet</td>
<td></td>
</tr>
<tr>
<td>g. Rocky Intertidal Shores</td>
<td>1. square feet</td>
<td></td>
</tr>
<tr>
<td>h. Salt Marshes</td>
<td>1. square feet</td>
<td>2. sq ft restoration, rehab., creation</td>
</tr>
<tr>
<td>i. Land Under Salt Ponds</td>
<td>1. square feet</td>
<td></td>
</tr>
<tr>
<td>j. Land Containing Shellfish</td>
<td>2. cubic yards dredged</td>
<td></td>
</tr>
<tr>
<td>k. Fish Runs</td>
<td>1. square feet</td>
<td></td>
</tr>
<tr>
<td>l. Land Subject to Coastal Storm Flowage</td>
<td>Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above</td>
<td>1. cubic yards dredged</td>
</tr>
<tr>
<td>4. Restoration/Enhancement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. square feet of BWV</td>
<td>b. square feet of Salt Marsh</td>
<td></td>
</tr>
<tr>
<td>5. Project Involves Stream Crossings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. number of new stream crossings</td>
<td>b. number of replacement stream crossings</td>
<td></td>
</tr>
</tbody>
</table>
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

   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).

2. Submit Supplemental Information for Endangered Species Review*

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

      (a) within wetland Resource Area
      percentage/acreage

      (b) outside Resource Area
      percentage/acreage

   2. ☒ Assessor’s Map or right-of-way plan of site

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

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

      (b) ☒ Photographs representative of the site

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

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.
C. Other Applicable Standards and Requirements (cont’d)

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

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

(d) ☐ Vegetation cover type map of site

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

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review. Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing.

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
   1213 Purchase Street – 3rd Floor
   New Bedford, MA  02740-6694
   Email: DMF.EnvReview-South@state.ma.us

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

   Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP’s Boston Office. For coastal towns in the Southeast Region, please contact MassDEP’s Southeast Regional Office.
C. Other Applicable Standards and Requirements (cont'd)

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
   a. ☐ Yes ☒ No  If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). Note: electronic filers click on Website.

   b. ACEC

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

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

Definitive Subdivision Plan

a. Plan Title
Dresser, Williams & Way, Inc.
b. Prepared By
Stephen R. Dresser, PE
c. Signed and Stamped by
1" = 40'
d. Final Revision Date
5/14/2020
e. Scale

f. Additional Plan or Document Title

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


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

DWW Inc.

6. Payor name on check: First Name

7. Payor 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.

1. Signature of Applicant

2. Date 6/2/20

3. Signature of Property Owner (if different)

4. Date 6/2/20

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.
NOI WETLAND FEE
TRANSMITTAL FORM
A. Applicant Information

1. Location of Project:

   a. Street Address: Chandler Rd
   b. City/Town: Burlington
   c. Check number
   d. Fee amount: $1,050

2. Applicant Mailing Address:

   a. First Name
   b. Last Name
   c. Organization: GTH Homes, LLC
   d. Mailing Address: 11 Bedford St
   e. City/Town: Burlington
   f. State: MA
   g. Zip Code: 01803
   h. Phone Number: 781-354-0031
   i. Fax Number
   j. Email Address

3. Property Owner (if different):

   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

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.
**B. Fees (continued)**

<table>
<thead>
<tr>
<th>Step 1/Type of Activity</th>
<th>Step 2/Number of Activities</th>
<th>Step 3/Individual Activity Fee</th>
<th>Step 4/Subtotal Activity Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>3b) Each Building Including Site</td>
<td>1</td>
<td>$1,050.00</td>
<td>$1,050.00</td>
</tr>
</tbody>
</table>

Step 5/Total Project Fee: $1,050.00

**Step 6/Fee Payments:**

<table>
<thead>
<tr>
<th>Total Project Fee: $1,050.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Total Fee from Step 5</td>
</tr>
<tr>
<td>State share of filing Fee:</td>
</tr>
<tr>
<td>b. 1/2 Total Fee less $12.50</td>
</tr>
<tr>
<td>City/Town share of filing Fee:</td>
</tr>
<tr>
<td>c. 1/2 Total Fee plus $12.50</td>
</tr>
</tbody>
</table>

**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.)
BYLAW
APPLICATION
FORM
BURLINGTON BY-LAW ARTICLE 14
WETLANDS
APPLICATION FORM

Application for: Notice of Intent X Determination of Applicability ANRAD

Filing Fee: (By-Law Fee Only)

Applicant: GTH Homes, LLC

Address: 11 Bedford St Burlington, MA

E-mail Address: jhickox@cemsolutioncenter.com

Property Owner: Same

Address:

Location of Site: Chandler Rd

Burlington Assessor’s Map No. 18 Parcel No. 105-0

Project Description:

A signed application by both the applicant, and the property owner, if other than the applicant, is required as part of a complete filing for work in a wetland (both bordering on a water body or isolated); a water body, intermittent stream, and/or ditch; and/or land within 100 feet of such areas; and/or land within 200 feet of a regulated stream. In signing this application form both the owner and applicant shall consent to granting permission to the Burlington Conservation Commission and agents thereof, as well as other Town employees who may be required to view the site, to enter upon and inspect the land in question.

Signature(s)

Applicant Property Owner

781-354-0031 Telephone Number

Incorrect information may be grounds to deny an application.
Burlington Bylaws – Article XIV, Section 6.0

EROSION & SEDIMENTATION CONTROL

Permit Application

Applicant:

GTH Homes, LLC
Name

11 Bedford St
Mailing Address

Burlington, MA 01803
City/Town State Zip

781-354-0031
Phone Number

Owner:

Name

Mailing Address

City/Town State Zip

Phone Number

Representative (if any):

Dresser, William and Way
Firm

Stephen Dresser PE
Contact Name

572 Boston Rd - 5
Mailing Address

Billerica, MA 01821
City/Town

(978) 663-5410
Phone Number

E-Mail Address

DwllwInc 11@yaho0.com

Project Description

Does area of land disturbance exceed 10,000 square feet? YES ☐ NO ☐

Does the area of land disturbance exceed 20,000 square feet? YES ☐ NO ☐

Work Description (Describe & quantify area/amount of earth disturbance, changes in grade and other construction activities. Use additional paper and/or provide plan(s) of work)

Project Location (Use maps and plans to identify the location of the area subject to this application):

Chandler Rd
Street Address

Assessors Map/Parcel

Area Description – Existing Conditions (i.e. wooded, lawn, slopes, paved, etc.):
EROSION & SEDIMENTATION CONTROL

Permit Application

Plan and/or Map Reference(s):

<table>
<thead>
<tr>
<th>Title</th>
<th>Date</th>
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<tbody>
<tr>
<td>Notice of Intent Site Plan</td>
<td>May 28, 2020</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</table>

Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Erosion & Sediment Control Permit Application and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge.

I further certify that abutters, as required under this Bylaw, have been notified of this application.

Signatures:

I also understand that notification of this application will be placed in a local newspaper at my expense in accordance with Section 6.0 of Article XIV of the Burlington General Bylaws.

Signature of Applicant

Date

Signature of Representative (if any)
ABUTTERS
LIST
Town of Burlington  
Abutters List

100-Feet Conservation

Subject Parcel ID: 18-105-0
Subject Property Location: CHANDLER RD

<table>
<thead>
<tr>
<th>ParcelID</th>
<th>Location</th>
<th>Owner</th>
<th>Co-Owner</th>
<th>Mailing Address</th>
<th>City</th>
<th>State</th>
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<td>18-105-0</td>
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<td>GTH HOMES LLC</td>
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<td>JANICE T GREAVES</td>
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<td>KERRY A ROSS</td>
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<td>18-51-9</td>
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<td>29 CHANDLER RD NOMINEE</td>
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<td>18-104-0</td>
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<td>CADARETTE BRUCE S</td>
<td>MARGARET MONTORE</td>
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<td>MA</td>
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<td>18-52-0</td>
<td>CHANDLER RD</td>
<td>LYNCH KERRI A</td>
<td>GERALDINE G LYNCH</td>
<td>31 CHANDLER RD</td>
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<td>18-63-0</td>
<td>CHANDLER RD</td>
<td>SALMON MICHAEL</td>
<td>LISA SALMON</td>
<td>33 CHANDLER RD</td>
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<td>18-51-0</td>
<td>HARRIS DR</td>
<td>WALSH MICHAEL E &amp; MARSHA A'T</td>
<td>M &amp; M WALSH REV TRUST</td>
<td>1 HARRIS DR</td>
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<td>24-85-0</td>
<td>LOCUST ST</td>
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<td>CONSERVATION</td>
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<td>MA</td>
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</table>

Parcel Count: 11

End of Report
NOTIFICATION TO ABUTTERS UNDER THE MASSACHUSETTS WETLANDS PROTECTION ACT

In accordance with the second paragraph of Massachusetts General Laws, Chapter 131, § 40, as well as the Town of Burlington Bylaws, you are hereby notified of the following work within a resource area or within the 100’ buffer zone of a resource area:

A. The name of the applicant is: **BTH Homes, LLC**

B. The address of the lot where the activity is proposed is: **Chandler Rd, Map 18, Lot 105-0**

C. The applicant has filed a **X** Notice of Intent or an __________ Abbreviated Notice of Resource Area Delineation with the Burlington Conservation Commission. Said permit applicant is seeking permission to confirm wetland resource area boundaries or to conduct work within a wetland, water body or resource area or a buffer zone to a wetland, waterbody or resource area subject to protection under the Wetlands Protection Act (MGL c. 131, § 40), and/or the Town of Burlington Wetland Bylaws.

D. **X** Copies of the application may be examined at the office of the Burlington Conservation Commission, Town Hall Annex, 25 Center Street, Burlington, MA between the hours 8:30 a.m. – 4:30 p.m. on Monday, Tuesday and Thursday, 8:30 a.m. – 7 p.m. on Wednesday, and 8:30 a.m. – 1 p.m. on Friday. Telephone: (781) 270-1655. Additional times are available by appointment.

E. Copies of the application may be obtained from either (check one) the ___ applicant, or **X** the applicant’s representative, by calling this telephone number (781) 663-5410 on the following days of the week: **Fro-MW** between the hours of: 10 and 3.

F. Information regarding the date, time and place of the public hearing may be obtained from the Burlington Conservation Commission. Telephone: **(781) 270-1655.** If available from the applicant, check here ___ and see the information available in # E.

NOTE: At least five days in advance, notice of the Public hearing will be published in The Daily Times Chronicle, Woburn, MA. The notice will include the hearing date, time and place. Notice of the Public Hearing will be posted in the Town Hall not less than forty-eight (48) hours in advance.
EXHIBITS, FIGURES, & PLANS
To Be Included in Notice of Intent

FIGURES

- Figure 1 .......................................................... Project Locus USGS Map
- Figure 2 .............................................................. Soil Map
- Figure 3 ......................................................... FEMA Flood Hazard Boundary Map

EXHIBITS

- Exhibit 1 ....................................................... Order of Resource Area Delineation

PLANS

- Site Plan .......................................................... Title: Definitive Subdivision Plan
  Dated: May 14, 2020
  Scale: 1” = 40’
  Sheets 1 of 1
Figure 1

Project Locus
USGS Map
Figure 2

Soils Map
# Map Unit Legend

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
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<tr>
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<td>Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes</td>
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<td>631C</td>
<td>Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky</td>
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<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td><strong>4.8</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Figure 3

FEMA Flood Hazard Boundary Map
Figure 3 - FEMA Flood Hazard Boundary Map

Scale: 1" = 500'

Source: FIRM 25017C0293E

Dresser, Williams & Way, Inc.
572 Boston Rd. - Unit 5
Billerica, MA
Telephone No. (978) 663-5410
Fax No. (978) 663-8658
Job No. 4578
Exhibit 1

Order of Resource Area Delineation
WPA Form 4B – Order of Resource Area Delineation

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

A. General Information

From: Burlington
   1. Conservation Commission

2. This Issuance is for (check one):
   a. ☑ Order of Resource Area Delineation
   b. ☐ Amended Order of Resource Area Delineation

3. Applicant:
   a. Name
   b. Name
   GTH Homes, LLC
   c. Organization
   11 Bedford Street
   d. Mailing Address
   Burlington MA 01803
   e. City/Town
   f. State
   g. Zip Code

4. Property Owner (if different from applicant):
   a. First Name
   b. Last Name
   c. Organization
   d. Mailing Address
   e. City/Town
   f. State
   g. Zip Code

5. Project Location:
   Chandler Road Burlington 01803
   a. Street Address
   18
   b. City/Town
   c. Zip Code
   d. Assessor's Map/Plat Number
   e. Parcel/Lot Number
   Latitude and Longitude
   (in degrees, minutes, seconds):
   42.515
   f. Latitude
   -71.185
   g. Longitude

6. Dates:
   a. Date ANRAD filed
   March 12, 2020
   b. Date Public Hearing Closed
   April 23, 2020
   c. Date of Issuance
   April 30, 2020

7. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:
   a. Title
   See attached
   b. Date
   c. Title
   d. Date
B. Order of Delineation

1. The Conservation Commission has determined the following (check whichever is applicable):

   a. ☐ Accurate: The boundaries described on the referenced plan(s) above and in the Abbreviated Notice of Resource Area Delineation are accurately drawn for the following resource area(s):

      1. ☑ Bordering Vegetated Wetlands
      2. ☑ Other resource area(s), specifically:

         a. See Bylaw Decision

   b. ☐ Modified: The boundaries described on the plan(s) referenced above, as modified by the Conservation Commission from the plans contained in the Abbreviated Notice of Resource Area Delineation, are accurately drawn from the following resource area(s):

      1. ☐ Bordering Vegetated Wetlands
      2. ☐ Other resource area(s), specifically:

         a. 

   c. ☐ Inaccurate: The boundaries described on the referenced plan(s) and in the Abbreviated Notice of Resource Area Delineation were found to be inaccurate and cannot be confirmed for the following resource area(s):

      1. ☐ Bordering Vegetated Wetlands
      2. ☐ Other resource area(s), specifically:

         ________________________________________________________________

         ________________________________________________________________

      3. ☐ The boundaries were determined to be inaccurate because:

         ________________________________________________________________

         ________________________________________________________________

         ________________________________________________________________
C. Findings

This Order of Resource Area Delineation determines that the boundaries of those resource areas noted above, have been delineated and approved by the Commission and are binding as to all decisions rendered pursuant to the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40) and its regulations (310 CMR 10.00). This Order does not, however, determine the boundaries of any resource area or Buffer Zone to any resource area not specifically noted above, regardless of whether such boundaries are contained on the plans attached to this Order or to the Abbreviated Notice of Resource Area Delineation.

This Order must be signed by a majority of the Conservation Commission. The Order must be sent by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/find-the-massdep-regional-office-for-your-city-or-town.html).

D. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate DEP Regional Office to issue a Superseding Order of Resource Area Delineation. When requested to issue a Superseding Order of Resource Area Delineation, the Department's review is limited to the objections to the resource area delineation(s) stated in the appeal request. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order of Resource Area Delineation will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order or Determination, or providing written information to the Department prior to issuance of a Superseding Order or Determination.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act, (M.G.L. c. 131, § 40) and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

E. Signatures

Please indicate the number of members who will sign this form.

Larry Cohen
William Belvin
Gail Long

Ed LoTurco
Jennifer O'Riorden
Don Bernstein

This Order is valid for three years from the date of issuance.

If this Order constitutes an Amended Order of Resource Area Delineation, this Order does not extend the issuance date of the original Final Order, which expires unless extended in writing by the issuing authority.

This Order is issued to the applicant and the property owner (if different) as follows:

2. ☐ By hand delivery on
   a. Date

3. ☑ By certified mail, return receipt requested on
   a. Date

   4/30/2020
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee
Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A. Request Information

1. Location of Project

   a. Street Address
   b. City/Town, Zip

   c. Check number
   d. Fee amount

2. Person or party making request (if appropriate, name the citizen group’s representative):

   Name

   Mailing Address

   City/Town

   State

   Zip Code

   Phone Number

   Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

   Name

   Mailing Address

   City/Town

   State

   Zip Code

   Phone Number

   Fax Number (if applicable)

4. DEP File Number:

   DEP122-641

B. Instructions

1. When the Departmental action request is for (check one):

   □ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

   □ Superseding Determination of Applicability – Fee: $120

   □ Superseding Order of Resource Area Delineation – Fee: $120

Send this form and check or money order, payable to the Commonwealth of Massachusetts, to:

Department of Environmental Protection
Box 4062
Boston, MA 02211
B. Instructions (cont.)

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a copy of this form and a copy of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.
ORDER OF RESOURCE AREA DELINEATION (ORAD)

Wetland Protection Act (WPA) - MGL Ch. 131, §40
310 CMR 10.00
&
BURLINGTON WETLAND BYLAW - ARTICLE 14

DEP NUMBER: #122-641

APPLICANT: GTH Homes, LLC
11 Bedford Street,
Burlington, MA 01803

PROJECT LOCATION: Chandler Road, Burlington, MA 01803

ASSESSORS MAPS-PARCELS: 18-105-0

OWNER: GTH Homes, LLC
11 Bedford Street,
Burlington, MA 01803

PUBLIC HEARING OPENED: April 9, 2020
CONTINUED HEARING DATE/S: April 23, 2020
PUBLIC HEARING CLOSED: April 23, 2020
DATE OF ISSUANCE: April 30, 2020

FINDINGS

Filing History: An Abbreviated Notice of Resource Area Delineation (ANRAD) was filed on March 12, 2020, by Dresser, Williams & Way, Inc. for the applicants. The purpose of the ANRAD was for approval of the boundaries of wetland resource areas occurring within the property under the WPA and Burlington Wetland Bylaw and the boundaries of a vernal pool under the Burlington Wetland Bylaw.
The application considered under Burlington By-law Article 14 includes that material submitted for the application filed pursuant to MGL Chap. 131, Section 40 for an Abbreviated Notice of Resource Area Delineation. A public hearing notice for the application was published in the Daily Times Chronicle on March 19, 2020. A copy of the hearing notice was posted in the Town Hall and given to the Board of Health, Planning Board, Town Administrator, and Town Engineer. The public hearing was scheduled to open on March 26, 2020, but that meeting was cancelled. The meeting opened on April 9 (virtual on-line meeting due to COVID-19) and was continued, after discussion, to April 23, 2020 (also virtual), with the consent of the applicant. The hearing closed on April 23.

Plan/Document References:

Resource Area Findings:
- The Conservation Commission finds the vernal pool delineation shown on the approved plan to be an accurate representation of the vernal pool on the parcel under the Burlington Wetland Bylaw.
- The Conservation Commission finds the wetland delineation shown on the approved plan to be an accurate representation of the bordering vegetated wetland (BVW) on the parcel under the WPA and Burlington Wetland Bylaw.
- The Conservation Commission finds that there are no other wetland resource areas on the parcel regulated under the WPA.

Additional Resource Area Discussion:
The Burlington Wetland Bylaw projects all vernal pools as resource areas, unlike the MA Wetland Protection Act. The Commission finds that the wetland on this property includes a vernal pool that is subject to the jurisdiction of the Bylaw.

The Bylaw defines the vernal pool as the area within 100 feet of the annual high water line. The Commission finds that the lines depicted on the plan accurately depict both the high water line and the vernal pool boundary 100 feet upgradient.

DEcision

The Burlington Conservation Commission hereby determines that the boundaries of the vernal pool and of bordering vegetated wetland described on the reference surveyed plan cited above represents an accurate delineation under M.G.L. Ch. 131 Sec. 40, 310 CMR 10.00 and Article XIV of the Burlington Bylaws.
Burlington By-laws Article IV
Order of Resource Area Delineation, DEP 122-641
Chandler Road, Map 18, Parcels 105-0
Applicant: GTH Homes LLC
Date: April 30, 2020

BY BURLINGTON CONSERVATION COMMISSION:

Larry Cohen
William Boivin
Indra Deb
Don Bernstein

Gail Lima
Ed LoTurco
Jennifer O'Riorden
Dresser, Williams & Way, Inc.
Professional Engineers & Land Surveyors
572 Boston Road – Suite 5
Billerica, MA 01821
Phone: (978) 663-5410 Fax: (978) 663-8658 E-Mail: DWWinc11@yahoo.com

STORMWATER DRAINAGE REPORT

For

MILL POND ESTATES
MILL POND LANE
BILLERICA, MA

MAY 15, 2020
Table of Contents

Introduction
Site Terrain and Soils
Existing Conditions
Proposed Conditions
Calculations and Design
Stormwater Standards
Summary

Exhibits

Exhibit 1    Drainage Analysis
Exhibit 2    NRCS Soils Report
Exhibit 3    Stormwater Management System Operation & Maintenance Manual
Exhibit 4    Long Term Pollution Prevention Plan
Exhibit 5    Illicit Discharge Statement
Exhibit 6    Stormwater Report Checklist

Attachments

Attachment A    HydroCAD Calculations
Attachment B    Forebay and WQV Calculations
Attachment C    Recharge Volume and Drawdown Calculations
Attachment D    TSS Removal Sheets
Attachment E    Soil Logs
I. Introduction

The existing site located on Chandler Road in Burlington, MA. The land is undeveloped and abuts the Mill Pond Conservation Area. The applicant proposes to construct a three lot single-family development with associated utilities and drainage design.

As a three-lot subdivision, the project is exempt the Commonwealth of Massachusetts Stormwater Management Guidelines. However, the project is subject to the Town of Burlington Stormwater By-Laws. As such, it has been designed in full compliance with the Massachusetts Stormwater Regulations.

The drainage system design consists of a single catch basin located in the low point of the roadway. The catch basin drains to a forebay, in compliance with the regulations which, in turn, flows via a field grate to an infiltration structure, as dictated by the Board of Health Regulations. The large infiltration structure consists of 60 Stormtech SC-740 units and crushed stone, the infiltration system will discharge via a 12” culvert, as well as exfiltration.

Furthermore, stone aprons are provided around the house and along the driveways to convey stormwater to infiltration structures that will provide groundwater discharge and stormwater attenuation.

II. Site Terrain and Soils

The existing site is wooded with the presence of a vernal pool at the low point of the lot. The easterly portion of the site is sloped toward the vernal pool in the middle of the site which slopes back upward at the westerly portion of the site. The roadway and homes will be constructed on the easterly portion. It is the intent of the applicant to donate the westerly portion of the site to the Town of Burlington to be used as additional protected land along the Mill Pond Conservation Area. The SCS Soil Maps report the soils as a Charlton (HSG A) – Hollis (HSG D) – Rock Outcrop Complex. On Site Soil tests showed a Loamy Sand at subsurface level. Based on the soil complex (A-D) and on site observations, an HSG B was used for the drainage calculations. Soil testing was observed by the Board of Health and Soil Logs are attached as a part of this report. A NRCS Soils Report is attached as Exhibit 2.

III Existing Conditions

The existing site is wooded with higher terrain at the easterly and westerly sides of the lot and the presence of a vernal pool in the middle at the low point of the lot. The applicant has received an Order of Resource Delineation for the Burlington Conservation Commission.

IV Proposed Conditions

The applicant proposes to construct a 24’ wide road with a 40’ radius cul-de-sac, in line with Burlington Subdivision Regulations. The roadway will service three single-family lots with driveways and utilities.
from the front of the homes will be infiltrated. The rear of the homes will flow to infiltration structures that will discharge stormwater to the surface during large storms. The roadway and other portions of the site direct stormwater to an infiltration basin to the rear of Lot 1.

There will be a reduction in runoff rate and volume for 2-, 10-, and 100-year storm events.

V Calculations and Design

Stormwater Calculations showing compliance with Stormwater Guidelines are enclosed in various attachments and exhibits including:

- Hydrocad Calculations
- WQV Calculations
- Recharge Volume and Drawdown Calculations
- TSS Removal Sheets
- Soil Information

VI. MADEP Stormwater Standards Compliance

The following sections detail how the project will meet DEP Stormwater Management Policy's ten stormwater management standards.

Standard 1 - Untreated Stormwater

There will be no untreated stormwater directly discharged to or cause erosion in the wetlands or waters of the Commonwealth. TSS will be removed by catch basins, proprietary separators and infiltration structures.

Standard 2 - Post-Development Peak Discharge Rates

There will be a reduction in rate of runoff and volume of runoff for all storms. See Attachment A.

Standard 3 - Recharge to Groundwater

Recharging of runoff will occur via the infiltration structures and the infiltration basin. The amount of stormwater recharged to groundwater exceeds the required volume and the basins will draw down in less than 72 hours. See Attachment C.

Standard 4 - Water Quality

Total Suspended Solids have been removed as required by the Stormwater Management Guidelines. See Attachment D.
In addition to removal of TSS, a Long Term Pollution Prevention Plan, *i.e.* Operations and Maintenance Manual, has been created to maintain a clean site and ensure that all BMPs are functioning to their maximum potential. See Exhibit 4.

**Standard 5 - Higher Potential Pollutant Loads**

MassDEP does not consider the project to be an area with Higher Potential Pollutant Loads.

**Standard 6 - Protection of Critical Areas**

The project site does not discharge to critical areas as defined in MA DEP Stormwater Policy Handbook.

**Standard 7 - Redevelopment Projects**

This project is not considered a redevelopment project due to the increase in impervious area when completed.

**Standard 8 - Erosion/Sediment Control**

Erosion and sediment controls have been incorporated into the project design to prevent erosion, control sediments, and stabilize exposed soils during construction and land disturbance. Straw wattle locations have been shown on the site plan. Sheet 4 of 9 of the Plan Set includes erosion and sedimentation control details.

**Standard 9 - Operation & Maintenance Plan**

An Operation and Maintenance Plan for the proposed project is included in Exhibit 3.

**Standard 10 - Prohibition of Illicit Discharges**

An Illicit Discharge Compliance Statement is included with this report.

**VII Summary**

Project is in compliance with the Stormwater Management Guidelines. A Drainage Analysis is enclosed explaining the design of the drainage. Various Attachments and Exhibits are attached showing how the design is in compliance.
Exhibit 1

Drainage Analysis
DRAINAGE ANALYSIS

The existing site located on Chandler Road in Burlington, MA. The land is undeveloped and abuts the Mill Pond Conservation Area. The applicant proposes to construct a three lot single-family development with associated utilities and drainage design.

As a three-lot subdivision, the project is exempt the Commonwealth of Massachusetts Stormwater Management Guidelines. However, the project is subject to the Town of Burlington Stormwater By-Laws. As such, it has been designed in full compliance with the Massachusetts Stormwater Regulations.

The drainage system design consists of a single catch basin located in the low point of the roadway. The catch basin drains to a forebay, in compliance with the regulations which, in turn, flows to an infiltration basin. The infiltration basin will be drained via two 8” PVC pipe, as well as exfiltration. One of the 8” PVC pipe is located at the bottom of the basin, thus the basin does not rely on exfiltration to fully empty. The second 8” PVC pipe and a weir help to control stormwater runoff for larger storm events. As per the HydroCad calculations, the peak depth of water in the basin will be 20” for a 100-year storm and the detention time is about 20 minutes following the storm event.

Furthermore, stone aprons are provided around the house and along the driveways to convey stormwater to infiltration structures that will provide groundwater discharge and stormwater attenuation.

Predevelopment

The majority of the future developed area consists of a wooded area. There is also a portion of the easterly abutting lot that flows toward the project. Based upon SCS Soils Maps and on-site observation it was determined that HSG B would be used for the HydroCad Calculations. The wooded area contains 156,736 SF and the abutting lots (1/2 acre lot) contributed 18,000 SF to the predevelopment subcatchment.

Postdevelopment Drainage System

The applicant proposes to construct a 24’ wide road with a 40’ radius cul-de-sac, in line with Burlington Subdivision Regulations. The roadway will service three single-family lots with driveways and utilities. The roadway runoff is directed to a catch basin at the low point of the road. The runoff is then piped to a forebay which flows to an infiltration basin at the rear of Lot 1.

Each house will provide groundwater recharge and stormwater attenuation through the use of stone aprons along the foundations that drain to subsurface infiltration structures. All roof runoff from the front of the homes will be infiltrated. The rear of the homes will flow to infiltration structures that will discharge stormwater to the surface during large storms. The roadway and other portions of the site direct stormwater to an infiltration basin to the rear of Lot 1.

The Hydrocad Calculations have been provided in two separate reports. The first show the front of the houses on Lots 1 and 2. These flows (Po-11 and Po-21) are directed through the stone
aprons (IT-11 and IT-21) to infiltration structures (IS-11 and IS21) which contain the 100-year storm in its entirety.

The second HydroCad Report shows all other drainage including the predevelopment subcatchment (1S). The roadway and easterly contributing areas, as well as a portion of the rear of the house on Lot 2 (Po-IB), flow to the Infiltration Basin (IB-1), as shown. The stormwater from the rear of the house and the driveway on Lot 1 (Po-12) are directed through the stone trench (IT-12) to an infiltration structure (IS-12). In large storms, flow from IS-12 will overflow the structure at a granite weir and flow to IB-1.

Furthermore, the stormwater runoff from portions of the house, overland flow and the entire driveway on Lot 2 (Po-22 and Po-23) are directed through the stone trenches (IT-22 and IT-23) to an infiltration structure (IS-22). In large storms, flow from IS-22 will overflow the structure at a granite weir and flow overland to the wetland area.

Finally, the stormwater runoff from the house, overland flow and the entire driveway on Lot 3 (Po-31 and Po-32) are directed through the stone trenches (IT-31 and IT-32) to infiltration structures (IS-31 and IS-32). In large storms, flow from IS-32 will overflow the structure at a granite weir and flow overland to the wetland area.

There will be a reduction in runoff rate and volume for 2-, 10-, and 100-year storm events.
Exhibit 2

NRCS Soils Report
# MAP LEGEND

<table>
<thead>
<tr>
<th>Area of Interest (AOI)</th>
<th>Soil Map Unit Polygons</th>
<th>Soil Map Unit Lines</th>
<th>Soil Map Unit Points</th>
<th>Special Point Features</th>
<th>Water Features</th>
<th>Transportation</th>
<th>Background</th>
</tr>
</thead>
<tbody>
<tr>
<td>❏</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Spill Area</td>
<td>Rails</td>
<td>Aerial Photography</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Stony Spot</td>
<td>Interstate Highways</td>
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</tr>
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<td></td>
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<td></td>
<td>Very Stony Spot</td>
<td>US Routes</td>
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<td></td>
<td></td>
<td>Wet Spot</td>
<td>Major Roads</td>
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<td>Other</td>
<td>Local Roads</td>
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<td></td>
<td></td>
<td></td>
<td>Special Line Features</td>
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</tr>
</tbody>
</table>

# 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 1:25,000 or larger.

Date(s) aerial images were photographed: Sep 13, 2019—Oct 5, 2019

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

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>103B</td>
<td>Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes</td>
<td>12.1</td>
<td>67.0%</td>
</tr>
<tr>
<td>103C</td>
<td>Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes</td>
<td>2.7</td>
<td>14.9%</td>
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<tr>
<td>103D</td>
<td>Charlton-Hollis-Rock outcrop complex, 15 to 25 percent slopes</td>
<td>1.1</td>
<td>6.1%</td>
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<tr>
<td>623C</td>
<td>Woodbridge-Urban land complex, 3 to 15 percent slopes</td>
<td>0.3</td>
<td>1.7%</td>
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<tr>
<td>631C</td>
<td>Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky</td>
<td>1.9</td>
<td>10.3%</td>
</tr>
</tbody>
</table>

**Totals for Area of Interest**

| Acres in AOI | 18.1          | 100.0%      |
Middlesex County, Massachusetts

103B—Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 98yc
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Charlton and similar soils: 50 percent
Hollis and similar soils: 25 percent
Rock outcrop: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting
Landform: Drumlins, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over friable loamy basal till derived from granite and gneiss

Typical profile
H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 22 inches: sandy loam
H3 - 22 to 65 inches: gravelly sandy loam

Properties and qualities
Slope: 3 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
  Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Hollis

Setting
- Landform: Ridges, hills
- Landform position (two-dimensional): Shoulder, summit
- Landform position (three-dimensional): Crest
- Down-slope shape: Convex
- Across-slope shape: Convex
- Parent material: Friable, shallow loamy basal till over granite and gneiss

Typical profile
- H1 - 0 to 2 inches: fine sandy loam
- H2 - 2 to 14 inches: fine sandy loam
- H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities
- Slope: 3 to 8 percent
- Percent of area covered with surface fragments: 9.0 percent
- Depth to restrictive feature: 8 to 20 inches to lithic bedrock
- Natural drainage class: Well drained
- Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
- Depth to water table: More than 80 inches
- Frequency of flooding: None
- Frequency of ponding: None
- Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups
- Land capability classification (irrigated): None specified
- Land capability classification (nonirrigated): 6s
- Hydrologic Soil Group: D
- Hydric soil rating: No

Description of Rock Outcrop

Setting
- Landform: Ledges
- Landform position (two-dimensional): Summit
- Landform position (three-dimensional): Head slope
- Down-slope shape: Concave
- Across-slope shape: Concave
- Parent material: Granite and gneiss

Properties and qualities
- Slope: 3 to 8 percent
- Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups
- Land capability classification (irrigated): None specified
- Land capability classification (nonirrigated): 8s
Minor Components

Woodbridge
Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, toeslope, summit
Landform position (three-dimensional): Head slope, base slope, nose slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Scituate
Percent of map unit: 2 percent
Landform: Depressions, hillslopes
Landform position (two-dimensional): Toe slope, summit
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Narragansett
Percent of map unit: 2 percent
Landform: Ridges, hills
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Canton
Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Unnamed
Percent of map unit: 1 percent

Montauk
Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Head slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 19, Sep 12, 2019
Exhibit 3

Stormwater Management System Operation and Maintenance Manual
MILL POND ESTATES
MILL POND LANE
BURLINGTON, MA
July 2, 2020

STORMWATER MANAGEMENT MAINTENANCE MANUAL

DESCRIPTION OF SYSTEM

The existing site located on Chandler Road in Burlington, MA. The land is undeveloped and abuts the Mill Pond Conservation Area. The applicant proposes to construct a three lot single-family development with associated utilities and drainage design.

The drainage system design consists of a single catch basin located in the low point of the roadway. The catch basin drains to a forebay, in compliance with the regulations which, in turn, flows via a field grate to an infiltration structure, as dictated by the Board of Health Regulations. The large infiltration structure consists of 60 Stormtech SC-740 units and crushed stone, the infiltration system will discharge via a 12” culvert, as well as exfiltration.

Furthermore, stone aprons are provided around the house and along the driveways to convey stormwater to infiltration structures that will provide groundwater discharge and stormwater attenuation.

STORMWATER SYSTEM MANAGEMENT OWNER

GTH Homes, LLC, or any subsequent owner of the property, shall be the entity responsible for the operation and maintenance of all drainage structures within the site.

MAINTENANCE PROCEDURES

During Construction

The Contractor shall be responsible for inspection and maintenance during construction.

At all times, siltation fabric fencing and stakes sufficient to construct a sedimentation control barrier a minimum of 50 feet long will be stockpiles on the site in order to repair established barriers which may have been damaged or breached.

An inspection of all erosion control and stormwater management systems shall be conducted by the Contractor at least once a week and during all rain storms until the completion of construction. In case of any noted breach or failure, the Contractor shall immediately make appropriate repairs to any erosion control system and notify the engineer of any problems involving stormwater management systems.

A rain storm shall be defined as all or one of the following:
• Any storm in which rain is predicted to last for twelve consecutive hours or more.
• Any storm for which a flash flood watch or warning is issued.
• Any single storm predicted to have a cumulative rainfall of greater than one-half inch.
• Any storm not meeting the previous three thresholds but which would mark a third consecutive day of measurable rainfall.

The Contractor shall also inspect the erosion control and stormwater management systems at times of significant increase in surface water runoff due to rapid thawing when the risk of failure of erosion control measures is significant.

In such instances as remedial action is necessary, the Contractor shall repair any and all significant deficiencies in erosion control systems within two days.

The Conservation Commission shall be notified of any significant failure of stormwater management systems and erosion and sediment control measures and shall be notified of any release of pollutants to a water body (stream, brook, pond, etc.).

The Contractor shall remove the sediment from behind the fence of the sedimentation control barrier when the accumulated sediment has reached one-half of the original installed height of the barrier.

Post-Construction

Stormwater Management System Owner:

GTH Homes, LLC, or any subsequent owner of the property, shall be the entity responsible for the operation and maintenance of all drainage structures within the site. Should any component become the legal responsibility of others, said entity shall assume the maintenance responsibility of said component.

Party Responsible For Operation & Maintenance:

GTH Homes, LLC, or any subsequent owner of the property, shall be the entity responsible for the operation and maintenance of all drainage structures within the site. Should any component become the legal responsibility of others, said entity shall assume the maintenance responsibility of said component.
Inspection & Maintenance Schedule

Street Sweeping – In Right-of-Way

1. At a minimum, the roadway shall be swept at least twice per year, in the late Fall and in the late Winter/early Spring.

Catch Basins

1. Inspect Units four times per year.

2. Four times per year or whenever the depth of deposits is greater than or equal to one-half the depth (2 feet) from the bottom of the invert of the lowest pipe in the basin.

Sediment Forebay

1. Inspect monthly.

2. Clean sediment forebays four times per year and when sediment depth is up to 3 inches

3. The banks of the forebay may be mowed as needed to cut grass. At a minimum, this should be done twice each growing season.

4. Cut grass shall be removed from the sediment forebay area and disposed of properly.

Infiltration Trenches

1. After major storms, the first two months after installation and at least twice each year, early spring and late fall, inspect to insure that stormwater percolates into ground.

Infiltration Structures

1. After major storms, the first two months after installation and at least twice each year, early spring and late fall, open inspection port to insure that stormwater percolates into ground.

2. Measure the water depth at the inspection port 24 hours and 48 hours after major storm to insure stormwater is infiltrating and unit is functioning.

3. Clear gutters of debris annually.
General

Dispose of the collected grit, debris and oil in accordance with current Town and State regulations.

The developer shall provide a copy of the Operation and Maintenance Plan to the Homeowners' Association and each individual homeowner.

Chemical Releases

Upon any chemical release, immediately clean all affected stormwater drainage components.

Snow Removal & Management Plan

General

The plowed snow from paved surface may contain salts, sediment, oils and various pollutants. The stormwater management system is designed to accommodate snow melt from the roadway, based upon conventional plowing techniques.

As per conventional plowing techniques, snow will be plowed to the sides of the roadway.

At no time shall any snow be stored within 100 feet of the bordering vegetated wetlands.
Exhibit 4

Long Term Pollution Prevention Plan
Long Term Pollution Prevention Plan

This plan was developed in compliance with the Massachusetts Department of Environmental Protection Stormwater requirements.

Good Housekeeping

The proposed project is designed to maintain high water quality treatment for all runoff. A general maintenance plan has been prepared and will be followed in a strict and complete manner as required.

Spill Prevention Plan

No hazardous materials will be stored on site. However the following spill prevention plan will be incorporated into the Long Term Pollution Prevention Plan:

1. Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.

2. Materials and equipment necessary for spill cleanup will be kept inside, in an on-site material storage area. Equipment and materials will include, but is not limited to, brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust and plastic and metal trash containers specifically for this purpose.

3. All spills will be cleaned up immediately after discovery.

4. Personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.

5. Spills of toxic or hazardous material will be reported, regardless of size, to the Massachusetts Department of Environmental Protection at 888-304-1133.

6. Should a spill occur, the spill prevention plan will be adjusted to include measures to prevent another spill and to clean up the spill should another occur. A description of the spill, along with the causes and cleanup measures will be included in the updated spill prevention plan.

7. The construction superintendent responsible for daily operation on the construction site will be the spill prevention and cleanup coordinator. The superintendent will designate at least three site personnel to receive spill prevention cleanup and training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the on-site job trailer.
After construction, the property owner will assume the responsibility of the construction superintendent as stated in the above paragraph.

**Stormwater BMP Maintenance**
A full stormwater operation and maintenance plan has been prepared in order to ensure that the system will function properly throughout the year.

**Landscape and Lawn Maintenance**
Routine mowing and associated maintenance of all landscape features will occur weekly or as needed to prevent excessive growth and debris from occurring on site.

**Solid Waste Management**
Solid waste is handled on site and will comply with all requirements on a local, state, and federal level.

**Road Maintenance**
The paved roadway is graded to allow drainage to flow to catch basins. Street sweeping and snowplowing will be maintained on an as needed basis.

**Training of Staff**
All personnel on site will be well briefed on all requirements for implementing the Long Term Pollution Prevention Plan.

**Emergency Contact for Implementing Long Term Pollution Prevention Plan**

Greg Hickox  
GTH Homes, LLC  
11 Bedford Street #3  
Burlington, MA 01803  
781-272-7722
Exhibit 5

Illicit Discharge Statement
Illicit Discharge Compliance Statement

There will be no hazardous materials stored on-site and/or discharged to the stormwater management system.

There are no sanitary sewer cross-connections to the stormwater collection system.

__________________________
Greg Hickox
GTH Homes, LLC
11 Bedford Street #3
Burlington, MA 01803
781-272-7722
Exhibit 6

Stormwater Report Checklist
A. Introduction

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

The Stormwater Report must include:

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

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

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

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

---

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

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

[Signature and Date 5/16/20]

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 (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field¹

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

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

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

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

☐ Site is comprised solely of C and D soils and/or bedrock at the land surface

☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000

☐ Solid Waste Landfill pursuant to 310 CMR 19.0000

☐ 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.
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 1/2" 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 maximumExtent 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.
Attachment A

Hydrocad Calculations
Predevelopment Subcatchment
Stromwater Management Design Basin and Total Runoff

Prepared by (enter your company name here)

HydroCAD® 10.00-17 s/n 00689 © 2016 HydroCAD Software Solutions LLC

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

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

Subcatchment 1S: Predevelopment

Runoff Area=174,376 sf  2.58% Impervious  Runoff Depth>0.27"
Flow Length=550’  Tc=22.1 min  CN=57  Runoff=0.41 cfs  0.092 af

Total Runoff Area = 4.003 ac  Runoff Volume = 0.092 af  Average Runoff Depth = 0.27"
97.42% Pervious = 3.900 ac  2.58% Impervious = 0.103 ac
Summary for Subcatchment 1S: Predevelopment Subcatchment

Runoff = 0.41 cfs @ 12.55 hrs, Volume = 0.092 af, Depth > 0.27"

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

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<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>156,376</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>18,000</td>
<td>70</td>
<td>1/2 acre lots, 25% imp, HSG B</td>
</tr>
<tr>
<td>174,376</td>
<td>57</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>169,876</td>
<td>97.42% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>4,500</td>
<td>2.58% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
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<td>0.0420</td>
<td>0.10</td>
<td></td>
<td><strong>Sheet Flow, A to B</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.10&quot;</td>
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<tr>
<td>3.7</td>
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<td><strong>Shallow Concentrated Flow, B to C</strong></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland Kv = 5.0 fps</td>
</tr>
<tr>
<td>2.2</td>
<td>190</td>
<td>0.0850</td>
<td>1.46</td>
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<td><strong>Shallow Concentrated Flow, C to D</strong></td>
</tr>
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<td>Woodland Kv = 5.0 fps</td>
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<tr>
<td>22.1</td>
<td>550</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>
Stromwater Management Design Basin and Total Runoff  Type III 24-hr 10-Yr Rainfall=4.50"

Prepared by (enter your company name here)

HydroCAD® 10.00-17  s/n 00689 © 2016 HydroCAD Software Solutions LLC

Printed 6/11/2020

Page 4

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

Subcatchment 1S: Predevelopment

Runoff Area=174,376 sf  2.58% Impervious  Runoff Depth=0.34”
Flow Length=550’  Tc=22.1 min  CN=57  Runoff=2.02 cfs  0.281 af

Total Runoff Area = 4.003 ac  Runoff Volume = 0.281 af  Average Runoff Depth = 0.34”
97.42% Pervious = 3.900 ac  2.58% Impervious = 0.103 ac
Summary for Subcatchment 1S: Predevelopment Subcatchment

Runoff = 2.02 cfs @ 12.38 hrs, Volume = 0.281 af, Depth = 0.84"

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

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<td>156,376</td>
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<td>Weighted Average</td>
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<td>169,876</td>
<td></td>
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<tr>
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<td></td>
<td>2.58% Impervious Area</td>
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<th>Tc (min)</th>
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<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<tr>
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<td>0.10</td>
<td></td>
<td>Sheet Flow, A to B</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush</td>
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<td></td>
<td></td>
<td></td>
<td>n = 0.400</td>
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<td></td>
<td></td>
<td></td>
<td>P2 = 3.10&quot;</td>
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<tr>
<td>22.1</td>
<td>550</td>
<td></td>
<td></td>
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<td>Total</td>
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</table>
Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Predevelopment

Runoff Area=174,376 sf  2.58% Impervious  Runoff Depth>1.98"
Flow Length=550'  Tc=22.1 min  CN=57  Runoff=5.59 cfs  0.659 af

Total Runoff Area = 4.003 ac  Runoff Volume = 0.659 af  Average Runoff Depth = 1.98"
97.42% Pervious = 3.900 ac  2.58% Impervious = 0.103 ac
Summary for Subcatchment 1S: Predevelopment Subcatchment

Runoff = 5.59 cfs @ 12.34 hrs, Volume = 0.659 af, Depth > 1.98"

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

<table>
<thead>
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<td>57</td>
<td>Weighted Average</td>
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<td>169876</td>
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<tr>
<td>4500</td>
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<td>2.58% Impervious Area</td>
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<table>
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<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<td>16.2</td>
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<td>0.10</td>
<td></td>
<td>Sheet Flow, A to B Woods: Light underbrush n = 0.400 P2 = 3.10&quot;</td>
</tr>
<tr>
<td>3.7</td>
<td>260</td>
<td>0.0540</td>
<td>1.16</td>
<td></td>
<td>Shallow Concentrated Flow, B to C Woodland Kv = 5.0 fps</td>
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<tr>
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<td>0.0850</td>
<td>1.46</td>
<td></td>
<td>Shallow Concentrated Flow, C to D Woodland Kv = 5.0 fps</td>
</tr>
<tr>
<td>22.1</td>
<td>550</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Stromwater Management Design Lots 1 and 2 Structures

*Type III 24-hr 2-Yr Rainfall=3.10''*

**Prepared by {enter your company name here}**

**Printed 5/14/2020**

**Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points**

**Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method**

<table>
<thead>
<tr>
<th>Subcatchment Po-11: Front House Lot 1</th>
<th>Runoff Area=1,306 sf  100.00% Impervious  Runoff Depth&gt;2.87''</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Tc=6.0 min  CN=98  Runoff=0.09 cfs  0.007 af</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subcatchment Po-21: Front House Lot 2</th>
<th>Runoff Area=952 sf  100.00% Impervious  Runoff Depth&gt;2.87''</th>
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</thead>
<tbody>
<tr>
<td></td>
<td><strong>Tc=6.0 min  CN=98  Runoff=0.06 cfs  0.005 af</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pond IS-11: Infiltration Structure - 11</th>
<th>Peak Elev=193.18'  Storage=17 cf  Inflow=0.03 cfs  0.001 af</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Outflow=0.01 cfs  0.001 af</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pond IS-21: Infiltration Structure - 21</th>
<th>Peak Elev=194.39'  Storage=26 cf  Inflow=0.05 cfs  0.001 af</th>
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</thead>
<tbody>
<tr>
<td></td>
<td><strong>Outflow=0.01 cfs  0.001 af</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pond IT-11: Infiltration Trench - 11</th>
<th>Peak Elev=195.14'  Storage=74 cf  Inflow=0.09 cfs  0.007 af</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Discarded=0.01 cfs  0.006 af  Primary=0.03 cfs  0.001 af  Outflow=0.04 cfs  0.007 af</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Pond IT-21: Infiltration Trench - 21</th>
<th>Peak Elev=195.15'  Storage=45 cf  Inflow=0.08 cfs  0.005 af</th>
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</thead>
<tbody>
<tr>
<td></td>
<td><strong>Discarded=0.01 cfs  0.004 af  Primary=0.05 cfs  0.001 af  Outflow=0.06 cfs  0.005 af</strong></td>
</tr>
</tbody>
</table>

**Total Runoff Area = 0.052 ac**  **Runoff Volume = 0.012 af**  **Average Runoff Depth = 2.87''**

**0.00% Pervious = 0.000 ac**  **100.00% Impervious = 0.052 ac**
**Summary for Subcatchment Po-11: Front House Lot 1**

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 2.87"

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

<table>
<thead>
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<tr>
<td>1,306</td>
<td>100.00% Impervious Area</td>
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<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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</thead>
<tbody>
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<td></td>
<td></td>
<td>Direct Entry, Overland Flow</td>
</tr>
</tbody>
</table>

**Summary for Subcatchment Po-21: Front House Lot 2**

Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af, Depth> 2.87"

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

<table>
<thead>
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<th>Area (sf)</th>
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<td>952</td>
<td>98</td>
<td>Front Roof Lot #2</td>
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<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry, Overland Flow</td>
</tr>
</tbody>
</table>

**Summary for Pond IS-11: Infiltration Structure - 11**

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth = 0.36" for 2-Yr event

Inflow = 0.03 cfs @ 12.26 hrs, Volume= 0.001 af

Outflow = 0.01 cfs @ 12.25 hrs, Volume= 0.001 af, Attenuation 64%, Lag = 0.0 min

Discarded = 0.01 cfs @ 12.25 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 193.18' @ 12.53 hrs  Surf.Area= 225 sf  Storage= 17 cf

Plug-Flow detention time= 13.7 min calculated for 0.001 af (100% of inflow)
Center-of-Mass detention time= 13.7 min (756.8 - 743.1)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail, Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>193.00'</td>
<td>190 cf</td>
<td>5.00'W x 45.00'L x 2.50'H Prismatoid 563 cf Overall - 88 cf Embedded = 474 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>193.50'</td>
<td>88 cf</td>
<td>ADS StormTech SC-310 +Cap x 6 Inside #1 Effective Size = 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0'W x 16.0'H x 7.56'L with 0.44' Overlap</td>
</tr>
</tbody>
</table>

278 cf Total Available Storage
Stromwater Management Design Lots 1 and 2 Structures 0 Type III 24-hr 2-Yr Rainfall=3.10”

Prepared by (enter your company name here)
HydroCAD® 10.00-17 s/n 00689 © 2019 HydroCAD Software Solutions LLC Printed 5/14/2020

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>193.00’</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
</tbody>
</table>

| Discarded Outflow | Max=0.01 cfs @ 12.25 hrs HW=193.06’ | Free Discharge |
|                   | (Exfiltration Controls 0.01 cfs)    |

**Summary for Pond IS-21: Infiltration Structure - 21**

Inflow Area = 0.022 ac, 100.00% Impervious, Inflow Depth = 0.58” for 2-Yr event
Inflow = 0.05 cfs @ 12.16 hrs, Volume= 0.001 af
Outflow = 0.01 cfs @ 12.15 hrs, Volume= 0.001 af, Atten= 83%, Lag= 0.0 min
Discarded = 0.01 cfs @ 12.15 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 194.36’ @ 12.53 hrs Surf.Area= 163 sf Storage= 26 cf

Plug-Flow detention time= 28.6 min calculated for 0.001 af (100% of inflow)
Center-of-Mass det. time= 28.6 min (767.4 - 738.8)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>194.00’</td>
<td>139 cf</td>
<td>5.00’W x 32.50’L x 2.50’H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>406 cf Overall - 59 cf Embedded = 347 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>194.50’</td>
<td>59 cf</td>
<td>ADS StormTech SC-310 +Cap x 4 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 28.9”W x 16.0”H =&gt; 2.07 sf x 7.12’L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0”W x 16.0”H x 7.56’L with 0.44’ Overlap</td>
</tr>
</tbody>
</table>

198 cf Total Available Storage

| Discarded Outflow | Max=0.01 cfs @ 12.15 hrs HW=194.10’ | Free Discharge |
|                   | (Exfiltration Controls 0.01 cfs)    |

**Summary for Pond IT-11: Infiltration Trench - 11**

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 2.87” for 2-Yr event
Inflow = 0.09 cfs @ 12.09 hrs, Volume= 0.007 af
Outflow = 0.04 cfs @ 12.26 hrs, Volume= 0.007 af, Atten= 51%, Lag= 10.2 min
Discarded = 0.01 cfs @ 11.45 hrs, Volume= 0.006 af
Primary = 0.03 cfs @ 12.26 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 195.14’ @ 12.26 hrs Surf.Area= 160 sf Storage= 74 cf

Plug-Flow detention time= 41.1 min calculated for 0.007 af (100% of inflow)
Center-of-Mass det. time= 40.8 min (797.5 - 756.8)
Stromwater Management Design Lots 1 and 2 Structures 0  Type III 24-hr 2-Yr Rainfall=3.10"  
Prepared by [enter your company name here]  Printed 5/14/2020  
HydroCAD® 10.00-17 s/n 00669 © 2016 HydroCAD Software Solutions LLC  Page 5

<table>
<thead>
<tr>
<th>Volume</th>
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<th>Avail. Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>194.00'</td>
<td>125 cf</td>
<td>2.00'W x 80.00'L x 2.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>320 cf Overall - 7 cf Embedded = 313 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>195.00'</td>
<td>7 cf</td>
<td>4.0&quot; Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 80.0'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>132 cf Total Available Storage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>194.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>195.00'</td>
<td>4.0&quot; Round Culvert L= 10.0', Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 195.00' / 194.90' S= 0.0100 ', Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.013, Flow Area= 0.09 sf</td>
</tr>
</tbody>
</table>

**Discarded OutFlow** Max=0.01 cfs @ 11.45 hrs HW=194.02' (Free Discharge)

**Primary OutFlow** Max=0.03 cfs @ 12.26 hrs HW=195.13' (Free Discharge)

**Summary for Pond IT-21: Infiltration Trench - 21**

Inflow Area = 0.022 ac, 100.00% Impervious, Inflow Depth > 2.87" for 2-Yr event

Inflow = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af

Outflow = 0.06 cfs @ 12.16 hrs, Volume= 0.005 af, Atten= 11%, Lag= 4.4 min

Discarded = 0.01 cfs @ 11.25 hrs, Volume= 0.004 af

Primary = 0.05 cfs @ 12.16 hrs, Volume= 0.001 af

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

Peak Elev= 195.15' @ 12.16 hrs Surf.Area= 94 sf Storage= 45 cf

Plug-Flow detention time= 38.5 min calculated for 0.005 af (100% of inflow)

Center-of-Mass det. time= 38.3 min (794.9 - 756.6)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>194.00'</td>
<td>72 cf</td>
<td>2.00'W x 47.00'L x 2.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>188 cf Overall - 8 cf Embedded = 180 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>195.00'</td>
<td>8 cf</td>
<td>6.0&quot; Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 42.0'</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>80 cf Total Available Storage</td>
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<th>Invert</th>
<th>Outlet Devices</th>
</tr>
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<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>194.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>195.00'</td>
<td>4.0&quot; Round Culvert L= 10.0', Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 195.00' / 194.80' S= 0.0200 ', Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.013, Flow Area= 0.09 sf</td>
</tr>
</tbody>
</table>

**Discarded OutFlow** Max=0.01 cfs @ 11.25 hrs HW=194.02' (Free Discharge)

**Primary OutFlow** Max=0.05 cfs @ 12.16 hrs HW=195.15' (Free Discharge)

**Primary OutFlow** (Inlet Controls 0.05 cfs @ 1.30 fps)
| Subcatchment Po-11: Front House Lot 1 | Runoff Area=1,306 sf 100.00% Impervious  Runoff Depth>4.26"  
|                                          | Tc=8.0 min  CN=98  Runoff=0.13 cfs  0.011 af |
| Subcatchment Po-21: Front House Lot 2 | Runoff Area=952 sf 100.00% Impervious  Runoff Depth>4.26"  
|                                          | Tc=8.0 min  CN=98  Runoff=0.09 cfs  0.008 af |
| Pond IS-11: Infiltration Structure - 11 | Peak Elev=193.71' Storage=77 cf Inflow=0.10 cfs  0.003 af  
|                                          | Outflow=0.01 cfs  0.003 af |
| Pond IS-21: Infiltration Structure - 21 | Peak Elev=194.90' Storage=74 cf Inflow=0.09 cfs  0.002 af  
|                                          | Outflow=0.01 cfs  0.002 af |
| Pond IT-11: Infiltration Trench - 11 | Peak Elev=195.26' Storage=84 cf Inflow=0.13 cfs  0.011 af  
|                                          | Discarded=0.01 cfs  0.008 af  Primary=0.10 cfs  0.003 af  Outflow=0.11 cfs  0.011 af |
| Pond IT-21: Infiltration Trench - 21 | Peak Elev=195.20' Storage=47 cf Inflow=0.09 cfs  0.008 af  
|                                          | Discarded=0.01 cfs  0.005 af  Primary=0.09 cfs  0.002 af  Outflow=0.09 cfs  0.008 af |

Total Runoff Area = 0.052 ac  Runoff Volume = 0.018 af  Average Runoff Depth = 4.26"  
0.00% Pervious = 0.000 ac  100.00% Impervious = 0.052 ac
Summary for Subcatchment Po-11: Front House Lot 1

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.011 af, Depth> 4.26"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>1,306</td>
<td>98</td>
<td>Roof #1</td>
</tr>
<tr>
<td>1,306</td>
<td>100.00% Impervious Area</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry, Overland Flow</td>
</tr>
</tbody>
</table>

Summary for Subcatchment Po-21: Front House Lot 2

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.008 af, Depth> 4.26"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>952</td>
<td>98</td>
<td>Front Roof Lot #2</td>
</tr>
<tr>
<td>952</td>
<td>100.00% Impervious Area</td>
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<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry, Overland Flow</td>
</tr>
</tbody>
</table>

Summary for Pond IS-11: Infiltration Structure - 11

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth = 1.06" for 10-Yr event
Inflow = 0.10 cfs @ 12.14 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 12.10 hrs, Volume= 0.003 af, Atten= 88%, Lag= 0.0 min
Discarded = 0.01 cfs @ 12.10 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 193.71' @ 12.62 hrs Surf.Area= 225 sf Storage= 77 cf
Plug-Flow detention time= 60.3 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 60.3 min ( 799.6 - 739.3 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 193.00'</td>
<td>190 cf</td>
<td>5.00'W x 45.00'L x 2.50'H Prismatoid</td>
<td>563 cf Overall - 88 cf Embedded = 474 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2 193.50'</td>
<td>88 cf</td>
<td>ADS StormTech SC-310 +Cap x 6 Inside #1</td>
<td>Effective Size= 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12' = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0&quot;W x 16.0&quot;H x 7.56' with 0.44' Overlap</td>
</tr>
</tbody>
</table>

278 cf Total Available Storage
Summary for Pond IS-21: Infiltration Structure - 21

Inflow Area = 0.022 ac, 100.00% Impervious, Inflow Depth = 1.35" for 10-Yr event
Inflow = 0.09 cfs @ 12.11 hrs, Volume = 0.002 af
Outflow = 0.01 cfs @ 12.00 hrs, Volume = 0.002 af, Atten = 90%, Lag = 0.0 min
Discarded = 0.01 cfs @ 12.00 hrs, Volume = 0.002 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs
Peak Elev = 194.90' @ 12.62 hrs Surf.Area = 163 sf Storage = 74 cf

Plug-Flow detention time = 79.1 min calculated for 0.002 af (100% of inflow)
Center-of-Mass det. time = 79.1 min (817.0 - 737.9)

Volume  Invert  Avail.Storage  Storage Description
#1  194.00'  139 cf  5.00"W x 32.50'L x 2.50'H Prismaticoid
      406 cf Overall - 59 cf Embedded = 347 cf x 40.0% Voids
#2  194.50'  59 cf  ADS_SurfTech SC-310 +Cap x 4 Inside #1
      Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
      Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
      198 cf Total Available Storage

Summary for Pond IT-11: Infiltration Trench - 11

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 4.26" for 10-Yr event
Inflow = 0.13 cfs @ 12.09 hrs, Volume = 0.011 af
Outflow = 0.11 cfs @ 12.14 hrs, Volume = 0.011 af, Atten = 13%, Lag = 3.4 min
Discarded = 0.01 cfs @ 10.95 hrs, Volume = 0.008 af
Primary = 0.10 cfs @ 12.14 hrs, Volume = 0.003 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs
Peak Elev = 195.25' @ 12.14 hrs Surf.Area = 160 sf Storage = 84 cf

Plug-Flow detention time = 37.5 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time = 37.3 min (786.7 - 749.4)
Stromwater Management Design Lots 1 and 2 Structures  
Prepared by [enter your company name here]  
Type III 24-hr 10-Yr Rainfall=4.50"  
Printed 5/14/2020

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<table>
<thead>
<tr>
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<th>Avail Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>194.00'</td>
<td>125 cf</td>
<td>2.00&quot;W x 80.00'L x 2.00'H Prismatoid 320 cf Overall - 7 cf Embedded = 313 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>195.00'</td>
<td>7 cf</td>
<td>4.0&quot; Round Pipe Storage Inside #1 L= 80.0'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>132 cf</td>
<td>Total Available Storage</td>
</tr>
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</table>

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<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>194.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>195.00'</td>
<td>4.0&quot; Round Culvert L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 195.00' / 194.90' S= 0.0100' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.01 cfs @ 10.95 hrs HW=194.02' (Free Discharge) 
-1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.10 cfs @ 12.14 hrs HW=195.25' (Free Discharge) 
-2=Culvert (Barrel Controls 0.10 cfs @ 1.97 fps)

Summary for Pond IT-21: Infiltration Trench - 21

Inflow Area = 0.022 ac, 100.00% Impervious, Inflow Depth > 4.26" for 10-Yr event

Inflow = 0.09 cfs @ 12.09 hrs, Volume= 0.008 af

Outflow = 0.09 cfs @ 12.11 hrs, Volume= 0.008 af, Atten= 2%, Lag= 1.2 min

Discarded = 0.01 cfs @ 10.40 hrs, Volume= 0.005 af

Primary = 0.09 cfs @ 12.11 hrs, Volume= 0.002 af

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

Peak Elev= 195.20' @ 12.11 hrs Surf.Area= 94 sf Storage= 47 cf

Plug-Flow detention time= 35.6 min calculated for 0.008 af (100% of inflow) Center-of-Mass det. time= 35.3 min (784.7 - 749.4)

<table>
<thead>
<tr>
<th>Volume</th>
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<th>Avail Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>194.00'</td>
<td>72 cf</td>
<td>2.00&quot;W x 47.00'L x 2.00'H Prismatoid 188 cf Overall - 8 cf Embedded = 180 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>195.00'</td>
<td>8 cf</td>
<td>6.0&quot; Round Pipe Storage Inside #1 L= 42.0'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80 cf</td>
<td>Total Available Storage</td>
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<tr>
<th>Device</th>
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<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>194.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>195.00'</td>
<td>4.0&quot; Round Culvert L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 195.00' / 194.80' S= 0.0200' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.01 cfs @ 10.40 hrs HW=194.02' (Free Discharge) 
-1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.09 cfs @ 12.11 hrs HW=195.20' (Free Discharge) 
-2=Culvert (Inlet Controls 0.09 cfs @ 1.53 fps)
Stromwater Management Design Lots 1 and 2 Structure  Type III 24-hr 100-Yr Rainfall=6.50"
Prepared by {enter your company name here} Printed 5/14/2020
HydroCAD® 10.00-17 s/n 00689 © 2016 HydroCAD Software Solutions LLC

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

Subcatchment Po-11: Front House Lot 1
Runoff Area=1,308 sf  100.00% Impervious  Runoff Depth>6.26"
Tc=6.0 min  CN=98  Runoff=0.19 cfs  0.016 af

Subcatchment Po-21: Front House Lot 2
Runoff Area=952 sf  100.00% Impervious  Runoff Depth>6.26"
Tc=6.0 min  CN=98  Runoff=0.14 cfs  0.011 af

Pond IS-11: Infiltration Structure - 11
Peak Elev=194.46'  Storage=180 cf  Inflow=0.17 cfs  0.006 af
Outflow=0.01 cfs  0.006 af

Pond IS-21: Infiltration Structure - 21
Peak Elev=195.79'  Storage=152 cf  Inflow=0.13 cfs  0.005 af
Outflow=0.01 cfs  0.005 af

Pond IT-11: Infiltration Trench - 11
Peak Elev=195.36'  Storage=91 cf  Inflow=0.19 cfs  0.016 af
Discarded=0.01 cfs  0.010 af  Primary=0.17 cfs  0.006 af  Outflow=0.18 cfs  0.016 af

Pond IT-21: Infiltration Trench - 21
Peak Elev=195.26'  Storage=50 cf  Inflow=0.14 cfs  0.011 af
Discarded=0.01 cfs  0.007 af  Primary=0.13 cfs  0.005 af  Outflow=0.13 cfs  0.011 af

Total Runoff Area = 0.052 ac  Runoff Volume = 0.027 af  Average Runoff Depth = 6.26"
0.00% Pervious = 0.000 ac  100.00% Impervious = 0.052 ac
Summary for Subcatchment Po-11: Front House Lot 1

Runoff = 0.19 cfs @ 12.09 hrs, Volume = 0.016 af, Depth > 6.26"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,306</td>
<td>98</td>
<td>Roof #1</td>
</tr>
</tbody>
</table>

1,306 100.00% Impervious Area

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
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<td></td>
<td></td>
<td></td>
<td>Direct Entry, Overland Flow</td>
</tr>
</tbody>
</table>

Summary for Subcatchment Po-21: Front House Lot 2

Runoff = 0.14 cfs @ 12.09 hrs, Volume = 0.011 af, Depth > 6.26"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>952</td>
<td>98</td>
<td>Front Roof Lot #2</td>
</tr>
</tbody>
</table>

952 100.00% Impervious Area

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>6.0</td>
<td></td>
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<td></td>
<td></td>
<td>Direct Entry, Overland Flow</td>
</tr>
</tbody>
</table>

Summary for Pond IS-11: Infiltration Structure - 11

inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth = 2.26" for 100-Yr event
Inflow = 0.17 cfs @ 12.12 hrs, Volume = 0.006 af
Outflow = 0.01 cfs @ 11.95 hrs, Volume = 0.006 af, Atten = 93%, Lag = 0.0 min
Discarded = 0.01 cfs @ 11.95 hrs, Volume = 0.006 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs
Peak Elev = 194.46' @ 12.79 hrs Surf.Area = 225 sf Storage = 180 cf

Plug-Flow detention time = 137.4 min calculated for 0.006 af (100% of inflow)
Center-of-Mass det. time = 137.3 min (876.9 - 739.6)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>193.00'</td>
<td>190 cf</td>
<td>5.00'W x 45.00'L x 2.50'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>563 cf Overall - 88 cf Embedded = 474 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>193.50'</td>
<td>88 cf</td>
<td>ADS StormTech SC-310 +Cap x 6 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size = 28.9''W x 16.0''H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size = 34.0''W x 16.0''H x 7.56'L with 0.44' Overlap</td>
</tr>
</tbody>
</table>

278 cf Total Available Storage
Stromwater Management Design Lots 1 and 2 Structure  
**Type III 24-hr 100-Yr Rainfall=6.50"**

Prepared by {enter your company name here}  
Printed 5/14/2020

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<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>193.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
</tbody>
</table>

**Discarded OutFlow**  
Max=0.01 cfs @ 11.95 hrs  HW=193.08' (Free Discharge)  
1=Exfiltration (Exfiltration Controls 0.01 cfs)

**Summary for Pond IS-21: Infiltration Structure - 21**

Inflow Area = 0.022 ac, 100.00% impervious, Inflow Depth = 2.68" for 100-Yr event

**Inflow**
- 0.13 cfs @ 12.11 hrs, Volume= 0.005 af
- 0.01 cfs @ 11.80 hrs, Volume= 0.005 af, Atten= 93%, Lag= 0.0 min
- Discarded = 0.01 cfs @ 11.80 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Peak Elev= 195.79' @ 12.84 hrs  Surf.Area= 163 sf  Storage= 152 cf

Plug-Flow detention time= 160.1 min calculated for 0.005 af (100% of inflow)  
Center-of-Mass det. time= 160.2 min (699.7 - 739.6)

**Volume**

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Available Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>194.00'</td>
<td>139 cf</td>
<td>5.00'W x 32.50'L x 2.50'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>406 cf Overall - 59 cf Embedded = 347 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>194.50'</td>
<td>59 cf</td>
<td>ADS_StormTech SC-310 +Cap x 4 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0&quot;W x 16.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
</tbody>
</table>

198 cf  Total Available Storage

**Summary for Pond IT-11: Infiltration Trench - 11**

Inflow Area = 0.030 ac, 100.00% Impervious, Inflow Depth > 6.26" for 100-Yr event

**Inflow**
- 0.19 cfs @ 12.09 hrs, Volume= 0.016 af
- 0.18 cfs @ 12.12 hrs, Volume= 0.016 af, Atten= 5%, Lag= 1.7 min
- Discarded = 0.01 cfs @ 9.95 hrs, Volume= 0.010 af
- Primary = 0.17 cfs @ 12.12 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Peak Elev= 195.36' @ 12.11 hrs  Surf.Area= 160 sf  Storage= 91 cf

Plug-Flow detention time= 35.2 min calculated for 0.016 af (100% of inflow)  
Center-of-Mass det. time= 34.9 min (778.4 - 743.6)
Stromwater Management Design Lots 1 and 2 Structure  Type III 24-hr 100-Yr Rainfall=6.50"

Prepared by [enter your company name here] Printed 5/14/2020
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Volume Invert Avail.Storage Storage Description
#1 194.00' 125 cf 2.00'W x 80.00'L x 2.00'H Prismatoid
320 cf Overall - 7 cf Embedded = 313 cf x 40.0% Voids
#2 195.00' 7 cf 4.0" Round Pipe Storage Inside #1
L = 80.0'

132 cf Total Available Storage

Device Routing Invert Outlet Devices
#1 Discarded 194.00' 2.410 in/hr Exfiltration over Surface area
#2 Primary 195.00' 4.0" Round Culvert L = 10.0' Ke = 0.500
Inlet / Outlet Invert = 195.00' / 194.90' S = 0.0100 '/' Cc = 0.900
n = 0.013, Flow Area = 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 9.95 hrs HW=194.02' (Free Discharge)
↑-1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.16 cfs @ 12.12 hrs HW=195.35' (Free Discharge)
↑-2=Culvert (Barrel Controls 0.16 cfs @ 2.18 fps)

Summary for Pond IT-21: Infiltration Trench - 21

Inflow Area = 0.022 ac, 100.00% Impervious, Inflow Depth > 6.26" for 100-Yr event
Inflow = 0.14 cfs @ 12.09 hrs, Volume = 0.011 af
Outflow = 0.13 cfs @ 12.11 hrs, Volume = 0.011 af, Atlen = 2%, Lag = 1.1 min
Discarded = 0.01 cfs @ 9.20 hrs, Volume = 0.007 af
Primary = 0.13 cfs @ 12.11 hrs, Volume = 0.005 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs
Peak Elev= 195.26' @ 12.11 hrs Surf.Area = 94 sf Storage = 50 cf

Plug-Flow detention time = 33.3 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time = 33.0 min (776.6 - 743.6 )

Volume Invert Avail.Storage Storage Description
#1 194.00' 72 cf 2.00'W x 47.00'L x 2.00'H Prismatoid
188 cf Overall - 8 cf Embedded = 180 cf x 40.0% Voids
#2 195.00' 8 cf 6.0" Round Pipe Storage Inside #1
L = 42.0'

80 cf Total Available Storage

Device Routing Invert Outlet Devices
#1 Discarded 194.00' 2.410 in/hr Exfiltration over Surface area
#2 Primary 195.00' 4.0" Round Culvert L = 10.0' Ke = 0.500
Inlet / Outlet Invert = 195.00' / 194.80' S = 0.0200 '/' Cc = 0.900
n = 0.013, Flow Area = 0.09 sf

Discarded OutFlow Max=0.01 cfs @ 9.20 hrs HW=194.02' (Free Discharge)
↑-1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.13 cfs @ 12.11 hrs HW=195.26' (Free Discharge)
↑-2=Culvert (Inlet Controls 0.13 cfs @ 1.73 fps)
Stromwater Management Design Infiltration Structure an

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

Subcatchment Po-12: Rear House and
Runoff Area=4,380 sf 53.42% Impervious Runoff Depth>1.39"
Tc=6.0 min  CN=81 Runoff=0.16 cfs 0.012 af

Subcatchment Po-22: Runoff to Driveway
Runoff Area=4,220 sf 45.26% Impervious Runoff Depth>1.20"
Tc=5.0 min  CN=78 Runoff=0.13 cfs 0.010 af

Subcatchment Po-23: Roof Runoff - Lot 2
Runoff Area=428 sf 100.00% Impervious Runoff Depth>2.87"
Tc=6.0 min  CN=98 Runoff=0.03 cfs 0.002 af

Subcatchment Po-24: Roof Runoff - Lot 2
Runoff Area=800 sf 100.00% Impervious Runoff Depth>2.87"
Tc=6.0 min  CN=98 Runoff=0.05 cfs 0.004 af

Subcatchment Po-31: Overland and and
Runoff Area=8,900 sf 35.73% Impervious Runoff Depth>0.87"
Flow Length=145’ Tc=14.1 min  CN=72 Runoff=0.15 cfs 0.015 af

Subcatchment Po-32: Runoff to Driveway
Runoff Area=8,725 sf 16.18% Impervious Runoff Depth>0.51"
Flow Length=130’ Tc=16.9 min  CN=64 Runoff=0.06 cfs 0.009 af

Subcatchment Po-Di: Postdevelooment
Runoff Area=73,075 sf 0.00% Impervious Runoff Depth>0.25"
Flow Length=550’ Tc=21.6 min  CN=56 Runoff=0.14 cfs 0.034 af

Subcatchment Po-IB: Postdevelopment to
Runoff Area=74,630 sf 17.49% Impervious Runoff Depth>0.51"
Flow Length=350’ Tc=19.2 min  CN=64 Runoff=0.51 cfs 0.073 af

Reach Total: Total Runoff
Inflow=0.14 cfs 0.034 af
Outflow=0.14 cfs 0.034 af

Pond 1P: Infiltration Trench - 23
Peak Elev=194.00’ Storage=64 cf Inflow=0.05 cfs 0.004 af
Discarded=0.00 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Pond IS-1: Infiltration Structure - 1
Peak Elev=188.70’ Storage=794 cf Inflow=0.51 cfs 0.073 af
Discarded=0.12 cfs 0.073 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.073 af

Pond IS-12: Infiltration Structure - 12
Peak Elev=192.50’ Storage=72 cf Inflow=0.10 cfs 0.003 af
Discarded=0.02 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.003 af

Pond IS-22: Infiltration Structure - 22
Peak Elev=195.61’ Storage=112 cf Inflow=0.14 cfs 0.005 af
Discarded=0.03 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.005 af

Pond IS-31: Infiltration Structure - 31
Peak Elev=201.59’ Storage=75 cf Inflow=0.08 cfs 0.003 af
Discarded=0.02 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.003 af

Pond IS-32: Infiltration Structure - 32
Peak Elev=197.14’ Storage=20 cf Inflow=0.04 cfs 0.002 af
Discarded=0.02 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.002 af

Pond IT-12: Infiltration Trench - 12
Peak Elev=196.72’ Storage=86 cf Inflow=0.16 cfs 0.012 af
Discarded=0.02 cfs 0.009 af Primary=0.10 cfs 0.003 af Outflow=0.12 cfs 0.012 af
<table>
<thead>
<tr>
<th>Pond IT-22: Infiltration Trench - 22</th>
<th>Peak Elev=198.51' Storage=20 cf Inflow=0.13 cfs 0.010 af Discarded=0.00 cfs 0.004 af Primary=0.12 cfs 0.006 af Outflow=0.13 cfs 0.010 af</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond IT-23: Infiltration Trench - 23</td>
<td>Peak Elev=197.25' Storage=38 cf Inflow=0.15 cfs 0.008 af Discarded=0.00 cfs 0.003 af Primary=0.14 cfs 0.005 af Outflow=0.15 cfs 0.008 af</td>
</tr>
<tr>
<td>Pond IT-31: Infiltration Trench - 31</td>
<td>Peak Elev=202.67' Storage=134 cf Inflow=0.15 cfs 0.015 af Discarded=0.02 cfs 0.011 af Primary=0.08 cfs 0.003 af Outflow=0.10 cfs 0.015 af</td>
</tr>
<tr>
<td>Pond IT-32: Infiltration Trench - 32</td>
<td>Peak Elev=202.64' Storage=49 cf Inflow=0.06 cfs 0.009 af Discarded=0.01 cfs 0.007 af Primary=0.04 cfs 0.002 af Outflow=0.05 cfs 0.009 af</td>
</tr>
</tbody>
</table>

**Total Runoff Area = 4.021 ac**  
**Runoff Volume = 0.159 af**  
**Average Runoff Depth = 0.47"**  
86.80% Pervious = 3.490 ac  
13.20% Impervious = 0.531 ac
Summary for Subcatchment Po-12: Rear House and Driveway Lot 1

Runoff = 0.16 cfs @ 12.10 hrs, Volume= 0.012 af, Depth> 1.39"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 2,340</td>
<td>98</td>
<td>Roof #1</td>
</tr>
<tr>
<td>2,040</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>4,380</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,040</td>
<td></td>
<td>46.55% Pervious Area</td>
</tr>
<tr>
<td>2,340</td>
<td></td>
<td>53.42% Impervious Area</td>
</tr>
</tbody>
</table>

Tc | Length | Slope | Velocity | Capacity | Description
---|--------|-------|----------|----------|----------------
6.0 |        |       |          |          | Direct Entry, Overland Flow

Summary for Subcatchment Po-22: Runoff to Driveway Trench - Lot 2

Runoff = 0.13 cfs @ 12.10 hrs, Volume= 0.010 af, Depth> 1.20"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
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<th>Description</th>
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</thead>
<tbody>
<tr>
<td>* 1,910</td>
<td>98</td>
<td>Driveway and Roof #2</td>
</tr>
<tr>
<td>2,310</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>4,220</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,310</td>
<td></td>
<td>54.74% Pervious Area</td>
</tr>
<tr>
<td>1,910</td>
<td></td>
<td>45.26% Impervious Area</td>
</tr>
</tbody>
</table>

Tc | Length | Slope | Velocity | Capacity | Description
---|--------|-------|----------|----------|----------------
6.0 |        |       |          |          | Direct Entry, Overland Flow

Summary for Subcatchment Po-23: Roof Runoff - Lot 2

Runoff = 0.03 cfs @ 12.09 hrs, Volume= 0.002 af, Depth> 2.87"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 428</td>
<td>98</td>
<td>Driveway and Roof #2</td>
</tr>
<tr>
<td>428</td>
<td></td>
<td>100.00% Impervious Area</td>
</tr>
</tbody>
</table>
### Summary for Subcatchment Po-24: Roof Runoff - Lot 2

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>98</td>
<td>Driveway and Roof #2</td>
</tr>
</tbody>
</table>

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

### Summary for Subcatchment Po-31: Overland and and Rear House Lot 3

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,000</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>3,180</td>
<td>98</td>
<td>Driveway and Front Roof #3</td>
</tr>
<tr>
<td>2,720</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
</tbody>
</table>

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"
Summary for Subcatchment Po-32: Runoff to Driveway Trench Lot 3

Runoff = 0.06 cfs @ 12.31 hrs, Volume = 0.009 af, Depth > 0.51"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>1,412</td>
<td>98</td>
<td>Roof and Driveway #3</td>
</tr>
<tr>
<td>2,313</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>8,725</td>
<td>64</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>7,313</td>
<td></td>
<td>83.82% Pervious Area</td>
</tr>
<tr>
<td>1,412</td>
<td></td>
<td>16.18% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>16.2</td>
<td>100</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n = 0.400 P2 = 3.10&quot;</td>
</tr>
<tr>
<td>0.7</td>
<td>30</td>
<td>0.0100</td>
<td>0.70</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Short Grass Pasture K_v = 7.0 fps</td>
</tr>
<tr>
<td>16.9</td>
<td>130</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Summary for Subcatchment Po-Di: Postdevelopment Direct Runoff

Runoff = 0.14 cfs @ 12.56 hrs, Volume = 0.034 af, Depth > 0.25"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>57,950</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>15,125</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>73,075</td>
<td>56</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>73,075</td>
<td></td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td>100</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, A to B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n = 0.400 P2 = 3.10&quot;</td>
</tr>
<tr>
<td>3.8</td>
<td>260</td>
<td>0.0520</td>
<td>1.14</td>
<td></td>
<td>Shallow Concentrated Flow, B to C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland K_v = 5.0 fps</td>
</tr>
<tr>
<td>1.6</td>
<td>190</td>
<td>0.1500</td>
<td>1.94</td>
<td></td>
<td>Shallow Concentrated Flow, C to D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland K_v = 5.0 fps</td>
</tr>
<tr>
<td>21.6</td>
<td>550</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>
Summary for Subcatchment Po-IB: Postdevelopment to Infiltration Basin

Runoff = 0.51 cfs @ 12.35 hrs, Volume= 0.073 af, Depth> 0.51"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>36,396</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>18,000</td>
<td>70</td>
<td>1/2 acre lots, 25% imp, HSG B</td>
</tr>
<tr>
<td>*</td>
<td>98</td>
<td>Roads and Driveway</td>
</tr>
<tr>
<td>11,684</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>74,630</td>
<td>64</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>61,580</td>
<td></td>
<td>82.51% Pervious Area</td>
</tr>
<tr>
<td>13,050</td>
<td></td>
<td>17.49% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td>100</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.10&quot;</td>
</tr>
<tr>
<td>2.7</td>
<td>190</td>
<td>0.0540</td>
<td>1.16</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>0.3</td>
<td>60</td>
<td>0.0250</td>
<td>3.21</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Paved Kv= 20.3 fps</td>
</tr>
<tr>
<td>19.2</td>
<td>350</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Summary for Reach Total: Total Runoff

Inflow Area = 4.021 ac, 13.20% Impervious, Inflow Depth > 0.10" for 2-Yr event
Inflow = 0.14 cfs @ 12.56 hrs, Volume= 0.034 af
Outflow = 0.14 cfs @ 12.56 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: Infiltration Trench - 23

Inflow Area = 0.018 ac, 100.00% Impervious, Inflow Depth > 2.87" for 2-Yr event
Inflow = 0.05 cfs @ 12.09 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.45 hrs, Volume= 0.004 af, Atten= 90%, Lag= 21.8 min
Discarded = 0.00 cfs @ 11.25 hrs, Volume= 0.004 af
Primary = 0.00 cfs @ 12.45 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 194.00' @ 12.45 hrs Surf.Area = 80 sf Storage= 64 cf

Plug-Flow detention time= 121.8 min calculated for 0.004 af (97% of inflow)
Center-of-Mass det. time= 103.0 min (859.6 - 756.6)
Stromwater Management Design Infiltration Structure an Type III 24-hr 2-Yr Rainfall=3.10"
Prepared by {enter your company name here} Printed 6/28/2020
HydroCAD® 10.00-17 s/n 00689 © 2016 HydroCAD Software Solutions LLC Page 8

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
</table>
| #1     | 192.00' | 64 cf         | 2.00'W x 40.00'L x 2.00'H Prismaticoid
|        |         |               | 160 cf Overall x 40.0% Voids |

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
</table>
| #1     | Discarded | 192.00' | 2.410 in/hr Exfiltration over Surface area
| #2     | Primary  | 194.00' | 34.0' long x 0.5' breadth Broad-Crested Rectangular Weir
|        |          |         | Head (feet) 0.20 0.40 0.60 0.80 1.00
|        |          |         | Coef. (English) 2.80 2.92 3.08 3.30 3.32 |

**Discarded OutFlow** Max=0.00 cfs @ 11.25 hrs HW=192.02' (Free Discharge)

**Primary OutFlow** Max=0.00 cfs @ 12.45 hrs HW=194.00' (Free Discharge)

---

**Summary for Pond IS-1: Infiltration Structure - 1**

<table>
<thead>
<tr>
<th>Inflow</th>
<th>Inflow Area =</th>
<th>1.713 ac, 17.49% Impervious, Inflow Depth &gt; 0.51&quot; for 2-Yr event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outflow=</td>
<td>0.51 cfs @ 12.35 hrs, Volume= 0.073 af</td>
<td></td>
</tr>
<tr>
<td>Discarded=</td>
<td>0.12 cfs @ 12.15 hrs, Volume= 0.073 af, Atten= 77%, Lag= 0.0 min</td>
<td></td>
</tr>
<tr>
<td>Primary=</td>
<td>0.00 cfs @ 0.00 hrs, Volume= 0.000 af</td>
<td></td>
</tr>
</tbody>
</table>

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 188.70' @ 13.57 hrs Surf.Area= 2,128 sf Storage= 794 cf

Plug-Flow detention time= 59.6 min calculated for 0.073 af (100% of inflow)
Center-of-Mass det. time= 58.7 min ( 970.7 - 912.0 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
</table>
| #1     | 188.00' | 1,877 cf      | 28.00'W x 76.00'L x 3.50'H Prismaticoid
| #2     | 188.50' | 2,756 cf      | ADS StormTech SC-740 +Cap x 60 Inside #1
|        |         |               | Effective Size= 44.6'W x 30.0'H => 6.45 sf x 7.12'L = 45.9 cf
|        |         |               | Overall Size= 51.0'W x 30.0'H x 7.56'L with 0.44' Overlap
|        |         |               | 6 Rows of 10 Chambers |
|        |         | 4,633 cf      | Total Available Storage |

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
</table>
| #1     | Primary | 190.00' | 12.0" Round Culvert L= 10.0' Ke= 0.500
|        |         | 190.00' / 189.90' | S= 0.0100 '/' Cc= 0.900
|        |         | 0.010, Flow Area= 0.79 sf |
| #2     | Discarded | 188.00' | 2.410 in/hr Exfiltration over Surface area |

**Discarded OutFlow** Max=0.12 cfs @ 12.15 hrs HW=188.04' (Free Discharge)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=188.00' (Free Discharge)
Summary for Pond IS-12: Infiltration Structure - 12

Inflow Area = 0.101 ac, 53.42% Impervious, Inflow Depth = 0.34" for 2-Yr event
Inflow = 0.10 cfs @ 12.18 hrs, Volume= 0.003 af
Outflow = 0.02 cfs @ 12.15 hrs, Volume= 0.003 af, Attenuation= 80%, Lag= 0.0 min
Discarded = 0.02 cfs @ 12.15 hrs, Volume= 0.003 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 192.50' @ 12.60 hrs Surf.Area= 360 sf Storage= 72 cf

Plug-Flow detention time= 36.0 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 35.9 min (777.5 - 741.6)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>192.00'</td>
<td>379 cf</td>
<td>12.00'W x 30.00'H x 3.00'L Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,080 cf Overall - 133 cf Embedded = 947 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>192.50'</td>
<td>133 cf</td>
<td>ADS StormTech SC-310 +Cap x 9 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 28.8&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0&quot;W x 16.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Rows of 3 Chambers</td>
</tr>
</tbody>
</table>

512 cf Total Available Storage

Device Routing Invert Outlet Devices
#1 Discarded 192.00' 2.410 in/hr Exfiltration over Surface area
#2 Primary 193.50' 4.0" Round Culvert L= 5.0' Ke= 0.500
Inlet / Outlet Invert= 193.50' / 193.45' S= 0.0100 '/' Cc= 0.900
n= 0.100, Flow Area= 0.09 sf

Discarded Outflow Max=0.02 cfs @ 12.15 hrs HW=192.07' (Free Discharge)

Primary Outflow Max=0.00 cfs @ 0.00 hrs HW=192.00' (Free Discharge)

Summary for Pond IS-22: Infiltration Structure - 22

Inflow Area = 0.107 ac, 50.30% Impervious, Inflow Depth = 0.59" for 2-Yr event
Inflow = 0.14 cfs @ 12.11 hrs, Volume= 0.005 af
Outflow = 0.03 cfs @ 12.05 hrs, Volume= 0.005 af, Attenuation= 82%, Lag= 0.0 min
Discarded = 0.03 cfs @ 12.05 hrs, Volume= 0.005 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 195.61' @ 12.60 hrs Surf.Area= 456 sf Storage= 112 cf

Plug-Flow detention time= 42.7 min calculated for 0.005 af (100% of inflow)
Center-of-Mass det. time= 42.6 min (796.6 - 754.0)
### Stromwater Management Design Infiltration Structure an Type III 24-hr 2-Yr Rainfall=3.10"  

Prepared by {enter your company name here}  
Printed 6/28/2020  
HydroCAD® 10.00-17 s/n 00689 © 2016 HydroCAD Software Solutions LLC  

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
<th></th>
</tr>
</thead>
</table>
| #1     | 195.00' | 476 cf         | 12.00'W x 38.00'L x 3.00'H Prismatoid  
1,368 cf Overall - 177 cf Embedded = 1,191 cf x 40.0% Voids |  |
| #2     | 196.00' | 177 cf         | ADS_StormTech SC-310 + Cap x 12 Inside #1  
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf  
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap  
3 Rows of 4 Chambers |  |

653 cf Total Available Storage

### Device Routing Invert Outlet Devices

| #1   | Discarded | 195.00' | 2.410 in/hr Exfiltration over Surface area  
6.0' long x 0.5' breadth Broad-Crested Rectangular Weir  
Head (feet) 0.20 0.40 0.60 0.80 1.00  
Coef. (English) 2.80 2.92 3.08 3.30 3.32 |  |
| #2   | Primary   | 197.50' |  |

**Discarded OutFlow** Max=0.03 cfs @ 12.05 hrs HW=195.06' (Free Discharge)  
**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=195.00' (Free Discharge)

### Summary for Pond IS-31: Infiltration Structure - 31

Inflow Area = 0.204 ac, 35.73% Impervious, Inflow Depth = 0.20" for 2-Yr event  
Inflow = 0.08 cfs @ 12.45 hrs, Volume= 0.003 af  
Outflow = 0.02 cfs @ 12.35 hrs, Volume= 0.003 af, Atten= 81%, Lag= 0.0 min  
Discarded = 0.02 cfs @ 12.35 hrs, Volume= 0.003 af  
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs  
Peak Elev= 201.59' @ 13.02 hrs  
Surf.Area= 282 sf  
Storage= 75 cf

Plug-Flow detention time= 49.7 min calculated for 0.003 af (100% of inflow)  
Center-of-Mass det. time= 49.7 min (817.0 - 767.4 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
<th></th>
</tr>
</thead>
</table>
| #1     | 201.00' | 229 cf         | 12.00'W x 23.50'L x 2.50'H Prismatoid  
705 cf Overall - 133 cf Embedded = 572 cf x 40.0% Voids |  |
| #2     | 201.50' | 133 cf         | ADS_StormTech SC-310 + Cap x 9 Inside #1  
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf  
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap  
3 Rows of 3 Chambers |  |

362 cf Total Available Storage

### Device Routing Invert Outlet Devices

| #1   | Discarded | 201.00' | 2.410 in/hr Exfiltration over Surface area  
6.0' Round Culvert L= 71.0' Ke= 0.500  
Inlet / Outlet Invert= 202.33' / 199.33' S= 0.0423 ' r Cc= 0.900  
 n= 0.010, Flow Area= 0.20 sf |  |
| #2   | Primary   | 202.33' |  |
**Stromwater Management Design Infiltration Structure an Type III 24-hr 2-Yr Rainfall=3.10"**

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**Discarded OutFlow** Max=0.02 cfs @ 12.35 hrs  HW=201.03'  (Free Discharge)  
↑1=Exfiltration  (Exfiltration Controls 0.02 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs  HW=201.00'  (Free Discharge)  
↑2=Culvert  (Controls 0.00 cfs)

---

**Summary for Pond IS-32: Infiltration Structure - 32**

<table>
<thead>
<tr>
<th>Inflow Area = 0.405 ac, 26.05% Impervious, Inflow Depth = 0.05&quot; for 2-Yr event</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflow = 0.04 cfs @ 12.51 hrs, Volume= 0.002 af</td>
<td></td>
</tr>
<tr>
<td>Outflow = 0.02 cfs @ 12.50 hrs, Volume= 0.002 af, Atten= 52%, Lag= 0.0 min</td>
<td></td>
</tr>
<tr>
<td>Discarded = 0.02 cfs @ 12.50 hrs, Volume= 0.002 af</td>
<td></td>
</tr>
<tr>
<td>Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af</td>
<td></td>
</tr>
</tbody>
</table>

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4  
Peak Elev= 197.14' @ 12.78 hrs  Surf.Area= 360 sf  Storage= 20 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
Center-of-Mass det. time= 9.9 min (782.3 - 772.4)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>197.00'</td>
<td>451 cf</td>
<td>12.00'W x 30.00'L x 3.50'H Prismatoid 1,260 cf Overall - 133 cf Embedded = 1,127 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>198.50'</td>
<td>133 cf</td>
<td>ADS_StormTech SC-310 +Cap x 9 Inside #1 Effective Size = 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf Overall Size = 34.0&quot;W x 16.0&quot;H x 7.56'L with 0.44' Overlap 3 Rows of 3 Chambers</td>
</tr>
</tbody>
</table>

584 cf  Total Available Storage

---

**Device**  
**Routing**  
**Invert**  
**Outlet Devices**

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
</table>
| #1 | Discarded | 197.00' | 2.410 in/hr Exfiltration over Surface area  
6.0' long x 0.5' breadth Broad-Crested Rectangular Weir  
Head (feet) 0.20 0.40 0.60 0.80 1.00  
Coef. (English) 2.80 2.92 3.08 3.30 3.32 |
| #2 | Primary | 200.00' |  |

**Discarded OutFlow** Max=0.02 cfs @ 12.50 hrs  HW=197.06'  (Free Discharge)  
↑1=Exfiltration  (Exfiltration Controls 0.02 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs  HW=197.00'  (Free Discharge)  
↑2=Broad-Crested Rectangular Weir  (Controls 0.00 cfs)

---

**Summary for Pond IT-12: Infiltration Trench - 12**

<table>
<thead>
<tr>
<th>Inflow Area = 0.101 ac, 53.42% Impervious, Inflow Depth &gt; 1.39&quot; for 2-Yr event</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflow = 0.16 cfs @ 12.10 hrs, Volume= 0.012 af</td>
<td></td>
</tr>
<tr>
<td>Outflow = 0.12 cfs @ 12.18 hrs, Volume= 0.012 af, Atten= 27%, Lag= 5.3 min</td>
<td></td>
</tr>
<tr>
<td>Discarded = 0.02 cfs @ 11.70 hrs, Volume= 0.009 af</td>
<td></td>
</tr>
<tr>
<td>Primary = 0.10 cfs @ 12.18 hrs, Volume= 0.003 af</td>
<td></td>
</tr>
</tbody>
</table>

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Stromwater Management Design Infiltration Structure

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

Prepared by [enter your company name here]

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Peak Elev= 196.72' @ 12.18 hrs  Surf.Area= 296 sf  Storage= 86 cf

Plug-Flow detention time= 23.0 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 22.9 min ( 863.1 - 840.5 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>196.00'</td>
<td>225 cf</td>
<td>2.00'W x 148.00'L x 2.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>592 cf Overall - 29 cf Embedded = 563 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>197.00'</td>
<td>29 cf</td>
<td>6.0&quot; Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 148.0'</td>
</tr>
</tbody>
</table>

Total Available Storage = 254 cf

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>196.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>196.50'</td>
<td>4.0&quot; Round Culvert L= 10.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 196.50' / 196.00' S= 0.0500 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.013, Flow Area= 0.09 sf</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.02 cfs @ 11.70 hrs HW=196.02' (Free Discharge)

Primary OutFlow Max=0.10 cfs @ 12.18 hrs HW=196.72' (Free Discharge)

Summary for Pond IT-22: Infiltration Trench - 22

Inflow Area = 0.097 ac, 45.28% Impervious, Inflow Depth > 1.20" for 2-Yr event

Inflow = 0.13 cfs @ 12.10 hrs, Volume= 0.010 af

Outflow = 0.13 cfs @ 12.11 hrs, Volume= 0.010 af, Attenu= 3%, Lag= 0.6 min

Discarded = 0.00 cfs @ 11.20 hrs, Volume= 0.004 af

Primary = 0.12 cfs @ 12.11 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 198.51' @ 12.11 hrs  Surf.Area= 60 sf  Storage= 20 cf

Plug-Flow detention time= 18.2 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 17.9 min ( 868.2 - 850.3 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>197.80'</td>
<td>45 cf</td>
<td>2.00'W x 30.00'L x 2.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>120 cf Overall - 7 cf Embedded = 113 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>198.30'</td>
<td>7 cf</td>
<td>4.0&quot; Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>L= 80.0'</td>
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Total Available Storage = 52 cf

<table>
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<tr>
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<th>Routing</th>
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<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>197.80'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>198.30'</td>
<td>6.0&quot; Round Culvert L= 50.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 198.30' / 197.00' S= 0.0260 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.013, Flow Area= 0.20 sf</td>
</tr>
</tbody>
</table>
Discarded Outflow Max=0.00 cfs @ 11.20 hrs HW=197.82' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary Outflow Max=0.12 cfs @ 12.11 hrs HW=198.51' (Free Discharge)
↑2=Culvert (Inlet Controls 0.12 cfs @ 1.56 fps)

Summary for Pond IT-23: Infiltration Trench - 23

Inflow Area = 0.107 ac, 50.30% Impervious, Inflow Depth > 0.95" for 2-Yr event
Inflow  = 0.15 cfs @ 12.10 hrs, Volume= 0.008 af
Outflow  = 0.15 cfs @ 12.11 hrs, Volume= 0.008 af, Atten= 2%, Lag= 0.5 min
Discarded = 0.00 cfs @ 11.65 hrs, Volume= 0.003 af
Primary  = 0.14 cfs @ 12.11 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 197.25' @ 12.11 hrs Surf.Area= 72 sf Storage= 38 cf

Plug-Flow detention time= 30.5 min calculated for 0.008 af (100% of inflow)
Center-of-Mass det. time= 29.2 min ( 797.2 - 768.1 )

<table>
<thead>
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<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 196.00'</td>
<td>56 cf</td>
<td>2.00'W x 36.00'L x 2.00'H Prismatoid</td>
<td></td>
</tr>
<tr>
<td>#2 197.00'</td>
<td>3 cf</td>
<td>4.0' Round Pipe Storage Inside #1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L= 36.0'</td>
<td></td>
</tr>
</tbody>
</table>

59 cf Total Available Storage

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Discarded 196.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#2 Primary 197.00'</td>
<td>6.0' Round Culvert L= 10.0' Ke= 0.500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Inlet / Outlet Invert= 197.00' / 196.88' S= 0.0120 '/' Cc= 0.900
n= 0.013, Flow Area= 0.20 sf

Discarded Outflow Max=0.00 cfs @ 11.65 hrs HW=198.02' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary Outflow Max=0.14 cfs @ 12.11 hrs HW=197.25' (Free Discharge)
↑2=Culvert (Barrel Controls 0.14 cfs @ 2.14 fps)

Summary for Pond IT-31: Infiltration Trench - 31

Inflow Area = 0.204 ac, 35.73% Impervious, Inflow Depth > 0.87" for 2-Yr event
Inflow  = 0.15 cfs @ 12.22 hrs, Volume= 0.015 af
Outflow  = 0.10 cfs @ 12.45 hrs, Volume= 0.015 af, Atten= 33%, Lag= 13.9 min
Discarded = 0.02 cfs @ 11.90 hrs, Volume= 0.011 af
Primary  = 0.08 cfs @ 12.45 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Stromwater Management Design Infiltration Structure an Type III 24-hr 2-Yr Rainfall = 3.10"  
Prepared by {enter your company name here}  
HydroCAD® 10.00-17  s/n 00599 © 2016 HydroCAD Software Solutions LLC  
Printed 6/28/2020  
Page 14

Peak Elev = 202.67' @ 12.45 hrs  Surf.Area = 276 sf  Storage = 134 cf

Plug-Flow detention time = 58.4 min calculated for 0.015 af (100% of inflow)  
Center-of-Mass det. time = 57.5 min (933.9 - 876.4)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>201.50'</td>
<td>210 cf</td>
<td>2.00'W x 138.00'L x 2.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>552 cf Overall - 27 cf Embedded = 525 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>202.50'</td>
<td>27 cf</td>
<td>6.0&quot; Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = 138.0'</td>
</tr>
</tbody>
</table>

237 cf Total Available Storage

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
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<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>201.50'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>202.50'</td>
<td>6.0&quot; Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = 17.0' Ke = 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert = 202.50' / 202.33' S = 0.0100 ' / Cc = 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n = 0.010, Flow Area = 0.20 sf</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max = 0.02 cfs @ 11.90 hrs  HW = 201.53' (Free Discharge)  
↑ 1 = Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max = 0.08 cfs @ 12.45 hrs  HW = 202.67' (Free Discharge)  
↑ 2 = Culvert (Inlet Controls 0.08 cfs @ 1.40 fps)

Summary for Pond IT-32: Infiltration Trench - 32

Inflow Area = 0.200 ac, 16.18% Impervious, Inflow Depth > 0.51" for 2-Yr event
Inflow = 0.06 cfs @ 12.31 hrs, Volume = 0.009 af
Outflow = 0.05 cfs @ 12.51 hrs, Volume = 0.008 af, Atten = 17%, Lag = 11.9 min
Discarded = 0.01 cfs @ 12.10 hrs, Volume = 0.007 af
Primary = 0.04 cfs @ 12.51 hrs, Volume = 0.002 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs / 2
Peak Elev = 202.64' @ 12.51 hrs  Surf.Area = 184 sf  Storage = 49 cf

Plug-Flow detention time = 29.4 min calculated for 0.009 af (100% of inflow)  
Center-of-Mass det. time = 28.7 min (939.0 - 910.4)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>202.00'</td>
<td>144 cf</td>
<td>2.00'W x 92.00'L x 2.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>368 cf Overall - 8 cf Embedded = 360 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>202.50'</td>
<td>8 cf</td>
<td>4.0&quot; Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = 92.0'</td>
</tr>
</tbody>
</table>

152 cf Total Available Storage

<table>
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<tr>
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<th>Routing</th>
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<th>Outlet Devices</th>
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<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>202.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>202.50'</td>
<td>4.0&quot; Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = 26.0' Ke = 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert = 202.50' / 199.33' S = 0.1219 ' / Cc = 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n = 0.013, Flow Area = 0.09 sf</td>
</tr>
</tbody>
</table>
Discarded OutFlow  Max=0.01 cfs @ 12.10 hrs  HW=202.03'  (Free Discharge)
\[\text{1=Exfiltration} \quad \text{(Exfiltration Controls 0.01 cfs)}\]

Primary OutFlow  Max=0.04 cfs @ 12.51 hrs  HW=202.63'  (Free Discharge)
\[\text{2=Culvert} \quad \text{(Inlet Controls 0.04 cfs @ 1.25 fps)}\]
Stromwater Management Design Infiltration Structure a  Type III 24-hr 10-Yr Rainfall=4.50"  
Prepared by {enter your company name here}  
Printed 6/28/2020 
HydroCAD® 10.00-17 s/n 00689 © 2016 HydroCAD Software Solutions LLC  
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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points 
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN 
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Po-12: Rear House and 
Runoff Area=4,380 sf 53.42% Impervious Runoff Depth>2.55" 
Tc=6.0 min CN=81 Runoff=0.29 cfs 0.021 af

Subcatchment Po-22: Runoff to Driveway 
Runoff Area=4,220 sf 45.26% Impervious Runoff Depth>2.29" 
Tc=6.0 min CN=78 Runoff=0.26 cfs 0.018 af

Subcatchment Po-23: Roof Runoff - Lot 2 
Runoff Area=428 sf 100.00% Impervious Runoff Depth>4.26" 
Tc=6.0 min CN=98 Runoff=0.04 cfs 0.003 af

Subcatchment Po-24: Roof Runoff - Lot 2 
Runoff Area=800 sf 100.00% Impervious Runoff Depth>4.26" 
Tc=6.0 min CN=98 Runoff=0.08 cfs 0.007 af

Subcatchment Po-31: Overland and and 
Runoff Area=8,900 sf 35.73% Impervious Runoff Depth>1.81" 
Flow Length=145’ Tc=14.1 min CN=72 Runoff=0.33 cfs 0.031 af

Subcatchment Po-32: Runoff to Driveway 
Runoff Area=8,725 sf 16.18% Impervious Runoff Depth>1.26" 
Flow Length=130’ Tc=16.9 min CN=64 Runoff=0.19 cfs 0.021 af

Subcatchment Po-D1: Postdevelopment 
Runoff Area=73,075 sf 0.00% Impervious Runoff Depth>0.79" 
Flow Length=550’ Tc=21.6 min CN=56 Runoff=0.77 cfs 0.110 af

Subcatchment Po-D2: Postdevelopment to 
Runoff Area=74,630 sf 17.49% Impervious Runoff Depth>1.26" 
Flow Length=350’ Tc=19.2 min CN=64 Runoff=1.58 cfs 0.180 af

Reach Total: Total Runoff 
Inflow=0.77 cfs 0.134 af 
Outflow=0.77 cfs 0.134 af

Pond 1P: Infiltration Trench - 23 
Peak Elev=194.00’ Storage=64 cf Inflow=0.08 cfs 0.007 af 
Discarded=0.00 cfs 0.005 af Primary=0.04 cfs 0.000 af Outflow=0.04 cfs 0.005 af

Pond IS-1: Infiltration Structure - 1 
Peak Elev=190.19’ Storage=3,250 cf Inflow=1.58 cfs 0.180 af 
Discarded=0.12 cfs 0.121 af Primary=0.14 cfs 0.023 af Outflow=0.26 cfs 0.144 af

Pond IS-12: Infiltration Structure - 12 
Peak Elev=193.40’ Storage=271 cf Inflow=0.23 cfs 0.009 af 
Discarded=0.02 cfs 0.009 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.009 af

Pond IS-22: Infiltration Structure - 22 
Peak Elev=196.50’ Storage=331 cf Inflow=0.28 cfs 0.013 af 
Discarded=0.03 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.013 af

Pond IS-31: Infiltration Structure - 31 
Peak Elev=202.58’ Storage=255 cf Inflow=0.30 cfs 0.015 af 
Discarded=0.02 cfs 0.009 af Primary=0.17 cfs 0.006 af Outflow=0.18 cfs 0.015 af

Pond IS-32: Infiltration Structure - 32 
Peak Elev=200.01’ Storage=513 cf Inflow=0.31 cfs 0.017 af 
Discarded=0.02 cfs 0.017 af Primary=0.02 cfs 0.000 af Outflow=0.04 cfs 0.017 af

Pond IS-12: Infiltration Trench - 12 
Peak Elev=196.97’ Storage=115 cf Inflow=0.29 cfs 0.021 af 
Discarded=0.02 cfs 0.013 af Primary=0.23 cfs 0.009 af Outflow=0.25 cfs 0.021 af
Pond IT-22: Infiltration Trench - 22
Peak Elev=198.61' Storage=24 cf Inflow=0.26 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.25 cfs 0.014 af Outflow=0.25 cfs 0.018 af

Pond IT-23: Infiltration Trench - 23
Peak Elev=197.37' Storage=41 cf Inflow=0.29 cfs 0.018 af
Discarded=0.00 cfs 0.004 af Primary=0.28 cfs 0.013 af Outflow=0.28 cfs 0.018 af

Pond IT-31: Infiltration Trench - 31
Peak Elev=202.86' Storage=163 cf Inflow=0.33 cfs 0.031 af
Discarded=0.02 cfs 0.015 af Primary=0.30 cfs 0.015 af Outflow=0.31 cfs 0.031 af

Pond IT-32: Infiltration Trench - 32
Peak Elev=202.84' Storage=67 cf Inflow=0.19 cfs 0.021 af
Discarded=0.01 cfs 0.010 af Primary=0.18 cfs 0.011 af Outflow=0.19 cfs 0.021 af

Total Runoff Area = 4.021 ac Runoff Volume = 0.392 af Average Runoff Depth = 1.17"
86.80% Pervious = 3.490 ac 13.20% Impervious = 0.531 ac
Summary for Subcatchment Po-12: Rear House and Driveway Lot 1

Runoff = 0.29 cfs @ 12.09 hrs, Volume = 0.021 af, Depth > 2.55"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>2,340</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>2,040</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>4,380</td>
<td>81</td>
</tr>
<tr>
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<td>2,040</td>
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</tr>
<tr>
<td></td>
<td>2,340</td>
<td></td>
</tr>
</tbody>
</table>

Tc | Length | Slope | Velocity | Capacity | Description
---|--------|-------|----------|----------|-----------------|
6.0 |        |       |          |          | Direct Entry, Overland Flow

Summary for Subcatchment Po-22: Runoff to Driveway Trench - Lot 2

Runoff = 0.26 cfs @ 12.09 hrs, Volume = 0.018 af, Depth > 2.29"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>*</td>
<td>1,910</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>2,310</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>4,220</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>2,310</td>
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</tr>
<tr>
<td></td>
<td>1,910</td>
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</tbody>
</table>

Tc | Length | Slope | Velocity | Capacity | Description
---|--------|-------|----------|----------|-----------------|
6.0 |        |       |          |          | Direct Entry, Overland Flow

Summary for Subcatchment Po-23: Roof Runoff - Lot 2

Runoff = 0.04 cfs @ 12.09 hrs, Volume = 0.003 af, Depth > 4.26"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>*</td>
<td>428</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>428</td>
<td></td>
</tr>
</tbody>
</table>
### Summary for Subcatchment Po-24: Roof Runoff - Lot 2

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 4.26"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>98</td>
<td>Driveway and Roof #2</td>
</tr>
<tr>
<td>800</td>
<td></td>
<td>100.00% Impervious Area</td>
</tr>
</tbody>
</table>

### Summary for Subcatchment Po-31: Overland and and Rear House Lot 3

Runoff = 0.33 cfs @ 12.21 hrs, Volume= 0.031 af, Depth> 1.81"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,000</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>3,180</td>
<td>98</td>
<td>Driveway and Front Roof #3</td>
</tr>
<tr>
<td>2,720</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>8,900</td>
<td>72</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>5,720</td>
<td>64.27% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>3,180</td>
<td>35.73% Impervious Area</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>13.6</td>
<td>80</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.10&quot;</td>
</tr>
<tr>
<td>0.2</td>
<td>25</td>
<td>0.0800</td>
<td>1.98</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td>0.3</td>
<td>40</td>
<td>0.0125</td>
<td>2.27</td>
<td></td>
<td>Short Grass Pasture Kv= 7.0 fps</td>
</tr>
<tr>
<td>14.1</td>
<td>145</td>
<td></td>
<td></td>
<td></td>
<td>Shallow Concentrated Flow, Driveway Flow Paved Kv= 20.3 fps</td>
</tr>
</tbody>
</table>
Summary for Subcatchment Po-32: Runoff to Driveway Trench Lot 3

Runoff = 0.19 cfs @ 12.26 hrs, Volume= 0.021 af, Depth> 1.26"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>1,412</td>
<td>98</td>
<td>Roof and Driveway #3</td>
</tr>
<tr>
<td>2,313</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>8,725</td>
<td>64</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>7,313</td>
<td>83.82%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>1,412</td>
<td>16.18%</td>
<td>Impervious Area</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td>100</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.10&quot;</td>
</tr>
<tr>
<td>0.7</td>
<td>30</td>
<td>0.0100</td>
<td>0.70</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Short Grass Pasture Kv= 7.0 fps</td>
</tr>
<tr>
<td>16.9</td>
<td>130</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Summary for Subcatchment Po-Di: Postdevelopment Direct Runoff

Runoff = 0.77 cfs @ 12.38 hrs, Volume= 0.110 af, Depth> 0.79"

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

<table>
<thead>
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<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>57,950</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>15,125</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>73,075</td>
<td>56</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>73,075</td>
<td></td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td>100</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, A to B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.10&quot;</td>
</tr>
<tr>
<td>3.8</td>
<td>260</td>
<td>0.0520</td>
<td>1.14</td>
<td></td>
<td>Shallow Concentrated Flow, B to C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>1.6</td>
<td>190</td>
<td>0.1500</td>
<td>1.94</td>
<td></td>
<td>Shallow Concentrated Flow, C to D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>21.6</td>
<td>550</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>
Summary for Subcatchment Po-IB: Postdevelopment to Infiltration Basin

Runoff = 1.58 cfs @ 12.30 hrs, Volume= 0.180 af, Depth> 1.26"  

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

<table>
<thead>
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<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>36,396</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>18,000</td>
<td>70</td>
<td>1/2 acre lots, 25% imp, HSG B</td>
</tr>
<tr>
<td>*</td>
<td>98</td>
<td>Roads and Driveway</td>
</tr>
<tr>
<td>11,684</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>74,630</td>
<td>64</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>61,580</td>
<td>82.51% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>13,050</td>
<td>17.49% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                     |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td>100</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, Overland Flow Woods: Light underbrush n= 0.400 P2= 3.10&quot;</td>
</tr>
<tr>
<td>2.7</td>
<td>190</td>
<td>0.0540</td>
<td>1.16</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>0.3</td>
<td>60</td>
<td>0.0250</td>
<td>3.21</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Paved Kv= 20.3 fps</td>
</tr>
</tbody>
</table>

Summary for Reach Total: Total Runoff

Inflow Area = 4.021 ac, 13.20% impervious, Inflow Depth > 0.40" for 10-Yr event  
Inflow = 0.77 cfs @ 12.38 hrs, Volume= 0.134 af  
Outflow = 0.77 cfs @ 12.38 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min  

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

Summary for Pond 1P: Infiltration Trench - 23

Inflow Area = 0.018 ac, 100.00% Impervious, Inflow Depth > 4.26" for 10-Yr event  
Inflow = 0.08 cfs @ 12.09 hrs, Volume= 0.007 af  
Outflow = 0.04 cfs @ 12.16 hrs, Volume= 0.005 af, Atten= 49%, Lag= 4.4 min  
Discarded = 0.00 cfs @ 10.45 hrs, Volume= 0.005 af  
Primary = 0.04 cfs @ 12.16 hrs, Volume= 0.000 af  

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4  
Peak Elev= 194.00' @ 12.15 hrs Surf.Area= 80 sf Storage= 64 cf  
Plug-Flow detention time= 168.9 min calculated for 0.005 af (84% of inflow)  
Center-of-Mass det. time= 102.8 min (852.2 - 749.4)
Stromwater Management Design Infiltration Structure a Type III 24-hr 10-Yr Rainfall=4.50"
Prepared by {enter your company name here} Printed 6/28/2020
HydroCAD® 10.00-17 s/n 00589 © 2016 HydroCAD Software Solutions LLC Page 22

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
</table>
| #1     | 192.00' | 64 cf         | 2.00'W x 40.00'L x 2.00'H Prismatico 
|        |         |               | 160 cf Overall x 40.0% Voids |

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>192.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>194.00'</td>
<td>34.0' long x 0.5' breadth Broad-Crested Rectangular Weir</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.20 0.40 0.60 0.80 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coef. (English) 2.80 2.92 3.08 3.30 3.32</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.00 cfs @ 10.45 hrs HW=192.02' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.01 cfs @ 12.16 hrs HW=194.00' (Free Discharge)
↑2=Broad-Crested Rectangular Weir (Weir Controls 0.01 cfs @ 0.14 fps)

Summary for Pond IS-1: Infiltration Structure - 1

Inflow Area = 1.713 ac, 17.49% Impervious, Inflow Depth > 1.26" for 10-Yr event
Inflow = 1.58 cfs @ 12.30 hrs, Volume= 0.180 ac
Outflow = 0.26 cfs @ 13.60 hrs, Volume= 0.144 ac, Attenu= 84%, Lag= 78.2 min
Discarded = 0.12 cfs @ 11.90 hrs, Volume= 0.121 ac
Primary = 0.14 cfs @ 13.60 hrs, Volume= 0.023 ac

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 190.19' @ 13.60 hrs Surf.Area= 2,128 sf Storage= 3,250 cf

Plug-Flow detention time= 238.7 min calculated for 0.143 ac (80% of inflow)
Center-of-Mass det. time= 158.4 min (1,038.4 - 880.0)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
</table>
| #1     | 188.00' | 1,877 cf      | 28.00'W x 76.00'L x 3.50'H Prismatico 
|        |         |               | 7,448 cf Overall - 2,756 cf Embedded = 4,692 cf x 40.0% Voids |
| #2     | 188.50' | 2,756 cf      | ADS_StormTech SC-740 +Cap x 60 Inside #1 |
|        |         |               | Effective Size= 44.6'W x 30.0'H => 6.45 sf x 7.12'L = 45.9 cf |
|        |         |               | Overall Size= 51.0'W x 30.0'H x 7.56'L with 0.44' Overlap |
|        |         |               | 6 Rows of 10 Chambers |

4,633 cf Total Available Storage

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>190.00'</td>
<td>12.0&quot; Round Culvert L= 10.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 190.00' / 189.90' S= 0.0100' n= 0.010, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Discarded</td>
<td>188.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.12 cfs @ 11.90 hrs HW=188.05' (Free Discharge)
↑2=Exfiltration (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.14 cfs @ 13.60 hrs HW=190.19' (Free Discharge)
↑1=Culvert (Barrel Controls 0.14 cfs @ 2.05 fps)
Summary for Pond IS-12: Infiltration Structure - 12

Inflow Area = 0.101 ac, 53.42% Impervious, Inflow Depth = 1.05" for 10-Yr event
Inflow = 0.23 cfs @ 12.15 hrs, Volume = 0.009 af
Outflow = 0.02 cfs @ 12.00 hrs, Volume = 0.009 af, Atten = 91%, Lag = 0.0 min
Discarded = 0.02 cfs @ 12.00 hrs, Volume = 0.009 af
Primary = 0.00 cfs @ 0.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs / 4
Peak Elev = 193.40' @ 12.87 hrs Surf.Area = 360 sf Storage = 271 cf

Plug-Flow detention time = 131.7 min calculated for 0.009 af (100% of inflow)
Center-of-Mass det. time = 131.5 min (875.4 - 743.9)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>192.00'</td>
<td>379 cf</td>
<td>12.00'W x 30.00' L x 3.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,080 cf Overall - 133 cf Embedded = 947 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>192.50'</td>
<td>133 cf</td>
<td>ADS_StromTech SC-310 +Cap x 9 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size = 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size = 34.0&quot;W x 16.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Rows of 3 Chambers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>512 cf</td>
<td>Total Available Storage</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Discarded 192.00' 2.410 in/hr Exfiltration over Surface area
#2 Primary 193.50' 4.0' Round Culvert L= 5.0' Ke = 0.500
Inlet / Outlet Invert = 193.50' / 193.45' S = 0.0100 '/' Cc = 0.900
n = 0.100, Flow Area= 0.09 sf

Discarded OutFlow Max = 0.02 cfs @ 12.00 hrs HW = 192.07' (Free Discharge)
\[\text{1-Exfiltration (Exfiltration Controls 0.02 cfs)}\]

Primary OutFlow Max = 0.00 cfs @ 0.00 hrs HW = 192.00' (Free Discharge)
\[\text{2-Culvert (Controls 0.00 cfs)}\]

Summary for Pond IS-22: Infiltration Structure - 22

Inflow Area = 0.107 ac, 50.30% Impervious, Inflow Depth = 1.48" for 10-Yr event
Inflow = 0.28 cfs @ 12.10 hrs, Volume = 0.013 af
Outflow = 0.03 cfs @ 11.80 hrs, Volume = 0.013 af, Atten = 91%, Lag = 0.0 min
Discarded = 0.03 cfs @ 11.80 hrs, Volume = 0.013 af
Primary = 0.00 cfs @ 0.00 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs
Peak Elev = 196.50' @ 12.96 hrs Surf.Area = 456 sf Storage = 331 cf

Plug-Flow detention time = 131.8 min calculated for 0.013 af (100% of inflow)
Center-of-Mass det. time = 131.6 min (893.0 - 761.4)
Stromwater Management Design Infiltration Structure - Type III 24-hr 10-Yr Rainfall=4.50"

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>195.00'</td>
<td>476 cf</td>
<td>12.00'W x 38.00'x x 3.00'H Prismatoid</td>
</tr>
<tr>
<td>#2</td>
<td>196.00'</td>
<td>177 cf</td>
<td>1,368 cf Overall - 177 cf Embedded = 1,191 cf x 40.0% Voids</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>ADS StormTech SC-310 +Cap</strong> x 12 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0&quot;W x 16.0&quot;H x 7.56&quot;L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Rows of 4 Chambers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>653 cf Total Available Storage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Discarded</td>
<td>195.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2 Primary</td>
<td>197.50'</td>
<td>6.0' long x 0.5' breadth Broad-Crested Rectangular Weir</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Head (feet) 0.20 0.40 0.60 0.80 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coef. (English) 2.80 2.92 3.08 3.30 3.32</td>
</tr>
</tbody>
</table>

**Discarded OutFlow** Max=0.03 cfs @ 11.80 hrs HW=195.05' (Free Discharge)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=195.00' (Free Discharge)

---

**Summary for Pond IS-31: Infiltration Structure - 31**

- **Inflow Area** = 0.204 ac, 35.73% Impervious, **Inflow Depth** = 0.90" for 10-Yr event
- **Inflow** = 0.30 cfs @ 12.25 hrs, **Volume** = 0.015 af
- **Outflow** = 0.18 cfs @ 12.50 hrs, **Volume** = 0.015 af, **Atten** = 38%, **Lag** = 14.6 min
- **Discarded** = 0.02 cfs @ 12.15 hrs, **Volume** = 0.009 af
- **Primary** = 0.17 cfs @ 12.50 hrs, **Volume** = 0.006 af

Routing by Stor-Ind method, **Time Span**= 0.00-24.00 hrs, **dt**= 0.05 hrs
**Peak Elev**= 202.58' @ 12.50 hrs **Surf.Area**= 282 sf **Storage**= 255 cf

Plug-Flow detention time= 101.2 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 101.3 min (874.5 - 773.2)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>201.00'</td>
<td>229 cf</td>
<td>12.00'W x 23.50'L x 2.50'H Prismatoid</td>
</tr>
<tr>
<td>#2</td>
<td>201.50'</td>
<td>133 cf</td>
<td>705 cf Overall - 133 cf Embedded = 572 cf x 40.0% Voids</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>ADS StormTech SC-310 +Cap</strong> x 9 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0&quot;W x 16.0&quot;H x 7.56&quot;L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Rows of 3 Chambers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>362 cf Total Available Storage</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Device Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Discarded</td>
<td>201.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2 Primary</td>
<td>202.33'</td>
<td>6.0&quot; Round Culvert L= 71.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 202.33' / 199.33' S= 0.0423 ' / Cc= 0.300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n= 0.010, Flow Area= 0.20 sf</td>
</tr>
</tbody>
</table>
Discarded Outflow  Max = 0.02 cfs @ 12.15 hrs  HW = 201.16' (Free Discharge)

Primary Outflow  Max = 0.17 cfs @ 12.50 hrs  HW = 202.58' (Free Discharge)

Summary for Pond IS-32: Infiltration Structure - 32

Inflow Area = 0.406 ac, 26.05% Impervious, Inflow Depth = 0.52" for 10-Yr event
Inflow = 0.31 cfs @ 12.47 hrs, Volume = 0.017 af
Outflow = 0.04 cfs @ 13.44 hrs, Volume = 0.017 af, Atten = 89%, Lag = 57.9 min
Discarded = 0.02 cfs @ 12.15 hrs, Volume = 0.017 af
Primary = 0.02 cfs @ 13.44 hrs, Volume = 0.000 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs / 4
Peak Elev = 200.01' @ 13.44 hrs  Surf.Area = 360 sf  Storage = 513 cf

Plug-Flow detention time = 248.9 min calculated for 0.017 af (100% of inflow)
Center-of-Mass det. time = 248.8 min (1,027.9 - 779.1)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>197.00'</td>
<td>451 cf</td>
<td>12.00'W x 30.00'L x 3.50'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.260 cf Overall - 133 cf Embedded = 1.127 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>198.50'</td>
<td>133 cf</td>
<td>ADS StormTech SC-310 + Cap x 9 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size = 28.9''W x 16.0''H =&gt; 2.07 sf x 7.12' = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size = 34.0''W x 16.0''H x 7.56' with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Rows of 3 Chambers</td>
</tr>
</tbody>
</table>

584 cf  Total Available Storage

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>197.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>200.00'</td>
<td>6.0' long x 0.5' breadth Broad-Crested Rectangular Weir</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.20 0.40 0.60 0.80 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coef. (English) 2.80 2.92 3.08 3.30 3.32</td>
</tr>
</tbody>
</table>

Discarded Outflow  Max = 0.02 cfs @ 12.15 hrs  HW = 197.04' (Free Discharge)

Primary Outflow  Max = 0.01 cfs @ 13.44 hrs  HW = 200.01' (Free Discharge)

Summary for Pond IT-12: Infiltration Trench - 12

Inflow Area = 0.101 ac, 53.42% Impervious, Inflow Depth > 2.55'' for 10-Yr event
Inflow = 0.29 cfs @ 12.09 hrs, Volume = 0.021 af
Outflow = 0.25 cfs @ 12.15 hrs, Volume = 0.021 af, Atten = 16%, Lag = 3.3 min
Discarded = 0.02 cfs @ 11.30 hrs, Volume = 0.013 af
Primary = 0.23 cfs @ 12.15 hrs, Volume = 0.009 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs
Peak Elev= 196.97' @ 12.15 hrs  Surf.Area= 296 sf  Storage= 115 cf

Plug-Flow detention time = 21.1 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time = 20.8 min (843.8 - 823.1 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>196.00'</td>
<td>225 cf</td>
<td>2.00'W x 148.00'L x 2.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>592 cf Overall - 29 cf Embedded = 563 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>197.00'</td>
<td>29 cf</td>
<td>6.0&quot; Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 148.0'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>254 cf Total Available Storage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>196.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>196.50'</td>
<td>4.0&quot; Round Culvert L= 10.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 196.50' / 196.00' S= 0.0500 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.013, Flow Area= 0.09 sf</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.02 cfs @ 11.30 hrs HW=196.02' (Free Discharge)
↑ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.23 cfs @ 12.15 hrs HW=196.97' (Free Discharge)
↑ 2=Culvert (Inlet Controls 0.23 cfs @ 2.85 fps)

Summary for Pond IT-22: Infiltration Trench - 22

Inflow Area = 0.097 ac, 45.26% Impervious, Inflow Depth > 2.29" for 10-Yr event
Inflow = 0.26 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.25 cfs @ 12.10 hrs, Volume= 0.018 af, Attenu= 2%, Lag= 0.4 min
Discarded = 0.00 cfs @ 10.00 hrs, Volume= 0.004 af
Primary = 0.25 cfs @ 12.10 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 198.61' @ 12.10 hrs  Surf.Area= 60 sf  Storage= 24 cf

Plug-Flow detention time = 12.9 min calculated for 0.018 af (99% of inflow)
Center-of-Mass det. time = 4.5 min (835.9 - 831.4 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>197.80'</td>
<td>45 cf</td>
<td>2.00'W x 30.00'L x 2.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>120 cf Overall - 7 cf Embedded = 113 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>198.30'</td>
<td>7 cf</td>
<td>4.0&quot; Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 80.0'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>52 cf Total Available Storage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>197.80'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>198.30'</td>
<td>6.0&quot; Round Culvert L= 50.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 198.30' / 197.00' S= 0.0260 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.013, Flow Area= 0.20 sf</td>
</tr>
</tbody>
</table>
Discarded Outflow  Max=0.00 cfs @ 10.00 hrs  HW=197.82'  (Free Discharge)
1=Exfiltration  (Exfiltration Controls 0.00 cfs)

Primary Outflow  Max=0.25 cfs @ 12.10 hrs  HW=198.61'  (Free Discharge)
2=Culvert  (Inlet Controls 0.25 cfs @ 1.91 fps)

Summary for Pond IT-23: Infiltration Trench - 23

| Inflow Area | 0.107 ac, 50.30% Impervious, Inflow Depth > 1.99" for 10-Yr event |
| Inflow      | 0.29 cfs @ 12.10 hrs, Volume= 0.018 af |
| Outflow     | 0.28 cfs @ 12.10 hrs, Volume= 0.018 af, Atten= 2%, Lag= 0.4 min |
| Discarded   | 0.00 cfs @ 11.15 hrs, Volume= 0.004 af |
| Primary     | 0.28 cfs @ 12.10 hrs, Volume= 0.013 af |

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 197.37' @ 12.10 hrs  Surf.Area= 72 sf  Storage= 41 cf
Plug-Flow detention time= 21.4 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 21.2 min (802.0 - 780.8)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>196.00'</td>
<td>56 cf</td>
<td>2.00'W x 36.00'L x 2.00'H Prismatico</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>144 cf Overall - 3 cf Embedded = 141 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>197.00'</td>
<td>3 cf</td>
<td>4.0&quot; Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 36.0'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>59 cf  Total Available Storage</td>
</tr>
</tbody>
</table>

Device  Routing  Invert  Outlet Devices
#1 Discarded  196.00'  2.410 in/hr Exfiltration over Surface area
#2 Primary   197.00'  6.0" Round Culvert  L= 10.0'  Ke= 0.500
Inlet / Outlet Invert= 197.00' / 196.88'  S= 0.0120 '/"  Cc= 0.900
n= 0.013, Flow Area= 0.20 sf

Discarded Outflow  Max=0.00 cfs @ 11.15 hrs  HW=198.03'  (Free Discharge)
1=Exfiltration  (Exfiltration Controls 0.00 cfs)

Primary Outflow  Max=0.28 cfs @ 12.10 hrs  HW=197.37'  (Free Discharge)
2=Culvert  ( Barrel Controls 0.28 cfs @ 2.48 fps)

Summary for Pond IT-31: Infiltration Trench - 31

| Inflow Area | 0.204 ac, 35.73% Impervious, Inflow Depth > 1.81" for 10-Yr event |
| Inflow      | 0.33 cfs @ 12.21 hrs, Volume= 0.031 af |
| Outflow     | 0.31 cfs @ 12.25 hrs, Volume= 0.031 af, Atten= 5%, Lag= 2.8 min |
| Discarded   | 0.02 cfs @ 11.45 hrs, Volume= 0.015 af |
| Primary     | 0.30 cfs @ 12.25 hrs, Volume= 0.015 af |

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Stromwater Management Design Infiltration Structure Type III 24-hr 10-Yr Rainfall=4.50" Prepared by {enter your company name here} Printed 6/28/2020

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Peak Elev=202.86' @ 12.25 hrs Surf.Area= 276 sf Storage= 163 cf

Plug-Flow detention time= 43.8 min calculated for 0.031 af (100% of inflow)
Center-of-Mass det. time= 43.2 min (897.0 - 853.8)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>201.50'</td>
<td>210 cf</td>
<td>2.00'W x 138.00'L x 2.00'H Prismatoid 552 cf Overall - 27 cf Embedded = 525 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>202.50'</td>
<td>27 cf</td>
<td>6.0&quot; Round Pipe Storage Inside #1 L= 138.0'</td>
</tr>
</tbody>
</table>

237 cf Total Available Storage

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>201.50'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>202.50'</td>
<td>6.0&quot; Round Culvert L= 17.0' Ke= 0.500 Inlet / Outlet invert= 202.50' / 202.33' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.02 cfs @ 11.45 hrs HW=201.52' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.30 cfs @ 12.25 hrs HW=202.86' (Free Discharge)
2=Culvert (Barrel Controls 0.30 cfs @ 2.73 fps)

Summary for Pond IT-32: Infiltration Trench - 32

Inflow Area = 0.200 ac, 16.18% Impervious, Inflow Depth > 1.26" for 10-Yr event
Inflow = 0.19 cfs @ 12.26 hrs, Volume= 0.021 af
Outflow = 0.19 cfs @ 12.31 hrs, Volume= 0.021 af, Atten= 4%, Lag= 2.9 min
Discarded = 0.01 cfs @ 11.80 hrs, Volume= 0.010 af
Primary = 0.18 cfs @ 12.31 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dl= 0.05 hrs / 2
Peak Elev= 202.84' @ 12.31 hrs Surf.Area= 184 sf Storage= 67 cf

Plug-Flow detention time= 22.5 min calculated for 0.021 af (100% of inflow)
Center-of-Mass det. time= 21.8 min (900.1 - 878.3)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>202.00'</td>
<td>144 cf</td>
<td>2.00'W x 92.00'L x 2.00'H Prismatoid 368 cf Overall - 8 cf Embedded = 360 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>202.50'</td>
<td>8 cf</td>
<td>4.0&quot; Round Pipe Storage Inside #1 L= 92.0'</td>
</tr>
</tbody>
</table>

152 cf Total Available Storage

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>202.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>202.50'</td>
<td>4.0&quot; Round Culvert L= 26.0' Ke= 0.500 Inlet / Outlet invert= 202.50' / 199.33' S= 0.1219 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf</td>
</tr>
</tbody>
</table>
OutFlow  Max=0.01 cfs @ 11.80 hrs  HW=202.03'  (Free Discharge)

Primary OutFlow  Max=0.18 cfs @ 12.31 hrs  HW=202.84'  (Free Discharge)

↑ → 2=Culvert  (Inlet Controls 0.18 cfs @ 2.02 fps)
<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>Type</th>
<th>Runoff Area</th>
<th>Impervious</th>
<th>Runoff Depth</th>
<th>Tc</th>
<th>CN</th>
<th>Runoff</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Po-12: Rear House</td>
<td>4,380 sf</td>
<td>53.42%</td>
<td>4.34&quot;</td>
<td>6.0 min</td>
<td>81</td>
<td>0.50 cfs</td>
<td>0.036 af</td>
<td></td>
</tr>
<tr>
<td>Po-22: Runoff to Driveway</td>
<td>4,220 sf</td>
<td>45.26%</td>
<td>4.02&quot;</td>
<td>6.0 min</td>
<td>78</td>
<td>0.45 cfs</td>
<td>0.032 af</td>
<td></td>
</tr>
<tr>
<td>Po-23: Roof Runoff - Lot 2</td>
<td>428 sf</td>
<td>100.00%</td>
<td>6.26&quot;</td>
<td>6.0 min</td>
<td>98</td>
<td>0.08 cfs</td>
<td>0.005 af</td>
<td></td>
</tr>
<tr>
<td>Po-24: Roof Runoff - Lot 2</td>
<td>800 sf</td>
<td>100.00%</td>
<td>6.26&quot;</td>
<td>6.0 min</td>
<td>98</td>
<td>0.11 cfs</td>
<td>0.010 af</td>
<td></td>
</tr>
<tr>
<td>Po-31: Overland and</td>
<td>8,900 sf</td>
<td>35.73%</td>
<td>3.40&quot;</td>
<td>14.1 min</td>
<td>72</td>
<td>0.63 cfs</td>
<td>0.058 af</td>
<td></td>
</tr>
<tr>
<td>Po-32: Runoff to Driveway</td>
<td>8,725 sf</td>
<td>16.18%</td>
<td>2.62&quot;</td>
<td>16.9 min</td>
<td>64</td>
<td>0.43 cfs</td>
<td>0.044 af</td>
<td></td>
</tr>
<tr>
<td>Po-Di: Postdevelopment</td>
<td>73,075 sf</td>
<td>0.00%</td>
<td>1.89&quot;</td>
<td>21.6 min</td>
<td>56</td>
<td>2.24 cfs</td>
<td>0.294 af</td>
<td></td>
</tr>
<tr>
<td>Po-IB: Postdevelopment to</td>
<td>74,630 sf</td>
<td>17.49%</td>
<td>2.62&quot;</td>
<td>19.2 min</td>
<td>64</td>
<td>3.51 cfs</td>
<td>0.373 af</td>
<td></td>
</tr>
</tbody>
</table>

Reach Total: Total Runoff

| Inflow | 5.27 cfs | 0.500 af |
| Outflow | 5.27 cfs | 0.500 af |

Pond 1P: Infiltration Trench - 23
Peak Elev=194.01' | Storage=64 cf | Inflow=0.11 cfs | 0.010 af |
Discarded=0.00 cfs | 0.008 af | Primary=0.12 cfs | 0.004 af |
Outflow=0.12 cfs | 0.011 af |

Pond IS-1: Infiltration Structure - 1
Peak Elev=191.02' | Storage=4,221 cf | Inflow=3.51 cfs | 0.373 af |
Discarded=0.12 cfs | 0.130 af | Primary=2.39 cfs | 0.183 af |
Outflow=2.51 cfs | 0.314 af |

Pond IS-12: Infiltration Structure - 12
Peak Elev=194.74' | Storage=475 cf | Inflow=0.35 cfs | 0.020 af |
Discarded=0.02 cfs | 0.012 af | Primary=0.11 cfs | 0.008 af |
Outflow=0.13 cfs | 0.020 af |

Pond IS-22: Infiltration Structure - 22
Peak Elev=197.54' | Storage=569 cf | Inflow=0.48 cfs | 0.027 af |
Discarded=0.03 cfs | 0.023 af | Primary=0.15 cfs | 0.004 af |
Outflow=0.18 cfs | 0.027 af |

Pond IS-31: Infiltration Structure - 31
Peak Elev=202.92' | Storage=296 cf | Inflow=0.59 cfs | 0.038 af |
Discarded=0.02 cfs | 0.012 af | Primary=0.55 cfs | 0.026 af |
Outflow=0.57 cfs | 0.038 af |

Pond IS-32: Infiltration Structure - 32
Peak Elev=200.14' | Storage=532 cf | Inflow=0.94 cfs | 0.057 af |
Discarded=0.02 cfs | 0.020 af | Primary=0.88 cfs | 0.036 af |
Outflow=0.90 cfs | 0.057 af |

Pond IT-12: Infiltration Trench - 12
Peak Elev=197.37' | Storage=176 cf | Inflow=0.50 cfs | 0.039 af |
Discarded=0.02 cfs | 0.017 af | Primary=0.35 cfs | 0.020 af |
Outflow=0.37 cfs | 0.036 af |
<table>
<thead>
<tr>
<th>Pond IT-22: Infiltration Trench - 22</th>
<th>Peak Elev=198.76' Storage=27 cf  Inflow=0.45 cfs  0.032 af Discarded=0.00 cfs  0.004 af  Primary=0.44 cfs  0.028 af Outflow=0.44 cfs  0.032 af</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond IT-23: Infiltration Trench - 23</td>
<td>Peak Elev=197.55' Storage=46 cf  Inflow=0.50 cfs  0.033 af Discarded=0.00 cfs  0.005 af  Primary=0.48 cfs  0.027 af Outflow=0.49 cfs  0.032 af</td>
</tr>
<tr>
<td>Pond IT-31: Infiltration Trench - 31</td>
<td>Peak Elev=203.13' Storage=197 cf  Inflow=0.63 cfs  0.058 af Discarded=0.02 cfs  0.018 af  Primary=0.59 cfs  0.038 af Outflow=0.60 cfs  0.056 af</td>
</tr>
<tr>
<td>Pond IT-32: Infiltration Trench - 32</td>
<td>Peak Elev=203.52' Storage=117 cf  Inflow=0.43 cfs  0.044 af Discarded=0.01 cfs  0.011 af  Primary=0.39 cfs  0.032 af Outflow=0.40 cfs  0.043 af</td>
</tr>
</tbody>
</table>

Total Runoff Area = 4.021 ac  Runoff Volume = 0.822 af  Average Runoff Depth = 2.45"
86.80% Pervious = 3.490 ac  13.20% Impervious = 0.531 ac
Summary for Subcatchment Po-12: Rear House and Driveway Lot 1

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.036 af, Depth> 4.34"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 2,340</td>
<td>98</td>
<td>Roof #1</td>
</tr>
<tr>
<td>2,040</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>4,380</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,040</td>
<td></td>
<td>46.58% Pervious Area</td>
</tr>
<tr>
<td>2,340</td>
<td></td>
<td>53.42% Impervious Area</td>
</tr>
</tbody>
</table>

Tc, Length (feet), Slope (ft/ft), Velocity (ft/sec), Capacity (cfs), Description

6.0 Direct Entry, Overland Flow

Summary for Subcatchment Po-22: Runoff to Driveway Trench - Lot 2

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.032 af, Depth> 4.02"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 1,910</td>
<td>98</td>
<td>Driveway and Roof #2</td>
</tr>
<tr>
<td>2,310</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>4,220</td>
<td>78</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>2,310</td>
<td></td>
<td>54.74% Pervious Area</td>
</tr>
<tr>
<td>1,910</td>
<td></td>
<td>45.26% Impervious Area</td>
</tr>
</tbody>
</table>

Tc, Length (feet), Slope (ft/ft), Velocity (ft/sec), Capacity (cfs), Description

6.0 Direct Entry, Overland Flow

Summary for Subcatchment Po-23: Roof Runoff - Lot 2

Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af, Depth> 6.26"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 428</td>
<td>98</td>
<td>Driveway and Roof #2</td>
</tr>
<tr>
<td>428</td>
<td></td>
<td>100.00% Impervious Area</td>
</tr>
</tbody>
</table>
### Summary for Subcatchment Po-24: Roof Runoff - Lot 2

Runoff = 0.11 cfs @ 12.09 hrs, Volume = 0.010 af, Depth > 6.26"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 800</td>
<td>98</td>
<td>Driveway and Roof #2</td>
</tr>
<tr>
<td>800</td>
<td></td>
<td>100.00% Impervious Area</td>
</tr>
</tbody>
</table>

### Summary for Subcatchment Po-31: Overland and and Rear House Lot 3

Runoff = 0.63 cfs @ 12.20 hrs, Volume = 0.058 af, Depth > 3.40"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 3,000</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>3,180</td>
<td>98</td>
<td>Driveway and Front Roof #3</td>
</tr>
<tr>
<td>2,720</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>8,900</td>
<td>72</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>5,720</td>
<td></td>
<td>64.27% Pervious Area</td>
</tr>
<tr>
<td>3,180</td>
<td></td>
<td>35.73% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.6</td>
<td>80</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n = 0.400 P2 = 3.10&quot;</td>
</tr>
<tr>
<td>0.2</td>
<td>25</td>
<td>0.0800</td>
<td>1.98</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td>0.3</td>
<td>40</td>
<td>0.0125</td>
<td>2.27</td>
<td></td>
<td>Short Grass Pasture Kv = 7.0 fps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Shallow Concentrated Flow, Driveway Flow</td>
</tr>
<tr>
<td>14.1</td>
<td>145</td>
<td></td>
<td></td>
<td></td>
<td>Paved Kv = 20.3 fps</td>
</tr>
</tbody>
</table>
**Summary for Subcatchment Po-32: Runoff to Driveway Trench Lot 3**

Runoff = 0.43 cfs @ 12.25 hrs, Volume = 0.044 af, Depth = 2.62"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>1,412</td>
<td>98</td>
<td>Roof and Driveway #3</td>
</tr>
<tr>
<td>2,313</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
</tbody>
</table>

| * | 8,725 | 64 | Weighted Average |
| 7,313 | 83.82% Pervious Area |
| 1,412 | 16.18% Impervious Area |

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td>100</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td><strong>Sheet Flow, Overland Flow</strong> Woods: Light underbrush n = 0.400 P2 = 3.10&quot;</td>
</tr>
<tr>
<td>0.7</td>
<td>30</td>
<td>0.0100</td>
<td>0.70</td>
<td></td>
<td><strong>Shallow Concentrated Flow, Overland Flow</strong> Short Grass Pasture Kv = 7.0 fps</td>
</tr>
</tbody>
</table>

| 16.9 | 130 | Total |

**Summary for Subcatchment Po-Di: Postdevelopment Direct Runoff**

Runoff = 2.24 cfs @ 12.33 hrs, Volume = 0.264 af, Depth = 1.89"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>57,950</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>15,125</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
</tbody>
</table>

| 73,075 | 56 | Weighted Average |
| 73,075 | 100.00% Pervious Area |

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td>100</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td><strong>Sheet Flow, A to B</strong> Woods: Light underbrush n = 0.400 P2 = 3.10&quot;</td>
</tr>
<tr>
<td>3.8</td>
<td>260</td>
<td>0.0520</td>
<td>1.14</td>
<td></td>
<td><strong>Shallow Concentrated Flow, B to C</strong> Woodland Kv = 5.0 fps</td>
</tr>
<tr>
<td>1.6</td>
<td>190</td>
<td>0.1500</td>
<td>1.94</td>
<td></td>
<td><strong>Shallow Concentrated Flow, C to D</strong> Woodland Kv = 5.0 fps</td>
</tr>
</tbody>
</table>

| 21.6 | 550 | Total |
Summary for Subcatchment Po-IB: Postdevelopment to Infiltration Basin

Runoff = 3.51 cfs @ 12.28 hrs, Volume= 0.373 af, Depth> 2.62"

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

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>38,396</td>
<td>55</td>
<td>Woods, Good, HSG B</td>
</tr>
<tr>
<td>18,000</td>
<td>70</td>
<td>1/2 acre lots, 25% imp, HSG B</td>
</tr>
<tr>
<td>8,550</td>
<td>98</td>
<td>Roads and Driveway</td>
</tr>
<tr>
<td>11,684</td>
<td>61</td>
<td>&gt;75% Grass cover, Good, HSG B</td>
</tr>
<tr>
<td>74,630</td>
<td>64</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>61,580</td>
<td>82.51% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>13,050</td>
<td>17.49% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.2</td>
<td>100</td>
<td>0.0420</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400  P2= 3.10&quot;</td>
</tr>
<tr>
<td>2.7</td>
<td>190</td>
<td>0.0540</td>
<td>1.16</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woodland Kv= 5.0 fps</td>
</tr>
<tr>
<td>0.3</td>
<td>60</td>
<td>0.0250</td>
<td>3.21</td>
<td></td>
<td>Shallow Concentrated Flow, Overland Flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Paved Kv= 20.3 fps</td>
</tr>
<tr>
<td>19.2</td>
<td>350</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary for Reach Total: Total Runoff

Inflow Area = 4.021 ac, 13.20% Impervious, Inflow Depth > 1.49" for 100-Yr event
Inflow = 5.27 cfs @ 12.45 hrs, Volume= 0.500 af
Outflow = 5.27 cfs @ 12.45 hrs, Volume= 0.500 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: Infiltration Trench - 23

Inflow Area = 0.018 ac, 100.00% Impervious, Inflow Depth > 6.26" for 100-Yr event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.010 af
Outflow = 0.12 cfs @ 12.09 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 9.25 hrs, Volume= 0.006 af
Primary = 0.12 cfs @ 12.09 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 194.01' @ 12.09 hrs Surf.Area= 80 sf Storage= 64 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 70.1 min (813.6 - 743.6)
Stromwater Management Design Infiltration Structure a Type III 24-hr 100-Yr Rainfall=6.50"  
Prepared by [enter your company name here]  
HydroCAD® 10.00-17  s/n 00589 © 2016 HydroCAD Software Solutions LLC  
Printed 6/28/2020  
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### Volume

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>192.00'</td>
<td>64 cf</td>
<td>2.00'W x 40.00'L x 2.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>160 cf Overall x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>194.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34.0' long x 0.5' breadth Broad-Crested Rectangular Weir</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.20 0.40 0.60 0.80 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coef. (English) 2.80 2.92 3.08 3.30 3.32</td>
</tr>
</tbody>
</table>

**Discarded OutFlow** Max=0.00 cfs @ 9.25 hrs HW=192.02' (Free Discharge)

**Primary OutFlow** Max=0.08 cfs @ 12.09 hrs HW=194.01' (Free Discharge)

### Summary for Pond IS-1: Infiltration Structure - 1

- **Inflow Area** = 1.713 ac, 17.49% Impervious, Inflow Depth > 2.62" for 100-Yr event
- **Inflow** = 3.51 cfs @ 12.28 hrs, Volume= 0.373 af
- **Outflow** = 2.51 cfs @ 12.50 hrs, Volume= 0.314 af, Atten= 29%, Lag= 13.5 min
- **Discarded** = 0.12 cfs @ 11.30 hrs, Volume= 0.130 af
- **Primary** = 2.39 cfs @ 12.50 hrs, Volume= 0.183 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 191.02' @ 12.50 hrs Surf.Area= 2,128 sf Storage= 4,221 cf

Plug-Flow detention time= 121.5 min calculated for 0.314 af (64% of inflow)
Center-of-Mass det. time= 53.7 min (911.6 - 857.9)

### Volume

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Avail. Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>188.00'</td>
<td>1,877 cf</td>
<td>28.00'W x 78.00'L x 3.50'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7,448 cf Overall - 2,756 cf Embedded = 4,692 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>188.50'</td>
<td>2,756 cf</td>
<td><strong>ADS StormTech SC-740 +Gap x 60 Inside #1</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Effective Size= 44.6&quot;W x 30.0&quot;H =&gt; 6.45 sf x 7.12L = 45.9 cf</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Overall Size= 51.0&quot;W x 30.0&quot;H x 7.56L with 0.44' Overlap</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>6 Rows of 10 Chambers</strong></td>
<td></td>
</tr>
</tbody>
</table>

4,633 cf Total Available Storage

### Device

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>190.00'</td>
<td>12.0' Round Culvert L= 10.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 190.00' / 189.90' S= 0.0100 '/&quot; Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.010, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Discarded</td>
<td>188.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
</tbody>
</table>

**Discarded OutFlow** Max=0.12 cfs @ 11.30 hrs HW=188.04' (Free Discharge)

**Primary OutFlow** Max=2.39 cfs @ 12.50 hrs HW=191.01' (Free Discharge)

1=Exfiltration (Exfiltration Controls 0.12 cfs)

1=Culvert (Barrel Controls 2.39 cfs @ 3.72 fps)
Summary for Pond IS-12: Infiltration Structure - 12

Inflow Area = 0.101 ac, 53.42% Impervious, Inflow Depth = 2.35" for 100-Yr event
Inflow = 0.35 cfs @ 12.17 hrs, Volume= 0.020 af
Outflow = 0.13 cfs @ 12.51 hrs, Volume= 0.020 af, Atten= 64%, Lag= 20.7 min
Discarded = 0.02 cfs @ 11.75 hrs, Volume= 0.012 af
Primary = 0.11 cfs @ 12.51 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 194.74' @ 12.51 hrs Surf.Area= 360 sf Storage= 475 cf

Plug-Flow detention time= 111.0 min calculated for 0.020 af (100% of inflow)
Center-of-Mass det. time= 110.9 min (861.0 - 750.1)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>192.00'</td>
<td>379 cf</td>
<td>12.00'W x 30.00'L x 3.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,080 cf Overall - 133 cf Embedded = 947 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>192.50'</td>
<td>133 cf</td>
<td>ADS StormTech SC-310 +Cap x 9 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0&quot;W x 16.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Rows of 3 Chambers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>512 cf Total Available Storage</td>
</tr>
</tbody>
</table>

Device | Routing | Invert | Outlet Devices |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>192.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>193.50'</td>
<td>4.0' Round Culvert $L= 5.0' \ K_e = 0.500$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 193.50' / 193.45' $S = 0.0100 \ '' \ C_c = 0.900$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$n = 0.100$, Flow Area= 0.09 sf</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.02 cfs @ 11.75 hrs HW=192.05' (Free Discharge)
↑↑1=Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.11 cfs @ 12.51 hrs HW=194.74' (Free Discharge)
↑↑2=Culvert (Barrel Controls 0.11 cfs @ 1.22 fps)

Summary for Pond IS-22: Infiltration Structure - 22

Inflow Area = 0.107 ac, 50.30% Impervious, Inflow Depth = 3.03" for 100-Yr event
Inflow = 0.48 cfs @ 12.10 hrs, Volume= 0.027 af
Outflow = 0.18 cfs @ 12.42 hrs, Volume= 0.027 af, Atten= 63%, Lag= 19.3 min
Discarded = 0.03 cfs @ 11.35 hrs, Volume= 0.023 af
Primary = 0.16 cfs @ 12.42 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 197.54' @ 12.40 hrs Surf.Area= 456 sf Storage= 569 cf

Plug-Flow detention time= 194.4 min calculated for 0.027 af (100% of inflow)
Center-of-Mass det. time= 194.2 min (962.8 - 768.6)
Stromwater Management Design Infiltration Structure a Type III 24-hr 100-Yr Rainfall=6.50"

Prepared by (enter your company name here)

HydrcAD® 10.00-17 s/n 00689 © 2016 HydrcAD Software Solutions LLC

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<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>195.00'</td>
<td>476 cf</td>
<td>12.00'W x 38.00'L x 3.00'H Prismatoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,368 cf Overall - 177 cf Embedded = 1,191 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>196.00'</td>
<td>177 cf</td>
<td>ADS StormTech SC-310 + Cap x 12 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0&quot;W x 16.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Rows of 4 Chambers</td>
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653 cf Total Available Storage

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>195.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>197.50'</td>
<td>6.0' long x 0.5' breadth Broad-Crested Rectangular Weir</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.20 0.40 0.60 0.60 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coef. (English) 2.80 2.92 3.08 3.30 3.32</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.03 cfs @ 11.35 hrs HW=195.03' (Free Discharge)

Primary OutFlow Max=0.13 cfs @ 12.42 hrs HW=197.54' (Free Discharge)

Summary for Pond IS-31: Infiltration Structure - 31

Inflow Area = 0.204 ac, 35.73% Impervious, Inflow Depth = 2.24" for 100-Yr event
Inflow    = 0.59 cfs @ 12.24 hrs, Volume= 0.038 af
Outflow   = 0.57 cfs @ 12.28 hrs, Volume= 0.038 af, Atten= 3%, Lag= 2.4 min
Discarded = 0.02 cfs @ 11.85 hrs, Volume= 0.012 af
Primary   = 0.55 cfs @ 12.28 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 202.92' @ 12.28 hrs Surf.Area= 282 sf Storage= 296 cf

Plug-Flow detention time= 59.2 min calculated for 0.038 af (100% of inflow)
Center-of-Mass det. time= 59.3 min (840.2 - 780.9 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>201.00'</td>
<td>229 cf</td>
<td>12.00'W x 23.50'L x 2.50'H Prismatoid</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>705 cf Overall - 133 cf Embedded = 572 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>201.50'</td>
<td>133 cf</td>
<td>ADS StormTech SC-310 + Cap x 9 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0&quot;W x 16.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Rows of 3 Chambers</td>
</tr>
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</table>

362 cf Total Available Storage

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<th>Outlet Devices</th>
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<tbody>
<tr>
<td>#1</td>
<td>Discarded</td>
<td>201.00'</td>
<td>2.410 in/hr Exfiltration over Surface area</td>
</tr>
<tr>
<td>#2</td>
<td>Primary</td>
<td>202.33'</td>
<td>6.0&quot; Round Culvert L= 71.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 202.33' / 199.33', S= 0.0423 ', Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.010, Flow Area= 0.20 sf</td>
</tr>
</tbody>
</table>
Discarded OutFlow Max=0.02 cfs @ 11.85 hrs HW=201.03' (Free Discharge)

Primary OutFlow Max=0.55 cfs @ 12.28 hrs HW=202.92' (Free Discharge)

Summary for Pond IS-32: Infiltration Structure - 32

Inflow Area = 0.405 ac, 26.05% Impervious, Inflow Depth = 1.70" for 100-Yr event
Inflow = 0.94 cfs @ 12.29 hrs, Volume= 0.057 af
Outflow = 0.90 cfs @ 12.36 hrs, Volume= 0.057 af, Attenu= 3%, Lag= 4.2 min
Discarded = 0.02 cfs @ 11.90 hrs, Volume= 0.020 af
Primary = 0.88 cfs @ 12.36 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 200.14' @ 12.35 hrs Surf.Area= 360 sf Storage= 532 cf

Plug-Flow detention time= 99.4 min calculated for 0.057 af (99% of inflow)
Center-of-Mass det. time= 94.9 min (881.1 - 786.2)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>197.00'</td>
<td>451 cf</td>
<td>12.00'W x 30.00'L x 3.50'H Prismatoid</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1,260 cf Overall - 133 cf Embedded = 1,127 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#2</td>
<td>196.50'</td>
<td>133 cf</td>
<td>ADS_StromTech SC-310 +Cap x 9 Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Effective Size= 28.9&quot;W x 16.0&quot;H =&gt; 2.07 sf x 7.12'L = 14.7 cf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overall Size= 34.0&quot;W x 16.0&quot;H x 7.56'L with 0.44' Overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 Rows of 3 Chambers</td>
</tr>
</tbody>
</table>

584 cf Total Available Storage

Device | Routing | Invert | Outlet Devices
-------|---------|--------|-------------------|
#1     | Discarded | 197.00' | 2.410 in/hr Exfiltration over Surface area |
#2     | Primary   | 200.00' | 6.0' long x 0.5' breadth Broad-Crested Rectangular Weir |
|        |          |        | Head (feet) 0.20 0.40 0.60 0.80 1.00 |
|        |          |        | Coef. (English) 2.80 2.92 3.08 3.30 3.32 |

Discarded OutFlow Max=0.02 cfs @ 11.90 hrs HW=197.06' (Free Discharge)

Primary OutFlow Max=0.85 cfs @ 12.36 hrs HW=200.14' (Free Discharge)

Summary for Pond IT-12: Infiltration Trench - 12

Inflow Area = 0.101 ac, 53.42% Impervious, Inflow Depth > 4.34" for 100-Yr event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.036 af
Outflow = 0.37 cfs @ 12.17 hrs, Volume= 0.036 af, Attenu= 26%, Lag= 4.6 min
Discarded = 0.02 cfs @ 10.40 hrs, Volume= 0.017 af
Primary = 0.35 cfs @ 12.17 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 197.37' @ 12.17 hrs  Surf.Area= 296 sf  Storage= 176 cf

Plug-Flow detention time= 18.8 min calculated for 0.036 af (100% of inflow)
Center-of-Mass det. time= 18.5 min ( 826.4 - 807.9 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
</table>
| #1     | 196.00' | 225 cf        | 2.00'W x 148.00'L x 2.00'H Prismatoid  
592 cf Overall - 29 cf Embedded = 563 cf x 40.0% Voids|
| #2     | 197.00' | 29 cf         | 6.0" Round Pipe Storage  Inside #1  
L= 148.0' |

254 cf  Total Available Storage

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
</table>
| #1     | Discarded | 196.00' | 2.410 in/hr Exfiltration over Surface area  
4.0" Round Culvert  L= 10.0'  Ke= 0.500  
Inlet / Outlet Invert= 196.50' / 196.00'  S= 0.0500 '/'  Cc= 0.900  
n= 0.013, Flow Area= 0.09 sf |
| #2     | Primary  | 196.50' |                 |

Discarded OutFlow  Max=0.02 cfs @ 10.40 hrs  HW=196.02' (Free Discharge)
Exfiltration (Exfiltration Controls 0.02 cfs)

Primary OutFlow  Max=0.35 cfs @ 12.17 hrs  HW=197.36' (Free Discharge)
Culvert (Inlet Controls 0.35 cfs @ 4.00 fps)

Summary for Pond IT-22: Infiltration Trench - 22

Inflow Area = 0.097 ac, 45.26% Impervious, Inflow Depth > 4.02" for 100-Yr event
Inflow = 0.45 cfs @ 12.09 hrs, Volume= 0.032 af
Outflow = 0.44 cfs @ 12.10 hrs, Volume= 0.032 af, Atten= 1%, Lag= 0.3 min
Discarded = 0.00 cfs @ 8.65 hrs, Volume= 0.004 af
Primary = 0.44 cfs @ 12.10 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 198.76' @ 12.10 hrs  Surf.Area= 60 sf  Storage= 27 cf

Plug-Flow detention time= 8.7 min calculated for 0.032 af (99% of inflow)
Center-of-Mass det. time= 3.3 min ( 818.6 - 815.3 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
</table>
| #1     | 197.80' | 45 cf         | 2.00'W x 30.00'L x 2.00'H Prismatoid  
120 cf Overall - 7 cf Embedded = 113 cf x 40.0% Voids|
| #2     | 198.30' | 7 cf          | 4.0" Round Pipe Storage  Inside #1  
L= 80.0' |

52 cf  Total Available Storage

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
</table>
| #1     | Discarded | 197.80' | 2.410 in/hr Exfiltration over Surface area  
6.0" Round Culvert  L= 50.0'  Ke= 0.500  
Inlet / Outlet Invert= 198.30' / 197.00'  S= 0.0250 '/'  Cc= 0.900  
n= 0.013, Flow Area= 0.20 sf |
| #2     | Primary  | 198.30' |                 |
Discarded Outflow Max = 0.00 cfs @ 8.65 hrs HW = 197.82' (Free Discharge)
1 = Exfiltration (Exfiltration Controls 0.00 cfs)

Primary Outflow Max = 0.43 cfs @ 12.10 hrs HW = 198.76' (Free Discharge)
2 = Culvert (Inlet Controls 0.43 cfs @ 2.30 fps)

Summary for Pond IT-23: Infiltration Trench - 23

inflow Area = 0.107 ac, 50.30% Impervious, Inflow Depth > 3.69" for 100-Yr event
Inflow = 0.50 cfs @ 12.09 hrs, Volume = 0.033 af
Outflow = 0.49 cfs @ 12.10 hrs, Volume = 0.032 af, Attenuation = 2%, Lag = 0.3 min
Discarded = 0.00 cfs @ 9.90 hrs, Volume = 0.005 af
Primary = 0.48 cfs @ 12.10 hrs, Volume = 0.027 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs / 4
Peak Elev = 197.55' @ 12.10 hrs Surfc.Area = 72 sf Storage = 46 cf

Plug-Flow detention time = 16.4 min calculated for 0.032 af (98% of inflow)
Center-of-Mass detention time = 8.5 min (796.4 - 787.9)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>196.00'</td>
<td>56 cf</td>
<td>2.00'W x 36.00'L x 2.00'H Prismaticoid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>144 cf Overall - 3 cf Embedded = 141 cf x 40.0% voids</td>
</tr>
<tr>
<td>#2</td>
<td>197.00'</td>
<td>3 cf</td>
<td>4.0' Round Pipe Storage Inside #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = 36.0'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>59 cf Total Available Storage</td>
</tr>
</tbody>
</table>

Device | Routing | Invert | Outlet Devices
       | #1      | 196.00' | 2.410 in/hr Exfiltration over Surface area
       | #2      | 197.00' | 6.0' Round Culvert L = 10.0' Ke = 0.500

Discarded Outflow Max = 0.00 cfs @ 9.90 hrs HW = 196.03' (Free Discharge)
1 = Exfiltration (Exfiltration Controls 0.00 cfs)

Primary Outflow Max = 0.48 cfs @ 12.10 hrs HW = 197.55' (Free Discharge)
2 = Culvert (Barrel Controls 0.48 cfs @ 2.80 fps)

Summary for Pond IT-31: Infiltration Trench - 31

inflow Area = 0.204 ac, 35.73% Impervious, Inflow Depth > 3.40" for 100-Yr event
Inflow = 0.63 cfs @ 12.20 hrs, Volume = 0.058 af
Outflow = 0.60 cfs @ 12.24 hrs, Volume = 0.056 af, Attenuation = 4%, Lag = 2.2 min
Discarded = 0.02 cfs @ 10.45 hrs, Volume = 0.018 af
Primary = 0.59 cfs @ 12.24 hrs, Volume = 0.038 af

Routing by Stor-Ind method, Time Span = 0.00-24.00 hrs, dt = 0.05 hrs / 4
Stromwater Management Design Infiltration Structure a Type III 24-hr 100-Yr Rainfall=6.50"  
Prepared by {enter your company name here}  
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Printed 6/28/2020  
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Peak Elev= 203.13' @ 12.24 hrs  Surf.Area= 276 sf  Storage= 197 cf

Plug-Flow detention time= 33.9 min calculated for 0.056 af (97% of inflow)  
Center-of-Mass det. time= 19.4 min (855.0 - 835.7)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
</table>
| #1     | 201.50' | 210 cf        | 2.00'W x 138.00'L x 2.00'H Prismatoid  
552 cf Overall - 27 cf Embedded = 525 cf x 40% Voids  
| #2     | 202.50' | 27 cf         | 6.0" Round Pipe Storage Inside #1  
L= 138.0'  
|         |         |               | 237 cf Total Available Storage |

Device | Routing | Invert | Outlet Devices  
|--------|---------|--------|------------------|  
| #1     | Discarded | 201.50' | 2.410 in/hr Exfiltration over Surface area  
| #2     | Primary   | 202.50' | 6.0" Round Culvert L= 17.0' Ke= 0.500  
Inlet / Outlet Invert= 202.50' / 202.33'  S= 0.0100 '/'  Cc= 0.990  
n= 0.010, Flow Area= 0.20 sf  
| Discarded OutFlow Max= 0.02 cfs @ 10.45 hrs HW=201.52' (Free Discharge)  
|         |          |         | 1=Exfiltration (Exfiltration Controls 0.02 cfs)  
| Primary OutFlow Max= 0.58 cfs @ 12.24 hrs HW=203.13' (Free Discharge)  
|         |          |         | 2=Culvert (Inlet Controls 0.58 cfs @ 2.96 fps) |

Summary for Pond IT-32: Infiltration Trench - 32

Inflow Area = 0.200 ac, 16.18% Impervious, Inflow Depth > 2.62" for 100-Yr event  
Inflow = 0.43 cfs @ 12.25 hrs, Volume= 0.044 af  
Outflow = 0.40 cfs @ 12.32 hrs, Volume= 0.043 af, Atten= 8%, Lag= 4.4 min  
Discarded = 0.01 cfs @ 11.00 hrs, Volume= 0.011 af  
Primary = 0.39 cfs @ 12.32 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs / 2  
Peak Elev= 203.52' @ 12.32 hrs  Surf.Area= 184 sf  Storage= 117 cf

Plug-Flow detention time= 17.3 min calculated for 0.043 af (98% of inflow)  
Center-of-Mass det. time= 7.9 min (864.0 - 856.1)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
</table>
| #1     | 202.00' | 144 cf        | 2.00'W x 92.00'L x 2.00'H Prismatoid  
368 cf Overall - 8 cf Embedded = 360 cf x 40% Voids  
| #2     | 202.50' | 8 cf          | 4.0" Round Pipe Storage Inside #1  
L= 92.0'  
|         |         |               | 152 cf Total Available Storage |

Device | Routing | Invert | Outlet Devices  
|--------|---------|--------|------------------|  
| #1     | Discarded | 202.00' | 2.410 in/hr Exfiltration over Surface area  
| #2     | Primary   | 202.50' | 4.0" Round Culvert L= 26.0' Ke= 0.500  
Inlet / Outlet Invert= 202.50' / 199.33'  S= 0.1219 '/'  Cc= 0.900  
n= 0.013, Flow Area= 0.09 sf
Discarded Outflow Max=0.01 cfs @ 11.00 hrs HW=202.02' (Free Discharge)

Exfiltration (Exfiltration Controls 0.01 cfs)

Primary Outflow Max=0.39 cfs @ 12.32 hrs HW=203.51' (Free Discharge)

Culvert (Inlet Controls 0.39 cfs @ 4.42 fps)
Attachment B

Forebay and WQV Calculations
<p>| | | |</p>
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<tr>
<td><strong>FOREBAY SIZING</strong></td>
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</tr>
<tr>
<td><strong>CONTRIBUTING AREA</strong></td>
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<td>ACRES</td>
</tr>
<tr>
<td><strong>TREATMENT VOLUME</strong></td>
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<td>IN/acre</td>
</tr>
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<td><strong>VOLUME REQUIRED</strong></td>
<td>72.6</td>
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<td><strong>Provide</strong></td>
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WATER QUALITY VOLUME
CALCULATION
TO INFILTRATION SYSTEM -1

<table>
<thead>
<tr>
<th>IMPERVIOUS AREA (roof excluded)</th>
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<tbody>
<tr>
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WQV = 1.0" X IMPERVIOUS AREA

WQV = 1,079 CF

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<tr>
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5,057 CF
Attachment C

Recharge Volume and Drawdown Calculations
### RECHARGE CALCULATIONS

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFILTRATION SYSTEM - 1</td>
<td></td>
</tr>
<tr>
<td>POSTDEVELOPMENT IMPERVIOUS AREA - B SOIL</td>
<td>0.30 ACRES</td>
</tr>
<tr>
<td>B SOIL - 0.35&quot; X IMPERVIOUS AREA</td>
<td>381 CF</td>
</tr>
<tr>
<td>TOTAL RECHARGE VOLUME REQUIRED (CF)</td>
<td>381 CF</td>
</tr>
<tr>
<td>STORAGE VOLUME</td>
<td>2,968 CF</td>
</tr>
</tbody>
</table>

### DRAWDOWN CALCULATIONS

Detention Time =

Storage Volume /

Infiltration Rate x Bottom Area

Infiltration Structure - 1

| INFILTRATION RATE (TABLE 2.33 - RAWLS RATE 1982) | 2.41 IN/HR |
| LOAMY SAND                                      |
| STORAGE VOLUME                                  | 2,968 CF |
| BOTTOM AREA OF STRUCTURE                        | 2128 SF   |
| DETENTION TIME                                  | 6.9 HRS   |
Attachment D

TSS Removal Sheets
# TSS REMOVAL

**CALCULATION WORKSHEET**

**LOCATION:** BMP Chain IS-1

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMP</td>
<td>TSS REMOVAL RATE</td>
<td>STARTING TSS LOAD*</td>
<td>AMOUNT REMOVED (BxC)</td>
<td>REMAINING LOAD (C-D)</td>
</tr>
<tr>
<td>Deep Sump and Hooded Catch Basin</td>
<td>0.25</td>
<td>1.00</td>
<td>0.25</td>
<td>0.75</td>
</tr>
<tr>
<td>Sediment Forebay</td>
<td>0.25</td>
<td>0.75</td>
<td>0.19</td>
<td>0.56</td>
</tr>
<tr>
<td>Infiltration Structure</td>
<td>0.80</td>
<td>0.56</td>
<td>0.45</td>
<td>0.11</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>0.11</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>0.11</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>0.11</td>
<td>0.00</td>
<td>0.11</td>
</tr>
</tbody>
</table>

**TOTAL TSS REMOVAL:** 0.89

*EQUALS REMAINING LOAD FROM PREVIOUS BMP (E) WHICH ENTERS THE BMP

**PROJECT:** Mill Pond Estates

**PREPARED BY:** Stephen R Dresser PE

**DATE:** 6/29/2020
Attachment E

Soil Logs
ON-SITE REVIEW

Deep Hole Number: 1  Date: 3/17/20  Time: 11:00 AM  Weather: 40°

Location (Identify on site plan)
- Land Use: RESIDENTIAL
- Slope: 5-8%
- Surface Stones: NONE
- Vegetation: None
- Landform: Outwash Plain
- Position on Landscape (Sketch on back):

Distances From:
- Open Water Body: >100 feet
- Possible Wet Areas: >100 feet
- Drinking Water Well: >100 feet
- Drainage Way: >100 feet
- Property Line: 20 feet
- Other:

DEEP OBSERVATION HOLE LOG

<table>
<thead>
<tr>
<th>Depth from Surface (Inches)</th>
<th>Soil Horizon</th>
<th>Soil Texture</th>
<th>Soil Color (Dunne)</th>
<th>Soil Noting</th>
<th>Other (Structure, Stones, Boulders, Consistency, &amp; Swell)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–10</td>
<td>Ap</td>
<td>fsl</td>
<td>10yr3/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10–26</td>
<td>Bw</td>
<td>fsl</td>
<td>10yr5/6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28–108</td>
<td>C1</td>
<td>LS</td>
<td>2.5y6/4</td>
<td>10yr5/8 @64</td>
<td></td>
</tr>
</tbody>
</table>

Parent Material: Proglacial Outwash

Depth to Bedrock: >108"

Depth to Groundwater: Standing water in hole: 90"  Weeping from pit face: 78"  Estimated Seasonal High Ground Water: 84"

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 matrices  64  inches
- Ground water adjustment  feet

Index Well Number  Reading Date  Index well level
Adjustment factor  Adjusted ground water level

Depth of Naturally Occurring Pervious Material:

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? N/A

If not, what is the depth of the naturally occurring material? N/A

I CERTIFY THAT IN NOVEMBER 1995 I PASSED THE SOIL EVALUATOR EXAMINATION APPROVED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THAT THE ABOVE ANALYSIS WAS PERFORMED BY ME CONSISTENT WITH REQUIRED TRAINING, EXPERTISE AND EXPERIENCE DESCRIBED IN 310 CMR 15.017.

SIGNATURE: [Signature]  DATE: May 15, 2020
ON-SITE REVIEW

Deep Hole Number: 2  Date: 3/17/20  Time: 11:00 AM  Weather: 40°
Location (Identify on site plan):
Land Use: RESIDENTIAL  Slope: 5–6%  Surface Stones: NONE
Vegetation: None
Landform: Outwash Plain
Position on Landscape (Sketch on back):
Distances From:
- Open Water Body: >100 feet
- Drainage Way: >100 feet
- Possible Wet Areas: >100 feet
- Property Line: 20 feet
- Drinking Water Well: >100 feet
- Other:

DEEP OBSERVATION HOLE LOG

<table>
<thead>
<tr>
<th>Depth from Surface (inches)</th>
<th>Soil Horizon</th>
<th>Soil Texture (USDA)</th>
<th>Soil Color (Munsell)</th>
<th>Soil Setting</th>
<th>Other (Structure, Stones, Boulders, Consistency, &amp; Grade)</th>
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</thead>
<tbody>
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<td>0–8</td>
<td>Ap</td>
<td>fsL</td>
<td>10yr3/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8–24</td>
<td>Bw</td>
<td>fsL</td>
<td>10yr5/6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24–85</td>
<td>C1</td>
<td>LS</td>
<td>2.5y6/4</td>
<td>10y5/8</td>
<td></td>
</tr>
</tbody>
</table>

Parent Material: Proglacial Outwash
Depth to Bedrock: >108*
Depth to Groundwater: Standing water in hole: 80"  Weeping from Pit Face: 44"
Estimated Seasonal High Ground Water: 32"

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  32 inches
Ground water adjustment  feet

Index Well Number
Adjustment factor
Reading Date
Adjusted ground water level

Depth of Naturally Occurring Pervious Material

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? N/A
If not, what is the depth of the naturally occurring material? N/A

I CERTIFY THAT IN NOVEMBER 1995 I PASSED THE SOIL EVALUATOR EXAMINATION APPROVED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THAT THE ABOVE ANALYSIS WAS PERFORMED BY ME CONSISTENT WITH REQUIRED TRAINING, EXPERTISE AND EXPERIENCE DESCRIBED IN 310 CMR 15.017.

SIGNATURE: ___________________________ DATE: May 15, 2020
ON-SITE REVIEW

Deep Hole Number: 3  Date: 3/17/20  Time: 11:00 AM  Weather: 40°

Location (Identify on site plan):
Land Use: RESIDENTIAL  Slope: 5-8%  Surface Stones: NONE
Vegetation: None
Landform: Outwash Plain
Position on Landscape (Sketch on Back):
Distances From:
Open Water Body >100 feet  Drainage Way: >100 feet
Possible Wet Area: >100 feet  Property Line: 20 feet
Drinking Water Well: >100 feet  Other:

DEEP OBSERVATION HOLE LOG

<table>
<thead>
<tr>
<th>Depth from Surface (Inches)</th>
<th>Soil Horizon</th>
<th>Soil Texture (OSA)</th>
<th>Soil Color (Munsell)</th>
<th>Soil Wetting</th>
<th>Other (Structure, Stones, Goodness, Consistency, &amp; Grade)</th>
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</thead>
<tbody>
<tr>
<td>0-8</td>
<td>Ap</td>
<td>fsl</td>
<td>10yr3/2</td>
<td></td>
<td></td>
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<tr>
<td>8-24</td>
<td>Bw</td>
<td>fsl</td>
<td>10yr5/6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-96</td>
<td>C1</td>
<td>LS</td>
<td>2.5y6/4 10yr5/8 @95°</td>
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</tr>
</tbody>
</table>

Parent Material: Proglacial Outwash
Depth to Bedrock: >95"
Depth to Groundwater: Standing water in hole: 90"  Weeping from pit face: 68"  Estimated Seasonal High Ground Water: 58"

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 matting: __________ inches
Ground water adjustment: __________ feet

Index Well Number  Reading Date  Index Well Level
Adjustment factor  Adjusted ground water level

Depth of Naturally Occurring Pervious Material:

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?  N/A

If not, what is the depth of the naturally occurring material? N/A

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SIGNATURE: __________________________ DATE: May 15, 2020
ON-SITE REVIEW

Deep Hole Number 4  Date: 3/17/20  Time: 11:00 AM  Weather: 40°
Location (identify on site plan)
Land Use: RESIDENTIAL  Slope: 5-6%  Surface Stones: NONE
Vegetation: None
Landform: Outwash Plain
Position on Landscape (Sketch on Back):
Distances From:
  Open Water Body >100 feet
  Possible Wet Areas: >100 feet
  Drinking Water Wells: >100 feet
  Drainage Way: >100 feet
  Property Line: 20 feet
  Other:

DEEP OBSERVATION HOLE LOG

<table>
<thead>
<tr>
<th>Depth from Surface (Inches)</th>
<th>Soil Horizon</th>
<th>Soil Texture (GMA)</th>
<th>Soil Color (Munsell)</th>
<th>Soil Wetting</th>
<th>Other (Structure, Stones, Boulders, Consistency, &amp; Grain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>Ap</td>
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<td>10yr3/2</td>
<td></td>
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<tr>
<td>6-20</td>
<td>Bw</td>
<td>fsl</td>
<td>10yr5/6</td>
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<td></td>
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<tr>
<td>20-72</td>
<td>C1</td>
<td>LS</td>
<td>2.5y6/4 10yr5/8 @94°</td>
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<td></td>
</tr>
</tbody>
</table>

Parent Material: Proglacial Outwash
Depth to Bedrock >95”
Depth to Groundwater: Standing water in Hole: 72”  Weeping from Pit Face: 68”
Estimated Seasonal High Ground Water: 64”

Determinations 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 moisture 64” inches
- Ground water adjustment feet

Index Well Number
Reading Date
Index well level
Adjustment factor
Adjusted ground water level

Depth of Naturally Occurring Permeable Material

Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? N/A

If not, what is the depth of the naturally occurring material? N/A

I CERTIFY THAT IN NOVEMBER 1995 I PASSED THE SOIL Evaluator EXAMINATION APPROVED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THAT THE ABOVE ANALYSIS WAS PERFORMED BY ME CONSISTENT WITH REQUIRED TRAINING, EXPERTISE AND EXPERIENCE DESCRIBED IN 310 CMR 15.017.

SIGNATURE: ____________________ DATE: May 15, 2020