DRAINAGE REPORT

ALLEN & MAJOR ASSOCIATES, INC.

40B Multi-Family Site Development
444 East Central Street Franklin, MA

APPLICANT:
TAG Central LLC
1070 E Indiantown Rd, Suite 308
Jupiter, FL 33477

PREPARED BY:
Allen & Major Associates, Inc.
Engineer of Record: Carlton M. Quinn
100 Commerce Way, Suite 5
Woburn, Massachusetts 01801

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ISSUED:
February 7, 2025

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A&M PROJECT NO.:
3317-01

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SECTION 1.0 -
DRAINAGE REPORT

Introduction

The purpose of this drainage report is to provide an overview of the proposed stormwater management system (SMS) for the proposed Multifamily project located at 444 East Central Street in Franklin. The report will show by means of narrative, calculations and exhibits that the proposed stormwater management system will meet or exceed the Massachusetts Department of Environmental Protection (MassDEP) stormwater standards, and the Franklin Stormwater Management Regulations.

The proposed site improvements include the development of 4 residential buildings and a clubhouse. The four residential buildings are composed of 264 units, with 66 (25%) of the units designated as affordable. The proposed site includes 431 parking stalls, parking garages, sidewalks, waste enclosures, drive aisles, and amenity areas. This site will be serviced by water, sewer, and electrical, which will be coordinated with the Town of Franklin.

The proposed SMS incorporates [structural and non-structural] Best Management Practices (BMPs) to provide stormwater peak flow mitigation, quality treatment, and conveyance.

The SMS includes underground infiltration systems, water quality structures, and deep sump catch basins.

Site Categorization for Stormwater Regulations

The proposed site improvements at 444 East Central Street are considered a new development under the DEP Stormwater Management Standards due to the net increase in impervious area. A new development project is required to meet all the Stormwater Management Standards listed within the MA DEP Stormwater Handbook.

Site Location and Access

The parcel identified as 284-066-000-000 is a single lot with 200± feet of frontage on East Central Street entirely within the Town of Franklin. The lot area of the parcel is 14.6±acres. The parcel is located approximately 0.7 miles from the bordering town of Wrentham.

The parcel is abutted by residential neighborhoods on Red Gate Lane & Northern Spy Road to the east and south. Commercial developments abut the site to the west.

The site is accessed by an existing curb cut along East Central Street.

Existing Site Conditions

The site is currently owned and occupied by Stobbart Properties LLC. A portion of the site is developed and contains a wood frame nursery dwelling, greenhouses, sheds, and accessory buildings with associated parking and drive aisles. The principal gross building area is approximately 11,500 sf. A large portion of the site is undisturbed, consisting of tree cover, wetlands, and a stream.

The surface drainage flows were analyzed at four Study Points. Study Point #1 summarizes on-site flows to a perennial stream at the northern section of the parcel. The flows for this study point are generated from the "front" of the site, including the principal nursery building and surrounding area as well as a large area abutting the property eastward. These flows are captured via catch basins and routed through an underground pipe system to discharge to the perennial stream. Study Point #2 summarizes on-site flows to a perennial stream south of the perennial stream at Study Point #1. The flows for this study point are generated from the surrounding developed area and discharge directly into the stream. Study Point #3 summarizes on site flows directed to the southernmost perennial stream.

Watershed

The subject property is located within the Charles Watershed. The Charles River flows 80 miles from Hopkinton, Mass. to Boston Harbor. The entire Charles River drains rain and melted snow from a watershed area of 310 square miles. Two hundred and sixty-eight square miles of that watershed area drain over the Watertown Dam into the Lower Charles River. The remaining 42 square miles drain directly into the Lower Charles River. The river flows through the municipalities of Milford, Bellingham, Franklin, Medway, Millis, Medfield, Sherborn, Dover, Natick, Wellesley, Needham, Dedham, Newton, Waltham, Watertown, Cambridge and Boston, MA and from there into Boston Harbor.

Source: United States Environmental Protection Agency (EPA)

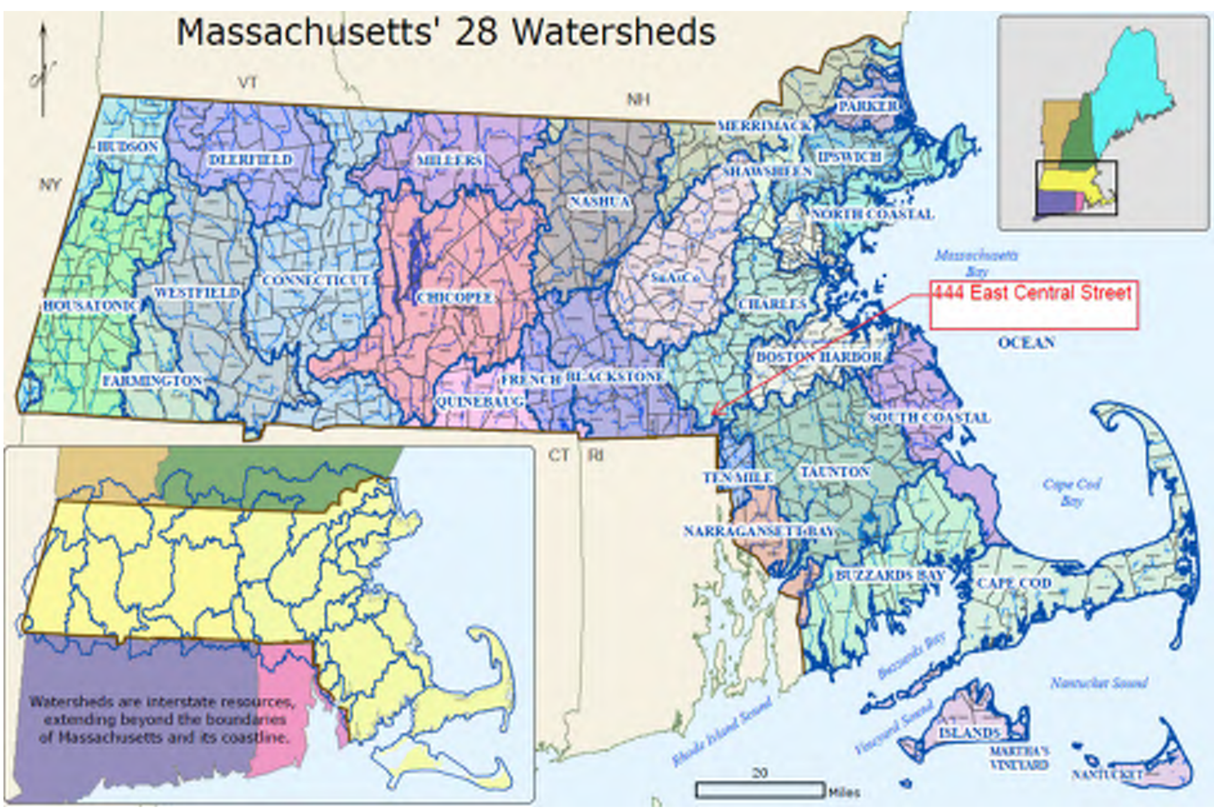

Exhibit 1: Watershed Map

Image Source: Mass.gov

Existing Soil Conditions

The on-site soils were identified using the USDA Natural Resources Conservation Services (NRCS) Soil Survey for Norfolk County. The site soil types, and corresponding Hydrologic Soil Groups (HSG) include:

- SCS 10 – Scarboro & Birdsall soils, 0 to 3 percent slopes, HSG A/D
- SCS 52 – Freetown muck, 0 to 1 percent slopes, HSG B/D
- SCS 254A – Merrimac Fine Sandy Loam, 0 to 3 percent slopes, HSG A
- SCS 254B – Merrimac Fine Sandy Loam, 3 to 8 percent slopes, HSG A
- SCS 260B – Sudbury Fine Sandy Loam, 2 to 8 percent slopes, HSG B
- SCS 420B – Canton Fine Sandy Loam. 3 to 8 percent slopes, HSG B

A copy of the NRCS Custom Soil Resource Report is included in the appendix of this report.

An exfiltration rate for the sandy loam has been determined to 1.02 inches per hour based upon Table 2.3.3 1982 Rawls Rate, Volume 3: Documenting Compliance with the Massachusetts's Stormwater Handbook.

FEMA Floodplain/Environmental Due Diligence

There are portions of the site located within the FEMA Zone "A" Special Flood Hazard Area Subject to Inundation by the 1% Annual Chance Flood (100-year floodplain). Zone "A" represents that there are no base flood elevations determined. There are also portions of the site encroached by Zone "X" Other Flood areas subject to 0.2% annual flood. The official Flood Insurance Rate Map (FIRM) effective date July 17, 2012, community panel 309 of 340, map number 25021C0309E. See Section 3 of this report for a copy of the FEMA FIRM.

Environmentally Sensitive Zones

The Commonwealth of Massachusetts asserts control over numerous protected and regulated areas including: Areas of Critical Environmental Concern (ACEC); Outstanding Resource Waters (ORWs); Priority and Protected Habitat for rare and endangered species, and areas protected under the Wetlands Protection Act. According to the MassGIS online map viewer MassMapper, the subject property is not located within AEC, ORW, or Priority and Protected Habitat for rare and endangered species areas. The subject is located within a few DEP wetlands. See Section 3 of this report for a copy of the wetland exhibit.

Drainage Analysis Methodology

A peak rate of runoff will be determined using techniques and data found in the following:

1. Urban Hydrology for Small Watersheds – Technical Release 55 by the United States Department of Agriculture Soils Conservation Service, June 1986. Runoff curve numbers and 24-hour precipitation values were obtained from this reference.
2. HydroCAD © Stormwater Modeling System by HydroCAD Software Solutions LLC, version 10.00-24. The HydroCAD program was used to generate the runoff hydrographs for the watershed areas, to determine discharge/ stage/storage characteristics for the stormwater BMPs, to perform drainage routing and to combine the results of the runoff hydrographs. HydroCAD uses the TR-20 methodology of the SCS Unit Hydrograph procedure (SCS-UH).

Proposed Conditions – Peak Rate of Runoff

The stormwater runoff analysis of the existing and proposed conditions includes an estimate of the peak rate of runoff from various rainfall events. Peak runoff rates were developed using TR55 Urban Hydrology for Small Watersheds, developed by the U.S. Department of Commerce, Engineering Division and the HydroCAD computer program. Further, the analysis has been prepared in accordance with the MassDEP and the city requirements and standard engineering practices. The peak rate of runoff has been estimated for each watershed during the 2, 10, and 100-year storm events.

The proposed stormwater management system for the site consists of deep sump catch basins, proprietary separators, and subsurface infiltration structures. These systems have been designed in accordance with the MA DEP Stormwater Management Policy to recharge groundwater and reduce rate of runoff from the parcel.

The stormwater runoff model indicates that the proposed site development reduces the rate of runoff during all storm events at the identified points of analysis. The following tables provide a summary of the estimated peak rate, in Cubic Feet per Second (CFS) at each of the four (4) Study Points for each of the design storm events. The HydroCAD worksheets are included in Section 4 and 5 of this report.

STUDY POINT FLOW (CFS) SUMMARY

STUDY POINT #1			
	2-Year	10-Year	100-Year
Existing Flow (CFS)	57.23	58.64	61.98
Proposed Flow (CFS)	55.46	55.99	60.36
Reduction %	**3%**	**5%**	**3%**

STUDY POINT #2			
	2-Year	10-Year	100-Year
Existing Flow (CFS)	58.62	60.83	66.08
Proposed Flow (CFS)	55.60	56.15	60.75
Reduction %	**5%**	**7%**	**8%**

STUDY POINT #3			
	2-Year	10-Year	100-Year
Existing Flow (CFS)	62.42	66.79	77.15
Proposed Flow (CFS)	57.75	59.58	72.97
Reduction %	**7%**	**10%**	**5%**

STUDY POINT VOLUME (CF) SUMMARY

STUDY POINT #1			
	2-Year	10-Year	100-Year
Existing Flow (CF)	7,094,084	7,101,253	7,115,775
Proposed Flow (CF)	7,079,789	7,082,063	7,097,757
Reduction %	**1%**	**1%**	**1%**

STUDY POINT #2			
	2-Year	10-Year	100-Year
Existing Flow (CF)	7,075,619	7,087,252	7,110,943
Proposed Flow (CF)	7,064,121	7,067,211	7,085,146
Reduction %	**1%**	**1%**	**1%**

STUDY POINT #3			
	2-Year	10-Year	100-Year
Existing Flow (CF)	7,093,216	7,118,254	7,185,611
Proposed Flow (CF)	7,073,403	7,085,707	7,142,975
Reduction %	**1%**	**1%**	**1%**

MASSDEP Stormwater Performance Standards

The MA DEP Stormwater Management Policy was developed to improve water quality by implementing performance standards for stormwater management. The intent is to implement the stormwater management standards through the review of Notice of Intent filings by the issuing authority (Conservation Commission or DEP). The following section outlines how the proposed Stormwater Management System meets the standards set forth by the Policy.

BMP’s implemented in the design include –

- Deep Sump Catch Basins
- Proprietary Separators
- Subsurface Structures

Stormwater Best Management Practices (BMP’s) have been incorporated into the design of the project to mitigate the anticipated pollutant loading. An Operations and Maintenance Plan has been developed for the project, which addresses the long-term maintenance requirements of the proposed system.

Temporary erosion and sedimentation controls will be incorporated into the construction phase of the project. These temporary controls may include straw bale and/or silt fence barriers, inlet sediment traps, slope stabilization, and stabilized construction entrances.

The Massachusetts Department of Environmental Protection has established ten (10) Stormwater Management Standards. A project that meets or exceeds the standards is presumed to satisfy the regulatory requirements regarding stormwater management. The Standards are enumerated below as well as descriptions and supporting calculations as to how the Project will comply with the Standards:

1. *No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

   The proposed development will not introduce any new outfalls with direct discharge to a wetland area or waters of the Commonwealth of Massachusetts. All discharges will be treated for water quality and the rate will not be increased over existing conditions.

2. *Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

   The proposed development has been designed so that the post-development peak discharge rates do not exceed the predevelopment peak discharge rates. A summary of the existing and proposed discharge rates is included within this document.

3. *Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.*

   The existing annual recharge for the site has been approximated in the proposed condition. There are proposed subsurface infiltration systems designed to meet this requirement. Stormwater runoff generated from the impervious areas of the proposed development are routed through these infiltration BMPs. The proposed Recharge Volume is based on the Static Method per the MA DEP Stormwater Management Standards, Volume 3, Chapter 1.

4. *Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This standard is met when:*
    - *Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;*
    - *Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and*
    - *Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

    The proposed stormwater management system has been designed so that the 44% TSS removal standard will be met for each drainage area. Standard #4 is met when structural stormwater best management practices are sized to capture and treat the required water quality volume and pretreatment is provided in accordance with the Massachusetts Stormwater Handbook. Standard #4 also requires that suitable source control measures are identified in the Long-Term Pollution Prevention Plan. The 44% TSS removal standard will be met using some combination of the following: deep-sump, hooded catch basins, subsurface infiltration systems with Isolator Rows and proprietary separators.

    The water quality volume for the site development will be captured and treated using proprietary separators and infiltration systems equipped with Isolator Rows. All systems have been sized to meet the water quality flow rate for the 0.5" storm event.

5. *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters*

Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

The site is considered a source of higher potential pollutant loads because [it has a parking lot with 1,000 vehicle trips per day or more. Shopping centers, malls, and large office parks.] Pretreatment and Source reduction is provided to the maximum extent practicable. The drainage system will be designed to treat 1" water quality volume utilizing the BMPs listed in Table LUHPPL, within the Massachusetts Stormwater Handbook, Volume 1: Overview of the Massachusetts Stormwater Standards, Chapter 1, Page 14. This requirement only applies to stormwater discharges that come into contact with the actual area or activity on the site that may generate the higher potential pollutant load.

6. *Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

   The stormwater systems have been sized to properly treat stormwater discharges to critical areas.

7. *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

The proposed project is not considered a re-development project under the Stormwater Management Handbook guidelines as there is an increase in the amount of impervious area.

8. *A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*

   A plan to control construction-related impacts, including erosion, sedimentation and other pollutant sources during construction has been developed. A detailed Erosion and Sedimentation Control Plan is included in the Permit Drawings. The proponent will prepare and submit a Stormwater Pollution Prevention Plan (SWPPP) prior to commencement of construction activities that will result in the disturbance of one acre of land or more.

9. *A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

   A Long-Term Operation & Maintenance (O&M) Plan has been developed for the proposed stormwater management system and is included within this document. See Section 2.0 of this report.

10. *All illicit discharges to the stormwater management system are prohibited.*

    There are no expected illicit discharges to the stormwater management system. The applicant will submit the Illicit Discharge Compliance Statement prior to the discharge of stormwater runoff to the post-construction stormwater best management practices and prior to the issuance of a Certificate of Compliance.

See the next page for the MassDEP Stormwater Checklist.

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

Checklist for Stormwater Report

A. Introduction

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

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

The Stormwater Report must include:

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature

Carlton Quinn 9/18/25

Signature and Date

Checklist

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

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist (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): Undeground Infiltration Systems

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 Field[1]

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

☐ is within the Zone II or Interim Wellhead Protection Area

☐ is near or to other critical areas

☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)

☒ involves runoff from land uses with higher potential pollutant loads.

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist (continued)

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

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

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

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

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist (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.

SECTION 2.0 -
OPERATION & MAINTENANCE PLAN

Introduction

In accordance with the standards set forth by the Stormwater Management Policy issued by the Massachusetts Department of Environmental Protection (MassDEP), Allen & Major Associates, Inc. has prepared the following Operations & Maintenance (O&M) Plan for the existing development at 444 East Central Street, Franklin, MA.

The plan is broken down into three major sections. The first section describes construction-related erosion and sedimentation controls (Demolition & Construction Maintenance Plan). The second section describes the long-term pollution prevention measures (Long Term Pollution Prevention Plan). The third section is a post-construction operation and maintenance plan designed to address the long-term maintenance needs of the stormwater management system (Long-Term Maintenance Plan – Facilities Description).

Notification Procedures for Change of Responsibility for O&M

The Stormwater Management System (SMS) for this project is owned by TAG Central LLC. The owner shall be legally responsible for the long-term operation and maintenance of this SMS as outlined in this Operation and Maintenance Plan.

The owner shall submit an annual summary report and the completed Operation & Maintenance Schedule & Checklist to the Conservation Commission (via email or print copy), highlighting inspection and maintenance activities including performances of BMPs. Should ownership of the SMS change, the owner will continue to be responsible until the succeeding owner shall notify the Commission that the succeeding owner has assumed such responsibility. Upon subsequent transfers, the responsibility shall continue to be that of transferring owner until the transferee owner notifies the Commission of its assumption of responsibility.

In the event the SMS will serve multiple lots/owners, such as the subdivision of the existing parcel or creation of lease areas, the owner(s) shall establish an association on other legally enforceable arrangements under which the association or a single party shall have legal responsibility for the operation and maintenance of the entire SMS. The legal instrument creating such responsibility shall be recorded with the Registry of Deeds and promptly following its recording, a copy thereof shall be furnished to the Commission.

Contact Information

Stormwater Management System Owner:	TAG Central LLC 1070 E Indiantown Rd Jupiter, FL

Emergency Contact Information:

TAG Central LLC (Owner/Operator)	Phone: (561) 685-5336
Allen & Major Associates, Inc. (Site Civil Engineer)	Phone: (781) 935-6889
Franklin Department of Public Works	Phone: (508) 553-5500
Franklin Conservation Commission	Phone: (508) 520-4929
Franklin Fire Department (non-emergency line)	Phone: (508) 528-2323
MassDEP Emergency Response	Phone: (888) 304-1133
Clean Harbors Inc (24-Hour Line)	Phone: (800) 645-8265

Demolition & Construction Maintenance Plan

1. Call Digsafe: 1-888-344-7233
2. Contact the City at least three (3) days prior to start of demolition and/or construction activities.
3. Install Erosion Control measures as shown on the Plans prepared by A&M. The City shall review the installation of straw bales and silt fencing prior to the start of any site demolition work. Install Construction fencing if determined to be necessary at the commencement of construction.
4. Install construction entrances, straw bales, and silt fence at the locations shown on the Erosion Control Plan prepared by A&M.
5. Site access shall be achieved only from the designated construction entrances.
6. Cut and clear trees in construction areas only (within the limit of work; see plans).
7. Stockpiles of materials subject to erosion shall be stabilized with erosion control matting or temporary seeding whenever practicable, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.
8. Install silt sacks and straw bales around each drain inlet prior to any demolition and or construction activities.

9. All erosion control measures shall be inspected weekly and after every rainfall event. Records of these inspections shall be kept on-site for review.
10. All erosion control measures shall be maintained, repaired, or replaced as required or at the direction of the owner's engineer or the City.
11. Sediment accumulation up-gradient of the straw bales, silt fence, and stone check dams greater than 6" in depth shall be removed and disposed of in accordance with all applicable regulations.
12. If it appears that sediment is exiting the site, silt sacks shall be installed in all catch basins adjacent to the site. Sediment accumulation on all adjacent catch basin inlets shall be removed and the silt sack replaced if torn or damaged.
13. Install stone check dams on-site during construction as needed. Refer to the erosion control details. Temporary sediment basins combined with stone check damns shall be installed on-site during construction to control and collect runoff from upland areas of this site during demolition and construction activities.
14. The contractor shall comply with the Sedimentation and Erosion Control Notes as shown on the Site Development Plans and Specifications.
15. The stabilized construction entrances shall be inspected weekly and records of inspections kept. The entrances shall be maintained by adding additional clean, angular, durable stone to remove the soil from the construction vehicle's tires when exiting the site. If soil is still leaving the site via the construction vehicle tires, adjacent roadways shall be kept clean by street sweeping.
16. Dust pollution shall be controlled using on-site water trucks and/or an approved soil stabilization product.
17. During demolition and construction activities, Status Reports on compliance with this O&M Document shall be submitted weekly. The report shall document any deficiencies and corrective actions taken by the applicant.

Long-Term Pollution Prevention Plan

Standard #4 from the MassDEP Stormwater Management Handbook requires that a Long-Term Pollution Prevention Plan (LTPPP) be prepared and incorporated as part of the Operation and Maintenance Plan of the Stormwater Management System. The purpose of the LTPPP is to identify potential sources of pollution that may affect the quality of stormwater discharges, and to describe the implementation of practices to reduce the pollutants in stormwater discharges. The following items describe the source control and proper procedures of the LTPPP.

- <u>Housekeeping</u>
  The existing development has been designed to maintain a high level of water quality treatment for all stormwater discharge to the wetland areas. An Operation and Maintenance (O&M) plan has been prepared and is included in this section of the report. The owner (or its designee) is responsible for adherence to the O&M plan in a strict and complete manner.

- <u>Storing of Materials & Water Products</u>
  The trash and waste program for the site includes exterior dumpsters. There is a trash contractor used to pick up the waste material in the dumpsters. The stormwater drainage system has water quality inlets designed to capture trash and debris.

- <u>Vehicle Washing</u>
  Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons during dry weather conditions, as the detergent-rich water used to wash the grime off the vehicle enters the stormwater drainage system. The existing development does not include any designated vehicle washing areas, nor is it expected that any vehicle washing will take place on-site.

- <u>Spill Prevention & Response</u>
  Sources of potential spill hazards include vehicle fluids, liquid fuels, pesticides, paints, solvents, and liquid cleaning products. The majority of the spill hazards would likely occur within the buildings and would not enter the stormwater drainage system. However, there are spill hazards from vehicle fluids or liquid fuels located outside of the buildings. These exterior spill hazards have the potential to enter the stormwater drainage system and are to be addressed as follows:

    1. Spill hazards of pesticides, paints, and solvents shall be remediated using the Manufacturers' recommended spill cleanup protocol.
    2. Vehicle fluids and liquid fuel spill shall be remediated according to the local and state regulations governing fuel spills.
    3. The owner shall have the following equipment and materials on hand to address a spill clean-up: brooms, dust pans, mops, rags, gloves, absorptive material, sand, sawdust, plastic and metal trash containers.
    4. All spills shall be cleaned up immediately after discovery.
    5. Spills of toxic or hazardous material shall be reported, regardless of size, to the Massachusetts Department of Environmental Protection at (888) 304-1333.

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

- <u>Maintenance of Lawns, Gardens, and Other Landscaped Areas</u>
  It should be recognized that this is a general guideline towards achieving high quality and well-groomed landscaped areas. The grounds staff/landscape contractor must recognize the shortcomings of a general maintenance plan such as this, and modify and/or augment it based on weekly, monthly, and yearly observations. In order to assure the highest quality conditions, the staff must also recognize and appreciate the need to be aware of the constantly changing conditions of the landscaping and be able to respond to them on a proactive basis. No trees shall be planted over the drain lines or recharge area, and that only shallow rooted plants and shrubs will be allowed.

  - <u>Fertilizer</u>
    Maintenance practices should be aimed at reducing environmental, mechanical and pest stresses to promote healthy and vigorous growth. When necessary, pest outbreaks should be treated with the most sensitive control measure available. Synthetic chemical controls should be used only as a last resort to organic and biological control methods. Fertilizer, synthetic chemical controls and pest management applications (when necessary) shall be performed only by licensed applicators in accordance with the manufacturer's label instructions when environmental conditions are conducive to controlled product application.

    Only slow-release organic fertilizers should be used in the planting and mulch areas to limit the amount of nutrients that could enter downstream resource areas. Fertilization of the planting and mulch areas will be performed within manufacturers labeling instructions and shall not exceed an NPK ration of 1:1:1 (i.e. Triple 10 fertilizer mix), considered a low nitrogen mixture. Fertilizers approved for the use under this O&M Plan are as follows:

    Type: LESCO® 28-0-12 (Lawn Fertilizer)
    MERIT® 0.2 Plus Turf Fertilizer
    MOMENTUM™ Force Weed & Feed

  - <u>Suggested Aeration Program</u>
    In-season aeration of lawn areas is good cultural practice, and is recommended whenever feasible. It should be accomplished with a solid thin tine aeration method to reduce disruption to the use of the area. The

depth of solid tine aeration is similar to core type, but should be performed when the soil is somewhat drier for a greater overall effect.

Depending on the intensity of use, it can be expected that all landscaped lawn areas will need aeration to reduce compaction at least once per year. The first operation should occur in late May following the spring season. Methods of reducing compaction will vary based on the nature of the compaction. Compaction on newly established landscaped areas is generally limited to the top 2-3" and can be alleviated using hollow core or thin tine aeration methods.

The spring aeration should consist of two passes at opposite directions with 1/4" hollow core tines penetrating 3-5" into the soil profile. Aeration should occur when the soil is moist but not saturated. The soil cores should be shattered in place and dragged or swept back into the turf to control thatch. If desired the cores may also be removed and the area top-dressed with sand or sandy loam. If the area drains on average too slowly, the topdressing should contain a higher percentage of sand. If it is draining on average too quickly, the top dressing should contain a higher percentage of soil and organic matter.

- Landscape Maintenance Program Practices:
  - Lawn

    1. Mow a minimum of once a week in spring, to a height of 2” to 2 1/2” high. Mowing should be frequent enough so that no more than 1/3 of grass blade is removed at each mowing. The top growth supports the roots; the shorter the grass is cute, the less the roots will grow. Short cutting also dries out the soil and encourages weeds to germinate.
    2. Mow approximately once every two weeks from July 1st to August 15th depending on lawn growth.
    3. Mow on a ten-day cycle in fall, when growth is stimulated by cooler nights and increased moisture.
    4. Do not remove grass clippings after mowing.
    5. Keep mower blades sharp to prevent ragged cuts on grass leaves, which cause a brownish appearance and increase the chance for disease to enter a leaf.
  - Shrubs

    1. Mulch not more than 3” depth with shredded pine or fir bark.

2. Hand prune annually, immediately after blooming, to remove 1/3 of the above-ground biomass (older stems). Stem removals are to occur within 6″ of the ground to open up shrub and maintain two-year wood (the blooming wood).
3. Hand-prune evergreen shrubs only as needed to remove dead and damaged wood and to maintain the naturalistic form of the shrub. Never mechanically shear evergreen shrubs.

- Trees
  1. Provide aftercare of new tree plantings for the first three years.
  2. Do not fertilize trees, it artificially stimulates them (unless tree health warrants).
  3. Water once a week for the first year; twice a month for the second; once a month for the third year.
  4. Prune trees on a four-year cycle.
- Invasive Species
  1. Inform the Conservation Commission Agent prior to the removal of invasive species proposed either through hand work or through chemical removal.

- Storage and Use of Herbicides and Pesticides

  Integrated Pest Management is the combination of all methods (of pest control) which may prevent, reduce, suppress, eliminate, or repel an insect population. The main requirements necessary to support any pest population are food, shelter and water, and any upset of the balance of these will assist in controlling a pest population. Scientific pest management is the knowledgeable use of all pest control methods (sanitation, mechanical, chemical) to benefit mankind's health, welfare, comfort, property and food. A Pest Management Professional (PMP) should be retained who is licensed with the Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs, Department of Agricultural Resources.

  The site manager will be provided with approved bulletin before entering into or renewing an agreement to apply pesticides for the control of indoor household or structural pests, refer to 333 CMR 13.08.

  Before beginning each application, the applicator must post a Department approved notice on all of the entrances to the treated room or area. The applicator must leave such notices posted after the application. The notice will be posted at conspicuous point(s) of access to the area treated. The location and number of signs will be determined by the configuration of the area to be treated based on the applicator's best judgment. It is intended to give sufficient notice so that no one comes into an area being treated unaware that the applicator is working and pesticides are being applied. However, if the contracting entity does not want the signs posted, he/she may sign a Department approved waiver indicating this.

The applicator or employer will provide to any person upon their request the following information on previously conducted applications:

1. Name and phone number of pest control company;
2. Date and time of the application;
3. Name and license number of the applicator;
4. Target pests; and
5. Name and EPA Registration Number of pesticide products applied.

- Pet Waste Management
  The owner's landscape crew (or designee) shall remove any obvious pet waste that has been left behind by pet owners within the development. The pet waste shall be disposed of in accordance with local and state regulations.
- Operations and Management of Septic Systems
  There are no proposed septic systems within the limits of the project.
- Management of Deicing Chemicals and Snow
  Snow will be stockpiled on site until the accumulated snow becomes a hazard to the daily operations of the site. It will be the responsibility of the snow removal contractor to properly dispose of transported snow according to MassDEP, Bureau of Resource Protection – Snow Disposal Guideline #BRPG01-01, governing the proper disposal of snow. It will be the responsibility of the snow removal contractor to follow these guidelines and all applicable laws and regulations

  The owner's maintenance staff (or its designee) will be responsible for the clearing of the sidewalk and building entrances. The owner may be required to use a de-icing agent such as potassium chloride to maintain a safe walking surface. If used, the de-icing agent for the walkways and building entrances will be kept within the storage rooms located within the building. If used, de-icing agents will not be stored outside. The owner's maintenance staff will limit the application of sand.

Long-Term Maintenance Plan – Facilities Description

A maintenance log will be kept (i.e. report) summarizing inspections, maintenance, and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated. The log will be made accessible to department staff and a copy provided to the department upon request.

The following is a description of the Stormwater Management System for the project site.

Stormwater Collection System – On-Site:

The stormwater collection system is a series of inlets located at low points within the limits of the paved area. All of the proposed on-site catch basins incorporate a deep sump and hooded outlet. The catch basins are connected by a closed gravity pipe network that pass through proprietary separators prior to entering the underground infiltration systems or infiltration basins.

Structural Pretreatment BMPs: Regular maintenance of these BMPs is especially critical because they typically receive the highest concentration of suspended solids during the first flush of a storm event.

Deep Sump Catch Basins:

Deep sump catch basins, also known as oil and grease or hooded catch basins, are underground retention systems designed to remove trash, debris, and coarse sediment from stormwater runoff, and serve as temporary spill containment devices for floatables such as oils and greases.

Regular maintenance is essential. Deep sump catch basins remain effective by removing pollutants only if they are cleaned out frequently. One study found that once 50% of the sump volume is filled, the catch basin is not able to retain additional sediments.

Inspect or clean deep sump catch basins at least four times per year and at the end of the foliage and snow-removal seasons. Sediments must also be removed four times per year or whenever the depths of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin.

Clamshell buckets are typically used to remove sediment in Massachusetts. However, vacuum trucks are preferable, because they remove more trapped sediment and supernatant than clamshells. Vacuuming is also a speedier process and is less likely to snap the cast iron hood within the deep sump catch basin.

Always consider the safety of the staff cleaning deep sump catch basins. Cleaning a deep sump catch basin within a road with active traffic or even within a parking lot is dangerous, and a police detail may be necessary to safeguard workers.

Although catch basin debris often contains concentrations of oil and hazardous materials, such as petroleum hydrocarbons and metals, MassDEP classifies them as solid waste. Unless there is evidence that they have been contaminated by a spill or other means, MassDEP does not routinely require catch basin cleanings to be tested before disposal. Contaminated catch basin cleanings must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

In the absence of evidence of contamination, catch basin cleanings may be taken to a landfill or other facility permitted by MassDEP to accept solid waste, without any prior approval by MassDEP. However, some landfills require catch basin cleanings to be tested before they are accepted.

With prior MassDEP approval, catch basin cleanings may be used as grading and shaping materials at landfills undergoing closure (see Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites) or as daily cover at active landfills. MassDEP also encourages the beneficial reuse of catch basin cleanings whenever possible. A Beneficial Reuse Determination is required for such use.

MassDEP regulations prohibit landfills from accepting materials that contain free-draining liquids. One way to remove liquids is to use a hydraulic lift truck during cleaning operations so that the material can be decanted at the site. After loading material from several catch basins into a truck, elevate the truck so that any free-draining liquid can flow back into the structure. If there is no free water in the truck, the material may be deemed to be sufficiently dry. Otherwise catch basin cleanings must undergo a Paint Filter Liquids Test. Go to www.Mass.gov/dep/recycle/laws/cafacts.doc for information on all of the MassDEP requirements pertaining to the disposal of catch basin cleanings.

Infiltration BMPs:

Subsurface Structures:

Subsurface structures are underground systems that capture runoff, and gradually infiltrate it into the groundwater through rock and gravel.

Because subsurface structures are installed underground, they are extremely difficult to maintain. Inspect inlets at least twice a year. Remove any debris that might clog the system. Include mosquito controls in the Operation and Maintenance Plan.

Inspect outlet from subsurface structures to adjacent resource area for signs of scour and sediment accumulation at least twice annually. Remove sediment accumulation and add rip rap as necessary to prevent scour.

<u>Other BMPs and Accessories</u>:

Outlet Structures:

Outlets of BMPs are devices that control the flow of stormwater out of the BMP to the conveyance system.

Inspect outlet structures twice per year. Remove any accumulated sediment and debris that could prevent flow at the outlet structure.

Vegetated Areas:

Inspect slopes and embankments early in the growing season to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

Roadway and Parking Surfaces:

Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader.

<u>Other Maintenance Activity</u>:

- Mosquito Control - Both above ground and underground stormwater BMPs have the potential to serve as mosquito breeding areas. Good design, proper operation and maintenance, and treatment with larvicides can minimize this potential. See the supplemental information for Mosquito Control in Stormwater Management Practices, and the Operation and Maintenance Plan Schedule for inspection schedule.
- Street Sweeping - Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader.

Inspection and Maintenance Frequency and Corrective Measures

In accordance with MA DEP Stormwater Handbook: Volume 2, Chapter 2; the previously described BMPs will be inspected and the identified deficiencies will be corrected. Clean-out must include the removal and legal disposal of any accumulated sediments, trash, and debris. In any and all cases, operations, inspections, and maintenance activities shall utilize best practical measures to avoid and minimize impacts to wetland resource areas outside the footprint of the SMS.

Supplemental Information

- Operation & Maintenance Plan Schedule
- Massachusetts Stormwater Handbook, Chapter 5, Miscellaneous Stormwater Topics, Mosquito Control in Stormwater Management Practices.

OPERATION AND MAINTENANCE PLAN SCHEDULE **Date: 7/21/2025**

Project: 40B Multi-Family Site Development
Project Address: 444 East Central Street Fanklin, MA

Responsible for O&M Plan: TAG Central LLC
Address: 275 Regatta Drive, Jupiter, FL 33477
Phone: (561) 685-5336

Alexander Alevizos
Principal

All information within table is derived from Massachussetts Stormwater Handbook: Volume 2, Chapter 2

BMP CATEGORY	BMP OR MAINTENANCE ACTIVITY	SCHEDULE/ FREQUENCY	NOTES	ESTIMATED ANNUAL MAINTENANCE COST	INSPECTION PERFORMED	
					DATE:	BY:
STRUCTURAL PRETREATMENT BMPs	**DEEP SUMP CATCH BASIN**	Four times per year (quarterly).	Inspect and clean catch basin units whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin.	$1,000		
	PROPRIETARY SEPARATORS	In accordance with manufacturers requirements, but no less than twice a year following installation and once a year thereafter.	Remove sediment and other trapped pollutants at frequency or level specified by manufacturer.	$2,000		
	GRAVEL TRENCH DRAIN	Inspect structure inlets at least twice a year. Remove debris that may clog the system as needed..	Observed trash and debris will removed at each inspection. Sediment will be removed as necessary.	$750		
INFILTRATION BMPs	**SUBSURFACE STRUCTURES**	Inspect structure inlets at least twice a year. Remove debris that may clog the system as needed.	Because subsurface structures are installed underground, they are extremely difficult to maintain. Remove any debris that might clog the system.	$500		
BMP ACCESSORIES	**OUTLET STRUCTURES**	Periodic cleaning of Outlet Control Structures as needed.	Clear trash and debris as necessary.	$500		
OTHER MAINTENANCE ACTIVITY	**MOSQUITO CONTROL**	Inspect BMPs as needed to ensure the system's drainage time is less than the maximum 72 hour period.	Massachusetts stormwater handbook requires all stormwater practices that are designed to drain do so within 72 hours to reduce the number of mosquitos that mature to adults since the aquatic stage of a mosquito is 7-10 days.	$100		
	SNOW STORAGE	Clear and remove snow to approved storage locations as necessary to ensure systems are working properly and are protected from meltwater pollutants.	Carefully select snow disposal sites before winter. Avoid dumping removed snow over catch basins, or in detention ponds, sediment forebays, rivers, wetlands, and flood plains. It is also prohibited to dump snow in the bioretention basins or gravel swales.	$500		
	STREET SWEEPING	Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.	Sweep, power broom or vacuum paved areas. Submit information that confirms that all street sweepings have been completed in accordance with state and local requirements	$2,000		

Chapter 5
Miscellaneous Stormwater Topics

Mosquito Control in Stormwater Management Practices

Both aboveground and underground stormwater BMPs have the potential to serve as mosquito breeding areas. Good design, proper operation and maintenance and treatment with larvicides can minimize this potential.

EPA recommends that stormwater treatment practices dewater within 3 days (72 hours) to reduce the number of mosquitoes that mature to adults, since the aquatic stage of many mosquito species is 7 to 10 days. Massachusetts has had a 72-hour dewatering rule in its Stormwater Management Standards since 1996. The 2008 technical specifications for BMPs set forth in Volume 2, Chapter 2 of the Massachusetts Stormwater Handbook also concur with this practice by requiring that all stormwater practices designed to drain do so within 72 hours.

Some stormwater practices are designed to include permanent wet pools. These practices – if maintained properly – can limit mosquito breeding by providing habitat for mosquito predators. Additional measures that can be taken to reduce mosquito populations include increasing water circulation, attracting mosquito predators by adding suitable habitat, and applying larvicides.

The Massachusetts State Reclamation and Mosquito Control Board (SRMCB), through the Massachusetts Mosquito Control Districts, can undertake further mosquito control actions specifically for the purpose of mosquito control pursuant to Massachusetts General Law Chapter 252. The Mosquito Control Board, http://www.mass.gov/agr/mosquito/, describes mosquito control methods and is in the process of developing guidance documents that describe Best Management Practices for mosquito control projects.

The SRMCB and Mosquito Control Districts are not responsible for operating and maintaining stormwater BMPs to reduce mosquito populations. The owners of property that construct the stormwater BMPs or municipalities that "accept" them through local subdivision approval are responsible for their maintenance.[1] The SRMCB is composed of officials from MassDEP, Department of Agricultural Resources, and Department of Conservation and Recreation. The nine (9) Mosquito Control Districts overseen by the SRMCB are located throughout Massachusetts, covering 176 municipalities.

Construction Period Best Management Practices for Mosquito Control

To minimize mosquito breeding during construction, it is essential that the following actions be taken to minimize the creation of standing pools by taking the following actions:

- ***Minimize Land Disturbance:*** Minimizing land disturbance reduces the likelihood of mosquito breeding by reducing silt in runoff that will cause construction period controls to clog and retain standing pools of water for more than 72 hours.
- ***Catch Basin inlets:*** Inspect and refresh filter fabric, hay bales, filter socks or stone dams on a regular basis to ensure that any stormwater ponded at the inlet drains within 8 hours after precipitation stops. Shorter periods may be necessary to avoid hydroplaning in roads

[1] MassDEP and MassHighway understand that the numerous stormwater BMPs along state highways pose a unique challenge. To address this challenge, the 2004 MassHighway Stormwater Handbook will provide additional information on appropriate operation and maintenance practices for mosquito control when the Handbook is revised to reflect the 2008 changes to the Stormwater Management Standards..

caused by water ponded at the catch basin inlet. Treat catch basin sumps with larvicides such as *Bacillus sphaericus* (*Bs*) using a licensed pesticide applicator.

- ***Check Dams:*** If temporary check dams are used during the construction period to lag peak rate of runoff or pond runoff for exfiltration, inspect and repair the check dams on a regular basis to ensure that any stormwater ponded behind the check dam drains within 72 hours.
- ***Design construction period sediment traps*** to dewater within 72 hours after precipitation. Because these traps are subject to high silt loads and tend to clog, treat them with the larvicide *Bs* after it rains from June through October, until the first frost occurs.
- ***Construction period open conveyances:*** When temporary manmade ditches are used for channelizing construction period runoff, inspect them on a regular basis to remove any accumulated sediment to restore flow capacity to the temporary ditch.
- ***Revegetating Disturbed Surfaces:*** Revegetating disturbed surfaces reduces sediment in runoff that will cause construction period controls to clog and retain standing pools of water for greater than 72 hours.
- ***Sediment fences/hay bale barriers:*** When inspections find standing pools of water beyond the 24-hour period after a storm, take action to restore barrier to its normal function.

<u>Post-Construction Stormwater Treatment Practices</u>

- Mosquito control begins with the environmentally sensitive site design. Environmentally sensitive site design that minimizes impervious surfaces reduces the amount of stormwater runoff. Disconnecting runoff using the LID Site Design credits outlined in the Massachusetts Stormwater Handbook reduces the amount of stormwater that must be conveyed to a treatment practice. Utilizing green roofs minimizes runoff from smaller storms. Storage media must be designed to dewater within 72 hours after precipitation.
- Mosquito control continues with the selection of structural stormwater BMPs that are unlikely to become breeding grounds for mosquitoes, such as:
    - ***Bioretention Areas/Rain Gardens/Sand Filter:*** These practices tend not to result in mosquito breeding. If any level spreaders, weirs or sediment forebays are used as part of the design, inspect them and correct them as necessary to prevent standing pools of water for more than 72 hours.
    - ***Infiltration Trenches:*** This practice tends not to result in mosquito breeding. If any level spreaders, weirs, or sediment forebays are used as part of the design, inspect them and correct them as necessary to prevent standing pools of water for more than 72 hours.
- Another mosquito control strategy is to select BMPs that can become habitats for mosquito predators, such as:
    - ***Constructed Stormwater Wetlands:*** Habitat features can be incorporated in constructed stormwater wetlands to attract dragonflies, amphibians, turtles, birds, bats, and other natural predators of mosquitoes.
    - ***Wet Basins:*** Wet basins can be designed to incorporate fish habitat features, such as deep pools. Introduce fish in consultation with Massachusetts Division of Fisheries and Wildlife. Vegetation within wet basins designed as fish habitat must be properly managed to ensure that vegetation does not overtake the habitat. Proper design to ensure that no low circulation or "dead" zones are created may reduce the potential for mosquito breeding. Introducing bubblers may increase water circulation in the wet basin.

Effective mosquito controls require proponents to design structural BMPs to prevent ponding and facilitate maintenance and, if necessary, the application of larvicides. Examples of such design practices include the following:

- ***Basins:*** Provide perimeter access around wet basins, extended dry detention basins and dry detention basins for both larviciding and routine maintenance. Control vegetation to ensure that access pathways stay open.
- ***BMPs without a permanent pool of water:*** All structural BMPs that do not rely on a permanent pool of water must drain and completely dewater within 72 hours after precipitation. This includes dry detention basins, extended dry detention basins, infiltration basins, and dry water quality swales. Use underdrains at extended dry detention basins to drain the small pools that form due to accumulation of silts. Wallace indicates that extended dry extended detention basins may breed more mosquitoes than wet basins. It is, therefore, imperative to design outlets from extended dry detention basins to completely dewater within the 72-hour period.
- ***Energy Dissipators and Flow Spreaders:*** Currier and Moeller, 2000 indicate that shallow recesses in energy dissipators and flow spreaders trap water where mosquitoes breed. Set the riprap in grout to reduce the shallow recesses and minimize mosquito breeding.
- ***Outlet control structures:*** Debris trapped in small orifices or on trash racks of outlet control structures such as multiple stage outlet risers may clog the orifices or the trash rack, causing a standing pool of water. Optimize the orifice size or trash rack mesh size to provide required peak rate attenuation/water quality detention/retention time while minimizing clogging.
- ***Rain Barrels and Cisterns:*** Seal lids to reduce the likelihood of mosquitoes laying eggs in standing water. Install mosquito netting over inlets. The cistern system should be designed to ensure that all collected water is drained into it within 72 hours.
- ***Subsurface Structures, Deep Sump Catch Basins, Oil Grit Separators, and Leaching Catch Basins:*** Seal all manhole covers to reduce likelihood of mosquitoes laying eggs in standing water. Install mosquito netting over the outlet (CALTRANS 2004).

The Operation and Maintenance Plan should provide for mosquito prevention and control.

- ***Check dams:*** Inspect permanent check dams on the schedule set forth in the O&M Plan. Inspect check dams 72 hours after storms for standing water ponding behind the dam. Take corrective action if standing water is found.
- ***Cisterns:*** Apply *Bs* larvicide in the cistern if any evidence of mosquitoes is found. The Operation and Maintenance Plan shall specify how often larvicides should be applied to waters in the cistern.
- ***Water quality swales:*** Remove and properly dispose of any accumulated sediment as scheduled in the Operation and Maintenance Plan.
- ***Larvicide Treatment:*** The Operation and Maintenance Plan must include measures to minimize mosquito breeding, including larviciding.
- The party identified in the Operation and Maintenance Plan as responsible for maintenance shall see that larvicides are applied as necessary to the following stormwater treatment practices: catch basins, oil/grit separators, wet basins, wet water quality swales, dry extended detention basins, infiltration basins, and constructed stormwater wetlands. The Operation and Maintenance Plan must ensure that all larvicides are applied by a licensed pesticide applicator and in compliance with all pesticide label requirements.
- The Operation and Maintenance Plan should identify the appropriate larvicide and the time and method of application. For example, *Bacillus sphaericus (Bs)*, the preferred

larvicide for stormwater BMPs, should be hand-broadcast.[2] Alternatively, Altosid, a Methopren product, may be used. Because some practices are designed to dewater between storms, such as dry extended detention and infiltration basins, the Operation and Maintenance Plan should provide that larviciding must be conducted during or immediately after wet weather, when the detention or infiltration basin has a standing pool of water, unless a product is used that can withstand extended dry periods.

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[2] *Bacillus thuringienis israelensis* or *Bti* is usually applied by helicopter to wetlands and floodplains

Roads and Stormwater BMPs

In general, the stormwater BMPs used for land development projects can also be used for new roadways and roadway improvement projects. However, for improvement of existing roads, there are often constraints that limit the choice of BMP. These constraints derive from the linear configuration of the road, the limited area within the existing right-of-way, the structural and safety requirements attendant to good roadway design, and the long-term maintainability of the roadway drainage systems. The MassHighway Handbook provides strategies for dealing with the constraints associated with providing stormwater BMPs for roadway redevelopment projects.

Roadway design can minimize impacts caused by stormwater. Reducing roadway width reduces the total and peak volume of runoff. Designing a road with country drainage (no road shoulders or curbs) disconnects roadway runoff. Disconnection of roadway runoff is eligible for the Low Impact Site Design Credit provided the drainage is disconnected in accordance with specifications outlined in Volume 3.

Like other parties, municipalities that work within wetlands jurisdictional areas and adjacent buffer zones must design and implement structural stormwater best management practices in accordance with the Stormwater Management Standards and the Stormwater Management Handbook. In addition, in municipalities and areas where state agencies operate stormwater systems, the DPWs (or other town or state agencies) must meet the “good housekeeping“ requirement of the municipality’s or agency's MS4 permit.

MassHighway has taken stormwater management one step further by working with MassDEP to develop the MassHighway Storm Water Handbook for Highways and Bridges. The purpose of the MassHighway Handbook is to provide guidance for persons involved in the design, permitting, review and implementation of state highway projects, especially those involving existing roadways where physical constraints often limit the stormwater management options available. These constraints, like those common to redevelopment sites, may make it difficult to comply precisely with the requirements of the Stormwater Management Standards and the Massachusetts Stormwater Handbook.[3] In response to these constraints, MassDEP and MHD developed specific design, permitting, review and implementation practices that meet the unique challenges of providing environmental protection for existing state roads. The information in the MassHighway Handbook may also aid in the planning and design of projects to build new highways and to add lanes to existing highways, since they may face similar difficulties in meeting the requirements of the Stormwater Management Standards.

Although it is very useful, the MassHighway Handbook does not allow MassHighway projects to proceed without individual review and approval by the issuing authority when subject to the Wetlands Protection Act Regulations, 310 CMR 10.00, or the 401 Water Quality Certification Regulations, 314 CMR 9.00. For example, MassHighway must provide a Conservation Commission with a project-specific Operation and Maintenance Plan in accordance with Standard 9 that documents how the project’s post-construction BMPs will be operated and maintained.[4]

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[3] The 2004 MassHighway Handbook outlines standardized methods for dealing with these constraints as they apply to highway redevelopment projects. MassDEP and MassHighway intend to work together to provide guidance for add a lane projects when the 2004 Handbook is revised to reflect the 2008 changes to the Stormwater Management Standards.

[4] The general permit for municipal separate storm sewer systems (the MS4 Permit) requires MassHighway to develop and implement procedures for the proper operation and maintenance of stormwater BMPs. To

Some municipalities have asked if the MassHighway Handbook governs municipal road projects. The answer is no.[5] The MassHighway Handbook was developed in response to the unique problems and challenges arising out of the management of the state highway system. Like other project proponents, cities and towns planning road or other projects in areas subject to jurisdiction under the Wetlands Protection Act must design and implement LID, non-structural and structural best management practices in accordance with the Stormwater Management Standards and the Massachusetts Stormwater Handbook.

avoid duplication of effort, MassHighway may be able rely on the same procedures to fulfill the operation and maintenance requirements of Standard 9 and the MS 4 Permit.

[5] Although the MassHighway Handbook does not govern municipal road projects, cities and towns may find some of the information presented in the Handbook useful.

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Snow Disposal Guidance

Effective Date: December 23, 2019

Applicability: Applies to all federal, state, regional and local agencies, as well as to private businesses.

Supersedes: Bureau of Resource Protection (BRP) Snow Disposal Guideline No. BRPG97-1 issued December 12, 1997 and BRPG01-01 issued March 8, 2001; Bureau of Water Resources (BWR) snow disposal guidance issued December 21, 2015 and December 12, 2018.

Approved by: Kathleen Baskin, Assistant Commissioner, Bureau of Water Resources

PURPOSE: To provide guidelines to all government agencies and private businesses regarding snow disposal site selection, site preparation and maintenance, and emergency snow disposal options that are protective of wetlands, drinking water, and water bodies, and are acceptable to the Massachusetts Department of Environmental Protection (MassDEP), Bureau of Water Resources.

APPLICABILITY: These Guidelines are issued by MassDEP's Bureau of Water Resources on behalf of all Bureau Programs (including Drinking Water Supply, Wetlands and Waterways, Wastewater Management, and Watershed Planning and Permitting). They apply to all federal agencies, state agencies, state authorities, municipal agencies and private businesses disposing of snow in the Commonwealth of Massachusetts.

INTRODUCTION

Finding a place to dispose of collected snow poses a challenge to municipalities and businesses as they clear roads, parking lots, bridges, and sidewalks. While MassDEP is aware of the threats to public safety caused by snow, collected snow that is contaminated with road salt, sand, litter, and automotive pollutants such as oil also threatens public health and the environment.

As snow melts, road salt, sand, litter, and other pollutants are transported into surface water or through the soil where they may eventually reach the groundwater. Road salt and other pollutants can contaminate water supplies and are toxic to aquatic life at certain levels. Sand washed into waterbodies can create sand bars or fill in wetlands and ponds, impacting aquatic life, causing flooding, and affecting our use of these resources.

There are several steps that communities can take to minimize the impacts of snow disposal on public health and the environment. These steps will help communities avoid the costs of a contaminated water supply, degraded waterbodies, and flooding. Everything that occurs on the land has the potential to impact the Commonwealth's water resources. Given the authority of local government over the use of the land, municipal officials and staff have a critically important role to play in protecting our water resources.

The purpose of these guidelines is to help federal agencies, state agencies, state authorities, municipalities and businesses select, prepare, and maintain appropriate snow disposal sites before the snow begins to accumulate through the winter. Following these guidelines and obtaining the necessary approvals may also help municipalities in cases when seeking reimbursement for snow disposal costs from the Federal Emergency Management Agency is possible.

RECOMMENDED GUIDELINES

These snow disposal guidelines address: (1) site selection; (2) site preparation and maintenance; and (3) emergency snow disposal.

1. SITE SELECTION

The key to selecting effective snow disposal sites is to locate them adjacent to or on pervious surfaces in upland areas or upland locations on impervious surfaces away from water resources and drinking water wells. At these locations, the snow meltwater can filter into the soil, leaving behind sand and debris which can be removed in the spring. The following conditions should be followed:

- Within water supply Zone A and Zone II, avoid storage or disposal of snow and ice containing deicing chemicals that has been collected from streets located outside these zones. Municipalities may have a water supply protection land use control that prohibits the disposal of snow and ice containing deicing chemicals from outside the Zone A and Zone II, subject to the Massachusetts Drinking Water Regulations at 310 CMR 22.20C and 310 CMR 22.21(2).
- Avoid storage or disposal of snow or ice in Interim Wellhead Protection Areas (IWPA) of public water supply wells, and within 75 feet of a private well, where road salt may contaminate water supplies.
- Avoid dumping snow into any waterbody, including rivers, the ocean, reservoirs, ponds, or wetlands. In addition to water quality impacts and flooding, snow disposed of in open water can cause navigational hazards when it freezes into ice blocks.
- Avoid dumping snow on MassDEP-designated high and medium-yield aquifers where it may contaminate groundwater.
- Avoid dumping snow in sanitary landfills and gravel pits. Snow meltwater will create more contaminated leachate in landfills posing a greater risk to groundwater, and in gravel pits, there is little opportunity for pollutants to be filtered out of the meltwater because groundwater is close to the land surface.

- Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage systems including detention basins, swales or ditches. Snow combined with sand and debris may block a stormwater drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

Recommended Site Selection Procedures

It is important that the municipal Department of Public Works or Highway Department, Conservation Commission, and Board of Health work together to select appropriate snow disposal sites. The following steps should be taken:

- Estimate how much snow disposal capacity may be needed for the season so that an adequate number of disposal sites can be selected and prepared.
- Identify sites that could potentially be used for snow disposal, such as municipal open space (e.g., parking lots or parks).
- Select sites located in upland locations that are not likely to impact sensitive environmental resources first.
- If more storage space is still needed, prioritize the sites with the least environmental impact (using the site selection criteria, and local or MassGIS maps as a guide).

Snow Disposal Mapping Assistance

MassDEP has an online mapping tool to assist in identifying possible locations to potentially dispose of snow. MassDEP encourages municipalities to use this tool to identify possible snow disposal options. The tool identifies wetland resource areas, public drinking water supplies and other sensitive locations where snow should not be disposed. The tool may be accessed through the Internet at the following web address:
https://maps.env.state.ma.us/dep/arcgis/js/templates/PSF/.

2. SITE PREPARATION AND MAINTENANCE

In addition to carefully selecting disposal sites before the winter begins, it is important to prepare and maintain these sites to maximize their effectiveness. The following maintenance measures should be undertaken for all snow disposal sites:

- A silt fence or equivalent barrier should be placed securely on the downgradient side of the snow disposal site.
- Wherever possible maintain a 50-foot vegetated buffer between the disposal site and adjacent waterbodies to filter pollutants from the meltwater.
- Clear debris from the site prior to using the site for snow disposal.
- Clear debris from the site and properly dispose of it at the end of the snow season, and no later than May 15.

3. SNOW DISPOSAL APPROVALS

Proper snow disposal may be undertaken through one of the following approval procedures:

- Routine snow disposal – Minimal, if any, administrative review is required in these cases when upland and pervious snow disposal locations or upland locations on impervious surfaces that have functioning and maintained stormwater management systems have been identified, mapped, and used for snow disposal following ordinary snowfalls. Use of upland and pervious snow disposal sites avoids wetland resource areas and allows snow meltwater to recharge groundwater and will help filter pollutants, sand, and other debris. This process will address the majority of snow removal efforts until an entity exhausts all available upland snow disposal sites. The location and mapping of snow disposal sites will help facilitate each entity's routine snow management efforts.
- Emergency Certifications – If an entity demonstrates that there is no remaining capacity at upland snow disposal locations, local conservation commissions may issue an Emergency Certification under the Massachusetts Wetlands Protection regulations to authorize snow disposal in buffer zones to wetlands, certain open water areas, and certain wetland resource areas (i.e. within flood plains). Emergency Certifications can only be issued at the request of a public agency or by order of a public agency for the protection of the health or safety of citizens, and are limited to those activities necessary to abate the emergency. See 310 CMR 10.06(1)-(4). Use the following guidelines in these emergency situations:
    - Dispose of snow in open water with adequate flow and mixing to prevent ice dams from forming.
    - Do not dispose of snow in salt marshes, vegetated wetlands, certified vernal pools, shellfish beds, mudflats, drinking water reservoirs and their tributaries, Zone IIs or IWPAs of public water supply wells, Outstanding Resource Waters, or Areas of Critical Environmental Concern.
    - Do not dispose of snow where trucks may cause shoreline damage or erosion.
    - Consult with the municipal Conservation Commission to ensure that snow disposal in open water complies with local ordinances and bylaws.

- Severe Weather Emergency Declarations – In the event of a large-scale severe weather event, MassDEP may issue a broader Emergency Declaration under the Wetlands Protection Act which allows federal agencies, state agencies, state authorities, municipalities, and businesses greater flexibility in snow disposal practices. Emergency Declarations typically authorize greater snow disposal options while protecting especially sensitive resources such as public drinking water supplies, vernal pools, land containing shellfish, FEMA designated floodways, coastal dunes, and salt marsh. In the event of severe winter storm emergencies, the snow disposal site maps created by municipalities will enable MassDEP and the Massachusetts Emergency Management Agency (MEMA) in helping communities identify appropriate snow disposal locations.

  If upland disposal sites have been exhausted, the Emergency Declaration issued by MassDEP allows for snow disposal near water bodies. In these situations, a buffer of at least 50 feet, preferably vegetated, should still be maintained between the site and the waterbody. Furthermore, it is essential that the other guidelines for preparing and maintaining snow disposal sites be followed to minimize the threat to adjacent waterbodies.

Under extraordinary conditions, when all land-based snow disposal options are exhausted, the Emergency Declaration issued by MassDEP may allow disposal of snow in certain waterbodies under certain conditions. ***A federal agency, state agency, state authority, municipality or business seeking to dispose of snow in a waterbody should take the following steps***:

- Call the emergency contact phone number [(888) 304-1133)] and notify the MEMA of the municipality's intent.
- MEMA will ask for some information about where the requested disposal will take place.
- MEMA will confirm that the disposal is consistent with MassDEP's Severe Weather Emergency Declaration and these guidelines and is therefore approved.

During declared statewide snow emergency events, MassDEP's website will also highlight the emergency contact phone number [(888) 304-1133)] for authorizations and inquiries. For further non-emergency information about this Guidance you may contact your MassDEP Regional Office Service Center:

Northeast Regional Office, Wilmington, 978-694-3246
Southeast Regional Office, Lakeville, 508-946-2714
Central Regional Office, Worcester, 508-792-7650
Western Regional Office, Springfield, 413-755-2114

StormTech® SC-800 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

Nominal Chamber Specifications
(not to scale)

Size (L x W x H)
85.4” x 51” x 33”
2169 mm x 1295 mm x 838 mm

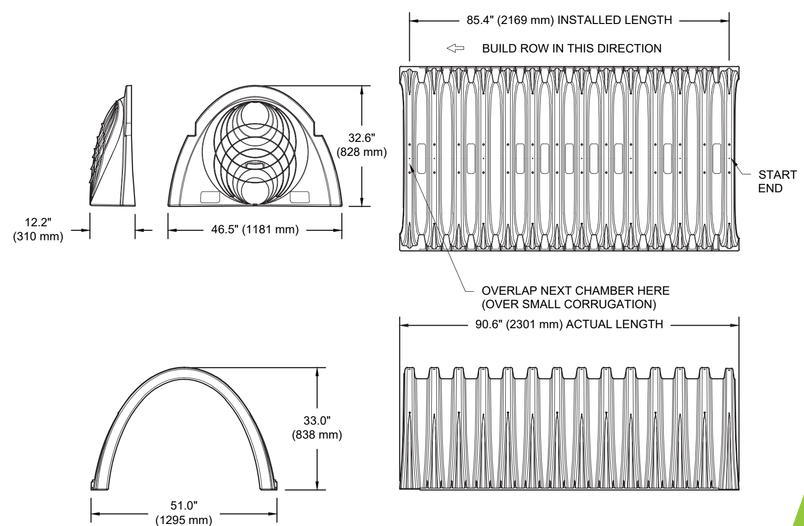
Chamber Storage
50.6 ft³ (1.43 m³)

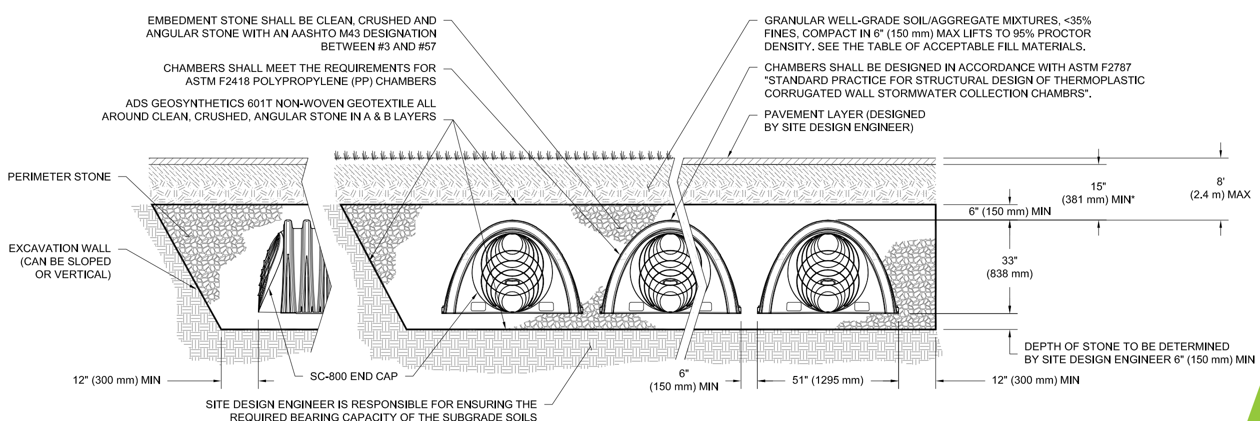
Min. Installed Storage*
81.0 ft³ (2.29 m³)

Weight
81.8 lbs (37.1 kg)

Shipping
30 chambers/pallet
60 end caps/pallet
12 pallets/truck

*Assumes 6” (150 mm) stone above, below and between chambers and 40% stone porosity.





*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 21" (533 mm).

ADS StormTech™

StormTech SC-800 Specifications

Cumulative Storage Volumes Per Chamber

Assumes 40% Stone Porosity. Calculations are Based Upon a 6" (150 mm) Stone Base Under Chambers.

Depth of Water in System Inches (mm)		Cumulative Chamber Storage ft^3 (m^3)	Total System Cumulative Storage ft^3 (m^3)
45 (1143)	Stone Cover	50.62 (1.433)	81.08 (2.296)
44 (1118)		50.62 (1.433)	79.96 (2.264)
43 (1092)		50.62 (1.433)	78.83 (2.232)
42 (1067)		50.62 (1.433)	77.70 (2.200)
41 (1041)		50.62 (1.433)	76.57 (2.168)
40 (1016)		50.62 (1.433)	75.44 (2.136)
39 (991)		50.62 (1.433)	74.31 (2.104)
38 (965)		50.55 (1.431)	73.14 (2.071)
37 (940)		50.35 (1.426)	71.90 (2.036)
36 (914)		50.07 (1.418)	70.60 (1.999)
35 (889)		49.56 (1.403)	69.17 (1.959)
34 (864)		48.82 (1.382)	67.60 (1.914)
33 (838)		47.93 (1.357)	65.94 (1.867)
32 (813)		46.91 (1.328)	64.20 (1.818)
31 (787)		45.79 (1.297)	62.40 (1.767)
30 (762)		44.58 (1.262)	60.55 (1.715)
29 (737)		43.28 (1.226)	58.65 (1.661)
28 (711)		41.91 (1.187)	56.70 (1.606)
27 (686)		40.47 (1.146)	54.71 (1.549)
26 (660)		38.96 (1.103)	52.68 (1.492)
25 (635)		37.40 (1.059)	50.61 (1.433)
24 (610)		35.78 (1.013)	48.51 (1.374)
23 (584)		34.10 (0.966)	46.38 (1.313)
22 (559)		32.38 (0.917)	44.22 (1.252)
21 (533)		30.61 (0.867)	42.03 (1.190)
20 (508)		28.80 (0.816)	39.82 (1.128)
19 (483)		26.95 (0.763)	37.58 (1.064)
18 (457)		25.06 (0.710)	35.32 (1.000)
17 (432)		23.13 (0.655)	33.04 (0.936)
16 (406)		21.17 (0.599)	30.74 (0.870)
15 (381)		19.17 (0.543)	28.42 (0.805)
14 (356)		17.14 (0.485)	26.08 (0.739)
13 (330)		15.09 (0.427)	23.72 (0.672)
12 (305)		13.00 (0.368)	21.34 (0.604)
11 (279)		10.89 (0.308)	18.95 (0.537)
10 (254)		8.76 (0.248)	16.54 (0.468)
9 (229)		6.60 (0.187)	14.12 (0.400)
8 (203)		4.42 (0.125)	11.69 (0.331)
7 (178)		2.22 (0.063)	9.24 (0.262)
6 (152)	Stone Foundation	0 (0)	6.78 (0.192)
5 (127)		0 (0)	5.65 (0.160)
4 (102)		0 (0)	4.52 (0.128)
3 (76)		0 (0)	3.39 (0.096)
2 (51)		0 (0)	2.26 (0.064)
1 (25)		0 (0)	1.13 (0.032)

Note: Add 1.13 ft^3 (0.032 m^3) of storage for each additional inch (25 mm) of stone foundation.

Storage Volume Per Chamber ft^3 (m^3)

	Bare Chamber Storage ft^3 (m^3)	Chamber and Stone Foundation Depth in. (mm)		
		6 (150)	12 (300)	18 (450)
SC-800 Chamber	50.6 (1.43)	81.0 (2.29)	87.8 (2.48)	94.6 (2.6)

Note: Assumes 6" (150 mm) stone above chambers, 6" (150 mm) row spacing and 40% stone porosity.

Amount of Stone Per Chamber

English Tons (yds^3)	Stone Foundation Depth		
	6"	12"	18"
SC-800	3.9 (2.8)	4.8 (3.4)	5.7 (4.1)
Metric Kilograms (m^3)	**150 mm**	**300 mm**	**450 mm**
SC-800	3580 (2.2)	4380 (2.6)	5170 (3.1)

Note: Assumes 6" (150 mm) of stone above and between chambers.

Volume Excavation Per Chamber yd^3 (m^3)

	Stone Foundation Depth		
	6" (150 mm)	12" (300 mm)	18" (450 mm)
SC-800	5.6 (4.3)	6.3 (4.8)	6.9 (5.3)

Note: Assumes 6" (150 mm) of row separation and 15" (375 mm) of cover. The volume of excavation will vary as depth of cover increases.

ADS StormTech products, manufactured in accordance with ASTM F2418 or ASTMF2922, comply with all requirements in the Build America, Buy America (BABA) Act.

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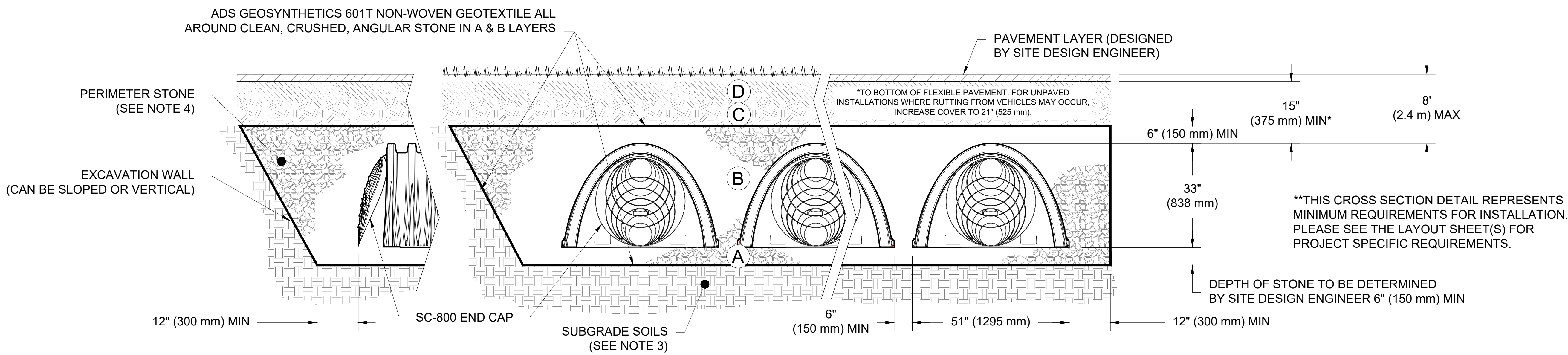
ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 15" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:

1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-800 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

STANDARD CROSS SECTION
SC-800 CHAMBER

DATE: 01/10/24 | DRAWN: JLM
PROJECT #: | CHECKED: JLM

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DATE	DRWN	CHKD	DESCRIPTION

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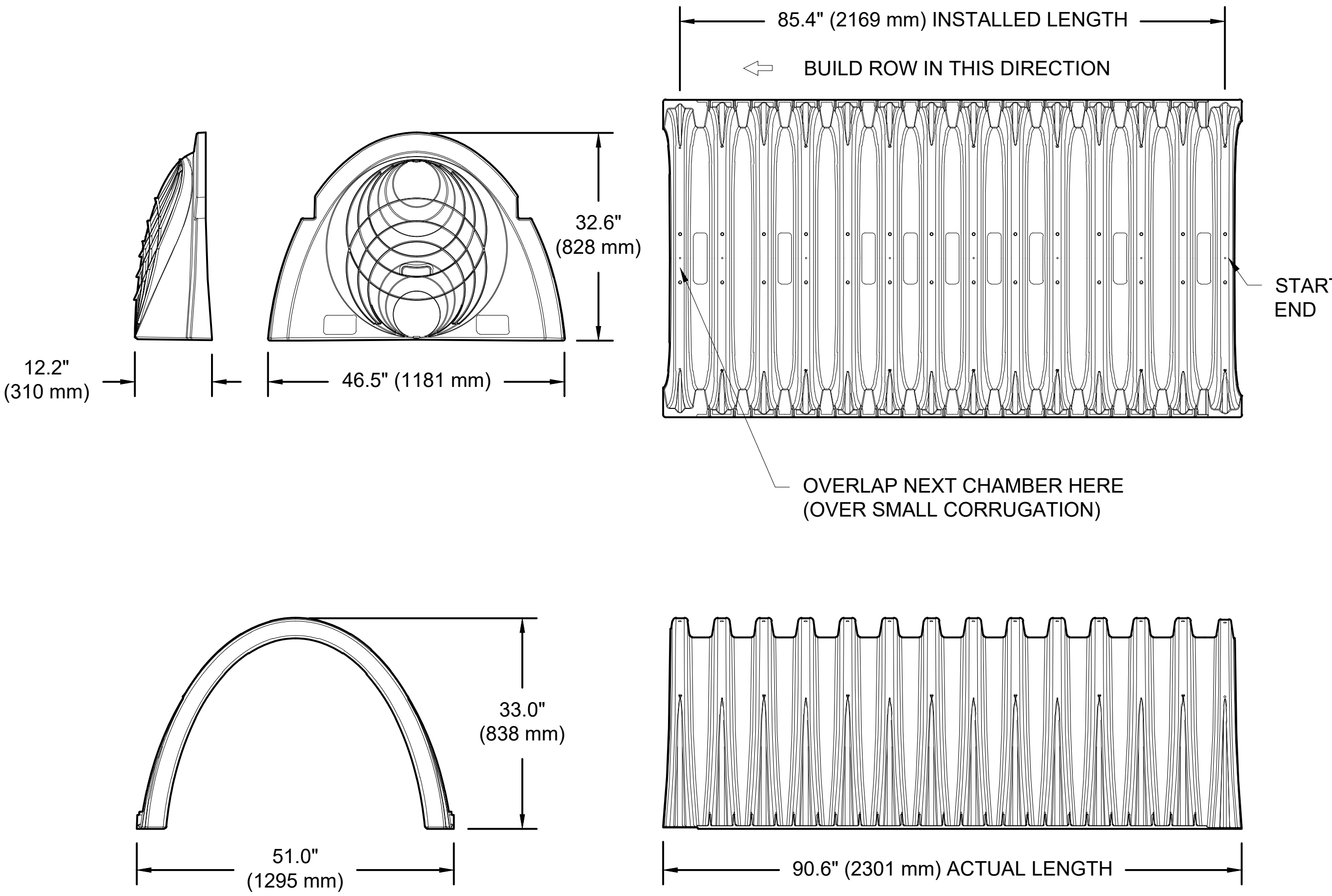
SHEET 1 OF 1

SC-800 TECHNICAL SPECIFICATION

NTS



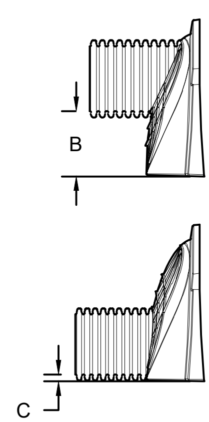
NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 33.0" X 85.4"	(1295 mm X 838 mm X 2169 mm)
CHAMBER STORAGE	50.6 CUBIC FEET	(1.43 m³)
MINIMUM INSTALLED STORAGE*	81.0 CUBIC FEET	(2.29 m³)
WEIGHT	81.8 lbs.	(37.1 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-CORED HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-CORED HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	B	C
SC800EPE06TPC	6" (150 mm)	21.4" (544 mm)	---
SC800EPE06BPC		---	0.9" (23 mm)
SC800EPE08TPC	8" (200 mm)	19.2" (488 mm)	---
SC800EPE08BPC		---	1.0" (25 mm)
SC800EPE10TPC	10" (250 mm)	17.0" (432 mm)	---
SC800EPE10BPC		---	1.2" (30 mm)
SC800EPE12TPC	12" (300 mm)	14.4" (366 mm)	---
SC800EPE12BPC		---	1.6" (41 mm)
SC800EPE15TPC	15" (375 mm)	11.3" (287 mm)	---
SC800EPE15BPC		---	1.7" (43 mm)
SC800EPE18TPC	18" (450 mm)	8.0" (203 mm)	---
SC800EPE18BPC		---	2.0" (51 mm)
SC800EPE24BPC	24" (600 mm)	---	2.3" (58 mm)
SC800EPE	NONE	SOLID END CAP	



NOTE: ALL DIMENSIONS ARE NOMINAL

TECHNICAL SPECIFICATIONS
SC-800 CHAMBER

DATE: 01/12/24
DRAWN: JLM
PROJECT #:
CHECKED: JLM

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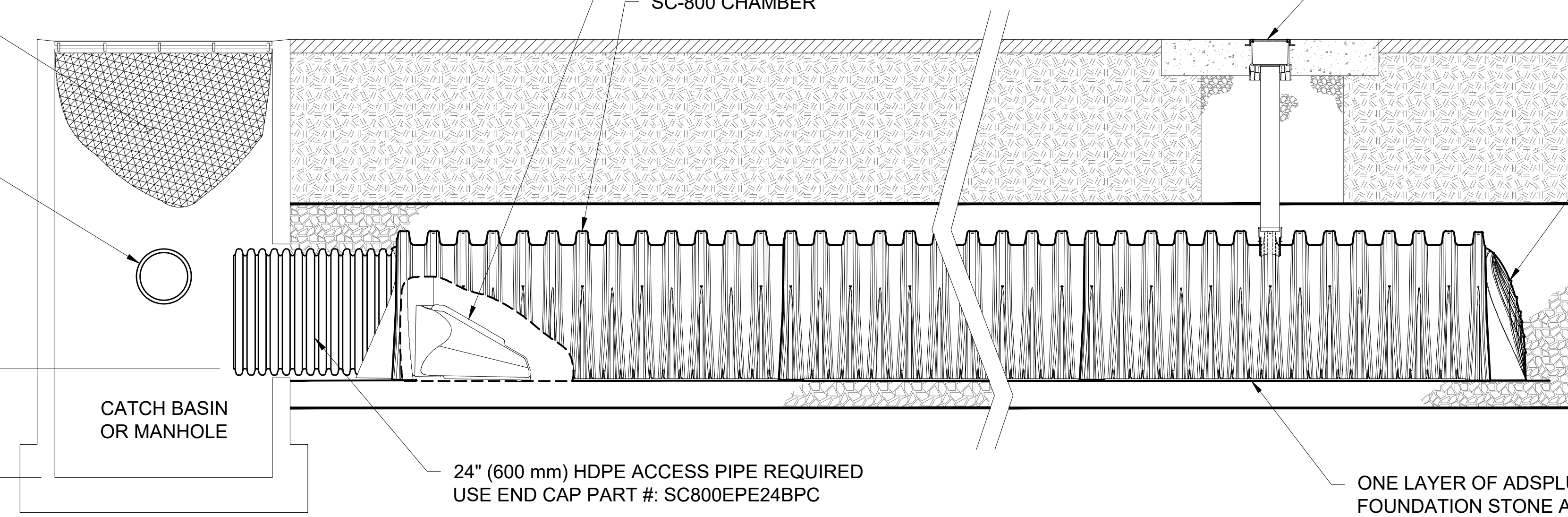


SC-800 ISOLATOR ROW PLUS DETAIL

NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

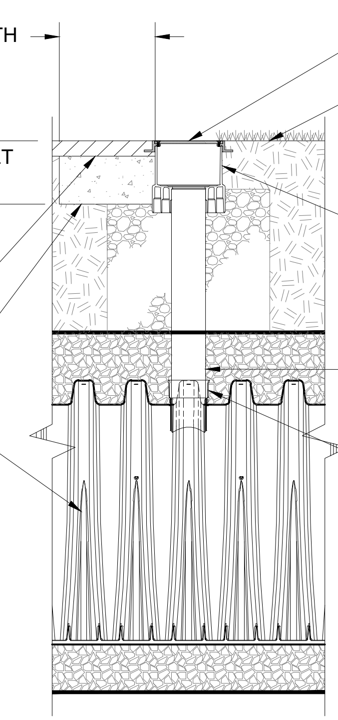
STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" PVC INSPECTION PORT DETAIL
(SC SERIES CHAMBER)

NTS

ISOLATOR ROW PLUS
SC-800 CHAMBER

DATE: 11/14/23 | DRAWN: JLM
PROJECT #: | CHECKED: CJD

DATE	DRWN	CHKD	DESCRIPTION
01/12/24	JLM	JLM	UPDATE END CAP CALLOUT

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SHEET 1 OF 1

Isolator® Row Plus
O&M Manual

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS), Total Phosphorus (TP), Total Petroluem Hydrocarbons (TPH) and Total Nitrogen (TN) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, SC-800, MC-3500, MC-4500 or MC-7200 models, are lined with filter fabric and connected to a closely located manhole for easy access. The fabric lined chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers allow stormwater to flow vertically out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS Isolator Row and Plus fabric are placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting.

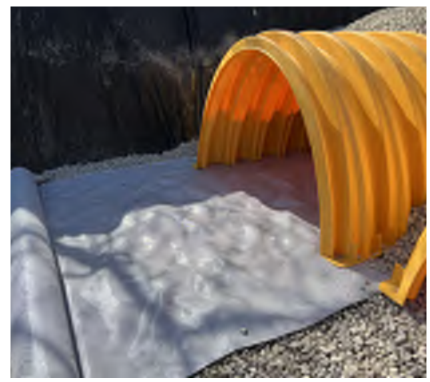
The Isolator Row Plus is designed to capture the “first flush” runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row Plus Flamp™ is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end, or more difficult to remove and require confined space entry into the chamber area. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

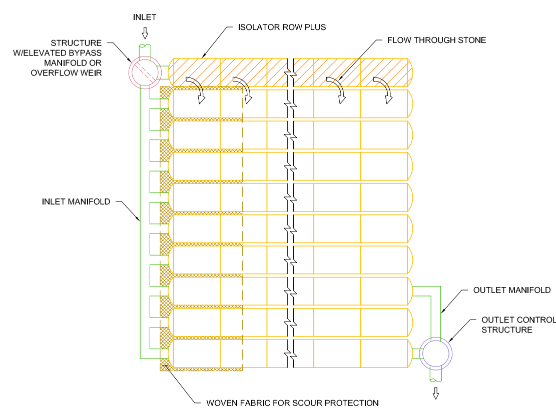
The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*

Looking down the Isolator Row Plus from the manhole opening, ADS Plus Fabric is shown between the chamber and stone base.



StormTech Isolator Row Plus with Overflow Structure (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

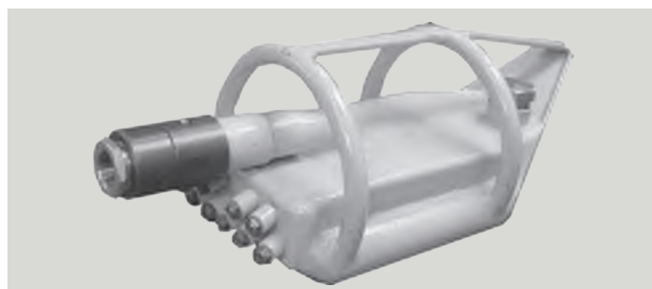
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3" (75 mm) throughout the length of the Isolator Row Plus, clean-out should be performed.

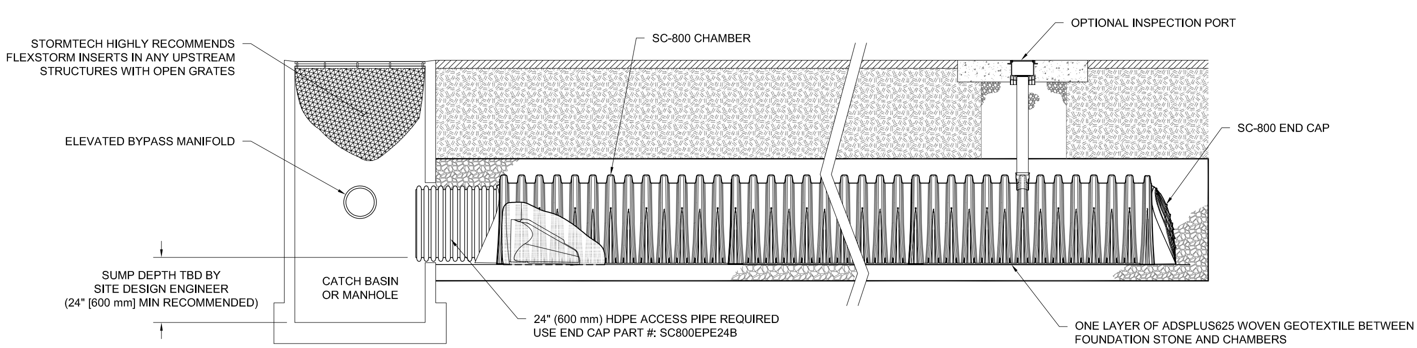
Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entry.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**



StormTech Isolator Row Plus (*not to scale*)



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

A) Inspection ports (if present)
   i. Remove lid from floor box frame
   ii. Remove cap from inspection riser
   iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
   iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Row Plus
   i. Remove cover from manhole at upstream end of Isolator Row Plus
   ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
      1. Mirrors on poles or cameras may be used to avoid a confined space entry
      2. Follow OSHA regulations for confined space entry if entering manhole
   iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
   If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

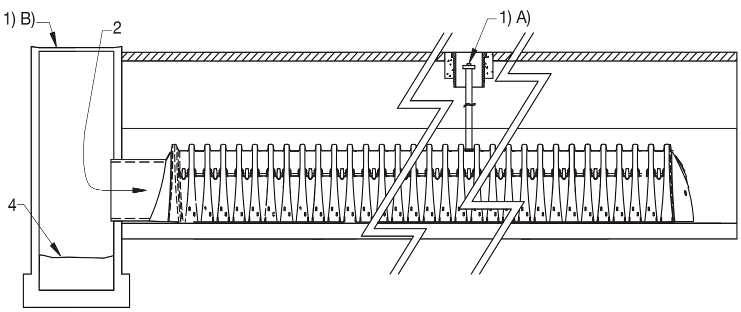
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row Plus, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

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StormTech® Installation Guide
SC-310/SC-740/DC-780/SC-800

StormTech
Installation Video

Required Materials and Equipment List

- Acceptable fill materials per Table 1
- ADS Plus and non-woven geotextile fabrics
- StormTech solid end caps and pre-cored end caps
- StormTech chambers
- StormTech manifolds and fittings

Important Notes:

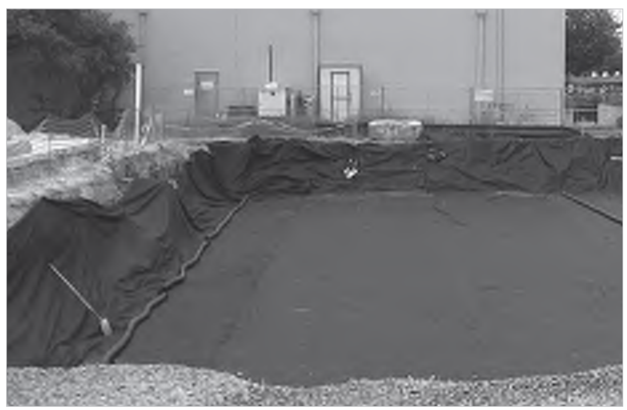
A. This installation guide provides the minimum requirements for proper installation of chambers. Non-adherence to this guide may result in damage to chambers during installation. Replacement of damaged chambers during or after backfilling is costly and very time consuming. It is recommended that all installers are familiar with this guide, and that the contractor inspects the chambers for distortion, damage and joint integrity as work progresses.

B. Use of a dozer to push embedment stone between the rows of chambers may cause damage to chambers and is not an acceptable backfill method. Any chambers damaged by using the “dump and push” method are not covered under the StormTech standard warranty.

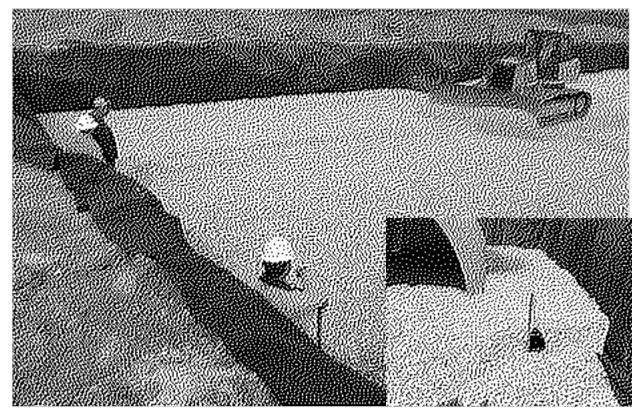
C. Care should be taken in the handling of chambers and end caps. Avoid dropping, prying or excessive force on chambers during removal from pallet and initial placement.

Requirements for System Installation

Excavate bed and prepare subgrade per engineer’s plans.



Place non-woven geotextile over prepared soils and up excavation walls. Install underdrains if required.



Place clean, crushed, angular stone foundation 6” (150 mm) min. Compact to achieve a flat surface.

Manifold, Scour Fabric and Chamber Assembly

Install manifolds and lay out ADS Plus fabric at inlet rows (min. 12.5 ft (3.8 m)) at each inlet end cap. Place a continuous piece along entire length of Isolator® Plus Row(s).

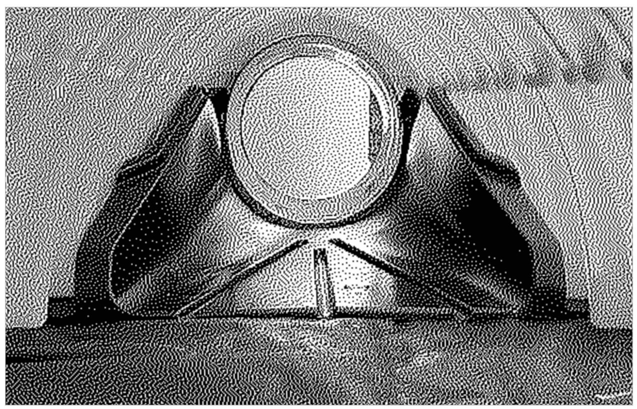
Align the first chamber and end cap of each row with inlet pipes. Contractor may choose to postpone stone placement around end chambers and leave ends of rows open for easy inspection of chambers during the backfill process.

Continue installing chambers by overlapping chamber end corrugations. Chamber joints are labeled "Lower Joint – Overlap Here" and "Build this direction – Upper Joint" Be sure that the chamber placement does not exceed the reach of the construction equipment used to place the stone. Maintain minimum 6" (150 mm) spacing between rows.

Attaching the End Caps

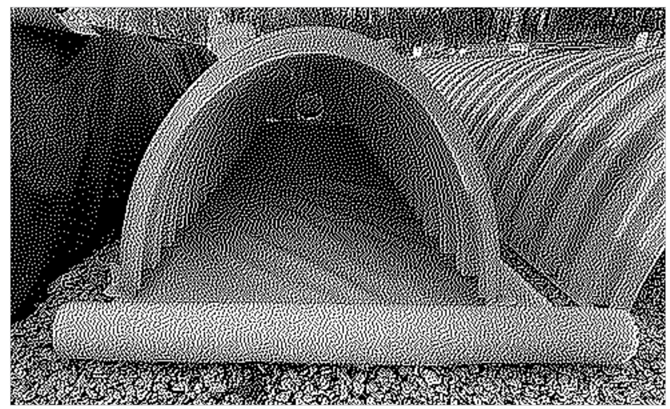
Lift the end of the chamber a few inches off the ground. With the curved face of the end cap facing outward, place the end cap into the chamber's end corrugation.

Prefabricated End Caps



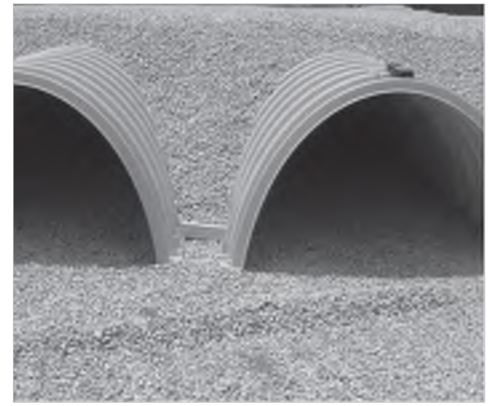
24" (600 mm) inlets are the maximum size that can fit into a SC-740/DC-780/SC-800 end cap and must be prefabricated with a 24" (600 mm) pipe stub. SC-310 chambers with a 12" (300 mm) inlet pipe must use a prefabricated end cap with a 12" (300 mm) pipe stub. When used on an Isolator Row Plus, these end caps will contain a welded Flamp (flared end ramp) that will lay on top of the ADS Plus fabric (shown above)

Isolator Row Plus



Place a continuous layer of ADS Plus fabric between the foundation stone and the Isolator Row Plus chambers, making sure the fabric lays flat and extends the entire width of the chamber feet.

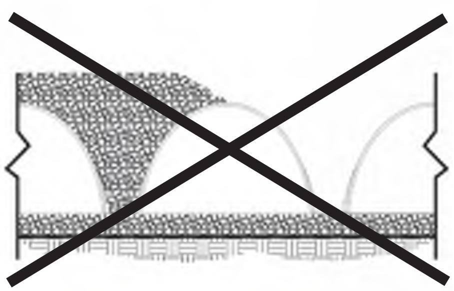
Initial Anchoring of Chambers – Embedment Stone



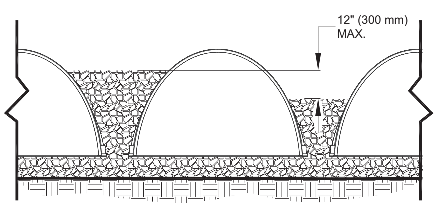
Initial embedment shall be spotted along the center line of the chamber evenly anchoring the lower portion of the chamber. This is best accomplished with a stone conveyor or excavator reaching along the row.

No equipment shall be operated on the bed at this stage of the installation. Excavators must be located off the bed. Dump trucks shall not dump stone directly on to the bed. Dozers or loaders are not allowed on the bed at this time.

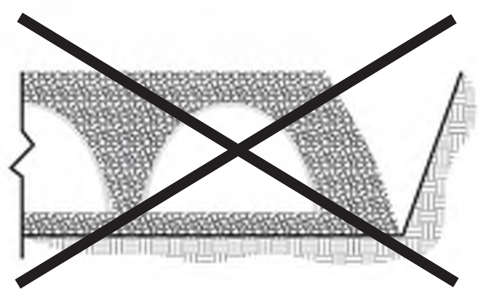
Backfill of Chambers – Embedment Stone



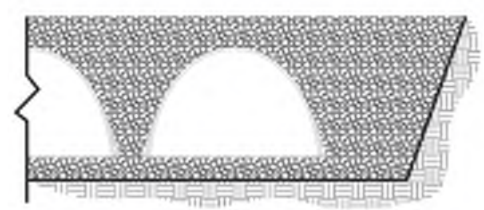
Uneven Backfill



Even Backfill



Perimeter Not Backfilled



Perimeter Fully Backfilled

Backfill chambers evenly. Stone column height should never differ by more than 12" (300 mm) between adjacent chamber rows or between chamber rows and perimeter.

Perimeter stone must be brought up evenly with chamber rows. Perimeter must be fully backfilled, with stone extended horizontally to the excavation wall.

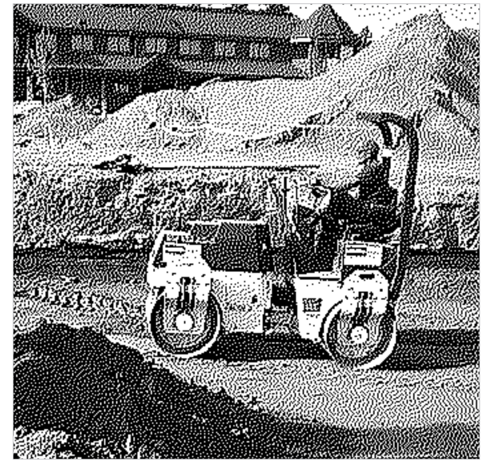
ADS StormTech™

Backfill - Embedment Stone & Cover Stone

Continue evenly backfilling between rows and around perimeter until embedment stone reaches tops of chambers. Perimeter stone must extend horizontally to the excavation wall for both straight or sloped sidewalls. **Only after chambers have been backfilled to top of chamber and with a minimum 6" (150 mm) of cover stone on top of chambers can small dozers be used over the chambers for backfilling remaining cover stone.**

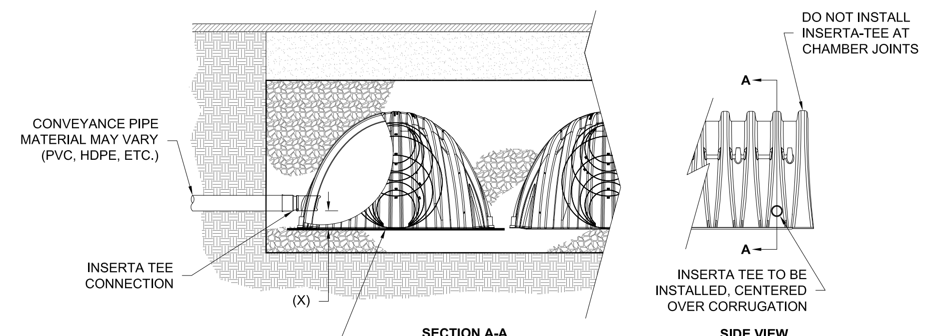
Small dozers and skid loaders may be used to finish grading stone backfill in accordance with ground pressure limits in Table 2. They must push material parallel to rows only. Never push perpendicular to rows. StormTech recommends that the contractor inspect chambers before placing final backfill. Any chambers damaged by construction shall be removed and replaced.

Final Backfill of Chambers – Fill Material



Install non-woven geotextile over stone. Geotextile must overlap 24" (600 mm) min. where edges meet. Compact each lift of backfill as specified in the site design engineer's drawings. Roller travel parallel with rows.

Inserta Tee Detail



CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
SC-800	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

NOTES:
- PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.
- CONTACT ADS ENGINEERING SERVICES IF INSERTA TEE INLET MUST BE RAISED AS NOT ALL INVERTS ARE POSSIBLE.

StormTech Isolator Row Plus Detail

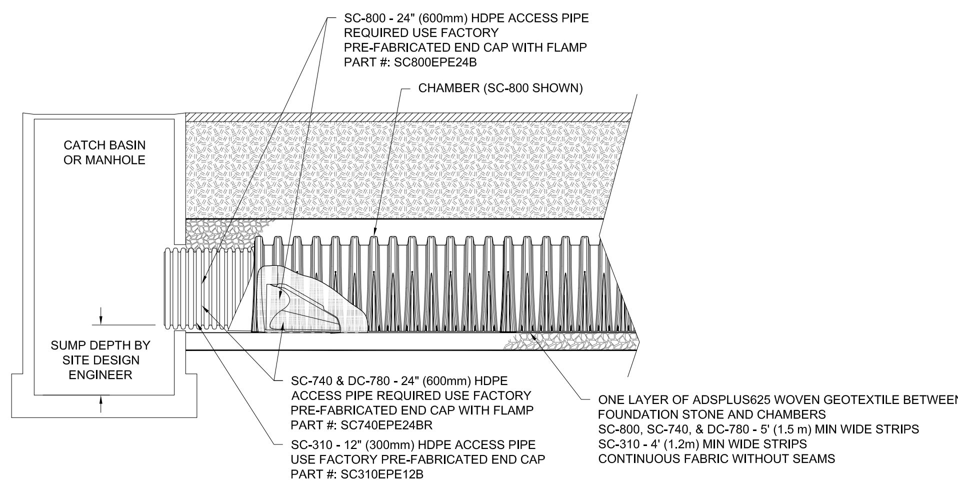


Table 1- Acceptable Fill Materials

Material Location	Description	AASHTO M43 Designation[1]	Compaction/Density Requirement
(D) **Final Fill:** Fill Material for layer 'D' starts from the top of the 'C' layer to the bottom of flexible pavement or unpaved finished grade above. Note that the pavement subbase may be part of the 'D' layer.	Any soil/rock materials, native soils or per engineer's plans. Check plans for pavement subgrade requirements.	N/A	Prepare per site design engineer's plans. Paved installations may have stringent material and preparation requirements.
(C) **Initial Fill:** Fill Material for layer 'C' starts from the top of the embedment stone ('B' layer) to 18" (450 mm) above the top of the chamber. Note that pavement subbase may be part of the 'C' layer.	Granular well-graded soil/aggregate mixtures, <35% fines or processed aggregate. Most pavement subbase materials can be used in lieu of this layer.	AASHTO M45 A-1, A-2-4, A-3 or AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	Begin compaction after min. 12" (300 mm) of material over the chambers is reached. Compact additional layers in 6" (150 mm) max. lifts to a min. 95% Proctor density for well-graded material and 95% relative density for processed aggregate materials. Roller gross vehicle weight not to exceed 12,000 lbs (53 kN). Dynamic force not to exceed 20,000 lbs (89 kN)
(B) **Embedment Stone:** Embedment Stone surrounding chambers from the foundation stone to the 'C' layer above.	Clean, crushed, angular stone or Recycled Concrete[4]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	No compaction required.
(A) **Foundation Stone:** Foundation Stone below the chambers from the subgrade up to the foot (bottom) of the chamber.	Clean, crushed, angular stone or Recycled Concrete[4]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	Place and compact in 6" (150 mm) lifts using two full coverages with a vibratory compactor.[2, 3]

Please Note:

1. The listed AASHTO designations are for gradations only. The stone must also be clean, crushed, angular. For example, a specification for #4 stone would state: "clean, crushed, angular no. 4 (AASHTO M43) stone".
2. StormTech compaction requirements are met for 'A' location materials when placed and compacted in 6" (150 mm) (max) lifts using two full coverages with a vibratory compactor.
3. Where infiltration surfaces may be comprised by compaction, for standard installations and standard design load conditions, a flat surface may be achieved by raking or dragging without compaction equipment. For special load designs, contact StormTech for compaction requirements.
4. Where recycled concrete aggregate is used in layers 'A' or 'B' the material should also meet the acceptable criteria outlined in ADS Technical Note 6.20 "Recycled Concrete Structural Backfill".

Figure 1- Inspection Port Detail

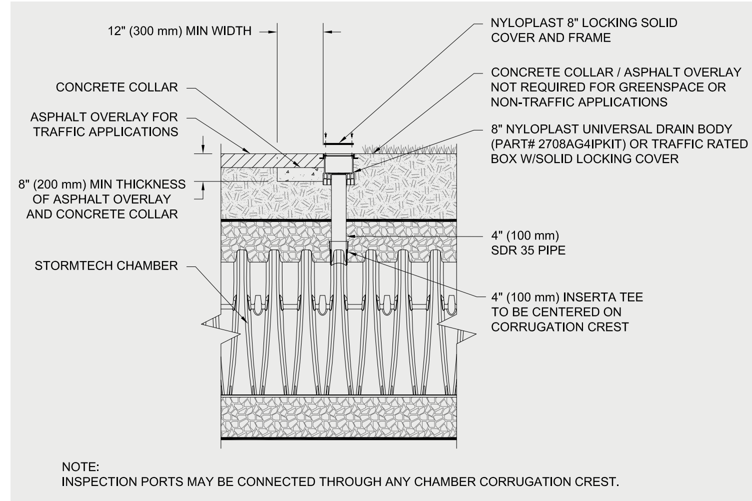
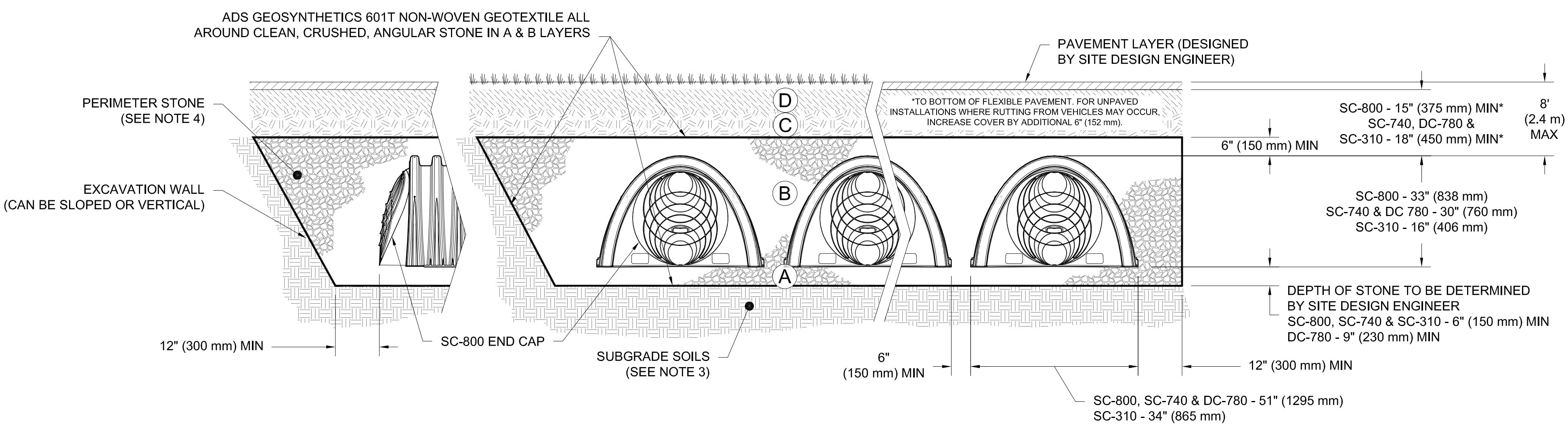


Figure 2 - Fill Material Locations



Notes:

1. 36” (900 mm) of stabilized cover materials over the chambers is recommended during the construction phase if general construction activities, such as full dump truck travel and dumping, are to occur over the bed.
2. During paving operations, dump truck axle loads on 18” (450 mm) of cover may be necessary. Precautions should be taken to avoid rutting of the road base layer, to ensure that compaction requirements have been met, and that a minimum of 18” (450 mm) of cover exists over the chambers. Contact StormTech for additional guidance on allowable axle loads during paving.
3. Ground pressure for track dozers is the vehicle operating weight divided by total ground contact area for both tracks. Excavators will exert higher ground pressures based on loaded bucket weight and boom extension.
4. Mini-excavators (< 8,000 lbs/3,628 kg) can be used with at least 12” (300 mm) of stone over the chambers and are limited by the maximum ground pressures in Table 2 based on a full bucket at maximum boom extension.
5. Storage of materials such as construction materials, equipment, spoils, etc. should not be located over the StormTech system. The use of equipment over the StormTech system not covered in Table 2 (ex. soil mixing equipment, cranes, etc) is limited. Please contact StormTech for more information.
6. Allowable track loads based on vehicle travel only. Excavators shall not operate on chamber beds until the total backfill reaches 3 feet (900 mm) over the entire bed.

Table 2 - Maximum Allowable Construction Vehicle Loads[6]

Material Location	Fill Depth over Chambers in. (mm)	Maximum Allowable Wheel Loads		Maximum Allowable Track Loads[6]		Maximum Allowable Roller Loads
		Max Axle Load for Trucks lbs (kN)	Max Wheel Load for Loaders lbs (kN)	Track Width in. (mm)	Max Ground Pressure psf (kPa)	Max Drum Weight or Dynamic Force lbs (kN)
Ⓓ Final Fill Material	36” (900) Compacted	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	3880 (186) 2640 (126) 2040 (97) 1690 (81) 1470 (70)	38,000 (169)
Ⓒ Initial Fill Material	24” (600) Compacted	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	2690 (128) 1880 (90) 1490 (71) 1280 (61) 1150 (55)	20,000 (89)
	24” (600) Loose/ Dumped	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	2390 (114) 1700 (81) 1370 (65) 1190 (57) 1080 (51)	20,000 (89) Roller gross vehicle weight not toexceed 12,000 lbs. (53 kN)
	18” (450)	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	2110 (101) 1510 (72) 1250 (59) 1100 (52) 1020 (48)	20,000 (89) Roller gross vehicle weight not to exceed 12,000 lbs. (53 kN)
Ⓑ Embedment Stone	12” (300)	16,000 (71)	NOT ALLOWED	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	1540 (74) 1190 (57) 1010 (48) 910 (43) 840 (40)	20,000 (89) Roller gross vehicle weight not to exceed 12,000 lbs. (53 kN)
	6” (150)	8,000 (35)	NOT ALLOWED	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	1070 (51) 900 (43) 800 (38) 760 (36) 720 (34)	NOT ALLOWED

Table 3 - Placement Methods and Descriptions

Material Location	Placement Methods/ Restrictions	Wheel Load Restrictions	Track Load Restrictions	Roller Load Restrictions
		See Table 2 for Maximum Construction Loads		
Ⓓ Final Fill Material	A variety of placement methods may be used. All construction loads must not exceed the maximum limits in Table 2.	36” (900 mm) minimum cover required for dump trucks to dump over chambers.	Dozers to push parallel to rows until 36” (900mm) compacted cover is reached.[4]	Roller travel parallel to rows only until 36” (900 mm) compacted cover is reached.
Ⓒ Initial Fill Material	Excavator positioned off bed recommended. Small excavator allowed over chambers. Small dozer allowed.	Asphalt can be dumped into paver when compacted pavement subbase reaches 18” (450 mm) above top of chambers.	Small LGP track dozers & skid loaders allowed to grade cover stone with at least 6” (150 mm) stone under tracks at all times. Equipment must push parallel to rows at all times.	Use dynamic force of roller only after compacted fill depth reaches 12” (300 mm) over chambers. Roller travel parallel to chamber rows only.
Ⓑ Embedment Stone	No equipment allowed on bare chambers. Use excavator or stone conveyor positioned off bed or on foundation stone to evenly fill around all chambers to at least the top of chambers.	No wheel loads allowed. Material must be placed outside the limits of the chamber bed.	No tracked equipment is allowed on chambers until a min. 6” (150 mm) cover stone is in place.	No rollers allowed.
Ⓐ Foundation Stone	No StormTech restrictions. Contractor responsible for any conditions or requirements by others relative to subgrade bearing capacity, dewatering or protection of subgrade.			

StormTech® Standard Limited Warranty

STANDARD LIMITED WARRANTY OF STORMTECH LLC (“STORMTECH”): PRODUCTS

(A) This Limited Warranty applies solely to the StormTech chambers and end plates manufactured by StormTech and sold to the original purchaser (the “Purchaser”). The chambers and end plates are collectively referred to as the “Products.”

(B) The structural integrity of the Products, when installed strictly in accordance with StormTech’s written installation instructions at the time of installation, are warranted to the Purchaser against defective materials and workmanship for one (1) year from the date of purchase. Should a defect appear in the Limited Warranty period, the Purchaser shall provide StormTech with written notice of the alleged defect at StormTech’s corporate headquarters within ten (10) days of the discovery of the defect. The notice shall describe the alleged defect in reasonable detail. StormTech agrees to supply replacements for those Products determined by StormTech to be defective and covered by this Limited Warranty. The supply of replacement products is the sole remedy of the Purchaser for breaches of this Limited Warranty. StormTech’s liability specifically excludes the cost of removal and/or installation of the Products.

(C) THIS LIMITED WARRANTY IS EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE PRODUCTS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

(D) This Limited Warranty only applies to the Products when the Products are installed in a single layer. UNDER NO CIRCUMSTANCES, SHALL THE PRODUCTS BE INSTALLED IN A MULTI-LAYER CONFIGURATION.

(E) No representative of StormTech has the authority to change this Limited Warranty in any manner or to extend this Limited Warranty. This Limited Warranty does not apply to any person other than to the Purchaser.

(F) Under no circumstances shall StormTech be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the Products, or the cost of other goods or services related to the purchase and installation of the Products. For this Limited Warranty to apply, the Products must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and StormTech’s written installation instructions.

(G) THE LIMITED WARRANTY DOES NOT EXTEND TO INCIDENTAL, CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES. STORMTECH SHALL NOT BE LIABLE FOR PENALTIES OR LIQUIDATED DAMAGES, INCLUDING LOSS OF PRODUCTION AND PROFITS; LABOR AND MATERIALS; OVERHEAD COSTS; OR OTHER LOSS OR EXPENSE INCURRED BY THE PURCHASER OR ANY THIRD PARTY. SPECIFICALLY EXCLUDED FROM LIMITED WARRANTY COVERAGE ARE DAMAGE TO THE PRODUCTS ARISING FROM ORDINARY WEAR AND TEAR; ALTERATION, ACCIDENT, MISUSE, ABUSE OR NEGLECT; THE PRODUCTS BEING SUBJECTED TO VEHICLE TRAFFIC OR OTHER CONDITIONS WHICH ARE NOT PERMITTED BY STORMTECH’S WRITTEN SPECIFICATIONS OR INSTALLATION INSTRUCTIONS; FAILURE TO MAINTAIN THE MINIMUM GROUND COVERS SET FORTH IN THE INSTALLATION INSTRUCTIONS; THE PLACEMENT OF IMPROPER MATERIALS INTO THE PRODUCTS; FAILURE OF THE PRODUCTS DUE TO IMPROPER SITING OR IMPROPER SIZING; OR ANY OTHER EVENT NOT CAUSED BY STORMTECH. A PRODUCT ALSO IS EXCLUDED FROM LIMITED WARRANTY COVERAGE IF SUCH PRODUCT IS USED IN A PROJECT OR SYSTEM IN WHICH ANY GEOTEXTILE PRODUCTS OTHER THAN THOSE PROVIDED BY ADVANCED DRAINAGE SYSTEMS ARE USED. THIS LIMITED WARRANTY REPRESENTS STORMTECH’S SOLE LIABILITY TO THE PURCHASER FOR CLAIMS RELATED TO THE PRODUCTS, WHETHER THE CLAIM IS BASED UPON CONTRACT, TORT, OR OTHER LEGAL THEORY.

adspipe.com
800-821-6710

Drainage Filtration Separation

ADS 0601T/O NONWOVEN GEOTEXTILE SPECIFICATION

Scope

This specification describes ADS 0601T/O nonwoven geotextile.

Filter Fabric Requirements

ADS 0601T/O is an orange nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. ADS 0601T/O is inert to biological degradation and resists naturally encountered chemicals, alkali and acids. ADS 0601T/O conforms to the physical property values listed below:

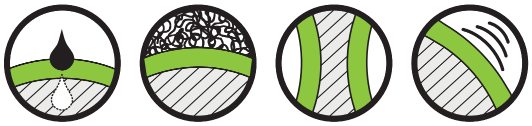
Filter Fabric Properties

Property	Test Method	Unit	Typical Value[1] MD	Typical Value[1] CD
Grab Tensile Strength	ASTM D4632	lbs (N)	175 (779)	175 (779)
Grab Tensile Elongation	ASTM D4632	%	75	75
Trapezoid Tear Strength	ASTM D4533	lbs (N)	85 (378)	85 (378)
CBR Puncture Strength	ASTM D6241	lbs (N)	480 (2136)	480 (2136)
Permittivity	ASTM D4491	sec^{-1}	1.5	1.5
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	105 (4278)	105 (4278)
UV Resistance (at 500 hours)[1]	ASTM D4355	% strength retained	80	80

Physical Properties

Property	Test Method	Unit	Typical Value[2]
Weight	ASTM D5161	oz/yd^2 (g/m^2)	6.5 (220)
Thickness	ASTM D5199	mils (mm)	65 (1.7)
Roll Dimensions (W x L)	-	ft (m)	15 x 300 (4.5 x 91)
Roll Area	-	yd^2 (m^2)	500 (418)
Estimated Roll Weight	-	lb (kg)	220 (100)

1 Modified, Minimum Test Value
2 ASTM D4439 Standard Terminology for Geosynthetics: typical value, n-*for geosynthetics*, the mean value calculated from documented manufacturing quality control test results for a defined population obtained from one test method associated with on specific property.



Filtration Separation Confinement Reinforcement

ADS PLUS WOVEN GEOTEXTILE SPECIFICATION

For use with StormTech® Isolator® Row Plus

Scope

This specification describes ADS Plus woven geotextile.

ADS Plus woven geotextile fabrics are woven polypropylene materials offering optimum performance when used in stabilization applications. Produced from first quality raw materials, they provide the perfect balance of strength and separation in styles capable of functioning exceptionally well in a wide range of performance requirements.

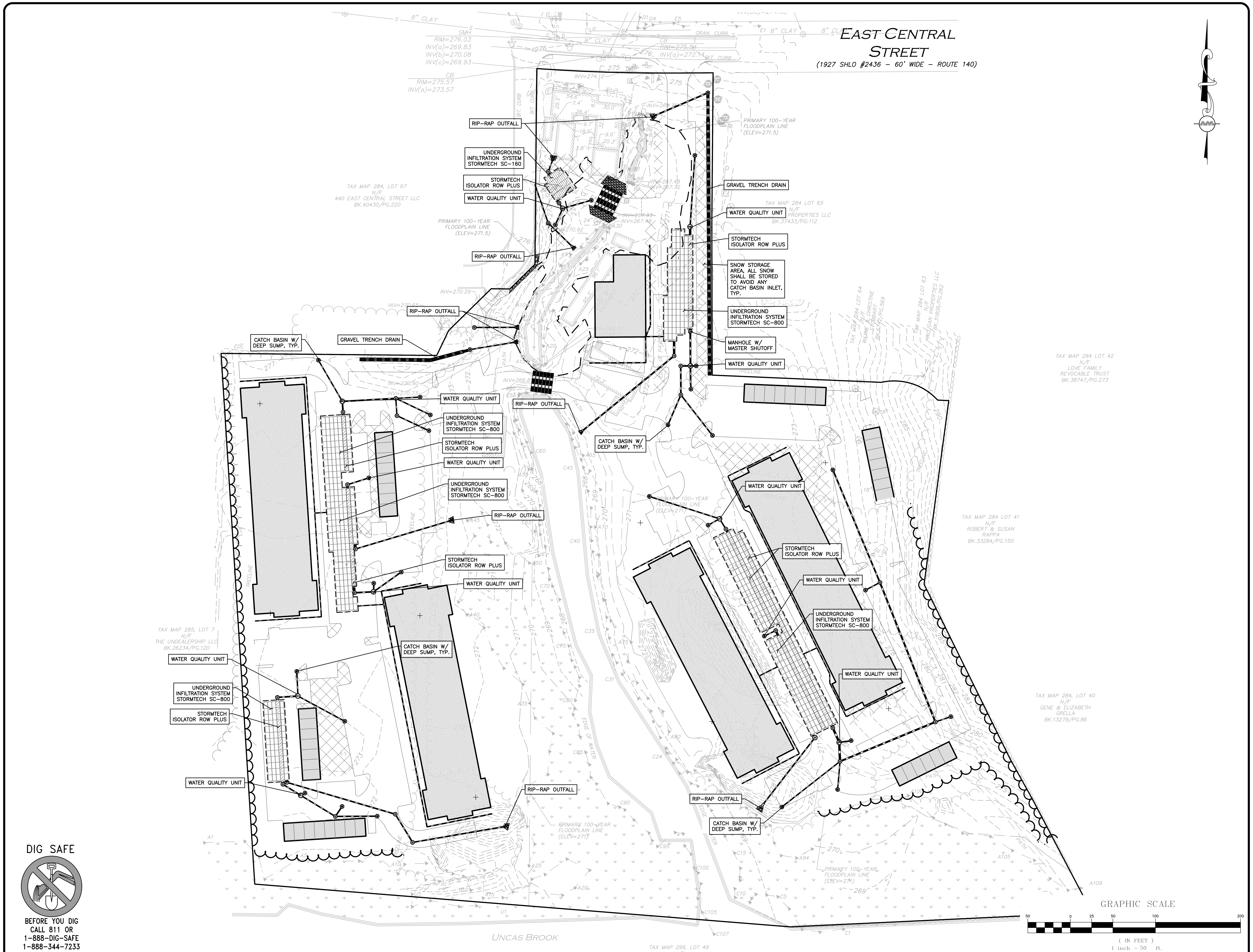
Filter Fabric Properties

Property[1]	Test Method	Unit	M.A.R.V. (Minimum Average Roll Value)[2]
Weight	ASTM D5261	oz/yd^2 (g/m^2)	8.0 (271.25)
Grab Tensile Strength	ASTM D4632	lbs (kN)	325 (1.45)
Grab Elongation	ASTM D4632	%	15
Trapezoidal Tear Strength	ASTM D4533	lbs (kN)	125 (0.89)
CBR Puncture Resistance	ASTM D6241	lbs (kN)	1,124 (5.0)

1. The property values listed above are subject to change without notice.
2. Minimum Average Roll Values (MARV) is calculated as the average minus two standard deviations. Statistically, it yields approximately 97.5% degree of confidence that any samples taken from quality assurance testing will meet or exceed the values described above.

Dimensions

ADS Plus shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 12.5’ (3.8 m) width x 360’ (110 m) length for Plus125 and 6.25’ (1.9 m) width x 360’ (110 m) length for Plus625.



ISSUED FOR DRAINAGE REPORT
SEPTEMBER 18, 2025

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
C	9/18/25	REVISED PER NOI PEER REVIEW
B	7/21/25	REVISED PER NOI PEER REVIEW
A	6/11/25	REVISED PER TOWN COMMENTS

APPLICANT\OWNER:

TAG CENTRAL LLC
275 REGATTA DRIVE
JUPITER, FL 33477

PROJECT:

40B MULTIFAMILY
444 EAST CENTRAL STREET
FRANKLIN, MA

PROJECT NO.	3317-01	DATE:	02-11-2025
SCALE:	1" = 50'	DWG. NAME:	C-3317-01
DESIGNED BY:	MTB	CHECKED BY:	CMQ

PREPARED BY:

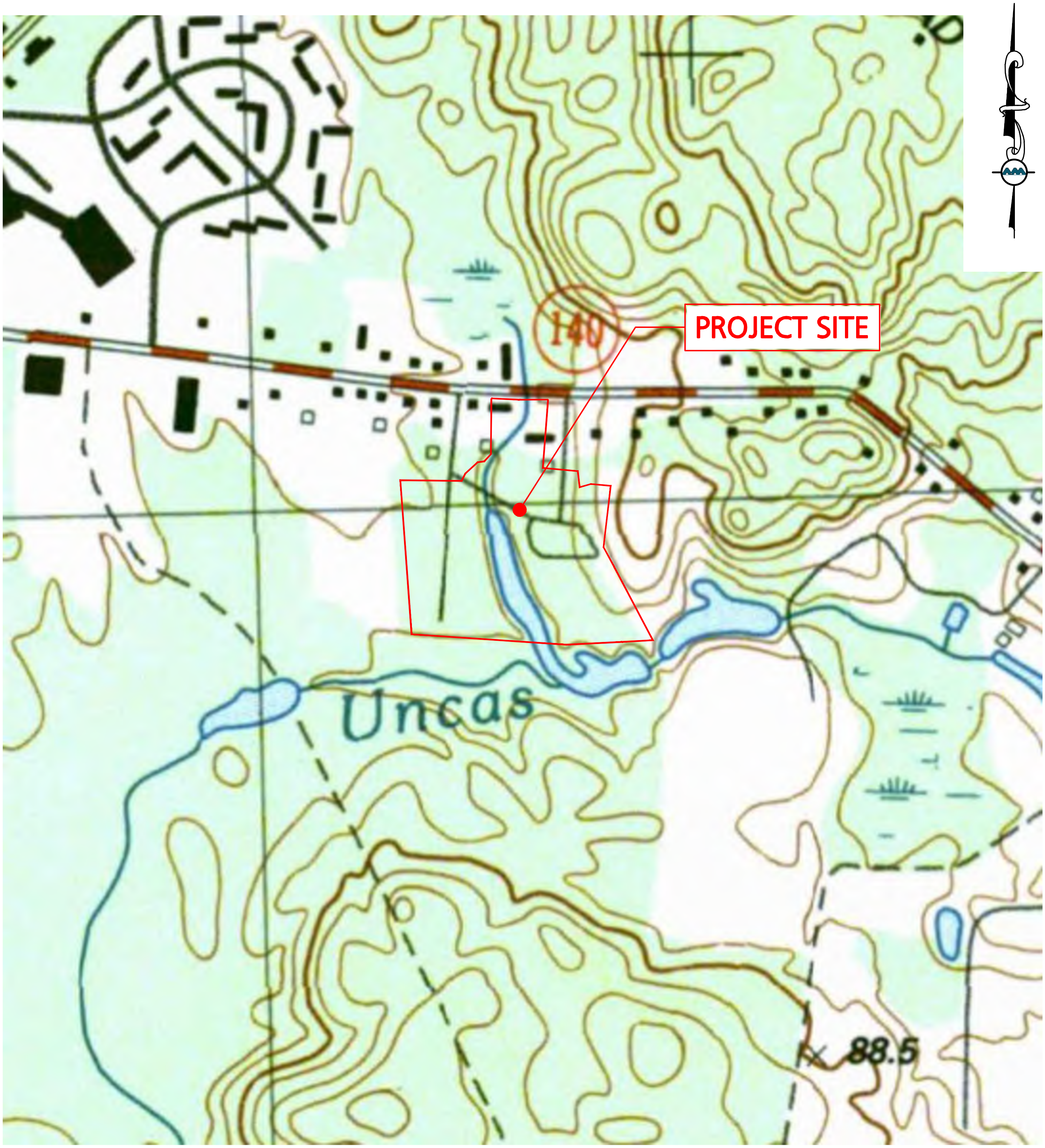
ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
100 COMMERCE WAY, SUITE 5
WOBURN MA 01801
TEL: (781) 935-6889
FAX: (781) 935-2896

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: BMP EXHIBIT

SHEET No. EXH-2

SECTION 3.0 - EXHIBITS



PREPARED BY:

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FAX: (781) 935-2896

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

PROJECT:

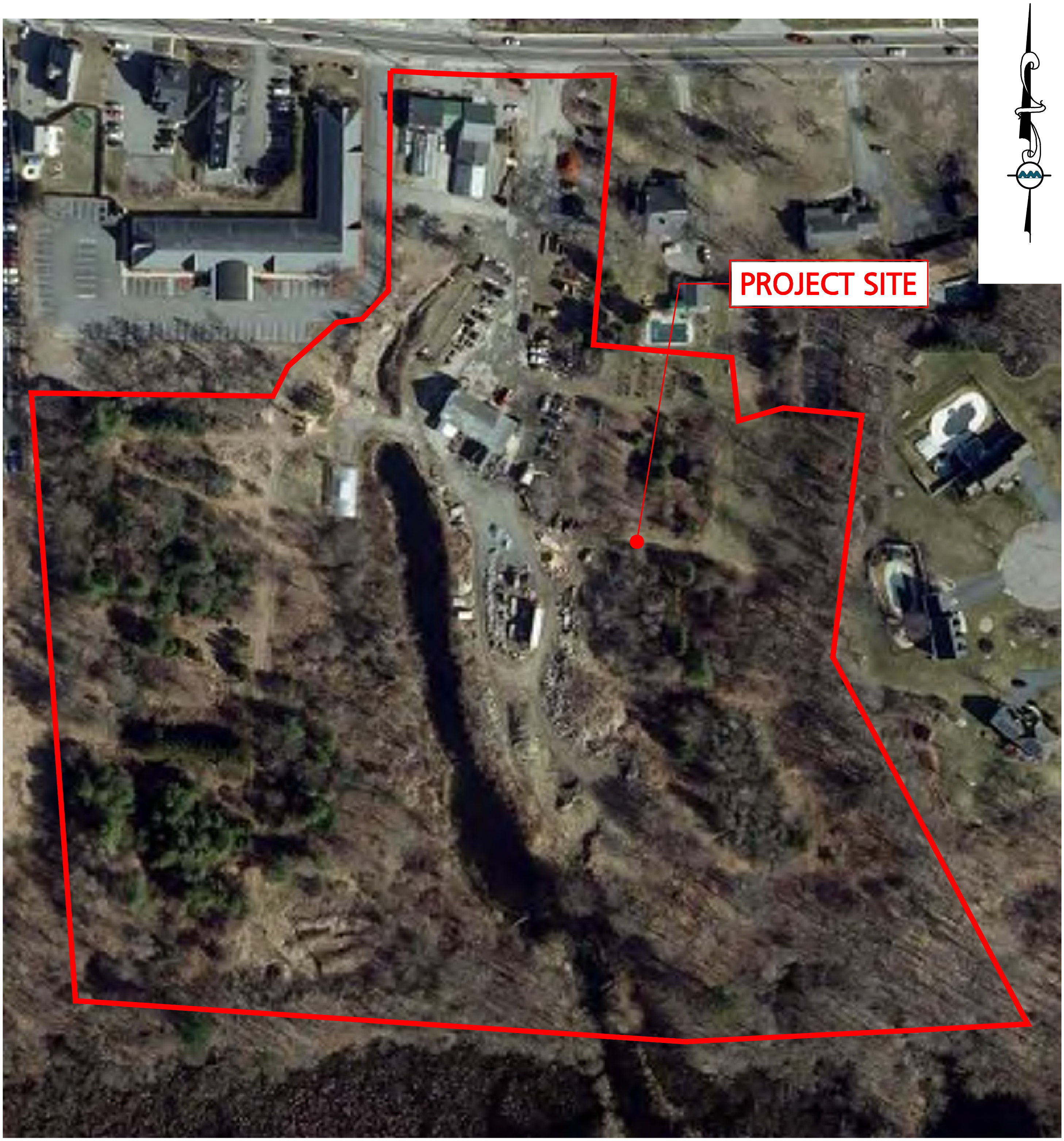
444 EAST CENTRAL STREET
FRANKLIN, MA

USGS SITE LOCUS MAP

PROJECT NO.	3317-01	DATE:	02/07/2025
SCALE:	1"=500'	DWG. NAME:	EXHIBITS
DESIGNED BY:	MTB	CHECKED BY:	CMQ

SHEET No.

EX-1



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WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

PROJECT:

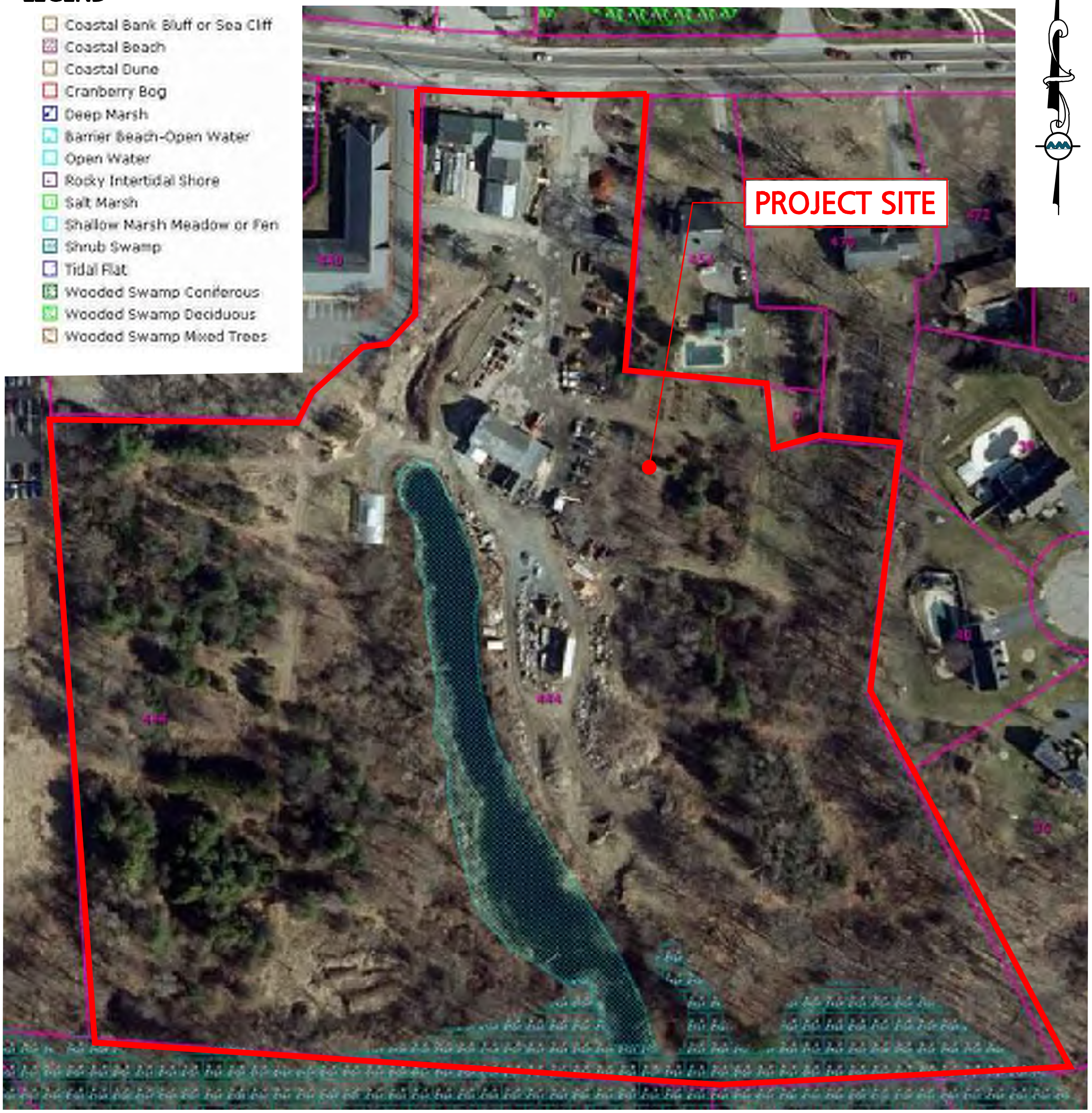
444 EAST CENTRAL STREET
FRANKLIN, MA

AERIAL PHOTO

PROJECT NO.	3317-01	DATE:	02/07/2025
SCALE:	1"=100'	DWG. NAME:	EXHIBITS
DESIGNED BY:	MTB	CHECKED BY:	CMQ

SHEET No.

EX-2



MA MAPPER DEP WETLANDS

THERE ARE OPEN WATER & SHRUB SWAMP WETLANDS DELINEATED ON THE SITE

PREPARED BY:

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FAX: (781) 935-2896

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

PROJECT:

444 EAST CENTRAL STREET
FRANKLIN, MA

WETLANDS MAP

PROJECT NO.	3317-01	DATE:	02/07/2025
SCALE:	1"=300'	DWG. NAME:	EXHIBITS
DESIGNED BY:	MTB	CHECKED BY:	CMQ

SHEET No.

EX-3

LEGEND

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

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A Cross section line

23 - - - - - 23 Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

4989000 N 1000-meter ticks: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection

1000-meter Universal Transverse Mercator grid values, zone 19N

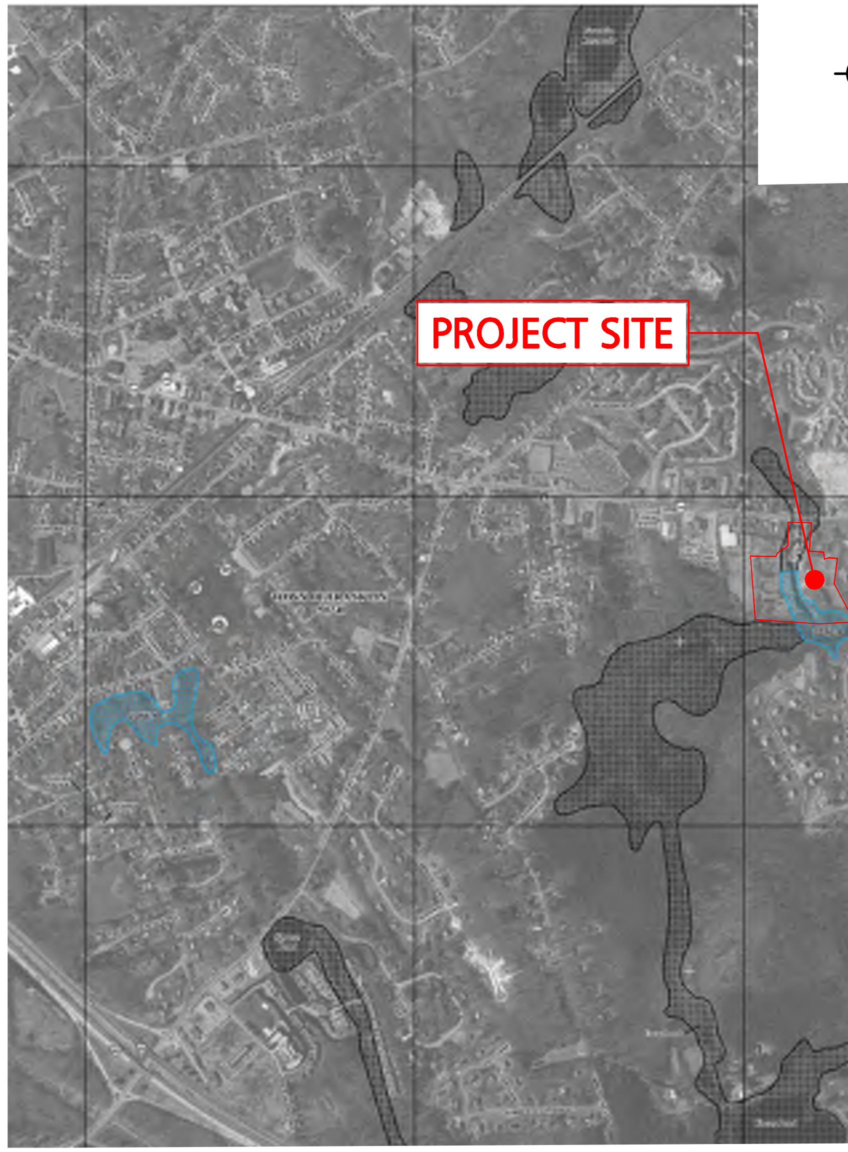
DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)

• M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
July 3, 2012

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL



FEMA FLOOD INSURANCE RATE MAP
NORFOLK COUNTY, MASSACHUSETTS
COMMUNITY PANEL 309 OF 430
MAP NUMBER 25021C0309E
EFFECTIVE DATE: JULY 17, 2012

PREPARED BY:

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WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

PROJECT:

444 EAST CENTRAL STREET
FRANKLIN, MA

FEMA FIRM MAP

PROJECT NO.	3317-01	DATE:	02/07/2025
SCALE:	1"=500'	DWG. NAME:	EXHIBITS
DESIGNED BY:	MTB	CHECKED BY:	CMQ

SHEET No.

EX-4

LEGEND

- NHESP Priority Habitats of Rare Species
- NHESP Estimated Habitats of Rare Wildlife
- Property Tax Parcels

MA MAPPER PRIORITY & ESTIMATED HABITATS
THERE ARE NO NHESP PRIORITY/ESTIMATED
HABITATS OF RARE SPECIES ON THE SITE

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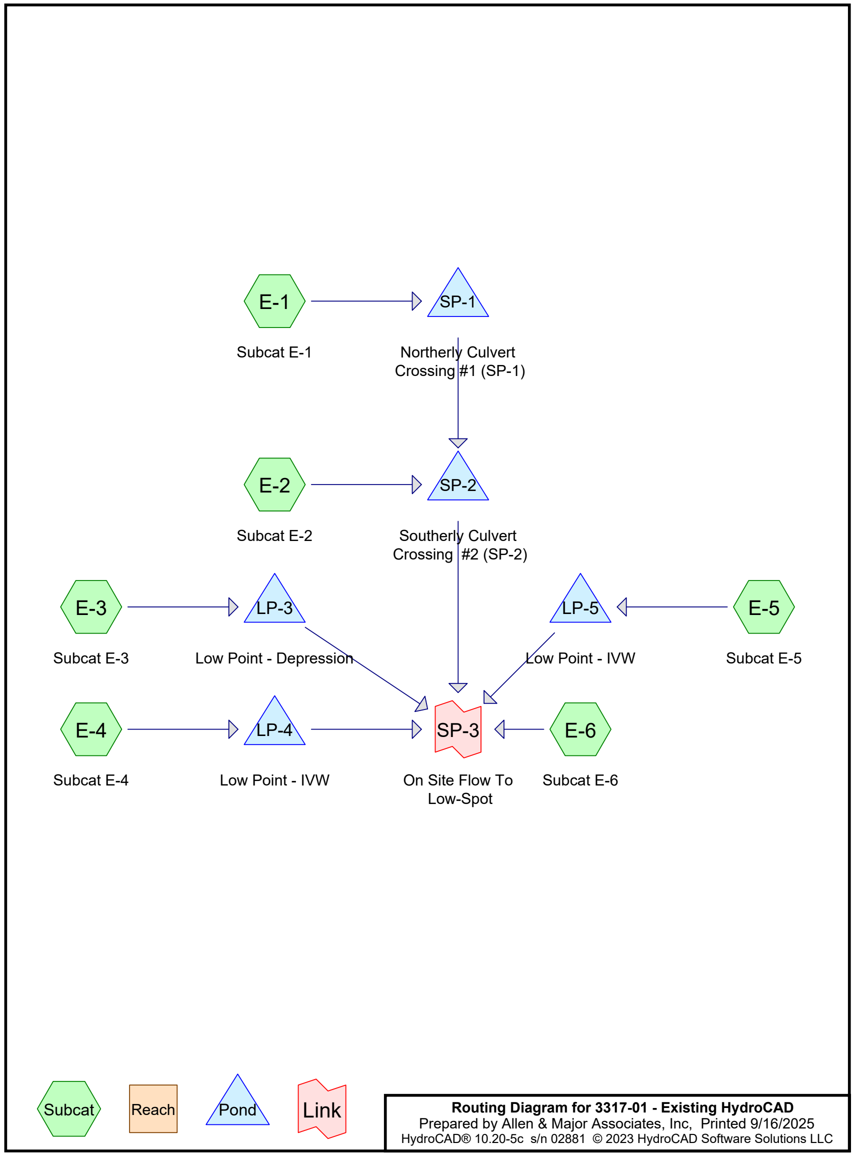
PROJECT:
444 EAST CENTRAL STREET
FRANKLIN, MA

PRIORITY & ESTIMATED HABITATS

PROJECT NO.	3317-01	DATE:	02/07/2025
SCALE:	1"=150'	DWG. NAME:	EXHIBITS
DESIGNED BY:	MTB	CHECKED BY:	CMQ

SHEET No.
EX-5

SECTION 4.0 - EXISTING DRAINAGE ANALYSIS



Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.37	2
2	10-year	Type III 24-hr		Default	24.00	1	5.22	2
3	100-year	Type III 24-hr		Default	24.00	1	8.16	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
250,370	39	>75% Grass cover, Good, HSG A (E-1, E-2, E-3, E-4, E-5, E-6)
23,768	96	Gravel surface, HSG A (E-2, E-5, E-6)
52,202	98	Paved parking, HSG A (E-1, E-2, E-4, E-6)
22,408	98	Unconnected roofs, HSG A (E-1, E-2, E-6)
33,288	98	Water Surface, HSG A (E-1, E-2, E-6)
485,446	30	Woods, Good, HSG A (E-3, E-4, E-5, E-6)
867,482	**43**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
867,482	HSG A	E-1, E-2, E-3, E-4, E-5, E-6
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
867,482		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
250,370	0	0	0	0	250,370	>75% Grass cover, Good	
23,768	0	0	0	0	23,768	Gravel surface	
52,202	0	0	0	0	52,202	Paved parking	
22,408	0	0	0	0	22,408	Unconnected roofs	
33,288	0	0	0	0	33,288	Water Surface	
485,446	0	0	0	0	485,446	Woods, Good	
867,482	**0**	**0**	**0**	**0**	**867,482**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	SP-1	267.72	267.93	59.0	-0.0036	0.012	0.0	21.0	0.0	
2	SP-1	267.48	267.48	59.0	0.0000	0.012	0.0	21.0	0.0	
3	SP-2	266.37	266.85	30.0	-0.0160	0.012	0.0	30.0	0.0	

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Subcat E-1 Runoff Area=101,514 sf 37.70% Impervious Runoff Depth=1.18"
Flow Length=671' Tc=8.6 min CN=WQ Runoff=2.64 cfs 10,024 cf

Subcatchment E-2: Subcat E-2 Runoff Area=65,426 sf 33.91% Impervious Runoff Depth=1.12"
Flow Length=485' Tc=8.1 min CN=WQ Runoff=1.64 cfs 6,133 cf

Subcatchment E-3: Subcat E-3 Runoff Area=17,073 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=170' Tc=10.4 min CN=WQ Runoff=0.00 cfs 2 cf

Subcatchment E-4: Subcat E-4 Runoff Area=111,271 sf 4.45% Impervious Runoff Depth=0.14"
Flow Length=570' Tc=19.9 min CN=WQ Runoff=0.25 cfs 1,296 cf

Subcatchment E-5: Subcat E-5 Runoff Area=68,461 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=351' Tc=8.1 min CN=WQ Runoff=0.07 cfs 264 cf

Subcatchment E-6: Subcat E-6 Runoff Area=503,736 sf 8.43% Impervious Runoff Depth=0.39"
Flow Length=710' Tc=14.7 min UI Adjusted CN=WQ Runoff=3.66 cfs 16,340 cf

Pond LP-3: Low Point - Depression Peak Elev=271.00' Storage=0 cf Inflow=0.00 cfs 2 cf
Discarded=0.00 cfs 2 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 2 cf

Pond LP-4: Low Point - IVW Peak Elev=271.51' Storage=41 cf Inflow=0.25 cfs 1,296 cf
Outflow=0.25 cfs 1,257 cf

Pond LP-5: Low Point - IVW Peak Elev=271.06' Storage=264 cf Inflow=0.07 cfs 264 cf
Outflow=0.00 cfs 0 cf

Pond SP-1: Northerly Culvert Crossing Peak Elev=271.66' Storage=7,191 cf Inflow=57.34 cfs 7,101,113 cf
Outflow=57.23 cfs 7,094,084 cf

Pond SP-2: Southerly Culvert Peak Elev=271.64' Storage=25,149 cf Inflow=58.85 cfs 7,100,217 cf
Outflow=58.62 cfs 7,075,619 cf

Link SP-3: On Site Flow To Low-Spot Inflow=62.42 cfs 7,093,216 cf
Primary=62.42 cfs 7,093,216 cf

Total Runoff Area = 867,482 sf Runoff Volume = 34,060 cf Average Runoff Depth = 0.47"
87.56% Pervious = 759,584 sf 12.44% Impervious = 107,898 sf

Summary for Subcatchment E-1: Subcat E-1

Runoff = 2.64 cfs @ 12.12 hrs, Volume= 10,024 cf, Depth= 1.18"
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
63,241	39	>75% Grass cover, Good, HSG A
26,126	98	Paved parking, HSG A
11,715	98	Unconnected roofs, HSG A
431	98	Water Surface, HSG A
101,514		Weighted Average
63,241	39	62.30% Pervious Area
38,273	98	37.70% Impervious Area
11,715		30.61% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.37"
2.1	195	0.0500	1.57		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.1	30	0.0300	3.52		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
1.8	166	0.0480	1.53		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	30	0.0300	3.52		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.1	100	0.0500	1.57		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.5	100	0.0330	3.69		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
8.6	671	Total			

Summary for Subcatchment E-2: Subcat E-2

Runoff = 1.64 cfs @ 12.11 hrs, Volume= 6,133 cf, Depth= 1.12"
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
41,920	39	>75% Grass cover, Good, HSG A
1,317	96	Gravel surface, HSG A
14,955	98	Paved parking, HSG A
4,757	98	Unconnected roofs, HSG A
2,477	98	Water Surface, HSG A
65,426		Weighted Average
43,237	41	66.09% Pervious Area
22,189	98	33.91% Impervious Area
4,757		21.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.37"
0.6	60	0.0600	1.71		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.3	55	0.0200	2.87		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.8	60	0.0330	1.27		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
1.2	50	0.0200	0.71		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
0.8	50	0.0200	0.99		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
1.3	130	0.0070	1.70		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.2	30	0.1000	2.85		**Shallow Concentrated Flow, H-I** Cultivated Straight Rows Kv= 9.0 fps
8.1	485	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 0.00 cfs @ 23.84 hrs, Volume= 2 cf, Depth= 0.00"
Routed to Pond LP-3 : Low Point - Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
6,828	39	>75% Grass cover, Good, HSG A
10,245	30	Woods, Good, HSG A
17,073		Weighted Average
17,073	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.37"
1.6	60	0.0160	0.63		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	60	0.0600	1.22		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
10.4	170	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.25 cfs @ 12.27 hrs, Volume= 1,296 cf, Depth= 0.14"
Routed to Pond LP-4 : Low Point - IVW

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
1,874	39	>75% Grass cover, Good, HSG A
4,954	98	Paved parking, HSG A
104,443	30	Woods, Good, HSG A
111,271		Weighted Average
106,317	30	95.55% Pervious Area
4,954	98	4.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	38	0.0200	1.16		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.37"
1.1	12	0.0600	0.18		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.37"
18.3	520	0.0090	0.47		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
19.9	570	Total			

Summary for Subcatchment E-5: Subcat E-5

Runoff = 0.07 cfs @ 12.11 hrs, Volume= 264 cf, Depth= 0.05"
Routed to Pond LP-5 : Low Point - IVW

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Description
20,858	39	>75% Grass cover, Good, HSG A
1,061	96	Gravel surface, HSG A
46,542	30	Woods, Good, HSG A
68,461		Weighted Average
68,461	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0300	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.37"
0.2	16	0.0300	1.21		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
3.2	285	0.0900	1.50		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
8.1	351	Total			

Summary for Subcatchment E-6: Subcat E-6

Runoff = 3.66 cfs @ 12.20 hrs, Volume= 16,340 cf, Depth= 0.39"
Routed to Link SP-3 : On Site Flow To Low-Spot

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.37"

Area (sf)	CN	Adj	Description
115,649	39	39	>75% Grass cover, Good, HSG A
21,390	96	96	Gravel surface, HSG A
6,166	98	98	Paved parking, HSG A
5,936	98	98	Unconnected roofs, HSG A
30,379	98	98	Water Surface, HSG A
324,216	30	30	Woods, Good, HSG A
503,736			Weighted Average
461,255	35	35	91.57% Pervious Area
42,482	98	98	8.43% Impervious Area
5,936			13.97% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.1200	0.21		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.37"
0.4	60	0.1500	2.71		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
3.3	330	0.0570	1.67		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
3.8	115	0.0100	0.50		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
3.1	130	0.0100	0.70		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0800	1.98		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
14.7	710	Total			

Summary for Pond LP-3: Low Point - Depression

Inflow Area = 17,073 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 23.84 hrs, Volume= 2 cf
Outflow = 0.00 cfs @ 23.94 hrs, Volume= 2 cf, Atten= 0%, Lag= 5.8 min
Discarded = 0.00 cfs @ 23.94 hrs, Volume= 2 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.00' @ 23.94 hrs Surf.Area= 65 sf Storage= 0 cf

Plug-Flow detention time= 6.9 min calculated for 2 cf (100% of inflow)
Center-of-Mass det. time= 6.9 min (1,317.3 - 1,310.4)

Volume	Invert	Avail.Storage	Storage Description
#1	271.00'	3,637 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	65	35.0	0	0	65
272.00	588	106.0	283	283	865
273.00	1,595	174.0	1,050	1,333	2,386
274.00	3,094	228.0	2,303	3,637	4,125

Device	Routing	Invert	Outlet Devices
#1	Primary	273.87'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.13 0.43 Width (feet) 0.00 17.00 64.00
#2	Discarded	271.00'	**1.040 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 23.94 hrs HW=271.00' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' TW=271.00' (Dynamic Tailwater)
└─**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond LP-4: Low Point - IVW

Inflow Area = 111,271 sf, 4.45% Impervious, Inflow Depth = 0.14" for 2-year event
Inflow = 0.25 cfs @ 12.27 hrs, Volume= 1,296 cf
Outflow = 0.25 cfs @ 12.26 hrs, Volume= 1,257 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.25 cfs @ 12.26 hrs, Volume= 1,257 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.51' @ 12.26 hrs Surf.Area= 403 sf Storage= 41 cf

Plug-Flow detention time= 34.0 min calculated for 1,257 cf (97% of inflow)
Center-of-Mass det. time= 15.5 min (784.0 - 768.5)

Volume	Invert	Avail.Storage	Storage Description
#1	271.20'	732 cf	**Low Point 4 (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.20	0	0.0	0	0	0
272.00	2,745	222.4	732	732	3,937

Device	Routing	Invert	Outlet Devices
#1	Primary	271.50'	**200.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	271.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 0.00 40.00

Primary OutFlow Max=0.25 cfs @ 12.26 hrs HW=271.51' TW=271.00' (Dynamic Tailwater)
—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.25 cfs @ 0.20 fps)
—**2=Custom Weir/Orifice** (Weir Controls 0.00 cfs @ 0.21 fps)

Summary for Pond LP-5: Low Point - IVW

Inflow Area = 68,461 sf, 0.00% Impervious, Inflow Depth = 0.05" for 2-year event
Inflow = 0.07 cfs @ 12.11 hrs, Volume= 264 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.06' @ 24.47 hrs Surf.Area= 4,401 sf Storage= 264 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	271.00'	4,025 cf	**Low Point 5.1 (Irregular)** Listed below (Recalc)
#2	271.00'	4,810 cf	**Low Point 5.2 (Irregular)** Listed below (Recalc)
		8,835 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	1,533	173.1	0	0	1,533
272.00	7,215	468.2	4,025	4,025	16,596

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	2,382	270.9	0	0	2,382
272.00	7,752	387.7	4,810	4,810	8,512

Device	Routing	Invert	Outlet Devices
#1	Primary	271.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 0.00 58.90

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' TW=271.00' (Dynamic Tailwater)
—**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond SP-1: Northerly Culvert Crossing #1 (SP-1)

Inflow Area = 101,514 sf, 37.70% Impervious, Inflow Depth >839.42" for 2-year event
Inflow = 57.34 cfs @ 12.12 hrs, Volume= 7,101,113 cf, Incl. 54.70 cfs Base Flow
Outflow = 57.23 cfs @ 12.13 hrs, Volume= 7,094,084 cf, Atten= 0%, Lag= 0.8 min
Primary = 57.23 cfs @ 12.13 hrs, Volume= 7,094,084 cf
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.66' @ 12.15 hrs Surf.Area= 7,123 sf Storage= 7,191 cf

Plug-Flow detention time= 2.3 min calculated for 7,091,483 cf (100% of inflow)
Center-of-Mass det. time= 1.1 min (1,080.6 - 1,079.5)

Volume	Invert	Avail.Storage	Storage Description
#1	267.48'	9,901 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
267.48	0	0.0	0	0	0
268.00	5	10.7	1	1	10
269.00	288	142.7	110	111	1,623
270.00	1,126	214.3	661	772	3,665
271.00	4,508	298.4	2,629	3,401	7,105
272.00	8,722	383.9	6,500	9,901	11,760

Device	Routing	Invert	Outlet Devices
#1	Primary	267.93'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.72' / 267.93' S= -0.0036 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#2	Primary	267.48'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.48' / 267.48' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#3	Primary	270.52'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 1.10 8.60 20.10 62.60 72.20 99.80 Height (feet) 1.48 1.11 0.00 0.04 0.14 0.48 1.48

Primary OutFlow Max=57.20 cfs @ 12.13 hrs HW=271.66' TW=271.64' (Dynamic Tailwater)
1=RCP_Round 21" (Inlet Controls 1.70 cfs @ 0.70 fps)
2=RCP_Round 21" (Inlet Controls 1.70 cfs @ 0.70 fps)
3=Asymmetrical Weir (Weir Controls 53.80 cfs @ 0.60 fps)

Summary for Pond SP-2: Southerly Culvert Crossing #2 (SP-2)

Inflow Area = 166,941 sf, 36.22% Impervious, Inflow Depth >510.38" for 2-year event
Inflow = 58.85 cfs @ 12.12 hrs, Volume= 7,100,217 cf
Outflow = 58.62 cfs @ 12.16 hrs, Volume= 7,075,619 cf, Atten= 0%, Lag= 2.1 min
Primary = 58.62 cfs @ 12.16 hrs, Volume= 7,075,619 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.64' @ 12.16 hrs Surf.Area= 25,195 sf Storage= 25,149 cf

Plug-Flow detention time= 7.6 min calculated for 7,073,301 cf (100% of inflow)
Center-of-Mass det. time= 3.7 min (1,084.1 - 1,080.3)

Volume	Invert	Avail.Storage	Storage Description
#1	266.85'	35,778 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
266.85	0	0.0	0	0	0
267.00	1,276	387.0	64	64	11,918
268.00	1,668	396.0	1,468	1,531	12,602
269.00	2,069	404.0	1,865	3,396	13,250
270.00	2,477	412.0	2,270	5,666	13,910
271.00	13,655	745.1	7,316	12,982	44,587
272.00	33,381	1,007.7	22,795	35,778	81,226

Device	Routing	Invert	Outlet Devices
#1	Primary	266.85'	**30.0" Round RCP_Round 30"** L= 30.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 266.37' / 266.85' S= -0.0160 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Primary	271.23'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 29.00 47.00 48.00 53.00 64.00 98.00 98.00 Height (feet) 0.77 0.57 0.11 0.18 0.25 0.00 0.11 0.77

Primary OutFlow Max=58.62 cfs @ 12.16 hrs HW=271.64' TW=271.00' (Dynamic Tailwater)
1=RCP_Round 30" (Inlet Controls 25.70 cfs @ 5.24 fps)
2=Asymmetrical Weir (Weir Controls 32.92 cfs @ 1.42 fps)

Summary for Link SP-3: On Site Flow To Low-Spot

Inflow Area = 867,482 sf, 12.44% Impervious, Inflow Depth > 98.12" for 2-year event
Inflow = 62.42 cfs @ 12.17 hrs, Volume= 7,093,216 cf
Primary = 62.42 cfs @ 12.17 hrs, Volume= 7,093,216 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 271.00'

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Subcat E-1 Runoff Area=101,514 sf 37.70% Impervious Runoff Depth=2.03"
Flow Length=671' Tc=8.6 min CN=WQ Runoff=4.12 cfs 17,193 cf

Subcatchment E-2: Subcat E-2 Runoff Area=65,426 sf 33.91% Impervious Runoff Depth=1.94"
Flow Length=485' Tc=8.1 min CN=WQ Runoff=2.57 cfs 10,597 cf

Subcatchment E-3: Subcat E-3 Runoff Area=17,073 sf 0.00% Impervious Runoff Depth=0.11"
Flow Length=170' Tc=10.4 min CN=WQ Runoff=0.01 cfs 151 cf

Subcatchment E-4: Subcat E-4 Runoff Area=111,271 sf 4.45% Impervious Runoff Depth=0.24"
Flow Length=570' Tc=19.9 min CN=WQ Runoff=0.40 cfs 2,207 cf

Subcatchment E-5: Subcat E-5 Runoff Area=68,461 sf 0.00% Impervious Runoff Depth=0.16"
Flow Length=351' Tc=8.1 min CN=WQ Runoff=0.11 cfs 899 cf

Subcatchment E-6: Subcat E-6 Runoff Area=503,736 sf 8.43% Impervious Runoff Depth=0.69"
Flow Length=710' Tc=14.7 min UI Adjusted CN=WQ Runoff=5.74 cfs 28,833 cf

Pond LP-3: Low Point - Depression Peak Elev=271.28' Storage=30 cf Inflow=0.01 cfs 151 cf
Discarded=0.00 cfs 151 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 151 cf

Pond LP-4: Low Point - IVW Peak Elev=271.51' Storage=42 cf Inflow=0.40 cfs 2,207 cf
Outflow=0.40 cfs 2,169 cf

Pond LP-5: Low Point - IVW Peak Elev=271.19' Storage=899 cf Inflow=0.11 cfs 899 cf
Outflow=0.00 cfs 0 cf

Pond SP-1: Northerly Culvert Crossing Peak Elev=271.67' Storage=7,280 cf Inflow=58.82 cfs 7,108,282 cf
Outflow=58.64 cfs 7,101,253 cf

Pond SP-2: Southerly Culvert Peak Elev=271.65' Storage=25,455 cf Inflow=61.18 cfs 7,111,850 cf
Outflow=60.83 cfs 7,087,252 cf

Link SP-3: On Site Flow To Low-Spot Inflow=66.79 cfs 7,118,254 cf
Primary=66.79 cfs 7,118,254 cf

Total Runoff Area = 867,482 sf Runoff Volume = 59,881 cf Average Runoff Depth = 0.83"
87.56% Pervious = 759,584 sf 12.44% Impervious = 107,898 sf

Summary for Subcatchment E-1: Subcat E-1

Runoff = 4.12 cfs @ 12.12 hrs, Volume= 17,193 cf, Depth= 2.03"
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.22"

Area (sf)	CN	Description
63,241	39	>75% Grass cover, Good, HSG A
26,126	98	Paved parking, HSG A
11,715	98	Unconnected roofs, HSG A
431	98	Water Surface, HSG A
101,514		Weighted Average
63,241	39	62.30% Pervious Area
38,273	98	37.70% Impervious Area
11,715		30.61% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.37"
2.1	195	0.0500	1.57		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.1	30	0.0300	3.52		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
1.8	166	0.0480	1.53		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	30	0.0300	3.52		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.1	100	0.0500	1.57		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.5	100	0.0330	3.69		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
8.6	671	Total			

Summary for Subcatchment E-2: Subcat E-2

Runoff = 2.57 cfs @ 12.11 hrs, Volume= 10,597 cf, Depth= 1.94"
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.22"

Area (sf)	CN	Description
41,920	39	>75% Grass cover, Good, HSG A
1,317	96	Gravel surface, HSG A
14,955	98	Paved parking, HSG A
4,757	98	Unconnected roofs, HSG A
2,477	98	Water Surface, HSG A
65,426		Weighted Average
43,237	41	66.09% Pervious Area
22,189	98	33.91% Impervious Area
4,757		21.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.37"
0.6	60	0.0600	1.71		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.3	55	0.0200	2.87		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.8	60	0.0330	1.27		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
1.2	50	0.0200	0.71		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
0.8	50	0.0200	0.99		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
1.3	130	0.0070	1.70		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.2	30	0.1000	2.85		**Shallow Concentrated Flow, H-I** Cultivated Straight Rows Kv= 9.0 fps
8.1	485	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 0.01 cfs @ 12.51 hrs, Volume= 151 cf, Depth= 0.11"
Routed to Pond LP-3 : Low Point - Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.22"

Area (sf)	CN	Description
6,828	39	>75% Grass cover, Good, HSG A
10,245	30	Woods, Good, HSG A
17,073		Weighted Average
17,073	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.37"
1.6	60	0.0160	0.63		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	60	0.0600	1.22		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
10.4	170	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.40 cfs @ 12.27 hrs, Volume= 2,207 cf, Depth= 0.24"
Routed to Pond LP-4 : Low Point - IVW

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.22"

Area (sf)	CN	Description
1,874	39	>75% Grass cover, Good, HSG A
4,954	98	Paved parking, HSG A
104,443	30	Woods, Good, HSG A
111,271		Weighted Average
106,317	30	95.55% Pervious Area
4,954	98	4.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	38	0.0200	1.16		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.37"
1.1	12	0.0600	0.18		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.37"
18.3	520	0.0090	0.47		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
19.9	570	Total			

Summary for Subcatchment E-5: Subcat E-5

Runoff = 0.11 cfs @ 12.11 hrs, Volume= 899 cf, Depth= 0.16"
Routed to Pond LP-5 : Low Point - IVW

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.22"

Area (sf)	CN	Description
20,858	39	>75% Grass cover, Good, HSG A
1,061	96	Gravel surface, HSG A
46,542	30	Woods, Good, HSG A
68,461		Weighted Average
68,461	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0300	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.37"
0.2	16	0.0300	1.21		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
3.2	285	0.0900	1.50		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
8.1	351	Total			

Summary for Subcatchment E-6: Subcat E-6

Runoff = 5.74 cfs @ 12.20 hrs, Volume= 28,833 cf, Depth= 0.69"
Routed to Link SP-3 : On Site Flow To Low-Spot

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.22"

Area (sf)	CN	Adj	Description
115,649	39	39	>75% Grass cover, Good, HSG A
21,390	96	96	Gravel surface, HSG A
6,166	98	98	Paved parking, HSG A
5,936	98	98	Unconnected roofs, HSG A
30,379	98	98	Water Surface, HSG A
324,216	30	30	Woods, Good, HSG A
503,736			Weighted Average
461,255	35	35	91.57% Pervious Area
42,482	98	98	8.43% Impervious Area
5,936			13.97% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.1200	0.21		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.37"
0.4	60	0.1500	2.71		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
3.3	330	0.0570	1.67		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
3.8	115	0.0100	0.50		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
3.1	130	0.0100	0.70		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0800	1.98		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
14.7	710	Total			

Summary for Pond LP-3: Low Point - Depression

Inflow Area = 17,073 sf, 0.00% Impervious, Inflow Depth = 0.11" for 10-year event
Inflow = 0.01 cfs @ 12.51 hrs, Volume= 151 cf
Outflow = 0.00 cfs @ 15.99 hrs, Volume= 151 cf, Atten= 58%, Lag= 209.2 min
Discarded = 0.00 cfs @ 15.99 hrs, Volume= 151 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.28' @ 15.99 hrs Surf.Area= 158 sf Storage= 30 cf

Plug-Flow detention time= 105.5 min calculated for 151 cf (100% of inflow)
Center-of-Mass det. time= 105.5 min (1,124.3 - 1,018.7)

Volume	Invert	Avail.Storage	Storage Description
#1	271.00'	3,637 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	65	35.0	0	0	65
272.00	588	106.0	283	283	865
273.00	1,595	174.0	1,050	1,333	2,386
274.00	3,094	228.0	2,303	3,637	4,125

Device	Routing	Invert	Outlet Devices
#1	Primary	273.87'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.13 0.43 Width (feet) 0.00 17.00 64.00
#2	Discarded	271.00'	**1.040 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 15.99 hrs HW=271.28' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' TW=271.00' (Dynamic Tailwater)
└─**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond LP-4: Low Point - IVW

Inflow Area = 111,271 sf, 4.45% Impervious, Inflow Depth = 0.24" for 10-year event
Inflow = 0.40 cfs @ 12.27 hrs, Volume= 2,207 cf
Outflow = 0.40 cfs @ 12.26 hrs, Volume= 2,169 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.40 cfs @ 12.26 hrs, Volume= 2,169 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.51' @ 12.26 hrs Surf.Area= 409 sf Storage= 42 cf

Plug-Flow detention time= 22.2 min calculated for 2,169 cf (98% of inflow)
Center-of-Mass det. time= 10.9 min (801.0 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	271.20'	732 cf	**Low Point 4 (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.20	0	0.0	0	0	0
272.00	2,745	222.4	732	732	3,937

Device	Routing	Invert	Outlet Devices
#1	Primary	271.50'	**200.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	271.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 0.00 40.00

Primary OutFlow Max=0.40 cfs @ 12.26 hrs HW=271.51' TW=271.00' (Dynamic Tailwater)
├─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.40 cfs @ 0.23 fps)
└─**2=Custom Weir/Orifice** (Weir Controls 0.00 cfs @ 0.24 fps)

Summary for Pond LP-5: Low Point - IVW

Inflow Area = 68,461 sf, 0.00% Impervious, Inflow Depth = 0.16" for 10-year event
Inflow = 0.11 cfs @ 12.11 hrs, Volume= 899 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.19' @ 24.47 hrs Surf.Area= 5,476 sf Storage= 899 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	271.00'	4,025 cf	**Low Point 5.1 (Irregular)** Listed below (Recalc)
#2	271.00'	4,810 cf	**Low Point 5.2 (Irregular)** Listed below (Recalc)
		8,835 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	1,533	173.1	0	0	1,533
272.00	7,215	468.2	4,025	4,025	16,596

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	2,382	270.9	0	0	2,382
272.00	7,752	387.7	4,810	4,810	8,512

Device	Routing	Invert	Outlet Devices
#1	Primary	271.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 0.00 58.90

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' TW=271.00' (Dynamic Tailwater)
└─**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond SP-1: Northerly Culvert Crossing #1 (SP-1)

Inflow Area = 101,514 sf, 37.70% Impervious, Inflow Depth >840.27" for 10-year event
Inflow = 58.82 cfs @ 12.12 hrs, Volume= 7,108,282 cf, Incl. 54.70 cfs Base Flow
Outflow = 58.64 cfs @ 12.13 hrs, Volume= 7,101,253 cf, Atten= 0%, Lag= 0.8 min
Primary = 58.64 cfs @ 12.13 hrs, Volume= 7,101,253 cf
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.67' @ 12.15 hrs Surf.Area= 7,178 sf Storage= 7,280 cf

Plug-Flow detention time= 2.3 min calculated for 7,098,650 cf (100% of inflow)
Center-of-Mass det. time= 1.1 min (1,080.3 - 1,079.2)

Volume	Invert	Avail.Storage	Storage Description
#1	267.48'	9,901 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
267.48	0	0.0	0	0	0
268.00	5	10.7	1	1	10
269.00	288	142.7	110	111	1,623
270.00	1,126	214.3	661	772	3,665
271.00	4,508	298.4	2,629	3,401	7,105
272.00	8,722	383.9	6,500	9,901	11,760

Device	Routing	Invert	Outlet Devices
#1	Primary	267.93'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.72' / 267.93' S= -0.0036 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#2	Primary	267.48'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.48' / 267.48' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#3	Primary	270.52'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 1.10 8.60 20.10 62.60 72.20 99.80 Height (feet) 1.48 1.11 0.00 0.04 0.14 0.48 1.48

Primary OutFlow Max=58.60 cfs @ 12.13 hrs HW=271.67' TW=271.65' (Dynamic Tailwater)
├─**1=RCP_Round 21"** (Inlet Controls 1.71 cfs @ 0.71 fps)
├─**2=RCP_Round 21"** (Inlet Controls 1.71 cfs @ 0.71 fps)
└─**3=Asymmetrical Weir** (Weir Controls 55.17 cfs @ 0.61 fps)

Summary for Pond SP-2: Southerly Culvert Crossing #2 (SP-2)

Inflow Area = 166,941 sf, 36.22% Impervious, Inflow Depth > 511.21" for 10-year event
Inflow = 61.18 cfs @ 12.12 hrs, Volume= 7,111,850 cf
Outflow = 60.83 cfs @ 12.15 hrs, Volume= 7,087,252 cf, Atten= 1%, Lag= 2.1 min
Primary = 60.83 cfs @ 12.15 hrs, Volume= 7,087,252 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.65' @ 12.15 hrs Surf.Area= 25,448 sf Storage= 25,455 cf

Plug-Flow detention time= 7.6 min calculated for 7,084,930 cf (100% of inflow)
Center-of-Mass det. time= 3.7 min (1,083.6 - 1,079.9)

Volume	Invert	Avail.Storage	Storage Description
#1	266.85'	35,778 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
266.85	0	0.0	0	0	0
267.00	1,276	387.0	64	64	11,918
268.00	1,668	396.0	1,468	1,531	12,602
269.00	2,069	404.0	1,865	3,396	13,250
270.00	2,477	412.0	2,270	5,666	13,910
271.00	13,655	745.1	7,316	12,982	44,587
272.00	33,381	1,007.7	22,795	35,778	81,226

Device	Routing	Invert	Outlet Devices
#1	Primary	266.85'	**30.0" Round RCP_Round 30"** L= 30.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 266.37' / 266.85' S= -0.0160 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Primary	271.23'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 29.00 47.00 48.00 53.00 64.00 98.00 98.00 Height (feet) 0.77 0.57 0.11 0.18 0.25 0.00 0.11 0.77

Primary OutFlow Max=60.82 cfs @ 12.15 hrs HW=271.65' TW=271.00' (Dynamic Tailwater)
—**1=RCP_Round 30"** (Inlet Controls 25.94 cfs @ 5.29 fps)
—**2=Asymmetrical Weir** (Weir Controls 34.88 cfs @ 1.45 fps)

Summary for Link SP-3: On Site Flow To Low-Spot

Inflow Area = 867,482 sf, 12.44% Impervious, Inflow Depth > 98.47" for 10-year event
Inflow = 66.79 cfs @ 12.17 hrs, Volume= 7,118,254 cf
Primary = 66.79 cfs @ 12.17 hrs, Volume= 7,118,254 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 271.00'

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Subcat E-1 Runoff Area=101,514 sf 37.70% Impervious Runoff Depth=3.75"
Flow Length=671' Tc=8.6 min CN=WQ Runoff=7.61 cfs 31,715 cf

Subcatchment E-2: Subcat E-2 Runoff Area=65,426 sf 33.91% Impervious Runoff Depth=3.63"
Flow Length=485' Tc=8.1 min CN=WQ Runoff=4.81 cfs 19,767 cf

Subcatchment E-3: Subcat E-3 Runoff Area=17,073 sf 0.00% Impervious Runoff Depth=0.76"
Flow Length=170' Tc=10.4 min CN=WQ Runoff=0.13 cfs 1,085 cf

Subcatchment E-4: Subcat E-4 Runoff Area=111,271 sf 4.45% Impervious Runoff Depth=0.80"
Flow Length=570' Tc=19.9 min CN=WQ Runoff=0.68 cfs 7,420 cf

Subcatchment E-5: Subcat E-5 Runoff Area=68,461 sf 0.00% Impervious Runoff Depth=0.80"
Flow Length=351' Tc=8.1 min CN=WQ Runoff=0.60 cfs 4,572 cf

Subcatchment E-6: Subcat E-6 Runoff Area=503,736 sf 8.43% Impervious Runoff Depth=1.57"
Flow Length=710' Tc=14.7 min UI Adjusted CN=WQ Runoff=10.81 cfs 65,822 cf

Pond LP-3: Low Point - Depression Peak Elev=272.27' Storage=470 cf Inflow=0.13 cfs 1,085 cf
Discarded=0.02 cfs 1,082 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,082 cf

Pond LP-4: Low Point - IVW Peak Elev=271.51' Storage=44 cf Inflow=0.68 cfs 7,420 cf
Outflow=0.68 cfs 7,382 cf

Pond LP-5: Low Point - IVW Peak Elev=271.54' Storage=3,400 cf Inflow=0.60 cfs 4,572 cf
Outflow=0.05 cfs 1,464 cf

Pond SP-1: Northerly Culvert Crossing Peak Elev=271.70' Storage=7,489 cf Inflow=62.31 cfs 7,122,804 cf
Outflow=61.98 cfs 7,115,775 cf

Pond SP-2: Southerly Culvert Peak Elev=271.68' Storage=26,170 cf Inflow=66.74 cfs 7,135,541 cf
Outflow=66.08 cfs 7,110,943 cf

Link SP-3: On Site Flow To Low-Spot Inflow=77.15 cfs 7,185,611 cf
Primary=77.15 cfs 7,185,611 cf

Total Runoff Area = 867,482 sf Runoff Volume = 130,382 cf Average Runoff Depth = 1.80"
87.56% Pervious = 759,584 sf 12.44% Impervious = 107,898 sf

Summary for Subcatchment E-1: Subcat E-1

Runoff = 7.61 cfs @ 12.12 hrs, Volume= 31,715 cf, Depth= 3.75"
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (sf)	CN	Description
63,241	39	>75% Grass cover, Good, HSG A
26,126	98	Paved parking, HSG A
11,715	98	Unconnected roofs, HSG A
431	98	Water Surface, HSG A
101,514		Weighted Average
63,241	39	62.30% Pervious Area
38,273	98	37.70% Impervious Area
11,715		30.61% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.37"
2.1	195	0.0500	1.57		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.1	30	0.0300	3.52		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
1.8	166	0.0480	1.53		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	30	0.0300	3.52		**Shallow Concentrated Flow, E-F** Paved Kv= 20.3 fps
1.1	100	0.0500	1.57		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
0.5	100	0.0330	3.69		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
8.6	671	Total			

Summary for Subcatchment E-2: Subcat E-2

Runoff = 4.81 cfs @ 12.12 hrs, Volume= 19,767 cf, Depth= 3.63"
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (sf)	CN	Description
41,920	39	>75% Grass cover, Good, HSG A
1,317	96	Gravel surface, HSG A
14,955	98	Paved parking, HSG A
4,757	98	Unconnected roofs, HSG A
2,477	98	Water Surface, HSG A
65,426		Weighted Average
43,237	41	66.09% Pervious Area
22,189	98	33.91% Impervious Area
4,757		21.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1000	0.29		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.37"
0.6	60	0.0600	1.71		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.3	55	0.0200	2.87		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
0.8	60	0.0330	1.27		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
1.2	50	0.0200	0.71		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
0.8	50	0.0200	0.99		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
1.3	130	0.0070	1.70		**Shallow Concentrated Flow, G-H** Paved Kv= 20.3 fps
0.2	30	0.1000	2.85		**Shallow Concentrated Flow, H-I** Cultivated Straight Rows Kv= 9.0 fps
8.1	485	Total			

Summary for Subcatchment E-3: Subcat E-3

Runoff = 0.13 cfs @ 12.21 hrs, Volume= 1,085 cf, Depth= 0.76"
Routed to Pond LP-3 : Low Point - Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (sf)	CN	Description
6,828	39	>75% Grass cover, Good, HSG A
10,245	30	Woods, Good, HSG A
17,073		Weighted Average
17,073	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.37"
1.6	60	0.0160	0.63		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	60	0.0600	1.22		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
10.4	170	Total			

Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.68 cfs @ 12.32 hrs, Volume= 7,420 cf, Depth= 0.80"
Routed to Pond LP-4 : Low Point - IVW

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (sf)	CN	Description
1,874	39	>75% Grass cover, Good, HSG A
4,954	98	Paved parking, HSG A
104,443	30	Woods, Good, HSG A
111,271		Weighted Average
106,317	30	95.55% Pervious Area
4,954	98	4.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	38	0.0200	1.16		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.37"
1.1	12	0.0600	0.18		**Sheet Flow, B-C** Grass: Short n= 0.150 P2= 3.37"
18.3	520	0.0090	0.47		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
19.9	570	Total			

Summary for Subcatchment E-5: Subcat E-5

Runoff = 0.60 cfs @ 12.14 hrs, Volume= 4,572 cf, Depth= 0.80"
Routed to Pond LP-5 : Low Point - IVW

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (sf)	CN	Description
20,858	39	>75% Grass cover, Good, HSG A
1,061	96	Gravel surface, HSG A
46,542	30	Woods, Good, HSG A
68,461		Weighted Average
68,461	34	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0300	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.37"
0.2	16	0.0300	1.21		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
3.2	285	0.0900	1.50		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
8.1	351	Total			

Summary for Subcatchment E-6: Subcat E-6

Runoff = 10.81 cfs @ 12.20 hrs, Volume= 65,822 cf, Depth= 1.57"
Routed to Link SP-3 : On Site Flow To Low-Spot

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (sf)	CN	Adj	Description
115,649	39	39	>75% Grass cover, Good, HSG A
21,390	96	96	Gravel surface, HSG A
6,166	98	98	Paved parking, HSG A
5,936	98	98	Unconnected roofs, HSG A
30,379	98	98	Water Surface, HSG A
324,216	30	30	Woods, Good, HSG A
503,736			Weighted Average
461,255	35	35	91.57% Pervious Area
42,482	98	98	8.43% Impervious Area
5,936			13.97% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.1200	0.21		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.37"
0.4	60	0.1500	2.71		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
3.3	330	0.0570	1.67		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
3.8	115	0.0100	0.50		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
3.1	130	0.0100	0.70		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
0.2	25	0.0800	1.98		**Shallow Concentrated Flow, F-G** Short Grass Pasture Kv= 7.0 fps
14.7	710	Total			

Summary for Pond LP-3: Low Point - Depression

Inflow Area = 17,073 sf, 0.00% Impervious, Inflow Depth = 0.76" for 100-year event
Inflow = 0.13 cfs @ 12.21 hrs, Volume= 1,085 cf
Outflow = 0.02 cfs @ 16.90 hrs, Volume= 1,082 cf, Atten= 85%, Lag= 281.2 min
Discarded = 0.02 cfs @ 16.90 hrs, Volume= 1,082 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.27' @ 16.90 hrs Surf.Area= 810 sf Storage= 470 cf

Plug-Flow detention time= 339.4 min calculated for 1,081 cf (100% of inflow)
Center-of-Mass det. time= 337.8 min (1,277.5 - 939.7)

Volume	Invert	Avail.Storage	Storage Description
#1	271.00'	3,637 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	65	35.0	0	0	65
272.00	588	106.0	283	283	865
273.00	1,595	174.0	1,050	1,333	2,386
274.00	3,094	228.0	2,303	3,637	4,125

Device	Routing	Invert	Outlet Devices
#1	Primary	273.87'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.13 0.43 Width (feet) 0.00 17.00 64.00
#2	Discarded	271.00'	**1.040 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.02 cfs @ 16.90 hrs HW=272.27' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' TW=271.00' (Dynamic Tailwater)
└─**1=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Pond LP-4: Low Point - IVW

Inflow Area = 111,271 sf, 4.45% Impervious, Inflow Depth = 0.80" for 100-year event
Inflow = 0.68 cfs @ 12.32 hrs, Volume= 7,420 cf
Outflow = 0.68 cfs @ 12.32 hrs, Volume= 7,382 cf, Atten= 0%, Lag= 0.1 min
Primary = 0.68 cfs @ 12.32 hrs, Volume= 7,382 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.51' @ 12.32 hrs Surf.Area= 419 sf Storage= 44 cf

Plug-Flow detention time= 7.1 min calculated for 7,382 cf (99% of inflow)
Center-of-Mass det. time= 4.1 min (891.1 - 887.0)

Volume	Invert	Avail.Storage	Storage Description
#1	271.20'	732 cf	**Low Point 4 (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.20	0	0.0	0	0	0
272.00	2,745	222.4	732	732	3,937

Device	Routing	Invert	Outlet Devices
#1	Primary	271.50'	**200.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	271.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 0.00 40.00

Primary OutFlow Max=0.68 cfs @ 12.32 hrs HW=271.51' TW=271.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.68 cfs @ 0.27 fps)
2=Custom Weir/Orifice (Weir Controls 0.00 cfs @ 0.29 fps)

Summary for Pond LP-5: Low Point - IVW

Inflow Area = 68,461 sf, 0.00% Impervious, Inflow Depth = 0.80" for 100-year event
Inflow = 0.60 cfs @ 12.14 hrs, Volume= 4,572 cf
Outflow = 0.05 cfs @ 18.91 hrs, Volume= 1,464 cf, Atten= 91%, Lag= 406.2 min
Primary = 0.05 cfs @ 18.91 hrs, Volume= 1,464 cf
Routed to Link SP-3 : On Site Flow To Low-Spot

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.54' @ 18.91 hrs Surf.Area= 8,997 sf Storage= 3,400 cf

Plug-Flow detention time= 571.5 min calculated for 1,463 cf (32% of inflow)
Center-of-Mass det. time= 371.7 min (1,287.9 - 916.2)

Volume	Invert	Avail.Storage	Storage Description
#1	271.00'	4,025 cf	**Low Point 5.1 (Irregular)** Listed below (Recalc)
#2	271.00'	4,810 cf	**Low Point 5.2 (Irregular)** Listed below (Recalc)
		8,835 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	1,533	173.1	0	0	1,533
272.00	7,215	468.2	4,025	4,025	16,596

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	2,382	270.9	0	0	2,382
272.00	7,752	387.7	4,810	4,810	8,512

Device	Routing	Invert	Outlet Devices
#1	Primary	271.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 0.00 58.90

Primary OutFlow Max=0.05 cfs @ 18.91 hrs HW=271.54' TW=271.00' (Dynamic Tailwater)
1=Custom Weir/Orifice (Weir Controls 0.05 cfs @ 0.53 fps)

Summary for Pond SP-1: Northerly Culvert Crossing #1 (SP-1)

```
Inflow Area =       101,514 sf,  37.70% Impervious,  Inflow Depth > 841.98"   for  100-year event
Inflow      =    62.31 cfs @  12.12 hrs,  Volume=      7,122,804 cf,  Incl. 54.70 cfs Base Flow
Outflow     =    61.98 cfs @  12.14 hrs,  Volume=      7,115,775 cf,  Atten= 1%,  Lag= 0.8 min
Primary     =    61.98 cfs @  12.14 hrs,  Volume=      7,115,775 cf
   Routed to Pond SP-2 : Southerly Culvert Crossing  #2 (SP-2)
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.70' @ 12.16 hrs Surf.Area= 7,307 sf Storage= 7,489 cf

Plug-Flow detention time= 2.3 min calculated for 7,113,168 cf (100% of inflow)
Center-of-Mass det. time= 1.1 min (1,079.7 - 1,078.7)

Volume	Invert	Avail.Storage	Storage Description
#1	267.48'	9,901 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
267.48	0	0.0	0	0	0
268.00	5	10.7	1	1	10
269.00	288	142.7	110	111	1,623
270.00	1,126	214.3	661	772	3,665
271.00	4,508	298.4	2,629	3,401	7,105
272.00	8,722	383.9	6,500	9,901	11,760

Device	Routing	Invert	Outlet Devices
#1	Primary	267.93'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.72' / 267.93' S= -0.0036 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#2	Primary	267.48'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.48' / 267.48' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#3	Primary	270.52'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 1.10 8.60 20.10 62.60 72.20 99.80 Height (feet) 1.48 1.11 0.00 0.04 0.14 0.48 1.48

Primary OutFlow Max=61.90 cfs @ 12.14 hrs HW=271.70' TW=271.67' (Dynamic Tailwater)
├─**1=RCP_Round 21"** (Inlet Controls 1.76 cfs @ 0.73 fps)
├─**2=RCP_Round 21"** (Inlet Controls 1.76 cfs @ 0.73 fps)
└─**3=Asymmetrical Weir** (Weir Controls 58.38 cfs @ 0.62 fps)

Summary for Pond SP-2: Southerly Culvert Crossing #2 (SP-2)

```
Inflow Area =       166,941 sf,  36.22% Impervious,  Inflow Depth > 512.91"   for  100-year event
Inflow      =    66.74 cfs @  12.13 hrs,  Volume=      7,135,541 cf
Outflow     =    66.08 cfs @  12.16 hrs,  Volume=      7,110,943 cf,  Atten= 1%,  Lag= 2.1 min
Primary     =    66.08 cfs @  12.16 hrs,  Volume=      7,110,943 cf
   Routed to Link SP-3 : On Site Flow To Low-Spot
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.68' @ 12.16 hrs Surf.Area= 26,035 sf Storage= 26,170 cf

Plug-Flow detention time= 7.6 min calculated for 7,108,615 cf (100% of inflow)
Center-of-Mass det. time= 3.7 min (1,082.6 - 1,078.9)

Volume	Invert	Avail.Storage	Storage Description
#1	266.85'	35,778 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
266.85	0	0.0	0	0	0
267.00	1,276	387.0	64	64	11,918
268.00	1,668	396.0	1,468	1,531	12,602
269.00	2,069	404.0	1,865	3,396	13,250
270.00	2,477	412.0	2,270	5,666	13,910
271.00	13,655	745.1	7,316	12,982	44,587
272.00	33,381	1,007.7	22,795	35,778	81,226

Device	Routing	Invert	Outlet Devices
#1	Primary	266.85'	**30.0" Round RCP_Round 30"** L= 30.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 266.37' / 266.85' S= -0.0160 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Primary	271.23'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.00 29.00 47.00 48.00 53.00 64.00 98.00 98.00 Height (feet) 0.77 0.57 0.11 0.18 0.25 0.00 0.11 0.77

Primary OutFlow Max=66.07 cfs @ 12.16 hrs HW=271.68' TW=271.00' (Dynamic Tailwater)
├─**1=RCP_Round 30"** (Inlet Controls 26.49 cfs @ 5.40 fps)
└─**2=Asymmetrical Weir** (Weir Controls 39.58 cfs @ 1.51 fps)

Summary for Link SP-3: On Site Flow To Low-Spot

Inflow Area = 867,482 sf, 12.44% Impervious, Inflow Depth > 99.40" for 100-year event
Inflow = 77.15 cfs @ 12.18 hrs, Volume= 7,185,611 cf
Primary = 77.15 cfs @ 12.18 hrs, Volume= 7,185,611 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 271.00'

Events for Subcatchment E-1: Subcat E-1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-year	3.37	2.64	10,024	1.18
10-year	5.22	4.12	17,193	2.03
100-year	**8.16**	**7.61**	**31,715**	**3.75**

Events for Subcatchment E-2: Subcat E-2

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-year	3.37	1.64	6,133	1.12
10-year	5.22	2.57	10,597	1.94
100-year	**8.16**	**4.81**	**19,767**	**3.63**

Events for Subcatchment E-3: Subcat E-3

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-year	3.37	0.00	2	0.00
10-year	5.22	0.01	151	0.11
100-year	**8.16**	**0.13**	**1,085**	**0.76**

Events for Subcatchment E-4: Subcat E-4

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-year	3.37	0.25	1,296	0.14
10-year	5.22	0.40	2,207	0.24
100-year	**8.16**	**0.68**	**7,420**	**0.80**

Events for Subcatchment E-5: Subcat E-5

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-year	3.37	0.07	264	0.05
10-year	5.22	0.11	899	0.16
100-year	**8.16**	**0.60**	**4,572**	**0.80**

Events for Subcatchment E-6: Subcat E-6

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-year	3.37	3.66	16,340	0.39
10-year	5.22	5.74	28,833	0.69
100-year	**8.16**	**10.81**	**65,822**	**1.57**

Events for Pond LP-3: Low Point - Depression

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-year	0.00	0.00	0.00	**0.00**	271.00	0
10-year	0.01	0.00	0.00	0.00	271.28	30
100-year	**0.13**	**0.02**	**0.02**	0.00	**272.27**	**470**

Events for Pond LP-4: Low Point - IVW

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-year	0.25	0.25	271.51	41
10-year	0.40	0.40	271.51	42
100-year	**0.68**	**0.68**	**271.51**	**44**

Events for Pond LP-5: Low Point - IVW

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-year	0.07	0.00	271.06	264
10-year	0.11	0.00	271.19	899
100-year	**0.60**	**0.05**	**271.54**	**3,400**

Events for Pond SP-1: Northerly Culvert Crossing #1 (SP-1)

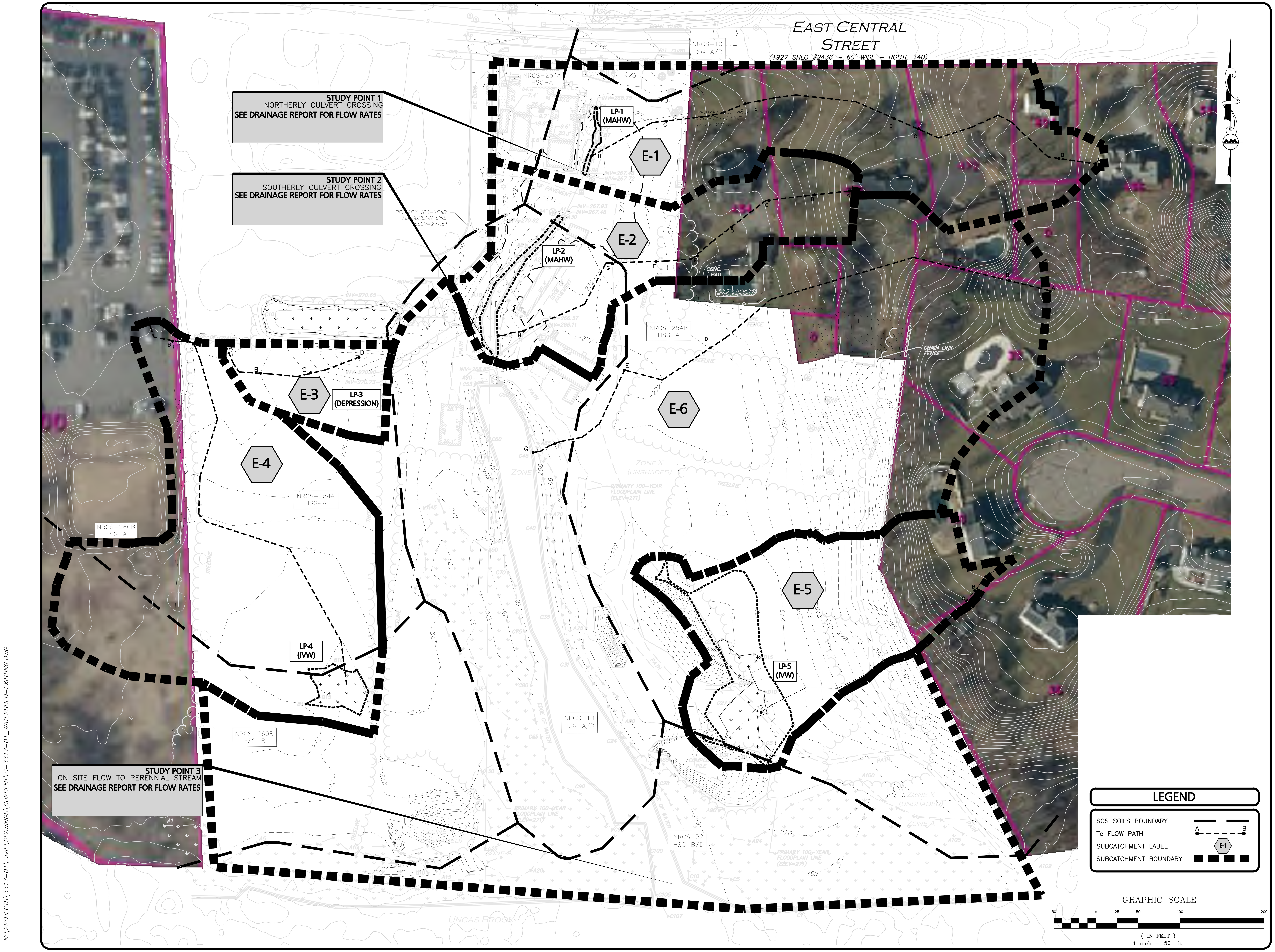
Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-year	57.34	57.23	271.66	7,191
10-year	58.82	58.64	271.67	7,280
100-year	**62.31**	**61.98**	**271.70**	**7,489**

Events for Pond SP-2: Southerly Culvert Crossing #2 (SP-2)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-year	58.85	58.62	271.64	25,149
10-year	61.18	60.83	271.65	25,455
100-year	**66.74**	**66.08**	**271.68**	**26,170**

Events for Link SP-3: On Site Flow To Low-Spot

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2-year	62.42	62.42	**271.00**
10-year	66.79	66.79	271.00
100-year	**77.15**	**77.15**	271.00



ISSUED FOR DRAINAGE REPORT
SEPTEMBER 18, 2025

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
C	9/18/25	REVISED PER NOI PEER REVIEW
B	7/21/25	REVISED PER NOI PEER REVIEW
A	6/11/25	REVISED PER TOWN COMMENTS

APPLICANT\OWNER:

TAG CENTRAL LLC
275 REGATTA DRIVE
JUPITER, FL 33477

PROJECT:

40B MULTIFAMILY
444 EAST CENTRAL STREET
FRANKLIN, MA

PROJECT NO.	3317-01	DATE:	02-11-2025
SCALE:	1" = 50'	DWG. NAME:	C-3317-01
DESIGNED BY:	MTB	CHECKED BY:	CMQ

PREPARED BY:

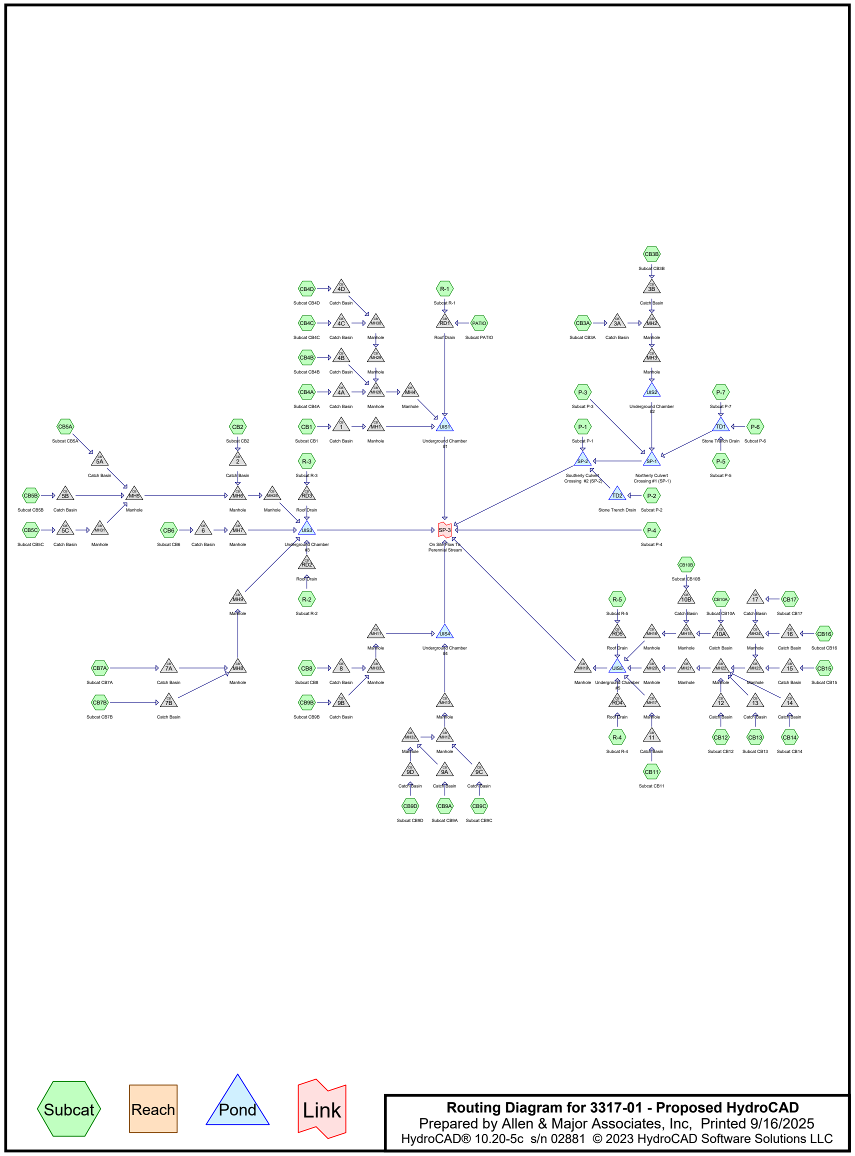
ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
100 COMMERCE WAY, SUITE 5
WOBURN MA 01801
TEL: (781) 935-6889
FAX: (781) 935-2896

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: EXISTING WATERSHED PLAN

SHEET No. EWS

SECTION 5.0 -
PROPOSED DRAINAGE ANALYSIS



Routing Diagram for 3317-01 - Proposed HydroCAD
Prepared by Allen & Major Associates, Inc, Printed 9/16/2025
HydroCAD® 10.20-5c s/n 02881 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 Year	Type III 24-hr		Default	24.00	1	3.37	2
2	10 Year	Type III 24-hr		Default	24.00	1	5.22	2
3	100 Year	Type III 24-hr		Default	24.00	1	8.16	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
378,054	39	>75% Grass cover, Good, HSG A (CB1, CB10A, CB10B, CB11, CB12, CB13, CB14, CB15, CB16, CB17, CB2, CB3A, CB3B, CB4A, CB4B, CB4C, CB4D, CB5A, CB5B, CB5C, CB6, CB7A, CB7B, CB8, CB9A, CB9B, CB9C, CB9D, P-1, P-2, P-3, P-4, P-5, P-6, P-7)
197,117	98	Paved parking, HSG A (CB1, CB10A, CB10B, CB11, CB12, CB13, CB14, CB15, CB16, CB17, CB2, CB3A, CB3B, CB4A, CB4B, CB4C, CB4D, CB5A, CB5B, CB5C, CB6, CB7A, CB7B, CB8, CB9A, CB9B, CB9C, CB9D, P-3, P-4, P-5, P-6, P-7, PATIO)
91,694	98	Roofs, HSG A (CB14, CB15, CB17, CB4C, CB5A, CB5B, CB7B, CB8, CB9A, CB9C, R-1, R-2, R-3, R-4, R-5)
33,288	98	Water Surface, HSG A (P-1, P-3, P-4)
167,329	30	Woods, Good, HSG A (P-4)
867,482	**59**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
867,482	HSG A	CB1, CB10A, CB10B, CB11, CB12, CB13, CB14, CB15, CB16, CB17, CB2, CB3A, CB3B, CB4A, CB4B, CB4C, CB4D, CB5A, CB5B, CB5C, CB6, CB7A, CB7B, CB8, CB9A, CB9B, CB9C, CB9D, P-1, P-2, P-3, P-4, P-5, P-6, P-7, PATIO, R-1, R-2, R-3, R-4, R-5
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
867,482		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
378,054	0	0	0	0	378,054	>75% Grass cover, Good	
197,117	0	0	0	0	197,117	Paved parking	
91,694	0	0	0	0	91,694	Roofs	
33,288	0	0	0	0	33,288	Water Surface	
167,329	0	0	0	0	167,329	Woods, Good	
867,482	**0**	**0**	**0**	**0**	**867,482**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1	271.54	270.70	84.0	0.0100	0.012	0.0	12.0	0.0	
2	2	272.18	271.62	56.0	0.0100	0.012	0.0	12.0	0.0	
3	3A	271.66	271.31	35.0	0.0100	0.012	0.0	12.0	0.0	
4	3B	271.52	271.31	21.1	0.0100	0.012	0.0	12.0	0.0	
5	4A	271.17	271.10	7.0	0.0100	0.012	0.0	12.0	0.0	
6	4B	271.38	271.10	27.4	0.0102	0.012	0.0	12.0	0.0	
7	4C	272.36	271.76	60.5	0.0099	0.012	0.0	12.0	0.0	
8	4D	272.14	271.76	38.0	0.0100	0.012	0.0	12.0	0.0	
9	5A	272.64	272.35	29.0	0.0100	0.012	0.0	12.0	0.0	
10	5B	272.80	272.35	45.0	0.0100	0.012	0.0	12.0	0.0	
11	5C	273.07	272.66	41.0	0.0100	0.012	0.0	12.0	0.0	
12	6	272.76	272.50	26.0	0.0100	0.012	0.0	12.0	0.0	
13	7A	272.92	272.82	10.0	0.0100	0.012	0.0	12.0	0.0	
14	7B	273.22	272.82	40.0	0.0100	0.012	0.0	12.0	0.0	
15	8	273.63	273.34	29.0	0.0100	0.012	0.0	12.0	0.0	
16	9A	272.99	272.85	14.0	0.0100	0.012	0.0	12.0	0.0	
17	9B	273.97	273.34	62.7	0.0100	0.012	0.0	12.0	0.0	
18	9C	272.33	272.28	5.0	0.0100	0.012	0.0	12.0	0.0	
19	9D	273.35	272.85	49.0	0.0102	0.012	0.0	12.0	0.0	
20	10A	271.41	270.54	87.0	0.0100	0.012	0.0	12.0	0.0	
21	10B	270.70	270.52	15.0	0.0120	0.012	0.0	12.0	0.0	
22	11	270.55	270.40	15.0	0.0100	0.012	0.0	12.0	0.0	
23	12	270.74	270.60	14.0	0.0100	0.012	0.0	12.0	0.0	
24	13	271.79	270.92	87.0	0.0100	0.012	0.0	12.0	0.0	
25	14	271.25	270.92	33.0	0.0100	0.012	0.0	12.0	0.0	
26	15	272.42	272.23	19.0	0.0100	0.012	0.0	12.0	0.0	
27	16	274.29	274.10	19.0	0.0100	0.012	0.0	12.0	0.0	
28	17	274.97	274.10	143.0	0.0061	0.012	0.0	15.0	0.0	
29	MH1	271.70	271.70	10.0	0.0000	0.012	0.0	24.0	0.0	
30	MH11	273.00	273.00	4.0	0.0000	0.012	0.0	24.0	0.0	
31	MH12	273.28	273.00	24.9	0.0112	0.012	0.0	15.0	0.0	
32	MH13	273.00	273.00	4.0	0.0000	0.012	0.0	24.0	0.0	
33	MH15	270.44	270.30	14.0	0.0100	0.012	0.0	12.0	0.0	
34	MH16	270.30	270.30	5.0	0.0000	0.012	0.0	24.0	0.0	
35	MH17	270.30	270.30	7.0	0.0000	0.012	0.0	24.0	0.0	
36	MH19	269.87	269.52	51.0	0.0069	0.012	0.0	18.0	0.0	
37	MH2	272.30	272.23	7.0	0.0100	0.012	0.0	12.0	0.0	
38	MH20	270.30	270.30	4.0	0.0000	0.012	0.0	24.0	0.0	
39	MH21	270.50	270.30	20.0	0.0100	0.012	0.0	24.0	0.0	
40	MH22	270.82	270.60	22.0	0.0100	0.012	0.0	24.0	0.0	
41	MH23	272.13	270.92	121.0	0.0100	0.012	0.0	18.0	0.0	
42	MH24	273.99	272.23	176.0	0.0100	0.012	0.0	18.0	0.0	

Pipe Listing (all nodes) (continued)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
43	MH25	272.50	272.50	4.0	0.0000	0.012	0.0	24.0	0.0	
44	MH26	272.10	271.70	40.2	0.0100	0.012	0.0	18.0	0.0	
45	MH29	271.22	271.10	11.5	0.0104	0.012	0.0	15.0	0.0	
46	MH3	272.13	272.13	4.0	0.0000	0.012	0.0	12.0	0.0	
47	MH30	271.66	271.32	34.0	0.0100	0.012	0.0	15.0	0.0	
48	MH31	272.56	272.35	20.9	0.0100	0.012	0.0	12.0	0.0	
49	MH32	272.75	272.28	47.5	0.0099	0.012	0.0	12.0	0.0	
50	MH33	273.24	273.00	24.0	0.0100	0.012	0.0	15.0	0.0	
51	MH4	271.70	271.70	4.0	0.0000	0.012	0.0	24.0	0.0	
52	MH5	272.25	271.62	63.0	0.0100	0.012	0.0	15.0	0.0	
53	MH6	272.62	272.50	12.0	0.0100	0.012	0.0	15.0	0.0	
54	MH7	272.50	272.50	5.0	0.0000	0.012	0.0	24.0	0.0	
55	MH8	272.72	272.50	22.0	0.0100	0.012	0.0	15.0	0.0	
56	MH9	272.50	272.50	8.0	0.0000	0.012	0.0	24.0	0.0	
57	RD1	272.25	272.03	21.0	0.0105	0.012	0.0	10.0	0.0	
58	RD2	273.14	272.83	31.0	0.0100	0.012	0.0	10.0	0.0	
59	RD3	272.98	272.83	14.7	0.0102	0.012	0.0	10.0	0.0	
60	RD4	270.88	270.63	24.0	0.0104	0.012	0.0	10.0	0.0	
61	RD5	270.81	270.63	18.0	0.0100	0.012	0.0	10.0	0.0	
62	SP-1	267.72	267.93	59.0	-0.0036	0.012	0.0	21.0	0.0	
63	SP-1	267.48	267.48	59.0	0.0000	0.012	0.0	21.0	0.0	
64	SP-1	270.02	269.73	29.0	0.0100	0.012	0.0	36.0	0.0	
65	SP-2	266.37	266.85	30.0	-0.0160	0.012	0.0	30.0	0.0	
66	SP-2	270.73	270.49	25.0	0.0096	0.012	0.0	36.0	0.0	
67	TD1	270.90	270.55	68.0	0.0051	0.012	0.0	12.0	0.0	
68	TD2	271.90	271.38	52.0	0.0100	0.012	0.0	12.0	0.0	
69	UIS1	271.70	270.00	137.6	0.0124	0.012	0.0	15.0	0.0	
70	UIS2	272.15	272.00	15.0	0.0100	0.012	0.0	12.0	0.0	
71	UIS3	273.16	272.00	116.0	0.0100	0.012	0.0	12.0	0.0	
72	UIS4	272.10	271.00	110.0	0.0100	0.012	0.0	12.0	0.0	
73	UIS5	272.98	272.00	97.6	0.0100	0.012	0.0	12.0	0.0	

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment CB1: Subcat CB1 Runoff Area=10,841 sf 91.76% Impervious Runoff Depth=2.88"
Tc=6.0 min CN=WQ Runoff=0.75 cfs 2,601 cf

Subcatchment CB10A: Subcat CB10A Runoff Area=3,059 sf 81.64% Impervious Runoff Depth=2.56"
Tc=6.0 min CN=WQ Runoff=0.19 cfs 653 cf

Subcatchment CB10B: Subcat CB10B Runoff Area=10,441 sf 85.21% Impervious Runoff Depth=2.67"
Tc=6.0 min CN=WQ Runoff=0.67 cfs 2,326 cf

Subcatchment CB11: Subcat CB11 Runoff Area=11,505 sf 85.23% Impervious Runoff Depth=2.67"
Tc=6.0 min CN=WQ Runoff=0.74 cfs 2,564 cf

Subcatchment CB12: Subcat CB12 Runoff Area=7,149 sf 71.10% Impervious Runoff Depth=2.23"
Tc=6.0 min CN=WQ Runoff=0.38 cfs 1,329 cf

Subcatchment CB13: Subcat CB13 Runoff Area=4,141 sf 81.21% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=WQ Runoff=0.25 cfs 879 cf

Subcatchment CB14: Subcat CB14 Runoff Area=6,167 sf 86.93% Impervious Runoff Depth=2.73"
Tc=6.0 min CN=WQ Runoff=0.40 cfs 1,401 cf

Subcatchment CB15: Subcat CB15 Runoff Area=20,154 sf 41.62% Impervious Runoff Depth=1.31"
Tc=6.0 min CN=WQ Runoff=0.63 cfs 2,196 cf

Subcatchment CB16: Subcat CB16 Runoff Area=20,584 sf 35.59% Impervious Runoff Depth=1.12"
Tc=6.0 min CN=WQ Runoff=0.55 cfs 1,919 cf

Subcatchment CB17: Subcat CB17 Runoff Area=36,035 sf 27.70% Impervious Runoff Depth=0.87"
Tc=6.0 min CN=WQ Runoff=0.75 cfs 2,618 cf

Subcatchment CB2: Subcat CB2 Runoff Area=4,621 sf 54.10% Impervious Runoff Depth=1.70"
Tc=6.0 min CN=WQ Runoff=0.19 cfs 654 cf

Subcatchment CB3A: Subcat CB3A Runoff Area=3,583 sf 93.36% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=WQ Runoff=0.25 cfs 874 cf

Subcatchment CB3B: Subcat CB3B Runoff Area=6,054 sf 80.94% Impervious Runoff Depth=2.54"
Tc=6.0 min CN=WQ Runoff=0.37 cfs 1,281 cf

Subcatchment CB4A: Subcat CB4A Runoff Area=3,970 sf 89.22% Impervious Runoff Depth=2.80"
Tc=6.0 min CN=WQ Runoff=0.27 cfs 926 cf

Subcatchment CB4B: Subcat CB4B Runoff Area=8,946 sf 74.01% Impervious Runoff Depth=2.32"
Tc=6.0 min CN=WQ Runoff=0.50 cfs 1,731 cf

Subcatchment CB4C: Subcat CB4C Runoff Area=10,741 sf 84.93% Impervious Runoff Depth=2.66"
Tc=6.0 min CN=WQ Runoff=0.69 cfs 2,385 cf

Subcatchment CB4D: Subcat CB4D Runoff Area=11,275 sf 78.19% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=WQ Runoff=0.66 cfs 2,305 cf

Subcatchment CB5A: Subcat CB5A Runoff Area=10,482 sf 93.66% Impervious Runoff Depth=2.94"
Tc=6.0 min CN=WQ Runoff=0.74 cfs 2,567 cf

Subcatchment CB5B: Subcat CB5B Runoff Area=3,866 sf 95.10% Impervious Runoff Depth=2.98"
Tc=6.0 min CN=WQ Runoff=0.28 cfs 961 cf

Subcatchment CB5C: Subcat CB5C Runoff Area=2,581 sf 92.81% Impervious Runoff Depth=2.91"
Tc=6.0 min CN=WQ Runoff=0.18 cfs 626 cf

Subcatchment CB6: Subcat CB6 Runoff Area=12,631 sf 77.28% Impervious Runoff Depth=2.43"
Tc=6.0 min CN=WQ Runoff=0.73 cfs 2,553 cf

Subcatchment CB7A: Subcat CB7A Runoff Area=7,101 sf 79.30% Impervious Runoff Depth=2.49"
Tc=6.0 min CN=WQ Runoff=0.42 cfs 1,472 cf

Subcatchment CB7B: Subcat CB7B Runoff Area=11,300 sf 80.70% Impervious Runoff Depth=2.53"
Tc=6.0 min CN=WQ Runoff=0.69 cfs 2,384 cf

Subcatchment CB8: Subcat CB8 Runoff Area=10,991 sf 80.89% Impervious Runoff Depth=2.54"
Tc=6.0 min CN=WQ Runoff=0.67 cfs 2,325 cf

Subcatchment CB9A: Subcat CB9A Runoff Area=11,743 sf 81.25% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=WQ Runoff=0.72 cfs 2,495 cf

Subcatchment CB9B: Subcat CB9B Runoff Area=14,736 sf 67.43% Impervious Runoff Depth=2.12"
Tc=6.0 min CN=WQ Runoff=0.75 cfs 2,599 cf

Subcatchment CB9C: Subcat CB9C Runoff Area=3,708 sf 100.00% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=WQ Runoff=0.28 cfs 969 cf

Subcatchment CB9D: Subcat CB9D Runoff Area=5,006 sf 63.14% Impervious Runoff Depth=1.98"
Tc=6.0 min CN=WQ Runoff=0.24 cfs 827 cf

Subcatchment P-1: Subcat P-1 Runoff Area=17,439 sf 14.20% Impervious Runoff Depth=0.45"
Tc=6.0 min CN=WQ Runoff=0.19 cfs 652 cf

Subcatchment P-2: Subcat P-2 Runoff Area=6,530 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 2 cf

Subcatchment P-3: Subcat P-3 Runoff Area=19,597 sf 2.20% Impervious Runoff Depth=0.07"
Tc=6.0 min CN=WQ Runoff=0.03 cfs 119 cf

Subcatchment P-4: Subcat P-4 Runoff Area=287,018 sf 12.34% Impervious Runoff Depth=0.39"
Tc=12.0 min CN=WQ Runoff=2.20 cfs 9,282 cf

Subcatchment P-5: Subcat P-5 Runoff Area=76,040 sf 11.69% Impervious Runoff Depth=0.37"
Tc=8.2 min CN=WQ Runoff=0.62 cfs 2,344 cf

Subcatchment P-6: Subcat P-6 Runoff Area=25,354 sf 10.27% Impervious Runoff Depth=0.33"
Tc=6.0 min CN=WQ Runoff=0.20 cfs 688 cf

Subcatchment P-7: Subcat P-7 Runoff Area=79,230 sf 5.41% Impervious Runoff Depth=0.17"
Tc=11.4 min CN=WQ Runoff=0.27 cfs 1,144 cf

Subcatchment PATIO: Subcat PATIO Runoff Area=2,384 sf 100.00% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=98 Runoff=0.18 cfs 623 cf

Subcatchment R-1: Subcat R-1 Runoff Area=5,045 sf 100.00% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=98 Runoff=0.38 cfs 1,319 cf

Subcatchment R-2: Subcat R-2 Runoff Area=18,290 sf 100.00% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=98 Runoff=1.38 cfs 4,781 cf

Subcatchment R-3: Subcat R-3 Runoff Area=18,290 sf 100.00% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=98 Runoff=1.38 cfs 4,781 cf

Subcatchment R-4: Subcat R-4 Runoff Area=18,290 sf 100.00% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=98 Runoff=1.38 cfs 4,781 cf

Subcatchment R-5: Subcat R-5 Runoff Area=20,565 sf 100.00% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=98 Runoff=1.55 cfs 5,376 cf

Pond 1: Catch Basin Peak Elev=272.31' Inflow=0.75 cfs 2,601 cf
12.0" Round Culvert n=0.012 L=84.0' S=0.0100 '/' Outflow=0.75 cfs 2,601 cf

Pond 2: Catch Basin Peak Elev=273.34' Inflow=0.19 cfs 654 cf
12.0" Round Culvert n=0.012 L=56.0' S=0.0100 '/' Outflow=0.19 cfs 654 cf

Pond 3A: Catch Basin Peak Elev=272.80' Inflow=0.25 cfs 874 cf
12.0" Round Culvert n=0.012 L=35.0' S=0.0100 '/' Outflow=0.26 cfs 874 cf

Pond 3B: Catch Basin Peak Elev=272.81' Inflow=0.37 cfs 1,281 cf
12.0" Round Culvert n=0.012 L=21.1' S=0.0100 '/' Outflow=0.38 cfs 1,281 cf

Pond 4A: Catch Basin Peak Elev=272.89' Inflow=0.27 cfs 926 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0100 '/' Outflow=0.28 cfs 926 cf

Pond 4B: Catch Basin Peak Elev=272.91' Inflow=0.50 cfs 1,731 cf
12.0" Round Culvert n=0.012 L=27.4' S=0.0102 '/' Outflow=0.52 cfs 1,730 cf

Pond 4C: Catch Basin Peak Elev=273.09' Inflow=0.69 cfs 2,385 cf
12.0" Round Culvert n=0.012 L=60.5' S=0.0099 '/' Outflow=0.69 cfs 2,385 cf

Pond 4D: Catch Basin Peak Elev=273.03' Inflow=0.66 cfs 2,305 cf
12.0" Round Culvert n=0.012 L=38.0' S=0.0100 '/' Outflow=0.66 cfs 2,305 cf

Pond 5A: Catch Basin Peak Elev=273.47' Inflow=0.74 cfs 2,567 cf
12.0" Round Culvert n=0.012 L=29.0' S=0.0100 '/' Outflow=0.74 cfs 2,567 cf

Pond 5B: Catch Basin Peak Elev=273.42' Inflow=0.28 cfs 961 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0100 '/' Outflow=0.28 cfs 961 cf

Pond 5C: Catch Basin Peak Elev=273.45' Inflow=0.18 cfs 626 cf
12.0" Round Culvert n=0.012 L=41.0' S=0.0100 '/' Outflow=0.18 cfs 626 cf

Pond 6: Catch Basin Peak Elev=273.25' Inflow=0.73 cfs 2,553 cf
12.0" Round Culvert n=0.012 L=26.0' S=0.0100 '/' Outflow=0.73 cfs 2,553 cf

Pond 7A: Catch Basin Peak Elev=273.40' Inflow=0.42 cfs 1,472 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.42 cfs 1,472 cf

Pond 7B: Catch Basin Peak Elev=273.69' Inflow=0.69 cfs 2,384 cf
12.0" Round Culvert n=0.012 L=40.0' S=0.0100 '/' Outflow=0.69 cfs 2,384 cf

Pond 8: Catch Basin Peak Elev=274.14' Inflow=0.67 cfs 2,325 cf
12.0" Round Culvert n=0.012 L=29.0' S=0.0100 '/' Outflow=0.67 cfs 2,325 cf

Pond 9A: Catch Basin Peak Elev=273.99' Inflow=0.72 cfs 2,495 cf
12.0" Round Culvert n=0.012 L=14.0' S=0.0100 '/' Outflow=0.72 cfs 2,494 cf

Pond 9B: Catch Basin Peak Elev=274.44' Inflow=0.75 cfs 2,599 cf
12.0" Round Culvert n=0.012 L=62.7' S=0.0100 '/' Outflow=0.75 cfs 2,599 cf

Pond 9C: Catch Basin Peak Elev=273.91' Inflow=0.28 cfs 969 cf
12.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=0.32 cfs 969 cf

Pond 9D: Catch Basin Peak Elev=273.98' Inflow=0.24 cfs 827 cf
12.0" Round Culvert n=0.012 L=49.0' S=0.0102 '/' Outflow=0.24 cfs 827 cf

Pond 10A: Catch Basin Peak Elev=271.64' Inflow=0.19 cfs 653 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.19 cfs 653 cf

Pond 10B: Catch Basin Peak Elev=271.20' Inflow=0.67 cfs 2,326 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.0120 '/' Outflow=0.67 cfs 2,326 cf

Pond 11: Catch Basin Peak Elev=271.09' Inflow=0.74 cfs 2,564 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.0100 '/' Outflow=0.74 cfs 2,564 cf

Pond 12: Catch Basin Peak Elev=271.74' Inflow=0.38 cfs 1,329 cf
12.0" Round Culvert n=0.012 L=14.0' S=0.0100 '/' Outflow=0.38 cfs 1,329 cf

Pond 13: Catch Basin Peak Elev=272.10' Inflow=0.25 cfs 879 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.25 cfs 879 cf

Pond 14: Catch Basin Peak Elev=271.80' Inflow=0.40 cfs 1,401 cf
12.0" Round Culvert n=0.012 L=33.0' S=0.0100 '/' Outflow=0.40 cfs 1,401 cf

Pond 15: Catch Basin Peak Elev=272.94' Inflow=0.63 cfs 2,196 cf
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=0.63 cfs 2,196 cf

Pond 16: Catch Basin Peak Elev=274.72' Inflow=0.55 cfs 1,919 cf
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=0.55 cfs 1,919 cf

Pond 17: Catch Basin Peak Elev=275.41' Inflow=0.75 cfs 2,618 cf
15.0" Round Culvert n=0.012 L=143.0' S=0.0061 '/' Outflow=0.75 cfs 2,618 cf

Pond MH1: Manhole Peak Elev=272.28' Inflow=0.75 cfs 2,601 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0000 '/' Outflow=0.75 cfs 2,601 cf

Pond MH11: Manhole Peak Elev=273.88' Inflow=1.42 cfs 4,924 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=1.42 cfs 4,924 cf

Pond MH12: Manhole Peak Elev=273.90' Inflow=1.27 cfs 4,290 cf
15.0" Round Culvert n=0.012 L=24.9' S=0.0112 '/' Outflow=1.27 cfs 4,290 cf

Pond MH13: Manhole Peak Elev=273.88' Inflow=1.27 cfs 4,290 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=1.27 cfs 4,290 cf

Pond MH15: Manhole Peak Elev=271.08' Inflow=0.86 cfs 2,979 cf
12.0" Round Culvert n=0.012 L=14.0' S=0.0100 '/' Outflow=0.86 cfs 2,979 cf

Pond MH16: Manhole Peak Elev=271.08' Inflow=0.86 cfs 2,979 cf
24.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=0.86 cfs 2,979 cf

Pond MH17: Manhole Peak Elev=271.08' Inflow=0.74 cfs 2,564 cf
24.0" Round Culvert n=0.012 L=7.0' S=0.0000 '/' Outflow=0.74 cfs 2,564 cf

Pond MH19: Manhole Peak Elev=270.95' Inflow=0.00 cfs 0 cf
18.0" Round Culvert n=0.012 L=51.0' S=0.0069 '/' Outflow=0.00 cfs 0 cf

Pond MH2: Manhole Peak Elev=272.80' Inflow=0.63 cfs 2,155 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0100 '/' Outflow=0.63 cfs 2,155 cf

Pond MH20: Manhole Peak Elev=271.22' Inflow=2.97 cfs 10,343 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=2.97 cfs 10,343 cf

Pond MH21: Manhole Peak Elev=271.46' Inflow=2.97 cfs 10,343 cf
24.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=2.97 cfs 10,343 cf

Pond MH22: Manhole Peak Elev=271.74' Inflow=2.97 cfs 10,343 cf
24.0" Round Culvert n=0.012 L=22.0' S=0.0100 '/' Outflow=2.97 cfs 10,343 cf

Pond MH23: Manhole Peak Elev=272.78' Inflow=1.93 cfs 6,733 cf
18.0" Round Culvert n=0.012 L=121.0' S=0.0100 '/' Outflow=1.93 cfs 6,733 cf

Pond MH24: Manhole Peak Elev=274.50' Inflow=1.30 cfs 4,537 cf
18.0" Round Culvert n=0.012 L=176.0' S=0.0100 '/' Outflow=1.30 cfs 4,537 cf

Pond MH25: Manhole Peak Elev=273.12' Inflow=1.40 cfs 4,808 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=1.40 cfs 4,808 cf

Pond MH26: Manhole Peak Elev=272.89' Inflow=2.18 cfs 7,346 cf
18.0" Round Culvert n=0.012 L=40.2' S=0.0100 '/' Outflow=2.18 cfs 7,346 cf

Pond MH29: Manhole Peak Elev=272.94' Inflow=1.36 cfs 4,691 cf
15.0" Round Culvert n=0.012 L=11.5' S=0.0104 '/' Outflow=1.40 cfs 4,691 cf

Pond MH3: Manhole Peak Elev=272.64' Inflow=0.63 cfs 2,155 cf
12.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=0.63 cfs 2,155 cf

Pond MH30: Manhole Peak Elev=272.99' Inflow=1.35 cfs 4,691 cf
15.0" Round Culvert n=0.012 L=34.0' S=0.0100 '/' Outflow=1.36 cfs 4,691 cf

Pond MH31: Manhole Peak Elev=273.40' Inflow=0.18 cfs 626 cf
12.0" Round Culvert n=0.012 L=20.9' S=0.0100 '/' Outflow=0.18 cfs 626 cf

Pond MH32: Manhole Peak Elev=273.97' Inflow=0.96 cfs 3,321 cf
12.0" Round Culvert n=0.012 L=47.5' S=0.0099 '/' Outflow=0.96 cfs 3,321 cf

Pond MH33: Manhole Peak Elev=273.92' Inflow=1.42 cfs 4,924 cf
15.0" Round Culvert n=0.012 L=24.0' S=0.0100 '/' Outflow=1.42 cfs 4,924 cf

Pond MH4: Manhole Peak Elev=272.48' Inflow=2.18 cfs 7,346 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=2.18 cfs 7,346 cf

Pond MH5: Manhole Peak Elev=273.40' Inflow=1.19 cfs 4,154 cf
15.0" Round Culvert n=0.012 L=63.0' S=0.0100 '/' Outflow=1.20 cfs 4,154 cf

Pond MH6: Manhole Peak Elev=273.33' Inflow=1.40 cfs 4,808 cf
15.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=1.40 cfs 4,808 cf

Pond MH7: Manhole Peak Elev=273.01' Inflow=0.73 cfs 2,553 cf
24.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=0.73 cfs 2,553 cf

Pond MH8: Manhole Peak Elev=273.32' Inflow=1.11 cfs 3,857 cf
15.0" Round Culvert n=0.012 L=22.0' S=0.0100 '/' Outflow=1.11 cfs 3,857 cf

Pond MH9: Manhole Peak Elev=273.06' Inflow=1.11 cfs 3,857 cf
24.0" Round Culvert n=0.012 L=8.0' S=0.0000 '/' Outflow=1.11 cfs 3,857 cf

Pond RD1: Roof Drain Peak Elev=272.67' Inflow=0.56 cfs 1,942 cf
10.0" Round Culvert n=0.012 L=21.0' S=0.0105 '/' Outflow=0.56 cfs 1,942 cf

Pond RD2: Roof Drain Peak Elev=273.86' Inflow=1.38 cfs 4,781 cf
10.0" Round Culvert n=0.012 L=31.0' S=0.0100 '/' Outflow=1.38 cfs 4,781 cf

Pond RD3: Roof Drain Peak Elev=273.75' Inflow=1.38 cfs 4,781 cf
10.0" Round Culvert n=0.012 L=14.7' S=0.0102 '/' Outflow=1.38 cfs 4,781 cf

Pond RD4: Roof Drain Peak Elev=271.62' Inflow=1.38 cfs 4,781 cf
10.0" Round Culvert n=0.012 L=24.0' S=0.0104 '/' Outflow=1.38 cfs 4,781 cf

Pond RD5: Roof Drain Peak Elev=271.64' Inflow=1.55 cfs 5,376 cf
10.0" Round Culvert n=0.012 L=18.0' S=0.0100 '/' Outflow=1.55 cfs 5,376 cf

Pond SP-1: Northerly Culvert Crossing Peak Elev=271.79' Storage=12,603 cf Inflow=55.58 cfs 7,092,224 cf
Outflow=55.46 cfs 7,079,789 cf

Pond SP-2: Southerly Culvert Peak Elev=271.65' Storage=16,439 cf Inflow=55.60 cfs 7,080,443 cf
Outflow=55.56 cfs 7,064,121 cf

Pond TD1: Stone Trench Drain Peak Elev=271.81' Storage=32 cf Inflow=1.06 cfs 4,176 cf
Discarded=0.20 cfs 3,159 cf Primary=0.85 cfs 1,017 cf Outflow=1.05 cfs 4,176 cf

Pond TD2: Stone Trench Drain Peak Elev=272.00' Storage=0 cf Inflow=0.00 cfs 2 cf
Discarded=0.00 cfs 0 cf Primary=0.00 cfs 2 cf Outflow=0.00 cfs 2 cf

Pond UIS1: Underground Chamber #1 Peak Elev=272.28' Storage=2,575 cf Inflow=3.48 cfs 11,889 cf
Discarded=0.73 cfs 11,889 cf Primary=0.00 cfs 0 cf Outflow=0.73 cfs 11,889 cf

Pond UIS2: Underground Chamber #2 Peak Elev=272.55' Storage=377 cf Inflow=0.63 cfs 2,155 cf
Discarded=0.17 cfs 2,155 cf Primary=0.00 cfs 0 cf Outflow=0.17 cfs 2,155 cf

Pond UIS3: Underground Chamber #3 Peak Elev=273.01' Storage=4,339 cf Inflow=5.98 cfs 20,780 cf
Discarded=1.33 cfs 20,780 cf Primary=0.00 cfs 0 cf Outflow=1.33 cfs 20,780 cf

Pond UIS4: Underground Chamber #4 Peak Elev=273.88' Storage=2,256 cf Inflow=2.68 cfs 9,213 cf
Discarded=0.48 cfs 9,213 cf Primary=0.00 cfs 0 cf Outflow=0.48 cfs 9,213 cf

Pond UIS5: Underground Chamber #5 Peak Elev=271.08' Storage=5,460 cf Inflow=7.49 cfs 26,043 cf
Discarded=1.66 cfs 26,043 cf Primary=0.00 cfs 0 cf Outflow=1.66 cfs 26,043 cf

Link SP-3: On Site Flow To Perennial Stream Inflow=57.75 cfs 7,073,403 cf
Primary=57.75 cfs 7,073,403 cf

Total Runoff Area = 867,482 sf Runoff Volume = 84,315 cf Average Runoff Depth = 1.17"
62.87% Pervious = 545,383 sf 37.13% Impervious = 322,099 sf

Summary for Subcatchment CB1: Subcat CB1

Runoff = 0.75 cfs @ 12.08 hrs, Volume= 2,601 cf, Depth= 2.88"
Routed to Pond 1 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
893	39	>75% Grass cover, Good, HSG A
9,948	98	Paved parking, HSG A
10,841		Weighted Average
893	39	8.24% Pervious Area
9,948	98	91.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB10A: Subcat CB10A

Runoff = 0.19 cfs @ 12.08 hrs, Volume= 653 cf, Depth= 2.56"
Routed to Pond 10A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
562	39	>75% Grass cover, Good, HSG A
2,497	98	Paved parking, HSG A
3,059		Weighted Average
562	39	18.36% Pervious Area
2,497	98	81.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB10B: Subcat CB10B

Runoff = 0.67 cfs @ 12.08 hrs, Volume= 2,326 cf, Depth= 2.67"
Routed to Pond 10B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
1,544	39	>75% Grass cover, Good, HSG A
8,897	98	Paved parking, HSG A
10,441		Weighted Average
1,544	39	14.79% Pervious Area
8,897	98	85.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB11: Subcat CB11

Runoff = 0.74 cfs @ 12.08 hrs, Volume= 2,564 cf, Depth= 2.67"
Routed to Pond 11 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
1,699	39	>75% Grass cover, Good, HSG A
9,806	98	Paved parking, HSG A
11,505		Weighted Average
1,699	39	14.77% Pervious Area
9,806	98	85.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB12: Subcat CB12

Runoff = 0.38 cfs @ 12.08 hrs, Volume= 1,329 cf, Depth= 2.23"
Routed to Pond 12 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
2,066	39	>75% Grass cover, Good, HSG A
5,082	98	Paved parking, HSG A
7,149		Weighted Average
2,066	39	28.90% Pervious Area
5,082	98	71.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB13: Subcat CB13

Runoff = 0.25 cfs @ 12.08 hrs, Volume= 879 cf, Depth= 2.55"
Routed to Pond 13 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
778	39	>75% Grass cover, Good, HSG A
3,363	98	Paved parking, HSG A
4,141		Weighted Average
778	39	18.79% Pervious Area
3,363	98	81.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB14: Subcat CB14

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 1,401 cf, Depth= 2.73"
Routed to Pond 14 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
806	39	>75% Grass cover, Good, HSG A
4,761	98	Paved parking, HSG A
600	98	Roofs, HSG A
6,167		Weighted Average
806	39	13.07% Pervious Area
5,360	98	86.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB15: Subcat CB15

Runoff = 0.63 cfs @ 12.08 hrs, Volume= 2,196 cf, Depth= 1.31"
Routed to Pond 15 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
11,766	39	>75% Grass cover, Good, HSG A
7,412	98	Paved parking, HSG A
975	98	Roofs, HSG A
20,154		Weighted Average
11,766	39	58.38% Pervious Area
8,388	98	41.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB16: Subcat CB16

Runoff = 0.55 cfs @ 12.08 hrs, Volume= 1,919 cf, Depth= 1.12"
Routed to Pond 16 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
13,257	39	>75% Grass cover, Good, HSG A
7,326	98	Paved parking, HSG A
20,584		Weighted Average
13,257	39	64.41% Pervious Area
7,326	98	35.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB17: Subcat CB17

Runoff = 0.75 cfs @ 12.08 hrs, Volume= 2,618 cf, Depth= 0.87"
Routed to Pond 17 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
26,052	39	>75% Grass cover, Good, HSG A
8,219	98	Paved parking, HSG A
1,764	98	Roofs, HSG A
36,035		Weighted Average
26,052	39	72.30% Pervious Area
9,983	98	27.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB2: Subcat CB2

Runoff = 0.19 cfs @ 12.08 hrs, Volume= 654 cf, Depth= 1.70"
Routed to Pond 2 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
2,121	39	>75% Grass cover, Good, HSG A
2,500	98	Paved parking, HSG A
4,621		Weighted Average
2,121	39	45.90% Pervious Area
2,500	98	54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB3A: Subcat CB3A

Runoff = 0.25 cfs @ 12.08 hrs, Volume= 874 cf, Depth= 2.93"
Routed to Pond 3A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
238	39	>75% Grass cover, Good, HSG A
3,345	98	Paved parking, HSG A
3,583		Weighted Average
238	39	6.64% Pervious Area
3,345	98	93.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB3B: Subcat CB3B

Runoff = 0.37 cfs @ 12.08 hrs, Volume= 1,281 cf, Depth= 2.54"
Routed to Pond 3B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
1,154	39	>75% Grass cover, Good, HSG A
4,901	98	Paved parking, HSG A
6,054		Weighted Average
1,154	39	19.06% Pervious Area
4,901	98	80.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4A: Subcat CB4A

Runoff = 0.27 cfs @ 12.08 hrs, Volume= 926 cf, Depth= 2.80"
Routed to Pond 4A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
428	39	>75% Grass cover, Good, HSG A
3,542	98	Paved parking, HSG A
3,970		Weighted Average
428	39	10.78% Pervious Area
3,542	98	89.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4B: Subcat CB4B

Runoff = 0.50 cfs @ 12.08 hrs, Volume= 1,731 cf, Depth= 2.32"
Routed to Pond 4B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
2,325	39	>75% Grass cover, Good, HSG A
6,621	98	Paved parking, HSG A
8,946		Weighted Average
2,325	39	25.99% Pervious Area
6,621	98	74.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4C: Subcat CB4C

Runoff = 0.69 cfs @ 12.08 hrs, Volume= 2,385 cf, Depth= 2.66"
Routed to Pond 4C : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
1,619	39	>75% Grass cover, Good, HSG A
7,106	98	Paved parking, HSG A
2,016	98	Roofs, HSG A
10,741		Weighted Average
1,619	39	15.07% Pervious Area
9,122	98	84.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4D: Subcat CB4D

Runoff = 0.66 cfs @ 12.08 hrs, Volume= 2,305 cf, Depth= 2.45"
Routed to Pond 4D : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
2,459	39	>75% Grass cover, Good, HSG A
8,817	98	Paved parking, HSG A
11,275		Weighted Average
2,459	39	21.81% Pervious Area
8,817	98	78.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB5A: Subcat CB5A

Runoff = 0.74 cfs @ 12.08 hrs, Volume= 2,567 cf, Depth= 2.94"
Routed to Pond 5A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
665	39	>75% Grass cover, Good, HSG A
9,303	98	Paved parking, HSG A
514	98	Roofs, HSG A
10,482		Weighted Average
665	39	6.34% Pervious Area
9,817	98	93.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB5B: Subcat CB5B

Runoff = 0.28 cfs @ 12.08 hrs, Volume= 961 cf, Depth= 2.98"
Routed to Pond 5B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
190	39	>75% Grass cover, Good, HSG A
2,916	98	Paved parking, HSG A
760	98	Roofs, HSG A
3,866		Weighted Average
190	39	4.90% Pervious Area
3,676	98	95.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB5C: Subcat CB5C

Runoff = 0.18 cfs @ 12.08 hrs, Volume= 626 cf, Depth= 2.91"
Routed to Pond 5C : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
185	39	>75% Grass cover, Good, HSG A
2,396	98	Paved parking, HSG A
2,581		Weighted Average
185	39	7.19% Pervious Area
2,396	98	92.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB6: Subcat CB6

Runoff = 0.73 cfs @ 12.08 hrs, Volume= 2,553 cf, Depth= 2.43"
Routed to Pond 6 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
2,869	39	>75% Grass cover, Good, HSG A
9,762	98	Paved parking, HSG A
12,631		Weighted Average
2,869	39	22.72% Pervious Area
9,762	98	77.28% Impervious Area

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

Summary for Subcatchment CB7A: Subcat CB7A

Runoff = 0.42 cfs @ 12.08 hrs, Volume= 1,472 cf, Depth= 2.49"
Routed to Pond 7A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
1,470	39	>75% Grass cover, Good, HSG A
5,631	98	Paved parking, HSG A
7,101		Weighted Average
1,470	39	20.70% Pervious Area
5,631	98	79.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB7B: Subcat CB7B

Runoff = 0.69 cfs @ 12.08 hrs, Volume= 2,384 cf, Depth= 2.53"
Routed to Pond 7B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
2,181	39	>75% Grass cover, Good, HSG A
8,314	98	Paved parking, HSG A
805	98	Roofs, HSG A
11,300		Weighted Average
2,181	39	19.30% Pervious Area
9,119	98	80.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB8: Subcat CB8

Runoff = 0.67 cfs @ 12.08 hrs, Volume= 2,325 cf, Depth= 2.54"
Routed to Pond 8 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
2,100	39	>75% Grass cover, Good, HSG A
8,498	98	Paved parking, HSG A
393	98	Roofs, HSG A
10,991		Weighted Average
2,100	39	19.11% Pervious Area
8,891	98	80.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9A: Subcat CB9A

Runoff = 0.72 cfs @ 12.08 hrs, Volume= 2,495 cf, Depth= 2.55"
Routed to Pond 9A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
2,202	39	>75% Grass cover, Good, HSG A
7,525	98	Paved parking, HSG A
2,016	98	Roofs, HSG A
11,743		Weighted Average
2,202	39	18.75% Pervious Area
9,541	98	81.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9B: Subcat CB9B

Runoff = 0.75 cfs @ 12.08 hrs, Volume= 2,599 cf, Depth= 2.12"
Routed to Pond 9B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
4,799	39	>75% Grass cover, Good, HSG A
9,937	98	Paved parking, HSG A
14,736		Weighted Average
4,799	39	32.57% Pervious Area
9,937	98	67.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9C: Subcat CB9C

Runoff = 0.28 cfs @ 12.08 hrs, Volume= 969 cf, Depth= 3.14"
Routed to Pond 9C : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
0	39	>75% Grass cover, Good, HSG A
2,337	98	Paved parking, HSG A
1,371	98	Roofs, HSG A
3,708		Weighted Average
0	39	0.00% Pervious Area
3,708	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9D: Subcat CB9D

Runoff = 0.24 cfs @ 12.08 hrs, Volume= 827 cf, Depth= 1.98"
Routed to Pond 9D : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
1,845	39	>75% Grass cover, Good, HSG A
3,161	98	Paved parking, HSG A
5,006		Weighted Average
1,845	39	36.86% Pervious Area
3,161	98	63.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-1: Subcat P-1

Runoff = 0.19 cfs @ 12.08 hrs, Volume= 652 cf, Depth= 0.45"
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
14,962	39	>75% Grass cover, Good, HSG A
2,477	98	Water Surface, HSG A
17,439		Weighted Average
14,962	39	85.80% Pervious Area
2,477	98	14.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.00 cfs @ 23.74 hrs, Volume= 2 cf, Depth= 0.00"
Routed to Pond TD2 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
6,530	39	>75% Grass cover, Good, HSG A
6,530	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-3: Subcat P-3

Runoff = 0.03 cfs @ 12.08 hrs, Volume= 119 cf, Depth= 0.07"
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
19,166	39	>75% Grass cover, Good, HSG A
0	98	Paved parking, HSG A
431	98	Water Surface, HSG A
19,597		Weighted Average
19,166	39	97.80% Pervious Area
432	98	2.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-4: Subcat P-4

Runoff = 2.20 cfs @ 12.16 hrs, Volume= 9,282 cf, Depth= 0.39"
Routed to Link SP-3 : On Site Flow To Perennial Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
84,280	39	>75% Grass cover, Good, HSG A
5,030	98	Paved parking, HSG A
30,379	98	Water Surface, HSG A
167,329	30	Woods, Good, HSG A
287,018		Weighted Average
251,608	33	87.66% Pervious Area
35,410	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, Copied from EWS**

Summary for Subcatchment P-5: Subcat P-5

Runoff = 0.62 cfs @ 12.11 hrs, Volume= 2,344 cf, Depth= 0.37"
Routed to Pond TD1 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
67,151	39	>75% Grass cover, Good, HSG A
8,890	98	Paved parking, HSG A
76,040		Weighted Average
67,151	39	88.31% Pervious Area
8,890	98	11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2					**Direct Entry, Copied From EWS. (TC ends at Point G)**

Summary for Subcatchment P-6: Subcat P-6

Runoff = 0.20 cfs @ 12.08 hrs, Volume= 688 cf, Depth= 0.33"
Routed to Pond TD1 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
22,749	39	>75% Grass cover, Good, HSG A
2,605	98	Paved parking, HSG A
25,354		Weighted Average
22,749	39	89.73% Pervious Area
2,605	98	10.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Copied from EWS (TC ends at Point F)**

Summary for Subcatchment P-7: Subcat P-7

Runoff = 0.27 cfs @ 12.15 hrs, Volume= 1,144 cf, Depth= 0.17"
Routed to Pond TD1 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
74,943	39	>75% Grass cover, Good, HSG A
4,287	98	Paved parking, HSG A
79,230		Weighted Average
74,943	39	94.59% Pervious Area
4,287	98	5.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4					**Direct Entry, Copied From EWS**

Summary for Subcatchment PATIO: Subcat PATIO

Runoff = 0.18 cfs @ 12.08 hrs, Volume= 623 cf, Depth= 3.14"
Routed to Pond RD1 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
2,384	98	Paved parking, HSG A
2,384	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-1: Subcat R-1

Runoff = 0.38 cfs @ 12.08 hrs, Volume= 1,319 cf, Depth= 3.14"
Routed to Pond RD1 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
5,045	98	Roofs, HSG A
5,045	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-2: Subcat R-2

Runoff = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf, Depth= 3.14"
Routed to Pond RD2 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
18,290	98	Roofs, HSG A
18,290	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-3: Subcat R-3

Runoff = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf, Depth= 3.14"
Routed to Pond RD3 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
18,290	98	Roofs, HSG A
18,290	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-4: Subcat R-4

Runoff = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf, Depth= 3.14"
Routed to Pond RD4 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
18,290	98	Roofs, HSG A
18,290	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-5: Subcat R-5

Runoff = 1.55 cfs @ 12.08 hrs, Volume= 5,376 cf, Depth= 3.14"
Routed to Pond RD5 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Rainfall=3.37"

Area (sf)	CN	Description
20,565	98	Roofs, HSG A
20,565	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Pond 1: Catch Basin

Inflow Area = 10,841 sf, 91.76% Impervious, Inflow Depth = 2.88" for 2 Year event
Inflow = 0.75 cfs @ 12.08 hrs, Volume= 2,601 cf
Outflow = 0.75 cfs @ 12.08 hrs, Volume= 2,601 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.08 hrs, Volume= 2,601 cf
Routed to Pond MH1 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.31' @ 12.08 hrs
Flood Elev= 274.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.54'	**12.0" Round Culvert** L= 84.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.54' / 270.70' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.75 cfs @ 12.08 hrs HW=272.31' TW=272.17' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.75 cfs @ 1.60 fps)

Summary for Pond 2: Catch Basin

Inflow Area = 4,621 sf, 54.10% Impervious, Inflow Depth = 1.70" for 2 Year event
Inflow = 0.19 cfs @ 12.08 hrs, Volume= 654 cf
Outflow = 0.19 cfs @ 12.09 hrs, Volume= 654 cf, Atten= 0%, Lag= 0.3 min
Primary = 0.19 cfs @ 12.09 hrs, Volume= 654 cf
Routed to Pond MH6 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.34' @ 12.09 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.18'	**12.0" Round Culvert** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.18' / 271.62' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.19 cfs @ 12.09 hrs HW=273.34' TW=273.33' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.19 cfs @ 0.26 fps)

Summary for Pond 3A: Catch Basin

Inflow Area = 3,583 sf, 93.36% Impervious, Inflow Depth = 2.93" for 2 Year event
Inflow = 0.25 cfs @ 12.08 hrs, Volume= 874 cf
Outflow = 0.26 cfs @ 12.08 hrs, Volume= 874 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.26 cfs @ 12.08 hrs, Volume= 874 cf
Routed to Pond MH2 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.80' @ 12.09 hrs
Flood Elev= 274.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.66'	**12.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.66' / 271.31' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.26 cfs @ 12.08 hrs HW=272.79' TW=272.79' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.26 cfs @ 0.33 fps)

Summary for Pond 3B: Catch Basin

Inflow Area = 6,054 sf, 80.94% Impervious, Inflow Depth = 2.54" for 2 Year event
Inflow = 0.37 cfs @ 12.08 hrs, Volume= 1,281 cf
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 1,281 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,281 cf
Routed to Pond MH2 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.81' @ 12.09 hrs
Flood Elev= 274.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.52'	**12.0" Round Culvert** L= 21.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.52' / 271.31' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.38 cfs @ 12.09 hrs HW=272.80' TW=272.79' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.38 cfs @ 0.49 fps)

Summary for Pond 4A: Catch Basin

Inflow Area = 3,970 sf, 89.22% Impervious, Inflow Depth = 2.80" for 2 Year event
Inflow = 0.27 cfs @ 12.08 hrs, Volume= 926 cf
Outflow = 0.28 cfs @ 12.08 hrs, Volume= 926 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.08 hrs, Volume= 926 cf
Routed to Pond MH26 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.89' @ 12.09 hrs
Flood Elev= 275.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.17'	**12.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.17' / 271.10' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.28 cfs @ 12.08 hrs HW=272.86' TW=272.86' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.28 cfs @ 0.35 fps)

Summary for Pond 4B: Catch Basin

Inflow Area = 8,946 sf, 74.01% Impervious, Inflow Depth = 2.32" for 2 Year event
Inflow = 0.50 cfs @ 12.08 hrs, Volume= 1,731 cf
Outflow = 0.52 cfs @ 12.09 hrs, Volume= 1,730 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.52 cfs @ 12.09 hrs, Volume= 1,730 cf
Routed to Pond MH26 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.91' @ 12.09 hrs
Flood Elev= 275.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.38'	**12.0" Round Culvert** L= 27.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.38' / 271.10' S= 0.0102 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.09 hrs HW=272.90' TW=272.88' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.52 cfs @ 0.66 fps)

Summary for Pond 4C: Catch Basin

Inflow Area = 10,741 sf, 84.93% Impervious, Inflow Depth = 2.66" for 2 Year event
Inflow = 0.69 cfs @ 12.08 hrs, Volume= 2,385 cf
Outflow = 0.69 cfs @ 12.08 hrs, Volume= 2,385 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 12.08 hrs, Volume= 2,385 cf
Routed to Pond MH30 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.09' @ 12.08 hrs
Flood Elev= 275.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.36'	**12.0" Round Culvert** L= 60.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.36' / 271.76' S= 0.0099 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.70 cfs @ 12.08 hrs HW=273.09' TW=272.97' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.70 cfs @ 1.59 fps)

Summary for Pond 4D: Catch Basin

Inflow Area = 11,275 sf, 78.19% Impervious, Inflow Depth = 2.45" for 2 Year event
Inflow = 0.66 cfs @ 12.08 hrs, Volume= 2,305 cf
Outflow = 0.66 cfs @ 12.08 hrs, Volume= 2,305 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.66 cfs @ 12.08 hrs, Volume= 2,305 cf
Routed to Pond MH30 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.03' @ 12.08 hrs
Flood Elev= 275.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.14'	**12.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.14' / 271.76' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.69 cfs @ 12.08 hrs HW=273.03' TW=272.97' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.69 cfs @ 1.24 fps)

Summary for Pond 5A: Catch Basin

Inflow Area = 10,482 sf, 93.66% Impervious, Inflow Depth = 2.94" for 2 Year event
Inflow = 0.74 cfs @ 12.08 hrs, Volume= 2,567 cf
Outflow = 0.74 cfs @ 12.08 hrs, Volume= 2,567 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.08 hrs, Volume= 2,567 cf
Routed to Pond MH5 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.47' @ 12.09 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.64'	**12.0" Round Culvert** L= 29.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.64' / 272.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.74 cfs @ 12.08 hrs HW=273.47' TW=273.40' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.74 cfs @ 1.44 fps)

Summary for Pond 5B: Catch Basin

Inflow Area = 3,866 sf, 95.10% Impervious, Inflow Depth = 2.98" for 2 Year event
Inflow = 0.28 cfs @ 12.08 hrs, Volume= 961 cf
Outflow = 0.28 cfs @ 12.08 hrs, Volume= 961 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.08 hrs, Volume= 961 cf
Routed to Pond MH5 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.42' @ 12.09 hrs
Flood Elev= 276.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.80'	**12.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.80' / 272.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.28 cfs @ 12.08 hrs HW=273.42' TW=273.40' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.28 cfs @ 0.77 fps)

Summary for Pond 5C: Catch Basin

Inflow Area = 2,581 sf, 92.81% Impervious, Inflow Depth = 2.91" for 2 Year event
Inflow = 0.18 cfs @ 12.08 hrs, Volume= 626 cf
Outflow = 0.18 cfs @ 12.08 hrs, Volume= 626 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.18 cfs @ 12.08 hrs, Volume= 626 cf
Routed to Pond MH31 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.45' @ 12.08 hrs
Flood Elev= 276.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.07'	**12.0" Round Culvert** L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.07' / 272.66' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.18 cfs @ 12.08 hrs HW=273.45' TW=273.40' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.18 cfs @ 0.97 fps)

Summary for Pond 6: Catch Basin

Inflow Area = 12,631 sf, 77.28% Impervious, Inflow Depth = 2.43" for 2 Year event
Inflow = 0.73 cfs @ 12.08 hrs, Volume= 2,553 cf
Outflow = 0.73 cfs @ 12.08 hrs, Volume= 2,553 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.08 hrs, Volume= 2,553 cf
Routed to Pond MH7 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.25' @ 12.08 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.76'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.76' / 272.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.73 cfs @ 12.08 hrs HW=273.25' TW=272.95' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.73 cfs @ 2.81 fps)

Summary for Pond 7A: Catch Basin

Inflow Area = 7,101 sf, 79.30% Impervious, Inflow Depth = 2.49" for 2 Year event
Inflow = 0.42 cfs @ 12.08 hrs, Volume= 1,472 cf
Outflow = 0.42 cfs @ 12.08 hrs, Volume= 1,472 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.08 hrs, Volume= 1,472 cf
Routed to Pond MH8 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.40' @ 12.08 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.92'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.92' / 272.82' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.08 hrs HW=273.40' TW=273.32' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.42 cfs @ 1.67 fps)

Summary for Pond 7B: Catch Basin

Inflow Area = 11,300 sf, 80.70% Impervious, Inflow Depth = 2.53" for 2 Year event
Inflow = 0.69 cfs @ 12.08 hrs, Volume= 2,384 cf
Outflow = 0.69 cfs @ 12.08 hrs, Volume= 2,384 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 12.08 hrs, Volume= 2,384 cf
Routed to Pond MH8 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.69' @ 12.08 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.22'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.22' / 272.82' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.68 cfs @ 12.08 hrs HW=273.69' TW=273.32' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.68 cfs @ 2.81 fps)

Summary for Pond 8: Catch Basin

Inflow Area = 10,991 sf, 80.89% Impervious, Inflow Depth = 2.54" for 2 Year event
Inflow = 0.67 cfs @ 12.08 hrs, Volume= 2,325 cf
Outflow = 0.67 cfs @ 12.08 hrs, Volume= 2,325 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.08 hrs, Volume= 2,325 cf
Routed to Pond MH33 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.14' @ 12.08 hrs
Flood Elev= 276.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.63'	**12.0" Round Culvert** L= 29.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.63' / 273.34' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.67 cfs @ 12.08 hrs HW=274.14' TW=273.92' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.67 cfs @ 2.40 fps)

Summary for Pond 9A: Catch Basin

Inflow Area = 11,743 sf, 81.25% Impervious, Inflow Depth = 2.55" for 2 Year event
Inflow = 0.72 cfs @ 12.08 hrs, Volume= 2,495 cf
Outflow = 0.72 cfs @ 12.08 hrs, Volume= 2,494 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.72 cfs @ 12.08 hrs, Volume= 2,494 cf
Routed to Pond MH32 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.99' @ 12.09 hrs
Flood Elev= 276.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.99'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.99' / 272.85' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.08 hrs HW=273.99' TW=273.95' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.76 cfs @ 1.21 fps)

Summary for Pond 9B: Catch Basin

Inflow Area = 14,736 sf, 67.43% Impervious, Inflow Depth = 2.12" for 2 Year event
Inflow = 0.75 cfs @ 12.08 hrs, Volume= 2,599 cf
Outflow = 0.75 cfs @ 12.08 hrs, Volume= 2,599 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.08 hrs, Volume= 2,599 cf
Routed to Pond MH33 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.44' @ 12.08 hrs
Flood Elev= 276.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.97'	**12.0" Round Culvert** L= 62.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.97' / 273.34' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.75 cfs @ 12.08 hrs HW=274.44' TW=273.92' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.75 cfs @ 2.98 fps)

Summary for Pond 9C: Catch Basin

Inflow Area = 3,708 sf,100.00% Impervious, Inflow Depth = 3.14" for 2 Year event
Inflow = 0.28 cfs @ 12.08 hrs, Volume= 969 cf
Outflow = 0.32 cfs @ 12.09 hrs, Volume= 969 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.32 cfs @ 12.09 hrs, Volume= 969 cf
Routed to Pond MH12 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.91' @ 12.09 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.33'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.33' / 272.28' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.31 cfs @ 12.09 hrs HW=273.91' TW=273.90' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.31 cfs @ 0.40 fps)

Summary for Pond 9D: Catch Basin

Inflow Area = 5,006 sf, 63.14% Impervious, Inflow Depth = 1.98" for 2 Year event
Inflow = 0.24 cfs @ 12.08 hrs, Volume= 827 cf
Outflow = 0.24 cfs @ 12.08 hrs, Volume= 827 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.08 hrs, Volume= 827 cf
Routed to Pond MH32 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.98' @ 12.09 hrs
Flood Elev= 276.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.35'	**12.0" Round Culvert** L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.35' / 272.85' S= 0.0102 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.25 cfs @ 12.08 hrs HW=273.97' TW=273.95' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.25 cfs @ 0.69 fps)

Summary for Pond 10A: Catch Basin

Inflow Area = 3,059 sf, 81.64% Impervious, Inflow Depth = 2.56" for 2 Year event
Inflow = 0.19 cfs @ 12.08 hrs, Volume= 653 cf
Outflow = 0.19 cfs @ 12.08 hrs, Volume= 653 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.19 cfs @ 12.08 hrs, Volume= 653 cf
Routed to Pond MH15 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.64' @ 12.08 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.41'	**12.0" Round Culvert** L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.41' / 270.54' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.19 cfs @ 12.08 hrs HW=271.64' TW=271.01' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.19 cfs @ 2.12 fps)

Summary for Pond 10B: Catch Basin

Inflow Area = 10,441 sf, 85.21% Impervious, Inflow Depth = 2.67" for 2 Year event
Inflow = 0.67 cfs @ 12.08 hrs, Volume= 2,326 cf
Outflow = 0.67 cfs @ 12.08 hrs, Volume= 2,326 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.08 hrs, Volume= 2,326 cf
Routed to Pond MH15 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.20' @ 12.08 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.70'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.70' / 270.52' S= 0.0120 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.67 cfs @ 12.08 hrs HW=271.20' TW=271.01' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.67 cfs @ 2.48 fps)

Summary for Pond 11: Catch Basin

Inflow Area = 11,505 sf, 85.23% Impervious, Inflow Depth = 2.67" for 2 Year event
Inflow = 0.74 cfs @ 12.08 hrs, Volume= 2,564 cf
Outflow = 0.74 cfs @ 12.08 hrs, Volume= 2,564 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.08 hrs, Volume= 2,564 cf
Routed to Pond MH17 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.09' @ 12.46 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.55'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.55' / 270.40' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.74 cfs @ 12.08 hrs HW=271.03' TW=270.76' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.74 cfs @ 2.91 fps)

Summary for Pond 12: Catch Basin

Inflow Area = 7,149 sf, 71.10% Impervious, Inflow Depth = 2.23" for 2 Year event
Inflow = 0.38 cfs @ 12.08 hrs, Volume= 1,329 cf
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 1,329 cf, Atten= 0%, Lag= 0.2 min
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,329 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.74' @ 12.09 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.74'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.74' / 270.60' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.09 hrs HW=271.74' TW=271.73' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.37 cfs @ 0.47 fps)

Summary for Pond 13: Catch Basin

Inflow Area = 4,141 sf, 81.21% Impervious, Inflow Depth = 2.55" for 2 Year event
Inflow = 0.25 cfs @ 12.08 hrs, Volume= 879 cf
Outflow = 0.25 cfs @ 12.08 hrs, Volume= 879 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.25 cfs @ 12.08 hrs, Volume= 879 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.10' @ 12.08 hrs
Flood Elev= 275.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.79'	**12.0" Round Culvert** L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.79' / 270.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.25 cfs @ 12.08 hrs HW=272.10' TW=271.73' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.25 cfs @ 1.86 fps)

Summary for Pond 14: Catch Basin

Inflow Area = 6,167 sf, 86.93% Impervious, Inflow Depth = 2.73" for 2 Year event
Inflow = 0.40 cfs @ 12.08 hrs, Volume= 1,401 cf
Outflow = 0.40 cfs @ 12.08 hrs, Volume= 1,401 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.40 cfs @ 12.08 hrs, Volume= 1,401 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.80' @ 12.09 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.25'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.25' / 270.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.40 cfs @ 12.08 hrs HW=271.80' TW=271.73' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.40 cfs @ 1.30 fps)

Summary for Pond 15: Catch Basin

Inflow Area = 20,154 sf, 41.62% Impervious, Inflow Depth = 1.31" for 2 Year event
Inflow = 0.63 cfs @ 12.08 hrs, Volume= 2,196 cf
Outflow = 0.63 cfs @ 12.08 hrs, Volume= 2,196 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.08 hrs, Volume= 2,196 cf
Routed to Pond MH23 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.94' @ 12.08 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.42'	**12.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.42' / 272.23' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.63 cfs @ 12.08 hrs HW=272.94' TW=272.78' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.63 cfs @ 2.22 fps)

Summary for Pond 16: Catch Basin

Inflow Area = 20,584 sf, 35.59% Impervious, Inflow Depth = 1.12" for 2 Year event
Inflow = 0.55 cfs @ 12.08 hrs, Volume= 1,919 cf
Outflow = 0.55 cfs @ 12.08 hrs, Volume= 1,919 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.55 cfs @ 12.08 hrs, Volume= 1,919 cf
Routed to Pond MH24 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.72' @ 12.08 hrs
Flood Elev= 277.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.29'	**12.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 274.29' / 274.10' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.55 cfs @ 12.08 hrs HW=274.72' TW=274.50' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.55 cfs @ 2.49 fps)

Summary for Pond 17: Catch Basin

Inflow Area = 36,035 sf, 27.70% Impervious, Inflow Depth = 0.87" for 2 Year event
Inflow = 0.75 cfs @ 12.08 hrs, Volume= 2,618 cf
Outflow = 0.75 cfs @ 12.08 hrs, Volume= 2,618 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.08 hrs, Volume= 2,618 cf
Routed to Pond MH24 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.41' @ 12.08 hrs
Flood Elev= 277.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.97'	**15.0" Round Culvert** L= 143.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 274.97' / 274.10' S= 0.0061 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.75 cfs @ 12.08 hrs HW=275.41' TW=274.50' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.75 cfs @ 2.90 fps)

Summary for Pond MH1: Manhole

Inflow Area = 10,841 sf, 91.76% Impervious, Inflow Depth = 2.88" for 2 Year event
Inflow = 0.75 cfs @ 12.08 hrs, Volume= 2,601 cf
Outflow = 0.75 cfs @ 12.08 hrs, Volume= 2,601 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.08 hrs, Volume= 2,601 cf
Routed to Pond UIS1 : Underground Chamber #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.28' @ 12.49 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.70'	**24.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.70' / 271.70' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.75 cfs @ 12.08 hrs HW=272.17' TW=271.84' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.75 cfs @ 2.03 fps)

Summary for Pond MH11: Manhole

Inflow Area = 25,727 sf, 73.18% Impervious, Inflow Depth = 2.30" for 2 Year event
Inflow = 1.42 cfs @ 12.08 hrs, Volume= 4,924 cf
Outflow = 1.42 cfs @ 12.08 hrs, Volume= 4,924 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.42 cfs @ 12.08 hrs, Volume= 4,924 cf
Routed to Pond UIS4 : Underground Chamber #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.88' @ 12.53 hrs
Flood Elev= 277.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.00' / 273.00' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.41 cfs @ 12.08 hrs HW=273.63' TW=273.28' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.41 cfs @ 2.52 fps)

Summary for Pond MH12: Manhole

Inflow Area = 20,457 sf, 80.22% Impervious, Inflow Depth = 2.52" for 2 Year event
Inflow = 1.27 cfs @ 12.09 hrs, Volume= 4,290 cf
Outflow = 1.27 cfs @ 12.09 hrs, Volume= 4,290 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.27 cfs @ 12.09 hrs, Volume= 4,290 cf
Routed to Pond MH13 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.90' @ 12.09 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.28'	**15.0" Round Culvert** L= 24.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.28' / 273.00' S= 0.0112 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.27 cfs @ 12.09 hrs HW=273.90' TW=273.59' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.27 cfs @ 3.04 fps)

Summary for Pond MH13: Manhole

Inflow Area = 20,457 sf, 80.22% Impervious, Inflow Depth = 2.52" for 2 Year event
Inflow = 1.27 cfs @ 12.09 hrs, Volume= 4,290 cf
Outflow = 1.27 cfs @ 12.09 hrs, Volume= 4,290 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.27 cfs @ 12.09 hrs, Volume= 4,290 cf
Routed to Pond UIS4 : Underground Chamber #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.88' @ 12.53 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.00' / 273.00' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.27 cfs @ 12.09 hrs HW=273.59' TW=273.30' (Dynamic Tailwater)
└—**1=Culvert** (Barrel Controls 1.27 cfs @ 2.44 fps)

Summary for Pond MH15: Manhole

Inflow Area = 13,501 sf, 84.40% Impervious, Inflow Depth = 2.65" for 2 Year event
Inflow = 0.86 cfs @ 12.08 hrs, Volume= 2,979 cf
Outflow = 0.86 cfs @ 12.08 hrs, Volume= 2,979 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.08 hrs, Volume= 2,979 cf
Routed to Pond MH16 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.08' @ 12.46 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.44'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.44' / 270.30' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.86 cfs @ 12.08 hrs HW=271.01' TW=270.79' (Dynamic Tailwater)
└—**1=Culvert** (Outlet Controls 0.86 cfs @ 2.70 fps)

Summary for Pond MH16: Manhole

Inflow Area = 13,501 sf, 84.40% Impervious, Inflow Depth = 2.65" for 2 Year event
Inflow = 0.86 cfs @ 12.08 hrs, Volume= 2,979 cf
Outflow = 0.86 cfs @ 12.08 hrs, Volume= 2,979 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.08 hrs, Volume= 2,979 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.08' @ 12.48 hrs
Flood Elev= 277.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.30'	**24.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.30' / 270.30' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.86 cfs @ 12.08 hrs HW=270.79' TW=270.55' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.86 cfs @ 2.18 fps)

Summary for Pond MH17: Manhole

Inflow Area = 11,505 sf, 85.23% Impervious, Inflow Depth = 2.67" for 2 Year event
Inflow = 0.74 cfs @ 12.08 hrs, Volume= 2,564 cf
Outflow = 0.74 cfs @ 12.08 hrs, Volume= 2,564 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.08 hrs, Volume= 2,564 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.08' @ 12.48 hrs
Flood Elev= 277.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.30'	**24.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.30' / 270.30' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.74 cfs @ 12.08 hrs HW=270.76' TW=270.55' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.74 cfs @ 2.06 fps)

Summary for Pond MH19: Manhole

Inflow Area = 158,089 sf, 62.98% Impervious, Inflow Depth = 0.00" for 2 Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 270.95' @ 0.05 hrs
Flood Elev= 276.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.87'	**18.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 269.87' / 269.52' S= 0.0069 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=270.00' TW=271.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond MH2: Manhole

Inflow Area = 9,637 sf, 85.56% Impervious, Inflow Depth = 2.68" for 2 Year event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 2,155 cf
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 2,155 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 2,155 cf
Routed to Pond MH3 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.80' @ 12.09 hrs
Flood Elev= 274.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.30'	**12.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.30' / 272.23' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.63 cfs @ 12.09 hrs HW=272.79' TW=272.64' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.63 cfs @ 2.36 fps)

Summary for Pond MH20: Manhole

Inflow Area = 94,229 sf, 41.92% Impervious, Inflow Depth = 1.32" for 2 Year event
Inflow = 2.97 cfs @ 12.08 hrs, Volume= 10,343 cf
Outflow = 2.97 cfs @ 12.08 hrs, Volume= 10,343 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.97 cfs @ 12.08 hrs, Volume= 10,343 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.22' @ 12.08 hrs
Flood Elev= 277.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.30'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.30' / 270.30' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.96 cfs @ 12.08 hrs HW=271.22' TW=270.55' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.96 cfs @ 3.08 fps)

Summary for Pond MH21: Manhole

Inflow Area = 94,229 sf, 41.92% Impervious, Inflow Depth = 1.32" for 2 Year event
Inflow = 2.97 cfs @ 12.08 hrs, Volume= 10,343 cf
Outflow = 2.97 cfs @ 12.08 hrs, Volume= 10,343 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.97 cfs @ 12.08 hrs, Volume= 10,343 cf
Routed to Pond MH20 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.46' @ 12.08 hrs
Flood Elev= 277.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.50'	**24.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.50' / 270.30' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.96 cfs @ 12.08 hrs HW=271.46' TW=271.22' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.96 cfs @ 2.92 fps)

Summary for Pond MH22: Manhole

Inflow Area = 94,229 sf, 41.92% Impervious, Inflow Depth = 1.32" for 2 Year event
Inflow = 2.97 cfs @ 12.08 hrs, Volume= 10,343 cf
Outflow = 2.97 cfs @ 12.08 hrs, Volume= 10,343 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.97 cfs @ 12.08 hrs, Volume= 10,343 cf
Routed to Pond MH21 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.74' @ 12.08 hrs
Flood Elev= 277.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.82'	**24.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.82' / 270.60' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.96 cfs @ 12.08 hrs HW=271.73' TW=271.46' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.96 cfs @ 3.11 fps)

Summary for Pond MH23: Manhole

Inflow Area = 76,773 sf, 33.47% Impervious, Inflow Depth = 1.05" for 2 Year event
Inflow = 1.93 cfs @ 12.08 hrs, Volume= 6,733 cf
Outflow = 1.93 cfs @ 12.08 hrs, Volume= 6,733 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.93 cfs @ 12.08 hrs, Volume= 6,733 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.78' @ 12.08 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.13'	**18.0" Round Culvert** L= 121.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.13' / 270.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.93 cfs @ 12.08 hrs HW=272.78' TW=271.73' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.93 cfs @ 3.91 fps)

Summary for Pond MH24: Manhole

Inflow Area = 56,619 sf, 30.57% Impervious, Inflow Depth = 0.96" for 2 Year event
Inflow = 1.30 cfs @ 12.08 hrs, Volume= 4,537 cf
Outflow = 1.30 cfs @ 12.08 hrs, Volume= 4,537 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.30 cfs @ 12.08 hrs, Volume= 4,537 cf
Routed to Pond MH23 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.50' @ 12.08 hrs
Flood Elev= 278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.99'	**18.0" Round Culvert** L= 176.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.99' / 272.23' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.30 cfs @ 12.08 hrs HW=274.50' TW=272.78' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.30 cfs @ 2.44 fps)

Summary for Pond MH25: Manhole

Inflow Area = 21,550 sf, 85.33% Impervious, Inflow Depth = 2.68" for 2 Year event
Inflow = 1.40 cfs @ 12.09 hrs, Volume= 4,808 cf
Outflow = 1.40 cfs @ 12.09 hrs, Volume= 4,808 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.40 cfs @ 12.09 hrs, Volume= 4,808 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.12' @ 12.09 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 272.50' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.39 cfs @ 12.09 hrs HW=273.12' TW=272.63' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.39 cfs @ 2.50 fps)

Summary for Pond MH26: Manhole

Inflow Area = 34,932 sf, 80.45% Impervious, Inflow Depth = 2.52" for 2 Year event
Inflow = 2.18 cfs @ 12.09 hrs, Volume= 7,346 cf
Outflow = 2.18 cfs @ 12.09 hrs, Volume= 7,346 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.18 cfs @ 12.09 hrs, Volume= 7,346 cf
Routed to Pond MH4 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.89' @ 12.09 hrs
Flood Elev= 275.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.10'	**18.0" Round Culvert** L= 40.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.10' / 271.70' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.17 cfs @ 12.09 hrs HW=272.88' TW=272.48' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.17 cfs @ 3.37 fps)

Summary for Pond MH29: Manhole

Inflow Area = 22,016 sf, 81.48% Impervious, Inflow Depth = 2.56" for 2 Year event
Inflow = 1.36 cfs @ 12.09 hrs, Volume= 4,691 cf
Outflow = 1.40 cfs @ 12.09 hrs, Volume= 4,691 cf, Atten= 0%, Lag= 0.1 min
Primary = 1.40 cfs @ 12.09 hrs, Volume= 4,691 cf
Routed to Pond MH26 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.94' @ 12.09 hrs
Flood Elev= 275.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.22'	**15.0" Round Culvert** L= 11.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.22' / 271.10' S= 0.0104 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.40 cfs @ 12.09 hrs HW=272.94' TW=272.88' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.40 cfs @ 1.14 fps)

Summary for Pond MH3: Manhole

Inflow Area = 9,637 sf, 85.56% Impervious, Inflow Depth = 2.68" for 2 Year event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 2,155 cf
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 2,155 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 2,155 cf
Routed to Pond UIS2 : Underground Chamber #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.64' @ 12.09 hrs
Flood Elev= 274.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.13'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.13' / 272.13' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.63 cfs @ 12.09 hrs HW=272.64' TW=272.24' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.63 cfs @ 2.25 fps)

Summary for Pond MH30: Manhole

Inflow Area = 22,016 sf, 81.48% Impervious, Inflow Depth = 2.56" for 2 Year event
Inflow = 1.35 cfs @ 12.08 hrs, Volume= 4,691 cf
Outflow = 1.36 cfs @ 12.09 hrs, Volume= 4,691 cf, Atten= 0%, Lag= 0.3 min
Primary = 1.36 cfs @ 12.09 hrs, Volume= 4,691 cf
Routed to Pond MH29 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.99' @ 12.09 hrs
Flood Elev= 275.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.66'	**15.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.66' / 271.32' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.26 cfs @ 12.09 hrs HW=272.98' TW=272.94' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.26 cfs @ 1.21 fps)

Summary for Pond MH31: Manhole

Inflow Area = 2,581 sf, 92.81% Impervious, Inflow Depth = 2.91" for 2 Year event
Inflow = 0.18 cfs @ 12.08 hrs, Volume= 626 cf
Outflow = 0.18 cfs @ 12.08 hrs, Volume= 626 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.18 cfs @ 12.08 hrs, Volume= 626 cf
Routed to Pond MH5 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.40' @ 12.09 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.56'	**12.0" Round Culvert** L= 20.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.56' / 272.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.19 cfs @ 12.08 hrs HW=273.40' TW=273.40' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.19 cfs @ 0.37 fps)

Summary for Pond MH32: Manhole

Inflow Area = 16,749 sf, 75.84% Impervious, Inflow Depth = 2.38" for 2 Year event
Inflow = 0.96 cfs @ 12.08 hrs, Volume= 3,321 cf
Outflow = 0.96 cfs @ 12.09 hrs, Volume= 3,321 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.96 cfs @ 12.09 hrs, Volume= 3,321 cf
Routed to Pond MH12 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.97' @ 12.09 hrs
Flood Elev= 276.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.75'	**12.0" Round Culvert** L= 47.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.75' / 272.28' S= 0.0099 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.96 cfs @ 12.09 hrs HW=273.96' TW=273.90' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.96 cfs @ 1.22 fps)

Summary for Pond MH33: Manhole

Inflow Area = 25,727 sf, 73.18% Impervious, Inflow Depth = 2.30" for 2 Year event
Inflow = 1.42 cfs @ 12.08 hrs, Volume= 4,924 cf
Outflow = 1.42 cfs @ 12.08 hrs, Volume= 4,924 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.42 cfs @ 12.08 hrs, Volume= 4,924 cf
Routed to Pond MH11 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.92' @ 12.08 hrs
Flood Elev= 277.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.24'	**15.0" Round Culvert** L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.24' / 273.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.41 cfs @ 12.08 hrs HW=273.92' TW=273.63' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.41 cfs @ 3.01 fps)

Summary for Pond MH4: Manhole

Inflow Area = 34,932 sf, 80.45% Impervious, Inflow Depth = 2.52" for 2 Year event
Inflow = 2.18 cfs @ 12.09 hrs, Volume= 7,346 cf
Outflow = 2.18 cfs @ 12.09 hrs, Volume= 7,346 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.18 cfs @ 12.09 hrs, Volume= 7,346 cf
Routed to Pond UIS1 : Underground Chamber #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.48' @ 12.09 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.70'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.70' / 271.70' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.17 cfs @ 12.09 hrs HW=272.48' TW=271.86' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.17 cfs @ 2.83 fps)

Summary for Pond MH5: Manhole

Inflow Area = 16,929 sf, 93.86% Impervious, Inflow Depth = 2.94" for 2 Year event
Inflow = 1.19 cfs @ 12.08 hrs, Volume= 4,154 cf
Outflow = 1.20 cfs @ 12.09 hrs, Volume= 4,154 cf, Atten= 0%, Lag= 0.3 min
Primary = 1.20 cfs @ 12.09 hrs, Volume= 4,154 cf
Routed to Pond MH6 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.40' @ 12.09 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.25'	**15.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.25' / 271.62' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.20 cfs @ 12.09 hrs HW=273.40' TW=273.33' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.20 cfs @ 1.33 fps)

Summary for Pond MH6: Manhole

Inflow Area = 21,550 sf, 85.33% Impervious, Inflow Depth = 2.68" for 2 Year event
Inflow = 1.40 cfs @ 12.09 hrs, Volume= 4,808 cf
Outflow = 1.40 cfs @ 12.09 hrs, Volume= 4,808 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.40 cfs @ 12.09 hrs, Volume= 4,808 cf
Routed to Pond MH25 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.33' @ 12.09 hrs
Flood Elev= 277.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.62'	**15.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.62' / 272.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.39 cfs @ 12.09 hrs HW=273.33' TW=273.12' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.39 cfs @ 2.77 fps)

Summary for Pond MH7: Manhole

Inflow Area = 12,631 sf, 77.28% Impervious, Inflow Depth = 2.43" for 2 Year event
Inflow = 0.73 cfs @ 12.08 hrs, Volume= 2,553 cf
Outflow = 0.73 cfs @ 12.08 hrs, Volume= 2,553 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.08 hrs, Volume= 2,553 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.01' @ 12.47 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	**24.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 272.50' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.73 cfs @ 12.08 hrs HW=272.95' TW=272.61' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.73 cfs @ 2.08 fps)

Summary for Pond MH8: Manhole

Inflow Area = 18,401 sf, 80.16% Impervious, Inflow Depth = 2.52" for 2 Year event
Inflow = 1.11 cfs @ 12.08 hrs, Volume= 3,857 cf
Outflow = 1.11 cfs @ 12.08 hrs, Volume= 3,857 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.11 cfs @ 12.08 hrs, Volume= 3,857 cf
Routed to Pond MH9 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.32' @ 12.08 hrs
Flood Elev= 276.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.72'	**15.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.72' / 272.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.11 cfs @ 12.08 hrs HW=273.32' TW=273.06' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.11 cfs @ 2.80 fps)

Summary for Pond MH9: Manhole

Inflow Area = 18,401 sf, 80.16% Impervious, Inflow Depth = 2.52" for 2 Year event
Inflow = 1.11 cfs @ 12.08 hrs, Volume= 3,857 cf
Outflow = 1.11 cfs @ 12.08 hrs, Volume= 3,857 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.11 cfs @ 12.08 hrs, Volume= 3,857 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.06' @ 12.08 hrs
Flood Elev= 277.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	**24.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 272.50' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.11 cfs @ 12.08 hrs HW=273.06' TW=272.61' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.11 cfs @ 2.30 fps)

Summary for Pond RD1: Roof Drain

Inflow Area = 7,429 sf,100.00% Impervious, Inflow Depth = 3.14" for 2 Year event
Inflow = 0.56 cfs @ 12.08 hrs, Volume= 1,942 cf
Outflow = 0.56 cfs @ 12.08 hrs, Volume= 1,942 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.56 cfs @ 12.08 hrs, Volume= 1,942 cf
Routed to Pond UIS1 : Underground Chamber #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.67' @ 12.08 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.25'	**10.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.25' / 272.03' S= 0.0105 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=0.56 cfs @ 12.08 hrs HW=272.67' TW=271.84' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.56 cfs @ 2.94 fps)

Summary for Pond RD2: Roof Drain

Inflow Area = 18,290 sf,100.00% Impervious, Inflow Depth = 3.14" for 2 Year event
Inflow = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf
Outflow = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.86' @ 12.08 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.14'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.14' / 272.83' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.37 cfs @ 12.08 hrs HW=273.86' TW=272.61' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.37 cfs @ 3.65 fps)

Summary for Pond RD3: Roof Drain

Inflow Area = 18,290 sf,100.00% Impervious, Inflow Depth = 3.14" for 2 Year event
Inflow = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf
Outflow = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.75' @ 12.08 hrs
Flood Elev= 278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.98'	**10.0" Round Culvert** L= 14.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.98' / 272.83' S= 0.0102 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.37 cfs @ 12.08 hrs HW=273.75' TW=272.61' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.37 cfs @ 3.41 fps)

Summary for Pond RD4: Roof Drain

Inflow Area = 18,290 sf,100.00% Impervious, Inflow Depth = 3.14" for 2 Year event
Inflow = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf
Outflow = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 12.08 hrs, Volume= 4,781 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.62' @ 12.08 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.88'	**10.0" Round Culvert** L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.88' / 270.63' S= 0.0104 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.37 cfs @ 12.08 hrs HW=271.61' TW=270.55' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.37 cfs @ 3.59 fps)

Summary for Pond RD5: Roof Drain

Inflow Area = 20,565 sf,100.00% Impervious, Inflow Depth = 3.14" for 2 Year event
Inflow = 1.55 cfs @ 12.08 hrs, Volume= 5,376 cf
Outflow = 1.55 cfs @ 12.08 hrs, Volume= 5,376 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.55 cfs @ 12.08 hrs, Volume= 5,376 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.64' @ 12.08 hrs
Flood Elev= 278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.81'	**10.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.81' / 270.63' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.54 cfs @ 12.08 hrs HW=271.64' TW=270.55' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.54 cfs @ 3.55 fps)

Summary for Pond SP-1: Northerly Culvert Crossing #1 (SP-1)

Inflow Area = 209,858 sf, 11.65% Impervious, Inflow Depth >405.54" for 2 Year event
Inflow = 55.58 cfs @ 12.12 hrs, Volume= 7,092,224 cf, Incl. 54.70 cfs Base Flow
Outflow = 55.46 cfs @ 12.16 hrs, Volume= 7,079,789 cf, Atten= 0%, Lag= 2.4 min
Primary = 55.46 cfs @ 12.16 hrs, Volume= 7,079,789 cf
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.79' @ 12.17 hrs Surf.Area= 13,286 sf Storage= 12,603 cf

Plug-Flow detention time= 4.0 min calculated for 7,077,127 cf (100% of inflow)
Center-of-Mass det. time= 1.9 min (1,081.8 - 1,079.9)

Volume	Invert	Avail.Storage	Storage Description
#1	267.00'	15,407 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
267.00	175	160.0	0	0	175
268.00	258	168.0	215	215	441
269.00	344	172.0	300	515	642
270.00	431	176.0	387	902	848
271.50	12,972	455.3	7,884	8,786	14,888
272.00	13,514	461.2	6,621	15,407	15,375

Device	Routing	Invert	Outlet Devices
#1	Primary	267.93'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.72' / 267.93' S= -0.0036 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#2	Primary	267.48'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.48' / 267.48' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#3	Primary	270.02'	**36.0" Round RCP_Round 36" X 6.00** L= 29.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 270.02' / 269.73' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=55.45 cfs @ 12.16 hrs HW=271.79' TW=271.65' (Dynamic Tailwater)
1=RCP_Round 21" (Inlet Controls 4.40 cfs @ 1.83 fps)
2=RCP_Round 21" (Inlet Controls 4.40 cfs @ 1.83 fps)
3=RCP_Round 36" (Outlet Controls 46.66 cfs @ 2.58 fps)

Summary for Pond SP-2: Southerly Culvert Crossing #2 (SP-2)

Inflow Area = 233,827 sf, 11.52% Impervious, Inflow Depth >363.37" for 2 Year event
Inflow = 55.60 cfs @ 12.14 hrs, Volume= 7,080,443 cf
Outflow = 55.56 cfs @ 12.18 hrs, Volume= 7,064,121 cf, Atten= 0%, Lag= 2.3 min
Primary = 55.56 cfs @ 12.18 hrs, Volume= 7,064,121 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.65' @ 12.18 hrs Surf.Area= 10,551 sf Storage= 16,439 cf

Plug-Flow detention time= 5.1 min calculated for 7,061,871 cf (100% of inflow)
Center-of-Mass det. time= 2.5 min (1,084.3 - 1,081.8)

Volume	Invert	Avail.Storage	Storage Description
#1	266.85'	20,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
266.85	0	0.0	0	0	0
267.00	1,276	387.0	64	64	11,918
268.00	1,668	396.0	1,468	1,531	12,602
269.00	2,069	404.0	1,865	3,396	13,250
270.00	2,477	412.0	2,270	5,666	13,910
271.50	10,776	591.7	9,210	14,876	28,283
272.00	10,017	544.5	5,197	20,073	32,560

Device	Routing	Invert	Outlet Devices
#1	Primary	266.85'	**30.0" Round RCP_Round 30"** L= 30.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 266.37' / 266.85' S= -0.0160 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Primary	270.73'	**36.0" Round RCP_Round 36" X 6.00** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.73' / 270.49' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=55.56 cfs @ 12.18 hrs HW=271.65' TW=271.00' (Dynamic Tailwater)
1=RCP_Round 30" (Inlet Controls 25.92 cfs @ 5.28 fps)
2=RCP_Round 36" (Barrel Controls 29.64 cfs @ 4.04 fps)

Summary for Pond TD1: Stone Trench Drain

Inflow Area = 180,624 sf, 8.74% Impervious, Inflow Depth = 0.28" for 2 Year event
Inflow = 1.06 cfs @ 12.11 hrs, Volume= 4,176 cf
Outflow = 1.05 cfs @ 12.12 hrs, Volume= 4,176 cf, Atten= 1%, Lag= 0.4 min
Discarded = 0.20 cfs @ 11.69 hrs, Volume= 3,159 cf
Primary = 0.85 cfs @ 12.12 hrs, Volume= 1,017 cf
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.81' @ 12.13 hrs Surf.Area= 1,050 sf Storage= 32 cf
Flood Elev= 275.00' Surf.Area= 15,899 sf Storage= 11,024 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.3 min (764.8 - 764.5)

Volume	Invert	Avail.Storage	Storage Description
#1	271.20'	4 cf	**3.50'W x 300.00'L x 1.70'H Prismatoid** 1,785 cf Overall - 471 cf Embedded = 1,314 cf x 0.3% Voids
#2	271.70'	471 cf	**12.0" Round Pipe Storage** x 2 Inside #1 L= 300.0'
#3	272.90'	10,549 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		11,024 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.90	1,054	609.5	0	0	1,054
273.00	6,212	814.0	327	327	24,220
274.00	14,849	858.3	10,222	10,549	30,174

Device	Routing	Invert	Outlet Devices
#1	Primary	270.90'	**12.0" Round Culvert X 2.00** L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.90' / 270.55' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Discarded	271.20'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.20 cfs @ 11.69 hrs HW=271.30' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.85 cfs @ 12.12 hrs HW=271.81' TW=271.79' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.85 cfs @ 0.74 fps)

Summary for Pond TD2: Stone Trench Drain

Inflow Area = 6,530 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2 Year event
Inflow = 0.00 cfs @ 23.74 hrs, Volume= 2 cf
Outflow = 0.00 cfs @ 23.74 hrs, Volume= 2 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 19.45 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 23.74 hrs, Volume= 2 cf
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.00' @ 0.00 hrs Surf.Area= 427 sf Storage= 0 cf
Flood Elev= 275.00' Surf.Area= 1,466 sf Storage= 536 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,306.3 - 1,306.3)

Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	167 cf	**3.50'W x 122.00'L x 1.75'H Prismatoid** 747 cf Overall - 192 cf Embedded = 556 cf x 30.0% Voids
#2	272.25'	192 cf	**12.0" Round Pipe Storage** x 2 Inside #1 L= 122.0'
#3	273.75'	178 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		536 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
273.75	430	253.0	0	0	430
274.00	1,039	301.0	178	178	2,547

Device	Routing	Invert	Outlet Devices
#1	Primary	271.90'	**12.0" Round Culvert** L= 52.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.90' / 271.38' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Discarded	272.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 19.45 hrs HW=272.00' (Free Discharge)
└**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 23.74 hrs HW=272.00' TW=271.64' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 0.03 cfs potential flow)

Summary for Pond UIS1: Underground Chamber #1

Inflow Area = 53,202 sf, 85.48% Impervious, Inflow Depth = 2.68" for 2 Year event
Inflow = 3.48 cfs @ 12.09 hrs, Volume= 11,889 cf
Outflow = 0.73 cfs @ 11.79 hrs, Volume= 11,889 cf, Atten= 79%, Lag= 0.0 min
Discarded = 0.73 cfs @ 11.79 hrs, Volume= 11,889 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.28' @ 12.49 hrs Surf.Area= 3,803 sf Storage= 2,575 cf

Plug-Flow detention time= 16.9 min calculated for 11,886 cf (100% of inflow)
Center-of-Mass det. time= 16.9 min (772.4 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.20'	3,578 cf	**39.50'W x 96.28'L x 3.75'H Field A** 14,262 cf Overall - 5,316 cf Embedded = 8,946 cf x 40.0% Voids
#2A	271.70'	5,316 cf	**ADS_StormTech SC-800 +Cap** x 104 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 104 Chambers in 8 Rows Cap Storage= 3.4 cf x 2 x 8 rows = 54.7 cf
		8,895 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	271.70'	**15.0" Round Culvert** L= 137.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 271.70' / 270.00' S= 0.0124 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	274.30'	**4.0' 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
#3	Discarded	271.20'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.73 cfs @ 11.79 hrs HW=271.24' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.73 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.20' TW=271.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond UIS1: Underground Chamber #1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 8 rows = 54.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

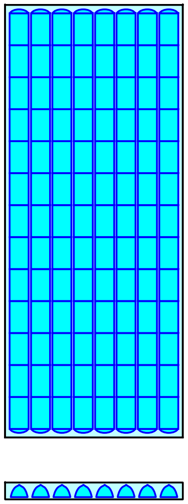
13 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 94.28' Row Length +12.0" End Stone x 2 = 96.28' Base Length
8 Rows x 51.0" Wide + 6.0" Spacing x 7 + 12.0" Side Stone x 2 = 39.50' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

104 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 8 Rows = 5,316.3 cf Chamber Storage

14,262.0 cf Field - 5,316.3 cf Chambers = 8,945.7 cf Stone x 40.0% Voids = 3,578.3 cf Stone Storage

Chamber Storage + Stone Storage = 8,894.6 cf = 0.204 af
Overall Storage Efficiency = 62.4%
Overall System Size = 96.28' x 39.50' x 3.75'

104 Chambers
528.2 cy Field
331.3 cy Stone



Summary for Pond UIS2: Underground Chamber #2

Inflow Area = 9,637 sf, 85.56% Impervious, Inflow Depth = 2.68" for 2 Year event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 2,155 cf
Outflow = 0.17 cfs @ 11.82 hrs, Volume= 2,155 cf, Atten= 74%, Lag= 0.0 min
Discarded = 0.17 cfs @ 11.82 hrs, Volume= 2,155 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.55' @ 12.43 hrs Surf.Area= 867 sf Storage= 377 cf

Plug-Flow detention time= 10.0 min calculated for 2,155 cf (100% of inflow)
Center-of-Mass det. time= 9.9 min (765.5 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.80'	502 cf	**16.58'W x 52.31'L x 1.83'H Field A** 1,590 cf Overall - 335 cf Embedded = 1,255 cf x 40.0% Voids
#2A	272.13'	335 cf	**ADS_StormTech SC-160LP +Cap** x 49 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		837 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	272.15'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 272.15' / 272.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	273.25'	**4.0' 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
#3	Discarded	271.80'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.17 cfs @ 11.82 hrs HW=271.82' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.80' TW=269.50' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond UIS2: Underground Chamber #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

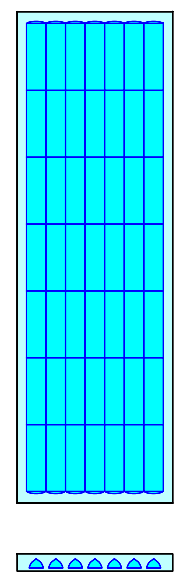
7 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 50.31' Row Length +12.0" End Stone x 2 = 52.31' Base Length
7 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 16.58' Base Width
4.0" Stone Base + 12.0" Chamber Height + 6.0" Stone Cover = 1.83' Field Height

49 Chambers x 6.8 cf = 335.0 cf Chamber Storage

1,590.3 cf of Field - 335.0 cf Chambers = 1,255.3 cf Stone x 40.0% Voids = 502.1 cf Stone Storage

Chamber Storage + Stone Storage = 837.1 cf = 0.019 af
Overall Storage Efficiency = 52.6%
Overall System Size = 52.31' x 16.58' x 1.83'

49 Chambers
58.9 cy Field
46.5 cy Stone



Summary for Pond UIS3: Underground Chamber #3

Inflow Area = 89,161 sf, 89.14% Impervious, Inflow Depth = 2.80" for 2 Year event
Inflow = 5.98 cfs @ 12.09 hrs, Volume= 20,780 cf
Outflow = 1.33 cfs @ 11.80 hrs, Volume= 20,780 cf, Atten= 78%, Lag= 0.0 min
Discarded = 1.33 cfs @ 11.80 hrs, Volume= 20,780 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.01' @ 12.48 hrs Surf.Area= 6,945 sf Storage= 4,339 cf

Plug-Flow detention time= 15.3 min calculated for 20,774 cf (100% of inflow)
Center-of-Mass det. time= 15.3 min (770.8 - 755.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	272.00'	6,516 cf	**30.00'W x 231.50'L x 3.75'H Field A** 26,044 cf Overall - 9,755 cf Embedded = 16,289 cf x 40.0% Voids
#2A	272.50'	9,755 cf	**ADS_StormTech SC-800 +Cap** x 192 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 192 Chambers in 6 Rows Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf
		16,270 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	273.16'	**12.0" Round Culvert** L= 116.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 273.16' / 272.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	274.75'	**4.0' 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
#3	Device 1	273.50'	**9.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	272.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=1.33 cfs @ 11.80 hrs HW=272.04' (Free Discharge)
└─**4=Exfiltration** (Exfiltration Controls 1.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=272.00' TW=271.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  ├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond UIS3: Underground Chamber #3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

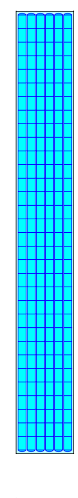
32 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 229.50' Row Length +12.0" End Stone x 2 = 231.50' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

192 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 6 Rows = 9,754.8 cf Chamber Storage

26,043.8 cf Field - 9,754.8 cf Chambers = 16,289.0 cf Stone x 40.0% Voids = 6,515.6 cf Stone Storage

Chamber Storage + Stone Storage = 16,270.4 cf = 0.374 af
Overall Storage Efficiency = 62.5%
Overall System Size = 231.50' x 30.00' x 3.75'

192 Chambers
964.6 cy Field
603.3 cy Stone



Summary for Pond UIS4: Underground Chamber #4

Inflow Area = 46,184 sf, 76.30% Impervious, Inflow Depth = 2.39" for 2 Year event
Inflow = 2.68 cfs @ 12.09 hrs, Volume= 9,213 cf
Outflow = 0.48 cfs @ 11.74 hrs, Volume= 9,213 cf, Atten= 82%, Lag= 0.0 min
Discarded = 0.48 cfs @ 11.74 hrs, Volume= 9,213 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.88' @ 12.53 hrs Surf.Area= 2,489 sf Storage= 2,256 cf

Plug-Flow detention time= 24.3 min calculated for 9,211 cf (100% of inflow)
Center-of-Mass det. time= 24.3 min (779.9 - 755.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	272.50'	2,382 cf	**63.25'W x 39.35'L x 3.75'H Field A** 9,333 cf Overall - 3,377 cf Embedded = 5,956 cf x 40.0% Voids
#2A	273.00'	3,377 cf	**ADS_StormTech SC-800 +Cap** x 65 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 65 Chambers in 13 Rows Cap Storage= 3.4 cf x 2 x 13 rows = 88.9 cf
		5,760 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	272.10'	**12.0" Round Culvert** L= 110.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 272.10' / 271.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	276.00'	**4.0' 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
#3	Device 1	274.25'	**9.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	272.50'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.48 cfs @ 11.74 hrs HW=272.54' (Free Discharge)
└─**4=Exfiltration** (Exfiltration Controls 0.48 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=272.50' TW=271.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.00 cfs of 0.50 cfs potential flow)
  ├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond UIS4: Underground Chamber #4 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 13 rows = 88.9 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

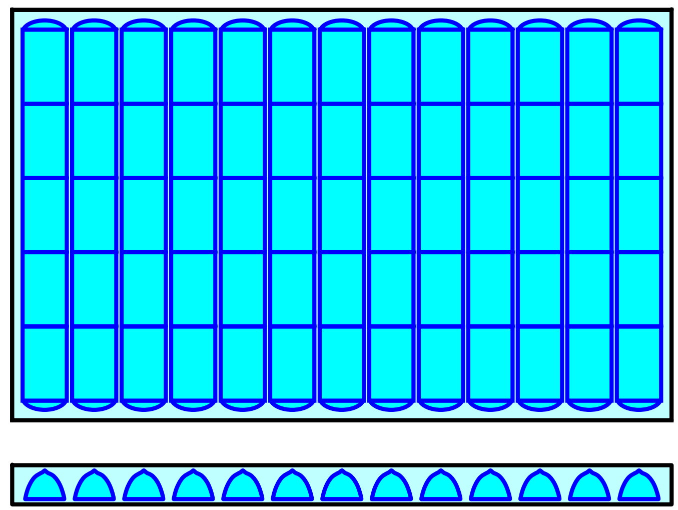
5 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 37.35' Row Length +12.0" End Stone x 2 = 39.35' Base Length
13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

65 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 13 Rows = 3,377.4 cf Chamber Storage

9,333.3 cf Field - 3,377.4 cf Chambers = 5,955.9 cf of Stone x 40.0% Voids = 2,382.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,759.8 cf = 0.132 af
Overall Storage Efficiency = 61.7%
Overall System Size = 39.35' x 63.25' x 3.75'

65 Chambers
345.7 cy Field
220.6 cy Stone



Summary for Pond UIS5: Underground Chamber #5

Inflow Area = 158,089 sf, 62.98% Impervious, Inflow Depth = 1.98" for 2 Year event
Inflow = 7.49 cfs @ 12.08 hrs, Volume= 26,043 cf
Outflow = 1.66 cfs @ 11.82 hrs, Volume= 26,043 cf, Atten= 78%, Lag= 0.0 min
Discarded = 1.66 cfs @ 11.82 hrs, Volume= 26,043 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond MH19 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.08' @ 12.48 hrs Surf.Area= 8,653 sf Storage= 5,460 cf
Flood Elev= 274.00' Surf.Area= 8,653 sf Storage= 21,847 cf

Plug-Flow detention time= 15.5 min calculated for 26,043 cf (100% of inflow)
Center-of-Mass det. time= 15.5 min (771.2 - 755.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	269.80'	11,567 cf	**30.00'W x 288.43'L x 4.75'H Field A** 41,102 cf Overall - 12,183 cf Embedded = 28,919 cf x 40.0% Voids
#2A	270.80'	12,183 cf	**ADS_StormTech SC-800 +Cap** x 240 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 240 Chambers in 6 Rows Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf
		23,751 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	272.98'	**12.0" Round Culvert** L= 97.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 272.98' / 272.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	274.00'	**4.0' 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
#3	Discarded	269.80'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=1.66 cfs @ 11.82 hrs HW=269.86' (Free Discharge)
3=Exfiltration (Exfiltration Controls 1.66 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=269.80' TW=270.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond UIS5: Underground Chamber #5 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

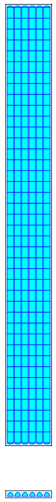
40 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 286.43' Row Length +12.0" End Stone x 2 = 288.43' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

240 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 6 Rows = 12,183.2 cf Chamber Storage

41,101.7 cf Field - 12,183.2 cf Chambers = 28,918.6 cf Stone x 40.0% Voids = 11,567.4 cf Stone Storage

Chamber Storage + Stone Storage = 23,750.6 cf = 0.545 af
Overall Storage Efficiency = 57.8%
Overall System Size = 288.43' x 30.00' x 4.75'

240 Chambers
1,522.3 cy Field
1,071.1 cy Stone



Summary for Link SP-3: On Site Flow To Perennial Stream

Inflow Area = 867,482 sf, 37.13% Impervious, Inflow Depth > 97.85" for 2 Year event
Inflow = 57.75 cfs @ 12.16 hrs, Volume= 7,073,403 cf
Primary = 57.75 cfs @ 12.16 hrs, Volume= 7,073,403 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 271.00'

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment CB1: Subcat CB1 Runoff Area=10,841 sf 91.76% Impervious Runoff Depth=4.59"
Tc=6.0 min CN=WQ Runoff=1.17 cfs 4,149 cf

Subcatchment CB10A: Subcat CB10A Runoff Area=3,059 sf 81.64% Impervious Runoff Depth=4.11"
Tc=6.0 min CN=WQ Runoff=0.29 cfs 1,049 cf

Subcatchment CB10B: Subcat CB10B Runoff Area=10,441 sf 85.21% Impervious Runoff Depth=4.28"
Tc=6.0 min CN=WQ Runoff=1.04 cfs 3,726 cf

Subcatchment CB11: Subcat CB11 Runoff Area=11,505 sf 85.23% Impervious Runoff Depth=4.28"
Tc=6.0 min CN=WQ Runoff=1.15 cfs 4,107 cf

Subcatchment CB12: Subcat CB12 Runoff Area=7,149 sf 71.10% Impervious Runoff Depth=3.61"
Tc=6.0 min CN=WQ Runoff=0.60 cfs 2,153 cf

Subcatchment CB13: Subcat CB13 Runoff Area=4,141 sf 81.21% Impervious Runoff Depth=4.09"
Tc=6.0 min CN=WQ Runoff=0.39 cfs 1,412 cf

Subcatchment CB14: Subcat CB14 Runoff Area=6,167 sf 86.93% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=WQ Runoff=0.63 cfs 2,242 cf

Subcatchment CB15: Subcat CB15 Runoff Area=20,154 sf 41.62% Impervious Runoff Depth=2.22"
Tc=6.0 min CN=WQ Runoff=0.98 cfs 3,725 cf

Subcatchment CB16: Subcat CB16 Runoff Area=20,584 sf 35.59% Impervious Runoff Depth=1.93"
Tc=6.0 min CN=WQ Runoff=0.86 cfs 3,315 cf

Subcatchment CB17: Subcat CB17 Runoff Area=36,035 sf 27.70% Impervious Runoff Depth=1.56"
Tc=6.0 min CN=WQ Runoff=1.17 cfs 4,681 cf

Subcatchment CB2: Subcat CB2 Runoff Area=4,621 sf 54.10% Impervious Runoff Depth=2.81"
Tc=6.0 min CN=WQ Runoff=0.29 cfs 1,082 cf

Subcatchment CB3A: Subcat CB3A Runoff Area=3,583 sf 93.36% Impervious Runoff Depth=4.67"
Tc=6.0 min CN=WQ Runoff=0.39 cfs 1,394 cf

Subcatchment CB3B: Subcat CB3B Runoff Area=6,054 sf 80.94% Impervious Runoff Depth=4.08"
Tc=6.0 min CN=WQ Runoff=0.57 cfs 2,059 cf

Subcatchment CB4A: Subcat CB4A Runoff Area=3,970 sf 89.22% Impervious Runoff Depth=4.47"
Tc=6.0 min CN=WQ Runoff=0.42 cfs 1,480 cf

Subcatchment CB4B: Subcat CB4B Runoff Area=8,946 sf 74.01% Impervious Runoff Depth=3.75"
Tc=6.0 min CN=WQ Runoff=0.78 cfs 2,797 cf

Subcatchment CB4C: Subcat CB4C Runoff Area=10,741 sf 84.93% Impervious Runoff Depth=4.27"
Tc=6.0 min CN=WQ Runoff=1.07 cfs 3,821 cf

Subcatchment CB4D: Subcat CB4D Runoff Area=11,275 sf 78.19% Impervious Runoff Depth=3.95"
Tc=6.0 min CN=WQ Runoff=1.03 cfs 3,712 cf

Subcatchment CB5A: Subcat CB5A Runoff Area=10,482 sf 93.66% Impervious Runoff Depth=4.68"
Tc=6.0 min CN=WQ Runoff=1.15 cfs 4,090 cf

Subcatchment CB5B: Subcat CB5B Runoff Area=3,866 sf 95.10% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=WQ Runoff=0.43 cfs 1,530 cf

Subcatchment CB5C: Subcat CB5C Runoff Area=2,581 sf 92.81% Impervious Runoff Depth=4.64"
Tc=6.0 min CN=WQ Runoff=0.28 cfs 999 cf

Subcatchment CB6: Subcat CB6 Runoff Area=12,631 sf 77.28% Impervious Runoff Depth=3.91"
Tc=6.0 min CN=WQ Runoff=1.14 cfs 4,112 cf

Subcatchment CB7A: Subcat CB7A Runoff Area=7,101 sf 79.30% Impervious Runoff Depth=4.00"
Tc=6.0 min CN=WQ Runoff=0.66 cfs 2,368 cf

Subcatchment CB7B: Subcat CB7B Runoff Area=11,300 sf 80.70% Impervious Runoff Depth=4.07"
Tc=6.0 min CN=WQ Runoff=1.07 cfs 3,831 cf

Subcatchment CB8: Subcat CB8 Runoff Area=10,991 sf 80.89% Impervious Runoff Depth=4.08"
Tc=6.0 min CN=WQ Runoff=1.04 cfs 3,735 cf

Subcatchment CB9A: Subcat CB9A Runoff Area=11,743 sf 81.25% Impervious Runoff Depth=4.09"
Tc=6.0 min CN=WQ Runoff=1.12 cfs 4,007 cf

Subcatchment CB9B: Subcat CB9B Runoff Area=14,736 sf 67.43% Impervious Runoff Depth=3.44"
Tc=6.0 min CN=WQ Runoff=1.17 cfs 4,225 cf

Subcatchment CB9C: Subcat CB9C Runoff Area=3,708 sf 100.00% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=WQ Runoff=0.43 cfs 1,540 cf

Subcatchment CB9D: Subcat CB9D Runoff Area=5,006 sf 63.14% Impervious Runoff Depth=3.24"
Tc=6.0 min CN=WQ Runoff=0.37 cfs 1,350 cf

Subcatchment P-1: Subcat P-1 Runoff Area=17,439 sf 14.20% Impervious Runoff Depth=0.92"
Tc=6.0 min CN=WQ Runoff=0.29 cfs 1,336 cf

Subcatchment P-2: Subcat P-2 Runoff Area=6,530 sf 0.00% Impervious Runoff Depth=0.25"
Tc=6.0 min CN=39 Runoff=0.01 cfs 134 cf

Subcatchment P-3: Subcat P-3 Runoff Area=19,597 sf 2.20% Impervious Runoff Depth=0.35"
Tc=6.0 min CN=WQ Runoff=0.05 cfs 573 cf

Subcatchment P-4: Subcat P-4 Runoff Area=287,018 sf 12.34% Impervious Runoff Depth=0.69"
Tc=12.0 min CN=WQ Runoff=3.44 cfs 16,615 cf

Subcatchment P-5: Subcat P-5 Runoff Area=76,040 sf 11.69% Impervious Runoff Depth=0.80"
Tc=8.2 min CN=WQ Runoff=0.97 cfs 5,072 cf

Subcatchment P-6: Subcat P-6 Runoff Area=25,354 sf 10.27% Impervious Runoff Depth=0.73"
Tc=6.0 min CN=WQ Runoff=0.31 cfs 1,549 cf

Subcatchment P-7: Subcat P-7 Runoff Area=79,230 sf 5.41% Impervious Runoff Depth=0.50"
Tc=11.4 min CN=WQ Runoff=0.42 cfs 3,321 cf

Subcatchment PATIO: Subcat PATIO Runoff Area=2,384 sf 100.00% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=98 Runoff=0.28 cfs 990 cf

Subcatchment R-1: Subcat R-1 Runoff Area=5,045 sf 100.00% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=98 Runoff=0.59 cfs 2,095 cf

Subcatchment R-2: Subcat R-2 Runoff Area=18,290 sf 100.00% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=98 Runoff=2.15 cfs 7,595 cf

Subcatchment R-3: Subcat R-3 Runoff Area=18,290 sf 100.00% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=98 Runoff=2.15 cfs 7,595 cf

Subcatchment R-4: Subcat R-4 Runoff Area=18,290 sf 100.00% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=98 Runoff=2.15 cfs 7,595 cf

Subcatchment R-5: Subcat R-5 Runoff Area=20,565 sf 100.00% Impervious Runoff Depth=4.98"
Tc=6.0 min CN=98 Runoff=2.41 cfs 8,539 cf

Pond 1: Catch Basin Peak Elev=273.21' Inflow=1.17 cfs 4,149 cf
12.0" Round Culvert n=0.012 L=84.0' S=0.0100 '/' Outflow=1.17 cfs 4,149 cf

Pond 2: Catch Basin Peak Elev=273.84' Inflow=0.29 cfs 1,082 cf
12.0" Round Culvert n=0.012 L=56.0' S=0.0100 '/' Outflow=0.30 cfs 1,082 cf

Pond 3A: Catch Basin Peak Elev=273.34' Inflow=0.39 cfs 1,394 cf
12.0" Round Culvert n=0.012 L=35.0' S=0.0100 '/' Outflow=0.40 cfs 1,394 cf

Pond 3B: Catch Basin Peak Elev=273.34' Inflow=0.57 cfs 2,059 cf
12.0" Round Culvert n=0.012 L=21.1' S=0.0100 '/' Outflow=0.58 cfs 2,058 cf

Pond 4A: Catch Basin Peak Elev=273.22' Inflow=0.42 cfs 1,480 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0100 '/' Outflow=0.42 cfs 1,479 cf

Pond 4B: Catch Basin Peak Elev=273.22' Inflow=0.78 cfs 2,797 cf
12.0" Round Culvert n=0.012 L=27.4' S=0.0102 '/' Outflow=0.81 cfs 2,797 cf

Pond 4C: Catch Basin Peak Elev=273.47' Inflow=1.07 cfs 3,821 cf
12.0" Round Culvert n=0.012 L=60.5' S=0.0099 '/' Outflow=1.07 cfs 3,821 cf

Pond 4D: Catch Basin Peak Elev=273.45' Inflow=1.03 cfs 3,712 cf
12.0" Round Culvert n=0.012 L=38.0' S=0.0100 '/' Outflow=1.03 cfs 3,712 cf

Pond 5A: Catch Basin Peak Elev=273.85' Inflow=1.15 cfs 4,090 cf
12.0" Round Culvert n=0.012 L=29.0' S=0.0100 '/' Outflow=1.15 cfs 4,090 cf

Pond 5B: Catch Basin Peak Elev=273.84' Inflow=0.43 cfs 1,530 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0100 '/' Outflow=0.43 cfs 1,530 cf

Pond 5C: Catch Basin Peak Elev=273.84' Inflow=0.28 cfs 999 cf
12.0" Round Culvert n=0.012 L=41.0' S=0.0100 '/' Outflow=0.28 cfs 999 cf

Pond 6: Catch Basin Peak Elev=273.84' Inflow=1.14 cfs 4,112 cf
12.0" Round Culvert n=0.012 L=26.0' S=0.0100 '/' Outflow=1.14 cfs 4,112 cf

Pond 7A: Catch Basin Peak Elev=273.84' Inflow=0.66 cfs 2,368 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=0.66 cfs 2,368 cf

Pond 7B: Catch Basin Peak Elev=273.85' Inflow=1.07 cfs 3,831 cf
12.0" Round Culvert n=0.012 L=40.0' S=0.0100 '/' Outflow=1.07 cfs 3,831 cf

Pond 8: Catch Basin Peak Elev=274.74' Inflow=1.04 cfs 3,735 cf
12.0" Round Culvert n=0.012 L=29.0' S=0.0100 '/' Outflow=1.04 cfs 3,735 cf

Pond 9A: Catch Basin Peak Elev=274.76' Inflow=1.12 cfs 4,007 cf
12.0" Round Culvert n=0.012 L=14.0' S=0.0100 '/' Outflow=1.12 cfs 4,007 cf

Pond 9B: Catch Basin Peak Elev=274.76' Inflow=1.17 cfs 4,225 cf
12.0" Round Culvert n=0.012 L=62.7' S=0.0100 '/' Outflow=1.17 cfs 4,225 cf

Pond 9C: Catch Basin Peak Elev=274.74' Inflow=0.43 cfs 1,540 cf
12.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=0.45 cfs 1,538 cf

Pond 9D: Catch Basin Peak Elev=274.75' Inflow=0.37 cfs 1,350 cf
12.0" Round Culvert n=0.012 L=49.0' S=0.0102 '/' Outflow=0.37 cfs 1,350 cf

Pond 10A: Catch Basin Peak Elev=271.95' Inflow=0.29 cfs 1,049 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.29 cfs 1,049 cf

Pond 10B: Catch Basin Peak Elev=271.95' Inflow=1.04 cfs 3,726 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.0120 '/' Outflow=1.04 cfs 3,726 cf

Pond 11: Catch Basin Peak Elev=271.95' Inflow=1.15 cfs 4,107 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.0100 '/' Outflow=1.15 cfs 4,107 cf

Pond 12: Catch Basin Peak Elev=272.07' Inflow=0.60 cfs 2,153 cf
12.0" Round Culvert n=0.012 L=14.0' S=0.0100 '/' Outflow=0.60 cfs 2,153 cf

Pond 13: Catch Basin Peak Elev=272.25' Inflow=0.39 cfs 1,412 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.39 cfs 1,412 cf

Pond 14: Catch Basin Peak Elev=272.09' Inflow=0.63 cfs 2,242 cf
12.0" Round Culvert n=0.012 L=33.0' S=0.0100 '/' Outflow=0.63 cfs 2,242 cf

Pond 15: Catch Basin Peak Elev=273.15' Inflow=0.98 cfs 3,725 cf
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=0.98 cfs 3,725 cf

Pond 16: Catch Basin Peak Elev=274.87' Inflow=0.86 cfs 3,315 cf
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=0.86 cfs 3,315 cf

Pond 17: Catch Basin Peak Elev=275.54' Inflow=1.17 cfs 4,681 cf
15.0" Round Culvert n=0.012 L=143.0' S=0.0061 '/' Outflow=1.17 cfs 4,681 cf

Pond MH1: Manhole Peak Elev=273.21' Inflow=1.17 cfs 4,149 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0000 '/' Outflow=1.17 cfs 4,149 cf

Pond MH11: Manhole Peak Elev=274.73' Inflow=2.21 cfs 7,960 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=2.21 cfs 7,960 cf

Pond MH12: Manhole Peak Elev=274.74' Inflow=1.94 cfs 6,895 cf
15.0" Round Culvert n=0.012 L=24.9' S=0.0112 '/' Outflow=1.94 cfs 6,895 cf

Pond MH13: Manhole Peak Elev=274.73' Inflow=1.94 cfs 6,895 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=1.94 cfs 6,895 cf

Pond MH15: Manhole Peak Elev=271.95' Inflow=1.34 cfs 4,775 cf
12.0" Round Culvert n=0.012 L=14.0' S=0.0100 '/' Outflow=1.34 cfs 4,775 cf

Pond MH16: Manhole Peak Elev=271.94' Inflow=1.34 cfs 4,775 cf
24.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=1.34 cfs 4,775 cf

Pond MH17: Manhole Peak Elev=271.94' Inflow=1.15 cfs 4,107 cf
24.0" Round Culvert n=0.012 L=7.0' S=0.0000 '/' Outflow=1.15 cfs 4,107 cf

Pond MH19: Manhole Peak Elev=270.95' Inflow=0.00 cfs 0 cf
18.0" Round Culvert n=0.012 L=51.0' S=0.0069 '/' Outflow=0.00 cfs 0 cf

Pond MH2: Manhole Peak Elev=273.34' Inflow=0.97 cfs 3,452 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0100 '/' Outflow=0.97 cfs 3,452 cf

Pond MH20: Manhole Peak Elev=271.95' Inflow=4.63 cfs 17,528 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=4.63 cfs 17,528 cf

Pond MH21: Manhole Peak Elev=271.95' Inflow=4.63 cfs 17,528 cf
24.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=4.63 cfs 17,528 cf

Pond MH22: Manhole Peak Elev=272.04' Inflow=4.63 cfs 17,528 cf
24.0" Round Culvert n=0.012 L=22.0' S=0.0100 '/' Outflow=4.63 cfs 17,528 cf

Pond MH23: Manhole Peak Elev=273.00' Inflow=3.01 cfs 11,721 cf
18.0" Round Culvert n=0.012 L=121.0' S=0.0100 '/' Outflow=3.01 cfs 11,721 cf

Pond MH24: Manhole Peak Elev=274.64' Inflow=2.03 cfs 7,996 cf
18.0" Round Culvert n=0.012 L=176.0' S=0.0100 '/' Outflow=2.03 cfs 7,996 cf

Pond MH25: Manhole Peak Elev=273.83' Inflow=2.16 cfs 7,701 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=2.16 cfs 7,701 cf

Pond MH26: Manhole Peak Elev=273.22' Inflow=3.37 cfs 11,808 cf
18.0" Round Culvert n=0.012 L=40.2' S=0.0100 '/' Outflow=3.37 cfs 11,808 cf

Pond MH29: Manhole Peak Elev=273.26' Inflow=2.11 cfs 7,533 cf
15.0" Round Culvert n=0.012 L=11.5' S=0.0104 '/' Outflow=2.16 cfs 7,533 cf

Pond MH3: Manhole Peak Elev=273.33' Inflow=0.97 cfs 3,452 cf
12.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=0.97 cfs 3,452 cf

Pond MH30: Manhole Peak Elev=273.38' Inflow=2.10 cfs 7,533 cf
15.0" Round Culvert n=0.012 L=34.0' S=0.0100 '/' Outflow=2.11 cfs 7,533 cf

Pond MH31: Manhole Peak Elev=273.84' Inflow=0.28 cfs 999 cf
12.0" Round Culvert n=0.012 L=20.9' S=0.0100 '/' Outflow=0.28 cfs 999 cf

Pond MH32: Manhole Peak Elev=274.75' Inflow=1.49 cfs 5,357 cf
12.0" Round Culvert n=0.012 L=47.5' S=0.0099 '/' Outflow=1.49 cfs 5,357 cf

Pond MH33: Manhole Peak Elev=274.74' Inflow=2.21 cfs 7,960 cf
15.0" Round Culvert n=0.012 L=24.0' S=0.0100 '/' Outflow=2.21 cfs 7,960 cf

Pond MH4: Manhole Peak Elev=273.21' Inflow=3.37 cfs 11,808 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.37 cfs 11,808 cf

Pond MH5: Manhole Peak Elev=273.84' Inflow=1.86 cfs 6,619 cf
15.0" Round Culvert n=0.012 L=63.0' S=0.0100 '/' Outflow=1.87 cfs 6,619 cf

Pond MH6: Manhole Peak Elev=273.84' Inflow=2.16 cfs 7,701 cf
15.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=2.16 cfs 7,701 cf

Pond MH7: Manhole Peak Elev=273.83' Inflow=1.14 cfs 4,112 cf
24.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=1.14 cfs 4,112 cf

Pond MH8: Manhole Peak Elev=273.84' Inflow=1.73 cfs 6,200 cf
15.0" Round Culvert n=0.012 L=22.0' S=0.0100 '/' Outflow=1.73 cfs 6,200 cf

Pond MH9: Manhole Peak Elev=273.83' Inflow=1.73 cfs 6,200 cf
24.0" Round Culvert n=0.012 L=8.0' S=0.0000 '/' Outflow=1.73 cfs 6,200 cf

Pond RD1: Roof Drain Peak Elev=273.21' Inflow=0.87 cfs 3,085 cf
10.0" Round Culvert n=0.012 L=21.0' S=0.0105 '/' Outflow=0.87 cfs 3,085 cf

Pond RD2: Roof Drain Peak Elev=274.28' Inflow=2.15 cfs 7,595 cf
10.0" Round Culvert n=0.012 L=31.0' S=0.0100 '/' Outflow=2.15 cfs 7,595 cf

Pond RD3: Roof Drain Peak Elev=274.14' Inflow=2.15 cfs 7,595 cf
10.0" Round Culvert n=0.012 L=14.7' S=0.0102 '/' Outflow=2.15 cfs 7,595 cf

Pond RD4: Roof Drain Peak Elev=272.02' Inflow=2.15 cfs 7,595 cf
10.0" Round Culvert n=0.012 L=24.0' S=0.0104 '/' Outflow=2.15 cfs 7,595 cf

Pond RD5: Roof Drain Peak Elev=272.11' Inflow=2.41 cfs 8,539 cf
10.0" Round Culvert n=0.012 L=18.0' S=0.0100 '/' Outflow=2.41 cfs 8,539 cf

Pond SP-1: Northerly Culvert Crossing Peak Elev=271.80' Storage=12,719 cf Inflow=56.18 cfs 7,094,498 cf
Outflow=55.99 cfs 7,082,063 cf

Pond SP-2: Southerly Culvert Peak Elev=271.65' Storage=16,520 cf Inflow=56.21 cfs 7,083,534 cf
Outflow=56.15 cfs 7,067,211 cf

Pond TD1: Stone Trench Drain Peak Elev=271.86' Storage=51 cf Inflow=1.66 cfs 9,942 cf
Discarded=0.20 cfs 7,249 cf Primary=1.44 cfs 2,693 cf Outflow=1.64 cfs 9,942 cf

Pond TD2: Stone Trench Drain Peak Elev=272.00' Storage=0 cf Inflow=0.01 cfs 134 cf
Discarded=0.00 cfs 0 cf Primary=0.01 cfs 134 cf Outflow=0.01 cfs 134 cf

Pond UIS1: Underground Chamber #1 Peak Elev=273.21' Storage=5,328 cf Inflow=5.41 cfs 19,042 cf
Discarded=0.73 cfs 19,042 cf Primary=0.00 cfs 0 cf Outflow=0.73 cfs 19,042 cf

Pond UIS2: Underground Chamber #2 Peak Elev=273.32' Storage=729 cf Inflow=0.97 cfs 3,452 cf
Discarded=0.17 cfs 3,309 cf Primary=0.21 cfs 143 cf Outflow=0.38 cfs 3,452 cf

Pond UIS3: Underground Chamber #3 Peak Elev=273.83' Storage=8,835 cf Inflow=9.33 cfs 33,202 cf
Discarded=1.33 cfs 32,513 cf Primary=0.37 cfs 690 cf Outflow=1.70 cfs 33,202 cf

Pond UIS4: Underground Chamber #4 Peak Elev=274.73' Storage=3,818 cf Inflow=4.15 cfs 14,855 cf
Discarded=0.48 cfs 13,664 cf Primary=0.69 cfs 1,191 cf Outflow=1.17 cfs 14,855 cf

Pond UIS5: Underground Chamber #5 Peak Elev=271.94' Storage=11,503 cf Inflow=11.68 cfs 42,544 cf
Discarded=1.66 cfs 42,544 cf Primary=0.00 cfs 0 cf Outflow=1.66 cfs 42,544 cf

Link SP-3: On Site Flow To Perennial Stream Inflow=59.58 cfs 7,085,707 cf
Primary=59.58 cfs 7,085,707 cf

Total Runoff Area = 867,482 sf Runoff Volume = 141,700 cf Average Runoff Depth = 1.96"
62.87% Pervious = 545,383 sf 37.13% Impervious = 322,099 sf

Summary for Subcatchment CB1: Subcat CB1

Runoff = 1.17 cfs @ 12.08 hrs, Volume= 4,149 cf, Depth= 4.59"
Routed to Pond 1 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
893	39	>75% Grass cover, Good, HSG A
9,948	98	Paved parking, HSG A
10,841		Weighted Average
893	39	8.24% Pervious Area
9,948	98	91.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB10A: Subcat CB10A

Runoff = 0.29 cfs @ 12.08 hrs, Volume= 1,049 cf, Depth= 4.11"
Routed to Pond 10A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
562	39	>75% Grass cover, Good, HSG A
2,497	98	Paved parking, HSG A
3,059		Weighted Average
562	39	18.36% Pervious Area
2,497	98	81.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB10B: Subcat CB10B

Runoff = 1.04 cfs @ 12.08 hrs, Volume= 3,726 cf, Depth= 4.28"
Routed to Pond 10B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
1,544	39	>75% Grass cover, Good, HSG A
8,897	98	Paved parking, HSG A
10,441		Weighted Average
1,544	39	14.79% Pervious Area
8,897	98	85.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB11: Subcat CB11

Runoff = 1.15 cfs @ 12.08 hrs, Volume= 4,107 cf, Depth= 4.28"
Routed to Pond 11 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
1,699	39	>75% Grass cover, Good, HSG A
9,806	98	Paved parking, HSG A
11,505		Weighted Average
1,699	39	14.77% Pervious Area
9,806	98	85.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB12: Subcat CB12

Runoff = 0.60 cfs @ 12.08 hrs, Volume= 2,153 cf, Depth= 3.61"
Routed to Pond 12 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
2,066	39	>75% Grass cover, Good, HSG A
5,082	98	Paved parking, HSG A
7,149		Weighted Average
2,066	39	28.90% Pervious Area
5,082	98	71.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB13: Subcat CB13

Runoff = 0.39 cfs @ 12.08 hrs, Volume= 1,412 cf, Depth= 4.09"
Routed to Pond 13 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
778	39	>75% Grass cover, Good, HSG A
3,363	98	Paved parking, HSG A
4,141		Weighted Average
778	39	18.79% Pervious Area
3,363	98	81.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB14: Subcat CB14

Runoff = 0.63 cfs @ 12.08 hrs, Volume= 2,242 cf, Depth= 4.36"
Routed to Pond 14 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
806	39	>75% Grass cover, Good, HSG A
4,761	98	Paved parking, HSG A
600	98	Roofs, HSG A
6,167		Weighted Average
806	39	13.07% Pervious Area
5,360	98	86.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB15: Subcat CB15

Runoff = 0.98 cfs @ 12.08 hrs, Volume= 3,725 cf, Depth= 2.22"
Routed to Pond 15 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
11,766	39	>75% Grass cover, Good, HSG A
7,412	98	Paved parking, HSG A
975	98	Roofs, HSG A
20,154		Weighted Average
11,766	39	58.38% Pervious Area
8,388	98	41.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB16: Subcat CB16

Runoff = 0.86 cfs @ 12.08 hrs, Volume= 3,315 cf, Depth= 1.93"
Routed to Pond 16 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
13,257	39	>75% Grass cover, Good, HSG A
7,326	98	Paved parking, HSG A
20,584		Weighted Average
13,257	39	64.41% Pervious Area
7,326	98	35.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB17: Subcat CB17

Runoff = 1.17 cfs @ 12.08 hrs, Volume= 4,681 cf, Depth= 1.56"
Routed to Pond 17 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
26,052	39	>75% Grass cover, Good, HSG A
8,219	98	Paved parking, HSG A
1,764	98	Roofs, HSG A
36,035		Weighted Average
26,052	39	72.30% Pervious Area
9,983	98	27.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB2: Subcat CB2

Runoff = 0.29 cfs @ 12.08 hrs, Volume= 1,082 cf, Depth= 2.81"
Routed to Pond 2 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
2,121	39	>75% Grass cover, Good, HSG A
2,500	98	Paved parking, HSG A
4,621		Weighted Average
2,121	39	45.90% Pervious Area
2,500	98	54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB3A: Subcat CB3A

Runoff = 0.39 cfs @ 12.08 hrs, Volume= 1,394 cf, Depth= 4.67"
Routed to Pond 3A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
238	39	>75% Grass cover, Good, HSG A
3,345	98	Paved parking, HSG A
3,583		Weighted Average
238	39	6.64% Pervious Area
3,345	98	93.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB3B: Subcat CB3B

Runoff = 0.57 cfs @ 12.08 hrs, Volume= 2,059 cf, Depth= 4.08"
Routed to Pond 3B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
1,154	39	>75% Grass cover, Good, HSG A
4,901	98	Paved parking, HSG A
6,054		Weighted Average
1,154	39	19.06% Pervious Area
4,901	98	80.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4A: Subcat CB4A

Runoff = 0.42 cfs @ 12.08 hrs, Volume= 1,480 cf, Depth= 4.47"
Routed to Pond 4A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
428	39	>75% Grass cover, Good, HSG A
3,542	98	Paved parking, HSG A
3,970		Weighted Average
428	39	10.78% Pervious Area
3,542	98	89.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4B: Subcat CB4B

Runoff = 0.78 cfs @ 12.08 hrs, Volume= 2,797 cf, Depth= 3.75"
Routed to Pond 4B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
2,325	39	>75% Grass cover, Good, HSG A
6,621	98	Paved parking, HSG A
8,946		Weighted Average
2,325	39	25.99% Pervious Area
6,621	98	74.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4C: Subcat CB4C

Runoff = 1.07 cfs @ 12.08 hrs, Volume= 3,821 cf, Depth= 4.27"
Routed to Pond 4C : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
1,619	39	>75% Grass cover, Good, HSG A
7,106	98	Paved parking, HSG A
2,016	98	Roofs, HSG A
10,741		Weighted Average
1,619	39	15.07% Pervious Area
9,122	98	84.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4D: Subcat CB4D

Runoff = 1.03 cfs @ 12.08 hrs, Volume= 3,712 cf, Depth= 3.95"
Routed to Pond 4D : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
2,459	39	>75% Grass cover, Good, HSG A
8,817	98	Paved parking, HSG A
11,275		Weighted Average
2,459	39	21.81% Pervious Area
8,817	98	78.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB5A: Subcat CB5A

Runoff = 1.15 cfs @ 12.08 hrs, Volume= 4,090 cf, Depth= 4.68"
Routed to Pond 5A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
665	39	>75% Grass cover, Good, HSG A
9,303	98	Paved parking, HSG A
514	98	Roofs, HSG A
10,482		Weighted Average
665	39	6.34% Pervious Area
9,817	98	93.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB5B: Subcat CB5B

Runoff = 0.43 cfs @ 12.08 hrs, Volume= 1,530 cf, Depth= 4.75"
Routed to Pond 5B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
190	39	>75% Grass cover, Good, HSG A
2,916	98	Paved parking, HSG A
760	98	Roofs, HSG A
3,866		Weighted Average
190	39	4.90% Pervious Area
3,676	98	95.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB5C: Subcat CB5C

Runoff = 0.28 cfs @ 12.08 hrs, Volume= 999 cf, Depth= 4.64"
Routed to Pond 5C : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
185	39	>75% Grass cover, Good, HSG A
2,396	98	Paved parking, HSG A
2,581		Weighted Average
185	39	7.19% Pervious Area
2,396	98	92.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB6: Subcat CB6

Runoff = 1.14 cfs @ 12.08 hrs, Volume= 4,112 cf, Depth= 3.91"
Routed to Pond 6 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
2,869	39	>75% Grass cover, Good, HSG A
9,762	98	Paved parking, HSG A
12,631		Weighted Average
2,869	39	22.72% Pervious Area
9,762	98	77.28% Impervious Area

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

Summary for Subcatchment CB7A: Subcat CB7A

Runoff = 0.66 cfs @ 12.08 hrs, Volume= 2,368 cf, Depth= 4.00"
Routed to Pond 7A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
1,470	39	>75% Grass cover, Good, HSG A
5,631	98	Paved parking, HSG A
7,101		Weighted Average
1,470	39	20.70% Pervious Area
5,631	98	79.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB7B: Subcat CB7B

Runoff = 1.07 cfs @ 12.08 hrs, Volume= 3,831 cf, Depth= 4.07"
Routed to Pond 7B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
2,181	39	>75% Grass cover, Good, HSG A
8,314	98	Paved parking, HSG A
805	98	Roofs, HSG A
11,300		Weighted Average
2,181	39	19.30% Pervious Area
9,119	98	80.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB8: Subcat CB8

Runoff = 1.04 cfs @ 12.08 hrs, Volume= 3,735 cf, Depth= 4.08"
Routed to Pond 8 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
2,100	39	>75% Grass cover, Good, HSG A
8,498	98	Paved parking, HSG A
393	98	Roofs, HSG A
10,991		Weighted Average
2,100	39	19.11% Pervious Area
8,891	98	80.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9A: Subcat CB9A

Runoff = 1.12 cfs @ 12.08 hrs, Volume= 4,007 cf, Depth= 4.09"
Routed to Pond 9A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
2,202	39	>75% Grass cover, Good, HSG A
7,525	98	Paved parking, HSG A
2,016	98	Roofs, HSG A
11,743		Weighted Average
2,202	39	18.75% Pervious Area
9,541	98	81.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9B: Subcat CB9B

Runoff = 1.17 cfs @ 12.08 hrs, Volume= 4,225 cf, Depth= 3.44"
Routed to Pond 9B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
4,799	39	>75% Grass cover, Good, HSG A
9,937	98	Paved parking, HSG A
14,736		Weighted Average
4,799	39	32.57% Pervious Area
9,937	98	67.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9C: Subcat CB9C

Runoff = 0.43 cfs @ 12.08 hrs, Volume= 1,540 cf, Depth= 4.98"
Routed to Pond 9C : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
0	39	>75% Grass cover, Good, HSG A
2,337	98	Paved parking, HSG A
1,371	98	Roofs, HSG A
3,708		Weighted Average
0	39	0.00% Pervious Area
3,708	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9D: Subcat CB9D

Runoff = 0.37 cfs @ 12.08 hrs, Volume= 1,350 cf, Depth= 3.24"
Routed to Pond 9D : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
1,845	39	>75% Grass cover, Good, HSG A
3,161	98	Paved parking, HSG A
5,006		Weighted Average
1,845	39	36.86% Pervious Area
3,161	98	63.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-1: Subcat P-1

Runoff = 0.29 cfs @ 12.08 hrs, Volume= 1,336 cf, Depth= 0.92"
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
14,962	39	>75% Grass cover, Good, HSG A
2,477	98	Water Surface, HSG A
17,439		Weighted Average
14,962	39	85.80% Pervious Area
2,477	98	14.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 134 cf, Depth= 0.25"
Routed to Pond TD2 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
6,530	39	>75% Grass cover, Good, HSG A
6,530	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-3: Subcat P-3

Runoff = 0.05 cfs @ 12.08 hrs, Volume= 573 cf, Depth= 0.35"
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
19,166	39	>75% Grass cover, Good, HSG A
0	98	Paved parking, HSG A
431	98	Water Surface, HSG A
19,597		Weighted Average
19,166	39	97.80% Pervious Area
432	98	2.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-4: Subcat P-4

Runoff = 3.44 cfs @ 12.16 hrs, Volume= 16,615 cf, Depth= 0.69"
Routed to Link SP-3 : On Site Flow To Perennial Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
84,280	39	>75% Grass cover, Good, HSG A
5,030	98	Paved parking, HSG A
30,379	98	Water Surface, HSG A
167,329	30	Woods, Good, HSG A
287,018		Weighted Average
251,608	33	87.66% Pervious Area
35,410	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, Copied from EWS**

Summary for Subcatchment P-5: Subcat P-5

Runoff = 0.97 cfs @ 12.11 hrs, Volume= 5,072 cf, Depth= 0.80"
Routed to Pond TD1 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
67,151	39	>75% Grass cover, Good, HSG A
8,890	98	Paved parking, HSG A
76,040		Weighted Average
67,151	39	88.31% Pervious Area
8,890	98	11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2					**Direct Entry, Copied From EWS. (TC ends at Point G)**

Summary for Subcatchment P-6: Subcat P-6

Runoff = 0.31 cfs @ 12.08 hrs, Volume= 1,549 cf, Depth= 0.73"
Routed to Pond TD1 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
22,749	39	>75% Grass cover, Good, HSG A
2,605	98	Paved parking, HSG A
25,354		Weighted Average
22,749	39	89.73% Pervious Area
2,605	98	10.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Copied from EWS (TC ends at Point F)**

Summary for Subcatchment P-7: Subcat P-7

Runoff = 0.42 cfs @ 12.15 hrs, Volume= 3,321 cf, Depth= 0.50"
Routed to Pond TD1 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
74,943	39	>75% Grass cover, Good, HSG A
4,287	98	Paved parking, HSG A
79,230		Weighted Average
74,943	39	94.59% Pervious Area
4,287	98	5.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4					**Direct Entry, Copied From EWS**

Summary for Subcatchment PATIO: Subcat PATIO

Runoff = 0.28 cfs @ 12.08 hrs, Volume= 990 cf, Depth= 4.98"
Routed to Pond RD1 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
2,384	98	Paved parking, HSG A
2,384	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-1: Subcat R-1

Runoff = 0.59 cfs @ 12.08 hrs, Volume= 2,095 cf, Depth= 4.98"
Routed to Pond RD1 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
5,045	98	Roofs, HSG A
5,045	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-2: Subcat R-2

Runoff = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf, Depth= 4.98"
Routed to Pond RD2 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
18,290	98	Roofs, HSG A
18,290	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-3: Subcat R-3

Runoff = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf, Depth= 4.98"
Routed to Pond RD3 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
18,290	98	Roofs, HSG A
18,290	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-4: Subcat R-4

Runoff = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf, Depth= 4.98"
Routed to Pond RD4 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
18,290	98	Roofs, HSG A
18,290	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-5: Subcat R-5

Runoff = 2.41 cfs @ 12.08 hrs, Volume= 8,539 cf, Depth= 4.98"
Routed to Pond RD5 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.22"

Area (sf)	CN	Description
20,565	98	Roofs, HSG A
20,565	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Pond 1: Catch Basin

Inflow Area = 10,841 sf, 91.76% Impervious, Inflow Depth = 4.59" for 10 Year event
Inflow = 1.17 cfs @ 12.08 hrs, Volume= 4,149 cf
Outflow = 1.17 cfs @ 12.08 hrs, Volume= 4,149 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.17 cfs @ 12.08 hrs, Volume= 4,149 cf
Routed to Pond MH1 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.21' @ 12.59 hrs
Flood Elev= 274.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.54'	**12.0" Round Culvert** L= 84.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.54' / 270.70' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 12.08 hrs HW=272.54' TW=272.36' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.17 cfs @ 1.85 fps)

Summary for Pond 2: Catch Basin

Inflow Area = 4,621 sf, 54.10% Impervious, Inflow Depth = 2.81" for 10 Year event
Inflow = 0.29 cfs @ 12.08 hrs, Volume= 1,082 cf
Outflow = 0.30 cfs @ 12.08 hrs, Volume= 1,082 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.30 cfs @ 12.08 hrs, Volume= 1,082 cf
Routed to Pond MH6 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.84' @ 12.52 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.18'	**12.0" Round Culvert** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.18' / 271.62' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.30 cfs @ 12.08 hrs HW=273.55' TW=273.54' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.30 cfs @ 0.38 fps)

Summary for Pond 3A: Catch Basin

Inflow Area = 3,583 sf, 93.36% Impervious, Inflow Depth = 4.67" for 10 Year event
Inflow = 0.39 cfs @ 12.08 hrs, Volume= 1,394 cf
Outflow = 0.40 cfs @ 12.09 hrs, Volume= 1,394 cf, Atten= 0%, Lag= 0.3 min
Primary = 0.40 cfs @ 12.09 hrs, Volume= 1,394 cf
Routed to Pond MH2 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.34' @ 12.30 hrs
Flood Elev= 274.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.66'	**12.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.66' / 271.31' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.09 hrs HW=272.96' TW=272.95' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.33 cfs @ 0.42 fps)

Summary for Pond 3B: Catch Basin

Inflow Area = 6,054 sf, 80.94% Impervious, Inflow Depth = 4.08" for 10 Year event
Inflow = 0.57 cfs @ 12.08 hrs, Volume= 2,059 cf
Outflow = 0.58 cfs @ 12.08 hrs, Volume= 2,058 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.58 cfs @ 12.08 hrs, Volume= 2,058 cf
Routed to Pond MH2 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.34' @ 12.30 hrs
Flood Elev= 274.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.52'	**12.0" Round Culvert** L= 21.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.52' / 271.31' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.58 cfs @ 12.08 hrs HW=272.97' TW=272.95' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.58 cfs @ 0.74 fps)

Summary for Pond 4A: Catch Basin

Inflow Area = 3,970 sf, 89.22% Impervious, Inflow Depth = 4.47" for 10 Year event
Inflow = 0.42 cfs @ 12.08 hrs, Volume= 1,480 cf
Outflow = 0.42 cfs @ 12.09 hrs, Volume= 1,479 cf, Atten= 0%, Lag= 0.4 min
Primary = 0.42 cfs @ 12.09 hrs, Volume= 1,479 cf
Routed to Pond MH26 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.22' @ 12.58 hrs
Flood Elev= 275.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.17'	**12.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.17' / 271.10' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.09 hrs HW=273.11' TW=273.10' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.42 cfs @ 0.54 fps)

Summary for Pond 4B: Catch Basin

Inflow Area = 8,946 sf, 74.01% Impervious, Inflow Depth = 3.75" for 10 Year event
Inflow = 0.78 cfs @ 12.08 hrs, Volume= 2,797 cf
Outflow = 0.81 cfs @ 12.08 hrs, Volume= 2,797 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.81 cfs @ 12.08 hrs, Volume= 2,797 cf
Routed to Pond MH26 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.22' @ 12.58 hrs
Flood Elev= 275.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.38'	**12.0" Round Culvert** L= 27.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.38' / 271.10' S= 0.0102 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 12.08 hrs HW=273.17' TW=273.13' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.81 cfs @ 1.03 fps)

Summary for Pond 4C: Catch Basin

Inflow Area = 10,741 sf, 84.93% Impervious, Inflow Depth = 4.27" for 10 Year event
Inflow = 1.07 cfs @ 12.08 hrs, Volume= 3,821 cf
Outflow = 1.07 cfs @ 12.08 hrs, Volume= 3,821 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.07 cfs @ 12.08 hrs, Volume= 3,821 cf
Routed to Pond MH30 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.47' @ 12.09 hrs
Flood Elev= 275.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.36'	**12.0" Round Culvert** L= 60.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.36' / 271.76' S= 0.0099 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.02 cfs @ 12.08 hrs HW=273.46' TW=273.37' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.02 cfs @ 1.47 fps)

Summary for Pond 4D: Catch Basin

Inflow Area = 11,275 sf, 78.19% Impervious, Inflow Depth = 3.95" for 10 Year event
Inflow = 1.03 cfs @ 12.08 hrs, Volume= 3,712 cf
Outflow = 1.03 cfs @ 12.08 hrs, Volume= 3,712 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.03 cfs @ 12.08 hrs, Volume= 3,712 cf
Routed to Pond MH30 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.45' @ 12.09 hrs
Flood Elev= 275.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.14'	**12.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.14' / 271.76' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.96 cfs @ 12.08 hrs HW=273.43' TW=273.37' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.96 cfs @ 1.23 fps)

Summary for Pond 5A: Catch Basin

Inflow Area = 10,482 sf, 93.66% Impervious, Inflow Depth = 4.68" for 10 Year event
Inflow = 1.15 cfs @ 12.08 hrs, Volume= 4,090 cf
Outflow = 1.15 cfs @ 12.08 hrs, Volume= 4,090 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.08 hrs, Volume= 4,090 cf
Routed to Pond MH5 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.85' @ 12.52 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.64'	**12.0" Round Culvert** L= 29.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.64' / 272.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.14 cfs @ 12.08 hrs HW=273.74' TW=273.65' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.14 cfs @ 1.45 fps)

Summary for Pond 5B: Catch Basin

Inflow Area = 3,866 sf, 95.10% Impervious, Inflow Depth = 4.75" for 10 Year event
Inflow = 0.43 cfs @ 12.08 hrs, Volume= 1,530 cf
Outflow = 0.43 cfs @ 12.08 hrs, Volume= 1,530 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.08 hrs, Volume= 1,530 cf
Routed to Pond MH5 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.84' @ 12.52 hrs
Flood Elev= 276.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.80'	**12.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.80' / 272.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.41 cfs @ 12.08 hrs HW=273.67' TW=273.65' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.41 cfs @ 0.76 fps)

Summary for Pond 5C: Catch Basin

Inflow Area = 2,581 sf, 92.81% Impervious, Inflow Depth = 4.64" for 10 Year event
Inflow = 0.28 cfs @ 12.08 hrs, Volume= 999 cf
Outflow = 0.28 cfs @ 12.08 hrs, Volume= 999 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.08 hrs, Volume= 999 cf
Routed to Pond MH31 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.84' @ 12.51 hrs
Flood Elev= 276.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.07'	**12.0" Round Culvert** L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.07' / 272.66' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.08 hrs HW=273.68' TW=273.65' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.27 cfs @ 0.77 fps)

Summary for Pond 6: Catch Basin

Inflow Area = 12,631 sf, 77.28% Impervious, Inflow Depth = 3.91" for 10 Year event
Inflow = 1.14 cfs @ 12.08 hrs, Volume= 4,112 cf
Outflow = 1.14 cfs @ 12.08 hrs, Volume= 4,112 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.14 cfs @ 12.08 hrs, Volume= 4,112 cf
Routed to Pond MH7 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.84' @ 12.52 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.76'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.76' / 272.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.14 cfs @ 12.08 hrs HW=273.42' TW=273.12' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.14 cfs @ 2.96 fps)

Summary for Pond 7A: Catch Basin

Inflow Area = 7,101 sf, 79.30% Impervious, Inflow Depth = 4.00" for 10 Year event
Inflow = 0.66 cfs @ 12.08 hrs, Volume= 2,368 cf
Outflow = 0.66 cfs @ 12.08 hrs, Volume= 2,368 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.66 cfs @ 12.08 hrs, Volume= 2,368 cf
Routed to Pond MH8 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.84' @ 12.53 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.92'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.92' / 272.82' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.65 cfs @ 12.08 hrs HW=273.58' TW=273.50' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.65 cfs @ 1.70 fps)

Summary for Pond 7B: Catch Basin

```
Inflow Area =       11,300 sf,  80.70% Impervious,  Inflow Depth =   4.07"    for  10 Year event
Inflow      =      1.07 cfs @  12.08 hrs,  Volume=          3,831 cf
Outflow     =      1.07 cfs @  12.08 hrs,  Volume=          3,831 cf,  Atten= 0%,  Lag= 0.0 min
Primary     =      1.07 cfs @  12.08 hrs,  Volume=          3,831 cf
    Routed to Pond MH8 : Manhole
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.85' @ 12.51 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.22'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.22' / 272.82' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.07 cfs @ 12.08 hrs HW=273.85' TW=273.50' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.07 cfs @ 2.93 fps)

Summary for Pond 8: Catch Basin

```
Inflow Area =       10,991 sf,  80.89% Impervious,  Inflow Depth =   4.08"    for  10 Year event
Inflow      =      1.04 cfs @  12.08 hrs,  Volume=          3,735 cf
Outflow     =      1.04 cfs @  12.08 hrs,  Volume=          3,735 cf,  Atten= 0%,  Lag= 0.0 min
Primary     =      1.04 cfs @  12.08 hrs,  Volume=          3,735 cf
    Routed to Pond MH33 : Manhole
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.74' @ 12.41 hrs
Flood Elev= 276.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.63'	**12.0" Round Culvert** L= 29.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.63' / 273.34' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.96 cfs @ 12.08 hrs HW=274.37' TW=274.20' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.96 cfs @ 2.17 fps)

Summary for Pond 9A: Catch Basin

Inflow Area = 11,743 sf, 81.25% Impervious, Inflow Depth = 4.09" for 10 Year event
Inflow = 1.12 cfs @ 12.08 hrs, Volume= 4,007 cf
Outflow = 1.12 cfs @ 12.09 hrs, Volume= 4,007 cf, Atten= 0%, Lag= 0.2 min
Primary = 1.12 cfs @ 12.09 hrs, Volume= 4,007 cf
Routed to Pond MH32 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.76' @ 12.41 hrs
Flood Elev= 276.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.99'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.99' / 272.85' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.12 cfs @ 12.09 hrs HW=274.39' TW=274.30' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.12 cfs @ 1.42 fps)

Summary for Pond 9B: Catch Basin

Inflow Area = 14,736 sf, 67.43% Impervious, Inflow Depth = 3.44" for 10 Year event
Inflow = 1.17 cfs @ 12.08 hrs, Volume= 4,225 cf
Outflow = 1.17 cfs @ 12.08 hrs, Volume= 4,225 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.17 cfs @ 12.08 hrs, Volume= 4,225 cf
Routed to Pond MH33 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.76' @ 12.40 hrs
Flood Elev= 276.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.97'	**12.0" Round Culvert** L= 62.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.97' / 273.34' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.13 cfs @ 12.08 hrs HW=274.63' TW=274.20' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.13 cfs @ 2.92 fps)

Summary for Pond 9C: Catch Basin

Inflow Area = 3,708 sf,100.00% Impervious, Inflow Depth = 4.98" for 10 Year event
Inflow = 0.43 cfs @ 12.08 hrs, Volume= 1,540 cf
Outflow = 0.45 cfs @ 12.08 hrs, Volume= 1,538 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.45 cfs @ 12.08 hrs, Volume= 1,538 cf
Routed to Pond MH12 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.74' @ 12.42 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.33'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.33' / 272.28' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=274.15' TW=274.16' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 9D: Catch Basin

Inflow Area = 5,006 sf, 63.14% Impervious, Inflow Depth = 3.24" for 10 Year event
Inflow = 0.37 cfs @ 12.08 hrs, Volume= 1,350 cf
Outflow = 0.37 cfs @ 12.08 hrs, Volume= 1,350 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.08 hrs, Volume= 1,350 cf
Routed to Pond MH32 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.75' @ 12.41 hrs
Flood Elev= 276.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.35'	**12.0" Round Culvert** L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.35' / 272.85' S= 0.0102 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.35 cfs @ 12.08 hrs HW=274.31' TW=274.30' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.35 cfs @ 0.59 fps)

Summary for Pond 10A: Catch Basin

Inflow Area = 3,059 sf, 81.64% Impervious, Inflow Depth = 4.11" for 10 Year event
Inflow = 0.29 cfs @ 12.08 hrs, Volume= 1,049 cf
Outflow = 0.29 cfs @ 12.08 hrs, Volume= 1,049 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.08 hrs, Volume= 1,049 cf
Routed to Pond MH15 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.95' @ 12.59 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.41'	**12.0" Round Culvert** L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.41' / 270.54' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.28 cfs @ 12.08 hrs HW=271.72' TW=271.31' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.28 cfs @ 2.02 fps)

Summary for Pond 10B: Catch Basin

Inflow Area = 10,441 sf, 85.21% Impervious, Inflow Depth = 4.28" for 10 Year event
Inflow = 1.04 cfs @ 12.08 hrs, Volume= 3,726 cf
Outflow = 1.04 cfs @ 12.08 hrs, Volume= 3,726 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 12.08 hrs, Volume= 3,726 cf
Routed to Pond MH15 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.95' @ 12.59 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.70'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.70' / 270.52' S= 0.0120 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.95 cfs @ 12.08 hrs HW=271.44' TW=271.31' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.95 cfs @ 2.13 fps)

Summary for Pond 11: Catch Basin

Inflow Area = 11,505 sf, 85.23% Impervious, Inflow Depth = 4.28" for 10 Year event
Inflow = 1.15 cfs @ 12.08 hrs, Volume= 4,107 cf
Outflow = 1.15 cfs @ 12.08 hrs, Volume= 4,107 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.08 hrs, Volume= 4,107 cf
Routed to Pond MH17 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.95' @ 12.59 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.55'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.55' / 270.40' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.15 cfs @ 12.08 hrs HW=271.31' TW=271.12' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.15 cfs @ 2.50 fps)

Summary for Pond 12: Catch Basin

Inflow Area = 7,149 sf, 71.10% Impervious, Inflow Depth = 3.61" for 10 Year event
Inflow = 0.60 cfs @ 12.08 hrs, Volume= 2,153 cf
Outflow = 0.60 cfs @ 12.08 hrs, Volume= 2,153 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.60 cfs @ 12.08 hrs, Volume= 2,153 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.07' @ 12.09 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.74'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.74' / 270.60' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.57 cfs @ 12.08 hrs HW=272.06' TW=272.04' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.57 cfs @ 0.72 fps)

Summary for Pond 13: Catch Basin

Inflow Area = 4,141 sf, 81.21% Impervious, Inflow Depth = 4.09" for 10 Year event
Inflow = 0.39 cfs @ 12.08 hrs, Volume= 1,412 cf
Outflow = 0.39 cfs @ 12.08 hrs, Volume= 1,412 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.08 hrs, Volume= 1,412 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.25' @ 12.09 hrs
Flood Elev= 275.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.79'	**12.0" Round Culvert** L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.79' / 270.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.08 hrs HW=272.25' TW=272.04' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.39 cfs @ 1.65 fps)

Summary for Pond 14: Catch Basin

Inflow Area = 6,167 sf, 86.93% Impervious, Inflow Depth = 4.36" for 10 Year event
Inflow = 0.63 cfs @ 12.08 hrs, Volume= 2,242 cf
Outflow = 0.63 cfs @ 12.08 hrs, Volume= 2,242 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.08 hrs, Volume= 2,242 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.09' @ 12.09 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.25'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.25' / 270.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.62 cfs @ 12.08 hrs HW=272.09' TW=272.04' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.62 cfs @ 1.18 fps)

Summary for Pond 15: Catch Basin

Inflow Area = 20,154 sf, 41.62% Impervious, Inflow Depth = 2.22" for 10 Year event
Inflow = 0.98 cfs @ 12.08 hrs, Volume= 3,725 cf
Outflow = 0.98 cfs @ 12.08 hrs, Volume= 3,725 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.98 cfs @ 12.08 hrs, Volume= 3,725 cf
Routed to Pond MH23 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.15' @ 12.08 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.42'	**12.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.42' / 272.23' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.98 cfs @ 12.08 hrs HW=273.15' TW=273.00' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.98 cfs @ 2.23 fps)

Summary for Pond 16: Catch Basin

Inflow Area = 20,584 sf, 35.59% Impervious, Inflow Depth = 1.93" for 10 Year event
Inflow = 0.86 cfs @ 12.08 hrs, Volume= 3,315 cf
Outflow = 0.86 cfs @ 12.08 hrs, Volume= 3,315 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.08 hrs, Volume= 3,315 cf
Routed to Pond MH24 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.87' @ 12.08 hrs
Flood Elev= 277.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.29'	**12.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 274.29' / 274.10' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.86 cfs @ 12.08 hrs HW=274.87' TW=274.64' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.86 cfs @ 2.64 fps)

Summary for Pond 17: Catch Basin

Inflow Area = 36,035 sf, 27.70% Impervious, Inflow Depth = 1.56" for 10 Year event
Inflow = 1.17 cfs @ 12.08 hrs, Volume= 4,681 cf
Outflow = 1.17 cfs @ 12.08 hrs, Volume= 4,681 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.17 cfs @ 12.08 hrs, Volume= 4,681 cf
Routed to Pond MH24 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.54' @ 12.08 hrs
Flood Elev= 277.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.97'	**15.0" Round Culvert** L= 143.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 274.97' / 274.10' S= 0.0061 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.17 cfs @ 12.08 hrs HW=275.53' TW=274.64' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.17 cfs @ 3.19 fps)

Summary for Pond MH1: Manhole

Inflow Area = 10,841 sf, 91.76% Impervious, Inflow Depth = 4.59" for 10 Year event
Inflow = 1.17 cfs @ 12.08 hrs, Volume= 4,149 cf
Outflow = 1.17 cfs @ 12.08 hrs, Volume= 4,149 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.17 cfs @ 12.08 hrs, Volume= 4,149 cf
Routed to Pond UIS1 : Underground Chamber #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.21' @ 12.59 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.70'	**24.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.70' / 271.70' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.17 cfs @ 12.08 hrs HW=272.36' TW=272.27' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.17 cfs @ 1.92 fps)

Summary for Pond MH11: Manhole

Inflow Area = 25,727 sf, 73.18% Impervious, Inflow Depth = 3.71" for 10 Year event
Inflow = 2.21 cfs @ 12.08 hrs, Volume= 7,960 cf
Outflow = 2.21 cfs @ 12.08 hrs, Volume= 7,960 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.21 cfs @ 12.08 hrs, Volume= 7,960 cf
Routed to Pond UIS4 : Underground Chamber #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.73' @ 12.42 hrs
Flood Elev= 277.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.00' / 273.00' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.21 cfs @ 12.08 hrs HW=273.93' TW=273.81' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.21 cfs @ 2.25 fps)

Summary for Pond MH12: Manhole

Inflow Area = 20,457 sf, 80.22% Impervious, Inflow Depth = 4.04" for 10 Year event
Inflow = 1.94 cfs @ 12.08 hrs, Volume= 6,895 cf
Outflow = 1.94 cfs @ 12.08 hrs, Volume= 6,895 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.08 hrs, Volume= 6,895 cf
Routed to Pond MH13 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.74' @ 12.42 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.28'	**15.0" Round Culvert** L= 24.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.28' / 273.00' S= 0.0112 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.94 cfs @ 12.08 hrs HW=274.16' TW=273.90' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.94 cfs @ 2.93 fps)

Summary for Pond MH13: Manhole

Inflow Area = 20,457 sf, 80.22% Impervious, Inflow Depth = 4.04" for 10 Year event
Inflow = 1.94 cfs @ 12.08 hrs, Volume= 6,895 cf
Outflow = 1.94 cfs @ 12.08 hrs, Volume= 6,895 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.08 hrs, Volume= 6,895 cf
Routed to Pond UIS4 : Underground Chamber #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.73' @ 12.42 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.00' / 273.00' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.94 cfs @ 12.08 hrs HW=273.90' TW=273.79' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.94 cfs @ 2.08 fps)

Summary for Pond MH15: Manhole

Inflow Area = 13,501 sf, 84.40% Impervious, Inflow Depth = 4.24" for 10 Year event
Inflow = 1.34 cfs @ 12.08 hrs, Volume= 4,775 cf
Outflow = 1.34 cfs @ 12.08 hrs, Volume= 4,775 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.34 cfs @ 12.08 hrs, Volume= 4,775 cf
Routed to Pond MH16 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.95' @ 12.58 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.44'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.44' / 270.30' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.34 cfs @ 12.08 hrs HW=271.31' TW=271.14' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.34 cfs @ 2.47 fps)

Summary for Pond MH16: Manhole

Inflow Area = 13,501 sf, 84.40% Impervious, Inflow Depth = 4.24" for 10 Year event
Inflow = 1.34 cfs @ 12.08 hrs, Volume= 4,775 cf
Outflow = 1.34 cfs @ 12.08 hrs, Volume= 4,775 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.34 cfs @ 12.08 hrs, Volume= 4,775 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.94' @ 12.59 hrs
Flood Elev= 277.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.30'	**24.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.30' / 270.30' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.34 cfs @ 12.08 hrs HW=271.14' TW=271.07' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.34 cfs @ 1.58 fps)

Summary for Pond MH17: Manhole

Inflow Area = 11,505 sf, 85.23% Impervious, Inflow Depth = 4.28" for 10 Year event
Inflow = 1.15 cfs @ 12.08 hrs, Volume= 4,107 cf
Outflow = 1.15 cfs @ 12.08 hrs, Volume= 4,107 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.08 hrs, Volume= 4,107 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.94' @ 12.59 hrs
Flood Elev= 277.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.30'	**24.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.30' / 270.30' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.15 cfs @ 12.08 hrs HW=271.12' TW=271.07' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.15 cfs @ 1.39 fps)

Summary for Pond MH19: Manhole

Inflow Area = 158,089 sf, 62.98% Impervious, Inflow Depth = 0.00" for 10 Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 270.95' @ 0.05 hrs
Flood Elev= 276.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.87'	**18.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 269.87' / 269.52' S= 0.0069 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=270.00' TW=271.00' (Dynamic Tailwater)
└—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond MH2: Manhole

Inflow Area = 9,637 sf, 85.56% Impervious, Inflow Depth = 4.30" for 10 Year event
Inflow = 0.97 cfs @ 12.08 hrs, Volume= 3,452 cf
Outflow = 0.97 cfs @ 12.08 hrs, Volume= 3,452 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.97 cfs @ 12.08 hrs, Volume= 3,452 cf
Routed to Pond MH3 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.34' @ 12.30 hrs
Flood Elev= 274.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.30'	**12.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.30' / 272.23' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.97 cfs @ 12.08 hrs HW=272.95' TW=272.78' (Dynamic Tailwater)
└—**1=Culvert** (Outlet Controls 0.97 cfs @ 2.54 fps)

Summary for Pond MH20: Manhole

Inflow Area = 94,229 sf, 41.92% Impervious, Inflow Depth = 2.23" for 10 Year event
Inflow = 4.63 cfs @ 12.08 hrs, Volume= 17,528 cf
Outflow = 4.63 cfs @ 12.08 hrs, Volume= 17,528 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.63 cfs @ 12.08 hrs, Volume= 17,528 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.95' @ 12.58 hrs
Flood Elev= 277.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.30'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.30' / 270.30' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.63 cfs @ 12.08 hrs HW=271.47' TW=271.07' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 4.63 cfs @ 3.49 fps)

Summary for Pond MH21: Manhole

Inflow Area = 94,229 sf, 41.92% Impervious, Inflow Depth = 2.23" for 10 Year event
Inflow = 4.63 cfs @ 12.08 hrs, Volume= 17,528 cf
Outflow = 4.63 cfs @ 12.08 hrs, Volume= 17,528 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.63 cfs @ 12.08 hrs, Volume= 17,528 cf
Routed to Pond MH20 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.95' @ 12.57 hrs
Flood Elev= 277.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.50'	**24.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.50' / 270.30' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.63 cfs @ 12.08 hrs HW=271.75' TW=271.47' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 4.63 cfs @ 3.21 fps)

Summary for Pond MH22: Manhole

Inflow Area = 94,229 sf, 41.92% Impervious, Inflow Depth = 2.23" for 10 Year event
Inflow = 4.63 cfs @ 12.08 hrs, Volume= 17,528 cf
Outflow = 4.63 cfs @ 12.08 hrs, Volume= 17,528 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.63 cfs @ 12.08 hrs, Volume= 17,528 cf
Routed to Pond MH21 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.04' @ 12.08 hrs
Flood Elev= 277.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.82'	**24.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.82' / 270.60' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.63 cfs @ 12.08 hrs HW=272.04' TW=271.75' (Dynamic Tailwater)
1=Culvert (Outlet Controls 4.63 cfs @ 3.30 fps)

Summary for Pond MH23: Manhole

Inflow Area = 76,773 sf, 33.47% Impervious, Inflow Depth = 1.83" for 10 Year event
Inflow = 3.01 cfs @ 12.08 hrs, Volume= 11,721 cf
Outflow = 3.01 cfs @ 12.08 hrs, Volume= 11,721 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.01 cfs @ 12.08 hrs, Volume= 11,721 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.00' @ 12.08 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.13'	**18.0" Round Culvert** L= 121.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.13' / 270.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.01 cfs @ 12.08 hrs HW=273.00' TW=272.04' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.01 cfs @ 4.10 fps)

Summary for Pond MH24: Manhole

Inflow Area = 56,619 sf, 30.57% Impervious, Inflow Depth = 1.69" for 10 Year event
Inflow = 2.03 cfs @ 12.08 hrs, Volume= 7,996 cf
Outflow = 2.03 cfs @ 12.08 hrs, Volume= 7,996 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.03 cfs @ 12.08 hrs, Volume= 7,996 cf
Routed to Pond MH23 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.64' @ 12.08 hrs
Flood Elev= 278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.99'	**18.0" Round Culvert** L= 176.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.99' / 272.23' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.03 cfs @ 12.08 hrs HW=274.64' TW=273.00' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.03 cfs @ 2.75 fps)

Summary for Pond MH25: Manhole

Inflow Area = 21,550 sf, 85.33% Impervious, Inflow Depth = 4.29" for 10 Year event
Inflow = 2.16 cfs @ 12.08 hrs, Volume= 7,701 cf
Outflow = 2.16 cfs @ 12.08 hrs, Volume= 7,701 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.16 cfs @ 12.08 hrs, Volume= 7,701 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.83' @ 12.52 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 272.50' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.16 cfs @ 12.08 hrs HW=273.28' TW=273.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.16 cfs @ 2.82 fps)

Summary for Pond MH26: Manhole

Inflow Area = 34,932 sf, 80.45% Impervious, Inflow Depth = 4.06" for 10 Year event
Inflow = 3.37 cfs @ 12.08 hrs, Volume= 11,808 cf
Outflow = 3.37 cfs @ 12.08 hrs, Volume= 11,808 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.37 cfs @ 12.08 hrs, Volume= 11,808 cf
Routed to Pond MH4 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.22' @ 12.58 hrs
Flood Elev= 275.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.10'	**18.0" Round Culvert** L= 40.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.10' / 271.70' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.37 cfs @ 12.08 hrs HW=273.13' TW=272.69' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 3.37 cfs @ 3.68 fps)

Summary for Pond MH29: Manhole

Inflow Area = 22,016 sf, 81.48% Impervious, Inflow Depth = 4.11" for 10 Year event
Inflow = 2.11 cfs @ 12.08 hrs, Volume= 7,533 cf
Outflow = 2.16 cfs @ 12.08 hrs, Volume= 7,533 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.16 cfs @ 12.08 hrs, Volume= 7,533 cf
Routed to Pond MH26 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.26' @ 12.08 hrs
Flood Elev= 275.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.22'	**15.0" Round Culvert** L= 11.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.22' / 271.10' S= 0.0104 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.15 cfs @ 12.08 hrs HW=273.26' TW=273.13' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.15 cfs @ 1.75 fps)

Summary for Pond MH3: Manhole

Inflow Area = 9,637 sf, 85.56% Impervious, Inflow Depth = 4.30" for 10 Year event
Inflow = 0.97 cfs @ 12.08 hrs, Volume= 3,452 cf
Outflow = 0.97 cfs @ 12.08 hrs, Volume= 3,452 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.97 cfs @ 12.08 hrs, Volume= 3,452 cf
Routed to Pond UIS2 : Underground Chamber #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.33' @ 12.30 hrs
Flood Elev= 274.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.13'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.13' / 272.13' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.97 cfs @ 12.08 hrs HW=272.78' TW=272.58' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.97 cfs @ 2.55 fps)

Summary for Pond MH30: Manhole

Inflow Area = 22,016 sf, 81.48% Impervious, Inflow Depth = 4.11" for 10 Year event
Inflow = 2.10 cfs @ 12.08 hrs, Volume= 7,533 cf
Outflow = 2.11 cfs @ 12.08 hrs, Volume= 7,533 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.11 cfs @ 12.08 hrs, Volume= 7,533 cf
Routed to Pond MH29 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.38' @ 12.08 hrs
Flood Elev= 275.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.66'	**15.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.66' / 271.32' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.04 cfs @ 12.08 hrs HW=273.37' TW=273.25' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.04 cfs @ 1.66 fps)

Summary for Pond MH31: Manhole

Inflow Area = 2,581 sf, 92.81% Impervious, Inflow Depth = 4.64" for 10 Year event
Inflow = 0.28 cfs @ 12.08 hrs, Volume= 999 cf
Outflow = 0.28 cfs @ 12.08 hrs, Volume= 999 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 12.08 hrs, Volume= 999 cf
Routed to Pond MH5 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.84' @ 12.52 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.56'	**12.0" Round Culvert** L= 20.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.56' / 272.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.23 cfs @ 12.08 hrs HW=273.65' TW=273.65' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.23 cfs @ 0.29 fps)

Summary for Pond MH32: Manhole

Inflow Area = 16,749 sf, 75.84% Impervious, Inflow Depth = 3.84" for 10 Year event
Inflow = 1.49 cfs @ 12.09 hrs, Volume= 5,357 cf
Outflow = 1.49 cfs @ 12.09 hrs, Volume= 5,357 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.49 cfs @ 12.09 hrs, Volume= 5,357 cf
Routed to Pond MH12 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.75' @ 12.42 hrs
Flood Elev= 276.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.75'	**12.0" Round Culvert** L= 47.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.75' / 272.28' S= 0.0099 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.34 cfs @ 12.09 hrs HW=274.30' TW=274.17' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.34 cfs @ 1.71 fps)

Summary for Pond MH33: Manhole

Inflow Area = 25,727 sf, 73.18% Impervious, Inflow Depth = 3.71" for 10 Year event
Inflow = 2.21 cfs @ 12.08 hrs, Volume= 7,960 cf
Outflow = 2.21 cfs @ 12.08 hrs, Volume= 7,960 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.21 cfs @ 12.08 hrs, Volume= 7,960 cf
Routed to Pond MH11 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.74' @ 12.41 hrs
Flood Elev= 277.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.24'	**15.0" Round Culvert** L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.24' / 273.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.21 cfs @ 12.08 hrs HW=274.20' TW=273.93' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.21 cfs @ 3.00 fps)

Summary for Pond MH4: Manhole

Inflow Area = 34,932 sf, 80.45% Impervious, Inflow Depth = 4.06" for 10 Year event
Inflow = 3.37 cfs @ 12.08 hrs, Volume= 11,808 cf
Outflow = 3.37 cfs @ 12.08 hrs, Volume= 11,808 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.37 cfs @ 12.08 hrs, Volume= 11,808 cf
Routed to Pond UIS1 : Underground Chamber #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.21' @ 12.60 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.70'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.70' / 271.70' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.37 cfs @ 12.08 hrs HW=272.69' TW=272.25' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 3.37 cfs @ 3.19 fps)

Summary for Pond MH5: Manhole

Inflow Area = 16,929 sf, 93.86% Impervious, Inflow Depth = 4.69" for 10 Year event
Inflow = 1.86 cfs @ 12.08 hrs, Volume= 6,619 cf
Outflow = 1.87 cfs @ 12.08 hrs, Volume= 6,619 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.87 cfs @ 12.08 hrs, Volume= 6,619 cf
Routed to Pond MH6 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.84' @ 12.52 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.25'	**15.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.25' / 271.62' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.86 cfs @ 12.08 hrs HW=273.65' TW=273.54' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.86 cfs @ 1.69 fps)

Summary for Pond MH6: Manhole

Inflow Area = 21,550 sf, 85.33% Impervious, Inflow Depth = 4.29" for 10 Year event
Inflow = 2.16 cfs @ 12.08 hrs, Volume= 7,701 cf
Outflow = 2.16 cfs @ 12.08 hrs, Volume= 7,701 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.16 cfs @ 12.08 hrs, Volume= 7,701 cf
Routed to Pond MH25 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.84' @ 12.52 hrs
Flood Elev= 277.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.62'	**15.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.62' / 272.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.16 cfs @ 12.08 hrs HW=273.54' TW=273.28' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.16 cfs @ 3.11 fps)

Summary for Pond MH7: Manhole

Inflow Area = 12,631 sf, 77.28% Impervious, Inflow Depth = 3.91" for 10 Year event
Inflow = 1.14 cfs @ 12.08 hrs, Volume= 4,112 cf
Outflow = 1.14 cfs @ 12.08 hrs, Volume= 4,112 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.14 cfs @ 12.08 hrs, Volume= 4,112 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.83' @ 12.53 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	**24.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 272.50' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.15 cfs @ 12.08 hrs HW=273.12' TW=273.01' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.15 cfs @ 2.07 fps)

Summary for Pond MH8: Manhole

Inflow Area = 18,401 sf, 80.16% Impervious, Inflow Depth = 4.04" for 10 Year event
Inflow = 1.73 cfs @ 12.08 hrs, Volume= 6,200 cf
Outflow = 1.73 cfs @ 12.08 hrs, Volume= 6,200 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.73 cfs @ 12.08 hrs, Volume= 6,200 cf
Routed to Pond MH9 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.84' @ 12.52 hrs
Flood Elev= 276.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.72'	**15.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.72' / 272.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.73 cfs @ 12.08 hrs HW=273.50' TW=273.21' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.73 cfs @ 3.08 fps)

Summary for Pond MH9: Manhole

Inflow Area = 18,401 sf, 80.16% Impervious, Inflow Depth = 4.04" for 10 Year event
Inflow = 1.73 cfs @ 12.08 hrs, Volume= 6,200 cf
Outflow = 1.73 cfs @ 12.08 hrs, Volume= 6,200 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.73 cfs @ 12.08 hrs, Volume= 6,200 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.83' @ 12.53 hrs
Flood Elev= 277.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	**24.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 272.50' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.74 cfs @ 12.08 hrs HW=273.21' TW=273.01' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.74 cfs @ 2.62 fps)

Summary for Pond RD1: Roof Drain

Inflow Area = 7,429 sf,100.00% Impervious, Inflow Depth = 4.98" for 10 Year event
Inflow = 0.87 cfs @ 12.08 hrs, Volume= 3,085 cf
Outflow = 0.87 cfs @ 12.08 hrs, Volume= 3,085 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.87 cfs @ 12.08 hrs, Volume= 3,085 cf
Routed to Pond UIS1 : Underground Chamber #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.21' @ 12.59 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.25'	**10.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.25' / 272.03' S= 0.0105 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=0.87 cfs @ 12.08 hrs HW=272.80' TW=272.27' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.87 cfs @ 3.22 fps)

Summary for Pond RD2: Roof Drain

Inflow Area = 18,290 sf,100.00% Impervious, Inflow Depth = 4.98" for 10 Year event
Inflow = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf
Outflow = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.28' @ 12.08 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.14'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.14' / 272.83' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=2.14 cfs @ 12.08 hrs HW=274.28' TW=273.01' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.14 cfs @ 3.93 fps)

Summary for Pond RD3: Roof Drain

Inflow Area = 18,290 sf,100.00% Impervious, Inflow Depth = 4.98" for 10 Year event
Inflow = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf
Outflow = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.14' @ 12.08 hrs
Flood Elev= 278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.98'	**10.0" Round Culvert** L= 14.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.98' / 272.83' S= 0.0102 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=2.14 cfs @ 12.08 hrs HW=274.14' TW=273.01' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.14 cfs @ 3.93 fps)

Summary for Pond RD4: Roof Drain

Inflow Area = 18,290 sf,100.00% Impervious, Inflow Depth = 4.98" for 10 Year event
Inflow = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf
Outflow = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.15 cfs @ 12.08 hrs, Volume= 7,595 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.02' @ 12.08 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.88'	**10.0" Round Culvert** L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.88' / 270.63' S= 0.0104 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=2.14 cfs @ 12.08 hrs HW=272.02' TW=271.07' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.14 cfs @ 3.93 fps)

Summary for Pond RD5: Roof Drain

Inflow Area = 20,565 sf,100.00% Impervious, Inflow Depth = 4.98" for 10 Year event
Inflow = 2.41 cfs @ 12.08 hrs, Volume= 8,539 cf
Outflow = 2.41 cfs @ 12.08 hrs, Volume= 8,539 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.41 cfs @ 12.08 hrs, Volume= 8,539 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.11' @ 12.08 hrs
Flood Elev= 278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.81'	**10.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.81' / 270.63' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=2.41 cfs @ 12.08 hrs HW=272.10' TW=271.07' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.41 cfs @ 4.42 fps)

Summary for Pond SP-1: Northerly Culvert Crossing #1 (SP-1)

Inflow Area = 209,858 sf, 11.65% Impervious, Inflow Depth > 405.67" for 10 Year event
Inflow = 56.18 cfs @ 12.12 hrs, Volume= 7,094,498 cf, Incl. 54.70 cfs Base Flow
Outflow = 55.99 cfs @ 12.16 hrs, Volume= 7,082,063 cf, Atten= 0%, Lag= 2.4 min
Primary = 55.99 cfs @ 12.16 hrs, Volume= 7,082,063 cf
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.80' @ 12.18 hrs Surf.Area= 13,295 sf Storage= 12,719 cf

Plug-Flow detention time= 4.0 min calculated for 7,079,400 cf (100% of inflow)
Center-of-Mass det. time= 1.9 min (1,081.7 - 1,079.9)

Volume	Invert	Avail.Storage	Storage Description
#1	267.00'	15,407 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
267.00	175	160.0	0	0	175
268.00	258	168.0	215	215	441
269.00	344	172.0	300	515	642
270.00	431	176.0	387	902	848
271.50	12,972	455.3	7,884	8,786	14,888
272.00	13,514	461.2	6,621	15,407	15,375

Device	Routing	Invert	Outlet Devices
#1	Primary	267.93'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.72' / 267.93' S= -0.0036 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#2	Primary	267.48'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.48' / 267.48' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#3	Primary	270.02'	**36.0" Round RCP_Round 36" X 6.00** L= 29.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 270.02' / 269.73' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=55.99 cfs @ 12.16 hrs HW=271.80' TW=271.65' (Dynamic Tailwater)
1=RCP_Round 21" (Inlet Controls 4.42 cfs @ 1.84 fps)
2=RCP_Round 21" (Inlet Controls 4.42 cfs @ 1.84 fps)
3=RCP_Round 36" (Outlet Controls 47.16 cfs @ 2.59 fps)

Summary for Pond SP-2: Southerly Culvert Crossing #2 (SP-2)

Inflow Area = 233,827 sf, 11.52% Impervious, Inflow Depth > 363.53" for 10 Year event
Inflow = 56.21 cfs @ 12.14 hrs, Volume= 7,083,534 cf
Outflow = 56.15 cfs @ 12.18 hrs, Volume= 7,067,211 cf, Atten= 0%, Lag= 2.3 min
Primary = 56.15 cfs @ 12.18 hrs, Volume= 7,067,211 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.65' @ 12.18 hrs Surf.Area= 10,539 sf Storage= 16,520 cf

Plug-Flow detention time= 5.1 min calculated for 7,064,961 cf (100% of inflow)
Center-of-Mass det. time= 2.5 min (1,084.2 - 1,081.7)

Volume	Invert	Avail.Storage	Storage Description
#1	266.85'	20,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
266.85	0	0.0	0	0	0
267.00	1,276	387.0	64	64	11,918
268.00	1,668	396.0	1,468	1,531	12,602
269.00	2,069	404.0	1,865	3,396	13,250
270.00	2,477	412.0	2,270	5,666	13,910
271.50	10,776	591.7	9,210	14,876	28,283
272.00	10,017	544.5	5,197	20,073	32,560

Device	Routing	Invert	Outlet Devices
#1	Primary	266.85'	**30.0" Round RCP_Round 30"** L= 30.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 266.37' / 266.85' S= -0.0160 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Primary	270.73'	**36.0" Round RCP_Round 36" X 6.00** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.73' / 270.49' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=56.15 cfs @ 12.18 hrs HW=271.65' TW=271.00' (Dynamic Tailwater)
1=RCP_Round 30" (Inlet Controls 26.07 cfs @ 5.31 fps)
2=RCP_Round 36" (Barrel Controls 30.08 cfs @ 4.06 fps)

Summary for Pond TD1: Stone Trench Drain

Inflow Area = 180,624 sf, 8.74% Impervious, Inflow Depth = 0.66" for 10 Year event
Inflow = 1.66 cfs @ 12.11 hrs, Volume= 9,942 cf
Outflow = 1.64 cfs @ 12.12 hrs, Volume= 9,942 cf, Atten= 1%, Lag= 0.6 min
Discarded = 0.20 cfs @ 11.52 hrs, Volume= 7,249 cf
Primary = 1.44 cfs @ 12.12 hrs, Volume= 2,693 cf
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.86' @ 12.13 hrs Surf.Area= 1,050 sf Storage= 51 cf
Flood Elev= 275.00' Surf.Area= 15,899 sf Storage= 11,024 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.5 min (835.3 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	271.20'	4 cf	**3.50'W x 300.00'L x 1.70'H Prismatoid** 1,785 cf Overall - 471 cf Embedded = 1,314 cf x 0.3% Voids
#2	271.70'	471 cf	**12.0" Round Pipe Storage** x 2 Inside #1 L= 300.0'
#3	272.90'	10,549 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		11,024 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.90	1,054	609.5	0	0	1,054
273.00	6,212	814.0	327	327	24,220
274.00	14,849	858.3	10,222	10,549	30,174

Device	Routing	Invert	Outlet Devices
#1	Primary	270.90'	**12.0" Round Culvert X 2.00** L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.90' / 270.55' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Discarded	271.20'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.20 cfs @ 11.52 hrs HW=271.26' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=1.44 cfs @ 12.12 hrs HW=271.86' TW=271.80' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.44 cfs @ 1.19 fps)

Summary for Pond TD2: Stone Trench Drain

Inflow Area = 6,530 sf, 0.00% Impervious, Inflow Depth = 0.25" for 10 Year event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 134 cf
Outflow = 0.01 cfs @ 12.44 hrs, Volume= 134 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 13.00 hrs, Volume= 0 cf
Primary = 0.01 cfs @ 12.44 hrs, Volume= 134 cf
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.00' @ 0.00 hrs Surf.Area= 427 sf Storage= 0 cf
Flood Elev= 275.00' Surf.Area= 1,466 sf Storage= 536 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (996.1 - 996.1)

Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	167 cf	**3.50'W x 122.00'L x 1.75'H Prismatoid** 747 cf Overall - 192 cf Embedded = 556 cf x 30.0% Voids
#2	272.25'	192 cf	**12.0" Round Pipe Storage** x 2 Inside #1 L= 122.0'
#3	273.75'	178 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		536 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
273.75	430	253.0	0	0	430
274.00	1,039	301.0	178	178	2,547

Device	Routing	Invert	Outlet Devices
#1	Primary	271.90'	**12.0" Round Culvert** L= 52.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.90' / 271.38' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Discarded	272.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 13.00 hrs HW=272.00' (Free Discharge)
└─**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 12.44 hrs HW=272.00' TW=271.65' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.00 cfs of 0.03 cfs potential flow)

Summary for Pond UIS1: Underground Chamber #1

Inflow Area = 53,202 sf, 85.48% Impervious, Inflow Depth = 4.29" for 10 Year event
Inflow = 5.41 cfs @ 12.08 hrs, Volume= 19,042 cf
Outflow = 0.73 cfs @ 11.68 hrs, Volume= 19,042 cf, Atten= 87%, Lag= 0.0 min
Discarded = 0.73 cfs @ 11.68 hrs, Volume= 19,042 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.21' @ 12.59 hrs Surf.Area= 3,803 sf Storage= 5,328 cf

Plug-Flow detention time= 41.8 min calculated for 19,037 cf (100% of inflow)
Center-of-Mass det. time= 41.8 min (791.3 - 749.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.20'	3,578 cf	**39.50'W x 96.28'L x 3.75'H Field A** 14,262 cf Overall - 5,316 cf Embedded = 8,946 cf x 40.0% Voids
#2A	271.70'	5,316 cf	**ADS_StormTech SC-800 +Cap** x 104 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 104 Chambers in 8 Rows Cap Storage= 3.4 cf x 2 x 8 rows = 54.7 cf
		8,895 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	271.70'	**15.0" Round Culvert** L= 137.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 271.70' / 270.00' S= 0.0124 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	274.30'	**4.0' 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
#3	Discarded	271.20'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.73 cfs @ 11.68 hrs HW=271.24' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.73 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.20' TW=271.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond UIS1: Underground Chamber #1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 8 rows = 54.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

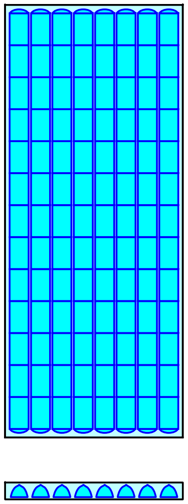
13 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 94.28' Row Length +12.0" End Stone x 2 = 96.28' Base Length
8 Rows x 51.0" Wide + 6.0" Spacing x 7 + 12.0" Side Stone x 2 = 39.50' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

104 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 8 Rows = 5,316.3 cf Chamber Storage

14,262.0 cf Field - 5,316.3 cf Chambers = 8,945.7 cf Stone x 40.0% Voids = 3,578.3 cf Stone Storage

Chamber Storage + Stone Storage = 8,894.6 cf = 0.204 af
Overall Storage Efficiency = 62.4%
Overall System Size = 96.28' x 39.50' x 3.75'

104 Chambers
528.2 cy Field
331.3 cy Stone



Summary for Pond UIS2: Underground Chamber #2

Inflow Area = 9,637 sf, 85.56% Impervious, Inflow Depth = 4.30" for 10 Year event
Inflow = 0.97 cfs @ 12.08 hrs, Volume= 3,452 cf
Outflow = 0.38 cfs @ 12.30 hrs, Volume= 3,452 cf, Atten= 61%, Lag= 13.3 min
Discarded = 0.17 cfs @ 11.70 hrs, Volume= 3,309 cf
Primary = 0.21 cfs @ 12.30 hrs, Volume= 143 cf
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.32' @ 12.30 hrs Surf.Area= 867 sf Storage= 729 cf

Plug-Flow detention time= 20.5 min calculated for 3,451 cf (100% of inflow)
Center-of-Mass det. time= 20.5 min (770.0 - 749.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.80'	502 cf	**16.58'W x 52.31'L x 1.83'H Field A** 1,590 cf Overall - 335 cf Embedded = 1,255 cf x 40.0% Voids
#2A	272.13'	335 cf	**ADS_StormTech SC-160LP +Cap** x 49 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		837 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	272.15'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 272.15' / 272.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	273.25'	**4.0' 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
#3	Discarded	271.80'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.17 cfs @ 11.70 hrs HW=271.82' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.21 cfs @ 12.30 hrs HW=273.32' TW=271.80' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.21 cfs of 2.45 cfs potential flow)
  └─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.21 cfs @ 0.75 fps)

Pond UIS2: Underground Chamber #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

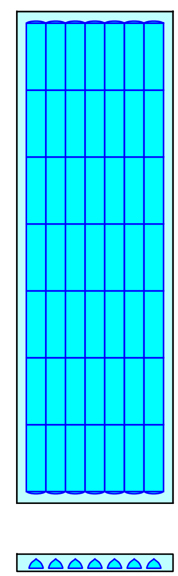
7 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 50.31' Row Length +12.0" End Stone x 2 = 52.31' Base Length
7 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 16.58' Base Width
4.0" Stone Base + 12.0" Chamber Height + 6.0" Stone Cover = 1.83' Field Height

49 Chambers x 6.8 cf = 335.0 cf Chamber Storage

1,590.3 cf of Field - 335.0 cf Chambers = 1,255.3 cf Stone x 40.0% Voids = 502.1 cf Stone Storage

Chamber Storage + Stone Storage = 837.1 cf = 0.019 af
Overall Storage Efficiency = 52.6%
Overall System Size = 52.31' x 16.58' x 1.83'

49 Chambers
58.9 cy Field
46.5 cy Stone



Summary for Pond UIS3: Underground Chamber #3

Inflow Area = 89,161 sf, 89.14% Impervious, Inflow Depth = 4.47" for 10 Year event
Inflow = 9.33 cfs @ 12.08 hrs, Volume= 33,202 cf
Outflow = 1.70 cfs @ 12.53 hrs, Volume= 33,202 cf, Atten= 82%, Lag= 26.7 min
Discarded = 1.33 cfs @ 11.69 hrs, Volume= 32,513 cf
Primary = 0.37 cfs @ 12.53 hrs, Volume= 690 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.83' @ 12.53 hrs Surf.Area= 6,945 sf Storage= 8,835 cf

Plug-Flow detention time= 34.5 min calculated for 33,193 cf (100% of inflow)
Center-of-Mass det. time= 34.5 min (783.3 - 748.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	272.00'	6,516 cf	**30.00'W x 231.50'L x 3.75'H Field A** 26,044 cf Overall - 9,755 cf Embedded = 16,289 cf x 40.0% Voids
#2A	272.50'	9,755 cf	**ADS_StormTech SC-800 +Cap** x 192 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 192 Chambers in 6 Rows Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf
		16,270 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	273.16'	**12.0" Round Culvert** L= 116.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 273.16' / 272.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	274.75'	**4.0' 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
#3	Device 1	273.50'	**9.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	272.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=1.33 cfs @ 11.69 hrs HW=272.04' (Free Discharge)
└─**4=Exfiltration** (Exfiltration Controls 1.33 cfs)

Primary OutFlow Max=0.37 cfs @ 12.53 hrs HW=273.83' TW=271.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.37 cfs of 1.24 cfs potential flow)
  ├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Orifice Controls 0.37 cfs @ 1.96 fps)

Pond UIS3: Underground Chamber #3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

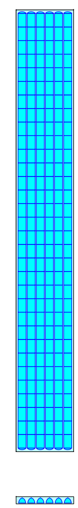
32 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 229.50' Row Length +12.0" End Stone x 2 = 231.50' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

192 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 6 Rows = 9,754.8 cf Chamber Storage

26,043.8 cf Field - 9,754.8 cf Chambers = 16,289.0 cf Stone x 40.0% Voids = 6,515.6 cf Stone Storage

Chamber Storage + Stone Storage = 16,270.4 cf = 0.374 af
Overall Storage Efficiency = 62.5%
Overall System Size = 231.50' x 30.00' x 3.75'

192 Chambers
964.6 cy Field
603.3 cy Stone



Summary for Pond UIS4: Underground Chamber #4

Inflow Area =	46,184 sf, 76.30% Impervious,	Inflow Depth = 3.86"	for 10 Year event	
Inflow =	4.15 cfs @	12.08 hrs, Volume=	14,855 cf	
Outflow =	1.17 cfs @	12.42 hrs, Volume=	14,855 cf,	Atten= 72%, Lag= 20.3 min
Discarded =	0.48 cfs @	11.64 hrs, Volume=	13,664 cf	
Primary =	0.69 cfs @	12.42 hrs, Volume=	1,191 cf	

Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.73' @ 12.42 hrs Surf.Area= 2,489 sf Storage= 3,818 cf

Plug-Flow detention time= 37.9 min calculated for 14,851 cf (100% of inflow)
Center-of-Mass det. time= 37.9 min (789.0 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	272.50'	2,382 cf	**63.25'W x 39.35'L x 3.75'H Field A** 9,333 cf Overall - 3,377 cf Embedded = 5,956 cf x 40.0% Voids
#2A	273.00'	3,377 cf	**ADS_StormTech SC-800 +Cap** x 65 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 65 Chambers in 13 Rows Cap Storage= 3.4 cf x 2 x 13 rows = 88.9 cf
		5,760 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	272.10'	**12.0" Round Culvert** L= 110.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 272.10' / 271.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	276.00'	**4.0' 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
#3	Device 1	274.25'	**9.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	272.50'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.48 cfs @ 11.64 hrs HW=272.54' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.48 cfs)

Primary OutFlow Max=0.69 cfs @ 12.42 hrs HW=274.73' TW=271.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.69 cfs of 4.35 cfs potential flow)
 ├**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 └**3=Orifice/Grate** (Orifice Controls 0.69 cfs @ 2.35 fps)

Pond UIS4: Underground Chamber #4 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 13 rows = 88.9 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

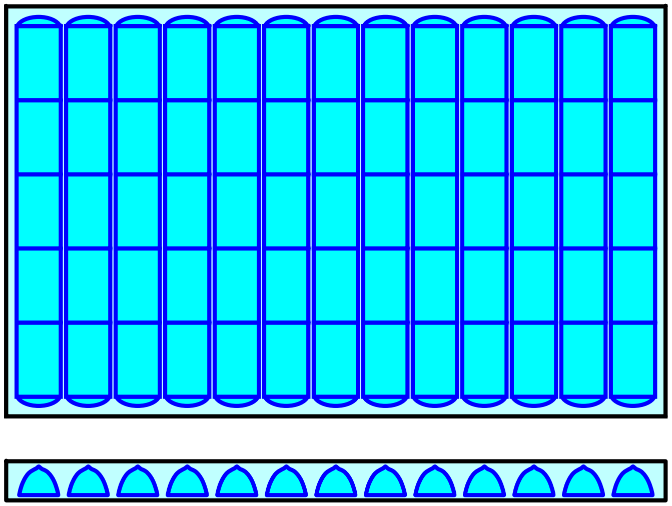
5 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 37.35' Row Length +12.0" End Stone x 2 = 39.35' Base Length
13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

65 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 13 Rows = 3,377.4 cf Chamber Storage

9,333.3 cf Field - 3,377.4 cf Chambers = 5,955.9 cf of Stone x 40.0% Voids = 2,382.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,759.8 cf = 0.132 af
Overall Storage Efficiency = 61.7%
Overall System Size = 39.35' x 63.25' x 3.75'

65 Chambers
345.7 cy Field
220.6 cy Stone



Summary for Pond UIS5: Underground Chamber #5

Inflow Area =	158,089 sf, 62.98% Impervious,	Inflow Depth = 3.23"	for 10 Year event
Inflow =	11.68 cfs @ 12.08 hrs,	Volume= 42,544 cf	
Outflow =	1.66 cfs @ 11.70 hrs,	Volume= 42,544 cf,	Atten= 86%, Lag= 0.0 min
Discarded =	1.66 cfs @ 11.70 hrs,	Volume= 42,544 cf	
Primary =	0.00 cfs @ 0.00 hrs,	Volume= 0 cf	

Routed to Pond MH19 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.94' @ 12.59 hrs Surf.Area= 8,653 sf Storage= 11,503 cf
Flood Elev= 274.00' Surf.Area= 8,653 sf Storage= 21,847 cf

Plug-Flow detention time= 39.2 min calculated for 42,532 cf (100% of inflow)
Center-of-Mass det. time= 39.2 min (793.6 - 754.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	269.80'	11,567 cf	**30.00'W x 288.43'L x 4.75'H Field A** 41,102 cf Overall - 12,183 cf Embedded = 28,919 cf x 40.0% Voids
#2A	270.80'	12,183 cf	**ADS_StormTech SC-800 +Cap** x 240 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 240 Chambers in 6 Rows Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf
		23,751 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	272.98'	**12.0" Round Culvert** L= 97.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 272.98' / 272.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	274.00'	**4.0' 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
#3	Discarded	269.80'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=1.66 cfs @ 11.70 hrs HW=269.85' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.66 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=269.80' TW=270.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond UIS5: Underground Chamber #5 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

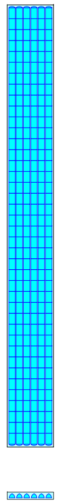
40 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 286.43' Row Length +12.0" End Stone x 2 = 288.43' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

240 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 6 Rows = 12,183.2 cf Chamber Storage

41,101.7 cf Field - 12,183.2 cf Chambers = 28,918.6 cf Stone x 40.0% Voids = 11,567.4 cf Stone Storage

Chamber Storage + Stone Storage = 23,750.6 cf = 0.545 af
Overall Storage Efficiency = 57.8%
Overall System Size = 288.43' x 30.00' x 4.75'

240 Chambers
1,522.3 cy Field
1,071.1 cy Stone



Summary for Link SP-3: On Site Flow To Perennial Stream

Inflow Area = 867,482 sf, 37.13% Impervious, Inflow Depth > 98.02" for 10 Year event
Inflow = 59.58 cfs @ 12.17 hrs, Volume= 7,085,707 cf
Primary = 59.58 cfs @ 12.17 hrs, Volume= 7,085,707 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 271.00'

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment CB1: Subcat CB1 Runoff Area=10,841 sf 91.76% Impervious Runoff Depth=7.37"
Tc=6.0 min CN=WQ Runoff=1.85 cfs 6,657 cf

Subcatchment CB10A: Subcat CB10A Runoff Area=3,059 sf 81.64% Impervious Runoff Depth=6.69"
Tc=6.0 min CN=WQ Runoff=0.47 cfs 1,706 cf

Subcatchment CB10B: Subcat CB10B Runoff Area=10,441 sf 85.21% Impervious Runoff Depth=6.93"
Tc=6.0 min CN=WQ Runoff=1.67 cfs 6,030 cf

Subcatchment CB11: Subcat CB11 Runoff Area=11,505 sf 85.23% Impervious Runoff Depth=6.93"
Tc=6.0 min CN=WQ Runoff=1.84 cfs 6,646 cf

Subcatchment CB12: Subcat CB12 Runoff Area=7,149 sf 71.10% Impervious Runoff Depth=5.98"
Tc=6.0 min CN=WQ Runoff=0.98 cfs 3,565 cf

Subcatchment CB13: Subcat CB13 Runoff Area=4,141 sf 81.21% Impervious Runoff Depth=6.66"
Tc=6.0 min CN=WQ Runoff=0.63 cfs 2,299 cf

Subcatchment CB14: Subcat CB14 Runoff Area=6,167 sf 86.93% Impervious Runoff Depth=7.04"
Tc=6.0 min CN=WQ Runoff=1.00 cfs 3,620 cf

Subcatchment CB15: Subcat CB15 Runoff Area=20,154 sf 41.62% Impervious Runoff Depth=4.01"
Tc=6.0 min CN=WQ Runoff=1.78 cfs 6,737 cf

Subcatchment CB16: Subcat CB16 Runoff Area=20,584 sf 35.59% Impervious Runoff Depth=3.61"
Tc=6.0 min CN=WQ Runoff=1.62 cfs 6,189 cf

Subcatchment CB17: Subcat CB17 Runoff Area=36,035 sf 27.70% Impervious Runoff Depth=3.08"
Tc=6.0 min CN=WQ Runoff=2.37 cfs 9,248 cf

Subcatchment CB2: Subcat CB2 Runoff Area=4,621 sf 54.10% Impervious Runoff Depth=4.85"
Tc=6.0 min CN=WQ Runoff=0.50 cfs 1,866 cf

Subcatchment CB3A: Subcat CB3A Runoff Area=3,583 sf 93.36% Impervious Runoff Depth=7.48"
Tc=6.0 min CN=WQ Runoff=0.62 cfs 2,232 cf

Subcatchment CB3B: Subcat CB3B Runoff Area=6,054 sf 80.94% Impervious Runoff Depth=6.64"
Tc=6.0 min CN=WQ Runoff=0.92 cfs 3,352 cf

Subcatchment CB4A: Subcat CB4A Runoff Area=3,970 sf 89.22% Impervious Runoff Depth=7.20"
Tc=6.0 min CN=WQ Runoff=0.66 cfs 2,381 cf

Subcatchment CB4B: Subcat CB4B Runoff Area=8,946 sf 74.01% Impervious Runoff Depth=6.18"
Tc=6.0 min CN=WQ Runoff=1.26 cfs 4,607 cf

Subcatchment CB4C: Subcat CB4C Runoff Area=10,741 sf 84.93% Impervious Runoff Depth=6.91"
Tc=6.0 min CN=WQ Runoff=1.71 cfs 6,186 cf

Subcatchment CB4D: Subcat CB4D Runoff Area=11,275 sf 78.19% Impervious Runoff Depth=6.46"
Tc=6.0 min CN=WQ Runoff=1.67 cfs 6,070 cf

Subcatchment CB5A: Subcat CB5A Runoff Area=10,482 sf 93.66% Impervious Runoff Depth=7.50"
Tc=6.0 min CN=WQ Runoff=1.82 cfs 6,547 cf

Subcatchment CB5B: Subcat CB5B Runoff Area=3,866 sf 95.10% Impervious Runoff Depth=7.59"
Tc=6.0 min CN=WQ Runoff=0.68 cfs 2,446 cf

Subcatchment CB5C: Subcat CB5C Runoff Area=2,581 sf 92.81% Impervious Runoff Depth=7.44"
Tc=6.0 min CN=WQ Runoff=0.44 cfs 1,600 cf

Subcatchment CB6: Subcat CB6 Runoff Area=12,631 sf 77.28% Impervious Runoff Depth=6.40"
Tc=6.0 min CN=WQ Runoff=1.85 cfs 6,736 cf

Subcatchment CB7A: Subcat CB7A Runoff Area=7,101 sf 79.30% Impervious Runoff Depth=6.53"
Tc=6.0 min CN=WQ Runoff=1.07 cfs 3,866 cf

Subcatchment CB7B: Subcat CB7B Runoff Area=11,300 sf 80.70% Impervious Runoff Depth=6.63"
Tc=6.0 min CN=WQ Runoff=1.72 cfs 6,241 cf

Subcatchment CB8: Subcat CB8 Runoff Area=10,991 sf 80.89% Impervious Runoff Depth=6.64"
Tc=6.0 min CN=WQ Runoff=1.68 cfs 6,082 cf

Subcatchment CB9A: Subcat CB9A Runoff Area=11,743 sf 81.25% Impervious Runoff Depth=6.66"
Tc=6.0 min CN=WQ Runoff=1.80 cfs 6,522 cf

Subcatchment CB9B: Subcat CB9B Runoff Area=14,736 sf 67.43% Impervious Runoff Depth=5.74"
Tc=6.0 min CN=WQ Runoff=1.92 cfs 7,048 cf

Subcatchment CB9C: Subcat CB9C Runoff Area=3,708 sf 100.00% Impervious Runoff Depth=7.92"
Tc=6.0 min CN=WQ Runoff=0.68 cfs 2,448 cf

Subcatchment CB9D: Subcat CB9D Runoff Area=5,006 sf 63.14% Impervious Runoff Depth=5.45"
Tc=6.0 min CN=WQ Runoff=0.62 cfs 2,275 cf

Subcatchment P-1: Subcat P-1 Runoff Area=17,439 sf 14.20% Impervious Runoff Depth=2.18"
Tc=6.0 min CN=WQ Runoff=0.77 cfs 3,162 cf

Subcatchment P-2: Subcat P-2 Runoff Area=6,530 sf 0.00% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=39 Runoff=0.14 cfs 666 cf

Subcatchment P-3: Subcat P-3 Runoff Area=19,597 sf 2.20% Impervious Runoff Depth=1.37"
Tc=6.0 min CN=WQ Runoff=0.50 cfs 2,241 cf

Subcatchment P-4: Subcat P-4 Runoff Area=287,018 sf 12.34% Impervious Runoff Depth=1.60"
Tc=12.0 min CN=WQ Runoff=6.78 cfs 38,315 cf

Subcatchment P-5: Subcat P-5 Runoff Area=76,040 sf 11.69% Impervious Runoff Depth=2.01"
Tc=8.2 min CN=WQ Runoff=2.81 cfs 12,721 cf

Subcatchment P-6: Subcat P-6 Runoff Area=25,354 sf 10.27% Impervious Runoff Depth=1.91"
Tc=6.0 min CN=WQ Runoff=0.96 cfs 4,041 cf

Subcatchment P-7: Subcat P-7 Runoff Area=79,230 sf 5.41% Impervious Runoff Depth=1.59"
Tc=11.4 min CN=WQ Runoff=1.98 cfs 10,478 cf

Subcatchment PATIO: Subcat PATIO Runoff Area=2,384 sf 100.00% Impervious Runoff Depth=7.92"
Tc=6.0 min CN=98 Runoff=0.44 cfs 1,573 cf

Subcatchment R-1: Subcat R-1 Runoff Area=5,045 sf 100.00% Impervious Runoff Depth=7.92"
Tc=6.0 min CN=98 Runoff=0.93 cfs 3,330 cf

Subcatchment R-2: Subcat R-2 Runoff Area=18,290 sf 100.00% Impervious Runoff Depth=7.92"
Tc=6.0 min CN=98 Runoff=3.36 cfs 12,072 cf

Subcatchment R-3: Subcat R-3 Runoff Area=18,290 sf 100.00% Impervious Runoff Depth=7.92"
Tc=6.0 min CN=98 Runoff=3.36 cfs 12,072 cf

Subcatchment R-4: Subcat R-4 Runoff Area=18,290 sf 100.00% Impervious Runoff Depth=7.92"
Tc=6.0 min CN=98 Runoff=3.36 cfs 12,072 cf

Subcatchment R-5: Subcat R-5 Runoff Area=20,565 sf 100.00% Impervious Runoff Depth=7.92"
Tc=6.0 min CN=98 Runoff=3.78 cfs 13,573 cf

Pond 1: Catch Basin Peak Elev=274.69' Inflow=1.85 cfs 6,657 cf
12.0" Round Culvert n=0.012 L=84.0' S=0.0100 '/' Outflow=1.85 cfs 6,657 cf

Pond 2: Catch Basin Peak Elev=274.99' Inflow=0.50 cfs 1,866 cf
12.0" Round Culvert n=0.012 L=56.0' S=0.0100 '/' Outflow=0.51 cfs 1,866 cf

Pond 3A: Catch Basin Peak Elev=273.82' Inflow=0.62 cfs 2,232 cf
12.0" Round Culvert n=0.012 L=35.0' S=0.0100 '/' Outflow=0.63 cfs 2,232 cf

Pond 3B: Catch Basin Peak Elev=273.85' Inflow=0.92 cfs 3,352 cf
12.0" Round Culvert n=0.012 L=21.1' S=0.0100 '/' Outflow=0.94 cfs 3,352 cf

Pond 4A: Catch Basin Peak Elev=274.72' Inflow=0.66 cfs 2,381 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0100 '/' Outflow=0.69 cfs 2,381 cf

Pond 4B: Catch Basin Peak Elev=274.73' Inflow=1.26 cfs 4,607 cf
12.0" Round Culvert n=0.012 L=27.4' S=0.0102 '/' Outflow=1.30 cfs 4,607 cf

Pond 4C: Catch Basin Peak Elev=274.84' Inflow=1.71 cfs 6,186 cf
12.0" Round Culvert n=0.012 L=60.5' S=0.0099 '/' Outflow=1.71 cfs 6,186 cf

Pond 4D: Catch Basin Peak Elev=274.84' Inflow=1.67 cfs 6,070 cf
12.0" Round Culvert n=0.012 L=38.0' S=0.0100 '/' Outflow=1.67 cfs 6,070 cf

Pond 5A: Catch Basin Peak Elev=275.03' Inflow=1.82 cfs 6,547 cf
12.0" Round Culvert n=0.012 L=29.0' S=0.0100 '/' Outflow=1.82 cfs 6,547 cf

Pond 5B: Catch Basin Peak Elev=275.01' Inflow=0.68 cfs 2,446 cf
12.0" Round Culvert n=0.012 L=45.0' S=0.0100 '/' Outflow=0.68 cfs 2,446 cf

Pond 5C: Catch Basin Peak Elev=275.01' Inflow=0.44 cfs 1,600 cf
12.0" Round Culvert n=0.012 L=41.0' S=0.0100 '/' Outflow=0.44 cfs 1,600 cf

Pond 6: Catch Basin Peak Elev=274.97' Inflow=1.85 cfs 6,736 cf
12.0" Round Culvert n=0.012 L=26.0' S=0.0100 '/' Outflow=1.85 cfs 6,736 cf

Pond 7A: Catch Basin Peak Elev=274.98' Inflow=1.07 cfs 3,866 cf
12.0" Round Culvert n=0.012 L=10.0' S=0.0100 '/' Outflow=1.07 cfs 3,866 cf

Pond 7B: Catch Basin Peak Elev=274.99' Inflow=1.72 cfs 6,241 cf
12.0" Round Culvert n=0.012 L=40.0' S=0.0100 '/' Outflow=1.72 cfs 6,241 cf

Pond 8: Catch Basin Peak Elev=276.06' Inflow=1.68 cfs 6,082 cf
12.0" Round Culvert n=0.012 L=29.0' S=0.0100 '/' Outflow=1.68 cfs 6,082 cf

Pond 9A: Catch Basin Peak Elev=276.13' Inflow=1.80 cfs 6,522 cf
12.0" Round Culvert n=0.012 L=14.0' S=0.0100 '/' Outflow=1.80 cfs 6,522 cf

Pond 9B: Catch Basin Peak Elev=276.08' Inflow=1.92 cfs 7,048 cf
12.0" Round Culvert n=0.012 L=62.7' S=0.0100 '/' Outflow=1.92 cfs 7,048 cf

Pond 9C: Catch Basin Peak Elev=276.01' Inflow=0.68 cfs 2,448 cf
12.0" Round Culvert n=0.012 L=5.0' S=0.0100 '/' Outflow=0.70 cfs 2,447 cf

Pond 9D: Catch Basin Peak Elev=276.09' Inflow=0.62 cfs 2,275 cf
12.0" Round Culvert n=0.012 L=49.0' S=0.0102 '/' Outflow=0.62 cfs 2,275 cf

Pond 10A: Catch Basin Peak Elev=274.28' Inflow=0.47 cfs 1,706 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.47 cfs 1,706 cf

Pond 10B: Catch Basin Peak Elev=274.28' Inflow=1.67 cfs 6,030 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.0120 '/' Outflow=1.67 cfs 6,030 cf

Pond 11: Catch Basin Peak Elev=274.28' Inflow=1.84 cfs 6,646 cf
12.0" Round Culvert n=0.012 L=15.0' S=0.0100 '/' Outflow=1.84 cfs 6,646 cf

Pond 12: Catch Basin Peak Elev=274.30' Inflow=0.98 cfs 3,565 cf
12.0" Round Culvert n=0.012 L=14.0' S=0.0100 '/' Outflow=0.98 cfs 3,565 cf

Pond 13: Catch Basin Peak Elev=274.30' Inflow=0.63 cfs 2,299 cf
12.0" Round Culvert n=0.012 L=87.0' S=0.0100 '/' Outflow=0.63 cfs 2,299 cf

Pond 14: Catch Basin Peak Elev=274.30' Inflow=1.00 cfs 3,620 cf
12.0" Round Culvert n=0.012 L=33.0' S=0.0100 '/' Outflow=1.00 cfs 3,620 cf

Pond 15: Catch Basin Peak Elev=274.33' Inflow=1.78 cfs 6,737 cf
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=1.78 cfs 6,737 cf

Pond 16: Catch Basin Peak Elev=275.21' Inflow=1.62 cfs 6,189 cf
12.0" Round Culvert n=0.012 L=19.0' S=0.0100 '/' Outflow=1.62 cfs 6,189 cf

Pond 17: Catch Basin Peak Elev=275.84' Inflow=2.37 cfs 9,248 cf
15.0" Round Culvert n=0.012 L=143.0' S=0.0061 '/' Outflow=2.37 cfs 9,248 cf

Pond MH1: Manhole Peak Elev=274.65' Inflow=1.85 cfs 6,657 cf
24.0" Round Culvert n=0.012 L=10.0' S=0.0000 '/' Outflow=1.85 cfs 6,657 cf

Pond MH11: Manhole Peak Elev=275.95' Inflow=3.60 cfs 13,130 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.60 cfs 13,130 cf

Pond MH12: Manhole Peak Elev=276.00' Inflow=3.12 cfs 11,243 cf
15.0" Round Culvert n=0.012 L=24.9' S=0.0112 '/' Outflow=3.12 cfs 11,243 cf

Pond MH13: Manhole Peak Elev=275.95' Inflow=3.12 cfs 11,243 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.12 cfs 11,243 cf

Pond MH15: Manhole Peak Elev=274.28' Inflow=2.14 cfs 7,735 cf
12.0" Round Culvert n=0.012 L=14.0' S=0.0100 '/' Outflow=2.14 cfs 7,735 cf

Pond MH16: Manhole Peak Elev=274.27' Inflow=2.14 cfs 7,735 cf
24.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=2.14 cfs 7,735 cf

Pond MH17: Manhole Peak Elev=274.27' Inflow=1.84 cfs 6,646 cf
24.0" Round Culvert n=0.012 L=7.0' S=0.0000 '/' Outflow=1.84 cfs 6,642 cf

Pond MH19: Manhole Peak Elev=271.07' Inflow=1.59 cfs 2,265 cf
18.0" Round Culvert n=0.012 L=51.0' S=0.0069 '/' Outflow=1.59 cfs 2,265 cf

Pond MH2: Manhole Peak Elev=273.81' Inflow=1.55 cfs 5,584 cf
12.0" Round Culvert n=0.012 L=7.0' S=0.0100 '/' Outflow=1.55 cfs 5,584 cf

Pond MH20: Manhole Peak Elev=274.28' Inflow=8.38 cfs 31,658 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=8.38 cfs 31,658 cf

Pond MH21: Manhole Peak Elev=274.29' Inflow=8.38 cfs 31,658 cf
24.0" Round Culvert n=0.012 L=20.0' S=0.0100 '/' Outflow=8.38 cfs 31,658 cf

Pond MH22: Manhole Peak Elev=274.30' Inflow=8.38 cfs 31,658 cf
24.0" Round Culvert n=0.012 L=22.0' S=0.0100 '/' Outflow=8.38 cfs 31,658 cf

Pond MH23: Manhole Peak Elev=274.32' Inflow=5.77 cfs 22,173 cf
18.0" Round Culvert n=0.012 L=121.0' S=0.0100 '/' Outflow=5.77 cfs 22,173 cf

Pond MH24: Manhole Peak Elev=274.98' Inflow=3.99 cfs 15,436 cf
18.0" Round Culvert n=0.012 L=176.0' S=0.0100 '/' Outflow=3.99 cfs 15,436 cf

Pond MH25: Manhole Peak Elev=274.95' Inflow=3.45 cfs 12,459 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=3.45 cfs 12,459 cf

Pond MH26: Manhole Peak Elev=274.72' Inflow=5.34 cfs 19,244 cf
18.0" Round Culvert n=0.012 L=40.2' S=0.0100 '/' Outflow=5.34 cfs 19,244 cf

Pond MH29: Manhole Peak Elev=274.76' Inflow=3.39 cfs 12,256 cf
15.0" Round Culvert n=0.012 L=11.5' S=0.0104 '/' Outflow=3.40 cfs 12,256 cf

Pond MH3: Manhole Peak Elev=273.65' Inflow=1.55 cfs 5,584 cf
12.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=1.55 cfs 5,584 cf

Pond MH30: Manhole Peak Elev=274.80' Inflow=3.38 cfs 12,256 cf
15.0" Round Culvert n=0.012 L=34.0' S=0.0100 '/' Outflow=3.39 cfs 12,256 cf

Pond MH31: Manhole Peak Elev=275.01' Inflow=0.44 cfs 1,600 cf
12.0" Round Culvert n=0.012 L=20.9' S=0.0100 '/' Outflow=0.44 cfs 1,600 cf

Pond MH32: Manhole Peak Elev=276.08' Inflow=2.42 cfs 8,796 cf
12.0" Round Culvert n=0.012 L=47.5' S=0.0099 '/' Outflow=2.42 cfs 8,796 cf

Pond MH33: Manhole Peak Elev=276.03' Inflow=3.60 cfs 13,130 cf
15.0" Round Culvert n=0.012 L=24.0' S=0.0100 '/' Outflow=3.60 cfs 13,130 cf

Pond MH4: Manhole Peak Elev=274.66' Inflow=5.34 cfs 19,244 cf
24.0" Round Culvert n=0.012 L=4.0' S=0.0000 '/' Outflow=5.34 cfs 19,244 cf

Pond MH5: Manhole Peak Elev=275.01' Inflow=2.94 cfs 10,593 cf
15.0" Round Culvert n=0.012 L=63.0' S=0.0100 '/' Outflow=2.94 cfs 10,593 cf

Pond MH6: Manhole Peak Elev=274.99' Inflow=3.45 cfs 12,459 cf
15.0" Round Culvert n=0.012 L=12.0' S=0.0100 '/' Outflow=3.45 cfs 12,459 cf

Pond MH7: Manhole Peak Elev=274.95' Inflow=1.85 cfs 6,736 cf
24.0" Round Culvert n=0.012 L=5.0' S=0.0000 '/' Outflow=1.85 cfs 6,736 cf

Pond MH8: Manhole Peak Elev=274.97' Inflow=2.79 cfs 10,108 cf
15.0" Round Culvert n=0.012 L=22.0' S=0.0100 '/' Outflow=2.79 cfs 10,108 cf

Pond MH9: Manhole Peak Elev=274.95' Inflow=2.79 cfs 10,108 cf
24.0" Round Culvert n=0.012 L=8.0' S=0.0000 '/' Outflow=2.79 cfs 10,108 cf

Pond RD1: Roof Drain Peak Elev=274.68' Inflow=1.37 cfs 4,903 cf
10.0" Round Culvert n=0.012 L=21.0' S=0.0105 '/' Outflow=1.37 cfs 4,903 cf

Pond RD2: Roof Drain Peak Elev=275.49' Inflow=3.36 cfs 12,072 cf
10.0" Round Culvert n=0.012 L=31.0' S=0.0100 '/' Outflow=3.36 cfs 12,072 cf

Pond RD3: Roof Drain Peak Elev=275.49' Inflow=3.36 cfs 12,072 cf
10.0" Round Culvert n=0.012 L=14.7' S=0.0102 '/' Outflow=3.36 cfs 12,072 cf

Pond RD4: Roof Drain Peak Elev=274.31' Inflow=3.36 cfs 12,072 cf
10.0" Round Culvert n=0.012 L=24.0' S=0.0104 '/' Outflow=3.36 cfs 12,072 cf

Pond RD5: Roof Drain Peak Elev=274.33' Inflow=3.78 cfs 13,573 cf
10.0" Round Culvert n=0.012 L=18.0' S=0.0100 '/' Outflow=3.78 cfs 13,573 cf

Pond SP-1: Northerly Culvert Crossing Peak Elev=271.87' Storage=13,624 cf Inflow=61.16 cfs 7,110,192 cf
Outflow=60.36 cfs 7,097,757 cf

Pond SP-2: Southerly Culvert Peak Elev=271.71' Storage=17,136 cf Inflow=60.91 cfs 7,101,468 cf
Outflow=60.75 cfs 7,085,146 cf

Pond TD1: Stone Trench Drain Peak Elev=272.39' Storage=349 cf Inflow=5.48 cfs 27,240 cf
Discarded=0.20 cfs 11,392 cf Primary=5.02 cfs 15,848 cf Outflow=5.22 cfs 27,240 cf

Pond TD2: Stone Trench Drain Peak Elev=272.03' Storage=4 cf Inflow=0.14 cfs 666 cf
Discarded=0.08 cfs 117 cf Primary=0.05 cfs 550 cf Outflow=0.14 cfs 666 cf

Pond UIS1: Underground Chamber #1 Peak Elev=274.64' Storage=8,429 cf Inflow=8.55 cfs 30,804 cf
Discarded=0.73 cfs 28,209 cf Primary=2.33 cfs 2,595 cf Outflow=3.06 cfs 30,804 cf

Pond UIS2: Underground Chamber #2 Peak Elev=273.49' Storage=786 cf Inflow=1.55 cfs 5,584 cf
Discarded=0.17 cfs 4,570 cf Primary=1.31 cfs 1,014 cf Outflow=1.47 cfs 5,584 cf

Pond UIS3: Underground Chamber #3 Peak Elev=274.95' Storage=13,940 cf Inflow=14.82 cfs 53,446 cf
Discarded=1.33 cfs 44,602 cf Primary=3.19 cfs 8,843 cf Outflow=4.52 cfs 53,446 cf

Pond UIS4: Underground Chamber #4 Peak Elev=275.94' Storage=5,452 cf Inflow=6.72 cfs 24,373 cf
Discarded=0.48 cfs 18,563 cf Primary=2.44 cfs 5,810 cf Outflow=2.92 cfs 24,373 cf

Pond UIS5: Underground Chamber #5 Peak Elev=274.27' Storage=22,781 cf Inflow=19.49 cfs 71,679 cf
Discarded=1.66 cfs 69,415 cf Primary=1.59 cfs 2,265 cf Outflow=3.25 cfs 71,679 cf

Link SP-3: On Site Flow To Perennial Stream Inflow=72.97 cfs 7,142,975 cf
Primary=72.97 cfs 7,142,975 cf

Total Runoff Area = 867,482 sf Runoff Volume = 257,517 cf Average Runoff Depth = 3.56"
62.87% Pervious = 545,383 sf 37.13% Impervious = 322,099 sf

Summary for Subcatchment CB1: Subcat CB1

Runoff = 1.85 cfs @ 12.08 hrs, Volume= 6,657 cf, Depth= 7.37"
Routed to Pond 1 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
893	39	>75% Grass cover, Good, HSG A
9,948	98	Paved parking, HSG A
10,841		Weighted Average
893	39	8.24% Pervious Area
9,948	98	91.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB10A: Subcat CB10A

Runoff = 0.47 cfs @ 12.08 hrs, Volume= 1,706 cf, Depth= 6.69"
Routed to Pond 10A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
562	39	>75% Grass cover, Good, HSG A
2,497	98	Paved parking, HSG A
3,059		Weighted Average
562	39	18.36% Pervious Area
2,497	98	81.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB10B: Subcat CB10B

Runoff = 1.67 cfs @ 12.08 hrs, Volume= 6,030 cf, Depth= 6.93"
Routed to Pond 10B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
1,544	39	>75% Grass cover, Good, HSG A
8,897	98	Paved parking, HSG A
10,441		Weighted Average
1,544	39	14.79% Pervious Area
8,897	98	85.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB11: Subcat CB11

Runoff = 1.84 cfs @ 12.08 hrs, Volume= 6,646 cf, Depth= 6.93"
Routed to Pond 11 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
1,699	39	>75% Grass cover, Good, HSG A
9,806	98	Paved parking, HSG A
11,505		Weighted Average
1,699	39	14.77% Pervious Area
9,806	98	85.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB12: Subcat CB12

Runoff = 0.98 cfs @ 12.09 hrs, Volume= 3,565 cf, Depth= 5.98"
Routed to Pond 12 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
2,066	39	>75% Grass cover, Good, HSG A
5,082	98	Paved parking, HSG A
7,149		Weighted Average
2,066	39	28.90% Pervious Area
5,082	98	71.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB13: Subcat CB13

Runoff = 0.63 cfs @ 12.08 hrs, Volume= 2,299 cf, Depth= 6.66"
Routed to Pond 13 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
778	39	>75% Grass cover, Good, HSG A
3,363	98	Paved parking, HSG A
4,141		Weighted Average
778	39	18.79% Pervious Area
3,363	98	81.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB14: Subcat CB14

Runoff = 1.00 cfs @ 12.08 hrs, Volume= 3,620 cf, Depth= 7.04"
Routed to Pond 14 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
806	39	>75% Grass cover, Good, HSG A
4,761	98	Paved parking, HSG A
600	98	Roofs, HSG A
6,167		Weighted Average
806	39	13.07% Pervious Area
5,360	98	86.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB15: Subcat CB15

Runoff = 1.78 cfs @ 12.09 hrs, Volume= 6,737 cf, Depth= 4.01"
Routed to Pond 15 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
11,766	39	>75% Grass cover, Good, HSG A
7,412	98	Paved parking, HSG A
975	98	Roofs, HSG A
20,154		Weighted Average
11,766	39	58.38% Pervious Area
8,388	98	41.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB16: Subcat CB16

Runoff = 1.62 cfs @ 12.09 hrs, Volume= 6,189 cf, Depth= 3.61"
Routed to Pond 16 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
13,257	39	>75% Grass cover, Good, HSG A
7,326	98	Paved parking, HSG A
20,584		Weighted Average
13,257	39	64.41% Pervious Area
7,326	98	35.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB17: Subcat CB17

Runoff = 2.37 cfs @ 12.09 hrs, Volume= 9,248 cf, Depth= 3.08"
Routed to Pond 17 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
26,052	39	>75% Grass cover, Good, HSG A
8,219	98	Paved parking, HSG A
1,764	98	Roofs, HSG A
36,035		Weighted Average
26,052	39	72.30% Pervious Area
9,983	98	27.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB2: Subcat CB2

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 1,866 cf, Depth= 4.85"
Routed to Pond 2 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
2,121	39	>75% Grass cover, Good, HSG A
2,500	98	Paved parking, HSG A
4,621		Weighted Average
2,121	39	45.90% Pervious Area
2,500	98	54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB3A: Subcat CB3A

Runoff = 0.62 cfs @ 12.08 hrs, Volume= 2,232 cf, Depth= 7.48"
Routed to Pond 3A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
238	39	>75% Grass cover, Good, HSG A
3,345	98	Paved parking, HSG A
3,583		Weighted Average
238	39	6.64% Pervious Area
3,345	98	93.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB3B: Subcat CB3B

Runoff = 0.92 cfs @ 12.08 hrs, Volume= 3,352 cf, Depth= 6.64"
Routed to Pond 3B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
1,154	39	>75% Grass cover, Good, HSG A
4,901	98	Paved parking, HSG A
6,054		Weighted Average
1,154	39	19.06% Pervious Area
4,901	98	80.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4A: Subcat CB4A

Runoff = 0.66 cfs @ 12.08 hrs, Volume= 2,381 cf, Depth= 7.20"
Routed to Pond 4A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
428	39	>75% Grass cover, Good, HSG A
3,542	98	Paved parking, HSG A
3,970		Weighted Average
428	39	10.78% Pervious Area
3,542	98	89.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4B: Subcat CB4B

Runoff = 1.26 cfs @ 12.08 hrs, Volume= 4,607 cf, Depth= 6.18"
Routed to Pond 4B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
2,325	39	>75% Grass cover, Good, HSG A
6,621	98	Paved parking, HSG A
8,946		Weighted Average
2,325	39	25.99% Pervious Area
6,621	98	74.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4C: Subcat CB4C

Runoff = 1.71 cfs @ 12.08 hrs, Volume= 6,186 cf, Depth= 6.91"
Routed to Pond 4C : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
1,619	39	>75% Grass cover, Good, HSG A
7,106	98	Paved parking, HSG A
2,016	98	Roofs, HSG A
10,741		Weighted Average
1,619	39	15.07% Pervious Area
9,122	98	84.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB4D: Subcat CB4D

Runoff = 1.67 cfs @ 12.08 hrs, Volume= 6,070 cf, Depth= 6.46"
Routed to Pond 4D : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
2,459	39	>75% Grass cover, Good, HSG A
8,817	98	Paved parking, HSG A
11,275		Weighted Average
2,459	39	21.81% Pervious Area
8,817	98	78.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB5A: Subcat CB5A

Runoff = 1.82 cfs @ 12.08 hrs, Volume= 6,547 cf, Depth= 7.50"
Routed to Pond 5A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
665	39	>75% Grass cover, Good, HSG A
9,303	98	Paved parking, HSG A
514	98	Roofs, HSG A
10,482		Weighted Average
665	39	6.34% Pervious Area
9,817	98	93.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB5B: Subcat CB5B

Runoff = 0.68 cfs @ 12.08 hrs, Volume= 2,446 cf, Depth= 7.59"
Routed to Pond 5B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
190	39	>75% Grass cover, Good, HSG A
2,916	98	Paved parking, HSG A
760	98	Roofs, HSG A
3,866		Weighted Average
190	39	4.90% Pervious Area
3,676	98	95.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB5C: Subcat CB5C

Runoff = 0.44 cfs @ 12.08 hrs, Volume= 1,600 cf, Depth= 7.44"
Routed to Pond 5C : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
185	39	>75% Grass cover, Good, HSG A
2,396	98	Paved parking, HSG A
2,581		Weighted Average
185	39	7.19% Pervious Area
2,396	98	92.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB6: Subcat CB6

Runoff = 1.85 cfs @ 12.08 hrs, Volume= 6,736 cf, Depth= 6.40"
Routed to Pond 6 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
2,869	39	>75% Grass cover, Good, HSG A
9,762	98	Paved parking, HSG A
12,631		Weighted Average
2,869	39	22.72% Pervious Area
9,762	98	77.28% Impervious Area

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

Summary for Subcatchment CB7A: Subcat CB7A

Runoff = 1.07 cfs @ 12.08 hrs, Volume= 3,866 cf, Depth= 6.53"
Routed to Pond 7A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
1,470	39	>75% Grass cover, Good, HSG A
5,631	98	Paved parking, HSG A
7,101		Weighted Average
1,470	39	20.70% Pervious Area
5,631	98	79.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB7B: Subcat CB7B

Runoff = 1.72 cfs @ 12.08 hrs, Volume= 6,241 cf, Depth= 6.63"
Routed to Pond 7B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
2,181	39	>75% Grass cover, Good, HSG A
8,314	98	Paved parking, HSG A
805	98	Roofs, HSG A
11,300		Weighted Average
2,181	39	19.30% Pervious Area
9,119	98	80.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB8: Subcat CB8

Runoff = 1.68 cfs @ 12.08 hrs, Volume= 6,082 cf, Depth= 6.64"
Routed to Pond 8 : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
2,100	39	>75% Grass cover, Good, HSG A
8,498	98	Paved parking, HSG A
393	98	Roofs, HSG A
10,991		Weighted Average
2,100	39	19.11% Pervious Area
8,891	98	80.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9A: Subcat CB9A

Runoff = 1.80 cfs @ 12.08 hrs, Volume= 6,522 cf, Depth= 6.66"
Routed to Pond 9A : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
2,202	39	>75% Grass cover, Good, HSG A
7,525	98	Paved parking, HSG A
2,016	98	Roofs, HSG A
11,743		Weighted Average
2,202	39	18.75% Pervious Area
9,541	98	81.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9B: Subcat CB9B

Runoff = 1.92 cfs @ 12.09 hrs, Volume= 7,048 cf, Depth= 5.74"
Routed to Pond 9B : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
4,799	39	>75% Grass cover, Good, HSG A
9,937	98	Paved parking, HSG A
14,736		Weighted Average
4,799	39	32.57% Pervious Area
9,937	98	67.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9C: Subcat CB9C

Runoff = 0.68 cfs @ 12.08 hrs, Volume= 2,448 cf, Depth= 7.92"
Routed to Pond 9C : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
0	39	>75% Grass cover, Good, HSG A
2,337	98	Paved parking, HSG A
1,371	98	Roofs, HSG A
3,708		Weighted Average
0	39	0.00% Pervious Area
3,708	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment CB9D: Subcat CB9D

Runoff = 0.62 cfs @ 12.09 hrs, Volume= 2,275 cf, Depth= 5.45"
Routed to Pond 9D : Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
1,845	39	>75% Grass cover, Good, HSG A
3,161	98	Paved parking, HSG A
5,006		Weighted Average
1,845	39	36.86% Pervious Area
3,161	98	63.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-1: Subcat P-1

Runoff = 0.77 cfs @ 12.10 hrs, Volume= 3,162 cf, Depth= 2.18"
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
14,962	39	>75% Grass cover, Good, HSG A
2,477	98	Water Surface, HSG A
17,439		Weighted Average
14,962	39	85.80% Pervious Area
2,477	98	14.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.14 cfs @ 12.12 hrs, Volume= 666 cf, Depth= 1.22"
Routed to Pond TD2 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
6,530	39	>75% Grass cover, Good, HSG A
6,530	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-3: Subcat P-3

Runoff = 0.50 cfs @ 12.11 hrs, Volume= 2,241 cf, Depth= 1.37"
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
19,166	39	>75% Grass cover, Good, HSG A
0	98	Paved parking, HSG A
431	98	Water Surface, HSG A
19,597		Weighted Average
19,166	39	97.80% Pervious Area
432	98	2.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment P-4: Subcat P-4

Runoff = 6.78 cfs @ 12.17 hrs, Volume= 38,315 cf, Depth= 1.60"
Routed to Link SP-3 : On Site Flow To Perennial Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
84,280	39	>75% Grass cover, Good, HSG A
5,030	98	Paved parking, HSG A
30,379	98	Water Surface, HSG A
167,329	30	Woods, Good, HSG A
287,018		Weighted Average
251,608	33	87.66% Pervious Area
35,410	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, Copied from EWS**

Summary for Subcatchment P-5: Subcat P-5

Runoff = 2.81 cfs @ 12.13 hrs, Volume= 12,721 cf, Depth= 2.01"
Routed to Pond TD1 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
67,151	39	>75% Grass cover, Good, HSG A
8,890	98	Paved parking, HSG A
76,040		Weighted Average
67,151	39	88.31% Pervious Area
8,890	98	11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2					**Direct Entry, Copied From EWS. (TC ends at Point G)**

Summary for Subcatchment P-6: Subcat P-6

Runoff = 0.96 cfs @ 12.10 hrs, Volume= 4,041 cf, Depth= 1.91"
Routed to Pond TD1 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
22,749	39	>75% Grass cover, Good, HSG A
2,605	98	Paved parking, HSG A
25,354		Weighted Average
22,749	39	89.73% Pervious Area
2,605	98	10.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Copied from EWS (TC ends at Point F)**

Summary for Subcatchment P-7: Subcat P-7

Runoff = 1.98 cfs @ 12.19 hrs, Volume= 10,478 cf, Depth= 1.59"
Routed to Pond TD1 : Stone Trench Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
74,943	39	>75% Grass cover, Good, HSG A
4,287	98	Paved parking, HSG A
79,230		Weighted Average
74,943	39	94.59% Pervious Area
4,287	98	5.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4					**Direct Entry, Copied From EWS**

Summary for Subcatchment PATIO: Subcat PATIO

Runoff = 0.44 cfs @ 12.08 hrs, Volume= 1,573 cf, Depth= 7.92"
Routed to Pond RD1 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
2,384	98	Paved parking, HSG A
2,384	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-1: Subcat R-1

Runoff = 0.93 cfs @ 12.08 hrs, Volume= 3,330 cf, Depth= 7.92"
Routed to Pond RD1 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
5,045	98	Roofs, HSG A
5,045	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-2: Subcat R-2

Runoff = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf, Depth= 7.92"
Routed to Pond RD2 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
18,290	98	Roofs, HSG A
18,290	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-3: Subcat R-3

Runoff = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf, Depth= 7.92"
Routed to Pond RD3 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
18,290	98	Roofs, HSG A
18,290	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-4: Subcat R-4

Runoff = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf, Depth= 7.92"
Routed to Pond RD4 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
18,290	98	Roofs, HSG A
18,290	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Subcatchment R-5: Subcat R-5

Runoff = 3.78 cfs @ 12.08 hrs, Volume= 13,573 cf, Depth= 7.92"
Routed to Pond RD5 : Roof Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=8.16"

Area (sf)	CN	Description
20,565	98	Roofs, HSG A
20,565	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. TC**

Summary for Pond 1: Catch Basin

Inflow Area = 10,841 sf, 91.76% Impervious, Inflow Depth = 7.37" for 100 Year event
Inflow = 1.85 cfs @ 12.08 hrs, Volume= 6,657 cf
Outflow = 1.85 cfs @ 12.08 hrs, Volume= 6,657 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.85 cfs @ 12.08 hrs, Volume= 6,657 cf
Routed to Pond MH1 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.69' @ 12.33 hrs
Flood Elev= 274.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.54'	**12.0" Round Culvert** L= 84.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.54' / 270.70' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.84 cfs @ 12.08 hrs HW=273.43' TW=273.11' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.84 cfs @ 2.35 fps)

Summary for Pond 2: Catch Basin

Inflow Area = 4,621 sf, 54.10% Impervious, Inflow Depth = 4.85" for 100 Year event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 1,866 cf
Outflow = 0.51 cfs @ 12.08 hrs, Volume= 1,866 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.08 hrs, Volume= 1,866 cf
Routed to Pond MH6 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.99' @ 12.38 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.18'	**12.0" Round Culvert** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.18' / 271.62' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=274.14' TW=274.19' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 3A: Catch Basin

Inflow Area = 3,583 sf, 93.36% Impervious, Inflow Depth = 7.48" for 100 Year event
Inflow = 0.62 cfs @ 12.08 hrs, Volume= 2,232 cf
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 2,232 cf, Atten= 0%, Lag= 0.3 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 2,232 cf
Routed to Pond MH2 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.82' @ 12.10 hrs
Flood Elev= 274.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.66'	**12.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.66' / 271.31' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=273.77' TW=273.79' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 3B: Catch Basin

Inflow Area = 6,054 sf, 80.94% Impervious, Inflow Depth = 6.64" for 100 Year event
Inflow = 0.92 cfs @ 12.08 hrs, Volume= 3,352 cf
Outflow = 0.94 cfs @ 12.08 hrs, Volume= 3,352 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.94 cfs @ 12.08 hrs, Volume= 3,352 cf
Routed to Pond MH2 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.85' @ 12.10 hrs
Flood Elev= 274.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.52'	**12.0" Round Culvert** L= 21.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.52' / 271.31' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=273.75' TW=273.77' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 4A: Catch Basin

Inflow Area = 3,970 sf, 89.22% Impervious, Inflow Depth = 7.20" for 100 Year event
Inflow = 0.66 cfs @ 12.08 hrs, Volume= 2,381 cf
Outflow = 0.69 cfs @ 12.08 hrs, Volume= 2,381 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 12.08 hrs, Volume= 2,381 cf
Routed to Pond MH26 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.72' @ 12.34 hrs
Flood Elev= 275.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.17'	**12.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.17' / 271.10' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=273.63' TW=273.65' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 4B: Catch Basin

Inflow Area = 8,946 sf, 74.01% Impervious, Inflow Depth = 6.18" for 100 Year event
Inflow = 1.26 cfs @ 12.08 hrs, Volume= 4,607 cf
Outflow = 1.30 cfs @ 12.08 hrs, Volume= 4,607 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.30 cfs @ 12.08 hrs, Volume= 4,607 cf
Routed to Pond MH26 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.73' @ 12.34 hrs
Flood Elev= 275.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.38'	**12.0" Round Culvert** L= 27.4' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.38' / 271.10' S= 0.0102 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.01 cfs @ 12.08 hrs HW=273.72' TW=273.65' (Dynamic Tailwater)
└—**1=Culvert** (Inlet Controls 1.01 cfs @ 1.29 fps)

Summary for Pond 4C: Catch Basin

Inflow Area = 10,741 sf, 84.93% Impervious, Inflow Depth = 6.91" for 100 Year event
Inflow = 1.71 cfs @ 12.08 hrs, Volume= 6,186 cf
Outflow = 1.71 cfs @ 12.08 hrs, Volume= 6,186 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.71 cfs @ 12.08 hrs, Volume= 6,186 cf
Routed to Pond MH30 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.84' @ 12.31 hrs
Flood Elev= 275.63'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.36'	**12.0" Round Culvert** L= 60.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.36' / 271.76' S= 0.0099 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.69 cfs @ 12.08 hrs HW=274.49' TW=274.26' (Dynamic Tailwater)
└—**1=Culvert** (Outlet Controls 1.69 cfs @ 2.15 fps)

Summary for Pond 4D: Catch Basin

Inflow Area = 11,275 sf, 78.19% Impervious, Inflow Depth = 6.46" for 100 Year event
Inflow = 1.67 cfs @ 12.08 hrs, Volume= 6,070 cf
Outflow = 1.67 cfs @ 12.08 hrs, Volume= 6,070 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.67 cfs @ 12.08 hrs, Volume= 6,070 cf
Routed to Pond MH30 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.84' @ 12.31 hrs
Flood Elev= 275.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.14'	**12.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.14' / 271.76' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.65 cfs @ 12.08 hrs HW=274.46' TW=274.27' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.65 cfs @ 2.10 fps)

Summary for Pond 5A: Catch Basin

Inflow Area = 10,482 sf, 93.66% Impervious, Inflow Depth = 7.50" for 100 Year event
Inflow = 1.82 cfs @ 12.08 hrs, Volume= 6,547 cf
Outflow = 1.82 cfs @ 12.08 hrs, Volume= 6,547 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.82 cfs @ 12.08 hrs, Volume= 6,547 cf
Routed to Pond MH5 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.03' @ 12.38 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.64'	**12.0" Round Culvert** L= 29.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.64' / 272.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.81 cfs @ 12.08 hrs HW=274.61' TW=274.38' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.81 cfs @ 2.30 fps)

Summary for Pond 5B: Catch Basin

Inflow Area = 3,866 sf, 95.10% Impervious, Inflow Depth = 7.59" for 100 Year event
Inflow = 0.68 cfs @ 12.08 hrs, Volume= 2,446 cf
Outflow = 0.68 cfs @ 12.08 hrs, Volume= 2,446 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.68 cfs @ 12.08 hrs, Volume= 2,446 cf
Routed to Pond MH5 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.01' @ 12.38 hrs
Flood Elev= 276.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.80'	**12.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.80' / 272.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 12.08 hrs HW=274.41' TW=274.38' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.66 cfs @ 0.84 fps)

Summary for Pond 5C: Catch Basin

Inflow Area = 2,581 sf, 92.81% Impervious, Inflow Depth = 7.44" for 100 Year event
Inflow = 0.44 cfs @ 12.08 hrs, Volume= 1,600 cf
Outflow = 0.44 cfs @ 12.08 hrs, Volume= 1,600 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.08 hrs, Volume= 1,600 cf
Routed to Pond MH31 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.01' @ 12.37 hrs
Flood Elev= 276.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.07'	**12.0" Round Culvert** L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.07' / 272.66' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.08 hrs HW=274.40' TW=274.40' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.33 cfs @ 0.42 fps)

Summary for Pond 6: Catch Basin

Inflow Area = 12,631 sf, 77.28% Impervious, Inflow Depth = 6.40" for 100 Year event
Inflow = 1.85 cfs @ 12.08 hrs, Volume= 6,736 cf
Outflow = 1.85 cfs @ 12.08 hrs, Volume= 6,736 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.85 cfs @ 12.08 hrs, Volume= 6,736 cf
Routed to Pond MH7 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.97' @ 12.38 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.76'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.76' / 272.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.85 cfs @ 12.08 hrs HW=274.05' TW=273.81' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.85 cfs @ 2.35 fps)

Summary for Pond 7A: Catch Basin

Inflow Area = 7,101 sf, 79.30% Impervious, Inflow Depth = 6.53" for 100 Year event
Inflow = 1.07 cfs @ 12.08 hrs, Volume= 3,866 cf
Outflow = 1.07 cfs @ 12.08 hrs, Volume= 3,866 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.07 cfs @ 12.08 hrs, Volume= 3,866 cf
Routed to Pond MH8 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.98' @ 12.39 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.92'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.92' / 272.82' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 12.08 hrs HW=274.07' TW=274.07' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.29 cfs @ 0.36 fps)

Summary for Pond 7B: Catch Basin

Inflow Area = 11,300 sf, 80.70% Impervious, Inflow Depth = 6.63" for 100 Year event
Inflow = 1.72 cfs @ 12.08 hrs, Volume= 6,241 cf
Outflow = 1.72 cfs @ 12.08 hrs, Volume= 6,241 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.72 cfs @ 12.08 hrs, Volume= 6,241 cf
Routed to Pond MH8 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.99' @ 12.39 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.22'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.22' / 272.82' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.45 cfs @ 12.08 hrs HW=274.25' TW=274.07' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.45 cfs @ 2.23 fps)

Summary for Pond 8: Catch Basin

Inflow Area = 10,991 sf, 80.89% Impervious, Inflow Depth = 6.64" for 100 Year event
Inflow = 1.68 cfs @ 12.08 hrs, Volume= 6,082 cf
Outflow = 1.68 cfs @ 12.08 hrs, Volume= 6,082 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.68 cfs @ 12.08 hrs, Volume= 6,082 cf
Routed to Pond MH33 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.06' @ 12.26 hrs
Flood Elev= 276.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.63'	**12.0" Round Culvert** L= 29.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.63' / 273.34' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.11 cfs @ 12.08 hrs HW=275.40' TW=275.31' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.11 cfs @ 1.42 fps)

Summary for Pond 9A: Catch Basin

Inflow Area = 11,743 sf, 81.25% Impervious, Inflow Depth = 6.66" for 100 Year event
Inflow = 1.80 cfs @ 12.08 hrs, Volume= 6,522 cf
Outflow = 1.80 cfs @ 12.08 hrs, Volume= 6,522 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.80 cfs @ 12.08 hrs, Volume= 6,522 cf
Routed to Pond MH32 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.13' @ 12.24 hrs
Flood Elev= 276.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.99'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.99' / 272.85' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.79 cfs @ 12.08 hrs HW=275.72' TW=275.49' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.79 cfs @ 2.28 fps)

Summary for Pond 9B: Catch Basin

Inflow Area = 14,736 sf, 67.43% Impervious, Inflow Depth = 5.74" for 100 Year event
Inflow = 1.92 cfs @ 12.09 hrs, Volume= 7,048 cf
Outflow = 1.92 cfs @ 12.09 hrs, Volume= 7,048 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.92 cfs @ 12.09 hrs, Volume= 7,048 cf
Routed to Pond MH33 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.08' @ 12.26 hrs
Flood Elev= 276.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.97'	**12.0" Round Culvert** L= 62.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.97' / 273.34' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.52 cfs @ 12.09 hrs HW=275.51' TW=275.33' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.52 cfs @ 1.94 fps)

Summary for Pond 9C: Catch Basin

Inflow Area = 3,708 sf,100.00% Impervious, Inflow Depth = 7.92" for 100 Year event
Inflow = 0.68 cfs @ 12.08 hrs, Volume= 2,448 cf
Outflow = 0.70 cfs @ 12.08 hrs, Volume= 2,447 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.08 hrs, Volume= 2,447 cf
Routed to Pond MH12 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.01' @ 12.28 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.33'	**12.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.33' / 272.28' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=275.09' TW=275.17' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 9D: Catch Basin

Inflow Area = 5,006 sf, 63.14% Impervious, Inflow Depth = 5.45" for 100 Year event
Inflow = 0.62 cfs @ 12.09 hrs, Volume= 2,275 cf
Outflow = 0.62 cfs @ 12.09 hrs, Volume= 2,275 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.62 cfs @ 12.09 hrs, Volume= 2,275 cf
Routed to Pond MH32 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.09' @ 12.26 hrs
Flood Elev= 276.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.35'	**12.0" Round Culvert** L= 49.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.35' / 272.85' S= 0.0102 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 12.09 hrs HW=275.54' TW=275.52' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.61 cfs @ 0.78 fps)

Summary for Pond 10A: Catch Basin

Inflow Area = 3,059 sf, 81.64% Impervious, Inflow Depth = 6.69" for 100 Year event
Inflow = 0.47 cfs @ 12.08 hrs, Volume= 1,706 cf
Outflow = 0.47 cfs @ 12.08 hrs, Volume= 1,706 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.47 cfs @ 12.08 hrs, Volume= 1,706 cf
Routed to Pond MH15 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.28' @ 12.57 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.41'	**12.0" Round Culvert** L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.41' / 270.54' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=272.17' TW=272.20' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 10B: Catch Basin

Inflow Area = 10,441 sf, 85.21% Impervious, Inflow Depth = 6.93" for 100 Year event
Inflow = 1.67 cfs @ 12.08 hrs, Volume= 6,030 cf
Outflow = 1.67 cfs @ 12.08 hrs, Volume= 6,030 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.67 cfs @ 12.08 hrs, Volume= 6,030 cf
Routed to Pond MH15 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.28' @ 12.56 hrs
Flood Elev= 276.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.70'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.70' / 270.52' S= 0.0120 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.22 cfs @ 12.08 hrs HW=272.30' TW=272.20' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.22 cfs @ 1.55 fps)

Summary for Pond 11: Catch Basin

Inflow Area = 11,505 sf, 85.23% Impervious, Inflow Depth = 6.93" for 100 Year event
Inflow = 1.84 cfs @ 12.08 hrs, Volume= 6,646 cf
Outflow = 1.84 cfs @ 12.08 hrs, Volume= 6,646 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.84 cfs @ 12.08 hrs, Volume= 6,646 cf
Routed to Pond MH17 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.28' @ 12.56 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.55'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.55' / 270.40' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.83 cfs @ 12.08 hrs HW=272.11' TW=271.87' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.83 cfs @ 2.34 fps)

Summary for Pond 12: Catch Basin

Inflow Area = 7,149 sf, 71.10% Impervious, Inflow Depth = 5.98" for 100 Year event
Inflow = 0.98 cfs @ 12.09 hrs, Volume= 3,565 cf
Outflow = 0.98 cfs @ 12.08 hrs, Volume= 3,565 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.98 cfs @ 12.08 hrs, Volume= 3,565 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.30' @ 12.55 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.74'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.74' / 270.60' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.94 cfs @ 12.08 hrs HW=272.79' TW=272.73' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.94 cfs @ 1.20 fps)

Summary for Pond 13: Catch Basin

Inflow Area = 4,141 sf, 81.21% Impervious, Inflow Depth = 6.66" for 100 Year event
Inflow = 0.63 cfs @ 12.08 hrs, Volume= 2,299 cf
Outflow = 0.63 cfs @ 12.08 hrs, Volume= 2,299 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.08 hrs, Volume= 2,299 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.30' @ 12.55 hrs
Flood Elev= 275.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.79'	**12.0" Round Culvert** L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.79' / 270.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 12.08 hrs HW=272.78' TW=272.73' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.61 cfs @ 0.97 fps)

Summary for Pond 14: Catch Basin

Inflow Area = 6,167 sf, 86.93% Impervious, Inflow Depth = 7.04" for 100 Year event
Inflow = 1.00 cfs @ 12.08 hrs, Volume= 3,620 cf
Outflow = 1.00 cfs @ 12.08 hrs, Volume= 3,620 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.00 cfs @ 12.08 hrs, Volume= 3,620 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.30' @ 12.55 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.25'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.25' / 270.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.97 cfs @ 12.08 hrs HW=272.79' TW=272.73' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.97 cfs @ 1.23 fps)

Summary for Pond 15: Catch Basin

Inflow Area = 20,154 sf, 41.62% Impervious, Inflow Depth = 4.01" for 100 Year event
Inflow = 1.78 cfs @ 12.09 hrs, Volume= 6,737 cf
Outflow = 1.78 cfs @ 12.09 hrs, Volume= 6,737 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.78 cfs @ 12.09 hrs, Volume= 6,737 cf
Routed to Pond MH23 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.33' @ 12.54 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.42'	**12.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.42' / 272.23' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.77 cfs @ 12.09 hrs HW=273.80' TW=273.58' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.77 cfs @ 2.26 fps)

Summary for Pond 16: Catch Basin

Inflow Area = 20,584 sf, 35.59% Impervious, Inflow Depth = 3.61" for 100 Year event
Inflow = 1.62 cfs @ 12.09 hrs, Volume= 6,189 cf
Outflow = 1.62 cfs @ 12.09 hrs, Volume= 6,189 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.62 cfs @ 12.09 hrs, Volume= 6,189 cf
Routed to Pond MH24 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.21' @ 12.09 hrs
Flood Elev= 277.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.29'	**12.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 274.29' / 274.10' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.60 cfs @ 12.09 hrs HW=275.21' TW=274.98' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.60 cfs @ 2.78 fps)

Summary for Pond 17: Catch Basin

Inflow Area = 36,035 sf, 27.70% Impervious, Inflow Depth = 3.08" for 100 Year event
Inflow = 2.37 cfs @ 12.09 hrs, Volume= 9,248 cf
Outflow = 2.37 cfs @ 12.09 hrs, Volume= 9,248 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.37 cfs @ 12.09 hrs, Volume= 9,248 cf
Routed to Pond MH24 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.84' @ 12.09 hrs
Flood Elev= 277.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.97'	**15.0" Round Culvert** L= 143.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 274.97' / 274.10' S= 0.0061 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.36 cfs @ 12.09 hrs HW=275.84' TW=274.98' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.36 cfs @ 3.63 fps)

Summary for Pond MH1: Manhole

Inflow Area = 10,841 sf, 91.76% Impervious, Inflow Depth = 7.37" for 100 Year event
Inflow = 1.85 cfs @ 12.08 hrs, Volume= 6,657 cf
Outflow = 1.85 cfs @ 12.08 hrs, Volume= 6,657 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.85 cfs @ 12.08 hrs, Volume= 6,657 cf
Routed to Pond UIS1 : Underground Chamber #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.65' @ 12.34 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.70'	**24.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.70' / 271.70' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.85 cfs @ 12.08 hrs HW=273.11' TW=273.08' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.85 cfs @ 1.10 fps)

Summary for Pond MH11: Manhole

Inflow Area = 25,727 sf, 73.18% Impervious, Inflow Depth = 6.12" for 100 Year event
Inflow = 3.60 cfs @ 12.08 hrs, Volume= 13,130 cf
Outflow = 3.60 cfs @ 12.08 hrs, Volume= 13,130 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.60 cfs @ 12.08 hrs, Volume= 13,130 cf
Routed to Pond UIS4 : Underground Chamber #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.95' @ 12.27 hrs
Flood Elev= 277.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.00' / 273.00' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.61 cfs @ 12.08 hrs HW=274.95' TW=274.89' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.61 cfs @ 1.16 fps)

Summary for Pond MH12: Manhole

Inflow Area = 20,457 sf, 80.22% Impervious, Inflow Depth = 6.59" for 100 Year event
Inflow = 3.12 cfs @ 12.08 hrs, Volume= 11,243 cf
Outflow = 3.12 cfs @ 12.08 hrs, Volume= 11,243 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.12 cfs @ 12.08 hrs, Volume= 11,243 cf
Routed to Pond MH13 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.00' @ 12.26 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.28'	**15.0" Round Culvert** L= 24.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.28' / 273.00' S= 0.0112 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.11 cfs @ 12.08 hrs HW=275.18' TW=274.90' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.11 cfs @ 2.54 fps)

Summary for Pond MH13: Manhole

Inflow Area = 20,457 sf, 80.22% Impervious, Inflow Depth = 6.59" for 100 Year event
Inflow = 3.12 cfs @ 12.08 hrs, Volume= 11,243 cf
Outflow = 3.12 cfs @ 12.08 hrs, Volume= 11,243 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.12 cfs @ 12.08 hrs, Volume= 11,243 cf
Routed to Pond UIS4 : Underground Chamber #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.95' @ 12.27 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.00' / 273.00' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.12 cfs @ 12.08 hrs HW=274.90' TW=274.85' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.12 cfs @ 1.01 fps)

Summary for Pond MH15: Manhole

Inflow Area = 13,501 sf, 84.40% Impervious, Inflow Depth = 6.88" for 100 Year event
Inflow = 2.14 cfs @ 12.08 hrs, Volume= 7,735 cf
Outflow = 2.14 cfs @ 12.08 hrs, Volume= 7,735 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.14 cfs @ 12.08 hrs, Volume= 7,735 cf
Routed to Pond MH16 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.28' @ 12.56 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.44'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.44' / 270.30' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.13 cfs @ 12.08 hrs HW=272.20' TW=271.88' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.13 cfs @ 2.72 fps)

Summary for Pond MH16: Manhole

Inflow Area = 13,501 sf, 84.40% Impervious, Inflow Depth = 6.88" for 100 Year event
Inflow = 2.14 cfs @ 12.08 hrs, Volume= 7,735 cf
Outflow = 2.14 cfs @ 12.08 hrs, Volume= 7,735 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.14 cfs @ 12.08 hrs, Volume= 7,735 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.27' @ 12.56 hrs
Flood Elev= 277.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.30'	**24.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.30' / 270.30' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.14 cfs @ 12.08 hrs HW=271.88' TW=271.85' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.14 cfs @ 1.10 fps)

Summary for Pond MH17: Manhole

Inflow Area = 11,505 sf, 85.23% Impervious, Inflow Depth = 6.93" for 100 Year event
Inflow = 1.84 cfs @ 12.08 hrs, Volume= 6,646 cf
Outflow = 1.84 cfs @ 12.08 hrs, Volume= 6,642 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.84 cfs @ 12.08 hrs, Volume= 6,642 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.27' @ 12.56 hrs
Flood Elev= 277.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.30'	**24.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.30' / 270.30' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.84 cfs @ 12.08 hrs HW=271.87' TW=271.85' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.84 cfs @ 0.95 fps)

Summary for Pond MH19: Manhole

Inflow Area = 158,089 sf, 62.98% Impervious, Inflow Depth = 0.17" for 100 Year event
Inflow = 1.59 cfs @ 12.56 hrs, Volume= 2,265 cf
Outflow = 1.59 cfs @ 12.56 hrs, Volume= 2,265 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.56 hrs, Volume= 2,265 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.07' @ 12.56 hrs
Flood Elev= 276.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.87'	**18.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 269.87' / 269.52' S= 0.0069 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.59 cfs @ 12.56 hrs HW=271.07' TW=271.00' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.59 cfs @ 1.44 fps)

Summary for Pond MH2: Manhole

Inflow Area = 9,637 sf, 85.56% Impervious, Inflow Depth = 6.95" for 100 Year event
Inflow = 1.55 cfs @ 12.08 hrs, Volume= 5,584 cf
Outflow = 1.55 cfs @ 12.08 hrs, Volume= 5,584 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.55 cfs @ 12.08 hrs, Volume= 5,584 cf
Routed to Pond MH3 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.81' @ 12.10 hrs
Flood Elev= 274.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.30'	**12.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.30' / 272.23' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.55 cfs @ 12.08 hrs HW=273.77' TW=273.60' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.55 cfs @ 1.97 fps)

Summary for Pond MH20: Manhole

Inflow Area = 94,229 sf, 41.92% Impervious, Inflow Depth = 4.03" for 100 Year event
Inflow = 8.38 cfs @ 12.09 hrs, Volume= 31,658 cf
Outflow = 8.38 cfs @ 12.09 hrs, Volume= 31,658 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.38 cfs @ 12.09 hrs, Volume= 31,658 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.28' @ 12.55 hrs
Flood Elev= 277.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.30'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.30' / 270.30' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=8.37 cfs @ 12.09 hrs HW=272.21' TW=271.90' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.37 cfs @ 2.71 fps)

Summary for Pond MH21: Manhole

Inflow Area = 94,229 sf, 41.92% Impervious, Inflow Depth = 4.03" for 100 Year event
Inflow = 8.38 cfs @ 12.09 hrs, Volume= 31,658 cf
Outflow = 8.38 cfs @ 12.09 hrs, Volume= 31,658 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.38 cfs @ 12.09 hrs, Volume= 31,658 cf
Routed to Pond MH20 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.29' @ 12.55 hrs
Flood Elev= 277.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.50'	**24.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.50' / 270.30' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=8.38 cfs @ 12.09 hrs HW=272.52' TW=272.21' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 8.38 cfs @ 2.67 fps)

Summary for Pond MH22: Manhole

Inflow Area = 94,229 sf, 41.92% Impervious, Inflow Depth = 4.03" for 100 Year event
Inflow = 8.38 cfs @ 12.09 hrs, Volume= 31,658 cf
Outflow = 8.38 cfs @ 12.09 hrs, Volume= 31,658 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.38 cfs @ 12.09 hrs, Volume= 31,658 cf
Routed to Pond MH21 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.30' @ 12.55 hrs
Flood Elev= 277.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.82'	**24.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.82' / 270.60' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.32 cfs @ 12.09 hrs HW=272.76' TW=272.52' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 7.32 cfs @ 2.35 fps)

Summary for Pond MH23: Manhole

Inflow Area = 76,773 sf, 33.47% Impervious, Inflow Depth = 3.47" for 100 Year event
Inflow = 5.77 cfs @ 12.09 hrs, Volume= 22,173 cf
Outflow = 5.77 cfs @ 12.09 hrs, Volume= 22,173 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.77 cfs @ 12.09 hrs, Volume= 22,173 cf
Routed to Pond MH22 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.32' @ 12.54 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.13'	**18.0" Round Culvert** L= 121.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.13' / 270.92' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.76 cfs @ 12.09 hrs HW=273.58' TW=272.77' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 5.76 cfs @ 4.19 fps)

Summary for Pond MH24: Manhole

Inflow Area = 56,619 sf, 30.57% Impervious, Inflow Depth = 3.27" for 100 Year event
Inflow = 3.99 cfs @ 12.09 hrs, Volume= 15,436 cf
Outflow = 3.99 cfs @ 12.09 hrs, Volume= 15,436 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.99 cfs @ 12.09 hrs, Volume= 15,436 cf
Routed to Pond MH23 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.98' @ 12.10 hrs
Flood Elev= 278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.99'	**18.0" Round Culvert** L= 176.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.99' / 272.23' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.98 cfs @ 12.09 hrs HW=274.98' TW=273.58' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 3.98 cfs @ 4.58 fps)

Summary for Pond MH25: Manhole

Inflow Area = 21,550 sf, 85.33% Impervious, Inflow Depth = 6.94" for 100 Year event
Inflow = 3.45 cfs @ 12.08 hrs, Volume= 12,459 cf
Outflow = 3.45 cfs @ 12.08 hrs, Volume= 12,459 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.45 cfs @ 12.08 hrs, Volume= 12,459 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.95' @ 12.39 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 272.50' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.45 cfs @ 12.08 hrs HW=273.86' TW=273.75' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 3.45 cfs @ 2.14 fps)

Summary for Pond MH26: Manhole

Inflow Area = 34,932 sf, 80.45% Impervious, Inflow Depth = 6.61" for 100 Year event
Inflow = 5.34 cfs @ 12.08 hrs, Volume= 19,244 cf
Outflow = 5.34 cfs @ 12.08 hrs, Volume= 19,244 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.34 cfs @ 12.08 hrs, Volume= 19,244 cf
Routed to Pond MH4 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.72' @ 12.32 hrs
Flood Elev= 275.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.10'	**18.0" Round Culvert** L= 40.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.10' / 271.70' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.33 cfs @ 12.08 hrs HW=273.65' TW=273.25' (Dynamic Tailwater)
1=Culvert (Outlet Controls 5.33 cfs @ 3.62 fps)

Summary for Pond MH29: Manhole

Inflow Area = 22,016 sf, 81.48% Impervious, Inflow Depth = 6.68" for 100 Year event
Inflow = 3.39 cfs @ 12.09 hrs, Volume= 12,256 cf
Outflow = 3.40 cfs @ 12.09 hrs, Volume= 12,256 cf, Atten= 0%, Lag= 0.1 min
Primary = 3.40 cfs @ 12.09 hrs, Volume= 12,256 cf
Routed to Pond MH26 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.76' @ 12.32 hrs
Flood Elev= 275.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.22'	**15.0" Round Culvert** L= 11.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.22' / 271.10' S= 0.0104 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.09 cfs @ 12.09 hrs HW=273.96' TW=273.68' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.09 cfs @ 2.52 fps)

Summary for Pond MH3: Manhole

Inflow Area = 9,637 sf, 85.56% Impervious, Inflow Depth = 6.95" for 100 Year event
Inflow = 1.55 cfs @ 12.08 hrs, Volume= 5,584 cf
Outflow = 1.55 cfs @ 12.08 hrs, Volume= 5,584 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.55 cfs @ 12.08 hrs, Volume= 5,584 cf
Routed to Pond UIS2 : Underground Chamber #2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.65' @ 12.10 hrs
Flood Elev= 274.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.13'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.13' / 272.13' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.55 cfs @ 12.08 hrs HW=273.60' TW=273.43' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.55 cfs @ 1.97 fps)

Summary for Pond MH30: Manhole

Inflow Area = 22,016 sf, 81.48% Impervious, Inflow Depth = 6.68" for 100 Year event
Inflow = 3.38 cfs @ 12.08 hrs, Volume= 12,256 cf
Outflow = 3.39 cfs @ 12.09 hrs, Volume= 12,256 cf, Atten= 0%, Lag= 0.1 min
Primary = 3.39 cfs @ 12.09 hrs, Volume= 12,256 cf
Routed to Pond MH29 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.80' @ 12.33 hrs
Flood Elev= 275.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.66'	**15.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.66' / 271.32' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.38 cfs @ 12.09 hrs HW=274.28' TW=273.95' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.38 cfs @ 2.75 fps)

Summary for Pond MH31: Manhole

Inflow Area = 2,581 sf, 92.81% Impervious, Inflow Depth = 7.44" for 100 Year event
Inflow = 0.44 cfs @ 12.08 hrs, Volume= 1,600 cf
Outflow = 0.44 cfs @ 12.08 hrs, Volume= 1,600 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.08 hrs, Volume= 1,600 cf
Routed to Pond MH5 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.01' @ 12.38 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.56'	**12.0" Round Culvert** L= 20.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.56' / 272.35' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.41 cfs @ 12.08 hrs HW=274.39' TW=274.38' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.41 cfs @ 0.52 fps)

Summary for Pond MH32: Manhole

Inflow Area = 16,749 sf, 75.84% Impervious, Inflow Depth = 6.30" for 100 Year event
Inflow = 2.42 cfs @ 12.08 hrs, Volume= 8,796 cf
Outflow = 2.42 cfs @ 12.08 hrs, Volume= 8,796 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.42 cfs @ 12.08 hrs, Volume= 8,796 cf
Routed to Pond MH12 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.08' @ 12.26 hrs
Flood Elev= 276.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.75'	**12.0" Round Culvert** L= 47.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.75' / 272.28' S= 0.0099 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.06 cfs @ 12.08 hrs HW=275.49' TW=275.20' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.06 cfs @ 2.63 fps)

Summary for Pond MH33: Manhole

Inflow Area = 25,727 sf, 73.18% Impervious, Inflow Depth = 6.12" for 100 Year event
Inflow = 3.60 cfs @ 12.08 hrs, Volume= 13,130 cf
Outflow = 3.60 cfs @ 12.08 hrs, Volume= 13,130 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.60 cfs @ 12.08 hrs, Volume= 13,130 cf
Routed to Pond MH11 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 276.03' @ 12.26 hrs
Flood Elev= 277.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.24'	**15.0" Round Culvert** L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.24' / 273.00' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.59 cfs @ 12.08 hrs HW=275.32' TW=274.95' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.59 cfs @ 2.93 fps)

Summary for Pond MH4: Manhole

Inflow Area = 34,932 sf, 80.45% Impervious, Inflow Depth = 6.61" for 100 Year event
Inflow = 5.34 cfs @ 12.08 hrs, Volume= 19,244 cf
Outflow = 5.34 cfs @ 12.08 hrs, Volume= 19,244 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.34 cfs @ 12.08 hrs, Volume= 19,244 cf
Routed to Pond UIS1 : Underground Chamber #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.66' @ 12.34 hrs
Flood Elev= 276.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.70'	**24.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.70' / 271.70' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.33 cfs @ 12.08 hrs HW=273.25' TW=273.06' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 5.33 cfs @ 2.82 fps)

Summary for Pond MH5: Manhole

Inflow Area = 16,929 sf, 93.86% Impervious, Inflow Depth = 7.51" for 100 Year event
Inflow = 2.94 cfs @ 12.08 hrs, Volume= 10,593 cf
Outflow = 2.94 cfs @ 12.08 hrs, Volume= 10,593 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.94 cfs @ 12.08 hrs, Volume= 10,593 cf
Routed to Pond MH6 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.01' @ 12.38 hrs
Flood Elev= 276.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.25'	**15.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.25' / 271.62' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.46 cfs @ 12.08 hrs HW=274.38' TW=274.21' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.46 cfs @ 2.01 fps)

Summary for Pond MH6: Manhole

Inflow Area = 21,550 sf, 85.33% Impervious, Inflow Depth = 6.94" for 100 Year event
Inflow = 3.45 cfs @ 12.08 hrs, Volume= 12,459 cf
Outflow = 3.45 cfs @ 12.08 hrs, Volume= 12,459 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.45 cfs @ 12.08 hrs, Volume= 12,459 cf
Routed to Pond MH25 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.99' @ 12.38 hrs
Flood Elev= 277.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.62'	**15.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.62' / 272.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.44 cfs @ 12.08 hrs HW=274.20' TW=273.86' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.44 cfs @ 2.81 fps)

Summary for Pond MH7: Manhole

Inflow Area = 12,631 sf, 77.28% Impervious, Inflow Depth = 6.40" for 100 Year event
Inflow = 1.85 cfs @ 12.08 hrs, Volume= 6,736 cf
Outflow = 1.85 cfs @ 12.08 hrs, Volume= 6,736 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.85 cfs @ 12.08 hrs, Volume= 6,736 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.95' @ 12.39 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	**24.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 272.50' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.85 cfs @ 12.08 hrs HW=273.81' TW=273.77' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.85 cfs @ 1.21 fps)

Summary for Pond MH8: Manhole

Inflow Area = 18,401 sf, 80.16% Impervious, Inflow Depth = 6.59" for 100 Year event
Inflow = 2.79 cfs @ 12.08 hrs, Volume= 10,108 cf
Outflow = 2.79 cfs @ 12.08 hrs, Volume= 10,108 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.79 cfs @ 12.08 hrs, Volume= 10,108 cf
Routed to Pond MH9 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.97' @ 12.38 hrs
Flood Elev= 276.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.72'	**15.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.72' / 272.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.78 cfs @ 12.08 hrs HW=274.07' TW=273.85' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.78 cfs @ 2.27 fps)

Summary for Pond MH9: Manhole

Inflow Area = 18,401 sf, 80.16% Impervious, Inflow Depth = 6.59" for 100 Year event
Inflow = 2.79 cfs @ 12.08 hrs, Volume= 10,108 cf
Outflow = 2.79 cfs @ 12.08 hrs, Volume= 10,108 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.79 cfs @ 12.08 hrs, Volume= 10,108 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.95' @ 12.39 hrs
Flood Elev= 277.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.50'	**24.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.50' / 272.50' S= 0.0000 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.79 cfs @ 12.08 hrs HW=273.85' TW=273.77' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 2.79 cfs @ 1.75 fps)

Summary for Pond RD1: Roof Drain

Inflow Area = 7,429 sf,100.00% Impervious, Inflow Depth = 7.92" for 100 Year event
Inflow = 1.37 cfs @ 12.08 hrs, Volume= 4,903 cf
Outflow = 1.37 cfs @ 12.08 hrs, Volume= 4,903 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.37 cfs @ 12.08 hrs, Volume= 4,903 cf
Routed to Pond UIS1 : Underground Chamber #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.68' @ 12.33 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.25'	**10.0" Round Culvert** L= 21.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.25' / 272.03' S= 0.0105 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.36 cfs @ 12.08 hrs HW=273.35' TW=273.08' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.36 cfs @ 2.50 fps)

Summary for Pond RD2: Roof Drain

Inflow Area = 18,290 sf,100.00% Impervious, Inflow Depth = 7.92" for 100 Year event
Inflow = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf
Outflow = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.49' @ 12.10 hrs
Flood Elev= 277.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.14'	**10.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 273.14' / 272.83' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=3.36 cfs @ 12.08 hrs HW=275.40' TW=273.76' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.36 cfs @ 6.16 fps)

Summary for Pond RD3: Roof Drain

Inflow Area = 18,290 sf,100.00% Impervious, Inflow Depth = 7.92" for 100 Year event
Inflow = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf
Outflow = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf
Routed to Pond UIS3 : Underground Chamber #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.49' @ 12.10 hrs
Flood Elev= 278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.98'	**10.0" Round Culvert** L= 14.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 272.98' / 272.83' S= 0.0102 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=3.36 cfs @ 12.08 hrs HW=275.40' TW=273.76' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.36 cfs @ 6.16 fps)

Summary for Pond RD4: Roof Drain

Inflow Area = 18,290 sf,100.00% Impervious, Inflow Depth = 7.92" for 100 Year event
Inflow = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf
Outflow = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.36 cfs @ 12.08 hrs, Volume= 12,072 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.31' @ 12.54 hrs
Flood Elev= 277.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.88'	**10.0" Round Culvert** L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.88' / 270.63' S= 0.0104 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=3.36 cfs @ 12.08 hrs HW=273.48' TW=271.84' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.36 cfs @ 6.16 fps)

Summary for Pond RD5: Roof Drain

Inflow Area = 20,565 sf,100.00% Impervious, Inflow Depth = 7.92" for 100 Year event
Inflow = 3.78 cfs @ 12.08 hrs, Volume= 13,573 cf
Outflow = 3.78 cfs @ 12.08 hrs, Volume= 13,573 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.78 cfs @ 12.08 hrs, Volume= 13,573 cf
Routed to Pond UIS5 : Underground Chamber #5

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.33' @ 12.53 hrs
Flood Elev= 278.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.81'	**10.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.81' / 270.63' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=3.78 cfs @ 12.08 hrs HW=273.91' TW=271.84' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.78 cfs @ 6.92 fps)

Summary for Pond SP-1: Northerly Culvert Crossing #1 (SP-1)

Inflow Area = 209,858 sf, 11.65% Impervious, Inflow Depth > 406.57" for 100 Year event
Inflow = 61.16 cfs @ 12.15 hrs, Volume= 7,110,192 cf, Incl. 54.70 cfs Base Flow
Outflow = 60.36 cfs @ 12.21 hrs, Volume= 7,097,757 cf, Atten= 1%, Lag= 3.7 min
Primary = 60.36 cfs @ 12.21 hrs, Volume= 7,097,757 cf
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.87' @ 12.24 hrs Surf.Area= 13,369 sf Storage= 13,624 cf

Plug-Flow detention time= 4.0 min calculated for 7,095,089 cf (100% of inflow)
Center-of-Mass det. time= 1.9 min (1,081.1 - 1,079.2)

Volume	Invert	Avail.Storage	Storage Description
#1	267.00'	15,407 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
267.00	175	160.0	0	0	175
268.00	258	168.0	215	215	441
269.00	344	172.0	300	515	642
270.00	431	176.0	387	902	848
271.50	12,972	455.3	7,884	8,786	14,888
272.00	13,514	461.2	6,621	15,407	15,375

Device	Routing	Invert	Outlet Devices
#1	Primary	267.93'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.72' / 267.93' S= -0.0036 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#2	Primary	267.48'	**21.0" Round RCP_Round 21"** L= 59.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 267.48' / 267.48' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf
#3	Primary	270.02'	**36.0" Round RCP_Round 36" X 6.00** L= 29.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 270.02' / 269.73' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=60.35 cfs @ 12.21 hrs HW=271.87' TW=271.71' (Dynamic Tailwater)
├─**1=RCP_Round 21"** (Inlet Controls 4.56 cfs @ 1.90 fps)
├─**2=RCP_Round 21"** (Inlet Controls 4.56 cfs @ 1.90 fps)
└─**3=RCP_Round 36"** (Outlet Controls 51.23 cfs @ 2.68 fps)

Summary for Pond SP-2: Southerly Culvert Crossing #2 (SP-2)

Inflow Area = 233,827 sf, 11.52% Impervious, Inflow Depth > 364.45" for 100 Year event
Inflow = 60.91 cfs @ 12.20 hrs, Volume= 7,101,468 cf
Outflow = 60.75 cfs @ 12.25 hrs, Volume= 7,085,146 cf, Atten= 0%, Lag= 2.7 min
Primary = 60.75 cfs @ 12.25 hrs, Volume= 7,085,146 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 271.71' @ 12.25 hrs Surf.Area= 10,449 sf Storage= 17,136 cf

Plug-Flow detention time= 5.1 min calculated for 7,082,891 cf (100% of inflow)
Center-of-Mass det. time= 2.5 min (1,083.5 - 1,081.0)

Volume	Invert	Avail.Storage	Storage Description
#1	266.85'	20,073 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
266.85	0	0.0	0	0	0
267.00	1,276	387.0	64	64	11,918
268.00	1,668	396.0	1,468	1,531	12,602
269.00	2,069	404.0	1,865	3,396	13,250
270.00	2,477	412.0	2,270	5,666	13,910
271.50	10,776	591.7	9,210	14,876	28,283
272.00	10,017	544.5	5,197	20,073	32,560

Device	Routing	Invert	Outlet Devices
#1	Primary	266.85'	**30.0" Round RCP_Round 30"** L= 30.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 266.37' / 266.85' S= -0.0160 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Primary	270.73'	**36.0" Round RCP_Round 36" X 6.00** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.73' / 270.49' S= 0.0096 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=60.75 cfs @ 12.25 hrs HW=271.71' TW=271.00' (Dynamic Tailwater)
├─**1=RCP_Round 30"** (Inlet Controls 27.21 cfs @ 5.54 fps)
└─**2=RCP_Round 36"** (Barrel Controls 33.54 cfs @ 4.14 fps)

Summary for Pond TD1: Stone Trench Drain

Inflow Area = 180,624 sf, 8.74% Impervious, Inflow Depth = 1.81" for 100 Year event
Inflow = 5.48 cfs @ 12.14 hrs, Volume= 27,240 cf
Outflow = 5.22 cfs @ 12.18 hrs, Volume= 27,240 cf, Atten= 5%, Lag= 2.1 min
Discarded = 0.20 cfs @ 10.94 hrs, Volume= 11,392 cf
Primary = 5.02 cfs @ 12.18 hrs, Volume= 15,848 cf
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.39' @ 12.18 hrs Surf.Area= 1,050 sf Storage= 349 cf
Flood Elev= 275.00' Surf.Area= 15,899 sf Storage= 11,024 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.7 min (848.7 - 848.0)

Volume	Invert	Avail.Storage	Storage Description
#1	271.20'	4 cf	**3.50'W x 300.00'L x 1.70'H Prismatoid** 1,785 cf Overall - 471 cf Embedded = 1,314 cf x 0.3% Voids
#2	271.70'	471 cf	**12.0" Round Pipe Storage** x 2 Inside #1 L= 300.0'
#3	272.90'	10,549 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		11,024 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.90	1,054	609.5	0	0	1,054
273.00	6,212	814.0	327	327	24,220
274.00	14,849	858.3	10,222	10,549	30,174

Device	Routing	Invert	Outlet Devices
#1	Primary	270.90'	**12.0" Round Culvert X 2.00** L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.90' / 270.55' S= 0.0051 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Discarded	271.20'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.20 cfs @ 10.94 hrs HW=271.24' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=5.02 cfs @ 12.18 hrs HW=272.39' TW=271.86' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 5.02 cfs @ 3.20 fps)

Summary for Pond TD2: Stone Trench Drain

Inflow Area = 6,530 sf, 0.00% Impervious, Inflow Depth = 1.22" for 100 Year event
Inflow = 0.14 cfs @ 12.12 hrs, Volume= 666 cf
Outflow = 0.14 cfs @ 12.15 hrs, Volume= 666 cf, Atten= 6%, Lag= 1.7 min
Discarded = 0.08 cfs @ 12.15 hrs, Volume= 117 cf
Primary = 0.05 cfs @ 12.15 hrs, Volume= 550 cf
Routed to Pond SP-2 : Southerly Culvert Crossing #2 (SP-2)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 272.03' @ 12.15 hrs Surf.Area= 427 sf Storage= 4 cf
Flood Elev= 275.00' Surf.Area= 1,466 sf Storage= 536 cf

Plug-Flow detention time= 0.1 min calculated for 666 cf (100% of inflow)
Center-of-Mass det. time= 0.1 min (909.7 - 909.6)

Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	167 cf	**3.50'W x 122.00'L x 1.75'H Prismatoid** 747 cf Overall - 192 cf Embedded = 556 cf x 30.0% Voids
#2	272.25'	192 cf	**12.0" Round Pipe Storage** x 2 Inside #1 L= 122.0'
#3	273.75'	178 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		536 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
273.75	430	253.0	0	0	430
274.00	1,039	301.0	178	178	2,547

Device	Routing	Invert	Outlet Devices
#1	Primary	271.90'	**12.0" Round Culvert** L= 52.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 271.90' / 271.38' S= 0.0100 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Discarded	272.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.08 cfs @ 12.15 hrs HW=272.03' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.05 cfs @ 12.15 hrs HW=272.03' TW=271.70' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.05 cfs @ 1.42 fps)

Summary for Pond UIS1: Underground Chamber #1

Inflow Area = 53,202 sf, 85.48% Impervious, Inflow Depth = 6.95" for 100 Year event
Inflow = 8.55 cfs @ 12.08 hrs, Volume= 30,804 cf
Outflow = 3.06 cfs @ 12.34 hrs, Volume= 30,804 cf, Atten= 64%, Lag= 15.5 min
Discarded = 0.73 cfs @ 11.40 hrs, Volume= 28,209 cf
Primary = 2.33 cfs @ 12.34 hrs, Volume= 2,595 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.64' @ 12.34 hrs Surf.Area= 3,803 sf Storage= 8,429 cf

Plug-Flow detention time= 66.2 min calculated for 30,795 cf (100% of inflow)
Center-of-Mass det. time= 66.2 min (811.5 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.20'	3,578 cf	**39.50'W x 96.28'L x 3.75'H Field A** 14,262 cf Overall - 5,316 cf Embedded = 8,946 cf x 40.0% Voids
#2A	271.70'	5,316 cf	**ADS_StormTech SC-800 +Cap** x 104 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 104 Chambers in 8 Rows Cap Storage= 3.4 cf x 2 x 8 rows = 54.7 cf
		8,895 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	271.70'	**15.0" Round Culvert** L= 137.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 271.70' / 270.00' S= 0.0124 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	274.30'	**4.0' 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
#3	Discarded	271.20'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.73 cfs @ 11.40 hrs HW=271.24' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.73 cfs)

Primary OutFlow Max=2.33 cfs @ 12.34 hrs HW=274.64' TW=271.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.33 cfs of 7.10 cfs potential flow)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 2.33 cfs @ 1.69 fps)

Pond UIS1: Underground Chamber #1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 8 rows = 54.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

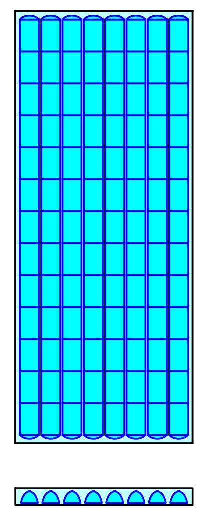
13 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 94.28' Row Length +12.0" End Stone x 2 = 96.28' Base Length
8 Rows x 51.0" Wide + 6.0" Spacing x 7 + 12.0" Side Stone x 2 = 39.50' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

104 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 8 Rows = 5,316.3 cf Chamber Storage

14,262.0 cf Field - 5,316.3 cf Chambers = 8,945.7 cf Stone x 40.0% Voids = 3,578.3 cf Stone Storage

Chamber Storage + Stone Storage = 8,894.6 cf = 0.204 af
Overall Storage Efficiency = 62.4%
Overall System Size = 96.28' x 39.50' x 3.75'

104 Chambers
528.2 cy Field
331.3 cy Stone



Summary for Pond UIS2: Underground Chamber #2

Inflow Area = 9,637 sf, 85.56% Impervious, Inflow Depth = 6.95" for 100 Year event
Inflow = 1.55 cfs @ 12.08 hrs, Volume= 5,584 cf
Outflow = 1.47 cfs @ 12.11 hrs, Volume= 5,584 cf, Atten= 5%, Lag= 1.8 min
Discarded = 0.17 cfs @ 11.57 hrs, Volume= 4,570 cf
Primary = 1.31 cfs @ 12.11 hrs, Volume= 1,014 cf
Routed to Pond SP-1 : Northerly Culvert Crossing #1 (SP-1)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 273.49' @ 12.11 hrs Surf.Area= 867 sf Storage= 786 cf

Plug-Flow detention time= 18.5 min calculated for 5,583 cf (100% of inflow)
Center-of-Mass det. time= 18.5 min (763.9 - 745.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.80'	502 cf	**16.58'W x 52.31'L x 1.83'H Field A** 1,590 cf Overall - 335 cf Embedded = 1,255 cf x 40.0% Voids
#2A	272.13'	335 cf	**ADS_StormTech SC-160LP +Cap** x 49 Inside #1 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		837 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	272.15'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 272.15' / 272.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	273.25'	**4.0' 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
#3	Discarded	271.80'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.17 cfs @ 11.57 hrs HW=271.82' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=1.30 cfs @ 12.11 hrs HW=273.49' TW=271.84' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.30 cfs of 2.73 cfs potential flow)
  └─**2=Broad-Crested Rectangular Weir** (Weir Controls 1.30 cfs @ 1.37 fps)

Pond UIS2: Underground Chamber #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-160LP +Cap (ADS StormTech® SC-160LP with cap length)
Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf
Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap

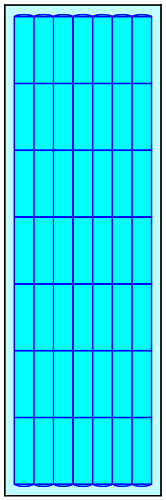
7 Chambers/Row x 7.12' Long +0.23' Cap Length x 2 = 50.31' Row Length +12.0" End Stone x 2 = 52.31' Base Length
7 Rows x 25.0" Wide + 12.0" Side Stone x 2 = 16.58' Base Width
4.0" Stone Base + 12.0" Chamber Height + 6.0" Stone Cover = 1.83' Field Height

49 Chambers x 6.8 cf = 335.0 cf Chamber Storage

1,590.3 cf of Field - 335.0 cf Chambers = 1,255.3 cf Stone x 40.0% Voids = 502.1 cf Stone Storage

Chamber Storage + Stone Storage = 837.1 cf = 0.019 af
Overall Storage Efficiency = 52.6%
Overall System Size = 52.31' x 16.58' x 1.83'

49 Chambers
58.9 cy Field
46.5 cy Stone



Summary for Pond UIS3: Underground Chamber #3

Inflow Area = 89,161 sf, 89.14% Impervious, Inflow Depth = 7.19" for 100 Year event
Inflow = 14.82 cfs @ 12.08 hrs, Volume= 53,446 cf
Outflow = 4.52 cfs @ 12.40 hrs, Volume= 53,446 cf, Atten= 70%, Lag= 18.7 min
Discarded = 1.33 cfs @ 11.45 hrs, Volume= 44,602 cf
Primary = 3.19 cfs @ 12.40 hrs, Volume= 8,843 cf
Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.95' @ 12.40 hrs Surf.Area= 6,945 sf Storage= 13,940 cf

Plug-Flow detention time= 38.4 min calculated for 53,446 cf (100% of inflow)
Center-of-Mass det. time= 38.4 min (782.5 - 744.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	272.00'	6,516 cf	**30.00'W x 231.50'L x 3.75'H Field A** 26,044 cf Overall - 9,755 cf Embedded = 16,289 cf x 40.0% Voids
#2A	272.50'	9,755 cf	**ADS_StormTech SC-800 +Cap** x 192 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 192 Chambers in 6 Rows Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf
		16,270 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	273.16'	**12.0" Round Culvert** L= 116.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 273.16' / 272.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	274.75'	**4.0' 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
#3	Device 1	273.50'	**9.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	272.00'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=1.33 cfs @ 11.45 hrs HW=272.04' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 1.33 cfs)

Primary OutFlow Max=3.19 cfs @ 12.40 hrs HW=274.95' TW=271.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.19 cfs of 3.39 cfs potential flow)
  ├**2=Broad-Crested Rectangular Weir** (Weir Controls 0.98 cfs @ 1.24 fps)
  └**3=Orifice/Grate** (Orifice Controls 2.20 cfs @ 4.99 fps)

Pond UIS3: Underground Chamber #3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

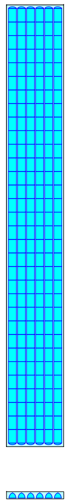
32 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 229.50' Row Length +12.0" End Stone x 2 = 231.50' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

192 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 6 Rows = 9,754.8 cf Chamber Storage

26,043.8 cf Field - 9,754.8 cf Chambers = 16,289.0 cf Stone x 40.0% Voids = 6,515.6 cf Stone Storage

Chamber Storage + Stone Storage = 16,270.4 cf = 0.374 af
Overall Storage Efficiency = 62.5%
Overall System Size = 231.50' x 30.00' x 3.75'

192 Chambers
964.6 cy Field
603.3 cy Stone



Summary for Pond UIS4: Underground Chamber #4

Inflow Area =	46,184 sf, 76.30% Impervious,	Inflow Depth = 6.33"	for 100 Year event
Inflow =	6.72 cfs @ 12.08 hrs,	Volume= 24,373 cf	
Outflow =	2.92 cfs @ 12.27 hrs,	Volume= 24,373 cf,	Atten= 57%, Lag= 11.5 min
Discarded =	0.48 cfs @ 11.24 hrs,	Volume= 18,563 cf	
Primary =	2.44 cfs @ 12.27 hrs,	Volume= 5,810 cf	

Routed to Link SP-3 : On Site Flow To Perennial Stream

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 275.94' @ 12.27 hrs Surf.Area= 2,489 sf Storage= 5,452 cf

Plug-Flow detention time= 36.1 min calculated for 24,367 cf (100% of inflow)
Center-of-Mass det. time= 36.1 min (784.8 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	272.50'	2,382 cf	**63.25'W x 39.35'L x 3.75'H Field A** 9,333 cf Overall - 3,377 cf Embedded = 5,956 cf x 40.0% Voids
#2A	273.00'	3,377 cf	**ADS_StormTech SC-800 +Cap** x 65 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 65 Chambers in 13 Rows Cap Storage= 3.4 cf x 2 x 13 rows = 88.9 cf
		5,760 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	272.10'	**12.0" Round Culvert** L= 110.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 272.10' / 271.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	276.00'	**4.0' 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
#3	Device 1	274.25'	**9.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Discarded	272.50'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.48 cfs @ 11.24 hrs HW=272.54' (Free Discharge)
└─**4=Exfiltration** (Exfiltration Controls 0.48 cfs)

Primary OutFlow Max=2.44 cfs @ 12.27 hrs HW=275.94' TW=271.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.44 cfs of 5.46 cfs potential flow)
  ├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Orifice Controls 2.44 cfs @ 5.52 fps)

Pond UIS4: Underground Chamber #4 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 13 rows = 88.9 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

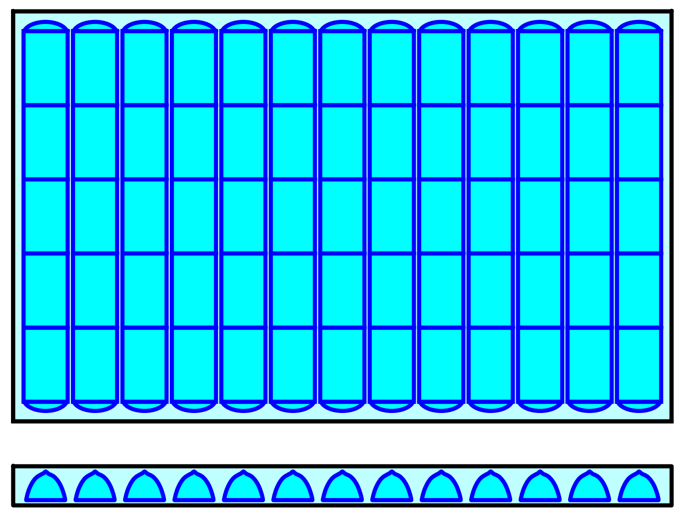
5 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 37.35' Row Length +12.0" End Stone x 2 = 39.35' Base Length
13 Rows x 51.0" Wide + 6.0" Spacing x 12 + 12.0" Side Stone x 2 = 63.25' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

65 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 13 Rows = 3,377.4 cf Chamber Storage

9,333.3 cf Field - 3,377.4 cf Chambers = 5,955.9 cf of Stone x 40.0% Voids = 2,382.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,759.8 cf = 0.132 af
Overall Storage Efficiency = 61.7%
Overall System Size = 39.35' x 63.25' x 3.75'

65 Chambers
345.7 cy Field
220.6 cy Stone



Summary for Pond UIS5: Underground Chamber #5

Inflow Area =	158,089 sf, 62.98% Impervious,	Inflow Depth = 5.44" for 100 Year event		
Inflow =	19.49 cfs @	12.09 hrs, Volume=	71,679 cf	
Outflow =	3.25 cfs @	12.56 hrs, Volume=	71,679 cf,	Atten= 83%, Lag= 28.5 min
Discarded =	1.66 cfs @	11.47 hrs, Volume=	69,415 cf	
Primary =	1.59 cfs @	12.56 hrs, Volume=	2,265 cf	

Routed to Pond MH19 : Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 274.27' @ 12.56 hrs Surf.Area= 8,653 sf Storage= 22,781 cf
Flood Elev= 274.00' Surf.Area= 8,653 sf Storage= 21,847 cf

Plug-Flow detention time= 90.5 min calculated for 71,679 cf (100% of inflow)
Center-of-Mass det. time= 90.5 min (845.6 - 755.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	269.80'	11,567 cf	**30.00'W x 288.43'L x 4.75'H Field A** 41,102 cf Overall - 12,183 cf Embedded = 28,919 cf x 40.0% Voids
#2A	270.80'	12,183 cf	**ADS_StormTech SC-800 +Cap** x 240 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 240 Chambers in 6 Rows Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf
		23,751 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	272.98'	**12.0" Round Culvert** L= 97.6' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 272.98' / 272.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	274.00'	**4.0' 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
#3	Discarded	269.80'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=1.66 cfs @ 11.47 hrs HW=269.85' (Free Discharge)
3=Exfiltration (Exfiltration Controls 1.66 cfs)

Primary OutFlow Max=1.59 cfs @ 12.56 hrs HW=274.27' TW=271.07' (Dynamic Tailwater)
1=Culvert (Passes 1.59 cfs of 2.65 cfs potential flow)
2=Broad-Crested Rectangular Weir (Weir Controls 1.59 cfs @ 1.48 fps)

Pond UIS5: Underground Chamber #5 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

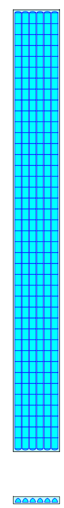
40 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 286.43' Row Length +12.0" End Stone x 2 = 288.43' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
12.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.75' Field Height

240 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 6 Rows = 12,183.2 cf Chamber Storage

41,101.7 cf Field - 12,183.2 cf Chambers = 28,918.6 cf Stone x 40.0% Voids = 11,567.4 cf Stone Storage

Chamber Storage + Stone Storage = 23,750.6 cf = 0.545 af
Overall Storage Efficiency = 57.8%
Overall System Size = 288.43' x 30.00' x 4.75'

240 Chambers
1,522.3 cy Field
1,071.1 cy Stone



Summary for Link SP-3: On Site Flow To Perennial Stream

Inflow Area = 867,482 sf, 37.13% Impervious, Inflow Depth > 98.81" for 100 Year event
Inflow = 72.97 cfs @ 12.32 hrs, Volume= 7,142,975 cf
Primary = 72.97 cfs @ 12.32 hrs, Volume= 7,142,975 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 271.00'

Events for Subcatchment CB1: Subcat CB1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.75	2,601	2.88
10 Year	5.22	1.17	4,149	4.59
100 Year	**8.16**	**1.85**	**6,657**	**7.37**

Events for Subcatchment CB10A: Subcat CB10A

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.19	653	2.56
10 Year	5.22	0.29	1,049	4.11
100 Year	**8.16**	**0.47**	**1,706**	**6.69**

Events for Subcatchment CB10B: Subcat CB10B

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.67	2,326	2.67
10 Year	5.22	1.04	3,726	4.28
100 Year	**8.16**	**1.67**	**6,030**	**6.93**

Events for Subcatchment CB11: Subcat CB11

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.74	2,564	2.67
10 Year	5.22	1.15	4,107	4.28
100 Year	**8.16**	**1.84**	**6,646**	**6.93**

Events for Subcatchment CB12: Subcat CB12

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.38	1,329	2.23
10 Year	5.22	0.60	2,153	3.61
100 Year	**8.16**	**0.98**	**3,565**	**5.98**

Events for Subcatchment CB13: Subcat CB13

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.25	879	2.55
10 Year	5.22	0.39	1,412	4.09
100 Year	**8.16**	**0.63**	**2,299**	**6.66**

Events for Subcatchment CB14: Subcat CB14

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.40	1,401	2.73
10 Year	5.22	0.63	2,242	4.36
100 Year	**8.16**	**1.00**	**3,620**	**7.04**

Events for Subcatchment CB15: Subcat CB15

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.63	2,196	1.31
10 Year	5.22	0.98	3,725	2.22
100 Year	**8.16**	**1.78**	**6,737**	**4.01**

Events for Subcatchment CB16: Subcat CB16

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.55	1,919	1.12
10 Year	5.22	0.86	3,315	1.93
100 Year	**8.16**	**1.62**	**6,189**	**3.61**

Events for Subcatchment CB17: Subcat CB17

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.75	2,618	0.87
10 Year	5.22	1.17	4,681	1.56
100 Year	**8.16**	**2.37**	**9,248**	**3.08**

Events for Subcatchment CB2: Subcat CB2

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.19	654	1.70
10 Year	5.22	0.29	1,082	2.81
100 Year	**8.16**	**0.50**	**1,866**	**4.85**

Events for Subcatchment CB3A: Subcat CB3A

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.25	874	2.93
10 Year	5.22	0.39	1,394	4.67
100 Year	**8.16**	**0.62**	**2,232**	**7.48**

Events for Subcatchment CB3B: Subcat CB3B

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.37	1,281	2.54
10 Year	5.22	0.57	2,059	4.08
100 Year	**8.16**	**0.92**	**3,352**	**6.64**

Events for Subcatchment CB4A: Subcat CB4A

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.27	926	2.80
10 Year	5.22	0.42	1,480	4.47
100 Year	**8.16**	**0.66**	**2,381**	**7.20**

Events for Subcatchment CB4B: Subcat CB4B

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.50	1,731	2.32
10 Year	5.22	0.78	2,797	3.75
100 Year	**8.16**	**1.26**	**4,607**	**6.18**

Events for Subcatchment CB4C: Subcat CB4C

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.69	2,385	2.66
10 Year	5.22	1.07	3,821	4.27
100 Year	**8.16**	**1.71**	**6,186**	**6.91**

Events for Subcatchment CB4D: Subcat CB4D

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.66	2,305	2.45
10 Year	5.22	1.03	3,712	3.95
100 Year	**8.16**	**1.67**	**6,070**	**6.46**

Events for Subcatchment CB5A: Subcat CB5A

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.74	2,567	2.94
10 Year	5.22	1.15	4,090	4.68
100 Year	**8.16**	**1.82**	**6,547**	**7.50**

Events for Subcatchment CB5B: Subcat CB5B

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.28	961	2.98
10 Year	5.22	0.43	1,530	4.75
100 Year	**8.16**	**0.68**	**2,446**	**7.59**

Events for Subcatchment CB5C: Subcat CB5C

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.18	626	2.91
10 Year	5.22	0.28	999	4.64
100 Year	**8.16**	**0.44**	**1,600**	**7.44**

Events for Subcatchment CB6: Subcat CB6

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.73	2,553	2.43
10 Year	5.22	1.14	4,112	3.91
100 Year	**8.16**	**1.85**	**6,736**	**6.40**

Events for Subcatchment CB7A: Subcat CB7A

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.42	1,472	2.49
10 Year	5.22	0.66	2,368	4.00
100 Year	**8.16**	**1.07**	**3,866**	**6.53**

Events for Subcatchment CB7B: Subcat CB7B

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.69	2,384	2.53
10 Year	5.22	1.07	3,831	4.07
100 Year	**8.16**	**1.72**	**6,241**	**6.63**

Events for Subcatchment CB8: Subcat CB8

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.67	2,325	2.54
10 Year	5.22	1.04	3,735	4.08
100 Year	**8.16**	**1.68**	**6,082**	**6.64**

Events for Subcatchment CB9A: Subcat CB9A

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.72	2,495	2.55
10 Year	5.22	1.12	4,007	4.09
100 Year	**8.16**	**1.80**	**6,522**	**6.66**

Events for Subcatchment CB9B: Subcat CB9B

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.75	2,599	2.12
10 Year	5.22	1.17	4,225	3.44
100 Year	**8.16**	**1.92**	**7,048**	**5.74**

Events for Subcatchment CB9C: Subcat CB9C

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.28	969	3.14
10 Year	5.22	0.43	1,540	4.98
100 Year	**8.16**	**0.68**	**2,448**	**7.92**

Events for Subcatchment CB9D: Subcat CB9D

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.24	827	1.98
10 Year	5.22	0.37	1,350	3.24
100 Year	**8.16**	**0.62**	**2,275**	**5.45**

Events for Subcatchment P-1: Subcat P-1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.19	652	0.45
10 Year	5.22	0.29	1,336	0.92
100 Year	**8.16**	**0.77**	**3,162**	**2.18**

Events for Subcatchment P-2: Subcat P-2

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.00	2	0.00
10 Year	5.22	0.01	134	0.25
100 Year	**8.16**	**0.14**	**666**	**1.22**

Events for Subcatchment P-3: Subcat P-3

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.03	119	0.07
10 Year	5.22	0.05	573	0.35
100 Year	**8.16**	**0.50**	**2,241**	**1.37**

Events for Subcatchment P-4: Subcat P-4

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	2.20	9,282	0.39
10 Year	5.22	3.44	16,615	0.69
100 Year	**8.16**	**6.78**	**38,315**	**1.60**

Events for Subcatchment P-5: Subcat P-5

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.62	2,344	0.37
10 Year	5.22	0.97	5,072	0.80
100 Year	**8.16**	**2.81**	**12,721**	**2.01**

Events for Subcatchment P-6: Subcat P-6

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.20	688	0.33
10 Year	5.22	0.31	1,549	0.73
100 Year	**8.16**	**0.96**	**4,041**	**1.91**

Events for Subcatchment P-7: Subcat P-7

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.27	1,144	0.17
10 Year	5.22	0.42	3,321	0.50
100 Year	**8.16**	**1.98**	**10,478**	**1.59**

Events for Subcatchment PATIO: Subcat PATIO

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.18	623	3.14
10 Year	5.22	0.28	990	4.98
100 Year	**8.16**	**0.44**	**1,573**	**7.92**

Events for Subcatchment R-1: Subcat R-1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	0.38	1,319	3.14
10 Year	5.22	0.59	2,095	4.98
100 Year	**8.16**	**0.93**	**3,330**	**7.92**

Events for Subcatchment R-2: Subcat R-2

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	1.38	4,781	3.14
10 Year	5.22	2.15	7,595	4.98
100 Year	**8.16**	**3.36**	**12,072**	**7.92**

Events for Subcatchment R-3: Subcat R-3

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	1.38	4,781	3.14
10 Year	5.22	2.15	7,595	4.98
100 Year	**8.16**	**3.36**	**12,072**	**7.92**

Events for Subcatchment R-4: Subcat R-4

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	1.38	4,781	3.14
10 Year	5.22	2.15	7,595	4.98
100 Year	**8.16**	**3.36**	**12,072**	**7.92**

Events for Subcatchment R-5: Subcat R-5

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2 Year	3.37	1.55	5,376	3.14
10 Year	5.22	2.41	8,539	4.98
100 Year	**8.16**	**3.78**	**13,573**	**7.92**

Events for Pond 1: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.75	0.75	272.31	**0**
10 Year	1.17	1.17	273.21	0
100 Year	**1.85**	**1.85**	**274.69**	0

Events for Pond 2: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.19	0.19	273.34	**0**
10 Year	0.29	0.30	273.84	0
100 Year	**0.50**	**0.51**	**274.99**	0

Events for Pond 3A: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.25	0.26	272.80	**0**
10 Year	0.39	0.40	273.34	0
100 Year	**0.62**	**0.63**	**273.82**	0

Events for Pond 3B: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.37	0.38	272.81	**0**
10 Year	0.57	0.58	273.34	0
100 Year	**0.92**	**0.94**	**273.85**	0

Events for Pond 4A: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.27	0.28	272.89	**0**
10 Year	0.42	0.42	273.22	0
100 Year	**0.66**	**0.69**	**274.72**	0

Events for Pond 4B: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.50	0.52	272.91	**0**
10 Year	0.78	0.81	273.22	0
100 Year	**1.26**	**1.30**	**274.73**	0

Events for Pond 4C: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.69	0.69	273.09	**0**
10 Year	1.07	1.07	273.47	0
100 Year	**1.71**	**1.71**	**274.84**	0

Events for Pond 4D: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.66	0.66	273.03	**0**
10 Year	1.03	1.03	273.45	0
100 Year	**1.67**	**1.67**	**274.84**	0

Events for Pond 5A: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.74	0.74	273.47	**0**
10 Year	1.15	1.15	273.85	0
100 Year	**1.82**	**1.82**	**275.03**	0

Events for Pond 5B: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.28	0.28	273.42	**0**
10 Year	0.43	0.43	273.84	0
100 Year	**0.68**	**0.68**	**275.01**	0

Events for Pond 5C: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.18	0.18	273.45	**0**
10 Year	0.28	0.28	273.84	0
100 Year	**0.44**	**0.44**	**275.01**	0

Events for Pond 6: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.73	0.73	273.25	**0**
10 Year	1.14	1.14	273.84	0
100 Year	**1.85**	**1.85**	**274.97**	0

Events for Pond 7A: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.42	0.42	273.40	**0**
10 Year	0.66	0.66	273.84	0
100 Year	**1.07**	**1.07**	**274.98**	0

Events for Pond 7B: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.69	0.69	273.69	**0**
10 Year	1.07	1.07	273.85	0
100 Year	**1.72**	**1.72**	**274.99**	0

Events for Pond 8: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.67	0.67	274.14	**0**
10 Year	1.04	1.04	274.74	0
100 Year	**1.68**	**1.68**	**276.06**	0

Events for Pond 9A: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.72	0.72	273.99	**0**
10 Year	1.12	1.12	274.76	0
100 Year	**1.80**	**1.80**	**276.13**	0

Events for Pond 9B: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.75	0.75	274.44	**0**
10 Year	1.17	1.17	274.76	0
100 Year	**1.92**	**1.92**	**276.08**	0

Events for Pond 9C: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.28	0.32	273.91	**0**
10 Year	0.43	0.45	274.74	0
100 Year	**0.68**	**0.70**	**276.01**	0

Events for Pond 9D: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.24	0.24	273.98	**0**
10 Year	0.37	0.37	274.75	0
100 Year	**0.62**	**0.62**	**276.09**	0

Events for Pond 10A: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.19	0.19	271.64	**0**
10 Year	0.29	0.29	271.95	0
100 Year	**0.47**	**0.47**	**274.28**	0

Events for Pond 10B: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.67	0.67	271.20	**0**
10 Year	1.04	1.04	271.95	0
100 Year	**1.67**	**1.67**	**274.28**	0

Events for Pond 11: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.74	0.74	271.09	**0**
10 Year	1.15	1.15	271.95	0
100 Year	**1.84**	**1.84**	**274.28**	0

Events for Pond 12: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.38	0.38	271.74	**0**
10 Year	0.60	0.60	272.07	0
100 Year	**0.98**	**0.98**	**274.30**	0

Events for Pond 13: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.25	0.25	272.10	**0**
10 Year	0.39	0.39	272.25	0
100 Year	**0.63**	**0.63**	**274.30**	0

Events for Pond 14: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.40	0.40	271.80	**0**
10 Year	0.63	0.63	272.09	0
100 Year	**1.00**	**1.00**	**274.30**	0

Events for Pond 15: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.63	0.63	272.94	**0**
10 Year	0.98	0.98	273.15	0
100 Year	**1.78**	**1.78**	**274.33**	0

Events for Pond 16: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.55	0.55	274.72	**0**
10 Year	0.86	0.86	274.87	0
100 Year	**1.62**	**1.62**	**275.21**	0

Events for Pond 17: Catch Basin

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.75	0.75	275.41	**0**
10 Year	1.17	1.17	275.54	0
100 Year	**2.37**	**2.37**	**275.84**	0

Events for Pond MH1: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.75	0.75	272.28	**0**
10 Year	1.17	1.17	273.21	0
100 Year	**1.85**	**1.85**	**274.65**	0

Events for Pond MH11: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.42	1.42	273.88	**0**
10 Year	2.21	2.21	274.73	0
100 Year	**3.60**	**3.60**	**275.95**	0

Events for Pond MH12: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.27	1.27	273.90	**0**
10 Year	1.94	1.94	274.74	0
100 Year	**3.12**	**3.12**	**276.00**	0

Events for Pond MH13: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.27	1.27	273.88	**0**
10 Year	1.94	1.94	274.73	0
100 Year	**3.12**	**3.12**	**275.95**	0

Events for Pond MH15: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.86	0.86	271.08	**0**
10 Year	1.34	1.34	271.95	0
100 Year	**2.14**	**2.14**	**274.28**	0

Events for Pond MH16: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.86	0.86	271.08	**0**
10 Year	1.34	1.34	271.94	0
100 Year	**2.14**	**2.14**	**274.27**	0

Events for Pond MH17: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.74	0.74	271.08	**0**
10 Year	1.15	1.15	271.94	0
100 Year	**1.84**	**1.84**	**274.27**	0

Events for Pond MH19: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.00	0.00	270.95	**0**
10 Year	0.00	0.00	270.95	0
100 Year	**1.59**	**1.59**	**271.07**	0

Events for Pond MH2: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.63	0.63	272.80	**0**
10 Year	0.97	0.97	273.34	0
100 Year	**1.55**	**1.55**	**273.81**	0

Events for Pond MH20: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	2.97	2.97	271.22	**0**
10 Year	4.63	4.63	271.95	0
100 Year	**8.38**	**8.38**	**274.28**	0

Events for Pond MH21: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	2.97	2.97	271.46	**0**
10 Year	4.63	4.63	271.95	0
100 Year	**8.38**	**8.38**	**274.29**	0

Events for Pond MH22: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	2.97	2.97	271.74	**0**
10 Year	4.63	4.63	272.04	0
100 Year	**8.38**	**8.38**	**274.30**	0

Events for Pond MH23: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.93	1.93	272.78	**0**
10 Year	3.01	3.01	273.00	0
100 Year	**5.77**	**5.77**	**274.32**	0

Events for Pond MH24: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.30	1.30	274.50	**0**
10 Year	2.03	2.03	274.64	0
100 Year	**3.99**	**3.99**	**274.98**	0

Events for Pond MH25: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.40	1.40	273.12	**0**
10 Year	2.16	2.16	273.83	0
100 Year	**3.45**	**3.45**	**274.95**	0

Events for Pond MH26: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	2.18	2.18	272.89	**0**
10 Year	3.37	3.37	273.22	0
100 Year	**5.34**	**5.34**	**274.72**	0

Events for Pond MH29: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.36	1.40	272.94	**0**
10 Year	2.11	2.16	273.26	0
100 Year	**3.39**	**3.40**	**274.76**	0

Events for Pond MH3: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.63	0.63	272.64	**0**
10 Year	0.97	0.97	273.33	0
100 Year	**1.55**	**1.55**	**273.65**	0

Events for Pond MH30: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.35	1.36	272.99	**0**
10 Year	2.10	2.11	273.38	0
100 Year	**3.38**	**3.39**	**274.80**	0

Events for Pond MH31: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.18	0.18	273.40	**0**
10 Year	0.28	0.28	273.84	0
100 Year	**0.44**	**0.44**	**275.01**	0

Events for Pond MH32: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.96	0.96	273.97	**0**
10 Year	1.49	1.49	274.75	0
100 Year	**2.42**	**2.42**	**276.08**	0

Events for Pond MH33: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.42	1.42	273.92	**0**
10 Year	2.21	2.21	274.74	0
100 Year	**3.60**	**3.60**	**276.03**	0

Events for Pond MH4: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	2.18	2.18	272.48	**0**
10 Year	3.37	3.37	273.21	0
100 Year	**5.34**	**5.34**	**274.66**	0

Events for Pond MH5: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.19	1.20	273.40	**0**
10 Year	1.86	1.87	273.84	0
100 Year	**2.94**	**2.94**	**275.01**	0

Events for Pond MH6: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.40	1.40	273.33	**0**
10 Year	2.16	2.16	273.84	0
100 Year	**3.45**	**3.45**	**274.99**	0

Events for Pond MH7: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.73	0.73	273.01	**0**
10 Year	1.14	1.14	273.83	0
100 Year	**1.85**	**1.85**	**274.95**	0

Events for Pond MH8: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.11	1.11	273.32	**0**
10 Year	1.73	1.73	273.84	0
100 Year	**2.79**	**2.79**	**274.97**	0

Events for Pond MH9: Manhole

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.11	1.11	273.06	**0**
10 Year	1.73	1.73	273.83	0
100 Year	**2.79**	**2.79**	**274.95**	0

Events for Pond RD1: Roof Drain

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.56	0.56	272.67	**0**
10 Year	0.87	0.87	273.21	0
100 Year	**1.37**	**1.37**	**274.68**	0

Events for Pond RD2: Roof Drain

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.38	1.38	273.86	**0**
10 Year	2.15	2.15	274.28	0
100 Year	**3.36**	**3.36**	**275.49**	0

Events for Pond RD3: Roof Drain

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.38	1.38	273.75	**0**
10 Year	2.15	2.15	274.14	0
100 Year	**3.36**	**3.36**	**275.49**	0

Events for Pond RD4: Roof Drain

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.38	1.38	271.62	**0**
10 Year	2.15	2.15	272.02	0
100 Year	**3.36**	**3.36**	**274.31**	0

Events for Pond RD5: Roof Drain

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.55	1.55	271.64	**0**
10 Year	2.41	2.41	272.11	0
100 Year	**3.78**	**3.78**	**274.33**	0

Events for Pond SP-1: Northerly Culvert Crossing #1 (SP-1)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	55.58	55.46	271.79	12,603
10 Year	56.18	55.99	271.80	12,719
100 Year	**61.16**	**60.36**	**271.87**	**13,624**

Events for Pond SP-2: Southerly Culvert Crossing #2 (SP-2)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	55.60	55.56	271.65	16,439
10 Year	56.21	56.15	271.65	16,520
100 Year	**60.91**	**60.75**	**271.71**	**17,136**

Events for Pond TD1: Stone Trench Drain

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	1.06	1.05	**0.20**	0.85	271.81	32
10 Year	1.66	1.64	0.20	1.44	271.86	51
100 Year	**5.48**	**5.22**	0.20	**5.02**	**272.39**	**349**

Events for Pond TD2: Stone Trench Drain

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.00	0.00	0.00	0.00	272.00	0
10 Year	0.01	0.01	0.00	0.01	272.00	0
100 Year	**0.14**	**0.14**	**0.08**	**0.05**	**272.03**	**4**

Events for Pond UIS1: Underground Chamber #1

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	3.48	0.73	**0.73**	0.00	272.28	2,575
10 Year	5.41	0.73	0.73	0.00	273.21	5,328
100 Year	**8.55**	**3.06**	0.73	**2.33**	**274.64**	**8,429**

Events for Pond UIS2: Underground Chamber #2

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	0.63	0.17	**0.17**	0.00	272.55	377
10 Year	0.97	0.38	0.17	0.21	273.32	729
100 Year	**1.55**	**1.47**	0.17	**1.31**	**273.49**	**786**

Events for Pond UIS3: Underground Chamber #3

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	5.98	1.33	**1.33**	0.00	273.01	4,339
10 Year	9.33	1.70	1.33	0.37	273.83	8,835
100 Year	**14.82**	**4.52**	1.33	**3.19**	**274.95**	**13,940**

Events for Pond UIS4: Underground Chamber #4

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	2.68	0.48	**0.48**	0.00	273.88	2,256
10 Year	4.15	1.17	0.48	0.69	274.73	3,818
100 Year	**6.72**	**2.92**	0.48	**2.44**	**275.94**	**5,452**

Events for Pond UIS5: Underground Chamber #5

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2 Year	7.49	1.66	**1.66**	0.00	271.08	5,460
10 Year	11.68	1.66	1.66	0.00	271.94	11,503
100 Year	**19.49**	**3.25**	1.66	**1.59**	**274.27**	**22,781**

Events for Link SP-3: On Site Flow To Perennial Stream

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2 Year	57.75	57.75	**271.00**
10 Year	59.58	59.58	271.00
100 Year	**72.97**	**72.97**	271.00

ISSUED FOR DRAINAGE REPORT
SEPTEMBER 18, 2025

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
C	9/18/25	REVISED PER NOI PEER REVIEW
B	7/21/25	REVISED PER NOI PEER REVIEW
A	6/11/25	REVISED PER TOWN COMMENTS

APPLICANT\OWNER:

TAG CENTRAL LLC
275 REGATTA DRIVE
JUPITER, FL 33477

PROJECT:

40B MULTIFAMILY
444 EAST CENTRAL STREET
FRANKLIN, MA

PROJECT NO.	3317-01	DATE:	02-11-2025
SCALE:	1" = 50'	DWG. NAME:	C-3317-01
DESIGNED BY:	MTB	CHECKED BY:	CMQ

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
100 COMMERCE WAY, SUITE 5
WOBURN MA 01801
TEL: (781) 935-6889
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WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: PROPOSED WATERSHED PLAN

SHEET No. PWS

N:\PROJECTS\3317-01\CIVIL\DRAWINGS\CURRENT\C-3317-01_WATERSHED-PROPOSED.DWG

SECTION 6.0 - APPENDIX

NOAA Atlas 14, Volume 10, Version 3
Location name: Franklin, Massachusetts, USA*
Latitude: 42.0791°, Longitude: -71.3773°
Elevation: 270 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF tabular | PF graphical | Maps & aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.321** (0.252-0.404)	**0.391** (0.307-0.493)	**0.506** (0.398-0.640)	**0.602** (0.468-0.766)	**0.733** (0.551-0.976)	**0.832** (0.612-1.13)	**0.935** (0.667-1.32)	**1.05** (0.709-1.52)	**1.21** (0.788-1.83)	**1.35** (0.853-2.07)
10-min	**0.454** (0.357-0.572)	**0.554** (0.435-0.698)	**0.717** (0.561-0.906)	**0.852** (0.663-1.08)	**1.04** (0.780-1.38)	**1.18** (0.867-1.60)	**1.32** (0.945-1.87)	**1.49** (1.00-2.16)	**1.72** (1.12-2.59)	**1.91** (1.21-2.93)
15-min	**0.535** (0.420-0.673)	**0.652** (0.512-0.821)	**0.843** (0.660-1.07)	**1.00** (0.780-1.28)	**1.22** (0.918-1.63)	**1.39** (1.02-1.89)	**1.56** (1.11-2.20)	**1.75** (1.18-2.54)	**2.02** (1.31-3.04)	**2.25** (1.42-3.45)
30-min	**0.733** (0.576-0.922)	**0.896** (0.702-1.13)	**1.16** (0.907-1.46)	**1.38** (1.07-1.75)	**1.68** (1.26-2.24)	**1.90** (1.40-2.59)	**2.14** (1.53-3.03)	**2.41** (1.63-3.49)	**2.78** (1.81-4.19)	**3.09** (1.96-4.75)
60-min	**0.932** (0.732-1.17)	**1.14** (0.893-1.43)	**1.47** (1.15-1.86)	**1.75** (1.36-2.23)	**2.14** (1.60-2.84)	**2.42** (1.78-3.30)	**2.73** (1.95-3.86)	**3.06** (2.07-4.44)	**3.55** (2.30-5.34)	**3.94** (2.49-6.05)
2-hr	**1.19** (0.945-1.49)	**1.47** (1.16-1.84)	**1.93** (1.52-2.42)	**2.30** (1.81-2.91)	**2.82** (2.14-3.75)	**3.21** (2.39-4.37)	**3.62** (2.62-5.15)	**4.12** (2.79-5.94)	**4.88** (3.17-7.29)	**5.52** (3.51-8.42)
3-hr	**1.38** (1.10-1.72)	**1.71** (1.36-2.12)	**2.24** (1.77-2.80)	**2.68** (2.11-3.37)	**3.29** (2.51-4.36)	**3.74** (2.80-5.08)	**4.23** (3.06-6.01)	**4.83** (3.28-6.94)	**5.76** (3.75-8.57)	**6.56** (4.17-9.96)
6-hr	**1.79** (1.43-2.20)	**2.20** (1.76-2.71)	**2.87** (2.29-3.56)	**3.43** (2.72-4.28)	**4.20** (3.22-5.62)	**4.76** (3.59-6.43)	**5.38** (3.96-7.60)	**6.15** (4.19-8.76)	**7.34** (4.80-10.8)	**8.37** (5.34-12.6)
12-hr	**2.29** (1.85-2.80)	**2.79** (2.25-3.42)	**3.61** (2.90-4.44)	**4.29** (3.43-5.31)	**5.23** (4.04-6.81)	**5.92** (4.48-7.91)	**6.68** (4.91-9.32)	**7.59** (5.20-10.7)	**8.99** (5.91-13.2)	**10.2** (6.53-15.2)
24-hr	**2.75** (2.24-3.34)	**3.37** (2.74-4.09)	**4.38** (3.55-5.34)	**5.22** (4.20-6.41)	**6.38** (4.96-8.25)	**7.23** (5.51-9.59)	**8.16** (6.04-11.3)	**9.30** (6.40-13.0)	**11.1** (7.29-16.1)	**12.6** (8.07-18.6)
2-day	**3.09** (2.54-3.73)	**3.86** (3.16-4.65)	**5.10** (4.17-6.18)	**6.14** (4.98-7.48)	**7.56** (5.94-9.74)	**8.61** (6.62-11.4)	**9.76** (7.31-13.5)	**11.2** (7.75-15.6)	**13.5** (8.94-19.5)	**15.5** (10.0-22.9)
3-day	**3.37** (2.78-4.04)	**4.19** (3.45-5.03)	**5.53** (4.54-6.67)	**6.64** (5.42-8.06)	**8.18** (6.45-10.5)	**9.30** (7.18-12.2)	**10.5** (7.92-14.5)	**12.1** (8.39-16.8)	**14.6** (9.68-21.0)	**16.8** (10.8-24.6)
4-day	**3.63** (3.01-4.34)	**4.48** (3.71-5.37)	**5.87** (4.84-7.06)	**7.03** (5.75-8.49)	**8.62** (6.81-11.0)	**9.78** (7.57-12.8)	**11.1** (8.32-15.2)	**12.7** (8.80-17.5)	**15.2** (10.1-21.8)	**17.4** (11.3-25.5)
7-day	**4.38** (3.65-5.20)	**5.28** (4.39-6.28)	**6.75** (5.60-8.06)	**7.97** (6.56-9.57)	**9.65** (7.66-12.2)	**10.9** (8.45-14.1)	**12.2** (9.20-16.6)	**13.9** (9.69-19.0)	**16.4** (10.9-23.3)	**18.6** (12.0-26.9)
10-day	**5.09** (4.26-6.02)	**6.02** (5.03-7.13)	**7.54** (6.27-8.98)	**8.80** (7.27-10.5)	**10.5** (8.38-13.2)	**11.8** (9.19-15.2)	**13.2** (9.91-17.7)	**14.8** (10.4-20.3)	**17.3** (11.6-24.5)	**19.3** (12.6-28.0)
20-day	**7.18** (6.05-8.42)	**8.17** (6.88-9.60)	**9.80** (8.22-11.6)	**11.1** (9.28-13.2)	**13.0** (10.4-16.1)	**14.4** (11.2-18.2)	**15.9** (11.9-20.8)	**17.5** (12.3-23.6)	**19.7** (13.2-27.6)	**21.4** (14.0-30.8)
30-day	**8.91** (7.56-10.4)	**9.96** (8.43-11.6)	**11.7** (9.83-13.7)	**13.1** (10.9-15.4)	**15.0** (12.0-18.4)	**16.5** (12.9-20.7)	**18.0** (13.5-23.3)	**19.5** (13.8-26.3)	**21.6** (14.6-30.1)	**23.2** (15.1-33.0)
45-day	**11.1** (9.45-12.9)	**12.2** (10.4-14.2)	**14.0** (11.8-16.3)	**15.5** (13.0-18.2)	**17.5** (14.1-21.3)	**19.1** (14.9-23.7)	**20.7** (15.4-26.5)	**22.1** (15.7-29.6)	**24.0** (16.2-33.3)	**25.3** (16.6-36.0)
60-day	**12.9** (11.0-15.0)	**14.1** (12.0-16.3)	**15.9** (13.5-18.6)	**17.5** (14.8-20.5)	**19.6** (15.8-23.8)	**21.3** (16.7-26.3)	**22.9** (17.1-29.1)	**24.3** (17.3-32.4)	**26.0** (17.7-36.0)	**27.1** (17.8-38.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Manning's Roughness Coefficients ("n")

Conduit	Manning's Coefficients
Closed Conduits	
Asbestos-Cement Pipe	0.011 to 0.015
Brick	0.013 to 0.017
Cast Iron Pipe	
Cement-lined and seal-coated	0.011 to 0.015
Concrete (Monolithic)	
Smooth forms	0.012 to 0.014
Rough forms	0.015 to 0.017
Concrete Pipe	0.011 to 0.015
Corrugated-Metal Pipe (1/2 - STUL 34470 2 1/2-inch corrgtn.)	
Plain	0.022 to 0.026
Paved invert	0.018 to 0.022
Spun asphalt-lined	0.011 to 0.015
Plastic Pipe (Smooth)	0.011 to 0.015
Vitrified Clay	
Pipes	0.011 to 0.015
Liner channels	0.013 to 0.017
Open Channels	
Lined Channels	
Asphalt	0.013 to 0.017
Brick	0.012 to 0.018
Concrete	0.011 to 0.020
Rubble or riprap	0.020 to 0.035
Vegetal	0.030 to 0.040
Excavated or Dredged	
Earth, straight and uniform	0.020 to 0.030
Earth, winding, fairly uniform	0.025 to 0.040
Rock	0.030 to 0.045
Unmaintained	0.050 to 0.140
Natural Channels (minor streams, top width at flood state < 100 feet)	
Fairly regular section	0.030 to 0.070
Irregular section with pools	0.040 to 0.100

Source: Design and Construction of Sanitary and Storm Sewers, American Society of Civil Engineers and the Water Pollution Control Federation, 1969.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Norfolk and Suffolk Counties, Massachusetts

444 East Central Street

November 29, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,620 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 35, 70, 140, 210

Feet: 0, 100, 200, 400, 600

N

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 19, Sep 10, 2023

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10	Scarboro and Birdsall soils, 0 to 3 percent slopes	3.7	18.8%
52	Freetown muck, 0 to 1 percent slopes	4.3	21.8%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	3.3	16.4%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	6.3	31.9%
260B	Sudbury fine sandy loam, 2 to 8 percent slopes	2.1	10.5%
420B	Canton fine sandy loam, 3 to 8 percent slopes	0.1	0.6%
Totals for Area of Interest		**19.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Norfolk and Suffolk Counties, Massachusetts

10—Scarboro and Birdsall soils, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vkxw
Elevation: 0 to 2,100 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scarboro and similar soils: 65 percent
Birdsall and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scarboro

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: mucky fine sandy loam
H2 - 9 to 60 inches: stratified loamy fine sand to gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F144AY031MA - Very Wet Outwash
Hydric soil rating: Yes

Description of Birdsall

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Soft coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: very fine sandy loam
H2 - 8 to 16 inches: very fine sandy loam
H3 - 16 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 12.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F144AY031MA - Very Wet Outwash
Hydric soil rating: Yes

Minor Components

Swansea

Percent of map unit: 5 percent
Landform: Bogs
Hydric soil rating: Yes

Raynham

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Walpole

Percent of map unit: 2 percent
Landform: Terraces
Hydric soil rating: Yes

52—Freetown muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t2q9
Elevation: 0 to 1,110 feet

Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Freetown and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown

Setting

Landform: Depressions, depressions, swamps, kettles, marshes, bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Swansea

Percent of map unit: 5 percent

Landform: Bogs, swamps, marshes, depressions, depressions, kettles
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman
Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

254A—Merrimac fine sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 2tyqr
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting
Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Crest, side slope, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile
Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities
Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope, head slope, nose slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Stream terraces, outwash terraces, outwash plains, moraines, eskers, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent
Landform: Dunes, deltas, outwash terraces, outwash plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear

Hydric soil rating: No

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Kames, outwash plains, outwash terraces, moraines, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Crest, side slope, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope, head slope, nose slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 3 percent
Landform: Outwash terraces, dunes, deltas, outwash plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash plains, outwash terraces, moraines, stream terraces, eskers, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

260B—Sudbury fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: vky4

Elevation: 0 to 2,100 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sudbury and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sudbury

Setting

Landform: Outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 22 inches: sandy loam
H3 - 22 to 60 inches: gravelly coarse sand

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Hydric soil rating: No

Deerfield

Percent of map unit: 5 percent
Landform: Outwash plains
Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Walpole

Percent of map unit: 5 percent
Landform: Terraces
Hydric soil rating: Yes

420B—Canton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w81b
Elevation: 0 to 1,180 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Canton

Setting

Landform: Hills, moraines, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: gravelly fine sandy loam
2C - 26 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Scituate

Percent of map unit: 10 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Montauk

Percent of map unit: 5 percent
Landform: Moraines, ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Charlton

Percent of map unit: 4 percent
Landform: Ridges, ground moraines, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Swansea

Percent of map unit: 1 percent
Landform: Marshes, depressions, bogs, swamps, kettles
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

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Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street
Street Address

284-066-000-000
Map/Lot #

Franklin
City

MA
State

02038
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey
   Web Soil Survey
   Source
   254B
   Soil Map Unit
   Merrimac fine sandy loam 3-8% slopes
   Soil Series
   Kames, outwash plais, outwash terraces, moraines, eskers
   Landform
   Somewhat excessively drained.
   Soil Limitations
   loamy glaciofluvial deposits derived from granite, shcist and gneiss.
   Soil Parent material

3. Surficial Geological Report
   2018 / Stone, Stone, & DiGiacomo-Cohen
   Year Published/Source
   Coarse Deposits
   Map Unit
   consist of gravel deposits, sand and gravel deposits, and sand deposits
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No If yes, MassGIS Wetland Data Layer:
   Shrub Swamp
   Wetland Type

7. Current Water Resource Conditions (USGS):
   5/17/2025
   Month/Day/ Year
   Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:
   (Zone II, IWPA, Zone A, EEA Data Portal, etc.)
   Not in Zone A or IWPA zones.
   Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-101 (Hole #) | 2025/05/27 (Date) | 9:30am (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) | Landscaped area and small trees (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

Description of Location: Lawn area near entrance of site.

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet
Property Line 30+ feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 32" Depth to Weeping in Hole 45" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	FSL	10YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
12-18	Bw	Fine Med. Sand	10YR 5/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
18-48	C	Medium Sand	10YR 5/4	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
					Cnc : Dpl:	-	-	-	-	-	-
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-102 (Hole #) 2025/05/20 (Date) 9:55am (Time) Cloudy (Weather) 42.079070 (Latitude) -71.377240 (Longitude)

1. Land Use: Parking Lot (e.g., woodland, agricultural field, vacant lot, etc.) Trees (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-3 (Slope (%))

Description of Location: Parking Lot at driveway near front

2. Soil Parent Material: Loamy glaciofluvial deposits Outwash Terraces (Landform) TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet Drainage Way ± feet Wetlands ± feet

Property Line ± feet Drinking Water Well ± feet Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 16" Depth to Weeping in Hole 46" Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	B	FSL	10YR 3/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
12-46	C1	Medium Loamy Sand	10YR 4/1	16	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	5%	-	-	Massive	Friable	Trace Silt
				-	Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):

	Obs. Hole #STP-1	Obs. Hole #TP-102
☒ Depth to soil redoximorphic features	_____ inches	16 inches
☒ Depth to observed standing water in observation hole	32 inches	inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number ______ Reading Date ______

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 12 inches Lower boundary: 46 inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

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Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	05/27/2025
Signature of Soil Evaluator	Date
DAVID M. ROBINSON, EIT	June 30, 2026
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
N/A	
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See Test Pits Plan, Sheet TPP-1

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street
Street Address

284-066-000-000
Map/Lot #

Franklin
City

MA
State

02038
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey Web Soil Survey (Source) 254B (Soil Map Unit) Merrimac fine sandy loam 3-8% slopes (Soil Series)

Kames, outwash plais, outwash terraces, moraines, eskers
Landform

Somewhat excessively drained.
Soil Limitations

loamy glaciofluvial deposits derived from granite, shcist and gneiss.
Soil Parent material

3. Surficial Geological Report 2018 / Stone, Stone, & DiGiacomo-Cohen (Year Published/Source) Coarse Deposits (Map Unit)

consist of gravel deposits, sand and gravel deposits, and sand deposits
Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No If yes, MassGIS Wetland Data Layer: Shrub Swamp (Wetland Type)

7. Current Water Resource Conditions (USGS): 5/17/2025 (Month/Day/ Year) Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed: (Zone II, IWPA, Zone A, EEA Data Portal, etc.)
Not in Zone A or IWPA zones.
Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-103 (Hole #) 2025/05/27 (Date) 10:00am (Time) Cloudy (Weather) 42.079070 (Latitude) -71.377240 (Longitude)

1. Land Use Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) Landscaped area and small trees (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-3 (Slope (%))

Description of Location: Treeline opposite existing shop building

2. Soil Parent Material: Loamy glaciofluvial deposits Outwash Terrace (Landform) TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet Drainage Way ± feet Wetlands ± feet
Property Line ± feet Drinking Water Well ± feet Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 40" Depth to Weeping in Hole 40" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-26	Bw	FSL	10YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
26-40	C	Fine Sand	10YR 5/2	40	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	5%	-	-	Massive	Friable	-
				-	Cnc : Dpl:	-	-	-	Massive	Friable	-
					Cnc : Dpl:	-	-	-	-	-	-
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-104 (Hole #) 2025/05/21 (Date) 10:00am (Time) Cloudy (Weather) 42.079070 (Latitude) -71.377240 (Longitude)

1. Land Use: Parking Lot (e.g., woodland, agricultural field, vacant lot, etc.) Trees (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-3 (Slope (%))

   Description of Location: Near path to rear southeast portion of site

2. Soil Parent Material: Loamy glaciofluvial deposits Outwash Terraces (Landform) TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet Drainage Way ± feet Wetlands ± feet

   Property Line ± feet Drinking Water Well ± feet Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 48" Depth to Weeping in Hole 72" Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-20	A	FSL	10YR 3/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
20-28	Bw	Gravelly Med Sand	10YR 4/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
28-72	C	Fine Sand	10YR5/2	40	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	10%	-	-	Massive	Friable	Trace Silt
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole #TP-103 Obs. Hole #TP-104

Method	Obs. Hole #TP-103	Obs. Hole #TP-104
☒ Depth to soil redoximorphic features	40 inches	40 inches
☐ Depth to observed standing water in observation hole	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number ____________ Reading Date ____________

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 20 inches Lower boundary: 72 inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	05/27/2025
Signature of Soil Evaluator	Date
DAVID M. ROBINSON, EIT	June 30, 2026
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
N/A	
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See Test Pits Plan, Sheet TPP-1

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street — Street Address
284-066-000-000 — Map/Lot #

Franklin — City
MA — State
02038 — Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey
Web Soil Survey — Source
254B — Soil Map Unit
Merrimac fine sandy loam 3-8% slopes — Soil Series
Kames, outwash plais, outwash terraces, moraines, eskers — Landform
Somewhat excessively drained. — Soil Limitations
loamy glaciofluvial deposits derived from granite, shcist and gneiss. — Soil Parent material

3. Surficial Geological Report
2018 / Stone, Stone, & DiGiacomo-Cohen — Year Published/Source
Coarse Deposits — Map Unit
consist of gravel deposits, sand and gravel deposits, and sand deposits — Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No — If yes, MassGIS Wetland Data Layer: Shrub Swamp — Wetland Type

7. Current Water Resource Conditions (USGS): 5/17/2025 — Month/Day/ Year — Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:
(Zone II, IWPA, Zone A, EEA Data Portal, etc.)
Not in Zone A or IWPA zones.
Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: TP-105 (Hole #) | 2025/05/21 (Date) | 11:00am (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) | Landscaped area and small trees (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

Description of Location: Treeline opposite existing shop building

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet
   Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 53" Depth to Weeping in Hole - Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-53	FILL	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
53-80	C	Fine Sand	10R 7/1	53	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	5%	-	-	Massive	Friable	Trace Silt
				-	Cnc : Dpl:	-	-	-			-
					Cnc : Dpl:	-	-	-	-	-	-
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-106 (Hole #) 2025/05/21 (Date) 11:45am (Time) Cloudy (Weather) 42.079070 (Latitude) -71.377240 (Longitude)

1. Land Use: Parking Lot (e.g., woodland, agricultural field, vacant lot, etc.) Trees (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-3 (Slope (%))

   Description of Location: Near stockpile to rear of site

2. Soil Parent Material: Loamy glaciofluvial deposits Outwash Terraces (Landform) TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet Drainage Way ± feet Wetlands ± feet

   Property Line ± feet Drinking Water Well ± feet Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 70" Depth to Weeping in Hole N/A Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-42	FILL	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
42-79	C	Gravelly Med Sand	10YR 4/1	52	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	5%	-	-	Massive	Friable	Trace Silt
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole #TP-105 Obs. Hole #TP-106

	Obs. Hole #TP-105	Obs. Hole #TP-106
☒ Depth to soil redoximorphic features	53 inches	52 inches
☐ Depth to observed standing water in observation hole	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_______________ Index Well Number _______________ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 9 inches Lower boundary: 58 inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	05/27/2025
Signature of Soil Evaluator	Date
DAVID M. ROBINSON, EIT	June 30, 2026
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
N/A	
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See Test Pits Plan, Sheet TPP-1

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street
Street Address

284-066-000-000
Map/Lot #

Franklin
City

MA
State

02038
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey

Web Soil Survey
Source

254B
Soil Map Unit

Merrimac fine sandy loam 3-8% slopes
Soil Series

Kames, outwash plais, outwash terraces, moraines, eskers
Landform

Somewhat excessively drained.
Soil Limitations

loamy glaciofluvial deposits derived from granite, shcist and gneiss.
Soil Parent material

3. Surficial Geological Report

2018 / Stone, Stone, & DiGiacomo-Cohen
Year Published/Source

Coarse Deposits
Map Unit

consist of gravel deposits, sand and gravel deposits, and sand deposits
Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No

If yes, MassGIS Wetland Data Layer: Shrub Swamp
Wetland Type

7. Current Water Resource Conditions (USGS): 5/17/2025
Month/Day/ Year

Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:
(Zone II, IWPA, Zone A, EEA Data Portal, etc.)

Not in Zone A or IWPA zones.

Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-107 (Hole #) | 2025/05/21 (Date) | 1:30pm (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) | Grassed area and small trees (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

Description of Location: Treeline opposite existing shop building

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet
Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 42" Depth to Weeping in Hole - Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-9	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
9-58	C	Fine Sandy Loam	5R 4/6	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
				-	Cnc : Dpl:	-	-	-			-
					Cnc : Dpl:	-	-	-	-	-	-
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-108 (Hole #) 2025/05/20 (Date) 10:45am (Time) Cloudy (Weather) 42.079070 (Latitude) -71.377240 (Longitude)

1. Land Use: Parking Lot (e.g., woodland, agricultural field, vacant lot, etc.) Trees (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-3 (Slope (%))

   Description of Location: Near stockpile to rear of site

2. Soil Parent Material: Loamy glaciofluvial deposits Outwash Terraces (Landform) TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet Drainage Way ± feet Wetlands ± feet

   Property Line ± feet Drinking Water Well ± feet Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 64" Depth to Weeping in Hole 64" Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
12-24	Bw	Med Sand	10YR 4/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
24-66	C	Med Sand	5R 7/1	-	Cnc :- Dpl: -	-	-	-	Granular	Loose	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole #TP-107 Obs. Hole #TP-108

	Obs. Hole #TP-107	Obs. Hole #TP-108
☐ Depth to soil redoximorphic features	inches	inches
☒ Depth to observed standing water in observation hole	42 inches	64 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number ______ Reading Date ______

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 9 inches Lower boundary: 66 inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	05/27/2025
Signature of Soil Evaluator	Date
DAVID M. ROBINSON, EIT	June 30, 2026
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
N/A	
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See Test Pit Plan TPP-1

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street
Street Address

284-066-000-000
Map/Lot #

Franklin
City

MA
State

02038
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey
   Web Soil Survey
   Source
   254B
   Soil Map Unit
   Merrimac fine sandy loam 3-8% slopes
   Soil Series
   Kames, outwash plais, outwash terraces, moraines, eskers
   Landform
   Somewhat excessively drained.
   Soil Limitations
   loamy glaciofluvial deposits derived from granite, shcist and gneiss.
   Soil Parent material

3. Surficial Geological Report
   2018 / Stone, Stone, & DiGiacomo-Cohen
   Year Published/Source
   Coarse Deposits
   Map Unit
   consist of gravel deposits, sand and gravel deposits, and sand deposits
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map   Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No   If yes, MassGIS Wetland Data Layer:
   Shrub Swamp
   Wetland Type

7. Current Water Resource Conditions (USGS):
   5/17/2025
   Month/Day/ Year
   Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:
   (Zone II, IWPA, Zone A, EEA Data Portal, etc.)
   Not in Zone A or IWPA zones.
   Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: TP-110 (Hole #) | 2025/05/20 (Date) | 11:30am (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) | Grassed area and small trees (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

Description of Location: Treeline westerly path to rear of site

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet
   Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 56" Depth to Weeping in Hole 62" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
12-24	Bw	Sandy Loam	5R 4/6	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
24-56	C1	Coarse Sand	2.5YR 6/3	-	Cnc :- Dpl: -	-	-	-	S. Grain	Loose	Gravelly
56-62	C2	Fine Sand	2.5 YR 6/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	Gravelly. Grey, gleyed.
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-111 (Hole #) | 2025/05/20 (Date) | 11:45am (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Parking Lot (e.g., woodland, agricultural field, vacant lot, etc.) | Trees (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   Description of Location: Near stockpile to rear of site

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terraces (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet

   Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 54" Depth to Weeping in Hole 46" Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-9	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
9-28	Bw	FLS	10YR 4/1	-	Cnc :- Dpl: -	-	-	-	Granular	Friable	
28-56	C	Coarse Sand	5R 7/1	36"	Cnc :- 7.5YR5/8 Dpl: - GLEY1 6/10Y	5%	2%	-	S. Grain	Loose	Gravelly
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole #TP-110 Obs. Hole #TP-111

	Obs. Hole #TP-110	Obs. Hole #TP-111
☒ Depth to soil redoximorphic features	_____ inches	36 inches
☒ Depth to observed standing water in observation hole	56 inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_______________ Index Well Number _______________ Reading Date

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 9 inches Lower boundary: 56 inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	05/27/2025
Signature of Soil Evaluator	Date
DAVID M. ROBINSON, EIT	June 30, 2026
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
N/A	
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See Test Pits Plan, Sheet TPP-1

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street
Street Address

284-066-000-000
Map/Lot #

Franklin
City

MA
State

02038
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey Web Soil Survey
Source
254B
Soil Map Unit
Merrimac fine sandy loam 3-8% slopes
Soil Series
Kames, outwash plais, outwash terraces, moraines, eskers
Landform
Somewhat excessively drained.
Soil Limitations
loamy glaciofluvial deposits derived from granite, shcist and gneiss.
Soil Parent material

3. Surficial Geological Report 2018 / Stone, Stone, & DiGiacomo-Cohen
Year Published/Source
Coarse Deposits
Map Unit
consist of gravel deposits, sand and gravel deposits, and sand deposits
Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No If yes, MassGIS Wetland Data Layer: Shrub Swamp
Wetland Type

7. Current Water Resource Conditions (USGS): 5/17/2025
Month/Day/ Year
Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:
(Zone II, IWPA, Zone A, EEA Data Portal, etc.)
Not in Zone A or IWPA zones.
Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-112 (Hole #) | 2025/05/20 (Date) | 12:30pm (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) | Grassed area and small trees (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

Description of Location: Treeline westerly path to rear of site

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet
   Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 42" Depth to Weeping in Hole 72" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
12-30	Bw	Fine Sand	5R 4/6	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
30-46	BC	Coarse Sand	2.5YR 6/3	36	Cnc :- 7.5YR5/8 Dpl: - GLEY1 6/10Y	10%	-	-	S. Grain	Loose	-
46-74	C1	Fine Sand	2.5 YR 6/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-113 (Hole #) | 2025/05/20 (Date) | 1:30pm (Time) | Cloudy, overcast (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   Description of Location: Near stockpile to rear of site

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terraces (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet

   Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 74" Depth to Weeping in Hole N/A Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
12-36	Bw	Fine Sand	10YR 4/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	Trace Silt
36-78	C	Fine Sand	5R 7/1	36"	Cnc :- 7.5YR5/8 Dpl: - GLEY1 6/10Y	5%	-	-	Massive	Friable	Trace Silt
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole #TP-112 Obs. Hole #TP-113

	Obs. Hole #TP-112	Obs. Hole #TP-113
☒ Depth to soil redoximorphic features	36 inches	36 inches
☐ Depth to observed standing water in observation hole	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number ______ Reading Date ______

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 12 inches Lower boundary: 78 inches

   c. If no, at what depth was impervious material observed? Upper boundary: ______ inches Lower boundary: ______ inches

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	05/27/2025
Signature of Soil Evaluator	Date
DAVID M. ROBINSON, EIT	June 30, 2026
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
N/A	
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See Test Pit Plan, Sheet TPP-1

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street
Street Address

284-066-000-000
Map/Lot #

Franklin
City

MA
State

02038
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey: Web Soil Survey (Source); 254B (Soil Map Unit); Merrimac fine sandy loam 3-8% slopes (Soil Series)

   Kames, outwash plais, outwash terraces, moraines, eskers
   Landform

   Somewhat excessively drained.
   Soil Limitations

   loamy glaciofluvial deposits derived from granite, shcist and gneiss.
   Soil Parent material

3. Surficial Geological Report: 2018 / Stone, Stone, & DiGiacomo-Cohen (Year Published/Source); Coarse Deposits (Map Unit)

   consist of gravel deposits, sand and gravel deposits, and sand deposits
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No — If yes, MassGIS Wetland Data Layer: Shrub Swamp (Wetland Type)

7. Current Water Resource Conditions (USGS): 5/17/2025 (Month/Day/ Year) — Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed: (Zone II, IWPA, Zone A, EEA Data Portal, etc.)

   Not in Zone A or IWPA zones.

   Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-114 (Hole #) 2025/05/20 (Date) 12:30pm (Time) Cloudy (Weather) 42.079070 (Latitude) -71.377240 (Longitude)

1. Land Use: Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) Grassed area and small trees (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-3 (Slope (%))

Description of Location: SW Corner to rear of site

2. Soil Parent Material: Loamy glaciofluvial deposits; Outwash Terrace (Landform); TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet; Drainage Way ± feet; Wetlands ± feet; Property Line ± feet; Drinking Water Well ± feet; Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 64" Depth to Weeping in Hole - Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
10-36	Bw	Fine Sand	5R 4/6	32	Cnc :- 7.5YR5/8 Dpl: - GLEY1 6/10Y	5%	-	-	Massive	Friable	-
36-66	BC	Fine Sand	2.5YR 6/3	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
				-	Cnc :- Dpl: -	-	-	-	-	-	-
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-115 (Hole #) | 2025/05/20 (Date) | 1:00pm (Time) | Cloudy, overcast (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   Description of Location: Near stockpile to rear of site

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terraces (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet

   Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 36" Depth to Weeping in Hole 76" Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
10-36	Bw	Fine Sand	10YR 4/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
36-78	C	Fine Sand	2.5 YR 7/1	36"	Cnc :- 7.5YR5/8 Dpl: - GLEY1 6/10Y	5%	-	-	Massive	Friable	Trace Silt
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole #TP-114 Obs. Hole #TP-115

	Obs. Hole #TP-114	Obs. Hole #TP-115
☒ Depth to soil redoximorphic features	32 inches	36 inches
☐ Depth to observed standing water in observation hole	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number ____________ Reading Date ____________

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 10 inches Lower boundary: 78 inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	05/27/2025
Signature of Soil Evaluator	Date
DAVID M. ROBINSON, EIT	June 30, 2026
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
N/A	
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See Test Pits Plan Sheet TPP-1

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street
Street Address

284-066-000-000
Map/Lot #

Franklin
City

MA
State

02038
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey
   Web Soil Survey — Source
   254B — Soil Map Unit
   Merrimac fine sandy loam 3-8% slopes — Soil Series
   Kames, outwash plais, outwash terraces, moraines, eskers — Landform
   Somewhat excessively drained. — Soil Limitations
   loamy glaciofluvial deposits derived from granite, shcist and gneiss. — Soil Parent material

3. Surficial Geological Report
   2018 / Stone, Stone, & DiGiacomo-Cohen — Year Published/Source
   Coarse Deposits — Map Unit
   consist of gravel deposits, sand and gravel deposits, and sand deposits — Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No — If yes, MassGIS Wetland Data Layer: Shrub Swamp — Wetland Type

7. Current Water Resource Conditions (USGS): 5/17/2025 — Month/Day/ Year — Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed: (Zone II, IWPA, Zone A, EEA Data Portal, etc.)
   Not in Zone A or IWPA zones.
   Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-116 (Hole #) | 2025/05/20 (Date) | 11:30am (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) | Grassed area (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

Description of Location: Grassed area near green house

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet
Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 38" Depth to Weeping in Hole - Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
12-24	Bw	Fine Sand	5R 4/6	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
24-66	C	Coarse Sand	2.5YR 6/3	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	-
				-	Cnc :- Dpl: -	-	-	-			-
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-117 (Hole #) | 2025/05/20 (Date) | 1:30pm (Time) | Cloudy, overcast (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Woodland (e.g., woodland, agricultural field, vacant lot, etc.) | Trees (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   Description of Location: Near stockpile to rear of site

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terraces (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet

   Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: - Depth to Weeping in Hole - Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-24	A	FSL	2.5YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
24-36	Bw	Fine Sandy Loam	10YR 4/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
36-68	C	Fine Loamy Sand	5R 7/1	48"	Cnc :- 7.5YR5/8 Dpl: - GLEY1 6/10Y	5%	-	-	Massive	Friable	Trace Silt
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):

	Obs. Hole #TP-116	Obs. Hole #TP-117
☒ Depth to soil redoximorphic features	_____ inches	48 inches
☒ Depth to observed standing water in observation hole	38 inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

______________________ Index Well Number ______________________ Reading Date

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 12 inches Lower boundary: 68 inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	05/27/2025
Signature of Soil Evaluator	Date
DAVID M. ROBINSON, EIT	June 30, 2026
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
N/A	
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See Test Pits Plan Sheet TPP-1

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street — Street Address
284-066-000-000 — Map/Lot #

Franklin — City
MA — State
02038 — Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey
   Web Soil Survey — Source
   254B — Soil Map Unit
   Merrimac fine sandy loam 3-8% slopes — Soil Series
   Kames, outwash plais, outwash terraces, moraines, eskers — Landform
   Somewhat excessively drained. — Soil Limitations
   loamy glaciofluvial deposits derived from granite, shcist and gneiss. — Soil Parent material

3. Surficial Geological Report
   2018 / Stone, Stone, & DiGiacomo-Cohen — Year Published/Source
   Coarse Deposits — Map Unit
   consist of gravel deposits, sand and gravel deposits, and sand deposits — Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No — If yes, MassGIS Wetland Data Layer: Shrub Swamp (Wetland Type)

7. Current Water Resource Conditions (USGS): 12/17/2023 (Month/Day/ Year) — Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed: (Zone II, IWPA, Zone A, EEA Data Portal, etc.)
   Not in Zone A or IWPA zones.
   Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: STP-1 (Hole #) | 12/6/2023 (Date) | 9:30 (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) | Landscaped area and small trees (Vegetation) | some stones nearby (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

Description of Location: Lawn area near entrance of site.

2. Soil Parent Material: Loamy glaciofluvial deposits | Outwash Terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet
Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 27" Depth to Weeping in Hole 84" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-5	A	FSL	10YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
5-13	C1	Coarse Sand	10YR 5/2	-	Cnc :- Dpl: -	-	15-35	15-35	S. Grain	Loose	stones, few cobbles
13-20	C2	Medium-Coarse Sand	10YR 5/4	-	Cnc :- Dpl: -	-	15-35	-	S. Grain	Loose	
20-114	C3	Fine Sand	10YR 7/1	22"	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	2%	15-35	15-35	S. Grain	Loose	Bouldery
					Cnc : Dpl:						
					Cnc : Dpl:						

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Additional Notes:

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: STP-2 (Hole #) 12/6/2023 (Date) 10:55 (Time) Cloudy (Weather) 42.079070 (Latitude) -71.377240 (Longitude)

1. Land Use: Vacant lot (e.g., woodland, agricultural field, vacant lot, etc.) Trees (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-3 (Slope (%))

   Description of Location: NW of STP-3, South of STP-1.

2. Soil Parent Material: Loamy glaciofluvial deposits Outwash Terraces (Landform) TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet Drainage Way ± feet Wetlands ± feet

   Property Line ± feet Drinking Water Well ± feet Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 40" Depth to Weeping in Hole 108" Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6	A	FSL	10YR 3/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
6-37	Ab	Medium Loamy Sand	10YR 4/1	-	Cnc :- Dpl: -	-	15-35	-	S. Grain	Loose	
37-114	C1	Fine Loamy Sand	10YR 7/1	40"	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	2%	15-35	15-35	S. Grain	Loose	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):

	Obs. Hole # STP-1	Obs. Hole # STP-2
☒ Depth to soil redoximorphic features	22 inches	40 inches
☐ Depth to observed standing water in observation hole	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____ Index Well Number _____ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 6 inches Lower boundary: 114 inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	12/18/2023
Signature of Soil Evaluator	Date
Carlton Quinn, PE	June 30, 2024
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street
Street Address

284-066-000-000
Map/Lot #

Franklin
City

MA
State

02038
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey
   Web Soil Survey
   Source
   254B
   Soil Map Unit
   Merrimac fine sandy loam 3-8% slopes
   Soil Series
   Kames, outwash plais, outwash terraces, moraines, eskers
   Landform
   Somewhat excessively drained.
   Soil Limitations
   loamy glaciofluvial deposits derived from granite, shcist and gneiss.
   Soil Parent material

3. Surficial Geological Report
   2018 / Stone, Stone, & DiGiacomo-Cohen
   Year Published/Source
   Coarse Deposits
   Map Unit
   consist of gravel deposits, sand and gravel deposits, and sand deposits
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No If yes, MassGIS Wetland Data Layer:
   Shrub Swamp
   Wetland Type

7. Current Water Resource Conditions (USGS): 12/17/2023
   Month/Day/ Year
   Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:
   (Zone II, IWPA, Zone A, EEA Data Portal, etc.)
   Not in Zone A or IWPA zones.
   Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: STP-3 (Hole #) | 12/6/2023 (Date) | 2:33 (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant Lot (e.g., woodland, agricultural field, vacant lot, etc.) | Trees (Vegetation) | Crushed stone nearby (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

Description of Location: SE of STP-2, NW of STP-4

2. Soil Parent Material: Loamy glaciofluvial deposits | outwash terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet
Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 101" Depth to Weeping in Hole - Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-7	A	Fine Sandy Loam	10YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
7-24	Ab	Coarse Sandy Loam	10YR 5/2	-	Cnc :- Dpl: -	-	15-35	-	Massive	Friable	Fill Layer
24-45	Ab2	Sandy Loam	10YR 2/1	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	Fill Layer
45-112	C	Fine Sand	10YR 7/1	45"	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	2%	15-35	15-35	S. Grain	Loose	Boulder at 112"
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: STP-4 (Hole #) | 12/6/2023 (Date) | 12:05 (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant Lot (e.g., woodland, agricultural field, vacant lot, etc.) | Trees (Vegetation) | Some Stones (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3 (Slope (%))

   Description of Location: SE of STP-3

2. Soil Parent Material: Loamy glaciofluvial deposits | outwash terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet

   Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 72" Depth to Weeping in Hole 107" Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-4	A	FSL	10YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
4-29	Ab	SL	10YR3/3	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	Fill Layer
29-37	C1	Fine Sand	10YR 5/3	-	Cnc :- Dpl: -	-	-	-	S. Grain	Loose	
37-38	Ab2	FSL	10YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
38-46	C2	Sand	10YR 5/2	-	Cnc :- Dpl: -	-	15-35	15-35	S. Grain	Loose	
46-120	2C	FLS	10YR 7/1	72"	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	2%	15-35	15-35	Massive	Friable	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole # STP-3 Obs. Hole # STP-4

	Obs. Hole # STP-3	Obs. Hole # STP-4
☒ Depth to soil redoximorphic features	45 inches	72 inches
☐ Depth to observed standing water in observation hole	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

______________________ Index Well Number ______________________ Reading Date

$S_h = S_c – [S_r \text{ x } (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 45 inches Lower boundary: 112 inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	12/18/2023
Signature of Soil Evaluator	Date
Carlton Quinn, PE	June 30, 2024
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

TAG Central LLC
Owner Name

444 E Central Street — Street Address
284-066-000-000 — Map/Lot #

Franklin — City
MA — State
02038 — Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey
   Web Soil Survey — Source
   254B — Soil Map Unit
   Merrimac fine sandy loam 3-8% slopes — Soil Series
   Kames, outwash plais, outwash terraces, moraines, eskers — Landform
   Somewhat excessively drained. — Soil Limitations
   loamy glaciofluvial deposits derived from granite, shcist and gneiss. — Soil Parent material

3. Surficial Geological Report
   2018 / Stone, Stone, & DiGiacomo-Cohen — Year Published/Source
   Coarse Deposits — Map Unit
   consist of gravel deposits, sand and gravel deposits, and sand deposits — Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☒ Yes ☐ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☒ Yes ☐ No — If yes, MassGIS Wetland Data Layer: Shrub Swamp — Wetland Type

7. Current Water Resource Conditions (USGS): 12/17/2023 — Month/Day/ Year — Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed: (Zone II, IWPA, Zone A, EEA Data Portal, etc.)
   Not in Zone A or IWPA zones.
   Is within Zone II area.

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: STP-5 (Hole #) | 12/6/2023 (Date) | 1:20 (Time) | Cloudy (Weather) | 42.079070 (Latitude) | -71.377240 (Longitude)

1. Land Use: Vacant Lot (e.g., woodland, agricultural field, vacant lot, etc.) | Trees (Vegetation) | Some stones, light boulders (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 3-8 (Slope (%))

Description of Location: SW of STP-1.

2. Soil Parent Material: Loamy glaciofluvial deposits | outwash terrace (Landform) | TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet | Drainage Way ± feet | Wetlands ± feet
Property Line ± feet | Drinking Water Well ± feet | Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 48" Depth to Weeping in Hole 107" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	FSL	10YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
12-107	C	FLS	10YR 7/1	48"	Cnc :7.5YR 5/8 Dpl: GLEY1 6/10Y	2%	-	-	S. Grain	Loose	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: STP-6 (Hole #) 12/6/2023 (Date) 3:15 (Time) Cloudy (Weather) 42.079070 (Latitude) -71.377240 (Longitude)

1. Land Use: Vacant Lot (e.g., woodland, agricultural field, vacant lot, etc.) Trees (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-3 (Slope (%))

   Description of Location: West side of stream, near dry vegetation patch.

2. Soil Parent Material: Loamy glaciofluvial deposits outwash terrace (Landform) TS (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body ± feet Drainage Way ± feet Wetlands ± feet

   Property Line ± feet Drinking Water Well ± feet Other ± feet

4. Unsuitable Materials Present: ☐ Yes ☐ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: - Depth to Weeping in Hole - Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-8	A	SL	10YR 3/2	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
8-24	Bw	SL	5YR 5/6	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
24-31	C	Coarse Sand	10YR 5/3		Cnc :- Dpl: -	-	-	-	S. Grain	Loose	
31-40	Bw2	SL	5YR 5/8	-	Cnc :- Dpl: -	-	-	-	Massive	Friable	
40-114	2C	LS	GLEY1 6/10Y	-	Cnc :- Dpl: -	-	-	-	S. Grain	Loose	
					Cnc : Dpl:						

Additional Notes:

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one): Obs. Hole # STP-5 Obs. Hole # STP-6

	Obs. Hole # STP-5	Obs. Hole # STP-6
☒ Depth to soil redoximorphic features	48 inches	N/A inches
☐ Depth to observed standing water in observation hole	_____ inches	_____ inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

________________ Index Well Number ________________ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: 12 inches Lower boundary: 114 inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Franklin

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

	12/18/2023
Signature of Soil Evaluator	Date
Carlton Quinn, PE	June 30, 2024
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

KEVIN M. MARTIN, P.E.
KMM GEOTECHNICAL CONSULTANTS, LLC
7 Marshall Road
Hampstead, NH 03841
603-489-5556 (p)/ 603-489-5558 (f)/781-718-4084(m)
kevinmartinpe@aol.com

MEMORANDUM

TO: A.J. Alevizos
TAG Central LLC
275 Regatta Drive
Jupiter, FL 33477

FROM: Kevin M. Martin, P.E.
Geotechnical Engineer

DATE: November 12, 2024

RE: **GEOTECHNICAL SUMMARY REPORT**
PROPOSED RESIDENTIAL BUILDINGS
444 EAST CENTRAL STREET
FRANKLIN, MASSACHUSETTS

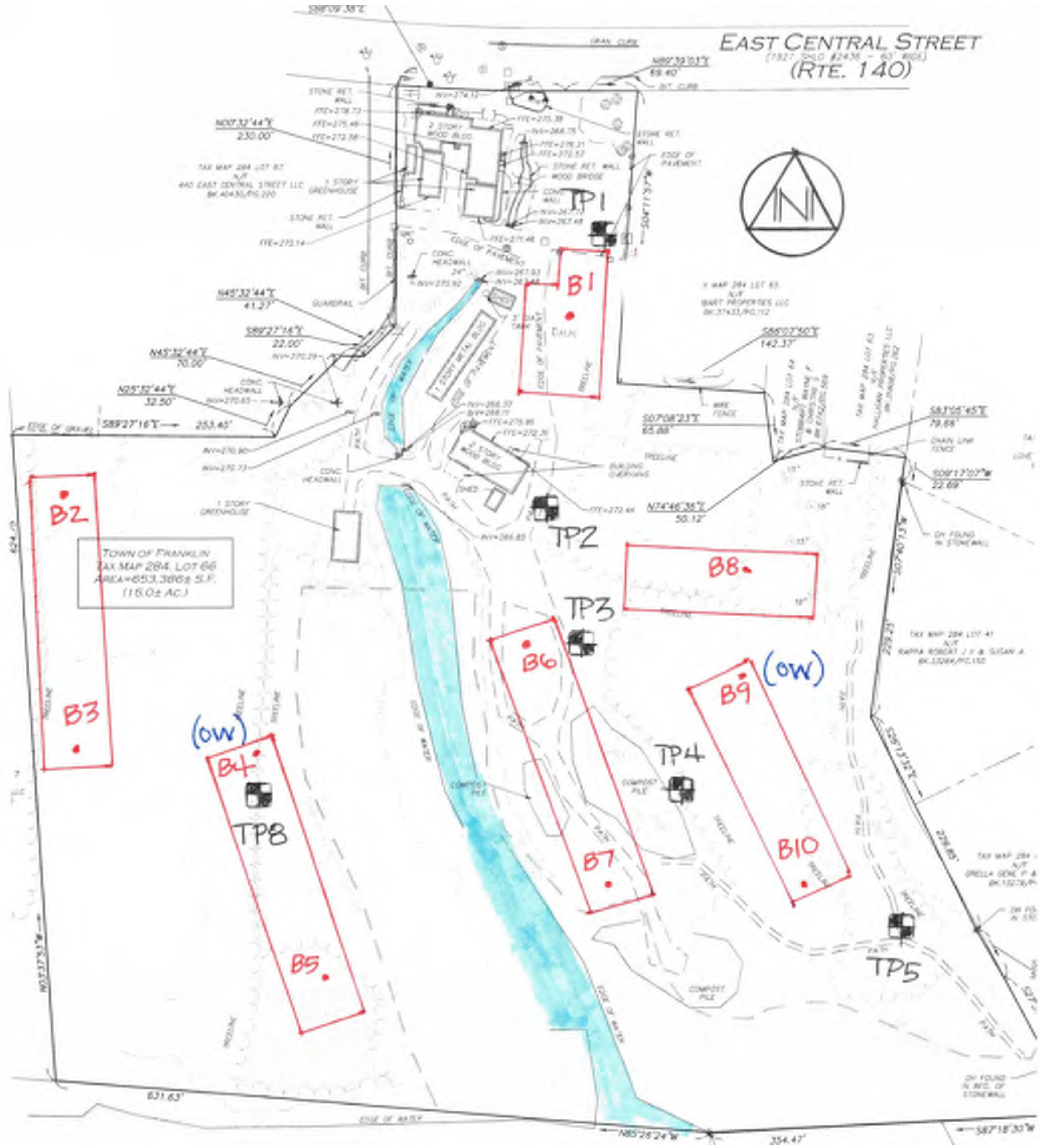
This memorandum serves as a Geotechnical Summary Report for the referenced project. The contents of this memorandum are subject to the attached ***Limitations***.

SITE & PROJECT DESCRIPTION

Present site development includes a landscape/ garden center with various buildings and garages. Present construction and use will be razed to accommodate the project. KMM has no knowledge of past construction, use and/or development of the property except what is visible or shown on the *Site Plan*. Based on the *Site Plan*, grades across the site vary from elevation ≈280-268 ft possessing gradual downward contour to the rear (south). The site is intersected by Uncas Brook.

The project includes a new residential apartment complex. The complex will include five (5) apartment buildings and a clubhouse. The apartment buildings will include 4-story, wood-framed, multi-unit residential structures. It is intended to support the buildings using a conventional spread footing foundation (no basement). Expansive Fill (≈5-6 ft) will be required to achieve final grade.

The purpose of this study is to review the subgrade conditions and provide a geotechnical evaluation related to foundation design and construction as required by the *Massachusetts State Building Code*. This report does not include an environmental assessment relative to oil, gasoline, solid waste and/or other hazardous materials. The environmental conditions of the property should be addressed by others as necessary. This study also does not include review of site design or construction issues such as infiltration systems, dry wells, retaining walls, excavation support, underground utilities, temporary shoring, water-proofing, septic systems, protection of surrounding buildings/utilities, pools, crane pads or other site and/or temporary design unless specifically addressed herein.



SITE PLAN - TEST BORE LOCATIONS

INTERSECTING UNCAS BROOK

SUBSURFACE EXPLORATION PROGRAM

Test Borings

The exploration program for the project included ten (10) test borings around the building pads where accessible. The test borings (B1 to B10) were advanced to depths of ≈8-22 utilizing 3 inch pneumatically driven casing. All the test bores to the east (B1, B6, B7, B8, B9 & B10) met refusal at depths of ≈8-18 ft. Soil samples were typically retrieved at no greater than 5 ft intervals with a 2 inch diameter split-spoon sampler. Standard Penetration Tests (SPTs) were performed at the sampling intervals in general accordance with ASTM-D1586 (*Standard Method for Penetration Test and Split-Barrel Sampling of Soils*). Rock coring was not completed for this study. Offset test holes were advanced in some cases to further review depth to refusal. Field descriptions and penetration resistance of the soils encountered, observed depth to groundwater, depth to refusal and other pertinent data are contained on the attached *Test Boring Logs*. The attached *Sketch* shows the test bore locations. Ground elevations were extrapolated from the *Site Plan*.

Observation Wells

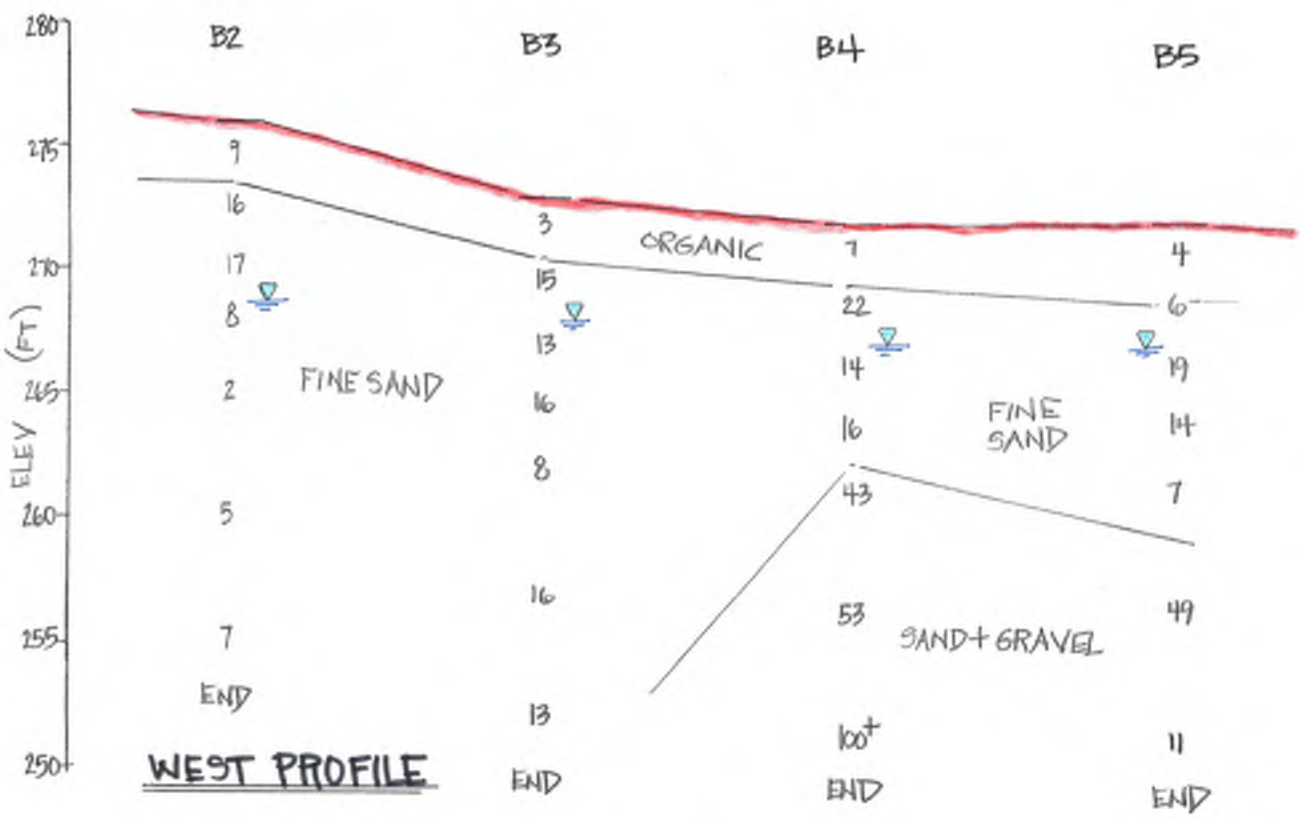
Observation Wells were installed to ≈13 ft depth at B4 & B9. The wells include 2 inch PVC well screen and riser with requisite end plugs, filter sand, bentonite seal and expansion plugs. The wells may be used to gauge seasonal fluctuations.

Test Pits by Others

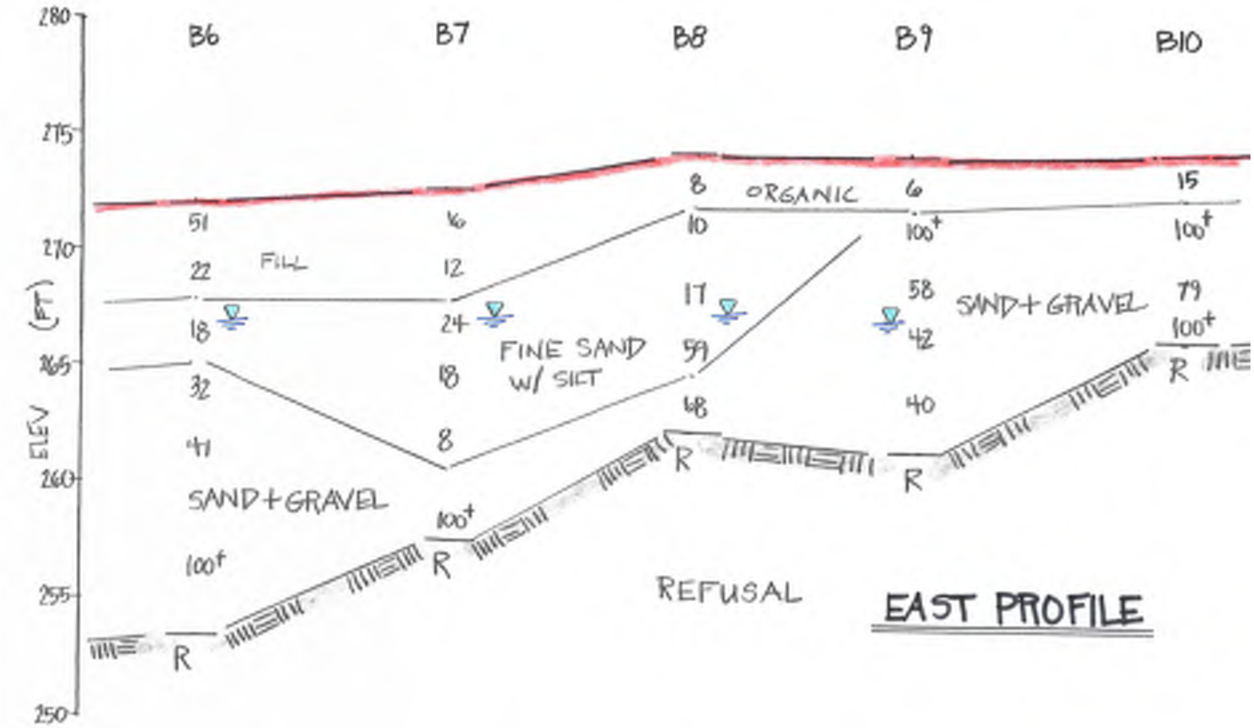
The *Site Plan* includes six (6) *Test Pit Logs* excavated in December 2023 for site design purposes to depths of ≈9-10 ft. The Logs were reviewed as considered relevant to this study.

SUBSURFACE CONDITIONS

The subsurface conditions below (1) Fill and/or Organic laden soils include (2) Fluvial soils, (3) Granular Outwash then (4) apparent Bedrock Refusal. The subgrade conditions are markedly different along the East & West of Uncas Brook. Two (2) *Subsurface Profiles* (East & West) depicting the soil and groundwater conditions are attached for review.



SUBSURFACE PROFILE - WEST



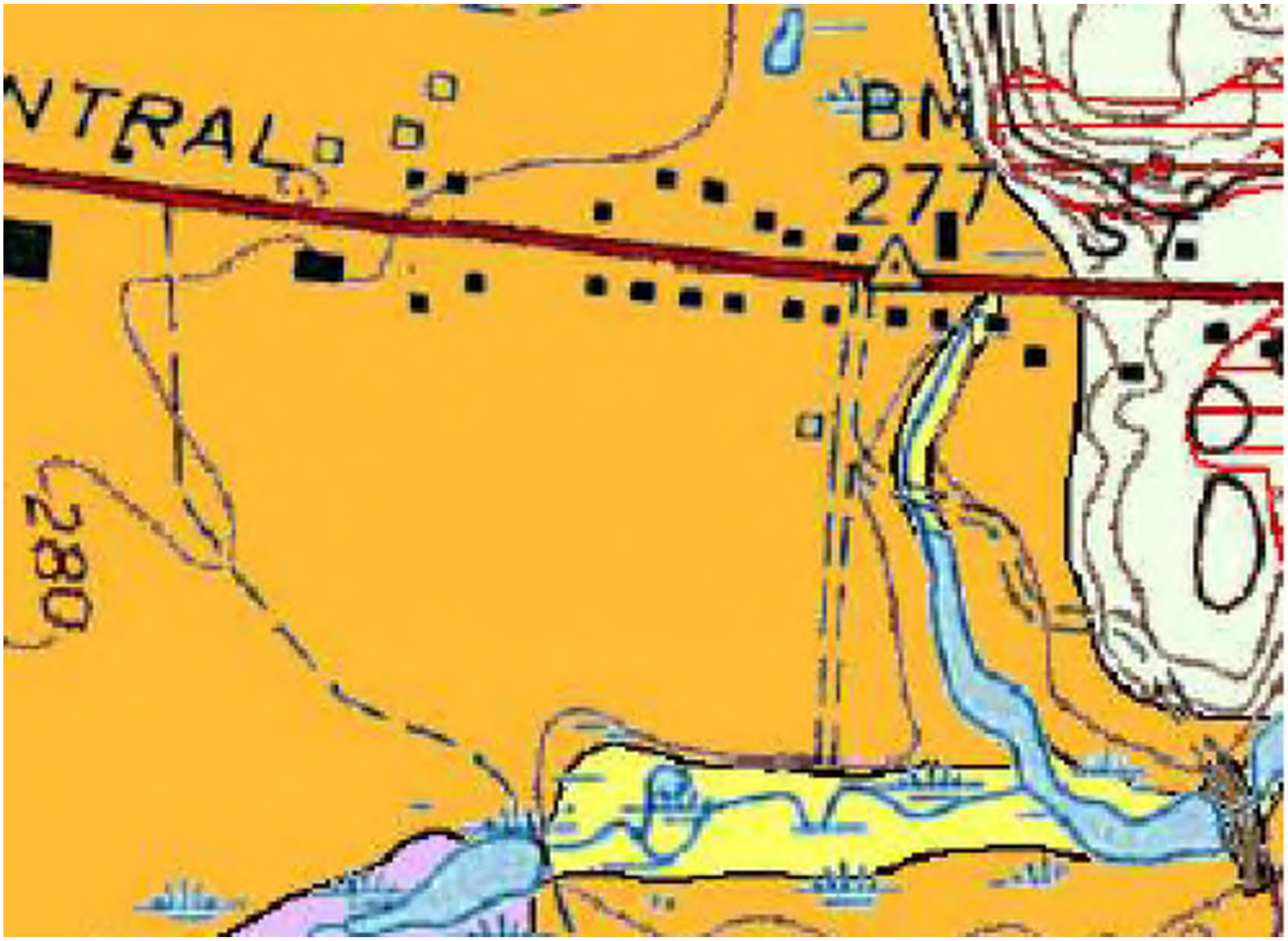
SUBSURFACE PROFILE - EAST

Fill and/or Organic laden soils were encountered to depths of ≈2-4 ft across the site. Topsoil and Loamy Subsoil are present in most areas to depths of ≈1-2 ft. Fill is also present in areas to depths of ≈2-5 ft. Fill should be expected given stockpiles, foundations, intersecting utilities, past grading, etc. Fill was also identified on some of the *Test Pit Logs*. The Fill was more noticeable along the stockpile areas to the south (B6-B7-TP3-TP4).

Finer-grained Fluvial soils were identified at shallower depths being more predominate to the west. A Fine Sand, trace to little silt was encountered to depths of ≈10 ft to greater than 22 ft to the west. A Fine Sand & Silt was encountered to shallow depths of ≈7-10 ft to the east. The Fine Sand varies from loose to medium dense to the west whereas the Fine Sand & Silt is generally more compact. The Fine Sand & Silt is rendered moisture sensitive, poor-draining and frost susceptible.

Stratified Outwash was identified at most locations especially to the east and south. The Granular Outwash generally includes a Sand & Gravel, cobbles. These soils are dense, granular, well-draining, stable and compact.

Test Bore Refusal, presumably Bedrock, was encountered at depths of ≈8-18 ft in all the test bores to the east. The other test bores (to the west) were terminated at 22 ft without refusal. The depth to refusal becomes progressively shallower to the south. Bedrock was not encountered in the test pits to ≈9-10 ft depth. Bedrock in the area is characteristically hard and of sound quality.



USGS SURFICIAL GEOLOGIC MAP - FRANKLIN, MASS - 2018

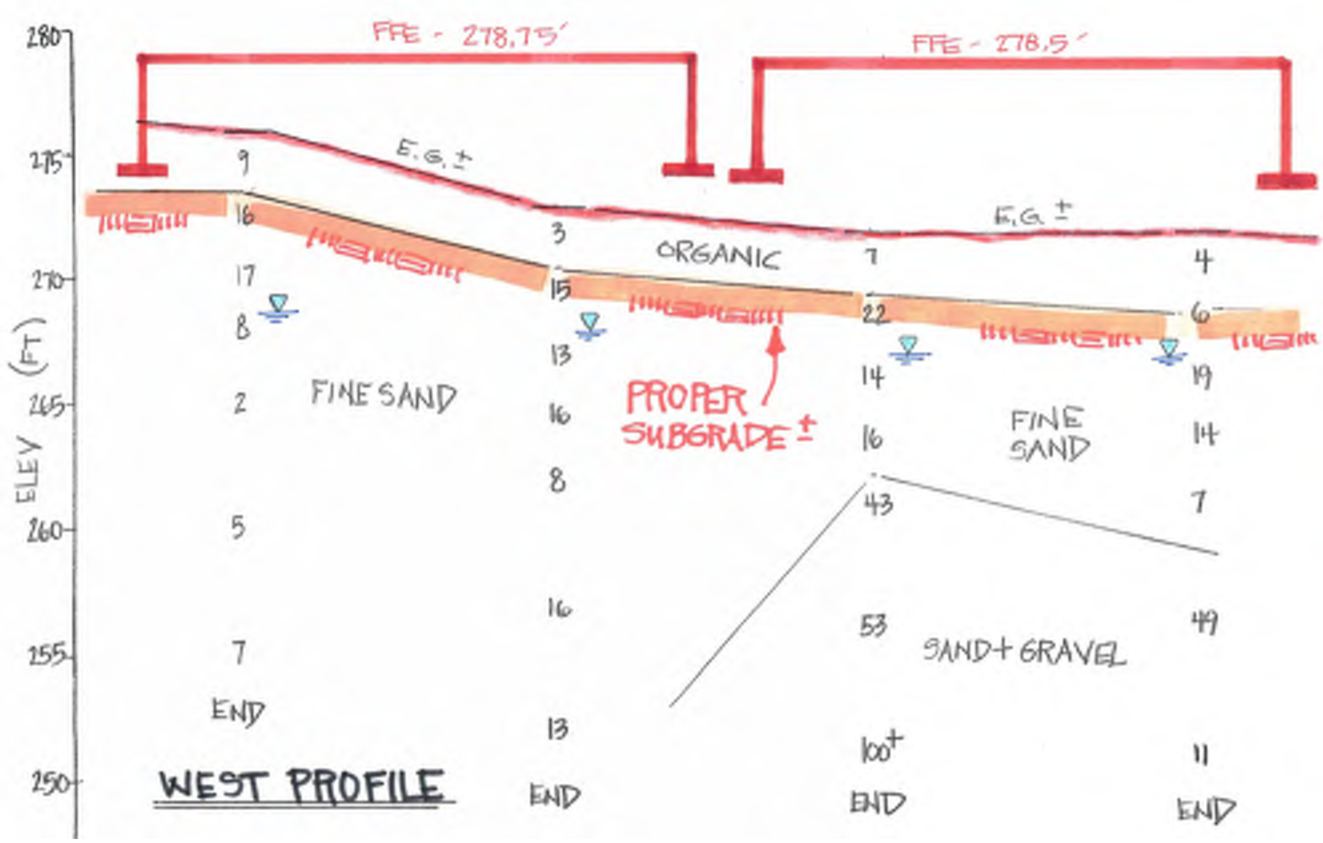
Coarse deposits consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay

The *USGS Surficial Geologic Map* identifies post glacial stratified Outwash in the low site area to include Coarse deposits with shallow bedrock to the east. These conditions are consistent with this study.

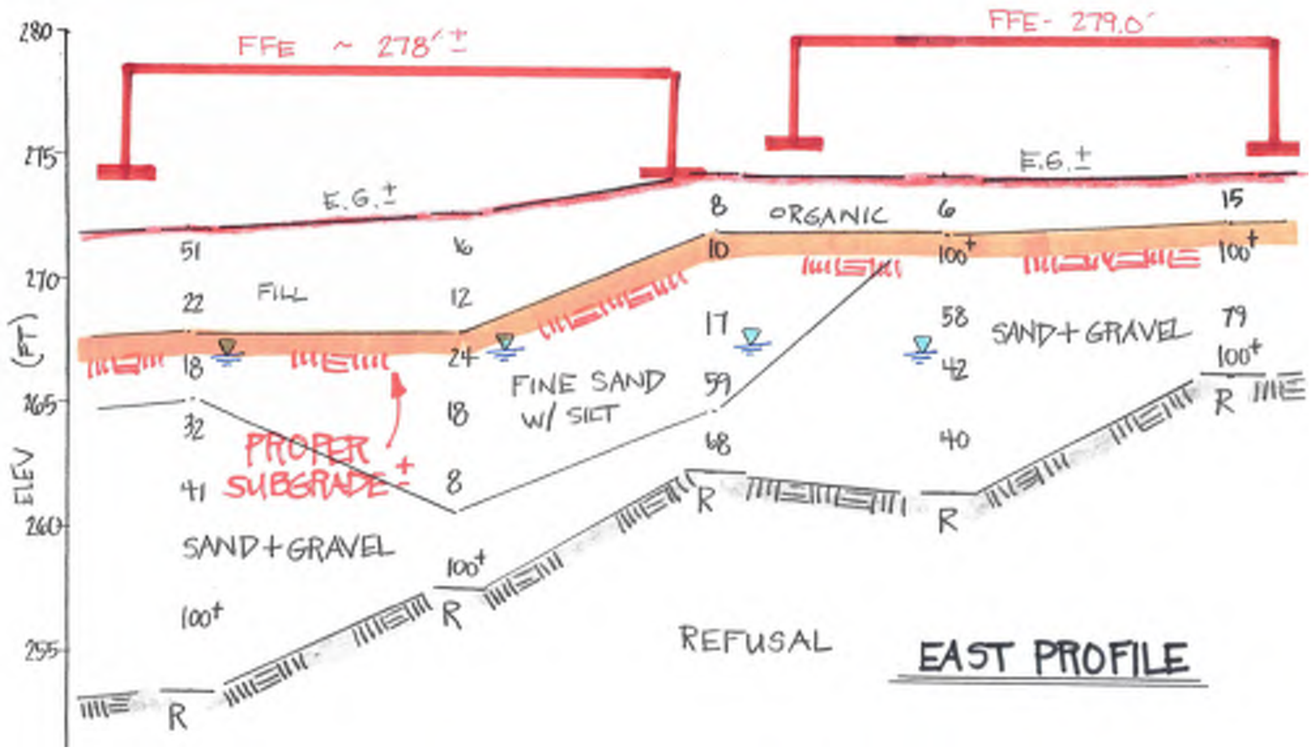
Groundwater was encountered in the test holes at depths of ≈5-8 ft below grade (typically 5-6 ft). Wet and saturated soils were encountered at these depths. These correspond to elevations ≈167-169 ft. It should be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, flooding, utilities and other factors differing from the time of the measurements. This study was completed at a time of seasonally low groundwater.

FOUNDATION SUBGRADE RECOMMENDATIONS

The subgrade conditions are favorable for supporting the proposed building on a conventional spread footing foundation with a concrete floor slab. The undocumented Fill and Organic soils, however, are **not** considered suitable for foundation support given questionable strength and compressibility. As such, these soils as well as intersecting utilities, abandoned foundations and other questionable materials shall be fully removed from the building pads including the *Footing Zone of Influence* (*FZOI*) to expose the Glacial subgrade. The *FZOI* is defined as that area extending laterally one foot from the edge of footing then outward and downward at a 1H:1V splay (up to ≈4 ft laterally beyond the edge of footing). The attached *Profiles* illustrates "Proper Subgrade" in relation to the proposed construction. Structural Fill (Table 1) should be used below the foundation as necessary.



CONCEPTUAL SPREAD FOOTING FOUNDATION



CONCEPTUAL SPREAD FOOTING FOUNDATION

The parent subgrade soils (Fluvial/Glacial) should be exposed in the foundation areas prior to casting the footings or placing structural fill. It is recommended that the parent subgrade soils be proof-rolled with vibratory densification and exhibit stable and compact conditions. The purpose of the proof-rolling is to densify the site soils and identify potential loose or unstable areas which should be removed as necessary. Proof-rolling should involve at least 4-5 passes with a vibratory compactor (minimum 850 pound static weight) operating at peak energy. During the proof rolling process, the subgrade should be observed by an Engineer to identify areas exhibiting weaving or instability. It will be necessary to remove weakened or unstable soils and replace with a Structural Fill or crushed stone. Proof-rolling should not be used when the subgrade is wet (groundwater, storm water, perched water, etc) as this may result in soil pumping and instability. The contractor should exercise extra precaution to minimize subgrade disturbance in these wet areas. Specifically, the groundwater should be continuously maintained at least one foot below construction grade until the backfilling is complete. A base of ¾-inch minus crushed stone (or larger graded stone) should be placed atop the earthen subgrade if wet conditions and groundwater seepage are present. The stone should be *immediately* placed atop the undisturbed subgrade then tamped with a plate compactor exhibiting stable conditions. The purpose of the stone base is to protect the wet subgrade, facilitate necessary dewatering and provide a dry/stable base upon which to progress foundation construction. Groundwater is typically more problematic if construction occurs during the wetter winter or spring season. The drier summer months are more favorable for groundwater control. Proper groundwater control and storm water management are also necessary to maintain site stability.

The subgrade should ultimately be stable, dewatered, compact and protected from frost throughout construction. Bearing subgrades that become weakened or disturbed due to wet conditions will be rendered unsuitable for structural support. The Contractor shall ultimately be responsible for the means and methods of temporary groundwater control, subgrade protection and site stability during construction. An Engineer from KMM should be scheduled to review the foundation subgrade conditions and preparation during construction.

FOUNDATION DESIGN RECOMMENDATIONS

The footings are expected to gain bearing support atop the parent soils and/or compacted structural fill. Footings may be designed using an allowable bearing capacity of 4 ksf (FS=3). The allowable bearing capacity may be increased a third (⅓) when considering transient loads such as wind or seismic. The bearing capacity is contingent upon the perimeter strip footings and isolated column footings being no less than 2 ft and 3 ft in width respectively. For footings less than 3 ft in lateral dimension, the allowable bearing capacity should be reduced to one-third and multiplied by the least lateral footing dimension in feet. Foundation settlement should be less than 1 inch with differential settlement less than ½ inch. The settlement should be elastic and occur during construction. Exterior footings shall be provided with at least 4 ft of frost protection.

The subsurface conditions were reviewed with respect to seismic criteria set forth in the ***Massachusetts State Building Code***. Based on the relative density of the soils and the depth to groundwater, the site does not appear susceptible to liquefaction in the event of an earthquake. Based on interpretation of the *Building Code*, the *Site Classification* is "D" (Stable Soil).

It is recommended that a minimum 6-inch base of *Gravel Base Fill* (Table 1) be placed below the concrete floor slabs for moisture, resilient strength and frost control. The gravel base shall be no less than 12 inches for exterior concrete slabs exposed to frost. A subgrade modulus of 150 pci may be used for design of the floor slab. A vapor retarder should be used below the concrete floor slab dependent upon the floor treatment. A vapor barrier should be specified by others per ACI Standards. A 10-mil StegoWrap™ or equal are often used as a vapor retarder.

Structural fill necessary within and below the foundation should also conform to the attached *Specifications* (Table 1). Expansive Fill will be required for site grading.

CONSTRUCTION CONCERNS

The contractor should be required to maintain a stable-dewatered subgrade for the building foundation and other concerned areas during construction. Subgrade disturbance may be influenced by excavation methods, moisture, precipitation, groundwater control and construction activities. The Granular Outwash soils are not considered vulnerable to disturbance when exposed to wet conditions and construction activities given their good drainage. Steady groundwater seepage, however, will likely disturb these soils if not properly managed during construction. The finer-grained Fluvial soils are considered moisture sensitive given poor drainage. The contractor should take precautions to reduce subgrade disturbance. Such precautions may include diverting storm run-off away from construction areas, reducing traffic in sensitive areas, minimizing the extent of exposed subgrade if inclement weather is forecast, backfilling footings as soon as practicable and maintaining an effective dewatering program. Soils exhibiting weaving or instability should be over-excavated to a competent bearing subgrade then replaced with a free draining structural fill or crushed stone. The moisture concerns are typically more problematic if construction takes place during the winter to spring season or other periods of inclement weather. A protective base of ¾-inch minus crushed stone may be placed at least ≈6 inches below and laterally beyond the footing limits for protection during construction. The stone base is to protect the site soils, facilitate necessary dewatering and provide a dry/stable base upon which to progress foundation construction. The protective base should be considered elective and dependent upon the site conditions. The stone base should be considered necessary if wet conditions are present at footing grade. The protective stone base shall be tamped with a plate compactor and exhibit stable conditions.

The groundwater table will need to be temporarily controlled during construction to complete work in dry conditions and protect the competency of the subgrade. The groundwater table should be continuously maintained at least one foot below construction grade until backfilling is complete. The groundwater is expected to be controlled with conventional sumps and pumps. The temporary sumps should be filtered with stone and fabric and extend at least ≈24 inches below construction grade. A ≈6 inch lift of ¾-inch minus crushed stone should be placed atop the wet subgrade to protect its competency and facilitate dewatering. Adequate dewatering and storm water management are necessary for maintaining the competency of the site soils. The discharge of the collected water should be reviewed by others.

The subgrade should ultimately be stable, dewatered, compact and protected from frost throughout construction. Bearing subgrades that become weakened or disturbed due to wet conditions will be rendered unsuitable for structural support. The Contractor shall ultimately be responsible for the means and methods of temporary groundwater control, subgrade protection and site stability during construction. An Engineer from KMM should be scheduled to review the foundation subgrade conditions and preparation during construction.

CONSTRUCTION MONITORING

It is recommended that a qualified engineer or representative be retained to review earthwork activities such as the preparation of the foundation bearing subgrade and the placement/compaction of Structural Fill. It is recommended that KMM be retained to provide construction monitoring services. This is to observe compliance with the design concepts presented herein.

We trust the contents of this memorandum report are responsive to your needs at this time. Should you have any questions or require additional assistance, please do not hesitate to contact our office.

Franklin444EastCentralSt.wpd

LIMITATIONS

Explorations

1. The analyses, recommendations and designs submitted in this report are based in part upon the data obtained from preliminary subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretation of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the individual test pit and/or boring logs.

3. Water level readings have been made in the test pits and/or test borings under conditions stated on the logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors differing from the time the measurements were made.

Review

4. It is recommended that this firm be given the opportunity to review final design drawings and specifications to evaluate the appropriate implementation of the recommendations provided herein.

5. In the event that any changes in the nature, design, or location of the proposed areas are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of the report modified or verified in writing by KMM Geotechnical Consultants, LLC.

Construction

6. It is recommended that this firm be retained to provide geotechnical engineering services during the earthwork phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Use of Report

7. This report has been prepared for the exclusive use of TAG Central, LLC in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

8. This report has been prepared for this project by KMM Geotechnical Consultants, LLC. This report was completed for preliminary design purposes and may be limited in its scope to complete an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to preliminary geotechnical design considerations only.

TABLE 1

444 East Central Street
Franklin, Massachusetts

Recommended Soil Gradation & Compaction Specifications

Gravel Base Fill
(Select CRUSHED GRAVEL borrow)

SIEVE SIZE	PERCENT PASSING BY WEIGHT
3 inch	100
3/4 inch	50-90
No. 4	30-70
No. 200	2-8

NOTES: For minimum 6 inch base below Concrete Slab-on-Grade (heated)
For minimum 12-inch base for exterior concrete slabs exposed to frost
Shall have less than 12% fines (No. 200 sieve) based on the Sand fraction

Structural Fill
(Gravelly SAND)

SIEVE SIZE	PERCENT PASSING BY WEIGHT
5 inch	100
3/4 inch	50-100
No. 4	20-80
No. 200	0-10

NOTES: For use below building foundations for structural bearing support
A ¾-inch crushed stone may be used for Structural Fill in wet conditions
Reclaimed Borrow (crushed concrete) shall conform to *MA-DPW Specification*
Reclaimed Borrow shall limit (less than 3%) brick or asphalt component
Shall have less than 20% fines (No. 200 sieve) based on the Sand fraction

Structural Fill placed beneath the foundation should include the *Footing Zone of Influence* which is defined as that area extending laterally one foot from the edge of the footing then outward and downward at a 1H:1V splay. Structural Fill should be placed in loose lifts not exceeding 12 inches for heavy vibratory rollers and 8 inches for vibratory plate compactors. All the fill on the project should be compacted to at least 95 percent of maximum dry density as determined by the Modified Proctor Test (ASTM-D1557). The fill shall be compacted within ±2 of the optimum moisture content. The adequacy of the compaction efforts should be verified by field density testing which is also a requirement of the *Massachusetts State Building Code*.

TEST BORING LOG

SOIL X, Corp. 148 Pioneer Drive Leominster, MA 01453	**444 East Central Street** **Franklin, MA**	**B-1** **24-10026**

Ground Elevation: 272 ft+/-
Date Started: 10/29/24
Date Finished: 10/29/24
Driller: MT
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS			
DATE	DEPTH	CASING AT	STABILIZATION
10/29/24	6 ft		

Depth Ft.		Sample No.	Sample Rec	Sample Depth	Sample Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	12"	0'0"-2'0"	4-8-19-20		Brown, fine to coarse Sand & Gravel, trace silt, dry
		2	13"	2'0"-4'0"	11-11-18-14		Brown, mottled, f-m Sand & Gravel, little silt, dry
5		3	9"	5'0"-7'0"	17-29-21-19		Brown, fine to medium Sand & Gravel, little silt, wet
		4	14"	7'0"-9'0"	13-10-11-25		Brown, f-m Sand, some gravel, little silt, wet
						10'	____________________
10							Refusal @ 10' BGS GWT @ 6' upon completion
15							
20							
25							
30							

Notes: GeoProbe 6712

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace 0 to 10%		CASING	SAMPLE	CORE TYPE
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little 10 to 20%	ID SIZE (IN)		SS	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some 20 to 35%	HAMMER WGT (LB)		140 lb.	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And 35% to 50%	HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

444 East Central Street
Franklin, MA

B-2

24-10026

Ground Elevation: 276 ft+/-
Date Started: 10/29/24
Date Finished: 10/29/24
Driller: MT
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
10/29/24	8 ft		

Depth Ft.		Sample No.	Rec	Sample Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	14"	0'0"-2'0"	1-4-5-5		Rust, Fine Sand, some silt, trace gravel, roots (SUBSOIL)
						2'	______
		2	16"	2'0"-4'0"	5-7-9-11		Tan, fine to medium Sand, little gravel, trace silt, dry
5		3	12"	5'0"-7'0"	10-9-8-7		Tan, fine to medium Sand, dry (SAND)
		4	12"	7'0"-9'0"	5-4-4-5		Brown, Fine Sand, wet
10		5	14"	10'0"-12'0"	1-1-1-2		Tan, Fine Sand, wet
							(FLUVIAL)
15		6	18"	15'0"-17'0"	3-3-2-2		Tan, Fine Sand, wet
20		7	16"	20'0"-22'0"	4-4-3-7		Tan, Fine Sand, little silt, wet
							______
							EOB @ 22' BGS GWT @ 8'5" upon completion
25							
30							

Notes: GeoProbe 6712

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace 0 to 10%		CASING	SAMPLE	CORE TYPE
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little 10 to 20%	ID SIZE (IN)		SS	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some 20 to 35%	HAMMER WGT (LB)		140 lb.	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And 35% to 50%	HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

444 East Central Street
Franklin, MA

B-3

24-10026

Ground Elevation:	273 ft+/-
Date Started:	10/29/24
Date Finished:	10/29/24
Driller:	MT
Soil Engineer/Geologist:	

GROUNDWATER OBSERVATIONS			
DATE	DEPTH	CASING AT	STABILIZATION
10/29/24	5 ft		

Depth Ft.		Sample No.	Rec	Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	15"	0'0"-2'0"	1-1-2-3		Dark Brown, Organic Silt (TOPSOIL)
						2'	
		2	15"	2'0"-4'0"	4-6-9-6		Tan-Rust, Fine Sand, trace silt, dry
5		3	16"	5'0"-7'0"	8-7-6-7		Grey, Fine Sand, little silt, wet
		4	17"	7'0"-9'0"	8-8-8-8		Grey, Fine Sand, wet
10		5	19"	10'0"-12'0"	4-5-3-4		Grey, Fine Sand, little/trace silt
							(FLUVIAL)
15		6	23"	15'0"-17'0"	8-9-7-8		Fine Sand
20		7	15"	20'0"-22'0"	6-5-8-6		Fine Sand, some silt
							EOB @ 22' BGS GWT @ 5' upon completion
25							
30							

Notes: GeoProbe 6712

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace 0 to 10%		CASING	SAMPLE	CORE TYPE
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little 10 to 20%	ID SIZE (IN)		SS	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some 20 to 35%	HAMMER WGT (LB)		140 lb.	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And 35% to 50%	HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

444 East Central Street
Franklin, MA

B-4

24-10026

Ground Elevation: 272 ft+/-
Date Started: 10/29/24
Date Finished: 10/29/24
Driller: MT
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
10/29/24	5 ft		

Depth Ft.		Sample No.	Rec	Depth	Blows/6”	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	18”	0’0”-2’0”	2-4-3-5		Topsoil/ Subsoil (ORGANIC)
						2’	
		2	15”	2’0”-4’0”	8-10-12-9		Orange-Tan, f-m Sand, trace gravel, trace silt, dry
5		3	19”	5’0”-7’0”	9-6-8-9		Grey, Fine Sand, little silt, wet (FLUVIAL)
		4	16”	7’0”-9’0”	8-7-9-10		Grey, Fine Sand, little silt, wet
						10’	
10		5	18”	10’0”-12’0”	22-22-21-19		Brown, fine to coarse Sand & Gravel, trace silt, wet
15		6	13”	15’0”-17’0”	27-27-26-21		Brown, fine to coarse Sand & Gravel, trace silt, wet
							(GLACIAL)
20		7	5”	20’0”-22’0”	34-50/2”		Same
							EOB @ 21 BGS GWT @ 5 ft upon completion
25							
30							

Notes: GeoProbe 6712

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace 0 to 10%		CASING	SAMPLE	CORE TYPE
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little 10 to 20%	ID SIZE (IN)		SS	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some 20 to 35%	HAMMER WGT (LB)		140 lb.	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And 35% to 50%	HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

444 East Central Street
Franklin, MA

B-5

24-10026

Ground Elevation:	272 ft+/-
Date Started:	10/29/24
Date Finished:	10/29/24
Driller:	MT
Soil Engineer/Geologist:	

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
10/29/24	5 ft		

Depth Ft.		Sample No.	Rec	Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	10"	0'0"-2'0"	2-2-2-4		Dark Brown, loamy, silty Sand, trace gravel, dry (ORGANIC)
		2	18"	2'0"-4'0"	3-3-3-6	3'	___
							Brown, Fine Sand, little silt
5		3	16"	5'0"-7'0"	9-10-9-8		Tan, Fine Sand, trace silt, wet
		4	20"	7'0"-9'0"	7-7-7-7		Fine Sand, little silt, wet (FLUVIAL)
10		5	21"	10'0"-12'0"	3-4-3-3		Tan, Fine Sand, some silt, wet
						14'	___
15		6	10"	15'0"-17'0"	15-16-33-29		Brown, fine to coarse Sand & Gravel, trace silt, wet
							(GLACIAL)
20		7	9"	20'0"-22'0"	5-4-7-32		Brown, fine to coarse Sand & Gravel, wet
							___
							EOB @ 22 BGS GW @ 5' BGS upon completion.
25							
30							

Notes: GeoProbe 6712

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace	0 to 10%		CASING	SAMPLE	CORE TYPE
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little	10 to 20%	ID SIZE (IN)		SS	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some	20 to 35%	HAMMER WGT (LB)		140 lb.	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And	35% to 50%	HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

444 East Central Street
Franklin, MA

B-6

24-10026

Ground Elevation: 272 ft+/-
Date Started: 10/29/24
Date Finished: 10/29/24
Driller: MT
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION TIME
10/29/24	5 ft		

Depth Ft.		Sample No.	Rec	Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	13"	0'0"-2'0"	7-21-30-24		Brown-Grey, fine to coarse Sand & Gravel, trace silt, dry
		2	18"	2'0"-4'0"	12-10-12-9		Grey, f-m Sand, some silt, trace gravel (SUSPECT FILL)
						4'	
5		3	15"	5'0"-7'0"	11-9-9-10		Tan, Silt & Fine Sand, wet (FLUVIAL)
						7'	
		4	18"	7'0"-9'0"	14-14-18-16		Brown, fine to coarse Sand & Gravel, wet
10		5	13"	10'0"-12'0"	23-18-23-22		Brown, fine to coarse Sand & Gravel, trace silt, wet
							(GLACIAL)
15		6	15"	15'0"-17'0"	65-43-50/5"		Same, cobbles
						18'5"	
20							Refusal @ 18'5" BGS GWT @ 5' upon completion
25							
30							

Notes: GeoProbe 6712

			CASING	SAMPLE	CORE TYPE
Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace 0 to 10%				
10-30 M Dense, 30 -50 Dense, 50+ V Dense.	Little 10 to 20%	ID SIZE (IN)		SS	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And 35% to 50%	HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

444 East Central Street
Franklin, MA

B-7

24-10026

Ground Elevation: 272 ft+/-
Date Started: 10/29/24
Date Finished: 10/29/24
Driller: MT
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS			
DATE	DEPTH	CASING AT	STABILIZATION
10/29/24	5 ft		

Depth Ft.		Sample No.	Rec	Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	9"	0'0"-2'0"	4-5-11-7		Dark Brown, loamy, silty Sand, trace gravel, organic (ORGANIC)
		2	12"	2'0"-4'0"	6-6-6-5		Dark Brown, loamy, silty Sand, little gravel, trace organic, dry
						4'	______
5		3	18"	5'0"-7'0"	10-12-12-11		Brown, f-c Sand, little gravel, little silt, wet
		4	19"	7'0"-9'0"	10-9-9-8		Grey, Fine Sand, some silt, wet (FLUVIAL)
10		5	22"	10'0"-12'0"	2-4-4-8		Brown, Silt, wet
						13'	______
							fine to coarse Sand & Gravel, wet (GLACIAL)
15		6	2"	15'0"-17'0"	50/3"	15'	______
							Refusal @ 15' BGS GWT @ 5 ft upon completion
20							
25							
30							

Notes: GeoProbe 6712

				CASING	SAMPLE	CORE TYPE
Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace	0 to 10%				
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little	10 to 20%	ID SIZE (IN)		SS	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some	20 to 35%	HAMMER WGT (LB)		140 lb.	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And	35% to 50%	HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

444 East Central Street
Franklin, MA

B-8

24-10026

Ground Elevation: 274 ft+/-
Date Started: 10/29/24
Date Finished: 10/29/24
Driller: MT
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS			
DATE	DEPTH	CASING AT	STABILIZATION
10/29/24	7 ft		

Depth Ft.		Sample No.	Rec	Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
							TOPSOIL
						6"	
1		1	22"	0'0"-2'0"	4-3-5-3		Tan, Silt & Fine Sand (SUBSOIL)
						2'	
		2	16"	2'0"-4'0"	3-4-6-7		Tan, fine to medium Sand, trace silt, dry
5		3	17"	5'0"-7'0"	12-9-8-8		Tan, Silt w/ Fine Sand, dry (FLUVIAL)
		4	20"	7'0"-9'0"	11-13-46-31		Tan, Fine Sand, little silt, wet
						9'	
10		5	15"	10'0"-12'0"	26-24-44-38		fine to coarse Sand & Gravel, trace silt, wet (GLACIAL)
						12'	
							Refusal @ 12' BGS GWT @ 7' upon completion
15							
20							
25							
30							

Notes: GeoProbe 6712

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace 0 to 10%		CASING	SAMPLE	CORE TYPE
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little 10 to 20%	ID SIZE (IN)		SS	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some 20 to 35%	HAMMER WGT (LB)		140 lb.	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And 35% to 50%	HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

444 East Central Street
Franklin, MA

B-9 (OW)

24-10026

Ground Elevation:	274 ft+/-
Date Started:	10/29/24
Date Finished:	10/29/24
Driller:	MT
Soil Engineer/Geologist:	

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
10/29/24	7 ft		

Depth Ft.		Sample No.	Rec	Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
							TOPSOIL
						4"	
1		1	9"	0'0"-2'0"	1-3-3-4		Brown, Fine Sand, some silt, trace gravel, dry (SUBSOIL)
						2'	
		2	8"	2'0"-4'0"	7-50/5"		Tan, fine to medium Sand & Gravel, trace silt, cobbles, dry
5		3	23"	5'0"-7'0"	43-37-21-19		Brown-Grey, fine to coarse Sand & Gravel, little silt, dry
		4	23"	7'0"-9'0"	17-21-21-21		Brown, fine to coarse Sand & Gravel, trace silt , wet
							(GLACIAL)
10		5	13"	10'0"-12'0"	16-24-16-12		Grey, fine to coarse Sand & Gravel, Fractured Rock, wet
						13'	
							Refusal @ 13' BGS
15							GWT @ 7' upon completion
							Observation Well insttalled to 12 ft
20							
25							
30							

Notes: GeoProbe 6712

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace 0 to 10%		CASING	SAMPLE	CORE TYPE
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little 10 to 20%	ID SIZE (IN)		SS	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some 20 to 35%	HAMMER WGT (LB)		140 lb.	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And 35% to 50%	HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

444 East Central Street
Franklin, MA

B-10

24-10026

Ground Elevation: 274 ft+/-
Date Started: 10/29/24
Date Finished: 10/29/24
Driller: MT
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS			
DATE	DEPTH	CASING AT	STABILIZATION
10/29/24	n/a		

Depth Ft.		Sample No.	Rec	Depth	Blows/6”	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	16”	0’0”-2’0”	2-6-9-9		Tan, f-m Sand, some silt, trace gravel, dry (SUBSOIL)
						2’5”	___
		2	9”	2’0”-4’0”	25-50/5”		Tan, f-m Sand & Gravel, little silt, cobbles, dry
							(GLACIAL)
5		3	18”	5’0”-7’0”	38-41-38-43		Brown, fine to coarse Sand & Gravel, trace silt, dry
		4	5”	7’0”-9’0”	50/5”		Tan, fine to coarse Sand, some gravel, trace silt, dry
						8’	___
10							Refusal @ 8’ BGS Offset Refusals @ 7’ & 7½’
							No GWT upon completion
15							
20							
25							
30							

Notes: GeoProbe 6712

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace 0 to 10%		CASING	SAMPLE	CORE TYPE
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little 10 to 20%	ID SIZE (IN)		SS	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some 20 to 35%	HAMMER WGT (LB)		140 lb.	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And 35% to 50%	HAMMER FALL (IN)		30"	

[redacted] [redacted]

Title	***Pipe Sizing Table***
Project	*40B Multifamily*
Location	444 East Central Street, Franklin MA
Date	2/11/2025
Revised	9/18/2025

Computation Sheet	
By	MTB
Chk'd	CMQ
Apprv'd	CMQ

Minimum Slope:	0.006
Minimum Pipe Size:	12"
Rainfall Intensity (in/hr):	6.60 (25 year storm)
Manning's n:	0.012 HDPE (SMOOTH BORE)

Line						Req'd. Capac.	Pipe Size	Slope	Flow at Inv. Slope		Drop	Invert Elevation		Rim Elev.		Pipe
From Upper	To Lower	Length (feet)	Area (acres)	wgt. *C*	*C* A	*Qd* (cfs)	*D* (in)	*s* (%)	Q_{full} (cfs)	V_{full} (fps)	(feet)	Upper (ft)	Lower (ft)	Upper (ft)	Cover (ft)	Material
CB1	DMH1	84	0.249	0.85	0.213	1.40	12	1.00%	3.87	4.91	0.84	271.54	270.70	274.60	1.94	HDPE
CB3A	DMH2	35	0.082	0.87	0.071	0.47	12	1.00%	3.86	4.91	0.35	271.66	271.31	274.75	1.97	HDPE
CB3B	DMH2	21	0.139	0.80	0.111	0.73	12	1.00%	3.88	4.93	0.21	271.52	271.31	274.75	2.11	HDPE
DMH2	DMH3	8				1.20	12	1.00%	3.87	4.91	0.08	272.31	272.23	274.80	1.37	HDPE
CB4C	DMH30	61	0.247	0.82	0.201	1.33	12	1.00%	3.87	4.91	0.61	272.36	271.76	275.63	2.14	HDPE
CB4D	DMH30	39	0.259	0.78	0.202	1.33	12	1.00%	3.87	4.92	0.39	272.14	271.75	275.70	2.44	HDPE
DMH30	DMH29	34				2.66	15	1.00%	7.00	5.69	0.34	271.66	271.32	275.35	2.32	HDPE
DMH29	DMH26	11				2.66	15	1.00%	7.02	5.71	0.12	271.22	271.10	275.30	2.71	HDPE
CB4A	DMH26	7	0.091	0.84	0.077	0.51	12	1.00%	3.87	4.91	0.07	271.17	271.10	275.50	3.20	HDPE
CB4B	DMH26	27	0.205	0.76	0.155	1.03	12	1.00%	3.87	4.92	0.27	271.38	271.10	274.95	2.45	HDPE
DMH26	DMH4	40				4.19	18	1.00%	11.42	6.45	0.40	272.10	271.70	275.60	1.87	HDPE
CB5C	DMH31	41	0.059	0.86	0.051	0.34	12	1.00%	3.87	4.91	0.41	273.07	272.66	276.75	2.55	HDPE
DMH31	DMH5	20				0.34	12	1.00%	3.87	4.92	0.20	272.56	272.35	276.80	3.12	HDPE
CB5A	DMH5	29	0.241	0.87	0.208	1.37	12	1.00%	3.87	4.92	0.29	272.64	272.35	276.50	2.74	HDPE
CB5B	DMH5	45	0.089	0.87	0.077	0.51	12	1.00%	3.87	4.92	0.45	272.80	272.35	276.85	2.92	HDPE
DMH5	DMH6	63				2.22	12	1.00%	3.87	4.91	0.63	272.25	271.63	276.80	3.42	HDPE
CB2	DMH6	56	0.106	0.65	0.069	0.45	12	1.00%	3.87	4.91	0.56	272.19	271.63	276.80	3.49	HDPE
DMH6	DMH25	13				2.68	15	1.00%	7.01	5.70	0.13	272.63	272.50	277.75	3.75	HDPE
CB6	DMH7	26	0.290	0.78	0.225	1.48	12	1.00%	3.86	4.90	0.26	272.76	272.50	276.50	2.62	HDPE
CB7A	DMH8	10	0.163	0.77	0.125	0.82	12	1.00%	3.87	4.91	0.10	272.92	272.82	276.50	2.45	HDPE
CB7B	DMH8	40	0.259	0.79	0.206	1.36	12	1.00%	3.88	4.93	0.40	273.22	272.82	276.00	1.65	HDPE
DMH8	DMH9	22				2.18	15	1.00%	7.00	5.69	0.22	272.72	272.50	276.65	2.55	HDPE
CB8	DMH33	29	0.252	0.79	0.201	1.32	12	1.00%	3.87	4.91	0.29	273.63	273.34	276.65	1.89	HDPE
CB9B	DMH33	62	0.338	0.72	0.244	1.61	12	1.00%	3.87	4.92	0.63	273.97	273.34	276.35	1.26	HDPE
DMH33	DMH11	24				2.93	15	1.00%	7.01	5.70	0.24	273.24	273.00	277.00	2.38	HDPE
CB9D	DMH32	49	0.115	0.55	0.064	0.42	12	1.00%	3.87	4.91	0.49	273.35	272.85	276.10	1.63	HDPE
CB9A	DMH32	14	0.270	0.80	0.215	1.42	12	1.00%	3.87	4.91	0.14	273.00	272.85	276.25	2.13	HDPE
DMH32	DMH12	48				1.84	12	1.00%	3.87	4.92	0.48	272.75	272.28	276.80	2.92	HDPE
CB9C	DMH12	6	0.085	0.90	0.077	0.51	12	1.00%	3.87	4.91	0.06	272.34	272.28	276.80	3.34	HDPE
DMH12	DMH13	25				2.34	15	1.13%	7.44	6.05	0.28	273.28	273.00	276.90	2.25	HDPE
CB10A	DMH15	87	0.070	0.80	0.056	0.37	12	1.00%	3.88	4.92	0.87	271.41	270.54	276.00	3.46	HDPE
CB10B	DMH15	16	0.240	0.82	0.196	1.30	12	1.00%	3.87	4.91	0.16	270.70	270.54	276.50	4.68	HDPE
DMH15	DMH16	14				1.67	12	1.00%	3.87	4.91	0.14	270.44	270.30	276.75	5.19	HDPE
CB11	DMH17	15	0.264	0.82	0.216	1.43	12	1.00%	3.87	4.92	0.15	270.55	270.40	277.00	5.32	HDPE
CB17	DMH24	143	0.827	0.50	0.416	2.74	15	0.61%	5.48	4.45	0.88	274.97	274.10	277.85	1.51	HDPE
CB16	DMH24	19	0.473	0.55	0.258	1.70	12	1.00%	3.87	4.91	0.19	274.29	274.10	277.85	2.44	HDPE
DMH24	DMH23	176				4.44	18	1.00%	11.41	6.44	1.76	274.00	272.23	278.00	2.38	HDPE
CB15	DMH23	19	0.463	0.58	0.268	1.77	12	1.00%	3.87	4.91	0.19	272.42	272.23	277.00	3.45	HDPE
DMH23	DMH22	121				6.21	18	1.00%	11.39	6.43	1.21	272.13	270.92	277.50	3.75	HDPE
CB13	DMH22	87	0.095	0.80	0.199	1.31	12	1.01%	3.59	4.56	0.31	271.79	270.92	275.80	1.63	HDPE
CB14	DMH22	33	0.142	0.83	0.199	1.31	12	1.00%	3.57	4.54	1.12	271.25	270.92	276.80	1.33	HDPE
DMH22	DMH21	22				8.84	24	1.00%	24.62	7.82	0.22	270.82	270.60	277.35	4.41	HDPE
CB12	DMH21	14	0.164	0.74	0.199	1.31	12	1.00%	3.57	4.54	1.12	270.74	270.60	277.00	1.33	HDPE
DMH21	DMH20	20				10.15	24	1.00%	24.59	7.81	0.20	270.50	270.30	277.30	4.68	HDPE

		Computation Sheet	
Title	*MA DEP Standard Calculations*	By	MTB
Project	*40B Multifamily*	Chk'd	CMQ
Location	444 East Central Street, Franklin MA	Apprv'd	CMQ
Date	02-11-2025		
Revised	9-18-2025		

Stormwater Recharge/Water Quality Volume Table

Rv = F * Impervious Area

Rv *= Required Recharge Volume, expressed in ft ^{3}, cubic yards or acre-feet*

F *= Target Depth Factor associated with each Hydraulic Soil Group*

Impervious Area *= pavement & rooftop area on site*

A_{WQ} *= Required Water Quality Treatment Volume, expressed in ft ^{3}*

D_{WQ} *= Water Quality Depth*

A_{IMP} *= Impervious Area (excluding non-metal roofs)*

				Recharge Required			Water Quality Volume Required	
Watershed	**Area (Sq. Ft.)**	**Landscaped**	**Impervious Area (Square Feet)** **HSG A (F=.6)**	*F Avg. (Inches)*	*Impervious Area (Feet)*	*Rv (ft^3)*	D_{WQ} *(Inch)*	A_{WQ}
CB1	10,841	893	9,948	0.6	9,948	497	1.0	829
CB2	4,621	2,121	2,500	0.6	2,500	125	1.0	208
CB3A	3,583	238	3,345	0.6	3,345	167	1.0	279
CB3B	6,055	1,154	4,901	0.6	4,901	245	1.0	408
CB4A	3,970	428	3,542	0.6	3,542	177	1.0	295
CB4B	8,946	2,325	6,621	0.6	6,621	331	1.0	552
CB4C	10,741	1,619	9,122	0.6	9,122	456	1.0	760
CB4D	11,276	2,459	8,817	0.6	8,817	441	1.0	735
CB5A	10,482	665	9,817	0.6	9,817	491	1.0	818
CB5B	3,866	190	3,676	0.6	3,676	184	1.0	306
CB5C	2,581	185	2,396	0.6	2,396	120	1.0	200
CB6	12,631	2,869	9,762	0.6	9,762	488	1.0	814
CB7A	7,101	1,740	5,361	0.6	5,361	268	1.0	447
CB7B	11,300	2,181	9,119	0.6	9,119	456	1.0	760
CB8	10,991	2,100	8,891	0.6	8,891	445	1.0	741
CB9A	11,743	2,202	9,541	0.6	9,541	477	1.0	795
CB9B	14,736	4,799	9,937	0.6	9,937	497	1.0	828
CB9C	3,708	0	3,708	0.6	3,708	185	1.0	309
CB9D	5,006	1,845	3,161	0.6	3,161	158	1.0	263
CB10A	3,059	562	2,497	0.6	2,497	125	1.0	208
CB10B	10,441	1,544	8,897	0.6	8,897	445	1.0	741
CB11	11,505	1,699	9,806	0.6	9,806	490	1.0	817
CB12	7,148	2,066	5,082	0.6	5,082	254	1.0	424
CB13	4,141	778	3,363	0.6	3,363	168	1.0	280
CB14	6,167	806	5,361	0.6	5,361	268	1.0	447
CB15	20,153	11,766	8,387	0.6	8,387	419	1.0	699
CB16	20,583	13,257	7,326	0.6	7,326	366	1.0	611
CB17	36,035	26,052	9,983	0.6	9,983	499	1.0	832
R1	5,045	0	5,045	0.6	5,045	252	1.0	420
R2	18,290	0	18,290	0.6	18,290	915	1.0	1,524
R3	18,290	0	18,290	0.6	18,290	915	1.0	1,524
R4	18,290	0	18,290	0.6	18,290	915	1.0	1,524
R5	20,565	0	20,565	0.6	20,565	1,028	1.0	1,714
Patio	2,384	0	2,384	0.6	2,384	119	1.0	199
Total	**356,274**	**88,543**	**267,731**	0.6	**267,731**	**13,387**	1.0	**22,311**

Stormwater Recharge Summary

Rv = F * Impervious Area

Rv *= Required Recharge Volume, expressed in ft ^{3}, cubic yards or acre-feet*

F *= Target Depth Factor associated with each Hydraulic Soil Group*

Impervious Area *= pavement & rooftop area on site*

	Required (cf)	***Provided (cf)***	
ARv =	***2,274***	***7,892***	***Underground Infiltration System #1 (CB1,CB4A,CB4B,CB4C,CB4D,R-1,Patio)***
ARv =	***2,274***	***7,892***	***Total***

	Required (cf)	***Provided (cf)***	
ARv =	***412***	***704***	***Underground Infiltration System #2 (CB3A,CB3B)***
ARv =	***412***	***704***	***Total***

	Required (cf)	***Provided (cf)***	
ARv =	***3,961***	***7,065***	***Underground Infiltration System #3 (CB5A,CB5B,CB5C,CB6,CB7B,CB7A,R2,R3,CB2)***
ARv =	***3,961***	***7,065***	***Total***

	Required (cf)	***Provided (cf)***	
ARv =	***1,762***	***2,873***	***Underground Infiltration System #4 (CB8,CB9A,CB9B,CB9C,DB9D)***
ARv =	***1,762***	***2,873***	***Total***

	Required (cf)	***Provided (cf)***	
ARv =	***4,978***	***21,847***	***Underground Infiltration System #5 (CB10A,CB10B,CB11,CB12,CB13,CB14,CB15,CB16,CB17,R4,R5)***
ARv =	***4,978***	***21,847***	***Total***

Water Quality Volume

A_{WQ} *= Required Water Quality Treatment Volume, expressed in ft ^{3}*

D_{WQ} *= Water Quality Depth*

A_{IMP} *= Impervious Area (excluding non-metal roofs)*

	Required (cf)	***Provided (cf)***	
A_{WQ} =	***3,790***	***7,892***	***Underground Infiltration System #1 (CB1,CB4A,CB4B,CB4C,CB4D,R-1,Patio)***
A_{WQ} =	***3,790***	***7,892***	***Total***

	Required (cf)	***Provided (cf)***	
A_{WQ} =	***687***	***704***	***Underground Infiltration System #2 (CB3A,CB3B)***
A_{WQ} =	***687***	***704***	***Total***

	Required (cf)	***Provided (cf)***	
A_{WQ} =	***6,601***	***7,065***	***Underground Infiltration System #3 (CB5A,CB5B,CB5C,CB6,CB7B,CB7A,R2,R3,CB2)***
A_{WQ} =	***6,601***	***7,065***	***Total***

	Required (cf)	***Provided (cf)***	
A_{WQ} =	***2,937***	***2,968***	***Underground Infiltration System #4 (CB8,CB9A,CB9B,CB9C,DB9D)***
A_{WQ} =	***2,937***	***2,968***	***Total***

	Required (cf)	***Provided (cf)***	
A_{WQ} =	***8,296***	***21,847***	***Underground Infiltration System #5 (CB10A,CB10B,CB11,CB12,CB13,CB14,CB15,CB16,CB17,R4,R5)***
A_{WQ} =	***8,296***	***21,847***	***Total***

Draindown Within 72 Hours

$Time_{drawdown}$=(Rv) (1/Design Infiltration Rate in inches per hour) (Conversion for inches to feet) (1/bottom area in feet

UIS1	
Infiltration Rate (in/Hr)=	8.27
Bottom Area (ft^2) =	3,840
Infiltration Volume (ft^3) =	7,892
$Time_{drawdown}$(Hours)=	2.98

$Time_{drawdown}$=(Rv) (1/Design Infiltration Rate in inches per hour) (Conversion for inches to feet) (1/bottom area in feet

UIS2	
Infiltration Rate (in/Hr)=	8.27
Bottom Area (ft^2) =	866
Infiltration Volume (ft^3) =	704
$Time_{drawdown}$(Hours)=	1.18

$Time_{drawdown}$=(Rv) (1/Design Infiltration Rate in inches per hour) (Conversion for inches to feet) (1/bottom area in feet

UIS3	
Infiltration Rate (in/Hr)=	8.27
Bottom Area (ft^2) =	7,030
Infiltration Volume (ft^3) =	7,065
$Time_{drawdown}$(Hours)=	1.46

$Time_{drawdown}$=(Rv) (1/Design Infiltration Rate in inches per hour) (Conversion for inches to feet) (1/bottom area in feet

UIS4	
Infiltration Rate (in/Hr)=	8.27
Bottom Area (ft^2) =	2,495
Infiltration Volume (ft^3) =	2,430
$Time_{drawdown}$(Hours)=	1.41

$Time_{drawdown}$=(Rv) (1/Design Infiltration Rate in inches per hour) (Conversion for inches to feet) (1/bottom area in feet

UIS5	
Infiltration Rate (in/Hr)=	8.27
Bottom Area (ft^2) =	8,721
Infiltration Volume (ft^3) =	21,847
$Time_{drawdown}$(Hours)=	3.63

TSS Removal Worksheet - FES1

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
Infiltration Trench	80%	100%	80%	20%
Deep Sump and Hooded Catch Basin	25%	20%	5%	15%

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1. Removal rates for proprietary devices are from approved studies and/or manufacturer data
** Equals remaining load from previous BMP (E)

Treatment Train TSS Removal = **85%**

TSS Removal Worksheet - FES2,FES5,FES6,FES7,FES8

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
Subsurface Infiltration Structure	**80%**	**100%**	**80%**	**20%**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1. Removal rates for proprietary devices are from approved studies and/or manufacturer data
** Equals remaining load from previous BMP (E)

Treatment Train TSS Removal = **80%**

TSS Removal Worksheet - FES9

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
Infiltration Trench	**80%**	**100%**	**80%**	**20%**
Deep Sump and Hooded Catch Basin	**25%**	**20%**	**5%**	**15%**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1. Removal rates for proprietary devices are from approved studies and/or manufacturer data
** Equals remaining load from previous BMP (E)

Treatment Train TSS Removal =	**85%**

Franklin 40B Project

Computation Sheet

By	CMQ
Chk'd	CMQ
Apprv'd	CMQ

Title *Inlet Grate Capacity*
Project Franklin 40B Project
Date July 21, 2025
Revised September 18, 2025
A&M Project Number: 3317-01

SUMP CATCH BASINS (at a low point, not gutter flow)

Rainfall Intensity (in/hr):	6.60	(25 year storm)
Single Grate Open Area (s.f.):	1.1	(Neenah R-2501)
Double Grate Open Area (s.f.):	2.2	
2-Double Grate Open Area (s.f.):	4.4	
Orifice Coefficient:	0.6	
gravitational constant (fps^2):	32.2	(unless along a curb)
Perimeter of single CB (ft):	8	(unless along a curb)
Perimeter of double CB (ft):	12	

Structure I.D.	Contributing Area (acres)	Weighted CN value	C*A	$Q_{25\ Year\ Storm}$	Orifice Flow Ponding depth (ft)	Perimeter of grate for weir flow	Weir Flow Ponding Depth	Total depth of ponding (ft)	CB Rim Elevation	Peak Elevation
CB1	0.249	0.85	0.212	1.4	0.07	6.0	0.17	0.17	274.60	274.77
CB2	0.106	0.65	0.069	0.5	0.01	8.0	0.07	0.07	276.50	276.57
CB3A	0.082	0.87	0.071	0.5	0.01	6.0	0.08	0.08	274.75	274.83
CB3B	0.139	0.80	0.111	0.7	0.02	6.0	0.11	0.11	274.75	274.86
CB4C	0.247	0.82	0.202	1.3	0.06	4.0	0.22	0.22	275.63	275.84
CB4D	0.259	0.78	0.202	1.3	0.06	6.0	0.17	0.17	275.70	275.87
CB4A	0.091	0.84	0.077	0.5	0.01	4.0	0.11	0.11	275.50	275.61
CB4B	0.205	0.76	0.156	1.0	0.00	6.0	0.14	0.14	274.95	275.09
CB5C	0.059	0.86	0.051	0.3	0.00	4.0	0.09	0.09	276.75	276.84
CB5A	0.241	0.87	0.210	1.4	0.02	8.0	0.14	0.14	276.50	276.64
CB5B	0.089	0.87	0.078	0.5	0.00	6.0	0.09	0.09	276.85	276.94
CB7A	0.163	0.77	0.126	0.8	0.01	4.0	0.16	0.16	276.50	276.66
CB7B	0.260	0.76	0.199	1.3	0.02	6.0	0.16	0.16	276.00	276.16
CB8	0.252	0.80	0.201	1.3	0.02	6.0	0.16	0.16	276.65	276.81
CB9B	0.338	0.72	0.244	1.6	0.02	6.0	0.19	0.19	276.35	276.54
CB9D	0.115	0.55	0.063	0.4	0.00	6.0	0.08	0.08	276.10	276.18
CB9A	0.270	0.80	0.215	1.4	0.02	8.0	0.14	0.14	276.25	276.39
CB9C	0.085	0.90	0.077	0.5	0.00	6.0	0.09	0.09	276.80	276.89
CB10A	0.066	0.80	0.053	0.3	0.00	4.0	0.09	0.09	276.00	276.09
CB10B	0.239	0.83	0.198	1.3	0.02	6.0	0.16	0.16	276.50	276.66
CB11	0.264	0.82	0.216	1.4	0.02	8.0	0.14	0.14	277.00	277.14
CB17	0.827	0.50	0.416	2.7	0.07	6.0	0.27	0.27	277.85	278.12
CB16	0.473	0.55	0.258	1.7	0.03	6.0	0.19	0.19	277.85	278.04
CB15	0.463	0.60	0.276	1.8	0.03	8.0	0.17	0.17	277.00	277.17
CB13	0.095	0.80	0.076	0.5	0.00	4.0	0.11	0.11	275.80	275.91
CB14	0.142	0.83	0.117	0.8	0.02	4.0	0.15	0.15	276.80	276.95
CB12	0.164	0.74	0.122	0.8	0.01	4.0	0.15	0.15	277.00	277.15

Orifice Equation: Q = C*A*(2*g*h)^.5
Solve for h yields: $(Q/(C*A))^2/(2*g)$

Weir Flow Equation: $Q=3.3*P(h)^{1.5}$
Solve for h yields: $(Q/(3.3*P))^{0.667}$

Project: **444 East Central Street**
Location: **Franklin, MA**
Prepared For: **Allen & Major Associates**

CONTECH ENGINEERED SOLUTIONS

Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 3 or 4. Figure 4 is in tabular form so is preferred. Using the tc, read the unit peak discharge (qu) from Figure 3 or Table in Figure 4. qu is expressed in the following units: cfs/mi^2/watershed inches (csm/in).

Compute Q Rate using the following equation:

Q = (qu) (A) (WQV)

where:

Q = flow rate associated with first 1" of runoff
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area (in square miles)
WQV = water quality volume in watershed inches (1" in this case)

Structure Name	Impv. (acres)	A (miles^2)	t_c (min)	t_c (hr)	WQV (in)	qu (csm/in.)	Q (cfs)
CB 1	0.21	0.0003346	6.0	0.100	1.00	774.00	0.26
DMH 26	0.66	0.0010314	6.0	0.100	1.00	774.00	0.80
DMH 28	0.35	0.0005540	6.0	0.100	1.00	774.00	0.43
CB 6	0.22	0.0003507	6.0	0.100	1.00	774.00	0.27
DMH 8	0.33	0.0005092	6.0	0.100	1.00	774.00	0.39
CB 8	0.21	0.0003204	6.0	0.100	1.00	774.00	0.25
DMH 12	0.55	0.0008638	6.0	0.100	1.00	774.00	0.67
DMH 15	0.26	0.0004081	6.0	0.100	1.00	774.00	0.32
CB 11	0.23	0.0003517	6.0	0.100	1.00	774.00	0.27
DMH 21	0.90	0.0014057	6.0	0.100	1.00	774.00	1.09

The WQf sizing calculation selects the minimum size CDS/Cascade/StormCeptor model capable of operating at the computed WQf peak flowrate prior to bypassing. It assumes free discharge of the WQf through the unit and ignores the routing effect of any upstream storm drain piping. As with all hydrodynamic separators, there will be some impact to the Hydraulic Gradient of the corresponding drainage system, and evaluation of this impact should be considered in the design.

Brief Stormceptor Sizing Report - CB 1

Project Information & Location			
Project Name	444 East Central Street	**Project Number**	863260
City	Franklin	**State/ Province**	Massachusetts
Country	United States of America	**Date**	7/22/2025
Designer Information		**EOR Information (optional)**	
Name	David Adams	**Name**	
Company	Contech Engineered Solutions	**Company**	Allen & Major
Phone #	207-885-6191	**Phone #**	
Email	dadams@conteches.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	CB 1
Target TSS Removal (%)	80
TSS Removal (%) Provided	93
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	93
STC 900	96
STC 1200	97
STC 1800	97
STC 2400	98
STC 3600	98
STC 4800	99
STC 6000	99
STC 7200	99
STC 11000	99
STC 13000	99
STC 16000	100

Sizing Details

Drainage Area	
Total Area (acres)	0.21
Imperviousness %	100.0

Rainfall	
Station Name	BLUE HILL
State/Province	Massachusetts
Station ID #	0736
Years of Records	58
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD)
The selected PSD defines TSS removal

OK-110		
Particle Diameter (microns)	Distribution %	Specific Gravity
1.0	0.0	2.65
53.0	3.0	2.65
75.0	15.0	2.65
88.0	25.0	2.65
106.0	41.0	2.65
125.0	15.0	2.65
150.0	1.0	2.65
212.0	0.0	2.65

Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
- For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
https://www.conteches.com/technical-guides/search?filter=1WBC0O5EYX

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

444 EAST CENTRAL STREET
FRANKLIN, MA

Area	**0.66 ac**	Unit Site Designation	**DMH 26**
Weighted C	**0.9**	Rainfall Station #	**68**
t_c	**6 min**		
CDS Model	**2015-4**	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	9.3%	9.3%	0.01	0.01	9.3
0.04	9.5%	18.8%	0.02	0.02	9.5
0.06	8.7%	27.5%	0.04	0.04	8.7
0.08	10.1%	37.6%	0.05	0.05	10.1
0.10	7.2%	44.8%	0.06	0.06	7.1
0.12	6.0%	50.8%	0.07	0.07	5.9
0.14	6.3%	57.1%	0.08	0.08	6.2
0.16	5.6%	62.7%	0.10	0.10	5.5
0.18	4.7%	67.4%	0.11	0.11	4.6
0.20	3.6%	71.0%	0.12	0.12	3.5
0.25	8.2%	79.1%	0.15	0.15	7.9
0.50	14.9%	94.0%	0.30	0.30	13.6
0.75	3.2%	97.3%	0.45	0.45	2.8
1.00	1.2%	98.5%	0.59	0.59	1.0
1.50	0.7%	99.2%	0.89	0.89	0.5
2.00	0.8%	100.0%	1.19	1.19	0.5
					96.7

Removal Efficiency Adjustment[2] =	6.5%
Predicted % Annual Rainfall Treated =	93.5%
Predicted Net Annual Load Removal Efficiency =	**90.2%**

1 - Based on 10 years of rainfall data from NCDC station 736, Blue Hill, Norfolk County, MA

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CONTECH ENGINEERED SOLUTIONS

CDS

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

444 EAST CENTRAL STREET
FRANKLIN, MA

Area	**0.35 ac**	Unit Site Designation	**DMH 28**
Weighted C	**0.9**	Rainfall Station #	**68**
t_c	**6 min**		
CDS Model	**2015-4**	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	9.3%	9.3%	0.01	0.01	9.3
0.04	9.5%	18.8%	0.01	0.01	9.5
0.06	8.7%	27.5%	0.02	0.02	8.7
0.08	10.1%	37.6%	0.03	0.03	10.1
0.10	7.2%	44.8%	0.03	0.03	7.2
0.12	6.0%	50.8%	0.04	0.04	6.0
0.14	6.3%	57.1%	0.04	0.04	6.3
0.16	5.6%	62.7%	0.05	0.05	5.6
0.18	4.7%	67.4%	0.06	0.06	4.7
0.20	3.6%	71.0%	0.06	0.06	3.6
0.25	8.2%	79.1%	0.08	0.08	8.1
0.50	14.9%	94.0%	0.16	0.16	14.3
0.75	3.2%	97.3%	0.24	0.24	3.0
1.00	1.2%	98.5%	0.32	0.32	1.1
1.50	0.7%	99.2%	0.47	0.47	0.6
2.00	0.8%	100.0%	0.63	0.63	0.6
					98.6

Removal Efficiency Adjustment[2] =	6.5%
Predicted % Annual Rainfall Treated =	93.5%
Predicted Net Annual Load Removal Efficiency =	**92.2%**

1 - Based on 10 years of rainfall data from NCDC station 736, Blue Hill, Norfolk County, MA

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Brief Stormceptor Sizing Report - CB 6

Project Information & Location			
Project Name	444 East Central Street	**Project Number**	863260
City	Franklin	**State/ Province**	Massachusetts
Country	United States of America	**Date**	7/22/2025
Designer Information		**EOR Information (optional)**	
Name	David Adams	**Name**	
Company	Contech Engineered Solutions	**Company**	Allen & Major
Phone #	207-885-6191	**Phone #**	
Email	dadams@conteches.com	**Email**	

Stormwater Treatment Recommendation
The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	CB 6
Target TSS Removal (%)	80
TSS Removal (%) Provided	93
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	93
STC 900	96
STC 1200	97
STC 1800	97
STC 2400	98
STC 3600	98
STC 4800	99
STC 6000	99
STC 7200	99
STC 11000	99
STC 13000	99
STC 16000	100

Sizing Details

Drainage Area	
Total Area (acres)	0.22
Imperviousness %	100.0

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	

Rainfall	
Station Name	BLUE HILL
State/Province	Massachusetts
Station ID #	0736
Years of Records	58
Latitude	42°12'44"N
Longitude	71°6'53"W

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD) The selected PSD defines TSS removal		
OK-110		
Particle Diameter (microns)	Distribution %	Specific Gravity
1.0	0.0	2.65
53.0	3.0	2.65
75.0	15.0	2.65
88.0	25.0	2.65
106.0	41.0	2.65
125.0	15.0	2.65
150.0	1.0	2.65
212.0	0.0	2.65

Notes

• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
• Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
• For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
https://www.conteches.com/technical-guides/search?filter=1WBC0O5EYX

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

444 EAST CENTRAL STREET
FRANKLIN, MA

Area	0.33 ac	Unit Site Designation	DMH 8
Weighted C	0.9	Rainfall Station #	68
t_c	6 min		
CDS Model	1515-3	CDS Treatment Capacity	1.0 cfs

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	9.3%	9.3%	0.01	0.01	9.3
0.04	9.5%	18.8%	0.01	0.01	9.5
0.06	8.7%	27.5%	0.02	0.02	8.7
0.08	10.1%	37.6%	0.02	0.02	10.1
0.10	7.2%	44.8%	0.03	0.03	7.2
0.12	6.0%	50.8%	0.04	0.04	6.0
0.14	6.3%	57.1%	0.04	0.04	6.3
0.16	5.6%	62.7%	0.05	0.05	5.5
0.18	4.7%	67.4%	0.05	0.05	4.6
0.20	3.6%	71.0%	0.06	0.06	3.6
0.25	8.2%	79.1%	0.07	0.07	8.0
0.50	14.9%	94.0%	0.15	0.15	14.1
0.75	3.2%	97.3%	0.22	0.22	2.9
1.00	1.2%	98.5%	0.29	0.29	1.1
1.50	0.7%	99.2%	0.44	0.44	0.6
2.00	0.8%	100.0%	0.59	0.59	0.6
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
					98.0
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**91.5%**

1 - Based on 10 years of rainfall data from NCDC station 736, Blue Hill, Norfolk County, MA

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Brief Stormceptor Sizing Report - CB 8

Project Information & Location			
Project Name	444 East Central Street	**Project Number**	863260
City	Franklin	**State/ Province**	Massachusetts
Country	United States of America	**Date**	7/22/2025
Designer Information		**EOR Information (optional)**	
Name	David Adams	**Name**	
Company	Contech Engineered Solutions	**Company**	Allen & Major
Phone #	207-885-6191	**Phone #**	
Email	dadams@conteches.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	CB 8
Target TSS Removal (%)	80
TSS Removal (%) Provided	93
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	93
STC 900	96
STC 1200	97
STC 1800	97
STC 2400	98
STC 3600	98
STC 4800	99
STC 6000	99
STC 7200	99
STC 11000	99
STC 13000	99
STC 16000	100

Sizing Details

Drainage Area	
Total Area (acres)	0.21
Imperviousness %	100.0

Rainfall	
Station Name	BLUE HILL
State/Province	Massachusetts
Station ID #	0736
Years of Records	58
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD)
The selected PSD defines TSS removal

OK-110

Particle Diameter (microns)	Distribution %	Specific Gravity
1.0	0.0	2.65
53.0	3.0	2.65
75.0	15.0	2.65
88.0	25.0	2.65
106.0	41.0	2.65
125.0	15.0	2.65
150.0	1.0	2.65
212.0	0.0	2.65

Notes

• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
• Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
• For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
https://www.conteches.com/technical-guides/search?filter=1WBC0O5EYX

CONTECH ENGINEERED SOLUTIONS

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

444 EAST CENTRAL STREET
FRANKLIN, MA

Area	**0.55 ac**	Unit Site Designation	**DMH 12**
Weighted C	**0.9**	Rainfall Station #	**68**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	9.3%	9.3%	0.01	0.01	9.3
0.04	9.5%	18.8%	0.02	0.02	9.5
0.06	8.7%	27.5%	0.03	0.03	8.7
0.08	10.1%	37.6%	0.04	0.04	10.0
0.10	7.2%	44.8%	0.05	0.05	7.1
0.12	6.0%	50.8%	0.06	0.06	5.9
0.14	6.3%	57.1%	0.07	0.07	6.2
0.16	5.6%	62.7%	0.08	0.08	5.5
0.18	4.7%	67.4%	0.09	0.09	4.6
0.20	3.6%	71.0%	0.10	0.10	3.5
0.25	8.2%	79.1%	0.12	0.12	7.8
0.50	14.9%	94.0%	0.25	0.25	13.4
0.75	3.2%	97.3%	0.37	0.37	2.7
1.00	1.2%	98.5%	0.50	0.50	1.0
1.50	0.7%	99.2%	0.75	0.75	0.5
2.00	0.8%	100.0%	1.00	1.00	0.4
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
					95.9
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**89.5%**

1 - Based on 10 years of rainfall data from NCDC station 736, Blue Hill, Norfolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

444 EAST CENTRAL STREET
FRANKLIN, MA

Area	**0.26 ac**	Unit Site Designation	**DMH 15**
Weighted C	**0.9**	Rainfall Station #	**68**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	9.3%	9.3%	0.00	0.00	9.3
0.04	9.5%	18.8%	0.01	0.01	9.5
0.06	8.7%	27.5%	0.01	0.01	8.7
0.08	10.1%	37.6%	0.02	0.02	10.1
0.10	7.2%	44.8%	0.02	0.02	7.2
0.12	6.0%	50.8%	0.03	0.03	6.0
0.14	6.3%	57.1%	0.03	0.03	6.3
0.16	5.6%	62.7%	0.04	0.04	5.6
0.18	4.7%	67.4%	0.04	0.04	4.7
0.20	3.6%	71.0%	0.05	0.05	3.6
0.25	8.2%	79.1%	0.06	0.06	8.0
0.50	14.9%	94.0%	0.12	0.12	14.3
0.75	3.2%	97.3%	0.18	0.18	3.0
1.00	1.2%	98.5%	0.24	0.24	1.1
1.50	0.7%	99.2%	0.35	0.35	0.6
2.00	0.8%	100.0%	0.47	0.47	0.6
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
0.00	0.0%	100.0%	0.00	0.00	0.0
					98.5
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**92.1%**

1 - Based on 10 years of rainfall data from NCDC station 736, Blue Hill, Norfolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Brief Stormceptor Sizing Report - CB 11

Project Information & Location			
Project Name	444 East Central Street	**Project Number**	863260
City	Franklin	**State/ Province**	Massachusetts
Country	United States of America	**Date**	7/22/2025
Designer Information		**EOR Information (optional)**	
Name	David Adams	**Name**	
Company	Contech Engineered Solutions	**Company**	Allen & Major
Phone #	207-885-6191	**Phone #**	
Email	dadams@conteches.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	CB 11
Target TSS Removal (%)	80
TSS Removal (%) Provided	93
Recommended Stormceptor Model	STC 450i

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	93
STC 900	96
STC 1200	96
STC 1800	97
STC 2400	98
STC 3600	98
STC 4800	99
STC 6000	99
STC 7200	99
STC 11000	99
STC 13000	99
STC 16000	99

Sizing Details

Drainage Area	
Total Area (acres)	0.23
Imperviousness %	100.0

Rainfall	
Station Name	BLUE HILL
State/Province	Massachusetts
Station ID #	0736
Years of Records	58
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD) The selected PSD defines TSS removal		
OK-110		
Particle Diameter (microns)	Distribution %	Specific Gravity
1.0	0.0	2.65
53.0	3.0	2.65
75.0	15.0	2.65
88.0	25.0	2.65
106.0	41.0	2.65
125.0	15.0	2.65
150.0	1.0	2.65
212.0	0.0	2.65

Notes

• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
• Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
• For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
https://www.conteches.com/technical-guides/search?filter=1WBC0O5EYX

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

444 EAST CENTRAL STREET
FRANKLIN, MA

Area	**0.90 ac**	Unit Site Designation	**DMH 21**
Weighted C	**0.9**	Rainfall Station #	**68**
t_c	**6 min**		
CDS Model	**2015-4**	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	9.3%	9.3%	0.02	0.02	9.3
0.04	9.5%	18.8%	0.03	0.03	9.5
0.06	8.7%	27.5%	0.05	0.05	8.7
0.08	10.1%	37.6%	0.06	0.06	10.0
0.10	7.2%	44.8%	0.08	0.08	7.1
0.12	6.0%	50.8%	0.10	0.10	5.9
0.14	6.3%	57.1%	0.11	0.11	6.2
0.16	5.6%	62.7%	0.13	0.13	5.4
0.18	4.7%	67.4%	0.15	0.15	4.5
0.20	3.6%	71.0%	0.16	0.16	3.5
0.25	8.2%	79.1%	0.20	0.20	7.7
0.50	14.9%	94.0%	0.41	0.41	13.1
0.75	3.2%	97.3%	0.61	0.61	2.6
1.00	1.2%	98.5%	0.81	0.81	0.9
1.50	0.7%	99.2%	1.22	1.22	0.4
2.00	0.8%	100.0%	1.62	1.40	0.4
					95.1

Removal Efficiency Adjustment[2] =	6.5%
Predicted % Annual Rainfall Treated =	93.4%
Predicted Net Annual Load Removal Efficiency =	**88.6%**

1 - Based on 10 years of rainfall data from NCDC station 736, Blue Hill, Norfolk County, MA

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Project No. 3317-01	**Sheet:** 1 of 1
Project Description: 444 East Central Street, Franklin	
Calculated By: MTB	Date: 09-18-2025
Checked By: CMQ	

RIP-RAP SIZING SPREADSHEET*

*Methods follow FHWA HEC-14, Third Edition.

$$D_{50} = 0.2D\left(\frac{Q}{\sqrt{g}D^{2.5}}\right)^{\frac{4}{3}}\left(\frac{D}{Tw}\right)$$

Where:
D_{50} = required rip-rap rock size (in)
Q = flow (cfs)
D = pipe diameter (ft)
Tw = tailwater depth (ft)
g = acceleration due to gravity

La = length of apron
W_1 = width of apron (start) = 3D
W_2 = width of apron (end) = 3D+(2/3)L
Da = depth of apron

Table 10.1 Rip-Rap Classes & Apron Dimensions

Class	D_{50} (in)	Apron Length (La)	Apron Depth (in)
1	5	4D	3.5D_{50}
2	6	4D	3.3D_{50}
3	10	5D	2.4D_{50}
4	14	6D	2.2D_{50}
5	20	7D	2.0D_{50}
6	22	8D	2.0D_{50}

Outlet	HydroCAD Node	D	Q100	Tw	D_{50} (in)	Min. D_{50} (in)	La (ft)	W_1 (ft)	W_2 (ft)	Da (ft)
FES-01	TD1	1.00	5.02	0.44	4.64	5	4.00	3.00	5.67	1.46
FES-10	UIS2	1.00	1.31	0.44	0.78	5	4.00	3.00	5.67	1.46
FES-03	Max Flow	1.00	3.50	0.44	2.87	5	4.00	3.00	5.67	1.46
FES-04	Max Flow	1.00	3.00	0.44	2.34	5	4.00	3.00	5.67	1.46
FES-05	UIS1	1.25	2.33	0.55	0.99	5	5.00	3.75	7.08	1.46
FES-06	UIS3	1.00	3.19	0.44	2.54	5	4.00	3.00	5.67	1.46
FES-07	UIS4	1.00	2.44	0.44	1.78	5	4.00	3.00	5.67	1.46
FES-08	UIS5	1.00	1.59	0.44	1.00	5	4.00	3.00	5.67	1.46
FES-09	TD2	1.00	0.05	0.44	0.01	5	4.00	3.00	5.67	1.46

Illicit Discharge Compliance Statement

Responsibility:

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

OWNER NAME: TAG Central LLC

ADDRESS: 275 Regatta Drive
Jupiter, FL 33477

TEL. NUMBER: (561) 685-5336

Engineer's Compliance Statement:

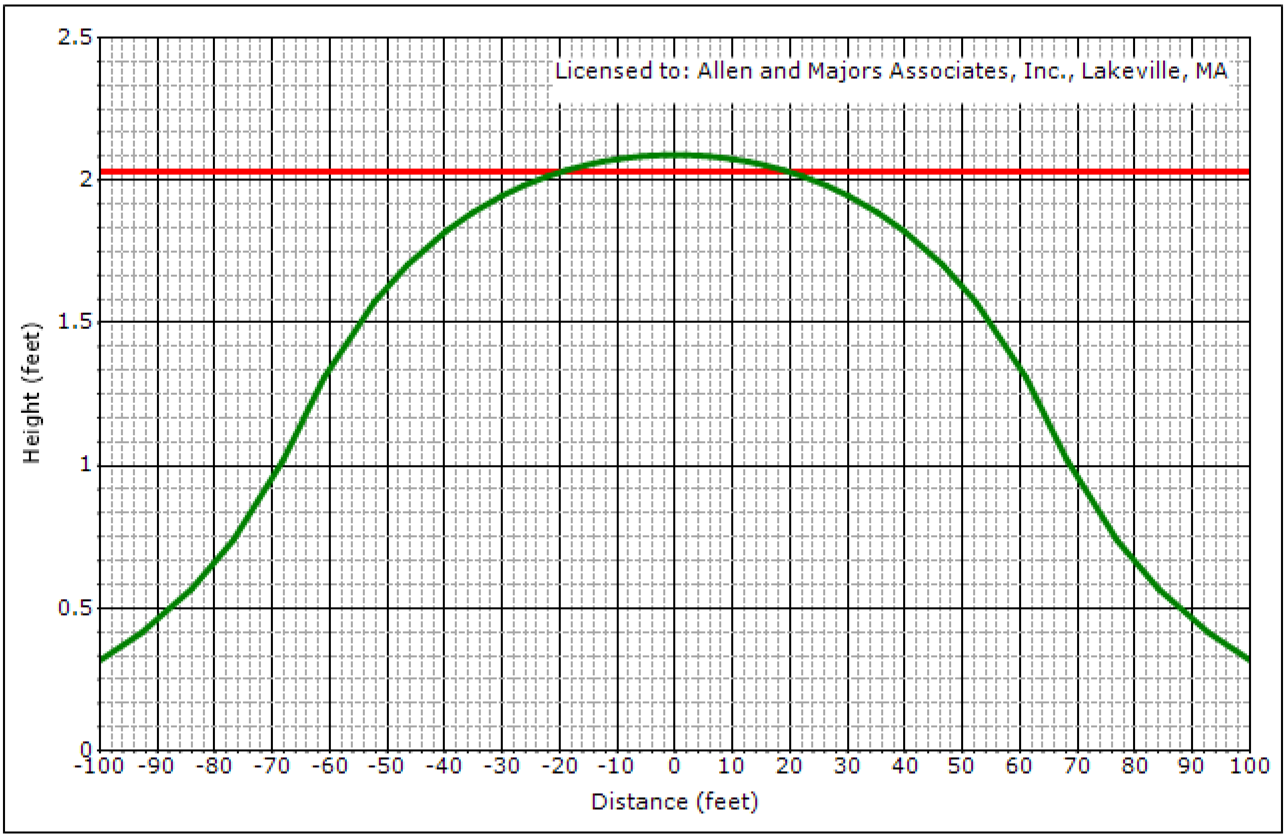
To the best of my knowledge, the attached plans, computations and specifications meet the requirements of Standard 10 of the Massachusetts Stormwater Handbook regarding illicit discharges to the stormwater management system and that no detectable illicit discharges exist on the site. All documents and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

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

For a redevelopment project (if applicable), all actions taken to identify and remove illicit discharges, including without limitation, visual screening, dye or smoke testing, and the removal of any sources of illicit discharges to the stormwater management system are documented and included with this statement.

Alexander Alevizos
Principal

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company: Allen and Major
Project: Associates
UIS1
Analyst: Carlton Quinn
Date: 09/16/2025

Recharge Basin Dimensions

Length (w): 130.5 ft
Width (l): 29.5 ft
Bottom Area: 3,850 ft²
SHGW Separation: 2.03 ft

Recharge Rate Calculations

Duration (t): 1 d
Volume (V): 7,892 ft³
Rate (R): 2.04 ft/d
Total Simulation Time: 4 d

Aquifer Characteristics

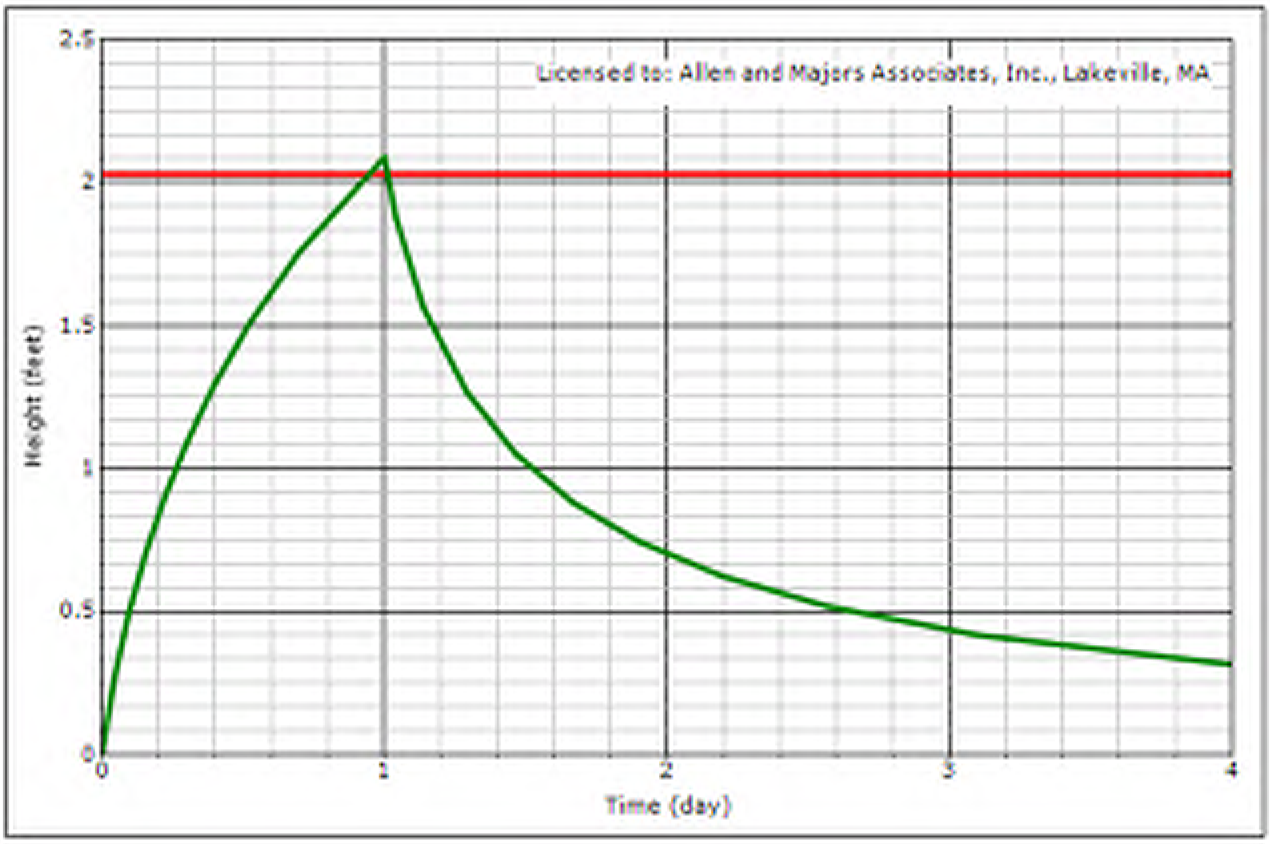
Hydraulic Conductivity (Kh): 82.7 ft/d
Drainable Porosity(Sy): 0.3
Saturated Thickness (h): 6.5 ft

Plot Geometry

X-Coordinate: 0 ft
Y-Coordinate: 0 ft
Left Side Plot Distance (Dl): 100 ft
Right Side Plot Distance (Dr): 100 ft
Plot Angle From Y-Axis (Φ): 0
Constant Head Boundary: No

Distance (ft)	Height (ft)	Distance (ft)	Height (ft)
-100.00	0.3172	0.00	2.0889
-92.78	0.4136	1.60	2.0885
-84.10	0.5669	3.15	2.0874
-76.87	0.7374	4.50	2.0859
-68.19	1.0180	5.80	2.0839
-60.96	1.3095	7.79	2.0799
-52.29	1.5727	9.69	2.0750
-46.49	1.7035	12.69	2.0649
-39.79	1.8216	15.49	2.0530
-35.21	1.8861	18.96	2.0345
-30.10	1.9451	22.18	2.0136
-26.32	1.9810	26.32	1.9810
-22.18	2.0136	30.10	1.9451
-18.96	2.0345	35.21	1.8861
-15.49	2.0530	39.79	1.8216
-12.69	2.0649	46.49	1.7035
-9.69	2.0750	52.29	1.5727
-7.79	2.0799	60.96	1.3095
-5.80	2.0839	68.19	1.0180
-4.50	2.0859	76.87	0.7374
-3.15	2.0874	84.10	0.5669
-1.60	2.0885	92.78	0.4136
		100.00	0.3172

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company: Allen and Major Associates
Project: UIS1
Analyst: Carlton Quinn
Date: 09/16/2025

Recharge Basin Dimensions

Length (w): 130.5 ft
Width (l): 29.5 ft
Bottom Area: 3,850 ft²
SHGW Separation: 2.03 ft

Recharge Rate Calculations

Duration (t): 1 d
Volume (V): 7,892 ft³
Rate (R): 2.04 ft/d
Total Simulation Time: 4 d

Aquifer Characteristics

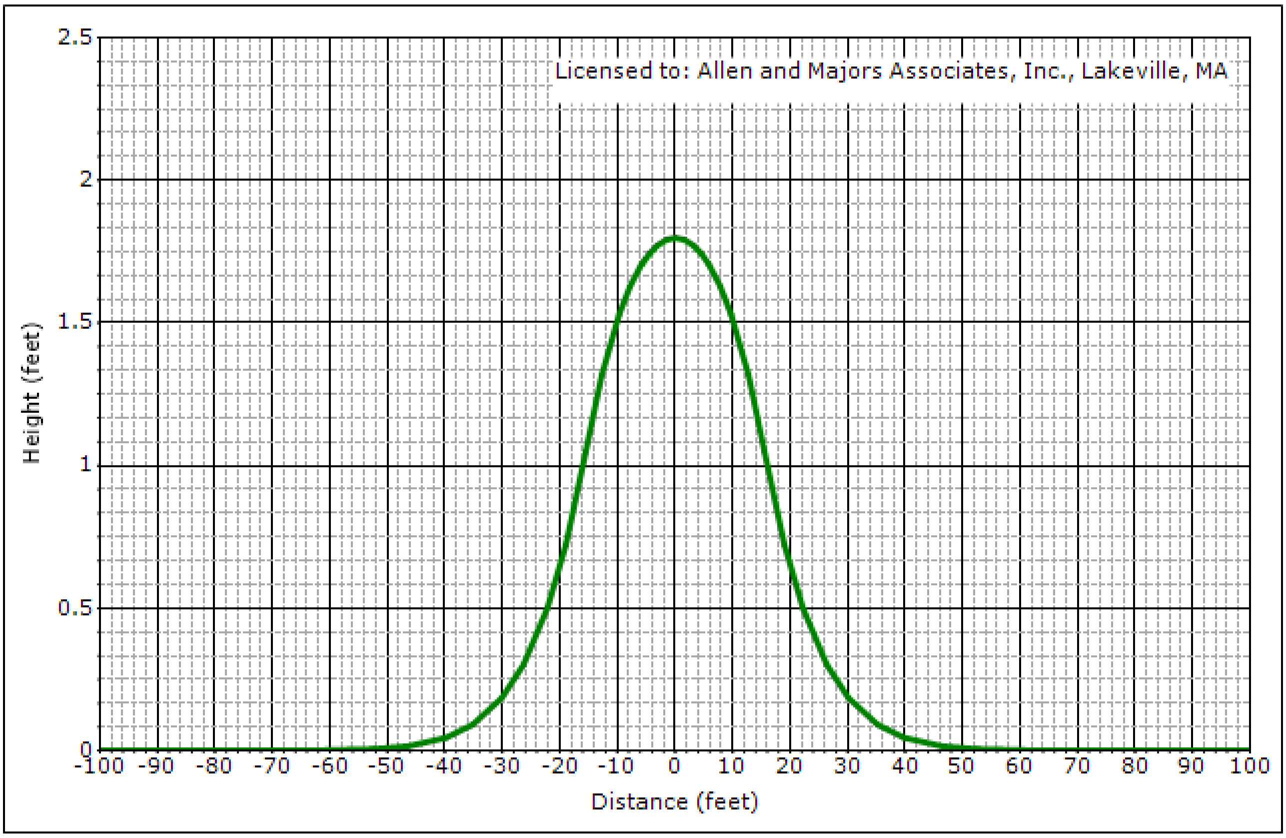
Hydraulic Conductivity (Kh): 82.7 ft/d
Drainable Porosity(Sy): 0.3
Saturated Thickness (h): 6.5 ft

Plot Geometry

X-Coordinate: 0 ft
Y-Coordinate: 0 ft
Left Side Plot Distance (Dl): 100 ft
Right Side Plot Distance (Dr): 100 ft
Plot Angle From Y-Axis (Φ): 0
Constant Head Boundary: No

Time (d)	Height (ft)
0.00	0.0000
0.01	0.0893
0.05	0.2783
0.10	0.5039
0.15	0.7066
0.22	0.9003
0.30	1.0935
0.40	1.2931
0.52	1.5086
0.70	1.7575
1.00	2.0889
1.04	1.8803
1.14	1.5641
1.29	1.2686
1.46	1.0529
1.67	0.8837
1.90	0.7442
2.19	0.6249
2.57	0.5184
3.10	0.4186
4.00	0.3153

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company: Allen and Major
Project: Associates
UIS2
Analyst: Carlton Quinn
Date: 09/16/2025

Recharge Basin Dimensions

Length (w): 31 ft
Width (l): 27.95 ft
Bottom Area: 866 ft²
SHGW Separation: 2 ft

Recharge Rate Calculations

Duration (t): 1 d
Volume (V): 704 ft³
Rate (R): 0.81 ft/d
Total Simulation Time: 4 d

Aquifer Characteristics

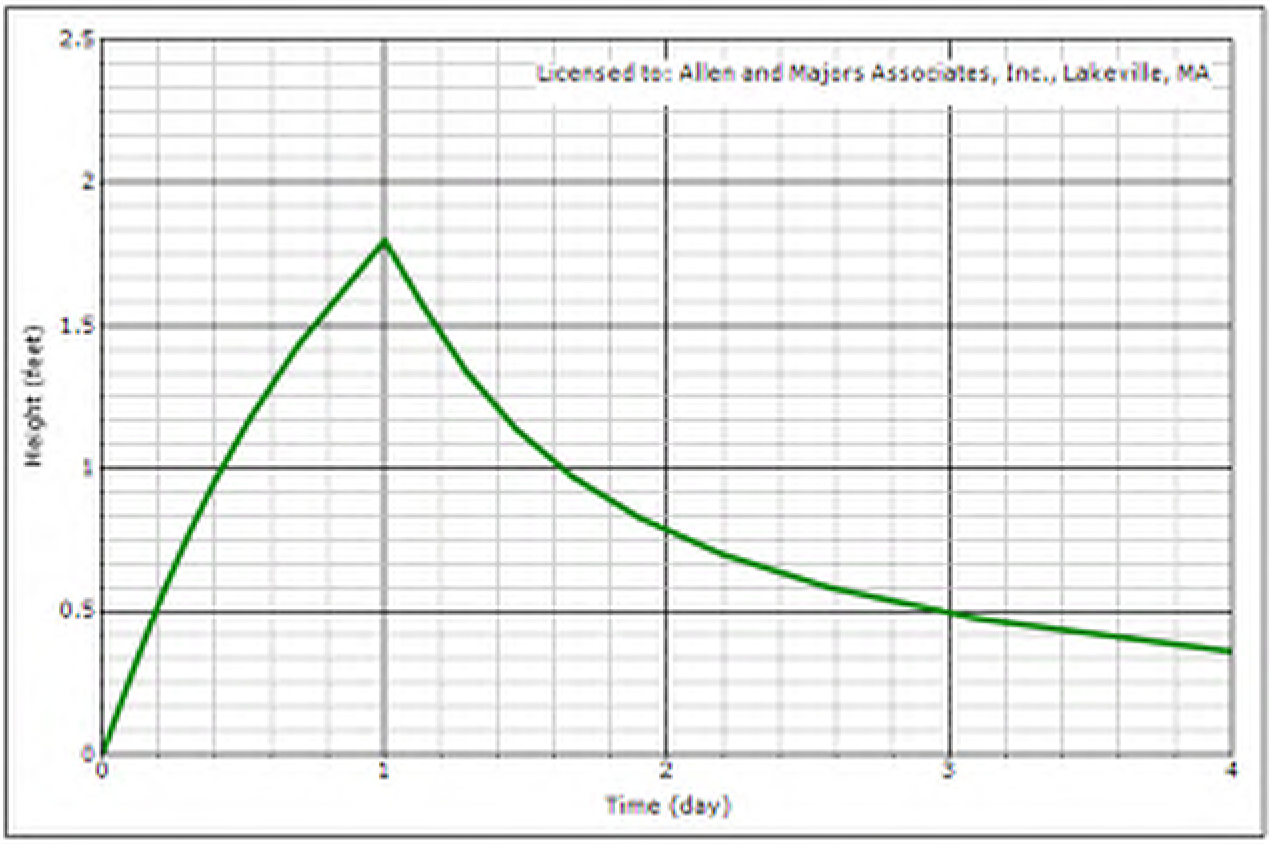
Hydraulic Conductivity (Kh): 82.7 ft/d
Drainable Porosity(Sy): 0.3
Saturated Thickness (h): 0.5 ft

Plot Geometry

X-Coordinate: 0 ft
Y-Coordinate: 0 ft
Left Side Plot Distance (Dl): 100 ft
Right Side Plot Distance (Dr): 100 ft
Plot Angle From Y-Axis (Φ): 0
Constant Head Boundary: No

Distance (ft)	Height (ft)	Distance (ft)	Height (ft)
-100.00	0.0000	0.00	1.7979
-92.78	0.0000	1.60	1.7910
-84.10	0.0006	3.15	1.7711
-76.87	0.0011	4.50	1.7427
-68.19	0.0015	5.80	1.7054
-60.96	0.0020	7.79	1.6280
-52.29	0.0059	9.69	1.5293
-46.49	0.0154	12.69	1.3180
-39.79	0.0456	15.49	1.0498
-35.21	0.0908	18.96	0.7223
-30.10	0.1852	22.18	0.5000
-26.32	0.3023	26.32	0.3023
-22.18	0.5000	30.10	0.1852
-18.96	0.7223	35.21	0.0908
-15.49	1.0498	39.79	0.0456
-12.69	1.3180	46.49	0.0154
-9.69	1.5293	52.29	0.0059
-7.79	1.6280	60.96	0.0020
-5.80	1.7054	68.19	0.0015
-4.50	1.7427	76.87	0.0011
-3.15	1.7711	84.10	0.0006
-1.60	1.7910	92.78	0.0000
		100.00	0.0000

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company: Allen and Major Associates

Project: UIS2

Analyst: Carlton Quinn

Date: 09/16/2025

Recharge Basin Dimensions

Length (w): 31 ft

Width (l): 27.95 ft

Bottom Area: 866 ft²

SHGW Separation: 2 ft

Recharge Rate Calculations

Duration (t): 1 d

Volume (V): 704 ft³

Rate (R): 0.81 ft/d

Total Simulation Time: 4 d

Aquifer Characteristics

Hydraulic Conductivity (Kh): 82.7 ft/d

Drainable Porosity(Sy): 0.3

Saturated Thickness (h): 0.5 ft

Plot Geometry

X-Coordinate: 0 ft

Y-Coordinate: 0 ft

Left Side Plot Distance (Dl): 100 ft

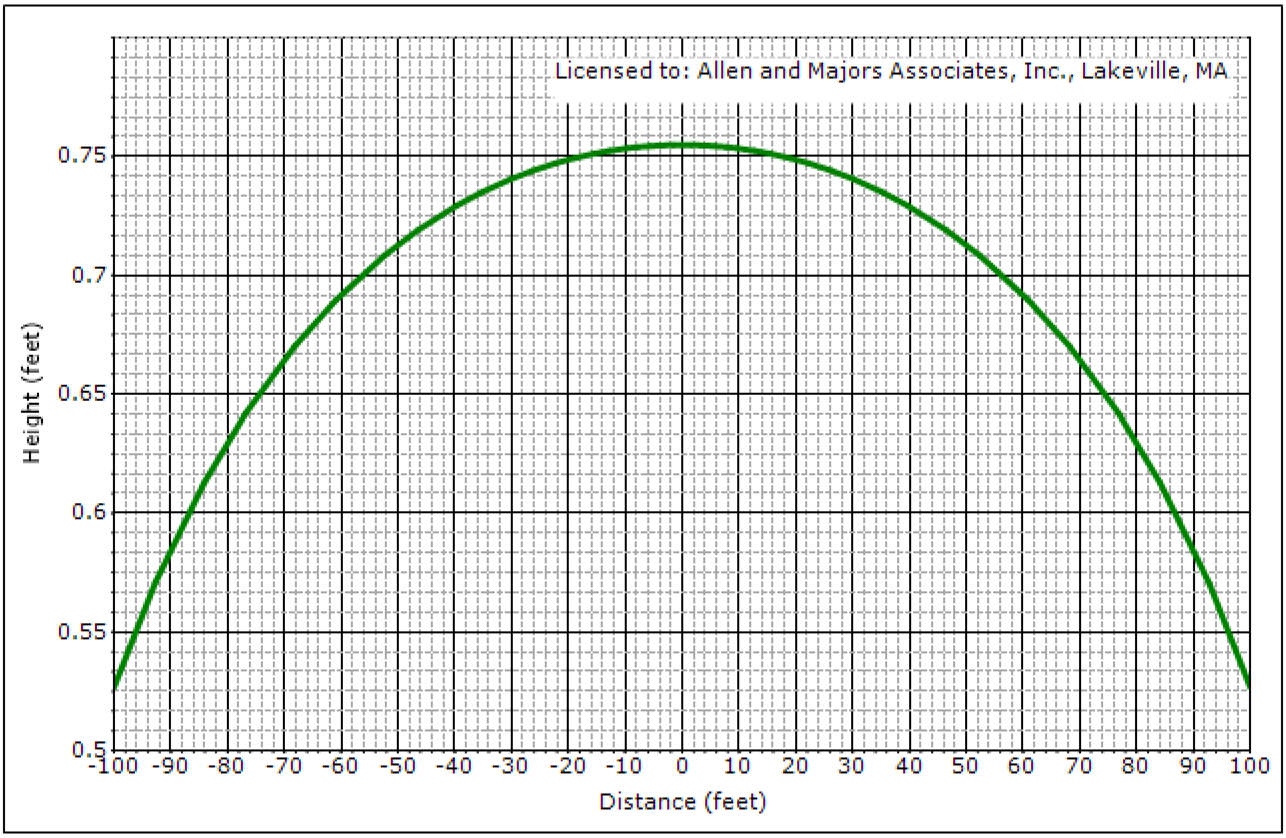
Right Side Plot Distance (Dr): 100 ft

Plot Angle From Y-Axis (Φ): 0

Constant Head Boundary: No

Time (d)	Height (ft)
0.00	0.0000
0.01	0.0356
0.05	0.1237
0.10	0.2612
0.15	0.4135
0.22	0.5792
0.30	0.7587
0.40	0.9548
0.52	1.1754
0.70	1.4383
1.00	1.7979
1.04	1.7321
1.14	1.5671
1.29	1.3377
1.46	1.1394
1.67	0.9717
1.90	0.8276
2.19	0.7009
2.57	0.5856
3.10	0.4757
4.00	0.3605

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company: Allen and Major
Project: Associates
UIS3
Analyst: Carlton Quinn
Date: 09/16/2025

Recharge Basin Dimensions

Length (w): 230 ft
Width (l): 30.56 ft
Bottom Area: 7,029 ft^2
SHGW Separation: 2 ft

Recharge Rate Calculations

Duration (t): 1 d
Volume (V): 7,065 ft^3
Rate (R): 1 ft/d
Total Simulation Time: 4 d

Aquifer Characteristics

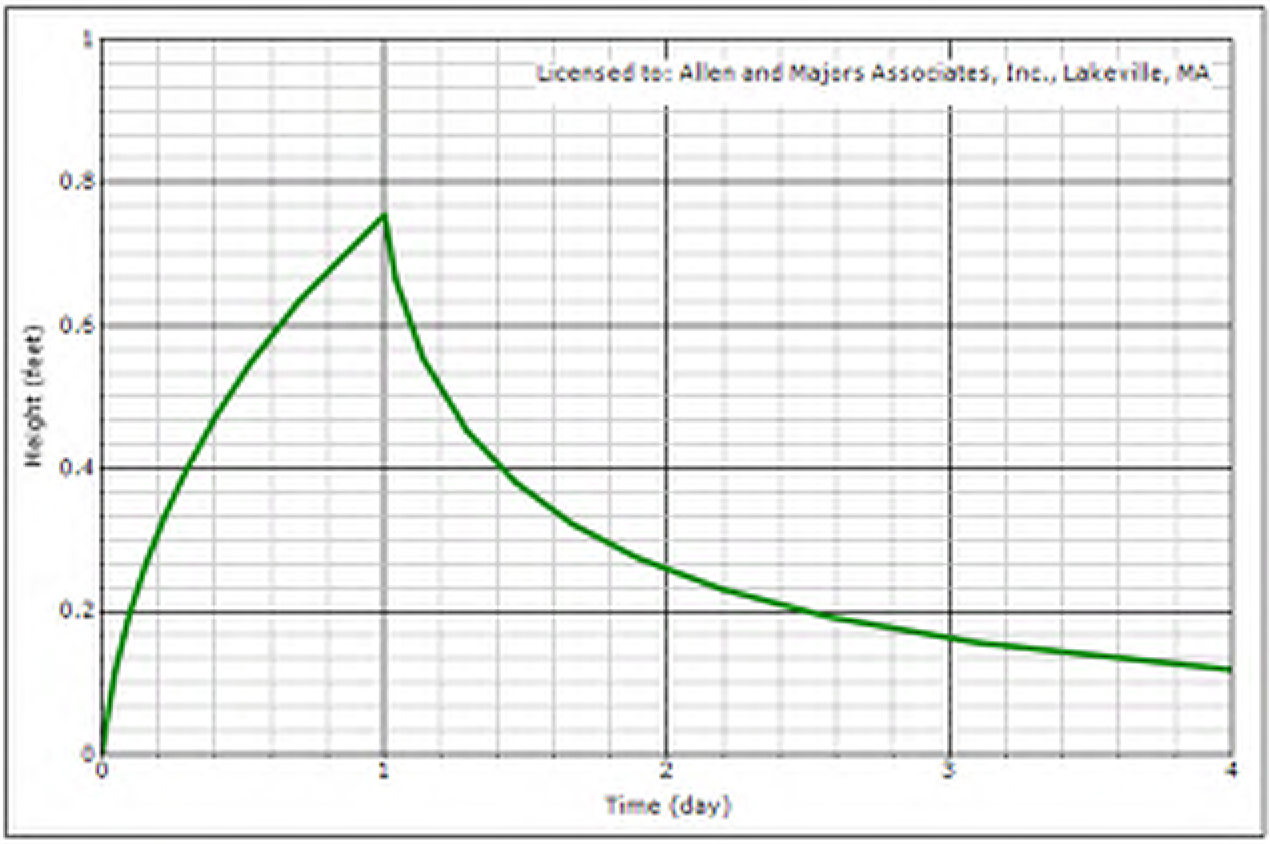
Hydraulic Conductivity (Kh): 82.7 ft/d
Drainable Porosity(Sy): 0.3
Saturated Thickness (h): 15.2 ft

Plot Geometry

X-Coordinate: 0 ft
Y-Coordinate: 0 ft
Left Side Plot Distance (Dl): 100 ft
Right Side Plot Distance (Dr): 100 ft
Plot Angle From Y-Axis (Φ): 0
Constant Head Boundary: No

Distance (ft)	Height (ft)	Distance (ft)	Height (ft)
-100.00	0.5268	0.00	0.7549
-92.78	0.5705	1.60	0.7549
-84.10	0.6130	3.15	0.7547
-76.87	0.6417	4.50	0.7546
-68.19	0.6701	5.80	0.7544
-60.96	0.6895	7.79	0.7540
-52.29	0.7085	9.69	0.7535
-46.49	0.7190	12.69	0.7524
-39.79	0.7291	15.49	0.7512
-35.21	0.7350	18.96	0.7493
-30.10	0.7405	22.18	0.7472
-26.32	0.7440	26.32	0.7440
-22.18	0.7472	30.10	0.7405
-18.96	0.7493	35.21	0.7350
-15.49	0.7512	39.79	0.7291
-12.69	0.7524	46.49	0.7190
-9.69	0.7535	52.29	0.7085
-7.79	0.7540	60.96	0.6895
-5.80	0.7544	68.19	0.6701
-4.50	0.7546	76.87	0.6417
-3.15	0.7547	84.10	0.6130
-1.60	0.7549	92.78	0.5705
		100.00	0.5268

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company: Allen and Major Associates
Project: UIS3
Analyst: Carlton Quinn
Date: 09/16/2025

Recharge Basin Dimensions

Length (w): 230 ft
Width (l): 30.56 ft
Bottom Area: 7,029 ft²
SHGW Separation: 2 ft

Recharge Rate Calculations

Duration (t): 1 d
Volume (V): 7,065 ft³
Rate (R): 1 ft/d
Total Simulation Time: 4 d

Aquifer Characteristics

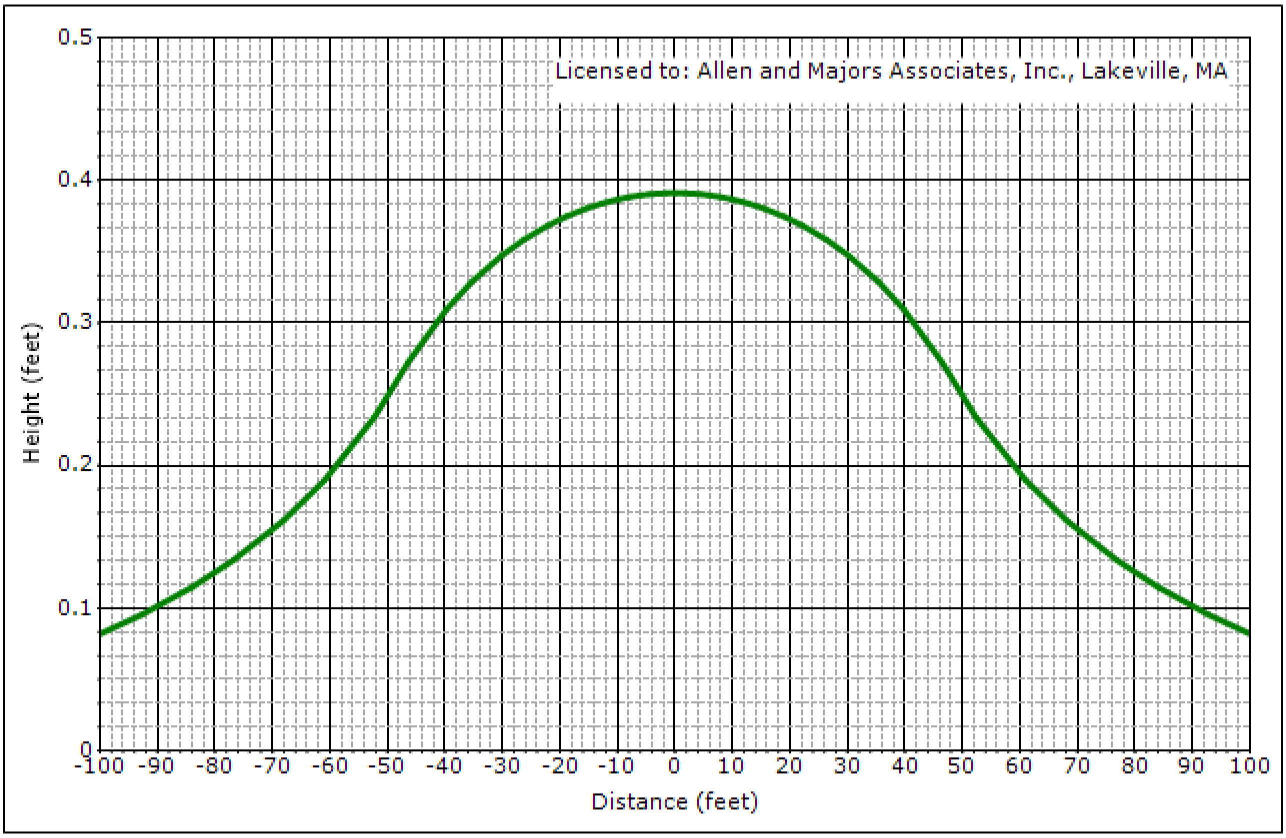
Hydraulic Conductivity (Kh): 82.7 ft/d
Drainable Porosity(Sy): 0.3
Saturated Thickness (h): 15.2 ft

Plot Geometry

X-Coordinate: 0 ft
Y-Coordinate: 0 ft
Left Side Plot Distance (Dl): 100 ft
Right Side Plot Distance (Dr): 100 ft
Plot Angle From Y-Axis (Φ): 0
Constant Head Boundary: No

Time (d)	Height (ft)
0.00	0.0000
0.01	0.0418
0.05	0.1159
0.10	0.1967
0.15	0.2670
0.22	0.3338
0.30	0.4006
0.40	0.4701
0.52	0.5461
0.70	0.6349
1.00	0.7549
1.04	0.6646
1.14	0.5532
1.29	0.4540
1.46	0.3811
1.67	0.3228
1.90	0.2739
2.19	0.2315
2.57	0.1931
3.10	0.1568
4.00	0.1187

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company: Allen and Major Associates
Project: UIS4
Analyst: Carlton Quinn
Date: 09/16/2025

Recharge Basin Dimensions

Length (w): 96.32 ft
Width (l): 25.22 ft
Bottom Area: 2,429 ft²
SHGW Separation: 2 ft

Recharge Rate Calculations

Duration (t): 1 d
Volume (V): 2,430 ft³
Rate (R): 0.98 ft/d
Total Simulation Time: 4 d

Aquifer Characteristics

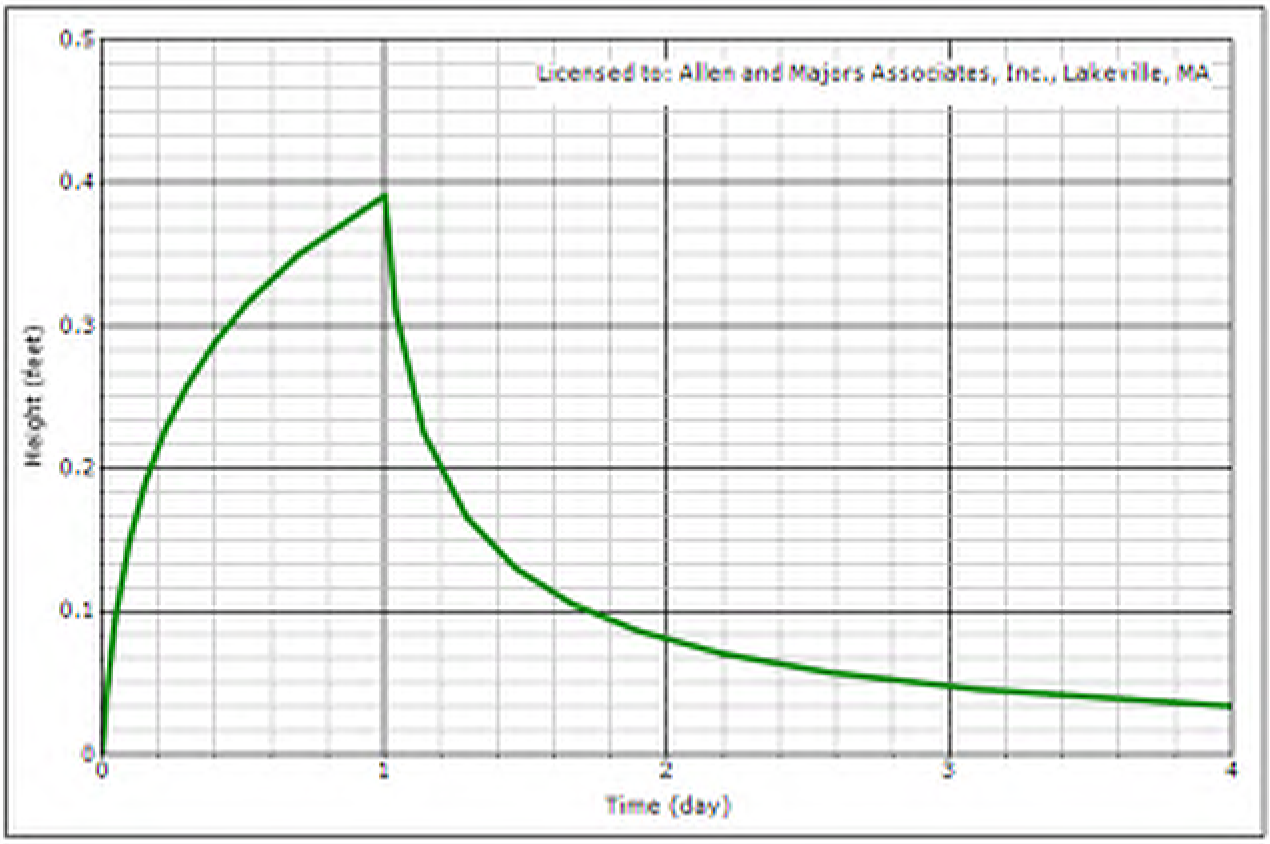
Hydraulic Conductivity (Kh): 82.7 ft/d
Drainable Porosity(Sy): 0.3
Saturated Thickness (h): 19.25 ft

Plot Geometry

X-Coordinate: 0 ft
Y-Coordinate: 0 ft
Left Side Plot Distance (Dl): 100 ft
Right Side Plot Distance (Dr): 100 ft
Plot Angle From Y-Axis (Φ): 0
Constant Head Boundary: No

Distance (ft)	Height (ft)	Distance (ft)	Height (ft)
-100.00	0.0819	0.00	0.3911
-92.78	0.0954	1.60	0.3910
-84.10	0.1145	3.15	0.3906
-76.87	0.1335	4.50	0.3902
-68.19	0.1611	5.80	0.3896
-60.96	0.1897	7.79	0.3884
-52.29	0.2339	9.69	0.3868
-46.49	0.2719	12.69	0.3838
-39.79	0.3094	15.49	0.3801
-35.21	0.3293	18.96	0.3745
-30.10	0.3474	22.18	0.3682
-26.32	0.3583	26.32	0.3583
-22.18	0.3682	30.10	0.3474
-18.96	0.3745	35.21	0.3293
-15.49	0.3801	39.79	0.3094
-12.69	0.3838	46.49	0.2719
-9.69	0.3868	52.29	0.2339
-7.79	0.3884	60.96	0.1897
-5.80	0.3896	68.19	0.1611
-4.50	0.3902	76.87	0.1335
-3.15	0.3906	84.10	0.1145
-1.60	0.3910	92.78	0.0954
		100.00	0.0819

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company:	Allen and Major
Project:	Associates
	UIS4
Analyst:	Carlton Quinn
Date:	09/16/2025

Recharge Basin Dimensions

Length (w):	96.32 ft
Width (l):	25.22 ft
Bottom Area:	2,429 ft²
SHGW Separation:	2 ft

Recharge Rate Calculations

Duration (t):	1 d
Volume (V):	2,430 ft³
Rate (R):	0.98 ft/d
Total Simulation Time:	4 d

Aquifer Characteristics

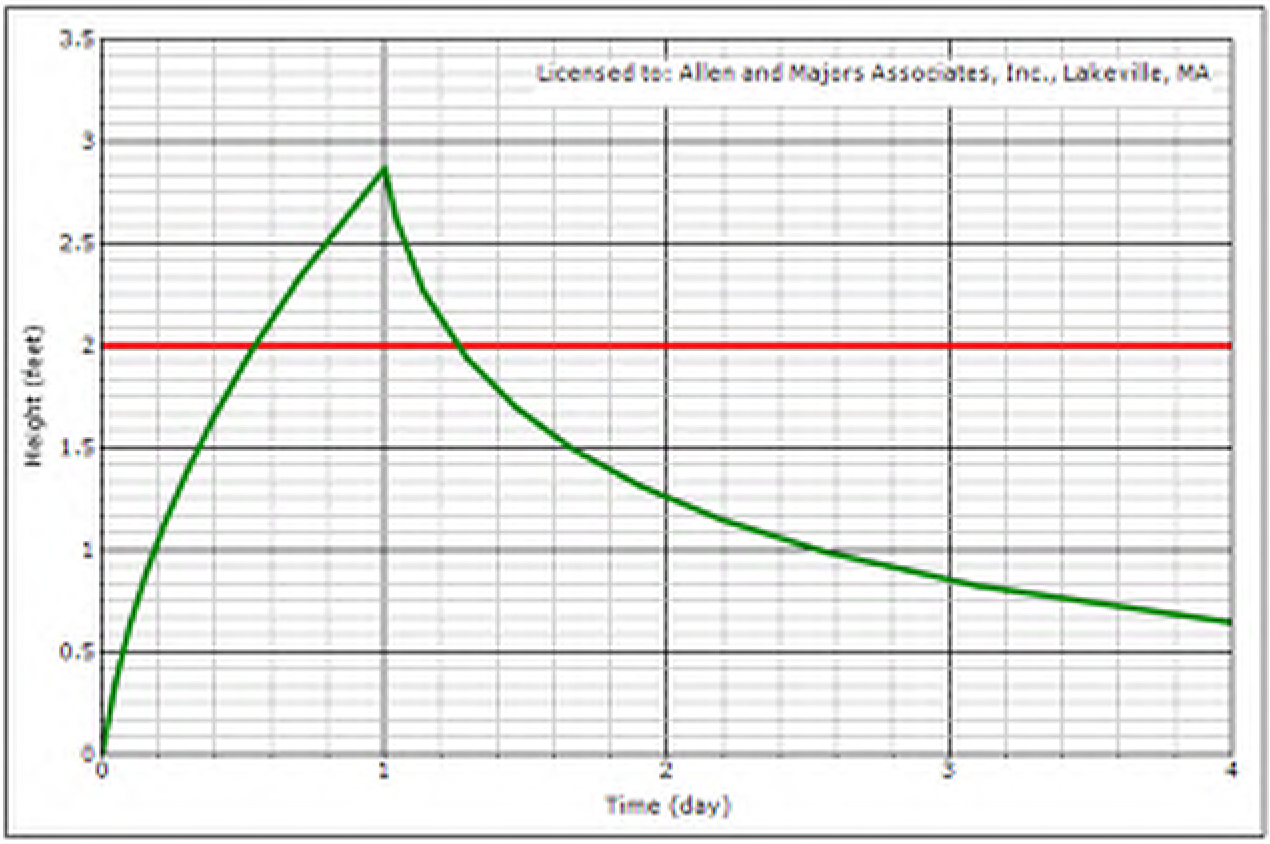
Hydraulic Conductivity (Kh):	82.7 ft/d
Drainable Porosity(Sy):	0.3
Saturated Thickness (h):	19.25 ft

Plot Geometry

X-Coordinate:	0 ft
Y-Coordinate:	0 ft
Left Side Plot Distance (Dl):	100 ft
Right Side Plot Distance (Dr):	100 ft
Plot Angle From Y-Axis (Φ):	0
Constant Head Boundary:	No

Time (d)	Height (ft)
0.00	0.0000
0.01	0.0375
0.05	0.0945
0.10	0.1497
0.15	0.1916
0.22	0.2268
0.30	0.2582
0.40	0.2880
0.52	0.3180
0.70	0.3504
1.00	0.3911
1.04	0.3099
1.14	0.2254
1.29	0.1659
1.46	0.1301
1.67	0.1051
1.90	0.0861
2.19	0.0707
2.57	0.0576
3.10	0.0457
4.00	0.0339

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company: Allen and Major Associates
Project: UIS5
Analyst: Carlton Quinn
Date: 09/16/2025

Recharge Basin Dimensions

Length (w): 260 ft
Width (l): 33.54 ft
Bottom Area: 8,720 ft²
SHGW Separation: 2 ft

Recharge Rate Calculations

Duration (t): 1 d
Volume (V): 21,847 ft³
Rate (R): 2.5 ft/d
Total Simulation Time: 4 d

Aquifer Characteristics

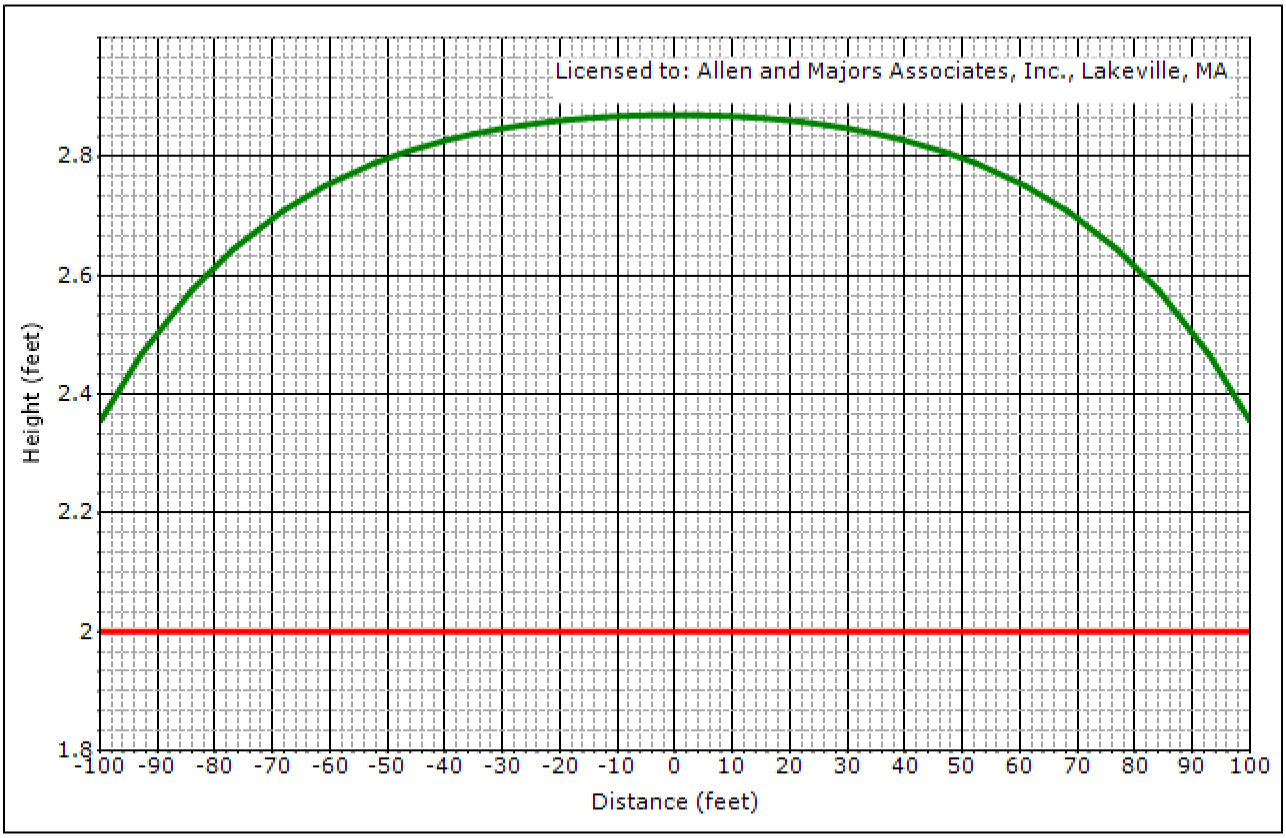
Hydraulic Conductivity (Kh): 82.7 ft/d
Drainable Porosity(Sy): 0.3
Saturated Thickness (h): 7.8 ft

Plot Geometry

X-Coordinate: 0 ft
Y-Coordinate: 0 ft
Left Side Plot Distance (Dl): 100 ft
Right Side Plot Distance (Dr): 100 ft
Plot Angle From Y-Axis (Φ): 0
Constant Head Boundary: No

Time (d)	Height (ft)
0.00	0.0000
0.01	0.1081
0.05	0.3452
0.10	0.6292
0.15	0.8860
0.22	1.1345
0.30	1.3879
0.40	1.6585
0.52	1.9641
0.70	2.3371
1.00	2.8701
1.04	2.6282
1.14	2.2680
1.29	1.9424
1.46	1.6998
1.67	1.4970
1.90	1.3166
2.19	1.1497
2.57	0.9893
3.10	0.8274
4.00	0.6470

Groundwater Mounding Analysis (Hantush Method using Glover's Solution)



Company: Allen and Major Associates
Project: UIS5
Analyst: Carlton Quinn
Date: 09/16/2025

Recharge Basin Dimensions

Length (w): 260 ft
Width (l): 33.54 ft
Bottom Area: 8,720 ft²
SHGW Separation: 2 ft

Recharge Rate Calculations

Duration (t): 1 d
Volume (V): 21,847 ft³
Rate (R): 2.5 ft/d
Total Simulation Time: 4 d

Aquifer Characteristics

Hydraulic Conductivity (Kh): 82.7 ft/d
Drainable Porosity(Sy): 0.3
Saturated Thickness (h): 7.8 ft

Plot Geometry

X-Coordinate: 0 ft
Y-Coordinate: 0 ft
Left Side Plot Distance (Dl): 100 ft
Right Side Plot Distance (Dr): 100 ft
Plot Angle From Y-Axis (Φ): 0
Constant Head Boundary: No

Distance (ft)	Height (ft)	Distance (ft)	Height (ft)
-100.00	2.3544	0.00	2.8701
-92.78	2.4682	1.60	2.8700
-84.10	2.5749	3.15	2.8699
-76.87	2.6442	4.50	2.8696
-68.19	2.7089	5.80	2.8693
-60.96	2.7505	7.79	2.8687
-52.29	2.7890	9.69	2.8679
-46.49	2.8091	12.69	2.8663
-39.79	2.8276	15.49	2.8644
-35.21	2.8378	18.96	2.8615
-30.10	2.8472	22.18	2.8581
-26.32	2.8529	26.32	2.8529
-22.18	2.8581	30.10	2.8472
-18.96	2.8615	35.21	2.8378
-15.49	2.8644	39.79	2.8276
-12.69	2.8663	46.49	2.8091
-9.69	2.8679	52.29	2.7890
-7.79	2.8687	60.96	2.7505
-5.80	2.8693	68.19	2.7089
-4.50	2.8696	76.87	2.6442
-3.15	2.8699	84.10	2.5749
-1.60	2.8700	92.78	2.4682
		100.00	2.3544