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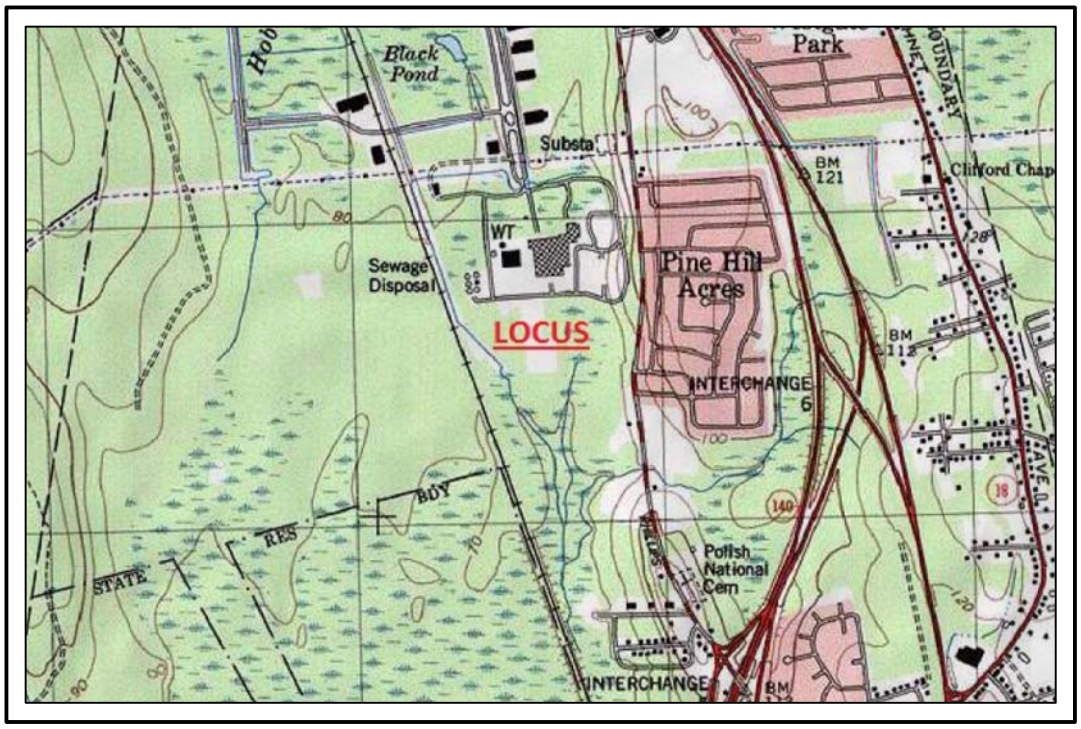
STORMWATER REPORT

LAST REVISED: 02-24-16

SITE PLAN

ASSESSORS MAP 134 – LOTS 456, 457, 458, & 459
50 DUCHAINE BLVD.
NEW BEDFORD, MASSACHUSETTS



PREPARED FOR:

PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

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STORMWATER MANAGEMENT REPORT

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STORMWATER MANAGEMENT REPORT
AND
HYDROLOGIC ANALYSIS

Proposed Site Plan – 50 Duchaine Boulevard
(Assessors Map 134, Lots 456, 457, 458, and 459)
New Bedford, Massachusetts

Project Summary

The project area associated with this proposed development is located at the southern terminus of Duchaine Boulevard in the New Bedford Business Park in northern New Bedford. The site is comprised of several tax parcels, including Lots 456, 457, 458, and 459 on Assessor's Map 134, and consists of approximately fifty-eight (58) acres. The proposed project area comprises only a small portion of the total parcel area. Much of the parcel area, including the entire proposed project area, is located in the city's Industrial C zoning district. The site currently contains a large un-occupied warehouse style building with associated parking, loading, and landscaped areas. Access to the site is gained from a looped road off of Duchaine Boulevard, over which access easements have been provided.

The applicant is seeking permission to provide parking, loading, and drainage improvements to the project site. The applicant is proposing to install twenty-four (24) loading docks on the north side of the existing building, and to provide an additional forty-one (41) trailer parking spaces throughout the site. Proposed improvements also include seventy-one (71) new employee parking spaces. In order to attenuate the increased stormwater runoff generated by the proposed impervious site coverage and to provide the appropriate level of water quality treatment, additional stormwater management practices have been proposed. Proposed structural BMP's include sediment forebays and infiltration basins.

Methodology

Drainage computations were performed using the Natural Resources Conservation Services (NRCS) TR-20 method and HydroCAD® Drainage Calculation Software to determine the change in the existing and post-development runoff rates from each drainage area for the 2-, 10-, and 100-year 24 hour storm events. The limits of the work proposed to complete the project fall within an area subject to protection by the Wetlands Protection Act, therefor, compliance with DEP Stormwater Management Standards is required. Sketches of the existing and proposed watershed areas, HydroCAD® Report, and copies of the calculation sheets are included as appendices to this report.

Existing Conditions

The soils underlying the site are identified in the Natural Resources Conservation Service (NRCS) Soil Survey of Bristol County ***(see Exhibit D)***. The site soils are classified as 256B (Deerfield loamy sand, Hydrologic Soils Group [HSG] "A"), 651 (Udorthents, smoothed, HSG "A"), 39A (Scarboro mucky fine sandy loam, HSG "A/D"), and 51A (Swansea muck, HSG "B/D")

Soil testing was performed by Thompson Farland, Inc. under the direction of John Marchand, P.E. on November 25, 2015 to confirm the soil survey and determine the soil suitability for on-site stormwater management purposes.

The deep test-holes were performed to a depth of approximately 3-1/2 feet to 7-1/2 feet to determine the seasonal high groundwater elevation. Mottling was encountered at depths varying from 20" to 56", and standing water was encountered at all test holes. The locations of the testholes are shown on the site plan.

Stormwater Management Overview

Existing Conditions:

The project site has been divided into eight existing subcatchment drainage areas, which discharge to one design point. The design point chosen for this site is the limit of the bordering vegetated wetlands surrounding the site to the east, south, and west. A number of depressions located inside the site driveway, which discharge runoff through culverts either directly toward the BVW or toward an existing stormwater "wet basin" at the south end of the site via a piped drainage system, have been incorporated into the existing drainage model. Although this basin is a wetland resource area, it does provide peak rate attenuation for runoff which is directed to it. Existing outlet controls within the wet basin have been incorporated into the model, and the outflow from the pond is combined with the runoff toward the BVW to provide a total flow to the design point.

Proposed Conditions:

Under proposed conditions, eleven subcatchment areas have been included in the drainage model. New paved areas behind (south of) the existing building sheds runoff overland toward two proposed infiltration basins, located between the existing driveway and the proposed paved area. Pretreatment is achieved through two sediment forebays at each basin. The new paved areas in front (north) of the existing building, where the proposed loading docks are located, shed runoff toward two proposed infiltration basins, located between the existing roadway and the proposed paved areas. Each of these basins is pretreated through two sediment forebays. A series of trench drains located in front of the proposed loading docks collect stormwater runoff and directs it to deep sump manhole structures, which discharge to one of two proposed 11,000 gallon pump chambers, which will discharge runoff toward the two infiltration basins between

the road and the paved areas. Each of these infiltration basins will then discharge toward another proposed infiltration basin, located between the existing driveway and the bordering vegetated wetland surrounding the site. Each of these basins is also designed to collect runoff from direct runoff from portions of the proposed paved surface.

The proposed infiltration basins have been designed in accordance with the DEP Stormwater Handbook. In accordance with the Stormwater Handbook, the rate mitigation facilities have been engineered to reduce post-development runoff rates from pre-development conditions.

Stormwater Management Standards

Standard 1:

- Under proposed conditions, there will be no new untreated discharges or erosion in wetland areas. Drainage outfalls from the two infiltration basins which discharge toward the existing BVW are provided with rip-rap spillways to help control velocity and erosion at the outlet. Stormwater discharges have been held below erodible velocities. This standard has been met.

Standard 2:

- The design of the stormwater system was designed for the post-development conditions to handle all storms' peak discharges and runoff volume to include the 2 and 10-year storm events. An evaluation of peak discharges from the 100-year storm 24-hour storm event demonstrates that although a small increase in the peak discharge rate occurs, the discharge will not result in increased off-site flooding due to the short duration of increased rate and the overall reduced volume of runoff. The site drainage system was designed in consideration of the structural standards and techniques of the Best Management Practices (BMP) and Low Impact Development (LID) outlined in the "Stormwater Management Handbook".

  The results of site drainage calculations are presented in the following Tables. The results are based upon evaluation of Pre-development conditions and the design of proposed surface drainage systems for the Post-development condition. These results show the Post-Development offsite runoff rates are reduced to less than the Pre-development conditions for the two-year and ten-year storm events, thus meeting the BMP guidelines for this site development.

Table 1 - Comparison of Pre- versus Post-Development Offsite Runoff toward BVW Resource Area						
Frequency Storm	**2-Year**		**10-Year**		**100-Year**	
	Rate (cfs)	Volume (af)	Rate (cfs)	Volume (af)	Rate (cfs)	Volume (af)
Pre-Development	0.89	1.217	3.85	2.424	12.40	4.638
Post-Development	0.57	0.909	3.72	1.969	14.20	4.026

Table 2 - Comparison of Pre- versus Post-Development Offsite Runoff toward Existing On-site Basin Resource Area						
Frequency Storm	**2-Year**		**10-Year**		**100-Year**	
	Rate (cfs)	Volume (af)	Rate (cfs)	Volume (af)	Rate (cfs)	Volume (af)
Pre-Development	21.97	1.681	32.51	2.580	49.15	4.043
Post-Development	19.86	1.501	31.54	2.367	48.78	3.766

*See ***Exhibit F*** for supporting hydrologic calculations

Standard 3:

- The proposed infiltration basins have been designed to recharge some of the anticipated stormwater runoff from all of the new impervious area and from some of the existing impervious area. The required Recharge Volume has been calculated using the Static Method and calculations are provided in ***Exhibit G***. We note that the required Recharge Volume was calculated for the entire impervious area on-site, including existing paved and roof areas which are proposed to remain unaltered during construction. As a partial re-development project, this Standard is required to be met to the maximum extent practicable for these existing areas. The proposed design, however, provides the required recharge volume within the proposed basins. Drawdown Calculations have also been provided in ***Exhibit H***. This standard has been met.

Standard 4:

- The proposed stormwater management systems for this project have been designed to remove 80% of the average annual post construction load of Total Suspended Solids in accordance with this standard, as shown in calculations provided in ***Exhibit J***. Suitable practices for source control and pollution prevention have been identified in a long-term pollution prevention plan in ***Exhibit M***. Structural BMPs have been designed to capture the required water quality volume (***Exhibit I***) determined in accordance with the Stormwater Handbook. We again note that a significant amount of the total on-site post-development impervious area is from existing impervious ground cover. As a partial redevelopment

project, runoff from these areas is required to be treated to the maximum extent practicable. Although the water quality volume provided in the proposed infiltration BMPs exceeds the required volume based upon the new impervious area, it does not fully comply with the required volume based on the total site impervious. Given the existing drainage system elevation and the groundwater conditions on-site, providing additional water quality volume for the runoff from the existing impervious areas is not practicable. This standard has been met.

Standard 5:

- As a recycling facility, the proposed use is a Land Use with Higher Potential Pollutant Load. Stormwater discharges are proposed to be treated by the specific structural BMPs determined to be suitable for treating runoff from such land uses. Sediment Forebays and Infiltration Basins are appropriate BMPs for use with Land Uses with Higher Potential Pollutant Load. Stormwater treatment has been designed to provide 44% TSS removal prior to discharge to the infiltration BMPs, and BMPs have been designed to treat 1.0 inch of runoff times the total new impervious are at the post-development site. This standard has been met

Standard 6:

- The site does not discharge within the Zone II or IWPA of a public water supply, nor does it discharge near or to any critical areas. This standard does not apply.

Standard 7:

- This project is a partial re-development project. Much of the site is currently paved or covered with impervious cover. Those areas where new impervious coverage is proposed have been designed to meet all of the required Stormwater Standards. Those areas where existing impervious is proposed to remain will be allowed to maintain existing drainage patterns, where much of the runoff from the existing driveway area is directed through an existing piped drainage system to an existing stormwater basin resource area at the rear of the site, which attenuates the runoff prior to discharge to the BVW. Due to the water table present on-site, it is not feasible to fully meet all Standards for the existing impervious conditions.

Standard 8:

- We have provided for Construction Period Pollution in accordance with the regulations. A formal Construction Period Pollution Prevention Plan will be submitted prior to construction.

Standard 9:

- A long-term operation and maintenance plan has been prepared to ensure that stormwater management systems function as designed. ***(Exhibit L)***

Standard 10:

- We are not proposing any illicit discharges as defined in the Stormwater Management Regulations. See attached letter in ***Exhibit N***

EXHIBIT "A"

TOPO! VERSION 2.1.0

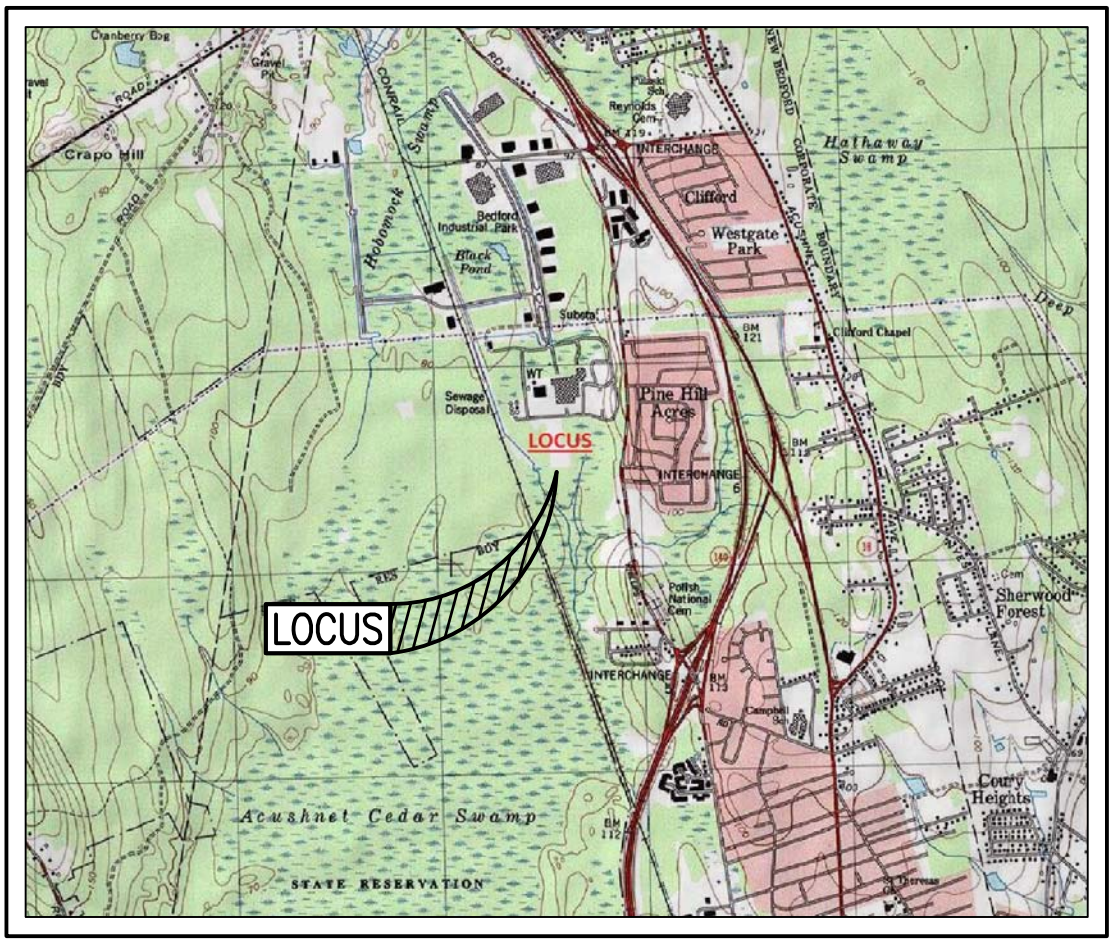

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EXHIBIT "B"

FIRM MAP
PANEL # 25005C0379F

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EXHIBIT "C"

NHESP PRIORITY & ESTIMATED HABITAT MAP 2008

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NRCS SOIL MAP

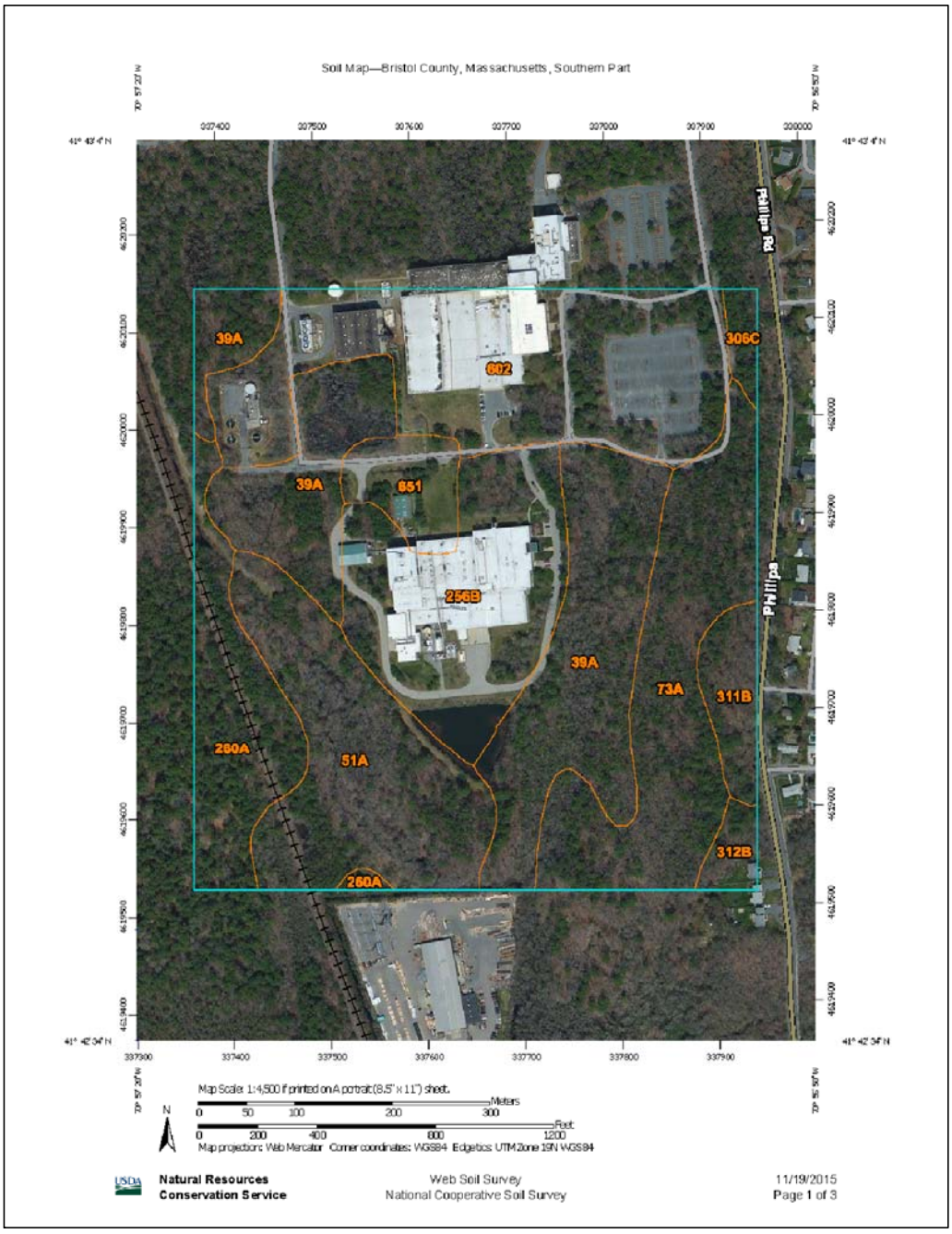

EXHIBIT "E"

STORMWATER REPORT CHECKLIST

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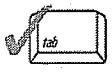
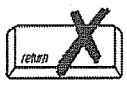
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

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





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

The Stormwater Report must include:

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

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

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

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

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

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

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.

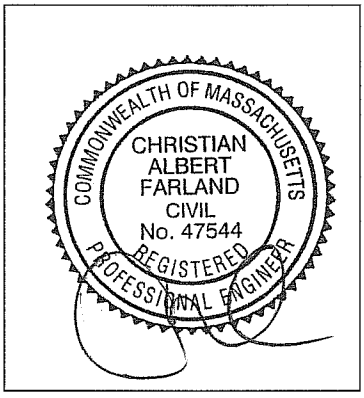
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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



12/11/15

Signature and Date

Checklist

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

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

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

EXHIBIT "F"

HYDROLOGIC CALCULATIONS & WATERSHED PLANS

www.ThompsonFarland.com

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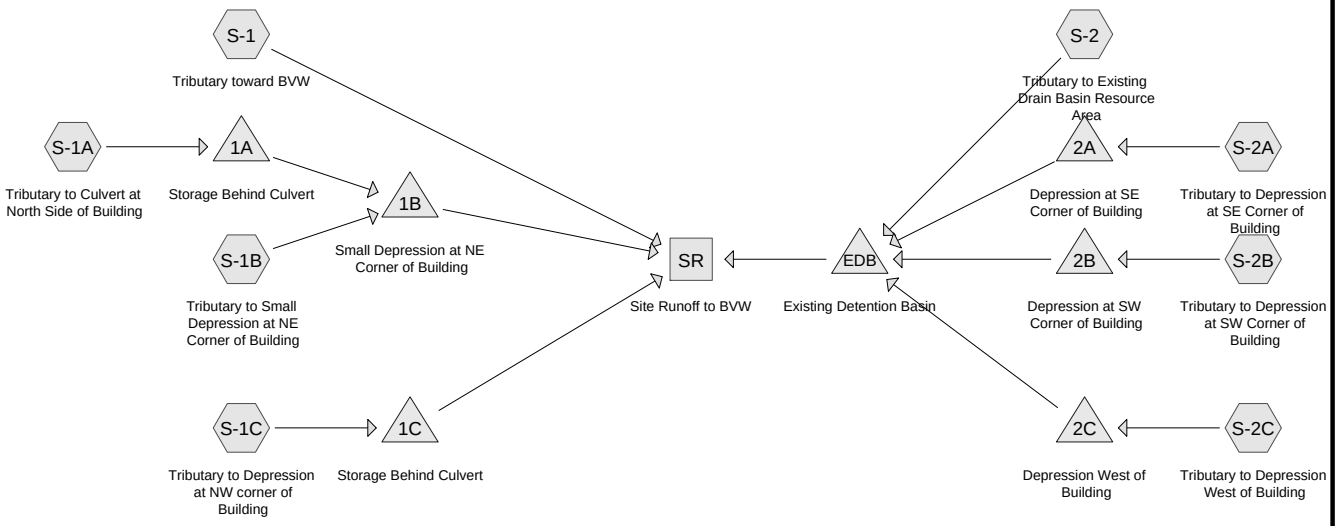


Subcat Reach Pond Link

Drainage Diagram for 15500PRE
Prepared by

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Tributary toward BVW Runoff Area=271,470 sf 8.63% Impervious Runoff Depth=0.13"
Flow Length=170' Tc=18.7 min CN=48 Runoff=0.11 cfs 0.065 af

Subcatchment S-1A: Tributary to Culvert at Runoff Area=88,339 sf 2.15% Impervious Runoff Depth=0.20"
Flow Length=250' Tc=15.0 min CN=51 Runoff=0.11 cfs 0.033 af

Subcatchment S-1B: Tributary to Small Runoff Area=4,113 sf 15.95% Impervious Runoff Depth=1.11"
Tc=6.0 min CN=73 Runoff=0.12 cfs 0.009 af

Subcatchment S-1C: Tributary to Runoff Area=39,365 sf 4.83% Impervious Runoff Depth=0.49"
Flow Length=150' Slope=0.0100 '/' Tc=19.1 min CN=60 Runoff=0.24 cfs 0.037 af

Subcatchment S-2: Tributary to Existing Runoff Area=302,083 sf 86.70% Impervious Runoff Depth=2.74"
Tc=6.0 min CN=94 Runoff=21.24 cfs 1.582 af

Subcatchment S-2A: Tributary to Runoff Area=43,001 sf 0.00% Impervious Runoff Depth=0.17"
Flow Length=320' Tc=14.2 min CN=50 Runoff=0.04 cfs 0.014 af

Subcatchment S-2B: Tributary to Runoff Area=38,720 sf 34.66% Impervious Runoff Depth=1.42"
Flow Length=180' Tc=6.8 min CN=78 Runoff=1.42 cfs 0.105 af

Subcatchment S-2C: Tributary to Runoff Area=23,604 sf 1.63% Impervious Runoff Depth=0.38"
Tc=6.0 min CN=57 Runoff=0.12 cfs 0.017 af

Reach SR: Site Runoff to BVW Inflow=0.89 cfs 1.217 af
Outflow=0.89 cfs 1.217 af

Pond 1A: Storage Behind Culvert Peak Elev=75.76' Storage=1 cf Inflow=0.11 cfs 0.033 af
Discarded=0.01 cfs 0.003 af Primary=0.10 cfs 0.031 af Outflow=0.11 cfs 0.033 af

Pond 1B: Small Depression at NE Corner of Peak Elev=75.63' Storage=1 cf Inflow=0.13 cfs 0.040 af
Discarded=0.00 cfs 0.001 af Primary=0.13 cfs 0.039 af Outflow=0.13 cfs 0.040 af

Pond 1C: Storage Behind Culvert Peak Elev=77.67' Storage=10 cf Inflow=0.24 cfs 0.037 af
Discarded=0.06 cfs 0.008 af Primary=0.18 cfs 0.029 af Outflow=0.24 cfs 0.037 af

Pond 2A: Depression at SE Corner of Building Peak Elev=74.00' Storage=1 cf Inflow=0.04 cfs 0.014 af
Discarded=0.00 cfs 0.001 af Primary=0.04 cfs 0.013 af Outflow=0.04 cfs 0.014 af

Pond 2B: Depression at SW Corner of Building Peak Elev=74.87' Storage=262 cf Inflow=1.42 cfs 0.105 af
Discarded=0.28 cfs 0.027 af Primary=0.87 cfs 0.079 af Outflow=1.15 cfs 0.105 af

Pond 2C: Depression West of Building Peak Elev=75.71' Storage=14 cf Inflow=0.12 cfs 0.017 af
Discarded=0.06 cfs 0.011 af Primary=0.04 cfs 0.006 af Outflow=0.11 cfs 0.017 af

Pond EDB: Existing Detention Basin Peak Elev=72.55' Storage=54,191 cf Inflow=21.97 cfs 1.681 af
Outflow=0.72 cfs 1.084 af

Total Runoff Area = 18.611 ac Runoff Volume = 1.863 af Average Runoff Depth = 1.20"
62.55% Pervious = 11.641 ac 37.45% Impervious = 6.970 ac

Summary for Subcatchment S-1: Tributary toward BVW

Runoff = 0.11 cfs @ 13.78 hrs, Volume= 0.065 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	150,613	30	Woods, Good, HSG A
	43,177	55	Woods, Good, HSG B
	50,419	68	<50% Grass cover, Poor, HSG A
	2,419	79	<50% Grass cover, Poor, HSG B
*	20,948	98	Existing Pavement
*	899	98	Existing Roof
*	1,574	98	Existing Concrete
*	1,421	77	Gravel & Rubble Stockpiles
	271,470	48	Weighted Average
	248,049		Pervious Area
	23,421		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
4.0	120	0.0100	0.50		**Shallow Concentrated Flow, bc** Woodland Kv= 5.0 fps
18.7	170	Total			

Summary for Subcatchment S-1A: Tributary to Culvert at North Side of Building

Runoff = 0.11 cfs @ 12.53 hrs, Volume= 0.033 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	43,289	30	Woods, Good, HSG A
	32,140	68	<50% Grass cover, Poor, HSG A
*	1,901	98	Existing Roof
*	11,009	77	Gravel & Rubble Stockpiles
	88,339	51	Weighted Average
	86,438		Pervious Area
	1,901		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0500	0.10		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
6.7	200	0.0100	0.50		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
15.0	250	Total			

Summary for Subcatchment S-1B: Tributary to Small Depression at NE Corner of Building

Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	3,457	68	<50% Grass cover, Poor, HSG A
*	656	98	Existing Concrete
	4,113	73	Weighted Average
	3,457		Pervious Area
	656		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1C: Tributary to Depression at NW corner of Building

Runoff = 0.24 cfs @ 12.37 hrs, Volume= 0.037 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	17,356	45	Woods, Poor, HSG A
	15,021	68	<50% Grass cover, Poor, HSG A
*	1,901	98	Existing Roof
*	5,087	77	Gravel & Rubble Stockpiles
	39,365	60	Weighted Average
	37,464		Pervious Area
	1,901		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	50	0.0100	0.05		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
3.3	100	0.0100	0.50		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
19.1	150	Total			

Summary for Subcatchment S-2: Tributary to Existing Drain Basin Resource Area

Runoff = 21.24 cfs @ 12.08 hrs, Volume= 1.582 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	33,511	68	<50% Grass cover, Poor, HSG A
	6,652	79	<50% Grass cover, Poor, HSG B
*	50,058	98	Exisitng Pavement
*	140,190	98	Existing Roof
*	11,517	98	Existing Concrete
*	60,155	98	Existing Basin @ Elev=71.7
	302,083	94	Weighted Average
	40,163		Pervious Area
	261,920		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2A: Tributary to Depression at SE Corner of Building

Runoff = 0.04 cfs @ 12.55 hrs, Volume= 0.014 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

Area (sf)	CN	Description
20,814	30	Woods, Good, HSG A
22,187	68	<50% Grass cover, Poor, HSG A
43,001	50	Weighted Average
43,001		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.40"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
4.9	190	0.0170	0.65		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
14.2	320	Total			

Summary for Subcatchment S-2B: Tributary to Depression at SW Corner of Building

Runoff = 1.42 cfs @ 12.10 hrs, Volume= 0.105 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	25,300	68	<50% Grass cover, Poor, HSG A
*	1,222	98	Existing Concrete
*	12,198	98	Existing Roof
	38,720	78	Weighted Average
	25,300		Pervious Area
	13,420		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0250	0.17		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
1.8	130	0.0280	1.17		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
6.8	180	Total			

Summary for Subcatchment S-2C: Tributary to Depression West of Building

Runoff = 0.12 cfs @ 12.14 hrs, Volume= 0.017 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	7,393	30	Woods, Good, HSG A
	15,827	68	<50% Grass cover, Poor, HSG A
*	384	98	Existing Roof
	23,604	57	Weighted Average
	23,220		Pervious Area
	384		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Reach SR: Site Runoff to BVW

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.611 ac, 37.45% Impervious, Inflow Depth > 0.78" for 2-yr event
Inflow = 0.89 cfs @ 15.15 hrs, Volume= 1.217 af
Outflow = 0.89 cfs @ 15.15 hrs, Volume= 1.217 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Summary for Pond 1A: Storage Behind Culvert

Inflow Area = 2.028 ac, 2.15% Impervious, Inflow Depth = 0.20" for 2-yr event
Inflow = 0.11 cfs @ 12.53 hrs, Volume= 0.033 af
Outflow = 0.11 cfs @ 12.53 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.01 cfs @ 12.53 hrs, Volume= 0.003 af
Primary = 0.10 cfs @ 12.53 hrs, Volume= 0.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.76' @ 12.53 hrs Surf.Area= 54 sf Storage= 1 cf

Plug-Flow detention time= 0.1 min calculated for 0.033 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (987.6 - 987.5)

Volume	Invert	Avail.Storage	Storage Description
#1	75.70'	11,295 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)
75.70	2	2.0	0	0	2
76.00	954	345.0	100	100	9,474
77.00	27,508	674.0	11,195	11,295	36,157

Device	Routing	Invert	Outlet Devices
#1	Primary	75.70'	**4.00' W x 2.00' H x 31.0' long Culvert** Box, 30-75° wingwalls, square crown, Ke= 0.400 Outlet Invert= 75.66' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	75.71'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 6 sf

Discarded OutFlow Max=0.01 cfs @ 12.53 hrs HW=75.76' (Free Discharge)
↑└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.10 cfs @ 12.53 hrs HW=75.76' TW=75.63' (Dynamic Tailwater)
↑└**1=Culvert** (Barrel Controls 0.10 cfs @ 0.57 fps)

Summary for Pond 1B: Small Depression at NE Corner of Building

Inflow Area = 2.122 ac, 2.77% Impervious, Inflow Depth = 0.22" for 2-yr event
Inflow = 0.13 cfs @ 12.49 hrs, Volume= 0.040 af
Outflow = 0.13 cfs @ 12.49 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.00 cfs @ 12.49 hrs, Volume= 0.001 af
Primary = 0.13 cfs @ 12.49 hrs, Volume= 0.039 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.63' @ 12.49 hrs Surf.Area= 15 sf Storage= 1 cf

Plug-Flow detention time= 0.3 min calculated for 0.040 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (960.7 - 960.6)

Volume	Invert	Avail.Storage	Storage Description
#1	75.54'	457 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)
75.54	2	2.0	0	0	2
76.00	193	85.0	33	33	577
77.00	709	107.0	424	457	927

Device	Routing	Invert	Outlet Devices
#1	Primary	75.54'	**4.00' W x 2.00' H x 45.0' long Culvert** Box, 30-75° wingwalls, square crown, Ke= 0.400 Outlet Invert= 75.53' S= 0.0002 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	75.55'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 3 sf

Discarded OutFlow Max=0.00 cfs @ 12.49 hrs HW=75.63' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.13 cfs @ 12.49 hrs HW=75.63' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.13 cfs @ 0.47 fps)

Summary for Pond 1C: Storage Behind Culvert

Inflow Area = 0.904 ac, 4.83% Impervious, Inflow Depth = 0.49" for 2-yr event
Inflow = 0.24 cfs @ 12.37 hrs, Volume= 0.037 af
Outflow = 0.24 cfs @ 12.39 hrs, Volume= 0.037 af, Atten= 0%, Lag= 1.2 min
Discarded = 0.06 cfs @ 12.39 hrs, Volume= 0.008 af
Primary = 0.18 cfs @ 12.39 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.67' @ 12.39 hrs Surf.Area= 313 sf Storage= 10 cf

Plug-Flow detention time= 0.4 min calculated for 0.037 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (924.9 - 924.5)

Volume	Invert	Avail.Storage	Storage Description
#1	77.58'	4,907 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)
77.58	2	2.0	0	0	2
78.00	5,752	313.0	821	821	7,798
78.50	10,860	398.0	4,086	4,907	12,611

Device	Routing	Invert	Outlet Devices
#1	Primary	77.58'	**4.00' W x 2.00' H x 45.0' long Culvert** Box, 30-75° wingwalls, square crown, Ke= 0.400 Outlet Invert= 77.54' S= 0.0009 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

#2	Discarded	77.59'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 10 sf

Discarded OutFlow Max=0.06 cfs @ 12.39 hrs HW=77.67' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.18 cfs @ 12.39 hrs HW=77.67' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.18 cfs @ 0.65 fps)

Summary for Pond 2A: Depression at SE Corner of Building

Inflow Area =	0.987 ac,	0.00% Impervious,	Inflow Depth =	0.17"	for 2-yr event
Inflow =	0.04 cfs @	12.55 hrs,	Volume=	0.014 af	
Outflow =	0.04 cfs @	12.55 hrs,	Volume=	0.014 af,	Atten= 0%, Lag= 0.3 min
Discarded =	0.00 cfs @	12.55 hrs,	Volume=	0.001 af	
Primary =	0.04 cfs @	12.55 hrs,	Volume=	0.013 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 74.00' @ 12.55 hrs Surf.Area= 13 sf Storage= 1 cf

Plug-Flow detention time= 0.3 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (998.3 - 998.0)

Volume	Invert	Avail.Storage	Storage Description
#1	73.90'	33,995 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)
73.90	2	2.0	0	0	2
74.00	10	10.0	1	1	10
75.00	8,304	644.0	2,867	2,868	33,007
76.00	16,851	655.0	12,328	15,196	34,316
77.00	20,817	705.0	18,799	33,995	39,770

Device	Routing	Invert	Outlet Devices
#1	Primary	73.90'	**12.0" x 44.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.55' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	73.91'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 3 sf

Discarded OutFlow Max=0.00 cfs @ 12.55 hrs HW=74.00' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.04 cfs @ 12.55 hrs HW=74.00' TW=72.41' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.04 cfs @ 1.35 fps)

Summary for Pond 2B: Depression at SW Corner of Building

Inflow Area = 0.889 ac, 34.66% Impervious, Inflow Depth = 1.42" for 2-yr event
Inflow = 1.42 cfs @ 12.10 hrs, Volume= 0.105 af
Outflow = 1.15 cfs @ 12.17 hrs, Volume= 0.105 af, Atten= 19%, Lag= 3.7 min
Discarded = 0.28 cfs @ 12.17 hrs, Volume= 0.027 af
Primary = 0.87 cfs @ 12.17 hrs, Volume= 0.079 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 74.87' @ 12.17 hrs Surf.Area= 1,464 sf Storage= 262 cf

Plug-Flow detention time= 2.0 min calculated for 0.105 af (100% of inflow)
Center-of-Mass det. time= 2.0 min (848.6 - 846.6)

Volume	Invert	Avail.Storage	Storage Description
#1	74.35'	14,436 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)
74.35	2	2.0	0	0	2
75.00	2,273	200.0	508	508	3,185
76.00	5,058	288.0	3,574	4,081	6,612
77.00	7,587	358.0	6,280	10,361	10,224
77.50	8,725	416.0	4,075	14,436	13,802

Device	Routing	Invert	Outlet Devices
#1	Primary	74.35'	**12.0" x 45.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.99' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	74.36'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 5 sf

Discarded OutFlow Max=0.28 cfs @ 12.17 hrs HW=74.87' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.87 cfs @ 12.17 hrs HW=74.87' TW=72.24' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.87 cfs @ 3.10 fps)

Summary for Pond 2C: Depression West of Building

Inflow Area = 0.542 ac, 1.63% Impervious, Inflow Depth = 0.38" for 2-yr event
Inflow = 0.12 cfs @ 12.14 hrs, Volume= 0.017 af
Outflow = 0.11 cfs @ 12.22 hrs, Volume= 0.017 af, Atten= 9%, Lag= 4.6 min
Discarded = 0.06 cfs @ 12.22 hrs, Volume= 0.011 af
Primary = 0.04 cfs @ 12.22 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.71' @ 12.22 hrs Surf.Area= 348 sf Storage= 14 cf

Plug-Flow detention time= 1.3 min calculated for 0.017 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (931.0 - 929.7)

Volume	Invert	Avail.Storage	Storage Description
#1	75.60'	15,028 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)
75.60	2	2.0	0	0	2
76.00	4,193	270.0	572	572	5,803
77.00	7,571	341.0	5,799	6,371	9,269
78.00	9,791	412.0	8,657	15,028	13,540

Device	Routing	Invert	Outlet Devices
#1	Primary	75.60'	**12.0" x 37.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 75.30' S= 0.0081 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	75.61'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 9 sf

Discarded OutFlow Max=0.06 cfs @ 12.22 hrs HW=75.71' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.04 cfs @ 12.22 hrs HW=75.71' TW=72.28' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.04 cfs @ 1.39 fps)

Summary for Pond EDB: Existing Detention Basin

Inflow Area = 9.353 ac, 67.68% Impervious, Inflow Depth = 2.16" for 2-yr event
Inflow = 21.97 cfs @ 12.09 hrs, Volume= 1.681 af
Outflow = 0.72 cfs @ 15.90 hrs, Volume= 1.084 af, Atten= 97%, Lag= 229.1 min
Primary = 0.72 cfs @ 15.90 hrs, Volume= 1.084 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 72.55' @ 15.90 hrs Surf.Area= 66,293 sf Storage= 54,191 cf

Plug-Flow detention time= 921.2 min calculated for 1.084 af (64% of inflow)
Center-of-Mass det. time= 820.7 min (1,610.8 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	71.70'	155,808 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)
71.70	60,155	952.0	0	0	60,155
72.00	63,529	1,023.0	18,550	18,550	71,318
73.00	68,606	1,069.0	66,051	84,602	79,047
74.00	73,838	1,080.0	71,206	155,808	81,213

Device	Routing	Invert	Outlet Devices
#1	Primary	72.01'	**12.0" x 3.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 72.00' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Primary	73.30'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**

Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
Coef. (English)	2.49	2.56	2.70	2.69	2.68	2.69	2.67	2.64

Primary OutFlow Max=0.72 cfs @ 15.90 hrs HW=72.55' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.72 cfs @ 2.40 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Tributary toward BVW Runoff Area=271,470 sf 8.63% Impervious Runoff Depth=0.51"
Flow Length=170' Tc=18.7 min CN=48 Runoff=1.43 cfs 0.267 af

Subcatchment S-1A: Tributary to Culvert at Runoff Area=88,339 sf 2.15% Impervious Runoff Depth=0.66"
Flow Length=250' Tc=15.0 min CN=51 Runoff=0.75 cfs 0.112 af

Subcatchment S-1B: Tributary to Small Runoff Area=4,113 sf 15.95% Impervious Runoff Depth=2.12"
Tc=6.0 min CN=73 Runoff=0.23 cfs 0.017 af

Subcatchment S-1C: Tributary to Runoff Area=39,365 sf 4.83% Impervious Runoff Depth=1.19"
Flow Length=150' Slope=0.0100 '/' Tc=19.1 min CN=60 Runoff=0.75 cfs 0.089 af

Subcatchment S-2: Tributary to Existing Runoff Area=302,083 sf 86.70% Impervious Runoff Depth=4.11"
Tc=6.0 min CN=94 Runoff=31.16 cfs 2.376 af

Subcatchment S-2A: Tributary to Runoff Area=43,001 sf 0.00% Impervious Runoff Depth=0.61"
Flow Length=320' Tc=14.2 min CN=50 Runoff=0.32 cfs 0.050 af

Subcatchment S-2B: Tributary to Runoff Area=38,720 sf 34.66% Impervious Runoff Depth=2.54"
Flow Length=180' Tc=6.8 min CN=78 Runoff=2.58 cfs 0.188 af

Subcatchment S-2C: Tributary to Runoff Area=23,604 sf 1.63% Impervious Runoff Depth=1.00"
Tc=6.0 min CN=57 Runoff=0.52 cfs 0.045 af

Reach SR: Site Runoff to BVW Inflow=3.85 cfs 2.424 af
Outflow=3.85 cfs 2.424 af

Pond 1A: Storage Behind Culvert Peak Elev=75.89' Storage=26 cf Inflow=0.75 cfs 0.112 af
Discarded=0.07 cfs 0.010 af Primary=0.68 cfs 0.103 af Outflow=0.75 cfs 0.112 af

Pond 1B: Small Depression at NE Corner of Peak Elev=75.78' Storage=6 cf Inflow=0.78 cfs 0.119 af
Discarded=0.01 cfs 0.002 af Primary=0.77 cfs 0.117 af Outflow=0.78 cfs 0.119 af

Pond 1C: Storage Behind Culvert Peak Elev=77.75' Storage=64 cf Inflow=0.75 cfs 0.089 af
Discarded=0.20 cfs 0.021 af Primary=0.54 cfs 0.068 af Outflow=0.74 cfs 0.089 af

Pond 2A: Depression at SE Corner of Building Peak Elev=74.17' Storage=22 cf Inflow=0.32 cfs 0.050 af
Discarded=0.06 cfs 0.005 af Primary=0.26 cfs 0.045 af Outflow=0.32 cfs 0.050 af

Pond 2B: Depression at SW Corner of Building Peak Elev=75.05' Storage=619 cf Inflow=2.58 cfs 0.188 af
Discarded=0.46 cfs 0.047 af Primary=1.44 cfs 0.142 af Outflow=1.90 cfs 0.188 af

Pond 2C: Depression West of Building Peak Elev=75.82' Storage=98 cf Inflow=0.52 cfs 0.045 af
Discarded=0.25 cfs 0.028 af Primary=0.17 cfs 0.017 af Outflow=0.42 cfs 0.045 af

Pond EDB: Existing Detention Basin Peak Elev=72.88' Storage=76,412 cf Inflow=32.51 cfs 2.580 af
Outflow=1.65 cfs 1.972 af

Total Runoff Area = 18.611 ac Runoff Volume = 3.145 af Average Runoff Depth = 2.03"
62.55% Pervious = 11.641 ac 37.45% Impervious = 6.970 ac

Summary for Subcatchment S-1: Tributary toward BVW

Runoff = 1.43 cfs @ 12.45 hrs, Volume= 0.267 af, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	150,613	30	Woods, Good, HSG A
	43,177	55	Woods, Good, HSG B
	50,419	68	<50% Grass cover, Poor, HSG A
	2,419	79	<50% Grass cover, Poor, HSG B
*	20,948	98	Existing Pavement
*	899	98	Existing Roof
*	1,574	98	Existing Concrete
*	1,421	77	Gravel & Rubble Stockpiles
	271,470	48	Weighted Average
	248,049		Pervious Area
	23,421		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
4.0	120	0.0100	0.50		**Shallow Concentrated Flow, bc** Woodland Kv= 5.0 fps
18.7	170	Total			

Summary for Subcatchment S-1A: Tributary to Culvert at North Side of Building

Runoff = 0.75 cfs @ 12.29 hrs, Volume= 0.112 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	43,289	30	Woods, Good, HSG A
	32,140	68	<50% Grass cover, Poor, HSG A
*	1,901	98	Existing Roof
*	11,009	77	Gravel & Rubble Stockpiles
	88,339	51	Weighted Average
	86,438		Pervious Area
	1,901		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0500	0.10		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
6.7	200	0.0100	0.50		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
15.0	250	Total			

Summary for Subcatchment S-1B: Tributary to Small Depression at NE Corner of Building

Runoff = 0.23 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	3,457	68	<50% Grass cover, Poor, HSG A
*	656	98	Existing Concrete
	4,113	73	Weighted Average
	3,457		Pervious Area
	656		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1C: Tributary to Depression at NW corner of Building

Runoff = 0.75 cfs @ 12.29 hrs, Volume= 0.089 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	17,356	45	Woods, Poor, HSG A
	15,021	68	<50% Grass cover, Poor, HSG A
*	1,901	98	Existing Roof
*	5,087	77	Gravel & Rubble Stockpiles
	39,365	60	Weighted Average
	37,464		Pervious Area
	1,901		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	50	0.0100	0.05		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
3.3	100	0.0100	0.50		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
19.1	150	Total			

Summary for Subcatchment S-2: Tributary to Existing Drain Basin Resource Area

Runoff = 31.16 cfs @ 12.08 hrs, Volume= 2.376 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	33,511	68	<50% Grass cover, Poor, HSG A
	6,652	79	<50% Grass cover, Poor, HSG B
*	50,058	98	Exisitng Pavement
*	140,190	98	Existing Roof
*	11,517	98	Existing Concrete
*	60,155	98	Existing Basin @ Elev=71.7
	302,083	94	Weighted Average
	40,163		Pervious Area
	261,920		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2A: Tributary to Depression at SE Corner of Building

Runoff = 0.32 cfs @ 12.30 hrs, Volume= 0.050 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	20,814	30	Woods, Good, HSG A
	22,187	68	<50% Grass cover, Poor, HSG A
	43,001	50	Weighted Average
	43,001		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.40"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
4.9	190	0.0170	0.65		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
14.2	320	Total			

Summary for Subcatchment S-2B: Tributary to Depression at SW Corner of Building

Runoff = 2.58 cfs @ 12.10 hrs, Volume= 0.188 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	25,300	68	<50% Grass cover, Poor, HSG A
*	1,222	98	Existing Concrete
*	12,198	98	Existing Roof
	38,720	78	Weighted Average
	25,300		Pervious Area
	13,420		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0250	0.17		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
1.8	130	0.0280	1.17		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
6.8	180	Total			

Summary for Subcatchment S-2C: Tributary to Depression West of Building

Runoff = 0.52 cfs @ 12.11 hrs, Volume= 0.045 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	7,393	30	Woods, Good, HSG A
	15,827	68	<50% Grass cover, Poor, HSG A
*	384	98	Existing Roof
	23,604	57	Weighted Average
	23,220		Pervious Area
	384		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Reach SR: Site Runoff to BVW

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.611 ac, 37.45% Impervious, Inflow Depth > 1.56" for 10-yr event
Inflow = 3.85 cfs @ 12.44 hrs, Volume= 2.424 af
Outflow = 3.85 cfs @ 12.44 hrs, Volume= 2.424 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Summary for Pond 1A: Storage Behind Culvert

Inflow Area = 2.028 ac, 2.15% Impervious, Inflow Depth = 0.66" for 10-yr event
Inflow = 0.75 cfs @ 12.29 hrs, Volume= 0.112 af
Outflow = 0.75 cfs @ 12.32 hrs, Volume= 0.112 af, Atten= 0%, Lag= 1.3 min
Discarded = 0.07 cfs @ 12.32 hrs, Volume= 0.010 af
Primary = 0.68 cfs @ 12.32 hrs, Volume= 0.103 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.89' @ 12.32 hrs Surf.Area= 384 sf Storage= 26 cf

Plug-Flow detention time= 0.3 min calculated for 0.112 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (923.6 - 923.4)

Volume	Invert	Avail.Storage	Storage Description
#1	75.70'	11,295 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)
75.70	2	2.0	0	0	2
76.00	954	345.0	100	100	9,474
77.00	27,508	674.0	11,195	11,295	36,157

Device	Routing	Invert	Outlet Devices
#1	Primary	75.70'	**4.00' W x 2.00' H x 31.0' long Culvert** Box, 30-75° wingwalls, square crown, Ke= 0.400 Outlet Invert= 75.66' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	75.71'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 6 sf

Discarded OutFlow Max=0.07 cfs @ 12.32 hrs HW=75.89' (Free Discharge)
↑└**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.68 cfs @ 12.32 hrs HW=75.89' TW=75.78' (Dynamic Tailwater)
↑└**1=Culvert** (Barrel Controls 0.68 cfs @ 1.22 fps)

Summary for Pond 1B: Small Depression at NE Corner of Building

Inflow Area = 2.122 ac, 2.77% Impervious, Inflow Depth = 0.67" for 10-yr event
Inflow = 0.78 cfs @ 12.30 hrs, Volume= 0.119 af
Outflow = 0.78 cfs @ 12.30 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.2 min
Discarded = 0.01 cfs @ 12.30 hrs, Volume= 0.002 af
Primary = 0.77 cfs @ 12.30 hrs, Volume= 0.117 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.78' @ 12.30 hrs Surf.Area= 62 sf Storage= 6 cf

Plug-Flow detention time= 0.1 min calculated for 0.119 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (913.3 - 913.2)

Volume	Invert	Avail.Storage	Storage Description
#1	75.54'	457 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)
75.54	2	2.0	0	0	2
76.00	193	85.0	33	33	577
77.00	709	107.0	424	457	927

Device	Routing	Invert	Outlet Devices
#1	Primary	75.54'	**4.00' W x 2.00' H x 45.0' long Culvert** Box, 30-75° wingwalls, square crown, Ke= 0.400 Outlet Invert= 75.53' S= 0.0002 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	75.55'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 3 sf

Discarded OutFlow Max=0.01 cfs @ 12.30 hrs HW=75.78' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.77 cfs @ 12.30 hrs HW=75.78' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.77 cfs @ 1.08 fps)

Summary for Pond 1C: Storage Behind Culvert

Inflow Area = 0.904 ac, 4.83% Impervious, Inflow Depth = 1.19" for 10-yr event
Inflow = 0.75 cfs @ 12.29 hrs, Volume= 0.089 af
Outflow = 0.74 cfs @ 12.34 hrs, Volume= 0.089 af, Atten= 2%, Lag= 2.8 min
Discarded = 0.20 cfs @ 12.34 hrs, Volume= 0.021 af
Primary = 0.54 cfs @ 12.34 hrs, Volume= 0.068 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.75' @ 12.34 hrs Surf.Area= 1,047 sf Storage= 64 cf

Plug-Flow detention time= 0.7 min calculated for 0.089 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (891.4 - 890.7)

Volume	Invert	Avail.Storage	Storage Description
#1	77.58'	4,907 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)
77.58	2	2.0	0	0	2
78.00	5,752	313.0	821	821	7,798
78.50	10,860	398.0	4,086	4,907	12,611

Device	Routing	Invert	Outlet Devices
#1	Primary	77.58'	**4.00' W x 2.00' H x 45.0' long Culvert** Box, 30-75° wingwalls, square crown, Ke= 0.400 Outlet Invert= 77.54' S= 0.0009 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

#2 Discarded 77.59' **8.270 in/hr Exfiltration over Surface area above invert**
Excluded Surface area = 10 sf

Discarded OutFlow Max=0.20 cfs @ 12.34 hrs HW=77.75' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.54 cfs @ 12.34 hrs HW=77.75' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.54 cfs @ 1.03 fps)

Summary for Pond 2A: Depression at SE Corner of Building

Inflow Area = 0.987 ac, 0.00% Impervious, Inflow Depth = 0.61" for 10-yr event
Inflow = 0.32 cfs @ 12.30 hrs, Volume= 0.050 af
Outflow = 0.32 cfs @ 12.35 hrs, Volume= 0.050 af, Atten= 1%, Lag= 3.2 min
Discarded = 0.06 cfs @ 12.35 hrs, Volume= 0.005 af
Primary = 0.26 cfs @ 12.35 hrs, Volume= 0.045 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 74.17' @ 12.35 hrs Surf.Area= 322 sf Storage= 22 cf

Plug-Flow detention time= 0.5 min calculated for 0.050 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (928.5 - 928.0)

Volume	Invert	Avail.Storage	Storage Description
#1	73.90'	33,995 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)
73.90	2	2.0	0	0	2
74.00	10	10.0	1	1	10
75.00	8,304	644.0	2,867	2,868	33,007
76.00	16,851	655.0	12,328	15,196	34,316
77.00	20,817	705.0	18,799	33,995	39,770

Device	Routing	Invert	Outlet Devices
#1	Primary	73.90'	**12.0" x 44.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.55' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	73.91'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 3 sf

Discarded OutFlow Max=0.06 cfs @ 12.35 hrs HW=74.17' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.26 cfs @ 12.35 hrs HW=74.17' TW=72.69' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.26 cfs @ 2.29 fps)

Summary for Pond 2B: Depression at SW Corner of Building

Inflow Area = 0.889 ac, 34.66% Impervious, Inflow Depth = 2.54" for 10-yr event
Inflow = 2.58 cfs @ 12.10 hrs, Volume= 0.188 af
Outflow = 1.90 cfs @ 12.18 hrs, Volume= 0.188 af, Atten= 26%, Lag= 4.7 min
Discarded = 0.46 cfs @ 12.18 hrs, Volume= 0.047 af
Primary = 1.44 cfs @ 12.18 hrs, Volume= 0.142 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.05' @ 12.18 hrs Surf.Area= 2,381 sf Storage= 619 cf

Plug-Flow detention time= 2.6 min calculated for 0.188 af (100% of inflow)
Center-of-Mass det. time= 2.6 min (832.4 - 829.7)

Volume	Invert	Avail.Storage	Storage Description
#1	74.35'	14,436 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)
74.35	2	2.0	0	0	2
75.00	2,273	200.0	508	508	3,185
76.00	5,058	288.0	3,574	4,081	6,612
77.00	7,587	358.0	6,280	10,361	10,224
77.50	8,725	416.0	4,075	14,436	13,802

Device	Routing	Invert	Outlet Devices
#1	Primary	74.35'	**12.0" x 45.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.99' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	74.36'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 5 sf

Discarded OutFlow Max=0.45 cfs @ 12.18 hrs HW=75.05' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=1.44 cfs @ 12.18 hrs HW=75.05' TW=72.55' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.44 cfs @ 3.47 fps)

Summary for Pond 2C: Depression West of Building

Inflow Area = 0.542 ac, 1.63% Impervious, Inflow Depth = 1.00" for 10-yr event
Inflow = 0.52 cfs @ 12.11 hrs, Volume= 0.045 af
Outflow = 0.42 cfs @ 12.17 hrs, Volume= 0.045 af, Atten= 20%, Lag= 4.1 min
Discarded = 0.25 cfs @ 12.17 hrs, Volume= 0.028 af
Primary = 0.17 cfs @ 12.17 hrs, Volume= 0.017 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.82' @ 12.17 hrs Surf.Area= 1,291 sf Storage= 98 cf

Plug-Flow detention time= 2.1 min calculated for 0.045 af (100% of inflow)
Center-of-Mass det. time= 2.1 min (891.1 - 888.9)

Volume	Invert	Avail.Storage	Storage Description
#1	75.60'	15,028 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)
75.60	2	2.0	0	0	2
76.00	4,193	270.0	572	572	5,803
77.00	7,571	341.0	5,799	6,371	9,269
78.00	9,791	412.0	8,657	15,028	13,540

Device	Routing	Invert	Outlet Devices
#1	Primary	75.60'	**12.0" x 37.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 75.30' S= 0.0081 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	75.61'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 9 sf

Discarded OutFlow Max=0.25 cfs @ 12.17 hrs HW=75.82' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=0.17 cfs @ 12.17 hrs HW=75.82' TW=72.55' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.17 cfs @ 2.05 fps)

Summary for Pond EDB: Existing Detention Basin

Inflow Area = 9.353 ac, 67.68% Impervious, Inflow Depth = 3.31" for 10-yr event
Inflow = 32.51 cfs @ 12.09 hrs, Volume= 2.580 af
Outflow = 1.65 cfs @ 14.50 hrs, Volume= 1.972 af, Atten= 95%, Lag= 144.6 min
Primary = 1.65 cfs @ 14.50 hrs, Volume= 1.972 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 72.88' @ 14.50 hrs Surf.Area= 67,987 sf Storage= 76,412 cf

Plug-Flow detention time= 749.4 min calculated for 1.971 af (76% of inflow)
Center-of-Mass det. time= 666.1 min (1,447.4 - 781.3)

Volume	Invert	Avail.Storage	Storage Description
#1	71.70'	155,808 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)
71.70	60,155	952.0	0	0	60,155
72.00	63,529	1,023.0	18,550	18,550	71,318
73.00	68,606	1,069.0	66,051	84,602	79,047
74.00	73,838	1,080.0	71,206	155,808	81,213

Device	Routing	Invert	Outlet Devices
#1	Primary	72.01'	**12.0" x 3.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 72.00' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Primary	73.30'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**

Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
Coef. (English)	2.49	2.56	2.70	2.69	2.68	2.69	2.67	2.64

Primary OutFlow Max=1.65 cfs @ 14.50 hrs HW=72.88' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.65 cfs @ 3.05 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Tributary toward BVW Runoff Area=271,470 sf 8.63% Impervious Runoff Depth=1.49"
Flow Length=170' Tc=18.7 min CN=48 Runoff=6.22 cfs 0.774 af

Subcatchment S-1A: Tributary to Culvert at Runoff Area=88,339 sf 2.15% Impervious Runoff Depth=1.76"
Flow Length=250' Tc=15.0 min CN=51 Runoff=2.76 cfs 0.297 af

Subcatchment S-1B: Tributary to Small Runoff Area=4,113 sf 15.95% Impervious Runoff Depth=3.94"
Tc=6.0 min CN=73 Runoff=0.44 cfs 0.031 af

Subcatchment S-1C: Tributary to Runoff Area=39,365 sf 4.83% Impervious Runoff Depth=2.60"
Flow Length=150' Slope=0.0100 '/' Tc=19.1 min CN=60 Runoff=1.83 cfs 0.196 af

Subcatchment S-2: Tributary to Existing Runoff Area=302,083 sf 86.70% Impervious Runoff Depth=6.29"
Tc=6.0 min CN=94 Runoff=46.54 cfs 3.634 af

Subcatchment S-2A: Tributary to Runoff Area=43,001 sf 0.00% Impervious Runoff Depth=1.67"
Flow Length=320' Tc=14.2 min CN=50 Runoff=1.28 cfs 0.137 af

Subcatchment S-2B: Tributary to Runoff Area=38,720 sf 34.66% Impervious Runoff Depth=4.47"
Flow Length=180' Tc=6.8 min CN=78 Runoff=4.51 cfs 0.331 af

Subcatchment S-2C: Tributary to Runoff Area=23,604 sf 1.63% Impervious Runoff Depth=2.31"
Tc=6.0 min CN=57 Runoff=1.40 cfs 0.104 af

Reach SR: Site Runoff to BVW Inflow=12.40 cfs 4.638 af
Outflow=12.40 cfs 4.638 af

Pond 1A: Storage Behind Culvert Peak Elev=76.11' Storage=267 cf Inflow=2.76 cfs 0.297 af
Discarded=0.40 cfs 0.031 af Primary=2.24 cfs 0.266 af Outflow=2.65 cfs 0.297 af

Pond 1B: Small Depression at NE Corner of Peak Elev=75.99' Storage=32 cf Inflow=2.44 cfs 0.297 af
Discarded=0.04 cfs 0.005 af Primary=2.41 cfs 0.292 af Outflow=2.44 cfs 0.297 af

Pond 1C: Storage Behind Culvert Peak Elev=77.86' Storage=259 cf Inflow=1.83 cfs 0.196 af
Discarded=0.51 cfs 0.050 af Primary=1.23 cfs 0.146 af Outflow=1.74 cfs 0.196 af

Pond 2A: Depression at SE Corner of Building Peak Elev=74.41' Storage=230 cf Inflow=1.28 cfs 0.137 af
Discarded=0.29 cfs 0.023 af Primary=0.85 cfs 0.114 af Outflow=1.14 cfs 0.137 af

Pond 2B: Depression at SW Corner of Peak Elev=75.33' Storage=1,401 cf Inflow=4.51 cfs 0.331 af
Discarded=0.59 cfs 0.077 af Primary=2.41 cfs 0.254 af Outflow=3.00 cfs 0.331 af

Pond 2C: Depression West of Building Peak Elev=75.94' Storage=361 cf Inflow=1.40 cfs 0.104 af
Discarded=0.59 cfs 0.063 af Primary=0.41 cfs 0.041 af Outflow=1.00 cfs 0.104 af

Pond EDB: Existing Detention Basin Peak Elev=73.39' Storage=111,501 cf Inflow=49.15 cfs 4.043 af
Outflow=4.37 cfs 3.426 af

Total Runoff Area = 18.611 ac Runoff Volume = 5.505 af Average Runoff Depth = 3.55"
62.55% Pervious = 11.641 ac 37.45% Impervious = 6.970 ac

Summary for Subcatchment S-1: Tributary toward BVW

Runoff = 6.22 cfs @ 12.31 hrs, Volume= 0.774 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	150,613	30	Woods, Good, HSG A
	43,177	55	Woods, Good, HSG B
	50,419	68	<50% Grass cover, Poor, HSG A
	2,419	79	<50% Grass cover, Poor, HSG B
*	20,948	98	Existing Pavement
*	899	98	Existing Roof
*	1,574	98	Existing Concrete
*	1,421	77	Gravel & Rubble Stockpiles
	271,470	48	Weighted Average
	248,049		Pervious Area
	23,421		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
4.0	120	0.0100	0.50		**Shallow Concentrated Flow, bc** Woodland Kv= 5.0 fps
18.7	170	Total			

Summary for Subcatchment S-1A: Tributary to Culvert at North Side of Building

Runoff = 2.76 cfs @ 12.23 hrs, Volume= 0.297 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	43,289	30	Woods, Good, HSG A
	32,140	68	<50% Grass cover, Poor, HSG A
*	1,901	98	Existing Roof
*	11,009	77	Gravel & Rubble Stockpiles
	88,339	51	Weighted Average
	86,438		Pervious Area
	1,901		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0500	0.10		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
6.7	200	0.0100	0.50		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
15.0	250	Total			

Summary for Subcatchment S-1B: Tributary to Small Depression at NE Corner of Building

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	3,457	68	<50% Grass cover, Poor, HSG A
*	656	98	Existing Concrete
	4,113	73	Weighted Average
	3,457		Pervious Area
	656		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1C: Tributary to Depression at NW corner of Building

Runoff = 1.83 cfs @ 12.28 hrs, Volume= 0.196 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	17,356	45	Woods, Poor, HSG A
	15,021	68	<50% Grass cover, Poor, HSG A
*	1,901	98	Existing Roof
*	5,087	77	Gravel & Rubble Stockpiles
	39,365	60	Weighted Average
	37,464		Pervious Area
	1,901		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	50	0.0100	0.05		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
3.3	100	0.0100	0.50		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
19.1	150	Total			

Summary for Subcatchment S-2: Tributary to Existing Drain Basin Resource Area

Runoff = 46.54 cfs @ 12.08 hrs, Volume= 3.634 af, Depth= 6.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	33,511	68	<50% Grass cover, Poor, HSG A
	6,652	79	<50% Grass cover, Poor, HSG B
*	50,058	98	Exisitng Pavement
*	140,190	98	Existing Roof
*	11,517	98	Existing Concrete
*	60,155	98	Existing Basin @ Elev=71.7
	302,083	94	Weighted Average
	40,163		Pervious Area
	261,920		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2A: Tributary to Depression at SE Corner of Building

Runoff = 1.28 cfs @ 12.22 hrs, Volume= 0.137 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

Area (sf)	CN	Description
20,814	30	Woods, Good, HSG A
22,187	68	<50% Grass cover, Poor, HSG A
43,001	50	Weighted Average
43,001		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.40"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
4.9	190	0.0170	0.65		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
14.2	320	Total			

Summary for Subcatchment S-2B: Tributary to Depression at SW Corner of Building

Runoff = 4.51 cfs @ 12.10 hrs, Volume= 0.331 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	25,300	68	<50% Grass cover, Poor, HSG A
*	1,222	98	Existing Concrete
*	12,198	98	Existing Roof
	38,720	78	Weighted Average
	25,300		Pervious Area
	13,420		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0250	0.17		**Sheet Flow, AB** Grass: Short n= 0.150 P2= 3.40"
1.8	130	0.0280	1.17		**Shallow Concentrated Flow, BC** Short Grass Pasture Kv= 7.0 fps
6.8	180	Total			

Summary for Subcatchment S-2C: Tributary to Depression West of Building

Runoff = 1.40 cfs @ 12.10 hrs, Volume= 0.104 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	7,393	30	Woods, Good, HSG A
	15,827	68	<50% Grass cover, Poor, HSG A
*	384	98	Existing Roof
	23,604	57	Weighted Average
	23,220		Pervious Area
	384		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Reach SR: Site Runoff to BVW

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.611 ac, 37.45% Impervious, Inflow Depth > 2.99" for 100-yr event
Inflow = 12.40 cfs @ 12.32 hrs, Volume= 4.638 af
Outflow = 12.40 cfs @ 12.32 hrs, Volume= 4.638 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Summary for Pond 1A: Storage Behind Culvert

Inflow Area = 2.028 ac, 2.15% Impervious, Inflow Depth = 1.76" for 100-yr event
Inflow = 2.76 cfs @ 12.23 hrs, Volume= 0.297 af
Outflow = 2.65 cfs @ 12.28 hrs, Volume= 0.297 af, Atten= 4%, Lag= 3.2 min
Discarded = 0.40 cfs @ 12.28 hrs, Volume= 0.031 af
Primary = 2.24 cfs @ 12.28 hrs, Volume= 0.266 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 76.11' @ 12.28 hrs Surf.Area= 2,113 sf Storage= 267 cf

Plug-Flow detention time= 0.7 min calculated for 0.297 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (886.6 - 886.0)

Volume	Invert	Avail.Storage	Storage Description
#1	75.70'	11,295 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)
75.70	2	2.0	0	0	2
76.00	954	345.0	100	100	9,474
77.00	27,508	674.0	11,195	11,295	36,157

Device	Routing	Invert	Outlet Devices
#1	Primary	75.70'	**4.00' W x 2.00' H x 31.0' long Culvert** Box, 30-75° wingwalls, square crown, Ke= 0.400 Outlet Invert= 75.66' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	75.71'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 6 sf

Discarded OutFlow Max=0.40 cfs @ 12.28 hrs HW=76.11' (Free Discharge)
↑└**2=Exfiltration** (Exfiltration Controls 0.40 cfs)

Primary OutFlow Max=2.24 cfs @ 12.28 hrs HW=76.11' TW=75.99' (Dynamic Tailwater)
↑└**1=Culvert** (Outlet Controls 2.24 cfs @ 1.82 fps)

Summary for Pond 1B: Small Depression at NE Corner of Building

Inflow Area = 2.122 ac, 2.77% Impervious, Inflow Depth = 1.68" for 100-yr event
Inflow = 2.44 cfs @ 12.27 hrs, Volume= 0.297 af
Outflow = 2.44 cfs @ 12.28 hrs, Volume= 0.297 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.04 cfs @ 12.28 hrs, Volume= 0.005 af
Primary = 2.41 cfs @ 12.28 hrs, Volume= 0.292 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.99' @ 12.28 hrs Surf.Area= 189 sf Storage= 32 cf

Plug-Flow detention time= 0.3 min calculated for 0.297 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (883.2 - 883.0)

Volume	Invert	Avail.Storage	Storage Description
#1	75.54'	457 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)
75.54	2	2.0	0	0	2
76.00	193	85.0	33	33	577
77.00	709	107.0	424	457	927

Device	Routing	Invert	Outlet Devices
#1	Primary	75.54'	**4.00' W x 2.00' H x 45.0' long Culvert** Box, 30-75° wingwalls, square crown, Ke= 0.400 Outlet Invert= 75.53' S= 0.0002 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	75.55'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 3 sf

Discarded OutFlow Max=0.04 cfs @ 12.28 hrs HW=75.99' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=2.41 cfs @ 12.28 hrs HW=75.99' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 2.41 cfs @ 1.77 fps)

Summary for Pond 1C: Storage Behind Culvert

Inflow Area = 0.904 ac, 4.83% Impervious, Inflow Depth = 2.60" for 100-yr event
Inflow = 1.83 cfs @ 12.28 hrs, Volume= 0.196 af
Outflow = 1.74 cfs @ 12.34 hrs, Volume= 0.196 af, Atten= 5%, Lag= 3.7 min
Discarded = 0.51 cfs @ 12.34 hrs, Volume= 0.050 af
Primary = 1.23 cfs @ 12.34 hrs, Volume= 0.146 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.86' @ 12.34 hrs Surf.Area= 2,665 sf Storage= 259 cf

Plug-Flow detention time= 1.2 min calculated for 0.196 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (866.9 - 865.7)

Volume	Invert	Avail.Storage	Storage Description
#1	77.58'	4,907 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)
77.58	2	2.0	0	0	2
78.00	5,752	313.0	821	821	7,798
78.50	10,860	398.0	4,086	4,907	12,611

Device	Routing	Invert	Outlet Devices
#1	Primary	77.58'	**4.00' W x 2.00' H x 45.0' long Culvert** Box, 30-75° wingwalls, square crown, Ke= 0.400 Outlet Invert= 77.54' S= 0.0009 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections

#2	Discarded	77.59'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 10 sf

Discarded OutFlow Max=0.51 cfs @ 12.34 hrs HW=77.86' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.51 cfs)

Primary OutFlow Max=1.23 cfs @ 12.34 hrs HW=77.86' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.23 cfs @ 1.45 fps)

Summary for Pond 2A: Depression at SE Corner of Building

Inflow Area = 0.987 ac, 0.00% Impervious, Inflow Depth = 1.67" for 100-yr event
Inflow = 1.28 cfs @ 12.22 hrs, Volume= 0.137 af
Outflow = 1.14 cfs @ 12.31 hrs, Volume= 0.137 af, Atten= 11%, Lag= 5.2 min
Discarded = 0.29 cfs @ 12.31 hrs, Volume= 0.023 af
Primary = 0.85 cfs @ 12.31 hrs, Volume= 0.114 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 74.41' @ 12.31 hrs Surf.Area= 1,543 sf Storage= 230 cf

Plug-Flow detention time= 1.6 min calculated for 0.137 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (889.7 - 888.4)

Volume	Invert	Avail.Storage	Storage Description
#1	73.90'	33,995 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)
73.90	2	2.0	0	0	2
74.00	10	10.0	1	1	10
75.00	8,304	644.0	2,867	2,868	33,007
76.00	16,851	655.0	12,328	15,196	34,316
77.00	20,817	705.0	18,799	33,995	39,770

Device	Routing	Invert	Outlet Devices
#1	Primary	73.90'	**12.0" x 44.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.55' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	73.91'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 3 sf

Discarded OutFlow Max=0.29 cfs @ 12.31 hrs HW=74.41' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=0.85 cfs @ 12.31 hrs HW=74.41' TW=73.18' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.85 cfs @ 3.07 fps)

Summary for Pond 2B: Depression at SW Corner of Building

Inflow Area = 0.889 ac, 34.66% Impervious, Inflow Depth = 4.47" for 100-yr event
Inflow = 4.51 cfs @ 12.10 hrs, Volume= 0.331 af
Outflow = 3.00 cfs @ 12.19 hrs, Volume= 0.331 af, Atten= 34%, Lag= 5.7 min
Discarded = 0.59 cfs @ 12.19 hrs, Volume= 0.077 af
Primary = 2.41 cfs @ 12.19 hrs, Volume= 0.254 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.33' @ 12.19 hrs Surf.Area= 3,083 sf Storage= 1,401 cf

Plug-Flow detention time= 3.7 min calculated for 0.331 af (100% of inflow)
Center-of-Mass det. time= 3.7 min (817.2 - 813.5)

Volume	Invert	Avail.Storage	Storage Description
#1	74.35'	14,436 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)
74.35	2	2.0	0	0	2
75.00	2,273	200.0	508	508	3,185
76.00	5,058	288.0	3,574	4,081	6,612
77.00	7,587	358.0	6,280	10,361	10,224
77.50	8,725	416.0	4,075	14,436	13,802

Device	Routing	Invert	Outlet Devices
#1	Primary	74.35'	**12.0" x 45.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.99' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	74.36'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 5 sf

Discarded OutFlow Max=0.59 cfs @ 12.19 hrs HW=75.33' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.59 cfs)

Primary OutFlow Max=2.41 cfs @ 12.19 hrs HW=75.33' TW=73.04' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.41 cfs @ 3.87 fps)

Summary for Pond 2C: Depression West of Building

Inflow Area = 0.542 ac, 1.63% Impervious, Inflow Depth = 2.31" for 100-yr event
Inflow = 1.40 cfs @ 12.10 hrs, Volume= 0.104 af
Outflow = 1.00 cfs @ 12.18 hrs, Volume= 0.104 af, Atten= 29%, Lag= 5.0 min
Discarded = 0.59 cfs @ 12.18 hrs, Volume= 0.063 af
Primary = 0.41 cfs @ 12.18 hrs, Volume= 0.041 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 75.94' @ 12.18 hrs Surf.Area= 3,089 sf Storage= 361 cf

Plug-Flow detention time= 3.3 min calculated for 0.104 af (100% of inflow)
Center-of-Mass det. time= 3.3 min (864.2 - 860.9)

Volume	Invert	Avail.Storage	Storage Description
#1	75.60'	15,028 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)
75.60	2	2.0	0	0	2
76.00	4,193	270.0	572	572	5,803
77.00	7,571	341.0	5,799	6,371	9,269
78.00	9,791	412.0	8,657	15,028	13,540

Device	Routing	Invert	Outlet Devices
#1	Primary	75.60'	**12.0" x 37.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 75.30' S= 0.0081 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Discarded	75.61'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 9 sf

Discarded OutFlow Max=0.59 cfs @ 12.18 hrs HW=75.94' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.59 cfs)

Primary OutFlow Max=0.41 cfs @ 12.18 hrs HW=75.94' TW=73.02' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.41 cfs @ 2.56 fps)

Summary for Pond EDB: Existing Detention Basin

Inflow Area = 9.353 ac, 67.68% Impervious, Inflow Depth = 5.19" for 100-yr event
Inflow = 49.15 cfs @ 12.09 hrs, Volume= 4.043 af
Outflow = 4.37 cfs @ 13.05 hrs, Volume= 3.426 af, Atten= 91%, Lag= 57.8 min
Primary = 4.37 cfs @ 13.05 hrs, Volume= 3.426 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 73.39' @ 13.05 hrs Surf.Area= 70,605 sf Storage= 111,501 cf

Plug-Flow detention time= 617.2 min calculated for 3.425 af (85% of inflow)
Center-of-Mass det. time= 551.9 min (1,324.6 - 772.6)

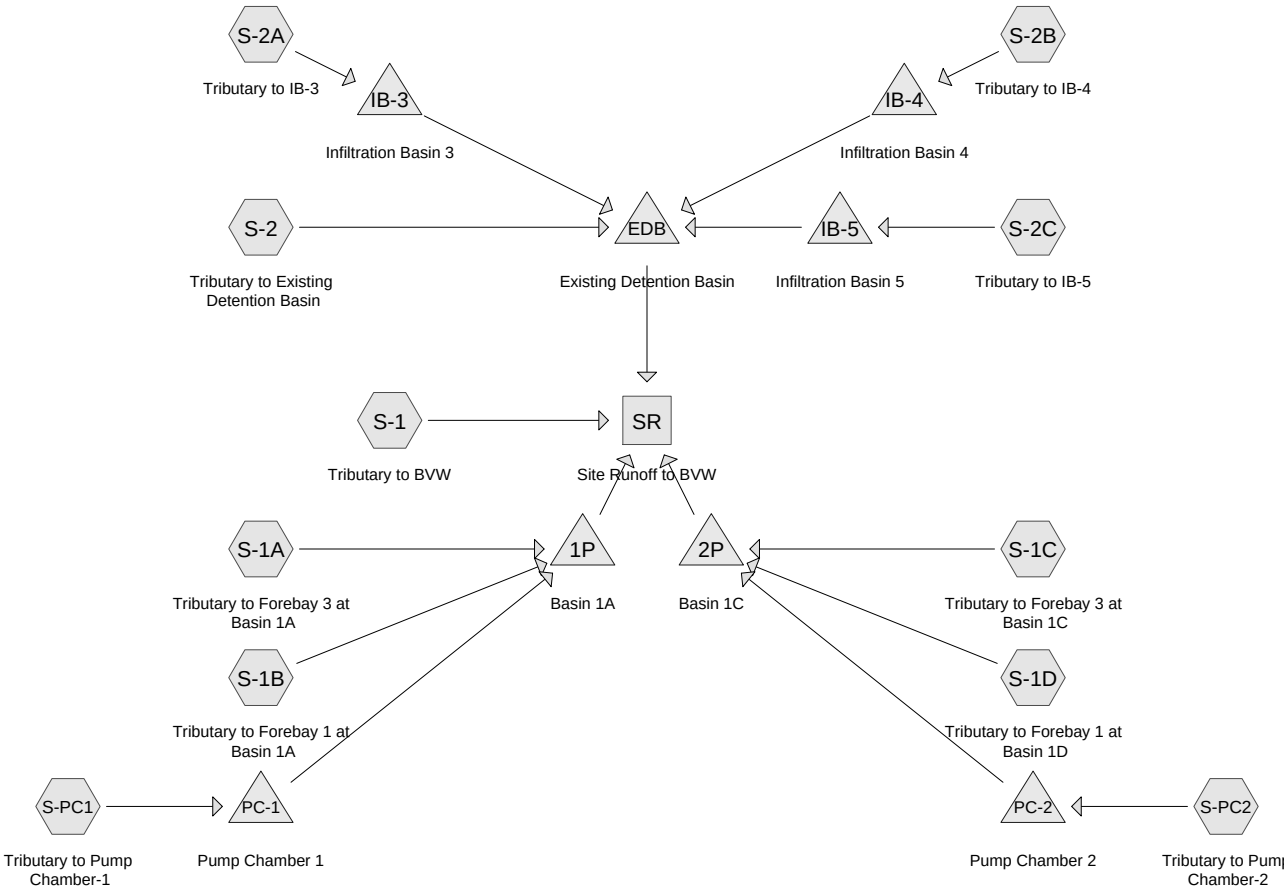
Volume	Invert	Avail.Storage	Storage Description
#1	71.70'	155,808 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
71.70	60,155	952.0	0	0	60,155
72.00	63,529	1,023.0	18,550	18,550	71,318
73.00	68,606	1,069.0	66,051	84,602	79,047
74.00	73,838	1,080.0	71,206	155,808	81,213

Device	Routing	Invert	Outlet Devices
#1	Primary	72.01'	**12.0" x 3.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 72.00' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Primary	73.30'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**

Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
Coef. (English)	2.49	2.56	2.70	2.69	2.68	2.69	2.67	2.64

Primary OutFlow Max=4.37 cfs @ 13.05 hrs HW=73.39' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 3.10 cfs @ 3.95 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 1.27 cfs @ 0.73 fps)



Subcat Reach Pond Link

Drainage Diagram for 15500POST
Prepared by

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Tributary to BVW Runoff Area=208,638 sf 1.42% Impervious Runoff Depth=0.00"
Flow Length=170' Tc=18.7 min CN=38 Runoff=0.00 cfs 0.000 af

Subcatchment S-1A: Tributary to Forebay Runoff Area=53,106 sf 72.43% Impervious Runoff Depth=1.70"
Tc=6.0 min CN=82 Runoff=2.43 cfs 0.173 af

Subcatchment S-1B: Tributary to Forebay Runoff Area=39,140 sf 77.07% Impervious Runoff Depth=1.85"
Tc=6.0 min CN=84 Runoff=1.95 cfs 0.139 af

Subcatchment S-1C: Tributary to Forebay Runoff Area=29,068 sf 48.79% Impervious Runoff Depth=0.84"
Tc=6.0 min CN=68 Runoff=0.58 cfs 0.047 af

Subcatchment S-1D: Tributary to Forebay Runoff Area=47,835 sf 87.15% Impervious Runoff Depth=2.35"
Tc=6.0 min CN=90 Runoff=2.99 cfs 0.215 af

Subcatchment S-2: Tributary to Existing Runoff Area=289,994 sf 89.63% Impervious Runoff Depth=2.54"
Tc=6.0 min CN=92 Runoff=19.30 cfs 1.410 af

Subcatchment S-2A: Tributary to IB-3 Runoff Area=42,292 sf 49.26% Impervious Runoff Depth=0.84"
Tc=6.0 min CN=68 Runoff=0.85 cfs 0.068 af

Subcatchment S-2B: Tributary to IB-4 Runoff Area=55,368 sf 73.47% Impervious Runoff Depth=1.70"
Tc=6.0 min CN=82 Runoff=2.53 cfs 0.180 af

Subcatchment S-2C: Tributary to IB-5 Runoff Area=20,685 sf 52.89% Impervious Runoff Depth=0.95"
Tc=6.0 min CN=70 Runoff=0.48 cfs 0.037 af

Subcatchment S-PC1: Tributary to Pump Runoff Area=11,572 sf 95.61% Impervious Runoff Depth=2.84"
Tc=6.0 min CN=95 Runoff=0.83 cfs 0.063 af

Subcatchment S-PC2: Tributary to Pump Runoff Area=17,206 sf 100.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=98 Runoff=1.31 cfs 0.104 af

Reach SR: Site Runoff to BVW Inflow=0.57 cfs 0.909 af
Outflow=0.57 cfs 0.909 af

Pond 1P: Basin 1A Peak Elev=77.24' Storage=6,321 cf Inflow=4.51 cfs 0.373 af
Discarded=0.91 cfs 0.372 af Primary=0.00 cfs 0.000 af Outflow=0.91 cfs 0.372 af

Pond 2P: Basin 1C Peak Elev=76.96' Storage=9,286 cf Inflow=4.01 cfs 0.365 af
Discarded=0.30 cfs 0.363 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.363 af

Pond EDB: Existing Detention Basin Peak Elev=72.49' Storage=50,012 cf Inflow=19.86 cfs 1.501 af
Outflow=0.57 cfs 0.908 af

Pond IB-3: Infiltration Basin 3 Peak Elev=77.21' Storage=1,282 cf Inflow=0.85 cfs 0.068 af
Discarded=0.08 cfs 0.067 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.067 af

Pond IB-4: Infiltration Basin 4 Peak Elev=76.96' Storage=2,326 cf Inflow=2.53 cfs 0.180 af
Discarded=0.09 cfs 0.087 af Primary=1.35 cfs 0.092 af Outflow=1.44 cfs 0.179 af

Pond IB-5: Infiltration Basin 5 Peak Elev=77.01' Storage=609 cf Inflow=0.48 cfs 0.037 af
Discarded=0.07 cfs 0.037 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.037 af

Pond PC-1: Pump Chamber 1 Peak Elev=70.15' Storage=838 cf Inflow=0.83 cfs 0.063 af
Outflow=0.13 cfs 0.061 af

Pond PC-2: Pump Chamber 2 Peak Elev=68.97' Storage=668 cf Inflow=1.31 cfs 0.104 af
Outflow=0.45 cfs 0.103 af

Total Runoff Area = 18.708 ac Runoff Volume = 2.437 af Average Runoff Depth = 1.56"
40.10% Pervious = 7.502 ac 59.90% Impervious = 11.206 ac

Summary for Subcatchment S-1: Tributary to BVW

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	118,418	30	Woods, Good, HSG A
	43,177	55	Woods, Good, HSG B
	41,657	39	>75% Grass cover, Good, HSG A
	2,420	61	>75% Grass cover, Good, HSG B
*	2,966	98	Proposed Pavement
	208,638	38	Weighted Average
	205,672		Pervious Area
	2,966		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
4.0	120	0.0100	0.50		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
18.7	170	Total			

Summary for Subcatchment S-1A: Tributary to Forebay 3 at Basin 1A

Runoff = 2.43 cfs @ 12.09 hrs, Volume= 0.173 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	14,643	39	>75% Grass cover, Good, HSG A
	35,113	98	Paved parking & roofs
*	3,350	98	Concrete
	53,106	82	Weighted Average
	14,643		Pervious Area
	38,463		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1B: Tributary to Forebay 1 at Basin 1A

Runoff = 1.95 cfs @ 12.09 hrs, Volume= 0.139 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

Area (sf)	CN	Description
8,973	39	>75% Grass cover, Good, HSG A
30,167	98	Paved parking & roofs
39,140	84	Weighted Average
8,973		Pervious Area
30,167		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1C: Tributary to Forebay 3 at Basin 1C

Runoff = 0.58 cfs @ 12.10 hrs, Volume= 0.047 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	14,886	39	>75% Grass cover, Good, HSG A
	11,729	98	Paved parking & roofs
*	1,901	98	Roof
*	552	98	Concrete
	29,068	68	Weighted Average
	14,886		Pervious Area
	14,182		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1D: Tributary to Forebay 1 at Basin 1D

Runoff = 2.99 cfs @ 12.09 hrs, Volume= 0.215 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	6,146	39	>75% Grass cover, Good, HSG A
	39,788	98	Paved parking & roofs
*	1,901	98	Roof
	47,835	90	Weighted Average
	6,146		Pervious Area
	41,689		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2: Tributary to Existing Detention Basin

Runoff = 19.30 cfs @ 12.09 hrs, Volume= 1.410 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	23,419	39	>75% Grass cover, Good, HSG A
	6,652	61	>75% Grass cover, Good, HSG B
*	53,807	98	Pavement
*	139,301	98	Existing Roof
*	6,660	98	Concrete
*	60,155	98	Existing Basin @ Elev=71.7
	289,994	92	Weighted Average
	30,071		Pervious Area
	259,923		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2A: Tributary to IB-3

Runoff = 0.85 cfs @ 12.10 hrs, Volume= 0.068 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	21,460	39	>75% Grass cover, Good, HSG A
*	20,832	98	Pavement
	42,292	68	Weighted Average
	21,460		Pervious Area
	20,832		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2B: Tributary to IB-4

Runoff = 2.53 cfs @ 12.09 hrs, Volume= 0.180 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	14,688	39	>75% Grass cover, Good, HSG A
*	28,482	98	Pavement
*	12,198	98	Existing Roof
	55,368	82	Weighted Average
	14,688		Pervious Area
	40,680		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2C: Tributary to IB-5

Runoff = 0.48 cfs @ 12.10 hrs, Volume= 0.037 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	9,745	39	>75% Grass cover, Good, HSG A
*	10,940	98	Pavement
	20,685	70	Weighted Average
	9,745		Pervious Area
	10,940		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-PC1: Tributary to Pump Chamber-1

Runoff = 0.83 cfs @ 12.08 hrs, Volume= 0.063 af, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

	Area (sf)	CN	Description
	508	39	>75% Grass cover, Good, HSG A
	11,064	98	Paved parking & roofs
	11,572	95	Weighted Average
	508		Pervious Area
	11,064		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-PC2: Tributary to Pump Chamber-2

Runoff = 1.31 cfs @ 12.08 hrs, Volume= 0.104 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.40"

Area (sf)	CN	Description
17,206	98	Paved parking & roofs
17,206		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Reach SR: Site Runoff to BVW

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.708 ac, 59.90% Impervious, Inflow Depth > 0.58" for 2-yr event
Inflow = 0.57 cfs @ 16.36 hrs, Volume= 0.909 af
Outflow = 0.57 cfs @ 16.36 hrs, Volume= 0.909 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Summary for Pond 1P: Basin 1A

[78] Warning: Submerged Pond PC-1 Primary device # 1 by 12.41'
[80] Warning: Exceeded Pond PC-1 by 12.15' @ 15.29 hrs (0.13 cfs 0.797 af)

Inflow Area = 2.383 ac, 76.76% Impervious, Inflow Depth = 1.88" for 2-yr event
Inflow = 4.51 cfs @ 12.09 hrs, Volume= 0.373 af
Outflow = 0.91 cfs @ 12.57 hrs, Volume= 0.372 af, Atten= 80%, Lag= 28.7 min
Discarded = 0.91 cfs @ 12.57 hrs, Volume= 0.372 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.24' @ 12.57 hrs Surf.Area= 8,463 sf Storage= 6,321 cf

Plug-Flow detention time= 187.8 min calculated for 0.372 af (100% of inflow)
Center-of-Mass det. time= 186.4 min (1,015.9 - 829.5)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	13,352 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)
76.00	3,695	480.0	0	0	3,695
77.00	5,259	533.0	4,454	4,454	7,997
77.10	8,153	686.0	665	5,119	22,839
78.00	10,178	777.0	8,232	13,352	33,454

Device	Routing	Invert	Outlet Devices
#1	Primary	77.40'	**10.0' long x 11.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64
#2	Discarded	76.01'	**8.270 in/hr Exfiltration over Surface area above invert**
			Excluded Surface area = 3,709 sf

Discarded OutFlow Max=0.91 cfs @ 12.57 hrs HW=77.24' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.91 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=76.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Basin 1C

[78] Warning: Submerged Pond PC-2 Primary device # 1 by 12.13'
[80] Warning: Exceeded Pond PC-2 by 12.11' @ 14.12 hrs (0.45 cfs 2.654 af)

Inflow Area =	2.160 ac,	77.65% Impervious,	Inflow Depth =	2.03" for 2-yr event
Inflow =	4.01 cfs @	12.09 hrs,	Volume=	0.365 af
Outflow =	0.30 cfs @	14.01 hrs,	Volume=	0.363 af, Atten= 93%, Lag= 115.0 min
Discarded =	0.30 cfs @	14.01 hrs,	Volume=	0.363 af
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 76.96' @ 14.01 hrs Surf.Area= 10,495 sf Storage= 9,286 cf

Plug-Flow detention time= 508.1 min calculated for 0.363 af (99% of inflow)
Center-of-Mass det. time= 504.4 min (1,308.6 - 804.2)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	24,188 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)
76.00	8,916	527.0	0	0	8,916
77.00	10,567	568.0	9,730	9,730	12,530
77.10	13,589	835.0	1,205	10,934	42,340
78.00	15,893	892.0	13,253	24,188	50,212

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	**10.0' long x 11.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64
#2	Discarded	76.01'	**8.270 in/hr Exfiltration over Horizontal area above invert**
			Excluded Horizontal area = 8,932 sf

Discarded OutFlow Max=0.30 cfs @ 14.01 hrs HW=76.96' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=76.00' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond EDB: Existing Detention Basin

Inflow Area = 9.374 ac, 81.40% Impervious, Inflow Depth = 1.92" for 2-yr event
Inflow = 19.86 cfs @ 12.09 hrs, Volume= 1.501 af
Outflow = 0.57 cfs @ 16.36 hrs, Volume= 0.908 af, Atten= 97%, Lag= 256.3 min
Primary = 0.57 cfs @ 16.36 hrs, Volume= 0.908 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 72.49' @ 16.36 hrs Surf.Area= 65,972 sf Storage= 50,012 cf

Plug-Flow detention time= 965.7 min calculated for 0.908 af (61% of inflow)
Center-of-Mass det. time= 866.2 min (1,661.4 - 795.2)

Volume	Invert	Avail.Storage	Storage Description
#1	71.70'	155,808 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)
71.70	60,155	952.0	0	0	60,155
72.00	63,529	1,023.0	18,550	18,550	71,318
73.00	68,606	1,069.0	66,051	84,602	79,047
74.00	73,838	1,080.0	71,206	155,808	81,213

Device	Routing	Invert	Outlet Devices
#1	Primary	72.01'	**12.0" x 3.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 72.00' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Primary	73.30'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.57 cfs @ 16.36 hrs HW=72.49' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.57 cfs @ 2.26 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IB-3: Infiltration Basin 3

Inflow Area = 0.971 ac, 49.26% Impervious, Inflow Depth = 0.84" for 2-yr event
Inflow = 0.85 cfs @ 12.10 hrs, Volume= 0.068 af
Outflow = 0.08 cfs @ 14.11 hrs, Volume= 0.067 af, Atten= 91%, Lag= 120.7 min
Discarded = 0.08 cfs @ 14.11 hrs, Volume= 0.067 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 77.21' @ 14.11 hrs Surf.Area= 6,411 sf Storage= 1,282 cf

Plug-Flow detention time= 274.1 min calculated for 0.067 af (98% of inflow)
Center-of-Mass det. time= 263.0 min (1,141.3 - 878.3)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	18,565 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)
77.00	5,983	726.0	0	0	5,983
78.00	8,190	745.0	7,058	7,058	8,326
78.10	10,337	917.0	924	7,982	31,074
79.00	13,240	1,028.0	10,583	18,565	48,277

Device	Routing	Invert	Outlet Devices
#1	Primary	73.90'	**12.0" x 35.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.55' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Device 1	78.50'	**24.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	77.01'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 6,003 sf

Discarded OutFlow Max=0.08 cfs @ 14.11 hrs HW=77.21' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=77.00' TW=71.70' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.00 cfs of 6.10 cfs potential flow)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IB-4: Infiltration Basin 4

Inflow Area = 1.271 ac, 73.47% Impervious, Inflow Depth = 1.70" for 2-yr event
Inflow = 2.53 cfs @ 12.09 hrs, Volume= 0.180 af
Outflow = 1.44 cfs @ 12.22 hrs, Volume= 0.179 af, Atten= 43%, Lag= 7.5 min
Discarded = 0.09 cfs @ 12.22 hrs, Volume= 0.087 af
Primary = 1.35 cfs @ 12.22 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 76.96' @ 12.22 hrs Surf.Area= 5,257 sf Storage= 2,326 cf

Plug-Flow detention time= 216.0 min calculated for 0.179 af (99% of inflow)
Center-of-Mass det. time= 212.6 min (1,045.9 - 833.3)

Volume	Invert	Avail.Storage	Storage Description
#1	76.50'	8,482 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)
76.50	4,795	399.0	0	0	4,795
77.00	5,295	352.0	2,521	2,521	7,610
78.00	6,652	427.0	5,961	8,482	12,276

Device	Routing	Invert	Outlet Devices
#1	Discarded	76.51'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 4,805 sf
#2	Primary	73.50'	**12.0" x 35.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.22' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	76.80'	**24.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Discarded OutFlow Max=0.09 cfs @ 12.22 hrs HW=76.96' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=1.35 cfs @ 12.22 hrs HW=76.96' TW=72.19' (Dynamic Tailwater)
└**2=Culvert** (Passes 1.35 cfs of 6.48 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 1.35 cfs @ 1.32 fps)

Summary for Pond IB-5: Infiltration Basin 5

Inflow Area = 0.475 ac, 52.89% Impervious, Inflow Depth = 0.95" for 2-yr event
Inflow = 0.48 cfs @ 12.10 hrs, Volume= 0.037 af
Outflow = 0.07 cfs @ 12.90 hrs, Volume= 0.037 af, Atten= 85%, Lag= 48.3 min
Discarded = 0.07 cfs @ 12.90 hrs, Volume= 0.037 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.01' @ 12.90 hrs Surf.Area= 817 sf Storage= 609 cf

Plug-Flow detention time= 156.7 min calculated for 0.037 af (100% of inflow)
Center-of-Mass det. time= 155.2 min (1,026.5 - 871.3)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	4,136 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)
76.00	448	89.0	0	0	448
77.00	769	114.0	601	601	864
77.10	1,343	151.0	104	706	1,645
78.00	1,773	167.0	1,398	2,103	2,074
79.00	2,304	186.0	2,033	4,136	2,636

Device	Routing	Invert	Outlet Devices
#1	Discarded	76.01'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 451 sf
#2	Primary	74.74'	**12.0" x 32.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 74.42' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	78.50'	**12.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Discarded OutFlow Max=0.07 cfs @ 12.90 hrs HW=77.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=76.00' TW=71.70' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 3.22 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PC-1: Pump Chamber 1

Inflow Area = 0.266 ac, 95.61% Impervious, Inflow Depth = 2.84" for 2-yr event
Inflow = 0.83 cfs @ 12.08 hrs, Volume= 0.063 af
Outflow = 0.13 cfs @ 11.75 hrs, Volume= 0.061 af, Atten= 84%, Lag= 0.0 min
Primary = 0.13 cfs @ 11.75 hrs, Volume= 0.061 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 70.15' @ 12.56 hrs Surf.Area= 144 sf Storage= 838 cf

Plug-Flow detention time= 61.6 min calculated for 0.061 af (97% of inflow)
Center-of-Mass det. time= 45.5 min (824.7 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1	64.33'	1,392 cf	**9.00'W x 16.00'L x 9.67'H Prismatoid**
#2	74.00'	75 cf	**4.00'D x 3.00'H Vertical Cone/Cylinder** x 2
#3	77.00'	4,022 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		5,490 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.00	100	100.0	0	0	100
78.00	10,920	807.0	4,022	4,022	51,131

Device	Routing	Invert	Outlet Devices
#1	Primary	64.83'	**Special & User-Defined** Head (feet) 0.00 0.10 9.17 Disch. (cfs) 0.000 0.134 0.134

Primary OutFlow Max=0.13 cfs @ 11.75 hrs HW=65.02' TW=76.40' (Dynamic Tailwater)
└**1=Special & User-Defined** (Custom Controls 0.13 cfs)

Summary for Pond PC-2: Pump Chamber 2

Inflow Area = 0.395 ac,100.00% Impervious, Inflow Depth = 3.17" for 2-yr event
Inflow = 1.31 cfs @ 12.08 hrs, Volume= 0.104 af
Outflow = 0.45 cfs @ 11.92 hrs, Volume= 0.103 af, Atten= 66%, Lag= 0.0 min
Primary = 0.45 cfs @ 11.92 hrs, Volume= 0.103 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 68.97' @ 12.35 hrs Surf.Area= 144 sf Storage= 668 cf

Plug-Flow detention time= 24.7 min calculated for 0.103 af (98% of inflow)

Center-of-Mass det. time= 14.4 min (769.5 - 755.1)

Volume	Invert	Avail.Storage	Storage Description
#1	64.33'	1,392 cf	**9.00'W x 16.00'L x 9.67'H Prismatoid**
#2	74.00'	38 cf	**4.00'D x 3.00'H Vertical Cone/Cylinder**
#3	77.00'	4,021 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		5,451 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.00	100	100.0	0	0	100
78.00	10,919	807.0	4,021	4,021	51,131

Device	Routing	Invert	Outlet Devices
#1	Primary	64.83'	**Special & User-Defined** Head (feet) 0.00 0.10 9.17 Disch. (cfs) 0.000 0.446 0.446

Primary OutFlow Max=0.45 cfs @ 11.92 hrs HW=65.02' TW=76.35' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.45 cfs)

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Tributary to BVW Runoff Area=208,638 sf 1.42% Impervious Runoff Depth=0.13"
Flow Length=170' Tc=18.7 min CN=38 Runoff=0.09 cfs 0.053 af

Subcatchment S-1A: Tributary to Forebay Runoff Area=53,106 sf 72.43% Impervious Runoff Depth=2.90"
Tc=6.0 min CN=82 Runoff=4.14 cfs 0.295 af

Subcatchment S-1B: Tributary to Forebay Runoff Area=39,140 sf 77.07% Impervious Runoff Depth=3.09"
Tc=6.0 min CN=84 Runoff=3.24 cfs 0.231 af

Subcatchment S-1C: Tributary to Forebay Runoff Area=29,068 sf 48.79% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=68 Runoff=1.32 cfs 0.097 af

Subcatchment S-1D: Tributary to Forebay Runoff Area=47,835 sf 87.15% Impervious Runoff Depth=3.68"
Tc=6.0 min CN=90 Runoff=4.59 cfs 0.337 af

Subcatchment S-2: Tributary to Existing Runoff Area=289,994 sf 89.63% Impervious Runoff Depth=3.89"
Tc=6.0 min CN=92 Runoff=28.93 cfs 2.160 af

Subcatchment S-2A: Tributary to IB-3 Runoff Area=42,292 sf 49.26% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=68 Runoff=1.91 cfs 0.141 af

Subcatchment S-2B: Tributary to IB-4 Runoff Area=55,368 sf 73.47% Impervious Runoff Depth=2.90"
Tc=6.0 min CN=82 Runoff=4.32 cfs 0.307 af

Subcatchment S-2C: Tributary to IB-5 Runoff Area=20,685 sf 52.89% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=70 Runoff=1.03 cfs 0.075 af

Subcatchment S-PC1: Tributary to Pump Runoff Area=11,572 sf 95.61% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=95 Runoff=1.21 cfs 0.093 af

Subcatchment S-PC2: Tributary to Pump Runoff Area=17,206 sf 100.00% Impervious Runoff Depth=4.56"
Tc=6.0 min CN=98 Runoff=1.85 cfs 0.150 af

Reach SR: Site Runoff to BVW Inflow=3.72 cfs 1.969 af
Outflow=3.72 cfs 1.969 af

Pond 1P: Basin 1A Peak Elev=77.58' Storage=9,271 cf Inflow=7.51 cfs 0.618 af
Discarded=1.05 cfs 0.541 af Primary=1.91 cfs 0.076 af Outflow=2.96 cfs 0.617 af

Pond 2P: Basin 1C Peak Elev=77.12' Storage=11,162 cf Inflow=6.34 cfs 0.582 af
Discarded=0.90 cfs 0.501 af Primary=1.01 cfs 0.079 af Outflow=1.91 cfs 0.580 af

Pond EDB: Existing Detention Basin Peak Elev=72.81' Storage=71,742 cf Inflow=31.54 cfs 2.367 af
Outflow=1.44 cfs 1.761 af

Pond IB-3: Infiltration Basin 3 Peak Elev=77.44' Storage=2,825 cf Inflow=1.91 cfs 0.141 af
Discarded=0.17 cfs 0.139 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.139 af

Pond IB-4: Infiltration Basin 4 Peak Elev=77.09' Storage=3,003 cf Inflow=4.32 cfs 0.307 af
Discarded=0.12 cfs 0.100 af Primary=3.21 cfs 0.206 af Outflow=3.32 cfs 0.306 af

Pond IB-5: Infiltration Basin 5 Peak Elev=77.44' Storage=1,188 cf Inflow=1.03 cfs 0.075 af
Discarded=0.20 cfs 0.075 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.075 af

Pond PC-1: Pump Chamber 1 Peak Elev=74.45' Storage=1,404 cf Inflow=1.21 cfs 0.093 af
Outflow=0.13 cfs 0.092 af

Pond PC-2: Pump Chamber 2 Peak Elev=73.59' Storage=1,334 cf Inflow=1.85 cfs 0.150 af
Outflow=0.45 cfs 0.149 af

Total Runoff Area = 18.708 ac Runoff Volume = 3.939 af Average Runoff Depth = 2.53"
40.10% Pervious = 7.502 ac 59.90% Impervious = 11.206 ac

Summary for Subcatchment S-1: Tributary to BVW

Runoff = 0.09 cfs @ 14.77 hrs, Volume= 0.053 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	118,418	30	Woods, Good, HSG A
	43,177	55	Woods, Good, HSG B
	41,657	39	>75% Grass cover, Good, HSG A
	2,420	61	>75% Grass cover, Good, HSG B
*	2,966	98	Proposed Pavement
	208,638	38	Weighted Average
	205,672		Pervious Area
	2,966		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
4.0	120	0.0100	0.50		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
18.7	170	Total			

Summary for Subcatchment S-1A: Tributary to Forebay 3 at Basin 1A

Runoff = 4.14 cfs @ 12.09 hrs, Volume= 0.295 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	14,643	39	>75% Grass cover, Good, HSG A
	35,113	98	Paved parking & roofs
*	3,350	98	Concrete
	53,106	82	Weighted Average
	14,643		Pervious Area
	38,463		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1B: Tributary to Forebay 1 at Basin 1A

Runoff = 3.24 cfs @ 12.09 hrs, Volume= 0.231 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

Area (sf)	CN	Description
8,973	39	>75% Grass cover, Good, HSG A
30,167	98	Paved parking & roofs
39,140	84	Weighted Average
8,973		Pervious Area
30,167		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1C: Tributary to Forebay 3 at Basin 1C

Runoff = 1.32 cfs @ 12.09 hrs, Volume= 0.097 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	14,886	39	>75% Grass cover, Good, HSG A
	11,729	98	Paved parking & roofs
*	1,901	98	Roof
*	552	98	Concrete
	29,068	68	Weighted Average
	14,886		Pervious Area
	14,182		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1D: Tributary to Forebay 1 at Basin 1D

Runoff = 4.59 cfs @ 12.09 hrs, Volume= 0.337 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	6,146	39	>75% Grass cover, Good, HSG A
	39,788	98	Paved parking & roofs
*	1,901	98	Roof
	47,835	90	Weighted Average
	6,146		Pervious Area
	41,689		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2: Tributary to Existing Detention Basin

Runoff = 28.93 cfs @ 12.08 hrs, Volume= 2.160 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	23,419	39	>75% Grass cover, Good, HSG A
	6,652	61	>75% Grass cover, Good, HSG B
*	53,807	98	Pavement
*	139,301	98	Existing Roof
*	6,660	98	Concrete
*	60,155	98	Existing Basin @ Elev=71.7
	289,994	92	Weighted Average
	30,071		Pervious Area
	259,923		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2A: Tributary to IB-3

Runoff = 1.91 cfs @ 12.09 hrs, Volume= 0.141 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	21,460	39	>75% Grass cover, Good, HSG A
*	20,832	98	Pavement
	42,292	68	Weighted Average
	21,460		Pervious Area
	20,832		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2B: Tributary to IB-4

Runoff = 4.32 cfs @ 12.09 hrs, Volume= 0.307 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	14,688	39	>75% Grass cover, Good, HSG A
*	28,482	98	Pavement
*	12,198	98	Existing Roof
	55,368	82	Weighted Average
	14,688		Pervious Area
	40,680		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2C: Tributary to IB-5

Runoff = 1.03 cfs @ 12.09 hrs, Volume= 0.075 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	9,745	39	>75% Grass cover, Good, HSG A
*	10,940	98	Pavement
	20,685	70	Weighted Average
	9,745		Pervious Area
	10,940		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-PC1: Tributary to Pump Chamber-1

Runoff = 1.21 cfs @ 12.08 hrs, Volume= 0.093 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

	Area (sf)	CN	Description
	508	39	>75% Grass cover, Good, HSG A
	11,064	98	Paved parking & roofs
	11,572	95	Weighted Average
	508		Pervious Area
	11,064		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-PC2: Tributary to Pump Chamber-2

Runoff = 1.85 cfs @ 12.08 hrs, Volume= 0.150 af, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.80"

Area (sf)	CN	Description
17,206	98	Paved parking & roofs
17,206		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Reach SR: Site Runoff to BVW

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.708 ac, 59.90% Impervious, Inflow Depth > 1.26" for 10-yr event
Inflow = 3.72 cfs @ 12.42 hrs, Volume= 1.969 af
Outflow = 3.72 cfs @ 12.42 hrs, Volume= 1.969 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Summary for Pond 1P: Basin 1A

[78] Warning: Submerged Pond PC-1 Primary device # 1 by 12.75'
[80] Warning: Exceeded Pond PC-1 by 12.15' @ 17.43 hrs (0.13 cfs 0.797 af)

Inflow Area = 2.383 ac, 76.76% Impervious, Inflow Depth = 3.11" for 10-yr event
Inflow = 7.51 cfs @ 12.09 hrs, Volume= 0.618 af
Outflow = 2.96 cfs @ 12.34 hrs, Volume= 0.617 af, Atten= 61%, Lag= 15.3 min
Discarded = 1.05 cfs @ 12.34 hrs, Volume= 0.541 af
Primary = 1.91 cfs @ 12.34 hrs, Volume= 0.076 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.58' @ 12.34 hrs Surf.Area= 9,202 sf Storage= 9,271 cf

Plug-Flow detention time= 153.8 min calculated for 0.617 af (100% of inflow)
Center-of-Mass det. time= 152.9 min (972.8 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	13,352 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)
76.00	3,695	480.0	0	0	3,695
77.00	5,259	533.0	4,454	4,454	7,997
77.10	8,153	686.0	665	5,119	22,839
78.00	10,178	777.0	8,232	13,352	33,454

Device	Routing	Invert	Outlet Devices
#1	Primary	77.40'	**10.0' long x 11.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64
#2	Discarded	76.01'	**8.270 in/hr Exfiltration over Surface area above invert**
			Excluded Surface area = 3,709 sf

Discarded OutFlow Max=1.05 cfs @ 12.34 hrs HW=77.58' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 1.05 cfs)

Primary OutFlow Max=1.91 cfs @ 12.34 hrs HW=77.58' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.91 cfs @ 1.07 fps)

Summary for Pond 2P: Basin 1C

[78] Warning: Submerged Pond PC-2 Primary device # 1 by 12.29'
[80] Warning: Exceeded Pond PC-2 by 12.19' @ 13.76 hrs (0.45 cfs 2.654 af)

Inflow Area = 2.160 ac, 77.65% Impervious, Inflow Depth = 3.23" for 10-yr event
Inflow = 6.34 cfs @ 12.09 hrs, Volume= 0.582 af
Outflow = 1.91 cfs @ 12.48 hrs, Volume= 0.580 af, Atten= 70%, Lag= 23.6 min
Discarded = 0.90 cfs @ 12.48 hrs, Volume= 0.501 af
Primary = 1.01 cfs @ 12.48 hrs, Volume= 0.079 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.12' @ 12.48 hrs Surf.Area= 13,630 sf Storage= 11,162 cf

Plug-Flow detention time= 384.0 min calculated for 0.580 af (100% of inflow)
Center-of-Mass det. time= 381.6 min (1,178.1 - 796.5)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	24,188 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)
76.00	8,916	527.0	0	0	8,916
77.00	10,567	568.0	9,730	9,730	12,530
77.10	13,589	835.0	1,205	10,934	42,340
78.00	15,893	892.0	13,253	24,188	50,212

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	**10.0' long x 11.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64
#2	Discarded	76.01'	**8.270 in/hr Exfiltration over Horizontal area above invert**
			Excluded Horizontal area = 8,932 sf

Discarded OutFlow Max=0.90 cfs @ 12.48 hrs HW=77.12' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.90 cfs)

Primary OutFlow Max=1.01 cfs @ 12.48 hrs HW=77.12' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 1.01 cfs @ 0.86 fps)

Summary for Pond EDB: Existing Detention Basin

Inflow Area = 9.374 ac, 81.40% Impervious, Inflow Depth = 3.03" for 10-yr event
Inflow = 31.54 cfs @ 12.09 hrs, Volume= 2.367 af
Outflow = 1.44 cfs @ 14.79 hrs, Volume= 1.761 af, Atten= 95%, Lag= 162.1 min
Primary = 1.44 cfs @ 14.79 hrs, Volume= 1.761 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 72.81' @ 14.79 hrs Surf.Area= 67,633 sf Storage= 71,742 cf

Plug-Flow detention time= 768.3 min calculated for 1.761 af (74% of inflow)
Center-of-Mass det. time= 686.2 min (1,471.2 - 784.9)

Volume	Invert	Avail.Storage	Storage Description
#1	71.70'	155,808 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)
71.70	60,155	952.0	0	0	60,155
72.00	63,529	1,023.0	18,550	18,550	71,318
73.00	68,606	1,069.0	66,051	84,602	79,047
74.00	73,838	1,080.0	71,206	155,808	81,213

Device	Routing	Invert	Outlet Devices
#1	Primary	72.01'	**12.0" x 3.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 72.00' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Primary	73.30'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.44 cfs @ 14.79 hrs HW=72.81' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.44 cfs @ 2.93 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IB-3: Infiltration Basin 3

Inflow Area = 0.971 ac, 49.26% Impervious, Inflow Depth = 1.74" for 10-yr event
Inflow = 1.91 cfs @ 12.09 hrs, Volume= 0.141 af
Outflow = 0.17 cfs @ 13.61 hrs, Volume= 0.139 af, Atten= 91%, Lag= 91.2 min
Discarded = 0.17 cfs @ 13.61 hrs, Volume= 0.139 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 77.44' @ 13.61 hrs Surf.Area= 6,909 sf Storage= 2,825 cf

Plug-Flow detention time= 270.5 min calculated for 0.139 af (99% of inflow)
Center-of-Mass det. time= 264.8 min (1,120.0 - 855.2)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	18,565 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)
77.00	5,983	726.0	0	0	5,983
78.00	8,190	745.0	7,058	7,058	8,326
78.10	10,337	917.0	924	7,982	31,074
79.00	13,240	1,028.0	10,583	18,565	48,277

Device	Routing	Invert	Outlet Devices
#1	Primary	73.90'	**12.0" x 35.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.55' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Device 1	78.50'	**24.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	77.01'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 6,003 sf

Discarded OutFlow Max=0.17 cfs @ 13.61 hrs HW=77.44' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=77.00' TW=71.70' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 6.10 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IB-4: Infiltration Basin 4

Inflow Area = 1.271 ac, 73.47% Impervious, Inflow Depth = 2.90" for 10-yr event
Inflow = 4.32 cfs @ 12.09 hrs, Volume= 0.307 af
Outflow = 3.32 cfs @ 12.15 hrs, Volume= 0.306 af, Atten= 23%, Lag= 4.0 min
Discarded = 0.12 cfs @ 12.15 hrs, Volume= 0.100 af
Primary = 3.21 cfs @ 12.15 hrs, Volume= 0.206 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.09' @ 12.15 hrs Surf.Area= 5,411 sf Storage= 3,003 cf

Plug-Flow detention time= 144.2 min calculated for 0.306 af (100% of inflow)
Center-of-Mass det. time= 142.3 min (960.3 - 818.0)

Volume	Invert	Avail.Storage	Storage Description
#1	76.50'	8,482 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)
76.50	4,795	399.0	0	0	4,795
77.00	5,295	352.0	2,521	2,521	7,610
78.00	6,652	427.0	5,961	8,482	12,276

Device	Routing	Invert	Outlet Devices
#1	Discarded	76.51'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 4,805 sf
#2	Primary	73.50'	**12.0" x 35.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.22' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	76.80'	**24.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Discarded OutFlow Max=0.12 cfs @ 12.15 hrs HW=77.09' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=3.20 cfs @ 12.15 hrs HW=77.09' TW=72.43' (Dynamic Tailwater)
└**2=Culvert** (Passes 3.20 cfs of 6.62 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 3.20 cfs @ 1.76 fps)

Summary for Pond IB-5: Infiltration Basin 5

Inflow Area = 0.475 ac, 52.89% Impervious, Inflow Depth = 1.89" for 10-yr event
Inflow = 1.03 cfs @ 12.09 hrs, Volume= 0.075 af
Outflow = 0.20 cfs @ 12.57 hrs, Volume= 0.075 af, Atten= 81%, Lag= 28.5 min
Discarded = 0.20 cfs @ 12.57 hrs, Volume= 0.075 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.44' @ 12.57 hrs Surf.Area= 1,498 sf Storage= 1,188 cf

Plug-Flow detention time= 122.1 min calculated for 0.075 af (100% of inflow)
Center-of-Mass det. time= 121.2 min (971.1 - 849.9)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	4,136 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)
76.00	448	89.0	0	0	448
77.00	769	114.0	601	601	864
77.10	1,343	151.0	104	706	1,645
78.00	1,773	167.0	1,398	2,103	2,074
79.00	2,304	186.0	2,033	4,136	2,636

Device	Routing	Invert	Outlet Devices
#1	Discarded	76.01'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 451 sf
#2	Primary	74.74'	**12.0" x 32.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 74.42' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	78.50'	**12.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Discarded OutFlow Max=0.20 cfs @ 12.57 hrs HW=77.44' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=76.00' TW=71.70' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 3.22 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PC-1: Pump Chamber 1

Inflow Area = 0.266 ac, 95.61% Impervious, Inflow Depth = 4.22" for 10-yr event
Inflow = 1.21 cfs @ 12.08 hrs, Volume= 0.093 af
Outflow = 0.13 cfs @ 11.66 hrs, Volume= 0.092 af, Atten= 89%, Lag= 0.0 min
Primary = 0.13 cfs @ 11.66 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 74.45' @ 12.74 hrs Surf.Area= 169 sf Storage= 1,404 cf

Plug-Flow detention time= 87.3 min calculated for 0.092 af (98% of inflow)
Center-of-Mass det. time= 76.1 min (845.4 - 769.3)

Volume	Invert	Avail.Storage	Storage Description
#1	64.33'	1,392 cf	**9.00'W x 16.00'L x 9.67'H Prismatoid**
#2	74.00'	75 cf	**4.00'D x 3.00'H Vertical Cone/Cylinder** x 2
#3	77.00'	4,022 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		5,490 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.00	100	100.0	0	0	100
78.00	10,920	807.0	4,022	4,022	51,131

Device	Routing	Invert	Outlet Devices
#1	Primary	64.83'	**Special & User-Defined** Head (feet) 0.00 0.10 9.17 Disch. (cfs) 0.000 0.134 0.134

Primary OutFlow Max=0.13 cfs @ 11.66 hrs HW=65.02' TW=76.67' (Dynamic Tailwater)
└**1=Special & User-Defined** (Custom Controls 0.13 cfs)

Summary for Pond PC-2: Pump Chamber 2

Inflow Area = 0.395 ac,100.00% Impervious, Inflow Depth = 4.56" for 10-yr event
Inflow = 1.85 cfs @ 12.08 hrs, Volume= 0.150 af
Outflow = 0.45 cfs @ 11.79 hrs, Volume= 0.149 af, Atten= 76%, Lag= 0.0 min
Primary = 0.45 cfs @ 11.79 hrs, Volume= 0.149 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 73.59' @ 12.46 hrs Surf.Area= 144 sf Storage= 1,334 cf

Plug-Flow detention time= 26.9 min calculated for 0.149 af (99% of inflow)

Center-of-Mass det. time= 19.6 min (768.3 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1	64.33'	1,392 cf	**9.00'W x 16.00'L x 9.67'H Prismatoid**
#2	74.00'	38 cf	**4.00'D x 3.00'H Vertical Cone/Cylinder**
#3	77.00'	4,021 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		5,451 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.00	100	100.0	0	0	100
78.00	10,919	807.0	4,021	4,021	51,131

Device	Routing	Invert	Outlet Devices
#1	Primary	64.83'	**Special & User-Defined** Head (feet) 0.00 0.10 9.17 Disch. (cfs) 0.000 0.446 0.446

Primary OutFlow Max=0.45 cfs @ 11.79 hrs HW=65.01' TW=76.48' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.45 cfs)

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 3
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Tributary to BVW Runoff Area=208,638 sf 1.42% Impervious Runoff Depth=0.70"
Flow Length=170' Tc=18.7 min CN=38 Runoff=1.41 cfs 0.278 af

Subcatchment S-1A: Tributary to Forebay Runoff Area=53,106 sf 72.43% Impervious Runoff Depth=4.92"
Tc=6.0 min CN=82 Runoff=6.92 cfs 0.499 af

Subcatchment S-1B: Tributary to Forebay Runoff Area=39,140 sf 77.07% Impervious Runoff Depth=5.14"
Tc=6.0 min CN=84 Runoff=5.29 cfs 0.385 af

Subcatchment S-1C: Tributary to Forebay Runoff Area=29,068 sf 48.79% Impervious Runoff Depth=3.41"
Tc=6.0 min CN=68 Runoff=2.66 cfs 0.190 af

Subcatchment S-1D: Tributary to Forebay Runoff Area=47,835 sf 87.15% Impervious Runoff Depth=5.82"
Tc=6.0 min CN=90 Runoff=7.07 cfs 0.533 af

Subcatchment S-2: Tributary to Existing Runoff Area=289,994 sf 89.63% Impervious Runoff Depth=6.05"
Tc=6.0 min CN=92 Runoff=43.86 cfs 3.359 af

Subcatchment S-2A: Tributary to IB-3 Runoff Area=42,292 sf 49.26% Impervious Runoff Depth=3.41"
Tc=6.0 min CN=68 Runoff=3.87 cfs 0.276 af

Subcatchment S-2B: Tributary to IB-4 Runoff Area=55,368 sf 73.47% Impervious Runoff Depth=4.92"
Tc=6.0 min CN=82 Runoff=7.21 cfs 0.521 af

Subcatchment S-2C: Tributary to IB-5 Runoff Area=20,685 sf 52.89% Impervious Runoff Depth=3.62"
Tc=6.0 min CN=70 Runoff=2.01 cfs 0.143 af

Subcatchment S-PC1: Tributary to Pump Runoff Area=11,572 sf 95.61% Impervious Runoff Depth=6.41"
Tc=6.0 min CN=95 Runoff=1.80 cfs 0.142 af

Subcatchment S-PC2: Tributary to Pump Runoff Area=17,206 sf 100.00% Impervious Runoff Depth=6.76"
Tc=6.0 min CN=98 Runoff=2.71 cfs 0.223 af

Reach SR: Site Runoff to BVW Inflow=14.20 cfs 4.026 af
Outflow=14.20 cfs 4.026 af

Pond 1P: Basin 1A Peak Elev=77.83' Storage=11,679 cf Inflow=12.34 cfs 1.024 af
Discarded=1.16 cfs 0.732 af Primary=7.41 cfs 0.291 af Outflow=8.58 cfs 1.024 af

Pond 2P: Basin 1C Peak Elev=77.32' Storage=13,952 cf Inflow=10.17 cfs 0.943 af
Discarded=1.00 cfs 0.635 af Primary=4.59 cfs 0.306 af Outflow=5.59 cfs 0.941 af

Pond EDB: Existing Detention Basin Peak Elev=73.33' Storage=107,668 cf Inflow=48.78 cfs 3.766 af
Outflow=3.20 cfs 3.150 af

Pond IB-3: Infiltration Basin 3 Peak Elev=77.85' Storage=5,873 cf Inflow=3.87 cfs 0.276 af
Discarded=0.35 cfs 0.275 af Primary=0.00 cfs 0.000 af Outflow=0.35 cfs 0.275 af

Pond IB-4: Infiltration Basin 4 Peak Elev=77.23' Storage=3,755 cf Inflow=7.21 cfs 0.521 af
Discarded=0.15 cfs 0.112 af Primary=5.73 cfs 0.407 af Outflow=5.88 cfs 0.520 af

Pond IB-5: Infiltration Basin 5 Peak Elev=78.28' Storage=2,614 cf Inflow=2.01 cfs 0.143 af
Discarded=0.28 cfs 0.143 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.143 af

Pond PC-1: Pump Chamber 1 Peak Elev=77.58' Storage=2,420 cf Inflow=1.80 cfs 0.142 af
Outflow=0.13 cfs 0.140 af

Pond PC-2: Pump Chamber 2 Peak Elev=77.61' Storage=2,525 cf Inflow=2.71 cfs 0.223 af
Outflow=0.45 cfs 0.221 af

Total Runoff Area = 18.708 ac Runoff Volume = 6.548 af Average Runoff Depth = 4.20"
40.10% Pervious = 7.502 ac 59.90% Impervious = 11.206 ac

Summary for Subcatchment S-1: Tributary to BVW

Runoff = 1.41 cfs @ 12.48 hrs, Volume= 0.278 af, Depth= 0.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	118,418	30	Woods, Good, HSG A
	43,177	55	Woods, Good, HSG B
	41,657	39	>75% Grass cover, Good, HSG A
	2,420	61	>75% Grass cover, Good, HSG B
*	2,966	98	Proposed Pavement
	208,638	38	Weighted Average
	205,672		Pervious Area
	2,966		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0120	0.06		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.40"
4.0	120	0.0100	0.50		**Shallow Concentrated Flow, BC** Woodland Kv= 5.0 fps
18.7	170	Total			

Summary for Subcatchment S-1A: Tributary to Forebay 3 at Basin 1A

Runoff = 6.92 cfs @ 12.09 hrs, Volume= 0.499 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	14,643	39	>75% Grass cover, Good, HSG A
	35,113	98	Paved parking & roofs
*	3,350	98	Concrete
	53,106	82	Weighted Average
	14,643		Pervious Area
	38,463		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1B: Tributary to Forebay 1 at Basin 1A

Runoff = 5.29 cfs @ 12.09 hrs, Volume= 0.385 af, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

Area (sf)	CN	Description
8,973	39	>75% Grass cover, Good, HSG A
30,167	98	Paved parking & roofs
39,140	84	Weighted Average
8,973		Pervious Area
30,167		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1C: Tributary to Forebay 3 at Basin 1C

Runoff = 2.66 cfs @ 12.09 hrs, Volume= 0.190 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	14,886	39	>75% Grass cover, Good, HSG A
	11,729	98	Paved parking & roofs
*	1,901	98	Roof
*	552	98	Concrete
	29,068	68	Weighted Average
	14,886		Pervious Area
	14,182		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-1D: Tributary to Forebay 1 at Basin 1D

Runoff = 7.07 cfs @ 12.08 hrs, Volume= 0.533 af, Depth= 5.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	6,146	39	>75% Grass cover, Good, HSG A
	39,788	98	Paved parking & roofs
*	1,901	98	Roof
	47,835	90	Weighted Average
	6,146		Pervious Area
	41,689		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2: Tributary to Existing Detention Basin

Runoff = 43.86 cfs @ 12.08 hrs, Volume= 3.359 af, Depth= 6.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	23,419	39	>75% Grass cover, Good, HSG A
	6,652	61	>75% Grass cover, Good, HSG B
*	53,807	98	Pavement
*	139,301	98	Existing Roof
*	6,660	98	Concrete
*	60,155	98	Existing Basin @ Elev=71.7
	289,994	92	Weighted Average
	30,071		Pervious Area
	259,923		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2A: Tributary to IB-3

Runoff = 3.87 cfs @ 12.09 hrs, Volume= 0.276 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	21,460	39	>75% Grass cover, Good, HSG A
*	20,832	98	Pavement
	42,292	68	Weighted Average
	21,460		Pervious Area
	20,832		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2B: Tributary to IB-4

Runoff = 7.21 cfs @ 12.09 hrs, Volume= 0.521 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	14,688	39	>75% Grass cover, Good, HSG A
*	28,482	98	Pavement
*	12,198	98	Existing Roof
	55,368	82	Weighted Average
	14,688		Pervious Area
	40,680		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-2C: Tributary to IB-5

Runoff = 2.01 cfs @ 12.09 hrs, Volume= 0.143 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	9,745	39	>75% Grass cover, Good, HSG A
*	10,940	98	Pavement
	20,685	70	Weighted Average
	9,745		Pervious Area
	10,940		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-PC1: Tributary to Pump Chamber-1

Runoff = 1.80 cfs @ 12.08 hrs, Volume= 0.142 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

	Area (sf)	CN	Description
	508	39	>75% Grass cover, Good, HSG A
	11,064	98	Paved parking & roofs
	11,572	95	Weighted Average
	508		Pervious Area
	11,064		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Subcatchment S-PC2: Tributary to Pump Chamber-2

Runoff = 2.71 cfs @ 12.08 hrs, Volume= 0.223 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.00"

Area (sf)	CN	Description
17,206	98	Paved parking & roofs
17,206		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, TR-55 Minimum**

Summary for Reach SR: Site Runoff to BVW

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.708 ac, 59.90% Impervious, Inflow Depth > 2.58" for 100-yr event
Inflow = 14.20 cfs @ 12.20 hrs, Volume= 4.026 af
Outflow = 14.20 cfs @ 12.20 hrs, Volume= 4.026 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Summary for Pond 1P: Basin 1A

[78] Warning: Submerged Pond PC-1 Primary device # 1 by 13.00'
[80] Warning: Exceeded Pond PC-1 by 12.15' @ 21.07 hrs (0.13 cfs 0.746 af)

Inflow Area = 2.383 ac, 76.76% Impervious, Inflow Depth = 5.16" for 100-yr event
Inflow = 12.34 cfs @ 12.09 hrs, Volume= 1.024 af
Outflow = 8.58 cfs @ 12.17 hrs, Volume= 1.024 af, Atten= 30%, Lag= 4.9 min
Discarded = 1.16 cfs @ 12.17 hrs, Volume= 0.732 af
Primary = 7.41 cfs @ 12.17 hrs, Volume= 0.291 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.83' @ 12.17 hrs Surf.Area= 9,784 sf Storage= 11,679 cf

Plug-Flow detention time= 121.8 min calculated for 1.023 af (100% of inflow)
Center-of-Mass det. time= 121.5 min (935.7 - 814.2)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	13,352 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)
76.00	3,695	480.0	0	0	3,695
77.00	5,259	533.0	4,454	4,454	7,997
77.10	8,153	686.0	665	5,119	22,839
78.00	10,178	777.0	8,232	13,352	33,454

Device	Routing	Invert	Outlet Devices
#1	Primary	77.40'	**10.0' long x 11.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64
#2	Discarded	76.01'	**8.270 in/hr Exfiltration over Surface area above invert**
			Excluded Surface area = 3,709 sf

Discarded OutFlow Max=1.16 cfs @ 12.17 hrs HW=77.83' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 1.16 cfs)

Primary OutFlow Max=7.41 cfs @ 12.17 hrs HW=77.83' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 7.41 cfs @ 1.71 fps)

Summary for Pond 2P: Basin 1C

[78] Warning: Submerged Pond PC-2 Primary device # 1 by 12.49'
[80] Warning: Exceeded Pond PC-2 by 12.19' @ 15.09 hrs (0.45 cfs 2.589 af)

Inflow Area = 2.160 ac, 77.65% Impervious, Inflow Depth = 5.24" for 100-yr event
Inflow = 10.17 cfs @ 12.09 hrs, Volume= 0.943 af
Outflow = 5.59 cfs @ 12.22 hrs, Volume= 0.941 af, Atten= 45%, Lag= 8.0 min
Discarded = 1.00 cfs @ 12.22 hrs, Volume= 0.635 af
Primary = 4.59 cfs @ 12.22 hrs, Volume= 0.306 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.32' @ 12.22 hrs Surf.Area= 14,130 sf Storage= 13,952 cf

Plug-Flow detention time= 278.2 min calculated for 0.941 af (100% of inflow)
Center-of-Mass det. time= 276.8 min (1,067.0 - 790.2)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	24,188 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)
76.00	8,916	527.0	0	0	8,916
77.00	10,567	568.0	9,730	9,730	12,530
77.10	13,589	835.0	1,205	10,934	42,340
78.00	15,893	892.0	13,253	24,188	50,212

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	**10.0' long x 11.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64
#2	Discarded	76.01'	**8.270 in/hr Exfiltration over Horizontal area above invert**
			Excluded Horizontal area = 8,932 sf

Discarded OutFlow Max=1.00 cfs @ 12.22 hrs HW=77.32' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 1.00 cfs)

Primary OutFlow Max=4.59 cfs @ 12.22 hrs HW=77.32' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 4.59 cfs @ 1.45 fps)

Summary for Pond EDB: Existing Detention Basin

Inflow Area = 9.374 ac, 81.40% Impervious, Inflow Depth = 4.82" for 100-yr event
Inflow = 48.78 cfs @ 12.09 hrs, Volume= 3.766 af
Outflow = 3.20 cfs @ 13.65 hrs, Volume= 3.150 af, Atten= 93%, Lag= 93.4 min
Primary = 3.20 cfs @ 13.65 hrs, Volume= 3.150 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 73.33' @ 13.65 hrs Surf.Area= 70,322 sf Storage= 107,668 cf

Plug-Flow detention time= 638.5 min calculated for 3.150 af (84% of inflow)
Center-of-Mass det. time= 572.9 min (1,348.6 - 775.6)

Volume	Invert	Avail.Storage	Storage Description
#1	71.70'	155,808 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)
71.70	60,155	952.0	0	0	60,155
72.00	63,529	1,023.0	18,550	18,550	71,318
73.00	68,606	1,069.0	66,051	84,602	79,047
74.00	73,838	1,080.0	71,206	155,808	81,213

Device	Routing	Invert	Outlet Devices
#1	Primary	72.01'	**12.0" x 3.0' long Culvert** RCP, square edge headwall, Ke= 0.500 Outlet Invert= 72.00' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Primary	73.30'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.20 cfs @ 13.65 hrs HW=73.33' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 2.92 cfs @ 3.72 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.29 cfs @ 0.45 fps)

Summary for Pond IB-3: Infiltration Basin 3

Inflow Area = 0.971 ac, 49.26% Impervious, Inflow Depth = 3.41" for 100-yr event
Inflow = 3.87 cfs @ 12.09 hrs, Volume= 0.276 af
Outflow = 0.35 cfs @ 13.21 hrs, Volume= 0.275 af, Atten= 91%, Lag= 67.1 min
Discarded = 0.35 cfs @ 13.21 hrs, Volume= 0.275 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 77.85' @ 13.21 hrs Surf.Area= 7,842 sf Storage= 5,873 cf

Plug-Flow detention time= 272.9 min calculated for 0.274 af (99% of inflow)
Center-of-Mass det. time= 270.1 min (1,105.4 - 835.3)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	18,565 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)
77.00	5,983	726.0	0	0	5,983
78.00	8,190	745.0	7,058	7,058	8,326
78.10	10,337	917.0	924	7,982	31,074
79.00	13,240	1,028.0	10,583	18,565	48,277

Device	Routing	Invert	Outlet Devices
#1	Primary	73.90'	**12.0" x 35.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.55' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#2	Device 1	78.50'	**24.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	77.01'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 6,003 sf

Discarded OutFlow Max=0.35 cfs @ 13.21 hrs HW=77.85' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.35 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=77.00' TW=71.70' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 6.10 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IB-4: Infiltration Basin 4

Inflow Area = 1.271 ac, 73.47% Impervious, Inflow Depth = 4.92" for 100-yr event
Inflow = 7.21 cfs @ 12.09 hrs, Volume= 0.521 af
Outflow = 5.88 cfs @ 12.14 hrs, Volume= 0.520 af, Atten= 19%, Lag= 3.4 min
Discarded = 0.15 cfs @ 12.14 hrs, Volume= 0.112 af
Primary = 5.73 cfs @ 12.14 hrs, Volume= 0.407 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.23' @ 12.14 hrs Surf.Area= 5,589 sf Storage= 3,755 cf

Plug-Flow detention time= 95.4 min calculated for 0.520 af (100% of inflow)
Center-of-Mass det. time= 94.3 min (897.3 - 803.0)

Volume	Invert	Avail.Storage	Storage Description
#1	76.50'	8,482 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)
76.50	4,795	399.0	0	0	4,795
77.00	5,295	352.0	2,521	2,521	7,610
78.00	6,652	427.0	5,961	8,482	12,276

Device	Routing	Invert	Outlet Devices
#1	Discarded	76.51'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 4,805 sf
#2	Primary	73.50'	**12.0" x 35.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 73.22' S= 0.0080 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	76.80'	**24.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Discarded OutFlow Max=0.15 cfs @ 12.14 hrs HW=77.23' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=5.72 cfs @ 12.14 hrs HW=77.23' TW=72.86' (Dynamic Tailwater)
└**2=Culvert** (Passes 5.72 cfs of 6.78 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 5.72 cfs @ 2.14 fps)

Summary for Pond IB-5: Infiltration Basin 5

Inflow Area = 0.475 ac, 52.89% Impervious, Inflow Depth = 3.62" for 100-yr event
Inflow = 2.01 cfs @ 12.09 hrs, Volume= 0.143 af
Outflow = 0.28 cfs @ 12.68 hrs, Volume= 0.143 af, Atten= 86%, Lag= 35.2 min
Discarded = 0.28 cfs @ 12.68 hrs, Volume= 0.143 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 78.28' @ 12.68 hrs Surf.Area= 1,913 sf Storage= 2,614 cf

Plug-Flow detention time= 132.9 min calculated for 0.143 af (100% of inflow)
Center-of-Mass det. time= 132.5 min (963.4 - 830.9)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	4,136 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)
76.00	448	89.0	0	0	448
77.00	769	114.0	601	601	864
77.10	1,343	151.0	104	706	1,645
78.00	1,773	167.0	1,398	2,103	2,074
79.00	2,304	186.0	2,033	4,136	2,636

Device	Routing	Invert	Outlet Devices
#1	Discarded	76.01'	**8.270 in/hr Exfiltration over Surface area above invert** Excluded Surface area = 451 sf
#2	Primary	74.74'	**12.0" x 32.0' long Culvert** RCP, sq.cut end projecting, Ke= 0.500 Outlet Invert= 74.42' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections
#3	Device 2	78.50'	**12.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.600

Discarded OutFlow Max=0.28 cfs @ 12.68 hrs HW=78.28' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=76.00' TW=71.70' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 3.22 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PC-1: Pump Chamber 1

Inflow Area = 0.266 ac, 95.61% Impervious, Inflow Depth = 6.41" for 100-yr event
Inflow = 1.80 cfs @ 12.08 hrs, Volume= 0.142 af
Outflow = 0.13 cfs @ 11.33 hrs, Volume= 0.140 af, Atten= 93%, Lag= 0.0 min
Primary = 0.13 cfs @ 11.33 hrs, Volume= 0.140 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.58' @ 13.14 hrs Surf.Area= 4,357 sf Storage= 2,420 cf

Plug-Flow detention time= 146.5 min calculated for 0.140 af (99% of inflow)
Center-of-Mass det. time= 138.8 min (898.8 - 760.0)

Volume	Invert	Avail.Storage	Storage Description
#1	64.33'	1,392 cf	**9.00'W x 16.00'L x 9.67'H Prismatoid**
#2	74.00'	75 cf	**4.00'D x 3.00'H Vertical Cone/Cylinder** x 2
#3	77.00'	4,022 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		5,490 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.00	100	100.0	0	0	100
78.00	10,920	807.0	4,022	4,022	51,131

Device	Routing	Invert	Outlet Devices
#1	Primary	64.83'	**Special & User-Defined** Head (feet) 0.00 0.10 9.17 Disch. (cfs) 0.000 0.134 0.134

Primary OutFlow Max=0.13 cfs @ 11.33 hrs HW=65.02' TW=76.96' (Dynamic Tailwater)
└**1=Special & User-Defined** (Custom Controls 0.13 cfs)

Summary for Pond PC-2: Pump Chamber 2

Inflow Area = 0.395 ac,100.00% Impervious, Inflow Depth = 6.76" for 100-yr event
Inflow = 2.71 cfs @ 12.08 hrs, Volume= 0.223 af
Outflow = 0.45 cfs @ 11.70 hrs, Volume= 0.221 af, Atten= 84%, Lag= 0.0 min
Primary = 0.45 cfs @ 11.70 hrs, Volume= 0.221 af

Routing by Dyn-Stor-Ind method w/Net Flows, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 77.61' @ 12.55 hrs Surf.Area= 4,749 sf Storage= 2,525 cf

Plug-Flow detention time= 38.7 min calculated for 0.221 af (99% of inflow)

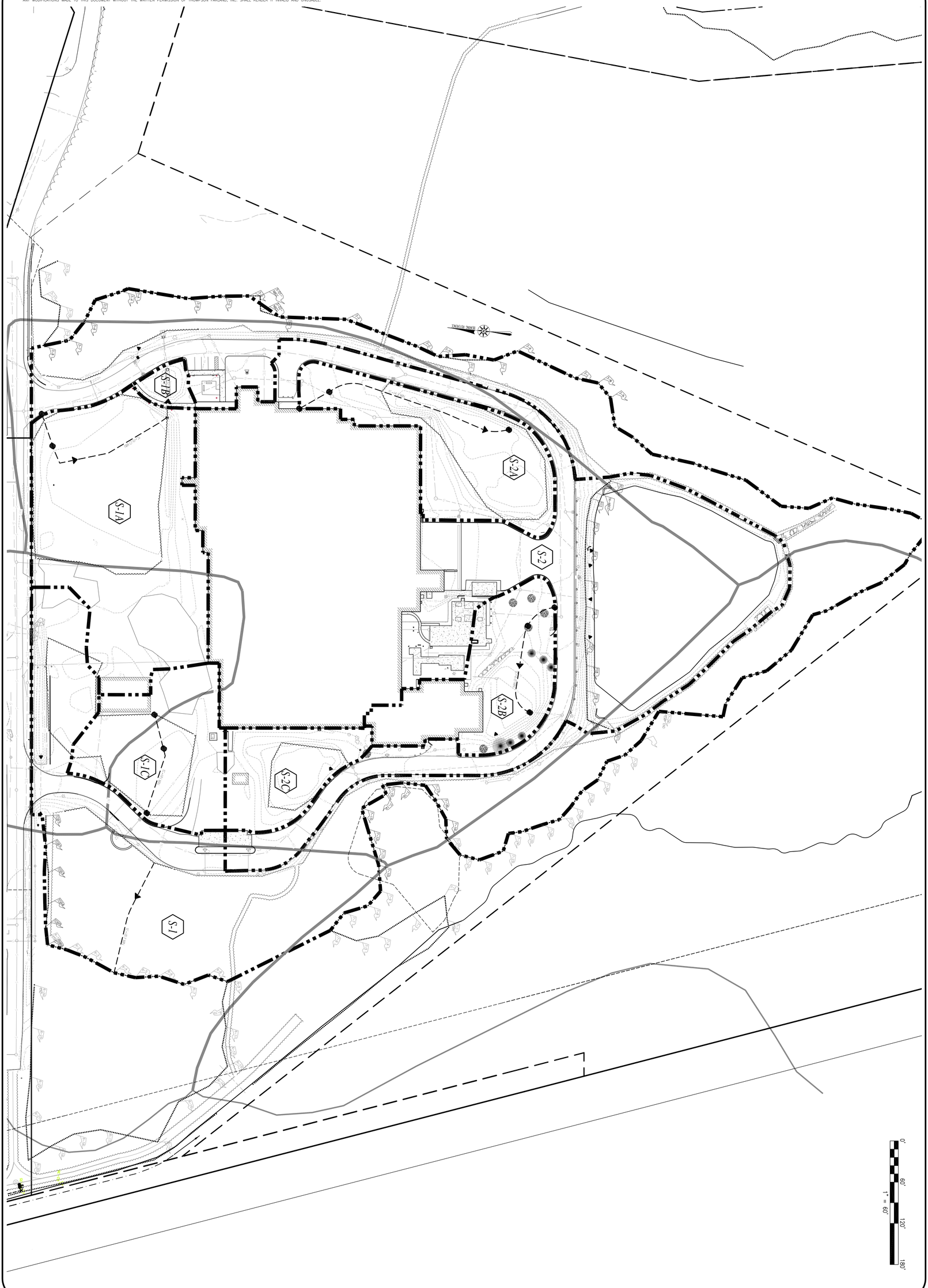
Center-of-Mass det. time= 33.6 min (776.6 - 743.0)

Volume	Invert	Avail.Storage	Storage Description
#1	64.33'	1,392 cf	**9.00'W x 16.00'L x 9.67'H Prismatoid**
#2	74.00'	38 cf	**4.00'D x 3.00'H Vertical Cone/Cylinder**
#3	77.00'	4,021 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		5,451 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
77.00	100	100.0	0	0	100
78.00	10,919	807.0	4,021	4,021	51,131

Device	Routing	Invert	Outlet Devices
#1	Primary	64.83'	**Special & User-Defined** Head (feet) 0.00 0.10 9.17 Disch. (cfs) 0.000 0.446 0.446

Primary OutFlow Max=0.45 cfs @ 11.70 hrs HW=65.04' TW=76.73' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 0.45 cfs)



SITE PLAN

50 DUCHAINE BLVD

ASSESSORS MAP 134 LOTS 456, 457, 458, & 459
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

PRE-DEVELOPMENT DRAINAGE MAP
SHEET 3a OF 7

DECEMBER 11, 2015
SCALE: 1"=60'
JOB NO. 15-500
LATEST REVISION: FEBRUARY 24, 2016

DRAWN BY: JKM
DESIGNED BY: CAF
CHECKED BY: CAF

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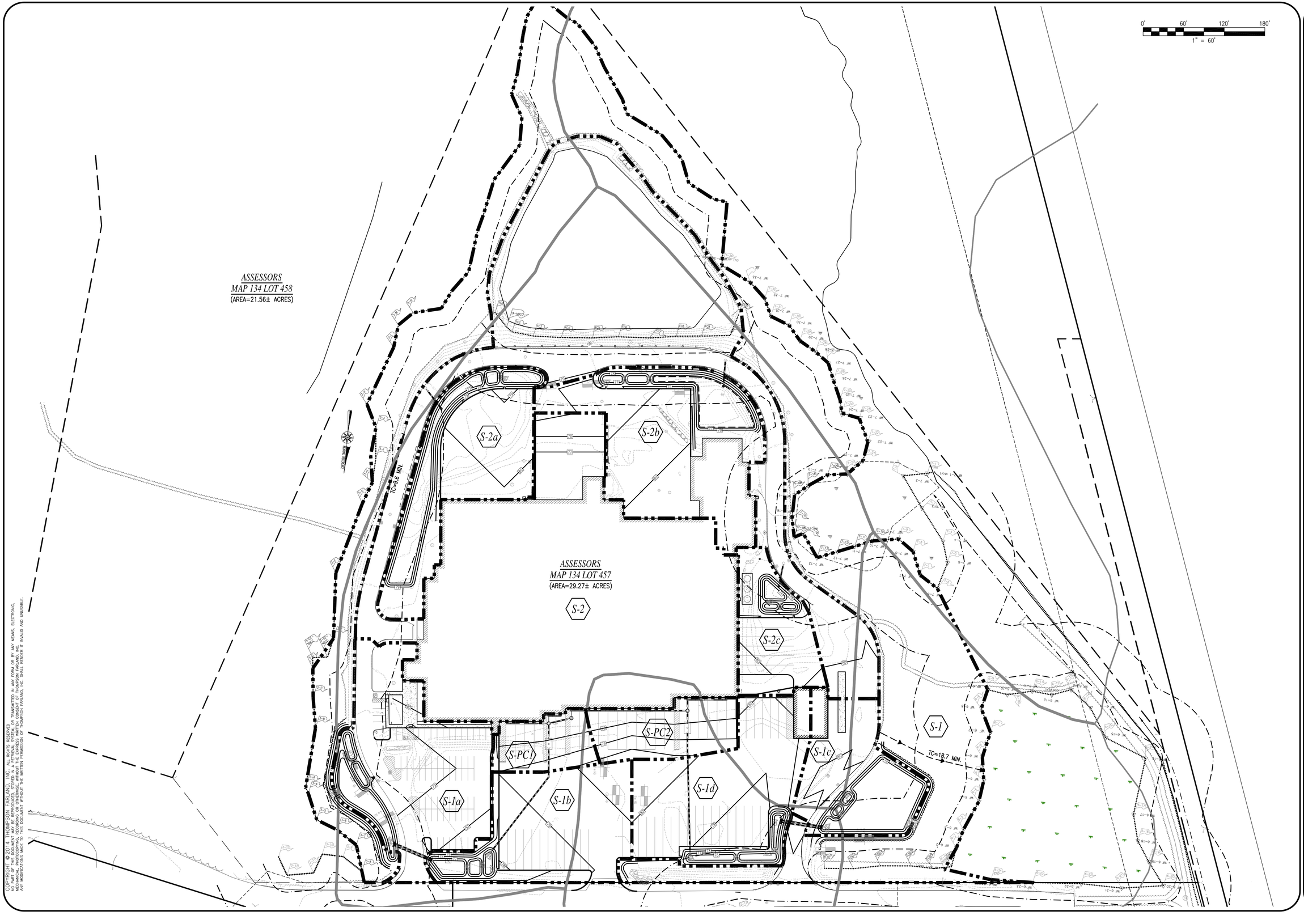
REVISIONS
1 012716 PER REVIEW COMMENTS
2 022416 PER REVIEW COMMENTS



REVISIONS

1	012716	PER REVIEW COMMENTS
2	022416	PER REVIEW COMMENTS

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DRAWN BY: JKM

DESIGNED BY: CAF

CHECKED BY: CAF

SITE PLAN

50 DUCHAINE BLVD

ASSESSORS MAP 134 LOTS 456, 457, 458, & 459
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

DECEMBER 11, 2015

SCALE: 1"=60'

JOB NO. 15-500

LATEST REVISION: FEBRUARY 24, 2016

POST-DEVELOPMENT DRAIANGE MAP

SHEET 5A OF 7

EXHIBIT "G"

GROUNDWATER RECHARGE CALCULATIONS

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RECHARGE CALCULATIONS

REQUIRED:

Recharge Volume Required ("A" Soils) = [Impervious Area x (Recharge Depth/12)]
= [427,957 sf x (0.60"/12)]
= 21,398 cf (Required Volume)

Total Required Recharge Volume = 21,398 cf

STATIC METHOD:

- Assume the entire Required Recharge Volume is discharged to the infiltration device before infiltration begins.

PROVIDED:

Infiltration Basin #1A:

- Cumulative Volume below the lowest outlet (elev=77.40) = 7,662 c.f.

Infiltration Basin #1C:

- Cumulative Volume below the lowest outlet (elev=77.00) = 9,730 c.f.

Infiltration Basin #3:

- Cumulative Volume below the lowest outlet (elev=78.50) = 12,364 c.f.

Infiltration Basin #4:

- Cumulative Volume below the lowest outlet (elev=76.80) = 1,483 c.f.

Infiltration Basin #5:

- Cumulative Volume below the lowest outlet (elev=78.50) = 3,053 c.f.

Total Recharge Volume Provided = 34,292 cf

* It is noted that a significant amount of the total on-site post-development impervious area is existing, and that as a partial redevelopment project, those areas are required to meet Standard #3 to the maximum extent practicable. The proposed site design provides adequate recharge volume for the total post-development impervious area, including existing impervious area.

DRAWDOWN CALCULATIONS

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$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$$

Where:

Rv = Required Storage Volume = (F)(impervious area)

K = Saturated Hydraulic Conductivity For "Static" and "Simple Dynamic" Methods, use Rawls Rate (see Table 2.3.3).

For "Dynamic Field" Method, use 50% of the in-situ saturated hydraulic conductivity.

$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)} = 1.30\ hours$$

Rv = 21,398 C.F.
K = 8.27 inch/hr.
BA = 23,837 S.F.

A	sand	**0.6-inch**
B	loam	**0.35-inch**
C	silty loam	**0.25-inch**
D	clay	**0.1-inch**

Texture Class	NRCS Hydrologic Soil Group (HSG)	Infiltration Rate Inches/Hour
Sand	A	8.27
Loamy Sand	A	2.41
Sandy Loam	B	1.02
Loam	B	0.52
Silt Loam	C	0.27
Sandy Clay Loam	C	0.17
Clay Loam	D	0.09
Silty Clay Loam	D	0.06
Sandy Clay	D	0.05
Silty Clay	D	0.04
Clay	D	0.02

EXHIBIT "I"

WATER QUALITY VOLUME CALCULATIONS

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WATER QUALITY VOLUME CALCULATIONS:

REQUIRED VOLUME:

*Water Quality Volume Required = (1.0"/12) x (Total Impervious Area)
*Water Quality Volume Required = (1.0"/12) x (217,990 sf) = 18,166 cf

PROVIDED:

Infiltration Basin #1A:

- Cumulative Volume below the lowest outlet (elev=77.40) = 7,662 c.f.

Infiltration Basin #1C:

- Cumulative Volume below the lowest outlet (elev=77.00) = 9,730 c.f.

Infiltration Basin #3:

- Cumulative Volume below the lowest outlet (elev=78.50) = 12,364 c.f.

Infiltration Basin #4:

- Cumulative Volume below the lowest outlet (elev=76.80) = 1,483 c.f.

Infiltration Basin #5:

- Cumulative Volume below the lowest outlet (elev=78.50) = 3,053 c.f.

Total Recharge Volume Provided = 34,292 cf

34,292 cf (Provided) >>> 18,166 cf (Required)

*It is noted that a significant amount of the total on-site post-development impervious area (427,957 s.f.) is existing. A portion of the existing on-site impervious area that is proposed to remain, including 151,500 s.f. of roof area and 58,467 s.f. of pavement area, which discharge stormwater runoff directly to the existing basin at the south end of the site (now a wetland resource area), is not proposed to receive any additional water quality treatment. As a partial re-development project, these existing areas are required to meet the structural BMP requirements of Standard #4 to the maximum extent practicable. Given the elevations of the existing drainage system, and the estimated seasonal high groundwater conditions on-site, providing water quality treatment for these existing areas is not practicable. The proposed site design provides adequate water quality volume for the remaining post-development impervious area, including the remainder of the existing impervious area which is to remain (217,990 s.f.).

EXHIBIT "J"

TSS REMOVAL CALCULATIONS

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

Version 1, Automated: Mar. 4, 2008

Location: Infiltration Basin *Same for all Infiltration Basins

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Sediment Forebay #1	0.25	1.00	0.25	0.75
Infiltration Basin	0.80	0.75	0.60	0.15
(w/ forebay #2)	0.00	0.15	0.00	0.15
	0.00	0.15	0.00	0.15
	0.00	0.15	0.00	0.15

Total TSS Removal = 85%

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

Project: Parallel Products
Prepared By: JKM
Date: 12/11/2015

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

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

EXHIBIT "K"

SEDIMENT FOREBAY SIZING CALCULATIONS

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SEDIMENT FOREBAY SIZING CALCULATIONS

CONTRIBUTING AREA TO FOREBAY #1 AT INFILTRATION BASIN #1A

Impervious Area = 41,231 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 41,231 S.F.

= 0.095 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.095 INCHES X 1 FT / 12 IN X 41,231 S.F.

= 325 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 319 S.F.
FOREBAY BERM EL. = 77.00 AREA = 585 S.F.

VOLUME PROVIDED = 452 C.F.

CONTRIBUTING AREA TO FOREBAY #2 AT INFILTRATION BASIN #1A

Impervious Area = 41,231 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 41,231 S.F.

= 0.095 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.095 INCHES X 1 FT / 12 IN X 41,231 S.F.

= 325 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 298 S.F.
FOREBAY BERM EL. = 77.00 AREA = 525 S.F.

VOLUME PROVIDED = 412 C.F.

CONTRIBUTING AREA TO FOREBAY #3 AT INFILTRATION BASIN #1A

Impervious Area = 38,463 S.F.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 38,463 S.F.

= 0.088 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.088 INCHES X 1 FT / 12 IN X 38,463 S.F.

= 283 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 276 S.F.
FOREBAY BERM EL. = 77.00 AREA = 552 S.F.

VOLUME PROVIDED = 414 C.F.

CONTRIBUTING AREA TO FOREBAY #4 AT INFILTRATION BASIN #1A

Impervious Area = 38,463 S.F.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 38,463 S.F.

= 0.088 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.088 INCHES X 1 FT / 12 IN X 38,463 S.F.

= 283 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 281 S.F.
FOREBAY BERM EL. = 77.00 AREA = 562 S.F.

VOLUME PROVIDED = 422 C.F.

CONTRIBUTING AREA TO FOREBAY #1 AT INFILTRATION BASIN #1C

Impervious Area = 58,895 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 58,895 S.F.

= 0.135 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.135 INCHES X 1 FT / 12 IN X 58,895 S.F.

= 664 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 527 S.F.
FOREBAY BERM EL. = 77.00 AREA = 995 S.F.

VOLUME PROVIDED = 761 C.F.

CONTRIBUTING AREA TO FOREBAY #2 AT INFILTRATION BASIN #1C

Impervious Area = 58,895 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 58,895 S.F.

= 0.135 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.135 INCHES X 1 FT / 12 IN X 58,895 S.F.

= 664 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 501 S.F.
FOREBAY BERM EL. = 77.00 AREA = 896 S.F.

VOLUME PROVIDED = 699 C.F.

CONTRIBUTING AREA TO FOREBAY #3 AT INFILTRATION BASIN #1C

Impervious Area = 14,182 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 14,182 S.F.

= 0.033 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.033 INCHES X 1 FT / 12 IN X 14,182 S.F.

= 38 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 772 S.F.
FOREBAY BERM EL. = 77.00 AREA = 1,084 S.F.

VOLUME PROVIDED = 928 C.F.

CONTRIBUTING AREA TO FOREBAY #4 AT INFILTRATION BASIN #1C

Impervious Area = 14,182 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 14,182 S.F.

= 0.033 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.033 INCHES X 1 FT / 12 IN X 14,182 S.F.

= 38 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 772 S.F.
FOREBAY BERM EL. = 77.00 AREA = 1,084 S.F.

VOLUME PROVIDED = 928 C.F.

CONTRIBUTING AREA TO FOREBAY #1 AT INFILTRATION BASIN #3

Impervious Area = 20,832 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 20,832 S.F.

= 0.048 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.048 INCHES X 1 FT / 12 IN X 20,832 S.F.

= 83 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 77.00 AREA = 835 S.F.
FOREBAY BERM EL. = 78.00 AREA = 1,264 S.F.

VOLUME PROVIDED = 1,050 C.F.

CONTRIBUTING AREA TO FOREBAY #2 AT INFILTRATION BASIN #3

Impervious Area = 20,832 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 20,832 S.F.

= 0.048 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.048 INCHES X 1 FT / 12 IN X 20,832 S.F.

= 83 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 77.00 AREA = 247 S.F.
FOREBAY BERM EL. = 78.00 AREA = 452 S.F.

VOLUME PROVIDED = 350 C.F.

CONTRIBUTING AREA TO FOREBAY #1 AT INFILTRATION BASIN #4

Impervious Area = 28,482 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x 1 ACRE / 43,560 S.F. X 28,482 S.F.

= 0.065 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.065 INCHES X 1 FT / 12 IN X 28,482 S.F.

= 155 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 77.00 AREA = 275 S.F.
FOREBAY BERM EL. = 78.00 AREA = 517 S.F.

VOLUME PROVIDED = 396 C.F.

CONTRIBUTING AREA TO FOREBAY #2 AT INFILTRATION BASIN #4

Impervious Area = 28,482 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x $\frac{\text{1 ACRE}}{\text{43,560 S.F.}}$ X 28,482 S.F.

= 0.065 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.065 INCHES X $\frac{\text{1 FT}}{\text{12 IN}}$ X 28,482 S.F.

= 155 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 77.00 AREA = 282 S.F.
FOREBAY BERM EL. = 78.00 AREA = 529 S.F.

VOLUME PROVIDED = 406 C.F.

CONTRIBUTING AREA TO FOREBAY #1 AT INFILTRATION BASIN #5

Impervious Area = 10,940 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x $\frac{\text{1 ACRE}}{\text{43,560 S.F.}}$ X 10,940 S.F.

= 0.025 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.025 INCHES X $\frac{\text{1 FT}}{\text{12 IN}}$ X 10,940 S.F.

= 23 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 106 S.F.
FOREBAY BERM EL. = 77.00 AREA = 268 S.F.

VOLUME PROVIDED = 187 C.F.

CONTRIBUTING AREA TO FOREBAY #2 AT INFILTRATION BASIN #5

Impervious Area = 10,940 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

= 0.1 "/ACRE x $\frac{\text{1 ACRE}}{\text{43,560 S.F.}}$ X 10,940 S.F.

= 0.025 INCHES OF RUNOFF

TOTAL VOLUME PRODUCED = 0.025 INCHES X $\frac{\text{1 FT}}{\text{12 IN}}$ X 10,940 S.F.

= 23 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 76.00 AREA = 106 S.F.
FOREBAY BERM EL. = 77.00 AREA = 268 S.F.

VOLUME PROVIDED = 187 C.F.

EXHIBIT "L"

LONG TERM OPERATION & MAINTENANCE PLAN

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A THOMPSON FARLAND COMPANY

Cullinan Engineering
A THOMPSON FARLAND COMPANY

Long Term Operation and Maintenance Plan

Proposed "Site Plan"
50 Duchaine Boulevard
New Bedford, MA

February 24, 2016

Owner:

Multilayer Coating Tech.
1 Cranberry Hill
750 Marrett Road, Suite 401
Lexington, MA 02421

Prepared For:

Parallel Products of New England
401 Industry Road
Louisville, KY 40208

Prepared By:

John Marchand, P.E.
Thompson Farland, Inc.
Project No. 15-500

Street Sweeping

The parking lot will be inspected and maintained by the owner.

It shall be the responsibility of the owner to:

Inspections:

Inspect sediment deposit accumulations on the parking lots quarterly.

Maintenance:

Sweep parking lots at least annually.

Dispose of the accumulated sediment and hydrocarbons in accordance with local, state, and federal guidelines and regulations.

Stone/ Rip Rap Areas

The owner of the rip rap areas shall be the owner.

The rip rap areas are to be inspected and maintained by the owner.

It shall be the responsibility of the owner to:

Inspections:

Inspect the rip rapped areas quarterly.

Maintenance:

Remove accumulated sediment, trash, leaves and debris at least annually. Check for signs of erosion and repair as need. Replace any damaged areas with new rip rap of the same size.

Dispose of the accumulated sediment and hydrocarbons in accordance with local, state, and federal guidelines and regulations.

Infiltration Basin

The owner of the basins shall be the owner.

The basins are to be inspected and maintained by the owner.

It shall be the responsibility of the owner to:

Inspections:

Inspect to basins quarterly and after major storms (>3.2" of rain in 24 hours)

Inspect fore-bay quarterly.

Inspect basins for settlement, subsidence, erosion, cracking or tree growth on the embankment, condition of stone; sediment accumulation around the outlet or within the basin; and erosion within the basin and banks.

Inspect outlet structures and/ or outlet pipes for evidence of clogging, sediment deposits or signs of erosion around the structure/ pipe.

Ensure that the basins are operating as designed. If inspection shows that a basin fails to fully drain within 72 hours following a storm event, then the responsible party shall retain a Registered Professional Civil Engineer licensed in the state of Massachusetts to assess the reason for infiltration/ detention failure and recommend corrective action for restoring the intended functions. For a wet pond, fully drained means that the ponding level in the basin is at or below the lowest elevation of the outlet structure. For an infiltration basin, fully drained means that there is no ponding occurring in the infiltration basin.

Inspect emergency spillways for signs of erosion.

Maintenance:

When mowing the basin and forebay, mow the buffer area, side slopes, and basin bottom. Remove grass clippings and accumulated debris. Mow three times per year in May, July and September.

Remove accumulated trash, leaves, debris in basin and forebay every month between April and November of each year. Inspect areas in February of each year, if possible, to determine whether the aforementioned services are required.

If the infiltration basin is ponding in areas or not infiltrating as designed, use deep tilling to break up clogged surfaces, and re-vegetate immediately.

Replace stone in forebay and at all pipe ends once every five (5) years or when sediment depth is excessive.

Do not store snow in basin area.

Remove sediment from the basin and forebay as necessary and at least once every 5 years but wait until the floor of the basin is thoroughly dry. After removing sediment, replace any vegetation damaged during clean-out by either re-seeding or re-sodding.

Dispose of the accumulated sediment and hydrocarbons in accordance with local, state, and federal guidelines and regulations.

Drain Lines

After construction, the drain lines shall be inspected after every major storm for the first few months to ensure proper functions. Presence of accumulated sand and silt would indicate more frequent maintenance of the pre-treatment devices is required. Thereafter, the drain lines shall be inspected at least once per year. Accumulated silt shall be removed by a vactor truck or other method preferred.

EXHIBIT "M"

LONG TERM POLLUTION PREVENTION PLAN

www.ThompsonFarland.com

(Main Office) 398 County Street, **New Bedford**, MA 02740 · P.508.717.3479 · F.508.717.3481
54 Longmeadow Road, **Taunton**, MA 02780 · P.508.822.9870
2 Canal Park, 5th Floor, **Cambridge**, MA 02141 · P.617.679.1601
241 Boston Post Road, West, 1st Floor, **Marlborough**, MA 01752 · P.508.832.5811

THOMPSONFARLAND
PROFESSIONAL ENGINEERS // LAND SURVEYORS

Hayward-Boynton & Williams
A THOMPSON FARLAND COMPANY

Cullinan Engineering
A THOMPSON FARLAND COMPANY

Long Term Pollution Prevention Plan

Site Plan
50 Duchaine Boulevard
New Bedford, MA 02740

February 24, 2016

Owner:

Multilayer Coating Technologies, LLC
1 Cranberry Hill
750 Marrett Road, Suite 401
Lexington, MA 02421

Prepared For:

Parallel Products
401 Industry Road
Louisville, KY 40208

Prepared By:

Christian A. Farland, P.E.
Thompson Farland, Inc.
Project No. 15-500

Long Term Pollution Prevention Plan

This Long Term Pollution Prevention Plan serves to outline good housekeeping practices in order to prevent pollution of the wetland resource areas and surrounding environment. The Long Term Operation & Maintenance Plan shall be taken as part of this document as it is a critical part of this plan and shall be adhered to. Proper operation and maintenance records shall be kept on file at all times.

Snow disposal shall be carried out by the owner. The owner should follow DEP guideline #BRPG 01-01 for all snow removal requirements.

The following areas shall be avoided for snow disposal:

- Avoid dumping the snow in the bordering vegetated wetlands.
- Avoid dumping of snow on top of storm drain catch basins or in stormwater drainage swales or ditches. Snow combined with sand and debris may block a storm 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.

In order to prevent or minimize the potential for a spill of hazardous substances or oils to contaminate stormwater, a spill control and containment kit, including spill berm, absorbent materials, rags, gloves, and trash containers, shall be readily available. All product manufacturers recommended spill cleanup methods shall be known by maintenance personnel, who shall be trained regarding these procedures and the location of the cleanup procedure information and supplies. In the event of oil, gasoline or other hazardous waste spill on-site, the City of New Bedford Fire Department, DEP and the Conservation Agent shall be notified immediately. For spills of less than ¼ gallon, clean-up with absorbent materials or other appropriate means, unless circumstances dictate that the spill should be treated by a professional emergency response contractor. Spills which exceed the reportable quantities of substances mentioned in 40 CFR 110, 40 CFR 117, or 40 CFG 302 must be immediately reported to the EPA National Response Center (800) 242-8802. Any catch basin that may be affected by the spill shall be covered immediately with a spill protector drain cover or similar product, or a spill berm placed around the perimeter of the opening to prevent any contamination into the drainage system. Proper cleanup and disposal of hazardous wastes must follow all applicable local and state regulations and must be carried out by a qualified contractor.

The maintenance of all individual lawns, gardens and landscaped areas shall be performed by the owner. The site is not located within or near an Area of Critical Environmental Concern. However, good housekeeping practices should include proper storage and minimal use of cleaning products and fertilizers.

ILLICIT DISCHARGE STATEMENT

February 24, 2016

New Bedford Conservation Commission
John Radcliffe, Chairman
City Hall, Room 304
133 William Street
New Bedford, MA 02740

RE: Site Plan, 50 Duchaine Boulevard
Illicit Discharge Compliance Statement (IDCS)

Dear Mr. Radcliffe,

As required, we are submitting this Illicit Discharge Compliance Statement verifying that no illicit discharges exist on the site or are proposed. We have included in the pollution prevention plan measures to prevent illicit discharges to the stormwater management system, including wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

The site plan identifies the location of any systems for conveying wastewater and/or groundwater on the site and show that there are no connections between the stormwater and wastewater management systems and the location of any measures taken to prevent the entry of illicit discharges into the stormwater management system.

Please feel free to contact us if you should need any further information.

Very Truly Yours,

THOMPSON FARLAND, INC.

Christian A. Farland

Christian A. Farland , P.E., LEED AP
Principal Engineer and President

cc: Client
File

PIPE CAPACITY CALCULATIONS

www.ThompsonFarland.com

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PIPE CAPACITY CALCULATIONS

100 YEAR STORM EVENT

Pipe Description				Draiange Area (Acres)			Comp. C-Value	CA	Time of Concentration (min)			I (in./hr)	Qc=CIA (cfs)
Length #	DA #	From	To	Total	Imperv. C=0.90	Pervious C=0.30			Inlet	Drain	Total		
DRAINAGE PIPES													
1		BASIN-3	DMH-2										0.00
2		DMH-1	DMH-2	0.305	0.261	0.044	0.81	0.248	10	0.37	10.37	6	1.49
3		DMH-2	DMH-3	0.305	0.261	0.044	0.81	0.248	10	0.61	10.61	6	1.49
4		CB-1	DMH-3	0.364	0.334	0.030	0.85	0.310	10	0.01	10.01	6	1.86
5		DMH-3	E-BASIN	0.669	0.595	0.074	0.83	0.558	10	0.20	10.20	6	3.35
6		CB-2	DMH-4	0.397	0.322	0.075	0.79	0.312	10	0.01	10.01	6	1.87
7		CB-3	DMH-4	0.177	0.164	0.013	0.86	0.152	10	0.01	10.01	6	0.91
8		BASIN-5	DMH-4										0.00
9		DMH-4	DMH-5	0.574	0.486	0.088	0.81	0.464	10	0.00	10.00	6	2.78
10		DMH-5	DMH-6	0.574	0.486	0.088	0.81	0.464	10	0.42	10.42	6	2.78
11		BASIN-4	DMH-6										5.73
12		DMH-6	E-BASIN	0.574	0.486	0.088	0.81	0.464	10	0.32	10.32	6	8.51

Length #	Pipe Diameter (in)	Pipe Material (n-value)	Slope (ft./ft.)	Length (ft)	Full Flow			Current Flow				Pipe capacity
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Flow Depth in pipe (in)	Flow capacity check
DRAINAGE PIPES												
4												
5	12	0.013	0.0044	72	3.01	2.36	3.26	1.49	0.63	0.6	6.8	**OK!**
6	12	0.013	0.0016	79	1.81	1.43	2.14	1.49	1.04	0.9	10.2	**OK!**
7	12	0.013	0.1170	7	15.52	12.19	11.59	1.86	0.15	0.3	3.2	**OK!**
8	12	0.013	0.0103	64	4.60	3.62	5.35	3.35	0.93	0.7	8.8	**OK!**
9	12	0.013	0.0900	7	13.61	10.69	10.58	1.87	0.18	0.3	3.4	**OK!**
10	12	0.013	0.1340	5	16.61	13.04	9.61	0.91	0.07	0.2	2.1	**OK!**
11												
12	12	0.013	0.0029	218	2.44	1.92	-40626.11	2.78	1.45	3.5	42.6	**FLOW TOO HIGH**
13	12	0.013	0.0057	103	3.42	2.69	4.05	2.78	1.03	0.8	10.1	**OK!**
14	18	0.013	0.0085	120	5.48	9.68	6.31	8.51	0.88	0.7	12.6	**OK!**

SITE PLAN

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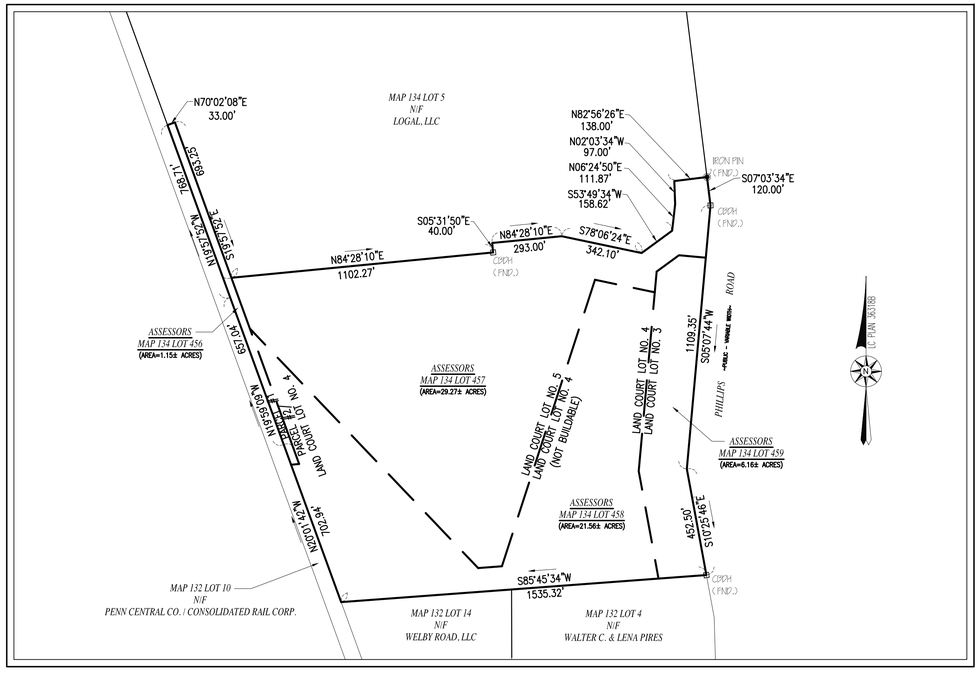
SITE PLAN

50 DUCHAINE BOULEVARD

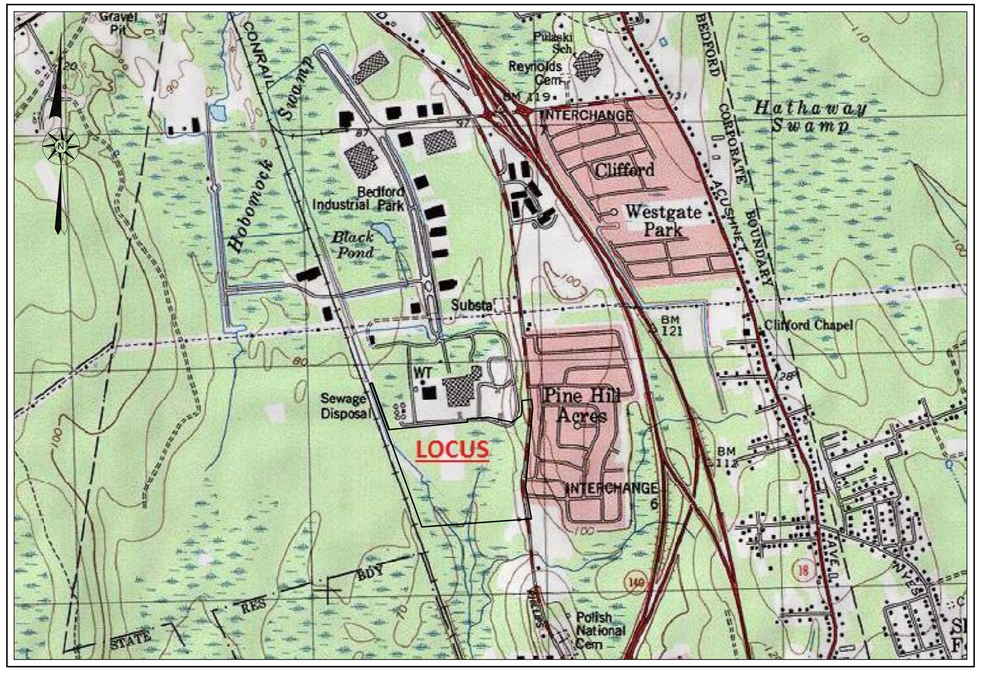
ASSESSORS MAP #134 LOTS #456, 457, 458, & 459

NEW BEDFORD, MASSACHUSETTS



— OVERALL SITE MAP —

SCALE: 1"=300'



— AREA MAP —

SCALE: 1"=1,000'±

— ZONING DATA —

DISTRICT: INDUSTRIAL C

DESCRIPTION	REQUIRED	EXISTING	PROVIDED
LOT AREA	0 S.F.	98.14 AC	58.14 AC
LOT FRONTAGE	0 FT	1681.85 FT	1681.85 FT
FRONT SETBACK	25 FT	756 FT	756 FT
SIDE SETBACK	25 FT	219 FT	219 FT
REAR SETBACK	25 FT	522 FT	522 FT
BUILDING HEIGHT (MAXIMUM)	100 FT	<100 FT	<100 FT
BUILDING COVERAGE (MAXIMUM)	50 %	6.0 %	6.0 %
LOT COVERAGE (MAXIMUM)	80 %	10.3 %	16.9 %

— PARKING REQUIREMENT —

PRINCIPAL USE: LIQUID WASTE DISPOSAL & RECYCLING

(FOR PARKING REGULATION PURPOSES: BUSINESS ENGAGED IN WAREHOUSING & DISTRIBUTION)

REQUIREMENT	REQURIED	PROVIDED
1 SPACE PER 1,500 S.F. OF G.F.A. UP TO 15,000 S.F. THEREAFTER, ON ADDITIONAL SPACE FOR EACH 5,000 S.F. OR PORTION THEREOF IN EXCESS OF 15,000 S.F., PLUS ONE SPACE FOR EACH VEHICLE UTILIZED IN THE BUSINESS.	41 SPACES	71 SPACES
WHEN 51–75 TOTAL PARKING SPACES ARE PROVIDED, 3 MUST BE ACCESSIBLE SPACES. ONE IN EVERY EIGHT ACCESSIBLE SPACES, BUT NOT LESS THAN ONE, SHALL BE VAN ACCESSIBLE	3 ACCESSIBLE, 1 VAN ACCESSIBLE	3 ACCESSIBLE, 2 VAN ACCESSIBLE

— INDEX —

RECORD OWNER:
ASSESSORS MAP 134
LOTS 456, 457, 458, & 459
MULITLAYER COATING TECH.
1 CRANBERRY HILL
750 MARRETT RD., SUITE 401
LEXINGTON, MA 02421
LEGAL REF: 22029

REVISIONS

1	012716	PER REVIEW COMMENTS
2	022416	PER REVIEW COMMENTS

CHRISTIAN ALBERT FARLAND No. 47544 CIVIL REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

THOMPSONFARLAND
PROFESSIONAL ENGINEERS // LAND SURVEYORS
www.ThompsonFarland.com
(MAIN OFFICE) 398 COUNTY STREET, NEW BEDFORD, MA 02740 P.508.717.3479
NEW BEDFORD | TAUNTON | CAMBRIDGE | MARLBOROUGH

DRAWN BY: JKM

DESIGNED BY: CAF

CHECKED BY: CAF

SITE PLAN
50 DUCHAINE BLVD
ASSESSORS MAP 134 LOTS 456, 457, 458, & 459
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

DECEMBER 11, 2015

SCALE: AS NOTED

JOB NO. 15–500

LATEST REVISION: FEBRUARY 24, 2016

COVER SHEET

GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY, AND "DIG SAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATION OF UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.
2. PROPERTY LINE INFORMATION TAKEN FROM:
   - PLAN ENTITLED: "PLAN OF LAND IN NEW BEDFORD, MASS., SURVEYED FOR POLAROID CORPORATION", DATED JUNE 10, 1969 BY TIBBETS ENGINEERING CORP. (PLAN BOOK 81, PAGE 78), AND
   - LAND COURT PLAN 36318C, ENTITLED "SUBDIVISION PLAN OF LAND IN NEW BEDFORD", BY CULLINAN ENGINEERING CO., INC., SURVEYORS, DATED JANUARY 6, 2009 (LAND COURT CERTIFICATE OF TITLE NO. 22029).
3. TOPOGRAPHIC SURVEY PERFORMED BY THOMPSON FARLAND, INC. IN SEPTEMBER 2015.
4. WETLAND DELINEATION BY FARLAND CORP. IN JANUARY 2016.
5. VERTICAL ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 AND HORIZONTAL LOCATIONS REFER TO THE NORTH AMERICAN DATUM (NAD) OF 1983.
6. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL STANDARDS AND REGULATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCH MARKS NECESSARY FOR THE WORK.
8. WHERE PROPOSED PAVEMENT AND WALKS ARE TO MEET EXISTING, THE CONTRACTOR SHALL SAWCUT A NEAT LINE AND MATCH GRADE. SEAL ALL JOINTS WITH HOT BITUMINOUS ASPHALT JOINT SEALER.
9. CURBING TO BE AS INDICATED ON THE PLANS.
10. ALL EXISTING TREES, SHRUBS AND GROUND COVER WHERE NATURAL GRADE IS TO BE RETAINED SHALL BE KEPT IN THEIR EXISTING STATE UNLESS REMOVAL IS REQUIRED FOR CONSTRUCTION PURPOSES.
11. ALL AREAS DISTURBED BY CONSTRUCTION AND NOT TO BE PAVED OR OTHERWISE TREATED AS NOTED ON PLAN SHALL BE TREATED WITH 4" OF LOAM, SEEDED AND HAY MULCHED FOR EROSION CONTROL.
12. SITE IMPROVEMENTS SHALL CONFORM TO A.D.A. SPECIFICATIONS.
13. LIGHTING SHALL BE DIRECTED ON SITE AND AWAY FROM TRAFFIC INTERFERENCE.
14. TEST PITS AND/OR BORINGS WERE TAKEN FOR THE PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY. THEY DO NOT NECESSARILY SHOW THE NATURE OF ALL MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
15. THE CONTRACTOR SHALL PROTECT AND/OR CAP OFF ALL EXISTING ON-SITE UTILITY SERVICES ACCORDING TO THE LOCAL AUTHORITY'S SPECIFICATIONS. SERVICES SHALL BE CAPPED OFF WHERE SAME ENTER THE PERIMETER OF THE PROPERTY LINE.
16. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
17. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
18. THESE PLANS ARE PERMITTING PLANS AND SHALL NOT TO BE USED FOR CONSTRUCTION. A FINAL SET OF STAMPED PLANS FOR CONSTRUCTION WILL BE ISSUED AFTER RECEIVING FINAL APPROVAL FROM THE LOCAL AND/OR STATE DEPARTMENTS.
19. ANY MINOR MODIFICATIONS (AS DETERMINIED BY THE CITY ENGINEER) TO THE INFORMATION SHOWN ON THE APPROVED SITE PLANS SHALL BE SUBMITTED TO THE CITY ENGINEER AS A MINOR PLAN REVISION FOR APPROVAL PRIOR TO WORK BEING PERFORMED.
20. ANY WORK AND MATERIAL WITHIN THE CITY RIGHT-OF-WAY SHALL CONFORM TO THE CITY OF NEW BEDFORD REQUIREMENTS.
21. ALL HANDICAP PARKING, RAMPS, AND ACCESS SHALL CONFORM TO AAB & MAAB REQUIREMENTS.
22. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO CONSTRUCTION. EROSION CONTROL SHALL CONFORM TO CITY OF NEW BEDFORD CONSERVATION COMMISSION REQUIREMENTS AS STATED IN THE ORDER OF CONDITIONS.
23. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO MUTCD REQUIREMENTS.
24. THE CONTRACTOR SHALL OBTAIN A STREET DISTURBANCE & OBSTRUCTION PERMIT PRIOR TO ANY CONSTRUCTION WITHIN THE RIGHT OF WAY.
25. ALL WATER AND SEWER MATERIAL AND CONSTRUCTION SHALL CONFORM TO THE CITY OF NEW BEDFORD REQUIREMENTS.
26. ALL WATER AND SEWER CONSTRUCTION SHALL BE INSPECTED BY THE CITY OF NEW BEDFORD BEFORE BEING BACKFILLED.
27. THE CITY SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO THE REQUIRED INSPECTIONS.

CONSTRUCTION SEQUENCING NOTES

1. CONSTRUCT TEMPORARY AND PERMANENT EROSION CONTROL FACILITIES. EROSION CONTROL FACILITIES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING.
2. TREE PROTECTION FENCE SHALL BE INSTALLED AND APPROVED BY THE OWNER REPRESENTATIVE PRIOR TO ANY EARTH MOVING.
3. ALL PERMANENT DITCHES AND SWALES ARE TO BE STABILIZED WITH VEGETATION OR RIP RAP PRIOR TO DIRECTING RUNOFF TO THEM.
4. CLEAR CUT, DEMOLISH AND DISPOSE OF EXISTING SITE ELEMENTS NOT TO REMAIN.
5. STORMWATER SHALL NOT BE DIRECTED TOWARDS THE INFILTRATION BASINS UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.
6. GRADE AND GRAVEL ALL PAVED AREAS. ALL PROPOSED PAVED AREAS SHALL BE STABILIZED IMMEDIATELY AFTER GRADING.
7. BEGIN ALL PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED IMMEDIATELY AFTER THEIR CONSTRUCTION.
8. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND MULCH AND SEED AS REQUIRED.
9. FINISH PAVING ALL HARD SURFACE AREAS.
10. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
11. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
12. REMOVE TEMPORARY EROSION CONTROL MEASURES.
13. THE CONSTRUCTION SEQUENCE SHALL BE CONFINED TO THE LIMIT OF WORK AS SHOWN ON THE DRAWINGS.
14. UPON COMPLETION OF CONSTRUCTION THE OWNER SHALL AGREE TO MAINTAIN AND CLEAN ALL DRAINAGE STRUCTURES AS REQUIRED.

SITE PREPARATION NOTES

1. WITHIN THE LIMIT OF WORK LINE AS NOTED ON THE SITE PLANS, REMOVE AND DISCARD ALL CONCRETE PAVEMENT, BITUMINOUS CONCRETE PAVEMENT, BRICK PAVEMENT, TOP SOIL, MULCH, TRASH, DEAD TREES AND STUMPS, SHRUBBERY, CHAIN LINK FENCE POSTS, RAILS, FABRIC, GATES, FOOTINGS AND ALL APPURTENANCES, BOLLARDS, POSTS, CONCRETE FOOTINGS AND FOUNDATIONS, WALLS AND CURBS UNLESS OTHERWISE NOTED.
2. THE OWNER'S REPRESENTATIVE SHALL BE CONSULTED AND WILL REVIEW THE WORK ON SITE WITH THE CONTRACTOR BEFORE ANY WORK SHALL COMMENCE.
3. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITIONS TO THE OWNER'S REPRESENTATIVE PRIOR TO STARTING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS TO REMAIN THAT ARE DUE TO CONTRACTOR OPERATIONS.
5. ALL ITEMS TO BE REMOVED THAT ARE NOT STOCKPILED FOR LATER REUSE ON THE PROJECT OR DELIVERED TO THE OWNER SHALL BE LEGALLY DISPOSED OF OFF SITE BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS EFFORTS OF THE DEMOLITION WITH ALL TRADES.
7. THE CONTRACTOR SHALL COORDINATE ALL ADJUSTMENT OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
8. THE CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADES AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS LIGHT POLES, SIGN POLES, MANHOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, HYDRANTS, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED OR DIRECTED BY THE OWNER'S REPRESENTATIVE.

UTILITY AND GRADING NOTES

1. ALL ON-SITE STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE PIPE (HDPE) OR RCP, UNLESS NOTED OTHERWISE.
2. HDPE PIPE SHALL CONFORM WITH AASHTO DESIGNATIONS M294 AND M252, SHALL BE MANUFACTURED WITH HIGH DENSITY POLYETHYLENE PLASTIC AND SHALL BE ADS N-12 PIPE AS MANUFACTURED BY ADVANCE DRAINAGE SYSTEM, INC. OR HANCOR HI Q PIPE AS MANUFACTURED BY HANCOR, INC. OR APPROVED EQUAL UNLESS OTHERWISE NOTED OR DETAILED.
3. BEFORE THE DEVELOPMENT SITE IS GRADED, THE AREA OF THE DRAINAGE BASINS SHOULD BE FENCED OFF TO PREVENT HEAVY EQUIPMENT FROM COMPACTING THE UNDERLYING SOIL.
4. WHERE PROPOSED GRADES MEET EXISTING GRADES, CONTRACTOR SHALL BLEND GRADES TO PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW WORK. PONDING AT TRANSITION AREAS WILL NOT BE ALLOWED.
5. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS AND STRUCTURES.
6. MAXIMUM SLOPE IN DISTURBED AREAS SHALL NOT EXCEED 3:1 , UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL VERIFY EXISTING GRADES AND NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.
8. CONTRACTOR SHALL ADJUST UTILITY ELEMENT MEANT TO BE FLUSH WITH GRADE THAT IS AFFECTED BY SITE WORK OR GRADE CHANGES, WHETHER SPECIFICALLY NOTED ON PLANS OR NOT.
9. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
10. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ALL GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
11. THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY AND APPROVED BY THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE AND ELECTRICAL). FINAL DESIGN AND LOCATIONS AT THE BUILDING WILL BE PROVIDED BY THE ARCHITECT. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE UTILITY CONNECTIONS WITH THE RESPECTIVE COMPANIES PRIOR TO ANY UTILITY CONSTRUCTION.

LAYOUT AND MATERIAL NOTES

1. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
2. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
3. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND ALL DETAILS CONTIGUOUS TO THE BUILDING INCLUDING SIDEWALKS, RAMPS, UTILITY ENTRANCE LOCATIONS, WALL PACKS, CONCRETE DOOR PADS, ROOF DRAINS, ETC.
4. ACCESSIBLE CURB RAMPS SHALL BE PER THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD AND THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES, WHICHER IS MORE STRINGENT.
5. THE FOLLOWING LAYOUT CRITERIA SHALL CONTROL UNLESS OTHERWISE NOTED ON THE PLAN:
   ALL DIMENSIONS ARE TO OUTSIDE FACE OF BUILDING.
   ALL DIMENSIONS ARE TO FACE OF CURB AT GUTTER LINE.
   ALL DIMENSIONS ARE TO CENTER OF PAVEMENT MARKINGS.
   ALL TIES TO PROPERTY LINES ARE PERPENDICULAR TO THE PROPERTY LINE UNLESS OTHERWISE NOTED.

SOIL EROSION AND SEDIMENT CONTROL NOTES

1. THE CONSERVATION COMMISSION SHALL BE NOTIFIED, AT LEAST 72 HOURS PRIOR TO ANY LAND DISTURBANCE.
2. A COPY OF THE SOIL EROSION AND SEDIMENT CONTROL PLAN MUST BE MAINTAINED ON THE PROJECT SITE DURING CONSTRUCTION.
3. SOIL EROSION AND SEDIMENT CONTROL PRACTICES IN THE PLAN SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
4. ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN PLACE PRIOR TO ANY DEMOLITION GRADING OPERATIONS AND/OR INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES.
5. ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE LEFT IN PLACE UNTIL CONSTRUCTION IS COMPLETED AND/OR THE AREA IS STABILIZED.
6. ALL SOIL EROSION AND SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED AND MAINTAINED ON A REGULAR BASIS AND AFTER EVERY STORM EVENT.
7. THE MAINTENANCE OF SOIL EROSION AND SEDIMENT CONTROL MEASURES AND FACILITIES DURING AND IMMEDIATELY AFTER CONSTRUCTION RESTS WITH THE GENERAL CONTRACTOR. UPON ACCEPTANCE OF THE PROJECT, THE OWNER SHALL BECOME RESPONSIBLE FOR MAINTENANCE OF ANY REMAINING MEASURES AND FACILITIES.
8. OFF SITE SEDIMENT DISTURBANCE MAY REQUIRE ADDITIONAL CONTROL MEASURES TO BE DETERMINED BY THE ENGINEER.
9. THE CONSERVATION COMMISSION AND/OR ENGINEER MAY REQUIRE ADDITIONAL SOIL EROSION MEASURES TO BE INSTALLED, AS DIRECTED BY THE DISTRICT INSPECTOR.
10. ADJOINING PROPERTIES SHALL BE PROTECTED FROM EXCAVATION AND FILLING OPERATIONS AT ALL TIMES.
11. THE CONTRACTOR SHALL UTILIZE ALL METHODS NECESSARY TO PREVENT BLOWING AND MOVEMENT OF DUST FROM THE EXPOSED SOIL SURFACES.
12. PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
13. A CRUSHED STONE TIRE CLEANING PAD WILL BE INSTALLED WHEREVER A CONSTRUCTION ENTRANCE EXISTS. SEE LOCATION DETAIL ON PLAN.
14. ALL CATCH BASIN INLETS SHALL BE PROTECTED DURING CONSTRUCTION AS DETAILED ON THE PLAN, IF APPLICABLE.
15. ALL STORM DRAINAGE OUTLETS SHALL BE PROTECTED AS REQUIRED HEREON BEFORE DISCHARGE POINTS BECOME OPERATIONAL.
16. THE SITE SHALL AT ALL TIMES BE GRADED AND MAINTAINED SUCH THAT ALL STORMWATER RUNOFF IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL FACILITIES.
17. LAND AREAS EXPOSED AT ANY ONE TIME AND THE LENGTH OF EXPOSURE SHALL BE KEPT TO A PRACTICAL MINIMUM. THEY SHALL BE LEFT IN A NEAT AND FINISHED APPEARANCE AND PROTECTED FROM EROSION.
18. ANY DISTURBED AREA THAT WILL BE LEFT EXPOSED FOR MORE THAN SIXTY (60) DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING AND FERTILIZATION. IF THE SEASON PROHIBITS TEMPORARY SEEDING, THE DISTRIBUTED AREAS SHALL BE MULCHED.
19. ALL CRITICAL AREAS SUBJECT TO EROSION SHALL RECEIVE A TEMPORARY SEEDING AND BE MULCHED IN ACCORDANCE WITH THE SPECIFICATIONS IMMEDIATELY FOLLOWING ROUGH GRADING.
20. IMMEDIATELY AFTER COMPLETION OF STRIPPING AND STOCKPILING OF TOPSOIL, SEED THE STOCKPILE WITH ANNUAL RYE GRASS. STABILIZE TOPSOIL STOCKPILES WITH STRAW MULCH FOR PROTECTION IF THE SEASON DOES NOT PERMIT THE APPLICATION AND ESTABLISHMENT OF TEMPORARY SEEDING.
21. SOIL STOCKPILES ARE NOT TO BE LOCATED WITHIN FIFTY (50) FEET OF WETLANDS, THE FLOODPLAIN, SLOPE, ROADWAY OR DRAINAGE FACILITIES. THE BASE OF ALL STOCKPILES SHALL BE PROTECTED BY A HAY BALE BARRIER OR SEDIMENT FENCE. LOCATIONS ARE DELINEATED ON THE PLAN.
22. MAXIMUM SIDE SLOPES OF ALL EXPOSED SURFACES SHALL NOT BE CONSTRUCTED STEEPER THAN 3:1 UNLESS OTHERWISE APPROVED BY THE DISTRICT.
23. ALL AREAS NOT STABILIZED BY CONSTRUCTION, SODDING OR LANDSCAPING SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE SEEDING AND MULCHING SPECIFICATIONS.
24. MULCHING IS REQUIRED ON ALL SEEDED AREAS TO INSURE AGAINST EROSION BEFORE GRASS IS ESTABLISHED TO PROMOTE EARLIER VEGETATIVE COVER.
25. ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTRATION DEVICE. THE SEDIMENT FILTER MUST BE CAPABLE OF FILTERING THE SEDIMENT AND BE PLACED SO AS NOT TO CAUSE EROSION OF THE DOWNSTREAM AREA.

LEGEND

EXISTING		PROPOSED
101	CONTOUR LINE	101
101.1	SPOT GRADE	+101.1
EOP	EDGE OF PAVEMENT	EOP
VGC	VERTICAL GRANITE CURB	VGC
SGC	SLOPED GRANITE CURB	SGC
VCC	VERTICAL CONCRETE CURB	VCC
BCC	BITUMINOUS CONCRETE CURB	BCC
CCB	CAPE COD BERM	CCB
	STONE WALL	
X X	CHAIN LINK FENCE	X X
	IRON FENCE	
	POST & RAIL FENCE	
	STOCKADE FENCE	
	GUARD RAIL	
	HAY BALES	
W W	WATER LINE	W W
	FIRE HYDRANT	
	POST INDICATOR VALVE	
	WATER GATE	
	WATER METER PIT	
	IRRIGATION HAND HOLE	
	WELL	
S S	SEWER LINE	
	SEWER MANHOLE	
G G	GAS LINE	
	GAS METER	
	GAS GATE	
D D	DRAIN LINE	
	DRAIN MANHOLE	
	CATCH BASIN	
OHW OHW	OVERHEAD WIRES	
ETC ETC	ELECTRIC, TELEPHONE & CABLE	
	UTILITY POLE	
	GUY WIRE	

DETAIL NUMBER

1/2 SAMPLE DETAIL

NOT TO SCALE

NUMBER REFERENCES WHAT SHEET THE DETAIL IS ON

REVISIONS

1	012716	PER REVIEW COMMENTS
2	022416	PER REVIEW COMMENTS

COMMONWEALTH OF MASSACHUSETTS
CHRISTIAN ALBERT FARLAND
No. 47544
CIVIL
REGISTERED PROFESSIONAL ENGINEER

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(MAIN OFFICE) 396 COUNTY STREET, NEW BEDFORD, MA 02740 P.508.717.3479
NEW BEDFORD | TAUNTON | CAMBRIDGE | MARLBOROUGH

DRAWN BY: JKM

DESIGNED BY: CAF

CHECKED BY: CAF

SITE PLAN
50 DUCHAINE BLVD
ASSESSORS MAP 134 LOTS 456, 457, 458, & 459
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

DECEMBER 11, 2015

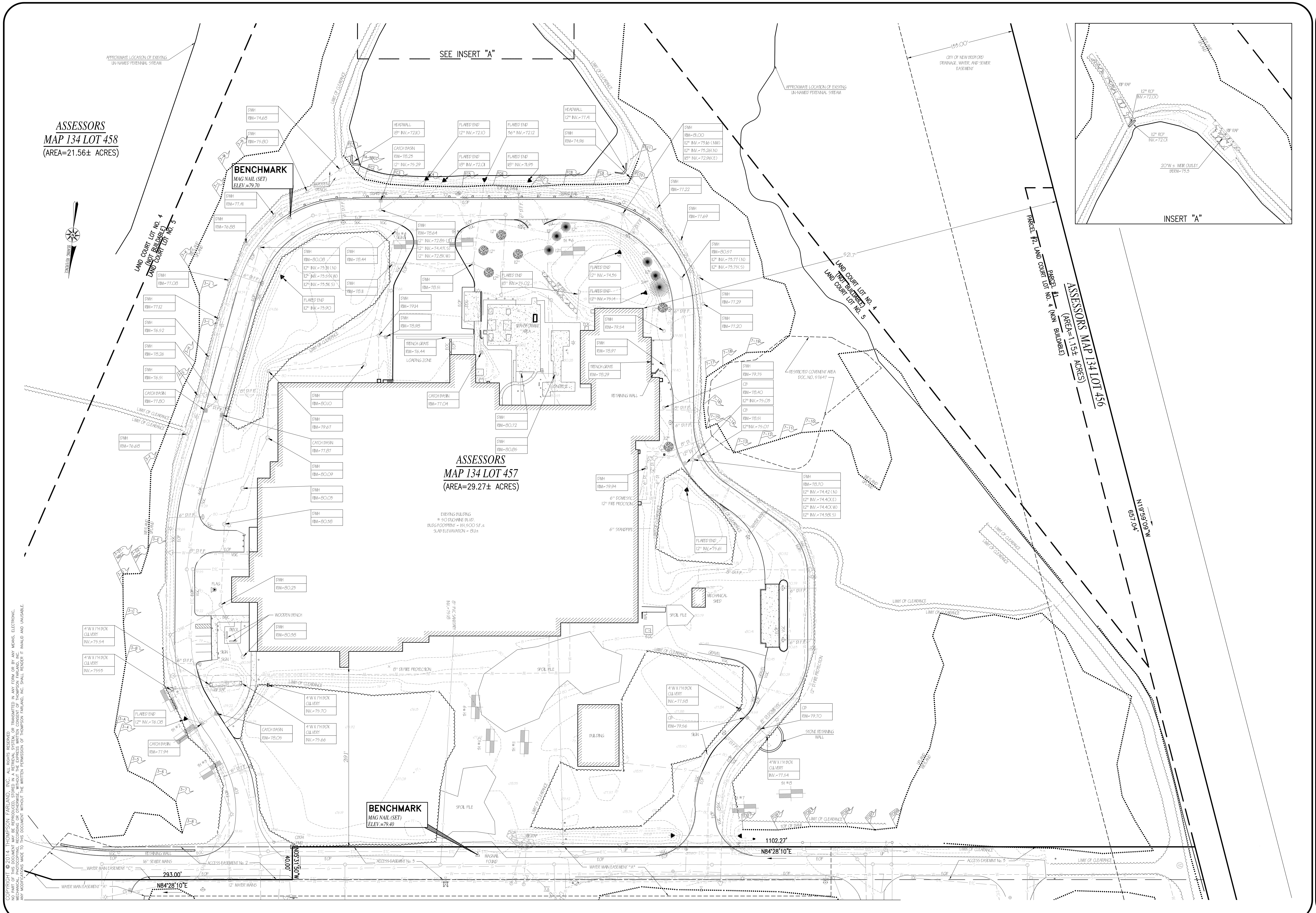
SCALE: N.T.S.

JOB NO. 15-500

LATEST REVISION: FEBRUARY 24, 2016

NOTES & LEGEND

SHEET 2 OF 7



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SCALE: 1" = 50'

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FEBRUARY 24, 2016

EXISTING CONDITIONS

SHEET 3 OF 7

LAND COURT LOT NO. 4
(NOT BUILDABLE)
LAND COURT LOT NO. 5

FOUND REBAR

STORMWATER BASIN

CCB

R=15'

R=15'

CCB

36'

STORMWATER BASIN

RETAINING WALL (BY OTHERS)

IN-BOUND GLASS STORAGE AREA

OUT-BOUND GLASS STORAGE AREA

LAND COURT LOT NO. 4
(NOT BUILDABLE)
LAND COURT LOT NO. 5

RESTRICTED COVENENT AREA
DOC. NO. 97647

WETLAND

WETLAND

WETLAND

WETLAND

ASSESSORS
MAP 134 LOT 457
(AREA=29.27± ACRES)

PROPOSED PARALLEL PRODUCTS FACILITIES

(3) 10' DIA. DISTILLATION COLLUMNS

STORMWATER BASIN

R=15'

VGC

65

PLASTIC / RUBBER RECEIVING AREA

6 PROPOSED TRAILER SPOTS

60

R=10'

CCB

ACCESSIBLE PARKING LAYOUT 9/7

DETECTABLE WARNING 12/7

ACCESSIBLE PARKING SIGN 10/7

ACCESSIBLE PARKING LAYOUT 8/7

ACCESSIBLE PARKING SYMBOL 11/7

5'W CONCRETE WALK 4/6

SIDEWALK PROVIDED

CCB

R=5'

1

16

17

18

24

25

30

NB-8 STEEL BUILDING (RELOCATION)

6 PROPOSED TRAILER SPOTS

PROPOSED VEHICLE SCALE

24'

9'

18'

60'

14'

24 PROPOSED LOADING DOCKS

RETAINING WALL (BY OTHERS)

100'

BITUMINOUS CONCRETE PAVEMENT 3/6

17

30

31

43

71 PROPOSED EMPLOYEE PARKING SPACES

STORMWATER BASIN

24'

44

53

54

63

CCB

CCB

100'

R=10'

R=15'

18 PROPOSED TRAILER SPOTS

59

42

12'

60'

R=5'

R=5'

R=5'

64

71

11 PROPOSED TRAILER SPOTS

31

41

STORMWATER BASIN

CCB

STORMWATER BASIN

R=5'

36'

CAPE COD BERM 2/6

R=30'

R=30'

x79.62

x79.51

1102.27'

N84°28'10"E

EDGE OF PAVEMENT

WETLAND

WETLAND

WETLAND

WETLAND

WETLAND

WETLAND

WATER MAIN EASEMENT "C"

ACCESS EASEMENT No. 2

ACCESS EASEMENT No. 3

WATER MAIN EASEMENT "A"

293.00'

N84°28'10"E

40.00'

N05°31'50"W

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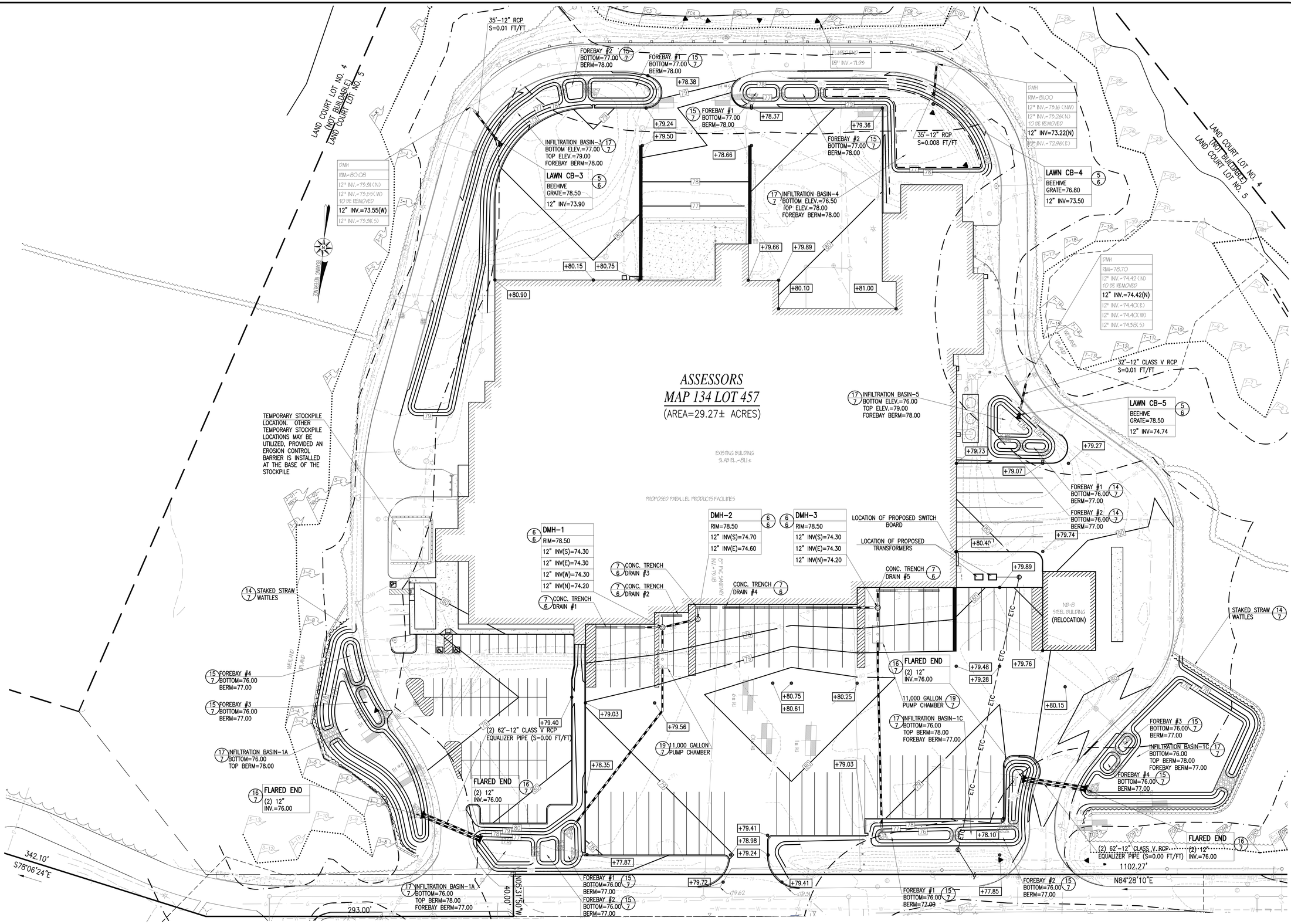
LAYOUT

SHEET 4 OF 7



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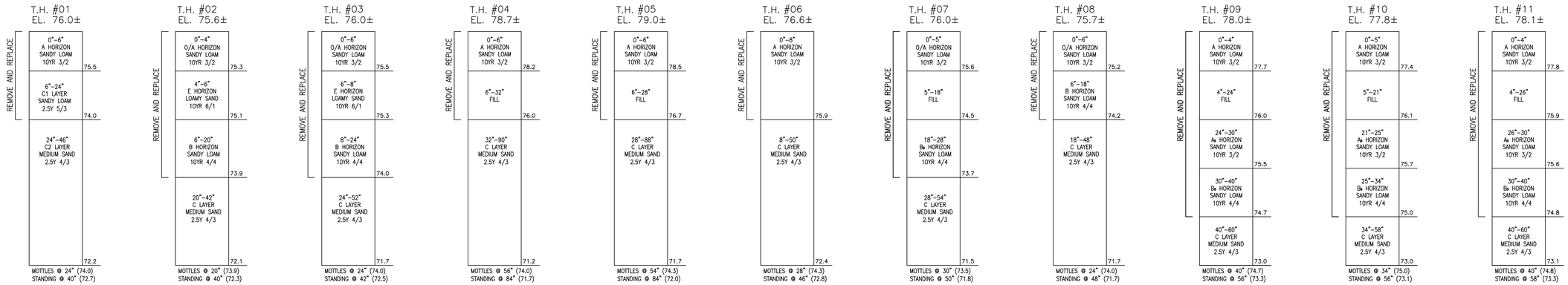
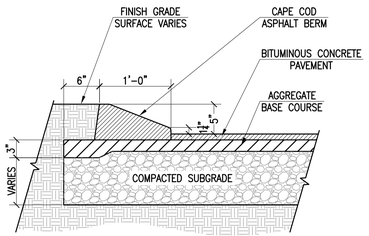
GRADING & UTILITY



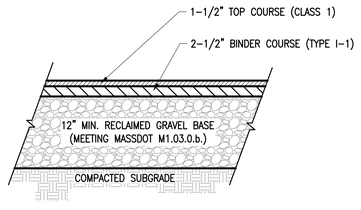
1/6 SOIL PROFILES

NOT TO SCALE



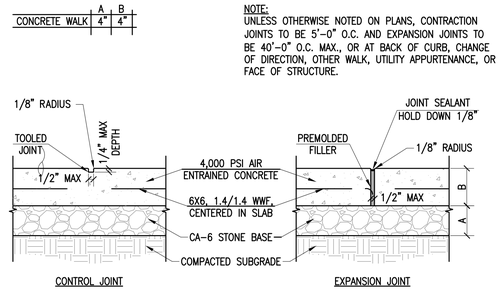
2/6 BITUMINIOUS CONCRETE CAPE COD BERM

NOT TO SCALE



3/6 BITUMINOUS CONCRETE PAVEMENT – RECLAIMED

NOT TO SCALE

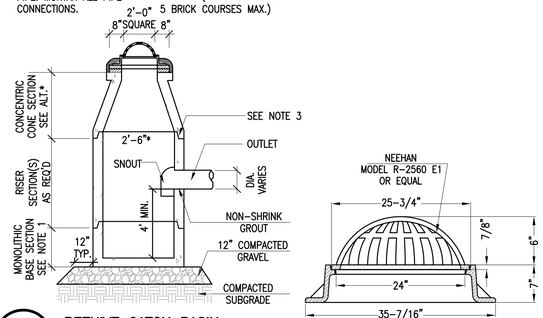


NOTE:
UNLESS OTHERWISE NOTED ON PLANS, CONTRACTION JOINTS TO BE 5'–0" O.C. AND EXPANSION JOINTS TO BE 40'–0" O.C. MAX., OR AT BACK OF CURB, CHANGE OF DIRECTION, OTHER WALK, UTILITY APPURTENANCE, OR FACE OF STRUCTURE.

4/6 CONCRETE PAVEMENT SIDEWALK

NOT TO SCALE

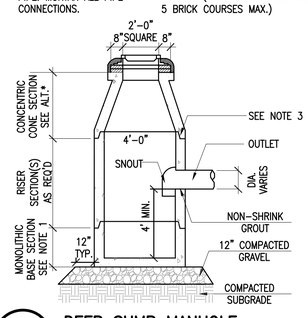
NOTES:
1. ALL SECTIONS SHALL BE DESIGNED FOR HS–20 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR. (2 BRICK COURSES MIN. 5 BRICK COURSES MAX.)
5. FRAME AND GRATE TO BE EQUAL TO NEENAH R–2560 E–1 BEEHIVE STYLE.



5/6 BEEHIVE CATCH BASIN

NOT TO SCALE

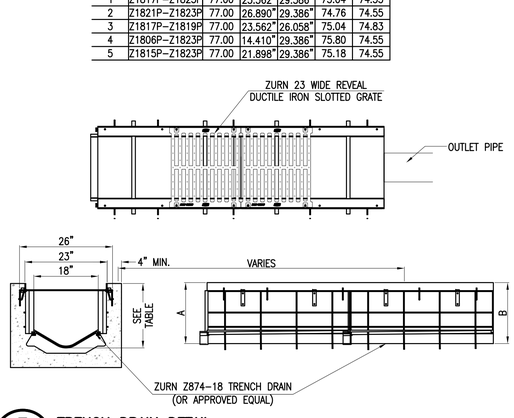
NOTES:
1. ALL SECTIONS SHALL BE DESIGNED FOR HS–20 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. MANHOLE FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR. (2 BRICK COURSES MIN. 5 BRICK COURSES MAX.)



6/6 DEEP SUMP MANHOLE

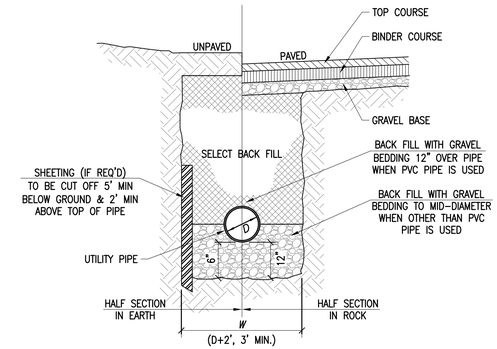
NOT TO SCALE

TRENCH DRAIN	TRENCH NO(S) USED	RIM ELEV.	SHALLOW INV. "A"	DEEP INV. "B"	SHALLOW INV. ELEV.	DEEP INV. ELEV.
1	Z1817P–Z1823P	77.00	23.562"	29.386"	75.04	74.55
2	Z1821P–Z1823P	77.00	26.890"	29.386"	74.76	74.55
3	Z1817P–Z1819P	77.00	23.562"	26.058"	75.04	74.83
4	Z1806P–Z1823P	77.00	14.410"	29.386"	75.80	74.55
5	Z1815P–Z1823P	77.00	21.898"	29.386"	75.18	74.55



7/6 TRENCH DRAIN DETAIL

NOT TO SCALE



8/6 UTILITY TRENCH

NOT TO SCALE

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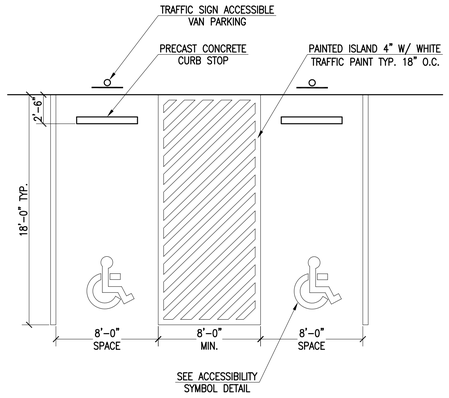
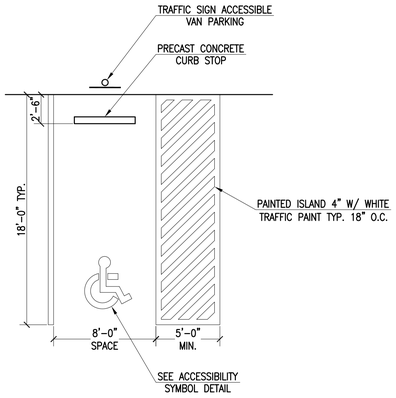
DETAIL

SHEET 6 OF 7



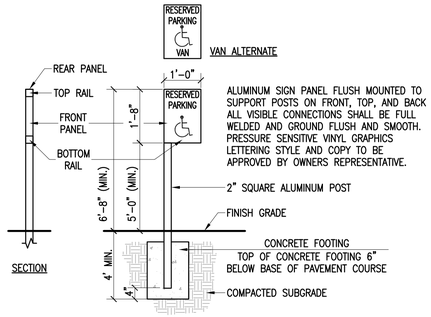
9/7 ACCESSIBLE PARKING LAYOUT

NOT TO SCALE



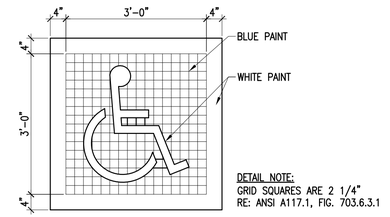
10/7 ACCESSIBLE PARKING LAYOUT

NOT TO SCALE



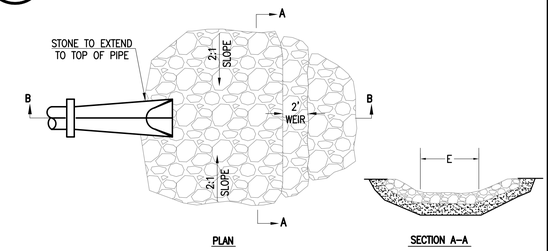
11/7 ACCESSIBLE PARKING SIGN

NOT TO SCALE

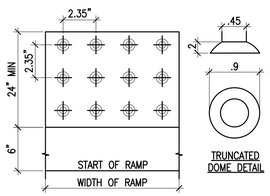


12/7 ACCESSIBLE PARKING SYMBOL

NOT TO SCALE

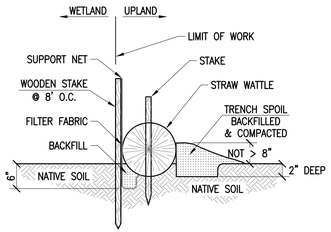


NOTES:
1. COLOR OF TACTILE DETECTABLE WARNINGS SHALL BE YELLOW.
2. CONTRACTOR SHALL INSTALL TILE PER MANUFACTURER'S SPECIFICATIONS
3. PREFERRED PRODUCT SHALL BE REPLACEABLE (WET-SET) COMPOSITE TACTILE BY ADA SOLUTIONS, INC. FOR PRICING QUOTATIONS, PLACING ORDERS, AND FURTHER INFORMATION, CALL JON MEHLMAN, EAST REGIONAL ACCOUNT DIRECTOR FOR ADA SOLUTIONS, INC. AT (800) 372-0519 or (978) 262-9900. DETAILED INFORMATION IS AVAILABLE AT www.ddotile.com.



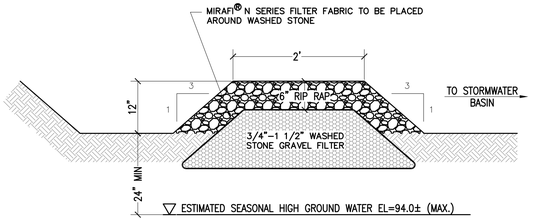
13/7 DETECTABLE WARNING DETAIL

NOT TO SCALE



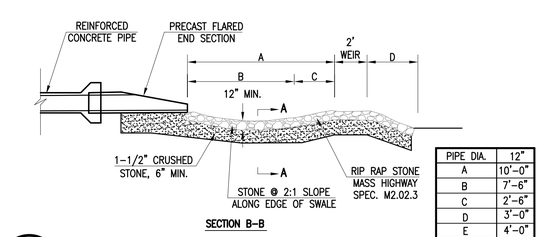
14/7 STAKED STRAW WATTLE WITH SILT FENCE

NOT TO SCALE



15/7 SEDIMENT FOREBAY W/ GRAVEL FILTER

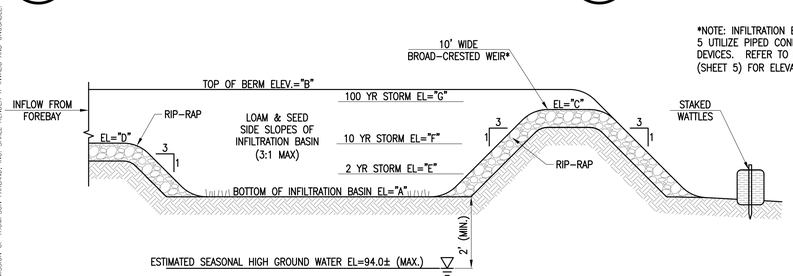
NOT TO SCALE



PIPE DIA.	12"
A	10'-0"
B	7'-6"
C	2'-6"
D	3'-0"
E	4'-0"

16/7 FLARED END OUTLET

NOT TO SCALE

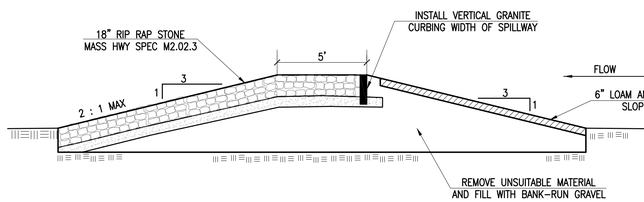


*NOTE: INFILTRATION BASINS 1B, 1D, 3, 4, AND 5 UTILIZE PIPED CONDUIT OUTLET CONTROL DEVICES. REFER TO GRADING & UTILITY PLAN (SHEET 5) FOR ELEVATION DETAILS.

INFILTRATION BASIN	"A"	"B"	"C"	"D"	"E"	"F"	"G"
1A	76.00	78.00	77.00	77.00	77.24	77.58	77.83
1C	76.00	78.00	76.60	77.00	76.96	77.12	77.32
3	77.00	79.00	*	78.00	77.21	77.44	77.85
4	76.50	78.00	*	78.00	76.96	77.09	77.23
5	76.00	79.00	*	78.00	77.01	77.44	78.28

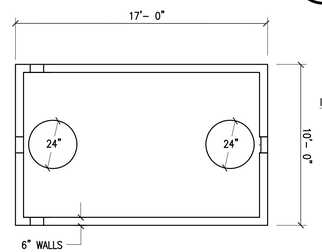
17/7 INFILITRATION BASIN

NOT TO SCALE



18/7 OVERFLOW SPILLWAY DETAIL

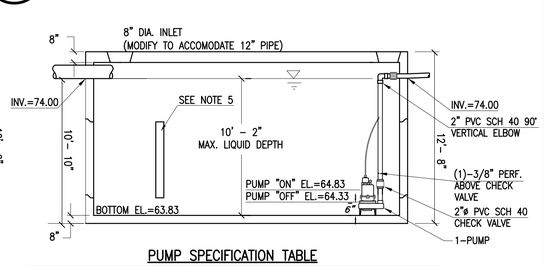
NOT TO SCALE



NOTES:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS
2. ALL REINFORCEMENT PER ASTM C1227
3. DESIGNED FOR H-20 LOADING, COVER 1-5 FEET.
4. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN. INLET HEIGHT MAY INCREASE SLIGHTLY DUE TO BUTYL RESIN USED.
5. SPANNERS USED IN CENTER SECTION FOR TANKS GREATER THAN 7,000 GALLONS.
6. CONSTRUCTION SHALL BE WATERTIGHT.
7. A MIN. 24" DIA. MANHOLE FRAME & COVER TO GRADE OVER THE INLET AND OUTLET SHALL BE PROVIDED.

19/7 11,000 GALLON PUMP CHAMBER

NOT TO SCALE



PUMP SPECIFICATION TABLE

	PUMP CHAMBER #1	PUMP CHAMBER #2
PUMP MODEL:	MYERS PUMPS	MYERS PUMPS
PUMP SERIES:	125M-2 SERIES	200M-5 SERIES
HORSE POWER:	2	5
PUMP RATING: TDH (FT) (115%)	115±	100±
PUMP RATING: GPM	60±	200±
DISCHARGE SIZE (IN):	2	2
MOTOR SPEED (RPM):	3450	3450
PHASE (ø):	1	1
VOLTAGE (V):	115-230	115-230
AVAILABLE VOLTAGE:	TO BE DETERMINED BY A LICENSED CONTRACTOR	TO BE DETERMINED BY A LICENSED CONTRACTOR
HERTZ (Hz):	60	60

REVISIONS

1	012716	PER REVIEW COMMENTS
2	022416	PER REVIEW COMMENTS

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DRAWN BY: JKM
DESIGNED BY: CAF
CHECKED BY: CAF

SITE PLAN
50 DUCHAINE BLVD
ASSESSORS MAP 134 LOTS 456, 457, 458, & 459
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

DECEMBER 11, 2015
SCALE: N.T.S.
JOB NO. 15-500
LATEST REVISION: FEBRUARY 24, 2016

DETAIL