

HANCOCK
ASSOCIATES

Stormwater Report
In Support of

**A Site Plan Approval Application, Special Permit Application
and Notice of Intent Filing**

for
Forest Ridge Drive
(Parcel ID # 7-17)
Rowley, MA

Prepared By:
Hancock Associates
#26696

Prepared For:
Gateway II Trust of 1997
June 2023
Revised August 2023
Revised September 2023

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Introduction

Gateway II Trust of 1997 proposes to construct two new industrial/warehouse buildings on Forest Ridge Drive, Rowley, MA. Associated improvements will include paved vehicular areas, a stormwater management system, and utility services. The project area is currently comprised of undeveloped wooded land. The project area is accessed by Forest Ridge Drive and consists of 9.7± acres and is bounded by undeveloped wooded land owned by the Town of Rowley to the west, south and north and industrial buildings to the east. Elevations on site range from 142 in the northwestern corner of the lot to 67 at the edge of the wetlands, along the southern property line.

The project site is located on the side of a hill with wetlands located at the toe slope. In the existing condition, stormwater runoff runs down the hill side to the wetlands. The proposed stormwater system was designed to mimic the existing drainage pattern.

The proposed stormwater management system will include catch basins with deep sumps and hoods and a hydrodynamic separator which will convey stormwater from the proposed parking areas and buildings to an infiltration basin via a network of pipes. The proposed infiltration basin is located in the southwestern portion of the lot and will reduce peak rates of runoff by promoting infiltration. Overflow from the infiltration basin will drain to the wetlands via overland flow through a level spreader. Stormwater flows from the north of the proposed site improvements will be routed to the wetlands via drainage swales that will bypass the infiltration basin. Level spreaders are proposed to reduce velocity and scouring from the drainage swales.

The proposed stormwater management system was designed to meet the Stormwater Management Standards described in the Massachusetts Stormwater Handbook. The following report describes the system's compliance with these standards.

August 2023 Revision

This report has been revised based on comments from a Peer Review conducted by H.L Graham Associates on July 11, 2023. The changes made are comprised of including swale sizing calculation and hydrodynamic sizing information.

September 2023 Revision

This report has been revised based on comments from a Peer Review conducted by H.L Graham Associates on September 6, 2023. The changes made are comprised of revised pond, structure and culvert information.

Standard 1: No New Untreated Discharges

The Massachusetts Stormwater Handbook states that no new stormwater conveyances may discharge untreated stormwater directly to or cause erosions in wetlands or waters of the Commonwealth. Stormwater from the site will be collected via deep sump catch basins with hoods and a network of pipes. The network of pipes connects to a hydrodynamic separator which provides 95% TSS removal. Flows from the hydrodynamic separator then outlet into an infiltration basin, providing an additional 80% TSS removal. Overflow from the infiltration basin flows to be three level spreaders, discharging to the wetlands located along the southern property line. The level spreaders have been designed to provide energy dissipation and will prevent erosion at the two discharge locations.

Standard 2: Peak Rate Attenuation

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

For the purpose of these calculations the following assumptions were made:

- LiDAR information was used to delineate watershed boundaries.
- The same total watershed area of the drainage areas is used to compare the existing and proposed conditions.
- The Natural Resources Conservation Service (NRCS) Web Soil Survey of Essex County defines soils in the project area as:
 - 307E, Paxton fine sandy loam, 25 to 35 percent slopes, extremely stony, Hydrologic Soil Group C
 - 255A, Windsor loamy sand, 0 to 3 percent slopes, Hydrologic Soil Group A
 - 255B, Windsor loamy sand, 3 to 8 percent slopes, Hydrologic Soil Group A
 - 256A, Deerfield loamy fine sand, 0 to 3 percent slopes, Hydrologic Soil Group A
- On-site soil testing has confirmed Hydrologic Soils Groups. The site has been split into Hydrologic Soil Group A and Hydrologic Soil Group C based on NRCS mapping.

Two drainage areas have been modeled to represent the existing condition:

- Drainage Area EX1A consists of wooded area mapped as Hydrologic Soil Group C soils. Stormwater runoff from EX1A drains via overland flow to the wetlands along the southern property line (Discharge Point DP1).
- Drainage Area EX1B consists of wooded area mapped as Hydrologic Soil Group A soils. Stormwater runoff from EX1B drains via overland flow to the wetlands along the southern property line (Discharge Point DP1).

In the proposed condition a stormwater management system will collect and treat stormwater runoff from the project site. This system will include deep sump hooded catch basins, a hydro dynamic separator and an infiltration basin. Four main drainage areas have been modeled to represent the proposed condition:

- Drainage Area PR1A will consist of wooded areas mapped as C-Soils, located uphill and northwest of the proposed project area. Stormwater flow from PR1A will be conveyed to the Discharge Point DP1 via a proposed rip rap swale, heading in a western direction, to a level spreader.
- Drainage Area PR1B will consist of wooded areas mapped as C-Soils, located uphill and northeast of the proposed project area. Stormwater flow from PR1A will be conveyed to the Discharge Point DP1 via a proposed rip rap swale, heading in an eastern direction, to a level spreader.
- Drainage Area PR1C will consist of wooded areas mapped as A-Soils, located downhill and south of the proposed project area. Stormwater flow from PR1A will be conveyed to the Discharge Point DP1 via overland flow.
- Drainage Area PR1D is split into 12 minor subcatchments. These minor subcatchments are split into contributing areas for each catch basin and the two building's roof areas. Stormwater flow from all points in subcatchment PR1D will be routed to the infiltration basin via a network of pipes. Overflow from the infiltration basin will drain to Discharge Point DP1 via overland flow.

The following table compares the peak rates of runoff under the existing and proposed conditions using the latest Atlas-14 Precipitation Data:

Table 1: Peak Rates of Runoff

Discharge Point	Peak Rate (cfs)							
	2-Year Storm (3.15" Rainfall Depth)		10-Year Storm (4.83" Rainfall Depth)		25-Year Storm (6.16" Rainfall Depth)		100-Year Storm (8.94" Rainfall Depth)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
DP1	6.2	4.6	16.4	13.1	25.6	21.3	47.9	42.4

cfs – Cubic Feet per Second

Standard 3: Recharge

The Massachusetts Stormwater Handbook states that loss of annual recharge to groundwater shall be eliminated or minimized. The annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions based on soil type. Recharge volumes are provided for all of the proposed impervious areas. For the purpose of these calculations, all of the development areas are considered to be Hydrologic Soil Group A. The required recharge volume is 0.60” multiplied by the area of impervious surfaces. Please see the attached Hydrocad summaries for the recharge volumes provided within the infiltration basin (Appendix VI). The volumes are as follows:

Required Recharge Volume, HSG A = Target Depth * Impervious Area = 0.60” * 188,136 SF = 9,407 CF

The recharge volume is provided below the lowest orifice within the infiltration basin. The volume provided is 15,934 cubic feet. Since the volume provided is greater than the required recharge volume, the standard is met.

The Massachusetts Stormwater Handbook states that the recharge volume must drain within 72 hours. Observations in deep hole soil testing performed on-site indicate that the soil that the chamber system will be installed upon is sand. Please see the soil testing logs shown on the Utility Plan in the Permit Site Plan Set. The following "drawdown" calculation assumes a Rawl's Rate of 8.27 inches per hour, corresponding to texture class "Sand".

$$\begin{aligned} \text{Drawdown Time} &= \text{Storage Volume} / (\text{Rawl's Rate} * \text{Bottom Area}) \\ &= 60,759 \text{ CF} / (8.27 \text{ in/hr} * 12,500 \text{ SF}) = 7.1 \text{ Hour} \end{aligned}$$

Since the drawdown time of 7.1 hours is less than 72 hours, the requirement is met.

Standard 4: Water Quality

The Massachusetts Stormwater Handbook states that systems shall be designed to remove 80% of the average annual post-development construction load of Total Suspended Solids (TSS). The treatment BMP's have been sized to provide at least 80% TSS removal and measures will be taken for long-term pollution prevention.

According to the Massachusetts Stormwater Handbook, the proposed infiltration basin is to be sized to treat 1” of stormwater volume over the contributing impervious areas. The water quality volume calculation is as follows:

$$\text{Required Water Quality Volume} = 1'' * \text{Impervious Area} = 1'' * 188,136 \text{ SF} = 15,678 \text{ CF}$$

The water quality volume is provided below the lowest orifice within the infiltration basin. The volume provided is 15,934 cubic feet. Since the volume provided is greater than the required water quality volume, the standard is met.

Stormwater runoff from vehicular paved areas will be treated for at least 80% TSS removal via catch basins with deep sumps, a hydrodynamic separator (Appendix VII) and hoods and an infiltration basin. The treatment train computation is as follows:

Table 2: Treatment Train Calculation

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Catch Basins with Deep Sumps and Hoods	0.25	1	0.25	0.75
Hydrodynamic Separator	0.50	0.75	0.38	0.38
Infiltration Basin	0.80	0.38	0.30	0.08
Total TSS Remaining				0.08

Standard 5: Land Uses with Higher Potential Pollutant Loads

The proposed project is not a Land Use with Higher Potential Pollutant Load (LUHPPL).

Standard 6: Critical Area

The proposed project discharges to wetlands which are a tributary to Mill Brook, which is considered a Critical Area. The infiltration basin has been sized to treat 1” of stormwater volume over the contributing impervious areas as described under Standard 4. All stormwater that drains to the BMP’s will be treated for at least 80% TSS removal prior to discharge.

Standard 7: Redevelopment

The proposed project is not a redevelopment.

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

Best management practices (BMP) for erosion and sedimentation control are staked, silt fences, compost wood fiber sock, hydro seeding, and phased development. Many stormwater BMP technologies (e.g., infiltration technologies) are not designed to handle the high concentrations of sediments typically

found in construction runoff and must be protected from construction-related sediment loadings. Construction BMP's must be maintained. In developing the proposed project certain measures will be implemented to minimize impacts erosion and sedimentation could have on surrounding areas. This section addresses items that involve proper construction techniques, close surveillance of workmanship, and immediate response to emergency situations. The developer must be prepared to provide whatever reasonable measures are necessary to protect the environment during construction and to stabilize all disturbed areas as soon as construction ends. Construction period pollution prevention and erosion and sediment control shall meet the requirements for the 2022 EPA Construction General Permit for all projects requiring coverage under the CGP.

Pre-Construction

1. The contractor shall have a stockpile of materials required to control erosion on-site to be used to supplement or repair erosion control devices. These materials shall include, but are not limited to compost wood fiber sock, silt fence, compost wood fiber sock and crushed stone.
2. The contractor is responsible for erosion control on site and shall utilize erosion control measures where needed, regardless of whether the measures are specified on the plan or in the order of conditions.

Preliminary Site Work

1. Excavated materials should be stockpiled, separating the topsoil for future use on the site. Erosion control shall be utilized along the down slope side of the piles and side slopes shall not exceed 2:1.
2. If intense rainfall is anticipated, the installation of supplemental straw bale dikes, silt fences, or armored dikes shall be considered.
3. Unsuitable excavated material shall be removed from the site.
4. Construction entrance shall be installed.
5. Existing catch basins shall be protected with silt sacks.

Ongoing Site Work

1. Erosion control measures shall be regularly inspected and replaced as needed.
2. Dewatering shall be done in a manner so as not to transmit silt, sand or particulate matter to the receiving water or existing drainage system.

Landscaping

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

Forest Ridge Drive – Construction Phase Maintenance

Operations and Maintenance Log
Inspections for Year: _____

Structural Best Management Practice (Frequency)	Action	Date Completed	Completed By	Comments
Compost Wood Fiber Sock and Silt Fence Inspect weekly and after major storm event.	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
Proposed Catch Basin Silt Sock Inspect weekly and after major storm event.	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
Vegetated Areas Inspect weekly and after major storm event.	Inspect			
	Inspect			
Construction Entrance Inspect weekly and after major storm event.	Inspect/Clean			
	Inspect/Clean			
Soil Stock Pile Area Inspect weekly and after major storm event.	Inspect			
	Inspect			

- (1) Refer to the Massachusetts Stormwater Management, Volume Two: Stormwater Technical Handbook (March 1997) for recommendations regarding frequency for inspection and maintenance of specific BMP's.
- (2) Inspections to be conducted by qualified professional such as an environmental scientist or civil engineer.

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended.

Other notes: (Included deviations from: Con Comm. Order of Conditions, PB Approval, Construction Sequence and Approved Plan).

Stormwater Control Manager: _____

Standard 9: Operations and Maintenance Plan

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

Stormwater management system owner: Gateway II Trust of 1997
The party responsible for operation and maintenance: Gateway II Trust of 1997

Preliminary Stormwater Operation and Maintenance Budget

Quarterly Inspection and Maintenance x \$2,500 per visit = \$10,000 annually

Illicit Discharge - Practices to Minimize Storm Water Contamination

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

Deep Sump Hooded Catch Basins

Inspect deep sump catch basins four times per year including the end of the foliage and snow removal seasons. Sediments must also be removed four times per year or when the depth of deposits is greater than or equal to one half the depth of the sump. Vacuum trucks are to be used to remove trapped sediment and supernatant.

Although catch basin debris often contains concentrations of oil and hazardous materials such as petroleum hydrocarbons and metals, MassDEP classifies them as solid waste. Any contaminated materials must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.00, and handled as hazardous waste. MassDEP regulations prohibit landfills from accepting materials that contain free draining liquids.

Hydrodynamic separators

Hydrodynamic separators will be inspected and cleaned in strict accordance with the manufacturer's recommendations and requirements.

Infiltration Basins

The infiltration basins shall be inspected in early May and the second half of October. Any accumulated silt, trash, or debris shall be removed from the infiltration basins. Outlet control structures should be cleaned as required for proper function. Note any settlement or erosion around drainage inlets, stabilize any eroded areas. The discharge ponds shall be inspected for stability, erosion, siltation and obstructions. Any obstructions including any woody vegetation in the flow path shall be removed. Rip-rap shall be replenished as needed. If silt reaches half way up the rip-rap, it shall be removed and the rocks replaced or replenished as needed.

Roof Drain Leaders

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

Vegetated Areas Maintenance

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

Initial Post-Construction Inspection

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

Long-Term Maintenance

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

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

Pesticide/Herbicide Usage

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

Forest Ridge Drive – Post Construction Maintenance

Operations and Maintenance Log
Inspections for Year: _____

Structural Best Management Practice (Frequency)	Action	Date Completed	Completed By	Comments
Deep Sump Hooded Catch Basin– Inspect/clean four times per year. Clean when sump is 50% full.	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
Hydrodynamic Separator– Inspect four times per year. Clean per manufacturer’s requirements.	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
Infiltration Basin – Inspect twice per year. Clean as required	Inspect			
	Inspect			
Roof Drain Leaders – Inspect/clean twice per year.	Inspect/Clean			
	Inspect/Clean			
Vegetated Areas Maintenance – Inspect twice per year. Maintain as required.	Inspect			
	Inspect			

- (1) Refer to the Massachusetts Stormwater Management, Volume Two: Stormwater Technical Handbook (March 1997) for recommendations regarding frequency for inspection and maintenance of specific BMP’s.
- (2) Inspections to be conducted by qualified professional such as an environmental scientist or civil engineer.

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended.

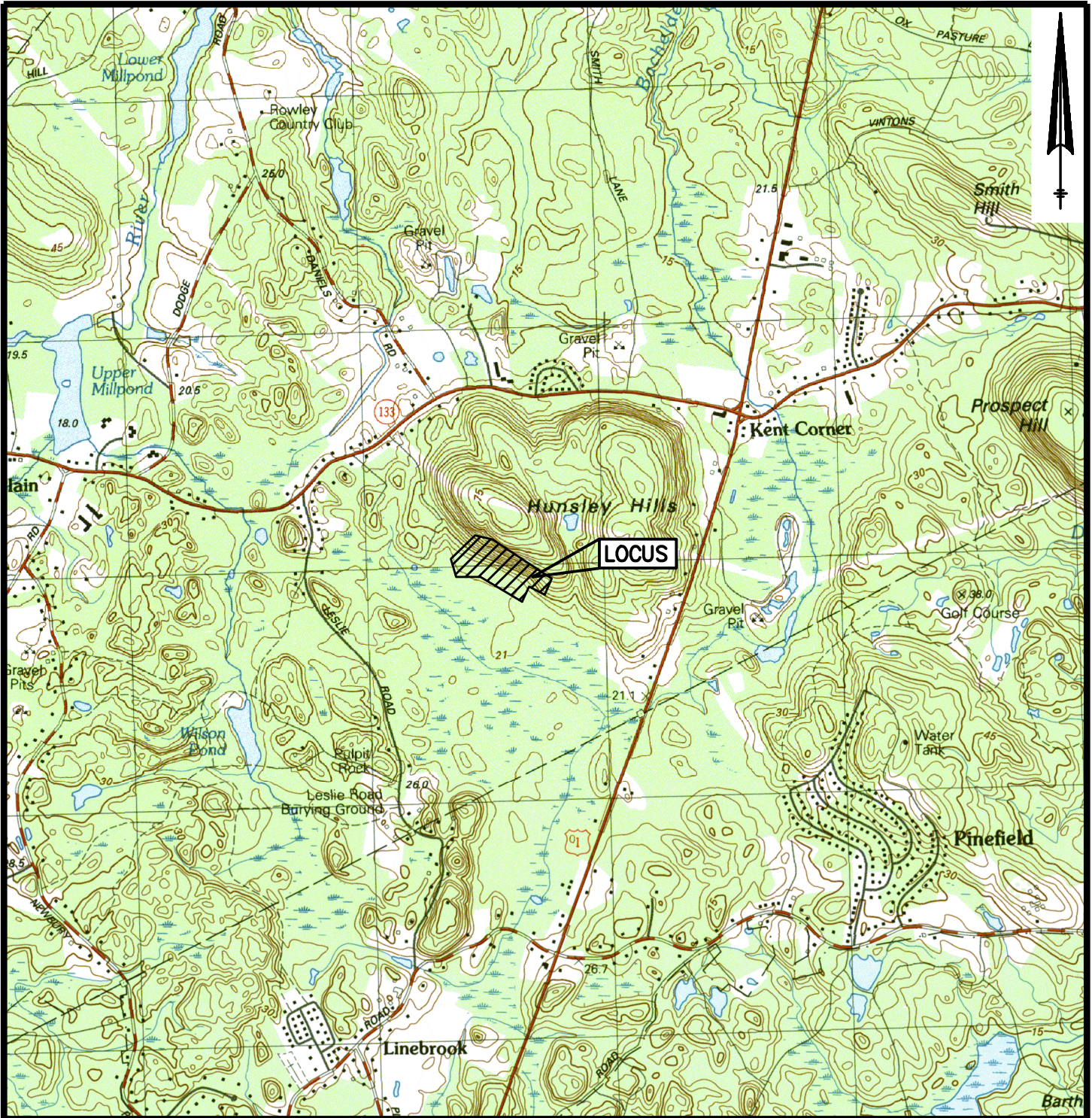
Other notes: (Included deviations from: Con Comm. Order of Conditions, PB Approval, Construction Sequence and Approved Plan).

Stormwater Control Manager: _____

Standard 10: Prohibition of Illicit Discharges

No illicit discharges currently exist and no future illicit discharges will be allowed including wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, soil, or grease.

Appendix I Locus Map



USGS LOCUS MAP

FOREST RIDGE DRIVE
ROWLEY, MA

**HANCOCK
ASSOCIATES**

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

DATE: 6/13/23

SCALE: 1"=2,000'

DESIGN: CFB

DRAWN: JJP

LAYOUT: LOCUS

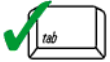
Appendix II Stormwater Checklist



Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

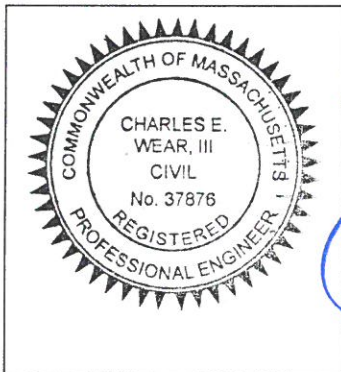
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature




Signature and Date 8/19/23

Checklist

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

- New development
 Redevelopment
 Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

Standard 3: Recharge

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

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



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

Standard 4: Water Quality

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

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



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

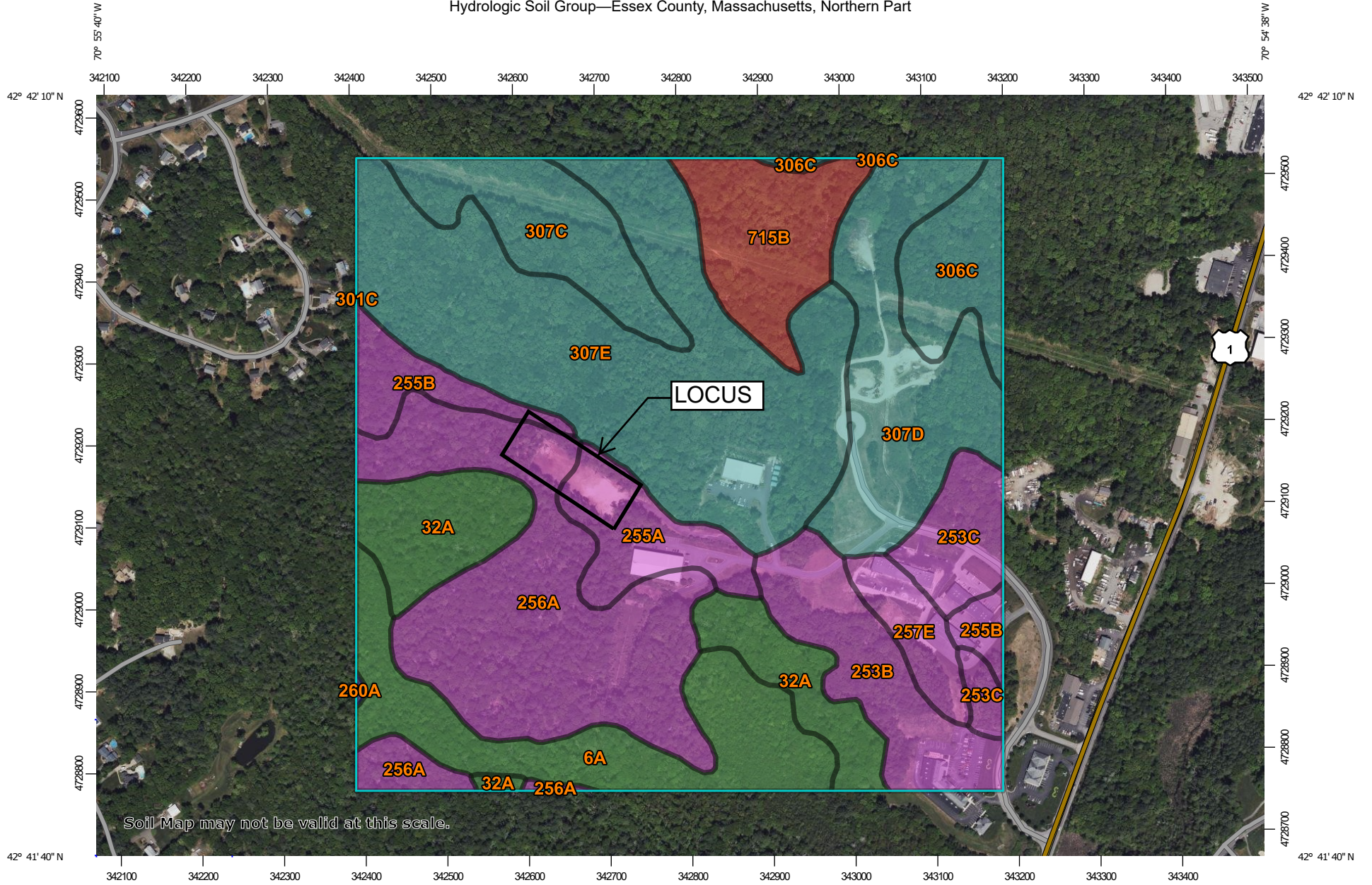
- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance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

Appendix III NRCS Soils Map

Hydrologic Soil Group—Essex County, Massachusetts, Northern Part



Soil Map may not be valid at this scale.

Map Scale: 1:6,540 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters


0 300 600 1200 1800 Feet

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



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, Massachusetts, Northern Part
 Survey Area Data: Version 18, Sep 9, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

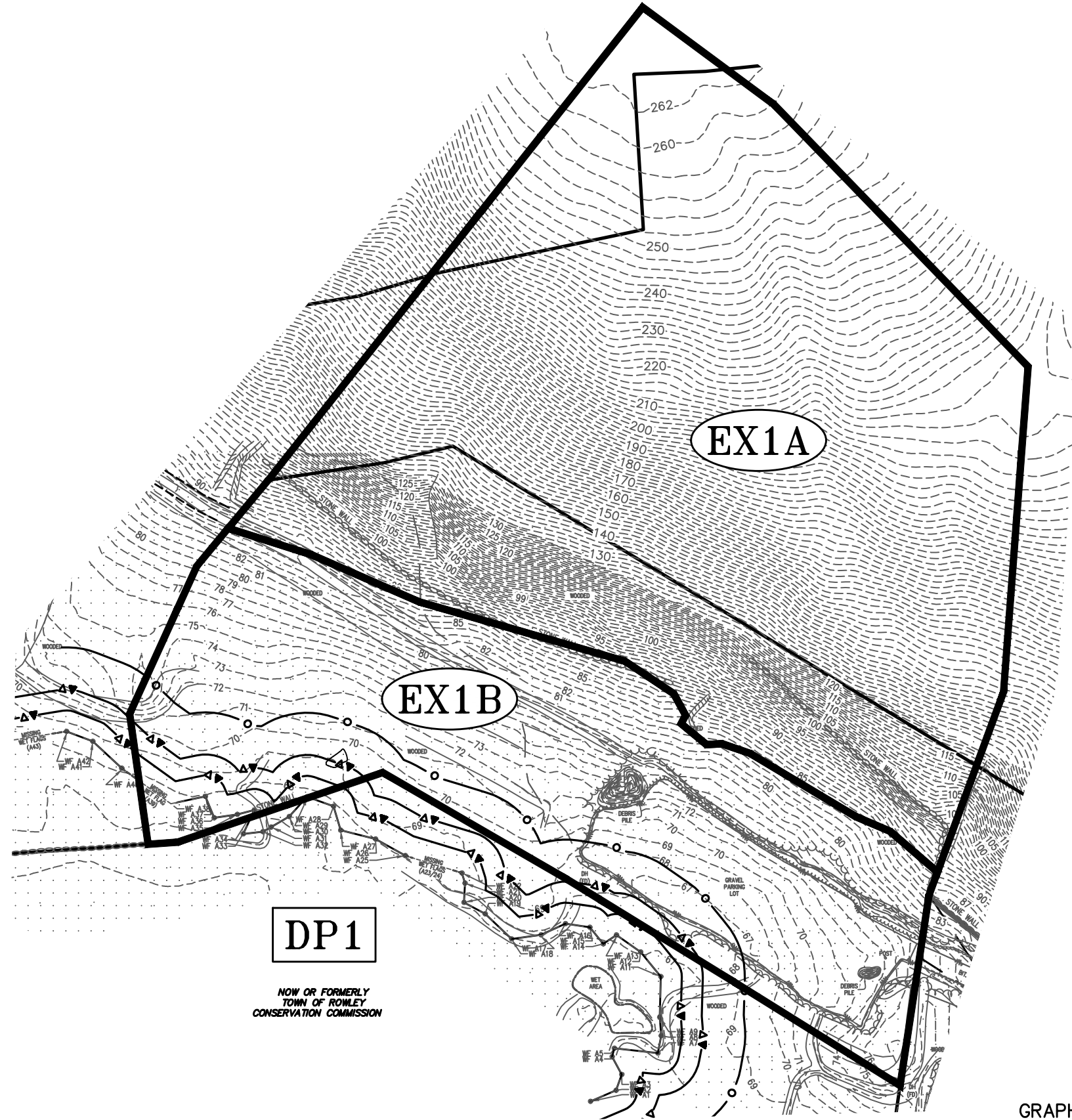
Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	A/D	13.2	8.7%
32A	Wareham loamy sand, 0 to 3 percent slopes	A/D	11.4	7.5%
253B	Hinckley loamy sand, 3 to 8 percent slopes	A	8.9	5.9%
253C	Hinckley loamy sand, 8 to 15 percent slopes	A	5.4	3.6%
255A	Windsor loamy sand, 0 to 3 percent slopes	A	5.8	3.8%
255B	Windsor loamy sand, 3 to 8 percent slopes	A	4.6	3.0%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	A	25.4	16.7%
257E	Hinckley and Windsor soils, 25 to 35 percent slopes	A	3.3	2.2%
260A	Sudbury fine sandy loam, 0 to 3 percent slopes	B	0.1	0.1%
301C	Montauk fine sandy loam, 8 to 15 percent slopes, very stony	C	0.0	0.0%
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	C	5.9	3.9%
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	C	8.4	5.5%
307D	Paxton fine sandy loam, 15 to 25 percent slopes, extremely stony	C	15.1	9.9%
307E	Paxton fine sandy loam, 25 to 35 percent slopes, extremely stony	C	35.7	23.5%
715B	Ridgebury and Leicester fine sandy loams, 3 to 8 percent slopes, extremely stony	D	8.6	5.7%
Totals for Area of Interest			151.8	100.0%

Appendix IV Existing and Proposed Drainage Figures



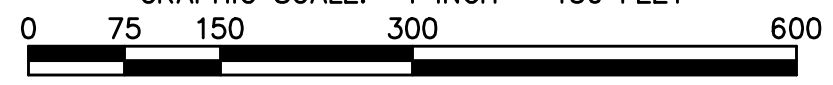
DP1

NOW OR FORMERLY
TOWN OF ROWLEY
CONSERVATION COMMISSION

EX1A

EX1B

GRAPHIC SCALE: 1 INCH = 150 FEET



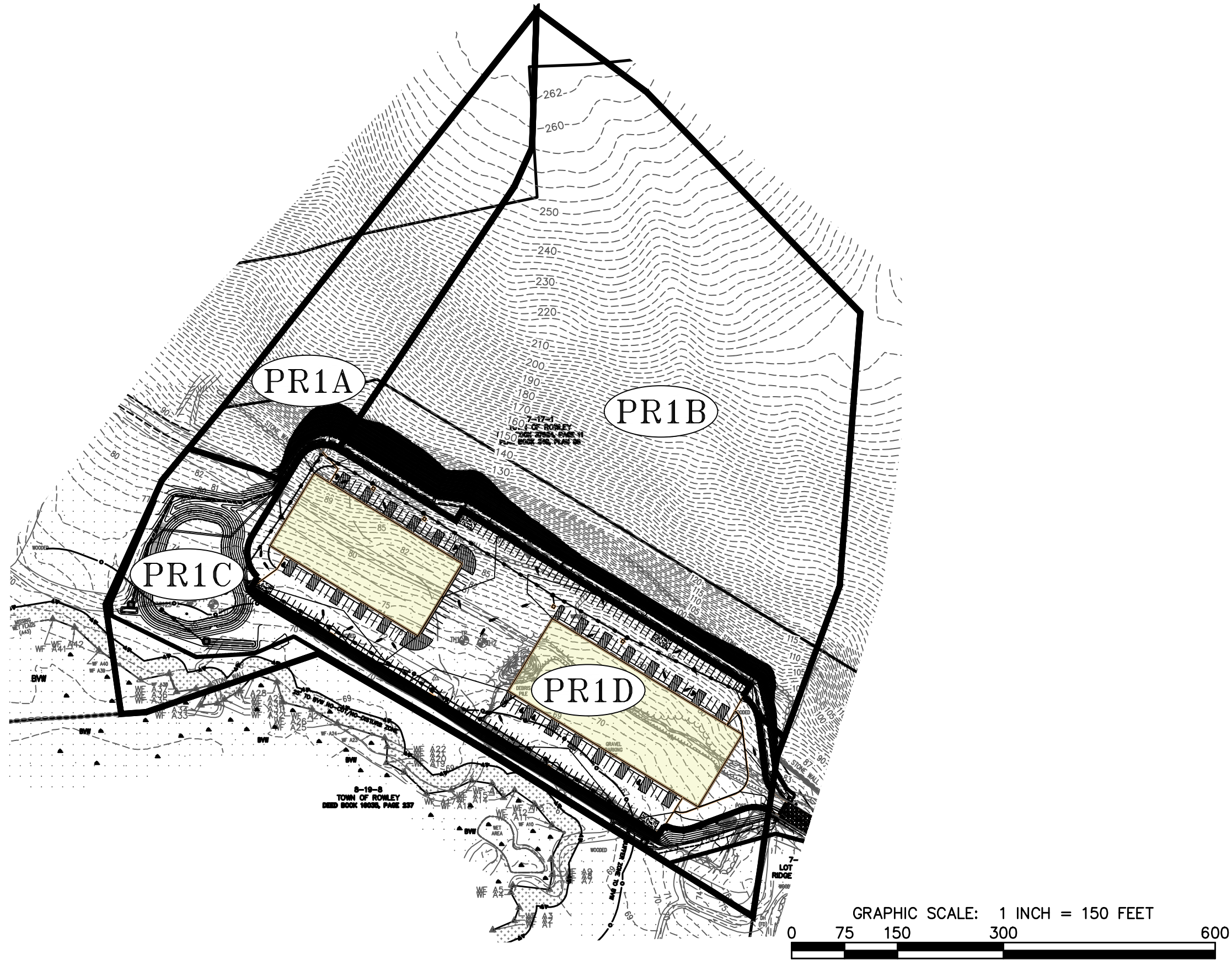
DATE:	6/6/23
LAYOUT:	EX
DESIGN:	JJP
DRAWN:	JJP
SCALE:	1"=150'
DWG: 26696 Drainage	

HANCOCK ASSOCIATES

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

EXISTING DRAINAGE FIGURE FOREST RIDGE ROWLEY, MA

SHEET	JOB NO.
1 OF 2	26696



DATE:	6/6/23
LAYOUT:	PR
DESIGN:	JJP
DRAWN:	JJP
SCALE:	1"=150'
DWG: 26696 Drainage	

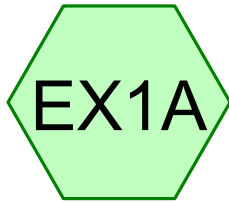
HANCOCK ASSOCIATES

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

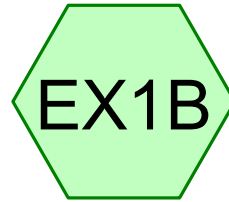
PROPOSED DRAINAGE FIGURE FOREST RIDGE ROWLEY, MA

SHEET	JOB NO.
2 OF 2	26696

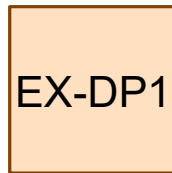
Appendix V Hydrocad Output



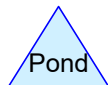
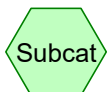
C-Soils to DP1



A-Soils to DP1



DP1



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Type III 24-hr 2-Year Rainfall=3.15"

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Page 2

Summary for Subcatchment EX1A: C-Soils to DP1

Runoff = 6.22 cfs @ 12.37 hrs, Volume= 0.783 af, Depth> 0.79"
 Routed to Reach EX-DP1 : DP1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
515,677	70	Woods, Good, HSG C
515,677		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
1.5	63	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.7	156	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.9	496	0.3300	2.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.7	217	0.0700	1.32		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.9	100	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
23.1	1,082	Total			

Summary for Subcatchment EX1B: A-Soils to DP1

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
 Routed to Reach EX-DP1 : DP1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
257,454	30	Woods, Good, HSG A
257,454		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0950	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
0.3	24	0.0950	1.54		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.6	133	0.0750	1.37		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.5	207	Total			

Summary for Reach EX-DP1: DP1

Inflow Area = 17.749 ac, 0.00% Impervious, Inflow Depth > 0.53" for 2-Year event
Inflow = 6.22 cfs @ 12.37 hrs, Volume= 0.783 af
Outflow = 6.22 cfs @ 12.37 hrs, Volume= 0.783 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

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Type III 24-hr 10-Year Rainfall=4.83"

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Page 1

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX1A: C-Soils to DP1

Runoff Area=515,677 sf 0.00% Impervious Runoff Depth>1.90"
Flow Length=1,082' Tc=23.1 min CN=70 Runoff=16.40 cfs 1.875 af

Subcatchment EX1B: A-Soils to DP1

Runoff Area=257,454 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=207' Tc=8.5 min CN=30 Runoff=0.00 cfs 0.001 af

Reach EX-DP1: DP1

Inflow=16.40 cfs 1.875 af
Outflow=16.40 cfs 1.875 af

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Type III 24-hr 25-Year Rainfall=6.16"

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Page 2

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX1A: C-Soils to DP1

Runoff Area=515,677 sf 0.00% Impervious Runoff Depth>2.92"
Flow Length=1,082' Tc=23.1 min CN=70 Runoff=25.62 cfs 2.878 af

Subcatchment EX1B: A-Soils to DP1

Runoff Area=257,454 sf 0.00% Impervious Runoff Depth>0.09"
Flow Length=207' Tc=8.5 min CN=30 Runoff=0.07 cfs 0.044 af

Reach EX-DP1: DP1

Inflow=25.62 cfs 2.922 af
Outflow=25.62 cfs 2.922 af

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Type III 24-hr 100-Year Rainfall=8.94"

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Page 3

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX1A: C-Soils to DP1

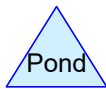
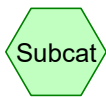
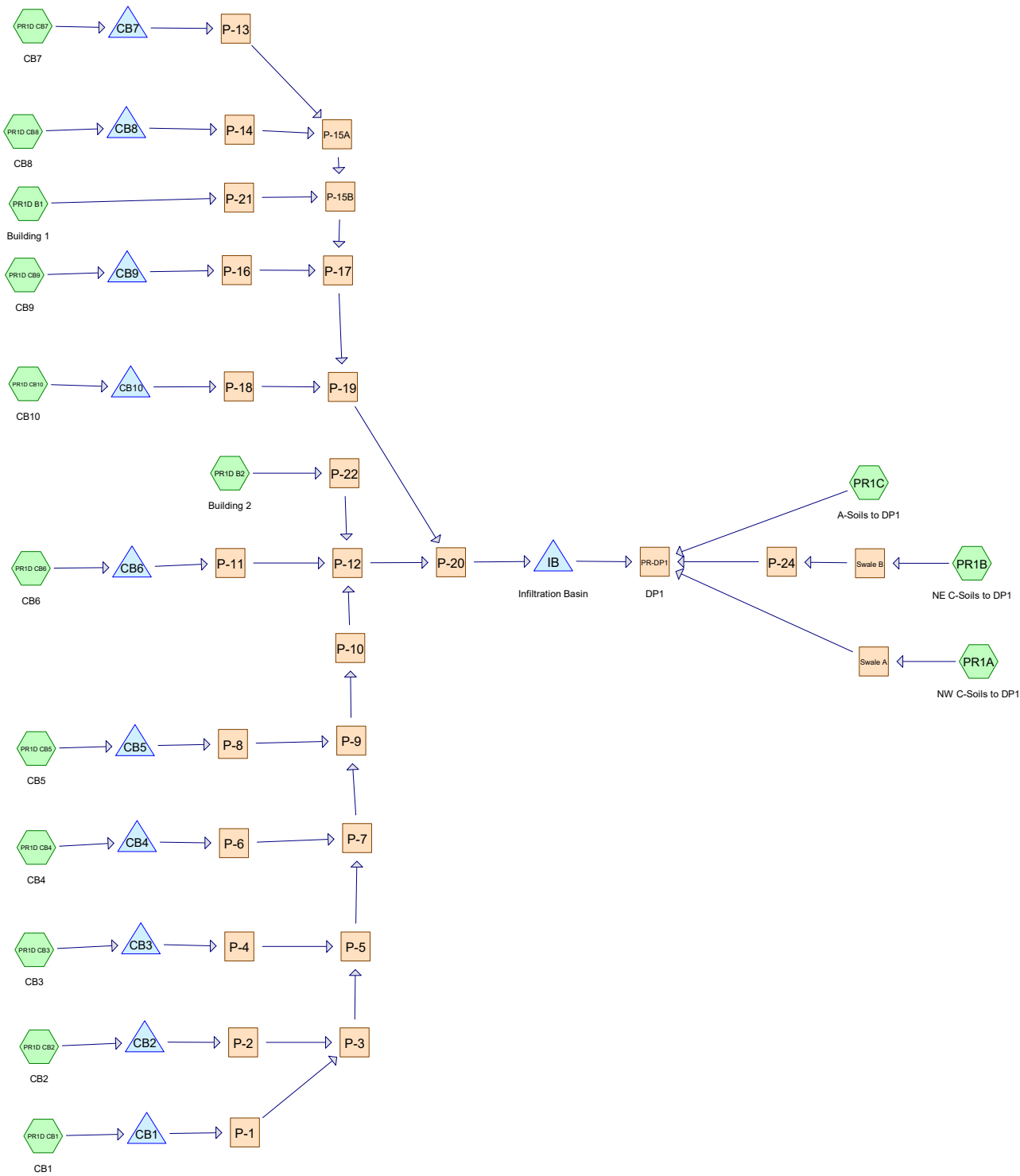
Runoff Area=515,677 sf 0.00% Impervious Runoff Depth>5.26"
Flow Length=1,082' Tc=23.1 min CN=70 Runoff=46.48 cfs 5.187 af

Subcatchment EX1B: A-Soils to DP1

Runoff Area=257,454 sf 0.00% Impervious Runoff Depth>0.66"
Flow Length=207' Tc=8.5 min CN=30 Runoff=1.52 cfs 0.324 af

Reach EX-DP1: DP1

Inflow=47.93 cfs 5.512 af
Outflow=47.93 cfs 5.512 af



Routing Diagram for 26696 HydroCAD - Lower Lot
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Prepared by Hancock Associates

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Type III 24-hr 2-Year Rainfall=3.15"

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Page 2

Summary for Subcatchment PR1A: NW C-Soils to DP1

Runoff = 1.14 cfs @ 12.39 hrs, Volume= 0.146 af, Depth> 0.79"

Routed to Reach Swale A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
96,227	70	Woods, Good, HSG C
96,227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
1.8	75	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.8	160	0.0875	1.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.4	402	0.3000	2.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.8	560	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
24.2	1,247	Total			

Summary for Subcatchment PR1B: NE C-Soils to DP1

Runoff = 4.38 cfs @ 12.45 hrs, Volume= 0.593 af, Depth> 0.79"

Routed to Reach Swale B :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
390,922	70	Woods, Good, HSG C
390,922		100.00% Pervious Area

26696 HydroCAD - Lower Lot

Type III 24-hr 2-Year Rainfall=3.15"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
1.8	75	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.8	160	0.0875	1.48		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.4	402	0.3000	2.74		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.4	907	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
27.8	1,594	Total			

Summary for Subcatchment PR1C: A-Soils to DP1

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Reach PR-DP1 : DP1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
99,724	30	Woods, Good, HSG A
99,724		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
2.4	230	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
18.7	280	Total			

Summary for Subcatchment PR1D B1: Building 1

Runoff = 2.65 cfs @ 12.08 hrs, Volume= 0.211 af, Depth> 2.92"
Routed to Reach P-21 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
37,800	98	Roofs, HSG A
37,800		100.00% Impervious Area

26696 HydroCAD - Lower Lot

Type III 24-hr 2-Year Rainfall=3.15"

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Page 4

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

Summary for Subcatchment PR1D B2: Building 2

Runoff = 2.06 cfs @ 12.08 hrs, Volume= 0.164 af, Depth> 2.92"
 Routed to Reach P-22 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
29,400	98	Roofs, HSG A
29,400		100.00% Impervious Area

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

Summary for Subcatchment PR1D CB1: CB1

Runoff = 0.92 cfs @ 12.08 hrs, Volume= 0.073 af, Depth> 2.92"
 Routed to Pond CB1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
13,150	98	Paved parking, HSG A
13,150		100.00% Impervious Area

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

Summary for Subcatchment PR1D CB10: CB10

Runoff = 1.12 cfs @ 12.08 hrs, Volume= 0.089 af, Depth> 2.92"
 Routed to Pond CB10 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
16,000	98	Paved parking, HSG A
16,000		100.00% Impervious Area

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Type III 24-hr 2-Year Rainfall=3.15"

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

Summary for Subcatchment PR1D CB2: CB2

Runoff = 0.82 cfs @ 12.08 hrs, Volume= 0.065 af, Depth> 2.92"
 Routed to Pond CB2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
11,700	98	Paved parking, HSG A
11,700		100.00% Impervious Area

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

Summary for Subcatchment PR1D CB3: CB3

Runoff = 1.33 cfs @ 12.08 hrs, Volume= 0.106 af, Depth> 2.92"
 Routed to Pond CB3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
18,950	98	Paved parking, HSG A
18,950		100.00% Impervious Area

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

Summary for Subcatchment PR1D CB4: CB4

Runoff = 0.45 cfs @ 12.08 hrs, Volume= 0.036 af, Depth> 2.92"
 Routed to Pond CB4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
6,400	98	Paved parking, HSG A
6,400		100.00% Impervious Area

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

Summary for Subcatchment PR1D CB5: CB5

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 0.032 af, Depth> 2.92"
Routed to Pond CB5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
5,650	98	Paved parking, HSG A
5,650		100.00% Impervious Area

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

Summary for Subcatchment PR1D CB6: CB6

Runoff = 0.39 cfs @ 12.08 hrs, Volume= 0.031 af, Depth> 2.92"
Routed to Pond CB6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
5,600	98	Paved parking, HSG A
5,600		100.00% Impervious Area

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

Summary for Subcatchment PR1D CB7: CB7

Runoff = 0.67 cfs @ 12.08 hrs, Volume= 0.053 af, Depth> 2.92"
Routed to Pond CB7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
9,500	98	Paved parking, HSG A
9,500		100.00% Impervious Area

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Type III 24-hr 2-Year Rainfall=3.15"

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

Summary for Subcatchment PR1D CB8: CB8

Runoff = 1.09 cfs @ 12.08 hrs, Volume= 0.086 af, Depth> 2.92"
 Routed to Pond CB8 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
15,500	98	Paved parking, HSG A
15,500		100.00% Impervious Area

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

Summary for Subcatchment PR1D CB9: CB9

Runoff = 1.30 cfs @ 12.08 hrs, Volume= 0.103 af, Depth> 2.92"
 Routed to Pond CB9 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-Year Rainfall=3.15"

Area (sf)	CN	Description
18,500	98	Paved parking, HSG A
18,500		100.00% Impervious Area

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

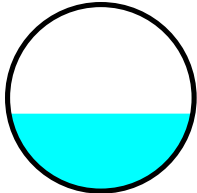
Summary for Reach P-1:

Inflow Area = 0.302 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
 Inflow = 0.92 cfs @ 12.08 hrs, Volume= 0.073 af
 Outflow = 0.91 cfs @ 12.10 hrs, Volume= 0.073 af, Atten= 1%, Lag= 0.8 min
 Routed to Reach P-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 2.95 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 0.99 fps, Avg. Travel Time= 3.0 min

Peak Storage= 56 cf @ 12.10 hrs
 Average Depth at Peak Storage= 0.42' , Surface Width= 0.99'
 Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 180.0' Slope= 0.0050 '/'
Inlet Invert= 75.00', Outlet Invert= 74.10'



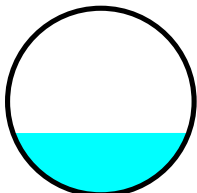
Summary for Reach P-10:

Inflow Area = 1.282 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 3.83 cfs @ 12.11 hrs, Volume= 0.311 af
Outflow = 3.83 cfs @ 12.11 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.3 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.18 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 1.2 min

Peak Storage= 93 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.67' , Surface Width= 1.89'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 102.0' Slope= 0.0050 '/'
Inlet Invert= 71.69', Outlet Invert= 71.18'



Summary for Reach P-11:

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af
Outflow = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.1 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.49 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.82 fps, Avg. Travel Time= 0.5 min

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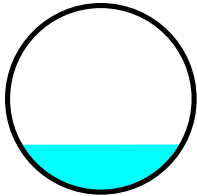
Type III 24-hr 2-Year Rainfall=3.15"

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Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 0.87'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.85'



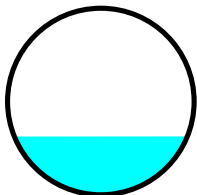
Summary for Reach P-12:

Inflow Area = 2.086 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 6.20 cfs @ 12.10 hrs, Volume= 0.506 af
Outflow = 6.19 cfs @ 12.11 hrs, Volume= 0.506 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-20 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.70 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 1.0 min

Peak Storage= 129 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.78' , Surface Width= 2.32'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 98.0' Slope= 0.0050 '/'
Inlet Invert= 71.18', Outlet Invert= 70.69'



Summary for Reach P-13:

Inflow Area = 0.218 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 0.67 cfs @ 12.09 hrs, Volume= 0.053 af
Outflow = 0.66 cfs @ 12.10 hrs, Volume= 0.053 af, Atten= 1%, Lag= 0.8 min
Routed to Reach P-15A :

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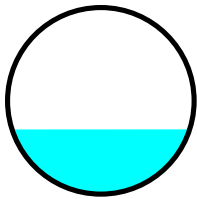
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.70 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 3.4 min

Peak Storage= 45 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.35' , Surface Width= 0.95'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 186.0' Slope= 0.0050 '/'
Inlet Invert= 74.30', Outlet Invert= 73.37'



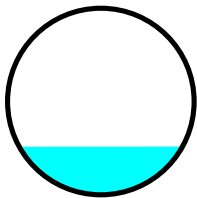
Summary for Reach P-14:

Inflow Area = 0.356 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 1.09 cfs @ 12.08 hrs, Volume= 0.086 af
Outflow = 1.09 cfs @ 12.09 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-15A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.00 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 1.31'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 73.60', Outlet Invert= 73.55'



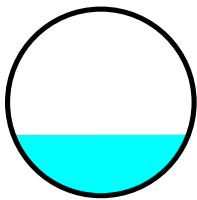
Summary for Reach P-15A:

Inflow Area = 0.574 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 1.74 cfs @ 12.09 hrs, Volume= 0.139 af
Outflow = 1.73 cfs @ 12.10 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.4 min
Routed to Reach P-15B :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.41 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 1.5 min

Peak Storage= 52 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.49' , Surface Width= 1.41'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.39 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 103.0' Slope= 0.0050 '/
Inlet Invert= 73.37', Outlet Invert= 72.86'



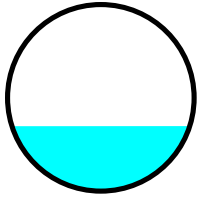
Summary for Reach P-15B:

Inflow Area = 1.442 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 4.37 cfs @ 12.09 hrs, Volume= 0.350 af
Outflow = 4.37 cfs @ 12.09 hrs, Volume= 0.350 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-17 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.48 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 0.8 min

Peak Storage= 73 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.70' , Surface Width= 1.91'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.73 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 75.0' Slope= 0.0055 '/
Inlet Invert= 72.86', Outlet Invert= 72.45'



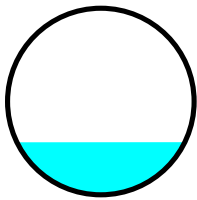
Summary for Reach P-16:

Inflow Area = 0.425 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 1.30 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 1.30 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-17 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.16 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.04 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.42' , Surface Width= 1.35'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 74.50', Outlet Invert= 74.45'



Summary for Reach P-17:

Inflow Area = 1.866 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 5.67 cfs @ 12.09 hrs, Volume= 0.453 af
Outflow = 5.64 cfs @ 12.10 hrs, Volume= 0.453 af, Atten= 0%, Lag= 0.4 min
Routed to Reach P-19 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.66 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 1.8 min

Peak Storage= 200 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.82' , Surface Width= 1.97'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.04 cfs

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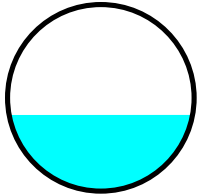
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Type III 24-hr 2-Year Rainfall=3.15"

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24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 165.0' Slope= 0.0050 '/'
Inlet Invert= 72.45', Outlet Invert= 71.62'



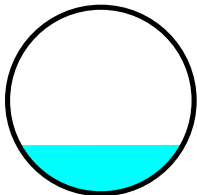
Summary for Reach P-18:

Inflow Area = 0.367 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 1.12 cfs @ 12.08 hrs, Volume= 0.089 af
Outflow = 1.12 cfs @ 12.09 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-19 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.03 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 1.32'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 75.60', Outlet Invert= 75.55'



Summary for Reach P-19:

Inflow Area = 2.234 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 6.75 cfs @ 12.10 hrs, Volume= 0.542 af
Outflow = 6.74 cfs @ 12.10 hrs, Volume= 0.542 af, Atten= 0%, Lag= 0.4 min
Routed to Reach P-20 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.81 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 1.5 min

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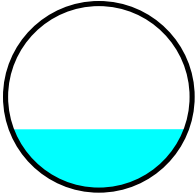
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Peak Storage= 196 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.82' , Surface Width= 2.35'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 140.0' Slope= 0.0050 '/'
Inlet Invert= 71.62', Outlet Invert= 70.92'



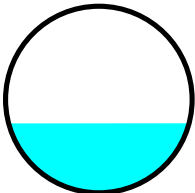
Summary for Reach P-2:

Inflow Area = 0.269 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 0.82 cfs @ 12.08 hrs, Volume= 0.065 af
Outflow = 0.82 cfs @ 12.09 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.06 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 0.97'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 75.00', Outlet Invert= 74.97'



Summary for Reach P-20:

Inflow Area = 4.319 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 12.92 cfs @ 12.10 hrs, Volume= 1.048 af
Outflow = 12.92 cfs @ 12.10 hrs, Volume= 1.048 af, Atten= 0%, Lag= 0.0 min
Routed to Pond IB : Infiltration Basin

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 5.74 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 1.94 fps, Avg. Travel Time= 0.1 min

Peak Storage= 36 cf @ 12.10 hrs

Average Depth at Peak Storage= 1.17' , Surface Width= 2.49'

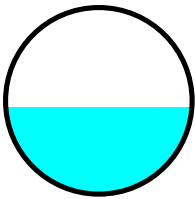
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

30.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 16.0' Slope= 0.0050 '/'

Inlet Invert= 70.69', Outlet Invert= 70.61'



Summary for Reach P-21:

Inflow Area = 0.868 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event

Inflow = 2.65 cfs @ 12.08 hrs, Volume= 0.211 af

Outflow = 2.65 cfs @ 12.08 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.1 min

Routed to Reach P-15B :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 7.52 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 2.47 fps, Avg. Travel Time= 0.4 min

Peak Storage= 20 cf @ 12.08 hrs

Average Depth at Peak Storage= 0.38' , Surface Width= 1.31'

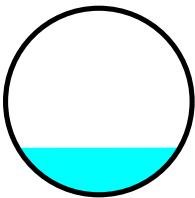
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.83 cfs

18.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 56.0' Slope= 0.0321 '/'

Inlet Invert= 77.00', Outlet Invert= 75.20'



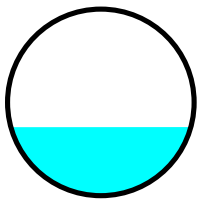
Summary for Reach P-22:

Inflow Area = 0.675 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
Inflow = 2.06 cfs @ 12.08 hrs, Volume= 0.164 af
Outflow = 2.06 cfs @ 12.08 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 7.85 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 0.96'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/
Inlet Invert= 77.20', Outlet Invert= 77.00'



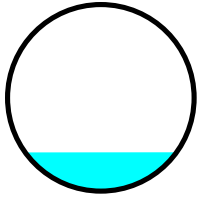
Summary for Reach P-24:

Inflow Area = 8.974 ac, 0.00% Impervious, Inflow Depth > 0.78" for 2-Year event
Inflow = 3.63 cfs @ 12.63 hrs, Volume= 0.583 af
Outflow = 3.63 cfs @ 12.63 hrs, Volume= 0.583 af, Atten= 0%, Lag= 0.0 min
Routed to Reach PR-DP1 : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 7.60 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.91 fps, Avg. Travel Time= 0.1 min

Peak Storage= 14 cf @ 12.63 hrs
Average Depth at Peak Storage= 0.42' , Surface Width= 1.63'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 37.81 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 30.0' Slope= 0.0200 '/
Inlet Invert= 76.40', Outlet Invert= 75.80'



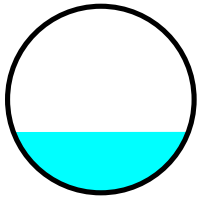
Summary for Reach P-3:

Inflow Area = 0.570 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 1.73 cfs @ 12.09 hrs, Volume= 0.138 af
Outflow = 1.72 cfs @ 12.10 hrs, Volume= 0.138 af, Atten= 0%, Lag= 0.4 min
Routed to Reach P-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.42 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 1.7 min

Peak Storage= 58 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.49' , Surface Width= 1.41'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 116.0' Slope= 0.0050 '/'
Inlet Invert= 74.10', Outlet Invert= 73.52'



Summary for Reach P-4:

Inflow Area = 0.435 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 1.33 cfs @ 12.08 hrs, Volume= 0.106 af
Outflow = 1.33 cfs @ 12.09 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.18 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 1.36'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

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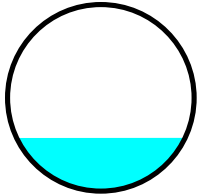
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18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.0050 '/'
Inlet Invert= 75.20', Outlet Invert= 75.14'



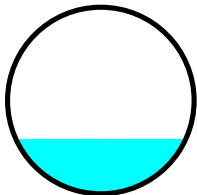
Summary for Reach P-5:

Inflow Area = 1.006 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 3.04 cfs @ 12.09 hrs, Volume= 0.244 af
Outflow = 3.02 cfs @ 12.10 hrs, Volume= 0.244 af, Atten= 1%, Lag= 0.6 min
Routed to Reach P-7 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.91 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 2.7 min

Peak Storage= 162 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 1.82'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 210.0' Slope= 0.0050 '/'
Inlet Invert= 73.52', Outlet Invert= 72.47'



Summary for Reach P-6:

Inflow Area = 0.147 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 0.45 cfs @ 12.09 hrs, Volume= 0.036 af
Outflow = 0.45 cfs @ 12.09 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-7 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.59 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 0.1 min

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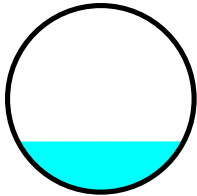
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Peak Storage= 1 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.89'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.97'



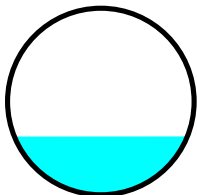
Summary for Reach P-7:

Inflow Area = 1.152 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 3.46 cfs @ 12.10 hrs, Volume= 0.280 af
Outflow = 3.45 cfs @ 12.11 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.06 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 1.0 min

Peak Storage= 66 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 1.86'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 78.0' Slope= 0.0050 '/'
Inlet Invert= 72.47', Outlet Invert= 72.08'



Summary for Reach P-8:

Inflow Area = 0.130 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af
Outflow = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-9 :

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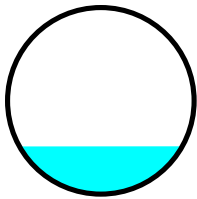
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.50 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.82 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.26' , Surface Width= 0.87'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.97'



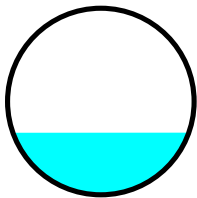
Summary for Reach P-9:

Inflow Area = 1.282 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
Inflow = 3.84 cfs @ 12.10 hrs, Volume= 0.311 af
Outflow = 3.83 cfs @ 12.11 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.18 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 0.9 min

Peak Storage= 71 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.67' , Surface Width= 1.89'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 78.0' Slope= 0.0050 '/'
Inlet Invert= 72.08', Outlet Invert= 71.69'



Summary for Reach PR-DP1: DP1

Inflow Area = 17.792 ac, 24.28% Impervious, Inflow Depth > 0.49" for 2-Year event
Inflow = 4.58 cfs @ 12.60 hrs, Volume= 0.728 af
Outflow = 4.58 cfs @ 12.60 hrs, Volume= 0.728 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 17R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Summary for Reach Swale A:

Inflow Area = 2.209 ac, 0.00% Impervious, Inflow Depth > 0.79" for 2-Year event
Inflow = 1.14 cfs @ 12.39 hrs, Volume= 0.146 af
Outflow = 1.10 cfs @ 12.45 hrs, Volume= 0.145 af, Atten= 3%, Lag= 3.8 min
Routed to Reach PR-DP1 : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 1.34 fps, Min. Travel Time= 5.1 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 11.5 min

Peak Storage= 337 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.43', Surface Width= 2.35'
Bank-Full Depth= 1.50' Flow Area= 4.5 sf, Capacity= 11.32 cfs

1.50' x 1.50' deep channel, n= 0.078 Riprap, 12-inch
Side Slope Z-value= 1.0 '/' Top Width= 4.50'
Length= 410.0' Slope= 0.0241 '/'
Inlet Invert= 80.90', Outlet Invert= 71.00'



Summary for Reach Swale B:

Inflow Area = 8.974 ac, 0.00% Impervious, Inflow Depth > 0.79" for 2-Year event
Inflow = 4.38 cfs @ 12.45 hrs, Volume= 0.593 af
Outflow = 3.63 cfs @ 12.63 hrs, Volume= 0.583 af, Atten= 17%, Lag= 11.1 min
Routed to Reach P-24 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 0.96 fps, Min. Travel Time= 15.0 min
Avg. Velocity = 0.44 fps, Avg. Travel Time= 32.7 min

Peak Storage= 3,259 cf @ 12.63 hrs
Average Depth at Peak Storage= 0.73', Surface Width= 5.95'
Bank-Full Depth= 2.50' Flow Area= 17.5 sf, Capacity= 31.78 cfs

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4.50' x 2.50' deep channel, n= 0.078 Riprap, 12-inch
 Side Slope Z-value= 1.0 '/' Top Width= 9.50'
 Length= 860.0' Slope= 0.0052 '/'
 Inlet Invert= 80.90', Outlet Invert= 76.40'



Summary for Pond CB1:

Inflow Area = 0.302 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 0.92 cfs @ 12.08 hrs, Volume= 0.073 af
 Outflow = 0.92 cfs @ 12.08 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.92 cfs @ 12.08 hrs, Volume= 0.073 af
 Routed to Reach P-1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.78' @ 12.09 hrs Surf.Area= 13 sf Storage= 10 cf

Plug-Flow detention time= 0.9 min calculated for 0.073 af (100% of inflow)
 Center-of-Mass det. time= 0.6 min (756.8 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	85 cf	4.00'D x 6.80'H Catch Basin
#2	77.80'	234 cf	Ponding Over CB Rim (Prismatic) Listed below
		319 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.80	4	0	0
78.30	932	234	234

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	12.0" Round Culvert L= 180.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.00' / 74.10' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.92 cfs @ 12.08 hrs HW=75.78' TW=75.41' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.92 cfs @ 1.92 fps)

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Summary for Pond CB10:

Inflow Area = 0.367 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 1.12 cfs @ 12.08 hrs, Volume= 0.089 af
 Outflow = 1.12 cfs @ 12.08 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.12 cfs @ 12.08 hrs, Volume= 0.089 af
 Routed to Reach P-18 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 76.19' @ 12.08 hrs Surf.Area= 20 sf Storage= 11 cf

Plug-Flow detention time= 0.7 min calculated for 0.089 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (756.7 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	75.60'	137 cf	5.00'D x 7.00'H Catch Basin
#2	78.60'	3,895 cf	Ponding Over CB Rim (Prismatic) Listed below
		4,032 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.60	8	0	0
83.60	1,550	3,895	3,895

Device	Routing	Invert	Outlet Devices
#1	Primary	75.60'	18.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.60' / 75.55' S= 0.0050 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.12 cfs @ 12.08 hrs HW=76.18' TW=75.99' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 1.12 cfs @ 2.61 fps)

Summary for Pond CB2:

Inflow Area = 0.269 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 0.82 cfs @ 12.08 hrs, Volume= 0.065 af
 Outflow = 0.82 cfs @ 12.08 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.82 cfs @ 12.08 hrs, Volume= 0.065 af
 Routed to Reach P-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.57' @ 12.08 hrs Surf.Area= 13 sf Storage= 7 cf

Plug-Flow detention time= 0.6 min calculated for 0.065 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (756.6 - 756.2)

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Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	78.00'	1,012 cf	Ponding Over CB Rim (Prismatic) Listed below
		1,100 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.00	4	0	0
78.50	4,044	1,012	1,012

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.00' / 74.97' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.82 cfs @ 12.08 hrs HW=75.57' TW=75.37' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 0.82 cfs @ 2.57 fps)

Summary for Pond CB3:

Inflow Area = 0.435 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 1.33 cfs @ 12.08 hrs, Volume= 0.106 af
 Outflow = 1.33 cfs @ 12.08 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.33 cfs @ 12.08 hrs, Volume= 0.106 af
 Routed to Reach P-4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.95' @ 12.08 hrs Surf.Area= 13 sf Storage= 9 cf

Plug-Flow detention time= 0.5 min calculated for 0.106 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (756.5 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	75.20'	88 cf	4.00'D x 7.00'H Catch Basin
#2	78.20'	248 cf	Ponding Over CB Rim (Prismatic) Listed below
		336 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.20	8	0	0
78.70	985	248	248

Device	Routing	Invert	Outlet Devices
#1	Primary	75.20'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.20' / 75.14' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.33 cfs @ 12.08 hrs HW=75.95' TW=75.63' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 1.33 cfs @ 2.93 fps)

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Summary for Pond CB4:

Inflow Area = 0.147 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 0.45 cfs @ 12.08 hrs, Volume= 0.036 af
 Outflow = 0.45 cfs @ 12.09 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.45 cfs @ 12.09 hrs, Volume= 0.036 af
 Routed to Reach P-6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.41' @ 12.09 hrs Surf.Area= 13 sf Storage= 5 cf

Plug-Flow detention time= 0.8 min calculated for 0.036 af (100% of inflow)
 Center-of-Mass det. time= 0.6 min (756.7 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	900 cf	Ponding Over CB Rim (Prismatic) Listed below
		988 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	3,595	900	900

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.97' S= 0.0060 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.45 cfs @ 12.09 hrs HW=77.41' TW=77.27' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 0.45 cfs @ 2.20 fps)

Summary for Pond CB5:

Inflow Area = 0.130 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 0.40 cfs @ 12.08 hrs, Volume= 0.032 af
 Outflow = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.40 cfs @ 12.09 hrs, Volume= 0.031 af
 Routed to Reach P-8 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.38' @ 12.09 hrs Surf.Area= 13 sf Storage= 5 cf

Plug-Flow detention time= 0.9 min calculated for 0.031 af (100% of inflow)
 Center-of-Mass det. time= 0.6 min (756.8 - 756.2)

26696 HydroCAD - Lower Lot

Type III 24-hr 2-Year Rainfall=3.15"

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Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	602 cf	Ponding Over CB Rim (Prismatic) Listed below
		690 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	2,405	602	602

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.97' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.40 cfs @ 12.09 hrs HW=77.38' TW=77.26' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 0.40 cfs @ 2.13 fps)

Summary for Pond CB6:

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 0.39 cfs @ 12.08 hrs, Volume= 0.031 af
 Outflow = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.39 cfs @ 12.09 hrs, Volume= 0.031 af
 Routed to Reach P-11 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.41' @ 12.09 hrs Surf.Area= 13 sf Storage= 5 cf

Plug-Flow detention time= 1.0 min calculated for 0.031 af (100% of inflow)
 Center-of-Mass det. time= 0.7 min (756.9 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	228 cf	Ponding Over CB Rim (Prismatic) Listed below
		316 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	908	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.85' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.09 hrs HW=77.41' TW=77.25' (Dynamic Tailwater)
 ←1=Culvert (Outlet Controls 0.39 cfs @ 1.91 fps)

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Type III 24-hr 2-Year Rainfall=3.15"

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Summary for Pond CB7:

Inflow Area = 0.218 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 0.67 cfs @ 12.08 hrs, Volume= 0.053 af
 Outflow = 0.67 cfs @ 12.09 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.67 cfs @ 12.09 hrs, Volume= 0.053 af
 Routed to Reach P-13 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 74.97' @ 12.09 hrs Surf.Area= 13 sf Storage= 8 cf

Plug-Flow detention time= 1.0 min calculated for 0.053 af (100% of inflow)
 Center-of-Mass det. time= 0.7 min (756.9 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	74.30'	88 cf	4.00'D x 7.00'H Catch Basin
#2	77.30'	101 cf	Ponding Over CB Rim (Prismatic) Listed below
		189 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.30	4	0	0
77.80	400	101	101

Device	Routing	Invert	Outlet Devices
#1	Primary	74.30'	12.0" Round Culvert L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.30' / 73.37' S= 0.0050 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.66 cfs @ 12.09 hrs HW=74.97' TW=74.65' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 0.66 cfs @ 1.69 fps)

Summary for Pond CB8:

Inflow Area = 0.356 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 1.09 cfs @ 12.08 hrs, Volume= 0.086 af
 Outflow = 1.09 cfs @ 12.08 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.09 cfs @ 12.08 hrs, Volume= 0.086 af
 Routed to Reach P-14 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 74.27' @ 12.08 hrs Surf.Area= 13 sf Storage= 8 cf

Plug-Flow detention time= 0.5 min calculated for 0.086 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (756.5 - 756.2)

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Volume	Invert	Avail.Storage	Storage Description
#1	73.60'	88 cf	4.00'D x 7.00'H Catch Basin
#2	76.60'	176 cf	Ponding Over CB Rim (Prismatic) Listed below
		264 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.60	4	0	0
77.10	700	176	176

Device	Routing	Invert	Outlet Devices
#1	Primary	73.60'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.60' / 73.55' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.09 cfs @ 12.08 hrs HW=74.27' TW=73.99' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 1.09 cfs @ 2.77 fps)

Summary for Pond CB9:

Inflow Area = 0.425 ac, 100.00% Impervious, Inflow Depth > 2.92" for 2-Year event
 Inflow = 1.30 cfs @ 12.08 hrs, Volume= 0.103 af
 Outflow = 1.30 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.30 cfs @ 12.09 hrs, Volume= 0.103 af
 Routed to Reach P-16 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.24' @ 12.09 hrs Surf.Area= 20 sf Storage= 15 cf

Plug-Flow detention time= 0.7 min calculated for 0.103 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (756.7 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	74.50'	134 cf	5.00'D x 6.80'H Catch Basin
#2	77.30'	302 cf	Ponding Over CB Rim (Prismatic) Listed below
		436 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.30	8	0	0
77.80	1,200	302	302

Device	Routing	Invert	Outlet Devices
#1	Primary	74.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.50' / 74.45' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.30 cfs @ 12.09 hrs HW=75.24' TW=74.92' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 1.30 cfs @ 2.90 fps)

Summary for Pond IB: Infiltration Basin

Inflow Area = 4.319 ac, 100.00% Impervious, Inflow Depth > 2.91" for 2-Year event
 Inflow = 12.92 cfs @ 12.10 hrs, Volume= 1.048 af
 Outflow = 2.60 cfs @ 12.54 hrs, Volume= 1.048 af, Atten= 80%, Lag= 26.3 min
 Discarded = 2.60 cfs @ 12.54 hrs, Volume= 1.048 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach PR-DP1 : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 70.83' @ 12.54 hrs Surf.Area= 13,571 sf Storage= 10,782 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 21.4 min (780.7 - 759.2)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	60,759 cf	Infiltration Basin (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	12,500	0	0
71.00	13,795	13,148	13,148
72.00	15,147	14,471	27,619
73.00	16,556	15,852	43,470
74.00	18,022	17,289	60,759

Device	Routing	Invert	Outlet Devices
#1	Discarded	70.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	73.00'	5.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Primary	71.20'	4.0" Vert. Orifice (Lower) C= 0.600 Limited to weir flow at low heads
#4	Primary	71.60'	6.0" Vert. Orifice (Middle) C= 0.600 Limited to weir flow at low heads
#5	Primary	72.10'	15.0" W x 6.0" H Vert. Orifice (Upper) C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=2.60 cfs @ 12.54 hrs HW=70.83' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.60 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=70.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
 ↑3=Orifice (Lower) (Controls 0.00 cfs)
 ↑4=Orifice (Middle) (Controls 0.00 cfs)
 ↑5=Orifice (Upper) (Controls 0.00 cfs)

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Type III 24-hr 10-Year Rainfall=4.83"

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 2
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR1A: NW C-Soils to DP1	Runoff Area=96,227 sf 0.00% Impervious Runoff Depth>1.90" Flow Length=1,247' Tc=24.2 min CN=70 Runoff=3.00 cfs 0.350 af
Subcatchment PR1B: NE C-Soils to DP1	Runoff Area=390,922 sf 0.00% Impervious Runoff Depth>1.90" Flow Length=1,594' Tc=27.8 min CN=70 Runoff=11.47 cfs 1.419 af
Subcatchment PR1C: A-Soils to DP1	Runoff Area=99,724 sf 0.00% Impervious Runoff Depth>0.00" Flow Length=280' Slope=0.0100 '/' Tc=18.7 min CN=30 Runoff=0.00 cfs 0.000 af
Subcatchment PR1D B1: Building 1	Runoff Area=37,800 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=4.10 cfs 0.332 af
Subcatchment PR1D B2: Building 2	Runoff Area=29,400 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=3.19 cfs 0.258 af
Subcatchment PR1D CB1: CB1	Runoff Area=13,150 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=1.43 cfs 0.115 af
Subcatchment PR1D CB10: CB10	Runoff Area=16,000 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=1.73 cfs 0.140 af
Subcatchment PR1D CB2: CB2	Runoff Area=11,700 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=1.27 cfs 0.103 af
Subcatchment PR1D CB3: CB3	Runoff Area=18,950 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=2.05 cfs 0.166 af
Subcatchment PR1D CB4: CB4	Runoff Area=6,400 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=0.69 cfs 0.056 af
Subcatchment PR1D CB5: CB5	Runoff Area=5,650 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=0.61 cfs 0.050 af
Subcatchment PR1D CB6: CB6	Runoff Area=5,600 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=0.61 cfs 0.049 af
Subcatchment PR1D CB7: CB7	Runoff Area=9,500 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=1.03 cfs 0.083 af
Subcatchment PR1D CB8: CB8	Runoff Area=15,500 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=1.68 cfs 0.136 af
Subcatchment PR1D CB9: CB9	Runoff Area=18,500 sf 100.00% Impervious Runoff Depth>4.59" Tc=6.0 min CN=98 Runoff=2.01 cfs 0.162 af

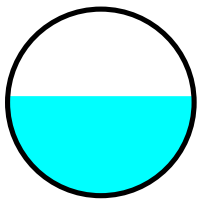
Summary for Reach P-1:

Inflow Area = 0.302 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 1.42 cfs @ 12.08 hrs, Volume= 0.115 af
Outflow = 1.41 cfs @ 12.10 hrs, Volume= 0.115 af, Atten= 1%, Lag= 0.7 min
Routed to Reach P-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.30 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 2.6 min

Peak Storage= 77 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.54' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 180.0' Slope= 0.0050 '/
Inlet Invert= 75.00', Outlet Invert= 74.10'



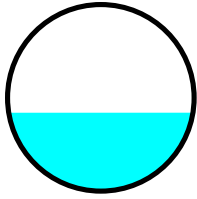
Summary for Reach P-10:

Inflow Area = 1.282 ac, 100.00% Impervious, Inflow Depth > 4.58" for 10-Year event
Inflow = 5.95 cfs @ 12.10 hrs, Volume= 0.490 af
Outflow = 5.94 cfs @ 12.11 hrs, Volume= 0.490 af, Atten= 0%, Lag= 0.3 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.71 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 1.1 min

Peak Storage= 128 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.84' , Surface Width= 1.98'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 102.0' Slope= 0.0050 '/
Inlet Invert= 71.69', Outlet Invert= 71.18'



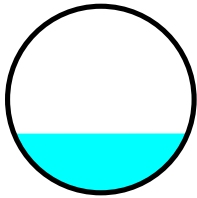
Summary for Reach P-11:

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 0.61 cfs @ 12.08 hrs, Volume= 0.049 af
Outflow = 0.61 cfs @ 12.09 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.1 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.82 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 0.94 fps, Avg. Travel Time= 0.4 min

Peak Storage= 5 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 0.93'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.85'



Summary for Reach P-12:

Inflow Area = 2.086 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 9.62 cfs @ 12.10 hrs, Volume= 0.797 af
Outflow = 9.62 cfs @ 12.10 hrs, Volume= 0.797 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-20 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.31 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.79 fps, Avg. Travel Time= 0.9 min

Peak Storage= 178 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.99' , Surface Width= 2.45'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

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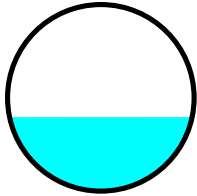
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30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 98.0' Slope= 0.0050 '/'
Inlet Invert= 71.18', Outlet Invert= 70.69'



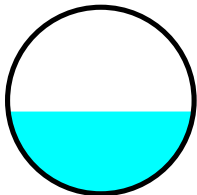
Summary for Reach P-13:

Inflow Area = 0.218 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 1.03 cfs @ 12.08 hrs, Volume= 0.083 af
Outflow = 1.02 cfs @ 12.10 hrs, Volume= 0.083 af, Atten= 1%, Lag= 0.8 min
Routed to Reach P-15A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.04 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 3.0 min

Peak Storage= 62 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.44' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 186.0' Slope= 0.0050 '/'
Inlet Invert= 74.30', Outlet Invert= 73.37'



Summary for Reach P-14:

Inflow Area = 0.356 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 1.68 cfs @ 12.08 hrs, Volume= 0.136 af
Outflow = 1.68 cfs @ 12.08 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-15A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.40 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 0.1 min

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Peak Storage= 5 cf @ 12.08 hrs

Average Depth at Peak Storage= 0.49' , Surface Width= 1.40'

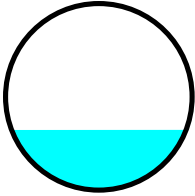
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 10.0' Slope= 0.0050 '/'

Inlet Invert= 73.60', Outlet Invert= 73.55'



Summary for Reach P-15A:

Inflow Area = 0.574 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event

Inflow = 2.69 cfs @ 12.09 hrs, Volume= 0.219 af

Outflow = 2.68 cfs @ 12.10 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.3 min

Routed to Reach P-15B :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 3.85 fps, Min. Travel Time= 0.4 min

Avg. Velocity = 1.30 fps, Avg. Travel Time= 1.3 min

Peak Storage= 72 cf @ 12.10 hrs

Average Depth at Peak Storage= 0.63' , Surface Width= 1.48'

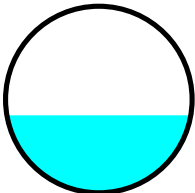
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.39 cfs

18.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 103.0' Slope= 0.0050 '/'

Inlet Invert= 73.37', Outlet Invert= 72.86'



Summary for Reach P-15B:

Inflow Area = 1.442 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event

Inflow = 6.77 cfs @ 12.09 hrs, Volume= 0.551 af

Outflow = 6.76 cfs @ 12.09 hrs, Volume= 0.551 af, Atten= 0%, Lag= 0.2 min

Routed to Reach P-17 :

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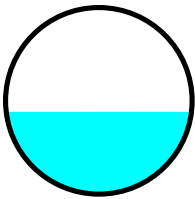
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.04 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 0.7 min

Peak Storage= 101 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.89' , Surface Width= 1.99'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.73 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 75.0' Slope= 0.0055 '/'
Inlet Invert= 72.86', Outlet Invert= 72.45'



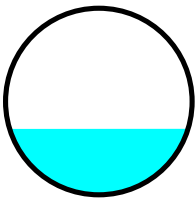
Summary for Reach P-16:

Inflow Area = 0.425 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 2.01 cfs @ 12.08 hrs, Volume= 0.162 af
Outflow = 2.01 cfs @ 12.09 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-17 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.57 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 0.1 min

Peak Storage= 6 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 1.44'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 74.50', Outlet Invert= 74.45'



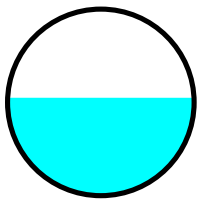
Summary for Reach P-17:

Inflow Area = 1.866 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 8.77 cfs @ 12.09 hrs, Volume= 0.714 af
Outflow = 8.74 cfs @ 12.10 hrs, Volume= 0.713 af, Atten= 0%, Lag= 0.4 min
Routed to Reach P-19 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.22 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.79 fps, Avg. Travel Time= 1.5 min

Peak Storage= 276 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.05' , Surface Width= 2.00'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.04 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 165.0' Slope= 0.0050 '/'
Inlet Invert= 72.45', Outlet Invert= 71.62'



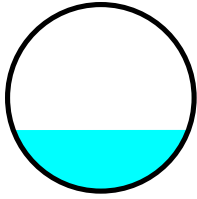
Summary for Reach P-18:

Inflow Area = 0.367 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 1.73 cfs @ 12.08 hrs, Volume= 0.140 af
Outflow = 1.73 cfs @ 12.08 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-19 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.43 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 0.1 min

Peak Storage= 5 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.49' , Surface Width= 1.41'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 75.60', Outlet Invert= 75.55'



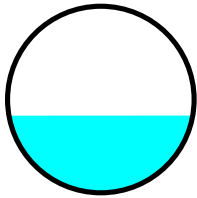
Summary for Reach P-19:

Inflow Area = 2.234 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 10.45 cfs @ 12.10 hrs, Volume= 0.854 af
Outflow = 10.43 cfs @ 12.10 hrs, Volume= 0.854 af, Atten= 0%, Lag= 0.3 min
Routed to Reach P-20 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.43 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 1.3 min

Peak Storage= 269 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.04' , Surface Width= 2.46'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 140.0' Slope= 0.0050 '/'
Inlet Invert= 71.62', Outlet Invert= 70.92'



Summary for Reach P-2:

Inflow Area = 0.269 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 1.27 cfs @ 12.08 hrs, Volume= 0.103 af
Outflow = 1.27 cfs @ 12.08 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.44 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.48' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

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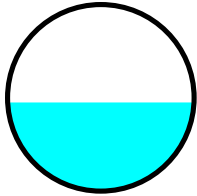
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12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 75.00', Outlet Invert= 74.97'



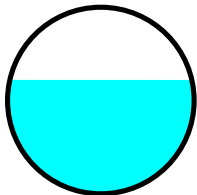
Summary for Reach P-20:

Inflow Area = 4.319 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 20.05 cfs @ 12.10 hrs, Volume= 1.650 af
Outflow = 20.05 cfs @ 12.10 hrs, Volume= 1.650 af, Atten= 0%, Lag= 0.0 min
Routed to Pond IB : Infiltration Basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.38 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.22 fps, Avg. Travel Time= 0.1 min

Peak Storage= 50 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.53' , Surface Width= 2.44'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 16.0' Slope= 0.0050 '/'
Inlet Invert= 70.69', Outlet Invert= 70.61'



Summary for Reach P-21:

Inflow Area = 0.868 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 4.10 cfs @ 12.08 hrs, Volume= 0.332 af
Outflow = 4.10 cfs @ 12.08 hrs, Volume= 0.332 af, Atten= 0%, Lag= 0.1 min
Routed to Reach P-15B :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 8.52 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.83 fps, Avg. Travel Time= 0.3 min

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Peak Storage= 27 cf @ 12.08 hrs

Average Depth at Peak Storage= 0.48' , Surface Width= 1.40'

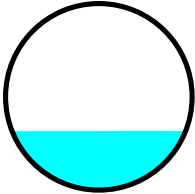
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.83 cfs

18.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 56.0' Slope= 0.0321 '/'

Inlet Invert= 77.00', Outlet Invert= 75.20'



Summary for Reach P-22:

Inflow Area = 0.675 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event

Inflow = 3.19 cfs @ 12.08 hrs, Volume= 0.258 af

Outflow = 3.19 cfs @ 12.08 hrs, Volume= 0.258 af, Atten= 0%, Lag= 0.0 min

Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 8.82 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 2.99 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.08 hrs

Average Depth at Peak Storage= 0.47' , Surface Width= 1.00'

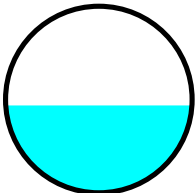
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 5.0' Slope= 0.0400 '/'

Inlet Invert= 77.20', Outlet Invert= 77.00'



Summary for Reach P-24:

Inflow Area = 8.974 ac, 0.00% Impervious, Inflow Depth > 1.88" for 10-Year event

Inflow = 10.26 cfs @ 12.54 hrs, Volume= 1.404 af

Outflow = 10.26 cfs @ 12.54 hrs, Volume= 1.404 af, Atten= 0%, Lag= 0.0 min

Routed to Reach PR-DP1 : DP1

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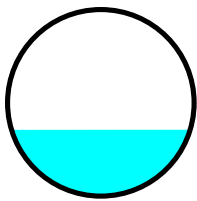
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 10.24 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.72 fps, Avg. Travel Time= 0.1 min

Peak Storage= 30 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.71' , Surface Width= 1.92'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 37.81 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 30.0' Slope= 0.0200 '/'
Inlet Invert= 76.40', Outlet Invert= 75.80'



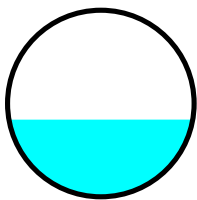
Summary for Reach P-3:

Inflow Area = 0.570 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 2.67 cfs @ 12.09 hrs, Volume= 0.218 af
Outflow = 2.67 cfs @ 12.10 hrs, Volume= 0.218 af, Atten= 0%, Lag= 0.4 min
Routed to Reach P-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.86 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 1.5 min

Peak Storage= 80 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.62' , Surface Width= 1.48'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 116.0' Slope= 0.0050 '/'
Inlet Invert= 74.10', Outlet Invert= 73.52'



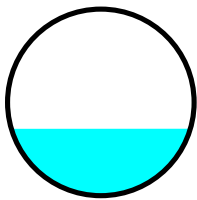
Summary for Reach P-4:

Inflow Area = 0.435 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 2.05 cfs @ 12.08 hrs, Volume= 0.166 af
Outflow = 2.05 cfs @ 12.09 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.59 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 0.2 min

Peak Storage= 7 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.54' , Surface Width= 1.44'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.0050 '/'
Inlet Invert= 75.20', Outlet Invert= 75.14'



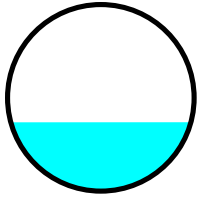
Summary for Reach P-5:

Inflow Area = 1.006 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 4.71 cfs @ 12.09 hrs, Volume= 0.384 af
Outflow = 4.68 cfs @ 12.10 hrs, Volume= 0.384 af, Atten= 1%, Lag= 0.6 min
Routed to Reach P-7 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.42 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 2.4 min

Peak Storage= 222 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.74' , Surface Width= 1.93'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 210.0' Slope= 0.0050 '/'
Inlet Invert= 73.52', Outlet Invert= 72.47'



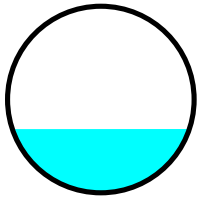
Summary for Reach P-6:

Inflow Area = 0.147 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 0.69 cfs @ 12.08 hrs, Volume= 0.056 af
Outflow = 0.69 cfs @ 12.08 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-7 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.92 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 0.95'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.97'



Summary for Reach P-7:

Inflow Area = 1.152 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 5.36 cfs @ 12.10 hrs, Volume= 0.440 af
Outflow = 5.35 cfs @ 12.10 hrs, Volume= 0.440 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.58 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.8 min

Peak Storage= 91 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.80' , Surface Width= 1.96'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

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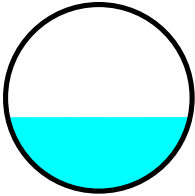
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24.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 78.0' Slope= 0.0050 '/'

Inlet Invert= 72.47', Outlet Invert= 72.08'



Summary for Reach P-8:

Inflow Area = 0.130 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 0.61 cfs @ 12.08 hrs, Volume= 0.050 af
Outflow = 0.61 cfs @ 12.09 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.82 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.94 fps, Avg. Travel Time= 0.1 min

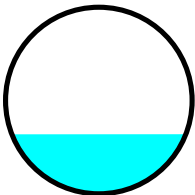
Peak Storage= 1 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 0.93'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 5.0' Slope= 0.0060 '/'

Inlet Invert= 77.00', Outlet Invert= 76.97'



Summary for Reach P-9:

Inflow Area = 1.282 ac, 100.00% Impervious, Inflow Depth > 4.58" for 10-Year event
Inflow = 5.95 cfs @ 12.10 hrs, Volume= 0.490 af
Outflow = 5.95 cfs @ 12.10 hrs, Volume= 0.490 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.71 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 0.8 min

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Peak Storage= 98 cf @ 12.10 hrs

Average Depth at Peak Storage= 0.84' , Surface Width= 1.98'

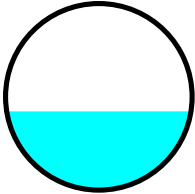
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 78.0' Slope= 0.0050 '/'

Inlet Invert= 72.08', Outlet Invert= 71.69'



Summary for Reach PR-DP1: DP1

Inflow Area = 17.792 ac, 24.28% Impervious, Inflow Depth > 1.19" for 10-Year event

Inflow = 13.07 cfs @ 12.51 hrs, Volume= 1.765 af

Outflow = 13.07 cfs @ 12.51 hrs, Volume= 1.765 af, Atten= 0%, Lag= 0.0 min

Routed to nonexistent node 17R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Summary for Reach Swale A:

Inflow Area = 2.209 ac, 0.00% Impervious, Inflow Depth > 1.90" for 10-Year event

Inflow = 3.00 cfs @ 12.35 hrs, Volume= 0.350 af

Outflow = 2.93 cfs @ 12.40 hrs, Volume= 0.348 af, Atten= 2%, Lag= 3.5 min

Routed to Reach PR-DP1 : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 1.77 fps, Min. Travel Time= 3.9 min

Avg. Velocity = 0.75 fps, Avg. Travel Time= 9.2 min

Peak Storage= 680 cf @ 12.40 hrs

Average Depth at Peak Storage= 0.74' , Surface Width= 2.98'

Bank-Full Depth= 1.50' Flow Area= 4.5 sf, Capacity= 11.32 cfs

1.50' x 1.50' deep channel, n= 0.078 Riprap, 12-inch

Side Slope Z-value= 1.0 '/' Top Width= 4.50'

Length= 410.0' Slope= 0.0241 '/'

Inlet Invert= 80.90', Outlet Invert= 71.00'



Summary for Reach Swale B:

Inflow Area = 8.974 ac, 0.00% Impervious, Inflow Depth > 1.90" for 10-Year event
 Inflow = 11.47 cfs @ 12.39 hrs, Volume= 1.419 af
 Outflow = 10.26 cfs @ 12.54 hrs, Volume= 1.404 af, Atten= 11%, Lag= 9.0 min
 Routed to Reach P-24 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 1.32 fps, Min. Travel Time= 10.8 min
 Avg. Velocity = 0.55 fps, Avg. Travel Time= 26.1 min

Peak Storage= 6,676 cf @ 12.54 hrs
 Average Depth at Peak Storage= 1.33' , Surface Width= 7.16'
 Bank-Full Depth= 2.50' Flow Area= 17.5 sf, Capacity= 31.78 cfs

4.50' x 2.50' deep channel, n= 0.078 Riprap, 12-inch
 Side Slope Z-value= 1.0 ' / ' Top Width= 9.50'
 Length= 860.0' Slope= 0.0052 ' / '
 Inlet Invert= 80.90', Outlet Invert= 76.40'



Summary for Pond CB1:

Inflow Area = 0.302 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 1.43 cfs @ 12.08 hrs, Volume= 0.115 af
 Outflow = 1.42 cfs @ 12.08 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.42 cfs @ 12.08 hrs, Volume= 0.115 af
 Routed to Reach P-1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 76.00' @ 12.09 hrs Surf.Area= 13 sf Storage= 13 cf

Plug-Flow detention time= 0.7 min calculated for 0.115 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (748.5 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	85 cf	4.00'D x 6.80'H Catch Basin
#2	77.80'	234 cf	Ponding Over CB Rim (Prismatic) Listed below
		319 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.80	4	0	0
78.30	932	234	234

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Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	12.0" Round Culvert L= 180.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.00' / 74.10' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.42 cfs @ 12.08 hrs HW=76.00' TW=75.53' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 1.42 cfs @ 2.26 fps)

Summary for Pond CB10:

Inflow Area = 0.367 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 1.73 cfs @ 12.08 hrs, Volume= 0.140 af
 Outflow = 1.73 cfs @ 12.08 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.73 cfs @ 12.08 hrs, Volume= 0.140 af
 Routed to Reach P-18 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 76.34' @ 12.08 hrs Surf.Area= 20 sf Storage= 14 cf

Plug-Flow detention time= 0.6 min calculated for 0.140 af (100% of inflow)

Center-of-Mass det. time= 0.4 min (748.5 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	75.60'	137 cf	5.00'D x 7.00'H Catch Basin
#2	78.60'	3,895 cf	Ponding Over CB Rim (Prismatic) Listed below
		4,032 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.60	8	0	0
83.60	1,550	3,895	3,895

Device	Routing	Invert	Outlet Devices
#1	Primary	75.60'	18.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.60' / 75.55' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.73 cfs @ 12.08 hrs HW=76.34' TW=76.09' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 1.73 cfs @ 2.94 fps)

Summary for Pond CB2:

Inflow Area = 0.269 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 1.27 cfs @ 12.08 hrs, Volume= 0.103 af
 Outflow = 1.27 cfs @ 12.08 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.27 cfs @ 12.08 hrs, Volume= 0.103 af
 Routed to Reach P-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

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Peak Elev= 75.73' @ 12.08 hrs Surf.Area= 13 sf Storage= 9 cf

Plug-Flow detention time= 0.5 min calculated for 0.103 af (100% of inflow)

Center-of-Mass det. time= 0.3 min (748.4 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	78.00'	1,012 cf	Ponding Over CB Rim (Prismatic) Listed below
		1,100 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.00	4	0	0
78.50	4,044	1,012	1,012

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.00' / 74.97' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.27 cfs @ 12.08 hrs HW=75.73' TW=75.48' (Dynamic Tailwater)←**1=Culvert** (Barrel Controls 1.27 cfs @ 2.88 fps)**Summary for Pond CB3:**

Inflow Area = 0.435 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 2.05 cfs @ 12.08 hrs, Volume= 0.166 af
 Outflow = 2.05 cfs @ 12.08 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.1 min
 Primary = 2.05 cfs @ 12.08 hrs, Volume= 0.166 af
 Routed to Reach P-4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 76.18' @ 12.08 hrs Surf.Area= 13 sf Storage= 12 cf

Plug-Flow detention time= 0.4 min calculated for 0.166 af (100% of inflow)

Center-of-Mass det. time= 0.3 min (748.3 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	75.20'	88 cf	4.00'D x 7.00'H Catch Basin
#2	78.20'	248 cf	Ponding Over CB Rim (Prismatic) Listed below
		336 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.20	8	0	0
78.70	985	248	248

Device	Routing	Invert	Outlet Devices
#1	Primary	75.20'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500

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Inlet / Outlet Invert= 75.20' / 75.14' S= 0.0050 ' / Cc= 0.900
 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.05 cfs @ 12.08 hrs HW=76.18' TW=75.74' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 2.05 cfs @ 3.31 fps)

Summary for Pond CB4:

Inflow Area = 0.147 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 0.69 cfs @ 12.08 hrs, Volume= 0.056 af
 Outflow = 0.69 cfs @ 12.08 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.69 cfs @ 12.08 hrs, Volume= 0.056 af
 Routed to Reach P-6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.52' @ 12.08 hrs Surf.Area= 13 sf Storage= 7 cf

Plug-Flow detention time= 0.6 min calculated for 0.056 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (748.5 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	900 cf	Ponding Over CB Rim (Prismatic) Listed below
		988 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	3,595	900	900

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.97' S= 0.0060 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.69 cfs @ 12.08 hrs HW=77.52' TW=77.34' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 0.69 cfs @ 2.46 fps)

Summary for Pond CB5:

Inflow Area = 0.130 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 0.61 cfs @ 12.08 hrs, Volume= 0.050 af
 Outflow = 0.61 cfs @ 12.08 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.61 cfs @ 12.08 hrs, Volume= 0.050 af
 Routed to Reach P-8 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.48' @ 12.08 hrs Surf.Area= 13 sf Storage= 6 cf

Plug-Flow detention time= 0.7 min calculated for 0.050 af (100% of inflow)

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Center-of-Mass det. time= 0.5 min (748.5 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	602 cf	Ponding Over CB Rim (Prismatic) Listed below
		690 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	2,405	602	602

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.97' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 12.08 hrs HW=77.48' TW=77.32' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 0.61 cfs @ 2.38 fps)

Summary for Pond CB6:

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 0.61 cfs @ 12.08 hrs, Volume= 0.049 af
 Outflow = 0.61 cfs @ 12.08 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.61 cfs @ 12.08 hrs, Volume= 0.049 af
 Routed to Reach P-11 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.51' @ 12.09 hrs Surf.Area= 13 sf Storage= 6 cf

Plug-Flow detention time= 0.8 min calculated for 0.049 af (100% of inflow)
 Center-of-Mass det. time= 0.6 min (748.6 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	228 cf	Ponding Over CB Rim (Prismatic) Listed below
		316 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	908	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.85' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 12.08 hrs HW=77.51' TW=77.32' (Dynamic Tailwater)

↳1=Culvert (Outlet Controls 0.61 cfs @ 2.21 fps)

Summary for Pond CB7:

Inflow Area = 0.218 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 1.03 cfs @ 12.08 hrs, Volume= 0.083 af
 Outflow = 1.03 cfs @ 12.08 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.03 cfs @ 12.08 hrs, Volume= 0.083 af
 Routed to Reach P-13 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.14' @ 12.09 hrs Surf.Area= 13 sf Storage= 10 cf

Plug-Flow detention time= 0.8 min calculated for 0.083 af (100% of inflow)
 Center-of-Mass det. time= 0.6 min (748.6 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	74.30'	88 cf	4.00'D x 7.00'H Catch Basin
#2	77.30'	101 cf	Ponding Over CB Rim (Prismatic) Listed below
		189 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.30	4	0	0
77.80	400	101	101

Device	Routing	Invert	Outlet Devices
#1	Primary	74.30'	12.0" Round Culvert L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.30' / 73.37' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.03 cfs @ 12.08 hrs HW=75.13' TW=74.74' (Dynamic Tailwater)

↳1=Culvert (Outlet Controls 1.03 cfs @ 1.99 fps)

Summary for Pond CB8:

Inflow Area = 0.356 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 1.68 cfs @ 12.08 hrs, Volume= 0.136 af
 Outflow = 1.68 cfs @ 12.08 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.68 cfs @ 12.08 hrs, Volume= 0.136 af
 Routed to Reach P-14 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 74.46' @ 12.08 hrs Surf.Area= 13 sf Storage= 11 cf

Plug-Flow detention time= 0.4 min calculated for 0.136 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (748.3 - 748.0)

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Volume	Invert	Avail.Storage	Storage Description
#1	73.60'	88 cf	4.00'D x 7.00'H Catch Basin
#2	76.60'	176 cf	Ponding Over CB Rim (Prismatic) Listed below
		264 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.60	4	0	0
77.10	700	176	176

Device	Routing	Invert	Outlet Devices
#1	Primary	73.60'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.60' / 73.55' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.68 cfs @ 12.08 hrs HW=74.46' TW=74.08' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 1.68 cfs @ 3.12 fps)

Summary for Pond CB9:

Inflow Area = 0.425 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 2.01 cfs @ 12.08 hrs, Volume= 0.162 af
 Outflow = 2.01 cfs @ 12.08 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.1 min
 Primary = 2.01 cfs @ 12.08 hrs, Volume= 0.162 af
 Routed to Reach P-16 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.47' @ 12.08 hrs Surf.Area= 20 sf Storage= 19 cf

Plug-Flow detention time= 0.6 min calculated for 0.162 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (748.5 - 748.0)

Volume	Invert	Avail.Storage	Storage Description
#1	74.50'	134 cf	5.00'D x 6.80'H Catch Basin
#2	77.30'	302 cf	Ponding Over CB Rim (Prismatic) Listed below
		436 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.30	8	0	0
77.80	1,200	302	302

Device	Routing	Invert	Outlet Devices
#1	Primary	74.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.50' / 74.45' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.00 cfs @ 12.08 hrs HW=75.47' TW=75.03' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 2.00 cfs @ 3.28 fps)

Summary for Pond IB: Infiltration Basin

Inflow Area = 4.319 ac, 100.00% Impervious, Inflow Depth > 4.59" for 10-Year event
 Inflow = 20.05 cfs @ 12.10 hrs, Volume= 1.650 af
 Outflow = 2.96 cfs @ 12.61 hrs, Volume= 1.650 af, Atten= 85%, Lag= 30.5 min
 Discarded = 2.78 cfs @ 12.61 hrs, Volume= 1.638 af
 Primary = 0.18 cfs @ 12.61 hrs, Volume= 0.012 af
 Routed to Reach PR-DP1 : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 71.54' @ 12.61 hrs Surf.Area= 14,526 sf Storage= 20,806 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 44.6 min (795.3 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	60,759 cf	Infiltration Basin (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	12,500	0	0
71.00	13,795	13,148	13,148
72.00	15,147	14,471	27,619
73.00	16,556	15,852	43,470
74.00	18,022	17,289	60,759

Device	Routing	Invert	Outlet Devices
#1	Discarded	70.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	73.00'	5.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Primary	71.20'	4.0" Vert. Orifice (Lower) C= 0.600 Limited to weir flow at low heads
#4	Primary	71.60'	6.0" Vert. Orifice (Middle) C= 0.600 Limited to weir flow at low heads
#5	Primary	72.10'	15.0" W x 6.0" H Vert. Orifice (Upper) C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=2.78 cfs @ 12.61 hrs HW=71.54' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.78 cfs)

Primary OutFlow Max=0.18 cfs @ 12.61 hrs HW=71.54' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
 ↑3=Orifice (Lower) (Orifice Controls 0.18 cfs @ 2.01 fps)
 ↑4=Orifice (Middle) (Controls 0.00 cfs)
 ↑5=Orifice (Upper) (Controls 0.00 cfs)

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 2
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR1A: NW C-Soils to DP1	Runoff Area=96,227 sf 0.00% Impervious Runoff Depth>2.92" Flow Length=1,247' Tc=24.2 min CN=70 Runoff=4.70 cfs 0.537 af
Subcatchment PR1B: NE C-Soils to DP1	Runoff Area=390,922 sf 0.00% Impervious Runoff Depth>2.91" Flow Length=1,594' Tc=27.8 min CN=70 Runoff=17.97 cfs 2.179 af
Subcatchment PR1C: A-Soils to DP1	Runoff Area=99,724 sf 0.00% Impervious Runoff Depth>0.09" Flow Length=280' Slope=0.0100 '/' Tc=18.7 min CN=30 Runoff=0.03 cfs 0.017 af
Subcatchment PR1D B1: Building 1	Runoff Area=37,800 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=5.24 cfs 0.428 af
Subcatchment PR1D B2: Building 2	Runoff Area=29,400 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=4.08 cfs 0.333 af
Subcatchment PR1D CB1: CB1	Runoff Area=13,150 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=1.82 cfs 0.149 af
Subcatchment PR1D CB10: CB10	Runoff Area=16,000 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=2.22 cfs 0.181 af
Subcatchment PR1D CB2: CB2	Runoff Area=11,700 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=1.62 cfs 0.132 af
Subcatchment PR1D CB3: CB3	Runoff Area=18,950 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=2.63 cfs 0.215 af
Subcatchment PR1D CB4: CB4	Runoff Area=6,400 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=0.89 cfs 0.072 af
Subcatchment PR1D CB5: CB5	Runoff Area=5,650 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=0.78 cfs 0.064 af
Subcatchment PR1D CB6: CB6	Runoff Area=5,600 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=0.78 cfs 0.063 af
Subcatchment PR1D CB7: CB7	Runoff Area=9,500 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=1.32 cfs 0.108 af
Subcatchment PR1D CB8: CB8	Runoff Area=15,500 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=2.15 cfs 0.175 af
Subcatchment PR1D CB9: CB9	Runoff Area=18,500 sf 100.00% Impervious Runoff Depth>5.92" Tc=6.0 min CN=98 Runoff=2.56 cfs 0.209 af

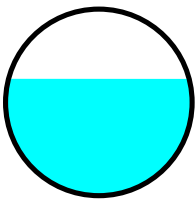
Summary for Reach P-1:

Inflow Area = 0.302 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 1.82 cfs @ 12.09 hrs, Volume= 0.149 af
Outflow = 1.80 cfs @ 12.10 hrs, Volume= 0.149 af, Atten= 1%, Lag= 0.7 min
Routed to Reach P-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.49 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 2.4 min

Peak Storage= 93 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 0.97'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 180.0' Slope= 0.0050 '/
Inlet Invert= 75.00', Outlet Invert= 74.10'



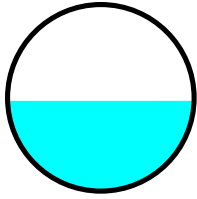
Summary for Reach P-10:

Inflow Area = 1.282 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 7.61 cfs @ 12.10 hrs, Volume= 0.632 af
Outflow = 7.60 cfs @ 12.11 hrs, Volume= 0.631 af, Atten= 0%, Lag= 0.3 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.03 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.73 fps, Avg. Travel Time= 1.0 min

Peak Storage= 154 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.97' , Surface Width= 2.00'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 102.0' Slope= 0.0050 '/
Inlet Invert= 71.69', Outlet Invert= 71.18'



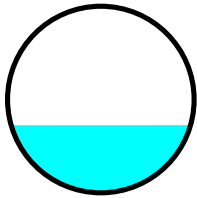
Summary for Reach P-11:

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 0.78 cfs @ 12.08 hrs, Volume= 0.063 af
Outflow = 0.78 cfs @ 12.09 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.1 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.02 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 0.4 min

Peak Storage= 6 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 0.96'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.85'



Summary for Reach P-12:

Inflow Area = 2.086 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 12.33 cfs @ 12.10 hrs, Volume= 1.028 af
Outflow = 12.32 cfs @ 12.10 hrs, Volume= 1.027 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-20 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.67 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.93 fps, Avg. Travel Time= 0.8 min

Peak Storage= 213 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.14' , Surface Width= 2.49'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

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Type III 24-hr 25-Year Rainfall=6.16"

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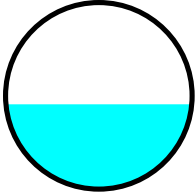
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30.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 98.0' Slope= 0.0050 '/'

Inlet Invert= 71.18', Outlet Invert= 70.69'



Summary for Reach P-13:

Inflow Area = 0.218 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 1.32 cfs @ 12.08 hrs, Volume= 0.108 af
Outflow = 1.30 cfs @ 12.10 hrs, Volume= 0.107 af, Atten= 1%, Lag= 0.7 min
Routed to Reach P-15A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.23 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 2.8 min

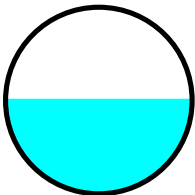
Peak Storage= 75 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.51' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 186.0' Slope= 0.0050 '/'

Inlet Invert= 74.30', Outlet Invert= 73.37'



Summary for Reach P-14:

Inflow Area = 0.356 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 2.15 cfs @ 12.08 hrs, Volume= 0.175 af
Outflow = 2.15 cfs @ 12.08 hrs, Volume= 0.175 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-15A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.64 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 0.1 min

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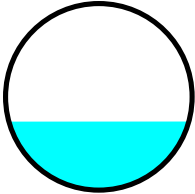
Type III 24-hr 25-Year Rainfall=6.16"

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Peak Storage= 6 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.55' , Surface Width= 1.45'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 73.60', Outlet Invert= 73.55'



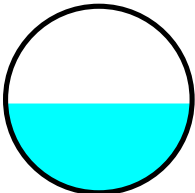
Summary for Reach P-15A:

Inflow Area = 0.574 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 3.44 cfs @ 12.09 hrs, Volume= 0.283 af
Outflow = 3.43 cfs @ 12.09 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.3 min
Routed to Reach P-15B :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.10 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 1.2 min

Peak Storage= 86 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.72' , Surface Width= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.39 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 103.0' Slope= 0.0050 '/'
Inlet Invert= 73.37', Outlet Invert= 72.86'



Summary for Reach P-15B:

Inflow Area = 1.442 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 8.66 cfs @ 12.09 hrs, Volume= 0.711 af
Outflow = 8.65 cfs @ 12.09 hrs, Volume= 0.711 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-17 :

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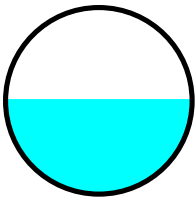
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.37 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.84 fps, Avg. Travel Time= 0.7 min

Peak Storage= 121 cf @ 12.09 hrs
Average Depth at Peak Storage= 1.02' , Surface Width= 2.00'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.73 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 75.0' Slope= 0.0055 '/'
Inlet Invert= 72.86', Outlet Invert= 72.45'



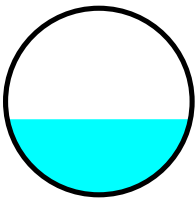
Summary for Reach P-16:

Inflow Area = 0.425 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 2.56 cfs @ 12.09 hrs, Volume= 0.209 af
Outflow = 2.56 cfs @ 12.09 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-17 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.82 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 0.1 min

Peak Storage= 7 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.61' , Surface Width= 1.47'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 74.50', Outlet Invert= 74.45'



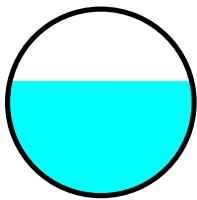
Summary for Reach P-17:

Inflow Area = 1.866 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 11.21 cfs @ 12.09 hrs, Volume= 0.920 af
Outflow = 11.18 cfs @ 12.10 hrs, Volume= 0.920 af, Atten= 0%, Lag= 0.4 min
Routed to Reach P-19 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.52 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.93 fps, Avg. Travel Time= 1.4 min

Peak Storage= 334 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.23' , Surface Width= 1.95'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.04 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 165.0' Slope= 0.0050 '/'
Inlet Invert= 72.45', Outlet Invert= 71.62'



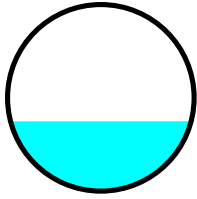
Summary for Reach P-18:

Inflow Area = 0.367 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 2.22 cfs @ 12.08 hrs, Volume= 0.181 af
Outflow = 2.22 cfs @ 12.08 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-19 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.67 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 0.1 min

Peak Storage= 6 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.56' , Surface Width= 1.45'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 75.60', Outlet Invert= 75.55'



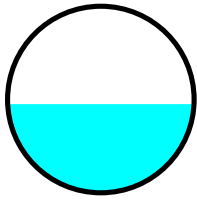
Summary for Reach P-19:

Inflow Area = 2.234 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 13.37 cfs @ 12.09 hrs, Volume= 1.101 af
Outflow = 13.35 cfs @ 12.10 hrs, Volume= 1.100 af, Atten= 0%, Lag= 0.3 min
Routed to Reach P-20 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.79 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 1.2 min

Peak Storage= 323 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.19' , Surface Width= 2.50'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 140.0' Slope= 0.0050 '/'
Inlet Invert= 71.62', Outlet Invert= 70.92'



Summary for Reach P-2:

Inflow Area = 0.269 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 1.62 cfs @ 12.08 hrs, Volume= 0.132 af
Outflow = 1.62 cfs @ 12.08 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.65 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.55' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

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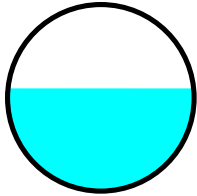
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Type III 24-hr 25-Year Rainfall=6.16"

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12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 75.00', Outlet Invert= 74.97'



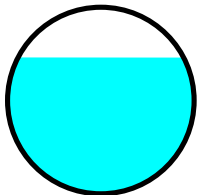
Summary for Reach P-20:

Inflow Area = 4.319 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 25.66 cfs @ 12.10 hrs, Volume= 2.128 af
Outflow = 25.66 cfs @ 12.10 hrs, Volume= 2.128 af, Atten= 0%, Lag= 0.0 min
Routed to Pond IB : Infiltration Basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.67 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 0.1 min

Peak Storage= 62 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.83' , Surface Width= 2.22'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 16.0' Slope= 0.0050 '/'
Inlet Invert= 70.69', Outlet Invert= 70.61'



Summary for Reach P-21:

Inflow Area = 0.868 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 5.24 cfs @ 12.08 hrs, Volume= 0.428 af
Outflow = 5.24 cfs @ 12.08 hrs, Volume= 0.428 af, Atten= 0%, Lag= 0.1 min
Routed to Reach P-15B :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 9.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.05 fps, Avg. Travel Time= 0.3 min

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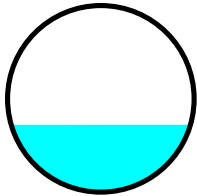
Type III 24-hr 25-Year Rainfall=6.16"

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Peak Storage= 32 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.54' , Surface Width= 1.44'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.83 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 56.0' Slope= 0.0321 '/'
Inlet Invert= 77.00', Outlet Invert= 75.20'



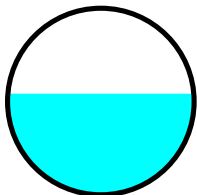
Summary for Reach P-22:

Inflow Area = 0.675 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 4.08 cfs @ 12.08 hrs, Volume= 0.333 af
Outflow = 4.08 cfs @ 12.08 hrs, Volume= 0.333 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 9.37 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.23 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.54' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 77.20', Outlet Invert= 77.00'



Summary for Reach P-24:

Inflow Area = 8.974 ac, 0.00% Impervious, Inflow Depth > 2.89" for 25-Year event
Inflow = 16.38 cfs @ 12.51 hrs, Volume= 2.161 af
Outflow = 16.38 cfs @ 12.52 hrs, Volume= 2.161 af, Atten= 0%, Lag= 0.0 min
Routed to Reach PR-DP1 : DP1

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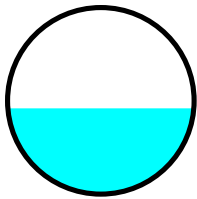
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 11.60 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 5.19 fps, Avg. Travel Time= 0.1 min

Peak Storage= 42 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.92' , Surface Width= 1.99'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 37.81 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 30.0' Slope= 0.0200 '/'
Inlet Invert= 76.40', Outlet Invert= 75.80'



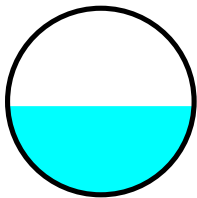
Summary for Reach P-3:

Inflow Area = 0.570 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 3.42 cfs @ 12.09 hrs, Volume= 0.281 af
Outflow = 3.41 cfs @ 12.10 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.4 min
Routed to Reach P-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.11 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 1.4 min

Peak Storage= 96 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.71' , Surface Width= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 116.0' Slope= 0.0050 '/'
Inlet Invert= 74.10', Outlet Invert= 73.52'



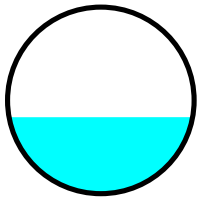
Summary for Reach P-4:

Inflow Area = 0.435 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 2.63 cfs @ 12.08 hrs, Volume= 0.214 af
Outflow = 2.63 cfs @ 12.09 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.84 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 0.2 min

Peak Storage= 8 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.62' , Surface Width= 1.48'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.0050 '/'
Inlet Invert= 75.20', Outlet Invert= 75.14'



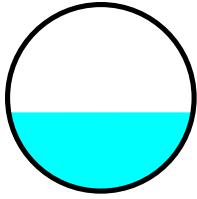
Summary for Reach P-5:

Inflow Area = 1.006 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 6.02 cfs @ 12.09 hrs, Volume= 0.496 af
Outflow = 5.98 cfs @ 12.10 hrs, Volume= 0.495 af, Atten= 1%, Lag= 0.6 min
Routed to Reach P-7 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.72 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 2.2 min

Peak Storage= 266 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.85' , Surface Width= 1.98'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 210.0' Slope= 0.0050 '/'
Inlet Invert= 73.52', Outlet Invert= 72.47'



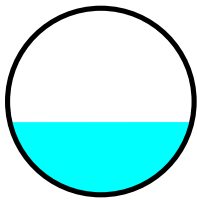
Summary for Reach P-6:

Inflow Area = 0.147 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af
Outflow = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-7 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.13 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.97'



Summary for Reach P-7:

Inflow Area = 1.152 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 6.86 cfs @ 12.10 hrs, Volume= 0.568 af
Outflow = 6.85 cfs @ 12.10 hrs, Volume= 0.568 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.89 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 0.8 min

Peak Storage= 109 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.91' , Surface Width= 1.99'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

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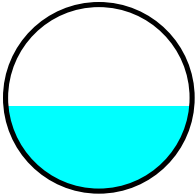
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24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 78.0' Slope= 0.0050 '/'
Inlet Invert= 72.47', Outlet Invert= 72.08'



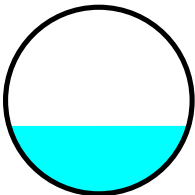
Summary for Reach P-8:

Inflow Area = 0.130 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
Inflow = 0.78 cfs @ 12.08 hrs, Volume= 0.064 af
Outflow = 0.78 cfs @ 12.08 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.02 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 0.96'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.97'



Summary for Reach P-9:

Inflow Area = 1.282 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
Inflow = 7.62 cfs @ 12.10 hrs, Volume= 0.632 af
Outflow = 7.61 cfs @ 12.10 hrs, Volume= 0.632 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.03 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.72 fps, Avg. Travel Time= 0.8 min

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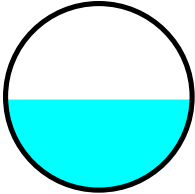
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Peak Storage= 118 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.97' , Surface Width= 2.00'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 78.0' Slope= 0.0050 '/'
Inlet Invert= 72.08', Outlet Invert= 71.69'



Summary for Reach PR-DP1: DP1

Inflow Area = 17.792 ac, 24.28% Impervious, Inflow Depth > 1.89" for 25-Year event
Inflow = 21.32 cfs @ 12.49 hrs, Volume= 2.800 af
Outflow = 21.32 cfs @ 12.49 hrs, Volume= 2.800 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 17R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Summary for Reach Swale A:

Inflow Area = 2.209 ac, 0.00% Impervious, Inflow Depth > 2.92" for 25-Year event
Inflow = 4.70 cfs @ 12.34 hrs, Volume= 0.537 af
Outflow = 4.61 cfs @ 12.39 hrs, Volume= 0.535 af, Atten= 2%, Lag= 2.8 min
Routed to Reach PR-DP1 : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.00 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 8.2 min

Peak Storage= 946 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.94' , Surface Width= 3.39'
Bank-Full Depth= 1.50' Flow Area= 4.5 sf, Capacity= 11.32 cfs

1.50' x 1.50' deep channel, n= 0.078 Riprap, 12-inch
Side Slope Z-value= 1.0 '/' Top Width= 4.50'
Length= 410.0' Slope= 0.0241 '/'
Inlet Invert= 80.90', Outlet Invert= 71.00'



Summary for Reach Swale B:

Inflow Area = 8.974 ac, 0.00% Impervious, Inflow Depth > 2.91" for 25-Year event
 Inflow = 17.97 cfs @ 12.39 hrs, Volume= 2.179 af
 Outflow = 16.38 cfs @ 12.51 hrs, Volume= 2.161 af, Atten= 9%, Lag= 7.4 min
 Routed to Reach P-24 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 1.51 fps, Min. Travel Time= 9.5 min
 Avg. Velocity = 0.62 fps, Avg. Travel Time= 23.3 min

Peak Storage= 9,309 cf @ 12.51 hrs
 Average Depth at Peak Storage= 1.74' , Surface Width= 7.97'
 Bank-Full Depth= 2.50' Flow Area= 17.5 sf, Capacity= 31.78 cfs

4.50' x 2.50' deep channel, n= 0.078 Riprap, 12-inch
 Side Slope Z-value= 1.0 ' / ' Top Width= 9.50'
 Length= 860.0' Slope= 0.0052 ' / '
 Inlet Invert= 80.90', Outlet Invert= 76.40'



Summary for Pond CB1:

Inflow Area = 0.302 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 1.82 cfs @ 12.08 hrs, Volume= 0.149 af
 Outflow = 1.82 cfs @ 12.09 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.82 cfs @ 12.09 hrs, Volume= 0.149 af
 Routed to Reach P-1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 76.19' @ 12.09 hrs Surf.Area= 13 sf Storage= 15 cf

Plug-Flow detention time= 0.6 min calculated for 0.149 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (744.6 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	85 cf	4.00'D x 6.80'H Catch Basin
#2	77.80'	234 cf	Ponding Over CB Rim (Prismatic) Listed below
		319 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.80	4	0	0
78.30	932	234	234

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Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	12.0" Round Culvert L= 180.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.00' / 74.10' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.82 cfs @ 12.09 hrs HW=76.18' TW=75.62' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 1.82 cfs @ 2.47 fps)

Summary for Pond CB10:

Inflow Area = 0.367 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 2.22 cfs @ 12.08 hrs, Volume= 0.181 af
 Outflow = 2.22 cfs @ 12.08 hrs, Volume= 0.181 af, Atten= 0%, Lag= 0.1 min
 Primary = 2.22 cfs @ 12.08 hrs, Volume= 0.181 af
 Routed to Reach P-18 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 76.44' @ 12.08 hrs Surf.Area= 20 sf Storage= 17 cf

Plug-Flow detention time= 0.5 min calculated for 0.181 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (744.6 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	75.60'	137 cf	5.00'D x 7.00'H Catch Basin
#2	78.60'	3,895 cf	Ponding Over CB Rim (Prismatic) Listed below
		4,032 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.60	8	0	0
83.60	1,550	3,895	3,895

Device	Routing	Invert	Outlet Devices
#1	Primary	75.60'	18.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.60' / 75.55' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.21 cfs @ 12.08 hrs HW=76.44' TW=76.16' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 2.21 cfs @ 3.13 fps)

Summary for Pond CB2:

Inflow Area = 0.269 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 1.62 cfs @ 12.08 hrs, Volume= 0.132 af
 Outflow = 1.62 cfs @ 12.08 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.62 cfs @ 12.08 hrs, Volume= 0.132 af
 Routed to Reach P-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

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Peak Elev= 75.85' @ 12.08 hrs Surf.Area= 13 sf Storage= 11 cf

Plug-Flow detention time= 0.4 min calculated for 0.132 af (100% of inflow)

Center-of-Mass det. time= 0.3 min (744.5 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	78.00'	1,012 cf	Ponding Over CB Rim (Prismatic) Listed below
		1,100 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.00	4	0	0
78.50	4,044	1,012	1,012

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.00' / 74.97' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.62 cfs @ 12.08 hrs HW=75.84' TW=75.55' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 1.62 cfs @ 3.09 fps)**Summary for Pond CB3:**

Inflow Area = 0.435 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 2.63 cfs @ 12.08 hrs, Volume= 0.215 af
 Outflow = 2.63 cfs @ 12.08 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.1 min
 Primary = 2.63 cfs @ 12.08 hrs, Volume= 0.214 af
 Routed to Reach P-4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 76.38' @ 12.08 hrs Surf.Area= 13 sf Storage= 15 cf

Plug-Flow detention time= 0.3 min calculated for 0.214 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (744.4 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	75.20'	88 cf	4.00'D x 7.00'H Catch Basin
#2	78.20'	248 cf	Ponding Over CB Rim (Prismatic) Listed below
		336 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.20	8	0	0
78.70	985	248	248

Device	Routing	Invert	Outlet Devices
#1	Primary	75.20'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500

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Inlet / Outlet Invert= 75.20' / 75.14' S= 0.0050 ' / Cc= 0.900
 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.62 cfs @ 12.08 hrs HW=76.38' TW=75.82' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 2.62 cfs @ 3.57 fps)

Summary for Pond CB4:

Inflow Area = 0.147 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af
 Outflow = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.89 cfs @ 12.08 hrs, Volume= 0.072 af
 Routed to Reach P-6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.59' @ 12.08 hrs Surf.Area= 13 sf Storage= 7 cf

Plug-Flow detention time= 0.6 min calculated for 0.072 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (744.6 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	900 cf	Ponding Over CB Rim (Prismatic) Listed below
		988 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	3,595	900	900

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.97' S= 0.0060 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.89 cfs @ 12.08 hrs HW=77.59' TW=77.39' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 0.89 cfs @ 2.62 fps)

Summary for Pond CB5:

Inflow Area = 0.130 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 0.78 cfs @ 12.08 hrs, Volume= 0.064 af
 Outflow = 0.78 cfs @ 12.08 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.78 cfs @ 12.08 hrs, Volume= 0.064 af
 Routed to Reach P-8 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.55' @ 12.08 hrs Surf.Area= 13 sf Storage= 7 cf

Plug-Flow detention time= 0.6 min calculated for 0.064 af (100% of inflow)

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Center-of-Mass det. time= 0.4 min (744.6 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	602 cf	Ponding Over CB Rim (Prismatic) Listed below
		690 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	2,405	602	602

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.97' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.78 cfs @ 12.08 hrs HW=77.55' TW=77.36' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 0.78 cfs @ 2.54 fps)

Summary for Pond CB6:

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 0.78 cfs @ 12.08 hrs, Volume= 0.063 af
 Outflow = 0.78 cfs @ 12.08 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.78 cfs @ 12.08 hrs, Volume= 0.063 af
 Routed to Reach P-11 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.58' @ 12.08 hrs Surf.Area= 13 sf Storage= 7 cf

Plug-Flow detention time= 0.7 min calculated for 0.063 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (744.7 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	228 cf	Ponding Over CB Rim (Prismatic) Listed below
		316 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	908	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.85' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.77 cfs @ 12.08 hrs HW=77.57' TW=77.36' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 0.77 cfs @ 2.39 fps)

Summary for Pond CB7:

Inflow Area = 0.218 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 1.32 cfs @ 12.08 hrs, Volume= 0.108 af
 Outflow = 1.32 cfs @ 12.08 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.32 cfs @ 12.08 hrs, Volume= 0.108 af
 Routed to Reach P-13 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.26' @ 12.09 hrs Surf.Area= 13 sf Storage= 12 cf

Plug-Flow detention time= 0.7 min calculated for 0.108 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (744.7 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	74.30'	88 cf	4.00'D x 7.00'H Catch Basin
#2	77.30'	101 cf	Ponding Over CB Rim (Prismatic) Listed below
		189 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.30	4	0	0
77.80	400	101	101

Device	Routing	Invert	Outlet Devices
#1	Primary	74.30'	12.0" Round Culvert L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.30' / 73.37' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.31 cfs @ 12.08 hrs HW=75.26' TW=74.81' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 1.31 cfs @ 2.18 fps)

Summary for Pond CB8:

Inflow Area = 0.356 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 2.15 cfs @ 12.08 hrs, Volume= 0.175 af
 Outflow = 2.15 cfs @ 12.08 hrs, Volume= 0.175 af, Atten= 0%, Lag= 0.1 min
 Primary = 2.15 cfs @ 12.08 hrs, Volume= 0.175 af
 Routed to Reach P-14 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 74.61' @ 12.08 hrs Surf.Area= 13 sf Storage= 13 cf

Plug-Flow detention time= 0.4 min calculated for 0.175 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (744.5 - 744.2)

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Volume	Invert	Avail.Storage	Storage Description
#1	73.60'	88 cf	4.00'D x 7.00'H Catch Basin
#2	76.60'	176 cf	Ponding Over CB Rim (Prismatic) Listed below
		264 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.60	4	0	0
77.10	700	176	176

Device	Routing	Invert	Outlet Devices
#1	Primary	73.60'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.60' / 73.55' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.14 cfs @ 12.08 hrs HW=74.61' TW=74.15' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 2.14 cfs @ 3.35 fps)

Summary for Pond CB9:

Inflow Area = 0.425 ac, 100.00% Impervious, Inflow Depth > 5.92" for 25-Year event
 Inflow = 2.56 cfs @ 12.08 hrs, Volume= 0.209 af
 Outflow = 2.56 cfs @ 12.09 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.1 min
 Primary = 2.56 cfs @ 12.09 hrs, Volume= 0.209 af
 Routed to Reach P-16 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.66' @ 12.09 hrs Surf.Area= 20 sf Storage= 23 cf

Plug-Flow detention time= 0.5 min calculated for 0.209 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (744.6 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	74.50'	134 cf	5.00'D x 6.80'H Catch Basin
#2	77.30'	302 cf	Ponding Over CB Rim (Prismatic) Listed below
		436 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.30	8	0	0
77.80	1,200	302	302

Device	Routing	Invert	Outlet Devices
#1	Primary	74.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.50' / 74.45' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.56 cfs @ 12.09 hrs HW=75.66' TW=75.11' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 2.56 cfs @ 3.54 fps)

Summary for Pond IB: Infiltration Basin

Inflow Area = 4.319 ac, 100.00% Impervious, Inflow Depth > 5.91" for 25-Year event
 Inflow = 25.66 cfs @ 12.10 hrs, Volume= 2.128 af
 Outflow = 3.71 cfs @ 12.61 hrs, Volume= 2.128 af, Atten= 86%, Lag= 30.6 min
 Discarded = 2.92 cfs @ 12.61 hrs, Volume= 2.042 af
 Primary = 0.80 cfs @ 12.61 hrs, Volume= 0.087 af
 Routed to Reach PR-DP1 : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 72.07' @ 12.61 hrs Surf.Area= 15,242 sf Storage= 28,638 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 58.0 min (804.7 - 746.7)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	60,759 cf	Infiltration Basin (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	12,500	0	0
71.00	13,795	13,148	13,148
72.00	15,147	14,471	27,619
73.00	16,556	15,852	43,470
74.00	18,022	17,289	60,759

Device	Routing	Invert	Outlet Devices
#1	Discarded	70.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	73.00'	5.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Primary	71.20'	4.0" Vert. Orifice (Lower) C= 0.600 Limited to weir flow at low heads
#4	Primary	71.60'	6.0" Vert. Orifice (Middle) C= 0.600 Limited to weir flow at low heads
#5	Primary	72.10'	15.0" W x 6.0" H Vert. Orifice (Upper) C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=2.92 cfs @ 12.61 hrs HW=72.07' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 2.92 cfs)

Primary OutFlow Max=0.80 cfs @ 12.61 hrs HW=72.07' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
 ↑3=Orifice (Lower) (Orifice Controls 0.35 cfs @ 4.03 fps)
 ↑4=Orifice (Middle) (Orifice Controls 0.44 cfs @ 2.33 fps)
 ↑5=Orifice (Upper) (Controls 0.00 cfs)

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 2
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR1A: NW C-Soils to DP1	Runoff Area=96,227 sf 0.00% Impervious Runoff Depth>5.26" Flow Length=1,247' Tc=24.2 min CN=70 Runoff=8.52 cfs 0.968 af
Subcatchment PR1B: NE C-Soils to DP1	Runoff Area=390,922 sf 0.00% Impervious Runoff Depth>5.25" Flow Length=1,594' Tc=27.8 min CN=70 Runoff=32.58 cfs 3.928 af
Subcatchment PR1C: A-Soils to DP1	Runoff Area=99,724 sf 0.00% Impervious Runoff Depth>0.66" Flow Length=280' Slope=0.0100 '/' Tc=18.7 min CN=30 Runoff=0.51 cfs 0.125 af
Subcatchment PR1D B1: Building 1	Runoff Area=37,800 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=7.62 cfs 0.629 af
Subcatchment PR1D B2: Building 2	Runoff Area=29,400 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=5.93 cfs 0.489 af
Subcatchment PR1D CB1: CB1	Runoff Area=13,150 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=2.65 cfs 0.219 af
Subcatchment PR1D CB10: CB10	Runoff Area=16,000 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=3.23 cfs 0.266 af
Subcatchment PR1D CB2: CB2	Runoff Area=11,700 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=2.36 cfs 0.195 af
Subcatchment PR1D CB3: CB3	Runoff Area=18,950 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=3.82 cfs 0.315 af
Subcatchment PR1D CB4: CB4	Runoff Area=6,400 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=1.29 cfs 0.106 af
Subcatchment PR1D CB5: CB5	Runoff Area=5,650 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=1.14 cfs 0.094 af
Subcatchment PR1D CB6: CB6	Runoff Area=5,600 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=1.13 cfs 0.093 af
Subcatchment PR1D CB7: CB7	Runoff Area=9,500 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=1.92 cfs 0.158 af
Subcatchment PR1D CB8: CB8	Runoff Area=15,500 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=3.12 cfs 0.258 af
Subcatchment PR1D CB9: CB9	Runoff Area=18,500 sf 100.00% Impervious Runoff Depth>8.69" Tc=6.0 min CN=98 Runoff=3.73 cfs 0.308 af

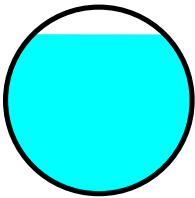
Summary for Reach P-1:

Inflow Area = 0.302 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 2.64 cfs @ 12.09 hrs, Volume= 0.219 af
Outflow = 2.61 cfs @ 12.10 hrs, Volume= 0.219 af, Atten= 1%, Lag= 0.8 min
Routed to Reach P-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.66 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 2.2 min

Peak Storage= 129 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.85' , Surface Width= 0.71'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 180.0' Slope= 0.0050 '/
Inlet Invert= 75.00', Outlet Invert= 74.10'



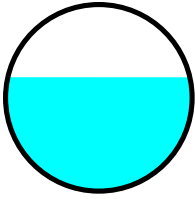
Summary for Reach P-10:

Inflow Area = 1.282 ac, 100.00% Impervious, Inflow Depth > 8.68" for 100-Year event
Inflow = 11.05 cfs @ 12.10 hrs, Volume= 0.928 af
Outflow = 11.04 cfs @ 12.11 hrs, Volume= 0.928 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.49 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.94 fps, Avg. Travel Time= 0.9 min

Peak Storage= 205 cf @ 12.11 hrs
Average Depth at Peak Storage= 1.22' , Surface Width= 1.95'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 102.0' Slope= 0.0050 '/
Inlet Invert= 71.69', Outlet Invert= 71.18'



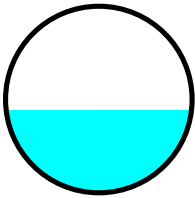
Summary for Reach P-11:

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 1.13 cfs @ 12.08 hrs, Volume= 0.093 af
Outflow = 1.13 cfs @ 12.09 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.1 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.34 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 0.4 min

Peak Storage= 8 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 25.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.85'



Summary for Reach P-12:

Inflow Area = 2.086 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 17.92 cfs @ 12.10 hrs, Volume= 1.510 af
Outflow = 17.90 cfs @ 12.10 hrs, Volume= 1.510 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-20 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.22 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.8 min

Peak Storage= 282 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.42' , Surface Width= 2.48'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

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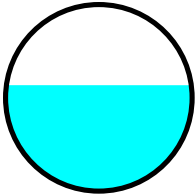
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30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 98.0' Slope= 0.0050 '/'
Inlet Invert= 71.18', Outlet Invert= 70.69'



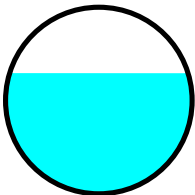
Summary for Reach P-13:

Inflow Area = 0.218 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 1.91 cfs @ 12.09 hrs, Volume= 0.158 af
Outflow = 1.89 cfs @ 12.10 hrs, Volume= 0.158 af, Atten= 1%, Lag= 0.7 min
Routed to Reach P-15A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.52 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 2.5 min

Peak Storage= 100 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.65' , Surface Width= 0.96'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 186.0' Slope= 0.0050 '/'
Inlet Invert= 74.30', Outlet Invert= 73.37'



Summary for Reach P-14:

Inflow Area = 0.356 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 3.13 cfs @ 12.09 hrs, Volume= 0.258 af
Outflow = 3.12 cfs @ 12.09 hrs, Volume= 0.258 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-15A :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.02 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 0.1 min

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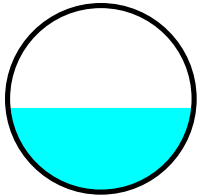
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Peak Storage= 8 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.68' , Surface Width= 1.49'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 73.60', Outlet Invert= 73.55'



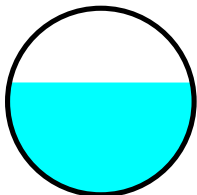
Summary for Reach P-15A:

Inflow Area = 0.574 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 5.00 cfs @ 12.09 hrs, Volume= 0.416 af
Outflow = 4.99 cfs @ 12.09 hrs, Volume= 0.416 af, Atten= 0%, Lag= 0.3 min
Routed to Reach P-15B :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.49 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 1.1 min

Peak Storage= 115 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.90' , Surface Width= 1.47'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.39 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 103.0' Slope= 0.0050 '/'
Inlet Invert= 73.37', Outlet Invert= 72.86'



Summary for Reach P-15B:

Inflow Area = 1.442 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 12.59 cfs @ 12.09 hrs, Volume= 1.044 af
Outflow = 12.59 cfs @ 12.09 hrs, Volume= 1.044 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-17 :

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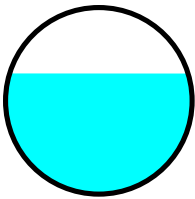
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.85 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.07 fps, Avg. Travel Time= 0.6 min

Peak Storage= 161 cf @ 12.09 hrs
Average Depth at Peak Storage= 1.30' , Surface Width= 1.91'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.73 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 75.0' Slope= 0.0055 '/'
Inlet Invert= 72.86', Outlet Invert= 72.45'



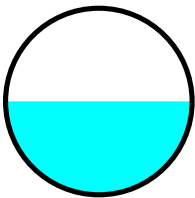
Summary for Reach P-16:

Inflow Area = 0.425 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 3.73 cfs @ 12.09 hrs, Volume= 0.308 af
Outflow = 3.73 cfs @ 12.09 hrs, Volume= 0.308 af, Atten= 0%, Lag= 0.1 min
Routed to Reach P-17 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.21 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 0.1 min

Peak Storage= 9 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.75' , Surface Width= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 74.50', Outlet Invert= 74.45'



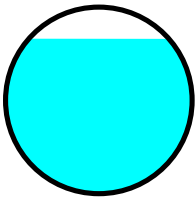
Summary for Reach P-17:

Inflow Area = 1.866 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 16.31 cfs @ 12.09 hrs, Volume= 1.352 af
Outflow = 16.23 cfs @ 12.10 hrs, Volume= 1.351 af, Atten= 1%, Lag= 0.5 min
Routed to Reach P-19 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.82 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 1.3 min

Peak Storage= 460 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.66' , Surface Width= 1.50'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.04 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 165.0' Slope= 0.0050 '/'
Inlet Invert= 72.45', Outlet Invert= 71.62'



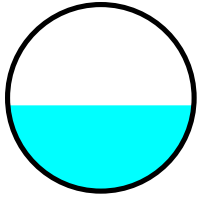
Summary for Reach P-18:

Inflow Area = 0.367 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 3.23 cfs @ 12.08 hrs, Volume= 0.266 af
Outflow = 3.23 cfs @ 12.08 hrs, Volume= 0.266 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-19 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.05 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 0.1 min

Peak Storage= 8 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.69' , Surface Width= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 75.60', Outlet Invert= 75.55'



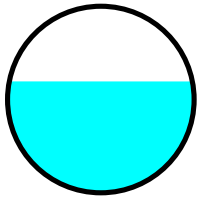
Summary for Reach P-19:

Inflow Area = 2.234 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 19.42 cfs @ 12.10 hrs, Volume= 1.617 af
Outflow = 19.39 cfs @ 12.10 hrs, Volume= 1.617 af, Atten= 0%, Lag= 0.3 min
Routed to Reach P-20 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.33 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.22 fps, Avg. Travel Time= 1.1 min

Peak Storage= 429 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.50' , Surface Width= 2.45'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 140.0' Slope= 0.0050 '/'
Inlet Invert= 71.62', Outlet Invert= 70.92'



Summary for Reach P-2:

Inflow Area = 0.269 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 2.36 cfs @ 12.09 hrs, Volume= 0.195 af
Outflow = 2.36 cfs @ 12.09 hrs, Volume= 0.195 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-3 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.95 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.71' , Surface Width= 0.91'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

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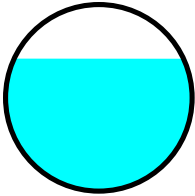
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12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 75.00', Outlet Invert= 74.97'



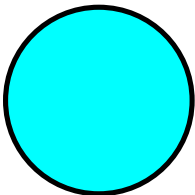
Summary for Reach P-20:

Inflow Area = 4.319 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 37.29 cfs @ 12.10 hrs, Volume= 3.126 af
Outflow = 30.86 cfs @ 12.05 hrs, Volume= 3.126 af, Atten= 17%, Lag= 0.0 min
Routed to Pond IB : Infiltration Basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.74 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.68 fps, Avg. Travel Time= 0.1 min

Peak Storage= 79 cf @ 12.06 hrs
Average Depth at Peak Storage= 2.50'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.00 cfs

30.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 16.0' Slope= 0.0050 '/'
Inlet Invert= 70.69', Outlet Invert= 70.61'



Summary for Reach P-21:

Inflow Area = 0.868 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 7.62 cfs @ 12.08 hrs, Volume= 0.629 af
Outflow = 7.62 cfs @ 12.08 hrs, Volume= 0.629 af, Atten= 0%, Lag= 0.1 min
Routed to Reach P-15B :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 10.09 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.43 fps, Avg. Travel Time= 0.3 min

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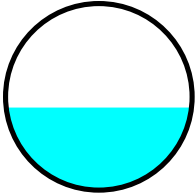
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Peak Storage= 42 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.66' , Surface Width= 1.49'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.83 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 56.0' Slope= 0.0321 '/'
Inlet Invert= 77.00', Outlet Invert= 75.20'



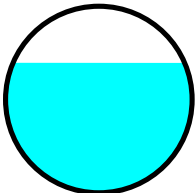
Summary for Reach P-22:

Inflow Area = 0.675 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 5.93 cfs @ 12.08 hrs, Volume= 0.489 af
Outflow = 5.93 cfs @ 12.08 hrs, Volume= 0.489 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-12 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 10.15 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.62 fps, Avg. Travel Time= 0.0 min

Peak Storage= 3 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.70' , Surface Width= 0.92'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 77.20', Outlet Invert= 77.00'



Summary for Reach P-24:

Inflow Area = 8.974 ac, 0.00% Impervious, Inflow Depth > 5.22" for 100-Year event
Inflow = 30.31 cfs @ 12.49 hrs, Volume= 3.904 af
Outflow = 30.31 cfs @ 12.49 hrs, Volume= 3.904 af, Atten= 0%, Lag= 0.0 min
Routed to Reach PR-DP1 : DP1

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Type III 24-hr 100-Year Rainfall=8.94"

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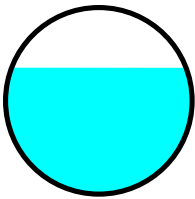
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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 13.38 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 5.89 fps, Avg. Travel Time= 0.1 min

Peak Storage= 68 cf @ 12.49 hrs
Average Depth at Peak Storage= 1.36' , Surface Width= 1.87'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 37.81 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 30.0' Slope= 0.0200 '/'
Inlet Invert= 76.40', Outlet Invert= 75.80'



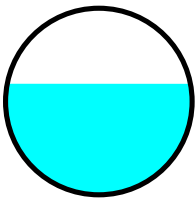
Summary for Reach P-3:

Inflow Area = 0.570 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 4.94 cfs @ 12.09 hrs, Volume= 0.413 af
Outflow = 4.93 cfs @ 12.10 hrs, Volume= 0.413 af, Atten= 0%, Lag= 0.3 min
Routed to Reach P-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.50 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 1.2 min

Peak Storage= 127 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.89' , Surface Width= 1.47'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 116.0' Slope= 0.0050 '/'
Inlet Invert= 74.10', Outlet Invert= 73.52'



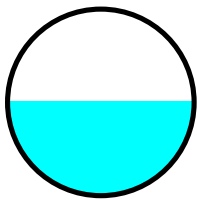
Summary for Reach P-4:

Inflow Area = 0.435 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 3.82 cfs @ 12.08 hrs, Volume= 0.315 af
Outflow = 3.82 cfs @ 12.09 hrs, Volume= 0.315 af, Atten= 0%, Lag= 0.1 min
Routed to Reach P-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.23 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 0.1 min

Peak Storage= 11 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.76' , Surface Width= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.0050 '/'
Inlet Invert= 75.20', Outlet Invert= 75.14'



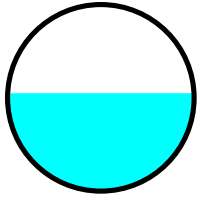
Summary for Reach P-5:

Inflow Area = 1.006 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 8.73 cfs @ 12.09 hrs, Volume= 0.728 af
Outflow = 8.68 cfs @ 12.10 hrs, Volume= 0.728 af, Atten= 1%, Lag= 0.5 min
Routed to Reach P-7 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.20 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 1.9 min

Peak Storage= 351 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.05' , Surface Width= 2.00'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 210.0' Slope= 0.0050 '/'
Inlet Invert= 73.52', Outlet Invert= 72.47'



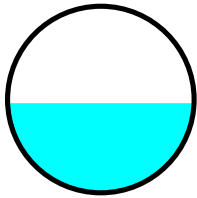
Summary for Reach P-6:

Inflow Area = 0.147 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 1.29 cfs @ 12.08 hrs, Volume= 0.106 af
Outflow = 1.29 cfs @ 12.08 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-7 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.45 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.48' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.97'



Summary for Reach P-7:

Inflow Area = 1.152 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 9.95 cfs @ 12.10 hrs, Volume= 0.834 af
Outflow = 9.94 cfs @ 12.10 hrs, Volume= 0.834 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.37 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.88 fps, Avg. Travel Time= 0.7 min

Peak Storage= 145 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.14' , Surface Width= 1.98'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

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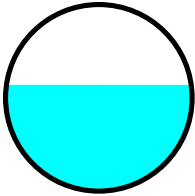
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24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 78.0' Slope= 0.0050 '/'
Inlet Invert= 72.47', Outlet Invert= 72.08'



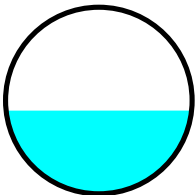
Summary for Reach P-8:

Inflow Area = 0.130 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 1.14 cfs @ 12.08 hrs, Volume= 0.094 af
Outflow = 1.14 cfs @ 12.08 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min
Routed to Reach P-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.34 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0060 '/'
Inlet Invert= 77.00', Outlet Invert= 76.97'



Summary for Reach P-9:

Inflow Area = 1.282 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
Inflow = 11.06 cfs @ 12.10 hrs, Volume= 0.928 af
Outflow = 11.05 cfs @ 12.10 hrs, Volume= 0.928 af, Atten= 0%, Lag= 0.2 min
Routed to Reach P-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.49 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.94 fps, Avg. Travel Time= 0.7 min

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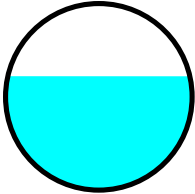
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Peak Storage= 157 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.22' , Surface Width= 1.95'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 16.00 cfs

24.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 78.0' Slope= 0.0050 '/'
Inlet Invert= 72.08', Outlet Invert= 71.69'



Summary for Reach PR-DP1: DP1

Inflow Area = 17.792 ac, 24.28% Impervious, Inflow Depth > 3.69" for 100-Year event
Inflow = 42.43 cfs @ 12.47 hrs, Volume= 5.472 af
Outflow = 42.43 cfs @ 12.47 hrs, Volume= 5.472 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 17R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Summary for Reach Swale A:

Inflow Area = 2.209 ac, 0.00% Impervious, Inflow Depth > 5.26" for 100-Year event
Inflow = 8.52 cfs @ 12.34 hrs, Volume= 0.968 af
Outflow = 8.39 cfs @ 12.37 hrs, Volume= 0.966 af, Atten= 2%, Lag= 2.0 min
Routed to Reach PR-DP1 : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 2.33 fps, Min. Travel Time= 2.9 min
Avg. Velocity= 0.96 fps, Avg. Travel Time= 7.1 min

Peak Storage= 1,475 cf @ 12.37 hrs
Average Depth at Peak Storage= 1.29' , Surface Width= 4.08'
Bank-Full Depth= 1.50' Flow Area= 4.5 sf, Capacity= 11.32 cfs

1.50' x 1.50' deep channel, n= 0.078 Riprap, 12-inch
Side Slope Z-value= 1.0 '/' Top Width= 4.50'
Length= 410.0' Slope= 0.0241 '/'
Inlet Invert= 80.90', Outlet Invert= 71.00'



Summary for Reach Swale B:

Inflow Area = 8.974 ac, 0.00% Impervious, Inflow Depth > 5.25" for 100-Year event
 Inflow = 32.58 cfs @ 12.39 hrs, Volume= 3.928 af
 Outflow = 30.31 cfs @ 12.49 hrs, Volume= 3.904 af, Atten= 7%, Lag= 5.9 min
 Routed to Reach P-24 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 1.79 fps, Min. Travel Time= 8.0 min
 Avg. Velocity = 0.71 fps, Avg. Travel Time= 20.1 min

Peak Storage= 14,540 cf @ 12.49 hrs
 Average Depth at Peak Storage= 2.44' , Surface Width= 9.37'
 Bank-Full Depth= 2.50' Flow Area= 17.5 sf, Capacity= 31.78 cfs

4.50' x 2.50' deep channel, n= 0.078 Riprap, 12-inch
 Side Slope Z-value= 1.0 ' / ' Top Width= 9.50'
 Length= 860.0' Slope= 0.0052 ' / '
 Inlet Invert= 80.90', Outlet Invert= 76.40'



Summary for Pond CB1:

Inflow Area = 0.302 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 2.65 cfs @ 12.08 hrs, Volume= 0.219 af
 Outflow = 2.64 cfs @ 12.09 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.2 min
 Primary = 2.64 cfs @ 12.09 hrs, Volume= 0.219 af
 Routed to Reach P-1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.10' @ 12.09 hrs Surf.Area= 13 sf Storage= 26 cf

Plug-Flow detention time= 0.5 min calculated for 0.219 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (739.7 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	85 cf	4.00'D x 6.80'H Catch Basin
#2	77.80'	234 cf	Ponding Over CB Rim (Prismatic) Listed below
		319 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.80	4	0	0
78.30	932	234	234

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Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	12.0" Round Culvert L= 180.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.00' / 74.10' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.64 cfs @ 12.09 hrs HW=77.09' TW=75.84' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 2.64 cfs @ 3.36 fps)

Summary for Pond CB10:

Inflow Area = 0.367 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 3.23 cfs @ 12.08 hrs, Volume= 0.266 af
 Outflow = 3.23 cfs @ 12.08 hrs, Volume= 0.266 af, Atten= 0%, Lag= 0.1 min
 Primary = 3.23 cfs @ 12.08 hrs, Volume= 0.266 af
 Routed to Reach P-18 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 76.64' @ 12.08 hrs Surf.Area= 20 sf Storage= 21 cf

Plug-Flow detention time= 0.4 min calculated for 0.266 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (739.6 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	75.60'	137 cf	5.00'D x 7.00'H Catch Basin
#2	78.60'	3,895 cf	Ponding Over CB Rim (Prismatic) Listed below
		4,032 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.60	8	0	0
83.60	1,550	3,895	3,895

Device	Routing	Invert	Outlet Devices
#1	Primary	75.60'	18.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.60' / 75.55' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.22 cfs @ 12.08 hrs HW=76.64' TW=76.29' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 3.22 cfs @ 3.45 fps)

Summary for Pond CB2:

Inflow Area = 0.269 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 2.36 cfs @ 12.08 hrs, Volume= 0.195 af
 Outflow = 2.36 cfs @ 12.09 hrs, Volume= 0.195 af, Atten= 0%, Lag= 0.1 min
 Primary = 2.36 cfs @ 12.09 hrs, Volume= 0.195 af
 Routed to Reach P-2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

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Peak Elev= 76.10' @ 12.08 hrs Surf.Area= 13 sf Storage= 14 cf

Plug-Flow detention time= 0.3 min calculated for 0.194 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (739.6 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	78.00'	1,012 cf	Ponding Over CB Rim (Prismatic) Listed below
		1,100 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.00	4	0	0
78.50	4,044	1,012	1,012

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.00' / 74.97' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.36 cfs @ 12.09 hrs HW=76.10' TW=75.71' (Dynamic Tailwater)←**1=Culvert** (Inlet Controls 2.36 cfs @ 3.00 fps)**Summary for Pond CB3:**

Inflow Area = 0.435 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 3.82 cfs @ 12.08 hrs, Volume= 0.315 af
 Outflow = 3.82 cfs @ 12.08 hrs, Volume= 0.315 af, Atten= 0%, Lag= 0.1 min
 Primary = 3.82 cfs @ 12.08 hrs, Volume= 0.315 af
 Routed to Reach P-4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 76.98' @ 12.09 hrs Surf.Area= 13 sf Storage= 22 cf

Plug-Flow detention time= 0.3 min calculated for 0.315 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (739.5 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	75.20'	88 cf	4.00'D x 7.00'H Catch Basin
#2	78.20'	248 cf	Ponding Over CB Rim (Prismatic) Listed below
		336 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.20	8	0	0
78.70	985	248	248

Device	Routing	Invert	Outlet Devices
#1	Primary	75.20'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500

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Inlet / Outlet Invert= 75.20' / 75.14' S= 0.0050 ' /' Cc= 0.900
 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.81 cfs @ 12.08 hrs HW=76.98' TW=75.96' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 3.81 cfs @ 4.85 fps)

Summary for Pond CB4:

Inflow Area = 0.147 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 1.29 cfs @ 12.08 hrs, Volume= 0.106 af
 Outflow = 1.29 cfs @ 12.08 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.29 cfs @ 12.08 hrs, Volume= 0.106 af
 Routed to Reach P-6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.74' @ 12.08 hrs Surf.Area= 13 sf Storage= 9 cf

Plug-Flow detention time= 0.5 min calculated for 0.106 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (739.7 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	900 cf	Ponding Over CB Rim (Prismatic) Listed below
		988 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	3,595	900	900

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.97' S= 0.0060 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.29 cfs @ 12.08 hrs HW=77.74' TW=77.48' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 1.29 cfs @ 2.90 fps)

Summary for Pond CB5:

Inflow Area = 0.130 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 1.14 cfs @ 12.08 hrs, Volume= 0.094 af
 Outflow = 1.14 cfs @ 12.08 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.14 cfs @ 12.08 hrs, Volume= 0.094 af
 Routed to Reach P-8 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.69' @ 12.08 hrs Surf.Area= 13 sf Storage= 9 cf

Plug-Flow detention time= 0.5 min calculated for 0.094 af (100% of inflow)

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Center-of-Mass det. time= 0.4 min (739.7 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	602 cf	Ponding Over CB Rim (Prismatic) Listed below
		690 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	2,405	602	602

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.97' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.14 cfs @ 12.08 hrs HW=77.68' TW=77.45' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 1.14 cfs @ 2.80 fps)

Summary for Pond CB6:

Inflow Area = 0.129 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 1.13 cfs @ 12.08 hrs, Volume= 0.093 af
 Outflow = 1.13 cfs @ 12.08 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.13 cfs @ 12.08 hrs, Volume= 0.093 af
 Routed to Reach P-11 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 77.70' @ 12.08 hrs Surf.Area= 13 sf Storage= 9 cf

Plug-Flow detention time= 0.6 min calculated for 0.093 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (739.7 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	88 cf	4.00'D x 7.00'H Catch Basin
#2	80.00'	228 cf	Ponding Over CB Rim (Prismatic) Listed below
		316 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4	0	0
80.50	908	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	77.00'	12.0" Round Culvert L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 77.00' / 76.85' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.13 cfs @ 12.08 hrs HW=77.70' TW=77.44' (Dynamic Tailwater)

↳1=Culvert (Outlet Controls 1.13 cfs @ 2.70 fps)

Summary for Pond CB7:

Inflow Area = 0.218 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 1.92 cfs @ 12.08 hrs, Volume= 0.158 af
 Outflow = 1.91 cfs @ 12.09 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.91 cfs @ 12.09 hrs, Volume= 0.158 af
 Routed to Reach P-13 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.55' @ 12.09 hrs Surf.Area= 13 sf Storage= 16 cf

Plug-Flow detention time= 0.6 min calculated for 0.158 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (739.7 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	74.30'	88 cf	4.00'D x 7.00'H Catch Basin
#2	77.30'	101 cf	Ponding Over CB Rim (Prismatic) Listed below
		189 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.30	4	0	0
77.80	400	101	101

Device	Routing	Invert	Outlet Devices
#1	Primary	74.30'	12.0" Round Culvert L= 186.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.30' / 73.37' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.91 cfs @ 12.09 hrs HW=75.55' TW=74.94' (Dynamic Tailwater)

↳1=Culvert (Outlet Controls 1.91 cfs @ 2.50 fps)

Summary for Pond CB8:

Inflow Area = 0.356 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 3.12 cfs @ 12.08 hrs, Volume= 0.258 af
 Outflow = 3.13 cfs @ 12.09 hrs, Volume= 0.258 af, Atten= 0%, Lag= 0.2 min
 Primary = 3.13 cfs @ 12.09 hrs, Volume= 0.258 af
 Routed to Reach P-14 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 75.00' @ 12.09 hrs Surf.Area= 13 sf Storage= 18 cf

Plug-Flow detention time= 0.3 min calculated for 0.258 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (739.6 - 739.3)

26696 HydroCAD - Lower Lot

Type III 24-hr 100-Year Rainfall=8.94"

Prepared by Hancock Associates

Printed 9/12/2023

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Volume	Invert	Avail.Storage	Storage Description
#1	73.60'	88 cf	4.00'D x 7.00'H Catch Basin
#2	76.60'	176 cf	Ponding Over CB Rim (Prismatic) Listed below
		264 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.60	4	0	0
77.10	700	176	176

Device	Routing	Invert	Outlet Devices
#1	Primary	73.60'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 73.60' / 73.55' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.12 cfs @ 12.09 hrs HW=74.99' TW=74.28' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 3.12 cfs @ 3.97 fps)

Summary for Pond CB9:

Inflow Area = 0.425 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 3.73 cfs @ 12.08 hrs, Volume= 0.308 af
 Outflow = 3.73 cfs @ 12.09 hrs, Volume= 0.308 af, Atten= 0%, Lag= 0.2 min
 Primary = 3.73 cfs @ 12.09 hrs, Volume= 0.308 af
 Routed to Reach P-16 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 76.22' @ 12.09 hrs Surf.Area= 20 sf Storage= 34 cf

Plug-Flow detention time= 0.4 min calculated for 0.308 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (739.6 - 739.3)

Volume	Invert	Avail.Storage	Storage Description
#1	74.50'	134 cf	5.00'D x 6.80'H Catch Basin
#2	77.30'	302 cf	Ponding Over CB Rim (Prismatic) Listed below
		436 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.30	8	0	0
77.80	1,200	302	302

Device	Routing	Invert	Outlet Devices
#1	Primary	74.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 74.50' / 74.45' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.72 cfs @ 12.09 hrs HW=76.22' TW=75.25' (Dynamic Tailwater)
 ←1=Culvert (Inlet Controls 3.72 cfs @ 4.74 fps)

Summary for Pond IB: Infiltration Basin

Inflow Area = 4.319 ac, 100.00% Impervious, Inflow Depth > 8.69" for 100-Year event
 Inflow = 30.86 cfs @ 12.05 hrs, Volume= 3.126 af
 Outflow = 7.13 cfs @ 12.54 hrs, Volume= 3.126 af, Atten= 77%, Lag= 29.6 min
 Discarded = 3.17 cfs @ 12.54 hrs, Volume= 2.649 af
 Primary = 3.96 cfs @ 12.54 hrs, Volume= 0.477 af
 Routed to Reach PR-DP1 : DP1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 73.00' @ 12.54 hrs Surf.Area= 16,555 sf Storage= 43,454 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 65.7 min (807.4 - 741.7)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	60,759 cf	Infiltration Basin (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	12,500	0	0
71.00	13,795	13,148	13,148
72.00	15,147	14,471	27,619
73.00	16,556	15,852	43,470
74.00	18,022	17,289	60,759

Device	Routing	Invert	Outlet Devices
#1	Discarded	70.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	73.00'	5.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Primary	71.20'	4.0" Vert. Orifice (Lower) C= 0.600 Limited to weir flow at low heads
#4	Primary	71.60'	6.0" Vert. Orifice (Middle) C= 0.600 Limited to weir flow at low heads
#5	Primary	72.10'	15.0" W x 6.0" H Vert. Orifice (Upper) C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=3.17 cfs @ 12.54 hrs HW=73.00' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 3.17 cfs)

Primary OutFlow Max=3.96 cfs @ 12.54 hrs HW=73.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
 ↑3=Orifice (Lower) (Orifice Controls 0.54 cfs @ 6.15 fps)
 ↑4=Orifice (Middle) (Orifice Controls 1.01 cfs @ 5.16 fps)
 ↑5=Orifice (Upper) (Orifice Controls 2.41 cfs @ 3.85 fps)

Appendix VI Hydrocad Output for Recharge Volume

26696 HydroCAD - Lower Lot

Prepared by Hancock Associates

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Type III 24-hr 2-Year Rainfall=3.15"

Printed 9/11/2023

Stage-Area-Storage for Pond IB: Infiltration Basin

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
70.00	12,500	0	72.60	15,992	36,960
70.05	12,565	627	72.65	16,063	37,762
70.10	12,629	1,256	72.70	16,133	38,567
70.15	12,694	1,890	72.75	16,204	39,375
70.20	12,759	2,526	72.80	16,274	40,187
70.25	12,824	3,165	72.85	16,345	41,002
70.30	12,888	3,808	72.90	16,415	41,821
70.35	12,953	4,454	72.95	16,486	42,644
70.40	13,018	5,104	73.00	16,556	43,470
70.45	13,083	5,756	73.05	16,629	44,300
70.50	13,148	6,412	73.10	16,702	45,133
70.55	13,212	7,071	73.15	16,776	45,970
70.60	13,277	7,733	73.20	16,849	46,811
70.65	13,342	8,399	73.25	16,922	47,655
70.70	13,407	9,067	73.30	16,995	48,503
70.75	13,471	9,739	73.35	17,069	49,354
70.80	13,536	10,414	73.40	17,142	50,210
70.85	13,601	11,093	73.45	17,215	51,069
70.90	13,666	11,774	73.50	17,289	51,931
70.95	13,730	12,459	73.55	17,362	52,797
71.00	13,795	13,148	73.60	17,435	53,667
71.05	13,863	13,839	73.65	17,508	54,541
71.10	13,930	14,534	73.70	17,582	55,418
71.15	13,998	15,232	73.75	17,655	56,299
71.20	14,065	15,934	73.80	17,728	57,184
71.25	14,133	16,639	73.85	17,801	58,072
71.30	14,201	17,347	73.90	17,875	58,964
71.35	14,268	18,059	73.95	17,948	59,859
71.40	14,336	18,774	74.00	18,021	60,759
71.45	14,403	19,492			
71.50	14,471	20,214			
71.55	14,539	20,939			
71.60	14,606	21,668			
71.65	14,674	22,400			
71.70	14,741	23,135			
71.75	14,809	23,874			
71.80	14,877	24,616			
71.85	14,944	25,362			
71.90	15,012	26,111			
71.95	15,079	26,863			
72.00	15,147	27,619			
72.05	15,217	28,378			
72.10	15,288	29,140			
72.15	15,358	29,906			
72.20	15,429	30,676			
72.25	15,499	31,449			
72.30	15,570	32,226			
72.35	15,640	33,006			
72.40	15,711	33,790			
72.45	15,781	34,577			
72.50	15,852	35,368			
72.55	15,922	36,162			

Appendix VII Water Quality Sizing Information

**Estimated Net Annual Solids Load Reduction
Based on the Rational Rainfall Method**



**FOREST RIDGE DRIVE
ROWLEY, MA
SITE DESIGNATION: DMH-10**



AREA	4.21	acres	CASCADE MODEL	CS-6	
WEIGHTED C	0.90		PARTICLE SIZE	110	microns
TC	6.00	minutes	RAINFALL STATION	67	

Rainfall Intensity ¹ (in/hr)	Percent Rainfall Volume ¹	Hydraulic Loading Rate (gpm/ft ²)	Removal Efficiency (%)	Incremental Removal (%)
0.08	41.0%	4.81	100.0	41.0
0.16	23.9%	9.62	100.0	23.9
0.24	11.5%	14.44	98.3	11.3
0.32	7.4%	19.25	93.8	7.0
0.40	4.4%	24.06	89.3	4.0
0.48	2.9%	28.87	84.8	2.5
0.56	1.8%	33.68	80.2	1.4
0.64	1.2%	38.49	75.7	0.9
0.72	1.6%	43.31	71.2	1.1
0.80	0.8%	48.12	66.7	0.5
1.00	0.6%	60.15	55.4	0.3
1.40	1.4%	84.21	32.7	0.5
1.80	0.9%	108.26	10.1	0.1
2.20	0.5%	115.09	3.2	0.0
				94.5
				Removal Efficiency Adjustment ² = 0.0%
				Predicted % Annual Rainfall Treated = 99.9%
				Predicted Net Annual Load Removal Efficiency = 94.5%

1 - Based on 7 years of data from NCDC station #3276, Groveland, Essex County, MA

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Appendix VIII Mounding Analysis

Proposed Infiltration Basin (IB1)

Length of field:

100 feet

Width of Field:

95.5 feet

Rate of application:

16,711 c.f. / 9,550 s.f. = **1.75 c.f./s.f/day**

Aquifer hydraulic conductivity:

148 ft/day is used, which is the average hydraulic conductivity of coarse sand per DEP guidelines.

Fillable Porosity:

0.27 was used for coarse sand per DEP guidance

Initial Saturated Thickness:

Soil testing in the area of the Infiltration Basin (IB) has show that the ESHGW is 39" below the existing ground surface and the bottom of the test pits was 72". Refusal was not observed in the test pits within the infiltration basin. The test pits were dug during the time of seasonal high groundwater and the sidewalls of the test pit were not stable and collapsed into the bottom of the pit. Other test pits on site were dug to a depth of 120" and we feel confident in the assumption that a depth of 120" or greater can be achieved in the area of the basin. Using this assumption, the initial saturated thickness for this analysis 6.7'.

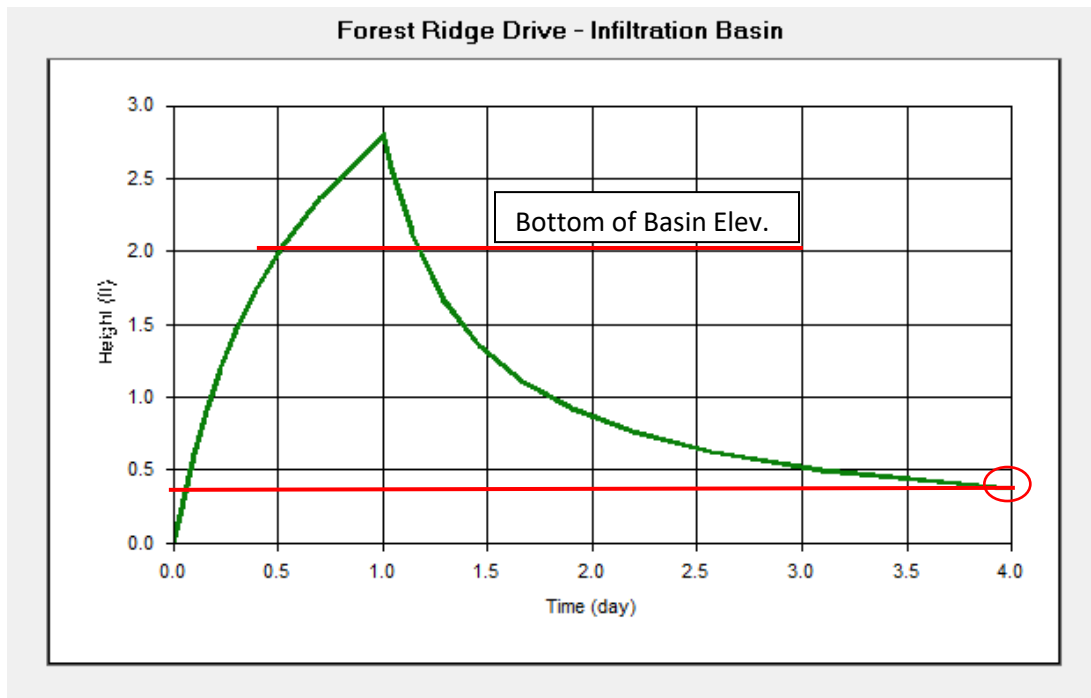
User Data	Simulation Characteristics
Company Name: Hancock Associates	Plotting Location X-Coordinate: 0
Model or Project Title: Forest Ridge Drive - Infiltration Basin	Plotting Location Y-Coordinate: 0
Analyst Name: Russell Tedford	Duration of Application: 1
	Total Simulation Time: 4

Units
Units of Length: ft
Units of Time: day

Disposal Area/Aquifer Characteristics
Length of Disposal Area (L): 100
Width of Disposal Area (W): 95.5
Constant Head Boundary Exists? <input type="checkbox"/>
Opposite Side Plot Distance (DI): 0
Distance to Constant Head Boundary (Dr): 90
Rate of Application: 1.75
Angle from y axis (ϕ): 0
Aquifer Hydraulic Conductivity: 148
Initial Saturated Thickness: 6.7
Fillable Porosity (as a decimal percent): 0.27

The diagram illustrates the geometry of the infiltration basin and its relationship to a constant head boundary. The basin is a rectangle with a vertical 'Length' and a horizontal 'Width'. A dashed line representing the 'Constant Head Boundary' is positioned at an angle ϕ from the Y-axis. The distance from the basin to this boundary is labeled 'Dr'. The plot distance 'DI' is also indicated. The X and Y axes are shown for reference.

Output:



Conclusion:

In the Height vs. Time Plot, mounding underneath the system after the 72-hour drawdown period is approximately 0.4 feet, and considering the infiltration basin has an offset from the estimated seasonal high groundwater (ESHGW) of 2.0 feet the basin is able to draw down from its recharge volume and handle the next storm and continue to recharge stormwater.

Appendix IX Operations and Maintenance Log

Forest Ridge Drive – Post Construction Maintenance

Operations and Maintenance Log
Inspections for Year: _____

Structural Best Management Practice (Frequency)	Action	Date Completed	Completed By	Comments
Deep Sump Hooded Catch Basin– Inspect/clean four times per year. Clean when sump is 50% full.	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
Hydrodynamic Separator– Inspect four times per year. Clean per manufacturer’s requirements.	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
	Inspect/ Clean			
Infiltration Basin – Inspect twice per year. Clean as required	Inspect			
	Inspect			
Roof Drain Leaders – Inspect/clean twice per year.	Inspect/Clean			
	Inspect/Clean			
Vegetated Areas Maintenance – Inspect twice per year. Maintain as required.	Inspect			
	Inspect			

- (1) Refer to the Massachusetts Stormwater Management, Volume Two: Stormwater Technical Handbook (March 1997) for recommendations regarding frequency for inspection and maintenance of specific BMP’s.
- (2) Inspections to be conducted by qualified professional such as an environmental scientist or civil engineer.

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended.

Other notes: (Included deviations from: Con Comm. Order of Conditions, PB Approval, Construction Sequence and Approved Plan).

Stormwater Control Manager: _____