



**ALLEN & MAJOR
ASSOCIATES, INC.**

SUPPLEMENTAL DRAINAGE REPORT

6 Forge Parkway
Franklin, Massachusetts



APPLICANT:

Donegal, LLC
PO Box 4430
Manchester, NH 03108

PREPARED BY:

Allen & Major Associates, Inc.
400 Harvey Road
Manchester, NH 03103



DRAINAGE REPORT

6 Forge Parkway
Franklin, Massachusetts

APPLICANT:

Donegal, LLC
PO Box 4430
Manchester, NH 03108

PREPARED BY:

Allen & Major Associates, Inc.
400 Harvey Road
Manchester, NH 03103

ISSUED:

February 5, 2024
Revised 03-29-24
Revised 04-30-24
Revised 05-21-24
Revised 06-20-24

A&M PROJECT NO.:

1362-25



TABLE OF CONTENTS

SECTION 1.0 - DRAINAGE REPORT 5

 Introduction..... 6

 Site Categorization for Stormwater Regulations..... 6

 Site Location and Access 6

 Existing Site Conditions 6

 Existing Soil Conditions 7

 FEMA Floodplain/Environmental Due Diligence 7

 Environmentally Sensitive Zones 7

 Drainage Analysis Methodology 7

 Proposed Conditions – Peak Rate of Runoff..... 8

 MASSDEP Stormwater Performance Standards 9

 Town of Franklin Stormwater Management Bylaw Standards 13

 MASSDEP Stormwater Checklist..... 14

~~**SECTION 2.0 - OPERATION & MAINTENANCE PLAN 15**~~

~~Introduction..... 16~~

~~Notification Procedures for Change of Responsibility for O&M 16~~

~~Contact Information 17~~

~~Demolition & Construction Maintenance Plan..... 17~~

~~Long-Term Pollution Prevention Plan..... 19~~

~~Long-Term Maintenance Plan – Facilities Description 23~~

~~Inspection and Maintenance Frequency and Corrective Measures 25~~

~~Supplemental Information 25~~

~~**SECTION 3.0 - EXHIBITS 26**~~

~~USGS Site Locus Map 27~~

~~Aerial Photo..... 28~~

~~MASSDEP Wetlands Map 29~~

~~FEMA Flood Insurance Rate Map 30~~

~~NHESP Map 31~~



SECTION 4.0 - EXISTING DRAINAGE ANALYSIS	32
Existing HydroCAD	33
Existing Watershed Plan	34
SECTION 5.0 - PROPOSED DRAINAGE ANALYSIS	35
Proposed HydroCAD	36
Proposed Watershed Plan	37
SECTION 6.0 - APPENDIX	38
Illicit Discharge Compliance Statement	39
Rainfall Data	40
Manning's Number Tables	41
NRCS Soil Report	42
Test Pit Logs	43
MA Groundwater Recharge Calculation	44
Water Quality Volume Calculation	45
Infiltration System Drain Calculation	46
TSS Removal Calculation	47
Stage Storage Calculations	48
Existing Offsite Pipe Evaluation	49
Rip Rap Design	50



**SECTION 1.0 -
DRAINAGE REPORT**



Introduction

The purpose of this drainage report is to provide an overview of the proposed stormwater management system (SMS) for the proposed construction of a 36,000 square foot building, 51 parking spaces, and paved loading docks located at 6 Forge Parkway in Franklin, MA. The report will show by means of narrative, calculations and exhibits that the proposed stormwater management system will meet or exceed the Massachusetts Department of Environmental Protection (MassDEP) stormwater standards, and the Town's Stormwater Management Regulations.

The proposed SMS incorporates structural and non-structural Best Management Practices (BMPs) to provide stormwater peak flow mitigation, quality treatment, and conveyance. The SMS for the proposed development includes a series of deep sump catch basins, proprietary water quality devices, chamber infiltration systems, an outlet control structure, and bioretention system.

Site Categorization for Stormwater Regulations

The proposed site improvements at 6 Forge Parkway are considered a new development under the DEP Stormwater Management Standards due to the net increase in impervious area.

Site Location and Access

The site is a single lot with 207± feet of frontage on Forge Parkway, entirely within the Town of Franklin. The parcel is located approximately 1,000± feet west of Interstate 495 and is directly south of Route 140. The parcel is abutted to the west by a hotel, to the east by railroad and undeveloped woodland, and to the south by an office building. The parcel is located within the Town's Industrial zone. The site shares driveway access to Forge Parkway with the Residence Inn, located at 4 Forge Parkway, the abutter to the west.

Existing Site Conditions

The project site is located at 6 Forge Parkway, Franklin, Massachusetts, and is identified on the town Assessor's Map 272 as Parcel 5 and is approximately 5.91 acres. The project site is on the north side of Forge Parkway and is covered by scrub-brush and woods. A significant portion of the property was cleared in the early 2000's but was never developed. The site's topography ranges from moderate to steep slopes. The high point on-site is approximately elevation 296 in the southwestern corner of the site; the low point on-site is approximately elevation 221 in the northeastern corner of the site. The existing impervious area on-site is approximately 6,000 square feet, which includes the existing driveway to 4 Forge Parkway.

On the property presently, stormwater flows to three distinct locations, or "Study Points". Stormwater from the southwestern portion of the site flows towards the adjacent lot, 4 Forge Parkway (Study Point #1). Flow from a small portion in the northwest of the site flows overland towards route 140 (Study Point #2). Stormwater from more than half of the site on the eastern side flows overland and discharges to the wetlands on the northeast side of the site (Study Point #3). It was at these three study points that surface drainage flows were analyzed for the following analysis.



Existing Soil Conditions

The on-site soils were identified using the USDA Natural Resources Conservation Services (NRCS) Soil Survey for Norfolk County, which indicates that the soils on-site consist of Charlton-Hollis-Rock outcrop complex and Canton fine sandy loam. Charlton-Hollis-Rock outcrop complex is categorized as Hydrologic Soil Group Type "A". Canton fine sandy loam is categorized as Hydrologic Soil Group Type "B". A copy of the NRCS Custom Soil Resource Report is included in the appendix of this report.

Further investigation of the underlying soils has been conducted by performing a series of test pits across the site. On November 15 and 16, 2023, GeoEngineers, the project Geotechnical Engineer, witnessed and logged eight test pits in various locations. The test pits showed that the underlying soils are loamy sands. Copies of the test pit logs are included in the appendix of this report. An exfiltration rate for the loamy sands was determined to be 2.41 inches per hour using Table 2.3.3 1982 Rawls Rate, Massachusetts Stormwater Handbook, Volume 3, Chapter 1.

FEMA Floodplain/Environmental Due Diligence

There are no portions of the site located within the FEMA Zone "AE" Special Flood Hazard Area Subject to Inundation by the 1% Annual Chance Flood (100-year floodplain) per the official Flood Insurance Rate Map (FIRM) effective date July 17, 2012, community panel 25021C0308E. See section 3 of this report for a copy of the FEMA FIRM.

Environmentally Sensitive Zones

The Commonwealth of Massachusetts asserts control over numerous protected and regulated areas including: Areas of Critical Environmental Concern (ACEC); Outstanding Resource Waters (ORWs); Priority and Protected Habitat for rare and endangered species, and areas protected under the Wetlands Protection Act. The subject property is not located within any of these regulated areas.

Drainage Analysis Methodology

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

1. Urban Hydrology for Small Watersheds – Technical Release 55 by the United States Department of Agriculture Soils Conservation Service, June 1986. Runoff curve numbers and 24-hour precipitation values were obtained from this reference.
2. HydroCAD © Stormwater Modeling System by HydroCAD Software Solutions LLC, version 10.20-4a. The HydroCAD program was used to generate runoff hydrographs for the watershed areas, to determine discharge/ stage/storage characteristics for the stormwater BMPs, to perform drainage routing and to combine the results of the runoff hydrographs. HydroCAD uses the TR-20 methodology of the SCS Unit Hydrograph procedure (SCS-UH).



Proposed Conditions – Peak Rate of Runoff

The stormwater runoff analysis of the existing and proposed conditions includes an estimate of the peak rate of runoff from various rainfall events. Peak runoff rates were developed using TR55 Urban Hydrology for Small Watersheds, developed by the U.S. Department of Commerce, Engineering Division and the HydroCAD computer program. Further, the analysis has been prepared in accordance with the MassDEP and the Town of Franklin requirements and standard engineering practices. The peak rate of runoff has been estimated for each watershed during the 2, 10, 25, and 100-year storm events.

The proposed stormwater management system for the site consists of deep sump catch basins, proprietary water quality devices, a Stormtech MC-3500 chamber infiltration system with isolator row, a bioretention system, a Stormtech SC-740 chamber infiltration system, and an outlet control structure. These systems have been designed in accordance with the MA DEP Stormwater Management Policy to recharge groundwater and reduce the rate of runoff from the parcel.

A portion of the new driveway entrance and adjacent hillside will continue to generate stormwater that ultimately discharges to the 4 Forge Parkway property (Study Point #1). This runoff will be intercepted by two Rain Guardian Turret devices which are curb inlet structures that provide pretreatment of trash and debris and discharge to the ground surface. The runoff will then spill over a rip rap apron which discharges to a bioretention system. The bioretention system media and plants will provide further treatment of the runoff. The bioretention system is overlaid on top of a Stormtech SC-740 chamber infiltration system. Runoff will flow freely through the bioretention system media into the infiltration system. An overflow grate will be installed into the infiltration system, which will allow stormwater to enter the system, should it be necessary during large storm events. This system will infiltrate all runoff up to the 25-year design storm event while larger storm events will overflow to a landscaped island on the 4 Forge Parkway property. (Study Point #1).

Stormwater generated on the northwesterly corner of the site will flow overland to the Route 140 right-of-way (Study Point #2). The ground cover in this relatively small portion of the site is landscaped and does not include any impervious cover.

Stormwater generated on the main portion of the developed site will be captured within a series of catch basins, directed to one of two proprietary water quality devices and flow to the Stormtech MC-3500 chamber infiltration system. All pavement runoff will be treated within the system's isolator row. Approximately half of the roof runoff will be piped directly to the infiltration. This system will infiltrate the 2-year design storm event while larger storm events will overflow through an outlet control structure to the hillside on the east side of the site and eventually to the easterly wetlands (Study Point #3).



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

STUDY POINT #1 (Flow to 4 Forge Parkway property)				
	2-Year	10-Year	25-Year	100-Year
Existing Flow (CFS)	0.17	0.26	0.34	0.65
Proposed Flow (CFS)	0.00	0.00	0.01	0.65
Change (CFS)	-0.17	-0.26	-0.33	0.00

STUDY POINT #2 (Flow to Route 140 right-of-way)				
	2-Year	10-Year	25-Year	100-Year
Existing Flow (CFS)	0.00	0.00	0.00	0.06
Proposed Flow (CFS)	0.00	0.00	0.00	0.00
Change (CFS)	0.00	0.00	0.00	-0.06

STUDY POINT #3 (Flow to wetlands)				
	2-Year	10-Year	25-Year	100-Year
Existing Flow (CFS)	6.08	10.80	15.15	25.12
Proposed Flow (CFS)	5.34	9.71	13.62	23.59
Change (CFS)	-0.74	-1.09	-1.53	-1.53

MASSDEP Stormwater Performance Standards

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

BMP's implemented in the design include:

- Deep Sump Catch Basins
- Proprietary water quality devices
- Stormtech MC-3500 Infiltration System
- Stormtech SC-740 Infiltration System
- Bioretention System
- Outlet Control Structure

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



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

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

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

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

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

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

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

The existing annual recharge for the site has been approximated in the proposed condition. The proposed subsurface infiltration systems are designed to meet this requirement. Stormwater runoff generated from the impervious areas of the proposed development are routed through the Stormtech MC-3500 and SC-740 chamber infiltration systems. The proposed Recharge Volume is based on the Static Method per the MA DEP Stormwater Management Standards, Volume 3, Chapter 1. See the appendix located in section 6 of this report for stormwater recharge calculations.



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

Standard #4 is met when structural stormwater best management practices are sized to capture and treat the required water quality volume and pretreatment is provided in accordance with the Massachusetts Stormwater Handbook. Standard #4 also requires that suitable source control measures are identified in the Long-term Pollution Prevention Plan. The water quality volume for the site development is captured and treated using proprietary water quality devices, the Stormtech MC-3500 and SC-740 chamber infiltration systems, and the bioretention system.

The implemented BMPs have been designed to treat the contributing water quality volume. These water quality calculations can be seen within the appendix of this report.

The proposed stormwater management system has been designed to remove greater than 80% of the average annual post-construction load for each treatment train. The TSS removal calculations can be seen within the appendix of this report.

5. *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

The site is not considered a land use with higher potential pollutant loads..

6. *Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to*



Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

The project site does not discharge stormwater within a Zone II or Interim Wellhead Protection Area or near a critical area. Critical Areas are Outstanding Resource Waters as designated in 314 CMR 4.00, Special Resource Waters as designated in 314 CMR 4.00, recharge areas for public water supplies as defined in 310 CMR 22.02, bathing beaches as defined in 105 CMR 445.000, cold-water fisheries as defined in 314 CMR 9.02 and 310 CMR 10.04, and shellfish growing areas as defined in 314 CMR 9.02 and 310 CMR 10.04.

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

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

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

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

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

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

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

There are no expected illicit discharges to the stormwater management system.

See the following pages for the MassDEP Stormwater Checklist.



Town of Franklin Stormwater Management Bylaw Standards

In addition to the MassDEP Stormwater Standards, the Town of Franklin has established its own Stormwater Management Bylaw, the standards of which are outlined in Section 153-16 of the General Legislation Bylaws. In addition to requiring that project's meet federal and state requirements, including the MassDEP Stormwater Standards above, the Stormwater Management Bylaw requires that all stormwater management systems for new developments shall be designed to:

- (a) Retain the volume of runoff equivalent to one inch multiplied by the impervious surface on the site.*

The project proposes to increase the impervious area on site by 97,622 square feet. One inch over this area is 8,132 cubic feet. The two systems that use infiltration provide a total of 13,205 cubic feet of storage below the lowest overflow outlet. This standard is met.

- (b) Remove 90% of the average annual load of total suspended solids (TSS) and 60% of the average annual load of total phosphorus (TP)*

Stormwater runoff from the proposed parking lot will be treated by the various BMPs described above prior to discharge to the subsurface infiltration systems. The subsurface infiltration systems have been designed to infiltrate a volume that far exceeds the Water Quality Volume. The treatment provided by the combination of these BMPs exceeds 90% TSS removal. TSS removal calculations can be found in the appendix of this report. Phosphorus removal is provided by the infiltration systems. As mentioned above, the infiltration systems are designed to infiltrate a volume that far exceeds the Water Quality Volume. The systems have been designed such that **all** runoff from the 2-year storm event is infiltrated. The MassDEP Stormwater handbook, Volume 2, Chapter 2 specifies that infiltration basins provide between 60% and 70% phosphorus removal. Therefore, this requirement is met.



MASSDEP Stormwater Checklist



**SECTION 2.0 -
OPERATION &
MAINTENANCE PLAN**



Introduction

In accordance with the standards set forth by the Stormwater Management Policy issued by the Massachusetts Department of Environmental Protection (MassDEP), Allen & Major Associates, Inc. has prepared the following Operations & Maintenance (O&M) Plan for the development at 6 Forge Parkway, Franklin, Massachusetts.

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

Notification Procedures for Change of Responsibility for O&M

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

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

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



Contact Information

Stormwater Management System Owner: Donegal LLC
PO Box 4430
Manchester, NH 03108
Phone: (603) 623-8811

Owner Signature

Date

Emergency Contact Information:

Donegal LLC (Owner/Operator)	Phone: (603) 623-8811
Allen & Major Associates, Inc. (Site Civil Engineer)	Phone: (603) 627-5500
Franklin Department of Public Works	Phone: (508) 553-5500
Franklin Conservation Commission	Phone: (508) 520-4929
Franklin Fire Department (non-emergency line)	Phone: (508) 528-2323
MassDEP Emergency Response	Phone: (888) 304-1133
Clean Harbors Inc (24-Hour Line)	Phone: (800) 645-8265

Demolition & Construction Maintenance Plan

1. Call Digsafe: 1-888-344-7233
2. Contact the Town at least three (3) days prior to start of demolition and/or construction activities.
3. Install Erosion Control measures as shown on the Site Preparation Plan prepared by A&M. The Town shall review the installation of catch basin filters and tubular barrier protection prior to the start of any site demolition work. Install Construction fencing if determined to be necessary at the commencement of construction.
4. Install construction entrances, catch basin filters, and tubular sediment barriers at the locations shown on the Site Preparation Plan prepared by A&M.
5. Site access shall be achieved only from the designated construction entrances.
6. Cut and clear trees in construction areas only (within the limit of work; see plans).



7. Stockpiles of materials subject to erosion shall be stabilized with erosion control matting or temporary seeding whenever practicable, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.
8. Install silt sacks at each drain inlet prior to any demolition and or construction activities.
9. All erosion control measures shall be inspected weekly and after every rainfall event. Records of these inspections shall be kept on-site for review.
10. All erosion control measures shall be maintained, repaired, or replaced as required or at the direction of the owner's engineer or the Town.
11. Sediment accumulation up-gradient of the tubular sediment barriers greater than 6" in depth shall be removed and disposed of in accordance with all applicable regulations.
12. If it appears that sediment is exiting the site, silt sacks shall be installed in all catch basins adjacent to the site. Sediment accumulation on all adjacent catch basin inlets shall be removed and the silt sack replaced if torn or damaged.
13. Install stone check dams on-site during construction as needed. Refer to the erosion control details. Temporary sediment basins combined with stone check dams shall be installed on-site during construction to control and collect runoff from upland areas of this site during demolition and construction activities.
14. The contractor shall comply with the Sedimentation and Erosion Control Notes as shown on the Site Development Plans and Specifications.
15. The stabilized construction entrances shall be inspected weekly and records of inspections kept. The entrances shall be maintained by adding additional clean, angular, durable stone to remove the soil from the construction vehicle's tires when exiting the site. If soil is still leaving the site via the construction vehicle tires, adjacent roadways shall be kept clean by street sweeping.
16. Dust pollution shall be controlled using on-site water trucks and/or an approved soil stabilization product.
17. During demolition and construction activities, Status Reports on compliance with this O&M Document shall be submitted weekly. The report shall document any deficiencies and corrective actions taken by the applicant.



Long-Term Pollution Prevention Plan

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

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

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

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

- Spill Prevention & Response
Sources of potential spill hazards include vehicle fluids, liquid fuels, pesticides, paints, solvents, and liquid cleaning products. The majority of the spill hazards would likely occur within the buildings and would not enter the stormwater drainage system. However, there are spill hazards from vehicle fluids or liquid fuels located outside of the buildings. These exterior spill hazards have the potential to enter the stormwater drainage system and are to be addressed as follows:
 1. Spill hazards of pesticides, paints, and solvents shall be remediated using the Manufacturers' recommended spill cleanup protocol.
 2. Vehicle fluids and liquid fuel spill shall be remediated according to the local and state regulations governing fuel spills.
 3. The owner shall have the following equipment and materials on hand to address a spill clean-up: brooms, dust pans, mops, rags, gloves, absorptive material, sand, sawdust, plastic and metal trash containers.
 4. All spills shall be cleaned up immediately after discovery.



5. Spills of toxic or hazardous material shall be reported, regardless of size, to the Massachusetts Department of Environmental Protection at (888) 304-1333.
6. Should a spill occur, the pollution prevention plan will be adjusted to include measures to prevent another spill of a similar nature. A description of the spill, along with the causes and cleanup measures will be included in the updated pollution prevention plan.

- Maintenance of Lawns, Gardens, and Other Landscaped Areas

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

- Fertilizer

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

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

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

- Suggested Aeration Program

In-season aeration of lawn areas is good cultural practice, and is recommended whenever feasible. It should be accomplished with a solid thin tine aeration method to reduce disruption to the use of the area. The depth of solid tine aeration is similar to core type, but should be performed when the soil is somewhat drier for a greater overall effect.

Depending on the intensity of use, it can be expected that all landscaped lawn areas will need aeration to reduce compaction at least once per year. The first



operation should occur in late May following the spring season. Methods of reducing compaction will vary based on the nature of the compaction. Compaction on newly established landscaped areas is generally limited to the top 2-3" and can be alleviated using hollow core or thin tine aeration methods.

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

o Landscape Maintenance Program Practices:

▪ Lawn

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

▪ Shrubs

1. Mulch not more than 3" depth with shredded pine or fir bark.
2. Hand prune annually, immediately after blooming, to remove 1/3 of the above-ground biomass (older stems). Stem removals are to occur within 6" of the ground to open up shrub and maintain two-year wood (the blooming wood).
3. Hand-prune evergreen shrubs only as needed to remove dead and damaged wood and to maintain the naturalistic form of the shrub. Never mechanically shear evergreen shrubs.

▪ Trees

1. Provide aftercare of new tree plantings for the first three years.



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

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

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

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

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

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



- Pet Waste Management

The owner's landscape crew (or designee) shall remove any obvious pet waste that has been left behind by pet owners within the development. The pet waste shall be disposed of in accordance with local and state regulations.

- Operations and Management of Septic Systems

There are no proposed septic systems within the limits of the project.

- Management of Deicing Chemicals and Snow

Snow will be stockpiled on site until the accumulated snow becomes a hazard to the daily operations of the site. It will be the responsibility of the snow removal contractor to properly dispose of transported snow according to MassDEP, Bureau of Resource Protection – Snow Disposal Guideline #BRPG01-01, governing the proper disposal of snow. It will be the responsibility of the snow removal contractor to follow these guidelines and all applicable laws and regulations

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

Long-Term Maintenance Plan – Facilities Description

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

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

Stormwater Collection System:

The stormwater collection system on site is composed of a series of catch basins, proprietary water quality devices, drainage conveyance pipe, Stormtech MC-3500 infiltration system, Stormtech SC-740 infiltration system, bioretention system, and outlet control structure. All the proposed on-site catch basins incorporate a deep sump and hooded outlet. The proposed catch basins and proprietary water quality devices are connected by a closed gravity pipe network that routes stormwater to the MC-3500 infiltration system for treatment prior to discharge.



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

- **Deep Sump Catch Basin:**
There are various catch basins located throughout the project site, both existing and proposed. Each catch basin unit shall be inspected four times per year. These units should be cleaned at each inspection or when the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin.
- **Proprietary water quality devices:**
Inspect all hydrodynamic separators with the same frequency as catch basins. Remove sediment when the isolated sump has reached 75% of its capacity. Refer to the manufacturer's Maintenance Guide for additional information.
- **Rain Guardian - Turret:**
The Rain Guardian Turret is a concrete curb-inlet device that discharges to the bioretention system. It is recommended that the Rain Guardian - Turret be inspected at least twice per year. If observed, remove trash and debris at each inspection. Replace the grate if damaged.
- **Outlet Control Structure:**
The outlet control structure shall be inspected periodically, at least annually; remove debris and sediment when encountered. Review that the structure's internal weir is functioning properly following any major storm events.
- **Outfall Structure (Headwall) & Rip-Rap Aprons:**
The outfall shall be inspected annually. Remove debris, sediment, and woody vegetation when encountered. Repair erosion and scouring by replacing rip-rap and/or regrading. Regrade outfall to be level if channelization occurs.

Infiltration BMPs:

- **Subsurface Structure – Stormtech MC-3500 and SC-740 Chamber Systems:**
Inspect the catch basins that inlet to the subsurface infiltration system as recommended to ensure no trash or debris is entering the system. JetVac maintenance is recommended if sediment within the isolator row has been collected to an average depth of 3".

Other Maintenance Activity:

- **Mosquito Control:**
Both above ground and underground stormwater BMPs have the potential to serve as mosquito breeding areas. Good design, proper operation and maintenance, and treatment with larvicides can minimize this potential. See the supplemental information for Mosquito Control in Stormwater Management Practices, and the Operation and Maintenance Plan Schedule for inspection schedule.



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

Inspection and Maintenance Frequency and Corrective Measures

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

Supplemental Information

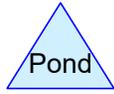
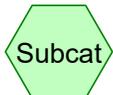
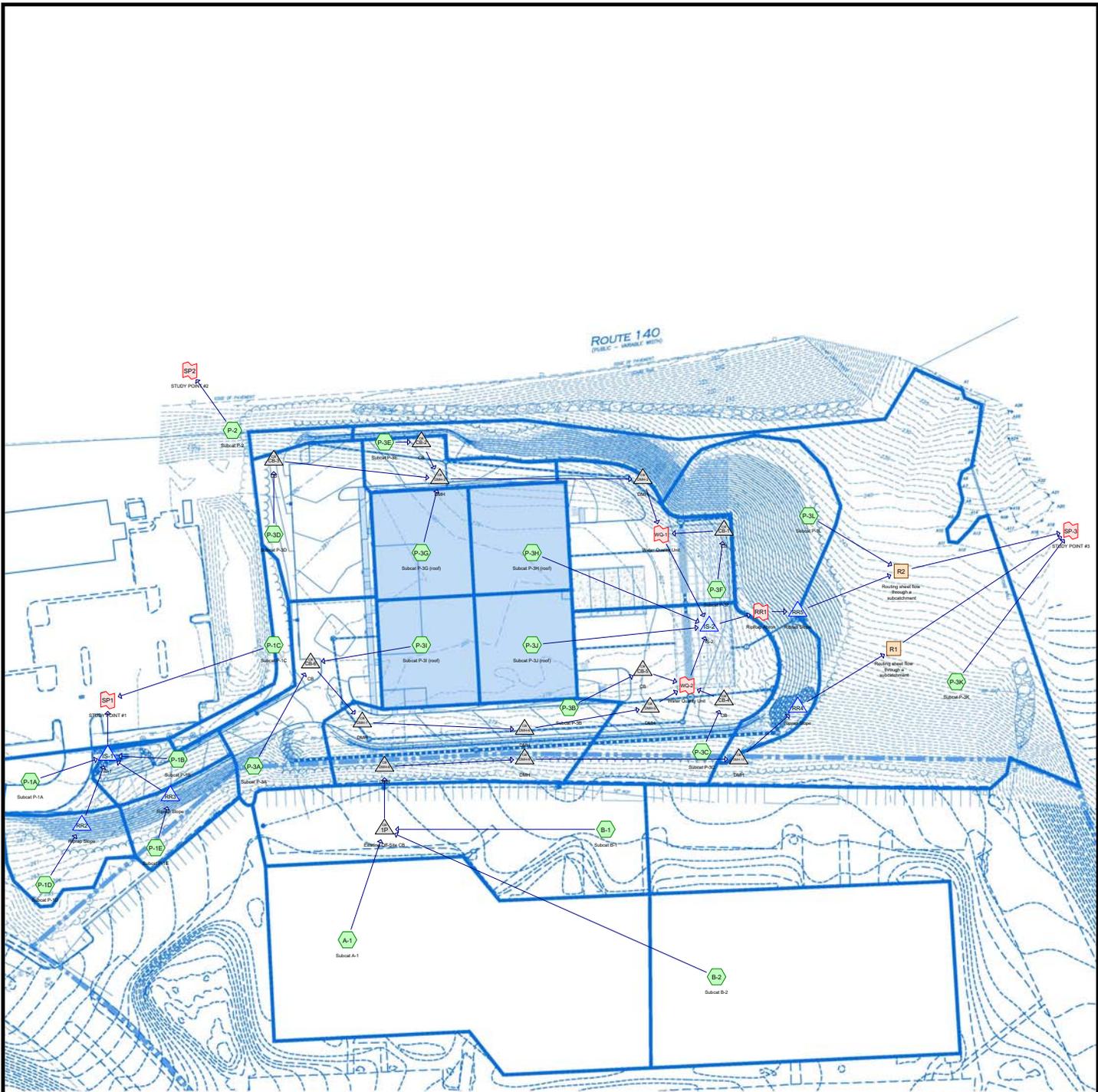
- Operation & Maintenance Plan Schedule
- Massachusetts Stormwater Handbook, Chapter 5, Miscellaneous Stormwater Topics, Mosquito Control in Stormwater Management Practices
- Massachusetts DEP – Snow Disposal Guidance
- Isolator® Row Plus O&M Manual
- CDS Guide, Operation, Design, Performance and Maintenance
- Operation & Maintenance Figure



**SECTION 5.0 -
PROPOSED DRAINAGE
ANALYSIS**



Proposed HydroCAD



Routing Diagram for 1362-25 - Proposed HydroCAD_rev2
 Prepared by Allen & Major Associates, Inc, Printed 6/20/2024
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
43,332	39	>75% Grass cover, Good, HSG A (B-1, P-1A, P-1B, P-1C, P-1D, P-1E, P-2, P-3A, P-3B, P-3C, P-3D, P-3E, P-3K)
30,275	61	>75% Grass cover, Good, HSG B (P-3C, P-3E, P-3F, P-3K, P-3L)
4,800	62	>Stone Rip Rap, Good, HSG A (P-1D, P-1E, P-2, P-3A, P-3D, P-3K)
7,134	68	>Stone Rip Rap, Good, HSG B (P-3C, P-3K, P-3L)
166,299	98	Paved parking, HSG A (A-1, B-1, B-2, P-1A, P-1B, P-1E, P-3A, P-3B, P-3C, P-3D, P-3E, P-3F)
28,683	98	Paved parking, HSG B (P-3C, P-3E, P-3F, P-3L)
35,032	98	Roofs, HSG A (P-3G, P-3H, P-3I, P-3J)
968	98	Roofs, HSG B (P-3H)
11,940	30	Woods, Good, HSG A (P-1C, P-1D, P-1E, P-2, P-3A, P-3B, P-3C, P-3D, P-3K)
62,335	55	Woods, Good, HSG B (P-3C, P-3K, P-3L)
390,798	79	TOTAL AREA

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Printed 6/20/2024

Page 3

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
261,403	HSG A	A-1, B-1, B-2, P-1A, P-1B, P-1C, P-1D, P-1E, P-2, P-3A, P-3B, P-3C, P-3D, P-3E, P-3F, P-3G, P-3H, P-3I, P-3J, P-3K
129,395	HSG B	P-3C, P-3E, P-3F, P-3H, P-3K, P-3L
0	HSG C	
0	HSG D	
0	Other	
390,798		TOTAL AREA

Summary for Subcatchment A-1: Subcat A-1

Runoff = 3.85 cfs @ 12.11 hrs, Volume= 14,304 cf, Depth= 3.04"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
56,517	98	Paved parking, HSG A
56,517	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment B-1: Subcat B-1

Runoff = 1.95 cfs @ 12.08 hrs, Volume= 6,785 cf, Depth= 2.65"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
3,889	39	>75% Grass cover, Good, HSG A
26,806	98	Paved parking, HSG A
30,695		Weighted Average
3,889	39	12.67% Pervious Area
26,806	98	87.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	117	0.0200	1.44		Sheet Flow, Paved parking Smooth surfaces n= 0.011 P2= 3.28"
0.9	163	0.0200	2.87		Shallow Concentrated Flow, Paved Parking Lot Paved Kv= 20.3 fps
2.3	280	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B-2: Subcat B-2

Runoff = 3.07 cfs @ 12.11 hrs, Volume= 11,386 cf, Depth= 3.04"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
44,985	98	Paved parking, HSG A
44,985	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-1A: Subcat P-1A

Runoff = 0.24 cfs @ 12.08 hrs, Volume= 834 cf, Depth= 1.71"
 Routed to Pond IS-1 : IS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 2-year Rainfall=3.27"

Printed 6/20/2024

Page 5

Area (sf)	CN	Description
2,565	39	>75% Grass cover, Good, HSG A
3,294	98	Paved parking, HSG A
5,859		Weighted Average
2,565	39	43.78% Pervious Area
3,294	98	56.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	67	0.0300	1.51		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.28"
0.7	67	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1B: Subcat P-1B

Runoff = 0.20 cfs @ 12.08 hrs, Volume= 677 cf, Depth= 1.72"
 Routed to Pond IS-1 : IS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
2,046	39	>75% Grass cover, Good, HSG A
2,675	98	Paved parking, HSG A
4,722		Weighted Average
2,046	39	43.34% Pervious Area
2,675	98	56.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	34	0.0300	1.32		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
0.4	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1C: Subcat P-1C

Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Link SP1 : STUDY POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
2,460	39	>75% Grass cover, Good, HSG A
964	30	Woods, Good, HSG A
3,424		Weighted Average
3,424	36	100.00% Pervious Area

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

Summary for Subcatchment P-1D: Subcat P-1D

Runoff = 0.02 cfs @ 12.12 hrs, Volume= 79 cf, Depth= 0.13"
 Routed to Pond RR2 : Riprap Slope

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 2-year Rainfall=3.27"

Printed 6/20/2024

Page 6

Area (sf)	CN	Description
1,126	39	>75% Grass cover, Good, HSG A
1,840	62	>Stone Rip Rap, Good, HSG A
4,547	30	Woods, Good, HSG A
7,513		Weighted Average
7,513	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.1673	0.16		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	18	0.1673	2.05		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
5.3	68	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1E: Subcat P-1E

Runoff = 0.03 cfs @ 12.10 hrs, Volume= 134 cf, Depth= 0.28"
 Routed to Pond RR3 : Riprap Slope

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
2,868	39	>75% Grass cover, Good, HSG A
1,801	62	>Stone Rip Rap, Good, HSG A
225	98	Paved parking, HSG A
813	30	Woods, Good, HSG A
5,707		Weighted Average
5,482	45	96.06% Pervious Area
225	98	3.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	21	0.1200	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
0.3	41	0.0992	2.20		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.3	62	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.00 cfs @ 12.12 hrs, Volume= 5 cf, Depth= 0.04"
 Routed to Link SP2 : STUDY POINT #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
746	39	>75% Grass cover, Good, HSG A
107	62	>Stone Rip Rap, Good, HSG A
734	30	Woods, Good, HSG A
1,587		Weighted Average
1,587	36	100.00% Pervious Area

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

Summary for Subcatchment P-3A: Subcat P-3A

Runoff = 0.60 cfs @ 12.09 hrs, Volume= 2,092 cf, Depth= 1.65"
 Routed to Pond CB-6 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
5,602	39	>75% Grass cover, Good, HSG A
250	62	>Stone Rip Rap, Good, HSG A
8,221	98	Paved parking, HSG A
1,098	30	Woods, Good, HSG A
15,170		Weighted Average
6,950	38	45.81% Pervious Area
8,221	98	54.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	47	0.1200	0.14		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.28"
0.5	106	0.0300	3.52		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
6.2	153	Total			

Summary for Subcatchment P-3B: Subcat P-3B

Runoff = 0.46 cfs @ 12.10 hrs, Volume= 1,696 cf, Depth= 1.15"
 Routed to Pond CB-5 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
9,329	39	>75% Grass cover, Good, HSG A
6,696	98	Paved parking, HSG A
1,685	30	Woods, Good, HSG A
17,711		Weighted Average
11,014	38	62.19% Pervious Area
6,696	98	37.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	47	0.1200	0.14		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.28"
1.8	254	0.0140	2.40		Shallow Concentrated Flow,
					Paved Kv= 20.3 fps
7.5	301	Total			

Summary for Subcatchment P-3C: Subcat P-3C

Runoff = 1.27 cfs @ 12.08 hrs, Volume= 4,440 cf, Depth= 2.10"
 Routed to Pond CB-4 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 2-year Rainfall=3.27"

Printed 6/20/2024

Page 8

Area (sf)	CN	Description
5,279	39	>75% Grass cover, Good, HSG A
1,565	61	>75% Grass cover, Good, HSG B
12	68	>Stone Rip Rap, Good, HSG B
2,364	98	Paved parking, HSG A
14,929	98	Paved parking, HSG B
1,229	30	Woods, Good, HSG A
14	55	Woods, Good, HSG B
25,392		Weighted Average
8,099	42	31.90% Pervious Area
17,293	98	68.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	158	0.0200	1.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
1.7	158	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-3D: Subcat P-3D

Runoff = 0.68 cfs @ 12.08 hrs, Volume= 2,365 cf, Depth= 2.05"
 Routed to Pond CB-3 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
3,871	39	>75% Grass cover, Good, HSG A
1	62	>Stone Rip Rap, Good, HSG A
9,341	98	Paved parking, HSG A
619	30	Woods, Good, HSG A
13,831		Weighted Average
4,491	38	32.47% Pervious Area
9,341	98	67.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0360	1.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
0.4	85	0.0360	3.85		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.9	135	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-3E: Subcat P-3E

Runoff = 0.37 cfs @ 12.08 hrs, Volume= 1,287 cf, Depth= 2.53"
 Routed to Pond CB-2 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
925	39	>75% Grass cover, Good, HSG A
125	61	>75% Grass cover, Good, HSG B
4,721	98	Paved parking, HSG A
346	98	Paved parking, HSG B
6,117		Weighted Average
1,050	42	17.17% Pervious Area
5,067	98	82.83% Impervious Area

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

Summary for Subcatchment P-3F: Subcat P-3F

Runoff = 1.03 cfs @ 12.08 hrs, Volume= 3,618 cf, Depth= 2.61"
 Routed to Pond CB-1 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
2,781	61	>75% Grass cover, Good, HSG B
455	98	Paved parking, HSG A
13,407	98	Paved parking, HSG B
16,643		Weighted Average
2,781	61	16.71% Pervious Area
13,862	98	83.29% Impervious Area

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

Summary for Subcatchment P-3G: Subcat P-3G (roof)

Runoff = 0.61 cfs @ 12.11 hrs, Volume= 2,278 cf, Depth= 3.04"
 Routed to Pond DMH-3 : DMH

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3H: Subcat P-3H (roof)

Runoff = 0.61 cfs @ 12.11 hrs, Volume= 2,278 cf, Depth= 3.04"
 Routed to Pond IS-2 : IS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
8,032	98	Roofs, HSG A
968	98	Roofs, HSG B
9,000		Weighted Average
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3I: Subcat P-3I (roof)

Runoff = 0.61 cfs @ 12.11 hrs, Volume= 2,278 cf, Depth= 3.04"
 Routed to Pond CB-6 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 2-year Rainfall=3.27"

Printed 6/20/2024

Page 10

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3J: Subcat P-3J (roof)

Runoff = 0.61 cfs @ 12.11 hrs, Volume= 2,278 cf, Depth= 3.04"
 Routed to Pond IS-2 : IS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3K: Subcat P-3K

Runoff = 0.25 cfs @ 12.35 hrs, Volume= 2,010 cf, Depth= 0.31"
 Routed to Link SP-3 : STUDY POINT #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
2,624	39	>75% Grass cover, Good, HSG A
8,980	61	>75% Grass cover, Good, HSG B
801	62	>Stone Rip Rap, Good, HSG A
3,956	68	>Stone Rip Rap, Good, HSG B
250	30	Woods, Good, HSG A
60,357	55	Woods, Good, HSG B
76,968		Weighted Average
76,968	56	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.2500	0.11		Sheet Flow, A-B Woods: Dense underbrush n= 0.800 P2= 3.28"
3.6	359	0.1100	1.66		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
11.3	409	Total			

Summary for Subcatchment P-3L: Subcat P-3L

Runoff = 0.20 cfs @ 12.12 hrs, Volume= 911 cf, Depth= 0.50"
 Routed to Reach R2 : Routing sheet flow through a subcatchment

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-year Rainfall=3.27"

Area (sf)	CN	Description
16,823	61	>75% Grass cover, Good, HSG B
3,167	68	>Stone Rip Rap, Good, HSG B
1	98	Paved parking, HSG B
1,964	55	Woods, Good, HSG B
21,955		Weighted Average
21,954	61	100.00% Pervious Area
1	98	0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	81	0.4000	0.25		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
5.4	81	Total, Increased to minimum Tc = 6.0 min			

Summary for Reach R1: Routing sheet flow through a subcatchment

A subcatchment performs runoff calculations, including the associated Tc and CN determinations. It does not have any facility for routing an inflow hydrograph from another source. However, a reach may be used to perform this type of specialized routing.

This reach demonstrates a procedure for performing a sheet-flow routing through a subcatchment area. In this case, the "reach" is defined as a wide channel with very low side slopes. The Manning's value of 0.15 is selected from the table of sheet flow roughness coefficients, which are much higher than normal Manning's values, in order to allow for the greater frictional losses of shallow flow. This value is comparable to the Manning's value for "very weedy reaches".

This example assumes that sheet flow occurs evenly over the entire 100' channel width, and that the flow depth is therefore very small. If the flow is concentrated or forms channels, the description and Manning's value must be adjusted accordingly.

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 2.27" for 2-year event
 Inflow = 8.71 cfs @ 12.10 hrs, Volume= 25,010 cf
 Outflow = 5.09 cfs @ 12.23 hrs, Volume= 25,010 cf, Atten= 42%, Lag= 7.6 min
 Routed to Link SP-3 : STUDY POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.22 fps, Min. Travel Time= 20.9 min
 Avg. Velocity = 0.05 fps, Avg. Travel Time= 91.9 min

Peak Storage= 6,396 cf @ 12.23 hrs
 Average Depth at Peak Storage= 0.19' , Surface Width= 138.33'
 Bank-Full Depth= 1.00' Flow Area= 200.0 sf, Capacity= 113.05 cfs

100.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
 Side Slope Z-value= 100.0 ' / Top Width= 300.00'
 Length= 280.0' Slope= 0.1590 ' /'
 Inlet Invert= 265.92', Outlet Invert= 221.40'



Summary for Reach R2: Routing sheet flow through a subcatchment

A subcatchment performs runoff calculations, including the associated Tc and CN determinations. It does not have any facility for routing an inflow hydrograph from another source. However, a reach may be used to perform this type of specialized routing.

This reach demonstrates a procedure for performing a sheet-flow routing through a subcatchment area. In this case, the "reach" is defined as a wide channel with very low side slopes. The Manning's value of 0.15 is selected from the table of sheet flow roughness coefficients, which are much higher than normal Manning's values, in order to allow for the greater frictional losses of shallow flow. This value is comparable to the Manning's value for "very weedy reaches".

This example assumes that sheet flow occurs evenly over the entire 100' channel width, and that the flow depth is therefore very small. If the flow is concentrated or forms channels, the description and Manning's value must be adjusted accordingly.

[80] Warning: Exceeded Pond RR5 by 4.93' @ 13.49 hrs (433.32 cfs 111,991,419 cf)

Inflow Area = 152,820 sf, 63.13% Impervious, Inflow Depth = 0.07" for 2-year event
 Inflow = 0.20 cfs @ 12.12 hrs, Volume= 911 cf
 Outflow = 0.03 cfs @ 13.49 hrs, Volume= 911 cf, Atten= 83%, Lag= 82.4 min
 Routed to Link SP-3 : STUDY POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.03 fps, Min. Travel Time= 136.6 min
 Avg. Velocity= 0.03 fps, Avg. Travel Time= 136.6 min

Peak Storage= 270 cf @ 13.49 hrs
 Average Depth at Peak Storage= 0.01', Surface Width= 101.91'
 Bank-Full Depth= 1.00' Flow Area= 200.0 sf, Capacity= 113.05 cfs

100.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
 Side Slope Z-value= 100.0 '/' Top Width= 300.00'
 Length= 280.0' Slope= 0.1590 '/'
 Inlet Invert= 265.92', Outlet Invert= 221.40'



Summary for Pond 1P: Existing Off-Site CB

[58] Hint: Peaked 2.15' above defined flood level

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 2.95" for 2-year event
 Inflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf
 Outflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf, Atten= 0%, Lag= 0.0 min
 Primary = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf
 Routed to Pond DMH-8 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 292.01' @ 12.10 hrs
 Flood Elev= 289.86'

Device	Routing	Invert	Outlet Devices
#1	Primary	283.08'	12.0" Round Culvert L= 118.0' Ke= 0.500 Inlet / Outlet Invert= 283.08' / 278.95' S= 0.0350 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=8.80 cfs @ 12.10 hrs HW=291.99' TW=282.91' (Dynamic Tailwater)
 ←**1=Culvert** (Outlet Controls 8.80 cfs @ 11.20 fps)

Summary for Pond CB-1: CB

Inflow Area = 16,643 sf, 83.29% Impervious, Inflow Depth = 2.61" for 2-year event
 Inflow = 1.03 cfs @ 12.08 hrs, Volume= 3,618 cf
 Outflow = 1.03 cfs @ 12.08 hrs, Volume= 3,618 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.03 cfs @ 12.08 hrs, Volume= 3,618 cf
 Routed to Link WQ-1 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.76' @ 12.08 hrs
 Flood Elev= 272.52'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.22'	12.0" Round Culvert L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 269.22' / 268.77' S= 0.0100 '/' 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=269.76' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 1.03 cfs @ 3.43 fps)

Summary for Pond CB-2: CB

Inflow Area = 6,117 sf, 82.83% Impervious, Inflow Depth = 2.53" for 2-year event
 Inflow = 0.37 cfs @ 12.08 hrs, Volume= 1,287 cf
 Outflow = 0.37 cfs @ 12.08 hrs, Volume= 1,287 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.37 cfs @ 12.08 hrs, Volume= 1,287 cf
 Routed to Pond DMH-3 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.82' @ 12.09 hrs
 Flood Elev= 273.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.46'	12.0" Round Culvert L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 270.46' / 270.23' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.08 hrs HW=270.82' TW=270.61' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 0.37 cfs @ 2.18 fps)

Summary for Pond CB-3: CB

Inflow Area = 13,831 sf, 67.53% Impervious, Inflow Depth = 2.05" for 2-year event
 Inflow = 0.68 cfs @ 12.08 hrs, Volume= 2,365 cf
 Outflow = 0.68 cfs @ 12.08 hrs, Volume= 2,365 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.68 cfs @ 12.08 hrs, Volume= 2,365 cf
 Routed to Pond DMH-3 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 271.82' @ 12.08 hrs
 Flood Elev= 274.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.40'	12.0" Round Culvert L= 126.0' Ke= 0.500 Inlet / Outlet Invert= 271.40' / 270.23' S= 0.0093 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.68 cfs @ 12.08 hrs HW=271.82' TW=270.61' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 0.68 cfs @ 3.19 fps)

Summary for Pond CB-4: CB

Inflow Area = 25,392 sf, 68.10% Impervious, Inflow Depth = 2.10" for 2-year event
 Inflow = 1.27 cfs @ 12.08 hrs, Volume= 4,440 cf
 Outflow = 1.27 cfs @ 12.08 hrs, Volume= 4,440 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.27 cfs @ 12.08 hrs, Volume= 4,440 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.86' @ 12.08 hrs
 Flood Elev= 272.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.24'	12.0" Round Culvert L= 44.0' Ke= 0.500 Inlet / Outlet Invert= 269.24' / 268.80' S= 0.0100 '/ 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=269.86' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 1.27 cfs @ 3.58 fps)

Summary for Pond CB-5: CB

Inflow Area = 17,711 sf, 37.81% Impervious, Inflow Depth = 1.15" for 2-year event
 Inflow = 0.46 cfs @ 12.10 hrs, Volume= 1,696 cf
 Outflow = 0.46 cfs @ 12.10 hrs, Volume= 1,696 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.46 cfs @ 12.10 hrs, Volume= 1,696 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 271.70' @ 12.10 hrs
 Flood Elev= 275.46'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.36'	12.0" Round Culvert L= 65.0' Ke= 0.500 Inlet / Outlet Invert= 271.36' / 269.55' S= 0.0278 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.10 hrs HW=271.70' TW=0.00' (Dynamic Tailwater)
 ←**1=Culvert** (Inlet Controls 0.46 cfs @ 1.98 fps)

Summary for Pond CB-6: CB

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 2.17" for 2-year event
 Inflow = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf
 Outflow = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf
 Routed to Pond DMH-7 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 275.32' @ 12.10 hrs
 Flood Elev= 278.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.74'	12.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 274.74' / 273.79' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.20 cfs @ 12.10 hrs HW=275.32' TW=274.27' (Dynamic Tailwater)
 ←**1=Culvert** (Outlet Controls 1.20 cfs @ 3.70 fps)

Summary for Pond DMH-10: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 2.95" for 2-year event
 Inflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf
 Outflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf, Atten= 0%, Lag= 0.0 min
 Primary = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf
 Routed to Pond RR4 : Riprap Slope

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 275.60' @ 12.10 hrs
 Flood Elev= 279.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.28'	30.0" Round Culvert L= 9.0' Ke= 0.500 Inlet / Outlet Invert= 274.28' / 274.00' S= 0.0311 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=8.80 cfs @ 12.10 hrs HW=275.59' TW=269.09' (Dynamic Tailwater)
 ←**1=Culvert** (Barrel Controls 8.80 cfs @ 4.89 fps)

Summary for Pond DMH-2: DMH

Inflow Area = 28,949 sf, 80.86% Impervious, Inflow Depth = 2.46" for 2-year event
 Inflow = 1.65 cfs @ 12.09 hrs, Volume= 5,930 cf
 Outflow = 1.65 cfs @ 12.09 hrs, Volume= 5,930 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.65 cfs @ 12.09 hrs, Volume= 5,930 cf
 Routed to Link WQ-1 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.07' @ 12.09 hrs
 Flood Elev= 274.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	268.42'	15.0" Round Culvert L= 64.0' Ke= 0.500 Inlet / Outlet Invert= 268.42' / 267.87' S= 0.0086 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.65 cfs @ 12.09 hrs HW=269.07' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 1.65 cfs @ 3.69 fps)

Summary for Pond DMH-3: DMH

Inflow Area = 28,949 sf, 80.86% Impervious, Inflow Depth = 2.46" for 2-year event
 Inflow = 1.65 cfs @ 12.09 hrs, Volume= 5,930 cf
 Outflow = 1.65 cfs @ 12.09 hrs, Volume= 5,930 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.65 cfs @ 12.09 hrs, Volume= 5,930 cf
 Routed to Pond DMH-2 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.61' @ 12.09 hrs
 Flood Elev= 274.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.98'	15.0" Round Culvert L= 168.0' Ke= 0.500 Inlet / Outlet Invert= 269.98' / 268.52' S= 0.0087 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.65 cfs @ 12.09 hrs HW=270.61' TW=269.07' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 1.65 cfs @ 3.88 fps)

Summary for Pond DMH-5: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 2.17" for 2-year event
 Inflow = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf
 Outflow = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 267.91' @ 12.10 hrs
 Flood Elev= 274.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	267.34'	12.0" Round Culvert L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 267.34' / 266.88' S= 0.0200 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.20 cfs @ 12.10 hrs HW=267.91' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 1.20 cfs @ 2.58 fps)

Summary for Pond DMH-6: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 2.17" for 2-year event
 Inflow = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf
 Outflow = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf
 Routed to Pond DMH-5 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 272.74' @ 12.10 hrs
 Flood Elev= 277.33'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.17'	12.0" Round Culvert L= 147.0' Ke= 0.500 Inlet / Outlet Invert= 272.17' / 269.87' S= 0.0156 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.20 cfs @ 12.10 hrs HW=272.74' TW=267.91' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 1.20 cfs @ 2.58 fps)

Summary for Pond DMH-7: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 2.17" for 2-year event
 Inflow = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf
 Outflow = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.20 cfs @ 12.10 hrs, Volume= 4,370 cf
 Routed to Pond DMH-6 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 274.27' @ 12.10 hrs
 Flood Elev= 279.73'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.70'	12.0" Round Culvert L= 143.0' Ke= 0.500 Inlet / Outlet Invert= 273.70' / 272.27' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.20 cfs @ 12.10 hrs HW=274.27' TW=272.74' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 1.20 cfs @ 2.58 fps)

Summary for Pond DMH-8: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 2.95" for 2-year event
 Inflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf
 Outflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf, Atten= 0%, Lag= 0.0 min
 Primary = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf
 Routed to Pond DMH-9 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 282.91' @ 12.10 hrs
 Flood Elev= 286.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	281.70'	30.0" Round Culvert L= 170.0' Ke= 0.500 Inlet / Outlet Invert= 281.70' / 278.93' S= 0.0163 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=8.80 cfs @ 12.10 hrs HW=282.91' TW=280.04' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 8.80 cfs @ 3.74 fps)

Summary for Pond DMH-9: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 2.95" for 2-year event
 Inflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf
 Outflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf, Atten= 0%, Lag= 0.0 min
 Primary = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf
 Routed to Pond DMH-10 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.04' @ 12.10 hrs
 Flood Elev= 284.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	278.83'	30.0" Round Culvert L= 274.0' Ke= 0.500 Inlet / Outlet Invert= 278.83' / 274.38' S= 0.0162 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=8.80 cfs @ 12.10 hrs HW=280.04' TW=275.59' (Dynamic Tailwater)
 ←**1=Culvert** (Inlet Controls 8.80 cfs @ 3.74 fps)

Summary for Pond IS-1: IS-1

Inflow Area = 23,802 sf, 26.02% Impervious, Inflow Depth = 0.76" for 2-year event
 Inflow = 0.44 cfs @ 12.08 hrs, Volume= 1,511 cf
 Outflow = 0.04 cfs @ 11.69 hrs, Volume= 1,511 cf, Atten= 91%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.69 hrs, Volume= 1,511 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link SP1 : STUDY POINT #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 274.29' @ 12.92 hrs Surf.Area= 938 sf Storage= 521 cf
 Flood Elev= 278.00' Surf.Area= 1,839 sf Storage= 1,645 cf

Plug-Flow detention time= 89.6 min calculated for 1,511 cf (100% of inflow)
 Center-of-Mass det. time= 89.6 min (845.7 - 756.1)

Volume	Invert	Avail.Storage	Storage Description
#1	277.00'	1,272 cf	surface storage (Irregular) Listed below (Recalc)
#2	275.00'	78 cf	media storage (Irregular) Listed below (Recalc) 260 cf Overall x 30.0% Voids
#3A	273.30'	602 cf	20.75'W x 45.19'L x 2.00'H Field A 1,875 cf Overall - 369 cf Embedded = 1,506 cf x 40.0% Voids
#4A	273.80'	369 cf	ADS_StormTech SC-160LP +Cap x 54 Inside #3 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 54 Chambers in 9 Rows
		2,322 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
277.00	435	96.0	0	0	435
278.00	771	118.0	595	595	825
279.00	588	81.0	677	1,272	1,419

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	130	53.0	0	0	130
277.00	130	53.0	260	260	236

Device	Routing	Invert	Outlet Devices
#0	Primary	279.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	273.30'	0.04 cfs Exfiltration at all elevations Phase-In= 0.01'
#2	Primary	277.80'	9.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50

5.00 5.50
 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88
 3.07 3.32

Discarded OutFlow Max=0.04 cfs @ 11.69 hrs HW=273.36' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=273.30' TW=0.00' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond IS-2: IS-2

GEO-TP-5 indicates silty sand to a depth of 14' below grade with no refusal. The infiltration rate for loamy sand is 2.41 inches per hour (Rawls Rates)

Redox was encountered at 9' below grade or elevation 263.0

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 2.26" for 2-year event
 Inflow = 6.81 cfs @ 12.09 hrs, Volume= 24,610 cf
 Outflow = 0.44 cfs @ 11.45 hrs, Volume= 24,610 cf, Atten= 94%, Lag= 0.0 min
 Discarded = 0.44 cfs @ 11.45 hrs, Volume= 24,610 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link RR1 : RipRap Apron

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 267.77' @ 13.66 hrs Surf.Area= 8,152 sf Storage= 10,014 cf
 Flood Elev= 271.58' Surf.Area= 8,627 sf Storage= 27,840 cf

Plug-Flow detention time= 178.1 min calculated for 24,607 cf (100% of inflow)
 Center-of-Mass det. time= 178.1 min (936.1 - 758.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	266.00'	12,250 cf	52.75'W x 150.43'L x 5.58'H Field A Z=0.3 46,227 cf Overall - 15,602 cf Embedded = 30,625 cf x 40.0% Voids
#2A	266.50'	15,602 cf	ADS_StormTech MC-3500 d +Cap x 140 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 140 Chambers in 7 Rows Cap Storage= 14.9 cf x 2 x 7 rows = 208.6 cf
		27,852 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	266.00'	0.44 cfs Exfiltration at all elevations Phase-In= 0.01'
#2	Primary	267.00'	10.0" Round Culvert L= 29.0' Ke= 0.500 Inlet / Outlet Invert= 267.00' / 265.92' S= 0.0372 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#3	Device 2	269.40'	4.0' long x 6.26' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.44 cfs @ 11.45 hrs HW=266.10' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=266.00' TW=0.00' (Dynamic Tailwater)

↑**2=Culvert** (Controls 0.00 cfs)

↑**3=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond RR2: Riprap Slope

Inflow Area = 7,513 sf, 0.00% Impervious, Inflow Depth = 0.13" for 2-year event
 Inflow = 0.02 cfs @ 12.12 hrs, Volume= 79 cf
 Outflow = 0.02 cfs @ 12.12 hrs, Volume= 79 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 12.12 hrs, Volume= 79 cf
 Primary = 0.00 cfs @ 24.30 hrs, Volume= 0 cf
 Routed to Pond IS-1 : IS-1

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 2-year Rainfall=3.27"

Printed 6/20/2024

Page 19

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.00' @ 0.00 hrs Surf.Area= 111 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.0 min (907.6 - 907.6)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	328 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 821 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	111	0	0
281.00	111	111	111
282.00	111	111	222
283.00	103	107	329
284.00	75	89	418
285.00	73	74	492
286.00	70	72	564
287.00	68	69	633
288.00	66	67	700
289.00	62	64	764
290.00	52	57	821

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	0.37 cfs Exfiltration at all elevations
#2	Primary	280.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.12 hrs HW=280.00' (Free Discharge)
 ↑**1=Exfiltration** (Passes 0.00 cfs of 0.37 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 24.30 hrs HW=280.00' TW=273.30' (Dynamic Tailwater)
 ↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RR3: Riprap Slope

Inflow Area = 5,707 sf, 3.94% Impervious, Inflow Depth = 0.28" for 2-year event
 Inflow = 0.03 cfs @ 12.10 hrs, Volume= 134 cf
 Outflow = 0.03 cfs @ 12.10 hrs, Volume= 134 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 12.10 hrs, Volume= 134 cf
 Primary = 0.00 cfs @ 24.30 hrs, Volume= 0 cf
 Routed to Pond IS-1 : IS-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.00' @ 0.00 hrs Surf.Area= 116 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.0 min (843.8 - 843.8)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	464 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,160 cf Overall x 40.0% Voids

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 2-year Rainfall=3.27"

Printed 6/20/2024

Page 20

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	116	0	0
281.00	116	116	116
282.00	116	116	232
283.00	116	116	348
284.00	116	116	464
285.00	116	116	580
286.00	116	116	696
287.00	116	116	812
288.00	116	116	928
289.00	116	116	1,044
290.00	116	116	1,160

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	0.37 cfs Exfiltration at all elevations
#2	Primary	280.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=280.00' (Free Discharge)

↑**1=Exfiltration** (Passes 0.00 cfs of 0.37 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 24.30 hrs HW=280.00' TW=273.30' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RR4: Riprap Slope

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 2.95" for 2-year event
 Inflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf
 Outflow = 8.81 cfs @ 12.10 hrs, Volume= 32,475 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 5.67 hrs, Volume= 7,466 cf
 Primary = 8.71 cfs @ 12.10 hrs, Volume= 25,010 cf
 Routed to Reach R1 : Routing sheet flow through a subcatchment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.09' @ 12.10 hrs Surf.Area= 112 sf Storage= 44 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 1.3 min (758.7 - 757.4)

Volume	Invert	Avail.Storage	Storage Description
#1	268.00'	225 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 563 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
268.00	87	0	0
269.00	110	99	99
270.00	126	118	217
271.00	96	111	328
272.00	76	86	414
273.00	63	70	483
274.00	97	80	563

Device	Routing	Invert	Outlet Devices
#1	Discarded	268.00'	0.10 cfs Exfiltration at all elevations
#2	Primary	269.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 5.67 hrs HW=268.06' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=8.70 cfs @ 12.10 hrs HW=269.09' TW=266.08' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir**(Weir Controls 8.70 cfs @ 0.83 fps)

Summary for Pond RR5: Riprap Slope

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach R2 : Routing sheet flow through a subcatchment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 261.00' @ 0.00 hrs Surf.Area= 14 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	261.00'	35 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 89 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
261.00	14	0	0
262.00	34	24	24
263.00	26	30	54
264.00	18	22	76
265.00	7	13	89

Device	Routing	Invert	Outlet Devices
#1	Discarded	261.00'	0.10 cfs Exfiltration at all elevations
#2	Primary	261.50'	14.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=261.00' (Free Discharge)
 ↳1=Exfiltration (Passes 0.00 cfs of 0.10 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=261.00' TW=265.92' (Dynamic Tailwater)
 ↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link RR1: RipRap Apron

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
 Routed to Pond RR5 : Riprap Slope

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP-3: STUDY POINT #3

Inflow Area = 361,985 sf, 62.10% Impervious, Inflow Depth = 0.93" for 2-year event
 Inflow = 5.34 cfs @ 12.23 hrs, Volume= 27,931 cf
 Primary = 5.34 cfs @ 12.23 hrs, Volume= 27,931 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP1: STUDY POINT #1

Inflow Area = 27,226 sf, 22.75% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.00 cfs @ 24.01 hrs, Volume= 0 cf
 Primary = 0.00 cfs @ 24.01 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP2: STUDY POINT #2

Inflow Area = 1,587 sf, 0.00% Impervious, Inflow Depth = 0.04" for 2-year event
Inflow = 0.00 cfs @ 12.12 hrs, Volume= 5 cf
Primary = 0.00 cfs @ 12.12 hrs, Volume= 5 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link WQ-1: Water Quality Unit

Inflow Area = 45,592 sf, 81.75% Impervious, Inflow Depth = 2.51" for 2-year event
Inflow = 2.68 cfs @ 12.09 hrs, Volume= 9,548 cf
Primary = 2.68 cfs @ 12.09 hrs, Volume= 9,548 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond IS-2 : IS-2

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link WQ-2: Water Quality Unit

Inflow Area = 67,273 sf, 61.26% Impervious, Inflow Depth = 1.87" for 2-year event
Inflow = 2.93 cfs @ 12.09 hrs, Volume= 10,506 cf
Primary = 2.93 cfs @ 12.09 hrs, Volume= 10,506 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond IS-2 : IS-2

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment A-1: Subcat A-1

Runoff = 5.81 cfs @ 12.11 hrs, Volume= 21,963 cf, Depth= 4.66"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
56,517	98	Paved parking, HSG A
56,517	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment B-1: Subcat B-1

Runoff = 2.95 cfs @ 12.08 hrs, Volume= 10,475 cf, Depth= 4.10"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
3,889	39	>75% Grass cover, Good, HSG A
26,806	98	Paved parking, HSG A
30,695		Weighted Average
3,889	39	12.67% Pervious Area
26,806	98	87.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	117	0.0200	1.44		Sheet Flow, Paved parking Smooth surfaces n= 0.011 P2= 3.28"
0.9	163	0.0200	2.87		Shallow Concentrated Flow, Paved Parking Lot Paved Kv= 20.3 fps
2.3	280	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B-2: Subcat B-2

Runoff = 4.63 cfs @ 12.11 hrs, Volume= 17,482 cf, Depth= 4.66"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
44,985	98	Paved parking, HSG A
44,985	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-1A: Subcat P-1A

Runoff = 0.36 cfs @ 12.08 hrs, Volume= 1,319 cf, Depth= 2.70"
 Routed to Pond IS-1 : IS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-year Rainfall=4.90"

Printed 6/20/2024

Page 24

Area (sf)	CN	Description
2,565	39	>75% Grass cover, Good, HSG A
3,294	98	Paved parking, HSG A
5,859		Weighted Average
2,565	39	43.78% Pervious Area
3,294	98	56.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	67	0.0300	1.51		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.28"
0.7	67	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1B: Subcat P-1B

Runoff = 0.29 cfs @ 12.08 hrs, Volume= 1,070 cf, Depth= 2.72"
 Routed to Pond IS-1 : IS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
2,046	39	>75% Grass cover, Good, HSG A
2,675	98	Paved parking, HSG A
4,722		Weighted Average
2,046	39	43.34% Pervious Area
2,675	98	56.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	34	0.0300	1.32		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
0.4	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1C: Subcat P-1C

Runoff = 0.00 cfs @ 12.50 hrs, Volume= 37 cf, Depth= 0.13"
 Routed to Link SP1 : STUDY POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
2,460	39	>75% Grass cover, Good, HSG A
964	30	Woods, Good, HSG A
3,424		Weighted Average
3,424	36	100.00% Pervious Area

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

Summary for Subcatchment P-1D: Subcat P-1D

Runoff = 0.06 cfs @ 12.10 hrs, Volume= 229 cf, Depth= 0.37"
 Routed to Pond RR2 : Riprap Slope

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-year Rainfall=4.90"

Printed 6/20/2024

Page 25

Area (sf)	CN	Description
1,126	39	>75% Grass cover, Good, HSG A
1,840	62	>Stone Rip Rap, Good, HSG A
4,547	30	Woods, Good, HSG A
7,513		Weighted Average
7,513	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.1673	0.16		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	18	0.1673	2.05		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
5.3	68	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1E: Subcat P-1E

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 337 cf, Depth= 0.71"
 Routed to Pond RR3 : Riprap Slope

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
2,868	39	>75% Grass cover, Good, HSG A
1,801	62	>Stone Rip Rap, Good, HSG A
225	98	Paved parking, HSG A
813	30	Woods, Good, HSG A
5,707		Weighted Average
5,482	45	96.06% Pervious Area
225	98	3.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	21	0.1200	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
0.3	41	0.0992	2.20		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.3	62	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.00 cfs @ 12.10 hrs, Volume= 24 cf, Depth= 0.18"
 Routed to Link SP2 : STUDY POINT #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
746	39	>75% Grass cover, Good, HSG A
107	62	>Stone Rip Rap, Good, HSG A
734	30	Woods, Good, HSG A
1,587		Weighted Average
1,587	36	100.00% Pervious Area

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

Summary for Subcatchment P-3A: Subcat P-3A

Runoff = 0.91 cfs @ 12.09 hrs, Volume= 3,308 cf, Depth= 2.62"
 Routed to Pond CB-6 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
5,602	39	>75% Grass cover, Good, HSG A
250	62	>Stone Rip Rap, Good, HSG A
8,221	98	Paved parking, HSG A
1,098	30	Woods, Good, HSG A
15,170		Weighted Average
6,950	38	45.81% Pervious Area
8,221	98	54.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	47	0.1200	0.14		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.28"
0.5	106	0.0300	3.52		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
6.2	153	Total			

Summary for Subcatchment P-3B: Subcat P-3B

Runoff = 0.70 cfs @ 12.10 hrs, Volume= 2,743 cf, Depth= 1.86"
 Routed to Pond CB-5 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
9,329	39	>75% Grass cover, Good, HSG A
6,696	98	Paved parking, HSG A
1,685	30	Woods, Good, HSG A
17,711		Weighted Average
11,014	38	62.19% Pervious Area
6,696	98	37.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	47	0.1200	0.14		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.28"
1.8	254	0.0140	2.40		Shallow Concentrated Flow,
					Paved Kv= 20.3 fps
7.5	301	Total			

Summary for Subcatchment P-3C: Subcat P-3C

Runoff = 1.95 cfs @ 12.08 hrs, Volume= 6,973 cf, Depth= 3.30"
 Routed to Pond CB-4 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-year Rainfall=4.90"

Printed 6/20/2024

Page 27

Area (sf)	CN	Description
5,279	39	>75% Grass cover, Good, HSG A
1,565	61	>75% Grass cover, Good, HSG B
12	68	>Stone Rip Rap, Good, HSG B
2,364	98	Paved parking, HSG A
14,929	98	Paved parking, HSG B
1,229	30	Woods, Good, HSG A
14	55	Woods, Good, HSG B
25,392		Weighted Average
8,099	42	31.90% Pervious Area
17,293	98	68.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	158	0.0200	1.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
1.7	158	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-3D: Subcat P-3D

Runoff = 1.03 cfs @ 12.08 hrs, Volume= 3,688 cf, Depth= 3.20"
 Routed to Pond CB-3 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
3,871	39	>75% Grass cover, Good, HSG A
1	62	>Stone Rip Rap, Good, HSG A
9,341	98	Paved parking, HSG A
619	30	Woods, Good, HSG A
13,831		Weighted Average
4,491	38	32.47% Pervious Area
9,341	98	67.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0360	1.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
0.4	85	0.0360	3.85		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.9	135	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-3E: Subcat P-3E

Runoff = 0.56 cfs @ 12.08 hrs, Volume= 1,997 cf, Depth= 3.92"
 Routed to Pond CB-2 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
925	39	>75% Grass cover, Good, HSG A
125	61	>75% Grass cover, Good, HSG B
4,721	98	Paved parking, HSG A
346	98	Paved parking, HSG B
6,117		Weighted Average
1,050	42	17.17% Pervious Area
5,067	98	82.83% Impervious Area

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

Summary for Subcatchment P-3F: Subcat P-3F

Runoff = 1.61 cfs @ 12.08 hrs, Volume= 5,690 cf, Depth= 4.10"
 Routed to Pond CB-1 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
2,781	61	>75% Grass cover, Good, HSG B
455	98	Paved parking, HSG A
13,407	98	Paved parking, HSG B
16,643		Weighted Average
2,781	61	16.71% Pervious Area
13,862	98	83.29% Impervious Area

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

Summary for Subcatchment P-3G: Subcat P-3G (roof)

Runoff = 0.93 cfs @ 12.11 hrs, Volume= 3,497 cf, Depth= 4.66"
 Routed to Pond DMH-3 : DMH

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3H: Subcat P-3H (roof)

Runoff = 0.93 cfs @ 12.11 hrs, Volume= 3,497 cf, Depth= 4.66"
 Routed to Pond IS-2 : IS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
8,032	98	Roofs, HSG A
968	98	Roofs, HSG B
9,000		Weighted Average
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3I: Subcat P-3I (roof)

Runoff = 0.93 cfs @ 12.11 hrs, Volume= 3,497 cf, Depth= 4.66"
 Routed to Pond CB-6 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-year Rainfall=4.90"

Printed 6/20/2024

Page 29

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3J: Subcat P-3J (roof)

Runoff = 0.93 cfs @ 12.11 hrs, Volume= 3,497 cf, Depth= 4.66"
 Routed to Pond IS-2 : IS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3K: Subcat P-3K

Runoff = 1.39 cfs @ 12.18 hrs, Volume= 6,388 cf, Depth= 1.00"
 Routed to Link SP-3 : STUDY POINT #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
2,624	39	>75% Grass cover, Good, HSG A
8,980	61	>75% Grass cover, Good, HSG B
801	62	>Stone Rip Rap, Good, HSG A
3,956	68	>Stone Rip Rap, Good, HSG B
250	30	Woods, Good, HSG A
60,357	55	Woods, Good, HSG B
76,968		Weighted Average
76,968	56	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.2500	0.11		Sheet Flow, A-B Woods: Dense underbrush n= 0.800 P2= 3.28"
3.6	359	0.1100	1.66		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
11.3	409	Total			

Summary for Subcatchment P-3L: Subcat P-3L

Runoff = 0.72 cfs @ 12.10 hrs, Volume= 2,466 cf, Depth= 1.35"
 Routed to Reach R2 : Routing sheet flow through a subcatchment

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-year Rainfall=4.90"

Area (sf)	CN	Description
16,823	61	>75% Grass cover, Good, HSG B
3,167	68	>Stone Rip Rap, Good, HSG B
1	98	Paved parking, HSG B
1,964	55	Woods, Good, HSG B
21,955		Weighted Average
21,954	61	100.00% Pervious Area
1	98	0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	81	0.4000	0.25		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
5.4	81	Total, Increased to minimum Tc = 6.0 min			

Summary for Reach R1: Routing sheet flow through a subcatchment

A subcatchment performs runoff calculations, including the associated Tc and CN determinations. It does not have any facility for routing an inflow hydrograph from another source. However, a reach may be used to perform this type of specialized routing.

This reach demonstrates a procedure for performing a sheet-flow routing through a subcatchment area. In this case, the "reach" is defined as a wide channel with very low side slopes. The Manning's value of 0.15 is selected from the table of sheet flow roughness coefficients, which are much higher than normal Manning's values, in order to allow for the greater frictional losses of shallow flow. This value is comparable to the Manning's value for "very weedy reaches".

This example assumes that sheet flow occurs evenly over the entire 100' channel width, and that the flow depth is therefore very small. If the flow is concentrated or forms channels, the description and Manning's value must be adjusted accordingly.

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 3.80" for 10-year event
 Inflow = 13.19 cfs @ 12.10 hrs, Volume= 41,904 cf
 Outflow = 8.24 cfs @ 12.22 hrs, Volume= 41,904 cf, Atten= 38%, Lag= 6.8 min
 Routed to Link SP-3 : STUDY POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.26 fps, Min. Travel Time= 17.9 min
 Avg. Velocity = 0.06 fps, Avg. Travel Time= 82.9 min

Peak Storage= 8,829 cf @ 12.22 hrs
 Average Depth at Peak Storage= 0.25' , Surface Width= 150.37'
 Bank-Full Depth= 1.00' Flow Area= 200.0 sf, Capacity= 113.05 cfs

100.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
 Side Slope Z-value= 100.0 ' / Top Width= 300.00'
 Length= 280.0' Slope= 0.1590 ' / '
 Inlet Invert= 265.92', Outlet Invert= 221.40'



Summary for Reach R2: Routing sheet flow through a subcatchment

A subcatchment performs runoff calculations, including the associated Tc and CN determinations. It does not have any facility for routing an inflow hydrograph from another source. However, a reach may be used to perform this type of specialized routing.

This reach demonstrates a procedure for performing a sheet-flow routing through a subcatchment area. In this case, the "reach" is defined as a wide channel with very low side slopes. The Manning's value of 0.15 is selected from the table of sheet flow roughness coefficients, which are much higher than normal Manning's values, in order to allow for the greater frictional losses of shallow flow. This value is comparable to the Manning's value for "very weedy reaches".

This example assumes that sheet flow occurs evenly over the entire 100' channel width, and that the flow depth is therefore very small. If the flow is concentrated or forms channels, the description and Manning's value must be adjusted accordingly.

[80] Warning: Exceeded Pond RR5 by 4.95' @ 12.54 hrs (435.83 cfs 112,032,146 cf)

Inflow Area = 152,820 sf, 63.13% Impervious, Inflow Depth = 0.19" for 10-year event
 Inflow = 0.72 cfs @ 12.10 hrs, Volume= 2,466 cf
 Outflow = 0.18 cfs @ 12.54 hrs, Volume= 2,466 cf, Atten= 75%, Lag= 26.7 min
 Routed to Link SP-3 : STUDY POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.07 fps, Min. Travel Time= 70.6 min
 Avg. Velocity= 0.04 fps, Avg. Travel Time= 127.5 min

Peak Storage= 766 cf @ 12.54 hrs
 Average Depth at Peak Storage= 0.03', Surface Width= 105.33'
 Bank-Full Depth= 1.00' Flow Area= 200.0 sf, Capacity= 113.05 cfs

100.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
 Side Slope Z-value= 100.0 '/' Top Width= 300.00'
 Length= 280.0' Slope= 0.1590 '/'
 Inlet Invert= 265.92', Outlet Invert= 221.40'



Summary for Pond 1P: Existing Off-Site CB

[58] Hint: Peaked 14.09' above defined flood level

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 4.53" for 10-year event
 Inflow = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf
 Outflow = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf, Atten= 0%, Lag= 0.0 min
 Primary = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf
 Routed to Pond DMH-8 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 303.95' @ 12.10 hrs
 Flood Elev= 289.86'

Device	Routing	Invert	Outlet Devices
#1	Primary	283.08'	12.0" Round Culvert L= 118.0' Ke= 0.500 Inlet / Outlet Invert= 283.08' / 278.95' S= 0.0350 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=13.28 cfs @ 12.10 hrs HW=303.90' TW=283.23' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 13.28 cfs @ 16.91 fps)

Summary for Pond CB-1: CB

Inflow Area = 16,643 sf, 83.29% Impervious, Inflow Depth = 4.10" for 10-year event
 Inflow = 1.61 cfs @ 12.08 hrs, Volume= 5,690 cf
 Outflow = 1.61 cfs @ 12.08 hrs, Volume= 5,690 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.61 cfs @ 12.08 hrs, Volume= 5,690 cf
 Routed to Link WQ-1 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.93' @ 12.08 hrs
 Flood Elev= 272.52'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.22'	12.0" Round Culvert L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 269.22' / 268.77' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.61 cfs @ 12.08 hrs HW=269.93' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 1.61 cfs @ 3.77 fps)

Summary for Pond CB-2: CB

Inflow Area = 6,117 sf, 82.83% Impervious, Inflow Depth = 3.92" for 10-year event
 Inflow = 0.56 cfs @ 12.08 hrs, Volume= 1,997 cf
 Outflow = 0.56 cfs @ 12.08 hrs, Volume= 1,997 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.56 cfs @ 12.08 hrs, Volume= 1,997 cf
 Routed to Pond DMH-3 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.96' @ 12.09 hrs
 Flood Elev= 273.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.46'	12.0" Round Culvert L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 270.46' / 270.23' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.56 cfs @ 12.08 hrs HW=270.95' TW=270.78' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 0.56 cfs @ 2.11 fps)

Summary for Pond CB-3: CB

Inflow Area = 13,831 sf, 67.53% Impervious, Inflow Depth = 3.20" for 10-year event
 Inflow = 1.03 cfs @ 12.08 hrs, Volume= 3,688 cf
 Outflow = 1.03 cfs @ 12.08 hrs, Volume= 3,688 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.03 cfs @ 12.08 hrs, Volume= 3,688 cf
 Routed to Pond DMH-3 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 271.94' @ 12.08 hrs
 Flood Elev= 274.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.40'	12.0" Round Culvert L= 126.0' Ke= 0.500 Inlet / Outlet Invert= 271.40' / 270.23' S= 0.0093 '/ 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=271.94' TW=270.78' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 1.03 cfs @ 3.44 fps)

Summary for Pond CB-4: CB

Inflow Area = 25,392 sf, 68.10% Impervious, Inflow Depth = 3.30" for 10-year event
 Inflow = 1.95 cfs @ 12.08 hrs, Volume= 6,973 cf
 Outflow = 1.95 cfs @ 12.08 hrs, Volume= 6,973 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.95 cfs @ 12.08 hrs, Volume= 6,973 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.05' @ 12.08 hrs
 Flood Elev= 272.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.24'	12.0" Round Culvert L= 44.0' Ke= 0.500 Inlet / Outlet Invert= 269.24' / 268.80' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.95 cfs @ 12.08 hrs HW=270.05' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 1.95 cfs @ 3.92 fps)

Summary for Pond CB-5: CB

Inflow Area = 17,711 sf, 37.81% Impervious, Inflow Depth = 1.86" for 10-year event
 Inflow = 0.70 cfs @ 12.10 hrs, Volume= 2,743 cf
 Outflow = 0.70 cfs @ 12.10 hrs, Volume= 2,743 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.70 cfs @ 12.10 hrs, Volume= 2,743 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 271.78' @ 12.10 hrs
 Flood Elev= 275.46'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.36'	12.0" Round Culvert L= 65.0' Ke= 0.500 Inlet / Outlet Invert= 271.36' / 269.55' S= 0.0278 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.70 cfs @ 12.10 hrs HW=271.78' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 0.70 cfs @ 2.21 fps)

Summary for Pond CB-6: CB

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 3.38" for 10-year event
 Inflow = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf
 Outflow = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf
 Routed to Pond DMH-7 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 275.49' @ 12.10 hrs
 Flood Elev= 278.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.74'	12.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 274.74' / 273.79' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.81 cfs @ 12.10 hrs HW=275.49' TW=274.44' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 1.81 cfs @ 4.00 fps)

Summary for Pond DMH-10: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 4.53" for 10-year event
 Inflow = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf
 Outflow = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf, Atten= 0%, Lag= 0.0 min
 Primary = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf
 Routed to Pond RR4 : Riprap Slope

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 275.97' @ 12.10 hrs
 Flood Elev= 279.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.28'	30.0" Round Culvert L= 9.0' Ke= 0.500 Inlet / Outlet Invert= 274.28' / 274.00' S= 0.0311 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=13.28 cfs @ 12.10 hrs HW=275.97' TW=269.12' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 13.28 cfs @ 5.30 fps)

Summary for Pond DMH-2: DMH

Inflow Area = 28,949 sf, 80.86% Impervious, Inflow Depth = 3.81" for 10-year event
 Inflow = 2.49 cfs @ 12.09 hrs, Volume= 9,182 cf
 Outflow = 2.49 cfs @ 12.09 hrs, Volume= 9,182 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.49 cfs @ 12.09 hrs, Volume= 9,182 cf
 Routed to Link WQ-1 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.26' @ 12.09 hrs
 Flood Elev= 274.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	268.42'	15.0" Round Culvert L= 64.0' Ke= 0.500 Inlet / Outlet Invert= 268.42' / 267.87' S= 0.0086 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.49 cfs @ 12.09 hrs HW=269.26' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 2.49 cfs @ 4.04 fps)

Summary for Pond DMH-3: DMH

Inflow Area = 28,949 sf, 80.86% Impervious, Inflow Depth = 3.81" for 10-year event
 Inflow = 2.49 cfs @ 12.09 hrs, Volume= 9,182 cf
 Outflow = 2.49 cfs @ 12.09 hrs, Volume= 9,182 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.49 cfs @ 12.09 hrs, Volume= 9,182 cf
 Routed to Pond DMH-2 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.79' @ 12.09 hrs
 Flood Elev= 274.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.98'	15.0" Round Culvert L= 168.0' Ke= 0.500 Inlet / Outlet Invert= 269.98' / 268.52' S= 0.0087 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.49 cfs @ 12.09 hrs HW=270.79' TW=269.26' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 2.49 cfs @ 4.22 fps)

Summary for Pond DMH-5: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 3.38" for 10-year event
 Inflow = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf
 Outflow = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 268.08' @ 12.10 hrs
 Flood Elev= 274.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	267.34'	12.0" Round Culvert L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 267.34' / 266.88' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.81 cfs @ 12.10 hrs HW=268.08' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 1.81 cfs @ 2.92 fps)

Summary for Pond DMH-6: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 3.38" for 10-year event
 Inflow = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf
 Outflow = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf
 Routed to Pond DMH-5 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 272.91' @ 12.10 hrs
 Flood Elev= 277.33'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.17'	12.0" Round Culvert L= 147.0' Ke= 0.500 Inlet / Outlet Invert= 272.17' / 269.87' S= 0.0156 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.81 cfs @ 12.10 hrs HW=272.91' TW=268.08' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 1.81 cfs @ 2.92 fps)

Summary for Pond DMH-7: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 3.38" for 10-year event
 Inflow = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf
 Outflow = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.82 cfs @ 12.10 hrs, Volume= 6,805 cf
 Routed to Pond DMH-6 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 274.44' @ 12.10 hrs
 Flood Elev= 279.73'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.70'	12.0" Round Culvert L= 143.0' Ke= 0.500 Inlet / Outlet Invert= 273.70' / 272.27' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.81 cfs @ 12.10 hrs HW=274.44' TW=272.91' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 1.81 cfs @ 2.92 fps)

Summary for Pond DMH-8: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 4.53" for 10-year event
 Inflow = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf
 Outflow = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf, Atten= 0%, Lag= 0.0 min
 Primary = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf
 Routed to Pond DMH-9 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 283.23' @ 12.10 hrs
 Flood Elev= 286.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	281.70'	30.0" Round Culvert L= 170.0' Ke= 0.500 Inlet / Outlet Invert= 281.70' / 278.93' S= 0.0163 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=13.28 cfs @ 12.10 hrs HW=283.23' TW=280.36' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 13.28 cfs @ 4.21 fps)

Summary for Pond DMH-9: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 4.53" for 10-year event
 Inflow = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf
 Outflow = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf, Atten= 0%, Lag= 0.0 min
 Primary = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf
 Routed to Pond DMH-10 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.36' @ 12.10 hrs
 Flood Elev= 284.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	278.83'	30.0" Round Culvert L= 274.0' Ke= 0.500 Inlet / Outlet Invert= 278.83' / 274.38' S= 0.0162 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=13.28 cfs @ 12.10 hrs HW=280.36' TW=275.97' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 13.28 cfs @ 4.21 fps)

Summary for Pond IS-1: IS-1

Inflow Area = 23,802 sf, 26.02% Impervious, Inflow Depth = 1.20" for 10-year event
 Inflow = 0.66 cfs @ 12.08 hrs, Volume= 2,389 cf
 Outflow = 0.04 cfs @ 11.29 hrs, Volume= 2,389 cf, Atten= 94%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 11.29 hrs, Volume= 2,389 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link SP1 : STUDY POINT #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 275.23' @ 13.83 hrs Surf.Area= 1,068 sf Storage= 955 cf
 Flood Elev= 278.00' Surf.Area= 1,839 sf Storage= 1,645 cf

Plug-Flow detention time= 189.0 min calculated for 2,389 cf (100% of inflow)
 Center-of-Mass det. time= 188.9 min (945.1 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	277.00'	1,272 cf	surface storage (Irregular) Listed below (Recalc)
#2	275.00'	78 cf	media storage (Irregular) Listed below (Recalc) 260 cf Overall x 30.0% Voids
#3A	273.30'	602 cf	20.75'W x 45.19'L x 2.00'H Field A 1,875 cf Overall - 369 cf Embedded = 1,506 cf x 40.0% Voids
#4A	273.80'	369 cf	ADS_StormTech SC-160LP +Cap x 54 Inside #3 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 54 Chambers in 9 Rows
		2,322 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
277.00	435	96.0	0	0	435
278.00	771	118.0	595	595	825
279.00	588	81.0	677	1,272	1,419

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	130	53.0	0	0	130
277.00	130	53.0	260	260	236

Device	Routing	Invert	Outlet Devices
#0	Primary	279.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	273.30'	0.04 cfs Exfiltration at all elevations Phase-In= 0.01'
#2	Primary	277.80'	9.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50

5.00 5.50
 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88
 3.07 3.32

Discarded OutFlow Max=0.04 cfs @ 11.29 hrs HW=273.36' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=273.30' TW=0.00' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond IS-2: IS-2

GEO-TP-5 indicates silty sand to a depth of 14' below grade with no refusal. The infiltration rate for loamy sand is 2.41 inches per hour (Rawls Rates)

Redox was encountered at 9' below grade or elevation 263.0

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 3.52" for 10-year event
 Inflow = 10.37 cfs @ 12.09 hrs, Volume= 38,389 cf
 Outflow = 0.44 cfs @ 10.52 hrs, Volume= 38,389 cf, Atten= 96%, Lag= 0.0 min
 Discarded = 0.44 cfs @ 10.52 hrs, Volume= 38,389 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link RR1 : RipRap Apron

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

Peak Elev= 269.21' @ 15.05 hrs Surf.Area= 8,331 sf Storage= 18,673 cf

Flood Elev= 271.58' Surf.Area= 8,627 sf Storage= 27,840 cf

Plug-Flow detention time= 356.8 min calculated for 38,384 cf (100% of inflow)

Center-of-Mass det. time= 356.8 min (1,110.3 - 753.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	266.00'	12,250 cf	52.75'W x 150.43'L x 5.58'H Field A Z=0.3 46,227 cf Overall - 15,602 cf Embedded = 30,625 cf x 40.0% Voids
#2A	266.50'	15,602 cf	ADS_StormTech MC-3500 d +Cap x 140 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 140 Chambers in 7 Rows Cap Storage= 14.9 cf x 2 x 7 rows = 208.6 cf
		27,852 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	266.00'	0.44 cfs Exfiltration at all elevations Phase-In= 0.01'
#2	Primary	267.00'	10.0" Round Culvert L= 29.0' Ke= 0.500 Inlet / Outlet Invert= 267.00' / 265.92' S= 0.0372 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#3	Device 2	269.40'	4.0' long x 6.26' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.44 cfs @ 10.52 hrs HW=266.10' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=266.00' TW=0.00' (Dynamic Tailwater)

↑2=Culvert (Controls 0.00 cfs)

↑3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond RR2: Riprap Slope

Inflow Area = 7,513 sf, 0.00% Impervious, Inflow Depth = 0.37" for 10-year event
 Inflow = 0.06 cfs @ 12.10 hrs, Volume= 229 cf
 Outflow = 0.06 cfs @ 12.10 hrs, Volume= 229 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.06 cfs @ 12.10 hrs, Volume= 229 cf
 Primary = 0.00 cfs @ 24.34 hrs, Volume= 0 cf
 Routed to Pond IS-1 : IS-1

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-year Rainfall=4.90"

Printed 6/20/2024

Page 38

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.00' @ 0.00 hrs Surf.Area= 111 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.0 min (883.4 - 883.4)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	328 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 821 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	111	0	0
281.00	111	111	111
282.00	111	111	222
283.00	103	107	329
284.00	75	89	418
285.00	73	74	492
286.00	70	72	564
287.00	68	69	633
288.00	66	67	700
289.00	62	64	764
290.00	52	57	821

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	0.37 cfs Exfiltration at all elevations
#2	Primary	280.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=280.00' (Free Discharge)
 ↳ **1=Exfiltration** (Passes 0.00 cfs of 0.37 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 24.34 hrs HW=280.00' TW=273.30' (Dynamic Tailwater)
 ↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RR3: Riprap Slope

Inflow Area = 5,707 sf, 3.94% Impervious, Inflow Depth = 0.71" for 10-year event
 Inflow = 0.09 cfs @ 12.09 hrs, Volume= 337 cf
 Outflow = 0.09 cfs @ 12.09 hrs, Volume= 337 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.09 cfs @ 12.09 hrs, Volume= 337 cf
 Primary = 0.00 cfs @ 24.34 hrs, Volume= 0 cf
 Routed to Pond IS-1 : IS-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.00' @ 0.00 hrs Surf.Area= 116 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.0 min (858.0 - 858.0)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	464 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,160 cf Overall x 40.0% Voids

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 10-year Rainfall=4.90"

Printed 6/20/2024

Page 39

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	116	0	0
281.00	116	116	116
282.00	116	116	232
283.00	116	116	348
284.00	116	116	464
285.00	116	116	580
286.00	116	116	696
287.00	116	116	812
288.00	116	116	928
289.00	116	116	1,044
290.00	116	116	1,160

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	0.37 cfs Exfiltration at all elevations
#2	Primary	280.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=280.00' (Free Discharge)

↑**1=Exfiltration** (Passes 0.00 cfs of 0.37 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 24.34 hrs HW=280.00' TW=273.30' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RR4: Riprap Slope

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 4.53" for 10-year event
 Inflow = 13.29 cfs @ 12.10 hrs, Volume= 49,920 cf
 Outflow = 13.29 cfs @ 12.10 hrs, Volume= 49,922 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 3.38 hrs, Volume= 8,017 cf
 Primary = 13.19 cfs @ 12.10 hrs, Volume= 41,904 cf
 Routed to Reach R1 : Routing sheet flow through a subcatchment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.12' @ 12.10 hrs Surf.Area= 112 sf Storage= 45 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 1.0 min (751.1 - 750.1)

Volume	Invert	Avail.Storage	Storage Description
#1	268.00'	225 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 563 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
268.00	87	0	0
269.00	110	99	99
270.00	126	118	217
271.00	96	111	328
272.00	76	86	414
273.00	63	70	483
274.00	97	80	563

Device	Routing	Invert	Outlet Devices
#1	Discarded	268.00'	0.10 cfs Exfiltration at all elevations
#2	Primary	269.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 3.38 hrs HW=268.06' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=13.18 cfs @ 12.10 hrs HW=269.12' TW=266.14' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir**(Weir Controls 13.18 cfs @ 0.95 fps)

Summary for Pond RR5: Riprap Slope

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 0.00" for 10-year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach R2 : Routing sheet flow through a subcatchment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 261.00' @ 0.00 hrs Surf.Area= 14 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	261.00'	35 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 89 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
261.00	14	0	0
262.00	34	24	24
263.00	26	30	54
264.00	18	22	76
265.00	7	13	89

Device	Routing	Invert	Outlet Devices
#1	Discarded	261.00'	0.10 cfs Exfiltration at all elevations
#2	Primary	261.50'	14.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=261.00' (Free Discharge)
 ↳1=Exfiltration (Passes 0.00 cfs of 0.10 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=261.00' TW=265.92' (Dynamic Tailwater)
 ↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link RR1: RipRap Apron

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 0.00" for 10-year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
 Routed to Pond RR5 : Riprap Slope

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP-3: STUDY POINT #3

Inflow Area = 361,985 sf, 62.10% Impervious, Inflow Depth = 1.68" for 10-year event
 Inflow = 9.71 cfs @ 12.21 hrs, Volume= 50,758 cf
 Primary = 9.71 cfs @ 12.21 hrs, Volume= 50,758 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP1: STUDY POINT #1

Inflow Area = 27,226 sf, 22.75% Impervious, Inflow Depth = 0.02" for 10-year event
 Inflow = 0.00 cfs @ 12.50 hrs, Volume= 37 cf
 Primary = 0.00 cfs @ 12.50 hrs, Volume= 37 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP2: STUDY POINT #2

Inflow Area = 1,587 sf, 0.00% Impervious, Inflow Depth = 0.18" for 10-year event
Inflow = 0.00 cfs @ 12.10 hrs, Volume= 24 cf
Primary = 0.00 cfs @ 12.10 hrs, Volume= 24 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link WQ-1: Water Quality Unit

Inflow Area = 45,592 sf, 81.75% Impervious, Inflow Depth = 3.91" for 10-year event
Inflow = 4.10 cfs @ 12.09 hrs, Volume= 14,873 cf
Primary = 4.10 cfs @ 12.09 hrs, Volume= 14,873 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond IS-2 : IS-2

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link WQ-2: Water Quality Unit

Inflow Area = 67,273 sf, 61.26% Impervious, Inflow Depth = 2.95" for 10-year event
Inflow = 4.45 cfs @ 12.09 hrs, Volume= 16,521 cf
Primary = 4.45 cfs @ 12.09 hrs, Volume= 16,521 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond IS-2 : IS-2

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment A-1: Subcat A-1

Runoff = 7.34 cfs @ 12.11 hrs, Volume= 27,936 cf, Depth= 5.93"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
56,517	98	Paved parking, HSG A
56,517	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment B-1: Subcat B-1

Runoff = 3.73 cfs @ 12.08 hrs, Volume= 13,411 cf, Depth= 5.24"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
3,889	39	>75% Grass cover, Good, HSG A
26,806	98	Paved parking, HSG A
30,695		Weighted Average
3,889	39	12.67% Pervious Area
26,806	98	87.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	117	0.0200	1.44		Sheet Flow, Paved parking Smooth surfaces n= 0.011 P2= 3.28"
0.9	163	0.0200	2.87		Shallow Concentrated Flow, Paved Parking Lot Paved Kv= 20.3 fps
2.3	280	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B-2: Subcat B-2

Runoff = 5.84 cfs @ 12.11 hrs, Volume= 22,236 cf, Depth= 5.93"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
44,985	98	Paved parking, HSG A
44,985	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-1A: Subcat P-1A

Runoff = 0.46 cfs @ 12.08 hrs, Volume= 1,734 cf, Depth= 3.55"
 Routed to Pond IS-1 : IS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-year Rainfall=6.17"

Printed 6/20/2024

Page 43

Area (sf)	CN	Description
2,565	39	>75% Grass cover, Good, HSG A
3,294	98	Paved parking, HSG A
5,859		Weighted Average
2,565	39	43.78% Pervious Area
3,294	98	56.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	67	0.0300	1.51		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.28"
0.7	67	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1B: Subcat P-1B

Runoff = 0.37 cfs @ 12.08 hrs, Volume= 1,407 cf, Depth= 3.58"
 Routed to Pond IS-1 : IS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
2,046	39	>75% Grass cover, Good, HSG A
2,675	98	Paved parking, HSG A
4,722		Weighted Average
2,046	39	43.34% Pervious Area
2,675	98	56.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	34	0.0300	1.32		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
0.4	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1C: Subcat P-1C

Runoff = 0.01 cfs @ 12.33 hrs, Volume= 109 cf, Depth= 0.38"
 Routed to Link SP1 : STUDY POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
2,460	39	>75% Grass cover, Good, HSG A
964	30	Woods, Good, HSG A
3,424		Weighted Average
3,424	36	100.00% Pervious Area

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

Summary for Subcatchment P-1D: Subcat P-1D

Runoff = 0.11 cfs @ 12.10 hrs, Volume= 419 cf, Depth= 0.67"
 Routed to Pond RR2 : Riprap Slope

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-year Rainfall=6.17"

Printed 6/20/2024

Page 44

Area (sf)	CN	Description
1,126	39	>75% Grass cover, Good, HSG A
1,840	62	>Stone Rip Rap, Good, HSG A
4,547	30	Woods, Good, HSG A
7,513		Weighted Average
7,513	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.1673	0.16		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	18	0.1673	2.05		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
5.3	68	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1E: Subcat P-1E

Runoff = 0.14 cfs @ 12.10 hrs, Volume= 567 cf, Depth= 1.19"
 Routed to Pond RR3 : Riprap Slope

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
2,868	39	>75% Grass cover, Good, HSG A
1,801	62	>Stone Rip Rap, Good, HSG A
225	98	Paved parking, HSG A
813	30	Woods, Good, HSG A
5,707		Weighted Average
5,482	45	96.06% Pervious Area
225	98	3.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	21	0.1200	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
0.3	41	0.0992	2.20		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.3	62	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.01 cfs @ 12.13 hrs, Volume= 56 cf, Depth= 0.42"
 Routed to Link SP2 : STUDY POINT #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
746	39	>75% Grass cover, Good, HSG A
107	62	>Stone Rip Rap, Good, HSG A
734	30	Woods, Good, HSG A
1,587		Weighted Average
1,587	36	100.00% Pervious Area

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

Summary for Subcatchment P-3A: Subcat P-3A

Runoff = 1.15 cfs @ 12.09 hrs, Volume= 4,349 cf, Depth= 3.44"
 Routed to Pond CB-6 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
5,602	39	>75% Grass cover, Good, HSG A
250	62	>Stone Rip Rap, Good, HSG A
8,221	98	Paved parking, HSG A
1,098	30	Woods, Good, HSG A
15,170		Weighted Average
6,950	38	45.81% Pervious Area
8,221	98	54.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	47	0.1200	0.14		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.28"
0.5	106	0.0300	3.52		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
6.2	153	Total			

Summary for Subcatchment P-3B: Subcat P-3B

Runoff = 0.89 cfs @ 12.11 hrs, Volume= 3,708 cf, Depth= 2.51"
 Routed to Pond CB-5 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
9,329	39	>75% Grass cover, Good, HSG A
6,696	98	Paved parking, HSG A
1,685	30	Woods, Good, HSG A
17,711		Weighted Average
11,014	38	62.19% Pervious Area
6,696	98	37.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	47	0.1200	0.14		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.28"
1.8	254	0.0140	2.40		Shallow Concentrated Flow,
					Paved Kv= 20.3 fps
7.5	301	Total			

Summary for Subcatchment P-3C: Subcat P-3C

Runoff = 2.49 cfs @ 12.08 hrs, Volume= 9,056 cf, Depth= 4.28"
 Routed to Pond CB-4 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-year Rainfall=6.17"

Printed 6/20/2024

Page 46

Area (sf)	CN	Description
5,279	39	>75% Grass cover, Good, HSG A
1,565	61	>75% Grass cover, Good, HSG B
12	68	>Stone Rip Rap, Good, HSG B
2,364	98	Paved parking, HSG A
14,929	98	Paved parking, HSG B
1,229	30	Woods, Good, HSG A
14	55	Woods, Good, HSG B
25,392		Weighted Average
8,099	42	31.90% Pervious Area
17,293	98	68.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	158	0.0200	1.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
1.7	158	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-3D: Subcat P-3D

Runoff = 1.30 cfs @ 12.08 hrs, Volume= 4,782 cf, Depth= 4.15"
 Routed to Pond CB-3 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
3,871	39	>75% Grass cover, Good, HSG A
1	62	>Stone Rip Rap, Good, HSG A
9,341	98	Paved parking, HSG A
619	30	Woods, Good, HSG A
13,831		Weighted Average
4,491	38	32.47% Pervious Area
9,341	98	67.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0360	1.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
0.4	85	0.0360	3.85		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.9	135	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-3E: Subcat P-3E

Runoff = 0.71 cfs @ 12.08 hrs, Volume= 2,565 cf, Depth= 5.03"
 Routed to Pond CB-2 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
925	39	>75% Grass cover, Good, HSG A
125	61	>75% Grass cover, Good, HSG B
4,721	98	Paved parking, HSG A
346	98	Paved parking, HSG B
6,117		Weighted Average
1,050	42	17.17% Pervious Area
5,067	98	82.83% Impervious Area

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

Summary for Subcatchment P-3F: Subcat P-3F

Runoff = 2.08 cfs @ 12.08 hrs, Volume= 7,344 cf, Depth= 5.29"
 Routed to Pond CB-1 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
2,781	61	>75% Grass cover, Good, HSG B
455	98	Paved parking, HSG A
13,407	98	Paved parking, HSG B
16,643		Weighted Average
2,781	61	16.71% Pervious Area
13,862	98	83.29% Impervious Area

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

Summary for Subcatchment P-3G: Subcat P-3G (roof)

Runoff = 1.17 cfs @ 12.11 hrs, Volume= 4,449 cf, Depth= 5.93"
 Routed to Pond DMH-3 : DMH

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3H: Subcat P-3H (roof)

Runoff = 1.17 cfs @ 12.11 hrs, Volume= 4,449 cf, Depth= 5.93"
 Routed to Pond IS-2 : IS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
8,032	98	Roofs, HSG A
968	98	Roofs, HSG B
9,000		Weighted Average
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3I: Subcat P-3I (roof)

Runoff = 1.17 cfs @ 12.11 hrs, Volume= 4,449 cf, Depth= 5.93"
 Routed to Pond CB-6 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-year Rainfall=6.17"

Printed 6/20/2024

Page 48

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3J: Subcat P-3J (roof)

Runoff = 1.17 cfs @ 12.11 hrs, Volume= 4,449 cf, Depth= 5.93"
 Routed to Pond IS-2 : IS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3K: Subcat P-3K

Runoff = 2.65 cfs @ 12.17 hrs, Volume= 10,882 cf, Depth= 1.70"
 Routed to Link SP-3 : STUDY POINT #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
2,624	39	>75% Grass cover, Good, HSG A
8,980	61	>75% Grass cover, Good, HSG B
801	62	>Stone Rip Rap, Good, HSG A
3,956	68	>Stone Rip Rap, Good, HSG B
250	30	Woods, Good, HSG A
60,357	55	Woods, Good, HSG B
76,968		Weighted Average
76,968	56	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.2500	0.11		Sheet Flow, A-B Woods: Dense underbrush n= 0.800 P2= 3.28"
3.6	359	0.1100	1.66		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
11.3	409	Total			

Summary for Subcatchment P-3L: Subcat P-3L

Runoff = 1.23 cfs @ 12.09 hrs, Volume= 3,964 cf, Depth= 2.17"
 Routed to Reach R2 : Routing sheet flow through a subcatchment

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-year Rainfall=6.17"

Area (sf)	CN	Description
16,823	61	>75% Grass cover, Good, HSG B
3,167	68	>Stone Rip Rap, Good, HSG B
1	98	Paved parking, HSG B
1,964	55	Woods, Good, HSG B
21,955		Weighted Average
21,954	61	100.00% Pervious Area
1	98	0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	81	0.4000	0.25		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
5.4	81	Total, Increased to minimum Tc = 6.0 min			

Summary for Reach R1: Routing sheet flow through a subcatchment

A subcatchment performs runoff calculations, including the associated Tc and CN determinations. It does not have any facility for routing an inflow hydrograph from another source. However, a reach may be used to perform this type of specialized routing.

This reach demonstrates a procedure for performing a sheet-flow routing through a subcatchment area. In this case, the "reach" is defined as a wide channel with very low side slopes. The Manning's value of 0.15 is selected from the table of sheet flow roughness coefficients, which are much higher than normal Manning's values, in order to allow for the greater frictional losses of shallow flow. This value is comparable to the Manning's value for "very weedy reaches".

This example assumes that sheet flow occurs evenly over the entire 100' channel width, and that the flow depth is therefore very small. If the flow is concentrated or forms channels, the description and Manning's value must be adjusted accordingly.

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 5.03" for 25-year event
 Inflow = 16.68 cfs @ 12.10 hrs, Volume= 55,362 cf
 Outflow = 10.77 cfs @ 12.21 hrs, Volume= 55,362 cf, Atten= 35%, Lag= 6.4 min
 Routed to Link SP-3 : STUDY POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.28 fps, Min. Travel Time= 16.4 min
 Avg. Velocity = 0.06 fps, Avg. Travel Time= 77.1 min

Peak Storage= 10,585 cf @ 12.21 hrs
 Average Depth at Peak Storage= 0.29' , Surface Width= 158.50'
 Bank-Full Depth= 1.00' Flow Area= 200.0 sf, Capacity= 113.05 cfs

100.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
 Side Slope Z-value= 100.0 ' / Top Width= 300.00'
 Length= 280.0' Slope= 0.1590 ' /'
 Inlet Invert= 265.92', Outlet Invert= 221.40'



Summary for Reach R2: Routing sheet flow through a subcatchment

A subcatchment performs runoff calculations, including the associated Tc and CN determinations. It does not have any facility for routing an inflow hydrograph from another source. However, a reach may be used to perform this type of specialized routing.

This reach demonstrates a procedure for performing a sheet-flow routing through a subcatchment area. In this case, the "reach" is defined as a wide channel with very low side slopes. The Manning's value of 0.15 is selected from the table of sheet flow roughness coefficients, which are much higher than normal Manning's values, in order to allow for the greater frictional losses of shallow flow. This value is comparable to the Manning's value for "very weedy reaches".

This example assumes that sheet flow occurs evenly over the entire 100' channel width, and that the flow depth is therefore very small. If the flow is concentrated or forms channels, the description and Manning's value must be adjusted accordingly.

[80] Warning: Exceeded Pond RR5 by 4.96' @ 12.36 hrs (437.90 cfs 108,045,305 cf)

Inflow Area = 152,820 sf, 63.13% Impervious, Inflow Depth = 0.76" for 25-year event
 Inflow = 2.64 cfs @ 12.51 hrs, Volume= 9,638 cf
 Outflow = 1.28 cfs @ 12.88 hrs, Volume= 9,638 cf, Atten= 52%, Lag= 22.1 min
 Routed to Link SP-3 : STUDY POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.14 fps, Min. Travel Time= 34.0 min
 Avg. Velocity= 0.04 fps, Avg. Travel Time= 110.4 min

Peak Storage= 2,607 cf @ 12.88 hrs
 Average Depth at Peak Storage= 0.09', Surface Width= 117.15'
 Bank-Full Depth= 1.00' Flow Area= 200.0 sf, Capacity= 113.05 cfs

100.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
 Side Slope Z-value= 100.0 '/' Top Width= 300.00'
 Length= 280.0' Slope= 0.1590 '/'
 Inlet Invert= 265.92', Outlet Invert= 221.40'



Summary for Pond 1P: Existing Off-Site CB

[58] Hint: Peaked 26.63' above defined flood level

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 5.77" for 25-year event
 Inflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf
 Outflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf, Atten= 0%, Lag= 0.0 min
 Primary = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf
 Routed to Pond DMH-8 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 316.49' @ 12.10 hrs
 Flood Elev= 289.86'

Device	Routing	Invert	Outlet Devices
#1	Primary	283.08'	12.0" Round Culvert L= 118.0' Ke= 0.500 Inlet / Outlet Invert= 283.08' / 278.95' S= 0.0350 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=16.77 cfs @ 12.10 hrs HW=316.42' TW=283.47' (Dynamic Tailwater)
 ←**1=Culvert** (Outlet Controls 16.77 cfs @ 21.35 fps)

Summary for Pond CB-1: CB

Inflow Area = 16,643 sf, 83.29% Impervious, Inflow Depth = 5.29" for 25-year event
 Inflow = 2.08 cfs @ 12.08 hrs, Volume= 7,344 cf
 Outflow = 2.08 cfs @ 12.08 hrs, Volume= 7,344 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.08 cfs @ 12.08 hrs, Volume= 7,344 cf
 Routed to Link WQ-1 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.06' @ 12.08 hrs
 Flood Elev= 272.52'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.22'	12.0" Round Culvert L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 269.22' / 268.77' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.07 cfs @ 12.08 hrs HW=270.06' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 2.07 cfs @ 3.97 fps)

Summary for Pond CB-2: CB

Inflow Area = 6,117 sf, 82.83% Impervious, Inflow Depth = 5.03" for 25-year event
 Inflow = 0.71 cfs @ 12.08 hrs, Volume= 2,565 cf
 Outflow = 0.71 cfs @ 12.08 hrs, Volume= 2,565 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.71 cfs @ 12.08 hrs, Volume= 2,565 cf
 Routed to Pond DMH-3 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 271.07' @ 12.09 hrs
 Flood Elev= 273.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.46'	12.0" Round Culvert L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 270.46' / 270.23' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 12.08 hrs HW=271.07' TW=270.92' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 0.71 cfs @ 2.05 fps)

Summary for Pond CB-3: CB

Inflow Area = 13,831 sf, 67.53% Impervious, Inflow Depth = 4.15" for 25-year event
 Inflow = 1.30 cfs @ 12.08 hrs, Volume= 4,782 cf
 Outflow = 1.30 cfs @ 12.08 hrs, Volume= 4,782 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.30 cfs @ 12.08 hrs, Volume= 4,782 cf
 Routed to Pond DMH-3 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 272.03' @ 12.09 hrs
 Flood Elev= 274.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.40'	12.0" Round Culvert L= 126.0' Ke= 0.500 Inlet / Outlet Invert= 271.40' / 270.23' S= 0.0093 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.30 cfs @ 12.08 hrs HW=272.03' TW=270.92' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 1.30 cfs @ 3.56 fps)

Summary for Pond CB-4: CB

Inflow Area = 25,392 sf, 68.10% Impervious, Inflow Depth = 4.28" for 25-year event
 Inflow = 2.49 cfs @ 12.08 hrs, Volume= 9,056 cf
 Outflow = 2.49 cfs @ 12.08 hrs, Volume= 9,056 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.49 cfs @ 12.08 hrs, Volume= 9,056 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.20' @ 12.08 hrs
 Flood Elev= 272.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.24'	12.0" Round Culvert L= 44.0' Ke= 0.500 Inlet / Outlet Invert= 269.24' / 268.80' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.49 cfs @ 12.08 hrs HW=270.20' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 2.49 cfs @ 4.11 fps)

Summary for Pond CB-5: CB

Inflow Area = 17,711 sf, 37.81% Impervious, Inflow Depth = 2.51" for 25-year event
 Inflow = 0.89 cfs @ 12.11 hrs, Volume= 3,708 cf
 Outflow = 0.89 cfs @ 12.11 hrs, Volume= 3,708 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.89 cfs @ 12.11 hrs, Volume= 3,708 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 271.84' @ 12.11 hrs
 Flood Elev= 275.46'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.36'	12.0" Round Culvert L= 65.0' Ke= 0.500 Inlet / Outlet Invert= 271.36' / 269.55' S= 0.0278 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.89 cfs @ 12.11 hrs HW=271.84' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 0.89 cfs @ 2.37 fps)

Summary for Pond CB-6: CB

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 4.37" for 25-year event
 Inflow = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf
 Outflow = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf
 Routed to Pond DMH-7 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 275.63' @ 12.10 hrs
 Flood Elev= 278.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.74'	12.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 274.74' / 273.79' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.30 cfs @ 12.10 hrs HW=275.63' TW=274.57' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 2.30 cfs @ 4.16 fps)

Summary for Pond DMH-10: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 5.77" for 25-year event
 Inflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf
 Outflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf, Atten= 0%, Lag= 0.0 min
 Primary = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf
 Routed to Pond RR4 : Riprap Slope

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 276.24' @ 12.10 hrs
 Flood Elev= 279.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.28'	30.0" Round Culvert L= 9.0' Ke= 0.500 Inlet / Outlet Invert= 274.28' / 274.00' S= 0.0311 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=16.77 cfs @ 12.10 hrs HW=276.24' TW=269.15' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 16.77 cfs @ 5.57 fps)

Summary for Pond DMH-2: DMH

Inflow Area = 28,949 sf, 80.86% Impervious, Inflow Depth = 4.89" for 25-year event
 Inflow = 3.15 cfs @ 12.09 hrs, Volume= 11,795 cf
 Outflow = 3.15 cfs @ 12.09 hrs, Volume= 11,795 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.15 cfs @ 12.09 hrs, Volume= 11,795 cf
 Routed to Link WQ-1 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.39' @ 12.09 hrs
 Flood Elev= 274.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	268.42'	15.0" Round Culvert L= 64.0' Ke= 0.500 Inlet / Outlet Invert= 268.42' / 267.87' S= 0.0086 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.15 cfs @ 12.09 hrs HW=269.39' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 3.15 cfs @ 4.25 fps)

Summary for Pond DMH-3: DMH

Inflow Area = 28,949 sf, 80.86% Impervious, Inflow Depth = 4.89" for 25-year event
 Inflow = 3.15 cfs @ 12.09 hrs, Volume= 11,795 cf
 Outflow = 3.15 cfs @ 12.09 hrs, Volume= 11,795 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.15 cfs @ 12.09 hrs, Volume= 11,795 cf
 Routed to Pond DMH-2 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.92' @ 12.09 hrs
 Flood Elev= 274.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.98'	15.0" Round Culvert L= 168.0' Ke= 0.500 Inlet / Outlet Invert= 269.98' / 268.52' S= 0.0087 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.15 cfs @ 12.09 hrs HW=270.92' TW=269.39' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 3.15 cfs @ 4.41 fps)

Summary for Pond DMH-5: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 4.37" for 25-year event
 Inflow = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf
 Outflow = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 268.21' @ 12.10 hrs
 Flood Elev= 274.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	267.34'	12.0" Round Culvert L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 267.34' / 266.88' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.30 cfs @ 12.10 hrs HW=268.21' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 2.30 cfs @ 3.17 fps)

Summary for Pond DMH-6: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 4.37" for 25-year event
 Inflow = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf
 Outflow = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf
 Routed to Pond DMH-5 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 273.04' @ 12.10 hrs
 Flood Elev= 277.33'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.17'	12.0" Round Culvert L= 147.0' Ke= 0.500 Inlet / Outlet Invert= 272.17' / 269.87' S= 0.0156 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.30 cfs @ 12.10 hrs HW=273.04' TW=268.21' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 2.30 cfs @ 3.17 fps)

Summary for Pond DMH-7: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 4.37" for 25-year event
 Inflow = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf
 Outflow = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.31 cfs @ 12.10 hrs, Volume= 8,798 cf
 Routed to Pond DMH-6 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 274.57' @ 12.10 hrs
 Flood Elev= 279.73'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.70'	12.0" Round Culvert L= 143.0' Ke= 0.500 Inlet / Outlet Invert= 273.70' / 272.27' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.30 cfs @ 12.10 hrs HW=274.57' TW=273.04' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 2.30 cfs @ 3.17 fps)

Summary for Pond DMH-8: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 5.77" for 25-year event
 Inflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf
 Outflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf, Atten= 0%, Lag= 0.0 min
 Primary = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf
 Routed to Pond DMH-9 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 283.47' @ 12.10 hrs
 Flood Elev= 286.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	281.70'	30.0" Round Culvert L= 170.0' Ke= 0.500 Inlet / Outlet Invert= 281.70' / 278.93' S= 0.0163 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=16.77 cfs @ 12.10 hrs HW=283.47' TW=280.60' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 16.77 cfs @ 4.52 fps)

Summary for Pond DMH-9: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 5.77" for 25-year event
 Inflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf
 Outflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf, Atten= 0%, Lag= 0.0 min
 Primary = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf
 Routed to Pond DMH-10 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.60' @ 12.10 hrs
 Flood Elev= 284.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	278.83'	30.0" Round Culvert L= 274.0' Ke= 0.500 Inlet / Outlet Invert= 278.83' / 274.38' S= 0.0162 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=16.77 cfs @ 12.10 hrs HW=280.60' TW=276.24' (Dynamic Tailwater)
 ←**1=Culvert** (Inlet Controls 16.77 cfs @ 4.52 fps)

Summary for Pond IS-1: IS-1

Inflow Area = 23,802 sf, 26.02% Impervious, Inflow Depth = 1.58" for 25-year event
 Inflow = 0.83 cfs @ 12.08 hrs, Volume= 3,141 cf
 Outflow = 0.04 cfs @ 10.75 hrs, Volume= 3,141 cf, Atten= 95%, Lag= 0.0 min
 Discarded = 0.04 cfs @ 10.75 hrs, Volume= 3,141 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Link SP1 : STUDY POINT #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 277.68' @ 14.87 hrs Surf.Area= 1,719 sf Storage= 1,414 cf
 Flood Elev= 278.00' Surf.Area= 1,839 sf Storage= 1,645 cf

Plug-Flow detention time= 296.1 min calculated for 3,141 cf (100% of inflow)
 Center-of-Mass det. time= 296.1 min (1,053.5 - 757.4)

Volume	Invert	Avail.Storage	Storage Description
#1	277.00'	1,272 cf	surface storage (Irregular) Listed below (Recalc)
#2	275.00'	78 cf	media storage (Irregular) Listed below (Recalc) 260 cf Overall x 30.0% Voids
#3A	273.30'	602 cf	20.75'W x 45.19'L x 2.00'H Field A 1,875 cf Overall - 369 cf Embedded = 1,506 cf x 40.0% Voids
#4A	273.80'	369 cf	ADS_StormTech SC-160LP +Cap x 54 Inside #3 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 54 Chambers in 9 Rows
		2,322 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
277.00	435	96.0	0	0	435
278.00	771	118.0	595	595	825
279.00	588	81.0	677	1,272	1,419

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	130	53.0	0	0	130
277.00	130	53.0	260	260	236

Device	Routing	Invert	Outlet Devices
#0	Primary	279.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	273.30'	0.04 cfs Exfiltration at all elevations Phase-In= 0.01'
#2	Primary	277.80'	9.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50

5.00 5.50
 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88
 3.07 3.32

Discarded OutFlow Max=0.04 cfs @ 10.75 hrs HW=273.36' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=273.30' TW=0.00' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-2: IS-2

GEO-TP-5 indicates silty sand to a depth of 14' below grade with no refusal. The infiltration rate for loamy sand is 2.41 inches per hour (Rawls Rates)

Redox was encountered at 9' below grade or elevation 263.0

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 4.55" for 25-year event
 Inflow = 13.19 cfs @ 12.09 hrs, Volume= 49,599 cf
 Outflow = 2.50 cfs @ 12.55 hrs, Volume= 49,599 cf, Atten= 81%, Lag= 27.3 min
 Discarded = 0.44 cfs @ 9.73 hrs, Volume= 42,592 cf
 Primary = 2.06 cfs @ 12.55 hrs, Volume= 7,006 cf
 Routed to Link RR1 : RipRap Apron

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.69' @ 12.55 hrs Surf.Area= 8,391 sf Storage= 21,124 cf
 Flood Elev= 271.58' Surf.Area= 8,627 sf Storage= 27,840 cf

Plug-Flow detention time= 337.3 min calculated for 49,592 cf (100% of inflow)
 Center-of-Mass det. time= 337.3 min (1,089.3 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	266.00'	12,250 cf	52.75'W x 150.43'L x 5.58'H Field A Z=0.3 46,227 cf Overall - 15,602 cf Embedded = 30,625 cf x 40.0% Voids
#2A	266.50'	15,602 cf	ADS_StormTech MC-3500 d +Cap x 140 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 140 Chambers in 7 Rows Cap Storage= 14.9 cf x 2 x 7 rows = 208.6 cf
		27,852 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	266.00'	0.44 cfs Exfiltration at all elevations Phase-In= 0.01'
#2	Primary	267.00'	10.0" Round Culvert L= 29.0' Ke= 0.500 Inlet / Outlet Invert= 267.00' / 265.92' S= 0.0372 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#3	Device 2	269.40'	4.0' long x 6.26' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.44 cfs @ 9.73 hrs HW=266.10' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=2.05 cfs @ 12.55 hrs HW=269.69' TW=0.00' (Dynamic Tailwater)

↑**2=Culvert** (Passes 2.05 cfs of 3.96 cfs potential flow)

↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 2.05 cfs @ 1.77 fps)

Summary for Pond RR2: Riprap Slope

Inflow Area = 7,513 sf, 0.00% Impervious, Inflow Depth = 0.67" for 25-year event
 Inflow = 0.11 cfs @ 12.10 hrs, Volume= 419 cf
 Outflow = 0.11 cfs @ 12.10 hrs, Volume= 419 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.11 cfs @ 12.10 hrs, Volume= 419 cf
 Primary = 0.00 cfs @ 24.34 hrs, Volume= 0 cf
 Routed to Pond IS-1 : IS-1

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-year Rainfall=6.17"

Printed 6/20/2024

Page 57

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.00' @ 0.00 hrs Surf.Area= 111 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.0 min (886.9 - 886.9)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	328 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 821 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	111	0	0
281.00	111	111	111
282.00	111	111	222
283.00	103	107	329
284.00	75	89	418
285.00	73	74	492
286.00	70	72	564
287.00	68	69	633
288.00	66	67	700
289.00	62	64	764
290.00	52	57	821

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	0.37 cfs Exfiltration at all elevations
#2	Primary	280.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=280.00' (Free Discharge)
 ↳ **1=Exfiltration** (Passes 0.00 cfs of 0.37 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 24.34 hrs HW=280.00' TW=274.45' (Dynamic Tailwater)
 ↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RR3: Riprap Slope

Inflow Area = 5,707 sf, 3.94% Impervious, Inflow Depth = 1.19" for 25-year event
 Inflow = 0.14 cfs @ 12.10 hrs, Volume= 567 cf
 Outflow = 0.14 cfs @ 12.10 hrs, Volume= 567 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.14 cfs @ 12.10 hrs, Volume= 567 cf
 Primary = 0.00 cfs @ 24.34 hrs, Volume= 0 cf
 Routed to Pond IS-1 : IS-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.00' @ 0.00 hrs Surf.Area= 116 sf Storage= 0 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	464 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,160 cf Overall x 40.0% Voids

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 25-year Rainfall=6.17"

Printed 6/20/2024

Page 58

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	116	0	0
281.00	116	116	116
282.00	116	116	232
283.00	116	116	348
284.00	116	116	464
285.00	116	116	580
286.00	116	116	696
287.00	116	116	812
288.00	116	116	928
289.00	116	116	1,044
290.00	116	116	1,160

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	0.37 cfs Exfiltration at all elevations
#2	Primary	280.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=280.00' (Free Discharge)

↑**1=Exfiltration** (Passes 0.00 cfs of 0.37 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 24.34 hrs HW=280.00' TW=274.45' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RR4: Riprap Slope

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 5.77" for 25-year event
 Inflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf
 Outflow = 16.78 cfs @ 12.10 hrs, Volume= 63,584 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 2.45 hrs, Volume= 8,222 cf
 Primary = 16.68 cfs @ 12.10 hrs, Volume= 55,362 cf
 Routed to Reach R1 : Routing sheet flow through a subcatchment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.15' @ 12.10 hrs Surf.Area= 112 sf Storage= 46 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.8 min (747.5 - 746.7)

Volume	Invert	Avail.Storage	Storage Description
#1	268.00'	225 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 563 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
268.00	87	0	0
269.00	110	99	99
270.00	126	118	217
271.00	96	111	328
272.00	76	86	414
273.00	63	70	483
274.00	97	80	563

Device	Routing	Invert	Outlet Devices
#1	Discarded	268.00'	0.10 cfs Exfiltration at all elevations
#2	Primary	269.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 2.45 hrs HW=268.07' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=16.67 cfs @ 12.10 hrs HW=269.15' TW=266.18' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir**(Weir Controls 16.67 cfs @ 1.03 fps)

Summary for Pond RR5: Riprap Slope

[93] Warning: Storage range exceeded by 1.01'
 [90] Warning: Qout>Qin may require smaller dt or Finer Routing
 [87] Warning: Oscillations may require smaller dt or Finer Routing (severity=172)

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 0.64" for 25-year event
 Inflow = 2.06 cfs @ 12.55 hrs, Volume= 7,006 cf
 Outflow = 2.41 cfs @ 12.51 hrs, Volume= 6,996 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 12.37 hrs, Volume= 1,322 cf
 Primary = 2.31 cfs @ 12.51 hrs, Volume= 5,675 cf
 Routed to Reach R2 : Routing sheet flow through a subcatchment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 266.01' @ 12.88 hrs Surf.Area= 7 sf Storage= 35 cf

Plug-Flow detention time= 1.3 min calculated for 6,995 cf (100% of inflow)
 Center-of-Mass det. time= 1.1 min (801.3 - 800.2)

Volume	Invert	Avail.Storage	Storage Description
#1	261.00'	35 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 89 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
261.00	14	0	0
262.00	34	24	24
263.00	26	30	54
264.00	18	22	76
265.00	7	13	89

Device	Routing	Invert	Outlet Devices
#1	Discarded	261.00'	0.10 cfs Exfiltration at all elevations
#2	Primary	261.50'	14.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 12.37 hrs HW=261.29' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 12.51 hrs HW=265.98' TW=265.98' (Dynamic Tailwater)
 ↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link RR1: RipRap Apron

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 0.64" for 25-year event
 Inflow = 2.06 cfs @ 12.55 hrs, Volume= 7,006 cf
 Primary = 2.06 cfs @ 12.55 hrs, Volume= 7,006 cf, Atten= 0%, Lag= 0.0 min
 Routed to Pond RR5 : Riprap Slope

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP-3: STUDY POINT #3

Inflow Area = 361,985 sf, 62.10% Impervious, Inflow Depth = 2.52" for 25-year event
 Inflow = 13.62 cfs @ 12.20 hrs, Volume= 75,882 cf
 Primary = 13.62 cfs @ 12.20 hrs, Volume= 75,882 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP1: STUDY POINT #1

Inflow Area = 27,226 sf, 22.75% Impervious, Inflow Depth = 0.05" for 25-year event
Inflow = 0.01 cfs @ 12.33 hrs, Volume= 109 cf
Primary = 0.01 cfs @ 12.33 hrs, Volume= 109 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP2: STUDY POINT #2

Inflow Area = 1,587 sf, 0.00% Impervious, Inflow Depth = 0.42" for 25-year event
Inflow = 0.01 cfs @ 12.13 hrs, Volume= 56 cf
Primary = 0.01 cfs @ 12.13 hrs, Volume= 56 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link WQ-1: Water Quality Unit

Inflow Area = 45,592 sf, 81.75% Impervious, Inflow Depth = 5.04" for 25-year event
Inflow = 5.22 cfs @ 12.09 hrs, Volume= 19,139 cf
Primary = 5.22 cfs @ 12.09 hrs, Volume= 19,139 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond IS-2 : IS-2

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link WQ-2: Water Quality Unit

Inflow Area = 67,273 sf, 61.26% Impervious, Inflow Depth = 3.85" for 25-year event
Inflow = 5.67 cfs @ 12.09 hrs, Volume= 21,562 cf
Primary = 5.67 cfs @ 12.09 hrs, Volume= 21,562 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond IS-2 : IS-2

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment A-1: Subcat A-1

Runoff = 10.46 cfs @ 12.11 hrs, Volume= 40,220 cf, Depth= 8.54"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
56,517	98	Paved parking, HSG A
56,517	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment B-1: Subcat B-1

Runoff = 5.42 cfs @ 12.08 hrs, Volume= 19,562 cf, Depth= 7.65"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
3,889	39	>75% Grass cover, Good, HSG A
26,806	98	Paved parking, HSG A
30,695		Weighted Average
3,889	39	12.67% Pervious Area
26,806	98	87.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	117	0.0200	1.44		Sheet Flow, Paved parking Smooth surfaces n= 0.011 P2= 3.28"
0.9	163	0.0200	2.87		Shallow Concentrated Flow, Paved Parking Lot Paved Kv= 20.3 fps
2.3	280	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment B-2: Subcat B-2

Runoff = 8.33 cfs @ 12.11 hrs, Volume= 32,014 cf, Depth= 8.54"
 Routed to Pond 1P : Existing Off-Site CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
44,985	98	Paved parking, HSG A
44,985	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-1A: Subcat P-1A

Runoff = 0.72 cfs @ 12.09 hrs, Volume= 2,665 cf, Depth= 5.46"
 Routed to Pond IS-1 : IS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-year Rainfall=8.78"

Printed 6/20/2024

Page 62

Area (sf)	CN	Description
2,565	39	>75% Grass cover, Good, HSG A
3,294	98	Paved parking, HSG A
5,859		Weighted Average
2,565	39	43.78% Pervious Area
3,294	98	56.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	67	0.0300	1.51		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.28"
0.7	67	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1B: Subcat P-1B

Runoff = 0.59 cfs @ 12.09 hrs, Volume= 2,160 cf, Depth= 5.49"
 Routed to Pond IS-1 : IS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
2,046	39	>75% Grass cover, Good, HSG A
2,675	98	Paved parking, HSG A
4,722		Weighted Average
2,046	39	43.34% Pervious Area
2,675	98	56.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	34	0.0300	1.32		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
0.4	34	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1C: Subcat P-1C

Runoff = 0.07 cfs @ 12.11 hrs, Volume= 357 cf, Depth= 1.25"
 Routed to Link SP1 : STUDY POINT #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
2,460	39	>75% Grass cover, Good, HSG A
964	30	Woods, Good, HSG A
3,424		Weighted Average
3,424	36	100.00% Pervious Area

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

Summary for Subcatchment P-1D: Subcat P-1D

Runoff = 0.24 cfs @ 12.10 hrs, Volume= 1,014 cf, Depth= 1.62"
 Routed to Pond RR2 : Riprap Slope

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-year Rainfall=8.78"

Printed 6/20/2024

Page 63

Area (sf)	CN	Description
1,126	39	>75% Grass cover, Good, HSG A
1,840	62	>Stone Rip Rap, Good, HSG A
4,547	30	Woods, Good, HSG A
7,513		Weighted Average
7,513	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.1673	0.16		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.28"
0.1	18	0.1673	2.05		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
5.3	68	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-1E: Subcat P-1E

Runoff = 0.33 cfs @ 12.10 hrs, Volume= 1,186 cf, Depth= 2.49"
 Routed to Pond RR3 : Riprap Slope

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
2,868	39	>75% Grass cover, Good, HSG A
1,801	62	>Stone Rip Rap, Good, HSG A
225	98	Paved parking, HSG A
813	30	Woods, Good, HSG A
5,707		Weighted Average
5,482	45	96.06% Pervious Area
225	98	3.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	21	0.1200	0.12		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
0.3	41	0.0992	2.20		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.3	62	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-2: Subcat P-2

Runoff = 0.03 cfs @ 12.11 hrs, Volume= 168 cf, Depth= 1.27"
 Routed to Link SP2 : STUDY POINT #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
746	39	>75% Grass cover, Good, HSG A
107	62	>Stone Rip Rap, Good, HSG A
734	30	Woods, Good, HSG A
1,587		Weighted Average
1,587	36	100.00% Pervious Area

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

Summary for Subcatchment P-3A: Subcat P-3A

Runoff = 1.80 cfs @ 12.09 hrs, Volume= 6,694 cf, Depth= 5.30"
 Routed to Pond CB-6 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
5,602	39	>75% Grass cover, Good, HSG A
250	62	>Stone Rip Rap, Good, HSG A
8,221	98	Paved parking, HSG A
1,098	30	Woods, Good, HSG A
15,170		Weighted Average
6,950	38	45.81% Pervious Area
8,221	98	54.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	47	0.1200	0.14		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.28"
0.5	106	0.0300	3.52		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
6.2	153	Total			

Summary for Subcatchment P-3B: Subcat P-3B

Runoff = 1.51 cfs @ 12.11 hrs, Volume= 6,018 cf, Depth= 4.08"
 Routed to Pond CB-5 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
9,329	39	>75% Grass cover, Good, HSG A
6,696	98	Paved parking, HSG A
1,685	30	Woods, Good, HSG A
17,711		Weighted Average
11,014	38	62.19% Pervious Area
6,696	98	37.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	47	0.1200	0.14		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.28"
1.8	254	0.0140	2.40		Shallow Concentrated Flow,
					Paved Kv= 20.3 fps
7.5	301	Total			

Summary for Subcatchment P-3C: Subcat P-3C

Runoff = 3.74 cfs @ 12.08 hrs, Volume= 13,567 cf, Depth= 6.41"
 Routed to Pond CB-4 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-year Rainfall=8.78"

Printed 6/20/2024

Page 65

Area (sf)	CN	Description
5,279	39	>75% Grass cover, Good, HSG A
1,565	61	>75% Grass cover, Good, HSG B
12	68	>Stone Rip Rap, Good, HSG B
2,364	98	Paved parking, HSG A
14,929	98	Paved parking, HSG B
1,229	30	Woods, Good, HSG A
14	55	Woods, Good, HSG B
25,392		Weighted Average
8,099	42	31.90% Pervious Area
17,293	98	68.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	158	0.0200	1.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
1.7	158	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-3D: Subcat P-3D

Runoff = 1.96 cfs @ 12.09 hrs, Volume= 7,163 cf, Depth= 6.21"
 Routed to Pond CB-3 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
3,871	39	>75% Grass cover, Good, HSG A
1	62	>Stone Rip Rap, Good, HSG A
9,341	98	Paved parking, HSG A
619	30	Woods, Good, HSG A
13,831		Weighted Average
4,491	38	32.47% Pervious Area
9,341	98	67.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0360	1.53		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"
0.4	85	0.0360	3.85		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.9	135	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment P-3E: Subcat P-3E

Runoff = 1.04 cfs @ 12.08 hrs, Volume= 3,764 cf, Depth= 7.38"
 Routed to Pond CB-2 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
925	39	>75% Grass cover, Good, HSG A
125	61	>75% Grass cover, Good, HSG B
4,721	98	Paved parking, HSG A
346	98	Paved parking, HSG B
6,117		Weighted Average
1,050	42	17.17% Pervious Area
5,067	98	82.83% Impervious Area

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

Summary for Subcatchment P-3F: Subcat P-3F

Runoff = 3.04 cfs @ 12.08 hrs, Volume= 10,804 cf, Depth= 7.79"
 Routed to Pond CB-1 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
2,781	61	>75% Grass cover, Good, HSG B
455	98	Paved parking, HSG A
13,407	98	Paved parking, HSG B
16,643		Weighted Average
2,781	61	16.71% Pervious Area
13,862	98	83.29% Impervious Area

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

Summary for Subcatchment P-3G: Subcat P-3G (roof)

Runoff = 1.67 cfs @ 12.11 hrs, Volume= 6,405 cf, Depth= 8.54"
 Routed to Pond DMH-3 : DMH

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3H: Subcat P-3H (roof)

Runoff = 1.67 cfs @ 12.11 hrs, Volume= 6,405 cf, Depth= 8.54"
 Routed to Pond IS-2 : IS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
8,032	98	Roofs, HSG A
968	98	Roofs, HSG B
9,000		Weighted Average
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3I: Subcat P-3I (roof)

Runoff = 1.67 cfs @ 12.11 hrs, Volume= 6,405 cf, Depth= 8.54"
 Routed to Pond CB-6 : CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-year Rainfall=8.78"

Printed 6/20/2024

Page 67

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3J: Subcat P-3J (roof)

Runoff = 1.67 cfs @ 12.11 hrs, Volume= 6,405 cf, Depth= 8.54"
 Routed to Pond IS-2 : IS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
9,000	98	Roofs, HSG A
9,000	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					Direct Entry, Internal roof drains

Summary for Subcatchment P-3K: Subcat P-3K

Runoff = 5.78 cfs @ 12.16 hrs, Volume= 22,013 cf, Depth= 3.43"
 Routed to Link SP-3 : STUDY POINT #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
2,624	39	>75% Grass cover, Good, HSG A
8,980	61	>75% Grass cover, Good, HSG B
801	62	>Stone Rip Rap, Good, HSG A
3,956	68	>Stone Rip Rap, Good, HSG B
250	30	Woods, Good, HSG A
60,357	55	Woods, Good, HSG B
76,968		Weighted Average
76,968	56	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.2500	0.11		Sheet Flow, A-B Woods: Dense underbrush n= 0.800 P2= 3.28"
3.6	359	0.1100	1.66		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
11.3	409	Total			

Summary for Subcatchment P-3L: Subcat P-3L

Runoff = 2.41 cfs @ 12.09 hrs, Volume= 7,516 cf, Depth= 4.11"
 Routed to Reach R2 : Routing sheet flow through a subcatchment

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-year Rainfall=8.78"

Area (sf)	CN	Description
16,823	61	>75% Grass cover, Good, HSG B
3,167	68	>Stone Rip Rap, Good, HSG B
1	98	Paved parking, HSG B
1,964	55	Woods, Good, HSG B
21,955		Weighted Average
21,954	61	100.00% Pervious Area
1	98	0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	81	0.4000	0.25		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.28"
5.4	81	Total, Increased to minimum Tc = 6.0 min			

Summary for Reach R1: Routing sheet flow through a subcatchment

A subcatchment performs runoff calculations, including the associated Tc and CN determinations. It does not have any facility for routing an inflow hydrograph from another source. However, a reach may be used to perform this type of specialized routing.

This reach demonstrates a procedure for performing a sheet-flow routing through a subcatchment area. In this case, the "reach" is defined as a wide channel with very low side slopes. The Manning's value of 0.15 is selected from the table of sheet flow roughness coefficients, which are much higher than normal Manning's values, in order to allow for the greater frictional losses of shallow flow. This value is comparable to the Manning's value for "very weedy reaches".

This example assumes that sheet flow occurs evenly over the entire 100' channel width, and that the flow depth is therefore very small. If the flow is concentrated or forms channels, the description and Manning's value must be adjusted accordingly.

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 7.57" for 100-year event
 Inflow = 23.94 cfs @ 12.10 hrs, Volume= 83,366 cf
 Outflow = 16.14 cfs @ 12.20 hrs, Volume= 83,366 cf, Atten= 33%, Lag= 5.9 min
 Routed to Link SP-3 : STUDY POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.32 fps, Min. Travel Time= 14.4 min
 Avg. Velocity = 0.07 fps, Avg. Travel Time= 68.8 min

Peak Storage= 13,976 cf @ 12.20 hrs
 Average Depth at Peak Storage= 0.37' , Surface Width= 173.11'
 Bank-Full Depth= 1.00' Flow Area= 200.0 sf, Capacity= 113.05 cfs

100.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
 Side Slope Z-value= 100.0 ' / ' Top Width= 300.00'
 Length= 280.0' Slope= 0.1590 ' / '
 Inlet Invert= 265.92', Outlet Invert= 221.40'



Summary for Reach R2: Routing sheet flow through a subcatchment

A subcatchment performs runoff calculations, including the associated Tc and CN determinations. It does not have any facility for routing an inflow hydrograph from another source. However, a reach may be used to perform this type of specialized routing.

This reach demonstrates a procedure for performing a sheet-flow routing through a subcatchment area. In this case, the "reach" is defined as a wide channel with very low side slopes. The Manning's value of 0.15 is selected from the table of sheet flow roughness coefficients, which are much higher than normal Manning's values, in order to allow for the greater frictional losses of shallow flow. This value is comparable to the Manning's value for "very weedy reaches".

This example assumes that sheet flow occurs evenly over the entire 100' channel width, and that the flow depth is therefore very small. If the flow is concentrated or forms channels, the description and Manning's value must be adjusted accordingly.

[80] Warning: Exceeded Pond RR5 by 4.97' @ 12.08 hrs (439.15 cfs 105,740,864 cf)

Inflow Area = 152,820 sf, 63.13% Impervious, Inflow Depth = 2.47" for 100-year event
 Inflow = 6.76 cfs @ 12.13 hrs, Volume= 31,475 cf
 Outflow = 5.15 cfs @ 12.72 hrs, Volume= 31,475 cf, Atten= 24%, Lag= 35.5 min
 Routed to Link SP-3 : STUDY POINT #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Max. Velocity= 0.22 fps, Min. Travel Time= 20.8 min
 Avg. Velocity = 0.05 fps, Avg. Travel Time= 94.6 min

Peak Storage= 6,446 cf @ 12.72 hrs
 Average Depth at Peak Storage= 0.19' , Surface Width= 138.59'
 Bank-Full Depth= 1.00' Flow Area= 200.0 sf, Capacity= 113.05 cfs

100.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
 Side Slope Z-value= 100.0 '/' Top Width= 300.00'
 Length= 280.0' Slope= 0.1590 '/'
 Inlet Invert= 265.92', Outlet Invert= 221.40'



Summary for Pond 1P: Existing Off-Site CB

[58] Hint: Peaked 61.85' above defined flood level

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 8.33" for 100-year event
 Inflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf
 Outflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf, Atten= 0%, Lag= 0.0 min
 Primary = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf
 Routed to Pond DMH-8 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 351.71' @ 12.10 hrs
 Flood Elev= 289.86'

Device	Routing	Invert	Outlet Devices
#1	Primary	283.08'	12.0" Round Culvert L= 118.0' Ke= 0.500 Inlet / Outlet Invert= 283.08' / 278.95' S= 0.0350 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=24.01 cfs @ 12.10 hrs HW=351.56' TW=283.97' (Dynamic Tailwater)
 ←**1=Culvert** (Outlet Controls 24.01 cfs @ 30.57 fps)

Summary for Pond CB-1: CB

Inflow Area = 16,643 sf, 83.29% Impervious, Inflow Depth = 7.79" for 100-year event
 Inflow = 3.04 cfs @ 12.08 hrs, Volume= 10,804 cf
 Outflow = 3.04 cfs @ 12.08 hrs, Volume= 10,804 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.04 cfs @ 12.08 hrs, Volume= 10,804 cf
 Routed to Link WQ-1 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.37' @ 12.08 hrs
 Flood Elev= 272.52'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.22'	12.0" Round Culvert L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 269.22' / 268.77' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.04 cfs @ 12.08 hrs HW=270.37' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 3.04 cfs @ 3.87 fps)

Summary for Pond CB-2: CB

Inflow Area = 6,117 sf, 82.83% Impervious, Inflow Depth = 7.38" for 100-year event
 Inflow = 1.04 cfs @ 12.08 hrs, Volume= 3,764 cf
 Outflow = 1.04 cfs @ 12.08 hrs, Volume= 3,764 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.04 cfs @ 12.08 hrs, Volume= 3,764 cf
 Routed to Pond DMH-3 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 271.35' @ 12.09 hrs
 Flood Elev= 273.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	270.46'	12.0" Round Culvert L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 270.46' / 270.23' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.04 cfs @ 12.08 hrs HW=271.34' TW=271.23' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 1.04 cfs @ 1.88 fps)

Summary for Pond CB-3: CB

Inflow Area = 13,831 sf, 67.53% Impervious, Inflow Depth = 6.21" for 100-year event
 Inflow = 1.96 cfs @ 12.09 hrs, Volume= 7,163 cf
 Outflow = 1.96 cfs @ 12.09 hrs, Volume= 7,163 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.96 cfs @ 12.09 hrs, Volume= 7,163 cf
 Routed to Pond DMH-3 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 272.25' @ 12.09 hrs
 Flood Elev= 274.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.40'	12.0" Round Culvert L= 126.0' Ke= 0.500 Inlet / Outlet Invert= 271.40' / 270.23' S= 0.0093 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.95 cfs @ 12.09 hrs HW=272.25' TW=271.23' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 1.95 cfs @ 3.70 fps)

Summary for Pond CB-4: CB

Inflow Area = 25,392 sf, 68.10% Impervious, Inflow Depth = 6.41" for 100-year event
 Inflow = 3.74 cfs @ 12.08 hrs, Volume= 13,567 cf
 Outflow = 3.74 cfs @ 12.08 hrs, Volume= 13,567 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.74 cfs @ 12.08 hrs, Volume= 13,567 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 270.82' @ 12.08 hrs
 Flood Elev= 272.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.24'	12.0" Round Culvert L= 44.0' Ke= 0.500 Inlet / Outlet Invert= 269.24' / 268.80' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.74 cfs @ 12.08 hrs HW=270.81' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Barrel Controls 3.74 cfs @ 4.76 fps)

Summary for Pond CB-5: CB

Inflow Area = 17,711 sf, 37.81% Impervious, Inflow Depth = 4.08" for 100-year event
 Inflow = 1.51 cfs @ 12.11 hrs, Volume= 6,018 cf
 Outflow = 1.51 cfs @ 12.11 hrs, Volume= 6,018 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.51 cfs @ 12.11 hrs, Volume= 6,018 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 272.02' @ 12.11 hrs
 Flood Elev= 275.46'

Device	Routing	Invert	Outlet Devices
#1	Primary	271.36'	12.0" Round Culvert L= 65.0' Ke= 0.500 Inlet / Outlet Invert= 271.36' / 269.55' S= 0.0278 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.51 cfs @ 12.11 hrs HW=272.02' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 1.51 cfs @ 2.76 fps)

Summary for Pond CB-6: CB

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 6.50" for 100-year event
 Inflow = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf
 Outflow = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf
 Routed to Pond DMH-7 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 276.63' @ 12.10 hrs
 Flood Elev= 278.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.74'	12.0" Round Culvert L= 95.0' Ke= 0.500 Inlet / Outlet Invert= 274.74' / 273.79' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.44 cfs @ 12.10 hrs HW=276.62' TW=275.28' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 3.44 cfs @ 4.38 fps)

Summary for Pond DMH-10: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 8.33" for 100-year event
 Inflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf
 Outflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf, Atten= 0%, Lag= 0.0 min
 Primary = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf
 Routed to Pond RR4 : Riprap Slope

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 276.79' @ 12.10 hrs
 Flood Elev= 279.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	274.28'	30.0" Round Culvert L= 9.0' Ke= 0.500 Inlet / Outlet Invert= 274.28' / 274.00' S= 0.0311 '/' Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=24.01 cfs @ 12.10 hrs HW=276.79' TW=269.19' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 24.01 cfs @ 6.07 fps)

Summary for Pond DMH-2: DMH

Inflow Area = 28,949 sf, 80.86% Impervious, Inflow Depth = 7.18" for 100-year event
 Inflow = 4.63 cfs @ 12.09 hrs, Volume= 17,332 cf
 Outflow = 4.63 cfs @ 12.09 hrs, Volume= 17,332 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.63 cfs @ 12.09 hrs, Volume= 17,332 cf
 Routed to Link WQ-1 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.70' @ 12.09 hrs
 Flood Elev= 274.78'

Device	Routing	Invert	Outlet Devices
#1	Primary	268.42'	15.0" Round Culvert L= 64.0' Ke= 0.500 Inlet / Outlet Invert= 268.42' / 267.87' S= 0.0086 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.62 cfs @ 12.09 hrs HW=269.69' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 4.62 cfs @ 4.59 fps)

Summary for Pond DMH-3: DMH

Inflow Area = 28,949 sf, 80.86% Impervious, Inflow Depth = 7.18" for 100-year event
 Inflow = 4.63 cfs @ 12.09 hrs, Volume= 17,332 cf
 Outflow = 4.63 cfs @ 12.09 hrs, Volume= 17,332 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.63 cfs @ 12.09 hrs, Volume= 17,332 cf
 Routed to Pond DMH-2 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 271.23' @ 12.09 hrs
 Flood Elev= 274.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	269.98'	15.0" Round Culvert L= 168.0' Ke= 0.500 Inlet / Outlet Invert= 269.98' / 268.52' S= 0.0087 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.62 cfs @ 12.09 hrs HW=271.23' TW=269.69' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 4.62 cfs @ 4.67 fps)

Summary for Pond DMH-5: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 6.50" for 100-year event
 Inflow = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf
 Outflow = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf
 Routed to Link WQ-2 : Water Quality Unit

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 268.67' @ 12.10 hrs
 Flood Elev= 274.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	267.34'	12.0" Round Culvert L= 23.0' Ke= 0.500 Inlet / Outlet Invert= 267.34' / 266.88' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.44 cfs @ 12.10 hrs HW=268.67' TW=0.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 3.44 cfs @ 4.38 fps)

Summary for Pond DMH-6: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 6.50" for 100-year event
 Inflow = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf
 Outflow = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf
 Routed to Pond DMH-5 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 273.50' @ 12.10 hrs
 Flood Elev= 277.33'

Device	Routing	Invert	Outlet Devices
#1	Primary	272.17'	12.0" Round Culvert L= 147.0' Ke= 0.500 Inlet / Outlet Invert= 272.17' / 269.87' S= 0.0156 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.44 cfs @ 12.10 hrs HW=273.50' TW=268.67' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 3.44 cfs @ 4.38 fps)

Summary for Pond DMH-7: DMH

Inflow Area = 24,170 sf, 71.25% Impervious, Inflow Depth = 6.50" for 100-year event
 Inflow = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf
 Outflow = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.45 cfs @ 12.10 hrs, Volume= 13,099 cf
 Routed to Pond DMH-6 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 275.29' @ 12.10 hrs
 Flood Elev= 279.73'

Device	Routing	Invert	Outlet Devices
#1	Primary	273.70'	12.0" Round Culvert L= 143.0' Ke= 0.500 Inlet / Outlet Invert= 273.70' / 272.27' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.44 cfs @ 12.10 hrs HW=275.28' TW=273.50' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 3.44 cfs @ 4.38 fps)

Summary for Pond DMH-8: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 8.33" for 100-year event
 Inflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf
 Outflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf, Atten= 0%, Lag= 0.0 min
 Primary = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf
 Routed to Pond DMH-9 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 283.97' @ 12.10 hrs
 Flood Elev= 286.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	281.70'	30.0" Round Culvert L= 170.0' Ke= 0.500 Inlet / Outlet Invert= 281.70' / 278.93' S= 0.0163 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=24.01 cfs @ 12.10 hrs HW=283.97' TW=281.10' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 24.01 cfs @ 5.13 fps)

Summary for Pond DMH-9: DMH

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 8.33" for 100-year event
 Inflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf
 Outflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf, Atten= 0%, Lag= 0.0 min
 Primary = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf
 Routed to Pond DMH-10 : DMH

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 281.10' @ 12.10 hrs
 Flood Elev= 284.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	278.83'	30.0" Round Culvert L= 274.0' Ke= 0.500 Inlet / Outlet Invert= 278.83' / 274.38' S= 0.0162 '/ Cc= 0.900 n= 0.015 Concrete sewer w/manholes & inlets, Flow Area= 4.91 sf

Primary OutFlow Max=24.01 cfs @ 12.10 hrs HW=281.10' TW=276.79' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 24.01 cfs @ 5.13 fps)

Summary for Pond IS-1: IS-1

Inflow Area = 23,802 sf, 26.02% Impervious, Inflow Depth = 2.43" for 100-year event
 Inflow = 1.31 cfs @ 12.09 hrs, Volume= 4,825 cf
 Outflow = 0.63 cfs @ 12.25 hrs, Volume= 4,825 cf, Atten= 52%, Lag= 9.8 min
 Discarded = 0.04 cfs @ 9.61 hrs, Volume= 3,693 cf
 Primary = 0.59 cfs @ 12.25 hrs, Volume= 1,131 cf
 Routed to Link SP1 : STUDY POINT #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 277.89' @ 12.25 hrs Surf.Area= 1,798 sf Storage= 1,563 cf
 Flood Elev= 278.00' Surf.Area= 1,839 sf Storage= 1,645 cf

Plug-Flow detention time= 256.2 min calculated for 4,824 cf (100% of inflow)
 Center-of-Mass det. time= 256.3 min (1,015.6 - 759.3)

Volume	Invert	Avail.Storage	Storage Description
#1	277.00'	1,272 cf	surface storage (Irregular) Listed below (Recalc)
#2	275.00'	78 cf	media storage (Irregular) Listed below (Recalc) 260 cf Overall x 30.0% Voids
#3A	273.30'	602 cf	20.75'W x 45.19'L x 2.00'H Field A 1,875 cf Overall - 369 cf Embedded = 1,506 cf x 40.0% Voids
#4A	273.80'	369 cf	ADS_StormTech SC-160LP +Cap x 54 Inside #3 Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap 54 Chambers in 9 Rows
		2,322 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
277.00	435	96.0	0	0	435
278.00	771	118.0	595	595	825
279.00	588	81.0	677	1,272	1,419

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	130	53.0	0	0	130
277.00	130	53.0	260	260	236

Device	Routing	Invert	Outlet Devices
#0	Primary	279.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	273.30'	0.04 cfs Exfiltration at all elevations Phase-In= 0.01'
#2	Primary	277.80'	9.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50

5.00 5.50
 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88
 3.07 3.32

Discarded OutFlow Max=0.04 cfs @ 9.61 hrs HW=273.36' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.59 cfs @ 12.25 hrs HW=277.89' TW=0.00' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir**(Weir Controls 0.59 cfs @ 0.72 fps)

Summary for Pond IS-2: IS-2

GEO-TP-5 indicates silty sand to a depth of 14' below grade with no refusal. The infiltration rate for loamy sand is 2.41 inches per hour (Rawls Rates)

Redox was encountered at 9' below grade or elevation 263.0

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 6.75" for 100-year event
 Inflow = 19.59 cfs @ 12.09 hrs, Volume= 73,629 cf
 Outflow = 5.77 cfs @ 12.44 hrs, Volume= 73,629 cf, Atten= 71%, Lag= 20.7 min
 Discarded = 0.44 cfs @ 8.65 hrs, Volume= 47,700 cf
 Primary = 5.33 cfs @ 12.44 hrs, Volume= 25,928 cf
 Routed to Link RR1 : RipRap Apron

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 271.54' @ 12.44 hrs Surf.Area= 8,621 sf Storage= 27,692 cf
 Flood Elev= 271.58' Surf.Area= 8,627 sf Storage= 27,840 cf

Plug-Flow detention time= 269.6 min calculated for 73,618 cf (100% of inflow)
 Center-of-Mass det. time= 269.6 min (1,020.2 - 750.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	266.00'	12,250 cf	52.75'W x 150.43'L x 5.58'H Field A Z=0.3 46,227 cf Overall - 15,602 cf Embedded = 30,625 cf x 40.0% Voids
#2A	266.50'	15,602 cf	ADS_StormTech MC-3500 d +Cap x 140 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 140 Chambers in 7 Rows Cap Storage= 14.9 cf x 2 x 7 rows = 208.6 cf
		27,852 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	266.00'	0.44 cfs Exfiltration at all elevations Phase-In= 0.01'
#2	Primary	267.00'	10.0" Round Culvert L= 29.0' Ke= 0.500 Inlet / Outlet Invert= 267.00' / 265.92' S= 0.0372 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.55 sf
#3	Device 2	269.40'	4.0' long x 6.26' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.44 cfs @ 8.65 hrs HW=266.10' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=5.33 cfs @ 12.44 hrs HW=271.54' TW=0.00' (Dynamic Tailwater)

↑**2=Culvert** (Inlet Controls 5.33 cfs @ 9.77 fps)

↑**3=Sharp-Crested Rectangular Weir**(Passes 5.33 cfs of 36.49 cfs potential flow)

Summary for Pond RR2: Riprap Slope

Inflow Area = 7,513 sf, 0.00% Impervious, Inflow Depth = 1.62" for 100-year event
 Inflow = 0.24 cfs @ 12.10 hrs, Volume= 1,014 cf
 Outflow = 0.24 cfs @ 12.10 hrs, Volume= 1,014 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.24 cfs @ 12.10 hrs, Volume= 1,014 cf
 Primary = 0.00 cfs @ 12.10 hrs, Volume= 0 cf
 Routed to Pond IS-1 : IS-1

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-year Rainfall=8.78"

Printed 6/20/2024

Page 76

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.00' @ 12.10 hrs Surf.Area= 111 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.0 min (875.2 - 875.2)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	328 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 821 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	111	0	0
281.00	111	111	111
282.00	111	111	222
283.00	103	107	329
284.00	75	89	418
285.00	73	74	492
286.00	70	72	564
287.00	68	69	633
288.00	66	67	700
289.00	62	64	764
290.00	52	57	821

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	0.37 cfs Exfiltration at all elevations
#2	Primary	280.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.37 cfs @ 12.10 hrs HW=280.00' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=280.00' TW=277.28' (Dynamic Tailwater)
 ↳ **2=Broad-Crested Rectangular Weir**(Weir Controls 0.00 cfs)

Summary for Pond RR3: Riprap Slope

Inflow Area = 5,707 sf, 3.94% Impervious, Inflow Depth = 2.49" for 100-year event
 Inflow = 0.33 cfs @ 12.10 hrs, Volume= 1,186 cf
 Outflow = 0.33 cfs @ 12.10 hrs, Volume= 1,186 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.33 cfs @ 12.10 hrs, Volume= 1,186 cf
 Primary = 0.00 cfs @ 12.10 hrs, Volume= 0 cf
 Routed to Pond IS-1 : IS-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 280.00' @ 12.10 hrs Surf.Area= 116 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.0 min (847.9 - 847.9)

Volume	Invert	Avail.Storage	Storage Description
#1	280.00'	464 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,160 cf Overall x 40.0% Voids

1362-25 - Proposed HydroCAD_rev2

Prepared by Allen & Major Associates, Inc
 HydroCAD® 10.20-5a s/n 02881 © 2023 HydroCAD Software Solutions LLC

Type III 24-hr 100-year Rainfall=8.78"

Printed 6/20/2024

Page 77

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
280.00	116	0	0
281.00	116	116	116
282.00	116	116	232
283.00	116	116	348
284.00	116	116	464
285.00	116	116	580
286.00	116	116	696
287.00	116	116	812
288.00	116	116	928
289.00	116	116	1,044
290.00	116	116	1,160

Device	Routing	Invert	Outlet Devices
#1	Discarded	280.00'	0.37 cfs Exfiltration at all elevations
#2	Primary	280.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.37 cfs @ 12.10 hrs HW=280.00' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=0.00 cfs @ 12.10 hrs HW=280.00' TW=277.27' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir**(Weir Controls 0.00 cfs @ 0.02 fps)

Summary for Pond RR4: Riprap Slope

Inflow Area = 132,196 sf, 97.06% Impervious, Inflow Depth = 8.33" for 100-year event
 Inflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf
 Outflow = 24.04 cfs @ 12.10 hrs, Volume= 91,796 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 1.33 hrs, Volume= 8,430 cf
 Primary = 23.94 cfs @ 12.10 hrs, Volume= 83,366 cf
 Routed to Reach R1 : Routing sheet flow through a subcatchment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 269.19' @ 12.10 hrs Surf.Area= 113 sf Storage= 48 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.6 min (743.0 - 742.4)

Volume	Invert	Avail.Storage	Storage Description
#1	268.00'	225 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 563 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
268.00	87	0	0
269.00	110	99	99
270.00	126	118	217
271.00	96	111	328
272.00	76	86	414
273.00	63	70	483
274.00	97	80	563

Device	Routing	Invert	Outlet Devices
#1	Discarded	268.00'	0.10 cfs Exfiltration at all elevations
#2	Primary	269.00'	111.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 1.33 hrs HW=268.07' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=23.91 cfs @ 12.10 hrs HW=269.19' TW=266.24' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir**(Weir Controls 23.91 cfs @ 1.16 fps)

Summary for Pond RR5: Riprap Slope

[93] Warning: Storage range exceeded by 1.11'

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=253)

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 2.38" for 100-year event
 Inflow = 5.33 cfs @ 12.44 hrs, Volume= 25,928 cf
 Outflow = 5.73 cfs @ 12.43 hrs, Volume= 25,911 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.10 cfs @ 12.09 hrs, Volume= 1,952 cf
 Primary = 5.63 cfs @ 12.43 hrs, Volume= 23,959 cf
 Routed to Reach R2 : Routing sheet flow through a subcatchment

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 266.11' @ 12.73 hrs Surf.Area= 7 sf Storage= 35 cf

Plug-Flow detention time= 0.6 min calculated for 25,908 cf (100% of inflow)
 Center-of-Mass det. time= 0.4 min (788.8 - 788.5)

Volume	Invert	Avail.Storage	Storage Description
#1	261.00'	35 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 89 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
261.00	14	0	0
262.00	34	24	24
263.00	26	30	54
264.00	18	22	76
265.00	7	13	89

Device	Routing	Invert	Outlet Devices
#1	Discarded	261.00'	0.10 cfs Exfiltration at all elevations
#2	Primary	261.50'	14.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.10 cfs @ 12.09 hrs HW=262.35' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=5.63 cfs @ 12.43 hrs HW=266.10' TW=266.10' (Dynamic Tailwater)

↑**2=Broad-Crested Rectangular Weir**(Weir Controls 5.63 cfs @ 0.09 fps)

Summary for Link RR1: RipRap Apron

Inflow Area = 130,865 sf, 73.72% Impervious, Inflow Depth = 2.38" for 100-year event
 Inflow = 5.33 cfs @ 12.44 hrs, Volume= 25,928 cf
 Primary = 5.33 cfs @ 12.44 hrs, Volume= 25,928 cf, Atten= 0%, Lag= 0.0 min
 Routed to Pond RR5 : Riprap Slope

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP-3: STUDY POINT #3

Inflow Area = 361,985 sf, 62.10% Impervious, Inflow Depth = 4.54" for 100-year event
 Inflow = 23.59 cfs @ 12.20 hrs, Volume= 136,854 cf
 Primary = 23.59 cfs @ 12.20 hrs, Volume= 136,854 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP1: STUDY POINT #1

Inflow Area = 27,226 sf, 22.75% Impervious, Inflow Depth = 0.66" for 100-year event
Inflow = 0.65 cfs @ 12.25 hrs, Volume= 1,488 cf
Primary = 0.65 cfs @ 12.25 hrs, Volume= 1,488 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link SP2: STUDY POINT #2

Inflow Area = 1,587 sf, 0.00% Impervious, Inflow Depth = 1.27" for 100-year event
Inflow = 0.03 cfs @ 12.11 hrs, Volume= 168 cf
Primary = 0.03 cfs @ 12.11 hrs, Volume= 168 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link WQ-1: Water Quality Unit

Inflow Area = 45,592 sf, 81.75% Impervious, Inflow Depth = 7.41" for 100-year event
Inflow = 7.66 cfs @ 12.09 hrs, Volume= 28,135 cf
Primary = 7.66 cfs @ 12.09 hrs, Volume= 28,135 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond IS-2 : IS-2

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link WQ-2: Water Quality Unit

Inflow Area = 67,273 sf, 61.26% Impervious, Inflow Depth = 5.83" for 100-year event
Inflow = 8.65 cfs @ 12.09 hrs, Volume= 32,683 cf
Primary = 8.65 cfs @ 12.09 hrs, Volume= 32,683 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond IS-2 : IS-2

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs