

Stormwater Runoff Analysis

Campos 5 Lot Residential Subdivision

Assessor's Map 120, Lots 68-A & 68-B

Serenity Drive

Middletown, RI 02842

Prepared For

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1.0 PROJECT NARRATIVE

1.1 SITE INFORMATION

City / Town:	Middletown, Rhode Island
Adjacent Roadways:	Serenity Drive
Lot(s) identification:	A.P. 120 Lots 68-A & 68-B
Zoning District:	R-40
Current Use:	Residential (Vacant)
Site Area:	9.3 Acres
FEMA Zone and Map:	Zone "X" (Panel 44005C0094H)

1.2 EXISTING IMPROVEMENTS AND SITE CONDITIONS

The existing properties are two undeveloped residential lots at the end of Serenity Drive in Middletown. These two properties were part of a three-lot subdivision completed in 2017. While a cul-de-sac provides frontage for both lots, Serenity Drive does not feature a paved turnaround. There are no improvements to the properties aside from narrow paved driveway which extend from Serenity Drive to the property lines. The remainder of the property ground cover consists of grass, brush and trees. The properties are surrounded on all sides by R-40 and R-30 residential uses. The site has access to municipal sewer via a private sewer line which runs through Lot 68A to Maidford River Road. Each lot is served by a private well and underground electric and communication services. There are no drainage features on either of the two properties. A National Grid gas main is located in Compton View Drive, which intersections with Serenity Drive; however, gas services are not present at the site.

1.3 PROTECTED FEATURES

Freshwater wetlands are located at the east end of both properties and extend off the property in this direction. This feature is associated with a 50-foot-wide perimeter wetland. A small forested wetland was also identified in the northwest corner of the site. A stream identified as "Maidford River" runs parallel to the site about 350' to the east. The 200-foot riverbank wetland associated with this water way does not extend onto the subject properties. The freshwater wetlands were delineated in August of 2019 by Natural Resource Services at the time of the original subdivision and verified by RIDEM in 2020 (file no. 20-0147). The perimeter wetlands are entirely vegetated, and this natural vegetation extends to the west across approximately 75% of the site. Both the wetlands and the perimeter wetlands are features protected by the state.

1.4 SITE TERRAIN AND SOILS

In general, the site slopes from the west towards the wetlands at the east side of the site. The soil types on site are PmA and PmB (Pittstown silt loam) as designated by RIDEM environmental resource maps and the USDA Natural Resource Conservation Service. These are generally type C hydrologic soils common to Aquidneck Island. A small area of Se (Stissing) soils are present within the wetland boundary. Class IV soil evaluations performed on site revealed silt loams with a 12-24 inch water table.

1.5 PROPOSED IMPROVEMENTS

The owner intends to develop the cul-de-sac and the two properties into a proper extension of Serenity Drive and a five-lot residential subdivision. While the property could support as many as 8 lots per the Town of Middletown zoning code, only 5 lots are proposed. These lots will be accessed from the Serenity Drive extension; however, the paved road extension is proposed to extend only partially down the new right-of-way. This reduced roadway surface will minimize impervious surfaces and the impact to existing greenspace. Each new residential lot will feature a stone driveway from the municipal roadway.

Each new residential property will be served by a new public water main extension from Compton View Drive. The existing wells will not be used to provide domestic water for any of the residences. The existing private sewer line will be removed or abandoned, and a new public sewer main will be run along the Serenity Drive extension through to Maidford River Road. Gas, electrical, and communication services will also be run from Compton View Drive to serve the new residences.

The proposed road extension will include a conventional collection system of catch basins and drain manholes. This system will be routed to a hydrodynamic separator for pretreatment and then to a surface sand filter for primary water quality treatment. Treated water from this device will flow to a shallow infiltration basin. This basin will provide the necessary groundwater recharge. Overflow and high flow bypass stormwater will be routed to a detention basin located upstream of the perimeter wetlands. This device will meter the outflow via staged outlets and a concrete weir to provide peak flow mitigation.

Additional water quality treatment for the stone driveways and certain residences will be provided by a wet swale which will run along the exterior boundary of the perimeter wetlands. This swale will overflow to the perimeter wetlands.

2.0 PROPOSED ALTERATIONS AND STORMWATER CONSIDERATIONS

2.1 STORMWATER SYSTEM OBJECTIVES

The objectives of the project stormwater system are to accomplish the following:

- Provide water quality treatment for stormwater runoff in accordance with the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM).
- Provide 100% capture of runoff from proposed impervious surfaces during a water quality storm (1.2" using the split pervious/impervious method)
- Reduce or maintain the peak rate of runoff to all design points for the 1, 2, 10, 25 and 100-Year Type III 24-hour storm events (1,10, & 100 per the state and 2 & 25 per the municipality).
- Maintain the overall drainage patterns from the site to the extent practicable.
- Reduce peak runoff and stormwater impact to the downstream abutters and freshwater wetlands.

2.2 REDEVELOPMENT SITE

As the existing site lot coverage consists of much less than 40% impervious and less than 10,000 square feet of this impervious surface is to be developed, this project does not qualify as a "redevelopment site" per section 3.2.6 of the RISDISM.

2.3 MINIMUM STORMWATER MANAGEMENT STANDARDS

2.3.1 MINIMUM STANDARD 1: LID SITE PLANNING AND DESIGN STRATEGIES

The proposed development utilizes LID designs conforming to the RISDISM. These elements are located downstream of the new improvements and will directly treat the newly generated runoff with minimal interception of clean runoff. Impervious surfaces are limited to the proposed structures and travel way surfaces. Roadway surfaces have been minimized to the extent possible while still conforming to town standards. It is the opinion of NE&C that the proposed approach to the stormwater system is in conformance with the intent of LID site planning.

2.3.2 MINIMUM STANDARD 2: GROUNDWATER RECHARGE

This standard shall be met by infiltrating runoff in the detention basin. A total of **27,685** square feet of impervious surfaces (roadway and (5) 3,000 square foot rooftops) will require groundwater recharge. This equates to a total of **591** cubic feet of recharge volume based on the underlying hydrologic soil type. Based on the 72-hour HydroCAD analysis for the water quality storm, a total of **697** cubic feet of recharge will be provided by the detention basin. Refer to Appendix E for complete calculations.



2.3.3 MINIMUM STANDARD 3: WATER QUALITY

This standard shall be met by a surface sand filter and a wet swale. These systems have been designed in accordance with the RISDISM. Due to the elevated water tables, the sand filter shall be lined to prevent interaction with the groundwater. Filtered water will be discharged to the downstream detention basin for infiltration and metered release. The wet swale has been provided with a ponding area equivalent to the required water quality volume. Refer to Appendix E for complete calculations.

2.3.4 MINIMUM STANDARD 4: CONVEYANCE AND NATURAL CHANNEL PROTECTION

Per the RISDISM, this standard can be waived on sites having less than 1 acre of impervious. The total impervious site proposed for the development is 0.84 acres.

2.3.5 MINIMUM STANDARD 5: OVERBANK FLOOD PROTECTION

The TR-20 HydroCAD model demonstrates that the proposed system will successfully mitigate the 100-year storm event. In these calculations, all pre-development land was characterized as "good condition" as required by this standard. An off-site component of runoff from upstream residential properties passes through the development area, which was also modeled as "good condition". The modeling also demonstrates that the structures and stormwater devices will safely pass the 100-year storm event without flooding or breaching.

2.3.6 MINIMUM STANDARD 6: REDEVELOPMENT AND INFILL PROJECTS

As stated in section 2.2 above, this project does not qualify as a re-development project.

2.3.7 MINIMUM STANDARD 7: POLLUTION PREVENTION

Source controls and pollution prevention measures will be present during all phases of construction. A separate stormwater pollution prevention plan (Soil Erosion and Sediment Control Narrative) has been prepared.

2.3.8 MINIMUM STANDARD 8: LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS

The use of this property does not qualify as a LUHPPL and does not require any specific source controls, limited BMPs, or and additional state permitting.

2.3.9 MINIMUM STANDARD 9: ILLICIT DISCHARGES

Neither the using use nor any proposed uses will include any discharges considered to be "illicit" per this section of the Manual.

2.3.10 MINIMUM STANDARD 10: SOILS EROSION AND SEDIMENT CONTROL

Soil erosion and sediment control measures will be implemented during all phases of construction. A SESC plan has been provided in the permitting plan set and a separate Soil Erosion and Sediment Control Narrative has been prepared.

2.3.11 MINIMUM STANDARD 11: STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE

An Operations and Maintenance (O&M) Document has been prepared. Basic operations and maintenance requirements are also provided in this document and on the submission plan set.

2.4 OVERALL STORMWATER DESIGN FUNCTION

The overall design of the stormwater system is to provide a reduction in peak rate of runoff, and will meet the 11 minimum standards established in the RISDISM. All proposed stormwater devices are to be situated downstream of the proposed improvements and upstream of the existing receiving point for the runoff from this catchment. The existing drainage patterns across the site will be minimally impacted. There will be no negative impact to the receiving stream or freshwater wetlands.

3.0 DESIGN MODELING METHODOLOGY

Runoff and routing calculations have been performed for the watershed areas affected by the proposed development under existing and proposed development conditions scenarios. Time of concentration and runoff curve number calculations have been performed using the method described in NRCS Technical Release 55 – Urban Hydrology for Small Watersheds. The TR-20 based HydroCAD modeling software has been utilized to perform the more complex runoff and routing calculations, most of which are beyond the scope of the TR-55 method.

Design rainfall events have been modeled using the Soil Conservation Service (SCS) Type III hydrograph for 24-hour duration storms. The rainfall depth for each return period is taken from the RISDISM. This guidance document splits the state into five regions for rainfall frequency based on county. The project site is located in the Newport County region defined in the RISDISM. The rainfall frequency values recommended by RIDEM and used in this drainage analysis are listed in the table below.

Rainfall Frequency Values for Newport County Rhode Island with 24-Hour Storm Duration					
RIDEM <i>Stormwater Design and Installation Standards manual 3/15</i>					
Frequency	1-Yr	2-Yr	10-Yr	25-Yr	100-Yr
Inches of Rainfall	2.8	3.3	4.9	6.1	8.6

The existing and proposed conditions runoff calculations were analyzed and the proposed stormwater devices were designed to mitigate the peak runoff for the 1, 2, 10, 25 and 100-year 24-hour design storms. The resulting design effectively mitigates and treats runoff from newly developed areas of the site before allowing it to discharge in a non-erosive manner to downstream areas in accordance with the RISDISM.

3.1 ANALYSIS DESIGN POINTS AND OFF-SITE CONTRIBUTIONS

The proposed development contributes stormwater runoff to the following design points. These design points provide a direct comparison for pre-construction and post-construction runoff flows and runoff volumes.

1. Downstream freshwater wetlands

The following off-site areas contribute surface stormwater runoff to these design points. This runoff either drains through the project area or contributes in some manner which directly affects the design of the stormwater system and has been included in the design calculations. These areas are:

1. Small residential properties to the northwest which front on Compton View Drive.
2. Overflow from under capacity catch basin inlets in Serenity Drive.

Watershed maps for both the existing and proposed conditions can be found in Appendix B. These maps demonstrate the areas of the site which contribute to each of the design points and indicate the general pattern of surface or piped runoff flow.

3.2 DESIGN LIMITATIONS

There are no design limitations associated with this project.

4.0 STORMWATER RUNOFF COMPARISONS

Analysis of the existing and proposed runoff during design storms demonstrates that there will be no increase in the peak runoff to the downstream design points as a result of the development.

Comparisons of the runoff at the design points are given below in. The runoff volumes given have been evaluated over a 72-hour period. All of the HydroCAD modeling worksheets are attached in Appendix C and D.

4.1 SUMMARY OF STORMWATER CALCULATIONS

**Table 4.1.1 Comparison of Runoff Values at the Design Point (EX vs. PR)
(Freshwater Wetlands)**

Storm Return Period	Existing Conditions Peak Runoff (cfs)	Proposed Conditions Peak Runoff (cfs)	Existing Conditions Volume 72 hr Runoff (af)	Proposed Conditions Volume 72 hr Runoff (af)
WQ storm*	0.26	0.28	0.076	0.134
1-year	6.98	5.50	0.773	0.886
2-year	10.27	8.04	1.088	1.221
10-year	22.29	20.66	2.252	2.434
25-year	32.16	30.63	3.228	3.437
100-year	54.84	54.59	5.421	5.671

*Based on a modified CN analysis

5.0 STORMWATER BMPS

5.1 SURFACE SAND FILTER

Description

A Sand Filter is designed to capture and temporarily store the water quality storm runoff volume and pass it through a sand media layer. In areas of shallow water tables or poorly draining soils, the media is lined with an impermeable membrane and the filtered runoff is collected by an underdrain. This treated runoff is then discharged downgradient. High flow runoff to a sand filter typically passes over an overflow weir to the detention basin. Sand filters are not intended to have permanent pools and should drain within 24 hours. The filter beds are planted with water tolerant grasses selected from the Rhode Island Coastal Plant Guide or Appendix B of the RIDISM.

The stormwater design for this development includes the following sand filters.

- | | |
|--------------------------|---------------------|
| 1. Device ID (HydroCAD): | SF-1 |
| Location: | east of cul-de-sac |
| Subwatershed treated: | P1, P2, P3, P4 |
| Lined or Unlined: | Lined |
| Discharge location: | Detention Basin D-1 |

Required Maintenance

Sand filters shall be inspected following at least the first two precipitation events of at least 1.0 inch to ensure that the system is functioning properly. Thereafter, a filter should be inspected at least annually and after storm events of greater than or equal to the 1-year, 24-hour Type III precipitation event (2.8 inches). These maintenance objectives are focused on preserving the hydraulic and removal efficiency and maintaining structural integrity and include the following:

1. The slopes of a sand filter shall be inspected for erosion and gulying. Inlet areas shall be reinforced if they are found to be deficient or erosion is present at the overflow outlet. All material, including any trash and/or debris from all areas within the extents of the filter shall be disposed of in accordance with all applicable regulations. The overflow weir shall be inspected for structural faults.
2. Any areas within the extents of a sand filter that are subject to erosion or gulying shall be replenished with the original design material and re-vegetated according to the design drawings. Slope protection material shall be placed in areas prone to erosion. Embankment stability shall be verified by inspecting for seepage and burrowing animals.

The following maintenance tasks shall be completed on an annual basis.

1. Silt/sediment shall be removed from the sand filter bed annually, when accumulation exceeds one inch, or when the filtering capacity of the device diminishes substantially. This material shall be disposed of in accordance with all applicable regulations.

2. Mow the grass around the perimeter of and within the sand filter, seed bare areas, and remove litter and debris at least three times per growing season to maintain maximum grass heights less than twelve inches.
3. Remove any invasive vegetation within the extents of the sand filter. Any invasive vegetation encroaching upon the perimeter of the filter shall be pruned or removed if it is prohibiting access to the device, compromising sight visibility, and/or compromising the original design intent.

If dead or dying grass on the bottom is observed, check to ensure that water drains down within two days following storms. If standing water is observed more than 48 hours after a storm event, then the top six (6) inches of sand shall be removed and replaced in kind. If discolored or contaminated material is found below this removed material, then that material shall also be removed and replaced in kind until all contaminated sand has been removed from the filter media. The sand shall be disposed of in accordance with all applicable regulations.

5.2 CONVEYANCE STRUCTURES

Description

Conveyance structures include all man-made subsurface structures which collect and convey stormwater surface runoff across the site, typically to stormwater treatment or control devices. These structures include catch basins, curb inlets, drain manholes, culverts, and pipes. These structures are typically made of concrete or high-density plastics.

The stormwater design for this development includes the following conveyance systems:

- | | |
|----------------------|--------------------------|
| 1. Location: | Serenity Drive extension |
| Subwatershed served: | P1, P2, P3, P4 |
| Discharge location: | Sand Filter SF-1 |

Required Maintenance:

All conveyance structures are to be inspected at least three times in the first six months of operation. Additionally, these structures shall be inspected semi-annually (twice a year). The inspection objectives are as follows:

1. Any structural faults shall be repaired as necessary for proper function.
2. Pipes and roof runoff conveyances such as gutters and downspouts shall be clean and free of obstructions that reduce flow.
3. A registered professional engineer shall be consulted, if necessary, to determine whether a structure has been compromised.

4. Catch basin sumps shall be cleaned annually and whenever the depth of the sediment is greater than or equal to half the sump depth.

5.3 LINED DETENTION BASIN

Description

A detention basin collects and temporarily detains high volume stormwater runoff in order to mitigate the downstream effects. Water is released slowly through an outlet structure located at the bottom of the basin. Higher flow stormwater is released through an overflow weir and down a stone spillway. Lined detention basins are not intended to have permanent pools and should drain within 72 hours.

The stormwater design for this development includes the following detention basins:

1. Location:	East of sand filter SF-1
Subwatershed served:	P1, P2, P3, P4, 202, 204
Lined or Unlined:	Lined
Outlet Structure (Y/N):	Y
Overflow weir type:	Concrete weir
Discharge location:	Perimeter wetland edge

Required Maintenance

A detention basin shall be inspected following at least the first two precipitation events of at least 1.0 inch to ensure that the system is functioning properly. Thereafter, a basin shall be inspected at least annually and after storm events of greater than or equal to the 1-year, 24-hour Type III precipitation event (2.8 inches). The purpose of these maintenance objectives is to preserve hydraulic efficiency and to maintain the structural integrity of the device. These objectives include:

1. The slopes of the basin shall be inspected for erosion and gullyng.
2. Reinforce inlet areas if they are found to be deficient or erosion is present at the outlet structure.
3. All material, including any trash and/or debris from all areas within the extents of a basin shall be disposed of in accordance with all applicable regulations.
4. The overflow weir shall be inspected for structural faults.
5. Any areas within the extents of a basin that are subject to erosion or gullyng shall be filled, compacted and re-vegetated according to the design drawings. Slope protection material should be placed in areas prone to erosion.
6. Embankments shall be inspected for seepage and burrowing animals.

The following maintenance tasks shall be completed on an annual basis.

1. Silt/sediment shall be removed from the bottom of a basin when accumulation exceeds one inch, or when the drain down time increases substantially.
2. Mow the grass around the perimeter of and within a basin, seed bare areas, and remove litter and debris at least three times per growing season to maintain maximum grass heights less than twelve inches.

Remove any invasive vegetation within the extents of a basin. Any invasive vegetation encroaching upon the perimeter of the basin shall be pruned or removed if it is prohibiting access to the device, compromising sight visibility, and/or compromising the original design intent.

5.4 INFILTRATION BASIN

Description

The infiltration basin receives treated runoff from the sand filter underdrain and stores it in a shallow pool where it slowly drains down into the material below. High flow water from the sand filter and detention basin will bypass this device entirely; it is only intended to operate in smaller storms. Higher flow stormwater is released over an earthen weir to the perimeter wetlands. The infiltration basin is not intended to have a permanent pool and should drain within 72 hours.

The stormwater design for this development includes the following detention basins:

- | | |
|-------------------------|-----------------------------|
| 2. Location: | East of detention basin D-1 |
| Subwatershed served: | P1, P2, P3, P4, 202, 205 |
| Outlet Structure (Y/N): | N |
| Overflow weir type: | Earthen weir |
| Discharge location: | Perimeter wetland edge |

Required Maintenance

The infiltration basin shall be inspected following at least the first two precipitation events of at least 1.0 inch to ensure that the system is functioning properly. Thereafter, a basin shall be inspected at least annually and after storm events of greater than or equal to the 1-year, 24-hour Type III precipitation event (2.8 inches). The purpose of these maintenance objectives is to preserve hydraulic efficiency and to maintain the structural integrity of the device. These objectives include:

7. The slopes of the basin shall be inspected for erosion and gullyng.
8. Reinforce inlet areas if they are found to be deficient or erosion is present at the outlet structure.
9. All material, including any trash and/or debris from all areas within the extents of a basin shall be disposed of in accordance with all applicable regulations.
10. The overflow weir shall be inspected for structural faults.

11. Any areas within the extents of a basin that are subject to erosion or gullying shall be filled, compacted and re-vegetated according to the design drawings. Slope protection material should be placed in areas prone to erosion.
12. Embankments shall be inspected for seepage and burrowing animals.

The following maintenance tasks shall be completed on an annual basis.

3. Silt/sediment shall be removed from the bottom of a basin when accumulation exceeds one inch, or when the drain down time increases substantially.
4. Mow the grass around the perimeter of and within a basin, seed bare areas, and remove litter and debris at least three times per growing season to maintain maximum grass heights less than twelve inches.

Remove any invasive vegetation within the extents of a basin. Any invasive vegetation encroaching upon the perimeter of the basin shall be pruned or removed if it is prohibiting access to the device, compromising sight visibility, and/or compromising the original design intent.

5.5 HYDRODYNAMIC SEPARATOR

Description

A hydrodynamic separator is a proprietary stormwater pre-treatment device which removes the majority of large diameter sediments before discharging runoff to a primary treatment device. High flow stormwater bypasses a separator via a bypass pipe in an upstream structure.

The stormwater design for this development includes the following hydrodynamic separators:

1. Location: East of the cul-de-sac
Subwatershed served: P1, P2, P3, P4
Primary device supported: Sand Filter SF-1
Bypass Structure: DMH 1.040

Required Maintenance

The Hydrodynamic Separator must be maintained according to the manufacturer's recommendations. Specific maintenance criteria will depend on the make and model of the separator. In general, maintenance goals for the separator will include sediment removal from the storage chamber at a specific sediment depth, and ensuring the structural integrity of the system. Sediments collected from the separator shall be removed and stockpiled on site. These sediments shall be disposed of at a licensed off-site facility if not needed.

5.6 WET SWALE

Description:

Swales intercept surface runoff and convey stormwater towards water quality features or away from sensitive areas. Wet swales are located at or within the water table and are planted with wetland grasses or other plantings. Wet swales are intended to have permanent ponding areas designed to provide water quality treatment.

The stormwater design for this development includes the following swales:

1. Location:	Downstream of residences
Subwatershed served:	201
Surface: (grass or stone lined):	Planted
Discharge location:	Perimeter wetlands

Required Maintenance:

General inspections shall be conducted on a monthly basis and after storm events greater than or equal to the 1-year, 24-hour Type III precipitation event (2.8 inches). The maintenance objectives for this device include maintaining the hydraulic efficiency of the swale, minimizing invasive plants, and ensuring structural integrity. These inspections include the following:

1. The side slopes of a swale shall be inspected for erosion and gullyng. Reinforce existing plantings if found to be deficient, erosion is present, or the channel has been compromised.
2. Sediment shall be removed from a swale when the design depth has been reduced by 25%. All material shall be disposed of in accordance with all state and local regulations.

Invasive plants which reduce the capacity or integrity of the swales are to be removed and disposed of.



6.0 CONSTRUCTION STORMWATER MAINTENANCE PLAN

During the period of construction and/or until long term vegetation is established, the erosion control measures shall be inspected.

- A. Erosion control barriers (filter socks or similar approved) shall be inspected as indicated in the plan details. At a minimum these devices shall be inspected and repaired once a week and/or immediately following a significant rainfall or snowmelt. Sediment trapped behind these barriers shall be excavated when it reaches a depth of 6" and regraded on the site.
- B. Any erosion control blankets employed throughout the site shall be inspected on a weekly basis.
- C. Any stone construction entrance(s) shall be inspected weekly, and re-established or repaired as necessary. These devices shall be inspected monthly for excessive accumulation of sediment. It may be necessary to remove stones, excavate sediment, and replace stones. If existing paved entrances are utilized to remove construction sediment from vehicle tires, these areas shall be swept on a similar basis. The stabilized construction entrance(s) shall be removed prior to final roadway surfacing.
- D. Seeded areas shall be fertilized and reseeded as necessary to ensure establishment of a vegetative growth that meets the approval of reviewing entities.
- E. Maintenance of the stormwater system during construction shall be the responsibility of the site contractor. Once construction of the site is complete, maintenance of the system shall be the responsibility of the owners.

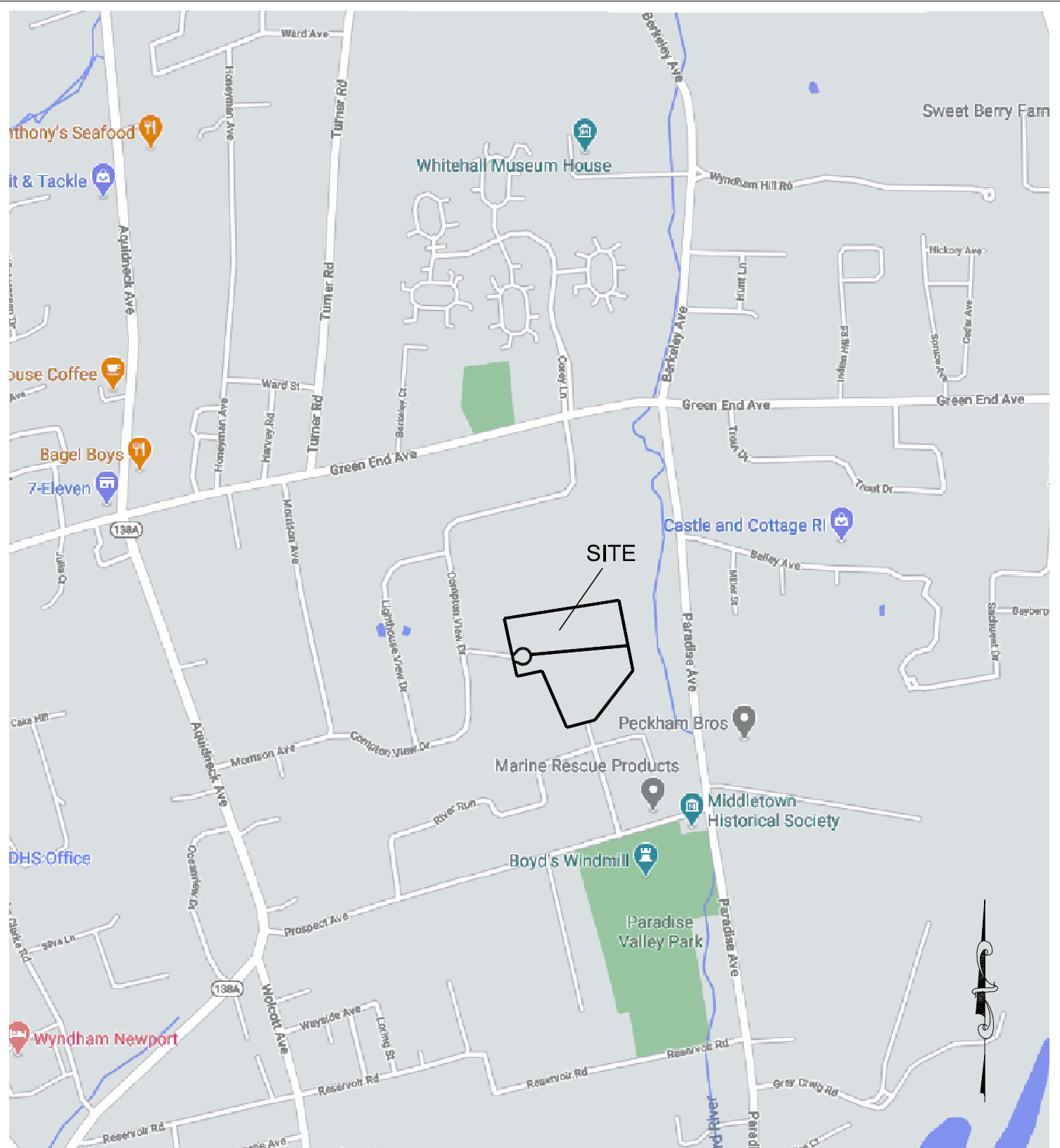


7.0 LIMITATIONS AND SPECIAL TERMS AND CONDITIONS

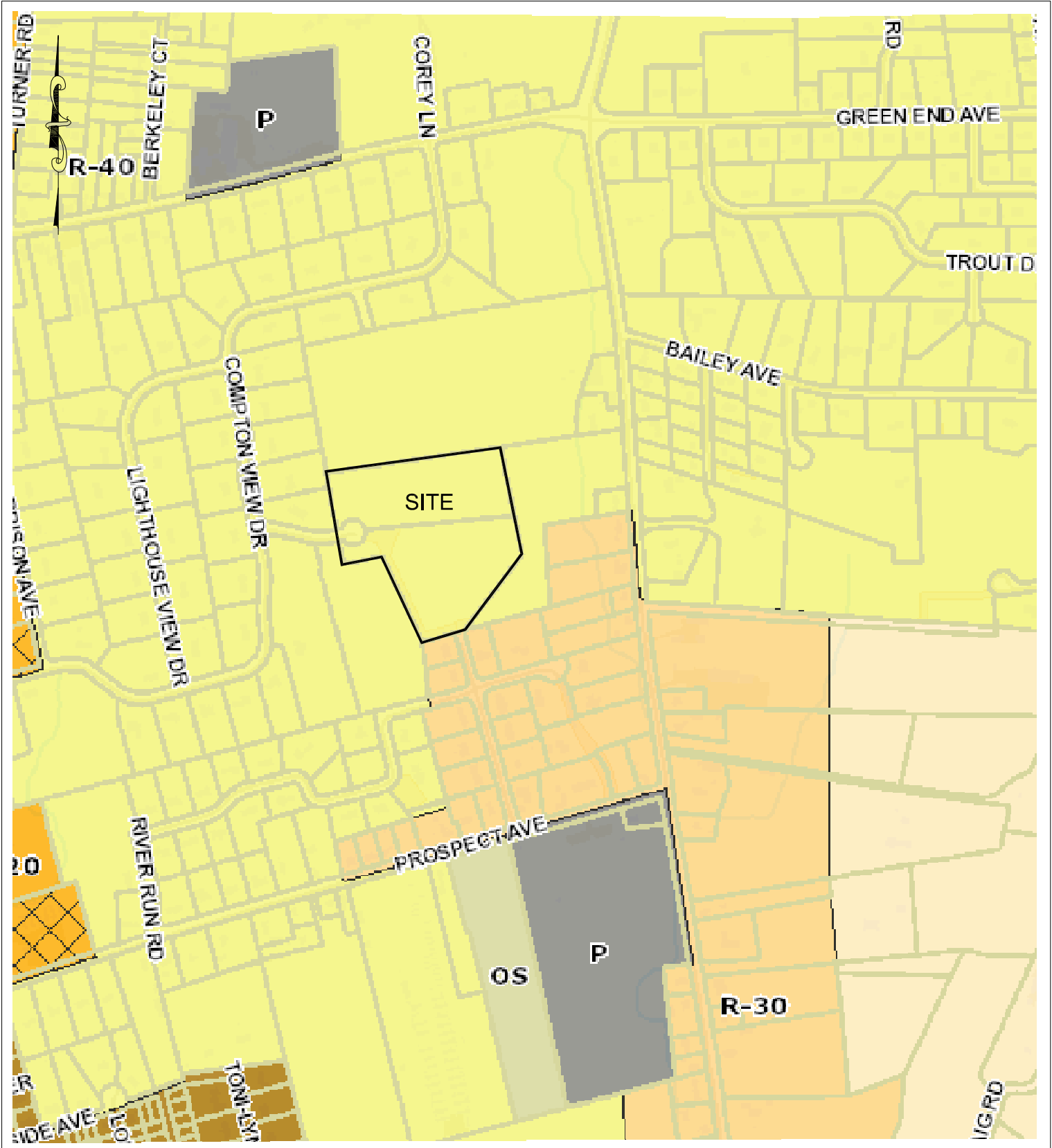
1. NE&C's evaluation was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area, and NE&C observed the degree of care and skill generally exercised by other consultants under similar circumstances and conditions. No warrantee expressed or implied is made.
2. Any additional research conducted should be reviewed by Northeast Engineers & Consultants, Inc., such that the conclusions presented herein may be modified.
3. All observations documented in this report were performed under the existing conditions at the time of the assessment.
4. This report has been prepared on the behalf of and is for the exclusive use of the Client. This report and findings contained herein shall not, in whole or in part be disseminated or conveyed to any party, nor used by any other party in whole or in part, without the written consent of NE&C.



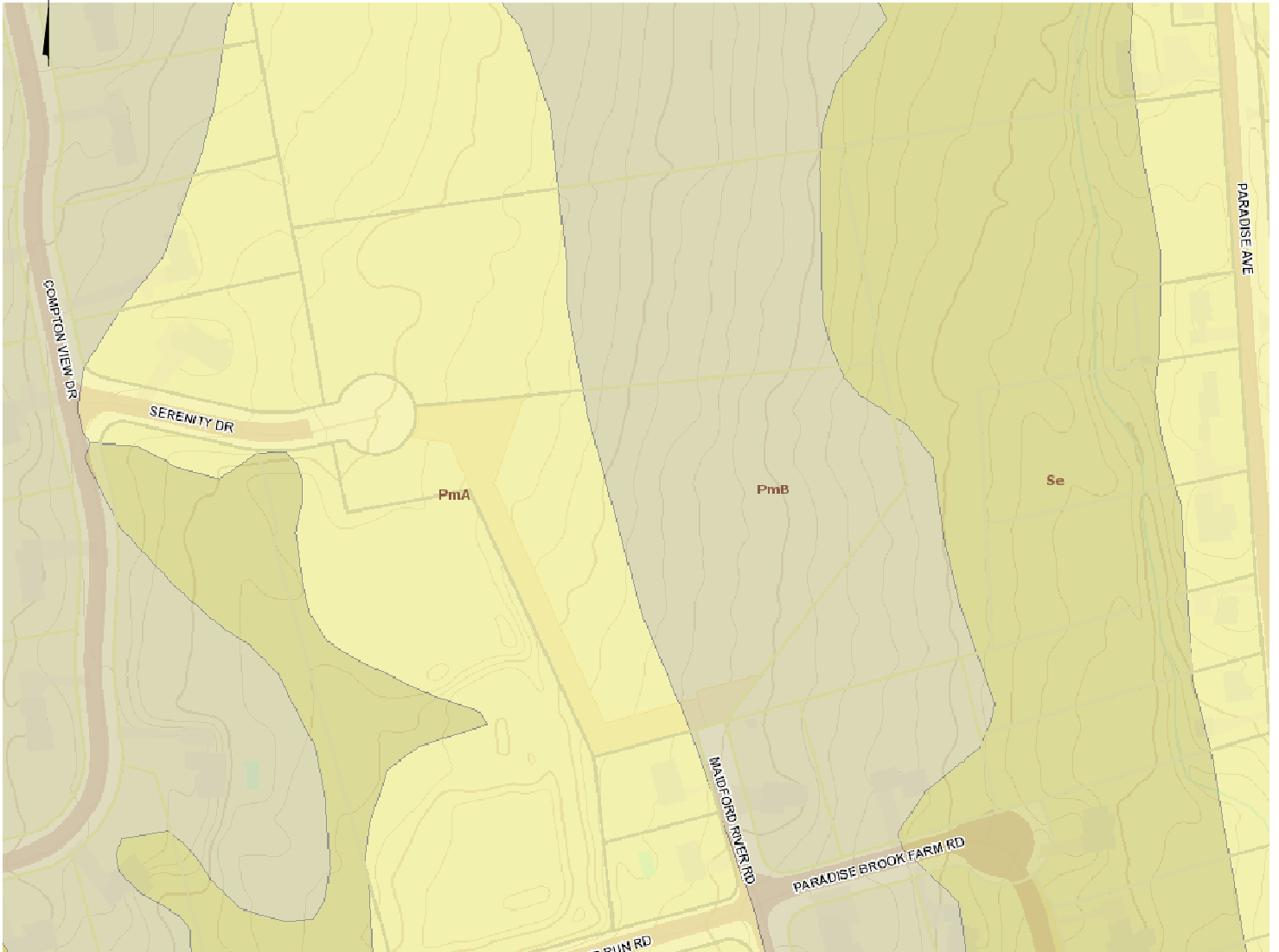
APPENDIX A FIGURES



Scale:	NTS	Date:	20NOV20	Designed By:	JJR	Drawn By:	JJR	Checked By:	GES
Project Title:	CAMPOS SUBDIVISION MIDDLETOWN, RHODE ISLAND, 02842				Drawing Title:	LOCUS MAP			
Issued for:	PERMITTING			Drawing Number:	FIG 1		Project Number:	19187.0	



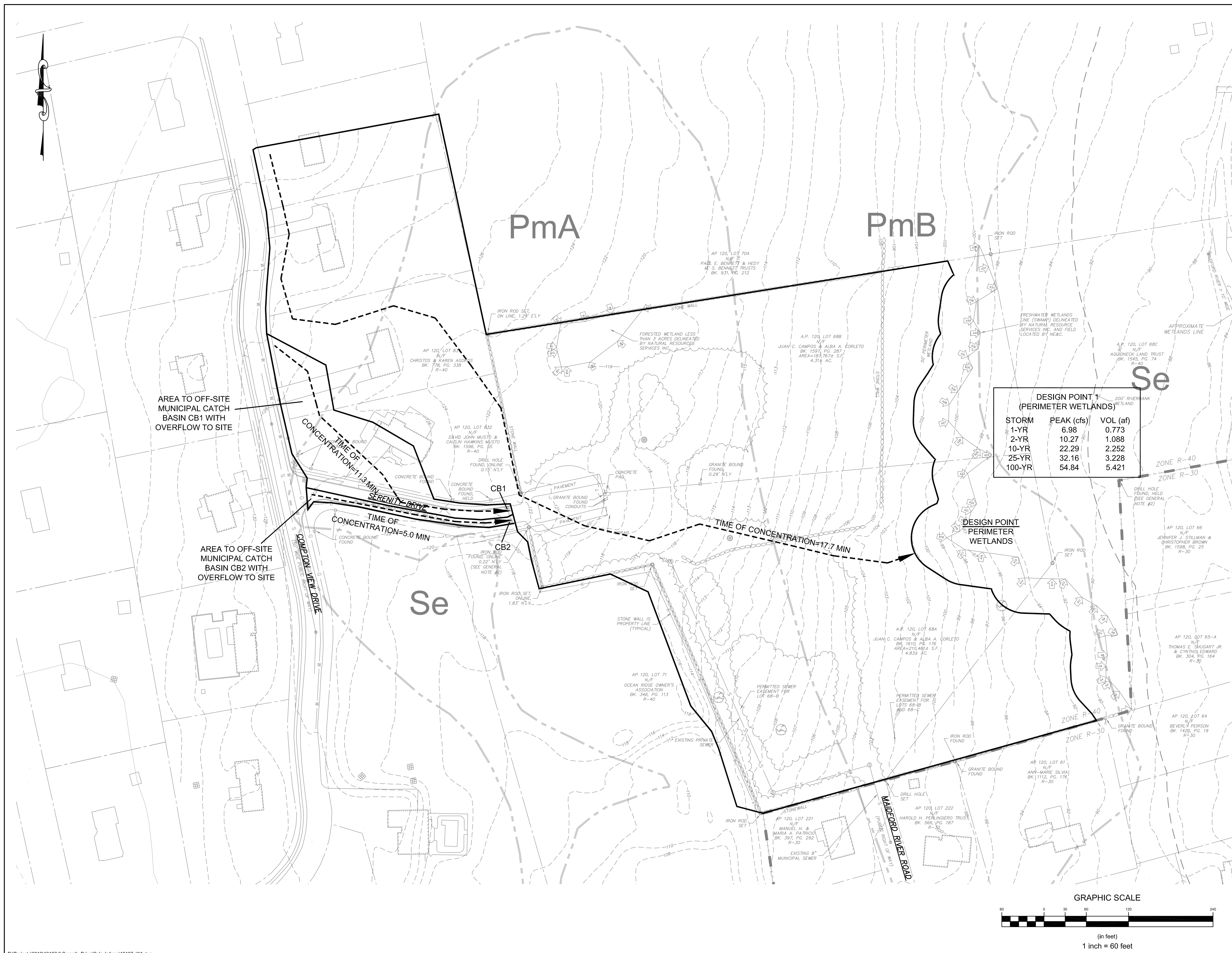
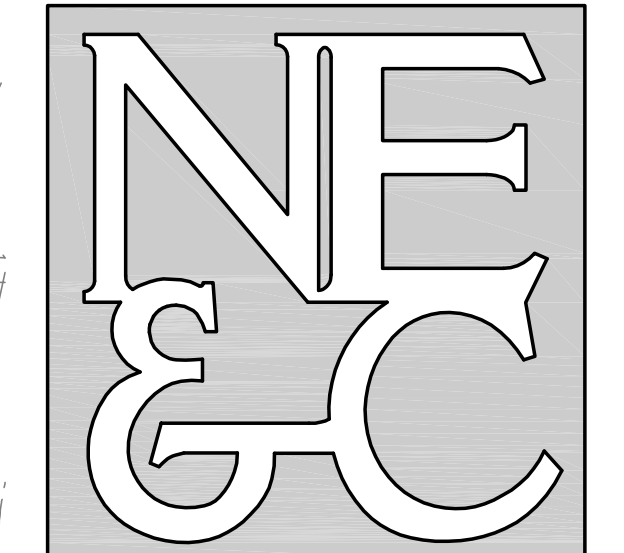
Scale:	NTS	Date:	20NOV20	Designed By:	JJR	Drawn By:	JJR	Checked By:	GES
Project Title:					Drawing Title:				
CAMPOS SUBDIVISION MIDDLETOWN, RHODE ISLAND, 02842					ZONING MAP				
Issued for:			Drawing Number:		Project Number:				
PERMITTING			FIG 2		19187.0				



Scale:	NTS	Date:	20NOV20	Designed By:	JJR	Drawn By:	JJR	Checked By:	GES
Project Title:	CAMPOS SUBDIVISION MIDDLETOWN, RHODE ISLAND, 02842			Drawing Title:	SOILS MAP				
Issued for:	PERMITTING			Drawing Number:	FIG 3		Project Number:	19187.0	



APPENDIX B WATERSHED MAPS

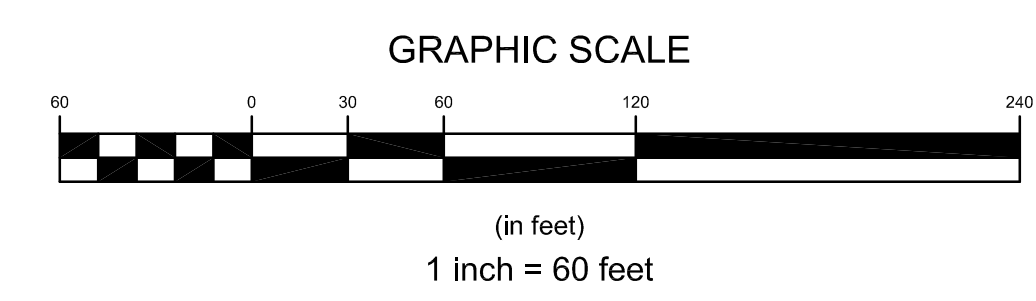


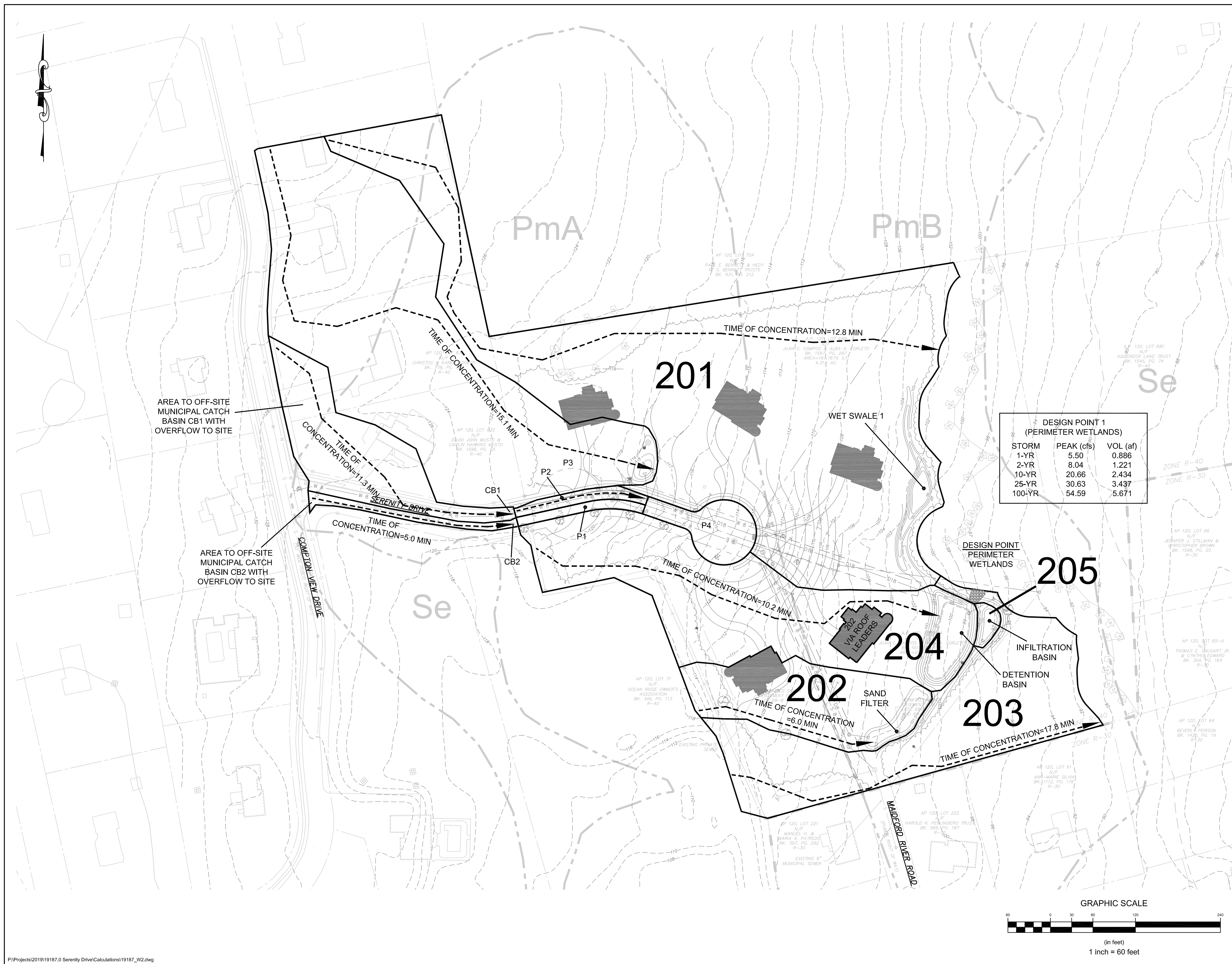
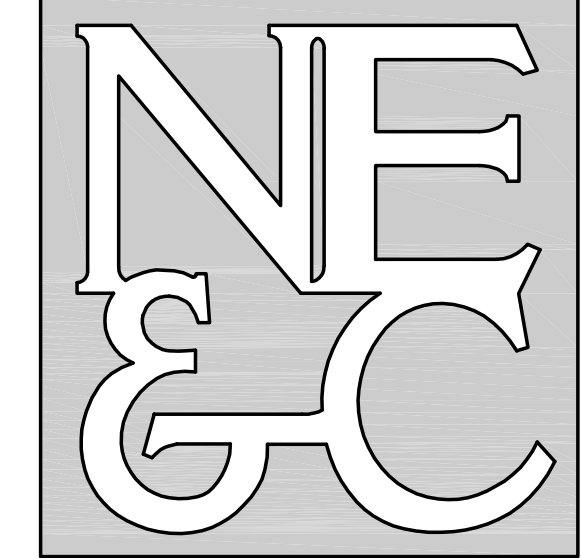
DESIGN POINT 1 (PERIMETER WETLANDS)		
STORM	PEAK (cfs)	VOL (af)
1-YR	6.98	0.773
2-YR	10.27	1.088
10-YR	22.29	2.252
25-YR	32.16	3.228
100-YR	54.84	5.421

AREA TO OFF-SITE MUNICIPAL CATCH BASIN CB1 WITH OVERFLOW TO SITE

AREA TO OFF-SITE MUNICIPAL CATCH BASIN CB2 WITH OVERFLOW TO SITE

1	REVISED PER TOWN COMMENTS	28SEP21	
No.	Revision	Date	App.
Designed By:	Drawn by: JJR	Checked by: GES	
Scale:	1"=60'	Date:	10NOV20
Project Title:			
CAMPOS SUBDIVISION A.P. 120 LOTS 68-A & 68-B SERENITY DRIVE MIDDLETOWN RHODE ISLAND			
Client/Owner:			
MR. JUAN CAMPOS 162 BROADWAY, UNIT 1 NEWPORT, RI 02840			
Issued for:			
PERMITTING			
Drawing Title:			
EXISTING WATERSHED PLAN			
Drawing Number:			W-1
Sheet			1 of 1
Project Number:			19187.0
Survey Index:			- 120 - 68A & B
OWNERSHIP AND USE OF DOCUMENTS: DRAWINGS AND SPECIFICATIONS, AS INSTRUMENTS OF PROFESSIONAL SERVICE, ARE AND SHALL REMAIN THE PROPERTY OF THE ENGINEER. THESE DOCUMENTS ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECTS OR PURPOSES, OR BY ANY OTHER PARTIES, THAN THOSE PROPERLY AUTHORIZED BY CONTRACT, WITHOUT THE EXPRESS AUTHORIZATION OF THE ENGINEER.			





DESIGN POINT 1 (PERIMETER WETLANDS)		
STORM	PEAK (cfs)	VOL (af)
1-YR	5.50	0.886
2-YR	8.04	1.221
10-YR	20.66	2.434
25-YR	30.63	3.437
100-YR	54.59	5.671

No.	Revision	Date	App.
2	TOWN PRELIMINARY REVISIONS	01MAR22	
1	RIDEM REVISIONS	15FEB21	

Designed By: _____ Drawn by: JJR Checked by: GES
 Scale: 1"=60' Date: 26MAR20

Project Title:
CAMPOS SUBDIVISION
 A.P. 120 LOTS 68-A & 68-B
 SERENITY DRIVE
 MIDDLETOWN
 RHODE ISLAND

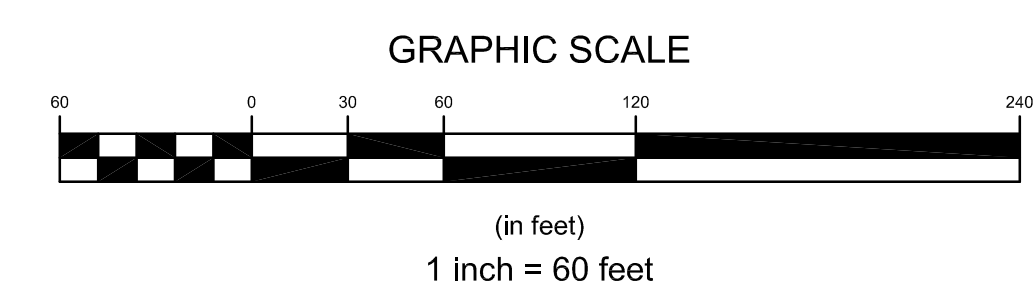
Client/Owner:
 MR. JUAN CAMPOS
 162 BROADWAY, UNIT 1
 NEWPORT, RI 02840

Issued for:
 PERMITTING

Drawing Title:
**PROPOSED
 WATERSHED PLAN**

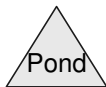
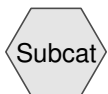
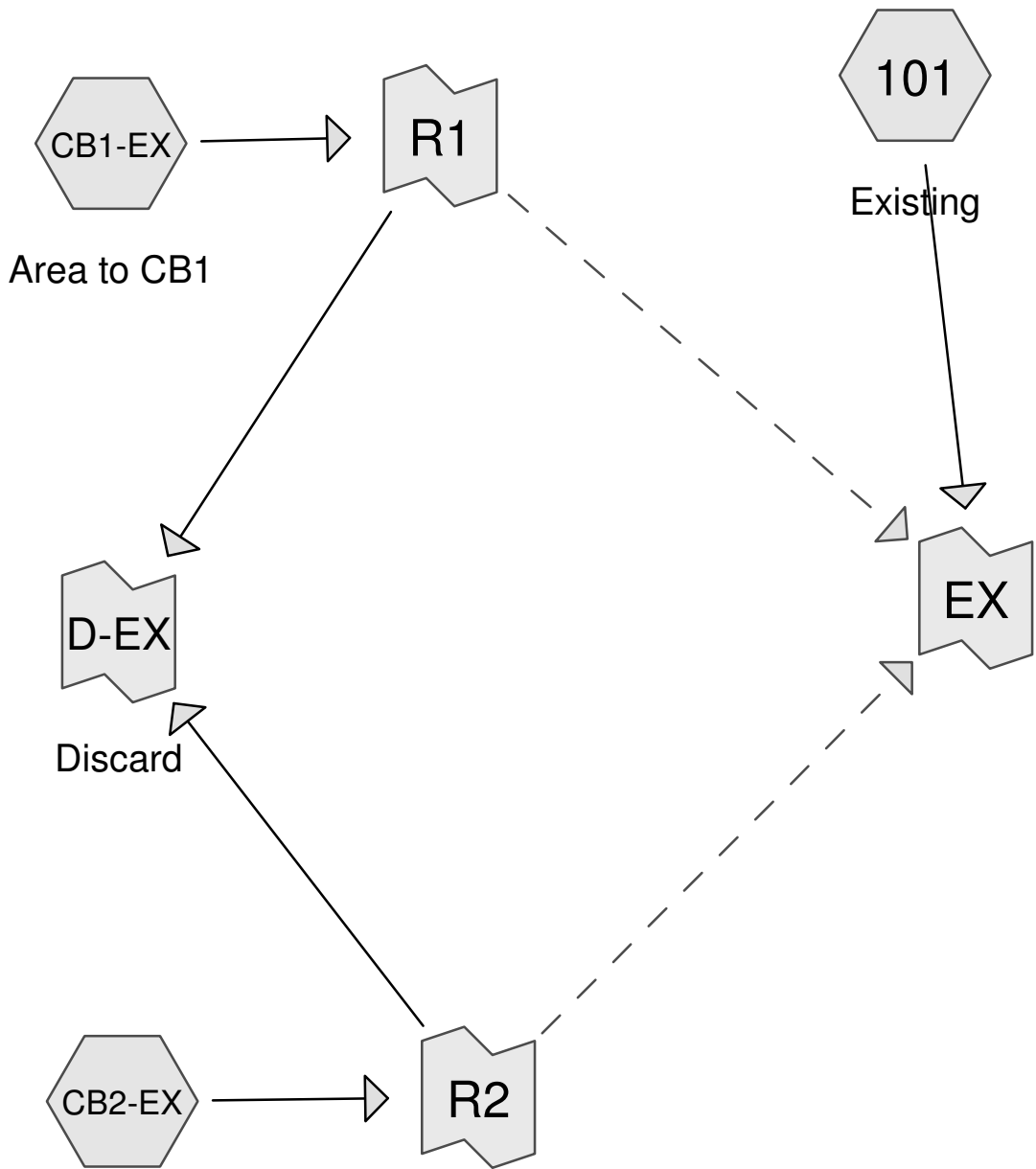
Drawing Number: W-2
Sheet 1 of 1
Project Number: 19187.0
Survey Index: - 120 - 68A & B

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APPENDIX C EXISTING CONDITIONS HYDROCAD



Routing Diagram for 2022-02-24 19187.0
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.043	74	>75% Grass cover, Good, HSG C (101, CB1-EX)
0.023	98	Building (CB1-EX)
0.081	98	Pavement (CB2-EX)
0.156	98	Pavement and Concrete (CB1-EX)
5.953	72	Woods/grass comb., Good, HSG C (101)
0.074	98	off-site pavement (101)
0.154	98	off-site roof (101)
0.098	98	pavement (101)

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Serenity Drive: Existing Conditions
Type III 24-hr 1-YEAR Rainfall=2.80"

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Summary for Subcatchment 101: Existing

Runoff = 6.98 cfs @ 12.27 hrs, Volume= 0.773 af, Depth= 0.78"
Routed to Link EX :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
* 6,713	98	off-site roof
* 3,228	98	off-site pavement
* 4,273	98	pavement
259,329	72	Woods/grass comb., Good, HSG C
241,764	74	>75% Grass cover, Good, HSG C
515,307	74	Weighted Average
501,093	73	97.24% Pervious Area
14,214	98	2.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.0	653	0.0180	2.16		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
0.5	81	0.0154	2.52		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
2.6	492	0.0375	3.12		Shallow Concentrated Flow, Woods and grass Unpaved Kv= 16.1 fps
17.7	1,326	Total			

Summary for Subcatchment CB1-EX: Area to CB1

Runoff = 0.71 cfs @ 12.16 hrs, Volume= 0.062 af, Depth= 1.10"
Routed to Link R1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

Summary for Subcatchment CB2-EX:

Runoff = 0.23 cfs @ 12.07 hrs, Volume= 0.017 af, Depth= 2.57"
Routed to Link R2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Link D-EX: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 1.26" for 1-YEAR event
Inflow = 0.86 cfs @ 12.14 hrs, Volume= 0.079 af
Primary = 0.86 cfs @ 12.14 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link EX:

Inflow Area = 11.830 ac, 2.76% Impervious, Inflow Depth = 0.78" for 1-YEAR event
Inflow = 6.98 cfs @ 12.27 hrs, Volume= 0.773 af
Primary = 6.98 cfs @ 12.27 hrs, Volume= 0.773 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R1:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 1.10" for 1-YEAR event
Inflow = 0.71 cfs @ 12.16 hrs, Volume= 0.062 af
Primary = 0.71 cfs @ 12.16 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-EX : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link R2:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 2.57" for 1-YEAR event
Inflow = 0.23 cfs @ 12.07 hrs, Volume= 0.017 af
Primary = 0.23 cfs @ 12.07 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-EX : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

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Serenity Drive: Existing Conditions
Type III 24-hr 2-YEAR Rainfall=3.30"

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Summary for Subcatchment 101: Existing

Runoff = 10.27 cfs @ 12.26 hrs, Volume= 1.088 af, Depth= 1.10"
Routed to Link EX :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
* 6,713	98	off-site roof
* 3,228	98	off-site pavement
* 4,273	98	pavement
259,329	72	Woods/grass comb., Good, HSG C
241,764	74	>75% Grass cover, Good, HSG C
515,307	74	Weighted Average
501,093	73	97.24% Pervious Area
14,214	98	2.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.0	653	0.0180	2.16		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
0.5	81	0.0154	2.52		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
2.6	492	0.0375	3.12		Shallow Concentrated Flow, Woods and grass Unpaved Kv= 16.1 fps
17.7	1,326	Total			

Summary for Subcatchment CB1-EX: Area to CB1

Runoff = 0.97 cfs @ 12.16 hrs, Volume= 0.083 af, Depth= 1.48"
Routed to Link R1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

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Serenity Drive: Existing Conditions
Type III 24-hr 2-YEAR Rainfall=3.30"

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Summary for Subcatchment CB2-EX:

Runoff = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af, Depth= 3.07"
Routed to Link R2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Link D-EX: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 1.65" for 2-YEAR event
Inflow = 1.14 cfs @ 12.14 hrs, Volume= 0.103 af
Primary = 1.14 cfs @ 12.14 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link EX:

Inflow Area = 11.830 ac, 2.76% Impervious, Inflow Depth = 1.10" for 2-YEAR event
Inflow = 10.27 cfs @ 12.26 hrs, Volume= 1.088 af
Primary = 10.27 cfs @ 12.26 hrs, Volume= 1.088 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R1:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 1.48" for 2-YEAR event
Inflow = 0.97 cfs @ 12.16 hrs, Volume= 0.083 af
Primary = 0.97 cfs @ 12.16 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min

Routed to Link D-EX : Discard

Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link R2:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 3.07" for 2-YEAR event
Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af
Primary = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Routed to Link D-EX : Discard

Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

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Serenity Drive: Existing Conditions
Type III 24-hr 10-YEAR Rainfall=4.90"
Printed 3/1/2022
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Summary for Subcatchment 101: Existing

Runoff = 22.29 cfs @ 12.25 hrs, Volume= 2.252 af, Depth= 2.28"
Routed to Link EX :

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

Area (sf)	CN	Description
* 6,713	98	off-site roof
* 3,228	98	off-site pavement
* 4,273	98	pavement
259,329	72	Woods/grass comb., Good, HSG C
241,764	74	>75% Grass cover, Good, HSG C
515,307	74	Weighted Average
501,093	73	97.24% Pervious Area
14,214	98	2.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.0	653	0.0180	2.16		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
0.5	81	0.0154	2.52		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
2.6	492	0.0375	3.12		Shallow Concentrated Flow, Woods and grass Unpaved Kv= 16.1 fps
17.7	1,326	Total			

Summary for Subcatchment CB1-EX: Area to CB1

Runoff = 1.85 cfs @ 12.16 hrs, Volume= 0.157 af, Depth= 2.81"
Routed to Link R1 :

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

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

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Serenity Drive: Existing Conditions
Type III 24-hr 10-YEAR Rainfall=4.90"
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Summary for Subcatchment CB2-EX:

Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af, Depth= 4.66"
Routed to Link R2 :

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

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Link D-EX: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 3.01" for 10-YEAR event
Inflow = 2.12 cfs @ 12.14 hrs, Volume= 0.188 af
Primary = 2.12 cfs @ 12.14 hrs, Volume= 0.188 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link EX:

Inflow Area = 11.830 ac, 2.76% Impervious, Inflow Depth = 2.28" for 10-YEAR event
Inflow = 22.29 cfs @ 12.25 hrs, Volume= 2.252 af
Primary = 22.29 cfs @ 12.25 hrs, Volume= 2.252 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R1:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 1.85 cfs @ 12.16 hrs, Volume= 0.157 af
Primary = 1.85 cfs @ 12.16 hrs, Volume= 0.157 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-EX : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link R2:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 4.66" for 10-YEAR event
Inflow = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af
Primary = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-EX : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

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Serenity Drive: Existing Conditions
Type III 24-hr 25-YEAR Rainfall=6.10"
Printed 3/1/2022
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Summary for Subcatchment 101: Existing

Runoff = 32.14 cfs @ 12.25 hrs, Volume= 3.223 af, Depth= 3.27"
Routed to Link EX :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 6,713	98	off-site roof
* 3,228	98	off-site pavement
* 4,273	98	pavement
259,329	72	Woods/grass comb., Good, HSG C
241,764	74	>75% Grass cover, Good, HSG C
515,307	74	Weighted Average
501,093	73	97.24% Pervious Area
14,214	98	2.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.0	653	0.0180	2.16		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
0.5	81	0.0154	2.52		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
2.6	492	0.0375	3.12		Shallow Concentrated Flow, Woods and grass Unpaved Kv= 16.1 fps
17.7	1,326	Total			

Summary for Subcatchment CB1-EX: Area to CB1

Runoff = 2.55 cfs @ 12.16 hrs, Volume= 0.217 af, Depth= 3.87"
Routed to Link R1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

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Serenity Drive: Existing Conditions
Type III 24-hr 25-YEAR Rainfall=6.10"
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Summary for Subcatchment CB2-EX:

Runoff = 0.50 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 5.86"
Routed to Link R2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Link D-EX: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 4.01" for 25-YEAR event
Inflow = 2.51 cfs @ 12.08 hrs, Volume= 0.251 af
Primary = 2.51 cfs @ 12.08 hrs, Volume= 0.251 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link EX:

Inflow Area = 11.830 ac, 2.76% Impervious, Inflow Depth = 3.27" for 25-YEAR event
Inflow = 32.16 cfs @ 12.24 hrs, Volume= 3.228 af
Primary = 32.16 cfs @ 12.24 hrs, Volume= 3.228 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R1:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 3.87" for 25-YEAR event
Inflow = 2.55 cfs @ 12.16 hrs, Volume= 0.217 af
Primary = 2.00 cfs @ 12.08 hrs, Volume= 0.212 af, Atten= 22%, Lag= 0.0 min
Routed to Link D-EX : Discard
Secondary = 0.55 cfs @ 12.16 hrs, Volume= 0.005 af
Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link R2:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 5.86" for 25-YEAR event
Inflow = 0.50 cfs @ 12.07 hrs, Volume= 0.040 af
Primary = 0.50 cfs @ 12.07 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-EX : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

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Summary for Subcatchment 101: Existing

Runoff = 53.57 cfs @ 12.24 hrs, Volume= 5.388 af, Depth= 5.47"
 Routed to Link EX :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
* 6,713	98	off-site roof
* 3,228	98	off-site pavement
* 4,273	98	pavement
259,329	72	Woods/grass comb., Good, HSG C
241,764	74	>75% Grass cover, Good, HSG C
515,307	74	Weighted Average
501,093	73	97.24% Pervious Area
14,214	98	2.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.0	653	0.0180	2.16		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
0.5	81	0.0154	2.52		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
2.6	492	0.0375	3.12		Shallow Concentrated Flow, Woods and grass Unpaved Kv= 16.1 fps
17.7	1,326	Total			

Summary for Subcatchment CB1-EX: Area to CB1

Runoff = 4.02 cfs @ 12.15 hrs, Volume= 0.346 af, Depth= 6.19"
 Routed to Link R1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

Summary for Subcatchment CB2-EX:

Runoff = 0.71 cfs @ 12.07 hrs, Volume= 0.056 af, Depth= 8.36"
Routed to Link R2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Link D-EX: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 5.90" for 100-YEAR event
Inflow = 2.71 cfs @ 12.07 hrs, Volume= 0.370 af
Primary = 2.71 cfs @ 12.07 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link EX:

Inflow Area = 11.830 ac, 2.76% Impervious, Inflow Depth = 5.50" for 100-YEAR event
Inflow = 54.84 cfs @ 12.23 hrs, Volume= 5.421 af
Primary = 54.84 cfs @ 12.23 hrs, Volume= 5.421 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R1:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 6.19" for 100-YEAR event
Inflow = 4.02 cfs @ 12.15 hrs, Volume= 0.346 af
Primary = 2.00 cfs @ 12.01 hrs, Volume= 0.313 af, Atten= 50%, Lag= 0.0 min
Routed to Link D-EX : Discard
Secondary = 2.02 cfs @ 12.15 hrs, Volume= 0.033 af
Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

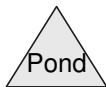
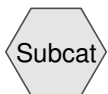
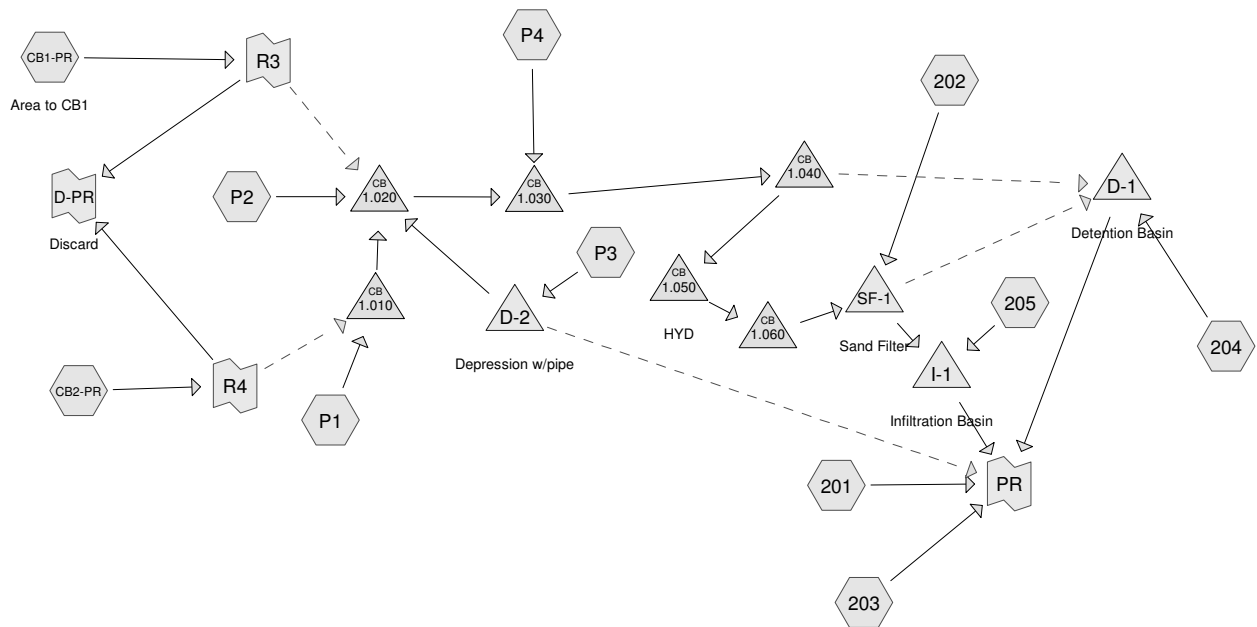
Summary for Link R2:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 8.36" for 100-YEAR event
Inflow = 0.71 cfs @ 12.07 hrs, Volume= 0.056 af
Primary = 0.71 cfs @ 12.07 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-EX : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link EX :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



APPENDIX D PROPOSED CONDITIONS HYDROCAD



Routing Diagram for 2022-02-24 19187.0
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.156	74	>75% Grass cover, Good, HSG C (201, 202, 203, 204, 205, CB1-PR, P2, P3)
0.023	98	Building (CB1-PR)
0.162	98	Detention Basin (204)
0.015	98	Infiltration Basin (98% Capture) (205)
0.388	98	Pavement (CB2-PR, P1, P2, P4)
0.156	98	Pavement and Concrete (CB1-PR)
0.029	85	Pervious Driveway (P2, P3)
0.174	85	Pervious Driveways (201, 204)
0.344	98	Rooftops (201, 202)
0.048	98	Sand Filter (202)
1.858	72	Woods/grass comb., Good, HSG C (201, 202, 203, 204, P3)
0.154	98	off-site buildings (P3)
0.074	98	off-site pavement (P3)

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Serenity Drive: Proposed Conditions
Type III 24-hr 1-YEAR Rainfall=2.80"

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Summary for Subcatchment 201:

Runoff = 3.36 cfs @ 12.19 hrs, Volume= 0.322 af, Depth= 0.83"
Routed to Link PR :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
28,634	72	Woods/grass comb., Good, HSG C
* 9,000	98	Rooftops
* 4,610	85	Pervious Driveways
160,026	74	>75% Grass cover, Good, HSG C
202,270	75	Weighted Average
193,270	74	95.55% Pervious Area
9,000	98	4.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0500	0.25		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
6.1	980	0.0280	2.69		Shallow Concentrated Flow, Lawns and woods Unpaved Kv= 16.1 fps
12.8	1,080	Total			

Summary for Subcatchment 202:

Runoff = 0.96 cfs @ 12.09 hrs, Volume= 0.070 af, Depth= 1.04"
Routed to Pond SF-1 : Sand Filter

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
1,467	72	Woods/grass comb., Good, HSG C
* 6,000	98	Rooftops
25,475	74	>75% Grass cover, Good, HSG C
* 2,085	98	Sand Filter
35,027	79	Weighted Average
26,942	74	76.92% Pervious Area
8,085	98	23.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0900	0.32		Sheet Flow, Lawns/Trees Grass: Short n= 0.150 P2= 3.30"
0.7	145	0.0413	3.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
6.0	245	Total			

Summary for Subcatchment 203:

Runoff = 0.78 cfs @ 12.28 hrs, Volume= 0.087 af, Depth= 0.74"
Routed to Link PR :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

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Area (sf)	CN	Description
42,051	72	Woods/grass comb., Good, HSG C
19,959	74	>75% Grass cover, Good, HSG C
62,010	73	Weighted Average
62,010	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0450	0.11		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.30"
2.5	438	0.0340	2.97		Shallow Concentrated Flow, Woods and grass
					Unpaved Kv= 16.1 fps
17.8	538	Total			

Summary for Subcatchment 204:

Runoff = 1.51 cfs @ 12.15 hrs, Volume= 0.130 af, Depth= 0.93"
 Routed to Pond D-1 : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
* 7,045	98	Detention Basin
57,639	74	>75% Grass cover, Good, HSG C
5,270	72	Woods/grass comb., Good, HSG C
* 2,959	85	Pervious Driveways
72,913	77	Weighted Average
65,868	74	90.34% Pervious Area
7,045	98	9.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0400	0.23		Sheet Flow, Woods/grasses
					Grass: Short n= 0.150 P2= 3.30"
2.9	488	0.0310	2.83		Shallow Concentrated Flow, Grasses
					Unpaved Kv= 16.1 fps
10.2	588	Total			

Summary for Subcatchment 205:

Runoff = 0.06 cfs @ 12.08 hrs, Volume= 0.004 af, Depth= 1.29"
 Routed to Pond I-1 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
* 650	98	Infiltration Basin (98% Capture)
1,000	74	>75% Grass cover, Good, HSG C
1,650	83	Weighted Average
1,000	74	60.61% Pervious Area
650	98	39.39% Impervious Area

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

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Serenity Drive: Proposed Conditions
Type III 24-hr 1-YEAR Rainfall=2.80"

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Summary for Subcatchment CB1-PR: Area to CB1

Runoff = 0.71 cfs @ 12.16 hrs, Volume= 0.062 af, Depth= 1.10"
Routed to Link R3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

Summary for Subcatchment CB2-PR:

Runoff = 0.23 cfs @ 12.07 hrs, Volume= 0.017 af, Depth= 2.57"
Routed to Link R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Subcatchment P1:

Runoff = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af, Depth= 2.57"
Routed to Pond 1.010 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

Area (sf)	CN	Description
* 2,379	98	Pavement
2,379	98	100.00% Impervious Area

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

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Type III 24-hr 1-YEAR Rainfall=2.80"

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Summary for Subcatchment P2:

Runoff = 0.18 cfs @ 12.07 hrs, Volume= 0.013 af, Depth= 2.06"
Routed to Pond 1.020 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	2,469	98	Pavement
*	230	85	Pervious Driveway
	512	74	>75% Grass cover, Good, HSG C
	3,211	93	Weighted Average
	742	77	23.11% Pervious Area
	2,469	98	76.89% Impervious Area

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

Summary for Subcatchment P3:

Runoff = 2.13 cfs @ 12.23 hrs, Volume= 0.215 af, Depth= 0.88"
Routed to Pond D-2 : Depression w/pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	6,713	98	off-site buildings
*	3,228	98	off-site pavement
	3,510	72	Woods/grass comb., Good, HSG C
	112,794	74	>75% Grass cover, Good, HSG C
*	1,050	85	Pervious Driveway
	127,295	76	Weighted Average
	117,354	74	92.19% Pervious Area
	9,941	98	7.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.5	745	0.0198	2.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
15.1	845	Total			

Summary for Subcatchment P4:

Runoff = 0.55 cfs @ 12.07 hrs, Volume= 0.042 af, Depth= 2.57"
Routed to Pond 1.030 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.80"

	Area (sf)	CN	Description
*	8,545	98	Pavement
	8,545	98	100.00% Impervious Area

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Type III 24-hr 1-YEAR Rainfall=2.80"

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

Summary for Pond 1.010:

Inflow Area = 0.055 ac, 100.00% Impervious, Inflow Depth = 2.57" for 1-YEAR event
 Inflow = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af
 Outflow = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af
 Routed to Pond 1.020 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 113.55' @ 12.07 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	113.35'	12.0" Round 12" ADS L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 113.35' / 113.15' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.07 hrs HW=113.55' (Free Discharge)
 ↑ **1=12" ADS** (Barrel Controls 0.15 cfs @ 2.12 fps)

Summary for Pond 1.020:

Inflow Area = 3.051 ac, 11.13% Impervious, Inflow Depth = 0.94" for 1-YEAR event
 Inflow = 2.26 cfs @ 12.24 hrs, Volume= 0.239 af
 Outflow = 2.26 cfs @ 12.24 hrs, Volume= 0.239 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.26 cfs @ 12.24 hrs, Volume= 0.239 af
 Routed to Pond 1.030 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 113.09' @ 12.24 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.40'	18.0" Round 18" ADS L= 158.0' Ke= 0.500 Inlet / Outlet Invert= 112.40' / 109.55' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.26 cfs @ 12.24 hrs HW=113.09' (Free Discharge)
 ↑ **1=18" ADS** (Inlet Controls 2.26 cfs @ 2.83 fps)

Summary for Pond 1.030:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 1.04" for 1-YEAR event
 Inflow = 2.50 cfs @ 12.23 hrs, Volume= 0.281 af
 Outflow = 2.50 cfs @ 12.23 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.50 cfs @ 12.23 hrs, Volume= 0.281 af
 Routed to Pond 1.040 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 111.79' @ 12.23 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Device 2	111.60'	24.0" W x 48.0" H 1° Double Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	109.30'	18.0" Round 18" ADS L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 109.30' / 109.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=2.47 cfs @ 12.23 hrs HW=111.79' (Free Discharge)
 ↑2=18" ADS (Passes 2.47 cfs of 11.24 cfs potential flow)
 ↑1=Double Grate (Weir Controls 2.47 cfs @ 1.29 fps)

Summary for Pond 1.040:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 1.04" for 1-YEAR event
 Inflow = 2.50 cfs @ 12.23 hrs, Volume= 0.281 af
 Outflow = 2.50 cfs @ 12.23 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.91 cfs @ 12.23 hrs, Volume= 0.223 af
 Routed to Pond 1.050 : HYD
 Secondary = 1.59 cfs @ 12.23 hrs, Volume= 0.058 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 109.42' @ 12.23 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	6.0" Round 6" PVC L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 108.25' / 107.49' S= 0.0200 '/ Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	108.85'	18.0" Round 18" ADS L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 108.85' / 100.00' S= 0.0354 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.91 cfs @ 12.23 hrs HW=109.42' (Free Discharge)
 ↑1=6" PVC (Inlet Controls 0.91 cfs @ 4.62 fps)

Secondary OutFlow Max=1.59 cfs @ 12.23 hrs HW=109.42' (Free Discharge)
 ↑2=18" ADS (Inlet Controls 1.59 cfs @ 2.57 fps)

Summary for Pond 1.050: HYD

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 0.83" for 1-YEAR event
 Inflow = 0.91 cfs @ 12.23 hrs, Volume= 0.223 af
 Outflow = 0.91 cfs @ 12.23 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.91 cfs @ 12.23 hrs, Volume= 0.223 af
 Routed to Pond 1.060 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 107.86' @ 12.23 hrs
 Flood Elev= 113.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.24'	8.0" Round 8" PVC L= 258.0' Ke= 0.500 Inlet / Outlet Invert= 107.24' / 102.46' S= 0.0185 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.91 cfs @ 12.23 hrs HW=107.86' (Free Discharge)
 ↑1=8" PVC (Inlet Controls 0.91 cfs @ 2.68 fps)

Summary for Pond 1.060:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 0.83" for 1-YEAR event
 Inflow = 0.91 cfs @ 12.23 hrs, Volume= 0.223 af
 Outflow = 0.91 cfs @ 12.23 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.91 cfs @ 12.23 hrs, Volume= 0.223 af
 Routed to Pond SF-1 : Sand Filter

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Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.84' @ 12.23 hrs
 Flood Elev= 105.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.21'	8.0" Round 8" PVC L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 102.21' / 102.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.91 cfs @ 12.23 hrs HW=102.84' (Free Discharge)
 ↑ **1=8" PVC** (Barrel Controls 0.91 cfs @ 3.42 fps)

Summary for Pond D-1: Detention Basin

Inflow Area = 1.674 ac, 9.66% Impervious, Inflow Depth = 2.27" for 1-YEAR event
 Inflow = 3.10 cfs @ 12.34 hrs, Volume= 0.317 af
 Outflow = 2.00 cfs @ 12.54 hrs, Volume= 0.317 af, Atten= 35%, Lag= 12.4 min
 Primary = 2.00 cfs @ 12.54 hrs, Volume= 0.317 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 98.25' @ 12.54 hrs Surf.Area= 4,332 sf Storage= 2,982 cf
 Flood Elev= 101.00' Surf.Area= 7,045 sf Storage= 18,615 cf

Plug-Flow detention time= 36.6 min calculated for 0.317 af (100% of inflow)
 Center-of-Mass det. time= 36.7 min (867.7 - 831.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	18,615 cf	Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	3,693	0	0
98.00	4,092	1,946	1,946
99.00	5,068	4,580	6,526
100.00	6,032	5,550	12,076
101.00	7,045	6,539	18,615

Device	Routing	Invert	Outlet Devices
#1	Device 2	97.50'	6.0" Vert. (3) 6" Underdrains X 3.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	97.25'	12.0" Round 12" ADS L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 97.25' / 97.00' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Primary	98.50'	2.0' long x 3.00' rise Concrete Weir 2 End Contraction(s)

Primary OutFlow Max=2.00 cfs @ 12.54 hrs HW=98.25' (Free Discharge)
 ↑ **2=12" ADS** (Passes 2.00 cfs of 2.28 cfs potential flow)
 ↑ **1=(3) 6" Underdrains** (Orifice Controls 2.00 cfs @ 3.39 fps)
 ↑ **3=Concrete Weir** (Controls 0.00 cfs)

Summary for Pond D-2: Depression w/pipe

Inflow Area = 2.922 ac, 7.81% Impervious, Inflow Depth = 0.88" for 1-YEAR event
 Inflow = 2.13 cfs @ 12.23 hrs, Volume= 0.215 af
 Outflow = 2.11 cfs @ 12.24 hrs, Volume= 0.215 af, Atten= 1%, Lag= 1.0 min
 Primary = 2.11 cfs @ 12.24 hrs, Volume= 0.215 af
 Routed to Pond 1.020 :
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link PR :

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

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Peak Elev= 116.17' @ 12.24 hrs Surf.Area= 380 sf Storage= 57 cf
 Flood Elev= 118.00' Surf.Area= 1,700 sf Storage= 1,777 cf

Plug-Flow detention time= 0.1 min calculated for 0.215 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (872.4 - 872.2)

Volume	Invert	Avail.Storage	Storage Description
#1	116.00'	1,777 cf	Grassed Depression (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.00	300	0	0
117.00	777	539	539
118.00	1,700	1,239	1,777

Device	Routing	Invert	Outlet Devices
#1	Primary	115.50'	18.0" Round 18" ADS L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 115.50' / 112.65' S= 0.0950 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	117.50'	127.0 deg x 10.0' long x 0.50' rise Grassed overflow Cv= 2.48 (C= 3.10)

Primary OutFlow Max=2.11 cfs @ 12.24 hrs HW=116.17' (Free Discharge)
 ↑1=18" ADS (Inlet Controls 2.11 cfs @ 2.78 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=116.00' (Free Discharge)
 ↑2=Grassed overflow (Controls 0.00 cfs)

Summary for Pond I-1: Infiltration Basin

Inflow Area = 4.089 ac, 18.01% Impervious, Inflow Depth = 0.49" for 1-YEAR event
 Inflow = 0.14 cfs @ 12.08 hrs, Volume= 0.168 af
 Outflow = 0.14 cfs @ 12.11 hrs, Volume= 0.160 af, Atten= 2%, Lag= 1.7 min
 Discarded = 0.00 cfs @ 12.11 hrs, Volume= 0.000 af
 Primary = 0.14 cfs @ 12.11 hrs, Volume= 0.160 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 99.53' @ 12.11 hrs Surf.Area= 761 sf Storage= 372 cf
 Flood Elev= 100.00' Surf.Area= 860 sf Storage= 755 cf

Plug-Flow detention time= 76.8 min calculated for 0.160 af (95% of inflow)
 Center-of-Mass det. time= 37.2 min (1,317.8 - 1,280.6)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	755 cf	Infiltration Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	650	0	0
100.00	860	755	755

Device	Routing	Invert	Outlet Devices
#1	Discarded	99.00'	0.001 in/hr Exfiltration over Surface area
#2	Primary	99.50'	90.0 deg x 10.0' long x 0.50' rise Overflow weir Cv= 2.50 (C= 3.13)

Discarded OutFlow Max=0.00 cfs @ 12.11 hrs HW=99.53' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.14 cfs @ 12.11 hrs HW=99.53' (Free Discharge)
 ↑2=Overflow weir (Weir Controls 0.14 cfs @ 0.51 fps)

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Summary for Pond SF-1: Sand Filter

Inflow Area = 4.051 ac, 17.81% Impervious, Inflow Depth = 0.87" for 1-YEAR event
 Inflow = 1.83 cfs @ 12.10 hrs, Volume= 0.293 af
 Outflow = 1.18 cfs @ 12.42 hrs, Volume= 0.292 af, Atten= 36%, Lag= 19.6 min
 Primary = 0.10 cfs @ 12.42 hrs, Volume= 0.164 af
 Routed to Pond I-1 : Infiltration Basin
 Secondary = 1.08 cfs @ 12.42 hrs, Volume= 0.128 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.28' @ 12.42 hrs Surf.Area= 4,562 sf Storage= 3,087 cf
 Flood Elev= 103.00' Surf.Area= 5,126 sf Storage= 5,240 cf

Plug-Flow detention time= 225.2 min calculated for 0.292 af (99% of inflow)
 Center-of-Mass det. time= 222.6 min (1,093.2 - 870.5)

Volume	Invert	Avail.Storage	Storage Description
#1	101.50'	4,002 cf	Sand filter Basin (Prismatic) Listed below (Recalc)
#2	99.50'	1,238 cf	12" Sand Media/4" Loam/8" Stone (Prismatic) Listed below (Recalc)
			3,750 cf Overall x 33.0% Voids
			5,240 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.50	2,085	0	0
103.00	3,251	4,002	4,002

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.50	1,875	0	0
101.50	1,875	3,750	3,750

Device	Routing	Invert	Outlet Devices
#1	Primary	99.50'	6.0" Round 6" PVC L= 112.0' Ke= 0.500 Inlet / Outlet Invert= 99.50' / 99.00' S= 0.0045 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Device 1	99.60'	1.5" Vert. 1.5" Orifice Plate C= 0.600 Limited to weir flow at low heads
#3	Device 2	99.50'	8.270 in/hr Filtration through sand to outlet over Surface area
#4	Secondary	102.17'	90.0 deg x 10.0' long x 0.83' rise Overflow weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=0.10 cfs @ 12.42 hrs HW=102.28' (Free Discharge)
 ↑1=6" PVC (Passes 0.10 cfs of 1.01 cfs potential flow)
 ↑2=1.5" Orifice Plate (Orifice Controls 0.10 cfs @ 7.78 fps)
 ↑3=filtration through sand to outlet (Passes 0.10 cfs of 0.87 cfs potential flow)

Secondary OutFlow Max=1.07 cfs @ 12.42 hrs HW=102.28' (Free Discharge)
 ↑4=Overflow weir (Weir Controls 1.07 cfs @ 1.01 fps)

Summary for Link D-PR: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 1.26" for 1-YEAR event
 Inflow = 0.86 cfs @ 12.14 hrs, Volume= 0.079 af
 Primary = 0.86 cfs @ 12.14 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min

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

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Type III 24-hr 1-YEAR Rainfall=2.80"

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Summary for Link PR:

Inflow Area = 11.830 ac, 9.34% Impervious, Inflow Depth = 0.90" for 1-YEAR event
Inflow = 5.50 cfs @ 12.22 hrs, Volume= 0.886 af
Primary = 5.50 cfs @ 12.22 hrs, Volume= 0.886 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R3:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 1.10" for 1-YEAR event
Inflow = 0.71 cfs @ 12.16 hrs, Volume= 0.062 af
Primary = 0.71 cfs @ 12.16 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.020 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link R4:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 2.57" for 1-YEAR event
Inflow = 0.23 cfs @ 12.07 hrs, Volume= 0.017 af
Primary = 0.23 cfs @ 12.07 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.010 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

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Serenity Drive: Proposed Conditions
Type III 24-hr 2-YEAR Rainfall=3.30"

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Summary for Subcatchment 201:

Runoff = 4.86 cfs @ 12.19 hrs, Volume= 0.450 af, Depth= 1.16"
Routed to Link PR :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
28,634	72	Woods/grass comb., Good, HSG C
* 9,000	98	Rooftops
* 4,610	85	Pervious Driveways
160,026	74	>75% Grass cover, Good, HSG C
202,270	75	Weighted Average
193,270	74	95.55% Pervious Area
9,000	98	4.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0500	0.25		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
6.1	980	0.0280	2.69		Shallow Concentrated Flow, Lawns and woods Unpaved Kv= 16.1 fps
12.8	1,080	Total			

Summary for Subcatchment 202:

Runoff = 1.32 cfs @ 12.09 hrs, Volume= 0.095 af, Depth= 1.41"
Routed to Pond SF-1 : Sand Filter

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
1,467	72	Woods/grass comb., Good, HSG C
* 6,000	98	Rooftops
25,475	74	>75% Grass cover, Good, HSG C
* 2,085	98	Sand Filter
35,027	79	Weighted Average
26,942	74	76.92% Pervious Area
8,085	98	23.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0900	0.32		Sheet Flow, Lawns/Trees Grass: Short n= 0.150 P2= 3.30"
0.7	145	0.0413	3.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
6.0	245	Total			

Summary for Subcatchment 203:

Runoff = 1.16 cfs @ 12.26 hrs, Volume= 0.124 af, Depth= 1.05"
Routed to Link PR :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

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Area (sf)	CN	Description
42,051	72	Woods/grass comb., Good, HSG C
19,959	74	>75% Grass cover, Good, HSG C
62,010	73	Weighted Average
62,010	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0450	0.11		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.30"
2.5	438	0.0340	2.97		Shallow Concentrated Flow, Woods and grass
					Unpaved Kv= 16.1 fps
17.8	538	Total			

Summary for Subcatchment 204:

Runoff = 2.13 cfs @ 12.15 hrs, Volume= 0.179 af, Depth= 1.28"
 Routed to Pond D-1 : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
* 7,045	98	Detention Basin
57,639	74	>75% Grass cover, Good, HSG C
5,270	72	Woods/grass comb., Good, HSG C
* 2,959	85	Pervious Driveways
72,913	77	Weighted Average
65,868	74	90.34% Pervious Area
7,045	98	9.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0400	0.23		Sheet Flow, Woods/grasses
					Grass: Short n= 0.150 P2= 3.30"
2.9	488	0.0310	2.83		Shallow Concentrated Flow, Grasses
					Unpaved Kv= 16.1 fps
10.2	588	Total			

Summary for Subcatchment 205:

Runoff = 0.08 cfs @ 12.08 hrs, Volume= 0.005 af, Depth= 1.69"
 Routed to Pond I-1 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
* 650	98	Infiltration Basin (98% Capture)
1,000	74	>75% Grass cover, Good, HSG C
1,650	83	Weighted Average
1,000	74	60.61% Pervious Area
650	98	39.39% Impervious Area

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

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Type III 24-hr 2-YEAR Rainfall=3.30"

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Summary for Subcatchment CB1-PR: Area to CB1

Runoff = 0.97 cfs @ 12.16 hrs, Volume= 0.083 af, Depth= 1.48"
Routed to Link R3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

Summary for Subcatchment CB2-PR:

Runoff = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af, Depth= 3.07"
Routed to Link R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Subcatchment P1:

Runoff = 0.18 cfs @ 12.07 hrs, Volume= 0.014 af, Depth= 3.07"
Routed to Pond 1.010 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

Area (sf)	CN	Description
* 2,379	98	Pavement
2,379	98	100.00% Impervious Area

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

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Type III 24-hr 2-YEAR Rainfall=3.30"

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Summary for Subcatchment P2:

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 0.016 af, Depth= 2.54"
Routed to Pond 1.020 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	2,469	98	Pavement
*	230	85	Pervious Driveway
	512	74	>75% Grass cover, Good, HSG C
	3,211	93	Weighted Average
	742	77	23.11% Pervious Area
	2,469	98	76.89% Impervious Area

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

Summary for Subcatchment P3:

Runoff = 3.04 cfs @ 12.22 hrs, Volume= 0.298 af, Depth= 1.22"
Routed to Pond D-2 : Depression w/pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	6,713	98	off-site buildings
*	3,228	98	off-site pavement
	3,510	72	Woods/grass comb., Good, HSG C
	112,794	74	>75% Grass cover, Good, HSG C
*	1,050	85	Pervious Driveway
	127,295	76	Weighted Average
	117,354	74	92.19% Pervious Area
	9,941	98	7.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.5	745	0.0198	2.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
15.1	845	Total			

Summary for Subcatchment P4:

Runoff = 0.65 cfs @ 12.07 hrs, Volume= 0.050 af, Depth= 3.07"
Routed to Pond 1.030 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	8,545	98	Pavement
	8,545	98	100.00% Impervious Area

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Type III 24-hr 2-YEAR Rainfall=3.30"

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

Summary for Pond 1.010:

Inflow Area = 0.055 ac, 100.00% Impervious, Inflow Depth = 3.07" for 2-YEAR event
 Inflow = 0.18 cfs @ 12.07 hrs, Volume= 0.014 af
 Outflow = 0.18 cfs @ 12.07 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.18 cfs @ 12.07 hrs, Volume= 0.014 af
 Routed to Pond 1.020 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 113.56' @ 12.07 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	113.35'	12.0" Round 12" ADS L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 113.35' / 113.15' S= 0.0100 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.18 cfs @ 12.07 hrs HW=113.56' (Free Discharge)
 ↑ **1=12" ADS** (Barrel Controls 0.18 cfs @ 2.21 fps)

Summary for Pond 1.020:

Inflow Area = 3.051 ac, 11.13% Impervious, Inflow Depth = 1.29" for 2-YEAR event
 Inflow = 3.19 cfs @ 12.24 hrs, Volume= 0.327 af
 Outflow = 3.19 cfs @ 12.24 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.19 cfs @ 12.24 hrs, Volume= 0.327 af
 Routed to Pond 1.030 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 113.24' @ 12.24 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.40'	18.0" Round 18" ADS L= 158.0' Ke= 0.500 Inlet / Outlet Invert= 112.40' / 109.55' S= 0.0180 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.19 cfs @ 12.24 hrs HW=113.24' (Free Discharge)
 ↑ **1=18" ADS** (Inlet Controls 3.19 cfs @ 3.12 fps)

Summary for Pond 1.030:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 1.39" for 2-YEAR event
 Inflow = 3.48 cfs @ 12.23 hrs, Volume= 0.377 af
 Outflow = 3.48 cfs @ 12.23 hrs, Volume= 0.377 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.48 cfs @ 12.23 hrs, Volume= 0.377 af
 Routed to Pond 1.040 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 111.83' @ 12.23 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Device 2	111.60'	24.0" W x 48.0" H 1° Double Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	109.30'	18.0" Round 18" ADS L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 109.30' / 109.10' S= 0.0200 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=3.46 cfs @ 12.23 hrs HW=111.83' (Free Discharge)

↑**2=18" ADS** (Passes 3.46 cfs of 11.37 cfs potential flow)

↑**1=Double Grate** (Weir Controls 3.46 cfs @ 1.44 fps)

Summary for Pond 1.040:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 1.39" for 2-YEAR event
 Inflow = 3.48 cfs @ 12.23 hrs, Volume= 0.377 af
 Outflow = 3.48 cfs @ 12.23 hrs, Volume= 0.377 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.98 cfs @ 12.23 hrs, Volume= 0.278 af
 Routed to Pond 1.050 : HYD
 Secondary = 2.49 cfs @ 12.23 hrs, Volume= 0.099 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 109.58' @ 12.23 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	6.0" Round 6" PVC L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 108.25' / 107.49' S= 0.0200 '/ Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	108.85'	18.0" Round 18" ADS L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 108.85' / 100.00' S= 0.0354 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.98 cfs @ 12.23 hrs HW=109.58' (Free Discharge)

↑**1=6" PVC** (Inlet Controls 0.98 cfs @ 5.01 fps)

Secondary OutFlow Max=2.49 cfs @ 12.23 hrs HW=109.58' (Free Discharge)

↑**2=18" ADS** (Inlet Controls 2.49 cfs @ 2.91 fps)

Summary for Pond 1.050: HYD

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 1.03" for 2-YEAR event
 Inflow = 0.98 cfs @ 12.23 hrs, Volume= 0.278 af
 Outflow = 0.98 cfs @ 12.23 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.98 cfs @ 12.23 hrs, Volume= 0.278 af
 Routed to Pond 1.060 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 107.92' @ 12.23 hrs
 Flood Elev= 113.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.24'	8.0" Round 8" PVC L= 258.0' Ke= 0.500 Inlet / Outlet Invert= 107.24' / 102.46' S= 0.0185 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.98 cfs @ 12.23 hrs HW=107.91' (Free Discharge)

↑**1=8" PVC** (Inlet Controls 0.98 cfs @ 2.81 fps)

Summary for Pond 1.060:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 1.03" for 2-YEAR event
 Inflow = 0.98 cfs @ 12.23 hrs, Volume= 0.278 af
 Outflow = 0.98 cfs @ 12.23 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.98 cfs @ 12.23 hrs, Volume= 0.278 af
 Routed to Pond SF-1 : Sand Filter

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Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.89' @ 12.23 hrs
 Flood Elev= 105.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.21'	8.0" Round 8" PVC L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 102.21' / 102.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.98 cfs @ 12.23 hrs HW=102.89' (Free Discharge)
 ↑1=8" PVC (Inlet Controls 0.98 cfs @ 2.82 fps)

Summary for Pond D-1: Detention Basin

Inflow Area = 1.674 ac, 9.66% Impervious, Inflow Depth = 3.44" for 2-YEAR event
 Inflow = 5.87 cfs @ 12.21 hrs, Volume= 0.479 af
 Outflow = 3.23 cfs @ 12.49 hrs, Volume= 0.479 af, Atten= 45%, Lag= 17.2 min
 Primary = 3.23 cfs @ 12.49 hrs, Volume= 0.479 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 98.68' @ 12.49 hrs Surf.Area= 4,756 sf Storage= 4,957 cf
 Flood Elev= 101.00' Surf.Area= 7,045 sf Storage= 18,615 cf

Plug-Flow detention time= 33.8 min calculated for 0.479 af (100% of inflow)
 Center-of-Mass det. time= 33.9 min (863.1 - 829.2)

Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	18,615 cf	Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	3,693	0	0
98.00	4,092	1,946	1,946
99.00	5,068	4,580	6,526
100.00	6,032	5,550	12,076
101.00	7,045	6,539	18,615

Device	Routing	Invert	Outlet Devices
#1	Device 2	97.50'	6.0" Vert. (3) 6" Underdrains X 3.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	97.25'	12.0" Round 12" ADS L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 97.25' / 97.00' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Primary	98.50'	2.0' long x 3.00' rise Concrete Weir 2 End Contraction(s)

Primary OutFlow Max=3.23 cfs @ 12.49 hrs HW=98.68' (Free Discharge)
 ↑2=12" ADS (Passes 2.74 cfs of 3.16 cfs potential flow)
 ↑1=(3) 6" Underdrains (Orifice Controls 2.74 cfs @ 4.64 fps)
 ↑3=Concrete Weir (Weir Controls 0.49 cfs @ 1.39 fps)

Summary for Pond D-2: Depression w/pipe

Inflow Area = 2.922 ac, 7.81% Impervious, Inflow Depth = 1.22" for 2-YEAR event
 Inflow = 3.04 cfs @ 12.22 hrs, Volume= 0.298 af
 Outflow = 3.02 cfs @ 12.24 hrs, Volume= 0.298 af, Atten= 1%, Lag= 1.1 min
 Primary = 3.02 cfs @ 12.24 hrs, Volume= 0.298 af
 Routed to Pond 1.020 :
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link PR :

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

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Peak Elev= 116.32' @ 12.24 hrs Surf.Area= 450 sf Storage= 118 cf
 Flood Elev= 118.00' Surf.Area= 1,700 sf Storage= 1,777 cf

Plug-Flow detention time= 0.2 min calculated for 0.298 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (862.4 - 862.2)

Volume	Invert	Avail.Storage	Storage Description
#1	116.00'	1,777 cf	Grassed Depression (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.00	300	0	0
117.00	777	539	539
118.00	1,700	1,239	1,777

Device	Routing	Invert	Outlet Devices
#1	Primary	115.50'	18.0" Round 18" ADS L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 115.50' / 112.65' S= 0.0950 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	117.50'	127.0 deg x 10.0' long x 0.50' rise Grassed overflow Cv= 2.48 (C= 3.10)

Primary OutFlow Max=3.02 cfs @ 12.24 hrs HW=116.32' (Free Discharge)
 ↑1=18" ADS (Inlet Controls 3.02 cfs @ 3.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=116.00' (Free Discharge)
 ↑2=Grassed overflow (Controls 0.00 cfs)

Summary for Pond I-1: Infiltration Basin

Inflow Area = 4.089 ac, 18.01% Impervious, Inflow Depth = 0.52" for 2-YEAR event
 Inflow = 0.17 cfs @ 12.08 hrs, Volume= 0.176 af
 Outflow = 0.17 cfs @ 12.11 hrs, Volume= 0.168 af, Atten= 2%, Lag= 1.6 min
 Discarded = 0.00 cfs @ 12.11 hrs, Volume= 0.000 af
 Primary = 0.17 cfs @ 12.11 hrs, Volume= 0.167 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 99.53' @ 12.11 hrs Surf.Area= 761 sf Storage= 374 cf
 Flood Elev= 100.00' Surf.Area= 860 sf Storage= 755 cf

Plug-Flow detention time= 76.4 min calculated for 0.168 af (95% of inflow)
 Center-of-Mass det. time= 37.2 min (1,313.1 - 1,275.9)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	755 cf	Infiltration Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	650	0	0
100.00	860	755	755

Device	Routing	Invert	Outlet Devices
#1	Discarded	99.00'	0.001 in/hr Exfiltration over Surface area
#2	Primary	99.50'	90.0 deg x 10.0' long x 0.50' rise Overflow weir Cv= 2.50 (C= 3.13)

Discarded OutFlow Max=0.00 cfs @ 12.11 hrs HW=99.53' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.17 cfs @ 12.11 hrs HW=99.53' (Free Discharge)
 ↑2=Overflow weir (Weir Controls 0.17 cfs @ 0.54 fps)

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Type III 24-hr 2-YEAR Rainfall=3.30"

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Summary for Pond SF-1: Sand Filter

Inflow Area = 4.051 ac, 17.81% Impervious, Inflow Depth = 1.10" for 2-YEAR event
 Inflow = 2.24 cfs @ 12.10 hrs, Volume= 0.373 af
 Outflow = 1.67 cfs @ 12.25 hrs, Volume= 0.371 af, Atten= 25%, Lag= 9.3 min
 Primary = 0.10 cfs @ 12.25 hrs, Volume= 0.170 af
 Routed to Pond I-1 : Infiltration Basin
 Secondary = 1.58 cfs @ 12.25 hrs, Volume= 0.201 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.31' @ 12.25 hrs Surf.Area= 4,586 sf Storage= 3,169 cf
 Flood Elev= 103.00' Surf.Area= 5,126 sf Storage= 5,240 cf

Plug-Flow detention time= 185.1 min calculated for 0.371 af (100% of inflow)
 Center-of-Mass det. time= 183.1 min (1,052.8 - 869.7)

Volume	Invert	Avail.Storage	Storage Description
#1	101.50'	4,002 cf	Sand filter Basin (Prismatic) Listed below (Recalc)
#2	99.50'	1,238 cf	12" Sand Media/4" Loam/8" Stone (Prismatic) Listed below (Recalc)
			3,750 cf Overall x 33.0% Voids
			5,240 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.50	2,085	0	0
103.00	3,251	4,002	4,002

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.50	1,875	0	0
101.50	1,875	3,750	3,750

Device	Routing	Invert	Outlet Devices
#1	Primary	99.50'	6.0" Round 6" PVC L= 112.0' Ke= 0.500 Inlet / Outlet Invert= 99.50' / 99.00' S= 0.0045 ' /' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Device 1	99.60'	1.5" Vert. 1.5" Orifice Plate C= 0.600 Limited to weir flow at low heads
#3	Device 2	99.50'	8.270 in/hr Filtration through sand to outlet over Surface area
#4	Secondary	102.17'	90.0 deg x 10.0' long x 0.83' rise Overflow weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=0.10 cfs @ 12.25 hrs HW=102.31' (Free Discharge)
 ↑1=6" PVC (Passes 0.10 cfs of 1.02 cfs potential flow)
 ↑2=1.5" Orifice Plate (Orifice Controls 0.10 cfs @ 7.83 fps)
 ↑3= Filtration through sand to outlet (Passes 0.10 cfs of 0.88 cfs potential flow)

Secondary OutFlow Max=1.57 cfs @ 12.25 hrs HW=102.31' (Free Discharge)
 ↑4= Overflow weir (Weir Controls 1.57 cfs @ 1.15 fps)

Summary for Link D-PR: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 1.65" for 2-YEAR event
 Inflow = 1.14 cfs @ 12.14 hrs, Volume= 0.103 af
 Primary = 1.14 cfs @ 12.14 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

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

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Type III 24-hr 2-YEAR Rainfall=3.30"

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Summary for Link PR:

Inflow Area = 11.830 ac, 9.34% Impervious, Inflow Depth = 1.24" for 2-YEAR event
Inflow = 8.04 cfs @ 12.22 hrs, Volume= 1.221 af
Primary = 8.04 cfs @ 12.22 hrs, Volume= 1.221 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R3:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 1.48" for 2-YEAR event
Inflow = 0.97 cfs @ 12.16 hrs, Volume= 0.083 af
Primary = 0.97 cfs @ 12.16 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.020 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link R4:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 3.07" for 2-YEAR event
Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af
Primary = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.010 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

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

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Summary for Subcatchment 201:

Runoff = 10.29 cfs @ 12.18 hrs, Volume= 0.916 af, Depth= 2.37"
Routed to Link PR :

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

Area (sf)	CN	Description
28,634	72	Woods/grass comb., Good, HSG C
* 9,000	98	Rooftops
* 4,610	85	Pervious Driveways
160,026	74	>75% Grass cover, Good, HSG C
202,270	75	Weighted Average
193,270	74	95.55% Pervious Area
9,000	98	4.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0500	0.25		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
6.1	980	0.0280	2.69		Shallow Concentrated Flow, Lawns and woods Unpaved Kv= 16.1 fps
12.8	1,080	Total			

Summary for Subcatchment 202:

Runoff = 2.56 cfs @ 12.09 hrs, Volume= 0.182 af, Depth= 2.72"
Routed to Pond SF-1 : Sand Filter

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

Area (sf)	CN	Description
1,467	72	Woods/grass comb., Good, HSG C
* 6,000	98	Rooftops
25,475	74	>75% Grass cover, Good, HSG C
* 2,085	98	Sand Filter
35,027	79	Weighted Average
26,942	74	76.92% Pervious Area
8,085	98	23.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0900	0.32		Sheet Flow, Lawns/Trees Grass: Short n= 0.150 P2= 3.30"
0.7	145	0.0413	3.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
6.0	245	Total			

Summary for Subcatchment 203:

Runoff = 2.57 cfs @ 12.25 hrs, Volume= 0.261 af, Depth= 2.20"
Routed to Link PR :

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

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

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Area (sf)	CN	Description
42,051	72	Woods/grass comb., Good, HSG C
19,959	74	>75% Grass cover, Good, HSG C
62,010	73	Weighted Average
62,010	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0450	0.11		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.30"
2.5	438	0.0340	2.97		Shallow Concentrated Flow, Woods and grass
					Unpaved Kv= 16.1 fps
17.8	538	Total			

Summary for Subcatchment 204:

Runoff = 4.32 cfs @ 12.14 hrs, Volume= 0.354 af, Depth= 2.54"
Routed to Pond D-1 : Detention Basin

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

Area (sf)	CN	Description
* 7,045	98	Detention Basin
57,639	74	>75% Grass cover, Good, HSG C
5,270	72	Woods/grass comb., Good, HSG C
* 2,959	85	Pervious Driveways
72,913	77	Weighted Average
65,868	74	90.34% Pervious Area
7,045	98	9.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0400	0.23		Sheet Flow, Woods/grasses
					Grass: Short n= 0.150 P2= 3.30"
2.9	488	0.0310	2.83		Shallow Concentrated Flow, Grasses
					Unpaved Kv= 16.1 fps
10.2	588	Total			

Summary for Subcatchment 205:

Runoff = 0.14 cfs @ 12.07 hrs, Volume= 0.010 af, Depth= 3.08"
Routed to Pond I-1 : Infiltration Basin

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

Area (sf)	CN	Description
* 650	98	Infiltration Basin (98% Capture)
1,000	74	>75% Grass cover, Good, HSG C
1,650	83	Weighted Average
1,000	74	60.61% Pervious Area
650	98	39.39% Impervious Area

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

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

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Summary for Subcatchment CB1-PR: Area to CB1

Runoff = 1.85 cfs @ 12.16 hrs, Volume= 0.157 af, Depth= 2.81"
Routed to Link R3 :

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

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

Summary for Subcatchment CB2-PR:

Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af, Depth= 4.66"
Routed to Link R4 :

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

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Subcatchment P1:

Runoff = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af, Depth= 4.66"
Routed to Pond 1.010 :

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

Area (sf)	CN	Description
* 2,379	98	Pavement
2,379	98	100.00% Impervious Area

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

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

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Summary for Subcatchment P2:

Runoff = 0.35 cfs @ 12.07 hrs, Volume= 0.025 af, Depth= 4.10"
Routed to Pond 1.020 :

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

	Area (sf)	CN	Description
*	2,469	98	Pavement
*	230	85	Pervious Driveway
	512	74	>75% Grass cover, Good, HSG C
	3,211	93	Weighted Average
	742	77	23.11% Pervious Area
	2,469	98	76.89% Impervious Area

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

Summary for Subcatchment P3:

Runoff = 6.32 cfs @ 12.21 hrs, Volume= 0.597 af, Depth= 2.45"
Routed to Pond D-2 : Depression w/pipe

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

	Area (sf)	CN	Description
*	6,713	98	off-site buildings
*	3,228	98	off-site pavement
	3,510	72	Woods/grass comb., Good, HSG C
	112,794	74	>75% Grass cover, Good, HSG C
*	1,050	85	Pervious Driveway
	127,295	76	Weighted Average
	117,354	74	92.19% Pervious Area
	9,941	98	7.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.5	745	0.0198	2.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
15.1	845	Total			

Summary for Subcatchment P4:

Runoff = 0.97 cfs @ 12.07 hrs, Volume= 0.076 af, Depth= 4.66"
Routed to Pond 1.030 :

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

	Area (sf)	CN	Description
*	8,545	98	Pavement
	8,545	98	100.00% Impervious Area

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

Summary for Pond 1.010:

Inflow Area = 0.055 ac, 100.00% Impervious, Inflow Depth = 4.66" for 10-YEAR event
 Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af
 Outflow = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.27 cfs @ 12.07 hrs, Volume= 0.021 af
 Routed to Pond 1.020 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 113.62' @ 12.07 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	113.35'	12.0" Round 12" ADS L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 113.35' / 113.15' S= 0.0100 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.07 hrs HW=113.62' (Free Discharge)
 ↑ **1=12" ADS** (Barrel Controls 0.27 cfs @ 2.43 fps)

Summary for Pond 1.020:

Inflow Area = 3.051 ac, 11.13% Impervious, Inflow Depth = 2.53" for 10-YEAR event
 Inflow = 6.48 cfs @ 12.23 hrs, Volume= 0.644 af
 Outflow = 6.48 cfs @ 12.23 hrs, Volume= 0.644 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.48 cfs @ 12.23 hrs, Volume= 0.644 af
 Routed to Pond 1.030 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 113.73' @ 12.23 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.40'	18.0" Round 18" ADS L= 158.0' Ke= 0.500 Inlet / Outlet Invert= 112.40' / 109.55' S= 0.0180 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=6.48 cfs @ 12.23 hrs HW=113.73' (Free Discharge)
 ↑ **1=18" ADS** (Inlet Controls 6.48 cfs @ 3.92 fps)

Summary for Pond 1.030:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 2.66" for 10-YEAR event
 Inflow = 6.90 cfs @ 12.23 hrs, Volume= 0.720 af
 Outflow = 6.90 cfs @ 12.23 hrs, Volume= 0.720 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.90 cfs @ 12.23 hrs, Volume= 0.720 af
 Routed to Pond 1.040 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 111.95' @ 12.23 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Device 2	111.60'	24.0" W x 48.0" H 1° Double Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	109.30'	18.0" Round 18" ADS L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 109.30' / 109.10' S= 0.0200 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=6.89 cfs @ 12.23 hrs HW=111.95' (Free Discharge)
 ↑ **2=18" ADS** (Passes 6.89 cfs of 11.73 cfs potential flow)
 ↑ **1=Double Grate** (Weir Controls 6.89 cfs @ 1.81 fps)

Summary for Pond 1.040:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 2.66" for 10-YEAR event
 Inflow = 6.90 cfs @ 12.23 hrs, Volume= 0.720 af
 Outflow = 6.90 cfs @ 12.23 hrs, Volume= 0.720 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.18 cfs @ 12.23 hrs, Volume= 0.445 af
 Routed to Pond 1.050 : HYD
 Secondary = 5.72 cfs @ 12.23 hrs, Volume= 0.275 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 110.06' @ 12.23 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	6.0" Round 6" PVC L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 108.25' / 107.49' S= 0.0200 '/ Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	108.85'	18.0" Round 18" ADS L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 108.85' / 100.00' S= 0.0354 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.18 cfs @ 12.23 hrs HW=110.06' (Free Discharge)
 ↑ **1=6" PVC** (Inlet Controls 1.18 cfs @ 6.01 fps)

Secondary OutFlow Max=5.72 cfs @ 12.23 hrs HW=110.06' (Free Discharge)
 ↑ **2=18" ADS** (Inlet Controls 5.72 cfs @ 3.75 fps)

Summary for Pond 1.050: HYD

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 1.64" for 10-YEAR event
 Inflow = 1.18 cfs @ 12.23 hrs, Volume= 0.445 af
 Outflow = 1.18 cfs @ 12.23 hrs, Volume= 0.445 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.18 cfs @ 12.23 hrs, Volume= 0.445 af
 Routed to Pond 1.060 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 108.07' @ 12.23 hrs
 Flood Elev= 113.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.24'	8.0" Round 8" PVC L= 258.0' Ke= 0.500 Inlet / Outlet Invert= 107.24' / 102.46' S= 0.0185 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.18 cfs @ 12.23 hrs HW=108.07' (Free Discharge)
 ↑ **1=8" PVC** (Inlet Controls 1.18 cfs @ 3.38 fps)

Summary for Pond 1.060:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 1.64" for 10-YEAR event
 Inflow = 1.18 cfs @ 12.23 hrs, Volume= 0.445 af
 Outflow = 1.18 cfs @ 12.23 hrs, Volume= 0.445 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.18 cfs @ 12.23 hrs, Volume= 0.445 af
 Routed to Pond SF-1 : Sand Filter

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Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 103.04' @ 12.23 hrs
 Flood Elev= 105.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.21'	8.0" Round 8" PVC L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 102.21' / 102.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.18 cfs @ 12.23 hrs HW=103.04' (Free Discharge)
 ↑1=8" PVC (Inlet Controls 1.18 cfs @ 3.38 fps)

Summary for Pond D-1: Detention Basin

Inflow Area = 1.674 ac, 9.66% Impervious, Inflow Depth = 7.69" for 10-YEAR event
 Inflow = 12.74 cfs @ 12.16 hrs, Volume= 1.073 af
 Outflow = 9.37 cfs @ 12.34 hrs, Volume= 1.073 af, Atten= 26%, Lag= 10.7 min
 Primary = 9.37 cfs @ 12.34 hrs, Volume= 1.073 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 99.47' @ 12.34 hrs Surf.Area= 5,521 sf Storage= 9,017 cf
 Flood Elev= 101.00' Surf.Area= 7,045 sf Storage= 18,615 cf

Plug-Flow detention time= 26.1 min calculated for 1.073 af (100% of inflow)
 Center-of-Mass det. time= 26.2 min (851.7 - 825.5)

Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	18,615 cf	Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	3,693	0	0
98.00	4,092	1,946	1,946
99.00	5,068	4,580	6,526
100.00	6,032	5,550	12,076
101.00	7,045	6,539	18,615

Device	Routing	Invert	Outlet Devices
#1	Device 2	97.50'	6.0" Vert. (3) 6" Underdrains X 3.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	97.25'	12.0" Round 12" ADS L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 97.25' / 97.00' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Primary	98.50'	2.0' long x 3.00' rise Concrete Weir 2 End Contraction(s)

Primary OutFlow Max=9.36 cfs @ 12.34 hrs HW=99.47' (Free Discharge)
 ↑2=12" ADS (Passes 3.72 cfs of 4.65 cfs potential flow)
 ↑1=(3) 6" Underdrains (Orifice Controls 3.72 cfs @ 6.32 fps)
 ↑3=Concrete Weir (Weir Controls 5.64 cfs @ 3.22 fps)

Summary for Pond D-2: Depression w/pipe

Inflow Area = 2.922 ac, 7.81% Impervious, Inflow Depth = 2.45" for 10-YEAR event
 Inflow = 6.32 cfs @ 12.21 hrs, Volume= 0.597 af
 Outflow = 6.21 cfs @ 12.24 hrs, Volume= 0.597 af, Atten= 2%, Lag= 1.8 min
 Primary = 6.21 cfs @ 12.24 hrs, Volume= 0.597 af
 Routed to Pond 1.020 :
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link PR :

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

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Peak Elev= 116.78' @ 12.24 hrs Surf.Area= 674 sf Storage= 382 cf
 Flood Elev= 118.00' Surf.Area= 1,700 sf Storage= 1,777 cf

Plug-Flow detention time= 0.4 min calculated for 0.597 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (842.1 - 841.7)

Volume	Invert	Avail.Storage	Storage Description
#1	116.00'	1,777 cf	Grassed Depression (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.00	300	0	0
117.00	777	539	539
118.00	1,700	1,239	1,777

Device	Routing	Invert	Outlet Devices
#1	Primary	115.50'	18.0" Round 18" ADS L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 115.50' / 112.65' S= 0.0950 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	117.50'	127.0 deg x 10.0' long x 0.50' rise Grassed overflow Cv= 2.48 (C= 3.10)

Primary OutFlow Max=6.21 cfs @ 12.24 hrs HW=116.78' (Free Discharge)
 ↑1=18" ADS (Inlet Controls 6.21 cfs @ 3.86 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=116.00' (Free Discharge)
 ↑2=Grassed overflow (Controls 0.00 cfs)

Summary for Pond I-1: Infiltration Basin

Inflow Area = 4.089 ac, 18.01% Impervious, Inflow Depth = 0.56" for 10-YEAR event
 Inflow = 0.24 cfs @ 12.07 hrs, Volume= 0.192 af
 Outflow = 0.23 cfs @ 12.10 hrs, Volume= 0.184 af, Atten= 3%, Lag= 1.4 min
 Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0.000 af
 Primary = 0.23 cfs @ 12.10 hrs, Volume= 0.184 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 99.54' @ 12.10 hrs Surf.Area= 763 sf Storage= 380 cf
 Flood Elev= 100.00' Surf.Area= 860 sf Storage= 755 cf

Plug-Flow detention time= 74.8 min calculated for 0.184 af (96% of inflow)
 Center-of-Mass det. time= 36.5 min (1,266.0 - 1,229.5)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	755 cf	Infiltration Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	650	0	0
100.00	860	755	755

Device	Routing	Invert	Outlet Devices
#1	Discarded	99.00'	0.001 in/hr Exfiltration over Surface area
#2	Primary	99.50'	90.0 deg x 10.0' long x 0.50' rise Overflow weir Cv= 2.50 (C= 3.13)

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=99.54' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.23 cfs @ 12.10 hrs HW=99.54' (Free Discharge)
 ↑2=Overflow weir (Weir Controls 0.23 cfs @ 0.61 fps)

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Summary for Pond SF-1: Sand Filter

Inflow Area = 4.051 ac, 17.81% Impervious, Inflow Depth = 1.86" for 10-YEAR event
 Inflow = 3.66 cfs @ 12.09 hrs, Volume= 0.627 af
 Outflow = 3.48 cfs @ 12.12 hrs, Volume= 0.625 af, Atten= 5%, Lag= 2.0 min
 Primary = 0.10 cfs @ 12.12 hrs, Volume= 0.182 af
 Routed to Pond I-1 : Infiltration Basin
 Secondary = 3.38 cfs @ 12.12 hrs, Volume= 0.443 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.39' @ 12.12 hrs Surf.Area= 4,655 sf Storage= 3,412 cf
 Flood Elev= 103.00' Surf.Area= 5,126 sf Storage= 5,240 cf

Plug-Flow detention time= 118.4 min calculated for 0.625 af (100% of inflow)
 Center-of-Mass det. time= 117.3 min (981.9 - 864.6)

Volume	Invert	Avail.Storage	Storage Description
#1	101.50'	4,002 cf	Sand filter Basin (Prismatic) Listed below (Recalc)
#2	99.50'	1,238 cf	12" Sand Media/4" Loam/8" Stone (Prismatic) Listed below (Recalc)
			3,750 cf Overall x 33.0% Voids
			5,240 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.50	2,085	0	0
103.00	3,251	4,002	4,002

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.50	1,875	0	0
101.50	1,875	3,750	3,750

Device	Routing	Invert	Outlet Devices
#1	Primary	99.50'	6.0" Round 6" PVC L= 112.0' Ke= 0.500 Inlet / Outlet Invert= 99.50' / 99.00' S= 0.0045 ' /' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Device 1	99.60'	1.5" Vert. 1.5" Orifice Plate C= 0.600 Limited to weir flow at low heads
#3	Device 2	99.50'	8.270 in/hr Filtration through sand to outlet over Surface area
#4	Secondary	102.17'	90.0 deg x 10.0' long x 0.83' rise Overflow weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=0.10 cfs @ 12.12 hrs HW=102.39' (Free Discharge)
 ↑1=6" PVC (Passes 0.10 cfs of 1.03 cfs potential flow)
 ↑2=1.5" Orifice Plate (Orifice Controls 0.10 cfs @ 7.96 fps)
 ↑3= Filtration through sand to outlet (Passes 0.10 cfs of 0.89 cfs potential flow)

Secondary OutFlow Max=3.37 cfs @ 12.12 hrs HW=102.39' (Free Discharge)
 ↑4= Overflow weir (Weir Controls 3.37 cfs @ 1.47 fps)

Summary for Link D-PR: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 3.01" for 10-YEAR event
 Inflow = 2.12 cfs @ 12.14 hrs, Volume= 0.188 af
 Primary = 2.12 cfs @ 12.14 hrs, Volume= 0.188 af, Atten= 0%, Lag= 0.0 min

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

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Summary for Link PR:

Inflow Area = 11.830 ac, 9.34% Impervious, Inflow Depth = 2.47" for 10-YEAR event
Inflow = 20.66 cfs @ 12.23 hrs, Volume= 2.434 af
Primary = 20.66 cfs @ 12.23 hrs, Volume= 2.434 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R3:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 2.81" for 10-YEAR event
Inflow = 1.85 cfs @ 12.16 hrs, Volume= 0.157 af
Primary = 1.85 cfs @ 12.16 hrs, Volume= 0.157 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.020 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link R4:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 4.66" for 10-YEAR event
Inflow = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af
Primary = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.010 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

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Serenity Drive: Proposed Conditions
Type III 24-hr 25-YEAR Rainfall=6.10"

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Summary for Subcatchment 201:

Runoff = 14.71 cfs @ 12.18 hrs, Volume= 1.303 af, Depth= 3.37"
Routed to Link PR :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
28,634	72	Woods/grass comb., Good, HSG C
* 9,000	98	Rooftops
* 4,610	85	Pervious Driveways
160,026	74	>75% Grass cover, Good, HSG C
202,270	75	Weighted Average
193,270	74	95.55% Pervious Area
9,000	98	4.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0500	0.25		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
6.1	980	0.0280	2.69		Shallow Concentrated Flow, Lawns and woods Unpaved Kv= 16.1 fps
12.8	1,080	Total			

Summary for Subcatchment 202:

Runoff = 3.54 cfs @ 12.09 hrs, Volume= 0.253 af, Depth= 3.77"
Routed to Pond SF-1 : Sand Filter

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
1,467	72	Woods/grass comb., Good, HSG C
* 6,000	98	Rooftops
25,475	74	>75% Grass cover, Good, HSG C
* 2,085	98	Sand Filter
35,027	79	Weighted Average
26,942	74	76.92% Pervious Area
8,085	98	23.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0900	0.32		Sheet Flow, Lawns/Trees Grass: Short n= 0.150 P2= 3.30"
0.7	145	0.0413	3.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
6.0	245	Total			

Summary for Subcatchment 203:

Runoff = 3.74 cfs @ 12.24 hrs, Volume= 0.376 af, Depth= 3.17"
Routed to Link PR :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

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Area (sf)	CN	Description
42,051	72	Woods/grass comb., Good, HSG C
19,959	74	>75% Grass cover, Good, HSG C
62,010	73	Weighted Average
62,010	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0450	0.11		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.30"
2.5	438	0.0340	2.97		Shallow Concentrated Flow, Woods and grass
					Unpaved Kv= 16.1 fps
17.8	538	Total			

Summary for Subcatchment 204:

Runoff = 6.08 cfs @ 12.14 hrs, Volume= 0.497 af, Depth= 3.57"
 Routed to Pond D-1 : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 7,045	98	Detention Basin
57,639	74	>75% Grass cover, Good, HSG C
5,270	72	Woods/grass comb., Good, HSG C
* 2,959	85	Pervious Driveways
72,913	77	Weighted Average
65,868	74	90.34% Pervious Area
7,045	98	9.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0400	0.23		Sheet Flow, Woods/grasses
					Grass: Short n= 0.150 P2= 3.30"
2.9	488	0.0310	2.83		Shallow Concentrated Flow, Grasses
					Unpaved Kv= 16.1 fps
10.2	588	Total			

Summary for Subcatchment 205:

Runoff = 0.19 cfs @ 12.07 hrs, Volume= 0.013 af, Depth= 4.18"
 Routed to Pond I-1 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 650	98	Infiltration Basin (98% Capture)
1,000	74	>75% Grass cover, Good, HSG C
1,650	83	Weighted Average
1,000	74	60.61% Pervious Area
650	98	39.39% Impervious Area

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

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Summary for Subcatchment CB1-PR: Area to CB1

Runoff = 2.55 cfs @ 12.16 hrs, Volume= 0.217 af, Depth= 3.87"
 Routed to Link R3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

Summary for Subcatchment CB2-PR:

Runoff = 0.50 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 5.86"
 Routed to Link R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Subcatchment P1:

Runoff = 0.34 cfs @ 12.07 hrs, Volume= 0.027 af, Depth= 5.86"
 Routed to Pond 1.010 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 2,379	98	Pavement
2,379	98	100.00% Impervious Area

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

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Summary for Subcatchment P2:

Runoff = 0.44 cfs @ 12.07 hrs, Volume= 0.032 af, Depth= 5.28"
Routed to Pond 1.020 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

	Area (sf)	CN	Description
*	2,469	98	Pavement
*	230	85	Pervious Driveway
	512	74	>75% Grass cover, Good, HSG C
	3,211	93	Weighted Average
	742	77	23.11% Pervious Area
	2,469	98	76.89% Impervious Area

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

Summary for Subcatchment P3:

Runoff = 8.97 cfs @ 12.20 hrs, Volume= 0.844 af, Depth= 3.47"
Routed to Pond D-2 : Depression w/pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

	Area (sf)	CN	Description
*	6,713	98	off-site buildings
*	3,228	98	off-site pavement
	3,510	72	Woods/grass comb., Good, HSG C
	112,794	74	>75% Grass cover, Good, HSG C
*	1,050	85	Pervious Driveway
	127,295	76	Weighted Average
	117,354	74	92.19% Pervious Area
	9,941	98	7.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.5	745	0.0198	2.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
15.1	845	Total			

Summary for Subcatchment P4:

Runoff = 1.21 cfs @ 12.07 hrs, Volume= 0.096 af, Depth= 5.86"
Routed to Pond 1.030 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

	Area (sf)	CN	Description
*	8,545	98	Pavement
	8,545	98	100.00% Impervious Area

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

Summary for Pond 1.010:

Inflow Area = 0.055 ac, 100.00% Impervious, Inflow Depth = 5.86" for 25-YEAR event
 Inflow = 0.34 cfs @ 12.07 hrs, Volume= 0.027 af
 Outflow = 0.34 cfs @ 12.07 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.34 cfs @ 12.07 hrs, Volume= 0.027 af
 Routed to Pond 1.020 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 113.65' @ 12.07 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	113.35'	12.0" Round 12" ADS L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 113.35' / 113.15' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.34 cfs @ 12.07 hrs HW=113.65' (Free Discharge)
 ↑ **1=12" ADS** (Barrel Controls 0.34 cfs @ 2.55 fps)

Summary for Pond 1.020:

Inflow Area = 3.051 ac, 11.13% Impervious, Inflow Depth = 3.57" for 25-YEAR event
 Inflow = 8.96 cfs @ 12.22 hrs, Volume= 0.908 af
 Outflow = 8.96 cfs @ 12.22 hrs, Volume= 0.908 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.96 cfs @ 12.22 hrs, Volume= 0.908 af
 Routed to Pond 1.030 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 114.26' @ 12.22 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.40'	18.0" Round 18" ADS L= 158.0' Ke= 0.500 Inlet / Outlet Invert= 112.40' / 109.55' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.96 cfs @ 12.22 hrs HW=114.26' (Free Discharge)
 ↑ **1=18" ADS** (Inlet Controls 8.96 cfs @ 5.07 fps)

Summary for Pond 1.030:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 3.71" for 25-YEAR event
 Inflow = 9.51 cfs @ 12.21 hrs, Volume= 1.004 af
 Outflow = 9.51 cfs @ 12.21 hrs, Volume= 1.004 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.51 cfs @ 12.21 hrs, Volume= 1.004 af
 Routed to Pond 1.040 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 112.03' @ 12.21 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Device 2	111.60'	24.0" W x 48.0" H 1° Double Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	109.30'	18.0" Round 18" ADS L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 109.30' / 109.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=9.49 cfs @ 12.21 hrs HW=112.03' (Free Discharge)
 ↑**2=18" ADS** (Passes 9.49 cfs of 11.97 cfs potential flow)
 ↑**1=Double Grate** (Weir Controls 9.49 cfs @ 2.01 fps)

Summary for Pond 1.040:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 3.71" for 25-YEAR event
 Inflow = 9.51 cfs @ 12.21 hrs, Volume= 1.004 af
 Outflow = 9.51 cfs @ 12.21 hrs, Volume= 1.004 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.34 cfs @ 12.21 hrs, Volume= 0.557 af
 Routed to Pond 1.050 : HYD
 Secondary = 8.17 cfs @ 12.21 hrs, Volume= 0.447 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 110.52' @ 12.21 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	6.0" Round 6" PVC L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 108.25' / 107.49' S= 0.0200 '/ Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	108.85'	18.0" Round 18" ADS L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 108.85' / 100.00' S= 0.0354 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.34 cfs @ 12.21 hrs HW=110.52' (Free Discharge)
 ↑**1=6" PVC** (Inlet Controls 1.34 cfs @ 6.85 fps)

Secondary OutFlow Max=8.17 cfs @ 12.21 hrs HW=110.52' (Free Discharge)
 ↑**2=18" ADS** (Inlet Controls 8.17 cfs @ 4.62 fps)

Summary for Pond 1.050: HYD

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 2.06" for 25-YEAR event
 Inflow = 1.34 cfs @ 12.21 hrs, Volume= 0.557 af
 Outflow = 1.34 cfs @ 12.21 hrs, Volume= 0.557 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.34 cfs @ 12.21 hrs, Volume= 0.557 af
 Routed to Pond 1.060 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 108.21' @ 12.21 hrs
 Flood Elev= 113.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.24'	8.0" Round 8" PVC L= 258.0' Ke= 0.500 Inlet / Outlet Invert= 107.24' / 102.46' S= 0.0185 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.34 cfs @ 12.21 hrs HW=108.21' (Free Discharge)
 ↑**1=8" PVC** (Inlet Controls 1.34 cfs @ 3.85 fps)

Summary for Pond 1.060:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 2.06" for 25-YEAR event
 Inflow = 1.34 cfs @ 12.21 hrs, Volume= 0.557 af
 Outflow = 1.34 cfs @ 12.21 hrs, Volume= 0.557 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.34 cfs @ 12.21 hrs, Volume= 0.557 af
 Routed to Pond SF-1 : Sand Filter

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Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 103.18' @ 12.21 hrs
 Flood Elev= 105.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.21'	8.0" Round 8" PVC L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 102.21' / 102.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.34 cfs @ 12.21 hrs HW=103.18' (Free Discharge)
 ↑ **1=8" PVC** (Inlet Controls 1.34 cfs @ 3.85 fps)

Summary for Pond D-1: Detention Basin

Inflow Area = 1.674 ac, 9.66% Impervious, Inflow Depth = 11.21" for 25-YEAR event
 Inflow = 18.09 cfs @ 12.15 hrs, Volume= 1.563 af
 Outflow = 13.79 cfs @ 12.32 hrs, Volume= 1.563 af, Atten= 24%, Lag= 10.3 min
 Primary = 13.79 cfs @ 12.32 hrs, Volume= 1.563 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 99.93' @ 12.32 hrs Surf.Area= 5,967 sf Storage= 11,669 cf
 Flood Elev= 101.00' Surf.Area= 7,045 sf Storage= 18,615 cf

Plug-Flow detention time= 23.4 min calculated for 1.563 af (100% of inflow)
 Center-of-Mass det. time= 23.5 min (843.8 - 820.4)

Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	18,615 cf	Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	3,693	0	0
98.00	4,092	1,946	1,946
99.00	5,068	4,580	6,526
100.00	6,032	5,550	12,076
101.00	7,045	6,539	18,615

Device	Routing	Invert	Outlet Devices
#1	Device 2	97.50'	6.0" Vert. (3) 6" Underdrains X 3.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	97.25'	12.0" Round 12" ADS L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 97.25' / 97.00' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Primary	98.50'	2.0' long x 3.00' rise Concrete Weir 2 End Contraction(s)

Primary OutFlow Max=13.79 cfs @ 12.32 hrs HW=99.93' (Free Discharge)
 ↑ **2=12" ADS** (Passes 4.19 cfs of 5.33 cfs potential flow)
 ↑ **1=(3) 6" Underdrains** (Orifice Controls 4.19 cfs @ 7.11 fps)
 ↑ **3=Concrete Weir** (Weir Controls 9.60 cfs @ 3.91 fps)

Summary for Pond D-2: Depression w/pipe

Inflow Area = 2.922 ac, 7.81% Impervious, Inflow Depth = 3.47" for 25-YEAR event
 Inflow = 8.97 cfs @ 12.20 hrs, Volume= 0.844 af
 Outflow = 8.53 cfs @ 12.26 hrs, Volume= 0.844 af, Atten= 5%, Lag= 3.1 min
 Primary = 8.53 cfs @ 12.26 hrs, Volume= 0.844 af
 Routed to Pond 1.020 :
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link PR :

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

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Peak Elev= 117.25' @ 12.26 hrs Surf.Area= 1,012 sf Storage= 766 cf
 Flood Elev= 118.00' Surf.Area= 1,700 sf Storage= 1,777 cf

Plug-Flow detention time= 0.5 min calculated for 0.844 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (832.3 - 831.7)

Volume	Invert	Avail.Storage	Storage Description
#1	116.00'	1,777 cf	Grassed Depression (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.00	300	0	0
117.00	777	539	539
118.00	1,700	1,239	1,777

Device	Routing	Invert	Outlet Devices
#1	Primary	115.50'	18.0" Round 18" ADS L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 115.50' / 112.65' S= 0.0950 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	117.50'	127.0 deg x 10.0' long x 0.50' rise Grassed overflow Cv= 2.48 (C= 3.10)

Primary OutFlow Max=8.52 cfs @ 12.26 hrs HW=117.25' (Free Discharge)
 ↑1=18" ADS (Inlet Controls 8.52 cfs @ 4.82 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=116.00' (Free Discharge)
 ↑2=Grassed overflow (Controls 0.00 cfs)

Summary for Pond I-1: Infiltration Basin

Inflow Area = 4.089 ac, 18.01% Impervious, Inflow Depth = 0.59" for 25-YEAR event
 Inflow = 0.29 cfs @ 12.07 hrs, Volume= 0.202 af
 Outflow = 0.28 cfs @ 12.09 hrs, Volume= 0.194 af, Atten= 2%, Lag= 1.3 min
 Discarded = 0.00 cfs @ 12.09 hrs, Volume= 0.000 af
 Primary = 0.28 cfs @ 12.09 hrs, Volume= 0.194 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 99.54' @ 12.09 hrs Surf.Area= 764 sf Storage= 384 cf
 Flood Elev= 100.00' Surf.Area= 860 sf Storage= 755 cf

Plug-Flow detention time= 73.2 min calculated for 0.194 af (96% of inflow)
 Center-of-Mass det. time= 35.6 min (1,235.0 - 1,199.4)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	755 cf	Infiltration Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	650	0	0
100.00	860	755	755

Device	Routing	Invert	Outlet Devices
#1	Discarded	99.00'	0.001 in/hr Exfiltration over Surface area
#2	Primary	99.50'	90.0 deg x 10.0' long x 0.50' rise Overflow weir Cv= 2.50 (C= 3.13)

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=99.54' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.28 cfs @ 12.09 hrs HW=99.54' (Free Discharge)
 ↑2=Overflow weir (Weir Controls 0.28 cfs @ 0.65 fps)

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Summary for Pond SF-1: Sand Filter

Inflow Area = 4.051 ac, 17.81% Impervious, Inflow Depth = 2.40" for 25-YEAR event
 Inflow = 4.75 cfs @ 12.09 hrs, Volume= 0.809 af
 Outflow = 4.54 cfs @ 12.12 hrs, Volume= 0.808 af, Atten= 4%, Lag= 1.8 min
 Primary = 0.10 cfs @ 12.12 hrs, Volume= 0.189 af
 Routed to Pond I-1 : Infiltration Basin
 Secondary = 4.44 cfs @ 12.12 hrs, Volume= 0.618 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.44' @ 12.12 hrs Surf.Area= 4,690 sf Storage= 3,537 cf
 Flood Elev= 103.00' Surf.Area= 5,126 sf Storage= 5,240 cf

Plug-Flow detention time= 96.5 min calculated for 0.808 af (100% of inflow)
 Center-of-Mass det. time= 95.6 min (955.2 - 859.6)

Volume	Invert	Avail.Storage	Storage Description
#1	101.50'	4,002 cf	Sand filter Basin (Prismatic) Listed below (Recalc)
#2	99.50'	1,238 cf	12" Sand Media/4" Loam/8" Stone (Prismatic) Listed below (Recalc)
			3,750 cf Overall x 33.0% Voids
			5,240 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.50	2,085	0	0
103.00	3,251	4,002	4,002

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.50	1,875	0	0
101.50	1,875	3,750	3,750

Device	Routing	Invert	Outlet Devices
#1	Primary	99.50'	6.0" Round 6" PVC L= 112.0' Ke= 0.500 Inlet / Outlet Invert= 99.50' / 99.00' S= 0.0045 ' /' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Device 1	99.60'	1.5" Vert. 1.5" Orifice Plate C= 0.600 Limited to weir flow at low heads
#3	Device 2	99.50'	8.270 in/hr Filtration through sand to outlet over Surface area
#4	Secondary	102.17'	90.0 deg x 10.0' long x 0.83' rise Overflow weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=0.10 cfs @ 12.12 hrs HW=102.44' (Free Discharge)
 ↑1=6" PVC (Passes 0.10 cfs of 1.04 cfs potential flow)
 ↑2=1.5" Orifice Plate (Orifice Controls 0.10 cfs @ 8.02 fps)
 ↑3= Filtration through sand to outlet (Passes 0.10 cfs of 0.90 cfs potential flow)

Secondary OutFlow Max=4.44 cfs @ 12.12 hrs HW=102.44' (Free Discharge)
 ↑4= Overflow weir (Weir Controls 4.44 cfs @ 1.61 fps)

Summary for Link D-PR: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 4.01" for 25-YEAR event
 Inflow = 2.51 cfs @ 12.08 hrs, Volume= 0.251 af
 Primary = 2.51 cfs @ 12.08 hrs, Volume= 0.251 af, Atten= 0%, Lag= 0.0 min

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

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Serenity Drive: Proposed Conditions
Type III 24-hr 25-YEAR Rainfall=6.10"

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Summary for Link PR:

Inflow Area = 11.830 ac, 9.34% Impervious, Inflow Depth = 3.49" for 25-YEAR event
Inflow = 30.63 cfs @ 12.22 hrs, Volume= 3.437 af
Primary = 30.63 cfs @ 12.22 hrs, Volume= 3.437 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R3:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 3.87" for 25-YEAR event
Inflow = 2.55 cfs @ 12.16 hrs, Volume= 0.217 af
Primary = 2.00 cfs @ 12.08 hrs, Volume= 0.212 af, Atten= 22%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.55 cfs @ 12.16 hrs, Volume= 0.005 af
Routed to Pond 1.020 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link R4:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 5.86" for 25-YEAR event
Inflow = 0.50 cfs @ 12.07 hrs, Volume= 0.040 af
Primary = 0.50 cfs @ 12.07 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.010 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

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Serenity Drive: Proposed Conditions
Type III 24-hr 100-YEAR Rainfall=8.60"

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Summary for Subcatchment 201:

Runoff = 24.30 cfs @ 12.17 hrs, Volume= 2.162 af, Depth= 5.59"
Routed to Link PR :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
28,634	72	Woods/grass comb., Good, HSG C
* 9,000	98	Rooftops
* 4,610	85	Pervious Driveways
160,026	74	>75% Grass cover, Good, HSG C
202,270	75	Weighted Average
193,270	74	95.55% Pervious Area
9,000	98	4.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0500	0.25		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
6.1	980	0.0280	2.69		Shallow Concentrated Flow, Lawns and woods Unpaved Kv= 16.1 fps
12.8	1,080	Total			

Summary for Subcatchment 202:

Runoff = 5.63 cfs @ 12.09 hrs, Volume= 0.407 af, Depth= 6.07"
Routed to Pond SF-1 : Sand Filter

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
1,467	72	Woods/grass comb., Good, HSG C
* 6,000	98	Rooftops
25,475	74	>75% Grass cover, Good, HSG C
* 2,085	98	Sand Filter
35,027	79	Weighted Average
26,942	74	76.92% Pervious Area
8,085	98	23.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0900	0.32		Sheet Flow, Lawns/Trees Grass: Short n= 0.150 P2= 3.30"
0.7	145	0.0413	3.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
6.0	245	Total			

Summary for Subcatchment 203:

Runoff = 6.31 cfs @ 12.24 hrs, Volume= 0.634 af, Depth= 5.35"
Routed to Link PR :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

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Area (sf)	CN	Description
42,051	72	Woods/grass comb., Good, HSG C
19,959	74	>75% Grass cover, Good, HSG C
62,010	73	Weighted Average
62,010	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0450	0.11		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.30"
2.5	438	0.0340	2.97		Shallow Concentrated Flow, Woods and grass
					Unpaved Kv= 16.1 fps
17.8	538	Total			

Summary for Subcatchment 204:

Runoff = 9.84 cfs @ 12.14 hrs, Volume= 0.813 af, Depth= 5.83"
 Routed to Pond D-1 : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
* 7,045	98	Detention Basin
57,639	74	>75% Grass cover, Good, HSG C
5,270	72	Woods/grass comb., Good, HSG C
* 2,959	85	Pervious Driveways
72,913	77	Weighted Average
65,868	74	90.34% Pervious Area
7,045	98	9.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0400	0.23		Sheet Flow, Woods/grasses
					Grass: Short n= 0.150 P2= 3.30"
2.9	488	0.0310	2.83		Shallow Concentrated Flow, Grasses
					Unpaved Kv= 16.1 fps
10.2	588	Total			

Summary for Subcatchment 205:

Runoff = 0.29 cfs @ 12.07 hrs, Volume= 0.021 af, Depth= 6.55"
 Routed to Pond I-1 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
* 650	98	Infiltration Basin (98% Capture)
1,000	74	>75% Grass cover, Good, HSG C
1,650	83	Weighted Average
1,000	74	60.61% Pervious Area
650	98	39.39% Impervious Area

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

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Type III 24-hr 100-YEAR Rainfall=8.60"

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Summary for Subcatchment CB1-PR: Area to CB1

Runoff = 4.02 cfs @ 12.15 hrs, Volume= 0.346 af, Depth= 6.19"
Routed to Link R3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

Summary for Subcatchment CB2-PR:

Runoff = 0.71 cfs @ 12.07 hrs, Volume= 0.056 af, Depth= 8.36"
Routed to Link R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Subcatchment P1:

Runoff = 0.48 cfs @ 12.07 hrs, Volume= 0.038 af, Depth= 8.36"
Routed to Pond 1.010 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

Area (sf)	CN	Description
* 2,379	98	Pavement
2,379	98	100.00% Impervious Area

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

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Type III 24-hr 100-YEAR Rainfall=8.60"

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Summary for Subcatchment P2:

Runoff = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af, Depth= 7.76"
Routed to Pond 1.020 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

	Area (sf)	CN	Description
*	2,469	98	Pavement
*	230	85	Pervious Driveway
	512	74	>75% Grass cover, Good, HSG C
	3,211	93	Weighted Average
	742	77	23.11% Pervious Area
	2,469	98	76.89% Impervious Area

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

Summary for Subcatchment P3:

Runoff = 14.69 cfs @ 12.20 hrs, Volume= 1.390 af, Depth= 5.71"
Routed to Pond D-2 : Depression w/pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

	Area (sf)	CN	Description
*	6,713	98	off-site buildings
*	3,228	98	off-site pavement
	3,510	72	Woods/grass comb., Good, HSG C
	112,794	74	>75% Grass cover, Good, HSG C
*	1,050	85	Pervious Driveway
	127,295	76	Weighted Average
	117,354	74	92.19% Pervious Area
	9,941	98	7.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.5	745	0.0198	2.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
15.1	845	Total			

Summary for Subcatchment P4:

Runoff = 1.72 cfs @ 12.07 hrs, Volume= 0.137 af, Depth= 8.36"
Routed to Pond 1.030 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YEAR Rainfall=8.60"

	Area (sf)	CN	Description
*	8,545	98	Pavement
	8,545	98	100.00% Impervious Area

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

Summary for Pond 1.010:

Inflow Area = 0.055 ac, 100.00% Impervious, Inflow Depth = 8.36" for 100-YEAR event
 Inflow = 0.48 cfs @ 12.07 hrs, Volume= 0.038 af
 Outflow = 0.48 cfs @ 12.07 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.48 cfs @ 12.07 hrs, Volume= 0.038 af
 Routed to Pond 1.020 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 113.71' @ 12.07 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	113.35'	12.0" Round 12" ADS L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 113.35' / 113.15' S= 0.0100 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.07 hrs HW=113.71' (Free Discharge)
 ↑ **1=12" ADS** (Barrel Controls 0.48 cfs @ 2.75 fps)

Summary for Pond 1.020:

Inflow Area = 3.051 ac, 11.13% Impervious, Inflow Depth = 5.71" for 100-YEAR event
 Inflow = 12.91 cfs @ 12.17 hrs, Volume= 1.451 af
 Outflow = 12.91 cfs @ 12.17 hrs, Volume= 1.451 af, Atten= 0%, Lag= 0.0 min
 Primary = 12.91 cfs @ 12.17 hrs, Volume= 1.451 af
 Routed to Pond 1.030 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 115.45' @ 12.17 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.40'	18.0" Round 18" ADS L= 158.0' Ke= 0.500 Inlet / Outlet Invert= 112.40' / 109.55' S= 0.0180 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=12.90 cfs @ 12.17 hrs HW=115.45' (Free Discharge)
 ↑ **1=18" ADS** (Inlet Controls 12.90 cfs @ 7.30 fps)

Summary for Pond 1.030:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 5.87" for 100-YEAR event
 Inflow = 13.97 cfs @ 12.15 hrs, Volume= 1.587 af
 Outflow = 13.97 cfs @ 12.15 hrs, Volume= 1.587 af, Atten= 0%, Lag= 0.0 min
 Primary = 13.97 cfs @ 12.15 hrs, Volume= 1.587 af
 Routed to Pond 1.040 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 112.75' @ 12.15 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Device 2	111.60'	24.0" W x 48.0" H 1° Double Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	109.30'	18.0" Round 18" ADS L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 109.30' / 109.10' S= 0.0200 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=13.96 cfs @ 12.15 hrs HW=112.74' (Free Discharge)
 ↑2=18" ADS (Inlet Controls 13.96 cfs @ 7.90 fps)
 ↑1=Double Grate (Passes 13.96 cfs of 40.55 cfs potential flow)

Summary for Pond 1.040:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 5.87" for 100-YEAR event
 Inflow = 13.97 cfs @ 12.15 hrs, Volume= 1.587 af
 Outflow = 13.97 cfs @ 12.15 hrs, Volume= 1.587 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.67 cfs @ 12.15 hrs, Volume= 0.757 af
 Routed to Pond 1.050 : HYD
 Secondary = 12.30 cfs @ 12.15 hrs, Volume= 0.830 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 111.69' @ 12.15 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	6.0" Round 6" PVC L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 108.25' / 107.49' S= 0.0200 '/ Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	108.85'	18.0" Round 18" ADS L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 108.85' / 100.00' S= 0.0354 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.67 cfs @ 12.15 hrs HW=111.69' (Free Discharge)
 ↑1=6" PVC (Barrel Controls 1.67 cfs @ 8.52 fps)

Secondary OutFlow Max=12.29 cfs @ 12.15 hrs HW=111.69' (Free Discharge)
 ↑2=18" ADS (Inlet Controls 12.29 cfs @ 6.96 fps)

Summary for Pond 1.050: HYD

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 2.80" for 100-YEAR event
 Inflow = 1.67 cfs @ 12.15 hrs, Volume= 0.757 af
 Outflow = 1.67 cfs @ 12.15 hrs, Volume= 0.757 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.67 cfs @ 12.15 hrs, Volume= 0.757 af
 Routed to Pond 1.060 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 108.56' @ 12.15 hrs
 Flood Elev= 113.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.24'	8.0" Round 8" PVC L= 258.0' Ke= 0.500 Inlet / Outlet Invert= 107.24' / 102.46' S= 0.0185 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.67 cfs @ 12.15 hrs HW=108.56' (Free Discharge)
 ↑1=8" PVC (Inlet Controls 1.67 cfs @ 4.79 fps)

Summary for Pond 1.060:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 2.80" for 100-YEAR event
 Inflow = 1.67 cfs @ 12.15 hrs, Volume= 0.757 af
 Outflow = 1.67 cfs @ 12.15 hrs, Volume= 0.757 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.67 cfs @ 12.15 hrs, Volume= 0.757 af
 Routed to Pond SF-1 : Sand Filter

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Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 103.53' @ 12.15 hrs
 Flood Elev= 105.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.21'	8.0" Round 8" PVC L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 102.21' / 102.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.67 cfs @ 12.15 hrs HW=103.53' (Free Discharge)
 ↑1=8" PVC (Inlet Controls 1.67 cfs @ 4.79 fps)

Summary for Pond D-1: Detention Basin

Inflow Area = 1.674 ac, 9.66% Impervious, Inflow Depth = 18.67" for 100-YEAR event
 Inflow = 28.71 cfs @ 12.14 hrs, Volume= 2.604 af
 Outflow = 21.37 cfs @ 12.28 hrs, Volume= 2.604 af, Atten= 26%, Lag= 8.3 min
 Primary = 21.37 cfs @ 12.28 hrs, Volume= 2.604 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 100.68' @ 12.28 hrs Surf.Area= 6,726 sf Storage= 16,445 cf
 Flood Elev= 101.00' Surf.Area= 7,045 sf Storage= 18,615 cf

Plug-Flow detention time= 21.1 min calculated for 2.604 af (100% of inflow)
 Center-of-Mass det. time= 20.9 min (832.6 - 811.7)

Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	18,615 cf	Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	3,693	0	0
98.00	4,092	1,946	1,946
99.00	5,068	4,580	6,526
100.00	6,032	5,550	12,076
101.00	7,045	6,539	18,615

Device	Routing	Invert	Outlet Devices
#1	Device 2	97.50'	6.0" Vert. (3) 6" Underdrains X 3.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	97.25'	12.0" Round 12" ADS L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 97.25' / 97.00' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Primary	98.50'	2.0' long x 3.00' rise Concrete Weir 2 End Contraction(s)

Primary OutFlow Max=21.36 cfs @ 12.28 hrs HW=100.68' (Free Discharge)
 ↑2=12" ADS (Passes 4.86 cfs of 6.28 cfs potential flow)
 ↑1=(3) 6" Underdrains (Orifice Controls 4.86 cfs @ 8.25 fps)
 ↑3=Concrete Weir (Weir Controls 16.50 cfs @ 4.83 fps)

Summary for Pond D-2: Depression w/pipe

Inflow Area = 2.922 ac, 7.81% Impervious, Inflow Depth = 5.71" for 100-YEAR event
 Inflow = 14.69 cfs @ 12.20 hrs, Volume= 1.390 af
 Outflow = 14.58 cfs @ 12.22 hrs, Volume= 1.390 af, Atten= 1%, Lag= 1.0 min
 Primary = 10.44 cfs @ 12.22 hrs, Volume= 1.332 af
 Routed to Pond 1.020 :
 Secondary = 4.15 cfs @ 12.22 hrs, Volume= 0.058 af
 Routed to Link PR :

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

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Peak Elev= 117.75' @ 12.22 hrs Surf.Area= 1,473 sf Storage= 1,388 cf
 Flood Elev= 118.00' Surf.Area= 1,700 sf Storage= 1,777 cf

Plug-Flow detention time= 0.7 min calculated for 1.390 af (100% of inflow)
 Center-of-Mass det. time= 0.7 min (818.3 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1	116.00'	1,777 cf	Grassed Depression (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.00	300	0	0
117.00	777	539	539
118.00	1,700	1,239	1,777

Device	Routing	Invert	Outlet Devices
#1	Primary	115.50'	18.0" Round 18" ADS L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 115.50' / 112.65' S= 0.0950 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	117.50'	127.0 deg x 10.0' long x 0.50' rise Grassed overflow Cv= 2.48 (C= 3.10)

Primary OutFlow Max=10.44 cfs @ 12.22 hrs HW=117.75' (Free Discharge)
 ↑1=18" ADS (Inlet Controls 10.44 cfs @ 5.91 fps)

Secondary OutFlow Max=4.14 cfs @ 12.22 hrs HW=117.75' (Free Discharge)
 ↑2=Grassed overflow (Weir Controls 4.14 cfs @ 1.55 fps)

Summary for Pond I-1: Infiltration Basin

Inflow Area = 4.089 ac, 18.01% Impervious, Inflow Depth = 0.65" for 100-YEAR event
 Inflow = 0.39 cfs @ 12.07 hrs, Volume= 0.222 af
 Outflow = 0.38 cfs @ 12.09 hrs, Volume= 0.214 af, Atten= 2%, Lag= 1.2 min
 Discarded = 0.00 cfs @ 12.09 hrs, Volume= 0.000 af
 Primary = 0.38 cfs @ 12.09 hrs, Volume= 0.213 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 99.55' @ 12.09 hrs Surf.Area= 766 sf Storage= 391 cf
 Flood Elev= 100.00' Surf.Area= 860 sf Storage= 755 cf

Plug-Flow detention time= 69.6 min calculated for 0.214 af (96% of inflow)
 Center-of-Mass det. time= 33.6 min (1,183.0 - 1,149.4)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	755 cf	Infiltration Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	650	0	0
100.00	860	755	755

Device	Routing	Invert	Outlet Devices
#1	Discarded	99.00'	0.001 in/hr Exfiltration over Surface area
#2	Primary	99.50'	90.0 deg x 10.0' long x 0.50' rise Overflow weir Cv= 2.50 (C= 3.13)

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=99.55' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.38 cfs @ 12.09 hrs HW=99.55' (Free Discharge)
 ↑2=Overflow weir (Weir Controls 0.38 cfs @ 0.72 fps)

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Summary for Pond SF-1: Sand Filter

Inflow Area = 4.051 ac, 17.81% Impervious, Inflow Depth = 3.45" for 100-YEAR event
 Inflow = 7.19 cfs @ 12.09 hrs, Volume= 1.164 af
 Outflow = 6.90 cfs @ 12.12 hrs, Volume= 1.162 af, Atten= 4%, Lag= 1.6 min
 Primary = 0.10 cfs @ 12.12 hrs, Volume= 0.201 af
 Routed to Pond I-1 : Infiltration Basin
 Secondary = 6.80 cfs @ 12.12 hrs, Volume= 0.961 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.52' @ 12.12 hrs Surf.Area= 4,757 sf Storage= 3,783 cf
 Flood Elev= 103.00' Surf.Area= 5,126 sf Storage= 5,240 cf

Plug-Flow detention time= 72.6 min calculated for 1.162 af (100% of inflow)
 Center-of-Mass det. time= 72.1 min (921.8 - 849.7)

Volume	Invert	Avail.Storage	Storage Description
#1	101.50'	4,002 cf	Sand filter Basin (Prismatic) Listed below (Recalc)
#2	99.50'	1,238 cf	12" Sand Media/4" Loam/8" Stone (Prismatic) Listed below (Recalc)
			3,750 cf Overall x 33.0% Voids
			5,240 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.50	2,085	0	0
103.00	3,251	4,002	4,002

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.50	1,875	0	0
101.50	1,875	3,750	3,750

Device	Routing	Invert	Outlet Devices
#1	Primary	99.50'	6.0" Round 6" PVC L= 112.0' Ke= 0.500 Inlet / Outlet Invert= 99.50' / 99.00' S= 0.0045 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Device 1	99.60'	1.5" Vert. 1.5" Orifice Plate C= 0.600 Limited to weir flow at low heads
#3	Device 2	99.50'	8.270 in/hr Filtration through sand to outlet over Surface area
#4	Secondary	102.17'	90.0 deg x 10.0' long x 0.83' rise Overflow weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=0.10 cfs @ 12.12 hrs HW=102.52' (Free Discharge)
 ↑1=6" PVC (Passes 0.10 cfs of 1.06 cfs potential flow)
 ↑2=1.5" Orifice Plate (Orifice Controls 0.10 cfs @ 8.15 fps)
 ↑3= Filtration through sand to outlet (Passes 0.10 cfs of 0.91 cfs potential flow)

Secondary OutFlow Max=6.79 cfs @ 12.12 hrs HW=102.52' (Free Discharge)
 ↑4= Overflow weir (Weir Controls 6.79 cfs @ 1.85 fps)

Summary for Link D-PR: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 5.90" for 100-YEAR event
 Inflow = 2.71 cfs @ 12.07 hrs, Volume= 0.370 af
 Primary = 2.71 cfs @ 12.07 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.0 min

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

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Serenity Drive: Proposed Conditions
Type III 24-hr 100-YEAR Rainfall=8.60"

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Summary for Link PR:

Inflow Area = 11.830 ac, 9.34% Impervious, Inflow Depth = 5.75" for 100-YEAR event
Inflow = 54.59 cfs @ 12.21 hrs, Volume= 5.671 af
Primary = 54.59 cfs @ 12.21 hrs, Volume= 5.671 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R3:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 6.19" for 100-YEAR event
Inflow = 4.02 cfs @ 12.15 hrs, Volume= 0.346 af
Primary = 2.00 cfs @ 12.01 hrs, Volume= 0.313 af, Atten= 50%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 2.02 cfs @ 12.15 hrs, Volume= 0.033 af
Routed to Pond 1.020 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

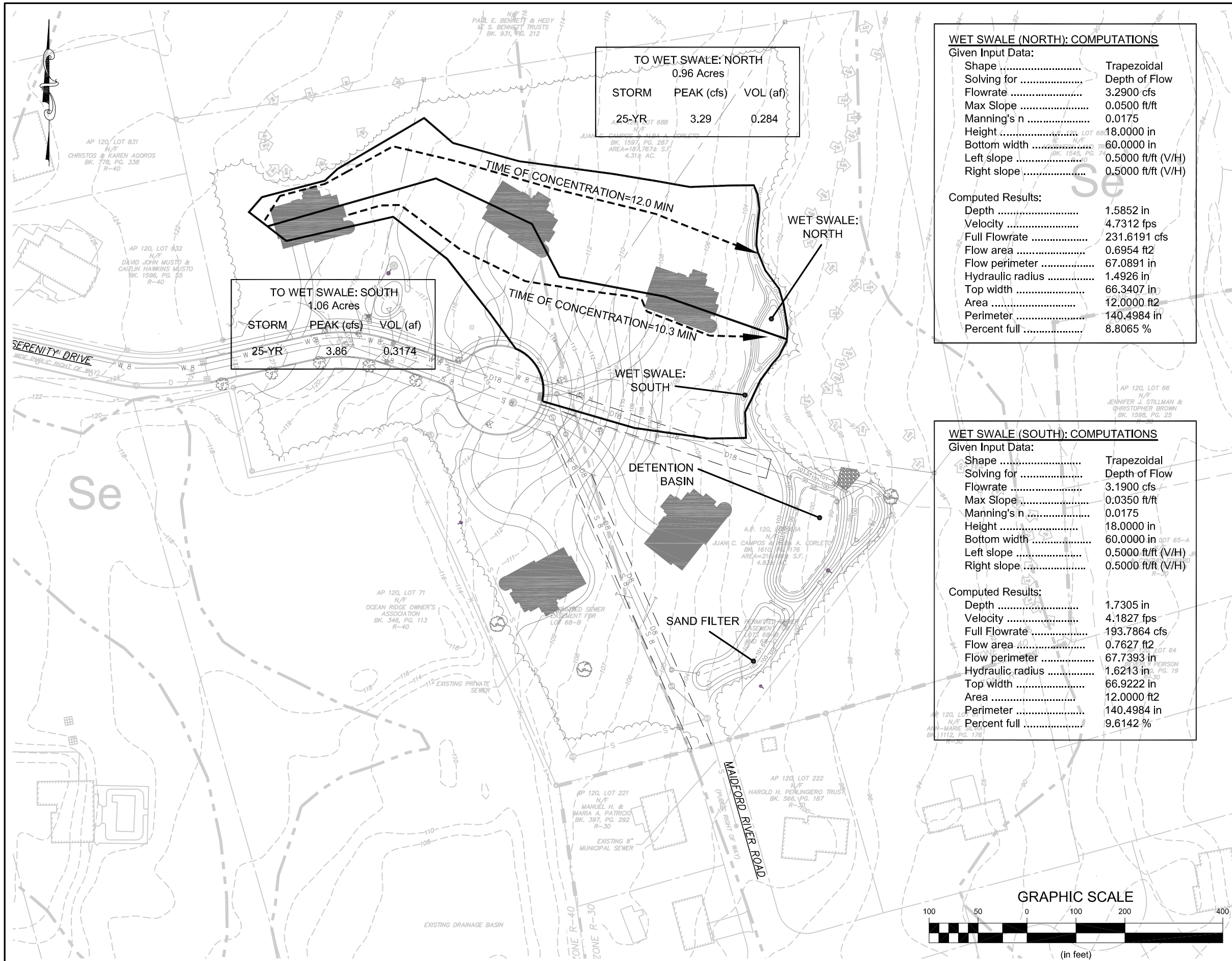
Summary for Link R4:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 8.36" for 100-YEAR event
Inflow = 0.71 cfs @ 12.07 hrs, Volume= 0.056 af
Primary = 0.71 cfs @ 12.07 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.010 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



APPENDIX E SUPPLEMENTARY CALCULATIONS



TO WET SWALE: NORTH		
0.96 Acres		
STORM	PEAK (cfs)	VOL (af)
25-YR	3.29	0.284

TO WET SWALE: SOUTH		
1.06 Acres		
STORM	PEAK (cfs)	VOL (af)
25-YR	3.86	0.3174

WET SWALE (NORTH): COMPUTATIONS

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	3.2900 cfs
Max Slope	0.0500 ft/ft
Manning's n	0.0175
Height	18.0000 in
Bottom width	60.0000 in
Left slope	0.5000 ft/ft (V/H)
Right slope	0.5000 ft/ft (V/H)

Computed Results:

Depth	1.5852 in
Velocity	4.7312 fps
Full Flowrate	231.6191 cfs
Flow area	0.6954 ft ²
Flow perimeter	67.0891 in
Hydraulic radius	1.4926 in
Top width	66.3407 in
Area	12.0000 ft ²
Perimeter	140.4984 in
Percent full	8.8065 %

WET SWALE (SOUTH): COMPUTATIONS

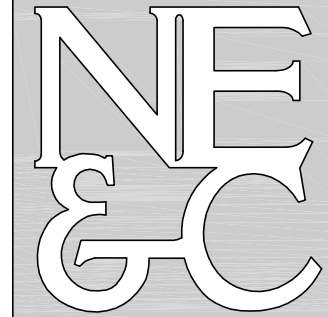
Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	3.1900 cfs
Max Slope	0.0350 ft/ft
Manning's n	0.0175
Height	18.0000 in
Bottom width	60.0000 in
Left slope	0.5000 ft/ft (V/H)
Right slope	0.5000 ft/ft (V/H)

Computed Results:

Depth	1.7305 in
Velocity	4.1827 fps
Full Flowrate	193.7864 cfs
Flow area	0.7627 ft ²
Flow perimeter	67.7393 in
Hydraulic radius	1.6213 in
Top width	66.9222 in
Area	12.0000 ft ²
Perimeter	140.4984 in
Percent full	9.6142 %

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Drawn by: JJR	Checked by: GES
Scale: 1"=100'	Date: 01MAR22

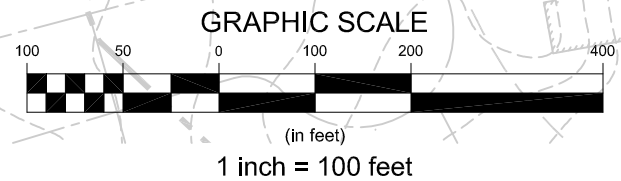
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 A.P. 120 LOTS 68-A & 68-B
 SERENITY DRIVE
 MIDDLETOWN, RI

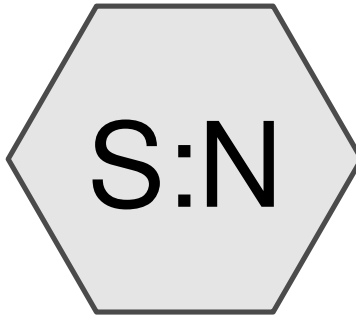
Issued for:
PERMITTING

Drawing Title:
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 WATERSHED MAP
 AND DESIGN
 COMPUTATIONS**

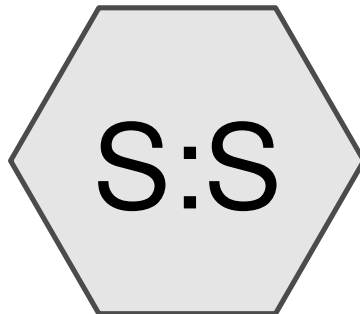
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Project Number:
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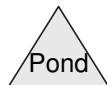
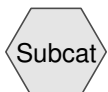




Area to Swale: North



Area to Swale: South



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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.710	74	>75% Grass cover, Good, HSG C (S:N, S:S)
0.106	85	Pervious Driveways (S:S)
0.207	98	Rooftops (S:N, S:S)

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Serenity Drive Swale Analysis
Type III 24-hr 25-YEAR Rainfall=6.10"
Printed 3/1/2022
Page 3

Summary for Subcatchment S:N: Area to Swale: North

Runoff = 3.29 cfs @ 12.17 hrs, Volume= 0.284 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 4,500	98	Rooftops
37,167	74	>75% Grass cover, Good, HSG C
41,667	77	Weighted Average
37,167	74	89.20% Pervious Area
4,500	98	10.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
2.4	438	0.0370	3.10		Shallow Concentrated Flow, Lawns and woods Unpaved Kv= 16.1 fps
12.0	538	Total			

Summary for Subcatchment S:S: Area to Swale: South

Runoff = 3.86 cfs @ 12.14 hrs, Volume= 0.317 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.10"

Area (sf)	CN	Description
* 4,500	98	Rooftops
* 4,610	85	Pervious Driveways
37,333	74	>75% Grass cover, Good, HSG C
46,443	77	Weighted Average
41,943	75	90.31% Pervious Area
4,500	98	9.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0275	0.20		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.8	356	0.0430	3.34		Shallow Concentrated Flow, Lawns and woods Unpaved Kv= 16.1 fps
10.3	456	Total			



SF-1: Lined Surface Sand Filter

Project: 19187.0 Proposed 5 Lot Subdivision

Water Quality Volume Calculation (RIDEM Minimum Standard 3):

Pavement =	12,685	sf		
Buildings =	6,000	sf		
Off-site Impervious =	9,941	sf	Min. WQ _R :	1,417 cf
Impervious Area:	28,626	sf	WQ _R :	2,386 cf
Total Disturbed Area:	85,000	sf	WQ _{R75%} :	1,789 cf

A = Surface area of filter bed (ft ²)	2,085	ft ²
d _f = Filter bed depth (ft)	1	ft
V _R = media void ratio	33%	

Storage Volume in Media:

$$2,085 \times 1 \times 33\% = 688 \text{ cf}$$

Total System Volume Calculation:

Per the RISDISM, the storage volume of the system must accommodate 75% of the WQ volume (including pretreatment). The total provided area is this area, plus the storage in the mulch layer plus the area under the outlet.

V _M = storage volume in media	688	cf
A = Surface area of filter bed (ft ²)	2,085	ft ²
d _M = depth of mulch	0.33	ft
h _o = storage height below outlet	0.67	ft
V _{FB} = Volume of pretreatment	100	cf

Total Storage provided by this BMP:

$$WQ_V = V_M + (A \times d_M \times V_R) + (A \times h_o) + V_{FB} = 2,412 \text{ cf}$$

Minimum Area Calculation:

Drain time in an lined filter is limited by the underdrain capacity:

t _f = Determined by HydroCAD Analysis for (1) 2.5-inch orifice	
t _f =	0.30 days

The minimum area of the filter, according to RISDISM, is calculated using the following equation:

$$A_R = (WQ_V) \times (d_f) / [(k) \times (h_f + d_f) \times (t_f)]$$

Where,	WQ _V = Total Required Water Quality Volume	2,386	cf
	d _f = Filter bed depth (ft)	1	ft
	k = Coefficient of permeability of filter media (ft/day)	3.5	ft/day
	h _f = Average height of water above surface of media	0.5	ft
	t _f = Design filter bed drain time	0.30	days

Therefore, the minimum surface areas is:

A _R =	1,515	sf	
A =	2,085	sf	Area is greater and therefore satisfactory.



WS: Wet Swale

Project: 19187.0 Proposed 5 Lot Subdivision

Water Quality Volume Calculation (RIDEM Minimum Standard 3):

Pavement =	0	sf		
Driveways =	0	sf		
Buildings =	9,000	sf	Min. WQ _R :	350 cf
Impervious Area:	9,000	sf	WQ _R :	750 cf
Total Disturbed Area:	21,000	sf		

Ponding Area:	1200	sf
Depth of Ponding:	1	ft
Total Storage:	1200	cf



Groundwater Recharge Calculations

Project: 19187.0 Proposed 5 Lot Subdivision

Impervious Area*: 28,372 sf

Water Recharge Volume Calculations:

HSG	Recharge Factor (F)
A	0.60
B	0.35
C	0.25
D	0.10

Impervious Area: 27,685 sf F = 0.25

$$WRec_v = (\text{Impervious Area}) / 12 \times F$$

$$WRec_v = 591 \text{ cf}$$

Volume of Infiltration for a WQ storm**: 697 cf

* Summarized from HydroCAD Report

** As shown in the HydroCAD analysis for the WQ storm (72-hr)



Outlet Protection Calculations

Project: 19187.0 Proposed 5 Lot Subdivision

Stone Apron Calculations

$$L_A = (1.7Q) / D_O^{3/2} + 8D_O$$

$$W = 3(D_O) + 0.4(L_A) \quad \text{Where Tailwater} \geq 0.5(D_O)$$

$$W = 3(D_O) + L_A \quad \text{Where Tailwater} < 0.5(D_O)$$

$$d_{50} = (0.02/TW) \times (Q/DO)^{4/3}$$

Device	25-Year Outlet (cfs)	Outlet Pipe Size (in)	Tailwater Depth (in)	Min. L _A (ft)	Min. W (ft)	d ₅₀ (in)
SF-1	0.10	6	3.0	4.5	3.3	0.1
DMH1.040	8.17	18	9.4	19.6	12.3	2.9
D-1	4.19	12	4.3	15.1	18.1	4.5
DMH1.060	1.34	8	5.1	9.5	5.8	1.4



APPENDIX F SOIL EVALUATIONS



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program



Site Evaluation Form
Part A - Soil Profile Description

Application Number NA

Property Owner: J&M Mello Nominee Trust

Property Location: Paradise Avenue (AP 120 Lot 168) Middletown, RI

Date of Test Hole: May 5, 2015

Soil Evaluator: Chris Sutter

License Number: D-4077

Weather: Clear, 60's

Shaded: Yes [] No [x] Time: 8:00 am

Table with 11 columns: TH Horizon, Depth, Horizon Boundaries (Dist, Topo), Soil Colors (Matrix, Re-Dox Features), Re-Dox (Ab., S., Contr.), Texture, Structure, Consistence, Soil Category. It contains two sections for TH 1 and TH 2 horizons with data for Ap, Bw, and Cd layers.

TH 1 Soil Class Basal Till Total Depth 84" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 20" (og)

TH 2 Soil Class Basal Till Total Depth 84" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth 50" SHWT 18" (og)

Comments: [Blank lines for notes]



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program



Site Evaluation Form
Part A - Soil Profile Description

Application Number NA

Property Owner: J&M Mello Nominee Trust

Property Location: Paradise Avenue (AP 120 Lot 168) Middletown, RI

Date of Test Hole: May 5, 2015

Soil Evaluator: Chris Sutter

License Number: D-4077

Weather: Clear, 60's

Shaded: Yes [] No [x] Time: 8:00 am

Table with 11 columns: TH Horizon, Depth, Horizon Boundaries (Dist, Topo), Soil Colors (Matrix, Re-Dox Features), Re-Dox (Ab., S., Contr.), Texture, Structure, Consistence, Soil Category. Contains data for TH 3 and TH 4 horizons.

TH 3 Soil Class Basal Till Total Depth 80" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 24" (og)

TH 4 Soil Class Basal Till Total Depth 78" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 16" (og)

Comments: [Blank lines for notes]



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program



Site Evaluation Form
Part A - Soil Profile Description

Application Number NA

Property Owner: J&M Mello Nominee Trust

Property Location: Paradise Avenue (AP 120 Lot 168) Middletown, RI

Date of Test Hole: May 5, 2015

Soil Evaluator: Chris Sutter

License Number: D-4077

Weather: Clear, 60's

Shaded: Yes [] No [x] Time: 8:00 am

Table with 11 columns: TH Horizon, Depth, Horizon Boundaries (Dist, Topo), Soil Colors (Matrix, Re-Dox Features), Re-Dox (Ab., S., Contr.), Texture, Structure, Consistence, Soil Category. Contains data for TH 5 and TH 6 horizons.

TH 5 Soil Class Basal Till Total Depth 78" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 23" (og)

TH 6 Soil Class Basal Till Total Depth 78" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 21" (og)

Comments: [Blank lines for notes]



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment System Program



Site Evaluation Form
Part A - Soil Profile Description

Application Number NA

Property Owner: J&M Mello Nominee Trust

Property Location: Paradise Avenue (AP 120 Lot 168) Middletown, RI

Date of Test Hole: May 5, 2015

Soil Evaluator: Chris Sutter

License Number: D-4077

Weather: Clear, 60's

Shaded: Yes [] No [x] Time: 8:00 am

Table with 11 columns: TH Horizon, Depth, Horizon Boundaries (Dist, Topo), Soil Colors (Matrix, Re-Dox Features), Re-Dox (Ab., S., Contr.), Texture, Structure, Consistence, Soil Category. Contains data for TH 7* and TH 8 horizons.

TH 7 Soil Class Basal Till Total Depth 72" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 12" (og)

TH 8 Soil Class Basal Till Total Depth 72" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 17" (og)

Comments:

*Evidence of temporary standing water at this location



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

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Onsite Wastewater Treatment System Program



Site Evaluation Form
Part A - Soil Profile Description

Application Number NA

Property Owner: J&M Mello Nominee Trust

Property Location: Paradise Avenue (AP 120 Lot 168) Middletown, RI

Date of Test Hole: May 5, 2015

Soil Evaluator: Chris Sutter

License Number: D-4077

Weather: Clear, 60's

Shaded: Yes [] No [x] Time: 8:00 am

Table with 11 columns: TH Horizon, Depth, Horizon Boundaries (Dist, Topo), Soil Colors (Matrix, Re-Dox Features), Re-Dox (Ab., S., Contr.), Texture, Structure, Consistence, Soil Category. Contains data for TH 9 and TH 10 horizons.

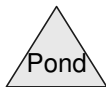
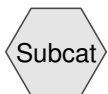
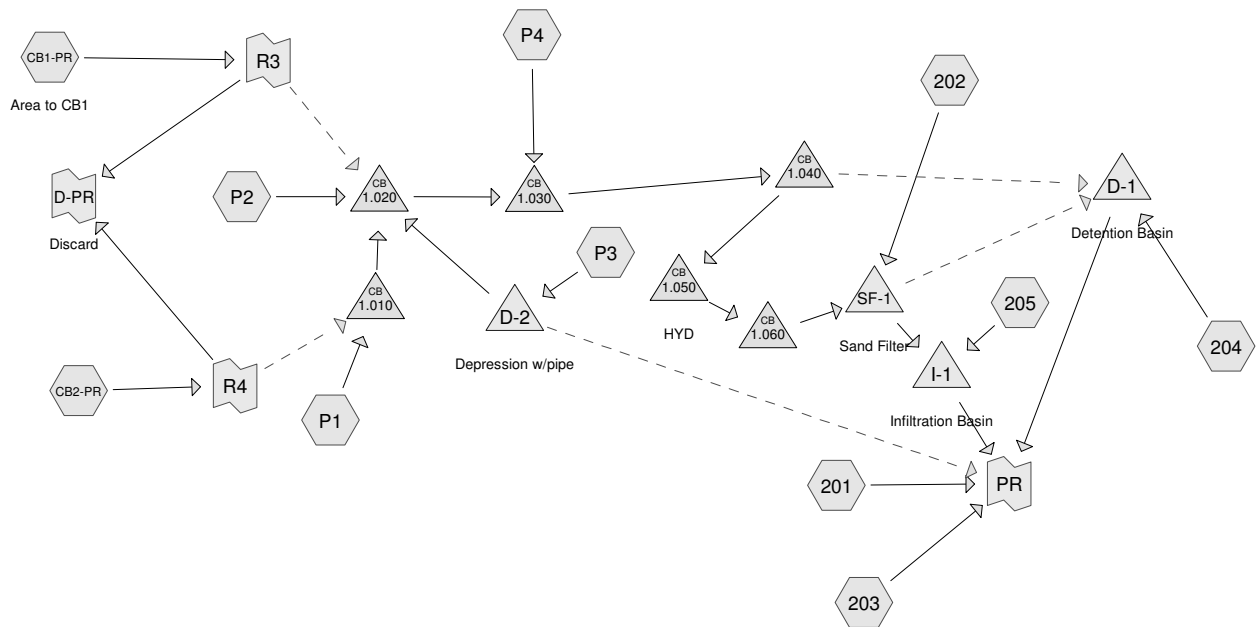
TH 9 Soil Class Basal Till Total Depth 72" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 19" (og)

TH 10 Soil Class Basal Till Total Depth 72" Impervious/Limiting Layer Depth NA (og) GW Seepage Depth NA SHWT 18" (og)

Comments:



APPENDIX G WQ-STORM (1.2" SPLIT PERVIOUS/IMPERVIOUS)



Routing Diagram for 2022-02-24 19187.0
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.156	74	>75% Grass cover, Good, HSG C (201, 202, 203, 204, 205, CB1-PR, P2, P3)
0.023	98	Building (CB1-PR)
0.162	98	Detention Basin (204)
0.015	98	Infiltration Basin (98% Capture) (205)
0.388	98	Pavement (CB2-PR, P1, P2, P4)
0.156	98	Pavement and Concrete (CB1-PR)
0.029	85	Pervious Driveway (P2, P3)
0.174	85	Pervious Driveways (201, 204)
0.344	98	Rooftops (201, 202)
0.048	98	Sand Filter (202)
1.858	72	Woods/grass comb., Good, HSG C (201, 202, 203, 204, P3)
0.154	98	off-site buildings (P3)
0.074	98	off-site pavement (P3)

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Summary for Subcatchment 201:Runoff = 0.18 cfs @ 12.17 hrs, Volume= 0.040 af, Depth= 0.10"
Routed to Link PR :Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (sf)	CN	Description
28,634	72	Woods/grass comb., Good, HSG C
* 9,000	98	Rooftops
* 4,610	85	Pervious Driveways
160,026	74	>75% Grass cover, Good, HSG C
202,270	75	Weighted Average
193,270	74	95.55% Pervious Area
9,000	98	4.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	100	0.0500	0.25		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
6.1	980	0.0280	2.69		Shallow Concentrated Flow, Lawns and woods Unpaved Kv= 16.1 fps
12.8	1,080	Total			

Summary for Subcatchment 202:Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.018 af, Depth= 0.27"
Routed to Pond SF-1 : Sand FilterRunoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (sf)	CN	Description
1,467	72	Woods/grass comb., Good, HSG C
* 6,000	98	Rooftops
25,475	74	>75% Grass cover, Good, HSG C
* 2,085	98	Sand Filter
35,027	79	Weighted Average
26,942	74	76.92% Pervious Area
8,085	98	23.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0900	0.32		Sheet Flow, Lawns/Trees Grass: Short n= 0.150 P2= 3.30"
0.7	145	0.0413	3.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
6.0	245	Total			

Summary for Subcatchment 203:Runoff = 0.01 cfs @ 12.67 hrs, Volume= 0.006 af, Depth= 0.05"
Routed to Link PR :Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

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Area (sf)	CN	Description
42,051	72	Woods/grass comb., Good, HSG C
19,959	74	>75% Grass cover, Good, HSG C
62,010	73	Weighted Average
62,010	73	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0450	0.11		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.30"
2.5	438	0.0340	2.97		Shallow Concentrated Flow, Woods and grass
					Unpaved Kv= 16.1 fps
17.8	538	Total			

Summary for Subcatchment 204:

Runoff = 0.15 cfs @ 12.14 hrs, Volume= 0.021 af, Depth= 0.15"
Routed to Pond D-1 : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (sf)	CN	Description
* 7,045	98	Detention Basin
57,639	74	>75% Grass cover, Good, HSG C
5,270	72	Woods/grass comb., Good, HSG C
* 2,959	85	Pervious Driveways
72,913	77	Weighted Average
65,868	74	90.34% Pervious Area
7,045	98	9.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0400	0.23		Sheet Flow, Woods/grasses
					Grass: Short n= 0.150 P2= 3.30"
2.9	488	0.0310	2.83		Shallow Concentrated Flow, Grasses
					Unpaved Kv= 16.1 fps
10.2	588	Total			

Summary for Subcatchment 205:

Runoff = 0.02 cfs @ 12.07 hrs, Volume= 0.001 af, Depth= 0.43"
Routed to Pond I-1 : Infiltration Basin

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (sf)	CN	Description
* 650	98	Infiltration Basin (98% Capture)
1,000	74	>75% Grass cover, Good, HSG C
1,650	83	Weighted Average
1,000	74	60.61% Pervious Area
650	98	39.39% Impervious Area

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

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Summary for Subcatchment CB1-PR: Area to CB1

Runoff = 0.17 cfs @ 12.15 hrs, Volume= 0.017 af, Depth= 0.31"
 Routed to Link R3 :

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr WQ Rainfall=1.20"

Area (sf)	CN	Description
* 1,000	98	Building
* 6,804	98	Pavement and Concrete
21,452	74	>75% Grass cover, Good, HSG C
29,256	80	Weighted Average
21,452	74	73.33% Pervious Area
7,804	98	26.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	100	0.0250	0.19		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
1.2	178	0.0250	2.55		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
1.3	161	0.0110	2.13		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
11.3	439	Total			

Summary for Subcatchment CB2-PR:

Runoff = 0.09 cfs @ 12.07 hrs, Volume= 0.007 af, Depth= 0.99"
 Routed to Link R4 :

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr WQ Rainfall=1.20"

Area (sf)	CN	Description
* 3,525	98	Pavement
3,525	98	100.00% Impervious Area

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

Summary for Subcatchment P1:

Runoff = 0.06 cfs @ 12.07 hrs, Volume= 0.004 af, Depth= 0.99"
 Routed to Pond 1.010 :

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Type III 24-hr WQ Rainfall=1.20"

Area (sf)	CN	Description
* 2,379	98	Pavement
2,379	98	100.00% Impervious Area

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

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Summary for Subcatchment P2:Runoff = 0.06 cfs @ 12.07 hrs, Volume= 0.005 af, Depth= 0.78"
Routed to Pond 1.020 :Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	2,469	98	Pavement
*	230	85	Pervious Driveway
	512	74	>75% Grass cover, Good, HSG C
	3,211	93	Weighted Average
	742	77	23.11% Pervious Area
	2,469	98	76.89% Impervious Area

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

Summary for Subcatchment P3:Runoff = 0.19 cfs @ 12.20 hrs, Volume= 0.033 af, Depth= 0.13"
Routed to Pond D-2 : Depression w/pipeRunoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	6,713	98	off-site buildings
*	3,228	98	off-site pavement
	3,510	72	Woods/grass comb., Good, HSG C
	112,794	74	>75% Grass cover, Good, HSG C
*	1,050	85	Pervious Driveway
	127,295	76	Weighted Average
	117,354	74	92.19% Pervious Area
	9,941	98	7.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		Sheet Flow, Lawns Grass: Short n= 0.150 P2= 3.30"
5.5	745	0.0198	2.27		Shallow Concentrated Flow, Lawns Unpaved Kv= 16.1 fps
15.1	845	Total			

Summary for Subcatchment P4:Runoff = 0.22 cfs @ 12.07 hrs, Volume= 0.016 af, Depth= 0.99"
Routed to Pond 1.030 :Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

	Area (sf)	CN	Description
*	8,545	98	Pavement
	8,545	98	100.00% Impervious Area

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

Summary for Pond 1.010:

Inflow Area = 0.055 ac, 100.00% Impervious, Inflow Depth = 0.99" for WQ event
 Inflow = 0.06 cfs @ 12.07 hrs, Volume= 0.004 af
 Outflow = 0.06 cfs @ 12.07 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.06 cfs @ 12.07 hrs, Volume= 0.004 af
 Routed to Pond 1.020 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 113.47' @ 12.07 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	113.35'	12.0" Round 12" ADS L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 113.35' / 113.15' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.06 cfs @ 12.07 hrs HW=113.47' (Free Discharge)
 ↑ **1=12" ADS** (Barrel Controls 0.06 cfs @ 1.69 fps)

Summary for Pond 1.020:

Inflow Area = 3.051 ac, 11.13% Impervious, Inflow Depth = 0.16" for WQ event
 Inflow = 0.27 cfs @ 12.12 hrs, Volume= 0.042 af
 Outflow = 0.27 cfs @ 12.12 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.27 cfs @ 12.12 hrs, Volume= 0.042 af
 Routed to Pond 1.030 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 112.62' @ 12.12 hrs
 Flood Elev= 117.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	112.40'	18.0" Round 18" ADS L= 158.0' Ke= 0.500 Inlet / Outlet Invert= 112.40' / 109.55' S= 0.0180 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.26 cfs @ 12.12 hrs HW=112.62' (Free Discharge)
 ↑ **1=18" ADS** (Inlet Controls 0.26 cfs @ 1.61 fps)

Summary for Pond 1.030:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 0.21" for WQ event
 Inflow = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af
 Outflow = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af
 Routed to Pond 1.040 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 111.68' @ 12.08 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Device 2	111.60'	24.0" W x 48.0" H 1° Double Grate C= 0.600 Limited to weir flow at low heads
#2	Primary	109.30'	18.0" Round 18" ADS L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 109.30' / 109.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

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Primary OutFlow Max=0.41 cfs @ 12.08 hrs HW=111.68' (Free Discharge)
 ↑**2=18" ADS** (Passes 0.41 cfs of 10.86 cfs potential flow)
 ↑**1=Double Grate** (Weir Controls 0.41 cfs @ 0.77 fps)

Summary for Pond 1.040:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 0.21" for WQ event
 Inflow = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af
 Outflow = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af
 Routed to Pond 1.050 : HYD
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 108.75' @ 12.08 hrs
 Flood Elev= 114.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	108.25'	6.0" Round 6" PVC L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 108.25' / 107.49' S= 0.0200 '/ Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	108.85'	18.0" Round 18" ADS L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 108.85' / 100.00' S= 0.0354 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.48 cfs @ 12.08 hrs HW=108.75' (Free Discharge)
 ↑**1=6" PVC** (Inlet Controls 0.48 cfs @ 2.43 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=108.25' (Free Discharge)
 ↑**2=18" ADS** (Controls 0.00 cfs)

Summary for Pond 1.050: HYD

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 0.21" for WQ event
 Inflow = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af
 Outflow = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af
 Routed to Pond 1.060 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 107.64' @ 12.08 hrs
 Flood Elev= 113.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.24'	8.0" Round 8" PVC L= 258.0' Ke= 0.500 Inlet / Outlet Invert= 107.24' / 102.46' S= 0.0185 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.48 cfs @ 12.08 hrs HW=107.64' (Free Discharge)
 ↑**1=8" PVC** (Inlet Controls 0.48 cfs @ 2.16 fps)

Summary for Pond 1.060:

Inflow Area = 3.247 ac, 16.50% Impervious, Inflow Depth = 0.21" for WQ event
 Inflow = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af
 Outflow = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.48 cfs @ 12.08 hrs, Volume= 0.058 af
 Routed to Pond SF-1 : Sand Filter

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HydroCAD® 10.10-6a s/n 04733 © 2020 HydroCAD Software Solutions LLCRouting by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 102.62' @ 12.08 hrs
Flood Elev= 105.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	102.21'	8.0" Round 8" PVC L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 102.21' / 102.00' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.48 cfs @ 12.08 hrs HW=102.62' (Free Discharge)
 ↑ **1=8" PVC** (Barrel Controls 0.48 cfs @ 3.02 fps)

Summary for Pond D-1: Detention Basin

Inflow Area = 1.674 ac, 9.66% Impervious, Inflow Depth = 0.15" for WQ event
 Inflow = 0.15 cfs @ 12.14 hrs, Volume= 0.021 af
 Outflow = 0.05 cfs @ 12.63 hrs, Volume= 0.021 af, Atten= 69%, Lag= 29.5 min
 Primary = 0.05 cfs @ 12.63 hrs, Volume= 0.021 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 97.57' @ 12.63 hrs Surf.Area= 3,749 sf Storage= 263 cf
 Flood Elev= 101.00' Surf.Area= 7,045 sf Storage= 18,615 cf

Plug-Flow detention time= 135.6 min calculated for 0.021 af (100% of inflow)
 Center-of-Mass det. time= 135.5 min (997.8 - 862.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	18,615 cf	Basin (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	3,693	0	0
98.00	4,092	1,946	1,946
99.00	5,068	4,580	6,526
100.00	6,032	5,550	12,076
101.00	7,045	6,539	18,615

Device	Routing	Invert	Outlet Devices
#1	Device 2	97.50'	6.0" Vert. (3) 6" Underdrains X 3.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	97.25'	12.0" Round 12" ADS L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 97.25' / 97.00' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#3	Primary	98.50'	2.0' long x 3.00' rise Concrete Weir 2 End Contraction(s)

Primary OutFlow Max=0.05 cfs @ 12.63 hrs HW=97.57' (Free Discharge)
 ↑ **2=12" ADS** (Passes 0.05 cfs of 0.33 cfs potential flow)
 ↑ **1=(3) 6" Underdrains** (Orifice Controls 0.05 cfs @ 0.91 fps)
 ↑ **3=Concrete Weir** (Controls 0.00 cfs)

Summary for Pond D-2: Depression w/pipe

Inflow Area = 2.922 ac, 7.81% Impervious, Inflow Depth = 0.13" for WQ event
 Inflow = 0.19 cfs @ 12.20 hrs, Volume= 0.033 af
 Outflow = 0.19 cfs @ 12.20 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.19 cfs @ 12.20 hrs, Volume= 0.033 af
 Routed to Pond 1.020 :
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link PR :

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

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Peak Elev= 116.00' @ 12.20 hrs Surf.Area= 301 sf Storage= 1 cf
Flood Elev= 118.00' Surf.Area= 1,700 sf Storage= 1,777 cfPlug-Flow detention time= 0.1 min calculated for 0.033 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (878.5 - 878.4)

Volume	Invert	Avail.Storage	Storage Description
#1	116.00'	1,777 cf	Grassed Depression (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.00	300	0	0
117.00	777	539	539
118.00	1,700	1,239	1,777

Device	Routing	Invert	Outlet Devices
#1	Primary	115.50'	18.0" Round 18" ADS L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 115.50' / 112.65' S= 0.0950 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	117.50'	127.0 deg x 10.0' long x 0.50' rise Grassed overflow Cv= 2.48 (C= 3.10)

Primary OutFlow Max=1.25 cfs @ 12.20 hrs HW=116.00' (Free Discharge)
↑**1=18" ADS** (Inlet Controls 1.25 cfs @ 2.41 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=116.00' (Free Discharge)
↑**2=Grassed overflow** (Controls 0.00 cfs)**Summary for Pond I-1: Infiltration Basin**

Inflow Area = 4.089 ac, 18.01% Impervious, Inflow Depth > 0.22" for WQ event
 Inflow = 0.08 cfs @ 12.51 hrs, Volume= 0.076 af
 Outflow = 0.08 cfs @ 12.55 hrs, Volume= 0.070 af, Atten= 0%, Lag= 2.4 min
 Discarded = 0.00 cfs @ 12.55 hrs, Volume= 0.002 af
 Primary = 0.08 cfs @ 12.55 hrs, Volume= 0.067 af
 Routed to Link PR :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 99.52' @ 12.55 hrs Surf.Area= 759 sf Storage= 366 cf
Flood Elev= 100.00' Surf.Area= 860 sf Storage= 755 cfPlug-Flow detention time= 137.0 min calculated for 0.070 af (91% of inflow)
Center-of-Mass det. time= 89.2 min (1,125.0 - 1,035.8)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	755 cf	Infiltration Basin (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	650	0	0
100.00	860	755	755
Device	Routing	Invert	Outlet Devices
#1	Discarded	99.00'	0.027 in/hr Exfiltration over Surface area
#2	Primary	99.50'	90.0 deg x 10.0' long x 0.50' rise Overflow weir Cv= 2.50 (C= 3.13)

Discarded OutFlow Max=0.00 cfs @ 12.55 hrs HW=99.52' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)**Primary OutFlow** Max=0.08 cfs @ 12.55 hrs HW=99.52' (Free Discharge)
↑**2=Overflow weir** (Weir Controls 0.08 cfs @ 0.43 fps)

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Summary for Pond SF-1: Sand Filter

Inflow Area = 4.051 ac, 17.81% Impervious, Inflow Depth = 0.23" for WQ event
 Inflow = 0.68 cfs @ 12.08 hrs, Volume= 0.076 af
 Outflow = 0.08 cfs @ 13.64 hrs, Volume= 0.075 af, Atten= 88%, Lag= 93.6 min
 Primary = 0.08 cfs @ 13.64 hrs, Volume= 0.075 af
 Routed to Pond I-1 : Infiltration Basin
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond D-1 : Detention Basin

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 101.57' @ 13.64 hrs Surf.Area= 4,012 sf Storage= 1,378 cf
 Flood Elev= 103.00' Surf.Area= 5,126 sf Storage= 5,240 cf

Plug-Flow detention time= 219.1 min calculated for 0.075 af (98% of inflow)
 Center-of-Mass det. time= 208.3 min (1,040.0 - 831.8)

Volume	Invert	Avail.Storage	Storage Description
#1	101.50'	4,002 cf	Sand filter Basin (Prismatic) Listed below (Recalc)
#2	99.50'	1,238 cf	12" Sand Media/4" Loam/8" Stone (Prismatic) Listed below (Recalc)
			3,750 cf Overall x 33.0% Voids
			5,240 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.50	2,085	0	0
103.00	3,251	4,002	4,002

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.50	1,875	0	0
101.50	1,875	3,750	3,750

Device	Routing	Invert	Outlet Devices
#1	Primary	99.50'	6.0" Round 6" PVC L= 112.0' Ke= 0.500 Inlet / Outlet Invert= 99.50' / 99.00' S= 0.0045 ' /' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Device 1	99.60'	1.5" Vert. 1.5" Orifice Plate C= 0.600 Limited to weir flow at low heads
#3	Device 2	99.50'	8.270 in/hr Filtration through sand to outlet over Surface area
#4	Secondary	102.17'	90.0 deg x 10.0' long x 0.83' rise Overflow weir Cv= 2.50 (C= 3.13)

Primary OutFlow Max=0.08 cfs @ 13.64 hrs HW=101.57' (Free Discharge)
 ↑1=6" PVC (Passes 0.08 cfs of 0.87 cfs potential flow)
 ↑2=1.5" Orifice Plate (Orifice Controls 0.08 cfs @ 6.64 fps)
 ↑3=filtration through sand to outlet (Passes 0.08 cfs of 0.77 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=99.50' (Free Discharge)
 ↑4=Overflow weir (Controls 0.00 cfs)

Summary for Link D-PR: Discard

Inflow Area = 0.753 ac, 34.56% Impervious, Inflow Depth = 0.38" for WQ event
 Inflow = 0.24 cfs @ 12.11 hrs, Volume= 0.024 af
 Primary = 0.24 cfs @ 12.11 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

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

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Summary for Link PR:

Inflow Area = 11.830 ac, 9.34% Impervious, Inflow Depth = 0.14" for WQ event
Inflow = 0.28 cfs @ 12.47 hrs, Volume= 0.134 af
Primary = 0.28 cfs @ 12.47 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link R3:

Inflow Area = 0.672 ac, 26.67% Impervious, Inflow Depth = 0.31" for WQ event
Inflow = 0.17 cfs @ 12.15 hrs, Volume= 0.017 af
Primary = 0.17 cfs @ 12.15 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.020 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link R4:

Inflow Area = 0.081 ac, 100.00% Impervious, Inflow Depth = 0.99" for WQ event
Inflow = 0.09 cfs @ 12.07 hrs, Volume= 0.007 af
Primary = 0.09 cfs @ 12.07 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
Routed to Link D-PR : Discard
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1.010 :

Primary outflow = Inflow below 2.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs



APPENDIX H RIDEM APPENDIX "A" CHECKLIST
