DiPrete Engineering

Stormwater Management Report

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Champagne Heights

Located in South Kingstown, Rhode Island

Applicant: SKHA Services & Development Corporation

09-24-2024

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Executive Summary

On behalf of the Client, we are submitting drainage calculations for the proposed development at 364 Curtis Corner Road in South Kingstown, Rhode Island. The site is located on Assessors' Plat 48-1 Lot 8. The site exists today as an existing housing development with an open grassed field. The client proposes to demolish the buildings and construct 35 new apartment buildings with two or three apartments each and new maintenance building.

The post development stormwater will be treated for water quality using Best Management Practices (BMPs). The Site has been designed to meet the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM).

To mitigate post-development flows, the runoff is routed to underground infiltration StormTech chamber systems via an onsite drainage pipe network.

This report details how the site will show no net increase in stormwater runoff from pre development to post development conditions, and how the proposed BMPs will provide water quality treatment for stormwater runoff.

Pre development Conditions versus Post Development Conditions Flow Rates for each watershed are summarized below:

Subwatershed (design point)	1-yr Peak Flow		2-yr Peak Flow		10-yr Peak Flow		25-yr Peak Flow		100-yr Peak Flow	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
DP-1:	1.28	0.20	1.97	0.51	11.33	2.39	16.80	4.18	27.60	8.36
DP-2:	2.00	0.22	2.85	0.44	5.88	1.32	8.33	2.12	13.38	9.97
DP-3:	0.22	0.02	0.36	0.05	0.93	0.20	1.42	0.35	2.48	0.68
DP-4:	0.22	0.10	0.38	0.17	1.05	0.54	1.63	0.88	2.92	1.62
Totals:	3.72	0.54	5.56	1.17	19.19	4.45	28.18	7.53	46.38	20.63

All flows in cubic feet per second (cfs)

APPENDIX A: STORMWATER MANAGEMENT PLAN CHECKLIST AND LID PLANNING REPORT – STORMWATER DESIGN SUMMARY

PROJECT NAME **Champagne Heights**	**(RIDEM USE ONLY)** **STW/WQC File #:** **Date Received:**
TOWN **South Kingstown**	
BRIEF PROJECT DESCRIPTION: Construct 35 new multi-family dwellings and associated parking	

Stormwater Management Plan (SMP) Elements – Minimum Standards

When submitting a SMP,[1] submit four separately bound documents: Appendix A Checklist; Stormwater Site Planning, Analysis and Design Report with Plan Set/Drawings; Soil Erosion and Sediment Control (SESC) Plan, and Post Construction Operations and Maintenance (O&M) Plan. Please refer to Suggestions to Promote Brevity**.**

Note**: All stormwater construction projects must create a Stormwater Management Plan (SMP). However, not every element listed below is required per the** RIDEM Stormwater Rules **and the** RIPDES Construction General Permit (CGP)**. This checklist will help identify the required elements to be submitted with an Application for Stormwater Construction Permit & Water Quality Certification.**

PART 1. PROJECT AND SITE INFORMATION

PROJECT TYPE (Check all that apply)

☒ Residential	☐ Commercial	☐ Federal	☐ Retrofit	☐ Restoration
☐ Road	☐ Utility	☐ Fill	☐ Dredge	☐ Mine
☐ Other (specify):				

SITE INFORMATION

☒ Vicinity Map

INITIAL DISCHARGE LOCATION(S): The WQv discharges to: (You may choose more than one answer if several discharge points are associated with the project.)

☒ **Groundwater**	☐ **Surface Water**	☐ **MS4**
☐ GAA	☐ Isolated Wetland	☐ RIDOT
☒ GA	☐ Named Waterbody	☐ RIDOT Alteration Permit is Approved
☐ GB	☐ Unnamed Waterbody Connected to Named Waterbody	☐ Town
		☐ Other (specify):

ULTIMATE RECEIVING WATERBODY LOCATION(S): Include pertinent information that applies to both WQ_v and flow from larger storm events including overflows. Choose all that apply, and repeat table for each waterbody.

☒ Groundwater or Disconnected Wetland	☐ SRWP		
☐ Waterbody Name: Asa Pond	☐ Coldwater	☒ Warmwater	☐ Unassessed
☐ Waterbody ID: RI0010045L-02	☐ 4th order stream of pond 50 acres or more		
☐ TMDL for:	☐ Watershed of flood prone river (e.g., Pocasset River)		
☐ Contributes to a priority outfall listed in the TMDL	☐ Contributes stormwater to a public beach		
☐ 303(d) list – Impairment(s) for:	☐ Contributes to shellfishing grounds		

[1] Applications for a Construction General Permit that do not require any other permits from RIDEM and will disturb less than 5 acres over the entire course of the project do not need to submit a SMP. The Appendix A checklist must still be submitted.

PROJECT HISTORY		
☐ RIDEM Pre- Application Meeting	Meeting Date:	☐ Minutes Attached
☐ Municipal Master Plan Approval	Approval Date:	☐ Minutes Attached
☐ Subdivision Suitability Required	Approval #:	
☐ Previous Enforcement Action has been taken on the property	Enforcement #:	

FLOODPLAIN & FLOODWAY See Guidance Pertaining to Floodplain and Floodways	
☐ Riverine 100-year floodplain: **FEMA FLOODPLAIN FIRMETTE** has been reviewed and the 100-year floodplain is on site	
☐ Delineated from FEMA Maps	
NOTE: Per Rule 250-RICR-150-10-8-1.1(B)(5)(d)(3), provide volumetric floodplain compensation calculations for cut and fill/displacement calculated by qualified professional	
☐ Calculated by Professional Engineer	
☐ Calculations are provided for cut vs. fill/displacement volumes proposed within the 100-year floodplain	Amount of Fill (CY):
	Amount of Cut (CY):
☐ Restrictions or modifications are proposed to the flow path or velocities in a floodway	
☐ Floodplain storage capacity is impacted	
☒ Project area is not within 100-year floodplain as defined by RIDEM	

CRMC JURISDICTION
☐ CRMC Assent required
☐ Property subject to a Special Area Management Plan (SAMP). If so, specify which SAMP:
☐ Sea level rise mitigation has been designed into this project

LUHPPL IDENTIFICATION - MINIMUM STANDARD 8: N/A			
1. OFFICE OF Land Revitalization and Sustainable Materials Management (OLRSMM)			
	☐ Known or suspected releases of HAZARDOUS MATERIAL are present at the site (Hazardous Material is defined in Rule 1.4(A)(33) of 250-140-30-1 of the RIDEM Rules and Regulations for Investigation and Remediation of Hazardous Materials (the Remediation Regulations))		**RIDEM CONTACT:**
	☐ Known or suspected releases of PETROLEUM PRODUCT are present at the site (Petroleum Product as defined in Rule 1.5(A)(84) of 250-140-25-1 of the RIDEM Rules and Regulations for Underground Storage Facilities Used for Regulated Substances and Hazardous Materials)		
	☐ This site is identified on the RIDEM Environmental Resources Map as one of the following regulated facilities		**SITE ID#**:
		☐ CERCLIS/Superfund (NPL)	
		☐ State Hazardous Waste Site (SHWS)	
		☐ Environmental Land Usage Restriction (ELUR)	
		☐ Leaking Underground Storage Tank (LUST)	
		☐ Closed Landfill	
Note: If any boxes in 1 above are checked, the applicant must contact the RIDEM OLRSMM Project Manager associated with the Site to determine if subsurface infiltration of stormwater is allowable for the project. Indicate if the infiltration corresponds to "Red," "Yellow" or "Green" as described in Section 3.2.8 of the RISDISM Guidance (Subsurface Contamination Guidance). Also, note and reference approval in PART 3, Minimum Standard 2: Groundwater Recharge/Infiltration**.**			
2. PER MINIMUM STANDARD 8 of RICR 8.14.C.1-6 "LUHPPLS," THE SITE IS/HAS:			
	☐ Industrial Site with RIPDES MSGP, except where No Exposure Certification exists. http://www.dem.ri.gov/programs/water/permits/ripdes/stormwater/status.php		
	☐ Auto Fueling Facility (e.g., gas station)		
	☐ Exterior Vehicles Service, Maintenance, or Equipment Cleaning Area		

	☐ Road Salt Storage and Loading Areas (exposed to rainwater)	
	☐ Outdoor Storage and Loading/Unloading of Hazardous Substances	
3.	**STORMWATER INDUSTRIAL PERMITTING**	
	☐ The site is associated with existing or proposed activities that are considered Land Uses with Higher Potential Pollutant Loads (LUHPPLS) (see RICR 8.14.C)	Activities: Sector:
	☐ Construction is proposed on a site that is subject to THE MULTI-SECTOR GENERAL PERMIT (MSGP) UNDER RULE 31(B)15 OF THE RIPDES REGULATIONS.	MSGP permit #
	☐ Additional stormwater treatment is required by the MSGP Explain:	

REDEVELOPMENT STANDARD – MINIMUM STANDARD 6		
☒ Pre Construction Impervious Area		
	☐ Total Pre-Construction Impervious Area (**TIA**) 2.67 ac	
	☐ Total Site Area (**TSA**) 10.5 ac	
	☐ Jurisdictional Wetlands (**JW**) 0 ac	
	☐ Conservation Land (**CL**) 0 ac	
☒ Calculate the Site Size (defined as contiguous properties under same ownership)		
	☐ Site Size (**SS**) = (**TSA**) – (**JW**) – (**CL**) 10.5 ac	
	☐ (**TIA**) / (**SS**) = 0.25	☒ (**TIA**) / (**SS**) >**0.4**? NO
☐ YES, Redevelopment		

PART 2. LOW IMPACT DEVELOPMENT ASSESSMENT – MINIMUM STANDARD 1

(NOT REQUIRED FOR REDEVELOPMENT OR RETROFITS)

This section may be deleted if not required.

Note: A written description must be provided specifying why each method is not being used or is not applicable at the Site. Appropriate answers may include:

- Town requires … (state the specific local requirement)
- Meets Town's dimensional requirement of …
- Not practical for site because …
- Applying for waiver/variance to achieve this (pending/approved/denied)
- Applying for wavier/variance to seek relief from this (pending/approved/denied)

A) PRESERVATION OF UNDISTURBED AREAS, BUFFERS, AND FLOODPLAINS	**IF NOT IMPLEMENTED, EXPLAIN HERE**
☒ Sensitive resource areas and site constraints are identified (required) ☒ Local development regulations have been reviewed (required) ☒ All vegetated buffers and coastal and freshwater wetlands will be protected during and after construction ☐ Conservation Development or another site design technique has been incorporated to protect open space and pre-development hydrology. **Note:** If Conservation Development has been used, check box and skip to Subpart C ☐ As much natural vegetation and pre-development hydrology as possible has been maintained	

B) LOCATE DEVELOPMENT IN LESS SENSITIVE AREAS AND WORK WITH THE NATURAL LANDSCAPE CONDITIONS, HYDROLOGY, AND SOILS ☐ Development sites and building envelopes have been appropriately distanced from wetlands and waterbodies ☒ Development and stormwater systems have been located in areas with greatest infiltration capacity (e.g., soil groups A and B) ☒ Plans show measures to prevent soil compaction in areas designated as Qualified Pervious Areas (QPA's) ☒ Development sites and building envelopes have been positioned outside of floodplains ☐ Site design positions buildings, roadways and parking areas in a manner that avoids impacts to surface water features ☐ Development sites and building envelopes have been located to minimize impacts to steep slopes (≥15%) ☐ Other (describe):	
C) MINIMIZE CLEARING AND GRADING ☒ Site clearing has been restricted to minimum area needed for building footprints, development activities, construction access, and safety. ☐ Site has been designed to position buildings, roadways, and parking areas in a manner that minimizes grading (cut and fill quantities) ☐ Protection for stands of trees and individual trees and their root zones to be preserved has been specified, and such protection extends at least to the tree canopy drip line(s) ☐ Plan notes specify that public trees removed or damaged during construction shall be replaced with equivalent	
D) REDUCE IMPERVIOUS COVER ☒ Reduced roadway widths (≤22 feet for ADT ≤ 400; ≤ 26 feet for ADT 400 - 2,000) ☐ Reduced driveway areas (length minimized via reduced ROW width (≤ 45 ft.) and/or reduced (or absolute minimum) front yard setback; width minimized to ≤ 9 ft. wide one lane; ≤ 18 ft. wide two lanes; shared driveways; pervious surface) ☐ Reduced building footprint: Explain approach: ☐ Reduced sidewalk area (≤ 4 ft. wide; one side of the street; unpaved path; pervious surface) ☐ Reduced cul-de-sacs (radius < 45 ft; vegetated island; alternative turn-around) ☐ Reduced parking lot area: Explain approach ☐ Use of pervious surfaces for driveways, sidewalks, parking areas/overflow parking areas, etc. ☐ Minimized impervious surfaces (project meets or is less than maximum specified by Zoning Ordinance) ☐ Other (describe):	
E) DISCONNECT IMPERVIOUS AREA ☒ Impervious surfaces have been disconnected, and runoff has been diverted to QPAs to the maximum extent possible ☐ Residential street edges allow side-of-the-road drainage into vegetated open swales ☐ Parking lot landscaping breaks up impervious expanse AND accepts runoff ☐ Other (describe):	
F) MITIGATE RUNOFF AT THE POINT OF GENERATION ☒ Small-scale BMPs have been designated to treat runoff as close as possible to the source	

G) PROVIDE LOW-MAINTENANCE NATIVE VEGETATION ☒ Low-maintenance landscaping has been proposed using native species and cultivars ☐ Plantings of native trees and shrubs in areas previously cleared of native vegetation are shown on site plan ☐ Lawn areas have been limited/minimized, and yards have been kept undisturbed to the maximum extent practicable on residential lots	
H) RESTORE STREAMS/WETLANDS ☐ Historic drainage patterns have been restored by removing closed drainage systems, daylighting buried streams, and/or restoring degraded stream channels and/or wetlands ☐ Removal of invasive species ☐ Other	No historic drainage patterns or invasive species are found on the site.

PART 3. SUMMARY OF REMAINING STANDARDS

GROUNDWATER RECHARGE – MINIMUM STANDARD 2		
YES	**NO**	
☒	☐	The project has been designed to meet the groundwater recharge standard.
☐	☐	If "No," the justification for groundwater recharge criterion waiver has been explained in the Narrative (e.g., threat of groundwater contamination or physical limitation), if applicable (see RICR 8.8.D);
☐	☐	Your waiver request has been explained in the Narrative, if applicable.
☐	☒	Is this site identified as a Regulated Facility in Part 1, Minimum Standard 8: LUHPPL Identification?
☐	☐	If "Yes," has approval for infiltration by the OLRSMM Site Project Manager, per Part 1, Minimum Standard 8, been requested?

TABLE 2-1: Summary of Recharge (see RISDISM Section 3.3.2)
(Add or Subtract Rows as Necessary)

Design Point	**Impervious Area Treated (sq ft)**	**Total Re_v Required (cu ft)**	**LID Stormwater Credits (see RISDISM Section 4.6.1)** **Portion of Re_v directed to a QPA (cu ft)**	**Recharge Required by Remaining BMPs (cu ft)**	**Recharge Provided by BMPs (cu ft)**
DP-1:	154,550	4,507		4,507	12,879
DP-2:	31,668	924		924	2,639
DP-3:	0	0		0	0
DP-4:	0	0		0	0
TOTALS:	186,218	5,431		5,431	15,518

Notes:
1. Only BMPs listed in RISDISM Table 3-5 "List of BMPs Acceptable for Recharge" may be used to meet the recharge requirement.
2. Recharge requirement must be satisfied for each waterbody ID.

☒ Indicate where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.):

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WATER QUALITY – MINIMUM STANDARD 3		
YES	**NO**	
☒	☐	Does this project meet or exceed the required water quality volume WQv (see RICR 8.9.E-I)?
☒	☐	Is the proposed final impervious cover greater than 20% of the disturbed area (see RICR 8.9.E-I)?
☒	☐	If "Yes," either the Modified Curve Number Method or the Split Pervious/Impervious method in Hydro-CAD was used to calculate WQv; or,
☐	☐	If "Yes," either TR-55 or TR-20 was used to calculate WQv; and,
☐	☐	If "No," the project meets the minimum WQv of 0.2 watershed inches over the entire disturbed area.
☐	☐	Not Applicable
☒	☐	Does this project meet or exceed the ability to treat required water quality flow WQf (see RICR 8.9.I.1-3)?
☐	☒	Does this project propose an increase of impervious cover to a receiving water body with impairments? If "Yes," please indicate below the method that was used to address the water quality requirements of no further degradation to a low-quality water.
☐	☒	RICR 8.36. A Pollutant Loading Analysis is needed and has been completed.
☒	☐	The Water Quality Guidance Document (Water Quality Goals and Pollutant Loading Analysis Guidance for Discharges to Impaired Waters) has been followed as applicable.
☒	☐	BMPs are proposed that are on the approved technology list . If "Yes," please provide all required worksheets from the manufacturer.
☐	☒	Additional pollutant-specific requirements and/or pollutant removal efficiencies are applicable to the site as the result of a TMDL, SAMP, or other watershed-specific requirements. If "Yes," please describe:

TABLE 3-1: Summary of Water Quality (see RICR 8.9)

Design Point and WB ID	Impervious area treated (sq ft)	Total WQ_v Required (cu ft)	LID Stormwater Credits (see RICR 8.18) WQv directed to a QPA (cu ft)	Water Quality Treatment Remaining (cu ft)	Water Quality Provided by BMPs (cu ft)
DP-1:	154,550	12,879		12,879	12,879
DP-2:	31,668	2,639		2,639	2,639
DP-3:	0	0		0	0
DP-4:	0	0		0	0
TOTALS:	186,218	15,518		15,518	15,518

Notes:
1. Only BMPs listed in RICR 8.20 and 8.25 or the Approved Technologies List of BMPs is Acceptable for Water Quality treatment.
2. For each Design Point, the Water Quality Volume Standard must be met for each Waterbody ID.

☐ YES ☐ NO	This project has met the setback requirements for each BMP. If "No," please explain:

☐ Indicate where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.):

CONVEYANCE AND NATURAL CHANNEL PROTECTION (RICR 8.10) – MINIMUM STANDARD 4		
YES	**NO**	
☐	☒	Is this standard waived? If "Yes," please indicate one or more of the reasons below:
		☐ The project directs discharge to a large river (i.e., 4th-order stream or larger. See RISDISM Appendix I for State-wide list and map of stream orders), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters. ☐ The project is a small facility with impervious cover of less than or equal to 1 acre. ☐ The project has a post-development peak discharge rate from the facility that is less than 2 cfs for the 1-year, 24-hour Type III design storm event (prior to any attenuation). (Note: LID design strategies can greatly reduce the peak discharge rate).
☒	☐	Conveyance and natural channel protection for the site have been met. If "No,' explain why: The 1-year storm is fully infiltrated

TABLE 4-1: Summary of Channel Protection Volumes (see RICR 8.10)					
Design Point	**Receiving Water Body Name**	**Coldwater Fishery? (Y/N)**	**Total CPv Required (cu ft)**	**Total CPv Provided (cu ft)**	**Average Release Rate Modeled in the 1-yr storm (cfs)**
DP-1:					
DP-2:					
DP-3:					
DP-4:					
TOTALS:					
Note: The Channel Protection Volume Standard must be met in each waterbody ID.					
☐ YES ☐ NO	The CPv is released at roughly a uniform rate over a 24-hour duration (see examples of sizing calculations in Appendix D of the RISDISM).				
☐ YES ☐ NO	Do additional design restrictions apply resulting from any discharge to cold-water fisheries; If "Yes," please indicate restrictions and solutions below.				
☒ Indicate below where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.). Stormwater Management Report					

OVERBANK FLOOD PROTECTION (RICR 8.11) AND OTHER POTENTIAL HIGH FLOWS – MINIMUM STANDARD 5			
YES	**NO**		
☐	☒	Is this standard waived? If yes, please indicate one or more of the reasons below:	
		☐	The project directs discharge to a large river (i.e., 4th-order stream or larger. See Appendix I for state-wide list and map of stream orders), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters.
		☐	A Downstream Analysis (see RICR 8.11.D and E) indicates that peak discharge control would not be beneficial or would exacerbate peak flows in a downstream tributary of a particular site (e.g., through coincident peaks).
☐	☒	Does the project flow to an MS4 system or subject to other stormwater requirements? If "Yes," indicate as follows:	
		☐	RIDOT
		☐	Other (specify):
Note: The project could be approved by RIDEM but not meet RIDOT or Town standards. RIDOT's regulations indicate that post-volumes must be **less** than pre-volumes for the 10-yr storm at the design point entering the RIDOT system. If you have not already received approval for the discharge to an MS4, please explain below your strategy to comply with RIDEM and the MS4.			
		Indicate below which model was used for your analysis. ☐ TR-55 ☐ TR-20 ☒ HydroCAD ☐ Bentley/Haestad ☐ Intellisolve ☐ Other (Specify):	
YES	**NO**		
☒	☐	Does the drainage design demonstrate that flows from the 100-year storm event through a BMP will safely manage and convey the 100-year storm? If "No," please explain briefly below and reference where in the application further documentation can be found (i.e., name of report/document, page numbers, appendices, etc.):	
☒	☐	Do off-site areas contribute to the sub-watersheds and design points? If "Yes,"	
☒	☐	Are the areas modeled as "present condition" for both pre- and post-development analysis?	
☒	☐	Are the off-site areas shown on the subwatershed maps?	
☒	☐	Does the drainage design confirm safe passage of the 100-year flow through the site for off-site runoff?	
☐	☒	Is a Downstream Analysis required (see RICR 8.11.E.1)?	
☒	☐	Calculate the following:	
		☒	Area of disturbance within the sub-watershed (areas) 9.65
		☒	Impervious cover (%) 46%
☐	☒	Is a dam breach analysis required (earthen embankments over six (6) feet in height, or a capacity of 15 acre-feet or more, and contributes to a significant or high hazard dam)?	
☒	☐	Does this project meet the overbank flood protection standard?	

Table 5-1 Hydraulic Analysis Summary								
Subwatershed (Design Point)	**1.2" Peak Flow** (cfs) **		**1-yr Peak Flow** (cfs)		**10-yr Peak Flow** (cfs)		**100-yr Peak Flow** (cfs)	
	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)
DP-1:	0.60	0.00	1.28	0.20	11.33	2.39	27.60	8.36
DP-2:	0.96	0.12	2.00	0.44	5.88	1.32	13.38	9.97
DP-3:	0.10	0.00	0.22	0.02	0.93	0.20	2.48	0.68
DP-4:	0.10	0.04	0.22	0.10	1.05	0.54	2.92	1.62
TOTALS:	1.76	0.16	3.72	0.76	19.19	4.45	46.38	20.63

** Utilize modified curve number method or split pervious /impervious method in HydroCAD.

Note: The hydraulic analysis must demonstrate no impact to each individual subwatershed DP unless each DP discharges to the same wetland or water resource.

Indicate as follows where the pertinent calculations and/or information for the items above are provided	**Name of report/document, page numbers, appendices, etc.**
Existing conditions analysis for each subwatershed, including curve numbers, times of concentration, runoff rates, volumes, and water surface elevations showing methodologies used and supporting calculations.	Stormwater Management Report
Proposed conditions analysis for each subwatershed, including curve numbers, times of concentration, runoff rates, volumes, water surface elevations, and routing showing the methodologies used and supporting calculations.	Stormwater Management Report
Final sizing calculations for structural stormwater BMPs, including contributing drainage area, storage, and outlet configuration.	Stormwater Management Report
Stage-storage, inflow and outflow hydrographs for storage facilities (e.g., detention, retention, or infiltration facilities).	Stormwater Management Report

Table 5-2 Summary of Best Management Practices											
BMP ID	**DP #**	**BMP Type** (e.g., bioretention, tree filter)	**BMP Functions**					**Bypass Type**	**Horizontal Setback Criteria are met per RICR 8.21.B.10, 8.22.D.11, and 8.35.B.4**		
			Pre-Treatment (Y/N/NA)	Re_v	WQ_v	CP_v (Y/N/NA)	Overbank Flood Reduction (Y/N/NA)	External (E) Internal (I) or NA	Yes/No	Technical Justification (Design Report page number)	Distance Provided
A	1	Underground Infiltration	Y	Y	Y	NA	NA	I	Y		
B	1	Underground Infiltration	N	Y	Y	NA	NA	NA	Y		
C	1	Underground Infiltration	N	Y	Y	NA	NA	NA	Y		
D	1	Underground Infiltration	Y	Y	Y	NA	NA	I	Y		
E	2	Underground Infiltration	N	Y	Y	NA	NA	NA	Y		
F	2	Underground Infiltration	Y	Y	Y	NA	NA	I	Y		

Table 5.3 Summary of Soils to Evaluate Each BMP									
DP #	**BMP ID**	**BMP Type** (e.g., bioretention, tree filter)	**Soils Analysis for Each BMP**						
			Test Pit ID# and Ground Elevation		SHWT Elevation (ft)	Bottom of Practice Elevation* (ft)	Separation Distance Provided (ft)	Hydrologic Soil Group (A, B, C, D)	Exfiltration Rate Applied (in/hr)
			Primary	Secondary					
1	A	Underground Infiltration	23-5	24-5	133.50	137.92	4.42	B	14.7
1	B	Underground Infiltration	23-6	23-7	137.92	142.15	4.23	B	8.27
1	C	Underground Infiltration	24-2	24-5	136.50	140.55	4.05	B	8.27
1	D	Underground Infiltration	24-2	23-6	139.50	143.92	4.42	B	8.27
2	E	Underground Infiltration	24-6	24-1	143.50	147.92	4.42	B	1.12
2	F	Underground Infiltration	24-6	24-1	136.50	140.52	4.02	B	1.12
* For underground infiltration systems (UICs) bottom equals bottom of stone, for surface infiltration basins bottom equals bottom of basin, for filters bottom equals interface of storage and top of filter layer									

LAND USES WITH HIGHER POTENTIAL POLLUTANTS LOADS (LUHPPLs) – MINIMUM STANDARD 8			
YES	**NO**	**N/A**	
☐	☐	☒	Describe any LUHPPLs identified in Part 1, Minimum Standard 8, Section 2. If not applicable, continue to Minimum Standard 9.
☐	☐	☒	Are these activities already covered under an MSGP? If "No," please explain if you have applied for an MSGP or intend to do so?
☐	☐	☒	List the specific BMPs that are proposed for this project that receive stormwater from LUHPPL drainage areas. These BMP types must be listed in RISDISM Table 3-3, "Acceptable BMPs for Use at LUHPPLs." Please list BMPs:
☐	☐	☒	Additional BMPs, or additional pretreatment BMP's if any, that meet RIPDES MSGP requirements; Please list BMPs:
			Indicate below where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.).

ILLICIT DISCHARGES – MINIMUM STANDARD 9			
Illicit discharges are defined as unpermitted discharges to Waters of the State that do not consist entirely of stormwater or uncontaminated groundwater, except for certain discharges identified in the RIPDES Phase II Stormwater General Permit.			
YES	**NO**	**N/A**	
☒	☐	☐	Have you checked for illicit discharges?
☐	☒	☐	Have any been found and/or corrected? If "Yes," please identify.

☒	☐	☐	Does your report explain preventative measures that keep non-stormwater discharges out of the Waters of the State (during and after construction)?

SOIL EROSION AND SEDIMENT CONTROL (SESC) – MINIMUM STANDARD 10				
YES	**NO**	**N/A**		
☒	☐	☐	Have you included a Soil Erosion and Sediment Control Plan Set and/or Complete Construction Plan Set?	
☒	☐	☐	Have you provided a **separately-bound** document based upon the SESC Template? If yes, proceed to Minimum Standard 11 (the following items can be assumed to be addressed).	
			If "No," include a document with your submittal that addresses the following elements of an SESC Plan:	
			☐	Soil Erosion and Sediment Control Plan Project Narrative, including a description of how the fifteen (15) Performance Criteria have been met:
			☐	Provide Natural Buffers and Maintain Existing Vegetation
			☐	Minimize Area of Disturbance
			☐	Minimize the Disturbance of Steep Slopes
			☐	Preserve Topsoil
			☐	Stabilize Soils
			☐	Protect Storm Drain Inlets
			☐	Protect Storm Drain Outlets
			☐	Establish Temporary Controls for the Protection of Post-Construction Stormwater Control Measures
			☐	Establish Perimeter Controls and Sediment Barriers
			☐	Divert or Manage Run-On from Up-Gradient Areas
			☐	Properly Design Constructed Stormwater Conveyance Channels
			☐	Retain Sediment On-Site
			☐	Control Temporary Increases in Stormwater Velocity, Volume, and Peak Flows
			☐	Apply Construction Activity Pollution Prevention Control Measures
			☐	Install, Inspect, and Maintain Control Measures and Take Corrective Actions
			☐	Qualified SESC Plan Preparer's Information and Certification
			☐	Operator's Information and Certification; if not known at the time of application, the Operator must certify the SESC Plan upon selection and prior to initiating site activities
			☐	Description of Control Measures, such as Temporary Sediment Trapping and Conveyance Practices, including design calculations and supporting documentation, as required

STORMWATER MANAGEMENT SYSTEM OPERATION, MAINTENANCE, AND POLLUTION PREVENTION PLAN – MINIMUM STANDARDS 7 AND 9		
Operation and Maintenance Section		
YES	**NO**	
☒	☐	Have you minimized all sources of pollutant contact with stormwater runoff, to the maximum extent practicable?
☒	☐	Have you provided a **separately-bound** Operation and Maintenance Plan for the site and for all of the BMPs, and does it address each element of RICR 8.17 and RISDISM Appendix C and E?
☒	☐	Lawn, Garden, and Landscape Management meet the requirements of RISDISM Section G.7? If "No," why not?
☒	☐	Is the property owner or homeowner's association responsible for the stormwater maintenance of all BMP's? If "No," you must provide a legally binding and enforceable maintenance agreement (see RISDISM Appendix E, page 26) that identifies the entity that will be responsible for maintenance of the stormwater. Indicate where this agreement can be found in your report (i.e., name of report/document, page numbers, appendices, etc.).

☐	☒	Do you anticipate that you will need legal agreements related to the stormwater structures? (e.g. off-site easements, deed restrictions, covenants, or ELUR per the Remediation Regulations). If "Yes," have you obtained them? Or please explain your plan to obtain them:
☐	☒	Is stormwater being directed from public areas to private property? If "Yes," note the following: Note: This is not allowed unless a funding mechanism is in place to provide the finances for the long-term maintenance of the BMP and drainage, or a funding mechanism is demonstrated that can guarantee the long-term maintenance of a stormwater BMP by an individual homeowner.
Pollution Prevention Section		
☒	☐	Designated snow stockpile locations?
☐	☒	Trash racks to prevent floatables, trash, and debris from discharging to Waters of the State?
☒	☐	Asphalt-only based sealants?
☐	☒	Pet waste stations? (Note: If a receiving water has a bacterial impairment, and the project involves housing units, then this could be an important part of your pollution prevention plan).
☒	☐	Regular sweeping? Please describe:
☒	☐	De-icing specifications, in accordance with RISDISM Appendix G. (NOTE: If the groundwater is GAA, or this area contributes to a drinking water supply, then this could be an important part of your pollution prevention plan).
☒	☐	A prohibition of phosphate-based fertilizers? (Note: If the site discharges to a phosphorus impaired waterbody, then this could be an important part of your pollution prevention plan).

PART 4. SUBWATERSHED MAPPING AND SITE-PLAN DETAILS

Existing and Proposed Subwatershed Mapping (REQUIRED)			
YES	**NO**		
☒	☐		Existing and proposed drainage area delineations
☒	☐		Locations of all streams and drainage swales
☒	☐		Drainage flow paths, mapped according to the DEM *Guidance for Preparation of Drainage Area Maps* (included in RISDISM Appendix K)
☒	☐		Complete drainage area boundaries; include off-site areas in both mapping and analyses, as applicable
☒	☐		Logs of borings and/or test pit investigations along with supporting soils/geotechnical report
☒	☐		Mapped seasonal high-water-table test pit locations
☒	☐		Mapped locations of the site-specific borings and/or test pits and soils information from the test pits at the locations of the BMPs
☒	☐		Mapped locations of the BMPs, with the BMPs consistently identified on the Site Construction Plans
☒	☐		Mapped bedrock outcrops adjacent to any infiltration BMP
☒	☐		Soils were logged by a:
		☒	DEM-licensed Class IV soil evaluator Name: Allison Drake D-4105
		☐	RI-registered P.E. Name:

Subwatershed and Impervious Area Summary				
Subwatershed (area to each design point)	**First Receiving Water ID or MS4**	**Area Disturbed (acres)**	**Existing Impervious (acres)**	**Proposed Impervious (acres)**
DP-1:	Asa Pond	8.91	1.613	3.55
DP-2:	Curtis Corner Road	2.05	0.873	0.84
DP-3:	NW Abutter	0.45	0.093	0
DP-4:	NE Abutter	0.57	0.091	0.04
TOTALS:		11.99	2.67	4.43

Site Construction Plans (Indicate that the following applicable specifications are provided)		
YES	**NO**	
☒	☐	Existing and proposed plans (scale not greater than 1" = 40') with North arrow
☒	☐	Existing and proposed site topography (with 1 or 2-foot contours); 10-foot contours accepted for off-site areas
☒	☐	Boundaries of existing predominant vegetation and proposed limits of clearing
☒	☐	Site Location clarification
☒	☐	Location and field-verified boundaries of resource protection areas such as: ► freshwater and coastal wetlands, including lakes and ponds ► coastal shoreline features Perennial and intermittent streams, in addition to Areas Subject to Storm Flowage (ASSFs)
☒	☐	All required setbacks (e.g., buffers, water-supply wells, septic systems)
☒	☐	Representative cross-section and profile drawings, and notes and details of structural stormwater management practices and conveyances (i.e., storm drains, open channels, swales, etc.), which include: ► Location and size of the stormwater treatment practices (type of practice, depth, area). Stormwater treatment practices (BMPs) must have labels that correspond to RISDISM Table 5-2; ► Design water surface elevations (applicable storms); ► Structural details of outlet structures, embankments, spillways, stilling basins, grade-control structures, conveyance channels, etc.; ► Existing and proposed structural elevations (e.g., inverts of pipes, manholes, etc.); ► Location of floodplain and, if applicable, floodway limits and relationship of site to upstream and downstream properties or drainage that could be affected by work in the floodplain; ► Planting plans for structural stormwater BMPs, including species, size, planting methods, and maintenance requirements of proposed planting
☒	☐	Logs of borings and/or test pit investigations along with supporting soils/geotechnical report and corresponding water tables
☐	☒	Mapping of any OLRSMM-approved remedial actions/systems (including ELURs)
☒	☐	Location of existing and proposed roads, buildings, and other structures including limits of disturbance; ► Existing and proposed utilities (e.g., water, sewer, gas, electric) and easements; ► Location of existing and proposed conveyance systems, such as grass channels, swales, and storm drains, and location(s) of final discharge point(s) (wetland, waterbody, etc.); ► Cross sections of roadways, with edge details such as curbs and sidewalks; ► Location and dimensions of channel modifications, such as bridge or culvert crossings
☐	☒	Locations, cross sections, and profiles of all stream or wetland crossings and their method of stabilization

1.0 Project Description

The purpose of this report is to specify a Stormwater Management System to be implemented in the new Project at 364 Curtis Corner Road. The 10.5 acre site is located on Assessor's Plat 48-1 Lot 8 in South Kingstown, Rhode Island. The site is located west of the intersection to Kingstown Road (Route 108) and west of the Curtis Corner Middle School. There is a manmade perimeter berm that is wooded along the westerly and rear lot lines on the adjacent properties.

The proposed development includes 35 buildings with a total of 85 units, a new maintenance building, infrastructure and parking. The intent of the stormwater design is to capture and treat the new impervious runoff areas and route to a series of underground infiltration systems. The entrance to the site and sidewalk will remain as it exists today to maintain the entrance to the community building that will remain. The proposed road will begin approximately 250 feet from Curtis Corner Road.

The stormwater quality will be improved by utilizing Best Management Practices (BMPs) as established by the RISDISM for the treatment of stormwater runoff from the proposed development. BMPs will consist of Proprietary Structures and underground StormTech chamber systems designed to treat water quality. The system has been designed to meet the RIDEM Stormwater Design and Installations Standards Manual.

2.0 Site Conditions

2.1 SOILS

There are the following soil types within the analyzed area of the Site as mapped by the NRCS USDA Soil Conservation service:

Soil Symbol	Description	Hydrologic Group
BmA	Bridgehampton silt loam, till substratum, 0 to 3 percent slopes	B
BmB	Bridgehampton silt loam, till substratum, 3 to 8 percent slopes	B
BnB	Bridgehampton-Charlton complex, very stony, 0 to 8 percent slopes	B
CdB	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B
ChB	Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes	B
NbB	Narragansett very stony silt loam, 0 to 8 percent slopes	B

Site specific soil evaluations can be found in Appendix A2.1.

2.2 EXISTING SITE CONDITIONS

Currently the site is an existing housing development for the South Kingstown Housing Authority with nine existing multi-apartment buildings and infrastructure. An existing wooded berm is located along the western and rear properly line. A large, grassed field and walking path are located at the rear of the development.

Approximately half of the stormwater from the site travels overland to an existing depression in the grassed field or to a rip rapped waterway at the end of the roadway and discharges directly the abutting properties (DP-1). The remainder of the stormwater runoff from the site travels overland to Curtis Corner Road (DP-2) with a small portion discharging to the northeast abutters (DP-4) and northwest abutters (DP-3). None of the stormwater runoff is detained or treated prior to discharge.

The ultimate discharge, receiving water and overall watershed is for Asa Pond (RI0010045L-02). There are no TMDLs listed for Asa Pond.

2.3 POST SITE CONDITIONS

The proposed development will consist of 35 buildings, a new maintenance building, roadway and parking. The stormwater will be collected via onsite pipe networks, treated through proprietary structures and underground infiltration StormTech chamber systems. The proposed BMPs are designed to infiltrate all design storms up to and including the 100-yearstorm, but in an abundance of caution, a grassed level spreader has also been designed downstream to provide an additional layer of protection in the event of any unexpected or emergency flows. Under normal circumstances, the level spreader should see no flows other than its immediate catchment and should remain generally dry.

The proposed drainage analysis uses stormwater management systems to control and treat runoff from the proposed development. The following BMP's are used on site and have been designed to include the following elements:

- Proprietary Devices
    - Pretreatment TSS removal of runoff from roadways and sidewalks

- Underground Infiltration System
    - Provides pretreatment in isolator row
    - Fully treats and infiltrates the water quality storm volume
    - Sized to detain and infiltrate through the 100-year storm in systems A-E and through the 10-year storm in system F

The above elements will be used to meet the design standards of the Rhode Island Stormwater Design and Installation Standard.

The primary goal of increasing water quality treatment is accomplished by providing water quality BMPs. Stormwater runoff mitigation is provided through the use of underground infiltration chambers. By reducing post development stormwater flow rate to a level no greater than the pre development rate, the second goal of the proposed drainage system is achieved.

Any potential impacts from the proposed development on the abutting properties have been mitigated.

3.0 Minimum Standards

The site has been designed to meet the minimum standards as outlined in the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM). The following sections outline how the site meets and exceeds the minimum required standards.

3.1 Minimum Standard 1: LID Site Planning and Design Strategies

See "Appendix A: Stormwater Management Checklist" from the RISDISM provided at the beginning of this report.

3.2 Minimum Standard 2: Groundwater Recharge

Groundwater is to be recharged per watershed based on impervious area coverage in accordance with section 3.2.2 of the RISDISM.

Groundwater recharge is determined from the following equation:

Re_V=1"*F*I/12

Where:

Re_V=Groundwater Recharge Volume (cf)

F=Recharge Factor based on Hydrologic Soil Groups (HSG) (see table below)

I=Impervious Area (sf)

HSG	Recharge Factor (F)
A	0.60
B	0.35
C	0.25
D	0.10

Recharge volume for watersheds 1 and 2 are provided through the use of underground infiltration chamber systems A, B, C, D, E and F. See Table 2-1 of the Appendix A checklist for a summary of recharge values.

The required recharge volume is based on all impervious area, not just areas which are captured in the proposed BMPs.

See Appendix A3.2 for the water quality storm HydroCAD analysis. The water quality storm is calculated in HydroCAD using the 'calculate separate Pervious/Impervious runoff' option.

3.3 Minimum Standard 3: Water Quality

All stormwater is treated through an approved BMP before being discharged. This site has been designed to use underground infiltration StormTech chamber systems to treat stormwater before being infiltrated. There are no pollutant-specific requirements and/or pollutant removal efficiencies applicable to the site as the result of SAMP, TMDL, or other watershed-specific requirements.

The systems have been sized using HydroCAD and an infiltration rate based on a parent material within the footprint of the BMP. Amoozmeter testing was performed in some of the test holes and an infiltration rate of 29.4 in/hr was measured at System A. Half of this rate of 14.7 in/hr was used in designing system A. Pretreatment for the underground infiltration system has been provided through the use of proprietary devices (Cascade or approved equal) and the StormTech Isolator Rows.

Water Quality Underground Infiltration System

The Underground Infiltration Systems have been designed as a water quality system. The system has been sized using HydroCAD and an infiltration rate based on a parent material within the footprint of the BMP. The project site largely consists of sand and loamy sand and an infiltration rate was used from table 5-3 in section 5.3.4 of the RISDISM. Amoozmeter testing was performed on select test holes and rates from those tests were used for Systems A, D and F. See Appendix A3.2 for HydroCAD analysis for the water quality event. The underground infiltration systems have been designed to fully infiltrate the water quality event.

Pretreatment for the underground infiltration system has been provided through the use of an isolator row. The isolator row has been designed to store and infiltrate a minimum of 25% of the water quality volume. A proprietary device has been included to each of these systems to help protect the systems from damage.

Underground Infiltration System:

BMP	Total Watershed Area (acres)	Impervious (acres)	Required Isolator Row Volume (cf)	Minimum Provided Isolator Row Volume (cf)
A	4.218	2.154	1,830	4,791
D	2.408	0.912	1,045	3,746
F	1.251	0.535	784	3,746

3.4 Minimum Standard 4: Conveyance and Natural Channel Protection

3.4.1 Drainage Network Design Parameters:

A. PIPES

- All drainage pipes are HDPE or equivalent unless otherwise noted.
- Manning's coefficient = 0.012 for HDPE Pipe
- Diameters & lengths as specified
- The 25-year design storm is utilized for the drainage pipe design to ensure that the drainage system contains and channels water to the BMP areas as shown on the plans.
- The rational method has been used for the closed drainage system.

B. STRUCTURES

- Catch basins – Pre-cast concrete with 3' sump unless otherwise noted and inverts as specified
- Manholes – Pre-cast concrete with inverts as specified.

C. OPEN CHANNELS SYSTEMS (SWALES)

- All open channels systems shall be grass channels unless otherwise noted
- Manning's coefficient =0.030
- Width, depth, slope and side slopes as noted on plans.
- The 100-year design storm is utilized for the open channel design to ensure that the drainage system contains and channels water to the BMP areas as shown on the plans.
- HydroCAD has been used to model the swales. See Appendix A3.5.4.4.

3.4.2 Channel Protection Volume:

The site has been designed to fully infiltrate the channel protection volume. The channel protection required has been met. See table 4-1 of the Appendix A Checklist for a Summary of Channel Protection Volumes. See Appendix A3.5.4.2 for the 1-year storm event HydroCAD analysis.

3.5 Minimum Standard 5: Overbank Flood Protection & Downstream Analysis

3.5.1 Method of Analysis

USDA Soil Conservation Service Method as defined by Technical Release No. 20 (TR-20) determines Stormwater runoff rate and volume. Type III rainfall distribution is utilized. Time of concentration is determined using Technical Release No 55 (TR-55) methodology, through the computer program *HydroCAD ver. 10.0* by HydroCAD Software Solutions LLC.

The soils have been modeled in HydroCAD with a 1.12 – 14.7 inches/hr infiltration rate per table 5-3 in section 5.3.4 of the RISDISM and results from Amoozmeter testing. Soil evaluations have been performed by DiPrete Engineering. The existing soil has a texture of Sand and Loamy Sand. Based on table table 5-3 in section 5.3.4 of the RISDISM and Amoozmeter testing, underlying soils have the same infiltration rate or greater. The drainage system has been designed to mitigate all stormwater flows for the 10 and 100 year storm events. The emergency outlets have been sized to handle the 100-year storm event.

3.5.2 Design Storm

Analysis of 1-year, 2-year, 10-year, 25-year, and 100-year frequency storms are included. The following 24-hour rainfall intensities are obtained from the Rhode Island Stormwater Design and Installation Standards Manual, Table 3-1 for Washington County.

1 year =	2.8 inches
2 year =	3.3 inches
10 year =	4.9 inches
25 year =	6.1 inches
100 year=	8.5 inches

3.5.3 Design Point Breakdown

The site is analyzed as four watershed areas. In the pre development stage there are nine subcatchments. In the post development stage there are twelve subcatchments. Each watershed will demonstrate zero increase of runoff due to the proposed development. A description of each watershed and associated subcatchments are summarized as follows, for cover types see color watershed maps located in back of this report. Numbers in parentheses ( ) indicate the HydroCAD Node Number.

<u>Design Point 1:</u>

Watershed #1 flows to Design Point- 1 (DP-1). This watershed consists of the majority of the site, including the impervious parking and roadway areas. The design point is the abutter at AP 48-1 Lot 7.

In pre development conditions there are three watersheds to Design Point-1.

Pre-01 (10) contains about one-third of the site, including two of the existing buildings and the surrounding roadway and parking. This area flows overland and is collected in the existing depression (11) before ultimately discharging to DP-1.

Pre-02 (12) contains a portion of the existing building roofs, the roadway, parking area and part of the paved walking path. This area flows overland undetained and untreated directly to DP-1.

Pre-03 (13) contains half of two building roofs and the grassed lawns and woods. Stormwater flows overland undetained and untreated to AP 48-1 Lot 6 (14) before reaching DP-1.

In post development conditions there are five sub watersheds:

Post-01 (100) collects runoff from a portion of the new roadway and thirteen buildings. The stormwater is collected in the drainage network where it is treated and fully infiltrated through the 100-year storm in UIS A (101).

Post-02 (102) consists of five of the building roofs where it is fully infiltrated through the 100-year storm in UIS B (103).

Post-03 (104) consists of six of the building roofs where it is fully infiltrated through the 100-year storm in UIS C (105).

Post-04 (106) consists of a portion of the new roadway, six building roofs and part of the wooded offsite runoff. The stormwater is collected in the drainage network where it is treated and fully infiltrated through the 100-year storm in UIS D (107).

Post-05 (108) consists of the grassed areas surrounding the new buildings and discharges to AP 40-4 Lot 6 (110) and ultimately to DP-1.

Post-06 (109) consists of the grassed areas surrounding the new buildings, as well as the off site wooded areas and discharges to DP-1.

Below is a summary of the hydrologic parameters for the pre and post development sub-areas in Design Point-1.

	Area (acres)	CN	Tc (min)
Pre-01	5.492	65	30.8
Pre-02	2.490	72	23.3
Pre-03	0.926	63	6.0
Post-01	4.218	80	6.0
Post-02	0.221	98	6.0
Post-03	0.261	98	6.0
Post-04	2.409	74	6.0
Post-05	0.414	61	6.0
Post-06	1.624	58	6.0

Design Point 2:
Watershed #2 flows to Design Point- 2 (DP-2). This watershed consists of the road from Curtis Corner Road to the high point of the site, as well as half of three building roofs. The stormwater runs overland untreated and undetained to Curtis Corner Road (DP-2).

In pre development conditions there is only one watershed to Design Point-2.

Pre-04 (20) consists of the road from Curtis Corner Road to the high point of the site, as well as half of three building roofs and discharges to Curtis Corner Road (DP-2).

In post development conditions there are three sub watersheds:

Post-07 (200) consists of the new maintenance building, new roadway and half of the existing community building. The stormwater is collected in the drainage system to UIS F (201) where it is treated and infiltrated through the 10-year storm. Overflow from the 25 and 100-year storms discharge directly to DP-2.

Post-08 (202) consists of the remaining four buildings and discharges directly via piped roof leaders to UIS E (203). Stormwater is fully infiltrated through the 100-year storm.

Post-09 (204) consists of the existing roadway that is to remain, wooded area at the entrance and grassed area along the roadway. Stormwater discharges directly via overland flow to DP-2.

Below is a summary of the hydrologic parameters for the pre and post development sub-areas in Design Point-2.

	Area (acres)	CN	Tc (min)
Pre-04	2.048	76	6.0
Post-07	1.348	76	6.0
Post-08	0.192	98	6.0
Post-09	0.793	64	6.0

Design Point 3:
Watershed #3 flows to Design Point- 3 (DP-3). This watershed consists of two of the existing building roofs and grassed areas that flow to the NW Abutters (DP-3).

In pre development conditions there are two watersheds to Design Point-3.

Pre-05 (30) consists of one of the building roof halves and grassed area that discharges to AP 48-1 OS (32).

Pre-06 (31) consists of one of the building roof halves and grassed area that discharges to AP 39-3 Lot 19 (33).

In post development conditions there are two sub watersheds:

Post-10 (300) consists of the grassed area that discharges to AP 48-1 OS (302).

Post-11 (301) consists of the grassed are that discharges to AP 39-3 Lot 19 (303).

Below is a summary of the hydrologic parameters for the pre and post development sub-areas in Design Point-3.

	Area (acres)	CN	Tc (min)
Pre-05	0.222	68	6.0
Pre-06	0.232	68	6.0
Post-10	0.103	60	6.0
Post-11	0.055	60	6.0

Design Point 4:

Watershed #4 flows to Design Point- 4 (DP-4). This watershed consists of half of one existing building roof and community building roof and grassed/wooded areas that discharge directly to the NE Abutters (DP-4).

In pre development conditions there are three watersheds to Design Point-4.

Pre-07 (40) consists of the small grassed area along the property line that discharges directly to AP 40-4 Lot 5 (43).

Pre-08 (41) consists of half of one existing building and community building roof and discharges directly to AP 40-4 Lot 4 (44).

Pre-09 (42) consists of a small portion of the existing parking lot and wooded area that discharges directly to AP 40-4 Lot 3 (45).

In post development conditions there are three sub watersheds:

Post-12 (400) consists of a small portion of grassed area discharging directly to AP 40-4 Lot 5 (403).

Post-13 (401) consists of the rear half of the existing community building roof and surrounding grassed area that discharges directly to AP 40-4 Lot 4 (404).

Post-14 (402) consists of the wooded area behind the proposed maintenance building that discharges directly to AP 40-4 Lot 3 (405).

Below is a summary of the hydrologic parameters for the pre and post development sub-areas in Design Point-4.

	Area (acres)	CN	Tc (min)
Pre-07	0.052	61	6.0
Pre-08	0.389	69	6.0
Pre-09	0.133	57	6.0
Post-12	0.048	61	6.0
Post-13	0.170	69	6.0
Post-14	0.128	55	6.0

3.5.5 Downstream Analysis

A downstream analysis is required under the following conditions:

Area of Disturbance (Acres)	Impervious Cover (%)
>5 to 10	>75
>10 to 25	>50
>25 to 50	>25
>50	All Projects

The proposed project disturbs 9.65 acres and is 4.43 acres of impervious. This is approximately 46% impervious cover. A downstream analysis is not required.

3.5.6 Overbank Flood Protection Conclusion

The tables below presents a summary of the pre development flows vs. the mitigated post development flows. The table shows a decrease in the rate of runoff for all storms included in the analysis.

Pre Development Flows vs. Post Development Flows Mitigated

Subwatershed (design point)	**1-yr Peak Flow**		**2-yr Peak Flow**		**10-yr Peak Flow**		**25-yr Peak Flow**		**100-yr Peak Flow**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
DP-1:	1.28	0.20	1.97	0.51	11.33	2.39	16.80	4.18	27.60	8.36
DP-2:	2.00	0.22	2.85	0.44	5.88	1.32	8.33	2.12	13.38	9.97
DP-3:	0.22	0.02	0.36	0.05	0.93	0.20	1.42	0.35	2.48	0.68
DP-4:	0.22	0.10	0.38	0.17	1.05	0.54	1.63	0.88	2.92	1.62
Totals:	3.72	0.54	5.56	1.17	19.19	4.45	28.18	7.53	46.38	20.63

All flows in cubic feet per second (cfs)

As shown in the tables above, no increase in stormwater runoff flow will occur following the proposed construction during the 1 through 100-year storm events.

3.6 Minimum Standard 6: Redevelopment and Infill Projects.

The site is not classified as a redevelopment or infill project.

3.7 Minimum Standard 7: Pollution Prevention

A Soil Erosion and Sediment Control Plan (SESC) for this development can be found under a separate document. See the Soil Erosion and Sediment Control Plan for the development prepared by DiPrete Engineering. The SESC contains information for construction pollution prevention. For post construction pollution prevention see the Operations and Maintenance (O&M) document prepared for this development by DiPrete Engineering.

3.8 Minimum Standard 8: Land Uses with High Potential Pollutant Loads (LUHPPLs)

The site is not considered LUHPPL.

3.9 Minimum Standard 9: Illicit Discharges

There are no proposed Illicit Discharges on site. The site will be serviced by public water and sewer.

3.10 Minimum Standard 10: Construction Activity Soil Erosion, Runoff and Sedimentation and Pollution Prevention Control Measure Requirements

See the SESC for this development prepared by DiPrete Engineering.

3.11 Minimum Standard 11: Stormwater Management System Operation and Maintenance

See the O&M for this development prepared by DiPrete Engineering.

Appendix A

A2.1 Soil Evaluations

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: South Kingstown Housing Authority
Property Location: 364 Curtis Corner Road, Wakefield
Date of Test Hole: 11/8/2023
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Sunny, 30s Shaded: Yes ☐ No ☑ Time: 8:00

TH dth 23-1 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
A	0-5"	C	S	10YR 3/3	-		-		sl	1 SBK	-	3
Bw	5-15"	C	S	2.5Y 5/4	-		-		sl	1 SBK	-	3
C	15-96"	-	-	2.5Y 5/3	-		-		Cb Gr s	0 SGR	Lo	1m

TH dth 23-2 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
^A	0-21"	C	S	10YR 3/3	-		-		loamy	-	-	Fill
^C	21-60"	C	S	2.5Y 4/1	-		-		loamy	-	-	Fill
C1	60-72"	C	S	7.5YR 5/6	-		-		cos	0 SGR	Lo	1
C2	72-108"	-	-	10YR 6/3	-		-		Gr s	0 SGR	Lo	1m

TH dth 23-1 Soil Class Outwash Total Depth 96" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT >96" (og)
TH dth 23-2 Soil Class Fill/outwash Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT >108" (og)

Comments: dth 23-2: rust color in C1 cos likely due to hanging water table due to abrupt texture change. Large stones in ^C. May be old leachfield area.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: South Kingstown Housing Authority
Property Location: 364 Curtis Corner Road, Wakefield
Date of Test Hole: 11/8/2023
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Sunny, 30s Shaded: Yes ☐ No ☑ Time: 8:00

TH dth 23-3 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
^A	0-24"	C	S	10YR 4/3	-	-	loamy	-	-	Fill
Bwb	24-43"	C	S	10YR 4/6	7.5YR 5/8	C M D	sil	1 SBK	Fr	5
2C1	43-55"	C	S	7.5YR 5/6	-	-	cos	0 SGR	Lo	1
2C2	55-96"	-	-	10YR 5/3	-	-	s	0 SGR	Lo	1

TH dth 23-4 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A	0-5"	C	S	10YR 3/2	-	-	sil	1 SBK	Fr	5
Bw	5-13"	C	S	10YR 4/4	10YR 5/8	C F D	sil	1 SBK	Fr	5
E	13-22"	C	W	2.5Y 5/2	10YR 5/8	C F P	sil	1 SBK	Fr	5
B'w	22-32"	C	S	2.5Y 4/4	10YR 5/8	C F P	sil	1 SBK	Fr	5
2C1	32-43"	C	S	7.5YR 5/6	7.5YR 5/6	-	Cb Gr cos	0 SGR	Lo	1m
2C2	43-108"	-	-	2.5Y 5/3	2.5Y 5/3	-	s	0 SGR	Lo	1

TH dth 23-3 Soil Class Eolian/Outwash Total Depth 96" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT >96" (og)
TH dth 23-4 Soil Class Eolian/outwash Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT >108" (og)

Comments: dth 23-3: ^A is topsoil fill. Underlying Bw horizon is compacted. Redox due to abrupt texture change.
dth 23-4: redox due to abrupt texture change.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
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Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: South Kingstown Housing Authority
Property Location: 364 Curtis Corner Road, Wakefield
Date of Test Hole: 11/8/2023
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Sunny, 30s Shaded: Yes ☐ No ☑ Time: 8:00

TH dth 23-5 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
^A	0-7"	C	S	10YR 3/3	-	-	loamy	-	-	Fill
^B	7-96"	-	-	10YR 5/4	-	-	loamy	-	-	Fill

TH dth 23-6 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
^A	0-7"	C	S	10YR 3/2	-	-	loamy	-	-	Fill
^B	7-14"	C	S	10YR 4/6	-	-	loamy	-	-	Fill
2C1	14-45"	C	S	10YR 5/3	-	-	Gr cos	0 SGR	Lo	1m
2C2	45-96"	-	-	2.5Y 5/3	-	-	s	0 SGR	Lo	1

TH dth 23-5 Soil Class Fill Total Depth 96" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT >96" (og)
TH dth 23-6 Soil Class Fill/outwash Total Depth 96" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT >96" (og)

Comments: dth 23-5: ^B is mostly sil texture but with scattered pebbles and pockets of 10YR 5/6 and 2.5Y 5/2. Pieces of concrete riser @ 84".

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
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Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: South Kingstown Housing Authority
Property Location: 364 Curtis Corner Road, Wakefield
Date of Test Hole: 11/8/2023
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Sunny, 30s Shaded: Yes ☐ No ☑ Time: 8:00

TH dth 23-7 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
^A	0-31"	C	S	10YR 3/3	-	-	loamy	-	-	Fill
C	31-60"	C	S	2.5Y 5/3	7.5YR 5/6	C M P	sil	1 SBK	Fr	5
2C	60-96"	-	-	10YR 5/3	-	-	s	0 SGR	Lo	1

TH____ Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				

TH dth 23-7 Soil Class Fill/Eolian/outwash Total Depth 96" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT >96" (og)

TH _____ Soil Class _____ Total Depth _____ Impervious/Limiting Layer Depth _____(og) GW Seepage Depth _____ SHWT _____(og)

Comments: dth 23-7: ^A is compacted topsoil fill. C is firm in place - tightly packed. Some sidewall seepage at 19". Redox due to abrupt textural change and not SHWT.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: South Kingstown Housing Authority
Property Location: 364 Curtis Corner Road, Wakefield
Date of Test Hole: July 23, 2024
Soil Evaluator: Allison Drake License Number: D-4105
Weather: Cloudy 70's Shaded: Yes ☐ No ☑ Time: 8:00 AM

TH DTH 24-1 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
HTM1	0-8"											Loam
HTM2	8-21"											Sand/Fill
C	21-36"	C	S	2.5Y 5/2	7.5YR 5/6	C	M	P	sil	1-sbk	fri	5
2C	36-96"	-	-	2.5Y 4/4	-	-			gls	0m	fri	6

TH DTH 24-2 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
HTM1	02-8"											Loam
HTM2	8-48"											Sand/Fill
C	48-60"	C	S	2.5Y 5/2	7.5YR 5/6	C	M	P	sil	1-sbk	fri	5
2C	60-96"	-	-	2.5Y 4/4	-	-			gcbls	0m	fri	6

TH DTH 24-1 _____ Soil Class Loess/Ablation Till Total Depth 96" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth N/A SHWT 96" (og)
TH DTH 24-2 _____ Soil Class Loess/Ablation Till Total Depth 96" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth N/A SHWT 96" (og)

Comments: _____

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
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Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: South Kingstown Housing Authority
Property Location: 364 Curtis Corner Road, Wakefield
Date of Test Hole: July 23, 2024
Soil Evaluator: Allison Drake License Number: D-4105
Weather: Cloudy 70's Shaded: Yes ☐ No ☑ Time: 8:00 AM

TH DTH 24-3 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
HTM1	0-12"											Loam
HTM2	12-29"											Sand/Fill
C	29-55"	C	S	2.5Y 5/2	7.5YR 5/6	C	M	P	sil	1-sbk	fri	5
2C	55-96"	-	-	2.5Y 4/4	-		-		gcbls	0m	fri	6

TH DTH 24-4 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
HTM	0-8"											Loam
Bw	8-16"	C	S	10YR 4/4	-		-		sil	1-sbk	fri	5
C	16-52"	C	S	2.5Y 5/2	7.5YR 5/6	C	M	P	sil	1-sbk	fri	5
2C	52-96"	-	-	2.5Y 4/4	-		-		gcbls	0m	fri	6

TH DTH 24-3 _____ Soil Class Loess/Ablation Till Total Depth 96" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth N/A SHWT 96" (og)
TH DTH 24-4 _____ Soil Class Loess/Ablation Till Total Depth 96" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth N/A SHWT 96" (og)

Comments: _____

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: South Kingstown Housing Authority
Property Location: 364 Curtis Corner Road, Wakefield
Date of Test Hole: July 23, 2024
Soil Evaluator: Allison Drake License Number: D-4105
Weather: Cloudy 70's Shaded: Yes ☐ No ☑ Time: 8:00 AM

TH DTH 24-5 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
HTM1	0-8"									Loam
Bw	8-22"	C	S	10YR 4/6	-	-	sil	1-sbk	fri	5
C	22-42"	C	S	2.5Y 5/2	7.5YR 5/6	C M P	sil	1-sbk	fri	5
2C1	42-64"	C	S	2.5Y 5/4	-	-	cos	0-sg	L	1
2C2	64-96"	-	-	2.5Y 5/3	-	-	s	0-sg	L	1

TH DTH 24-6 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
HTM	0-12"									Loam
Bw	12-24"	C	S	10YR 4/6	-	-	sil	1-sbk	fri	5
2C	24-96"	-	-	2.5Y 6/4	-	-	glcos	0m	fri	6

TH DTH 24-5 Soil Class Loess/Ice Contact Total Depth 96" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth N/A SHWT 96" (og)
TH DTH 24-4 Soil Class Loess/Ablation Till Total Depth 96" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth N/A SHWT 96" (og)

Comments: _____

A3.2 Water Quality HydroCAD Storm Analysis

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10: Pre-01 Runoff Area=5.492 ac 13.17% Impervious Runoff Depth=0.13"
Flow Length=494' Tc=30.8 min CN=60/98 Runoff=0.45 cfs 0.059 af

Subcatchment 12: Pre-02 Runoff Area=2.490 ac 32.30% Impervious Runoff Depth=0.32"
Flow Length=475' Tc=23.3 min CN=60/98 Runoff=0.56 cfs 0.066 af

Subcatchment 13: Pre-03 Runoff Area=0.926 ac 9.18% Impervious Runoff Depth=0.09"
Tc=6.0 min CN=59/98 Runoff=0.09 cfs 0.007 af

Subcatchment 20: Pre-04 Runoff Area=2.048 ac 42.66% Impervious Runoff Depth=0.42"
Tc=6.0 min CN=59/98 Runoff=0.96 cfs 0.072 af

Subcatchment 30: Pre-05 Runoff Area=0.222 ac 21.01% Impervious Runoff Depth=0.21"
Tc=6.0 min CN=60/98 Runoff=0.05 cfs 0.004 af

Subcatchment 31: Pre-06 Runoff Area=0.232 ac 19.89% Impervious Runoff Depth=0.20"
Tc=6.0 min CN=61/98 Runoff=0.05 cfs 0.004 af

Subcatchment 40: Pre-07 Runoff Area=0.052 ac 0.58% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=61/98 Runoff=0.00 cfs 0.000 af

Subcatchment 41: Pre-08 Runoff Area=0.389 ac 22.31% Impervious Runoff Depth=0.22"
Tc=6.0 min CN=61/98 Runoff=0.09 cfs 0.007 af

Subcatchment 42: Pre-09 Runoff Area=0.133 ac 3.29% Impervious Runoff Depth=0.03"
Tc=6.0 min CN=55/98 Runoff=0.00 cfs 0.000 af

Reach 14: AP 40-4 LOT 6 Inflow=0.09 cfs 0.007 af
Outflow=0.09 cfs 0.007 af

Reach 32: AP 48-1 OS Inflow=0.05 cfs 0.004 af
Outflow=0.05 cfs 0.004 af

Reach 33: AP 39-3 LOT 19 Inflow=0.05 cfs 0.004 af
Outflow=0.05 cfs 0.004 af

Reach 43: AP 40-4 LOT 5 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 44: AP 40-4 LOT 4 Inflow=0.09 cfs 0.007 af
Outflow=0.09 cfs 0.007 af

Reach 45: AP 40-4 LOT 3 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 11: Existing Depression Peak Elev=144.70' Storage=367 cf Inflow=0.45 cfs 0.059 af
Discarded=0.27 cfs 0.059 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.059 af

Link DP-1: AP 48-1 LOT 7 Inflow=0.60 cfs 0.073 af
Primary=0.60 cfs 0.073 af

Link DP-2: Curtis Corner Road Inflow=0.96 cfs 0.072 af
Primary=0.96 cfs 0.072 af

Link DP-3: NW Abutters Inflow=0.10 cfs 0.008 af
Primary=0.10 cfs 0.008 af

Link DP-4: NE Abutters Inflow=0.10 cfs 0.008 af
Primary=0.10 cfs 0.008 af

A3.4.2 Drainage Network Hydraulic Calculations

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: Post-01 Runoff Area=4.218 ac 51.07% Impervious Runoff Depth=0.50"
Tc=6.0 min CN=61/98 Runoff=2.36 cfs 0.177 af

Subcatchment 102: Post-02 Runoff Area=0.221 ac 100.00% Impervious Runoff Depth=0.99"
Tc=6.0 min CN=0/98 Runoff=0.24 cfs 0.018 af

Subcatchment 104: Post-03 Runoff Area=0.261 ac 100.00% Impervious Runoff Depth=0.99"
Tc=6.0 min CN=0/98 Runoff=0.29 cfs 0.021 af

Subcatchment 106: Post-04 Runoff Area=2.409 ac 37.89% Impervious Runoff Depth=0.37"
Tc=6.0 min CN=59/98 Runoff=1.00 cfs 0.075 af

Subcatchment 108: Post-05 Runoff Area=0.414 ac 0.04% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=61/98 Runoff=0.00 cfs 0.000 af

Subcatchment 109: Post-06 Runoff Area=1.624 ac 0.05% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=58/98 Runoff=0.00 cfs 0.000 af

Subcatchment 200: Post-07 Runoff Area=1.348 ac 39.69% Impervious Runoff Depth=0.39"
Tc=6.0 min CN=61/98 Runoff=0.59 cfs 0.044 af

Subcatchment 202: Post-08 Runoff Area=0.192 ac 100.00% Impervious Runoff Depth=0.99"
Tc=6.0 min CN=0/98 Runoff=0.21 cfs 0.016 af

Subcatchment 204: Post-09 Runoff Area=0.793 ac 14.25% Impervious Runoff Depth=0.14"
Tc=6.0 min CN=58/98 Runoff=0.12 cfs 0.009 af

Subcatchment 300: Post-10 Runoff Area=0.103 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=60/0 Runoff=0.00 cfs 0.000 af

Subcatchment 301: Post-11 Runoff Area=0.055 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=60/0 Runoff=0.00 cfs 0.000 af

Subcatchment 400: Post-12 Runoff Area=0.048 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=61/0 Runoff=0.00 cfs 0.000 af

Subcatchment 401: Post-13 Runoff Area=0.170 ac 23.45% Impervious Runoff Depth=0.23"
Tc=6.0 min CN=60/98 Runoff=0.04 cfs 0.003 af

Subcatchment 402: Post-14 Runoff Area=0.128 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=55/0 Runoff=0.00 cfs 0.000 af

Reach 110: AP 40-4 LOT 6 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 302: AP 48-1 OS Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 303: AP 39-3 LOT 19 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 403: AP 40-4 LOT 5 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 404: AP 40-4 LOT 4 Inflow=0.04 cfs 0.003 af
Outflow=0.04 cfs 0.003 af

Reach 405: AP 40-4 LOT 3 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 101: UIS A Peak Elev=137.93' Storage=0.001 af Inflow=2.36 cfs 0.177 af
Discarded=2.36 cfs 0.177 af Primary=0.00 cfs 0.000 af Outflow=2.36 cfs 0.177 af

Pond 103: UIS B Peak Elev=142.41' Storage=0.001 af Inflow=0.24 cfs 0.018 af
Discarded=0.13 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.018 af

Pond 105: UIS C Peak Elev=140.80' Storage=0.001 af Inflow=0.29 cfs 0.021 af
Discarded=0.15 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.021 af

Pond 107: UIS D Peak Elev=143.93' Storage=0.000 af Inflow=1.00 cfs 0.075 af
Discarded=1.00 cfs 0.075 af Primary=0.00 cfs 0.000 af Outflow=1.00 cfs 0.075 af

Pond 201: UIS F Peak Elev=141.24' Storage=0.014 af Inflow=0.59 cfs 0.044 af
Discarded=0.07 cfs 0.044 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.044 af

Pond 203: UIS E Peak Elev=148.55' Storage=0.005 af Inflow=0.21 cfs 0.016 af
Discarded=0.03 cfs 0.016 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.016 af

Link DP-1: AP 48-1 LOT 7 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP-2: Curtis Corner Road Inflow=0.12 cfs 0.009 af
Primary=0.12 cfs 0.009 af

Link DP-3: NW Abutters Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP-4: NE Abutters Inflow=0.04 cfs 0.003 af
Primary=0.04 cfs 0.003 af

DiPrete Engineering
Engineers • Planners • Surveyors

Project Name: Champagne Heights
Project Number: 3083-001

100-Year Storm
Date: 9/20/2024

Pipe Analysis

Pipe ID	Pipe Length	Pipe Size	Pipe Slope	Flow Rate	Capacity Full	Velocity	Invert Down	Invert Up
	(ft)	(in)	(%)	(cfs)	(cfs)	(ft/s)	(Ft)	(ft)
A7 - A8	69.49	24	2.00%	6.3	34.69	8.4	138.34	139.73
A6 - A7	32.54	24	3.00%	6.3	42.49	9.7	139.73	140.70
A4 - A6	144.39	18	2.41%	4.3	17.70	8.2	141.20	144.68
A2 - A4	163.07	15	1.00%	2.1	7.01	5.0	144.93	146.57
A1 - A2	19.47	15	1.00%	0.9	7.01	4.0	146.57	146.76
A3 - A4	17.77	15	1.00%	1.1	7.01	4.1	144.93	145.11
A5 - A6	18.35	15	3.00%	1.0	12.13	6.0	141.45	142.00
A14 - A18	81.78	24	2.00%	12.4	34.65	10.1	139.19	140.82
A12 - A14	76.67	18	1.00%	2.7	11.39	5.3	140.48	141.25
A11 - A12	102.89	15	1.00%	2.8	7.01	5.4	141.50	142.53
A10 - A11	18.59	15	1.00%	1.1	7.01	4.1	142.53	142.72
A13 - A14	18.04	15	1.00%	5.6	7.01	6.3	140.73	140.91
A17 - A18	98.64	18	1.00%	2.6	11.39	5.2	139.69	140.67
A16 - A17	14.53	15	1.00%	2.6	7.01	5.3	140.92	141.07
A15 - A16	16.50	15	1.00%	1.2	7.01	4.3	141.07	141.23
D4 - D10	23.11	18	1.00%	3.0	11.39	5.4	144.67	144.90
D3 - D4	18.34	15	1.00%	1.0	7.01	4.0	146.34	146.52
D2 - D4	119.50	15	1.00%	2.0	7.01	4.9	145.15	146.34
D1 - D2	17.00	15	1.05%	1.4	7.19	4.5	146.34	146.52
D9 - D10	144.83	18	1.00%	4.4	11.39	6.0	144.67	146.11
D8 - D9	42.97	15	1.00%	2.5	7.01	5.3	146.36	146.79
D7 - D8	16.93	15	1.06%	2.4	7.21	5.3	146.79	146.97
D6 - D9	94.17	15	1.00%	1.9	7.01	4.9	146.36	147.31
D5 - D6	17.94	15	1.00%	0.5	7.01	3.4	147.31	147.48
F2 - F5	127.99	15	1.00%	3.4	7.01	5.7	142.32	143.60
F1 - F2	19.88	15	1.00%	2.1	7.01	5.0	143.60	143.80
F4 - F5	30.78	15	1.00%	2.9	7.01	5.4	142.32	142.63
F3 - F4	23.91	15	1.00%	0.6	7.01	3.5	142.63	142.87

DiPrete Engineering
Engineers • Planners • Surveyors

Project Name: Champagne Heights 100-Year Storm
Project Number: 3083-001 Date: 9/20/2024

HGL at Structure

Structure	Rim Elevation (ft)	HGL Elevation (ft)	Rim-HGL (ft)
A8	147.32	0.00	N/A
A7	148.19	143.69	4.50
A6	148.15	143.77	4.38
A4	149.59	145.19	4.40
A2	151.17	147.03	4.14
A1	151.25	147.17	4.08
A3	149.59	146.24	3.35
A5	148.17	143.87	4.30
A18	145.88	0.00	N/A
A14	145.42	143.85	1.57
A12	145.75	144.26	1.49
A11	147.20	144.44	2.77
A10	147.22	144.57	2.65
A13	145.41	144.16	1.25
A17	148.59	143.69	4.90
A16	148.17	143.73	4.44
A15	148.13	143.84	4.29
D10	154.65	0.00	N/A
D4	154.88	150.28	4.60
D3	154.89	150.36	4.53
D2	151.20	150.43	0.76
D1	151.23	150.50	0.73
D9	153.22	150.48	2.74
D8	152.78	150.64	2.14
D7	152.80	150.75	2.05
D6	151.13	150.67	0.46
D5	151.13	150.73	0.40
F5	149.67	0.00	N/A
F2	154.69	148.62	6.07
F1	154.90	148.85	6.05
F4	144.51	148.36	-3.86
F3	148.31	148.48	-0.17

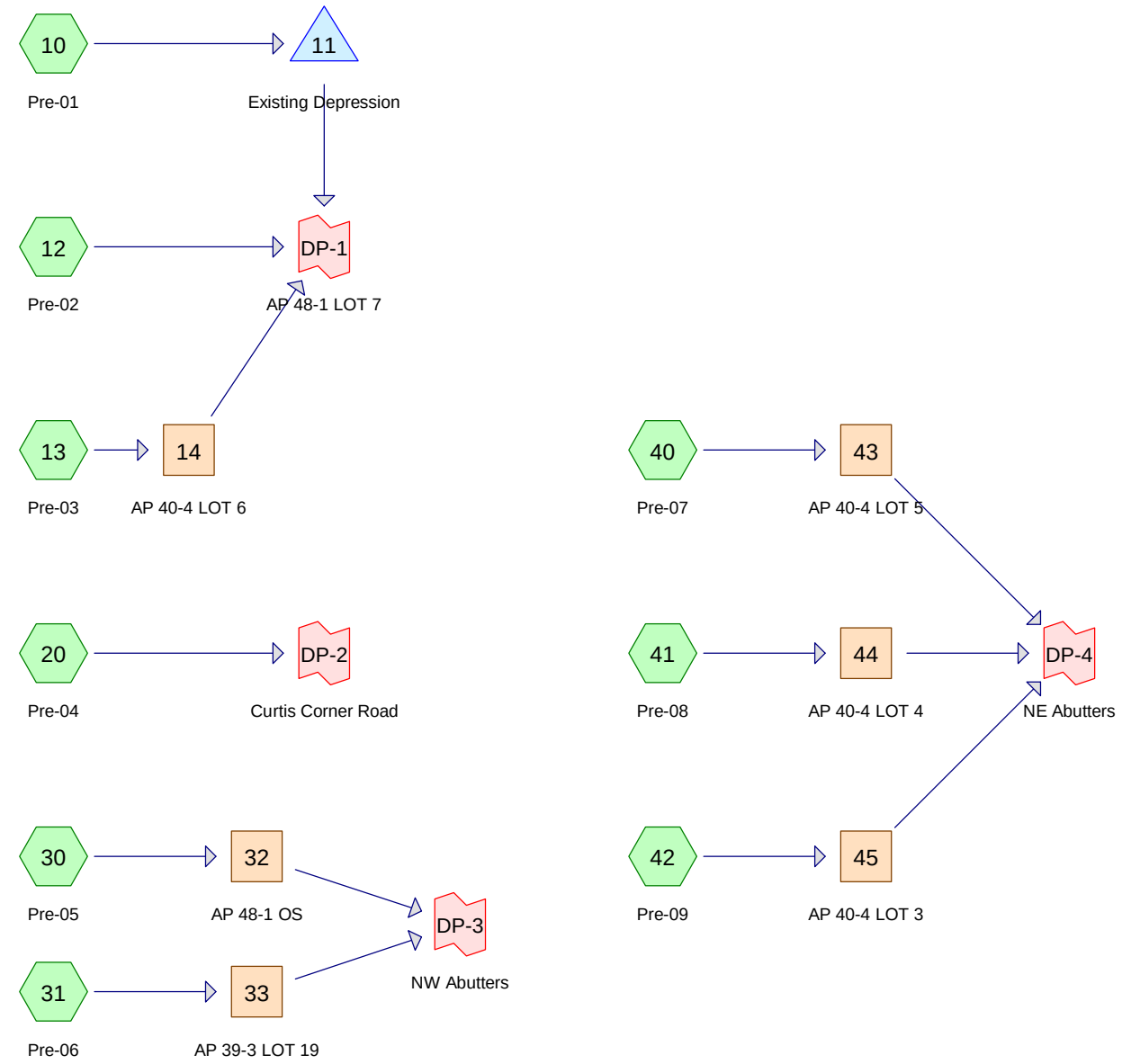
DiPrete Engineering
Engineers • Planners • Surveyors

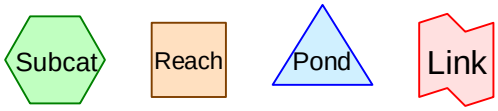
Project Name: Champagne Heights
Project Number: 3083-001

10-Year Storm
Date: 9/20/2024

Structure	Area	Inlet Time	Intensity	Runoff C	Q=Cia	Q Carry over	Q Captured	Q Bypassed	Bypass Structure	Inlet Type	Curb Opening	Curb Opening	Grate Length	Grate Width	Depth	Spread
	(sf)	(min)	(in/hr)	(C)	(cfs)	(cfs)	(cfs)	(cfs)			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
A1	5,450	6	6.94	0.69	0.60	0	0.45	0.15	A3	Grate inlet	---	---	2	2	0.11	5.519
A2	7,250	6	6.938	0.61	0.71	0	0.59	0.12	A4	Grate inlet	---	---	4	2	0.117	5.865
A4	9,227	6	6.938	0.54	0.80	0.124	0.73	0.19	A6	Grate inlet	---	---	4	2	0.13	6.476
A6	7,909	6	6.938	0.58	0.74	0.194	0.63	0.30	---	Grate inlet	---	---	2	2	0.13	6.491
A3	7,075	6	6.938	0.6	0.68	0.153	0.67	0.16	A5	Grate inlet	---	---	4	2	0.125	6.23
A5	7,269	6	6.938	0.57	0.67	0.164	0.67	0.16	---	Grate inlet	---	---	4	2	0.124	6.216
A10	7,413	6	6.938	0.57	0.68	0	0.56	0.12	A14	Grate inlet	---	---	4	2	0.115	5.766
A11	14,090	6	6.938	0.48	1.09	0	0.83	0.25	A13	Grate inlet	---	---	4	2	0.138	6.878
A14	33,192	6	6.938	0.53	2.83	0.115	2.94	0.00	---	Grate inlet	---	---	4	2	0.267	13.333
A16	11,923	6	6.938	0.47	0.90	0	0.71	0.19	A13	Grate inlet	---	---	4	2	0.128	6.41
A15	9,235	6	6.938	0.52	0.77	0	0.63	0.14	A13	Grate inlet	---	---	4	2	0.121	6.049
A13	49,177	6	6.938	0.45	3.55	0.581	4.14	0.00	---	Grate inlet	---	---	4	2	0.33	16.481
D3	8,473	6	6.938	0.47	0.64	0	0.47	0.17	D7	Grate inlet	---	---	2	2	0.113	5.639
D8	590	6	6.938	0.76	0.07	0.284	0.30	0.06	---	Grate inlet	---	---	2	2	0.091	4.525
D7	22,502	6	6.938	0.43	1.55	0.168	1.21	0.51	---	Grate inlet	---	---	4	2	0.164	8.175
D5	3,615	6	6.938	0.58	0.34	0	0.28	0.05	D8	Grate inlet	---	---	2	2	0.089	4.434
D6	7,826	6	6.938	0.72	0.91	0	0.72	0.19	D8	Grate inlet	---	---	4	2	0.128	6.423
D1	10,164	6	6.938	0.53	0.87	0	0.69	0.17	D4	Grate inlet	---	---	4	2	0.126	6.316
D2	3,737	6	6.938	0.69	0.41	0	0.33	0.08	D4	Grate inlet	---	---	2	2	0.096	4.791
D4	282	6	6.938	0.9	0.04	0.254	0.25	0.04	D8	Grate inlet	---	---	2	2	0.084	4.216
F1	17,525	6	6.938	0.47	1.32	0	0.82	0.50	F3	Grate inlet	---	---	2	2	0.148	7.406
F2	9,186	6	6.938	0.59	0.87	0	0.60	0.27	F4	Grate inlet	---	---	2	2	0.127	6.33
F4	18,187	6	6.938	0.5	1.46	0.272	1.00	0.73	---	Grate inlet	---	---	2	2	0.164	8.194
F3	5,506	6	6.938	0.45	0.40	0.504	0.62	0.29	---	Grate inlet	---	---	2	2	0.128	6.414

A3.5.4.1 HydroCAD Node Diagram

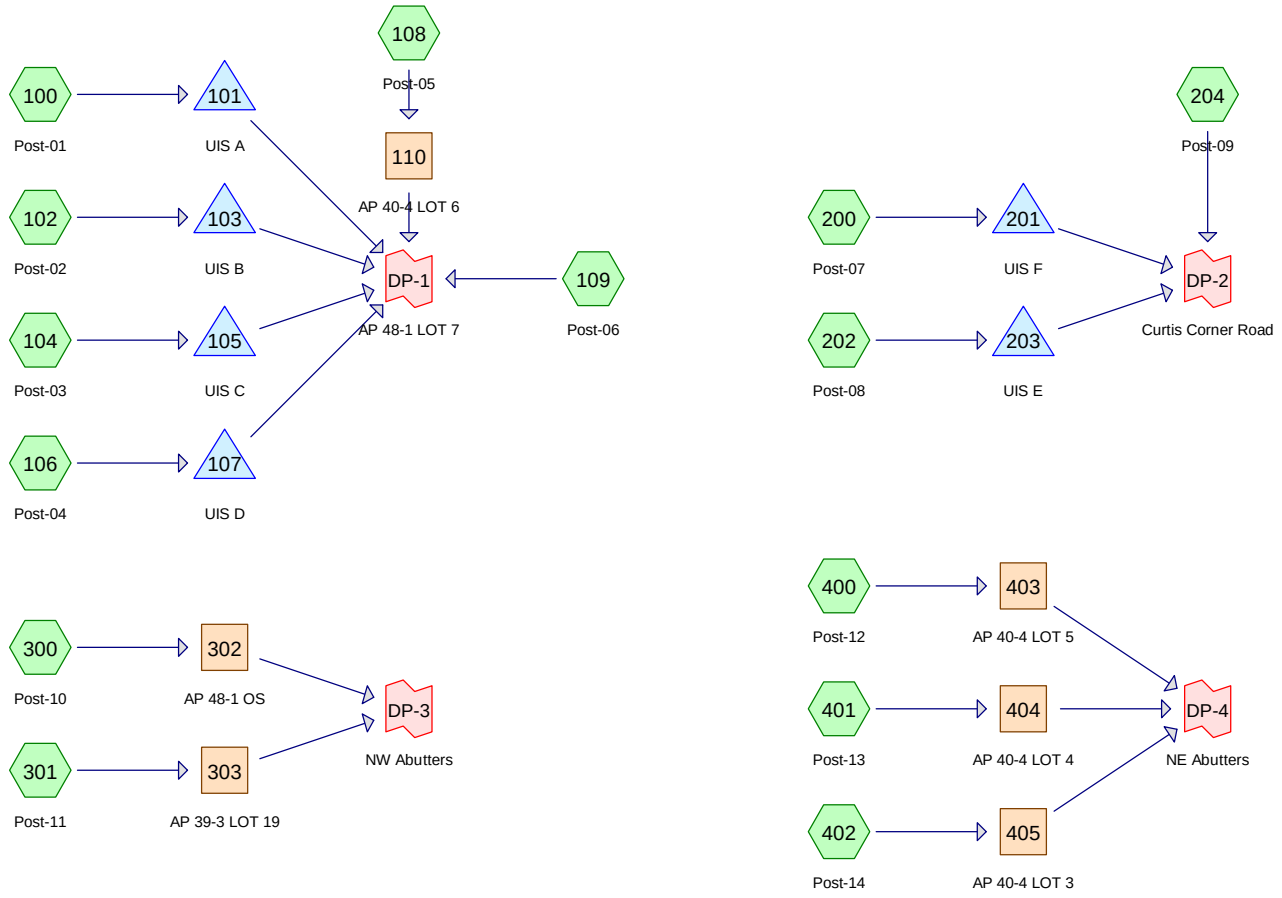




Routing Diagram for 3083-001-EHCD
Prepared by DiPrete Engineering, Printed 9/23/2024

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.087	61	>75% Grass cover, Good, HSG B (10, 12, 13, 20, 30, 31, 40, 41, 42)
1.915	98	Impervious, HSG B (10, 12, 13, 20, 30, 31, 40, 41, 42)
0.755	98	Roofs, HSG B (10, 12, 13, 20, 30, 31, 41)
2.227	55	Woods, Good, HSG B (10, 12, 13, 20, 30, 31, 41, 42)
11.984	**68**	**TOTAL AREA**



Subcat Reach Pond Link

Routing Diagram for 3083-001-PHCD
Prepared by DiPrete Engineering, Printed 9/23/2024
HydroCAD® 10.20-3g s/n 01125 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.821	61	>75% Grass cover, Good, HSG B (100, 106, 108, 109, 200, 204, 300, 301, 400, 401)
2.755	98	Impervious, HSG B (100, 106, 108, 109, 200, 204, 401)
1.674	98	Roofs, HSG B (100, 102, 104, 106, 108, 109, 200, 202, 204, 401)
1.733	55	Woods, Good, HSG B (106, 109, 200, 204, 300, 301, 401, 402)
11.984	**74**	**TOTAL AREA**

A3.5.4.2 HydroCAD 1-Year Storm Analysis

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

Subcatchment 10: Pre-01 Runoff Area=5.492 ac 13.17% Impervious Runoff Depth=0.42"
Flow Length=494' Tc=30.8 min CN=65 Runoff=1.07 cfs 0.191 af

Subcatchment 12: Pre-02 Runoff Area=2.490 ac 32.30% Impervious Runoff Depth=0.69"
Flow Length=475' Tc=23.3 min CN=72 Runoff=1.12 cfs 0.144 af

Subcatchment 13: Pre-03 Runoff Area=0.926 ac 9.18% Impervious Runoff Depth=0.35"
Tc=6.0 min CN=63 Runoff=0.22 cfs 0.027 af

Subcatchment 20: Pre-04 Runoff Area=2.048 ac 42.66% Impervious Runoff Depth=0.88"
Tc=6.0 min CN=76 Runoff=2.00 cfs 0.151 af

Subcatchment 30: Pre-05 Runoff Area=0.222 ac 21.01% Impervious Runoff Depth=0.53"
Tc=6.0 min CN=68 Runoff=0.11 cfs 0.010 af

Subcatchment 31: Pre-06 Runoff Area=0.232 ac 19.89% Impervious Runoff Depth=0.53"
Tc=6.0 min CN=68 Runoff=0.11 cfs 0.010 af

Subcatchment 40: Pre-07 Runoff Area=0.052 ac 0.58% Impervious Runoff Depth=0.29"
Tc=6.0 min CN=61 Runoff=0.01 cfs 0.001 af

Subcatchment 41: Pre-08 Runoff Area=0.389 ac 22.31% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=69 Runoff=0.21 cfs 0.018 af

Subcatchment 42: Pre-09 Runoff Area=0.133 ac 3.29% Impervious Runoff Depth=0.19"
Tc=6.0 min CN=57 Runoff=0.01 cfs 0.002 af

Reach 14: AP 40-4 LOT 6 Inflow=0.22 cfs 0.027 af
Outflow=0.22 cfs 0.027 af

Reach 32: AP 48-1 OS Inflow=0.11 cfs 0.010 af
Outflow=0.11 cfs 0.010 af

Reach 33: AP 39-3 LOT 19 Inflow=0.11 cfs 0.010 af
Outflow=0.11 cfs 0.010 af

Reach 43: AP 40-4 LOT 5 Inflow=0.01 cfs 0.001 af
Outflow=0.01 cfs 0.001 af

Reach 44: AP 40-4 LOT 4 Inflow=0.21 cfs 0.018 af
Outflow=0.21 cfs 0.018 af

Reach 45: AP 40-4 LOT 3 Inflow=0.01 cfs 0.002 af
Outflow=0.01 cfs 0.002 af

Pond 11: Existing Depression Peak Elev=144.89' Storage=1,573 cf Inflow=1.07 cfs 0.191 af
Discarded=0.42 cfs 0.191 af Primary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.191 af

Link DP-1: AP 48-1 LOT 7 Inflow=1.28 cfs 0.171 af
Primary=1.28 cfs 0.171 af

Link DP-2: Curtis Corner Road Inflow=2.00 cfs 0.151 af
Primary=2.00 cfs 0.151 af

Link DP-3: NW Abutters Inflow=0.22 cfs 0.020 af
Primary=0.22 cfs 0.020 af

Link DP-4: NE Abutters Inflow=0.22 cfs 0.022 af
Primary=0.22 cfs 0.022 af

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

Subcatchment 100: Post-01 Runoff Area=4.218 ac 51.07% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=80 Runoff=5.33 cfs 0.387 af

Subcatchment 102: Post-02 Runoff Area=0.221 ac 100.00% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=98 Runoff=0.60 cfs 0.047 af

Subcatchment 104: Post-03 Runoff Area=0.261 ac 100.00% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=98 Runoff=0.71 cfs 0.056 af

Subcatchment 106: Post-04 Runoff Area=2.409 ac 37.89% Impervious Runoff Depth=0.78"
Tc=6.0 min CN=74 Runoff=2.03 cfs 0.157 af

Subcatchment 108: Post-05 Runoff Area=0.414 ac 0.04% Impervious Runoff Depth=0.29"
Tc=6.0 min CN=61 Runoff=0.06 cfs 0.010 af

Subcatchment 109: Post-06 Runoff Area=1.624 ac 0.05% Impervious Runoff Depth=0.21"
Tc=6.0 min CN=58 Runoff=0.14 cfs 0.029 af

Subcatchment 200: Post-07 Runoff Area=1.348 ac 39.69% Impervious Runoff Depth=0.88"
Tc=6.0 min CN=76 Runoff=1.31 cfs 0.099 af

Subcatchment 202: Post-08 Runoff Area=0.192 ac 100.00% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=98 Runoff=0.52 cfs 0.041 af

Subcatchment 204: Post-09 Runoff Area=0.793 ac 14.25% Impervious Runoff Depth=0.38"
Tc=6.0 min CN=64 Runoff=0.22 cfs 0.025 af

Subcatchment 300: Post-10 Runoff Area=0.103 ac 0.00% Impervious Runoff Depth=0.26"
Tc=6.0 min CN=60 Runoff=0.01 cfs 0.002 af

Subcatchment 301: Post-11 Runoff Area=0.055 ac 0.00% Impervious Runoff Depth=0.26"
Tc=6.0 min CN=60 Runoff=0.01 cfs 0.001 af

Subcatchment 400: Post-12 Runoff Area=0.048 ac 0.00% Impervious Runoff Depth=0.29"
Tc=6.0 min CN=61 Runoff=0.01 cfs 0.001 af

Subcatchment 401: Post-13 Runoff Area=0.170 ac 23.45% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=69 Runoff=0.09 cfs 0.008 af

Subcatchment 402: Post-14 Runoff Area=0.128 ac 0.00% Impervious Runoff Depth=0.14"
Tc=6.0 min CN=55 Runoff=0.01 cfs 0.002 af

Reach 110: AP 40-4 LOT 6 Inflow=0.06 cfs 0.010 af
Outflow=0.06 cfs 0.010 af

Reach 302: AP 48-1 OS Inflow=0.01 cfs 0.002 af
Outflow=0.01 cfs 0.002 af

Reach 303: AP 39-3 LOT 19 Inflow=0.01 cfs 0.001 af
Outflow=0.01 cfs 0.001 af

Reach 403: AP 40-4 LOT 5 Inflow=0.01 cfs 0.001 af
Outflow=0.01 cfs 0.001 af

Reach 404: AP 40-4 LOT 4 Inflow=0.09 cfs 0.008 af
Outflow=0.09 cfs 0.008 af

Reach 405: AP 40-4 LOT 3 Inflow=0.01 cfs 0.002 af
Outflow=0.01 cfs 0.002 af

Pond 101: UIS A Peak Elev=138.28' Storage=0.024 af Inflow=5.33 cfs 0.387 af
Discarded=3.01 cfs 0.387 af Primary=0.00 cfs 0.000 af Outflow=3.01 cfs 0.387 af

Pond 103: UIS B Peak Elev=143.47' Storage=0.010 af Inflow=0.60 cfs 0.047 af
Discarded=0.13 cfs 0.047 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.047 af

Pond 105: UIS C Peak Elev=141.84' Storage=0.012 af Inflow=0.71 cfs 0.056 af
Discarded=0.15 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.056 af

Pond 107: UIS D Peak Elev=144.21' Storage=0.012 af Inflow=2.03 cfs 0.157 af
Discarded=1.04 cfs 0.157 af Primary=0.00 cfs 0.000 af Outflow=1.04 cfs 0.157 af

Pond 201: UIS F Peak Elev=141.96' Storage=0.050 af Inflow=1.31 cfs 0.099 af
Discarded=0.07 cfs 0.099 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.099 af

Pond 203: UIS E Peak Elev=149.32' Storage=0.018 af Inflow=0.52 cfs 0.041 af
Discarded=0.03 cfs 0.041 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.041 af

Link DP-1: AP 48-1 LOT 7 Inflow=0.20 cfs 0.039 af
Primary=0.20 cfs 0.039 af

Link DP-2: Curtis Corner Road Inflow=0.22 cfs 0.025 af
Primary=0.22 cfs 0.025 af

Link DP-3: NW Abutters Inflow=0.02 cfs 0.003 af
Primary=0.02 cfs 0.003 af

Link DP-4: NE Abutters Inflow=0.10 cfs 0.011 af
Primary=0.10 cfs 0.011 af

A3.5.4.3 HydroCAD 2-Year Storm Analysis

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

Subcatchment 10: Pre-01 Runoff Area=5.492 ac 13.17% Impervious Runoff Depth=0.65"
Flow Length=494' Tc=30.8 min CN=65 Runoff=1.90 cfs 0.297 af

Subcatchment 12: Pre-02 Runoff Area=2.490 ac 32.30% Impervious Runoff Depth=0.99"
Flow Length=475' Tc=23.3 min CN=72 Runoff=1.70 cfs 0.206 af

Subcatchment 13: Pre-03 Runoff Area=0.926 ac 9.18% Impervious Runoff Depth=0.56"
Tc=6.0 min CN=63 Runoff=0.45 cfs 0.044 af

Subcatchment 20: Pre-04 Runoff Area=2.048 ac 42.66% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=76 Runoff=2.85 cfs 0.209 af

Subcatchment 30: Pre-05 Runoff Area=0.222 ac 21.01% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=68 Runoff=0.18 cfs 0.015 af

Subcatchment 31: Pre-06 Runoff Area=0.232 ac 19.89% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=68 Runoff=0.19 cfs 0.015 af

Subcatchment 40: Pre-07 Runoff Area=0.052 ac 0.58% Impervious Runoff Depth=0.49"
Tc=6.0 min CN=61 Runoff=0.02 cfs 0.002 af

Subcatchment 41: Pre-08 Runoff Area=0.389 ac 22.31% Impervious Runoff Depth=0.84"
Tc=6.0 min CN=69 Runoff=0.34 cfs 0.027 af

Subcatchment 42: Pre-09 Runoff Area=0.133 ac 3.29% Impervious Runoff Depth=0.34"
Tc=6.0 min CN=57 Runoff=0.02 cfs 0.004 af

Reach 14: AP 40-4 LOT 6 Inflow=0.45 cfs 0.044 af
Outflow=0.45 cfs 0.044 af

Reach 32: AP 48-1 OS Inflow=0.18 cfs 0.015 af
Outflow=0.18 cfs 0.015 af

Reach 33: AP 39-3 LOT 19 Inflow=0.19 cfs 0.015 af
Outflow=0.19 cfs 0.015 af

Reach 43: AP 40-4 LOT 5 Inflow=0.02 cfs 0.002 af
Outflow=0.02 cfs 0.002 af

Reach 44: AP 40-4 LOT 4 Inflow=0.34 cfs 0.027 af
Outflow=0.34 cfs 0.027 af

Reach 45: AP 40-4 LOT 3 Inflow=0.02 cfs 0.004 af
Outflow=0.02 cfs 0.004 af

Pond 11: Existing Depression Peak Elev=145.09' Storage=3,364 cf Inflow=1.90 cfs 0.297 af
Discarded=0.58 cfs 0.297 af Primary=0.00 cfs 0.000 af Outflow=0.58 cfs 0.297 af

Link DP-1: AP 48-1 LOT 7 Inflow=1.97 cfs 0.250 af
Primary=1.97 cfs 0.250 af

Link DP-2: Curtis Corner Road Inflow=2.85 cfs 0.209 af
Primary=2.85 cfs 0.209 af

Link DP-3: NW Abutters Inflow=0.36 cfs 0.030 af
Primary=0.36 cfs 0.030 af

Link DP-4: NE Abutters Inflow=0.38 cfs 0.033 af
Primary=0.38 cfs 0.033 af

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

Subcatchment 100: Post-01 Runoff Area=4.218 ac 51.07% Impervious Runoff Depth=1.48"
Tc=6.0 min CN=80 Runoff=7.26 cfs 0.520 af

Subcatchment 102: Post-02 Runoff Area=0.221 ac 100.00% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=98 Runoff=0.71 cfs 0.056 af

Subcatchment 104: Post-03 Runoff Area=0.261 ac 100.00% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=98 Runoff=0.84 cfs 0.067 af

Subcatchment 106: Post-04 Runoff Area=2.409 ac 37.89% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=74 Runoff=2.97 cfs 0.222 af

Subcatchment 108: Post-05 Runoff Area=0.414 ac 0.04% Impervious Runoff Depth=0.49"
Tc=6.0 min CN=61 Runoff=0.16 cfs 0.017 af

Subcatchment 109: Post-06 Runoff Area=1.624 ac 0.05% Impervious Runoff Depth=0.38"
Tc=6.0 min CN=58 Runoff=0.36 cfs 0.051 af

Subcatchment 200: Post-07 Runoff Area=1.348 ac 39.69% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=76 Runoff=1.87 cfs 0.137 af

Subcatchment 202: Post-08 Runoff Area=0.192 ac 100.00% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=98 Runoff=0.62 cfs 0.049 af

Subcatchment 204: Post-09 Runoff Area=0.793 ac 14.25% Impervious Runoff Depth=0.61"
Tc=6.0 min CN=64 Runoff=0.44 cfs 0.040 af

Subcatchment 300: Post-10 Runoff Area=0.103 ac 0.00% Impervious Runoff Depth=0.45"
Tc=6.0 min CN=60 Runoff=0.03 cfs 0.004 af

Subcatchment 301: Post-11 Runoff Area=0.055 ac 0.00% Impervious Runoff Depth=0.45"
Tc=6.0 min CN=60 Runoff=0.02 cfs 0.002 af

Subcatchment 400: Post-12 Runoff Area=0.048 ac 0.00% Impervious Runoff Depth=0.49"
Tc=6.0 min CN=61 Runoff=0.02 cfs 0.002 af

Subcatchment 401: Post-13 Runoff Area=0.170 ac 23.45% Impervious Runoff Depth=0.84"
Tc=6.0 min CN=69 Runoff=0.15 cfs 0.012 af

Subcatchment 402: Post-14 Runoff Area=0.128 ac 0.00% Impervious Runoff Depth=0.28"
Tc=6.0 min CN=55 Runoff=0.02 cfs 0.003 af

Reach 110: AP 40-4 LOT 6 Inflow=0.16 cfs 0.017 af
Outflow=0.16 cfs 0.017 af

Reach 302: AP 48-1 OS Inflow=0.03 cfs 0.004 af
Outflow=0.03 cfs 0.004 af

Reach 303: AP 39-3 LOT 19 Inflow=0.02 cfs 0.002 af
Outflow=0.02 cfs 0.002 af

Reach 403: AP 40-4 LOT 5 Inflow=0.02 cfs 0.002 af
Outflow=0.02 cfs 0.002 af

Reach 404: AP 40-4 LOT 4 Inflow=0.15 cfs 0.012 af
Outflow=0.15 cfs 0.012 af

Reach 405: AP 40-4 LOT 3 Inflow=0.02 cfs 0.003 af
Outflow=0.02 cfs 0.003 af

Pond 101: UIS A Peak Elev=138.72' Storage=0.058 af Inflow=7.26 cfs 0.520 af
Discarded=3.01 cfs 0.520 af Primary=0.00 cfs 0.000 af Outflow=3.01 cfs 0.520 af

Pond 103: UIS B Peak Elev=143.77' Storage=0.014 af Inflow=0.71 cfs 0.056 af
Discarded=0.13 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.056 af

Pond 105: UIS C Peak Elev=142.14' Storage=0.016 af Inflow=0.84 cfs 0.067 af
Discarded=0.15 cfs 0.067 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.067 af

Pond 107: UIS D Peak Elev=144.68' Storage=0.032 af Inflow=2.97 cfs 0.222 af
Discarded=1.04 cfs 0.222 af Primary=0.00 cfs 0.000 af Outflow=1.04 cfs 0.222 af

Pond 201: UIS F Peak Elev=142.55' Storage=0.079 af Inflow=1.87 cfs 0.137 af
Discarded=0.07 cfs 0.137 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.137 af

Pond 203: UIS E Peak Elev=149.59' Storage=0.024 af Inflow=0.62 cfs 0.049 af
Discarded=0.03 cfs 0.049 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.049 af

Link DP-1: AP 48-1 LOT 7 Inflow=0.51 cfs 0.068 af
Primary=0.51 cfs 0.068 af

Link DP-2: Curtis Corner Road Inflow=0.44 cfs 0.040 af
Primary=0.44 cfs 0.040 af

Link DP-3: NW Abutters Inflow=0.05 cfs 0.006 af
Primary=0.05 cfs 0.006 af

Link DP-4: NE Abutters Inflow=0.17 cfs 0.017 af
Primary=0.17 cfs 0.017 af

A3.5.4.3 HydroCAD 10-Year Storm Analysis

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

Subcatchment 10: Pre-01 Runoff Area=5.492 ac 13.17% Impervious Runoff Depth=1.59"
Flow Length=494' Tc=30.8 min CN=65 Runoff=5.39 cfs 0.727 af

Subcatchment 12: Pre-02 Runoff Area=2.490 ac 32.30% Impervious Runoff Depth=2.12"
Flow Length=475' Tc=23.3 min CN=72 Runoff=3.85 cfs 0.440 af

Subcatchment 13: Pre-03 Runoff Area=0.926 ac 9.18% Impervious Runoff Depth=1.45"
Tc=6.0 min CN=63 Runoff=1.46 cfs 0.112 af

Subcatchment 20: Pre-04 Runoff Area=2.048 ac 42.66% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=76 Runoff=5.88 cfs 0.419 af

Subcatchment 30: Pre-05 Runoff Area=0.222 ac 21.01% Impervious Runoff Depth=1.81"
Tc=6.0 min CN=68 Runoff=0.46 cfs 0.033 af

Subcatchment 31: Pre-06 Runoff Area=0.232 ac 19.89% Impervious Runoff Depth=1.81"
Tc=6.0 min CN=68 Runoff=0.48 cfs 0.035 af

Subcatchment 40: Pre-07 Runoff Area=0.052 ac 0.58% Impervious Runoff Depth=1.31"
Tc=6.0 min CN=61 Runoff=0.07 cfs 0.006 af

Subcatchment 41: Pre-08 Runoff Area=0.389 ac 22.31% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=69 Runoff=0.84 cfs 0.061 af

Subcatchment 42: Pre-09 Runoff Area=0.133 ac 3.29% Impervious Runoff Depth=1.05"
Tc=6.0 min CN=57 Runoff=0.14 cfs 0.012 af

Reach 14: AP 40-4 LOT 6 Inflow=1.46 cfs 0.112 af
Outflow=1.46 cfs 0.112 af

Reach 32: AP 48-1 OS Inflow=0.46 cfs 0.033 af
Outflow=0.46 cfs 0.033 af

Reach 33: AP 39-3 LOT 19 Inflow=0.48 cfs 0.035 af
Outflow=0.48 cfs 0.035 af

Reach 43: AP 40-4 LOT 5 Inflow=0.07 cfs 0.006 af
Outflow=0.07 cfs 0.006 af

Reach 44: AP 40-4 LOT 4 Inflow=0.84 cfs 0.061 af
Outflow=0.84 cfs 0.061 af

Reach 45: AP 40-4 LOT 3 Inflow=0.14 cfs 0.012 af
Outflow=0.14 cfs 0.012 af

Pond 11: Existing Depression Peak Elev=146.15' Storage=4,616 cf Inflow=5.39 cfs 0.727 af
Discarded=0.72 cfs 0.516 af Primary=7.31 cfs 0.211 af Outflow=8.03 cfs 0.727 af

Link DP-1: AP 48-1 LOT 7 Inflow=11.33 cfs 0.763 af
Primary=11.33 cfs 0.763 af

Link DP-2: Curtis Corner Road Inflow=5.88 cfs 0.419 af
Primary=5.88 cfs 0.419 af

Link DP-3: NW Abutters Inflow=0.93 cfs 0.068 af
Primary=0.93 cfs 0.068 af

Link DP-4: NE Abutters Inflow=1.05 cfs 0.078 af
Primary=1.05 cfs 0.078 af

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

Subcatchment 100: Post-01 Runoff Area=4.218 ac 51.07% Impervious Runoff Depth=2.81"
Tc=6.0 min CN=80 Runoff=13.88 cfs 0.986 af

Subcatchment 102: Post-02 Runoff Area=0.221 ac 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=1.06 cfs 0.086 af

Subcatchment 104: Post-03 Runoff Area=0.261 ac 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=1.25 cfs 0.101 af

Subcatchment 106: Post-04 Runoff Area=2.409 ac 37.89% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=74 Runoff=6.42 cfs 0.459 af

Subcatchment 108: Post-05 Runoff Area=0.414 ac 0.04% Impervious Runoff Depth=1.31"
Tc=6.0 min CN=61 Runoff=0.57 cfs 0.045 af

Subcatchment 109: Post-06 Runoff Area=1.624 ac 0.05% Impervious Runoff Depth=1.11"
Tc=6.0 min CN=58 Runoff=1.81 cfs 0.151 af

Subcatchment 200: Post-07 Runoff Area=1.348 ac 39.69% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=76 Runoff=3.87 cfs 0.276 af

Subcatchment 202: Post-08 Runoff Area=0.192 ac 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=0.92 cfs 0.075 af

Subcatchment 204: Post-09 Runoff Area=0.793 ac 14.25% Impervious Runoff Depth=1.52"
Tc=6.0 min CN=64 Runoff=1.32 cfs 0.100 af

Subcatchment 300: Post-10 Runoff Area=0.103 ac 0.00% Impervious Runoff Depth=1.24"
Tc=6.0 min CN=60 Runoff=0.13 cfs 0.011 af

Subcatchment 301: Post-11 Runoff Area=0.055 ac 0.00% Impervious Runoff Depth=1.24"
Tc=6.0 min CN=60 Runoff=0.07 cfs 0.006 af

Subcatchment 400: Post-12 Runoff Area=0.048 ac 0.00% Impervious Runoff Depth=1.31"
Tc=6.0 min CN=61 Runoff=0.07 cfs 0.005 af

Subcatchment 401: Post-13 Runoff Area=0.170 ac 23.45% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=69 Runoff=0.37 cfs 0.027 af

Subcatchment 402: Post-14 Runoff Area=0.128 ac 0.00% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=55 Runoff=0.11 cfs 0.010 af

Reach 110: AP 40-4 LOT 6 Inflow=0.57 cfs 0.045 af
Outflow=0.57 cfs 0.045 af

Reach 302: AP 48-1 OS Inflow=0.13 cfs 0.011 af
Outflow=0.13 cfs 0.011 af

Reach 303: AP 39-3 LOT 19 Inflow=0.07 cfs 0.006 af
Outflow=0.07 cfs 0.006 af

Reach 403: AP 40-4 LOT 5 Inflow=0.07 cfs 0.005 af
Outflow=0.07 cfs 0.005 af

Reach 404: AP 40-4 LOT 4 Inflow=0.37 cfs 0.027 af
Outflow=0.37 cfs 0.027 af

Reach 405: AP 40-4 LOT 3 Inflow=0.11 cfs 0.010 af
Outflow=0.11 cfs 0.010 af

Pond 101: UIS A Peak Elev=139.73' Storage=0.232 af Inflow=13.88 cfs 0.986 af
Discarded=3.01 cfs 0.986 af Primary=0.00 cfs 0.000 af Outflow=3.01 cfs 0.986 af

Pond 103: UIS B Peak Elev=144.83' Storage=0.026 af Inflow=1.06 cfs 0.086 af
Discarded=0.13 cfs 0.086 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.086 af

Pond 105: UIS C Peak Elev=143.16' Storage=0.030 af Inflow=1.25 cfs 0.101 af
Discarded=0.15 cfs 0.101 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.101 af

Pond 107: UIS D Peak Elev=145.63' Storage=0.131 af Inflow=6.42 cfs 0.459 af
Discarded=1.04 cfs 0.459 af Primary=0.00 cfs 0.000 af Outflow=1.04 cfs 0.459 af

Pond 201: UIS F Peak Elev=145.23' Storage=0.197 af Inflow=3.87 cfs 0.276 af
Discarded=0.07 cfs 0.276 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.276 af

Pond 203: UIS E Peak Elev=150.60' Storage=0.042 af Inflow=0.92 cfs 0.075 af
Discarded=0.03 cfs 0.075 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.075 af

Link DP-1: AP 48-1 LOT 7 Inflow=2.39 cfs 0.196 af
Primary=2.39 cfs 0.196 af

Link DP-2: Curtis Corner Road Inflow=1.32 cfs 0.100 af
Primary=1.32 cfs 0.100 af

Link DP-3: NW Abutters Inflow=0.20 cfs 0.016 af
Primary=0.20 cfs 0.016 af

Link DP-4: NE Abutters Inflow=0.54 cfs 0.042 af
Primary=0.54 cfs 0.042 af

A3.5.4.4 HydroCAD 25-Year Storm Analysis

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

Subcatchment 10: Pre-01 Runoff Area=5.492 ac 13.17% Impervious Runoff Depth=2.42"
Flow Length=494' Tc=30.8 min CN=65 Runoff=8.51 cfs 1.110 af

Subcatchment 12: Pre-02 Runoff Area=2.490 ac 32.30% Impervious Runoff Depth=3.08"
Flow Length=475' Tc=23.3 min CN=72 Runoff=5.65 cfs 0.638 af

Subcatchment 13: Pre-03 Runoff Area=0.926 ac 9.18% Impervious Runoff Depth=2.25"
Tc=6.0 min CN=63 Runoff=2.37 cfs 0.173 af

Subcatchment 20: Pre-04 Runoff Area=2.048 ac 42.66% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=76 Runoff=8.33 cfs 0.592 af

Subcatchment 30: Pre-05 Runoff Area=0.222 ac 21.01% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=68 Runoff=0.69 cfs 0.050 af

Subcatchment 31: Pre-06 Runoff Area=0.232 ac 19.89% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=68 Runoff=0.73 cfs 0.052 af

Subcatchment 40: Pre-07 Runoff Area=0.052 ac 0.58% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=61 Runoff=0.12 cfs 0.009 af

Subcatchment 41: Pre-08 Runoff Area=0.389 ac 22.31% Impervious Runoff Depth=2.79"
Tc=6.0 min CN=69 Runoff=1.26 cfs 0.090 af

Subcatchment 42: Pre-09 Runoff Area=0.133 ac 3.29% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=57 Runoff=0.25 cfs 0.019 af

Reach 14: AP 40-4 LOT 6 Inflow=2.37 cfs 0.173 af
Outflow=2.37 cfs 0.173 af

Reach 32: AP 48-1 OS Inflow=0.69 cfs 0.050 af
Outflow=0.69 cfs 0.050 af

Reach 33: AP 39-3 LOT 19 Inflow=0.73 cfs 0.052 af
Outflow=0.73 cfs 0.052 af

Reach 43: AP 40-4 LOT 5 Inflow=0.12 cfs 0.009 af
Outflow=0.12 cfs 0.009 af

Reach 44: AP 40-4 LOT 4 Inflow=1.26 cfs 0.090 af
Outflow=1.26 cfs 0.090 af

Reach 45: AP 40-4 LOT 3 Inflow=0.25 cfs 0.019 af
Outflow=0.25 cfs 0.019 af

Pond 11: Existing Depression Peak Elev=146.42' Storage=4,616 cf Inflow=8.51 cfs 1.110 af
Discarded=0.72 cfs 0.618 af Primary=10.64 cfs 0.492 af Outflow=11.36 cfs 1.110 af

Link DP-1: AP 48-1 LOT 7 Inflow=16.80 cfs 1.303 af
Primary=16.80 cfs 1.303 af

Link DP-2: Curtis Corner Road Inflow=8.33 cfs 0.592 af
Primary=8.33 cfs 0.592 af

Link DP-3: NW Abutters Inflow=1.42 cfs 0.102 af
Primary=1.42 cfs 0.102 af

Link DP-4: NE Abutters Inflow=1.63 cfs 0.119 af
Primary=1.63 cfs 0.119 af

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

Subcatchment 100: Post-01 Runoff Area=4.218 ac 51.07% Impervious Runoff Depth=3.87"
Tc=6.0 min CN=80 Runoff=19.06 cfs 1.361 af

Subcatchment 102: Post-02 Runoff Area=0.221 ac 100.00% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=98 Runoff=1.32 cfs 0.108 af

Subcatchment 104: Post-03 Runoff Area=0.261 ac 100.00% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=98 Runoff=1.56 cfs 0.127 af

Subcatchment 106: Post-04 Runoff Area=2.409 ac 37.89% Impervious Runoff Depth=3.27"
Tc=6.0 min CN=74 Runoff=9.24 cfs 0.656 af

Subcatchment 108: Post-05 Runoff Area=0.414 ac 0.04% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=61 Runoff=0.96 cfs 0.071 af

Subcatchment 109: Post-06 Runoff Area=1.624 ac 0.05% Impervious Runoff Depth=1.82"
Tc=6.0 min CN=58 Runoff=3.22 cfs 0.246 af

Subcatchment 200: Post-07 Runoff Area=1.348 ac 39.69% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=76 Runoff=5.48 cfs 0.389 af

Subcatchment 202: Post-08 Runoff Area=0.192 ac 100.00% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=98 Runoff=1.15 cfs 0.094 af

Subcatchment 204: Post-09 Runoff Area=0.793 ac 14.25% Impervious Runoff Depth=2.33"
Tc=6.0 min CN=64 Runoff=2.12 cfs 0.154 af

Subcatchment 300: Post-10 Runoff Area=0.103 ac 0.00% Impervious Runoff Depth=1.99"
Tc=6.0 min CN=60 Runoff=0.23 cfs 0.017 af

Subcatchment 301: Post-11 Runoff Area=0.055 ac 0.00% Impervious Runoff Depth=1.99"
Tc=6.0 min CN=60 Runoff=0.12 cfs 0.009 af

Subcatchment 400: Post-12 Runoff Area=0.048 ac 0.00% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=61 Runoff=0.11 cfs 0.008 af

Subcatchment 401: Post-13 Runoff Area=0.170 ac 23.45% Impervious Runoff Depth=2.79"
Tc=6.0 min CN=69 Runoff=0.55 cfs 0.040 af

Subcatchment 402: Post-14 Runoff Area=0.128 ac 0.00% Impervious Runoff Depth=1.58"
Tc=6.0 min CN=55 Runoff=0.21 cfs 0.017 af

Reach 110: AP 40-4 LOT 6 Inflow=0.96 cfs 0.071 af
Outflow=0.96 cfs 0.071 af

Reach 302: AP 48-1 OS Inflow=0.23 cfs 0.017 af
Outflow=0.23 cfs 0.017 af

Reach 303: AP 39-3 LOT 19 Inflow=0.12 cfs 0.009 af
Outflow=0.12 cfs 0.009 af

Reach 403: AP 40-4 LOT 5 Inflow=0.11 cfs 0.008 af
Outflow=0.11 cfs 0.008 af

Reach 404: AP 40-4 LOT 4 Inflow=0.55 cfs 0.040 af
Outflow=0.55 cfs 0.040 af

Reach 405: AP 40-4 LOT 3 Inflow=0.21 cfs 0.017 af
Outflow=0.21 cfs 0.017 af

Pond 101: UIS A Peak Elev=140.72' Storage=0.395 af Inflow=19.06 cfs 1.361 af
Discarded=3.01 cfs 1.361 af Primary=0.00 cfs 0.000 af Outflow=3.01 cfs 1.361 af

Pond 103: UIS B Peak Elev=145.76' Storage=0.036 af Inflow=1.32 cfs 0.108 af
Discarded=0.13 cfs 0.108 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.108 af

Pond 105: UIS C Peak Elev=144.06' Storage=0.042 af Inflow=1.56 cfs 0.127 af
Discarded=0.15 cfs 0.127 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.127 af

Pond 107: UIS D Peak Elev=146.59' Storage=0.227 af Inflow=9.24 cfs 0.656 af
Discarded=1.04 cfs 0.656 af Primary=0.00 cfs 0.000 af Outflow=1.04 cfs 0.656 af

Pond 201: UIS F Peak Elev=147.95' Storage=0.247 af Inflow=5.48 cfs 0.389 af
Discarded=0.07 cfs 0.334 af Primary=0.45 cfs 0.056 af Outflow=0.51 cfs 0.389 af

Pond 203: UIS E Peak Elev=151.47' Storage=0.057 af Inflow=1.15 cfs 0.094 af
Discarded=0.03 cfs 0.094 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.094 af

Link DP-1: AP 48-1 LOT 7 Inflow=4.18 cfs 0.318 af
Primary=4.18 cfs 0.318 af

Link DP-2: Curtis Corner Road Inflow=2.12 cfs 0.210 af
Primary=2.12 cfs 0.210 af

Link DP-3: NW Abutters Inflow=0.35 cfs 0.026 af
Primary=0.35 cfs 0.026 af

Link DP-4: NE Abutters Inflow=0.88 cfs 0.065 af
Primary=0.88 cfs 0.065 af

A3.5.4.5 HydroCAD 100-Year Storm Analysis

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

Subcatchment 10: Pre-01 Runoff Area=5.492 ac 13.17% Impervious Runoff Depth=4.30"
Flow Length=494' Tc=30.8 min CN=65 Runoff=15.45 cfs 1.969 af

Subcatchment 12: Pre-02 Runoff Area=2.490 ac 32.30% Impervious Runoff Depth=5.14"
Flow Length=475' Tc=23.3 min CN=72 Runoff=9.47 cfs 1.066 af

Subcatchment 13: Pre-03 Runoff Area=0.926 ac 9.18% Impervious Runoff Depth=4.07"
Tc=6.0 min CN=63 Runoff=4.40 cfs 0.314 af

Subcatchment 20: Pre-04 Runoff Area=2.048 ac 42.66% Impervious Runoff Depth=5.61"
Tc=6.0 min CN=76 Runoff=13.38 cfs 0.958 af

Subcatchment 30: Pre-05 Runoff Area=0.222 ac 21.01% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=68 Runoff=1.21 cfs 0.086 af

Subcatchment 31: Pre-06 Runoff Area=0.232 ac 19.89% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=68 Runoff=1.27 cfs 0.090 af

Subcatchment 40: Pre-07 Runoff Area=0.052 ac 0.58% Impervious Runoff Depth=3.83"
Tc=6.0 min CN=61 Runoff=0.23 cfs 0.017 af

Subcatchment 41: Pre-08 Runoff Area=0.389 ac 22.31% Impervious Runoff Depth=4.78"
Tc=6.0 min CN=69 Runoff=2.18 cfs 0.155 af

Subcatchment 42: Pre-09 Runoff Area=0.133 ac 3.29% Impervious Runoff Depth=3.36"
Tc=6.0 min CN=57 Runoff=0.51 cfs 0.037 af

Reach 14: AP 40-4 LOT 6 Inflow=4.40 cfs 0.314 af
Outflow=4.40 cfs 0.314 af

Reach 32: AP 48-1 OS Inflow=1.21 cfs 0.086 af
Outflow=1.21 cfs 0.086 af

Reach 33: AP 39-3 LOT 19 Inflow=1.27 cfs 0.090 af
Outflow=1.27 cfs 0.090 af

Reach 43: AP 40-4 LOT 5 Inflow=0.23 cfs 0.017 af
Outflow=0.23 cfs 0.017 af

Reach 44: AP 40-4 LOT 4 Inflow=2.18 cfs 0.155 af
Outflow=2.18 cfs 0.155 af

Reach 45: AP 40-4 LOT 3 Inflow=0.51 cfs 0.037 af
Outflow=0.51 cfs 0.037 af

Pond 11: Existing Depression Peak Elev=146.88' Storage=4,616 cf Inflow=15.45 cfs 1.969 af
Discarded=0.72 cfs 0.783 af Primary=17.16 cfs 1.186 af Outflow=17.88 cfs 1.969 af

Link DP-1: AP 48-1 LOT 7 Inflow=27.60 cfs 2.566 af
Primary=27.60 cfs 2.566 af

Link DP-2: Curtis Corner Road Inflow=13.38 cfs 0.958 af
Primary=13.38 cfs 0.958 af

Link DP-3: NW Abutters Inflow=2.48 cfs 0.176 af
Primary=2.48 cfs 0.176 af

Link DP-4: NE Abutters Inflow=2.92 cfs 0.209 af
Primary=2.92 cfs 0.209 af

Summary for Subcatchment 10: Pre-01

Runoff = 15.45 cfs @ 12.43 hrs, Volume= 1.969 af, Depth= 4.30"
Routed to Pond 11 : Existing Depression

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=8.50"

Area (ac)	CN	Description
3.797	61	>75% Grass cover, Good, HSG B
0.482	98	Impervious, HSG B
0.241	98	Roofs, HSG B
0.972	55	Woods, Good, HSG B
5.492	65	Weighted Average
4.769	60	86.83% Pervious Area
0.723	98	13.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	51	0.0160	0.09		**Sheet Flow, A** Grass: Dense n= 0.240 P2= 3.30"
0.1	8	0.0250	0.92		**Sheet Flow, B** Smooth surfaces n= 0.011 P2= 3.30"
17.6	42	0.0020	0.04		**Sheet Flow, C** Grass: Dense n= 0.240 P2= 3.30"
4.1	393	0.0100	1.61		**Shallow Concentrated Flow, D** Unpaved Kv= 16.1 fps
30.8	494	Total			

Summary for Subcatchment 12: Pre-02

Runoff = 9.47 cfs @ 12.32 hrs, Volume= 1.066 af, Depth= 5.14"
Routed to Link DP-1 : AP 48-1 LOT 7

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=8.50"

Area (ac)	CN	Description
1.287	61	>75% Grass cover, Good, HSG B
0.670	98	Impervious, HSG B
0.135	98	Roofs, HSG B
0.399	55	Woods, Good, HSG B
2.490	72	Weighted Average
1.686	60	67.70% Pervious Area
0.804	98	32.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	14	0.0500	0.12		**Sheet Flow, A** Grass: Dense n= 0.240 P2= 3.30"
0.3	21	0.0200	1.02		**Sheet Flow, B** Smooth surfaces n= 0.011 P2= 3.30"
13.7	65	0.0090	0.08		**Sheet Flow, C** Grass: Dense n= 0.240 P2= 3.30"
1.9	153	0.0070	1.35		**Shallow Concentrated Flow, D** Unpaved Kv= 16.1 fps
0.7	59	0.0050	1.44		**Shallow Concentrated Flow, E** Paved Kv= 20.3 fps
1.4	14	0.0001	0.16		**Shallow Concentrated Flow, F** Unpaved Kv= 16.1 fps
2.8	103	0.0009	0.61		**Shallow Concentrated Flow, G** Paved Kv= 20.3 fps
0.5	46	0.0080	1.44		**Shallow Concentrated Flow, H** Unpaved Kv= 16.1 fps
23.3	475	Total			

Summary for Subcatchment 13: Pre-03

Runoff = 4.40 cfs @ 12.09 hrs, Volume= 0.314 af, Depth= 4.07"
Routed to Reach 14 : AP 40-4 LOT 6

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=8.50"

Area (ac)	CN	Description
0.557	61	>75% Grass cover, Good, HSG B
0.006	98	Impervious, HSG B
0.079	98	Roofs, HSG B
0.284	55	Woods, Good, HSG B
0.926	63	Weighted Average
0.841	59	90.82% Pervious Area
0.085	98	9.18% Impervious Area

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

Summary for Subcatchment 20: Pre-04

Runoff = 13.38 cfs @ 12.09 hrs, Volume= 0.958 af, Depth= 5.61"
Routed to Link DP-2 : Curtis Corner Road

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=8.50"

Area (ac)	CN	Description
0.769	61	>75% Grass cover, Good, HSG B
0.732	98	Impervious, HSG B
0.141	98	Roofs, HSG B
0.406	55	Woods, Good, HSG B
2.048	76	Weighted Average
1.174	59	57.34% Pervious Area
0.874	98	42.66% Impervious Area

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

Summary for Subcatchment 30: Pre-05

Runoff = 1.21 cfs @ 12.09 hrs, Volume= 0.086 af, Depth= 4.66"
Routed to Reach 32 : AP 48-1 OS

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=8.50"

Area (ac)	CN	Description
0.159	61	>75% Grass cover, Good, HSG B
0.003	98	Impervious, HSG B
0.044	98	Roofs, HSG B
0.017	55	Woods, Good, HSG B
0.222	68	Weighted Average
0.175	60	78.99% Pervious Area
0.047	98	21.01% Impervious Area

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

Summary for Subcatchment 31: Pre-06

Runoff = 1.27 cfs @ 12.09 hrs, Volume= 0.090 af, Depth= 4.66"
Routed to Reach 33 : AP 39-3 LOT 19

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=8.50"

Area (ac)	CN	Description
0.171	61	>75% Grass cover, Good, HSG B
0.002	98	Impervious, HSG B
0.044	98	Roofs, HSG B
0.015	55	Woods, Good, HSG B
0.232	68	Weighted Average
0.186	61	80.11% Pervious Area
0.046	98	19.89% Impervious Area

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

Summary for Subcatchment 40: Pre-07

Runoff = 0.23 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 3.83"
Routed to Reach 43 : AP 40-4 LOT 5

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=8.50"

Area (ac)	CN	Description
0.052	61	>75% Grass cover, Good, HSG B
0.000	98	Impervious, HSG B
0.052	61	Weighted Average
0.052	61	99.42% Pervious Area
0.000	98	0.58% Impervious Area

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

Summary for Subcatchment 41: Pre-08

Runoff = 2.18 cfs @ 12.09 hrs, Volume= 0.155 af, Depth= 4.78"
Routed to Reach 44 : AP 40-4 LOT 4

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=8.50"

Area (ac)	CN	Description
0.291	61	>75% Grass cover, Good, HSG B
0.016	98	Impervious, HSG B
0.071	98	Roofs, HSG B
0.011	55	Woods, Good, HSG B
0.389	69	Weighted Average
0.302	61	77.69% Pervious Area
0.087	98	22.31% Impervious Area

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

Summary for Subcatchment 42: Pre-09

Runoff = 0.51 cfs @ 12.09 hrs, Volume= 0.037 af, Depth= 3.36"
Routed to Reach 45 : AP 40-4 LOT 3

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=8.50"

Area (ac)	CN	Description
0.004	61	>75% Grass cover, Good, HSG B
0.004	98	Impervious, HSG B
0.124	55	Woods, Good, HSG B
0.133	57	Weighted Average
0.128	55	96.71% Pervious Area
0.004	98	3.29% Impervious Area

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

Summary for Reach 14: AP 40-4 LOT 6

Inflow Area = 0.926 ac, 9.18% Impervious, Inflow Depth = 4.07" for 100-Year event
Inflow = 4.40 cfs @ 12.09 hrs, Volume= 0.314 af
Outflow = 4.40 cfs @ 12.09 hrs, Volume= 0.314 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-1 : AP 48-1 LOT 7

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

Summary for Reach 32: AP 48-1 OS

Inflow Area = 0.222 ac, 21.01% Impervious, Inflow Depth = 4.66" for 100-Year event
Inflow = 1.21 cfs @ 12.09 hrs, Volume= 0.086 af
Outflow = 1.21 cfs @ 12.09 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-3 : NW Abutters

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

Summary for Reach 33: AP 39-3 LOT 19

Inflow Area = 0.232 ac, 19.89% Impervious, Inflow Depth = 4.66" for 100-Year event
Inflow = 1.27 cfs @ 12.09 hrs, Volume= 0.090 af
Outflow = 1.27 cfs @ 12.09 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-3 : NW Abutters

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

Summary for Reach 43: AP 40-4 LOT 5

Inflow Area = 0.052 ac, 0.58% Impervious, Inflow Depth = 3.83" for 100-Year event
Inflow = 0.23 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.23 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-4 : NE Abutters

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

Summary for Reach 44: AP 40-4 LOT 4

Inflow Area = 0.389 ac, 22.31% Impervious, Inflow Depth = 4.78" for 100-Year event
Inflow = 2.18 cfs @ 12.09 hrs, Volume= 0.155 af
Outflow = 2.18 cfs @ 12.09 hrs, Volume= 0.155 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-4 : NE Abutters

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

Summary for Reach 45: AP 40-4 LOT 3

Inflow Area = 0.133 ac, 3.29% Impervious, Inflow Depth = 3.36" for 100-Year event
Inflow = 0.51 cfs @ 12.09 hrs, Volume= 0.037 af
Outflow = 0.51 cfs @ 12.09 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-4 : NE Abutters

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

Summary for Pond 11: Existing Depression

Inflow Area = 5.492 ac, 13.17% Impervious, Inflow Depth = 4.30" for 100-Year event
Inflow = 15.45 cfs @ 12.43 hrs, Volume= 1.969 af
Outflow = 17.88 cfs @ 12.43 hrs, Volume= 1.969 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.72 cfs @ 12.02 hrs, Volume= 0.783 af
Primary = 17.16 cfs @ 12.43 hrs, Volume= 1.186 af
Routed to Link DP-1 : AP 48-1 LOT 7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 146.88' @ 12.43 hrs Surf.Area= 12,902 sf Storage= 4,616 cf

Plug-Flow detention time= 37.0 min calculated for 1.969 af (100% of inflow)
Center-of-Mass det. time= 37.0 min (892.5 - 855.5)

Volume	Invert	Avail.Storage	Storage Description
#1	144.60'	4,616 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
144.60	2,430	0	0
144.70	4,791	361	361
144.80	6,336	556	917
144.90	7,684	701	1,618
145.00	9,096	839	2,457
145.10	10,583	984	3,441
145.20	12,902	1,174	4,616

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.60'	**2.410 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	145.20'	**3.0' long x 170.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.72 cfs @ 12.02 hrs HW=145.48' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.72 cfs)

Primary OutFlow Max=17.15 cfs @ 12.43 hrs HW=146.88' TW=0.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 17.15 cfs @ 3.41 fps)

Summary for Link DP-1: AP 48-1 LOT 7

Inflow Area = 8.909 ac, 18.10% Impervious, Inflow Depth = 3.46" for 100-Year event
Inflow = 27.60 cfs @ 12.37 hrs, Volume= 2.566 af
Primary = 27.60 cfs @ 12.37 hrs, Volume= 2.566 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link DP-2: Curtis Corner Road

Inflow Area = 2.048 ac, 42.66% Impervious, Inflow Depth = 5.61" for 100-Year event
Inflow = 13.38 cfs @ 12.09 hrs, Volume= 0.958 af
Primary = 13.38 cfs @ 12.09 hrs, Volume= 0.958 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link DP-3: NW Abutters

Inflow Area = 0.454 ac, 20.44% Impervious, Inflow Depth = 4.66" for 100-Year event
Inflow = 2.48 cfs @ 12.09 hrs, Volume= 0.176 af
Primary = 2.48 cfs @ 12.09 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link DP-4: NE Abutters

Inflow Area = 0.574 ac, 15.94% Impervious, Inflow Depth = 4.36" for 100-Year event
Inflow = 2.92 cfs @ 12.09 hrs, Volume= 0.209 af
Primary = 2.92 cfs @ 12.09 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment 100: Post-01 Runoff Area=4.218 ac 51.07% Impervious Runoff Depth=6.10"
Tc=6.0 min CN=80 Runoff=29.57 cfs 2.142 af

Subcatchment 102: Post-02 Runoff Area=0.221 ac 100.00% Impervious Runoff Depth=8.26"
Tc=6.0 min CN=98 Runoff=1.84 cfs 0.152 af

Subcatchment 104: Post-03 Runoff Area=0.261 ac 100.00% Impervious Runoff Depth=8.26"
Tc=6.0 min CN=98 Runoff=2.18 cfs 0.180 af

Subcatchment 106: Post-04 Runoff Area=2.409 ac 37.89% Impervious Runoff Depth=5.38"
Tc=6.0 min CN=74 Runoff=15.12 cfs 1.079 af

Subcatchment 108: Post-05 Runoff Area=0.414 ac 0.04% Impervious Runoff Depth=3.83"
Tc=6.0 min CN=61 Runoff=1.84 cfs 0.132 af

Subcatchment 109: Post-06 Runoff Area=1.624 ac 0.05% Impervious Runoff Depth=3.48"
Tc=6.0 min CN=58 Runoff=6.51 cfs 0.471 af

Subcatchment 200: Post-07 Runoff Area=1.348 ac 39.69% Impervious Runoff Depth=5.61"
Tc=6.0 min CN=76 Runoff=8.80 cfs 0.631 af

Subcatchment 202: Post-08 Runoff Area=0.192 ac 100.00% Impervious Runoff Depth=8.26"
Tc=6.0 min CN=98 Runoff=1.60 cfs 0.132 af

Subcatchment 204: Post-09 Runoff Area=0.793 ac 14.25% Impervious Runoff Depth=4.18"
Tc=6.0 min CN=64 Runoff=3.88 cfs 0.277 af

Subcatchment 300: Post-10 Runoff Area=0.103 ac 0.00% Impervious Runoff Depth=3.71"
Tc=6.0 min CN=60 Runoff=0.44 cfs 0.032 af

Subcatchment 301: Post-11 Runoff Area=0.055 ac 0.00% Impervious Runoff Depth=3.71"
Tc=6.0 min CN=60 Runoff=0.24 cfs 0.017 af

Subcatchment 400: Post-12 Runoff Area=0.048 ac 0.00% Impervious Runoff Depth=3.83"
Tc=6.0 min CN=61 Runoff=0.21 cfs 0.015 af

Subcatchment 401: Post-13 Runoff Area=0.170 ac 23.45% Impervious Runoff Depth=4.78"
Tc=6.0 min CN=69 Runoff=0.95 cfs 0.068 af

Subcatchment 402: Post-14 Runoff Area=0.128 ac 0.00% Impervious Runoff Depth=3.13"
Tc=6.0 min CN=55 Runoff=0.46 cfs 0.033 af

Reach 110: AP 40-4 LOT 6 Inflow=1.84 cfs 0.132 af
Outflow=1.84 cfs 0.132 af

Reach 302: AP 48-1 OS Inflow=0.44 cfs 0.032 af
Outflow=0.44 cfs 0.032 af

Reach 303: AP 39-3 LOT 19 Inflow=0.24 cfs 0.017 af
Outflow=0.24 cfs 0.017 af

Reach 403: AP 40-4 LOT 5 Inflow=0.21 cfs 0.015 af
Outflow=0.21 cfs 0.015 af

Reach 404: AP 40-4 LOT 4 Inflow=0.95 cfs 0.068 af
Outflow=0.95 cfs 0.068 af

Reach 405: AP 40-4 LOT 3 Inflow=0.46 cfs 0.033 af
Outflow=0.46 cfs 0.033 af

Pond 101: UIS A Peak Elev=143.64' Storage=0.760 af Inflow=29.57 cfs 2.142 af
Discarded=3.01 cfs 2.142 af Primary=0.00 cfs 0.000 af Outflow=3.01 cfs 2.142 af

Pond 103: UIS B Peak Elev=148.88' Storage=0.058 af Inflow=1.84 cfs 0.152 af
Discarded=0.13 cfs 0.152 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.152 af

Pond 105: UIS C Peak Elev=146.96' Storage=0.068 af Inflow=2.18 cfs 0.180 af
Discarded=0.15 cfs 0.180 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.180 af

Pond 107: UIS D Peak Elev=149.59' Storage=0.459 af Inflow=15.12 cfs 1.079 af
Discarded=1.04 cfs 1.079 af Primary=0.00 cfs 0.000 af Outflow=1.04 cfs 1.079 af

Pond 201: UIS F Peak Elev=148.31' Storage=0.247 af Inflow=8.80 cfs 0.631 af
Discarded=0.07 cfs 0.342 af Primary=7.52 cfs 0.289 af Outflow=7.59 cfs 0.631 af

Pond 203: UIS E Peak Elev=154.09' Storage=0.089 af Inflow=1.60 cfs 0.132 af
Discarded=0.03 cfs 0.132 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.132 af

Link DP-1: AP 48-1 LOT 7 Inflow=8.36 cfs 0.603 af
Primary=8.36 cfs 0.603 af

Link DP-2: Curtis Corner Road Inflow=9.97 cfs 0.566 af
Primary=9.97 cfs 0.566 af

Link DP-3: NW Abutters Inflow=0.68 cfs 0.049 af
Primary=0.68 cfs 0.049 af

Link DP-4: NE Abutters Inflow=1.62 cfs 0.116 af
Primary=1.62 cfs 0.116 af

Summary for Subcatchment 100: Post-01

Runoff = 29.57 cfs @ 12.09 hrs, Volume= 2.142 af, Depth= 6.10"
Routed to Pond 101 : UIS A

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=8.50"

Area (ac)	CN	Description
2.064	61	>75% Grass cover, Good, HSG B
1.525	98	Impervious, HSG B
0.629	98	Roofs, HSG B
4.218	80	Weighted Average
2.064	61	48.93% Pervious Area
2.154	98	51.07% Impervious Area

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

Summary for Subcatchment 102: Post-02

Runoff = 1.84 cfs @ 12.08 hrs, Volume= 0.152 af, Depth= 8.26"
Routed to Pond 103 : UIS B

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=8.50"

Area (ac)	CN	Description
0.221	98	Roofs, HSG B
0.221	98	100.00% Impervious Area

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

Summary for Subcatchment 104: Post-03

Runoff = 2.18 cfs @ 12.08 hrs, Volume= 0.180 af, Depth= 8.26"
Routed to Pond 105 : UIS C

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=8.50"

Area (ac)	CN	Description
0.261	98	Roofs, HSG B
0.261	98	100.00% Impervious Area

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

Summary for Subcatchment 106: Post-04

Runoff = 15.12 cfs @ 12.09 hrs, Volume= 1.079 af, Depth= 5.38"
Routed to Pond 107 : UIS D

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=8.50"

Area (ac)	CN	Description
1.016	61	>75% Grass cover, Good, HSG B
0.638	98	Impervious, HSG B
0.274	98	Roofs, HSG B
0.480	55	Woods, Good, HSG B
2.409	74	Weighted Average
1.496	59	62.11% Pervious Area
0.913	98	37.89% Impervious Area

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

Summary for Subcatchment 108: Post-05

Runoff = 1.84 cfs @ 12.09 hrs, Volume= 0.132 af, Depth= 3.83"
Routed to Reach 110 : AP 40-4 LOT 6

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=8.50"

Area (ac)	CN	Description
0.414	61	>75% Grass cover, Good, HSG B
0.000	98	Impervious, HSG B
0.000	98	Roofs, HSG B
0.414	61	Weighted Average
0.414	61	99.96% Pervious Area
0.000	98	0.04% Impervious Area

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

Summary for Subcatchment 109: Post-06

Runoff = 6.51 cfs @ 12.09 hrs, Volume= 0.471 af, Depth= 3.48"
Routed to Link DP-1 : AP 48-1 LOT 7

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=8.50"

Area (ac)	CN	Description
0.883	61	>75% Grass cover, Good, HSG B
0.000	98	Impervious, HSG B
0.001	98	Roofs, HSG B
0.740	55	Woods, Good, HSG B
1.624	58	Weighted Average
1.623	58	99.95% Pervious Area
0.001	98	0.05% Impervious Area

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

Summary for Subcatchment 200: Post-07

Runoff = 8.80 cfs @ 12.09 hrs, Volume= 0.631 af, Depth= 5.61"
Routed to Pond 201 : UIS F

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=8.50"

Area (ac)	CN	Description
0.811	61	>75% Grass cover, Good, HSG B
0.476	98	Impervious, HSG B
0.059	98	Roofs, HSG B
0.002	55	Woods, Good, HSG B
1.348	76	Weighted Average
0.813	61	60.31% Pervious Area
0.535	98	39.69% Impervious Area

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

Summary for Subcatchment 202: Post-08

Runoff = 1.60 cfs @ 12.08 hrs, Volume= 0.132 af, Depth= 8.26"
Routed to Pond 203 : UIS E

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=8.50"

Area (ac)	CN	Description
0.192	98	Roofs, HSG B
0.192	98	100.00% Impervious Area

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

Summary for Subcatchment 204: Post-09

Runoff = 3.88 cfs @ 12.09 hrs, Volume= 0.277 af, Depth= 4.18"
Routed to Link DP-2 : Curtis Corner Road

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=8.50"

Area (ac)	CN	Description
0.344	61	>75% Grass cover, Good, HSG B
0.113	98	Impervious, HSG B
0.000	98	Roofs, HSG B
0.336	55	Woods, Good, HSG B
0.793	64	Weighted Average
0.680	58	85.75% Pervious Area
0.113	98	14.25% Impervious Area

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

Summary for Subcatchment 300: Post-10

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.032 af, Depth= 3.71"
Routed to Reach 302 : AP 48-1 OS

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=8.50"

Area (ac)	CN	Description
0.013	55	Woods, Good, HSG B
0.090	61	>75% Grass cover, Good, HSG B
0.103	60	Weighted Average
0.103	60	100.00% Pervious Area

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

Summary for Subcatchment 301: Post-11

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 3.71"
Routed to Reach 303 : AP 39-3 LOT 19

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=8.50"

Area (ac)	CN	Description
0.008	55	Woods, Good, HSG B
0.047	61	>75% Grass cover, Good, HSG B
0.055	60	Weighted Average
0.055	60	100.00% Pervious Area

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

Summary for Subcatchment 400: Post-12

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 3.83"
Routed to Reach 403 : AP 40-4 LOT 5

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=8.50"

Area (ac)	CN	Description
0.048	61	>75% Grass cover, Good, HSG B
0.048	61	100.00% Pervious Area

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

Summary for Subcatchment 401: Post-13

Runoff = 0.95 cfs @ 12.09 hrs, Volume= 0.068 af, Depth= 4.78"
Routed to Reach 404 : AP 40-4 LOT 4

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=8.50"

Area (ac)	CN	Description
0.104	61	>75% Grass cover, Good, HSG B
0.003	98	Impervious, HSG B
0.037	98	Roofs, HSG B
0.026	55	Woods, Good, HSG B
0.170	69	Weighted Average
0.130	60	76.55% Pervious Area
0.040	98	23.45% Impervious Area

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

Summary for Subcatchment 402: Post-14

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.033 af, Depth= 3.13"
Routed to Reach 405 : AP 40-4 LOT 3

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=8.50"

Area (ac)	CN	Description
0.128	55	Woods, Good, HSG B
0.128	55	100.00% Pervious Area

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

Summary for Reach 110: AP 40-4 LOT 6

Inflow Area = 0.414 ac, 0.04% Impervious, Inflow Depth = 3.83" for 100-Year event
Inflow = 1.84 cfs @ 12.09 hrs, Volume= 0.132 af
Outflow = 1.84 cfs @ 12.09 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-1 : AP 48-1 LOT 7

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

Summary for Reach 302: AP 48-1 OS

Inflow Area = 0.103 ac, 0.00% Impervious, Inflow Depth = 3.71" for 100-Year event
Inflow = 0.44 cfs @ 12.09 hrs, Volume= 0.032 af
Outflow = 0.44 cfs @ 12.09 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-3 : NW Abutters

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

Summary for Reach 303: AP 39-3 LOT 19

Inflow Area = 0.055 ac, 0.00% Impervious, Inflow Depth = 3.71" for 100-Year event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.24 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-3 : NW Abutters

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

Summary for Reach 403: AP 40-4 LOT 5

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 3.83" for 100-Year event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-4 : NE Abutters

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

Summary for Reach 404: AP 40-4 LOT 4

Inflow Area = 0.170 ac, 23.45% Impervious, Inflow Depth = 4.78" for 100-Year event
Inflow = 0.95 cfs @ 12.09 hrs, Volume= 0.068 af
Outflow = 0.95 cfs @ 12.09 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-4 : NE Abutters

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

Summary for Reach 405: AP 40-4 LOT 3

Inflow Area = 0.128 ac, 0.00% Impervious, Inflow Depth = 3.13" for 100-Year event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.033 af
Outflow = 0.46 cfs @ 12.09 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min
Routed to Link DP-4 : NE Abutters

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

Summary for Pond 101: UIS A

Inflow Area = 4.218 ac, 51.07% Impervious, Inflow Depth = 6.10" for 100-Year event
Inflow = 29.57 cfs @ 12.09 hrs, Volume= 2.142 af
Outflow = 3.01 cfs @ 11.66 hrs, Volume= 2.142 af, Atten= 90%, Lag= 0.0 min
Discarded = 3.01 cfs @ 11.66 hrs, Volume= 2.142 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : AP 48-1 LOT 7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 143.64' @ 12.89 hrs Surf.Area= 0.203 ac Storage= 0.760 af

Plug-Flow detention time= 82.3 min calculated for 2.142 af (100% of inflow)
Center-of-Mass det. time= 82.3 min (883.0 - 800.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	137.92'	0.266 af	**73.92'W x 119.53'L x 6.75'H Field A** 1.369 af Overall - 0.564 af Embedded = 0.805 af x 33.0% Voids
#2A	138.67'	0.564 af	**ADS_StormTech MC-7200 +Cap** x 136 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 136 Chambers in 8 Rows Cap Storage= 39.5 cf x 2 x 8 rows = 632.0 cf

0.829 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	137.92'	**14.700 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	145.41'	**24.00" x 24.00" Horiz. Emergency Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=3.01 cfs @ 11.66 hrs HW=138.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 3.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.92' TW=0.00' (Dynamic Tailwater)
2=Emergency Outlet (Controls 0.00 cfs)

Summary for Pond 103: UIS B

Inflow Area = 0.221 ac,100.00% Impervious, Inflow Depth = 8.26" for 100-Year event
Inflow = 1.84 cfs @ 12.08 hrs, Volume= 0.152 af
Outflow = 0.13 cfs @ 11.20 hrs, Volume= 0.152 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.13 cfs @ 11.20 hrs, Volume= 0.152 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : AP 48-1 LOT 7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 148.88' @ 13.37 hrs Surf.Area= 0.015 ac Storage= 0.058 af

Plug-Flow detention time= 145.7 min calculated for 0.152 af (100% of inflow)
Center-of-Mass det. time= 145.7 min (886.2 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	142.15'	0.022 af	**19.42'W x 33.83'L x 6.75'H Field A** 0.102 af Overall - 0.036 af Embedded = 0.066 af x 33.0% Voids
#2A	142.90'	0.036 af	**ADS_StormTech MC-7200 +Cap** x 8 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 8 Chambers in 2 Rows Cap Storage= 39.5 cf x 2 x 2 rows = 158.0 cf
		0.058 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	142.15'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	149.00'	**6.00" Horiz. Emergency Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.13 cfs @ 11.20 hrs HW=142.22' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=142.15' TW=0.00' (Dynamic Tailwater)
2=Emergency Outlet (Controls 0.00 cfs)

Summary for Pond 105: UIS C

Inflow Area = 0.261 ac,100.00% Impervious, Inflow Depth = 8.26" for 100-Year event
Inflow = 2.18 cfs @ 12.08 hrs, Volume= 0.180 af
Outflow = 0.15 cfs @ 11.21 hrs, Volume= 0.180 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.15 cfs @ 11.21 hrs, Volume= 0.180 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : AP 48-1 LOT 7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 146.96' @ 13.33 hrs Surf.Area= 0.018 ac Storage= 0.068 af

Plug-Flow detention time= 142.7 min calculated for 0.180 af (100% of inflow)
Center-of-Mass det. time= 142.7 min (883.2 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	140.55'	0.026 af	**19.42'W x 40.42'L x 6.75'H Field A** 0.122 af Overall - 0.044 af Embedded = 0.078 af x 33.0% Voids
#2A	141.30'	0.044 af	**ADS_StormTech MC-7200 +Cap** x 10 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 10 Chambers in 2 Rows Cap Storage= 39.5 cf x 2 x 2 rows = 158.0 cf
		0.070 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	140.55'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	147.00'	**6.00" Horiz. Emergency Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.15 cfs @ 11.21 hrs HW=140.62' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=140.55' TW=0.00' (Dynamic Tailwater)
2=Emergency Outlet (Controls 0.00 cfs)

Summary for Pond 107: UIS D

Inflow Area = 2.409 ac, 37.89% Impervious, Inflow Depth = 5.38" for 100-Year event
Inflow = 15.12 cfs @ 12.09 hrs, Volume= 1.079 af
Outflow = 1.04 cfs @ 11.55 hrs, Volume= 1.079 af, Atten= 93%, Lag= 0.0 min
Discarded = 1.04 cfs @ 11.55 hrs, Volume= 1.079 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : AP 48-1 LOT 7

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 149.59' @ 13.71 hrs Surf.Area= 0.125 ac Storage= 0.459 af

Plug-Flow detention time= 171.6 min calculated for 1.079 af (100% of inflow)
Center-of-Mass det. time= 171.5 min (985.4 - 813.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	143.92'	0.166 af	**73.92'W x 73.38'L x 6.75'H Field A** 0.841 af Overall - 0.338 af Embedded = 0.503 af x 33.0% Voids
#2A	144.67'	0.338 af	**ADS_StormTech MC-7200 +Cap** x 80 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 80 Chambers in 8 Rows Cap Storage= 39.5 cf x 2 x 8 rows = 632.0 cf
		0.504 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	143.92'	**8.270 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	151.13'	**24.00" x 24.00" Horiz. Emergency Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.04 cfs @ 11.55 hrs HW=143.99' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=143.92' TW=0.00' (Dynamic Tailwater)
↑—**2=Emergency Outlet** (Controls 0.00 cfs)

Summary for Pond 201: UIS F

Inflow Area = 1.348 ac, 39.69% Impervious, Inflow Depth = 5.61" for 100-Year event
Inflow = 8.80 cfs @ 12.09 hrs, Volume= 0.631 af
Outflow = 7.59 cfs @ 12.19 hrs, Volume= 0.631 af, Atten= 14%, Lag= 6.3 min
Discarded = 0.07 cfs @ 9.01 hrs, Volume= 0.342 af
Primary = 7.52 cfs @ 12.19 hrs, Volume= 0.289 af
Routed to Link DP-2 : Curtis Corner Road

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 148.31' @ 12.19 hrs Surf.Area= 0.061 ac Storage= 0.247 af

Plug-Flow detention time= 802.2 min calculated for 0.631 af (100% of inflow)

Center-of-Mass det. time= 802.2 min (1,611.7 - 809.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	140.52'	0.082 af	**28.50'W x 93.16'L x 6.75'H Field A** 0.411 af Overall - 0.163 af Embedded = 0.249 af x 33.0% Voids
#2A	141.27'	0.163 af	**ADS_StormTech MC-7200 +Cap** x 39 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap 39 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
#3	143.88'	0.001 af	**4.00'D x 4.00'H Vertical Cone/Cylinder** -Impervious
#4	144.31'	0.001 af	**4.00'D x 4.00'H Vertical Cone/Cylinder** -Impervious
		0.247 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	140.52'	**1.120 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	148.31'	**24.00" x 24.00" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	147.88'	**24.00" x 24.00" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.07 cfs @ 9.01 hrs HW=140.60' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=6.79 cfs @ 12.19 hrs HW=148.29' TW=0.00' (Dynamic Tailwater)
├**2=Orifice/Grate** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Weir Controls 6.79 cfs @ 2.09 fps)

Summary for Pond 203: UIS E

Inflow Area = 0.192 ac,100.00% Impervious, Inflow Depth = 8.26" for 100-Year event
Inflow = 1.60 cfs @ 12.08 hrs, Volume= 0.132 af
Outflow = 0.03 cfs @ 7.54 hrs, Volume= 0.132 af, Atten= 98%, Lag= 0.0 min
Discarded = 0.03 cfs @ 7.54 hrs, Volume= 0.132 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : Curtis Corner Road

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 154.09' @ 18.01 hrs Surf.Area= 0.024 ac Storage= 0.089 af

Plug-Flow detention time= 1,222.6 min calculated for 0.132 af (100% of inflow)
Center-of-Mass det. time= 1,222.8 min (1,963.3 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	147.92'	0.033 af	**19.42'W x 53.61'L x 6.75'H Field A** 0.161 af Overall - 0.060 af Embedded = 0.101 af x 33.0% Voids
#2A	148.67'	0.060 af	**ADS_StormTech MC-7200 +Cap** x 14 Inside #1 Effective Size= 91.2"W x 60.0"H => 26.68 sf x 6.59'L = 175.9 cf Overall Size= 100.0"W x 60.0"H x 6.95'L with 0.36' Overlap

14 Chambers in 2 Rows
Cap Storage= 39.5 cf x 2 x 2 rows = 158.0 cf

0.094 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	147.92'	**1.120 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	154.25'	**6.00" Horiz. Emergency Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 7.54 hrs HW=147.99' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=147.92' TW=0.00' (Dynamic Tailwater)
2=Emergency Outlet (Controls 0.00 cfs)

Summary for Link DP-1: AP 48-1 LOT 7

Inflow Area = 9.147 ac, 38.81% Impervious, Inflow Depth = 0.79" for 100-Year event
Inflow = 8.36 cfs @ 12.09 hrs, Volume= 0.603 af
Primary = 8.36 cfs @ 12.09 hrs, Volume= 0.603 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link DP-2: Curtis Corner Road

Inflow Area = 2.333 ac, 36.00% Impervious, Inflow Depth = 2.91" for 100-Year event
Inflow = 9.97 cfs @ 12.19 hrs, Volume= 0.566 af
Primary = 9.97 cfs @ 12.19 hrs, Volume= 0.566 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link DP-3: NW Abutters

Inflow Area = 0.158 ac, 0.00% Impervious, Inflow Depth = 3.71" for 100-Year event
Inflow = 0.68 cfs @ 12.09 hrs, Volume= 0.049 af
Primary = 0.68 cfs @ 12.09 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min

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

Summary for Link DP-4: NE Abutters

Inflow Area = 0.346 ac, 11.53% Impervious, Inflow Depth = 4.04" for 100-Year event
Inflow = 1.62 cfs @ 12.09 hrs, Volume= 0.116 af
Primary = 1.62 cfs @ 12.09 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min

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

CURTIS CORNER ROAD

MELLBRIDGE DRIVE

DP-1
DP-2
DP-3
DP-4

45
42
44
41
40
43
33
31
20
32
30
14
13
12
10

DTH 24-6 GWT>96'
DTH 24-3 GWT>96'
DTH 24-4 GWT>96'
DTH 24-5 GWT>96'
DTH 24-1 GWT>96'
DTH 24-2 GWT>96'
DTH 23-5 GWT>96'
DTH 23-1 GWT>96'
DTH 23-6 GWT>96'
STH 23-7 GWT>96'
DTH 23-4 GWT>108'
DTH 23-3 GWT>96'
DTH 23-2 GWT>108'

LEGEND

- WOODS - A SOILS
- WOODS - B SOILS
- WOODS - C SOILS
- WOODS - D SOILS
- GRASS - A SOILS
- GRASS - B SOILS
- GRASS - C SOILS
- GRASS - D SOILS
- GRAVEL - A SOILS
- GRAVEL - B SOILS
- GRAVEL - C SOILS
- GRAVEL - D SOILS
- IMPERVIOUS
- BRUSH - A SOILS
- BRUSH - B SOILS
- BRUSH - C SOILS
- BRUSH - D SOILS
- WATER

LEGEND

- TC LINE WITH ELEVATIONS (XX.X A XX.X B)
- SUBCATCHMENT AREA
- SOIL BOUNDARY
- REACH
- SUBCATCHMENT (10)
- DRAINAGE POND/BIO RETENTION/SAND FILTER/INFILTRATING SWALE (10)
- DRAINAGE STRUCTURE/POND WITH INSIGNIFICANT STORAGE (10)
- REACH/SWALE (10)
- DESIGN POINT (DP-1)

SCALE: 1"=60'
0 30' 60' 120'

PRE-DEVELOPMENT WATERSHED MAP
CHAMPAGNE HEIGHTS

DiPrete Engineering
Two Stafford Court Cranston, RI 02920
tel 401-943-1000 fax 401-464-6006 www.diprete-eng.com

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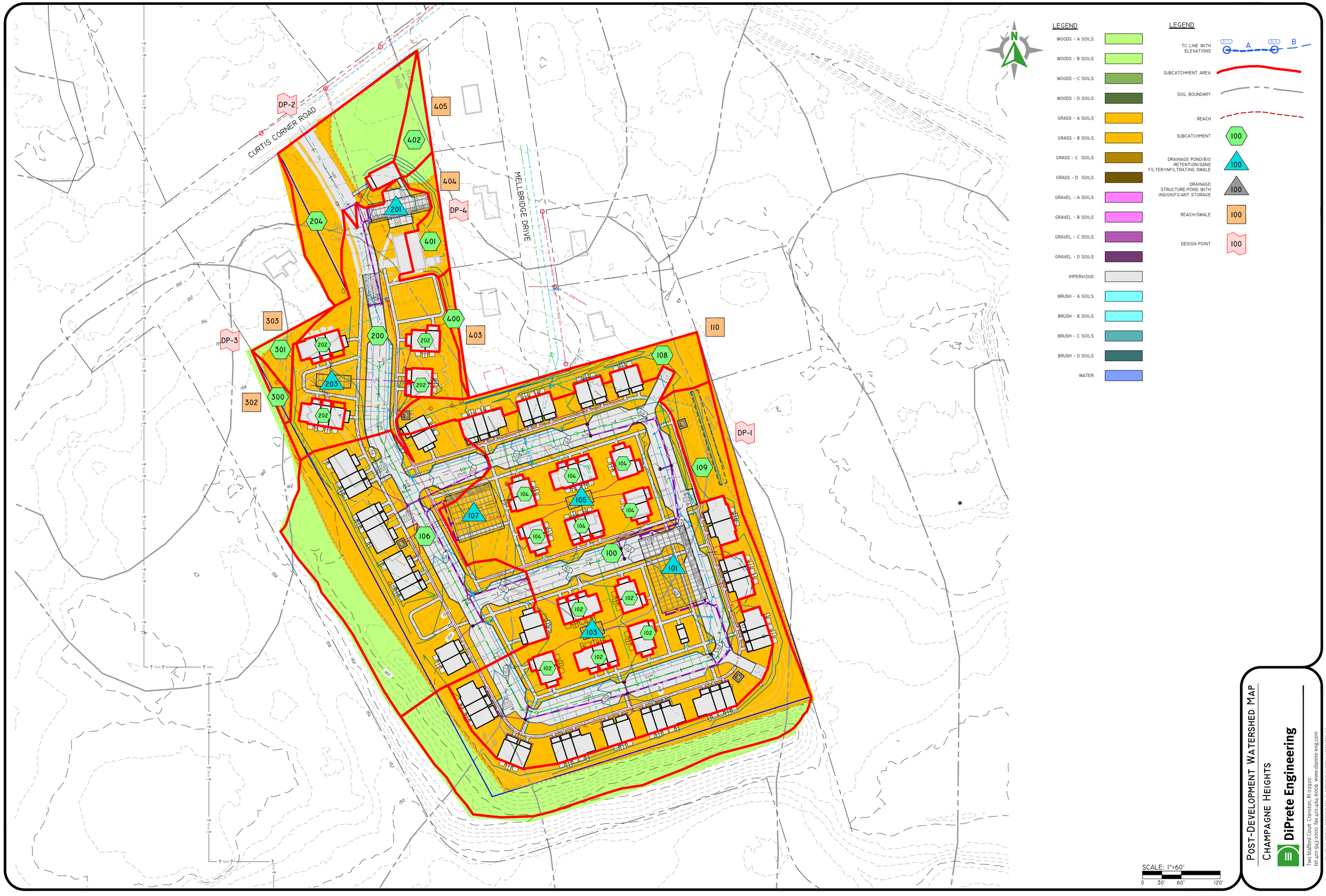

POST-DEVELOPMENT WATERSHED MAP

CHAMPAGNE HEIGHTS

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