UNION PLACE Mixed Use Development

DRAFT ENVIRONMENTAL IMPACT STATEMENT

VOLUME III

US Route 6 / Baldwin Place Road

Town of Carmel, Putnam County, New York

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Public Hearing Date: 11/17/10

Deadline for Receipt of Public Comments: _______

October 27, 2010

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UNION PLACE Draft Environmental Impact Statement

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Stormwater Pollution Prevention Plan



PRELIMINARY STORMWATER POLLUTION PREVENTION PLAN

For

Union Place

U.S. Route 6 & Baldwin Place Road Town of Carmel, New York

October 8, 2010

Applicant Information:

Camarda Realty Investments, LLC 1699 Route 6, Suite 1 Carmel, NY 10512

Note: This report in conjunction with the project plans make up the complete Stormwater Pollution Prevention Plan.

Prepared by: Insite Engineering, Surveying & Landscape Architecture, P.C. 3 Garrett Place Carmel, New York 10512

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1.0 INTRODUCTION

1.1 Project Description

Located in the Town of Carmel, Putnam County, the proposed Union Place project is situated on a 302acre +/- parcel along U.S. Route 6 and Baldwin Place Road, just north of the Westchester County Line. Figure 1, "Location Map", provided herein delineates the project site and surrounding locale. The total site consists of six parcels identified as Tax Map Numbers 75.19-1-1.12, 86.6-1-4, 86.10-1-2, 86.10-1-3, 86.11-1-1 and 86.14-1-7. It is proposed to develop approximately eighty acres on the western portion of the site as mixed-use development consisting of commercial, office, retail, and residential development. On the eastern portion of the property, approximately one hundred acres is proposed to be developed as Union Heights, a senior housing community. Union Place and Union Heights are proposed to be connected via local roads and walking trails.

There are no known enforcement actions, including lawsuits or administrative proceedings, commenced against the applicant, or any principle affiliate of the applicant, for any alleged violations of law related to the applicant of the site, in the five years preceding this application.

1.2 Existing Site Conditions

Generally, the shape of the project site takes the form of an inverted "L" with the long leg running north to south, and Baldwin Place Road forming the western boundary. U.S. Route 6 runs north and south along the eastern side of the project site and provides frontage to the site in two locations. The first is along the northeastern corner of the property between the Mahopac Post Office and Lupi Court, and the second is along the southeastern portion of the property between Baldwin Place Road and the William Koehler Memorial Senior Center/Senior Housing at Mahopac Hills.

Topographically the site consists of two hills separated by a valley. One hillside is located on the northeastern portion of the project site. Slopes on this hillside are generally moderate to strongly sloping with gentle slopes located near the top of the hill. It is on this hillside where the majority of the Union Heights development is proposed. A second hill is located on the southwestern portion of the property. The mixed-use portion of the Union Place project is proposed on this hillside. A valley running north to south separates the two hills and bisects the project site into an eastern and western half. Existing ground cover on the western half of the property consists of farm fields and forest, with the southern tip of the project site is currently developed as a farm, and gas station. The eastern portion of the project site is currently forest. Located along the valley, between the two hillsides is a New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetland.

The NYSDEC Wetland is identified as ML-11, and comprises approximately 39-acres on the project site. Freshwater Wetland ML-11 lies along a valley, between the aforementioned hillsides, and flows north and south. The majority of the wetland's watershed consists of the project site. There is a high point in the valley adjacent to the William Koehler Memorial Senior Center/Senior Housing at Mahopac Hills, which causes ML-11 to flow in two different directions. Most of the wetland flows northwest across the site, under Baldwin Place Road and Stillwater Road, and into the Muscoot River, which is in the Amawalk Reservoir Watershed. The remainder of the wetland flows south into an existing onsite water body, and then continues south into the stormwater collection system along U.S. Route 6. From there, it is conveyed to an open channel conveyance system south of Kennard Road. Ultimately the stormwater runoff reaches Lake Baldwin, which discharges to Muscoot River, and finally the Amawalk Reservoir. The eastern hillside forms the drainage divide between the Amawalk and Muscoot Reservoir watershed. The portion of the Union Heights project is located in the Muscoot Reservoir watershed consists of areas tributary to Design Points 6 & 7.

As previously mentioned the project site falls in the Amawalk and Muscoot Reservoir Watershed Basins. Both Reservoirs are located in the New York City East-of-Hudson Croton Watershed, where the Environmental Protection Agency (EPA) has established a Total Maximum Daily Load (TMDLs) for phosphorus (Amawalk Reservoir and Muscoot Reservoir) and mercury (Amawalk Reservoir only). The burden for reducing current phosphorous loading to achieve the TMDL presently lies with the Town of Carmel and its regional partners. The program for phosphorous reduction has been established in the NYSDEC document entitled *Croton Watershed Phase II Phosphorous TMDL Nonpoint Source Implementation Plan* (TMDL Implementation Plan) dated January 14, 2009. This plan clearly states that for simplicity and ease of local government administration the plan is largely structured to use existing programs to achieve reductions. These programs include:

- Potential additional point source reductions.
- NYSDEC SPDES General Permit for Stormwater Discharges for Municipal Separate Stormwater Sewer Systems (MS4s) Permit No. GP-0-10-002.
- State and regional source control and agricultural programs.
- US EPA Filtration Avoidance Determination Program.
- Putnam County "Croton Plan".
- NYCDEP "Croton Strategy".
- NYCDEP EOH Water Quality Investment Funds, including the Putnam County Septic Repair Program.
- New York State non point source programs.
- NYSDEC NYCDEP Coordinated Stormwater Enforcement Protocol.

The Union Place project is consistent with the TMDL Implementation Plan and applicable portions of the above-cited programs

For the project site, seven design points can be identified. Each design point represents a point on an existing collection system (i.e. catch basin, culvert crossing, etc.) and has been selected to minimize the amount of offsite area tributary to the design point. By selecting points that meet this criteria it allows for the most effective evaluation of any potential quantitative and qualitative hydrologic impacts associated with the proposed improvements. Design Points 1 through 5 are located in the Amawalk Reservoir Watershed. Within the Amawalk Watershed, approximately 1,600 west of the site, is Lake Baldwin. Design Points 3, 4, and 5 are tributary to Lake Baldwin. Two of the Design Points, Design Point 3 and 4 discharge to culverts underneath Baldwin Place Road. Runoff is then conveyed to Lake Baldwin via road side swales and the stormwater collection system for the residential development surrounding Lake Baldwin. It should be noted the peak flows and volume of runoff from these two design points are reduced in the post-development condition. Design Point 5 represents a point on an existing open channel conveyance system south of Kennard Road. Runoff is conveyed to Design Point 5 via the stormwater collection system located along US Route 6, and Baldwin Place Road. The open channel swale south of Kennard Road discharges to a wetland system upstream of Lake Baldwin. Based upon aerial photography two water bodies connected by a stream channel and a wetland make up the system. Design Points 6 and 7 are located in the Muscoot Reservoir Watershed. Table 1 has been provided below to summarizing the seven design points identified for the project site. Refer to Figure 2, the "Predevelopment Drainage Map" for the location of each design point, and an illustration of their respective tributary areas.

	Description	Watershed	Approximate Pre- development Tributary Area (acres)	Approximate Post- development Tributary Area (acres)
DP-1	Existing culvert crossing under Baldwin Place Road.		174.6	180.5
DP-2	Existing culvert crossing under Baldwin Place Road.		18.7	11.9
DP-3	Existing culvert crossing under Baldwin Place Road (Lake Baldwin Watershed).	Amawalk Beservoir	10.6	2.4
DP-4	Existing culvert crossing under Baldwin Place Road (Lake Baldwin Watershed).		3.1	1.2
DP-5	Point on existing open channel conveyance system south of Kennard Road (Lake Baldwin Watershed).		59.8	72.1
DP-6	Existing culvert crossing at Lupi Court	Muscoot	51.9	65.4
DP-7	Existing culvert crossing under U.S. Route 6.	Reservoir	23.5	11.1

Table 1:2.1 Summary of Design Points

The majority of the existing soils onsite consist of Woodbridge Loam, Paxton Fine Sandy Loam, and Ridgebury Loam as identified on the Nation Resource Conservation Service's (NRCS) *Soil Survey of Putnam and Westchester Counties, New York.* All three soils belong to the hydrologic group "C" indicating the soils are less infiltrative, and will in turn yield a larger amount of surface runoff. Typically, the Woodbridge and Paxton fine sandy loams are very deep, and moderately well drained. This is dissimilar from the Ridgebury soils, which are typically deep, but usually poorly drained. Pockets of Sun Loam are also present onsite, and located along the valley in the wetland areas. Sun Loam is characterized as a very deep, poorly to very poorly drained soil. Also present onsite, are small pockets of Charlton Loam (hydrologic group "B") and Leicester Loam (hydrologic group "C"). The approximate locations of the NRCS soil boundaries have been illustrated on Figure 2 and 3. The majority of the proposed improvements are located on the Woodbridge and Paxton soils comprising the two hillsides. It should be noted the band of Charlton Loam located on the eastern hillside belongs to the soil phase "E" (slopes typically between 25% to 35%). Disturbance totaling one acre or more an "E" phase soil is not eligible for coverage under the *SPDES General Permit GP-0-10-001*. Less than one acre of disturbance has been proposed on an "E" phase soil for the construction of the stormwater quality basin access drive.

1.3 Proposed Site Conditions

As noted above two distinct but integrated developments are proposed at the project site. Along the western half of the property, a mixed-use development is proposed. The mixed-use development will consist of a created Main Street surrounded by retail, residential, and professional office uses, with parking proposed along the perimeter of development. Overall, the mixed-use development will consist of 14 buildings, 8 streets, and the development of parks and walkways for pedestrian use. Approximately eighty acres of disturbance are anticipated for the mixed-use portion of the project. Access to the site will necessitate a reconfiguration of the NYS Route 118, U.S. Route 6, and the Baldwin Place Road Intersection, as well as a relocation of Baldwin Place Road. It should be noted this report is intended only to address the impacts and mitigation to stormwater from the proposed development, separate reports regarding the relocation of the proposed roadways, as well as the proposed water and sewer improvements have been prepared.

Connected to the mixed-used portion of the project is Union Heights, a proposed senior housing community consisting of approximately 300 residential units. Thirteen roads will be constructed to service the 75 buildings. Approximately one hundred acres of disturbance is anticipated for the construction of Union Heights.

All of the proposed development will be directed to a stormwater management system consisting of open and closed channel conveyance systems, and stormwater management practices designed to treat water quality as well as attenuate water quantity in accordance with local, city, and state regulations. It should also be noted, that as the site design progresses an examination of Better Site Design techniques and source controls will be employed to further enhance the proposed Stormwater Pollution Prevention Plan (SWPPP) for the project.

The same seven design points identified in the previous section will be evaluated in the post-development quantity and quality analysis (refer to Figure 3). As noted above Design Points 3, 4, and 5 are tributary to Lake Baldwin. Design Points 3 and 4 are tributary to culverts underneath Baldwin Place Road which discharge to the stormwater conveyance system for the residential neighborhood surrounding Lake Baldwin. The peak flows to each of the design points tributary to Lake Baldwin are summarized in Table 2.5-1, and have been reduced to below pre-development levels for all storm events. In addition, the volumes to the two existing culverts represented by Design Points 3 and 4 have been reduced because of a reduction in the tributary area to each of the two existing culverts. Cumulatively there will be an increase in runoff volume to Lake Baldwin, however, the peak rates of flow will be mitigated onsite to maintain pre-development levels so as not to impact the capacity of the downstream stormwater conveyance systems.

Further discussions on each analysis, as well as the stormwater management practices and techniques utilized to mitigate stormwater impacts from the proposed Union Place project, are provided below.

2.0 STORMWATER MANAGEMENT

The proposed stormwater management system for the Union Place project has been designed to meet the requirements of local, city, and state stormwater ordinances and guidelines, including but not limited to those of the NYSDEC, and the recently amended regulations of the New York City Department of Environmental Protection (NYCDEP).

Since the subject project proposes the disturbance of more than 5,000 square feet, coverage under the New York State Department of Environmental Conservation (NYSDEC) SPDES General Permit No. GP-0-10-001 is required. In order to meet the requirements set forth by this permit, the latest edition of the NYSDEC *New York State Stormwater Management Design Manual* (NYSSMDM), including Chapter 10 *Enhanced Phosphorus Removal Standards,* was referenced for the design of the proposed stormwater management system. This manual specifies four design criteria that are discussed in detail below. They are Water Quality Volume, Stream Channel Protection Volume, Overbank Flood Control, and Extreme Flood Control. The first of the requirements relates to treating water quality, while the later pertain to stormwater quantity (peak flow) attenuation.

With regard to NYCDEP requirements, Section 18-39 of the *Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the New York City Water Supply and Its Sources (Rules and Regulations)*, requires a SWPPP Approval for this project. This initial project SWPPP was developed prior to the April 4, 2010 amendment of the *Rules and* Regulations. The Union Place SWPPP generally conforms to the amended regulations in that multiple stormwater management practices have been placed in series, for subcatchments with an impervious cover greater than 20%. As the project is refined, the SWPPP will be updated to remain in compliance with the *Rules and Regulations*. In order to satisfy NYCDEP SWPPP Approval requirements, the proposed stormwater management system has also been designed in accordance with *Reducing the Impacts of Stormwater Runoff from New Development*. For further discussion on NYCDEP requirements refer to sections 2.4 and 2.5 below.

To address stormwater quantity requirements of both the NYSDEC and NYCDEP, the "HydroCAD" Stormwater Modeling System," by HydroCAD Software Solutions LLC in Tamworth, New Hampshire, was used to model and assess the peak stormwater flows for the subject project. HydroCAD is a computer aided design program for modeling the hydrology and hydraulics of stormwater runoff. It is based primarily on hydrology techniques developed by the United States Department of Agriculture, Soil Conservation Service (USDA, SCS) TR-20 method combined with standard hydraulic calculations. For details on the input data for the subcatchments and design storms, please refer to Appendix A.

The input requirements for the HydroCAD computer program are as follows:

Subcatchments (contributing watershed/sub-watersheds)

- Design storm rainfall in inches
- CN (runoff curve number) values which are based on soil type and land use/ground cover
- Tc (time of concentration) flow path information

Stormwater Basins

- Surface area at appropriate elevations
- Flood elevation
- Outlet structure information

The following is a general description of the input data used to calculate the pre- and postdevelopment stormwater runoff values. For detailed information for each subcatchment and pond, see Appendices A & B. The precipitation values for the 2-Year and 25-Year design storms analyzed were obtained from the local Soil Conservation Service office. Precipitation values for the 1-Year, 10-Year, and 100-Year, 24-hour design storm events were obtained from the Northeast Regional Climate Center (2003 Data) as required by Chapter 10 of the NYSSMDM. The values provided for all design storms analyzed have been listed below.

Design Storm	24-Hour Rainfall
1-Year	3.0"
2-Year	3.5"
10-Year	5.1"
25-Year	6.0"
100-Year	8.5"

The CN (runoff curve number) values utilized in this report were referenced from the USDA, SCS publication *Urban Hydrology for Small Watersheds*.

2.1 NYSDEC Water Quality Volume, WQv

The subject project is located in the New York City East-of-Hudson Croton Watershed, which is listed as a phosphorus-limited watershed. Therefore, the stormwater management practices have been designed in accordance with the *Enhanced Phosphorus Removal Standards* (Chapter 10) of the NYSSMDM. As outlined in Chapter 10, the WQv, is the runoff volume produced during the 1-year 24-hour design storm. In order to treat the required WQv from the proposed development two types of practices have been provided, Micropool Extended Detention Basins (P-1), and W-4 Pocket Wetlands (W-4). It should be noted, not all stormwater management basins proposed have been designed in accordance with NYSDEC criteria. This is because the NYSDEC criteria only requires one practice to treat the WQv, while NYCDEP requirements generally require multiple practices in series to satisfy their water quality objectives. Therefore, in accordance with accepted practice when a treatment train has been provided the first practice in the series have been designed in accordance with both NYSDEC and NYCDEP criteria, while the subsequent practices have been designed to address NYCDEP requirements only. All proposed improvements at the Union Place project will receive treatment by at least one NYSDEC compliant practice as required.

Calculations for the required WQv can be found in Appendix B. Listed in Table 2.1 below is a summary of each NYSDEC compliant practice, and its satisfaction of the NYSDEC WQv requirements:

Subcatchment	WQ _v (cf) 1-Year 24-hour design storm runoff volume (From Appendix B)	Basin Providing Treatment	NYSDEC Practice Designation	Minimum % WQv Required in Permanent Pool	Volume of Permanent Pool (cf) (From Appendix B)	% WQv Provided in Permanent Pool
1.1S	142,354	1.1P	P-1	50%	81,050	57%
1.3S	39,596	1.3P	P-1	50%	29,600	75%
1.5S	216,450	1.5P	P-1	50%	157,900	73%
1.7S	63,510	1.7P	P-1	50%	41,300	65%
2.1S	64,338	2.1P	P-1	50%	37,300	58%
5.1S	18,034	5.1P	W-4	50%	19,400	108%
5.3S	94,743	5.3P	P-1	50%	64,450	68%
5.4S	139,653	5.4P	P-1	50%	69,900	50%
5.6S	27,661	5.6P	W-4	50%	15,000	54%
5.7S	22,346	5.7P	W-4	50%	18,240	82%
6.1S	41,818	6.1P	P-1	50%	23,775	57%
6.3S	70,480	6.3P	P-1	50%	43,193	61%
6.4S	30,056	6.4P	P-1	50%	33,800	112%
6.6S	38,681	6.6P	P-1	50%	40,000	103%

Table 2.1.1 Water Quality Volume Summary

As shown in the table above, a minimum of 50% of the WQv will be provided in the permanent pool. Additionally a minimum of 10% of the WQv has been provided in the forebay of basin. It is assumed that by meeting the water quality volume requirements through employment of a P-1, Micropool Extended Detention Basin, and W-4, Pocket Wetland, to treat all proposed disturbances, the water quality objectives of the NYSDEC have been met for the subject project.

2.2 NYSDEC Stream Channel Protection Volume, CPv

The Stream Channel Protection (CP_v) criterion is intended to protect stream channels from erosion and is accomplished by the 24-hour extended detention of the center-of-mass from the one-year, 24-hour storm event. The proposed stormwater management system has been designed to meet this requirement. Refer to Appendix B for the center of mass detention times for the one-year, 24-hour storm event.

2.3 NYSDEC Overbank Flood Control, Q_p , and Extreme Flood Control, Q_f

The Overbank Flood Control (Q_p) requirement is intended to prevent an increase in the frequency and magnitude of out-of-bank flooding events generated by urban development. Overbank control requires storage to attenuate the post-development 10-year, 24-hour peak discharge to predevelopment rates. The Extreme Flood Control (Q_p) requirement is intended to prevent the increased risk of flood damage from large storm events, maintain the boundaries of the pre-development 100-year flood plain, and protect the physical integrity of stormwater management practices. Extreme flood control requires storage to attenuate the post-development 100-year, 24-hour peak discharge to predevelopment rates. All proposed stormwater management basins have been sized to meet both of these requirements (see Appendix B). Table 2.5 provides a comparison of existing and proposed peak flows.

2.4 NYCDEP Water Quality Requirement

This initial project SWPPP was developed prior to the April 4, 2010 amendment of the *Rules and* Regulations. The Union Place SWPPP generally conforms to the amended regulations in that multiple stormwater management practices have been placed in series, for subcatchments with an impervious cover greater than 20%. As the project is refined, the SWPPP will be updated to remain in compliance with the *Rules and Regulations*.

In order to meet NYCDEP water quality requirements a combination of Design 2 Extended Detention Basins, Design 3 Extended Detention Basins, and Design 14 – low gradient grass swales with stone check dams have been provided. These practices have been linked in various series to form "treatment trains," allowing for multiple stages of treatment of stormwater runoff. Pursuant to NYCDEP design criteria all extend detention basins have been designed to provide the 24-hours of plug flow detention time for the 1-year design storm. To further demonstrate water quality has been maintained to pre-development levels a pollutant loading analysis was preformed. The analysis, which is discussed in further detail below, demonstrates the post-development pollutant loading rates are within the range of pre-development rates based on low and high removal efficiencies for the proposed stormwater management practices.

The pollutant loading coefficient method was utilized to calculate the annual export of Biological Oxygen Demand (BOD), Total Phosphorus (TP), Total Nitrogen (TN), and Total Suspended Solids (TSS). The publication *Fundamentals of Urban Runoff Management: Technical and Institutional Issues* produced by the Terrene Institute was referenced to determine the appropriate loading rates for TSS. The New York State Department of Environmental Conservation (NYSDEC) publication *Reducing the Impacts of Stormwater Runoff from New Development (Impacts)* was referenced to determine appropriate loading rates for TP, TN. and BOD. The appropriate loading rates were then utilized to calculate the annual pollutant runoff values. The following table summarizes the pollutant loading rates utilized for the subject project.

Land Use/Ground Cover	BOD	TP	TN	TSS
Commercial	163.0	0.71	4.6	716.5
Town House	50.0	0.62	5.0	286.6
Cow Pasture	32.0	0.12	3.7	305.3
Conventional Tillage	45.0	4.20	18.6	305.3
Forest	7.0	0.10	1.8	76.5

Table 2.4.1 Summary of Pollutant Loading Rates (lbs/acre/year)

Pollutant removal efficiencies for the various treatment practices were referenced from the publication *Reducing the Impacts of Stormwater Runoff from New Development*, prepared by the NYSDEC, and have been listed below.

Table 2.4.2 Long Term Pollutant Removal Efficiencies

Treatment Method	BOD	ТР	TN	TSS
Design 2 Extended Detention Basins	40%-60%	40%-60%	20%-40%	80%-100%
Design 3 Extended Detention Basins	40%-60%	60%-80%	40%-60%	80%-100%
Design 14 Low gradient grass swale with stone checkdams	20-40%	20-40%	20%-40%	20%-40%

The following table summarizes the estimated pre-development and post-development annual pollutant loads (calculated in Appendix C) generated by the subject project in each the Amawalk and Muscoot Reservoir watersheds. The same boundaries utilized in the quantitative analysis were used in the pollutant loading calculations, and the results summarized by watershed.

	Annual Loads (lb/yr)			
	BOD	TP	TN	TSS
Pre-Development	7,937.6	148.48	1,059.7	51,940.5
Post-Development	8,459.6 to 6,172.2	45.86 to 33.40	634.6 to 478.8	29,768.5 to 25,869.5

Table 2.4.1 Annual Pollutant Loading Summary To Amawalk Reservoir Watershed

Table 2.4.2 Annual Pollutant Loading Summary To Muscoot Reservoir Watershed

	Annual Loads (lb/yr)				
	BOD TP TN TSS				
Pre-Development	5,107.0	24.46	228.4	25,463.7	
Post-Development	5,338.2 to 5,053.5	25.98 to 23.26	256.2 to 215.3	23,081.7 to 22,423.0	

Table 2.4.3 Annual Pollutant Loading Summary To Design Point 1

	Annual Loads (lb/yr)					
	BOD TP TN TSS					
Pre-Development	3,172.8	44.20	483.4	25,580.1		
Post-Development	3,194.5 to 2,284.9	22.85 to 16.31	391.0 to 293.7	14,647.0 to 13,540.8		

Table 2.4.4 Annual Pollutant Loading Summary To Design Point 2

	Annual Loads (Ib/yr)			
	BOD	ТР	TN	TSS
Pre-Development	503.0	39.59	189.9	3,741.5
Post-Development	956.2 to 699.4	4.24 to 3.12	43.3 to 35.8	2,257.6 to 1,115.4

Table 2.4.5 Annual Pollutant Loading Summary To Design Point 3

	Annual Loads (Ib/yr)			
	BOD	TP	TN	TSS
Pre-Development	240.4	6.63	47.2	1,941.0
Post-Development	109.2	0.52	7.6	714.2

	Annual Loads (lb/yr)			
	BOD TP TN TSS			
Pre-Development	26.7	0.31	5.9	283.0
Post-Development	33.3	0.15	1.1	151.0

Table 2.4.6 Annual Pollutant Loading Summary To Design Point 4

Table 2.4.7 Annual Pollutant Loading Summary To Design Point 5

		Annual Lo	ads (lb/yr)	
	BOD	TP	TN	TSS
Pre-Development	3,994.7	57.75	333.3	20,394.9
Post-Development	4,166.4 to 3,045.4	18.10 to 13.30	191.6 to 140.6	11,998.7 to 10,348.1

Table 2.4.8 Annual Pollutant Loading Summary To Design Point 6

		Annual Lo	ads (lb/yr)	
	BOD	ТР	TN	TSS
Pre-Development	3,934.6	18.57	162.9	19,089.0
Post-Development	4,214.5 to 3,929.8	21.12 to 18.40	211.0 to 170.1	17,385.8 to 16,727.1

Table 2.4.9 Annual Pollutant Loading Summary To Design Point 7

		Annual Lo	ads (lb/yr)	
	BOD	TP	TN	TSS
Pre-Development	1,172.4	5.89	65.5	6,374.7
Post-Development	1,123.7	4.86	45.2	5,695.9

As seen by the above summary, the post-development pollutant loads are within the range of the pre-development pollutants of concern as required by the NYCDEP regulations in all instances.

2.5 NYCDEP Quantity Requirements

As required per the NYCDEP, the attenuation of peak flows from the 10, 25, and 100-year storms to pre-development levels is accomplished with the stormwater management basins. The following tables summarize the pre and post development peak flows expected for the proposed project.

24-HOUR DESIGN STORM PEAK FLOWS (c.f.s.)												
	2-YI	EAR	10-Y (Overbank F	(EAR Flood Control)	25-Y	EAR	100-YEAR (Extreme Flood Control)					
	Pre	Post	Pre	Post	Pre	Post	Pre	Post				
Design Point 1	106.23	70.09	226.05	181.68	299.78	260.71	516.03	502.99				
Design Point 2	17.05	5.85	33.49	22.42	43.34	34.39	71.61	59.14				
Design Point 3	8.97	3.43	19.23	7.30	25.51	9.67	43.92	16.57				
Design Point 4	2.94	1.56	6.48	3.24	8.66	4.26	15.06	7.22				
Design Point 5	64.20	45.12	119.76	88.32	152.56	115.37	245.12	237.64				
Design Point 6	64.50	54.45	116.55	90.15	146.78	110.29	232.07	171.40				
Design Point 7	20.97	13.86	40.47	24.30	52.07	30.30	85.23	47.04				

Table 2.5 1– Pre and Post-Development Peak Flows

As shown in the above table the peak flows discharging to the design point in the proposed condition have been mitigated to below the existing condition levels, therefore the receiving drainage systems will see a reduction in peak flows during the storm events shown above.

3.0 STORMWATER CONVEYANCE SYSTEM

The stormwater collection and conveyance systems for the project will consist of drain inlets, catch basins, HDPE pipe, and open channel swales. The systems will be sized to collect and convey at minimum the 10-year, 1-hour design storm using the Rational Method. The Rational Method is a standard method used by engineers to develop flow rates for sizing collection systems. The Rational Method calculates flows based on a one-hour design storm.

4.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control should be accomplished by four basic principles: diversion of clean water, containment of sediment, treatment of dirty water, and stabilization of disturbed areas. Diversion of clean water should be accomplished with swales. This diverted water should be safely conveyed around the construction area as necessary and discharged downstream of the disturbed areas. Sediment should be contained with the use of silt fence at the toe of disturbed slopes and excavation of the temporary sediment basin. Disturbed areas should be permanently stabilized within 14 days of final grading to limit the required length of time that the temporary facilities must be utilized. The owner will be responsible for the maintenance of the temporary erosion control facilities.

4.1 Temporary Erosion and Sediment Control Facilities

Temporary erosion and sediment control facilities should be installed and maintained as required to reduce the impacts to off-site properties. The owner will be required to provide maintenance for the temporary erosion and sediment control facilities. In general, the following temporary methods and materials should be used to control erosion and sedimentation from the project site:

- Stabilized Construction Entrance
- Silt Fence Barriers
- Storm Drain Inlet Protection
- Sediment Basins Traps with optional Dewatering Devices

A stabilized construction entrance should be installed at the entrance to the site as shown on the plan. The design drawings will include details to guide the contractor in the construction of this entrance. The intent of the stabilized construction entrance is to prevent the "tracking" of soil from the site. Dust control should be accomplished with water sprinkling trucks if required. During dry periods, sprinkler trucks should wet all exposed earth surfaces as required to prevent the transport of air-borne particles to adjoining areas.

Siltation barriers constructed of geosynthetic filter cloth should be installed at the toe of all disturbed slopes. The intent of these barriers is to contain silt and sediment at the source and inhibit its transport by stormwater runoff. The siltation barriers will also help reduce the rate of runoff by creating filters through which the stormwater must pass.

The proposed stormwater management basins will also act as temporary sediment traps with optional dewatering devices during construction of the proposed road and utilities. Most stormwater runoff from disturbed areas will be directed to the sediment traps. The traps will be sized in accordance with the publication, *New York State Standards and Specifications for Erosion and Sediment Control* (Blue Book).

In addition to the temporary sediment and erosion control measures listed above, pollution prevention measures on the site will also be accomplished by the use of a dumpster. All waste and scrap building materials on site shall be disposed of in the dumpster, with no waste being buried or improperly discarded. A portable toilet will be provided on site during construction for waste management. No construction chemicals are anticipated to be used or stored on site during and after construction.

4.2 Permanent Erosion and Sediment Control Facilities

Permanent erosion and sediment control will be accomplished by diverting stormwater runoff from steep slopes, controlling/reducing stormwater runoff velocities and volumes, and vegetative and structural surface stabilization. All of the permanent facilities are relatively maintenance free and only require periodic inspections. The owner will provide maintenance for all the permanent erosion and sediment control facilities.

The temporary sediment traps shall be cleaned of all sediment and debris, excavated to their final elevations and dimensions, and stabilized with the vegetation as indicated on the plans. Rip rap aprons will be used at the discharge end of all piped drainage systems. Runoff velocities will be reduced to levels that are non-erosive to the receiving waterbodies through use of these aprons.

Other than the buildings and paved surfaces, disturbed surfaces will be stabilized with vegetation. The vegetation will control stormwater runoff by preventing soil erosion, reducing runoff volume and velocities, and providing a filter medium. Permanent seeding should optimally be undertaken in the spring from March 21st through May 20th and in late summer from August 15th to October 15th. The stormwater basins will allow for settlement of suspended sediment that is generated by stormwater runoff from the site. These facilities provide a central collection area for sediment deposition and eventual disposal.

5.0 IMPLEMENTATION AND MAINTENANCE

5.1 Construction Phase

Details associated with the implementation and maintenance of the proposed stormwater facilities and erosion control measures during construction will be shown on the project plans. Construction phasing sequence will be provided to guide the contractor in the installation of the erosion control measures as well as the site plan features. In accordance with NYSDEC SPDES General Permit GP-0-10-001 each phase will be limited to a maximum of 5 acres of disturbance at any given time. The erosion control plan will include associated details and notes to aid the contractor in implementing the plan.

During construction, a Site Log Book, Appendix E, is required to be kept per NYSDEC SPDES General Permit GP-0-10-001. Erosion and sediment control inspections are required to be conducted as necessary under coverage of the permit (minimum once a week) and an updated logbook and a copy of the SWPPP is required to be kept on site for the duration of the construction activities. The Construction Site Log Book is an appendix taken from the *New York Standards and Specifications for Urban Erosion and Sediment Control* (Blue Book).

Initially the stormwater management basins and pocket wetlands will require regular maintenance until the permanent vegetation is established. Vegetation should be inspected every 30 days and after every major storm event until established, after which inspections should take place on a quarterly basis and after every large storm event. Damaged areas should be immediately re-seeded and re-mulched. The floor of the basin will be planted with a seed mixture that contains plants that are tolerant of occasional flooding. The seed mixtures contain several plant species that vary slightly in their needs for survival. It is expected that not all of the species will survive within each basin due to variations within each basin such as water,

nutrients, and light. During the initial year of planting, the plants may require watering to germinate and establish. Note that several seedings may be required during the first year to completely establish vegetation within the basin. After the initial year of establishment, the basin does not need to be fertilized or watered. A natural selection process will occur over the first few years, such that the species within the seed mixture most suitable to the conditions will survive.

5.2 Long Term Maintenance Plan

The owner will be responsible for the maintenance of the permanent erosion control and stormwater facilities. Each spring the paved areas should be cleaned to remove the winter's accumulation of traction sand. After this is completed, all drain inlets sumps and stormwater management basin forebays should be cleaned. All pipes should be checked for debris and blockages and cleaned as required. During the cleaning process, the drain inlets and pipes should be inspected for structural integrity and overall condition; repairs and/or replacement will be made as required.

Once the desired vegetative cover is established in the basins, only limited maintenance is required. The basins and outlet structures should be inspected after major storm events and semi-annually. During the inspections, the following should be checked:

- Evidence of clogging of outlet structure.
- Erosion of the flow path through the detention basin.
- Subsidence, erosion, cracking or tree growth on the embankment/berm.
- Condition of the emergency spillway.
- Accumulation of sediment around the outlet structure.
- Adequacy of upstream/downstream channel erosion control measures.
- Erosion of the basin bed and banks.
- Sources of erosion in the contributory drainage, which should be stabilized.

Access to the pond will be through stabilized basin accesses. The accesses are proposed to be graded to final grades and seeded and mulched in accordance with the Erosion & Sedimentation Control The graded basin accesses, and the side slopes and berms of the basins should be mowed annually to prevent the establishment of woody plants within the swales, accesses, or basin berms. The bottoms of the basins should not be mowed. During the mowing operations, debris and litter should be removed from all parts of the swales, accesses, and basins. Accumulated sediment will need to be removed from the swales and basins approximately every 10 to 20 years, or when 50 percent of their capacity has been reached.

In addition to guidelines discussed above all maintenance requirements outlined in the NYSSMDM shall be followed.

APPENDIX A

Pre-development Computer Data



Summary for Subcatchment 1.0S:

Runoff = 106.23 cfs @ 12.60 hrs, Volume= 16.309 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) C	N Des	cription								
4.	700 9	94 Urba	rban commercial, 85% imp, HSG C								
3.	100 8	37 Dirt	irt roads, HSG C								
1.	600 7	74 >75	% Grass co	over, Good,	, HSG C						
5.	600 E	32 Row	crops, SF	+ CR, God	bd, HSG C						
30.	200 7	71 Mea	dow, non-g	grazed, HS	GC						
14.	300 7	77 Woo	ds, Good,	HSG D							
109.	000 7	70 Woo	ds, Good,	HSG C							
6.	<u>100 6</u>	60 Woo	ds, Fair, F	ISG B							
174.	600 7	2 Wei	ghted Aver	age							
170.	605	Perv	ious Area								
3.	995	Impe	ervious Are	a							
Tc	Length	Slope	Velocity	Capacity	Description						
(min)	(teet)	(ft/ft)	(ft/sec)	(cts)							
17.5	100	0.0300	0.10		Sheet Flow,						
					Woods: Light underbrush n= 0.400 P2= 3.50"						
5.6	490	0.0860	1.47		Shallow Concentrated Flow,						
					Woodland Kv= 5.0 tps						
0.2	60	0.1300	5.80		Shallow Concentrated Flow,						
					Unpaved Kv= 16.1 tps						
2.2	290	0.1930	2.20		Shallow Concentrated Flow,						
	100	0 0000	0.40		Woodland KV= 5.0 rps						
0.6	120	0.2000	3.13		Shallow Concentrated Flow,						
10 F					Short Grass Pasture KV= 7.0 lps						
10.5	1 000	0 1 1 1 0	1 (20)								
10.0	1,060	0.1140	1.69		Shallow Concentrated Flow,						
2.5	1,060	0.1140	1.69	12.07	Shallow Concentrated Flow, Woodland Kv= 5.0 fps						
3.5	1,060 1,210	0.1140 0.0590	1.69 5.77	13.27	Shallow Concentrated Flow, Woodland $Kv=5.0$ fps Channel Flow, Area 2.3 of Rovim 0.11 r. 0.251						
3.5	1,060 1,210	0.1140 0.0590	1.69 5.77	13.27	Shallow Concentrated Flow, Woodland Kv= 5.0 fps Channel Flow, Area= 2.3 sf Perime 9.1' $r = 0.25'$ p = 0.025 Earth close 8 winding						

40.1 3,330 Total

Subcatchment 1.0S:



Summary for Subcatchment 2.0S:

Runoff = 17.05 cfs @ 12.41 hrs, Volume= 2.128 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) C	N De	scription							
0.	100	87 Dir	rt roads. HSG C							
9.	100	82 Ro	v crops, SF	+ CR, Goo	bd, HSG C					
0.	900	71 Me	adow, non-	grazed, HS	GC GC					
8.	600	70 Wc	ods, Good,	HSG C						
18.	700	76 We	ighted Ave	rage						
18.	700	Per	vious Area	0						
Tc	Length	Slope	Velocity	Capacity	Description					
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	-					
11.6	100	0.0300	0.14		Sheet Flow,					
					Grass: Dense n= 0.240 P2= 3.50"					
11.9	1,060	0.0450	1.48		Shallow Concentrated Flow,					
					Short Grass Pasture Kv= 7.0 fps					
1.1	150	0.2170	2.33		Shallow Concentrated Flow,					
					Woodland Kv= 5.0 fps					
3.1	700	0.0380	3.75	8.24	Channel Flow,					
					Area= 2.2 sf Perim= 9.1' r= 0.24'					
					n= 0.030 Earth, grassed & winding					

27.7 2,010 Total

Subcatchment 2.0S:

Hydrograph



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10 20

Summary for Subcatchment 3.0S:

Runoff = 8.97 cfs @ 12.29 hrs, Volume= 0.990 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	a (ac) C	CN Desc	cription											
(0.100	98 Pave	ed parking	& roofs										
(0.100	87 Dirtı 74 ⊳759	roads, HS0	GC over Good	HSG C									
	1.300	82 Row	crops, SF	1 + CR, Goo	d, HSG C									
2	2.800	71 Mea	dow, non-g	grazed, HS	GĊ									
	5.200 0.600	70 Woo 72 Woid	ds, Good,	HSG C										
10).500	Perv	ious Area	aye										
(0.100	Impe	ervious Are	ea										
Тс	Length	Slope	Velocity	Capacity	Description	n								
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	Ohash Else									
13.6	100	0.0200	0.12		Grass: De	∧, nse n=0	.240 P2	2= 3.50"						
4.5	550	0.0830	2.02		Shallow C	oncentrat	ted Flow,							
0.8	120	0 2830	2 66		Short Gras	ss Pasture	e Kv=7.	0 fps						
0.0	120	0.2000	2.00		Woodland	Kv= 5.0	fps	1						
18.9	770	Total												
						C 11	beatch	mont 3	00.					
						Ju	Deaten	ment J.	03.					
						Hydr	rograph	า						
	10	 					++-	-++	++			- -		
	8.9	7 cfs												- Runoff
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										Гуре	III 24	4-hi	⁻ 2-yr	
										R	ainfa	all=:	3.50"	
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30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 Time (hours)

HydroCAD® 8.50 s/n 000891 @ 2007 HydroCAD Software Solutions LLC Summary for Subcatchment 4.0S:

Runoff = 2.94 cfs @ 12.18 hrs, Volume= 0.275 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"



Summary for Subcatchment 5.0S:

Runoff = 64.20 cfs @ 12.39 hrs, Volume= 7.804 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) C	N D	escription								
8.	100	98 Pa	ved parking & roofs								
0.	200	37 Di	rt roads, HS	GC							
6.	800	74 >7	'5% Grass c	over, Good	, HSG C						
9.	700	32 R	ow crops, SF	R + CR, Go	bd, HSG C						
3.	500	71 M	eadow, non-	grazed, HS	GC						
23.	700	70 W	oods, Good	, HSG C							
1.	200	77 W	oods, Good	, HSG D							
1.	500	98 W	ater Surface	•							
5.	100	94 U	ban comme	rcial, 85% ir	np, HSG C						
59.	800	79 W	eighted Ave	rage							
45.	865	P	ervious Area								
13.	935	In	pervious Ar	ea							
То	Longth	Slor		Consoity	Description						
(min)	(feet)	(ft/	t) (ft/sec)	(cfs)	Description						
11.6	100	0.030	0 0 14	(0.0)	Sheet Flow.						
		0.000	• ••••		Grass: Dense $n = 0.240$ P2= 3.50"						
4.2	440	0.061	0 1.73		Shallow Concentrated Flow.						
	-				Short Grass Pasture Kv= 7.0 fps						
2.8	240	0.083	3 1.44		Shallow Concentrated Flow,						
					Woodland Kv= 5.0 fps						
8.4	2,600	0.039	0 5.15	10.30	Trap/Vee/Rect Channel Flow,						
					Bot.W=3.00' D=0.50' Z= 2.0 '/' Top.W=5.00'						
					n= 0.030 Earth, grassed & winding						

27.0 3,380 Total

Subcatchment 5.0S:



Summary for Subcatchment 6.0S:

Runoff = 64.50 cfs @ 12.34 hrs, Volume= 7.390 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) C	CN D	escript	tion								
1.	400	87 C	rt roads, HSG C									
0.	500	74 >	75% G	75% Grass cover, Good, HSG C								
3.	700	71 N	leadow	w, non-g	razed, HS	GC						
24.	500	73 V	loods.	Fair, H	SGC							
16.	700	94 L	rban c	commerc	cial, 85% ir	np. HSG C						
5.	100	83 1	4 acre	e lots, 38	3% imp, HS	SG C						
51.	900	81 V	/eiahte	ed Avera	ade							
35.	767	P	ervious	s Area								
16.	133	İr	npervio	ous Are	а							
			1									
Тс	Length	Slo	be Ve	elocity	Capacity	Description						
(min)	(feet)	(ft	ft) (f	ft/sec)	(cfs)							
12.4	100	0.07	00	0.13		Sheet Flow,						
						Woods: Light underbrush n= 0.400 P2= 3.50"						
1.9	160	0.07	50	1.37		Shallow Concentrated Flow,						
						Woodland Kv= 5.0 fps						
3.6	475	0.09	90	2.20		Shallow Concentrated Flow,						
						Short Grass Pasture Kv= 7.0 fps						
1.6	140	0.08	50	1.47		Shallow Concentrated Flow,						
						Woodland Kv= 5.0 fps						
2.9	390	0.10	50	2.27		Shallow Concentrated Flow,						
						Short Grass Pasture Kv= 7.0 fps						
1.5	930	0.08	00	10.59	33.27	Circular Channel (pipe),						
						Diam= 24.0" Area= 3.1 sf Perim= 6.3' r= 0.50'						
						n= 0.025 Corrugated metal						

23.9 2,195 Total

Subcatchment 6.0S:



Summary for Subcatchment 7.0S:

Runoff 20.97 cfs @ 12.48 hrs, Volume= 2.801 af, Depth= 1.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac)	CN	Desc	ription		
0.	900	87	Dirt re	oads, HSC	ЭС	
3.	500	71	Mead	low, non-c	razed, HS	GC
13.	200	70	Wood	ds, Good,	HSG C	
5.	900	94	Urbaı	n commer	cial, 85% ir	np, HSG C
23.	500	77	Weig	hted Aver	age	
18.	485		Pervi	ous Area		
5.	015		Impe	rvious Are	а	
Tc	Length	S	lope	Velocity	Capacity	Description
(min)	(feet)		(ft/ft)	(ft/sec)	(cfs)	
20.5	100	0.0	0200	0.08		Sheet Flow,
						Woods: Light underbrush n= 0.400 P2= 3.50"
1.3	90	0.0	0560	1.18		Shallow Concentrated Flow,
						Woodland Kv= 5.0 fps
4.6	350	0.0	0630	1.25		Shallow Concentrated Flow,
						Woodland Kv= 5.0 fps
6.2	920	0.1	1260	2.48		Shallow Concentrated Flow,
						Short Grass Pasture Kv= 7.0 fps

32.6 1,460 Total

Subcatchment 7.0S:

Hydrograph



Summary for Subcatchment 1.0S:

Runoff = 226.05 cfs @ 12.57 hrs, Volume= 33.104 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac) C	N Des	cription								
4.	700 9	94 Urba	rban commercial, 85% imp, HSG C								
3.	100 8	37 Dirt	irt roads, HSG C								
1.	600	74 >75	% Grass co	over, Good,	HSG C						
5.	600 8	32 Row	<pre>r crops, SF</pre>	+ CR, Goo	bd, HSG C						
30.	200	71 Mea	dow, non-g	grazed, HS	GC						
14.	300	77 Woo	ods, Good,	HSG D							
109.	000	70 Woo	ods, Good,	HSG C							
6.	100 6	60 Woo	ods, Fair, H	ISG B							
174.	600	72 Wei	ghted Aver	age							
170.	605	Perv	vious Area								
3.	995	Imp	ervious Are	a							
_				- ·							
TC	Length	Slope	Velocity	Capacity	Description						
(min)	(feet)	(ft/ft)	(ft/sec)	(CfS)							
17.5	100	0.0300	0.10		Sheet Flow,						
					Woods: Light underbrush $n = 0.400$ P2= 3.50"						
5.6	490	0.0860	1.47		Shallow Concentrated Flow,						
					Woodland Kv= 5.0 tps						
0.2	60	0.1300	5.80		Shallow Concentrated Flow,						
0.0	000	0 1000	0.00		Unpaved KV= 16.1 lps						
2.2	290	0.1930	2.20		Shahow Concentrated Flow,						
0.6	100	0 2000	2 1 2		Woodalid Kv= 5.0 lps						
0.0	120	0.2000	3.13		Shart Grase Basture, Ku-7.0 for						
10.5	1 060	0 1 1 4 0	1 69		Shallow Concentrated Flow						
10.0	1,000	0.1140	1.00		Woodland Ky- 5.0 frs						
3.5	1.210	0.0590	5.77	13.27	Channel Flow.						
0.0	.,=		0	.0.27	Area= 2.3 sf Perim= 9.1' r= 0.25'						
					n= 0.025 Earth, clean & winding						

40.1 3,330 Total

Subcatchment 1.0S:


Summary for Subcatchment 2.0S:

Runoff = 33.49 cfs @ 12.39 hrs, Volume= 4.080 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac) C	N De	scription											
0.	100	37 Dir	roads, HS	ЭC										
9.	100	32 Ro	v crops, SF	+ CR, Goo	bd, HSG C									
0.	900	71 Me	leadow, non-grazed, HSG C											
8.	600	70 Wc	Woods, Good, HSG C											
18.	700	76 We	ighted Ave	rage										
18.	700	Per	vious Area	-										
Tc	Length	Slope	Velocity	Capacity	Description									
(min)	(feet)	(ft/ft	(ft/sec)	(cfs)										
11.6	100	0.0300	0.14		Sheet Flow,									
					Grass: Dense n= 0.240 P2= 3.50"									
11.9	1,060	0.0450	1.48		Shallow Concentrated Flow,									
					Short Grass Pasture Kv= 7.0 fps									
1.1	150	0.2170	2.33		Shallow Concentrated Flow,									
					Woodland Kv= 5.0 fps									
3.1	700	0.0380	3.75	8.24	Channel Flow,									
					Area= 2.2 sf Perim= 9.1' r= 0.24'									
					n= 0.030 Earth, grassed & winding									

27.7 2,010 Total

Subcatchment 2.0S:

Hydrograph



Summary for Subcatchment 3.0S:

Runoff = 19.23 cfs @ 12.27 hrs, Volume= 2.010 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac) C	N De	scription											
0.	100 9	98 Pa	/ed parking	& roofs										
0.	100	87 Dir	rt roads, HSG C											
0.	100	74 >7	75% Grass cover, Good, HSG C											
1.	300 8	82 Ro	low crops, SR + CR, Good, HSG C											
2.	800	71 Me	adow, non-	grazed, HS	GC									
6.	200	70 Wo	ods, Good,	HSG C										
10.	600	72 We	ighted Ave	rage										
10.	500	Pe	vious Area											
0.	100	Imp	ervious Are	ea										
_														
TC	Length	Slope	e Velocity	Capacity	Description									
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)										
13.6	100	0.0200	0.12		Sheet Flow,									
					Grass: Dense n= 0.240 P2= 3.50"									
4.5	550	0.0830) 2.02		Shallow Concentrated Flow,									
					Short Grass Pasture Kv= 7.0 fps									
0.8	120	0.2830	2.66		Shallow Concentrated Flow,									
					Woodland Kv= 5.0 fps									
18.9	770	Total												

Subcatchment 3.0S:

Hydrograph



Summary for Subcatchment 4.0S:

Runoff = 6.48 cfs @ 12.17 hrs, Volume= 0.566 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac) C	N Des	cription			
0	.100 8	7 Dirt	roads, HS	G C		
2	.200 7	0 Woo	dow, non-g ods, Good,	HSG C		
3	.100 7	'1 Wei Pen	ghted Aver	age		
_				a		
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
7.2	100	0.1000	0.23		Sheet Flow,	
0.3	40	0.0750	1.92		Shallow Concentrated Flow,	
4.1	470	0.1490	1.93		Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow,	
11.6	610	Total			Woodland Kv= 5.0 fps	
11.0	610	Total				
					Subcatchment 4.0S:	
					Hydrograph	
	7-		-			Dunoff
	6.4	8 cfs				Runom
					Type III 24-hr 10-yr	
	- 1				Raintaii=5.10	
	5	<u> </u> 	-' 		Runoff Area=3.100 ac	
~	- 1				Bunoff Volume-0 566 af	
(cfs	4		- 			
wol ⁻					Runoff Deptn=2.19	
-	3				Flow Length=610'	
					Tc-116 min	
	2		- 			
					CN=71	
	1	 	-¦¦			
		K 🗉				
		$\underline{\sim}$	 			
	0 1	0 20	30 40	50 60	70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240	

110 120 130 1 Time (hours)

Summary for Subcatchment 5.0S:

Runoff = 119.76 cfs @ 12.38 hrs, Volume= 14.392 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac) C	N De	scription												
8.	100	98 Pa	ved parking	& roofs											
0.	200	37 Di	t roads, HS	GC											
6.	800	74 >7	75% Grass cover, Good, HSG C												
9.	700	32 Ro	low crops, SR + CR, Good, HSG C												
3.	500	71 Me	/leadow, non-grazed, HSG C												
23.	700	70 W	Voods, Good, HSG C												
1.	200	77 W	ods, Good	, HSG D											
1.	500 9	98 W	ater Surface	•											
5.	100 9	94 Ur	oan comme	rcial, 85% ir	np, HSG C										
59.	800	79 W	eighted Ave	rage											
45.	865	Pe	rvious Area												
13.	935	lm	pervious Are	ea											
_				. .											
IC	Length	Slop	e Velocity	Capacity	Description										
(min)	(feet)	(ft/f) (ft/sec)	(CfS)											
11.6	100	0.030	0.14		Sheet Flow,										
					Grass: Dense n= 0.240 P2= 3.50"										
4.2	440	0.061) 1.73		Shallow Concentrated Flow,										
					Short Grass Pasture Kv= 7.0 tps										
2.8	240	0.083	3 1.44		Shallow Concentrated Flow,										
				40.00	Woodland Kv= 5.0 fps										
8.4	2,600	0.039) 5.15	10.30	Irap/vee/Rect Channel How,										
					Bot. W=3.00° D=0.50° Z= 2.0 7° Top.W=5.00°										
					n= 0.030 Earth, grassed & winding										

27.0 3,380 Total

Subcatchment 5.0S:





Summary for Subcatchment 6.0S:

Runoff = 116.55 cfs @ 12.33 hrs, Volume= 13.294 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac) C	N De	scription											
1.4	400	87 Di	t roads, HS	GC										
0.	500	74 >7	5% Grass c	over, Good	, HSG C									
3.	700	71 M	adow, non-	grazed, HS	GC									
24.	500	73 W	/oods, Fair, HSG C											
16.	700	94 Ui	Jrban commercial, 85% imp, HSG C											
5.	100	83 1/	l acre lots, 3	<u>88% imp, H</u>	SG C									
51.	900	B1 W	eighted Ave	rage										
35.	767	Pe	rvious Area											
16.	133	In	pervious Are	ea										
_		<u>.</u>			-									
IC	Length	Slop	e Velocity	Capacity	Description									
(min)	(feet)	(†t/1	t) (ft/sec)	(cfs)										
12.4	100	0.070	0 0.13		Sheet Flow,									
					Woods: Light underbrush n= 0.400 P2= 3.50"									
1.9	160	0.075	0 1.37		Shallow Concentrated Flow,									
					Woodland Kv= 5.0 tps									
3.6	475	0.099	0 2.20		Shallow Concentrated Flow,									
			· · · -		Short Grass Pasture Kv= 7.0 tps									
1.6	140	0.086	0 1.47		Shallow Concentrated Flow,									
0.0	000	0 105	0 0 07		Woodland KV= 5.0 lps									
2.9	390	0.105	0 2.27		Sharto concentrated riow,									
1 5	000	0.000	0 10.50	22.07	Short Grass Fasture (V=7.0 lps									
1.5	930	0.060	0 10.59	33.27	Diame 24.0" Area 2.1 of Darim $= 6.2$ ' $r = 0.50$ '									
					Diame 24.0 Aleas 5.1 51 femilie 0.5 1= 0.50 $=$									
					n= 0.020 Contigated metal									

23.9 2,195 Total

Subcatchment 6.0S:



De 8.50 s/n 000891 © 2007 HydroCAD Software Solutions LLC Summary for Subcatchment 7.0S:

Runoff = 40.47 cfs @ 12.46 hrs, Volume= 5.301 af, Depth= 2.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac)	CN	Desc	ription											
0.	900	87	Dirt r	oads, HSC	ЭС										
3.	500	71	Meac	dow, non-g	grazed, HS	GC									
13.	200	70	Wood	oods, Good, HSG C											
5.	900	94	Urba	rban commercial, 85% imp, HSG C											
23.	500	77	Weig	hted Aver	age										
18.	485		Pervi	ous Area											
5.	015		Impe	rvious Are	а										
Tc	Length	ı S	Slope	Velocity	Capacity	Description									
(min)	(feet		(ft/ft)	(ft/sec)	(cfs)										
20.5	100	0.0	0200	0.08		Sheet Flow,									
						Woods: Light underbrush n= 0.400 P2= 3.50"									
1.3	90	0.0	0560	1.18		Shallow Concentrated Flow,									
						Woodland Kv= 5.0 fps									
4.6	350	0.0	0630	1.25		Shallow Concentrated Flow,									
						Woodland Kv= 5.0 fps									
6.2	920	0.	1260	2.48		Shallow Concentrated Flow,									
						Short Grass Pasture Kv= 7.0 fps									

32.6 1,460 Total

Subcatchment 7.0S:

Hydrograph



Summary for Subcatchment 1.0S:

Runoff = 299.78 cfs @ 12.57 hrs, Volume= 43.551 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (ac) C	N De	scription											
4.	700 9	94 Url	ban commei	cial, 85% ir	np, HSG C									
3.	100 8	37 Dir	t roads, HS	GC										
1.0	500 7	74 >7	5% Grass c	over, Good,	, HSG C									
5.0	300 S	32 Ro	w crops, SF	+ CR, Goo	bd, HSG C									
30.2	200 7	71 Me	eadow, non-grazed, HSG C											
14.3	300 7	77 Wo	ods, Good,	HSG D										
109.0	000 7	70 Wo	ods, Good,	HSG C										
6.	100 6	50 Wo	ods, Fair, F	ISG B										
174.0	500 7	72 We	eighted Ave	rage										
170.0	605	Pe	rvious Area											
3.9	995	Im	pervious Are	ea										
Tc	Length	Slop	e Velocity	Capacity	Description									
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)										
17.5	100	0.030	0.10		Sheet Flow,									
					Woods: Light underbrush n= 0.400 P2= 3.50"									
5.6	490	0.086) 1.47		Shallow Concentrated Flow,									
					Woodland Kv= 5.0 fps									
0.2	60	0.130) 5.80		Shallow Concentrated Flow,									
					Unpaved Kv= 16.1 fps									
2.2	290	0.193) 2.20		Shallow Concentrated Flow,									
	400				Woodland Kv= 5.0 tps									
0.6	120	0.200	3.13		Shallow Concentrated Flow,									
40.5	4 000				Short Grass Pasture Kv= 7.0 tps									
10.5	1,060	0.114	1.69		Shallow Concentrated Flow,									
0.5	4 0 4 0	0.050		10.07	Woodland KV= 5.0 fps									
3.5	1,210	0.059	5.77	13.27										
					Area= 2.3 st Perim= 9.1° r= 0.25									
					n= 0.025 Earth, clean & winding									

40.1 3,330 Total

Subcatchment 1.0S:



Summary for Subcatchment 2.0S:

Runoff 43.34 cfs @ 12.39 hrs, Volume= 5.267 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area	(ac) C	N De	scription											
0.	100	87 Dir	t roads, HS	GC										
9.	100	82 Ro	w crops, SF	R + CR, Goo	bd, HSG C									
0.	900	71 Me	adow, non-	grazed, HS	GC									
8.	600	70 W	/oods, Good, HSG C											
18.	700	76 W	eighted Ave	rage										
18.	700	Pe	rvious Area											
Tc	Length	Slop	e Velocity	Capacity	Description									
(min)	(feet)	(ft/f) (ft/sec)	(cfs)										
11.6	100	0.030	0.14		Sheet Flow,									
					Grass: Dense n= 0.240 P2= 3.50"									
11.9	1,060	0.045) 1.48		Shallow Concentrated Flow,									
					Short Grass Pasture Kv= 7.0 fps									
1.1	150	0.217	2.33		Shallow Concentrated Flow,									
					Woodland Kv= 5.0 fps									
3.1	700	0.038) 3.75	8.24	Channel Flow,									
					Area= 2.2 sf Perim= 9.1' r= 0.24'									
					n= 0.030 Earth, grassed & winding									

27.7 2,010 Total

Subcatchment 2.0S:

Hydrograph



18

14 12-

10

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Flow (cfs) 16-

Summary for Subcatchment 3.0S:

Runoff 25.51 cfs @ 12.27 hrs, Volume= 2.644 af, Depth= 2.99" =

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (a	ic) C	N Desc	cription											
0.10	00 9	8 Pave	ed parking	& roofs										
0.10	8 00	7 Dirt	roads, HS0	GС										
0.10	00 7	4 >759	% Grass co	over, Good	HSG C									
1.30	8 00	2 Row	crops, SF	1 + CR, Go	od, HSG C									
2.80	00 7	1 Mea	dow, non-g	grazed, HS	GC									
6.20	00 7	<u>0 Woo</u>	ds, Good,	HSG C										
10.60	10.500 /2 Weighted Average													
10,500 Pervious Area														
0.100 Impervious Area														
- ·		~		.										
IC L	ength	Slope	Velocity	Capacity	Description									
(min)	(feet)	(ft/ft)	(ft/sec)	(CTS)										
13.6	100	0.0200	0.12		Sheet Flow,									
4.5	550	0 0000	0.00		Grass: Dense	n= 0.240	$P2=3.50^{\circ}$							
4.5	550	0.0830	2.02		Shallow Conc		W, 70 fee							
0.0	100	0 0000	0.66		Shollow Cone	asture KV=	7.0 ips							
0.0	120	0.2030	2.00		Woodland K	entrated FIO	w,							
19.0	770	Total			Wooulanu K	/= 3.0 ips								
10.5	110	TULAI												
						Subcato	chment 3.	0S:						
						Hydrogra	ph							
28-	1													
	25.5	1 ofc	i i	i i	i i i	i i i	i i	ii	i i	i.	i i	i i	i i	- Runoff
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Runoff Area=10.600 ac

Runoff Depth=2.99"

Flow Length=770'

Tc=18.9 min

CN=72

Runoff Volume=2.644 af



Summary for Subcatchment 4.0S:

Runoff 8.66 cfs @ 12.17 hrs, Volume= 0.749 af, Depth= 2.90" =

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area	(ac)) C	N E	Desc	ription	I																					
0	.100) 8) 7	37 E 71 M	Dirt r Meac	oads, Iow, n	HSG on-gi	C razec	, HS	GC																		
2	.800) 7	7 <u>0 \</u>	Noo	ds, Go	od, ł	ISG	Ć																			
3	100) /	F	/veig Pervi	nted A ous A	vera rea	.ge																				
Tc (min)	Le	ngth feet)	Slo (ft	ppe	Veloo (ft/s	city ec)	Capa	acity	Des	script	ion																
7.2		100	0.10	000	0.	.23		0.07	She	eet Flow, ass: Dense _ n= 0.240 _ P2= 3.50"																	
0.3		40	0.07	750	1.	.92			Gra Sha	ass: Dense n= 0.240 P2= 3.50" allow Concentrated Flow,																	
4.1		470	0.14	190	1.	.93			Sho Sha	ort Gr allow	rass Con	Pastu centr	re K ated I	v= 7. Flow,	0 fps												
11.6	Woodland Kv= 5.0 fps																										
													uha	atak													
												5	udc	atch	men	it 4.0	15:										
												Hyo	drog	raph	1						-						
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													Time	e (ho	ours)												

Summary for Subcatchment 5.0S:

Runoff = 152.56 cfs @ 12.37 hrs, Volume= 18.337 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area	(ac) C	N De	scription												
8.	100	98 Pa	ved parking	& roofs											
0.	200	37 Di	t roads, HS	GC											
6.	800	74 >7	75% Grass cover, Good, HSG C												
9.	700	32 Ro	ow crops, SR + CR, Good, HSG C												
3.	500	71 Me	/leadow, non-grazed, HSG C												
23.	700	70 W	oods, Good	, HSG C											
1.	200	77 W	oods, Good	, HSG D											
1.	500	98 W	ater Surface	•											
5.	100 9	94 Ur	oan comme	rcial, 85% ir	np, HSG C										
59.	800	79 W	eighted Ave	rage											
45.	865	Pe	rvious Area												
13.	935	Im	pervious Are	ea											
То	Longth	Slop	- Volooity	Consoity	Description										
(min)	(feet)	(ft/f	(ft/sec)	(cfs)	Description										
11.6	100	0.030	0.014	(0.0)	Sheet Flow.										
		0.000			Grass: Dense n= 0.240 P2= 3.50"										
4.2	440	0.061	0 1.73		Shallow Concentrated Flow.										
					Short Grass Pasture Kv= 7.0 fps										
2.8	240	0.083	3 1.44		Shallow Concentrated Flow,										
					Woodland Kv= 5.0 fps										
8.4	2,600	0.039	5.15	10.30	Trap/Vee/Rect Channel Flow,										
					Bot.W=3.00' D=0.50' Z= 2.0 '/' Top.W=5.00'										
					n= 0.030 Earth, grassed & winding										

27.0 3,380 Total

Subcatchment 5.0S:



Summary for Subcatchment 6.0S:

Runoff = 146.78 cfs @ 12.33 hrs, Volume= 16.797 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area	(ac) C	N Des	cription											
1.4	400 8	37 Dirt	roads, HS	GС										
0.	500	74 >75	% Grass c	over, Good	, HSG C									
3.	700	71 Mea	dow, non-g	grazed, HS	GC									
24.	500 7	73 Wo	oods, Fair, HSG C											
16.	700 9	94 Urb	rban commercial, 85% imp, HSG C											
5.	100 8) 83 1/4 acre lots, 38% imp, HSG C												
51.9	900 8	31 Wei	ghted Avei	rage										
35.	767	Per	vious Area											
16.	133	Imp	ervious Are	a										
Tc	Length	Slope	Velocity	Capacity	Description									
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)										
12.4	100	0.0700	0.13		Sheet Flow,									
					Woods: Light underbrush n= 0.400 P2= 3.50"									
1.9	160	0.0750	1.37		Shallow Concentrated Flow,									
					Woodland Kv= 5.0 fps									
3.6	475	0.0990	2.20		Shallow Concentrated Flow,									
					Short Grass Pasture Kv= 7.0 fps									
1.6	140	0.0860	1.47		Shallow Concentrated Flow,									
			o 07		Woodland Kv= 5.0 tps									
2.9	390	0.1050	2.27		Shallow Concentrated Flow,									
			10 50	~~~~	Short Grass Pasture KV= 7.0 tps									
1.5	930	0.0800	10.59	33.27	Circular Channel (pipe),									
					Diam= 24.0° Area= 3.1 St Perim= 6.3° r= 0.50°									
					n= 0.025 Corrugated metal									

23.9 2,195 Total

Subcatchment 6.0S:



Summary for Subcatchment 7.0S:

Runoff = 52.07 cfs @ 12.45 hrs, Volume= 6.813 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area	(ac)	CN	Desc	ription											
0.	900	87	Dirt r	oads, HSC	ЭС										
3.	500	71	Mead	low, non-o	razed, HS	GC									
13.	200	70	Wood	Woods, Good, HSG C											
5.	900	94 Urban commercial, 85% imp, HSG C													
23.	500	77	Weig	hted Aver	age										
18.	485		Pervi	ous Area											
5.	015		Impe	rvious Are	а										
Tc	Length	S	Slope	Velocity	Capacity	Description									
(min)	(feet)		(ft/ft)	(ft/sec)	(cfs)										
20.5	100	0.0	0200	0.08		Sheet Flow,									
						Woods: Light underbrush n= 0.400 P2= 3.50"									
1.3	90	0.0	0560	1.18		Shallow Concentrated Flow,									
						Woodland Kv= 5.0 fps									
4.6	350	0.0	0630	1.25		Shallow Concentrated Flow,									
						Woodland Kv= 5.0 fps									
6.2	920	0.	1260	2.48		Shallow Concentrated Flow,									
						Short Grass Pasture Kv= 7.0 fps									

32.6 1,460 Total

Subcatchment 7.0S:





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Summary for Subcatchment 1.0S:

Runoff = 516.03 cfs @ 12.55 hrs, Volume= 74.726 af, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	ac) C	N Des	cription										
4.	700 9	94 Urb	an commer	cial, 85% ir	np, HSG C								
3.	100 8	37 Dirt	roads, HS0	ЭC									
1.0	500 7	′4 >75	% Grass co	over, Good,	HSG C								
5.	600 E	32 Rov	low crops, SR + CR, Good, HSG C										
30.3	200 7	'1 Mea	adow, non-g	grazed, HS	GC								
14.	300 7	'7 Wo	ods, Good,	HSG D									
109.	000 7	'0 Wo	ods, Good,	HSG C									
6.	100 6	<u>60 Wo</u>	ods, Fair, H	ISG B									
174.	500 7	'2 We	ighted Aver	age									
170.	605	Per	vious Area										
3.	995	Imp	ervious Are	a									
Tc	Length	Slope	Velocity	Capacity	Description								
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)									
17.5	100	0.0300	0.10		Sheet Flow,								
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"								
17.5 5.6	100 490	0.0300	0.10 1.47		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow,								
17.5 5.6	100 490	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps								
17.5 5.6 0.2	100 490 60	0.0300 0.0860 0.1300	0.10 1.47 5.80		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow,								
17.5 5.6 0.2	100 490 60	0.0300 0.0860 0.1300	0.10 1.47 5.80		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Unpaved Kv= 16.1 fps Okalker Concentrated Flow,								
17.5 5.6 0.2 2.2	100 490 60 290	0.0300 0.0860 0.1300 0.1930	0.10 1.47 5.80 2.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Unpaved Kv= 16.1 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps								
17.5 5.6 0.2 2.2	100 490 60 290	0.0300 0.0860 0.1300 0.1930	0.10 1.47 5.80 2.20		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Unpaved Kv= 16.1 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow;								
17.5 5.6 0.2 2.2 0.6	100 490 60 290 120	0.0300 0.0860 0.1300 0.1930 0.2000	0.10 1.47 5.80 2.20 3.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Unpaved Kv= 16.1 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Shallow Concentrated Flow,								
17.5 5.6 0.2 2.2 0.6	100 490 60 290 120	0.0300 0.0860 0.1300 0.1930 0.2000	0.10 1.47 5.80 2.20 3.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Unpaved Kv= 16.1 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow,								
17.5 5.6 0.2 2.2 0.6 10.5	100 490 60 290 120 1,060	0.0300 0.0860 0.1300 0.1930 0.2000 0.1140	0.10 1.47 5.80 2.20 3.13 1.69		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Unpaved Kv= 16.1 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps								
17.5 5.6 0.2 2.2 0.6 10.5 3.5	100 490 60 290 120 1,060 1 210	0.0300 0.0860 0.1300 0.1930 0.2000 0.1140	0.10 1.47 5.80 2.20 3.13 1.69 5.77	13 27	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50° Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Unpaved Kv= 16.1 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Channel Flow								
17.5 5.6 0.2 2.2 0.6 10.5 3.5	100 490 60 290 120 1,060 1,210	0.0300 0.0860 0.1300 0.1930 0.2000 0.1140 0.0590	0.10 1.47 5.80 2.20 3.13 1.69 5.77	13.27	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50° Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Unpaved Kv= 16.1 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Channel Flow, Area= 2.3 sf Parim= 9.1' r= 0.25'								
17.5 5.6 0.2 2.2 0.6 10.5 3.5	100 490 60 290 120 1,060 1,210	0.0300 0.0860 0.1300 0.1930 0.2000 0.1140 0.0590	0.10 1.47 5.80 2.20 3.13 1.69 5.77	13.27	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50° Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Unpaved Kv= 16.1 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps Channel Flow, Area= 2.3 sf Perim= 9.1' r= 0.25' = 0.025 Earth clean & winding								

40.1 3,330 Total

Subcatchment 1.0S:



Summary for Subcatchment 2.0S:

Runoff = 71.61 cfs @ 12.38 hrs, Volume= 8.750 af, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac) C	N De	scription		
0.	100	37 Dir	t roads, HS	GC	
9.	100	32 Ro	w crops, SF	R + CR, Goo	bd, HSG C
0.	900	71 Me	adow, non-	grazed, HS	GĆ
8.	600	70 Wo	ods, Good,	HSG C	
18.	700	76 We	eighted Ave	rage	
18.	700	Pe	rvious Area	U	
Tc	Length	Slop	e Velocity	Capacity	Description
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)	
11.6	100	0.030	0.14		Sheet Flow,
					Grass: Dense n= 0.240 P2= 3.50"
11.9	1,060	0.045) 1.48		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
1.1	150	0.217	2.33		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
3.1	700	0.038) 3.75	8.24	Channel Flow,
					Area= 2.2 sf Perim= 9.1' r= 0.24'
					n= 0.030 Earth, grassed & winding

27.7 2,010 Total

Subcatchment 2.0S:



Summary for Subcatchment 3.0S:

Runoff 43.92 cfs @ 12.26 hrs, Volume= 4.537 af, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac) C	N D	escription										
0.	100	98 P	aved parking	& roofs									
0.	100	37 D	rt roads, HS	GC									
0.	100	74 >	75% Grass c	over, Good	, HSG C								
1.	300	32 R	Row crops, SR + CR, Good, HSG C										
2.	800	71 N	eadow, non-	grazed, HS	GC								
6.	200	70 W	oods, Good,	HSG C									
10.	600	72 W	eighted Ave	rage									
10.	500	Р	ervious Area										
0.	100	In	pervious Are	ea									
Tc (min)	Length (feet)	Sloj (ft/	e Velocity it) (ft/sec)	Capacity (cfs)	Description								
13.6	100	0.02	0 0.12		Sheet Flow,								
4.5 0.8	550 120	0.08 0.28	30 2.02 30 2.66		Grass: Dense n= 0.240 P2= 3.50" Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow, Woodland Kv= 5.0 fps								

18.9 770 Total

Subcatchment 3.0S:

Hydrograph



12

11

Summary for Subcatchment 4.0S:

Runoff = 15.06 cfs @ 12.16 hrs, Volume= 1.296 af, Depth= 5.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac) C	N Des	cription									
0.	100 8	37 Dirt	roads, HS	ЭC								
0.	200 7	'1 Mea	dow. non-o	arazed. HS	SG C							
2.	2.800 70 Woods, Good, HSG C											
3.100 71 Weighted Average												
3.	100	Perv	ious Area	0								
Tc	Length	Slope	Velocity	Capacity	Description							
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)								
7.2	100	0.1000	0.23		Sheet Flow,							
					Grass: Dense n= 0.240 P2= 3.50"							
0.3	40	0.0750	1.92		Shallow Concentrated Flow,							
					Short Grass Pasture Kv= 7.0 fps							
4.1	470	0.1490	1.93		Shallow Concentrated Flow,							
					Woodland Kv= 5.0 tps							
11.6	610	Total										
					Subcatchment 4.0S:							
					Lhudwa awan h							
					Hydrograph							
		1										
10	⁶ 15.0	6 cfs		-		- Runoff						
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Runoff Area=3.100 ac



Summary for Subcatchment 5.0S:

Runoff = 245.12 cfs @ 12.37 hrs, Volume= 29.776 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac) C	N N	Description		
8.	100	98	Paved parkin	g & roofs	
0.	200	87	Dirt roads, HS	G C	
6.	800	74 :	>75% Grass	cover, Good	, HSG C
9.	700	82	Row crops, S	R + CR, Go	bd, HSG C
3.	500	71	Meadow, non	-grazed, HS	GC
23.	700	70	Noods, Good	I, HSG C	
1.	200	77	Noods, Good	I, HSG D	
1.	500	98	Nater Surfac	e	
5.	100	94	Jrban comme	ercial, 85% ii	np, HSG C
59.	800	79	Neighted Ave	erage	
45.	865		Pervious Area	1	
13.	935		mpervious A	ea	
То	Longth	cı,	vna Valacity	Capacity	Description
(min)	(feet)	(f	t/ft) (ft/sec)	(cfs)	Description
11.6	100	0.0	300 0.14	(0.0)	Sheet Flow.
					Grass: Dense n= 0.240 P2= 3.50"
4.2	440	0.0	610 1.73		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
2.8	240	0.0	333 1.44		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
8.4	2,600	0.0	390 5.15	10.30	Trap/Vee/Rect Channel Flow,
					Bot.W=3.00' D=0.50' Z= 2.0 '/' Top.W=5.00'
					n= 0.030 Earth, grassed & winding

27.0 3,380 Total

Subcatchment 5.0S:



Summary for Subcatchment 6.0S:

Runoff = 232.07 cfs @ 12.32 hrs, Volume= 26.882 af, Depth= 6.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac)	CN	Desc	ription										
1.	400	87	Dirt r	oads, HSC	ЭС									
0.	500	74	>75%	Grass co	over, Good,	HSG C								
3.	700	71	Meac	leadow, non-grazed, HSG C										
24.	500	73	Wood	ds, Fair, H	SG C									
16.	700	94	Urba	n commer	cial, 85% ir	np, HSG C								
5.	100	83	1/4 a	cre lots, 3	8% imp, HS	SG C								
51.	900	81	Weig	hted Aver	age									
35.	767		Pervi	ous Area										
16.	133		Impe	rvious Are	а									
Tc	Length	ı Sl	lope	Velocity	Capacity	Description								
(min)	(feet) (ft/ft)	(ft/sec)	(cfs)									
12.4	100	0.0	700	0.13		Sheet Flow,								
						Woods: Light underbrush n= 0.400 P2= 3.50"								
1.9	160	0.0)750	1.37		Shallow Concentrated Flow,								
						Woodland Kv= 5.0 fps								
3.6	475	0.0	990	2.20		Shallow Concentrated Flow,								
						Short Grass Pasture Kv= 7.0 fps								
1.6	140	0.0	860	1.47		Shallow Concentrated Flow,								
						Woodland Kv= 5.0 fps								
2.9	390	0.1	050	2.27		Shallow Concentrated Flow,								
						Short Grass Pasture Kv= 7.0 fps								
1.5	930	0.0	0080	10.59	33.27	Circular Channel (pipe),								
						Diam= 24.0" Area= 3.1 sf Perim= 6.3' r= 0.50'								
						n= 0.025 Corrugated metal								

23.9 2,195 Total

Subcatchment 6.0S:



Summary for Subcatchment 7.0S:

Runoff 85.23 cfs @ 12.44 hrs, Volume= 11.231 af, Depth= 5.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac) (CN	Desc	ription											
0.	900	87	Dirt ro	oads, HSC	ЭC										
3.	500	71	Mead	Meadow, non-grazed, HSG C											
13.	200	70	Wood	Noods, Good, HSG C											
5.	900	94	Urbar	n commer	cial, 85% ir	np, HSG C									
23.	500	77	Weig	hted Aver	age										
18.	485		Pervi	ous Area	0										
5.	015		Imper	vious Are	a										
Tc	Length	S	lope	Velocity	Capacity	Description									
(min)	(feet)	((ft/ft)	(ft/sec)	(cfs)										
20.5	100	0.0	0200	0.08		Sheet Flow,									
						Woods: Light underbrush n= 0.400 P2= 3.50"									
1.3	90	0.0	0560	1.18		Shallow Concentrated Flow,									
						Woodland Kv= 5.0 fps									
4.6	350	0.0	0630	1.25		Shallow Concentrated Flow,									
						Woodland Kv= 5.0 fps									
6.2	920	0.1	1260	2.48		Shallow Concentrated Flow,									
						Short Grass Pasture Ky= 7.0 fps									

32.6 1,460 Total

Subcatchment 7.0S:

Hydrograph



APPENDIX B

Post-development Computer Data



Summary for Subcatchment 1.1S:

Runoff = 25.84 cfs @ 12.09 hrs, Volume= 1.884 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

А	rea	(ac)	(CN		De	sci	ript	ion																								
*	7.90098Paved parking & roofs1.60074>75% Grass cover, Good, HSG C1.00071Meadow, non-grazed, HSG C0.50098Water Surface0.90056Pervious Pavement																																	
11.90089Weighted Average3.500Pervious Area8.400Impervious Area																																		
(n	Tc nin)	Le	eng (fe	gth et)		Sl (f	ope t/ft	e :)	Ve (fl	loc /se	ity ec)	С	ар	acit (cfs	ty S)	D)es	crip	otio	n														
	6.0															D)ire	ct I	Ent	try,	ı													
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Summary for Subcatchment 1.2S:

Runoff = 1.14 cfs @ 12.01 hrs, Volume= 0.076 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

 Area (ac)	CN	Description						
0.100	98	Water Surface						
 0.900	71	leadow, non-grazed, HSG C						
 1.000	74	Weighted Average						
0.900		Pervious Area						
0.100		Impervious Area						

Subcatchment 1.2S:



Summary for Subcatchment 1.3S:

Runoff = 12.42 cfs @ 12.09 hrs, Volume= 0.909 af, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

A	rea	(ac)	CN	l De	script	ion													
	3.900 98 Paved parking & roofs 0.200 74 >75% Grass cover, Good, HSG C																		
	0.	.900	71 92	Me Wa	adow	, non-	graze	d, HS	GC										
*	0.	.300	56	B Pe	rvious	Pave	ment												
	5. 1	.500	90) We Po	eighte	d Ave	rage												
	4.	.100		Im	pervic	us Area	ea												
(m	Tc iin)	Len (fe	gth eet)	Slope (ft/ft	e Ve) (fi	locity /sec)	Cap	acity (cfs)	De	scrip	tion								
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Summary for Subcatchment 1.4S:

Runoff = 2.54 cfs @ 12.10 hrs, Volume= 0.186 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (ac) CN Description	
0.100 98 Paved parking & roofs	
0.900 74 >75% Grass cover, Good, H	ISG C C
0.400 98 Water Surface	0
1.700 81 Weighted Average	
1.200 Pervious Area	
Tc Length Slope Velocity Capacity D (min) (feet) (ft/ft) (ft/sec) (cfs)	Description
6.0 D	Direct Entry,
Subcato	hment 1 4S.
Hydrogra	aph
	Type III 24-hr 1-yr
	Rainfall=3.00''
2	Runoff Area=1.700 ac
	Bunoff Volume-0 186 af
(cts)	Duneff Denth 1 21
	Runoff Deptn=1.31
	Tc=6.0 min
	CN=81
0 10 20 30 40 50 60 70 80 90 100 110 1 Time	120 130 140 150 160 170 180 190 200 210 220 230 240 (hours)

Summary for Subcatchment 1.5S:

Runoff = 51.68 cfs @ 12.22 hrs, Volume= 4.969 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area	(ac)	CN	Desc	cription					
12.	200	98	Pave	Paved parking & roofs					
0.	200	87	Dirt ı	roads, HS	GС				
10.	500	74	>75%	% Grass co	over, Good,	, HSG C			
9.	700	71	Mea	dow, non-g	grazed, HS	GC			
12.	700	70	Woo	ds, Good,	HSG C				
0.	700	98	Wate	er Surface					
1.1	700	94	Urba	ın commer	cial, 85% ir	mp, HSG C			
47.	700	80	Weig	ghted Aver	age				
33.	355		Perv	ious Area	•				
14.	345		Impe	ervious Are	a				
_									
Tc	Leng	th	Slope	Velocity	Capacity	Description			
(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)				
15.0						Direct Entry,			

Subcatchment 1.5S:



Summary for Subcatchment 1.6S:

Runoff = 4.26 cfs @ 12.01 hrs, Volume= 0.286 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (ac)	CN	Description
3.200	71	Meadow, non-grazed, HSG C
0.500	73	Woods, Fair, HSG C
0.300	98	Water Surface
4.000	73	Weighted Average
3.700		Pervious Area
0.300		Impervious Area

Subcatchment 1.6S:



Summary for Subcatchment 1.7S:

Runoff = 23.25 cfs @ 12.01 hrs, Volume= 1.458 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

 Area (ac)	CN	Description
 3.700	98	Paved parking & roofs
2.900	74	>75% Grass cover, Good, HSG C
3.100	71	Meadow, non-grazed, HSG C
3.900	73	Woods, Fair, HSG C
 0.400	98	Water Surface
 14.000	80	Weighted Average
9.900		Pervious Area
4.100		Impervious Area

Subcatchment 1.7S:



Summary for Subcatchment 1.8S:

Runoff = 1.93 cfs @ 12.01 hrs, Volume= 0.120 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

 Area (ac)	CN	Description
 0.700	71	Meadow, non-grazed, HSG C
 0.400	98	Water Surface
 1.100	81	Weighted Average
0.700		Pervious Area
0.400		Impervious Area

Subcatchment 1.8S:



Summary for Subcatchment 1.9S:

Runoff = 48.00 cfs @ 12.55 hrs, Volume= 7.084 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area	(ac) (CN Des	cription						
1.500 87		87 Dirt	Dirt roads, HSG C						
0.500 74		74 >75	>75% Grass cover, Good, HSG C						
13.	900	71 Mea	Meadow, non-grazed, HSG C						
1.	500	60 Woo	ods, Fair, H	ISG B					
63.	300	73 Woo	ods, Fair, F	ISG C					
9.	900	79 Woo	ods, Fair, F	ISG D					
3.	000	94 Urba	an commei	<u>rcial, 85% ir</u>	mp, HSG C				
93.	600	74 Wei	ghted Avei	rage					
91.	050	Perv	vious Area						
2.	550	Impe	ervious Are	ea					
_									
Tc	Length	Slope	Velocity	Capacity	Description				
(min)	(feet)	(ft/ft)	(ft/sec)	(cts)					
5.8	100	0.0500	0.29		Sheet Flow,				
					Range n= 0.130 P2= 3.50"				
9.9	1,643	0.1560	2.76		Shallow Concentrated Flow,				
					Short Grass Pasture Kv= 7.0 fps				
11.7	668	0.0360	0.95		Shallow Concentrated Flow,				
	4 9 5 9			4 67	Woodland Kv= 5.0 fps				
8.8	1,359	0.0220	2.58	1.37	Irap/Vee/Rect Channel Flow,				
					BOI.W= 2.00° D= 0.25° Z= 0.5° 10p.W= 2.25°				
					n= 0.030 Earth, grassed & Winding				
36.2	3,770	Total							

Subcatchment 1.9S:



Summary for Reach DP 1: Design Point 1

Inflow A	rea =	180.500 ac, 1	19.28% Impervious,	Inflow Depth > 1.	.14" for 1-yr event
Inflow	=	48.51 cfs @	12.55 hrs, Volume	= 17.175 af	
Outflow	=	48.51 cfs @	12.55 hrs, Volume	= 17.175 af,	, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Reach DP 1: Design Point 1



Summary for Pond 1.1P: Micropool Extended Detention Pond (P-1)

Inflow Area =		19.100 ac, 68.06% Impervious, Inflow Depth = 2.05" for 1-yr event	
Inflow	=	25.96 cfs @ 12.09 hrs, Volume= 3.268 af	
Outflow	=	5.07 cfs @ 12.55 hrs, Volume= 3.250 af, Atten= 80%, Lag= 27.7 min	
Primary	=	5.07 cfs @ 12.55 hrs, Volume= 3.250 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 613.00' Surf.Area= 19,800 sf Storage= 81,050 cf Peak Elev= 614.98' @ 12.55 hrs Surf.Area= 24,289 sf Storage= 124,419 cf (43,369 cf above start) Flood Elev= 617.00' Surf.Area= 29,400 sf Storage= 178,700 cf (97,650 cf above start)

Plug-Flow detention time= 6,372.2 min calculated for 1.390 af (43% of inflow) Center-of-Mass det. time= 1,726.8 min (3,700.7 - 1,973.9)

Volume	١n	vert Ava	il.Storage	Storage	Description		
#1	605.	00' 2	209,400 cf	Custom	Stage Data (Pri	ismatic) Listed below (Recalc)	
		~		.	a a		
Elevation	on	Surt.Area	Inc	Store.	Cum.Store		
(fee	et)	(sq-ft)	(cubi	c-feet)	(cubic-feet)		
605.0	00	5,000		0	0		
606.0	00	6,000		5,500	5,500		
608.0	00	8,100	-	14,100	19,600		
610.0	00	10,400	-	18,500	38,100		
612.0	00	15,100		25,500	63,600		
613.0	00	19,800	-	17,450	81,050		
614.0	00	21,900		20,850	101,900		
616.0	00	26,800	4	48,700	150,600		
618.00		32,000	Ę	58,800	209,400		
Device	Routing	Ir	nvert Outl	et Device	S		
#1	Primary	613	3.00' 2.0''	Vert. Ori	fice/Grate C= 0	0.600	
#2 Primary		y 614.50' 5. 0		5.0' long x 0.5' breadth Broad-Crested Rectangular Weir			
			Hea	d (feet) 0	.20 0.40 0.60	0.80 1.00	
			Coe	f. (Englisł	n) 2.80 2.92 3.	08 3.30 3.32	

Primary OutFlow Max=5.02 cfs @ 12.55 hrs HW=614.97' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.14 cfs @ 6.62 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 4.88 cfs @ 2.05 fps)


Pond 1.1P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	=	20.100 ac, 65	.17% Impervious,	Inflow Depth >	1.99" fo	or 1-yr event
Inflow	=	5.24 cfs @ 1	2.55 hrs, Volume	e= 3.326	af	
Outflow	=	0.63 cfs @ 2	4.33 hrs, Volume	e= 3.321	af, Atten=	= 88%, Lag= 706.7 min
Primary	=	0.63 cfs @ 2	4.33 hrs, Volume	e= 3.321	af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 600.00' Surf.Area= 6,300 sf Storage= 9,700 cf Peak Elev= 603.99' @ 24.33 hrs Surf.Area= 14,588 sf Storage= 50,918 cf (41,218 cf above start) Flood Elev= 609.00' Surf.Area= 27,250 sf Storage= 154,575 cf (144,875 cf above start)

Plug-Flow detention time= 1,524.8 min calculated for 3.098 af (93% of inflow) Center-of-Mass det. time= 619.6 min (4,255.7 - 3,636.1)

Volume	Inv	ert Avail.Sto	rage	Storage	Description		
#1	596.0	00' 183,20)0 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)	
		0 ()	1	01.0.0			
Elevatio	on	Surf.Area	inc.	Store	Cum.Store		
(fee	et)	(sq-ft)	(cubic	-feet)	(cubic-feet)		
596.0	00	600		0	0		
598.0	00	1,400		2,000	2,000		
600.0	00	6,300		7,700	9,700		
602.0	00	10,200	1	6,500	26,200		
604.0	00	14,600	2	4,800	51,000		
606.0	00	19,300	3	3,900	84,900		
608.0	00	24,500	4	3,800	128,700		
610.0	00	30,000	5	4,500	183,200		
Device	Routing	Invert	Outle	et Device	S		
#1	Primary	600.00'	3.5"	Vert. Ori	fice/Grate C=	0.600	
#2	Primary	607.50'	8.0' l	ong x0.	5' breadth Broa	ad-Crested Rectangular Weir	
			Head	l (feet) 0	.20 0.40 0.60	0.80 1.00	
			Coef	. (English	n) 2.80 2.92 3.	08 3.30 3.32	
Drimory	Primary OutElow Max-0.63 of @ 24.33 hrs. HW/-603.00' (Free Discharge)						

Primary OutFlow Max=0.63 cfs @ 24.33 hrs HW=603.99' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.63 cfs @ 9.45 fps)

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

Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.3P: Micropool Extended Detention Pond (P-1)

Inflow Are	a =	5.500 ac, 7	4.55% Imper	vious, Inflow I	Depth = 1.9	98" for 1-yr	event
Inflow	=	12.42 cfs @	12.09 hrs, V	/olume=	0.909 af		
Outflow	=	0.59 cfs @	14.89 hrs, V	/olume=	1.199 af,	Atten= 95%,	Lag= 167.9 min
Primary	=	0.59 cfs @	14.89 hrs, V	/olume=	1.199 af		

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 14,500 sf Storage= 29,600 cf Peak Elev= 665.53' @ 14.89 hrs Surf.Area= 17,634 sf Storage= 54,167 cf (24,567 cf above start) Flood Elev= 667.00' Surf.Area= 20,550 sf Storage= 82,275 cf (52,675 cf above start)

Plug-Flow detention time= 5,274.2 min calculated for 0.519 af (57% of inflow) Center-of-Mass det. time= 2,495.0 min (3,304.4 - 809.4)

Volume	Inve	ert Avail.Sto	rage Storage	Description	
#1	659.0	0' 103,80	00 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
659.0	00	1,500	0	0	
660.0	00	2,000	1,750	1,750	
662.0	00	5,200	7,200	8,950	
663.0	00	10,800	8,000	16,950	
664.0	00	14,500	12,650	29,600	
666.0	00	18,600	33,100	62,700	
668.0	00	22,500	41,100	103,800	
Device	Routing	Invert	Outlet Devices	3	
#1	Primary	663.00'	1.5" Vert. Orif	ice/Grate C= (0.600
#2	Primary	665.50'	8.0' long x 0.9 Head (feet) 0. Coef (English	5' breadth Broa 20 0.40 0.60	Id-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32
#3	Primary	664.75'	4.0" Vert. Orif	ice/Grate $C=0$	0.600
Primary	OutFlow	Max=0.53 cfs (@ 14.89 hrs HV	V=665.53' (Fre	ee Discharge)

1=Orifice/Grate (Orifice Controls 0.09 cfs @ 7.56 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 0.11 cfs @ 0.48 fps)

-3=Orifice/Grate (Orifice Controls 0.33 cfs @ 3.77 fps)



Pond 1.3P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided

Inflow Area =	7.200 ac, 63.89% Impervious, Inflow Depth > 2.31" for 1-yr event	
Inflow =	2.62 cfs @ 12.10 hrs, Volume= 1.385 af	
Outflow =	0.37 cfs @ 23.65 hrs, Volume= 1.384 af, Atten= 86%, Lag= 693	3.2 min
Primary =	0.37 cfs @ 23.65 hrs, Volume= 1.384 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 657.00' Surf.Area= 12,850 sf Storage= 36,525 cf Peak Elev= 657.93' @ 23.65 hrs Surf.Area= 15,502 sf Storage= 49,714 cf (13,189 cf above start) Flood Elev= 661.00' Surf.Area= 28,250 sf Storage= 116,475 cf (79,950 cf above start)

Plug-Flow detention time= 5,623.3 min calculated for 0.545 af (39% of inflow) Center-of-Mass det. time= 580.1 min (3,553.7 - 2,973.6)

Volume	Inv	ert Avail.S	torage Stora	age Description	
#1	650.	00' 146,	900 cf Cus t	tom Stage Data (Pr	ri smatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	e Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet) (cubic-feet)	
650.0	00	500	(0 0	
652.0	00	1,100	1,600	1,600	
654.0	00	6,200	7,300	8,900	
656.0	00	10,000	16,200	25,100	
658.0	00	15,700	25,700	50,800	
660.0	00	23,900	39,600	90,400	
662.0	00	32,600	56,500	0 146,900	
Device	Routing	Inver	t Outlet Dev	vices	
#1	Primary	657.00	4.0" Vert.	Orifice/Grate C=	0.600
#2	Primary	659.25	2.5' long	x 0.5' breadth Broa	ad-Crested Rectangular Weir
			Head (fee	t) 0.20 0.40 0.60	0.80 1.00
			Coef. (En	glish) 2.80 2.92 3	.08 3.30 3.32
			-		

Primary OutFlow Max=0.37 cfs @ 23.65 hrs HW=657.93' (Free Discharge) **1=Orifice/Grate** (Orifice Controls 0.37 cfs @ 4.21 fps)

- I=Ornice/Grate (Ornice Controls 0.37 cls @ 4.21 lps)

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

Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided



Summary for Pond 1.5P: Micropool Extended Detention Pond (P-1)

Inflow Area	a =	47.700 ac, 30.07% Impervious, Inflow Depth = 1.25" for 1-yr event
Inflow	=	51.68 cfs @ 12.22 hrs, Volume= 4.969 af
Outflow	=	4.30 cfs @ 12.72 hrs, Volume= 4.946 af, Atten= 72%, Lag= 30.3 min
Primary	=	4.30 cfs @ 12.72 hrs, Volume= 4.946 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 38,400 sf Storage= 157,900 cf Peak Elev= 658.04' @ 12.72 hrs Surf.Area= 48,603 sf Storage= 246,877 cf (88,977 cf above start) Flood Elev= 661.00' Surf.Area= 61,600 sf Storage= 404,050 cf (246,150 cf above start)

Plug-Flow detention time= 4,254.4 min calculated for 1.321 af (27% of inflow) Center-of-Mass det. time= 1,144.3 min (1,998.8 - 854.5)

Volume	Inve	ert Avail.Sto	rage	Storage	Description	
#1	648.0	0' 469,80	00 cf	Custom	Stage Data (Pri	smatic) Listed below (Recalc)
Elevatio	n	Surf.Area	Inc	Store	Cum.Store	
(tee	t)	(sq-ft)	(Cubi	c-feet)	(cubic-feet)	
648.0	0	10,500		0	0	
650.0	0	14,200	2	24,700	24,700	
652.0	0	18,100	3	32,300	57,000	
654.0	0	22,200	2	40,300	97,300	
656.0	0	38,400	6	60,600	157,900	
658.0	0	48,500	8	36,900	244,800	
660.0	0	53,300	10	01,800	346,600	
662.0	0	69,900	12	23,200	469,800	
Device	Routing	Invert	Outl	et Device	S	
#1	Primary	656.00'	2.0"	Vert. Ori	fice/Grate C= 0	0.600
#2	Primary	657.00'	4.0'	long x 0.	.5' breadth Broa	d-Crested Rectangular Weir
	,		Hea	d (feet) C	0.20 0.40 0.60	0.80 1.00
			Coe	f. (Englisl	n) 2.80 2.92 3.0	08 3.30 3.32
#3	Primary	658.75'	4.0'	long x 0.	5' breadth Broa	d-Crested Rectangular Weir
			Hea	d (feet) C	0.20 0.40 0.60	0.80 1.00
			Coe	f. (Englisł	n) 2.80 2.92 3.0	08 3.30 3.32
_ .	o .=.		<u> </u>			
Primary 1=Ori	Primary OutFlow Max=14.27 cfs @ 12.72 hrs HW=658.04 (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.15 cfs @ 6.74 fps)					

-2=Broad-Crested Rectangular Weir (Weir Controls 14.12 cfs @ 3.39 fps)

-3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)



Pond 1.5P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	ι =	51.700 ac, 28.33% Impervious, Inflow Depth > 1.21" for 1-yr event	
Inflow	=	4.87 cfs @ 12.72 hrs, Volume= 5.232 af	
Outflow	=	5.93 cfs @ 14.84 hrs, Volume= 5.194 af, Atten= 60%, Lag= 127.6 min	
Primary	=	5.93 cfs @ 14.84 hrs, Volume= 5.194 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 627.00' Surf.Area= 30,860 sf Storage= 131,598 cf Peak Elev= 629.16' @ 14.84 hrs Surf.Area= 36,875 sf Storage= 204,822 cf (73,224 cf above start) Flood Elev= 633.00' Surf.Area= 48,641 sf Storage= 368,223 cf (236,625 cf above start)

Plug-Flow detention time= 4,621.0 min calculated for 2.173 af (42% of inflow) Center-of-Mass det. time= 960.0 min (2,896.8 - 1,936.8)

Volume	Inve	ert Avail.Sto	rage S	Storage	Description	
#1	621.0	00' 418,50	08 cf 🛛 🕻	Custom	Stage Data ((Prismatic) Listed below (Recalc)
Elevatic	n	Surf.Area	Inc.S	Store	Cum.Stor	re
(fee	et)	(sq-ft)	(cubic-	feet)	(cubic-fee	<u>et)</u>
621.0	00	14,753		0		0
622.0	0	16,761	15	,757	15,75	57
624.0	0	21,116	37	,877	53,63	34
627.0	00	30,860	77	,964	131,59	98
628.0	00	33,557	32	,209	163,80)7
630.0	00	39,254	72	,811	236,61	8
632.0	00	45,354	84	,608	321,22	26
634.0	00	51,928	97	,282	418,50)8
		1			_	
Device	Routing	Invert	Outlet	Device	S	
#1	Primary	627.00'	2.5'' V	ert. Ori	fice/Grate C	i = 0.600
#2	Primary	627.75'	8.0'' V	ert. Ori	fice/Grate C	i = 0.600
#3	Primary	628.75'	5.0' lo	ng x0.	5' breadth Br	road-Crested Rectangular Weir
			Head	(feet) 0	0.20 0.40 0.6	0 0.80 1.00
			Coef.	(Englisł	1) 2.80 2.92 (r	3.08 3.30 3.32
	· · ····		~			

Primary OutFlow Max=5.90 cfs @ 14.84 hrs HW=629.16' (Free Discharge) **1=Orifice/Grate** (Orifice Controls 0.24 cfs @ 6.91 fps)

2=Orifice/Grate (Orifice Controls 0.24 cls @ 0.91 ips)

-3=Broad-Crested Rectangular Weir (Weir Controls 3.91 cfs @ 1.89 fps)

Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.7P: Micropool Extended Detention Pond (P-1)

Inflow Area	a =	14.000 ac, 29.29% Impervious, Inflow Depth = 1.25" for 1-yr event	
Inflow	=	23.25 cfs @ 12.01 hrs, Volume= 1.458 af	
Outflow	=	6.03 cfs @ 12.37 hrs, Volume= 1.457 af, Atten= 74%, Lag= 22.0 m	in
Primary	=	6.03 cfs @ 12.37 hrs, Volume= 1.457 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 16,200 sf Storage= 41,300 cf Peak Elev= 665.30' @ 12.37 hrs Surf.Area= 21,605 sf Storage= 65,917 cf (24,617 cf above start) Flood Elev= 667.00' Surf.Area= 28,800 sf Storage= 108,650 cf (67,350 cf above start)

Plug-Flow detention time= 3,345.0 min calculated for 0.509 af (35% of inflow) Center-of-Mass det. time= 1,137.9 min (1,978.5 - 840.6)

Volume	Invo	ert Avail.Sto	rage Storage	Description	
#1	658.0	00' 139,6	00 cf Custom	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
658.0	00	3,100	0	0	
660.0	00	4,500	7,600	7,600	
662.0	00	6,500	11,000	18,600	
664.0	00	16,200	22,700	41,300	
666.0	00	24,500	40,700	82,000	
668.0	00	33,100	57,600	139,600	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	664.00'	1.5" Vert. Ori	ifice/Grate C=	0.600
#2	Primary	664.90'	8.0' long x 0 Head (feet) (Coef. (Englis	.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=6.00 cfs @ 12.37 hrs HW=665.30' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.07 cfs @ 5.36 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 5.94 cfs @ 1.85 fps)



Pond 1.7P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area =	15.100 ac, 29.80% Impervious, Inflow	Depth = 1.25" for 1-yr event
Inflow =	6.54 cfs @ 12.35 hrs, Volume=	1.578 af
Outflow =	1.83 cfs @ 14.01 hrs, Volume=	1.576 af, Atten= 72%, Lag= 99.3 min
Primary =	1.83 cfs @ 14.01 hrs, Volume=	1.576 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 644.00' Surf.Area= 16,900 sf Storage= 54,400 cf Peak Elev= 645.17' @ 14.01 hrs Surf.Area= 20,069 sf Storage= 76,095 cf (21,695 cf above start) Flood Elev= 647.00' Surf.Area= 25,150 sf Storage= 117,325 cf (62,925 cf above start)

Plug-Flow detention time= 6,514.0 min calculated for 0.327 af (21% of inflow) Center-of-Mass det. time= 951.5 min (2,842.8 - 1,891.4)

Inve	<u>rt Avail.Sto</u>	rage Storage	e Description	
638.0	0' 143,90	00 cf Custon	n Stage Data (Pri	ismatic) Listed below (Recalc)
n s	Surf.Area	Inc.Store	Cum.Store	
t)	(sq-tt)	(CUDIC-TEET)	(CUDIC-TEET)	
0	5,100	0	0	
0	7,000	12,100	12,100	
0	9,200	16,200	28,300	
0	16,900	26,100	54,400	
0	22,300	39,200	93,600	
0	28,000	50,300	143,900	
Routing	Invert	Outlet Device	es	
Primary	644.00'	2.5" Vert. Or	ifice/Grate C= ().600
Primary	645.00'	8.0' long x 0 Head (feet) Coef. (Englis	5.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.0	d-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32
	Inve 638.00 n S t) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Invert Avail.Sto 638.00' 143,90 n Surf.Area t) (sq-ft) 0 5,100 0 7,000 0 9,200 0 16,900 0 22,300 0 28,000 Routing Primary 644.00' Primary 645.00'	Invert Avail.Storage Storage 638.00' 143,900 cf Custon n Surf.Area Inc.Store t) (sq-ft) (cubic-feet) 0 5,100 0 0 7,000 12,100 0 9,200 16,200 0 16,900 26,100 0 22,300 39,200 0 28,000 50,300 Routing Primary 644.00' Primary 645.00' 8.0' long x 0 Head (feet) Coef. (Englis)	Invert Avail.Storage Storage Description 638.00' 143,900 cf Custom Stage Data (Prince n Surf.Area Inc.Store Cum.Store t) (sq-ft) (cubic-feet) (cubic-feet) 0 5,100 0 0 0 5,100 0 0 0 7,000 12,100 12,100 0 9,200 16,200 28,300 0 16,900 26,100 54,400 0 22,300 39,200 93,600 0 28,000 50,300 143,900 Routing Invert Outlet Devices Primary 644.00' 2.5" Vert. Orifice/Grate C= 0 8.0' long x 0.5' breadth Broat Head (feet) 0.20 0.40 0.60 Coef. (English) 2.80 2.92 3.0

Primary OutFlow Max=1.79 cfs @ 14.01 hrs HW=645.17' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.17 cfs @ 4.98 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 1.62 cfs @ 1.17 fps)

Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided



0-

Summary for Subcatchment 1.1S:

Runoff = 31.86 cfs @ 12.09 hrs, Volume= 2.338 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Ar	ea (ac)	CN De	scription								
	7.9	7.900 98 Paved parking & roofs										
	1.600 74 >75% Grass cover, Good, HSG C											
	1.000 71 Meadow, non-grazed, HSG C											
	0.5	500	98 Wa	Water Surface								
*	0.9	000	<u>56 Pe</u>	rvious Pave	ement							
	11.9	000	89 We	eighted Ave	rage							
	3.C		Pe Im	rvious Area	00							
	0.4	00		pervious Are	ea							
- (mi	Tc n)	Length (feet)	Slope	e Velocity	Capacity (cfs)	Description						
6	5.0	((1010	(10000)	(0.0)	Direct Entry,						
					Subca	tchment 1.1S	5:					
	Hydrograph											
3	34	1 00 - (-								 -	¦	- Bunoff
	3	1.86 CIS 1									1	Tunon
	32		i i			+ + + +	-++	\vdash $ \vdash$		-	i	-1
3	32 30								24-h	r 2	-vr	-
3	32 30 28						Туре		24-h	r 2	-yr	
2	32 30 28 26						Type	HI 2 ain	24-h fall=	r 2 :3.5	-yr 50''	
2	32 30 28 26 24						Type R	ain ain	24-h fall= 11.9	ir 2 :3.5	-yr 50''' ac	
	32 30 28 26 24 24 22					Runo	Type R off Are		24-h fall= 11.9	ir 2 :3.5)00	-yr 50'' ac	
(cfs)	32 30 28 26 24 22 20					Runo Runofi	Type R ff Are Volu	III 2 ain ∋a= µme	24-h fall= 11.9 =2.:	ir 2 3.5 000 338	-yr 50'' ac 5 af	
ow (cfs)	32 30 28 26 24 22 20 18					Runo Runofi Ru	Type R off Are Volu	lll 2 ain ea= ime Dej	24-h fall= 11.9 =2.4 oth=	ir 2 -3.5 100 338 -2.3	-yr 50'' ac 5 af 86''	
Flow (cfs)	32					Runo Runofi Ru	Type R off Are Volu Inoff	III 2 ain ea= Ime Dej	24-h fall= 11.9 =2.0 oth=	ir 2 3.5 000 338 -2.3	-yr 50'' ac 5 af 56''	
Flow (cfs)	32					Runof	Type R ff Are Volu	III 2 ain ea= Ime Dej	24-h fall= 11.9 =2.3 oth= C=6.	ir 2 3.5 000 338 -2.3 0 m	-yr 50'' ac af 36'' nin	
Flow (cfs)	32					Runo Runofi Ru	Type R off Are Volu Inoff	III 2 ain a= Ime Dej	24-h fall= 11.9 =2.3 oth= =6.	ir 2 -3.5 000 -2.3 0 m :N=	-yr 50'' ac af 36'' nin 89	
Flow (cfs)	32					Runo Runofí Ru	Type R off Are Volu Inoff	III 2 ain a= Ime Dej	24-h fall= 11.9 =2.3 oth= =6. C	ir 2 :3.5)00 338 :2.3 0 m :N=	-yr 50'' ac af 56'' nin :89	
Flow (cfs)	32					Runof	Type R ff Are Volu Inoff	ine ain Dej	24-h fall= 11.9 =2.: oth= =6. C	ir 2 3.5 100 338 -2.3 0 m :N=	-yr 50'' ac af 86'' nin 89	
Flow (cfs)	32					Runo Runofi Ru	Type R off Are Volu	illi ain a= Dej	24-h fall= 11.9 =2.3 oth= C	ir 2 3.5 000 338 2.3 0 m	-yr 50'' ac af 56'' nin 89	

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 Time (hours)

Summary for Subcatchment 1.2S:

Runoff = 1.61 cfs @ 12.01 hrs, Volume= 0.103 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

 Area (ac)	CN	Description
0.100	98	Water Surface
 0.900	71	Meadow, non-grazed, HSG C
 1.000	74	Weighted Average
0.900		Pervious Area
0.100		Impervious Area

Subcatchment 1.2S:



Summary for Subcatchment 1.3S:

Runoff = 15.21 cfs @ 12.09 hrs, Volume= 1.122 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac)	CN	Des	criptio	on															
3 0 0 * 0	.900 .200 .900 .200 .300	98 74 71 98 56	Pav >75 Mea Wa Per	red pa % Gra adow, ter Su vious	rking ass co non-g rface Pave	& roo over, (grazed ment	fs Good d, HS	, HS G C	G C											
5 1 4	.500 .400 .100	90	We Per Imp	ighted vious erviou	l Avei Area is Are	rage ea	''	D												
(min)	(feet	())	(ft/ft)	veid (ft/	sec)	Cap	acity (cfs)	De	scri	JUON										
6.0	(100)	· /	(10.10)	(10)			(0.0)	Dir	ect	Entry	/,									
	Subcatchment 1.3S:																			
Hydrograph																				
16 15	15.21 cfs]!- !-							·						 0/1	 	- - -		- Runoff	
14 13 12				 						-+ $-\frac{1}{1}$ $-\frac{1}{1}$		y 	Ra	ain	z4- fall	-11 =3	∠-y 3.50	₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩		
11-	· -		!!-				i i + +		- + -	Rι	ind	off	Ar	ea	=5.	50	0 a	C		
<u>م</u> 10	·						$\frac{1}{1} \frac{1}{1}$		R	uno	off	Vo	lu	me)=1	.12	22 a	af		
) 9) 9	<mark></mark> <u> </u> - -	- -	ii- I I	i I i		i I i			- + - - + -	- + _ +	Ru	no	ff I	De	pth	=2	2.45	,		
Ĕ 7-	<mark> </mark>						$\frac{1}{1} \frac{1}{1}$		- + -	- 				-T	c=6	5.0	mi	n		
6	· -						++		- + -	-+	+	· + · +				CN	J0	0		
5- 4-	· [4] [4] [4] [4] _ [4	' -	''- 	' 		' 			· - + -	- <u>+</u>										
3		-	-				· · · · · · · · · · · · · · · · · · ·		-+-	- +	+ 4	, , +				 	 	-		
2	-			!																
1	\mathcal{N}								- + - I	- + I	+ + 					· -	· -	-ii		
0-	10 20	30	40 50) 60	70 80) 90	100 11 Tir	0 120 ne (ho	130 Durs)	140 1	50 16	60 17	0 18	0 190	200	210	220 2	230 240	0	

Summary for Subcatchment 1.4S:

Runoff = 3.33 cfs @ 12.09 hrs, Volume= 0.242 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac) CN Description	
0.100 98 Paved parking & roofs	
0.900 /4 >/5% Grass cover, Good, 0.300 71 Meadow non-grazed HSC	, HSG C G C
0.400 98 Water Surface	
1.700 81 Weighted Average	
0.500 Impervious Area	
Tc Length Slope Velocity Capacity (min) (feet) (ft/ft) (ft/sec) (cfs)	Description
6.0	Direct Entry,
Suboo	tohmont 1 AC:
Subca	graph
3.33 cfs	
	Type III 24-hr 2-yr
	Rainfall=3.50''
	Bunoff Area=1,700 ac
	Bunoff Volume-0 242 af
s s 2 - - - - - - - - - -	Dunoff Donth 1 71"
NOTION	
	Ic=6.0 min
	CN=81
0 10 20 30 40 50 60 70 80 90 100 110	0 120 130 140 150 160 170 180 190 200 210 220 230 240
Tin	ne (nours)

Summary for Subcatchment 1.5S:

Runoff = 68.44 cfs @ 12.21 hrs, Volume= 6.505 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

15.0						Direct Entry,			
 (min)	(fee	t)	(ft/ft)	(ft/sec)	(cfs)				
Tc L	engt	h	Slope	Velocity	Capacity	Description			
14.34	t5		inpe	rvious Are	a				
14.2	15			nuis Area					
22.21	55	50	Dony		uyu				
 47 70	າດ	80	Weic	ihted Aver	ane				
1.70	00	94	Urba	n commer	cial, 85% ir	np, HSG C			
0.70	00	98	Wate	er Surface					
12.70	00	70	Woo	ds, Good,	HSG C				
9.70	00	71	Mead	dow, non-g	grazed, HS	GC			
10.50	00	74	>75%	6 Grass co	over, Good,	, HSG C			
0.20	00	87	Dirt r	oads, HSC	ЭС				
12.20	00	98	Pave	Paved parking & roofs					
 Area (a	.c)	CN	Desc	ription					

Subcatchment 1.5S:



Summary for Subcatchment 1.6S:

Runoff = 6.08 cfs @ 12.01 hrs, Volume= 0.393 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac)	CN	Description
3.200	71	Meadow, non-grazed, HSG C
0.500	73	Woods, Fair, HSG C
0.300	98	Water Surface
4.000	73	Weighted Average
3.700		Pervious Area
0.300		Impervious Area

Subcatchment 1.6S:



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Summary for Subcatchment 1.7S:

Runoff = 30.73 cfs @ 12.01 hrs, Volume= 1.909 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

 Area (ac)	CN	Description
3.700	98	Paved parking & roofs
2.900	74	>75% Grass cover, Good, HSG C
3.100	71	Meadow, non-grazed, HSG C
3.900	73	Woods, Fair, HSG C
 0.400	98	Water Surface
 14.000	80	Weighted Average
9.900		Pervious Area
4.100		Impervious Area

Subcatchment 1.7S:



Summary for Subcatchment 1.8S:

Runoff = 2.53 cfs @ 12.01 hrs, Volume= 0.157 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

_	Area (ac)	CN	Description
	0.700	71	Meadow, non-grazed, HSG C
	0.400	98	Water Surface
	1.100	81	Weighted Average
	0.700		Pervious Area
	0 400		Impervious Area

Subcatchment 1.8S:



Summary for Subcatchment 1.9S:

Runoff = 67.53 cfs @ 12.54 hrs, Volume= 9.671 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) C	N Des	cription		
1.	500	87 Dirt	roads, HS	GC	
0.	500	74 >75	% Grass c	over, Good	, HSG C
13.	900	71 Mea	dow, non-g	grazed, HS	GC
1.	500	60 Woo	ods, Fair, H	ISG B	
63.	300	73 Woo	ods, Fair, F	ISG C	
9.	900	79 Woo	ods, Fair, F	ISG D	
3.	000	94 Urba	an commei	<u>rcial, 85% ir</u>	mp, HSG C
93.	600	74 Wei	ghted Avei	age	
91.	050	Perv	vious Area		
2.	550	Impe	ervious Are	ea	
_					
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(†t/†t)	(ft/sec)	(cts)	
5.8	100	0.0500	0.29		Sheet Flow,
					Range n= 0.130 P2= 3.50"
9.9	1,643	0.1560	2.76		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
11.7	668	0.0360	0.95		Shallow Concentrated Flow,
	4 9 5 9			4 67	Woodland Kv= 5.0 fps
8.8	1,359	0.0220	2.58	1.37	Irap/Vee/Rect Channel Flow,
					BOI.W= 2.00° D= 0.25° Z= 0.5° / 10p.W= 2.25°
					n= 0.030 Earth, grassed & Winding
36.2	3,770	Fotal			



Subcatchment 1.9S:

Summary for Reach DP 1: Design Point 1

Inflow Are	ea =	180.500 ac, 1	19.28% Impervious,	Inflow Depth > 1.	51" for 2-yr event
Inflow	=	70.09 cfs @	12.57 hrs, Volume	= 22.642 af	
Outflow	=	70.09 cfs @	12.57 hrs, Volume	= 22.642 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs



Reach DP 1: Design Point 1

Summary for Pond 1.1P: Micropool Extended Detention Pond (P-1)

Inflow Area =	19.100 ac, 68.06% Impervious, Inflow	Depth = 2.51" for 2-yr event
Inflow =	32.02 cfs @ 12.09 hrs, Volume=	3.990 af
Outflow =	9.69 cfs @ 12.43 hrs, Volume=	3.972 af, Atten= 70%, Lag= 20.5 min
Primary =	9.69 cfs @ 12.43 hrs, Volume=	3.972 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 613.00' Surf.Area= 19,800 sf Storage= 81,050 cf Peak Elev= 615.21' @ 12.43 hrs Surf.Area= 24,854 sf Storage= 130,090 cf (49,040 cf above start) Flood Elev= 617.00' Surf.Area= 29,400 sf Storage= 178,700 cf (97,650 cf above start)

Plug-Flow detention time= 4,627.0 min calculated for 2.111 af (53% of inflow) Center-of-Mass det. time= 1,452.0 min (3,285.0 - 1,832.9)

Volume	١n	vert Ava	il.Storage	age Storage Description				
#1	605.	00' 2	209,400 cf	Custom	n Stage Data (Pri	ismatic) Listed below (Recalc)		
Elovatio	on	Surf Aroa	In	c Store	Cum Store			
Lievaiii (for	011 ot)	Jun Area	iii (oub		(oubic feet)			
	.	(Sq-II)	(CUD	ic-ieel)	(Cubic-leet)			
605.0	00	5,000		0	0			
606.0	00	6,000		5,500	5,500			
608.0	00	8,100		14,100	19,600			
610.0	00	10,400		18,500	38,100			
612.0	00	15,100		25,500	63,600			
613.0	00	19,800		17,450	81,050			
614.0	00	21,900		20,850	101,900			
616.0	00	26,800		48,700	150,600			
618.0	00	32,000		58,800	209,400			
Device	Routing	lr	nvert Out	let Device	es			
#1	Primary	613	3.00' 2.0 '	' Vert. Or	ifice/Grate C= 0	0.600		
#2	Primary	614	4.50' 5.0 '	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir				
	•		Hea	ad (feet) (0.20 0.40 0.60	0.80 1.00		
			Coe	ef. (Englis	h) 2.80 2.92 3.	08 3.30 3.32		

Primary OutFlow Max=9.60 cfs @ 12.43 hrs HW=615.20' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.15 cfs @ 7.01 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 9.45 cfs @ 2.68 fps)



Pond 1.1P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	20.100 ac, 65	5.17% Impervious	, Inflow Dept	th > 2.43"	for 2-yr event
Inflow	=	10.05 cfs @ 1	12.42 hrs, Volum	ie= 4	.075 af	
Outflow	=	0.73 cfs @ 2	24.29 hrs, Volum	ie= 4	.070 af, Atte	n= 93%, Lag= 712.4 min
Primary	=	0.73 cfs @ 2	24.29 hrs, Volum	ie= 4	.070 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 600.00' Surf.Area= 6,300 sf Storage= 9,700 cf Peak Elev= 605.27' @ 24.29 hrs Surf.Area= 17,589 sf Storage= 71,468 cf (61,768 cf above start) Flood Elev= 609.00' Surf.Area= 27,250 sf Storage= 154,575 cf (144,875 cf above start)

Plug-Flow detention time= 1,576.9 min calculated for 3.847 af (94% of inflow) Center-of-Mass det. time= 827.7 min (4,051.0 - 3,223.3)

Volume	Inv	ert Avail.Sto	orage S	Storage	Description	
#1	596.0	00' 183,2	00 cf C	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.S (cubic-f	Store feet)	Cum.Store (cubic-feet)	
596.0 598.0 600.0 602.0 604.0 606.0 608.0 610.0)0)0)0)0)0)0)0)0)0	600 1,400 6,300 10,200 14,600 19,300 24,500 30,000	2 7 16 24 33 43 54	0 ,000 ,700 ,500 ,800 ,900 ,800 ,500	0 2,000 9,700 26,200 51,000 84,900 128,700 183,200	
Device	Routing	Invert	Outlet	Devices	6	
#1 #2	Primary Primary	600.00' 607.50'	3.5'' V 8.0' Io Head Coef.	ert. Orif ng x 0.9 (feet) 0.9 (English	ice/Grate C= (5' breadth Broa .20 0.40 0.60) 2.80 2.92 3.	0.600 Id-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32
Drimary	OutFlow	Max=0.73 ofe	@ 21 20	bre HV	V_605.27' (Erd	e Discharge)

JutFlow Max=0./3 cts @ 24.29 hrs HW=605.27' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.73 cfs @ 10.90 fps)

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

Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.3P: Micropool Extended Detention Pond (P-1)

Inflow Area	a =	5.500 ac, 74.55% Impervious, Inflow Depth = 2.45" for 2-yr event	
Inflow	=	15.21 cfs @ 12.09 hrs, Volume= 1.122 af	
Outflow	=	1.62 cfs @ 12.87 hrs, Volume= 1.411 af, Atten= 89%, Lag= 47.0 min	
Primary	=	1.62 cfs @ 12.87 hrs, Volume= 1.411 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 14,500 sf Storage= 29,600 cf Peak Elev= 665.64'@ 12.87 hrs Surf.Area= 17,855 sf Storage= 56,079 cf (26,479 cf above start) Flood Elev= 667.00' Surf.Area= 20,550 sf Storage= 82,275 cf (52,675 cf above start)

Plug-Flow detention time= 4,119.7 min calculated for 0.732 af (65% of inflow) Center-of-Mass det. time= 2,159.5 min (2,963.0 - 803.5)

Volume	Inve	ert Avail.Sto	rage Storage	age Storage Description				
#1	659.0	00' 103,80	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)			
Elevatio	on	Surf.Area	Inc.Store	Cum.Store				
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)				
659.0)0	1,500	0	0				
660.0	00	2,000	1,750	1,750				
662.0	00	5,200	7,200	8,950				
663.0	00	10,800	8,000	16,950				
664.0	00	14,500	12,650	29,600				
666.0	00	18,600	33,100	62,700				
668.0	00	22,500	41,100	103,800				
Device	Routing	Invert	Outlet Device	es				
#1	Primary	663.00'	1.5" Vert. Or	ifice/Grate C=	0.600			
#2	Primary	665.50'	8.0' long x 0	.5' breadth Broa	ad-Crested Rectangular Weir			
			Head (feet)	0.20 0.40 0.60	0.80 1.00			
			Coef. (English) 2.80 2.92 3.08 3.30 3.32					
#3	Primary	664.75'	4.0" Vert. Orifice/Grate C= 0.600					
Drimary	OutFlow	May-1 58 cfc (බ 12 87 hre H	W-665 64' (Erd	Pe Discharge)			

rimary OutFlow Max=1.58 cfs @ 12.87 hrs HW=665.64' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.09 cfs @ 7.73 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 1.13 cfs @ 1.04 fps)

-3=Orifice/Grate (Orifice Controls 0.36 cfs @ 4.09 fps)

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Type III 24-hr 2-yr Rainfall=3.50"

Printed 10/12/2010





Summary for Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided

Inflow Area =	7.200 ac, 63.89% Impervious, Inflow I	Depth > 2.76" for 2-yr event
Inflow =	3.53 cfs @ 12.10 hrs, Volume=	1.653 af
Outflow =	0.46 cfs @ 19.90 hrs, Volume=	1.652 af, Atten= 87%, Lag= 468.1 min
Primary =	0.46 cfs @ 19.90 hrs, Volume=	1.652 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 657.00' Surf.Area= 12,850 sf Storage= 36,525 cf Peak Elev= 658.35' @ 19.90 hrs Surf.Area= 17,155 sf Storage= 56,628 cf (20,103 cf above start) Flood Elev= 661.00' Surf.Area= 28,250 sf Storage= 116,475 cf (79,950 cf above start)

Plug-Flow detention time= 4,354.6 min calculated for 0.814 af (49% of inflow) Center-of-Mass det. time= 632.2 min (3,283.6 - 2,651.5)

Volume	Inv	ert Avail.	Storage	age Storage Description				
#1	650.	00' 146	6,900 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)		
Elevatio	on	Surf.Area	Inc.	Store	Cum.Store			
(fee	et)	(sq-ft)	(cubic	-feet)	(cubic-feet)			
650.0	00	500		0	0			
652.0	00	1,100		1,600	1,600			
654.0	00	6,200		7,300	8,900			
656.0	00	10,000	1	6,200	25,100			
658.0	00	15,700	2	5,700	50,800			
660.0	00	23,900	3	9,600	90,400			
662.0	00	32,600	5	6,500	146,900			
Device	Routing	Inve	ert Outle	et Device	S			
#1	Primary	657.0	0' 4.0''	Vert. Ori	fice/Grate C= 0	0.600		
#2	Primary	659.2	25' 2.5' l	ong x 0	.5' breadth Broa	ad-Crested Rectangular Weir		
			Head	d (feet) C	0.20 0.40 0.60	0.80 1.00		
			Coef	Coef. (English) 2.80 2.92 3.08 3.30 3.32				

Primary OutFlow Max=0.46 cfs @ 19.90 hrs HW=658.35' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.46 cfs @ 5.25 fps)

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

Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided



Summary for Pond 1.5P: Micropool Extended Detention Pond (P-1)

Inflow Area	=	47.700 ac, 3	0.07% Impervious,	Inflow Depth =	1.64" f	or 2-yr event
Inflow	=	68.44 cfs @	12.21 hrs, Volume	= 6.505	af	
Outflow	=	24.09 cfs @	12.63 hrs, Volume	= 6.482	af, Atten	= 65%, Lag= 25.3 min
Primary	=	24.09 cfs @	12.63 hrs, Volume	= 6.482	af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 38,400 sf Storage= 157,900 cf Peak Elev= 658.48' @ 12.63 hrs Surf.Area= 49,653 sf Storage= 268,377 cf (110,477 cf above start) Flood Elev= 661.00' Surf.Area= 61,600 sf Storage= 404,050 cf (246,150 cf above start)

Plug-Flow detention time= 2,182.9 min calculated for 2.856 af (44% of inflow) Center-of-Mass det. time= 889.5 min (1,736.1 - 846.6)

Volume	Inve	ert Avail.Sto	rage	Storage	Description	
#1	648.0	00' 469,80	00 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	n t)	Surf.Area	Inc (cubi	.Store	Cum.Store	
6/8 0	<u>.)</u>	10 500	(Cubit	0		
650.0	0	14 200	2	24 700	24 700	
652.0	0	18,100	3	32.300	57,000	
654.0	0	22,200	4	10,300	97,300	
656.0	0	38,400	6	600,600	157,900	
658.0	0	48,500	8	36,900	244,800	
660.0	0	53,300	10	01,800	346,600	
662.0	0	69,900	12	23,200	469,800	
Device	Routing	Invert	Outle	et Device	S	
#1	Primary	656.00'	2.0"	Vert. Ori	fice/Grate C= (0.600
#2	Primary	657.00'	4.0'	long x 0.	5' breadth Broa	d-Crested Rectangular Weir
			Head	d (feet) 0	.20 0.40 0.60	0.80 1.00
			Coel	f. (Englisł	n) 2.80 2.92 3.	08 3.30 3.32
#3	Primary	658.75'	4.0'	long x 0.	5' breadth Broa	d-Crested Rectangular Weir
			Head	d (feet) (U	.20 0.40 0.60	
			Coel	i. (Engilsr	1) 2.80 2.92 3.	08 3.30 3.32
Primary OutFlow Max=24.05 cfs @ 12.63 hrs HW=658.48' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.16 cfs @ 7.45 fps)						

-2=Broad-Crested Rectangular Weir (Weir Controls 23.89 cfs @ 4.04 fps)

-3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)



Pond 1.5P: Micropool Extended Detention Pond (P-1)
Summary for Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	51.700 ac, 28.33% Impervious, Inflow Depth > 1.60" for 2-yr event
Inflow	=	24.91 cfs @ 12.63 hrs, Volume= 6.875 af
Outflow	=	12.05 cfs @ 13.81 hrs, Volume= 6.837 af, Atten= 52%, Lag= 71.0 min
Primary	=	12.05 cfs @ 13.81 hrs, Volume= 6.837 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 627.00' Surf.Area= 30,860 sf Storage= 131,598 cf Peak Elev= 629.47' @ 13.81 hrs Surf.Area= 37,743 sf Storage= 216,199 cf (84,601 cf above start) Flood Elev= 633.00' Surf.Area= 48,641 sf Storage= 368,223 cf (236,625 cf above start)

Plug-Flow detention time= 2,842.1 min calculated for 3.815 af (55% of inflow) Center-of-Mass det. time= 747.4 min (2,433.0 - 1,685.7)

Volume	Inv	ert Avail.Sto	orage	Storage	Description	
#1	621.0	00' 418,5	08 cf	Custom	Stage Data (Prismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc. (cubic	Store -feet)	Cum.Stor (cubic-fee	'е t)
621.0)0	14,753		0	,	0
622.0	00	16,761	15	5,757	15,75	57
624.0	00	21,116	37	7,877	53,63	4
627.0	00	30,860	77	7,964	131,59	8
628.0	00	33,557	32	2,209	163,80	17
630.0	00	39,254	72	2,811	236,61	8
632.0	00	45,354	84	4,608	321,22	:6
634.0	00	51,928	97	7,282	418,50	18
Device	Routing	Invert	Outle	t Device	S	
#1	Primary	627.00'	2.5" \	Vert. Ori	fice/Grate C	= 0.600
#2	Primary	627.75'	8.0'' \	/ert. Ori	fice/Grate C	= 0.600
#3	Primary	628.75'	5.0' lo	ong x0.	5' breadth Br	oad-Crested Rectangular Weir
			Head	(feet) 0	.20 0.40 0.6	0 0.80 1.00
			Coef.	(English	2.80 2.92 (ו	3.08 3.30 3.32
Duimou	OutFlow	May 10.00 of	A 10	01 bra l		(Free Discharge)

Primary OutFlow Max=12.03 cfs @ 13.81 hrs HW=629.47' (Free Discharge)

2=Orifice/Grate (Orifice Controls 0.23 cfs @ 7.41 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 9.80 cfs @ 2.72 fps)

Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.7P: Micropool Extended Detention Pond (P-1)

Inflow Are	a =	14.000 ac, 29.29% Impervious, Inflow Depth = 1.64" for 2-yr event
Inflow	=	80.73 cfs @ 12.01 hrs, Volume= 1.909 af
Outflow	=	1.01 cfs @ 12.25 hrs, Volume= 1.908 af, Atten= 64%, Lag= 14.7 min
Primary	=	1.01 cfs @ 12.25 hrs, Volume= 1.908 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 16,200 sf Storage= 41,300 cf Peak Elev= 665.48' @ 12.25 hrs Surf.Area= 22,353 sf Storage= 69,879 cf (28,579 cf above start) Flood Elev= 667.00' Surf.Area= 28,800 sf Storage= 108,650 cf (67,350 cf above start)

Plug-Flow detention time= 1,926.6 min calculated for 0.960 af (50% of inflow) Center-of-Mass det. time= 878.7 min (1,711.4 - 832.7)

Volume	Inve	ert Avail.Sto	rage Storage	e Description	
#1	658.0	0' 139,60	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	n t)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
658.0	0	3,100	0	0	
660.0	0	4,500	7,600	7,600	
662.0	0	6,500	11,000	18,600	
664.0	0	16,200	22,700	41,300	
666.0	0	24,500	40,700	82,000	
668.0	0	33,100	57,600	139,600	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	664.00'	1.5" Vert. Or	ifice/Grate C=	0.600
#2	Primary	664.90'	8.0' long x 0 Head (feet) Coef. (Englis	0.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=10.97 cfs @ 12.25 hrs HW=665.48' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.07 cfs @ 5.74 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 10.90 cfs @ 2.34 fps)



Pond 1.7P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	15.100 ac, 29.80% Impervious, Inflow Depth = 1.64" for 2-yr event
Inflow	=	11.91 cfs @ 12.23 hrs, Volume= 2.065 af
Outflow	=	4.39 cfs @ 12.94 hrs, Volume= 2.063 af, Atten= 63%, Lag= 42.3 min
Primary	=	4.39 cfs @ 12.94 hrs, Volume= 2.063 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 644.00' Surf.Area= 16,900 sf Storage= 54,400 cf Peak Elev= 645.32' @ 12.94 hrs Surf.Area= 20,466 sf Storage= 79,078 cf (24,678 cf above start) Flood Elev= 647.00' Surf.Area= 25,150 sf Storage= 117,325 cf (62,925 cf above start)

Plug-Flow detention time= 3,810.7 min calculated for 0.814 af (39% of inflow) Center-of-Mass det. time= 739.3 min (2,383.8 - 1,644.5)

Volume	Inve	ert Avail.Sto	rage Storage	Description	
#1	638.0	0' 143,90	00 cf Custom	n Stage Data (Pri	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
638.0	00	5,100	0	0	
640.0	00	7,000	12,100	12,100	
642.0)0	9,200	16,200	28,300	
644.0)0	16,900	26,100	54,400	
646.0	00	22,300	39,200	93,600	
648.0	00	28,000	50,300	143,900	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	644.00'	2.5" Vert. Or	ifice/Grate C= 0).600
#2	Primary	645.00'	8.0' long x 0 Head (feet) (Coef. (Englis	.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.0	d-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=4.35 cfs @ 12.94 hrs HW=645.32' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.18 cfs @ 5.31 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 4.17 cfs @ 1.63 fps)

Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Subcatchment 1.1S:

Runoff = 51.17 cfs @ 12.09 hrs, Volume= 3.836 af, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area (ac)	CN	Desc	cription					
7.900	98	Pave	ed parking	& roofs				
1.600	1.600 74 >75% Grass cover, Good, HSG C							
0.500	98	Wate	er Surface	yrazeu, 113	90			
* 0.900	56	Perv	ious Pave	ment				
11.900	89	Weig	phted Aver	age				
3.500 8.400		Impe	ervious Area	ea				
	_							
Tc Ler (min) (f	ngth	Slope	Velocity	Capacity	Description			
6.0		(1011)	(17300)	(013)	Direct Ent	ν.		
				Subca	atchment 1	.1S:		
				Hydro	graph	· · · · · · · · · · · · · · · · · · ·		
55 51.17	cfs	!!-					! !	- Runoff
50								
45		!!-	!!			Type III 24-nr	iu-yr	
						Rainfall=5	5.10"	
40		- 			Ru	noff Area=11.90	0 ac	
35					Run	off Volume=3.8	36 af	
 ق	- ·	- 			+++	Runoff Denth-	2 87"	
<u>∂</u> ≝ 25	<mark> </mark> -	 -			$\frac{1}{1}\frac{1}{1}\frac{1}{1}-$			
20						¦ ¦ ¦ C≑6.U	min	
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10	 	- 						
5								
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0 10	20 30	40 50	60 70 80	90 100 110 Tin	0 120 130 140	150 160 170 180 190 200 210	220 230 240	

Summary for Subcatchment 1.2S:

Runoff = 3.28 cfs @ 12.01 hrs, Volume= 0.204 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

_	Area (ac)	CN	Description
	0.100	98	Water Surface
_	0.900	71	Meadow, non-grazed, HSG C
	1.000	74	Weighted Average
	0.900		Pervious Area
	0.100		Impervious Area

Subcatchment 1.2S:



Summary for Subcatchment 1.3S:

Runoff = 24.13 cfs @ 12.09 hrs, Volume= 1.821 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac)	CN	Des	cription					
3	.900	98	Paved parking & roofs						
0	.200	74	>75	% Grass c	over, Good	, HSG C			
0	.900	71	Mea	idow, non-	grazed, HS	GC			
* 0	0.200	98	Wat	er Surface	e en e ret				
0	500	00	- Perv	Abtod Ave					
1	.400	90	Perv	/ious Area	laye				
4	.100		Imp	ervious Ar	ea				
Тс	Lena	th	Slope	Velocity	Capacity	Descri	otion		
(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)				
6.0						Direct	Entry,		
					Subca	atchme	nt 1.3S	:	
					Hydro	ograph			
27- 26-	L I	!-					-++	- <u>-</u> - <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>	
25	24.13 cfs	¦-	· -			+-+-	-++		- Runoff
24 23 22		- -	·				- + + T	ype III 24-hr 10-yr	_ _
21 20	 	- !-	· = - - = - -			+ + -	$-\frac{1}{1}\frac{1}{1}$	Rainfall=5.10"	- -
19 18	<mark>/</mark> /	¦- !-	·¦¦- ·''-	·¦¦			Run	off Area=5.500 ac	-
17- 16-		i- !-	·ii-			++-	up-off	1 001 of	-1
(cis) 15			·ii-	ii	,	P			-1
N 13		-	·				-+- Ru	Inoff Depth=3.97"	-
E 12		!-	· -				-++	Tc=6.0 min	
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0) 10 20	0 30	40 50	60 70 8	80 90 100 11	0 120 130	140 150 1	160 170 180 190 200 210 220 230 2	- 240

Time (hours)

Summary for Subcatchment 1.4S:

Runoff = 5.99 cfs @ 12.09 hrs, Volume= 0.435 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area (ac)	CN	Description						
0.100	98	Paved parking	& roofs					
0.900	74 71	>75% Grass c	over, Good	, HSG C				
0.300	98	Water Surface	yrazeu, no e	GC				
1.700	81	Weighted Ave	rage					
1.200		Pervious Area						
0.500		Impervious Are	ea					
Tc Leng	gth S	Slope Velocity	Capacity	Description				
(min) (fe	et)	(ft/ft) (ft/sec)	(cfs)					
6.0				Direct Entry,				
			Subca	atchment 1.4S	S:			
			Hydro	ograph				
5.99 ct	S		 +++					- Runoff
			 	T	ype l	ll 24-hr	10-yr	
 5	 -		 +++		R	ainfall-	-5 10"	1
				D um				
				Run		ea=1./		
(s)				Runof	f Volu	me=0.	435 af	
o) i i				Ru	unoff	Depth:	=3.07"	
	- 	· - 	$\begin{array}{cccccccccccccccccccccccccccccccccccc$			Tc=6	0 min	
2		· _	$\begin{array}{cccccccccccccccccccccccccccccccccccc$				→IN=0- 	
			I I I I I I I I I I I I				1 1 1 1 1 1 1 1	

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 Time (hours)

Summary for Subcatchment 1.5S:

Runoff = 125.64 cfs @ 12.21 hrs, Volume= 11.847 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area (ac)	CN	Description			
12.200	98	Paved parking	& roofs		
0.200	87	Dirt roads, HS	GC		
10.500	74	>75% Grass c	over, Good,	, HSG C	
9.700	71	Meadow, non-	grazed, HS	GC	
12.700	70	Woods, Good,	HSG C		
0.700	98	Water Surface	1		
1.700	94	Urban comme	rcial, 85% ir	np, HSG C	
47.700	80	Weighted Aver	rage		
33.355		Pervious Area			
14.345		Impervious Are	ea		
- ·			o ''	D	
	gth s	Slope Velocity	Capacity	Description	
<u>(min)</u> (fe	et)	(ft/ft) (ft/sec)	(CfS)		
15.0				Direct Entry,	

Subcatchment 1.5S:



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Summary for Subcatchment 1.6S:

Runoff = 12.65 cfs @ 12.01 hrs, Volume= 0.786 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area (ac)	CN	Description
3.200	71	Meadow, non-grazed, HSG C
0.500	73	Woods, Fair, HSG C
0.300	98	Water Surface
4.000	73	Weighted Average
3.700		Pervious Area
0.300		Impervious Area

Subcatchment 1.6S:



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Type III 24-hr 10-yr Rainfall=5.10" Printed 10/12/2010 Page 62

Summary for Subcatchment 1.7S:

Runoff = 56.18 cfs @ 12.00 hrs, Volume= 3.477 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

 Area (ac)	CN	Description
 3.700	98	Paved parking & roofs
2.900	74	>75% Grass cover, Good, HSG C
3.100	71	Meadow, non-grazed, HSG C
3.900	73	Woods, Fair, HSG C
 0.400	98	Water Surface
14.000	80	Weighted Average
9.900		Pervious Area
4.100		Impervious Area

Subcatchment 1.7S:



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Summary for Subcatchment 1.8S:

Runoff = 4.55 cfs @ 12.00 hrs, Volume= 0.282 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

 Area (ac)	CN	Description
0.700	71	Meadow, non-grazed, HSG C
 0.400	98	Water Surface
1.100	81	Weighted Average
0.700		Pervious Area
0.400		Impervious Area

Subcatchment 1.8S:



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Summary for Subcatchment 1.9S:

Runoff = 137.93 cfs @ 12.51 hrs, Volume= 19.065 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac) C	N Des	cription		
1.	500	87 Dirt	roads, HS	ЭC	
0.	500	74 >75	% Grass co	over, Good,	, HSG C
13.	900	71 Mea	dow, non-g	grazed, HS	GC
1.	500	60 Woo	ods, Fair, F	ISG B	
63.	300	73 Woo	ods, Fair, H	ISG C	
9.	900	79 Woo	ods, Fair, F	ISG D	
3.	000	94 Urba	an commer	<u>cial, 85% ir</u>	mp, HSG C
93.	600 [·]	74 Wei	ghted Aver	age	
91.	050	Perv	vious Area		
2.	550	Impe	ervious Are	ea	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
5.8	100	0.0500	0.29		Sheet Flow,
					Range n= 0.130 P2= 3.50"
9.9	1,643	0.1560	2.76		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
11.7	668	0.0360	0.95		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
8.8	1,359	0.0220	2.58	1.37	Trap/Vee/Rect Channel Flow,
					Bot.W=2.00' D=0.25' Z= 0.5 '/' Top.W=2.25'
					n= 0.030 Earth, grassed & winding
36.2	3,770	Total			



Subcatchment 1.9S:

Summary for Reach DP 1: Design Point 1

Inflow A	rea =	180.500 ac, 1	19.28% Impervious,	Inflow Depth = 2.7	79" for 10-yr event
Inflow	=	181.68 cfs @	12.57 hrs, Volume	= 41.953 af	
Outflow	=	181.68 cfs @	12.57 hrs, Volume	= 41.953 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs



Reach DP 1: Design Point 1

Summary for Pond 1.1P: Micropool Extended Detention Pond (P-1)

Inflow Area	ι =	19.100 ac, 68.06% Impervious, Inflow Depth = 4.01" for 10-yr event	
Inflow	=	1.44 cfs @ 12.09 hrs, Volume= 6.380 af	
Outflow	=	6.20 cfs @ 12.24 hrs, Volume= 6.361 af, Atten= 49%, Lag= 9.4 min	
Primary	=	6.20 cfs @ 12.24 hrs, Volume= 6.361 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 613.00' Surf.Area= 19,800 sf Storage= 81,050 cf Peak Elev= 615.85' @ 12.24 hrs Surf.Area= 26,429 sf Storage= 146,575 cf (65,525 cf above start) Flood Elev= 617.00' Surf.Area= 29,400 sf Storage= 178,700 cf (97,650 cf above start)

Plug-Flow detention time= 2,462.9 min calculated for 4.500 af (71% of inflow) Center-of-Mass det. time= 963.7 min (2,537.1 - 1,573.4)

Volume	Inv	vert Avai	I.Storage	brage Storage Description		
#1	605.	00' 2	09,400 cf	Custom	Stage Data (Pri	ismatic) Listed below (Recalc)
		~ ~ ~		0.		
Elevation	on	Surf.Area	Inc	.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubi	c-feet)	(cubic-feet)	
605.0	00	5,000		0	0	
606.0	00	6,000		5,500	5,500	
608.0	00	8,100	1	4,100	19,600	
610.0	00	10,400	1	8,500	38,100	
612.0	00	15,100	2	25,500	63,600	
613.0	00	19,800	1	7,450	81,050	
614.0	00	21,900	2	20,850	101,900	
616.0	00	26,800	2	18,700	150,600	
618.0	00	32,000	5	58,800	209,400	
Device	Routing	In	vert Outl	et Device	S	
#1	Primary	613	.00' 2.0''	Vert. Ori	fice/Grate C= 0	0.600
#2	Primary	614	.50' 5.0'	long x 0.	.5' breadth Broa	d-Crested Rectangular Weir
			Hea	d (feet) C	0.20 0.40 0.60	0.80 1.00
			Coe	f. (Englisł	n) 2.80 2.92 3.	08 3.30 3.32

Primary OutFlow Max=26.14 cfs @ 12.24 hrs HW=615.85' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.17 cfs @ 8.01 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 25.96 cfs @ 3.85 fps)

70 80 90 100

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20

30 40 50 60

10



Time (hours)

110 120 130 140 150 160 170 180 190 200 210 220 230 240

Pond 1.1P: Micropool Extended Detention Pond (P-1)

Type III 24-hr 10-yr Rainfall=5.10"

Printed 10/12/2010

Summary for Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	20.100 ac, 65.17% Impervious, Inflow Depth > 3.92" for 10-yr event
Inflow	=	27.39 cfs @ 12.24 hrs, Volume= 6.565 af
Outflow	=	3.07 cfs @ 16.49 hrs, Volume= 6.560 af, Atten= 89%, Lag= 255.2 min
Primary	=	3.07 cfs @ 16.49 hrs, Volume= 6.560 af
Primary	=	3.07 cfs @ 16.49 hrs, Volume= 6.560 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 600.00' Surf.Area= 6,300 sf Storage= 9,700 cf Peak Elev= 607.70' @ 16.49 hrs Surf.Area= 23,732 sf Storage= 121,580 cf (111,880 cf above start) Flood Elev= 609.00' Surf.Area= 27,250 sf Storage= 154,575 cf (144,875 cf above start)

Plug-Flow detention time= 1,609.5 min calculated for 6.336 af (97% of inflow) Center-of-Mass det. time= 1,135.5 min (3,619.7 - 2,484.1)

Volume	Inv	ert Avail.Sto	rage	Storage	Description		
#1	596.0	00' 183,20	00 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevatio	on	Surf.Area	Inc.	Store	Cum.Store		
(fee	et)	(sq-ft)	(cubic	-feet)	(cubic-feet)		
596.0	00	600		0	0		
598.0	00	1,400		2,000	2,000		
600.0	00	6,300	-	7,700	9,700		
602.0	00	10,200	10	6,500	26,200		
604.0	00	14,600	24	4,800	51,000		
606.0	00	19,300	33	3,900	84,900		
608.0	00	24,500	43	3,800	128,700		
610.0)0	30,000	54	4,500	183,200		
Device	Routing	Invert	Outle	t Device:	S		
#1	Primary	600.00'	3.5" \	Vert. Orif	ice/Grate C=	0.600	
#2	Primary	607.50'	8.0' le	ong x 0.	5' breadth Broa	ad-Crested Rectangular Weir	
			Head	(feet) 0	.20 0.40 0.60	0.80 1.00	
			Coef.	(English	i) 2.80 2.92 3.	.08 3.30 3.32	
	_						
Drimory	rimery OutFlow May 206 at a 16 10 bra UN 607 70' (Free Discharge)						

Primary OutFlow Max=2.96 cfs @ 16.49 hrs HW=607.70' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.88 cfs @ 13.24 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 2.08 cfs @ 1.27 fps)

Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.3P: Micropool Extended Detention Pond (P-1)

Inflow Area	a =	5.500 ac, 74.55% Impervious, Inflow Depth = 3.97" for 10-yr event
Inflow	=	24.13 cfs @ 12.09 hrs, Volume= 1.821 af
Outflow	=	10.41 cfs @ 12.29 hrs, Volume= 2.110 af, Atten= 57%, Lag= 12.2 min
Primary	=	10.41 cfs @ 12.29 hrs, Volume= 2.110 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 14,500 sf Storage= 29,600 cf Peak Elev= 666.05' @ 12.29 hrs Surf.Area= 18,691 sf Storage= 63,572 cf (33,972 cf above start) Flood Elev= 667.00' Surf.Area= 20,550 sf Storage= 82,275 cf (52,675 cf above start)

Plug-Flow detention time= 2,330.7 min calculated for 1.431 af (79% of inflow) Center-of-Mass det. time= 1,504.8 min (2,294.9 - 790.1)

<u>Volume</u>	Inve	ert Avail.Sto	rage Storage	Description	
#1	659.0	00' 103,80	00 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
659.0	00	1,500	0	0	
660.0	00	2,000	1,750	1,750	
662.0	00	5,200	7,200	8,950	
663.0	00	10,800	8,000	16,950	
664.0	00	14,500	12,650	29,600	
666.0	00	18,600	33,100	62,700	
668.0	00	22,500	41,100	103,800	
Device	Routing	Invert	Outlet Devices	6	
#1	Primary	663.00'	1.5" Vert. Orif	ice/Grate C=	0.600
#2	Primary	665.50'	8.0' long x 0.	5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet) 0.	20 0.40 0.60	0.80 1.00
			Coef. (English) 2.80 2.92 3.	.08 3.30 3.32
#3 Primary		664.75'	4.0" Vert. Orif	ice/Grate C=	0.600
D			O 40 00 h 11		

Primary OutFlow Max=10.35 cfs @ 12.29 hrs HW=666.05' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.10 cfs @ 8.32 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 9.80 cfs @ 2.24 fps)

-3=Orifice/Grate (Orifice Controls 0.45 cfs @ 5.12 fps)



Pond 1.3P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided

Inflow Area	=	7.200 ac, 63.89% Impervious, Inflow Depth = 4.24" for 10-yr event	
Inflow	=	3.28 cfs @ 12.25 hrs, Volume= 2.546 af	
Outflow	=	1.52 cfs @ 14.90 hrs, Volume= 2.544 af, Atten= 89%, Lag= 159.1 mir	n
Primary	=	1.52 cfs @ 14.90 hrs, Volume= 2.544 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 657.00' Surf.Area= 12,850 sf Storage= 36,525 cf Peak Elev= 659.50' @ 14.90 hrs Surf.Area= 21,840 sf Storage= 78,911 cf (42,386 cf above start) Flood Elev= 661.00' Surf.Area= 28,250 sf Storage= 116,475 cf (79,950 cf above start)

Plug-Flow detention time= 2,763.3 min calculated for 1.706 af (67% of inflow) Center-of-Mass det. time= 706.3 min (2,748.6 - 2,042.2)

Volume	Inve	ert Avail.Sto	rage Storage	e Description				
#1	650.0	00' 146,9	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)			
Elevatio	on	Surf.Area	Inc.Store	Cum.Store				
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)				
650.0	00	500	0	0				
652.0	00	1,100	1,600	1,600				
654.0	00	6,200	7,300	8,900				
656.0	00	10,000	16,200	25,100				
658.0	00	15,700	25,700	50,800				
660.0	00	23,900	39,600	90,400				
662.0	00	32,600	56,500	146,900				
Device	Routing	Invert	Outlet Device	es				
#1	Primary	657.00'	4.0" Vert. Or	ifice/Grate C=	0.600			
#2	Primary	659.25'	2.5' long x 0).5' breadth Broa	ad-Crested Rectangular Weir			
			Head (feet)	0.20 0.40 0.60	0.80 1.00			
			Coef. (Englis	h) 2.80 2.92 3.	08 3.30 3.32			
Drimon	Vimery OutFlow May 1 51 of a @ 14.00 bro LIW 650 50' (Free Discharge)							

Primary OutFlow Max=1.51 cfs @ 14.90 hrs HW=659.50' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.64 cfs @ 7.35 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 0.87 cfs @ 1.41 fps)

Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided



Summary for Pond 1.5P: Micropool Extended Detention Pond (P-1)

Inflow Are	ea =	47.700 ac, 3	0.07% Impervious,	Inflow Depth = 2	2.98" for 10-yr event
Inflow	=	125.64 cfs @	12.21 hrs, Volume	= 11.847 at	f i i i i i i i i i i i i i i i i i i i
Outflow	=	69.12 cfs @	12.47 hrs, Volume	⊨ 11.824 af	f, Atten= 45%, Lag= 15.8 min
Primary	=	69.12 cfs @	12.47 hrs, Volume	= 11.824 at	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 38,400 sf Storage= 157,900 cf Peak Elev= 659.66' @ 12.47 hrs Surf.Area= 52,474 sf Storage= 328,391 cf (170,491 cf above start) Flood Elev= 661.00' Surf.Area= 61,600 sf Storage= 404,050 cf (246,150 cf above start)

Plug-Flow detention time= 872.7 min calculated for 8.199 af (69% of inflow) Center-of-Mass det. time= 513.0 min (1,342.3 - 829.3)

Volume	Invert	Avail.Sto	rage	Storage	Description				
#1	648.00'	469,80	00 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)			
Elevation	Su	rf.Area	Inc	.Store	Cum.Store				
		(sq-ii)	(Cubic						
648.00		10,500		0	0				
650.00		14,200	2	24,700	24,700				
652.00		18,100	3	32,300	57,000				
654.00		22,200	4	0,300	97,300				
656.00		38,400	6	60,600	157,900				
658.00		48,500	8	36,900	244,800				
660.00		53,300	10	1,800	346,600				
662.00		69,900	12	23,200	469,800				
Device R	outing	Invert	Outle	et Device:	S				
#1 P	rimary	656.00'	2.0"	Vert. Ori	fice/Grate C=	0.600			
#2 P	rimarý	657.00'	4.0'	lona x0.	5' breadth Broa	ad-Crested Rectangular Weir			
	,		Head	d (feet) 0	.20 0.40 0.60	0.80 1.00			
			Coef	f. (Enalish	n) 2.80 2.92 3.	.08 3.30 3.32			
#3 P	rimary	658.75'	 Coef. (English) 2.80 2.92 3.08 3.30 3.32 75' 4.0' long x 0.5' breadth Broad-Crested Rectangular Wei Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 						
Primary O	utFlow M	ax=68.86 cfs	@ 12	.47 hrs F	IW=659.65' (F	ree Discharge)			

-1=Orifice/Grate (Orifice Controls 0.20 cfs @ 9.10 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 57.33 cfs @ 5.41 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 11.33 cfs @ 3.14 fps)



Pond 1.5P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area =	=	51.700 ac, 28.33% Impervious, Inflow Depth = 2.93" for 10-yr event
Inflow =		71.22 cfs @ 12.46 hrs, Volume= 12.610 af
Outflow =		43.57 cfs @ 12.91 hrs, Volume= 12.572 af, Atten= 39%, Lag= 27.1 min
Primary =		43.57 cfs @ 12.91 hrs, Volume= 12.572 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 627.00' Surf.Area= 30,860 sf Storage= 131,598 cf Peak Elev= 630.57' @ 12.91 hrs Surf.Area= 40,978 sf Storage= 259,294 cf (127,696 cf above start) Flood Elev= 633.00' Surf.Area= 48,641 sf Storage= 368,223 cf (236,625 cf above start)

Plug-Flow detention time= 1,227.9 min calculated for 9.551 af (76% of inflow) Center-of-Mass det. time= 427.1 min (1,737.6 - 1,310.6)

Volume	Inv	ert Avail.	Storage	Storage	e Description	
#1	621.	00' 418	3,508 cf	Custon	n Stage Data (Prismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc (cubi	c.Store c-feet)	Cum.Stor (cubic-fee	re et)
621.0	00	14,753		0		0
622.0)0	16,761		15,757	15,75	57
624.0	00	21,116	4	37,877	53,63	34
627.0	00	30,860		77,964	131,59)8
628.0	00	33,557	4	32,209	163,80)7
630.0	00	39,254		72,811	236,61	8
632.0	00	45,354	1	84,608	321,22	26
634.0	00	51,928	9	97,282	418,50)8
Device	Routing	Inve	ert Out	let Device	es	
#1	Primary	627.0	0' 2.5' '	Vert. Or	ifice/Grate C	c= 0.600
#2	Primary	627.7	5' 8.0' '	Vert. Or	ifice/Grate C	c= 0.600
#3	Primary	628.7	5' 5.0'	long x 0).5' breadth Br	road-Crested Rectangular Weir
			Hea	d (feet)	0.20 0.40 0.6	0 0.80 1.00
			Coe	f. (Englis	sh) 2.80 2.92	3.08 3.30 3.32
Duimou	OutFlow	May 40 50	ofo @ 10	01 hra		(Free Discharge)

Primary OutFlow Max=43.52 cfs @ 12.91 hrs HW=630.56' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.31 cfs @ 8.96 fps) -2=Orifice/Grate (Orifice Controls 2.65 cfs @ 7.58 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 40.57 cfs @ 4.47 fps)

Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.7P: Micropool Extended Detention Pond (P-1)

$1110W$ Area = 14.000 ac, 25.25 / 6 impervious, $1110W$ Deptit = 2.50 for 10^{-1} yr event	
Inflow = 56.18 cfs @ 12.00 hrs, Volume= 3.477 af	
Outflow = 32.05 cfs @ 12.10 hrs, Volume= 3.476 af, Atten= 43%, Lag= 5.4	6 min
Primary = 32.05 cfs @ 12.10 hrs, Volume= 3.476 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 16,200 sf Storage= 41,300 cf Peak Elev= 666.03' @ 12.10 hrs Surf.Area= 24,633 sf Storage= 82,763 cf (41,463 cf above start) Flood Elev= 667.00' Surf.Area= 28,800 sf Storage= 108,650 cf (67,350 cf above start)

Plug-Flow detention time= 808.7 min calculated for 2.528 af (73% of inflow) Center-of-Mass det. time= 498.8 min (1,314.1 - 815.4)

Volume	Invei	rt Avail.Sto	rage Storage	e Description	
#1	658.00)' 139,60	00 cf Custom	n Stage Data (Pri	ismatic) Listed below (Recalc)
Elevatio	n 5	Surf.Area	Inc.Store	Cum.Store	
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	
658.00)	3,100	0	0	
660.00	C	4,500	7,600	7,600	
662.00	C	6,500	11,000	18,600	
664.00	C	16,200	22,700	41,300	
666.00	C	24,500	40,700	82,000	
668.00	C	33,100	57,600	139,600	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	664.00'	1.5" Vert. Or	ifice/Grate C= (0.600
#2	ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32				

Primary OutFlow Max=31.94 cfs @ 12.10 hrs HW=666.03' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.08 cfs @ 6.75 fps) 2=Pread Created Pastengular Wair (Wair Controls 31.86 cfs @ 3.53 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 31.86 cfs @ 3.53 fps)

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Pond 1.7P: Micropool Extended Detention Pond (P-1)

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 Time (hours)

Summary for Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area =	=	15.100 ac, 29.80% Impervious, Inflow Depth = 2.99" for 10-yr event
Inflow =	:	34.51 cfs @ 12.08 hrs, Volume= 3.758 af
Outflow =	:	22.15 cfs @ 12.37 hrs, Volume= 3.756 af, Atten= 36%, Lag= 17.6 min
Primary =	:	22.15 cfs @ 12.37 hrs, Volume= 3.756 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 644.00' Surf.Area= 16,900 sf Storage= 54,400 cf Peak Elev= 645.88'@ 12.37 hrs Surf.Area= 21,981 sf Storage= 90,984 cf (36,584 cf above start) Flood Elev= 647.00' Surf.Area= 25,150 sf Storage= 117,325 cf (62,925 cf above start)

Plug-Flow detention time= 1,402.5 min calculated for 2.507 af (67% of inflow) Center-of-Mass det. time= 419.9 min (1,696.4 - 1,276.5)

Inve	<u>rt Avail.Sto</u>	rage Storage	e Description					
638.0	0' 143,90	00 cf Custon	n Stage Data (Pri	ismatic) Listed below (Recalc)				
n s	Surf.Area	Inc.Store	Cum.Store					
t)	(sq-tt)	(CUDIC-TEET)	(CUDIC-TEET)					
0	5,100	0	0					
0	7,000	12,100	12,100					
0	9,200	16,200	28,300					
0	16,900	26,100	54,400					
0	22,300	39,200	93,600					
0	28,000	50,300	143,900					
Routing	Invert	Outlet Device	es					
Primary	644.00'	2.5" Vert. Or	ifice/Grate C= ().600				
Primary	645.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32						
	Inve 638.00 n S t) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Invert Avail.Sto 638.00' 143,90 n Surf.Area t) (sq-ft) 0 5,100 0 7,000 0 9,200 0 16,900 0 22,300 0 28,000 Routing Primary 644.00' Primary 645.00'	Invert Avail.Storage Storage 638.00' 143,900 cf Custon n Surf.Area Inc.Store t) (sq-ft) (cubic-feet) 0 5,100 0 0 7,000 12,100 0 9,200 16,200 0 16,900 26,100 0 22,300 39,200 0 28,000 50,300 Routing Primary 644.00' Primary 645.00' 8.0' long x 0 Head (feet) Coef. (Englis)	Invert Avail.Storage Storage Description 638.00' 143,900 cf Custom Stage Data (Prince n Surf.Area Inc.Store Cum.Store t) (sq-ft) (cubic-feet) (cubic-feet) 0 5,100 0 0 0 5,100 0 0 0 7,000 12,100 12,100 0 9,200 16,200 28,300 0 16,900 26,100 54,400 0 22,300 39,200 93,600 0 28,000 50,300 143,900 Routing Invert Outlet Devices Primary 644.00' 2.5" Vert. Orifice/Grate C= 0 8.0' long x 0.5' breadth Broat Head (feet) 0.20 0.40 0.60 Coef. (English) 2.80 2.92 3.				

Primary OutFlow Max=22.04 cfs @ 12.37 hrs HW=645.88' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.22 cfs @ 6.42 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 21.82 cfs @ 3.10 fps)

Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Subcatchment 1.1S:

Runoff = 61.99 cfs @ 12.09 hrs, Volume= 4.696 af, Depth= 4.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area	(ac) C	N Des	scription					
7.	.900 9	98 Pav	ed parking	& roofs				
1.	.600	74 >75	5% Grass c	over, Good	, HSG C			
1.	.000	(1 Mea	adow, non-	grazed, HS	GC			
* 0.	.500 ÷	56 Vva 56 Per	vious Pave	ment				
11.	.900 8	39 We	ighted Ave	rage				
3.	.500	Per	vious Area	-				
8.	.400	Imp	ervious Are	ea				
Тс	Length	Slope	Velocity	Capacity	Description			
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	1			
6.0					Direct Entry	,		
				Subca	atchmont 1	16.		
				Jubic		10.		
1	· · ·		<u> </u>	nyaro	grapn			
65	61.99 cfs	-¦¦			$\frac{1}{1}\frac{1}{1}\frac{1}{1}$	$\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}-\frac{1}{1}$		- Runoff
60						Type III 94 k	75 Vr	
55		-					11 ZJ-yi	
50					+++	Rainfal	l=6.00''	
45						off Area=11	.900 ac	
- 40					Dung	ff.Valumo-4	606 of	
(cfs)					nunc		.090 ai	
N 35		-				Runoff Depth	1=4.74"	
ш 30						Tc=	5.0 min	
25		-;;;				- $ -$	CN-89	
20		-¦¦ 			$ \frac{1}{1} \frac{1}{1} \frac{1}{1} \frac{1}{1}$	$\frac{1}{\Gamma}\frac{1}{\Gamma}\frac{1}{\Gamma}\frac{1}{\Gamma}\frac{1}{\Gamma}$		
15					$\frac{1}{1}\frac{1}{1}\frac{1}{1}$	$ \frac{1}{1}$ $ \frac{1}{1}$ $ \frac{1}{1}$ $ \frac{1}{1}$ $ \frac{1}{1}$ $ \frac{1}{1}$ $\frac{1}{1}$		
10								
5	}}-							
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0	10 20	30 40 5	0 60 70 80	11 טטר טפ ט Tin	0 120 130 140 15 ne (hours)	0 160 170 180 190 200	210 220 230 240	J

Summary for Subcatchment 1.2S:

Runoff = 4.29 cfs @ 12.00 hrs, Volume= 0.265 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

 Area (ac)	CN	Description
 0.100	98	Water Surface
 0.900	71	Meadow, non-grazed, HSG C
 1.000	74	Weighted Average
0.900		Pervious Area
0.100		Impervious Area

Subcatchment 1.2S:



Summary for Subcatchment 1.3S:

Runoff = 29.11 cfs @ 12.09 hrs, Volume= 2.221 af, Depth= 4.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

3.900 98 Paved parking & roofs 0.200 74 >75% Grass cover, Good, HSG C 0.900 71 Meadow, non-grazed, HSG C 0.200 98 Water Surface • 0.300 56 Pervious Pavement 5.500 90 Weighted Average 1.400 Pervious Area 4.100 Impervious Area Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 1.3S: Hydrograph • Type III 24-hr 25-yr Rainfall=6.00" Runoff Area=5.500 ac Runoff Volume=2.221 af 10 10 10 10 10 10 10 10 10 10	А	rea	(ac)		CN	D	esc	riptio	on																	
0.900 71 Meadow, non-grazed, HSG C 0.200 98 Water Surface • 0.300 56 Pervious Pavement 5.500 90 Weighted Average 1.400 Pervious Area Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 1.3S: Hydrograph • Type III 24-hr 25-yr Rainfall=6.00'' Runoff Area=5.500 ac Runoff Area=5.500 ac Runoff Depth=4.85'' Tc=6.0 min (min) (CN=90)		3. 0.	.900 .200		98 74	P >	ave 75%	d pa 5 Gra	rkin ass	ig & cov	roc ver,	ofs Good	d, H	ISG	С											
 0.200 98 Water Surface 0.300 56 Pervious Pavement 5.500 90 Weighted Average 1.400 Pervious Area 4.100 Impervious Area Tc Length Slope Velocity Capacity Description (fmin) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 1.3S: Hydrograph 		0.	.900		71	N	lead	ow,	non	n-gra	aze	d, HS	SG (С												
5:500 90 Weighted Average Pervious Area 1:400 Pervious Area Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 1.3S: Hydrograph Type III 24-hr 25-yr Rainfall=6.00" 20 Runoff Area=5.500 ac 90 Runoff Depth=4.85" Tc=6.0 min 14 CN=90 4 CN=90	*	0. 0.	.200 .300		98 56	V P	vate ervi	r Su ous	rfac Pav	e vem	ent															
1.400 Impervious Area Impervious Area Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 1.3S: Hydrograph Type III 24-hr 25-yr Rainfall=6.00'' Runoff Area=5.500 ac Runoff Volume=2.221 af Runoff Depth=4.85'' Tc=6.0 min CN=90		5.	.500		90	V	/eig	hted	Av	era	ge															
Tc Length (ft/ft) Slope Velocity (cfs) Description (cfs) 6.0 Direct Entry, Subcatchment 1.3S: Hydrograph 32 32 32 32 32 32 32 32 32 32 32 32 33 106 24 106 25 106 26 106 27 106 28 106 29 106 20 106 21 106 22 106 23 106 24 107 25 108 20 108 21 108 20 108 21 108 20 108 21 108 21 108 22 108 23 108 24 108 25 108 26 <t< td=""><th></th><td>1.</td><td>400</td><td></td><td></td><td>P</td><td>ervi</td><td>ous</td><td>Are</td><td>a</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		1.	400			P	ervi	ous	Are	a																
Tc Length (ftet) Slope (tt/ft) Velocity (cfs) Description (cfs) 6.0 Direct Entry, Subcatchment 1.3S: Hydrograph 30 20.11 cfs		4.	.100			Ir	npei	VIOL	ls A	rea																
(IIIII) (IUII) (IUSEC) (CIS) 6.0 Direct Entry, Subcatchment 1.3S: Hydrograph 32 20 33 20 24 20 20 Runoff Area=5.500 ac 31 Runoff Volume=2.221 af 31 Runoff Depth=4.85'' 31 CN=90 36 CN=90	(~	Tc	Le	ngth	n v	Slop)e	Vel	ocity	y (Cap	acity	D)esc	cript	tion										
Subcatchment 1.3S: Hydrograph Type III 24-hr 25-yr Rainfall=6.00" (9) (9) (9) (9) (9) (9) (9) (9)		6.0	(1	eel)	(11/	11)	(11/	Sec)		(015)	D)ire	ct E	ntr	v.									
Subcatchment 1.3S: Hydrograph Type III 24-hr 25-yr Rainfall=6.00" Runoff Area=5.500 ac Runoff Depth=4.85" Tc=6.0 min CN=90																										
Hydrograph		Subcatchment 1.3S:																								
Type III 24-hr 25-yr Rainfall=6.00" Runoff Area=5.500 ac Runoff Volume=2.221 af Runoff Depth=4.85" Tc=6.0 min CN=90		-					-	-		-		Hydr	ogra	aph	-	1	,						1			
Type III 24-hr 25-yr Rainfall=6.00" Runoff Area=5.500 ac Runoff Volume=2.221 af Runoff Depth=4.85" Tc=6.0 min CN=90		32- 30-	29.11	cfs	i- L_L		i	-i	1	<u> </u>			i	<u> </u>	÷ +			<u> </u>						;;	- Run	off
26 24 Rainfall=6.00" 22 Runoff Area=5.500 ac 20 Runoff Volume=2.221 af 16 Runoff Depth=4.85" 12 Tc=6.0 min 10 CN=90 8 6 4 2		28	!		!-		!						! 	; 	; 	; 	; 	 	1					.!	_	
24 Rainfall=6.00" 22 Runoff Area=5.500 ac 20 Runoff Volume=2.221 af 16 Runoff Depth=4.85" 16 Tc=6.0 min 10 CN=90 8 - 6 - 2 -		26	H	-	-		1	-					 +		; +	; +	¦	yp	e I	11 24	4-n	r 2	25-y	/r		
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20 18 Runoff Volume=2.221 af 16 14 Runoff Depth=4.85" 14 Tc=6.0 min 10 CN=90 8 6 4 2		22	F	- 		 	 	-	 	- 	- 	 	 + 	 	 + 	Rı	jn	off	A	rea	=5.	50	0 a	C		
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Summary for Subcatchment 1.4S:

Runoff = 7.53 cfs @ 12.09 hrs, Volume= 0.550 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area	(ac)	CN	Desc	ription							
0. 0.	.100 .900	98 74	Pave >75%	d parking 6 Grass o	g & roofs cover, Goo	d, HSG	C				
0. 0.	.300 .400	71 98	Mead Wate	dow, non er Surface	-grazed, H e	SG C					
1. 1. 0.	.700 .200 .500	81	Weig Perv Impe	hted Ave ous Area rvious Ar	erage a rea						
Tc (min)	Lengtl (feet	ר נ)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Dese	cription				
6.0						Dire	ct Entry,				
	Subcatchment 1.4S:										
8 - - - - - -	7.53 cfs	 								r 95 v	Runoff
7		·				$\frac{1}{1} = -\frac{1}{1} = -$		ype n Ra	ainfall	=6.00'	•
-							Run	off Ar	ea=1.	700 ac	
/ (cfs)							Runoff	Volu	me=0. Dopth	.550 a 2 oo'	f /•
× 4→ ■ -		 							Tc=6	=3.00 .0 min	1
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60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240

Time (hours)

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Summary for Subcatchment 1.5S:

Runoff = 159.00 cfs @ 12.21 hrs, Volume= 15.030 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (a	ac)	CN	Desc	ription			
12.2	00	98	Pave	d parking	& roofs		
0.2	00	87	Dirt r	oads, HSC	ЭC		
10.5	00	74	>75%	6 Grass co	over, Good,	, HSG C	
9.7	00	71	Mea	dow, non-g	grazed, HS	GC	
12.7	00	70	Woo	ds, Good,	HSG C		
0.7	00	98	Wate	er Surface			
1.7	00	94	Urba	n commer	cial, 85% ir	np, HSG C	
47.7	00	80	Weig	hted Aver	age		
33.3	55		Perv	ious Area	-		
14.3	45		Impe	rvious Are	a		
Tc (min)	Lengi (fee	th et)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
15.0						Direct Entry,	

Subcatchment 1.5S:



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Summary for Subcatchment 1.6S:

Runoff = 16.64 cfs @ 12.00 hrs, Volume= 1.030 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

 Area (ac)	CN	Description
3.200	71	Meadow, non-grazed, HSG C
0.500	73	Woods, Fair, HSG C
 0.300	98	Water Surface
 4.000	73	Weighted Average
3.700		Pervious Area
0.300		Impervious Area

Subcatchment 1.6S:



Summary for Subcatchment 1.7S:

Runoff = 70.98 cfs @ 12.00 hrs, Volume= 4.411 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

 Area (ac)	CN	Description
 3.700	98	Paved parking & roofs
2.900	74	>75% Grass cover, Good, HSG C
3.100	71	Meadow, non-grazed, HSG C
3.900	73	Woods, Fair, HSG C
 0.400	98	Water Surface
 14.000	80	Weighted Average
9.900		Pervious Area
4.100		Impervious Area

Subcatchment 1.7S:



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Summary for Subcatchment 1.8S:

Runoff = 5.71 cfs @ 12.00 hrs, Volume= 0.356 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

 Area (ac)	CN	Description
 0.700	71	Meadow, non-grazed, HSG C
 0.400	98	Water Surface
 1.100	81	Weighted Average
0.700		Pervious Area
0.400		Impervious Area

Subcatchment 1.8S:



Summary for Subcatchment 1.9S:

Runoff = 180.62 cfs @ 12.51 hrs, Volume= 24.842 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area	(ac) C	N Des	cription							
1.	500	87 Dirt	Dirt roads, HSG C							
0.	500	74 >75	>75% Grass cover, Good, HSG C							
13.	900	71 Mea	dow, non-g	grazed, HS	GC					
1.	500	60 Woo	ods, Fair, F	ISG B						
63.	300	73 Woo	ods, Fair, H	ISG C						
9.	900	79 Woo	ods, Fair, F	ISG D						
3.	000	94 Urba	an commei	<u>cial, 85% ir</u>	mp, HSG C					
93.	600 [·]	74 Wei	ghted Avei	age						
91.	050	Perv	vious Area							
2.	550	Impe	ervious Are	ea						
Tc	Length	Slope	Velocity	Capacity	Description					
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)						
5.8	100	0.0500	0.29		Sheet Flow,					
					Range n= 0.130 P2= 3.50"					
9.9	1,643	0.1560	2.76		Shallow Concentrated Flow,					
					Short Grass Pasture Kv= 7.0 fps					
11.7	668	0.0360	0.95		Shallow Concentrated Flow,					
					Woodland Kv= 5.0 fps					
8.8	1,359	0.0220	2.58	1.37	Trap/Vee/Rect Channel Flow,					
					Bot.W=2.00' D=0.25' Z= 0.5 '/' Top.W=2.25'					
					n= 0.030 Earth, grassed & winding					
36.2	3,770	Total								

Subcatchment 1.9S:



Summary for Reach DP 1: Design Point 1

Inflow A	rea =	180.500 ac, 1	19.28% Impervious,	Inflow Depth = 3.5	56" for 25-yr event
Inflow	=	260.71 cfs @	12.55 hrs, Volume	= 53.602 af	
Outflow	=	260.71 cfs @	12.55 hrs, Volume	= 53.602 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs



Reach DP 1: Design Point 1

Summary for Pond 1.1P: Micropool Extended Detention Pond (P-1)

Inflow Area	ι =	19.100 ac, 68.06% Impervious, Inflow Depth	ı = 4.87" for 25-yr event
Inflow	=	62.33 cfs @ 12.09 hrs, Volume= 7.7	'55 af
Outflow	=	35.04 cfs @ 12.22 hrs, Volume= 7.7	'36 af, Atten= 44%, Lag= 7.8 min
Primary	=	35.04 cfs @ 12.22 hrs, Volume= 7.7	'36 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 613.00' Surf.Area= 19,800 sf Storage= 81,050 cf Peak Elev= 616.14' @ 12.22 hrs Surf.Area= 27,162 sf Storage= 154,353 cf (73,303 cf above start) Flood Elev= 617.00' Surf.Area= 29,400 sf Storage= 178,700 cf (97,650 cf above start)

Plug-Flow detention time= 1,918.8 min calculated for 5.876 af (76% of inflow) Center-of-Mass det. time= 802.7 min (2,249.5 - 1,446.8)

Volume	Inv	ert Ava	I.Storage	Storage	Description	
#1	605.	00' 2	09,400 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
		~ ~ ~		0.	0 0	
Elevation	on	Surf.Area	Inc	.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubi	c-feet)	(cubic-feet)	
605.0	00	5,000		0	0	
606.0	00	6,000		5,500	5,500	
608.0	00	8,100	-	14,100	19,600	
610.0	00	10,400	-	18,500	38,100	
612.0	00	15,100		25,500	63,600	
613.0	00	19,800	-	17,450	81,050	
614.0	00	21,900		20,850	101,900	
616.0	00	26,800	4	18,700	150,600	
618.0	00	32,000	Ę	58,800	209,400	
Device	Routing	In	<u>vert Outl</u>	et Device	S	
#1	Primary	613	8.00' 2.0''	Vert. Ori	fice/Grate C=	0.600
#2	Primary	614	.50' 5.0'	long x0	.5' breadth Broa	ad-Crested Rectangular Weir
			Hea	d (feet) (0.20 0.40 0.60	0.80 1.00
			Coe	f. (Englisl	h) 2.80 2.92 3.	08 3.30 3.32

Primary OutFlow Max=34.76 cfs @ 12.22 hrs HW=616.13' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.18 cfs @ 8.41 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 34.58 cfs @ 4.24 fps)



Pond 1.1P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area =	20.100 ac, 65.17% Impervious, Inflow De	epth > 4.78" for 25-yr event
Inflow =	36.64 cfs @ 12.21 hrs, Volume=	8.002 af
Outflow =	7.46 cfs @ 14.06 hrs, Volume=	7.997 af, Atten= 80%, Lag= 110.7 min
Primary =	7.46 cfs @ 14.06 hrs, Volume=	7.997 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 600.00' Surf.Area= 6,300 sf Storage= 9,700 cf Peak Elev= 607.93' @ 14.06 hrs Surf.Area= 24,306 sf Storage= 126,879 cf (117,179 cf above start) Flood Elev= 609.00' Surf.Area= 27,250 sf Storage= 154,575 cf (144,875 cf above start)

Plug-Flow detention time= 1,338.7 min calculated for 7.774 af (97% of inflow) Center-of-Mass det. time= 954.6 min (3,156.8 - 2,202.2)

Volume	Inv	ert Avail.Sto	orage 3	Storage	Description	
#1	596.0	00' 183,2	00 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (feet	n t)	Surf.Area (sq-ft)	Inc.s (cubic-	Store feet)	Cum.Store (cubic-feet)	
596.0 598.0 600.0 602.0 604.0 606.0 608.0 610.0	0 0 0 0 0 0 0 0	600 1,400 6,300 10,200 14,600 19,300 24,500 30,000	2 7 16 24 33 43 54	0 2,000 7,700 5,500 4,800 3,900 3,800 4,500	0 2,000 9,700 26,200 51,000 84,900 128,700 183,200	
Device	Routing	Invert	Outlet	t Devices	6	
#1 #2	Primary Primary	600.00' 607.50'	3.5" V 8.0' Ic Head Coef.	/ert. Orif ong x 0.4 (feet) 0. (English	ice/Grate C= (5' breadth Broa 20 0.40 0.60) 2.80 2.92 3.	0.600 d-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32
Drimory		Max-742 of a		Shre UV	V_607 02' (Erc	o Dischargo)

Primary OutFlow Max=7.42 cfs @ 14.06 hrs HW=607.93' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.90 cfs @ 13.43 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 6.52 cfs @ 1.92 fps)

Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.3P: Micropool Extended Detention Pond (P-1)

Inflow Area	=	5.500 ac, 74.5	55% Impervious,	Inflow Depth = 4	.85" for 25-yr event
Inflow	=	29.11 cfs @ 12	2.09 hrs, Volume	= 2.221 af	
Outflow	=	17.01 cfs @ 12	2.21 hrs, Volume	= 2.510 af	, Atten= 42%, Lag= 7.4 min
Primary	=	17.01 cfs @ 12	2.21 hrs, Volume	= 2.510 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 14,500 sf Storage= 29,600 cf Peak Elev= 666.24'@ 12.21 hrs Surf.Area= 19,063 sf Storage= 67,174 cf (37,574 cf above start) Flood Elev= 667.00' Surf.Area= 20,550 sf Storage= 82,275 cf (52,675 cf above start)

Plug-Flow detention time= 1,860.4 min calculated for 1.830 af (82% of inflow) Center-of-Mass det. time= 1,286.0 min (2,070.7 - 784.7)

Volume	Inve	ert Avail.Sto	rage Storage	Description	
#1	659.0	00' 103,80	00 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
659.0	00	1,500	0	0	
660.0	00	2,000	1,750	1,750	
662.0	00	5,200	7,200	8,950	
663.0	00	10,800	8,000	16,950	
664.0	00	14,500	12,650	29,600	
666.0	00	18,600	33,100	62,700	
668.0	00	22,500	41,100	103,800	
Device	Routing	Invert	Outlet Devices	S	
#1	Primary	663.00'	1.5" Vert. Orif	iice/Grate C=	0.600
#2	Primary	665.50'	8.0' long x 0.	5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet) 0	.20 0.40 0.60	0.80 1.00
			Coef. (English	ı) 2.80 2.92 3.	.08 3.30 3.32
#3	Primary	664.75'	4.0" Vert. Orif	fice/Grate C=	0.600
Duine out	O.451	May 10.00 ata			

Primary OutFlow Max=16.80 cfs @ 12.21 hrs HW=666.23' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.11 cfs @ 8.57 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 16.21 cfs @ 2.76 fps)

-3=Orifice/Grate (Orifice Controls 0.48 cfs @ 5.53 fps)



Pond 1.3P: Micropool Extended Detention Pond (P-1)

Type III 24-hr 25-yr Rainfall=6.00"

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Type III 24-hr 25-yr Rainfall=6.00"

Printed 10/12/2010

Summary for Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided

Inflow Are	a =	7.200 ac, 63.89% Impervious, Inflow Depth = 5.10" for 25-yr event
Inflow	=	21.90 cfs @ 12.17 hrs, Volume= 3.060 af
Outflow	=	3.36 cfs @ 13.36 hrs, Volume= 3.059 af, Atten= 85%, Lag= 71.2 min
Primary	=	3.36 cfs @ 13.36 hrs, Volume= 3.059 af
Primary	=	3.36 cfs @ 13.36 hrs, Volume= 3.059 af, Atten= 85%, Lag= /1.2 min 3.36 cfs @ 13.36 hrs, Volume= 3.059 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 657.00' Surf.Area= 12,850 sf Storage= 36,525 cf Peak Elev= 659.75' @ 13.36 hrs Surf.Area= 22,881 sf Storage= 84,588 cf (48,063 cf above start) Flood Elev= 661.00' Surf.Area= 28,250 sf Storage= 116,475 cf (79,950 cf above start)

Plug-Flow detention time= 2,229.3 min calculated for 2.220 af (73% of inflow) Center-of-Mass det. time= 613.4 min (2,457.8 - 1,844.4)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	650.0	00' 146,9	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
650.0	00	500	0	0	
652.0	00	1,100	1,600	1,600	
654.0	00	6,200	7,300	8,900	
656.0	00	10,000	16,200	25,100	
658.0	00	15,700	25,700	50,800	
660.0	00	23,900	39,600	90,400	
662.0	00	32,600	56,500	146,900	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	657.00'	4.0" Vert. Or	fifice/Grate C= (0.600
#2	Primary	659.25'	2.5' long x 0).5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Englis	sh) 2.80 2.92 3.	08 3.30 3.32
Duine a m	0.4 51		0 10 00 hm		

Primary OutFlow Max=3.34 cfs @ 13.36 hrs HW=659.75' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.68 cfs @ 7.74 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 2.66 cfs @ 2.13 fps)

Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided



Summary for Pond 1.5P: Micropool Extended Detention Pond (P-1)

Inflow Are	ea =	47.700 ac, 3	0.07% Impervious	, Inflow Depth =	3.78"	for 25-yr event	
Inflow	=	159.00 cfs @	12.21 hrs, Volum	e= 15.030	af		
Outflow	=	97.20 cfs @	12.43 hrs, Volum	e= 15.007	af, Atter	n= 39%, Lag= 13.	.2 min
Primary	=	97.20 cfs @	12.43 hrs, Volum	e= 15.007	af		

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 38,400 sf Storage= 157,900 cf Peak Elev= 660.16' @ 12.43 hrs Surf.Area= 54,648 sf Storage= 355,364 cf (197,464 cf above start) Flood Elev= 661.00' Surf.Area= 61,600 sf Storage= 404,050 cf (246,150 cf above start)

Plug-Flow detention time= 656.5 min calculated for 11.381 af (76% of inflow) Center-of-Mass det. time= 414.4 min (1,236.9 - 822.5)

Volume	Inver	t Avail.Sto	rage	Storage	Description			
#1	648.00	' 469,8	00 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)		
Elevation	S	urf.Area	Inc	Store	Cum.Store			
(feet)		(sq-ft)	(cubi	c-feet)	(cubic-feet)			
648.00		10,500		0	0			
650.00		14,200	2	24,700	24,700			
652.00		18,100	3	32,300	57,000			
654.00		22,200	4	10,300	97,300			
656.00		38,400	6	60,600	157,900			
658.00		48,500	8	36,900	244,800			
660.00		53,300	10	01,800	346,600			
662.00		69,900	12	23,200	469,800			
Device F	Routing	Invert	Outl	et Device	S			
#1 F	rimary	656.00'	2.0"	Vert. Ori	fice/Grate C=	0.600		
#2 F	Primary	657.00'	4.0'	long x0.	5' breadth Broa	ad-Crested Rectangular Weir		
			Hea	d (feet) 0	.20 0.40 0.60	0.80 1.00		
			Coe	f. (Englisł	n) 2.80 2.92 3.	08 3.30 3.32		
#3 F	rimary	658.75'	4.0'	long x 0.	5' breadth Broa	ad-Crested Rectangular Weir		
	-		Hea	d (feet) 0	.20 0.40 0.60	0.80 1.00		
			Coe	f. (Englisł	n) 2.80 2.92 3.	08 3.30 3.32		
Primary O	rimary OutFlow Max=96.91 cfs @ 12.43 hrs HW=660.16' (Free Discharge)							

-1=Orifice/Grate (Orifice Controls 0.21 cfs @ 9.72 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 74.52 cfs @ 5.90 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 22.18 cfs @ 3.94 fps)



Pond 1.5P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Are	a =	51.700 ac, 2	8.33% Impervious,	Inflow Depth = 3.7	72" for 25-yr event
Inflow	=	100.64 cfs @	12.41 hrs, Volume	= 16.037 af	
Outflow	=	68.44 cfs @	12.77 hrs, Volume	= 15.998 af,	Atten= 32%, Lag= 21.2 min
Primary	=	68.44 cfs @	12.77 hrs, Volume	= 15.998 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 627.00' Surf.Area= 30,860 sf Storage= 131,598 cf Peak Elev= 631.24' @ 12.77 hrs Surf.Area= 43,027 sf Storage= 287,511 cf (155,913 cf above start) Flood Elev= 633.00' Surf.Area= 48,641 sf Storage= 368,223 cf (236,625 cf above start)

Plug-Flow detention time= 924.0 min calculated for 12.977 af (81% of inflow) Center-of-Mass det. time= 343.2 min (1,553.7 - 1,210.5)

Volume	Inv	ert Avail.Sto	orage	Storage I	Description	
#1	621.0	00' 418,5	08 cf	Custom	Stage Data (I	Prismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc. (cubic	Store -feet)	Cum.Store (cubic-feet	e)
621.0	00	14,753		0		$\tilde{\mathbf{D}}$
622.0	00	16,761	1	5,757	15,75	7
624.0	00	21,116	3	7,877	53,634	4
627.0	00	30,860	7	7,964	131,598	8
628.0	00	33,557	3	2,209	163,807	7
630.0	00	39,254	7	2,811	236,618	8
632.0	00	45,354	8	4,608	321,220	6
634.0	00	51,928	9	7,282	418,508	3
Device	Routing	Invert	Outle	et Devices	6	
#1	Primary	627.00'	2.5"	Vert. Orif	ice/Grate C=	= 0.600
#2	Primary	627.75'	8.0"	Vert. Orif	ice/Grate C=	= 0.600
#3	Primary	628.75'	5.0' I	ong x 0.8	5' breadth Bro	oad-Crested Rectangular Weir
			Head	d (feet) 0.	20 0.40 0.60	0.80 1.00
			Coef	. (English) 2.80 2.92	3.08 3.30 3.32
Duimou	OutFlow	May 60.01 of	A 10	77 bro 11		(Free Discharge)

Primary OutFlow Max=68.31 cfs @ 12.77 hrs HW=631.23' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.33 cfs @ 9.79 fps)

2=Orifice/Grate (Orifice Controls 2.98 cfs @ 8.55 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 65.00 cfs @ 5.23 fps)

Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.7P: Micropool Extended Detention Pond (P-1)

Inflow Area	=	14.000 ac, 2	9.29% Impe	ervious,	Inflow Depth =	3.78"	for 25-yr	event
Inflow =	=	70.98 cfs @	12.00 hrs,	Volume	= 4.41	af		
Outflow =	=	42.48 cfs @	12.09 hrs,	Volume	= 4.41	af, Att	en= 40%,	Lag= 5.1 min
Primary =	=	42.48 cfs @	12.09 hrs,	Volume	= 4.41	af		

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 16,200 sf Storage= 41,300 cf Peak Elev= 666.27' @ 12.09 hrs Surf.Area= 25,641 sf Storage= 88,651 cf (47,351 cf above start) Flood Elev= 667.00' Surf.Area= 28,800 sf Storage= 108,650 cf (67,350 cf above start)

Plug-Flow detention time= 612.5 min calculated for 3.462 af (78% of inflow) Center-of-Mass det. time= 400.2 min (1,208.7 - 808.6)

Volume	Inve	ert Avail.Sto	rage Storage	e Description	
#1	658.0	0' 139,6	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
658.0	00	3.100	0	0	
660.0	00	4,500	7,600	7,600	
662.0	00	6,500	11,000	18,600	
664.0	00	16,200	22,700	41,300	
666.0	00	24,500	40,700	82,000	
668.0	00	33,100	57,600	139,600	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	664.00'	1.5" Vert. Or	fifice/Grate C= (0.600
#2	Primary	664.90'	8.0' long x 0).5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Englis	sh) 2.80 2.92 3.	08 3.30 3.32

Primary OutFlow Max=42.08 cfs @ 12.09 hrs HW=666.26' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.09 cfs @ 7.13 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 41.99 cfs @ 3.87 fps)



Pond 1.7P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	15.100 ac, 29.80% Impervious, Inflow Depth = 3.79" for 25-yr event
Inflow	=	46.46 cfs @ 12.07 hrs, Volume= 4.767 af
Outflow	=	33.15 cfs @ 12.28 hrs, Volume= 4.765 af, Atten= 29%, Lag= 12.7 min
Primary	=	33.15 cfs @ 12.28 hrs, Volume= 4.765 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 644.00' Surf.Area= 16,900 sf Storage= 54,400 cf Peak Elev= 646.15' @ 12.28 hrs Surf.Area= 22,737 sf Storage= 97,052 cf (42,652 cf above start) Flood Elev= 647.00' Surf.Area= 25,150 sf Storage= 117,325 cf (62,925 cf above start)

Plug-Flow detention time= 1,025.1 min calculated for 3.516 af (74% of inflow) Center-of-Mass det. time= 336.1 min (1,514.8 - 1,178.7)

Volume	Inve	ert Avail.Sto	orage Storage	e Description	
#1	638.0	00' 143,9	00 cf Custon	n Stage Data (Pri	smatic) Listed below (Recalc)
Elevatio	on et)	Surf.Area	Inc.Store	Cum.Store	
638.0 640.0 642.0 644.0 644.0 646.0)0)0)0)0)0)0	5,100 7,000 9,200 16,900 22,300 28,000	0 12,100 16,200 26,100 39,200 50,300	0 12,100 28,300 54,400 93,600 143,900	
Device #1	Routing	Invert	Outlet Device	es ifice/Grate (- ()	0.600
#1 #2	Primary	645.00'	8.0' long x 0 Head (feet) (Coef. (Englis	0.5' breadth Broa 0.20 0.40 0.60 (h) 2.80 2.92 3.0	d-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=33.02 cfs @ 12.28 hrs HW=646.15' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.23 cfs @ 6.89 fps) -2 Presed Created Destensively Wain Controls 20 70 cfs @ 2.56 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 32.78 cfs @ 3.56 fps)

Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Subcatchment 1.1S:

Runoff = 91.75 cfs @ 12.09 hrs, Volume= 7.118 af, Depth= 7.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac) CN	l Desci	ription				
7.	.900 98	B Paveo	d parking	& roofs			
1.	.600 74	>75%	Grass co	over, Good	, HSG C		
1.	.000 71	Mead	low, non-ę	grazed, HS	GC		
* 0.	.500 98 .900 56	s wate Porviv	r Surface	mont			
	<u>.900 30</u>	Weial	hted Aver				
3.	.500	Pervi	ous Area	ugo			
8.	.400	Imper	rvious Are	a			
Та	Longth	Clana	Valaaitu	Consoitu	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	Description		
6.0	((10.10)	(1000)	(0.0)	Direct Entry,		
					-	_	
				Subca	tchment 1.1	S:	
				Hydro	graph		
100				· + + +	-		- Bupoff
95	91./5 cfs _ =			· + + +			
90 85		-		· +	· ¦ ¦ <mark> </mark> -	ype III 24-hr 100-yr	
80				· +		Bainfall-8 50"	
75-				· + + + + + + + + - + + - + + + - + - + + - + - + + - +			
65				$ \frac{1}{1} \frac{1}{1} \frac{1}{1}$	Run	off Area=11.900 ac	
⁶⁰ (چ		-		$\frac{1}{1}\frac{1}{1}\frac{1}{1}$	Runo	ff Volume=7.118 af	
້ ວ 55	;			· 		upoff Dopth 7 19"	
o o u 45							
40				$\frac{1}{1}\frac{1}{1}\frac{1}{1}$		Tc=6.0 min	
35		!!!-	$-\frac{1}{1}$ $-\frac{1}{1}$ $-\frac{1}{1}$ $-\frac{1}{1}$	$\frac{1}{1}\frac{1}{1}\frac{1}{1}$		CN-89	
30-							
20					· · · · · · · · · · · · · · · · · · ·		
15				· L L L			
10							
5-0-	2	''' '			' ' ' ' ' ' ' ' '		
Ű	0 10 20 3	80 40 50	60 70 8	0 90 100 11 Ti i	0 120 130 140 150 me (hours)	0 160 170 180 190 200 210 220 230 240)

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Summary for Subcatchment 1.2S:

Runoff = 7.20 cfs @ 12.00 hrs, Volume= 0.448 af, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

A	rea (ac)	CN	Description
	0.100	98	Water Surface
	0.900	71	Meadow, non-grazed, HSG C
	1.000	74	Weighted Average
	0.900		Pervious Area
	0.100		Impervious Area

Subcatchment 1.2S:



Summary for Subcatchment 1.3S:

Runoff = 42.81 cfs @ 12.09 hrs, Volume= 3.345 af, Depth= 7.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

	Area (ac)	CN	Desc	cription			
	3.900	98	Pave	ed parking	& roofs		
	0.200	74	>75%	% Grass co	over, Good,	, HSG C	
	0.900	71	Mea	dow, non-g	grazed, HS	GC	
	0.200	98	Wate	er Surface	-		
*	0.300	56	Perv	ious Pave	ment		
	5.500	90	Weig	ghted Aver	age		
	1.400 Pervious Area						
	4.100		Impe	ervious Are	a		
	- ·				A	D	
	IC Ler	ngth	Slope	Velocity	Capacity	Description	
	<u>(min)</u> (f	eet)	(†t/†t)	(ft/sec)	(cts)		
	60					Direct Entry	



Direct Entry,

Subcatchment 1.3S:



5-

4-3-2-1-

0

10 20

40 50

30

60 70

80

Time (hours)

Tc=6.0 min

90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240

CN=81

Summary for Subcatchment 1.4S:

Runoff = 11.84 cfs @ 12.09 hrs, Volume= 0.881 af, Depth= 6.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

А	rea (ac)	CN	Desc	cription				
	0.100 98 Paved parking & roofs							
	0.900	74	>75%	% Grass co	over, Good	, HSG C		
	0.300	71	Mea	dow, non-(grazed, HS	GC		
	0.400	98	Wate	er Surface				
	1.700	81	Weig	phted Aver	rage			
	1.200		Perv	ious Area				
	0.500		impe	ervious Are	ea			
	Tc Lend	ath	Slope	Velocity	Capacity	Description		
(n	in) (fe	et)	(ft/ft)	(ft/sec)	(cfs)	•		
	5.0					Direct Entry,		
					Subca	atchment 1.4S:		
					Hydro	graph		
	13	S					- Runoff	
	12							
	11	· i i-	ii-					
	10	$\frac{1}{1}$ $ \frac{1}{1}$ $ 1$ $-$	- $ $ $ $ $ $			Rainfall=8.50"		
	9		$\begin{smallmatrix}&&&&\\&-&&&\\&&&&\\&&&&\\&&&&\\&&&&\\&&&&\\&&$	- $ -$		Runoff Area=1.700 ac		
()	8			- $ -$		Runoff Volume=0.881 af		
÷.	7							
9	1 1	i i	1 1					
o) wol:	6					Runoff Depth=6.22"		

Summary for Subcatchment 1.5S:

Runoff = 252.97 cfs @ 12.20 hrs, Volume= 24.229 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac)	CN	Desc	cription			
12.	200	98	Pave	ed parking	& roofs		
0.3	200	87	Dirt ı	oads, HS	GC		
10.	500	74	>75%	% Grass co	over, Good,	, HSG C	
9.	700	71	Mea	dow, non-g	grazed, HS	GC	
12.	700	70	Woo	ds, Good,	HSG C		
0.	700	98	Wate	er Surface			
1.	700	94	Urba	in commer	rcial, 85% ir	mp, HSG C	
47.	700	80	Weig	ghted Aver	age		
33.	355		Perv	ious Area	•		
14.:	345		Impe	ervious Are	ea		
Tc	Leng	th	Slope	Velocity	Capacity	Description	
(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)		
15.0						Direct Entry,	

Subcatchment 1.5S:



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Summary for Subcatchment 1.6S:

Runoff = 28.22 cfs @ 12.00 hrs, Volume= 1.752 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

 Area (ac)	CN	Description
3.200	71	Meadow, non-grazed, HSG C
0.500	73	Woods, Fair, HSG C
 0.300	98	Water Surface
 4.000	73	Weighted Average
3.700		Pervious Area
0.300		Impervious Area

Subcatchment 1.6S:



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Type III 24-hr 100-yr Rainfall=8.50" Printed 10/12/2010 Page 116

Summary for Subcatchment 1.7S:

Runoff = 112.57 cfs @ 12.00 hrs, Volume= 7.111 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

 Area (ac)	CN	Description
 3.700	98	Paved parking & roofs
2.900	74	>75% Grass cover, Good, HSG C
3.100	71	Meadow, non-grazed, HSG C
3.900	73	Woods, Fair, HSG C
 0.400	98	Water Surface
14.000	80	Weighted Average
9.900		Pervious Area
4.100		Impervious Area

Subcatchment 1.7S:



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Summary for Subcatchment 1.8S:

Runoff = 8.99 cfs @ 12.00 hrs, Volume= 0.570 af, Depth= 6.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

_	Area (ac)	CN	Description
	0.700	71	Meadow, non-grazed, HSG C
	0.400	98	Water Surface
	1.100	81	Weighted Average
	0.700		Pervious Area
	0 400		Impervious Area

Subcatchment 1.8S:



Summary for Subcatchment 1.9S:

Runoff = 304.44 cfs @ 12.50 hrs, Volume= 41.927 af, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac) C	N Des	cription					
1.	500	87 Dirt	Dirt roads, HSG C					
0.	500	74 >75	% Grass c	over, Good	, HSG C			
13.	900	71 Mea	dow, non-g	grazed, HS	GC			
1.	500	60 Woo	ods, Fair, H	ISG B				
63.	300	73 Woo	ods, Fair, F	ISG C				
9.	900	79 Woo	ods, Fair, F	ISG D				
3.	000	94 Urba	an commei	<u>rcial, 85% ir</u>	mp, HSG C			
93.	600	74 Wei	ghted Avei	age				
91.	050	Perv	vious Area					
2.	550	Impe	ervious Are	ea				
_								
Tc	Length	Slope	Velocity	Capacity	Description			
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
5.8	100	0.0500	0.29		Sheet Flow,			
					Range n= 0.130 P2= 3.50"			
9.9	1,643	0.1560	2.76		Shallow Concentrated Flow,			
					Short Grass Pasture Kv= 7.0 fps			
11.7	668	0.0360	0.95		Shallow Concentrated Flow,			
					Woodland Kv= 5.0 fps			
8.8	1,359	0.0220	2.58	1.37	Trap/Vee/Rect Channel Flow,			
					Bot.W=2.00' D=0.25' Z= 0.5 '/' Top.W=2.25'			
					n= 0.030 Earth, grassed & winding			
36.2	3,770	Total						

Hydrograph 340 - Runoff 320 304.44 cfs 300 Type III 24-hr 100-yr 280 Rainfall=8.50" 260 240 Runoff Area=93.600 ac 220 Runoff Volume=41.927 af 200 (cfs) 180 Runoff Depth=5.38" Flow 160 Flow Length=3,770' 140 Tc=36.2 min 120 100 CN=74 80-60-40 20-0-20 40 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 10 30 50 60 Ó Time (hours)

Subcatchment 1.9S:

Summary for Reach DP 1: Design Point 1

Inflow A	rea =	180.500 ac,	19.28% Impervious,	Inflow Depth = 5.8	82" for 100-yr event
Inflow	=	502.99 cfs @	12.53 hrs, Volume	= 87.578 af	
Outflow	=	502.99 cfs @	12.53 hrs, Volume	= 87.578 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs



Reach DP 1: Design Point 1

Summary for Pond 1.1P: Micropool Extended Detention Pond (P-1)

Inflow Area =	19.100 ac, 68.06% Impervious, Inflo	w Depth = 7.31" for 100-yr event
Inflow =	92.27 cfs @ 12.09 hrs, Volume=	11.632 af
Outflow =	56.35 cfs @ 12.21 hrs, Volume=	11.613 af, Atten= 39%, Lag= 7.5 min
Primary =	56.35 cfs @ 12.21 hrs, Volume=	11.613 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 613.00' Surf.Area= 19,800 sf Storage= 81,050 cf Peak Elev= 616.75' @ 12.21 hrs Surf.Area= 28,757 sf Storage= 171,512 cf (90,462 cf above start) Flood Elev= 617.00' Surf.Area= 29,400 sf Storage= 178,700 cf (97,650 cf above start)

Plug-Flow detention time= 1,186.2 min calculated for 9.750 af (84% of inflow) Center-of-Mass det. time= 549.5 min (1,786.1 - 1,236.6)

Volume	Inv	ert Avail.S	Storage	Storage	Description	
#1	605.	00' 209	,400 cf	Custom	n Stage Data (Pri	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc	Store	Cum.Store	
(fee	et)	(sq-ft)	(cubi	c-feet)	(cubic-feet)	
605.0	00	5,000		0	0	
606.0	00	6,000		5,500	5,500	
608.0	00	8,100	-	14,100	19,600	
610.0	00	10,400	-	18,500	38,100	
612.0	00	15,100		25,500	63,600	
613.0	00	19,800	-	17,450	81,050	
614.0	00	21,900		20,850	101,900	
616.0	00	26,800	4	48,700	150,600	
618.0	00	32,000	Ę	58,800	209,400	
Device	Routing	Inve	rt Outl	et Device	es	
#1	Primary	613.0	0' 2.0''	Vert. Or	ifice/Grate C= (0.600
#2 Primary 614.50'		0' 5.0' Hea Coe	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32			

Primary OutFlow Max=56.06 cfs @ 12.21 hrs HW=616.75' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.20 cfs @ 9.21 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 55.86 cfs @ 4.97 fps)


Pond 1.1P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	20.100 ac, 65.1	7% Impervious, Inflow E	Depth = 7.20" for 100-y	/r event
Inflow	=	58.96 cfs @ 12.	.21 hrs, Volume=	12.060 af	
Outflow	=	34.41 cfs @ 12.	.71 hrs, Volume=	12.055 af, Atten= 42%,	Lag= 30.2 min
Primary	=	34.41 cfs @ 12.	.71 hrs, Volume=	12.055 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 600.00' Surf.Area= 6,300 sf Storage= 9,700 cf Peak Elev= 608.67' @ 12.71 hrs Surf.Area= 26,331 sf Storage= 145,620 cf (135,920 cf above start) Flood Elev= 609.00' Surf.Area= 27,250 sf Storage= 154,575 cf (144,875 cf above start)

Plug-Flow detention time= 903.4 min calculated for 11.832 af (98% of inflow) Center-of-Mass det. time= 654.6 min (2,404.4 - 1,749.8)

Volume	Inv	ert Avail.Sto	orage Stora	age Description	
#1	596.0	00' 183,2	00 cf Custo	om Stage Data (Prismatic) Listed below (Re	calc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	cum.Store (cubic-feet)	
596.0 598.0 600.0 602.0 604.0 606.0 608.0 610.0)0)0)0)0)0)0)0)0)0	600 1,400 6,300 10,200 14,600 19,300 24,500 30,000	0 2,000 7,700 16,500 24,800 33,900 43,800 54,500	0 2,000 9,700 26,200 51,000 84,900 128,700 183,200	
Device	Routing	Invert	Outlet Devi	vices	
#1 #2	Primary Primary	600.00' 607.50'	3.5" Vert. Orifice/Grate C= 0.600 8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32		
Drimory	OutElow	Mov 24 21 of	@ 10 71 hr	a UW 609 66' (Erea Diasharas)	

Primary OutFlow Max=34.31 cfs @ 12.71 hrs HW=608.66' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.94 cfs @ 14.05 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 33.37 cfs @ 3.58 fps)

Pond 1.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.3P: Micropool Extended Detention Pond (P-1)

Inflow Area =	5.500 ac, 74.55% Impervious, Inflow	v Depth = 7.30" for 100-yr event
Inflow =	42.81 cfs @ 12.09 hrs, Volume=	3.345 af
Outflow =	30.78 cfs @ 12.17 hrs, Volume=	3.634 af, Atten= 28%, Lag= 4.9 min
Primary =	30.78 cfs @ 12.17 hrs, Volume=	3.634 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 14,500 sf Storage= 29,600 cf Peak Elev= 666.59'@ 12.17 hrs Surf.Area= 19,746 sf Storage= 73,964 cf (44,364 cf above start) Flood Elev= 667.00' Surf.Area= 20,550 sf Storage= 82,275 cf (52,675 cf above start)

Plug-Flow detention time= 1,196.8 min calculated for 2.954 af (88% of inflow) Center-of-Mass det. time= 914.4 min (1,688.6 - 774.2)

Volume	Inve	ert Avail.Stor	rage Stora	ge Description		
#1	659.0	00' 103,80	00 cf Custo	om Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevatio	n	Surf.Area	Inc.Store	Cum.Store		
(feet	t)	(sq-ft)	(cubic-feet)	(cubic-feet)		
659.0	0	1,500	0	0		
660.0	0	2,000	1,750	1,750		
662.0	0	5,200	7,200	8,950		
663.0	0	10,800	8,000	16,950		
664.0	0	14,500	12,650	29,600		
666.0	0	18,600	33,100	62,700		
668.0	0	22,500	41,100	103,800		
Device	Routing	Invert	Outlet Devi	ces		
#1	Primary	663.00'	1.5" Vert. C	Drifice/Grate C=	0.600	
#2	Primary	665.50'	8.0' long x	0.5' breadth Broa	ad-Crested Rectangular Weir	
			Head (feet)	0.20 0.40 0.60	0.80 1.00	
			Coef. (English) 2.80 2.92 3.08 3.30 3.32			
#3	Primary	664.75'	4.0" Vert. C	Drifice/Grate C=	0.600	
D.:	$\mathbf{P}_{\mathbf{r}}(\mathbf{r}) = \mathbf{P}_{\mathbf{r}}(\mathbf{r}) + \mathbf{P}_{\mathbf{r}}(\mathbf{r}) = \mathbf{P}_{\mathbf{r}}(\mathbf{r}) + \mathbf{P}$					

Primary OutFlow Max=30.31 cfs @ 12.17 hrs HW=666.58' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.11 cfs @ 9.03 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 29.65 cfs @ 3.44 fps)

-3=Orifice/Grate (Orifice Controls 0.54 cfs @ 6.20 fps)



Pond 1.3P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided

Inflow Area	a =	7.200 ac, 63.89% Impervious, Inflow Depth = 7.52" for 100-yr event	
Inflow	=	9.98 cfs @ 12.14 hrs, Volume= 4.515 af	
Outflow	=	3.12 cfs @ 12.61 hrs, Volume= 4.514 af, Atten= 67%, Lag= 28.0 mir	n
Primary	=	3.12 cfs @ 12.61 hrs, Volume= 4.514 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 657.00' Surf.Area= 12,850 sf Storage= 36,525 cf Peak Elev= 660.55' @ 12.61 hrs Surf.Area= 26,305 sf Storage= 104,276 cf (67,751 cf above start) Flood Elev= 661.00' Surf.Area= 28,250 sf Storage= 116,475 cf (79,950 cf above start)

Plug-Flow detention time= 1,413.4 min calculated for 3.674 af (81% of inflow) Center-of-Mass det. time= 446.1 min (1,961.1 - 1,515.0)

Volume Invert Avail.St	orage Storage [Description	
#1 650.00' 146,9	000 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevation Surf.Area	Inc.Store	Cum.Store	
(feet) (sq-ft)	(cubic-feet)	(cubic-feet)	
650.00 500	0	0	
652.00 1,100	1,600	1,600	
654.00 6,200	7,300	8,900	
656.00 10,000	16,200	25,100	
658.00 15,700	25,700	50,800	
660.00 23,900	39,600	90,400	
662.00 32,600	56,500	146,900	
Device Routing Invert	Outlet Devices	5	
#1 Primary 657.00	4.0" Vert. Orifi	ice/Grate C=	0.600
#2 Primary 659.25	2.5' long x 0.5	5' breadth Broa	ad-Crested Rectangular Weir
-	Head (feet) 0.	20 0.40 0.60	0.80 1.00
	Coef. (English)) 2.80 2.92 3.	08 3.30 3.32

Primary OutFlow Max=13.11 cfs @ 12.61 hrs HW=660.55' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.77 cfs @ 8.86 fps) 2 Presed Created Rectangular Weir (Wair Controls 12.22 cfs @ 2.70 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 12.33 cfs @ 3.79 fps)

Pond 1.4P: Extended Detention Pond (Design 2) - Premanent Pool Provided



Summary for Pond 1.5P: Micropool Extended Detention Pond (P-1)

Inflow Area	a =	47.700 ac, 3	0.07% Impervious,	Inflow Depth = 6.10" for 100-yr event
Inflow	=	252.97 cfs @	12.20 hrs, Volume	= 24.229 af
Outflow	=	170.98 cfs @	12.38 hrs, Volume	= 24.205 af, Atten= 32%, Lag= 10.6 min
Primary	=	170.98 cfs @	12.38 hrs, Volume	= 24.205 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 38,400 sf Storage= 157,900 cf Peak Elev= 661.28' @ 12.38 hrs Surf.Area= 63,889 sf Storage= 421,353 cf (263,453 cf above start) Flood Elev= 661.00' Surf.Area= 61,600 sf Storage= 404,050 cf (246,150 cf above start)

Plug-Flow detention time= 403.6 min calculated for 20.581 af (85% of inflow) Center-of-Mass det. time= 272.9 min (1,081.9 - 809.0)

Volume	Inv	ert Avail.Sto	rage	Storage	Description	
#1	648.0	00' 469,8	00 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	n	Surf.Area	Inc	.Store	Cum.Store	
(fee	t)	(sq-ft)	(cubio	c-feet)	(cubic-feet)	
648.0	0	10,500		0	0	
650.0	0	14,200	2	24,700	24,700	
652.0	0	18,100	З	32,300	57,000	
654.0	0	22,200	4	0,300	97,300	
656.0	0	38,400	6	60,600	157,900	
658.0	0	48,500	8	86,900	244,800	
660.0	0	53,300	10	1,800	346,600	
662.0	0	69,900	12	23,200	469,800	
Device	Routing	Invert	Outle	et Device	S	
#1	Primary	656.00'	2.0"	Vert. Ori	fice/Grate C=	0.600
#2	Primary	657.00'	4.0'	long x 0.	5' breadth Broa	ad-Crested Rectangular Weir
			Head	d (feet) 0	.20 0.40 0.60	0.80 1.00
			Coef	. (English	n) 2.80 2.92 3.	.08 3.30 3.32
#3	Primary	658.75'	4.0'	long x 0.	5' breadth Broa	ad-Crested Rectangular Weir
			Head	d (feet) 0	.20 0.40 0.60	0.80 1.00
			Coef	i. (English	ı) 2.80 2.92 3.	.08 3.30 3.32
Primary OutFlow Max=170.47 cfs @ 12.38 hrs HW=661.27' (Free Discharge)						

rifice/Grate (Orifice Controls 0.24 cfs @ 10.96 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 117.13 cfs @ 6.86 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 53.09 cfs @ 5.27 fps)



Pond 1.5P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area =	51.700 ac, 2	8.33% Impervious,	Inflow Depth = 6.02" for 100-yr event
Inflow =	177.67 cfs @	12.37 hrs, Volume	e= 25.957 af
Outflow =	138.47 cfs @	12.63 hrs, Volume	= 25.919 af, Atten= 22%, Lag= 15.6 min
Primary =	138.47 cfs @	12.63 hrs, Volume	e= 25.919 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 627.00' Surf.Area= 30,860 sf Storage= 131,598 cf Peak Elev= 632.78' @ 12.63 hrs Surf.Area= 47,926 sf Storage= 357,719 cf (226,121 cf above start) Flood Elev= 633.00' Surf.Area= 48,641 sf Storage= 368,223 cf (236,625 cf above start)

Plug-Flow detention time= 548.0 min calculated for 22.897 af (88% of inflow) Center-of-Mass det. time= 224.5 min (1,288.0 - 1,063.5)

Volume	Invert	Avail.Sto	rage S	Storage De	escription				
#1	621.00'	418,50	08 cf	Custom S	tage Data	a (Prism	natic) Liste	ed below (Recalc)
Elevation (feet) 621.00 622.00 624.00 627.00 628.00 630.00 632.00	Surf. () 14 16 21 30 33 39 45	Area sq-ft) I,753 S,761 I,116 J,860 J,860 J,254 J,254 S,354	Inc.6 (cubic- 15 37 77 32 72 84	Store <u>feet)</u> 0 5,757 7,877 7,964 2,209 2,811 4,608	Cum.St (cubic-fe 15, 53, 131, 163, 236, 321,	core <u>eet)</u> 0 757 634 598 807 618 226	,	· · · · · · · · · · · · · · · · · · ·	
634.00	51	,928	97	',282	418,	508			
Device Ro #1 Pr #2 Pr #3 Pr	outing imary imary imary	Invert 627.00' 627.75' 628.75'	Outlet 2.5" V 8.0" V 5.0' Io Head Coef.	t Devices /ert. Orific /ert. Orific ong x 0.5' (feet) 0.2 (English)	e/Grate e/Grate breadth 0 0.40 0 2.80 2.9	C= 0.60 C= 0.60 Broad-0 .60 0.8 2 3.08	00 00 Crested R 0 1.00 3.30 3.32	ectangula	ar Weir

Primary OutFlow Max=138.21 cfs @ 12.63 hrs HW=632.78' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.39 cfs @ 11.47 fps)

-2=Orifice/Grate (Orifice Controls 3.64 cfs @ 10.43 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 134.18 cfs @ 6.66 fps)

Pond 1.6P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 1.7P: Micropool Extended Detention Pond (P-1)

Inflow Area =	14.000 ac, 29.29% Impervious, Inflov	w Depth = 6.10" for 100-yr event	
Inflow =	112.57 cfs @ 12.00 hrs, Volume=	7.111 af	
Outflow =	70.36 cfs @ 12.08 hrs, Volume=	7.110 af, Atten= 37%, Lag= 4.5 min	
Primary =	70.36 cfs @ 12.08 hrs, Volume=	7.110 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 664.00' Surf.Area= 16,200 sf Storage= 41,300 cf Peak Elev= 666.81' @ 12.08 hrs Surf.Area= 27,996 sf Storage= 103,339 cf (62,039 cf above start) Flood Elev= 667.00' Surf.Area= 28,800 sf Storage= 108,650 cf (67,350 cf above start)

Plug-Flow detention time= 373.2 min calculated for 6.161 af (87% of inflow) Center-of-Mass det. time= 259.0 min (1,054.1 - 795.1)

Volume	Inv	ert Avail.Sto	orage Storage	Description	
#1	658.0	00' 139,6	00 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(196	əl)	(SQ-II)	(Judic-Teel)	(cubic-ieet)	
658.0	00	3,100	0	0	
660.0	00	4,500	7,600	7,600	
662.0	00	6,500	11,000	18,600	
664.0	00	16,200	22,700	41,300	
666.0	00	24,500	40,700	82,000	
668.0	00	33,100	57,600	139,600	
Device	Routing	Invert	Outlet Device	S	
#1	Primarv	664.00'	1.5" Vert. Ori	fice/Grate C=	0.600
#2	Primary	664.90'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32		

Primary OutFlow Max=69.58 cfs @ 12.08 hrs HW=666.80' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.10 cfs @ 7.96 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 69.48 cfs @ 4.57 fps)



Pond 1.7P: Micropool Extended Detention Pond (P-1)

Summary for Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area =	=	15.100 ac, 29.80% Impervious, Inflow Depth = 6.	.10" for 100-yr event
Inflow =	=	77.02 cfs @ 12.07 hrs, Volume= 7.680 af	
Outflow =	=	61.35 cfs @ 12.20 hrs, Volume= 7.678 af,	, Atten= 20%, Lag= 8.1 min
Primary =	=	61.35 cfs @ 12.20 hrs, Volume= 7.678 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 644.00' Surf.Area= 16,900 sf Storage= 54,400 cf Peak Elev= 646.74' @ 12.20 hrs Surf.Area= 24,415 sf Storage= 110,931 cf (56,531 cf above start) Flood Elev= 647.00' Surf.Area= 25,150 sf Storage= 117,325 cf (62,925 cf above start)

Plug-Flow detention time= 586.0 min calculated for 6.429 af (84% of inflow) Center-of-Mass det. time= 217.5 min (1,252.2 - 1,034.7)

Volume	Inve	<u>rt Avail.Sto</u>	rage Storage	ge Storage Description			
#1	638.0	0' 143,90	00 cf Custon	n Stage Data (Pri	ismatic) Listed below (Recalc)		
Elevatio	n :	Surf.Area	Inc.Store	Cum.Store			
(iee	()	(Sq-II)	(cubic-leet)	(Jeer-Didub)			
638.0	0	5,100	0	0			
640.0	0	7,000	12,100	12,100			
642.0	0	9,200	16,200	28,300			
644.0	0	16,900	26,100	54,400			
646.0	0	22.300	39,200	93,600			
648.0	0	28,000	50,300	143,900			
Device	Routing	Invert	Outlet Device	es			
#1	Primary	644.00'	2.5" Vert. Or	ifice/Grate C= (0.600		
#2	Primary	645.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32				

Primary OutFlow Max=61.32 cfs @ 12.20 hrs HW=646.74' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.27 cfs @ 7.82 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 61.06 cfs @ 4.38 fps)

Pond 1.8P: Extended Detention Pond (Design 2) - Permanent Pool Provided





Summary for Subcatchment 2.1S:

Runoff = 19.92 cfs @ 12.09 hrs, Volume= 1.477 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

	0.0						, ,,
	6.0	/		· · /	,/	/	Direct Entry.
	(min)	(feet)		(ft/ft)	(ft/sec)	(cfs)	•
	Tc L	.ength	ę	Slope	Velocity	Capacity	Description
	6.30	00		Impe	rvious Are	a	
	1.90)0		Pervi	ous Area	-	
	8.20)0	92	Weig	hted Aver	age	
*	0.30)0	56	Pervi	ous Pave	ment	
	0.30)0	98	Wate	er Surface		
	0.40	00	71	Mead	dow, non-o	grazed, HS	G C
	1.20	00	74	>75%	6 Grass co	over, Good,	I, HSG C
	6.00)0	98	Pave	d parking	& roofs	
	Area (a	c) (CN	Desc	ription		



Summary for Subcatchment 2.2S:

Runoff = 3.94 cfs @ 12.01 hrs, Volume= 0.264 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (ad	;) CN	Description
0.30	0 98	Paved parking & roofs
0.50	0 74	>75% Grass cover, Good, HSG C
1.40	0 71	Meadow, non-grazed, HSG C
1.50	0 70	Woods, Good, HSG C
3.70	0 73	Weighted Average
3.40	0	Pervious Area
0.30	0	Impervious Area

Subcatchment 2.2S:



Summary for Reach DP2: Design Point 2

Inflow A	rea =	11.900 ac, 55.46	% Impervious,	Inflow Depth = 1	.75" for 1-yr event
Inflow	=	4.15 cfs @ 12.	01 hrs, Volume	= 1.739 af	f
Outflow	=	4.15 cfs @ 12.	01 hrs, Volume	= 1.739 af	f, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs



Reach DP2: Design Point 2

Summary for Pond 2.1P: Mircopool Extended Detention Pond (P-1)

Inflow Area =	8.200 ac, 76.83% Impervious, Inflow	Depth = 2.16" for 1-yr event
Inflow =	19.92 cfs @ 12.09 hrs, Volume=	1.477 af
Outflow =	1.08 cfs @ 14.26 hrs, Volume=	1.475 af, Atten= 95%, Lag= 130.3 min
Primary =	1.08 cfs @ 14.26 hrs, Volume=	1.475 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 620.00' Surf.Area= 11,200 sf Storage= 37,300 cf Peak Elev= 623.11' @ 14.26 hrs Surf.Area= 17,167 sf Storage= 81,131 cf (43,831 cf above start) Flood Elev= 625.00' Surf.Area= 21,300 sf Storage= 117,450 cf (80,150 cf above start)

Plug-Flow detention time= 2,925.9 min calculated for 0.619 af (42% of inflow) Center-of-Mass det. time= 1,489.7 min (2,289.8 - 800.1)

Volume	Inve	ert Avail.Sto	rage St	orage D	escription	
#1	612.0	00' 139,90	00 cf Cı	ustom S	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.St	ore	Cum.Store	
(fee	et)	(sq-ft)	(cubic-fe	et)	(cubic-feet)	
612.0)0	1,700	•	0	0	
614.0	00	2,700	4,4	00	4,400	
616.0	00	4,000	6,7	00	11,100	
618.0	00	5,500	9,5	00	20,600	
620.0	00	11,200	16,7	00	37,300	
622.0	00	14,900	26,1	00	63,400	
624.0	00	19,000	33,9	00	97,300	
626.0	00	23,600	42,6	00	139,900	
Device	Routing	Invert	Outlet E)evices		
#1	Primary	620.00'	2.6" Ve	rt. Orifio	ce/Grate C=	0.600
#2	Primary	623.00'	8.0' lon	g x 0.5'	breadth Broa	ad-Crested Rectangular Weir
			Head (f	eet) 0.2	20 0.40 0.60	0.80 1.00
			Coef. (E	English)	2.80 2.92 3.	.08 3.30 3.32
_ .	o					

Primary OutFlow Max=1.08 cfs @ 14.26 hrs HW=623.11' TW=0.00' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 0.31 cfs @ 8.34 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 0.77 cfs @ 0.91 fps)



Pond 2.1P: Mircopool Extended Detention Pond (P-1)

Summary for Subcatchment 2.1S:

Runoff = 24.08 cfs @ 12.09 hrs, Volume= 1.802 af, Depth= 2.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

	Area (ac)	CN	Description				
	6.000	98	Paved parking	& roofs			
	1.200	74	>75% Grass co	over, Good,	, HSG C		
	0.400	71	Meadow, non-ç	grazed, HS	GC		
	0.300	98	Water Surface				
*	0.300	56	Pervious Pave	ment			
	8.200	92	Weighted Aver	age			
	1.900		Pervious Area				
	6.300		Impervious Are	a			
	Tc Leng (min) (fee	gth S	Slope Velocity (ft/ft) (ft/sec)	Capacity (cfs)	Description		
	6.0	/	<u>(</u> , , , , , , , , , , , , , , , , , , ,	()	Direct Entry,		
Subcatchment 2.1S:							
Hydrograph							
	25 24.08 cfs	;	· · - + - + - + - + - + - + - + - + - +				- Runom



Summary for Subcatchment 2.2S:

Runoff = 5.63 cfs @ 12.01 hrs, Volume= 0.364 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac)) CN	Description
0.300) 98	Paved parking & roofs
0.500) 74	>75% Grass cover, Good, HSG C
1.400) 71	Meadow, non-grazed, HSG C
1.500) 70	Woods, Good, HSG C
3.700) 73	Weighted Average
3.400)	Pervious Area
0.300)	Impervious Area

Subcatchment 2.2S:



Summary for Reach DP2: Design Point 2

Inflow Area	a =	11.900 ac, 5	55.46% Imper	rvious,	Inflow Depth =	2.1	8" for 2-yr event	
Inflow	=	5.85 cfs @	12.01 hrs, \	Volume=	= 2.164	af		
Outflow	=	5.85 cfs @	12.01 hrs, \	Volume=	= 2.164	af,	Atten= 0%, Lag= 0.0	min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Hydrograph - Inflow 5.85 cfs 6- Outflow Inflow Area=11.900 ac 5 4 Flow (cfs) 3-2 1 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó Time (hours)

Reach DP2: Design Point 2

Summary for Pond 2.1P: Mircopool Extended Detention Pond (P-1)

Inflow Are	ea =	8.200 ac, 76.83% Impervious, Inflow Depth = 2.64" for 2-yr event
Inflow	=	24.08 cfs @ 12.09 hrs, Volume= 1.802 af
Outflow	=	2.86 cfs @ 12.73 hrs, Volume= 1.800 af, Atten= 88%, Lag= 38.7 min
Primary	=	2.86 cfs @ 12.73 hrs, Volume= 1.800 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 620.00' Surf.Area= 11,200 sf Storage= 37,300 cf Peak Elev= 623.23' @ 12.73 hrs Surf.Area= 17,428 sf Storage= 83,336 cf (46,036 cf above start) Flood Elev= 625.00' Surf.Area= 21,300 sf Storage= 117,450 cf (80,150 cf above start)

Plug-Flow detention time= 2,348.9 min calculated for 0.944 af (52% of inflow) Center-of-Mass det. time= 1,248.8 min (2,043.4 - 794.6)

Volume	Invert	Avail.Stor	rage	Storage [Description	
#1	612.00'	139,90)0 cf	Custom 9	Stage Data (Pi	rismatic) Listed below (Recalc)
Elevation (feet)	Sı	urf.Area (sq-ft)	Inc. (cubic	Store -feet)	Cum.Store (cubic-feet)	
612.00		1,700		0	0	
614.00		2,700		4,400	4,400	
616.00		4,000		6,700	11,100	
618.00		5,500		9,500	20,600	
620.00		11,200	1	6,700	37,300	
622.00		14,900	2	6,100	63,400	
624.00		19,000	3	3,900	97,300	
626.00		23,600	4	2,600	139,900	
Device R	outing	Invert	Outle	et Devices		
#1 Pi	rimary	620.00'	2.6"	Vert. Orifi	ce/Grate C=	0.600
#2 Pi	rimary	623.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32			

Primary OutFlow Max=2.85 cfs @ 12.73 hrs HW=623.23' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.31 cfs @ 8.51 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 2.54 cfs @ 1.36 fps)





Summary for Subcatchment 2.1S:

Runoff = 37.28 cfs @ 12.09 hrs, Volume= 2.861 af, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

	Area (ac)	CN	Description							
	6.000	98	Paved parking & roofs							
	1.200	74	74 >75% Grass cover, Good, HSG C							
	0.400	71	Meadow, non-grazed, HSG C							
	0.300	98	Water Surface							
*	0.300	56	Pervious Pavement							
	8.200	92	Weighted Average							
	1.900		Pervious Area							
	6.300		Impervious Area							
	IC Leng	th S	Slope Velocity Capacity Description							
	(min) (iee	el)								
	6.0 Direct Entry,									
			Subcatchment 2.1S:							
	Hydrograph									
	36		Type III 24-hr 10-yr							
	34									
	32									



Time (hours)

Summary for Subcatchment 2.2S:

Runoff = 11.70 cfs @ 12.01 hrs, Volume= 0.727 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

 Area (ac)	CN	Description
 0.300	98	Paved parking & roofs
0.500	74	>75% Grass cover, Good, HSG C
1.400	71	Meadow, non-grazed, HSG C
 1.500	70	Woods, Good, HSG C
 3.700	73	Weighted Average
3.400		Pervious Area
0.300		Impervious Area

Subcatchment 2.2S:



Summary for Reach DP2: Design Point 2

Inflow /	Area	=	11.900 ac, 5	5.46% Impe	ervious,	Inflow Depth =	3.6	62" for 10-yr event
Inflow	=	=	22.42 cfs @	12.24 hrs,	Volume	= 3.587	7 af	
Outflow	V =	=	22.42 cfs @	12.24 hrs,	Volume	= 3.587	7 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Reach DP2: Design Point 2



Summary for Pond 2.1P: Mircopool Extended Detention Pond (P-1)

Inflow Area =	8.200 ac, 76.83% Impervious, Inflow E	Depth = 4.19" for 10-yr event
Inflow =	37.28 cfs @ 12.09 hrs, Volume=	2.861 af
Outflow =	18.18 cfs @ 12.25 hrs, Volume=	2.859 af, Atten= 51%, Lag= 10.0 min
Primary =	18.18 cfs @ 12.25 hrs, Volume=	2.859 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 620.00' Surf.Area= 11,200 sf Storage= 37,300 cf Peak Elev= 623.77' @ 12.25 hrs Surf.Area= 18,538 sf Storage= 93,069 cf (55,769 cf above start) Flood Elev= 625.00' Surf.Area= 21,300 sf Storage= 117,450 cf (80,150 cf above start)

Plug-Flow detention time= 1,277.3 min calculated for 2.003 af (70% of inflow) Center-of-Mass det. time= 816.3 min (1,598.4 - 782.1)

Volume	Inv	ert Avail.Sto	rage	Storage D	escription	
#1	612.0	00' 139,9	00 cf	Custom S	tage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	n t)	Surf.Area (sq-ft)	Inc (cubi	.Store c-feet)	Cum.Store (cubic-feet)	
612.0	0	1,700		0	0	
616.0	0	2,700		4,400 6 700	4,400	
618.0	0	5,500		9,500	20,600	
620.0	0	11,200		6,700	37,300	
622.0	0	14,900		26,100	63,400	
624.0	0	19,000	3	33,900	97,300	
626.0	0	23,600	2	12,600	139,900	
Device	Routing	Invert	Outl	et Devices		
#1 #2	Primary Primary	620.00' 623.00'	2.6'' 8.0' Hea Coe	Vert. Orific long x 0.5' d (feet) 0.2 f. (English)	e/Grate C= (breadth Broa 0 0.40 0.60 2.80 2.92 3.	0.600 Id-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=18.14 cfs @ 12.25 hrs HW=623.77' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.34 cfs @ 9.22 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 17.80 cfs @ 2.88 fps)



Time (hours)

Pond 2.1P: Mircopool Extended Detention Pond (P-1)

Summary for Subcatchment 2.1S:

Runoff = 44.64 cfs @ 12.09 hrs, Volume= 3.464 af, Depth= 5.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

	Area (ac)) CN	Desc	ription					
	6.000) 98	Pave	ed parking	& roofs				
	1.200) 74	>75%	6 Grass co	over, Good,	, HSG C			
	0.400) 71	Mea	dow, non-g	grazed, HS	GC			
	0.300) 98	Wate	er Surface					
*	0.300) 56	Perv	ious Pave	ment				
	8.200) 92	Weig	phted Aver	age				
	1.900)	Perv	ious Area	-				
	6.300)	Impe	ervious Are	a				
	Tc Le (min) (ength feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description			
	6.0					Direct Entry,			
	Subcatchment 2 1S:								



Summary for Subcatchment 2.2S:

Runoff = 15.39 cfs @ 12.00 hrs, Volume= 0.952 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (ac)	CN	Description
0.300	98	Paved parking & roofs
0.500	74	>75% Grass cover, Good, HSG C
1.400	71	Meadow, non-grazed, HSG C
1.500	70	Woods, Good, HSG C
3.700	73	Weighted Average
3.400		Pervious Area
0.300		Impervious Area

Subcatchment 2.2S:



Summary for Reach DP2: Design Point 2

Inflow A	rea =	11.900 ac, 5	55.46% Impervious,	Inflow Depth = 4.4	45" for 25-yr event
Inflow	=	34.39 cfs @	12.18 hrs, Volume	= 4.415 af	
Outflow	=	34.39 cfs @	12.18 hrs, Volume	= 4.415 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Reach DP2: Design Point 2


Summary for Pond 2.1P: Mircopool Extended Detention Pond (P-1)

Inflow Area	ι =	8.200 ac, 76.83% Impervious, Inflow Depth = 5.07" for 25-yr event	
Inflow	=	14.64 cfs @ 12.09 hrs, Volume= 3.464 af	
Outflow	=	28.29 cfs @ 12.19 hrs, Volume= 3.462 af, Atten= 37%, Lag= 6.4 min	
Primary	=	28.29 cfs @ 12.19 hrs, Volume= 3.462 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 620.00' Surf.Area= 11,200 sf Storage= 37,300 cf Peak Elev= 624.03' @ 12.19 hrs Surf.Area= 19,079 sf Storage= 97,953 cf (60,653 cf above start) Flood Elev= 625.00' Surf.Area= 21,300 sf Storage= 117,450 cf (80,150 cf above start)

Plug-Flow detention time= 1,013.7 min calculated for 2.606 af (75% of inflow) Center-of-Mass det. time= 685.7 min (1,462.8 - 777.2)

Volume	Inv	ert Avail.Sto	rage Stora	ge Description	
#1	612.0	00' 139,90	00 cf Custo	om Stage Data (Pi	rismatic) Listed below (Recalc)
		0 ()		0 0	
Elevation	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
612.0	00	1,700	0	0	
614.(00	2,700	4,400	4,400	
616.0	00	4,000	6,700	11,100	
618.0	00	5,500	9,500	20,600	
620.0	00	11,200	16,700	37,300	
622.0	00	14,900	26,100	63,400	
624.0	00	19,000	33,900	97,300	
626.0	00	23,600	42,600	139,900	
Device	Routing	Invert	Outlet Dev	ces	
#1	Primary	620.00'	2.6" Vert. (Drifice/Grate C=	0.600
#2	Primary	623.00'	8.0' long x	0.5' breadth Broa	ad-Crested Rectangular Weir
	-		Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Eng	lish) 2.80 2.92 3	.08 3.30 3.32
			τ υ	,	

Primary OutFlow Max=28.17 cfs @ 12.19 hrs HW=624.03' TW=0.00' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 0.35 cfs @ 9.54 fps) 2 Presed Created Restangular Wair (Wair Controls 0.2 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 27.82 cfs @ 3.37 fps)





Summary for Subcatchment 2.1S:

Runoff = 64.89 cfs @ 12.09 hrs, Volume= 5.151 af, Depth= 7.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

A *	rea 6. 1. 0. 0. 0. 8. 1. 6.	(ac) 200 400 300 <u>300</u> 200 300))))))		2 <u>N</u> 98 74 71 98 56 92		De Pa >7 Me Pe We Pe Im	ve 5% ate eig ervi pe	rip d p lov r S ou hte ou rvi	tion arl àras v, r Sur Sur s F ed s F ous	n kir ss fac Av Av s A	lg cc n-c ce ver ver va Are	<u> </u>	roc er, ze ent e	ofs Go d,	DOO HS	d, I SG	HS C	G	С																			
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Summary for Subcatchment 2.2S:

Runoff = 26.11 cfs @ 12.00 hrs, Volume= 1.620 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area (ac)	CN	Description
0.300	98	Paved parking & roofs
0.500	74	>75% Grass cover, Good, HSG C
1.400	71	Meadow, non-grazed, HSG C
1.500	70	Woods, Good, HSG C
3.700	73	Weighted Average
3.400		Pervious Area
0.300		Impervious Area

Subcatchment 2.2S:



Summary for Reach DP2: Design Point 2

Inflow Area	a =	11.900 ac, 5	5.46% Impervious,	Inflow Depth = 6.	83" for 100-yr event
Inflow	=	59.14 cfs @	12.15 hrs, Volume	= 6.770 af	
Outflow	=	59.14 cfs @	12.15 hrs, Volume	= 6.770 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Hydrograph 65 - Inflow 59.14 cfs 60 Outflow Inflow Area=11.900 ac 55 50 45 40 **(cts)** 35 **Plo** 30-25 20-15 10-5-0-10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó Time (hours)

Reach DP2: Design Point 2

Summary for Pond 2.1P: Mircopool Extended Detention Pond (P-1)

Inflow Area	a =	8.200 ac, 7	6.83% Impervior	us, Inflow Depth =	7.54" for 100-yr ev	ent
Inflow	=	64.89 cfs @	12.09 hrs, Volu	me= 5.15	af	
Outflow	=	48.63 cfs @	12.16 hrs, Volu	me= 5.150) af, Atten= 25%, Lag=	= 4.6 min
Primary	=	48.63 cfs @	12.16 hrs, Volu	me= 5.150) af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 620.00' Surf.Area= 11,200 sf Storage= 37,300 cf Peak Elev= 624.49' @ 12.16 hrs Surf.Area= 20,125 sf Storage= 106,871 cf (69,571 cf above start) Flood Elev= 625.00' Surf.Area= 21,300 sf Storage= 117,450 cf (80,150 cf above start)

Plug-Flow detention time= 656.7 min calculated for 4.293 af (83% of inflow) Center-of-Mass det. time= 480.9 min (1,248.4 - 767.5)

Volume	Inv	ert Avail.Sto	rage Stora	ge Description	
#1	612.0	00' 139,90	00 cf Custo	om Stage Data (Pi	rismatic) Listed below (Recalc)
		0 ()		0 0	
Elevation	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
612.0	00	1,700	0	0	
614.(00	2,700	4,400	4,400	
616.0	00	4,000	6,700	11,100	
618.0	00	5,500	9,500	20,600	
620.0	00	11,200	16,700	37,300	
622.0	00	14,900	26,100	63,400	
624.0	00	19,000	33,900	97,300	
626.0	00	23,600	42,600	139,900	
Device	Routing	Invert	Outlet Dev	ces	
#1	Primary	620.00'	2.6" Vert. (Drifice/Grate C=	0.600
#2	Primary	623.00'	8.0' long x	0.5' breadth Broa	ad-Crested Rectangular Weir
	-		Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Eng	lish) 2.80 2.92 3	.08 3.30 3.32
			τ υ	,	

Primary OutFlow Max=48.00 cfs @ 12.16 hrs HW=624.48' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.37 cfs @ 10.06 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 47.63 cfs @ 4.03 fps)



Pond 2.1P: Mircopool Extended Detention Pond (P-1)



Summary for Subcatchment 3.1S:

Runoff = 2.37 cfs @ 12.01 hrs, Volume= 0.162 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area	(ac)	CN	Description
0.	100	98	Paved roads w/curbs & sewers
0.	300	74	>75% Grass cover, Good, HSG C
1.	200	71	Meadow, non-grazed, HSG C
0.	800	70	Woods, Good, HSG C
2.	400	72	Weighted Average
2.	300		Pervious Area
0.	100		Impervious Area



Summary for Subcatchment 3.1S:

Runoff = 3.43 cfs @ 12.01 hrs, Volume= 0.224 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac)	CN	Description
0.1	100	98	Paved roads w/curbs & sewers
0.3	300	74	>75% Grass cover, Good, HSG C
1.2	200	71	Meadow, non-grazed, HSG C
0.8	300	70	Woods, Good, HSG C
2.4	400	72	Weighted Average
2.3	300		Pervious Area
0.1	100		Impervious Area



Summary for Subcatchment 3.1S:

Runoff = 7.30 cfs @ 12.01 hrs, Volume= 0.455 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

<u> </u>	rea (ac)	CN	Description
	0.100	98	Paved roads w/curbs & sewers
	0.300	74	>75% Grass cover, Good, HSG C
	1.200	71	Meadow, non-grazed, HSG C
	0.800	70	Woods, Good, HSG C
	2.400	72	Weighted Average
	2.300		Pervious Area
	0.100		Impervious Area



Summary for Subcatchment 3.1S:

Runoff = 9.67 cfs @ 12.00 hrs, Volume= 0.599 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (a	c) CN	Description
0.10	0 98	Paved roads w/curbs & sewers
0.30	0 74	>75% Grass cover, Good, HSG C
1.20	0 71	Meadow, non-grazed, HSG C
0.80	0 70	Woods, Good, HSG C
2.40	0 72	Weighted Average
2.30	00	Pervious Area
0.10	00	Impervious Area



Summary for Subcatchment 3.1S:

Runoff = 16.57 cfs @ 12.00 hrs, Volume= 1.027 af, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area (ac)	CN	Description
0.100	98	Paved roads w/curbs & sewers
0.300	74	>75% Grass cover, Good, HSG C
1.200	71	Meadow, non-grazed, HSG C
0.800	70	Woods, Good, HSG C
2.400	72	Weighted Average
2.300		Pervious Area
0.100		Impervious Area

Subcatchment 3.1S:

Hydrograph 18 - Runoff 16.57 cfs 17 16 Type III 24-hr 100-yr 15 Rainfall=8.50" 14 13 Runoff Area=2.400 ac 12 11 Runoff Volume=1.027 af **Flow (cfs)** Runoff Depth=5.14" 8-Tc=0.0 min 7-CN=72 6-5 4-3-2 1 0-10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 0 Time (hours)



Summary for Subcatchment 4.1S:

Runoff = 1.09 cfs @ 12.10 hrs, Volume= 0.086 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (ac) CN Description	
0.100 98 Paved parking & roofs	
0.100 74 >75% Grass cover, Good, HSG C 0.900 71 Meadow, non-grazed, HSG C	
0.100 70 Woods, Good, HSG C	
1.200 /3 Weighted Average 1.100 Pervious Area	
0.100 Impervious Area	
Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs)	
6.0 Direct Entry,	
Subcatchment 4.1S:	
Hydrograph	
Type III 24-hr 1-yr	- Runoff
Rainfall=3.00"	
Runoff Area=1.200 ac	
☞ Runoff Volume=0.086 af	
Bunoff Depth=0.86"	
Tc=6.0 min	
CN=73	
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300	

Summary for Subcatchment 4.1S:

Runoff = 1.56 cfs @ 12.10 hrs, Volume= 0.118 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac) CN	Description	
0.100 98	Paved parking & roofs	
0.100 74	>75% Grass cover, Good, HSG C	
0.900 71	Meadow, non-grazed, HSG C	
0.100 70	Woods, Good, HSG C	
1.200 73	Weighted Average	
1.100	Pervious Area	
0.100	Impervious Area	
To Length S	Slone Velocity Canacity Description	
(min) (feet)	(ft/ft) (ft/sec) (cfs)	
6.0	Direct Entry,	_
	Subcatchment 4.1S:	
	Hydrograph	
1.56 cfs	- Runoff	
	Type III 24-hr 2-yr	
	Rainfall=3.50"	
	Runoff Area=1.200 ac	



Summary for Subcatchment 4.1S:

Runoff = 3.24 cfs @ 12.10 hrs, Volume= 0.236 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area (ac)	CN	Description									
0.100	98	8 Paved parking & roofs									
0.100	74 71	74 >75% Grass cover, Good, HSG C									
0.900	70	Woods, Goo	d, HSG C								
1.200	73	Weighted Av	erage								
1.100		Pervious Are	a								
0.100		Impervious P	rea								
Tc Leng	gth S	Slope Velocit	y Capacity	Description							
(min) (fe	et)	(ft/ft) (ft/sec) (CIS)	Direct Entry							
0.0				Direct Linuy,							
			Subca	atchment 4.1S:							
			Hydro	ograph							
3.24 cfs	3				- Runoff						
3				Type III 24-hr 10-yr							
- 1				Rainfall=5.10"							
				Runoff Area=1.200 ac							
				Bunoff Volume-0 236 af							
cts 2											
Nol				Runoff Deptn=2.36							
-				Tc=6.0 min							
				CN=73							

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Time (hours)

Summary for Subcatchment 4.1S:

Runoff = 4.26 cfs @ 12.09 hrs, Volume= 0.309 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (ac)	CN	Description					
0.100	98	Paved parking & roofs					
0.100	74	>75% Grass cover, Good, HSG C					
0.900	71	Meadow, non-grazed, HSG C					
0.100	70	Woods, Good, HSG C					
1.200	73	Weighted Average					
1.100		Pervious Area					
0.100		Impervious Area					
Tc Leng (min) (fe	Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs)						
6.0		Direct Entry,					
Subcatchment 4.1S:							
- 4.26 cfs							
		Type III 24-hr 25-yr					



Summary for Subcatchment 4.1S:

Runoff = 7.22 cfs @ 12.09 hrs, Volume= 0.526 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	a (ac)	CN	Desc	cription					
(0.100	98 74	Pave	ed parking	& roofs over Good	HSG C			
(0.900	71	Mea	dow, non-	grazed, HS	G C			
(0.100	70	Woo	ds, Good,	HSG C				
	1.200	73	Weię Perv	ghted Avei ious Area	rage				
(0.100		Impe	ervious Are	ea				
Tc (min)	Leng (fee	jth et)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	1		
6.0)					Direct Ent	ry,		
					Subca	atchment 4	1.1S:		
8	.				Hydro	ograph			I
J. J	7.22 cfs								- Runoff
7							Type III 24-h	ור 100-yr	
6		 					Rainfa	all=8.50''	
5						R	unoff Area=	1.200 ac	
its)	- 1 1 - 1 1					Run	off Volume=	=0.526 af	
3 3 4							Runoff Dep	th=5.26"	
ш З							Tc	=6.0 min	
-								CN=73	
2									
1	┨ ┨ ┨╴╢╎	 -							
	丨人								
0	0 10 20	30 4	0 50 60	70 80 90 10	0 110 120 130 1	40 150 160 170 18	0 190 200 210 220 230 240 2	250 260 270 280 290 30	

Time (hours)



Summary for Subcatchment 5.1S:

Runoff = 5.63 cfs @ 12.09 hrs, Volume= 0.414 af, Depth= 2.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Are	a (ac)	CN	Desc	cription					
	1.600	98	B Pave	ed parking	& roofs				
	0.200 74 >75% Grass cover, Good, HSG C								
	0.300 /1 Meadow, non-grazed, HSG C								
*	0.200	56	Perv	ious Pave	ment				
	2.400	91	Weig	ghted Aver	rage				
	0.600		Perv	ious Area					
	1.800		Impe	ervious Are	ea				
Т	c Leng	th	Slope	Velocity	Capacity	Description			
(min) (fee	et)	(ft/ft)	(ft/sec)	(cfs)				
6.0)					Direct Entry,			
					Subca	atchment 5.19	3:		
					Hydro	graph			
(- Bunoff	
							Type III 24-hr 1-yr		
:							Rainfall=3.00"		
		-				Bur	off Area-2 400 ac		
4	1 − 1 − − ¹ − − ¹ − − 1 1 1		$\frac{1}{1} = -\frac{1}{1} = -\frac{1}{1} = -\frac{1}{1} = -\frac{1}{1}$	$-\frac{1}{1}\frac{1}{1}\frac{1}{1} - \frac{1}{1}$	$ \frac{1}{1} \frac{1}{1} \frac{1}{1}$				
(cfs)						Runor	T volume=0.414 af		
Ň	3		+ + -			+- -+ R I	unoff Depth=2.07"		
Ē		i					Tc=6.0 min		
		L _	· · · ·				CN_01		
		 					CIN=91		
	 	·	+ + -				· +		
	1 1								
(•	
	U 10 20	30 4	40 50 60	70 80 90 10	130 120 130 14 Tir	40 150 160 170 180 190 ne (hours)	200 210 220 230 240 250 260 270 280 290 30	J	

Summary for Subcatchment 5.2S:

Runoff = 1.49 cfs @ 12.01 hrs, Volume= 0.094 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (ac)	CN	Description
0.100	74	>75% Grass cover, Good, HSG C
0.500	71	Meadow, non-grazed, HSG C
0.300	98	Water Surface
0.900	80	Weighted Average
0.600		Pervious Area
0.300		Impervious Area

Subcatchment 5.2S:



Summary for Subcatchment 5.3S:

Runoff = 22.81 cfs @ 12.09 hrs, Volume= 1.670 af, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

	Area (ac)	CN	Desc	ription					
	6.600	98	Pave	d parking	& roofs				
	1.900	74	>75%	6 Grass co	over, Good	, HSG C			
	0.700	71	Mead	dow, non-g	grazed, HS	GC			
	0.600	98	Wate	er Surface					
*	0.300	56	Perv	ous Pave	ment				
	10.100	90	Weig	hted Aver	age				
	2.900		Perv	ous Area					
	7.200		Impe	rvious Are	a				
			_						
	Tc Len	gth	Slope	Velocity	Capacity	Description			
	(min) (fe	et)	(ft/ft)	(ft/sec)	(cfs)				
	6.0					Direct Entry,			
					Subca	atchment 5.3S:			
	Hydrograph								



Summary for Subcatchment 5.4S:

Runoff = 43.24 cfs @ 12.09 hrs, Volume= 3.206 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

	(min)	(feet	t)	(ft/ft)	(ft/sec)	(cfs)	Beeenption				
	Тс	Lenat	h :	Slope	Velocitv	Capacity	Description				
	14.2	200		Impe	rvious Are	ea					
	3.6	600		Pervi	ious Area	0					
_	17.8	300	92	Weig	hted Aver	age					
*	0.5	500	56	Pervi	Pervious Pavement						
	0.4	400	98	Wate	er Surface						
	0.9	900	71	Mead	dow, non-g	grazed, HS	GC				
	2.2	200	74	>75%	6 Grass co	over, Good,	HSG C				
	13.8	300	98	Pave	d parking	& roofs					
_	Area (ac)	CN	Desc	ription						

Subcatchment 5.4S:



0

Summary for Subcatchment 5.5S:

Runoff = 2.64 cfs @ 12.10 hrs, Volume= 0.204 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (ac)	CN	Descr	iption			
0.100	98	Paveo	d parking	& roofs		
0.100	74	>75%	Grass co	over, Good	I, HSG C	
2.300	71	Mead	ow, non-g	grazed, HS	G C	
0.200	98	Water	r Surface			
2.700	74	Weigh	nted Aver	age		
2.400		Pervic	ous Area			
0.300		imper	vious Are	a		
Tc Leng	gth	Slope	Velocity	Capacity	Description	
(min) (fee	et)	(ft/ft)	(ft/sec)	(CIS)	N	
6.0					Direct Entry,	
				Subos	atahmant 5 59:	
				Subca	alchment 5.55.	
· · · · · · · · · · · · · · · · · · ·				Hydro	ograph	_
2.64 cfs	1					- Runoff
					Type III 24-hr 1-yr	
					Rainfall=3.00"	
2						-
	i i i i					
(s					Runoff Volume=0.204 af	
(ct					Buneff Depth_0.01"	
					Runon Deptn=0.91	
					Tc=6.0 min	
1	$\frac{1}{1}-\frac{1}{1}$				СN_7/-	1

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 **Time (hours)**

Summary for Subcatchment 5.6S:

Runoff = 8.76 cfs @ 12.09 hrs, Volume= 0.635 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (ac)	CN	Desc	ription			
2.100	98	Pave	d parking	& roofs		
1.000	74	>75%	6 Grass co	over, Good	, HSG C	
1.400	71	Mead	dow, non-g	grazed, HS	GC	
0.300	98	Wate	er Surface	-		
4.800	85	Weig	hted Aver	age		
2.400		Pervi	ious Area	-		
2.400		Impe	rvious Are	a		
Tc Leng	th S	Slope	Velocity	Capacity	Description	
(min) (fee	et)	(ft/ft)	(ft/sec)	(cfs)		
6.0					Direct Entry,	
					•	

Subcatchment 5.6S:



Summary for Subcatchment 5.7S:

Runoff = 7.07 cfs @ 12.09 hrs, Volume= 0.513 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (ac) CN Description	
1.700 98 Paved parking & roofs	
0.300 74 >75% Grass cover, G	bod, HSG C
0.700 /1 Meadow, non-grazed,	HSG C
0.800 73 Woods, Fair, HSG C	
3.700 86 Weighted Average	
1.800 Pervious Area	
1.900 Impervious Area	
Tc Length Slope Velocity Capac	tity Description
	IS) Direct Entry
0.0	Direct Litty,
Su	bcatchment 5.7S:
H	ydrograph
7.07 cfs	
	Type III 24-hr 1-yr
6	Rainfall=3.00"
5	Runoff Area=3.700 ac
cts)	Runoff Volume=0.513 af
A=	Runoff Depth=1.66"
3	Tc=6.0 min
	CN=86
2	
1	
	Time (hours)

Summary for Subcatchment 5.8S:

Runoff = 34.08 cfs @ 12.21 hrs, Volume= 3.251 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area	(ac) C	N Des	cription				
4.700 98		98 Pav	Paved parking & roofs				
2.400 74		74 >75	>75% Grass cover, Good, HSG C				
4.500 71		71 Mea	Meadow, non-grazed, HSG C				
10.100 70		70 Wo	Woods, Good, HSG C				
1.200 83		33 Wo	Woods, Poor, HSG D				
1.700 9		98 Wat	Water Surface				
5.100 94 Urban commercial, 85% imp, HSG C							
29.700 81 Weighted Average							
18.965		Per	Pervious Area				
10.735		Imp	Impervious Area				
Tc	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
5.1	100	0.0900	0.32		Sheet Flow,		
					Grass: Short n= 0.150 P2= 3.50"		
1.4	136	0.0500	1.57		Shallow Concentrated Flow,		
					Short Grass Pasture Kv= 7.0 fps		
8.4	2,600	0.0390	5.15	10.30	Trap/Vee/Rect Channel Flow,		
					Bot.W=3.00' D=0.50' Z= 2.0 '/' Top.W=5.00'		
					n= 0.030 Earth, grassed & winding		
14.9	2,836	Total					

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Summary for Reach DP 5: Design Point 5

Inflow A	rea =	72.100 ac, 5	53.86% Impervious,	Inflow Depth > 1.0	62" for 1-yr event
Inflow	=	34.39 cfs @	12.21 hrs, Volume	= 9.753 af	
Outflow	=	34.39 cfs @	12.21 hrs, Volume	= 9.753 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Hydrograph 38-- Inflow 36 34.39 cfs Outflow 34 Inflow Area=72.100 ac 32 30 28 26 24 22-(s) 22 20 Flow 18-16 14-12-10 8 6-4 2 0-10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó Time (hours)

Reach DP 5: Design Point 5
Summary for Pond 5.1P: Pocket Wetland (W-4)

Inflow Area	ι =	2.400 ac, 7	5.00% Impe	ervious, Inflow De	epth = 2.0	7" for 1-yr	event
Inflow	=	5.63 cfs @	12.09 hrs,	Volume=	0.414 af		
Outflow	=	0.17 cfs @	16.18 hrs,	Volume=	0.413 af,	Atten= 97%,	Lag= 245.5 min
Primary	=	0.17 cfs @	16.18 hrs,	Volume=	0.413 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 678.00' Surf.Area= 9,300 sf Storage= 19,400 cf Peak Elev= 679.18' @ 16.18 hrs Surf.Area= 11,961 sf Storage= 31,971 cf (12,571 cf above start) Flood Elev= 681.00' Surf.Area= 16,250 sf Storage= 57,525 cf (38,125 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow) Center-of-Mass det. time= 1,022.2 min (1,827.1 - 804.9)

Volume	Inv	ert Avai	I.Storage	Storage	e Description	
#1	672.0)0'	75,000 cf	Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	n t)	Surf.Area (sq-ft)	Inc (cubi	Store <u>c-feet)</u>	Cum.Store (cubic-feet)	
672.0 674.0 676.0 678.0 680.0 682.0	0 0 0 0 0 0	300 1,600 3,300 9,300 13,800 18,700	1	0 1,900 4,900 12,600 23,100 32,500	0 1,900 6,800 19,400 42,500 75,000	
Device	Routing	In	vert Outl	et Device	es	
#1 #2	Primary Primary	678 680	.00' 2.5'' .00' 8.0' Hea Coe	Vert. Or long x 0 d (feet) (f. (Englis	ifice/Grate C= (0.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=0.17 cfs @ 16.18 hrs HW=679.18' TW=666.27' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.17 cfs @ 5.00 fps) -2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Hydrograph 6 5.63 cfs Inflow - Primary Inflow Area=2.400 ac 5 **Peak Elev=679.18'** Storage=31,971 cf 4-Flow (cfs) 3-2-1 0.17 cfs 0 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Time (hours)

Pond 5.1P: Pocket Wetland (W-4)

Summary for Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area =	3.300 ac, 63.64% Impervious, Inflow	<pre>/ Depth = 1.84" for 1-yr event</pre>
Inflow =	1.59 cfs @ 12.01 hrs, Volume=	0.507 af
Outflow =	0.20 cfs @ 17.93 hrs, Volume=	0.505 af, Atten= 87%, Lag= 355.7 min
Primary =	0.20 cfs @ 17.93 hrs, Volume=	0.505 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 666.00' Surf.Area= 13,600 sf Storage= 42,650 cf Peak Elev= 666.28' @ 17.93 hrs Surf.Area= 14,407 sf Storage= 46,545 cf (3,895 cf above start) Flood Elev= 669.00' Surf.Area= 22,350 sf Storage= 96,525 cf (53,875 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow) Center-of-Mass det. time= 471.8 min (2,116.4 - 1,644.7)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	660.5	50' 120,3	50 cf Custor	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatic (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
660.5	50	4,400	0	0	
662.0	00	5,800	7,650	7,650	
664.0)0	7,800	13,600	21,250	
666.0	00	13,600	21,400	42,650	
668.0	00	19,400	33,000	75,650	
670.0	00	25,300	44,700	120,350	
Device	Routing	Invert	Outlet Devic	es	
#1	Primary	666.00'	6.0" Vert. Or	rifice/Grate C=	0.600
#2	Primary	668.25'	5.0' long x (Head (feet) Coef. (Englis	0.5' breadth Broa 0.20 0.40 0.60 sh) 2.80 2.92 3.	ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=0.20 cfs @ 17.93 hrs HW=666.28' TW=655.61' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 0.20 cfs @ 1.80 fps) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 5.3P: Micropool Extended Detention (P-1)

Inflow Area	ι =	13.400 ac, 69.40% Impervious, Inflow Depth = 1.95" for 1-yr event	
Inflow	=	22.85 cfs @ 12.09 hrs, Volume= 2.175 af	
Outflow	=	1.14 cfs @ 15.34 hrs, Volume= 2.168 af, Atten= 95%, Lag= 194.9 min	I.
Primary	=	1.14 cfs @ 15.34 hrs, Volume= 2.168 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 654.00' Surf.Area= 24,400 sf Storage= 64,450 cf Peak Elev= 655.70' @ 15.34 hrs Surf.Area= 30,172 sf Storage= 110,770 cf (46,320 cf above start) Flood Elev= 657.00' Surf.Area= 34,800 sf Storage= 153,050 cf (88,600 cf above start)

Plug-Flow detention time= 2,235.2 min calculated for 0.688 af (32% of inflow) Center-of-Mass det. time= 638.4 min (1,751.2 - 1,112.8)

Volume	Inve	ert Avail.Sto	orage Storage	e Description	
#1	649.0	0' 189,6	50 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	on it)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
649.0	0	7,900	0	0	
650.0	0	9,000	8,450	8,450	
652.0	0	11,300	20,300	28,750	
654.0	00	24,400	35,700	64,450	
656.0	00	31,200	55,600	120,050	
658.0	00	38,400	69,600	189,650	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	654.00'	6.0" Vert. Or	ifice/Grate C=	0.600
#2	Primary	655.75'	8.0' long x 0 Head (feet) Coef. (Englis	0.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	ad-Crested Rectangular Weir 0.80 1.00 .08 3.30 3.32

Primary OutFlow Max=1.14 cfs @ 15.34 hrs HW=655.70' TW=624.09' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 1.14 cfs @ 5.79 fps) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5.3P: Micropool Extended Detention (P-1)



Summary for Pond 5.4P: Micropool Extended Detention Pond (P-1)

Inflow Area	a =	17.800 ac, 79.78% Impervious, Inflow Depth	= 2.16" for 1-yr event
Inflow	=	43.24 cfs @ 12.09 hrs, Volume= 3.2	:06 af
Outflow	=	23.85 cfs @ 12.22 hrs, Volume= 3.0	33 af, Atten= 45%, Lag= 8.0 min
Primary	=	23.85 cfs @ 12.22 hrs, Volume= 3.0	33 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 636.00' Surf.Area= 17,300 sf Storage= 69,900 cf Peak Elev= 638.53' @ 12.22 hrs Surf.Area= 25,192 sf Storage= 123,805 cf (53,905 cf above start) Flood Elev= 640.00' Surf.Area= 29,488 sf Storage= 163,964 cf (94,064 cf above start)

Plug-Flow detention time= 3,453.5 min calculated for 1.428 af (45% of inflow) Center-of-Mass det. time= 1,550.4 min (2,350.5 - 800.1)

Volume	Inve	ert Avail.Sto	rage	Storage D	escription	
#1	628.0	0' 195,3	08 cf	Custom S	tage Data (Pr	ismatic) Listed below (Recalc)
Elevatior (feet)	ו))	Surf.Area (sq-ft) 4 600	Inc (cubio	.Store <u>c-feet)</u> 0	Cum.Store (cubic-feet) 0	
630.00)	6,100	1	0,700	10,700	
632.00)	7,900	1	4,000	24,700	
634.00)	10,000	1	7,900	42,600	
636.00)	17,300	2	27,300	69,900	
638.00)	23,638	4	0,938	110,838	
640.00)	29,488	5	53,126	163,964	
641.00)	33,200	3	31,344	195,308	
Device	Routing	Invert	Outle	et Devices		
#1 #2	Primary Primary	636.00' 637.60'	1.0'' 8.0' Head Coet	Vert. Orific long x 0.5' d (feet) 0.2 f. (English)	ce/Grate C= 0 breadth Broad 20 0.40 0.60 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=23.59 cfs @ 12.22 hrs HW=638.52' TW=620.86' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.04 cfs @ 7.59 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 23.55 cfs @ 3.18 fps)





Summary for Pond 5.5P: Extended Detention Pond (Design 2) - Dry Pond

Inflow Are	a =	33.900 ac, 7	70.21% Impervious,	Inflow Depth >	1.91" for	1-yr event
Inflow	=	26.41 cfs @	12.22 hrs, Volume	= 5.405 a	af	
Outflow	=	1.68 cfs @	21.61 hrs, Volume	= 5.357 a	af, Atten=	94%, Lag= 563.6 min
Primary	=	1.68 cfs @	21.61 hrs, Volume	= 5.357 a	af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Peak Elev= 625.02' @ 21.61 hrs Surf.Area= 29,141 sf Storage= 121,964 cf Flood Elev= 629.00' Surf.Area= 40,550 sf Storage= 259,975 cf

Plug-Flow detention time= 2,981.1 min calculated for 5.357 af (99% of inflow) Center-of-Mass det. time= 2,846.8 min (4,900.8 - 2,054.0)

Volume	Inve	rt Avail.Sto	rage St	orage	Description	
#1	620.00	0' 302,10	00 cf C	ustom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	n S t)	Surf.Area (sq-ft)	Inc.St (cubic-fe	ore eet)	Cum.Store (cubic-feet)	
620.0	0	20,400		0	0	
622.0	0	23,400	43,8	300	43,800	
624.0	0	26,500	49,9	900	93,700	
626.0	0	31,700	58,2	200	151,900	
628.0	0	37,400	69, ⁻	100	221,000	
630.0	0	43,700	81,	100	302,100	
Device	Routing	Invert	Outlet I	Device	S	
#1	Primary	620.00'	2.5" Ve	rt. Ori	fice/Grate C= (0.600
#2	Primary	624.50'	18.0'' V	ert. Or	rifice/Grate C=	0.600
#3	Primary	627.00'	8.0' lon	g x 0.	5' breadth Broa	ad-Crested Rectangular Weir
	-		Head (f	eet) 0	.20 0.40 0.60	0.80 1.00
			Coef. (I	Engĺisł	n) 2.80 2.92 3.	08 3.30 3.32
Duine a m	0 F I			IN		

Primary OutFlow Max=1.68 cfs @ 21.61 hrs HW=625.02' TW=0.00' (Dynamic Tailwater) **1=Orifice/Grate** (Orifice Controls 0.36 cfs @ 10.67 fps)

2=Orifice/Grate (Orifice Controls 0.36 cis @ 10.67 ips)

-2=Ormce/Grate (Ormce Controls 1.32 cis @ 2.45 lps)



Pond 5.5P: Extended Detention Pond (Design 2) - Dry Pond

Summary for Pond 5.6P: Pocket Wetland (W-4)

Inflow Area	=	4.800 ac, 5	50.00% Impe	ervious,	Inflow Depth	= 1.	59" for	1-yr	event	
Inflow	=	8.76 cfs @	12.09 hrs,	Volume	= 0.6	35 af				
Outflow	=	0.15 cfs @	20.23 hrs,	Volume	= 0.6	34 af,	Atten=	98%,	Lag= 488	3.4 min
Primary	=	0.15 cfs @	20.23 hrs,	Volume	= 0.6	34 af				

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 609.00' Surf.Area= 7,500 sf Storage= 15,000 cf Peak Elev= 611.26' @ 20.23 hrs Surf.Area= 11,552 sf Storage= 36,285 cf (21,285 cf above start) Flood Elev= 614.00' Surf.Area= 17,000 sf Storage= 75,400 cf (60,400 cf above start)

Plug-Flow detention time= 2,953.9 min calculated for 0.290 af (46% of inflow) Center-of-Mass det. time= 1,684.9 min (2,513.9 - 829.0)

volume	Invert	Avail.Stor	rage St	orage De	escription		
#1	601.00'	93,40	0 cf C	ustom St	age Data (Pr	ismatic) Listed below (Recalc)	
Elevation (feet)	Surf. (Area sq-ft)	Inc.Ste (cubic-fe	ore eet)	Cum.Store (cubic-feet)		
601.00	· · · · · · · · · · · · · · · · · · ·	220	•	0	0		
602.00		360	2	290	290		
604.00		850	1,2	210	1,500		
606.00	1	,900	2,7	750	4,250		
608.00	3	3,400	5,3	300	9,550		
609.00	7	7,500	5,4	150	15,000		
610.00	ę	9,100	8,3	300	23,300		
612.00	13	3,000	22,1	00	45,400		
614.00	17	7,000	30,0	000	75,400		
615.00	19	9,000	18,0	000	93,400		
Device R	outing	Invert	Outlet [Devices			
#1 Pr	rimary	609.00'	2.0" Ve	rt. Orific	e/Grate C=	0.600	
#2 Pi	rimary	613.50'	2.5' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef (English) 2.80 2.92 3.08 3.30 3.32				

Primary OutFlow Max=0.15 cfs @ 20.23 hrs HW=611.26' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.15 cfs @ 7.10 fps) -2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Hydrograph Inflow 8.76 cfs 9-- Primary Inflow Area=4.800 ac 8-Peak Elev=611.26' 7-Storage=36,285 cf 6-Flow (cfs) 5-4-3-2-1-0.15 cfs Z 0-10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó Time (hours)

Pond 5.6P: Pocket Wetland (W-4)

Summary for Pond 5.7P: Pocket Wetland (W-4)

Inflow Area	=	3.700 ac, 5	1.35% Impe	ervious, Inflow D	Depth = 1.66"	for 1-yr e	event
Inflow	=	7.07 cfs @	12.09 hrs,	Volume=	0.513 af		
Outflow	=	0.39 cfs @	14.64 hrs,	Volume=	0.511 af, Att	ten= 94%,	Lag= 152.7 min
Primary	=	0.39 cfs @	14.64 hrs,	Volume=	0.511 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 8,300 sf Storage= 18,240 cf Peak Elev= 657.56'@ 14.64 hrs Surf.Area= 11,184 sf Storage= 33,425 cf (15,185 cf above start) Flood Elev= 659.00' Surf.Area= 13,750 sf Storage= 51,415 cf (33,175 cf above start)

Plug-Flow detention time= 5,461.6 min calculated for 0.092 af (18% of inflow) Center-of-Mass det. time= 2,006.2 min (2,831.6 - 825.4)

Volume	Inv	ert Ava	il.Storage	Storage	Description					
#1	648.	00'	66,040 cf	Custom	n Stage Data (Pr	rismatic) Listed below (Recalc)				
Elevatio	on	Surf.Area	Inc	c.Store	Cum.Store					
(fee	et)	(sq-ft)	(cubi	c-feet)	(cubic-feet)					
648.0	00	240		0	0					
650.0	00	650		890	890					
652.0	00	1,400		2,050	2,940					
654.0	00	2,800		4,200	7,140					
656.0	00	8,300		11,100	18,240					
658.0	00	12,000		20,300	38,540					
660.0	JÜ	15,500		27,500	66,040					
Device	Routing	In	vert Out	let Device	es					
#1	Primary	656	6.00' 1.5' '	Vert. Ori	fice/Grate C=	0.600				
#2	Primary	657	'.50' 8.0'	long x 0	.5' breadth Broa	ad-Crested Rectangular Weir				
			Hea	d (feet)	0.20 0.40 0.60	0.80 1.00				
			Coe	Coef. (English) 2.80 2.92 3.08 3.30 3.32						

Primary OutFlow Max=0.39 cfs @ 14.64 hrs HW=657.56' TW=0.00' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 0.07 cfs @ 5.89 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 0.32 cfs @ 0.68 fps)

Hydrograph Inflow 7.07 cfs Primary 7 Inflow Area=3.700 ac 6-Peak Elev=657.56' Storage=33,425 cf 5-Flow (cfs) 4-3-2-1 0.39 cfs 0-0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Time (hours)

Pond 5.7P: Pocket Wetland (W-4)

Summary for Subcatchment 5.1S:

Runoff = 6.84 cfs @ 12.09 hrs, Volume= 0.508 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Ar	ea (ac) CN	Des	cription			
+	1.0 0.2 0.2	500 98 200 74 300 71 200 98	B Pave >75° Mea B Wat	ed parking % Grass co dow, non-g er Surface	& roofs over, Good grazed, HS	I, HSG C iG C	
	0.	100 56 100 91	i Perv Wai	hted Aver	ment		
	0.0	500 51 500	Perv	rious Area	age		
	1.8	300	Impe	ervious Are	ea		
(mi	Гс n)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
6	.0					Direct Entry,	
					Subca	atchment 5.1S:	
					Hydro	ograph	
	1 7 7	6.84 cfs					- Runoff
						Type III 24-hr 2-yr	
	6					Rainfall=3.50"	
	5-			 - - - - -	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Runoff Area=2.400 ac	
fs)	-					Runoff Volume=0.508 af	
o) wol	4					Runoff Depth=2.54"	
ш	3					Tc=6.0 min	
						CN=91	
	2-		+			**-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*	
			 + +-				
		K					
	0	10 20 30	40 50 60	70 80 90 10	0 110 120 130 1	40 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 30	0
					Ti	me (hours)	

Summary for Subcatchment 5.2S:

Runoff = 1.98 cfs @ 12.01 hrs, Volume= 0.123 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac)	CN	Description
0.1	00	74	>75% Grass cover, Good, HSG C
0.5	500	71	Meadow, non-grazed, HSG C
0.3	300	98	Water Surface
0.9	000	80	Weighted Average
0.6	600		Pervious Area
0.3	300		Impervious Area

Subcatchment 5.2S:



Summary for Subcatchment 5.3S:

Runoff = 27.93 cfs @ 12.09 hrs, Volume= 2.060 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac)	CN	l Desc	cription			
6.600 1.900	98 74	8 Pave >75%	ed parking % Grass co	& roofs over, Good	d, HSG C	
0.700	71	Mea	dow, non-(grazed, HS	SG C	
* 0.300	90 56	6 Vale 6 Perv	ious Pave	ment		
10.100	90) Weię	phted Aver	age		
2.900 7.200		Impe	ious Area ervious Are	ea		
Tc Ler (min) (f	ngth eet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
6.0					Direct Entry,	
				Subca	atchment 5.3S:	
			<u> </u>	Hydro	ograph	
30 <u>27.93 c</u>	ofs					Runoff
26		$\begin{array}{c} \mathbf{r} = -\mathbf{l} = -\mathbf{r} = $			Type III 24-hr 2-yr	
24					Rainfall=3.50"	
20					Runoff Area=10.100 ac	
<u>و</u> 18					Runoff Volume=2.060 af	
b 16		$\frac{1}{1} = -\frac{1}{1} =$			Runoff Depth=2.45"	
ب '۲ - 12	i i -	$\begin{array}{ccc} & & & \\ & & & \\ \\ & & \\ \\ T1 T - \end{array}$			Tc=6.0 min	
10					CN=90	
8						
6		;; ; - , - , - , - , - ,				
2		$\begin{array}{ccc} & & & & & - & - & - & - & - & - & - & $				
0 10 2	20 30 4	00 00 00	10 00 90 10	Tin	ine (hours)	

Summary for Subcatchment 5.4S:

Runoff = 52.26 cfs @ 12.09 hrs, Volume= 3.911 af, Depth= 2.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) CN	Desc	ription				
13. 2. 0. 0. * 0.	800 98 200 74 900 71 400 98 500 56	Pave >75% Mead Wate Pervi	d parking 6 Grass co dow, non- <u>c</u> er Surface fous Pave	& roofs over, Good grazed, HS ment	, HSG C G C		
17. 3. 14.	800 92 600 200	2 Weig Pervi Impe	hted Aver ous Area rvious Are	age ea	D		
(min)	Length (feet)	Siope (ft/ft)	(ft/sec)	Capacity (cfs)	Description		
6.0	(1001)	(1210)	(1000)	(0.0)	Direct Entry,		
				Subca	atchment 5.4S	6:	
-				Hydro	graph		7
55 5 50 45 40 35 30 80 80 80 80 80 80 80 80 80 80 80 80 80	2.26 cfs 				Runo Runof Ru	Type III 24-hr 2-yr Rainfall=3.50" off Area=17.800 ac f Volume=3.911 af unoff Depth=2.64" Tc=6.0 min	- Runoff
20	- <u> </u>					CN-92	_
15- 10- 5-							-
0	10 20 30 4	0 50 60	70 80 90 100) 110 120 130 14 Tin	40 150 160 170 180 190 ne (hours)	200 210 220 230 240 250 260 270 280 290 3	00

Summary for Subcatchment 5.5S:

Runoff = 3.72 cfs @ 12.10 hrs, Volume= 0.279 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac)	CN	Desc	cription			
0.100	98	Pave	ed parking	& roofs		
0.100	74	>75%	% Grass co	over, Good	, HSG C	
2.300	71	Mea	dow, non-g	grazed, HS	GC	
0.200	98	Wate	er Surface			
2.700	74	· Weię	phted Aver	rage		
2.400		Perv	ious Area	2		
0.000		impe		a		
Tc Le	ngth	Slope	Velocity	Capacity	Description	
(min) (1	feet)	(ft/ft)	(ft/sec)	(cfs)	-	
6.0					Direct Entry,	
				Subca	atchment 5.5S:	
				Hydro	ograph	
3.72	cfs					- Runoff
					Type III 24-hr 2-yr	1
						1
3+		+ + -			Raintaii=3.50	l
					Runoff Area=2.700 ac	1
					Pupoff Volumo-0 270 of	l
(cts)						l
ð 2		+ + -	·		Runoff Depth=1.24"	l
E 1					Tc=6_0 min	1
						1
-					GN=/4	l
1	$\cdot - \begin{vmatrix} - & - & - \\ - & - & - \end{vmatrix} - $	+	·	$\frac{1}{1}-\frac{1}{1}-\frac{1}{1}-\frac{1}{1}-\frac{1}{1}$		1
						1
						1
						1

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Time (hours)

Summary for Subcatchment 5.6S:

Runoff = 11.12 cfs @ 12.09 hrs, Volume= 0.807 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac) CN Description		
2.100 98 Paved parking & roofs 1.000 74 >75% Grass cover. Go	ood HSG C	
1.400 71 Meadow, non-grazed, l	HSG C	
4.800 85 Weighted Average		
2.400 Pervious Area 2.400 Impervious Area		
Tc Length Slope Velocity Capaci (min) (feet) (ft/ft) (ft/sec) (cf	ity Description is)	
6.0	Direct Entry,	
Sub	ocatchment 5.6S:	
	/drograph	
$12 \frac{1}{11.12 \text{ cfs}} + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +$		- Runoff
	Type III 24-hr 2-yr	
9	Rainfall=3.50"	
	Runoff Area=4.800 ac	
(in the second s	Runoff Volume=0.807 af	
	Runoff Depth=2.02"	
5	Tc=6.0 min-	
	CN=85	
2		
0 10 20 30 40 50 60 70 80 90 100 110 120 13	30 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Time (hours)	

Summary for Subcatchment 5.7S:

Runoff = 8.90 cfs @ 12.09 hrs, Volume= 0.647 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) (CN	Desc	ription				
1	.700	98	Pave	d parking	& roofs			
0).300	74 71	>75%	6 Grass co	over, Good	, HSG C		
).800	73	Woo	ds. Fair. F	ISG C	GC		
0).200	98	Wate	er Surface				
3	3.700	86	Weig	hted Aver	rage			
1	.800		Pervi	ious Area	22			
ľ			mpe		Ju			
Tc	Length	SI	ope	Velocity	Capacity	Description		
(min)	(teet)	(1	t/ft)	(ft/sec)	(CfS)	Direct Entry		
6.0						Direct Entry,		
					Subca	atchment 5.7S	6:	
					Hydro	ograph		
-								- Rupoff
9-	8.90 cfs							
-							Type III 24-hr 2-yr	
_						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Rainfall=3.50"	
/-						Run	off Area=3.700 ac	
cfs) 				\neg		Runof	f Volume=0.647 af	
o Nol		 + 					unoff Depth=2.10"	
4-		 + 					Tc=6.0 min-	-
3_			 				CN=86	
2-		+	⊨ _					1
1-								1
-						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
0-	0 10 20 3	0 40 5	i0 60	70 80 90 10	0 110 120 130 1	40 150 160 170 180 190		# 00
					Ti	me (nours)		

Summary for Subcatchment 5.8S:

Runoff = 44.73 cfs @ 12.21 hrs, Volume= 4.229 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) C	N Des	cription						
4.	700	98 Pav	ed parking	& roofs					
2.4	400	74 >75	% Grass c	over, Good	, HSG C				
4.	500	71 Mea	adow, non-	grazed, HS	GC				
10.	100	70 Wo	ods, Good,	HSG C					
1.:	200	83 Wo	Woods, Poor, HSG D						
1.1	1.700 98 Water Surface								
5.	100	94 Urb	an comme	<u>rcial, 85% i</u> i	mp, HSG C				
29.	700	81 We	ighted Ave	rage					
18.	965	Per	vious Area						
10.	735	Imp	ervious Are	ea					
Tc	Length	Slope	Velocity	Capacity	Description				
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)					
5.1	100	0.0900	0.32		Sheet Flow,				
					Grass: Short n= 0.150 P2= 3.50"				
1.4	136	0.0500	1.57		Shallow Concentrated Flow,				
					Short Grass Pasture Kv= 7.0 fps				
8.4	2,600	0.0390	5.15	10.30	Trap/Vee/Rect Channel Flow,				
					Bot.W=3.00' D=0.50' Z= 2.0 '/' Top.W=5.00'				
					n= 0.030 Earth, grassed & winding				
14.9	2,836	Total							

Subcatchment 5.8S:



Summary for Reach DP 5: Design Point 5

Inflow Are	ea =	72.100 ac, 5	53.86% Impervious,	Inflow Depth > 2	.05" for 2-yr event
Inflow	=	45.12 cfs @	12.21 hrs, Volume	= 12.330 af	
Outflow	=	45.12 cfs @	12.21 hrs, Volume	= 12.330 af	, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Reach DP 5: Design Point 5



Summary for Pond 5.1P: Pocket Wetland (W-4)

Inflow Area	a =	2.400 ac, 7	'5.00% Impe	ervious,	Inflow De	pth =	2.54"	for 2-yr	event	
Inflow	=	6.84 cfs @	12.09 hrs,	Volume	=	0.508	af			
Outflow	=	0.19 cfs @	16.51 hrs,	Volume	=	0.507	af, Atte	en= 97%,	Lag= 265.1 mir	ı
Primary	=	0.19 cfs @	16.51 hrs,	Volume	=	0.507	af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 678.00' Surf.Area= 9,300 sf Storage= 19,400 cf Peak Elev= 679.44'@ 16.51 hrs Surf.Area= 12,542 sf Storage= 35,137 cf (15,737 cf above start) Flood Elev= 681.00' Surf.Area= 16,250 sf Storage= 57,525 cf (38,125 cf above start)

Plug-Flow detention time= 3,310.8 min calculated for 0.062 af (12% of inflow) Center-of-Mass det. time= 1,105.3 min (1,904.5 - 799.2)

Volume	Inve	rt Avail.Sto	rage Storage	ge Storage Description				
#1	672.0	0' 75,0	00 cf Custon	n Stage Data (Pri	ismatic) Listed below (Recalc)			
Elevatio (feet	n S t)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)				
672.0 674.0 676.0 678.0 680.0 682.0	0 0 0 0 0 0	300 1,600 3,300 9,300 13,800 18,700	0 1,900 4,900 12,600 23,100 32,500	0 1,900 6,800 19,400 42,500 75,000				
Device	Routing	Invert	Outlet Device	es				
#1 #2	Primary Primary	678.00' 680.00'	2.5" Vert. Or 8.0' long x 0 Head (feet) Coef. (Englis	ifice/Grate C= 0 .5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	0.600 Id-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32			

Primary OutFlow Max=0.19 cfs @ 16.51 hrs HW=679.44' TW=6666.31' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 0.19 cfs @ 5.57 fps) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Hydrograph - Inflow 6.84 cfs 7 Primary Inflow Area=2.400 ac 6-Peak Elev=679.44' Storage=35,137 cf 5-Flow (cfs) 4 3-2-1 0.19 cfs 0-0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Time (hours)

Pond 5.1P: Pocket Wetland (W-4)

Summary for Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	=	3.300 ac, 6	3.64% Impe	ervious,	Inflow Dept	h= 2.2	9" for	2-yr	event
Inflow =	=	2.09 cfs @	12.01 hrs,	Volume	= 0.	630 af			
Outflow =	=	0.25 cfs @	16.46 hrs,	Volume	= 0.	628 af,	Atten=	88%,	Lag= 267.4 min
Primary =	=	0.25 cfs @	16.46 hrs,	Volume	= 0.	628 af			

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 666.00' Surf.Area= 13,600 sf Storage= 42,650 cf Peak Elev= 666.31' @ 16.46 hrs Surf.Area= 14,510 sf Storage= 47,058 cf (4,408 cf above start) Flood Elev= 669.00' Surf.Area= 22,350 sf Storage= 96,525 cf (53,875 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow) Center-of-Mass det. time= 433.6 min (2,129.3 - 1,695.7)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	660.5	50' 120,3	50 cf Custor	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	n t)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
660.5	0	4,400	0	0	
662.0 664.0 666.0	10 10 10	5,800 7,800 13,600	7,650 13,600 21,400	21,250 42,650	
668.0 670.0	0	19,400 25,300	33,000 44,700	75,650 120,350	
Device	Routing	Invert	Outlet Devic	es	
#1 #2	Primary Primary	666.00' 668.25'	6.0" Vert. Or 5.0' long x (Head (feet) Coef. (Englis	ifice/Grate C= (0.5' breadth Broa 0.20 0.40 0.60 sh) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=0.25 cfs @ 16.46 hrs HW=666.31' TW=655.79' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.25 cfs @ 1.91 fps) -2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 5.3P: Micropool Extended Detention (P-1)

Inflow Area	a =	13.400 ac, 69.40% Impervious, Inflow Depth = 2.41" for 2-yr event
Inflow	=	28.01 cfs @ 12.09 hrs, Volume= 2.688 af
Outflow	=	2.45 cfs @ 13.22 hrs, Volume= 2.681 af, Atten= 91%, Lag= 67.8 min
Primary	=	2.45 cfs @ 13.22 hrs, Volume= 2.681 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 654.00' Surf.Area= 24,400 sf Storage= 64,450 cf Peak Elev= 655.89' @ 13.22 hrs Surf.Area= 30,842 sf Storage= 116,786 cf (52,336 cf above start) Flood Elev= 657.00' Surf.Area= 34,800 sf Storage= 153,050 cf (88,600 cf above start)

Plug-Flow detention time= 1,821.1 min calculated for 1.201 af (45% of inflow) Center-of-Mass det. time= 588.7 min (1,701.8 - 1,113.1)

Volume	Inve	ert Avail.Sto	orage Storage	e Storage Description				
#1	649.0	00' 189,6	50 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)			
Elevatic (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)				
649.0 650.0 652.0 654.0 656.0 658.0	00 00 00 00 00 00	7,900 9,000 11,300 24,400 31,200 38,400	0 8,450 20,300 35,700 55,600 69,600	0 8,450 28,750 64,450 120,050 189,650				
Device	Routing	Invert	Outlet Device	es				
#1 #2	Primary Primary	654.00' 655.75'	6.0" Vert. Or 8.0' long x 0 Head (feet) Coef. (Englis	ifice/Grate C= (0.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32			

Primary OutFlow Max=2.45 cfs @ 13.22 hrs HW=655.89' TW=623.99' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 1.21 cfs @ 6.18 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 1.23 cfs @ 1.07 fps)

Pond 5.3P: Micropool Extended Detention (P-1)



Summary for Pond 5.4P: Micropool Extended Detention Pond (P-1)

Inflow Area	l =	17.800 ac, 79.78% Impervious, Inflow Depth = 2.64" for 2-yr event	
Inflow	=	52.26 cfs @ 12.09 hrs, Volume= 3.911 af	
Outflow	=	32.77 cfs @ 12.20 hrs, Volume= 3.738 af, Atten= 37%, Lag= 6.6 min	
Primary	=	32.77 cfs @ 12.20 hrs, Volume= 3.738 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 636.00' Surf.Area= 17,300 sf Storage= 69,900 cf Peak Elev= 638.75' @ 12.20 hrs Surf.Area= 25,830 sf Storage= 129,370 cf (59,470 cf above start) Flood Elev= 640.00' Surf.Area= 29,488 sf Storage= 163,964 cf (94,064 cf above start)

Plug-Flow detention time= 2,366.8 min calculated for 2.133 af (55% of inflow) Center-of-Mass det. time= 1,266.7 min (2,061.3 - 794.6)

Volume	Inv	ert Avail.St	orage	Storage D	Description	
#1	628.	00' 195,	308 cf	Custom S	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatic (fee 628.0	on it) 00	Surf.Area (sq-ft) 4.600	Inc (cubi	:.Store <u>c-feet)</u> 0	Cum.Store (cubic-feet) 0	
630.0	0	6,100		10,700	10,700	
632.0	0	7,900		14,000	24,700	
634.0	00	10,000		17,900	42,600	
636.0	00	17,300	2	27,300	69,900	
638.0	00	23,638	4	40,938	110,838	
640.0	0	29,488	ļ	53,126	163,964	
641.0	00	33,200	:	31,344	195,308	
Device #1 #2	Routing Primary Primary	Inver 636.00 637.60	<u>Outl</u> 1.0'' 8.0' Hea Coe	et Devices Vert. Orifi long x 0.5 d (feet) 0.3 f. (English)	ce/Grate C= (breadth Broa 20 0.40 0.60 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=32.74 cfs @ 12.20 hrs HW=638.75' TW=621.35' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.04 cfs @ 7.92 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 32.69 cfs @ 3.56 fps)



Pond 5.4P: Micropool Extended Detention Pond (P-1)

Summary for Pond 5.5P: Extended Detention Pond (Design 2) - Dry Pond

Inflow Are	a =	33.900 ac, 7	0.21% Impervious,	Inflow Depth >	2.37" f	or 2-yr event	
Inflow	=	36.30 cfs @	12.19 hrs, Volume	e= 6.698	af		
Outflow	=	3.25 cfs @	16.29 hrs, Volume	e= 6.650	af, Atten	= 91%, Lag= 246.0	min
Primary	=	3.25 cfs @	16.29 hrs, Volume	e= 6.650	af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Peak Elev= 625.29' @ 16.29 hrs Surf.Area= 29,863 sf Storage= 130,156 cf Flood Elev= 629.00' Surf.Area= 40,550 sf Storage= 259,975 cf

Plug-Flow detention time= 2,508.3 min calculated for 6.649 af (99% of inflow) Center-of-Mass det. time= 2,398.4 min (4,265.6 - 1,867.2)

Volume	Inve	rt Avail.Sto	rage Stora	age Description					
#1	620.0	0' 302,10	00 cf Cust	om Stage Data (Pr	ismatic) Listed below (Recalc)				
Elevatio (fee	n s t)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	cum.Store (cubic-feet)					
620.0	0	20,400	0	0					
622.0	0	23,400	43,800	43,800					
624.0	0	26,500	49,900	93,700					
626.0	0	31,700	58,200	151,900					
628.0	0	37,400	69,100	221,000					
630.0	0	43,700	81,100	302,100					
Device	Routing	Invert	Outlet Dev	vices					
#1	Primary	620.00'	2.5" Vert.	Orifice/Grate C=	0.600				
#2	Primary	624.50'	18.0" Vert	. Orifice/Grate C=	= 0.600				
#3	Primary	627.00'	8.0' long	x 0.5' breadth Broa	ad-Crested Rectangular Weir				
			Head (feet	i) 0.20 0.40 0.60	0.80 1.00				
			Coef. (Eng	glish) 2.80 2.92 3	.08 3.30 3.32				

Primary OutFlow Max=3.25 cfs @ 16.29 hrs HW=625.29' TW=0.00' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 0.37 cfs @ 10.97 fps)

2=Orifice/Grate (Orifice Controls 2.88 cfs @ 3.03 fps)

-3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)





Summary for Pond 5.6P: Pocket Wetland (W-4)

Inflow Area	a =	4.800 ac, 5	50.00% Impe	ervious,	Inflow Depth =	2.0)2" for	2-yr	event	
Inflow	=	11.12 cfs @	12.09 hrs,	Volume	= 0.807	af				
Outflow	=	0.17 cfs @	21.16 hrs,	Volume	= 0.806	af,	Atten=	98%,	Lag= 544.1	min
Primary	=	0.17 cfs @	21.16 hrs,	Volume	= 0.806	af				

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 609.00' Surf.Area= 7,500 sf Storage= 15,000 cf Peak Elev= 611.79' @ 21.16 hrs Surf.Area= 12,597 sf Storage= 42,758 cf (27,758 cf above start) Flood Elev= 614.00' Surf.Area= 17,000 sf Storage= 75,400 cf (60,400 cf above start)

Plug-Flow detention time= 2,991.3 min calculated for 0.461 af (57% of inflow) Center-of-Mass det. time= 1,914.7 min (2,736.9 - 822.2)

<u>Volume</u>	Inv	ert Ava	il.Storage	Storage	e Description	
#1	601.0	20'	93,400 cf	Custom	n Stage Data (Pri	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc (cubi	c.Store c-feet)	Cum.Store (cubic-feet)	
601.0)0	220		0	0	
602.0	00	360		290	290	
604.0	00	850		1,210	1,500	
606.0	00	1,900		2,750	4,250	
608.0	00	3,400		5,300	9,550	
609.0	00	7,500		5,450	15,000	
610.0	00	9,100		8,300	23,300	
612.0	00	13,000		22,100	45,400	
614.0	00	17,000	3	30,000	75,400	
615.0	00	19,000		18,000	93,400	
Device	Routing	Ir	vert Outl	et Device	es	
#1	Primary	609	9.00' 2.0''	Vert. Or	ifice/Grate C= (0.600
#2	Primary	613	3.50' 2.5'	long x0	.5' breadth Broa	nd-Crested Rectangular Weir
			Hea	d (feet) (0.20 0.40 0.60	0.80 1.00
			Coe	f. (Englis	h) 2.80 2.92 3.	08 3.30 3.32

Primary OutFlow Max=0.17 cfs @ 21.16 hrs HW=611.79' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.17 cfs @ 7.93 fps) -2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Hydrograph 12-- Inflow 11.12 cfs - Primary 11 Inflow Area=4.800 ac 10 Peak Elev=611.79' 9 Storage=42,758 cf 8-7-Flow (cfs) 6-5-4-3-2 1 0.17 cfs 0-10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó Time (hours)

Pond 5.6P: Pocket Wetland (W-4)
Summary for Pond 5.7P: Pocket Wetland (W-4)

Inflow Area =	3.700 ac, 51.35% Impervious, Inflow D	epth = 2.10" for 2-yr event
Inflow =	8.90 cfs @ 12.09 hrs, Volume=	0.647 af
Outflow =	1.00 cfs @ 12.88 hrs, Volume=	0.646 af, Atten= 89%, Lag= 47.2 min
Primary =	1.00 cfs @ 12.88 hrs, Volume=	0.646 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 8,300 sf Storage= 18,240 cf Peak Elev= 657.62' @ 12.88 hrs Surf.Area= 11,296 sf Storage= 34,106 cf (15,866 cf above start) Flood Elev= 659.00' Surf.Area= 13,750 sf Storage= 51,415 cf (33,175 cf above start)

Plug-Flow detention time= 3,931.7 min calculated for 0.227 af (35% of inflow) Center-of-Mass det. time= 1,607.5 min (2,426.2 - 818.7)

Volume	Inv	ert Avail.	<u>Storage St</u>	orage	Description				
#1	648.	00' 6	6,040 cf C l	istom	i Stage Data (Pr	rismatic) Listed below (Recalc)			
Elevatio	on	Surf.Area	Inc.Sto	ore	Cum.Store				
(fee	et)	(sq-ft)	(cubic-fe	et)	(cubic-feet)				
648.0	00	240	·	0	0				
650.0	00	650	8	90	890				
652.0	00	1,400	2,0	50	2,940				
654.0	00	2,800	4,2	00	7,140				
656.0	00	8,300	11,1	00	18,240				
658.0	00	12,000	20,3	00	38,540				
660.0	00	15,500	27,5	00	66,040				
Device	Routing	Inv	ert Outlet E)evice	S				
#1	Primary	656.0	00' 1.5'' Ve	rt. Ori	fice/Grate C=	0.600			
#2	Primary	657.	50' 8.0' lon	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir					
			Head (f	Head (feet) 0.20 0.40 0.60 0.80 1.00					
			Coef. (E	Inglis	h) 2.80 2.92 3.	.08 3.30 3.32			

Primary OutFlow Max=1.00 cfs @ 12.88 hrs HW=657.62' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.07 cfs @ 6.01 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 0.92 cfs @ 0.97 fps)



Pond 5.7P: Pocket Wetland (W-4)

Summary for Subcatchment 5.1S:

Runoff = 10.73 cfs @ 12.09 hrs, Volume= 0.816 af, Depth= 4.08"

Area (ac) CN	Desc	ription			
1.0	600 98	Pave	ed parking	& roofs		
0.2	200 74 300 71	>/5% Moa	6 Grass co	over, Good Brazed HS		
0.2	200 98	Wate	er Surface	jiazeu, no		
* 0.	100 56	Perv	ious Pave	ment		
2.4	400 91	Weig	hted Aver	age		
1.8	300	Impe	ervious Area	a		
_				-		
IC (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
6.0	(1001)	(10/10)	(1000)	(010)	Direct Entry,	
				Subca	atchment 5 1S.	
				Jubic	atoninent J. 13.	
12			· · · · · ·	пушо		
	0.73 cfs	·l + -				- Runoff
10	·				Type III 24-hr 10-yr	
- 9	 - + + - +			 - +	Bainfall=5-10"	
8		 lL_			= -2400 ac	
7						
(cfs)					Runoff Volume=0.816 af	
NO	- + + + 	+ - 			Runoff Depth=4.08"	
- 5					Tc=6.0 min	
4	- +	· + - 			CN=91	
3	- +	· + - 				
2		$ \frac{1}{1}$ $ \frac{1}{1}$ $ \frac{1}{1}$ $-$	$\frac{1}{1} - \frac{1}{1} - \frac{1}{1} - \frac{1}{1} - \frac{1}{1}$	<mark> </mark> <u> </u> 		
1	- +	+ -				
0	\sim	; ; 	· · · · ·			
0	10 20 30 4	0 50 60	70 80 90 100	0 110 120 130 14 Tin	40 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 ne (hours))

Summary for Subcatchment 5.2S:

Runoff = 3.61 cfs @ 12.00 hrs, Volume= 0.224 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area (ac)	CN	Description
0.1	00	74	>75% Grass cover, Good, HSG C
0.5	500	71	Meadow, non-grazed, HSG C
0.3	300	98	Water Surface
0.9	000	80	Weighted Average
0.6	600		Pervious Area
0.3	300		Impervious Area

Subcatchment 5.2S:



Summary for Subcatchment 5.3S:

Runoff = 44.30 cfs @ 12.09 hrs, Volume= 3.344 af, Depth= 3.97"

6.600 98 Paved parking & roofs 1.900 74 >75% Grass cover, Good, HSG C 0.700 71 Meadow, non-grazed, HSG C	
1.900 74 >75% Grass cover, Good, HSG C 0.700 71 Meadow, non-grazed, HSG C	
0.700 71 Meadow, non-grazed, HSG C	
0.600 98 Water Surface	
<u>* 0.300 56 Pervious Pavement</u>	
10.100 90 Weighted Average	
2.900 Pervious Area 7.200 Impervious Area	
Tc Length Slope Velocity Capacity Description	
Subcatchment 5.3S:	
Hydrograph	
48	1
³⁸ ₃₆ ₃₆ ₃₆ ₃₆ ₃₆ ₃₆ ₃₆ ₃₆	
³⁴ ³²	
28	
© 26	
^E ²² ²⁰ ¹ ¹	
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300	

Summary for Subcatchment 5.4S:

Runoff = 80.93 cfs @ 12.09 hrs, Volume= 6.211 af, Depth= 4.19"

Area (ac) CN	Desc	cription				
13.8	300 98	Pave	ed parking	& roofs			
2.2	200 74	>75%	% Grass co	over, Good	, HSG C		
0.9	900 /1 100 Q8	Mea Wate	dow, non-(ar Surface	grazed, HS	GC		
* 0.5	500 56	Perv	ious Pave	ment			
17.8	300 92	Weig	ghted Aver	age			
3.6	500	Perv	ious Area	_			
14.2	200	Impe	ervious Are	ea			
Тс	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
6.0					Direct Entry,		
				Subca	atchment 5.4	S:	
				Hvdro	graph	-	
90	+					- +	
85 80).93 cfs						- Runoff
80				i i i i i i i i		Type III 24-hr 10-yr	
70	+++	+ + -				Bainfall-5 10"	
65	+			+			
60 -						off Area=17.800 ac	
50 <u> </u> 50	· +			T +	Runo	ff Volume=6.211 af	
jo ⁰⁰ ≥ ⁴⁵						unoff Depth=4-19"	
은 40 -	· +						
35		$\frac{1}{1}\frac{1}{1}\frac{1}{1} - \frac{1}{1}$	$-\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}$				
30	· +			+ 		CN=92	
20							
15 - -				<mark> </mark> 		· · · · · · · · · · · · · · · · · · ·	
10	· +						
5 -	八	+					
0	10 20 30 4	0 50 60	70 80 90 10	0 110 120 130 14	++ +0 150 160 170 180 190	0 200 210 220 230 240 250 260 270 280 290 30	0
				Tin	ne (hours)		

Summary for Subcatchment 5.5S:

Runoff = 7.56 cfs @ 12.09 hrs, Volume= 0.550 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Ar	ea (ac) C	N Des	cription						
	0.	0.100 98 Paved parking & roofs								
	0.		74 >75° 71 Maa	% Grass c	over, Good	I, HSG C				
	0.2	200	98 Wat	er Surface	grazeu, no					
	2.7	700 7	74 Wei	ghted Ave	rage					
	2.4	400	Per	vious Area						
	0.0	500	mpe	ervious Are	đ					
(mi	۲c	Length	Slope	Velocity	Capacity	Description				
(m) 6	n) 0	(leet)	(11/11)	(II/Sec)	(CIS)	Direct Entry				
0	.0					Direct Linky;				
					Subca	atchment 5.5S:				
	_				Hydro	ograph				
	8-	7.56 cfs					- Runoff			
	_					Type III 24-br 10-yr				
	6		$-\frac{1}{1}-\frac{1}{1}-\frac{1}{1}-\frac{1}{1}$			 				
	-					Runoff Area=2.700 ac				
(s)	5					Runoff Volume=0.550 af				
د د (د						Bunoff Depth-2 44"				
Flo	4									
	3	- +	- + + ·	- + + - +						
	-					CN=74				
	2	- + - + - + - + - + - + - + - + - + - +	$-\frac{1}{1} - \frac{1}{1} - \frac{1}{1} - \frac{1}{1}$	$-\frac{1}{1}\frac{1}{1}\frac{1}{1} - \frac{1}{1}$	$ _{1}^{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1} $					

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Time (hours)

Summary for Subcatchment 5.6S:

Runoff = 18.85 cfs @ 12.09 hrs, Volume= 1.384 af, Depth= 3.46"

2.100 98 Paved parking & roofs 1.000 74 >75% Grass cover, Good, HSG C 1.400 71 Meadow, non-grazed, HSG C 0.300 98 Water Surface 4.800 85 Weighted Average 2.400 Pervious Area 2.400 Impervious Area 2.400 Impervious Area 6.0 Direct Entry, 6.0 Direct Entry, Subcatchment 5.6S: Hydrograph
1.000 74 >75% Grass cover, Good, HSG C 1.400 71 Meadow, non-grazed, HSG C 0.300 98 Water Surface 4.800 85 Weighted Average 2.400 Pervious Area 2.400 Impervious Area Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) 6.0 Direct Entry, Bubcatchment 5.6S: Hydrograph
1.400 71 Meadow, non-grazed, HSG C 0.300 98 Water Surface 4.800 85 Weighted Average 2.400 Pervious Area 2.400 Impervious Area 2.400 Impervious Area 6.0 Direct Entry, Gubcatchment 5.6S: Hydrograph
0.300 98 Water Surface 4.800 85 Weighted Average 2.400 Pervious Area Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Hydrograph
4.800 85 Weighted Average 2.400 Pervious Area 2.400 Impervious Area Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 5.6S: Hydrograph
2.400 Pervious Area 2.400 Impervious Area Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 5.6S: Hydrograph
2.400 Impervious Area Tc Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 5.6S: Hydrograph
Tc Length (feet) Slope (ft/ft) Velocity (ft/sec) Description (cfs) 6.0 Direct Entry, Subcatchment 5.6S: Hydrograph
Ic Length Slope Velocity Capacity Description (min) (fteet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 5.6S: Hydrograph 20 18.85 cfs
(min) (feet) (ft/ft) (ft/sec) (cfs) 6.0 Direct Entry, Subcatchment 5.6S: Hydrograph
6.0 Direct Entry, Subcatchment 5.6S: Hydrograph
Subcatchment 5.6S: Hydrograph
Hydrograph 21
¹⁶
14 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2



Summary for Subcatchment 5.7S:

Runoff = 14.89 cfs @ 12.09 hrs, Volume= 1.098 af, Depth= 3.56"

Area (ac) Cl	N Description		
1.700 9	8 Paved parking & roofs		
0.300 7	4 >75% Grass cover, Good	d, HSG C	
0.700 7	1 Meadow, non-grazed, HS	SGC	
0.800 7	8 Water Surface		
3.700 8	6 Weighted Average		
1.800	Pervious Area		
1.900	Impervious Area		
Tc Length	Slope Velocity Capacity	Description	
<u>(min) (teet)</u>	(II/II) (II/SEC) (CIS)	Direct Entry	
0.0		Direct Litty,	
	Subca	atchment 5.7S:	
-	Hydro	ograph	
16			- Runoff
14 +		Type III 24-hr 10-yr	
13	$\begin{array}{c} - & - & - & - & - & - & - & - & - & - $	Rainfall=5.10"	
11	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Runoff Area=3.700 ac	
10	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Runoff Volume=1.098 af	
(Ct		Bunoff Depth=3.56"	
e 7 <u>-</u> - <u>+</u> - - <u></u>			
6			
5	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	······································	
4	$\frac{1}{1} - \frac{1}{1} - \frac{1}$		
3	+ + + + +	· · · · · · · · · · · · · · · · · · ·	
0 10 20 30	40 50 60 70 80 90 100 110 120 130 1 Ti	40 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300	

Summary for Subcatchment 5.8S:

Runoff = 80.81 cfs @ 12.21 hrs, Volume= 7.608 af, Depth= 3.07"

Area	(ac) C	N Des	cription		
4.	700	98 Pav	ed parking	& roofs	
2.4	400	74 >75	% Grass c	over, Good	, HSG C
4.	500	71 Mea	adow, non-	grazed, HS	GC
10.	100	70 Wo	ods, Good,	HSG C	
1.:	200	83 Wo	ods, Poor,	HSG D	
1.1	700	98 Wa	ter Surface		
5.	100	94 Urb	an comme	<u>rcial, 85% i</u> i	mp, HSG C
29.	700	81 We	ighted Ave	rage	
18.	965	Per	vious Area		
10.	735	Imp	ervious Are	ea	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
5.1	100	0.0900	0.32		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.50"
1.4	136	0.0500	1.57		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
8.4	2,600	0.0390	5.15	10.30	Trap/Vee/Rect Channel Flow,
					Bot.W=3.00' D=0.50' Z= 2.0 '/' Top.W=5.00'
					n= 0.030 Earth, grassed & winding
14.9	2,836	Total			

Subcatchment 5.8S:



Summary for Reach DP 5: Design Point 5

Inflow Ar	ea =	72.100 ac, 5	53.86% Impervious,	Inflow Depth > 3	.49" for 10-yr event
Inflow	=	88.32 cfs @	12.21 hrs, Volume	e= 20.998 af	-
Outflow	=	88.32 cfs @	12.21 hrs, Volume	e= 20.998 af	, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Hydrograph 95 - Inflow 88.32 cfs 90 Outflow 85 Inflow Area=72.100 ac 80-75 70 65 60-(c) 55⁻ 50⁻ 45⁻ 40-35-30 25-20 15 10 5 0-10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó Time (hours)

Reach DP 5: Design Point 5

Summary for Pond 5.1P: Pocket Wetland (W-4)

Inflow Area	a =	2.400 ac, 7	5.00% Impervious	s, Inflow Depth =	4.08" for	10-yr event
Inflow	=	10.73 cfs @	12.09 hrs, Volun	ne= 0.816	af	
Outflow	=	0.59 cfs @	14.08 hrs, Volun	ne= 0.815	af, Atten=	95%, Lag= 119.5 min
Primary	=	0.59 cfs @	14.08 hrs, Volun	ne= 0.815	af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 678.00' Surf.Area= 9,300 sf Storage= 19,400 cf Peak Elev= 680.06'@ 14.08 hrs Surf.Area= 13,955 sf Storage= 43,378 cf (23,978 cf above start) Flood Elev= 681.00' Surf.Area= 16,250 sf Storage= 57,525 cf (38,125 cf above start)

Plug-Flow detention time= 2,247.3 min calculated for 0.369 af (45% of inflow) Center-of-Mass det. time= 1,184.2 min (1,970.4 - 786.2)

Volume	Inve	ert Avail.Sto	orage Storage	e Description	
#1	672.0	0' 75,0	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	n t)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
672.0 674.0 676.0 678.0 680.0 682.0	0 0 0 0 0 0	300 1,600 3,300 9,300 13,800 18,700	0 1,900 4,900 12,600 23,100 32,500	0 1,900 6,800 19,400 42,500 75,000	
Device	Routing	Invert	Outlet Device	es	
#1 #2	Primary Primary	678.00' 680.00'	2.5" Vert. Or 8.0' long x 0 Head (feet) Coef. (Englis	ifice/Grate C= (0.5' breadth Broa 0.20 0.40 0.60 sh) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=0.59 cfs @ 14.08 hrs HW=680.06' TW=666.50' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 0.23 cfs @ 6.74 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 0.36 cfs @ 0.70 fps)

Hydrograph 12 10.73 cfs - Inflow 11 - Primary Inflow Area=2.400 ac 10-Peak Elev=680.06' 9 8-Storage=43,378 cf 7-Flow (cfs) 6 5-4 3-2-0.59 cfs 1-0-10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó Time (hours)

Pond 5.1P: Pocket Wetland (W-4)

Type III 24-hr 10-yr Rainfall=5.10"

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Summary for Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area = 3.300 ac, 6	3.64% Impervious, Inflow De	epth = 3.78" for 10-yr event
Inflow = 3.77 cfs @	12.00 hrs, Volume=	1.038 af
Outflow = 0.53 cfs @	15.80 hrs, Volume=	1.036 af, Atten= 86%, Lag= 227.6 min
Primary = $0.53 \text{cfs} @$	15.80 hrs, Volume=	1.036 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 666.00' Surf.Area= 13,600 sf Storage= 42,650 cf Peak Elev= 666.56' @ 15.80 hrs Surf.Area= 15,237 sf Storage= 50,790 cf (8,140 cf above start) Flood Elev= 669.00' Surf.Area= 22,350 sf Storage= 96,525 cf (53,875 cf above start)

Plug-Flow detention time= 5,391.2 min calculated for 0.057 af (5% of inflow) Center-of-Mass det. time= 361.7 min (2,083.4 - 1,721.7)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	660.	50' 120,3	50 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
660.5 662.0 664.0 666.0 668.0 670.0	50 50 50 50 50 50 50 50	4,400 5,800 7,800 13,600 19,400 25,300	0 7,650 13,600 21,400 33,000 44,700	0 7,650 21,250 42,650 75,650 120,350	
Device	Routing	Invert	Outlet Device	es	
#1 #2	Primary Primary	666.00' 668.25'	6.0" Vert. Or 5.0' long x 0 Head (feet) Coef. (Englis	ifice/Grate C= (0.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=0.53 cfs @ 15.80 hrs HW=666.56' TW=655.89' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 0.53 cfs @ 2.70 fps) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 5.3P: Micropool Extended Detention (P-1)

Inflow Area	a =	13.400 ac, 69.40% Impervious, Inflow Depth = 3.92" for 10-yr event	
Inflow	=	44.57 cfs @ 12.09 hrs, Volume= 4.380 af	
Outflow	=	14.49 cfs @ 12.40 hrs, Volume= 4.372 af, Atten= 67%, Lag= 1	8.7 min
Primary	=	14.49 cfs @ 12.40 hrs, Volume= 4.372 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 654.00' Surf.Area= 24,400 sf Storage= 64,450 cf Peak Elev= 656.40' @ 12.40 hrs Surf.Area= 32,636 sf Storage= 132,783 cf (68,333 cf above start) Flood Elev= 657.00' Surf.Area= 34,800 sf Storage= 153,050 cf (88,600 cf above start)

Plug-Flow detention time= 1,200.0 min calculated for 2.892 af (66% of inflow) Center-of-Mass det. time= 438.7 min (1,534.7 - 1,096.0)

Volume	Inve	ert Avail.Sto	orage Storage	e Description	
#1	649.0	00' 189,6	50 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatic (fee	on it)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
649.0 650.0 652.0 654.0 656.0 658.0	90 90 90 90 90 90	7,900 9,000 11,300 24,400 31,200 38,400	0 8,450 20,300 35,700 55,600 69,600	0 8,450 28,750 64,450 120,050 189,650	
Device	Routing	Invert	Outlet Device	es	
#1 #2	Primary Primary	654.00' 655.75'	6.0" Vert. Or 8.0' long x 0 Head (feet) Coef. (Englis	ifice/Grate C= (0.5' breadth Broa 0.20 0.40 0.60 sh) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=14.49 cfs @ 12.40 hrs HW=656.40' TW=625.20' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 1.39 cfs @ 7.06 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 13.10 cfs @ 2.52 fps)

Pond 5.3P: Micropool Extended Detention (P-1)



Summary for Pond 5.4P: Micropool Extended Detention Pond (P-1)

Inflow Area	a =	17.800 ac, 79.78% Impervious, Inflow Depth = 4.19" for 10-yr event	
Inflow	=	0.93 cfs @ 12.09 hrs, Volume= 6.211 af	
Outflow	=	5.61 cfs @ 12.18 hrs, Volume= 6.037 af, Atten= 31%, Lag= 5.3 min	n
Primary	=	5.61 cfs @ 12.18 hrs, Volume= 6.037 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 636.00' Surf.Area= 17,300 sf Storage= 69,900 cf Peak Elev= 639.24' @ 12.18 hrs Surf.Area= 27,253 sf Storage= 142,282 cf (72,382 cf above start) Flood Elev= 640.00' Surf.Area= 29,488 sf Storage= 163,964 cf (94,064 cf above start)

Plug-Flow detention time= 1,206.2 min calculated for 4.433 af (71% of inflow) Center-of-Mass det. time= 801.2 min (1,583.3 - 782.1)

Volume	Inve	ert Avail.Sto	rage	Storage D	escription	
#1	628.0	0' 195,3	08 cf	Custom S	tage Data (Pr	ismatic) Listed below (Recalc)
Elevatior (feet	ו)	Surf.Area (sq-ft) 4 600	Inc (cubio	.Store c-feet) 0	Cum.Store (cubic-feet)	
630.00)	6,100	1	0,700	10,700	
632.00)	7,900	1	4,000	24,700	
634.00)	10,000	1	7,900	42,600	
636.00)	17,300	2	27,300	69,900	
638.00)	23,638	4	0,938	110,838	
640.00)	29,488	5	53,126	163,964	
641.00)	33,200	3	31,344	195,308	
Device	Routing	Invert	Outl	et Devices		
#1 #2	Primary Primary	636.00' 637.60'	1.0'' 8.0' Head Coet	Vert. Orific long x 0.5' d (feet) 0.2 f. (English)	breadth Broa 0 0.40 0.60 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=55.16 cfs @ 12.18 hrs HW=639.23' TW=623.32' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.05 cfs @ 8.59 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 55.11 cfs @ 4.23 fps)



Pond 5.4P: Micropool Extended Detention Pond (P-1)

Summary for Pond 5.5P: Extended Detention Pond (Design 2) - Dry Pond

Inflow Area	ι =	33.900 ac, 70.21% Impervious, Inflow Depth > 3.88" for 10-yr event
Inflow	=	0.06 cfs @ 12.20 hrs, Volume= 10.960 af
Outflow	=	1.58 cfs @ 13.57 hrs, Volume= 10.911 af, Atten= 83%, Lag= 82.1 min
Primary	=	1.58 cfs @ 13.57 hrs, Volume= 10.911 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Peak Elev= 626.97' @ 13.57 hrs Surf.Area= 34,458 sf Storage= 183,911 cf Flood Elev= 629.00' Surf.Area= 40,550 sf Storage= 259,975 cf

Plug-Flow detention time= 1,662.7 min calculated for 10.909 af (100% of inflow) Center-of-Mass det. time= 1,593.8 min (3,120.3 - 1,526.4)

Volume	Inve	ert Avail.Sto	rage Storag	ge Description	
#1	620.0	00' 302,1	00 cf Custo	om Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(166	et)	(sq-tt)	(CUDIC-TEET)	(CUDIC-TEET)	
620.0	00	20,400	0	0	
622.0	00	23,400	43,800	43,800	
624.0	00	26,500	49,900	93,700	
626.0	00	31,700	58,200	151,900	
628.0	00	37,400	69,100	221,000	
630.0	00	43,700	81,100	302,100	
Device	Routing	Invert	Outlet Devi	ces	
#1	Primary	620.00'	2.5" Vert. C	Drifice/Grate C=	0.600
#2	Primary	624.50'	18.0" Vert.	Orifice/Grate C=	= 0.600
#3	Primary	627.00'	8.0' long x	0.5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Engl	ish) 2.80 2.92 3.	.08 3.30 3.32
D.:			0 40 57 5		

Primary OutFlow Max=11.58 cfs @ 13.57 hrs HW=626.97' TW=0.00' (Dynamic Tailwater) **1=Orifice/Grate** (Orifice Controls 0.43 cfs @ 12.61 fps)

2=Orifice/Grate (Orifice Controls 11.15 cfs @ 6.31 fps)

-3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5.5P: Extended Detention Pond (Design 2) - Dry Pond



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Summary for Pond 5.6P: Pocket Wetland (W-4)

Inflow Area =	4.800 ac, 50.00% Im	pervious, Inflow Depth =	3.46" for 10-yr event
Inflow =	18.85 cfs @ 12.09 hrs	s, Volume= 1.384	af
Outflow =	0.22 cfs @ 23.17 hrs	s, Volume= 1.383	af, Atten= 99%, Lag= 664.7 min
Primary =	0.22 cfs @ 23.17 hrs	s, Volume= 1.383	af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 609.00' Surf.Area= 7,500 sf Storage= 15,000 cf Peak Elev= 613.39' @ 23.17 hrs Surf.Area= 15,778 sf Storage= 65,386 cf (50,386 cf above start) Flood Elev= 614.00' Surf.Area= 17,000 sf Storage= 75,400 cf (60,400 cf above start)

Plug-Flow detention time= 3,412.0 min calculated for 1.039 af (75% of inflow) Center-of-Mass det. time= 2,610.9 min (3,417.7 - 806.8)

Volume	Inve	ert Ava	il.Storage	Storage	Description	
#1	601.0)0'	93,400 cf	Custom	I Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	n t)	Surf.Area (sq-ft)	Inc (cubic	.Store c-feet)	Cum.Store (cubic-feet)	
601.0	0	220		0	0	
602.0	0	360		290	290	
604.0	0	850		1,210	1,500	
606.0	0	1,900		2,750	4,250	
608.0	0	3,400		5,300	9,550	
609.0	0	7,500		5,450	15,000	
610.0	0	9,100		8,300	23,300	
612.0	0	13,000	2	2,100	45,400	
614.0	0	17,000	3	0,000	75,400	
615.0	0	19,000	1	8,000	93,400	
Device	Routing	Ir	nvert Outle	et Device	S	
#1	Primary	609	9.00' 2.0''	Vert. Ori	fice/Grate C= (0.600
#2	Primary	613	3.50' 2.5' Head Coef	2.5' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32		

Primary OutFlow Max=0.22 cfs @ 23.17 hrs HW=613.39' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.22 cfs @ 9.99 fps)

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

Pond 5.6P: Pocket Wetland (W-4)



Summary for Pond 5.7P: Pocket Wetland (W-4)

Inflow Area =	3.700 ac, 51.35% Impervious, Inflo	w Depth = 3.56" for 10-yr event
Inflow =	14.89 cfs @ 12.09 hrs, Volume=	1.098 af
Outflow =	7.28 cfs @ 12.26 hrs, Volume=	1.096 af, Atten= 51%, Lag= 10.3 min
Primary =	7.28 cfs @ 12.26 hrs, Volume=	1.096 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 8,300 sf Storage= 18,240 cf Peak Elev= 657.95' @ 12.26 hrs Surf.Area= 11,911 sf Storage= 37,966 cf (19,726 cf above start) Flood Elev= 659.00' Surf.Area= 13,750 sf Storage= 51,415 cf (33,175 cf above start)

Plug-Flow detention time= 1,701.6 min calculated for 0.678 af (62% of inflow) Center-of-Mass det. time= 969.3 min (1,773.0 - 803.7)

Volume	Inv	ert Avail.St	orage Storag	ge Description	
#1	648.0	00' 66,0	040 cf Custo	m Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
648.0	00	240	0	0	
650.0	00	650	890	890	
652.0	00	1,400	2,050	2,940	
654.0	00	2,800	4,200	7,140	
656.0	00	8,300	11,100	18,240	
658.0	00	12,000	20,300	38,540	
660.0	00	15,500	27,500	66,040	
Device	Routing	Invert	Outlet Devic	ces	
#1	Primary	656.00	1.5" Vert. O	rifice/Grate C=	0.600
#2	Primary	657.50	8.0' long x	0.5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Engli	ish) 2.80 2.92 3.	.08 3.30 3.32

Primary OutFlow Max=7.24 cfs @ 12.26 hrs HW=657.95' TW=0.00' (Dynamic Tailwater) **1=Orifice/Grate** (Orifice Controls 0.08 cfs @ 6.62 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 7.15 cfs @ 1.99 fps)





Summary for Subcatchment 5.1S:

Runoff = 12.89 cfs @ 12.09 hrs, Volume= 0.991 af, Depth= 4.96"

Area	(ac)	CN	Desc	cription				
1	.600	98 Paved parking & roofs						
C	0.200 74 >75% Grass cover, Good, HSG C							
C	0.300 71 Meadow, non-grazed, HSG C							
* 0	100	98 56	Perv	ious Pave	ment			
2	2.400	91	Weid	ahted Ave	rage			
C	0.600	•	Perv	ious Area				
1	.800		Impe	ervious Are	ea			
Tc	Lengt	th	Slope	Velocity	Capacity	Description		
6.0	(iee	ι)	(11/11)	(II/Sec)	(CIS)	Direct Entry.		
010						,,,,		
					Subca	atchment 5.19	S:	
-					Hydro	ograph		
14-] [13-]	12.89 cfs	- + - + 	l + - l l l + -			+ - 		- Runoff
12				$\begin{array}{cccccccccccccccccccccccccccccccccccc$			Type III 24-hr 25-yr	
11							Rainfall=6.00"	
10	¹⁰ Runoff Area=2.400 ac							
9 (s a)	⁹ Bunoff Volume=0.991 af							
jo n 7	[™] 71-1							
임 6	$\overset{\text{\tiny left}}{=} \frac{1}{6} + \frac{1}{2} $							
4	+ I		! + -					
3-		 				 - -		
2								
1								
, i , i , i	\mathcal{N}							
0- () 10 20	30 40) 50 60	70 80 90 10	0 110 120 130 14	40 150 160 170 180 190	200 210 220 230 240 250 260 270 280 290 30	0
					110			

Summary for Subcatchment 5.2S:

Runoff = 4.56 cfs @ 12.00 hrs, Volume= 0.284 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (ac)	CN	Description
0.1	00	74	>75% Grass cover, Good, HSG C
0.5	500	71	Meadow, non-grazed, HSG C
0.3	300	98	Water Surface
0.9	000	80	Weighted Average
0.6	600		Pervious Area
0.3	300		Impervious Area

Subcatchment 5.2S:



Summary for Subcatchment 5.3S:

Runoff = 53.45 cfs @ 12.09 hrs, Volume= 4.079 af, Depth= 4.85"

Area (a	ac) CN	Descr	ription				
6.6	6.600 98 Paved parking & roofs 1.900 74 >75% Grass cover, Good, HSG C						
0.7	'00 71	Mead	ow, non-g	grazed, HS	ĠC		
* 0.6	600 98	Wate	r Surface	mont			
10.1	00 <u>56</u> 00 90	Weial	hted Aver				
2.9	000	Pervic	ous Area	~90			
7.2	200	Imper	vious Are	ea			
Tc	Length	Slope	Velocity	Capacity	Description		
(min) 6.0	(feet)	(11/11)	(ft/sec)	(CIS)	Direct Entry.		
0.0					,,,		
				Subca	atchment 5.3	S:	
F	· · · · ·			Hydro	ograph		
55_53	.45 cfs						- Runoff
50						Type III 24-hr 25-yr	
45						Bainfall=6.00"	
40	10 - 10 - 10 - 100 - 10 - 100 - 10 - 10						
25							
(cfs)	\mathfrak{F} 3° Runott Volume=4.079 af						
<u>s</u> 30	+ $ +$ $ +$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$				$\overset{\vdash}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}{}}\overset{\scriptstyle}{}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset{\scriptstyle}}{}\overset$	unoff Depth=4.85"	
L 25	[™] ²⁵ Tc=6.0 min						
20	20						
15	++						
10							
5							
	八						
0	10 20 30 40	0 50 60 7	0 80 90 10	0 110 120 130 14 Tin	40 150 160 170 180 19 me (hours)	0 200 210 220 230 240 250 260 270 280 290 30	0

Summary for Subcatchment 5.4S:

Runoff = 96.90 cfs @ 12.09 hrs, Volume= 7.520 af, Depth= 5.07"

Ar	ea (ac)	CN	Desc	cription			
	13.800 98 Paved parking & roofs 2 200 74 >75% Grass cover Good HSG C							
	0.9	900	71	Mea	dow, non-g	grazed, HS	GC	
ж	0.4	400	98	Wate	er Surface			
×	0.	500	56	Perv	ious Pave	ment		
	17.8	500 200	92	VVei	ious Area	age		
	14.2	200		Impe	ervious Are	ea		
- (mi	Tc n)	Lengt (feet	h t)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description	
6	.0	(-/	(1011)	(10000)	(0.0)	Direct Entry,	
						Subor	atabmant 5 4 St	
						Subca		
	Ŧ			, , , , , , , , , , , , , , , , , , , 	- 1 - 1 - 1	Hydro	ograph	
	105 1 100 1	96.90 cfs]+-	+	- + - +			- Runoff
	95 90	· - +		+	- +	·	Type III 24-hr 25-yr	
	80 75							
	70	\tilde{a}						
s)	Bunoff Volume=7-520 af							
ر د (و								
Flov	ê ₅₀							
⁴⁵ 40								
	35	·	- L -					
	30	- +		+	-+			
	25	· - +			- + + - + +	· + + + - +		
	15			+	- +			
	10	┈╫╧		+				
	0 0	ノト						
	0	10 20	30	40 50 60	70 80 90 10	0 110 120 130 1 Ti i	140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 ime (hours)	

Summary for Subcatchment 5.5S:

Runoff = 9.88 cfs @ 12.09 hrs, Volume= 0.717 af, Depth= 3.18"



Summary for Subcatchment 5.6S:

Runoff = 23.23 cfs @ 12.09 hrs, Volume= 1.721 af, Depth= 4.30"

Area (ac)	CN	Description				
2.100	98	Paved parking	& roofs			
1.000	74	>75% Grass co	over, Good	, HSG C		
1.400	71	Meadow, non-g	grazed, HS	GC		
0.300	98	Water Surface				
4.800	85	Weighted Aver	age			
2.400		Pervious Area	U			
2.400		Impervious Are	a			
Tc Leng	gth S	Slope Velocity	Capacity	Description		
(min) (fee	et)	(ft/ft) (ft/sec)	(cfs)			
6.0				Direct Entry,		
			Suboo	atahmant 5 68.		
			Subca	achiment 5.65.		
Hydrograph						
26						
24 23.23 cfs			+			
23			+			
22			+	i ype iii 24-nr 25-yr		
20+			+			



Summary for Subcatchment 5.7S:

Runoff = 18.27 cfs @ 12.09 hrs, Volume= 1.360 af, Depth= 4.41"

Area (ac) CN	Description						
1.700 98	Paved parking & roofs						
0.300 74 >75% Grass cover, Good, HSG C							
0.700 71	Meadow, non-grazed, HSG C Woode, Eair, HSG C						
0.200 98	Woods, Fail, HSG C Water Surface						
3.700 86	Weighted Average	-					
1.800	Pervious Area						
1.900	Impervious Area						
Tc Length S	Slope Velocity Capacity Description (ft/ft) (ft/sec) (cfs)						
6.0	Direct Entry,	-					
	Subotobmont 5 7St						
	Subcatchinent 5.75.						
20	Hydrograph						
19- <u>18.27 cfs</u>							
18	Type III 24-hr 25-yr						
16	Rainfall=6.00"						
14	Runoff Area=3.700 ac						
13	Bunoff Volume=1.360 af						
⁵ ⁵ 11 ⁻							
	$\mathbf{T}_{\mathbf{C}} = \mathbf{G}_{\mathbf{C}} \mathbf{G}_{\mathbf{C}}$						
7							
6							
3							
-							

Summary for Subcatchment 5.8S:

Runoff = 101.73 cfs @ 12.20 hrs, Volume= 9.612 af, Depth= 3.88"

Area	(ac) C	N Des	cription				
4.	700	98 Pav	Paved parking & roofs				
2.	400	74 >75	% Grass c	over, Good	, HSG C		
4.	500	71 Mea	dow, non-	grazed, HS	GC		
10.	100	70 Wo	ods, Good,	HSG C			
1.	200	33 Wo	ods, Poor,	HSG D			
1.	700	98 Wat	er Surface				
5.	100	94 Urb	an commei	rcial, 85% ii	mp, HSG C		
29.	700	31 Wei	ghted Avei	rage			
18.	965	Per	vious Area				
10.	735	Imp	ervious Are	ea			
Tc	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
5.1	100	0.0900	0.32		Sheet Flow,		
					Grass: Short n= 0.150 P2= 3.50"		
1.4	136	0.0500	1.57		Shallow Concentrated Flow,		
					Short Grass Pasture Kv= 7.0 fps		
8.4	2,600	0.0390	5.15	10.30	Trap/Vee/Rect Channel Flow,		
					Bot.W=3.00' D=0.50' Z= 2.0 '/' Top.W=5.00'		
					n= 0.030 Earth, grassed & winding		
14.9	2,836	Total					

Subcatchment 5.8S:



Summary for Reach DP 5: Design Point 5

Inflow Area	a =	72.100 ac, 5	3.86% Impervious,	Inflow Depth > 4	.34" for 25-yr event
Inflow	=	115.37 cfs @	12.21 hrs, Volume	= 26.047 af	
Outflow	=	115.37 cfs @	12.21 hrs, Volume	= 26.047 af	, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Hydrograph 125 - Inflow 120 115.37 cfs Outflow 115 110 Inflow Area=72.100 ac 105 100 95 90 85 80 75 Flow (cfs) 70-65 60 55-50 45 40 35-30-25-20 15 10-5 0 0 10 20 30 40 50 60 70 80 90 100110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Time (hours)

Reach DP 5: Design Point 5
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Summary for Pond 5.1P: Pocket Wetland (W-4)

Inflow Area =	=	2.400 ac, 7	5.00% Impervio	ous, Inflow E	Depth = 4.	96" for	25-yr event
Inflow =	-	12.89 cfs @	12.09 hrs, Vol	lume=	0.991 af		
Outflow =	-	1.71 cfs @	12.63 hrs, Vol	lume=	0.990 af,	Atten= 8	37%, Lag= 32.7 min
Primary =	:	1.71 cfs @	12.63 hrs, Vol	lume=	0.990 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 678.00' Surf.Area= 9,300 sf Storage= 19,400 cf Peak Elev= 680.16' @ 12.63 hrs Surf.Area= 14,199 sf Storage= 44,781 cf (25,381 cf above start) Flood Elev= 681.00' Surf.Area= 16,250 sf Storage= 57,525 cf (38,125 cf above start)

Plug-Flow detention time= 1,851.8 min calculated for 0.545 af (55% of inflow) Center-of-Mass det. time= 1,012.2 min (1,793.3 - 781.0)

Volume	Inv	ert Ava	il.Storage	Storage	Description	
#1	672.0	20'	75,000 cf	Custom	n Stage Data (Pri	ismatic) Listed below (Recalc)
Elevatio	n t)	Surf.Area (sq-ft)	Inc (cubi	:.Store c-feet)	Cum.Store (cubic-feet)	
672.0 674.0 676.0 678.0 680.0		300 1,600 3,300 9,300 13,800 18,700		1,900 4,900 12,600 23,100	0 1,900 6,800 19,400 42,500 75 000	
Device	Routing	10,700 Ir	vert Outl	et Device	73,000 es	
#1 #2	Primary Primary	678 680	3.00' 2.5'').00' 8.0' Hea Coe	Vert. Or long x 0 d (feet) (f. (Englis	ifice/Grate C= (.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	0.600 Id-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=1.71 cfs @ 12.63 hrs HW=680.16' TW=666.61' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.24 cfs @ 6.91 fps) -2=Broad-Crested Rectangular Weir (Weir Controls 1.47 cfs @ 1.13 fps)

Pond 5.1P: Pocket Wetland (W-4)



Summary for Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	3.300 ac, 6	3.64% Impervious	, Inflow Depth	= 4.63"	for 25-yr	r event
Inflow	=	4.74 cfs @	12.00 hrs, Volum	ne= 1.2	74 af		
Outflow	=	0.77 cfs @	15.12 hrs, Volum	ne= 1.2	72 af, Atte	ən= 84%,	Lag= 187.1 min
Primary	=	0.77 cfs @	15.12 hrs, Volum	ie= 1.2	72 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 666.00' Surf.Area= 13,600 sf Storage= 42,650 cf Peak Elev= 666.92' @ 15.12 hrs Surf.Area= 16,258 sf Storage= 56,336 cf (13,686 cf above start) Flood Elev= 669.00' Surf.Area= 22,350 sf Storage= 96,525 cf (53,875 cf above start)

Plug-Flow detention time= 3,083.0 min calculated for 0.292 af (23% of inflow) Center-of-Mass det. time= 350.2 min (1,924.3 - 1,574.1)

Volume	Inve	ert Avail.Sto	rage Storage	e Description	
#1	660.5	0' 120,3	50 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatior (feet	ר)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
660.50 662.00 664.00 666.00 668.00 670.00)))))	4,400 5,800 7,800 13,600 19,400 25,300	0 7,650 13,600 21,400 33,000 44,700	0 7,650 21,250 42,650 75,650 120,350	
Device #1 #2	Routing Primary Primary	Invert 666.00' 668.25'	Outlet Device 6.0" Vert. Or 5.0' long x 0 Head (feet)	es ifice/Grate C= (0.5' breadth Broa 0.20 0.40 0.60	0.600 ad-Crested Rectangular Weir 0.80 1.00
			Coet. (Englis	sh) 2.80 2.92 3.	08 3.30 3.32

Primary OutFlow Max=0.77 cfs @ 15.12 hrs HW=666.92' TW=655.96' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 0.77 cfs @ 3.93 fps) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 5.3P: Micropool Extended Detention (P-1)

Inflow Area	ι =	13.400 ac, 69.40% Impervious, Inflow Depth = 4.79" for 25-yr event	
Inflow	=	3.84 cfs @ 12.09 hrs, Volume= 5.350 af	
Outflow	=	2.28 cfs @ 12.29 hrs, Volume= 5.343 af, Atten= 57%, Lag= 12.3 min	1
Primary	=	3.28 cfs @ 12.29 hrs, Volume= 5.343 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 654.00' Surf.Area= 24,400 sf Storage= 64,450 cf Peak Elev= 656.63' @ 12.29 hrs Surf.Area= 33,465 sf Storage= 140,395 cf (75,945 cf above start) Flood Elev= 657.00' Surf.Area= 34,800 sf Storage= 153,050 cf (88,600 cf above start)

Plug-Flow detention time= 965.1 min calculated for 3.863 af (72% of inflow) Center-of-Mass det. time= 382.0 min (1,437.5 - 1,055.5)

Volume	Inv	ert Avail.Sto	orage Storage	age Storage Description					
#1	649.0	00' 189,6	50 cf Custon	n Stage Data (Pri	ismatic) Listed below (Recalc)				
Elevatio (fee	on it)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)					
649.0	0	7,900	0	0					
650.0	0	9,000	8,450	8,450					
652.0	0	11,300	20,300	28,750					
654.0	0	24,400	35,700	64,450					
656.0	0	31,200	55,600	120,050					
658.0	00	38,400	69,600	189,650					
Device	Routing	Invert	Outlet Device	es					
#1	Primary	654.00'	6.0" Vert. Or	ifice/Grate C= (0.600				
#2	Primary	655.75'	8.0' long x 0 Head (feet) (Coef. (Englis	.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	Id-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32				

Primary OutFlow Max=23.24 cfs @ 12.29 hrs HW=656.63' TW=625.85' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 1.46 cfs @ 7.43 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 21.78 cfs @ 3.10 fps)

Pond 5.3P: Micropool Extended Detention (P-1)



Summary for Pond 5.4P: Micropool Extended Detention Pond (P-1)

Inflow Area =	17.800 ac, 79.78% Impervious, Inflow De	epth = 5.07" for 25-yr event
Inflow =	96.90 cfs @ 12.09 hrs, Volume=	7.520 af
Outflow =	68.13 cfs @ 12.17 hrs, Volume=	7.346 af, Atten= 30%, Lag= 5.1 min
Primary =	68.13 cfs @ 12.17 hrs, Volume=	7.346 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 636.00' Surf.Area= 17,300 sf Storage= 69,900 cf Peak Elev= 639.47' @ 12.17 hrs Surf.Area= 27,948 sf Storage= 148,840 cf (78,940 cf above start) Flood Elev= 640.00' Surf.Area= 29,488 sf Storage= 163,964 cf (94,064 cf above start)

Plug-Flow detention time= 953.3 min calculated for 5.741 af (76% of inflow) Center-of-Mass det. time= 665.4 min (1,442.5 - 777.2)

Volume	Inv	ert Avail.Sto	rage	Storage D	escription	
#1	628.0)0' 195,3	08 cf	Custom S	tage Data (Pr	ismatic) Listed below (Recalc)
Elevation	n t)	Surf.Area (sq-ft)	Inc (cubi	Store <u>c-feet)</u>	Cum.Store (cubic-feet)	
630.0	0	4,000	-	0	10 700	
632.0	0	7,900	-	4.000	24,700	
634.0	0	10,000	1	7,900	42,600	
636.0	0	17,300	2	27,300	69,900	
638.0	0	23,638	2	10,938	110,838	
640.0	0	29,488	Ę	53,126	163,964	
641.0	0	33,200	3	31,344	195,308	
Device	Routing	Invert	Outl	et Devices		
#1 #2	Primary Primary	636.00' 637.60'	1.0'' 8.0' Hea Coe	Vert. Orific long x 0.5' d (feet) 0.2 f. (English)	breadth Broa 0 0.40 0.60 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=67.11 cfs @ 12.17 hrs HW=639.45' TW=624.57' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.05 cfs @ 8.89 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 67.06 cfs @ 4.52 fps)



Pond 5.4P: Micropool Extended Detention Pond (P-1)

Summary for Pond 5.5P: Extended Detention Pond (Design 2) - Dry Pond

Inflow Area	a =	33.900 ac, 7	0.21% Impe	ervious,	Inflow Depth >	4.75"	for 25-yr	event
Inflow	=	94.97 cfs @	12.19 hrs,	Volume=	= 13.406	af		
Outflow	=	29.59 cfs @	12.80 hrs,	Volume=	= 13.357	af, Atte	n= 69%,	Lag= 36.7 min
Primary	=	29.59 cfs @	12.80 hrs,	Volume=	= 13.357	af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Peak Elev= 627.72' @ 12.80 hrs Surf.Area= 36,606 sf Storage= 210,695 cf Flood Elev= 629.00' Surf.Area= 40,550 sf Storage= 259,975 cf

Plug-Flow detention time= 1,383.7 min calculated for 13.357 af (100% of inflow) Center-of-Mass det. time= 1,326.8 min (2,734.6 - 1,407.7)

Volume	Inv	ert Avail.Sto	orage Stor	rage Description	
#1	620.	00' 302,1	00 cf Cus	stom Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.Stor (cubic-fee	t) Cum.Store	
620.0	00	20,400	•	0 0	
622.0	00	23,400	43,80	0 43,800	
624.0	00	26,500	49,90	0 93,700	
626.0	00	31,700	58,20	0 151,900	
628.0	00	37,400	69,10	0 221,000	
630.0	00	43,700	81,10	0 302,100	
Device	Routing	Invert	Outlet De	evices	
#1	Primary	620.00'	2.5" Vert	. Orifice/Grate C=	0.600
#2	Primary	624.50'	18.0'' Vei	rt. Orifice/Grate C=	= 0.600
#3	Primary	627.00'	8.0' long	x 0.5' breadth Broa	ad-Crested Rectangular Weir
			Head (fee	et) 0.20 0.40 0.60	0.80 1.00
			Coef. (Er	nglish) 2.80 2.92 3.	.08 3.30 3.32
	. .		<u> </u>		

Primary OutFlow Max=29.57 cfs @ 12.80 hrs HW=627.72' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.45 cfs @ 13.29 fps)

-2=Orifice/Grate (Orifice Controls 13.38 cfs @ 7.57 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 15.75 cfs @ 2.73 fps)





Summary for Pond 5.6P: Pocket Wetland (W-4)

Inflow Area	a =	4.800 ac, 5	50.00% Impe	ervious,	Inflow	Depth =	4.3	0" for	[.] 25-y	r event	
Inflow	=	23.23 cfs @	12.09 hrs,	Volume	=	1.721	af				
Outflow	=	0.89 cfs @	15.47 hrs,	Volume	=	1.720	af,	Atten=	96%,	Lag= 202.9 mir	l
Primary	=	0.89 cfs @	15.47 hrs,	Volume	=	1.720	af				

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 609.00' Surf.Area= 7,500 sf Storage= 15,000 cf Peak Elev= 613.71' @ 15.47 hrs Surf.Area= 16,417 sf Storage= 70,531 cf (55,531 cf above start) Flood Elev= 614.00' Surf.Area= 17,000 sf Storage= 75,400 cf (60,400 cf above start)

Plug-Flow detention time= 2,907.4 min calculated for 1.376 af (80% of inflow) Center-of-Mass det. time= 2,291.3 min (3,091.9 - 800.6)

Volume	Inv	ert Ava	il.Storage	Storage	e Description				
#1	601.0	00'	93,400 cf	Custom	n Stage Data (Pr	ismatic) Listed below (Recalc)			
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc (cubi	c.Store c-feet)	Cum.Store (cubic-feet)				
601.0	00	220	•	0	0				
602.0	00	360		290	290				
604.0	00	850		1,210	1,500				
606.0	00	1,900		2,750	4,250				
608.0	00	3,400		5,300	9,550				
609.0	00	7,500		5,450	15,000				
610.0	00	9,100		8,300	23,300				
612.0	00	13,000		22,100	45,400				
614.0	00	17,000	3	30,000	75,400				
615.0	00	19,000	-	18,000	93,400				
Device	Routing	Ir	vert Outl	et Device	es				
#1	Primary	609	9.00' 2.0''	Vert. Or	ifice/Grate C= 0	0.600			
#2	Primary	613	3.50' 2.5'	2.5' long x 0.5' breadth Broad-Crested Rectangular Weir					
			Hea	d (feet) (0.20 0.40 0.60	0.80 1.00			
			Coe	f. (Englis	h) 2.80 2.92 3.	08 3.30 3.32			

Primary OutFlow Max=0.89 cfs @ 15.47 hrs HW=613.71' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.23 cfs @ 10.36 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 0.67 cfs @ 1.28 fps)

Pond 5.6P: Pocket Wetland (W-4)



Summary for Pond 5.7P: Pocket Wetland (W-4)

Inflow Area	a =	3.700 ac, 51.35% Impervious, Inflow Depth = 4.41" for 25-yr event	
Inflow	=	8.27 cfs @ 12.09 hrs, Volume= 1.360 af	
Outflow	=	1.98 cfs @ 12.19 hrs, Volume= 1.358 af, Atten= 34%, Lag= 6.2 n	nin
Primary	=	1.98 cfs @ 12.19 hrs, Volume= 1.358 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 8,300 sf Storage= 18,240 cf Peak Elev= 658.11' @ 12.19 hrs Surf.Area= 12,199 sf Storage= 39,913 cf (21,673 cf above start) Flood Elev= 659.00' Surf.Area= 13,750 sf Storage= 51,415 cf (33,175 cf above start)

Plug-Flow detention time= 1,267.1 min calculated for 0.939 af (69% of inflow) Center-of-Mass det. time= 791.8 min (1,589.5 - 797.7)

<u>Volume</u>	Inv	ert Avai	.Storage	Storage	Description				
#1	648.0	00' (66,040 cf	Custom	n Stage Data (Pr	ismatic) Listed below (Recalc)			
Elevatio	on	Surf.Area	Inc	.Store	Cum.Store				
(fee	et)	(sq-ft)	(cubio	c-feet)	(cubic-feet)				
648.0	00	240		0	0				
650.0	00	650		890	890				
652.0	00	1,400		2,050	2,940				
654.0	00	2,800		4,200	7,140				
656.0	00	8,300	1	1,100	18,240				
658.0	00	12,000	2	20,300	38,540				
660.0	00	15,500	2	27,500	66,040				
Device	Routing	In	vert Outle	et Device	es				
#1	Primary	656	.00' 1.5''	Vert. Or	ifice/Grate C=	0.600			
#2	Primary	657	.50' 8.0' Head Coet	.0' long x 0.5' breadth Broad-Crested Rectangular Weir lead (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32					

Primary OutFlow Max=11.89 cfs @ 12.19 hrs HW=658.11' TW=0.00' (Dynamic Tailwater) **1=Orifice/Grate** (Orifice Controls 0.08 cfs @ 6.89 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 11.81 cfs @ 2.42 fps)

Hydrograph 20-- Inflow 18.27 cfs 19 Primary 18 Inflow Area=3.700 ac 17 16 Peak Elev=658.11' 15 14-Storage=39,913 cf 13-11.98 cfs 12-Flow (cfs) 11-10-9-8-7-6 5 4-3-2-1 0-10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó Time (hours)

Pond 5.7P: Pocket Wetland (W-4)

Summary for Subcatchment 5.1S:

Runoff = 18.84 cfs @ 12.09 hrs, Volume= 1.484 af, Depth= 7.42"

	Area ((ac)	CN	Desc	ription		
	1.6	600	98	Pave	ed parking	& roofs	
	0.2	200	74	>75%	6 Grass co	over, Good,	d, HSG C
	0.3	300	71	Mea	dow, non-g	grazed, HS	SG C
	0.2	200	98	Wate	er Surface		
*	0.1	100	56	Perv	ious Pavei	ment	
	2.4	400	91	Weig	phted Aver	age	
	0.0	600		Perv	ious Area		
	1.8	800		Impe	rvious Are	a	
	Тс	Lengt	th	Slope	Velocity	Capacity	Description
	(min)	(fee	et)	(ft/ft)	(ft/sec)	(cfs)	
	6.0						Direct Entry,
						Subca	atchment 5.1S:



Summary for Subcatchment 5.2S:

Runoff = 7.24 cfs @ 12.00 hrs, Volume= 0.457 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area (ac)	CN	Description
0.100	74	>75% Grass cover, Good, HSG C
0.500	71	Meadow, non-grazed, HSG C
0.300	98	Water Surface
0.900	80	Weighted Average
0.600		Pervious Area
0.300		Impervious Area

Subcatchment 5.2S:



Summary for Subcatchment 5.3S:

Runoff = 78.61 cfs @ 12.09 hrs, Volume= 6.143 af, Depth= 7.30"

Area (ac)	CN	Desc	cription							
6.600	98	Pave	ed parking	& roofs						
1.900 74 >75% Grass cover, Good, HSG C										
0.700 71 Meadow, non-grazed, HSG C										
* 0.300	0.600 98 Water Surface									
10.100	90	Weid	phted Aver	age						
2.900		Perv	ious Area	0						
7.200		Impe	ervious Are	ea						
Tc Lenç	gth	Slope	Velocity	Capacity	Description					
(min) (fe	et)	(ft/ft)	(ft/sec)	(cfs)						
6.0					Direct Entry,					
				Subca	tchment 5.3S:					
				Hydro	graph					
85 - +		!+-								
80 78.61 CIS		$\frac{1}{1} \frac{1}{1} - \frac{1}{1}$								
75					Type III 24-hr 1	00-yr				
65					Rainfall=	:8.50''				
60					Runoff Area=10.1	00 ac				
55	H - + I I	+ - + -		+ 	Bunoff Volume-6	143 af				
s s b b b b c c c c c c c c c c	 <u> </u>	$ \frac{1}{1} \frac{1}{1}$								
8 40 +	 +	+ -								
35 +						0 min -				
30	<u> </u> <u> </u> 	$\frac{1}{1}\frac{1}{1}-$:N=90				
		ı - -								
	+ 									
10	 	$ \frac{1}{1} \frac{1}{1}$								
5	+-+	! + -								
						0.270.280.200.200				
0 10 20	30 40	00 00	10 00 90 10	5 110 120 130 12 Tin	ne (hours)	7 21 0 200 230 300				

Summary for Subcatchment 5.4S:

Runoff = 140.86 cfs @ 12.09 hrs, Volume= 11.182 af, Depth= 7.54"

Are	a (ac)	CN	Desc	cription						
1	13.800 98 Paved parking & roofs 2.200 74 >75% Grass cover, Good, HSG C 0.900 71 Meadow, non-grazed, HSG C									
*	0.400 0.500	98 56	Wate	er Surface	ment					
1	7.800 3.600 4.200	92	Weig Perv Impe	ghted Aver ious Area ervious Are	age a					
T (mir	c Len ı) (fe	gth eet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
6.	0			· ·		Direct Entry,				
					Subca	atchment 5.4S:				
					Hydro	rograph				
15	0 140.86	cfs					- Runoff			
13	80					Type III 24-hr 100-yr				
12	20					Rainfall=8.50"-				
11		- ⊢ - 	+ - +	- + 	+ + 	Runoff Area=17.800 ac				
م						Runoff Volume=11.182 af				
w (cfs	80					Runoff Depth=7.54"				
E F	70					Tc=6.0 min				
6	50			- + +		CN=92				
3	30									
2	20	-	 + -	-+						
1	₀ -- 1			- 						
	0	20 30	40 50 60							
	0 10	20 00	+0 00 00	10 00 00 10	Ti	Time (hours)				

Summary for Subcatchment 5.5S:

Runoff = 16.59 cfs @ 12.09 hrs, Volume= 1.209 af, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area (ac)	CN	Desc	ription			
0.100	98	Pave	d parking	& roofs		
0.100	74	>75%	6 Grass co	over, Good	d, HSG C	
2.300	71	Mead	dow, non-g	grazed, HS	SG C	
0.200	98	Wate	er Surface			
2.700	74	Weig	hted Aver	age		
2.400		Perv	ious Area	-		
0.300		Impe	rvious Are	a		
Tc Leng	ith S	Slope	Velocity	Capacity	Description	
(min) (fee	et)	(ft/ft)	(ft/sec)	(cfs)		
6.0					Direct Entry,	

Subcatchment 5.5S:



Summary for Subcatchment 5.6S:

Runoff = 35.38 cfs @ 12.09 hrs, Volume= 2.679 af, Depth= 6.70"

_	Area (ac)	CN	Desc	ription			
	2.100	98	Pave	d parking	& roofs		
	1.000	74	>75%	Grass co	over, Good,	HSG C	
	1.400	71	Meac	dow, non-g	grazed, HS	GC	
	0.300	98	Wate	er Surface			
	4.800	85	Weig	hted Aver	age		
	2.400		Pervi	ous Area	-		
	2.400		Impe	rvious Are	a		
	Tc Len	gth 3	Slope	Velocity	Capacity	Description	
	(min) (fe	et)	(ft/ft)	(ft/sec)	(cfs)		
	6.0					Direct Entry,	







Summary for Subcatchment 5.7S:

Runoff = 27.61 cfs @ 12.09 hrs, Volume= 2.102 af, Depth= 6.82"

Area (ac) CN Description	
1.700 98 Paved parking & roofs	
0.300 74 >75% Grass cover, Good,	, HSG C
0.700 71 Meadow, non-grazed, HS	GC
0.800 73 Woods, Fair, HSG C 0.200 98 Water Surface	
3.700 86 Weighted Average	
1.800 Pervious Area	
1.900 Impervious Area	
Tc Length Slope Velocity Capacity	Description
	Direct Entry
0.0	
Subca	tchment 5.7S:
Hydro	graph
30	
28 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	
26++++++++++++	Type III 24-hr 100-yr
24	Rainfall=8.50"
20 + + - + - + - + - + - + - +	Runoff Area=3.700 ac
o 18	Runoff Volume=2.102 af
5 16	Bunoff Depth=6.82"
	$\mathbf{T}_{\mathbf{C}} = \mathbf{C} \mathbf{C} \mathbf{C}$
	CN=86
2	
0	
0 10 20 30 40 50 60 70 80 90 10011012013014 Tim	10 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 ne (hours)

Summary for Subcatchment 5.8S:

Runoff = 160.43 cfs @ 12.20 hrs, Volume= 15.383 af, Depth= 6.22"

Area	(ac) C	N Des	scription		
4.	700	98 Pav	ed parking	& roofs	
2.	400	74 >75	% Grass c	over, Good	, HSG C
4.	500	71 Me	adow, non-	grazed, HS	GC
10.	100	70 Wo	ods, Good,	HSG C	
1.	200	83 Wo	ods, Poor,	HSG D	
1.	700	98 Wa	ter Surface		
5.	100	94 Urb	an comme	rcial, 85% ii	mp, HSG C
29.	700	81 We	ighted Ave	rage	
18.	965	Per	vious Area		
10.	735	Imp	ervious Are	ea	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
5.1	100	0.0900	0.32		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.50"
1.4	136	0.0500	1.57		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
8.4	2,600	0.0390	5.15	10.30	Trap/Vee/Rect Channel Flow,
					Bot.W=3.00' D=0.50' Z= 2.0 '/' Top.W=5.00'
					n= 0.030 Earth, grassed & winding
14.9	2,836	Total			

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Summary for Reach DP 5: Design Point 5

Inflow Ar	'ea =	72.100 ac, 5	53.86% Impervious,	Inflow Depth = 6.7	72" for 100-yr event
Inflow	=	237.64 cfs @	12.26 hrs, Volume	= 40.403 af	
Outflow	=	237.64 cfs @	12.26 hrs, Volume	= 40.403 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Reach DP 5: Design Point 5 Hydrograph



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Summary for Pond 5.1P: Pocket Wetland (W-4)

Inflow Are	a =	2.400 ac, 75.00% Impervious, Inflow Depth = 7.42" for 100-yr event	
Inflow	=	8.84 cfs @ 12.09 hrs, Volume= 1.484 af	
Outflow	=	8.46 cfs @ 12.27 hrs, Volume= 1.483 af, Atten= 55%, Lag= 11.1 r	min
Primary	=	8.46 cfs @ 12.27 hrs, Volume= 1.483 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 678.00' Surf.Area= 9,300 sf Storage= 19,400 cf Peak Elev= 680.49' @ 12.27 hrs Surf.Area= 15,000 sf Storage= 49,555 cf (30,155 cf above start) Flood Elev= 681.00' Surf.Area= 16,250 sf Storage= 57,525 cf (38,125 cf above start)

Plug-Flow detention time= 1,140.1 min calculated for 1.037 af (70% of inflow) Center-of-Mass det. time= 722.3 min (1,493.2 - 770.9)

Volume	Inv	ert Ava	il.Storage	Storage	e Description		
#1	672.0	00'	75,000 cf	Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevatio (fee	n t)	Surf.Area (sq-ft)	Inc (cubi	.Store c-feet)	Cum.Store (cubic-feet)		
672.0	0	300		0	0		
674.0	0	1,600		1,900	1,900		
676.0	0	3,300		4,900	6,800		
678.0	0	9,300	-	2,600	19,400		
680.0	0	13,800		23,100	42,500		
682.0	0	18,700	(32,500	75,000		
Device	Routing	In	vert Outl	et Device	es		
#1 #2	Primary Primary	678 680	3.00' 2.5'').00' 8.0' Hea Coe	2.5" Vert. Orifice/Grate C= 0.600 8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32			

Primary OutFlow Max=8.39 cfs @ 12.27 hrs HW=680.49' TW=667.03' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.25 cfs @ 7.43 fps) -2=Broad-Crested Rectangular Weir (Weir Controls 8.13 cfs @ 2.09 fps)

Pond 5.1P: Pocket Wetland (W-4)



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Summary for Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	3.300 ac, 63.64% Impervious, Inflow Depth = 7.05" for 100-yr event	
Inflow	=	10.72 cfs @ 12.25 hrs, Volume= 1.940 af	
Outflow	=	1.23 cfs @ 14.73 hrs, Volume= 1.937 af, Atten= 89%, Lag= 148.9 min	
Primary	=	1.23 cfs @ 14.73 hrs, Volume= 1.937 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 666.00' Surf.Area= 13,600 sf Storage= 42,650 cf Peak Elev= 667.94' @ 14.73 hrs Surf.Area= 19,240 sf Storage= 74,583 cf (31,933 cf above start) Flood Elev= 669.00' Surf.Area= 22,350 sf Storage= 96,525 cf (53,875 cf above start)

Plug-Flow detention time= 1,687.4 min calculated for 0.958 af (49% of inflow) Center-of-Mass det. time= 382.0 min (1,710.6 - 1,328.7)

Volume	Inv	ert Avail.Sto	orage Sto	orage Description				
#1	660.	50' 120,3	50 cf Cu	ustom Stage Data (Prismatic) Listed below (Recalc)				
Elevatio	n t)	Surf.Area (sq-ft)	Inc.Sto (cubic-fee	ore Cum.Store eet) (cubic-feet)				
660.5 662 0	50 10	4,400 5,800	7 65	0 0 650 7 650				
664.0	0	7,800	13,60	600 21,250				
666.0	0	13,600	21,40	400 42,650				
668.0 670.0	0	19,400 25,300	33,00 44,70	700 75,650 700 120,350				
Device	Routing	Invert	Outlet D	Devices				
#1 #2	Primary Primary	666.00' 668.25'	6.0" Ver 5.0' long Head (fe Coef. (E	6.0" Vert. Orifice/Grate C= 0.600 5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32				

Primary OutFlow Max=1.23 cfs @ 14.73 hrs HW=667.94' TW=656.06' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 1.23 cfs @ 6.27 fps) -2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 5.3P: Micropool Extended Detention (P-1)

Inflow Area	ι =	13.400 ac, 69.40% Impervious, Inflow Depth = 7.24" for 100-yr event	
Inflow	=	'9.23 cfs @ 12.09 hrs, Volume= 8.080 af	
Outflow	=	6.96 cfs @ 12.21 hrs, Volume= 8.073 af, Atten= 41%, Lag= 7.2 min	
Primary	=	6.96 cfs @ 12.21 hrs, Volume= 8.073 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 654.00' Surf.Area= 24,400 sf Storage= 64,450 cf Peak Elev= 657.18' @ 12.21 hrs Surf.Area= 35,442 sf Storage= 159,315 cf (94,865 cf above start) Flood Elev= 657.00' Surf.Area= 34,800 sf Storage= 153,050 cf (88,600 cf above start)

Plug-Flow detention time= 651.7 min calculated for 6.593 af (82% of inflow) Center-of-Mass det. time= 289.7 min (1,288.4 - 998.7)

Volume	Inv	ert Avail.Sto	orage Storage	Description			
#1	649.0	00' 189,6	50 cf Custon	n Stage Data (Pri	ismatic) Listed below (Recalc)		
Elevatio (fee	on it)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)			
649.0	0	7,900	0	0			
650.0	0	9,000	8,450	8,450			
652.0	0	11,300	20,300	28,750			
654.0	0	24,400	35,700	64,450			
656.0	0	31,200	55,600	120,050			
658.0	00	38,400	69,600	189,650			
Device	Routing	Invert	Outlet Device	es			
#1	Primary	654.00'	6.0" Vert. Or	ifice/Grate C= (0.600		
#2	Primary	655.75'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32				

Primary OutFlow Max=46.76 cfs @ 12.21 hrs HW=657.17' TW=628.12' (Dynamic Tailwater) 1=Orifice/Grate (Orifice Controls 1.62 cfs @ 8.23 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 45.14 cfs @ 3.96 fps)

Pond 5.3P: Micropool Extended Detention (P-1)



Summary for Pond 5.4P: Micropool Extended Detention Pond (P-1)

Inflow Are	ea =	17.800 ac, 7	'9.78% Impe	ervious, In	flow Depth = 7	7.54" for	100-yr event	
Inflow	=	140.86 cfs @	12.09 hrs,	Volume=	11.182 a	ıf		
Outflow	=	101.90 cfs @	12.17 hrs,	Volume=	11.009 a	If, Atten= 2	28%, Lag= 4.9 min	i
Primary	=	101.90 cfs @	12.17 hrs,	Volume=	11.009 a	ıf		
-								

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 636.00' Surf.Area= 17,300 sf Storage= 69,900 cf Peak Elev= 640.05' @ 12.17 hrs Surf.Area= 29,675 sf Storage= 165,452 cf (95,552 cf above start) Flood Elev= 640.00' Surf.Area= 29,488 sf Storage= 163,964 cf (94,064 cf above start)

Plug-Flow detention time= 620.6 min calculated for 9.404 af (84% of inflow) Center-of-Mass det. time= 454.9 min (1,222.4 - 767.5)

Volume	Inv	ert Avail.S	Storage	Storage	Description		
#1	628.	00' 195	,308 cf	Custom	n Stage Data (Pr	ismatic) Listed below (Recalc)	
				_			
Elevatic	on	Surf.Area	Inc.	Store	Cum.Store		
(fee	et)	(sq-ft)	(cubic	;-feet)	(cubic-feet)		
628.0	00	4,600		0	0		
630.0	00	6,100	1	0,700	10,700		
632.0	00	7,900	1	4,000	24,700		
634.0	00	10,000	1	7,900	42,600		
636.0	00	17,300	2	7,300	69,900		
638.0	00	23,638	4	0,938	110,838		
640.0	00	29,488	5	3,126	163,964		
641.0	00	33,200	3	1,344	195,308		
Device	Routing	Inve	rt Outle	et Device	s		
#1	Primary	636.0	0' 1.0'' '	Vert. Ori	fice/Grate C= (0.600	
#2	Primary	637.6	0' 8.0' I	ong x0	.5' breadth Broa	d-Crested Rectangular Weir	
	-		Head	Head (feet) 0.20 0.40 0.60 0.80 1.00			
			Coef	. (Englis	h) 2.80 2.92 3.	08 3.30 3.32	

Primary OutFlow Max=100.43 cfs @ 12.17 hrs HW=640.03' TW=627.66' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.05 cfs @ 9.61 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 100.38 cfs @ 5.17 fps)



Pond 5.4P: Micropool Extended Detention Pond (P-1)

Summary for Pond 5.5P: Extended Detention Pond (Design 2) - Dry Pond

Inflow Are	ea =	33.900 ac, 7	0.21% Impervious,	Inflow Depth > 7.18"	for 100-yr event
Inflow	=	160.22 cfs @	12.17 hrs, Volume	= 20.291 af	
Outflow	=	98.33 cfs @	12.45 hrs, Volume	= 20.242 af, Att	en= 39%, Lag= 17.1 min
Primary	=	98.33 cfs @	12.45 hrs, Volume	= 20.242 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Peak Elev= 629.11' @ 12.45 hrs Surf.Area= 40,882 sf Storage= 264,263 cf Flood Elev= 629.00' Surf.Area= 40,550 sf Storage= 259,975 cf

Plug-Flow detention time= 948.9 min calculated for 20.239 af (100% of inflow) Center-of-Mass det. time= 911.1 min (2,135.4 - 1,224.3)

Volume	Inve	ert Avail.Sto	rage Storage Description				
#1	620.0	0' 302,1	00 cf Custor	n Stage Data (Pr	ismatic) Listed below (Recalc)		
Elevatio	on	Surf.Area	Inc.Store	Cum.Store			
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)			
620.0	00	20,400	0	0			
622.0	00	23,400	43,800	43,800			
624.0	00	26,500	49,900	93,700			
626.0	00	31,700	58,200	151,900			
628.0	00	37,400	69,100	221,000			
630.0	00	43,700	81,100	302,100			
Device	Routing	Invert	Outlet Devic	es			
#1	Primary	620.00'	2.5" Vert. O	rifice/Grate C=	0.600		
#2	Primary	624.50'	18.0" Vert. (Drifice/Grate C=	= 0.600		
#3	Primary	627.00'	8.0' long x	0.5' breadth Broa	ad-Crested Rectangular Weir		
			Head (feet)	0.20 0.40 0.60	0.80 1.00		
			Coef. (Englis	sh) 2.80 2.92 3.	08 3.30 3.32		
_ .	· · =						

Primary OutFlow Max=98.32 cfs @ 12.45 hrs HW=629.11' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.49 cfs @ 14.45 fps)

-2=Orifice/Grate (Orifice Controls 16.71 cfs @ 9.45 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 81.12 cfs @ 4.82 fps)

Hydrograph 170 160.22 cfs - Inflow - Primary 160 Inflow Area=33.900 ac 150 140 Peak Elev=629.11' 130 120 Storage=264,263 cf 110 98.33 cfs 100 Flow (cfs) 90-80 70 60 50-40 30 20 10 0-10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó Time (hours)

Pond 5.5P: Extended Detention Pond (Design 2) - Dry Pond

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Summary for Pond 5.6P: Pocket Wetland (W-4)

Inflow Area	a =	4.800 ac, 50.00% Impervious, Inflow Depth = 6.70" for 100-yr event	
Inflow	=	35.38 cfs @ 12.09 hrs, Volume= 2.679 af	
Outflow	=	6.33 cfs @ 12.55 hrs, Volume= 2.677 af, Atten= 82%, Lag= 27.7 mi	n
Primary	=	6.33 cfs @ 12.55 hrs, Volume= 2.677 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 609.00' Surf.Area= 7,500 sf Storage= 15,000 cf Peak Elev= 614.32' @ 12.55 hrs Surf.Area= 17,634 sf Storage= 80,885 cf (65,885 cf above start) Flood Elev= 614.00' Surf Area= 17,000 sf Storage= 75,400 cf (60,400 cf above start)

Plug-Flow detention time= 1,811.1 min calculated for 2.333 af (87% of inflow) Center-of-Mass det. time= 1,521.0 min (2,309.5 - 788.4)

Volume	Inver	t Avail.Si	orage	Storage	Description		
#1	601.00	' 93,	400 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevation (feet)	S	urf.Area (sq-ft)	Inc (cubio	.Store	Cum.Store		
601.00		220	(00.01	0	0		
602.00		360		290	290		
604.00		850		1,210	1,500		
606.00		1,900		2,750	4,250		
608.00		3,400		5,300	9,550		
609.00		7,500		5,450	15,000		
610.00		9,100		8,300	23,300		
612.00		13,000	2	2,100	45,400		
614.00		17,000	3	80,000	75,400		
615.00		19,000	1	8,000	93,400		
Device F	louting	Inver	t Outle	et Device:	S		
#1 P	rimary	609.00	2.0"	Vert. Ori	fice/Grate C= (0.600	
#2 P	rimary	613.50	2.5	2.5' long x 0.5' breadth Broad-Crested Rectangular Weir			
			Head	d (feet) 0	.20 0.40 0.60	0.80 1.00	
			Coel	. (English	1) 2.80 2.92 3.	08 3.30 3.32	

Primary OutFlow Max=6.33 cfs @ 12.55 hrs HW=614.32' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.24 cfs @ 11.01 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 6.09 cfs @ 2.98 fps)

Pond 5.6P: Pocket Wetland (W-4)


Summary for Pond 5.7P: Pocket Wetland (W-4)

Inflow Area =	3.700 ac, 51.35% Impervious, Inflow D	epth = 6.82" for 100-yr event
Inflow =	27.61 cfs @ 12.09 hrs, Volume=	2.102 af
Outflow =	21.99 cfs @ 12.15 hrs, Volume=	2.100 af, Atten= 20%, Lag= 4.0 min
Primary =	21.99 cfs @ 12.15 hrs, Volume=	2.100 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 656.00' Surf.Area= 8,300 sf Storage= 18,240 cf Peak Elev= 658.38' @ 12.15 hrs Surf.Area= 12,667 sf Storage= 43,243 cf (25,003 cf above start) Flood Elev= 659.00' Surf.Area= 13,750 sf Storage= 51,415 cf (33,175 cf above start)

Plug-Flow detention time= 753.3 min calculated for 1.682 af (80% of inflow) Center-of-Mass det. time= 528.3 min (1,314.1 - 785.8)

Inve	rt Avail.Sto	orage Storage	Description	
648.00)' 66,0	40 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
n 5	Surf.Area	Inc.Store	Cum.Store	
)	(sq-ft)	(cubic-feet)	(cubic-feet)	
)	240	0	0	
)	650	890	890	
)	1,400	2,050	2,940	
)	2,800	4,200	7,140	
)	8,300	11,100	18,240	
)	12,000	20,300	38,540	
)	15,500	27,500	66,040	
Routing	Invert	Outlet Device	S	
Primary	656.00'	1.5" Vert. Ori	fice/Grate C= 0	0.600
Primary	657.50'	8.0' long x 0 Head (feet) C Coef. (Englis)	.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32
	Inver 648.00))))) Primary Primary	Invert Avail.Std 648.00' 66,0 n Surf.Area) (sq-ft)) 240) 650) 1,400) 2,800) 8,300) 12,000) 15,500 Routing Invert Primary 656.00' Primary 657.50'	Invert Avail.Storage Storage 648.00' 66,040 cf Custom n Surf.Area Inc.Store o (sq-ft) (cubic-feet) o 240 0 o 650 890 o 1,400 2,050 o 2,800 4,200 o 8,300 11,100 o 12,000 20,300 o 15,500 27,500 Routing Invert Outlet Device Primary 656.00' 1.5'' Vert. Ori B.0' long x 0 Head (feet) (Coef. (Englis)	Invert Avail.Storage Storage Description 648.00' 66,040 cf Custom Stage Data (Pr n Surf.Area Inc.Store Cum.Store 0 240 0 0 0 0 650 890 890 890 1,400 2,050 2,940 7,140 1,8,300 11,100 18,240 12,000 20,300 38,540 1,5,500 27,500 66,040 15,500 27,500 66,040 Primary 656.00'

Primary OutFlow Max=21.85 cfs @ 12.15 hrs HW=658.38' TW=0.00' (Dynamic Tailwater) -1=Orifice/Grate (Orifice Controls 0.09 cfs @ 7.33 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 21.76 cfs @ 3.10 fps)

Pond 5.7P: Pocket Wetland (W-4)





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Summary for Subcatchment 6.1S:

Runoff = 11.07 cfs @ 12.17 hrs, Volume= 0.960 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area	(ac) (CN D	escription		
3.	100	98 P	aved parking	& roofs	
3.	700	74 >	75% Ġrass c	over, Good	, HSG C
0.4	400	71 M	eadow, non-	grazed, HS	GC
0.3	200	70 W	oods, Good	, HSG C	
0.2	200	98 W	ater Surface	9	
7.	600	84 W	eighted Ave	rage	
4.3	300	Р	ervious Area		
3.3	300	In	npervious Ar	ea	
Tc	Length	Slop	e Velocity	Capacity	Description
(min)	(feet)	(ft/	t) (ft/sec)	(cfs)	
11.3	100	0.090	0.15		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
0.5	70	0.130	0 2.52		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
11.8	170	Total			

Subcatchment 6.1S:



Summary for Subcatchment 6.2S:

Runoff = 0.87 cfs @ 12.10 hrs, Volume= 0.070 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

	Area ((ac) C	N Des	cription			
	0.8	800	71 Mea	dow, non-g	grazed, HS	GC	
_	0.3	300	70 Woo	ods, Good,	HSG C		
	1.	100	71 Wei	ghted Avei	rage		
	1.1	100	Perv	vious Area	•		
	Тс	Length	Slope	Velocity	Capacity	Description	
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)		
	5.1	100	0.0900	0.32		Sheet Flow,	
						Grass: Short n= 0.150 P2= 3.50"	
	0.6	80	0.1000	2.21		Shallow Concentrated Flow,	
_						Short Grass Pasture Kv= 7.0 fps	

5.7 180 Total

Subcatchment 6.2S:



Summary for Subcatchment 6.3S:

Runoff = 17.59 cfs @ 12.19 hrs, Volume= 1.618 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (a	.c) C	N Des	cription		
4.00	00 9	8 Pav	ed parking	& roofs	
0.20	30 8	87 Dirt	roads, HS	GC	
2.80	00 7	'4 >75	% Grass c	over, Good	, HSG C
6.40	00 7	'1 Mea	adow, non-g	grazed, HS	GC
3.40	00 7	'0 Wo	ods, Good,	HSG C	
0.40	00 9	98 Wa	ter Surface		
17.20	00 7	'8 We	ghted Ave	rage	
12.80	00	Per	vious Area		
4.40	00	Imp	ervious Are	ea	
Tc L	ength	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
11.8	100	0.0800	0.14		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
0.8	130	0.1600	2.80		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps

12.6 230 Total

Subcatchment 6.3S:



Summary for Subcatchment 6.4S:

Runoff = 9.59 cfs @ 12.08 hrs, Volume= 0.690 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

_	Area (ac)	CN	Desc	cription		
	1.6	600	98	Pave	ed parking	& roofs	
	0.3	300	87	Dirt r	oads, HS	GC	
	1.1	700	74	>75%	% Grass co	over, Good	, HSG C
	1.	500	71	Mea	dow, non-g	grazed, HS	GC
	0.9	900	70	Woo	ds, Good,	HSG C	
_	0.3	300	98	Wate	er Surface		
	6.3	300	81	Weig	ghted Aver	age	
	4.4	400		Perv	ious Area	•	
	1.9	900		Impe	ervious Are	ea	
	Тс	Length	n S	Slope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	4.7	100	0.	.1100	0.35		Sheet Flow,
							Grass: Short n= 0.150 P2= 3.50"
	0.5	97	70.	.2500	3.50		Shallow Concentrated Flow,
							Short Grass Pasture Kv= 7.0 fps

5.2 197 Total

Subcatchment 6.4S:



Summary for Subcatchment 6.5S:

Runoff = 2.95 cfs @ 12.06 hrs, Volume= 0.208 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

_	Area (ac) C	N Des	cription				
	0.400) 9	8 Pav	ed parking	& roofs			
	0.300) 7	4 >75	% Grass c	over, Good	, HSG C		
	1.700) 7	'1 Mea	dow, non-g	grazed, HS	GC		
_	0.200) 7	0 Wo	ods, Good,	HSG C			
	2.600) 7	'5 Wei	ghted Aver	age			
	2.200)	Perv	vious Area				
	0.400)	Imp	ervious Are	ea			
					<u> </u>			
	Tc Le	ength	Slope	Velocity	Capacity	Description		
_	(min) ((feet)	(ft/ft)	(ft/sec)	(cfs)			
	3.6	100	0.2200	0.46		Sheet Flow,		

Grass: Short n= 0.150 P2= 3.50'

Subcatchment 6.5S:



Summary for Subcatchment 6.6S:

Runoff = 2.92 cfs @ 12.16 hrs, Volume= 0.250 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area	(ac) C	N Des	cription		
0.	500	98 Pav	ed parking	& roofs	
0.	100	74 >75	% Grass c	over, Good	, HSG C
1.:	200	71 Mea	dow, non-g	grazed, HS	GC
0.3	300	70 Woo	ods, Good,	HSG C	
0.3	300	98 Wat	er Surface		
2.4	400	30 Wei	ghted Aver	age	
1.0	600	Perv	vious Area	0	
0.8	800	Impe	ervious Are	ea	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
4.5	75	0.0700	0.28		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.50"
3.9	25	0.0800	0.11		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.1	140	0.0900	2.10		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
0.1	40	0.4500	4.70		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
1.2	240	0.0250	3.21		Shallow Concentrated Flow,
					Paved Kv= 20.3 fps
10.8	520	Total			

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Hydrograph - Runoff 2.92 cfs 3-Type III 24-hr 1-yr Rainfall=3.00" Runoff Area=2.400 ac 2 Runoff Volume=0.250 af Flow (cfs) Runoff Depth=1.25" Flow Length=520' Tc=10.8 min 1 **CN=80** 0 10 20 30 40 50 60 70 80 90 100110120130140150160170180190200210220230240250260270280290300 Ó Time (hours)

Subcatchment 6.6S:

Summary for Subcatchment 6.7S:

Runoff = 43.35 cfs @ 12.21 hrs, Volume= 4.087 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area ((ac) C	N Des	cription		
0.3	200 9	8 Pave	ed parking	& roofs	
0.3	200 7	′4 >75°	% Grass co	over, Good,	, HSG C
2.	700 7	'1 Mea	dow, non-g	grazed, HS	GC
3.	700 7	'0 Woo	ods, Good,	HSG C	
16.3	300 9	4 Urba	an commer	rcial, 85% ir	np, HSG C
5.	100 8	3 1/4 a	acre lots, 3	8% imp, H	SG C
28.	200 8	87 Weig	ghted Aver	age	
12.	207	Perv	vious Area		
15.9	993	Impe	ervious Are	ea	
Тс	Lenath	Slope	Velocity	Capacity	Description
(min)	(feet)	(11/11)	(1)	(of a)	
	· · · · ·	(11/11)	(II/SEC)	(CIS)	
11.8	100	0.0800	(tt/sec)0.14	(CIS)	Sheet Flow,
11.8	100	0.0800	(ft/sec) 0.14	(CIS)	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
11.8 1.8	100 175	0.0800	0.14 1.58	(CIS)	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow,
11.8 1.8	100 175	0.0800	0.14 1.58		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.8 1.8 1.4	100 175 100	0.0800	0.14 1.58 1.21	(CIS)	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow,
11.8 1.8 1.4	100 175 100	0.0800 0.1000 0.0300	(ff/sec) 0.14 1.58 1.21	(CIS)	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps

Subcatchment 6.7S:



Summary for Reach DP 6: Design Point 6

Inflow Ar	ea =	65.400 ac, 4	10.97% Impervious,	Inflow Depth > 1.	43" for 1-yr event
Inflow	=	43.47 cfs @	12.21 hrs, Volume	e= 7.806 af	
Outflow	=	43.47 cfs @	12.21 hrs, Volume	e= 7.806 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Reach DP 6: Design Point 6



Summary for Pond 6.1P: Micropool Extended Detention Pond (P-1)

Inflow Area =	7.600 ac, 43.42% Impervious, Inflow	Depth = 1.52" for 1-yr event
Inflow =	11.07 cfs @ 12.17 hrs, Volume=	0.960 af
Outflow =	1.25 cfs @ 13.24 hrs, Volume=	0.960 af, Atten= 89%, Lag= 64.4 min
Primary =	1.25 cfs @ 13.24 hrs, Volume=	0.960 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 687.00' Surf.Area= 9,450 sf Storage= 23,775 cf Peak Elev= 688.93' @ 13.24 hrs Surf.Area= 14,108 sf Storage= 46,843 cf (23,068 cf above start) Flood Elev= 691.00' Surf.Area= 18,550 sf Storage= 80,525 cf (56,750 cf above start)

Plug-Flow detention time= 2,693.5 min calculated for 0.415 af (43% of inflow) Center-of-Mass det. time= 1,232.2 min (2,070.1 - 837.9)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	682.0	00' 100,2	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
682.0	00	2.200	0	0	
684.0	00	3,400	5,600	5,600	
686.0	00	6,700	10,100	15,700	
688.0	00	12,200	18,900	34,600	
690.0	00	16,300	28,500	63,100	
692.0	00	20,800	37,100	100,200	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	687.00'	2.0" Vert. Or	fifice/Grate C= (0.600
#2	Primary	688.75'	5.0' long x 0).5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coet. (Englis	sh) 2.80 2.92 3.	08 3.30 3.32

Primary OutFlow Max=1.22 cfs @ 13.24 hrs HW=688.93' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.14 cfs @ 6.54 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 1.08 cfs @ 1.19 fps)



Pond 6.1P: Micropool Extended Detention Pond (P-1)

Summary for Pond 6.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	=	8.700 ac, 37.93% Impervious, Inflow Depth = 1.4	2" for 1-yr event
Inflow	=	1.36 cfs @ 13.22 hrs, Volume= 1.030 af	
Outflow	=	0.08 cfs @ 58.88 hrs, Volume= 1.029 af,	Atten= 94%, Lag= 2,739.7 min
Primary	=	0.08 cfs @ 58.88 hrs, Volume= 1.029 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 673.00' Surf.Area= 10,250 sf Storage= 30,225 cf Peak Elev= 674.95' @ 58.88 hrs Surf.Area= 15,190 sf Storage= 55,464 cf (25,239 cf above start) Flood Elev= 677.00' Surf.Area= 19,650 sf Storage= 91,075 cf (60,850 cf above start)

Plug-Flow detention time= 9,261.9 min calculated for 0.335 af (33% of inflow) Center-of-Mass det. time= 4,056.7 min (6,046.0 - 1,989.3)

Volume	Inv	ert Avail.St	orage Storage	e Description	
#1	668.0	00' 111,9	900 cf Custon	n Stage Data (Pri	ismatic) Listed below (Recalc)
Elevatio (fee	n t)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
668.0 670.0 672.0 674.0 676.0 676.0	0 0 0 0 0 0 0 0 0	3,700 5,300 7,200 13,300 17,300 22,000	0 9,000 12,500 20,500 30,600 39,300	0 9,000 21,500 42,000 72,600 111,900	
Device	Routing	Invert	Outlet Device	es vifice/Crete	2 000
#1 #2	Primary	675.50	5.0' long x (Head (feet) Coef. (Englis	0.20 0.40 0.60 (sh) 2.80 2.92 3.	ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=0.08 cfs @ 58.88 hrs HW=674.95' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.08 cfs @ 6.61 fps) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 6.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.3P: Micropool Extended Detention Pond (P-1)

Inflow = 17.59 cfs @ 12.19 hrs, Volume= 1.618 af	
Outflow = 5.34 cfs @ 12.64 hrs, Volume= 1.618 af, Atten= 70%, Lag= 27.2 m	n
Primary = 5.34 cfs @ 12.64 hrs, Volume= 1.618 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 747.50' Surf.Area= 15,148 sf Storage= 43,193 cf Peak Elev= 748.99' @ 12.64 hrs Surf.Area= 21,528 sf Storage= 70,835 cf (27,642 cf above start) Flood Elev= 751.10' Surf.Area= 30,065 sf Storage= 125,041 cf (81,848 cf above start)

Plug-Flow detention time= 2,085.9 min calculated for 0.626 af (39% of inflow) Center-of-Mass det. time= 762.5 min (1,621.4 - 858.9)

Volume	Inv	ert Avail.St	orage Sto	torage Description
#1	742.0	00' 153,	780 cf Cu	ustom Stage Data (Prismatic) Listed below (Recalc)
Elevatio	n t)	Surf.Area (sq-ft) 5 200	Inc.Sto (cubic-fee	ore Cum.Store <u>et) (cubic-feet)</u>
744.0 746.0 748.0 750.0 752.0		6,500 7,790 17,600 25,500 33,800	11,70 14,29 25,39 43,10 59,30	700 11,700 290 25,990 390 51,380 100 94,480 300 153,780
Device	Routing	Inver	t Outlet D	Devices
#1 #2	Primary Primary	747.50 748.50	2.0" Ver 5.0' long Head (fe Coef. (E	rt. Orifice/Grate C= 0.600 g x 0.5' breadth Broad-Crested Rectangular Weir eet) 0.20 0.40 0.60 0.80 1.00 English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.32 cfs @ 12.64 hrs HW=748.99' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.12 cfs @ 5.72 fps) -2=Broad-Crested Rectangular Weir (Weir Controls 5.20 cfs @ 2.10 fps)





Summary for Pond 6.4P: Micropool Extended Detention Pond (P-1)

Inflow Area	=	6.300 ac, 3	30.16% Impe	ervious,	Inflow Depth =	- 1.3	1" for	1-yr	event	
Inflow =	=	9.59 cfs @	12.08 hrs,	Volume	= 0.69	0 af				
Outflow =	=	0.20 cfs @	19.53 hrs,	Volume	= 0.63	8 af,	Atten= 9	98%,	Lag= 446.9 m	ιin
Primary =	=	0.20 cfs @	19.53 hrs,	Volume	= 0.63	8 af				

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 728.00' Surf.Area= 12,100 sf Storage= 33,800 cf Peak Elev= 729.80' @ 19.53 hrs Surf.Area= 16,055 sf Storage= 59,108 cf (25,308 cf above start) Flood Elev= 732.00' Surf.Area= 21,200 sf Storage= 100,100 cf (66,300 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow) Center-of-Mass det. time= 6,047.6 min (6,889.7 - 842.1)

Volume	Invert Avail.St	orage Storage	Description	
#1 7	22.00' 122,	600 cf Custom	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevation	Surf.Area	Inc.Store	Cum.Store	
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	
722.00	2,700	0	0	
724.00	4,000	6,700	6,700	
726.00	5,500	9,500	16,200	
728.00	12,100	17,600	33,800	
730.00	16,500	28,600	62,400	
732.00	21,200	37,700	100,100	
733.00	23,800	22,500	122,600	
Device Rout	ing Inver	t Outlet Device	es	
#1 Prim	ary 728.00	' 1.0" Vert. Ori	fice/Grate C=	0.600
#2 Prim	ary 729.75	5.0' long x 0	.5' breadth Broa	ad-Crested Rectangular Weir
		Head (feet) (0.20 0.40 0.60	0.80 1.00
		Coef. (Englis	h) 2.80 2.92 3.	08 3.30 3.32
Brimon OutE	Low Max 0.19 of	@ 10 52 hra U		

Primary OutFlow Max=0.18 cfs @ 19.53 hrs HW=729.80' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.03 cfs @ 6.38 fps) 2=Proved Created Rectangular Wair (Wair Controls 0.15 ofs @ 0.61 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 0.15 cfs @ 0.61 fps)



Pond 6.4P: Micropool Extended Detention Pond (P-1)

Summary for Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	ι =	19.800 ac, 2	24.24% Impe	ervious, Inflov	v Depth = 1.1	1" for 1-yr	event
Inflow	=	5.79 cfs @	12.63 hrs,	Volume=	1.826 af		
Outflow	=	0.32 cfs @	24.36 hrs,	Volume=	1.826 af,	Atten= 95%,	Lag= 703.8 min
Primary	=	0.32 cfs @	24.36 hrs,	Volume=	1.826 af		

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 732.00' Surf.Area= 8,900 sf Storage= 5,350 cf Peak Elev= 735.84' @ 24.36 hrs Surf.Area= 16,396 sf Storage= 53,970 cf (48,620 cf above start) Flood Elev= 741.00' Surf.Area= 28,300 sf Storage= 170,100 cf (164,750 cf above start)

Plug-Flow detention time= 2,258.9 min calculated for 1.703 af (93% of inflow) Center-of-Mass det. time= 1,780.0 min (3,314.7 - 1,534.7)

Volume	Inv	ert Ava	I.Storage	Storage	e Description	
#1	731.	00' 1	99,250 cf	Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc	c.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubi	ic-feet)	(cubic-feet)	
731.0	00	1,800		0	0	
732.0	00	8,900		5,350	5,350	
734.0	00	12,800		21,700	27,050	
736.0	00	16,700		29,500	56,550	
738.0	00	21,400		38,100	94,650	
740.0	00	26,600		48,000	142,650	
742.0	00	30,000		56,600	199,250	
Device	Routing	In	vert Out	let Device	es	
#1	Primary	732	.00' 2.5'	' Vert. Or	ifice/Grate C=	0.600
#2	Primary	738	.50' 5.0'	long x 0	.5' breadth Broa	ad-Crested Rectangular Weir
			Hea	d (feet)	0.20 0.40 0.60	0.80 1.00
			Coe	ef. (Englis	h) 2.80 2.92 3.	.08 3.30 3.32

Primary OutFlow Max=0.32 cfs @ 24.36 hrs HW=735.84' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.32 cfs @ 9.31 fps)

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

Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.6P: Micropool Extended Detention Pond (P-1)

Inflow Area =	8.700 ac, 31.03% Impervious, Inflow	Depth > 1.22" for 1-yr event	
Inflow =	2.94 cfs @ 12.16 hrs, Volume=	0.888 af	
Outflow =	0.08 cfs @ 24.83 hrs, Volume=	0.864 af, Atten= 97%, Lag= 760.	2 min
Primary =	0.08 cfs @ 24.83 hrs, Volume=	0.864 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 690.00' Surf.Area= 12,300 sf Storage= 40,000 cf Peak Elev= 690.98' @ 24.83 hrs Surf.Area= 14,168 sf Storage= 53,009 cf (13,009 cf above start) Flood Elev= 695.00' Surf.Area= 22,600 sf Storage= 126,250 cf (86,250 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow) Center-of-Mass det. time= 1,513.8 min (6,702.5 - 5,188.7)

Volume	Inver	t Avail.Stor	rage Storag	ge Description	
#1	684.00	' 150,00	00 cf Custo	om Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on S	urf.Area	Inc.Store	Cum.Store	
)())()	3 700			
686.0	0	5,200	8,900	8,900	
688.0	00	6,800	12,000	20,900	
690.0	00	12,300	19,100	40,000	
692.0	00	16,100	28,400	68,400	
694.0	00	20,300	36,400	104,800	
696.0	00	24,900	45,200	150,000	
Device	Routing	Invert	Outlet Devi	ces	
#1	Primary	690.00'	1.8" Vert. C	Drifice/Grate C=	0.600
#2	Primary	691.25'	10.0" Vert.	Orifice/Grate C=	= 0.600
#3	Primary	693.00'	8.0' long x Head (feet) Coef (Engl	0.5' breadth Broa 0.20 0.40 0.60 (isb) 2.80 2.92 3	ad-Crested Rectangular Weir 0.80 1.00 08 3 30 3 32
			eeen (2ng		

Primary OutFlow Max=0.08 cfs @ 24.83 hrs HW=690.98' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.08 cfs @ 4.59 fps)

-2=Orifice/Grate (Controls 0.00 cfs)

-3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)



Pond 6.6P: Micropool Extended Detention Pond (P-1)

Summary for Subcatchment 6.1S:

Runoff = 14.17 cfs @ 12.17 hrs, Volume= 1.226 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Are	a (ac)	C	V Des	cription		
	3.100	9	8 Pave	ed parking	& roofs	
	3.700	74	4 >759	% Ġrass c	over, Good	, HSG C
	0.400	7	1 Mea	dow, non-g	grazed, HS	GC
	0.200	7	0 Woo	ods, Good,	HSG C	
	0.200	98	8 Wat	er Surface		
	7.600	8	4 Wei	ghted Aver	age	
	4.300		Perv	vious Area	0	
	3.300		Impe	ervious Are	ea	
T	c Leng	th	Slope	Velocity	Capacity	Description
(min) (fee	et)	(ft/ft)	(ft/sec)	(cfs)	
11.3	3 10	00	0.0900	0.15		Sheet Flow,
						Woods: Light underbrush n= 0.400 P2= 3.50"
0.	5 7	70	0.1300	2.52		Shallow Concentrated Flow,
						Short Grass Pasture Kv= 7.0 fps
11.8	3 17	70	Total			

Subcatchment 6.1S:



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			Sun	nmary for	Subcatch	ment 6.2	2S:		
Runoff	=	1.27 cfs	s@ 12.1	0 hrs, Volu	me=	0.098 af,	Depth= 1.06"		
Runoff b Type III 2	y SCS TF 24-hr 2-yr	R-20 meth Rainfall	nod, UH=S =3.50"	CS, Time S	Span= 0.00-3	300.00 hrs	, dt= 0.05 hrs		
Area	(ac) C	N Dese	cription						
0. 0.	800 7 300 7	'1 Mea '0 Woo	dow, non-g ods, Good,	grazed, HS HSG C	GC				
1.	100 7	′1 Wei	ghted Aver	age					
1.	100	Perv	vious Area						
Tc (min)	Length	Slope	Velocity	Capacity	Description	1			
<u>(1111)</u> 5 1	100	0.0900	0.32	(015)	Sheet Flow				
0.1	100	0.0000	0.02		Grass: Sho	ort n= 0.1	50 P2= 3.50"		
0.6	80	0.1000	2.21		Shallow Co	oncentrate	ed Flow,		
5.7	180	Total			Short Gras	s Pasture	KV= 7.0 Ips		
				Subca	tchment 6	.2S:			
				Hydro	graph				
ſ	1 27 cfe								- Runoff
ľ									
-						Тур	e III 24-nr	2-yr	
-							Rainfall=3	.50''	
1					R	unoff	∆rea_1 10(0 ac	

Type III 24-hr 2-yr Rainfall=3.50"

Union Place Post-development DP6



Summary for Subcatchment 6.3S:

Runoff = 23.72 cfs @ 12.18 hrs, Volume= 2.146 af, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac)	CN	Desc	cription					
4.	000	98	Pave	ed parking	& roofs				
0.	200	87	Dirt r	oads, HS	GC				
2.	800	74	>75%	6 Grass co	over, Good,	, HSG C			
6.	400	71	Mea	dow, non-g	grazed, HS	GC			
3.	400	70	Woo	ds, Good,	HSG C				
0.	400	98	Wate	er Surface					
17.	200	78	Weig	ghted Aver	age				
12.	12.800		Perv	Pervious Area					
4.400			Impe	ervious Are	ea				
Tc	Length	n S	Slope	Velocity	Capacity	Description			
(min)	(feet)		(ft/ft)	(ft/sec)	(cfs)				
11.8	100) ().	0800	0.14		Sheet Flow,			
						Woods: Light underbrush n= 0.400 P2= 3.50"			
0.8	130) ().	1600	2.80		Shallow Concentrated Flow,			
						Short Grass Pasture Kv= 7.0 fps			

12.6 230 Total

Subcatchment 6.3S:



Summary for Subcatchment 6.4S:

Runoff = 12.56 cfs @ 12.08 hrs, Volume= 0.897 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

	Area ((ac)	CN	Desc	cription				
	1.600 98 Paved parking & roofs								
	0.3	300	87	Dirt r	roads, HS	GC			
	1.	700	74	>75%	% Grass co	over, Good	, HSG C		
	1.	500	71	Mea	dow, non-g	grazed, HS	GC		
	0.9	900	70	Woo	ds, Good,	HSG C			
	0.3	300	98	Wate	er Surface				
	6.3	300	81	Weig	ghted Aver	age			
	4.400 Pervious Area								
1.900 Impervious Area									
	Тс	Lengt	h	Slope	Velocity	Capacity	Description		
	(min)	(feet	t)	(ft/ft)	(ft/sec)	(cfs)			
	4.7	10	0 0	.1100	0.35		Sheet Flow,		
							Grass: Short n= 0.150 P2= 3.50"		
	0.5	9	70	.2500	3.50		Shallow Concentrated Flow,		
							Short Grass Pasture Kv= 7.0 fps		

5.2 197 Total

Subcatchment 6.4S:



Summary for Subcatchment 6.5S:

Runoff = 4.11 cfs @ 12.06 hrs, Volume= 0.282 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

	Area (ac)	С	N De	scription		
	0.400	ç	98 Pa	ved parking	& roofs	
	0.300	7	′4 >7	5% Grass c	over, Good	d, HSG C
	1.700	7	′1 Me	adow, non-	grazed, HS	SG C
	0.200	7	70 W	oods, Good,	HSG C	
	2.600	7	'5 W	eighted Ave	rage	
	2.200		Pe	rvious Area	-	
	0.400		lm	pervious Are	ea	
	Tc Lei	ngth	Slope	e Velocity	Capacity	Description
_	<u>(min)</u> (f	eet)	(ft/ft) (ft/sec)	(cfs)	
	3.6	100	0.220	0.46		Sheet Flow,
						Cross Short n 0.150 D2 2.50"

Grass: Short n= 0.150 P2= 3.50





Summary for Subcatchment 6.6S:

Runoff = 3.87 cfs @ 12.16 hrs, Volume= 0.327 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) C	N Des	cription					
0.500 98		98 Pav	Paved parking & roofs					
0.	100	74 >75	'5% Grass cover, Good, HSG C					
1.	200	71 Mea	eadow, non-grazed, HSG C					
0.	300	70 Woo	ods, Good,	HSG C				
0.	300	98 Wat	ater Surface					
2.	400	80 Wei	eighted Average					
1.	600	Perv	vious Area	C				
0.	800	Impe	ervious Are	ea				
Tc	Length	Slope	Velocity	Capacity	Description			
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
4.5	75	0.0700	0.28		Sheet Flow,			
					Grass: Short n= 0.150 P2= 3.50"			
3.9	25	0.0800	0.11		Sheet Flow,			
					Woods: Light underbrush n= 0.400 P2= 3.50"			
1.1	140	0.0900	2.10		Shallow Concentrated Flow,			
					Short Grass Pasture Kv= 7.0 fps			
0.1	40	0.4500	4.70		Shallow Concentrated Flow,			
					Short Grass Pasture Kv= 7.0 fps			
1.2	240	0.0250	3.21		Shallow Concentrated Flow,			
					Paved Kv= 20.3 fps			
10.8	520	Total						

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Subcatchment 6.6S:

Summary for Subcatchment 6.7S:

Runoff = 54.28 cfs @ 12.21 hrs, Volume= 5.129 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area	(ac) C	N Des	cription			
0.	0.200 98 Paved parking & roofs					
0.	200	74 >75	% Grass c	over, Good	, HSG C	
2.	700 7	71 Mea	dow, non-g	grazed, HS	GC	
3.	700 7	70 Woo	ods, Good,	HSG C		
16.	300 9	94 Urba	an commei	cial, 85% ir	mp, HSG C	
5.	100 8	<u>33 1/4 a</u>	acre lots, 3	8% imp, H	SG C	
28.	200 8	37 Wei	ghted Avei	age		
12.	207	Perv	vious Area			
15.993 Impervious Area						
Та	l on ath	Clana	Volooitu	Consoitu	Description	
IC (min)	Length			Capacity	Description	
(11111)	(leet)	(11/11)	(IL/Sec)	(CIS)		
11.8	100	0.0800	0.14		Sheet Flow,	
					Woods: Light underbrush n= 0.400 P2= 3.50"	
1.8	175	0.1000	1.58		Shallow Concentrated Flow,	
					Woodland Kv= 5.0 fps	
1.4	100	0.0300	1.21		Shallow Concentrated Flow,	
					Short Grass Pasture Kv= 7.0 fps	



Subcatchment 6.7S:

Summary for Reach DP 6: Design Point 6

Inflow Ar	rea =	65.400 ac, 4	10.97% Impervious,	Inflow Depth > 1	.84" for 2-yr event
Inflow	=	54.45 cfs @	12.21 hrs, Volume	= 10.027 af	
Outflow	=	54.45 cfs @	12.21 hrs, Volume	= 10.027 af	, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs



Reach DP 6: Design Point 6
Summary for Pond 6.1P: Micropool Extended Detention Pond (P-1)

Inflow Area = 7.600 ac, 43.42% Impervious, Inflow Depth = 1.94" for 2	2-yr event
Inflow = 14.17 cfs @ 12.17 hrs, Volume= 1.226 af	
Outflow = 3.53 cfs @ 12.64 hrs, Volume= 1.226 af, Atten= 75	5%, Lag= 28.3 min
Primary = 3.53 cfs @ 12.64 hrs, Volume= 1.226 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 687.00' Surf.Area= 9,450 sf Storage= 23,775 cf Peak Elev= 689.13' @ 12.64 hrs Surf.Area= 14,509 sf Storage= 49,644 cf (25,869 cf above start) Flood Elev= 691.00' Surf.Area= 18,550 sf Storage= 80,525 cf (56,750 cf above start)

Plug-Flow detention time= 1,874.6 min calculated for 0.681 af (55% of inflow) Center-of-Mass det. time= 981.1 min (1,812.0 - 830.9)

Volume	Inv	ert Avail.Sto	orage Storage	Description		
#1	682.0	00' 100,2	00 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevatio	on	Surf.Area	Inc.Store	Cum.Store		
(tee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)		
682.0	00	2,200	0	0		
684.0	00	3,400	5,600	5,600		
686.0	00	6,700	10,100	15,700		
688.0	00	12,200	18,900	34,600		
690.0	00	16,300	28,500	63,100		
692.0	00	20,800	37,100	100,200		
Device	Routing	Invert	Outlet Device	S		
#1	Primary	687.00'	2.0" Vert. Ori	fice/Grate C=	0.600	
#2	Primary	688.75'	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32			

Primary OutFlow Max=3.50 cfs @ 12.64 hrs HW=689.13' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.15 cfs @ 6.88 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 3.35 cfs @ 1.78 fps)



Pond 6.1P: Micropool Extended Detention Pond (P-1)

Summary for Pond 6.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	ι =	8.700 ac, 37.93% Impervious, Inflow Depth = 1.83" for 2-yr event
Inflow	=	3.76 cfs @ 12.63 hrs, Volume= 1.324 af
Outflow	=).13 cfs @ 31.47 hrs, Volume= 1.321 af, Atten= 97%, Lag= 1,130.4 min
Primary	=).13 cfs @ 31.47 hrs, Volume= 1.321 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 673.00' Surf.Area= 10,250 sf Storage= 30,225 cf Peak Elev= 675.51' @ 31.47 hrs Surf.Area= 16,315 sf Storage= 64,323 cf (34,098 cf above start) Flood Elev= 677.00' Surf.Area= 19,650 sf Storage= 91,075 cf (60,850 cf above start)

Plug-Flow detention time= 8,799.6 min calculated for 0.627 af (47% of inflow) Center-of-Mass det. time= 4,587.1 min (6,329.4 - 1,742.3)

Volume	Invo	ert Avail.Sto	orage Storage	e Description	
#1	668.0	00' 111,9	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	n t)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
668.0	0	3,700	0	0	
670.0	0	5,300	9,000	9,000	
672.0	0	7,200	12,500	21,500	
674.0	0	13,300	20,500	42,000	
676.0	0	17,300	30,600	72,600	
678.0	0	22,000	39,300	111,900	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	673.00'	1.5" Vert. Or	ifice/Grate C= (0.600
#2	Primary	675.50'	5.0' long x 0 Head (feet) Coef. (Englis	0.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=0.10 cfs @ 31.47 hrs HW=675.51' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.09 cfs @ 7.53 fps) 2=Pread Created Restangular Wair (Wair Controls 0.01 cfa @ 0.24 fpc)

-2=Broad-Crested Rectangular Weir (Weir Controls 0.01 cfs @ 0.24 fps)

Pond 6.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.3P: Micropool Extended Detention Pond (P-1)

Inflow Area =	17.200 ac, 25.58% Impervious, Inflow	Depth = 1.50" for 2-yr event
Inflow =	23.72 cfs @ 12.18 hrs, Volume=	2.146 af
Outflow =	10.38 cfs @ 12.52 hrs, Volume=	2.146 af, Atten= 56%, Lag= 20.3 min
Primary =	10.38 cfs @ 12.52 hrs, Volume=	2.146 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 747.50' Surf.Area= 15,148 sf Storage= 43,193 cf Peak Elev= 749.24' @ 12.52 hrs Surf.Area= 22,485 sf Storage= 76,166 cf (32,973 cf above start) Flood Elev= 751.10' Surf.Area= 30,065 sf Storage= 125,041 cf (81,848 cf above start)

Plug-Flow detention time= 1,267.4 min calculated for 1.155 af (54% of inflow) Center-of-Mass det. time= 587.0 min (1,437.5 - 850.5)

Volume	Inv	ert Avail.Sto	orage Storage	Description		
#1	742.0	00' 153,7	80 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevatio (fee	on it)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		
742.0	0	5,200	0	0		
744.0	0	6,500	11,700	11,700		
746.0	00	7,790	14,290	25,990		
748.0	00	17,600	25,390	51,380		
750.0	00	25,500	43,100	94,480		
752.0	00	33,800	59,300	153,780		
Device	Routing	Invert	Outlet Device	S		
#1	Primary	747.50'	2.0" Vert. Ori	fice/Grate C=	0.600	
#2	Primary	748.50'	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32			

Primary OutFlow Max=10.30 cfs @ 12.52 hrs HW=749.23' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.13 cfs @ 6.19 fps) -2. Presed Created Pastengular Wair (Mair Controls 10 17 cfs @ 2.77 fpc)

-2=Broad-Crested Rectangular Weir (Weir Controls 10.17 cfs @ 2.77 fps)

Pond 6.3P: Micropool Extended Detention Pond (P-1)



Summary for Pond 6.4P: Micropool Extended Detention Pond (P-1)

Inflow Are	a =	6.300 ac, 3	0.16% Impervious,	Inflow Depth = 1.	71" for 2-yr event
Inflow	=	12.56 cfs @	12.08 hrs, Volume	e= 0.897 af	
Outflow	=	0.68 cfs @	14.84 hrs, Volume	e= 0.845 af,	Atten= 95%, Lag= 165.7 min
Primary	=	0.68 cfs @	14.84 hrs, Volume	e= 0.845 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 728.00' Surf.Area= 12,100 sf Storage= 33,800 cf Peak Elev= 729.87' @ 14.84 hrs Surf.Area= 16,220 sf Storage= 60,318 cf (26,518 cf above start) Flood Elev= 732.00' Surf.Area= 21,200 sf Storage= 100,100 cf (66,300 cf above start)

Plug-Flow detention time= 15,261.6 min calculated for 0.069 af (8% of inflow) Center-of-Mass det. time= 4,611.6 min (5,446.0 - 834.4)

Volume	Inv	ert Avail.Sto	orage Storage	e Description				
#1	722.	00' 122,6	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)			
Elevatio	on	Surf.Area	Inc.Store	Cum.Store				
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)				
722.0	00	2,700	0	0				
724.0	00	4,000	6,700	6,700				
726.0	00	5,500	9,500	16,200				
728.0	00	12,100	17,600	33,800				
730.0	00	16,500	28,600	62,400				
732.0	00	21,200	37,700	100,100				
733.0	00	23,800	22,500	122,600				
Device	Routing	Invert	Outlet Device	es				
#1	Primary	728.00'	1.0" Vert. Or	rifice/Grate C=	0.600			
#2	Primary	729.75'	5.0' long x 0).5' breadth Broa	ad-Crested Rectangular Weir			
	-		Head (feet)	0.20 0.40 0.60	0.80 1.00			
			Coef. (Englis	sh) 2.80 2.92 3.	08 3.30 3.32			
Drimory	Drimony OutElow , Max 0.64 of a @ 14.94 bro HW/ 720.97' (Erec Discharge)							

Primary OutFlow Max=0.64 cfs @ 14.84 hrs HW=729.87' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.04 cfs @ 6.52 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 0.60 cfs @ 0.98 fps)



Pond 6.4P: Micropool Extended Detention Pond (P-1)

Summary for Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	19.800 ac, 2	4.24% Impervious,	Inflow Depth = 1	.47" for 2-yr event
Inflow	=	11.23 cfs @	12.49 hrs, Volume	e 2.428 af	
Outflow	=	0.37 cfs @	24.44 hrs, Volume	e 2.428 af	, Atten= 97%, Lag= 716.9 min
Primary	=	0.37 cfs @	24.44 hrs, Volume	e= 2.428 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 732.00' Surf.Area= 8,900 sf Storage= 5,350 cf Peak Elev= 737.16' @ 24.44 hrs Surf.Area= 19,423 sf Storage= 77,475 cf (72,125 cf above start) Flood Elev= 741.00' Surf.Area= 28,300 sf Storage= 170,100 cf (164,750 cf above start)

Plug-Flow detention time= 2,616.9 min calculated for 2.305 af (95% of inflow) Center-of-Mass det. time= 2,236.0 min (3,605.4 - 1,369.4)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	731.	00' 199,2	250 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
731.0	00	1,800	0	0	
732.0	00	8,900	5,350	5,350	
734.0	00	12,800	21,700	27,050	
736.0	00	16,700	29,500	56,550	
738.0	00	21,400	38,100	94,650	
740.0	00	26,600	48,000	142,650	
742.0	00	30,000	56,600	199,250	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	732.00'	2.5" Vert. Or	rifice/Grate C=	0.600
#2	Primary	738.50'	5.0' long x ().5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Englis	sh) 2.80 2.92 3.	.08 3.30 3.32
_ .	. .				

Primary OutFlow Max=0.37 cfs @ 24.44 hrs HW=737.16' (Free Discharge) **1=Orifice/Grate** (Orifice Controls 0.37 cfs @ 10.83 fps)

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

Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.6P: Micropool Extended Detention Pond (P-1)

Inflow Area	l =	8.700 ac, 3	1.03% Impe	ervious,	Inflow	Depth >	1.62	?" for	2-yr	event	
Inflow	=	3.89 cfs @	12.16 hrs,	Volume	=	1.172	af				
Outflow	=	0.30 cfs @	21.48 hrs,	Volume	=	1.149	af, A	Atten= 9	92%,	Lag= 55	9.4 min
Primary	=	0.30 cfs @	21.48 hrs,	Volume	=	1.149	af			-	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 690.00' Surf.Area= 12,300 sf Storage= 40,000 cf Peak Elev= 691.48' @ 21.48 hrs Surf.Area= 15,103 sf Storage= 60,213 cf (20,213 cf above start) Flood Elev= 695.00' Surf.Area= 22,600 sf Storage= 126,250 cf (86,250 cf above start)

Plug-Flow detention time= 12,467.3 min calculated for 0.231 af (20% of inflow) Center-of-Mass det. time= 1,640.8 min (5,801.4 - 4,160.6)

Volume	Inve	t Avail.Stor	rage Storage	Description	
#1	684.00)' 150,00	0 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevation (feet 684.00 686.00 688.00 690.00 692.00 694.00	n S t) 0 0 0 0 0 0 0	Surf.Area (sq-ft) 3,700 5,200 6,800 12,300 16,100 20,300	Inc.Store (cubic-feet) 0 8,900 12,000 19,100 28,400 36,400	Cum.Store (cubic-feet) 0 8,900 20,900 40,000 68,400 104,800	
696.0	0	24,900	45,200	150,000	
Device	Routing	Invert	Outlet Device	S	2.000
#1 #2 #3	Primary Primary Primary	690.00' 691.25' 693.00'	10.0" Vert. Or 10.0" Vert. Or 8.0' long x 0. Head (feet) 0 Coef. (English	rifice/Grate C= (rifice/Grate C= 5' breadth Broa 0.20 0.40 0.60 n) 2.80 2.92 3.	0.600 0.600 0.600 0.60 1.00 08 3.30 3.32

Primary OutFlow Max=0.29 cfs @ 21.48 hrs HW=691.48' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.10 cfs @ 5.70 fps)

-2=Orifice/Grate (Orifice Controls 0.19 cfs @ 1.62 fps)

-3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Hydrograph - Inflow 3.89 cfs 4 - Primary Inflow Area=8.700 ac **Peak Elev=691.48'** 3-Storage=60,213 cf Flow (cfs) 2 1 0.30 cfs Λ 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Ó

Time (hours)

Pond 6.6P: Micropool Extended Detention Pond (P-1)

Summary for Subcatchment 6.1S:

Runoff = 24.46 cfs @ 12.16 hrs, Volume= 2.129 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac)	CN	Desc	cription		
3.	100	98	Pave	ed parking	& roofs	
3.	700	74	>75%	% Grass co	over, Good	, HSG C
0.	400	71	Mea	dow, non-g	grazed, HS	GC
0.	200	70	Woo	ds, Good,	HSG C	
0.1	200	98	Wate	er Surface		
7.	600	84	Weig	phted Aver	age	
4.	300		Perv	ious Area	0	
3.	300		Impe	ervious Are	a	
Tc	Length	n S	Slope	Velocity	Capacity	Description
(min)	(feet)		(ft/ft)	(ft/sec)	(cfs)	
11.3	100	0.	0900	0.15		Sheet Flow,
						Woods: Light underbrush n= 0.400 P2= 3.50"
0.5	70	0.	1300	2.52		Shallow Concentrated Flow,
						Short Grass Pasture Kv= 7.0 fps
11.8	170) To	otal			

Subcatchment 6.1S:



Summary for Subcatchment 6.2S:

Runoff 2.76 cfs @ 12.09 hrs, Volume= 0.201 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

	Area ((ac) (CN Des	cription			
_	0.8	800	71 Mea	dow, non-	grazed, HS	GC	
_	0.3	300	70 Wo	ods, Good,	HSG C		
	1.1	100	71 Wei	ghted Ave	rage		
	1.1	100	Per	vious Area	-		
	Тс	Length	Slope	Velocity	Capacity	Description	
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)		
	5.1	100	0.0900	0.32		Sheet Flow,	
						Grass: Short n= 0.150 P2= 3.50"	
	0.6	80	0.1000	2.21		Shallow Concentrated Flow,	
_						Short Grass Pasture Kv= 7.0 fps	

5.7 180 Total

Subcatchment 6.2S:



Summary for Subcatchment 6.3S:

Runoff = 44.98 cfs @ 12.18 hrs, Volume= 4.009 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area (a	.c) C	N Des	cription		
4.00	00 9	8 Pav	ed parking	& roofs	
0.20	30 8	87 Dirt	roads, HS	GC	
2.80	00 7	'4 >75	% Grass c	over, Good	, HSG C
6.40	00 7	'1 Mea	adow, non-g	grazed, HS	GC
3.40	00 7	'0 Wo	ods, Good,	HSG C	
0.40	00 9	98 Wa	ter Surface		
17.20	00 7	'8 We	ghted Ave	rage	
12.80	00	Per	vious Area		
4.40	00	Imp	ervious Are	ea	
Tc L	ength	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
11.8	100	0.0800	0.14		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
0.8	130	0.1600	2.80		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps

12.6 230 Total

Subcatchment 6.3S:



Summary for Subcatchment 6.4S:

Runoff = 22.57 cfs @ 12.08 hrs, Volume= 1.614 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area ((ac)	CN	Desc	cription		
1.0	600	98	Pave	ed parking	& roofs	
0.3	300	87	Dirt r	oads, HS	GC	
1.1	700	74	>75%	6 Grass co	over, Good,	, HSG C
1.	500	71	Mea	dow, non-g	grazed, HS	GC
0.9	900	70	Woo	ds, Good,	HSG C	
0.3	300	98	Wate	er Surface		
6.3	300	81	Weig	ghted Aver	age	
4.4	400		Perv	ious Area	-	
1.9	900		Impe	ervious Are	ea	
Tc	Length	า 8	Slope	Velocity	Capacity	Description
(min)	(feet))	(ft/ft)	(ft/sec)	(cfs)	
4.7	100) ().	1100	0.35		Sheet Flow,
						Grass: Short n= 0.150 P2= 3.50"
0.5	97	70.	2500	3.50		Shallow Concentrated Flow,
						Short Grass Pasture Kv= 7.0 fps

5.2 197 Total

Subcatchment 6.4S:



Summary for Subcatchment 6.5S:

Runoff = 8.22 cfs @ 12.06 hrs, Volume= 0.548 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

 Area (ac)	С	N Des	cription			
0.400	9	8 Pav	ed parking	& roofs		
0.300	7	4 >75	% Grass c	over, Good	HSG C	
1.700	7	1 Mea	adow, non-g	grazed, HS	GC	
 0.200	7	0 Wo	ods, Good,	HSG C		
2.600	7	5 Wei	ghted Aver	age		
2.200		Per	vious Area	•		
0.400		Imp	ervious Are	ea		
Tc Len	gth	Slope	Velocity	Capacity	Description	
 (min) (fe	et)	(ft/ft)	(ft/sec)	(cfs)		
3.6 1	00	0.2200	0.46		Sheet Flow,	

Grass: Short n= 0.150 P2= 3.50

Subcatchment 6.5S:



Summary for Subcatchment 6.6S:

Runoff = 7.09 cfs @ 12.15 hrs, Volume= 0.596 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area	(ac) C	N Des	cription		
0.	500	98 Pav	ed parking	& roofs	
0.	100	74 >75	% Grass c	over, Good	, HSG C
1.:	200	71 Mea	dow, non-g	grazed, HS	GC
0.3	300	70 Woo	ods, Good,	HSG C	
0.3	300	98 Wat	er Surface		
2.4	400	30 Wei	ghted Aver	age	
1.0	600	Perv	vious Area	0	
0.8	800	Impe	ervious Are	ea	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
4.5	75	0.0700	0.28		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.50"
3.9	25	0.0800	0.11		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.1	140	0.0900	2.10		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
0.1	40	0.4500	4.70		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
1.2	240	0.0250	3.21		Shallow Concentrated Flow,
					Paved Kv= 20.3 fps
10.8	520	Total			

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Subcatchment 6.6S:

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Summary for Subcatchment 6.7S:

Runoff = 89.82 cfs @ 12.20 hrs, Volume= 8.605 af, Depth= 3.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

	(ac) C	N Des	cription		
0.	200 9	8 Pave	ed parking	& roofs	
0.	200 7	′4 >75°	% Grass c	over, Good	, HSG C
2.	700 7	'1 Mea	dow, non-g	grazed, HS	GC
3.	700 7	'0 Woo	ods, Good,	HSG C	
16.	300 9	4 Urba	an commer	cial, 85% ir	mp, HSG C
5.	100 E	<u>3 1/4 a</u>	acre lots, 3	8% imp, H	SG C
28.	200 8	7 Wei	ghted Aver	age	
12.	207	Perv	vious Area		
15.	993	Impe	ervious Are	ea	
-				o ''	
IC	Length	Slope	Velocity	Capacity	Description
	/ ()	10.10.	(6.)		
((((((((((((((((((((((((((((((((((((((((feet)	(ft/ft)	(ft/sec)	(cfs)	
11.8	(feet) 100	(ft/ft) 0.0800	(ft/sec) 0.14	(cfs)	Sheet Flow,
11.8	(feet) 100	(ft/ft) 0.0800	(ft/sec) 0.14	(cfs)	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
11.8 1.8	(feet) 100 175	(ft/ft) 0.0800 0.1000	(ft/sec) 0.14 1.58	(cfs)	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow,
11.8 1.8	(feet) 100 175	(ft/ft) 0.0800 0.1000	(ft/sec) 0.14 1.58	(cfs)	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps
(1111) 11.8 1.8 1.4	(feet) 100 175 100	(ft/ft) 0.0800 0.1000 0.0300	(ft/sec) 0.14 1.58 1.21	(cfs)	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow,
(1111) 11.8 1.8 1.4	(feet) 100 175 100	(ft/ft) 0.0800 0.1000 0.0300	(ft/sec) 0.14 1.58 1.21	(cfs)	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps

Subcatchment 6.7S:



Summary for Reach DP 6: Design Point 6

Inflow Are	ea =	65.400 ac, 4	0.97% Impervious	, Inflow Depth >	3.23"	for 10-yr event	
Inflow	=	90.15 cfs @	12.20 hrs, Volum	ie= 17.623	af		
Outflow	=	90.15 cfs @	12.20 hrs, Volum	ie= 17.623	af, At	ten= 0%, Lag= 0.0 m	iin

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs



Reach DP 6: Design Point 6

Summary for Pond 6.1P: Micropool Extended Detention Pond (P-1)

Inflow Area	=	7.600 ac, 43.42% Impervious, Inflow Depth = 3.36" for 10-yr event	
Inflow	=	24.46 cfs @ 12.16 hrs, Volume= 2.129 af	
Outflow	=	4.50 cfs @ 12.36 hrs, Volume= 2.129 af, Atten= 41%, Lag= 11.7 r	min
Primary	=	4.50 cfs @ 12.36 hrs, Volume= 2.129 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 687.00' Surf.Area= 9,450 sf Storage= 23,775 cf Peak Elev= 689.66' @ 12.36 hrs Surf.Area= 15,598 sf Storage= 57,639 cf (33,864 cf above start) Flood Elev= 691.00' Surf.Area= 18,550 sf Storage= 80,525 cf (56,750 cf above start)

Plug-Flow detention time= 903.8 min calculated for 1.583 af (74% of inflow) Center-of-Mass det. time= 587.7 min (1,402.8 - 815.1)

Volume	Inve	rt Avail.Sto	rage Storage	Description	
#1	682.0	0' 100,20	00 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevation	n 9	Surf.Area	Inc.Store	Cum.Store	
(feet)	(sq-ft)	(cubic-feet)	(cubic-feet)	
682.00)	2,200	0	0	
684.00)	3,400	5,600	5,600	
686.00)	6,700	10,100	15,700	
688.00)	12,200	18,900	34,600	
690.00)	16,300	28,500	63,100	
692.00)	20,800	37,100	100,200	
Device	Routing	Invert	Outlet Device	S	
#1	Primary	687.00'	2.0" Vert. Ori	fice/Grate C=	0.600
#2	Primary	688.75'	5.0' long x 0 . Head (feet) 0 Coef. (English	.5' breadth Broa 0.20 0.40 0.60 n) 2.80 2.92 3.	ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=14.44 cfs @ 12.36 hrs HW=689.66' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.17 cfs @ 7.72 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 14.27 cfs @ 3.15 fps)



Pond 6.1P: Micropool Extended Detention Pond (P-1)

Summary for Pond 6.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Are	a =	8.700 ac, 37.93% Impervious, Inflow Depth = 3.21" for 10-yr event
Inflow	=	15.63 cfs @ 12.35 hrs, Volume= 2.330 af
Outflow	=	2.93 cfs @ 13.59 hrs, Volume= 2.327 af, Atten= 81%, Lag= 74.7 min
Primary	=	2.93 cfs @ 13.59 hrs, Volume= 2.327 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 673.00' Surf.Area= 10,250 sf Storage= 30,225 cf Peak Elev= 675.84'@ 13.59 hrs Surf.Area= 16,972 sf Storage= 69,792 cf (39,567 cf above start) Flood Elev= 677.00' Surf.Area= 19,650 sf Storage= 91,075 cf (60,850 cf above start)

Plug-Flow detention time= 4,561.1 min calculated for 1.633 af (70% of inflow) Center-of-Mass det. time= 2,688.7 min (4,043.3 - 1,354.6)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	668.	00' 111,9	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
668.0	00	3,700	0	0	
670.0	00	5,300	9,000	9,000	
672.0	00	7,200	12,500	21,500	
674.0	00	13,300	20,500	42,000	
676.0	00	17,300	30,600	72,600	
678.0	00	22,000	39,300	111,900	
Device	Routing	Invert	Outlet Device	es	
#1 #2	Primary Primary	673.00' 675.50'	1.5" Vert. Or 5.0' long x 0 Head (feet) Coef. (Englis	ifice/Grate C= (0.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=2.91 cfs @ 13.59 hrs HW=675.84' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.10 cfs @ 8.02 fps) 2=Broad-Crested Rectangular Weir (Weir Controls 2.81 cfs @ 1.67 fps)

Pond 6.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.3P: Micropool Extended Detention Pond (P-1)

Inflow Area =	17.200 ac, 25.58% Impervious, Inflow	Depth = 2.80" for 10-yr event
Inflow =	44.98 cfs @ 12.18 hrs, Volume=	4.009 af
Outflow =	28.28 cfs @ 12.37 hrs, Volume=	4.009 af, Atten= 37%, Lag= 11.6 min
Primary =	28.28 cfs @ 12.37 hrs, Volume=	4.009 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 747.50' Surf.Area= 15,148 sf Storage= 43,193 cf Peak Elev= 749.92' @ 12.37 hrs Surf.Area= 25,188 sf Storage= 92,475 cf (49,282 cf above start) Flood Elev= 751.10' Surf.Area= 30,065 sf Storage= 125,041 cf (81,848 cf above start)

Plug-Flow detention time= 558.3 min calculated for 3.017 af (75% of inflow) Center-of-Mass det. time= 332.4 min (1,164.8 - 832.3)

Volume	Inve	ert Avail.Sto	rage Storage	e Storage Description		
#1	742.0	0' 153,73	80 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevatio	on	Surf.Area	Inc.Store	Cum.Store		
(tee	et)	(SQ-II)	(CUDIC-TEET)	(CUDIC-TEET)		
742.0	00	5,200	0	0		
744.0	00	6,500	11,700	11,700		
746.0	00	7,790	14,290	25,990		
748.0	00	17,600	25,390	51,380		
750.0	00	25,500	43,100	94,480		
752.0	00	33,800	59,300	153,780		
Device	Routing	Invert	Outlet Device	S		
#1	Primary	747.50'	2.0" Vert. Ori	fice/Grate C= (0.600	
#2	Primary	748.50'	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32			

Primary OutFlow Max=28.17 cfs @ 12.37 hrs HW=749.92' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.16 cfs @ 7.36 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 28.01 cfs @ 3.95 fps)





Summary for Pond 6.4P: Micropool Extended Detention Pond (P-1)

Inflow Area = 6.300 ac, 30.16% Impervious, Inflow	Depth = 3.07" for 10-yr event
Inflow = 22.57 cfs @ 12.08 hrs, Volume=	1.614 af
Outflow = 5.99 cfs @ 12.46 hrs, Volume=	1.561 af, Atten= 73%, Lag= 22.7 min
Primary = 5.99 cfs @ 12.46 hrs, Volume=	1.561 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 728.00' Surf.Area= 12,100 sf Storage= 33,800 cf Peak Elev= 730.28' @ 12.46 hrs Surf.Area= 17,168 sf Storage= 67,188 cf (33,388 cf above start) Flood Elev= 732.00' Surf.Area= 21,200 sf Storage= 100,100 cf (66,300 cf above start)

Plug-Flow detention time= 5,136.5 min calculated for 0.785 af (49% of inflow) Center-of-Mass det. time= 2,527.2 min (3,344.7 - 817.5)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	722.0	00' 122,6	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
722.0	00	2,700	0	0	
724.0	00	4,000	6,700	6,700	
726.0	00	5,500	9,500	16,200	
728.0	00	12,100	17,600	33,800	
730.0	00	16,500	28,600	62,400	
732.0	00	21,200	37,700	100,100	
733.0	00	23,800	22,500	122,600	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	728.00'	1.0" Vert. Or	ifice/Grate C=	0.600
#2	Primary	729.75'	5.0' long x 0	.5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Englis	h) 2.80 2.92 3.	.08 3.30 3.32
Drimory	OutFlow	Max_5.04 of a	@ 12.46 bra ⊔	M_720 20' /Er	

Primary OutFlow Max=5.94 cfs @ 12.46 hrs HW=730.28' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.04 cfs @ 7.21 fps) 2=Prood Crosted Postangular Wair (Wair Controls 5.00 cfs @ 2.21 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 5.90 cfs @ 2.21 fps)





Summary for Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	a =	19.800 ac, 24.24% Impervious, Inflow Depth = 2.76" for 10-yr event
Inflow	=	31.00 cfs @ 12.35 hrs, Volume= 4.557 af
Outflow	=	3.97 cfs @ 14.70 hrs, Volume= 4.557 af, Atten= 87%, Lag= 140.9 min
Primary	=	3.97 cfs @ 14.70 hrs, Volume= 4.557 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 732.00' Surf.Area= 8,900 sf Storage= 5,350 cf Peak Elev= 738.89' @ 14.70 hrs Surf.Area= 23,706 sf Storage= 114,655 cf (109,305 cf above start) Flood Elev= 741.00' Surf.Area= 28,300 sf Storage= 170,100 cf (164,750 cf above start)

Plug-Flow detention time= 2,155.8 min calculated for 4.434 af (97% of inflow) Center-of-Mass det. time= 1,962.3 min (3,087.0 - 1,124.7)

Volume	Invo	ert Avail.Sto	orage Storage	Description	
#1	731.0	00' 199,2	50 cf Custom	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
731.0	00	1,800	0	0	
732.0	00	8,900	5,350	5,350	
734.0	00	12,800	21,700	27,050	
736.0	00	16,700	29,500	56,550	
738.0	00	21,400	38,100	94,650	
740.0	00	26,600	48,000	142,650	
742.0	00	30,000	56,600	199,250	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	732.00'	2.5" Vert. Or	ifice/Grate C= (0.600
#2	Primary	738.50'	5.0' long x 0	.5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet) (0.20 0.40 0.60	0.80 1.00
			Coef. (Englis	h) 2.80 2.92 3.	08 3.30 3.32
Drimory		Max-2.02 of	@ 11 70 bra ⊔	M_720 00' (Erc	Discharge)

Primary OutFlow Max=3.93 cfs @ 14.70 hrs HW=738.89' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.43 cfs @ 12.54 fps) 2=Prood Crosted Postangular Wair (Wair Controls 2.51 cfs @ 1.81 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 3.51 cfs @ 1.81 fps)

Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.6P: Micropool Extended Detention Pond (P-1)

Inflow Area =	8.700 ac, 31.03% Impervious, Inflow	/ Depth > 2.98"	for 10-yr event
Inflow =	9.44 cfs @ 12.34 hrs, Volume=	2.157 af	
Outflow =	2.06 cfs @ 14.24 hrs, Volume=	2.134 af, Atte	en= 78%, Lag= 114.3 min
Primary =	2.06 cfs @ 14.24 hrs, Volume=	2.134 af	-

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 690.00' Surf.Area= 12,300 sf Storage= 40,000 cf Peak Elev= 692.21' @ 14.24 hrs Surf.Area= 16,550 sf Storage= 71,895 cf (31,895 cf above start) Flood Elev= 695.00' Surf.Area= 22,600 sf Storage= 126,250 cf (86,250 cf above start)

Plug-Flow detention time= 4,821.2 min calculated for 1.215 af (56% of inflow) Center-of-Mass det. time= 953.1 min (3,601.7 - 2,648.6)

Volume	Inver	t Avail.Sto	rage Storage Description			
#1	684.00)' 150,00	00 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevatio	on S	Surf.Area	Inc.Store	Cum.Store		
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)		
684.0	00	3,700	0	0		
686.0	00	5,200	8,900	8,900		
688.0	00	6,800	12,000	20,900		
690.0	00	12,300	19,100	40,000		
692.0	00	16,100	28,400	68,400		
694.0	00	20,300	36,400	104,800		
696.0	00	24,900	45,200	150,000		
Device	Routing	Invert	Outlet Device	S		
#1	Primary	690.00'	1.8" Vert. Ori	fice/Grate C= (0.600	
#2	Primary	691.25'	10.0" Vert. Oı	rifice/Grate C=	0.600	
#3	Primary	693.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32			

Primary OutFlow Max=2.07 cfs @ 14.24 hrs HW=692.21' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.12 cfs @ 7.04 fps)

-2=Orifice/Grate (Orifice Controls 1.94 cfs @ 3.56 fps)

-3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)



Pond 6.6P: Micropool Extended Detention Pond (P-1)

Summary for Subcatchment 6.1S:

Runoff = 30.33 cfs @ 12.16 hrs, Volume= 2.658 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (a	ac) C	N Des	cription		
3.1	00 9	8 Pav	ed parking	& roofs	
3.7	00 7	′4 >75°	% Grass c	over, Good	, HSG C
0.4	00 7	'1 Mea	dow, non-g	grazed, HS	GC
0.2	00 7	'0 Woo	ods, Good,	HSG C	
0.2	00 9	98 Wat	er Surface		
7.6	00 E	4 Wei	ghted Avei	age	
4.3	00	Perv	vious Area	0	
3.3	00	Impe	ervious Are	ea	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
11.3	100	0.0900	0.15		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
0.5	70	0.1300	2.52		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
11.8	170	Total			· ·

Subcatchment 6.1S:



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Summary for Subcatchment 6.2S:

Runoff = 3.68 cfs @ 12.09 hrs, Volume= 0.266 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

	Area	(ac) C	N Des	cription		
_	0.	800	71 Mea	dow, non-g	grazed, HS	GC
_	0.	300	70 Woo	ods, Good,	HSG C	
	1.	100	71 Wei	ghted Avei	rage	
	1.	100	Perv	vious Area	-	
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	5.1	100	0.0900	0.32		Sheet Flow,
						Grass: Short n= 0.150 P2= 3.50"
	0.6	80	0.1000	2.21		Shallow Concentrated Flow,
_						Short Grass Pasture Kv= 7.0 fps

5.7 180 Total

Subcatchment 6.2S:


Summary for Subcatchment 6.3S:

Runoff = 57.88 cfs @ 12.17 hrs, Volume= 5.130 af, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (a	ac) C	N De	scription		
4.0	00 9	98 Pa	ved parking	& roofs	
0.2	00 E	37 Dir	t roads, HS	GC	
2.8	00 7	74 >7	5% Grass c	over, Good	, HSG C
6.4	00 7	71 Me	adow, non-	grazed, HS	GC
3.4	00 7	70 Wo	ods, Good,	HSG C	
0.4	<u>00 s</u>	98 Wa	ter Surface		
17.2	00 7	78 We	eighted Ave	rage	
12.8	00	Pe	rvious Area		
4.4	00	Im	pervious Are	ea	
Tc I	Length	Slope	e Velocity	Capacity	Description
(min)	(feet)	(ft/ft	(ft/sec)	(cfs)	
11.8	100	0.0800	0.14		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
0.8	130	0.1600	2.80		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps

12.6 230 Total

Subcatchment 6.3S:



Summary for Subcatchment 6.4S:

Runoff = 28.37 cfs @ 12.08 hrs, Volume= 2.039 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area ((ac)	CN	Desc	cription		
1.0	600	98	Pave	ed parking	& roofs	
0.3	300	87	Dirt r	roads, HS0	GC	
1.1	700	74	>75%	% Grass co	over, Good	, HSG C
1.	500	71	Mea	dow, non-g	grazed, HS	GC
0.9	900	70	Woo	ds, Good,	HSG C	
0.3	300	98	Wate	er Surface		
6.3	300	81	Weig	ghted Aver	age	
4.4	400		Perv	ious Area	•	
1.9	900		Impe	ervious Are	ea	
Tc	Lengtl	h	Slope	Velocity	Capacity	Description
(min)	(feet	.)	(ft/ft)	(ft/sec)	(cfs)	
4.7	10	0 0	.1100	0.35		Sheet Flow,
						Grass: Short n= 0.150 P2= 3.50"
0.5	9	70	.2500	3.50		Shallow Concentrated Flow,
						Short Grass Pasture Kv= 7.0 fps

5.2 197 Total

Subcatchment 6.4S:



Summary for Subcatchment 6.5S:

Runoff = 10.68 cfs @ 12.06 hrs, Volume= 0.711 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

	Area (ac	;) C	N De	escription			
	0.400	0 9)8 Pa	ved parking	& roofs		
	0.300	07	′4 >7	5% Grass c	over, Good	, HSG C	
	1.700	07	′1 M	eadow, non-	grazed, HS	GC	
_	0.200	07	'0 W	oods, Good	, HSG C		
	2.600	07	'5 W	eighted Ave	rage		
	2.200	0	Pe	ervious Area	-		
	0.400	0	Im	pervious Ar	ea		
	Tc Le	ength	Slop	e Velocity	Capacity	Description	
_	(min) ((feet)	(ft/f	t) (ft/sec)	(cfs)		
	3.6	100	0.220	0 0.46		Sheet Flow,	
						<u> </u>	

Grass: Short n= 0.150 P2= 3.50"

Subcatchment 6.5S:



Summary for Subcatchment 6.6S:

Runoff = 8.96 cfs @ 12.15 hrs, Volume= 0.756 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area	(ac) (CN Des	cription		
0.	500	98 Pav	ed parking	& roofs	
0.	100	74 >75	% Grass c	over, Good	, HSG C
1.	200	71 Mea	dow, non-g	grazed, HS	GC
0.	300	70 Woo	ods, Good,	HSG C	
0.	300	98 Wat	er Surface		
2.	400	80 Wei	ahted Aver	age	
1.	600	Perv	vious Area	0	
0.	800	Imp	ervious Are	ea	
		•			
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
4.5	75	0.0700	0.28		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.50"
3.9	25	0.0800	0.11		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.1	140	0.0900	2.10		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
0.1	40	0.4500	4.70		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
1.2	240	0.0250	3.21		Shallow Concentrated Flow,
					Paved Kv= 20.3 fps
10.8	520	Total			

1-

0-

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Subcatchment 6.6S: Hydrograph 10-- Runoff 8.96 cfs 9 Type III 24-hr 25-yr 8-Rainfall=6.00" 7-Runoff Area=2.400 ac 6-Runoff Volume=0.756 af Flow (cfs) 5-Runoff Depth=3.78" Flow Length=520' 4-Tc=10.8 min 3-**CN=80** 2-

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 Time (hours)

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Summary for Subcatchment 6.7S:

Runoff = 109.86 cfs @ 12.20 hrs, Volume= 10.615 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (ac) C	N Des	cription		
0.2	200 9	8 Pave	ed parking	& roofs	
0.2	200 7	′4 >75°	% Grass co	over, Good,	, HSG C
2.7	700 7	'1 Mea	dow, non-g	grazed, HS	GC
3.7	700 7	0 Woo	ods, Good,	HSG C	
16.3	300 S	4 Urba	an commer	rcial, 85% ir	mp, HSG C
5.1	100 8	<u>3 1/4 a</u>	acre lots, 3	8% imp, H	SG C
28.2	200 8	7 Weig	ghted Aver	rage	
12.2	207	Perv	vious Area		
15.9	993	Impe	ervious Are	ea	
Т	الم به مناله	01.0.0	Mala altri	0	Description
	Length	Siope	velocity	Capacity	Description
(min)	(teet)	(11/11)	(II/SEC)	(CIS)	
11.8	100	0.0800	0.14		Sheet Flow,
					•
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.8	175	0.1000	1.58		Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow,
1.8	175	0.1000	1.58		Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.8 1.4	175 100	0.1000 0.0300	1.58 1.21		Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow,
1.8 1.4	175 100	0.1000 0.0300	1.58 1.21		Woods: Light underbrush n= 0.400 P2= 3.50" Shallow Concentrated Flow, Woodland Kv= 5.0 fps Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps

Subcatchment 6.7S:



Summary for Reach DP 6: Design Point 6

Inflow Are	ea =	65.400 ac, 4	0.97% Impervious,	Inflow Depth > 4.	05" for 25-yr event
Inflow	=	110.29 cfs @	12.20 hrs, Volume	= 22.096 af	
Outflow	=	110.29 cfs @	12.20 hrs, Volume	= 22.096 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs

Reach DP 6: Design Point 6



Summary for Pond 6.1P: Micropool Extended Detention Pond (P-1)

Inflow Area =	7.600 ac, 43.42% Impervious, Inflow De	epth = 4.20" for 25-yr event
Inflow = 3	30.33 cfs @ 12.16 hrs, Volume=	2.658 af
Outflow = 2	20.75 cfs @ 12.31 hrs, Volume=	2.658 af, Atten= 32%, Lag= 8.8 min
Primary = 2	20.75 cfs @ 12.31 hrs, Volume=	2.658 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 687.00' Surf.Area= 9,450 sf Storage= 23,775 cf Peak Elev= 689.90' @ 12.31 hrs Surf.Area= 16,103 sf Storage= 61,540 cf (37,765 cf above start) Flood Elev= 691.00' Surf.Area= 18,550 sf Storage= 80,525 cf (56,750 cf above start)

Plug-Flow detention time= 699.9 min calculated for 2.112 af (79% of inflow) Center-of-Mass det. time= 480.0 min (1,288.8 - 808.9)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	682.0	00' 100,2	200 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
682.0	00	2,200	0	0	
684.0	00	3,400	5,600	5,600	
686.0	00	6,700	10,100	15,700	
688.0	00	12,200	18,900	34,600	
690.0	00	16,300	28,500	63,100	
692.0	00	20,800	37,100	100,200	
Device	Routing	Invert	Outlet Device	es	
#1 #2	Primary Primary	687.00' 688.75'	2.0" Vert. Or 5.0' long x 0 Head (feet) (Coef. (Englis	ifice/Grate C= (.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=20.68 cfs @ 12.31 hrs HW=689.90' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.18 cfs @ 8.08 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 20.50 cfs @ 3.56 fps)



Pond 6.1P: Micropool Extended Detention Pond (P-1)

Type III 24-hr 25-yr Rainfall=6.00"

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Summary for Pond 6.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area =	8.700 ac, 37.93% Impervious, Inflow D	Depth = 4.03" for 25-yr event
Inflow =	22.40 cfs @ 12.30 hrs, Volume=	2.924 af
Outflow =	7.49 cfs @ 12.88 hrs, Volume=	2.920 af, Atten= 67%, Lag= 35.0 min
Primary =	7.49 cfs @ 12.88 hrs, Volume=	2.920 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 673.00' Surf.Area= 10,250 sf Storage= 30,225 cf Peak Elev= 676.11' @ 12.88 hrs Surf.Area= 17,560 sf Storage= 74,528 cf (44,303 cf above start) Flood Elev= 677.00' Surf.Area= 19,650 sf Storage= 91,075 cf (60,850 cf above start)

Plug-Flow detention time= 3,393.2 min calculated for 2.226 af (76% of inflow) Center-of-Mass det. time= 2,152.3 min (3,399.9 - 1,247.6)

Volume	Inv	ert Avail.Sto	orage Storag	e Description	
#1	668.0	00' 111,9	00 cf Custo	m Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	n t)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
668.0	0	3,700	0	0	
672.0	0	7,200	9,000 12,500	21,500	
674.0	0	13,300	20,500	42,000	
676.0 678.0	0	17,300 22,000	30,600 39,300	72,600 111,900	
Device	Routing	Invert	Outlet Devic	ces	
#1 #2	Primary Primary	673.00' 675.50'	1.5" Vert. O 5.0' long x Head (feet) Coef. (Engli	rifice/Grate C= (0.5' breadth Broa 0.20 0.40 0.60 sh) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=7.46 cfs @ 12.88 hrs HW=676.11' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.10 cfs @ 8.41 fps) -2=Broad-Crested Rectangular Weir (Weir Controls 7.36 cfs @ 2.41 fps)

Pond 6.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.3P: Micropool Extended Detention Pond (P-1)

Inflow Area	=	17.200 ac, 2	5.58% Impervious,	Inflow Depth = 3.58" for 25-yr event
Inflow =	=	57.88 cfs @	12.17 hrs, Volume	= 5.130 af
Outflow =	=	38.33 cfs @	12.34 hrs, Volume	= 5.130 af, Atten= 34%, Lag= 10.2 min
Primary =	=	38.33 cfs @	12.34 hrs, Volume	= 5.130 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 747.50' Surf.Area= 15,148 sf Storage= 43,193 cf Peak Elev= 750.24' @ 12.34 hrs Surf.Area= 26,502 sf Storage= 100,760 cf (57,567 cf above start) Flood Elev= 751.10' Surf.Area= 30,065 sf Storage= 125,041 cf (81,848 cf above start)

Plug-Flow detention time= 428.5 min calculated for 4.137 af (81% of inflow) Center-of-Mass det. time= 267.6 min (1,092.9 - 825.3)

Volume	Inve	ert Avail.Sto	rage Storage	e Description	
#1	742.0	0' 153,73	80 cf Custon	n Stage Data (Pri	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sg-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
742.0	00	5.200	0	0	
744.0	00	6,500	11,700	11,700	
746.0	00	7,790	14,290	25,990	
748.0	00	17,600	25,390	51,380	
750.0	00	25,500	43,100	94,480	
752.0	00	33,800	59,300	153,780	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	747.50'	2.0" Vert. Or	ifice/Grate C= 0	0.600
#2	Primary	748.50'	5.0' long x 0	0.5' breadth Broa	d-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Englis	n) 2.80 2.92 3.	08 3.30 3.32

Primary OutFlow Max=38.26 cfs @ 12.34 hrs HW=750.24' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.17 cfs @ 7.85 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 38.09 cfs @ 4.38 fps)

Type III 24-hr 25-yr Rainfall=6.00"



Pond 6.3P: Micropool Extended Detention Pond (P-1)

Summary for Pond 6.4P: Micropool Extended Detention Pond (P-1)

Inflow Area =	6.300 ac, 30.16% Impervious, Inflow	Depth = 3.88" for 25-yr event
Inflow =	28.37 cfs @ 12.08 hrs, Volume=	2.039 af
Outflow =	11.15 cfs @ 12.32 hrs, Volume=	1.986 af, Atten= 61%, Lag= 14.5 min
Primary =	11.15 cfs @ 12.32 hrs, Volume=	1.986 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 728.00' Surf.Area= 12,100 sf Storage= 33,800 cf Peak Elev= 730.52' @ 12.32 hrs Surf.Area= 17,730 sf Storage= 71,360 cf (37,560 cf above start) Flood Elev= 732.00' Surf.Area= 21,200 sf Storage= 100,100 cf (66,300 cf above start)

Plug-Flow detention time= 3,413.0 min calculated for 1.210 af (59% of inflow) Center-of-Mass det. time= 1,996.9 min (2,807.7 - 810.8)

Volume	Inv	ert Avail.Sto	orage Storage	e Description				
#1	722.0	00' 122,6	00 cf Custor	n Stage Data (Pr	ismatic) Listed below (Recalc)			
Elevatio	on	Surf.Area	Inc.Store	Cum.Store				
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)				
722.0	00	2,700	0	0				
724.0	00	4,000	6,700	6,700				
726.0	00	5,500	9,500	16,200				
728.0	00	12,100	17,600	33,800				
730.0	00	16,500	28,600	62,400				
732.0	00	21,200	37,700	100,100				
733.0	00	23,800	22,500	122,600				
Device	Routing	Invert	Outlet Devic	es				
#1	Primary	728.00'	1.0" Vert. O	rifice/Grate C=	0.600			
#2	Primary	729.75'	5.0' long x (0.5' breadth Broa	ad-Crested Rectangular Weir			
			Head (feet)	0.20 0.40 0.60	0.80 1.00			
			Coef. (Englis	sh) 2.80 2.92 3.	.08 3.30 3.32			

Primary OutFlow Max=11.12 cfs @ 12.32 hrs HW=730.52' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.04 cfs @ 7.58 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 11.08 cfs @ 2.87 fps)



Pond 6.4P: Micropool Extended Detention Pond (P-1)

Summary for Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area	ι =	19.800 ac, 24.24% Impervious, Inflow Depth = 3.54" for 25-yr event	
Inflow	=	2.08 cfs @ 12.32 hrs, Volume= 5.841 af	
Outflow	=	0.46 cfs @ 13.24 hrs, Volume= 5.841 af, Atten= 75%, Lag= 55.2 min	
Primary	=	0.46 cfs @ 13.24 hrs, Volume= 5.841 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 732.00' Surf.Area= 8,900 sf Storage= 5,350 cf Peak Elev= 739.23' @ 13.24 hrs Surf.Area= 24,592 sf Storage= 122,884 cf (117,534 cf above start) Flood Elev= 741.00' Surf.Area= 28,300 sf Storage= 170,100 cf (164,750 cf above start)

Plug-Flow detention time= 1,689.7 min calculated for 5.717 af (98% of inflow) Center-of-Mass det. time= 1,549.0 min (2,609.1 - 1,060.2)

Volume	Inv	vert Ava	ail.Storage	Storage	Description	
#1	731.	00'	199,250 cf	Custom	Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	. In	c.Store	Cum.Store	
(fee	et)	(sq-ft)	(cub	ic-feet)	(cubic-feet)	
731.0	00	1,800		0	0	
732.0	00	8,900		5,350	5,350	
734.(00	12,800		21,700	27,050	
736.0	00	16,700		29,500	56,550	
738.0	00	21,400		38,100	94,650	
740.0	00	26,600		48,000	142,650	
742.0	00	30,000		56,600	199,250	
Device	Routing	I	nvert Out	let Device	S	
#1	Primary	73	2.00' 2.5 '	" Vert. Ori	fice/Grate C=	0.600
#2	Primary	73	8.50' 5.0 '	long x 0	.5' breadth Broa	ad-Crested Rectangular Weir
			Hea	ad (feet) (0.20 0.40 0.60	0.80 1.00
			Coe	ef. (Englisl	h) 2.80 2.92 3.	.08 3.30 3.32
						

Primary OutFlow Max=10.43 cfs @ 13.24 hrs HW=739.23' (Free Discharge) **1=Orifice/Grate** (Orifice Controls 0.44 cfs @ 12.85 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 9.99 cfs @ 2.75 fps)

Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.6P: Micropool Extended Detention Pond (P-1)

Inflow Area =	8.700 ac, 31.03% Impervious, Inflow	Depth > 3.78" for 25-yr event
Inflow =	18.04 cfs @ 12.22 hrs, Volume=	2.743 af
Outflow =	3.03 cfs @ 13.78 hrs, Volume=	2.719 af, Atten= 83%, Lag= 93.6 min
Primary =	3.03 cfs @ 13.78 hrs, Volume=	2.719 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 690.00' Surf.Area= 12,300 sf Storage= 40,000 cf Peak Elev= 692.88'@ 13.78 hrs Surf.Area= 17,943 sf Storage= 83,339 cf (43,339 cf above start) Flood Elev= 695.00' Surf.Area= 22,600 sf Storage= 126,250 cf (86,250 cf above start)

Plug-Flow detention time= 3,361.1 min calculated for 1.801 af (66% of inflow) Center-of-Mass det. time= 780.7 min (3,039.9 - 2,259.2)

Volume	Inver	t Avail.Sto	rage Storage	e Description	
#1	684.00	' 150,00	00 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on S	urf.Area	Inc.Store	Cum.Store	
(fee	t)	(sq-ft)	(cubic-feet)	(cubic-feet)	
684.0	0	3,700	0	0	
686.0	0	5,200	8,900	8,900	
688.0	0	6,800	12,000	20,900	
690.0	0	12,300	19,100	40,000	
692.0	0	16,100	28,400	68,400	
694.0	0	20,300	36,400	104,800	
696.0	0	24,900	45,200	150,000	
Device	Routing	Invert	Outlet Devic	es	
#1	Primary	690.00'	1.8" Vert. Or	rifice/Grate C= (0.600
#2	Primary	691.25'	10.0" Vert. C	Drifice/Grate C=	0.600
#3 Primary 693.00' 8.0' long x 0.5' breadth Br Head (feet) 0.20 0.40 0.60 Coef. (English) 2.80 2.92		0.5' breadth Broa 0.20 0.40 0.60 sh) 2.80 2.92 3.	Id-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32		

Primary OutFlow Max=3.03 cfs @ 13.78 hrs HW=692.88' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.14 cfs @ 8.06 fps)

-2=Orifice/Grate (Orifice Controls 2.89 cfs @ 5.30 fps)

-3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)



Pond 6.6P: Micropool Extended Detention Pond (P-1)

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Summary for Subcatchment 6.1S:

Runoff = 46.64 cfs @ 12.16 hrs, Volume= 4.165 af, Depth= 6.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac)	CN	Desc	cription		
3.	100	98	Pave	ed parking	& roofs	
3.	700	74	>75%	% Grass co	over, Good	, HSG C
0.	400	71	Mea	dow, non-g	grazed, HS	GC
0.	200	70	Woo	ds, Good,	HSG C	
0.1	200	98	Wate	er Surface		
7.	600	84	Weig	phted Aver	age	
4.	300		Perv	ious Area	0	
3.	300		Impe	ervious Are	a	
Tc	Length	n S	Slope	Velocity	Capacity	Description
(min)	(feet)		(ft/ft)	(ft/sec)	(cfs)	
11.3	100	0.	0900	0.15		Sheet Flow,
						Woods: Light underbrush n= 0.400 P2= 3.50"
0.5	70	0.	1300	2.52		Shallow Concentrated Flow,
						Short Grass Pasture Kv= 7.0 fps
11.8	170) To	otal			

Subcatchment 6.1S:



Summary for Subcatchment 6.2S:

Runoff = 6.37 cfs @ 12.09 hrs, Volume= 0.460 af, Depth= 5.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

	Area	(ac) C	N Des	cription		
_	0.	800	71 Mea	dow, non-g	grazed, HS	GC
_	0.	300	70 Woo	ods, Good,	HSG C	
	1.	100	71 Wei	ghted Avei	rage	
	1.	100	Perv	vious Area	-	
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
	5.1	100	0.0900	0.32		Sheet Flow,
						Grass: Short n= 0.150 P2= 3.50"
	0.6	80	0.1000	2.21		Shallow Concentrated Flow,
_						Short Grass Pasture Kv= 7.0 fps

5.7 180 Total

Subcatchment 6.2S:



Summary for Subcatchment 6.3S:

Runoff = 93.77 cfs @ 12.17 hrs, Volume= 8.392 af, Depth= 5.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area (ac) (CN	Desc	cription		
4.(000	98	Pave	ed parking	& roofs	
0.2	200	87	Dirt r	oads, HS	GC	
2.8	300	74	>75%	6 Grass co	over, Good,	, HSG C
6.4	400	71	Mead	dow, non-g	grazed, HS	GC
3.4	400	70	Woo	ds, Good,	HSG C	
0.4	400	98	Wate	er Surface		
17.2	200	78	Weig	ghted Aver	age	
12.8	300		Perv	ious Area		
4.4	400		Impe	ervious Are	ea	
Tc	Length	S	Slope	Velocity	Capacity	Description
(min)	(feet)		(ft/ft)	(ft/sec)	(cfs)	
11.8	100	0.0	0800	0.14		Sheet Flow,
						Woods: Light underbrush n= 0.400 P2= 3.50"
0.8	130	0.1	1600	2.80		Shallow Concentrated Flow,
						Short Grass Pasture Kv= 7.0 fps

12.6 230 Total

Subcatchment 6.3S:



Summary for Subcatchment 6.4S:

Runoff = 44.61 cfs @ 12.08 hrs, Volume= 3.263 af, Depth= 6.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area ((ac)	CN	Desc	cription		
1.0	600	98	Pave	ed parking	& roofs	
0.3	300	87	Dirt r	oads, HS	GC	
1.1	700	74	>75%	% Grass co	over, Good,	, HSG C
1.	500	71	Mea	dow, non-g	grazed, HS	GC
0.9	900	70	Woo	ds, Good,	HSG C	
0.3	300	98	Wate	er Surface		
6.3	300	81	Weig	ghted Aver	age	
4.4	400		Perv	ious Area	-	
1.9	900		Impe	ervious Are	ea	
Tc	Length	า 8	Slope	Velocity	Capacity	Description
(min)	(feet))	(ft/ft)	(ft/sec)	(cfs)	
4.7	100) ().	1100	0.35		Sheet Flow,
						Grass: Short n= 0.150 P2= 3.50"
0.5	97	70.	2500	3.50		Shallow Concentrated Flow,
						Short Grass Pasture Kv= 7.0 fps

5.2 197 Total

Subcatchment 6.4S:



Summary for Subcatchment 6.5S:

Runoff = 17.76 cfs @ 12.06 hrs, Volume= 1.191 af, Depth= 5.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

_	Area (ac)	<u> </u>	N Des	scription			
	0.400	9	8 Pav	ed parking	& roofs		
	0.300	7	4 >75	% Grass c	over, Good	, HSG C	
	1.700	7	1 Mea	adow, non-g	grazed, HS	GC	
_	0.200	7	'0 Wo	ods, Good,	HSG C		
	2.600	7	5 We	ighted Ave	rage		
	2.200		Per	vious Area			
	0.400		Imp	ervious Are	ea		
					_		
	Tc Ler	ngth	Slope	Velocity	Capacity	Description	
	(min) (f	eet)	(ft/ft)	(ft/sec)	(cfs)		
	3.6	100	0.2200	0.46		Sheet Flow,	
						• • •	

Grass: Short n= 0.150 P2= 3.50"

Subcatchment 6.5S:



Summary for Subcatchment 6.6S:

Runoff = 14.25 cfs @ 12.15 hrs, Volume= 1.219 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac) C	N Des	cription		
0.	500	98 Pav	ed parking	& roofs	
0.	100	74 >75	% Grass c	over, Good	, HSG C
1.:	200	71 Mea	dow, non-g	grazed, HS	GC
0.3	300	70 Woo	ods, Good,	HSG C	
0.3	300	98 Wat	er Surface		
2.4	400	30 Wei	ghted Aver	age	
1.0	600	Perv	vious Area	0	
0.8	800	Impe	ervious Are	ea	
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
4.5	75	0.0700	0.28		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.50"
3.9	25	0.0800	0.11		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.1	140	0.0900	2.10		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
0.1	40	0.4500	4.70		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
1.2	240	0.0250	3.21		Shallow Concentrated Flow,
					Paved Kv= 20.3 fps
10.8	520	Total			

Subcatchment 6.6S:



Summary for Subcatchment 6.7S:

Runoff = 165.18 cfs @ 12.20 hrs, Volume= 16.302 af, Depth= 6.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area	(ac) C	CN De	scription		
0.	200	98 Pa	ed parking	& roofs	
0.	200	74 >7	5% Grass c	over, Good	, HSG C
2.	700	71 Me	adow, non-	grazed, HS	GC
3.	700	70 Wo	ods, Good,	HSG C	
16.	300	94 Urk	an comme	rcial, 85% ii	mp, HSG C
5.	100	83 1/4	acre lots, 3	8% imp, H	SG C
28.	200	87 We	ighted Ave	rage	
12.	207	Pe	vious Area		
15.	993	Imp	ervious Are	ea	
Та	Longth	Clana	Valaaitu	Consoitu	Description
IC (min)	Lengin	Siope		Capacity	Description
<u>(min)</u>	(leel)	(11/11	(II/Sec)	(CIS)	
11.8	100	0.0800	0.14		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
1.8	175	0.1000	1.58		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
1.4	100	0.0300	1.21		Shallow Concentrated Flow,
					Short Grass Pasture Kv= 7.0 fps
15.0	375	Total			

Subcatchment 6.7S:



Summary for Reach DP 6: Design Point 6

Inflow Are	ea =	65.400 ac, 4	0.97% Impervious,	Inflow Depth = 6.4	11" for 100-yr event
Inflow	=	171.40 cfs @	12.22 hrs, Volume	= 34.912 af	
Outflow	=	171.40 cfs @	12.22 hrs, Volume	= 34.912 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs



Reach DP 6: Design Point 6

Summary for Pond 6.1P: Micropool Extended Detention Pond (P-1)

Inflow Area =	7.600 ac, 43.42% Impervious, Inflow De	epth = 6.58" for 100-yr event
Inflow = 4	46.64 cfs @ 12.16 hrs, Volume=	4.165 af
Outflow = 3	35.30 cfs @ 12.27 hrs, Volume=	4.165 af, Atten= 24%, Lag= 6.7 min
Primary = 3	35.30 cfs @ 12.27 hrs, Volume=	4.165 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 687.00' Surf.Area= 9,450 sf Storage= 23,775 cf Peak Elev= 690.40' @ 12.27 hrs Surf.Area= 17,195 sf Storage= 69,759 cf (45,984 cf above start) Flood Elev= 691.00' Surf.Area= 18,550 sf Storage= 80,525 cf (56,750 cf above start)

Plug-Flow detention time= 443.5 min calculated for 3.619 af (87% of inflow) Center-of-Mass det. time= 322.1 min (1,118.5 - 796.4)

Volume	Inve	ert Avail.Sto	orage Storage	Description		
#1	682.0	00' 100,2	00 cf Custom	Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevation		Surf.Area	Inc.Store	Cum.Store		
(fee	t)	(sq-ft)	(cubic-feet)	(cubic-feet)		
682.0	0	2,200	0	0		
684.0	0	3,400	5,600	5,600		
686.0	0	6,700	10,100	15,700		
688.0	0	12,200	18,900	34,600		
690.0	0	16,300	28,500	63,100		
692.0	0	20,800	37,100	100,200		
Device	Routing	Invert	Outlet Device	S		
#1	Primary	687.00'	2.0" Vert. Ori	fice/Grate C=	0.600	
#2	Primary	688.75'	688.75' 5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32			

Primary OutFlow Max=34.99 cfs @ 12.27 hrs HW=690.39' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.19 cfs @ 8.75 fps) 2=Pread Created Pastangular Wair (Wair Controls 34.80 cfs @ 4.25 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 34.80 cfs @ 4.25 fps)

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Hydrograph 52 50 46.64 cfs - Inflow 48- Primary 46-Inflow Area=7.600 ac 44 42 40-Peak Elev=690.40' 38-35.30 cfs 36 34 32 Storage=69,759 cf 30-Flow (cfs) 28-26 24 22 20-18-16 14-12 10-8-6-4-2

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300

Time (hours)

Pond 6.1P: Micropool Extended Detention Pond (P-1)

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Inflow Area	a =	8.700 ac, 37.93% Impervious, Inflow Depth = 6.38" for 100-yr event
Inflow	=	38.28 cfs @ 12.26 hrs, Volume= 4.625 af
Outflow	=	25.73 cfs @ 12.53 hrs, Volume= 4.622 af, Atten= 33%, Lag= 15.9 min
Primary	=	25.73 cfs @ 12.53 hrs, Volume= 4.622 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 673.00' Surf.Area= 10,250 sf Storage= 30,225 cf Peak Elev= 676.83' @ 12.53 hrs Surf.Area= 19,262 sf Storage= 87,862 cf (57,637 cf above start) Flood Elev= 677.00' Surf.Area= 19,650 sf Storage= 91,075 cf (60,850 cf above start)

Plug-Flow detention time= 1,951.7 min calculated for 3.928 af (85% of inflow) Center-of-Mass det. time= 1,372.9 min (2,461.7 - 1,088.8)

Volume	Inv	ert Avail.Sto	orage Storage	Description		
#1	668.0	00' 111,9	00 cf Custom	n Stage Data (Pr	ismatic) Listed below (Recalc)	
Elevatio	on h)	Surf.Area	Inc.Store	Cum.Store		
668.0	00	3,700	0	0		
670.0	00	5,300	9,000	9,000		
672.0	00	7,200	12,500	21,500		
674.0	00	13,300	20,500	42,000		
676.0	00	17,300	30,600	72,600		
678.0	00	22,000	39,300	111,900		
Device	Routing	Invert	Outlet Device	es		
#1	Primary	673.00'	1.5" Vert. Ori	fice/Grate C=	0.600	
#2	Primary	675.50'	 575.50' 5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 			

Primary OutFlow Max=25.63 cfs @ 12.53 hrs HW=676.83' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.11 cfs @ 9.35 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 25.52 cfs @ 3.83 fps)

Pond 6.2P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.3P: Micropool Extended Detention Pond (P-1)

Inflow Area =	17.200 ac, 2	25.58% Impe	ervious,	Inflow Depth =	5.85"	for	100-yr event	
Inflow =	93.77 cfs @	12.17 hrs,	Volume	= 8.392	af			
Outflow =	65.16 cfs @	12.32 hrs,	Volume	= 8.392	af, Atte	en= 3	1%, Lag= 8.9 min	
Primary =	65.16 cfs @	12.32 hrs,	Volume	= 8.392	af			

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 747.50' Surf.Area= 15,148 sf Storage= 43,193 cf Peak Elev= 750.98' @ 12.32 hrs Surf.Area= 29,581 sf Storage= 121,559 cf (78,366 cf above start) Flood Elev= 751.10' Surf.Area= 30,065 sf Storage= 125,041 cf (81,848 cf above start)

Plug-Flow detention time= 268.0 min calculated for 7.399 af (88% of inflow) Center-of-Mass det. time= 176.1 min (987.3 - 811.3)

Volume	Inve	ert Avail.Sto	rage Storage	Description	
#1	742.0	0' 153,7	80 cf Custom	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sɑ-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
742.0 744.0 746.0 746.0 748.0 750.0 752.0	00 00 00 00 00 00 00	5,200 6,500 7,790 17,600 25,500 33,800	0 11,700 14,290 25,390 43,100 59,300	0 11,700 25,990 51,380 94,480 153,780	
Device	Routing	Invert	Outlet Device	es	
#1 #2	Primary Primary	747.50' 748.50'	2.0" Vert. Ori 5.0' long x 0 Head (feet) (Coef. (Englis	ifice/Grate C= (.5' breadth Broa 0.20 0.40 0.60 h) 2.80 2.92 3.	0.600 ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32

Primary OutFlow Max=64.81 cfs @ 12.32 hrs HW=750.97' (Free Discharge) -1=Orifice/Grate (Orifice Controls 0.19 cfs @ 8.87 fps)

-2=Broad-Crested Rectangular Weir (Weir Controls 64.62 cfs @ 5.22 fps)



Pond 6.3P: Micropool Extended Detention Pond (P-1)
Summary for Pond 6.4P: Micropool Extended Detention Pond (P-1)

Inflow Area	l =	6.300 ac, 30.16% Impervious, Inflow Depth = 6.22" for 100-yr event
Inflow	=	44.61 cfs @ 12.08 hrs, Volume= 3.263 af
Outflow	=	26.85 cfs @ 12.19 hrs, Volume= 3.210 af, Atten= 40%, Lag= 6.8 min
Primary	=	26.85 cfs @ 12.19 hrs, Volume= 3.210 af

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 728.00' Surf.Area= 12,100 sf Storage= 33,800 cf Peak Elev= 731.13' @ 12.19 hrs Surf.Area= 19,147 sf Storage= 82,474 cf (48,674 cf above start) Flood Elev= 732.00' Surf.Area= 21,200 sf Storage= 100,100 cf (66,300 cf above start)

Plug-Flow detention time= 1,761.3 min calculated for 2.434 af (75% of inflow) Center-of-Mass det. time= 1,253.7 min (2,051.3 - 797.6)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	722.	00' 122,6	600 cf Custor	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
722.0	00	2,700	0	0	
724.0	00	4,000	6,700	6,700	
726.0	00	5,500	9,500	16,200	
728.0	00	12,100	17,600	33,800	
730.0	00	16,500	28,600	62,400	
732.0	00	21,200	37,700	100,100	
733.0	00	23,800	22,500	122,600	
Device	Routing	Invert	Outlet Devic	es	
#1	Primary	728.00'	1.0" Vert. Or	rifice/Grate C=	0.600
#2	Primary	729.75'	5.0' long x (0.5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Englis	sh) 2.80 2.92 3.	.08 3.30 3.32
Duine eur		Max 00 70 ef	0 10 10 hrs		

Primary OutFlow Max=26.72 cfs @ 12.19 hrs HW=731.12' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.05 cfs @ 8.45 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 26.67 cfs @ 3.89 fps)

Pond 6.4P: Micropool Extended Detention Pond (P-1)



Summary for Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided

Inflow Area =	=	19.800 ac, 24.24% Impervious, Inflow Depth = 5.81" for 100-yr event	
Inflow =		71.33 cfs @ 12.31 hrs, Volume= 9.583 af	
Outflow =		13.49 cfs @ 12.66 hrs, Volume= 9.583 af, Atten= 39%, Lag= 21.4 min	
Primary =		I3.49 cfs @ 12.66 hrs, Volume= 9.583 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 732.00' Surf.Area= 8,900 sf Storage= 5,350 cf Peak Elev= 740.39' @ 12.66 hrs Surf.Area= 27,257 sf Storage= 153,052 cf (147,702 cf above start) Flood Elev= 741.00' Surf.Area= 28,300 sf Storage= 170,100 cf (164,750 cf above start)

Plug-Flow detention time= 1,044.0 min calculated for 9.460 af (99% of inflow) Center-of-Mass det. time= 964.6 min (1,929.9 - 965.2)

Volume	Inv	ert Avail.Sto	orage Storage	e Description	
#1	731.	00' 199,2	250 cf Custon	n Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
731.0	00	1,800	0	0	
732.0	00	8,900	5,350	5,350	
734.0	00	12,800	21,700	27,050	
736.0	00	16,700	29,500	56,550	
738.0	00	21,400	38,100	94,650	
740.0	00	26,600	48,000	142,650	
742.0	00	30,000	56,600	199,250	
Device	Routing	Invert	Outlet Device	es	
#1	Primary	732.00'	2.5" Vert. Or	rifice/Grate C= (0.600
#2	Primary	738.50'	5.0' long x 0).5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Englis	sh) 2.80 2.92 3.	08 3.30 3.32
		Ma 40.07 (

Primary OutFlow Max=43.37 cfs @ 12.66 hrs HW=740.38' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.47 cfs @ 13.85 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 42.90 cfs @ 4.56 fps)

Pond 6.5P: Extended Detention Pond (Design 2) - Permanent Pool Provided



Summary for Pond 6.6P: Micropool Extended Detention Pond (P-1)

Inflow Area	a =	8.700 ac, 31.03% Impervious, Inflow Depth > 6.11" for 100-yr event	
Inflow	=	10.96 cfs @ 12.17 hrs, Volume= 4.429 af	
Outflow	=	20.82 cfs @ 12.52 hrs, Volume= 4.406 af, Atten= 49%, Lag= 21.	3 min
Primary	=	20.82 cfs @ 12.52 hrs, Volume= 4.406 af	

Routing by Stor-Ind method, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Starting Elev= 690.00' Surf.Area= 12,300 sf Storage= 40,000 cf Peak Elev= 693.75' @ 12.52 hrs Surf.Area= 19,775 sf Storage= 99,792 cf (59,792 cf above start) Flood Elev= 695.00' Surf.Area= 22,600 sf Storage= 126,250 cf (86,250 cf above start)

Plug-Flow detention time= 1,812.4 min calculated for 3.488 af (79% of inflow) Center-of-Mass det. time= 509.0 min (2,217.3 - 1,708.3)

Volume	Inve	ert Avail.Sto	rage Storag	e Description	
#1	684.0	0' 150,00	00 cf Custo	m Stage Data (Pr	ismatic) Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
684.0	00	3,700	0	0	
686.0	00	5,200	8,900	8,900	
688.0	00	6,800	12,000	20,900	
690.0	00	12,300	19,100	40,000	
692.0	00	16,100	28,400	68,400	
694.0	00	20,300	36,400	104,800	
696.0	00	24,900	45,200	150,000	
Device	Routing	Invert	Outlet Devic	ces	
#1	Primary	690.00'	1.8" Vert. O	rifice/Grate C=	0.600
#2	Primary	691.25'	10.0" Vert. (Orifice/Grate C=	= 0.600
#3	Primary	693.00'	8.0' long x	0.5' breadth Broa	ad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00
			Coef. (Engli	sh) 2.80 2.92 3.	08 3.30 3.32

Primary OutFlow Max=20.67 cfs @ 12.52 hrs HW=693.75' (Free Discharge)

-1=Orifice/Grate (Orifice Controls 0.16 cfs @ 9.23 fps)

-2=Orifice/Grate (Orifice Controls 3.79 cfs @ 6.94 fps)

-3=Broad-Crested Rectangular Weir (Weir Controls 16.72 cfs @ 2.80 fps)

Pond 6.6P: Micropool Extended Detention Pond (P-1)





Summary for Subcatchment 7.1S:

Runoff = 10.74 cfs @ 12.41 hrs, Volume= 1.338 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 1-yr Rainfall=3.00"

Area (a	ac) (N I	Desc	cription		
0.1	00	74 :	>75%	% Grass co	over, Good	, HSG C
4.4	-00	71 I	Mea	dow, non-g	grazed, HS	GC
0.7	200	73	Woo	ds, Fair, F	ISG C	
5.9	000	94	Urba	in commer	rcial, 85% in	mp, HSG C
11.1	00	83 \	Weig	phted Aver	age	
6.0)85		Perv	ious Area	0	
5.0)15		Impe	ervious Are	ea	
Тс	Length	Slo	ope	Velocity	Capacity	Description
(min)	(feet)	(f	t/ft)	(ft/sec)	(cfs)	
13.2	100	0.06	500	0.13		Sheet Flow,
						Woods: Light underbrush n= 0.400 P2= 3.50"
15.7	1,550	0.10	080	1.64		Shallow Concentrated Flow,
	-					Woodland Kv= 5.0 fps

28.9 1,650 Total



Summary for Subcatchment 7.1S:

Runoff = 13.86 cfs @ 12.41 hrs, Volume= 1.719 af, Depth= 1.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Rainfall=3.50"

Area (ac)) C	N Des	cription		
0.100) 7	4 >75°	% Grass co	over, Good	, HSG C
4.400) 7	1 Mea	dow, non-g	grazed, HS	GC
0.700) 7	3 Woo	ods, Fair, F	ISG C	
5.900) 9	4 Urba	an commer	cial, 85% ir	mp, HSG C
11.100) 8	3 Wei	ghted Aver	age	
6.085	5	Perv	vious Area	0	
5.015	5	Impe	ervious Are	ea	
		•			
Tc Le	ength	Slope	Velocity	Capacity	Description
(min) ((feet)	(ft/ft)	(ft/sec)	(cfs)	·
13.2	100	0.0600	0.13		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
15.7 1	,550	0.1080	1.64		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps

28.9 1,650 Total



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Summary for Subcatchment 7.1S:

Runoff = 24.30 cfs @ 12.40 hrs, Volume= 3.020 af, Depth= 3.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Rainfall=5.10"

Area (ac)) CI	N Des	cription		
0.100) 7	4 >759	% Grass co	over, Good	, HSG C
4.400) 7	1 Mea	dow, non-g	grazed, HS	GC
0.700) 7	3 Woo	ods, Fair, F	ISG C	
5.900) 9	4 Urba	an commer	rcial, 85% in	mp, HSG C
11.100) 8	3 Wei	ghted Aver	age	
6.085	5	Perv	vious Area	0	
5.015	5	Impe	ervious Are	ea	
Tc Le	ngth	Slope	Velocity	Capacity	Description
(min) (feet)	(ft/ft)	(ft/sec)	(cfs)	
13.2	100	0.0600	0.13		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
15.7 1	,550	0.1080	1.64		Shallow Concentrated Flow,
	-				Woodland Kv= 5.0 fps

28.9 1,650 Total



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Summary for Subcatchment 7.1S:

Runoff = 30.30 cfs @ 12.39 hrs, Volume= 3.785 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Rainfall=6.00"

Area (ac)	CN	Desc	cription		
0.100	74	>75%	% Grass co	over, Good	, HSG C
4.400	71	Mea	dow, non-g	grazed, HS	GC
0.700	73	Woo	ds, Fair, F	ISG C	
5.900	94	Urba	an commer	rcial, 85% in	mp, HSG C
11.100	83	Weig	ghted Aver	age	
6.085		Perv	ious Area	0	
5.015		Impe	ervious Are	ea	
Tc Len	gth	Slope	Velocity	Capacity	Description
(min) (fe	et)	(ft/ft)	(ft/sec)	(cfs)	
13.2	100	0.0600	0.13		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
15.7 1,5	550	0.1080	1.64		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps

28.9 1,650 Total



Summary for Subcatchment 7.1S:

Runoff = 47.04 cfs @ 12.39 hrs, Volume= 5.972 af, Depth= 6.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-300.00 hrs, dt= 0.05 hrs Type III 24-hr 100-yr Rainfall=8.50"

Area (ac)	CI	N Dese	cription		
0.100	7	4 >759	% Grass co	over, Good	, HSG C
4.400	7	1 Mea	dow, non-g	grazed, HS	GC
0.700	7	3 Woo	ods, Fair, F	ISG C	
5.900	9	4 Urba	an commer	rcial, 85% in	mp, HSG C
11.100	8	3 Wei	ghted Aver	age	
6.085		Perv	vious Area	0	
5.015		Impe	ervious Are	ea	
Tc Lei	ngth	Slope	Velocity	Capacity	Description
(min) (f	feet)	(ft/ft)	(ft/sec)	(cfs)	
13.2	100	0.0600	0.13		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.50"
15.7 1.	,550	0.1080	1.64		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps

28.9 1,650 Total



APPENDIX C

Pollutant Loading Calculation

		DESI	gn <mark>poin</mark>	T 1					
	PRF-DF								
	ANNU	UAL PU	LLUIA	NI LUA	DS				
		S	UB 1.0S						
		NO 1	REATMEN	IT					
			1						
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	6.3	163.0	0.70	4.6	716.5	1026.9	4.41	29.0	4514.0
Cow Pasture	30.2	32.0	0.10	3.7	305.3	966.4	3.02	111.7	9220.1
Conventional Tillage	5.6	45.0	4.20	18.6	305.3	252.0	23.52	104.2	1/09./
Forest	132.5	7.0	0.10	1.8	76.5	927.5	13.25	238.5	10136.3
					TOTALO	2170.0	44.00	402.4	05500.1
					TUTALS	31/2.0	44.20	403.4	25560.1
		DEOL		T 4					
		DESI	GN POIN						
	POST-DE	EVELOF	MENT	UNION	PLACE				
		S	UB 1.1S						
			Rates	s (lb/ac/yr)			Annual I	Loads (lb/yr)
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	10.4	163.0	0.71	4.6	716.5	1695.2	7.38	47.8	7451.6
Cow Pasture	1.0	32.0	0.10	3.7	305.3	32.0	0.10	3.7	305.3
Forest	0.5	7.0	0.10	1.8	76.5	3.5	0.05	0.9	38.3
			TOTALS	PRIOR TO	IREAIMENI	1730.7	7.53	52.4	7795.2
						400/	400/	000/	000/
DESIGN 2 EXTEN					EFFICIENCIES	40%	40%	20%	60%
DESIGN 2 EXTEN			LUTANT			60%	60%	10%	100%
						1038.4	4 52	41.9	1559.0
					SUBTOTAL	to	to	to	to
						692.3	3.01	31.4	0.0
						40%	40%	20%	80%
DESIGN 2 EXTEN	NDED DETENTION PONE	D 1.2P POL	LUTANT R	REMOVAL I	EFFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						623.0	2.71	33.5	311.8
					SUBTOTAL	to	to	to	to
						276.9	1.20	18.8	0.0
						20%	20%	20%	20%
DE	SIGN 14 LOW GRADIEN	T GRASS S	SWALE WI	TH STONE	CHECKDAMS	to	to	to	to
						40%	40%	40%	40%
						498.4	2.17	26.8	249.4
			1014	ALS AFTER	REATMENT	to	to	to	to
						100.1	0.72	11.3	0.0
		3	OB 1.25						
			Date	h (lb/ac/sm)			Annual	oodo /lb/····)
Land use/Ground Cover	Aron (Anron)	POD	Rates	s (ID/ac/yr)	Tee	POD	Annual I	Loads (ID/yr)
Cow Pasturo	Area (Acres)	32.0	0.10	37	305.3	32.0	0.10	37	305.3
Cow r astare	1.0	52.0	0.10	5.7	303.3	32.0	0.10	5.7	303.5
			TOTALS	PRIOR TO	TREATMENT	32.0	0 10	37	305.3
		1				0110	0.10		00010
						40%	40%	20%	80%
DESIGN 2 EXTEN	NDED DETENTION PONE	0 1.2P POL	LUTANT R	REMOVAL	EFFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						19.2	0.06	3.0	61.1
					SUBTOTAL	to	to	to	to
						12.8	0.04	2.2	0.0
						20%	20%	20%	20%
DE	SIGN 14 LOW GRADIEN	T GRASS S	SWALE WI	TH STONE	CHECKDAMS	to	to	to	to
						40%	40%	40%	40%
						15.4	0.05	2.4	48.9
			TOTA	ALS AFTEF	REATMENT	to	to	to	to
1						77	0.02	1 1 3	0.0

SUB 1.3S										
			Bates	s (lb/ac/yr)			Annual I	oads (lb/yr)		
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP		TSS	
Commercial (High Impervious)	4.6	163.0	0.71	4.6	716.5	749.8	3.27	21.2	3295.9	
Cow Pasture	0.9	32.0	0.10	3.7	305.3	28.8	0.09	3.3	274.8	
			TOTALS	PRIOR TO	TREATMENT	778.6	3.36	24.5	3570.7	
						10%	40%	20%	80%	
DESIGN 2 EXTEND		1 3P POL			FEFICIENCIES	40 /0	40 /0	20 /0 to	to	
BEGIAN E EXTEND			LOTANT			60%	60%	40%	100%	
						467.2	2.02	19.6	714.1	
					SUBTOTAL	to	to	to	to	
						311.4	1.34	14.7	0.0	
						40%	40%	20%	80%	
DESIGN 2 EXTEND	ED DETENTION POND	0 1.4P POL	LUTANT R	EMOVAL E	EFFICIENCIES	to	to	to	to	
						60%	60%	40%	100%	
						280.3	1.21	15.7	142.8	
					SUBTOTAL	to	to	to	to	
	0.54	8.8	0.0							
DESIC										
DESIC	an 14 LOW GRADIEN		SWALE WI	IN STONE	CHECKDAWS	10%	10%	10%	10%	
						224.2	0.97	12.6	114.2	
					SUBTOTAL	to	to	to	to	
						74.8	0.32	5.3	0.0	
						40%	40%	20%	80%	
DESIGN 2 EXTEND	ED DETENTION PONE	0 1.2P POL	LUTANT R	EMOVAL B	EFFICIENCIES	to	to	to	to	
						60%	60%	40%	100%	
						134.5	0.58	10.1	22.8	
					SUBTOTAL	to	to	to	to	
						29.9	0.13	3.2	0.0	
DEOK						20%	20%	20%	20%	
DESIC	IN 14 LOW GRADIEN	I GRASS S	SWALE WI	IH STONE	CHECKDAMS	t0	t0	10 400/	t0	
						40%	40%	40%	40%	
			τοτι			107.0	0.40	0.1 to	10.2	
			1017			17.9	0.08	1.9	0.0	
		S	UB 1.4S							
			Rates	s (lb/ac/yr)			Annual I	Loads (lb/yr)		
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS	
Commercial (High Impervious)	1.4	163.0	0.71	4.6	716.5	228.2	0.99	6.4	1003.1	
Cow Pasture	0.3	32.0	0.10	3.7	305.3	9.6	0.03	1.1	91.6	
			TOTALS	PRIOR TO	TREATMENT	237.8	1.02	7.5	1094.7	
						409/	409/	009/	000/	
DESIGN 2 EXTEND					FEEICIENCIES	40%	40%	20%	00%	
DEGICIN 2 EXTEND			LOTANT			60%	60%	40%	100%	
						142.7	0.61	6.0	218.9	
					SUBTOTAL	to	to	to	to	
						95.1	0.41	4.5	0.0	
						40%	40%	20%	80%	
DESIGN 2 EXTEND	ED DETENTION POND	0 1.2P POL	LUTANT R	EMOVAL E	EFFICIENCIES	to	to	to	to	
						60%	60%	40%	100%	
SUBTOTAL 85.6 0.37 4.8 10 to to to										
DESIC	N 14 LOW GRADIEN	T GRASS S	SWALE WIT	TH STONE	CHECKDAMS	±0 /0	±0 %	±0 /0	±0 /0	
						40%	40%	40%	40%	
			TOTA	ALS AFTER	R TREATMENT	to	to	to	to	
						22.8	0.10	1.6	0.0	

			1.59						
		NO .		Т					
		NU NU	Rate	s (lb/ac/yr)				oade (lb/wr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	799	BOD	TP		227
Town House	24.6	50.0	0.62	5.0	286.6	1230.0	15.25	123.0	7050.4
Cow Pasture	9.7	32.0	0.02	3.7	305.3	310.4	0.97	35.9	2961.4
Forest	13.4	7.0	0.10	1.8	76.5	93.8	1.34	24.1	1025.1
	10.4	7.0	0.10	1.0	70.0	50.0	1.04	67.1	1023.1
			TOTALS			1634.2	17 56	183.0	11036.0
			TOTALS			1034.2	17.50	105.0	11030.3
						20%	20%	20%	20%
DESIGN 14	I OW GRADIEN	T GRASS	SWALE WI	TH STONE	CHECKDAMS	±0/0	±070	±070	2070
BEORIA 14					ONEONDAINO	40%	40%	40%	40%
						1307.4	14.05	146.4	8829.5
					SUBTOTAL	to	to	to	to
						980.5	10.54	109.8	6622 1
						40%	40%	20%	80%
DESIGN 2 EXTENDED DE	TENTION PON	1.5P POL			EFFICIENCIES	to	to	to	to
			LUTAN			60%	60%	40%	100%
						784.4	8 43	117 1	1765.9
					SUBTOTAL	to	to	to	to
						392.2	4 22	65.9	0.0
						40%	40%	20%	80%
DESIGN 2 EXTENDED DE	TENTION PONE	0 1.6P POL	LUTANT F	REMOVAL	EFFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						470.6	5.06	93.7	353.2
			тот	ALS AFTEF	TREATMENT	to	to	to	to
						156.9	1.69	39.5	0.0
			1.6S						
		NO .	TREATMEN	NT					
			Rate	s (lh/ac/vr)			Annual I	oads (lb/yr)	1
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Cow Pasture	3.2	32.0	0.12	3.7	305.3	102.4	0.38	11.8	977.0
Forest	0.8	7.0	0.10	1.8	76.5	5.6	0.08	1.4	61.2
			TOTALS	S PRIOR TO	TREATMENT	108.0	0.46	13.2	1038.2
						40%	40%	20%	80%
DESIGN 2 EXTENDED DE	TENTION PONE	0 1.6P POL	LUTANT F	REMOVAL	EFFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						64.8	0.28	10.6	207.6
			тот	ALS AFTEF	R TREATMENT	to	to	to	to
						43.2	0.18	7.9	0.0
			1.7S						
		NO .	TREATMEN	NT					
			Rate	s (lb/ac/yr)			Annual L	_oads (lb/yr))
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Town House	6.6	50.0	0.62	5.0	286.6	330.0	4.09	33.0	1891.6
Cow Pasture	3.1	32.0	0.12	3.7	305.3	99.2	0.37	11.5	946.4
Forest	4.3	7.0	0.10	1.8	76.5	30.1	0.43	7.7	329.0
			TOTALS	S PRIOR TO	TREATMENT	459.3	4.89	52.2	3167.0
						40%	40%	20%	80%
DESIGN 2 EXTENDED DE	TENTION PONE	0 1.7P POL	LUTANT F	REMOVAL I	EFFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						275.6	2.93	41.8	633.4
	SUBT					to	to	to	to
						183.7	1.96	31.3	0.0
						40%	40%	20%	80%
DESIGN 2 EXTENDED DE	TENTION PONE	0 1.8P POL	LUTANT F	REMOVAL	EFFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						165.4	1.76	33.4	126.7
			тот	ALS AFTEF	RTREATMENT	to	to	to	to
						73.5	0.78	18.8	0.0

NO TREATMENT Rates (lb/ac/tr) Annual Loads (lb/tr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Cow Pasture 1.1 32.0 0.12 3.7 305.3 35.2 0.13 4.1 335.8 TOTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 TOTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 OTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 OLISE COLSPOND DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 100% OLISE AFTER TREATMENT 10				1.8S							
Rates (lb/ac/yr) Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Cow Pasture 1.1 32.0 0.12 3.7 305.3 35.2 0.13 4.1 335.8 TOTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 OPENLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 100 12.0 20.0 23.0			NO 1	REATMEN	IT						
Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Cow Pasture 1.1 32.0 0.12 3.7 305.3 35.2 0.13 4.1 335.8 TOTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 TOTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 TOTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 10 <td< th=""><th></th><th></th><th></th><th>Rates</th><th>(lb/ac/yr)</th><th></th><th></th><th>Annual L</th><th>oads (lb/yr</th><th>)</th></td<>				Rates	(lb/ac/yr)			Annual L	oads (lb/yr)	
Cow Pasture 1.1 32.0 0.12 3.7 305.3 35.2 0.13 4.1 335.8 TOTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 100% 60% 60% 40% 100% TOTALS AFTER TREATMENT 10	Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS	
TOTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 40% 80% DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 40% 80% TOTALS AFTER TREATMENT 10 to 10 SUB 1.9S NO TREATMENT Commercial (High Impervious) 5.0 163.0 0.71 4.6 7 TO TALS BOD TP TN TSS Commercial (High Impervious) 5.0 163.0 0.71 4.6 7 TN TSS Commercial (High Impervious) 5.0 163.0 0.71 4.6 7 47 TN TSS	Cow Pasture	1.1	32.0	0.12	3.7	305.3	35.2	0.13	4.1	335.8	
TOTALS PRIOR TO TREATMENT 35.2 0.13 4.1 335.8 DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 10 to to TOTALS AFTER TREATMENT Land use/Ground Cover Area (Acres) BOD TP TN TSS GOM TP TN TSS GOM TP TN TSS Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3282.5											
USUB 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% 10 to to </th <th></th> <th></th> <th></th> <th>TOTALS</th> <th>PRIOR TO</th> <th>TREATMENT</th> <th>35.2</th> <th>0.13</th> <th>4.1</th> <th>335.8</th>				TOTALS	PRIOR TO	TREATMENT	35.2	0.13	4.1	335.8	
DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% 00% 60% 60% 40% 10 to to TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT NO TREATMENT NO TREATMENT Total colspan="4">Colspan="4">Colspan="4">Total colspan="4">Colspan="4">Colspan="4">Total colspan="4">Colspan="4"Colspan="4">Colspan="4"Colspan="4">Colspan="4"Colspan="4"Colspan="4">Colspan="4"Colspa="4"Colspan="4"Colspan="4"Colspan="4"Colspan="4"Co											
DESIGN 2 EXTENDED DETENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES to to to to to COMPACE AND ALL OPENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES to to to to 100% COMPACE AND ALL OPENTION POND 1.8P POLLUTANT REMOVAL EFFICIENCIES to to to to to TOTALS AFTER TREATMENT to to </td <th></th> <td></td> <td></td> <td></td> <td></td> <td></td> <td>40%</td> <td>40%</td> <td>20%</td> <td>80%</td>							40%	40%	20%	80%	
60% 60% 40% 100% TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT SUB 1.9S NO TREATMENT Rates (lb/ac/yr) Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3582.5 Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3582.5 Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3582.5 Commercial (High Impervious) 74.7 7.0 0.10 1.8 76.5 522.9 7.47 134.5 5714.6 <th>DESIGN 2 EXTENDED DE</th> <td>TENTION POND</td> <td>) 1.8P POL</td> <td>LUTANT R</td> <td>EMOVAL I</td> <td>EFFICIENCIES</td> <td>to</td> <td>to</td> <td>to</td> <td>to</td>	DESIGN 2 EXTENDED DE	TENTION POND) 1.8P POL	LUTANT R	EMOVAL I	EFFICIENCIES	to	to	to	to	
OTALS AFTER TREATMENT 21.1 0.08 3.3 67.2 totals AFTER TREATMENT totals AFTER TREATMENT SUB 1.9S NO TREATMENT Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS Commercial (High Impervious) 5.0 163.0 0.12 3.7 305.3 444.8 1.67 51.4 42423.7 Forest 74.7 7.0 0.10 1.8 5 0 355 23.0 355 23.0 355 23.0 355 23.0 355 23.0 355 23.0 355 23.0 355 23.0 355 23.0 355 23.0 <th colspa<="" td=""><th></th><td></td><td></td><td></td><td></td><td></td><td>60%</td><td>60%</td><td>40%</td><td>100%</td></th>	<th></th> <td></td> <td></td> <td></td> <td></td> <td></td> <td>60%</td> <td>60%</td> <td>40%</td> <td>100%</td>							60%	60%	40%	100%
TOTALS AFTER TREATMENT to to to SUB 1.9S NO TREATMENT Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS Commercial (High Impervious) 5.0 16.0 TSS Commercial (High Impervious) 5.0 16.0 TSS Commercial (High Impervious) 5.0 16.0 TSS Commercial (High Impervious) 5.0 16.3 0.35.5 23.0 335.3 444.8 1.67 5.71.4 4243.7 Forest TOTALS 1782.7 12.69 208.9 13540.8 TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT 136.5 22.85 391.0 14647.0 <t< td=""><th></th><td></td><td></td><td></td><td></td><td></td><td>21.1</td><td>0.08</td><td>3.3</td><td>67.2</td></t<>							21.1	0.08	3.3	67.2	
14.1 0.05 2.5 0.0 SUB 1.9S NO TREATMENT Rates (lb/ac/yr) Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3582.5 Cow Pasture 13.9 32.0 0.12 3.7 305.3 444.8 1.67 51.4 4243.7 Forest 74.7 7.0 0.10 1.8 76.5 522.9 7.47 134.5 5714.6 TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT 1394.5 22.85 391.0 14647.0 to to to				τοτμ	LS AFTEF	R TREATMENT	to	to	to	to	
SUB 1.9S NO TREATMENT Rates (lb/ac/yr) Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3582.5 Cow Pasture 13.9 32.0 0.12 3.7 305.3 444.8 1.67 51.4 4243.7 Forest 74.7 7.0 0.10 1.8 76.5 522.9 7.47 13.9 POST-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT 13194.5 22.85 391.0 14647.0 10							14.1	0.05	2.5	0.0	
NO TREATMENT Rates (lb/ac/yr) Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3582.5 Cow Pasture 13.9 32.0 0.12 3.7 305.3 444.8 1.67 51.4 4243.7 Forest 74.7 7.0 0.10 1.8 76.5 522.9 7.47 134.5 5714.6 VOST-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT 1394.5 22.85 391.0 14647.0 to to to			S	UB 1.9S							
Rates (lb/ac/yr) Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3582.5 Cow Pasture 13.9 32.0 0.12 3.7 305.3 444.8 1.67 51.4 4243.7 Forest 74.7 7.0 0.10 1.8 76.5 522.9 7.47 134.5 5714.6 POST-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT 1394.5 22.85 391.0 14647.0 10 10 10 10			NO 1	REATMEN	IT						
Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3582.5 Cow Pasture 13.9 32.0 0.12 3.7 305.3 444.8 1.67 51.4 4243.7 Forest 74.7 7.0 0.10 1.8 76.5 522.9 7.47 134.5 5714.6 FORST-DEVELOPMENT TOTALS AT DESIGN POINT 1				Rates	s (lb/ac/yr)			Annual L	oads (lb/yr)	
Commercial (High Impervious) 5.0 163.0 0.71 4.6 716.5 815.0 3.55 23.0 3582.5 Cow Pasture 13.9 32.0 0.12 3.7 305.3 444.8 1.67 51.4 4243.7 Forest 74.7 7.0 0.10 1.8 76.5 522.9 7.47 134.5 5714.6 TOTALS 1782.7 12.69 208.9 13540.8 FORT-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT 13194.5 22.85 391.0 14647.0 10 10 10 10	Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS	
Cow Pasture 13.9 32.0 0.12 3.7 305.3 444.8 1.67 51.4 4243.7 Forest 74.7 7.0 0.10 1.8 76.5 522.9 7.47 134.5 5714.6 TOTALS 1782.7 12.69 208.9 13540.8 FOST-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT TOTALS AFTER TREATMENT 13194.5 22.85 391.0 14647.0 10 to TOTALS AFTER TREATMENT 13194.5 22.85 391.0 14647.0 to to to to	Commercial (High Impervious)	5.0	163.0	0.71	4.6	716.5	815.0	3.55	23.0	3582.5	
Forest 74.7 7.0 0.10 1.8 76.5 522.9 7.47 134.5 5714.6 TOTALS 1782.7 12.69 208.9 13540.8 POST-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT 13194.5 22.85 391.0 14647.0 10 10 10 10 1284.9 16.31 293.7 13540.8	Cow Pasture	13.9	32.0	0.12	3.7	305.3	444.8	1.67	51.4	4243.7	
TOTALS 1782.7 12.69 208.9 13540.8 POST-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT 1394.5 22.85 391.0 14647.0 10 10 10 10 2284.9 16.31 293.7 13540.8	Forest	74.7	7.0	0.10	1.8	76.5	522.9	7.47	134.5	5714.6	
TOTALS 1782.7 12.69 208.9 13540.8 POST-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AT DESIGN POINT 1 TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT 114647.0 to 14647.0 to 10 14647.0 to 10 14647.0 to 10 14647.0 to 14647.0 to 12.69 14647.0 to 14647.0 to 10 14647.0 to 13540.8									1		
POST-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT 1194.5 22.85 391.0 14647.0 to to to to to to to to 2284.9 16.31 293.7 13540.8						TOTALS	1782.7	12.69	208.9	13540.8	
POST-DEVELOPMENT TOTALS AT DESIGN POINT 1 TOTALS AFTER TREATMENT 10 10 14647.0 10 10 10 10 2284.9 16.31 293.7 13540.8											
TOTALS AFTER TREATMENT 3194.5 22.85 391.0 14647.0 to to to to to to 2284.9 16.31 293.7 13540.8		POST-DEVEL	OPMENT	TOTALS	AT DESIC	IN POINT 1					
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TOTALS AFTER TREATMENT to to to to 2284.9 16.31 293.7 13540.8	<u>3194.5</u> 22.85 391.0 14647.0										
2284.9 16.31 293.7 13540.8				TOTA	LS AFTEF	R TREATMENT	to	to	to	to	
							2284.9	16.31	293.7	13540.8	

		DESIG		2					
	PRE-DE	VELOP	MENT U	NION P	LACE				
	ANNU	AL POI	LLUTAN)S				
		รเ	JB 2.0S						
		NO TI	REATMEN	Г					
			Rates	s (lb/ac/yr)			Annual L	oads (lb/yr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Cow Pasture	0.9	32.0	0.10	3.7	305.3	28.8	0.09	3.3	274.8
Conventional Tillage	9.2	45.0	4.20	18.6	305.3	414.0	38.64	171.1	2808.8
Forest	8.6	7.0	0.10	1.8	/6.5	60.2	0.86	15.5	657.9
					TOTALS	503.0	39.59	189.9	3741.5
	POST-DE		IN POINT						
	FUST-DL	SI	JB 2.1S		LACL				
			Rates	s (lb/ac/yr)			Annual L	oads (lb/yr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commerical (High Impervious)	7.8	163.0	0.71	4.6	716.5	1271.4	5.54	35.9	5588.7
Cow Pasture	0.4	32.0	0.10	3.7	305.3	12.8	0.04	1.5	122.1
			TOTALS		TREATMENT	128/1 2	5 58	37.4	5710.8
			IUIALS			1204.2	5.50	57.4	5/10.0
						40%	40%	20%	80%
DESIGN 2 EXTE	NDED DETENTION PONE	0 1.0P POL	LUTANT R	EMOVAL E	EFFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						770.5	3.35	29.9	1142.2
			TOTA	ALS AFTER	TREATMENT	to	to	to	to
						513.7	2.23	22.4	0.0
		61	10 2 20						
				r					
			Bates	s (lb/ac/vr)			Annual I	oads (lb/vr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (high Impervious)	0.8	163.0	0.71	4.6	716.5	130.4	0.57	3.7	573.2
Cow Pasture	1.4	32.0	0.12	5.0	305.3	44.8	0.17	7.0	427.4
Forest	1.5	7.0	0.10	1.8	76.5	10.5	0.15	2.7	114.8
							1	1	1
					TOTALS	185.7	0.89	13.4	1115.4
	POST-DEVELC	PMENT 1	TOTALS A	T DESIGN	N POINT 2				
						050.0	4.04	40.0	0077.0
			TOT /		TDEATMENT	956.2	4.24	43.3	2257.6
			1014	ALS AFIER		0J	10 2 1 2	10 35 9	1115 /
						099.4	3.12	33.0	1115.4

		DESIG		3					
	PRE-DE\	/ELOPI	IENT U	NION PI	LACE				
	ANNU	AL POL	LUTAN	T LOAD	S				
		SU	B 3.0S						
		NO TR	EATMENT						
			Rates	(lb/ac/yr)			Annual Lo	oads (lb/yr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	0.3	163.0	0.71	4.6	716.5	48.9	0.21	1.4	215.0
Cow Pasture	2.8	32.0	0.12	3.7	305.3	89.6	0.34	10.4	854.8
Conventional Tillage	1.3	45.0	4.20	18.6	305.3	58.5	5.46	24.2	396.9
Forest	6.2	7.0	0.10	1.8	76.5	43.4	0.62	11.2	474.3
					TOTALS	240.4	6.63	47.2	1941.0
	POST-DE\	DESIG	N <mark>POINT</mark> MENT U	3 NION PI	LACE				
	POST-DE\	DESIG /ELOPN SU	N <mark>POINT</mark> MENT U B 3.1S	3 NION PI	LACE				
	POST-DE\	DESIG /ELOPI SU NO TR	N POINT MENT U B 3.1S EATMENT	3 NION P	LACE				
	POST-DE\	DESIG /ELOPI SU NO TR	N POINT MENT U B 3.1S EATMENT Rates	3 NION P	LACE		Annual Lo	bads (lb/yr)	
Land use/Ground Cover	POST-DE	DESIG /ELOPM SU NO TR BOD	N POINT MENT U B 3.1S EATMENT Rates TP	3 NION PI (lb/ac/yr) TN	LACE TSS	BOD	Annual Lo	pads (Ib/yr)	TSS
L and use/Ground Cover Commercial (High Impervious)	POST-DE	DESIG /ELOPM SU NO TR BOD 163.0	N POINT MENT U B 3.1S EATMENT Rates TP 0.71	3 NION P (lb/ac/yr) TN 4.6	TSS 716.5	BOD 65.2	Annual Lo TP 0.3	pads (lb/yr) TN 1.8	TSS 286.6
Land use/Ground Cover Commercial (High Impervious) Cow Pasture	POST-DE Area (Acres) 0.4 1.2	DESIG /ELOPM SU NO TR BOD 163.0 32.0	N POINT MENT U B 3.1S EATMENT Rates TP 0.71 0.12	3 NION P (lb/ac/yr) TN 4.6 3.7	TSS 716.5 305.3	BOD 65.2 38.4	Annual Lo TP 0.3 0.14	oads (lb/yr) TN 1.8 4.4	TSS 286.6 366.4
Land use/Ground Cover Commercial (High Impervious) Cow Pasture Forest	POST-DE Area (Acres) 0.4 1.2 0.8	DESIG /ELOPM SU NOTR 163.0 32.0 7.0	N POINT MENT U B 3.1S EATMENT Rates TP 0.71 0.12 0.10	3 NION P (lb/ac/yr) TN 4.6 3.7 1.8	TSS 716.5 305.3 76.5	BOD 65.2 38.4 5.6	Annual Lo TP 0.3 0.14 0.08	oads (lb/yr) TN 1.8 4.4 1.4	TSS 286.6 366.4 61.2
Land use/Ground Cover Commercial (High Impervious) Cow Pasture Forest	POST-DE	DESIG /ELOPM SU NOTR BOD 163.0 32.0 7.0	N POINT MENT U B 3.1S EATMENT Rates TP 0.71 0.12 0.10	3 NION P (lb/ac/yr) TN 4.6 3.7 1.8	TSS 716.5 305.3 76.5 TOTALS	BOD 65.2 38.4 5.6 109.2	Annual Lo TP 0.3 0.14 0.08 0.52	pads (lb/yr) TN 1.8 4.4 1.4 7.6	TSS 286.6 366.4 61.2 714.2
Land use/Ground Cover Commercial (High Impervious) Cow Pasture Forest	POST-DE	DESIG /ELOPM SU NOTR 163.0 32.0 7.0	N POINT MENT U B 3.1S EATMENT Rates TP 0.71 0.12 0.10	3 NION P (lb/ac/yr) TN 4.6 3.7 1.8	TSS 716.5 305.3 76.5 TOTALS	BOD 65.2 38.4 5.6 109.2	Annual Lo TP 0.3 0.14 0.08 0.52	oads (lb/yr) TN 1.8 4.4 1.4 7.6	TSS 286.6 366.4 61.2 714.2
Land use/Ground Cover Commercial (High Impervious) Cow Pasture Forest	POST-DE	DESIG /ELOPM SU NOTR BOD 163.0 32.0 7.0	N POINT MENT U B 3.1S EATMENT Rates TP 0.71 0.12 0.10	3 NION P (lb/ac/yr) TN 4.6 3.7 1.8	TSS 716.5 305.3 76.5 TOTALS	BOD 65.2 38.4 5.6 109.2	Annual Lo TP 0.3 0.14 0.08 0.52	Dads (Ib/yr) TN 1.8 4.4 1.4 7.6	TSS 286.6 366.4 61.2 714.2
Land use/Ground Cover Commercial (High Impervious) Cow Pasture Forest	POST-DE	DESIG /ELOPM SU NOTR BOD 163.0 32.0 7.0	N POINT MENT U B 3.1S EATMENT Rates TP 0.71 0.12 0.10	3 NION P (lb/ac/yr) TN 4.6 3.7 1.8	TSS 716.5 305.3 76.5 TOTALS	BOD 65.2 38.4 5.6 109.2	Annual Lo TP 0.3 0.14 0.08 0.52	Dads (lb/yr) TN 1.8 4.4 1.4 7.6	TSS 286.6 366.4 61.2 714.2
Land use/Ground Cover Commercial (High Impervious) Cow Pasture Forest	POST-DE	DESIG /ELOPM SU NO TR BOD 163.0 32.0 7.0	N POINT MENT U B 3.1S EATMENT Rates TP 0.71 0.12 0.10	3 NION P (lb/ac/yr) TN 4.6 3.7 1.8	LACE TSS 716.5 305.3 76.5 TOTALS	BOD 65.2 38.4 5.6 109.2	Annual Lo TP 0.3 0.14 0.08 0.52	pads (lb/yr) TN 1.8 4.4 1.4 7.6	TSS 286.6 366.4 61.2 714.2

		DESIG		4					
	PRE-DE\	/ELOPN	IENT U	NION PI	LACE				
	ANNU	AL POL	LUTAN	T LOAD	S				
		SU	B 4.0S						
		NO TR	EATMENT						
			Rates	(lb/ac/yr)			Annual L	bads (lb/yr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Cow Pasture	0.2	32.0	0.10	3.7	305.3	6.4	0.02	0.7	61.1
Forest	2.9	7.0	0.10	1.8	76.5	20.3	0.29	5.2	221.9
					TOTALS	26.7	0.31	5.9	283.0
		DESIG		4					
	FUST-DEV								
		NO TR	EATMENT						
			Rates	(lb/ac/yr)			Annual L	oads (lb/yr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	0.2	163.0	0.71	4.6	716.5	32.6	0.14	0.9	143.3
Cow Pasture	0.9	32.0	0.10	3.7	305.3	28.8	0.09	3.3	274.8
Forest	0.1	7.0	0.10	1.8	76.5	0.7	0.01	0.2	7.7
					TOTALS	33.3	0.15	1.1	151.0

				INION P					
	ANNO		IB 5 0S		5				
			REATMEN	г					
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	20.0	163.0	0.70	4.6	716.5	3260.0	14.00	92.0	14330.0
Cow Pasture	3.5	32.0	0.10	3.7	305.3	112.0	0.35	13.0	1068.6
Eorost	9.7	45.0	4.20	18.0	305.3	430.5	40.74	180.4	2901.4
orest	20.0	7.0	0.10	1.0	70.5	100.2	2.00	47.5	2004.0
					TOTALS	3994.7	57.75	333.3	20394.9
		DESIG		5					
	FUSI-DEV								
	ANNU	AL POI	LLUTAN		15				
		~	ID 5 10						
		51	Bator	s (lb/ac/vr)			Annually	oads (lb/vr)	
and use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP		TSS
Commercial (High Impervious)	2.1	163.0	0.71	4.6	716.5	342.3	1.49	9.7	1504.7
Cow Pasture	0.3	32.0	0.10	3.7	305.3	9.6	0.03	1.1	91.6
			TOTALS F	PRIOR TO T	REATMENT	351.9	1.52	10.8	1596.3
						40%	60%	40%	80%
DESIGN 3 EXTENDE				MOVAL FF	FICIENCIES	40%	to	40%	ð0%
BEGIGN O EXTENDE						60%	80%	60%	100%
						211.1	0.61	6.5	319.3
					SUBTOTAL	to	to	to	to
						140.8	0.30	4.3	0.0
						40%	40%	20%	80%
DESIGN 2 EXTENDE	D DETENTION POND 5	.2P POLL	UTANT RE	EMOVAL EF	FICIENCIES	to	to	to	to
						60%	60%	40%	100%
					OUDTOTA	126.7	0.37	5.2	63.9
					SURIOIAL	IO FC O	10 0 1 0	to	to
						56.3 40%	0.12	2.0	0.0
DESIGN 2 FXTENDE	D DETENTION POND 5	3P POLI			FICIENCIES	0/0 to	0 /o	±0 /0	to
						60%	60%	40%	100%
						76.0	0.22	4.2	12.8
					SUBTOTAL	to	to	to	to
						22.5	0.05	1.6	0.0
						40%	40%	20%	80%
DESIGN 2 EXTENDE	D DETENTION POND 5	.5P POLL	UTANT RE	MOVAL EF	FICIENCIES	to	to	to	to
						60%	60%	40%	100%
					SUBTOTAL	45.0	0.13 to	3.4 to	2.0 to
					JUBIUIAL	9.0	0.02	1.0	0.0
						20%	20%	20%	20%
						, .			10,0
DESIG	N 14 LOW GRADIENT G	RASS S		H STONE C	HECKDAMS	to	to	to	10
DESIG	N 14 LOW GRADIENT G	RASS S	WALE WIT	H STONE C	HECKDAMS	to 40%	to 40%	to 40%	40%
DESIG	N 14 LOW GRADIENT G	RASS S	WALE WIT	H STONE C	HECKDAMS	to 40% 36.5	to 40% 0.10	to 40% 2.7	40%
DESIG	N 14 LOW GRADIENT G	RASS S	VALE WIT	H STONE C	HECKDAMS	to 40% 36.5 to	to 40% 0.10 to	to 40% 2.7 to	40% 2.1 to

Induse@Ground Cover Areas (Acres) Bitles (Iblacyir) Annual Loads (Bx)r) Commercial (High Impervious) 0.4 163.0 0.71 14.5 776.5 162.0 228.6 228.6 Commercial (High Impervious) 0.5 32.0 0.1 3.7 305.3 16.0 D.05 19 152.7 Commercial (High Impervious) 0.5 32.0 0.1 3.7 305.3 10.0 0.05 19 105.7 Commercial (High Impervious) 0.5 32.0 0.1 3.7 493.5 0.05 10 0 <th colspan="11">SUB 5.2S</th>	SUB 5.2S										
Lind use(Ground Cover Area (Acres) BOD TP UT N TSS BOD TP NTN TSS Commercial (High Inpervious) 0.6 32.0 0.71 4.6 715.5 50.2 0.28 1.8 226.6 Cow Pasture 0.5 32.0 0.10 3.7 305.3 16.0 0.05 1.9 152.7 TOTALS PRIOR TO TREATMENT 81.2 0.33 3.7 439.3 DESIGN 2 EXTENDED DETENTION POND 5.2P POLLUTANT REMOVAL EFFICIENCIES 10 10 10 0 0 0 60% 40			1	Rate	(lb/ac/yr)			Annual L	oads (lb/vr)		
Commercial (High Impervious) D 0.5 16.0 0.26 19.2 18.2 26.6 Cow Pasture 0.5 32.0 0.10 3.7 398.3 160.0 0.06 19 152.7 Cow Pasture TOTALS PRIOR TO TREATMENT 81.2 0.33 3.7 439.3 Design 2 EXTENDED DETENTION POND 5.2P POLLUTANT REMOVAL EFFICIENCIES 10 10 10 10 10 JESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 10	Land use/Ground Cover	Area (Acres)	BOD	TP	TN	227	BOD	TP	TN	TSS	
Cow Pasture 0.5 32.0 0.10 3.7 305.3 16.0 0.06 1.9 152.7 TOTALS PRIOR TO TREATMENT 81.2 0.33 3.7 438.3 DESIGN 2 EXTENDED DETENTION POND 5.2P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 5.2P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 40% 10% 10	Commercial (High Impervious)	0.4	163.0	0.71	4.6	716.5	65.2	0.28	1.8	286.6	
TOTALS PRIOR TO TREATMENT 81.2 0.33 3.7 439.3 DESIGN 2 EXTENDED DETENTION POND 5.2P POLLUTANT REMOVAL EFFICIENCIES b	Cow Pasture	0.5	32.0	0.10	3.7	305.3	16.0	0.05	1.9	152.7	
Instant Sector Instant											
DESIGN 2 EXTENDED DETENTION POND 5.2P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% 00% 60% 60% 40% 100% 60% 40% 100% 01% 60% 60% 40% 100% 40% <td></td> <td></td> <td></td> <td>TOTALS F</td> <td>RIOR TO</td> <td>TREATMENT</td> <td>81.2</td> <td>0.33</td> <td>3.7</td> <td>439.3</td>				TOTALS F	RIOR TO	TREATMENT	81.2	0.33	3.7	439.3	
DESIGN 2 EXTENDED DETENTION POND 5.2P POLLUTANT REMOVAL EFFICIENCIES 100% 100% 100% 100% 100% SUBTOTAL 00 00 00 100% 22 00 40.7 0.33 2.0 00 100% 20% <							40%	40%	20%	80%	
DESIGN E EXTENDED DETENTION FOND S.3P FOLLUTANT REMOVAL EFFICIENCIES 60% 64% 70% 64% 70% 64% 70% 64% 70% 64% 70% 64% 70% 64% 70% 64% 70% 64% 70% 64% 70% 64% 70% 84% 70% 70% 70% </td <td>DESIGN 2 EXTENDED DET</td> <td></td> <td></td> <td></td> <td></td> <td>FEICIENCIES</td> <td>+0 /0</td> <td>+0 /0</td> <td>2078</td> <td>00%</td>	DESIGN 2 EXTENDED DET					FEICIENCIES	+0 /0	+0 /0	2078	00%	
SUBTOTAL 48.7 0.20 3.0 07.5 SUBTOTAL 48.7 0.20 3.0 07.5 DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES b b b b DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES b	BEGIGN 2 EXTENDED BET						60%	60%	40%	100%	
SUBTOTAL 100 0							48.7	0.20	30	87.9	
SUB CVM 22.5 0.13 2.2 0.0 DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 10 40% 40% 20% 80% SUBTOTAL 10 10 10 10 10 10 AUDIA 10						SUBTOTAL	+0.7	to	to	to	
Units Units <th< td=""><td></td><td></td><td></td><td></td><td></td><td>000101742</td><td>32.5</td><td>0.13</td><td>22</td><td>0.0</td></th<>						000101742	32.5	0.13	22	0.0	
DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 10 10 10 10 10 10 10 10 100							40%	40%	20%	80%	
SUB TOTAL 60% 60% 40% 100% 29.2 0.12 2.4 17.6 0 10 <td>DESIGN 2 EXTENDED DET</td> <td>ENTION POND 5</td> <td>3P POLI</td> <td></td> <td></td> <td>FEICIENCIES</td> <td>to</td> <td>+070</td> <td>to</td> <td>to</td>	DESIGN 2 EXTENDED DET	ENTION POND 5	3P POLI			FEICIENCIES	to	+070	to	to	
SUB 5.35 Substant 100 / 100	BEORGINE EXTENDED BET						60%	60%	40%	100%	
SUBTOTAL Co. Co							20.2	012	2/	17.6	
SUB 5.35 Control 13.0 0.05 13.3 0.06 DESIGN 2 EXTENDED DETENTION POND 5.5P POLLUTANT REMOVAL EFFICIENCIES 10 10 10 10 10 10 10 80% DESIGN 2 EXTENDED DETENTION POND 5.5P POLLUTANT REMOVAL EFFICIENCIES 10						SUBTOTAL	29.2	0.12 to	2.4 to	17.0	
International constraints In						SUBIUIAL	13.0	0.05	13	0.0	
UDESIGN 2 EXTENDED DETENTION POND 5.5P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 20% UDESIGN 2 EXTENDED DETENTION POND 5.5P POLLUTANT REMOVAL EFFICIENCIES UDESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS UDESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS TOTALS AFTER TREATMENT 10.0 TOTALS AFTER TREATMENT 10.0 TOTALS AFTER TREATMENT TOTALS PRIOR TO TREATMENT SUB 5.3S Annual Loads (Ib/yr) Land user/Ground Cover Area (Acres) OO TOTALS PRIOR TO TREATMENT TOTALS PRIOR TO TREATMENT DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES <td colspa<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>10.0</td><td>0.05</td><td>1.3</td><td>0.0</td></td>	<td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>10.0</td> <td>0.05</td> <td>1.3</td> <td>0.0</td>							10.0	0.05	1.3	0.0
SUBSIGN 2 EXTENDED DETENTION FORD 3.5F POLLOTART REMOVAL EFFICIENCIES 00 00 00 100 SUBTOTAL 60% 60% 60% 100% 100% SUBTOTAL 10 10 10 10 10 10 DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS 10 10 10 10 10 DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS 10 10 10 10 10 DESIGN 14 LOW GRADIENT GRASS SWALE TOTALS AFTER TREATMENT 10 10 10 10 Commercial (High Impervious) 9.4 163.0 71 TN TSS 667 43.2 6735.1 Commercial (High Impervious) 9.7 10.1 3.7 305.3 22.4 0.07 2.6 213.7 Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 1522.2 6.67 43.2 6936.8 DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 10 10 10 10 10 10		DESIGN 2 EXTENDED DETENTION POND 5.5P POLLUTANT REMOVAL EFFICIEN									
SUB 5.3S Annual Loads (b/yr) Annual Loads (b/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 152.2 0.67 432.8 Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 152.2 6.67 432.2 6735.1 Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 1532.2 6.67 432.2 6735.1 Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 1532.2 6.67 43.2 6948.8 DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 10 10 10 10 10 0.60% 60% 40% 100% 60% 60% 60% 60% 60% 60% 60% 100% 0.61 10 10 10 10 10 10 10 10 10 10	DESIGN 2 EXTENDED DET										
SUBTOTAL 15 07							17.5	0.07	40%	100%	
SUB 17 IAL 10						SUBTOTAL	17.5	0.07	1.9	3.5	
SUB 3.2 0.02 0.2 0.0 0.0 DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS 10 10 10 10 10 40% 40% 40% 40% 40% 40% 40% 14.0 0.06 1.5 2.8 10 10 10 14.0 0.06 1.5 2.8 10.0 10 10 14.0 0.06 1.5 2.8 10.0 10 10 14.0 0.06 1.5 2.8 10.0 10.0 10 14.0 0.06 1.5 2.8 10.0 10.5 0.0 14.0 0.06 1.5 2.8 10.0 10.5 0.0 14.0 0.06 1.5 2.8 2.7 10.0 10.7 10.0 10.7 10.0 10.7 10.0 10.7 10.0 10.7 10.0 10.7 10.0 10.0 10.0 10.0 10.0 10.0 10.0 <td></td> <td></td> <td></td> <td></td> <td></td> <td>SUBIUIAL</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td>						SUBIUIAL	10	10	10	10	
20% 20%							5.2	0.02	0.8	0.0	
SUB 5.3S IDENSIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDARD ID ID <thid< th=""> ID <thid< th=""> ID<!--</td--><td>DESIGN 141</td><td></td><td></td><td></td><td></td><td></td><td>20%</td><td>20%</td><td>20%</td><td>20%</td></thid<></thid<>	DESIGN 141						20%	20%	20%	20%	
40% 40%	DESIGN 14 L	OW GRADIENT C	JRA55 5	WALE WIT	1 STONE (HECKDAMS	t0	to	to	to	
TOTALS AFTER TREATMENT 14.0 0.00 1.3 2.8 TOTALS AFTER TREATMENT 10 10 10 10 SUB 5.3S Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 1532.2 6.67 43.2 6735.1 Cow Pasture 0.7 32.0 0.10 3.7 305.3 22.4 0.07 2.6 213.7 TOTALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 OUT ALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 OUT ALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 OUT ALS PRIOR TO TREATMENT 1554.6 6.0% 40% 100% OUT ALS PRIOR TO TREATMENT 1554.6 6.0% 60% 60% 60% </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>40%</td> <td>40%</td> <td>40%</td> <td>40%</td>							40%	40%	40%	40%	
IDTALS AFTER TREATMENT ID ID <thid< th=""> ID ID ID<!--</td--><td></td><td></td><td></td><td>TOTA</td><td></td><td></td><td>14.0</td><td>0.06</td><td>1.5</td><td>2.8</td></thid<>				TOTA			14.0	0.06	1.5	2.8	
SUB 5.3S Annual Loads (lb/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 1532.2 6.67 43.2 6735.1 Cow Pasture 0.7 32.0 0.10 3.7 305.3 22.4 0.07 2.6 213.7 TOTALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 OLITION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES USUBTOTAL DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES USUBTOTAL OLITION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES USUBTOTAL DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES USUBTOTAL OLITION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES USUBTOTAL DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES USUBTOTAL DESIGN 2 EXT				TOTAL	S AFTER	IREAIMENI	to	to	to	to	
Rates (Ib/ac/yr) Annual Loads (Ib/yr) Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 1532.2 6.67 43.2 6735.1 Cow Pasture 0.7 32.0 0.10 3.7 305.3 22.4 0.07 2.6 213.7 TOTALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES M0% 40% 20% 80% 10 10 10 10 DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES 10 10 10 10 DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES 10 10 10 10 DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL			SI	UB 5.3S							
Land use/Ground Cover Area (Acres) BOD TP TN TSS BOD TP TN TSS Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 1532.2 6.67 43.2 6735.1 Cow Pasture 0.7 32.0 0.10 3.7 305.3 22.4 0.07 2.6 213.7 TOTALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% BUBTOTAL 40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 10 to				Rates	s (lb/ac/vr)			Annual L	oads (lb/vr)		
Commercial (High Impervious) 9.4 163.0 0.71 4.6 716.5 1532.2 6.67 43.2 6735.1 Cow Pasture 0.7 32.0 0.10 3.7 305.3 22.4 0.07 2.6 213.7 TOTALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 100% DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES DESIGN 2 EXTENDE GRASS	Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS	
Cow Pasture 0.7 32.0 0.10 3.7 305.3 22.4 0.07 2.6 213.7 TOTALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES to to to to to DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES 40% 40% 100% 932.8 4.04 36.6 1389.8 DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES to to <td>Commercial (High Impervious)</td> <td>9.4</td> <td>163.0</td> <td>0.71</td> <td>4.6</td> <td>716.5</td> <td>1532.2</td> <td>6.67</td> <td>43.2</td> <td>6735.1</td>	Commercial (High Impervious)	9.4	163.0	0.71	4.6	716.5	1532.2	6.67	43.2	6735.1	
TOTALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% 10 to to to to to to 80% 60% 60% 40% 100% 932.8 4.04 36.6 1389.8 80BTOTAL to to to to to to to DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% 0 100 to to to to to to 0 0 0 100 to to to to to 0 00% 60% 40% 100% 80% 100% 100% 0 0 to to to to to to 0 0 0 to to to to to 0	Cow Pasture	0.7	32.0	0.10	3.7	305.3	22.4	0.07	2.6	213.7	
TOTALS PRIOR TO TREATMENT 1554.6 6.74 45.8 6948.8 OPENION DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% 100% 932.8 4.04 36.6 1389.8 SUBTOTAL 10 10 10 10 621.8 2.70 27.5 0.0 621.8 2.70 27.5 0.0 60% 60% 40% 100% 621.8 2.70 27.5 0.0 OPENIESTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES 40% 40% 40% 40% OPENIESTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES 40% 40% 40% 100% 60% 60% 40% 100% SUBTOTAL DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS Colspan= 20% 20% 20% Adv 40% 40% 40% DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td>										-	
DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% 100% 60% 60% 40% 100% 60% 60% 40% 100% 100% 932.8 4.04 36.6 1389.8 10 10 10 10 100% 932.8 4.04 36.6 1389.8 100% 621.8 2.70 27.5 0.0 100% 40% 40% 20% 80% 100% 80% 100% 80% 100% 80% 100% 80% 100% 80% 100% 80% 100% 80% 100% 80% 100% 80% 100% 80% 100% 80% 100% 80% 100% <				TOTALS F	RIOR TO	TREATMENT	1554.6	6.74	45.8	6948.8	
40% 40% 20% 80% DESIGN 2 EXTENDED DETENTION POND 5.3P POLLUTANT REMOVAL EFFICIENCIES to to <thto< th=""> to to</thto<>							100/	40%	200/	<u>000/</u>	
DESIGN 2 EXTENDED BETENTION FOND 5.3F FOLLUTANT REMOVAL EFFICIENCIES 100% 60% 60% 40% 100% 932.8 4.04 36.6 1389.8 1389.8 100% 621.8 2.70 27.5 0.0 <td between="" column="" example="" of="" t<="" td="" the=""><td></td><td></td><td>20 001</td><td></td><td></td><td>FEICIENCIES</td><td>40%</td><td>40%</td><td>20%</td><td>00%</td></td>	<td></td> <td></td> <td>20 001</td> <td></td> <td></td> <td>FEICIENCIES</td> <td>40%</td> <td>40%</td> <td>20%</td> <td>00%</td>			20 001			FEICIENCIES	40%	40%	20%	00%
50% 50% 40% 100% SUBTOTAL 932.8 4.04 36.6 1389.8 DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES to to to to 40% 40% 20% 80% 509.7 2.42 29.3 278.0 509.7 2.42 29.3 278.0 509.7 2.42 29.3 278.0 248.7 1.08 16.5 0.0 248.7 1.08 16.5 0.0 248.7 1.08 16.5 0.0 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% <	DESIGN 2 EATENDED DET		JF FULL			I I ICIENCIES	1U 60º/	1U 60%	100/	100%	
SUBTOTAL 332.0 4.04 36.6 1389.8 50 to to to to to 621.8 2.70 27.5 0.0 40% 40% 20% 80% 40% 40% 20% 80% 509.7 2.42 29.3 278.0 559.7 2.42 29.3 278.0 248.7 1.08 16.5 0.0 248.7 1.08 16.5 0.0 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40%							0200	4.04	40%	1200 0	
SUBTOTAL to to to to to 621.8 2.70 27.5 0.0 40% 40% 20% 80% 40% 40% 20% 80% 559.7 2.42 29.3 278.0 SUBTOTAL to to to to 248.7 1.08 16.5 0.0 248.7 1.08 16.5 0.0 248.7 1.08 16.5 0.0 20% 20% 20% 20% 20% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40% <						SUBTOTAL	೨೦೭.ರ tc	4.04	30.0 to	1309.0 to	
b21.8 2.70 27.5 0.0 DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% to to to to to to to SUBTOTAL 559.7 2.42 29.3 278.0 DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS to to to to 40% 40% 40% 40% 40% 20% 20% 20% DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS to to to to to 100% 40%						JUBIUIAL	10 601 0	10	10	10	
DESIGN 2 EXTENDED DETENTION POND 5.5 POLLUTANT REMOVAL EFFICIENCIES 40% 40% 20% 80% 100% 60% 60% 40% 100% 559.7 2.42 29.3 278.0 100% 559.7 2.42 29.3 278.0 100% 100% 100% 20% 20% 10.0 10 10 10 100% 20% <							0∠1.ŏ 40º/	2.70	27.5	0.0	
DESIGN 2 EXTENDED DETENTION FOND 3.5 FOLLOTANT REMOVAL EFFICIENCIES to to to to to to to to to SUBTOTAL 559.7 2.42 29.3 278.0 248.7 1.08 16.5 0.0 DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS to to to to to Methods 40% <			5 5 POL 1			FEICIENCIES	+0%	+U %	20%	00%	
50% 50% 40% 100% SUBTOTAL 559.7 2.42 29.3 278.0 to to to to to to to DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS to to to to to to Mathematical Street 40% 40% 40% 40% 40% 40% Mathematical Street to to to to to to TOTALS AFTER TREATMENT 1.94 23.4 222.4 100 to to	DESIGN 2 EXTENDED DETENTION FOND 5.5 POLLOTANT REMOVAL EFFICIENCIES TO TO									100%	
SUBTOTAL 335.7 2.42 29.3 278.0 10 to to to to to DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS 20% 20% 20% 20% 20% 20% 40% 40% 40% 40% 40% 40% 40% 10 to to to to to to to							550.7	2 4 2	40% 20.2	27º 0	
ID ID<						SUBTOTAL	559.7	2.42 to	23.3 to	2/0.0 to	
Z48.7 1.06 16.5 0.0 DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS 20% 20% 20% 20% 20% Mathematical Control Contrel Control Control Contrel Control Control Contrel Co						SUBIUTAL	249.7	1.09	16.5	0.0	
DESIGN 14 LOW GRADIENT GRASS SWALE WITH STONE CHECKDAMS 20% <							240./	1.00	200/	0.0	
Image: Design 14 Low GRADIENT GRASS SWALE WITH STONE CRECKDAWS to to to to to 40% 40% 40% 40% 40% 40% 40% TOTALS AFTER TREATMENT to to to to to 149.2 0.65 9.9 0.0	DESIGN 141						20%	20%	20%	20%	
40% 40% 40% 40% 447.8 1.94 23.4 222.4 TOTALS AFTER TREATMENT to to to 149.2 0.65 9.9 0.0	DESIGN 14 L				1 STORE (UNE ON DAINS	100/	100/	100/	100/	
TOTALS AFTER TREATMENT 447.0 1.34 222.4 TOTALS AFTER TREATMENT to to <th colsp<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>40%</td><td>40%</td><td>40% 22 /</td><td>40%</td></th>	<td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>40%</td> <td>40%</td> <td>40% 22 /</td> <td>40%</td>							40%	40%	40% 22 /	40%
		TOTAL		TREATMENT	++/.0	1.94 to	20.4 to	44 to			
				IUTA			149 2	0.65	0.0	00	

		SI	JB 5.4S						
			Rate	s (lb/ac/yr)			Annual L	oads (lb/yr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	16.9	163.0	0.71	4.6	716.5	2754.7	12.00	77.7	12108.9
Cow Pasture	0.9	32.0	0.10	3.7	305.3	28.8	0.09	3.3	274.8
			TOTALS F	PRIOR TO	TREATMENT	2783.5	12.09	81.0	12383.7
						40%	40%	20%	80%
DESIGN 2 EXTENDE	D DETENTION POND 5	.4P POLL	UTANT RE	MOVAL E	FFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						1670.1	7.25	64.8	2476.7
					SUBTOTAL	to	to	to	to
						1113.4	4.84	48.6	0.0
						40%	40%	20%	80%
DESIGN 2 EXTENDE	D DETENTION POND 5	.5P POLL	UTANT RE	EMOVAL E	FFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						1002.1	4.35	51.8	495.3
					SUBTOTAL	to	to	to	to
						445.4	1.94	29.2	0.0
						20%	20%	20%	20%
DESIG	N 14 LOW GRADIENT O	RASS SV	VALE WIT	H STONE (CHEKCDAMS	to	to	to	to
						40%	40%	40%	40%
						801.7	3.48	41.4	396.2
			ΤΟΤΑ	LS AFTER	TREATMENT	to	to	to	to
						267.2	1.16	17.5	0.0
			10 5 50						
		SL	JB 5.55						
			Rate	s (lb/ac/yr)			Annual L	oads (lb/yr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	0.4	163.0	0.71	4.6	716.5	65.2	0.28	1.8	286.6
Cow Pasture	2.3	32.0	0.12	3.7	305.3	73.6	0.28	8.5	702.2
			TOTALS F	PRIOR TO	TREATMENT	138.8	0.56	10.3	988.8
						40%	40%	20%	80%
DESIGN 2 EXTENDE	D DETENTION POND 5	5P POLL	UTANT RE	EMOVAL E	FFICIENCIES	to	to	to	to
						60%	60%	40%	100%
						83.3	0.34	8.2	197.8
					SUBTOTAL	to	to	to	to
						55.5	0.22	6.2	0.0
						20%	20%	20%	20%
DESIG	N 14 LOW GRADIENT G	RASS SV		H STONE	CHEKCDAMS	to	to	to	to
						40%	40%	40%	40%
						66.6	0,27	6.6	158.2
			TOTA	S AFTER	TREATMENT	to	to	to	to
						33 3	0 13	37	00

		S	UB 5.6S						
			Rate	s (lb/ac/yr)			Annual L	oads (lb/yr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	3.40	163.0	0.71	4.6	716.5	554.2	2.41	15.6	2436.1
Cow Pasture	1.4	32.0	0.12	3.7	305.3	44.8	0.17	5.2	427.4
			TOTALS	VRIOR TO	IREAIMENI	599.0	2.58	20.8	2863.5
						40%	60%	40%	80%
DESIGN 3 EXTENDED DETE	NTION POND 5	6P POLL	UTANT RE		FFICIENCIES	to	to	to	to
BEGIGIN O EXTENDED BETE						60%	80%	60%	100%
						359.4	1.03	12.5	572.7
			ΤΟΤΑ	LS AFTER	TREATMENT	to	to	to	to
						239.6	0.52	8.3	0.0
		SI	UB 5.7S						
			Rate	s (lb/ac/yr)			Annual L	oads (lb/yr)	
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	2.2	163.0	0.71	4.6	716.5	358.6	1.56	10.1	1576.3
Cow Pasture	0.7	32.0	0.12	3.7	305.3	22.4	0.08	2.6	213.7
Forest	0.8	7.0	0.10	1.8	76.5	5.6	0.08	1.4	61.2
			TOTALS		TREATMENT	386.6	1 72	14.1	1851.2
			TOTALST			500.0	1.72	14.1	1031.2
						40%	60%	40%	80%
DESIGN 3 EXTENDED DETE	NTION POND 5	.7P POLL	UTANT RE	EMOVAL E	FFICIENCIES	to	to	to	to
						60%	80%	60%	100%
						232.0	0.69	8.5	370.2
					SUBTOTAL	to	to	to	to
						154.6	0.34	5.6	0.0
						20%	20%	20%	20%
DESIGN 14 LO	W GRADIENT G	iRASS S	WALE WIT	HSIONE	CHEKCDAMS	10 400/	t0	t0	10 100/
						40%	40%	40%	40%
			TOTA		TDEATMENT	100.0	0.0	0.0 to	290.2
			IUIA		INCATMENT	02 8	02	31	00
						52.0	0.2	0.4	0.0
		SI	UB 5.8S						
		NO T	REATMEN	Т					
Land use/Ground Cover		BOD	тр	TN	227	BOD	тр	TN	227
Commercial (High Impervious)	12.4	163.0	0.71	4.6	716.5	2021.2	8,80	57.0	8884.6
Cow Pasture	4.5	32.0	0.12	3.7	305.3	144.0	0.54	16.7	1373.9
Forest	12.8	7.0	0.10	1.8	7.0	89.6	1.28	23.0	89.6
					TOTALS	2254.8	10.62	96.7	10348.1
PC	ST-DEVELOP	MENT T	OTALS F	OR DESI	GN POINT 5				
						4166 A	10 10	101 6	11000 7
			TOTA		TREATMENT	4100.4	10.10 to	191.0	11998.7
			IUIA			3045 /	13 30	140 6	10348 1
	1	30-3.4	13.30	1-0.0	100-0.1				

DESIGN POINT 6											
PRE-DEVELOPMENT UNION PLACE											
ANNUAL POLLUTANT LOADS											
		SU	B 6.0S								
		NO TR	EATMENT								
			Rates	(lb/ac/yr)		Annual Loads (lb)			/yr)		
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS		
Commercial (High Impervious)	22.3	163.0	0.70	4.6	716.5	3634.9	15.61	102.6	15978.0		
Cow Pasture	3.7	32.0	0.10	3.7	305.3	118.4	0.37	13.7	1129.6		
Forest	25.9	7.0	0.10	1.8	76.5	181.3	2.59	46.6	1981.4		
i la								100.0	10000		

TOTALS 3934.6 18.57 162.9 19089.0

DESIGN POINT 6												
POST-DEVELOPMENT UNION PLACE												
		SU	B 6.1S									
		NO TR	EATMENT									
			Rates	(lb/ac/yr)			Annual Lo	oads (lb/yr)				
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS			
Town House	6.8	50.0	0.62	5.0	286.6	340.0	4.22	34.0	1948.9			
Cow Pasture	0.4	32.0	0.10	3.7	305.3	12.8	0.04	1.5	122.1			
Forest	0.4	7.0	0.10	1.8	76.5	2.8	0.04	0.7	30.6			
			TOTALS F	PRIOR TO	TREATMENT	355.6	4.30	36.2	2101.6			
						40%	40%	20%	80%			
DESIGN 2 EXTENDED DE	TENTION POND	6.1P POLL	UTANT RE	MOVAL E	FFICIENCIES	to	to	to	to			
						60%	60%	40%	100%			
						213.4	2.58	29.0	420.3			
					SUBTOTAL	to	to	to	to			
						142.2	1.72	21.7	0.0			
						40%	40%	20%	80%			
DESIGN 2 EXTENDED DE	TENTION POND	6.2P POLL	UTANT RE	MOVAL E	FFICIENCIES	to	to	to	to			
						60%	60%	40%	100%			
						128.0	1.55	23.2	84.1			
					SUBTOTAL	to	to	to	to			
						56.9	0.69	13.0	0.0			
						20%	20%	20%	20%			
DESIGN 14 I	OW GRADIENT	GRASS S	NALE WITH	STONE C	CHECKDAMS	to	to	to	to			
						40%	40%	40%	40%			
						102.4	1.24	18.6	67.3			
			TOTAL	S AFTER	TREATMENT	to	to	to	to			
						34.1	0.41	7.8	0.0			

			6.2S								
		NO TR	EATMENT								
			Rates	(lb/ac/yr)		Annual Loads (lb/yr)					
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS		
Cow Pasture	0.8	32.0	0.12	3.7	305.3	25.6	0.10	3.0	244.2		
Forest	0.3	7.0	0.10	1.8	76.5	2.1	0.03	0.5	23.0		
			TOTALS F	PRIOR TO 1	REATMENT	27.7	0.13	3.5	267.2		
						40%	40%	20%	80%		
DESIGN 2 EXTEND	ED DETENTION POND	6.2P POLL	UTANT RE	MOVAL EF	FICIENCIES	to	to	to	to		
						60%	60%	40%	100%		
						16.6	0.08	2.8	53.4		
SUBTOTAL							to	to	to		
						11.1	0.05	2.1	0.0		
						20%	20%	20%	20%		
DESIG	GN 14 LOW GRADIENT	GRASS S	NALE WITH	I STONE C	HECKDAMS	to	to	to	to		
						40%	40%	40%	40%		
						13.3	0.06	2.2	42.7		
			TOTAL	S AFTER 1	REATMENT	to	to	to	to		
						6.7	0.03	1.3	0.0		
			6.3								
		NO TR	EATMENT								
			Rates	(lb/ac/yr)			Annual Lo	oads (lb/yr)			
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS		
Town House	7.0	50.0	0.62	5.0	286.6	350.0	4.34	35.0	2006.2		
Cow Pasture	6.4	32.0	0.12	3.7	305.3	204.8	0.77	23.7	1953.9		
Forest	3.8	7.0	0.10	1.8	76.5	26.6	0.38	6.8	290.7		
			TOTALS F	PRIOR TO 1	FREATMENT	581.4	5.49	65.5	4250.8		
						40%	40%	20%	80%		
DESIGN 2 EXTEND	ED DETENTION POND	6.3P POLL	UTANT RE	MOVAL EF	FICIENCIES	to	to	to	to		
						60%	60%	40%	100%		
						348.8	3.29	52.4	850.2		
					SUBTOTAL	to	to	to	to		
						232.6	2.20	39.3	0.0		
						40%	40%	20%	80%		
DESIGN 2 EXTEND	ED DETENTION POND	6.5P POLL	UTANT RE	MOVAL EF	FICIENCIES	to	to	to	to		

to

60% 209.3

to 93.0

TOTALS AFTER TREATMENT

to

60% 1.97

to 0.88

to

40%

41.9

to 23.6

to

100%

170.0

to 0.0

			6.4								
		NO TR	EATMENT								
Rates (lb/ac/yr) Annual Loads (lb/yr)								ual Loads (lb/yr)			
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS		
Town House	3.6	50.0	0.62	5.0	286.6	180.0	2.23	18.0	1031.8		
Cow Pasture	1.5	32.0	0.12	3.7	305.3	48.0	0.18	5.6	458.0		
Forest	1.2	7.0	0.10	1.8	76.5	8.4	0.12	2.2	91.8		
			TOTALS F	RIOR TO	REATMENT	236.4	2.53	25.8	1581.6		
						40%	40%	20%	80%		
DESIGN 2 EXTE	NDED DETENTION POND	6.4P POLL	UTANT RE	MOVAL EF	FICIENCIES	to	to	to	to		
						60%	60%	40%	100%		
						141.8	1.52	20.6	316.3		
					SUBTOTAL	to	to	to	to		
						94.6	1.01	15.5	0.0		
						40%	40%	20%	80%		
DESIGN 2 EXTE	NDED DETENTION POND	6.6P POLL	UTANT RE	MOVAL EF	FICIENCIES	to	to	to	to		
			-	-		60%	60%	40%	100%		
						85.1	0.91	16.5	63.3		
			TOTAL	S AFTER	REATMENT	to	to	to	to		
								9.3	0.0		
			6.5S								
		NO TR	EATMENT								
Rates (lb/ac/yr)							Annual L	oads (lb/yr)			
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS		
Fown House	0.7	50.0	0.62	5.0	286.6	35.0	0.43	3.5	200.6		
Cow Pasture	1.7	32.0	0.12	3.7	305.3	54.4	0.20	6.3	519.0		
oon i dolaio											

TOTALS PRIOR TO TREATMENT	90.8	0.65	10.2	734.9
	40%	40%	20%	80%
DESIGN 2 EXTENDED DETENTION POND 6.5P POLLUTANT REMOVAL EFFICIENCIES	to	to	to	to
	60%	60%	40%	100%
	54.5	0.39	8.2	147.0
TOTALS AFTER TREATMENT	to	to	to	to
	36.3	0.26	6.1	0.0

			6.6							
		NO TR	EATMENT							
Rates (lb/ac/yr) Annual Loads (lb/yr)										
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS	
Commercial (High Impervious)	0.6	163.0	0.72	4.6	716.5	97.8	0.43	2.8	429.9	
Cow Pasture	1.2	32.0	0.12	3.7	305.3	38.4	0.14	4.4	366.4	
Forest	0.6	7.0	0.10	1.8	76.5	4.2	0.06	1.1	45.9	
			TOTALS R	PRIOR TO	TREATMENT	140.4	0.63	8.3	842.2	
						40%	40%	20%	80%	
DESIGN 2 EXTEND	ED DETENTION POND	6.6P POLL	UTANT RE	MOVAL E	FFICIENCIES	to	to	to	to	
						60%	60%	40%	100%	
						84.2	0.38	6.6	168.4	
			TOTAL	S AFTER	TREATMENT	to	to	to	to	
						56.2	0.25	5.0	0.0	
		SU	B 6 7S							
		NO TR								
Bates (lb/ac/vr)							Annual Lo	oads (lb/vr)		
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS	
Commercial (High Impervious)	21.8	163.0	0.71	4.6	716.5	3553.4	15.48	100.3	15619.7	
Cow Pasture	2.7	32.0	0.12	3.7	305.3	86.4	0.32	10.0	824.3	
Forest	3.7	7.0	0.10	1.8	76.5	25.9	0.37	6.7	283.1	
					TOTALS	3665.7	16.17	117.0	16727.1	

POST-DEVELOPMENT TOTALS AT DESIGN POINT 6									
	4214.5	21.12	211.0	17385.8					
TOTALS AFTER TREATMENT	to	to	to	to					
	3929.8	18.40	170.1	16727.1					

		DESIG	N POINT	7					
	PRE-DEV	ELOPN	IENT U	NION P	LACE				
	ANNU	AL POL	LUTAN)S				
		SU	B 7.0S						
		NO TR	REATMENT						
			Rates	(lb/ac/yr)		Annual Loads (lb/yr)			
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS
Commercial (High Impervious)	5.9	163.0	0.70	4.6	716.5	961.7	4.13	27.1	4227.4
Cow Pasture	3.5	32.0	0.10	3.7	305.3	112.0	0.35	13.0	1068.6
Forest	14.1	7.0	0.10	1.8	76.5	98.7	1.41	25.4	1078.7
					TOTALC	1170 4	F 90	65 F	C074 7

TOTALS	1172.4	5.89	65.5	6374.7

DESIGN POINT 7											
	POST-DEV	/ELOPN	/IENT U	NION P	LACE						
		SU	B 7.1S								
		NO TR	EATMENT								
		Rates (lb/ac/yr)				Annual Loads (lb/yr)					
Land use/Ground Cover	Area (Acres)	BOD	TP	TN	TSS	BOD	TP	TN	TSS		
Commercial (High Impervious)	6.0	163.0	0.71	4.6	716.5	978.0	4.26	27.6	4299.0		
Cow Pasture	4.4	32.0	0.12	3.7	305.3	140.8	0.53	16.3	1343.3		
Forest	0.7	7.0	0.10	1.8	76.5	4.9	0.07	1.3	53.6		
					TOTALS	1123.7	4.86	45.2	5695.9		
APPENDIX D

Project and Owner Information

<u>Site Data:</u> Union Place U.S. Route 6 & Baldwin Place Road Town of Carmel New York Tax Map Numbers: 75.19-1-1.12, 86.6-1-4, 86.10-1-2, 86.10-1-3, 86.14-1-7, 86.11-1-1 Area: 287.2 acres

Owner Information: Camarda Realty Investments, LLC 1699 Route 6, Suite 1 Carmel, N.Y. 10512

Party Responsible for Implementation of the Stormwater Pollution Prevention Plan:

To be determined prior to construction

<u>Qualified Professional Responsible for Inspection of the Stormwater Pollution Prevention Plan:</u> Inspector to be determined at time of construction

APPENDIX E

NYSDEC SPDES for Construction Activities Construction Site Log Book

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

CONSTRUCTION SITE LOG BOOK

Table of Contents

- I. Pre-Construction Meeting Documents.
 - a. Preamble to Site Assessment and Inspections
 - b. Operator's Certification
 - c. Qualified Professional's Credentials & Certification
 - d. Contractors Certification
 - e. Pre-Construction Site Assessment Checklist

a.

- II. Construction Duration Inspections
 - a. Directions
 - b. Modification to the SWPPP
- a

Properly completing forms such as those contained in this document meet the inspection requirement of NYSDEC SPDES GP 0-10-001 for Construction Activities, or superceding permit. Completed forms shall be kept on site at all times and made available to authorities upon request.

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name	
Permit No	Date of Authorization
Name of Operator	
Prime Contractor	

a. Preamble to Site Assessment and Inspections -The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified professional¹ conduct an assessment of the site prior to the commencement of construction² and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements.

When construction starts, site inspections shall be conducted by the qualified professional at least every 7 calendar days (Construction Duration Inspections). The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization³ using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).

2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Operators Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law. "

Name (please pri	int):		
Title		Date:	
Address:			
Phone:	Email:		
Signature:			

c. Qualified Professional's Credentials & Certification

" I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (please pri	int):		
Title		Date:	
Address:			
Phone:	Email:		
Signature:			

d. Contractors Certification Statement

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

Signature of Contractor		Date	
Print Name	Title		
Signature of Trained Contractor		Date	
Print Name of Trained Contractor	Title		
Name of Contracting Firm			
Street Address			
City, State, Zip			
Telephone No.	f the Stormwater Dollutio	n Dravantian Dlan (SW/DDD) for a	maniad

A copy of this statement shall be retained as part of the Stormwater Pollution Prevention Plan (SWPPP) for a period off at least five (5) years after the subject property is stabilized.

e. Pre-construction Site Assessment Checklist (NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

- [] [] Has a Notice of Intent been filed with the NYS Department of Conservation?
- [] [] [] Is the SWPPP on-site? Where?
- [] [] [] Is the Plan current? What is the latest revision date?_____
- [] [] [] Is a copy of the NOI (with brief description) onsite? Where?_____
- [] [] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

- [] [] Are construction limits clearly flagged or fenced?
- [] [] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
- [] [] [] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

- [] [] Clean stormwater runoff has been diverted from areas to be disturbed.
- [] [] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
- [] [] Appropriate practices to protect on-site or downstream surface water are installed.
- [] [] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Entrance

Yes No NA

- [] [] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
- [] [] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
- [] [] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Perimeter Sediment Controls

Yes No NA

- [] [] Silt fence material and installation comply with the standard drawing and specifications.
- [] [] Silt fences are installed at appropriate spacing intervals
- [] [] [] Sediment/detention basin was installed as first land disturbing activity.
- [] [] [] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

- [] [] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
- [] [] The plan is contained in the SWPPP on page _____
- [] [] Appropriate materials to control spills are onsite. Where?

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project. Required Elements:

(1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

(2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(3) Indicate all disturbed site areas that have not undergone active site work during the previous 7-day period;

Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

(5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

(6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

CONSTRUCTION DURATION INSPECTIONS

Page 1 of _____

SITE PLAN/SKETCH

Inspector (print name)

Date of Inspection

Qualified Professional (print name)

Qualified Professional Signature

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

CONSTRUCTION DURATION INSPECTIONS

Maintaining Water Quality

Yes No NA

- [] [] Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
- [] [] [] Is there residue from oil and floating substances, visible oil film, or globules or grease?
- [] [] All disturbance is within the limits of the approved plans.
- [] [] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA

- [] [] [] Is construction site litter and debris appropriately managed?
- [] [] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
- [] [] [] Is construction impacting the adjacent property?
- [] [] Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA

- [] [] Maximum diameter pipes necessary to span creek without dredging are installed.
- [] [] [] Installed non-woven geotextile fabric beneath approaches.
- [] [] Is fill composed of aggregate (no earth or soil)?
- [] [] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

Runoff Control Practices

1. Excavation Dewatering

Yes No NA

- [] [] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
- [] [] Clean water from upstream pool is being pumped to the downstream pool.
- [] [] Sediment laden water from work area is being discharged to a silt-trapping device.
- [] [] [] Constructed upstream berm with one-foot minimum freeboard.

2. Level Spreader

Yes No NA

- [] [] Installed per plan.
- [] [] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
- [] [] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

- [] [] Installed per plan with minimum side slopes 2H:1V or flatter.
- [] [] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
- [] [] [] Sediment-laden runoff directed to sediment trapping structure

CONSTRUCTION DURATION INSPECTIONS Runoff Control Practices (continued)

4. Stone Check Dam

Yes No NA

- [] [] [] Is channel stable? (flow is not eroding soil underneath or around the structure).
- [] [] Check is in good condition (rocks in place and no permanent pools behind the structure).
- [] [] [] Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

- [] [] Installed per plan.
- [] [] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

- [] [] [] Stockpiles are stabilized with vegetation and/or mulch.
- [] [] [] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

- [] [] Temporary seedings and mulch have been applied to idle areas.
- [] [] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control

1. Stabilized Construction Entrance

Yes No NA

- [] [] Stone is clean enough to effectively remove mud from vehicles.
- [] [] [] Installed per standards and specifications?
- [] [] Does all traffic use the stabilized entrance to enter and leave site?
- [] [] [] Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence

Yes No NA

- [] [] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
- [] [] Joints constructed by wrapping the two ends together for continuous support.
- [] [] Fabric buried 6 inches minimum.
- [] [] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is ____% of design capacity.

CONSTRUCTION DURATION INSPECTIONS

Page 4 of _____

Sediment Control (continued)

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated practices) **Yes No NA**

- [] [] Installed concrete blocks lengthwise so open ends face outward, not upward.
- [] [] Placed wire screen between No. 3 crushed stone and concrete blocks.
- [] [] Drainage area is 1acre or less.
- [] [] Excavated area is 900 cubic feet.
- [] [] [] Excavated side slopes should be 2:1.
- [] [] 2" x 4" frame is constructed and structurally sound.
- [] [] Posts 3-foot maximum spacing between posts.
- [] [] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
- [] [] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation ____% of design capacity.

4. Temporary Sediment Trap

Yes No NA

[] [] Outlet structure is constructed per the approved plan or drawing.

[] [] [] Geotextile fabric has been placed beneath rock fill.

Sediment accumulation is ____% of design capacity.

5. Temporary Sediment Basin

Yes No NA

- [] [] Basin and outlet structure constructed per the approved plan.
- [] [] Basin side slopes are stabilized with seed/mulch.
- [] [] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.

Sediment accumulation is ____% of design capacity.

<u>Note</u>: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or

2. The SWPPP proves to be ineffective in:

a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or

b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and

3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

FIGURES





