DRAINAGE REPORT

For

Toll Brothers

PROPOSED

GLEN ELLEN SENIOR RESIDENTIAL COMMUNITY DEVELOPMENT

Orchard Street
Millis, Massachusetts
Norfolk County

Prepared by:

BOHLER ENGINEERING
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900 TEL.

COMMONWEALTH OF MASSACHUSETTS
WILLIAM D. GOEBEL
CIVIL
No. 42644-C
REGISTERED PROFESSIONAL ENGINEER

William D. Goebel
Massachusetts P.E. Lic. # 42644

BOHLER
ENGINEERING

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I. EXECUTIVE SUMMARY

This report examines the changes in drainage that are calculated to occur as the result of the development of a proposed residential development located north of Orchard Street in the Town of Millis, Massachusetts. The site contains approximately 233.5 acres of land and is currently used as the Glen Ellen Country Club. The site consists primarily of open lawn golfing greens and wooded areas.

The proposed project includes the construction of 324 residential units, new paved roadways, landscaping, storm water management components, and associated utility infrastructure. This report provides a comparative analysis of the calculated pre- and post-development site runoff conditions. Additionally, this report provides calculations documenting the design of the proposed stormwater conveyance/management system as illustrated within the accompanying Site Development Plans. The project proposes erosion and sedimentation controls during the demolition and construction periods, as well as long term stabilization of the site.

For the purposes of this analysis the pre- and post-development drainage conditions were analyzed at nine (9) "Points of Analysis (POA)". These design points are described in further detail in Section 2. A comparison of the pre and post development 1, 2, 10, 50, and 100 year storm peak runoff rates and volumes are included in Tables 1.1 and 1.2 on the following pages.

The project has been designed in accordance with the Town of Millis and MassDEP standards. In some instances, the Town of Millis standards area more stringent than those required by MassDEP. Accordingly, the project has been designed to accommodate same. Those standards include:

- Maximum basin depth of three feet.
- Basin side slopes of 4:1, maximum.
- The water quality volume is based on two (2) inches of runoff.
- Pre and post development peak runoff rates and volumes have been analyzed for the one-year storm.

Table 1.1

Peak Rates of Runoff (CFS)

	Storm (yr)	1	2	10	50	100
POA-1	Existing	0.15	1.01	9.17	22.12	28.74
	Proposed	0.05	0.31	2.91	13.5	18.06
	Change	**-0.1**	**-0.7**	**-6.26**	**-8.62**	**-10.68**
POA-2	Existing	3.93	6.6	12.97	19.31	22.07
	Proposed	0.01	0.12	0.78	1.74	2.21
	Change	**-3.92**	**-6.48**	**-12.19**	**-17.57**	**-19.86**
POA-3	Existing	0	0	0	0	0
	Proposed	N/A	N/A	N/A	N/A	N/A
	Change	**0**	**0**	**0**	**0**	**0**
POA-4	Existing	0.19	1.03	7.88	19.54	25.63
	Proposed	0.02	0.25	2.79	9.25	13.31
	Change	**-0.17**	**-0.78**	**-5.09**	**-10.29**	**-12.32**
POA-5	Existing	0	0	0	0	0
	Proposed	N/A	N/A	N/A	N/A	N/A
	Change	**0**	**0**	**0**	**0**	**0**
POA-6	Existing	0	0.06	1.29	4.76	6.97
	Proposed	0	0.06	1.28	4.74	6.94
	Change	**0**	**0**	**-0.01**	**-0.02**	**-0.03**
POA-7	Existing	0	0	0.02	0.13	0.32
	Proposed	0	0	0.01	0.11	0.27
	Change	**0**	**0**	**-0.01**	**-0.02**	**-0.05**
POA-8	Existing	0	0	0.08	0.49	0.99
	Proposed	0	0	0	0.34	0.87
	Change	**0**	**0**	**-0.08**	**-0.15**	**-0.12**
POA-9	Existing	0	0	0.01	0.13	0.34
	Proposed	0	0	0	0.02	0.03
	Change	**0**	**0**	**-0.01**	**-0.11**	**-0.31**

Table 1.2

Runoff Volumes (Ac-ft)

	Storm (yr)	1	2	10	50	100
POA-1	Existing	0.103	0.562	2.696	5.752	7.304
	Proposed	0.040	0.242	1.702	5.450	7.291
	Change	**-0.063**	**-0.32**	**-0.994**	**-0.302**	**-0.013**
POA-2	Existing	0.301	0.487	0.941	1.403	1.608
	Proposed	0.008	0.025	0.082	0.155	0.190
	Change	**-0.293**	**-0.462**	**-0.859**	**-1.248**	**-1.418**
POA-3	Existing	0	0	0	0	0
	Proposed	N/A	N/A	N/A	N/A	N/A
	Change	**0**	**0**	**0**	**0**	**0**
POA-4	Existing	0.131	0.601	2.493	5.066	6.349
	Proposed	0.011	0.161	1.114	2.776	3.824
	Change	**-0.12**	**-0.44**	**-1.379**	**-2.29**	**-2.525**
POA-5	Existing	0	0	0	0	0
	Proposed	N/A	N/A	N/A	N/A	N/A
	Change	**0**	**0**	**0**	**0**	**0**
POA-6	Existing	0	0.039	0.308	0.738	0.963
	Proposed	0	0.038	0.307	0.735	0.959
	Change	**0**	**-0.001**	**-0.001**	**-0.003**	**-0.004**
POA-7	Existing	0	0	0.011	0.060	0.091
	Proposed	0	0	0.009	0.049	0.075
	Change	**0**	**0**	**-0.002**	**-0.011**	**-0.016**
POA-8	Existing	0	0	0.033	0.153	0.227
	Proposed	0	0	0.003	0.07	0.183
	Change	**0**	**0**	**-0.03**	**-0.083**	**-0.044**
POA-9	Existing	0	0	0.009	0.081	0.133
	Proposed	0	0	0.001	0.003	0.004
	Change	**0**	**0**	**-0.008**	**-0.078**	**-0.129**

As outlined in the tables above, the proposed stormwater management system is calculated to provide a reduction in the peak rates of runoff and volumes for the analyzed storm events when compared to the existing condition. The project has been designed to meet or exceed the MassDEP Stormwater Management Standards and Town of Millis requirements, as described further herein.

II. EXISTING SITE CONDITIONS

The site contains approximately 233.5 acres of land currently used as the Glen Ellen Country Club. The site consists primarily of open lawn golfing greens and wooded areas. Wetlands/resource areas are present at various locations on-site. A high pressure gas pipeline crosses the approximate middle of the property.

The site contains a variety of soil types with the majority of soils within the development area being classified by the Natural Resource Conservation Service (NRCS) as Hydrologic Soil Group (HSG) types "A" and "B", which are well drained and moderately well drained soils. This soil classification was confirmed by the geotechnical evaluation performed by UTS of Massachusetts, Inc., dated May 26, 2015, and numerous test pits conducted between June 7, 2016 and June 9, 2016. Boring and test pit logs associated with same are included in Appendix K.

The site generally drains from high points on the east and west side of the site in the direction of wetland areas located along central part of the site. They then drain in a southerly direction. Slopes on the site range from 1%-50% with on-site elevations ranging from approximately 137 to 140 feet where the wetlands cross Orchard Street up to approximately elevation 200 feet at the east and west property lines.

For the purposes of this analysis, the pre- and post-development drainage conditions were analyzed at nine (9) "points of analysis". Please refer to the Pre-Development Watershed Area Map in Appendix B. Please note that the outer boundary of the Pre-Development watersheds coincides with the outer boundary of the Post-Development watershed map and may not necessarily follow existing topography. It does, however, include all areas within the limit of work. This is done to simplify the hydrologic model, as areas outside the proposed development footprint are intended to remain unchanged.

Accordingly we do not anticipate changes in the peak rates of runoff or volumes from the existing to proposed condition, as these portions of the property are proposed to remain unaltered.

Point of Analysis #1 (POA-1) is located at the eastern side of the site that flows in the direction of the existing stream in the east part of the site. Two subareas drain to POA-1; E-1A and E-1B. E-1A is the area in the central-eastern part of the site consisting mostly of open grassed lawn areas that flows overland in the direction of the stream. E-1B is an area in the north part of the site containing wetlands and forested areas that flows in the direction of an existing pond before discharging and combining with the flow from E-1A. Soils in area E-1A and E-1B consist mainly of hydrologic type A and B soils, except for the wetlands in area E-1B, which have been modelled as type D soils.

Point of Analysis #2 (POA-2) is a point at Orchard Street that the existing Glen Ellen Country Club pool and surrounding facilities contribute to. Subarea E2 includes the Glen Ellen parking lot and portions of the pool, patios, and a building. Soils are mostly type B, with areas of type A soil as well.

Point of Analysis #3 (POA-3) is an isolated depression with no calculated outflow. The drainage area (E-3) to this low point is approximately 75% lawn area, and 25% woods, in well-drained Type A soil.

Point of Analysis #4 (POA-4) is the point where an intermittent stream draining the wetlands in the central-southwest part of the site crosses Orchard Street. Subarea E-4 contributes to POA-4 and contains approximately 3 acres of impervious surfaces associated with the Glen Ellen Country Club buildings and paved access drives. The remainder is mostly woods and grass, with some areas comprised of gravel access roads. Soil types are modelled as type A and B, with some areas of type D soil proximate to existing wetland areas.

Point of Analysis #5 (POA-5) is an area in the southwest part of the site that contributes to an isolated depression. The E-5 subarea draining to this point consists of woods within a well-drained type A soil.

Point of Analysis #6 (POA-6) is located at the southwest corner of the site adjacent to Orchard Street. Subarea E-6 contributes to this point and consists of woods and residential lots on primarily type A soil, with a small component consisting of type B soil adjacent to Orchard Street.

Point of Analysis #7 (POA-7) is a point on Orchard Street near the southwest corner of the subject property. The subarea (E-7) draining to this point contains mostly woods and a portion of an adjacent residential lot.

Point of Analysis #8 (POA-8) consists of three areas of future development that contribute to the wetlands in the southwest corner of the site. The three parts of this subarea ultimately contributes to the same point, which is a wetland/stream crossing under Orchard Street. These areas are comprised primarily of woods over type A, B, and D soils.

Point of Analysis #9 (POA-9) is a point at the northwest part of the site that contributes to an area of wetlands discharging off-site to the north. Subarea E-9 is wooded and primarily type A soil, with a small area of type D soil associated with wetlands within the subarea.

III. PROPOSED SITE CONDITIONS

The proposed project includes the construction of 324 residential units, new paved roadways, landscaping, storm water management components, and associated utilities. The majority of the developed portion of the site is proposed to be collected by deep sump, hooded catch basins. The catch basins are designed to capture and convey stormwater runoff via an underground pipe system to one of several proposed detention/infiltration basins. Pretreatment of stormwater runoff is proposed by a combination of deep sump, hooded catch basins and sediment forebays prior to discharge into the proposed detention/infiltration basins. Rooftop runoff has been designed to flow to the basins as well.

The open infiltration basins are proposed to be constructed in accordance with Town and MassDEP guidelines. Basin depth is designed to be a maximum of three feet with 4:1 side slopes. Basins are proposed to have outlets and are not intended to rely solely on infiltration to drain.

One underground infiltration basin consisting of prefabricated Stormtech MC-3500 chambers is proposed to capture, treat, and attenuate runoff generated from the southwest driveway where it intersects Orchard Street. Pretreatment is proposed by way of deep sump, hooded catch basins which convey runoff to an isolator row within the basin.

The project has been designed to maintain existing drainage watersheds to the extent practiacable, with the same Design Points described in Section 2 above. Please refer to the watershed maps in the appendices of the report for the proposed drainage areas. The site was subdivided into twenty-five (25) separate sub catchments for the proposed conditions as shown in the Post-Development Watershed Area Map in Appendix D. The points of analysis under post-development conditions are consistent with those of the pre-development conditions, with the exception of the elimination of POAs 3 and 5, which flow to depressions with no outlets under existing conditions. Those subcatchments and associated flows are not present in the proposed condition.

The best management practices (BMPs) incorporated into the proposed stormwater management system have been designed to meet the total suspended solid (TSS) removal requirements as set forth in the MassDEP Stormwater Handbook standards. In addition, a Stormwater Operation and Maintenance (O&M) Plan has been developed which includes pavement sweepings and proposed maintenance procedures for same periodic inspections of stormwater management structures (i.e catch basins and infiltration basins).

Storm Sewer System

Deep sump, hooded catch basins are proposed to collect and route runoff from the paved roadway areas to the existing surface detention/infiltration basins. Pipes have been designed for the 25-year storm using Storm Sewers by Hydraflow software. Pipe sizing information is included in Appendix F.

IV. METHODOLOGY

Peak Flow Calculations

The pre- and post-development runoff rates being discharged from the site were computed using the HydroCAD modeling software. The drainage areas and outlet information were entered into the program, which routes storm flows based on NRCS TR-20 and TR-55 methods. The other components of the model were determined following standard NRCS procedures for Curve Numbers (CNs) and times of concentrations documented in the appendices of this report. The following rainfall data based on Hydrology Handbook-40, was utilized in the calculations:

Table 4.1 – Rainfall Intensities*

Frequency	1 year	2 year	10 year	50 year	100 year
Rainfall (inches)	2.50	3.20	4.70	6.10	6.70

*Values derived from Hydrology Handbook for Conservation Commissioners prepared by Mass DEP (TP-40 Maps)

The proposed stormwater management is calculated to provide a decrease in peak rates of runoff and volumes associated with same from the proposed facility for the 1-, 2-, 10-, 50- and 100-year design storm events, when compared to the existing condition. The proposed project meets or exceeds the MassDEP and Town of Millis Stormwater Management standards. Compliance with these standards is described further below:

V. STORMWATER MANAGEMENT STANDARDS

The below represents a discussion of the projects compliance with the ten standards outlined in the MassDEP Stormwater Management Handbook:

Standard #1: No New Untreated Discharges:

The project has been designed such that the majority proposed impervious areas, including the building roof and paved parking/driveway areas, shall be collected and directed to the proposed stormwater management system for treatment.

Standard 2: Peak Rate Attenuation

As outlined in Table 1.1, the proposed stormwater management system has been designed such that the calculated post-development peak rates and volumes of runoff are reduced when compared to pre-development conditions for the analyzed storm events at the points of analysis.

Standard 3: Recharge

Stormwater runoff from the project is proposed to be collected and routed to proposed detention/infiltration basins. The project, as proposed, will involve the creation of approximately 24.7 acres of new impervious area and will require approximately 59,845 cubic feet of recharge volume. The proposed infiltration basins are designed to provide the requisite recharge volumes, as indicated in the Appendices of this Report.

The MassDEP Stormwater Standards require that the infiltration BMP drains completely within 72 hours of the end of the storm event. Calculations showing that the proposed infiltration basins are designed to drain within 72 hours are included in the Appendices of this report.

Several of the basins will be located within four feet of Estimated Seasonal High Groundwater (ESHGW). Groundwater mounding analyses have been provided for the basins anticipated to have a bottom elevation within four feet of ESHGW in Appendix F of this report. The analyses indicated that the mounds are not anticipated to impact the basin's ability to infiltrate stormwater as designed.

Standard #4 Water Quality:

Water quality treatment is provided via deep sump, hooded catch basins, sediment forebays, and detention / infiltration basins. TSS removal calculations are included in Appendix F of this report. The project as proposed will involve the creation of approximately 24.7 acres of new impervious area and is required to treat a calculated volume of approximately 180,000 cubic feet of water quality volume as defined in Stormwater Standard 4. The calculated water quality volumes of the proposed detention/infiltration basins exceed the required water quality volumes. Supporting calculations are included in Appendix F of this Report.

Standard #5 Land Uses with Higher Potential Pollutant Loads

The proposed project can be considered a "Land Uses with Higher Potential Pollutant Loads". Accordingly, the stormwater management system includes deep sump, hooded catch basins, is designed to achieve 44% TSS removal prior to infiltration, and meet or exceed the applicable MassDEP standards associated with same.

Standard 6: Critical Areas

A Zone II drinking water protection zone exists in the extreme northwest corner of the site. The proposed stormwater management system has been designed to provide at least eighty percent (80%) removal of Total Suspended Solids (TSS) through the use of several Best Management Practices (BMPs), including deep-sump, hooded catch basins, sediment forebays, and detention/infiltration basins. The deep-sump, hooded catch basins and sediment forebays are calculated to provide a minimum of 44% TSS removal prior to the infiltration of stormwater. A long-term pollution prevention plan has also been developed for the site and can be found in Appendix G.

Standard 7: Redevelopment

The project has been designed as a new development.

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

The proposed project is designed to provide construction period erosion and sedimentation controls as indicated within the site plan set provided for this project. Erosion and sedimentation control measures include a proposed construction entrance, protection for stormwater inlets, perimeter controls, protection around temporary material stock piles and various other techniques as outlined in the Site Development Plans. Additionally, the project is required to file a Notice of Intent with the US Environmental Protection Agency (EPA) and implement a Stormwater Pollution Prevention Plan (SWPPP) during the construction period. The SWPPP is required to be prepared prior to the start of construction and will be implemented by the site contractor under the guidance and responsibility of the project's proponent.

Standard 9: Operation and Maintenance (O&M) Plan

An Operation and Maintenance (O&M) Plan for this site has been prepared and is included within this report. The O&M Plan outlines procedures and time tables for the long term operation and maintenance of the proposed site stormwater management system, including initial inspections upon completion of construction and periodic monitoring of the system components in accordance with established practices and the manufacturer's recommendations. The O&M Plan includes a list of responsible parties.

Standard 10: Prohibition of Illicit Discharges

The proposed stormwater system is designed to convey allowable non-stormwater discharges (firefighting waters, irrigation, etc.) and is not designed to contain illicit discharges from prohibited sources. An Illicit Discharge Statement is included in the appendices of this report.

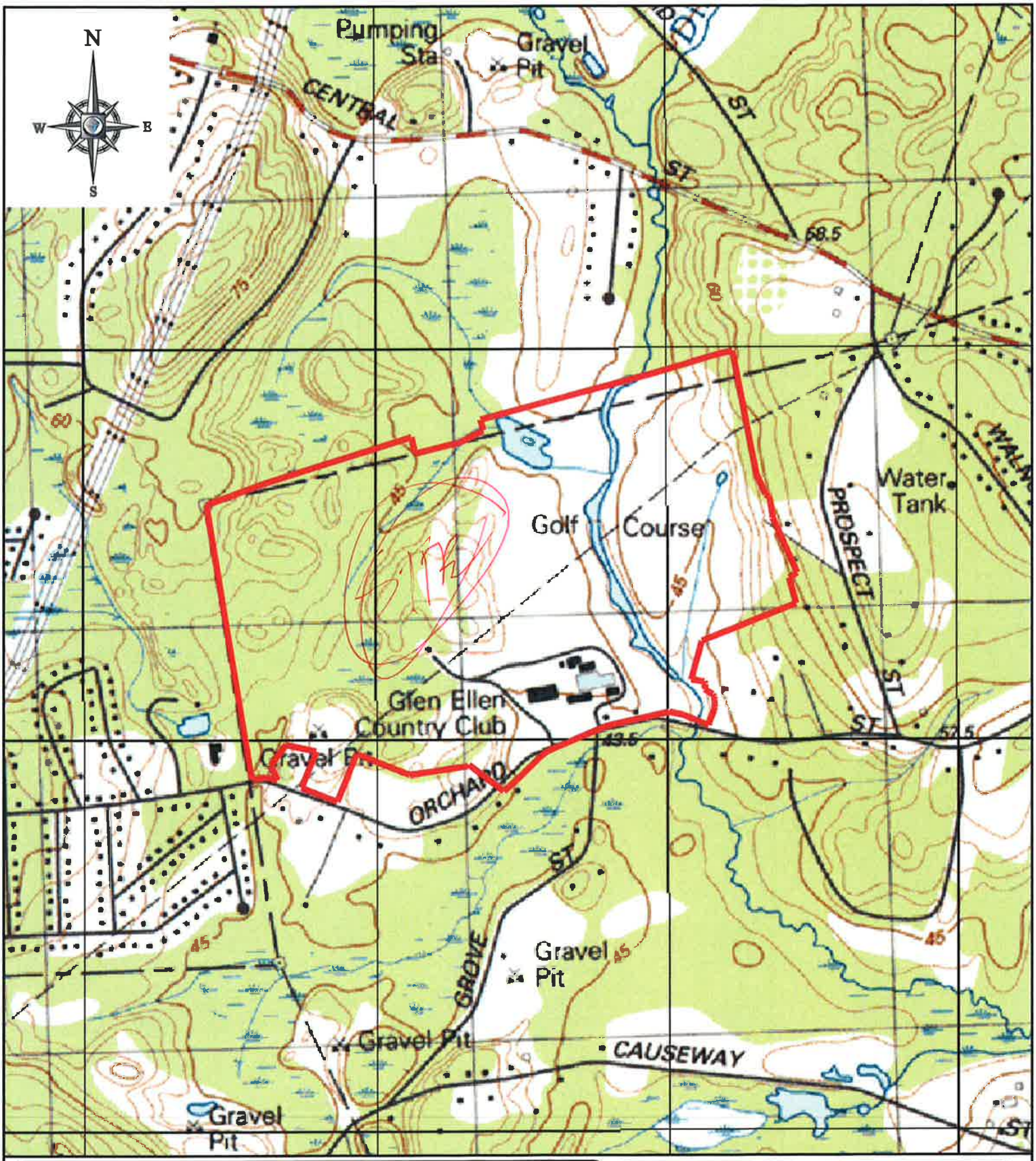
As noted previously in this document, the project has also been designed to accommodate the Town of Millis stormwater management design standards. In some instances, these standards exceed those required by MassDEP.

VI. SUMMARY

In summary, the proposed stormwater management system illustrated on the Site Development Plans is calculated to result in a reduction in-peak rates of runoff and volume from the subject site when compared to pre-development conditions for the analyzed storm events. In addition, the proposed best management practices are calculated to result in an effective removal of total suspended solids from the post-development runoff.

APPENDIX A – PROJECT MAPS AND SOIL DATA

- USGS Map
- NRCS Soils Maps
- Soil Testing Logs



PROJECT:

USGS MAP

FOR

Toll Brothers

MAP #01, LOTS #1-4, 6
MAP #05, LOT #35
WALNUT STREET, TOWN OF MILLIS
NORFOLK COUNTY, MASSACHUSETTS

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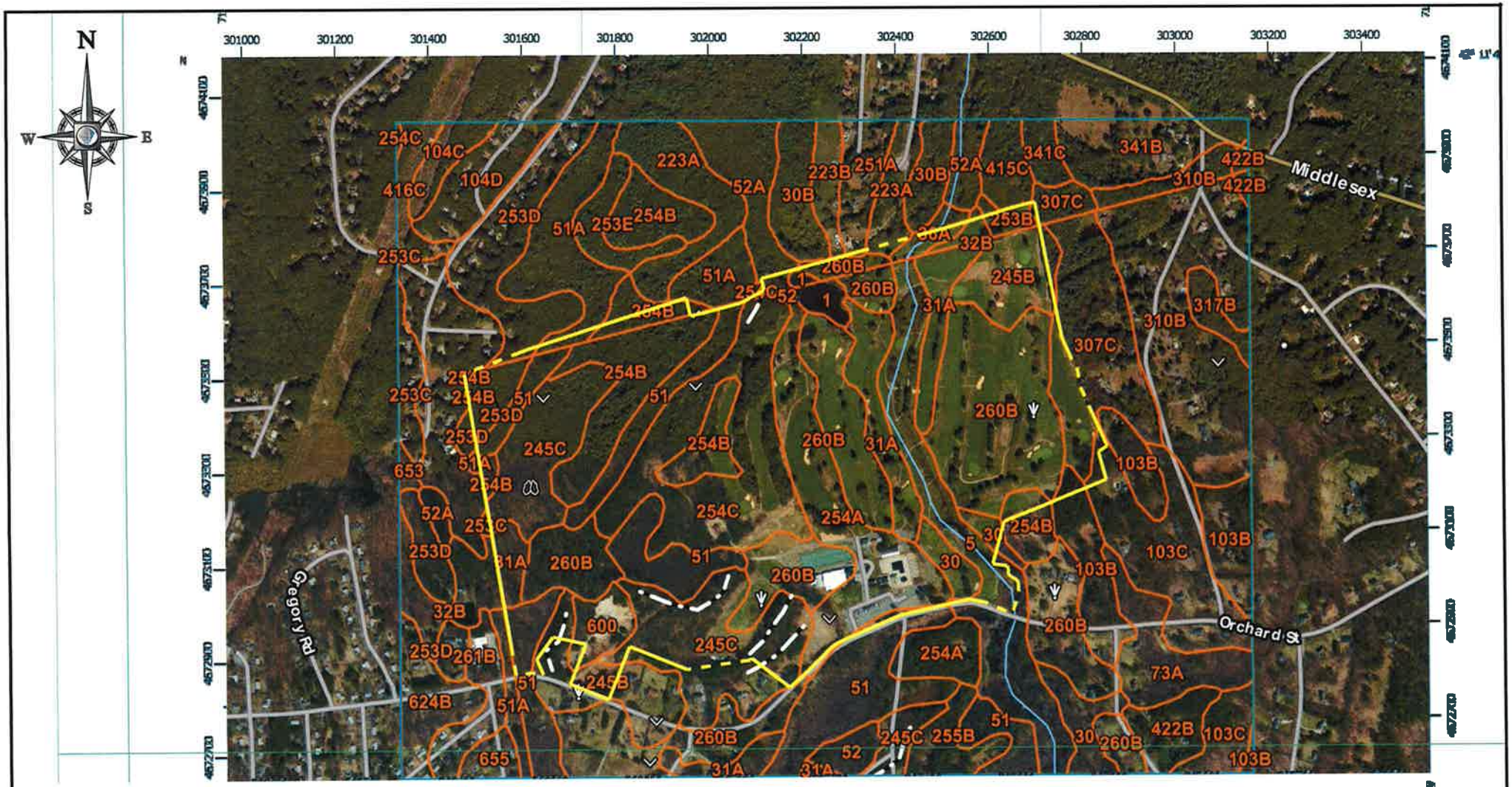

PROJECT:

SOILS MAP

FOR

Toll Brothers

MAP #01, LOTS #1-4, 6
MAP #05, LOT #35
WALNUT STREET, TOWN OF MILLIS
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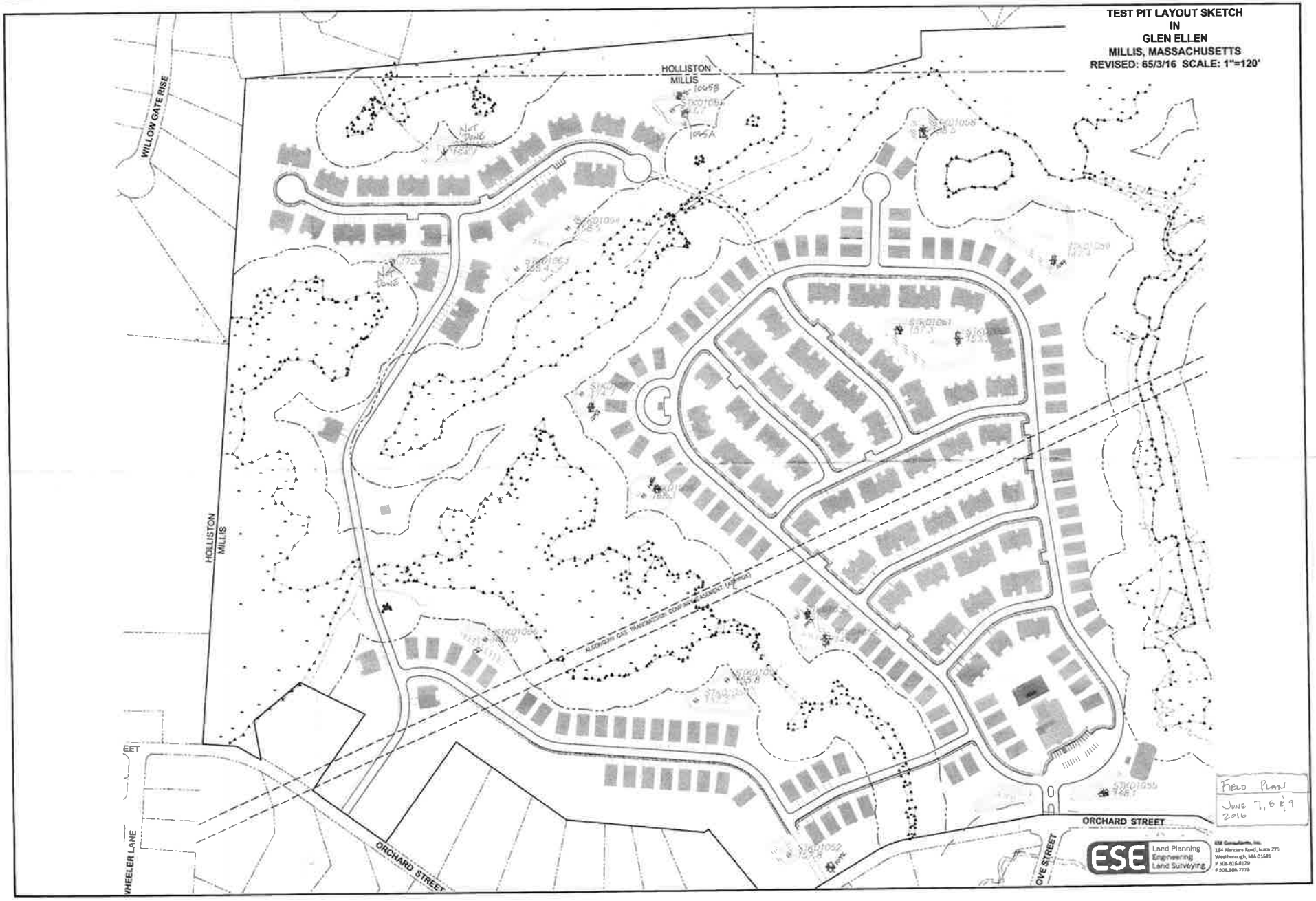
Map Unit Legend

Middlesex County, Massachusetts (MA017)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1	Water	0.4	0.1%
30B	Raynham silt loam, 0 to 5 percent slopes	10.8	1.7%
32B	Wareham loamy fine sand, 0 to 5 percent slopes	8.3	1.3%
36A	Saco mucky silt loam, 0 to 1 percent slopes	2.1	0.3%
51A	Swansea muck, 0 to 1 percent slopes	20.5	3.2%
52A	Freetown muck, 0 to 1 percent slopes	13.7	2.2%
104C	Hollis-Rock outcrop-Charlton complex, 3 to 15 percent slopes	3.7	0.6%
104D	Hollis-Rock outcrop-Charlton complex, 15 to 25 percent slopes	8.4	1.3%
223A	Scio very fine sandy loam, 0 to 3 percent slopes	15.6	2.5%
223B	Scio very fine sandy loam, 3 to 8 percent slopes	3.7	0.6%
251A	Haven silt loam, 0 to 3 percent slopes	5.9	0.9%
253B	Hinckley loamy sand, 3 to 8 percent slopes	1.3	0.2%
253C	Hinckley loamy sand, 8 to 15 percent slopes	3.9	0.6%
253D	Hinckley loamy sand, 15 to 25 percent slopes	21.4	3.4%
253E	Hinckley loamy sand, 25 to 35 percent slopes	4.8	0.8%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	26.3	4.2%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	0.4	0.1%
260B	Sudbury fine sandy loam, 3 to 8 percent slopes	1.6	0.3%
261B	Tisbury silt loam, 3 to 8 percent slopes	6.0	1.0%
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	2.4	0.4%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	3.5	0.5%

Middlesex County, Massachusetts (MA017)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
341B	Broadbrook very fine sandy loam, 3 to 8 percent slopes, very stony	11.2	1.8%
341C	Broadbrook very fine sandy loam, 8 to 15 percent slopes, very stony	2.7	0.4%
415C	Narragansett silt loam, 8 to 15 percent slopes	4.7	0.7%
416C	Narragansett silt loam, 8 to 15 percent slopes, very stony	4.0	0.6%
422B	Canton fine sandy loam, 3 to 8 percent slopes, extremely stony	0.5	0.1%
624B	Haven-Urban land complex, 0 to 8 percent slopes	7.7	1.2%
653	Udorthents, sandy	0.8	0.1%
655	Udorthents, wet substratum	2.5	0.4%
Subtotals for Soil Survey Area		**198.7**	**31.5%**
Totals for Area of Interest		**630.4**	**100.0%**

Norfolk and Suffolk Counties, Massachusetts (MA616)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1	Water	1.9	0.3%
5	Saco silt loam, 0 to 3 percent slopes	23.6	3.7%
30	Raynham silt loam, 0 to 3 percent slopes	8.7	1.4%
31A	Walpole sandy loam, 0 to 3 percent slopes	18.9	3.0%
51	Swansea muck, 0 to 1 percent slopes	40.9	6.5%
52	Freetown muck, 0 to 1 percent slopes	3.0	0.5%
73A	Whitman fine sandy loam, 0 to 5 percent slopes, extremely stony	10.4	1.6%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	18.2	2.9%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	23.2	3.7%
245B	Hinckley loamy sand, 3 to 8 percent slopes	19.4	3.1%
245C	Hinckley loamy sand, 8 to 15 percent slopes	36.7	5.8%

Norfolk and Suffolk Counties, Massachusetts (MA616)			
Map Unit Symbol	**Map Unit Name**	**Acres In AOI**	**Percent of AOI**
253D	Hinckley loamy sand, 15 to 35 percent slopes	3.3	0.5%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	26.5	4.2%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	21.4	3.4%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	27.9	4.4%
255B	Windsor loamy sand, 3 to 8 percent slopes	5.2	0.8%
260B	Sudbury fine sandy loam, 2 to 8 percent slopes	75.5	12.0%
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	19.8	3.1%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	34.4	5.5%
317B	Scituate fine sandy loam, 3 to 8 percent slopes, extremely stony	2.8	0.4%
422B	Canton fine sandy loam, 3 to 8 percent slopes, extremely stony	6.0	0.9%
600	Pits, sand and gravel	4.2	0.7%
Subtotals for Soil Survey Area		**431.7**	**68.5%**
Totals for Area of Interest		**630.4**	**100.0%**


TEST PIT LAYOUT SKETCH
IN
GLEN ELLEN
MILLIS, MASSACHUSETTS
REVISED: 65/3/16 SCALE: 1"=120'
HOLLISTON
MILLIS
WILLOW GATE RISE
HOLLISTON
MILLIS
WHEELER LANE
ORCHARD STREET
ORCHARD STREET
OVE STREET
ALGONQUIN GAS TRANSMISSION COMPANY EASEMENT (TYP.)
FIELD PLAN
JUNE 7, 8 & 9
2016
ESE
Land Planning
Engineering
Land Surveying
ESE Consultants, Inc.
184 Hancock Road, Suite 275
Westborough, MA 01581
P 508.616.8159
F 508.366.7778

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1050
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 7, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			

Land Use:	Golf Course	Landform:	Outwash Plain
Vegetation:	Mostly Pines	Slope:	0-5%
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-8	A	FSL	10YR 2/2	GR, MVFR, <2% GRAVEL
8-50	C1	FINE SAND	2.5Y 7/3	SG, LOOSE, 5% GRAVEL
50-80	C2	MED. SAND	2.5Y 7/2	SG, LOOSE, 10% GRAVEL

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>80"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		62"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			62", 5Y 5/1		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							

Notes:	

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1051
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 7, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-9	A	FSL	10YR 3/3	GR, MVFR, 5% GRAVEL
9-31	C	LS	2.5Y 5/4	M, 10% GRAVEL, 10%COBBLES, FRACTURED ROCK

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	31"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		N/A

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:					
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1052
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 7, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-12	A	FSL	10YR 3/3	GR, MVFR, <2% GRAVEL
12-51	C1	MED. SAND	2.5Y 6/4	SG, LOOSE, 5% GRAVEL
51-84	C2	MED./FINE SAND	2.5Y 7/3	M, FRIABLE, 10% GRAVEL, 20% COBBLES

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>84"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		54"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			54", 2.5 YR 7/1		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							

Notes:	TEST PIT DUG DOWN GRADIENT OF STAKE #1052

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1053
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 7, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-7	A	FSL	10YR 2/2	GR, MVFR, <2% GRAVEL
7-42	C1	FINE SAND	2.5Y 7/3	SG, LOOSE, <2% GRAVEL, TRACE SILT
42-84	C2	FINE SAND	2.5Y 6/1	SG, LOOSE, <2% GRAVEL, TRACE SILT

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>84"
Depth to Groundwater:	Standing Water in Hole:	80"	
	Weeping From Pit Face:	80"	
	Estimated Seasonal High Groundwater:		38"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			38", 5Y 5/1		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1054
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 7, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-11	FILL1	FSL	10YR 3/3	GR, MVFR, <2% GRAVEL
11-67	FILL2	MED. SAND	2.5Y 6/4	SG, LOOSE, 5% GRAVEL, STUMPS FROM 3-6±
67-80	FILL3	FSL/ORGANIC	10YR 2/2	GR, MVFR, <2% GRAVEL, MANY ROOTS
80-108	C	MED. SAND	2.5Y 7/2	SG, LOOSE, 5% GRAVEL

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>108"
Depth to Groundwater:	Standing Water in Hole:	77"	
	Weeping From Pit Face:	67"	
	Estimated Seasonal High Groundwater:		48"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			48", 5Y 5/1		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1055
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 7, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-12	A	FSL	10 YR 3/3	GR, MVFR, <2% GRAVEL
12-26	B	SL	10 YR 5/6	ABK, MFR, <2% GRAVEL
26-70	C1	MED. SAND	2.5Y 6/4	SG, LOOSE, 5% GRAVEL
70-120	C2	FINE SAND	2.5Y 7/2	BLOCKY, FR, <2% GRAVEL, TRACE SILT

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>120"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		68"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			68", 7.5 YR 5/8		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1056
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 8, 2016	WEATHER:	Sunny	TEMP: 70 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-8	A	FSL	10YR 2/2	GR, MVFR, <2% GRAVEL
8-30	B	SL	10YR 5/6	ABK, MFR, <2% GRAVEL
30-144	C	MED. SAND	2.5Y 7/3	SG, LOOSE, 5% GRAVEL

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>144"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		>144"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:					
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							

Notes:	

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1057
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 8, 2016	WEATHER:	Sunny	TEMP: 70 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-25	FILL	N/A	10YR 2/2	ORGANIC, FILL MATERIAL
25-30	Ab	N/A	10YR 2/1	GR, MVFR, <2% GRAVEL
30-44	Bb	N/A	10YR 5/6	ABK, MFR, <2% GRAVEL
44-120	C	N/A	2.5Y 7/4	M, FR, 10% GRAVEL, 15% COBBLES, SOME BOULDERS

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>120"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		>120"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:					
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1058
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 8, 2016	WEATHER:	Sunny	TEMP: 70 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-9	A	FSL	10YR 3/3	GR, MVFR, <2% GRAVEL
9-25	B	SL	10YR 5/6	ABK, MFR, <2% GRAVEL
25-88	C1	MED. SAND	2.5Y 7/3	SG, LOOSE, 5% GRAVEL
88-104	C2	LFS	2.5Y 6/2	PLATY, FR, <2% GRAVEL

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>104"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		84"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			84", 2.5Y 7/1		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1059
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 8, 2016	WEATHER:	Sunny	TEMP: 70 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-8	A	FSL	10YR 3/3	GR, MVFR, <2% GRAVEL
8-47	C1	LFS	2.5Y 7/4	PLATY, FR, <2% GRAVEL
47-84	C2	FSL	2.5Y 6/2	M, FR, <2% GRAVEL

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>84"
Depth to Groundwater:	Standing Water in Hole:	60"	
	Weeping From Pit Face:	57"	
	Estimated Seasonal High Groundwater:		46"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			46", 7.5YR 5/8		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1060
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 8, 2016	WEATHER:	Sunny	TEMP: 70 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			

Land Use:	Golf Course	Landform:	Outwash Plain
Vegetation:	Mostly Pines	Slope:	0-5%
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-8	A	FSL	10YR 3/3	GR, MVFR, <2% GRAVEL
8-18	B	SL	10YR 5/6	ABK, MFR, <2% GRAVEL
18-108	C	MED. SAND	2.5Y 6/4	SG, LOOSE, 5% GRAVEL

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>108"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		96"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			96", 7.5YR 5/8		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1061
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 8, 2016	WEATHER:	Sunny	TEMP: 70 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Matthew Bombaci, Bohler Engineering			
WITNESSED BY:	Barbara Thissell, Millis Board of Health			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-12	A	FSL	10YR 3/3	GR, MVFR, <2% GRAVEL
12-26	B	SL	10YR 5/6	ABK, MFR, <2% GRAVEL
26-132	C	MED SAND	2.5Y 7/3	SG, LOOSE, <2% GRAVEL

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>132"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		132"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:					
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1063
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 9, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Jesse Johnson, Bohler Engineering			
WITNESSED BY:	N/A			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-9	Ap	FSL	10YR 3/2	MASSIVE, FRIABLE, <2% GRAVEL
9-24	Bw	SL	10YR 5/6	WEAK, BLOCKY, 5% GRAVEL
24-52	C1	SL	2.5Y 6/3	MASSIVE, FRIABLE, 20% GRAVEL, 5% STONE
52-108	C2	GRV. SAND	2.5Y 6/1	SINGLE GRAIN, LOOSE, 30% GRAVEL, 5% STONE

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>108"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		42"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			42"		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							

Notes:	

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1064
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 9, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Jesse Johnson, Bohler Engineering			
WITNESSED BY:	N/A			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-8	Ap	FSL	10YR 3/2	MASSIVE, FRIABLE, <2% GRAVEL
8-28	Bw	SL	10YR 5/6	WEAK, BLOCKY, 5% GRAVEL
28-120	C*	GRV. SAND	2.5Y 6/1	SINGLE GRAIN, LOOSE, 30% GRAVEL, 5% STONE

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>120"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		67"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			67"		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							

Notes:	*Soil sample taken from C layer.

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1065
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 9, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Jesse Johnson, Bohler Engineering			
WITNESSED BY:	N/A			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-8	Ap	FSL	10YR 3/2	MASSIVE, FRIABLE, <2% GRAVEL
8-20	Bw	SL	10YR 5/6	WEAK, BLOCKY, 5% GRAVEL
20-42	C1*	MED. SAND	2.5Y 6/3	SINGLE GRAIN, LOOSE, 20% GRAVEL, 5% STONE
42-120	C2	GRV. SAND	2.5Y 6/1	SINGLE GRAIN, LOOSE, 30% GRAVEL, 5% STONE

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>120"
Depth to Groundwater:	Standing Water in Hole:	120"	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		48"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			48"		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							

Notes:	*Soil sample taken from C1 layer.

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1065-A
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 9, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Jesse Johnson, Bohler Engineering			
WITNESSED BY:	N/A			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-7	Ap	FSL	10YR 3/2	MASSIVE, FRIABLE, <2% GRAVEL
7-18	Bw	SL	10YR 5/6	WEAK, BLOCKY, 5% GRAVEL
18-47	C1	MED. SAND	2.5Y 6/3	SINGLE GRAIN, LOOSE, 20% GRAVEL, 5% STONE
47-120	C2	GRV. SAND	2.5Y 6/1	SINGLE GRAIN, LOOSE, 30% GRAVEL, 5% STONE

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>120"
Depth to Groundwater:	Standing Water in Hole:	108"	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		42"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			42"		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA				DEEP HOLE # 1065-B
Applicant/owner:	Toll Brothers, Inc.				
DATE:	June 9, 2016	WEATHER:	Sunny	TEMP: 80 °	
LOCATION: (Refer to sketch attached)	See attached sketch.				
PERFORMED BY:	Jesse Johnson, Bohler Engineering				
WITNESSED BY:	N/A				
Land Use:	Golf Course		Landform:	Outwash Plain	
Vegetation:	Mostly Pines		Slope:	0-5%	
Stone Walls:	☐ Y ☒ N		Surface Stones:	☐ Y ☒ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>10 ft.	Other:	

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-9	Ap	FSL	10YR 3/2	MASSIVE, FRIABLE, <2% GRAVEL
9-19	Bw	SL	10YR 5/6	WEAK, BLOCKY, 5% GRAVEL
19-50	C1	MED. SAND	2.5Y 6/3	SINGLE GRAIN, LOOSE, 20% GRAVEL, 5% STONE
50-58	C2	GRV. SAND	2.5Y 6/1	SINGLE GRAIN, LOOSE, 30% GRAVEL, 5% STONE

Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>58"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		48"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			48"		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							
Notes:							

Site Location or lot #	Glen Ellen Country Club, 84 Orchard Street, Millis MA			DEEP HOLE # 1066
Applicant/owner:	Toll Brothers, Inc.			
DATE:	June 9, 2016	WEATHER:	Sunny	TEMP: 80 °
LOCATION: (Refer to sketch attached)	See attached sketch.			
PERFORMED BY:	Jesse Johnson, Bohler Engineering			
WITNESSED BY:	N/A			
Land Use:	Golf Course	Landform:	Outwash Plain	
Vegetation:	Mostly Pines	Slope:	0-5%	
Stone Walls:	☐ Y ☒ N	Surface Stones:	☐ Y ☒ N	
Distance From:				
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.	
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.	
Property Line:	>10 ft.	Other:		

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
0-120	C	FINE SAND	2.5Y 7/1	SINGLE GRAIN, LOOSE, <2% GRAVEL

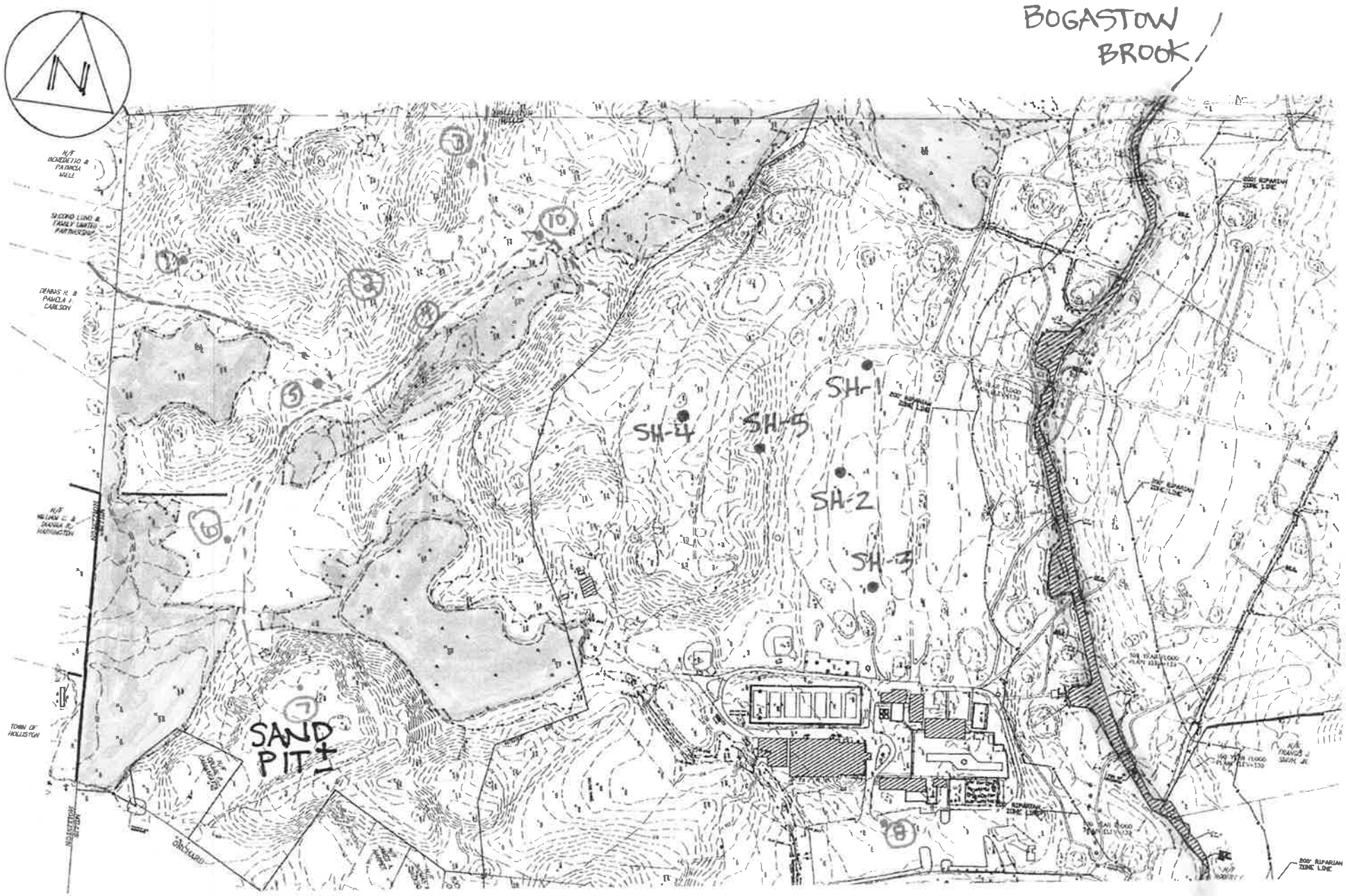
Parent Material (geologic):	Glacial Outwash	Depth to Bedrock:	>120"
Depth to Groundwater:	Standing Water in Hole:	N/A	
	Weeping From Pit Face:	N/A	
	Estimated Seasonal High Groundwater:		>120"

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:					
		Depth to weeping from side of obs. hole:					
		Depth to soil mottles, description:			None Observed		
		Groundwater adjustment:					
Index Well #:		Reading Date:		Index Well Level:		Adj. Factor:	
Adj. ground water level:							

Notes:	

APPENDIX B – PRE DEVELOPMENT WATERSHED AREA MAP



① TEST BORE BY UTS - MAY 2015

SH-1 ● TEST BORE BY OTHERS - JUNE 2005

REFUSAL ±

APPROXIMATE DEPTH TO REFUSAL ±

BORING INFORMATION PROVIDED BY UTS OF MASSACHUSETTS, INC.

TEST BORING LOG

SHEET 1

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glen Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-1

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 15, 2015
Date Finished: May 15, 2015
Driller: PG
Soil Engineer/Geologist: LC

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/15/15	9 ft		

Depth Ft.	Casing bl/ft	Sample No.	Pen/Rec	Sample Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
						6"	Organic Forest Mat
1		1	15"	0-2'0"	1-1-1-1		Rust Brown, Fine Sand, some silt, trace loam (SUBSOIL)
						2'6"	
5		2	12"	5'0"-7'0"	13-14-22-17		Brown, fine to coarse Sand & Gravel, trace silt, dry (SAND & GRAVEL)
10		3	12"	10'0"-12'0"	16-28-26-18		Rust Brown, fine to coarse Sand & Gravel, trace silt, wet
15		4	3"	15'0"-15'7"	67-100/1"		Same, wet
						16'	Refusal at 16 ft Groundwater at 9 ft
20							
25							
30							
35							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SHEET 2

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glen Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-2

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 15, 2015
Date Finished: May 15, 2015
Driller: PG
Soil Engineer/Geologist: LC

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/15/15	n/a		

Depth Ft.	Casing bl/ft	Sample No.	Pen/Rec	Sample Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
						4"	Forest Mat
1		1	15"	0-2'0"	1-1-1-1		Rust Brown, Fine Sand, some silt, trace loam, roots (SUBSOIL)
						2'6"	
5		2	18"	5'0"-7'0"	6-6-9-10		Brown, fine to coarse Sand, some gravel, trace silt (GLACIAL OUTWASH)
10		3	9"	10'0"-11'2"	37-61-100/2"		Brown, fine to medium Sand, some silt, little gravel, damp
						11'6"	Refusal at 11'6" No Groundwater
15							
20							
25							
30							
35							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SHEET 3

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glen Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-3

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 14, 2015
Date Finished: May 14, 2015
Driller: PG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/14/15	5 ft	n/a	

Depth Ft.	Casing bl/ft	Sample No.	Pen/Rec	Sample Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
						5"	Forest Mat / Topsoil
1		1	12"	0-2'0"	1-1-2-8	2'	Rust Brown, Fine Sand, some silt, trace gravel, loam (SUBSOIL)
5		2	6"	5'0"-6'1"	10-15-100/1"	6'6"	Brown, fine and medium Sand, little silt, wet
							Auger Refusal @ 6.5 ft Groundwater at 6 ft
10							
15							
20							
25							
30							
35							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff, 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SHEET 4

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glen Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-4

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 15, 2015
Date Finished: May 15, 2015
Driller: PG
Soil Engineer/Geologist: KM

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/15/15	10 ft		

Depth Ft.	Casing bl/ft	Sample No.	Pen/Rec	Sample Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
						6"	Forest Mat (ORGANIC)
1		1	18"	0-2'0"	1-1-1-1		Rust Brown, Fine Sand & Silt, trace loam, roots (SUBSOIL)
						2'6"	
5		2	21"	5'0"-7'0"	4-6-7-10		Brown, Fine Sand w/ silt, damp
10		3	20"	10'0"-12'0"	10-12-11-21		Brown, Fine Sand, some silt, wet
						13'6"	
15							Auger Refusal @ 13'6" Groundwater at 10'
20							
25							
30							
35							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SHEET 5

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glen Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-5

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 15, 2015
Date Finished: May 15, 2015
Driller: PG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/15/15	8 ft	n/a	

Depth Ft.	Casing bl/ft	Sample No.	Pen/Rec	Sample Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
						6"	Forest Mat
1		1	21"	0-2'0"	1-1-2-2		Rust-brown, Fine Sand, some silt, loam, roots (SUBSOIL)
						2'6"	
5		2	21"	5'0"-7'0"	9-12-15-21		Brown, fine to coarse Sand, some gravel, trace silt, dry
10		3		10'0"-12'0"	21-37-45-58		Rust Brown, fine to coarse Sand, some gravel, little silt, wet
15						13'	Auger Refusal @ 13 ft Groundwater at 8 ft
20							
25							
30							
35							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SHEET 6

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glen Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-6

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 15, 2015
Date Finished: May 15, 2015
Driller: PG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/15/15	7 ft	n/a	

Depth Ft.	Casing bl/ft	Sample No.	Pen/Rec	Sample Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
						6"	Forest Mat
1		1	12"	0-2'0"	2-2-3-3	2'	Brown, fine and medium Sand, some silt, roots (SUBSOIL)
5		2	12"	5'0"-7'0"	39-41-53-57		Grey, fine and medium Sand, some gravel, trace silt, dry
						8'	Auger Refusal @ 8 ft Groundwater at 7'6"
10							
15							
20							
25							
30							
35							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SHEET 7

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glen Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-7

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 15, 2015
Date Finished: May 15, 2015
Driller: PG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/15/15	16 ft		

Depth Ft.	Casing bl/ft	Sample No.	Pen/Rec	Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
1		1	15"	0-2'0"	1-2-2-3		Tan, Fine Sand, trace silt, dry
5		2	18"	5'0"-7'0"	4-5-6-7		Tan, Fine Sand, trace silt, dry (SAND)
10		3	21"	10'0"-12'0"	4-6-6-8		Tan, Fine Sand, trace silt, dry
15		4	21"	15'0"-17'0"	4-5-6-7		Brown, Fine Sand, trace silt, wet
20		5	18"	20'0"-22'0"	3-3-4-3		Brown, Fine Sand, trace silt, wet
25							End of boring at 22 ft Groundwater at 16 ft Test Bore located in Sand Pit
30							
35							

Notes: Hollow Stem Auger Size - 4 1/4"

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SHEET 8

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glen Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-8

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 15, 2015
Date Finished: May 15, 2015
Driller: PG
Soil Engineer/Geologist: KM

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/15/15	6 ft	n/a	

Depth Ft.	Casing bl/ft	Sample No.	Pcn/Rec	Sample Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
						2"	Pavement
1		1	18"	0-2'0"	5-4-5-7		Brown, fine to coarse Sand, trace gravel, trace silt
		2	21"	2'0"-4'0"	7-10-11-13		Brown, fine to coarse Sand, trace gravel, trace silt
5		3	15"	5'0"-7'0"	7-10-8-9		Same, wet (SAND)
		4	21"	7'0"-9'0"	8-6-7-7		Brown, fine to coarse Sand, little gravel, trace silt
10		5	21"	10'0"-12'0"	4-4-5-5		Brown, Fine Sand, trace silt, wet
15		6	21"	15'0"-17'0"	2-1-2-3		Brown, Fine Sand, some silt, wet (FINE SAND)
20		7	18"	20'0"-22'0"	4-5-5-7		Brown, Fine Sand, little/some silt
25		8	21"	25'0"-27'0"	4-7-8-8		Brown, fine to coarse Sand, little gravel, trace silt, wet
30		9	21"	30'0"-32'0"	10-10-14-15		Rust-Brown, fine to coarse Sand, little gravel, trace silt, wet (GRAVELLY SAND)
35		10	15"	35'0"-37'0"	8-8-9-8		Rust-Brown, fine to coarse Sand, little gravel, trace silt, wet

(Co ntinued)

Notes: NW Casing

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SHEET 8a

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glenn Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-8

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 15, 2015
Date Finished: May 15, 2015
Driller: PG
Soil Engineer/Geologist: LC

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/15/15	6 ft		

Depth Ft.	Casing bl/ft	Sample No.	Pen/Rec	Sample Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
40		11	21"	40'0"-42'0"	21-27-30-45		Brown, fine to coarse Sand & Gravel, little silt
							End of boring at 42 ft Groundwater table at 6 ft
45							
50							
55							
60							
65							
70							
75							

Notes: NW Casing

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff, 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SHEET 9

Soil Exploration Corp.
Geotechnical Drilling
Groundwater Monitor Well
148 Pioneer Drive
Leominster, MA 01453
978 840-0391

Site: Glen Ellen Country Club
84 Orchard Street
Millis, MA

BORING B-9

PROJECT NO. 15-0524

DATE: May 18, 2015

Ground Elevation:
Date Started: May 15, 2015
Date Finished: May 15, 2015
Driller: PG
Soil Engineer/Geologist: LC

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING	STABILIZATION
5/15/15	10 ft		

Depth Ft.	Casing bl/ft	Sample No.	Pen/Rec	Sample Depth	Blows/6"	Strata	Visual Identification of Soil and / or Rock Sample
						4"	Forest Mat (ORGANIC)
1		1	12"	0-2'0"	1-1-1-1		Rust-Brown, Fine Sand w/ Silt, roots, loam (SUBSOIL)
						2'6"	
5		2	15"	5'0"-7'0"	8-10-11-12		Brown, Fine Sand, little silt, trace gravel
							(GLACIAL)
10		3	12"	10'0"-11'4"	11-14-100/4"	12'	Rust-Brown, fine to medium Sand, little gravel, trace silt, wet
							Refusal at 12 ft Groundwater at 10 ft
15							
20							
25							
30							
35							

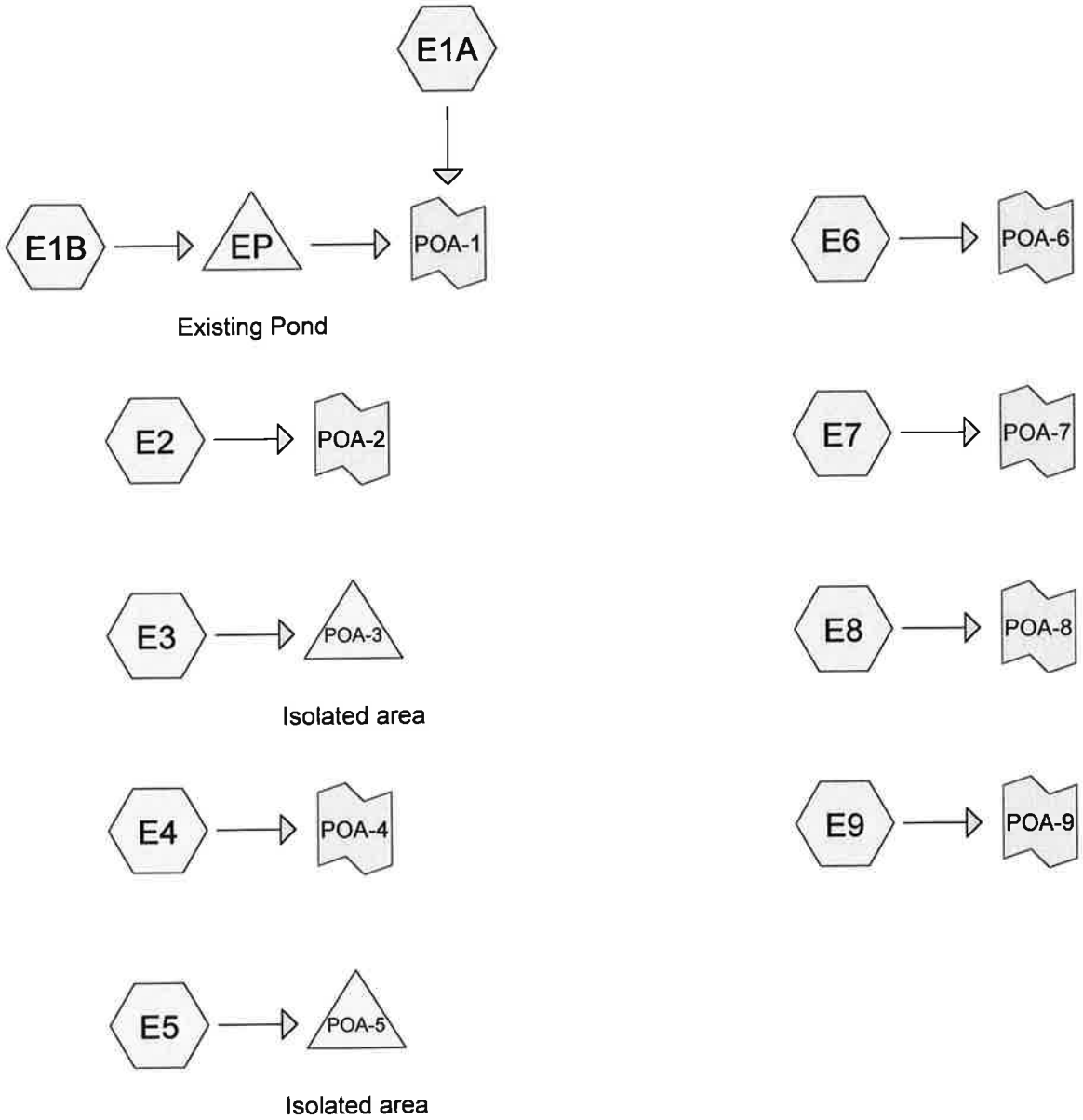
Notes: Hollow Stem Auger Size - 4 1/4"

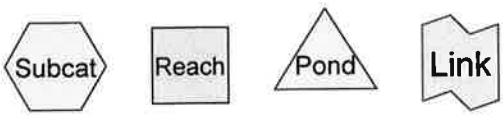
Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

APPENDIX C – PRE DEVELOPMENT STORMWATER CALCULATIONS





Routing Diagram for W161041 - Pre
Prepared by Bohler Engineering, Printed 11/17/2016
HydroCAD® 10.00-19 s/n 08311 © 2016 HydroCAD Software Solutions LLC

Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1A: Runoff Area=26.862 ac 9.01% Impervious Runoff Depth=0.04"
Flow Length=1,010' Tc=25.3 min CN=52 Runoff=0.15 cfs 0.097 af

Subcatchment E1B: Runoff Area=36.288 ac 7.08% Impervious Runoff Depth=0.00"
Flow Length=2,120' Tc=43.5 min CN=46 Runoff=0.02 cfs 0.006 af

Subcatchment E2: Runoff Area=4.591 ac 62.62% Impervious Runoff Depth=0.79"
Flow Length=420' Tc=6.0 min CN=78 Runoff=3.93 cfs 0.301 af

Subcatchment E3: Runoff Area=4.138 ac 1.64% Impervious Runoff Depth=0.00"
Flow Length=525' Tc=12.4 min CN=38 Runoff=0.00 cfs 0.000 af

Subcatchment E4: Runoff Area=48.005 ac 6.92% Impervious Runoff Depth=0.03"
Flow Length=2,385' Tc=77.6 min CN=51 Runoff=0.19 cfs 0.131 af

Subcatchment E5: Runoff Area=1.156 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=210' Tc=9.2 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment E6: Runoff Area=10.520 ac 10.58% Impervious Runoff Depth=0.00"
Flow Length=545' Tc=17.2 min CN=45 Runoff=0.00 cfs 0.000 af

Subcatchment E7: Runoff Area=2.631 ac 3.32% Impervious Runoff Depth=0.00"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.00 cfs 0.000 af

Subcatchment E8: Runoff Area=5.755 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=240' Tc=10.7 min CN=36 Runoff=0.00 cfs 0.000 af

Subcatchment E9: Runoff Area=5.240 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=335' Tc=11.3 min CN=33 Runoff=0.00 cfs 0.000 af

Pond EP: Existing Pond Peak Elev=143.50' Storage=0.000 af Inflow=0.02 cfs 0.006 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=0.02 cfs 0.006 af

Pond POA-3: Isolated area Peak Elev=153.60' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond POA-5: Isolated area Peak Elev=168.00' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link POA-1: Inflow=0.15 cfs 0.103 af
Primary=0.15 cfs 0.103 af

Link POA-2: Inflow=3.93 cfs 0.301 af
Primary=3.93 cfs 0.301 af

Link POA-4: Inflow=0.19 cfs 0.131 af
Primary=0.19 cfs 0.131 af

Link POA-6:

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-7:

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-8:

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-9:

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment E1A:

Runoff = 0.15 cfs @ 15.41 hrs, Volume= 0.097 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
1.814	98	Paved parking, HSG A
0.392	98	Paved parking, HSG B
0.213	98	Paved parking, HSG C
12.977	39	>75% Grass cover, Good, HSG A
9.807	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
1.540	30	Woods, Good, HSG A
26.862	52	Weighted Average
24.443		90.99% Pervious Area
2.419		9.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
13.0	960	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.3	1,010	Total			

Summary for Subcatchment E1B:

Runoff = 0.02 cfs @ 24.08 hrs, Volume= 0.006 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
*	0.183	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	1.061	39	>75% Grass cover, Good, HSG A
	22.594	30	Woods, Good, HSG A
	2.849	55	Woods, Good, HSG B
	7.213	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
	36.288	46	Weighted Average
	33.717		92.92% Pervious Area
	2.571		7.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment E2:

Runoff = 3.93 cfs @ 12.10 hrs, Volume= 0.301 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
2.841	98	Paved parking, HSG A
0.034	98	Paved parking, HSG B
1.368	39	>75% Grass cover, Good, HSG A
0.348	61	>75% Grass cover, Good, HSG B
4.591	78	Weighted Average
1.716		37.38% Pervious Area
2.875		62.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1200	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.4	370	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9					**Direct Entry, To make min. allowable**
6.0	420	Total			

Summary for Subcatchment E3:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
*	0.068	98	Impervious areas
	3.041	39	>75% Grass cover, Good, HSG A
	1.029	30	Woods, Good, HSG A
	4.138	38	Weighted Average
	4.070		98.36% Pervious Area
	0.068		1.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
5.0	475	0.0505	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	525	Total			

Summary for Subcatchment E4:

Runoff = 0.19 cfs @ 16.65 hrs, Volume= 0.131 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
1.096	98	Paved parking, HSG A
2.226	98	Paved parking, HSG B
12.744	39	>75% Grass cover, Good, HSG A
6.640	61	>75% Grass cover, Good, HSG B
13.210	30	Woods, Good, HSG A
4.724	55	Woods, Good, HSG B
0.532	72	Dirt roads, HSG A
2.311	73	Brush, Good, HSG D
4.522	77	Woods, Good, HSG D
48.005	51	Weighted Average
44.683		93.08% Pervious Area
3.322		6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
6.9	350	0.0290	0.85		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
58.1	955	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.7	1,030	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030 Earth, grassed & winding
77.6	2,385	Total			

Summary for Subcatchment E5:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
1.156	30	Woods, Good, HSG A
1.156		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.1	160	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	210	Total			

Summary for Subcatchment E6:

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.249	30	Woods, Good, HSG A
10.520	45	Weighted Average
9.407		89.42% Pervious Area
1.113		10.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment E7:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
0.025	61	>75% Grass cover, Good, HSG B
1.877	30	Woods, Good, HSG A
2.631	35	Weighted Average
2.544		96.68% Pervious Area
0.087		3.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment E8:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
4.709	30	Woods, Good, HSG A
0.678	55	Woods, Good, HSG B
0.368	77	Woods, Good, HSG D
5.755	36	Weighted Average
5.755		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	190	0.0816	1.43		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.7	240	Total			

Summary for Subcatchment E9:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
4.923	30	Woods, Good, HSG A
0.317	77	Woods, Good, HSG D
5.240	33	Weighted Average
5.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	215	0.1070	1.64		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	70	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.3	335	Total			

Summary for Pond EP: Existing Pond

Inflow Area = 36.288 ac, 7.08% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.02 cfs @ 24.08 hrs, Volume= 0.006 af
Outflow = 0.02 cfs @ 24.08 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min
Primary = 0.02 cfs @ 24.08 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 143.50' @ 0.00 hrs Surf.Area= 2.550 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,359.5 - 1,359.5)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=0.00 cfs @ 24.08 hrs HW=143.50' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 0.29 cfs potential flow)

Summary for Pond POA-3: Isolated area

Inflow Area = 4.138 ac, 1.64% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Peak Elev= 153.60' @ 0.00 hrs Surf.Area= 0.000 ac Storage= 0.000 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	153.60'	0.206 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
153.60	0.000	0.000	0.000
154.00	0.028	0.006	0.006
155.00	0.094	0.061	0.067
156.00	0.185	0.139	0.206

Device	Routing	Invert	Outlet Devices
#1	Discarded	153.60'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=153.60' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Summary for Pond POA-5: Isolated area

Inflow Area = 1.156 ac, 0.00% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 168.00' @ 0.00 hrs Surf.Area= 0.000 ac Storage= 0.000 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	0.450 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
168.00	0.000	0.000	0.000
169.00	0.106	0.053	0.053
170.00	0.204	0.155	0.208
171.00	0.280	0.242	0.450

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=168.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Summary for Link POA-1:

Inflow Area = 63.150 ac, 7.90% Impervious, Inflow Depth = 0.02" for 1-yr event
Inflow = 0.15 cfs @ 15.41 hrs, Volume= 0.103 af
Primary = 0.15 cfs @ 15.41 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-2:

Inflow Area = 4.591 ac, 62.62% Impervious, Inflow Depth = 0.79" for 1-yr event
Inflow = 3.93 cfs @ 12.10 hrs, Volume= 0.301 af
Primary = 3.93 cfs @ 12.10 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-4:

Inflow Area = 48.005 ac, 6.92% Impervious, Inflow Depth = 0.03" for 1-yr event
Inflow = 0.19 cfs @ 16.65 hrs, Volume= 0.131 af
Primary = 0.19 cfs @ 16.65 hrs, Volume= 0.131 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.520 ac, 10.58% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 3.32% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 5.755 ac, 0.00% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

Inflow Area =	5.240 ac,	0.00% Impervious,	Inflow Depth =	0.00"	for 1-yr event
Inflow =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af,	Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1A: Runoff Area=26.862 ac 9.01% Impervious Runoff Depth=0.17"
Flow Length=1,010' Tc=25.3 min CN=52 Runoff=1.01 cfs 0.388 af

Subcatchment E1B: Runoff Area=36.288 ac 7.08% Impervious Runoff Depth=0.06"
Flow Length=2,120' Tc=43.5 min CN=46 Runoff=0.27 cfs 0.174 af

Subcatchment E2: Runoff Area=4.591 ac 62.62% Impervious Runoff Depth=1.27"
Flow Length=420' Tc=6.0 min CN=78 Runoff=6.60 cfs 0.487 af

Subcatchment E3: Runoff Area=4.138 ac 1.64% Impervious Runoff Depth=0.00"
Flow Length=525' Tc=12.4 min CN=38 Runoff=0.00 cfs 0.000 af

Subcatchment E4: Runoff Area=48.005 ac 6.92% Impervious Runoff Depth=0.15"
Flow Length=2,385' Tc=77.6 min CN=51 Runoff=1.03 cfs 0.601 af

Subcatchment E5: Runoff Area=1.156 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=210' Tc=9.2 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment E6: Runoff Area=10.520 ac 10.58% Impervious Runoff Depth=0.04"
Flow Length=545' Tc=17.2 min CN=45 Runoff=0.06 cfs 0.039 af

Subcatchment E7: Runoff Area=2.631 ac 3.32% Impervious Runoff Depth=0.00"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.00 cfs 0.000 af

Subcatchment E8: Runoff Area=5.755 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=240' Tc=10.7 min CN=36 Runoff=0.00 cfs 0.000 af

Subcatchment E9: Runoff Area=5.240 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=335' Tc=11.3 min CN=33 Runoff=0.00 cfs 0.000 af

Pond EP: Existing Pond Peak Elev=143.50' Storage=0.000 af Inflow=0.27 cfs 0.174 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=0.27 cfs 0.174 af

Pond POA-3: Isolated area Peak Elev=153.60' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond POA-5: Isolated area Peak Elev=168.00' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link POA-1: Inflow=1.01 cfs 0.562 af
Primary=1.01 cfs 0.562 af

Link POA-2: Inflow=6.60 cfs 0.487 af
Primary=6.60 cfs 0.487 af

Link POA-4: Inflow=1.03 cfs 0.601 af
Primary=1.03 cfs 0.601 af

Link POA-6:

Inflow=0.06 cfs 0.039 af
Primary=0.06 cfs 0.039 af

Link POA-7:

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-8:

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-9:

Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment E1A:

Runoff = 1.01 cfs @ 12.71 hrs, Volume= 0.388 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.814	98	Paved parking, HSG A
0.392	98	Paved parking, HSG B
0.213	98	Paved parking, HSG C
12.977	39	>75% Grass cover, Good, HSG A
9.807	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
1.540	30	Woods, Good, HSG A
26.862	52	Weighted Average
24.443		90.99% Pervious Area
2.419		9.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
13.0	960	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.3	1,010	Total			

Summary for Subcatchment E1B:

Runoff = 0.27 cfs @ 15.70 hrs, Volume= 0.174 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (ac)	CN	Description
*	0.183	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	1.061	39	>75% Grass cover, Good, HSG A
	22.594	30	Woods, Good, HSG A
	2.849	55	Woods, Good, HSG B
	7.213	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
	36.288	46	Weighted Average
	33.717		92.92% Pervious Area
	2.571		7.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment E2:

Runoff = 6.60 cfs @ 12.10 hrs, Volume= 0.487 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
2.841	98	Paved parking, HSG A
0.034	98	Paved parking, HSG B
1.368	39	>75% Grass cover, Good, HSG A
0.348	61	>75% Grass cover, Good, HSG B
4.591	78	Weighted Average
1.716		37.38% Pervious Area
2.875		62.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1200	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.4	370	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9					**Direct Entry, To make min. allowable**
6.0	420	Total			

Summary for Subcatchment E3:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (ac)	CN	Description
*	0.068	98	Impervious areas
	3.041	39	>75% Grass cover, Good, HSG A
	1.029	30	Woods, Good, HSG A
	4.138	38	Weighted Average
	4.070		98.36% Pervious Area
	0.068		1.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
5.0	475	0.0505	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	525	Total			

Summary for Subcatchment E4:

Runoff = 1.03 cfs @ 14.26 hrs, Volume= 0.601 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.096	98	Paved parking, HSG A
2.226	98	Paved parking, HSG B
12.744	39	>75% Grass cover, Good, HSG A
6.640	61	>75% Grass cover, Good, HSG B
13.210	30	Woods, Good, HSG A
4.724	55	Woods, Good, HSG B
0.532	72	Dirt roads, HSG A
2.311	73	Brush, Good, HSG D
4.522	77	Woods, Good, HSG D
48.005	51	Weighted Average
44.683		93.08% Pervious Area
3.322		6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
6.9	350	0.0290	0.85		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
58.1	955	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.7	1,030	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030 Earth, grassed & winding
77.6	2,385	Total			

Summary for Subcatchment E5:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.156	30	Woods, Good, HSG A
1.156		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.1	160	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	210	Total			

Summary for Subcatchment E6:

Runoff = 0.06 cfs @ 15.54 hrs, Volume= 0.039 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.249	30	Woods, Good, HSG A
10.520	45	Weighted Average
9.407		89.42% Pervious Area
1.113		10.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment E7:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
0.025	61	>75% Grass cover, Good, HSG B
1.877	30	Woods, Good, HSG A
2.631	35	Weighted Average
2.544		96.68% Pervious Area
0.087		3.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment E8:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.709	30	Woods, Good, HSG A
0.678	55	Woods, Good, HSG B
0.368	77	Woods, Good, HSG D
5.755	36	Weighted Average
5.755		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	190	0.0816	1.43		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.7	240	Total			

Summary for Subcatchment E9:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
4.923	30	Woods, Good, HSG A
0.317	77	Woods, Good, HSG D
5.240	33	Weighted Average
5.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	215	0.1070	1.64		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	70	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.3	335	Total			

Summary for Pond EP: Existing Pond

Inflow Area = 36.288 ac, 7.08% Impervious, Inflow Depth = 0.06" for 2-yr event
Inflow = 0.27 cfs @ 15.70 hrs, Volume= 0.174 af
Outflow = 0.27 cfs @ 15.66 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min
Primary = 0.27 cfs @ 15.66 hrs, Volume= 0.174 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 143.50' @ 15.66 hrs Surf.Area= 2.550 ac Storage= 0.000 af

Plug-Flow detention time= 0.1 min calculated for 0.174 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (1,117.0 - 1,117.0)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=0.29 cfs @ 15.66 hrs HW=143.50' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.29 cfs @ 2.18 fps)

Summary for Pond POA-3: Isolated area

Inflow Area = 4.138 ac, 1.64% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Peak Elev= 153.60' @ 0.00 hrs Surf.Area= 0.000 ac Storage= 0.000 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	153.60'	0.206 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
153.60	0.000	0.000	0.000
154.00	0.028	0.006	0.006
155.00	0.094	0.061	0.067
156.00	0.185	0.139	0.206

Device	Routing	Invert	Outlet Devices
#1	Discarded	153.60'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=153.60' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Summary for Pond POA-5: Isolated area

Inflow Area = 1.156 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 168.00' @ 0.00 hrs Surf.Area= 0.000 ac Storage= 0.000 af

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

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	0.450 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
168.00	0.000	0.000	0.000
169.00	0.106	0.053	0.053
170.00	0.204	0.155	0.208
171.00	0.280	0.242	0.450

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=168.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Summary for Link POA-1:

Inflow Area = 63.150 ac, 7.90% Impervious, Inflow Depth = 0.11" for 2-yr event
Inflow = 1.01 cfs @ 12.71 hrs, Volume= 0.562 af
Primary = 1.01 cfs @ 12.71 hrs, Volume= 0.562 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-2:

Inflow Area = 4.591 ac, 62.62% Impervious, Inflow Depth = 1.27" for 2-yr event
Inflow = 6.60 cfs @ 12.10 hrs, Volume= 0.487 af
Primary = 6.60 cfs @ 12.10 hrs, Volume= 0.487 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-4:

Inflow Area = 48.005 ac, 6.92% Impervious, Inflow Depth = 0.15" for 2-yr event
Inflow = 1.03 cfs @ 14.26 hrs, Volume= 0.601 af
Primary = 1.03 cfs @ 14.26 hrs, Volume= 0.601 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.520 ac, 10.58% Impervious, Inflow Depth = 0.04" for 2-yr event
Inflow = 0.06 cfs @ 15.54 hrs, Volume= 0.039 af
Primary = 0.06 cfs @ 15.54 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 3.32% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 5.755 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

Inflow Area =	5.240 ac,	0.00% Impervious,	Inflow Depth =	0.00"	for 2-yr event
Inflow =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af,	Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1A: Runoff Area=26.862 ac 9.01% Impervious Runoff Depth=0.67"
Flow Length=1,010' Tc=25.3 min CN=52 Runoff=8.87 cfs 1.509 af

Subcatchment E1B: Runoff Area=36.288 ac 7.08% Impervious Runoff Depth=0.39"
Flow Length=2,120' Tc=43.5 min CN=46 Runoff=3.81 cfs 1.187 af

Subcatchment E2: Runoff Area=4.591 ac 62.62% Impervious Runoff Depth=2.46"
Flow Length=420' Tc=6.0 min CN=78 Runoff=12.97 cfs 0.941 af

Subcatchment E3: Runoff Area=4.138 ac 1.64% Impervious Runoff Depth=0.12"
Flow Length=525' Tc=12.4 min CN=38 Runoff=0.06 cfs 0.040 af

Subcatchment E4: Runoff Area=48.005 ac 6.92% Impervious Runoff Depth=0.62"
Flow Length=2,385' Tc=77.6 min CN=51 Runoff=7.88 cfs 2.493 af

Subcatchment E5: Runoff Area=1.156 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=210' Tc=9.2 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment E6: Runoff Area=10.520 ac 10.58% Impervious Runoff Depth=0.35"
Flow Length=545' Tc=17.2 min CN=45 Runoff=1.29 cfs 0.308 af

Subcatchment E7: Runoff Area=2.631 ac 3.32% Impervious Runoff Depth=0.05"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.02 cfs 0.011 af

Subcatchment E8: Runoff Area=5.755 ac 0.00% Impervious Runoff Depth=0.07"
Flow Length=240' Tc=10.7 min CN=36 Runoff=0.05 cfs 0.033 af

Subcatchment E9: Runoff Area=5.240 ac 0.00% Impervious Runoff Depth=0.02"
Flow Length=335' Tc=11.3 min CN=33 Runoff=0.01 cfs 0.009 af

Pond EP: Existing Pond Peak Elev=143.68' Storage=0.467 af Inflow=3.81 cfs 1.187 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=1.01 cfs 1.188 af

Pond POA-3: Isolated area Peak Elev=153.71' Storage=0.000 af Inflow=0.06 cfs 0.040 af
Outflow=0.06 cfs 0.040 af

Pond POA-5: Isolated area Peak Elev=168.00' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link POA-1: Inflow=9.17 cfs 2.696 af
Primary=9.17 cfs 2.696 af

Link POA-2: Inflow=12.97 cfs 0.941 af
Primary=12.97 cfs 0.941 af

Link POA-4: Inflow=7.88 cfs 2.493 af
Primary=7.88 cfs 2.493 af

Link POA-6:

Inflow=1.29 cfs 0.308 af
Primary=1.29 cfs 0.308 af

Link POA-7:

Inflow=0.02 cfs 0.011 af
Primary=0.02 cfs 0.011 af

Link POA-8:

Inflow=0.05 cfs 0.033 af
Primary=0.05 cfs 0.033 af

Link POA-9:

Inflow=0.01 cfs 0.009 af
Primary=0.01 cfs 0.009 af

Summary for Subcatchment E1A:

Runoff = 8.87 cfs @ 12.48 hrs, Volume= 1.509 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.814	98	Paved parking, HSG A
0.392	98	Paved parking, HSG B
0.213	98	Paved parking, HSG C
12.977	39	>75% Grass cover, Good, HSG A
9.807	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
1.540	30	Woods, Good, HSG A
26.862	52	Weighted Average
24.443		90.99% Pervious Area
2.419		9.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
13.0	960	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.3	1,010	Total			

Summary for Subcatchment E1B:

Runoff = 3.81 cfs @ 12.89 hrs, Volume= 1.187 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

	Area (ac)	CN	Description
*	0.183	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	1.061	39	>75% Grass cover, Good, HSG A
	22.594	30	Woods, Good, HSG A
	2.849	55	Woods, Good, HSG B
	7.213	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
	36.288	46	Weighted Average
	33.717		92.92% Pervious Area
	2.571		7.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment E2:

Runoff = 12.97 cfs @ 12.09 hrs, Volume= 0.941 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
2.841	98	Paved parking, HSG A
0.034	98	Paved parking, HSG B
1.368	39	>75% Grass cover, Good, HSG A
0.348	61	>75% Grass cover, Good, HSG B
4.591	78	Weighted Average
1.716		37.38% Pervious Area
2.875		62.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1200	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.4	370	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9					**Direct Entry, To make min. allowable**
6.0	420	Total			

Summary for Subcatchment E3:

Runoff = 0.06 cfs @ 14.80 hrs, Volume= 0.040 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

	Area (ac)	CN	Description
*	0.068	98	Impervious areas
	3.041	39	>75% Grass cover, Good, HSG A
	1.029	30	Woods, Good, HSG A
	4.138	38	Weighted Average
	4.070		98.36% Pervious Area
	0.068		1.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
5.0	475	0.0505	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	525	Total			

Summary for Subcatchment E4:

Runoff = 7.88 cfs @ 13.31 hrs, Volume= 2.493 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.096	98	Paved parking, HSG A
2.226	98	Paved parking, HSG B
12.744	39	>75% Grass cover, Good, HSG A
6.640	61	>75% Grass cover, Good, HSG B
13.210	30	Woods, Good, HSG A
4.724	55	Woods, Good, HSG B
0.532	72	Dirt roads, HSG A
2.311	73	Brush, Good, HSG D
4.522	77	Woods, Good, HSG D
48.005	51	Weighted Average
44.683		93.08% Pervious Area
3.322		6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
6.9	350	0.0290	0.85		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
58.1	955	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.7	1,030	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030 Earth, grassed & winding
77.6	2,385	Total			

Summary for Subcatchment E5:

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.156	30	Woods, Good, HSG A
1.156		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.1	160	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	210	Total			

Summary for Subcatchment E6:

Runoff = 1.29 cfs @ 12.51 hrs, Volume= 0.308 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.249	30	Woods, Good, HSG A
10.520	45	Weighted Average
9.407		89.42% Pervious Area
1.113		10.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment E7:

Runoff = 0.02 cfs @ 15.78 hrs, Volume= 0.011 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
0.025	61	>75% Grass cover, Good, HSG B
1.877	30	Woods, Good, HSG A
2.631	35	Weighted Average
2.544		96.68% Pervious Area
0.087		3.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment E8:

Runoff = 0.05 cfs @ 15.35 hrs, Volume= 0.033 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
4.709	30	Woods, Good, HSG A
0.678	55	Woods, Good, HSG B
0.368	77	Woods, Good, HSG D
5.755	36	Weighted Average
5.755		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	190	0.0816	1.43		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.7	240	Total			

Summary for Subcatchment E9:

Runoff = 0.01 cfs @ 21.62 hrs, Volume= 0.009 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
4.923	30	Woods, Good, HSG A
0.317	77	Woods, Good, HSG D
5.240	33	Weighted Average
5.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	215	0.1070	1.64		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	70	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.3	335	Total			

Summary for Pond EP: Existing Pond

Inflow Area = 36.288 ac, 7.08% Impervious, Inflow Depth = 0.39" for 10-yr event
Inflow = 3.81 cfs @ 12.89 hrs, Volume= 1.187 af
Outflow = 1.01 cfs @ 17.32 hrs, Volume= 1.188 af, Atten= 73%, Lag= 266.2 min
Primary = 1.01 cfs @ 17.32 hrs, Volume= 1.188 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 143.68' @ 17.32 hrs Surf.Area= 2.640 ac Storage= 0.467 af

Plug-Flow detention time= 290.1 min calculated for 1.187 af (100% of inflow)
Center-of-Mass det. time= 290.5 min (1,275.8 - 985.3)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=1.01 cfs @ 17.32 hrs HW=143.68' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.01 cfs @ 2.96 fps)

Summary for Pond POA-3: Isolated area

Inflow Area = 4.138 ac, 1.64% Impervious, Inflow Depth = 0.12" for 10-yr event
Inflow = 0.06 cfs @ 14.80 hrs, Volume= 0.040 af
Outflow = 0.06 cfs @ 14.95 hrs, Volume= 0.040 af, Atten= 0%, Lag= 9.0 min
Discarded = 0.06 cfs @ 14.95 hrs, Volume= 0.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Peak Elev= 153.71' @ 14.95 hrs Surf.Area= 0.008 ac Storage= 0.000 af

Plug-Flow detention time= 3.4 min calculated for 0.040 af (100% of inflow)
Center-of-Mass det. time= 3.4 min (1,062.5 - 1,059.1)

Volume	Invert	Avail.Storage	Storage Description
#1	153.60'	0.206 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
153.60	0.000	0.000	0.000
154.00	0.028	0.006	0.006
155.00	0.094	0.061	0.067
156.00	0.185	0.139	0.206

Device	Routing	Invert	Outlet Devices
#1	Discarded	153.60'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 14.95 hrs HW=153.71' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Summary for Pond POA-5: Isolated area

Inflow Area = 1.156 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-yr event
Inflow = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 168.00' @ 24.03 hrs Surf.Area= 0.000 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,432.3 - 1,432.3)

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	0.450 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
168.00	0.000	0.000	0.000
169.00	0.106	0.053	0.053
170.00	0.204	0.155	0.208
171.00	0.280	0.242	0.450

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 24.03 hrs HW=168.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Summary for Link POA-1:

Inflow Area = 63.150 ac, 7.90% Impervious, Inflow Depth = 0.51" for 10-yr event
Inflow = 9.17 cfs @ 12.49 hrs, Volume= 2.696 af
Primary = 9.17 cfs @ 12.49 hrs, Volume= 2.696 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-2:

Inflow Area = 4.591 ac, 62.62% Impervious, Inflow Depth = 2.46" for 10-yr event
Inflow = 12.97 cfs @ 12.09 hrs, Volume= 0.941 af
Primary = 12.97 cfs @ 12.09 hrs, Volume= 0.941 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-4:

Inflow Area = 48.005 ac, 6.92% Impervious, Inflow Depth = 0.62" for 10-yr event
Inflow = 7.88 cfs @ 13.31 hrs, Volume= 2.493 af
Primary = 7.88 cfs @ 13.31 hrs, Volume= 2.493 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.520 ac, 10.58% Impervious, Inflow Depth = 0.35" for 10-yr event
Inflow = 1.29 cfs @ 12.51 hrs, Volume= 0.308 af
Primary = 1.29 cfs @ 12.51 hrs, Volume= 0.308 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 3.32% Impervious, Inflow Depth = 0.05" for 10-yr event
Inflow = 0.02 cfs @ 15.78 hrs, Volume= 0.011 af
Primary = 0.02 cfs @ 15.78 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 5.755 ac, 0.00% Impervious, Inflow Depth = 0.07" for 10-yr event
Inflow = 0.05 cfs @ 15.35 hrs, Volume= 0.033 af
Primary = 0.05 cfs @ 15.35 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

Inflow Area =	5.240 ac,	0.00% Impervious,	Inflow Depth =	0.02"	for 10-yr event
Inflow =	0.01 cfs @	21.62 hrs, Volume=	0.009 af		
Primary =	0.01 cfs @	21.62 hrs, Volume=	0.009 af,	Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1A: Runoff Area=26.862 ac 9.01% Impervious Runoff Depth=1.34"
Flow Length=1,010' Tc=25.3 min CN=52 Runoff=21.75 cfs 3.004 af

Subcatchment E1B: Runoff Area=36.288 ac 7.08% Impervious Runoff Depth=0.91"
Flow Length=2,120' Tc=43.5 min CN=46 Runoff=12.98 cfs 2.748 af

Subcatchment E2: Runoff Area=4.591 ac 62.62% Impervious Runoff Depth=3.67"
Flow Length=420' Tc=6.0 min CN=78 Runoff=19.31 cfs 1.403 af

Subcatchment E3: Runoff Area=4.138 ac 1.64% Impervious Runoff Depth=0.42"
Flow Length=525' Tc=12.4 min CN=38 Runoff=0.60 cfs 0.145 af

Subcatchment E4: Runoff Area=48.005 ac 6.92% Impervious Runoff Depth=1.27"
Flow Length=2,385' Tc=77.6 min CN=51 Runoff=19.54 cfs 5.066 af

Subcatchment E5: Runoff Area=1.156 ac 0.00% Impervious Runoff Depth=0.08"
Flow Length=210' Tc=9.2 min CN=30 Runoff=0.01 cfs 0.008 af

Subcatchment E6: Runoff Area=10.520 ac 10.58% Impervious Runoff Depth=0.84"
Flow Length=545' Tc=17.2 min CN=45 Runoff=4.76 cfs 0.738 af

Subcatchment E7: Runoff Area=2.631 ac 3.32% Impervious Runoff Depth=0.27"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.13 cfs 0.060 af

Subcatchment E8: Runoff Area=5.755 ac 0.00% Impervious Runoff Depth=0.32"
Flow Length=240' Tc=10.7 min CN=36 Runoff=0.49 cfs 0.153 af

Subcatchment E9: Runoff Area=5.240 ac 0.00% Impervious Runoff Depth=0.19"
Flow Length=335' Tc=11.3 min CN=33 Runoff=0.13 cfs 0.081 af

Pond EP: Existing Pond Peak Elev=143.94' Storage=1.159 af Inflow=12.98 cfs 2.748 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=2.66 cfs 2.749 af

Pond POA-3: Isolated area Peak Elev=154.17' Storage=0.011 af Inflow=0.60 cfs 0.145 af
Outflow=0.33 cfs 0.145 af

Pond POA-5: Isolated area Peak Elev=168.01' Storage=0.000 af Inflow=0.01 cfs 0.008 af
Outflow=0.01 cfs 0.008 af

Link POA-1: Inflow=22.12 cfs 5.752 af
Primary=22.12 cfs 5.752 af

Link POA-2: Inflow=19.31 cfs 1.403 af
Primary=19.31 cfs 1.403 af

Link POA-4: Inflow=19.54 cfs 5.066 af
Primary=19.54 cfs 5.066 af

Link POA-6:

Inflow=4.76 cfs 0.738 af
Primary=4.76 cfs 0.738 af

Link POA-7:

Inflow=0.13 cfs 0.060 af
Primary=0.13 cfs 0.060 af

Link POA-8:

Inflow=0.49 cfs 0.153 af
Primary=0.49 cfs 0.153 af

Link POA-9:

Inflow=0.13 cfs 0.081 af
Primary=0.13 cfs 0.081 af

Summary for Subcatchment E1A:

Runoff = 21.75 cfs @ 12.42 hrs, Volume= 3.004 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
1.814	98	Paved parking, HSG A
0.392	98	Paved parking, HSG B
0.213	98	Paved parking, HSG C
12.977	39	>75% Grass cover, Good, HSG A
9.807	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
1.540	30	Woods, Good, HSG A
26.862	52	Weighted Average
24.443		90.99% Pervious Area
2.419		9.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
13.0	960	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.3	1,010	Total			

Summary for Subcatchment E1B:

Runoff = 12.98 cfs @ 12.75 hrs, Volume= 2.748 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

	Area (ac)	CN	Description
*	0.183	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	1.061	39	>75% Grass cover, Good, HSG A
	22.594	30	Woods, Good, HSG A
	2.849	55	Woods, Good, HSG B
	7.213	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
	36.288	46	Weighted Average
	33.717		92.92% Pervious Area
	2.571		7.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment E2:

Runoff = 19.31 cfs @ 12.09 hrs, Volume= 1.403 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
2.841	98	Paved parking, HSG A
0.034	98	Paved parking, HSG B
1.368	39	>75% Grass cover, Good, HSG A
0.348	61	>75% Grass cover, Good, HSG B
4.591	78	Weighted Average
1.716		37.38% Pervious Area
2.875		62.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1200	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.4	370	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9					**Direct Entry, To make min. allowable**
6.0	420	Total			

Summary for Subcatchment E3:

Runoff = 0.60 cfs @ 12.46 hrs, Volume= 0.145 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

	Area (ac)	CN	Description
*	0.068	98	Impervious areas
	3.041	39	>75% Grass cover, Good, HSG A
	1.029	30	Woods, Good, HSG A
	4.138	38	Weighted Average
	4.070		98.36% Pervious Area
	0.068		1.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
5.0	475	0.0505	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	525	Total			

Summary for Subcatchment E4:

Runoff = 19.54 cfs @ 13.20 hrs, Volume= 5.066 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
1.096	98	Paved parking, HSG A
2.226	98	Paved parking, HSG B
12.744	39	>75% Grass cover, Good, HSG A
6.640	61	>75% Grass cover, Good, HSG B
13.210	30	Woods, Good, HSG A
4.724	55	Woods, Good, HSG B
0.532	72	Dirt roads, HSG A
2.311	73	Brush, Good, HSG D
4.522	77	Woods, Good, HSG D
48.005	51	Weighted Average
44.683		93.08% Pervious Area
3.322		6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
6.9	350	0.0290	0.85		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
58.1	955	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.7	1,030	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030 Earth, grassed & winding
77.6	2,385	Total			

Summary for Subcatchment E5:

Runoff = 0.01 cfs @ 15.42 hrs, Volume= 0.008 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
1.156	30	Woods, Good, HSG A
1.156		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.1	160	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	210	Total			

Summary for Subcatchment E6:

Runoff = 4.76 cfs @ 12.35 hrs, Volume= 0.738 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.249	30	Woods, Good, HSG A
10.520	45	Weighted Average
9.407		89.42% Pervious Area
1.113		10.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment E7:

Runoff = 0.13 cfs @ 12.61 hrs, Volume= 0.060 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
0.025	61	>75% Grass cover, Good, HSG B
1.877	30	Woods, Good, HSG A
2.631	35	Weighted Average
2.544		96.68% Pervious Area
0.087		3.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment E8:

Runoff = 0.49 cfs @ 12.49 hrs, Volume= 0.153 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
4.709	30	Woods, Good, HSG A
0.678	55	Woods, Good, HSG B
0.368	77	Woods, Good, HSG D
5.755	36	Weighted Average
5.755		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	190	0.0816	1.43		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.7	240	Total			

Summary for Subcatchment E9:

Runoff = 0.13 cfs @ 13.84 hrs, Volume= 0.081 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
4.923	30	Woods, Good, HSG A
0.317	77	Woods, Good, HSG D
5.240	33	Weighted Average
5.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	215	0.1070	1.64		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	70	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.3	335	Total			

Summary for Pond EP: Existing Pond

Inflow Area = 36.288 ac, 7.08% Impervious, Inflow Depth = 0.91" for 50-yr event
Inflow = 12.98 cfs @ 12.75 hrs, Volume= 2.748 af
Outflow = 2.66 cfs @ 16.05 hrs, Volume= 2.749 af, Atten= 79%, Lag= 197.9 min
Primary = 2.66 cfs @ 16.05 hrs, Volume= 2.749 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 143.94' @ 16.05 hrs Surf.Area= 2.768 ac Storage= 1.159 af

Plug-Flow detention time= 311.9 min calculated for 2.746 af (100% of inflow)
Center-of-Mass det. time= 312.3 min (1,257.2 - 944.9)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=2.66 cfs @ 16.05 hrs HW=143.94' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 2.66 cfs @ 3.68 fps)

Summary for Pond POA-3: Isolated area

Inflow Area = 4.138 ac, 1.64% Impervious, Inflow Depth = 0.42" for 50-yr event
Inflow = 0.60 cfs @ 12.46 hrs, Volume= 0.145 af
Outflow = 0.33 cfs @ 12.90 hrs, Volume= 0.145 af, Atten= 46%, Lag= 26.5 min
Discarded = 0.33 cfs @ 12.90 hrs, Volume= 0.145 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Peak Elev= 154.17' @ 12.90 hrs Surf.Area= 0.039 ac Storage= 0.011 af

Plug-Flow detention time= 14.5 min calculated for 0.145 af (100% of inflow)
Center-of-Mass det. time= 14.5 min (985.8 - 971.3)

Volume	Invert	Avail.Storage	Storage Description
#1	153.60'	0.206 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
153.60	0.000	0.000	0.000
154.00	0.028	0.006	0.006
155.00	0.094	0.061	0.067
156.00	0.185	0.139	0.206

Device	Routing	Invert	Outlet Devices
#1	Discarded	153.60'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.33 cfs @ 12.90 hrs HW=154.17' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Summary for Pond POA-5: Isolated area

Inflow Area = 1.156 ac, 0.00% Impervious, Inflow Depth = 0.08" for 50-yr event
Inflow = 0.01 cfs @ 15.42 hrs, Volume= 0.008 af
Outflow = 0.01 cfs @ 15.44 hrs, Volume= 0.008 af, Atten= 0%, Lag= 1.2 min
Discarded = 0.01 cfs @ 15.44 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 168.01' @ 15.44 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= 0.5 min calculated for 0.008 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (1,111.5 - 1,111.0)

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	0.450 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
168.00	0.000	0.000	0.000
169.00	0.106	0.053	0.053
170.00	0.204	0.155	0.208
171.00	0.280	0.242	0.450

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 15.44 hrs HW=168.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Summary for Link POA-1:

Inflow Area = 63.150 ac, 7.90% Impervious, Inflow Depth = 1.09" for 50-yr event
Inflow = 22.12 cfs @ 12.42 hrs, Volume= 5.752 af
Primary = 22.12 cfs @ 12.42 hrs, Volume= 5.752 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-2:

Inflow Area = 4.591 ac, 62.62% Impervious, Inflow Depth = 3.67" for 50-yr event
Inflow = 19.31 cfs @ 12.09 hrs, Volume= 1.403 af
Primary = 19.31 cfs @ 12.09 hrs, Volume= 1.403 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-4:

Inflow Area = 48.005 ac, 6.92% Impervious, Inflow Depth = 1.27" for 50-yr event
Inflow = 19.54 cfs @ 13.20 hrs, Volume= 5.066 af
Primary = 19.54 cfs @ 13.20 hrs, Volume= 5.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.520 ac, 10.58% Impervious, Inflow Depth = 0.84" for 50-yr event
Inflow = 4.76 cfs @ 12.35 hrs, Volume= 0.738 af
Primary = 4.76 cfs @ 12.35 hrs, Volume= 0.738 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 3.32% Impervious, Inflow Depth = 0.27" for 50-yr event
Inflow = 0.13 cfs @ 12.61 hrs, Volume= 0.060 af
Primary = 0.13 cfs @ 12.61 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 5.755 ac, 0.00% Impervious, Inflow Depth = 0.32" for 50-yr event
Inflow = 0.49 cfs @ 12.49 hrs, Volume= 0.153 af
Primary = 0.49 cfs @ 12.49 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

Inflow Area =	5.240 ac,	0.00% Impervious,	Inflow Depth =	0.19"	for 50-yr event
Inflow =	0.13 cfs @	13.84 hrs, Volume=	0.081 af		
Primary =	0.13 cfs @	13.84 hrs, Volume=	0.081 af,	Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1A: Runoff Area=26.862 ac 9.01% Impervious Runoff Depth=1.67"
Flow Length=1,010' Tc=25.3 min CN=52 Runoff=28.32 cfs 3.744 af

Subcatchment E1B: Runoff Area=36.288 ac 7.08% Impervious Runoff Depth=1.18"
Flow Length=2,120' Tc=43.5 min CN=46 Runoff=18.25 cfs 3.560 af

Subcatchment E2: Runoff Area=4.591 ac 62.62% Impervious Runoff Depth=4.20"
Flow Length=420' Tc=6.0 min CN=78 Runoff=22.07 cfs 1.608 af

Subcatchment E3: Runoff Area=4.138 ac 1.64% Impervious Runoff Depth=0.60"
Flow Length=525' Tc=12.4 min CN=38 Runoff=1.05 cfs 0.206 af

Subcatchment E4: Runoff Area=48.005 ac 6.92% Impervious Runoff Depth=1.59"
Flow Length=2,385' Tc=77.6 min CN=51 Runoff=25.63 cfs 6.349 af

Subcatchment E5: Runoff Area=1.156 ac 0.00% Impervious Runoff Depth=0.16"
Flow Length=210' Tc=9.2 min CN=30 Runoff=0.03 cfs 0.016 af

Subcatchment E6: Runoff Area=10.520 ac 10.58% Impervious Runoff Depth=1.10"
Flow Length=545' Tc=17.2 min CN=45 Runoff=6.97 cfs 0.963 af

Subcatchment E7: Runoff Area=2.631 ac 3.32% Impervious Runoff Depth=0.41"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.32 cfs 0.091 af

Subcatchment E8: Runoff Area=5.755 ac 0.00% Impervious Runoff Depth=0.47"
Flow Length=240' Tc=10.7 min CN=36 Runoff=0.99 cfs 0.227 af

Subcatchment E9: Runoff Area=5.240 ac 0.00% Impervious Runoff Depth=0.30"
Flow Length=335' Tc=11.3 min CN=33 Runoff=0.34 cfs 0.133 af

Pond EP: Existing Pond Peak Elev=144.06' Storage=1.499 af Inflow=18.25 cfs 3.560 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=3.67 cfs 3.560 af

Pond POA-3: Isolated area Peak Elev=154.45' Storage=0.025 af Inflow=1.05 cfs 0.206 af
Outflow=0.48 cfs 0.206 af

Pond POA-5: Isolated area Peak Elev=168.03' Storage=0.000 af Inflow=0.03 cfs 0.016 af
Outflow=0.03 cfs 0.016 af

Link POA-1: Inflow=28.74 cfs 7.304 af
Primary=28.74 cfs 7.304 af

Link POA-2: Inflow=22.07 cfs 1.608 af
Primary=22.07 cfs 1.608 af

Link POA-4: Inflow=25.63 cfs 6.349 af
Primary=25.63 cfs 6.349 af

Link POA-6: Inflow=6.97 cfs 0.963 af
Primary=6.97 cfs 0.963 af

Link POA-7: Inflow=0.32 cfs 0.091 af
Primary=0.32 cfs 0.091 af

Link POA-8: Inflow=0.99 cfs 0.227 af
Primary=0.99 cfs 0.227 af

Link POA-9: Inflow=0.34 cfs 0.133 af
Primary=0.34 cfs 0.133 af

Summary for Subcatchment E1A:

Runoff = 28.32 cfs @ 12.41 hrs, Volume= 3.744 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
1.814	98	Paved parking, HSG A
0.392	98	Paved parking, HSG B
0.213	98	Paved parking, HSG C
12.977	39	>75% Grass cover, Good, HSG A
9.807	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
1.540	30	Woods, Good, HSG A
26.862	52	Weighted Average
24.443		90.99% Pervious Area
2.419		9.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
13.0	960	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.3	1,010	Total			

Summary for Subcatchment E1B:

Runoff = 18.25 cfs @ 12.72 hrs, Volume= 3.560 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

	Area (ac)	CN	Description
*	0.183	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	1.061	39	>75% Grass cover, Good, HSG A
	22.594	30	Woods, Good, HSG A
	2.849	55	Woods, Good, HSG B
	7.213	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
	36.288	46	Weighted Average
	33.717		92.92% Pervious Area
	2.571		7.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment E2:

Runoff = 22.07 cfs @ 12.09 hrs, Volume= 1.608 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
2.841	98	Paved parking, HSG A
0.034	98	Paved parking, HSG B
1.368	39	>75% Grass cover, Good, HSG A
0.348	61	>75% Grass cover, Good, HSG B
4.591	78	Weighted Average
1.716		37.38% Pervious Area
2.875		62.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1200	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.4	370	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9					**Direct Entry, To make min. allowable**
6.0	420	Total			

Summary for Subcatchment E3:

Runoff = 1.05 cfs @ 12.41 hrs, Volume= 0.206 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

	Area (ac)	CN	Description
*	0.068	98	Impervious areas
	3.041	39	>75% Grass cover, Good, HSG A
	1.029	30	Woods, Good, HSG A
	4.138	38	Weighted Average
	4.070		98.36% Pervious Area
	0.068		1.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
5.0	475	0.0505	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	525	Total			

Summary for Subcatchment E4:

Runoff = 25.63 cfs @ 13.18 hrs, Volume= 6.349 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
1.096	98	Paved parking, HSG A
2.226	98	Paved parking, HSG B
12.744	39	>75% Grass cover, Good, HSG A
6.640	61	>75% Grass cover, Good, HSG B
13.210	30	Woods, Good, HSG A
4.724	55	Woods, Good, HSG B
0.532	72	Dirt roads, HSG A
2.311	73	Brush, Good, HSG D
4.522	77	Woods, Good, HSG D
48.005	51	Weighted Average
44.683		93.08% Pervious Area
3.322		6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
6.9	350	0.0290	0.85		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
58.1	955	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.7	1,030	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030 Earth, grassed & winding
77.6	2,385	Total			

Summary for Subcatchment E5:

Runoff = 0.03 cfs @ 14.76 hrs, Volume= 0.016 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
1.156	30	Woods, Good, HSG A
1.156		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.1	160	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	210	Total			

Summary for Subcatchment E6:

Runoff = 6.97 cfs @ 12.32 hrs, Volume= 0.963 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.249	30	Woods, Good, HSG A
10.520	45	Weighted Average
9.407		89.42% Pervious Area
1.113		10.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment E7:

Runoff = 0.32 cfs @ 12.54 hrs, Volume= 0.091 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
0.025	61	>75% Grass cover, Good, HSG B
1.877	30	Woods, Good, HSG A
2.631	35	Weighted Average
2.544		96.68% Pervious Area
0.087		3.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment E8:

Runoff = 0.99 cfs @ 12.43 hrs, Volume= 0.227 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
4.709	30	Woods, Good, HSG A
0.678	55	Woods, Good, HSG B
0.368	77	Woods, Good, HSG D
5.755	36	Weighted Average
5.755		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	190	0.0816	1.43		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.7	240	Total			

Summary for Subcatchment E9:

Runoff = 0.34 cfs @ 12.53 hrs, Volume= 0.133 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
4.923	30	Woods, Good, HSG A
0.317	77	Woods, Good, HSG D
5.240	33	Weighted Average
5.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	215	0.1070	1.64		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	70	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.3	335	Total			

Summary for Pond EP: Existing Pond

Inflow Area = 36.288 ac, 7.08% Impervious, Inflow Depth = 1.18" for 100-yr event
Inflow = 18.25 cfs @ 12.72 hrs, Volume= 3.560 af
Outflow = 3.67 cfs @ 15.64 hrs, Volume= 3.560 af, Atten= 80%, Lag= 175.2 min
Primary = 3.67 cfs @ 15.64 hrs, Volume= 3.560 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 144.06' @ 15.64 hrs Surf.Area= 2.890 ac Storage= 1.499 af

Plug-Flow detention time= 304.1 min calculated for 3.556 af (100% of inflow)
Center-of-Mass det. time= 304.7 min (1,238.9 - 934.3)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=3.67 cfs @ 15.64 hrs HW=144.06' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 3.67 cfs @ 3.95 fps)

Summary for Pond POA-3: Isolated area

Inflow Area = 4.138 ac, 1.64% Impervious, Inflow Depth = 0.60" for 100-yr event
Inflow = 1.05 cfs @ 12.41 hrs, Volume= 0.206 af
Outflow = 0.48 cfs @ 12.90 hrs, Volume= 0.206 af, Atten= 54%, Lag= 29.6 min
Discarded = 0.48 cfs @ 12.90 hrs, Volume= 0.206 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Peak Elev= 154.45' @ 12.90 hrs Surf.Area= 0.058 ac Storage= 0.025 af

Plug-Flow detention time= 22.0 min calculated for 0.206 af (100% of inflow)
Center-of-Mass det. time= 22.0 min (973.6 - 951.6)

Volume	Invert	Avail.Storage	Storage Description
#1	153.60'	0.206 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
153.60	0.000	0.000	0.000
154.00	0.028	0.006	0.006
155.00	0.094	0.061	0.067
156.00	0.185	0.139	0.206

Device	Routing	Invert	Outlet Devices
#1	Discarded	153.60'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.48 cfs @ 12.90 hrs HW=154.45' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.48 cfs)

Summary for Pond POA-5: Isolated area

Inflow Area = 1.156 ac, 0.00% Impervious, Inflow Depth = 0.16" for 100-yr event
Inflow = 0.03 cfs @ 14.76 hrs, Volume= 0.016 af
Outflow = 0.03 cfs @ 14.81 hrs, Volume= 0.016 af, Atten= 0%, Lag= 2.9 min
Discarded = 0.03 cfs @ 14.81 hrs, Volume= 0.016 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 168.03' @ 14.81 hrs Surf.Area= 0.003 ac Storage= 0.000 af

Plug-Flow detention time= 0.9 min calculated for 0.016 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (1,058.6 - 1,057.7)

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	0.450 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
168.00	0.000	0.000	0.000
169.00	0.106	0.053	0.053
170.00	0.204	0.155	0.208
171.00	0.280	0.242	0.450

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 14.81 hrs HW=168.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Summary for Link POA-1:

Inflow Area = 63.150 ac, 7.90% Impervious, Inflow Depth = 1.39" for 100-yr event
Inflow = 28.74 cfs @ 12.41 hrs, Volume= 7.304 af
Primary = 28.74 cfs @ 12.41 hrs, Volume= 7.304 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-2:

Inflow Area = 4.591 ac, 62.62% Impervious, Inflow Depth = 4.20" for 100-yr event
Inflow = 22.07 cfs @ 12.09 hrs, Volume= 1.608 af
Primary = 22.07 cfs @ 12.09 hrs, Volume= 1.608 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-4:

Inflow Area = 48.005 ac, 6.92% Impervious, Inflow Depth = 1.59" for 100-yr event
Inflow = 25.63 cfs @ 13.18 hrs, Volume= 6.349 af
Primary = 25.63 cfs @ 13.18 hrs, Volume= 6.349 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.520 ac, 10.58% Impervious, Inflow Depth = 1.10" for 100-yr event
Inflow = 6.97 cfs @ 12.32 hrs, Volume= 0.963 af
Primary = 6.97 cfs @ 12.32 hrs, Volume= 0.963 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 3.32% Impervious, Inflow Depth = 0.41" for 100-yr event
Inflow = 0.32 cfs @ 12.54 hrs, Volume= 0.091 af
Primary = 0.32 cfs @ 12.54 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 5.755 ac, 0.00% Impervious, Inflow Depth = 0.47" for 100-yr event
Inflow = 0.99 cfs @ 12.43 hrs, Volume= 0.227 af
Primary = 0.99 cfs @ 12.43 hrs, Volume= 0.227 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

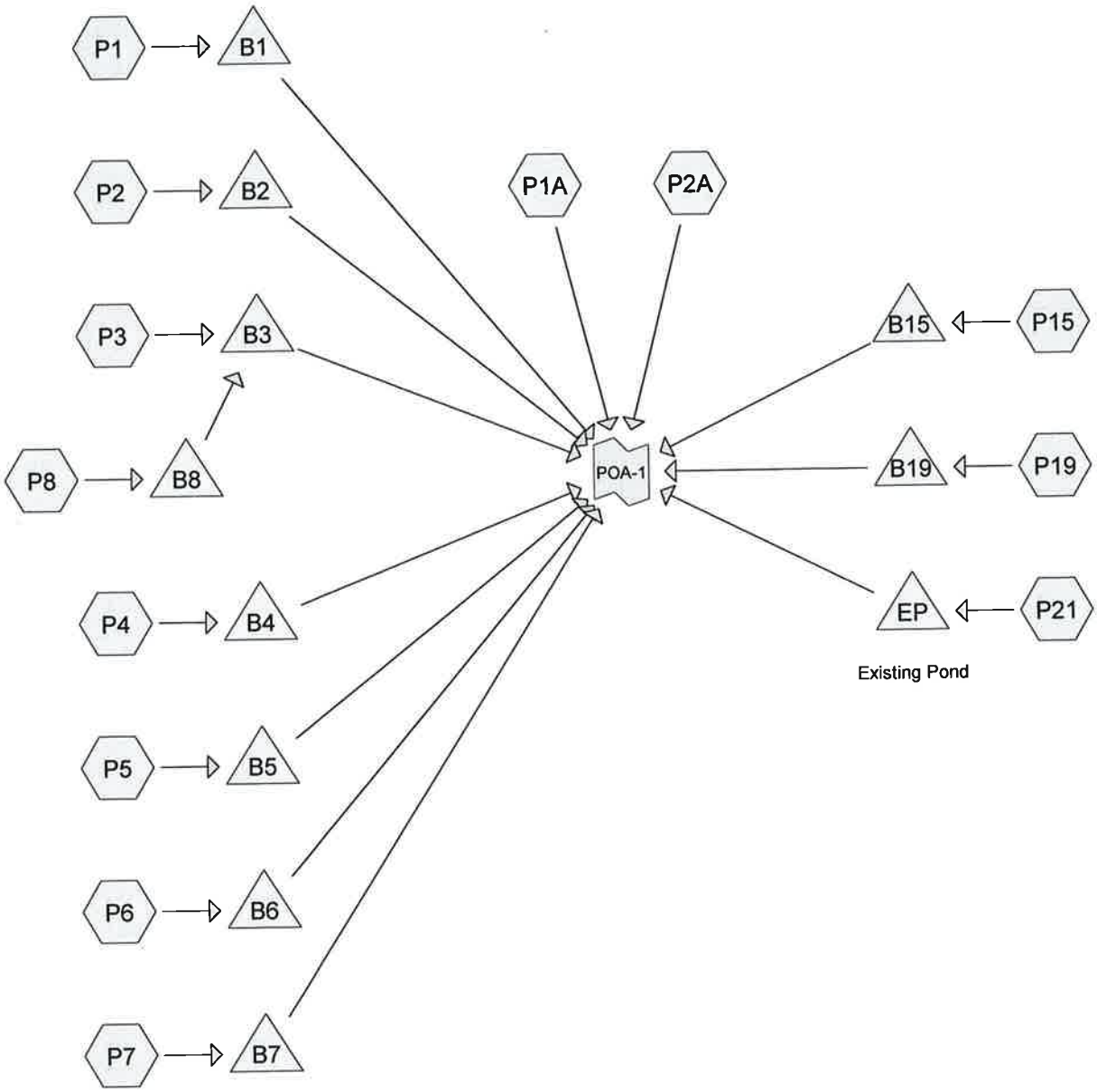
Inflow Area =	5.240 ac,	0.00% Impervious,	Inflow Depth =	0.30"	for 100-yr event
Inflow =	0.34 cfs @	12.53 hrs, Volume=	0.133 af		
Primary =	0.34 cfs @	12.53 hrs, Volume=	0.133 af,	Atten= 0%,	Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

APPENDIX D – POST DEVELOPMENT WATERSHED AREA MAP

APPENDIX E – POST DEVELOPMENT STORMWATER CALCULATIONS

SEE 2ND HYDROCAD FILE IN THIS APPENDIX FOR OTHER POA'S



Subcat Reach Pond Link

Routing Diagram for W161041 - Post - POA1
Prepared by Bohler Engineering, Printed 11/17/2016
HydroCAD® 10.00-19 s/n 08311 © 2016 HydroCAD Software Solutions LLC

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

Subcatchment P1: Runoff Area=7.269 ac 48.40% Impervious Runoff Depth=0.42"
Tc=6.0 min CN=69 Runoff=2.62 cfs 0.255 af

Subcatchment P15: Runoff Area=4.354 ac 56.43% Impervious Runoff Depth=0.53"
Tc=6.0 min CN=72 Runoff=2.24 cfs 0.192 af

Subcatchment P19: Runoff Area=0.526 ac 77.19% Impervious Runoff Depth=1.31"
Tc=6.0 min CN=87 Runoff=0.81 cfs 0.057 af

Subcatchment P1A: Runoff Area=0.224 ac 0.00% Impervious Runoff Depth=0.30"
Tc=6.0 min CN=65 Runoff=0.04 cfs 0.006 af

Subcatchment P2: Runoff Area=11.575 ac 48.12% Impervious Runoff Depth=0.53"
Tc=6.0 min CN=72 Runoff=5.95 cfs 0.510 af

Subcatchment P21: Runoff Area=25.491 ac 10.29% Impervious Runoff Depth=0.02"
Flow Length=2,120' Tc=43.5 min CN=49 Runoff=0.05 cfs 0.034 af

Subcatchment P2A: Runoff Area=0.529 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment P3: Runoff Area=6.635 ac 58.87% Impervious Runoff Depth=0.84"
Tc=6.0 min CN=79 Runoff=6.21 cfs 0.463 af

Subcatchment P4: Runoff Area=1.047 ac 37.44% Impervious Runoff Depth=0.36"
Tc=6.0 min CN=67 Runoff=0.28 cfs 0.031 af

Subcatchment P5: Runoff Area=1.385 ac 46.21% Impervious Runoff Depth=0.53"
Tc=6.0 min CN=72 Runoff=0.71 cfs 0.061 af

Subcatchment P6: Runoff Area=1.060 ac 54.06% Impervious Runoff Depth=0.65"
Tc=6.0 min CN=75 Runoff=0.72 cfs 0.057 af

Subcatchment P7: Runoff Area=0.450 ac 54.44% Impervious Runoff Depth=0.69"
Tc=6.0 min CN=76 Runoff=0.33 cfs 0.026 af

Subcatchment P8: Runoff Area=13.365 ac 53.06% Impervious Runoff Depth=0.49"
Tc=6.0 min CN=71 Runoff=6.16 cfs 0.547 af

Pond B1: Peak Elev=144.57' Storage=1,295 cf Inflow=2.62 cfs 0.255 af
Discarded=1.04 cfs 0.255 af Primary=0.00 cfs 0.000 af Outflow=1.04 cfs 0.255 af

Pond B15: Peak Elev=164.09' Storage=1,192 cf Inflow=2.24 cfs 0.192 af
Discarded=0.77 cfs 0.192 af Primary=0.00 cfs 0.000 af Outflow=0.77 cfs 0.192 af

Pond B19: Peak Elev=161.56' Storage=872 cf Inflow=0.81 cfs 0.057 af
Discarded=0.10 cfs 0.057 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.057 af

Pond B2: Peak Elev=145.82' Storage=11,046 cf Inflow=5.95 cfs 0.510 af
Discarded=0.35 cfs 0.510 af Primary=0.00 cfs 0.000 af Outflow=0.35 cfs 0.510 af

Pond B3: Peak Elev=146.38' Storage=10,116 cf Inflow=6.21 cfs 0.463 af
Discarded=0.33 cfs 0.463 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.463 af

Pond B4: Peak Elev=154.02' Storage=65 cf Inflow=0.28 cfs 0.031 af
Discarded=0.17 cfs 0.031 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.031 af

Pond B5: Peak Elev=160.22' Storage=581 cf Inflow=0.71 cfs 0.061 af
Discarded=0.15 cfs 0.061 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.061 af

Pond B6: Peak Elev=171.34' Storage=677 cf Inflow=0.72 cfs 0.057 af
Discarded=0.12 cfs 0.057 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.057 af

Pond B7: Peak Elev=171.07' Storage=156 cf Inflow=0.33 cfs 0.026 af
Discarded=0.12 cfs 0.026 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.026 af

Pond B8: Peak Elev=148.91' Storage=6,527 cf Inflow=6.16 cfs 0.547 af
Discarded=0.91 cfs 0.547 af Primary=0.00 cfs 0.000 af Outflow=0.91 cfs 0.547 af

Pond EP: Existing Pond Peak Elev=143.50' Storage=0.000 af Inflow=0.05 cfs 0.034 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=0.05 cfs 0.034 af

Link POA-1: Inflow=0.05 cfs 0.040 af
Primary=0.05 cfs 0.040 af

Summary for Subcatchment P1:

Runoff = 2.62 cfs @ 12.11 hrs, Volume= 0.255 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
2.894	98	Paved parking, HSG A
3.188	39	>75% Grass cover, Good, HSG A
0.563	61	>75% Grass cover, Good, HSG B
0.624	98	Water Surface, HSG A
7.269	69	Weighted Average
3.751		51.60% Pervious Area
3.518		48.40% Impervious Area

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

Summary for Subcatchment P15:

Runoff = 2.24 cfs @ 12.10 hrs, Volume= 0.192 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
1.922	98	Paved parking, HSG A
1.897	39	>75% Grass cover, Good, HSG A
0.535	98	Water Surface, HSG A
4.354	72	Weighted Average
1.897		43.57% Pervious Area
2.457		56.43% Impervious Area

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

Summary for Subcatchment P19:

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.057 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.313	98	Paved parking, HSG A
0.120	49	50-75% Grass cover, Fair, HSG A
0.093	98	Water Surface, HSG A
0.526	87	Weighted Average
0.120		22.81% Pervious Area
0.406		77.19% Impervious Area

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

Summary for Subcatchment P1A:

Runoff = 0.04 cfs @ 12.13 hrs, Volume= 0.006 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.028	39	>75% Grass cover, Good, HSG A
0.077	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
0.224	65	Weighted Average
0.224		100.00% Pervious Area

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

Summary for Subcatchment P2:

Runoff = 5.95 cfs @ 12.10 hrs, Volume= 0.510 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
2.892	98	Paved parking, HSG A
2.105	98	Paved parking, HSG B
0.074	98	Paved parking, HSG B
3.531	39	>75% Grass cover, Good, HSG A
2.124	61	>75% Grass cover, Good, HSG B
0.350	61	>75% Grass cover, Good, HSG B
0.499	98	Water Surface, HSG B
11.575	72	Weighted Average
6.005		51.88% Pervious Area
5.570		48.12% Impervious Area

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

Summary for Subcatchment P21:

Runoff = 0.05 cfs @ 17.83 hrs, Volume= 0.034 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
*	0.234	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	16.113	30	Woods, Good, HSG A
	6.285	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
*	0.471	30	Woods, Good, HSG A on west side of rd
	25.491	49	Weighted Average
	22.869		89.71% Pervious Area
	2.622		10.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment P2A:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.529	39	>75% Grass cover, Good, HSG A
0.529		100.00% Pervious Area

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

Summary for Subcatchment P3:

Runoff = 6.21 cfs @ 12.10 hrs, Volume= 0.463 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
1.928	98	Paved parking, HSG A
1.158	98	Paved parking, HSG B
1.251	39	>75% Grass cover, Good, HSG A
1.478	61	>75% Grass cover, Good, HSG B
0.820	98	Water Surface, HSG B
6.635	79	Weighted Average
2.729		41.13% Pervious Area
3.906		58.87% Impervious Area

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

Summary for Subcatchment P4:

Runoff = 0.28 cfs @ 12.12 hrs, Volume= 0.031 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.255	98	Paved parking, HSG A
0.655	49	50-75% Grass cover, Fair, HSG A
0.137	98	Water Surface, HSG A
1.047	67	Weighted Average
0.655		62.56% Pervious Area
0.392		37.44% Impervious Area

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

Summary for Subcatchment P5:

Runoff = 0.71 cfs @ 12.10 hrs, Volume= 0.061 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.510	98	Paved parking, HSG A
0.745	49	50-75% Grass cover, Fair, HSG A
0.130	98	Water Surface, HSG A
1.385	72	Weighted Average
0.745		53.79% Pervious Area
0.640		46.21% Impervious Area

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

Summary for Subcatchment P6:

Runoff = 0.72 cfs @ 12.10 hrs, Volume= 0.057 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.444	98	Paved parking, HSG A
0.487	49	50-75% Grass cover, Fair, HSG A
0.129	98	Water Surface, HSG A
1.060	75	Weighted Average
0.487		45.94% Pervious Area
0.573		54.06% Impervious Area

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

Summary for Subcatchment P7:

Runoff = 0.33 cfs @ 12.10 hrs, Volume= 0.026 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.127	98	Paved parking, HSG A
0.205	49	50-75% Grass cover, Fair, HSG A
0.118	98	Water Surface, HSG A
0.450	76	Weighted Average
0.205		45.56% Pervious Area
0.245		54.44% Impervious Area

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

Summary for Subcatchment P8:

Runoff = 6.16 cfs @ 12.11 hrs, Volume= 0.547 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
5.877	98	Paved parking, HSG A
0.612	98	Paved parking, HSG B
5.683	39	>75% Grass cover, Good, HSG A
0.591	61	>75% Grass cover, Good, HSG B
0.527	98	Water Surface, HSG A
0.075	98	Water Surface, HSG B
13.365	71	Weighted Average
6.274		46.94% Pervious Area
7.091		53.06% Impervious Area

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

Summary for Pond B1:

Inflow Area = 7.269 ac, 48.40% Impervious, Inflow Depth = 0.42" for 1-yr event
Inflow = 2.62 cfs @ 12.11 hrs, Volume= 0.255 af
Outflow = 1.04 cfs @ 12.50 hrs, Volume= 0.255 af, Atten= 60%, Lag= 23.2 min
Discarded = 1.04 cfs @ 12.50 hrs, Volume= 0.255 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 144.57' @ 12.50 hrs Surf.Area= 18,658 sf Storage= 1,295 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 5.3 min (907.5 - 902.2)

Volume	Invert	Avail.Storage	Storage Description
#1	144.50'	69,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.50	18,491	600.0	0	0	18,491
145.00	19,705	613.0	9,547	9,547	19,782
146.00	22,208	639.0	20,944	30,491	22,447
147.00	27,898	753.0	24,999	55,490	35,094
147.50	29,416	765.0	14,327	69,817	36,593

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	142.60'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.60' / 142.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	146.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.04 cfs @ 12.50 hrs HW=144.57' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 1.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=144.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 5.27 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B15:

Inflow Area =	4.354 ac, 56.43% Impervious, Inflow Depth = 0.53" for 1-yr event				
Inflow =	2.24 cfs @	12.10 hrs, Volume=	0.192 af		
Outflow =	0.77 cfs @	12.50 hrs, Volume=	0.192 af, Atten= 65%, Lag= 23.6 min		
Discarded =	0.77 cfs @	12.50 hrs, Volume=	0.192 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 164.09' @ 12.50 hrs Surf.Area= 13,867 sf Storage= 1,192 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.2 min (895.1 - 888.0)

Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	55,104 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
164.00	13,647	648.0	0	0	13,647
165.00	16,290	672.0	14,949	14,949	16,253
166.00	20,496	647.0	18,353	33,302	18,959
167.00	23,135	672.0	21,802	55,104	21,664

Device	Routing	Invert	Outlet Devices
#1	Discarded	164.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.00'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.00' / 162.50' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	165.90'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.77 cfs @ 12.50 hrs HW=164.09' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.77 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=164.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 2.83 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B19:

Inflow Area =	0.526 ac, 77.19% Impervious, Inflow Depth = 1.31" for 1-yr event				
Inflow =	0.81 cfs @	12.09 hrs, Volume=	0.057 af		
Outflow =	0.10 cfs @	12.82 hrs, Volume=	0.057 af, Atten= 88%, Lag= 43.7 min		
Discarded =	0.10 cfs @	12.82 hrs, Volume=	0.057 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.56' @ 12.82 hrs Surf.Area= 1,760 sf Storage= 872 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 74.1 min (903.9 - 829.7)

Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	8,062 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
161.00	1,369	171.0	0	0	1,369
162.00	2,104	196.0	1,723	1,723	2,122
163.00	3,285	249.0	2,673	4,396	4,012
164.00	4,060	268.0	3,666	8,062	4,835

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.95'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 160.95' / 160.75' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	163.20'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.10 cfs @ 12.82 hrs HW=161.56' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.01 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B2:

Inflow Area =	11.575 ac, 48.12% Impervious, Inflow Depth = 0.53" for 1-yr event				
Inflow =	5.95 cfs @	12.10 hrs,	Volume=	0.510 af	
Outflow =	0.35 cfs @	16.22 hrs,	Volume=	0.510 af,	Atten= 94%, Lag= 247.0 min
Discarded =	0.35 cfs @	16.22 hrs,	Volume=	0.510 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 145.82' @ 16.22 hrs Surf.Area= 14,684 sf Storage= 11,046 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 368.9 min (1,256.9 - 888.0)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	57,064 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.00	12,284	726.0	0	0	12,284
146.00	15,238	751.0	13,735	13,735	15,314
147.00	22,698	838.0	18,845	32,579	26,343
148.00	26,316	939.0	24,485	57,064	40,653

Device	Routing	Invert	Outlet Devices
#1	Discarded	145.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	142.20'	**24.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.20' / 141.90' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 3.14 sf
#3	Device 2	147.10'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.35 cfs @ 16.22 hrs HW=145.82' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.35 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=145.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 15.84 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B3:

Inflow Area =	20.000 ac, 54.99% Impervious, Inflow Depth = 0.28" for 1-yr event				
Inflow =	6.21 cfs @	12.10 hrs,	Volume=	0.463 af	
Outflow =	0.33 cfs @	15.60 hrs,	Volume=	0.463 af,	Atten= 95%, Lag= 210.4 min
Discarded =	0.33 cfs @	15.60 hrs,	Volume=	0.463 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

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

Peak Elev= 146.38' @ 15.60 hrs Surf.Area= 27,211 sf Storage= 10,116 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 333.3 min (1,193.4 - 860.1)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	101,752 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	26,149	699.0	0	0	26,149
147.00	28,995	724.0	27,560	27,560	29,068
148.00	38,623	1,118.0	33,694	61,254	86,829
149.00	42,403	996.0	40,498	101,752	107,379

Device	Routing	Invert	Outlet Devices
#1	Discarded	146.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	145.40'	**15.0" Round Culvert** L= 90.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.40' / 144.50' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	148.05'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.33 cfs @ 15.60 hrs HW=146.38' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=146.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.11 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B4:

Inflow Area =	1.047 ac, 37.44% Impervious, Inflow Depth = 0.36" for 1-yr event			
Inflow =	0.28 cfs @	12.12 hrs, Volume=	0.031 af	
Outflow =	0.17 cfs @	12.40 hrs, Volume=	0.031 af, Atten= 39%, Lag= 16.8 min	
Discarded =	0.17 cfs @	12.40 hrs, Volume=	0.031 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 154.02' @ 12.40 hrs Surf.Area= 3,050 sf Storage= 65 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.2 min (914.2 - 913.0)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	13,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.00	3,033	204.0	0	0	3,033
155.00	3,898	229.0	3,456	3,456	3,921
156.00	4,863	254.0	4,372	7,828	4,912
157.00	5,966	291.0	5,405	13,233	6,540

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	153.25'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 153.25' / 152.25' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	155.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.17 cfs @ 12.40 hrs HW=154.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.66 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B5:

Inflow Area =	1.385 ac, 46.21% Impervious, Inflow Depth = 0.53" for 1-yr event				
Inflow =	0.71 cfs @	12.10 hrs,	Volume=	0.061 af	
Outflow =	0.15 cfs @	12.63 hrs,	Volume=	0.061 af,	Atten= 78%, Lag= 31.5 min
Discarded =	0.15 cfs @	12.63 hrs,	Volume=	0.061 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 160.22' @ 12.63 hrs Surf.Area= 2,749 sf Storage= 581 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 25.0 min (913.0 - 888.0)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	12,134 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	2,555	224.0	0	0	2,555
161.00	3,500	249.0	3,015	3,015	3,525
162.00	4,545	274.0	4,011	7,026	4,598
163.00	5,691	299.0	5,107	12,134	5,774

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

			Inlet / Outlet Invert= 159.50' / 159.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	162.55'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.15 cfs @ 12.63 hrs HW=160.22' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B6:

Inflow Area =	1.060 ac, 54.06% Impervious, Inflow Depth = 0.65" for 1-yr event			
Inflow =	0.72 cfs @	12.10 hrs, Volume=	0.057 af	
Outflow =	0.12 cfs @	12.77 hrs, Volume=	0.057 af, Atten= 83%, Lag= 40.4 min	
Discarded =	0.12 cfs @	12.77 hrs, Volume=	0.057 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 171.34' @ 12.77 hrs Surf.Area= 2,179 sf Storage= 677 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 43.9 min (919.3 - 875.4)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,797 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	1,828	269.0	0	0	1,828
172.00	2,953	294.0	2,368	2,368	2,983
173.00	4,178	319.0	3,548	5,916	4,240
174.00	5,619	382.0	4,881	10,797	7,772

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	170.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 170.50' / 170.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	173.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.12 cfs @ 12.77 hrs HW=171.34' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B7:

Inflow Area = 0.450 ac, 54.44% Impervious, Inflow Depth = 0.69" for 1-yr event
Inflow = 0.33 cfs @ 12.10 hrs, Volume= 0.026 af
Outflow = 0.12 cfs @ 12.45 hrs, Volume= 0.026 af, Atten= 64%, Lag= 21.1 min
Discarded = 0.12 cfs @ 12.45 hrs, Volume= 0.026 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 171.07' @ 12.45 hrs Surf.Area= 2,173 sf Storage= 156 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 5.9 min (877.4 - 871.5)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,628 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	2,112	214.0	0	0	2,112
172.00	3,018	239.0	2,552	2,552	3,041
173.00	4,025	264.0	3,509	6,061	4,073
174.00	5,132	289.0	4,567	10,628	5,207

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	169.90'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 169.90' / 169.30' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	172.15'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.12 cfs @ 12.45 hrs HW=171.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 3.22 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B8:

Inflow Area = 13.365 ac, 53.06% Impervious, Inflow Depth = 0.49" for 1-yr event
Inflow = 6.16 cfs @ 12.11 hrs, Volume= 0.547 af
Outflow = 0.91 cfs @ 13.12 hrs, Volume= 0.547 af, Atten= 85%, Lag= 60.6 min
Discarded = 0.91 cfs @ 13.12 hrs, Volume= 0.547 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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

Peak Elev= 148.91' @ 13.12 hrs Surf.Area= 16,333 sf Storage= 6,527 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 63.3 min (955.8 - 892.5)

Volume	Invert	Avail.Storage	Storage Description
#1	148.50'	67,796 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.50	15,240	657.0	0	0	15,240
149.00	16,566	669.0	7,949	7,949	16,549
150.50	26,501	661.0	32,010	39,959	17,857
151.50	29,194	686.0	27,837	67,796	20,620

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	149.60'	**30.0" Round Culvert** L= 310.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 149.60' / 148.05' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 4.91 sf

Discarded OutFlow Max=0.91 cfs @ 13.12 hrs HW=148.91' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.91 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.50' TW=146.00' (Dynamic Tailwater)
↑—**2=Culvert** (Controls 0.00 cfs)

Summary for Pond EP: Existing Pond

Inflow Area =	25.491 ac, 10.29% Impervious, Inflow Depth = 0.02" for 1-yr event			
Inflow =	0.05 cfs @	17.83 hrs, Volume=	0.034 af	
Outflow =	0.05 cfs @	17.83 hrs, Volume=	0.034 af, Atten= 0%, Lag= 0.0 min	
Primary =	0.05 cfs @	17.83 hrs, Volume=	0.034 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 143.50' @ 0.00 hrs Surf.Area= 2.550 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,209.5 - 1,209.5)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=0.00 cfs @ 17.83 hrs HW=143.50' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.00 cfs of 0.29 cfs potential flow)

Summary for Link POA-1:

Inflow Area = 73.910 ac, 37.10% Impervious, Inflow Depth = 0.01" for 1-yr event
Inflow = 0.05 cfs @ 17.74 hrs, Volume= 0.040 af
Primary = 0.05 cfs @ 17.74 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment P1: Runoff Area=7.269 ac 48.40% Impervious Runoff Depth=0.78"
Tc=6.0 min CN=69 Runoff=5.83 cfs 0.472 af

Subcatchment P15: Runoff Area=4.354 ac 56.43% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=72 Runoff=4.39 cfs 0.337 af

Subcatchment P19: Runoff Area=0.526 ac 77.19% Impervious Runoff Depth=1.91"
Tc=6.0 min CN=87 Runoff=1.18 cfs 0.084 af

Subcatchment P1A: Runoff Area=0.224 ac 0.00% Impervious Runoff Depth=0.60"
Tc=6.0 min CN=65 Runoff=0.12 cfs 0.011 af

Subcatchment P2: Runoff Area=11.575 ac 48.12% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=72 Runoff=11.66 cfs 0.897 af

Subcatchment P21: Runoff Area=25.491 ac 10.29% Impervious Runoff Depth=0.11"
Flow Length=2,120' Tc=43.5 min CN=49 Runoff=0.38 cfs 0.231 af

Subcatchment P2A: Runoff Area=0.529 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment P3: Runoff Area=6.635 ac 58.87% Impervious Runoff Depth=1.34"
Tc=6.0 min CN=79 Runoff=10.25 cfs 0.739 af

Subcatchment P4: Runoff Area=1.047 ac 37.44% Impervious Runoff Depth=0.69"
Tc=6.0 min CN=67 Runoff=0.70 cfs 0.060 af

Subcatchment P5: Runoff Area=1.385 ac 46.21% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=72 Runoff=1.40 cfs 0.107 af

Subcatchment P6: Runoff Area=1.060 ac 54.06% Impervious Runoff Depth=1.09"
Tc=6.0 min CN=75 Runoff=1.30 cfs 0.097 af

Subcatchment P7: Runoff Area=0.450 ac 54.44% Impervious Runoff Depth=1.15"
Tc=6.0 min CN=76 Runoff=0.59 cfs 0.043 af

Subcatchment P8: Runoff Area=13.365 ac 53.06% Impervious Runoff Depth=0.88"
Tc=6.0 min CN=71 Runoff=12.53 cfs 0.978 af

Pond B1: Peak Elev=144.77' Storage=5,065 cf Inflow=5.83 cfs 0.472 af
Discarded=1.07 cfs 0.472 af Primary=0.00 cfs 0.000 af Outflow=1.07 cfs 0.472 af

Pond B15: Peak Elev=164.27' Storage=3,750 cf Inflow=4.39 cfs 0.337 af
Discarded=0.80 cfs 0.337 af Primary=0.00 cfs 0.000 af Outflow=0.80 cfs 0.337 af

Pond B19: Peak Elev=161.86' Storage=1,442 cf Inflow=1.18 cfs 0.084 af
Discarded=0.11 cfs 0.084 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.084 af

Pond B2: Peak Elev=146.55' Storage=23,244 cf Inflow=11.66 cfs 0.897 af
Discarded=0.45 cfs 0.897 af Primary=0.00 cfs 0.000 af Outflow=0.45 cfs 0.897 af

Pond B3: Peak Elev=146.71' Storage=19,281 cf Inflow=10.25 cfs 0.739 af
Discarded=0.34 cfs 0.739 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.739 af

Pond B4: Peak Elev=154.16' Storage=511 cf Inflow=0.70 cfs 0.060 af
Discarded=0.18 cfs 0.060 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.060 af

Pond B5: Peak Elev=160.55' Storage=1,531 cf Inflow=1.40 cfs 0.107 af
Discarded=0.17 cfs 0.107 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.107 af

Pond B6: Peak Elev=171.69' Storage=1,509 cf Inflow=1.30 cfs 0.097 af
Discarded=0.14 cfs 0.097 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.097 af

Pond B7: Peak Elev=171.20' Storage=444 cf Inflow=0.59 cfs 0.043 af
Discarded=0.13 cfs 0.043 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.043 af

Pond B8: Peak Elev=149.50' Storage=16,896 cf Inflow=12.53 cfs 0.978 af
Discarded=1.09 cfs 0.978 af Primary=0.00 cfs 0.000 af Outflow=1.09 cfs 0.978 af

Pond EP: Existing Pond Peak Elev=143.51' Storage=0.015 af Inflow=0.38 cfs 0.231 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=0.30 cfs 0.231 af

Link POA-1: Inflow=0.31 cfs 0.242 af
Primary=0.31 cfs 0.242 af

Summary for Subcatchment P1:

Runoff = 5.83 cfs @ 12.10 hrs, Volume= 0.472 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
2.894	98	Paved parking, HSG A
3.188	39	>75% Grass cover, Good, HSG A
0.563	61	>75% Grass cover, Good, HSG B
0.624	98	Water Surface, HSG A
7.269	69	Weighted Average
3.751		51.60% Pervious Area
3.518		48.40% Impervious Area

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

Summary for Subcatchment P15:

Runoff = 4.39 cfs @ 12.10 hrs, Volume= 0.337 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.922	98	Paved parking, HSG A
1.897	39	>75% Grass cover, Good, HSG A
0.535	98	Water Surface, HSG A
4.354	72	Weighted Average
1.897		43.57% Pervious Area
2.457		56.43% Impervious Area

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

Summary for Subcatchment P19:

Runoff = 1.18 cfs @ 12.09 hrs, Volume= 0.084 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.313	98	Paved parking, HSG A
0.120	49	50-75% Grass cover, Fair, HSG A
0.093	98	Water Surface, HSG A
0.526	87	Weighted Average
0.120		22.81% Pervious Area
0.406		77.19% Impervious Area

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

Summary for Subcatchment P1A:

Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.011 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.028	39	>75% Grass cover, Good, HSG A
0.077	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
0.224	65	Weighted Average
0.224		100.00% Pervious Area

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

Summary for Subcatchment P2:

Runoff = 11.66 cfs @ 12.10 hrs, Volume= 0.897 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
2.892	98	Paved parking, HSG A
2.105	98	Paved parking, HSG B
0.074	98	Paved parking, HSG B
3.531	39	>75% Grass cover, Good, HSG A
2.124	61	>75% Grass cover, Good, HSG B
0.350	61	>75% Grass cover, Good, HSG B
0.499	98	Water Surface, HSG B
11.575	72	Weighted Average
6.005		51.88% Pervious Area
5.570		48.12% Impervious Area

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

Summary for Subcatchment P21:

Runoff = 0.38 cfs @ 14.26 hrs, Volume= 0.231 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (ac)	CN	Description
*	0.234	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	16.113	30	Woods, Good, HSG A
	6.285	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
*	0.471	30	Woods, Good, HSG A on west side of rd
	25.491	49	Weighted Average
	22.869		89.71% Pervious Area
	2.622		10.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment P2A:

Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.529	39	>75% Grass cover, Good, HSG A
0.529		100.00% Pervious Area

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

Summary for Subcatchment P3:

Runoff = 10.25 cfs @ 12.09 hrs, Volume= 0.739 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.928	98	Paved parking, HSG A
1.158	98	Paved parking, HSG B
1.251	39	>75% Grass cover, Good, HSG A
1.478	61	>75% Grass cover, Good, HSG B
0.820	98	Water Surface, HSG B
6.635	79	Weighted Average
2.729		41.13% Pervious Area
3.906		58.87% Impervious Area

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

Summary for Subcatchment P4:

Runoff = 0.70 cfs @ 12.10 hrs, Volume= 0.060 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.255	98	Paved parking, HSG A
0.655	49	50-75% Grass cover, Fair, HSG A
0.137	98	Water Surface, HSG A
1.047	67	Weighted Average
0.655		62.56% Pervious Area
0.392		37.44% Impervious Area

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

Summary for Subcatchment P5:

Runoff = 1.40 cfs @ 12.10 hrs, Volume= 0.107 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.510	98	Paved parking, HSG A
0.745	49	50-75% Grass cover, Fair, HSG A
0.130	98	Water Surface, HSG A
1.385	72	Weighted Average
0.745		53.79% Pervious Area
0.640		46.21% Impervious Area

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

Summary for Subcatchment P6:

Runoff = 1.30 cfs @ 12.09 hrs, Volume= 0.097 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.444	98	Paved parking, HSG A
0.487	49	50-75% Grass cover, Fair, HSG A
0.129	98	Water Surface, HSG A
1.060	75	Weighted Average
0.487		45.94% Pervious Area
0.573		54.06% Impervious Area

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

Summary for Subcatchment P7:

Runoff = 0.59 cfs @ 12.09 hrs, Volume= 0.043 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.127	98	Paved parking, HSG A
0.205	49	50-75% Grass cover, Fair, HSG A
0.118	98	Water Surface, HSG A
0.450	76	Weighted Average
0.205		45.56% Pervious Area
0.245		54.44% Impervious Area

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

Summary for Subcatchment P8:

Runoff = 12.53 cfs @ 12.10 hrs, Volume= 0.978 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
5.877	98	Paved parking, HSG A
0.612	98	Paved parking, HSG B
5.683	39	>75% Grass cover, Good, HSG A
0.591	61	>75% Grass cover, Good, HSG B
0.527	98	Water Surface, HSG A
0.075	98	Water Surface, HSG B
13.365	71	Weighted Average
6.274		46.94% Pervious Area
7.091		53.06% Impervious Area

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

Summary for Pond B1:

Inflow Area = 7.269 ac, 48.40% Impervious, Inflow Depth = 0.78" for 2-yr event
Inflow = 5.83 cfs @ 12.10 hrs, Volume= 0.472 af
Outflow = 1.07 cfs @ 12.71 hrs, Volume= 0.472 af, Atten= 82%, Lag= 36.2 min
Discarded = 1.07 cfs @ 12.71 hrs, Volume= 0.472 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 144.77' @ 12.71 hrs Surf.Area= 19,140 sf Storage= 5,065 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 33.6 min (913.0 - 879.4)

Volume	Invert	Avail.Storage	Storage Description
#1	144.50'	69,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.50	18,491	600.0	0	0	18,491
145.00	19,705	613.0	9,547	9,547	19,782
146.00	22,208	639.0	20,944	30,491	22,447
147.00	27,898	753.0	24,999	55,490	35,094
147.50	29,416	765.0	14,327	69,817	36,593

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	142.60'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.60' / 142.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	146.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.07 cfs @ 12.71 hrs HW=144.77' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 1.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=144.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 5.27 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B15:

Inflow Area =	4.354 ac, 56.43% Impervious, Inflow Depth = 0.93" for 2-yr event				
Inflow =	4.39 cfs @	12.10 hrs,	Volume=	0.337 af	
Outflow =	0.80 cfs @	12.64 hrs,	Volume=	0.337 af,	Atten= 82%, Lag= 32.2 min
Discarded =	0.80 cfs @	12.64 hrs,	Volume=	0.337 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 164.27' @ 12.64 hrs Surf.Area= 14,333 sf Storage= 3,750 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 32.4 min (901.1 - 868.8)

Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	55,104 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
164.00	13,647	648.0	0	0	13,647
165.00	16,290	672.0	14,949	14,949	16,253
166.00	20,496	647.0	18,353	33,302	18,959
167.00	23,135	672.0	21,802	55,104	21,664

Device	Routing	Invert	Outlet Devices
#1	Discarded	164.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.00'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.00' / 162.50' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	165.90'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.80 cfs @ 12.64 hrs HW=164.27' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.80 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=164.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 2.83 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B19:

Inflow Area =	0.526 ac, 77.19% Impervious, Inflow Depth = 1.91" for 2-yr event				
Inflow =	1.18 cfs @	12.09 hrs,	Volume=	0.084 af	
Outflow =	0.11 cfs @	13.02 hrs,	Volume=	0.084 af,	Atten= 91%, Lag= 56.1 min
Discarded =	0.11 cfs @	13.02 hrs,	Volume=	0.084 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.86' @ 13.02 hrs Surf.Area= 1,994 sf Storage= 1,442 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 119.6 min (938.5 - 818.9)

Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	8,062 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
161.00	1,369	171.0	0	0	1,369
162.00	2,104	196.0	1,723	1,723	2,122
163.00	3,285	249.0	2,673	4,396	4,012
164.00	4,060	268.0	3,666	8,062	4,835

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.95'	**15.0" Round Culvert**
			L= 20.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 160.95' / 160.75' S= 0.0100 '/' Cc= 0.900
			n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	163.20'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.11 cfs @ 13.02 hrs HW=161.86' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.01 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B2:

Inflow Area =	11.575 ac, 48.12% Impervious, Inflow Depth = 0.93" for 2-yr event				
Inflow =	11.66 cfs @	12.10 hrs,	Volume=	0.897 af	
Outflow =	0.45 cfs @	17.13 hrs,	Volume=	0.897 af,	Atten= 96%, Lag= 302.2 min
Discarded =	0.45 cfs @	17.13 hrs,	Volume=	0.897 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 146.55' @ 17.13 hrs Surf.Area= 19,186 sf Storage= 23,244 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 614.7 min (1,483.4 - 868.8)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	57,064 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.00	12,284	726.0	0	0	12,284
146.00	15,238	751.0	13,735	13,735	15,314
147.00	22,698	838.0	18,845	32,579	26,343
148.00	26,316	939.0	24,485	57,064	40,653

Device	Routing	Invert	Outlet Devices
#1	Discarded	145.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	142.20'	**24.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.20' / 141.90' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 3.14 sf
#3	Device 2	147.10'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.45 cfs @ 17.13 hrs HW=146.55' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=145.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 15.84 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B3:

Inflow Area =	20.000 ac, 54.99% Impervious, Inflow Depth = 0.44" for 2-yr event				
Inflow =	10.25 cfs @	12.09 hrs,	Volume=	0.739 af	
Outflow =	0.34 cfs @	16.90 hrs,	Volume=	0.739 af,	Atten= 97%, Lag= 288.2 min
Discarded =	0.34 cfs @	16.90 hrs,	Volume=	0.739 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

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

Peak Elev= 146.71' @ 16.90 hrs Surf.Area= 28,155 sf Storage= 19,281 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 595.7 min (1,441.7 - 846.0)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	101,752 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	26,149	699.0	0	0	26,149
147.00	28,995	724.0	27,560	27,560	29,068
148.00	38,623	1,118.0	33,694	61,254	86,829
149.00	42,403	996.0	40,498	101,752	107,379

Device	Routing	Invert	Outlet Devices
#1	Discarded	146.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	145.40'	**15.0" Round Culvert** L= 90.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.40' / 144.50' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	148.05'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.34 cfs @ 16.90 hrs HW=146.71' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=146.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.11 cfs potential flow)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B4:

Inflow Area =	1.047 ac, 37.44% Impervious, Inflow Depth = 0.69" for 2-yr event			
Inflow =	0.70 cfs @ 12.10 hrs, Volume=	0.060 af		
Outflow =	0.18 cfs @ 12.57 hrs, Volume=	0.060 af, Atten= 75%, Lag= 27.9 min		
Discarded =	0.18 cfs @ 12.57 hrs, Volume=	0.060 af		
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 154.16' @ 12.57 hrs Surf.Area= 3,168 sf Storage= 511 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 16.6 min (903.7 - 887.0)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	13,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.00	3,033	204.0	0	0	3,033
155.00	3,898	229.0	3,456	3,456	3,921
156.00	4,863	254.0	4,372	7,828	4,912
157.00	5,966	291.0	5,405	13,233	6,540

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	153.25'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 153.25' / 152.25' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	155.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.18 cfs @ 12.57 hrs HW=154.16' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.66 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B5:

Inflow Area = 1.385 ac, 46.21% Impervious, Inflow Depth = 0.93" for 2-yr event
Inflow = 1.40 cfs @ 12.10 hrs, Volume= 0.107 af
Outflow = 0.17 cfs @ 13.06 hrs, Volume= 0.107 af, Atten= 88%, Lag= 57.8 min
Discarded = 0.17 cfs @ 13.06 hrs, Volume= 0.107 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 160.55' @ 13.06 hrs Surf.Area= 3,053 sf Storage= 1,531 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 82.6 min (951.4 - 868.8)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	12,134 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	2,555	224.0	0	0	2,555
161.00	3,500	249.0	3,015	3,015	3,525
162.00	4,545	274.0	4,011	7,026	4,598
163.00	5,691	299.0	5,107	12,134	5,774

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

			Inlet / Outlet Invert= 159.50' / 159.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	162.55'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.17 cfs @ 13.06 hrs HW=160.55' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B6:

Inflow Area =	1.060 ac, 54.06% Impervious, Inflow Depth = 1.09" for 2-yr event			
Inflow =	1.30 cfs @ 12.09 hrs, Volume=	0.097 af		
Outflow =	0.14 cfs @ 13.10 hrs, Volume=	0.097 af, Atten= 89%, Lag= 60.0 min		
Discarded =	0.14 cfs @ 13.10 hrs, Volume=	0.097 af		
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 171.69' @ 13.10 hrs Surf.Area= 2,574 sf Storage= 1,509 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 102.7 min (961.6 - 858.8)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,797 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	1,828	269.0	0	0	1,828
172.00	2,953	294.0	2,368	2,368	2,983
173.00	4,178	319.0	3,548	5,916	4,240
174.00	5,619	382.0	4,881	10,797	7,772

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	170.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 170.50' / 170.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	173.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.14 cfs @ 13.10 hrs HW=171.69' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B7:

Inflow Area =	0.450 ac, 54.44% Impervious, Inflow Depth = 1.15" for 2-yr event				
Inflow =	0.59 cfs @	12.09 hrs, Volume=	0.043 af		
Outflow =	0.13 cfs @	12.55 hrs, Volume=	0.043 af, Atten= 78%, Lag= 27.4 min		
Discarded =	0.13 cfs @	12.55 hrs, Volume=	0.043 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 171.20' @ 12.55 hrs Surf.Area= 2,282 sf Storage= 444 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 21.1 min (876.6 - 855.6)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,628 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	2,112	214.0	0	0	2,112
172.00	3,018	239.0	2,552	2,552	3,041
173.00	4,025	264.0	3,509	6,061	4,073
174.00	5,132	289.0	4,567	10,628	5,207

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	169.90'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 169.90' / 169.30' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	172.15'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.13 cfs @ 12.55 hrs HW=171.20' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 3.22 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B8:

Inflow Area =	13.365 ac, 53.06% Impervious, Inflow Depth = 0.88" for 2-yr event				
Inflow =	12.53 cfs @	12.10 hrs, Volume=	0.978 af		
Outflow =	1.09 cfs @	14.09 hrs, Volume=	0.978 af, Atten= 91%, Lag= 119.5 min		
Discarded =	1.09 cfs @	14.09 hrs, Volume=	0.978 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

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

Peak Elev= 149.50' @ 14.09 hrs Surf.Area= 19,591 sf Storage= 16,896 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 170.8 min (1,043.0 - 872.2)

Volume	Invert	Avail.Storage	Storage Description
#1	148.50'	67,796 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.50	15,240	657.0	0	0	15,240
149.00	16,566	669.0	7,949	7,949	16,549
150.50	26,501	661.0	32,010	39,959	17,857
151.50	29,194	686.0	27,837	67,796	20,620

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	149.60'	**30.0" Round Culvert** L= 310.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 149.60' / 148.05' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 4.91 sf

Discarded OutFlow Max=1.09 cfs @ 14.09 hrs HW=149.50' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.09 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.50' TW=146.00' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)

Summary for Pond EP: Existing Pond

Inflow Area =	25.491 ac, 10.29% Impervious, Inflow Depth = 0.11" for 2-yr event			
Inflow =	0.38 cfs @ 14.26 hrs, Volume=	0.231 af		
Outflow =	0.30 cfs @ 16.37 hrs, Volume=	0.231 af, Atten= 20%, Lag= 126.9 min		
Primary =	0.30 cfs @ 16.37 hrs, Volume=	0.231 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 143.51' @ 16.37 hrs Surf.Area= 2.553 ac Storage= 0.015 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.0 min (1,073.7 - 1,059.6)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=0.30 cfs @ 16.37 hrs HW=143.51' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.30 cfs @ 2.21 fps)

Summary for Link POA-1:

Inflow Area = 73.910 ac, 37.10% Impervious, Inflow Depth = 0.04" for 2-yr event
Inflow = 0.31 cfs @ 15.90 hrs, Volume= 0.242 af
Primary = 0.31 cfs @ 15.90 hrs, Volume= 0.242 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment P1: Runoff Area=7.269 ac 48.40% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=69 Runoff=14.41 cfs 1.055 af

Subcatchment P15: Runoff Area=4.354 ac 56.43% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=72 Runoff=9.91 cfs 0.715 af

Subcatchment P19: Runoff Area=0.526 ac 77.19% Impervious Runoff Depth=3.29"
Tc=6.0 min CN=87 Runoff=2.00 cfs 0.144 af

Subcatchment P1A: Runoff Area=0.224 ac 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=65 Runoff=0.36 cfs 0.027 af

Subcatchment P2: Runoff Area=11.575 ac 48.12% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=72 Runoff=26.35 cfs 1.900 af

Subcatchment P21: Runoff Area=25.491 ac 10.29% Impervious Runoff Depth=0.53"
Flow Length=2,120' Tc=43.5 min CN=49 Runoff=4.47 cfs 1.118 af

Subcatchment P2A: Runoff Area=0.529 ac 0.00% Impervious Runoff Depth=0.14"
Tc=6.0 min CN=39 Runoff=0.01 cfs 0.006 af

Subcatchment P3: Runoff Area=6.635 ac 58.87% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=79 Runoff=19.81 cfs 1.407 af

Subcatchment P4: Runoff Area=1.047 ac 37.44% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=67 Runoff=1.88 cfs 0.139 af

Subcatchment P5: Runoff Area=1.385 ac 46.21% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=72 Runoff=3.15 cfs 0.227 af

Subcatchment P6: Runoff Area=1.060 ac 54.06% Impervious Runoff Depth=2.21"
Tc=6.0 min CN=75 Runoff=2.73 cfs 0.195 af

Subcatchment P7: Runoff Area=0.450 ac 54.44% Impervious Runoff Depth=2.29"
Tc=6.0 min CN=76 Runoff=1.21 cfs 0.086 af

Subcatchment P8: Runoff Area=13.365 ac 53.06% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=71 Runoff=29.10 cfs 2.108 af

Pond B1: Peak Elev=145.46' Storage=18,779 cf Inflow=14.41 cfs 1.055 af
Discarded=1.16 cfs 1.056 af Primary=0.00 cfs 0.000 af Outflow=1.16 cfs 1.056 af

Pond B15: Peak Elev=164.83' Storage=12,177 cf Inflow=9.91 cfs 0.715 af
Discarded=0.88 cfs 0.715 af Primary=0.00 cfs 0.000 af Outflow=0.88 cfs 0.715 af

Pond B19: Peak Elev=162.47' Storage=2,834 cf Inflow=2.00 cfs 0.144 af
Discarded=0.15 cfs 0.144 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.144 af

Pond B2: Peak Elev=147.30' Storage=39,538 cf Inflow=26.35 cfs 1.900 af
Discarded=0.56 cfs 1.365 af Primary=2.33 cfs 0.534 af Outflow=2.89 cfs 1.900 af

Pond B3: Peak Elev=148.10' Storage=65,002 cf Inflow=19.81 cfs 1.954 af
Discarded=0.47 cfs 1.938 af Primary=0.06 cfs 0.016 af Outflow=0.53 cfs 1.954 af

Pond B4: Peak Elev=154.65' Storage=2,159 cf Inflow=1.88 cfs 0.139 af
Discarded=0.20 cfs 0.139 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.139 af

Pond B5: Peak Elev=161.40' Storage=4,485 cf Inflow=3.15 cfs 0.227 af
Discarded=0.22 cfs 0.227 af Primary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.227 af

Pond B6: Peak Elev=172.47' Storage=3,870 cf Inflow=2.73 cfs 0.195 af
Discarded=0.20 cfs 0.195 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.195 af

Pond B7: Peak Elev=171.55' Storage=1,298 cf Inflow=1.21 cfs 0.086 af
Discarded=0.14 cfs 0.086 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.086 af

Pond B8: Peak Elev=150.39' Storage=37,051 cf Inflow=29.10 cfs 2.108 af
Discarded=1.43 cfs 1.561 af Primary=2.31 cfs 0.547 af Outflow=3.74 cfs 2.108 af

Pond EP: Existing Pond Peak Elev=143.67' Storage=0.453 af Inflow=4.47 cfs 1.118 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=0.98 cfs 1.118 af

Link POA-1: Inflow=2.91 cfs 1.702 af
Primary=2.91 cfs 1.702 af

Summary for Subcatchment P1:

Runoff = 14.41 cfs @ 12.09 hrs, Volume= 1.055 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
2.894	98	Paved parking, HSG A
3.188	39	>75% Grass cover, Good, HSG A
0.563	61	>75% Grass cover, Good, HSG B
0.624	98	Water Surface, HSG A
7.269	69	Weighted Average
3.751		51.60% Pervious Area
3.518		48.40% Impervious Area

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

Summary for Subcatchment P15:

Runoff = 9.91 cfs @ 12.09 hrs, Volume= 0.715 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.922	98	Paved parking, HSG A
1.897	39	>75% Grass cover, Good, HSG A
0.535	98	Water Surface, HSG A
4.354	72	Weighted Average
1.897		43.57% Pervious Area
2.457		56.43% Impervious Area

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

Summary for Subcatchment P19:

Runoff = 2.00 cfs @ 12.09 hrs, Volume= 0.144 af, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.313	98	Paved parking, HSG A
0.120	49	50-75% Grass cover, Fair, HSG A
0.093	98	Water Surface, HSG A
0.526	87	Weighted Average
0.120		22.81% Pervious Area
0.406		77.19% Impervious Area

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

Summary for Subcatchment P1A:

Runoff = 0.36 cfs @ 12.10 hrs, Volume= 0.027 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.028	39	>75% Grass cover, Good, HSG A
0.077	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
0.224	65	Weighted Average
0.224		100.00% Pervious Area

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

Summary for Subcatchment P2:

Runoff = 26.35 cfs @ 12.09 hrs, Volume= 1.900 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
2.892	98	Paved parking, HSG A
2.105	98	Paved parking, HSG B
0.074	98	Paved parking, HSG B
3.531	39	>75% Grass cover, Good, HSG A
2.124	61	>75% Grass cover, Good, HSG B
0.350	61	>75% Grass cover, Good, HSG B
0.499	98	Water Surface, HSG B
11.575	72	Weighted Average
6.005		51.88% Pervious Area
5.570		48.12% Impervious Area

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

Summary for Subcatchment P21:

Runoff = 4.47 cfs @ 12.81 hrs, Volume= 1.118 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

	Area (ac)	CN	Description
*	0.234	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	16.113	30	Woods, Good, HSG A
	6.285	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
*	0.471	30	Woods, Good, HSG A on west side of rd
	25.491	49	Weighted Average
	22.869		89.71% Pervious Area
	2.622		10.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment P2A:

Runoff = 0.01 cfs @ 13.78 hrs, Volume= 0.006 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.529	39	>75% Grass cover, Good, HSG A
0.529		100.00% Pervious Area

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

Summary for Subcatchment P3:

Runoff = 19.81 cfs @ 12.09 hrs, Volume= 1.407 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.928	98	Paved parking, HSG A
1.158	98	Paved parking, HSG B
1.251	39	>75% Grass cover, Good, HSG A
1.478	61	>75% Grass cover, Good, HSG B
0.820	98	Water Surface, HSG B
6.635	79	Weighted Average
2.729		41.13% Pervious Area
3.906		58.87% Impervious Area

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

Summary for Subcatchment P4:

Runoff = 1.88 cfs @ 12.10 hrs, Volume= 0.139 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.255	98	Paved parking, HSG A
0.655	49	50-75% Grass cover, Fair, HSG A
0.137	98	Water Surface, HSG A
1.047	67	Weighted Average
0.655		62.56% Pervious Area
0.392		37.44% Impervious Area

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

Summary for Subcatchment P5:

Runoff = 3.15 cfs @ 12.09 hrs, Volume= 0.227 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.510	98	Paved parking, HSG A
0.745	49	50-75% Grass cover, Fair, HSG A
0.130	98	Water Surface, HSG A
1.385	72	Weighted Average
0.745		53.79% Pervious Area
0.640		46.21% Impervious Area

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

Summary for Subcatchment P6:

Runoff = 2.73 cfs @ 12.09 hrs, Volume= 0.195 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.444	98	Paved parking, HSG A
0.487	49	50-75% Grass cover, Fair, HSG A
0.129	98	Water Surface, HSG A
1.060	75	Weighted Average
0.487		45.94% Pervious Area
0.573		54.06% Impervious Area

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

Summary for Subcatchment P7:

Runoff = 1.21 cfs @ 12.09 hrs, Volume= 0.086 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.127	98	Paved parking, HSG A
0.205	49	50-75% Grass cover, Fair, HSG A
0.118	98	Water Surface, HSG A
0.450	76	Weighted Average
0.205		45.56% Pervious Area
0.245		54.44% Impervious Area

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

Summary for Subcatchment P8:

Runoff = 29.10 cfs @ 12.09 hrs, Volume= 2.108 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
5.877	98	Paved parking, HSG A
0.612	98	Paved parking, HSG B
5.683	39	>75% Grass cover, Good, HSG A
0.591	61	>75% Grass cover, Good, HSG B
0.527	98	Water Surface, HSG A
0.075	98	Water Surface, HSG B
13.365	71	Weighted Average
6.274		46.94% Pervious Area
7.091		53.06% Impervious Area

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

Summary for Pond B1:

Inflow Area = 7.269 ac, 48.40% Impervious, Inflow Depth = 1.74" for 10-yr event
Inflow = 14.41 cfs @ 12.09 hrs, Volume= 1.055 af
Outflow = 1.16 cfs @ 13.89 hrs, Volume= 1.056 af, Atten= 92%, Lag= 108.0 min
Discarded = 1.16 cfs @ 13.89 hrs, Volume= 1.056 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 145.46' @ 13.89 hrs Surf.Area= 20,827 sf Storage= 18,779 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 162.7 min (1,016.5 - 853.7)

Volume	Invert	Avail.Storage	Storage Description
#1	144.50'	69,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.50	18,491	600.0	0	0	18,491
145.00	19,705	613.0	9,547	9,547	19,782
146.00	22,208	639.0	20,944	30,491	22,447
147.00	27,898	753.0	24,999	55,490	35,094
147.50	29,416	765.0	14,327	69,817	36,593

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	142.60'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.60' / 142.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	146.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.16 cfs @ 13.89 hrs HW=145.46' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 1.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=144.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 5.27 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B15:

Inflow Area =	4.354 ac, 56.43% Impervious, Inflow Depth = 1.97" for 10-yr event			
Inflow =	9.91 cfs @ 12.09 hrs, Volume=	0.715 af		
Outflow =	0.88 cfs @ 13.47 hrs, Volume=	0.715 af, Atten= 91%, Lag= 82.7 min		
Discarded =	0.88 cfs @ 13.47 hrs, Volume=	0.715 af		
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 164.83' @ 13.47 hrs Surf.Area= 15,817 sf Storage= 12,177 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 132.3 min (978.1 - 845.8)

Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	55,104 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
164.00	13,647	648.0	0	0	13,647
165.00	16,290	672.0	14,949	14,949	16,253
166.00	20,496	647.0	18,353	33,302	18,959
167.00	23,135	672.0	21,802	55,104	21,664

Device	Routing	Invert	Outlet Devices
#1	Discarded	164.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.00'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.00' / 162.50' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	165.90'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.88 cfs @ 13.47 hrs HW=164.83' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.88 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=164.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 2.83 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B19:

Inflow Area =	0.526 ac, 77.19% Impervious, Inflow Depth = 3.29" for 10-yr event				
Inflow =	2.00 cfs @	12.09 hrs,	Volume=	0.144 af	
Outflow =	0.15 cfs @	13.43 hrs,	Volume=	0.144 af,	Atten= 93%, Lag= 80.3 min
Discarded =	0.15 cfs @	13.43 hrs,	Volume=	0.144 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 162.47' @ 13.43 hrs Surf.Area= 2,627 sf Storage= 2,834 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 203.1 min (1,006.6 - 803.5)

Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	8,062 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
161.00	1,369	171.0	0	0	1,369
162.00	2,104	196.0	1,723	1,723	2,122
163.00	3,285	249.0	2,673	4,396	4,012
164.00	4,060	268.0	3,666	8,062	4,835

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.95'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 160.95' / 160.75' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	163.20'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.15 cfs @ 13.43 hrs HW=162.47' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.01 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B2:

Inflow Area =	11.575 ac,	48.12% Impervious,	Inflow Depth =	1.97"	for 10-yr event
Inflow =	26.35 cfs @	12.09 hrs,	Volume=	1.900 af	
Outflow =	2.89 cfs @	13.01 hrs,	Volume=	1.900 af,	Atten= 89%, Lag= 55.0 min
Discarded =	0.56 cfs @	13.01 hrs,	Volume=	1.365 af	
Primary =	2.33 cfs @	13.01 hrs,	Volume=	0.534 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 147.30' @ 13.01 hrs Surf.Area= 23,754 sf Storage= 39,538 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 577.3 min (1,423.1 - 845.8)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	57,064 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.00	12,284	726.0	0	0	12,284
146.00	15,238	751.0	13,735	13,735	15,314
147.00	22,698	838.0	18,845	32,579	26,343
148.00	26,316	939.0	24,485	57,064	40,653

Device	Routing	Invert	Outlet Devices
#1	Discarded	145.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	142.20'	**24.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.20' / 141.90' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 3.14 sf
#3	Device 2	147.10'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.56 cfs @ 13.01 hrs HW=147.30' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.56 cfs)

Primary OutFlow Max=2.33 cfs @ 13.01 hrs HW=147.30' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 2.33 cfs of 24.18 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 2.33 cfs @ 1.46 fps)

Summary for Pond B3:

Inflow Area =	20.000 ac,	54.99% Impervious,	Inflow Depth =	1.17"	for 10-yr event
Inflow =	19.81 cfs @	12.09 hrs,	Volume=	1.954 af	
Outflow =	0.53 cfs @	18.25 hrs,	Volume=	1.954 af,	Atten= 97%, Lag= 369.7 min
Discarded =	0.47 cfs @	18.25 hrs,	Volume=	1.938 af	
Primary =	0.06 cfs @	18.25 hrs,	Volume=	0.016 af	

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

Peak Elev= 148.10' @ 18.25 hrs Surf.Area= 38,980 sf Storage= 65,002 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,435.8 min (2,270.4 - 834.6)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	101,752 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	26,149	699.0	0	0	26,149
147.00	28,995	724.0	27,560	27,560	29,068
148.00	38,623	1,118.0	33,694	61,254	86,829
149.00	42,403	996.0	40,498	101,752	107,379

Device	Routing	Invert	Outlet Devices
#1	Discarded	146.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	145.40'	**15.0" Round Culvert** L= 90.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.40' / 144.50' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	148.05'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.47 cfs @ 18.25 hrs HW=148.10' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.47 cfs)

Primary OutFlow Max=0.06 cfs @ 18.25 hrs HW=148.10' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.06 cfs of 5.76 cfs potential flow)
└**3=Orifice/Grate** (Orifice Controls 0.06 cfs @ 0.69 fps)

Summary for Pond B4:

Inflow Area =	1.047 ac, 37.44% Impervious, Inflow Depth = 1.60" for 10-yr event			
Inflow =	1.88 cfs @ 12.10 hrs, Volume=	0.139 af		
Outflow =	0.20 cfs @ 13.18 hrs, Volume=	0.139 af, Atten= 89%, Lag= 65.3 min		
Discarded =	0.20 cfs @ 13.18 hrs, Volume=	0.139 af		
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 154.65' @ 13.18 hrs Surf.Area= 3,586 sf Storage= 2,159 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 101.7 min (960.9 - 859.2)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	13,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.00	3,033	204.0	0	0	3,033
155.00	3,898	229.0	3,456	3,456	3,921
156.00	4,863	254.0	4,372	7,828	4,912
157.00	5,966	291.0	5,405	13,233	6,540

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	153.25'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 153.25' / 152.25' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	155.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.20 cfs @ 13.18 hrs HW=154.65' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.66 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B5:

Inflow Area = 1.385 ac, 46.21% Impervious, Inflow Depth = 1.97" for 10-yr event
Inflow = 3.15 cfs @ 12.09 hrs, Volume= 0.227 af
Outflow = 0.22 cfs @ 14.15 hrs, Volume= 0.227 af, Atten= 93%, Lag= 123.7 min
Discarded = 0.22 cfs @ 14.15 hrs, Volume= 0.227 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.40' @ 14.15 hrs Surf.Area= 3,899 sf Storage= 4,485 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 228.1 min (1,073.9 - 845.8)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	12,134 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	2,555	224.0	0	0	2,555
161.00	3,500	249.0	3,015	3,015	3,525
162.00	4,545	274.0	4,011	7,026	4,598
163.00	5,691	299.0	5,107	12,134	5,774

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 159.50' / 159.00' S= 0.0200 '/' Cc= 0.900
n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3 Device 2 162.55' **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600
Limited to weir flow at low heads

Discarded OutFlow Max=0.22 cfs @ 14.15 hrs HW=161.40' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B6:

Inflow Area =	1.060 ac, 54.06% Impervious, Inflow Depth = 2.21" for 10-yr event				
Inflow =	2.73 cfs @	12.09 hrs, Volume=	0.195 af		
Outflow =	0.20 cfs @	13.92 hrs, Volume=	0.195 af, Atten= 93%, Lag= 109.9 min		
Discarded =	0.20 cfs @	13.92 hrs, Volume=	0.195 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 172.47' @ 13.92 hrs Surf.Area= 3,498 sf Storage= 3,870 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 222.6 min (1,060.5 - 837.9)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,797 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	1,828	269.0	0	0	1,828
172.00	2,953	294.0	2,368	2,368	2,983
173.00	4,178	319.0	3,548	5,916	4,240
174.00	5,619	382.0	4,881	10,797	7,772

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	170.50'	**15.0" Round Culvert**
			L= 25.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 170.50' / 170.00' S= 0.0200 '/' Cc= 0.900
			n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	173.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.20 cfs @ 13.92 hrs HW=172.47' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B7:

Inflow Area =	0.450 ac, 54.44% Impervious, Inflow Depth = 2.29" for 10-yr event				
Inflow =	1.21 cfs @	12.09 hrs, Volume=	0.086 af		
Outflow =	0.14 cfs @	12.86 hrs, Volume=	0.086 af, Atten= 88%, Lag= 46.2 min		
Discarded =	0.14 cfs @	12.86 hrs, Volume=	0.086 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 171.55' @ 12.86 hrs Surf.Area= 2,593 sf Storage= 1,298 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 75.4 min (910.6 - 835.3)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,628 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	2,112	214.0	0	0	2,112
172.00	3,018	239.0	2,552	2,552	3,041
173.00	4,025	264.0	3,509	6,061	4,073
174.00	5,132	289.0	4,567	10,628	5,207

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	169.90'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 169.90' / 169.30' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	172.15'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.14 cfs @ 12.86 hrs HW=171.55' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
↑└**2=Culvert** (Passes 0.00 cfs of 3.22 cfs potential flow)
↑└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B8:

Inflow Area =	13.365 ac, 53.06% Impervious, Inflow Depth = 1.89" for 10-yr event				
Inflow =	29.10 cfs @	12.09 hrs, Volume=	2.108 af		
Outflow =	3.74 cfs @	12.86 hrs, Volume=	2.108 af, Atten= 87%, Lag= 46.3 min		
Discarded =	1.43 cfs @	12.86 hrs, Volume=	1.561 af		
Primary =	2.31 cfs @	12.86 hrs, Volume=	0.547 af		

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

Peak Elev= 150.39' @ 12.86 hrs Surf.Area= 25,683 sf Storage= 37,051 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 200.4 min (1,048.8 - 848.4)

Volume	Invert	Avail.Storage	Storage Description
#1	148.50'	67,796 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.50	15,240	657.0	0	0	15,240
149.00	16,566	669.0	7,949	7,949	16,549
150.50	26,501	661.0	32,010	39,959	17,857
151.50	29,194	686.0	27,837	67,796	20,620

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	149.60'	**30.0" Round Culvert** L= 310.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 149.60' / 148.05' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 4.91 sf

Discarded OutFlow Max=1.43 cfs @ 12.86 hrs HW=150.39' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.43 cfs)

Primary OutFlow Max=2.31 cfs @ 12.86 hrs HW=150.39' TW=147.29' (Dynamic Tailwater)
└**2=Culvert** (Barrel Controls 2.31 cfs @ 2.60 fps)

Summary for Pond EP: Existing Pond

Inflow Area =	25.491 ac, 10.29% Impervious, Inflow Depth = 0.53" for 10-yr event			
Inflow =	4.47 cfs @ 12.81 hrs, Volume=	1.118 af		
Outflow =	0.98 cfs @ 16.68 hrs, Volume=	1.118 af, Atten= 78%, Lag= 232.6 min		
Primary =	0.98 cfs @ 16.68 hrs, Volume=	1.118 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 143.67' @ 16.68 hrs Surf.Area= 2.637 ac Storage= 0.453 af

Plug-Flow detention time= 286.9 min calculated for 1.118 af (100% of inflow)
Center-of-Mass det. time= 287.0 min (1,251.1 - 964.1)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=0.98 cfs @ 16.68 hrs HW=143.67' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.98 cfs @ 2.95 fps)

Summary for Link POA-1:

Inflow Area = 73.910 ac, 37.10% Impervious, Inflow Depth = 0.28" for 10-yr event
Inflow = 2.91 cfs @ 13.06 hrs, Volume= 1.702 af
Primary = 2.91 cfs @ 13.06 hrs, Volume= 1.702 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment P1: Runoff Area=7.269 ac 48.40% Impervious Runoff Depth=2.79"
Tc=6.0 min CN=69 Runoff=23.63 cfs 1.691 af

Subcatchment P15: Runoff Area=4.354 ac 56.43% Impervious Runoff Depth=3.08"
Tc=6.0 min CN=72 Runoff=15.68 cfs 1.116 af

Subcatchment P19: Runoff Area=0.526 ac 77.19% Impervious Runoff Depth=4.61"
Tc=6.0 min CN=87 Runoff=2.76 cfs 0.202 af

Subcatchment P1A: Runoff Area=0.224 ac 0.00% Impervious Runoff Depth=2.42"
Tc=6.0 min CN=65 Runoff=0.62 cfs 0.045 af

Subcatchment P2: Runoff Area=11.575 ac 48.12% Impervious Runoff Depth=3.08"
Tc=6.0 min CN=72 Runoff=41.69 cfs 2.966 af

Subcatchment P21: Runoff Area=25.491 ac 10.29% Impervious Runoff Depth=1.12"
Flow Length=2,120' Tc=43.5 min CN=49 Runoff=12.46 cfs 2.378 af

Subcatchment P2A: Runoff Area=0.529 ac 0.00% Impervious Runoff Depth=0.47"
Tc=6.0 min CN=39 Runoff=0.10 cfs 0.021 af

Subcatchment P3: Runoff Area=6.635 ac 58.87% Impervious Runoff Depth=3.77"
Tc=6.0 min CN=79 Runoff=29.25 cfs 2.084 af

Subcatchment P4: Runoff Area=1.047 ac 37.44% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=67 Runoff=3.16 cfs 0.227 af

Subcatchment P5: Runoff Area=1.385 ac 46.21% Impervious Runoff Depth=3.08"
Tc=6.0 min CN=72 Runoff=4.99 cfs 0.355 af

Subcatchment P6: Runoff Area=1.060 ac 54.06% Impervious Runoff Depth=3.37"
Tc=6.0 min CN=75 Runoff=4.19 cfs 0.297 af

Subcatchment P7: Runoff Area=0.450 ac 54.44% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=76 Runoff=1.83 cfs 0.130 af

Subcatchment P8: Runoff Area=13.365 ac 53.06% Impervious Runoff Depth=2.98"
Tc=6.0 min CN=71 Runoff=46.57 cfs 3.318 af

Pond B1: Peak Elev=146.25' Storage=36,232 cf Inflow=23.63 cfs 1.691 af
Discarded=1.32 cfs 1.691 af Primary=0.00 cfs 0.000 af Outflow=1.32 cfs 1.691 af

Pond B15: Peak Elev=165.43' Storage=22,393 cf Inflow=15.68 cfs 1.116 af
Discarded=1.01 cfs 1.116 af Primary=0.00 cfs 0.000 af Outflow=1.01 cfs 1.116 af

Pond B19: Peak Elev=162.97' Storage=4,285 cf Inflow=2.76 cfs 0.202 af
Discarded=0.18 cfs 0.202 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.202 af

Pond B2: Peak Elev=147.72' Storage=49,861 cf Inflow=41.69 cfs 2.966 af
Discarded=0.60 cfs 1.434 af Primary=12.80 cfs 1.533 af Outflow=13.39 cfs 2.966 af

Pond B3: Peak Elev=148.73' Storage=90,532 cf Inflow=30.32 cfs 3.566 af
Discarded=0.50 cfs 2.066 af Primary=3.62 cfs 1.473 af Outflow=4.11 cfs 3.539 af

Pond B4: Peak Elev=155.22' Storage=4,339 cf Inflow=3.16 cfs 0.227 af
Discarded=0.23 cfs 0.227 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.227 af

Pond B5: Peak Elev=162.20' Storage=7,965 cf Inflow=4.99 cfs 0.355 af
Discarded=0.27 cfs 0.355 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.355 af

Pond B6: Peak Elev=173.15' Storage=6,559 cf Inflow=4.19 cfs 0.297 af
Discarded=0.24 cfs 0.297 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.297 af

Pond B7: Peak Elev=171.90' Storage=2,269 cf Inflow=1.83 cfs 0.130 af
Discarded=0.16 cfs 0.130 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.130 af

Pond B8: Peak Elev=151.10' Storage=56,261 cf Inflow=46.57 cfs 3.318 af
Discarded=1.57 cfs 1.836 af Primary=7.77 cfs 1.482 af Outflow=9.34 cfs 3.319 af

Pond EP: Existing Pond Peak Elev=143.89' Storage=1.035 af Inflow=12.46 cfs 2.378 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=2.32 cfs 2.378 af

Link POA-1: Inflow=13.50 cfs 5.450 af
Primary=13.50 cfs 5.450 af

Summary for Subcatchment P1:

Runoff = 23.63 cfs @ 12.09 hrs, Volume= 1.691 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
2.894	98	Paved parking, HSG A
3.188	39	>75% Grass cover, Good, HSG A
0.563	61	>75% Grass cover, Good, HSG B
0.624	98	Water Surface, HSG A
7.269	69	Weighted Average
3.751		51.60% Pervious Area
3.518		48.40% Impervious Area

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

Summary for Subcatchment P15:

Runoff = 15.68 cfs @ 12.09 hrs, Volume= 1.116 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
1.922	98	Paved parking, HSG A
1.897	39	>75% Grass cover, Good, HSG A
0.535	98	Water Surface, HSG A
4.354	72	Weighted Average
1.897		43.57% Pervious Area
2.457		56.43% Impervious Area

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

Summary for Subcatchment P19:

Runoff = 2.76 cfs @ 12.09 hrs, Volume= 0.202 af, Depth= 4.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.313	98	Paved parking, HSG A
0.120	49	50-75% Grass cover, Fair, HSG A
0.093	98	Water Surface, HSG A
0.526	87	Weighted Average
0.120		22.81% Pervious Area
0.406		77.19% Impervious Area

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

Summary for Subcatchment P1A:

Runoff = 0.62 cfs @ 12.09 hrs, Volume= 0.045 af, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.028	39	>75% Grass cover, Good, HSG A
0.077	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
0.224	65	Weighted Average
0.224		100.00% Pervious Area

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

Summary for Subcatchment P2:

Runoff = 41.69 cfs @ 12.09 hrs, Volume= 2.966 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
2.892	98	Paved parking, HSG A
2.105	98	Paved parking, HSG B
0.074	98	Paved parking, HSG B
3.531	39	>75% Grass cover, Good, HSG A
2.124	61	>75% Grass cover, Good, HSG B
0.350	61	>75% Grass cover, Good, HSG B
0.499	98	Water Surface, HSG B
11.575	72	Weighted Average
6.005		51.88% Pervious Area
5.570		48.12% Impervious Area

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

Summary for Subcatchment P21:

Runoff = 12.46 cfs @ 12.71 hrs, Volume= 2.378 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

	Area (ac)	CN	Description
*	0.234	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	16.113	30	Woods, Good, HSG A
	6.285	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
*	0.471	30	Woods, Good, HSG A on west side of rd
	25.491	49	Weighted Average
	22.869		89.71% Pervious Area
	2.622		10.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment P2A:

Runoff = 0.10 cfs @ 12.33 hrs, Volume= 0.021 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.529	39	>75% Grass cover, Good, HSG A
0.529		100.00% Pervious Area

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

Summary for Subcatchment P3:

Runoff = 29.25 cfs @ 12.09 hrs, Volume= 2.084 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
1.928	98	Paved parking, HSG A
1.158	98	Paved parking, HSG B
1.251	39	>75% Grass cover, Good, HSG A
1.478	61	>75% Grass cover, Good, HSG B
0.820	98	Water Surface, HSG B
6.635	79	Weighted Average
2.729		41.13% Pervious Area
3.906		58.87% Impervious Area

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

Summary for Subcatchment P4:

Runoff = 3.16 cfs @ 12.09 hrs, Volume= 0.227 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.255	98	Paved parking, HSG A
0.655	49	50-75% Grass cover, Fair, HSG A
0.137	98	Water Surface, HSG A
1.047	67	Weighted Average
0.655		62.56% Pervious Area
0.392		37.44% Impervious Area

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

Summary for Subcatchment P5:

Runoff = 4.99 cfs @ 12.09 hrs, Volume= 0.355 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.510	98	Paved parking, HSG A
0.745	49	50-75% Grass cover, Fair, HSG A
0.130	98	Water Surface, HSG A
1.385	72	Weighted Average
0.745		53.79% Pervious Area
0.640		46.21% Impervious Area

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

Summary for Subcatchment P6:

Runoff = 4.19 cfs @ 12.09 hrs, Volume= 0.297 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.444	98	Paved parking, HSG A
0.487	49	50-75% Grass cover, Fair, HSG A
0.129	98	Water Surface, HSG A
1.060	75	Weighted Average
0.487		45.94% Pervious Area
0.573		54.06% Impervious Area

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

Summary for Subcatchment P7:

Runoff = 1.83 cfs @ 12.09 hrs, Volume= 0.130 af, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.127	98	Paved parking, HSG A
0.205	49	50-75% Grass cover, Fair, HSG A
0.118	98	Water Surface, HSG A
0.450	76	Weighted Average
0.205		45.56% Pervious Area
0.245		54.44% Impervious Area

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

Summary for Subcatchment P8:

Runoff = 46.57 cfs @ 12.09 hrs, Volume= 3.318 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
5.877	98	Paved parking, HSG A
0.612	98	Paved parking, HSG B
5.683	39	>75% Grass cover, Good, HSG A
0.591	61	>75% Grass cover, Good, HSG B
0.527	98	Water Surface, HSG A
0.075	98	Water Surface, HSG B
13.365	71	Weighted Average
6.274		46.94% Pervious Area
7.091		53.06% Impervious Area

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

Summary for Pond B1:

Inflow Area = 7.269 ac, 48.40% Impervious, Inflow Depth = 2.79" for 50-yr event
Inflow = 23.63 cfs @ 12.09 hrs, Volume= 1.691 af
Outflow = 1.32 cfs @ 14.88 hrs, Volume= 1.691 af, Atten= 94%, Lag= 167.4 min
Discarded = 1.32 cfs @ 14.88 hrs, Volume= 1.691 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 146.25' @ 14.88 hrs Surf.Area= 23,574 sf Storage= 36,232 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 300.7 min (1,140.5 - 839.8)

Volume	Invert	Avail.Storage	Storage Description
#1	144.50'	69,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.50	18,491	600.0	0	0	18,491
145.00	19,705	613.0	9,547	9,547	19,782
146.00	22,208	639.0	20,944	30,491	22,447
147.00	27,898	753.0	24,999	55,490	35,094
147.50	29,416	765.0	14,327	69,817	36,593

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	142.60'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.60' / 142.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	146.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.32 cfs @ 14.88 hrs HW=146.25' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 1.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=144.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 5.27 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B15:

Inflow Area =	4.354 ac, 56.43% Impervious, Inflow Depth = 3.08" for 50-yr event				
Inflow =	15.68 cfs @	12.09 hrs,	Volume=	1.116 af	
Outflow =	1.01 cfs @	14.11 hrs,	Volume=	1.116 af,	Atten= 94%, Lag= 120.9 min
Discarded =	1.01 cfs @	14.11 hrs,	Volume=	1.116 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 165.43' @ 14.11 hrs Surf.Area= 18,055 sf Storage= 22,393 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 235.1 min (1,067.8 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	55,104 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
164.00	13,647	648.0	0	0	13,647
165.00	16,290	672.0	14,949	14,949	16,253
166.00	20,496	647.0	18,353	33,302	18,959
167.00	23,135	672.0	21,802	55,104	21,664

Device	Routing	Invert	Outlet Devices
#1	Discarded	164.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.00'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.00' / 162.50' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	165.90'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=1.01 cfs @ 14.11 hrs HW=165.43' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 1.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=164.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 2.83 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B19:

Inflow Area =	0.526 ac, 77.19% Impervious, Inflow Depth = 4.61" for 50-yr event				
Inflow =	2.76 cfs @	12.09 hrs, Volume=	0.202 af		
Outflow =	0.18 cfs @	13.65 hrs, Volume=	0.202 af, Atten= 93%, Lag= 94.0 min		
Discarded =	0.18 cfs @	13.65 hrs, Volume=	0.202 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 162.97' @ 13.65 hrs Surf.Area= 3,240 sf Storage= 4,285 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 262.0 min (1,056.1 - 794.1)

Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	8,062 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
161.00	1,369	171.0	0	0	1,369
162.00	2,104	196.0	1,723	1,723	2,122
163.00	3,285	249.0	2,673	4,396	4,012
164.00	4,060	268.0	3,666	8,062	4,835

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.95'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 160.95' / 160.75' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	163.20'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.18 cfs @ 13.65 hrs HW=162.97' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.01 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B2:

Inflow Area =	11.575 ac,	48.12% Impervious,	Inflow Depth =	3.08"	for 50-yr event
Inflow =	41.69 cfs @	12.09 hrs,	Volume=	2.966 af	
Outflow =	13.39 cfs @	12.43 hrs,	Volume=	2.966 af,	Atten= 68%, Lag= 20.1 min
Discarded =	0.60 cfs @	12.43 hrs,	Volume=	1.434 af	
Primary =	12.80 cfs @	12.43 hrs,	Volume=	1.533 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 147.72' @ 12.43 hrs Surf.Area= 25,279 sf Storage= 49,861 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 395.2 min (1,227.9 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	57,064 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.00	12,284	726.0	0	0	12,284
146.00	15,238	751.0	13,735	13,735	15,314
147.00	22,698	838.0	18,845	32,579	26,343
148.00	26,316	939.0	24,485	57,064	40,653

Device	Routing	Invert	Outlet Devices
#1	Discarded	145.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	142.20'	**24.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.20' / 141.90' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 3.14 sf
#3	Device 2	147.10'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.60 cfs @ 12.43 hrs HW=147.72' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.60 cfs)

Primary OutFlow Max=12.79 cfs @ 12.43 hrs HW=147.72' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 12.79 cfs of 25.39 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 12.79 cfs @ 2.58 fps)

Summary for Pond B3:

Inflow Area =	20.000 ac,	54.99% Impervious,	Inflow Depth =	2.14"	for 50-yr event
Inflow =	30.32 cfs @	12.09 hrs,	Volume=	3.566 af	
Outflow =	4.11 cfs @	14.68 hrs,	Volume=	3.539 af,	Atten= 86%, Lag= 155.0 min
Discarded =	0.50 cfs @	14.68 hrs,	Volume=	2.066 af	
Primary =	3.62 cfs @	14.68 hrs,	Volume=	1.473 af	

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

Peak Elev= 148.73' @ 14.68 hrs Surf.Area= 41,373 sf Storage= 90,532 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 914.5 min (1,742.3 - 827.9)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	101,752 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	26,149	699.0	0	0	26,149
147.00	28,995	724.0	27,560	27,560	29,068
148.00	38,623	1,118.0	33,694	61,254	86,829
149.00	42,403	996.0	40,498	101,752	107,379

Device	Routing	Invert	Outlet Devices
#1	Discarded	146.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	145.40'	**15.0" Round Culvert** L= 90.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.40' / 144.50' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	148.05'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.50 cfs @ 14.68 hrs HW=148.73' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.50 cfs)

Primary OutFlow Max=3.62 cfs @ 14.68 hrs HW=148.73' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 3.62 cfs of 6.49 cfs potential flow)
└─**3=Orifice/Grate** (Orifice Controls 3.62 cfs @ 2.65 fps)

Summary for Pond B4:

Inflow Area =	1.047 ac, 37.44% Impervious, Inflow Depth = 2.61" for 50-yr event			
Inflow =	3.16 cfs @ 12.09 hrs, Volume=	0.227 af		
Outflow =	0.23 cfs @ 13.99 hrs, Volume=	0.227 af, Atten= 93%, Lag= 113.9 min		
Discarded =	0.23 cfs @ 13.99 hrs, Volume=	0.227 af		
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 155.22' @ 13.99 hrs Surf.Area= 4,102 sf Storage= 4,339 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 201.2 min (1,045.6 - 844.5)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	13,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.00	3,033	204.0	0	0	3,033
155.00	3,898	229.0	3,456	3,456	3,921
156.00	4,863	254.0	4,372	7,828	4,912
157.00	5,966	291.0	5,405	13,233	6,540

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	153.25'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 153.25' / 152.25' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	155.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.23 cfs @ 13.99 hrs HW=155.22' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.66 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B5:

Inflow Area =	1.385 ac, 46.21% Impervious, Inflow Depth = 3.08" for 50-yr event				
Inflow =	4.99 cfs @	12.09 hrs,	Volume=	0.355 af	
Outflow =	0.27 cfs @	14.87 hrs,	Volume=	0.355 af,	Atten= 95%, Lag= 166.8 min
Discarded =	0.27 cfs @	14.87 hrs,	Volume=	0.355 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 162.20' @ 14.87 hrs Surf.Area= 4,766 sf Storage= 7,965 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 341.6 min (1,174.4 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	12,134 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	2,555	224.0	0	0	2,555
161.00	3,500	249.0	3,015	3,015	3,525
162.00	4,545	274.0	4,011	7,026	4,598
163.00	5,691	299.0	5,107	12,134	5,774

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 159.50' / 159.00' S= 0.0200 '/' Cc= 0.900
n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf

#3	Device 2	162.55'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.27 cfs @ 14.87 hrs HW=162.20' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B6:

Inflow Area =	1.060 ac, 54.06% Impervious, Inflow Depth = 3.37" for 50-yr event				
Inflow =	4.19 cfs @	12.09 hrs,	Volume=	0.297 af	
Outflow =	0.24 cfs @	14.34 hrs,	Volume=	0.297 af,	Atten= 94%, Lag= 135.0 min
Discarded =	0.24 cfs @	14.34 hrs,	Volume=	0.297 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 173.15' @ 14.34 hrs Surf.Area= 4,381 sf Storage= 6,559 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 311.7 min (1,137.4 - 825.7)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,797 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	1,828	269.0	0	0	1,828
172.00	2,953	294.0	2,368	2,368	2,983
173.00	4,178	319.0	3,548	5,916	4,240
174.00	5,619	382.0	4,881	10,797	7,772

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	170.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 170.50' / 170.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	173.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.24 cfs @ 14.34 hrs HW=173.15' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B7:

Inflow Area =	0.450 ac, 54.44% Impervious, Inflow Depth = 3.47" for 50-yr event				
Inflow =	1.83 cfs @	12.09 hrs,	Volume=	0.130 af	
Outflow =	0.16 cfs @	13.11 hrs,	Volume=	0.130 af,	Atten= 91%, Lag= 61.1 min
Discarded =	0.16 cfs @	13.11 hrs,	Volume=	0.130 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 171.90' @ 13.11 hrs Surf.Area= 2,925 sf Storage= 2,269 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 130.5 min (953.8 - 823.3)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,628 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	2,112	214.0	0	0	2,112
172.00	3,018	239.0	2,552	2,552	3,041
173.00	4,025	264.0	3,509	6,061	4,073
174.00	5,132	289.0	4,567	10,628	5,207

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	169.90'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 169.90' / 169.30' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	172.15'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.16 cfs @ 13.11 hrs HW=171.90' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 3.22 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B8:

Inflow Area =	13.365 ac, 53.06% Impervious, Inflow Depth = 2.98" for 50-yr event				
Inflow =	46.57 cfs @	12.09 hrs,	Volume=	3.318 af	
Outflow =	9.34 cfs @	12.55 hrs,	Volume=	3.319 af,	Atten= 80%, Lag= 27.3 min
Discarded =	1.57 cfs @	12.55 hrs,	Volume=	1.836 af	
Primary =	7.77 cfs @	12.55 hrs,	Volume=	1.482 af	

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

Peak Elev= 151.10' @ 12.55 hrs Surf.Area= 28,094 sf Storage= 56,261 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 168.1 min (1,003.2 - 835.1)

Volume	Invert	Avail.Storage	Storage Description
#1	148.50'	67,796 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.50	15,240	657.0	0	0	15,240
149.00	16,566	669.0	7,949	7,949	16,549
150.50	26,501	661.0	32,010	39,959	17,857
151.50	29,194	686.0	27,837	67,796	20,620

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	149.60'	**30.0" Round Culvert** L= 310.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 149.60' / 148.05' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 4.91 sf

Discarded OutFlow Max=1.57 cfs @ 12.55 hrs HW=151.10' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.57 cfs)

Primary OutFlow Max=7.77 cfs @ 12.55 hrs HW=151.10' TW=147.87' (Dynamic Tailwater)
└**2=Culvert** (Barrel Controls 7.77 cfs @ 3.64 fps)

Summary for Pond EP: Existing Pond

Inflow Area = 25.491 ac, 10.29% Impervious, Inflow Depth = 1.12" for 50-yr event
Inflow = 12.46 cfs @ 12.71 hrs, Volume= 2.378 af
Outflow = 2.32 cfs @ 15.80 hrs, Volume= 2.378 af, Atten= 81%, Lag= 185.0 min
Primary = 2.32 cfs @ 15.80 hrs, Volume= 2.378 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 143.89' @ 15.80 hrs Surf.Area= 2.745 ac Storage= 1.035 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 313.4 min (1,245.0 - 931.5)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=2.32 cfs @ 15.80 hrs HW=143.89' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 2.32 cfs @ 3.57 fps)

Summary for Link POA-1:

Inflow Area = 73.910 ac, 37.10% Impervious, Inflow Depth = 0.88" for 50-yr event
Inflow = 13.50 cfs @ 12.43 hrs, Volume= 5.450 af
Primary = 13.50 cfs @ 12.43 hrs, Volume= 5.450 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment P1: Runoff Area=7.269 ac 48.40% Impervious Runoff Depth=3.27"
Tc=6.0 min CN=69 Runoff=27.79 cfs 1.980 af

Subcatchment P15: Runoff Area=4.354 ac 56.43% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=72 Runoff=18.26 cfs 1.297 af

Subcatchment P19: Runoff Area=0.526 ac 77.19% Impervious Runoff Depth=5.19"
Tc=6.0 min CN=87 Runoff=3.09 cfs 0.227 af

Subcatchment P1A: Runoff Area=0.224 ac 0.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=65 Runoff=0.75 cfs 0.054 af

Subcatchment P2: Runoff Area=11.575 ac 48.12% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=72 Runoff=48.53 cfs 3.448 af

Subcatchment P21: Runoff Area=25.491 ac 10.29% Impervious Runoff Depth=1.42"
Flow Length=2,120' Tc=43.5 min CN=49 Runoff=16.75 cfs 3.015 af

Subcatchment P2A: Runoff Area=0.529 ac 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=39 Runoff=0.17 cfs 0.029 af

Subcatchment P3: Runoff Area=6.635 ac 58.87% Impervious Runoff Depth=4.31"
Tc=6.0 min CN=79 Runoff=33.35 cfs 2.383 af

Subcatchment P4: Runoff Area=1.047 ac 37.44% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=67 Runoff=3.74 cfs 0.268 af

Subcatchment P5: Runoff Area=1.385 ac 46.21% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=72 Runoff=5.81 cfs 0.413 af

Subcatchment P6: Runoff Area=1.060 ac 54.06% Impervious Runoff Depth=3.89"
Tc=6.0 min CN=75 Runoff=4.83 cfs 0.343 af

Subcatchment P7: Runoff Area=0.450 ac 54.44% Impervious Runoff Depth=3.99"
Tc=6.0 min CN=76 Runoff=2.10 cfs 0.150 af

Subcatchment P8: Runoff Area=13.365 ac 53.06% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=71 Runoff=54.40 cfs 3.867 af

Pond B1: Peak Elev=146.58' Storage=44,325 cf Inflow=27.79 cfs 1.980 af
Discarded=1.42 cfs 1.981 af Primary=0.00 cfs 0.000 af Outflow=1.42 cfs 1.981 af

Pond B15: Peak Elev=165.69' Storage=27,222 cf Inflow=18.26 cfs 1.297 af
Discarded=1.07 cfs 1.297 af Primary=0.00 cfs 0.000 af Outflow=1.07 cfs 1.297 af

Pond B19: Peak Elev=163.17' Storage=4,957 cf Inflow=3.09 cfs 0.227 af
Discarded=0.19 cfs 0.227 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.227 af

Pond B2: Peak Elev=147.90' Storage=54,394 cf Inflow=48.53 cfs 3.448 af
Discarded=0.61 cfs 1.452 af Primary=17.20 cfs 1.996 af Outflow=17.82 cfs 3.448 af

Pond B3: Peak Elev=148.96' Storage=100,141 cf Inflow=35.93 cfs 4.321 af
Discarded=0.51 cfs 2.087 af Primary=5.59 cfs 2.196 af Outflow=6.10 cfs 4.283 af

Pond B4: Peak Elev=155.47' Storage=5,404 cf Inflow=3.74 cfs 0.268 af
Discarded=0.24 cfs 0.268 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.268 af

Pond B5: Peak Elev=162.53' Storage=9,611 cf Inflow=5.81 cfs 0.413 af
Discarded=0.29 cfs 0.413 af Primary=0.00 cfs 0.000 af Outflow=0.29 cfs 0.413 af

Pond B6: Peak Elev=173.42' Storage=7,813 cf Inflow=4.83 cfs 0.343 af
Discarded=0.27 cfs 0.343 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.343 af

Pond B7: Peak Elev=172.06' Storage=2,726 cf Inflow=2.10 cfs 0.150 af
Discarded=0.17 cfs 0.150 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.150 af

Pond B8: Peak Elev=151.40' Storage=64,814 cf Inflow=54.40 cfs 3.867 af
Discarded=1.61 cfs 1.930 af Primary=10.64 cfs 1.938 af Outflow=12.25 cfs 3.868 af

Pond EP: Existing Pond Peak Elev=143.99' Storage=1.316 af Inflow=16.75 cfs 3.015 af
36.0" Round Culvert n=0.013 L=20.0' S=0.0100 '/' Outflow=3.11 cfs 3.015 af

Link POA-1: Inflow=18.06 cfs 7.291 af
Primary=18.06 cfs 7.291 af

Summary for Subcatchment P1:

Runoff = 27.79 cfs @ 12.09 hrs, Volume= 1.980 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
2.894	98	Paved parking, HSG A
3.188	39	>75% Grass cover, Good, HSG A
0.563	61	>75% Grass cover, Good, HSG B
0.624	98	Water Surface, HSG A
7.269	69	Weighted Average
3.751		51.60% Pervious Area
3.518		48.40% Impervious Area

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

Summary for Subcatchment P15:

Runoff = 18.26 cfs @ 12.09 hrs, Volume= 1.297 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
1.922	98	Paved parking, HSG A
1.897	39	>75% Grass cover, Good, HSG A
0.535	98	Water Surface, HSG A
4.354	72	Weighted Average
1.897		43.57% Pervious Area
2.457		56.43% Impervious Area

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

Summary for Subcatchment P19:

Runoff = 3.09 cfs @ 12.09 hrs, Volume= 0.227 af, Depth= 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.313	98	Paved parking, HSG A
0.120	49	50-75% Grass cover, Fair, HSG A
0.093	98	Water Surface, HSG A
0.526	87	Weighted Average
0.120		22.81% Pervious Area
0.406		77.19% Impervious Area

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

Summary for Subcatchment P1A:

Runoff = 0.75 cfs @ 12.09 hrs, Volume= 0.054 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.028	39	>75% Grass cover, Good, HSG A
0.077	61	>75% Grass cover, Good, HSG B
0.119	74	>75% Grass cover, Good, HSG C
0.224	65	Weighted Average
0.224		100.00% Pervious Area

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

Summary for Subcatchment P2:

Runoff = 48.53 cfs @ 12.09 hrs, Volume= 3.448 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
2.892	98	Paved parking, HSG A
2.105	98	Paved parking, HSG B
0.074	98	Paved parking, HSG B
3.531	39	>75% Grass cover, Good, HSG A
2.124	61	>75% Grass cover, Good, HSG B
0.350	61	>75% Grass cover, Good, HSG B
0.499	98	Water Surface, HSG B
11.575	72	Weighted Average
6.005		51.88% Pervious Area
5.570		48.12% Impervious Area

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

Summary for Subcatchment P21:

Runoff = 16.75 cfs @ 12.71 hrs, Volume= 3.015 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

	Area (ac)	CN	Description
*	0.234	98	Impervious, HSG A
*	0.075	98	Impervious, HSG B
	16.113	30	Woods, Good, HSG A
	6.285	77	Woods, Good, HSG D
	2.313	98	Water Surface, HSG A
*	0.471	30	Woods, Good, HSG A on west side of rd
	25.491	49	Weighted Average
	22.869		89.71% Pervious Area
	2.622		10.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.7	85	0.1600	2.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
34.9	1,985	0.0040	0.95		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
43.5	2,120	Total			

Summary for Subcatchment P2A:

Runoff = 0.17 cfs @ 12.16 hrs, Volume= 0.029 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.529	39	>75% Grass cover, Good, HSG A
0.529		100.00% Pervious Area

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

Summary for Subcatchment P3:

Runoff = 33.35 cfs @ 12.09 hrs, Volume= 2.383 af, Depth= 4.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
1.928	98	Paved parking, HSG A
1.158	98	Paved parking, HSG B
1.251	39	>75% Grass cover, Good, HSG A
1.478	61	>75% Grass cover, Good, HSG B
0.820	98	Water Surface, HSG B
6.635	79	Weighted Average
2.729		41.13% Pervious Area
3.906		58.87% Impervious Area

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

Summary for Subcatchment P4:

Runoff = 3.74 cfs @ 12.09 hrs, Volume= 0.268 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.255	98	Paved parking, HSG A
0.655	49	50-75% Grass cover, Fair, HSG A
0.137	98	Water Surface, HSG A
1.047	67	Weighted Average
0.655		62.56% Pervious Area
0.392		37.44% Impervious Area

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

Summary for Subcatchment P5:

Runoff = 5.81 cfs @ 12.09 hrs, Volume= 0.413 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.510	98	Paved parking, HSG A
0.745	49	50-75% Grass cover, Fair, HSG A
0.130	98	Water Surface, HSG A
1.385	72	Weighted Average
0.745		53.79% Pervious Area
0.640		46.21% Impervious Area

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

Summary for Subcatchment P6:

Runoff = 4.83 cfs @ 12.09 hrs, Volume= 0.343 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.444	98	Paved parking, HSG A
0.487	49	50-75% Grass cover, Fair, HSG A
0.129	98	Water Surface, HSG A
1.060	75	Weighted Average
0.487		45.94% Pervious Area
0.573		54.06% Impervious Area

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

Summary for Subcatchment P7:

Runoff = 2.10 cfs @ 12.09 hrs, Volume= 0.150 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.127	98	Paved parking, HSG A
0.205	49	50-75% Grass cover, Fair, HSG A
0.118	98	Water Surface, HSG A
0.450	76	Weighted Average
0.205		45.56% Pervious Area
0.245		54.44% Impervious Area

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

Summary for Subcatchment P8:

Runoff = 54.40 cfs @ 12.09 hrs, Volume= 3.867 af, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
5.877	98	Paved parking, HSG A
0.612	98	Paved parking, HSG B
5.683	39	>75% Grass cover, Good, HSG A
0.591	61	>75% Grass cover, Good, HSG B
0.527	98	Water Surface, HSG A
0.075	98	Water Surface, HSG B
13.365	71	Weighted Average
6.274		46.94% Pervious Area
7.091		53.06% Impervious Area

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

Summary for Pond B1:

Inflow Area = 7.269 ac, 48.40% Impervious, Inflow Depth = 3.27" for 100-yr event
Inflow = 27.79 cfs @ 12.09 hrs, Volume= 1.980 af
Outflow = 1.42 cfs @ 15.08 hrs, Volume= 1.981 af, Atten= 95%, Lag= 179.3 min
Discarded = 1.42 cfs @ 15.08 hrs, Volume= 1.981 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 146.58' @ 15.08 hrs Surf.Area= 25,436 sf Storage= 44,325 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 347.1 min (1,182.3 - 835.2)

Volume	Invert	Avail.Storage	Storage Description
#1	144.50'	69,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.50	18,491	600.0	0	0	18,491
145.00	19,705	613.0	9,547	9,547	19,782
146.00	22,208	639.0	20,944	30,491	22,447
147.00	27,898	753.0	24,999	55,490	35,094
147.50	29,416	765.0	14,327	69,817	36,593

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	142.60'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.60' / 142.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	146.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.42 cfs @ 15.08 hrs HW=146.58' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 1.42 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=144.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 5.27 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B15:

Inflow Area =	4.354 ac, 56.43% Impervious, Inflow Depth = 3.57" for 100-yr event				
Inflow =	18.26 cfs @	12.09 hrs,	Volume=	1.297 af	
Outflow =	1.07 cfs @	14.39 hrs,	Volume=	1.297 af,	Atten= 94%, Lag= 138.1 min
Discarded =	1.07 cfs @	14.39 hrs,	Volume=	1.297 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 165.69' @ 14.39 hrs Surf.Area= 19,155 sf Storage= 27,222 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 274.0 min (1,102.4 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	55,104 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
164.00	13,647	648.0	0	0	13,647
165.00	16,290	672.0	14,949	14,949	16,253
166.00	20,496	647.0	18,353	33,302	18,959
167.00	23,135	672.0	21,802	55,104	21,664

Device	Routing	Invert	Outlet Devices
#1	Discarded	164.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.00'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.00' / 162.50' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	165.90'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=1.07 cfs @ 14.39 hrs HW=165.69' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 1.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=164.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 2.83 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B19:

Inflow Area =	0.526 ac, 77.19% Impervious, Inflow Depth = 5.19" for 100-yr event				
Inflow =	3.09 cfs @	12.09 hrs, Volume=	0.227 af		
Outflow =	0.19 cfs @	13.78 hrs, Volume=	0.227 af, Atten= 94%, Lag= 101.8 min		
Discarded =	0.19 cfs @	13.78 hrs, Volume=	0.227 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 163.17' @ 13.78 hrs Surf.Area= 3,409 sf Storage= 4,957 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 286.3 min (1,077.1 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	8,062 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
161.00	1,369	171.0	0	0	1,369
162.00	2,104	196.0	1,723	1,723	2,122
163.00	3,285	249.0	2,673	4,396	4,012
164.00	4,060	268.0	3,666	8,062	4,835

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.95'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 160.95' / 160.75' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	163.20'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.19 cfs @ 13.78 hrs HW=163.17' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.01 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B2:

Inflow Area =	11.575 ac, 48.12% Impervious, Inflow Depth = 3.57" for 100-yr event				
Inflow =	48.53 cfs @	12.09 hrs,	Volume=	3.448 af	
Outflow =	17.82 cfs @	12.37 hrs,	Volume=	3.448 af,	Atten= 63%, Lag= 17.1 min
Discarded =	0.61 cfs @	12.37 hrs,	Volume=	1.452 af	
Primary =	17.20 cfs @	12.37 hrs,	Volume=	1.996 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 147.90' @ 12.37 hrs Surf.Area= 25,934 sf Storage= 54,394 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 346.2 min (1,174.6 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	57,064 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
145.00	12,284	726.0	0	0	12,284
146.00	15,238	751.0	13,735	13,735	15,314
147.00	22,698	838.0	18,845	32,579	26,343
148.00	26,316	939.0	24,485	57,064	40,653

Device	Routing	Invert	Outlet Devices
#1	Discarded	145.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	142.20'	**24.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 142.20' / 141.90' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 3.14 sf
#3	Device 2	147.10'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.61 cfs @ 12.37 hrs HW=147.90' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.61 cfs)

Primary OutFlow Max=17.20 cfs @ 12.37 hrs HW=147.90' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 17.20 cfs of 25.88 cfs potential flow)
└─**3=Orifice/Grate** (Orifice Controls 17.20 cfs @ 4.30 fps)

Summary for Pond B3:

Inflow Area =	20.000 ac, 54.99% Impervious, Inflow Depth = 2.59" for 100-yr event				
Inflow =	35.93 cfs @	12.10 hrs,	Volume=	4.321 af	
Outflow =	6.10 cfs @	14.12 hrs,	Volume=	4.283 af,	Atten= 83%, Lag= 121.8 min
Discarded =	0.51 cfs @	14.12 hrs,	Volume=	2.087 af	
Primary =	5.59 cfs @	14.12 hrs,	Volume=	2.196 af	

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

Peak Elev= 148.96' @ 14.12 hrs Surf.Area= 42,256 sf Storage= 100,141 cf

Plug-Flow detention time= 779.8 min calculated for 4.283 af (99% of inflow)
Center-of-Mass det. time= 774.6 min (1,600.9 - 826.3)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	101,752 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	26,149	699.0	0	0	26,149
147.00	28,995	724.0	27,560	27,560	29,068
148.00	38,623	1,118.0	33,694	61,254	86,829
149.00	42,403	996.0	40,498	101,752	107,379

Device	Routing	Invert	Outlet Devices
#1	Discarded	146.00'	**0.520 in/hr Exfiltration over Surface area**
#2	Primary	145.40'	**15.0" Round Culvert** L= 90.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 145.40' / 144.50' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	148.05'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.51 cfs @ 14.12 hrs HW=148.96' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.51 cfs)

Primary OutFlow Max=5.59 cfs @ 14.12 hrs HW=148.96' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 5.59 cfs of 6.74 cfs potential flow)
  └─**3=Orifice/Grate** (Orifice Controls 5.59 cfs @ 3.07 fps)

Summary for Pond B4:

Inflow Area =	1.047 ac, 37.44% Impervious, Inflow Depth = 3.07" for 100-yr event			
Inflow =	3.74 cfs @ 12.09 hrs, Volume=	0.268 af		
Outflow =	0.24 cfs @ 14.26 hrs, Volume=	0.268 af, Atten= 94%, Lag= 130.1 min		
Discarded =	0.24 cfs @ 14.26 hrs, Volume=	0.268 af		
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 155.47' @ 14.26 hrs Surf.Area= 4,341 sf Storage= 5,404 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 242.2 min (1,081.9 - 839.7)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	13,233 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.00	3,033	204.0	0	0	3,033
155.00	3,898	229.0	3,456	3,456	3,921
156.00	4,863	254.0	4,372	7,828	4,912
157.00	5,966	291.0	5,405	13,233	6,540

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	153.25'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 153.25' / 152.25' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	155.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.24 cfs @ 14.26 hrs HW=155.47' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.66 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B5:

Inflow Area =	1.385 ac, 46.21% Impervious, Inflow Depth = 3.57" for 100-yr event				
Inflow =	5.81 cfs @	12.09 hrs,	Volume=	0.413 af	
Outflow =	0.29 cfs @	15.05 hrs,	Volume=	0.413 af,	Atten= 95%, Lag= 177.3 min
Discarded =	0.29 cfs @	15.05 hrs,	Volume=	0.413 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 162.53' @ 15.05 hrs Surf.Area= 5,141 sf Storage= 9,611 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 384.4 min (1,212.8 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	12,134 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	2,555	224.0	0	0	2,555
161.00	3,500	249.0	3,015	3,015	3,525
162.00	4,545	274.0	4,011	7,026	4,598
163.00	5,691	299.0	5,107	12,134	5,774

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 159.50' / 159.00' S= 0.0200 '/' Cc= 0.900
n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf

#3 Device 2 162.55' **24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600
Limited to weir flow at low heads

Discarded OutFlow Max=0.29 cfs @ 15.05 hrs HW=162.53' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B6:

Inflow Area =	1.060 ac, 54.06% Impervious, Inflow Depth = 3.89" for 100-yr event				
Inflow =	4.83 cfs @	12.09 hrs,	Volume=	0.343 af	
Outflow =	0.27 cfs @	14.49 hrs,	Volume=	0.343 af,	Atten= 94%, Lag= 144.3 min
Discarded =	0.27 cfs @	14.49 hrs,	Volume=	0.343 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 173.42' @ 14.49 hrs Surf.Area= 4,764 sf Storage= 7,813 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 344.5 min (1,166.1 - 821.6)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,797 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	1,828	269.0	0	0	1,828
172.00	2,953	294.0	2,368	2,368	2,983
173.00	4,178	319.0	3,548	5,916	4,240
174.00	5,619	382.0	4,881	10,797	7,772

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	170.50'	**15.0" Round Culvert**
			L= 25.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 170.50' / 170.00' S= 0.0200 '/' Cc= 0.900
			n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	173.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.27 cfs @ 14.49 hrs HW=173.42' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B7:

Inflow Area = 0.450 ac, 54.44% Impervious, Inflow Depth = 3.99" for 100-yr event
Inflow = 2.10 cfs @ 12.09 hrs, Volume= 0.150 af
Outflow = 0.17 cfs @ 13.30 hrs, Volume= 0.150 af, Atten= 92%, Lag= 72.9 min
Discarded = 0.17 cfs @ 13.30 hrs, Volume= 0.150 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 172.06' @ 13.30 hrs Surf.Area= 3,072 sf Storage= 2,726 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 154.0 min (973.3 - 819.3)

Volume	Invert	Avail.Storage	Storage Description
#1	171.00'	10,628 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
171.00	2,112	214.0	0	0	2,112
172.00	3,018	239.0	2,552	2,552	3,041
173.00	4,025	264.0	3,509	6,061	4,073
174.00	5,132	289.0	4,567	10,628	5,207

Device	Routing	Invert	Outlet Devices
#1	Discarded	171.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	169.90'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 169.90' / 169.30' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	172.15'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.17 cfs @ 13.30 hrs HW=172.06' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=171.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 3.22 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B8:

Inflow Area = 13.365 ac, 53.06% Impervious, Inflow Depth = 3.47" for 100-yr event
Inflow = 54.40 cfs @ 12.09 hrs, Volume= 3.867 af
Outflow = 12.25 cfs @ 12.52 hrs, Volume= 3.868 af, Atten= 77%, Lag= 25.6 min
Discarded = 1.61 cfs @ 12.52 hrs, Volume= 1.930 af
Primary = 10.64 cfs @ 12.52 hrs, Volume= 1.938 af

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

Peak Elev= 151.40' @ 12.52 hrs Surf.Area= 28,912 sf Storage= 64,814 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 157.9 min (988.5 - 830.7)

Volume	Invert	Avail.Storage	Storage Description
#1	148.50'	67,796 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.50	15,240	657.0	0	0	15,240
149.00	16,566	669.0	7,949	7,949	16,549
150.50	26,501	661.0	32,010	39,959	17,857
151.50	29,194	686.0	27,837	67,796	20,620

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	149.60'	**30.0" Round Culvert** L= 310.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 149.60' / 148.05' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 4.91 sf

Discarded OutFlow Max=1.61 cfs @ 12.52 hrs HW=151.40' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.61 cfs)

Primary OutFlow Max=10.64 cfs @ 12.52 hrs HW=151.40' TW=148.15' (Dynamic Tailwater)
└**2=Culvert** (Barrel Controls 10.64 cfs @ 3.94 fps)

Summary for Pond EP: Existing Pond

Inflow Area =	25.491 ac,	10.29% Impervious,	Inflow Depth =	1.42"	for 100-yr event
Inflow =	16.75 cfs @	12.71 hrs,	Volume=	3.015 af	
Outflow =	3.11 cfs @	15.41 hrs,	Volume=	3.015 af,	Atten= 81%, Lag= 162.0 min
Primary =	3.11 cfs @	15.41 hrs,	Volume=	3.015 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 143.99' @ 15.41 hrs Surf.Area= 2.796 ac Storage= 1.316 af

Plug-Flow detention time= 308.7 min calculated for 3.015 af (100% of inflow)
Center-of-Mass det. time= 308.8 min (1,231.4 - 922.6)

Volume	Invert	Avail.Storage	Storage Description
#1	143.50'	11.328 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
143.50	2.550	0.000	0.000
144.00	2.800	1.337	1.337
145.00	4.387	3.593	4.931
146.00	8.408	6.397	11.328

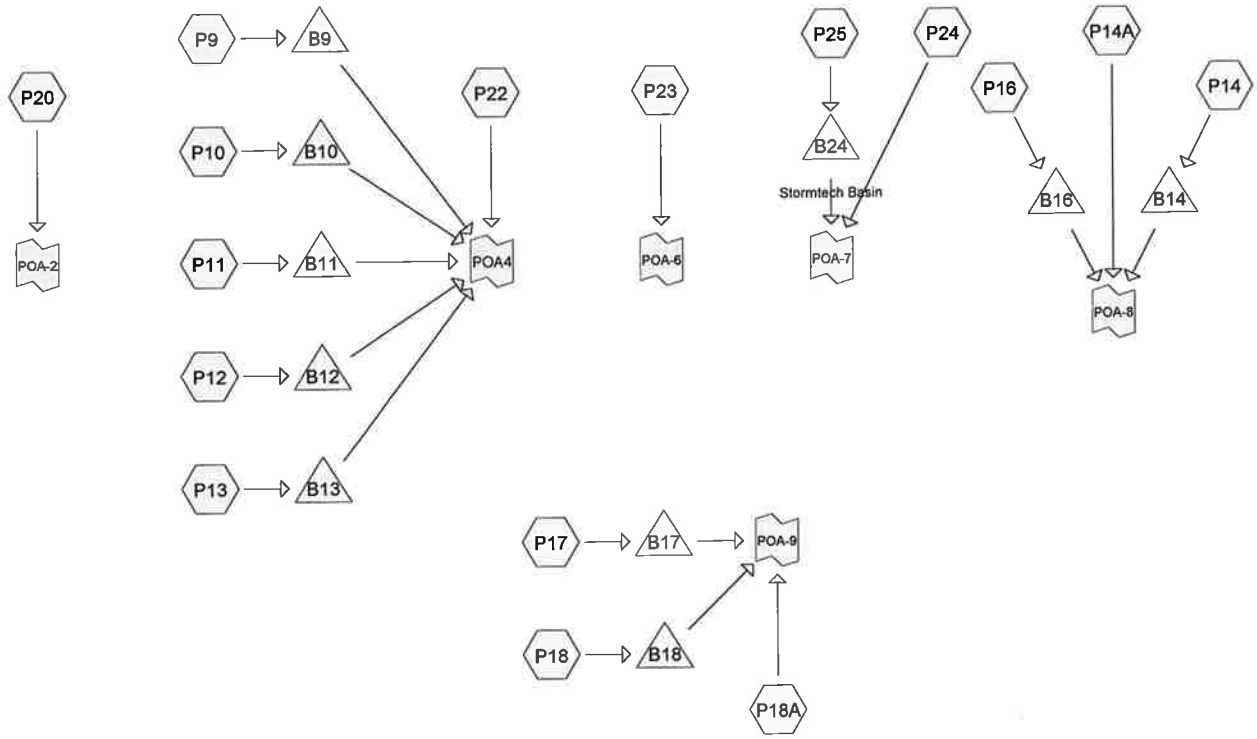
Device	Routing	Invert	Outlet Devices
#1	Primary	143.30'	**36.0" Round Culvert** L= 20.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 143.30' / 143.10' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 7.07 sf

Primary OutFlow Max=3.11 cfs @ 15.41 hrs HW=143.99' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 3.11 cfs @ 3.81 fps)

Summary for Link POA-1:

Inflow Area = 73.910 ac, 37.10% Impervious, Inflow Depth = 1.18" for 100-yr event
Inflow = 18.06 cfs @ 12.37 hrs, Volume= 7.291 af
Primary = 18.06 cfs @ 12.37 hrs, Volume= 7.291 af, Atten= 0%, Lag= 0.0 min

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



Subcat Reach Pond Link

Routing Diagram for W161041 - Post All but POA1
Prepared by Bohler Engineering, Printed 11/17/2016
HydroCAD® 10.00-19 s/n 08311 © 2016 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P10: Runoff Area=2.878 ac 51.08% Impervious Runoff Depth=0.74"
Tc=6.0 min CN=77 Runoff=2.29 cfs 0.178 af

Subcatchment P11: Runoff Area=2.569 ac 44.84% Impervious Runoff Depth=0.36"
Tc=6.0 min CN=67 Runoff=0.68 cfs 0.076 af

Subcatchment P12: Runoff Area=7.614 ac 26.52% Impervious Runoff Depth=0.10"
Tc=6.0 min CN=56 Runoff=0.13 cfs 0.062 af

Subcatchment P13: Runoff Area=2.385 ac 39.33% Impervious Runoff Depth=0.24"
Tc=6.0 min CN=63 Runoff=0.28 cfs 0.049 af

Subcatchment P14: Runoff Area=3.055 ac 37.74% Impervious Runoff Depth=0.39"
Tc=6.0 min CN=68 Runoff=0.95 cfs 0.099 af

Subcatchment P14A: Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment P16: Runoff Area=1.395 ac 42.29% Impervious Runoff Depth=0.53"
Tc=6.0 min CN=72 Runoff=0.71 cfs 0.061 af

Subcatchment P17: Runoff Area=3.022 ac 56.29% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=78 Runoff=2.59 cfs 0.198 af

Subcatchment P18: Runoff Area=3.624 ac 48.68% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=73 Runoff=2.03 cfs 0.171 af

Subcatchment P18A: Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment P20: Runoff Area=1.177 ac 19.63% Impervious Runoff Depth=0.08"
Flow Length=204' Tc=8.5 min CN=55 Runoff=0.01 cfs 0.008 af

Subcatchment P22: Runoff Area=26.508 ac 2.59% Impervious Runoff Depth=0.01"
Flow Length=1,980' Tc=79.7 min CN=47 Runoff=0.02 cfs 0.011 af

Subcatchment P23: Runoff Area=10.473 ac 10.62% Impervious Runoff Depth=0.00"
Flow Length=545' Tc=17.2 min CN=45 Runoff=0.00 cfs 0.000 af

Subcatchment P24: Runoff Area=2.183 ac 4.01% Impervious Runoff Depth=0.00"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.00 cfs 0.000 af

Subcatchment P25: Runoff Area=0.448 ac 75.45% Impervious Runoff Depth=1.12"
Tc=6.0 min CN=84 Runoff=0.57 cfs 0.042 af

Subcatchment P9: Runoff Area=3.645 ac 51.44% Impervious Runoff Depth=0.42"
Tc=6.0 min CN=69 Runoff=1.30 cfs 0.128 af

Pond B10: Peak Elev=150.80' Storage=2,803 cf Inflow=2.29 cfs 0.178 af
Discarded=0.23 cfs 0.178 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.178 af

Pond B11: Peak Elev=145.36' Storage=1,249 cf Inflow=0.68 cfs 0.076 af
Discarded=0.08 cfs 0.076 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.076 af

Pond B12: Peak Elev=154.50' Storage=0 cf Inflow=0.13 cfs 0.062 af
Discarded=0.13 cfs 0.062 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.062 af

Pond B13: Peak Elev=169.06' Storage=164 cf Inflow=0.28 cfs 0.049 af
Discarded=0.15 cfs 0.049 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.049 af

Pond B14: Peak Elev=157.79' Storage=1,376 cf Inflow=0.95 cfs 0.099 af
Discarded=0.12 cfs 0.099 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.099 af

Pond B16: Peak Elev=165.62' Storage=824 cf Inflow=0.71 cfs 0.061 af
Discarded=0.10 cfs 0.061 af Primary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.061 af

Pond B17: Peak Elev=166.34' Storage=2,448 cf Inflow=2.59 cfs 0.198 af
Discarded=0.41 cfs 0.198 af Primary=0.00 cfs 0.000 af Outflow=0.41 cfs 0.198 af

Pond B18: Peak Elev=156.09' Storage=1,139 cf Inflow=2.03 cfs 0.171 af
Discarded=0.67 cfs 0.172 af Primary=0.00 cfs 0.000 af Outflow=0.67 cfs 0.172 af

Pond B24: Stormtech Basin Peak Elev=150.96' Storage=0.014 af Inflow=0.57 cfs 0.042 af
Discarded=0.07 cfs 0.042 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.042 af

Pond B9: Peak Elev=160.33' Storage=1,324 cf Inflow=1.30 cfs 0.128 af
Discarded=0.24 cfs 0.128 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.128 af

Link POA-2: Inflow=0.01 cfs 0.008 af
Primary=0.01 cfs 0.008 af

Link POA-6: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-7: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-8: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-9: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA4: Inflow=0.02 cfs 0.011 af
Primary=0.02 cfs 0.011 af

Summary for Subcatchment P10:

Runoff = 2.29 cfs @ 12.10 hrs, Volume= 0.178 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG A
0.871	98	Paved parking, HSG B
0.385	39	>75% Grass cover, Good, HSG A
1.023	61	>75% Grass cover, Good, HSG B
0.313	98	Water Surface, HSG B
2.878	77	Weighted Average
1.408		48.92% Pervious Area
1.470		51.08% Impervious Area

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

Summary for Subcatchment P11:

Runoff = 0.68 cfs @ 12.12 hrs, Volume= 0.076 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
1.044	98	Paved parking, HSG A
0.022	98	Paved parking, HSG B
1.288	39	>75% Grass cover, Good, HSG A
0.129	61	>75% Grass cover, Good, HSG B
0.086	98	Water Surface, HSG A
2.569	67	Weighted Average
1.417		55.16% Pervious Area
1.152		44.84% Impervious Area

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

Summary for Subcatchment P12:

Runoff = 0.13 cfs @ 12.48 hrs, Volume= 0.062 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
	1.194	98	Paved parking, HSG A
	0.567	98	Paved parking, HSG B
	5.208	39	>75% Grass cover, Good, HSG A
	0.387	61	>75% Grass cover, Good, HSG B
	0.124	98	Water Surface, HSG A
	0.123	98	Water Surface, HSG B
*	0.011	98	Paved parking, Former Sand Pit, HSG A
	7.614	56	Weighted Average
	5.595		73.48% Pervious Area
	2.019		26.52% Impervious Area

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

Summary for Subcatchment P13:

Runoff = 0.28 cfs @ 12.27 hrs, Volume= 0.049 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
*	0.771	98	Impervious
	1.382	39	>75% Grass cover, Good, HSG A
	0.065	61	>75% Grass cover, Good, HSG B
	0.167	98	Water Surface, HSG A
	2.385	63	Weighted Average
	1.447		60.67% Pervious Area
	0.938		39.33% Impervious Area

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

Summary for Subcatchment P14:

Runoff = 0.95 cfs @ 12.12 hrs, Volume= 0.099 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
*	0.258	98	roofs
*	0.790	98	pavement
	0.906	39	>75% Grass cover, Good, HSG A
	0.996	61	>75% Grass cover, Good, HSG B
*	0.105	98	water
	3.055	68	Weighted Average
	1.902		62.26% Pervious Area
	1.153		37.74% Impervious Area

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

Summary for Subcatchment P14A:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.220	39	>75% Grass cover, Good, HSG A
0.220		100.00% Pervious Area

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

Summary for Subcatchment P16:

Runoff = 0.71 cfs @ 12.11 hrs, Volume= 0.061 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
*	0.435	98	Impervious
	0.665	49	50-75% Grass cover, Fair, HSG A
	0.140	69	50-75% Grass cover, Fair, HSG B
	0.155	98	Water Surface, HSG A
	1.395	72	Weighted Average
	0.805		57.71% Pervious Area
	0.590		42.29% Impervious Area

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

Summary for Subcatchment P17:

Runoff = 2.59 cfs @ 12.10 hrs, Volume= 0.198 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
1.137	98	Paved parking, HSG A
0.284	98	Paved parking, HSG B
1.128	49	50-75% Grass cover, Fair, HSG A
0.193	69	50-75% Grass cover, Fair, HSG B
0.280	98	Water Surface, HSG A
3.022	78	Weighted Average
1.321		43.71% Pervious Area
1.701		56.29% Impervious Area

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

Summary for Subcatchment P18:

Runoff = 2.03 cfs @ 12.11 hrs, Volume= 0.171 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
1.301	98	Paved parking, HSG A
1.860	49	50-75% Grass cover, Fair, HSG A
0.463	98	Water Surface, HSG A
3.624	73	Weighted Average
1.860		51.32% Pervious Area
1.764		48.68% Impervious Area

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

Summary for Subcatchment P18A:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.080	39	>75% Grass cover, Good, HSG A
0.080		100.00% Pervious Area

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

Summary for Subcatchment P20:

Runoff = 0.01 cfs @ 13.73 hrs, Volume= 0.008 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.231	98	Paved parking, HSG A
0.690	39	>75% Grass cover, Good, HSG A
0.256	61	>75% Grass cover, Good, HSG B
1.177	55	Weighted Average
0.946		80.37% Pervious Area
0.231		19.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.1	154	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.5	204	Total			

Summary for Subcatchment P22:

Runoff = 0.02 cfs @ 24.00 hrs, Volume= 0.011 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

	Area (ac)	CN	Description
	5.488	39	>75% Grass cover, Good, HSG A
	0.705	61	>75% Grass cover, Good, HSG B
	10.200	30	Woods, Good, HSG A
	4.907	55	Woods, Good, HSG B
	4.522	77	Woods, Good, HSG D
*	0.686	98	Impervious
	26.508	47	Weighted Average
	25.822		97.41% Pervious Area
	0.686		2.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	65	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
68.2	1,120	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.4	745	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030
79.7	1,980	Total			

Summary for Subcatchment P23:

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.202	30	Woods, Good, HSG A
10.473	45	Weighted Average
9.360		89.38% Pervious Area
1.113		10.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment P24:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
1.454	30	Woods, Good, HSG A
2.183	35	Weighted Average
2.096		95.99% Pervious Area
0.087		4.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment P25:

Runoff = 0.57 cfs @ 12.10 hrs, Volume= 0.042 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
0.338	98	Paved parking, HSG A
0.110	39	>75% Grass cover, Good, HSG A
0.448	84	Weighted Average
0.110		24.55% Pervious Area
0.338		75.45% Impervious Area

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

Summary for Subcatchment P9:

Runoff = 1.30 cfs @ 12.12 hrs, Volume= 0.128 af, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.50"

Area (ac)	CN	Description
1.661	98	Paved parking, HSG A
1.770	39	>75% Grass cover, Good, HSG A
0.214	98	Water Surface, HSG A
3.645	69	Weighted Average
1.770		48.56% Pervious Area
1.875		51.44% Impervious Area

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

Summary for Pond B10:

Inflow Area = 2.878 ac, 51.08% Impervious, Inflow Depth = 0.74" for 1-yr event
Inflow = 2.29 cfs @ 12.10 hrs, Volume= 0.178 af
Outflow = 0.23 cfs @ 13.67 hrs, Volume= 0.178 af, Atten= 90%, Lag= 94.3 min
Discarded = 0.23 cfs @ 13.67 hrs, Volume= 0.178 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 150.80' @ 13.67 hrs Surf.Area= 9,631 sf Storage= 2,803 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 119.4 min (987.0 - 867.6)

Volume	Invert	Avail.Storage	Storage Description
#1	150.50'	36,364 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
150.50	9,138	404.0	0	0	9,138
151.00	9,970	419.0	4,775	4,775	10,142
152.00	11,714	447.0	10,830	15,606	12,119
153.50	16,079	501.0	20,759	36,364	16,255

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	148.40'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 148.40' / 148.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	152.85'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.23 cfs @ 13.67 hrs HW=150.80' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 5.67 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B11:

Inflow Area = 2.569 ac, 44.84% Impervious, Inflow Depth = 0.36" for 1-yr event
Inflow = 0.68 cfs @ 12.12 hrs, Volume= 0.076 af
Outflow = 0.08 cfs @ 15.27 hrs, Volume= 0.076 af, Atten= 88%, Lag= 188.5 min
Discarded = 0.08 cfs @ 15.27 hrs, Volume= 0.076 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 145.36' @ 15.27 hrs Surf.Area= 1,427 sf Storage= 1,249 cf

Plug-Flow detention time= 213.4 min calculated for 0.076 af (100% of inflow)
Center-of-Mass det. time= 213.6 min (1,126.6 - 913.0)

Volume	Invert	Avail.Storage	Storage Description
#1	144.00'	8,613 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.00	575	96.0	0	0	575
145.00	1,054	131.0	802	802	1,217
146.00	2,225	190.0	1,603	2,406	2,733
147.00	3,062	220.0	2,632	5,038	3,733
148.00	4,114	254.0	3,575	8,613	5,037

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	144.00'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 144.00' / 143.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.77 sf
#3	Device 2	146.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 15.27 hrs HW=145.36' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=144.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B12:

Inflow Area =	7.614 ac, 26.52% Impervious, Inflow Depth = 0.10" for 1-yr event				
Inflow =	0.13 cfs @	12.48 hrs, Volume=	0.062 af		
Outflow =	0.13 cfs @	12.48 hrs, Volume=	0.062 af, Atten= 0%, Lag= 0.0 min		
Discarded =	0.13 cfs @	12.48 hrs, Volume=	0.062 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 154.50' @ 0.00 hrs Surf.Area= 5,451 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (1,012.0 - 1,012.0)

Volume	Invert	Avail.Storage	Storage Description
#1	154.50'	25,940 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.50	5,451	297.0	0	0	5,451
155.00	6,068	311.0	2,878	2,878	6,145
156.00	7,382	340.0	6,714	9,593	7,682
157.00	12,186	447.0	9,684	19,277	14,395
157.50	14,501	479.0	6,663	25,940	16,764

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.10'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 154.10' / 153.85' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 12.48 hrs HW=154.50' (Free Discharge)
└─**1=Exfiltration** (Passes 0.00 cfs of 0.30 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.49 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B13:

Inflow Area =	2.385 ac, 39.33% Impervious, Inflow Depth = 0.24" for 1-yr event				
Inflow =	0.28 cfs @	12.27 hrs,	Volume=	0.049 af	
Outflow =	0.15 cfs @	12.57 hrs,	Volume=	0.049 af,	Atten= 46%, Lag= 17.7 min
Discarded =	0.15 cfs @	12.57 hrs,	Volume=	0.049 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 169.06' @ 12.57 hrs Surf.Area= 2,694 sf Storage= 164 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.4 min (943.5 - 939.1)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	19,003 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
169.00	2,583	360.0	0	0	2,583
170.00	4,651	530.0	3,567	3,567	14,631
171.00	7,887	680.0	6,198	9,765	29,087
172.00	10,658	705.0	9,238	19,003	31,928

Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	166.00'	**15.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 166.00' / 164.40' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	171.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.15 cfs @ 12.57 hrs HW=169.06' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=169.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 7.17 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B14:

Inflow Area =	3.055 ac, 37.74% Impervious, Inflow Depth = 0.39" for 1-yr event				
Inflow =	0.95 cfs @	12.12 hrs,	Volume=	0.099 af	
Outflow =	0.12 cfs @	14.61 hrs,	Volume=	0.099 af,	Atten= 88%, Lag= 149.6 min
Discarded =	0.12 cfs @	14.61 hrs,	Volume=	0.099 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 157.79' @ 14.61 hrs Surf.Area= 4,957 sf Storage= 1,376 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 123.8 min (1,031.3 - 907.4)

Volume	Invert	Avail.Storage	Storage Description
#1	157.50'	22,869 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.50	4,484	407.0	0	0	4,484
158.00	5,310	419.0	2,446	2,446	5,299
159.00	7,037	444.0	6,153	8,599	7,070
160.00	10,528	563.0	8,724	17,323	16,619
160.50	11,666	576.0	5,546	22,869	17,831

Device	Routing	Invert	Outlet Devices
#1	Discarded	157.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 155.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	160.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.12 cfs @ 14.61 hrs HW=157.79' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=157.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 4.25 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B16:

Inflow Area =	1.395 ac, 42.29% Impervious, Inflow Depth = 0.53" for 1-yr event				
Inflow =	0.71 cfs @	12.11 hrs, Volume=	0.061 af		
Outflow =	0.10 cfs @	13.17 hrs, Volume=	0.061 af, Atten= 86%, Lag= 63.6 min		
Discarded =	0.10 cfs @	13.17 hrs, Volume=	0.061 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 165.62' @ 13.17 hrs Surf.Area= 1,777 sf Storage= 824 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 88.0 min (976.0 - 888.0)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	11,143 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
165.00	934	346.0	0	0	934
166.00	2,432	385.0	1,624	1,624	3,232
167.00	4,935	474.0	3,610	5,235	9,331
168.00	6,937	508.0	5,908	11,143	12,033

Device	Routing	Invert	Outlet Devices
#1	Discarded	165.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	165.00'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.00' / 164.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	167.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.10 cfs @ 13.17 hrs HW=165.62' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=165.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B17:

Inflow Area = 3.022 ac, 56.29% Impervious, Inflow Depth = 0.79" for 1-yr event
Inflow = 2.59 cfs @ 12.10 hrs, Volume= 0.198 af
Outflow = 0.41 cfs @ 12.75 hrs, Volume= 0.198 af, Atten= 84%, Lag= 38.9 min
Discarded = 0.41 cfs @ 12.75 hrs, Volume= 0.198 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 166.34' @ 12.75 hrs Surf.Area= 7,397 sf Storage= 2,448 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 45.0 min (908.8 - 863.8)

Volume	Invert	Avail.Storage	Storage Description
#1	166.00'	30,023 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
166.00	6,892	368.0	0	0	6,892
167.00	8,416	394.0	7,641	7,641	8,514
168.00	11,574	420.0	9,953	17,594	10,247
169.00	13,303	445.0	12,428	30,023	12,021

Device	Routing	Invert	Outlet Devices
#1	Discarded	166.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0500 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	168.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.41 cfs @ 12.75 hrs HW=166.34' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.41 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=166.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 6.39 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B18:

Inflow Area = 3.624 ac, 48.68% Impervious, Inflow Depth = 0.57" for 1-yr event
Inflow = 2.03 cfs @ 12.11 hrs, Volume= 0.171 af
Outflow = 0.67 cfs @ 12.50 hrs, Volume= 0.172 af, Atten= 67%, Lag= 23.7 min
Discarded = 0.67 cfs @ 12.50 hrs, Volume= 0.172 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 156.09' @ 12.50 hrs Surf.Area= 12,087 sf Storage= 1,139 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 8.5 min (892.1 - 883.6)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	48,110 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.00	11,892	521.0	0	0	11,892
157.00	14,026	546.0	12,944	12,944	14,081
158.00	18,118	639.0	16,028	28,973	22,871
159.00	20,175	582.0	19,137	48,110	28,442

Device	Routing	Invert	Outlet Devices
#1	Discarded	156.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.50'	**15.0" Round Culvert**
			L= 25.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 154.50' / 154.00' S= 0.0200 '/' Cc= 0.900
			n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.80'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.67 cfs @ 12.50 hrs HW=156.09' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.67 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=156.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 4.36 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B24: Stormtech Basin

Inflow Area =	0.448 ac, 75.45% Impervious, Inflow Depth = 1.12" for 1-yr event			
Inflow =	0.57 cfs @ 12.10 hrs, Volume=	0.042 af		
Outflow =	0.07 cfs @ 11.95 hrs, Volume=	0.042 af, Atten= 88%, Lag= 0.0 min		
Discarded =	0.07 cfs @ 11.95 hrs, Volume=	0.042 af		
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 150.96' @ 12.88 hrs Surf.Area= 0.029 ac Storage= 0.014 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 66.9 min (908.4 - 841.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	150.00'	0.042 af	**22.75'W x 55.89'L x 5.50'H Field A** 0.161 af Overall - 0.055 af Embedded = 0.105 af x 40.0% Voids
#2A	150.75'	0.055 af	**ADS_StormTech MC-3500 d +Cap** x 21 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 3 Rows of 7 Chambers Cap Storage= +14.9 cf x 2 x 3 rows = 89.4 cf
#3	160.25'	0.094 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		0.191 af	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
160.25	0.250	0.000	0.000
160.50	0.500	0.094	0.094

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.07 cfs @ 11.95 hrs HW=150.12' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.00' TW=0.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B9:

Inflow Area =	3.645 ac, 51.44% Impervious, Inflow Depth = 0.42" for 1-yr event				
Inflow =	1.30 cfs @	12.12 hrs, Volume=	0.128 af		
Outflow =	0.24 cfs @	13.01 hrs, Volume=	0.128 af, Atten= 82%, Lag= 53.6 min		
Discarded =	0.24 cfs @	13.01 hrs, Volume=	0.128 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 160.33' @ 13.01 hrs Surf.Area= 4,266 sf Storage= 1,324 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 46.3 min (948.5 - 902.2)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	18,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	3,823	293.0	0	0	3,823
161.00	5,252	308.0	4,519	4,519	4,601
162.00	7,083	364.0	6,145	10,663	7,614
163.00	9,337	686.0	8,184	18,847	34,525

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.20'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 159.20' / 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	162.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.24 cfs @ 13.01 hrs HW=160.33' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.69 cfs potential flow)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link POA-2:

Inflow Area = 1.177 ac, 19.63% Impervious, Inflow Depth = 0.08" for 1-yr event
Inflow = 0.01 cfs @ 13.73 hrs, Volume= 0.008 af
Primary = 0.01 cfs @ 13.73 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.473 ac, 10.62% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 24.04 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 16.17% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 4.670 ac, 37.32% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

Inflow Area = 6.726 ac, 51.52% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA4:

Inflow Area = 45.599 ac, 17.85% Impervious, Inflow Depth = 0.00" for 1-yr event
Inflow = 0.02 cfs @ 24.00 hrs, Volume= 0.011 af
Primary = 0.02 cfs @ 24.00 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P10: Runoff Area=2.878 ac 51.08% Impervious Runoff Depth=1.21"
Tc=6.0 min CN=77 Runoff=3.91 cfs 0.291 af

Subcatchment P11: Runoff Area=2.569 ac 44.84% Impervious Runoff Depth=0.69"
Tc=6.0 min CN=67 Runoff=1.71 cfs 0.147 af

Subcatchment P12: Runoff Area=7.614 ac 26.52% Impervious Runoff Depth=0.28"
Tc=6.0 min CN=56 Runoff=0.95 cfs 0.177 af

Subcatchment P13: Runoff Area=2.385 ac 39.33% Impervious Runoff Depth=0.52"
Tc=6.0 min CN=63 Runoff=1.02 cfs 0.103 af

Subcatchment P14: Runoff Area=3.055 ac 37.74% Impervious Runoff Depth=0.73"
Tc=6.0 min CN=68 Runoff=2.22 cfs 0.187 af

Subcatchment P14A: Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment P16: Runoff Area=1.395 ac 42.29% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=72 Runoff=1.38 cfs 0.108 af

Subcatchment P17: Runoff Area=3.022 ac 56.29% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=78 Runoff=4.34 cfs 0.321 af

Subcatchment P18: Runoff Area=3.624 ac 48.68% Impervious Runoff Depth=0.98"
Tc=6.0 min CN=73 Runoff=3.85 cfs 0.297 af

Subcatchment P18A: Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment P20: Runoff Area=1.177 ac 19.63% Impervious Runoff Depth=0.25"
Flow Length=204' Tc=8.5 min CN=55 Runoff=0.12 cfs 0.025 af

Subcatchment P22: Runoff Area=26.508 ac 2.59% Impervious Runoff Depth=0.07"
Flow Length=1,980' Tc=79.7 min CN=47 Runoff=0.25 cfs 0.161 af

Subcatchment P23: Runoff Area=10.473 ac 10.62% Impervious Runoff Depth=0.04"
Flow Length=545' Tc=17.2 min CN=45 Runoff=0.06 cfs 0.038 af

Subcatchment P24: Runoff Area=2.183 ac 4.01% Impervious Runoff Depth=0.00"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.00 cfs 0.000 af

Subcatchment P25: Runoff Area=0.448 ac 75.45% Impervious Runoff Depth=1.68"
Tc=6.0 min CN=84 Runoff=0.87 cfs 0.063 af

Subcatchment P9: Runoff Area=3.645 ac 51.44% Impervious Runoff Depth=0.78"
Tc=6.0 min CN=69 Runoff=2.88 cfs 0.237 af

Pond B10: Peak Elev=151.12' Storage=5,951 cf Inflow=3.91 cfs 0.291 af
Discarded=0.24 cfs 0.291 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.291 af

Pond B11: Peak Elev=146.21' Storage=2,891 cf Inflow=1.71 cfs 0.147 af
Discarded=0.13 cfs 0.147 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.147 af

Pond B12: Peak Elev=154.68' Storage=1,026 cf Inflow=0.95 cfs 0.177 af
Discarded=0.32 cfs 0.178 af Primary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.178 af

Pond B13: Peak Elev=169.38' Storage=1,101 cf Inflow=1.02 cfs 0.103 af
Discarded=0.18 cfs 0.103 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.103 af

Pond B14: Peak Elev=158.27' Storage=3,963 cf Inflow=2.22 cfs 0.187 af
Discarded=0.14 cfs 0.187 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.187 af

Pond B16: Peak Elev=166.08' Storage=1,815 cf Inflow=1.38 cfs 0.108 af
Discarded=0.14 cfs 0.108 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.108 af

Pond B17: Peak Elev=166.70' Storage=5,158 cf Inflow=4.34 cfs 0.321 af
Discarded=0.44 cfs 0.321 af Primary=0.00 cfs 0.000 af Outflow=0.44 cfs 0.321 af

Pond B18: Peak Elev=156.28' Storage=3,374 cf Inflow=3.85 cfs 0.297 af
Discarded=0.70 cfs 0.297 af Primary=0.00 cfs 0.000 af Outflow=0.70 cfs 0.297 af

Pond B24: Stormtech Basin Peak Elev=151.43' Storage=0.025 af Inflow=0.87 cfs 0.063 af
Discarded=0.07 cfs 0.063 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.063 af

Pond B9: Peak Elev=160.87' Storage=3,843 cf Inflow=2.88 cfs 0.237 af
Discarded=0.28 cfs 0.237 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.237 af

Link POA-2: Inflow=0.12 cfs 0.025 af
Primary=0.12 cfs 0.025 af

Link POA-6: Inflow=0.06 cfs 0.038 af
Primary=0.06 cfs 0.038 af

Link POA-7: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-8: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-9: Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA4: Inflow=0.25 cfs 0.161 af
Primary=0.25 cfs 0.161 af

Summary for Subcatchment P10:

Runoff = 3.91 cfs @ 12.10 hrs, Volume= 0.291 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG A
0.871	98	Paved parking, HSG B
0.385	39	>75% Grass cover, Good, HSG A
1.023	61	>75% Grass cover, Good, HSG B
0.313	98	Water Surface, HSG B
2.878	77	Weighted Average
1.408		48.92% Pervious Area
1.470		51.08% Impervious Area

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

Summary for Subcatchment P11:

Runoff = 1.71 cfs @ 12.11 hrs, Volume= 0.147 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.044	98	Paved parking, HSG A
0.022	98	Paved parking, HSG B
1.288	39	>75% Grass cover, Good, HSG A
0.129	61	>75% Grass cover, Good, HSG B
0.086	98	Water Surface, HSG A
2.569	67	Weighted Average
1.417		55.16% Pervious Area
1.152		44.84% Impervious Area

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

Summary for Subcatchment P12:

Runoff = 0.95 cfs @ 12.31 hrs, Volume= 0.177 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (ac)	CN	Description
	1.194	98	Paved parking, HSG A
	0.567	98	Paved parking, HSG B
	5.208	39	>75% Grass cover, Good, HSG A
	0.387	61	>75% Grass cover, Good, HSG B
	0.124	98	Water Surface, HSG A
	0.123	98	Water Surface, HSG B
*	0.011	98	Paved parking, Former Sand Pit, HSG A
	7.614	56	Weighted Average
	5.595		73.48% Pervious Area
	2.019		26.52% Impervious Area

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

Summary for Subcatchment P13:

Runoff = 1.02 cfs @ 12.12 hrs, Volume= 0.103 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (ac)	CN	Description
*	0.771	98	Impervious
	1.382	39	>75% Grass cover, Good, HSG A
	0.065	61	>75% Grass cover, Good, HSG B
	0.167	98	Water Surface, HSG A
	2.385	63	Weighted Average
	1.447		60.67% Pervious Area
	0.938		39.33% Impervious Area

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

Summary for Subcatchment P14:

Runoff = 2.22 cfs @ 12.11 hrs, Volume= 0.187 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (ac)	CN	Description
*	0.258	98	roofs
*	0.790	98	pavement
	0.906	39	>75% Grass cover, Good, HSG A
	0.996	61	>75% Grass cover, Good, HSG B
*	0.105	98	water
	3.055	68	Weighted Average
	1.902		62.26% Pervious Area
	1.153		37.74% Impervious Area

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

Summary for Subcatchment P14A:

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.220	39	>75% Grass cover, Good, HSG A
0.220		100.00% Pervious Area

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

Summary for Subcatchment P16:

Runoff = 1.38 cfs @ 12.10 hrs, Volume= 0.108 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (ac)	CN	Description
*	0.435	98	Impervious
	0.665	49	50-75% Grass cover, Fair, HSG A
	0.140	69	50-75% Grass cover, Fair, HSG B
	0.155	98	Water Surface, HSG A
	1.395	72	Weighted Average
	0.805		57.71% Pervious Area
	0.590		42.29% Impervious Area

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

Summary for Subcatchment P17:

Runoff = 4.34 cfs @ 12.10 hrs, Volume= 0.321 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.137	98	Paved parking, HSG A
0.284	98	Paved parking, HSG B
1.128	49	50-75% Grass cover, Fair, HSG A
0.193	69	50-75% Grass cover, Fair, HSG B
0.280	98	Water Surface, HSG A
3.022	78	Weighted Average
1.321		43.71% Pervious Area
1.701		56.29% Impervious Area

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

Summary for Subcatchment P18:

Runoff = 3.85 cfs @ 12.10 hrs, Volume= 0.297 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.301	98	Paved parking, HSG A
1.860	49	50-75% Grass cover, Fair, HSG A
0.463	98	Water Surface, HSG A
3.624	73	Weighted Average
1.860		51.32% Pervious Area
1.764		48.68% Impervious Area

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

Summary for Subcatchment P18A:

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.080	39	>75% Grass cover, Good, HSG A
0.080		100.00% Pervious Area

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

Summary for Subcatchment P20:

Runoff = 0.12 cfs @ 12.37 hrs, Volume= 0.025 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.231	98	Paved parking, HSG A
0.690	39	>75% Grass cover, Good, HSG A
0.256	61	>75% Grass cover, Good, HSG B
1.177	55	Weighted Average
0.946		80.37% Pervious Area
0.231		19.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.1	154	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.5	204	Total			

Summary for Subcatchment P22:

Runoff = 0.25 cfs @ 16.00 hrs, Volume= 0.161 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

	Area (ac)	CN	Description
	5.488	39	>75% Grass cover, Good, HSG A
	0.705	61	>75% Grass cover, Good, HSG B
	10.200	30	Woods, Good, HSG A
	4.907	55	Woods, Good, HSG B
	4.522	77	Woods, Good, HSG D
*	0.686	98	Impervious
	26.508	47	Weighted Average
	25.822		97.41% Pervious Area
	0.686		2.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	65	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
68.2	1,120	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.4	745	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030
79.7	1,980	Total			

Summary for Subcatchment P23:

Runoff = 0.06 cfs @ 15.54 hrs, Volume= 0.038 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.202	30	Woods, Good, HSG A
10.473	45	Weighted Average
9.360		89.38% Pervious Area
1.113		10.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment P24:

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
1.454	30	Woods, Good, HSG A
2.183	35	Weighted Average
2.096		95.99% Pervious Area
0.087		4.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment P25:

Runoff = 0.87 cfs @ 12.09 hrs, Volume= 0.063 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
0.338	98	Paved parking, HSG A
0.110	39	>75% Grass cover, Good, HSG A
0.448	84	Weighted Average
0.110		24.55% Pervious Area
0.338		75.45% Impervious Area

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

Summary for Subcatchment P9:

Runoff = 2.88 cfs @ 12.11 hrs, Volume= 0.237 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.20"

Area (ac)	CN	Description
1.661	98	Paved parking, HSG A
1.770	39	>75% Grass cover, Good, HSG A
0.214	98	Water Surface, HSG A
3.645	69	Weighted Average
1.770		48.56% Pervious Area
1.875		51.44% Impervious Area

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

Summary for Pond B10:

Inflow Area =	2.878 ac, 51.08% Impervious, Inflow Depth = 1.21" for 2-yr event				
Inflow =	3.91 cfs @	12.10 hrs,	Volume=	0.291 af	
Outflow =	0.24 cfs @	14.93 hrs,	Volume=	0.291 af,	Atten= 94%, Lag= 170.2 min
Discarded =	0.24 cfs @	14.93 hrs,	Volume=	0.291 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 151.12' @ 14.93 hrs Surf.Area= 10,166 sf Storage= 5,951 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 264.9 min (1,117.3 - 852.4)

Volume	Invert	Avail.Storage	Storage Description
#1	150.50'	36,364 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
150.50	9,138	404.0	0	0	9,138
151.00	9,970	419.0	4,775	4,775	10,142
152.00	11,714	447.0	10,830	15,606	12,119
153.50	16,079	501.0	20,759	36,364	16,255

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	148.40'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 148.40' / 148.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	152.85'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.24 cfs @ 14.93 hrs HW=151.12' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.50' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 5.67 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B11:

Inflow Area =	2.569 ac, 44.84% Impervious, Inflow Depth = 0.69" for 2-yr event				
Inflow =	1.71 cfs @	12.11 hrs,	Volume=	0.147 af	
Outflow =	0.13 cfs @	15.31 hrs,	Volume=	0.147 af,	Atten= 92%, Lag= 192.0 min
Discarded =	0.13 cfs @	15.31 hrs,	Volume=	0.147 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 146.21' @ 15.31 hrs Surf.Area= 2,390 sf Storage= 2,891 cf

Plug-Flow detention time= 292.2 min calculated for 0.147 af (100% of inflow)
Center-of-Mass det. time= 292.4 min (1,179.4 - 887.0)

Volume	Invert	Avail.Storage	Storage Description
#1	144.00'	8,613 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.00	575	96.0	0	0	575
145.00	1,054	131.0	802	802	1,217
146.00	2,225	190.0	1,603	2,406	2,733
147.00	3,062	220.0	2,632	5,038	3,733
148.00	4,114	254.0	3,575	8,613	5,037

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	144.00'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 144.00' / 143.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.77 sf
#3	Device 2	146.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.13 cfs @ 15.31 hrs HW=146.21' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=144.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B12:

Inflow Area =	7.614 ac, 26.52% Impervious, Inflow Depth = 0.28" for 2-yr event			
Inflow =	0.95 cfs @	12.31 hrs, Volume=	0.177 af	
Outflow =	0.32 cfs @	13.33 hrs, Volume=	0.178 af, Atten= 67%, Lag= 61.6 min	
Discarded =	0.32 cfs @	13.33 hrs, Volume=	0.178 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 154.68' @ 13.33 hrs Surf.Area= 5,675 sf Storage= 1,026 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 25.0 min (972.2 - 947.2)

Volume	Invert	Avail.Storage	Storage Description
#1	154.50'	25,940 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.50	5,451	297.0	0	0	5,451
155.00	6,068	311.0	2,878	2,878	6,145
156.00	7,382	340.0	6,714	9,593	7,682
157.00	12,186	447.0	9,684	19,277	14,395
157.50	14,501	479.0	6,663	25,940	16,764

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.10'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 154.10' / 153.85' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.32 cfs @ 13.33 hrs HW=154.68' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.50' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 0.49 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B13:

Inflow Area =	2.385 ac, 39.33% Impervious, Inflow Depth = 0.52" for 2-yr event			
Inflow =	1.02 cfs @	12.12 hrs, Volume=	0.103 af	
Outflow =	0.18 cfs @	13.07 hrs, Volume=	0.103 af, Atten= 82%, Lag= 57.1 min	
Discarded =	0.18 cfs @	13.07 hrs, Volume=	0.103 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 169.38' @ 13.07 hrs Surf.Area= 3,290 sf Storage= 1,101 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 54.2 min (958.7 - 904.5)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	19,003 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
169.00	2,583	360.0	0	0	2,583
170.00	4,651	530.0	3,567	3,567	14,631
171.00	7,887	680.0	6,198	9,765	29,087
172.00	10,658	705.0	9,238	19,003	31,928

Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	166.00'	**15.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 166.00' / 164.40' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	171.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.18 cfs @ 13.07 hrs HW=169.38' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=169.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 7.17 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B14:

Inflow Area =	3.055 ac, 37.74% Impervious, Inflow Depth = 0.73" for 2-yr event				
Inflow =	2.22 cfs @	12.11 hrs, Volume=	0.187 af		
Outflow =	0.14 cfs @	15.90 hrs, Volume=	0.187 af, Atten= 94%, Lag= 227.6 min		
Discarded =	0.14 cfs @	15.90 hrs, Volume=	0.187 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 158.27' @ 15.90 hrs Surf.Area= 5,760 sf Storage= 3,963 cf

Plug-Flow detention time= 339.6 min calculated for 0.186 af (100% of inflow)
Center-of-Mass det. time= 339.9 min (1,223.1 - 883.1)

Volume	Invert	Avail.Storage	Storage Description
#1	157.50'	22,869 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.50	4,484	407.0	0	0	4,484
158.00	5,310	419.0	2,446	2,446	5,299
159.00	7,037	444.0	6,153	8,599	7,070
160.00	10,528	563.0	8,724	17,323	16,619
160.50	11,666	576.0	5,546	22,869	17,831

Device	Routing	Invert	Outlet Devices
#1	Discarded	157.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 155.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	160.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.14 cfs @ 15.90 hrs HW=158.27' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=157.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 4.25 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B16:

Inflow Area =	1.395 ac, 42.29% Impervious, Inflow Depth = 0.93" for 2-yr event				
Inflow =	1.38 cfs @	12.10 hrs,	Volume=	0.108 af	
Outflow =	0.14 cfs @	13.56 hrs,	Volume=	0.108 af,	Atten= 90%, Lag= 87.5 min
Discarded =	0.14 cfs @	13.56 hrs,	Volume=	0.108 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 166.08' @ 13.56 hrs Surf.Area= 2,591 sf Storage= 1,815 cf

Plug-Flow detention time= 151.9 min calculated for 0.108 af (100% of inflow)
Center-of-Mass det. time= 152.1 min (1,020.9 - 868.8)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	11,143 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
165.00	934	346.0	0	0	934
166.00	2,432	385.0	1,624	1,624	3,232
167.00	4,935	474.0	3,610	5,235	9,331
168.00	6,937	508.0	5,908	11,143	12,033

Device	Routing	Invert	Outlet Devices
#1	Discarded	165.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	165.00'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.00' / 164.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	167.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.14 cfs @ 13.56 hrs HW=166.08' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=165.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B17:

Inflow Area = 3.022 ac, 56.29% Impervious, Inflow Depth = 1.27" for 2-yr event
Inflow = 4.34 cfs @ 12.10 hrs, Volume= 0.321 af
Outflow = 0.44 cfs @ 13.17 hrs, Volume= 0.321 af, Atten= 90%, Lag= 64.3 min
Discarded = 0.44 cfs @ 13.17 hrs, Volume= 0.321 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 166.70' @ 13.17 hrs Surf.Area= 7,937 sf Storage= 5,158 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 108.0 min (957.2 - 849.2)

Volume	Invert	Avail.Storage	Storage Description
#1	166.00'	30,023 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
166.00	6,892	368.0	0	0	6,892
167.00	8,416	394.0	7,641	7,641	8,514
168.00	11,574	420.0	9,953	17,594	10,247
169.00	13,303	445.0	12,428	30,023	12,021

Device	Routing	Invert	Outlet Devices
#1	Discarded	166.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0500 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	168.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.44 cfs @ 13.17 hrs HW=166.70' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=166.00' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 6.39 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B18:

Inflow Area = 3.624 ac, 48.68% Impervious, Inflow Depth = 0.98" for 2-yr event
Inflow = 3.85 cfs @ 12.10 hrs, Volume= 0.297 af
Outflow = 0.70 cfs @ 12.65 hrs, Volume= 0.297 af, Atten= 82%, Lag= 32.7 min
Discarded = 0.70 cfs @ 12.65 hrs, Volume= 0.297 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 156.28' @ 12.65 hrs Surf.Area= 12,466 sf Storage= 3,374 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 33.6 min (899.0 - 865.4)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	48,110 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.00	11,892	521.0	0	0	11,892
157.00	14,026	546.0	12,944	12,944	14,081
158.00	18,118	639.0	16,028	28,973	22,871
159.00	20,175	582.0	19,137	48,110	28,442

Device	Routing	Invert	Outlet Devices
#1	Discarded	156.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 154.50' / 154.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.80'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.70 cfs @ 12.65 hrs HW=156.28' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.70 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=156.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 4.36 cfs potential flow)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B24: Stormtech Basin

Inflow Area =	0.448 ac, 75.45% Impervious, Inflow Depth = 1.68" for 2-yr event				
Inflow =	0.87 cfs @	12.09 hrs,	Volume=	0.063 af	
Outflow =	0.07 cfs @	11.85 hrs,	Volume=	0.063 af,	Atten= 92%, Lag= 0.0 min
Discarded =	0.07 cfs @	11.85 hrs,	Volume=	0.063 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 151.43' @ 13.49 hrs Surf.Area= 0.029 ac Storage= 0.025 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 139.2 min (968.8 - 829.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	150.00'	0.042 af	**22.75'W x 55.89'L x 5.50'H Field A** 0.161 af Overall - 0.055 af Embedded = 0.105 af x 40.0% Voids
#2A	150.75'	0.055 af	**ADS_StormTech MC-3500 d +Cap** x 21 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 3 Rows of 7 Chambers Cap Storage= +14.9 cf x 2 x 3 rows = 89.4 cf
#3	160.25'	0.094 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		0.191 af	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
160.25	0.250	0.000	0.000
160.50	0.500	0.094	0.094

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.07 cfs @ 11.85 hrs HW=150.15' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.00' TW=0.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B9:

Inflow Area = 3.645 ac, 51.44% Impervious, Inflow Depth = 0.78" for 2-yr event
Inflow = 2.88 cfs @ 12.11 hrs, Volume= 0.237 af
Outflow = 0.28 cfs @ 14.01 hrs, Volume= 0.237 af, Atten= 90%, Lag= 114.6 min
Discarded = 0.28 cfs @ 14.01 hrs, Volume= 0.237 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 160.87' @ 14.01 hrs Surf.Area= 5,052 sf Storage= 3,843 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 147.2 min (1,026.6 - 879.4)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	18,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	3,823	293.0	0	0	3,823
161.00	5,252	308.0	4,519	4,519	4,601
162.00	7,083	364.0	6,145	10,663	7,614
163.00	9,337	686.0	8,184	18,847	34,525

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.20'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 159.20' / 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	162.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.28 cfs @ 14.01 hrs HW=160.87' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.69 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link POA-2:

Inflow Area = 1.177 ac, 19.63% Impervious, Inflow Depth = 0.25" for 2-yr event
Inflow = 0.12 cfs @ 12.37 hrs, Volume= 0.025 af
Primary = 0.12 cfs @ 12.37 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.473 ac, 10.62% Impervious, Inflow Depth = 0.04" for 2-yr event
Inflow = 0.06 cfs @ 15.54 hrs, Volume= 0.038 af
Primary = 0.06 cfs @ 15.54 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 16.17% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 4.670 ac, 37.32% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

Inflow Area = 6.726 ac, 51.52% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA4:

Inflow Area = 45.599 ac, 17.85% Impervious, Inflow Depth = 0.04" for 2-yr event
Inflow = 0.25 cfs @ 16.00 hrs, Volume= 0.161 af
Primary = 0.25 cfs @ 16.00 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P10: Runoff Area=2.878 ac 51.08% Impervious Runoff Depth=2.37"
Tc=6.0 min CN=77 Runoff=7.85 cfs 0.569 af

Subcatchment P11: Runoff Area=2.569 ac 44.84% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=67 Runoff=4.53 cfs 0.342 af

Subcatchment P12: Runoff Area=7.614 ac 26.52% Impervious Runoff Depth=0.89"
Tc=6.0 min CN=56 Runoff=6.18 cfs 0.565 af

Subcatchment P13: Runoff Area=2.385 ac 39.33% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=63 Runoff=3.34 cfs 0.263 af

Subcatchment P14: Runoff Area=3.055 ac 37.74% Impervious Runoff Depth=1.67"
Tc=6.0 min CN=68 Runoff=5.67 cfs 0.425 af

Subcatchment P14A: Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=0.14"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.003 af

Subcatchment P16: Runoff Area=1.395 ac 42.29% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=72 Runoff=3.12 cfs 0.229 af

Subcatchment P17: Runoff Area=3.022 ac 56.29% Impervious Runoff Depth=2.46"
Tc=6.0 min CN=78 Runoff=8.54 cfs 0.619 af

Subcatchment P18: Runoff Area=3.624 ac 48.68% Impervious Runoff Depth=2.05"
Tc=6.0 min CN=73 Runoff=8.45 cfs 0.618 af

Subcatchment P18A: Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=0.14"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.001 af

Subcatchment P20: Runoff Area=1.177 ac 19.63% Impervious Runoff Depth=0.83"
Flow Length=204' Tc=8.5 min CN=55 Runoff=0.78 cfs 0.082 af

Subcatchment P22: Runoff Area=26.508 ac 2.59% Impervious Runoff Depth=0.44"
Flow Length=1,980' Tc=79.7 min CN=47 Runoff=2.46 cfs 0.962 af

Subcatchment P23: Runoff Area=10.473 ac 10.62% Impervious Runoff Depth=0.35"
Flow Length=545' Tc=17.2 min CN=45 Runoff=1.28 cfs 0.307 af

Subcatchment P24: Runoff Area=2.183 ac 4.01% Impervious Runoff Depth=0.05"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.01 cfs 0.009 af

Subcatchment P25: Runoff Area=0.448 ac 75.45% Impervious Runoff Depth=3.00"
Tc=6.0 min CN=84 Runoff=1.53 cfs 0.112 af

Subcatchment P9: Runoff Area=3.645 ac 51.44% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=69 Runoff=7.10 cfs 0.529 af

Pond B10: Peak Elev=151.92' Storage=14,715 cf Inflow=7.85 cfs 0.569 af
Discarded=0.27 cfs 0.570 af Primary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.570 af

Pond B11: Peak Elev=146.48' Storage=3,568 cf Inflow=4.53 cfs 0.342 af
Discarded=0.15 cfs 0.190 af Primary=2.89 cfs 0.152 af Outflow=3.03 cfs 0.342 af

Pond B12: Peak Elev=156.22' Storage=11,293 cf Inflow=6.18 cfs 0.565 af
Discarded=0.46 cfs 0.566 af Primary=0.00 cfs 0.000 af Outflow=0.46 cfs 0.566 af

Pond B13: Peak Elev=170.23' Storage=4,707 cf Inflow=3.34 cfs 0.263 af
Discarded=0.30 cfs 0.263 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.263 af

Pond B14: Peak Elev=159.38' Storage=11,523 cf Inflow=5.67 cfs 0.425 af
Discarded=0.20 cfs 0.425 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.425 af

Pond B16: Peak Elev=166.86' Storage=4,590 cf Inflow=3.12 cfs 0.229 af
Discarded=0.25 cfs 0.229 af Primary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.229 af

Pond B17: Peak Elev=167.53' Storage=12,570 cf Inflow=8.54 cfs 0.619 af
Discarded=0.56 cfs 0.620 af Primary=0.00 cfs 0.000 af Outflow=0.56 cfs 0.620 af

Pond B18: Peak Elev=156.83' Storage=10,563 cf Inflow=8.45 cfs 0.618 af
Discarded=0.76 cfs 0.619 af Primary=0.00 cfs 0.000 af Outflow=0.76 cfs 0.619 af

Pond B24: Stormtech Basin Peak Elev=152.84' Storage=0.057 af Inflow=1.53 cfs 0.112 af
Discarded=0.07 cfs 0.112 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.112 af

Pond B9: Peak Elev=162.14' Storage=11,665 cf Inflow=7.10 cfs 0.529 af
Discarded=0.41 cfs 0.530 af Primary=0.00 cfs 0.000 af Outflow=0.41 cfs 0.530 af

Link POA-2: Inflow=0.78 cfs 0.082 af
Primary=0.78 cfs 0.082 af

Link POA-6: Inflow=1.28 cfs 0.307 af
Primary=1.28 cfs 0.307 af

Link POA-7: Inflow=0.01 cfs 0.009 af
Primary=0.01 cfs 0.009 af

Link POA-8: Inflow=0.00 cfs 0.003 af
Primary=0.00 cfs 0.003 af

Link POA-9: Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Link POA4: Inflow=2.79 cfs 1.114 af
Primary=2.79 cfs 1.114 af

Summary for Subcatchment P10:

Runoff = 7.85 cfs @ 12.09 hrs, Volume= 0.569 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG A
0.871	98	Paved parking, HSG B
0.385	39	>75% Grass cover, Good, HSG A
1.023	61	>75% Grass cover, Good, HSG B
0.313	98	Water Surface, HSG B
2.878	77	Weighted Average
1.408		48.92% Pervious Area
1.470		51.08% Impervious Area

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

Summary for Subcatchment P11:

Runoff = 4.53 cfs @ 12.10 hrs, Volume= 0.342 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.044	98	Paved parking, HSG A
0.022	98	Paved parking, HSG B
1.288	39	>75% Grass cover, Good, HSG A
0.129	61	>75% Grass cover, Good, HSG B
0.086	98	Water Surface, HSG A
2.569	67	Weighted Average
1.417		55.16% Pervious Area
1.152		44.84% Impervious Area

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

Summary for Subcatchment P12:

Runoff = 6.18 cfs @ 12.11 hrs, Volume= 0.565 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

	Area (ac)	CN	Description
	1.194	98	Paved parking, HSG A
	0.567	98	Paved parking, HSG B
	5.208	39	>75% Grass cover, Good, HSG A
	0.387	61	>75% Grass cover, Good, HSG B
	0.124	98	Water Surface, HSG A
	0.123	98	Water Surface, HSG B
*	0.011	98	Paved parking, Former Sand Pit, HSG A
	7.614	56	Weighted Average
	5.595		73.48% Pervious Area
	2.019		26.52% Impervious Area

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

Summary for Subcatchment P13:

Runoff = 3.34 cfs @ 12.10 hrs, Volume= 0.263 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

	Area (ac)	CN	Description
*	0.771	98	Impervious
	1.382	39	>75% Grass cover, Good, HSG A
	0.065	61	>75% Grass cover, Good, HSG B
	0.167	98	Water Surface, HSG A
	2.385	63	Weighted Average
	1.447		60.67% Pervious Area
	0.938		39.33% Impervious Area

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

Summary for Subcatchment P14:

Runoff = 5.67 cfs @ 12.10 hrs, Volume= 0.425 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

	Area (ac)	CN	Description
*	0.258	98	roofs
*	0.790	98	pavement
	0.906	39	>75% Grass cover, Good, HSG A
	0.996	61	>75% Grass cover, Good, HSG B
*	0.105	98	water
	3.055	68	Weighted Average
	1.902		62.26% Pervious Area
	1.153		37.74% Impervious Area

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

Summary for Subcatchment P14A:

Runoff = 0.00 cfs @ 13.76 hrs, Volume= 0.003 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.220	39	>75% Grass cover, Good, HSG A
0.220		100.00% Pervious Area

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

Summary for Subcatchment P16:

Runoff = 3.12 cfs @ 12.10 hrs, Volume= 0.229 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

	Area (ac)	CN	Description
*	0.435	98	Impervious
	0.665	49	50-75% Grass cover, Fair, HSG A
	0.140	69	50-75% Grass cover, Fair, HSG B
	0.155	98	Water Surface, HSG A
	1.395	72	Weighted Average
	0.805		57.71% Pervious Area
	0.590		42.29% Impervious Area

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

Summary for Subcatchment P17:

Runoff = 8.54 cfs @ 12.09 hrs, Volume= 0.619 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.137	98	Paved parking, HSG A
0.284	98	Paved parking, HSG B
1.128	49	50-75% Grass cover, Fair, HSG A
0.193	69	50-75% Grass cover, Fair, HSG B
0.280	98	Water Surface, HSG A
3.022	78	Weighted Average
1.321		43.71% Pervious Area
1.701		56.29% Impervious Area

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

Summary for Subcatchment P18:

Runoff = 8.45 cfs @ 12.10 hrs, Volume= 0.618 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.301	98	Paved parking, HSG A
1.860	49	50-75% Grass cover, Fair, HSG A
0.463	98	Water Surface, HSG A
3.624	73	Weighted Average
1.860		51.32% Pervious Area
1.764		48.68% Impervious Area

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

Summary for Subcatchment P18A:

Runoff = 0.00 cfs @ 13.76 hrs, Volume= 0.001 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.080	39	>75% Grass cover, Good, HSG A
0.080		100.00% Pervious Area

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

Summary for Subcatchment P20:

Runoff = 0.78 cfs @ 12.16 hrs, Volume= 0.082 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.231	98	Paved parking, HSG A
0.690	39	>75% Grass cover, Good, HSG A
0.256	61	>75% Grass cover, Good, HSG B
1.177	55	Weighted Average
0.946		80.37% Pervious Area
0.231		19.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.1	154	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.5	204	Total			

Summary for Subcatchment P22:

Runoff = 2.46 cfs @ 13.46 hrs, Volume= 0.962 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

	Area (ac)	CN	Description
	5.488	39	>75% Grass cover, Good, HSG A
	0.705	61	>75% Grass cover, Good, HSG B
	10.200	30	Woods, Good, HSG A
	4.907	55	Woods, Good, HSG B
	4.522	77	Woods, Good, HSG D
*	0.686	98	Impervious
	26.508	47	Weighted Average
	25.822		97.41% Pervious Area
	0.686		2.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	65	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
68.2	1,120	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.4	745	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030
79.7	1,980	Total			

Summary for Subcatchment P23:

Runoff = 1.28 cfs @ 12.51 hrs, Volume= 0.307 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.202	30	Woods, Good, HSG A
10.473	45	Weighted Average
9.360		89.38% Pervious Area
1.113		10.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment P24:

Runoff = 0.01 cfs @ 15.78 hrs, Volume= 0.009 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
1.454	30	Woods, Good, HSG A
2.183	35	Weighted Average
2.096		95.99% Pervious Area
0.087		4.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment P25:

Runoff = 1.53 cfs @ 12.09 hrs, Volume= 0.112 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
0.338	98	Paved parking, HSG A
0.110	39	>75% Grass cover, Good, HSG A
0.448	84	Weighted Average
0.110		24.55% Pervious Area
0.338		75.45% Impervious Area

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

Summary for Subcatchment P9:

Runoff = 7.10 cfs @ 12.10 hrs, Volume= 0.529 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

Area (ac)	CN	Description
1.661	98	Paved parking, HSG A
1.770	39	>75% Grass cover, Good, HSG A
0.214	98	Water Surface, HSG A
3.645	69	Weighted Average
1.770		48.56% Pervious Area
1.875		51.44% Impervious Area

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

Summary for Pond B10:

Inflow Area =	2.878 ac,	51.08% Impervious,	Inflow Depth =	2.37"	for 10-yr event
Inflow =	7.85 cfs @	12.09 hrs,	Volume=	0.569 af	
Outflow =	0.27 cfs @	16.24 hrs,	Volume=	0.570 af,	Atten= 97%, Lag= 248.9 min
Discarded =	0.27 cfs @	16.24 hrs,	Volume=	0.570 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 151.92' @ 16.24 hrs Surf.Area= 11,576 sf Storage= 14,715 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 571.0 min (1,403.6 - 832.6)

Volume	Invert	Avail.Storage	Storage Description
#1	150.50'	36,364 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
150.50	9,138	404.0	0	0	9,138
151.00	9,970	419.0	4,775	4,775	10,142
152.00	11,714	447.0	10,830	15,606	12,119
153.50	16,079	501.0	20,759	36,364	16,255

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	148.40'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 148.40' / 148.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	152.85'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.27 cfs @ 16.24 hrs HW=151.92' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 5.67 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B11:

Inflow Area =	2.569 ac,	44.84% Impervious,	Inflow Depth =	1.60"	for 10-yr event
Inflow =	4.53 cfs @	12.10 hrs,	Volume=	0.342 af	
Outflow =	3.03 cfs @	12.22 hrs,	Volume=	0.342 af,	Atten= 33%, Lag= 7.3 min
Discarded =	0.15 cfs @	12.22 hrs,	Volume=	0.190 af	
Primary =	2.89 cfs @	12.22 hrs,	Volume=	0.152 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 146.48' @ 12.22 hrs Surf.Area= 2,611 sf Storage= 3,568 cf

Plug-Flow detention time= 176.3 min calculated for 0.342 af (100% of inflow)
Center-of-Mass det. time= 176.8 min (1,036.0 - 859.2)

Volume	Invert	Avail.Storage	Storage Description
#1	144.00'	8,613 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.00	575	96.0	0	0	575
145.00	1,054	131.0	802	802	1,217
146.00	2,225	190.0	1,603	2,406	2,733
147.00	3,062	220.0	2,632	5,038	3,733
148.00	4,114	254.0	3,575	8,613	5,037

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	144.00'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 144.00' / 143.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.77 sf
#3	Device 2	146.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.15 cfs @ 12.22 hrs HW=146.47' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=2.70 cfs @ 12.22 hrs HW=146.47' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 2.70 cfs of 8.81 cfs potential flow)
  └─**3=Orifice/Grate** (Weir Controls 2.70 cfs @ 1.53 fps)

Summary for Pond B12:

Inflow Area =	7.614 ac, 26.52% Impervious, Inflow Depth = 0.89" for 10-yr event				
Inflow =	6.18 cfs @	12.11 hrs,	Volume=	0.565 af	
Outflow =	0.46 cfs @	15.75 hrs,	Volume=	0.566 af,	Atten= 92%, Lag= 218.3 min
Discarded =	0.46 cfs @	15.75 hrs,	Volume=	0.566 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 156.22' @ 15.75 hrs Surf.Area= 8,321 sf Storage= 11,293 cf

Plug-Flow detention time= 307.8 min calculated for 0.565 af (100% of inflow)
Center-of-Mass det. time= 308.4 min (1,203.1 - 894.7)

Volume	Invert	Avail.Storage	Storage Description
#1	154.50'	25,940 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.50	5,451	297.0	0	0	5,451
155.00	6,068	311.0	2,878	2,878	6,145
156.00	7,382	340.0	6,714	9,593	7,682
157.00	12,186	447.0	9,684	19,277	14,395
157.50	14,501	479.0	6,663	25,940	16,764

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.10'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 154.10' / 153.85' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.46 cfs @ 15.75 hrs HW=156.22' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.46 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.49 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B13:

Inflow Area =	2.385 ac, 39.33% Impervious, Inflow Depth = 1.32" for 10-yr event				
Inflow =	3.34 cfs @	12.10 hrs,	Volume=	0.263 af	
Outflow =	0.30 cfs @	14.04 hrs,	Volume=	0.263 af,	Atten= 91%, Lag= 116.5 min
Discarded =	0.30 cfs @	14.04 hrs,	Volume=	0.263 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 170.23' @ 14.04 hrs Surf.Area= 5,317 sf Storage= 4,707 cf

Plug-Flow detention time= 192.4 min calculated for 0.263 af (100% of inflow)
Center-of-Mass det. time= 192.6 min (1,063.2 - 870.7)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	19,003 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
169.00	2,583	360.0	0	0	2,583
170.00	4,651	530.0	3,567	3,567	14,631
171.00	7,887	680.0	6,198	9,765	29,087
172.00	10,658	705.0	9,238	19,003	31,928

Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	166.00'	**15.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 166.00' / 164.40' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	171.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.30 cfs @ 14.04 hrs HW=170.23' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=169.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 7.17 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B14:

Inflow Area =	3.055 ac, 37.74% Impervious, Inflow Depth = 1.67" for 10-yr event				
Inflow =	5.67 cfs @	12.10 hrs,	Volume=	0.425 af	
Outflow =	0.20 cfs @	17.19 hrs,	Volume=	0.425 af,	Atten= 97%, Lag= 305.2 min
Discarded =	0.20 cfs @	17.19 hrs,	Volume=	0.425 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 159.38' @ 17.19 hrs Surf.Area= 8,288 sf Storage= 11,523 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 704.7 min (1,561.2 - 856.4)

Volume	Invert	Avail.Storage	Storage Description
#1	157.50'	22,869 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.50	4,484	407.0	0	0	4,484
158.00	5,310	419.0	2,446	2,446	5,299
159.00	7,037	444.0	6,153	8,599	7,070
160.00	10,528	563.0	8,724	17,323	16,619
160.50	11,666	576.0	5,546	22,869	17,831

Device	Routing	Invert	Outlet Devices
#1	Discarded	157.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 155.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	160.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.20 cfs @ 17.19 hrs HW=159.38' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=157.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 4.25 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B16:

Inflow Area =	1.395 ac, 42.29% Impervious, Inflow Depth = 1.97" for 10-yr event				
Inflow =	3.12 cfs @	12.10 hrs,	Volume=	0.229 af	
Outflow =	0.25 cfs @	13.78 hrs,	Volume=	0.229 af,	Atten= 92%, Lag= 100.7 min
Discarded =	0.25 cfs @	13.78 hrs,	Volume=	0.229 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 166.86' @ 13.78 hrs Surf.Area= 4,543 sf Storage= 4,590 cf

Plug-Flow detention time= 235.2 min calculated for 0.229 af (100% of inflow)
Center-of-Mass det. time= 235.5 min (1,081.2 - 845.8)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	11,143 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
165.00	934	346.0	0	0	934
166.00	2,432	385.0	1,624	1,624	3,232
167.00	4,935	474.0	3,610	5,235	9,331
168.00	6,937	508.0	5,908	11,143	12,033

Device	Routing	Invert	Outlet Devices
#1	Discarded	165.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	165.00'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.00' / 164.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	167.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.25 cfs @ 13.78 hrs HW=166.86' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=165.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B17:

Inflow Area = 3.022 ac, 56.29% Impervious, Inflow Depth = 2.46" for 10-yr event
Inflow = 8.54 cfs @ 12.09 hrs, Volume= 0.619 af
Outflow = 0.56 cfs @ 14.06 hrs, Volume= 0.620 af, Atten= 93%, Lag= 117.9 min
Discarded = 0.56 cfs @ 14.06 hrs, Volume= 0.620 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 167.53' @ 14.06 hrs Surf.Area= 10,042 sf Storage= 12,570 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 244.5 min (1,074.4 - 829.9)

Volume	Invert	Avail.Storage	Storage Description
#1	166.00'	30,023 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
166.00	6,892	368.0	0	0	6,892
167.00	8,416	394.0	7,641	7,641	8,514
168.00	11,574	420.0	9,953	17,594	10,247
169.00	13,303	445.0	12,428	30,023	12,021

Device	Routing	Invert	Outlet Devices
#1	Discarded	166.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0500 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	168.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.56 cfs @ 14.06 hrs HW=167.53' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.56 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=166.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 6.39 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B18:

Inflow Area = 3.624 ac, 48.68% Impervious, Inflow Depth = 2.05" for 10-yr event
Inflow = 8.45 cfs @ 12.10 hrs, Volume= 0.618 af
Outflow = 0.76 cfs @ 13.44 hrs, Volume= 0.619 af, Atten= 91%, Lag= 80.7 min
Discarded = 0.76 cfs @ 13.44 hrs, Volume= 0.619 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 156.83' @ 13.44 hrs Surf.Area= 13,646 sf Storage= 10,563 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 132.0 min (975.1 - 843.1)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	48,110 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.00	11,892	521.0	0	0	11,892
157.00	14,026	546.0	12,944	12,944	14,081
158.00	18,118	639.0	16,028	28,973	22,871
159.00	20,175	582.0	19,137	48,110	28,442

Device	Routing	Invert	Outlet Devices
#1	Discarded	156.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 154.50' / 154.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.80'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.76 cfs @ 13.44 hrs HW=156.83' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.76 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=156.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 4.36 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B24: Stormtech Basin

Inflow Area =	0.448 ac, 75.45% Impervious, Inflow Depth = 3.00" for 10-yr event			
Inflow =	1.53 cfs @	12.09 hrs, Volume=	0.112 af	
Outflow =	0.07 cfs @	11.55 hrs, Volume=	0.112 af, Atten= 95%, Lag= 0.0 min	
Discarded =	0.07 cfs @	11.55 hrs, Volume=	0.112 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 152.84' @ 15.06 hrs Surf.Area= 0.029 ac Storage= 0.057 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 335.3 min (1,148.3 - 813.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	150.00'	0.042 af	**22.75'W x 55.89'L x 5.50'H Field A** 0.161 af Overall - 0.055 af Embedded = 0.105 af x 40.0% Voids
#2A	150.75'	0.055 af	**ADS_StormTech MC-3500 d +Cap** x 21 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 3 Rows of 7 Chambers Cap Storage= +14.9 cf x 2 x 3 rows = 89.4 cf
#3	160.25'	0.094 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		0.191 af	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
160.25	0.250	0.000	0.000
160.50	0.500	0.094	0.094

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.07 cfs @ 11.55 hrs HW=150.12' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.00' TW=0.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B9:

Inflow Area = 3.645 ac, 51.44% Impervious, Inflow Depth = 1.74" for 10-yr event
Inflow = 7.10 cfs @ 12.10 hrs, Volume= 0.529 af
Outflow = 0.41 cfs @ 15.18 hrs, Volume= 0.530 af, Atten= 94%, Lag= 184.9 min
Discarded = 0.41 cfs @ 15.18 hrs, Volume= 0.530 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 162.14' @ 15.18 hrs Surf.Area= 7,377 sf Storage= 11,665 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 340.9 min (1,194.7 - 853.7)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	18,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	3,823	293.0	0	0	3,823
161.00	5,252	308.0	4,519	4,519	4,601
162.00	7,083	364.0	6,145	10,663	7,614
163.00	9,337	686.0	8,184	18,847	34,525

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.20'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 159.20' / 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	162.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.41 cfs @ 15.18 hrs HW=162.14' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.41 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 1.69 cfs potential flow)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link POA-2:

Inflow Area = 1.177 ac, 19.63% Impervious, Inflow Depth = 0.83" for 10-yr event
Inflow = 0.78 cfs @ 12.16 hrs, Volume= 0.082 af
Primary = 0.78 cfs @ 12.16 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.473 ac, 10.62% Impervious, Inflow Depth = 0.35" for 10-yr event
Inflow = 1.28 cfs @ 12.51 hrs, Volume= 0.307 af
Primary = 1.28 cfs @ 12.51 hrs, Volume= 0.307 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 16.17% Impervious, Inflow Depth = 0.04" for 10-yr event
Inflow = 0.01 cfs @ 15.78 hrs, Volume= 0.009 af
Primary = 0.01 cfs @ 15.78 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 4.670 ac, 37.32% Impervious, Inflow Depth = 0.01" for 10-yr event
Inflow = 0.00 cfs @ 13.76 hrs, Volume= 0.003 af
Primary = 0.00 cfs @ 13.76 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

Inflow Area = 6.726 ac, 51.52% Impervious, Inflow Depth = 0.00" for 10-yr event
Inflow = 0.00 cfs @ 13.76 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 13.76 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA4:

Inflow Area = 45.599 ac, 17.85% Impervious, Inflow Depth = 0.29" for 10-yr event
Inflow = 2.79 cfs @ 13.44 hrs, Volume= 1.114 af
Primary = 2.79 cfs @ 13.44 hrs, Volume= 1.114 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P10: Runoff Area=2.878 ac 51.08% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=77 Runoff=11.78 cfs 0.855 af

Subcatchment P11: Runoff Area=2.569 ac 44.84% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=67 Runoff=7.61 cfs 0.558 af

Subcatchment P12: Runoff Area=7.614 ac 26.52% Impervious Runoff Depth=1.66"
Tc=6.0 min CN=56 Runoff=13.23 cfs 1.051 af

Subcatchment P13: Runoff Area=2.385 ac 39.33% Impervious Runoff Depth=2.25"
Tc=6.0 min CN=63 Runoff=5.99 cfs 0.447 af

Subcatchment P14: Runoff Area=3.055 ac 37.74% Impervious Runoff Depth=2.70"
Tc=6.0 min CN=68 Runoff=9.40 cfs 0.687 af

Subcatchment P14A: Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=0.47"
Tc=6.0 min CN=39 Runoff=0.04 cfs 0.009 af

Subcatchment P16: Runoff Area=1.395 ac 42.29% Impervious Runoff Depth=3.08"
Tc=6.0 min CN=72 Runoff=4.93 cfs 0.357 af

Subcatchment P17: Runoff Area=3.022 ac 56.29% Impervious Runoff Depth=3.67"
Tc=6.0 min CN=78 Runoff=12.71 cfs 0.924 af

Subcatchment P18: Runoff Area=3.624 ac 48.68% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=73 Runoff=13.21 cfs 0.958 af

Subcatchment P18A: Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=0.47"
Tc=6.0 min CN=39 Runoff=0.02 cfs 0.003 af

Subcatchment P20: Runoff Area=1.177 ac 19.63% Impervious Runoff Depth=1.58"
Flow Length=204' Tc=8.5 min CN=55 Runoff=1.74 cfs 0.155 af

Subcatchment P22: Runoff Area=26.508 ac 2.59% Impervious Runoff Depth=0.98"
Flow Length=1,980' Tc=79.7 min CN=47 Runoff=7.34 cfs 2.159 af

Subcatchment P23: Runoff Area=10.473 ac 10.62% Impervious Runoff Depth=0.84"
Flow Length=545' Tc=17.2 min CN=45 Runoff=4.74 cfs 0.735 af

Subcatchment P24: Runoff Area=2.183 ac 4.01% Impervious Runoff Depth=0.27"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.11 cfs 0.049 af

Subcatchment P25: Runoff Area=0.448 ac 75.45% Impervious Runoff Depth=4.29"
Tc=6.0 min CN=84 Runoff=2.17 cfs 0.160 af

Subcatchment P9: Runoff Area=3.645 ac 51.44% Impervious Runoff Depth=2.79"
Tc=6.0 min CN=69 Runoff=11.63 cfs 0.848 af

Pond B10: Peak Elev=152.68' Storage=24,192 cf Inflow=11.78 cfs 0.855 af
Discarded=0.32 cfs 0.855 af Primary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.855 af

Pond B11: Peak Elev=146.66' Storage=4,050 cf Inflow=7.61 cfs 0.558 af
Discarded=0.15 cfs 0.211 af Primary=6.88 cfs 0.346 af Outflow=7.03 cfs 0.558 af

Pond B12: Peak Elev=157.09' Storage=20,382 cf Inflow=13.23 cfs 1.051 af
Discarded=0.70 cfs 0.940 af Primary=0.70 cfs 0.111 af Outflow=1.40 cfs 1.051 af

Pond B13: Peak Elev=170.93' Storage=9,184 cf Inflow=5.99 cfs 0.447 af
Discarded=0.42 cfs 0.447 af Primary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.447 af

Pond B14: Peak Elev=160.05' Storage=17,892 cf Inflow=9.40 cfs 0.687 af
Discarded=0.25 cfs 0.591 af Primary=0.33 cfs 0.061 af Outflow=0.58 cfs 0.652 af

Pond B16: Peak Elev=167.50' Storage=7,917 cf Inflow=4.93 cfs 0.357 af
Discarded=0.33 cfs 0.358 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.358 af

Pond B17: Peak Elev=168.27' Storage=20,787 cf Inflow=12.71 cfs 0.924 af
Discarded=0.67 cfs 0.924 af Primary=0.00 cfs 0.000 af Outflow=0.67 cfs 0.924 af

Pond B18: Peak Elev=157.42' Storage=19,136 cf Inflow=13.21 cfs 0.958 af
Discarded=0.87 cfs 0.959 af Primary=0.00 cfs 0.000 af Outflow=0.87 cfs 0.959 af

Pond B24: Stormtech Basin Peak Elev=155.10' Storage=0.093 af Inflow=2.17 cfs 0.160 af
Discarded=0.07 cfs 0.160 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.160 af

Pond B9: Peak Elev=162.66' Storage=15,801 cf Inflow=11.63 cfs 0.848 af
Discarded=0.48 cfs 0.689 af Primary=1.66 cfs 0.159 af Outflow=2.13 cfs 0.848 af

Link POA-2: Inflow=1.74 cfs 0.155 af
Primary=1.74 cfs 0.155 af

Link POA-6: Inflow=4.74 cfs 0.735 af
Primary=4.74 cfs 0.735 af

Link POA-7: Inflow=0.11 cfs 0.049 af
Primary=0.11 cfs 0.049 af

Link POA-8: Inflow=0.34 cfs 0.070 af
Primary=0.34 cfs 0.070 af

Link POA-9: Inflow=0.02 cfs 0.003 af
Primary=0.02 cfs 0.003 af

Link POA4: Inflow=9.25 cfs 2.776 af
Primary=9.25 cfs 2.776 af

Summary for Subcatchment P10:

Runoff = 11.78 cfs @ 12.09 hrs, Volume= 0.855 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG A
0.871	98	Paved parking, HSG B
0.385	39	>75% Grass cover, Good, HSG A
1.023	61	>75% Grass cover, Good, HSG B
0.313	98	Water Surface, HSG B
2.878	77	Weighted Average
1.408		48.92% Pervious Area
1.470		51.08% Impervious Area

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

Summary for Subcatchment P11:

Runoff = 7.61 cfs @ 12.10 hrs, Volume= 0.558 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
1.044	98	Paved parking, HSG A
0.022	98	Paved parking, HSG B
1.288	39	>75% Grass cover, Good, HSG A
0.129	61	>75% Grass cover, Good, HSG B
0.086	98	Water Surface, HSG A
2.569	67	Weighted Average
1.417		55.16% Pervious Area
1.152		44.84% Impervious Area

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

Summary for Subcatchment P12:

Runoff = 13.23 cfs @ 12.10 hrs, Volume= 1.051 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

	Area (ac)	CN	Description
	1.194	98	Paved parking, HSG A
	0.567	98	Paved parking, HSG B
	5.208	39	>75% Grass cover, Good, HSG A
	0.387	61	>75% Grass cover, Good, HSG B
	0.124	98	Water Surface, HSG A
	0.123	98	Water Surface, HSG B
*	0.011	98	Paved parking, Former Sand Pit, HSG A
	7.614	56	Weighted Average
	5.595		73.48% Pervious Area
	2.019		26.52% Impervious Area

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

Summary for Subcatchment P13:

Runoff = 5.99 cfs @ 12.10 hrs, Volume= 0.447 af, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

	Area (ac)	CN	Description
*	0.771	98	Impervious
	1.382	39	>75% Grass cover, Good, HSG A
	0.065	61	>75% Grass cover, Good, HSG B
	0.167	98	Water Surface, HSG A
	2.385	63	Weighted Average
	1.447		60.67% Pervious Area
	0.938		39.33% Impervious Area

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

Summary for Subcatchment P14:

Runoff = 9.40 cfs @ 12.10 hrs, Volume= 0.687 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

	Area (ac)	CN	Description
*	0.258	98	roofs
*	0.790	98	pavement
	0.906	39	>75% Grass cover, Good, HSG A
	0.996	61	>75% Grass cover, Good, HSG B
*	0.105	98	water
	3.055	68	Weighted Average
	1.902		62.26% Pervious Area
	1.153		37.74% Impervious Area

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

Summary for Subcatchment P14A:

Runoff = 0.04 cfs @ 12.33 hrs, Volume= 0.009 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.220	39	>75% Grass cover, Good, HSG A
0.220		100.00% Pervious Area

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

Summary for Subcatchment P16:

Runoff = 4.93 cfs @ 12.09 hrs, Volume= 0.357 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

	Area (ac)	CN	Description
*	0.435	98	Impervious
	0.665	49	50-75% Grass cover, Fair, HSG A
	0.140	69	50-75% Grass cover, Fair, HSG B
	0.155	98	Water Surface, HSG A
	1.395	72	Weighted Average
	0.805		57.71% Pervious Area
	0.590		42.29% Impervious Area

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

Summary for Subcatchment P17:

Runoff = 12.71 cfs @ 12.09 hrs, Volume= 0.924 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
1.137	98	Paved parking, HSG A
0.284	98	Paved parking, HSG B
1.128	49	50-75% Grass cover, Fair, HSG A
0.193	69	50-75% Grass cover, Fair, HSG B
0.280	98	Water Surface, HSG A
3.022	78	Weighted Average
1.321		43.71% Pervious Area
1.701		56.29% Impervious Area

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

Summary for Subcatchment P18:

Runoff = 13.21 cfs @ 12.09 hrs, Volume= 0.958 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
1.301	98	Paved parking, HSG A
1.860	49	50-75% Grass cover, Fair, HSG A
0.463	98	Water Surface, HSG A
3.624	73	Weighted Average
1.860		51.32% Pervious Area
1.764		48.68% Impervious Area

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

Summary for Subcatchment P18A:

Runoff = 0.02 cfs @ 12.33 hrs, Volume= 0.003 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.080	39	>75% Grass cover, Good, HSG A
0.080		100.00% Pervious Area

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

Summary for Subcatchment P20:

Runoff = 1.74 cfs @ 12.14 hrs, Volume= 0.155 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.231	98	Paved parking, HSG A
0.690	39	>75% Grass cover, Good, HSG A
0.256	61	>75% Grass cover, Good, HSG B
1.177	55	Weighted Average
0.946		80.37% Pervious Area
0.231		19.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.1	154	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.5	204	Total			

Summary for Subcatchment P22:

Runoff = 7.34 cfs @ 13.29 hrs, Volume= 2.159 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

	Area (ac)	CN	Description
	5.488	39	>75% Grass cover, Good, HSG A
	0.705	61	>75% Grass cover, Good, HSG B
	10.200	30	Woods, Good, HSG A
	4.907	55	Woods, Good, HSG B
	4.522	77	Woods, Good, HSG D
*	0.686	98	Impervious
	26.508	47	Weighted Average
	25.822		97.41% Pervious Area
	0.686		2.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	65	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
68.2	1,120	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.4	745	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030
79.7	1,980	Total			

Summary for Subcatchment P23:

Runoff = 4.74 cfs @ 12.35 hrs, Volume= 0.735 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.202	30	Woods, Good, HSG A
10.473	45	Weighted Average
9.360		89.38% Pervious Area
1.113		10.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment P24:

Runoff = 0.11 cfs @ 12.61 hrs, Volume= 0.049 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
1.454	30	Woods, Good, HSG A
2.183	35	Weighted Average
2.096		95.99% Pervious Area
0.087		4.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment P25:

Runoff = 2.17 cfs @ 12.09 hrs, Volume= 0.160 af, Depth= 4.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
0.338	98	Paved parking, HSG A
0.110	39	>75% Grass cover, Good, HSG A
0.448	84	Weighted Average
0.110		24.55% Pervious Area
0.338		75.45% Impervious Area

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

Summary for Subcatchment P9:

Runoff = 11.63 cfs @ 12.10 hrs, Volume= 0.848 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=6.10"

Area (ac)	CN	Description
1.661	98	Paved parking, HSG A
1.770	39	>75% Grass cover, Good, HSG A
0.214	98	Water Surface, HSG A
3.645	69	Weighted Average
1.770		48.56% Pervious Area
1.875		51.44% Impervious Area

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

Summary for Pond B10:

Inflow Area = 2.878 ac, 51.08% Impervious, Inflow Depth = 3.57" for 50-yr event
Inflow = 11.78 cfs @ 12.09 hrs, Volume= 0.855 af
Outflow = 0.32 cfs @ 17.06 hrs, Volume= 0.855 af, Atten= 97%, Lag= 298.3 min
Discarded = 0.32 cfs @ 17.06 hrs, Volume= 0.855 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 152.68' @ 17.06 hrs Surf.Area= 13,604 sf Storage= 24,192 cf

Plug-Flow detention time= 811.5 min calculated for 0.855 af (100% of inflow)
Center-of-Mass det. time= 812.1 min (1,633.0 - 820.9)

Volume	Invert	Avail.Storage	Storage Description
#1	150.50'	36,364 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
150.50	9,138	404.0	0	0	9,138
151.00	9,970	419.0	4,775	4,775	10,142
152.00	11,714	447.0	10,830	15,606	12,119
153.50	16,079	501.0	20,759	36,364	16,255

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	148.40'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 148.40' / 148.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	152.85'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.32 cfs @ 17.06 hrs HW=152.68' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.50' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 5.67 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B11:

Inflow Area = 2.569 ac, 44.84% Impervious, Inflow Depth = 2.61" for 50-yr event
Inflow = 7.61 cfs @ 12.10 hrs, Volume= 0.558 af
Outflow = 7.03 cfs @ 12.13 hrs, Volume= 0.558 af, Atten= 8%, Lag= 2.1 min
Discarded = 0.15 cfs @ 12.13 hrs, Volume= 0.211 af
Primary = 6.88 cfs @ 12.13 hrs, Volume= 0.346 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 146.66' @ 12.13 hrs Surf.Area= 2,763 sf Storage= 4,050 cf

Plug-Flow detention time= 123.2 min calculated for 0.557 af (100% of inflow)
Center-of-Mass det. time= 123.8 min (968.2 - 844.5)

Volume	Invert	Avail.Storage	Storage Description
#1	144.00'	8,613 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.00	575	96.0	0	0	575
145.00	1,054	131.0	802	802	1,217
146.00	2,225	190.0	1,603	2,406	2,733
147.00	3,062	220.0	2,632	5,038	3,733
148.00	4,114	254.0	3,575	8,613	5,037

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	144.00'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 144.00' / 143.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.77 sf
#3	Device 2	146.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.15 cfs @ 12.13 hrs HW=146.65' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=6.72 cfs @ 12.13 hrs HW=146.65' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 6.72 cfs of 9.27 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 6.72 cfs @ 2.08 fps)

Summary for Pond B12:

Inflow Area =	7.614 ac, 26.52% Impervious, Inflow Depth = 1.66" for 50-yr event				
Inflow =	13.23 cfs @	12.10 hrs,	Volume=	1.051 af	
Outflow =	1.40 cfs @	13.63 hrs,	Volume=	1.051 af,	Atten= 89%, Lag= 91.6 min
Discarded =	0.70 cfs @	13.63 hrs,	Volume=	0.940 af	
Primary =	0.70 cfs @	13.63 hrs,	Volume=	0.111 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 157.09' @ 13.63 hrs Surf.Area= 12,584 sf Storage= 20,382 cf

Plug-Flow detention time= 348.7 min calculated for 1.050 af (100% of inflow)
Center-of-Mass det. time= 349.3 min (1,222.1 - 872.9)

Volume	Invert	Avail.Storage	Storage Description
#1	154.50'	25,940 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.50	5,451	297.0	0	0	5,451
155.00	6,068	311.0	2,878	2,878	6,145
156.00	7,382	340.0	6,714	9,593	7,682
157.00	12,186	447.0	9,684	19,277	14,395
157.50	14,501	479.0	6,663	25,940	16,764

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.10'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 154.10' / 153.85' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.70 cfs @ 13.63 hrs HW=157.09' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.70 cfs)

Primary OutFlow Max=0.70 cfs @ 13.63 hrs HW=157.09' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.70 cfs of 7.17 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 0.70 cfs @ 0.98 fps)

Summary for Pond B13:

Inflow Area =	2.385 ac, 39.33% Impervious, Inflow Depth = 2.25" for 50-yr event			
Inflow =	5.99 cfs @	12.10 hrs, Volume=	0.447 af	
Outflow =	0.42 cfs @	14.39 hrs, Volume=	0.447 af, Atten= 93%, Lag= 137.7 min	
Discarded =	0.42 cfs @	14.39 hrs, Volume=	0.447 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 170.93' @ 14.39 hrs Surf.Area= 7,615 sf Storage= 9,184 cf

Plug-Flow detention time= 274.8 min calculated for 0.446 af (100% of inflow)
Center-of-Mass det. time= 275.0 min (1,129.1 - 854.1)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	19,003 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
169.00	2,583	360.0	0	0	2,583
170.00	4,651	530.0	3,567	3,567	14,631
171.00	7,887	680.0	6,198	9,765	29,087
172.00	10,658	705.0	9,238	19,003	31,928

Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	166.00'	**15.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 166.00' / 164.40' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	171.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.42 cfs @ 14.39 hrs HW=170.93' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.42 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=169.00' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 7.17 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B14:

Inflow Area =	3.055 ac, 37.74% Impervious, Inflow Depth = 2.70" for 50-yr event			
Inflow =	9.40 cfs @	12.10 hrs, Volume=	0.687 af	
Outflow =	0.58 cfs @	14.63 hrs, Volume=	0.652 af, Atten= 94%, Lag= 152.3 min	
Discarded =	0.25 cfs @	14.63 hrs, Volume=	0.591 af	
Primary =	0.33 cfs @	14.63 hrs, Volume=	0.061 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 160.05' @ 14.63 hrs Surf.Area= 10,648 sf Storage= 17,892 cf

Plug-Flow detention time= 744.2 min calculated for 0.651 af (95% of inflow)
Center-of-Mass det. time= 717.6 min (1,559.7 - 842.1)

Volume	Invert	Avail.Storage	Storage Description
#1	157.50'	22,869 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.50	4,484	407.0	0	0	4,484
158.00	5,310	419.0	2,446	2,446	5,299
159.00	7,037	444.0	6,153	8,599	7,070
160.00	10,528	563.0	8,724	17,323	16,619
160.50	11,666	576.0	5,546	22,869	17,831

Device	Routing	Invert	Outlet Devices
#1	Discarded	157.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 155.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	160.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.25 cfs @ 14.63 hrs HW=160.05' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=0.33 cfs @ 14.63 hrs HW=160.05' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.33 cfs of 8.64 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 0.33 cfs @ 0.76 fps)

Summary for Pond B16:

Inflow Area =	1.395 ac, 42.29% Impervious, Inflow Depth = 3.08" for 50-yr event				
Inflow =	4.93 cfs @	12.09 hrs, Volume=	0.357 af		
Outflow =	0.33 cfs @	14.06 hrs, Volume=	0.358 af, Atten= 93%, Lag= 117.9 min		
Discarded =	0.33 cfs @	14.06 hrs, Volume=	0.358 af		
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 167.50' @ 14.06 hrs Surf.Area= 5,886 sf Storage= 7,917 cf

Plug-Flow detention time= 302.8 min calculated for 0.357 af (100% of inflow)
Center-of-Mass det. time= 303.1 min (1,135.8 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	11,143 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
165.00	934	346.0	0	0	934
166.00	2,432	385.0	1,624	1,624	3,232
167.00	4,935	474.0	3,610	5,235	9,331
168.00	6,937	508.0	5,908	11,143	12,033

Device	Routing	Invert	Outlet Devices
#1	Discarded	165.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	165.00'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.00' / 164.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	167.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.33 cfs @ 14.06 hrs HW=167.50' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=165.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B17:

Inflow Area =	3.022 ac,	56.29% Impervious,	Inflow Depth =	3.67"	for 50-yr event
Inflow =	12.71 cfs @	12.09 hrs,	Volume=	0.924 af	
Outflow =	0.67 cfs @	14.67 hrs,	Volume=	0.924 af,	Atten= 95%, Lag= 155.0 min
Discarded =	0.67 cfs @	14.67 hrs,	Volume=	0.924 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 168.27' @ 14.67 hrs Surf.Area= 12,030 sf Storage= 20,787 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 341.6 min (1,160.1 - 818.5)

Volume	Invert	Avail.Storage	Storage Description
#1	166.00'	30,023 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
166.00	6,892	368.0	0	0	6,892
167.00	8,416	394.0	7,641	7,641	8,514
168.00	11,574	420.0	9,953	17,594	10,247
169.00	13,303	445.0	12,428	30,023	12,021

Device	Routing	Invert	Outlet Devices
#1	Discarded	166.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0500 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	168.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.67 cfs @ 14.67 hrs HW=168.27' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.67 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=166.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 6.39 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B18:

Inflow Area =	3.624 ac,	48.68% Impervious,	Inflow Depth =	3.17"	for 50-yr event
Inflow =	13.21 cfs @	12.09 hrs,	Volume=	0.958 af	
Outflow =	0.87 cfs @	14.04 hrs,	Volume=	0.959 af,	Atten= 93%, Lag= 117.0 min
Discarded =	0.87 cfs @	14.04 hrs,	Volume=	0.959 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 157.42' @ 14.04 hrs Surf.Area= 15,670 sf Storage= 19,136 cf

Plug-Flow detention time= 230.6 min calculated for 0.957 af (100% of inflow)
Center-of-Mass det. time= 230.9 min (1,061.3 - 830.4)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	48,110 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.00	11,892	521.0	0	0	11,892
157.00	14,026	546.0	12,944	12,944	14,081
158.00	18,118	639.0	16,028	28,973	22,871
159.00	20,175	582.0	19,137	48,110	28,442

Device	Routing	Invert	Outlet Devices
#1	Discarded	156.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 154.50' / 154.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.80'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.87 cfs @ 14.04 hrs HW=157.42' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.87 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=156.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 4.36 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B24: Stormtech Basin

Inflow Area =	0.448 ac, 75.45% Impervious, Inflow Depth = 4.29" for 50-yr event			
Inflow =	2.17 cfs @	12.09 hrs, Volume=	0.160 af	
Outflow =	0.07 cfs @	11.00 hrs, Volume=	0.160 af, Atten= 97%, Lag= 0.0 min	
Discarded =	0.07 cfs @	11.00 hrs, Volume=	0.160 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 155.10' @ 15.93 hrs Surf.Area= 0.029 ac Storage= 0.093 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 536.7 min (1,339.5 - 802.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	150.00'	0.042 af	**22.75'W x 55.89'L x 5.50'H Field A** 0.161 af Overall - 0.055 af Embedded = 0.105 af x 40.0% Voids
#2A	150.75'	0.055 af	**ADS_StormTech MC-3500 d +Cap** x 21 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 3 Rows of 7 Chambers Cap Storage= +14.9 cf x 2 x 3 rows = 89.4 cf
#3	160.25'	0.094 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		0.191 af	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
160.25	0.250	0.000	0.000
160.50	0.500	0.094	0.094

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.07 cfs @ 11.00 hrs HW=150.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.00' TW=0.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B9:

Inflow Area = 3.645 ac, 51.44% Impervious, Inflow Depth = 2.79" for 50-yr event
Inflow = 11.63 cfs @ 12.10 hrs, Volume= 0.848 af
Outflow = 2.13 cfs @ 12.58 hrs, Volume= 0.848 af, Atten= 82%, Lag= 29.4 min
Discarded = 0.48 cfs @ 12.58 hrs, Volume= 0.689 af
Primary = 1.66 cfs @ 12.58 hrs, Volume= 0.159 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 162.66' @ 12.58 hrs Surf.Area= 8,533 sf Storage= 15,801 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 323.2 min (1,163.0 - 839.8)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	18,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	3,823	293.0	0	0	3,823
161.00	5,252	308.0	4,519	4,519	4,601
162.00	7,083	364.0	6,145	10,663	7,614
163.00	9,337	686.0	8,184	18,847	34,525

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.20'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 159.20' / 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	162.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.48 cfs @ 12.58 hrs HW=162.66' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.48 cfs)

Primary OutFlow Max=1.65 cfs @ 12.58 hrs HW=162.66' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 1.65 cfs of 7.85 cfs potential flow)
  └─**3=Orifice/Grate** (Weir Controls 1.65 cfs @ 1.30 fps)

Summary for Link POA-2:

Inflow Area = 1.177 ac, 19.63% Impervious, Inflow Depth = 1.58" for 50-yr event
Inflow = 1.74 cfs @ 12.14 hrs, Volume= 0.155 af
Primary = 1.74 cfs @ 12.14 hrs, Volume= 0.155 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.473 ac, 10.62% Impervious, Inflow Depth = 0.84" for 50-yr event
Inflow = 4.74 cfs @ 12.35 hrs, Volume= 0.735 af
Primary = 4.74 cfs @ 12.35 hrs, Volume= 0.735 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 16.17% Impervious, Inflow Depth = 0.23" for 50-yr event
Inflow = 0.11 cfs @ 12.61 hrs, Volume= 0.049 af
Primary = 0.11 cfs @ 12.61 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 4.670 ac, 37.32% Impervious, Inflow Depth = 0.18" for 50-yr event
Inflow = 0.34 cfs @ 14.63 hrs, Volume= 0.070 af
Primary = 0.34 cfs @ 14.63 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

Inflow Area = 6.726 ac, 51.52% Impervious, Inflow Depth = 0.01" for 50-yr event
Inflow = 0.02 cfs @ 12.33 hrs, Volume= 0.003 af
Primary = 0.02 cfs @ 12.33 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA4:

Inflow Area = 45.599 ac, 17.85% Impervious, Inflow Depth = 0.73" for 50-yr event
Inflow = 9.25 cfs @ 13.29 hrs, Volume= 2.776 af
Primary = 9.25 cfs @ 13.29 hrs, Volume= 2.776 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment P10: Runoff Area=2.878 ac 51.08% Impervious Runoff Depth=4.10"
Tc=6.0 min CN=77 Runoff=13.51 cfs 0.983 af

Subcatchment P11: Runoff Area=2.569 ac 44.84% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=67 Runoff=9.01 cfs 0.657 af

Subcatchment P12: Runoff Area=7.614 ac 26.52% Impervious Runoff Depth=2.03"
Tc=6.0 min CN=56 Runoff=16.62 cfs 1.285 af

Subcatchment P13: Runoff Area=2.385 ac 39.33% Impervious Runoff Depth=2.68"
Tc=6.0 min CN=63 Runoff=7.21 cfs 0.532 af

Subcatchment P14: Runoff Area=3.055 ac 37.74% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=68 Runoff=11.09 cfs 0.807 af

Subcatchment P14A: Runoff Area=0.220 ac 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=39 Runoff=0.07 cfs 0.012 af

Subcatchment P16: Runoff Area=1.395 ac 42.29% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=72 Runoff=5.73 cfs 0.416 af

Subcatchment P17: Runoff Area=3.022 ac 56.29% Impervious Runoff Depth=4.20"
Tc=6.0 min CN=78 Runoff=14.53 cfs 1.059 af

Subcatchment P18: Runoff Area=3.624 ac 48.68% Impervious Runoff Depth=3.68"
Tc=6.0 min CN=73 Runoff=15.32 cfs 1.111 af

Subcatchment P18A: Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=39 Runoff=0.03 cfs 0.004 af

Subcatchment P20: Runoff Area=1.177 ac 19.63% Impervious Runoff Depth=1.94"
Flow Length=204' Tc=8.5 min CN=55 Runoff=2.21 cfs 0.190 af

Subcatchment P22: Runoff Area=26.508 ac 2.59% Impervious Runoff Depth=1.26"
Flow Length=1,980' Tc=79.7 min CN=47 Runoff=10.09 cfs 2.776 af

Subcatchment P23: Runoff Area=10.473 ac 10.62% Impervious Runoff Depth=1.10"
Flow Length=545' Tc=17.2 min CN=45 Runoff=6.94 cfs 0.959 af

Subcatchment P24: Runoff Area=2.183 ac 4.01% Impervious Runoff Depth=0.41"
Flow Length=485' Tc=16.0 min CN=35 Runoff=0.27 cfs 0.075 af

Subcatchment P25: Runoff Area=0.448 ac 75.45% Impervious Runoff Depth=4.86"
Tc=6.0 min CN=84 Runoff=2.44 cfs 0.181 af

Subcatchment P9: Runoff Area=3.645 ac 51.44% Impervious Runoff Depth=3.27"
Tc=6.0 min CN=69 Runoff=13.67 cfs 0.993 af

Pond B10: Peak Elev=152.90' Storage=27,211 cf Inflow=13.51 cfs 0.983 af
Discarded=0.34 cfs 0.912 af Primary=0.26 cfs 0.042 af Outflow=0.59 cfs 0.955 af

Pond B11: Peak Elev=146.72' Storage=4,208 cf Inflow=9.01 cfs 0.657 af
Discarded=0.16 cfs 0.217 af Primary=8.34 cfs 0.440 af Outflow=8.49 cfs 0.657 af

Pond B12: Peak Elev=157.19' Storage=21,648 cf Inflow=16.62 cfs 1.285 af
Discarded=0.73 cfs 0.994 af Primary=2.13 cfs 0.291 af Outflow=2.86 cfs 1.286 af

Pond B13: Peak Elev=171.20' Storage=11,426 cf Inflow=7.21 cfs 0.532 af
Discarded=0.47 cfs 0.533 af Primary=0.00 cfs 0.000 af Outflow=0.47 cfs 0.533 af

Pond B14: Peak Elev=160.10' Storage=18,358 cf Inflow=11.09 cfs 0.807 af
Discarded=0.25 cfs 0.603 af Primary=0.79 cfs 0.164 af Outflow=1.05 cfs 0.767 af

Pond B16: Peak Elev=167.72' Storage=9,304 cf Inflow=5.73 cfs 0.416 af
Discarded=0.35 cfs 0.409 af Primary=0.09 cfs 0.007 af Outflow=0.45 cfs 0.416 af

Pond B17: Peak Elev=168.59' Storage=24,770 cf Inflow=14.53 cfs 1.059 af
Discarded=0.70 cfs 1.059 af Primary=0.00 cfs 0.000 af Outflow=0.70 cfs 1.059 af

Pond B18: Peak Elev=157.66' Storage=23,140 cf Inflow=15.32 cfs 1.111 af
Discarded=0.93 cfs 1.111 af Primary=0.00 cfs 0.000 af Outflow=0.93 cfs 1.111 af

Pond B24: Stormtech Basin Peak Elev=160.25' Storage=0.097 af Inflow=2.44 cfs 0.181 af
Discarded=0.23 cfs 0.181 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.181 af

Pond B9: Peak Elev=162.77' Storage=16,800 cf Inflow=13.67 cfs 0.993 af
Discarded=0.49 cfs 0.719 af Primary=3.76 cfs 0.275 af Outflow=4.25 cfs 0.993 af

Link POA-2: Inflow=2.21 cfs 0.190 af
Primary=2.21 cfs 0.190 af

Link POA-6: Inflow=6.94 cfs 0.959 af
Primary=6.94 cfs 0.959 af

Link POA-7: Inflow=0.27 cfs 0.075 af
Primary=0.27 cfs 0.075 af

Link POA-8: Inflow=0.87 cfs 0.183 af
Primary=0.87 cfs 0.183 af

Link POA-9: Inflow=0.03 cfs 0.004 af
Primary=0.03 cfs 0.004 af

Link POA4: Inflow=13.31 cfs 3.824 af
Primary=13.31 cfs 3.824 af

Summary for Subcatchment P10:

Runoff = 13.51 cfs @ 12.09 hrs, Volume= 0.983 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG A
0.871	98	Paved parking, HSG B
0.385	39	>75% Grass cover, Good, HSG A
1.023	61	>75% Grass cover, Good, HSG B
0.313	98	Water Surface, HSG B
2.878	77	Weighted Average
1.408		48.92% Pervious Area
1.470		51.08% Impervious Area

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

Summary for Subcatchment P11:

Runoff = 9.01 cfs @ 12.10 hrs, Volume= 0.657 af, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
1.044	98	Paved parking, HSG A
0.022	98	Paved parking, HSG B
1.288	39	>75% Grass cover, Good, HSG A
0.129	61	>75% Grass cover, Good, HSG B
0.086	98	Water Surface, HSG A
2.569	67	Weighted Average
1.417		55.16% Pervious Area
1.152		44.84% Impervious Area

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

Summary for Subcatchment P12:

Runoff = 16.62 cfs @ 12.10 hrs, Volume= 1.285 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

	Area (ac)	CN	Description
	1.194	98	Paved parking, HSG A
	0.567	98	Paved parking, HSG B
	5.208	39	>75% Grass cover, Good, HSG A
	0.387	61	>75% Grass cover, Good, HSG B
	0.124	98	Water Surface, HSG A
	0.123	98	Water Surface, HSG B
*	0.011	98	Paved parking, Former Sand Pit, HSG A
	7.614	56	Weighted Average
	5.595		73.48% Pervious Area
	2.019		26.52% Impervious Area

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

Summary for Subcatchment P13:

Runoff = 7.21 cfs @ 12.10 hrs, Volume= 0.532 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

	Area (ac)	CN	Description
*	0.771	98	Impervious
	1.382	39	>75% Grass cover, Good, HSG A
	0.065	61	>75% Grass cover, Good, HSG B
	0.167	98	Water Surface, HSG A
	2.385	63	Weighted Average
	1.447		60.67% Pervious Area
	0.938		39.33% Impervious Area

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

Summary for Subcatchment P14:

Runoff = 11.09 cfs @ 12.09 hrs, Volume= 0.807 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

	Area (ac)	CN	Description
*	0.258	98	roofs
*	0.790	98	pavement
	0.906	39	>75% Grass cover, Good, HSG A
	0.996	61	>75% Grass cover, Good, HSG B
*	0.105	98	water
	3.055	68	Weighted Average
	1.902		62.26% Pervious Area
	1.153		37.74% Impervious Area

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

Summary for Subcatchment P14A:

Runoff = 0.07 cfs @ 12.26 hrs, Volume= 0.012 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.220	39	>75% Grass cover, Good, HSG A
0.220		100.00% Pervious Area

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

Summary for Subcatchment P16:

Runoff = 5.73 cfs @ 12.09 hrs, Volume= 0.416 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

	Area (ac)	CN	Description
*	0.435	98	Impervious
	0.665	49	50-75% Grass cover, Fair, HSG A
	0.140	69	50-75% Grass cover, Fair, HSG B
	0.155	98	Water Surface, HSG A
	1.395	72	Weighted Average
	0.805		57.71% Pervious Area
	0.590		42.29% Impervious Area

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

Summary for Subcatchment P17:

Runoff = 14.53 cfs @ 12.09 hrs, Volume= 1.059 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
1.137	98	Paved parking, HSG A
0.284	98	Paved parking, HSG B
1.128	49	50-75% Grass cover, Fair, HSG A
0.193	69	50-75% Grass cover, Fair, HSG B
0.280	98	Water Surface, HSG A
3.022	78	Weighted Average
1.321		43.71% Pervious Area
1.701		56.29% Impervious Area

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

Summary for Subcatchment P18:

Runoff = 15.32 cfs @ 12.09 hrs, Volume= 1.111 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
1.301	98	Paved parking, HSG A
1.860	49	50-75% Grass cover, Fair, HSG A
0.463	98	Water Surface, HSG A
3.624	73	Weighted Average
1.860		51.32% Pervious Area
1.764		48.68% Impervious Area

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

Summary for Subcatchment P18A:

Runoff = 0.03 cfs @ 12.26 hrs, Volume= 0.004 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.080	39	>75% Grass cover, Good, HSG A
0.080		100.00% Pervious Area

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

Summary for Subcatchment P20:

Runoff = 2.21 cfs @ 12.14 hrs, Volume= 0.190 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.231	98	Paved parking, HSG A
0.690	39	>75% Grass cover, Good, HSG A
0.256	61	>75% Grass cover, Good, HSG B
1.177	55	Weighted Average
0.946		80.37% Pervious Area
0.231		19.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.1	154	0.0250	2.37		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.5	204	Total			

Summary for Subcatchment P22:

Runoff = 10.09 cfs @ 13.24 hrs, Volume= 2.776 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

	Area (ac)	CN	Description
	5.488	39	>75% Grass cover, Good, HSG A
	0.705	61	>75% Grass cover, Good, HSG B
	10.200	30	Woods, Good, HSG A
	4.907	55	Woods, Good, HSG B
	4.522	77	Woods, Good, HSG D
*	0.686	98	Impervious
	26.508	47	Weighted Average
	25.822		97.41% Pervious Area
	0.686		2.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	65	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
68.2	1,120	0.0030	0.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.4	745	0.0080	3.66	21.94	**Channel Flow,** Area= 6.0 sf Perim= 8.0' r= 0.75' n= 0.030
79.7	1,980	Total			

Summary for Subcatchment P23:

Runoff = 6.94 cfs @ 12.32 hrs, Volume= 0.959 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
8.571	46	2 acre lots, 12% imp, HSG A
0.700	65	2 acre lots, 12% imp, HSG B
1.202	30	Woods, Good, HSG A
10.473	45	Weighted Average
9.360		89.38% Pervious Area
1.113		10.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0350	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.3	495	0.0510	1.13		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.2	545	Total			

Summary for Subcatchment P24:

Runoff = 0.27 cfs @ 12.54 hrs, Volume= 0.075 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.729	46	2 acre lots, 12% imp, HSG A
1.454	30	Woods, Good, HSG A
2.183	35	Weighted Average
2.096		95.99% Pervious Area
0.087		4.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.5	435	0.0690	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	485	Total			

Summary for Subcatchment P25:

Runoff = 2.44 cfs @ 12.09 hrs, Volume= 0.181 af, Depth= 4.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
0.338	98	Paved parking, HSG A
0.110	39	>75% Grass cover, Good, HSG A
0.448	84	Weighted Average
0.110		24.55% Pervious Area
0.338		75.45% Impervious Area

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

Summary for Subcatchment P9:

Runoff = 13.67 cfs @ 12.09 hrs, Volume= 0.993 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=6.70"

Area (ac)	CN	Description
1.661	98	Paved parking, HSG A
1.770	39	>75% Grass cover, Good, HSG A
0.214	98	Water Surface, HSG A
3.645	69	Weighted Average
1.770		48.56% Pervious Area
1.875		51.44% Impervious Area

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

Summary for Pond B10:

Inflow Area = 2.878 ac, 51.08% Impervious, Inflow Depth = 4.10" for 100-yr event
Inflow = 13.51 cfs @ 12.09 hrs, Volume= 0.983 af
Outflow = 0.59 cfs @ 15.30 hrs, Volume= 0.955 af, Atten= 96%, Lag= 192.3 min
Discarded = 0.34 cfs @ 15.30 hrs, Volume= 0.912 af
Primary = 0.26 cfs @ 15.30 hrs, Volume= 0.042 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 152.90' @ 15.30 hrs Surf.Area= 14,238 sf Storage= 27,211 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 798.8 min (1,615.8 - 816.9)

Volume	Invert	Avail.Storage	Storage Description
#1	150.50'	36,364 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
150.50	9,138	404.0	0	0	9,138
151.00	9,970	419.0	4,775	4,775	10,142
152.00	11,714	447.0	10,830	15,606	12,119
153.50	16,079	501.0	20,759	36,364	16,255

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	148.40'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 148.40' / 148.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	152.85'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.34 cfs @ 15.30 hrs HW=152.90' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=0.26 cfs @ 15.30 hrs HW=152.90' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.26 cfs of 9.18 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 0.26 cfs @ 0.70 fps)

Summary for Pond B11:

Inflow Area = 2.569 ac, 44.84% Impervious, Inflow Depth = 3.07" for 100-yr event
Inflow = 9.01 cfs @ 12.10 hrs, Volume= 0.657 af
Outflow = 8.49 cfs @ 12.12 hrs, Volume= 0.657 af, Atten= 6%, Lag= 1.8 min
Discarded = 0.16 cfs @ 12.12 hrs, Volume= 0.217 af
Primary = 8.34 cfs @ 12.12 hrs, Volume= 0.440 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 146.72' @ 12.12 hrs Surf.Area= 2,812 sf Storage= 4,208 cf

Plug-Flow detention time= 107.5 min calculated for 0.656 af (100% of inflow)
Center-of-Mass det. time= 108.1 min (947.7 - 839.7)

Volume	Invert	Avail.Storage	Storage Description
#1	144.00'	8,613 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
144.00	575	96.0	0	0	575
145.00	1,054	131.0	802	802	1,217
146.00	2,225	190.0	1,603	2,406	2,733
147.00	3,062	220.0	2,632	5,038	3,733
148.00	4,114	254.0	3,575	8,613	5,037

Device	Routing	Invert	Outlet Devices
#1	Discarded	144.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	144.00'	**18.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 144.00' / 143.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.77 sf
#3	Device 2	146.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.16 cfs @ 12.12 hrs HW=146.71' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=8.07 cfs @ 12.12 hrs HW=146.71' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 8.07 cfs of 9.40 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 8.07 cfs @ 2.21 fps)

Summary for Pond B12:

Inflow Area =	7.614 ac,	26.52% Impervious,	Inflow Depth =	2.03"	for 100-yr event
Inflow =	16.62 cfs @	12.10 hrs,	Volume=	1.285 af	
Outflow =	2.86 cfs @	12.69 hrs,	Volume=	1.286 af,	Atten= 83%, Lag= 35.1 min
Discarded =	0.73 cfs @	12.69 hrs,	Volume=	0.994 af	
Primary =	2.13 cfs @	12.69 hrs,	Volume=	0.291 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 157.19' @ 12.69 hrs Surf.Area= 13,033 sf Storage= 21,648 cf

Plug-Flow detention time= 305.3 min calculated for 1.284 af (100% of inflow)
Center-of-Mass det. time= 305.8 min (1,172.1 - 866.3)

Volume	Invert	Avail.Storage	Storage Description
#1	154.50'	25,940 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
154.50	5,451	297.0	0	0	5,451
155.00	6,068	311.0	2,878	2,878	6,145
156.00	7,382	340.0	6,714	9,593	7,682
157.00	12,186	447.0	9,684	19,277	14,395
157.50	14,501	479.0	6,663	25,940	16,764

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.10'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 154.10' / 153.85' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.73 cfs @ 12.69 hrs HW=157.19' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.73 cfs)

Primary OutFlow Max=2.13 cfs @ 12.69 hrs HW=157.19' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 2.13 cfs of 7.32 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 2.13 cfs @ 1.42 fps)

Summary for Pond B13:

Inflow Area =	2.385 ac,	39.33% Impervious,	Inflow Depth =	2.68"	for 100-yr event
Inflow =	7.21 cfs @	12.10 hrs,	Volume=	0.532 af	
Outflow =	0.47 cfs @	14.59 hrs,	Volume=	0.533 af,	Atten= 93%, Lag= 149.8 min
Discarded =	0.47 cfs @	14.59 hrs,	Volume=	0.533 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 171.20' @ 14.59 hrs Surf.Area= 8,418 sf Storage= 11,426 cf

Plug-Flow detention time= 305.8 min calculated for 0.532 af (100% of inflow)
Center-of-Mass det. time= 306.2 min (1,155.1 - 848.9)

Volume	Invert	Avail.Storage	Storage Description
#1	169.00'	19,003 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
169.00	2,583	360.0	0	0	2,583
170.00	4,651	530.0	3,567	3,567	14,631
171.00	7,887	680.0	6,198	9,765	29,087
172.00	10,658	705.0	9,238	19,003	31,928

Device	Routing	Invert	Outlet Devices
#1	Discarded	169.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	166.00'	**15.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 166.00' / 164.40' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	171.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.47 cfs @ 14.59 hrs HW=171.20' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.47 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=169.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 7.17 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B14:

Inflow Area =	3.055 ac, 37.74% Impervious, Inflow Depth = 3.17" for 100-yr event			
Inflow =	11.09 cfs @	12.09 hrs, Volume=	0.807 af	
Outflow =	1.05 cfs @	13.19 hrs, Volume=	0.767 af, Atten= 91%, Lag= 65.6 min	
Discarded =	0.25 cfs @	13.19 hrs, Volume=	0.603 af	
Primary =	0.79 cfs @	13.19 hrs, Volume=	0.164 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 160.10' @ 13.19 hrs Surf.Area= 10,745 sf Storage= 18,358 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 621.8 min (1,459.2 - 837.4)

Volume	Invert	Avail.Storage	Storage Description
#1	157.50'	22,869 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
157.50	4,484	407.0	0	0	4,484
158.00	5,310	419.0	2,446	2,446	5,299
159.00	7,037	444.0	6,153	8,599	7,070
160.00	10,528	563.0	8,724	17,323	16,619
160.50	11,666	576.0	5,546	22,869	17,831

Device	Routing	Invert	Outlet Devices
#1	Discarded	157.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 155.80' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	160.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.25 cfs @ 13.19 hrs HW=160.10' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=0.79 cfs @ 13.19 hrs HW=160.10' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.79 cfs of 8.69 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 0.79 cfs @ 1.02 fps)

Summary for Pond B16:

Inflow Area =	1.395 ac, 42.29% Impervious, Inflow Depth = 3.57" for 100-yr event				
Inflow =	5.73 cfs @	12.09 hrs,	Volume=	0.416 af	
Outflow =	0.45 cfs @	13.62 hrs,	Volume=	0.416 af,	Atten= 92%, Lag= 91.5 min
Discarded =	0.35 cfs @	13.62 hrs,	Volume=	0.409 af	
Primary =	0.09 cfs @	13.62 hrs,	Volume=	0.007 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 167.72' @ 13.62 hrs Surf.Area= 6,349 sf Storage= 9,304 cf

Plug-Flow detention time= 322.7 min calculated for 0.415 af (100% of inflow)
Center-of-Mass det. time= 322.9 min (1,151.3 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	11,143 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
165.00	934	346.0	0	0	934
166.00	2,432	385.0	1,624	1,624	3,232
167.00	4,935	474.0	3,610	5,235	9,331
168.00	6,937	508.0	5,908	11,143	12,033

Device	Routing	Invert	Outlet Devices
#1	Discarded	165.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	165.00'	**15.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.00' / 164.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	167.70'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.35 cfs @ 13.62 hrs HW=167.72' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.35 cfs)

Primary OutFlow Max=0.09 cfs @ 13.62 hrs HW=167.72' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.09 cfs of 5.69 cfs potential flow)
└─**3=Orifice/Grate** (Weir Controls 0.09 cfs @ 0.50 fps)

Summary for Pond B17:

Inflow Area = 3.022 ac, 56.29% Impervious, Inflow Depth = 4.20" for 100-yr event
Inflow = 14.53 cfs @ 12.09 hrs, Volume= 1.059 af
Outflow = 0.70 cfs @ 14.93 hrs, Volume= 1.059 af, Atten= 95%, Lag= 170.4 min
Discarded = 0.70 cfs @ 14.93 hrs, Volume= 1.059 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 168.59' @ 14.93 hrs Surf.Area= 12,587 sf Storage= 24,770 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 385.8 min (1,200.4 - 814.6)

Volume	Invert	Avail.Storage	Storage Description
#1	166.00'	30,023 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
166.00	6,892	368.0	0	0	6,892
167.00	8,416	394.0	7,641	7,641	8,514
168.00	11,574	420.0	9,953	17,594	10,247
169.00	13,303	445.0	12,428	30,023	12,021

Device	Routing	Invert	Outlet Devices
#1	Discarded	166.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**15.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0500 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	168.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.70 cfs @ 14.93 hrs HW=168.59' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.70 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=166.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 6.39 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B18:

Inflow Area = 3.624 ac, 48.68% Impervious, Inflow Depth = 3.68" for 100-yr event
Inflow = 15.32 cfs @ 12.09 hrs, Volume= 1.111 af
Outflow = 0.93 cfs @ 14.26 hrs, Volume= 1.111 af, Atten= 94%, Lag= 130.2 min
Discarded = 0.93 cfs @ 14.26 hrs, Volume= 1.111 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 157.66' @ 14.26 hrs Surf.Area= 16,688 sf Storage= 23,140 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 267.2 min (1,093.3 - 826.1)

Volume	Invert	Avail.Storage	Storage Description
#1	156.00'	48,110 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
156.00	11,892	521.0	0	0	11,892
157.00	14,026	546.0	12,944	12,944	14,081
158.00	18,118	639.0	16,028	28,973	22,871
159.00	20,175	582.0	19,137	48,110	28,442

Device	Routing	Invert	Outlet Devices
#1	Discarded	156.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	154.50'	**15.0" Round Culvert** L= 25.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 154.50' / 154.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	157.80'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.93 cfs @ 14.26 hrs HW=157.66' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.93 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=156.00' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 4.36 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B24: Stormtech Basin

Inflow Area =	0.448 ac, 75.45% Impervious, Inflow Depth = 4.86" for 100-yr event			
Inflow =	2.44 cfs @	12.09 hrs, Volume=	0.181 af	
Outflow =	0.23 cfs @	13.35 hrs, Volume=	0.181 af, Atten= 91%, Lag= 75.6 min	
Discarded =	0.23 cfs @	13.35 hrs, Volume=	0.181 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 160.25' @ 13.35 hrs Surf.Area= 0.029 ac Storage= 0.097 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 534.0 min (1,333.4 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	150.00'	0.042 af	**22.75'W x 55.89'L x 5.50'H Field A** 0.161 af Overall - 0.055 af Embedded = 0.105 af x 40.0% Voids
#2A	150.75'	0.055 af	**ADS_StormTech MC-3500 d +Cap** x 21 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 3 Rows of 7 Chambers Cap Storage= +14.9 cf x 2 x 3 rows = 89.4 cf
#3	160.25'	0.094 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		0.191 af	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
160.25	0.250	0.000	0.000
160.50	0.500	0.094	0.094

Device	Routing	Invert	Outlet Devices
#1	Discarded	150.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	160.25'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.07 cfs @ 13.35 hrs HW=160.25' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=150.00' TW=0.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B9:

Inflow Area = 3.645 ac, 51.44% Impervious, Inflow Depth = 3.27" for 100-yr event
Inflow = 13.67 cfs @ 12.09 hrs, Volume= 0.993 af
Outflow = 4.25 cfs @ 12.45 hrs, Volume= 0.993 af, Atten= 69%, Lag= 21.3 min
Discarded = 0.49 cfs @ 12.45 hrs, Volume= 0.719 af
Primary = 3.76 cfs @ 12.45 hrs, Volume= 0.275 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 162.77' @ 12.45 hrs Surf.Area= 8,801 sf Storage= 16,800 cf

Plug-Flow detention time= 290.5 min calculated for 0.992 af (100% of inflow)
Center-of-Mass det. time= 291.0 min (1,126.2 - 835.2)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	18,847 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
160.00	3,823	293.0	0	0	3,823
161.00	5,252	308.0	4,519	4,519	4,601
162.00	7,083	364.0	6,145	10,663	7,614
163.00	9,337	686.0	8,184	18,847	34,525

Device	Routing	Invert	Outlet Devices
#1	Discarded	160.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	159.20'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 159.20' / 159.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#3	Device 2	162.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.49 cfs @ 12.45 hrs HW=162.77' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.49 cfs)

Primary OutFlow Max=3.75 cfs @ 12.45 hrs HW=162.77' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 3.75 cfs of 8.01 cfs potential flow)
  └─**3=Orifice/Grate** (Weir Controls 3.75 cfs @ 1.71 fps)

Summary for Link POA-2:

Inflow Area = 1.177 ac, 19.63% Impervious, Inflow Depth = 1.94" for 100-yr event
Inflow = 2.21 cfs @ 12.14 hrs, Volume= 0.190 af
Primary = 2.21 cfs @ 12.14 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-6:

Inflow Area = 10.473 ac, 10.62% Impervious, Inflow Depth = 1.10" for 100-yr event
Inflow = 6.94 cfs @ 12.32 hrs, Volume= 0.959 af
Primary = 6.94 cfs @ 12.32 hrs, Volume= 0.959 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-7:

Inflow Area = 2.631 ac, 16.17% Impervious, Inflow Depth = 0.34" for 100-yr event
Inflow = 0.27 cfs @ 12.54 hrs, Volume= 0.075 af
Primary = 0.27 cfs @ 12.54 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-8:

Inflow Area = 4.670 ac, 37.32% Impervious, Inflow Depth = 0.47" for 100-yr event
Inflow = 0.87 cfs @ 13.38 hrs, Volume= 0.183 af
Primary = 0.87 cfs @ 13.38 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA-9:

Inflow Area = 6.726 ac, 51.52% Impervious, Inflow Depth = 0.01" for 100-yr event
Inflow = 0.03 cfs @ 12.26 hrs, Volume= 0.004 af
Primary = 0.03 cfs @ 12.26 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link POA4:

Inflow Area = 45.599 ac, 17.85% Impervious, Inflow Depth = 1.01" for 100-yr event
Inflow = 13.31 cfs @ 13.13 hrs, Volume= 3.824 af
Primary = 13.31 cfs @ 13.13 hrs, Volume= 3.824 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

APPENDIX F – STORMWATER MANAGEMENT CALCULATIONS

- RECHARGE VOLUME CALCULATIONS
- WATER QUALITY VOLUME CALCULATIONS
- TSS REMOVAL CALCULATIONS
- PIPE SIZING CALCULATIONS
- GROUNDWATER MOUNDING ANALYSIS
- OUTLET PROTECTION SIZING

Overall Required Water Quality & Recharge Volumes
Glen Ellen Development
Millis, Massachusetts

Point of Interest	Existing Impervious Area (Ac.)	Proposed Impervious Area (Ac.)	Delta	WQV Required*	ReV Required**
POA-1	2.674	22.514	19.84	144,038	43,212
POA-2	2.875	0.231	-2.644	N/A	N/A
POA-3	0.068	0	-0.068	N/A	N/A
POA-4	3.322	6.416	3.094	22,462	6,739
POA-5	0	0	0	N/A	N/A
POA-6	0	0	0	0	0
POA-7	0	0.338	0.338	2,454	736
POA-8	0	1.483	1.483	10,767	3,230
POA-9	0	2.722	2.722	19,762	5,929
Totals	8.939	33.704	24.765	179,794	59,845

Total impervious area draining to detention basins (ac.)=	30.481
Percentage of impevious area being recharged=	90%

Required Water Quality & Recharge Volumes Per Basin
Glen Ellen Development
Millis, Massachusetts

Basin #	Impervious area draining to basin	WQV Required*	ReV Required**	Forebay Volume Provided (CF)	WQV /Recharge Volume Provided Below Outlet in Basin (excludes forebay)(CF)	Total Water Quality Volume Provided (includes forebay) (CF)
POA-1						
B1	2.894	**21,010**	**6,303**	2,835	**47,389**	**50,224**
B2	5.071	**36,815**	**11,045**	3,838	**34,866**	**38,704**
B3	3.086	**22,404**	**6,721**	5,185	**63,190**	**68,375**
B4	0.255	**1,851**	**555**	0	**5,522**	**5,522**
B5	0.51	**3,703**	**1,111**	0	**9,693**	**9,693**
B6	0.444	**3,223**	**967**	0	**8,671**	**8,671**
B7	0.127	**922**	**277**	0	**3,015**	**3,015**
B8	6.489	**47,110**	**14,133**	5,678	**18,979**	**24,657**
B15	1.922	**13,954**	**4,186**	1,121	**31,274**	**32,395**
B19	0.313	**2,272**	**682**	370	**5,068**	**5,438**
Sub-total	21.111	**153,266**	**45,980**	19,027	**227,667**	**246,694**
POA-4						
B9	0.726	**5,271**	**1,581**	379	14,474	**14,853**
B10	1.157	**8,400**	**2,520**	1,007	26,562	**27,569**
B11	0.64	**4,646**	**1,394**	667	2,987	**3,654**
B12	1.772	**12,865**	**3,859**	2,206	19,277	**21,483**
B13	0.771	**5,597**	**1,679**	672	11,818	**12,490**
Sub-total	5.066	**36,779**	**11,034**	4,931	**75,118**	**80,049**
POA-7						
B24	0.338	**2,454**	**736**	1,515	2,710	**4,225**
Sub-total	0.338	**2,454**	**736**	1,515	**2,710**	**4,225**
POA-8						
B14	0.809	**5,873**	**1,762**	1,310	17,323	**18,633**
B16	0.435	**3,158**	**947**	867	7,938	**8,805**
Sub-total	1.244	**9,031**	**2,709**	2,177	**25,261**	**27,438**
POA-9						
B17	1.421	**10,316**	**3,095**	1,505	24,844	**26,349**
B18	1.301	**9,445**	**2,834**	1,733	25,436	**27,169**
Sub-total	2.722	**19,762**	**5,929**	3,238	**50,280**	**53,518**
Total	**30.481**	**221,292**	**66,388**	30,888	**381,036**	**411,924**

* Water Quality Volume (WQV) calculated using 2" of rainfall
**Recharge Volume (ReV) calculated assuming new impervious area is over type A soil (most conservative)
Runoff from Basin #8 is 0 through the 2 year storm

Required Forebay Volumes
Glen Ellen Development

Basin #	Impervious area draining to basin (Ac.)	Forebay volume required (CF)	Forebay Volume Provided (CF)
B-1	2.894	1051	2835
B-2 (north)	2.567	932	2492
B-2 (south)	1.314	477	1346
B-3	3.086	1120	5185
B-4	N/A		
B-5	N/A		
B-6	N/A		
B-7	N/A		
B-8 (east)	0.428	155	1065
B-8 (west)	1.843	669	4613
B-9 (east)	0.54	196	229
B-9 (west)	0.186	68	150
B-10	1.157	420	1007
B-11 (north)	0.3	109	474
B-11 (south)	0.34	123	193
B-12	1.772	643	2206
B-13	0.771	280	672
B-14 (north)	0.125	45	1132
B-14 (south)	0.145	53	178
B-15	1.922	698	1121
B-16	0.435	158	867
B-17	1.421	516	1505
B-18	1.301	472	1733
B-19	0.313	114	370
B-24	0.338	123	1515*

* Volume provided by isolator row

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Treatment for all basins except B-24

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Sediment Forebay	**0.25**	**0.75**	**0.19**	**0.56**
Infiltration Basin	**0.80**	**0.56**	**0.45**	**0.11**
	0.00	**0.11**	**0.00**	**0.11**
	0.00	**0.11**	**0.00**	**0.11**

Total TSS Removal = **89%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: W161041
Prepared By: **Bohler Engineering**
Date: **11/15/2016**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: Treatment Train to Basin #24 (Underground Infiltration)

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Isolator Row	**0.25**	**0.75**	**0.19**	**0.56**
Infiltration Basin	**0.80**	**0.56**	**0.45**	**0.11**

Total TSS Removal = **89%** **Completed for Each Outlet**

Project: **W161041**

Prepared By: **Bohler Engineering**

Date: **11/15/2016**

*Equals remaining load from previous BMP (E) which enters the BMP

Stage-Area-Storage for Pond B1:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
144.50	18,491	0
144.55	18,611	928
144.60	18,731	1,861
144.65	18,851	2,801
144.70	18,972	3,746
144.75	19,093	4,698
144.80	19,215	5,656
144.85	19,337	6,619
144.90	19,459	7,589
144.95	19,582	8,565
145.00	19,705	9,547
145.05	19,827	10,536
145.10	19,949	11,530
145.15	20,071	12,531
145.20	20,194	13,537
145.25	20,317	14,550
145.30	20,440	15,569
145.35	20,564	16,594
145.40	20,688	17,625
145.45	20,813	18,663
145.50	20,938	19,707
145.55	21,063	20,757
145.60	21,189	21,813
145.65	21,315	22,875
145.70	21,441	23,944
145.75	21,568	25,020
145.80	21,695	26,101
145.85	21,823	27,189
145.90	21,951	28,283
145.95	22,079	29,384
146.00	22,208	30,491
146.05	22,477	31,609
146.10	22,748	32,739
146.15	23,020	33,883
146.20	23,294	35,041
146.25	23,570	36,213
146.30	23,847	37,398
146.35	24,126	38,598
146.40	24,406	39,811
146.45	24,688	41,038
146.50	24,972	42,280
146.55	25,257	43,535
146.60	25,544	44,805
146.65	25,833	46,090
146.70	26,123	47,389
146.75	26,415	48,702
146.80	26,708	50,030
146.85	27,003	51,373
146.90	27,300	52,731
146.95	27,598	54,103
147.00	27,898	55,490
147.05	28,048	56,889
147.10	28,198	58,295
147.15	28,349	59,709
147.20	28,500	61,130
147.25	28,652	62,559
147.30	28,804	63,995
147.35	28,956	65,439
147.40	29,109	66,891
147.45	29,262	68,350
147.50	**29,416**	**69,817**

OUTLET ELEV.

Stage-Area-Storage for Pond B2:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
145.00	12,284	0
145.05	12,424	618
145.10	12,565	1,242
145.15	12,707	1,874
145.20	12,849	2,513
145.25	12,993	3,159
145.30	13,137	3,812
145.35	13,282	4,473
145.40	13,427	5,141
145.45	13,574	5,816
145.50	13,721	6,498
145.55	13,869	7,188
145.60	14,018	7,885
145.65	14,168	8,590
145.70	14,318	9,302
145.75	14,470	10,021
145.80	14,622	10,749
145.85	14,775	11,484
145.90	14,928	12,226
145.95	15,083	12,976
146.00	15,238	13,735
146.05	15,576	14,505
146.10	15,917	15,292
146.15	16,263	16,097
146.20	16,611	16,918
146.25	16,964	17,758
146.30	17,320	18,615
146.35	17,680	19,490
146.40	18,044	20,383
146.45	18,412	21,294
146.50	18,783	22,224
146.55	19,158	23,173
146.60	19,536	24,140
146.65	19,918	25,126
146.70	20,304	26,132
146.75	20,694	27,157
146.80	21,087	28,201
146.85	21,485	29,266
146.90	21,885	30,350
146.95	22,290	31,454
147.00	22,698	32,579
147.05	22,873	33,718
147.10	23,048	34,866
147.15	23,224	36,023
147.20	23,400	37,189
147.25	23,577	38,363
147.30	23,755	39,546
147.35	23,934	40,739
147.40	24,113	41,940
147.45	24,293	43,150
147.50	24,474	44,369
147.55	24,655	45,597
147.60	24,837	46,835
147.65	25,019	48,081
147.70	25,203	49,337
147.75	25,386	50,601
147.80	25,571	51,875
147.85	25,756	53,158
147.90	25,942	54,451
147.95	26,129	55,753
148.00	**26,316**	**57,064**

OUTLET ELEV

Stage-Area-Storage for Pond B3:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
146.00	26,149	0
146.05	26,288	1,311
146.10	26,427	2,629
146.15	26,567	3,954
146.20	26,706	5,285
146.25	26,847	6,624
146.30	26,987	7,970
146.35	27,128	9,323
146.40	27,270	10,683
146.45	27,412	12,050
146.50	27,554	13,424
146.55	27,696	14,805
146.60	27,839	16,194
146.65	27,982	17,589
146.70	28,126	18,992
146.75	28,270	20,402
146.80	28,414	21,819
146.85	28,559	23,243
146.90	28,704	24,675
146.95	28,849	26,114
147.00	28,995	27,560
147.05	29,444	29,021
147.10	29,896	30,504
147.15	30,351	32,010
147.20	30,810	33,539
147.25	31,273	35,091
147.30	31,739	36,667
147.35	32,208	38,265
147.40	32,681	39,888
147.45	33,157	41,534
147.50	33,637	43,203
147.55	34,120	44,897
147.60	34,606	46,615
147.65	35,096	48,358
147.70	35,590	50,125
147.75	36,087	51,917
147.80	36,587	53,734
147.85	37,091	55,576
147.90	37,598	57,443
147.95	38,109	59,336
148.00	38,623	61,254
148.05	38,808	63,190
148.10	38,993	65,135
148.15	39,179	67,089
148.20	39,365	69,053
148.25	39,551	71,026
148.30	39,738	73,008
148.35	39,926	74,999
148.40	40,114	77,000
148.45	40,302	79,011
148.50	40,491	81,031
148.55	40,680	83,060
148.60	40,870	85,099
148.65	41,060	87,147
148.70	41,250	89,205
148.75	41,441	91,272
148.80	41,633	93,349
148.85	41,825	95,435
148.90	42,017	97,531
148.95	42,210	99,637
149.00	**42,403**	**101,752**
149.05	42,403	101,752
149.10	42,403	101,752
149.15	42,403	101,752
149.20	42,403	101,752
149.25	42,403	101,752
149.30	42,403	101,752
149.35	42,403	101,752
149.40	42,403	101,752
149.45	42,403	101,752
149.50	42,403	101,752
149.55	42,403	101,752
149.60	42,403	101,752
149.65	42,403	101,752
149.70	42,403	101,752
149.75	42,403	101,752
149.80	42,403	101,752
149.85	42,403	101,752
149.90	42,403	101,752
149.95	42,403	101,752
150.00	42,403	101,752
150.05	42,403	101,752

OUTLET ELEV.

Stage-Area-Storage for Pond B4:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
154.00	3,033	0
154.05	3,074	153
154.10	3,115	307
154.15	3,156	464
154.20	3,197	623
154.25	3,239	784
154.30	3,281	947
154.35	3,323	1,112
154.40	3,366	1,279
154.45	3,409	1,449
154.50	3,452	1,620
154.55	3,495	1,794
154.60	3,539	1,970
154.65	3,583	2,148
154.70	3,627	2,328
154.75	3,672	2,510
154.80	3,716	2,695
154.85	3,761	2,882
154.90	3,807	3,071
154.95	3,852	3,263
155.00	3,898	3,456
155.05	3,944	3,653
155.10	3,990	3,851
155.15	4,036	4,051
155.20	4,082	4,254
155.25	4,129	4,460
155.30	4,176	4,667
155.35	4,224	4,877
155.40	4,271	5,090
155.45	4,319	5,304
155.50	4,367	5,522
155.55	4,416	5,741
155.60	4,464	5,963
155.65	4,513	6,188
155.70	4,562	6,415
155.75	4,612	6,644
155.80	4,661	6,876
155.85	4,711	7,110
155.90	4,762	7,347
155.95	4,812	7,586
156.00	4,863	7,828
156.05	4,915	8,073
156.10	4,968	8,320
156.15	5,021	8,569
156.20	5,075	8,822
156.25	5,128	9,077
156.30	5,182	9,335
156.35	5,236	9,595
156.40	5,291	9,858
156.45	5,345	10,124
156.50	5,400	10,393
156.55	5,456	10,664
156.60	5,511	10,938
156.65	5,567	11,215
156.70	5,623	11,495
156.75	5,680	11,778
156.80	5,736	12,063
156.85	5,793	12,351
156.90	5,851	12,642
156.95	5,908	12,936
157.00	**5,966**	**13,233**

OUTLET ELEV.

Stage-Area-Storage for Pond B5:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
160.00	2,555	0
160.05	2,599	129
160.10	2,643	260
160.15	2,687	393
160.20	2,732	529
160.25	2,777	666
160.30	2,823	806
160.35	2,869	949
160.40	2,915	1,093
160.45	2,962	1,240
160.50	3,009	1,389
160.55	3,056	1,541
160.60	3,104	1,695
160.65	3,152	1,851
160.70	3,201	2,010
160.75	3,250	2,172
160.80	3,299	2,335
160.85	3,349	2,502
160.90	3,399	2,670
160.95	3,449	2,841
161.00	3,500	3,015
161.05	3,549	3,191
161.10	3,598	3,370
161.15	3,648	3,551
161.20	3,698	3,735
161.25	3,748	3,921
161.30	3,799	4,110
161.35	3,850	4,301
161.40	3,902	4,495
161.45	3,953	4,691
161.50	4,005	4,890
161.55	4,058	5,092
161.60	4,111	5,296
161.65	4,164	5,503
161.70	4,217	5,712
161.75	4,271	5,924
161.80	4,325	6,139
161.85	4,380	6,357
161.90	4,434	6,577
161.95	4,490	6,800
162.00	4,545	7,026
162.05	4,599	7,255
162.10	4,654	7,486
162.15	4,709	7,720
162.20	4,764	7,957
162.25	4,819	8,197
162.30	4,875	8,439
162.35	4,931	8,684
162.40	4,988	8,932
162.45	5,045	9,183
162.50	5,102	9,437
162.55	5,159	9,693
162.60	5,217	9,953
162.65	5,275	10,215
162.70	5,334	10,480
162.75	5,392	10,748
162.80	5,452	11,019
162.85	5,511	11,293
162.90	5,571	11,570
162.95	5,631	11,851
163.00	**5,691**	**12,134**

OUTLET ELEV

Stage-Area-Storage for Pond B6:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.00	1,828	0
171.05	1,878	93
171.10	1,928	188
171.15	1,980	285
171.20	2,032	386
171.25	2,084	489
171.30	2,137	594
171.35	2,191	702
171.40	2,246	813
171.45	2,301	927
171.50	2,357	1,043
171.55	2,414	1,163
171.60	2,471	1,285
171.65	2,529	1,410
171.70	2,587	1,538
171.75	2,647	1,669
171.80	2,707	1,802
171.85	2,767	1,939
171.90	2,828	2,079
171.95	2,890	2,222
172.00	2,953	2,368
172.05	3,009	2,517
172.10	3,066	2,669
172.15	3,123	2,824
172.20	3,181	2,981
172.25	3,239	3,142
172.30	3,298	3,305
172.35	3,358	3,472
172.40	3,418	3,641
172.45	3,478	3,813
172.50	3,539	3,989
172.55	3,601	4,167
172.60	3,663	4,349
172.65	3,725	4,534
172.70	3,788	4,721
172.75	3,852	4,913
172.80	3,916	5,107
172.85	3,981	5,304
172.90	4,046	5,505
172.95	4,112	5,709
173.00	4,178	5,916
173.05	4,245	6,127
173.10	4,313	6,340
173.15	4,381	6,558
173.20	4,449	6,779
173.25	4,518	7,003
173.30	4,588	7,230
173.35	4,658	7,462
173.40	4,729	7,696
173.45	4,800	7,934
173.50	4,872	8,176
173.55	4,944	8,422
173.60	5,017	8,671
173.65	5,090	8,923
173.70	5,164	9,180
173.75	5,239	9,440
173.80	5,314	9,704
173.85	5,389	9,971
173.90	5,465	10,243
173.95	5,542	10,518
174.00	**5,619**	**10,797**

OUTLET ELEV.

Stage-Area-Storage for Pond B7:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
171.00	2,112	0
171.05	2,153	107
171.10	2,195	215
171.15	2,238	326
171.20	2,280	439
171.25	2,323	554
171.30	2,367	671
171.35	2,411	791
171.40	2,455	913
171.45	2,500	1,036
171.50	2,545	1,163
171.55	2,590	1,291
171.60	2,636	1,422
171.65	2,683	1,555
171.70	2,729	1,690
171.75	2,776	1,827
171.80	2,824	1,967
171.85	2,872	2,110
171.90	2,920	2,255
171.95	2,969	2,402
172.00	3,018	2,552
172.05	3,065	2,704
172.10	3,112	2,858
172.15	3,160	3,015
172.20	3,208	3,174
172.25	3,256	3,336
172.30	3,305	3,500
172.35	3,354	3,666
172.40	3,403	3,835
172.45	3,453	4,006
172.50	3,503	4,180
172.55	3,554	4,357
172.60	3,605	4,536
172.65	3,656	4,717
172.70	3,708	4,901
172.75	3,760	5,088
172.80	3,812	5,277
172.85	3,865	5,469
172.90	3,918	5,664
172.95	3,971	5,861
173.00	4,025	6,061
173.05	4,077	6,264
173.10	4,130	6,469
173.15	4,182	6,677
173.20	4,236	6,887
173.25	4,289	7,100
173.30	4,343	7,316
173.35	4,397	7,534
173.40	4,452	7,756
173.45	4,507	7,980
173.50	4,562	8,206
173.55	4,617	8,436
173.60	4,673	8,668
173.65	4,729	8,903
173.70	4,786	9,141
173.75	4,843	9,382
173.80	4,900	9,625
173.85	4,957	9,872
173.90	5,015	10,121
173.95	5,073	10,373
174.00	**5,132**	**10,628**

OUTLET ELEV.

Stage-Area-Storage for Pond B8:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
148.50	15,240	0
148.55	15,370	765
148.60	15,501	1,537
148.65	15,632	2,315
148.70	15,764	3,100
148.75	15,896	3,892
148.80	16,029	4,690
148.85	16,162	5,495
148.90	16,296	6,306
148.95	16,431	7,124
149.00	16,566	7,949
149.05	16,860	8,785
149.10	17,156	9,635
149.15	17,455	10,500
149.20	17,756	11,381
149.25	18,060	12,276
149.30	18,367	13,187
149.35	18,676	14,113
149.40	18,988	15,055
149.45	19,303	16,012
149.50	19,620	16,985
149.55	19,939	17,974
149.60	20,261	18,979
149.65	20,586	20,000
149.70	20,913	21,037
149.75	21,243	22,091
149.80	21,576	23,162
149.85	21,911	24,249
149.90	22,248	25,353
149.95	22,588	26,474
150.00	22,931	27,612
150.05	23,277	28,767
150.10	23,625	29,939
150.15	23,975	31,129
150.20	24,328	32,337
150.25	24,684	33,562
150.30	25,042	34,805
150.35	25,403	36,067
150.40	25,766	37,346
150.45	26,132	38,643
150.50	26,501	39,959
150.55	26,633	41,287
150.60	26,764	42,622
150.65	26,897	43,964
150.70	27,029	45,312
150.75	27,162	46,667
150.80	27,295	48,028
150.85	27,429	49,396
150.90	27,563	50,771
150.95	27,697	52,153
151.00	27,831	53,541
151.05	27,966	54,936
151.10	28,101	56,337
151.15	28,237	57,746
151.20	28,372	59,161
151.25	28,509	60,583
151.30	28,645	62,012
151.35	28,782	63,448
151.40	28,919	64,890
151.45	29,056	66,339
151.50	**29,194**	**67,796**
151.55	29,194	67,796
151.60	29,194	67,796
151.65	29,194	67,796
151.70	29,194	67,796
151.75	29,194	67,796
151.80	29,194	67,796
151.85	29,194	67,796
151.90	29,194	67,796
151.95	29,194	67,796
152.00	29,194	67,796
152.05	29,194	67,796
152.10	29,194	67,796

OUTLET ELEV

Stage-Area-Storage for Pond B9:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
160.00	3,823	0
160.05	3,889	193
160.10	3,956	389
160.15	4,023	588
160.20	4,091	791
160.25	4,159	997
160.30	4,228	1,207
160.35	4,297	1,420
160.40	4,367	1,637
160.45	4,438	1,857
160.50	4,509	2,081
160.55	4,581	2,308
160.60	4,653	2,539
160.65	4,726	2,773
160.70	4,800	3,011
160.75	4,874	3,253
160.80	4,948	3,499
160.85	5,023	3,748
160.90	5,099	4,001
160.95	5,175	4,258
161.00	5,252	4,519
161.05	5,337	4,783
161.10	5,423	5,052
161.15	5,509	5,326
161.20	5,596	5,603
161.25	5,684	5,885
161.30	5,773	6,172
161.35	5,862	6,463
161.40	5,952	6,758
161.45	6,042	7,058
161.50	6,133	7,362
161.55	6,225	7,671
161.60	6,318	7,985
161.65	6,411	8,303
161.70	6,505	8,626
161.75	6,600	8,953
161.80	6,695	9,286
161.85	6,791	9,623
161.90	6,888	9,965
161.95	6,985	10,312
162.00	7,083	10,663
162.05	7,188	11,020
162.10	7,294	11,382
162.15	7,401	11,750
162.20	7,509	12,122
162.25	7,617	12,500
162.30	7,727	12,884
162.35	7,837	13,273
162.40	7,947	13,668
162.45	8,059	14,068
162.50	8,171	14,474
162.55	8,284	14,885
162.60	8,398	15,302
162.65	8,513	15,725
162.70	8,628	16,153
162.75	8,744	16,588
162.80	8,861	17,028
162.85	8,979	17,474
162.90	9,098	17,926
162.95	9,217	18,384
163.00	**9,337**	**18,847**

OUTLET ELEV.

Stage-Area-Storage for Pond B10:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
150.50	9,138	0
150.55	9,220	459
150.60	9,302	922
150.65	9,384	1,389
150.70	9,466	1,860
150.75	9,549	2,336
150.80	9,633	2,815
150.85	9,717	3,299
150.90	9,801	3,787
150.95	9,885	4,279
151.00	9,970	4,775
151.05	10,054	5,276
151.10	10,138	5,781
151.15	10,223	6,290
151.20	10,308	6,803
151.25	10,393	7,321
151.30	10,478	7,842
151.35	10,564	8,369
151.40	10,651	8,899
151.45	10,737	9,434
151.50	10,824	9,973
151.55	10,912	10,516
151.60	11,000	11,064
151.65	11,088	11,616
151.70	11,176	12,173
151.75	11,265	12,734
151.80	11,354	13,299
151.85	11,443	13,869
151.90	11,533	14,443
151.95	11,623	15,022
152.00	11,714	15,606
152.05	11,848	16,195
152.10	11,984	16,791
152.15	12,119	17,393
152.20	12,256	18,003
152.25	12,394	18,619
152.30	12,532	19,242
152.35	12,671	19,872
152.40	12,811	20,509
152.45	12,951	21,153
152.50	13,092	21,804
152.55	13,234	22,462
152.60	13,377	23,128
152.65	13,521	23,800
152.70	13,665	24,480
152.75	13,810	25,167
152.80	13,956	25,861
152.85	14,103	26,562
152.90	14,250	27,271
152.95	14,398	27,987
153.00	14,547	28,711
153.05	14,697	29,442
153.10	14,848	30,181
153.15	14,999	30,927
153.20	15,151	31,681
153.25	15,304	32,442
153.30	15,457	33,211
153.35	15,611	33,988
153.40	15,767	34,772
153.45	15,922	35,564
153.50	**16,079**	**36,364**

OUTLET ELEV

Stage-Area-Storage for Pond B11:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
144.00	575	0
144.05	596	29
144.10	616	60
144.15	638	91
144.20	659	123
144.25	681	157
144.30	704	191
144.35	726	227
144.40	749	264
144.45	773	302
144.50	796	341
144.55	821	382
144.60	845	423
144.65	870	466
144.70	895	510
144.75	921	556
144.80	947	603
144.85	973	651
144.90	1,000	700
144.95	1,027	750
145.00	1,054	802
145.05	1,102	856
145.10	1,152	913
145.15	1,202	972
145.20	1,254	1,033
145.25	1,306	1,097
145.30	1,360	1,164
145.35	1,415	1,233
145.40	1,471	1,305
145.45	1,527	1,380
145.50	1,585	1,458
145.55	1,645	1,539
145.60	1,705	1,622
145.65	1,766	1,709
145.70	1,828	1,799
145.75	1,892	1,892
145.80	1,956	1,988
145.85	2,022	2,088
145.90	2,088	2,190
145.95	2,156	2,296
146.00	2,225	2,406
146.05	2,264	2,518
146.10	2,303	2,632
146.15	2,342	2,748
146.20	2,382	2,867
146.25	2,422	2,987
146.30	2,462	3,109
146.35	2,503	3,233
146.40	2,544	3,359
146.45	2,585	3,487
146.50	2,627	3,618
146.55	2,669	3,750
146.60	2,711	3,884
146.65	2,754	4,021
146.70	2,797	4,160
146.75	2,840	4,301
146.80	2,884	4,444
146.85	2,928	4,589
146.90	2,972	4,737
146.95	3,017	4,886
147.00	3,062	5,038
147.05	3,111	5,193
147.10	3,160	5,349
147.15	3,210	5,509
147.20	3,260	5,670
147.25	3,310	5,835
147.30	3,361	6,001
147.35	3,413	6,171
147.40	3,464	6,343
147.45	3,516	6,517
147.50	3,569	6,694
147.55	3,621	6,874
147.60	3,675	7,057
147.65	3,728	7,242
147.70	3,782	7,429
147.75	3,836	7,620
147.80	3,891	7,813
147.85	3,946	8,009
147.90	4,002	8,208
147.95	4,058	8,409
148.00	**4,114**	**8,613**

OUTLET ELEV

Stage-Area-Storage for Pond B12:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
154.50	5,451	0
154.55	5,511	274
154.60	5,572	551
154.65	5,633	831
154.70	5,694	1,114
154.75	5,755	1,401
154.80	5,817	1,690
154.85	5,879	1,982
154.90	5,942	2,278
154.95	6,005	2,577
155.00	6,068	2,878
155.05	6,131	3,183
155.10	6,194	3,491
155.15	6,257	3,803
155.20	6,321	4,117
155.25	6,384	4,435
155.30	6,449	4,756
155.35	6,513	5,080
155.40	6,578	5,407
155.45	6,643	5,737
155.50	6,709	6,071
155.55	6,775	6,408
155.60	6,841	6,749
155.65	6,907	7,092
155.70	6,974	7,439
155.75	7,041	7,790
155.80	7,109	8,144
155.85	7,177	8,501
155.90	7,245	8,861
155.95	7,313	9,225
156.00	7,382	9,593
156.05	7,594	9,967
156.10	7,809	10,352
156.15	8,026	10,748
156.20	8,247	11,155
156.25	8,471	11,573
156.30	8,697	12,002
156.35	8,927	12,442
156.40	9,160	12,895
156.45	9,396	13,359
156.50	9,634	13,834
156.55	9,876	14,322
156.60	10,121	14,822
156.65	10,368	15,334
156.70	10,619	15,859
156.75	10,873	16,396
156.80	11,129	16,946
156.85	11,389	17,509
156.90	11,652	18,085
156.95	11,917	18,674
157.00	12,186	19,277
157.05	12,408	19,892
157.10	12,633	20,518
157.15	12,859	21,155
157.20	13,088	21,804
157.25	13,318	22,464
157.30	13,551	23,136
157.35	13,785	23,819
157.40	14,022	24,514
157.45	14,260	25,221
157.50	**14,501**	**25,940**

OUTLET ELEV.

Stage-Area-Storage for Pond B13:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
169.00	2,583	0
169.05	2,672	131
169.10	2,763	267
169.15	2,855	408
169.20	2,948	553
169.25	3,043	703
169.30	3,140	857
169.35	3,238	1,017
169.40	3,338	1,181
169.45	3,439	1,350
169.50	3,542	1,525
169.55	3,646	1,705
169.60	3,751	1,889
169.65	3,859	2,080
169.70	3,967	2,275
169.75	4,077	2,476
169.80	4,189	2,683
169.85	4,302	2,895
169.90	4,417	3,113
169.95	4,533	3,337
170.00	4,651	3,567
170.05	4,793	3,803
170.10	4,936	4,046
170.15	5,082	4,296
170.20	5,230	4,554
170.25	5,380	4,819
170.30	5,533	5,092
170.35	5,687	5,373
170.40	5,843	5,661
170.45	6,002	5,957
170.50	6,163	6,261
170.55	6,326	6,573
170.60	6,491	6,894
170.65	6,658	7,223
170.70	6,827	7,560
170.75	6,998	7,905
170.80	7,172	8,260
170.85	7,347	8,623
170.90	7,525	8,994
170.95	7,705	9,375
171.00	7,887	9,765
171.05	8,016	10,162
171.10	8,145	10,566
171.15	8,276	10,977
171.20	8,408	11,394
171.25	8,541	11,818
171.30	8,675	12,248
171.35	8,809	12,685
171.40	8,945	13,129
171.45	9,082	13,580
171.50	9,220	14,037
171.55	9,360	14,502
171.60	9,500	14,973
171.65	9,641	15,452
171.70	9,783	15,937
171.75	9,926	16,430
171.80	10,070	16,930
171.85	10,216	17,437
171.90	10,362	17,952
171.95	10,510	18,474
172.00	**10,658**	**19,003**
172.05	10,658	19,003
172.10	10,658	19,003
172.15	10,658	19,003
172.20	10,658	19,003
172.25	10,658	19,003
172.30	10,658	19,003
172.35	10,658	19,003
172.40	10,658	19,003
172.45	10,658	19,003
172.50	10,658	19,003
172.55	10,658	19,003
172.60	10,658	19,003
172.65	10,658	19,003
172.70	10,658	19,003
172.75	10,658	19,003
172.80	10,658	19,003
172.85	10,658	19,003
172.90	10,658	19,003
172.95	10,658	19,003
173.00	10,658	19,003
173.05	10,658	19,003
173.10	10,658	19,003
173.15	10,658	19,003
173.20	10,658	19,003
173.25	10,658	19,003

OUTLET ELEV.

Stage-Area-Storage for Pond B14:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
157.50	4,484	0
157.55	4,563	226
157.60	4,644	456
157.65	4,724	691
157.70	4,806	929
157.75	4,888	1,171
157.80	4,971	1,418
157.85	5,055	1,668
157.90	5,139	1,923
157.95	5,224	2,182
158.00	5,310	2,446
158.05	5,391	2,713
158.10	5,472	2,985
158.15	5,554	3,260
158.20	5,636	3,540
158.25	5,719	3,824
158.30	5,803	4,112
158.35	5,887	4,404
158.40	5,972	4,701
158.45	6,057	5,001
158.50	6,143	5,306
158.55	6,230	5,616
158.60	6,317	5,929
158.65	6,405	6,247
158.70	6,493	6,570
158.75	6,582	6,897
158.80	6,672	7,228
158.85	6,762	7,564
158.90	6,853	7,904
158.95	6,945	8,249
159.00	7,037	8,599
159.05	7,195	8,955
159.10	7,355	9,318
159.15	7,516	9,690
159.20	7,679	10,070
159.25	7,844	10,458
159.30	8,011	10,854
159.35	8,179	11,259
159.40	8,349	11,672
159.45	8,521	12,094
159.50	8,695	12,525
159.55	8,870	12,964
159.60	9,048	13,412
159.65	9,226	13,868
159.70	9,407	14,334
159.75	9,590	14,809
159.80	9,774	15,293
159.85	9,960	15,787
159.90	10,147	16,289
159.95	10,337	16,801
160.00	10,528	17,323
160.05	10,639	17,852
160.10	10,751	18,387
160.15	10,863	18,927
160.20	10,976	19,473
160.25	11,090	20,025
160.30	11,204	20,582
160.35	11,318	21,145
160.40	11,434	21,714
160.45	11,550	22,289
160.50	**11,666**	**22,869**

OUTLET ELEV.

Stage-Area-Storage for Pond B15:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
164.00	13,647	0	166.60	22,060	46,066
164.05	13,774	686	166.65	22,193	47,172
164.10	13,901	1,377	166.70	22,327	48,285
164.15	14,029	2,076	166.75	22,460	49,405
164.20	14,157	2,780	166.80	22,594	50,531
164.25	14,286	3,491	166.85	22,729	51,664
164.30	14,415	4,209	166.90	22,864	52,804
164.35	14,545	4,933	166.95	22,999	53,951
164.40	14,676	5,663	167.00	**23,135**	**55,104**
164.45	14,807	6,400	167.05	23,135	55,104
164.50	14,939	7,144	167.10	23,135	55,104
164.55	15,072	7,894	167.15	23,135	55,104
164.60	15,205	8,651	167.20	23,135	55,104
164.65	15,338	9,415	167.25	23,135	55,104
164.70	15,473	10,185	167.30	23,135	55,104
164.75	15,607	10,962	167.35	23,135	55,104
164.80	15,743	11,746	167.40	23,135	55,104
164.85	15,879	12,536	167.45	23,135	55,104
164.90	16,015	13,334	167.50	23,135	55,104
164.95	16,152	14,138	167.55	23,135	55,104
165.00	16,290	14,949	167.60	23,135	55,104
165.05	16,489	15,768	167.65	23,135	55,104
165.10	16,689	16,598	167.70	23,135	55,104
165.15	16,890	17,437	167.75	23,135	55,104
165.20	17,093	18,287	167.80	23,135	55,104
165.25	17,296	19,147	167.85	23,135	55,104
165.30	17,501	20,017	167.90	23,135	55,104
165.35	17,707	20,897			
165.40	17,915	21,787			
165.45	18,123	22,688			
165.50	18,333	23,600			
165.55	18,544	24,522			
165.60	18,756	25,454			
165.65	18,969	26,397			
165.70	19,184	27,351			
165.75	19,399	28,316			
165.80	19,616	29,291			
165.85	19,834	30,277			
165.90	20,054	31,274	OUTLET ELEV.		
165.95	20,274	32,283			
166.00	20,496	33,302			
166.05	20,624	34,330			
166.10	20,753	35,364			
166.15	20,882	36,405			
166.20	21,011	37,452			
166.25	21,141	38,506			
166.30	21,271	39,566			
166.35	21,401	40,633			
166.40	21,532	41,707			
166.45	21,664	42,787			
166.50	21,796	43,873			
166.55	21,928	44,966			

Stage-Area-Storage for Pond B16:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
165.00	934	0
165.05	992	48
165.10	1,052	99
165.15	1,114	153
165.20	1,177	211
165.25	1,243	271
165.30	1,310	335
165.35	1,378	402
165.40	1,449	473
165.45	1,521	547
165.50	1,595	625
165.55	1,671	707
165.60	1,748	792
165.65	1,828	881
165.70	1,909	975
165.75	1,992	1,072
165.80	2,076	1,174
165.85	2,162	1,280
165.90	2,251	1,390
165.95	2,340	1,505
166.00	2,432	1,624
166.05	2,536	1,749
166.10	2,643	1,878
166.15	2,752	2,013
166.20	2,862	2,153
166.25	2,976	2,299
166.30	3,091	2,451
166.35	3,208	2,608
166.40	3,328	2,772
166.45	3,450	2,941
166.50	3,574	3,117
166.55	3,700	3,299
166.60	3,829	3,487
166.65	3,959	3,681
166.70	4,092	3,883
166.75	4,227	4,091
166.80	4,364	4,305
166.85	4,504	4,527
166.90	4,645	4,756
166.95	4,789	4,992
167.00	4,935	5,235
167.05	5,027	5,484
167.10	5,120	5,738
167.15	5,214	5,996
167.20	5,308	6,259
167.25	5,404	6,527
167.30	5,500	6,799
167.35	5,597	7,077
167.40	5,695	7,359
167.45	5,794	7,646
167.50	5,893	7,938
167.55	5,994	8,236
167.60	6,095	8,538
167.65	6,198	8,845
167.70	6,301	9,158
167.75	6,405	9,475
167.80	6,509	9,798
167.85	6,615	10,126
167.90	6,721	10,460
167.95	6,829	10,798
168.00	**6,937**	**11,143**

OUTLET ELEV.

Stage-Area-Storage for Pond B17:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
166.00	6,892	0
166.05	6,965	346
166.10	7,038	696
166.15	7,111	1,050
166.20	7,185	1,408
166.25	7,259	1,769
166.30	7,333	2,133
166.35	7,408	2,502
166.40	7,483	2,874
166.45	7,559	3,250
166.50	7,635	3,630
166.55	7,711	4,014
166.60	7,788	4,401
166.65	7,865	4,793
166.70	7,943	5,188
166.75	8,021	5,587
166.80	8,099	5,990
166.85	8,178	6,397
166.90	8,257	6,808
166.95	8,336	7,223
167.00	8,416	7,641
167.05	8,562	8,066
167.10	8,709	8,498
167.15	8,858	8,937
167.20	9,007	9,383
167.25	9,158	9,837
167.30	9,311	10,299
167.35	9,464	10,769
167.40	9,619	11,246
167.45	9,775	11,730
167.50	9,932	12,223
167.55	10,091	12,724
167.60	10,251	13,232
167.65	10,412	13,749
167.70	10,574	14,273
167.75	10,737	14,806
167.80	10,902	15,347
167.85	11,068	15,896
167.90	11,236	16,454
167.95	11,404	17,020
168.00	11,574	17,594
168.05	11,658	18,175
168.10	11,741	18,760
168.15	11,826	19,349
168.20	11,910	19,943
168.25	11,995	20,540
168.30	12,080	21,142
168.35	12,165	21,748
168.40	12,251	22,359
168.45	12,337	22,974
168.50	12,423	23,593
168.55	12,510	24,216
168.60	12,597	24,844
168.65	12,684	25,476
168.70	12,772	26,112
168.75	12,859	26,753
168.80	12,948	27,398
168.85	13,036	28,048
168.90	13,125	28,702
168.95	13,214	29,360
169.00	**13,303**	**30,023**

OUTLET ELEV

Stage-Area-Storage for Pond B18:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
156.00	11,892	0
156.05	11,995	597
156.10	12,097	1,199
156.15	12,201	1,807
156.20	12,305	2,420
156.25	12,409	3,037
156.30	12,514	3,660
156.35	12,619	4,289
156.40	12,724	4,922
156.45	12,831	5,561
156.50	12,937	6,205
156.55	13,044	6,855
156.60	13,151	7,510
156.65	13,259	8,170
156.70	13,367	8,836
156.75	13,476	9,507
156.80	13,585	10,183
156.85	13,695	10,865
156.90	13,805	11,553
156.95	13,915	12,246
157.00	14,026	12,944
157.05	14,218	13,650
157.10	14,412	14,366
157.15	14,606	15,092
157.20	14,803	15,827
157.25	15,000	16,572
157.30	15,199	17,327
157.35	15,399	18,092
157.40	15,600	18,867
157.45	15,803	19,652
157.50	16,007	20,447
157.55	16,212	21,252
157.60	16,418	22,068
157.65	16,626	22,894
157.70	16,835	23,731
157.75	17,046	24,578
157.80	17,258	25,436
157.85	17,471	26,304
157.90	17,685	27,183
157.95	17,901	28,072
158.00	18,118	28,973
158.05	18,218	29,881
158.10	18,319	30,795
158.15	18,420	31,713
158.20	18,521	32,637
158.25	18,622	33,565
158.30	18,723	34,499
158.35	18,825	35,437
158.40	18,928	36,381
158.45	19,030	37,330
158.50	19,133	38,284
158.55	19,236	39,243
158.60	19,339	40,208
158.65	19,442	41,177
158.70	19,546	42,152
158.75	19,650	43,132
158.80	19,755	44,117
158.85	19,859	45,107
158.90	19,964	46,103
158.95	20,070	47,104
159.00	**20,175**	**48,110**
159.05	20,175	48,110
159.10	20,175	48,110
159.15	20,175	48,110
159.20	20,175	48,110
159.25	20,175	48,110
159.30	20,175	48,110
159.35	20,175	48,110
159.40	20,175	48,110
159.45	20,175	48,110
159.50	20,175	48,110
159.55	20,175	48,110
159.60	20,175	48,110
159.65	20,175	48,110
159.70	20,175	48,110
159.75	20,175	48,110
159.80	20,175	48,110

OUTLET ELEV.

Stage-Area-Storage for Pond B19:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
161.00	1,369	0
161.05	1,402	69
161.10	1,435	140
161.15	1,469	213
161.20	1,503	287
161.25	1,538	363
161.30	1,573	441
161.35	1,608	520
161.40	1,644	602
161.45	1,680	685
161.50	1,717	770
161.55	1,754	857
161.60	1,791	945
161.65	1,829	1,036
161.70	1,867	1,128
161.75	1,906	1,222
161.80	1,944	1,319
161.85	1,984	1,417
161.90	2,023	1,517
161.95	2,064	1,619
162.00	2,104	1,723
162.05	2,157	1,830
162.10	2,210	1,939
162.15	2,264	2,051
162.20	2,319	2,166
162.25	2,375	2,283
162.30	2,431	2,403
162.35	2,488	2,526
162.40	2,545	2,652
162.45	2,603	2,780
162.50	2,662	2,912
162.55	2,721	3,047
162.60	2,781	3,184
162.65	2,842	3,325
162.70	2,903	3,468
162.75	2,965	3,615
162.80	3,028	3,765
162.85	3,091	3,918
162.90	3,155	4,074
162.95	3,220	4,233
163.00	3,285	4,396
163.05	3,322	4,561
163.10	3,359	4,728
163.15	3,396	4,897
163.20	3,433	5,068
163.25	3,471	5,240
163.30	3,509	5,415
163.35	3,547	5,591
163.40	3,585	5,770
163.45	3,624	5,950
163.50	3,662	6,132
163.55	3,701	6,316
163.60	3,740	6,502
163.65	3,779	6,690
163.70	3,819	6,880
163.75	3,859	7,072
163.80	3,898	7,266
163.85	3,939	7,462
163.90	3,979	7,660
163.95	4,019	7,860
164.00	**4,060**	**8,062**
164.05	4,060	8,062
164.10	4,060	8,062
164.15	4,060	8,062
164.20	4,060	8,062
164.25	4,060	8,062
164.30	4,060	8,062
164.35	4,060	8,062
164.40	4,060	8,062
164.45	4,060	8,062
164.50	4,060	8,062
164.55	4,060	8,062
164.60	4,060	8,062
164.65	4,060	8,062
164.70	4,060	8,062
164.75	4,060	8,062
164.80	4,060	8,062
164.85	4,060	8,062
164.90	4,060	8,062
164.95	4,060	8,062
165.00	4,060	8,062
165.05	4,060	8,062
165.10	4,060	8,062
165.15	4,060	8,062
165.20	4,060	8,062

OUTLET ELEV.

Stage-Area-Storage for Pond B24: Stormtech Basin

Elevation (feet)	Surface (acres)	Storage (acre-feet)
150.00	0.029	0.000
150.15	0.029	0.002
150.30	0.029	0.004
150.45	0.029	0.005
150.60	0.029	0.007
150.75	0.029	0.009
150.90	0.029	0.012
151.05	0.029	0.016
151.20	0.029	0.020
151.35	0.029	0.023
151.50	0.029	0.027
151.65	0.029	0.030
151.80	0.029	0.034
151.95	0.029	0.037
152.10	0.029	0.041
152.25	0.029	0.044
152.40	0.029	0.047
152.55	0.029	0.051
152.70	0.029	0.054
152.85	0.029	0.057
153.00	0.029	0.060
153.15	0.029	0.063
153.30	0.029	0.066
153.45	0.029	0.069
153.60	0.029	0.072
153.75	0.029	0.075
153.90	0.029	0.077
154.05	0.029	0.080
154.20	0.029	0.082
154.35	0.029	0.084
154.50	0.029	0.086
154.65	0.029	0.087
154.80	0.029	0.089
154.95	0.029	0.091
155.10	0.029	0.093
155.25	0.029	0.094
155.40	0.029	0.096
155.55	0.029	0.097
155.70	0.029	0.097
155.85	0.029	0.097
156.00	0.029	0.097
156.15	0.029	0.097
156.30	0.029	0.097
156.45	0.029	0.097
156.60	0.029	0.097
156.75	0.029	0.097
156.90	0.029	0.097
157.05	0.029	0.097
157.20	0.029	0.097
157.35	0.029	0.097
157.50	0.029	0.097
157.65	0.029	0.097
157.80	0.029	0.097
157.95	0.029	0.097
158.10	0.029	0.097
158.25	0.029	0.097
158.40	0.029	0.097
158.55	0.029	0.097
158.70	0.029	0.097
158.85	0.029	0.097
159.00	0.029	0.097
159.15	0.029	0.097
159.30	0.029	0.097
159.45	0.029	0.097
159.60	0.029	0.097
159.75	0.029	0.097
159.90	0.029	0.097
160.05	0.029	0.097
160.20	0.029	0.097
160.35	0.379	0.127 OUTLET ELEV
160.50	**0.529**	**0.191**
160.65	0.529	0.191
160.80	0.529	0.191
160.95	0.529	0.191
161.10	0.529	0.191
161.25	0.529	0.191
161.40	0.529	0.191
161.55	0.529	0.191
161.70	0.529	0.191
161.85	0.529	0.191
162.00	0.529	0.191
162.15	0.529	0.191

Stage-Area-Storage for Pond 1: Forebay Basin 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
144.50	1,417	0
144.52	1,429	28
144.54	1,441	57
144.56	1,453	86
144.58	1,465	115
144.60	1,477	145
144.62	1,489	174
144.64	1,501	204
144.66	1,513	234
144.68	1,525	265
144.70	1,537	295
144.72	1,549	326
144.74	1,561	357
144.76	1,572	389
144.78	1,584	420
144.80	1,596	452
144.82	1,608	484
144.84	1,620	516
144.86	1,632	549
144.88	1,644	582
144.90	1,656	615
144.92	1,668	648
144.94	1,680	681
144.96	1,692	715
144.98	1,704	749
145.00	1,716	783
145.02	1,729	818
145.04	1,743	852
145.06	1,756	887
145.08	1,770	923
145.10	1,783	958
145.12	1,797	994
145.14	1,810	1,030
145.16	1,824	1,066
145.18	1,837	1,103
145.20	1,850	1,140
145.22	1,864	1,177
145.24	1,877	1,214
145.26	1,891	1,252
145.28	1,904	1,290
145.30	1,918	1,328
145.32	1,931	1,367
145.34	1,944	1,406
145.36	1,958	1,445
145.38	1,971	1,484
145.40	1,985	1,523
145.42	1,998	1,563
145.44	2,012	1,603
145.46	2,025	1,644
145.48	2,039	1,684
145.50	2,052	1,725
145.52	2,065	1,766
145.54	2,079	1,808
145.56	2,092	1,850
145.58	2,106	1,892
145.60	2,119	1,934
145.62	2,133	1,976
145.64	2,146	2,019
145.66	2,160	2,062
145.68	2,173	2,105
145.70	2,186	2,149
145.72	2,200	2,193
145.74	2,213	2,237
145.76	2,227	2,281
145.78	2,240	2,326
145.80	2,254	2,371
145.82	2,267	2,416
145.84	2,280	2,462
145.86	2,294	2,508
145.88	2,307	2,554
145.90	2,321	2,600
145.92	2,334	2,646
145.94	2,348	2,693
145.96	2,361	2,740
145.98	2,375	2,788
146.00	**2,388**	**2,835**

FOREBAY VOLUMES ARE DESIGNED TO EQUAL OR EXCEED THE HIGHEST VOLUMES LISTED IN THESE SUMMARIES

Stage-Area-Storage for Pond 2N: Forebay Basin 2- North

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
145.00	1,362	0
145.02	1,377	27
145.04	1,393	55
145.06	1,408	83
145.08	1,424	111
145.10	1,439	140
145.12	1,455	169
145.14	1,470	198
145.16	1,486	228
145.18	1,501	258
145.20	1,517	288
145.22	1,532	318
145.24	1,548	349
145.26	1,563	380
145.28	1,578	412
145.30	1,594	443
145.32	1,609	475
145.34	1,625	508
145.36	1,640	540
145.38	1,656	573
145.40	1,671	607
145.42	1,687	640
145.44	1,702	674
145.46	1,718	708
145.48	1,733	743
145.50	1,749	778
145.52	1,764	813
145.54	1,779	848
145.56	1,795	884
145.58	1,810	920
145.60	1,826	956
145.62	1,841	993
145.64	1,857	1,030
145.66	1,872	1,067
145.68	1,888	1,105
145.70	1,903	1,143
145.72	1,919	1,181
145.74	1,934	1,220
145.76	1,949	1,258
145.78	1,965	1,298
145.80	1,980	1,337
145.82	1,996	1,377
145.84	2,011	1,417
145.86	2,027	1,457
145.88	2,042	1,498
145.90	2,058	1,539
145.92	2,073	1,580
145.94	2,089	1,622
145.96	2,104	1,664
145.98	2,120	1,706
146.00	2,135	1,749
146.02	2,152	1,791
146.04	2,169	1,835
146.06	2,186	1,878
146.08	2,203	1,922
146.10	2,220	1,966
146.12	2,237	2,011
146.14	2,254	2,056
146.16	2,271	2,101
146.18	2,288	2,147
146.20	2,305	2,192
146.22	2,322	2,239
146.24	2,339	2,285
146.26	2,355	2,332
146.28	2,372	2,380
146.30	2,389	2,427
146.32	2,406	2,475
146.34	2,423	2,523
146.36	2,440	2,572
146.38	2,457	2,621
146.40	2,474	2,670
146.42	2,491	2,720
146.44	2,508	2,770
146.46	2,525	2,820
146.48	2,542	2,871
146.50	**2,559**	**2,922**

Stage-Area-Storage for Pond 2S: Forebay Basin 2- South

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
145.00	712	0
145.02	721	14
145.04	731	29
145.06	740	44
145.08	750	58
145.10	759	74
145.12	769	89
145.14	778	104
145.16	788	120
145.18	797	136
145.20	807	152
145.22	816	168
145.24	826	185
145.26	835	201
145.28	845	218
145.30	854	235
145.32	864	252
145.34	873	269
145.36	883	287
145.38	892	305
145.40	902	323
145.42	911	341
145.44	921	359
145.46	930	378
145.48	940	396
145.50	949	415
145.52	958	434
145.54	968	454
145.56	977	473
145.58	987	493
145.60	996	513
145.62	1,006	533
145.64	1,015	553
145.66	1,025	573
145.68	1,034	594
145.70	1,044	615
145.72	1,053	636
145.74	1,063	657
145.76	1,072	678
145.78	1,082	700
145.80	1,091	721
145.82	1,101	743
145.84	1,110	765
145.86	1,120	788
145.88	1,129	810
145.90	1,139	833
145.92	1,148	856
145.94	1,158	879
145.96	1,167	902
145.98	1,177	925
146.00	1,186	949
146.02	1,197	973
146.04	1,208	997
146.06	1,219	1,021
146.08	1,230	1,046
146.10	1,241	1,070
146.12	1,252	1,095
146.14	1,263	1,120
146.16	1,274	1,146
146.18	1,285	1,171
146.20	1,296	1,197
146.22	1,307	1,223
146.24	1,318	1,249
146.26	1,329	1,276
146.28	1,340	1,303
146.30	1,351	1,330
146.32	1,362	1,357
146.34	1,373	1,384
146.36	1,384	1,412
146.38	1,395	1,439
146.40	1,406	1,467
146.42	1,417	1,496
146.44	1,428	1,524
146.46	1,439	1,553
146.48	1,450	1,582
146.50	**1,461**	**1,611**

Stage-Area-Storage for Pond 3: Forebay Basin 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
146.00	3,043	0
146.02	3,053	61
146.04	3,062	122
146.06	3,072	183
146.08	3,081	245
146.10	3,091	307
146.12	3,100	369
146.14	3,110	431
146.16	3,119	493
146.18	3,129	555
146.20	3,139	618
146.22	3,148	681
146.24	3,158	744
146.26	3,167	807
146.28	3,177	871
146.30	3,186	934
146.32	3,196	998
146.34	3,206	1,062
146.36	3,215	1,126
146.38	3,225	1,191
146.40	3,234	1,255
146.42	3,244	1,320
146.44	3,253	1,385
146.46	3,263	1,450
146.48	3,272	1,516
146.50	3,282	1,581
146.52	3,292	1,647
146.54	3,301	1,713
146.56	3,311	1,779
146.58	3,320	1,845
146.60	3,330	1,912
146.62	3,339	1,979
146.64	3,349	2,045
146.66	3,358	2,112
146.68	3,368	2,180
146.70	3,378	2,247
146.72	3,387	2,315
146.74	3,397	2,383
146.76	3,406	2,451
146.78	3,416	2,519
146.80	3,425	2,587
146.82	3,435	2,656
146.84	3,445	2,725
146.86	3,454	2,794
146.88	3,464	2,863
146.90	3,473	2,932
146.92	3,483	3,002
146.94	3,492	3,072
146.96	3,502	3,142
146.98	3,511	3,212
147.00	3,521	3,282
147.02	3,544	3,353
147.04	3,567	3,424
147.06	3,589	3,495
147.08	3,612	3,567
147.10	3,635	3,640
147.12	3,658	3,713
147.14	3,680	3,786
147.16	3,703	3,860
147.18	3,726	3,934
147.20	3,749	4,009
147.22	3,771	4,084
147.24	3,794	4,160
147.26	3,817	4,236
147.28	3,840	4,312
147.30	3,862	4,390
147.32	3,885	4,467
147.34	3,908	4,545
147.36	3,931	4,623
147.38	3,953	4,702
147.40	3,976	4,781
147.42	3,999	4,861
147.44	4,022	4,941
147.46	4,044	5,022
147.48	4,067	5,103
147.50	**4,090**	**5,185**

Stage-Area-Storage for Pond 4: Forebay Basin 4

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
145.00	2,791	0
145.02	2,820	56
145.04	2,849	113
145.06	2,879	170
145.08	2,908	228
145.10	2,937	286
145.12	2,966	345
145.14	2,995	405
145.16	3,025	465
145.18	3,054	526
145.20	3,083	587
145.22	3,112	649
145.24	3,141	712
145.26	3,171	775
145.28	3,200	839
145.30	3,229	903
145.32	3,258	968
145.34	3,287	1,033
145.36	3,317	1,099
145.38	3,346	1,166
145.40	3,375	1,233
145.42	3,404	1,301
145.44	3,433	1,369
145.46	3,463	1,438
145.48	3,492	1,508
145.50	3,521	1,578
145.52	3,550	1,649
145.54	3,579	1,720
145.56	3,609	1,792
145.58	3,638	1,864
145.60	3,667	1,937
145.62	3,696	2,011
145.64	3,725	2,085
145.66	3,755	2,160
145.68	3,784	2,235
145.70	3,813	2,311
145.72	3,842	2,388
145.74	3,871	2,465
145.76	3,901	2,543
145.78	3,930	2,621
145.80	3,959	2,700
145.82	3,988	2,779
145.84	4,017	2,860
145.86	4,047	2,940
145.88	4,076	3,021
145.90	4,105	3,103
145.92	4,134	3,186
145.94	4,163	3,269
145.96	4,193	3,352
145.98	4,222	3,436
146.00	4,251	3,521
146.02	4,282	3,606
146.04	4,313	3,692
146.06	4,344	3,779
146.08	4,376	3,866
146.10	4,407	3,954
146.12	4,438	4,042
146.14	4,469	4,131
146.16	4,500	4,221
146.18	4,531	4,311
146.20	4,563	4,402
146.22	4,594	4,494
146.24	4,625	4,586
146.26	4,656	4,679
146.28	4,687	4,772
146.30	4,718	4,866
146.32	4,750	4,961
146.34	4,781	5,056
146.36	4,812	5,152
146.38	4,843	5,249
146.40	4,874	5,346
146.42	4,905	5,444
146.44	4,937	5,542
146.46	4,968	5,641
146.48	4,999	5,741
146.50	**5,030**	**5,841**

Stage-Area-Storage for Pond 8E: Forebay Basin 8 East

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
148.50	434	0
148.52	441	9
148.54	447	18
148.56	454	27
148.58	461	36
148.60	467	45
148.62	474	54
148.64	481	64
148.66	487	74
148.68	494	84
148.70	501	93
148.72	507	104
148.74	514	114
148.76	521	124
148.78	528	135
148.80	534	145
148.82	541	156
148.84	548	167
148.86	554	178
148.88	561	189
148.90	568	200
148.92	574	212
148.94	581	223
148.96	588	235
148.98	594	247
149.00	601	259
149.02	609	271
149.04	617	283
149.06	626	296
149.08	634	308
149.10	642	321
149.12	650	334
149.14	658	347
149.16	667	360
149.18	675	374
149.20	683	387
149.22	691	401
149.24	699	415
149.26	708	429
149.28	716	443
149.30	724	458
149.32	732	472
149.34	740	487
149.36	749	502
149.38	757	517
149.40	765	532
149.42	773	547
149.44	781	563
149.46	790	579
149.48	798	594
149.50	806	611
149.52	814	627
149.54	822	643
149.56	831	660
149.58	839	676
149.60	847	693
149.62	855	710
149.64	863	727
149.66	872	745
149.68	880	762
149.70	888	780
149.72	896	798
149.74	904	816
149.76	913	834
149.78	921	852
149.80	929	871
149.82	937	889
149.84	945	908
149.86	954	927
149.88	962	946
149.90	970	966
149.92	978	985
149.94	986	1,005
149.96	995	1,025
149.98	1,003	1,045
150.00	**1,011**	**1,065**

Stage-Area-Storage for Pond 8W: Forebay Basin 8 West

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
148.50	2,472	0
148.52	2,487	50
148.54	2,503	99
148.56	2,518	150
148.58	2,534	200
148.60	2,549	251
148.62	2,564	302
148.64	2,580	354
148.66	2,595	405
148.68	2,611	457
148.70	2,626	510
148.72	2,641	562
148.74	2,657	615
148.76	2,672	669
148.78	2,688	722
148.80	2,703	776
148.82	2,718	830
148.84	2,734	885
148.86	2,749	940
148.88	2,765	995
148.90	2,780	1,050
148.92	2,795	1,106
148.94	2,811	1,162
148.96	2,826	1,219
148.98	2,842	1,275
149.00	2,857	1,332
149.02	2,874	1,390
149.04	2,891	1,447
149.06	2,908	1,505
149.08	2,925	1,564
149.10	2,942	1,622
149.12	2,959	1,681
149.14	2,976	1,741
149.16	2,993	1,800
149.18	3,009	1,860
149.20	3,026	1,921
149.22	3,043	1,981
149.24	3,060	2,042
149.26	3,077	2,104
149.28	3,094	2,165
149.30	3,111	2,227
149.32	3,128	2,290
149.34	3,145	2,353
149.36	3,162	2,416
149.38	3,179	2,479
149.40	3,196	2,543
149.42	3,213	2,607
149.44	3,230	2,671
149.46	3,247	2,736
149.48	3,264	2,801
149.50	3,281	2,867
149.52	3,297	2,932
149.54	3,314	2,999
149.56	3,331	3,065
149.58	3,348	3,132
149.60	3,365	3,199
149.62	3,382	3,266
149.64	3,399	3,334
149.66	3,416	3,402
149.68	3,433	3,471
149.70	3,450	3,540
149.72	3,467	3,609
149.74	3,484	3,678
149.76	3,501	3,748
149.78	3,518	3,818
149.80	3,535	3,889
149.82	3,552	3,960
149.84	3,568	4,031
149.86	3,585	4,102
149.88	3,602	4,174
149.90	3,619	4,247
149.92	3,636	4,319
149.94	3,653	4,392
149.96	3,670	4,465
149.98	3,687	4,539
150.00	**3,704**	**4,613**

Stage-Area-Storage for Pond 9E: Forebay Basin 9- East

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
160.00	111	0	160.52	234	90
160.01	113	1	160.53	236	92
160.02	116	2	160.54	238	94
160.03	118	3	160.55	241	97
160.04	120	5	160.56	243	99
160.05	123	6	160.57	246	102
160.06	125	7	160.58	248	104
160.07	128	8	160.59	250	107
160.08	130	10	160.60	253	109
160.09	132	11	160.61	255	112
160.10	135	12	160.62	257	114
160.11	137	14	160.63	260	117
160.12	139	15	160.64	262	119
160.13	142	16	160.65	264	122
160.14	144	18	160.66	267	125
160.15	146	19	160.67	269	127
160.16	149	21	160.68	271	130
160.17	151	22	160.69	274	133
160.18	153	24	160.70	276	136
160.19	156	25	160.71	279	138
160.20	158	27	160.72	281	141
160.21	161	29	160.73	283	144
160.22	163	30	160.74	286	147
160.23	165	32	160.75	288	150
160.24	168	33	160.76	290	153
160.25	170	35	160.77	293	155
160.26	172	37	160.78	295	158
160.27	175	39	160.79	297	161
160.28	177	40	160.80	300	164
160.29	179	42	160.81	302	167
160.30	182	44	160.82	305	170
160.31	184	46	160.83	307	173
160.32	187	48	160.84	309	177
160.33	189	49	160.85	312	180
160.34	191	51	160.86	314	183
160.35	194	53	160.87	316	186
160.36	196	55	160.88	319	189
160.37	198	57	160.89	321	192
160.38	201	59	160.90	323	195
160.39	203	61	160.91	326	199
160.40	205	63	160.92	328	202
160.41	208	65	160.93	330	205
160.42	210	67	160.94	333	209
160.43	212	70	160.95	335	212
160.44	215	72	160.96	338	215
160.45	217	74	160.97	340	219
160.46	220	76	160.98	342	222
160.47	222	78	160.99	345	226
160.48	224	80	161.00	**347**	**229**
160.49	227	83			
160.50	229	85			
160.51	231	87			

Stage-Area-Storage for Pond 9W: Forebay Basin 9- West

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
160.00	102	0
160.01	103	1
160.02	104	2
160.03	105	3
160.04	106	4
160.05	107	5
160.06	108	6
160.07	109	7
160.08	110	8
160.09	111	10
160.10	112	11
160.11	113	12
160.12	114	13
160.13	114	14
160.14	115	15
160.15	116	16
160.16	117	18
160.17	118	19
160.18	119	20
160.19	120	21
160.20	121	22
160.21	122	24
160.22	123	25
160.23	124	26
160.24	125	27
160.25	126	29
160.26	127	30
160.27	128	31
160.28	129	32
160.29	130	34
160.30	131	35
160.31	132	36
160.32	133	38
160.33	134	39
160.34	135	40
160.35	136	42
160.36	137	43
160.37	138	44
160.38	138	46
160.39	139	47
160.40	140	48
160.41	141	50
160.42	142	51
160.43	143	53
160.44	144	54
160.45	145	56
160.46	146	57
160.47	147	59
160.48	148	60
160.49	149	62
160.50	150	63
160.51	151	65
160.52	152	66
160.53	153	68
160.54	154	69
160.55	155	71
160.56	156	72
160.57	157	74
160.58	158	75
160.59	159	77
160.60	160	78
160.61	161	80
160.62	162	82
160.63	162	83
160.64	163	85
160.65	164	87
160.66	165	88
160.67	166	90
160.68	167	92
160.69	168	93
160.70	169	95
160.71	170	97
160.72	171	98
160.73	172	100
160.74	173	102
160.75	174	104
160.76	175	105
160.77	176	107
160.78	177	109
160.79	178	111
160.80	179	112
160.81	180	114
160.82	181	116
160.83	182	118
160.84	183	120
160.85	184	121
160.86	185	123
160.87	186	125
160.88	186	127
160.89	187	129
160.90	188	131
160.91	189	133
160.92	190	134
160.93	191	136
160.94	192	138
160.95	193	140
160.96	194	142
160.97	195	144
160.98	196	146
160.99	197	148
161.00	**198**	**150**

Stage-Area-Storage for Pond 10: Forebay Basin 10

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
150.50	384	0
150.52	391	8
150.54	398	16
150.56	405	24
150.58	412	32
150.60	419	40
150.62	426	49
150.64	433	57
150.66	440	66
150.68	447	75
150.70	454	84
150.72	461	93
150.74	468	102
150.76	475	112
150.78	482	121
150.80	489	131
150.82	496	141
150.84	503	151
150.86	510	161
150.88	517	171
150.90	524	182
150.92	531	192
150.94	538	203
150.96	545	214
150.98	552	225
151.00	559	236
151.02	567	247
151.04	576	258
151.06	584	270
151.08	593	282
151.10	601	294
151.12	610	306
151.14	618	318
151.16	627	331
151.18	635	343
151.20	644	356
151.22	652	369
151.24	661	382
151.26	669	395
151.28	678	409
151.30	686	423
151.32	695	436
151.34	703	450
151.36	712	464
151.38	720	479
151.40	729	493
151.42	737	508
151.44	746	523
151.46	754	538
151.48	763	553
151.50	771	568
151.52	779	584
151.54	788	599
151.56	796	615
151.58	805	631
151.60	813	647
151.62	822	664
151.64	830	680
151.66	839	697
151.68	847	714
151.70	856	731
151.72	864	748
151.74	873	766
151.76	881	783
151.78	890	801
151.80	898	819
151.82	907	837
151.84	915	855
151.86	924	873
151.88	932	892
151.90	941	911
151.92	949	929
151.94	958	949
151.96	966	968
151.98	975	987
152.00	**983**	**1,007**

Stage-Area-Storage for Pond 11N: Forebay Basin 11- North

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
144.50	137	0
144.52	141	3
144.54	145	6
144.56	149	9
144.58	153	12
144.60	158	15
144.62	162	18
144.64	166	21
144.66	170	25
144.68	174	28
144.70	178	32
144.72	182	35
144.74	186	39
144.76	191	43
144.78	195	46
144.80	199	50
144.82	203	54
144.84	207	58
144.86	211	63
144.88	215	67
144.90	219	71
144.92	224	76
144.94	228	80
144.96	232	85
144.98	236	89
145.00	240	94
145.02	246	99
145.04	251	104
145.06	257	109
145.08	262	114
145.10	268	120
145.12	273	125
145.14	279	131
145.16	285	136
145.18	290	142
145.20	296	148
145.22	301	154
145.24	307	160
145.26	313	166
145.28	318	172
145.30	324	179
145.32	329	185
145.34	335	192
145.36	340	199
145.38	346	206
145.40	352	213
145.42	357	220
145.44	363	227
145.46	368	234
145.48	374	242
145.50	380	249
145.52	385	257
145.54	391	265
145.56	396	272
145.58	402	280
145.60	407	288
145.62	413	297
145.64	419	305
145.66	424	313
145.68	430	322
145.70	435	331
145.72	441	339
145.74	446	348
145.76	452	357
145.78	458	366
145.80	463	376
145.82	469	385
145.84	474	394
145.86	480	404
145.88	486	413
145.90	491	423
145.92	497	433
145.94	502	443
145.96	508	453
145.98	513	463
146.00	**519**	**474**

Stage-Area-Storage for Pond 11S: Forebay Basin 11 - South

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
144.00	70	0	144.52	197	70
144.01	72	1	144.53	200	72
144.02	75	1	144.54	202	74
144.03	77	2	144.55	205	76
144.04	80	3	144.56	207	78
144.05	82	4	144.57	210	80
144.06	85	5	144.58	212	82
144.07	87	6	144.59	215	84
144.08	90	6	144.60	217	86
144.09	92	7	144.61	219	88
144.10	94	8	144.62	222	90
144.11	97	9	144.63	224	93
144.12	99	10	144.64	227	95
144.13	102	11	144.65	229	97
144.14	104	12	144.66	232	100
144.15	107	13	144.67	234	102
144.16	109	14	144.68	237	104
144.17	112	15	144.69	239	107
144.18	114	17	144.70	241	109
144.19	117	18	144.71	244	111
144.20	119	19	144.72	246	114
144.21	121	20	144.73	249	116
144.22	124	21	144.74	251	119
144.23	126	23	144.75	254	121
144.24	129	24	144.76	256	124
144.25	131	25	144.77	259	127
144.26	134	26	144.78	261	129
144.27	136	28	144.79	264	132
144.28	139	29	144.80	266	134
144.29	141	31	144.81	268	137
144.30	144	32	144.82	271	140
144.31	146	33	144.83	273	142
144.32	148	35	144.84	276	145
144.33	151	36	144.85	278	148
144.34	153	38	144.86	281	151
144.35	156	40	144.87	283	154
144.36	158	41	144.88	286	156
144.37	161	43	144.89	288	159
144.38	163	44	144.90	291	162
144.39	166	46	144.91	293	165
144.40	168	48	144.92	295	168
144.41	170	49	144.93	298	171
144.42	173	51	144.94	300	174
144.43	175	53	144.95	303	177
144.44	178	55	144.96	305	180
144.45	180	56	144.97	308	183
144.46	183	58	144.98	310	186
144.47	185	60	144.99	313	189
144.48	188	62	145.00	**315**	**193**
144.49	190	64			
144.50	193	66			
144.51	195	68			

Stage-Area-Storage for Pond 12: Forebay Basin 12

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
154.50	1,027	0
154.52	1,038	21
154.54	1,049	42
154.56	1,060	63
154.58	1,072	84
154.60	1,083	105
154.62	1,094	127
154.64	1,105	149
154.66	1,116	171
154.68	1,127	194
154.70	1,139	217
154.72	1,150	239
154.74	1,161	263
154.76	1,172	286
154.78	1,183	309
154.80	1,194	333
154.82	1,206	357
154.84	1,217	381
154.86	1,228	406
154.88	1,239	431
154.90	1,250	455
154.92	1,261	481
154.94	1,273	506
154.96	1,284	531
154.98	1,295	557
155.00	1,306	583
155.02	1,319	609
155.04	1,331	636
155.06	1,344	663
155.08	1,357	690
155.10	1,369	717
155.12	1,382	745
155.14	1,395	772
155.16	1,407	800
155.18	1,420	829
155.20	1,433	857
155.22	1,445	886
155.24	1,458	915
155.26	1,471	944
155.28	1,484	974
155.30	1,496	1,004
155.32	1,509	1,034
155.34	1,522	1,064
155.36	1,534	1,094
155.38	1,547	1,125
155.40	1,560	1,156
155.42	1,572	1,188
155.44	1,585	1,219
155.46	1,598	1,251
155.48	1,610	1,283
155.50	1,623	1,316
155.52	1,636	1,348
155.54	1,648	1,381
155.56	1,661	1,414
155.58	1,674	1,447
155.60	1,686	1,481
155.62	1,699	1,515
155.64	1,712	1,549
155.66	1,724	1,583
155.68	1,737	1,618
155.70	1,750	1,653
155.72	1,762	1,688
155.74	1,775	1,723
155.76	1,788	1,759
155.78	1,801	1,795
155.80	1,813	1,831
155.82	1,826	1,867
155.84	1,839	1,904
155.86	1,851	1,941
155.88	1,864	1,978
155.90	1,877	2,015
155.92	1,889	2,053
155.94	1,902	2,091
155.96	1,915	2,129
155.98	1,927	2,168
156.00	**1,940**	**2,206**

Stage-Area-Storage for Pond 13: Forebay Basin 13

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
169.00	137	0
169.02	145	3
169.04	153	6
169.06	162	9
169.08	170	12
169.10	178	16
169.12	186	19
169.14	194	23
169.16	203	27
169.18	211	31
169.20	219	36
169.22	227	40
169.24	235	45
169.26	244	49
169.28	252	54
169.30	260	60
169.32	268	65
169.34	276	70
169.36	285	76
169.38	293	82
169.40	301	88
169.42	309	94
169.44	317	100
169.46	326	106
169.48	334	113
169.50	342	120
169.52	350	127
169.54	358	134
169.56	367	141
169.58	375	148
169.60	383	156
169.62	391	164
169.64	399	172
169.66	408	180
169.68	416	188
169.70	424	196
169.72	432	205
169.74	440	214
169.76	449	223
169.78	457	232
169.80	465	241
169.82	473	250
169.84	481	260
169.86	490	269
169.88	498	279
169.90	506	289
169.92	514	300
169.94	522	310
169.96	531	320
169.98	539	331
170.00	547	342
170.02	556	353
170.04	565	364
170.06	574	376
170.08	583	387
170.10	592	399
170.12	601	411
170.14	610	423
170.16	619	435
170.18	628	448
170.20	637	460
170.22	646	473
170.24	655	486
170.26	665	499
170.28	674	513
170.30	683	526
170.32	692	540
170.34	701	554
170.36	710	568
170.38	719	582
170.40	728	597
170.42	737	612
170.44	746	626
170.46	755	641
170.48	764	657
170.50	**773**	**672**

Stage-Area-Storage for Pond 14N: Forebay Basin 14

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
157.50	456	0
157.52	463	9
157.54	471	19
157.56	478	28
157.58	485	38
157.60	492	47
157.62	500	57
157.64	507	67
157.66	514	78
157.68	522	88
157.70	529	98
157.72	536	109
157.74	543	120
157.76	551	131
157.78	558	142
157.80	565	153
157.82	572	165
157.84	580	176
157.86	587	188
157.88	594	200
157.90	602	212
157.92	609	224
157.94	616	236
157.96	623	248
157.98	631	261
158.00	638	274
158.02	647	286
158.04	656	299
158.06	664	313
158.08	673	326
158.10	682	339
158.12	691	353
158.14	700	367
158.16	708	381
158.18	717	395
158.20	726	410
158.22	735	425
158.24	744	439
158.26	752	454
158.28	761	469
158.30	770	485
158.32	779	500
158.34	788	516
158.36	796	532
158.38	805	548
158.40	814	564
158.42	823	580
158.44	832	597
158.46	840	614
158.48	849	630
158.50	858	648
158.52	867	665
158.54	876	682
158.56	884	700
158.58	893	718
158.60	902	735
158.62	911	754
158.64	920	772
158.66	928	790
158.68	937	809
158.70	946	828
158.72	955	847
158.74	964	866
158.76	972	885
158.78	981	905
158.80	990	925
158.82	999	945
158.84	1,008	965
158.86	1,016	985
158.88	1,025	1,005
158.90	1,034	1,026
158.92	1,043	1,047
158.94	1,052	1,068
158.96	1,060	1,089
158.98	1,069	1,110
159.00	**1,078**	**1,132**

Stage-Area-Storage for Pond 14S: Forebay Basin 14 - South

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
157.50	253	0
157.51	257	3
157.52	261	5
157.53	265	8
157.54	270	10
157.55	274	13
157.56	278	16
157.57	282	19
157.58	286	22
157.59	290	24
157.60	294	27
157.61	299	30
157.62	303	33
157.63	307	36
157.64	311	39
157.65	315	43
157.66	319	46
157.67	323	49
157.68	328	52
157.69	332	56
157.70	336	59
157.71	340	62
157.72	344	66
157.73	348	69
157.74	352	73
157.75	357	76
157.76	361	80
157.77	365	83
157.78	369	87
157.79	373	91
157.80	377	95
157.81	381	98
157.82	385	102
157.83	390	106
157.84	394	110
157.85	398	114
157.86	402	118
157.87	406	122
157.88	410	126
157.89	414	130
157.90	419	134
157.91	423	139
157.92	427	143
157.93	431	147
157.94	435	151
157.95	439	156
157.96	443	160
157.97	448	165
157.98	452	169
157.99	456	174
158.00	**460**	**178**

Stage-Area-Storage for Pond 15: Forebay Basin 15

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
164.00	463	0
164.02	470	9
164.04	478	19
164.06	485	28
164.08	493	38
164.10	500	48
164.12	508	58
164.14	515	68
164.16	522	79
164.18	530	89
164.20	537	100
164.22	545	111
164.24	552	122
164.26	559	133
164.28	567	144
164.30	574	156
164.32	582	167
164.34	589	179
164.36	597	191
164.38	604	203
164.40	611	215
164.42	619	227
164.44	626	240
164.46	634	252
164.48	641	265
164.50	649	278
164.52	656	291
164.54	663	304
164.56	671	317
164.58	678	331
164.60	686	345
164.62	693	358
164.64	700	372
164.66	708	386
164.68	715	401
164.70	723	415
164.72	730	430
164.74	738	444
164.76	745	459
164.78	752	474
164.80	760	489
164.82	767	504
164.84	775	520
164.86	782	535
164.88	789	551
164.90	797	567
164.92	804	583
164.94	812	599
164.96	819	615
164.98	827	632
165.00	834	649
165.02	843	665
165.04	852	682
165.06	861	699
165.08	870	717
165.10	879	734
165.12	888	752
165.14	896	770
165.16	905	788
165.18	914	806
165.20	923	824
165.22	932	843
165.24	941	862
165.26	950	880
165.28	959	900
165.30	968	919
165.32	977	938
165.34	986	958
165.36	995	978
165.38	1,003	998
165.40	1,012	1,018
165.42	1,021	1,038
165.44	1,030	1,059
165.46	1,039	1,079
165.48	1,048	1,100
165.50	**1,057**	**1,121**

Stage-Area-Storage for Pond 16: Forebay Basin 16

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
165.00	193	0
165.02	198	4
165.04	204	8
165.06	209	12
165.08	214	16
165.10	219	21
165.12	225	25
165.14	230	30
165.16	235	34
165.18	241	39
165.20	246	44
165.22	251	49
165.24	256	54
165.26	262	59
165.28	267	64
165.30	272	70
165.32	277	75
165.34	283	81
165.36	288	87
165.38	293	92
165.40	299	98
165.42	304	104
165.44	309	110
165.46	314	117
165.48	320	123
165.50	325	130
165.52	330	136
165.54	336	143
165.56	341	149
165.58	346	156
165.60	351	163
165.62	357	170
165.64	362	178
165.66	367	185
165.68	373	192
165.70	378	200
165.72	383	207
165.74	388	215
165.76	394	223
165.78	399	231
165.80	404	239
165.82	409	247
165.84	415	255
165.86	420	264
165.88	425	272
165.90	431	281
165.92	436	289
165.94	441	298
165.96	446	307
165.98	452	316
166.00	457	325
166.02	460	334
166.04	464	343
166.06	467	353
166.08	471	362
166.10	474	372
166.12	477	381
166.14	481	391
166.16	484	400
166.18	488	410
166.20	491	420
166.22	494	430
166.24	498	440
166.26	501	450
166.28	505	460
166.30	508	470
166.32	511	480
166.34	515	490
166.36	518	501
166.38	522	511
166.40	525	521
166.42	528	532
166.44	532	543
166.46	535	553
166.48	539	564
166.50	542	575
166.52	545	586
166.54	549	597
166.56	552	608
166.58	556	619
166.60	559	630
166.62	562	641
166.64	566	652
166.66	569	664
166.68	573	675
166.70	576	687
166.72	579	698
166.74	583	710
166.76	586	721
166.78	590	733
166.80	593	745
166.82	596	757
166.84	600	769
166.86	603	781
166.88	607	793
166.90	610	805
166.92	613	817
166.94	617	830
166.96	620	842
166.98	624	854
167.00	**627**	**867**

Stage-Area-Storage for Pond 17: Forebay Basin 17

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
166.00	658	0
166.02	667	13
166.04	676	27
166.06	685	40
166.08	694	54
166.10	703	68
166.12	712	82
166.14	721	97
166.16	730	111
166.18	739	126
166.20	748	141
166.22	757	156
166.24	766	171
166.26	776	186
166.28	785	202
166.30	794	218
166.32	803	234
166.34	812	250
166.36	821	266
166.38	830	283
166.40	839	299
166.42	848	316
166.44	857	333
166.46	866	351
166.48	875	368
166.50	884	386
166.52	893	403
166.54	902	421
166.56	911	439
166.58	920	458
166.60	929	476
166.62	938	495
166.64	947	514
166.66	956	533
166.68	965	552
166.70	974	571
166.72	983	591
166.74	992	611
166.76	1,002	631
166.78	1,011	651
166.80	1,020	671
166.82	1,029	692
166.84	1,038	712
166.86	1,047	733
166.88	1,056	754
166.90	1,065	775
166.92	1,074	797
166.94	1,083	818
166.96	1,092	840
166.98	1,101	862
167.00	1,110	884
167.02	1,120	906
167.04	1,131	929
167.06	1,141	952
167.08	1,152	974
167.10	1,162	998
167.12	1,173	1,021
167.14	1,183	1,045
167.16	1,194	1,068
167.18	1,204	1,092
167.20	1,215	1,116
167.22	1,225	1,141
167.24	1,236	1,165
167.26	1,246	1,190
167.28	1,257	1,215
167.30	1,267	1,241
167.32	1,278	1,266
167.34	1,288	1,292
167.36	1,299	1,318
167.38	1,309	1,344
167.40	1,320	1,370
167.42	1,330	1,396
167.44	1,341	1,423
167.46	1,351	1,450
167.48	1,362	1,477
167.50	**1,372**	**1,505**

Stage-Area-Storage for Pond 18: Forebay Basin 18

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
156.00	791	0
156.02	801	16
156.04	810	32
156.06	820	48
156.08	829	65
156.10	839	81
156.12	848	98
156.14	858	115
156.16	867	133
156.18	877	150
156.20	886	168
156.22	896	186
156.24	905	204
156.26	915	222
156.28	925	240
156.30	934	259
156.32	944	278
156.34	953	297
156.36	963	316
156.38	972	335
156.40	982	355
156.42	991	374
156.44	1,001	394
156.46	1,010	414
156.48	1,020	435
156.50	1,030	455
156.52	1,039	476
156.54	1,049	497
156.56	1,058	518
156.58	1,068	539
156.60	1,077	560
156.62	1,087	582
156.64	1,096	604
156.66	1,106	626
156.68	1,115	648
156.70	1,125	671
156.72	1,134	693
156.74	1,144	716
156.76	1,154	739
156.78	1,163	762
156.80	1,173	785
156.82	1,182	809
156.84	1,192	833
156.86	1,201	857
156.88	1,211	881
156.90	1,220	905
156.92	1,230	930
156.94	1,239	954
156.96	1,249	979
156.98	1,258	1,004
157.00	1,268	1,030
157.02	1,279	1,055
157.04	1,290	1,081
157.06	1,301	1,107
157.08	1,312	1,133
157.10	1,323	1,159
157.12	1,334	1,186
157.14	1,346	1,212
157.16	1,357	1,239
157.18	1,368	1,267
157.20	1,379	1,294
157.22	1,390	1,322
157.24	1,401	1,350
157.26	1,412	1,378
157.28	1,423	1,406
157.30	1,434	1,435
157.32	1,445	1,464
157.34	1,456	1,493
157.36	1,467	1,522
157.38	1,479	1,551
157.40	1,490	1,581
157.42	1,501	1,611
157.44	1,512	1,641
157.46	1,523	1,671
157.48	1,534	1,702
157.50	**1,545**	**1,733**

Stage-Area-Storage for Pond 19: Forebay Basin 19

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
161.00	117	0
161.02	120	2
161.04	123	5
161.06	127	7
161.08	130	10
161.10	133	13
161.12	136	15
161.14	140	18
161.16	143	21
161.18	146	24
161.20	149	27
161.22	152	30
161.24	156	33
161.26	159	36
161.28	162	39
161.30	165	42
161.32	169	46
161.34	172	49
161.36	175	53
161.38	178	56
161.40	181	60
161.42	185	63
161.44	188	67
161.46	191	71
161.48	194	75
161.50	198	79
161.52	201	83
161.54	204	87
161.56	207	91
161.58	210	95
161.60	214	99
161.62	217	103
161.64	220	108
161.66	223	112
161.68	226	117
161.70	230	121
161.72	233	126
161.74	236	131
161.76	239	135
161.78	243	140
161.80	246	145
161.82	249	150
161.84	252	155
161.86	255	160
161.88	259	165
161.90	262	171
161.92	265	176
161.94	268	181
161.96	272	187
161.98	275	192
162.00	278	198
162.02	283	203
162.04	289	209
162.06	294	215
162.08	299	221
162.10	305	227
162.12	310	233
162.14	315	239
162.16	321	245
162.18	326	252
162.20	331	258
162.22	337	265
162.24	342	272
162.26	347	279
162.28	352	286
162.30	358	293
162.32	363	300
162.34	368	307
162.36	374	315
162.38	379	322
162.40	384	330
162.42	390	338
162.44	395	346
162.46	400	354
162.48	406	362
162.50	**411**	**370**

UNIVERSITY OF MASSACHUSETTS
AT AMHERST
Water Resources Research Center
Blaisdell House, UMass
310 Hicks Way
Amherst, MA 01003

MASTEP Technology Review

Massachusetts Stormwater Evaluation Project
(413) 545-5532
(413) 545-2304 FAX
www.mastep.net

Technology Name: Isolator Row

Studies Reviewed: Christensen, Andrew and Vince Neary. Hydraulic Performance and Sediment Trap Efficiency for the StormTech SC-740 Isolator Row. Tennessee Technological University, February 2005.

Neary, Vincent, PhD. Performance Evaluation of Sediment Removal Efficiency Stormtech Isolator Row. Tennessee Tech University. October 20, 2006.

New Jersey Corporation for Advanced Technology. NJCAT Verification of the StormTech Isolator Row. August 2007.

University of New Hampshire Stormwater Center. Final Report on Field Verification Testing of the Stormtech Isolator Row Treatment Unit. Submitted to StormTech LLC June 2008.

University of New Hampshire Stormwater Center. Performance Evaluation Report on of the Stormtech Isolator Row Treatment Unit. September 2010

Date: January 14, 2012

Reviewers: Sarah Titus, updated by Jerry Schoen

Rating: 2

Brief rationale for rating:
The Isolator Row was tested in the field by the UNH Stormwater Center and in the lab by Tennessee Tech University. Field testing monitored 23 events over two years, sampling 13.2" rainfall or about 27% of the annual average. This study was done under a QAPP that was designed to substantially meet TARP and TAPE requirements.

Lab testing examined sediment removal for three different influent mixes; the SIL-CO-SIL 106, SIL-CO-SIL 250 and the OK-110 silica. Across all influent mixes, 21 test runs were done and 14 flow rates were tested at average influent concentrations from 164-424mg/l. NJCAT was able to use the runs to extrapolate the data to calculate weighted removal efficiencies for 25, 50, 75, 100 and 125% of treatment operating rate. Claims for each influent mix were verified by NJCAT. While all of these studies met many requirements necessary for TARP there was no scour testing, statistical analysis or QC data presented for any study. The laboratory studies did not use a certified lab and the one micron filter sock at the outlet was only partially effective at trapping the finer particles from the flow stream. This led to increasing influent and effluent SSC values as the detention time went up during the course of each test run. Removal rates for earlier samples were higher than later samples in the same run.

Requirements not met:
- No discussion of QC test results.
- Sampled <50% of average annual rainfall and less than minimum 13" required total in the field
- No discussion of scour testing

Other comments:
Field study:
- d50 influent particle size 44 microns.
- Effective TSS, SSC, Zinc, total phosphorus, total petroleum hydrocarbon reported throughout study period.
- Zinc and TP removal efficiency improved over the course of the study, presumably due to build of an organic filter cake on system's fabric. However, this buildup may also lead to increased incidence of bypass in larger storms. This may be a consideration for maintenance planning.
- Negative removal rates for dissolved inorganic nitrogen, suggesting this system is not effective at treating dissolved nitrogen.

Lab study:
- Particle size distributions: OK 110 d50=110, SIL CO SIL 106 d50=22, SIL CO SIL 250= 45 microns. In the field the d50 was measured as 0.038mm.
- Flow rates tested in the lab at treatment flow rates from 0.1-1.2cfs. SIL CO SIL 106 was tested at 3.2gpm/ft2 and SIL CO SIL 250 was tested at 3.2 (0.4cfs) and 1.7gpm/ft2 (0.21cfs). The OK 110 was tested at hydraulic loading rates of 4.8 and 8.1 gpm/ft2.

- Average influent SSC for the SIL CO SIL 106 test runs 270mg/L. The average influent SSC was 211 and 424mg/L for the SIL CO SIL 250 influent at 3.2 and 1.7gpm respectively. The OK 110 tests calculated influent SSC ranged from 140-230mg/L with an average of 183.18. Field testing measured influent TSS at a mean 58mg/l.

Results

Line No.	Line ID	Inlet Time (min)	Tc (min)	i Inlet (in/hr)	Drng Area (ac)	Runoff Coeff (C)	Q Capt (cfs)	Total CxA	Known Q (cfs)	Line Length (ft)	Line Slope (%)	Line Size (in)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)
1	MH19-FES7	0.0	23.5	0.00	0.00	0.00	....	1.73	0.00	184.00	6.18	30	4.52	101.95	3.66	159.87	148.50	168.69	160.58
2	MH20-MH19	0.0	22.5	0.00	0.00	0.00	....	1.42	0.00	122.00	0.50	24	3.79	15.99	3.30	160.48	159.87	167.55	161.17
3	MH21-MH20	0.0	11.2	0.00	0.00	0.00	....	1.36	0.00	71.00	2.15	24	5.24	33.20	4.14	162.01	160.48	169.60	162.82
4	MH22-MH21	0.0	10.1	0.00	0.00	0.00	....	1.36	0.00	125.00	0.55	24	5.51	16.80	3.86	162.70	162.01	175.89	163.53
5	MH24-MH22	0.0	8.8	0.00	0.00	0.00	....	0.62	0.00	141.00	1.85	18	2.72	14.29	5.04	174.50	171.89	178.59	175.13
6	MH25-MH24	0.0	5.6	0.00	0.00	0.00	....	0.33	0.00	293.00	0.53	15	1.84	4.68	2.86	176.04	174.50	181.35	176.58
7	CB47-DMH25	5.0	5.0	5.84	0.09	0.75	0.39	0.07	0.00	16.00	5.31	12	0.39	8.21	1.49	176.89	176.04	180.39	177.16
8	CB49-DMH25	5.0	5.0	5.84	0.25	0.62	0.91	0.16	0.00	43.00	1.21	12	0.91	3.92	2.27	176.56	176.04	180.06	176.96
9	CB48-DMH25	5.0	5.0	5.84	0.14	0.80	0.65	0.11	0.00	32.00	5.31	12	0.65	8.21	1.90	177.74	176.04	181.24	178.08
10	CB46-MH24	5.0	5.0	5.84	0.18	0.72	0.76	0.13	0.00	19.00	0.58	12	0.76	2.71	2.90	175.11	175.00	178.61	175.48
11	CB45-MH24	5.0	5.0	5.84	0.22	0.72	0.92	0.16	0.00	6.00	1.00	12	0.92	3.56	3.36	175.06	175.00	178.56	175.48
12	CB40-MH20	5.0	5.0	5.84	0.19	0.30	0.33	0.06	0.00	111.00	0.50	24	0.33	15.92	0.53	161.03	160.48	165.53	161.41
13	MH23-MH22	0.0	6.3	0.00	0.00	0.00	....	0.45	0.00	129.00	0.50	15	2.35	4.58	3.76	167.82	167.17	173.22	168.45
14	CB42-MH23	5.0	5.0	5.84	0.29	0.71	1.20	0.21	0.00	12.00	11.58	12	1.20	12.12	2.45	169.21	167.82	172.71	169.68
15	CB43-MH23	5.0	5.0	5.84	0.13	0.66	0.50	0.09	0.00	50.00	0.50	12	0.50	2.52	0.68	168.07	167.82	171.57	168.89
16	CB44-MH23	5.0	5.0	5.84	0.22	0.74	0.95	0.16	0.00	28.00	8.00	12	0.95	10.07	2.16	170.06	167.82	173.56	170.47
17	CB41-MH22	5.0	5.0	5.84	0.94	0.30	1.65	0.28	0.00	143.00	0.50	24	1.65	15.94	2.25	163.76	163.05	167.92	164.21
18	CB38-MH19	5.0	5.0	5.84	0.26	0.74	1.12	0.19	0.00	60.00	1.38	12	1.12	4.19	3.90	166.40	165.57	169.90	166.85
19	CB39-MH19	5.0	5.0	5.84	0.25	0.48	0.70	0.12	0.00	35.00	0.51	12	0.70	2.55	2.77	165.75	165.57	169.25	166.11
20	MH51-FES23	0.0	10.7	0.00	0.00	0.00	....	0.71	0.00	136.00	1.68	18	2.82	13.63	3.91	168.29	166.00	180.06	168.93
21	CB96-MH51	5.0	5.0	5.84	0.15	0.71	0.62	0.11	0.00	55.00	0.51	12	0.62	2.54	2.67	175.63	175.35	178.63	175.97

Project File: W161041.stm | Number of lines: 174 | Date: 11-18-2016

NOTES: Intensity = 13.73 / (Inlet time + 0.10) ^ 0.52 -- Return period = 25 Yrs. ; ** Critical depth

Results

Line No.	Line ID	Inlet Time (min)	Tc (min)	i Inlet (in/hr)	Drng Area (ac)	Runoff Coeff (C)	Q Capt (cfs)	Total CxA	Known Q (cfs)	Line Length (ft)	Line Slope (%)	Line Size (in)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)
22	CB97-MH51	5.0	5.0	5.84	0.12	0.77	0.54	0.09	0.00	27.00	4.33	12	0.54	7.41	4.02	176.52	175.35	179.52	176.83
23	MH52-MH51	0.0	9.6	0.00	0.00	0.00	....	0.51	0.00	199.00	0.50	12	2.14	2.52	3.54	169.29	168.29	181.43	169.97
24	MH53-MH52	0.0	9.1	0.00	0.00	0.00	....	0.51	0.00	118.00	0.50	12	2.21	2.52	3.47	169.88	169.29	178.54	170.59
25	CB99-MH53	5.0	5.0	5.84	0.20	0.72	0.84	0.14	0.00	12.00	0.50	12	0.84	2.52	2.88	175.18	175.12	178.17	175.58
26	CB98-MH53	5.0	5.0	5.84	0.15	0.67	0.59	0.10	0.00	17.00	0.94	12	0.59	3.45	2.94	175.28	175.12	178.28	175.61
27	MH54-MH53	0.0	6.5	0.00	0.00	0.00	....	0.13	0.00	138.00	0.50	12	0.65	2.52	1.22	170.57	169.88	175.11	171.08
28	CB101-MH54	5.0	5.0	5.84	0.19	0.75	0.83	0.14	0.00	37.00	5.97	12	0.83	8.70	2.78	172.78	170.57	175.78	173.17
29	CB100-MH54	5.0	5.0	5.84	0.17	0.75	0.74	0.13	0.00	86.00	0.50	12	0.74	2.52	2.21	171.00	170.57	174.01	171.37
30	MH43-FES17	0.0	8.4	0.00	0.00	0.00	....	0.39	0.00	152.00	2.58	12	1.72	5.72	3.81	172.92	169.00	182.05	173.48
31	MH44-MH43	0.0	7.6	0.00	0.00	0.00	....	0.39	0.00	139.00	0.48	12	1.81	2.47	3.34	173.59	172.92	179.11	174.20
32	CB84-MH44	5.0	5.0	5.84	0.04	0.90	0.21	0.04	0.00	42.00	0.43	12	0.21	2.33	1.84	174.97	174.79	179.69	175.17
33	CB83-MH44	5.0	5.0	5.84	0.20	0.76	0.89	0.15	0.00	17.00	6.88	12	0.89	9.34	5.23	175.96	174.79	179.46	176.36
34	CB85-MH44	5.0	5.0	5.84	0.29	0.68	1.15	0.20	0.00	33.00	0.52	12	1.15	2.56	1.59	173.76	173.59	176.75	174.57
35	MH30-FES10	0.0	5.3	0.00	0.00	0.00	....	0.63	0.00	145.00	9.52	12	3.56	10.99	5.28	173.80	160.00	177.30	174.60
36	CB61-MH30	5.0	5.0	5.84	0.26	0.71	1.08	0.18	0.00	27.00	1.48	12	1.08	4.33	1.49	174.20	173.80	177.70	175.00
37	CB60-MH30	5.0	5.0	5.84	0.73	0.61	2.60	0.45	0.00	20.00	2.00	12	2.60	5.04	3.92	174.20	173.80	177.70	174.89
38	MH26-FES9B	0.0	9.7	0.00	0.00	0.00	....	1.54	0.00	153.00	1.03	36	11.52	67.77	5.02	147.58	146.00	156.25	148.66
39	MH27-MH26	0.0	9.2	0.00	0.00	0.00	....	1.54	0.00	98.00	6.92	18	6.54	27.62	4.75	154.36	147.58	158.00	155.34
40	MH28-MH27	0.0	7.8	0.00	0.00	0.00	....	1.19	0.00	295.00	1.68	18	5.54	13.62	4.24	159.32	154.36	162.96	160.22
41	MH29-MH28	0.0	5.9	0.00	0.00	0.00	....	0.57	0.00	295.00	2.29	15	3.09	9.78	3.45	166.08	159.32	169.94	166.78
42	FES09A-MH26	0.0	0.0	0.00	0.00	0.00	5.13	0.00	5.13	173.00	0.50	24	5.13	15.95	4.44	149.60	148.74	154.00	150.40

Project File: W161041.stm | Number of lines: 174 | Date: 11-18-2016

NOTES: Intensity = 13.73 / (Inlet time + 0.10) ^ 0.52 -- Return period = 25 Yrs. ; ** Critical depth

Results

Line No.	Line ID	Inlet Time (min)	Tc (min)	i Inlet (in/hr)	Drng Area (ac)	Runoff Coeff (C)	Q Capt (cfs)	Total CxA	Known Q (cfs)	Line Length (ft)	Line Slope (%)	Line Size (in)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)
43	CB52-MH27	5.0	5.0	5.84	0.21	0.67	0.82	0.14	0.00	10.00	5.20	12	0.82	8.12	1.09	154.88	154.36	157.88	155.76
44	CB53-MH27	5.0	5.0	5.84	0.30	0.70	1.23	0.21	0.00	19.00	1.32	12	1.23	4.09	1.56	154.61	154.36	157.61	155.77
45	CB55-MH28	5.0	5.0	5.84	0.40	0.42	0.98	0.17	0.00	14.00	2.64	12	0.98	5.79	1.29	159.69	159.32	162.69	160.58
46	CB54-MH28	5.0	5.0	5.84	0.30	0.72	1.26	0.22	0.00	17.00	1.18	12	1.26	3.86	1.61	159.52	159.32	162.52	160.59
47	CB56-MH28	5.0	5.0	5.84	0.55	0.42	1.35	0.23	0.00	50.00	2.92	12	1.35	6.09	2.61	160.78	159.32	163.78	161.27
48	CB59-MH29	5.0	5.0	5.84	0.24	0.64	0.90	0.15	0.00	49.00	3.16	12	0.90	6.33	2.09	167.63	166.08	171.13	168.03
49	CB58-MH29	5.0	5.0	5.84	0.27	0.76	1.20	0.21	0.00	80.00	3.36	12	1.20	6.53	2.45	168.77	166.08	172.27	169.23
50	CB57-MH29	5.0	5.0	5.84	0.30	0.72	1.26	0.22	0.00	10.00	0.60	12	1.26	2.76	1.68	166.14	166.08	169.64	167.03
51	MH15-FES08	0.0	5.7	0.00	0.00	0.00	....	0.65	0.00	263.00	0.50	15	3.51	4.56	2.86	147.31	146.00	150.42	149.10
52	MH16-MH15	0.0	5.2	0.00	0.00	0.00	....	0.65	0.00	108.00	0.53	15	3.72	4.69	3.03	147.88	147.31	152.73	149.58
53	CB50-MH16	5.0	5.0	5.84	0.54	0.64	2.02	0.35	0.00	8.00	0.75	12	2.02	3.08	2.57	147.94	147.88	152.80	149.79
54	CB51-MH16	5.0	5.0	5.84	0.43	0.70	1.76	0.30	0.00	21.00	0.43	12	1.76	2.33	2.24	147.97	147.88	152.76	149.84
55	MH13-FES05	0.0	7.9	0.00	0.00	0.00	....	0.43	0.00	141.00	0.50	24	2.00	15.94	1.47	149.20	148.50	152.81	149.90
56	MH14-MH13	0.0	5.2	0.00	0.00	0.00	....	0.43	0.00	124.00	0.50	24	2.46	15.99	2.75	149.82	149.20	154.81	150.38
57	CB34-MH14	5.0	5.0	5.84	0.22	0.72	0.92	0.16	0.00	17.00	5.29	12	0.92	8.19	2.12	150.40	149.50	153.40	150.81
58	CB33-MH14	5.0	5.0	5.84	0.37	0.74	1.60	0.27	0.00	27.00	0.52	12	1.60	2.56	3.03	149.96	149.82	152.65	150.56
59	MH17-FES06	0.0	6.3	0.00	0.00	0.00	....	0.63	0.00	191.00	4.42	12	3.28	7.49	4.17	156.95	148.50	160.45	159.46
60	MH18-MH17	0.0	6.1	0.00	0.00	0.00	....	0.63	0.00	55.00	3.53	12	3.33	6.69	4.25	158.89	156.95	162.56	160.15
61	CB35-MH18	5.0	5.0	5.84	0.28	0.73	1.19	0.20	0.00	15.00	0.20	12	1.19	1.59	1.52	158.92	158.89	162.42	160.69
62	CB36-MH18	5.0	5.0	5.84	0.32	0.71	1.33	0.23	0.00	10.00	1.40	12	1.33	4.21	1.69	159.03	158.89	162.53	160.68
63	CB37-MH18	5.0	5.0	5.84	0.26	0.77	1.17	0.20	0.00	97.00	2.99	12	1.17	6.16	2.41	161.79	158.89	165.29	162.25

Project File: W161041.stm | Number of lines: 174 | Date: 11-18-2016

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Results

Line No.	Line ID	Inlet Time (min)	Tc (min)	i Inlet (in/hr)	Drng Area (ac)	Runoff Coeff (C)	Q Capt (cfs)	Total CxA	Known Q (cfs)	Line Length (ft)	Line Slope (%)	Line Size (in)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)
64	MH56-FES24	0.0	6.8	0.00	0.00	0.00	....	0.72	0.00	148.00	0.50	18	3.60	7.43	2.10	156.74	156.00	161.21	158.08
65	MH57-MH56	0.0	6.2	0.00	0.00	0.00	....	0.72	0.00	74.00	4.26	18	3.76	21.67	3.26	159.89	156.74	164.72	160.63
66	CB104-MH57	5.0	5.0	5.84	0.41	0.77	1.84	0.32	0.00	60.00	0.50	12	1.84	2.52	2.62	160.19	159.89	163.19	160.96
67	MH58-MH57	0.0	5.3	0.00	0.00	0.00	....	0.41	0.00	112.00	1.26	15	2.31	7.25	3.07	161.30	159.89	166.54	161.91
68	CB106-MH58	5.0	5.0	5.84	0.26	0.69	1.05	0.18	0.00	21.00	1.81	12	1.05	4.79	2.88	161.98	161.60	166.78	162.41
69	CB105-MH58	5.0	5.0	5.84	0.31	0.73	1.32	0.23	0.00	22.00	0.50	12	1.32	2.52	3.19	161.68	161.57	166.60	162.19
70	MH55-FES23	0.0	5.3	0.00	0.00	0.00	....	0.35	0.00	170.00	3.00	12	2.00	6.17	2.55	169.10	164.00	172.86	170.40
71	CB102-MH55	5.0	5.0	5.84	0.31	0.68	1.23	0.21	0.00	20.00	0.65	12	1.23	2.87	1.57	169.23	169.10	172.23	170.59
72	CB103-MH55	5.0	5.0	5.84	0.20	0.72	0.84	0.14	0.00	22.00	0.73	12	0.84	3.04	1.07	169.26	169.10	172.26	170.59
73	MH50-FES21	0.0	8.5	0.00	0.00	0.00	....	0.38	0.00	178.00	0.51	12	1.69	2.53	2.15	165.90	165.00	168.88	167.20
74	CB94-MH50	5.0	5.0	5.84	0.29	0.68	1.15	0.20	0.00	10.00	1.00	12	1.15	3.56	1.47	166.00	165.90	169.16	167.32
75	CB95-MH50	5.0	5.0	5.84	0.26	0.71	1.08	0.18	0.00	292.00	0.05	12	1.08	0.81	1.37	166.05	165.90	169.47	167.58
76	MH62-FES25	0.0	301.1	0.00	0.00	0.00	....	0.00	0.00	95.00	2.99	12	0.01	6.16	0.19	163.84	161.00	165.53	163.92
77	MH61-MH62	0.0	144.0	0.00	0.00	0.00	....	0.00	0.00	120.00	0.51	12	0.01	2.54	0.61	164.45	163.84	172.53	164.49
78	OCS16-MH61	0.0	0.0	0.00	0.00	0.00	0.01	0.00	0.01	110.00	0.50	12	0.01	2.52	0.74	165.00	164.45	167.55	165.04
79	MH49-FES20	0.0	5.4	0.00	0.00	0.00	....	0.28	0.00	25.00	9.28	12	1.60	10.85	2.33	163.32	161.00	166.69	164.05
80	CB92-MH49	5.0	5.0	5.84	0.16	0.82	0.77	0.13	0.00	9.00	1.11	12	0.77	3.75	1.07	163.42	163.32	166.70	164.23
81	CB93-MH49	5.0	5.0	5.84	0.17	0.90	0.89	0.15	0.00	25.00	0.40	12	0.89	2.25	1.25	163.42	163.32	166.70	164.23
82	MH31-FES11	0.0	6.5	0.00	0.00	0.00	....	0.50	0.00	151.00	0.50	15	2.56	4.55	2.13	160.75	160.00	164.43	161.88
83	MH32-MH31	0.0	6.0	0.00	0.00	0.00	....	0.50	0.00	111.00	5.85	12	2.67	8.61	4.00	167.24	160.75	171.26	167.93
84	CB64-MH32	5.0	5.0	5.84	0.32	0.75	1.40	0.24	0.00	29.00	4.00	12	1.40	7.12	2.68	168.41	167.25	171.51	168.91

Project File: W161041.stm | Number of lines: 174 | Date: 11-18-2016

NOTES: Intensity = 13.73 / (Inlet time + 0.10) ^ 0.52 -- Return period = 25 Yrs. ; ** Critical depth

Results

Line No.	Line ID	Inlet Time (min)	Tc (min)	i Inlet (in/hr)	Drng Area (ac)	Runoff Coeff (C)	Q Capt (cfs)	Total CxA	Known Q (cfs)	Line Length (ft)	Line Slope (%)	Line Size (in)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)
85	CB63-MH32	5.0	5.0	5.84	0.14	0.71	0.58	0.10	0.00	43.00	2.63	12	0.58	5.77	1.69	168.38	167.25	170.98	168.70
86	CB62-MH32	5.0	5.0	5.84	0.26	0.62	0.94	0.16	0.00	29.00	0.52	12	0.94	2.56	1.26	167.39	167.24	170.49	168.24
87	MH48-FES19	0.0	5.6	0.00	0.00	0.00	....	0.17	0.00	44.00	8.91	15	0.94	19.27	1.77	161.42	157.50	166.00	161.82
88	CB90-MH48	5.0	5.0	5.84	0.23	0.39	0.52	0.09	0.00	6.00	1.67	12	0.52	4.60	1.22	161.52	161.42	165.91	162.01
89	CB91-MH48	5.0	5.0	5.84	0.09	0.90	0.47	0.08	0.00	23.00	0.43	12	0.47	2.35	1.07	161.52	161.42	165.99	162.03
90	MH45-FES19	0.0	11.4	0.00	0.00	0.00	....	0.31	0.00	68.00	2.87	12	1.19	6.03	1.83	159.45	157.50	163.42	160.12
91	MH46-MH45	0.0	11.0	0.00	0.00	0.00	....	0.31	0.00	54.00	0.50	12	1.22	2.52	2.28	159.72	159.45	162.87	160.28
92	MH47-MH46	0.0	6.6	0.00	0.00	0.00	....	0.11	0.00	205.00	0.87	12	0.54	3.32	1.72	161.50	159.72	166.59	161.81
93	CB86-MH46	5.0	5.0	5.84	0.22	0.33	0.42	0.07	0.00	18.00	0.50	12	0.42	2.52	0.72	159.81	159.72	162.65	160.47
94	CB87-MH46	5.0	5.0	5.84	0.34	0.39	0.77	0.13	0.00	15.00	0.53	12	0.77	2.60	1.35	159.80	159.72	162.65	160.45
95	CB88-MH47	5.0	5.0	5.84	0.15	0.42	0.37	0.06	0.00	25.00	1.76	12	0.37	4.72	2.93	163.24	162.80	167.59	163.50
96	CB89-MH47	5.0	5.0	5.84	0.05	0.90	0.26	0.05	0.00	33.00	1.33	12	0.26	4.11	2.50	163.24	162.80	167.59	163.46
97	MH59-B24	0.0	17.3	0.00	0.00	0.00	....	0.07	0.00	24.00	2.08	15	0.22	9.32	0.53	154.53	154.03	158.69	154.88
98	MH60-MH59	0.0	6.9	0.00	0.00	0.00	....	0.04	0.00	166.00	5.25	12	0.18	8.16	2.68	163.50	154.78	169.21	163.68
99	CB109-MH60	5.0	5.0	5.84	0.06	0.30	0.11	0.02	0.00	15.00	0.93	12	0.11	3.44	1.77	166.00	165.86	169.86	166.14
100	CB110-MH60	5.0	5.0	5.84	0.06	0.30	0.11	0.02	0.00	15.00	0.93	12	0.11	3.44	1.77	166.00	165.86	169.86	166.14
101	CB108-MH59	5.0	5.0	5.84	0.06	0.31	0.11	0.02	0.00	15.00	1.07	12	0.11	3.68	1.83	155.78	155.62	158.78	155.92
102	CB107-MH59	5.0	5.0	5.84	0.06	0.31	0.11	0.02	0.00	34.00	1.00	12	0.11	3.56	1.82	155.12	154.78	158.12	155.26
103	MH8-FES04	0.0	12.4	0.00	0.00	0.00	....	3.52	0.00	134.00	0.50	30	12.85	29.00	5.52	145.67	145.00	150.34	146.87
104	MH9-MH8	0.0	12.2	0.00	0.00	0.00	....	1.14	0.00	33.00	0.48	18	4.19	7.31	2.38	145.83	145.67	150.13	147.29
105	MH11-MH9	0.0	10.8	0.00	0.00	0.00	....	0.47	0.00	168.00	2.35	15	1.83	9.89	2.54	149.77	145.83	152.83	150.31

Project File: W161041.stm | Number of lines: 174 | Date: 11-18-2016

NOTES: Intensity = 13.73 / (Inlet time + 0.10) ^ 0.52 -- Return period = 25 Yrs. ; ** Critical depth

Results

Line No.	Line ID	Inlet Time (min)	Tc (min)	i Inlet (in/hr)	Drng Area (ac)	Runoff Coeff (C)	Q Capt (cfs)	Total CxA	Known Q (cfs)	Line Length (ft)	Line Slope (%)	Line Size (in)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)
106	MH12-MH11	0.0	5.5	0.00	0.00	0.00	....	0.19	0.00	277.00	1.35	15	1.04	7.49	2.19	153.50	149.77	156.98	153.91
107	MH10-MH9	0.0	5.1	0.00	0.00	0.00	....	0.54	0.00	45.00	0.78	18	3.10	9.26	1.85	146.18	145.83	149.94	147.45
108	CB23-MH10	5.0	5.0	5.84	0.32	0.78	1.46	0.25	0.00	12.00	0.83	12	1.46	3.25	1.86	146.28	146.18	149.78	147.52
109	CB24-MH10	5.0	5.0	5.84	0.46	0.63	1.69	0.29	0.00	19.00	0.53	12	1.69	2.58	2.15	146.28	146.18	149.78	147.54
110	CB22-MH9	5.0	5.0	5.84	0.28	0.48	0.78	0.13	0.00	33.00	3.36	12	0.78	6.53	1.49	146.94	145.83	150.43	147.44
111	CB26-MH11	5.0	5.0	5.84	0.23	0.48	0.64	0.11	0.00	28.00	0.96	12	0.64	3.50	1.88	150.04	149.77	153.04	150.40
112	CB25-MH11	5.0	5.0	5.84	0.24	0.70	0.98	0.17	0.00	7.00	0.71	12	0.98	3.01	1.82	149.82	149.77	152.82	150.45
113	CB28-MH12	5.0	5.0	5.84	0.20	0.48	0.56	0.10	0.00	22.00	2.50	12	0.56	5.63	1.96	154.05	153.50	157.05	154.37
114	CB27-MH12	5.0	5.0	5.84	0.19	0.48	0.53	0.09	0.00	11.00	5.00	12	0.53	7.96	1.90	154.05	153.50	157.05	154.36
115	CB29-MH8	5.0	7.2	5.84	1.43	0.50	4.18	2.38	0.00	146.00	0.64	24	11.49	18.05	5.25	146.60	145.67	150.60	147.80
116	CB30-CB29	5.0	6.7	5.84	1.03	0.50	3.01	1.67	0.00	163.00	0.71	18	8.40	8.86	5.41	147.76	146.60	151.98	148.89
117	CB31-CB30	5.0	6.0	5.84	1.34	0.56	4.38	1.15	0.00	187.00	1.33	15	6.11	7.44	5.43	150.24	147.76	154.97	151.23
118	CB32-CB31	5.0	5.0	5.84	0.84	0.48	2.35	0.40	0.00	186.00	0.81	12	2.35	3.21	3.44	151.75	150.24	158.37	152.47
119	MH6-FES03	0.0	10.3	0.00	0.00	0.00	....	1.46	0.00	128.00	1.21	24	5.84	24.89	4.54	146.55	145.00	151.06	147.41
120	MH7-MH6	0.0	9.3	0.00	0.00	0.00	....	1.46	0.00	140.00	0.54	24	6.18	16.66	4.03	147.31	146.55	152.82	148.19
121	CB17-MH7	5.0	5.0	5.84	0.20	0.67	0.78	0.13	0.00	30.00	0.53	12	0.78	2.60	2.88	149.56	149.40	153.14	149.94
122	CB18-MH7	5.0	5.0	5.84	0.20	0.71	0.83	0.14	0.00	23.00	0.65	12	0.83	2.88	3.05	149.55	149.40	153.14	149.94
123	CB19-MH7	5.0	8.1	5.84	0.86	0.59	2.96	1.18	0.00	136.00	0.50	24	5.38	15.99	2.24	147.23	146.55	151.44	148.44
124	CB20-CB19	5.0	7.2	5.84	0.69	0.61	2.46	0.67	0.00	154.00	1.93	15	3.26	8.97	3.54	150.20	147.23	153.92	150.92
125	CB21-CB20	5.0	5.0	5.84	0.28	0.90	1.47	0.25	0.00	158.00	0.82	15	1.47	5.83	2.37	151.49	150.20	155.81	151.98
126	MH1-FES-01	0.0	10.2	0.00	0.00	0.00	....	2.33	0.00	148.00	0.50	24	9.42	15.99	5.30	145.24	144.50	149.09	146.36

Project File: W161041.stm | Number of lines: 174 | Date: 11-18-2016

NOTES: Intensity = 13.73 / (Inlet time + 0.10) ^ 0.52 -- Return period = 25 Yrs. ; ** Critical depth

Results

Line No.	Line ID	Inlet Time (min)	Tc (min)	i Inlet (in/hr)	Drng Area (ac)	Runoff Coeff (C)	Q Capt (cfs)	Total CxA	Known Q (cfs)	Line Length (ft)	Line Slope (%)	Line Size (in)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)
127	MH4-MH1	0.0	7.3	0.00	0.00	0.00	....	1.17	0.00	175.00	0.64	18	5.62	8.40	3.52	146.36	145.24	150.31	147.51
128	MH5-MH4	0.0	6.7	0.00	0.00	0.00	....	0.86	0.00	145.00	1.70	15	4.33	8.43	4.26	148.83	146.36	152.62	149.66
129	CB14-MH5	5.0	6.5	5.84	0.57	0.63	2.10	0.72	0.00	37.00	0.57	15	3.67	4.86	2.99	147.94	147.73	151.73	150.03
130	CB15-CB14	5.0	5.0	5.84	0.57	0.63	2.10	0.36	0.00	151.00	1.50	15	2.10	7.92	1.71	148.23	145.96	151.21	150.35
131	CB12-MH5	5.0	5.0	5.84	0.08	0.81	0.38	0.06	0.00	19.00	1.11	12	0.38	3.74	0.48	149.04	148.83	152.54	150.04
132	CB13-MH5	5.0	5.0	5.84	0.12	0.64	0.45	0.08	0.00	16.00	1.19	12	0.45	3.88	0.57	149.02	148.83	152.52	150.05
133	CB11-MH4	5.0	5.0	5.84	0.14	0.66	0.54	0.09	0.00	23.00	2.30	12	0.54	5.41	0.69	146.89	146.36	150.39	147.97
134	CB10-MH4	5.0	5.0	5.84	0.23	0.71	0.95	0.16	0.00	29.00	3.28	12	0.95	6.45	1.50	147.31	146.36	150.81	147.95
135	CB9-MH4	5.0	5.0	5.84	0.07	0.81	0.33	0.06	0.00	35.00	3.57	12	0.33	6.73	0.86	147.61	146.36	151.11	147.97
136	CB2-MH1	5.0	5.0	5.84	0.74	0.42	1.81	0.31	0.00	37.00	0.51	12	1.81	2.55	2.31	145.43	145.24	148.34	147.22
137	CB1-MH1	5.0	5.0	5.84	0.26	0.73	1.11	0.19	0.00	53.00	0.51	12	1.11	2.54	1.41	145.51	145.24	148.34	147.23
138	MH2-MH1	0.0	8.6	0.00	0.00	0.00	....	0.66	0.00	173.00	1.67	18	2.89	13.57	2.79	148.13	145.24	151.79	148.78
139	CB3-MH2	5.0	5.0	5.84	0.06	0.90	0.32	0.05	0.00	11.00	7.64	12	0.32	9.84	1.31	148.97	148.13	151.47	149.21
140	CB5-MH2	5.0	5.0	5.84	0.28	0.75	1.23	0.21	0.00	35.00	3.00	12	1.23	6.17	2.55	149.18	148.13	152.18	149.65
141	CB4-MH2	5.0	5.0	5.84	0.05	0.81	0.24	0.04	0.00	48.00	2.73	12	0.24	5.88	1.17	149.44	148.13	152.43	149.65
142	MH3-MH2	0.0	6.7	0.00	0.00	0.00	....	0.35	0.00	287.00	1.96	12	1.76	4.99	3.22	153.76	148.13	156.92	154.32
143	CB-7-MH3	5.0	5.0	5.84	0.21	0.72	0.88	0.15	0.00	10.00	4.20	12	0.88	7.30	2.19	154.18	153.76	157.18	154.58
144	CB6-MH3	5.0	5.0	5.84	0.06	0.54	0.19	0.03	0.00	25.00	0.52	12	0.19	2.57	0.32	153.89	153.76	156.89	154.55
145	CB8-MH3	5.0	5.0	5.84	0.40	0.42	0.98	0.17	0.00	40.00	1.90	12	0.98	4.91	2.32	154.52	153.76	157.02	154.94
146	CB16-FES02	5.0	5.0	5.84	0.69	0.73	2.94	0.50	0.00	162.00	0.49	12	2.94	2.50	4.27	145.30	144.50	148.00	146.63
147	MH35-FES1	0.0	7.6	0.00	0.00	0.00	....	0.20	0.00	153.00	0.58	12	0.96	2.70	3.09	151.38	150.50	154.38	151.80

Project File: W161041.stm | Number of lines: 174 | Date: 11-18-2016

NOTES: Intensity = 13.73 / (Inlet time + 0.10) ^ 0.52 -- Return period = 25 Yrs. ; ** Critical depth

Results

Line No.	Line ID	Inlet Time (min)	Tc (min)	i Inlet (in/hr)	Drng Area (ac)	Runoff Coeff (C)	Q Capt (cfs)	Total CxA	Known Q (cfs)	Line Length (ft)	Line Slope (%)	Line Size (in)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)
148	MH36-MH35	0.0	6.2	0.00	0.00	0.00	....	0.20	0.00	120.00	1.10	12	1.07	3.74	2.54	152.70	151.38	156.04	153.14
149	CB67-MH36	5.0	5.0	5.84	0.31	0.45	0.81	0.14	0.00	32.00	0.59	12	0.81	2.74	2.18	152.89	152.70	155.89	153.30
150	CB68-MH36	5.0	5.0	5.84	0.18	0.36	0.38	0.06	0.00	35.00	0.54	12	0.38	2.62	1.12	152.89	152.70	155.89	153.26
151	MH33-FES12	0.0	6.3	0.00	0.00	0.00	....	0.24	0.00	137.00	4.65	12	1.23	7.68	3.39	156.87	150.50	160.81	157.34
152	MH34-MH33	0.0	5.7	0.00	0.00	0.00	....	0.24	0.00	63.00	3.11	12	1.30	6.28	3.03	158.83	156.87	161.78	159.31
153	CB65-MH34	5.0	5.0	5.84	0.27	0.62	0.98	0.17	0.00	10.00	1.00	12	0.98	3.56	2.73	158.93	158.83	161.93	159.35
154	CB66-MH34	5.0	5.0	5.84	0.18	0.39	0.41	0.07	0.00	21.00	0.48	12	0.41	2.46	0.84	158.93	158.83	161.93	159.48
155	MH40-FES16	0.0	11.1	0.00	0.00	0.00	....	1.99	0.00	138.00	0.54	30	7.71	30.23	4.45	155.25	154.50	160.05	156.18
156	MH41-MH40	0.0	9.0	0.00	0.00	0.00	....	1.20	0.00	234.00	2.06	24	5.14	32.46	3.46	160.07	155.25	163.60	160.87
157	MH42-MH41	0.0	5.5	0.00	0.00	0.00	....	0.31	0.00	285.00	2.70	12	1.74	5.85	3.04	167.77	160.07	171.53	168.33
158	CB74-MH40	5.0	5.0	5.84	0.29	0.42	0.71	0.12	0.00	47.00	1.32	12	0.71	4.09	1.16	155.87	155.25	158.87	156.48
159	CB75-MH40	5.0	5.0	5.84	0.24	0.42	0.59	0.10	0.00	45.00	1.42	12	0.59	4.25	0.97	155.89	155.25	158.89	156.49
160	CB76-MH40	5.0	5.0	5.84	1.28	0.45	3.36	0.58	0.00	121.00	0.62	15	3.36	5.08	3.65	156.00	155.25	158.80	156.74
161	CB77-MH41	5.0	5.0	5.84	0.30	0.42	0.74	0.13	0.00	14.00	3.50	12	0.74	6.66	1.32	160.56	160.07	163.56	161.10
162	CB78-MH41	5.0	5.0	5.84	0.26	0.68	1.03	0.18	0.00	17.00	2.88	12	1.03	6.05	2.25	160.56	160.07	163.56	160.99
163	CB81-MH41	5.0	7.9	5.84	0.91	0.37	1.97	0.58	0.00	122.00	0.48	18	2.67	7.24	1.51	157.64	157.06	162.75	161.21
164	CB82-CB81	5.0	5.0	5.84	0.59	0.41	1.41	0.24	0.00	139.00	0.50	18	1.41	7.45	0.80	158.34	157.64	161.08	161.32
165	CB79-MH42	5.0	5.0	5.84	0.29	0.68	1.15	0.20	0.00	31.00	5.35	12	1.15	8.24	2.56	169.43	167.77	172.43	169.89
166	CB80-MH42	5.0	5.0	5.84	0.13	0.90	0.68	0.12	0.00	27.00	5.37	12	0.68	8.25	1.91	169.22	167.77	172.22	169.57
167	MH37-FES14	0.0	5.8	0.00	0.00	0.00	....	0.34	0.00	49.00	0.51	12	1.84	2.54	3.61	144.75	144.50	149.30	145.42
168	CB70-MH37	5.0	5.0	5.84	0.66	0.42	1.62	0.28	0.00	15.00	0.53	12	1.62	2.60	2.20	144.83	144.75	149.09	145.69

Project File: W161041.stm | Number of lines: 174 | Date: 11-18-2016

NOTES: Intensity = 13.73 / (Inlet time + 0.10) ^ 0.52 -- Return period = 25 Yrs. ; ** Critical depth

Results

Line No.	Line ID	Inlet Time (min)	Tc (min)	i Inlet (in/hr)	Drng Area (ac)	Runoff Coeff (C)	Q Capt (cfs)	Total CxA	Known Q (cfs)	Line Length (ft)	Line Slope (%)	Line Size (in)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)
169	CB69-MH37	5.0	5.0	5.84	0.16	0.39	0.36	0.06	0.00	21.00	0.52	12	0.36	2.58	0.48	144.86	144.75	149.08	145.75
170	MH38-FES15	0.0	9.9	0.00	0.00	0.00	....	0.53	0.00	44.00	0.50	18	2.18	7.43	3.58	144.22	144.00	146.95	144.79
171	MH39-MH38	0.0	8.5	0.00	0.00	0.00	....	0.53	0.00	141.00	0.50	18	2.37	7.40	2.92	144.92	144.22	148.23	145.51
172	CB73-MH39	5.0	5.0	5.84	0.77	0.50	2.25	0.39	0.00	111.00	0.50	12	2.25	2.53	3.64	145.48	144.92	148.20	146.21
173	CB71-MH39	5.0	5.0	5.84	0.03	0.30	0.05	0.01	0.00	14.00	0.57	12	0.05	2.69	0.08	145.00	144.92	148.32	145.71
174	CB72-MH39	5.0	5.0	5.84	0.33	0.42	0.81	0.14	0.00	17.00	0.53	12	0.81	2.59	1.36	145.01	144.92	148.32	145.68

Project File: W161041.stm | Number of lines: 174 | Date: 11-18-2016

NOTES: Intensity = 13.73 / (Inlet time + 0.10) ^ 0.52 -- Return period = 25 Yrs. ; ** Critical depth

"C" Coefficients
Glen Ellen
Millis, MA

c coefficient, grass=	0.30
c coefficient, impervious=	0.90

Inlet	Area (sf)	Perv (sf)	Imperv (sf)	Area (ac)	"C"
CB-01	11,202	3,122	8,080	0.26	0.73
CB-02	32,052	25,642	6,410	0.74	0.42
CB-03	2,549	0	2,549	0.06	0.90
CB-04	2,007	314	1,693	0.05	0.81
CB-05	12,129	3,016	9,113	0.28	0.75
CB-06	2,502	1,501	1,001	0.06	0.54
CB-07	9,338	2,755	6,583	0.21	0.72
CB-08	17,294	13,835	3,459	0.40	0.42
CB-09	2,994	470	2,524	0.07	0.81
CB-10	9,874	3,208	6,666	0.23	0.71
CB-11	5,944	2,345	3,599	0.14	0.66
CB-12	3,506	497	3,009	0.08	0.81
CB-13	5,031	2,186	2,845	0.12	0.64
CB-14	24,853	11,184	13,669	0.57	0.63
CB-15	29,020	13,059	15,961	0.67	0.63
CB-16	30,042	8,634	21,408	0.69	0.73
CB-17	8,823	3,333	5,490	0.20	0.67
CB-18	8,555	2,770	5,785	0.20	0.71
CB-19	37,639	19,453	18,186	0.86	0.59
CB-20	30,032	14,464	15,568	0.69	0.61
CB-21	12,208	0	12,208	0.28	0.90
CB-22	12,207	8,545	3,662	0.28	0.48
CB-23	14,020	2,716	11,304	0.32	0.78
CB-24	20,040	8,864	11,176	0.46	0.63
CB-25	10,255	3,406	6,849	0.24	0.70
CB-26	9,922	6,945	2,977	0.23	0.48
CB-27	8,120	5,684	2,436	0.19	0.48
CB-28	8,669	6,068	2,601	0.20	0.48
CB-29	62,449	41,287	21,162	1.43	0.50
CB-30	44,952	30,005	14,947	1.03	0.50
CB-31	58,462	33,531	24,931	1.34	0.56
CB-32	36,746	25,685	11,061	0.84	0.48
CB-33	16,222	4,266	11,956	0.37	0.74
CB-34	9,473	2,766	6,707	0.22	0.72
CB-35	12,096	3,350	8,746	0.28	0.73
CB-36	13,918	4,492	9,426	0.32	0.71
CB-37	11,183	2,489	8,694	0.26	0.77
CB-38	11,312	3,069	8,243	0.26	0.74
CB-39	11,037	7,726	3,311	0.25	0.48

CB-40	8,079	8,079	0	0.19	0.30
CB-41	40,959	40,959	0	0.94	0.30
CB-42	12,429	3,955	8,474	0.29	0.71
CB-43	5,451	2,180	3,271	0.13	0.66
CB-44	9,727	2,560	7,167	0.22	0.74
CB-45	9,590	2,824	6,766	0.22	0.72
CB-46	7,624	2,232	5,392	0.18	0.72
CB-47	3,936	1,000	2,936	0.09	0.75
CB-48	6,234	1,049	5,185	0.14	0.80
CB-49	10,938	4,978	5,960	0.25	0.63
CB-50	23,540	10,396	13,144	0.54	0.64
CB-51	18,715	6,239	12,476	0.43	0.70
CB-52	9,260	3,558	5,702	0.21	0.67
CB-53	12,984	4,255	8,729	0.30	0.70
CB-54	13,132	3,889	9,243	0.30	0.72
CB-55	17,352	13,882	3,470	0.40	0.42
CB-56	24,123	19,298	4,825	0.55	0.42
CB-57	4,792	669	4,123	0.11	0.82
CB-58	11,612	2,732	8,880	0.27	0.76
CB-59	10,663	4,588	6,075	0.24	0.64
CB-60	31,866	15,534	16,332	0.73	0.61
CB-61	11,197	3,456	7,741	0.26	0.71
CB-62	11,135	5,161	5,974	0.26	0.62
CB-63	6,021	1,929	4,092	0.14	0.71
CB-64	13,928	3,489	10,439	0.32	0.75
CB-65	11,631	5,497	6,134	0.27	0.62
CB-66	7,968	6,773	1,195	0.18	0.39
CB-67	13,625	10,219	3,406	0.31	0.45
CB-68	7,924	7,132	792	0.18	0.36
CB-69	7,113	6,046	1,067	0.16	0.39
CB-70	28,545	22,836	5,709	0.66	0.42
CB-71	1,368	1,368	0	0.03	0.30
CB-72	14,426	11,541	2,885	0.33	0.42
CB-73	33,736	22,629	11,107	0.77	0.50
CB-74	12,615	10,092	2,523	0.29	0.42
CB-75	10,384	8,307	2,077	0.24	0.42
CB-76	55,694	41,810	13,884	1.28	0.45
CB-77	12,874	10,299	2,575	0.30	0.42
CB-78	11,319	4,077	7,242	0.26	0.68
CB-79	12,767	4,654	8,113	0.29	0.68
CB-80	5,803	0	5,803	0.13	0.90
CB-81	39,631	34,911	4,720	0.91	0.37
CB-82	25,583	20,863	4,720	0.59	0.41
CB-83	8,841	2,108	6,733	0.20	0.76
CB-84	1,714	0	1,714	0.04	0.90
CB-85	12,814	4,646	8,168	0.29	0.68
CB-86	9,773	9,284	489	0.22	0.33

CB-87	14,615	12,423	2,192	0.34	0.39
CB-88	6,611	5,289	1,322	0.15	0.42
CB-89	2,308	0	2,308	0.05	0.90
CB-90	10,002	8,502	1,500	0.23	0.39
CB-91	3,982	0	3,982	0.09	0.90
CB-92	6,898	965	5,933	0.16	0.82
CB-93	7,530	0	7,530	0.17	0.90
CB-94	12,439	4,552	7,887	0.29	0.68
CB-95	11,230	3,610	7,620	0.26	0.71
CB-96	6,342	2,007	4,335	0.15	0.71
CB-97	5,400	1,127	4,273	0.12	0.77
CB-98	6,439	2,441	3,998	0.15	0.67
CB-99	8,654	2,530	6,124	0.20	0.72
CB-100	7,293	1,816	5,477	0.17	0.75
CB-101	8,310	2,021	6,289	0.19	0.75
CB-102	13,322	4,903	8,419	0.31	0.68
CB-103	8,495	2,493	6,002	0.20	0.72
CB-104	17,917	3,917	14,000	0.41	0.77
CB-105	13,339	3,848	9,491	0.31	0.73
CB-106	11,186	3,942	7,244	0.26	0.69
CB-107	2,804	2,744	60	0.06	0.31
CB-108	2,479	2,439	40	0.06	0.31
CB-109	2,727	2,727	0	0.06	0.30
CB-110	2,531	2,531	0	0.06	0.30

Preformed Scour Hole
Riprap Sizing
25 Year Storm
Based on Eq. 11.35 of ConnDOT Drainage Manual
for Type 1 Scour Holes

FES #	Pipe Size (ft)	Q (cfs)	TW (ft)	D_{50} (ft)
FES-1	2	9.42	0.3	**0.33**
FES-2	1	2.94	0.3	**0.17**
FES-3	2	5.84	0.3	**0.17**
FES-4	2.5	12.85	0.3	**0.37**
FES-5	2	2.00	0.3	**0.04**
FES-6	1	3.28	0.3	**0.20**
FES-7	2.5	4.52	0.3	**0.09**
FES-8	1.25	3.51	0.3	**0.16**
FES-9B	3	11.52	0.3	**0.25**
FES-10	1	3.56	0.3	**0.23**
FES-11	1.25	2.56	0.3	**0.11**
FES-12	1	1.23	0.3	**0.05**
FES-13	1	2.67	0.3	**0.15**
FES-14	1	1.84	0.3	**0.09**
FES-15	1.5	2.18	0.3	**0.07**
FES-16	2.5	8.73	0.3	**0.22**
FES-17	1	1.72	0.3	**0.09**
FES-18	1	2.67	0.3	**0.15**
FES-19	1.25	1.19	0.3	**0.04**
FES-20	1	2.67	0.3	**0.15**
FES-21	1	1.69	0.3	**0.08**
FES-22	1.5	2.67	0.3	**0.09**
FES-23	1.5	2.00	0.3	**0.06**
FES-24	1.5	3.60	0.3	**0.13**
FES-25	1	0.01	0.3	**0.00**

* Assume 0.3' (4") tailwater at all FES

Empirical Preformed Scour Hole Equations:

Type 1: Scour Hole Depression = one-half pipe rise, m (ft)

$$d_{50} = (0.0276\ R_p^2 / TW)\ (Q/R_p^{2.5})^{1.333} \qquad (\ d_{50} = (0.0125 R_p^2/TW)\ (Q/R_p^{2.5})^{1.333}\ ) \qquad \textbf{(11.35)}$$

Type 2: Scour Hole Depression = full pipe rise, m (ft)

$$d_{50} = (0.0181\ R_p^2 / TW)\ (Q/R_p^{2.5})^{1.333} \qquad (\ d_{50} = (0.0082 R_p^2/TW)\ (Q/R_p^{2.5})^{1.333}) \qquad \textbf{(11.36)}$$

d_{50} = median stone size required, m (ft)

For variables S_p, R_p, TW and Q, see Section 11.13.5.

Type 1 and 2 preformed scour hole dimensions (See Figure 11-15)

$C = 3S_p + 6F$ Basin Length m (ft)
$B = 2S_p + 6F$ Basin Inlet and Outlet Width m (ft) **(11.37)**
$F = 0.5R_p$ (Type 1) or R_p (Type 2) Basin Depression m (ft)

Table 11-14 solves the above set of equations for Type 1 and 2 preformed scour holes for various pipe sizes.

The type of riprap required is as follows:

Modified	$d_{50} < 0.13$m (0.42 ft)
Intermediate	0.13m (0.42 ft) $< d_{50} <$ 0.20m (0.67 ft)
Standard	0.20m (0.67 ft) $< d_{50} <$ 0.38m (1.25 ft)
Special Design	0.38m (1.25 ft) $< d_{50}$

Reference: Report No. FHWA-RD-75-508 ("Culvert Outlet Protection Design: Computer Program Documentation")

OUTLET PROTECTION
OUTLET VELOCITY > 14 feet/sec or Length of Apron exceeds limits shown on Tables 11-12.1 and 11-13.1

Preformed Scour Hole										
(See Figure 11-15)	PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
Type 1										
B	5	6	8	10	13	15	18	20	23	25
C	6	8	9	12	15	18	21	24	27	30
d	Depends on riprap type(see Figure 11-15)									
$2S_p$	2.0	2.6	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
$3S_p$	3.0	3.9	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
$F = 0.5\ S_p$	0.5	0.625	0.75	1	1.25	1.5	1.75	2	2.25	2.5
Type 2										
B	8	10	12	16	20	24	28	32	36	40
C	9	11	14	18	23	27	32	36	41	45
d	Depends on riprap size (see Figure 11-15)									
$2S_p$	2.0	2.6	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
$3S_p$	3.0	3.9	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
$F = S_p$	1.0	1.3	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0

Table 11-14.1 - Dimensions of Preformed Scour Hole (Feet)

GROUNDWATER MOUNDING ANALYSIS PARAMETERS
GLEN ELLEN
MILLIS, MA

	Estimated Groundwater Separation				Basin Properties					Mounding Analysis								
Basin #	Basin Btm. Elev. (ft)	Estimated Seasonal High GW Elev.	Estimated Seasonal High Depth to GW	Mounding Analysis Required?	Basin Btm. Area (sf)	Elevation of Lowest Outlet (ft)	Infiltration Area Storage Volume (cf) (1)	Design Infiltration Rate (in/hr)	Draw Down Time (hr) (2)	Design Infiltration Rate (ft/day)	Basin Length A (ft)	Basin Width B (ft)	Hydraulic Conductivity (ft/day)	Initial Saturated Thickness (ft)	Specific Yield	Time (days)	Time When Infiltration Stops (days) (2)	Computed Water Table Rise (ft)
POA-1																		
B1	144.50	142.43	2.07	YES	18,491	145.90	28,283	2.41	7.62	4.82	185	100	39.00	40	0.28	3	0.32	0.48
B2	145.00	141.50	3.50	YES	12,164	146.80	27,437	1.02	26.54	2.04	120	100	39.00	20	0.28	3	1.11	1.04
B3	146.00	143.00	3.00	YES	26,149	148.00	61,254	0.52	54.06	1.04	185	140	39.00	20	0.28	3	2.25	2.77
B4	154.00	151.50	2.50	YES	3,033	155.50	5,522	2.41	9.07	4.82	60	50	39.00	20	0.28	3	0.38	0.19
B5	160.00	148.00	12.00	NO														
B6	171.00	150.00	21.00	NO														
B7	171.00	150.00	21.00	NO														
B8	148.50	146.30	2.20	YES	15,240	151.00	53,541	2.41	17.49	4.82	150	100	39.00	20	0.28	3	0.73	1.80
B15	164.00	152.92	11.08	NO														
B19	161.00	154.00	7.00	NO														
POA-4																		
B9	160.00	154.00	6.00	NO														
B10	150.50	146.83	3.67	YES	9,138	152.85	26,562	1.02	34.20	2.04	100	90	39.00	20	0.28	3	1.42	1.10
B11	144.00	140.50	3.50	YES	575	146.25	2,987	2.41	25.87	4.82	20	30	39.00	20	0.28	3	1.08	0.13
B12	154.50	152.00	2.50	YES	5,451	157.00	19,277	2.41	17.61	4.82	100	55	39.00	10	0.28	3	0.73	1.32
B13	169.00	154.00	15.00	NO														
POA-7																		
B24	150.00	145.00	5.00	NO														
POA-8																		
B14	157.50	155.00	2.50	YES	4,484	160.00	17,323	1.02	45.45	2.04	30	150	39.00	8	0.28	3	1.89	1.71
B16	166.00	164.00	2.00	YES	934	167.50	7,938	2.41	42.32	4.82	10	90	39.00	10	0.28	3	1.76	0.71
POA-9																		
B17	166.00	155.00	11.00	NO														
B18	156.00	148.00	8.00	NO														

Notes
1. Volume below lowest outlet
2. Time to 0 discharge is calculated draw down time
3. 72 hour calculation time based on DEP requirement to drain BMP in 72 hours
4. Mounding analysis calucated using the Hantush (1967) method. Automated calculater available online from the Aquifer Test forum sponsored by HydroSOLVE, Inc.

APPENDIX G – OPERATIONS AND MAINTENANCE PLAN

- STORMWATER OPERATION AND MAINTENANCE PLAN
- STORMWATER MANAGEMENT SYSTEM POST CONSTRUCTION INSPECTION REPORT
- STORMWATER INSPECTION AND MAINTENANCE LOG FORM
- LONG TERM POLLUTION PREVENTION PLAN
- ILLICIT DISCHARGE STATEMENT
- SPILL PREVENTION AND RESPONSE PROCEDURE (POST CONSTRUCTION)
- SPILL PREVENTION AND CONTROL COUNTERMEASURE FORM

STORMWATER OPERATION & MAINTENANCE PLAN

Toll Brothers, Inc.
250 Gibraltar Road
Horsham, PA

RESPONSIBLE PARTY DURING CONSTRUCTION:

Contractor,
To be selected by Owner

RESPONSIBLE PARTY POST CONSTRUCTION:

Toll Brothers, Inc.
250 Gibraltar Road
Horsham, PA
and/or
Glen Ellen
Condominium Association

Construction Phase

During the construction phase, all erosion control devices and measures shall be maintained in accordance with the final record plans, local/state approvals and conditions, the EPA Construction General Permit and the Stormwater Pollution Prevention Plan (SWPPP). Additionally, the maintenance of all erosion / siltation control measures during construction shall be the responsibility of the general contractor. Contact information of the OWNER and CONTRACTOR shall be listed in the SWPPP for this site. The SWPPP also includes information regarding construction period allowable and illicit discharges, housekeeping, and emergency response procedures. Upon proper notice to the property owner, an authorized designee of the municipality shall be allowed to enter the property at a reasonable time and in a reasonable manner for the purposes of inspection and shall perform said inspection accompanied by a representative of the Owner.

Post Development Controls

Once construction is completed, the post development stormwater controls are to be operated and maintained in compliance with the following permanent procedures (note that the continued implementation of these procedures shall be the responsibility of the Owner or its assignee):

1. Catch basins, yard drains, manholes and piping: Inspect four times per year and at the end of foliage and snow-removal seasons. These features shall be cleaned four times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the catch basin or underground system. Accumulated sediment and hydrocarbons present must be removed and properly disposed of off site in accordance with MassDEP and other applicable requirements.

2. Water Quality Unit (Proprietary Separator): Follow manufacturer's recommendations (attached).

3. Sediment Forebay: The sediment forebay areas shall be inspected once per month to ensure they are operating as intended and that all components are stable and in working order. Inspections shall be by qualified personnel. During the growing season, the forebay shall be mowed at least twice, with

additional cuttings performed as needed. All vegetation (i.e. tree saplings) will be removed from embankments and the forebay bottom. The inlet to the forebay shall be inspected for erosion and sedimentation, and rip-rap shall be promptly repaired as needed. Sediment forebays shall be cleaned quarterly and when sediment depth reaches half the height of the stone weir, or three to six feet, whichever is less. After sediment is removed, replace any vegetation damaged during the clean out by either reseeding or re-sodding. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements.

4. Infiltration Basins: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter, and after every time drainage discharges through the high outlet orifice/grate or overflow spillway are observed. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months. Mow the side slopes and basin bottom of grassed floor, rake if stone or sand bottom, remove trash and debris, remove grass clippings and accumulated organic matter. Removal of sediment and/or other deris shall be disposed of in accordance with MassDEP and other applicable requirements.

5. Underground Infiltration Basin: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter, and after every time drainage discharges through the high outlet orifice/grate or overflow spillway are observed. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months. The outlet of the basin, if any, shall be inspected for erosion and sedimentation, and rip-rap shall be promptly repaired in the case of erosion, if applicable. Sediment collecting in the bottom of the basin shall be inspected twice annually, and removal shall commence any time the sediment reaches a depth of six inches anywhere in the basin. Removal of sediment and/or other debris shall be disposed of in accordance with MassDEP and other applicable requirements.

STORMWATER MANAGEMENT SYSTEM
POST-CONSTRUCTION INSPECTION REPORT

LOCATION:
Glen Ellen Senior Residential Community Development
Orchard Street
Millis, Massachusetts

RESPONSIBLE PARTY:
Toll Brothers, Inc.
250 Gibraltar Road
Horsham, PA
and/or
Glen Ellen Condominium Association

NAME OF INSPECTOR:	INSPECTION DATE:
Note Condition of the Following (sediment depth, debris, standing water, damage, etc.):	
Catch Basins:	
Discharge Points:	
Sediment Forebay:	
Infiltration Basin:	
Water Quality Units:	
Basin Outlet(s):	

Other:
Note Recommended Actions to be taken on the Following (sediment and/or debris removal, repairs, etc.):
Catch Basins:
Discharge Points:
Sediment Forebay:
Infiltration Basin:
Water Quality Units:
Basin Outlet(s):
Other:

STORMWATER MANAGEMENT SYSTEM
POST-CONSTRUCTION INSPECTION REPORT

Comments:

STORMWATER INSPECTION AND MAINTENANCE LOG FORM

Glen Ellen Senior Residential Community Development
Orchard Street – Millis, MA

Stormwater Management Practice	Responsible Party	Date	Maintenance Activity Performed

LONG-TERM POLLUTION PREVENTION PLAN

Glen Ellen Senior Residential Development
Orchard Street
Millis, MA

RESPONSIBLE PARTY:

Toll Brothers, Inc.
250 Gibraltar Road
Horsham, PA
and/or
Glen Ellen Condominium Association

For this site, the Long-Term Pollution Prevention Plan will consist of the following:

- The property owner shall be responsible for "good housekeeping" including proper periodic maintenance of building and pavement areas, curbing, landscaping, etc.
- Regular inspections and maintenance of Stormwater Management System as noted in the "O&M Plan".
- Snow removal shall be the responsibility of the property owner. Snow shall not be plowed, dumped and/or placed in infiltration basins or similar stormwater controls. Salting and/or sanding of pavement / walkway areas during winter conditions shall be done in accordance with all state/local requirements and approvals.
- Reseed any bare areas as soon as they occur. Erosion control measures shall be installed in these areas to prevent deposits of sediment from entering the drainage system.
- Grass shall be maintained at a minimum blade height of two to three inches and only 1/3 of the plant height shall be removed at a time.
- Plants shall be pruned as necessary.
- The use of fertilizers will be kept at a level consistent with typical residential use. Fertilizer will be applied a maximum of once to twice per year during the initial planting and stabilization of landscaped areas. Once plants are established and growing well, fertilizer will be applied judiciously.
- The use of pesticides will be kept at a level consistent with typical residential use. Where possible mechanical methods (i.e. pest traps) or biological methods (i.e. beneficial insects) of pest control shall be implemented, in accordance with all regulations governing same. If pesticides (insecticide, herbicide, and fungicide) are required to be used, a pesticide which poses the lowest risk to public health and the environment shall be used and shall only be applied in accordance with all regulations governing the use of same.
- Pet waste shall be disposed of in accordance with local regulations. Pet waste shall not be disposed of in a storm drain, catch basin, stormwater management area, wetland, or other drainage feature.
- Homeowners will be encouraged to implement the following methods when washing vehicles: Use soap sparingly, use a hose nozzle with a trigger to save water, and pour the bucket of soapy water down the sink when done and not in the street, or when possible, use a commercial car wash.
- Snow piles shall be located adjacent to or on pervious surfaces in upland areas. This will allow snow melt water to filter in to the soil, leaving behind sand and debris which can be removed in the springtime.
- In no case shall snow be disposed of or stored in resource areas (wetlands, floodplain, streams or other water bodies).

- In no case shall snow be disposed of or stored in the infiltration basins.
- If necessary, stockpiled snow will be removed from the Site and disposed of at an off-site location in accordance with all local, state and federal regulations.
- The amount of sand and deicing chemicals shall be kept at the minimum amount required to facilitate pedestrian and vehicle travel and shall be applied in accordance with all regulations governing the use of same.
- Sand and deicing chemicals should be stockpiled under covered storage facilities that prevent precipitation and adjacent runoff from coming in contact with said materials. Stockpile areas shall be located outside resource areas and applicable buffers associated with same.

OPERATON AND MAINTENANCE TRAINING PROGRAM

The Owner will coordinate an annual in-house training session to discuss the Operations and Maintenance Plan, the Long-Term Pollution Prevention Plan, and the Spill Prevention Plan and response procedures. Annual training will include the following:

Discuss the Operations and Maintenance Plan

- Explain the general operations of the stormwater management system and its BMPs.
- Identify potential sources of stormwater pollution and measures / methods of reducing or eliminating that pollution.
- Emphasize good housekeeping measures.

Discuss the Spill Prevention and Response Procedures

- Explain the process in the event of a spill.
- Identify potential sources of spills and procedures for cleanup and /or reporting and notification.
- Complete a yearly inventory or Materials Safety Data sheets of all tenants and confirm that no potentially harmful chemicals are in use.

ILLICIT DISCHARGE STATEMENT

Certain types of non-stormwater discharges listed below are allowed under the U.S. Environmental Protection Agency Construction General Permit. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this LTPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. Any existing illicit discharges, if discovered during the course of the work, will be reported to MassDEP and the local DPW, as applicable, to be addressed in accordance with their respective policies. No illicit discharges will be allowed in conjunction with the proposed improvements.

To the best of the engineer's knowledge, no discharges of non-stormwater related runoff are known or proposed as part of the proposed stormwater management system designed as part of this project.

Type of Allowable Non-Stormwater Discharge	**Likely to be Present at Your Site?**
Discharges from emergency fire-fighting activities	☐ YES ☒ NO
Fire hydrant flushings	☐ YES ☒ NO
Landscape irrigation	☒ YES ☐ NO
Waters used to wash vehicles and equipment	☐ YES ☒ NO
Water used to control dust	☒ YES ☐ NO
Potable water including uncontaminated water line flushings	☒ YES ☐ NO
Routine external building wash down	☐ YES ☒ NO
Pavement wash waters	☐ YES ☒ NO
Uncontaminated air conditioning or compressor condensate	☐ YES ☒ NO
Uncontaminated, non-turbid discharges of ground water or spring water	☐ YES ☒ NO
Foundation or footing drains	☒ YES ☐ NO
Construction dewatering water	☒ YES ☐ NO

Duly Acknowledged:

_____

Name & Title

SPILL PREVENTION AND RESPONSE PROCEDURES (POST-CONSTRUCTION)

In order to prevent or minimize the potential for a spill of Hazardous Substances or Oil or come into contact with stormwater, the following steps are suggested to be implemented:

1. All Hazardous Substances or Oil (such as pesticides, petroleum products, fertilizers, detergents, acids, paints, paint solvents, cleaning solvents, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.

2. The minimum practical quantity of all such materials will be kept on site and stored in accordance with all regulations governing same.

3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided on site.

4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

5. It is the OWNER's and/or condominium association's responsibility to ensure that all Hazardous Waste on site is disposed of properly by a licensed hazardous material disposal company. The OWNER and/or condominium association is responsible for not exceeding Hazardous Waste storage requirements mandated by the EPA or state and local authorities.

In the event of a spill of Hazardous Substances or Oil, the following procedures should be followed:

1. All measures should be taken to contain and abate the spill and to prevent the discharge of the Hazardous Substance or Oil to stormwater or off-site. (The spill area should be kept well ventilated and personnel should wear appropriate protective clothing to prevent injury from contact with the Hazardous Substances.)

2. For spills of less than five (5) gallons of material, proceed with source control and containment, clean-up with absorbent materials or other applicable means unless an imminent hazard or other circumstances dictate that the spill should be treated by a professional emergency response contractor.

3. For spills greater than five (5) gallons of material immediately contact the MassDEP at the toll-free 24-hour statewide emergency number: **1-888-304-1133**, the local fire department **(9-1-1)** and an approved emergency response contractor. Provide information on the type of material spilled, the location of the spill, the quantity spilled, and the time of the spill to the emergency response contractor or coordinator, and proceed with prevention, containment and/or clean-up if so desired. (Use the form provided, or similar).

4. If there is a Reportable Quantity (RQ) release, then the National Response Center should be notified immediately at (800) 424-8802; within 14 days a report should be submitted to the EPA regional office describing the release, the date and circumstances of the release and the steps taken to prevent another release. This Pollution Prevention Plan should be updated to reflect any such steps or actions taken and measures to prevent the same from reoccurring.

Glen Ellen Senior Residential Development
Orchard Street
Millis, MA

Spill Prevention Control and Countermeasure Form

Where a release containing a hazardous substance occurs, the following steps shall be taken by the facility manager and/or supervisor:

1. Immediately notify Millis Fire Department (at **9-1-1**)
2. All measures must be taken to contain and abate the spill and to prevent the discharge of the pollutant(s) to off-site locations, receiving waters, wetlands and/or resource areas.
3. Notify the Millis Emergency Management Department at (508) 376-7052

Date of spill:_____ Time:_____ Reported By:_____
Weather Conditions:_____

Material Spilled	Location of Spill	Approximate Quantity of Spill (in gallons)	Agency(s) Notified	Date of Notification

Cause of Spill:_____
_____

Measures Taken to Clean up Spill:_____
_____

Type of equipment: _____ Make: _____ Size:_____
License or S/N: _____

Location and Method of Disposal_____
_____

Procedures, method, and precautions instituted to prevent a similar occurrence from recurring:_____
_____

Additional Contact Numbers:

- DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)
  EMERGENCY PHONE: 1-888-304-1133

- NATIONAL RESPONSE CENTER
  PHONE: (800) 424-8802

- U.S. ENVIRONMENTAL PROTECTION AGENCY
  PHONE: (888) 372-7341

APPENDIX H – STORMWATER MANAGEMENT CHECKLIST

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

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

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

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

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

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

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

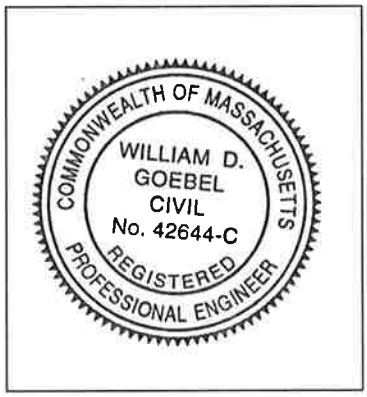
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



Signature and Date

Checklist

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

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

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

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☒ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☒ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☒ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☒ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

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

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.