DRAINAGE REPORT

FOR

Pulte Homes of New England, LLC

PROPOSED
"RESIDENCES AT QUAIL RIDGE"

Lots D-4/4, D-4/9 and C4/29
354 B Great Road and Skyline Drive
Town of Acton, Massachusetts
Middlesex County

Prepared by:

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DRAINAGE REPORT

I. INTRODUCTION

The purpose of this study is to analyze the stormwater drainage conditions that will occur as a result of the development of a 155 acre site located at 354 B Great Road and Skyline Drive in Acton, MA. The property is listed as Lots D-4/4. D-4/9 and C-4/29 on the Acton Town Atlas. The site is located off of Skyline Drive in Acton, MA and presently contains an existing 18 hole golf course with related appurtenances such as tennis courts, a family center, a swimming facility, parking areas and out buildings for maintenance equipment. This proposal is to convert 9 of the 18 holes of the Quail Ridge Country Club into a Senior Residential Development. Nine holes of the existing golf course will be preserved as well as the family center, tennis courts, swimming pool, parking lot and appurtenances. A restaurant will be added and there will be a total of 153 new residential units.

The Stormwater Analysis and design was performed by comparing the proposed development to the site prior to development of the golf course. Previously reviewed and approved by the Town of Acton, was the drainage analysis that was performed for the subject which was developed by Stamski and McNary, Inc and was entitled "drainage Calculations for the residences at Quail Ridge" Dated July 20, 2007 and revised December 21, 2007. The above referenced report was reviewed and the design data confirmed and utilized forin the development of the following Drainage Analysis

This report addresses a comparative analysis of the pre- and post-development site runoff conditions, with the primary focus being no increases in peak runoff rates exiting the site for the 2-, 10-, and 100-year storm events. Additionally, steps taken toward meeting the total suspended solid (TSS) removal requirements, as referenced within the MADEP Stormwater Management Handbook, are also addressed within this report. Lastly, this report provides calculations documenting the design of the proposed stormwater conveyance/management system as illustrated within the accompanying Site Engineering Documents prepared by Bohler Engineering. The project will also provide erosion and sedimentation controls during the demolition and construction periods, as well as long term stabilization of the site.

II. EXISTING SITE CONDITIONS

The subject property currently contains 155 acres of lands being utilized as an 18 hole golf course, however the predevelopment condition that was considered was the undeveloped lands prior to the construction of the golf course. The predevelopment drainage analysis was derived by reviewing and maintaining existing design criteria that was previously utilized, reviewed and approved for the project. The information was taken specifically from the drainage report entitled "The Residences at Quail Ridge, Acton, MA" dated July 20, 2077 and revised through December 21, 2007 prepared by Stamski and McNary, Inc.

Based upon the Natural Resources Conservation Services, soils onsite consist of Scarboro mucky fine sandy loam, Wareham loamy fine sand, Whitman fine sandy loam, Charlton Hollies rock outcrop complex, Hinckley Loamy sand and Scituate fine sandy loam. These soils have been assigned to Hydrological Groups D, C,D,B, c, A and C respectively.

The predevelopment conditions (prior to the golf course) consist of a dog kennel, wetlands, some open grass areas and primarily woods. Skyline Drive was essentially a driveway at that time servicing 3 residential homes.

Nagog Brook, which was determined to be intermittent during the permitting of the golf course , flows through the site. Will's Hole Brook, which was found to be perennial and flows through the site and joins Nagog Brook prior to joining Nashoba Brook. All of the site runoff drainage converges to one point, and that point being the location where Nagog Brook discharges off the property along the southern property line.

III. PROPOSED SITE CONDITIONS

The post-development features associated with the proposed development of this property consist primarily of the construction of 153 residential, age restricted, town house style units, site roadways, utilities, drainage infrastructure and site appurtenances. Nine of the 18 holes of the existing golf course will remain along with the family center, tennis courts and parking areas for the course. The site will also contain a new restaurant in lieu of the previously proposed club house.

IV. Compliance with Massachusetts Stream Crossing Standards

This report has been developed for the consideration of the request for an Amendment to the Order of Conditions (DEP #85-986) for the previously approved Residences at Quail Ridge development that consisted of 174 age restricted units. No modification to the proposed wetland stream crossing is proposed with the request for amendment. It is anticipated that the previously approved wetland fill areas, replication areas and the design of the culvert bottom wetland crossing will be part of the Amended Order of Conditions.

V. METHODOLOGY

Methodology utilized to design the stormwater management system associated with this project includes compliance with the guidelines set forth in the latest edition of Massachusetts DEP Stormwater Handbook. The proposed stormwater management design will provide a decrease in peak stormwater runoff rates from the proposed facility for the 2, 10 and 100-year design storm events utilizing the SCS TR-55 Urban Hydrology for Small Watersheds method. Lastly, as previously referenced, the proposed design includes the implementation of several BMP's designed to improve the quality of water runoff.

Times of concentration (Tc) utilized in the preparation of this report were generated utilizing the SCS TR-55 Urban Hydrology for Small Watersheds method. Runoff coefficients for the pre- and post-development conditions were calculated using widely accepted, and often utilized runoff coefficients and have been documented within the Appendices of this report.

Various hydrographs, illustrating the existing and proposed development conditions associated with the proposed redevelopment of this property were also created and have been included within the Appendices of this report. Specifically included are existing and proposed hydrograph reports, a site specific hydrograph summary report, on-site soil evaluation results, site location information, and other maps/information prepared to directly support the design conclusions contained within this report.

VI. Compliance with MA DEP Stormwater Management Policy

Additionally, the proposed project meets or exceeds the MADEP Stormwater Management Guidelines based on the following information:

1. MADEP Standard #1: No new Untreated Discharges – The project has been designed so that all proposed pavement areas including parking and driveway areas shall be collected and passed through the storm drain system for treatment. Runoff will be treated with a combination of BMPS including catch basins, Stormceptor Units, infiltration basins. infiltration trenches. water quality swales, detention basins and street sweeping.

2. MADEP Standard #2: Peak Rate Attenuation – The proposed stormwater system has been designed to provide peak rate attenuation with no increases in peak runoff rate for the 2-, 10- and 100-year storm events.

	2 year Storm (cfs)	!0 Year Storm (cfs)	100 year Storm (cfs)
Predevelopment	39.14	210.58	331.81
Postdevelopment	38.84	189.81	297.87
Difference	-0.30	-20.77	-33.84

Furthermore, the 100 year storm event will not increase flooding impacts offsite. Attenuation of peak rates of discharge will be accomplished by implementing infiltration and detention basins.

3. MADEP Standard #3: Recharge – This standard prescribes the stormwater that must be infiltrated to groundwater. This is based upon the NRCS soil types for the site. The site presently consists of multiple soil types (A, B, C and D). The Stormwater Management Policy which the original Notice of Intent was filed under required 0.4, 0.25, 0.1 and 0.0 inches of runoff times the impervious area to be infiltrated in areas with soils of respective hydrologic groups. Furthermore the Towns regulations require that Water Balance calculations be prepared to preserve groundwater supply. Detailed “Water Balance Calculations” showing compliance are attached.

4. MADEP Standard #4: Water Quality – 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 street sweeping, deep-sump hooded catch basins, Stormceptor Treatment Units and infiltration practices.

5. MADEP Standard #5: Land Uses With Higher Potential Pollutant Loads – The proposed development is not considered a land use with higher potential pollutant loadings.

6. MADEP Standard #6: Critical Areas – All of the proposed point source discharges that will treat runoff from impervious surfaces are outside “Critical Areas”.

7. MADEP Standard #7: Redevelopments – N/A - This project is not a redevelopment site.

8. MADEP Standard #8: Construction Period Pollution Prevention and Erosion and Sedimentation Control – The proposed project will provide construction period erosion and sedimentation controls as indicated within the site plan set provided for this project. This includes implementation of a perimeter erosion control barrier consisting of hay bales and/or silt fence, as well as a proposed construction entrance, protection for catch basin inlets, protection around temporary material stock piles and various other techniques as outlined on the erosion and sediment control sheets. Additionally, the project is required to file a Notice of Intent with the US EPA and implement a Stormwater Pollution Prevention Plan (SWPPP) during the construction period. The SWPPP will 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.

9. MADEP Standard #9: Operation and Maintenance (O&M) Plan – An 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 and an estimated budget for inspections and maintenance.

10. MADEP Standard #10 Prohibition of Illicit Discharges: The proposed stormwater system will convey only stormwater and allowable non-storm discharges (fire fighting water, landscape irrigation, air conditioning condensate, etc.) and will not contain any illicit discharges from prohibited sources.

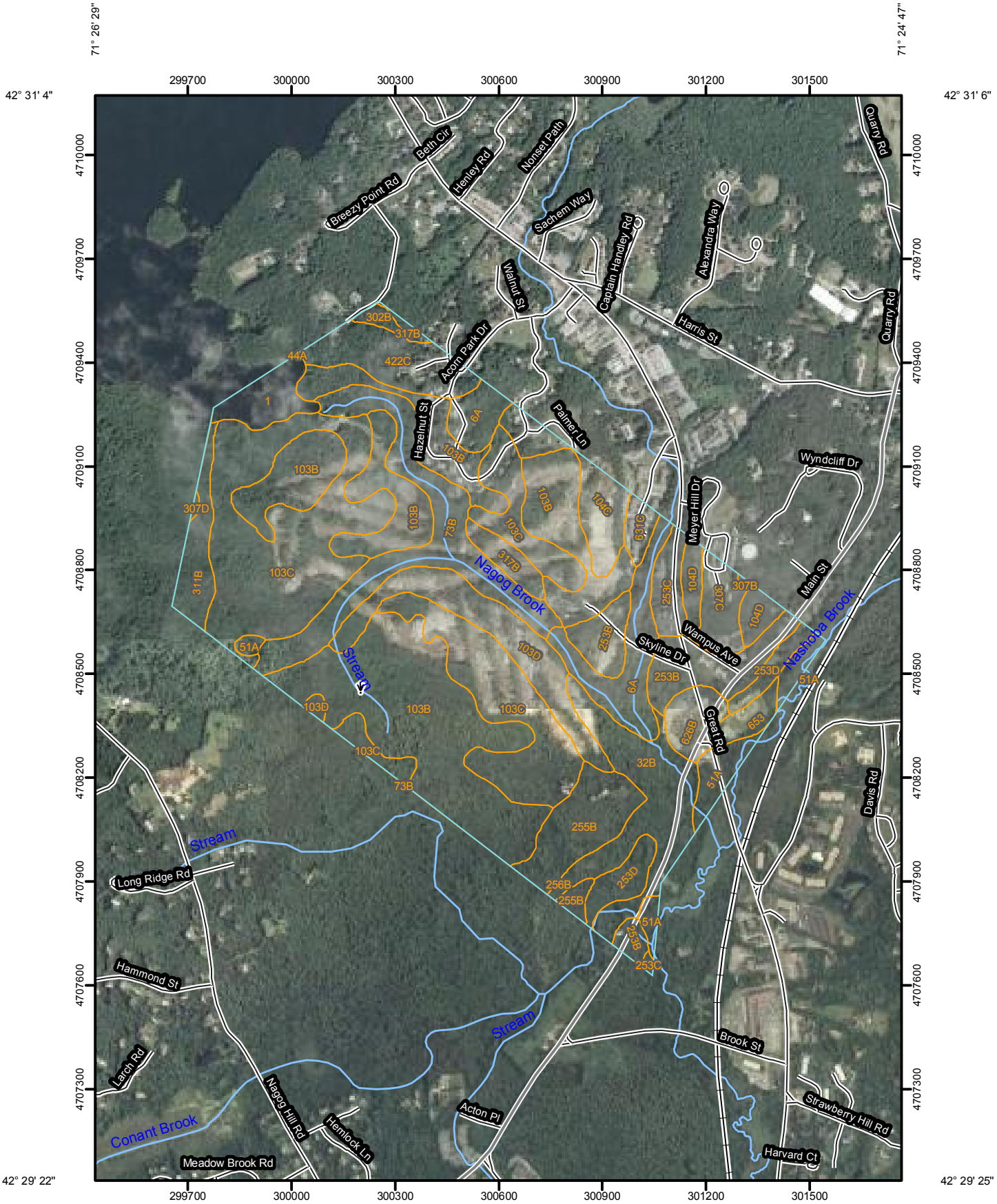
VII. CONCLUSIONS

In summary, the proposed stormwater management system design, illustrated within the Site Plan documents prepared by Bohler Engineering results in no increase in stormwater peak runoff rates from the subject site when compared to pre-development conditions for the 2, 10, and 100-year storm frequencies. In addition, the best management practices being implemented as part of the proposed stormwater management system design will result in a significant removal of total suspended solids (TSS). As a result, the project meets and exceeds the requirements of the Massachusetts Department of Environmental Protection Stormwater Management Guidelines. The pre-development versus post-development peak discharge rate comparisons are contained within Table 3 below, in cubic-feet per second (cfs):

Table 3

	2 year Storm (cfs)	!0 Year Storm (cfs)	100 year Storm (cfs)
Predevelopment	39.14	210.58	331.81
Postdevelopment	38.84	189.81	297.87
Difference	-0.30	-20.77	-33.84

APPENDIX 1


71° 26' 29"
71° 24' 47"
42° 31' 4"
42° 31' 6"
299700
300000
300300
300600
300900
301200
301500
4710000
4709700
4709400
4709100
4708800
4708500
4708200
4707900
4707600
4707300
42° 29' 22"
42° 29' 25"
71° 26' 25"
71° 24' 43"
Breezy Point Rd
Beth Cir
Henley Rd
Nonset Path
Quarry Rd
Sachem Way
Captain Handley Rd
Alexandra Way
Walnut St
Harris St
Acorn Park Dr
Hazelnut St
Palmer Ln
Wyndcliff Dr
Meyer Hill Dr
Main St
Nagog Brook
Nashoba Brook
Stream
Skyline Dr
Wampus Ave
Great Rd
Davis Rd
Long Ridge Rd
Hammond St
Larch Rd
Nagog Hill Rd
Hemlock Ln
Acton Pl
Brook St
Strawberry Hill Rd
Harvard Ct
Conant Brook
Meadow Brook Rd
302B
317B
44A
422C
1
6A
103B
104B
307D
73B
103C
103D
311B
51A
104C
631C
253C
104D
307C
307B
253B
253D
626B
653
32B
255B
256B
253C
N
Map Scale: 1:15,000 if printed on A size (8.5" x 11") sheet.
Meters
0 100 200 400 600
Feet
0 500 1,000 2,000 3,000

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Gully

Short Steep Slope

Other

Political Features

Cities

Water Features

Oceans

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:15,000 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:25,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 12, Feb 26, 2010

Date(s) aerial images were photographed: 7/28/2003; 8/14/2003; 7/10/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Middlesex County, Massachusetts (MA017)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1	Water	8.2	1.8%
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	21.7	4.7%
32B	Wareham loamy fine sand, 0 to 5 percent slopes	26.7	5.8%
44A	Birdsall mucky silt loam, 0 to 1 percent slopes	0.0	0.0%
51A	Swansea muck, 0 to 1 percent slopes	10.7	2.3%
73B	Whitman fine sandy loam, 0 to 5 percent slopes, extremely stony	33.1	7.2%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	112.8	24.4%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	97.5	21.1%
103D	Charlton-Hollis-Rock outcrop complex, 15 to 25 percent slopes	22.2	4.8%
104C	Hollis-Rock outcrop-Charlton complex, 3 to 15 percent slopes	12.5	2.7%
104D	Hollis-Rock outcrop-Charlton complex, 15 to 25 percent slopes	6.7	1.5%
253B	Hinckley loamy sand, 3 to 8 percent slopes	22.2	4.8%
253C	Hinckley loamy sand, 8 to 15 percent slopes	6.5	1.4%
253D	Hinckley loamy sand, 15 to 25 percent slopes	9.4	2.0%
255B	Windsor loamy sand, 3 to 8 percent slopes	17.4	3.8%
256B	Deerfield loamy sand, 3 to 8 percent slopes	0.4	0.1%
302B	Montauk fine sandy loam, 3 to 8 percent slopes, extremely stony	1.5	0.3%
307B	Paxton fine sandy loam, 3 to 8 percent slopes, extremely stony	0.3	0.1%
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	7.9	1.7%
307D	Paxton fine sandy loam, 15 to 25 percent slopes, extremely stony	0.3	0.1%
311B	Woodbridge fine sandy loam, 3 to 8 percent slopes, very stony	8.6	1.9%
317B	Scituate fine sandy loam, 3 to 8 percent slopes, extremely stony	5.6	1.2%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	15.2	3.3%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	7.0	1.5%
631C	Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky	3.2	0.7%

Middlesex County, Massachusetts (MA017)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
653	Udorthents, sandy	4.1	0.9%
Totals for Area of Interest		**461.7**	**100.0%**

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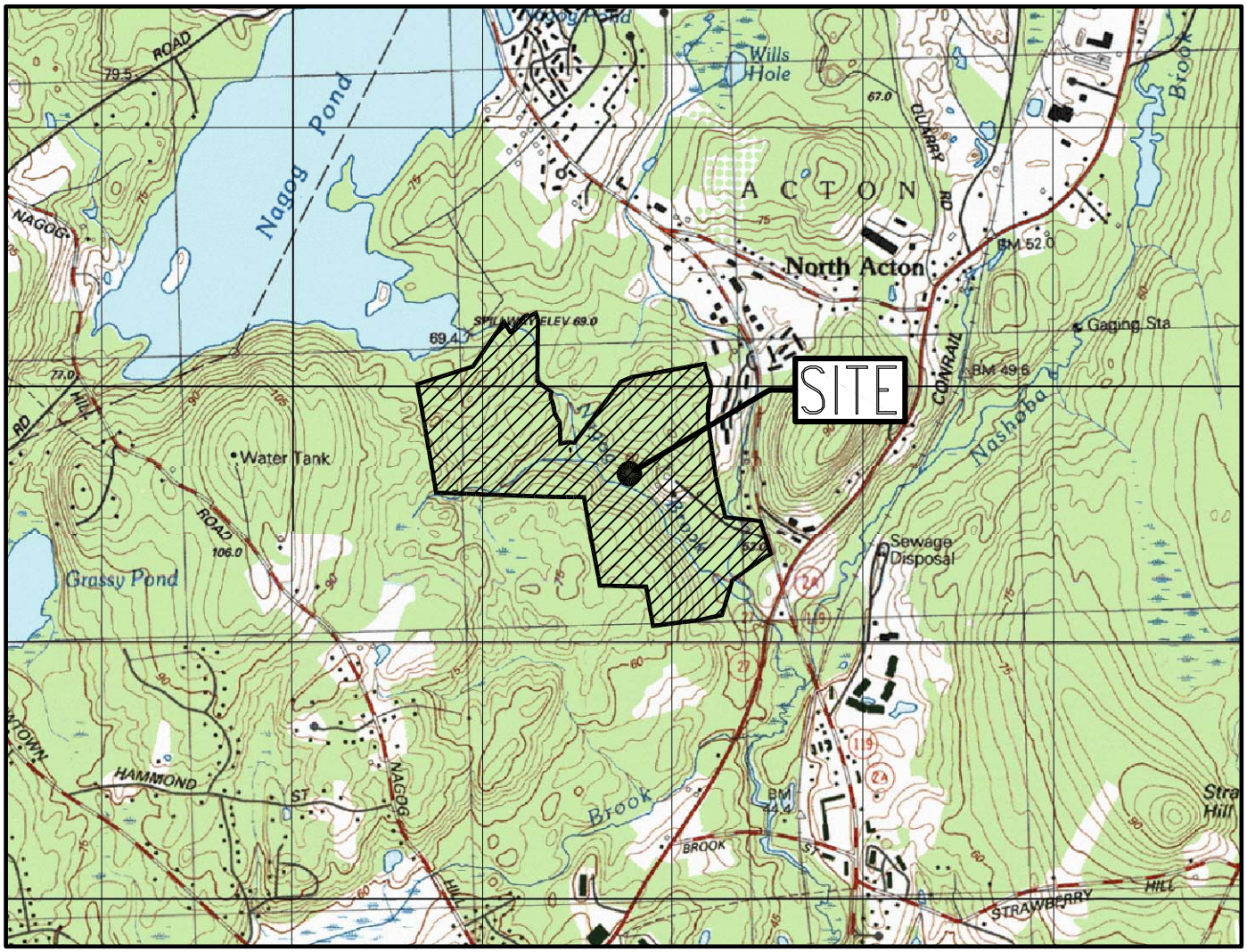
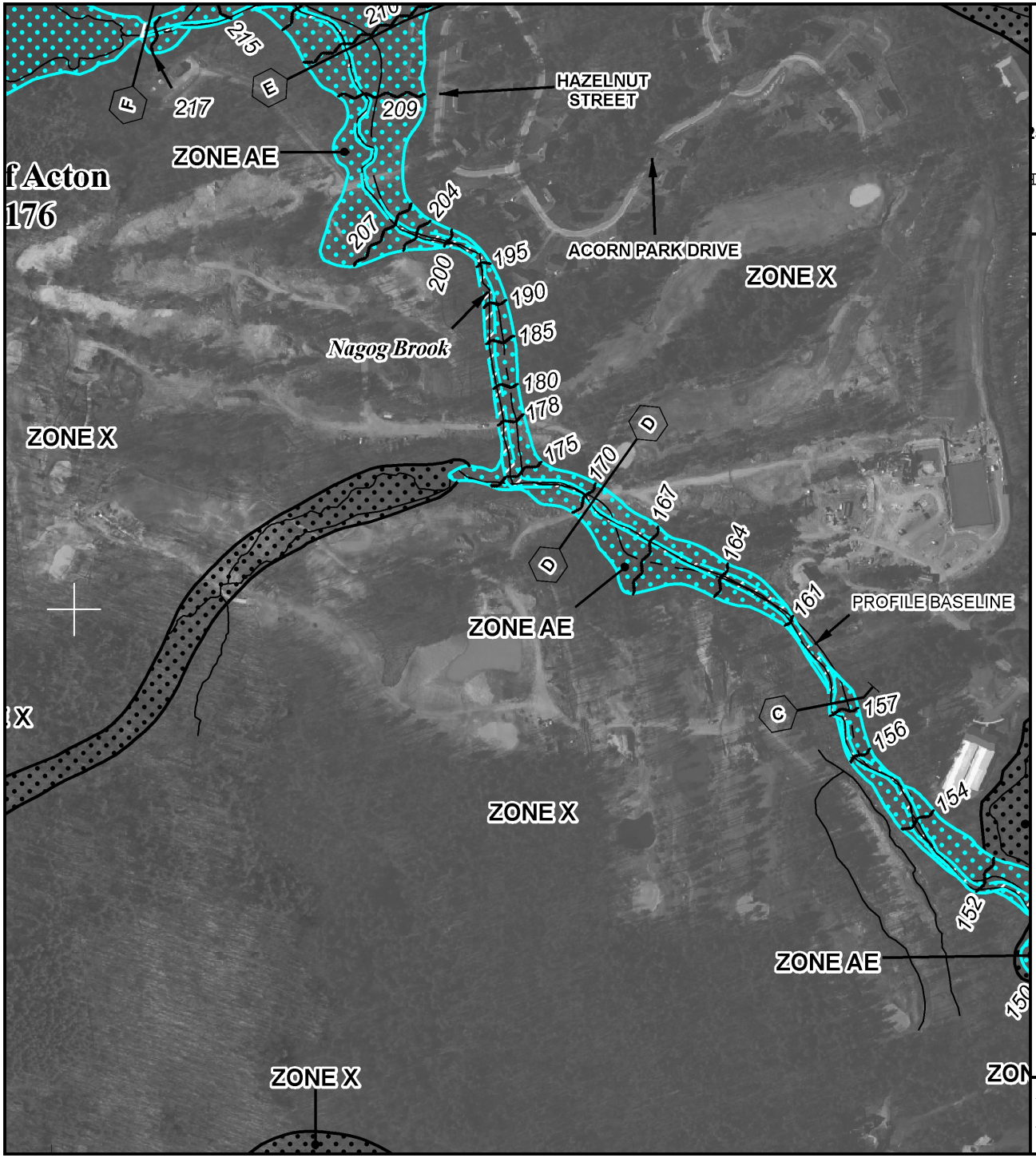


USGS MAP

1"=2000'±

THE RESIDENCES AT QUAIL RIDGE

354 B GREAT ROAD & SKYLINE DRIVE
TOWN OF ACTON
MIDDLESEX COUNTY, MA



MAP SCALE 1" = 500'

250 0 500 1000

FEET

METER

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

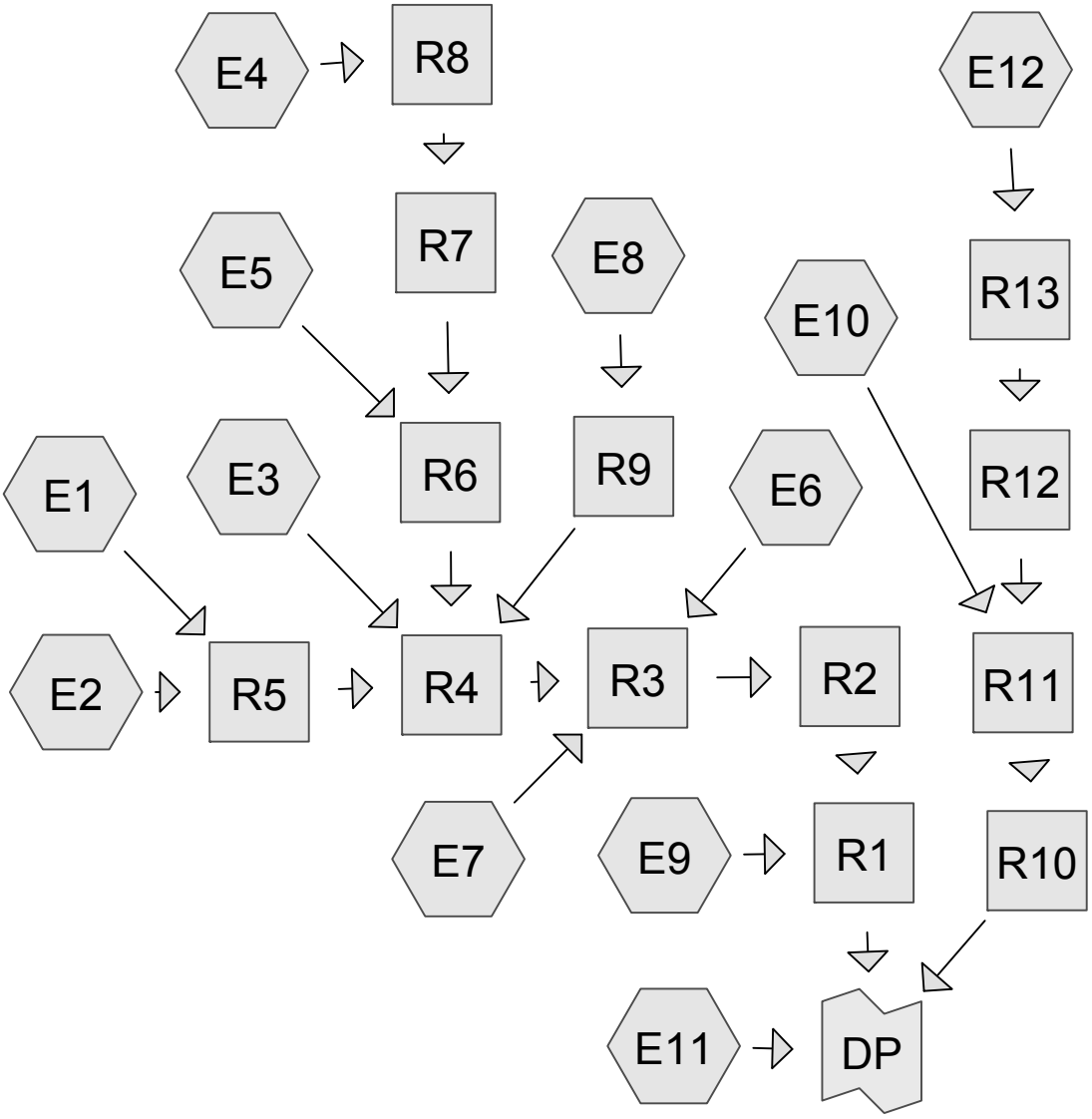
COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

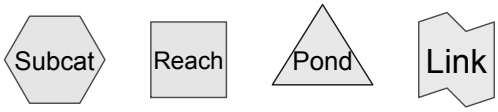
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX 2



Final Analysis Design Point



Drainage Diagram for PULTE-EXIST-MODEL-July-2011
Prepared by Bohler Engineering, Printed 6/30/2011
HydroCAD® 9.00 s/n 02612 © 2009 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
26.470	57	(E7, E8)
18.310	60	(E3, E4)
54.520	61	(E1, E11, E2)
9.500	63	(E5)
17.660	64	(E6)
44.430	65	(E10, E9)
2.830	67	(E12)
173.720		**TOTAL AREA**

Summary for Subcatchment E1:

Runoff = 4.72 cfs @ 12.27 hrs, Volume= 0.666 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
18.620	61	
18.620		100.00% Pervious Area

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

Summary for Subcatchment E10:

Runoff = 4.54 cfs @ 12.22 hrs, Volume= 0.525 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
10.900	65	
10.900		100.00% Pervious Area

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

Summary for Subcatchment E11:

Runoff = 5.89 cfs @ 12.36 hrs, Volume= 0.902 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
25.210	61	
25.210		100.00% Pervious Area

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

Summary for Subcatchment E12:

Runoff = 1.50 cfs @ 12.19 hrs, Volume= 0.156 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
2.830	67	
2.830		100.00% Pervious Area

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

Summary for Subcatchment E2:

Runoff = 2.87 cfs @ 12.22 hrs, Volume= 0.382 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
10.690	61	
10.690		100.00% Pervious Area

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

Summary for Subcatchment E3:

Runoff = 3.27 cfs @ 12.27 hrs, Volume= 0.484 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
14.690	60	
14.690		100.00% Pervious Area

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

Summary for Subcatchment E4:

Runoff = 0.77 cfs @ 12.32 hrs, Volume= 0.119 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
3.620	60	
3.620		100.00% Pervious Area

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

Summary for Subcatchment E5:

Runoff = 3.13 cfs @ 12.24 hrs, Volume= 0.397 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
9.500	63	
9.500		100.00% Pervious Area

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

Summary for Subcatchment E6:

Runoff = 6.54 cfs @ 12.23 hrs, Volume= 0.793 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
17.660	64	
17.660		100.00% Pervious Area

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

Summary for Subcatchment E7:

Runoff = 2.49 cfs @ 12.43 hrs, Volume= 0.471 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
18.740	57	
18.740		100.00% Pervious Area

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

Summary for Subcatchment E8:

Runoff = 1.02 cfs @ 12.44 hrs, Volume= 0.194 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
7.730	57	
7.730		100.00% Pervious Area

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

Summary for Subcatchment E9:

Runoff = 11.58 cfs @ 12.38 hrs, Volume= 1.615 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (ac)	CN	Description
33.530	65	
33.530		100.00% Pervious Area

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

Summary for Reach R1:

Inflow Area = 134.780 ac, 0.00% Impervious, Inflow Depth = 0.46" for 2 yr. event
Inflow = 30.18 cfs @ 12.49 hrs, Volume= 5.122 af
Outflow = 29.92 cfs @ 12.53 hrs, Volume= 5.122 af, Atten= 1%, Lag= 2.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.60 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 12.5 min

Peak Storage= 5,479 cf @ 12.53 hrs, Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 381.54 cfs

25.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 33.00'
Length= 477.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -2.86'

‡

Summary for Reach R10:

Inflow Area = 13.730 ac, 0.00% Impervious, Inflow Depth = 0.60" for 2 yr. event
Inflow = 4.01 cfs @ 12.50 hrs, Volume= 0.681 af
Outflow = 3.99 cfs @ 12.53 hrs, Volume= 0.681 af, Atten= 0%, Lag= 1.5 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.06 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 7.3 min

Peak Storage= 579 cf @ 12.53 hrs, Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 236.56 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 300.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -3.60'

‡

Summary for Reach R11:

Inflow Area = 13.730 ac, 0.00% Impervious, Inflow Depth = 0.60" for 2 yr. event
Inflow = 5.22 cfs @ 12.27 hrs, Volume= 0.681 af
Outflow = 4.01 cfs @ 12.50 hrs, Volume= 0.681 af, Atten= 23%, Lag= 14.2 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.82 fps, Min. Travel Time= 15.8 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 57.0 min

Peak Storage= 3,808 cf @ 12.50 hrs, Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 56.30 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,733.0' Slope= 0.0080 '/'
Inlet Invert= 0.00', Outlet Invert= -13.86'

‡

Summary for Reach R12:

Inflow Area = 2.830 ac, 0.00% Impervious, Inflow Depth = 0.66" for 2 yr. event
Inflow = 1.33 cfs @ 12.27 hrs, Volume= 0.156 af
Outflow = 1.15 cfs @ 12.41 hrs, Volume= 0.156 af, Atten= 13%, Lag= 8.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.71 fps, Min. Travel Time= 8.3 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 22.3 min

Peak Storage= 574 cf @ 12.41 hrs, Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 118.76 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 855.0' Slope= 0.0320 '/'
Inlet Invert= 0.00', Outlet Invert= -27.36'

‡

Summary for Reach R13:

Inflow Area = 2.830 ac, 0.00% Impervious, Inflow Depth = 0.66" for 2 yr. event
Inflow = 1.50 cfs @ 12.19 hrs, Volume= 0.156 af
Outflow = 1.33 cfs @ 12.27 hrs, Volume= 0.156 af, Atten= 11%, Lag= 5.1 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.65 fps, Min. Travel Time= 6.6 min
Avg. Velocity = 0.53 fps, Avg. Travel Time= 20.6 min

Peak Storage= 520 cf @ 12.27 hrs, Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 0.25', Capacity at Bank-Full= 28.71 cfs

20.00' x 0.25' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 21.50'
Length= 650.0' Slope= 0.0580 '/'
Inlet Invert= 0.00', Outlet Invert= -37.70'

‡

Summary for Reach R2:

Inflow Area = 101.250 ac, 0.00% Impervious, Inflow Depth = 0.42" for 2 yr. event
Inflow = 21.26 cfs @ 12.41 hrs, Volume= 3.507 af
Outflow = 19.64 cfs @ 12.52 hrs, Volume= 3.507 af, Atten= 8%, Lag= 6.9 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.21 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.54 fps, Avg. Travel Time= 31.0 min

Peak Storage= 8,933 cf @ 12.52 hrs, Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 233.27 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 1,008.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -6.05'

‡

Summary for Reach R3:

Inflow Area = 101.250 ac, 0.00% Impervious, Inflow Depth = 0.42" for 2 yr. event
Inflow = 21.44 cfs @ 12.37 hrs, Volume= 3.507 af
Outflow = 21.26 cfs @ 12.41 hrs, Volume= 3.507 af, Atten= 1%, Lag= 2.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.08 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 11.2 min

Peak Storage= 3,686 cf @ 12.41 hrs, Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 380.87 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 535.0' Slope= 0.0160 '/'
Inlet Invert= 0.00', Outlet Invert= -8.56'

‡

Summary for Reach R4:

Inflow Area = 64.850 ac, 0.00% Impervious, Inflow Depth = 0.42" for 2 yr. event
Inflow = 13.81 cfs @ 12.32 hrs, Volume= 2.243 af
Outflow = 13.46 cfs @ 12.40 hrs, Volume= 2.243 af, Atten= 3%, Lag= 4.4 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.85 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.46 fps, Avg. Travel Time= 17.0 min

Peak Storage= 3,394 cf @ 12.40 hrs, Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 168.44 cfs

15.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 23.00'
Length= 466.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.40'

‡

Summary for Reach R5:

Inflow Area = 29.310 ac, 0.00% Impervious, Inflow Depth = 0.43" for 2 yr. event
Inflow = 7.50 cfs @ 12.25 hrs, Volume= 1.049 af
Outflow = 7.29 cfs @ 12.32 hrs, Volume= 1.049 af, Atten= 3%, Lag= 3.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.91 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 10.7 min

Peak Storage= 1,724 cf @ 12.32 hrs, Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 154.45 cfs

15.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 19.00'
Length= 690.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -19.32'

‡

Summary for Reach R6:

Inflow Area = 13.120 ac, 0.00% Impervious, Inflow Depth = 0.47" for 2 yr. event
Inflow = 3.13 cfs @ 12.24 hrs, Volume= 0.516 af
Outflow = 2.91 cfs @ 12.33 hrs, Volume= 0.516 af, Atten= 7%, Lag= 5.2 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.37 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 18.7 min

Peak Storage= 969 cf @ 12.33 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 105.34 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 790.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -22.12'

‡

Summary for Reach R7:

Inflow Area = 3.620 ac, 0.00% Impervious, Inflow Depth = 0.40" for 2 yr. event
Inflow = 0.55 cfs @ 12.59 hrs, Volume= 0.119 af
Outflow = 0.20 cfs @ 13.91 hrs, Volume= 0.119 af, Atten= 64%, Lag= 79.5 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.14 fps, Min. Travel Time= 103.4 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 151.4 min

Peak Storage= 1,242 cf @ 13.91 hrs, Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 141.72 cfs

75.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 79.00'
Length= 850.0' Slope= 0.0010 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'

Summary for Reach R8:

Inflow Area = 3.620 ac, 0.00% Impervious, Inflow Depth = 0.40" for 2 yr. event
Inflow = 0.77 cfs @ 12.32 hrs, Volume= 0.119 af
Outflow = 0.55 cfs @ 12.59 hrs, Volume= 0.119 af, Atten= 28%, Lag= 16.2 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.12 fps, Min. Travel Time= 19.4 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 42.6 min

Peak Storage= 643 cf @ 12.59 hrs, Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 89.03 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,300.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -26.00'

Summary for Reach R9:

Inflow Area = 7.730 ac, 0.00% Impervious, Inflow Depth = 0.30" for 2 yr. event
Inflow = 1.02 cfs @ 12.44 hrs, Volume= 0.194 af
Outflow = 0.92 cfs @ 12.57 hrs, Volume= 0.194 af, Atten= 10%, Lag= 7.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.55 fps, Min. Travel Time= 9.7 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 17.8 min

Peak Storage= 535 cf @ 12.57 hrs, Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 374.04 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 900.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -27.00'

‡

Summary for Link DP: Final Analysis Design Point

Inflow Area = 173.720 ac, 0.00% Impervious, Inflow Depth = 0.46" for 2 yr. event
Inflow = 39.14 cfs @ 12.51 hrs, Volume= 6.705 af
Primary = 39.14 cfs @ 12.51 hrs, Volume= 6.705 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment E1:

Runoff = 16.74 cfs @ 12.21 hrs, Volume= 1.730 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
18.620	61	
18.620		100.00% Pervious Area

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

Summary for Subcatchment E10:

Runoff = 12.73 cfs @ 12.20 hrs, Volume= 1.239 af, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
10.900	65	
10.900		100.00% Pervious Area

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

Summary for Subcatchment E11:

Runoff = 20.30 cfs @ 12.28 hrs, Volume= 2.343 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
25.210	61	
25.210		100.00% Pervious Area

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

Summary for Subcatchment E12:

Runoff = 3.91 cfs @ 12.17 hrs, Volume= 0.353 af, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
2.830	67	
2.830		100.00% Pervious Area

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

Summary for Subcatchment E2:

Runoff = 10.13 cfs @ 12.18 hrs, Volume= 0.993 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
10.690	61	
10.690		100.00% Pervious Area

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

Summary for Subcatchment E3:

Runoff = 12.56 cfs @ 12.20 hrs, Volume= 1.293 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
14.690	60	
14.690		100.00% Pervious Area

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

Summary for Subcatchment E4:

Runoff = 2.90 cfs @ 12.24 hrs, Volume= 0.319 af, Depth= 1.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
3.620	60	
3.620		100.00% Pervious Area

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

Summary for Subcatchment E5:

Runoff = 9.82 cfs @ 12.21 hrs, Volume= 0.979 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
9.500	63	
9.500		100.00% Pervious Area

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

Summary for Subcatchment E6:

Runoff = 19.43 cfs @ 12.20 hrs, Volume= 1.913 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
17.660	64	
17.660		100.00% Pervious Area

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

Summary for Subcatchment E7:

Runoff = 11.42 cfs @ 12.27 hrs, Volume= 1.384 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
18.740	57	
18.740		100.00% Pervious Area

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

Summary for Subcatchment E8:

Runoff = 4.65 cfs @ 12.28 hrs, Volume= 0.571 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
7.730	57	
7.730		100.00% Pervious Area

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

Summary for Subcatchment E9:

Runoff = 32.07 cfs @ 12.34 hrs, Volume= 3.812 af, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (ac)	CN	Description
33.530	65	
33.530		100.00% Pervious Area

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

Summary for Reach R1:

Inflow Area = 134.780 ac, 0.00% Impervious, Inflow Depth = 1.16" for 10 yr. event
Inflow = 107.57 cfs @ 12.34 hrs, Volume= 12.995 af
Outflow = 107.36 cfs @ 12.36 hrs, Volume= 12.995 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.20 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 10.2 min

Peak Storage= 12,180 cf @ 12.36 hrs, Average Depth at Peak Storage= 0.95'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 381.54 cfs

25.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 33.00'
Length= 477.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -2.86'

‡

Summary for Reach R10:

Inflow Area = 13.730 ac, 0.00% Impervious, Inflow Depth = 1.39" for 10 yr. event
Inflow = 12.90 cfs @ 12.35 hrs, Volume= 1.592 af
Outflow = 12.89 cfs @ 12.37 hrs, Volume= 1.592 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.20 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 6.1 min

Peak Storage= 1,208 cf @ 12.37 hrs, Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 236.56 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 300.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -3.60'

‡

Summary for Reach R11:

Inflow Area = 13.730 ac, 0.00% Impervious, Inflow Depth = 1.39" for 10 yr. event
Inflow = 15.61 cfs @ 12.22 hrs, Volume= 1.592 af
Outflow = 12.90 cfs @ 12.35 hrs, Volume= 1.592 af, Atten= 17%, Lag= 8.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.82 fps, Min. Travel Time= 10.3 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 46.3 min

Peak Storage= 7,942 cf @ 12.35 hrs, Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 56.30 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,733.0' Slope= 0.0080 '/'
Inlet Invert= 0.00', Outlet Invert= -13.86'

‡

Summary for Reach R12:

Inflow Area = 2.830 ac, 0.00% Impervious, Inflow Depth = 1.50" for 10 yr. event
Inflow = 3.66 cfs @ 12.22 hrs, Volume= 0.353 af
Outflow = 3.35 cfs @ 12.29 hrs, Volume= 0.353 af, Atten= 8%, Lag= 4.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.59 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 18.2 min

Peak Storage= 1,107 cf @ 12.29 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 118.76 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 855.0' Slope= 0.0320 '/'
Inlet Invert= 0.00', Outlet Invert= -27.36'

‡

Summary for Reach R13:

Inflow Area = 2.830 ac, 0.00% Impervious, Inflow Depth = 1.50" for 10 yr. event
Inflow = 3.91 cfs @ 12.17 hrs, Volume= 0.353 af
Outflow = 3.66 cfs @ 12.22 hrs, Volume= 0.353 af, Atten= 6%, Lag= 3.1 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.47 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 16.4 min

Peak Storage= 959 cf @ 12.22 hrs, Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.25', Capacity at Bank-Full= 28.71 cfs

20.00' x 0.25' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 21.50'
Length= 650.0' Slope= 0.0580 '/'
Inlet Invert= 0.00', Outlet Invert= -37.70'

‡

Summary for Reach R2:

Inflow Area = 101.250 ac, 0.00% Impervious, Inflow Depth = 1.09" for 10 yr. event
Inflow = 79.07 cfs @ 12.28 hrs, Volume= 9.183 af
Outflow = 75.50 cfs @ 12.34 hrs, Volume= 9.183 af, Atten= 5%, Lag= 4.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.69 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 25.1 min

Peak Storage= 20,601 cf @ 12.34 hrs, Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 233.27 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 1,008.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -6.05'

‡

Summary for Reach R3:

Inflow Area = 101.250 ac, 0.00% Impervious, Inflow Depth = 1.09" for 10 yr. event
Inflow = 79.91 cfs @ 12.26 hrs, Volume= 9.183 af
Outflow = 79.07 cfs @ 12.28 hrs, Volume= 9.183 af, Atten= 1%, Lag= 1.1 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.10 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 9.1 min

Peak Storage= 8,282 cf @ 12.28 hrs, Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 380.87 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 535.0' Slope= 0.0160 '/'
Inlet Invert= 0.00', Outlet Invert= -8.56'

‡

Summary for Reach R4:

Inflow Area = 64.850 ac, 0.00% Impervious, Inflow Depth = 1.09" for 10 yr. event
Inflow = 51.10 cfs @ 12.24 hrs, Volume= 5.885 af
Outflow = 50.55 cfs @ 12.27 hrs, Volume= 5.885 af, Atten= 1%, Lag= 2.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.97 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 13.8 min

Peak Storage= 7,919 cf @ 12.27 hrs, Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 168.44 cfs

15.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 23.00'
Length= 466.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.40'

‡

Summary for Reach R5:

Inflow Area = 29.310 ac, 0.00% Impervious, Inflow Depth = 1.12" for 10 yr. event
Inflow = 26.70 cfs @ 12.20 hrs, Volume= 2.724 af
Outflow = 26.11 cfs @ 12.23 hrs, Volume= 2.724 af, Atten= 2%, Lag= 1.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.75 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 8.0 min

Peak Storage= 3,785 cf @ 12.23 hrs, Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 154.45 cfs

15.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 19.00'
Length= 690.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -19.32'

‡

Summary for Reach R6:

Inflow Area = 13.120 ac, 0.00% Impervious, Inflow Depth = 1.19" for 10 yr. event
Inflow = 9.87 cfs @ 12.21 hrs, Volume= 1.298 af
Outflow = 9.51 cfs @ 12.25 hrs, Volume= 1.298 af, Atten= 4%, Lag= 2.8 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.73 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 15.4 min

Peak Storage= 2,013 cf @ 12.25 hrs, Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 105.34 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 790.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -22.12'

‡

Summary for Reach R7:

Inflow Area = 3.620 ac, 0.00% Impervious, Inflow Depth = 1.06" for 10 yr. event
Inflow = 2.37 cfs @ 12.39 hrs, Volume= 0.319 af
Outflow = 1.04 cfs @ 12.87 hrs, Volume= 0.319 af, Atten= 56%, Lag= 29.1 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.26 fps, Min. Travel Time= 53.6 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 131.3 min

Peak Storage= 3,356 cf @ 12.87 hrs, Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 141.72 cfs

75.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 79.00'
Length= 850.0' Slope= 0.0010 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'

‡

Summary for Reach R8:

Inflow Area = 3.620 ac, 0.00% Impervious, Inflow Depth = 1.06" for 10 yr. event
Inflow = 2.90 cfs @ 12.24 hrs, Volume= 0.319 af
Outflow = 2.37 cfs @ 12.39 hrs, Volume= 0.319 af, Atten= 18%, Lag= 9.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.98 fps, Min. Travel Time= 11.0 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 33.4 min

Peak Storage= 1,557 cf @ 12.39 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 89.03 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,300.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -26.00'

‡

Summary for Reach R9:

Inflow Area = 7.730 ac, 0.00% Impervious, Inflow Depth = 0.89" for 10 yr. event
Inflow = 4.65 cfs @ 12.28 hrs, Volume= 0.571 af
Outflow = 4.43 cfs @ 12.35 hrs, Volume= 0.571 af, Atten= 5%, Lag= 4.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.85 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 13.9 min

Peak Storage= 1,397 cf @ 12.35 hrs, Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 374.04 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 900.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -27.00'

‡

Summary for Link DP: Final Analysis Design Point

Inflow Area = 173.720 ac, 0.00% Impervious, Inflow Depth = 1.17" for 10 yr. event
Inflow = 139.22 cfs @ 12.36 hrs, Volume= 16.929 af
Primary = 139.22 cfs @ 12.36 hrs, Volume= 16.929 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment E1:

Runoff = 39.33 cfs @ 12.20 hrs, Volume= 3.711 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
18.620	61	
18.620		100.00% Pervious Area

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

Summary for Subcatchment E10:

Runoff = 27.20 cfs @ 12.19 hrs, Volume= 2.509 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
10.900	65	
10.900		100.00% Pervious Area

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

Summary for Subcatchment E11:

Runoff = 47.89 cfs @ 12.26 hrs, Volume= 5.025 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
25.210	61	
25.210		100.00% Pervious Area

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

Summary for Subcatchment E12:

Runoff = 8.04 cfs @ 12.16 hrs, Volume= 0.696 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
2.830	67	
2.830		100.00% Pervious Area

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

Summary for Subcatchment E2:

Runoff = 24.08 cfs @ 12.17 hrs, Volume= 2.131 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
10.690	61	
10.690		100.00% Pervious Area

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

Summary for Subcatchment E3:

Runoff = 30.31 cfs @ 12.19 hrs, Volume= 2.817 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
14.690	60	
14.690		100.00% Pervious Area

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

Summary for Subcatchment E4:

Runoff = 7.06 cfs @ 12.22 hrs, Volume= 0.694 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
3.620	60	
3.620		100.00% Pervious Area

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

Summary for Subcatchment E5:

Runoff = 21.93 cfs @ 12.20 hrs, Volume= 2.039 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
9.500	63	
9.500		100.00% Pervious Area

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

Summary for Subcatchment E6:

Runoff = 42.42 cfs @ 12.19 hrs, Volume= 3.926 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
17.660	64	
17.660		100.00% Pervious Area

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

Summary for Subcatchment E7:

Runoff = 30.44 cfs @ 12.25 hrs, Volume= 3.179 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
18.740	57	
18.740		100.00% Pervious Area

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

Summary for Subcatchment E8:

Runoff = 12.48 cfs @ 12.25 hrs, Volume= 1.311 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
7.730	57	
7.730		100.00% Pervious Area

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

Summary for Subcatchment E9:

Runoff = 68.64 cfs @ 12.32 hrs, Volume= 7.717 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (ac)	CN	Description
33.530	65	
33.530		100.00% Pervious Area

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

Summary for Reach R1:

Inflow Area = 134.780 ac, 0.00% Impervious, Inflow Depth = 2.45" for 100 yr. event
Inflow = 255.87 cfs @ 12.30 hrs, Volume= 27.526 af
Outflow = 255.74 cfs @ 12.31 hrs, Volume= 27.526 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.73 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.94 fps, Avg. Travel Time= 8.5 min

Peak Storage= 21,277 cf @ 12.31 hrs, Average Depth at Peak Storage= 1.58'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 381.54 cfs

25.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 33.00'
Length= 477.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -2.86'

‡

Summary for Reach R10:

Inflow Area = 13.730 ac, 0.00% Impervious, Inflow Depth = 2.80" for 100 yr. event
Inflow = 29.73 cfs @ 12.30 hrs, Volume= 3.205 af
Outflow = 29.73 cfs @ 12.31 hrs, Volume= 3.205 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.32 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.97 fps, Avg. Travel Time= 5.1 min

Peak Storage= 2,065 cf @ 12.31 hrs, Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 236.56 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 300.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -3.60'

‡

Summary for Reach R11:

Inflow Area = 13.730 ac, 0.00% Impervious, Inflow Depth = 2.80" for 100 yr. event
Inflow = 34.02 cfs @ 12.21 hrs, Volume= 3.205 af
Outflow = 29.73 cfs @ 12.30 hrs, Volume= 3.205 af, Atten= 13%, Lag= 5.4 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.78 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 38.2 min

Peak Storage= 13,619 cf @ 12.30 hrs, Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 56.30 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,733.0' Slope= 0.0080 '/'
Inlet Invert= 0.00', Outlet Invert= -13.86'

‡

Summary for Reach R12:

Inflow Area = 2.830 ac, 0.00% Impervious, Inflow Depth = 2.95" for 100 yr. event
Inflow = 7.72 cfs @ 12.20 hrs, Volume= 0.696 af
Outflow = 7.30 cfs @ 12.25 hrs, Volume= 0.696 af, Atten= 5%, Lag= 3.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.47 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.93 fps, Avg. Travel Time= 15.2 min

Peak Storage= 1,797 cf @ 12.25 hrs, Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 118.76 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 855.0' Slope= 0.0320 '/'
Inlet Invert= 0.00', Outlet Invert= -27.36'

‡

Summary for Reach R13:

Inflow Area = 2.830 ac, 0.00% Impervious, Inflow Depth = 2.95" for 100 yr. event
Inflow = 8.04 cfs @ 12.16 hrs, Volume= 0.696 af
Outflow = 7.72 cfs @ 12.20 hrs, Volume= 0.696 af, Atten= 4%, Lag= 2.4 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.33 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 13.4 min

Peak Storage= 1,508 cf @ 12.20 hrs, Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 0.25', Capacity at Bank-Full= 28.71 cfs

20.00' x 0.25' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 21.50'
Length= 650.0' Slope= 0.0580 '/'
Inlet Invert= 0.00', Outlet Invert= -37.70'

‡

Summary for Reach R2:

Inflow Area = 101.250 ac, 0.00% Impervious, Inflow Depth = 2.35" for 100 yr. event
Inflow = 193.75 cfs @ 12.25 hrs, Volume= 19.809 af
Outflow = 187.86 cfs @ 12.29 hrs, Volume= 19.809 af, Atten= 3%, Lag= 2.5 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.14 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 20.7 min

Peak Storage= 36,801 cf @ 12.29 hrs, Average Depth at Peak Storage= 1.32'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 233.27 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 1,008.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -6.05'

‡

Summary for Reach R3:

Inflow Area = 101.250 ac, 0.00% Impervious, Inflow Depth = 2.35" for 100 yr. event
Inflow = 193.74 cfs @ 12.23 hrs, Volume= 19.809 af
Outflow = 193.75 cfs @ 12.25 hrs, Volume= 19.809 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.12 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 7.5 min

Peak Storage= 14,554 cf @ 12.25 hrs, Average Depth at Peak Storage= 1.01'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 380.87 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 535.0' Slope= 0.0160 '/'
Inlet Invert= 0.00', Outlet Invert= -8.56'

‡

Summary for Reach R4:

Inflow Area = 64.850 ac, 0.00% Impervious, Inflow Depth = 2.35" for 100 yr. event
Inflow = 125.07 cfs @ 12.21 hrs, Volume= 12.704 af
Outflow = 123.05 cfs @ 12.24 hrs, Volume= 12.704 af, Atten= 2%, Lag= 1.6 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.01 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.68 fps, Avg. Travel Time= 11.4 min

Peak Storage= 14,302 cf @ 12.24 hrs, Average Depth at Peak Storage= 1.67'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 168.44 cfs

15.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 23.00'
Length= 466.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.40'

‡

Summary for Reach R5:

Inflow Area = 29.310 ac, 0.00% Impervious, Inflow Depth = 2.39" for 100 yr. event
Inflow = 62.68 cfs @ 12.19 hrs, Volume= 5.842 af
Outflow = 62.44 cfs @ 12.21 hrs, Volume= 5.842 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.58 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 6.4 min

Peak Storage= 6,546 cf @ 12.21 hrs, Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 154.45 cfs

15.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 19.00'
Length= 690.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -19.32'

‡

Summary for Reach R6:

Inflow Area = 13.120 ac, 0.00% Impervious, Inflow Depth = 2.50" for 100 yr. event
Inflow = 22.70 cfs @ 12.20 hrs, Volume= 2.733 af
Outflow = 22.18 cfs @ 12.23 hrs, Volume= 2.733 af, Atten= 2%, Lag= 1.9 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.10 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 12.9 min

Peak Storage= 3,430 cf @ 12.23 hrs, Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 105.34 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 790.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -22.12'

‡

Summary for Reach R7:

Inflow Area = 3.620 ac, 0.00% Impervious, Inflow Depth = 2.30" for 100 yr. event
Inflow = 6.26 cfs @ 12.31 hrs, Volume= 0.694 af
Outflow = 3.57 cfs @ 12.64 hrs, Volume= 0.694 af, Atten= 43%, Lag= 19.5 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.43 fps, Min. Travel Time= 32.9 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 116.0 min

Peak Storage= 7,041 cf @ 12.63 hrs, Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 141.72 cfs

75.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 79.00'
Length= 850.0' Slope= 0.0010 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'

Summary for Reach R8:

Inflow Area = 3.620 ac, 0.00% Impervious, Inflow Depth = 2.30" for 100 yr. event
Inflow = 7.06 cfs @ 12.22 hrs, Volume= 0.694 af
Outflow = 6.26 cfs @ 12.31 hrs, Volume= 0.694 af, Atten= 11%, Lag= 5.5 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.87 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 27.4 min

Peak Storage= 2,837 cf @ 12.31 hrs, Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 89.03 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,300.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -26.00'

Summary for Reach R9:

Inflow Area = 7.730 ac, 0.00% Impervious, Inflow Depth = 2.04" for 100 yr. event
Inflow = 12.48 cfs @ 12.25 hrs, Volume= 1.311 af
Outflow = 12.13 cfs @ 12.30 hrs, Volume= 1.311 af, Atten= 3%, Lag= 2.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.18 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 11.0 min

Peak Storage= 2,612 cf @ 12.30 hrs, Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 374.04 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 900.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -27.00'

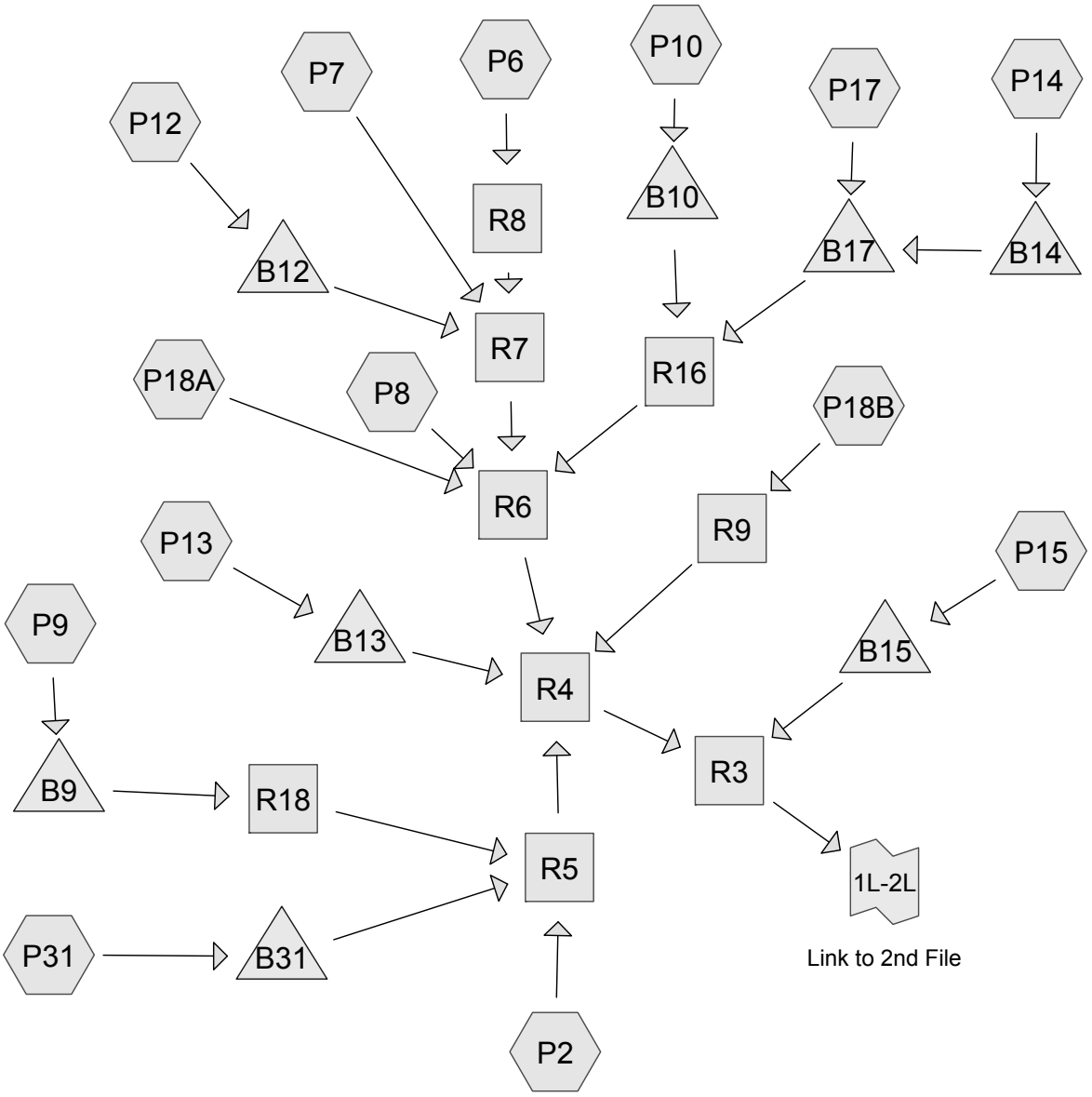
‡

Summary for Link DP: Final Analysis Design Point

Inflow Area = 173.720 ac, 0.00% Impervious, Inflow Depth = 2.47" for 100 yr. event
Inflow = 331.81 cfs @ 12.31 hrs, Volume= 35.756 af
Primary = 331.81 cfs @ 12.31 hrs, Volume= 35.756 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

APPENDIX 3



Subcat Reach Pond Link

Drainage Diagram for PULTE-PROP1-MODEL-July-2011
Prepared by Bohler Engineering, Printed 6/30/2011
HydroCAD® 9.00 s/n 02612 © 2009 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.583	55	Woods, Good, HSG B (P14, P17, P18A, P18B, P6, P7, P8)
7.953	61	(P10, P12, P13, P31, P9)
9.161	61	>75% Grass cover, Good, HSG B (P14, P15, P17, P18A, P18B, P6, P7, P8)
11.022	65	(P2)
0.439	74	>75% Grass cover, Good, HSG C (P15)
2.760	88	Wetlands (P14, P18B, P6, P7, P8)
6.941	98	(P10, P12, P13, P31, P9)
0.762	98	Impervious (P18A, P6, P7, P8)
3.446	98	Paved parking & roofs (P14, P15, P17, P18B)
48.067		**TOTAL AREA**

Summary for Subcatchment P10:

Runoff = 1.70 cfs @ 12.16 hrs, Volume= 0.154 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
*	26,364	98	
*	69,050	61	
	95,414	71	Weighted Average
	69,050		72.37% Pervious Area
	26,364		27.63% Impervious Area

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

Summary for Subcatchment P12:

Runoff = 2.11 cfs @ 12.09 hrs, Volume= 0.153 af, Depth= 1.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
*	31,373	98	
*	18,254	61	
	49,627	84	Weighted Average
	18,254		36.78% Pervious Area
	31,373		63.22% Impervious Area

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

Summary for Subcatchment P13:

Runoff = 9.19 cfs @ 12.11 hrs, Volume= 0.694 af, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
*	142,258	98	
*	127,669	61	
	269,927	80	Weighted Average
	127,669		47.30% Pervious Area
	142,258		52.70% Impervious Area

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

Summary for Subcatchment P14:

Runoff = 0.77 cfs @ 12.17 hrs, Volume= 0.090 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
*	10,210	88	Wetlands
	63,072	55	Woods, Good, HSG B
	20,820	61	>75% Grass cover, Good, HSG B
	6,782	98	Paved parking & roofs
	100,884	62	Weighted Average
	94,102		93.28% Pervious Area
	6,782		6.72% Impervious Area

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

Summary for Subcatchment P15:

Runoff = 4.64 cfs @ 12.17 hrs, Volume= 0.412 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
19,126	74	>75% Grass cover, Good, HSG C
59,630	61	>75% Grass cover, Good, HSG B
73,930	98	Paved parking & roofs
152,686	81	Weighted Average
78,756		51.58% Pervious Area
73,930		48.42% Impervious Area

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

Summary for Subcatchment P17:

Runoff = 2.05 cfs @ 12.15 hrs, Volume= 0.180 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
26,004	55	Woods, Good, HSG B
38,276	61	>75% Grass cover, Good, HSG B
35,360	98	Paved parking & roofs
99,640	73	Weighted Average
64,280		64.51% Pervious Area
35,360		35.49% Impervious Area

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

Summary for Subcatchment P18A:

Runoff = 0.50 cfs @ 12.16 hrs, Volume= 0.057 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
	21,578	55	Woods, Good, HSG B
*	5,973	98	Impervious
	36,046	61	>75% Grass cover, Good, HSG B
	63,597	62	Weighted Average
	57,624		90.61% Pervious Area
	5,973		9.39% Impervious Area

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

Summary for Subcatchment P18B:

Runoff = 2.02 cfs @ 12.21 hrs, Volume= 0.215 af, Depth= 0.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
1,650	88	Wetlands
35,644	55	Woods, Good, HSG B
87,961	61	>75% Grass cover, Good, HSG B
34,055	98	Paved parking & roofs
159,310	68	Weighted Average
125,255		78.62% Pervious Area
34,055		21.38% Impervious Area

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

Summary for Subcatchment P2:

Runoff = 5.08 cfs @ 12.17 hrs, Volume= 0.531 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
*	480,105	65	
	480,105		100.00% Pervious Area

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

Summary for Subcatchment P31:

Runoff = 3.91 cfs @ 12.12 hrs, Volume= 0.312 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
*	77,848	61	
*	62,366	98	
	140,214	77	Weighted Average
	77,848		55.52% Pervious Area
	62,366		44.48% Impervious Area

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

Summary for Subcatchment P6:

Runoff = 1.08 cfs @ 12.27 hrs, Volume= 0.141 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
	23,603	88	Wetlands
	67,401	55	Woods, Good, HSG B
*	3,360	98	Impervious
	52,796	61	>75% Grass cover, Good, HSG B
	147,160	63	Weighted Average
	143,800		97.72% Pervious Area
	3,360		2.28% Impervious Area

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

Summary for Subcatchment P7:

Runoff = 1.00 cfs @ 12.22 hrs, Volume= 0.101 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
	19,832	88	Wetlands
	4,740	55	Woods, Good, HSG B
*	5,213	98	Impervious
	26,272	61	>75% Grass cover, Good, HSG B
	56,057	73	Weighted Average
	50,844		90.70% Pervious Area
	5,213		9.30% Impervious Area

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

Summary for Subcatchment P8:

Runoff = 4.28 cfs @ 12.11 hrs, Volume= 0.335 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
	64,910	88	Wetlands
	24,737	55	Woods, Good, HSG B
*	18,656	98	Impervious
	77,235	61	>75% Grass cover, Good, HSG B
	185,538	73	Weighted Average
	166,882		89.94% Pervious Area
	18,656		10.06% Impervious Area

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

Summary for Subcatchment P9:

Runoff = 2.61 cfs @ 12.12 hrs, Volume= 0.208 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
*	40,000	98	
*	53,628	61	
	93,628	77	Weighted Average
	53,628		57.28% Pervious Area
	40,000		42.72% Impervious Area

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

Summary for Reach R16:

Inflow Area = 6.794 ac, 23.15% Impervious, Inflow Depth = 0.32" for 2 yr. event
Inflow = 0.32 cfs @ 12.99 hrs, Volume= 0.180 af
Outflow = 0.28 cfs @ 15.26 hrs, Volume= 0.180 af, Atten= 12%, Lag= 136.2 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.16 fps, Min. Travel Time= 89.3 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 142.3 min

Peak Storage= 1,512 cf @ 15.26 hrs, Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 141.72 cfs

75.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 79.00'
Length= 850.0' Slope= 0.0010 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'

Summary for Reach R18:

Inflow Area = 2.149 ac, 42.72% 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

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs, Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 50.59 cfs

15.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 19.00'
Length= 466.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.40'

‡

Summary for Reach R3:

Inflow Area = 48.067 ac, 23.20% Impervious, Inflow Depth = 0.49" for 2 yr. event
Inflow = 9.69 cfs @ 12.30 hrs, Volume= 1.971 af
Outflow = 9.44 cfs @ 12.36 hrs, Volume= 1.971 af, Atten= 3%, Lag= 3.4 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.25 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 14.1 min

Peak Storage= 2,248 cf @ 12.36 hrs, Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 380.87 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 535.0' Slope= 0.0160 '/'
Inlet Invert= 0.00', Outlet Invert= -8.56'

‡

Summary for Reach R4:

Inflow Area = 44.562 ac, 21.21% Impervious, Inflow Depth = 0.42" for 2 yr. event
Inflow = 9.97 cfs @ 12.22 hrs, Volume= 1.559 af
Outflow = 9.37 cfs @ 12.30 hrs, Volume= 1.559 af, Atten= 6%, Lag= 4.6 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.61 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 19.2 min

Peak Storage= 2,705 cf @ 12.30 hrs, Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 168.44 cfs

15.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 23.00'
Length= 466.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.40'

‡

Summary for Reach R5:

Inflow Area = 16.390 ac, 14.34% Impervious, Inflow Depth = 0.39" for 2 yr. event
Inflow = 5.08 cfs @ 12.17 hrs, Volume= 0.531 af
Outflow = 4.59 cfs @ 12.24 hrs, Volume= 0.531 af, Atten= 10%, Lag= 4.1 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.43 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 13.8 min

Peak Storage= 1,299 cf @ 12.24 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 154.45 cfs

15.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 19.00'
Length= 690.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -19.32'

‡

Summary for Reach R6:

Inflow Area = 18.318 ac, 16.68% Impervious, Inflow Depth = 0.53" for 2 yr. event
Inflow = 4.80 cfs @ 12.11 hrs, Volume= 0.814 af
Outflow = 4.24 cfs @ 12.17 hrs, Volume= 0.814 af, Atten= 12%, Lag= 3.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.73 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 0.77 fps, Avg. Travel Time= 17.0 min

Peak Storage= 1,221 cf @ 12.17 hrs, Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 105.34 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 790.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -22.12'

‡

Summary for Reach R7:

Inflow Area = 5.804 ac, 15.80% Impervious, Inflow Depth = 0.50" for 2 yr. event
Inflow = 1.44 cfs @ 12.39 hrs, Volume= 0.243 af
Outflow = 0.66 cfs @ 12.95 hrs, Volume= 0.243 af, Atten= 54%, Lag= 33.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.22 fps, Min. Travel Time= 64.5 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 137.6 min

Peak Storage= 2,550 cf @ 12.95 hrs, Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 141.72 cfs

75.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 79.00'
Length= 850.0' Slope= 0.0010 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'

‡

Summary for Reach R8:

Inflow Area = 3.378 ac, 2.28% Impervious, Inflow Depth = 0.50" for 2 yr. event
Inflow = 1.08 cfs @ 12.27 hrs, Volume= 0.141 af
Outflow = 0.78 cfs @ 12.52 hrs, Volume= 0.141 af, Atten= 28%, Lag= 15.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.28 fps, Min. Travel Time= 16.9 min
Avg. Velocity = 0.53 fps, Avg. Travel Time= 41.2 min

Peak Storage= 793 cf @ 12.52 hrs, Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 89.03 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,300.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -26.00'

‡

Summary for Reach R9:

Inflow Area = 3.657 ac, 21.38% Impervious, Inflow Depth = 0.70" for 2 yr. event
Inflow = 2.02 cfs @ 12.21 hrs, Volume= 0.215 af
Outflow = 1.76 cfs @ 12.32 hrs, Volume= 0.215 af, Atten= 13%, Lag= 6.2 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.00 fps, Min. Travel Time= 7.5 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 17.6 min

Peak Storage= 793 cf @ 12.32 hrs, Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 374.04 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 900.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -27.00'

‡

Summary for Pond B10:

Inflow Area = 2.190 ac, 27.63% Impervious, Inflow Depth = 0.84" for 2 yr. event
Inflow = 1.70 cfs @ 12.16 hrs, Volume= 0.154 af
Outflow = 0.16 cfs @ 14.40 hrs, Volume= 0.154 af, Atten= 90%, Lag= 134.4 min
Discarded = 0.16 cfs @ 14.40 hrs, Volume= 0.154 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 222.07' @ 14.40 hrs Surf.Area= 2,913 sf Storage= 2,786 cf
Flood Elev= 225.00' Surf.Area= 5,208 sf Storage= 14,480 cf

Plug-Flow detention time= 190.6 min calculated for 0.154 af (100% of inflow)
Center-of-Mass det. time= 190.5 min (1,065.8 - 875.2)

Volume	Invert	Avail.Storage	Storage Description
#1	221.00'	20,291 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
221.00	2,293	0	0	2,293
222.00	2,871	2,577	2,577	2,898
223.00	3,485	3,173	5,750	3,544
224.00	4,398	3,933	9,682	4,484
225.00	5,208	4,797	14,480	5,330
226.00	6,437	5,812	20,291	6,588

Device	Routing	Invert	Outlet Devices
#1	Discarded	221.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	224.00'	**6.0" Round Culvert** L= 43.0' Ke= 0.500 Outlet Invert= 222.00' S= 0.0465 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.16 cfs @ 14.40 hrs HW=222.07' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=221.00' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Summary for Pond B12:

Inflow Area = 1.139 ac, 63.22% Impervious, Inflow Depth = 1.61" for 2 yr. event
Inflow = 2.11 cfs @ 12.09 hrs, Volume= 0.153 af
Outflow = 0.11 cfs @ 14.92 hrs, Volume= 0.153 af, Atten= 95%, Lag= 169.5 min
Discarded = 0.11 cfs @ 14.92 hrs, Volume= 0.153 af
Primary = 0.01 cfs @ 14.92 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 224.22' @ 14.92 hrs Surf.Area= 1,891 sf Storage= 3,723 cf

Plug-Flow detention time= 436.0 min calculated for 0.153 af (100% of inflow)
Center-of-Mass det. time= 435.9 min (1,265.5 - 829.6)

Volume	Invert	Avail.Storage	Storage Description
#1	221.00'	7,960 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
221.00	520	0	0
222.00	875	698	698
223.00	1,296	1,086	1,783
224.00	1,773	1,535	3,318
225.00	2,307	2,040	5,358
226.00	2,897	2,602	7,960

Device	Routing	Invert	Outlet Devices
#1	Discarded	221.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	224.20'	**18.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	215.00'	**18.0" Round Culvert** L= 85.0' Ke= 0.500
			Outlet Invert= 213.30' S= 0.0200 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.11 cfs @ 14.92 hrs HW=224.22' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 14.92 hrs HW=224.22' (Free Discharge)
└─**3=Culvert** (Passes 0.00 cfs of 24.76 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.50 fps)

Summary for Pond B13:

Inflow Area = 6.197 ac, 52.70% Impervious, Inflow Depth = 1.34" for 2 yr. event
Inflow = 9.19 cfs @ 12.11 hrs, Volume= 0.694 af
Outflow = 0.44 cfs @ 15.61 hrs, Volume= 0.694 af, Atten= 95%, Lag= 210.0 min
Discarded = 0.44 cfs @ 15.61 hrs, Volume= 0.694 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 185.18' @ 15.61 hrs Surf.Area= 7,943 sf Storage= 17,085 cf
Flood Elev= 187.00' Surf.Area= 11,281 sf Storage= 34,578 cf

Plug-Flow detention time= 470.1 min calculated for 0.694 af (100% of inflow)
Center-of-Mass det. time= 470.3 min (1,313.9 - 843.6)

Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	46,822 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.00	3,100	0	0
183.00	4,434	3,767	3,767
184.00	5,908	5,171	8,938
185.00	7,625	6,767	15,705
186.00	9,420	8,523	24,227
187.00	11,281	10,351	34,578
188.00	13,207	12,244	46,822

Device	Routing	Invert	Outlet Devices
#1	Discarded	182.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	185.20'	**18.0" Round Culvert** L= 24.0' Ke= 0.500 Outlet Invert= 184.00' S= 0.0500 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.44 cfs @ 15.61 hrs HW=185.18' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.44 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=182.00' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Summary for Pond B14:

Inflow Area = 2.316 ac, 6.72% Impervious, Inflow Depth = 0.46" for 2 yr. event
Inflow = 0.77 cfs @ 12.17 hrs, Volume= 0.090 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 224.98' @ 24.55 hrs Surf.Area= 7,954 sf Storage= 3,905 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	224.00'	9,277 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
224.00	0	0	0
225.00	8,101	4,051	4,051
225.50	12,803	5,226	9,277

Device	Routing	Invert	Outlet Devices
#1	Primary	225.40'	**56.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=224.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B15:

Inflow Area = 3.505 ac, 48.42% Impervious, Inflow Depth = 1.41" for 2 yr. event
Inflow = 4.64 cfs @ 12.17 hrs, Volume= 0.412 af
Outflow = 0.39 cfs @ 14.18 hrs, Volume= 0.412 af, Atten= 92%, Lag= 120.5 min
Primary = 0.39 cfs @ 14.18 hrs, Volume= 0.412 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Peak Elev= 196.84' @ 14.18 hrs Surf.Area= 4,268 sf Storage= 9,071 cf

Plug-Flow detention time= 295.4 min calculated for 0.412 af (100% of inflow)
Center-of-Mass det. time= 295.0 min (1,140.3 - 845.2)

Volume	Invert	Avail.Storage	Storage Description
#1	194.00'	27,056 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
194.00	2,220	0	0	2,220
195.00	2,870	2,538	2,538	2,894
196.00	3,597	3,227	5,765	3,648
197.00	4,400	3,992	9,756	4,482
198.00	5,276	4,831	14,588	5,392
199.00	6,225	5,744	20,332	6,378
200.00	7,235	6,724	27,056	7,429

Device	Routing	Invert	Outlet Devices
#1	Device 3	194.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	196.85'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	192.00'	**12.0" Round Culvert** L= 85.0' Ke= 0.500 Outlet Invert= 191.15' S= 0.0100 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=0.39 cfs @ 14.18 hrs HW=196.84' (Free Discharge)
└─**3=Culvert** (Passes 0.39 cfs of 7.03 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.39 cfs @ 7.94 fps)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B17:

Inflow Area = 4.603 ac, 21.02% Impervious, Inflow Depth = 0.47" for 2 yr. event
Inflow = 2.05 cfs @ 12.15 hrs, Volume= 0.180 af
Outflow = 0.32 cfs @ 12.99 hrs, Volume= 0.180 af, Atten= 84%, Lag= 50.3 min
Primary = 0.32 cfs @ 12.99 hrs, Volume= 0.180 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 216.45' @ 12.99 hrs Surf.Area= 2,089 sf Storage= 2,685 cf
Flood Elev= 219.00' Surf.Area= 3,726 sf Storage= 10,012 cf

Plug-Flow detention time= 86.1 min calculated for 0.180 af (100% of inflow)
Center-of-Mass det. time= 86.1 min (954.6 - 868.5)

Volume	Invert	Avail.Storage	Storage Description
#1	214.50'	10,012 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
214.50	0	0	0	0
215.00	1,324	221	221	1,324
216.00	1,839	1,574	1,795	1,858
217.00	2,412	2,119	3,914	2,454
218.00	3,041	2,720	6,635	3,110
219.00	3,726	3,378	10,012	3,825

Device	Routing	Invert	Outlet Devices
#1	Device 2	214.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	212.50'	**12.0" Round Culvert** L= 103.0' Ke= 0.500
			Outlet Invert= 207.00' S= 0.0534 '/' Cc= 0.900 n= 0.012
#3	Device 2	216.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.32 cfs @ 12.99 hrs HW=216.45' (Free Discharge)
└─**2=Culvert** (Passes 0.32 cfs of 7.03 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.32 cfs @ 6.51 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B31:

Inflow Area = 3.219 ac, 44.48% Impervious, Inflow Depth = 1.16" for 2 yr. event
Inflow = 3.91 cfs @ 12.12 hrs, Volume= 0.312 af
Outflow = 0.33 cfs @ 14.00 hrs, Volume= 0.312 af, Atten= 92%, Lag= 112.7 min
Discarded = 0.33 cfs @ 14.00 hrs, Volume= 0.312 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 217.19' @ 14.00 hrs Surf.Area= 5,911 sf Storage= 5,946 cf

Plug-Flow detention time= 199.0 min calculated for 0.312 af (100% of inflow)
Center-of-Mass det. time= 198.9 min (1,052.9 - 854.0)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	40,805 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
216.00	4,061	0	0
217.00	5,596	4,829	4,829
218.00	7,218	6,407	11,236
219.00	8,928	8,073	19,309
220.00	10,726	9,827	29,136
221.00	12,612	11,669	40,805

Device	Routing	Invert	Outlet Devices
#1	Discarded	216.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	218.00'	**6.0" Round Culvert** L= 25.0' Ke= 0.500
			Outlet Invert= 216.00' S= 0.0800 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.33 cfs @ 14.00 hrs HW=217.19' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=216.00' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Summary for Pond B9:

Inflow Area = 2.149 ac, 42.72% Impervious, Inflow Depth = 1.16" for 2 yr. event
Inflow = 2.61 cfs @ 12.12 hrs, Volume= 0.208 af
Outflow = 0.24 cfs @ 13.80 hrs, Volume= 0.208 af, Atten= 91%, Lag= 100.7 min
Discarded = 0.24 cfs @ 13.80 hrs, Volume= 0.208 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 231.96' @ 13.80 hrs Surf.Area= 4,277 sf Storage= 3,754 cf

Plug-Flow detention time= 161.7 min calculated for 0.208 af (100% of inflow)
Center-of-Mass det. time= 161.6 min (1,015.6 - 854.0)

Volume	Invert	Avail.Storage	Storage Description
#1	231.00'	20,587 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
231.00	3,575	0	0
232.00	4,309	3,942	3,942
233.00	5,103	4,706	8,648
234.00	5,955	5,529	14,177
235.00	6,865	6,410	20,587

Device	Routing	Invert	Outlet Devices
#1	Discarded	231.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	233.00'	**6.0" Round Culvert** L= 31.0' Ke= 0.500 Outlet Invert= 229.00' S= 0.1290 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.24 cfs @ 13.80 hrs HW=231.96' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=231.00' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Summary for Link 1L-2L: Link to 2nd File

Inflow Area = 48.067 ac, 23.20% Impervious, Inflow Depth = 0.49" for 2 yr. event
Inflow = 9.44 cfs @ 12.36 hrs, Volume= 1.971 af
Primary = 9.44 cfs @ 12.36 hrs, Volume= 1.971 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment P10:

Runoff = 3.85 cfs @ 12.15 hrs, Volume= 0.324 af, Depth= 1.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
*	26,364	98	
*	69,050	61	
	95,414	71	Weighted Average
	69,050		72.37% Pervious Area
	26,364		27.63% Impervious Area

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

Summary for Subcatchment P12:

Runoff = 3.68 cfs @ 12.09 hrs, Volume= 0.269 af, Depth= 2.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
*	31,373	98	
*	18,254	61	
	49,627	84	Weighted Average
	18,254		36.78% Pervious Area
	31,373		63.22% Impervious Area

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

Summary for Subcatchment P13:

Runoff = 17.16 cfs @ 12.10 hrs, Volume= 1.282 af, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
*	142,258	98	
*	127,669	61	
	269,927	80	Weighted Average
	127,669		47.30% Pervious Area
	142,258		52.70% Impervious Area

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

Summary for Subcatchment P14:

Runoff = 2.54 cfs @ 12.15 hrs, Volume= 0.227 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
*	10,210	88	Wetlands
	63,072	55	Woods, Good, HSG B
	20,820	61	>75% Grass cover, Good, HSG B
	6,782	98	Paved parking & roofs
	100,884	62	Weighted Average
	94,102		93.28% Pervious Area
	6,782		6.72% Impervious Area

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

Summary for Subcatchment P15:

Runoff = 8.55 cfs @ 12.17 hrs, Volume= 0.750 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
19,126	74	>75% Grass cover, Good, HSG C
59,630	61	>75% Grass cover, Good, HSG B
73,930	98	Paved parking & roofs
152,686	81	Weighted Average
78,756		51.58% Pervious Area
73,930		48.42% Impervious Area

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

Summary for Subcatchment P17:

Runoff = 4.41 cfs @ 12.15 hrs, Volume= 0.367 af, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
26,004	55	Woods, Good, HSG B
38,276	61	>75% Grass cover, Good, HSG B
35,360	98	Paved parking & roofs
99,640	73	Weighted Average
64,280		64.51% Pervious Area
35,360		35.49% Impervious Area

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

Summary for Subcatchment P18A:

Runoff = 1.64 cfs @ 12.13 hrs, Volume= 0.143 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
	21,578	55	Woods, Good, HSG B
*	5,973	98	Impervious
	36,046	61	>75% Grass cover, Good, HSG B
	63,597	62	Weighted Average
	57,624		90.61% Pervious Area
	5,973		9.39% Impervious Area

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

Summary for Subcatchment P18B:

Runoff = 5.02 cfs @ 12.20 hrs, Volume= 0.477 af, Depth= 1.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
1,650	88	Wetlands
35,644	55	Woods, Good, HSG B
87,961	61	>75% Grass cover, Good, HSG B
34,055	98	Paved parking & roofs
159,310	68	Weighted Average
125,255		78.62% Pervious Area
34,055		21.38% Impervious Area

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

Summary for Subcatchment P2:

Runoff = 14.24 cfs @ 12.15 hrs, Volume= 1.253 af, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
*	480,105	65	
	480,105		100.00% Pervious Area

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

Summary for Subcatchment P31:

Runoff = 7.73 cfs @ 12.12 hrs, Volume= 0.599 af, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
*	77,848	61	
*	62,366	98	
	140,214	77	Weighted Average
	77,848		55.52% Pervious Area
	62,366		44.48% Impervious Area

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

Summary for Subcatchment P6:

Runoff = 3.33 cfs @ 12.23 hrs, Volume= 0.348 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
	23,603	88	Wetlands
	67,401	55	Woods, Good, HSG B
*	3,360	98	Impervious
	52,796	61	>75% Grass cover, Good, HSG B
	147,160	63	Weighted Average
	143,800		97.72% Pervious Area
	3,360		2.28% Impervious Area

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

Summary for Subcatchment P7:

Runoff = 2.15 cfs @ 12.21 hrs, Volume= 0.206 af, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
	19,832	88	Wetlands
	4,740	55	Woods, Good, HSG B
*	5,213	98	Impervious
	26,272	61	>75% Grass cover, Good, HSG B
	56,057	73	Weighted Average
	50,844		90.70% Pervious Area
	5,213		9.30% Impervious Area

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

Summary for Subcatchment P8:

Runoff = 9.20 cfs @ 12.10 hrs, Volume= 0.683 af, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
	64,910	88	Wetlands
	24,737	55	Woods, Good, HSG B
*	18,656	98	Impervious
	77,235	61	>75% Grass cover, Good, HSG B
	185,538	73	Weighted Average
	166,882		89.94% Pervious Area
	18,656		10.06% Impervious Area

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

Summary for Subcatchment P9:

Runoff = 5.16 cfs @ 12.12 hrs, Volume= 0.400 af, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
*	40,000	98	
*	53,628	61	
	93,628	77	Weighted Average
	53,628		57.28% Pervious Area
	40,000		42.72% Impervious Area

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

Summary for Reach R16:

Inflow Area = 6.794 ac, 23.15% Impervious, Inflow Depth = 0.72" for 10 yr. event
Inflow = 2.12 cfs @ 12.41 hrs, Volume= 0.409 af
Outflow = 0.99 cfs @ 12.89 hrs, Volume= 0.409 af, Atten= 53%, Lag= 28.5 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.26 fps, Min. Travel Time= 54.7 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 125.0 min

Peak Storage= 3,263 cf @ 12.89 hrs, Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 141.72 cfs

75.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 79.00'
Length= 850.0' Slope= 0.0010 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'

Summary for Reach R18:

Inflow Area = 2.149 ac, 42.72% Impervious, Inflow Depth = 0.01" for 10 yr. event
Inflow = 0.01 cfs @ 14.88 hrs, Volume= 0.002 af
Outflow = 0.01 cfs @ 15.50 hrs, Volume= 0.002 af, Atten= 26%, Lag= 37.1 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.15 fps, Min. Travel Time= 51.4 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 51.4 min

Peak Storage= 34 cf @ 15.50 hrs, Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 50.59 cfs

15.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 19.00'
Length= 466.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.40'

‡

Summary for Reach R3:

Inflow Area = 48.067 ac, 23.20% Impervious, Inflow Depth = 1.21" for 10 yr. event
Inflow = 27.42 cfs @ 12.26 hrs, Volume= 4.830 af
Outflow = 27.14 cfs @ 12.29 hrs, Volume= 4.830 af, Atten= 1%, Lag= 2.1 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.39 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 12.2 min

Peak Storage= 4,279 cf @ 12.29 hrs, Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 380.87 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 535.0' Slope= 0.0160 '/'
Inlet Invert= 0.00', Outlet Invert= -8.56'

‡

Summary for Reach R4:

Inflow Area = 44.562 ac, 21.21% Impervious, Inflow Depth = 1.10" for 10 yr. event
Inflow = 27.46 cfs @ 12.19 hrs, Volume= 4.080 af
Outflow = 26.66 cfs @ 12.24 hrs, Volume= 4.080 af, Atten= 3%, Lag= 2.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.37 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.49 fps, Avg. Travel Time= 15.8 min

Peak Storage= 5,235 cf @ 12.24 hrs, Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 168.44 cfs

15.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 23.00'
Length= 466.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.40'

‡

Summary for Reach R5:

Inflow Area = 16.390 ac, 14.34% Impervious, Inflow Depth = 0.94" for 10 yr. event
Inflow = 14.24 cfs @ 12.15 hrs, Volume= 1.290 af
Outflow = 13.56 cfs @ 12.19 hrs, Volume= 1.290 af, Atten= 5%, Lag= 2.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.71 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 10.7 min

Peak Storage= 2,523 cf @ 12.19 hrs, Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 154.45 cfs

15.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 19.00'
Length= 690.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -19.32'

‡

Summary for Reach R6:

Inflow Area = 18.318 ac, 16.68% Impervious, Inflow Depth = 1.23" for 10 yr. event
Inflow = 11.15 cfs @ 12.11 hrs, Volume= 1.879 af
Outflow = 10.34 cfs @ 12.15 hrs, Volume= 1.879 af, Atten= 7%, Lag= 2.6 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.85 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.93 fps, Avg. Travel Time= 14.2 min

Peak Storage= 2,121 cf @ 12.15 hrs, Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 105.34 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 790.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -22.12'

‡

Summary for Reach R7:

Inflow Area = 5.804 ac, 15.80% Impervious, Inflow Depth = 1.33" for 10 yr. event
Inflow = 5.75 cfs @ 12.32 hrs, Volume= 0.644 af
Outflow = 3.30 cfs @ 12.65 hrs, Volume= 0.644 af, Atten= 43%, Lag= 19.9 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.42 fps, Min. Travel Time= 33.9 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 118.9 min

Peak Storage= 6,708 cf @ 12.65 hrs, Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 141.72 cfs

75.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 79.00'
Length= 850.0' Slope= 0.0010 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'

‡

Summary for Reach R8:

Inflow Area = 3.378 ac, 2.28% Impervious, Inflow Depth = 1.24" for 10 yr. event
Inflow = 3.33 cfs @ 12.23 hrs, Volume= 0.348 af
Outflow = 2.77 cfs @ 12.36 hrs, Volume= 0.348 af, Atten= 17%, Lag= 7.9 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.10 fps, Min. Travel Time= 10.3 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 33.0 min

Peak Storage= 1,716 cf @ 12.36 hrs, Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 89.03 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,300.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -26.00'

‡

Summary for Reach R9:

Inflow Area = 3.657 ac, 21.38% Impervious, Inflow Depth = 1.56" for 10 yr. event
Inflow = 5.02 cfs @ 12.20 hrs, Volume= 0.477 af
Outflow = 4.67 cfs @ 12.26 hrs, Volume= 0.477 af, Atten= 7%, Lag= 3.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.91 fps, Min. Travel Time= 5.2 min
Avg. Velocity = 0.97 fps, Avg. Travel Time= 15.4 min

Peak Storage= 1,444 cf @ 12.26 hrs, Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 374.04 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 900.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -27.00'

‡

Summary for Pond B10:

Inflow Area = 2.190 ac, 27.63% Impervious, Inflow Depth = 1.78" for 10 yr. event
Inflow = 3.85 cfs @ 12.15 hrs, Volume= 0.324 af
Outflow = 0.22 cfs @ 15.59 hrs, Volume= 0.324 af, Atten= 94%, Lag= 206.4 min
Discarded = 0.22 cfs @ 15.59 hrs, Volume= 0.324 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 223.51' @ 15.59 hrs Surf.Area= 3,936 sf Storage= 7,636 cf
Flood Elev= 225.00' Surf.Area= 5,208 sf Storage= 14,480 cf

Plug-Flow detention time= 411.5 min calculated for 0.324 af (100% of inflow)
Center-of-Mass det. time= 411.6 min (1,264.1 - 852.5)

Volume	Invert	Avail.Storage	Storage Description
#1	221.00'	20,291 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
221.00	2,293	0	0	2,293
222.00	2,871	2,577	2,577	2,898
223.00	3,485	3,173	5,750	3,544
224.00	4,398	3,933	9,682	4,484
225.00	5,208	4,797	14,480	5,330
226.00	6,437	5,812	20,291	6,588

Device	Routing	Invert	Outlet Devices
#1	Discarded	221.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	224.00'	**6.0" Round Culvert** L= 43.0' Ke= 0.500 Outlet Invert= 222.00' S= 0.0465 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.22 cfs @ 15.59 hrs HW=223.51' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=221.00' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Summary for Pond B12:

Inflow Area = 1.139 ac, 63.22% Impervious, Inflow Depth = 2.83" for 10 yr. event
Inflow = 3.68 cfs @ 12.09 hrs, Volume= 0.269 af
Outflow = 1.36 cfs @ 12.37 hrs, Volume= 0.269 af, Atten= 63%, Lag= 16.5 min
Discarded = 0.12 cfs @ 12.37 hrs, Volume= 0.179 af
Primary = 1.24 cfs @ 12.37 hrs, Volume= 0.090 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 224.70' @ 12.37 hrs Surf.Area= 2,147 sf Storage= 4,691 cf

Plug-Flow detention time= 306.5 min calculated for 0.269 af (100% of inflow)
Center-of-Mass det. time= 306.8 min (1,120.5 - 813.7)

Volume	Invert	Avail.Storage	Storage Description
#1	221.00'	7,960 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
221.00	520	0	0
222.00	875	698	698
223.00	1,296	1,086	1,783
224.00	1,773	1,535	3,318
225.00	2,307	2,040	5,358
226.00	2,897	2,602	7,960

Device	Routing	Invert	Outlet Devices
#1	Discarded	221.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	224.20'	**18.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	215.00'	**18.0" Round Culvert** L= 85.0' Ke= 0.500
			Outlet Invert= 213.30' S= 0.0200 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.12 cfs @ 12.37 hrs HW=224.70' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=1.24 cfs @ 12.37 hrs HW=224.70' (Free Discharge)
└─**3=Culvert** (Passes 1.24 cfs of 25.45 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 1.24 cfs @ 2.40 fps)

Summary for Pond B13:

Inflow Area = 6.197 ac, 52.70% Impervious, Inflow Depth = 2.48" for 10 yr. event
Inflow = 17.16 cfs @ 12.10 hrs, Volume= 1.282 af
Outflow = 3.71 cfs @ 12.55 hrs, Volume= 1.282 af, Atten= 78%, Lag= 26.9 min
Discarded = 0.53 cfs @ 12.55 hrs, Volume= 0.848 af
Primary = 3.18 cfs @ 12.55 hrs, Volume= 0.434 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 186.04' @ 12.55 hrs Surf.Area= 9,494 sf Storage= 24,605 cf
Flood Elev= 187.00' Surf.Area= 11,281 sf Storage= 34,578 cf

Plug-Flow detention time= 342.1 min calculated for 1.282 af (100% of inflow)
Center-of-Mass det. time= 342.0 min (1,168.0 - 826.1)

Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	46,822 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.00	3,100	0	0
183.00	4,434	3,767	3,767
184.00	5,908	5,171	8,938
185.00	7,625	6,767	15,705
186.00	9,420	8,523	24,227
187.00	11,281	10,351	34,578
188.00	13,207	12,244	46,822

Device	Routing	Invert	Outlet Devices
#1	Discarded	182.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	185.20'	**18.0" Round Culvert** L= 24.0' Ke= 0.500 Outlet Invert= 184.00' S= 0.0500 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.53 cfs @ 12.55 hrs HW=186.04' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.53 cfs)

Primary OutFlow Max=3.17 cfs @ 12.55 hrs HW=186.04' (Free Discharge)
└─**2=Culvert** (Inlet Controls 3.17 cfs @ 3.12 fps)

Summary for Pond B14:

Inflow Area = 2.316 ac, 6.72% Impervious, Inflow Depth = 1.18" for 10 yr. event
Inflow = 2.54 cfs @ 12.15 hrs, Volume= 0.227 af
Outflow = 0.10 cfs @ 18.00 hrs, Volume= 0.042 af, Atten= 96%, Lag= 351.2 min
Primary = 0.10 cfs @ 18.00 hrs, Volume= 0.042 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 225.41' @ 18.00 hrs Surf.Area= 11,923 sf Storage= 8,120 cf

Plug-Flow detention time= 512.2 min calculated for 0.042 af (19% of inflow)
Center-of-Mass det. time= 357.6 min (1,234.4 - 876.8)

Volume	Invert	Avail.Storage	Storage Description
#1	224.00'	9,277 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
224.00	0	0	0
225.00	8,101	4,051	4,051
225.50	12,803	5,226	9,277

Device	Routing	Invert	Outlet Devices
#1	Primary	225.40'	**56.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.08 cfs @ 18.00 hrs HW=225.41' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.08 cfs @ 0.21 fps)

Summary for Pond B15:

Inflow Area = 3.505 ac, 48.42% Impervious, Inflow Depth = 2.57" for 10 yr. event
Inflow = 8.55 cfs @ 12.17 hrs, Volume= 0.750 af
Outflow = 2.86 cfs @ 12.57 hrs, Volume= 0.750 af, Atten= 67%, Lag= 23.7 min
Primary = 2.86 cfs @ 12.57 hrs, Volume= 0.750 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Peak Elev= 197.75' @ 12.57 hrs Surf.Area= 5,051 sf Storage= 13,304 cf

Plug-Flow detention time= 224.2 min calculated for 0.750 af (100% of inflow)
Center-of-Mass det. time= 225.0 min (1,053.1 - 828.1)

Volume	Invert	Avail.Storage	Storage Description
#1	194.00'	27,056 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
194.00	2,220	0	0	2,220
195.00	2,870	2,538	2,538	2,894
196.00	3,597	3,227	5,765	3,648
197.00	4,400	3,992	9,756	4,482
198.00	5,276	4,831	14,588	5,392
199.00	6,225	5,744	20,332	6,378
200.00	7,235	6,724	27,056	7,429

Device	Routing	Invert	Outlet Devices
#1	Device 3	194.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	196.85'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	192.00'	**12.0" Round Culvert** L= 85.0' Ke= 0.500
			Outlet Invert= 191.15' S= 0.0100 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=2.85 cfs @ 12.57 hrs HW=197.75' (Free Discharge)
└─**3=Culvert** (Passes 2.85 cfs of 7.68 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.45 cfs @ 9.17 fps)
  └─**2=Orifice/Grate** (Orifice Controls 2.40 cfs @ 3.23 fps)

Summary for Pond B17:

Inflow Area = 4.603 ac, 21.02% Impervious, Inflow Depth = 1.07" for 10 yr. event
Inflow = 4.41 cfs @ 12.15 hrs, Volume= 0.409 af
Outflow = 2.12 cfs @ 12.41 hrs, Volume= 0.409 af, Atten= 52%, Lag= 16.1 min
Primary = 2.12 cfs @ 12.41 hrs, Volume= 0.409 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 217.22' @ 12.41 hrs Surf.Area= 2,543 sf Storage= 4,453 cf
Flood Elev= 219.00' Surf.Area= 3,726 sf Storage= 10,012 cf

Plug-Flow detention time= 82.7 min calculated for 0.409 af (100% of inflow)
Center-of-Mass det. time= 82.6 min (969.8 - 887.2)

Volume	Invert	Avail.Storage	Storage Description
#1	214.50'	10,012 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
214.50	0	0	0	0
215.00	1,324	221	221	1,324
216.00	1,839	1,574	1,795	1,858
217.00	2,412	2,119	3,914	2,454
218.00	3,041	2,720	6,635	3,110
219.00	3,726	3,378	10,012	3,825

Device	Routing	Invert	Outlet Devices
#1	Device 2	214.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	212.50'	**12.0" Round Culvert** L= 103.0' Ke= 0.500
			Outlet Invert= 207.00' S= 0.0534 '/' Cc= 0.900 n= 0.012
#3	Device 2	216.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.11 cfs @ 12.41 hrs HW=217.22' (Free Discharge)
└─**2=Culvert** (Passes 2.11 cfs of 7.76 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.38 cfs @ 7.75 fps)
  └─**3=Orifice/Grate** (Orifice Controls 1.73 cfs @ 2.88 fps)

Summary for Pond B31:

Inflow Area = 3.219 ac, 44.48% Impervious, Inflow Depth = 2.23" for 10 yr. event
Inflow = 7.73 cfs @ 12.12 hrs, Volume= 0.599 af
Outflow = 0.58 cfs @ 13.97 hrs, Volume= 0.599 af, Atten= 92%, Lag= 110.9 min
Discarded = 0.43 cfs @ 13.97 hrs, Volume= 0.564 af
Primary = 0.16 cfs @ 13.97 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 218.24' @ 13.97 hrs Surf.Area= 7,629 sf Storage= 13,021 cf

Plug-Flow detention time= 326.1 min calculated for 0.599 af (100% of inflow)
Center-of-Mass det. time= 326.2 min (1,161.2 - 835.1)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	40,805 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
216.00	4,061	0	0
217.00	5,596	4,829	4,829
218.00	7,218	6,407	11,236
219.00	8,928	8,073	19,309
220.00	10,726	9,827	29,136
221.00	12,612	11,669	40,805

Device	Routing	Invert	Outlet Devices
#1	Discarded	216.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	218.00'	**6.0" Round Culvert** L= 25.0' Ke= 0.500
			Outlet Invert= 216.00' S= 0.0800 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.43 cfs @ 13.97 hrs HW=218.24' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.16 cfs @ 13.97 hrs HW=218.24' (Free Discharge)
└─**2=Culvert** (Inlet Controls 0.16 cfs @ 1.67 fps)

Summary for Pond B9:

Inflow Area = 2.149 ac, 42.72% Impervious, Inflow Depth = 2.23" for 10 yr. event
Inflow = 5.16 cfs @ 12.12 hrs, Volume= 0.400 af
Outflow = 0.30 cfs @ 14.88 hrs, Volume= 0.400 af, Atten= 94%, Lag= 165.7 min
Discarded = 0.29 cfs @ 14.88 hrs, Volume= 0.398 af
Primary = 0.01 cfs @ 14.88 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 233.07' @ 14.88 hrs Surf.Area= 5,160 sf Storage= 8,990 cf

Plug-Flow detention time= 341.5 min calculated for 0.400 af (100% of inflow)
Center-of-Mass det. time= 341.5 min (1,176.5 - 835.1)

Volume	Invert	Avail.Storage	Storage Description
#1	231.00'	20,587 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
231.00	3,575	0	0
232.00	4,309	3,942	3,942
233.00	5,103	4,706	8,648
234.00	5,955	5,529	14,177
235.00	6,865	6,410	20,587

Device	Routing	Invert	Outlet Devices
#1	Discarded	231.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	233.00'	**6.0" Round Culvert** L= 31.0' Ke= 0.500 Outlet Invert= 229.00' S= 0.1290 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.29 cfs @ 14.88 hrs HW=233.07' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=0.01 cfs @ 14.88 hrs HW=233.07' (Free Discharge)
└─**2=Culvert** (Inlet Controls 0.01 cfs @ 0.88 fps)

Summary for Link 1L-2L: Link to 2nd File

Inflow Area = 48.067 ac, 23.20% Impervious, Inflow Depth = 1.21" for 10 yr. event
Inflow = 27.14 cfs @ 12.29 hrs, Volume= 4.830 af
Primary = 27.14 cfs @ 12.29 hrs, Volume= 4.830 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Subcatchment P10:

Runoff = 7.40 cfs @ 12.14 hrs, Volume= 0.610 af, Depth= 3.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
*	26,364	98	
*	69,050	61	
	95,414	71	Weighted Average
	69,050		72.37% Pervious Area
	26,364		27.63% Impervious Area

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

Summary for Subcatchment P12:

Runoff = 5.99 cfs @ 12.09 hrs, Volume= 0.445 af, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
*	31,373	98	
*	18,254	61	
	49,627	84	Weighted Average
	18,254		36.78% Pervious Area
	31,373		63.22% Impervious Area

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

Summary for Subcatchment P13:

Runoff = 29.22 cfs @ 12.10 hrs, Volume= 2.199 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
*	142,258	98	
*	127,669	61	
	269,927	80	Weighted Average
	127,669		47.30% Pervious Area
	142,258		52.70% Impervious Area

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

Summary for Subcatchment P14:

Runoff = 5.80 cfs @ 12.14 hrs, Volume= 0.479 af, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
*	10,210	88	Wetlands
	63,072	55	Woods, Good, HSG B
	20,820	61	>75% Grass cover, Good, HSG B
	6,782	98	Paved parking & roofs
	100,884	62	Weighted Average
	94,102		93.28% Pervious Area
	6,782		6.72% Impervious Area

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

Summary for Subcatchment P15:

Runoff = 14.42 cfs @ 12.17 hrs, Volume= 1.275 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
19,126	74	>75% Grass cover, Good, HSG C
59,630	61	>75% Grass cover, Good, HSG B
73,930	98	Paved parking & roofs
152,686	81	Weighted Average
78,756		51.58% Pervious Area
73,930		48.42% Impervious Area

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

Summary for Subcatchment P17:

Runoff = 8.22 cfs @ 12.14 hrs, Volume= 0.675 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
26,004	55	Woods, Good, HSG B
38,276	61	>75% Grass cover, Good, HSG B
35,360	98	Paved parking & roofs
99,640	73	Weighted Average
64,280		64.51% Pervious Area
35,360		35.49% Impervious Area

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

Summary for Subcatchment P18A:

Runoff = 3.80 cfs @ 12.12 hrs, Volume= 0.302 af, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
	21,578	55	Woods, Good, HSG B
*	5,973	98	Impervious
	36,046	61	>75% Grass cover, Good, HSG B
	63,597	62	Weighted Average
	57,624		90.61% Pervious Area
	5,973		9.39% Impervious Area

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

Summary for Subcatchment P18B:

Runoff = 10.13 cfs @ 12.19 hrs, Volume= 0.929 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
1,650	88	Wetlands
35,644	55	Woods, Good, HSG B
87,961	61	>75% Grass cover, Good, HSG B
34,055	98	Paved parking & roofs
159,310	68	Weighted Average
125,255		78.62% Pervious Area
34,055		21.38% Impervious Area

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

Summary for Subcatchment P2:

Runoff = 30.40 cfs @ 12.15 hrs, Volume= 2.537 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
*	480,105	65	
	480,105		100.00% Pervious Area

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

Summary for Subcatchment P31:

Runoff = 13.67 cfs @ 12.11 hrs, Volume= 1.058 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
*	77,848	61	
*	62,366	98	
	140,214	77	Weighted Average
	77,848		55.52% Pervious Area
	62,366		44.48% Impervious Area

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

Summary for Subcatchment P6:

Runoff = 7.50 cfs @ 12.22 hrs, Volume= 0.725 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
	23,603	88	Wetlands
	67,401	55	Woods, Good, HSG B
*	3,360	98	Impervious
	52,796	61	>75% Grass cover, Good, HSG B
	147,160	63	Weighted Average
	143,800		97.72% Pervious Area
	3,360		2.28% Impervious Area

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

Summary for Subcatchment P7:

Runoff = 4.02 cfs @ 12.21 hrs, Volume= 0.380 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
	19,832	88	Wetlands
	4,740	55	Woods, Good, HSG B
*	5,213	98	Impervious
	26,272	61	>75% Grass cover, Good, HSG B
	56,057	73	Weighted Average
	50,844		90.70% Pervious Area
	5,213		9.30% Impervious Area

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

Summary for Subcatchment P8:

Runoff = 17.12 cfs @ 12.10 hrs, Volume= 1.256 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
	64,910	88	Wetlands
	24,737	55	Woods, Good, HSG B
*	18,656	98	Impervious
	77,235	61	>75% Grass cover, Good, HSG B
	185,538	73	Weighted Average
	166,882		89.94% Pervious Area
	18,656		10.06% Impervious Area

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

Summary for Subcatchment P9:

Runoff = 9.13 cfs @ 12.11 hrs, Volume= 0.707 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
*	40,000	98	
*	53,628	61	
	93,628	77	Weighted Average
	53,628		57.28% Pervious Area
	40,000		42.72% Impervious Area

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

Summary for Reach R16:

Inflow Area = 6.794 ac, 23.15% Impervious, Inflow Depth = 1.98" for 100 yr. event
Inflow = 5.05 cfs @ 12.56 hrs, Volume= 1.120 af
Outflow = 4.01 cfs @ 12.91 hrs, Volume= 1.120 af, Atten= 21%, Lag= 20.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.45 fps, Min. Travel Time= 31.4 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 105.7 min

Peak Storage= 7,545 cf @ 12.91 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 141.72 cfs

75.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 79.00'
Length= 850.0' Slope= 0.0010 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'

Summary for Reach R18:

Inflow Area = 2.149 ac, 42.72% Impervious, Inflow Depth = 1.21" for 100 yr. event
Inflow = 0.81 cfs @ 12.85 hrs, Volume= 0.216 af
Outflow = 0.80 cfs @ 13.07 hrs, Volume= 0.216 af, Atten= 1%, Lag= 13.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.62 fps, Min. Travel Time= 12.5 min
Avg. Velocity = 0.29 fps, Avg. Travel Time= 26.4 min

Peak Storage= 598 cf @ 13.07 hrs, Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 50.59 cfs

15.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 19.00'
Length= 466.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.40'

‡

Summary for Reach R3:

Inflow Area = 48.067 ac, 23.20% Impervious, Inflow Depth = 2.64" for 100 yr. event
Inflow = 71.67 cfs @ 12.22 hrs, Volume= 10.563 af
Outflow = 70.82 cfs @ 12.25 hrs, Volume= 10.563 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.90 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 10.5 min

Peak Storage= 7,733 cf @ 12.25 hrs, Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 380.87 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 535.0' Slope= 0.0160 '/'
Inlet Invert= 0.00', Outlet Invert= -8.56'

‡

Summary for Reach R4:

Inflow Area = 44.562 ac, 21.21% Impervious, Inflow Depth = 2.50" for 100 yr. event
Inflow = 67.76 cfs @ 12.18 hrs, Volume= 9.289 af
Outflow = 67.29 cfs @ 12.22 hrs, Volume= 9.289 af, Atten= 1%, Lag= 2.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.27 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 13.0 min

Peak Storage= 9,556 cf @ 12.22 hrs, Average Depth at Peak Storage= 1.18'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 168.44 cfs

15.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 23.00'
Length= 466.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.40'

‡

Summary for Reach R5:

Inflow Area = 16.390 ac, 14.34% Impervious, Inflow Depth = 2.27" for 100 yr. event
Inflow = 30.58 cfs @ 12.15 hrs, Volume= 3.102 af
Outflow = 29.85 cfs @ 12.17 hrs, Volume= 3.102 af, Atten= 2%, Lag= 1.5 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.96 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 8.2 min

Peak Storage= 4,116 cf @ 12.17 hrs, Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 154.45 cfs

15.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 19.00'
Length= 690.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -19.32'

‡

Summary for Reach R6:

Inflow Area = 18.318 ac, 16.68% Impervious, Inflow Depth = 2.64" for 100 yr. event
Inflow = 23.32 cfs @ 12.11 hrs, Volume= 4.022 af
Outflow = 22.34 cfs @ 12.15 hrs, Volume= 4.022 af, Atten= 4%, Lag= 2.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.12 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 11.9 min

Peak Storage= 3,445 cf @ 12.15 hrs, Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 105.34 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 790.0' Slope= 0.0280 '/'
Inlet Invert= 0.00', Outlet Invert= -22.12'

‡

Summary for Reach R7:

Inflow Area = 5.804 ac, 15.80% Impervious, Inflow Depth = 2.78" for 100 yr. event
Inflow = 13.98 cfs @ 12.24 hrs, Volume= 1.344 af
Outflow = 9.42 cfs @ 12.48 hrs, Volume= 1.344 af, Atten= 33%, Lag= 14.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.63 fps, Min. Travel Time= 22.4 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 104.7 min

Peak Storage= 12,633 cf @ 12.48 hrs, Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 141.72 cfs

75.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 79.00'
Length= 850.0' Slope= 0.0010 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'

‡

Summary for Reach R8:

Inflow Area = 3.378 ac, 2.28% Impervious, Inflow Depth = 2.58" for 100 yr. event
Inflow = 7.50 cfs @ 12.22 hrs, Volume= 0.725 af
Outflow = 6.68 cfs @ 12.30 hrs, Volume= 0.725 af, Atten= 11%, Lag= 5.2 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.94 fps, Min. Travel Time= 7.4 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 27.4 min

Peak Storage= 2,953 cf @ 12.30 hrs, Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 89.03 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,300.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -26.00'

‡

Summary for Reach R9:

Inflow Area = 3.657 ac, 21.38% Impervious, Inflow Depth = 3.05" for 100 yr. event
Inflow = 10.13 cfs @ 12.19 hrs, Volume= 0.929 af
Outflow = 9.67 cfs @ 12.24 hrs, Volume= 0.929 af, Atten= 5%, Lag= 2.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.83 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 13.0 min

Peak Storage= 2,267 cf @ 12.24 hrs, Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 374.04 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 900.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -27.00'

‡

Summary for Pond B10:

Inflow Area = 2.190 ac, 27.63% Impervious, Inflow Depth = 3.34" for 100 yr. event
Inflow = 7.40 cfs @ 12.14 hrs, Volume= 0.610 af
Outflow = 0.87 cfs @ 13.07 hrs, Volume= 0.610 af, Atten= 88%, Lag= 55.5 min
Discarded = 0.27 cfs @ 13.07 hrs, Volume= 0.459 af
Primary = 0.60 cfs @ 13.07 hrs, Volume= 0.151 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 224.65' @ 13.07 hrs Surf.Area= 4,914 sf Storage= 12,692 cf
Flood Elev= 225.00' Surf.Area= 5,208 sf Storage= 14,480 cf

Plug-Flow detention time= 386.7 min calculated for 0.610 af (100% of inflow)
Center-of-Mass det. time= 386.6 min (1,220.8 - 834.3)

Volume	Invert	Avail.Storage	Storage Description
#1	221.00'	20,291 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
221.00	2,293	0	0	2,293
222.00	2,871	2,577	2,577	2,898
223.00	3,485	3,173	5,750	3,544
224.00	4,398	3,933	9,682	4,484
225.00	5,208	4,797	14,480	5,330
226.00	6,437	5,812	20,291	6,588

Device	Routing	Invert	Outlet Devices
#1	Discarded	221.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	224.00'	**6.0" Round Culvert** L= 43.0' Ke= 0.500 Outlet Invert= 222.00' S= 0.0465 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.27 cfs @ 13.07 hrs HW=224.65' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.60 cfs @ 13.07 hrs HW=224.65' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.60 cfs @ 3.03 fps)

Summary for Pond B12:

Inflow Area = 1.139 ac, 63.22% Impervious, Inflow Depth = 4.68" for 100 yr. event
Inflow = 5.99 cfs @ 12.09 hrs, Volume= 0.445 af
Outflow = 4.38 cfs @ 12.17 hrs, Volume= 0.445 af, Atten= 27%, Lag= 4.9 min
Discarded = 0.14 cfs @ 12.17 hrs, Volume= 0.205 af
Primary = 4.24 cfs @ 12.17 hrs, Volume= 0.240 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 225.20' @ 12.17 hrs Surf.Area= 2,424 sf Storage= 5,825 cf

Plug-Flow detention time= 218.7 min calculated for 0.444 af (100% of inflow)
Center-of-Mass det. time= 219.2 min (1,018.8 - 799.6)

Volume	Invert	Avail.Storage	Storage Description
#1	221.00'	7,960 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
221.00	520	0	0
222.00	875	698	698
223.00	1,296	1,086	1,783
224.00	1,773	1,535	3,318
225.00	2,307	2,040	5,358
226.00	2,897	2,602	7,960

Device	Routing	Invert	Outlet Devices
#1	Discarded	221.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	224.20'	**18.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	215.00'	**18.0" Round Culvert** L= 85.0' Ke= 0.500
			Outlet Invert= 213.30' S= 0.0200 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.13 cfs @ 12.17 hrs HW=225.18' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=4.15 cfs @ 12.17 hrs HW=225.18' (Free Discharge)
└─**3=Culvert** (Passes 4.15 cfs of 26.13 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 4.15 cfs @ 3.38 fps)

Summary for Pond B13:

Inflow Area = 6.197 ac, 52.70% Impervious, Inflow Depth = 4.26" for 100 yr. event
Inflow = 29.22 cfs @ 12.10 hrs, Volume= 2.199 af
Outflow = 10.12 cfs @ 12.41 hrs, Volume= 2.199 af, Atten= 65%, Lag= 18.4 min
Discarded = 0.65 cfs @ 12.41 hrs, Volume= 0.963 af
Primary = 9.47 cfs @ 12.41 hrs, Volume= 1.236 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 187.19' @ 12.41 hrs Surf.Area= 11,645 sf Storage= 36,741 cf
Flood Elev= 187.00' Surf.Area= 11,281 sf Storage= 34,578 cf

Plug-Flow detention time= 237.1 min calculated for 2.197 af (100% of inflow)
Center-of-Mass det. time= 237.6 min (1,048.4 - 810.8)

Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	46,822 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.00	3,100	0	0
183.00	4,434	3,767	3,767
184.00	5,908	5,171	8,938
185.00	7,625	6,767	15,705
186.00	9,420	8,523	24,227
187.00	11,281	10,351	34,578
188.00	13,207	12,244	46,822

Device	Routing	Invert	Outlet Devices
#1	Discarded	182.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	185.20'	**18.0" Round Culvert** L= 24.0' Ke= 0.500 Outlet Invert= 184.00' S= 0.0500 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.65 cfs @ 12.41 hrs HW=187.19' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.65 cfs)

Primary OutFlow Max=9.46 cfs @ 12.41 hrs HW=187.19' (Free Discharge)
└─**2=Culvert** (Inlet Controls 9.46 cfs @ 5.36 fps)

Summary for Pond B14:

Inflow Area = 2.316 ac, 6.72% Impervious, Inflow Depth = 2.48" for 100 yr. event
Inflow = 5.80 cfs @ 12.14 hrs, Volume= 0.479 af
Outflow = 2.01 cfs @ 12.52 hrs, Volume= 0.295 af, Atten= 65%, Lag= 22.9 min
Primary = 2.01 cfs @ 12.52 hrs, Volume= 0.295 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 225.46' @ 12.52 hrs Surf.Area= 12,394 sf Storage= 8,728 cf

Plug-Flow detention time= 207.9 min calculated for 0.295 af (61% of inflow)
Center-of-Mass det. time= 92.5 min (946.2 - 853.7)

Volume	Invert	Avail.Storage	Storage Description
#1	224.00'	9,277 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
224.00	0	0	0
225.00	8,101	4,051	4,051
225.50	12,803	5,226	9,277

Device	Routing	Invert	Outlet Devices
#1	Primary	225.40'	**56.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.97 cfs @ 12.52 hrs HW=225.46' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.97 cfs @ 0.63 fps)

Summary for Pond B15:

Inflow Area = 3.505 ac, 48.42% Impervious, Inflow Depth = 4.36" for 100 yr. event
Inflow = 14.42 cfs @ 12.17 hrs, Volume= 1.275 af
Outflow = 5.47 cfs @ 12.52 hrs, Volume= 1.275 af, Atten= 62%, Lag= 20.9 min
Primary = 5.47 cfs @ 12.52 hrs, Volume= 1.275 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Peak Elev= 199.06' @ 12.52 hrs Surf.Area= 6,283 sf Storage= 20,702 cf

Plug-Flow detention time= 171.7 min calculated for 1.275 af (100% of inflow)
Center-of-Mass det. time= 171.3 min (984.5 - 813.2)

Volume	Invert	Avail.Storage	Storage Description
#1	194.00'	27,056 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
194.00	2,220	0	0	2,220
195.00	2,870	2,538	2,538	2,894
196.00	3,597	3,227	5,765	3,648
197.00	4,400	3,992	9,756	4,482
198.00	5,276	4,831	14,588	5,392
199.00	6,225	5,744	20,332	6,378
200.00	7,235	6,724	27,056	7,429

Device	Routing	Invert	Outlet Devices
#1	Device 3	194.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Device 3	196.85'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	192.00'	**12.0" Round Culvert** L= 85.0' Ke= 0.500 Outlet Invert= 191.15' S= 0.0100 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=5.46 cfs @ 12.52 hrs HW=199.06' (Free Discharge)
└─**3=Culvert** (Passes 5.46 cfs of 8.53 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.52 cfs @ 10.69 fps)
  └─**2=Orifice/Grate** (Orifice Controls 4.94 cfs @ 6.29 fps)

Summary for Pond B17:

Inflow Area = 4.603 ac, 21.02% Impervious, Inflow Depth = 2.53" for 100 yr. event
Inflow = 8.22 cfs @ 12.14 hrs, Volume= 0.969 af
Outflow = 4.58 cfs @ 12.52 hrs, Volume= 0.969 af, Atten= 44%, Lag= 22.8 min
Primary = 4.58 cfs @ 12.52 hrs, Volume= 0.969 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 218.20' @ 12.52 hrs Surf.Area= 3,170 sf Storage= 7,242 cf
Flood Elev= 219.00' Surf.Area= 3,726 sf Storage= 10,012 cf

Plug-Flow detention time= 63.5 min calculated for 0.969 af (100% of inflow)
Center-of-Mass det. time= 63.5 min (928.7 - 865.1)

Volume	Invert	Avail.Storage	Storage Description
#1	214.50'	10,012 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
214.50	0	0	0	0
215.00	1,324	221	221	1,324
216.00	1,839	1,574	1,795	1,858
217.00	2,412	2,119	3,914	2,454
218.00	3,041	2,720	6,635	3,110
219.00	3,726	3,378	10,012	3,825

Device	Routing	Invert	Outlet Devices
#1	Device 2	214.50'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	212.50'	**12.0" Round Culvert** L= 103.0' Ke= 0.500
			Outlet Invert= 207.00' S= 0.0534 '/' Cc= 0.900 n= 0.012
#3	Device 2	216.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=4.58 cfs @ 12.52 hrs HW=218.19' (Free Discharge)
└─**2=Culvert** (Passes 4.58 cfs of 8.62 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.45 cfs @ 9.10 fps)
  └─**3=Orifice/Grate** (Orifice Controls 4.13 cfs @ 5.26 fps)

Summary for Pond B31:

Inflow Area = 3.219 ac, 44.48% Impervious, Inflow Depth = 3.95" for 100 yr. event
Inflow = 13.67 cfs @ 12.11 hrs, Volume= 1.058 af
Outflow = 1.49 cfs @ 12.99 hrs, Volume= 1.058 af, Atten= 89%, Lag= 52.7 min
Discarded = 0.53 cfs @ 12.99 hrs, Volume= 0.709 af
Primary = 0.96 cfs @ 12.99 hrs, Volume= 0.349 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 219.28' @ 12.99 hrs Surf.Area= 9,434 sf Storage= 21,894 cf

Plug-Flow detention time= 275.1 min calculated for 1.058 af (100% of inflow)
Center-of-Mass det. time= 275.3 min (1,094.2 - 818.9)

Volume	Invert	Avail.Storage	Storage Description
#1	216.00'	40,805 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
216.00	4,061	0	0
217.00	5,596	4,829	4,829
218.00	7,218	6,407	11,236
219.00	8,928	8,073	19,309
220.00	10,726	9,827	29,136
221.00	12,612	11,669	40,805

Device	Routing	Invert	Outlet Devices
#1	Discarded	216.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	218.00'	**6.0" Round Culvert** L= 25.0' Ke= 0.500
			Outlet Invert= 216.00' S= 0.0800 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.53 cfs @ 12.99 hrs HW=219.28' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.53 cfs)

Primary OutFlow Max=0.96 cfs @ 12.99 hrs HW=219.28' (Free Discharge)
└─**2=Culvert** (Inlet Controls 0.96 cfs @ 4.89 fps)

Summary for Pond B9:

Inflow Area = 2.149 ac, 42.72% Impervious, Inflow Depth = 3.95" for 100 yr. event
Inflow = 9.13 cfs @ 12.11 hrs, Volume= 0.707 af
Outflow = 1.14 cfs @ 12.85 hrs, Volume= 0.707 af, Atten= 88%, Lag= 44.3 min
Discarded = 0.33 cfs @ 12.85 hrs, Volume= 0.490 af
Primary = 0.81 cfs @ 12.85 hrs, Volume= 0.216 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 233.98' @ 12.85 hrs Surf.Area= 5,940 sf Storage= 14,072 cf

Plug-Flow detention time= 276.0 min calculated for 0.706 af (100% of inflow)
Center-of-Mass det. time= 276.1 min (1,095.0 - 818.9)

Volume	Invert	Avail.Storage	Storage Description
#1	231.00'	20,587 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
231.00	3,575	0	0
232.00	4,309	3,942	3,942
233.00	5,103	4,706	8,648
234.00	5,955	5,529	14,177
235.00	6,865	6,410	20,587

Device	Routing	Invert	Outlet Devices
#1	Discarded	231.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	233.00'	**6.0" Round Culvert** L= 31.0' Ke= 0.500 Outlet Invert= 229.00' S= 0.1290 '/' Cc= 0.900 n= 0.012

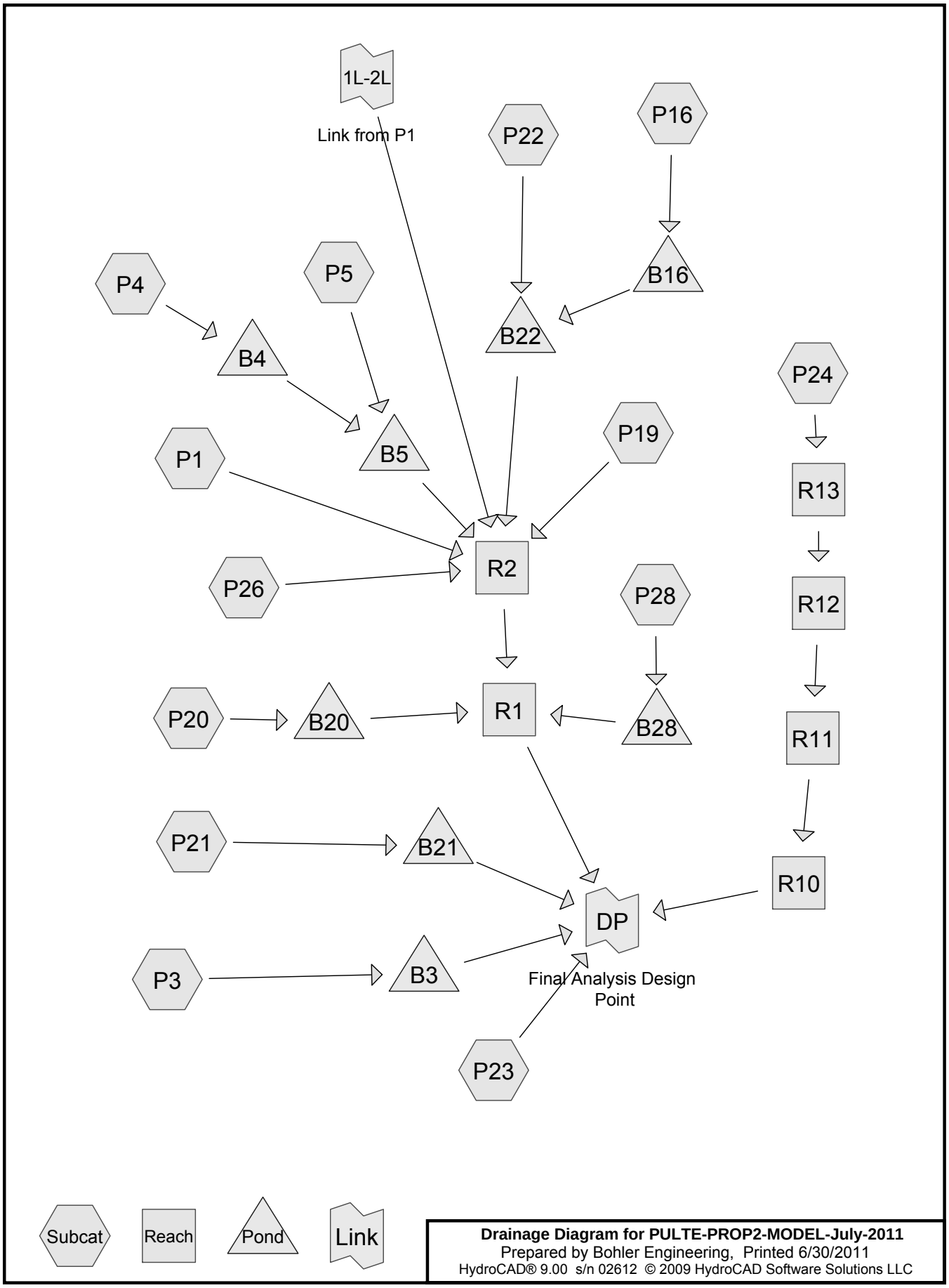
Discarded OutFlow Max=0.33 cfs @ 12.85 hrs HW=233.98' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.81 cfs @ 12.85 hrs HW=233.98' (Free Discharge)
└─**2=Culvert** (Inlet Controls 0.81 cfs @ 4.12 fps)

Summary for Link 1L-2L: Link to 2nd File

Inflow Area = 48.067 ac, 23.20% Impervious, Inflow Depth = 2.64" for 100 yr. event
Inflow = 70.82 cfs @ 12.25 hrs, Volume= 10.563 af
Primary = 70.82 cfs @ 12.25 hrs, Volume= 10.563 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Drainage Diagram for PULTE-PROP2-MODEL-July-2011
Prepared by Bohler Engineering, Printed 6/30/2011
HydroCAD® 9.00 s/n 02612 © 2009 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.069	55	Woods, Good, HSG B (P24)
7.229	58	(P4)
8.568	59	(P3)
9.519	61	(P20)
2.084	61	>75% Grass cover, Good, HSG B (P16, P28)
22.266	62	(P23)
18.324	63	(P19, P21)
38.540	66	(P1)
3.840	70	(P22, P5)
0.924	70	Woods, Good, HSG C (P24)
4.872	74	>75% Grass cover, Good, HSG C (P24, P28)
4.957	79	(P26)
4.485	98	Paved parking & roofs (P16, P24, P28)
125.676		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment P1: Runoff Area=1,678,786 sf 0.00% Impervious Runoff Depth=0.62"
Tc=13.5 min CN=66 Runoff=17.67 cfs 1.987 af

Subcatchment P16: Runoff Area=92,508 sf 52.74% Impervious Runoff Depth=1.41"
Tc=7.0 min CN=81 Runoff=3.31 cfs 0.249 af

Subcatchment P19: Runoff Area=612,322 sf 0.00% Impervious Runoff Depth=0.50"
Tc=13.3 min CN=63 Runoff=4.63 cfs 0.587 af

Subcatchment P20: Runoff Area=414,633 sf 0.00% Impervious Runoff Depth=0.43"
Tc=11.1 min CN=61 Runoff=2.57 cfs 0.341 af

Subcatchment P21: Runoff Area=185,885 sf 0.00% Impervious Runoff Depth=0.50"
Tc=16.7 min CN=63 Runoff=1.31 cfs 0.178 af

Subcatchment P22: Runoff Area=84,050 sf 0.00% Impervious Runoff Depth=0.80"
Tc=6.0 min CN=70 Runoff=1.59 cfs 0.128 af

Subcatchment P23: Runoff Area=969,892 sf 0.00% Impervious Runoff Depth=0.46"
Tc=9.5 min CN=62 Runoff=7.14 cfs 0.862 af

Subcatchment P24: Runoff Area=106,597 sf 8.65% Impervious Runoff Depth=1.00"
Tc=10.0 min CN=74 Runoff=2.33 cfs 0.203 af

Subcatchment P26: Runoff Area=215,921 sf 0.00% Impervious Runoff Depth=1.28"
Tc=11.0 min CN=79 Runoff=6.13 cfs 0.529 af

Subcatchment P28: Runoff Area=342,537 sf 40.10% Impervious Runoff Depth=1.48"
Tc=14.0 min CN=82 Runoff=10.41 cfs 0.967 af

Subcatchment P3: Runoff Area=373,203 sf 0.00% Impervious Runoff Depth=0.36"
Tc=13.0 min CN=59 Runoff=1.62 cfs 0.259 af

Subcatchment P4: Runoff Area=314,904 sf 0.00% Impervious Runoff Depth=0.33"
Tc=17.0 min CN=58 Runoff=1.11 cfs 0.200 af

Subcatchment P5: Runoff Area=83,222 sf 0.00% Impervious Runoff Depth=0.80"
Tc=7.3 min CN=70 Runoff=1.50 cfs 0.127 af

Reach R1: Avg. Depth=0.47' Max Vel=2.70 fps Inflow=33.17 cfs 6.571 af
n=0.025 L=477.0' S=0.0060 '/' Capacity=381.54 cfs Outflow=32.83 cfs 6.570 af

Reach R10: Avg. Depth=0.09' Max Vel=1.26 fps Inflow=1.11 cfs 0.203 af
n=0.025 L=300.0' S=0.0120 '/' Capacity=236.56 cfs Outflow=1.10 cfs 0.203 af

Reach R11: Avg. Depth=0.10' Max Vel=1.11 fps Inflow=1.84 cfs 0.203 af
n=0.025 L=1,733.0' S=0.0080 '/' Capacity=56.30 cfs Outflow=1.11 cfs 0.203 af

Reach R12: Avg. Depth=0.09' Max Vel=2.06 fps Inflow=2.09 cfs 0.203 af
n=0.025 L=855.0' S=0.0320 '/' Capacity=118.76 cfs Outflow=1.84 cfs 0.203 af

Reach R13: Avg. Depth=0.05' Max Vel=1.98 fps Inflow=2.33 cfs 0.203 af
n=0.025 L=650.0' S=0.0580 '/' Capacity=28.71 cfs Outflow=2.09 cfs 0.203 af

Reach R2: Avg. Depth=0.47' Max Vel=2.70 fps Inflow=35.13 cfs 5.528 af
n=0.025 L=1,008.0' S=0.0060 '/' Capacity=233.27 cfs Outflow=32.93 cfs 5.528 af

Pond B16: Peak Elev=211.60' Storage=5,231 cf Inflow=3.31 cfs 0.249 af
Discarded=0.22 cfs 0.249 af Primary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.249 af

Pond B20: Peak Elev=166.21' Storage=3,422 cf Inflow=2.57 cfs 0.341 af
Discarded=0.21 cfs 0.241 af Primary=0.92 cfs 0.100 af Outflow=1.13 cfs 0.341 af

Pond B21: Peak Elev=157.84' Storage=2,944 cf Inflow=1.31 cfs 0.178 af
Discarded=0.20 cfs 0.178 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.178 af

Pond B22: Peak Elev=203.54' Storage=1,708 cf Inflow=1.59 cfs 0.128 af
Outflow=0.28 cfs 0.128 af

Pond B28: Peak Elev=219.00' Storage=30,119 cf Inflow=10.41 cfs 0.967 af
Outflow=0.32 cfs 0.943 af

Pond B3: Peak Elev=219.02' Storage=11,284 cf Inflow=1.62 cfs 0.259 af
Outflow=0.00 cfs 0.000 af

Pond B4: Peak Elev=217.92' Storage=2,070 cf Inflow=1.11 cfs 0.200 af
Outflow=0.28 cfs 0.200 af

Pond B5: Peak Elev=207.30' Storage=2,248 cf Inflow=1.55 cfs 0.326 af
Outflow=0.46 cfs 0.326 af

Link Primary Outflow Imported from PULTE-PROP1-MODEL-July-2011~Link 1L-2L.hce Inflow=9.44 cfs 1.971 af
Area= 48.067 ac 23.20% Imperv. Primary=9.44 cfs 1.971 af

Link DP: Final Analysis Design Point Inflow=38.82 cfs 7.635 af
Primary=38.82 cfs 7.635 af

Total Runoff Area = 125.676 ac Runoff Volume = 6.617 af Average Runoff Depth = 0.63"
96.43% Pervious = 121.191 ac 3.57% Impervious = 4.485 ac

Summary for Subcatchment P1:

Runoff = 17.67 cfs @ 12.22 hrs, Volume= 1.987 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

	Area (sf)	CN	Description
*	1,678,786	66	
	1,678,786		100.00% Pervious Area

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

Summary for Subcatchment P16:

Runoff = 3.31 cfs @ 12.11 hrs, Volume= 0.249 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
43,717	61	>75% Grass cover, Good, HSG B
48,791	98	Paved parking & roofs
92,508	81	Weighted Average
43,717		47.26% Pervious Area
48,791		52.74% Impervious Area

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

Summary for Subcatchment P19:

Runoff = 4.63 cfs @ 12.24 hrs, Volume= 0.587 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
612,322	63	
612,322		100.00% Pervious Area

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

Summary for Subcatchment P20:

Runoff = 2.57 cfs @ 12.22 hrs, Volume= 0.341 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
414,633	61	
414,633		100.00% Pervious Area

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

Summary for Subcatchment P21:

Runoff = 1.31 cfs @ 12.30 hrs, Volume= 0.178 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
185,885	63	
185,885		100.00% Pervious Area

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

Summary for Subcatchment P22:

Runoff = 1.59 cfs @ 12.10 hrs, Volume= 0.128 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
84,050	70	
84,050		100.00% Pervious Area

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

Summary for Subcatchment P23:

Runoff = 7.14 cfs @ 12.18 hrs, Volume= 0.862 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
969,892	62	
969,892		100.00% Pervious Area

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

Summary for Subcatchment P24:

Runoff = 2.33 cfs @ 12.15 hrs, Volume= 0.203 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
3,019	55	Woods, Good, HSG B
40,259	70	Woods, Good, HSG C
54,096	74	>75% Grass cover, Good, HSG C
9,223	98	Paved parking & roofs
106,597	74	Weighted Average
97,374		91.35% Pervious Area
9,223		8.65% Impervious Area

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

Summary for Subcatchment P26:

Runoff = 6.13 cfs @ 12.16 hrs, Volume= 0.529 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
215,921	79	
215,921		100.00% Pervious Area

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

Summary for Subcatchment P28:

Runoff = 10.41 cfs @ 12.20 hrs, Volume= 0.967 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
158,133	74	>75% Grass cover, Good, HSG C
137,351	98	Paved parking & roofs
47,053	61	>75% Grass cover, Good, HSG B
342,537	82	Weighted Average
205,186		59.90% Pervious Area
137,351		40.10% Impervious Area

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

Summary for Subcatchment P3:

Runoff = 1.62 cfs @ 12.31 hrs, Volume= 0.259 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
373,203	59	
373,203		100.00% Pervious Area

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

Summary for Subcatchment P4:

Runoff = 1.11 cfs @ 12.42 hrs, Volume= 0.200 af, Depth= 0.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
314,904	58	
314,904		100.00% Pervious Area

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

Summary for Subcatchment P5:

Runoff = 1.50 cfs @ 12.12 hrs, Volume= 0.127 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr. Rainfall=3.10", Ia/S=0.19

Area (sf)	CN	Description
83,222	70	
83,222		100.00% Pervious Area

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

Summary for Reach R1:

[65] Warning: Inlet elevation not specified

Inflow Area = 136.195 ac, 11.32% Impervious, Inflow Depth > 0.58" for 2 yr. event
Inflow = 33.17 cfs @ 12.35 hrs, Volume= 6.571 af
Outflow = 32.83 cfs @ 12.39 hrs, Volume= 6.570 af, Atten= 1%, Lag= 2.1 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.70 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 14.2 min

Peak Storage= 5,802 cf @ 12.39 hrs, Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 381.54 cfs

25.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 33.00'
Length= 477.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -2.86'

‡

Summary for Reach R10:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 1.00" for 2 yr. event
Inflow = 1.11 cfs @ 12.60 hrs, Volume= 0.203 af
Outflow = 1.10 cfs @ 12.64 hrs, Volume= 0.203 af, Atten= 1%, Lag= 2.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.26 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.53 fps, Avg. Travel Time= 9.3 min

Peak Storage= 263 cf @ 12.64 hrs, Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 236.56 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 300.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -3.60'

‡

Summary for Reach R11:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 1.00" for 2 yr. event
Inflow = 1.84 cfs @ 12.30 hrs, Volume= 0.203 af
Outflow = 1.11 cfs @ 12.60 hrs, Volume= 0.203 af, Atten= 40%, Lag= 17.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.11 fps, Min. Travel Time= 25.9 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 80.3 min

Peak Storage= 1,733 cf @ 12.60 hrs, Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 56.30 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,733.0' Slope= 0.0080 '/'
Inlet Invert= 0.00', Outlet Invert= -13.86'

‡

Summary for Reach R12:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 1.00" for 2 yr. event
Inflow = 2.09 cfs @ 12.22 hrs, Volume= 0.203 af
Outflow = 1.84 cfs @ 12.30 hrs, Volume= 0.203 af, Atten= 12%, Lag= 5.4 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.06 fps, Min. Travel Time= 6.9 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 21.4 min

Peak Storage= 766 cf @ 12.30 hrs, Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 118.76 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 855.0' Slope= 0.0320 '/'
Inlet Invert= 0.00', Outlet Invert= -27.36'

‡

Summary for Reach R13:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 1.00" for 2 yr. event
Inflow = 2.33 cfs @ 12.15 hrs, Volume= 0.203 af
Outflow = 2.09 cfs @ 12.22 hrs, Volume= 0.203 af, Atten= 10%, Lag= 3.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.98 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 19.7 min

Peak Storage= 683 cf @ 12.22 hrs, Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.25', Capacity at Bank-Full= 28.71 cfs

20.00' x 0.25' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 21.50'
Length= 650.0' Slope= 0.0580 '/'
Inlet Invert= 0.00', Outlet Invert= -37.70'

‡

Summary for Reach R2:

[65] Warning: Inlet elevation not specified

Inflow Area = 118.813 ac, 10.33% Impervious, Inflow Depth = 0.56" for 2 yr. event
Inflow = 35.13 cfs @ 12.26 hrs, Volume= 5.528 af
Outflow = 32.93 cfs @ 12.35 hrs, Volume= 5.528 af, Atten= 6%, Lag= 5.6 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.70 fps, Min. Travel Time= 6.2 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 33.1 min

Peak Storage= 12,281 cf @ 12.35 hrs, Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 233.27 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 1,008.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -6.05'

‡

Summary for Pond B16:

Inflow Area = 2.124 ac, 52.74% Impervious, Inflow Depth = 1.41" for 2 yr. event
Inflow = 3.31 cfs @ 12.11 hrs, Volume= 0.249 af
Outflow = 0.22 cfs @ 14.48 hrs, Volume= 0.249 af, Atten= 94%, Lag= 142.2 min
Discarded = 0.22 cfs @ 14.48 hrs, Volume= 0.249 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 211.60' @ 14.48 hrs Surf.Area= 3,859 sf Storage= 5,231 cf

Plug-Flow detention time= 268.6 min calculated for 0.249 af (100% of inflow)
Center-of-Mass det. time= 268.5 min (1,108.9 - 840.4)

Volume	Invert	Avail.Storage	Storage Description
#1	210.00'	23,168 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
210.00	2,711	0	0
211.00	3,403	3,057	3,057
212.00	4,164	3,784	6,841
213.00	4,985	4,575	11,415
214.00	5,862	5,424	16,839
215.00	6,796	6,329	23,168

Device	Routing	Invert	Outlet Devices
#1	Discarded	210.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	213.00'	**8.0" Round Culvert** L= 128.0' Ke= 0.500
			Outlet Invert= 211.72' S= 0.0100 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.22 cfs @ 14.48 hrs HW=211.60' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=210.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Summary for Pond B20:

Inflow Area =	9.519 ac,	0.00% Impervious,	Inflow Depth =	0.43" for 2 yr. event
Inflow =	2.57 cfs @	12.22 hrs, Volume=	0.341 af	
Outflow =	1.13 cfs @	12.65 hrs, Volume=	0.341 af, Atten= 56%, Lag= 25.9 min	
Discarded =	0.21 cfs @	12.45 hrs, Volume=	0.241 af	
Primary =	0.92 cfs @	12.65 hrs, Volume=	0.100 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 166.21' @ 12.65 hrs Surf.Area= 3,735 sf Storage= 3,422 cf

Plug-Flow detention time= 143.8 min calculated for 0.340 af (100% of inflow)
Center-of-Mass det. time= 143.8 min (1,061.5 - 917.6)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	6,363 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
165.00	1,520	0	0
166.00	3,735	2,628	2,628
167.00	3,735	3,735	6,363

Device	Routing	Invert	Outlet Devices
#1	Discarded	165.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	166.10'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64
2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.21 cfs @ 12.45 hrs HW=166.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=0.92 cfs @ 12.65 hrs HW=166.21' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.92 cfs @ 0.82 fps)

Summary for Pond B21:

Inflow Area =	4.267 ac,	0.00% Impervious,	Inflow Depth =	0.50"	for 2 yr. event
Inflow =	1.31 cfs @	12.30 hrs,	Volume=	0.178 af	
Outflow =	0.20 cfs @	14.91 hrs,	Volume=	0.178 af,	Atten= 85%, Lag= 156.0 min
Discarded =	0.20 cfs @	14.91 hrs,	Volume=	0.178 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 157.84' @ 14.91 hrs Surf.Area= 3,611 sf Storage= 2,944 cf

Plug-Flow detention time= 226.9 min calculated for 0.178 af (100% of inflow)
Center-of-Mass det. time= 227.1 min (1,140.1 - 913.0)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	9,443 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
155.00	38	0	0
156.00	441	240	240
157.00	1,059	750	990
158.00	4,108	2,584	3,573
159.00	7,632	5,870	9,443

Device	Routing	Invert	Outlet Devices
#1	Discarded	155.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.10'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.20 cfs @ 14.91 hrs HW=157.84' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=155.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B22:

Inflow Area = 4.053 ac, 27.63% Impervious, Inflow Depth = 0.38" for 2 yr. event
Inflow = 1.59 cfs @ 12.10 hrs, Volume= 0.128 af
Outflow = 0.28 cfs @ 12.72 hrs, Volume= 0.128 af, Atten= 82%, Lag= 37.2 min
Primary = 0.28 cfs @ 12.72 hrs, Volume= 0.128 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 203.54' @ 12.72 hrs Surf.Area= 1,800 sf Storage= 1,708 cf

Plug-Flow detention time= 66.1 min calculated for 0.128 af (100% of inflow)
Center-of-Mass det. time= 65.6 min (940.7 - 875.1)

Volume	Invert	Avail.Storage	Storage Description
#1	202.00'	21,892 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
202.00	503	0	0	503
203.00	1,311	875	875	1,318
204.00	2,283	1,775	2,650	2,301
205.00	3,469	2,855	5,505	3,502
206.00	4,776	4,105	9,611	4,829
207.00	6,140	5,444	15,054	6,217
208.00	7,561	6,838	21,892	7,668

Device	Routing	Invert	Outlet Devices
#1	Primary	202.00'	**12.0" Round Culvert** L= 200.0' Ke= 0.500 Outlet Invert= 193.00' S= 0.0450 '/' Cc= 0.900 n= 0.012
#2	Device 1	202.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	203.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.28 cfs @ 12.72 hrs HW=203.54' (Free Discharge)
└─**1=Culvert** (Passes 0.28 cfs of 3.85 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 5.72 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B28:

Inflow Area = 7.864 ac, 40.10% Impervious, Inflow Depth = 1.48" for 2 yr. event
Inflow = 10.41 cfs @ 12.20 hrs, Volume= 0.967 af
Outflow = 0.32 cfs @ 18.03 hrs, Volume= 0.943 af, Atten= 97%, Lag= 349.7 min
Primary = 0.32 cfs @ 18.03 hrs, Volume= 0.943 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 219.00' @ 18.03 hrs Surf.Area= 18,263 sf Storage= 30,119 cf
Flood Elev= 220.50' Surf.Area= 23,722 sf Storage= 61,282 cf

Plug-Flow detention time= 1,121.3 min calculated for 0.942 af (97% of inflow)
Center-of-Mass det. time= 1,108.1 min (1,951.8 - 843.7)

Volume	Invert	Avail.Storage	Storage Description
#1	217.00'	73,722 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
217.00	11,855	0	0
218.00	15,100	13,478	13,478
219.00	18,270	16,685	30,163
220.00	21,405	19,838	50,000
221.00	26,038	23,722	73,722

Device	Routing	Invert	Outlet Devices
#1	Device 2	217.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	217.00'	**12.0" Round Culvert** L= 924.0' Ke= 0.500 Outlet Invert= 179.50' S= 0.0406 '/' Cc= 0.900 n= 0.012
#3	Device 2	219.10'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.32 cfs @ 18.03 hrs HW=219.00' (Free Discharge)
└─**2=Culvert** (Passes 0.32 cfs of 4.63 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.32 cfs @ 6.59 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B3:

Inflow Area = 8.568 ac, 0.00% Impervious, Inflow Depth = 0.36" for 2 yr. event
Inflow = 1.62 cfs @ 12.31 hrs, Volume= 0.259 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 219.02' @ 24.80 hrs Surf.Area= 70,485 sf Storage= 11,284 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	218.86'	236,112 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
218.86	69,951	0	0	69,951
219.00	70,422	9,826	9,826	70,440
220.00	73,492	71,952	81,778	73,654
221.00	76,825	75,152	156,930	77,126
222.00	81,562	79,182	236,112	81,967

Device	Routing	Invert	Outlet Devices
#1	Primary	221.80'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=218.86' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B4:

Inflow Area = 7.229 ac, 0.00% Impervious, Inflow Depth = 0.33" for 2 yr. event
Inflow = 1.11 cfs @ 12.42 hrs, Volume= 0.200 af
Outflow = 0.28 cfs @ 14.26 hrs, Volume= 0.200 af, Atten= 75%, Lag= 110.6 min
Primary = 0.28 cfs @ 14.26 hrs, Volume= 0.200 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 217.92' @ 14.26 hrs Surf.Area= 9,975 sf Storage= 2,070 cf

Plug-Flow detention time= 79.3 min calculated for 0.200 af (100% of inflow)
Center-of-Mass det. time= 79.2 min (1,019.7 - 940.4)

Volume	Invert	Avail.Storage	Storage Description
#1	217.30'	30,594 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
217.30	0	0	0	0
218.00	12,613	2,943	2,943	12,614
219.00	13,838	13,221	16,164	13,905
220.00	15,030	14,430	30,594	15,171

Device	Routing	Invert	Outlet Devices
#1	Primary	219.70'	**30.0' long Broad-Crested Rectangular Weir** Head (feet) 0.01 5.00 Coef. (English) 2.60 2.60
#2	Primary	217.30'	**4.0" Round Culvert** L= 135.0' Ke= 0.500 Outlet Invert= 210.01' S= 0.0540 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=0.28 cfs @ 14.26 hrs HW=217.92' (Free Discharge)
├─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**2=Culvert** (Inlet Controls 0.28 cfs @ 3.25 fps)

Summary for Pond B5:

Inflow Area = 9.140 ac, 0.00% Impervious, Inflow Depth = 0.43" for 2 yr. event
Inflow = 1.55 cfs @ 12.12 hrs, Volume= 0.326 af
Outflow = 0.46 cfs @ 13.54 hrs, Volume= 0.326 af, Atten= 70%, Lag= 85.0 min
Primary = 0.46 cfs @ 13.54 hrs, Volume= 0.326 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 207.30' @ 13.54 hrs Surf.Area= 18,050 sf Storage= 2,248 cf

Plug-Flow detention time= 98.8 min calculated for 0.326 af (100% of inflow)

Center-of-Mass det. time= 99.7 min (1,063.8 - 964.1)

Volume	Invert	Avail.Storage	Storage Description
#1	207.17'	15,537 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.17	17,765	0	0	17,765
208.00	19,689	15,537	15,537	19,731

Device	Routing	Invert	Outlet Devices
#1	Device 3	207.17'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	207.45'	**58.0' long Broad-Crested Rectangular Weir** Head (feet) 0.01 5.00 Coef. (English) 2.60 2.60
#3	Primary	205.62'	**8.0" Round Culvert** L= 101.2' Ke= 0.500 Outlet Invert= 199.28' S= 0.0626 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=0.46 cfs @ 13.54 hrs HW=207.30' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Passes 0.46 cfs of 1.95 cfs potential flow)
└─**1=Orifice/Grate** (Weir Controls 0.46 cfs @ 1.16 fps)

Summary for Link 1L-2L: Link from P1

Inflow Area = 48.067 ac, 23.20% Impervious, Inflow Depth = 0.49" for 2 yr. event
Inflow = 9.44 cfs @ 12.36 hrs, Volume= 1.971 af
Primary = 9.44 cfs @ 12.36 hrs, Volume= 1.971 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

2 yr. Primary Outflow Imported from PULTE-PROP1-MODEL-July-2011~Link 1L-2L.hce

Summary for Link DP: Final Analysis Design Point

Inflow Area = 173.743 ac, 9.00% Impervious, Inflow Depth > 0.53" for 2 yr. event
Inflow = 38.82 cfs @ 12.38 hrs, Volume= 7.635 af
Primary = 38.82 cfs @ 12.38 hrs, Volume= 7.635 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment P1: Runoff Area=1,678,786 sf 0.00% Impervious Runoff Depth=1.43"
Tc=13.5 min CN=66 Runoff=47.40 cfs 4.592 af

Subcatchment P16: Runoff Area=92,508 sf 52.74% Impervious Runoff Depth=2.57"
Tc=7.0 min CN=81 Runoff=6.08 cfs 0.455 af

Subcatchment P19: Runoff Area=612,322 sf 0.00% Impervious Runoff Depth=1.24"
Tc=13.3 min CN=63 Runoff=14.53 cfs 1.449 af

Subcatchment P20: Runoff Area=414,633 sf 0.00% Impervious Runoff Depth=1.12"
Tc=11.1 min CN=61 Runoff=9.17 cfs 0.885 af

Subcatchment P21: Runoff Area=185,885 sf 0.00% Impervious Runoff Depth=1.24"
Tc=16.7 min CN=63 Runoff=4.05 cfs 0.440 af

Subcatchment P22: Runoff Area=84,050 sf 0.00% Impervious Runoff Depth=1.70"
Tc=6.0 min CN=70 Runoff=3.68 cfs 0.274 af

Subcatchment P23: Runoff Area=969,892 sf 0.00% Impervious Runoff Depth=1.18"
Tc=9.5 min CN=62 Runoff=24.14 cfs 2.181 af

Subcatchment P24: Runoff Area=106,597 sf 8.65% Impervious Runoff Depth=2.00"
Tc=10.0 min CN=74 Runoff=4.89 cfs 0.408 af

Subcatchment P26: Runoff Area=215,921 sf 0.00% Impervious Runoff Depth=2.40"
Tc=11.0 min CN=79 Runoff=11.69 cfs 0.991 af

Subcatchment P28: Runoff Area=342,537 sf 40.10% Impervious Runoff Depth=2.66"
Tc=14.0 min CN=82 Runoff=18.85 cfs 1.740 af

Subcatchment P3: Runoff Area=373,203 sf 0.00% Impervious Runoff Depth=1.00"
Tc=13.0 min CN=59 Runoff=6.71 cfs 0.713 af

Subcatchment P4: Runoff Area=314,904 sf 0.00% Impervious Runoff Depth=0.94"
Tc=17.0 min CN=58 Runoff=4.71 cfs 0.567 af

Subcatchment P5: Runoff Area=83,222 sf 0.00% Impervious Runoff Depth=1.70"
Tc=7.3 min CN=70 Runoff=3.50 cfs 0.271 af

Reach R1: Avg. Depth=0.92' Max Vel=4.14 fps Inflow=103.74 cfs 15.287 af
n=0.025 L=477.0' S=0.0060 '/' Capacity=381.54 cfs Outflow=102.64 cfs 15.286 af

Reach R10: Avg. Depth=0.15' Max Vel=1.83 fps Inflow=2.94 cfs 0.408 af
n=0.025 L=300.0' S=0.0120 '/' Capacity=236.56 cfs Outflow=2.93 cfs 0.408 af

Reach R11: Avg. Depth=0.18' Max Vel=1.62 fps Inflow=4.22 cfs 0.408 af
n=0.025 L=1,733.0' S=0.0080 '/' Capacity=56.30 cfs Outflow=2.94 cfs 0.408 af

Reach R12: Avg. Depth=0.14' Max Vel=2.83 fps Inflow=4.57 cfs 0.408 af
n=0.025 L=855.0' S=0.0320 '/' Capacity=118.76 cfs Outflow=4.22 cfs 0.408 af

Reach R13: Avg. Depth=0.08' Max Vel=2.71 fps Inflow=4.89 cfs 0.408 af
n=0.025 L=650.0' S=0.0580 '/' Capacity=28.71 cfs Outflow=4.57 cfs 0.408 af

Reach R2: Avg. Depth=0.89' Max Vel=4.01 fps Inflow=99.69 cfs 12.974 af
n=0.025 L=1,008.0' S=0.0060 '/' Capacity=233.27 cfs Outflow=95.43 cfs 12.974 af

Pond B16: Peak Elev=212.95' Storage=11,162 cf Inflow=6.08 cfs 0.455 af
Discarded=0.28 cfs 0.455 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.455 af

Pond B20: Peak Elev=166.56' Storage=4,725 cf Inflow=9.17 cfs 0.885 af
Discarded=0.21 cfs 0.283 af Primary=8.12 cfs 0.602 af Outflow=8.33 cfs 0.885 af

Pond B21: Peak Elev=158.31' Storage=4,992 cf Inflow=4.05 cfs 0.440 af
Discarded=0.29 cfs 0.286 af Primary=2.28 cfs 0.154 af Outflow=2.57 cfs 0.440 af

Pond B22: Peak Elev=204.20' Storage=3,120 cf Inflow=3.68 cfs 0.274 af
Outflow=1.63 cfs 0.274 af

Pond B28: Peak Elev=219.37' Storage=37,075 cf Inflow=18.85 cfs 1.740 af
Outflow=5.17 cfs 1.711 af

Pond B3: Peak Elev=219.30' Storage=31,043 cf Inflow=6.71 cfs 0.713 af
Outflow=0.00 cfs 0.000 af

Pond B4: Peak Elev=218.67' Storage=11,620 cf Inflow=4.71 cfs 0.567 af
Outflow=0.46 cfs 0.567 af

Pond B5: Peak Elev=207.41' Storage=4,344 cf Inflow=3.72 cfs 0.839 af
Outflow=1.21 cfs 0.839 af

10 **Link** Primary Outflow Imported from PULTE-PROP1-MODEL-July-2011~Link 1L-2L.hce Inflow=27.14 cfs 4.830 af
Area= 48.067 ac 23.20% Imperv. Primary=27.14 cfs 4.830 af

Link DP: Final Analysis Design Point Inflow=121.67 cfs 18.029 af
Primary=121.67 cfs 18.029 af

Total Runoff Area = 125.676 ac Runoff Volume = 14.965 af Average Runoff Depth = 1.43"
96.43% Pervious = 121.191 ac 3.57% Impervious = 4.485 ac

Summary for Subcatchment P1:

Runoff = 47.40 cfs @ 12.20 hrs, Volume= 4.592 af, Depth= 1.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

	Area (sf)	CN	Description
*	1,678,786	66	
	1,678,786		100.00% Pervious Area

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

Summary for Subcatchment P16:

Runoff = 6.08 cfs @ 12.10 hrs, Volume= 0.455 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
43,717	61	>75% Grass cover, Good, HSG B
48,791	98	Paved parking & roofs
92,508	81	Weighted Average
43,717		47.26% Pervious Area
48,791		52.74% Impervious Area

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

Summary for Subcatchment P19:

Runoff = 14.53 cfs @ 12.21 hrs, Volume= 1.449 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
612,322	63	
612,322		100.00% Pervious Area

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

Summary for Subcatchment P20:

Runoff = 9.17 cfs @ 12.17 hrs, Volume= 0.885 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
414,633	61	
414,633		100.00% Pervious Area

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

Summary for Subcatchment P21:

Runoff = 4.05 cfs @ 12.26 hrs, Volume= 0.440 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
185,885	63	
185,885		100.00% Pervious Area

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

Summary for Subcatchment P22:

Runoff = 3.68 cfs @ 12.10 hrs, Volume= 0.274 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
84,050	70	
84,050		100.00% Pervious Area

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

Summary for Subcatchment P23:

Runoff = 24.14 cfs @ 12.15 hrs, Volume= 2.181 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
969,892	62	
969,892		100.00% Pervious Area

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

Summary for Subcatchment P24:

Runoff = 4.89 cfs @ 12.15 hrs, Volume= 0.408 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
3,019	55	Woods, Good, HSG B
40,259	70	Woods, Good, HSG C
54,096	74	>75% Grass cover, Good, HSG C
9,223	98	Paved parking & roofs
106,597	74	Weighted Average
97,374		91.35% Pervious Area
9,223		8.65% Impervious Area

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

Summary for Subcatchment P26:

Runoff = 11.69 cfs @ 12.16 hrs, Volume= 0.991 af, Depth= 2.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
215,921	79	
215,921		100.00% Pervious Area

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

Summary for Subcatchment P28:

Runoff = 18.85 cfs @ 12.20 hrs, Volume= 1.740 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
158,133	74	>75% Grass cover, Good, HSG C
137,351	98	Paved parking & roofs
47,053	61	>75% Grass cover, Good, HSG B
342,537	82	Weighted Average
205,186		59.90% Pervious Area
137,351		40.10% Impervious Area

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

Summary for Subcatchment P3:

Runoff = 6.71 cfs @ 12.21 hrs, Volume= 0.713 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
373,203	59	
373,203		100.00% Pervious Area

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

Summary for Subcatchment P4:

Runoff = 4.71 cfs @ 12.28 hrs, Volume= 0.567 af, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
314,904	58	
314,904		100.00% Pervious Area

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

Summary for Subcatchment P5:

Runoff = 3.50 cfs @ 12.11 hrs, Volume= 0.271 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr. Rainfall=4.50", Ia/S=0.19

Area (sf)	CN	Description
83,222	70	
83,222		100.00% Pervious Area

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

Summary for Reach R1:

[65] Warning: Inlet elevation not specified

Inflow Area = 136.195 ac, 11.32% Impervious, Inflow Depth > 1.35" for 10 yr. event
Inflow = 103.74 cfs @ 12.27 hrs, Volume= 15.287 af
Outflow = 102.64 cfs @ 12.30 hrs, Volume= 15.286 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.14 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 11.8 min

Peak Storage= 11,837 cf @ 12.30 hrs, Average Depth at Peak Storage= 0.92'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 381.54 cfs

25.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 33.00'
Length= 477.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -2.86'

‡

Summary for Reach R10:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 2.00" for 10 yr. event
Inflow = 2.94 cfs @ 12.44 hrs, Volume= 0.408 af
Outflow = 2.93 cfs @ 12.47 hrs, Volume= 0.408 af, Atten= 0%, Lag= 1.8 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.83 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 8.5 min

Peak Storage= 479 cf @ 12.47 hrs, Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 236.56 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 300.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -3.60'

‡

Summary for Reach R11:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 2.00" for 10 yr. event
Inflow = 4.22 cfs @ 12.25 hrs, Volume= 0.408 af
Outflow = 2.94 cfs @ 12.44 hrs, Volume= 0.408 af, Atten= 30%, Lag= 11.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.62 fps, Min. Travel Time= 17.8 min
Avg. Velocity = 0.42 fps, Avg. Travel Time= 69.6 min

Peak Storage= 3,146 cf @ 12.44 hrs, Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 56.30 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,733.0' Slope= 0.0080 '/'
Inlet Invert= 0.00', Outlet Invert= -13.86'

‡

Summary for Reach R12:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 2.00" for 10 yr. event
Inflow = 4.57 cfs @ 12.19 hrs, Volume= 0.408 af
Outflow = 4.22 cfs @ 12.25 hrs, Volume= 0.408 af, Atten= 8%, Lag= 3.5 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.83 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 17.9 min

Peak Storage= 1,277 cf @ 12.25 hrs, Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 118.76 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 855.0' Slope= 0.0320 '/'
Inlet Invert= 0.00', Outlet Invert= -27.36'

‡

Summary for Reach R13:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 2.00" for 10 yr. event
Inflow = 4.89 cfs @ 12.15 hrs, Volume= 0.408 af
Outflow = 4.57 cfs @ 12.19 hrs, Volume= 0.408 af, Atten= 7%, Lag= 2.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.71 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 16.2 min

Peak Storage= 1,097 cf @ 12.19 hrs, Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.25', Capacity at Bank-Full= 28.71 cfs

20.00' x 0.25' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 21.50'
Length= 650.0' Slope= 0.0580 '/'
Inlet Invert= 0.00', Outlet Invert= -37.70'

‡

Summary for Reach R2:

[65] Warning: Inlet elevation not specified

Inflow Area = 118.813 ac, 10.33% Impervious, Inflow Depth = 1.31" for 10 yr. event
Inflow = 99.69 cfs @ 12.22 hrs, Volume= 12.974 af
Outflow = 95.43 cfs @ 12.27 hrs, Volume= 12.974 af, Atten= 4%, Lag= 3.3 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.01 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 28.0 min

Peak Storage= 23,883 cf @ 12.27 hrs, Average Depth at Peak Storage= 0.89'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 233.27 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 1,008.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -6.05'

‡

Summary for Pond B16:

Inflow Area = 2.124 ac, 52.74% Impervious, Inflow Depth = 2.57" for 10 yr. event
Inflow = 6.08 cfs @ 12.10 hrs, Volume= 0.455 af
Outflow = 0.28 cfs @ 15.39 hrs, Volume= 0.455 af, Atten= 95%, Lag= 197.3 min
Discarded = 0.28 cfs @ 15.39 hrs, Volume= 0.455 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 212.95' @ 15.39 hrs Surf.Area= 4,943 sf Storage= 11,162 cf

Plug-Flow detention time= 455.8 min calculated for 0.455 af (100% of inflow)
Center-of-Mass det. time= 455.7 min (1,278.9 - 823.3)

Volume	Invert	Avail.Storage	Storage Description
#1	210.00'	23,168 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
210.00	2,711	0	0
211.00	3,403	3,057	3,057
212.00	4,164	3,784	6,841
213.00	4,985	4,575	11,415
214.00	5,862	5,424	16,839
215.00	6,796	6,329	23,168

Device	Routing	Invert	Outlet Devices
#1	Discarded	210.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	213.00'	**8.0" Round Culvert** L= 128.0' Ke= 0.500
			Outlet Invert= 211.72' S= 0.0100 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.28 cfs @ 15.39 hrs HW=212.95' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=210.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Summary for Pond B20:

Inflow Area =	9.519 ac,	0.00% Impervious,	Inflow Depth =	1.12" for 10 yr. event
Inflow =	9.17 cfs @	12.17 hrs, Volume=	0.885 af	
Outflow =	8.33 cfs @	12.25 hrs, Volume=	0.885 af, Atten= 9%, Lag= 4.5 min	
Discarded =	0.21 cfs @	12.10 hrs, Volume=	0.283 af	
Primary =	8.12 cfs @	12.25 hrs, Volume=	0.602 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 166.56' @ 12.25 hrs Surf.Area= 3,735 sf Storage= 4,725 cf

Plug-Flow detention time= 72.5 min calculated for 0.884 af (100% of inflow)
Center-of-Mass det. time= 72.6 min (954.5 - 881.8)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	6,363 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
165.00	1,520	0	0
166.00	3,735	2,628	2,628
167.00	3,735	3,735	6,363

Device	Routing	Invert	Outlet Devices
#1	Discarded	165.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	166.10'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64
2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.21 cfs @ 12.10 hrs HW=166.11' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=8.11 cfs @ 12.25 hrs HW=166.56' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 8.11 cfs @ 1.76 fps)

Summary for Pond B21:

Inflow Area =	4.267 ac,	0.00% Impervious,	Inflow Depth =	1.24"	for 10 yr. event
Inflow =	4.05 cfs @	12.26 hrs,	Volume=	0.440 af	
Outflow =	2.57 cfs @	12.53 hrs,	Volume=	0.440 af,	Atten= 37%, Lag= 16.5 min
Discarded =	0.29 cfs @	12.53 hrs,	Volume=	0.286 af	
Primary =	2.28 cfs @	12.53 hrs,	Volume=	0.154 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 158.31' @ 12.53 hrs Surf.Area= 5,185 sf Storage= 4,992 cf

Plug-Flow detention time= 163.1 min calculated for 0.440 af (100% of inflow)
Center-of-Mass det. time= 163.5 min (1,044.4 - 880.9)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	9,443 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
155.00	38	0	0
156.00	441	240	240
157.00	1,059	750	990
158.00	4,108	2,584	3,573
159.00	7,632	5,870	9,443

Device	Routing	Invert	Outlet Devices
#1	Discarded	155.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.10'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.29 cfs @ 12.53 hrs HW=158.30' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=2.25 cfs @ 12.53 hrs HW=158.30' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.25 cfs @ 1.10 fps)

Summary for Pond B22:

Inflow Area = 4.053 ac, 27.63% Impervious, Inflow Depth = 0.81" for 10 yr. event
Inflow = 3.68 cfs @ 12.10 hrs, Volume= 0.274 af
Outflow = 1.63 cfs @ 12.35 hrs, Volume= 0.274 af, Atten= 56%, Lag= 14.9 min
Primary = 1.63 cfs @ 12.35 hrs, Volume= 0.274 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 204.20' @ 12.35 hrs Surf.Area= 2,497 sf Storage= 3,120 cf

Plug-Flow detention time= 62.5 min calculated for 0.274 af (100% of inflow)
Center-of-Mass det. time= 62.0 min (913.5 - 851.5)

Volume	Invert	Avail.Storage	Storage Description
#1	202.00'	21,892 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
202.00	503	0	0	503
203.00	1,311	875	875	1,318
204.00	2,283	1,775	2,650	2,301
205.00	3,469	2,855	5,505	3,502
206.00	4,776	4,105	9,611	4,829
207.00	6,140	5,444	15,054	6,217
208.00	7,561	6,838	21,892	7,668

Device	Routing	Invert	Outlet Devices
#1	Primary	202.00'	**12.0" Round Culvert** L= 200.0' Ke= 0.500 Outlet Invert= 193.00' S= 0.0450 '/' Cc= 0.900 n= 0.012
#2	Device 1	202.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	203.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.62 cfs @ 12.35 hrs HW=204.20' (Free Discharge)
└─**1=Culvert** (Passes 1.62 cfs of 4.93 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.34 cfs @ 6.93 fps)
  └─**3=Orifice/Grate** (Orifice Controls 1.28 cfs @ 2.63 fps)

Summary for Pond B28:

Inflow Area = 7.864 ac, 40.10% Impervious, Inflow Depth = 2.66" for 10 yr. event
Inflow = 18.85 cfs @ 12.20 hrs, Volume= 1.740 af
Outflow = 5.17 cfs @ 12.66 hrs, Volume= 1.711 af, Atten= 73%, Lag= 28.0 min
Primary = 5.17 cfs @ 12.66 hrs, Volume= 1.711 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 219.37' @ 12.66 hrs Surf.Area= 19,420 sf Storage= 37,075 cf
Flood Elev= 220.50' Surf.Area= 23,722 sf Storage= 61,282 cf

Plug-Flow detention time= 734.9 min calculated for 1.711 af (98% of inflow)
Center-of-Mass det. time= 724.9 min (1,551.9 - 827.0)

Volume	Invert	Avail.Storage	Storage Description
#1	217.00'	73,722 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
217.00	11,855	0	0
218.00	15,100	13,478	13,478
219.00	18,270	16,685	30,163
220.00	21,405	19,838	50,000
221.00	26,038	23,722	73,722

Device	Routing	Invert	Outlet Devices
#1	Device 2	217.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	217.00'	**12.0" Round Culvert** L= 924.0' Ke= 0.500 Outlet Invert= 179.50' S= 0.0406 '/' Cc= 0.900 n= 0.012
#3	Device 2	219.10'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.17 cfs @ 12.66 hrs HW=219.37' (Free Discharge)
└─**2=Culvert** (Inlet Controls 5.17 cfs @ 6.58 fps)
  ├─**1=Orifice/Grate** (Passes < 0.35 cfs potential flow)
  └─**3=Orifice/Grate** (Passes < 5.64 cfs potential flow)

Summary for Pond B3:

Inflow Area = 8.568 ac, 0.00% Impervious, Inflow Depth = 1.00" for 10 yr. event
Inflow = 6.71 cfs @ 12.21 hrs, Volume= 0.713 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 219.30' @ 24.80 hrs Surf.Area= 71,334 sf Storage= 31,043 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	218.86'	236,112 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
218.86	69,951	0	0	69,951
219.00	70,422	9,826	9,826	70,440
220.00	73,492	71,952	81,778	73,654
221.00	76,825	75,152	156,930	77,126
222.00	81,562	79,182	236,112	81,967

Device	Routing	Invert	Outlet Devices
#1	Primary	221.80'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=218.86' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B4:

Inflow Area = 7.229 ac, 0.00% Impervious, Inflow Depth = 0.94" for 10 yr. event
Inflow = 4.71 cfs @ 12.28 hrs, Volume= 0.567 af
Outflow = 0.46 cfs @ 15.83 hrs, Volume= 0.567 af, Atten= 90%, Lag= 213.3 min
Primary = 0.46 cfs @ 15.83 hrs, Volume= 0.567 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 218.67' @ 15.83 hrs Surf.Area= 13,423 sf Storage= 11,620 cf

Plug-Flow detention time= 313.6 min calculated for 0.567 af (100% of inflow)
Center-of-Mass det. time= 313.7 min (1,211.1 - 897.4)

Volume	Invert	Avail.Storage	Storage Description
#1	217.30'	30,594 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
217.30	0	0	0	0
218.00	12,613	2,943	2,943	12,614
219.00	13,838	13,221	16,164	13,905
220.00	15,030	14,430	30,594	15,171

Device	Routing	Invert	Outlet Devices
#1	Primary	219.70'	**30.0' long Broad-Crested Rectangular Weir** Head (feet) 0.01 5.00 Coef. (English) 2.60 2.60
#2	Primary	217.30'	**4.0" Round Culvert** L= 135.0' Ke= 0.500 Outlet Invert= 210.01' S= 0.0540 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=0.46 cfs @ 15.83 hrs HW=218.67' (Free Discharge)
├─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**2=Culvert** (Inlet Controls 0.46 cfs @ 5.27 fps)

Summary for Pond B5:

Inflow Area = 9.140 ac, 0.00% Impervious, Inflow Depth = 1.10" for 10 yr. event
Inflow = 3.72 cfs @ 12.11 hrs, Volume= 0.839 af
Outflow = 1.21 cfs @ 12.56 hrs, Volume= 0.839 af, Atten= 67%, Lag= 27.0 min
Primary = 1.21 cfs @ 12.56 hrs, Volume= 0.839 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 207.41' @ 12.56 hrs Surf.Area= 18,313 sf Storage= 4,344 cf

Plug-Flow detention time= 79.7 min calculated for 0.838 af (100% of inflow)

Center-of-Mass det. time= 80.5 min (1,175.6 - 1,095.1)

Volume	Invert	Avail.Storage	Storage Description
#1	207.17'	15,537 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.17	17,765	0	0	17,765
208.00	19,689	15,537	15,537	19,731

Device	Routing	Invert	Outlet Devices
#1	Device 3	207.17'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	207.45'	**58.0' long Broad-Crested Rectangular Weir** Head (feet) 0.01 5.00 Coef. (English) 2.60 2.60
#3	Primary	205.62'	**8.0" Round Culvert** L= 101.2' Ke= 0.500 Outlet Invert= 199.28' S= 0.0626 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=1.21 cfs @ 12.56 hrs HW=207.41' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Culvert** (Passes 1.21 cfs of 2.03 cfs potential flow)
└─**1=Orifice/Grate** (Weir Controls 1.21 cfs @ 1.60 fps)

Summary for Link 1L-2L: Link from P1

Inflow Area = 48.067 ac, 23.20% Impervious, Inflow Depth = 1.21" for 10 yr. event
Inflow = 27.14 cfs @ 12.29 hrs, Volume= 4.830 af
Primary = 27.14 cfs @ 12.29 hrs, Volume= 4.830 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

10 yr. Primary Outflow Imported from PULTE-PROP1-MODEL-July-2011~Link 1L-2L.hce

Summary for Link DP: Final Analysis Design Point

Inflow Area = 173.743 ac, 9.00% Impervious, Inflow Depth > 1.25" for 10 yr. event
Inflow = 121.67 cfs @ 12.29 hrs, Volume= 18.029 af
Primary = 121.67 cfs @ 12.29 hrs, Volume= 18.029 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment P1: Runoff Area=1,678,786 sf 0.00% Impervious Runoff Depth=2.86"
Tc=13.5 min CN=66 Runoff=99.32 cfs 9.173 af

Subcatchment P16: Runoff Area=92,508 sf 52.74% Impervious Runoff Depth=4.36"
Tc=7.0 min CN=81 Runoff=10.24 cfs 0.772 af

Subcatchment P19: Runoff Area=612,322 sf 0.00% Impervious Runoff Depth=2.58"
Tc=13.3 min CN=63 Runoff=32.45 cfs 3.017 af

Subcatchment P20: Runoff Area=414,633 sf 0.00% Impervious Runoff Depth=2.39"
Tc=11.1 min CN=61 Runoff=21.58 cfs 1.897 af

Subcatchment P21: Runoff Area=185,885 sf 0.00% Impervious Runoff Depth=2.58"
Tc=16.7 min CN=63 Runoff=9.05 cfs 0.916 af

Subcatchment P22: Runoff Area=84,050 sf 0.00% Impervious Runoff Depth=3.24"
Tc=6.0 min CN=70 Runoff=7.16 cfs 0.521 af

Subcatchment P23: Runoff Area=969,892 sf 0.00% Impervious Runoff Depth=2.48"
Tc=9.5 min CN=62 Runoff=55.11 cfs 4.607 af

Subcatchment P24: Runoff Area=106,597 sf 8.65% Impervious Runoff Depth=3.64"
Tc=10.0 min CN=74 Runoff=9.00 cfs 0.742 af

Subcatchment P26: Runoff Area=215,921 sf 0.00% Impervious Runoff Depth=4.15"
Tc=11.0 min CN=79 Runoff=20.16 cfs 1.716 af

Subcatchment P28: Runoff Area=342,537 sf 40.10% Impervious Runoff Depth=4.47"
Tc=14.0 min CN=82 Runoff=31.42 cfs 2.929 af

Subcatchment P3: Runoff Area=373,203 sf 0.00% Impervious Runoff Depth=2.21"
Tc=13.0 min CN=59 Runoff=16.71 cfs 1.579 af

Subcatchment P4: Runoff Area=314,904 sf 0.00% Impervious Runoff Depth=2.12"
Tc=17.0 min CN=58 Runoff=12.17 cfs 1.279 af

Subcatchment P5: Runoff Area=83,222 sf 0.00% Impervious Runoff Depth=3.24"
Tc=7.3 min CN=70 Runoff=6.83 cfs 0.516 af

Reach R1: Avg. Depth=1.55' Max Vel=5.64 fps Inflow=245.43 cfs 31.506 af
n=0.025 L=477.0' S=0.0060 '/' Capacity=381.54 cfs Outflow=245.19 cfs 31.505 af

Reach R10: Avg. Depth=0.24' Max Vel=2.43 fps Inflow=6.17 cfs 0.742 af
n=0.025 L=300.0' S=0.0120 '/' Capacity=236.56 cfs Outflow=6.13 cfs 0.742 af

Reach R11: Avg. Depth=0.27' Max Vel=2.14 fps Inflow=8.15 cfs 0.742 af
n=0.025 L=1,733.0' S=0.0080 '/' Capacity=56.30 cfs Outflow=6.17 cfs 0.742 af

Reach R12: Avg. Depth=0.21' Max Vel=3.60 fps Inflow=8.57 cfs 0.742 af
n=0.025 L=855.0' S=0.0320 '/' Capacity=118.76 cfs Outflow=8.15 cfs 0.742 af

Reach R13: Avg. Depth=0.12' Max Vel=3.45 fps Inflow=9.00 cfs 0.742 af
n=0.025 L=650.0' S=0.0580 '/' Capacity=28.71 cfs Outflow=8.57 cfs 0.742 af

Reach R2: Avg. Depth=1.45' Max Vel=5.44 fps Inflow=227.48 cfs 27.009 af
n=0.025 L=1,008.0' S=0.0060 '/' Capacity=233.27 cfs Outflow=220.44 cfs 27.009 af

Pond B16: Peak Elev=213.84' Storage=15,938 cf Inflow=10.24 cfs 0.772 af
Discarded=0.32 cfs 0.548 af Primary=1.20 cfs 0.224 af Outflow=1.52 cfs 0.772 af

Pond B20: Peak Elev=166.94' Storage=6,136 cf Inflow=21.58 cfs 1.897 af
Discarded=0.21 cfs 0.300 af Primary=20.67 cfs 1.597 af Outflow=20.88 cfs 1.897 af

Pond B21: Peak Elev=158.56' Storage=6,417 cf Inflow=9.05 cfs 0.916 af
Discarded=0.34 cfs 0.352 af Primary=8.03 cfs 0.564 af Outflow=8.37 cfs 0.916 af

Pond B22: Peak Elev=204.93' Storage=5,256 cf Inflow=7.16 cfs 0.745 af
Outflow=3.83 cfs 0.745 af

Pond B28: Peak Elev=220.52' Storage=61,781 cf Inflow=31.42 cfs 2.929 af
Outflow=6.57 cfs 2.899 af

Pond B3: Peak Elev=219.82' Storage=68,793 cf Inflow=16.71 cfs 1.579 af
Outflow=0.00 cfs 0.000 af

Pond B4: Peak Elev=219.76' Storage=27,056 cf Inflow=12.17 cfs 1.279 af
Outflow=1.75 cfs 1.279 af

Pond B5: Peak Elev=207.52' Storage=6,295 cf Inflow=7.16 cfs 1.795 af
Outflow=4.69 cfs 1.795 af

100 yr **Link:** Primary Outflow Imported from PULTE-PROP1-MODEL-July-2011~Link 1L-2L.hce Inflow=70.82 cfs 10.563 af
Area= 48.067 ac 23.20% Imperv. Primary=70.82 cfs 10.563 af

Link DP: Final Analysis Design Point Inflow=297.32 cfs 37.418 af
Primary=297.32 cfs 37.418 af

Total Runoff Area = 125.676 ac Runoff Volume = 29.665 af Average Runoff Depth = 2.83"
96.43% Pervious = 121.191 ac 3.57% Impervious = 4.485 ac

Summary for Subcatchment P1:

Runoff = 99.32 cfs @ 12.20 hrs, Volume= 9.173 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

	Area (sf)	CN	Description
*	1,678,786	66	
	1,678,786		100.00% Pervious Area

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

Summary for Subcatchment P16:

Runoff = 10.24 cfs @ 12.10 hrs, Volume= 0.772 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
43,717	61	>75% Grass cover, Good, HSG B
48,791	98	Paved parking & roofs
92,508	81	Weighted Average
43,717		47.26% Pervious Area
48,791		52.74% Impervious Area

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

Summary for Subcatchment P19:

Runoff = 32.45 cfs @ 12.20 hrs, Volume= 3.017 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
612,322	63	
612,322		100.00% Pervious Area

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

Summary for Subcatchment P20:

Runoff = 21.58 cfs @ 12.16 hrs, Volume= 1.897 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
414,633	61	
414,633		100.00% Pervious Area

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

Summary for Subcatchment P21:

Runoff = 9.05 cfs @ 12.24 hrs, Volume= 0.916 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
185,885	63	
185,885		100.00% Pervious Area

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

Summary for Subcatchment P22:

Runoff = 7.16 cfs @ 12.09 hrs, Volume= 0.521 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
84,050	70	
84,050		100.00% Pervious Area

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

Summary for Subcatchment P23:

Runoff = 55.11 cfs @ 12.14 hrs, Volume= 4.607 af, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
969,892	62	
969,892		100.00% Pervious Area

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

Summary for Subcatchment P24:

Runoff = 9.00 cfs @ 12.14 hrs, Volume= 0.742 af, Depth= 3.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
3,019	55	Woods, Good, HSG B
40,259	70	Woods, Good, HSG C
54,096	74	>75% Grass cover, Good, HSG C
9,223	98	Paved parking & roofs
106,597	74	Weighted Average
97,374		91.35% Pervious Area
9,223		8.65% Impervious Area

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

Summary for Subcatchment P26:

Runoff = 20.16 cfs @ 12.15 hrs, Volume= 1.716 af, Depth= 4.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
215,921	79	
215,921		100.00% Pervious Area

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

Summary for Subcatchment P28:

Runoff = 31.42 cfs @ 12.19 hrs, Volume= 2.929 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
158,133	74	>75% Grass cover, Good, HSG C
137,351	98	Paved parking & roofs
47,053	61	>75% Grass cover, Good, HSG B
342,537	82	Weighted Average
205,186		59.90% Pervious Area
137,351		40.10% Impervious Area

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

Summary for Subcatchment P3:

Runoff = 16.71 cfs @ 12.20 hrs, Volume= 1.579 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
373,203	59	
373,203		100.00% Pervious Area

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

Summary for Subcatchment P4:

Runoff = 12.17 cfs @ 12.25 hrs, Volume= 1.279 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
314,904	58	
314,904		100.00% Pervious Area

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

Summary for Subcatchment P5:

Runoff = 6.83 cfs @ 12.11 hrs, Volume= 0.516 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr. Rainfall=6.50", Ia/S=0.19

Area (sf)	CN	Description
83,222	70	
83,222		100.00% Pervious Area

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

Summary for Reach R1:

[65] Warning: Inlet elevation not specified

Inflow Area = 136.195 ac, 11.32% Impervious, Inflow Depth = 2.78" for 100 yr. event
Inflow = 245.43 cfs @ 12.24 hrs, Volume= 31.506 af
Outflow = 245.19 cfs @ 12.26 hrs, Volume= 31.505 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.64 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 9.8 min

Peak Storage= 20,701 cf @ 12.26 hrs, Average Depth at Peak Storage= 1.55'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 381.54 cfs

25.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 33.00'
Length= 477.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -2.86'

‡

Summary for Reach R10:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 3.64" for 100 yr. event
Inflow = 6.17 cfs @ 12.36 hrs, Volume= 0.742 af
Outflow = 6.13 cfs @ 12.38 hrs, Volume= 0.742 af, Atten= 1%, Lag= 1.4 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.43 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 7.6 min

Peak Storage= 757 cf @ 12.38 hrs, Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 236.56 cfs

10.00' x 2.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 300.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -3.60'

‡

Summary for Reach R11:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 3.64" for 100 yr. event
Inflow = 8.15 cfs @ 12.22 hrs, Volume= 0.742 af
Outflow = 6.17 cfs @ 12.36 hrs, Volume= 0.742 af, Atten= 24%, Lag= 8.2 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.14 fps, Min. Travel Time= 13.5 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 60.3 min

Peak Storage= 4,984 cf @ 12.36 hrs, Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 56.30 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,733.0' Slope= 0.0080 '/'
Inlet Invert= 0.00', Outlet Invert= -13.86'

‡

Summary for Reach R12:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 3.64" for 100 yr. event
Inflow = 8.57 cfs @ 12.18 hrs, Volume= 0.742 af
Outflow = 8.15 cfs @ 12.22 hrs, Volume= 0.742 af, Atten= 5%, Lag= 2.7 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.60 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.93 fps, Avg. Travel Time= 15.4 min

Peak Storage= 1,925 cf @ 12.22 hrs, Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 118.76 cfs

10.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 855.0' Slope= 0.0320 '/'
Inlet Invert= 0.00', Outlet Invert= -27.36'

‡

Summary for Reach R13:

[65] Warning: Inlet elevation not specified

Inflow Area = 2.447 ac, 8.65% Impervious, Inflow Depth = 3.64" for 100 yr. event
Inflow = 9.00 cfs @ 12.14 hrs, Volume= 0.742 af
Outflow = 8.57 cfs @ 12.18 hrs, Volume= 0.742 af, Atten= 5%, Lag= 2.0 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.45 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 13.5 min

Peak Storage= 1,608 cf @ 12.18 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 0.25', Capacity at Bank-Full= 28.71 cfs

20.00' x 0.25' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 21.50'
Length= 650.0' Slope= 0.0580 '/'
Inlet Invert= 0.00', Outlet Invert= -37.70'

‡

Summary for Reach R2:

[65] Warning: Inlet elevation not specified

Inflow Area = 118.813 ac, 10.33% Impervious, Inflow Depth = 2.73" for 100 yr. event
Inflow = 227.48 cfs @ 12.21 hrs, Volume= 27.009 af
Outflow = 220.44 cfs @ 12.25 hrs, Volume= 27.009 af, Atten= 3%, Lag= 2.4 min

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.44 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 23.0 min

Peak Storage= 40,809 cf @ 12.25 hrs, Average Depth at Peak Storage= 1.45'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 233.27 cfs

25.00' x 1.50' deep channel, n= 0.025
Side Slope Z-value= 2.0 '/' Top Width= 31.00'
Length= 1,008.0' Slope= 0.0060 '/'
Inlet Invert= 0.00', Outlet Invert= -6.05'

‡

Summary for Pond B16:

Inflow Area = 2.124 ac, 52.74% Impervious, Inflow Depth = 4.36" for 100 yr. event
Inflow = 10.24 cfs @ 12.10 hrs, Volume= 0.772 af
Outflow = 1.52 cfs @ 12.64 hrs, Volume= 0.772 af, Atten= 85%, Lag= 32.4 min
Discarded = 0.32 cfs @ 12.64 hrs, Volume= 0.548 af
Primary = 1.20 cfs @ 12.64 hrs, Volume= 0.224 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 213.84' @ 12.64 hrs Surf.Area= 5,726 sf Storage= 15,938 cf

Plug-Flow detention time= 360.1 min calculated for 0.772 af (100% of inflow)
Center-of-Mass det. time= 360.4 min (1,168.8 - 808.3)

Volume	Invert	Avail.Storage	Storage Description
#1	210.00'	23,168 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
210.00	2,711	0	0
211.00	3,403	3,057	3,057
212.00	4,164	3,784	6,841
213.00	4,985	4,575	11,415
214.00	5,862	5,424	16,839
215.00	6,796	6,329	23,168

Device	Routing	Invert	Outlet Devices
#1	Discarded	210.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	213.00'	**8.0" Round Culvert** L= 128.0' Ke= 0.500
			Outlet Invert= 211.72' S= 0.0100 '/' Cc= 0.900 n= 0.012

Discarded OutFlow Max=0.32 cfs @ 12.64 hrs HW=213.84' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=1.20 cfs @ 12.64 hrs HW=213.84' (Free Discharge)
└**2=Culvert** (Inlet Controls 1.20 cfs @ 3.44 fps)

Summary for Pond B20:

Inflow Area =	9.519 ac,	0.00% Impervious,	Inflow Depth =	2.39"	for 100 yr. event
Inflow =	21.58 cfs @	12.16 hrs,	Volume=	1.897 af	
Outflow =	20.88 cfs @	12.20 hrs,	Volume=	1.897 af,	Atten= 3%, Lag= 2.1 min
Discarded =	0.21 cfs @	11.80 hrs,	Volume=	0.300 af	
Primary =	20.67 cfs @	12.20 hrs,	Volume=	1.597 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 166.94' @ 12.20 hrs Surf.Area= 3,735 sf Storage= 6,136 cf

Plug-Flow detention time= 37.3 min calculated for 1.896 af (100% of inflow)
Center-of-Mass det. time= 37.5 min (895.6 - 858.1)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	6,363 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
165.00	1,520	0	0
166.00	3,735	2,628	2,628
167.00	3,735	3,735	6,363

Device	Routing	Invert	Outlet Devices
#1	Discarded	165.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	166.10'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64
2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.21 cfs @ 11.80 hrs HW=166.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=20.67 cfs @ 12.20 hrs HW=166.94' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 20.67 cfs @ 2.46 fps)

Summary for Pond B21:

Inflow Area =	4.267 ac,	0.00% Impervious,	Inflow Depth =	2.58"	for 100 yr. event
Inflow =	9.05 cfs @	12.24 hrs,	Volume=	0.916 af	
Outflow =	8.37 cfs @	12.32 hrs,	Volume=	0.916 af,	Atten= 7%, Lag= 4.6 min
Discarded =	0.34 cfs @	12.32 hrs,	Volume=	0.352 af	
Primary =	8.03 cfs @	12.32 hrs,	Volume=	0.564 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 158.56' @ 12.32 hrs Surf.Area= 6,076 sf Storage= 6,417 cf

Plug-Flow detention time= 99.4 min calculated for 0.915 af (100% of inflow)
Center-of-Mass det. time= 99.9 min (958.5 - 858.6)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	9,443 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
155.00	38	0	0
156.00	441	240	240
157.00	1,059	750	990
158.00	4,108	2,584	3,573
159.00	7,632	5,870	9,443

Device	Routing	Invert	Outlet Devices
#1	Discarded	155.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	158.10'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.34 cfs @ 12.32 hrs HW=158.56' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=7.93 cfs @ 12.32 hrs HW=158.56' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 7.93 cfs @ 1.74 fps)

Summary for Pond B22:

Inflow Area = 4.053 ac, 27.63% Impervious, Inflow Depth = 2.21" for 100 yr. event
Inflow = 7.16 cfs @ 12.09 hrs, Volume= 0.745 af
Outflow = 3.83 cfs @ 12.34 hrs, Volume= 0.745 af, Atten= 46%, Lag= 14.6 min
Primary = 3.83 cfs @ 12.34 hrs, Volume= 0.745 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 204.93' @ 12.34 hrs Surf.Area= 3,374 sf Storage= 5,256 cf

Plug-Flow detention time= 42.6 min calculated for 0.745 af (100% of inflow)
Center-of-Mass det. time= 42.7 min (874.8 - 832.1)

Volume	Invert	Avail.Storage	Storage Description
#1	202.00'	21,892 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
202.00	503	0	0	503
203.00	1,311	875	875	1,318
204.00	2,283	1,775	2,650	2,301
205.00	3,469	2,855	5,505	3,502
206.00	4,776	4,105	9,611	4,829
207.00	6,140	5,444	15,054	6,217
208.00	7,561	6,838	21,892	7,668

Device	Routing	Invert	Outlet Devices
#1	Primary	202.00'	**12.0" Round Culvert** L= 200.0' Ke= 0.500 Outlet Invert= 193.00' S= 0.0450 '/' Cc= 0.900 n= 0.012
#2	Device 1	202.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	203.60'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=3.83 cfs @ 12.34 hrs HW=204.93' (Free Discharge)
└─**1=Culvert** (Passes 3.83 cfs of 5.89 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.40 cfs @ 8.06 fps)
  └─**3=Orifice/Grate** (Orifice Controls 3.44 cfs @ 4.38 fps)

Summary for Pond B28:

[58] Hint: Peaked 0.02' above defined flood level

Inflow Area = 7.864 ac, 40.10% Impervious, Inflow Depth = 4.47" for 100 yr. event
Inflow = 31.42 cfs @ 12.19 hrs, Volume= 2.929 af
Outflow = 6.57 cfs @ 12.74 hrs, Volume= 2.899 af, Atten= 79%, Lag= 32.6 min
Primary = 6.57 cfs @ 12.74 hrs, Volume= 2.899 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 220.52' @ 12.74 hrs Surf.Area= 23,819 sf Storage= 61,781 cf
Flood Elev= 220.50' Surf.Area= 23,722 sf Storage= 61,282 cf

Plug-Flow detention time= 473.9 min calculated for 2.899 af (99% of inflow)
Center-of-Mass det. time= 467.6 min (1,279.9 - 812.3)

Volume	Invert	Avail.Storage	Storage Description
#1	217.00'	73,722 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
217.00	11,855	0	0
218.00	15,100	13,478	13,478
219.00	18,270	16,685	30,163
220.00	21,405	19,838	50,000
221.00	26,038	23,722	73,722

Device	Routing	Invert	Outlet Devices
#1	Device 2	217.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	217.00'	**12.0" Round Culvert** L= 924.0' Ke= 0.500
			Outlet Invert= 179.50' S= 0.0406 '/' Cc= 0.900 n= 0.012
#3	Device 2	219.10'	**48.0" Horiz. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=6.57 cfs @ 12.74 hrs HW=220.52' (Free Discharge)
└─**2=Culvert** (Inlet Controls 6.57 cfs @ 8.37 fps)
  ├─**1=Orifice/Grate** (Passes < 0.44 cfs potential flow)
  └─**3=Orifice/Grate** (Passes < 69.56 cfs potential flow)

Summary for Pond B3:

Inflow Area = 8.568 ac, 0.00% Impervious, Inflow Depth = 2.21" for 100 yr. event
Inflow = 16.71 cfs @ 12.20 hrs, Volume= 1.579 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 219.82' @ 24.80 hrs Surf.Area= 72,943 sf Storage= 68,793 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	218.86'	236,112 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
218.86	69,951	0	0	69,951
219.00	70,422	9,826	9,826	70,440
220.00	73,492	71,952	81,778	73,654
221.00	76,825	75,152	156,930	77,126
222.00	81,562	79,182	236,112	81,967

Device	Routing	Invert	Outlet Devices
#1	Primary	221.80'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=218.86' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B4:

Inflow Area = 7.229 ac, 0.00% Impervious, Inflow Depth = 2.12" for 100 yr. event
Inflow = 12.17 cfs @ 12.25 hrs, Volume= 1.279 af
Outflow = 1.75 cfs @ 13.55 hrs, Volume= 1.279 af, Atten= 86%, Lag= 78.0 min
Primary = 1.75 cfs @ 13.55 hrs, Volume= 1.279 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 219.76' @ 13.55 hrs Surf.Area= 14,742 sf Storage= 27,056 cf

Plug-Flow detention time= 498.6 min calculated for 1.278 af (100% of inflow)
Center-of-Mass det. time= 499.0 min (1,369.8 - 870.8)

Volume	Invert	Avail.Storage	Storage Description
#1	217.30'	30,594 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
217.30	0	0	0	0
218.00	12,613	2,943	2,943	12,614
219.00	13,838	13,221	16,164	13,905
220.00	15,030	14,430	30,594	15,171

Device	Routing	Invert	Outlet Devices
#1	Primary	219.70'	**30.0' long Broad-Crested Rectangular Weir** Head (feet) 0.01 5.00 Coef. (English) 2.60 2.60
#2	Primary	217.30'	**4.0" Round Culvert** L= 135.0' Ke= 0.500 Outlet Invert= 210.01' S= 0.0540 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=1.73 cfs @ 13.55 hrs HW=219.76' (Free Discharge)
├─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.21 cfs @ 0.65 fps)
└─**2=Culvert** (Barrel Controls 0.52 cfs @ 5.95 fps)

Summary for Pond B5:

Inflow Area = 9.140 ac, 0.00% Impervious, Inflow Depth = 2.36" for 100 yr. event
Inflow = 7.16 cfs @ 12.11 hrs, Volume= 1.795 af
Outflow = 4.69 cfs @ 12.24 hrs, Volume= 1.795 af, Atten= 35%, Lag= 8.0 min
Primary = 4.69 cfs @ 12.24 hrs, Volume= 1.795 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Peak Elev= 207.52' @ 12.24 hrs Surf.Area= 18,557 sf Storage= 6,295 cf

Plug-Flow detention time= 66.1 min calculated for 1.794 af (100% of inflow)
Center-of-Mass det. time= 66.7 min (1,282.5 - 1,215.8)

Volume	Invert	Avail.Storage	Storage Description
#1	207.17'	15,537 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
207.17	17,765	0	0	17,765
208.00	19,689	15,537	15,537	19,731

Device	Routing	Invert	Outlet Devices
#1	Device 3	207.17'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	207.45'	**58.0' long Broad-Crested Rectangular Weir** Head (feet) 0.01 5.00 Coef. (English) 2.60 2.60
#3	Primary	205.62'	**8.0" Round Culvert** L= 101.2' Ke= 0.500 Outlet Invert= 199.28' S= 0.0626 '/' Cc= 0.900 n= 0.012

Primary OutFlow Max=4.67 cfs @ 12.24 hrs HW=207.52' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 2.57 cfs @ 0.67 fps)
└─**3=Culvert** (Passes 2.09 cfs of 2.10 cfs potential flow)
└─**1=Orifice/Grate** (Weir Controls 2.09 cfs @ 1.92 fps)

Summary for Link 1L-2L: Link from P1

Inflow Area = 48.067 ac, 23.20% Impervious, Inflow Depth = 2.64" for 100 yr. event
Inflow = 70.82 cfs @ 12.25 hrs, Volume= 10.563 af
Primary = 70.82 cfs @ 12.25 hrs, Volume= 10.563 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

100 yr. Primary Outflow Imported from PULTE-PROP1-MODEL-July-2011~Link 1L-2L.hce

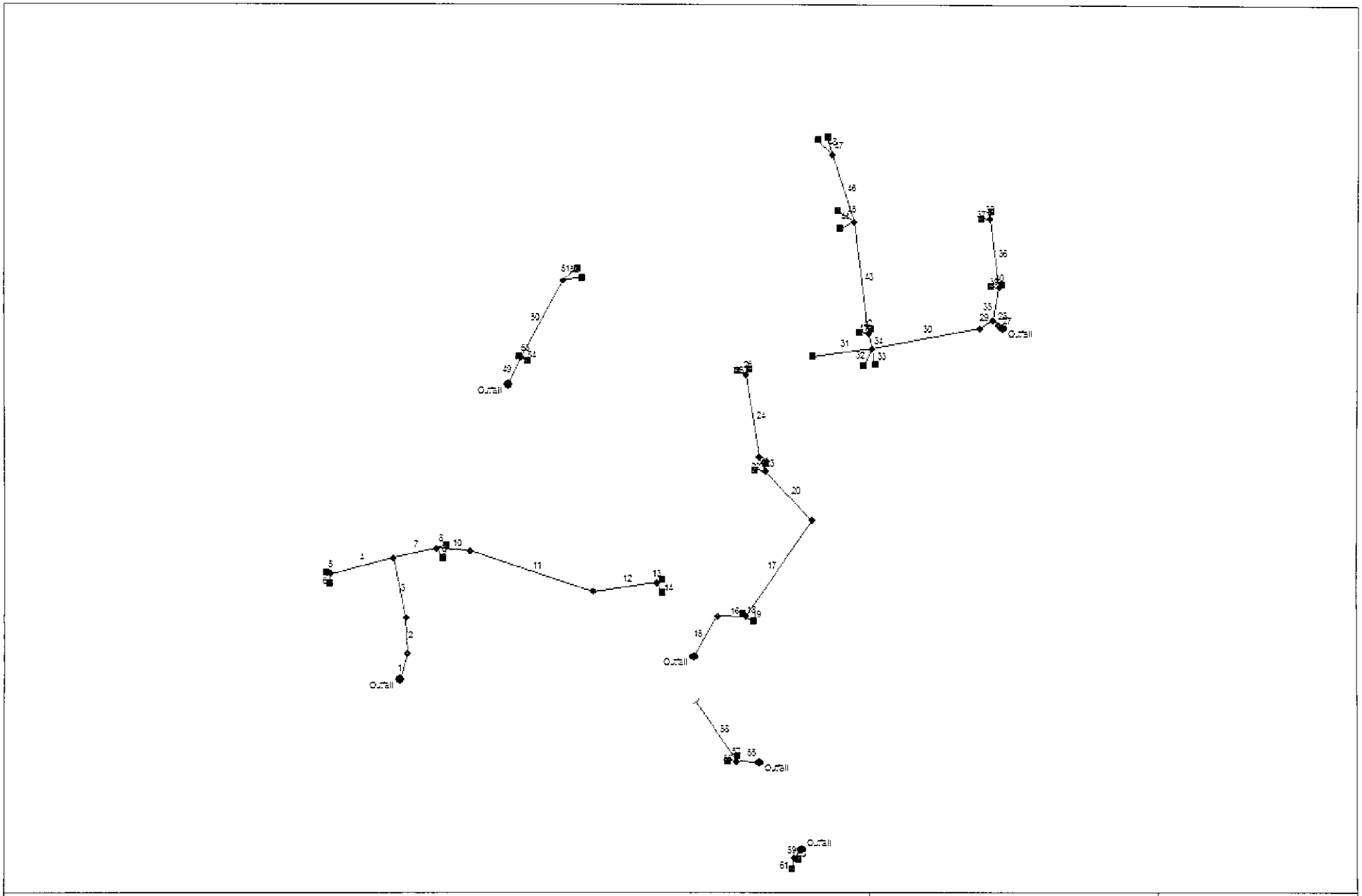
Summary for Link DP: Final Analysis Design Point

Inflow Area = 173.743 ac, 9.00% Impervious, Inflow Depth = 2.58" for 100 yr. event
Inflow = 297.32 cfs @ 12.25 hrs, Volume= 37.418 af
Primary = 297.32 cfs @ 12.25 hrs, Volume= 37.418 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

APPENDIX 4

Hydraflow Plan View



The Residences at Quail Ridge	No. Lines: 61	06-30-2011

Hydraflow Storm Sewers 2005

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	46.0	0.00	2.40	0.00	0.00	1.53	0.0	8.3	5.2	8.02	15.99	2.55	24	0.50	195.13	194.90	198.31	198.25	210.00	196.00	DMH-A
2	1	63.7	0.00	2.40	0.00	0.00	1.53	0.0	7.9	5.3	8.14	16.04	2.59	24	0.50	195.55	195.23	198.43	198.35	208.00	210.00	DMH-B
3	2	105.1	0.00	2.40	0.00	0.00	1.53	0.0	7.2	5.5	8.36	15.60	2.66	24	0.48	196.15	195.65	198.60	198.45	211.00	208.00	DMH 6+74
4	3	120.0	0.00	0.46	0.00	0.00	0.32	0.0	5.3	5.9	1.89	2.52	2.41	12	0.50	196.85	196.25	199.06	198.73	201.50	211.00	DMH 7+93
5	4	8.5	0.32	0.32	0.68	0.22	0.22	5.0	5.0	6.0	1.31	3.87	1.66	12	1.18	197.05	196.95	199.21	199.19	200.95	201.50	CB 8+00R
6	4	15.4	0.14	0.14	0.73	0.10	0.10	5.0	5.0	6.0	0.61	2.87	0.78	12	0.65	197.05	196.95	199.23	199.23	200.95	201.50	CB 8+00L
7	3	81.7	0.00	1.94	0.00	0.00	1.21	0.0	6.9	5.5	6.68	16.76	9.51	15	6.74	212.50	207.00	213.53	207.55	217.50	211.00	DMH 5+93
8	7	19.3	0.33	0.33	0.68	0.22	0.22	5.0	5.0	6.0	1.35	3.62	3.87	12	1.03	214.50	214.30	214.99	214.72	218.50	217.50	CB 5+74R
9	7	19.1	0.20	0.20	0.78	0.16	0.16	5.0	5.0	6.0	0.94	3.64	3.47	12	1.05	214.05	213.85	214.46	214.20	218.05	217.50	CB 5+82L
10	7	61.4	0.00	1.41	0.00	0.00	0.83	0.0	6.7	5.6	4.63	15.42	8.06	15	5.70	217.00	213.50	217.86	213.97	221.60	217.50	DMH 5+33
11	10	239.1	0.00	1.41	0.00	0.00	0.83	0.0	5.7	5.8	4.83	6.99	5.69	15	1.17	220.40	217.60	221.28	218.36	227.80	221.60	DMH 2+96
12	11	119.3	0.00	1.41	0.00	0.00	0.83	0.0	5.2	6.0	4.93	6.48	5.10	15	1.01	221.70	220.50	222.59	221.45	226.20	227.80	DMH 1+27
13	12	11.1	1.06	1.06	0.54	0.57	0.57	5.0	5.0	6.0	3.43	4.78	4.85	12	1.80	222.00	221.80	222.79	222.73	226.00	226.20	CB 1+20R
14	12	18.5	0.35	0.35	0.73	0.26	0.26	5.0	5.0	6.0	1.53	3.71	1.95	12	1.08	222.00	221.80	222.98	222.95	226.00	226.20	CB 1+20L
15	End	81.8	0.00	1.72	0.00	0.00	1.16	0.0	7.9	5.3	6.15	15.65	5.89	15	5.87	219.80	215.00	220.79	215.99	227.75	215.00	DMH 0+48
16	15	52.8	0.00	1.72	0.00	0.00	1.16	0.0	7.7	5.4	6.19	8.67	6.79	15	1.80	224.70	223.75	225.70	224.53	229.20	227.75	DMH 18+60
17	16	205.1	0.00	1.26	0.00	0.00	0.83	0.0	6.8	5.6	4.59	9.02	5.24	15	1.95	229.20	225.20	230.06	226.02	237.10	229.20	DMH 20+62
18	16	9.2	0.10	0.10	0.78	0.08	0.08	5.0	5.0	6.0	0.47	5.25	0.60	12	2.18	225.00	224.80	226.23	226.23	229.00	229.20	CB 18+60
19	16	16.2	0.36	0.36	0.70	0.25	0.25	5.0	5.0	6.0	1.51	5.60	1.93	12	2.47	225.20	224.80	226.20	226.17	229.20	229.20	CB 18+60R
20	17	120.2	0.00	1.26	0.00	0.00	0.83	0.0	6.3	5.7	4.68	6.45	4.95	15	1.00	230.50	229.30	231.37	230.24	235.80	237.10	DMH 1+30
21	20	19.5	0.36	0.36	0.67	0.24	0.24	5.0	5.0	6.0	1.45	3.61	3.95	12	1.03	231.50	231.30	232.01	231.74	235.50	235.80	CB 1+40L

The Residences at Quail Ridge | Number of lines: 61 | Run Date: 06-30-2011

NOTES: Intensity = 45.72 / (Inlet time + 11.30) ^ 0.73; Return period = 25 Yrs.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
22	20	13.4	0.39	0.39	0.59	0.23	0.23	5.0	5.0	6.0	1.38	4.35	3.89	12	1.49	231.50	231.30	232.00	231.73	235.50	235.80	CB 1+40R
23	20	26.8	0.00	0.51	0.00	0.00	0.35	0.0	6.1	5.7	2.03	3.77	3.12	12	1.12	230.90	230.60	231.57	231.56	236.00	235.80	DMH 1+50
24	23	140.1	0.00	0.51	0.00	0.00	0.35	0.0	5.3	5.9	2.10	3.43	3.80	12	0.93	232.30	231.00	232.92	231.72	236.70	236.00	DMH 2+90
25	24	11.6	0.29	0.29	0.73	0.21	0.21	5.0	5.0	6.0	1.27	5.24	2.73	12	2.16	232.65	232.40	233.13	233.14	236.65	236.70	CB 3+00R
26	24	17.8	0.22	0.22	0.65	0.14	0.14	5.0	5.0	6.0	0.86	4.22	2.29	12	1.40	232.65	232.40	233.05	233.05	236.65	236.70	CB 3+00L
27	End	9.7	0.00	4.92	0.00	0.00	3.23	0.0	20.2	3.7	11.99	18.51	7.29	18	3.11	220.30	220.00	221.62	221.32	227.00	220.00	STORMCEPTOR
28	27	12.5	0.00	4.92	0.00	0.00	3.23	0.0	20.2	3.7	12.00	18.77	9.03	18	3.20	221.90	221.50	223.91	222.37	227.80	227.00	DMH
29	28	27.7	0.00	2.90	0.00	0.00	1.85	0.0	20.2	3.7	6.86	10.27	5.92	15	2.53	224.10	223.40	225.15	224.82	228.20	227.80	DMH
30	29	201.8	0.00	2.90	0.00	0.00	1.85	0.0	19.7	3.8	6.93	7.81	6.26	15	1.46	227.15	224.20	228.20	225.26	232.05	228.20	DMH 23+92
31	30	111.7	0.81	0.81	0.49	0.40	0.40	5.0	5.0	6.0	2.38	3.69	3.62	12	1.07	228.50	227.30	229.18	228.67	232.50	232.05	CB
32	30	34.0	0.46	0.46	0.67	0.31	0.31	5.0	5.0	6.0	1.85	3.61	2.35	12	1.03	227.60	227.25	228.82	228.73	231.60	232.05	CB 23+65L
33	30	27.5	0.41	0.41	0.75	0.31	0.31	5.0	5.0	6.0	1.84	4.02	2.35	12	1.27	227.60	227.25	228.80	228.73	231.60	232.05	CB 23+65R
34	30	27.3	0.00	1.22	0.00	0.00	0.83	0.0	19.6	3.8	3.14	5.52	4.34	15	0.73	228.20	228.00	228.91	228.71	232.40	232.05	DMH 24+20
35	28	56.6	0.00	2.02	0.00	0.00	1.39	0.0	6.2	5.7	7.90	11.68	4.47	18	1.24	222.70	222.00	225.32	225.00	227.10	227.80	DMH
36	35	117.8	0.00	0.54	0.00	0.00	0.41	0.0	5.5	5.9	2.38	4.28	3.03	12	1.44	224.80	223.10	226.32	225.79	229.00	227.10	DMH
37	36	13.7	0.46	0.46	0.74	0.34	0.34	5.0	5.0	6.0	2.04	6.45	2.60	12	3.28	225.35	224.90	226.54	226.50	229.35	229.00	CB --R
38	36	16.4	0.08	0.08	0.82	0.07	0.07	5.0	5.0	6.0	0.39	3.41	0.50	12	0.92	225.05	224.90	226.60	226.60	229.05	229.00	CB --L
39	35	6.0	0.57	0.57	0.76	0.43	0.43	5.0	5.0	6.0	2.60	6.52	3.31	12	3.35	223.00	222.80	225.80	225.77	227.00	227.10	CB --R
40	35	16.5	0.91	0.91	0.60	0.55	0.55	5.0	5.0	6.0	3.28	3.92	4.17	12	1.21	223.00	222.80	225.81	225.67	227.00	227.10	CB --L
41	34	8.7	0.27	0.27	0.77	0.21	0.21	5.0	5.0	6.0	1.25	5.41	1.61	12	2.31	228.50	228.30	229.43	229.43	232.50	232.40	CB 24+25R
42	34	18.0	0.32	0.32	0.71	0.23	0.23	5.0	5.0	6.0	1.36	3.76	1.76	12	1.11	228.50	228.30	229.44	229.42	232.50	232.40	CB 24+25L

The Residences at Quail Ridge | Number of lines: 61 | Run Date: 06-30-2011

NOTES: Intensity = 45.72 / (Inlet time + 11.30) ^ 0.73; Return period = 25 Yrs.

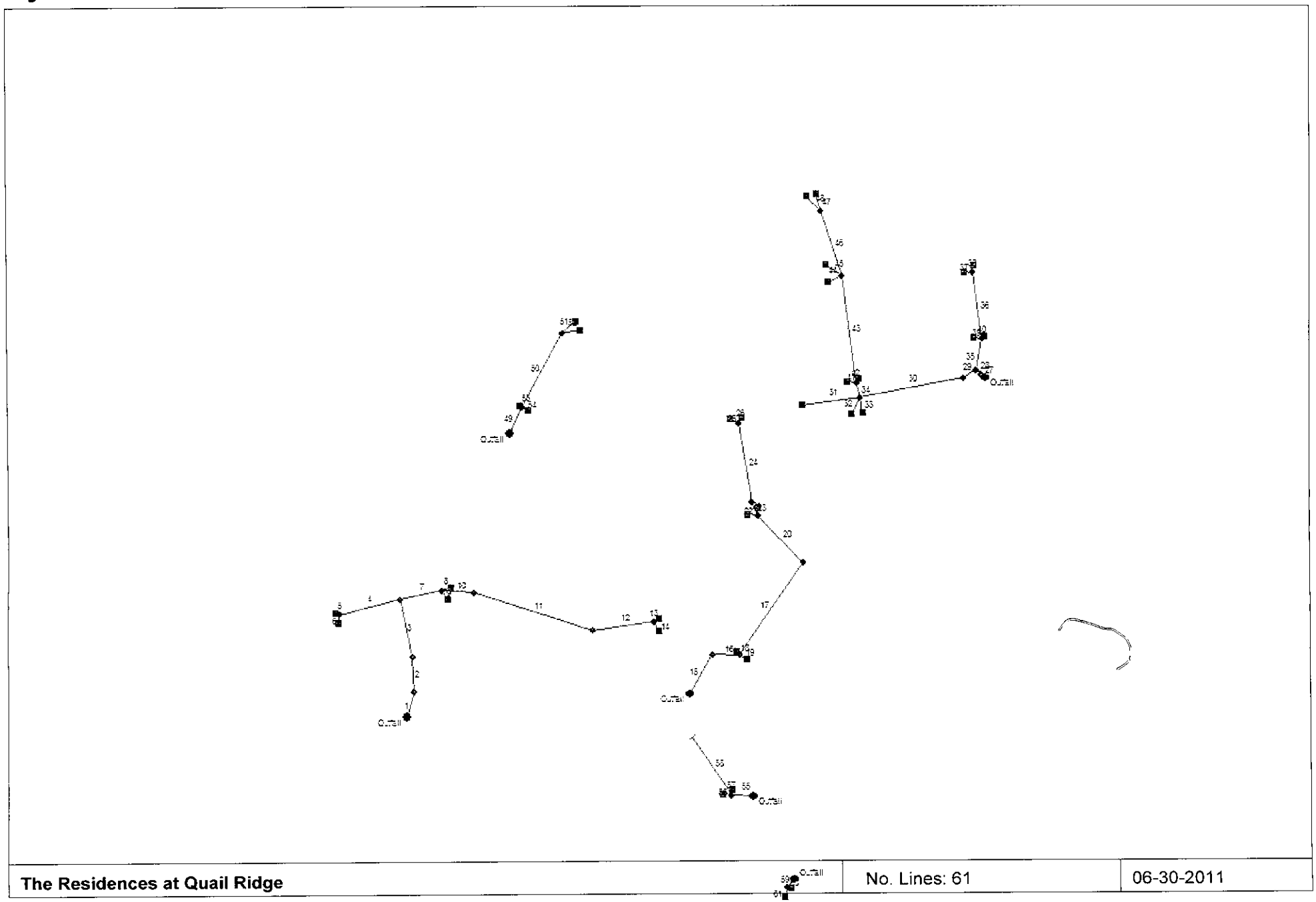
Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
43	34	191.3	0.00	0.63	0.00	0.00	0.40	0.0	18.5	3.9	1.54	5.34	2.82	12	2.25	232.70	228.40	233.23	229.42	238.70	232.40	DMH 26+10
44	43	28.2	0.06	0.06	0.80	0.05	0.05	5.0	5.0	6.0	0.29	4.24	2.61	12	1.42	234.80	234.40	235.03	234.58	238.80	238.70	CB 2+05L
45	43	36.4	0.52	0.52	0.61	0.32	0.32	5.0	5.0	6.0	1.90	3.73	4.37	12	1.10	234.80	234.40	235.39	234.91	238.80	238.70	CB 2+05R
46	43	119.8	0.00	0.05	0.00	0.00	0.03	0.0	10.5	4.8	0.16	3.56	1.06	12	1.00	234.00	232.80	234.17	233.44	239.20	238.70	DMH 27+30
47	46	31.7	0.02	0.02	0.90	0.02	0.02	5.0	5.0	6.0	0.11	4.00	1.82	12	1.26	234.50	234.10	234.64	234.22	238.50	239.20	CB 27+63R
48	46	38.1	0.03	0.03	0.50	0.02	0.02	5.0	5.0	6.0	0.09	3.65	1.61	12	1.05	234.50	234.10	234.63	234.22	238.50	239.20	CB 27+63L
49	End	52.9	0.00	1.25	0.00	0.00	0.83	0.0	6.0	5.7	4.79	7.34	6.40	12	4.25	220.25	218.00	221.16	218.91	224.70	219.00	DMH 9+20
50	49	150.8	0.00	0.79	0.00	0.00	0.53	0.0	5.4	5.9	3.12	7.78	4.66	12	4.77	227.90	220.70	228.65	221.55	232.00	224.70	DMH-7+70
51	50	34.2	0.47	0.47	0.66	0.31	0.31	5.0	5.0	6.0	1.86	7.71	3.19	12	4.68	229.60	228.00	230.18	228.94	233.60	232.00	CB 7+40R
52	50	35.5	0.32	0.32	0.68	0.22	0.22	5.0	5.0	6.0	1.31	7.68	2.56	12	4.65	229.65	228.00	230.13	228.99	233.65	232.00	CB 7+40L
53	49	5.5	0.26	0.26	0.67	0.17	0.17	5.0	5.0	6.0	1.05	4.82	1.33	12	1.83	220.50	220.40	221.77	221.77	224.50	224.70	CB 9+20R
54	49	13.0	0.20	0.20	0.66	0.13	0.13	5.0	5.0	6.0	0.79	3.83	1.01	12	1.16	220.50	220.35	221.79	221.78	224.50	224.70	CB 9+20L
55	End	42.3	0.00	0.17	0.00	0.00	0.15	0.0	5.4	5.9	1.20	3.87	3.35	12	1.18	210.00	209.50	210.46	209.96	214.10	209.50	DMH 15+90
56	55	10.3	0.07	0.07	0.90	0.06	0.06	5.0	5.0	6.0	0.38	4.96	1.68	12	1.94	210.30	210.10	210.56	210.56	214.30	214.10	CB 16+00R
57	55	16.0	0.10	0.10	0.84	0.08	0.08	5.0	5.0	6.0	0.50	3.98	1.84	12	1.25	210.30	210.10	210.60	210.63	214.30	214.10	CB 16+00L
58	55	126.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.33	5.40	1.50	12	2.30	213.00	210.10	213.24	210.64	214.10	214.10	BASIN 16
59	End	20.6	0.00	0.16	0.00	0.00	0.14	0.0	5.4	5.9	0.81	3.51	2.94	12	0.97	205.15	204.95	205.53	205.33	208.80	210.00	DMH 13+90
60	59	7.9	0.06	0.06	0.90	0.05	0.05	5.0	5.0	6.0	0.32	4.90	1.62	12	1.89	205.40	205.25	205.64	205.66	208.40	208.80	CB 208 +30R
61	59	17.0	0.10	0.10	0.84	0.08	0.08	5.0	5.0	6.0	0.50	3.86	2.10	12	1.18	205.45	205.25	205.75	205.66	208.45	208.80	CB 208+30L

The Residences at Quail Ridge | Number of lines: 61 | Run Date: 06-30-2011

NOTES: Intensity = 45.72 / (Inlet time + 11.30) ^ 0.73; Return period = 25 Yrs.

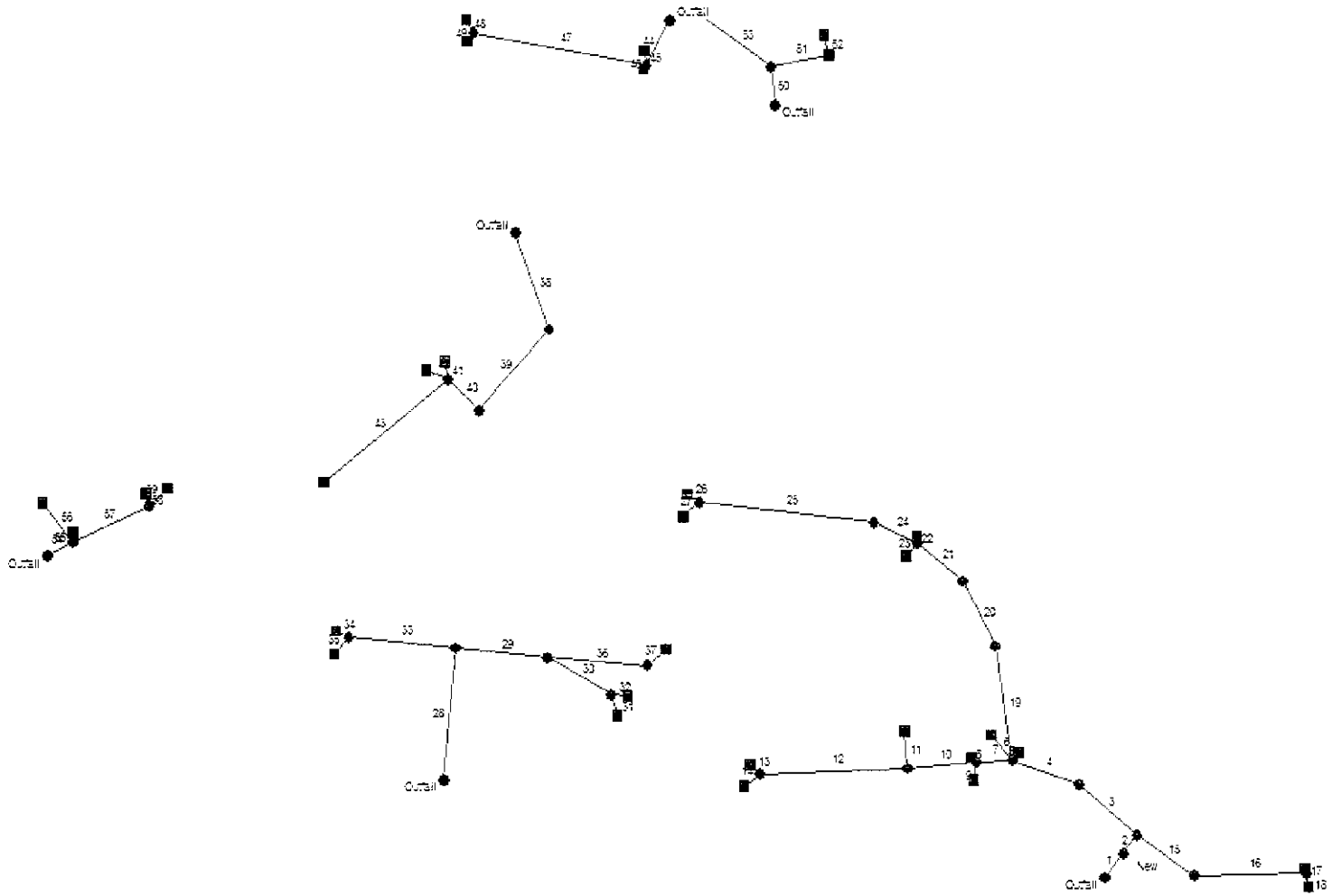
Hydraflow Plan View



The Residences at Quail Ridge	No. Lines: 61	06-30-2011

Hydraflow Storm Sewers 2005

Hydraflow Plan View



West Side Pipe Network	No. Lines: 59	06-30-2011

Hydraflow Storm Sewers 2005

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	30.0	0.00	4.85	0.00	0.00	3.19	0.0	8.9	5.1	16.38	34.65	6.80	24	2.00	183.44	182.84	184.87	184.27	195.20	183.00	
2	1	23.0	0.00	4.85	0.00	0.00	3.19	0.0	8.8	5.1	16.42	34.65	6.40	24	2.00	184.00	183.54	185.44	185.17	194.75	195.20	(2)
3	2	78.0	0.00	4.21	0.00	0.00	2.73	0.0	8.7	5.2	14.14	25.44	11.39	18	5.00	194.50	190.60	196.35	191.40	198.75	194.75	
4	3	74.0	0.00	4.21	0.00	0.00	2.73	0.0	8.5	5.2	14.22	16.20	8.05	18	2.03	196.00	194.50	197.90	196.74	202.50	198.75	
5	4	10.0	0.47	0.47	0.70	0.33	0.33	5.0	5.0	6.0	1.97	5.46	3.46	12	2.00	199.20	199.00	199.80	199.82	202.00	202.50	
6	4	33.0	0.26	0.26	0.71	0.18	0.18	5.0	5.0	6.0	1.11	4.75	2.39	12	1.52	199.50	199.00	199.95	199.88	203.00	202.50	
7	4	38.0	0.00	1.96	0.00	0.00	1.16	0.0	8.4	5.2	6.07	8.85	7.73	12	5.26	198.00	196.00	199.93	198.99	204.50	202.50	
8	7	7.0	0.22	0.22	0.73	0.16	0.16	5.0	5.0	6.0	0.96	6.52	1.45	12	2.86	201.00	200.80	201.70	201.72	204.70	204.50	
9	7	17.0	0.39	0.39	0.70	0.27	0.27	5.0	5.0	6.0	1.64	4.18	3.17	12	1.18	201.00	200.80	201.55	201.55	204.70	204.50	
10	7	73.0	0.00	1.35	0.00	0.00	0.73	0.0	8.2	5.3	3.84	5.53	4.89	12	2.05	199.50	198.00	202.12	201.39	208.50	204.50	
11	10	37.0	1.02	1.02	0.48	0.49	0.49	8.0	8.0	5.3	2.60	4.48	3.31	12	1.35	200.00	199.50	202.86	202.69	202.00	208.50	
12	10	155.0	0.00	0.33	0.00	0.00	0.24	0.0	5.4	5.9	1.41	10.91	2.68	12	8.00	211.90	199.50	212.40	202.81	217.00	208.50	
13	12	14.0	0.19	0.19	0.70	0.13	0.13	5.0	5.0	6.0	0.80	8.63	4.34	12	5.00	214.00	213.30	214.55	213.51	217.50	217.00	
14	12	21.0	0.14	0.14	0.76	0.11	0.11	5.0	5.0	6.0	0.64	7.04	4.15	12	3.33	214.00	213.30	214.34	213.50	217.50	217.00	
15	2	72.0	0.00	0.64	0.00	0.00	0.46	0.0	5.7	5.8	2.68	3.86	3.41	12	1.00	184.82	184.10	186.32	185.97	191.70	194.75	
16	15	118.0	0.00	0.64	0.00	0.00	0.46	0.0	5.1	6.0	2.75	3.86	3.50	12	1.00	186.00	184.82	186.99	186.43	189.70	191.70	
17	16	5.0	0.28	0.28	0.64	0.18	0.18	5.0	5.0	6.0	1.08	5.46	1.37	12	2.00	186.25	186.15	187.34	187.34	189.50	189.70	
18	16	13.0	0.36	0.36	0.78	0.28	0.28	5.0	5.0	6.0	1.68	4.14	2.15	12	1.15	186.25	186.10	187.32	187.30	189.50	189.70	
19	4	113.0	0.00	1.52	0.00	0.00	1.06	0.0	6.3	5.7	5.99	8.12	7.68	12	4.42	201.00	196.00	201.96	199.01	205.00	202.50	
20	19	73.0	0.00	1.52	0.00	0.00	1.06	0.0	6.2	5.7	6.03	7.82	7.76	12	4.11	204.00	201.00	204.96	201.97	208.30	205.00	
21	20	60.0	0.00	1.52	0.00	0.00	1.06	0.0	6.0	5.7	6.06	9.96	7.80	12	6.67	208.00	204.00	208.96	204.97	212.25	208.30	

West Side Pipe Network | Number of lines: 59 | Run Date: 06-30-2011

NOTES: Intensity = 45.72 / (Inlet time + 11.30) ^ 0.73; Return period = 25 Yrs.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
22	21	7.0	0.35	0.35	0.70	0.25	0.25	5.0	5.0	6.0	1.47	8.50	1.99	12	4.86	209.00	208.66	209.83	209.83	212.50	212.25	
23	21	17.0	0.30	0.30	0.72	0.22	0.22	5.0	5.0	6.0	1.30	5.46	1.73	12	2.00	209.00	208.66	209.86	209.85	212.50	212.25	
24	21	50.0	0.00	0.87	0.00	0.00	0.60	0.0	5.8	5.8	3.44	10.91	4.79	12	8.00	212.00	208.00	212.79	209.61	216.00	212.25	
25	24	185.0	0.00	0.87	0.00	0.00	0.60	0.0	5.2	6.0	3.55	10.03	5.04	12	6.76	224.50	212.00	225.30	212.89	228.50	216.00	
26	25	15.0	0.42	0.42	0.70	0.29	0.29	5.0	5.0	6.0	1.76	5.46	3.07	12	2.00	225.00	224.70	225.57	225.65	229.00	228.50	
27	25	22.0	0.45	0.45	0.67	0.30	0.30	5.0	5.0	6.0	1.81	4.51	3.02	12	1.36	225.00	224.70	225.60	225.65	229.00	228.50	
28	End	130.0	0.00	2.12	0.00	0.00	1.36	0.0	6.5	5.6	7.65	11.38	5.63	18	1.00	219.00	217.70	220.06	218.80	229.50	219.00	
29	28	98.0	0.00	1.45	0.00	0.00	0.85	0.0	6.1	5.7	4.88	5.00	3.98	15	0.51	219.50	219.00	220.74	220.33	226.50	229.50	
30	29	76.0	0.00	0.91	0.00	0.00	0.60	0.0	5.2	6.0	3.58	5.08	2.98	15	0.53	220.00	219.60	221.14	220.96	224.50	226.50	
31	30	22.0	0.45	0.45	0.69	0.31	0.31	5.0	5.0	6.0	1.86	4.80	2.52	12	1.55	220.50	220.16	221.33	221.30	223.50	224.50	
32	30	17.0	0.46	0.46	0.63	0.29	0.29	5.0	5.0	6.0	1.74	5.46	2.36	12	2.00	220.50	220.16	221.33	221.31	223.50	224.50	
33	28	113.0	0.00	0.67	0.00	0.00	0.51	0.0	5.2	6.0	3.03	6.69	6.59	12	3.01	229.50	226.10	230.24	226.57	232.80	229.50	
34	33	15.0	0.26	0.26	0.74	0.19	0.19	5.0	5.0	6.0	1.15	5.46	2.19	12	2.00	230.00	229.70	230.52	230.57	233.00	232.80	
35	33	22.0	0.41	0.41	0.77	0.32	0.32	5.0	5.0	6.0	1.89	4.51	3.37	12	1.36	230.00	229.70	230.58	230.52	233.00	232.80	
36	29	105.0	0.00	0.54	0.00	0.00	0.25	0.0	5.2	5.9	1.51	5.76	2.85	12	2.23	222.50	220.16	223.02	221.04	226.50	226.50	
37	36	26.0	0.54	0.54	0.47	0.25	0.25	5.0	5.0	6.0	1.52	5.35	3.19	12	1.92	223.00	222.50	223.52	223.17	226.00	226.50	
38	End	100.0	0.00	1.66	0.00	0.00	0.82	0.0	7.8	5.3	4.36	4.95	4.58	15	0.50	224.50	224.00	225.42	224.89	227.00	225.00	
39	38	108.0	0.00	1.66	0.00	0.00	0.82	0.0	7.3	5.4	4.45	9.89	4.33	15	2.00	226.66	224.50	227.50	225.82	233.00	227.00	
40	39	44.0	0.00	1.66	0.00	0.00	0.82	0.0	7.1	5.5	4.48	9.67	4.60	15	1.91	227.50	226.66	228.35	227.69	235.00	233.00	
41	40	18.0	0.20	0.20	0.71	0.14	0.14	5.0	5.0	6.0	0.85	8.63	4.73	12	5.00	231.00	230.10	231.45	230.31	235.60	235.00	
42	40	25.0	0.24	0.24	0.68	0.16	0.16	5.0	5.0	6.0	0.98	7.32	4.81	12	3.60	231.00	230.10	231.42	230.35	235.60	235.00	

West Side Pipe Network | Number of lines: 59 | Run Date: 06-30-2011

NOTES: Intensity = 45.72 / (Inlet time + 11.30) ^ 0.73; Return period = 25 Yrs.

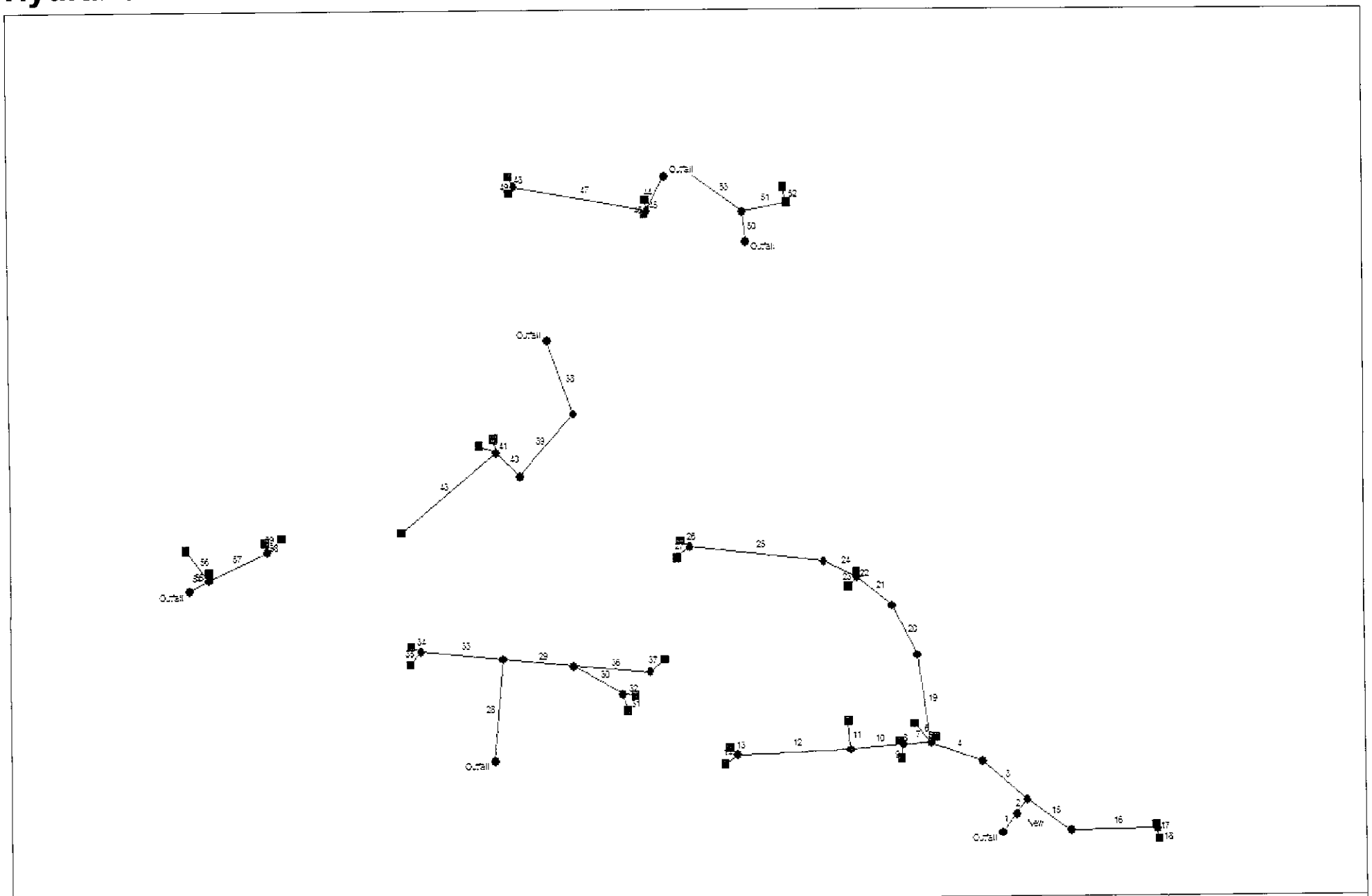
Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
43	40	165.0	1.22	1.22	0.42	0.51	0.51	6.0	6.0	5.7	2.94	4.96	3.55	15	0.50	228.50	227.67	229.19	228.66	231.00	235.00	
44	End	50.0	0.00	1.01	0.00	0.00	0.73	0.0	6.2	5.7	4.13	7.00	4.74	15	1.00	222.00	221.50	222.81	222.36	225.00	223.00	
45	44	14.0	0.27	0.27	0.75	0.20	0.20	5.0	5.0	6.0	1.21	4.61	1.56	12	1.43	222.20	222.00	223.15	223.13	225.00	225.00	
46	44	5.0	0.22	0.22	0.67	0.15	0.15	5.0	5.0	6.0	0.88	5.46	1.13	12	2.00	222.10	222.00	223.17	223.16	225.00	225.00	
47	44	185.0	0.00	0.52	0.00	0.00	0.38	0.0	5.2	6.0	2.24	9.83	3.56	12	6.49	234.00	222.00	234.63	223.06	239.00	225.00	
48	47	15.0	0.34	0.34	0.72	0.24	0.24	5.0	5.0	6.0	1.47	5.46	4.31	12	2.00	235.00	234.70	235.65	235.05	239.00	239.00	
49	47	10.0	0.18	0.18	0.73	0.13	0.13	5.0	5.0	6.0	0.79	6.68	3.76	12	3.00	235.00	234.70	235.54	234.93	239.00	239.00	
50	End	38.0	0.00	0.43	0.00	0.00	0.33	0.0	5.6	5.8	4.44	11.38	4.34	18	1.00	213.10	212.72	213.90	213.61	218.00	213.00	
51	50	62.0	0.12	0.43	0.90	0.11	0.33	5.0	5.2	5.9	1.99	3.95	3.30	12	1.05	213.80	213.15	214.40	214.13	217.00	218.00	
52	51	20.0	0.31	0.31	0.73	0.23	0.23	5.0	5.0	6.0	1.36	3.86	2.42	12	1.00	214.00	213.80	214.59	214.61	217.00	217.00	
53	50	80.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.49	16.09	5.18	18	2.00	215.60	214.00	216.20	214.40	224.00	218.00	
54	End	30.0	0.00	1.81	0.00	0.00	1.08	0.0	6.4	5.7	6.12	9.03	5.87	15	1.67	232.50	232.00	233.49	232.99	236.50	233.00	
55	54	10.0	0.20	0.20	0.64	0.13	0.13	5.0	5.0	6.0	0.77	5.46	0.98	12	2.00	233.00	232.80	234.01	234.01	236.00	236.50	
56	54	50.0	0.66	0.66	0.46	0.30	0.30	6.0	6.0	5.7	1.74	5.46	4.48	12	2.00	234.50	233.50	235.06	233.95	238.50	236.50	
57	54	88.0	0.00	0.95	0.00	0.00	0.65	0.0	5.3	5.9	3.85	6.10	5.45	12	2.50	235.00	232.80	235.83	233.65	238.30	236.50	
58	57	12.0	0.66	0.66	0.69	0.46	0.46	5.0	5.0	6.0	2.73	5.68	4.20	12	2.17	235.50	235.24	236.20	236.12	238.50	238.30	
59	57	26.0	0.29	0.29	0.67	0.19	0.19	5.0	5.0	6.0	1.17	3.86	1.67	12	1.00	235.50	235.24	236.25	236.24	238.50	238.30	

West Side Pipe Network | Number of lines: 59 | Run Date: 06-30-2011

NOTES: Intensity = 45.72 / (Inlet time + 11.30) ^ 0.73; Return period = 25 Yrs.

Hydraflow Plan View



West Side Pipe Network	No. Lines: 59	06-30-2011

Hydraflow Storm Sewers 2005

APPENDIX 5

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: Mail house

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Infiltration Trench	**0.80**	**0.68**	**0.54**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**

Total TSS Removal = **87%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Quail Ridge, Acton, MA**
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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:
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: Detention Basin #28

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Stormceptor	80%	**0.68**	0.54	0.14
	0.00		**0.00**	0.14
	0.00		**0.00**	0.14

Total TSS Removal = 86%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: Quail Ridge, Acton, MA
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	6/28/2011
Project Name	Pulte - Acton, MA
Project Number	W111022
Location	Basin #28

Designer Information

Company	Bohler Engineering
Contact	James Cerkanowicz

Notes

N/A

Drainage Area

Total Area (ac)	2.59
Imperviousness (%)	100

The Stormceptor System model STC 3600 achieves the water quality objective removing 80% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 3.1 cfs.

Rainfall

Name	BOSTON WSFO AP
State	MA
ID	770
Years of Records	1948 to 2005
Latitude	42°21'38"N
Longitude	71°0'38"W

Water Quality Objective

TSS Removal (%)	80
WQ Flow Rate (cfs)	3.1

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	65
STC 900	74
STC 1200	74
STC 1800	75
STC 2400	79
STC 3600	**80**
STC 4800	84
STC 6000	84
STC 7200	87
STC 11000	90
STC 13000	90
STC 16000	92

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

MassDEP Water Quality Conversion for Proprietary Best Management Practices		
Drainage area, impervious cover only in acres	2.93	Acres
Time of concenrtation, in minutes	6	Minutes
Calculate the Water Quality Volume (WQV)	10,636	Cubic Feet
Watershed Inches for Conversion	1	inch
Determine the unit peak discharge (qu)	774	csm/in
Calculate Water Quality Flow (WQF) WQF = (qu)(A)(WQV)	3.5	cfs

Determined by impervious area flowing to proposed infiltration basin #28.
Proposed proprietary treatment structure is a Stormcepter Model STC-4800 stormwater quality unit

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: Infiltration Basin #16

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Infiltration Basin	**0.80**	**0.68**	**0.54**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**

Total TSS Removal = 87%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Quail Ridge, Acton, MA**
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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

Location: Acton, MA

CALCULATION WORKSHEET

Water Quailty Volume Calculations	Drainage Area:	**Pond#16-Sub-P16**			
		0.5	inches of runoff x impervious area		
Proposed Site Impervious Area (site total) =		48791.00	SF		
	Rv =	2,033	cubic feet	required	
water qaulity volume provided below the overflow culvert/outlet control stucture		11,415	cubic feet	provided	
SEE ATTACHED HYDROCAD STORAGE TABLE					

Project: Proposed Residentail Development
Prep. by: Bohler Engineering
Date: July 2011

Stage-Area-Storage for Pond B16:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
210.00	2,711	0
210.05	2,746	136
210.10	2,780	275
210.15	2,815	414
210.20	2,849	556
210.25	2,884	699
210.30	2,919	844
210.35	2,953	991
210.40	2,988	1,140
210.45	3,022	1,290
210.50	3,057	1,442
210.55	3,092	1,596
210.60	3,126	1,751
210.65	3,161	1,908
210.70	3,195	2,067
210.75	3,230	2,228
210.80	3,265	2,390
210.85	3,299	2,554
210.90	3,334	2,720
210.95	3,368	2,888
211.00	3,403	3,057
211.05	3,441	3,228
211.10	3,479	3,401
211.15	3,517	3,576
211.20	3,555	3,753
211.25	3,593	3,932
211.30	3,631	4,112
211.35	3,669	4,295
211.40	3,707	4,479
211.45	3,745	4,665
211.50	3,784	4,854
211.55	3,822	5,044
211.60	3,860	5,236
211.65	3,898	5,430
211.70	3,936	5,626
211.75	3,974	5,823
211.80	4,012	6,023
211.85	4,050	6,224
211.90	4,088	6,428
211.95	4,126	6,633
212.00	4,164	6,841
212.05	4,205	7,050
212.10	4,246	7,261
212.15	4,287	7,474
212.20	4,328	7,690
212.25	4,369	7,907
212.30	4,410	8,127
212.35	4,451	8,348
212.40	4,492	8,572
212.45	4,533	8,797
212.50	4,575	9,025
212.55	4,616	9,255
212.60	4,657	9,487
212.65	4,698	9,721
212.70	4,739	9,956
212.75	4,780	10,194
212.80	4,821	10,434
212.85	4,862	10,676
212.90	4,903	10,921
212.95	4,944	11,167
213.00	4,985	11,415
213.05	5,029	11,665
213.10	5,073	11,918
213.15	5,117	12,173
213.20	5,160	12,430
213.25	5,204	12,689
213.30	5,248	12,950
213.35	5,292	13,213
213.40	5,336	13,479
213.45	5,380	13,747
213.50	5,424	14,017
213.55	5,467	14,289
213.60	5,511	14,564
213.65	5,555	14,841
213.70	5,599	15,119
213.75	5,643	15,400
213.80	5,687	15,684
213.85	5,730	15,969
213.90	5,774	16,257
213.95	5,818	16,546
214.00	5,862	16,839
214.05	5,909	17,133
214.10	5,955	17,429
214.15	6,002	17,728
214.20	6,049	18,030
214.25	6,096	18,333
214.30	6,142	18,639
214.35	6,189	18,947
214.40	6,236	19,258
214.45	6,282	19,571
214.50	6,329	19,886
214.55	6,376	20,204
214.60	6,422	20,524
214.65	6,469	20,846
214.70	6,516	21,171
214.75	6,563	21,498
214.80	6,609	21,827
214.85	6,656	22,159
214.90	6,703	22,493
214.95	6,749	22,829
215.00	**6,796**	**23,168**

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: Detention Basin #17

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Water Quality Swale - Dry	**0.70**	**0.68**	**0.47**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = **80%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: Quail Ridge, Acton, MA
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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

Location: Acton, MA

CALCULATION WORKSHEET

Water Quailty Volume Calculations	Drainage Area:	**Pond#17-Sub-P17**			
		0.50	inches of runoff x impervious area		
Proposed Site Impervious Area (site total) =		35360.00	SF		
	Rv =	1473.33	cubic feet	required	
Volume of Water Qaulity Swale provided		1635.00	cubic feet	provided	
ELEV	Area	Cum Storage			
213	442	0.00			
214	751	597.00			
215	1324	1038.00			
	Total Storage	1635.00			

Project: Proposed Residentail Development
Prep. by: Bohler Engineering
Date: July 2011

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: Detention Basin #15

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Water Quality Swale - Dry	**0.70**	**0.68**	**0.47**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = **80%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Quail Ridge, Acton, MA**
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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

Location: Acton, MA

CALCULATION WORKSHEET

Water Quailty Volume Calculations	Drainage Area:	**Pond#15-Sub-P15**			
		0.50	inches of runoff x impervious area		
Proposed Site Impervious Area (site total) =		73931.00	SF		
	Rv =	3080.46	cubic feet	required	
Volume of Water Qaulity Swale provided		3090.00	cubic feet	provided	
ELEV	Area	Cum Storage			
212	664	0.00			
213	1647	1156.00			
214	2220	1934.00			
	Total Storage	3090.00			

Project: Proposed Residentail Development
Prep. by: Bohler Engineering
Date: July 2011

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: Infiltration Basin #13

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Stormceptor	0.80	**0.68**	0.58	0.10
Infiltration Basin	**0.80**	0.10	0.08	0.02
	0.00		**0.00**	

Total TSS Removal = 99.8%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: Quail Ridge, Acton, MA
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	6/28/2011
Project Name	Pulte Acton
Project Number	W111022
Location	Basin #13

Designer Information

Company	Bohler Engineering
Contact	James Cerkanowicz

Notes

N/A

Drainage Area

Total Area (ac)	2.59
Imperviousness (%)	100

The Stormceptor System model STC 3600 achieves the water quality objective removing 80% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 3.1 cfs.

Rainfall

Name	BOSTON WSFO AP
State	MA
ID	770
Years of Records	1948 to 2005
Latitude	42°21'38"N
Longitude	71°0'38"W

Water Quality Objective

TSS Removal (%)	80
WQ Flow Rate (cfs)	3.1

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	65
STC 900	74
STC 1200	74
STC 1800	75
STC 2400	79
STC 3600	**80**
STC 4800	84
STC 6000	84
STC 7200	87
STC 11000	90
STC 13000	90
STC 16000	92

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

MassDEP Water Quality Conversion for Proprietary Best Management Practices		
Drainage area, impervious cover only in acres	2.59	Acres
Time of concenrtation, in minutes	6	Minutes
Calculate the Water Quality Volume (WQV)	9,402	Cubic Feet
Watershed Inches for Conversion	1	inch
Determine the unit peak discharge (qu)	774	csm/in
Calculate Water Quality Flow (WQF) WQF = (qu)(A)(WQV)	3.1	cfs

Determined by impervious area flowing to proposed infiltration basin #13.
Proposed proprietary treatment structure is a Stormcepter Model STC-3600 stormwater quality unit

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: Infiltration Basin #31

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Infiltration Basin	**0.80**	**0.68**	**0.54**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**

Total TSS Removal = 87%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Quail Ridge, Acton, MA**
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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

Location: Acton, MA

CALCULATION WORKSHEET

Water Quailty Volume Calculations	Drainage Area:	**Pond#31Sub-P31**			
		0.5	inches of runoff x impervious area		
Proposed Site Impervious Area (site total) =		62366.00	SF		
	Rv =	2,599	cubic feet	required	
water qaulity volume provided below the overflow culvert/outlet control stucture		11,236	cubic feet	provided	
SEE ATTACHED HYDROCAD STORAGE TABLE					

Project: Proposed Residentail Development
Prep. by: Bohler Engineering
Date: July 2011

Stage-Area-Storage for Pond B31:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
216.00	4,061	0
216.05	4,138	205
216.10	4,214	414
216.15	4,291	626
216.20	4,368	843
216.25	4,445	1,063
216.30	4,522	1,287
216.35	4,598	1,515
216.40	4,675	1,747
216.45	4,752	1,983
216.50	4,829	2,222
216.55	4,905	2,466
216.60	4,982	2,713
216.65	5,059	2,964
216.70	5,135	3,219
216.75	5,212	3,477
216.80	5,289	3,740
216.85	5,366	4,006
216.90	5,443	4,277
216.95	5,519	4,551
217.00	5,596	4,829
217.05	5,677	5,110
217.10	5,758	5,396
217.15	5,839	5,686
217.20	5,920	5,980
217.25	6,002	6,278
217.30	6,083	6,580
217.35	6,164	6,886
217.40	6,245	7,197
217.45	6,326	7,511
217.50	6,407	7,829
217.55	6,488	8,152
217.60	6,569	8,478
217.65	6,650	8,809
217.70	6,731	9,143
217.75	6,813	9,482
217.80	6,894	9,824
217.85	6,975	10,171
217.90	7,056	10,522
217.95	7,137	10,877
218.00	7,218	11,236
218.05	7,304	11,599
218.10	7,389	11,966
218.15	7,475	12,337
218.20	7,560	12,713
218.25	7,646	13,093
218.30	7,731	13,478
218.35	7,816	13,867
218.40	7,902	14,260
218.45	7,987	14,657
218.50	8,073	15,058
218.55	8,159	15,464
218.60	8,244	15,874
218.65	8,330	16,288
218.70	8,415	16,707
218.75	8,501	17,130
218.80	8,586	17,557
218.85	8,671	17,989
218.90	8,757	18,424
218.95	8,842	18,864
219.00	8,928	19,309
219.05	9,018	19,757
219.10	9,108	20,210
219.15	9,198	20,668
219.20	9,288	21,130
219.25	9,378	21,597
219.30	9,467	22,068
219.35	9,557	22,543
219.40	9,647	23,024
219.45	9,737	23,508
219.50	9,827	23,997
219.55	9,917	24,491
219.60	10,007	24,989
219.65	10,097	25,492
219.70	10,187	25,999
219.75	10,277	26,510
219.80	10,366	27,026
219.85	10,456	27,547
219.90	10,546	28,072
219.95	10,636	28,601
220.00	10,726	29,136
220.05	10,820	29,674
220.10	10,915	30,218
220.15	11,009	30,766
220.20	11,103	31,318
220.25	11,198	31,876
220.30	11,292	32,438
220.35	11,386	33,005
220.40	11,480	33,577
220.45	11,575	34,153
220.50	11,669	34,734
220.55	11,763	35,320
220.60	11,858	35,911
220.65	11,952	36,506
220.70	12,046	37,106
220.75	12,141	37,710
220.80	12,235	38,320
220.85	12,329	38,934
220.90	12,423	39,553
220.95	12,518	40,176
221.00	**12,612**	**40,805**

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: Infiltration Basin #9

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Infiltration Basin	**0.80**	**0.68**	**0.54**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**

Total TSS Removal = **87%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Quail Ridge, Acton, MA**
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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

Location: Acton, MA

CALCULATION WORKSHEET

Water Quailty Volume Calculations	Drainage Area:	**Pond#9-Sub-P9**			
		0.5	inches of runoff x impervious area		
Proposed Site Impervious Area (site total) =		40000.00	SF		
	Rv =	1,667	cubic feet	required	
water qaulity volume provided below the overflow culvert/outlet control stucture		8,648	cubic feet	provided	
SEE ATTACHED HYDROCAD STORAGE TABLE					

Project: Proposed Residentail Development
Prep. by: Bohler Engineering
Date: July 2011

Stage-Area-Storage for Pond B9:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
231.00	3,575	0
231.05	3,612	180
231.10	3,648	361
231.15	3,685	545
231.20	3,722	730
231.25	3,759	917
231.30	3,795	1,106
231.35	3,832	1,296
231.40	3,869	1,489
231.45	3,905	1,683
231.50	3,942	1,879
231.55	3,979	2,077
231.60	4,015	2,277
231.65	4,052	2,479
231.70	4,089	2,682
231.75	4,126	2,888
231.80	4,162	3,095
231.85	4,199	3,304
231.90	4,236	3,515
231.95	4,272	3,727
232.00	4,309	3,942
232.05	4,349	4,158
232.10	4,388	4,377
232.15	4,428	4,597
232.20	4,468	4,820
232.25	4,508	5,044
232.30	4,547	5,270
232.35	4,587	5,499
232.40	4,627	5,729
232.45	4,666	5,961
232.50	4,706	6,196
232.55	4,746	6,432
232.60	4,785	6,670
232.65	4,825	6,911
232.70	4,865	7,153
232.75	4,905	7,397
232.80	4,944	7,643
232.85	4,984	7,891
232.90	5,024	8,142
232.95	5,063	8,394
233.00	5,103	8,648
233.05	5,146	8,904
233.10	5,188	9,163
233.15	5,231	9,423
233.20	5,273	9,686
233.25	5,316	9,950
233.30	5,359	10,217
233.35	5,401	10,486
233.40	5,444	10,757
233.45	5,486	11,031
233.50	5,529	11,306
233.55	5,572	11,584
233.60	5,614	11,863
233.65	5,657	12,145
233.70	5,699	12,429
233.75	5,742	12,715
233.80	5,785	13,003
233.85	5,827	13,293
233.90	5,870	13,586
233.95	5,912	13,880
234.00	5,955	14,177
234.05	6,001	14,476
234.10	6,046	14,777
234.15	6,092	15,080
234.20	6,137	15,386
234.25	6,183	15,694
234.30	6,228	16,004
234.35	6,273	16,317
234.40	6,319	16,632
234.45	6,364	16,949
234.50	6,410	17,268
234.55	6,456	17,590
234.60	6,501	17,914
234.65	6,547	18,240
234.70	6,592	18,568
234.75	6,638	18,899
234.80	6,683	19,232
234.85	6,728	19,567
234.90	6,774	19,905
234.95	6,819	20,245
235.00	**6,865**	**20,587**

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: Near Infiltration Basin #12

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Stormceptor	0.86	**0.68**	0.58	0.10
	0.00		**0.00**	
	0.00		**0.00**	

Total TSS Removal = 90%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Quail Ridge, Acton, MA**
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	6/28/2011
Project Name	Pulte Acton
Project Number	W111022
Location	Near Basin #12

Designer Information

Company	Bohler Engineering
Contact	James Cerkanowicz

Notes

N/A

Drainage Area

Total Area (ac)	0.34
Imperviousness (%)	100

The Stormceptor System model STC 450i achieves the water quality objective removing 86% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 0.4 cfs.

Rainfall

Name	BOSTON WSFO AP
State	MA
ID	770
Years of Records	1948 to 2005
Latitude	42°21'38"N
Longitude	71°0'38"W

Water Quality Objective

TSS Removal (%)	80
WQ Flow Rate (cfs)	0.4

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	**86**
STC 900	92
STC 1200	92
STC 1800	92
STC 2400	94
STC 3600	94
STC 4800	96
STC 6000	96
STC 7200	97
STC 11000	98
STC 13000	98
STC 16000	98

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

MassDEP Water Quality Conversion for Proprietary Best Management Practices		
Drainage area, impervious cover only in acres	0.338	Acres
Time of concenrtation, in minutes	5	Minutes
Calculate the Water Quality Volume (WQV)	1,227	Cubic Feet
Watershed Inches for Conversion	1	inch
Determine the unit peak discharge (qu)	795	csm/in
Calculate Water Quality Flow (WQF) WQF = (qu)(A)(WQV)	0.4	cfs

Determined by impervious area flowing to two catch basins at Sta. 34+00 in Quail Ridge Drive.
Proposed proprietary treatment structure is a Stormcepter Model STC-450i stormwater quality unit

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: Infiltration Basin #12

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)
Street Sweeping - 10%	**0.10**	**1.00**	**0.10**	**0.90**
Deep Sump and Hooded Catch Basin	**0.25**	**0.90**	**0.23**	**0.68**
Infiltration Basin	**0.80**	**0.68**	**0.54**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**
	0.00	**0.14**	**0.00**	**0.14**

Total TSS Removal = 87%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Quail Ridge, Acton, MA**
Prepared By: **Bohler Engineering**
Date: **7/1/2011**

*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

Location: Acton, MA

CALCULATION WORKSHEET

Water Quailty Volume Calculations	Drainage Area:	**Pond#12Sub-P12**			
		0.5	inches of runoff x impervious area		
Proposed Site Impervious Area (site total) =		31373.00	SF		
	Rv =	1,307	cubic feet	required	
water qaulity volume provided below the overflow culvert/outlet control stucture		3,683	cubic feet	provided	
SEE ATTACHED HYDROCAD STORAGE TABLE					

Project: Proposed Residentail Development
Prep. by: Bohler Engineering
Date: July 2011

Stage-Area-Storage for Pond B12:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
221.00	520	0
221.05	538	26
221.10	555	54
221.15	573	82
221.20	591	111
221.25	609	141
221.30	627	172
221.35	644	204
221.40	662	236
221.45	680	270
221.50	698	304
221.55	715	340
221.60	733	376
221.65	751	413
221.70	768	451
221.75	786	490
221.80	804	530
221.85	822	570
221.90	840	612
221.95	857	654
222.00	875	698
222.05	896	742
222.10	917	787
222.15	938	833
222.20	959	881
222.25	980	929
222.30	1,001	979
222.35	1,022	1,030
222.40	1,043	1,081
222.45	1,064	1,134
222.50	1,086	1,188
222.55	1,107	1,242
222.60	1,128	1,298
222.65	1,149	1,355
222.70	1,170	1,413
222.75	1,191	1,472
222.80	1,212	1,532
222.85	1,233	1,593
222.90	1,254	1,656
222.95	1,275	1,719
223.00	1,296	1,783
223.05	1,320	1,848
223.10	1,344	1,915
223.15	1,368	1,983
223.20	1,391	2,052
223.25	1,415	2,122
223.30	1,439	2,193
223.35	1,463	2,266
223.40	1,487	2,340
223.45	1,511	2,414
223.50	1,535	2,491
223.55	1,558	2,568
223.60	1,582	2,646
223.65	1,606	2,726
223.70	1,630	2,807
223.75	1,654	2,889
223.80	1,678	2,972
223.85	1,701	3,057
223.90	1,725	3,143
223.95	1,749	3,229
224.00	1,773	3,318
224.05	1,800	3,407
224.10	1,826	3,497
224.15	1,853	3,589
224.20	1,880	3,683
224.25	1,907	3,777
224.30	1,933	3,873
224.35	1,960	3,971
224.40	1,987	4,069
224.45	2,013	4,169
224.50	2,040	4,271
224.55	2,067	4,373
224.60	2,093	4,477
224.65	2,120	4,583
224.70	2,147	4,689
224.75	2,174	4,797
224.80	2,200	4,907
224.85	2,227	5,017
224.90	2,254	5,129
224.95	2,280	5,243
225.00	2,307	5,358
225.05	2,337	5,474
225.10	2,366	5,591
225.15	2,396	5,710
225.20	2,425	5,831
225.25	2,455	5,953
225.30	2,484	6,076
225.35	2,513	6,201
225.40	2,543	6,328
225.45	2,572	6,455
225.50	2,602	6,585
225.55	2,632	6,716
225.60	2,661	6,848
225.65	2,691	6,982
225.70	2,720	7,117
225.75	2,750	7,254
225.80	2,779	7,392
225.85	2,808	7,532
225.90	2,838	7,673
225.95	2,867	7,815
226.00	**2,897**	**7,960**

APPENDIX 6

WATER BALANCE CALCULATIONS
RESIDENCES AT QUAIL RIDGE
JULY 2011

PRE- DEVELOPMENT RECHARGE

PREDEVELOPMENT RECHARGE CALCULATIONS REMAIN UNCHANGED FROM STAMSKI AND MCNARY WATER BALANCE CALCULATIONS DATED 6/3/08

CN=	61.9		
FROM FIGURE 1, INFILTRATION =	19.3	IN/YR	
DRAINAGE AREA =	7,567,243	SF	(INCLUDES OFFSITE AREAS)

RECHARGE = 7,567,243 X 19.30 X 1/12 = **12,170,649** CF/YR

POST- DEVELOPMENT RECHARGE

CN=	67.2		
FROM FIGURE 1, INFILTRATION =	17.9	IN/YR	
DRAINAGE AREA =	7,568,247	SF	(INCLUDES OFFSITE AREAS)

RECHARGE = 7,567,243 X 19.30 X 1/12 = CF/YR **11,289,301**

IRRIGATION FLOW
UNCHANGED - MAINTAINED FROM WATER BALANCE CALCULATIONS FROM STAMSKI AND MCNARY - 6/3/08

32.8 +/- AC TO BE IRRAGATED = 1,428768 SF X 16 WEEKS X 0.04 FT/WK 914,412 CF/YR

25% ALLOWED FOR DEEP INFILTARTION = **228603**

SEWERAGE FLOW

DESIGN FLOW = 153 UNITS X 3 BEDROOMS X 110 GPD/BR = 50,490 GPD
(50490 GPD*365 DAYS/YR)/(7.48 GAL/CF)=2,463,750 CF/YR
CONSERVATIVE ESTIMATE - 50% OF DESIGN FLOW **1231875**

BASIN 31-QUAIL RIDGE DRIVE AT UNIT #71

SUBCAT AREA		140214	sf	
SUBCAT CN		77		
INF VOLUME FROM 1 YR STORM	0.221	9626.76		
RAINFALL TO GENERATE RUNOFF		>2.6		from HydroCAD
% OF ANNUAL RAINFALL INFILTRATED		1		FIGURE 2
FROM GRAPH 1 ANNUAL RUNOFF		5.5	IN/YR	
ANNUAL RUNOFF X %INFILTAREATED X AREA		64264.75	CF/YR	**64264.75**

WATER BALANCE CALCULATIONS
RESIDENCES AT QUAIL RIDGE
JULY 2011

BASIN #9-QUAIL RIDGE DRIVE AT TRAIL HEAD PARKING

SUBCAT AREA		93628	sf	
SUBCAT CN		77		
INF VOLUME FROM 1 YR STORM	0.147	6403.32		
RAINFALL TO GENERATE RUNOFF		>2.6		from HydroCAD
% OF ANNUAL RAINFALL INFILTRATED		1		FIGURE 2
FROM GRAPH 1 ANNUAL RUNOFF		5.5	IN/YR	
ANNUAL RUNOFF X %INFILTAREATED X AREA			CF/YR	**42912.833**

BASIN #13-QUAILRIDGE DR -WEST OF CROSSING

SUBCAT AREA		269927	sf	
SUBCAT CN		80		
INF VOLUME FROM 1 YR STORM	0.504	21954.24		
RAINFALL TO GENERATE RUNOFF		>2.6		from HydroCAD
% OF ANNUAL RAINFALL INFILTRATED		1		FIGURE 2
FROM GRAPH 1 ANNUAL RUNOFF		6.8	IN/YR	
ANNUAL RUNOFF X %INFILTAREATED X AREA			CF/YR	**152958.63**

BASIN #12- QUAIL RIDGE DR ADJACENT TO CONCORD WATER EASEMENT

		49627	sf	
SUBCAT CN		84		
INF VOLUME FROM 1 YR STORM	0.115	5009.4		
RAINFALL TO GENERATE RUNOFF		2.5		from HydroCAD
% OF ANNUAL RAINFALL INFILTRATED		0.96		FIGURE 2
FROM GRAPH 1 ANNUAL RUNOFF		8.2	IN/YR	
ANNUAL RUNOFF X %INFILTAREATED X AREA			CF/YR	**32555.312**

BASIN #10 - PARKLAND AVE AT UNIT #102

SUBCAT AREA		95414	sf	
SUBCAT CN		71		
INF VOLUME FROM 1 YR STORM	0.103	4486.68		
RAINFALL TO GENERATE RUNOFF		>2.6		from HydroCAD
% OF ANNUAL RAINFALL INFILTRATED		1		FIGURE 2
FROM GRAPH 1 ANNUAL RUNOFF		3.5	IN/YR	
ANNUAL RUNOFF X %INFILTAREATED X AREA			CF/YR	**27829.083**

WATER BALANCE CALCULATIONS
RESIDENCES AT QUAIL RIDGE
JULY 2011

BASIN #17-BASIN AT END OF GREENSIDE
NO INFILTRATION PROPOSED

BASIN #14 - VERNAL POOL
NO INFILTRATION

BASIN #15-QUIAL RIDGE DRIVE AT UNIT #7
NO INFILTRATION PROPOSED

BASIN #3 - IRRIGATION POND
NO INFILTRATION PROPSED -

BASIN #21 - EXISTING BASIN IN GOLF COURSE TO REMAIN

SUBCAT AREA		185885	sf	
SUBCAT CN		63		
INF VOLUME FROM 1 YR STORM	0.106	4617.36		
RAINFALL TO GENERATE RUNOFF		>2.6		from HydroCAD
% OF ANNUAL RAINFALL INFILTRATED		1		FIGURE 2
FROM GRAPH 1 ANNUAL RUNOFF		1.9	IN/YR	
ANNUAL RUNOFF X %INFILTAREATED X AREA			CF/YR	**29431.792**

BASIN #20- EXISTING BASIN IN GOLF COURSE TO REMAIN

SUBCAT AREA		414633	sf	
SUBCAT CN		61		
INF VOLUME FROM 1 YR STORM	0.106	4617.36		
RAINFALL TO GENERATE RUNOFF		>2.6		from HydroCAD
% OF ANNUAL RAINFALL INFILTRATED		1		FIGURE 2
FROM GRAPH 1 ANNUAL RUNOFF		1.7	IN/YR	
ANNUAL RUNOFF X %INFILTAREATED X AREA			CF/YR	**58739.675**

BASIN #4- EXISTING BASIN IN GOLF COURSE TO REMAIN
NO INFILTRATION PROPOSED

BASIN #5- EXISTING BASIN IN GOLF COURSE TO REMAIN
NO INFILTRATION PROPOSED

BASIN #22 -BASIN ADJACENT TO PROPSED RESTAURANT
NO INFILTRATION PROPOSED

WATER BALANCE CALCULATIONS
RESIDENCES AT QUAIL RIDGE
JULY 2011

BASIN #16-SKYLINE DRIVE AT QUAIL RIDGE ROAD

SUBCAT AREA		92508	sf		
SUBCAT CN		81			
INF VOLUME FROM 1 YR STORM	0.183	7971.48			
RAINFALL TO GENERATE RUNOFF		>2.6		from HydroCAD	
% OF ANNUAL RAINFALL INFILTRATED		1		FIGURE 2	
FROM GRAPH 1 ANNUAL RUNOFF		7	IN/YR		
ANNUAL RUNOFF X %INFILTAREATED X AREA			CF/YR		**53963**

BASIN #28 - BEHIND GOLF CART STORAGE GARAGE

NO INFILTRATION PROPOSED

TOTAL RECHARGE ON A YEARLY BASIS = CF/YR **13212434**

13212434.1 CF/YR - PROPOSED RECHARGE VOLUME

12,170,649 CF/YR - EXISTING RECHARGE VOLUME

1,041,785 CF/YR INCREASE IN RECHARGE VOLUME

OR

7.9% INCREASE IN ANNUAL RECHARGE.

WATER BALANCE CALCULATIONS
RESIDENCES AT QUAIL RIDGE
JULY 2011

PRE- DEVELOPMENT WEIGHTED CURVE NUMBER CALCULATIONS

SUBCATCHMENT	AREA (AC)	CN	PRODUCT
1	18.62	71	1322.02
2	10.69	81	865.89
3	14.69	84	1233.96
4	3.62	80	289.6
5	9.5	62	589
6	17.66	81	1430.46
7	18.74	73	1368.02
8	7.73	62	479.26
9	33.53	68	2280.04
10	10.9	65	708.5
11	25.21	77	1941.17
12	2.83	63	178.29
	173.72		12686.21
	WEIGHTED CN=		73.026767

WATER BALANCE CALCULATIONS
RESIDENCES AT QUAIL RIDGE
JULY 2011

PROPSOSED DEVELOPMENT WEIGHTED CURVE NUMBER CALCULATIONS

SUBCATCHMENT	AREA (SF)	CN	PRODUCT
10	95414	71	6774394
11	69316	81	5614596
12	49627	84	4168668
13	200611	80	16048880
14	100884	62	6254808
15	152686	81	12367566
17	99640	73	7273720
18A	63597	62	3943014
18B	159310	68	10833080
2	480105	65	31206825
31	140214	77	10796478
6	147160	63	9271080
7	56057	73	4092161
8	185538	73	13544274
9	93628	77	7209356
1S	137403	84	11541852
1	1678786	66	110799876
16	92508	81	7493148
19	612322	63	38576286
20	414633	61	25292613
21	185885	63	11710755
22	84050	70	5883500
23	969892	62	60133304
24	106597	74	7888178
26	215921	79	17057759
27	44868	75	3365100
28	62728	75	4704600
29	97538	87	8485806
3	373203	59	22018977
4	314904	58	18264432
5	83222	70	5825540
	7568247		508440626

WEIGHTED CN= 67.180765

APPENDIX 7

STORMWATER OPERATION & MAINTENANCE PLAN

The Residences at Quail Ridge
Acton, Massachusetts

RESPONSIBLE PARTY:

Pulte Homes of New England, LLC
115 Flanders Road
Westborough, MA 01581
OR Subsequent Land Owners

Construction Phase

During the construction phase, all erosion control devices and measures shall be maintained in accordance with the final record plans, the EPA Construction General Permit and the Stormwater Pollution Prevention Plan (SWPPP). Additionally, the maintenance of all 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.

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 Pulte Homes of New England, LLC. or its assignee):

- Roads and parking lots shall be swept at least twice per year and on a more frequent basis depending on sanding operations. All resulting sweepings shall be collected and properly disposed of off site in accordance with MADEP and other applicable requirements.

- All catch basins shall be inspected four times per year. Catch basins 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. Accumulated sediment and hydrocarbons present must be removed and properly disposed of off site in accordance with MADEP and other applicable requirements.

- Inspect swales to make sure vegetation is adequate and slopes are not eroding, check for riling and gulling, repair eroded areas as needed: monthly for the first few month after construction then twice per year. Mow dry swales as needed. Remove sediment at least once per year. Reseed as necessary.

- Infiltration and detention Basins: preventative maintenance at least twice per year, and after every time drainage discharges through the high outlet orifice/grate or overflow spillway. Inspect structure and pretreatment BMP to ensure proper functioning after every major storm event (generally equal or greater to 3.0 inches in 24 hrs) for the first three months. Mow the buffer area, side slopes and basin bottom if grassed floor, rake if stone of sand bottom, remove trash and debris, remove grass clippings and accumulated organic matter.

- Stormceptor Treatment Units: Inspect and maintain per the manufactures recommendations or as needed.