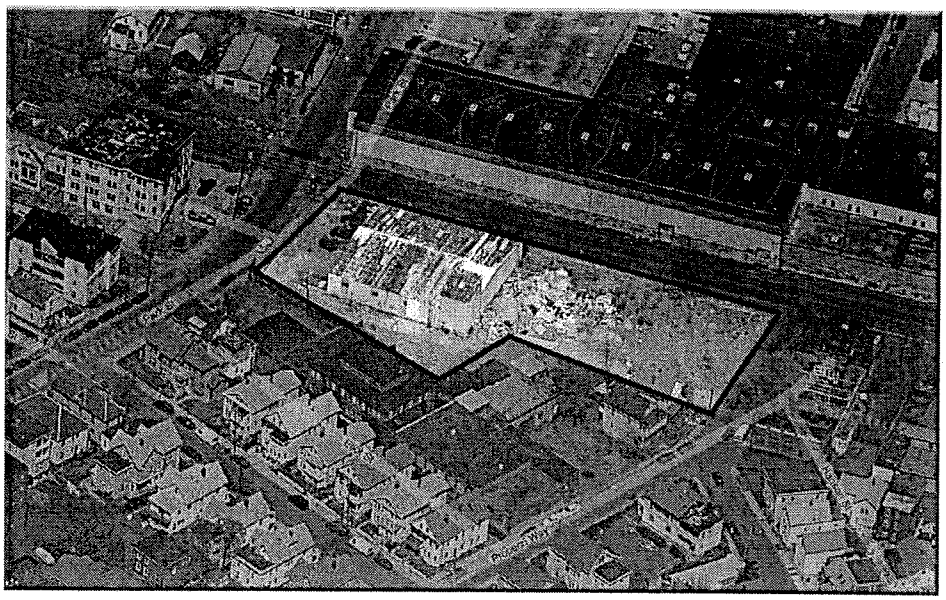
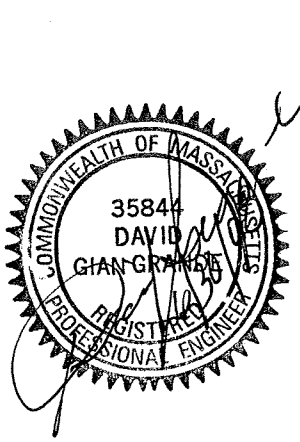
Design Consultants, Inc.
Consulting Engineers

265 MEDFORD STREET
SOMERVILLE, MA 02143
(617) 776-3350
TELECOPIER NUMBER
(617) 776-7710

Drainage Report
For
Park Street Senior Citizen Housing
44 Park Street
Somerville, MA

July 1, 2008





OFFICE COPY

Prepared for:
Thornbury Group, LLC
DCI Project #2008-014

Table of Contents

INTRODUCTION

The Thornbury Group, LLC proposes the development of the property at 44 Park Street in Somerville, MA. The site is zoned Residence RC. The existing parcel covers 43,012 square feet (0.99 acres). There is a two-story, abandoned, metal warehouse on the site with a small one-story brick building attached to the front near Park Street. In front of the warehouse is a small grassed area with a small concrete walkway and an asphalt driveway. The remainder of the site is primarily paved with asphalt or gravel. The majority of the paved area has deteriorated and broken to yield dense weeds and vegetation.

Existing Drainage:

The lot may be divided into four drainage areas. (See *Figure 1*)

1. The first drainage area drains the small brick building roof and the grassed and paved areas adjacent to Park Street. The runoff from this area discharges across the western property line, into the Park Street gutter, then into an adjacent catchbasin, and to the City's 28" by 24" combined sewer in the street.
2. The second area drains half of the warehouse roof and the portion of the site south of the warehouse to the property line. This area is a depression with a catchbasin in the center that drains to the aforementioned combined sewer in Park Street.
3. The third area drains half of the site's rear half. This portion of the site is composed of broken pavement and some dense vegetation through deteriorated pavement. This area drains to the southeast towards Properzi Way, into a catchbasin near Village Street and to the City's combined sewer system. This drainage area also includes the runoff from half of the private way that will become part of the site.
4. The forth area drains the second half of the warehouse and the remainder of the site's rear half, which is composed of some debris and much of the dense vegetation. This area drains to the north across the property line and onto the MBTA railroad right-of-way where it infiltrates into the railroad ballast.

Aside from minor onsite infiltration through broken pavement and overgrown gravel paved areas, the entire site drains offsite without mitigation. Much of the site drains either directly or indirectly to the City's municipal combined sewer system, while a large amount also drains to Properzi Way. A smaller portion drains onto the MBTA right-of-way and infiltrates.

The subject site is not located in a FEMA defined flood zone. Historically the area around the site has been subject to localized flooding due in part to insufficient Municipal infrastructure. Recent upgrades to stormdrains in Somerville Avenue in Somerville and Beacon Street in Cambridge have improved flooding conditions. It is not believed that the site is currently subject to flooding; however DCI will monitor the site after heavy rains to determine if the site is providing storage capacity for the local flooding.

SOILS

The NRCS Web Soil Survey, as viewed June 9, 2008, characterizes the soil at the site as Urban Land and does not specify a Hydrologic Soil Group.

Soils tests have not been performed at this time. A conservative percolation rate of thirty minutes per inch was used in modeling proposed infiltration chambers for the site. This rate is consistent with the Rawls table, used by MassDEP, for hydrologic soils group B. A planned soil test will determine the groundwater elevation. The proposed storage and infiltration fields, described below, have been designed for minimal cover. Storage capacities have been oversized to provide flexibility if unfavorable groundwater conditions are found. If necessary, shallower storage chambers could be substituted to provide better separation to groundwater.

PROPOSED CONDITION

The proposed development includes the demolition of the existing buildings and parking areas, and the construction of a new building with parking, walks, and green space. The site grading will remain close to existing elevations and the buildings are proposed to be at grade structures, with only foundation elements extending below grade. The roof and parking areas will be drained; the rest of the area will be landscaped. *(See Site Plan)*

Drainage:

Drainage calculations were conducted to evaluate peak discharges from the project site under the pre- and post-development conditions (See Appendix A). As required under the City of Somerville Stormwater Management Policy, peak discharges under post development condition will be less than the pre-development conditions.

The proposed stormwater management system consists of two water quality inlets (Stormceptor 450i), roof drains, and an area drain for collection, and infiltration chambers for storage and groundwater recharge. No connection to the Municipal combined sewer is allowed. The infiltrators for the parking area are sized to hold the first inch of rain. The Stormceptors can be expected to provide a minimum of 75% TSS removal before discharging to the infiltrators that provide additional TSS removal. During large storms, when the storage capacity is exceeded, the parking areas will overflow to the MBTA tracks to the north. The storage for the roof runoff is sized to contain about 90% of the 100 year storm (8.5" storm). The roof will support up to 3" of stormwater in excess of the infiltrator capacity. In extreme storm events, roof water can overflow through scuppers. Grading on the south side of the proposed building will channel the small amount of runoff produced by mostly landscaped areas, as well as from the walkway, to an area drain with a sump that discharges to infiltrators. In an overflow condition at this location, stormwater will be further channeled by grading to Properzi Way.

No direct connection from the site to the Municipal system will exist in the proposed condition.

4:1 Infiltration/Inflow Removal:

The 4:1 I-I requirement stipulates that for every increased gallon of sewage flow per day, four gallons of stormwater are stored and infiltrated onsite. The volume of stormwater represents the required amount to be stored/infiltrated per year.

Assumptions
During a midweek workday at 10am there were 12 cars present in the parking area. DCI assumes there are 12 employees, 2 of which are in offices and 10 that work in the warehouse/factory.

Flow Calculations:

Existing Condition

Office Building	200gallons per day(gpd) Minimum		=200gpd
Industrial Factory	20gpd / person	(10people)*(20gpd)	=200gpd
			Total = 400gpd

Proposed Conditions

Elderly Housing	150gpd / Unit	(89units)*(150gpd)	= 13,350gpd

Increase in gpd flow = 13,350gpd – 400gpd = 12,950gpd

Required storage/recharge volume per year: 12,950 x 4 = 51,800gallons (6,925 cubic feet)

Volume provided: The Applicant proposes 4,583 cubic feet of storage/infiltration onsite, with additional storage available on the roof. In a single 2" rainfall event the calculations provided indicate that approximately 6,150 cubic feet (45,987gal) of stormwater will be infiltrated. The Boston area receives an average of 41.5" of precipitation per year. The proposed stormwater management design will easily satisfy the 4:1 I-I requirement and greatly reduce the site's contribution to the Municipal sewer system.

HYDRAULIC MODEL

The hydraulic model used for this analysis is based upon the SCS Method. Both existing and proposed conditions are modeled for a 2-year, 10-year and 100-year storm events. The SCS Method allows for variable rainfall intensity throughout the storm duration, peaking near the middle of the Type III, 24-hour storm. The drainage area's time of concentration (Tc), assumed to be six minutes for this site. A conservative percolation rate of 30 minutes per inch has been assumed for the drainage design.

The designed on-site stormwater management system collects and infiltrates site runoff reducing off-site flows for all storm events.

Table 1

Total Offsite Runoff
Peak Discharges and Volumes
Existing vs. Proposed Conditions (6-min time of concentration)

Description	Existing Conditions		Proposed Conditions	
Drainage Area	0.99 Acres		0.99 Acres	
Weighted Runoff Coefficient, C	84		90	
Time of Concentration	6 minutes		6 minutes	
Storm Event (Years)	Offsite Peak Runoff (CFS)	Offsite Runoff Volume (CF)	Offsite Peak Runoff (CFS)	Offsite Runoff Volume (CF)
2	2.92	6,196	1.01	1,911
10	5.27	11,403	2.82	4,214
100	10.48	23,567	5.58	11,959

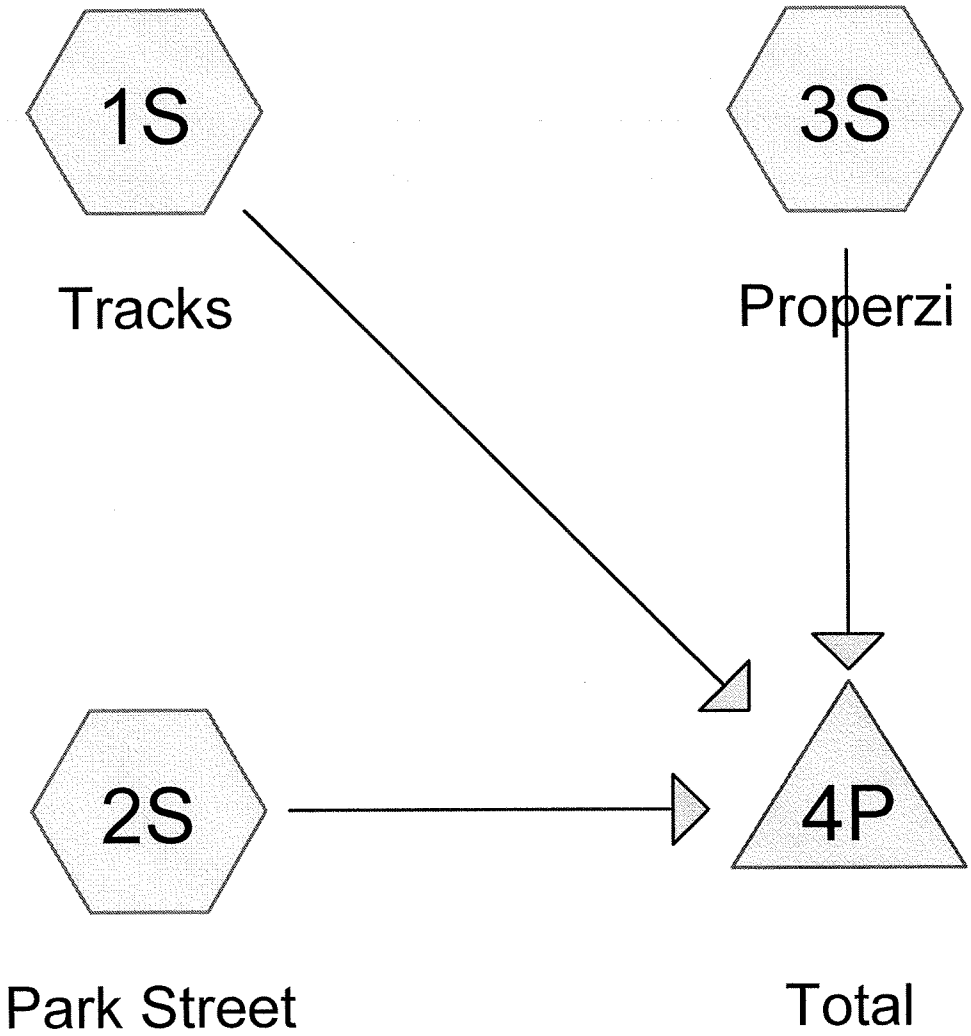
CONCLUSION

Based on DCI's analysis of the existing and proposed conditions, the proposed site condition meets the criteria set forth by the City of Somerville. Off-site runoff volume and peak flow rate for the 2, 10 and 100-year storm events is dramatically decreased. The existing connection to the Municipal system will be eliminated and no new connection is to occur. DCI will monitor the site for local flooding. If it is found that the site is subject to flooding, site grading changes maybe necessary to retain surface storage capacity. The 4:1 I/I requirement will easily be met. DCI concludes that the proposed development at 44 Park Street, Somerville, MA adheres to all applicable stormwater management policies.

APPENDIX A

STORM DRAINAGE CALCULATIONS

STORM DRAINAGE
EXISTING CONDITIONS



Subcat Reach Pond Link

Drainage Diagram for EXISTING
Prepared by DESIGN CONSULTANTS, INC 6/27/2008

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tracks
Runoff Area=8,625 sf Runoff Depth=2.04"
Tc=6.0 min CN=88 Runoff=0.68 cfs 1,468 cf

Subcatchment 2S: Park Street
Runoff Area=16,900 sf Runoff Depth=1.72"
Tc=6.0 min CN=84 Runoff=1.15 cfs 2,428 cf

Subcatchment 3S: Properzi
Runoff Area=17,487 sf Runoff Depth=1.58"
Tc=6.0 min CN=82 Runoff=1.09 cfs 2,300 cf

Pond 4P: Total
Inflow=2.92 cfs 6,196 cf
Primary=2.92 cfs 6,196 cf

Total Runoff Area = 43,012 sf Runoff Volume = 6,196 cf Average Runoff Depth = 1.73"

Subcatchment 1S: Tracks

Runoff = 0.68 cfs @ 11.97 hrs, Volume= 1,468 cf, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
1,300	61	>75% Grass cover, Good, HSG B
2,310	82	Dirt roads, HSG B
5,015	98	Paved parking & roofs
8,625	88	Weighted Average

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

Subcatchment 2S: Park Street

Runoff = 1.15 cfs @ 11.97 hrs, Volume= 2,428 cf, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
3,600	61	>75% Grass cover, Good, HSG B
6,100	82	Dirt roads, HSG B
7,200	98	Paved parking & roofs
16,900	84	Weighted Average

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

Subcatchment 3S: Properzi

Runoff = 1.09 cfs @ 11.97 hrs, Volume= 2,300 cf, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
17,487	82	Dirt roads, HSG B

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

Pond 4P: Total

Inflow Area = 43,012 sf, Inflow Depth = 1.73" for 2YR event
Inflow = 2.92 cfs @ 11.97 hrs, Volume= 6,196 cf
Primary = 2.92 cfs @ 11.97 hrs, Volume= 6,196 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tracks
Runoff Area=8,625 sf Runoff Depth=3.57"
Tc=6.0 min CN=88 Runoff=1.16 cfs 2,569 cf

Subcatchment 2S: Park Street
Runoff Area=16,900 sf Runoff Depth=3.18"
Tc=6.0 min CN=84 Runoff=2.07 cfs 4,477 cf

Subcatchment 3S: Properzi
Runoff Area=17,487 sf Runoff Depth=2.99"
Tc=6.0 min CN=82 Runoff=2.04 cfs 4,357 cf

Pond 4P: Total
Inflow=5.27 cfs 11,403 cf
Primary=5.27 cfs 11,403 cf

Total Runoff Area = 43,012 sf Runoff Volume = 11,403 cf Average Runoff Depth = 3.18"

Subcatchment 1S: Tracks

Runoff = 1.16 cfs @ 11.97 hrs, Volume= 2,569 cf, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.90"

Area (sf)	CN	Description
1,300	61	>75% Grass cover, Good, HSG B
2,310	82	Dirt roads, HSG B
5,015	98	Paved parking & roofs
8,625	88	Weighted Average

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

Subcatchment 2S: Park Street

Runoff = 2.07 cfs @ 11.97 hrs, Volume= 4,477 cf, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.90"

Area (sf)	CN	Description
3,600	61	>75% Grass cover, Good, HSG B
6,100	82	Dirt roads, HSG B
7,200	98	Paved parking & roofs
16,900	84	Weighted Average

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

Subcatchment 3S: Properzi

Runoff = 2.04 cfs @ 11.97 hrs, Volume= 4,357 cf, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.90"

Area (sf)	CN	Description
17,487	82	Dirt roads, HSG B

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

Pond 4P: Total

Inflow Area = 43,012 sf, Inflow Depth = 3.18" for 10YR event
Inflow = 5.27 cfs @ 11.97 hrs, Volume= 11,403 cf
Primary = 5.27 cfs @ 11.97 hrs, Volume= 11,403 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tracks Runoff Area=8,625 sf Runoff Depth=7.06"
Tc=6.0 min CN=88 Runoff=2.20 cfs 5,073 cf

Subcatchment 2S: Park Street Runoff Area=16,900 sf Runoff Depth=6.58"
Tc=6.0 min CN=84 Runoff=4.12 cfs 9,262 cf

Subcatchment 3S: Properzi Runoff Area=17,487 sf Runoff Depth=6.34"
Tc=6.0 min CN=82 Runoff=4.15 cfs 9,233 cf

Pond 4P: Total Inflow=10.48 cfs 23,567 cf
Primary=10.48 cfs 23,567 cf

Total Runoff Area = 43,012 sf Runoff Volume = 23,567 cf Average Runoff Depth = 6.57"

Subcatchment 1S: Tracks

Runoff = 2.20 cfs @ 11.96 hrs, Volume= 5,073 cf, Depth= 7.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
1,300	61	>75% Grass cover, Good, HSG B
2,310	82	Dirt roads, HSG B
5,015	98	Paved parking & roofs
8,625	88	Weighted Average

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

Subcatchment 2S: Park Street

Runoff = 4.12 cfs @ 11.96 hrs, Volume= 9,262 cf, Depth= 6.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
3,600	61	>75% Grass cover, Good, HSG B
6,100	82	Dirt roads, HSG B
7,200	98	Paved parking & roofs
16,900	84	Weighted Average

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

Subcatchment 3S: Properzi

Runoff = 4.15 cfs @ 11.97 hrs, Volume= 9,233 cf, Depth= 6.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
17,487	82	Dirt roads, HSG B

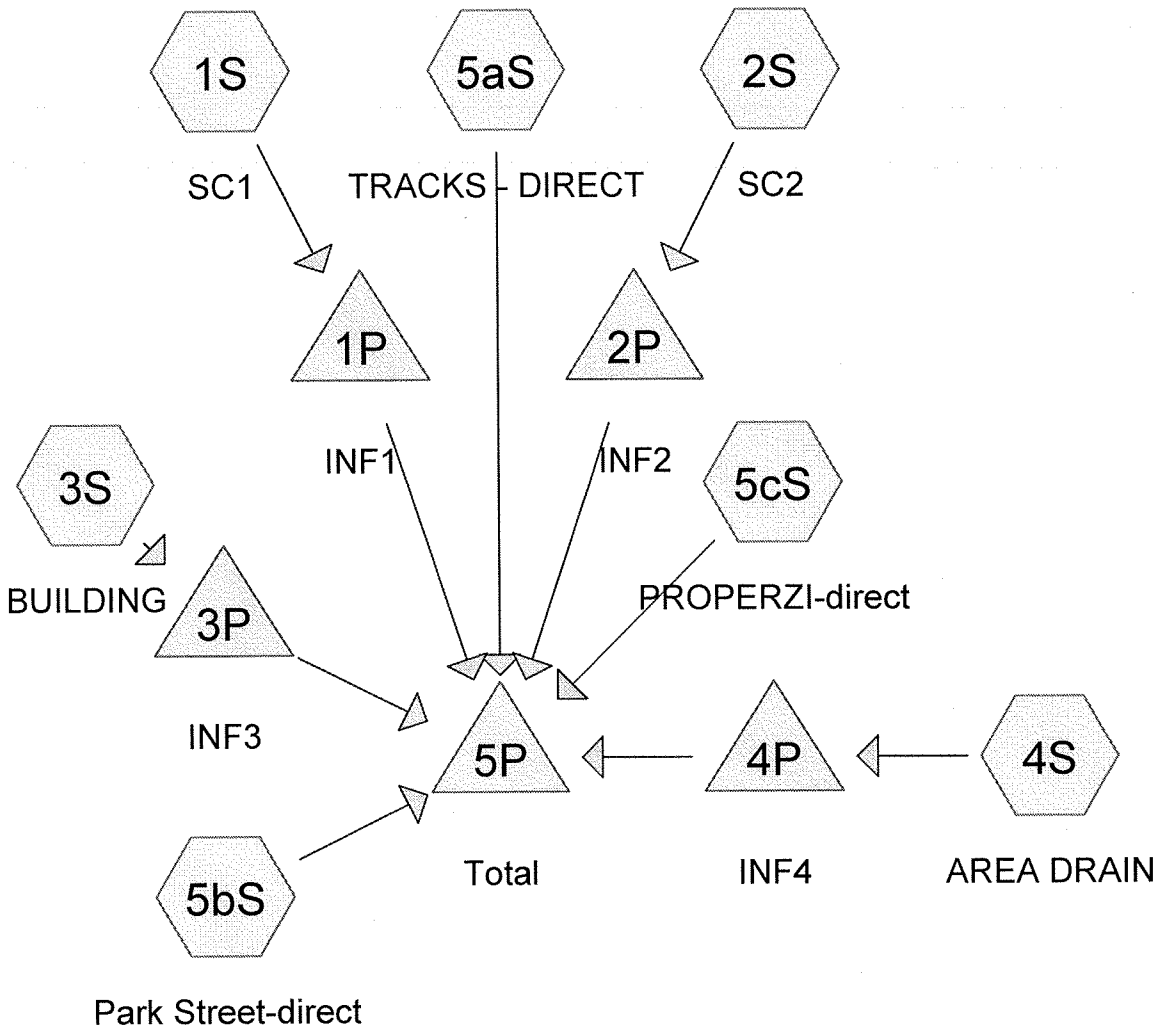
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Pond 4P: Total

Inflow Area = 43,012 sf, Inflow Depth = 6.57" for 100YR event
Inflow = 10.48 cfs @ 11.96 hrs, Volume= 23,567 cf
Primary = 10.48 cfs @ 11.96 hrs, Volume= 23,567 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

STORM DRAINAGE
PROPOSED CONDITIONS



Subcat Reach Pond Link

Drainage Diagram for PROPOSED
Prepared by DESIGN CONSULTANTS, INC 6/30/2008

Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SC1 Runoff Area=7,560 sf Runoff Depth=2.13"
Tc=6.0 min CN=89 Runoff=0.62 cfs 1,340 cf

Subcatchment 2S: SC2 Runoff Area=8,840 sf Runoff Depth=2.59"
Tc=6.0 min CN=94 Runoff=0.84 cfs 1,910 cf

Subcatchment 3S: BUILDING Runoff Area=17,532 sf Runoff Depth=3.02"
Tc=6.0 min CN=98 Runoff=1.80 cfs 4,408 cf

Subcatchment 4S: AREA DRAIN Runoff Area=2,660 sf Runoff Depth=0.62"
Tc=6.0 min CN=65 Runoff=0.06 cfs 139 cf

Subcatchment 5aS: TRACKS - DIRECT Runoff Area=1,060 sf Runoff Depth=0.46"
Tc=6.0 min CN=61 Runoff=0.02 cfs 41 cf

Subcatchment 5bS: Park Street-direct Runoff Area=720 sf Runoff Depth=0.46"
Tc=6.0 min CN=61 Runoff=0.01 cfs 28 cf

Subcatchment 5cS: PROPERZI-direct Runoff Area=4,640 sf Runoff Depth=0.91"
Tc=6.0 min CN=71 Runoff=0.16 cfs 351 cf

Pond 1P: INF1 Peak Elev=13.51' Storage=638 cf Inflow=0.62 cfs 1,340 cf
Discarded=0.00 cfs 850 cf Primary=0.16 cfs 480 cf Outflow=0.17 cfs 1,330 cf

Pond 2P: INF2 Peak Elev=12.34' Storage=641 cf Inflow=0.84 cfs 1,910 cf
Discarded=0.00 cfs 884 cf Primary=0.82 cfs 1,011 cf Outflow=0.83 cfs 1,896 cf

Pond 3P: INF3 Peak Elev=39.89' Storage=3,181 cf Inflow=1.80 cfs 4,408 cf
Discarded=0.03 cfs 4,450 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 4,450 cf

Pond 4P: INF4 Peak Elev=11.36' Storage=79 cf Inflow=0.06 cfs 139 cf
Discarded=0.00 cfs 139 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 139 cf

Pond 5P: Total Inflow=1.01 cfs 1,911 cf
Primary=1.01 cfs 1,911 cf

Total Runoff Area = 43,012 sf Runoff Volume = 8,217 cf Average Runoff Depth = 2.29"

Subcatchment 1S: SC1

Runoff = 0.62 cfs @ 11.97 hrs, Volume= 1,340 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
1,830	61	>75% Grass cover, Good, HSG B
5,730	98	Paved parking & roofs
7,560	89	Weighted Average

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

Subcatchment 2S: SC2

Runoff = 0.84 cfs @ 11.96 hrs, Volume= 1,910 cf, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
1,068	61	>75% Grass cover, Good, HSG B
7,772	98	Paved parking & roofs
8,840	94	Weighted Average

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

Subcatchment 3S: BUILDING

Runoff = 1.80 cfs @ 11.96 hrs, Volume= 4,408 cf, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
17,532	98	Roof

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

Subcatchment 4S: AREA DRAIN

Runoff = 0.06 cfs @ 11.99 hrs, Volume= 139 cf, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
888	98	Walk and Bike Racks
1,772	48	Brush, Good, HSG B
2,660	65	Weighted Average

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

Subcatchment 5aS: TRACKS - DIRECT

Runoff = 0.02 cfs @ 12.00 hrs, Volume= 41 cf, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
1,060	61	>75% Grass cover, Good, HSG B

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

Subcatchment 5bS: Park Street-direct

Runoff = 0.01 cfs @ 12.00 hrs, Volume= 28 cf, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
720	61	>75% Grass cover, Good, HSG B

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

Subcatchment 5cS: PROPERZI-direct

Runoff = 0.16 cfs @ 11.98 hrs, Volume= 351 cf, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 2YR Rainfall=3.25"

Area (sf)	CN	Description
3,040	61	>75% Grass cover, Good, HSG B
1,100	98	Ramp and wall
125	98	Wall
375	61	South grass
4,640	71	Weighted Average

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

Pond 1P: INF1

Inflow Area = 7,560 sf, Inflow Depth = 2.13" for 2YR event
Inflow = 0.62 cfs @ 11.97 hrs, Volume= 1,340 cf
Outflow = 0.17 cfs @ 12.12 hrs, Volume= 1,330 cf, Atten= 73%, Lag= 9.1 min
Discarded = 0.00 cfs @ 8.95 hrs, Volume= 850 cf
Primary = 0.16 cfs @ 12.12 hrs, Volume= 480 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 13.51' @ 12.10 hrs Surf.Area= 301 sf Storage= 638 cf
Plug-Flow detention time= 1,065.1 min calculated for 1,330 cf (99% of inflow)
Center-of-Mass det. time= 1,060.3 min (1,867.7 - 807.4)

Volume	Invert	Avail.Storage	Storage Description
#1	8.30'	459 cf	**44.6"W x 30.0"H x 35.60'L StormTech SC-740** x 2 Inside #2
#2	7.80'	178 cf	**4.00'W x 37.60'L x 3.50'H Stone** x 2 1,053 cf Overall - 459 cf Embedded = 593 cf x 30.0% Voids
#3	13.50'	10 cf	**Token overflow storage (Prismatic)**Listed below (Recalc) -Impervious
		647 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.50	100	0	0
13.60	100	10	10

Device	Routing	Invert	Outlet Devices
#1	Primary	13.50'	**0.22' x 0.22' Horiz. Orifice/Grate X 6.00 columns** X 6 rows Limited to weir flow C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 8.95 hrs HW=7.86' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.06 cfs @ 12.12 hrs HW=13.51' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 0.06 cfs @ 0.3 fps)

Pond 2P: INF2

Inflow Area =	8,840 sf,	Inflow Depth =	2.59"	for 2YR event
Inflow =	0.84 cfs @	11.96 hrs,	Volume=	1,910 cf
Outflow =	0.83 cfs @	11.99 hrs,	Volume=	1,896 cf, Atten= 2%, Lag= 1.6 min
Discarded =	0.00 cfs @	6.45 hrs,	Volume=	884 cf
Primary =	0.82 cfs @	11.99 hrs,	Volume=	1,011 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 5
Peak Elev= 12.34' @ 12.00 hrs Surf.Area= 301 sf Storage= 641 cf
Plug-Flow detention time= 759.1 min calculated for 1,896 cf (99% of inflow)
Center-of-Mass det. time= 754.2 min (1,537.5 - 783.3)

Volume	Invert	Avail.Storage	Storage Description
#1	7.00'	459 cf	**44.6"W x 30.0"H x 35.60'L StormTech SC-740** x 2 Inside #2
#2	6.50'	178 cf	**4.00'W x 37.60'L x 3.50'H Stone** x 2 1,053 cf Overall - 459 cf Embedded = 593 cf x 30.0% Voids
#3	12.30'	20 cf	**Token overflow storage (Prismatic)** Listed below (Recalc) -Impervious
		657 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.30	100	0	0
12.50	100	20	20

Device	Routing	Invert	Outlet Devices
#1	Primary	12.30'	**0.22' x 0.22' Horiz. Orifice/Grate X 6.00 columns** X 6 rows Limited to weir flow C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 6.45 hrs HW=6.56' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.66 cfs @ 11.99 hrs HW=12.33' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 0.66 cfs @ 0.6 fps)

Pond 3P: INF3

Inflow Area =	17,532 sf,	Inflow Depth =	3.02"	for 2YR event
Inflow =	1.80 cfs @	11.96 hrs,	Volume=	4,408 cf
Outflow =	0.03 cfs @	17.00 hrs,	Volume=	4,450 cf, Atten= 98%, Lag= 302.3 min
Discarded =	0.03 cfs @	17.00 hrs,	Volume=	4,450 cf
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 39.89' @ 17.00 hrs Surf.Area= 1,472 sf Storage= 3,181 cf
Plug-Flow detention time= 1,559.7 min calculated for 4,406 cf (100% of inflow)
Center-of-Mass det. time= 1,581.5 min (2,333.6 - 752.2)

Volume	Invert	Avail.Storage	Storage Description
#1	10.00'	2,336 cf	**44.6"W x 30.0"H x 120.70'L StormTech SC-740** x 3 Inside #2
#2	9.50'	845 cf	**4.00'W x 122.70'L x 3.50'H Stone** x 3 5,153 cf Overall - 2,336 cf Embedded = 2,817 cf x 30.0% Voids
#3	40.00'	7,500 cf	**Roof Storage (Prismatic)** Listed below (Recalc)
		10,681 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
40.00	15,000	0	0
40.50	15,000	7,500	7,500

Device	Routing	Invert	Outlet Devices
#1	Primary	40.25'	**0.50' W x 0.25' H Vert. Scuppers X 12.00** C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 17.00 hrs HW=39.89' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=9.50' (Free Discharge)
↑**1=Scuppers** (Controls 0.00 cfs)

Pond 4P: INF4

Inflow Area = 2,660 sf, Inflow Depth = 0.62" for 2YR event
Inflow = 0.06 cfs @ 11.99 hrs, Volume= 139 cf
Outflow = 0.00 cfs @ 11.85 hrs, Volume= 139 cf, Atten= 98%, Lag= 0.0 min
Discarded = 0.00 cfs @ 11.85 hrs, Volume= 139 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 11.36' @ 19.07 hrs Surf.Area= 120 sf Storage= 79 cf
Plug-Flow detention time= 615.7 min calculated for 138 cf (100% of inflow)
Center-of-Mass det. time= 615.9 min (1,507.3 - 891.4)

Volume	Invert	Avail.Storage	Storage Description
#1	10.80'	184 cf	**44.6"W x 30.0"H x 7.12'L StormTech SC-740** x 4 Inside #2
#2	10.30'	71 cf	**4.00'W x 30.00'L x 3.50'H Prismatoid** 420 cf Overall - 184 cf Embedded = 236 cf x 30.0% Voids
#3	14.00'	681 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		935 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	1	0	0
15.00	1,360	681	681

Device	Routing	Invert	Outlet Devices
#1	Primary	14.00'	**0.22' x 0.22' Horiz. Orifice/Grate X 6.00 columns** X 6 rows Limited to weir flow C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 11.85 hrs HW=10.36' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=10.30' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Total

Inflow Area = 43,012 sf, Inflow Depth = 0.53" for 2YR event
Inflow = 1.01 cfs @ 11.99 hrs, Volume= 1,911 cf
Primary = 1.01 cfs @ 11.99 hrs, Volume= 1,911 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SC1
Runoff Area=7,560 sf Runoff Depth=3.49"
Tc=6.0 min CN=89 Runoff=0.99 cfs 2,196 cf

Subcatchment 2S: SC2
Runoff Area=8,840 sf Runoff Depth=4.01"
Tc=6.0 min CN=94 Runoff=1.27 cfs 2,956 cf

Subcatchment 3S: BUILDING
Runoff Area=17,532 sf Runoff Depth=4.46"
Tc=6.0 min CN=98 Runoff=2.62 cfs 6,521 cf

Subcatchment 4S: AREA DRAIN
Runoff Area=2,660 sf Runoff Depth=1.46"
Tc=6.0 min CN=65 Runoff=0.15 cfs 323 cf

Subcatchment 5aS: TRACKS - DIRECT
Runoff Area=1,060 sf Runoff Depth=1.19"
Tc=6.0 min CN=61 Runoff=0.05 cfs 105 cf

Subcatchment 5bS: Park Street-direct
Runoff Area=720 sf Runoff Depth=1.19"
Tc=6.0 min CN=61 Runoff=0.03 cfs 72 cf

Subcatchment 5cS: PROPERZI-direct
Runoff Area=4,640 sf Runoff Depth=1.89"
Tc=6.0 min CN=71 Runoff=0.35 cfs 732 cf

Pond 1P: INF1
Peak Elev=13.55' Storage=642 cf Inflow=0.99 cfs 2,196 cf
Discarded=0.00 cfs 875 cf Primary=1.14 cfs 1,280 cf Outflow=1.14 cfs 2,155 cf

Pond 2P: INF2
Peak Elev=12.35' Storage=642 cf Inflow=1.27 cfs 2,956 cf
Discarded=0.00 cfs 904 cf Primary=1.26 cfs 2,022 cf Outflow=1.26 cfs 2,926 cf

Pond 3P: INF3
Peak Elev=40.04' Storage=3,763 cf Inflow=2.62 cfs 6,521 cf
Discarded=0.20 cfs 6,277 cf Primary=0.00 cfs 0 cf Outflow=0.20 cfs 6,277 cf

Pond 4P: INF4
Peak Elev=14.00' Storage=255 cf Inflow=0.15 cfs 323 cf
Discarded=0.00 cfs 321 cf Primary=0.00 cfs 3 cf Outflow=0.00 cfs 323 cf

Pond 5P: Total
Inflow=2.82 cfs 4,214 cf
Primary=2.82 cfs 4,214 cf

Total Runoff Area = 43,012 sf Runoff Volume = 12,905 cf Average Runoff Depth = 3.60"

Subcatchment 1S: SC1

Runoff = 0.99 cfs @ 11.97 hrs, Volume= 2,196 cf, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.70"

Area (sf)	CN	Description
1,830	61	>75% Grass cover, Good, HSG B
5,730	98	Paved parking & roofs
7,560	89	Weighted Average

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

Subcatchment 2S: SC2

Runoff = 1.27 cfs @ 11.96 hrs, Volume= 2,956 cf, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.70"

Area (sf)	CN	Description
1,068	61	>75% Grass cover, Good, HSG B
7,772	98	Paved parking & roofs
8,840	94	Weighted Average

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

Subcatchment 3S: BUILDING

Runoff = 2.62 cfs @ 11.96 hrs, Volume= 6,521 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.70"

Area (sf)	CN	Description
17,532	98	Roof

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

Subcatchment 4S: AREA DRAIN

Runoff = 0.15 cfs @ 11.98 hrs, Volume= 323 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.70"

Area (sf)	CN	Description
888	98	Walk and Bike Racks
1,772	48	Brush, Good, HSG B
2,660	65	Weighted Average

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

Subcatchment 5aS: TRACKS - DIRECT

Runoff = 0.05 cfs @ 11.98 hrs, Volume= 105 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.70"

Area (sf)	CN	Description
1,060	61	>75% Grass cover, Good, HSG B

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

Subcatchment 5bS: Park Street-direct

Runoff = 0.03 cfs @ 11.98 hrs, Volume= 72 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.70"

Area (sf)	CN	Description
720	61	>75% Grass cover, Good, HSG B

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

Subcatchment 5cS: PROPERZI-direct

Runoff = 0.35 cfs @ 11.98 hrs, Volume= 732 cf, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR Rainfall=4.70"

Area (sf)	CN	Description
3,040	61	>75% Grass cover, Good, HSG B
1,100	98	Ramp and wall
125	98	Wall
375	61	South grass
4,640	71	Weighted Average

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

Pond 1P: INF1

Inflow Area = 7,560 sf, Inflow Depth = 3.49" for 10YR event
Inflow = 0.99 cfs @ 11.97 hrs, Volume= 2,196 cf
Outflow = 1.14 cfs @ 11.97 hrs, Volume= 2,155 cf, Atten= 0%, Lag= 0.2 min
Discarded = 0.00 cfs @ 7.05 hrs, Volume= 875 cf
Primary = 1.14 cfs @ 11.97 hrs, Volume= 1,280 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 13.55' @ 11.95 hrs Surf.Area= 301 sf Storage= 642 cf
Plug-Flow detention time= 675.6 min calculated for 2,155 cf (98% of inflow)
Center-of-Mass det. time= 663.9 min (1,457.3 - 793.4)

Volume	Invert	Avail.Storage	Storage Description
#1	8.30'	459 cf	**44.6"W x 30.0"H x 35.60'L StormTech SC-740** x 2 Inside #2
#2	7.80'	178 cf	**4.00'W x 37.60'L x 3.50'H Stone** x 2 1,053 cf Overall - 459 cf Embedded = 593 cf x 30.0% Voids
#3	13.50'	10 cf	**Token overflow storage (Prismatic)** Listed below (Recalc) -Impervious
		647 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.50	100	0	0
13.60	100	10	10

Device	Routing	Invert	Outlet Devices
#1	Primary	13.50'	**0.22' x 0.22' Horiz. Orifice/Grate X 6.00 columns** X 6 rows Limited to weir flow C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 7.05 hrs HW=7.86' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=1.00 cfs @ 11.97 hrs HW=13.55' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 1.00 cfs @ 0.7 fps)

Pond 2P: INF2

Inflow Area =	8,840 sf,	Inflow Depth =	4.01"	for	10YR event
Inflow =	1.27 cfs @	11.96 hrs,	Volume=		2,956 cf
Outflow =	1.26 cfs @	11.96 hrs,	Volume=		2,926 cf, Atten= 0%, Lag= 0.0 min
Discarded =	0.00 cfs @	4.65 hrs,	Volume=		904 cf
Primary =	1.26 cfs @	11.96 hrs,	Volume=		2,022 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 5
Peak Elev= 12.35' @ 11.96 hrs Surf.Area= 301 sf Storage= 642 cf
Plug-Flow detention time= 506.1 min calculated for 2,924 cf (99% of inflow)
Center-of-Mass det. time= 501.1 min (1,272.9 - 771.8)

Volume	Invert	Avail.Storage	Storage Description
#1	7.00'	459 cf	**44.6"W x 30.0"H x 35.60'L StormTech SC-740** x 2 Inside #2
#2	6.50'	178 cf	**4.00'W x 37.60'L x 3.50'H Stone** x 2 1,053 cf Overall - 459 cf Embedded = 593 cf x 30.0% Voids
#3	12.30'	20 cf	**Token overflow storage (Prismatic)** Listed below (Recalc) -Impervious
		657 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.30	100	0	0
12.50	100	20	20

Device	Routing	Invert	Outlet Devices
#1	Primary	12.30'	**0.22' x 0.22' Horiz. Orifice/Grate X 6.00 columns** X 6 rows Limited to weir flow C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 4.65 hrs HW=6.56' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=1.07 cfs @ 11.96 hrs HW=12.35' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 1.07 cfs @ 0.7 fps)

Pond 3P: INF3

Inflow Area =	17,532 sf,	Inflow Depth =	4.46"	for	10YR event
Inflow =	2.62 cfs @	11.96 hrs,	Volume=		6,521 cf
Outflow =	0.20 cfs @	12.05 hrs,	Volume=		6,277 cf, Atten= 92%, Lag= 5.3 min
Discarded =	0.20 cfs @	12.05 hrs,	Volume=		6,277 cf
Primary =	0.00 cfs @	0.00 hrs,	Volume=		0 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 40.04' @ 12.52 hrs Surf.Area= 16,472 sf Storage= 3,763 cf
Plug-Flow detention time= 1,176.2 min calculated for 6,277 cf (96% of inflow)
Center-of-Mass det. time= 1,152.5 min (1,897.5 - 745.0)

Volume	Invert	Avail.Storage	Storage Description
#1	10.00'	2,336 cf	**44.6"W x 30.0"H x 120.70'L StormTech SC-740** x 3 Inside #2
#2	9.50'	845 cf	**4.00'W x 122.70'L x 3.50'H Stone** x 3 5,153 cf Overall - 2,336 cf Embedded = 2,817 cf x 30.0% Voids
#3	40.00'	7,500 cf	**Roof Storage (Prismatic)** Listed below (Recalc)
		10,681 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
40.00	15,000	0	0
40.50	15,000	7,500	7,500

Device	Routing	Invert	Outlet Devices
#1	Primary	40.25'	**0.50' W x 0.25' H Vert. Scuppers X 12.00** C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.20 cfs @ 12.05 hrs HW=40.01' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=9.50' (Free Discharge)
↑—**1=Scuppers** (Controls 0.00 cfs)

Pond 4P: INF4

Inflow Area = 2,660 sf, Inflow Depth = 1.46" for 10YR event
Inflow = 0.15 cfs @ 11.98 hrs, Volume= 323 cf
Outflow = 0.00 cfs @ 23.05 hrs, Volume= 323 cf, Atten= 98%, Lag= 664.2 min
Discarded = 0.00 cfs @ 23.05 hrs, Volume= 321 cf
Primary = 0.00 cfs @ 23.05 hrs, Volume= 3 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 14.00' @ 23.05 hrs Surf.Area= 121 sf Storage= 255 cf
Plug-Flow detention time= 1,660.4 min calculated for 323 cf (100% of inflow)
Center-of-Mass det. time= 1,663.6 min (2,525.1 - 861.5)

Volume	Invert	Avail.Storage	Storage Description
#1	10.80'	184 cf	**44.6"W x 30.0"H x 7.12'L StormTech SC-740** x 4 Inside #2
#2	10.30'	71 cf	**4.00'W x 30.00'L x 3.50'H Prismatoid** 420 cf Overall - 184 cf Embedded = 236 cf x 30.0% Voids
#3	14.00'	681 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		935 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	1	0	0
15.00	1,360	681	681

Device	Routing	Invert	Outlet Devices
#1	Primary	14.00'	**0.22' x 0.22' Horiz. Orifice/Grate X 6.00 columns** X 6 rows Limited to weir flow C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 23.05 hrs HW=14.00' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 23.05 hrs HW=14.00' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 0.00 cfs)

Pond 5P: Total

Inflow Area = 43,012 sf, Inflow Depth = 1.18" for 10YR event
Inflow = 2.82 cfs @ 11.97 hrs, Volume= 4,214 cf
Primary = 2.82 cfs @ 11.97 hrs, Volume= 4,214 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs

Time span=0.00-80.00 hrs, dt=0.05 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SC1 Runoff Area=7,560 sf Runoff Depth=7.18"
Tc=6.0 min CN=89 Runoff=1.95 cfs 4,522 cf

Subcatchment 2S: SC2 Runoff Area=8,840 sf Runoff Depth=7.78"
Tc=6.0 min CN=94 Runoff=2.36 cfs 5,731 cf

Subcatchment 3S: BUILDING Runoff Area=17,532 sf Runoff Depth=8.26"
Tc=6.0 min CN=98 Runoff=4.75 cfs 12,068 cf

Subcatchment 4S: AREA DRAIN Runoff Area=2,660 sf Runoff Depth=4.30"
Tc=6.0 min CN=65 Runoff=0.45 cfs 954 cf

Subcatchment 5aS: TRACKS - DIRECT Runoff Area=1,060 sf Runoff Depth=3.83"
Tc=6.0 min CN=61 Runoff=0.16 cfs 338 cf

Subcatchment 5bS: Park Street-direct Runoff Area=720 sf Runoff Depth=3.83"
Tc=6.0 min CN=61 Runoff=0.11 cfs 230 cf

Subcatchment 5cS: PROPERZI-direct Runoff Area=4,640 sf Runoff Depth=5.02"
Tc=6.0 min CN=71 Runoff=0.91 cfs 1,940 cf

Pond 1P: INF1 Peak Elev=13.58' Storage=645 cf Inflow=1.95 cfs 4,522 cf
Discarded=0.00 cfs 906 cf Primary=1.94 cfs 3,627 cf Outflow=1.94 cfs 4,533 cf

Pond 2P: INF2 Peak Elev=12.38' Storage=645 cf Inflow=2.36 cfs 5,731 cf
Discarded=0.00 cfs 925 cf Primary=2.35 cfs 4,802 cf Outflow=2.36 cfs 5,727 cf

Pond 3P: INF3 Peak Elev=40.27' Storage=7,264 cf Inflow=4.75 cfs 12,068 cf
Discarded=0.20 cfs 11,283 cf Primary=0.21 cfs 673 cf Outflow=0.41 cfs 11,956 cf

Pond 4P: INF4 Peak Elev=14.01' Storage=255 cf Inflow=0.45 cfs 954 cf
Discarded=0.00 cfs 334 cf Primary=0.14 cfs 349 cf Outflow=0.14 cfs 682 cf

Pond 5P: Total Inflow=5.58 cfs 11,959 cf
Primary=5.58 cfs 11,959 cf

Total Runoff Area = 43,012 sf Runoff Volume = 25,782 cf Average Runoff Depth = 7.19"

Subcatchment 1S: SC1

Runoff = 1.95 cfs @ 11.96 hrs, Volume= 4,522 cf, Depth= 7.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
1,830	61	>75% Grass cover, Good, HSG B
5,730	98	Paved parking & roofs
7,560	89	Weighted Average

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

Subcatchment 2S: SC2

Runoff = 2.36 cfs @ 11.96 hrs, Volume= 5,731 cf, Depth= 7.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
1,068	61	>75% Grass cover, Good, HSG B
7,772	98	Paved parking & roofs
8,840	94	Weighted Average

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

Subcatchment 3S: BUILDING

Runoff = 4.75 cfs @ 11.96 hrs, Volume= 12,068 cf, Depth= 8.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
17,532	98	Roof

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

Subcatchment 4S: AREA DRAIN

Runoff = 0.45 cfs @ 11.97 hrs, Volume= 954 cf, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
888	98	Walk and Bike Racks
1,772	48	Brush, Good, HSG B
2,660	65	Weighted Average

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

Subcatchment 5aS: TRACKS - DIRECT

Runoff = 0.16 cfs @ 11.97 hrs, Volume= 338 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
1,060	61	>75% Grass cover, Good, HSG B

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

Subcatchment 5bS: Park Street-direct

Runoff = 0.11 cfs @ 11.97 hrs, Volume= 230 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
720	61	>75% Grass cover, Good, HSG B

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

Subcatchment 5cS: PROPERZI-direct

Runoff = 0.91 cfs @ 11.97 hrs, Volume= 1,940 cf, Depth= 5.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR Rainfall=8.50"

Area (sf)	CN	Description
3,040	61	>75% Grass cover, Good, HSG B
1,100	98	Ramp and wall
125	98	Wall
375	61	South grass
4,640	71	Weighted Average

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

Pond 1P: INF1

Inflow Area = 7,560 sf, Inflow Depth = 7.18" for 100YR event
Inflow = 1.95 cfs @ 11.96 hrs, Volume= 4,522 cf
Outflow = 1.94 cfs @ 11.96 hrs, Volume= 4,533 cf, Atten= 0%, Lag= 0.1 min
Discarded = 0.00 cfs @ 4.20 hrs, Volume= 906 cf
Primary = 1.94 cfs @ 11.96 hrs, Volume= 3,627 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 13.58' @ 11.96 hrs Surf.Area= 301 sf Storage= 645 cf
Plug-Flow detention time= 322.1 min calculated for 4,522 cf (100% of inflow)
Center-of-Mass det. time= 330.2 min (1,104.0 - 773.8)

Volume	Invert	Avail.Storage	Storage Description
#1	8.30'	459 cf	**44.6"W x 30.0"H x 35.60'L StormTech SC-740** x 2 Inside #2
#2	7.80'	178 cf	**4.00'W x 37.60'L x 3.50'H Stone** x 2 1,053 cf Overall - 459 cf Embedded = 593 cf x 30.0% Voids
#3	13.50'	10 cf	**Token overflow storage (Prismatic)**Listed below (Recalc) -Impervious
		647 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.50	100	0	0
13.60	100	10	10

Device	Routing	Invert	Outlet Devices
#1	Primary	13.50'	**0.22' x 0.22' Horiz. Orifice/Grate X 6.00 columns** X 6 rows Limited to weir flow C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 4.20 hrs HW=7.86' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=2.12 cfs @ 11.96 hrs HW=13.57' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 2.12 cfs @ 0.9 fps)

Pond 2P: INF2

Inflow Area =	8,840 sf,	Inflow Depth =	7.78"	for 100YR event
Inflow =	2.36 cfs @	11.96 hrs,	Volume=	5,731 cf
Outflow =	2.36 cfs @	11.96 hrs,	Volume=	5,727 cf, Atten= 0%, Lag= 0.0 min
Discarded =	0.00 cfs @	2.55 hrs,	Volume=	925 cf
Primary =	2.35 cfs @	11.96 hrs,	Volume=	4,802 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 5
Peak Elev= 12.38' @ 11.96 hrs Surf.Area= 301 sf Storage= 645 cf
Plug-Flow detention time= 273.8 min calculated for 5,727 cf (100% of inflow)
Center-of-Mass det. time= 273.3 min (1,029.4 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	7.00'	459 cf	**44.6"W x 30.0"H x 35.60'L StormTech SC-740** x 2 Inside #2
#2	6.50'	178 cf	**4.00'W x 37.60'L x 3.50'H Stone** x 2 1,053 cf Overall - 459 cf Embedded = 593 cf x 30.0% Voids
#3	12.30'	20 cf	**Token overflow storage (Prismatic)** Listed below (Recalc) -Impervious
		657 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.30	100	0	0
12.50	100	20	20

Device	Routing	Invert	Outlet Devices
#1	Primary	12.30'	**0.22' x 0.22' Horiz. Orifice/Grate X 6.00 columns** X 6 rows Limited to weir flow C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 2.55 hrs HW=6.56' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=2.28 cfs @ 11.96 hrs HW=12.38' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 2.28 cfs @ 0.9 fps)

Pond 3P: INF3

Inflow Area =	17,532 sf,	Inflow Depth =	8.26"	for 100YR event
Inflow =	4.75 cfs @	11.96 hrs,	Volume=	12,068 cf
Outflow =	0.41 cfs @	12.45 hrs,	Volume=	11,956 cf, Atten= 91%, Lag= 29.4 min
Discarded =	0.20 cfs @	11.75 hrs,	Volume=	11,283 cf
Primary =	0.21 cfs @	12.45 hrs,	Volume=	673 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 40.27' @ 12.45 hrs Surf.Area= 16,472 sf Storage= 7,264 cf
Plug-Flow detention time= 753.8 min calculated for 11,949 cf (99% of inflow)
Center-of-Mass det. time= 749.0 min (1,485.2 - 736.2)

Volume	Invert	Avail.Storage	Storage Description
#1	10.00'	2,336 cf	**44.6"W x 30.0"H x 120.70'L StormTech SC-740** x 3 Inside #2
#2	9.50'	845 cf	**4.00'W x 122.70'L x 3.50'H Stone** x 3 5,153 cf Overall - 2,336 cf Embedded = 2,817 cf x 30.0% Voids
#3	40.00'	7,500 cf	**Roof Storage (Prismatic)** Listed below (Recalc)
		10,681 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
40.00	15,000	0	0
40.50	15,000	7,500	7,500

Device	Routing	Invert	Outlet Devices
#1	Primary	40.25'	**0.50' W x 0.25' H Vert. Scuppers X 12.00** C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.20 cfs @ 11.75 hrs HW=40.00' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.06 cfs @ 12.45 hrs HW=40.27' (Free Discharge)
↑**1=Scuppers** (Orifice Controls 0.06 cfs @ 0.5 fps)

Pond 4P: INF4

Inflow Area = 2,660 sf, Inflow Depth = 4.30" for 100YR event
Inflow = 0.45 cfs @ 11.97 hrs, Volume= 954 cf
Outflow = 0.14 cfs @ 11.99 hrs, Volume= 682 cf, Atten= 69%, Lag= 1.0 min
Discarded = 0.00 cfs @ 11.99 hrs, Volume= 334 cf
Primary = 0.14 cfs @ 11.99 hrs, Volume= 349 cf

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 14.01' @ 11.99 hrs Surf.Area= 137 sf Storage= 255 cf
Plug-Flow detention time= 962.2 min calculated for 682 cf (72% of inflow)
Center-of-Mass det. time= 861.9 min (1,691.2 - 829.3)

Volume	Invert	Avail.Storage	Storage Description
#1	10.80'	184 cf	**44.6"W x 30.0"H x 7.12'L StormTech SC-740** x 4 Inside #2
#2	10.30'	71 cf	**4.00'W x 30.00'L x 3.50'H Prismatoid** 420 cf Overall - 184 cf Embedded = 236 cf x 30.0% Voids
#3	14.00'	681 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		935 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.00	1	0	0
15.00	1,360	681	681

Device	Routing	Invert	Outlet Devices
#1	Primary	14.00'	**0.22' x 0.22' Horiz. Orifice/Grate X 6.00 columns** X 6 rows Limited to weir flow C= 0.600
#2	Discarded	0.00'	**0.520 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 11.99 hrs HW=14.01' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.11 cfs @ 11.99 hrs HW=14.01' (Free Discharge)
↑—**1=Orifice/Grate** (Weir Controls 0.11 cfs @ 0.3 fps)

Pond 5P: Total

Inflow Area = 43,012 sf, Inflow Depth = 3.34" for 100YR event
Inflow = 5.58 cfs @ 11.97 hrs, Volume= 11,959 cf
Primary = 5.58 cfs @ 11.97 hrs, Volume= 11,959 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.05 hrs