

August 30, 2016

Planning Board
Town Hall
Framingham, Massachusetts 01702

Reference: Minor Site Plan Review
Assessor's Map 103, Block 0023, Parcel 1975
231 Worcester Road
Framingham, Massachusetts
EDC Job No.: 3514

Dear Board Members:

On behalf of Partners 4 Realty Trust, owner and applicant of the above referenced project, we are submitting additional information in support of the Application for Minor Site Plan Review in order to raze the existing structure and construct a new 1-story Martial Arts Studio. We offer the following project details:

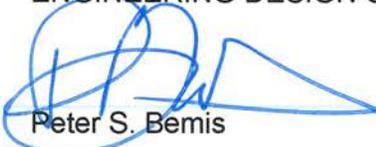
1. The facility will have a maximum occupancy load of 60 people with 5 employees.
2. In order to satisfy the tenants occupancy requirement, the project will commence construction immediately after necessary permits are secured and will be substantially completed in February 2017 with final completion in April 2017 to account for spring planting completion.
3. The property is owned by the applicant Partners 4 Realty Trust, it contains 19,546 SF. with 103.7 Ft. frontage and will comply with front, side and rear yard setbacks, will provide 25 parking spaces with 21 required by zoning and reduces the total existing impervious area by 2.7% to provide 39.5% open space with 20% required.
4. Storm Water Computation Package is attached to this letter addressing MassDEP Stormwater Management, BMP's and LID.
5. To the extent any property along Route 9 is accessible by bike or foot, the property at 231 Worcester Road is at no more advantage or disadvantage than its sister properties with the exception that both a sidewalk and breakdown lane are available for safe pedestrian and bike travel, a bike rack will be included in the site development plan in order to store up to 5 cycles and there are access points through the private way to the north where abutting residential properties could also reach this facility on foot. It appears that shuttle bus traffic does travel Route 9 East and West and could benefit patrons of the facility in order to eliminate a few vehicle trips per day.

6. Mechanical equipment will be set on the rooftop within the midsection of the roofline and set below a perimeter parapet. It is not anticipated that the units would require further shielding and we would not anticipate that the units would not create a noise burden to the abutting uses of this property. This facility will be occupied by a single tenant and they do not anticipate the need for an outdoor dumpster and will collect refuse for disposal within the interior mechanical space and will be removed by private contractor.
7. Hours of operation would observe the traditional retail limits imposed by the town and no special after hour operation is being sought.
8. Existing sewer and water must be cut and capped with new service connections made which are indicated and detailed on the Site Development Plans. We anticipate the volume of water consumption and sewer discharge to be on the order of 1,000 GPD. The water and sewer demand for this facility is similar to that a 2 new homes and we would not anticipate this demand to be a burden on municipal services.
9. In order to redevelop this property we do not anticipate any significant earthwork activities. The existing foundations will need to be removed and the cellar limits filled and properly compacted. No blasting or extra ordinary earthwork activities are needed and as such will not affect immediate or extended abutters.
10. The existing parking limits a portion of which is striped and a portion that is not can support about the same total number of parking spaces as is being proposed. The 25 parking spaces proposed is more than enough to adequately address the parking demand for the Martial Arts Studio use at the facility and this use will not adversely impact abutting properties. When possible the tenant will encourage use of public transportation and bicycle travel for its employees and patrons.

Thank you for processing this application and should you require additional information, do not hesitate to contact us.

Very truly yours,

ENGINEERING DESIGN CONSULTANTS, INC.



Peter S. Bemis

cc. Partners 4 Realty Trust

STORMWATER CALCULATIONS

Minor Site Plan Review

231 Worcester Road

Framingham, Massachusetts

Prepared for:

Partners 4 Realty Trust

163 Newbury Street

Framingham, MA 01701

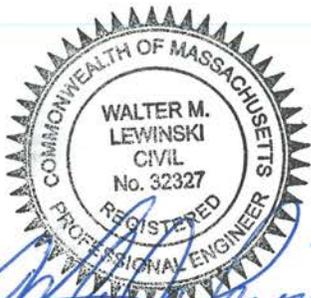
Prepared By:

Engineering
Design
Consultants, Inc.

32 Turnpike Road

Southborough, Massachusetts 01772

August 23, 2016



Walter M. Lewinski
8-23-16

PROJECT NARRATIVE

This reconstruction project titled, Minor Site Plan Review, located at 231 Worcester Road, encompasses the demolition of a building, the construction of a new building and the reconstruction of paved parking areas, with lighting, drainage and landscaping.

The existing total lot area is 19,546 s.f., is under half an acre.

The proposed project has 11,833 S.F. (60.5%) impervious area, and the existing impervious area is 12,346 S.F. (63.2%). The impervious area has been reduced.

The proposed drainage design includes two rows of underground infiltration chambers for roof runoff collection and infiltration, the proposed roof is 4,224 s.f. or 36% of the proposed impervious area. (The model is 1 Row of 4 chambers and the storage is multiplied by two)

DRAINAGE NARRATIVE

A storm water analysis was performed for the project at 231 Worcester Road. The method of analysis is the SCS method for hydrologic conditions. The SCS method utilized TR-55 and HydroCAD stormwater modeling system to analysis the 2-year, 10-year, and 100-year, 24 hour storm events. The soils for the proposed project are classified as "Urban," and a "B" hydrologic group was used for both the Pre & Post – Developed condition.

Hydrologic Existing Conditions:

The existing site runoff generally flows overland to the east into a paved private way and parking area, then into the Worcester Road piped drainage system.

Subcatchment Area 1S contains approximately 19,546 sf and is the predeveloped runoff from the site and is labeled, "Predeveloped."

Hydrologic Proposed Conditions:

Under proposed conditions the same design point location was analyzed for peak flow discharge for the 2-year, 10-year, and 100-year, 24 hour storm events.

There are two Subcatchments 10S and 11S, included in the proposed condition. Subcatchment 10S, is 4,224 sf of roof area flowing into the proposed infiltration basin labeled 10P. Subcatchment 11S is 15,322 sf of area containing lawn, landscaping and pavement and flows Overland into the adjacent paved private way.

The infiltration chambers are designed with overflow scuppers for larger storm events.

The overall developed flow to the south is summarized by the link "10L", labeled "Postdeveloped."

The peak discharge results are in the following table.

	Design Storms		
	2-Year	10-Year	100-year
Predeveloped (1s)	0.88	1.61	2.63
Postdeveloped (10L)	0.54	1.59	2.48

In conclusion, the 2-year, 10-year, and 100-year peak rates of runoff are reduced under proposed conditions to the design point.

The peak discharge results are in the following table.

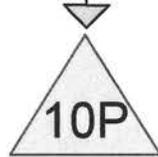
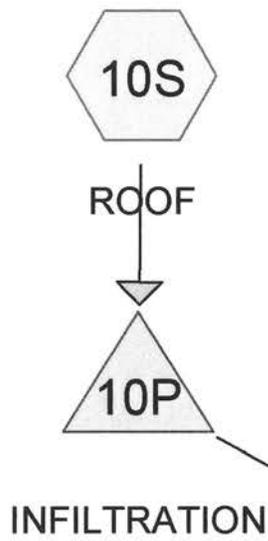
	Design Storms		
	2-Year	10-Year	100-year
Predeveloped (1s)	2,740	5,030	8,372
Postdeveloped (10L)	1,751	3,932	6,903

In conclusion, the 2-year, 10-year, and 100-year peak volumes of runoff are reduced under proposed conditions to the design point.

The underground infiltration chambers will drain in approximately 12 hours for the 100-year storm.

Best Management Practices & Low Impact Development:

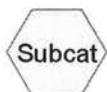
The proposed project was designed to reduce the impervious area from the existing condition and infiltrate the roof runoff, approximately 513 s.f. of impervious has been reduced. The exiting roof runoff flows through downspouts around the perimeter of the building without any control, in the proposed design all of the roof runoff flows to the underground infiltration chambers and the overflow from larger storms will runoff into landscaped areas.



INFILTRATION



POSTDEVELOPED



Summary for Subcatchment 1S: PREDEVELOPED

Runoff = 0.88 cfs @ 12.09 hrs, Volume= 2,740 cf, Depth= 1.68"

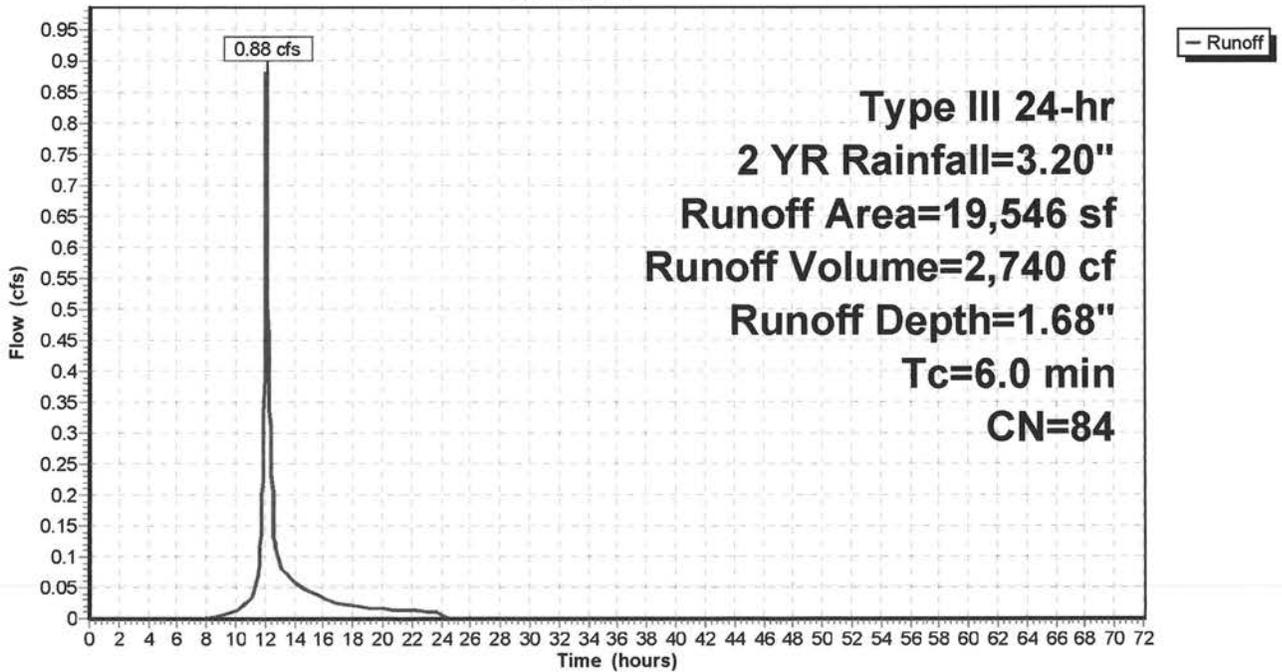
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
12,346	98	Paved parking, HSG B
7,200	61	>75% Grass cover, Good, HSG B
19,546	84	Weighted Average
7,200		36.84% Pervious Area
12,346		63.16% Impervious Area

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

Subcatchment 1S: PREDEVELOPED

Hydrograph



Summary for Subcatchment 10S: ROOF

Runoff = 0.30 cfs @ 12.08 hrs, Volume= 1,045 cf, Depth= 2.97"

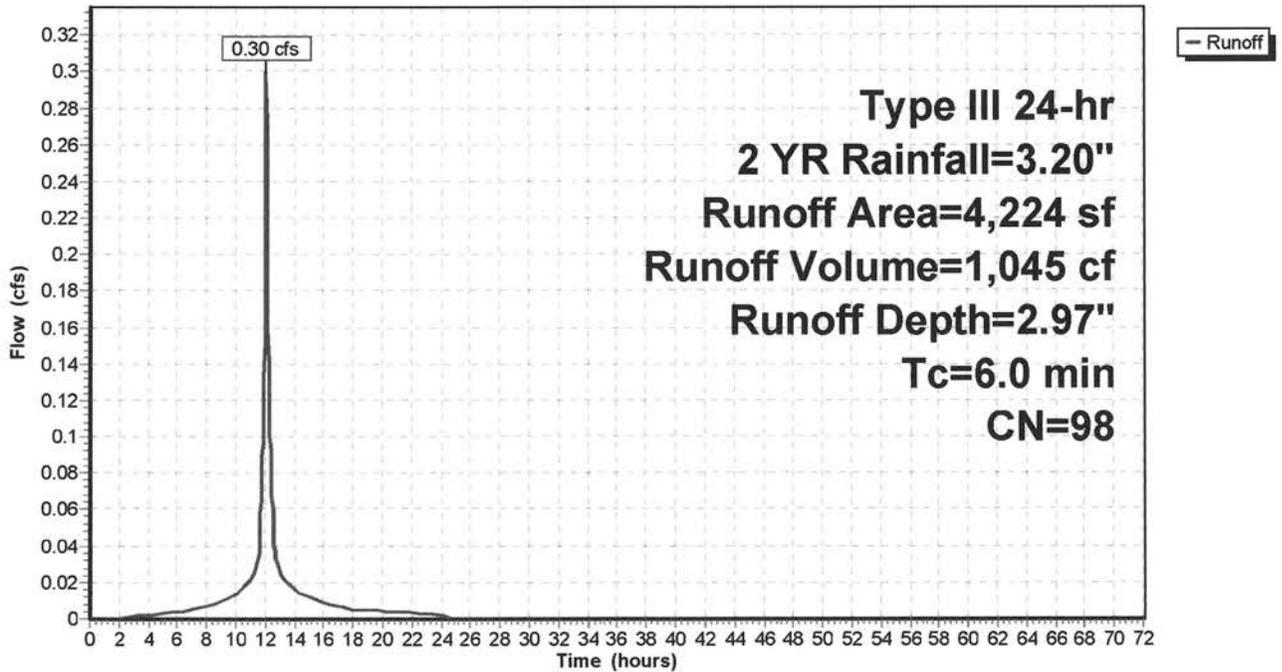
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
4,224	98	Roofs, HSG B
4,224		100.00% Impervious Area

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

Subcatchment 10S: ROOF

Hydrograph



Summary for Subcatchment 11S: SITE

Runoff = 0.54 cfs @ 12.09 hrs, Volume= 1,707 cf, Depth= 1.34"

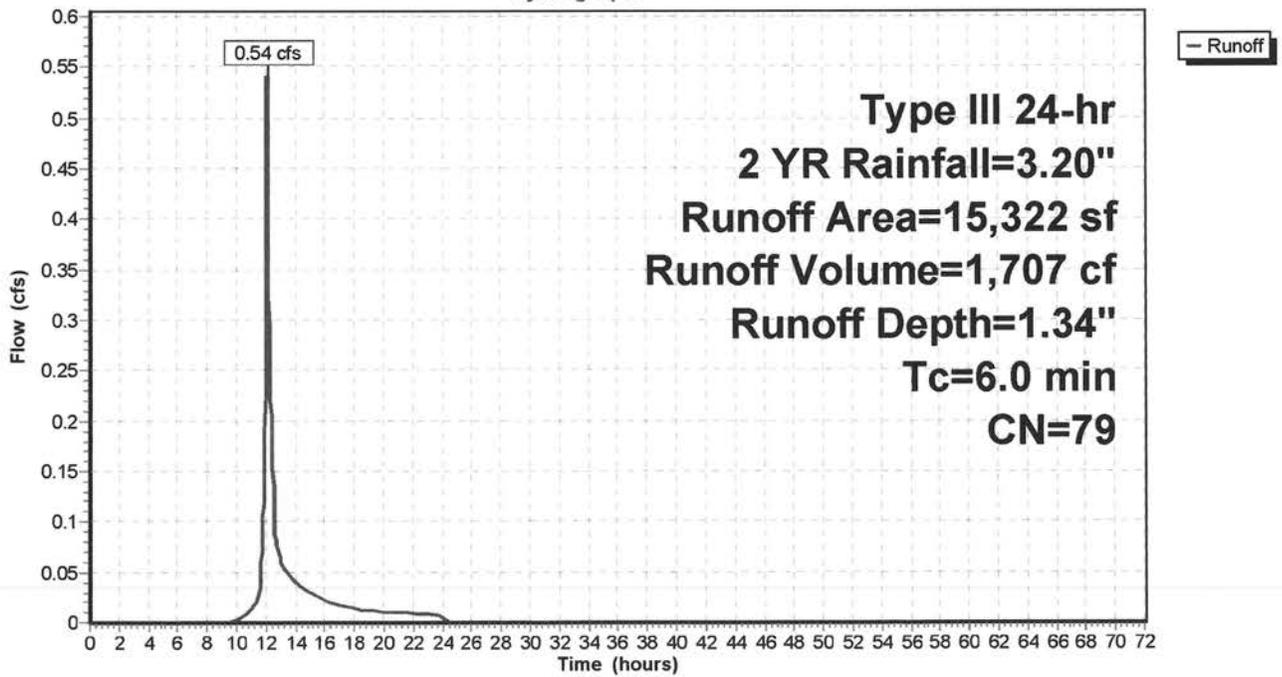
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type III 24-hr 2 YR Rainfall=3.20"

Area (sf)	CN	Description
7,609	98	Paved parking, HSG B
7,713	61	>75% Grass cover, Good, HSG B
15,322	79	Weighted Average
7,713		50.34% Pervious Area
7,609		49.66% Impervious Area

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

Subcatchment 11S: SITE

Hydrograph



Summary for Pond 10P: INFILTRATION

Inflow Area = 4,224 sf, 100.00% Impervious, Inflow Depth = 2.97" for 2 YR event
 Inflow = 0.30 cfs @ 12.08 hrs, Volume= 1,045 cf
 Outflow = 0.02 cfs @ 12.95 hrs, Volume= 1,032 cf, Atten= 93%, Lag= 51.6 min
 Discarded = 0.01 cfs @ 12.95 hrs, Volume= 987 cf
 Primary = 0.01 cfs @ 12.95 hrs, Volume= 45 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 209.51' @ 12.95 hrs Surf.Area= 0.010 ac Storage= 0.013 af

Plug-Flow detention time= 538.3 min calculated for 1,032 cf (99% of inflow)
 Center-of-Mass det. time= 530.3 min (1,286.7 - 756.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	206.80'	0.004 af	4.75'W x 43.75'L x 2.54'H Field A 0.012 af Overall - 0.003 af Embedded = 0.010 af x 40.0% Voids
#2A	207.30'	0.003 af	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
#3	206.80'	0.000 af	1.00'D x 3.00'H Vertical Cone/Cylinder
		0.006 af	x 2.00 = 0.013 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	206.80'	0.520 in/hr Exfiltration over Wetted area
#2	Primary	209.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.95 hrs HW=209.51' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 12.95 hrs HW=209.51' (Free Discharge)
 ↑2=Orifice/Grate (Weir Controls 0.00 cfs @ 0.23 fps)

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Type III 24-hr 2 YR Rainfall=3.20"

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Pond 10P: INFILTRATION - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

4 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 41.75' Row Length +12.0" End Stone x 2 = 43.75' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 110.6 cf Chamber Storage

528.2 cf Field - 110.6 cf Chambers = 417.6 cf Stone x 40.0% Voids = 167.0 cf Stone Storage

Chamber Storage + Stone Storage = 277.6 cf = 0.006 af

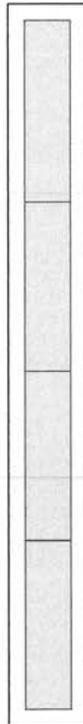
Overall Storage Efficiency = 52.6%

Overall System Size = 43.75' x 4.75' x 2.54'

4 Chambers

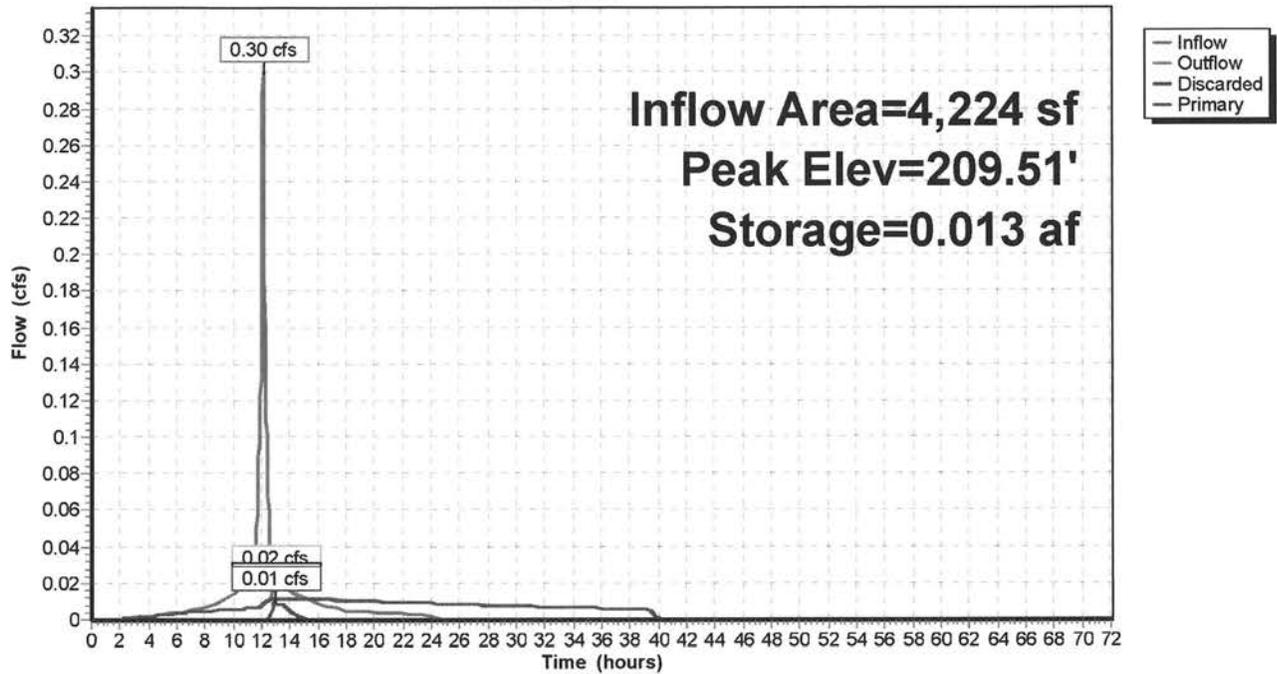
19.6 cy Field

15.5 cy Stone



Pond 10P: INFILTRATION

Hydrograph



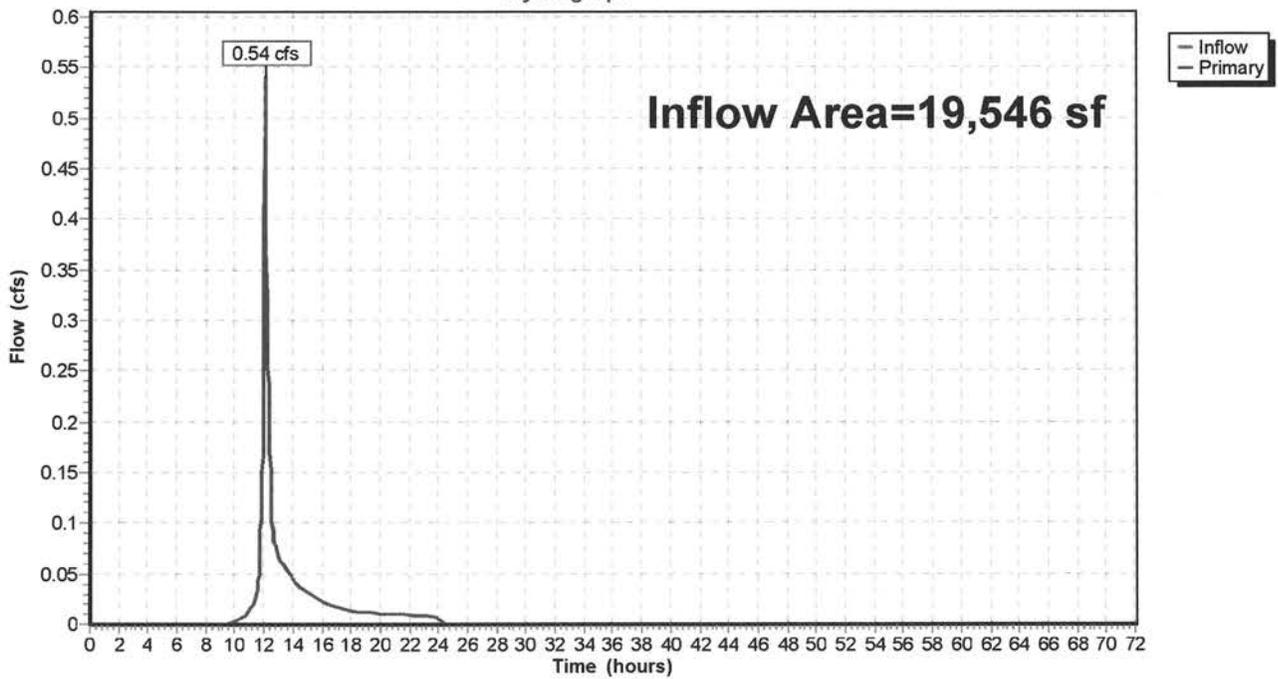
Summary for Link 10L: POSTDEVELOPED

Inflow Area = 19,546 sf, 60.54% Impervious, Inflow Depth = 1.08" for 2 YR event
Inflow = 0.54 cfs @ 12.09 hrs, Volume= 1,751 cf
Primary = 0.54 cfs @ 12.09 hrs, Volume= 1,751 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs

Link 10L: POSTDEVELOPED

Hydrograph



Summary for Subcatchment 1S: PREDEVELOPED

Runoff = 1.61 cfs @ 12.09 hrs, Volume= 5,030 cf, Depth= 3.09"

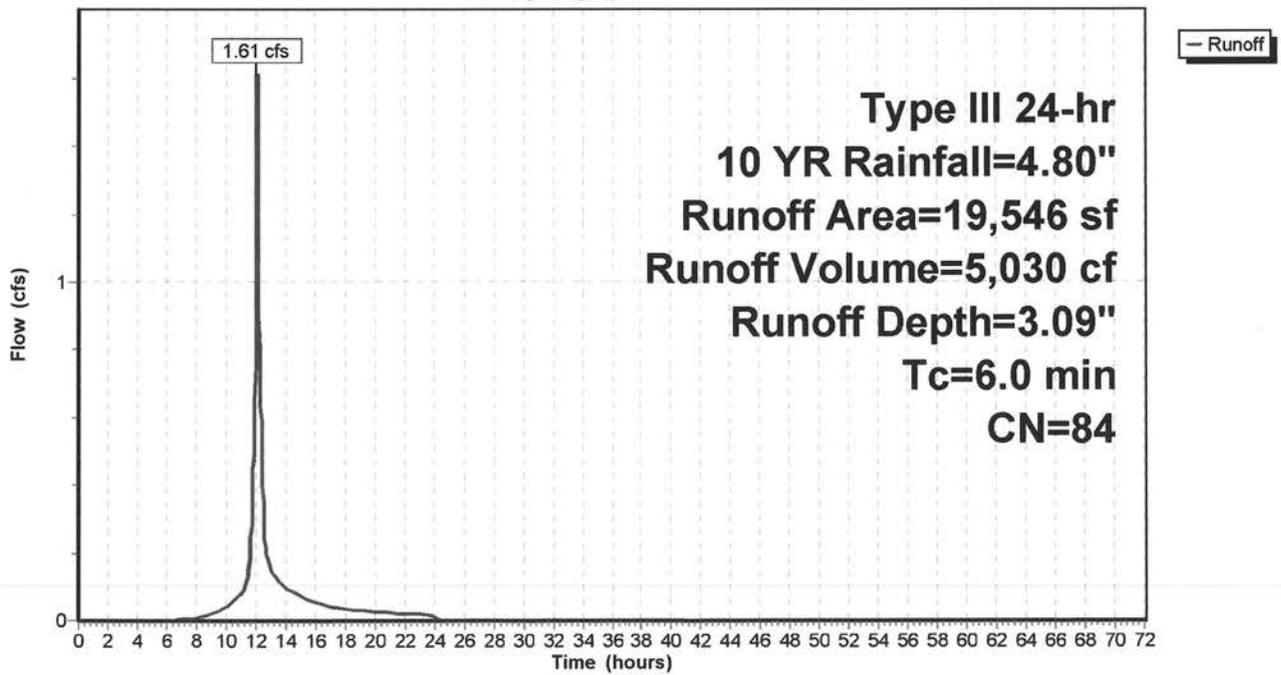
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
 Type III 24-hr 10 YR Rainfall=4.80"

Area (sf)	CN	Description
12,346	98	Paved parking, HSG B
7,200	61	>75% Grass cover, Good, HSG B
19,546	84	Weighted Average
7,200		36.84% Pervious Area
12,346		63.16% Impervious Area

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

Subcatchment 1S: PREDEVELOPED

Hydrograph



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Type III 24-hr 10 YR Rainfall=4.80"

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Summary for Subcatchment 10S: ROOF

Runoff = 0.45 cfs @ 12.08 hrs, Volume= 1,606 cf, Depth= 4.56"

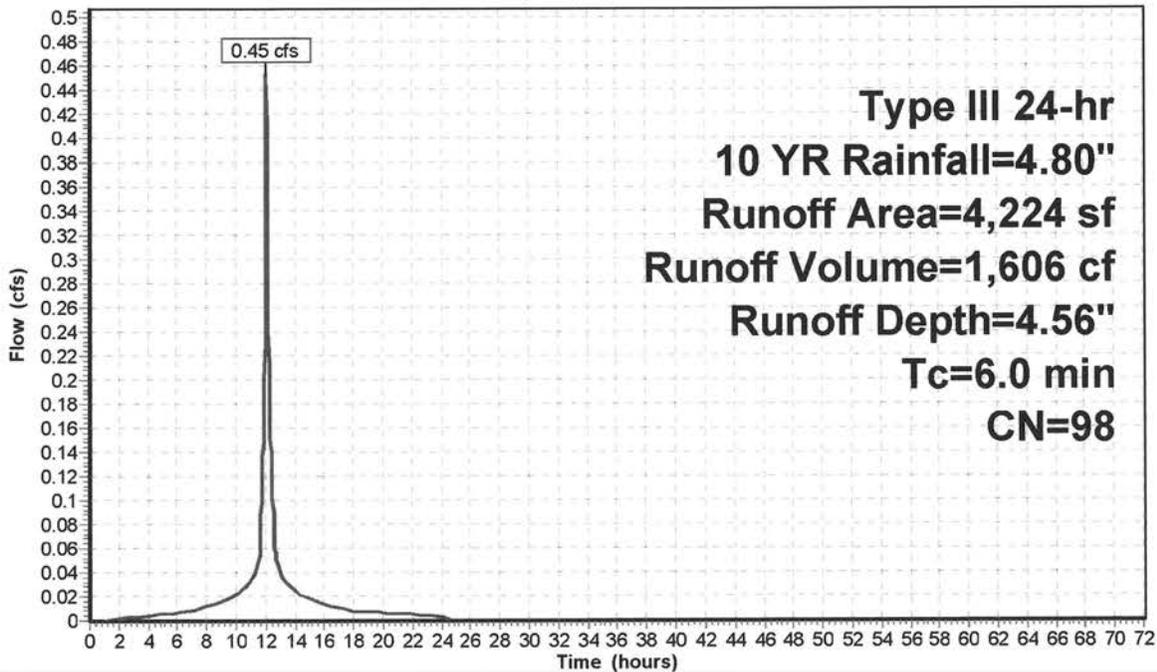
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type III 24-hr 10 YR Rainfall=4.80"

Area (sf)	CN	Description
4,224	98	Roofs, HSG B
4,224		100.00% Impervious Area

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

Subcatchment 10S: ROOF

Hydrograph



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Type III 24-hr 10 YR Rainfall=4.80"

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Summary for Subcatchment 11S: SITE

Runoff = 1.08 cfs @ 12.09 hrs, Volume= 3,358 cf, Depth= 2.63"

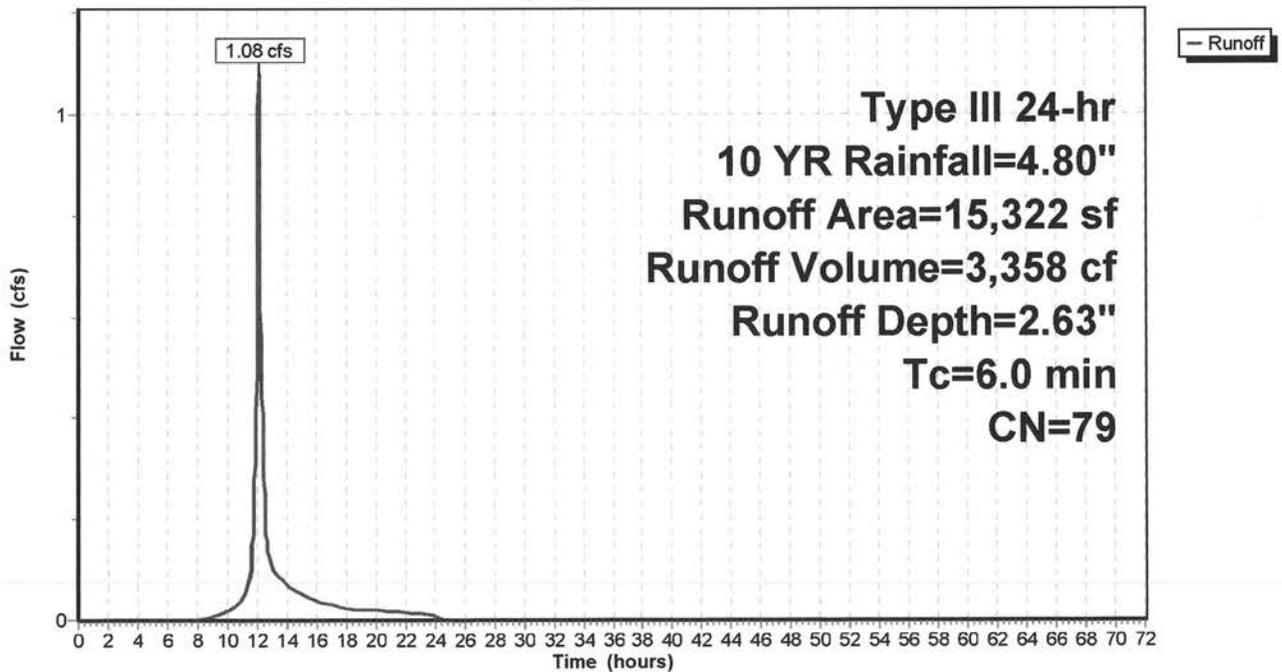
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type III 24-hr 10 YR Rainfall=4.80"

Area (sf)	CN	Description
7,609	98	Paved parking, HSG B
7,713	61	>75% Grass cover, Good, HSG B
15,322	79	Weighted Average
7,713		50.34% Pervious Area
7,609		49.66% Impervious Area

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

Subcatchment 11S: SITE

Hydrograph



Summary for Pond 10P: INFILTRATION

Inflow Area = 4,224 sf, 100.00% Impervious, Inflow Depth = 4.56" for 10 YR event
 Inflow = 0.45 cfs @ 12.08 hrs, Volume= 1,606 cf
 Outflow = 0.54 cfs @ 12.10 hrs, Volume= 1,676 cf, Atten= 0%, Lag= 1.1 min
 Discarded = 0.01 cfs @ 12.09 hrs, Volume= 1,102 cf
 Primary = 0.52 cfs @ 12.10 hrs, Volume= 573 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 209.63' @ 12.09 hrs Surf.Area= 0.010 ac Storage= 0.013 af

Plug-Flow detention time= 320.4 min calculated for 1,606 cf (100% of inflow)
 Center-of-Mass det. time= 374.6 min (1,123.3 - 748.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	206.80'	0.004 af	4.75'W x 43.75'L x 2.54'H Field A 0.012 af Overall - 0.003 af Embedded = 0.010 af x 40.0% Voids
#2A	207.30'	0.003 af	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
#3	206.80'	0.000 af	1.00'D x 3.00'H Vertical Cone/Cylinder
		0.006 af	x 2.00 = 0.013 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	206.80'	0.520 in/hr Exfiltration over Wetted area
#2	Primary	209.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.09 hrs HW=209.63' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.46 cfs @ 12.10 hrs HW=209.63' (Free Discharge)
 ↑**2=Orifice/Grate** (Weir Controls 0.46 cfs @ 1.16 fps)

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Type III 24-hr 10 YR Rainfall=4.80"

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Pond 10P: INFILTRATION - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

4 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 41.75' Row Length +12.0" End Stone x 2 = 43.75' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 110.6 cf Chamber Storage

528.2 cf Field - 110.6 cf Chambers = 417.6 cf Stone x 40.0% Voids = 167.0 cf Stone Storage

Chamber Storage + Stone Storage = 277.6 cf = 0.006 af

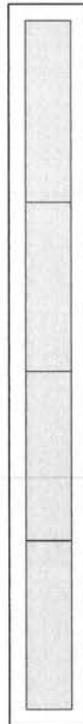
Overall Storage Efficiency = 52.6%

Overall System Size = 43.75' x 4.75' x 2.54'

4 Chambers

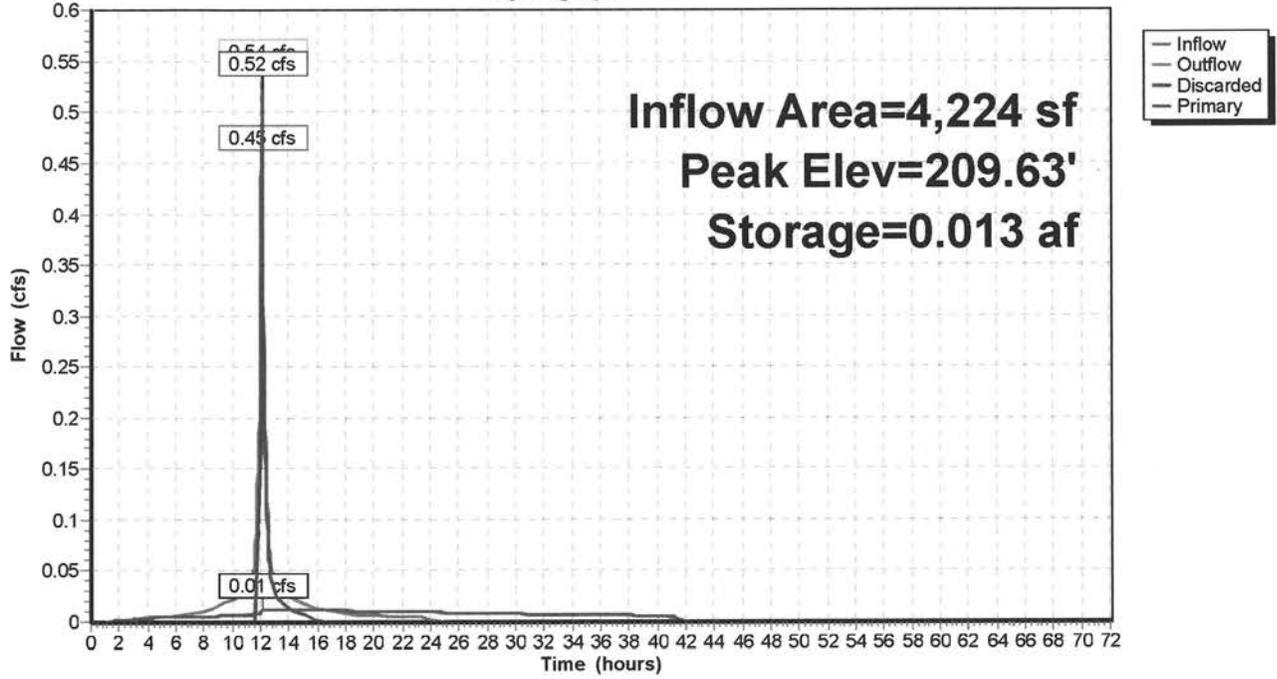
19.6 cy Field

15.5 cy Stone



Pond 10P: INFILTRATION

Hydrograph



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Type III 24-hr 10 YR Rainfall=4.80"

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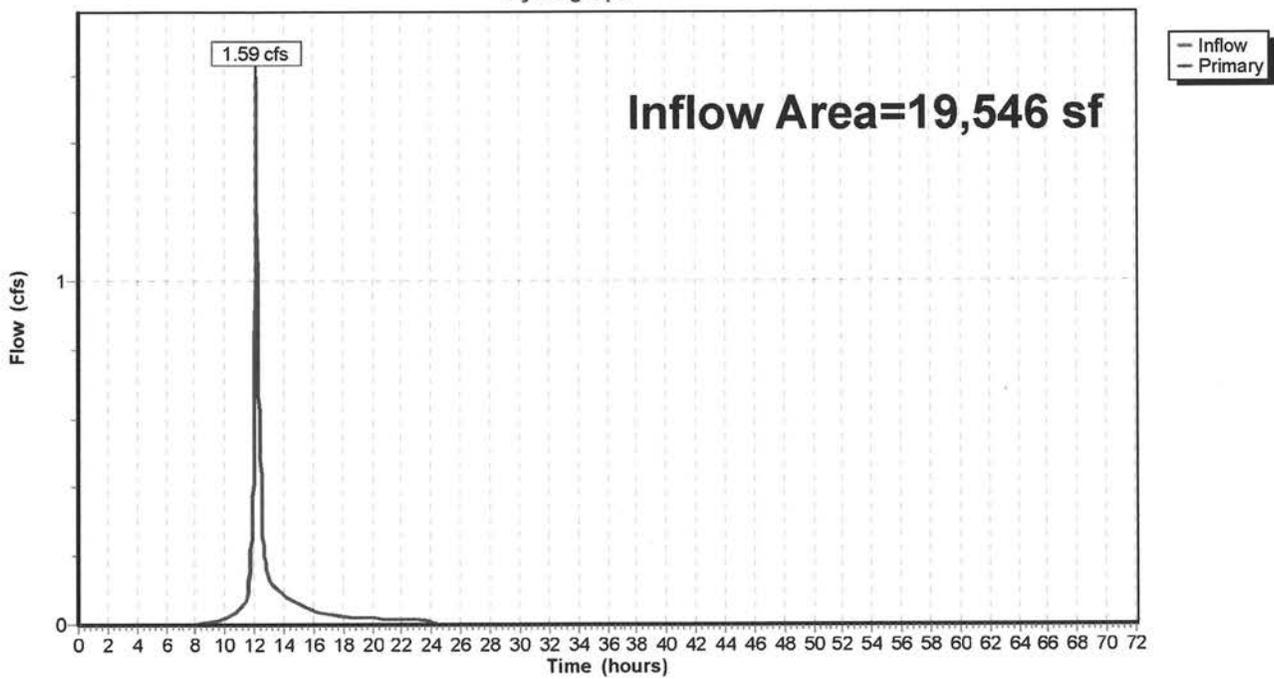
Summary for Link 10L: POSTDEVELOPED

Inflow Area = 19,546 sf, 60.54% Impervious, Inflow Depth = 2.41" for 10 YR event
Inflow = 1.59 cfs @ 12.10 hrs, Volume= 3,932 cf
Primary = 1.59 cfs @ 12.10 hrs, Volume= 3,932 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs

Link 10L: POSTDEVELOPED

Hydrograph



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Type III 24-hr 100 YR Rainfall=7.00"

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Summary for Subcatchment 1S: PREDEVELOPED

Runoff = 2.63 cfs @ 12.09 hrs, Volume= 8,372 cf, Depth= 5.14"

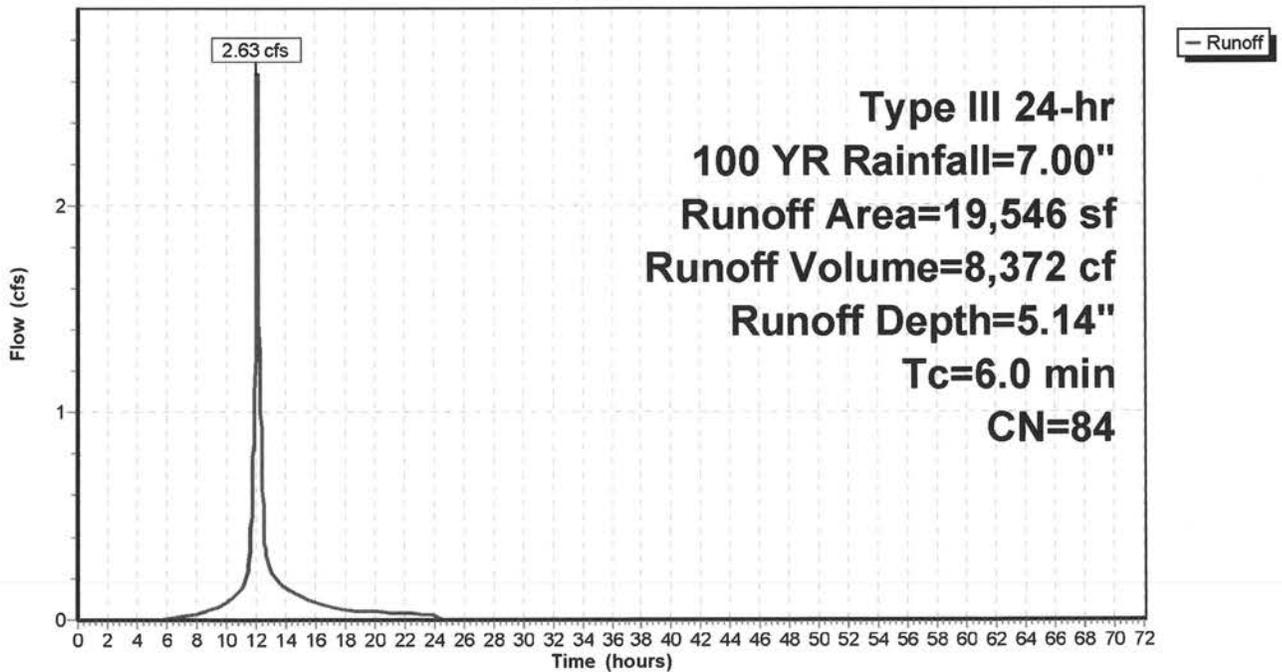
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
12,346	98	Paved parking, HSG B
7,200	61	>75% Grass cover, Good, HSG B
19,546	84	Weighted Average
7,200		36.84% Pervious Area
12,346		63.16% Impervious Area

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

Subcatchment 1S: PREDEVELOPED

Hydrograph



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Type III 24-hr 100 YR Rainfall=7.00"

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Summary for Subcatchment 10S: ROOF

Runoff = 0.66 cfs @ 12.08 hrs, Volume= 2,380 cf, Depth= 6.76"

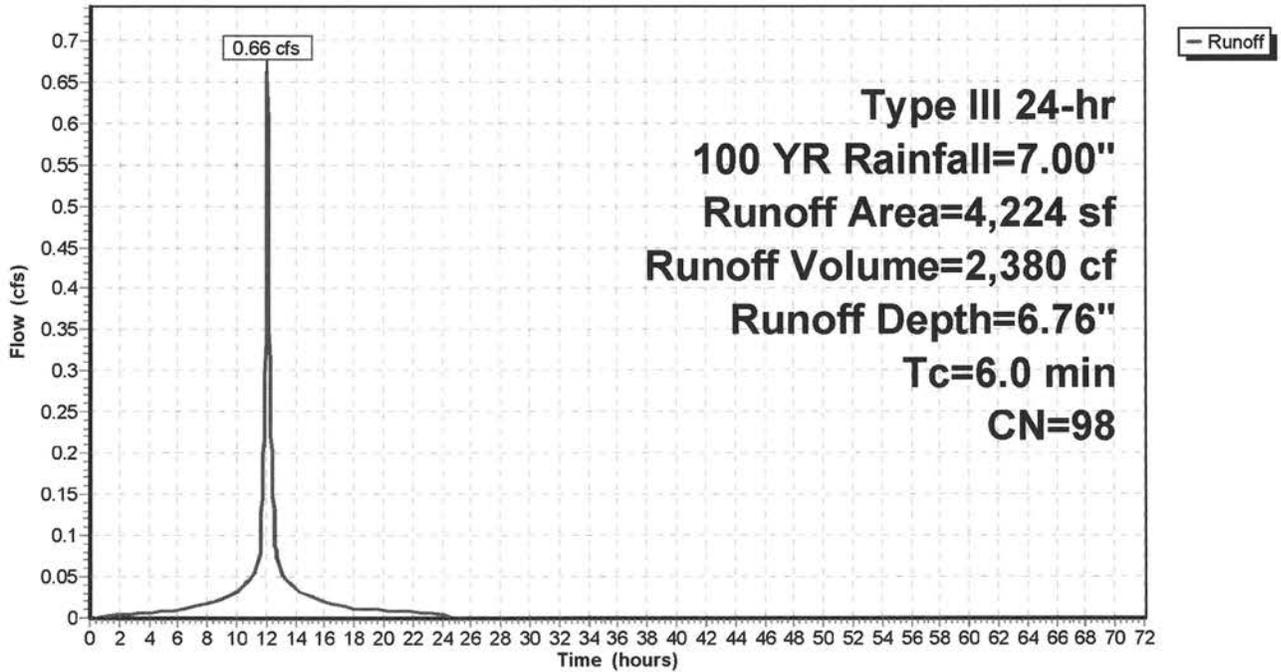
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
4,224	98	Roofs, HSG B
4,224		100.00% Impervious Area

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

Subcatchment 10S: ROOF

Hydrograph



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Type III 24-hr 100 YR Rainfall=7.00"

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Summary for Subcatchment 11S: SITE

Runoff = 1.87 cfs @ 12.09 hrs, Volume= 5,853 cf, Depth= 4.58"

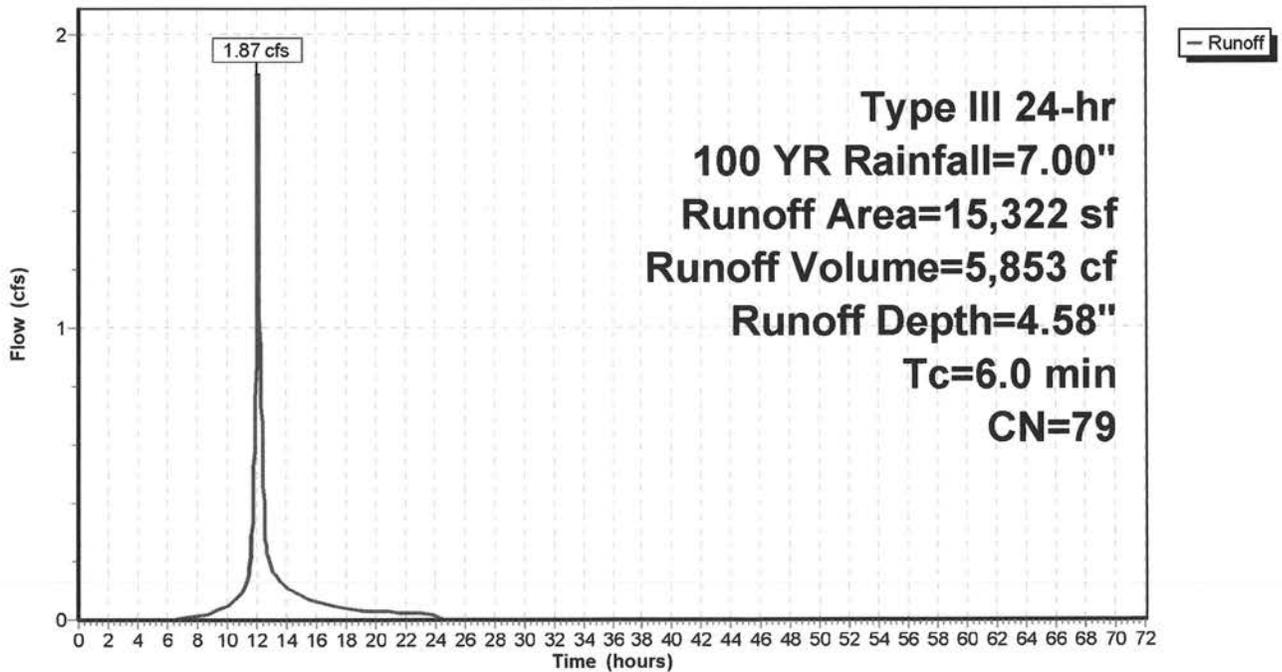
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
7,609	98	Paved parking, HSG B
7,713	61	>75% Grass cover, Good, HSG B
15,322	79	Weighted Average
7,713		50.34% Pervious Area
7,609		49.66% Impervious Area

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

Subcatchment 11S: SITE

Hydrograph



Summary for Pond 10P: INFILTRATION

Inflow Area = 4,224 sf, 100.00% Impervious, Inflow Depth = 6.76" for 100 YR event
 Inflow = 0.66 cfs @ 12.08 hrs, Volume= 2,380 cf
 Outflow = 0.62 cfs @ 12.08 hrs, Volume= 2,261 cf, Atten= 6%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 12.08 hrs, Volume= 1,212 cf
 Primary = 0.61 cfs @ 12.08 hrs, Volume= 1,050 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 209.65' @ 12.08 hrs Surf.Area= 0.010 ac Storage= 0.013 af

Plug-Flow detention time= 347.6 min calculated for 2,260 cf (95% of inflow)
 Center-of-Mass det. time= 318.7 min (1,061.6 - 743.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	206.80'	0.004 af	4.75'W x 43.75'L x 2.54'H Field A 0.012 af Overall - 0.003 af Embedded = 0.010 af x 40.0% Voids
#2A	207.30'	0.003 af	Cultec R-150XLHD x 4 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 1 rows
#3	206.80'	0.000 af	1.00'D x 3.00'H Vertical Cone/Cylinder
		0.006 af	x 2.00 = 0.013 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	206.80'	0.520 in/hr Exfiltration over Wetted area
#2	Primary	209.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=209.65' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.60 cfs @ 12.08 hrs HW=209.65' (Free Discharge)
 ↑2=Orifice/Grate (Weir Controls 0.60 cfs @ 1.27 fps)

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Type III 24-hr 100 YR Rainfall=7.00"

Prepared by Engineering Design Consultants, Inc.
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Pond 10P: INFILTRATION - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)

Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf

Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap

Row Length Adjustment= +0.75' x 2.65 sf x 1 rows

4 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 41.75' Row Length +12.0" End Stone x 2 = 43.75' Base Length

1 Rows x 33.0" Wide + 12.0" Side Stone x 2 = 4.75' Base Width

6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

4 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 1 Rows = 110.6 cf Chamber Storage

528.2 cf Field - 110.6 cf Chambers = 417.6 cf Stone x 40.0% Voids = 167.0 cf Stone Storage

Chamber Storage + Stone Storage = 277.6 cf = 0.006 af

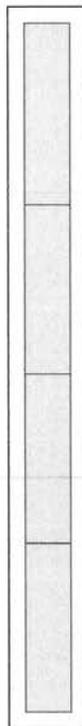
Overall Storage Efficiency = 52.6%

Overall System Size = 43.75' x 4.75' x 2.54'

4 Chambers

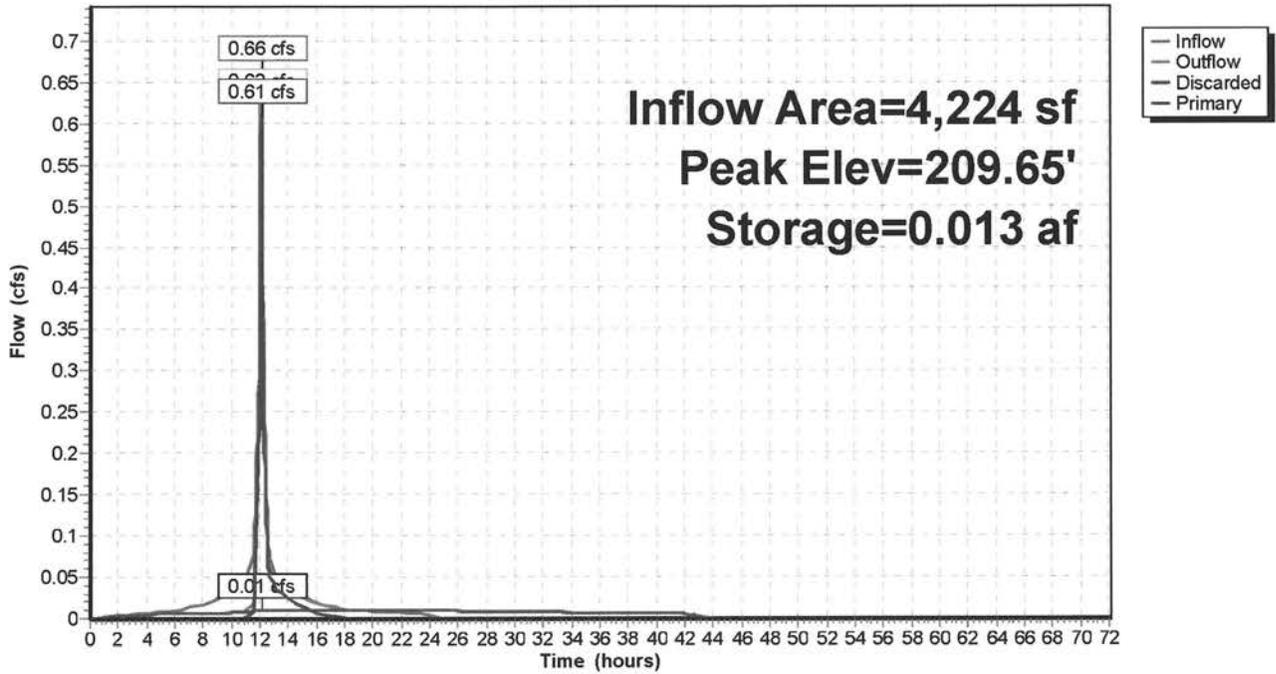
19.6 cy Field

15.5 cy Stone



Pond 10P: INFILTRATION

Hydrograph



Summary for Link 10L: POSTDEVELOPED

Inflow Area = 19,546 sf, 60.54% Impervious, Inflow Depth = 4.24" for 100 YR event
Inflow = 2.48 cfs @ 12.09 hrs, Volume= 6,903 cf
Primary = 2.48 cfs @ 12.09 hrs, Volume= 6,903 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.03 hrs

Link 10L: POSTDEVELOPED

Hydrograph

