

**STORMWATER POLLUTION PREVENTION PLAN /
STORMWATER MANAGEMENT REPORT
FOR 921 SOUNDVIEW DRIVE**

Village of Mamaroneck, New York

Date: December 29, 2021 (revised)

Prepared by: Alan L. Pilch, PE, RLA

ALP Engineering & Landscape Architecture, PLLC

INTRODUCTION:

The subject property is 22,998.8 square feet in size and is located on the east side of Soundview Drive. The lot is bounded by Soundview Drive on the west, existing residential properties on the north and south, Creek Road (a paper street) and Otter Creek to the east.

The project consists of the following:

- Construction of a new single family residential dwelling in the western portion of the property, with driveway access from Soundview Drive;
- Construction of a pool and pool deck to the east of the house.
- Construction of a stormwater management facility to manage the changes in stormwater runoff from the property.

The limits of disturbance are shown on drawing C-103. The drawing shows that the area of disturbance is 12,700 square feet (0.2916 acres). The proposed land disturbance involves the removal of some of the existing woods and brush areas on the property and the construction of the house, pool, pool deck, as well as the stormwater management facility.

STORMWATER MANAGEMENT PLAN

Stormwater Management Plan Requirements - The project stormwater management plan has been designed in accordance with Chapter 294 of the Code of the Village of Mamaroneck and the 2015 New York State *Stormwater Management Design Manual*. Since the land disturbance activity has been calculated to be about 12,700 square feet, as per Chapter 294-8 B.2, the stormwater management plan is to provide stormwater quality and quantity controls (post-construction stormwater runoff controls). And since the land disturbance area is less than one acre, a SPDES General Permit for Stormwater Runoff from Construction Activity from the NYSDEC will *not* be required.

At present, the property is vacant. With the construction of the house, driveway, pool and pool deck, the total amount of impervious surfaces will be 4,346 s.f. (this number includes the proposed pool deck as impervious to be very conservative). The remainder of the disturbed area will be lawn and landscaped areas.

There are no stormwater management controls on the property at present. Runoff from the entire property is presently conveyed to the east flowing toward Otter Creek. For purposes of analysis, the Design Line is defined as the eastern property line (see **Figures 3 and 4**).

To manage runoff from the property, it is proposed to install 8 Cultec 330XLHD chambers as four rows of 2 chambers end-to-end. This practice will provide water quantity control (i.e., peak rate attenuation) of the runoff discharged from the property to Otter Crook as well as water quality improvement by capturing and treating the water quality volume.

The runoff conveyed to the chambers will be conveyed first to a diversion structure which will direct the water quality volume to the chambers since the outlet pipe from the diversion structures to the chambers is at a lower elevation than the outlet pipe to the flow spreader. Outflow from the chambers is by infiltration (a conservative 1" per hour rate was used in the modeling) and to two 6" diameter pop-up emitters (see drawing C-102). In the event there is a more intense flow being conveyed to the chambers, the diversion structure will convey a portion of that flow to the flow spreader, and a portion of the flow to the chambers.

The calculations show that the peak rate of runoff to the design line will be less than the existing rate of runoff from the property for all of the modeled storm events.

The text below describes the compliance of the stormwater management plan with Chapter 294 of the Code of the Village of Mamaroneck.

B. Contents of stormwater pollution prevention plans.

(1) All SWPPPs shall provide the following background information and erosion and sediment controls:

(a) Background information about the scope of the project, including location, type and size of project;

The project scope includes:

- Construction of a 2,430 square foot house in the western portion of the property;
- Construction of a 40-foot length paved driveway to the house garage.
- Construction of a stormwater drainage system to consist of a trench drain, catch basins, a stormwater management facility to consist of subsurface chambers, two pop-up emitters and a flow spreader to manage the outflow of runoff.

(b) Site map/construction drawing(s) at a scale not smaller than one inch equals 50 feet, or as otherwise approved by the SMO, for the project, including a general location map. At a minimum, the site map should show the total site area; all improvements; areas of disturbance;

areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of off-site material, waste, borrow or equipment storage areas; and location(s) of the stormwater discharges(s);

The project drawings depict the required elements of the project, as follows: (i) the total site area is depicted on drawing C-101, (ii) all proposed site improvements may be referenced on drawing C-101 and C-102, (iii) areas of disturbance and areas that will not be disturbed may be found on drawing C-103, (iv) general areas of existing vegetation and the location of surveyed trees may be found on drawing C-101, (v) runoff from the project site currently and in the future will be conveyed into Otter Creek which lies to the east of the property; (vii) existing and final slopes may be found on drawing C-102, (viii) the project does not propose to locate any material, waste, or borrow areas off the property; equipment storage areas during construction may be found on drawing C-103.

(c) Description of the soil(s) present at the site;

According to the Soils Survey of Putnam and Westchester Counties (Web Soil Survey), the soils over the portion of the property to be impacted by the proposed work consist of Urban land-Charlton-Chatfield complex, rolling, very rocky. The wetland soils consist of Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded. The Charlton component of the Urban land-Charlton-Chatfield complex soils consist of loam and sandy loam to depth of 60" or so. Chatfield soils consist of loam and flaggy silt loam; the depth to the restrictive layer is 20 to 40 inches. Both soils are in Hydrologic Soils Group B. Group B soils have moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

(d) Construction phasing plan describing the intended sequence of construction activities, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance. Consistent with the New York Standards and Specifications for Erosion and Sediment Control (Erosion Control Manual), not more than five acres shall be disturbed at any one time unless pursuant to an approved SWPPP;

The construction phasing plan may be found on drawing C-103. As noted above, the total area of disturbance is calculated to be 12,700 square feet (0.2916 acres), well below the five acre threshold, and well below 1 acre of disturbance that would trigger the need for a SPDES General Permit.

(e) Description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a pollutant source in stormwater runoff;

The Erosion and Sediment Control Plan incorporates a variety of measures designed to control litter, construction chemicals, and construction debris from becoming a source of pollution. The plan requires the staking of the clearing and grading limit line before the commencement of construction activity. Following the demarcation of the limits of disturbance, a variety of erosion and sediment control measures are to be installed in accordance with the plans, including, but not limited to, silt fences and a stabilized construction entrance.

Each contractor and subcontractor who will be involved in soil disturbance and/or stormwater management practice installation shall sign and date a copy of the following certification statement before undertaking any land development activity: "I certify under penalty of law that I understand and agree to comply with the terms and conditions of the stormwater pollution prevention plan. I also understand that it is unlawful for any person to cause or contribute to a violation of water quality standards." The SMO shall provide a form for the contractor/subcontractor certification statement which shall be signed and returned to the SMO prior to any work taking place.

The certification must include the name and title of the person providing the signature, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made.

The certification statement(s) shall become part of the SWPPP for the land development activity.

A copy of the SWPPP shall be retained at the site of the land development activity during construction from the date of initiation of construction activities to the date of final stabilization.

As for construction materials, they will be stored in the locations shown on the erosion and sediment control plan, and will be protected by construction fencing as a containment.

Litter control is largely provided by having the maintenance and trash facilities placed inside a fenced-in area. This will reduce the risk of such materials from being washed by rain or blown by wind into the storm drainage system, the public street or toward neighboring properties.

In addition, the construction equipment and material storage area will be located within the portion of the site that is enclosed by the proposed erosion and sediment control measures.

(f) Description of construction and waste materials expected to be stored on-site with updates as appropriate, and a description of controls to reduce pollutants from these materials, including storage practices to minimize exposure of the materials to stormwater, and spill prevention and response;

Construction materials expected to be stored temporarily on site include, but are not limited to, soil stockpiles, stone aggregate for the footings and foundation of the building and pavement, and sod and/or seed to establish lawn for the disturbed areas. These items are not sources of pollution in the short term.

(g) Temporary and permanent structural and vegetative measures to be used for soil stabilization, runoff control and sediment control for each stage of the project from initial land clearing and grubbing to project closeout;

Permanent vegetative measures to be used for soil stabilization may be referenced on the drawings. In the event that site work for the construction is completed at a time of the year that the installation of permanent plantings is not feasible (i.e. late fall, winter and early spring, essentially corresponding to December 1 through April 15), temporary measures are to be installed to prevent erosion, as detailed on drawing C-103 will be implemented.

Temporary Critical Area Plantings, in the event that permanent vegetation cannot be established due to the time of year (i.e. December 1 through April 15), then the seed mixes so noted on drawing C-103 are to be used to stabilize the ground surface until such time as permanent stabilization can be achieved.

(h) A site map/construction drawing(s) specifying the location(s), size(s) and length(s) of each erosion and sediment control practice;

Drawing C-103 depicts the location, size and length of each erosion and sediment control measure to be implemented during construction.

(i) Dimensions, material specifications and installation details for all erosion and sediment control practices, including the siting and sizing of any temporary sediment basins;

Dimensions, material specifications and installation details for all erosion and sediment control practices may be referenced on drawing C-103. Temporary sediment basins are not proposed for the site construction.

(j) Temporary practices that will be converted to permanent control measures;

There are no temporary practices that will be converted to permanent control measures.

(k) Implementation schedule for staging temporary erosion and sediment control practices, including the timing of initial placement and duration that each practice should remain in place;

The erosion control narrative on drawing C-103 provides the implementation schedule for the staging temporary erosion and sediment control practices, describes the time when practices will

be placed and the duration that each practice is to remain in place. The work described in the narrative will occur in a single phase.

(l) Maintenance schedule to ensure continuous and effective operation of the erosion and sediment control practice;

The erosion control narrative on drawing C-103 provides the maintenance schedule for each erosion and sediment control practice.

(m) Name(s) of the receiving water(s);

All runoff from the subject property is conveyed to Otter Creek.

(n) Delineation of SWPPP implementation responsibilities for each part of the site;

Implementation of the SWPPP erosion control measures will be the responsibility of the property owner.

(o) Description of structural practices designed to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable; and

There are no structural practices being proposed to divert runoff flow around the construction area.

(p) Any existing data that describes the stormwater runoff at the site.

This stormwater management plan has been developed for the property that quantifies the existing and future condition site runoff. No other existing data is available which quantifies the flows from the property.

(2) Post-construction runoff controls for new development and redevelopment projects.

As noted above, all runoff from the subject property is conveyed directly into Otter Creek. The project will result in an increase of about 4,346 s.f., in the amount of impervious surfaces following the work (for purposes of this calculation, the deck is considered to be impervious).

Runoff from the impervious surfaces (house roof and driveway) will be collected via roof drain leaders and in a trench drain and directed into the chambers via underground storm drainage pipes. Two 6-inch diameter pop-up emitter from the chambers will attenuate the flows discharged from the chambers.

(a) All information in § 294-7 of this chapter;

See above for the description of the requirements of § 294-7.

(b) Description of each post-construction stormwater management practice (practices shall be as approved in Chapter 4 of the New York State DEC Stormwater Design Manual);

The post-construction stormwater management practice consists of the construction of subsurface detention system. The practice is to consist of eight (8) Cultec 330XLHD chambers, arranged as four rows of two chambers end-to-end. Cultec chambers are constructed of high density polyethylene. Each chamber is 8.5 feet in length by 52 inches in width and 30.5 inches in height. When installed, the stormwater management practice will be 17.5 feet in length by 20.83 feet in width.

(c) Site map/construction drawing(s) showing the specific location(s) and size(s) of each post-construction stormwater management practice;

The location of the subsurface infiltration chambers may be referenced on drawing C-102.

(d) Hydrologic and hydraulic analysis for all structural components of the stormwater management system for the applicable design storms;

The storm pipe table on sheet C-102 shows that for each segment of pipe to be installed the capacity will exceed the anticipated flows for the 25-year storm event.

(e) Comparison of post-development stormwater runoff conditions with pre-development conditions;

Appendix A provides the calculations which compare the pre-development conditions and the post-development conditions.

Table 1. Flows to Design Point

	Existing Condition	Future Condition
1-year storm	0.08	0.07
2-year storm	0.22	0.19
10-year storm	0.81	0.63
25-year storm	1.38	1.06
100-year storm	2.68	2.03

As can be seen in the calculations, the peak rates of runoff from the property to the Design Point will decrease over all of the modeled storm event. This will have the beneficial impact on runoff flows to the Beaver Swamp Brook.

The water quality volume calculation for the drainage area that conveys runoff to the stormwater management practice is calculated to be 425 cubic feet. The proposed 8 Cultec 330XLHD chambers will contain 794 cubic feet of runoff. Infiltration of runoff conveyed to the chambers will also occur. With an estimated very conservative soil percolation rate of 1.00 inches per hour, the volume of percolation is calculated to be 0.175 cubic feet per square foot per day. The bed area of the installed chambers will be 364.58 square feet. Therefore, the volume of percolation is calculated to be (364.58 square feet x 0.175 cubic feet per square foot per day) 63.8 cubic feet. Together, the chambers will capture and treat (794 c.f. + 63.8 c.f.) 857 cubic feet, in excess of the 425 cubic feet calculated for the water quality volume. The HydroCAD modeling also shows that there is no outflow from the chambers (except for exfiltration) during the 1-year storm event. This indicates that the runoff from the impervious surfaces will be fully treated by infiltration into the site's soils.

(f) Dimensions, material specifications and installation details for each post-construction stormwater management practice;

The proposed stormwater management practice to consist of subsurface chambers will be 17.5' in length x 20.83' in width, including the crushed stone installed around the perimeter of the chambers.

(g) Maintenance schedule to ensure continuous and effective operation of each post-construction stormwater management practice;

The maintenance schedule may be referenced on the drawings.

(h) Maintenance easements, if applicable, to ensure access to all stormwater management practices at the site for the purpose of inspection and repair. Easements shall be recorded on the plan and shall remain in effect with transfer of title to the property;

Maintenance easements are not required or proposed.

(i) Inspection and maintenance agreement binding on all subsequent landowners served by the on-site stormwater management practices in accordance with § 294-9 of this chapter;

Inspection and maintenance agreements would be made part of the approvals of the project.

(j) The SWPPP shall be prepared by a New York State licensed professional engineer, certified professional in erosion and sediment control (CPESC), or licensed landscape architect and must be signed by the professional preparing the plan, who shall certify that the design of all stormwater management practices meets the requirements in this chapter.

[Amended 9-22-2014 by L.L. No. 17-2014, effective 10-30-2014]

The SWPPP has been prepared by a professional engineer and landscape architect and certifies that the design of all stormwater management practices meets the requirements.

FIGURES

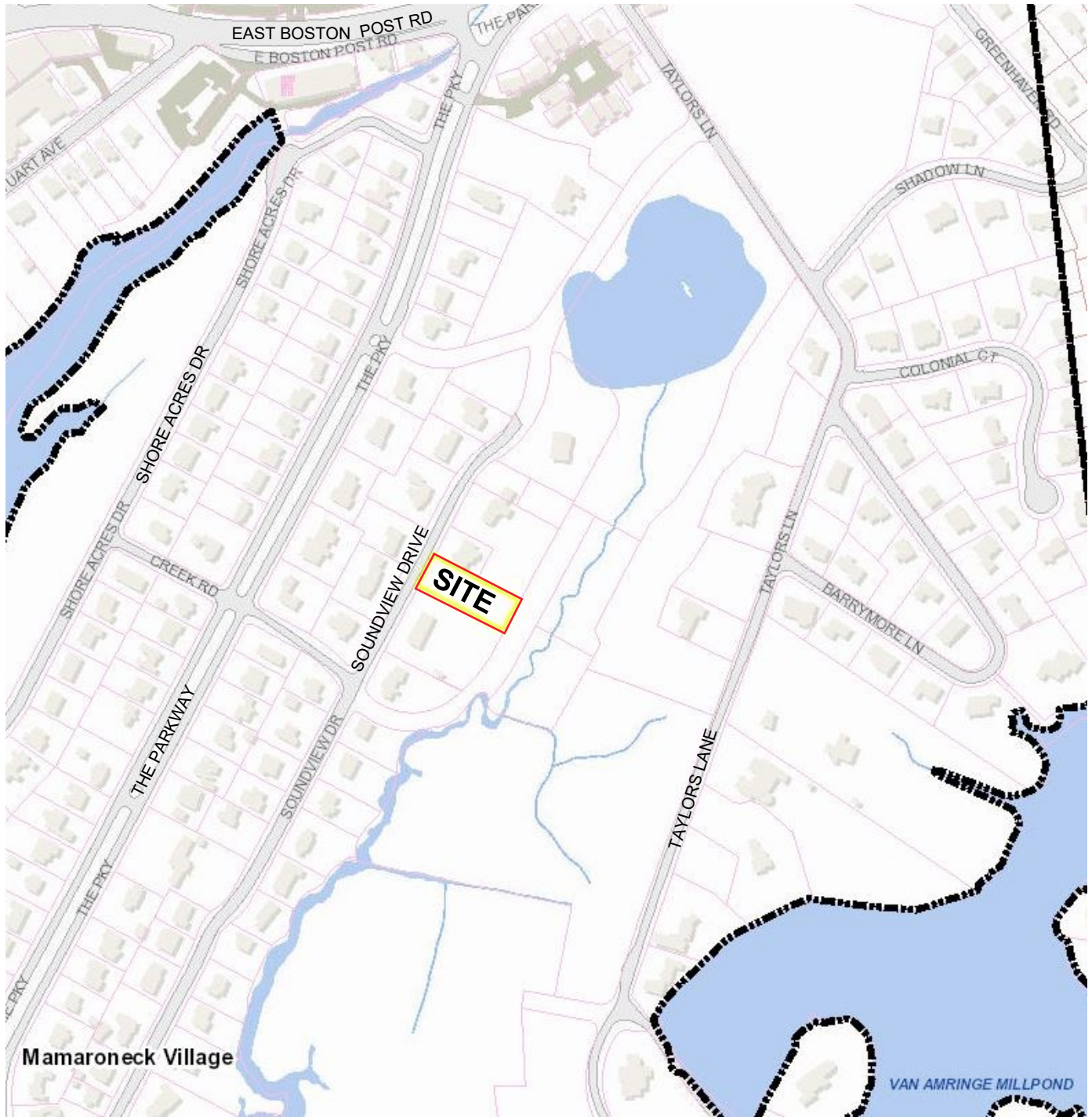
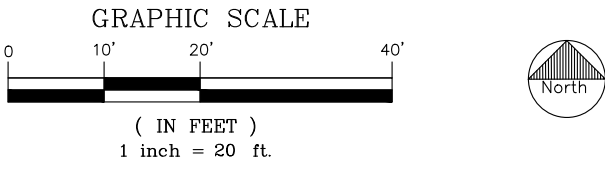
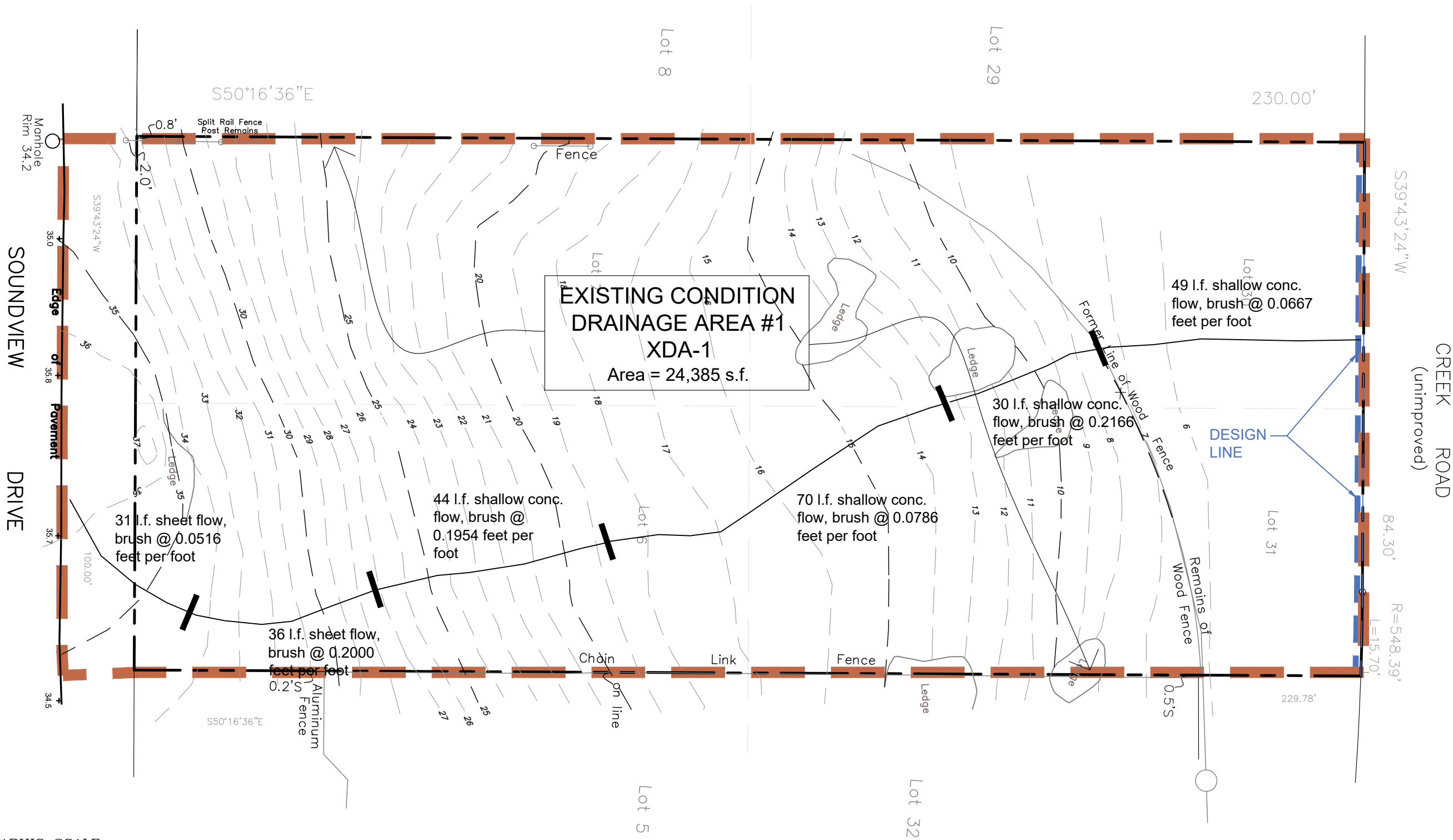


Figure 1
SITE LOCATION MAP
Scale: Not to Scale



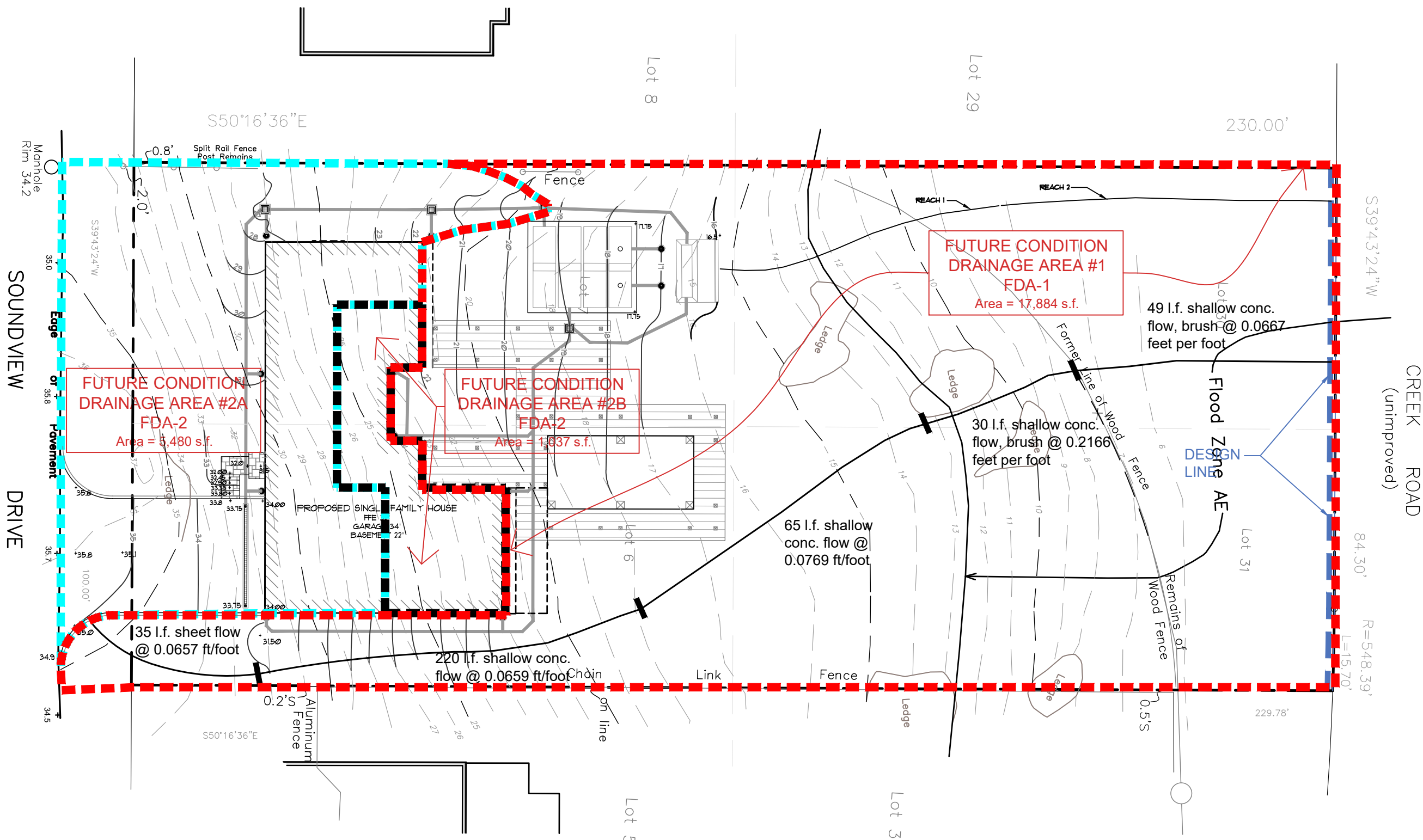
Date: December 29, 2021
Dwn. by: alp
ID:
921 Soundview_Site_12-24-2021

DRAWING TITLE:
Existing Conditions
Drainage Area Map

PROJECT NAME:
D'Arcangelo Property
921 Soundview Drive
Mamaroneck, New York 10543

ENGINEER:
ALP ENGINEERING
AND LANDSCAPE ARCHITECTURE, PLLC
P.O. Box 843
Ridgefield, Connecticut 06877
Tel. (475) 215-5343 Cell (203) 710-0587

Fig 3



SUPPORTING DOCUMENTATION

Table 1
921 Soundview Drive
Water Quality Volume Calculation

	Area (in sq feet)
<u>FDA-2A TO SW PRACTICE</u>	
Impervious surfaces	2,379
<u>Lawn, good, HSG B</u>	<u>3,101</u>
TOTAL	5,480

	Area (in sq feet)
<u>FDA-2B TO SW PRACTICE</u>	
<u>Impervious surfaces</u>	<u>1,037</u>
TOTAL	1,037

WQv Calculation

Rainfall Depth =	1.5 inches
Drainage Area =	6,517 s.f.
Impervious Area =	3,416 s.f.
% Impervious =	52.4 %
Rv =	0.52
WQv =	0.010 ac-feet
WQv =	425.0 cu feet

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	No
State	New York
Location	
Longitude	73.720 degrees West
Latitude	40.950 degrees North
Elevation	0 feet
Date/Time	Thu, 19 Aug 2021 12:12:57 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.34	0.52	0.63	0.85	1.05	1.26	1yr	0.90	1.23	1.48	1.92	2.38	2.86	3.22	1yr	2.53	3.09	3.58	4.31	4.94	1yr
2yr	0.40	0.62	0.77	1.04	1.28	1.53	2yr	1.11	1.50	1.75	2.26	2.81	3.45	3.87	2yr	3.05	3.72	4.27	5.08	5.75	2yr
5yr	0.47	0.73	0.91	1.25	1.59	1.89	5yr	1.37	1.85	2.16	2.80	3.49	4.32	4.89	5yr	3.82	4.70	5.45	6.39	7.13	5yr
10yr	0.54	0.83	1.03	1.44	1.86	2.22	10yr	1.61	2.17	2.54	3.29	4.12	5.12	5.84	10yr	4.53	5.62	6.56	7.60	8.39	10yr
25yr	0.65	0.99	1.23	1.76	2.31	2.75	25yr	2.00	2.68	3.14	4.08	5.13	6.41	7.40	25yr	5.68	7.11	8.37	9.57	10.40	25yr
50yr	0.74	1.13	1.41	2.03	2.73	3.23	50yr	2.35	3.15	3.70	4.81	6.06	7.61	8.84	50yr	6.73	8.50	10.08	11.39	12.25	50yr
100yr	0.86	1.30	1.62	2.35	3.22	3.80	100yr	2.78	3.71	4.35	5.69	7.17	9.03	10.58	100yr	7.99	10.17	12.14	13.57	14.42	100yr
200yr	0.99	1.49	1.88	2.72	3.80	4.47	200yr	3.28	4.37	5.11	6.72	8.48	10.73	12.65	200yr	9.49	12.17	14.63	16.16	16.99	200yr
500yr	1.20	1.78	2.29	3.33	4.74	5.56	500yr	4.09	5.43	6.35	8.40	10.59	13.48	16.04	500yr	11.93	15.43	18.73	20.38	21.10	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.41	0.50	0.68	0.83	0.89	1yr	0.72	0.87	1.32	1.56	1.94	2.57	2.88	1yr	2.28	2.77	3.25	3.87	4.53	1yr
2yr	0.39	0.61	0.75	1.01	1.25	1.50	2yr	1.08	1.47	1.71	2.19	2.75	3.35	3.76	2yr	2.97	3.61	4.14	4.92	5.60	2yr
5yr	0.44	0.68	0.84	1.15	1.46	1.77	5yr	1.26	1.73	2.01	2.60	3.26	4.02	4.54	5yr	3.56	4.37	5.05	5.93	6.68	5yr
10yr	0.48	0.74	0.92	1.29	1.66	2.00	10yr	1.43	1.96	2.27	2.96	3.70	4.62	5.22	10yr	4.09	5.02	5.87	6.75	7.61	10yr
25yr	0.54	0.82	1.01	1.45	1.91	2.36	25yr	1.65	2.30	2.67	3.47	4.38	5.53	6.28	25yr	4.89	6.03	7.18	8.01	9.05	25yr
50yr	0.58	0.88	1.09	1.57	2.12	2.66	50yr	1.83	2.60	3.03	3.93	4.97	6.34	7.22	50yr	5.61	6.94	8.38	9.06	10.32	50yr
100yr	0.63	0.95	1.19	1.72	2.36	2.99	100yr	2.03	2.92	3.44	4.46	5.66	7.26	8.29	100yr	6.43	7.97	9.77	10.27	11.77	100yr
200yr	0.69	1.03	1.31	1.90	2.64	3.38	200yr	2.28	3.30	3.92	5.06	6.46	8.34	9.54	200yr	7.38	9.17	11.42	11.63	13.45	200yr
500yr	0.77	1.15	1.48	2.15	3.05	3.99	500yr	2.63	3.90	4.66	6.05	8.25	10.00	11.49	500yr	8.85	11.05	14.05	13.67	16.04	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.37	0.57	0.70	0.94	1.16	1.38	1yr	1.00	1.35	1.61	2.13	2.62	3.13	3.51	1yr	2.77	3.38	3.84	4.65	5.27	1yr
2yr	0.43	0.66	0.81	1.10	1.35	1.60	2yr	1.17	1.57	1.83	2.37	2.94	3.56	4.02	2yr	3.15	3.87	4.41	5.30	5.95	2yr
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100yr	1.10	1.66	2.07	3.00	4.11	4.54	100yr	3.55	4.44	5.51	6.92	8.54	10.93	12.87	100yr	9.68	12.37	14.88	16.80	17.27	100yr
200yr	1.31	1.97	2.50	3.62	5.04	5.49	200yr	4.35	5.36	6.73	8.41	10.35	13.35	15.85	200yr	11.81	15.24	18.46	20.71	20.87	200yr
500yr	1.68	2.50	3.21	4.67	6.64	7.04	500yr	5.73	6.88	8.75	10.89	13.27	17.39	20.88	500yr	15.39	20.08	24.53	27.34	26.81	500yr



CULTEC Stormwater Design Calculator

Date: December 29, 2021

Project Information:

D'Arcangelo Property
921 Soundview Drive
Mamaroneck (V)
New York

Calculations Performed By:

Alan Pilch, PE, RLA
ALP Engineering & Land Arch
P.O. Box 845
Ridgefield CT
06877

(475) 215-5343
alan@eaec-inc.com

RECHARGER 330XLHD



Recharger 330XLHD Chamber Specifications

Height	30.5	inches
Width	52.0	inches
Length	8.50	feet
Installed Length	7.00	feet
Bare Chamber Volume	52.21	cu. feet
Installed Chamber Volume	79.26	cu. feet

Breakdown of Storage Provided by Recharger 330XLHD Stormwater System

Within Chambers	462.46	cu. feet
Within Feed Connectors	-	cu. feet
Within Stone	331.51	cu. feet
Total Storage Provided	794.0	cu. feet
Total Storage Required	600.00	cu. feet

Materials List

Recharger 330XLHD

Total Number of Chambers Required	8	pieces
Starter Chambers	4	pieces
Intermediate Chambers	0	pieces
End Chambers	4	pieces
HVLV FC-24 Feed Connectors	6	pieces
CULTEC No. 410 Non-Woven Geotextile	139	sq. yards
CULTEC No. 4800 Woven Geotextile	42	feet
Stone	31	cu. yards

Based on 2 Internal Manifolds

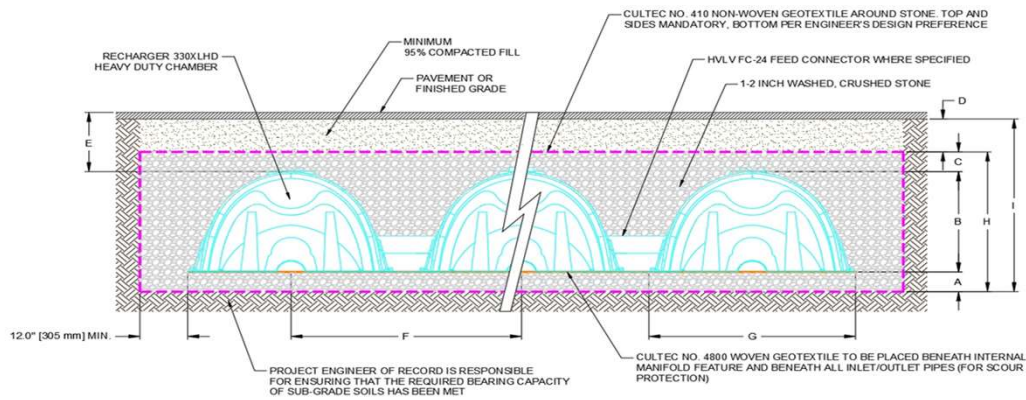
Bed Detail



Bed Layout Information

Number of Rows Wide	4	pieces
Number of Chambers Long	2	pieces
Chamber Row Width	18.83	feet
Chamber Row Length	15.50	feet
Bed Width	20.83	feet
Bed Length	17.50	feet
Bed Area Required	364.58	sq. feet
Length of Separator Row	N/A	feet

Bed detail for reference only. Not project specific. Not to scale.



Conceptual graphic only. Not job specific.

Cross Section Table Reference

A	Depth of Stone Base	6.0	inches
B	Chamber Height	30.5	inches
C	Depth of Stone Above Units	6.0	inches
D	Depth of 95% Compacted Fill	10.0	inches
E	Max. Depth Allowed Above the Chamber	12.00	feet
F	Chamber Width	52.0	inches
G	Center to Center Spacing	4.83	feet
H	Effective Depth	3.54	feet
I	Bed Depth	4.38	feet



CULTEC Stage-Storage Calculations

Date: December 30, 2021

Project Information:

D'Arcangelo Property
921 Soundview Drive
Mamaroneck (V)
New York 10543

Project Number:

0

Chamber Model -	Recharger 330XLHD	
Number of Rows -	4	units
Total Number of Chambers -	8	units
HVLV FC-24 Feed Connectors-	6	units
Stone Void -	40	%
Stone Base -	6	inches
Stone Above Units -	6	inches
Area -	364.58	ft2
Base of Stone Elevation -	13.71	

Recharger 330XLHD Incremental Storage Volumes

Height of System		Chamber Volume		HVLV Feed Connector Volume		Stone Volume		Cumulative Storage Volume		Total Cumulative Storage Volume		Elevation	
in	mm	ft ³	m ³	ft ³	m ³	ft ³	m ³	ft ³	m ³	ft ³	m ³	ft	m
42.5	1080	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	796.43	22.55	17.250	14.79
41.5	1054	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	784.28	22.21	17.170	14.76
40.5	1029	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	772.12	21.86	17.090	14.74
39.5	1003	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	759.97	21.52	17.000	14.71
38.5	978	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	747.82	21.18	16.920	14.69
37.5	953	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	735.66	20.83	16.840	14.66
36.5	927	0.0	0.0	0.0	0.0	6.1	0.2	6.080	0.2	723.51	20.49	16.750	14.64
36.0	914	1.2	0.0	0.0	0.0	11.7	0.3	12.860	0.4	717.43	20.32	16.710	14.62
35.0	889	3.2	0.1	0.0	0.0	10.9	0.3	14.050	0.4	704.57	19.95	16.630	14.60
34.0	864	5.2	0.1	0.0	0.0	10.1	0.3	15.278	0.4	690.52	19.55	16.540	14.57
33.0	838	7.7	0.2	0.0	0.0	9.1	0.3	16.766	0.5	675.24	19.12	16.460	14.55
32.0	813	9.3	0.3	0.0	0.0	8.4	0.2	17.733	0.5	658.48	18.65	16.380	14.52
31.0	787	10.7	0.3	0.0	0.0	7.9	0.2	18.588	0.5	640.75	18.14	16.290	14.50
30.0	762	11.8	0.3	0.0	0.0	7.4	0.2	19.258	0.5	622.16	17.62	16.210	14.47
29.0	737	12.8	0.4	0.0	0.0	7.0	0.2	19.853	0.6	602.90	17.07	16.130	14.45
28.0	711	13.7	0.4	0.0	0.0	6.7	0.2	20.374	0.6	583.05	16.51	16.040	14.42
27.0	686	14.4	0.4	0.0	0.0	6.4	0.2	20.820	0.6	562.67	15.93	15.960	14.40
26.0	660	15.1	0.4	0.0	0.0	6.1	0.2	21.230	0.6	541.85	15.34	15.880	14.37
25.0	635	15.7	0.4	0.0	0.0	5.9	0.2	21.602	0.6	520.62	14.74	15.790	14.35
24.0	610	16.4	0.5	0.0	0.0	5.6	0.2	21.974	0.6	499.02	14.13	15.710	14.32
23.0	584	16.8	0.5	0.0	0.0	5.4	0.2	22.234	0.6	477.05	13.51	15.630	14.29
22.0	559	17.5	0.5	0.0	0.0	5.1	0.1	22.680	0.6	454.81	12.88	15.540	14.27
21.0	533	18.2	0.5	0.0	0.0	4.9	0.1	23.090	0.7	432.13	12.24	15.460	14.24
20.0	508	18.4	0.5	0.0	0.0	4.8	0.1	23.164	0.7	409.04	11.58	15.380	14.22
19.0	483	18.5	0.5	0.0	0.0	4.7	0.1	23.276	0.7	385.88	10.93	15.290	14.19
18.0	457	18.7	0.5	0.3	0.0	4.7	0.1	23.680	0.7	362.60	10.27	15.210	14.17
17.0	432	18.8	0.5	0.3	0.0	4.6	0.1	23.694	0.7	338.92	9.60	15.130	14.14
16.0	406	18.8	0.5	0.3	0.0	4.6	0.1	23.720	0.7	315.23	8.93	15.040	14.12
15.0	381	19.0	0.5	0.3	0.0	4.6	0.1	23.791	0.7	291.51	8.25	14.960	14.09
14.0	356	19.4	0.5	0.2	0.0	4.4	0.1	24.045	0.7	267.72	7.58	14.880	14.07
13.0	330	19.9	0.6	0.2	0.0	4.2	0.1	24.331	0.7	243.67	6.90	14.790	14.04
12.0	305	20.0	0.6	0.2	0.0	4.2	0.1	24.353	0.7	219.34	6.21	14.710	14.01
11.0	279	20.0	0.6	0.2	0.0	4.1	0.1	24.381	0.7	194.99	5.52	14.630	13.99
10.0	254	20.1	0.6	0.2	0.0	4.1	0.1	24.392	0.7	170.61	4.83	14.540	13.96
9.0	229	20.2	0.6	0.1	0.0	4.1	0.1	24.381	0.7	146.22	4.14	14.460	13.94
8.0	203	20.3	0.6	0.1	0.0	4.0	0.1	24.377	0.7	121.84	3.45	14.380	13.91
7.0	178	20.6	0.6	0.0	0.0	3.9	0.1	24.542	0.7	97.46	2.76	14.290	13.89
6.0	152	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	72.92	2.06	14.210	13.86
5.0	127	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	60.76	1.72	14.130	13.84
4.0	102	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	48.61	1.38	14.040	13.81
3.0	76	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	36.46	1.03	13.960	13.79
2.0	51	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	24.31	0.69	13.880	13.76
1.0	25	0.0	0.0	0.0	0.0	12.2	0.3	12.153	0.3	12.15	0.34	13.790	13.74
0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.00	0.00	13.710	13.71
-1.0													
-2.0													
-3.0													
-4.0													
-5.0													

Top of Stone Elevation

Top of Chamber Elevation

Bottom of Chamber Elevation

Bottom of Stone Elevation

Recharger 330XLHD Incremental Storage Volumes													
Height of System		Chamber Volume		HVLV Feed Connector Volume		Stone Volume		Cumulative Storage Volume		Total Cumulative Storage Volume		Elevation	
in	mm	ft³	m³	ft3	m3	ft³	m³	ft³	m³	ft³	m³	ft	m
5.0													
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57.0													
58.0													
59.0													
0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.00	0.00	0.000	13.71
0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.00	0.00	0.000	13.71
0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.000	0.0	0.00	0.00	0.000	13.71
0.0	0	0											

00000000000000000000000000000000

Westchester County, New York

Ip—Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2tyqj

Elevation: 0 to 10 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 250 days

Farmland classification: Not prime farmland

Map Unit Composition

Ipswich and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ipswich

Setting

Landform: Tidal marshes

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Partially- decomposed herbaceous organic material

Typical profile

Oe - 0 to 42 inches: mucky peat

Oa - 42 to 59 inches: muck

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water

(Ksat): Moderately low to very high (0.14 to 99.90 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: Very frequent

Frequency of ponding: None

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)

Sodium adsorption ratio, maximum: 20.0

Available water supply, 0 to 60 inches: Very high (about 26.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded, R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded
Hydric soil rating: Yes

Minor Components

Pawcatuck

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded, R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded
Hydric soil rating: Yes

Westbrook

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded, R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Westchester County, New York
Survey Area Data: Version 16, Jun 11, 2020

Westchester County, New York

UIC—Urban land-Charlton-Chatfield complex, rolling, very rocky

Map Unit Setting

National map unit symbol: bd7n

Elevation: 0 to 1,000 feet

Mean annual precipitation: 46 to 50 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 115 to 215 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 40 percent

Charlton and similar soils: 20 percent

Chatfield and similar soils: 15 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Hills, ridges, till plains

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Acid loamy till derived mainly from schist, gneiss, or granite

Typical profile

H1 - 0 to 8 inches: loam

H2 - 8 to 24 inches: sandy loam

H3 - 24 to 60 inches: sandy loam

Properties and qualities

Slope: 2 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.57 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Hydrologic Soil Group: B

Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Chatfield

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from granite, gneiss, or schist

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: flaggy silt loam
H3 - 24 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Sutton

Percent of map unit: 5 percent
Hydric soil rating: No

Leicester

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Udorthents

Percent of map unit: 5 percent
Hydric soil rating: No

Hollis

Percent of map unit: 2 percent

Hydric soil rating: No

Sun

Percent of map unit: 2 percent

Landform: Depressions

Hydric soil rating: Yes

Palms

Percent of map unit: 1 percent

Landform: Swamps, marshes

Hydric soil rating: Yes

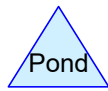
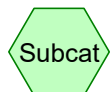
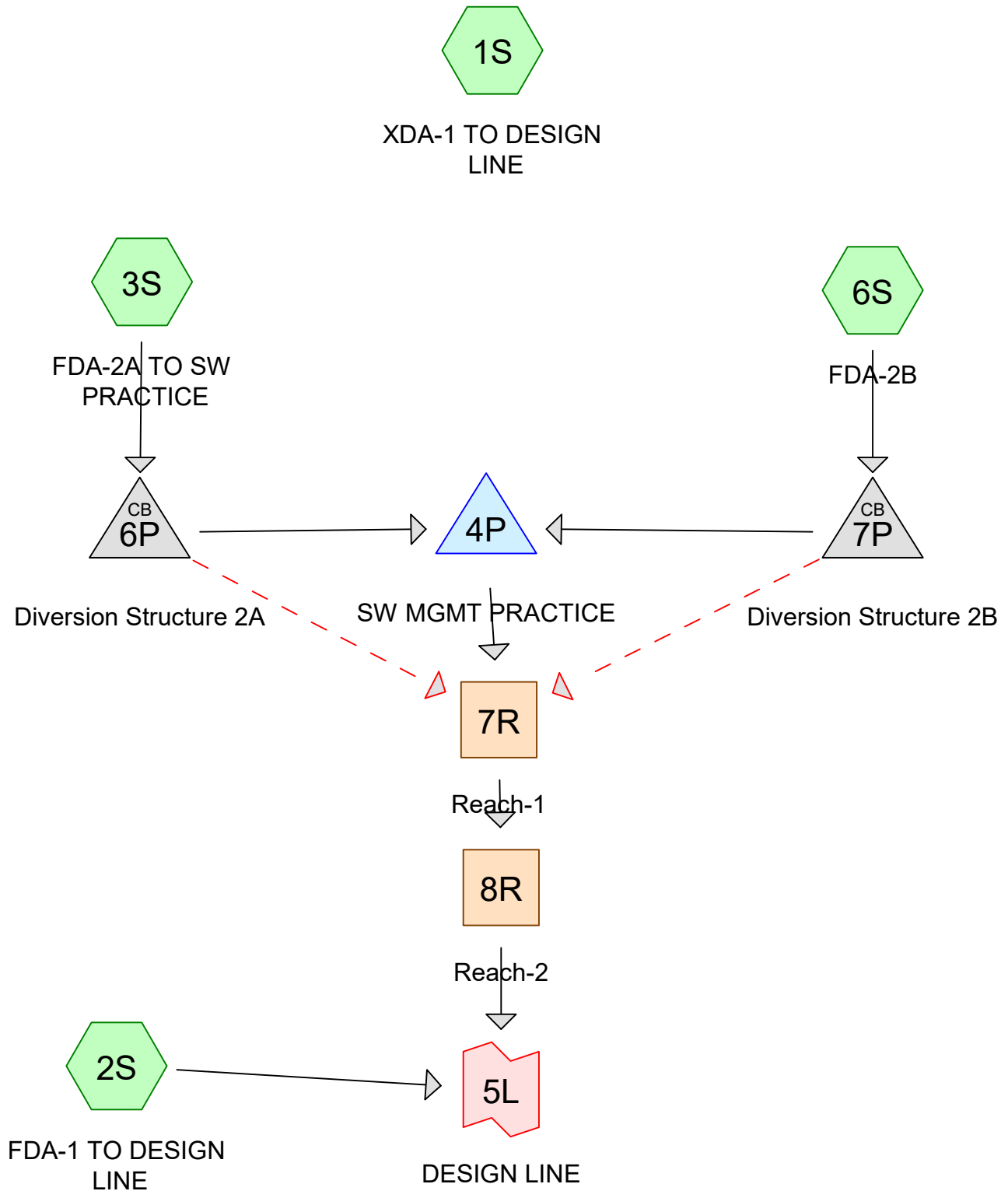
Data Source Information

Soil Survey Area: Westchester County, New York

Survey Area Data: Version 16, Jun 11, 2020

Appendix A

***Stormwater Management Report
Hydrographs and Routings***



Routing Diagram for 921 Soundview SW Mgmt_12-28-2021.2

Prepared by ALP Engineering & Land. Arch. PLLC

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921 Soundview SW Mgmt_12-28-2021.2

Prepared by ALP Engineering & Land. Arch. PLLC

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-year	Type III 24-hr		Default	24.00	1	2.86	2
2	2-year	Type III 24-hr		Default	24.00	1	3.45	2
3	10-year	Type III 24-hr		Default	24.00	1	5.12	2
4	25-year	Type III 24-hr		Default	24.00	1	6.41	2
5	100-year	Type III 24-hr		Default	24.00	1	9.03	2

921 Soundview SW Mgmt_12-28-2021.2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.191	61	>75% Grass cover, Good, HSG B (2S, 3S)
0.445	56	Brush, Fair, HSG B (1S)
0.138	48	Brush, Good, HSG B (2S)
0.231	73	Brush, Good, HSG D (1S, 2S)
0.029	61	Deck (use lawn for under deck), HSG B (2S)
0.055	98	Impervious surfaces, HSG B (3S)
0.009	98	Pool, HSG B (2S)
0.024	98	Roofs, HSG B (6S)
1.120	63	TOTAL AREA

921 Soundview SW Mgmt_12-28-2021.2

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.191	0.000	0.000	0.000	0.191	>75% Grass cover, Good	2S
							,
							3S
0.000	0.445	0.000	0.000	0.000	0.445	Brush, Fair	1S
0.000	0.138	0.000	0.231	0.000	0.368	Brush, Good	1S
							,
							2S
0.000	0.029	0.000	0.000	0.000	0.029	Deck (use lawn for under deck)	2S
0.000	0.055	0.000	0.000	0.000	0.055	Impervious surfaces	3S
0.000	0.009	0.000	0.000	0.000	0.009	Pool	2S
0.000	0.024	0.000	0.000	0.000	0.024	Roofs	6S
0.000	0.890	0.000	0.231	0.000	1.120	TOTAL AREA	

921 Soundview SW Mgmt_12-28-2021.2

Type III 24-hr 1-year Rainfall=2.86"

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Time span=0.00-48.00 hrs, dt=0.02 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: XDA-1 TO DESIGN LINE Runoff Area=24,402 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=260' Tc=6.0 min CN=60 Runoff=0.08 cfs 0.013 af

Subcatchment 2S: FDA-1 TO DESIGN LINE Runoff Area=17,884 sf 2.19% Impervious Runoff Depth=0.31"
Flow Length=399' Tc=6.0 min CN=61 Runoff=0.07 cfs 0.011 af

Subcatchment 3S: FDA-2A TO SW Runoff Area=5,480 sf 43.41% Impervious Runoff Depth=0.98"
Tc=6.0 min CN=77 Runoff=0.14 cfs 0.010 af

Subcatchment 6S: FDA-2B Runoff Area=1,037 sf 100.00% Impervious Runoff Depth=2.63"
Tc=6.0 min CN=98 Runoff=0.07 cfs 0.005 af

Reach 7R: Reach-1 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.400 L=55.0' S=0.1273 '/' Capacity=0.43 cfs Outflow=0.00 cfs 0.000 af

Reach 8R: Reach-2 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.400 L=64.0' S=0.0391 '/' Capacity=0.24 cfs Outflow=0.00 cfs 0.000 af

Pond 4P: SW MGMT PRACTICE Peak Elev=15.02' Storage=337 cf Inflow=0.20 cfs 0.015 af
Discarded=0.01 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.015 af

Pond 6P: Diversion Structure 2A Peak Elev=17.56' Inflow=0.14 cfs 0.010 af
Primary=0.14 cfs 0.010 af Secondary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.010 af

Pond 7P: Diversion Structure 2B Peak Elev=17.92' Inflow=0.07 cfs 0.005 af
Primary=0.07 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.005 af

Link 5L: DESIGN LINE Inflow=0.07 cfs 0.011 af
Primary=0.07 cfs 0.011 af

Total Runoff Area = 1.120 ac Runoff Volume = 0.039 af Average Runoff Depth = 0.42"
92.20% Pervious = 1.033 ac 7.80% Impervious = 0.087 ac

Summary for Subcatchment 1S: XDA-1 TO DESIGN LINE

Runoff = 0.08 cfs @ 12.16 hrs, Volume= 0.013 af, Depth= 0.28"

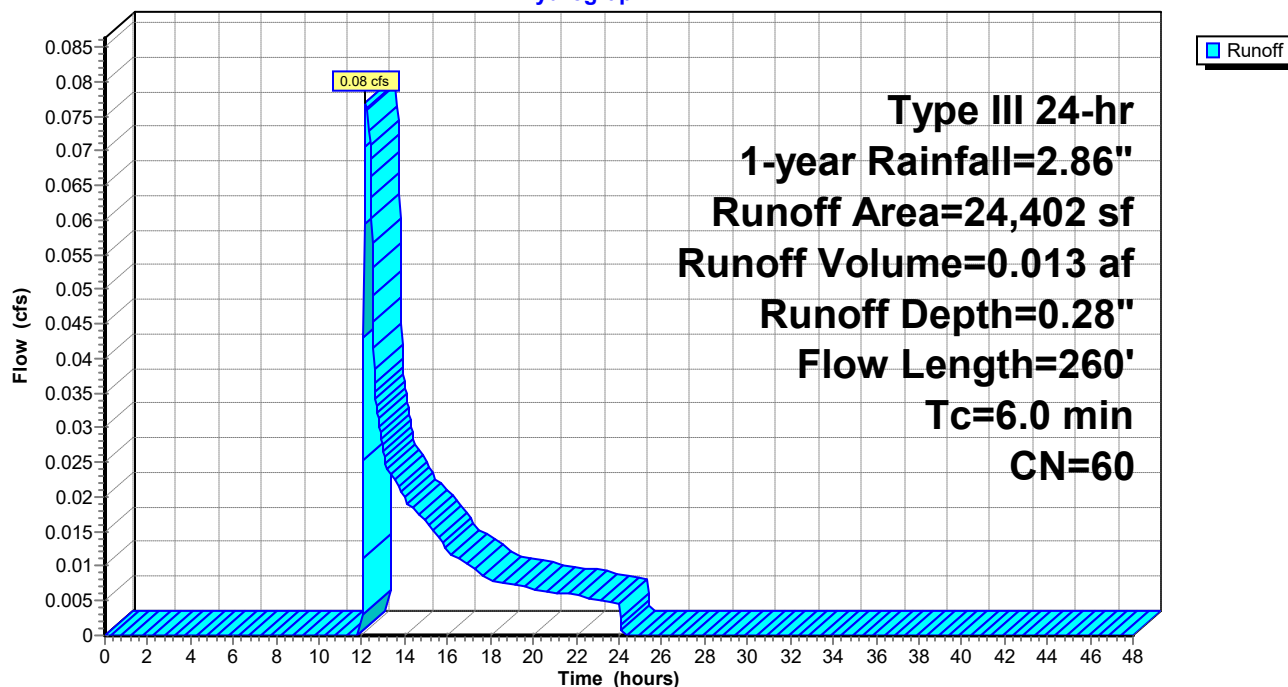
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Type III 24-hr 1-year Rainfall=2.86"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
19,374	56	Brush, Fair, HSG B
24,402	60	Weighted Average
24,402		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	31	0.0516	0.14		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
0.2	36	0.2000	3.13		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
0.2	44	0.1954	3.09		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0786	1.96		Shallow Concentrated Flow, D-E
					Short Grass Pasture Kv= 7.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.9					Direct Entry, Tc Factor
6.0	260	Total			

Subcatchment 1S: XDA-1 TO DESIGN LINE

Hydrograph



Summary for Subcatchment 2S: FDA-1 TO DESIGN LINE

Runoff = 0.07 cfs @ 12.14 hrs, Volume= 0.011 af, Depth= 0.31"
 Routed to Link 5L : DESIGN LINE

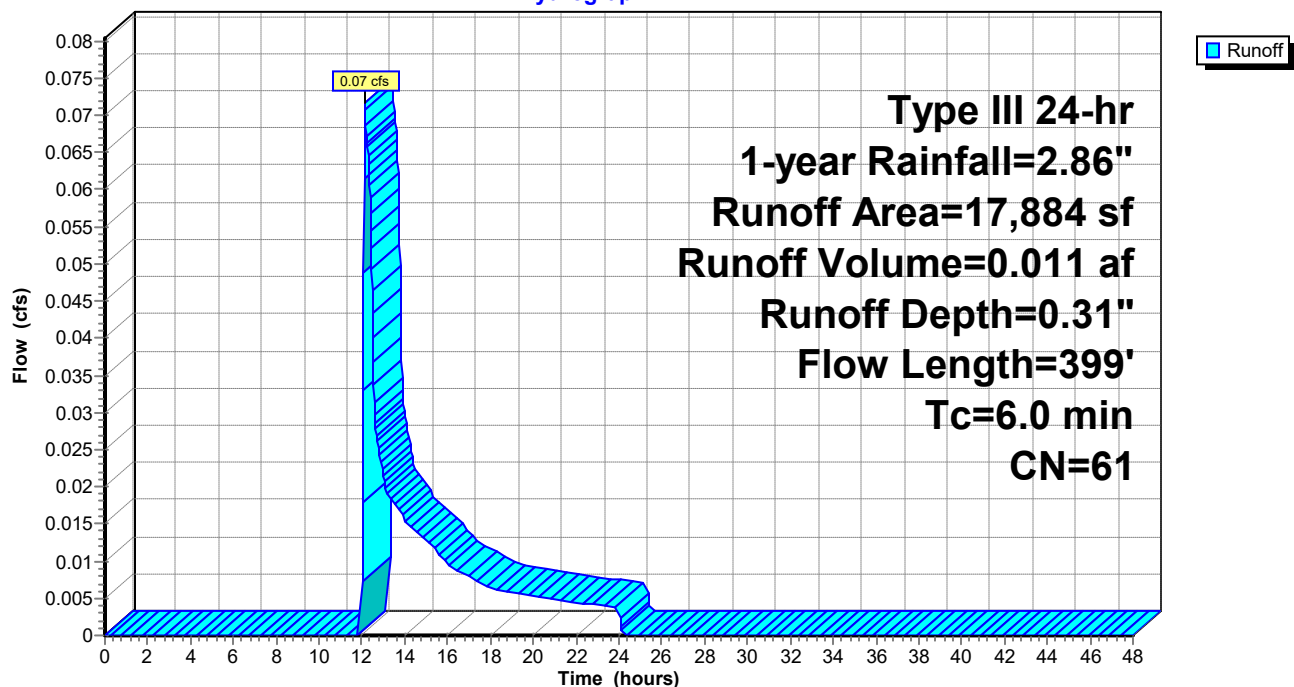
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 1-year Rainfall=2.86"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
5,993	48	Brush, Good, HSG B
5,229	61	>75% Grass cover, Good, HSG B
* 1,242	61	Deck (use lawn for under deck), HSG B
* 392	98	Pool, HSG B
17,884	61	Weighted Average
17,492		97.81% Pervious Area
392		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	35	0.0657	0.16		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
1.0	220	0.0659	3.85		Shallow Concentrated Flow, B-C
					Grassed Waterway Kv= 15.0 fps
0.3	65	0.0769	4.16		Shallow Concentrated Flow, C-D
					Grassed Waterway Kv= 15.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.6					Direct Entry, Tc Factor
6.0	399	Total			

Subcatchment 2S: FDA-1 TO DESIGN LINE

Hydrograph



Summary for Subcatchment 3S: FDA-2A TO SW PRACTICE

Runoff = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af, Depth= 0.98"
 Routed to Pond 6P : Diversion Structure 2A

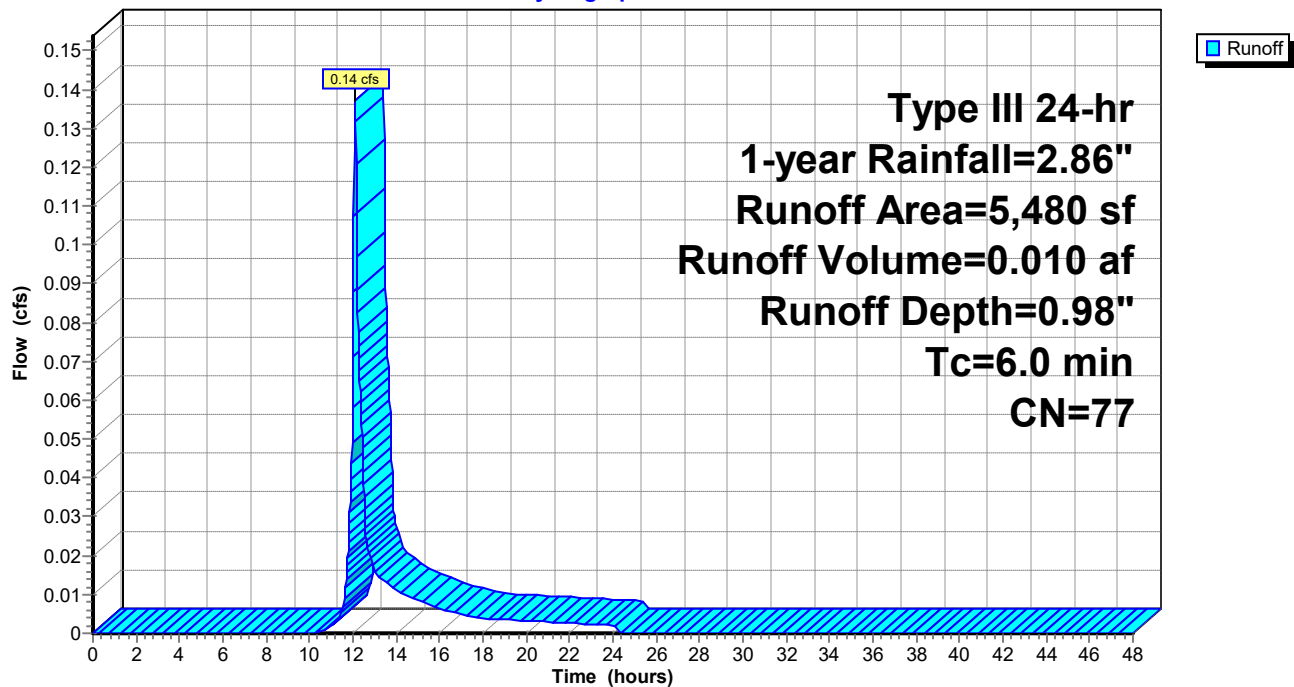
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 1-year Rainfall=2.86"

	Area (sf)	CN	Description
*	2,379	98	Impervious surfaces, HSG B
	3,101	61	>75% Grass cover, Good, HSG B
	5,480	77	Weighted Average
	3,101		56.59% Pervious Area
	2,379		43.41% Impervious Area

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

Subcatchment 3S: FDA-2A TO SW PRACTICE

Hydrograph



Summary for Subcatchment 6S: FDA-2B

Runoff = 0.07 cfs @ 12.08 hrs, Volume= 0.005 af, Depth= 2.63"
 Routed to Pond 7P : Diversion Structure 2B

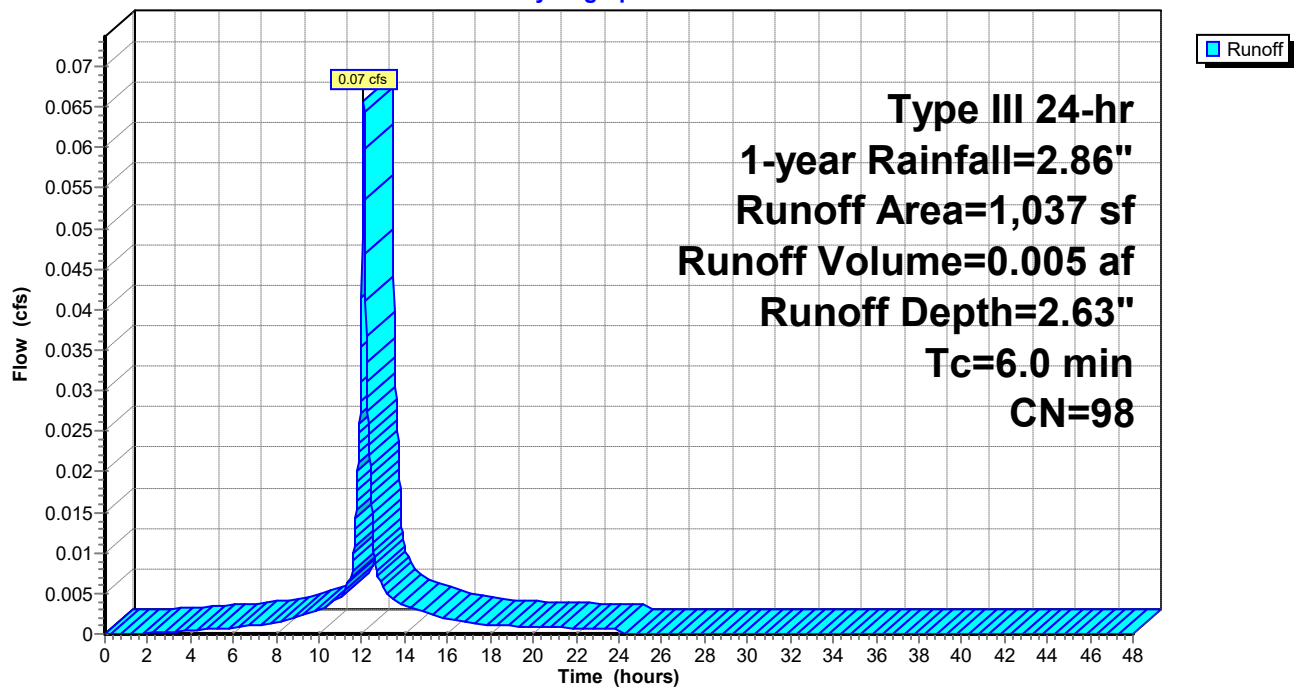
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 1-year Rainfall=2.86"

Area (sf)	CN	Description
1,037	98	Roofs, HSG B
1,037		100.00% Impervious Area

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

Subcatchment 6S: FDA-2B

Hydrograph



Summary for Reach 7R: Reach-1

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 0.00" for 1-year 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
 Routed to Reach 8R : Reach-2

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 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'

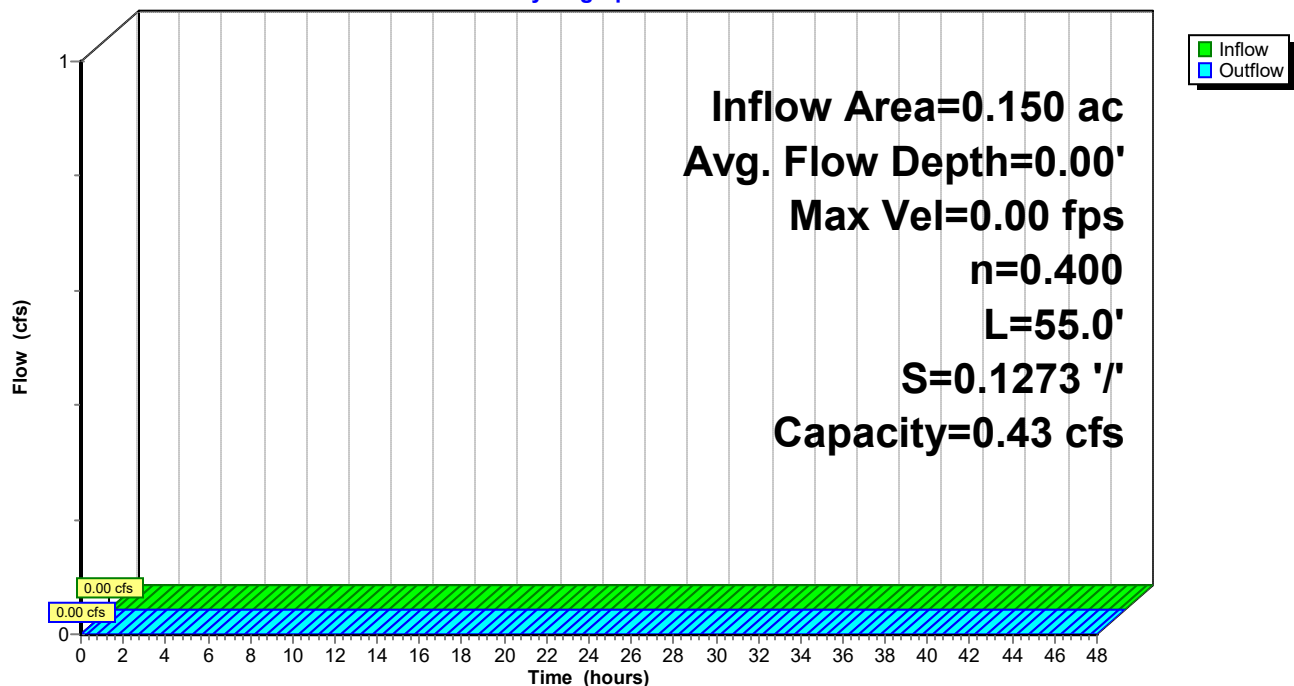
Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.43 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 3.0 '/' Top Width= 15.60'

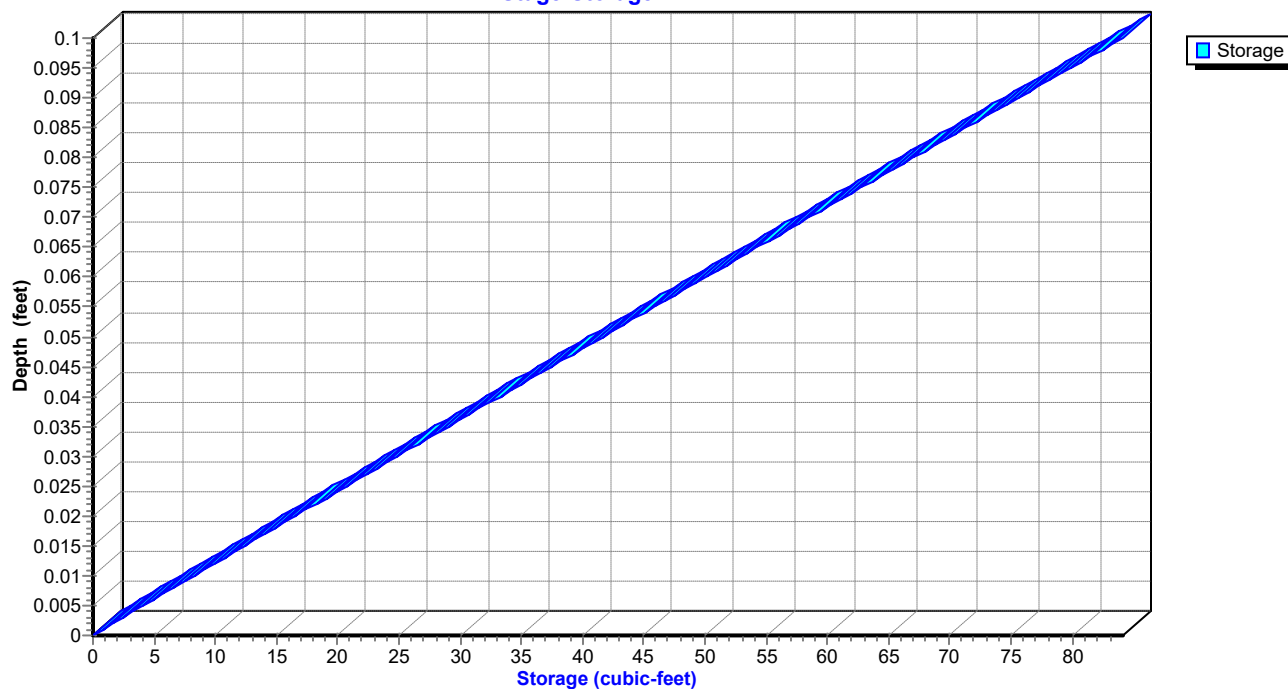
Length= 55.0' Slope= 0.1273 '/'

Inlet Invert= 15.00', Outlet Invert= 8.00'

**Reach 7R: Reach-1****Hydrograph**

Reach 7R: Reach-1

Stage-Storage



Summary for Reach 8R: Reach-2

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 0.00" for 1-year 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
 Routed to Link 5L : DESIGN LINE

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 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'

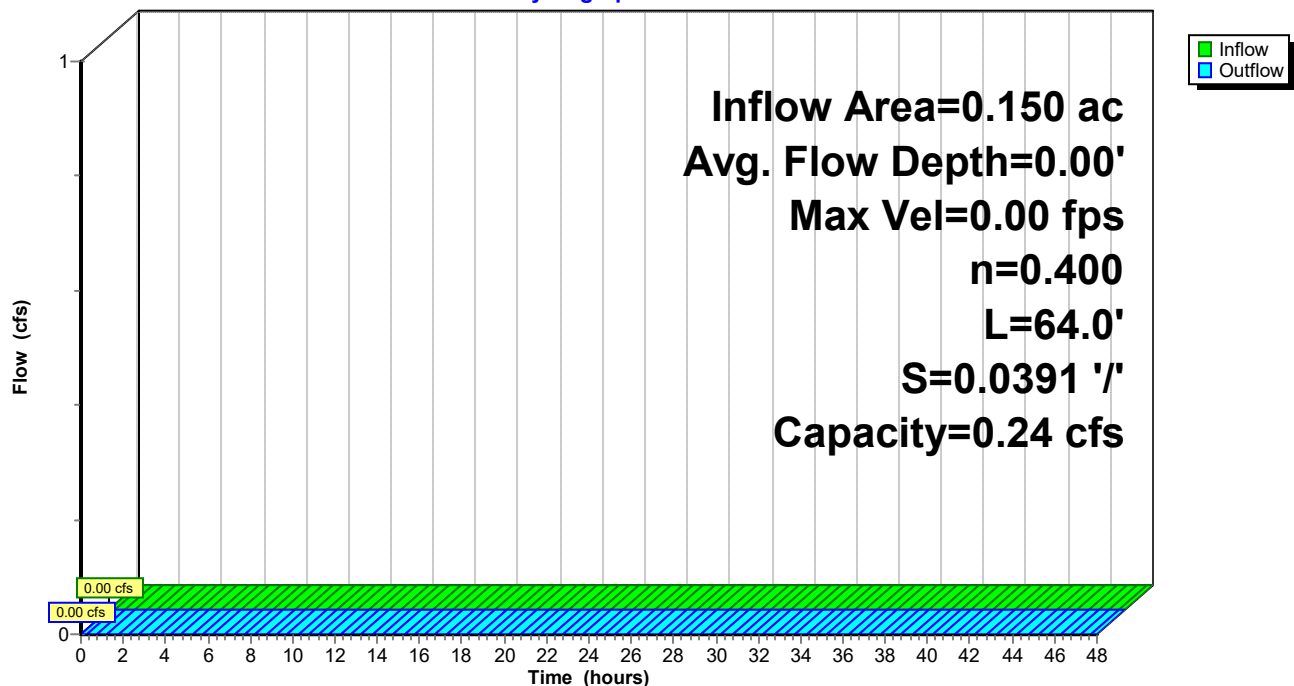
Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.24 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 3.0 '/' Top Width= 15.60'

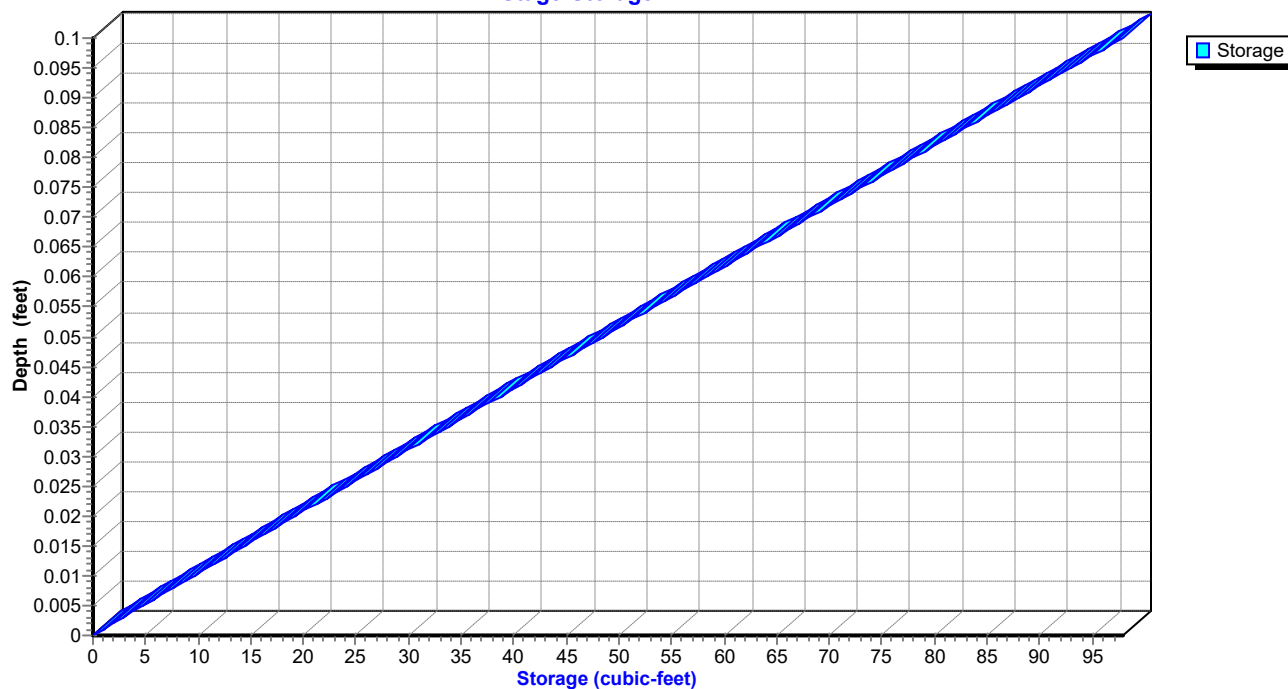
Length= 64.0' Slope= 0.0391 '/'

Inlet Invert= 8.00', Outlet Invert= 5.50'

**Reach 8R: Reach-2****Hydrograph**

Reach 8R: Reach-2

Stage-Storage



Summary for Pond 4P: SW MGMT PRACTICE

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 1.24" for 1-year event
 Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.015 af
 Outflow = 0.01 cfs @ 12.16 hrs, Volume= 0.015 af, Atten= 95%, Lag= 4.1 min
 Discarded = 0.01 cfs @ 12.16 hrs, Volume= 0.015 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Peak Elev= 15.02' @ 15.48 hrs Surf.Area= 421 sf Storage= 337 cf

Plug-Flow detention time= 349.6 min calculated for 0.015 af (100% of inflow)
 Center-of-Mass det. time= 349.6 min (1,174.7 - 825.1)

Volume	Invert	Avail.Storage	Storage Description
#1B	13.71'	332 cf	20.83'W x 17.50'L x 3.54'H Field A 1,291 cf Overall - 462 cf Embedded = 829 cf x 40.0% Voids
#2B	14.21'	462 cf	Cultec R-330XLHD x 8 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
#3	14.50'	156 cf	6.00'D x 2.75'H Vertical Cone/Cylinder x 2
		949 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.00'	6.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Discarded	13.71'	1.000 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.01 cfs @ 12.16 hrs HW=14.51' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=13.71' (Free Discharge)
 ↑ **1=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: SW MGMT PRACTICE - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Stone Base + 30.5" Chamber Height + 6.0" Stone Cover = 3.54' Field Height

8 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 462.0 cf Chamber Storage

1,291.2 cf Field - 462.0 cf Chambers = 829.3 cf Stone x 40.0% Voids = 331.7 cf Stone Storage

Chamber Storage + Stone Storage = 793.7 cf = 0.018 af

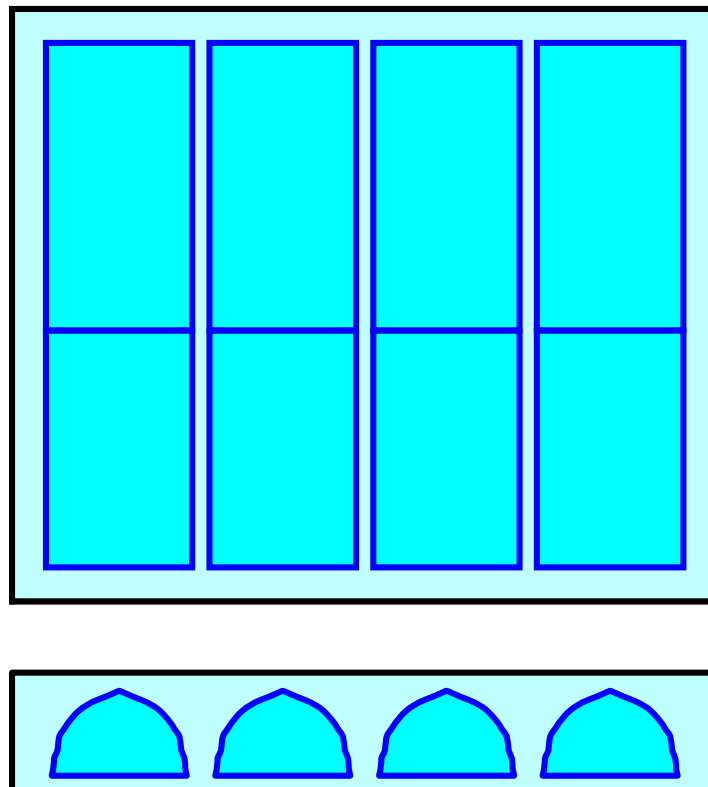
Overall Storage Efficiency = 61.5%

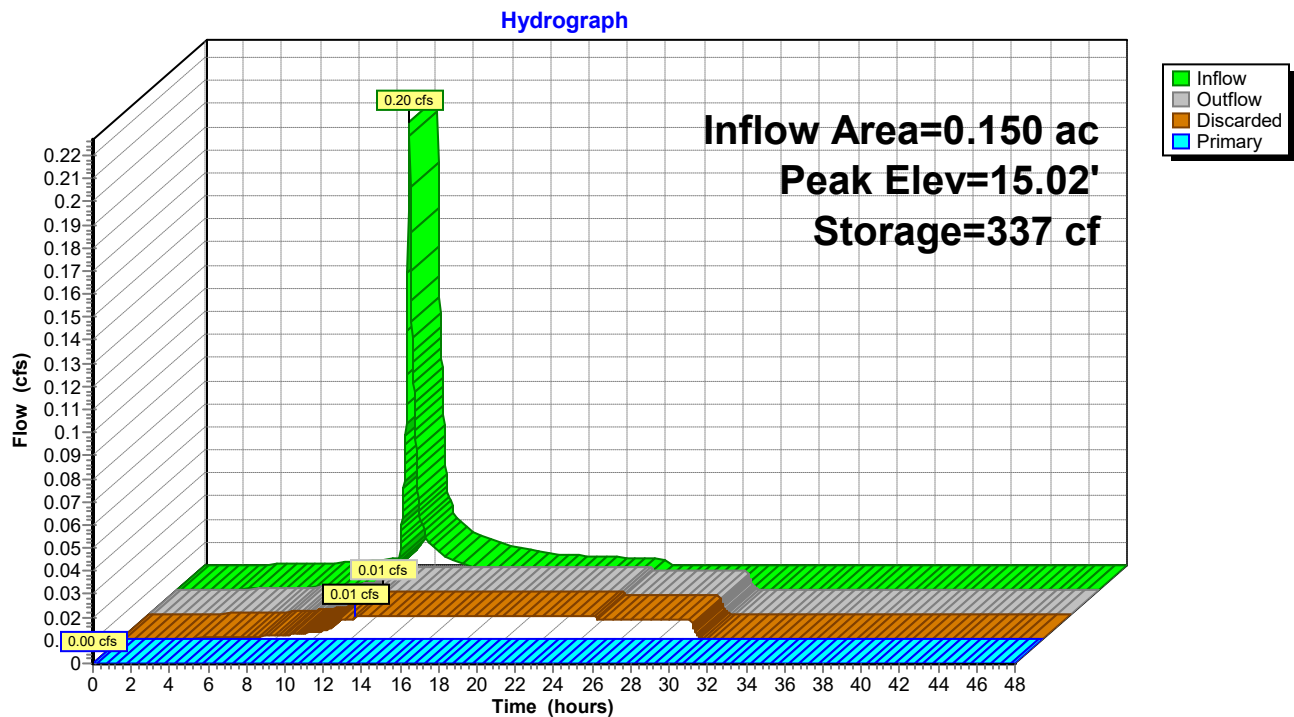
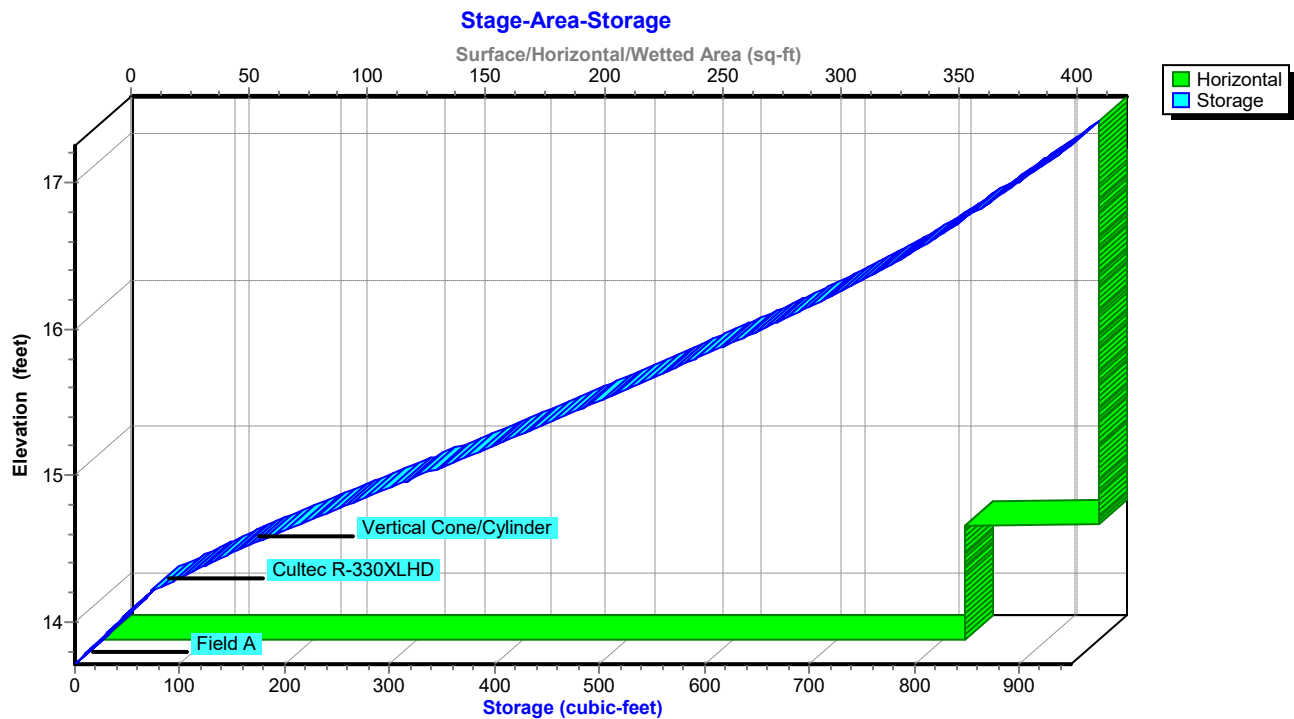
Overall System Size = 17.50' x 20.83' x 3.54'

8 Chambers

47.8 cy Field

30.7 cy Stone



Pond 4P: SW MGMT PRACTICE**Pond 4P: SW MGMT PRACTICE**

Summary for Pond 6P: Diversion Structure 2A

[57] Hint: Peaked at 17.56' (Flood elevation advised)

Inflow Area = 0.126 ac, 43.41% Impervious, Inflow Depth = 0.98" for 1-year event
 Inflow = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af
 Outflow = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 17.56' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.33'	8.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.33' / 15.92' S= 0.4029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	17.58'	8.0" Round Culvert to Flow Spreader L= 30.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.58' / 15.08' S= 0.0820 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

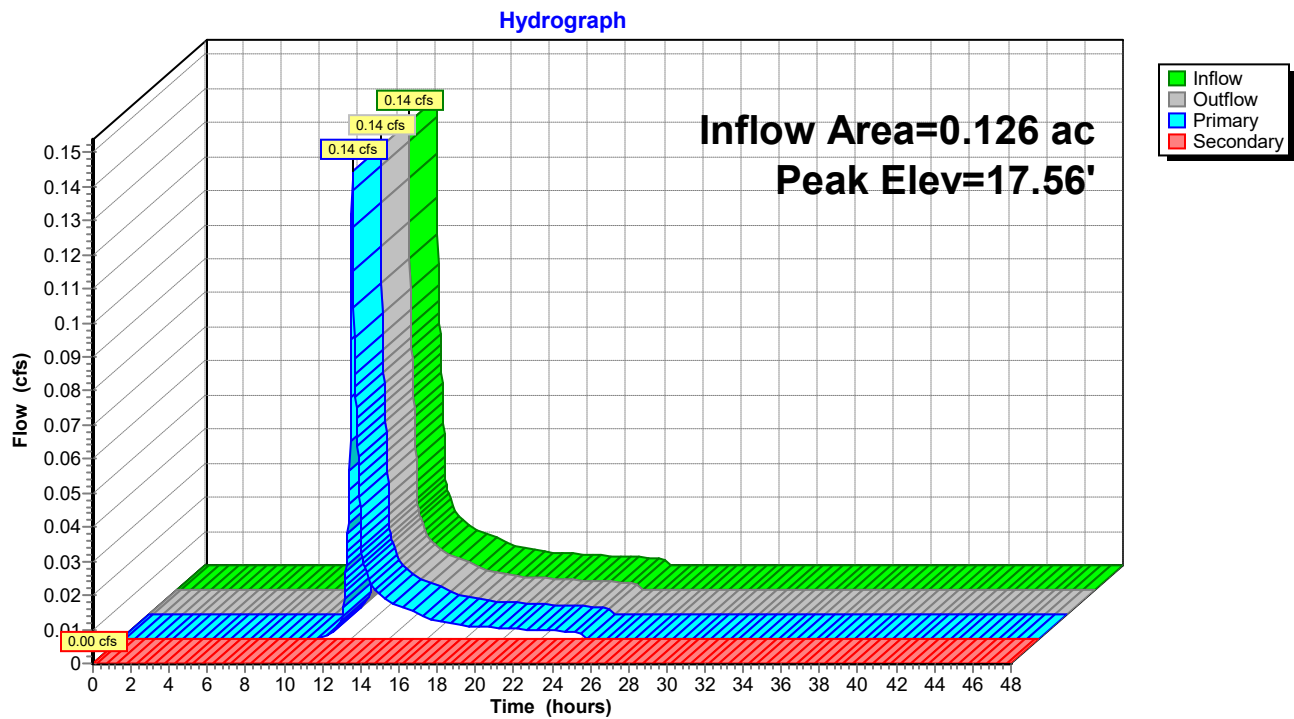
Primary OutFlow Max=0.14 cfs @ 12.10 hrs HW=17.56' (Free Discharge)

↑1=Culvert to SW Mgmt Facility (Inlet Controls 0.14 cfs @ 1.29 fps)

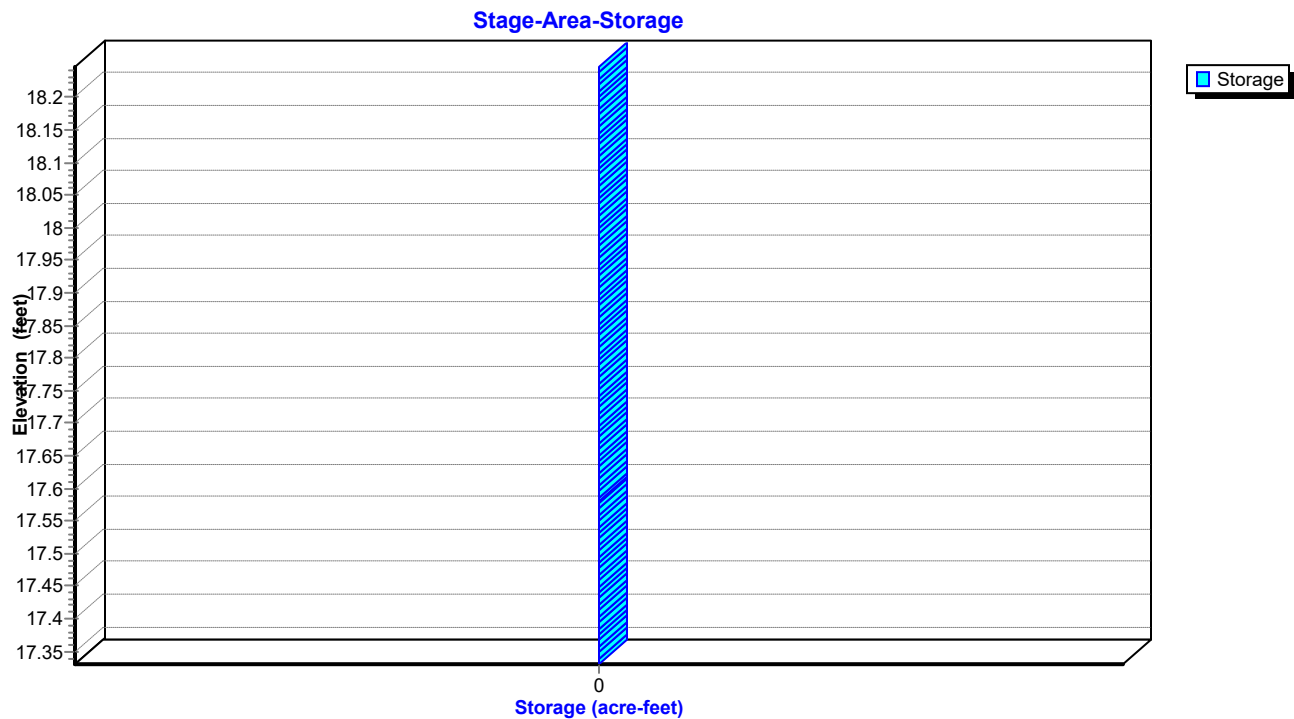
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.33' (Free Discharge)

↑2=Culvert to Flow Spreader (Controls 0.00 cfs)

Pond 6P: Diversion Structure 2A



Pond 6P: Diversion Structure 2A



Summary for Pond 7P: Diversion Structure 2B

[57] Hint: Peaked at 17.92' (Flood elevation advised)

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 2.63" for 1-year event
 Inflow = 0.07 cfs @ 12.08 hrs, Volume= 0.005 af
 Outflow = 0.07 cfs @ 12.08 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.07 cfs @ 12.08 hrs, Volume= 0.005 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 17.92' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.75'	6.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.75' / 16.25' S= 0.4286 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	18.00'	6.0" Round Culvert to Flow Spreader L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.00' / 15.25' S= 0.1019 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

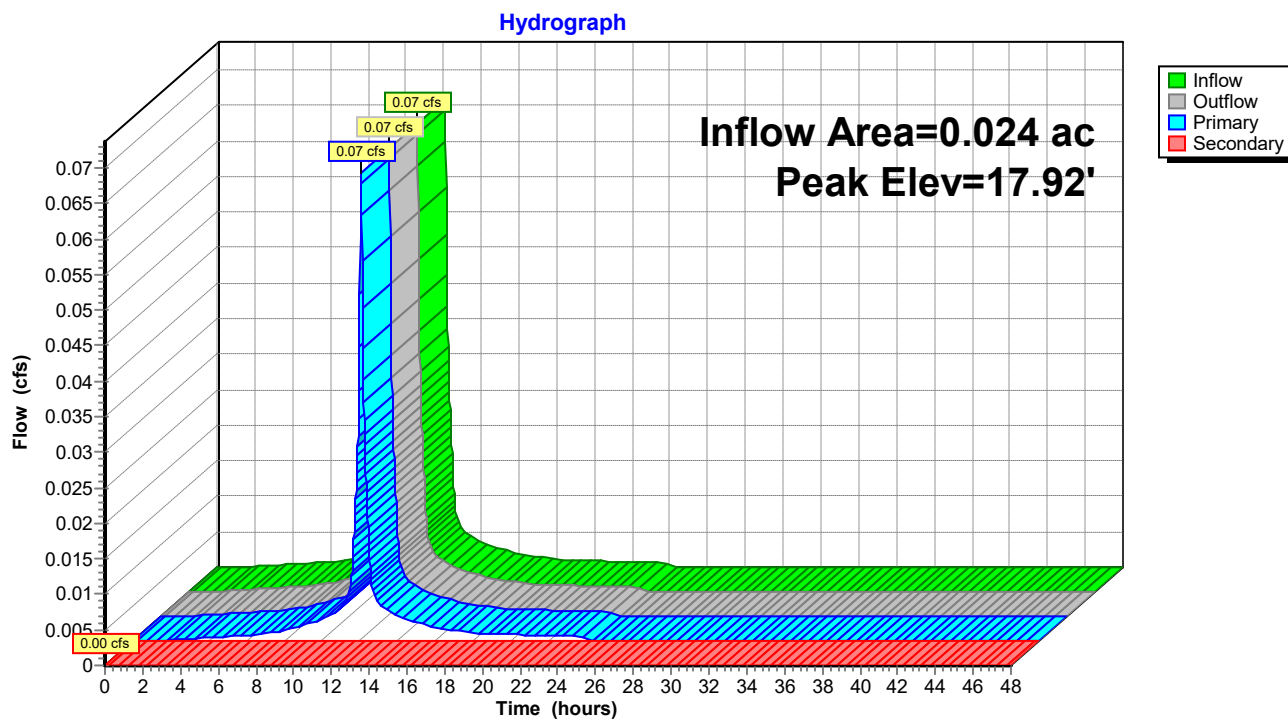
Primary OutFlow Max=0.07 cfs @ 12.08 hrs HW=17.92' (Free Discharge)

↑1=Culvert to SW Mgmt Facility (Inlet Controls 0.07 cfs @ 1.11 fps)

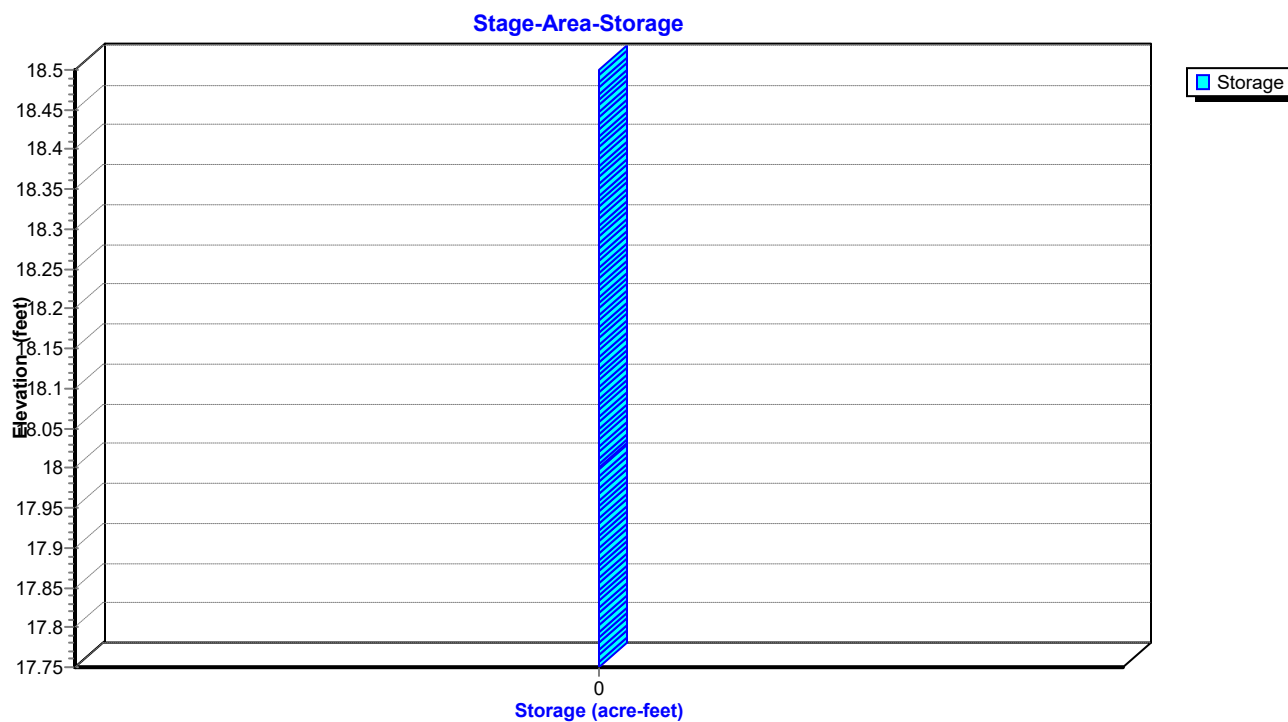
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.75' (Free Discharge)

↑2=Culvert to Flow Spreader (Controls 0.00 cfs)

Pond 7P: Diversion Structure 2B



Pond 7P: Diversion Structure 2B



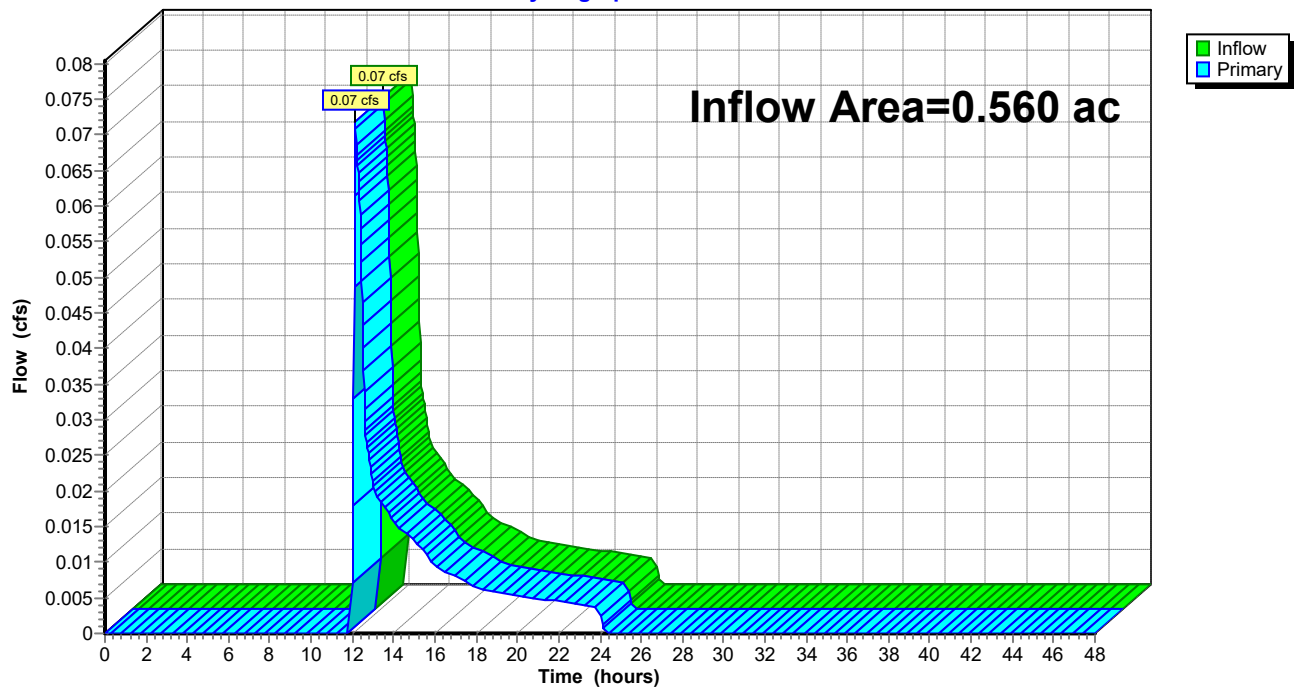
Summary for Link 5L: DESIGN LINE

Inflow Area = 0.560 ac, 15.61% Impervious, Inflow Depth = 0.23" for 1-year event
Inflow = 0.07 cfs @ 12.14 hrs, Volume= 0.011 af
Primary = 0.07 cfs @ 12.14 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Link 5L: DESIGN LINE

Hydrograph



921 Soundview SW Mgmt_12-28-2021.2

Type III 24-hr 2-year Rainfall=3.45"

Prepared by ALP Engineering & Land. Arch. PLLC

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Time span=0.00-48.00 hrs, dt=0.02 hrs, 2401 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: XDA-1 TO DESIGN LINE Runoff Area=24,402 sf 0.00% Impervious Runoff Depth=0.51"
Flow Length=260' Tc=6.0 min CN=60 Runoff=0.22 cfs 0.024 af

Subcatchment 2S: FDA-1 TO DESIGN LINE Runoff Area=17,884 sf 2.19% Impervious Runoff Depth=0.55"
Flow Length=399' Tc=6.0 min CN=61 Runoff=0.19 cfs 0.019 af

Subcatchment 3S: FDA-2A TO SW Runoff Area=5,480 sf 43.41% Impervious Runoff Depth=1.39"
Tc=6.0 min CN=77 Runoff=0.20 cfs 0.015 af

Subcatchment 6S: FDA-2B Runoff Area=1,037 sf 100.00% Impervious Runoff Depth=3.22"
Tc=6.0 min CN=98 Runoff=0.08 cfs 0.006 af

Reach 7R: Reach-1 Avg. Flow Depth=0.00' Max Vel=0.01 fps Inflow=0.00 cfs 0.000 af
n=0.400 L=55.0' S=0.1273 '/' Capacity=0.43 cfs Outflow=0.00 cfs 0.000 af

Reach 8R: Reach-2 Avg. Flow Depth=0.00' Max Vel=0.01 fps Inflow=0.00 cfs 0.000 af
n=0.400 L=64.0' S=0.0391 '/' Capacity=0.24 cfs Outflow=0.00 cfs 0.000 af

Pond 4P: SW MGMT PRACTICE Peak Elev=15.57' Storage=519 cf Inflow=0.28 cfs 0.021 af
Discarded=0.01 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.021 af

Pond 6P: Diversion Structure 2A Peak Elev=17.61' Inflow=0.20 cfs 0.015 af
Primary=0.20 cfs 0.015 af Secondary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.015 af

Pond 7P: Diversion Structure 2B Peak Elev=17.94' Inflow=0.08 cfs 0.006 af
Primary=0.08 cfs 0.006 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.006 af

Link 5L: DESIGN LINE Inflow=0.19 cfs 0.019 af
Primary=0.19 cfs 0.019 af

Total Runoff Area = 1.120 ac Runoff Volume = 0.064 af Average Runoff Depth = 0.68"
92.20% Pervious = 1.033 ac 7.80% Impervious = 0.087 ac

Summary for Subcatchment 1S: XDA-1 TO DESIGN LINE

Runoff = 0.22 cfs @ 12.12 hrs, Volume= 0.024 af, Depth= 0.51"

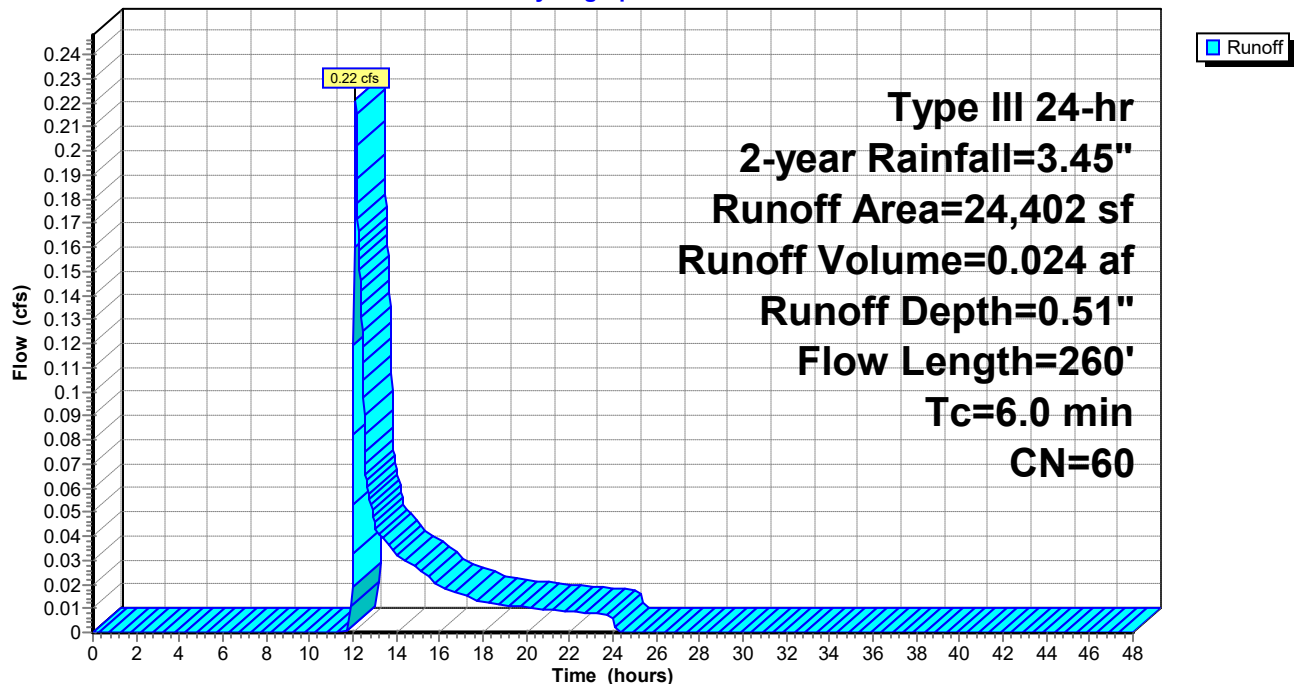
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-year Rainfall=3.45"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
19,374	56	Brush, Fair, HSG B
24,402	60	Weighted Average
24,402		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	31	0.0516	0.14		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
0.2	36	0.2000	3.13		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
0.2	44	0.1954	3.09		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0786	1.96		Shallow Concentrated Flow, D-E
					Short Grass Pasture Kv= 7.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.9					Direct Entry, Tc Factor
6.0	260	Total			

Subcatchment 1S: XDA-1 TO DESIGN LINE

Hydrograph



Summary for Subcatchment 2S: FDA-1 TO DESIGN LINE

Runoff = 0.19 cfs @ 12.12 hrs, Volume= 0.019 af, Depth= 0.55"
 Routed to Link 5L : DESIGN LINE

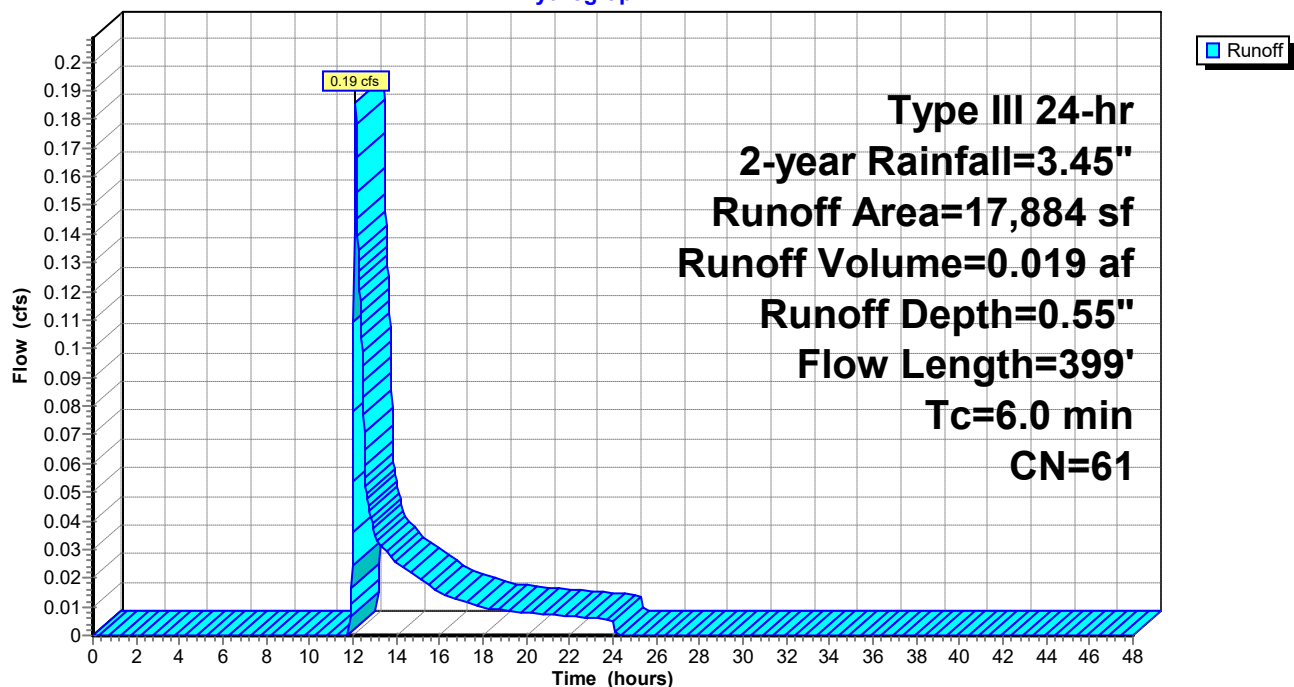
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 2-year Rainfall=3.45"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
5,993	48	Brush, Good, HSG B
5,229	61	>75% Grass cover, Good, HSG B
* 1,242	61	Deck (use lawn for under deck), HSG B
* 392	98	Pool, HSG B
17,884	61	Weighted Average
17,492		97.81% Pervious Area
392		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	35	0.0657	0.16		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
1.0	220	0.0659	3.85		Shallow Concentrated Flow, B-C
					Grassed Waterway Kv= 15.0 fps
0.3	65	0.0769	4.16		Shallow Concentrated Flow, C-D
					Grassed Waterway Kv= 15.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.6					Direct Entry, Tc Factor
6.0	399	Total			

Subcatchment 2S: FDA-1 TO DESIGN LINE

Hydrograph



Summary for Subcatchment 3S: FDA-2A TO SW PRACTICE

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 1.39"
 Routed to Pond 6P : Diversion Structure 2A

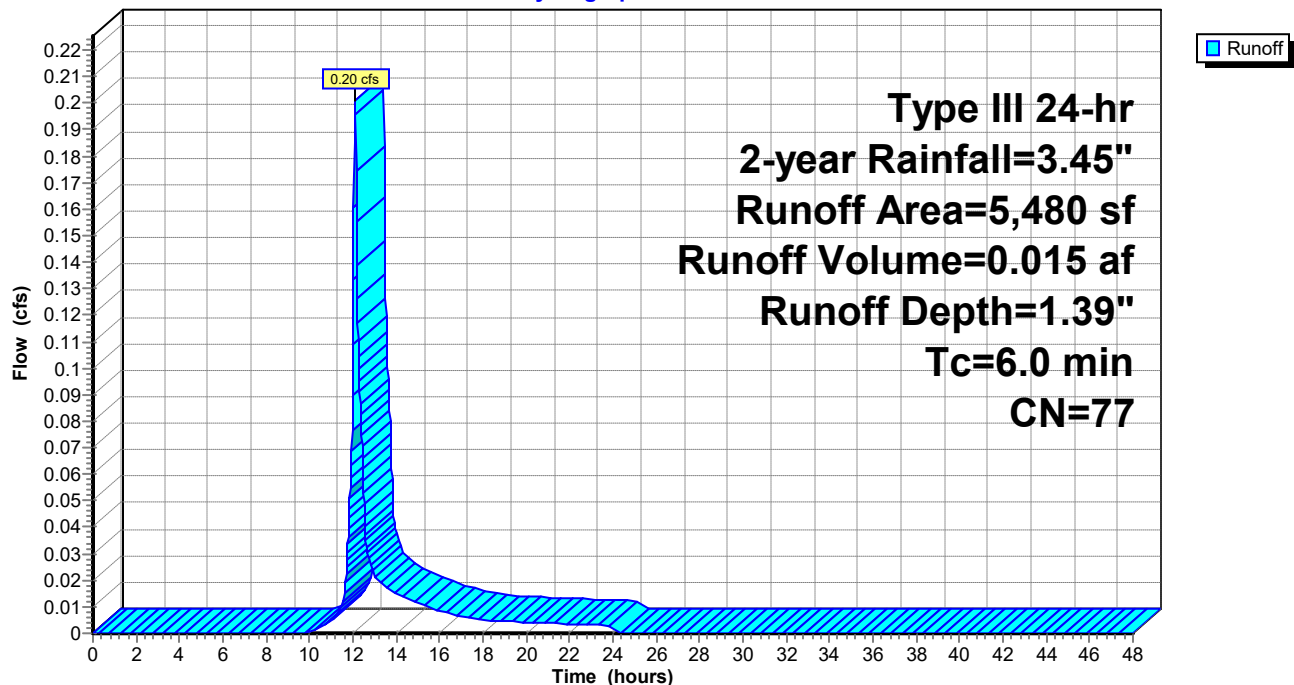
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 2-year Rainfall=3.45"

	Area (sf)	CN	Description
*	2,379	98	Impervious surfaces, HSG B
	3,101	61	>75% Grass cover, Good, HSG B
	5,480	77	Weighted Average
	3,101		56.59% Pervious Area
	2,379		43.41% Impervious Area

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

Subcatchment 3S: FDA-2A TO SW PRACTICE

Hydrograph



Summary for Subcatchment 6S: FDA-2B

Runoff = 0.08 cfs @ 12.08 hrs, Volume= 0.006 af, Depth= 3.22"
 Routed to Pond 7P : Diversion Structure 2B

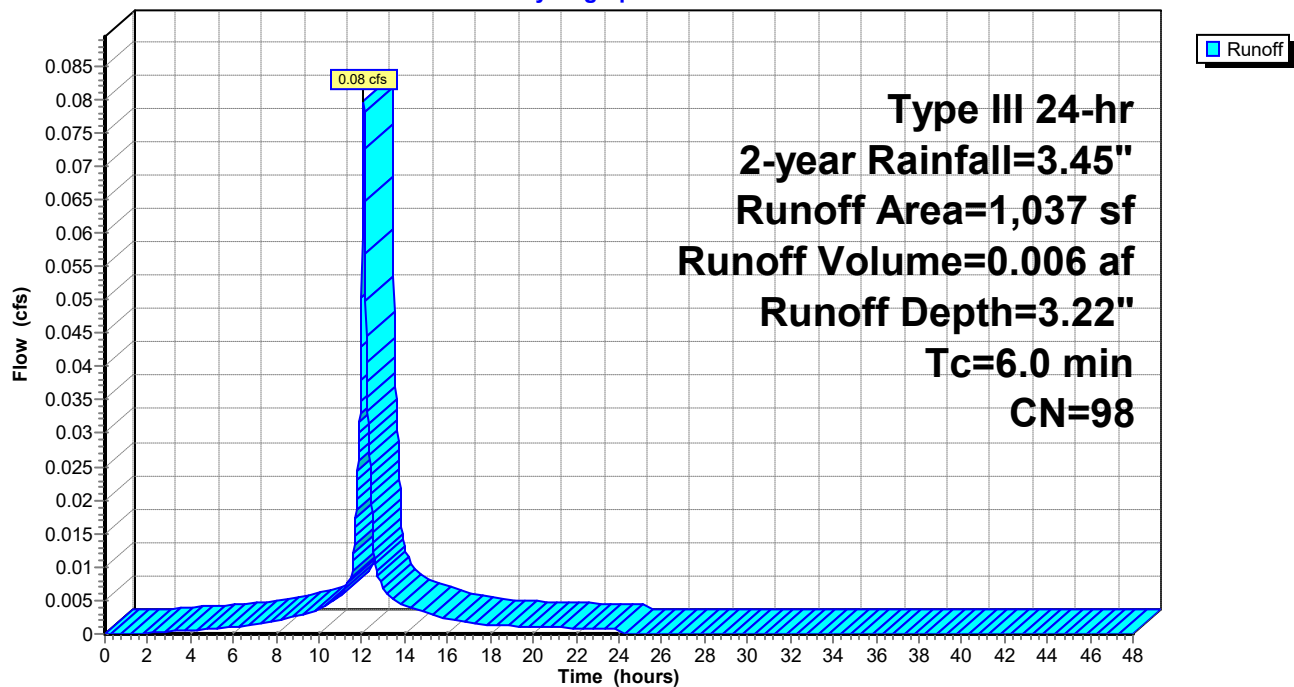
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 2-year Rainfall=3.45"

Area (sf)	CN	Description
1,037	98	Roofs, HSG B
1,037		100.00% Impervious Area

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

Subcatchment 6S: FDA-2B

Hydrograph



Summary for Reach 7R: Reach-1

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.00 cfs @ 12.09 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 13.31 hrs, Volume= 0.000 af, Atten= 95%, Lag= 73.0 min
 Routed to Reach 8R : Reach-2

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Max. Velocity= 0.01 fps, Min. Travel Time= 69.2 min

Avg. Velocity= 0.01 fps, Avg. Travel Time= 69.2 min

Peak Storage= 1 cf @ 12.16 hrs

Average Depth at Peak Storage= 0.00', Surface Width= 15.00'

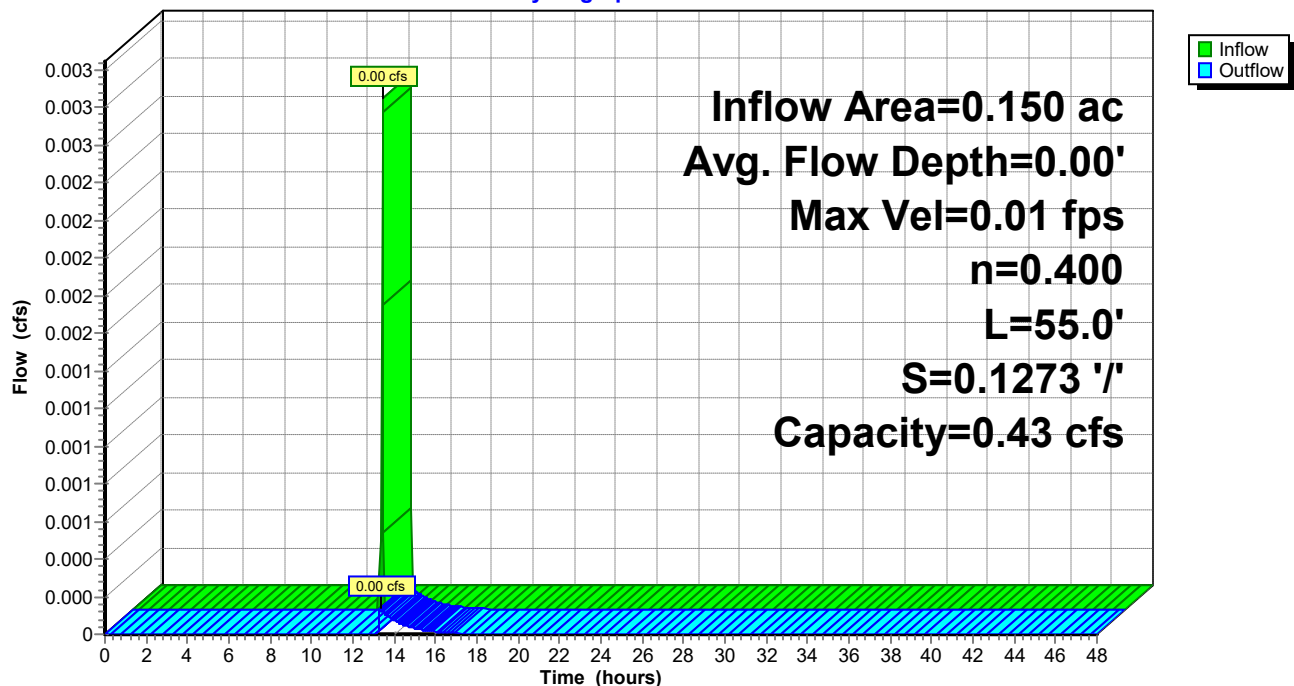
Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.43 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 3.0 '/' Top Width= 15.60'

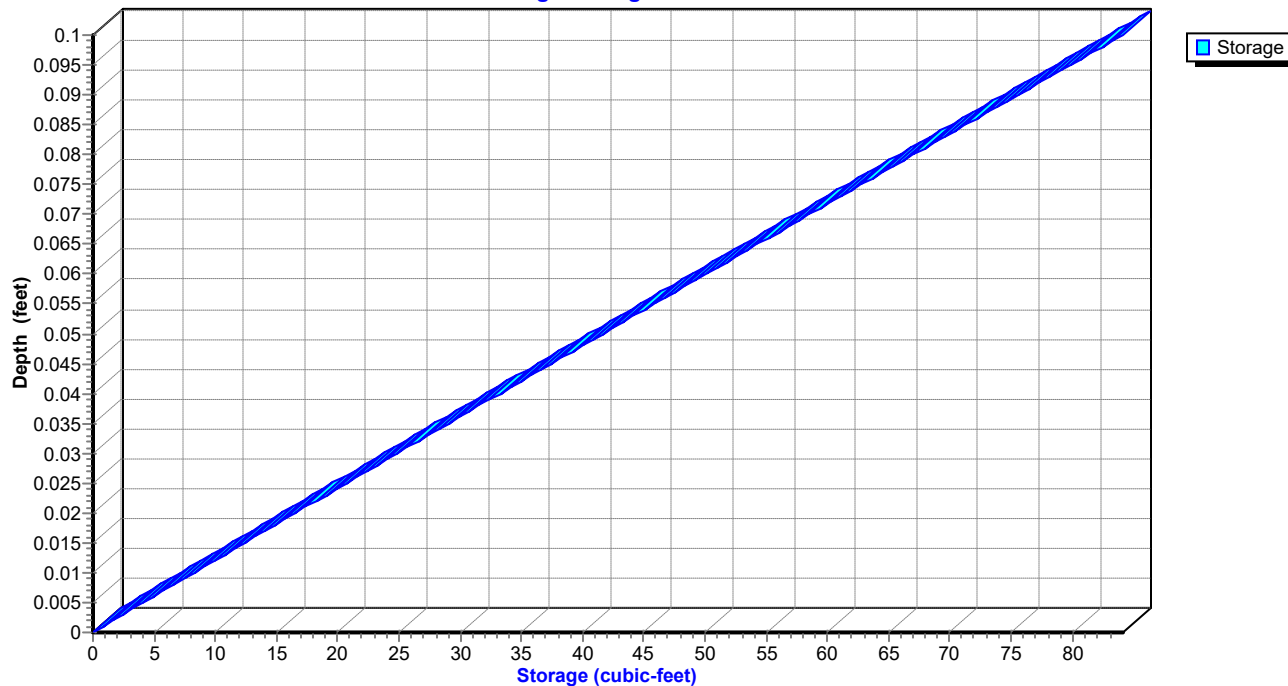
Length= 55.0' Slope= 0.1273 '/'

Inlet Invert= 15.00', Outlet Invert= 8.00'

**Reach 7R: Reach-1****Hydrograph**

Reach 7R: Reach-1

Stage-Storage



Summary for Reach 8R: Reach-2

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.00 cfs @ 13.31 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 17.30 hrs, Volume= 0.000 af, Atten= 74%, Lag= 239.6 min
 Routed to Link 5L : DESIGN LINE

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Max. Velocity= 0.01 fps, Min. Travel Time= 145.3 min

Avg. Velocity= 0.01 fps, Avg. Travel Time= 145.3 min

Peak Storage= 0 cf @ 14.88 hrs

Average Depth at Peak Storage= 0.00', Surface Width= 15.00'

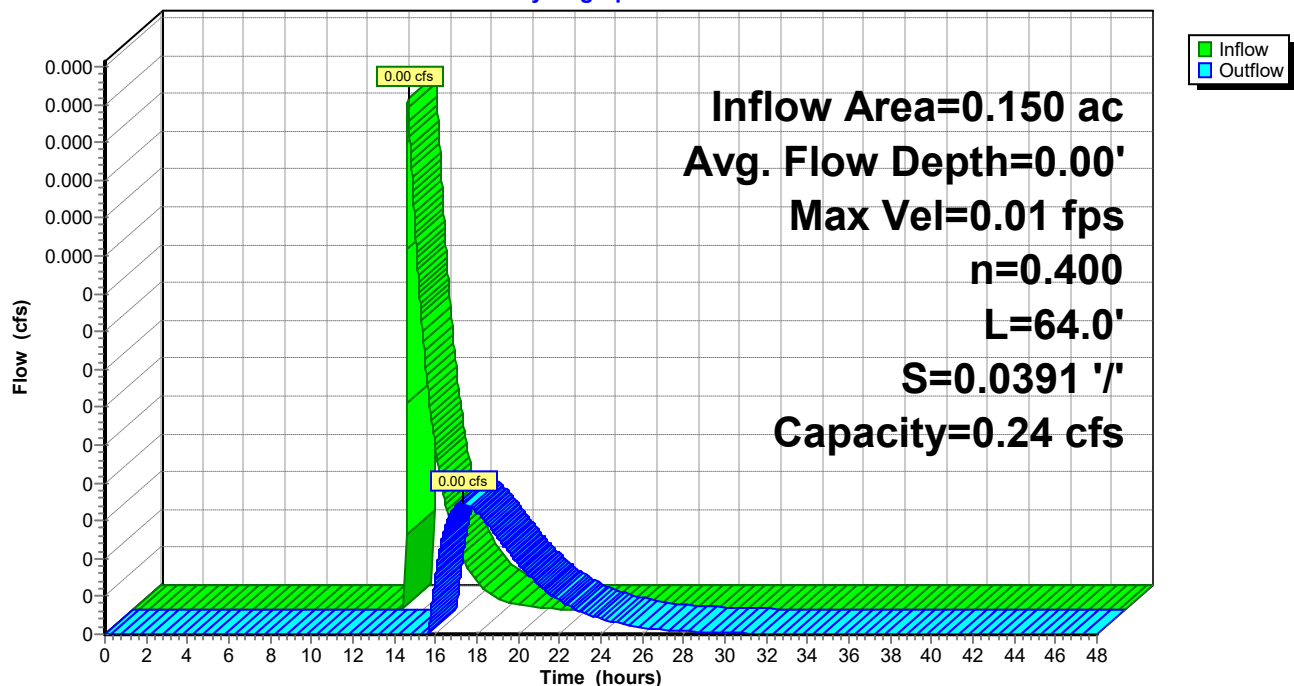
Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.24 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush

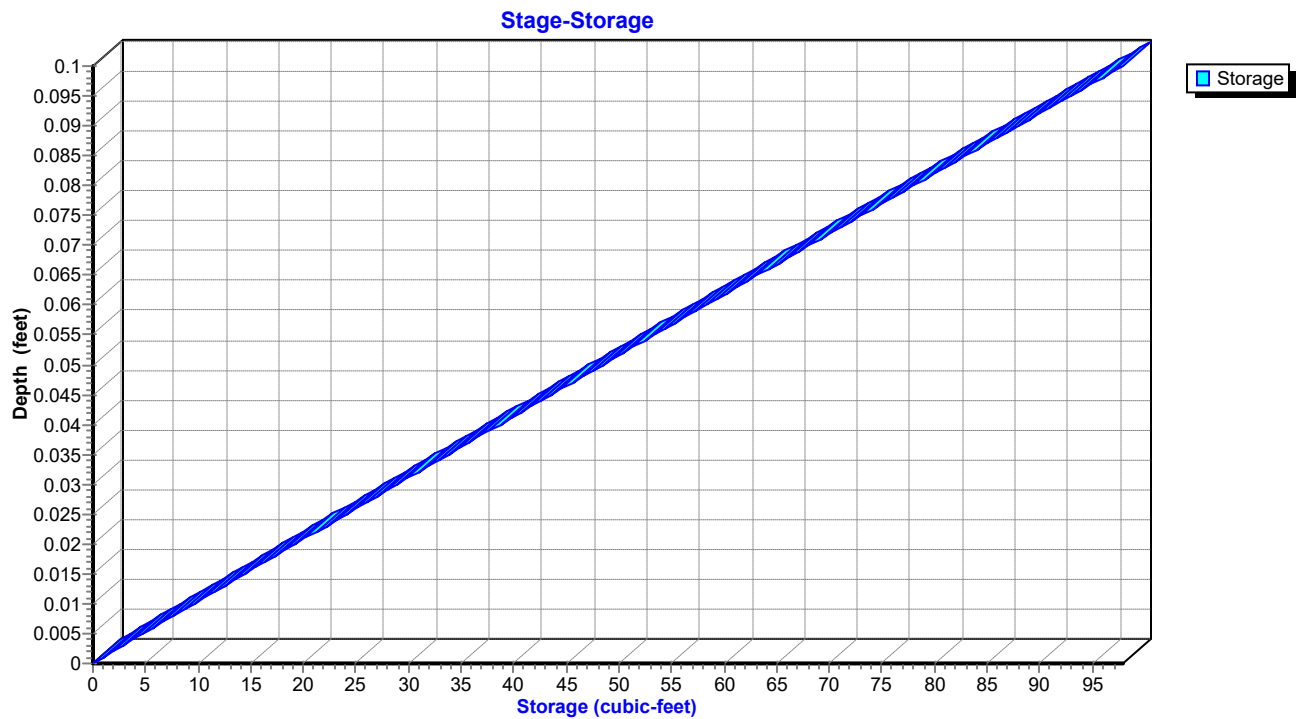
Side Slope Z-value= 3.0 '/' Top Width= 15.60'

Length= 64.0' Slope= 0.0391 '/'

Inlet Invert= 8.00', Outlet Invert= 5.50'

**Reach 8R: Reach-2****Hydrograph**

Reach 8R: Reach-2



Summary for Pond 4P: SW MGMT PRACTICE

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 1.68" for 2-year event
 Inflow = 0.28 cfs @ 12.09 hrs, Volume= 0.021 af
 Outflow = 0.01 cfs @ 12.08 hrs, Volume= 0.021 af, Atten= 96%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 12.08 hrs, Volume= 0.021 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Peak Elev= 15.57' @ 16.28 hrs Surf.Area= 421 sf Storage= 519 cf

Plug-Flow detention time= 528.2 min calculated for 0.021 af (100% of inflow)
 Center-of-Mass det. time= 528.2 min (1,348.1 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1B	13.71'	332 cf	20.83'W x 17.50'L x 3.54'H Field A 1,291 cf Overall - 462 cf Embedded = 829 cf x 40.0% Voids
#2B	14.21'	462 cf	Cultec R-330XLHD x 8 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
#3	14.50'	156 cf	6.00'D x 2.75'H Vertical Cone/Cylinder x 2
		949 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.00'	6.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Discarded	13.71'	1.000 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=14.54' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=13.71' (Free Discharge)
 ↑ **1=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: SW MGMT PRACTICE - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Stone Base + 30.5" Chamber Height + 6.0" Stone Cover = 3.54' Field Height

8 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 462.0 cf Chamber Storage

1,291.2 cf Field - 462.0 cf Chambers = 829.3 cf Stone x 40.0% Voids = 331.7 cf Stone Storage

Chamber Storage + Stone Storage = 793.7 cf = 0.018 af

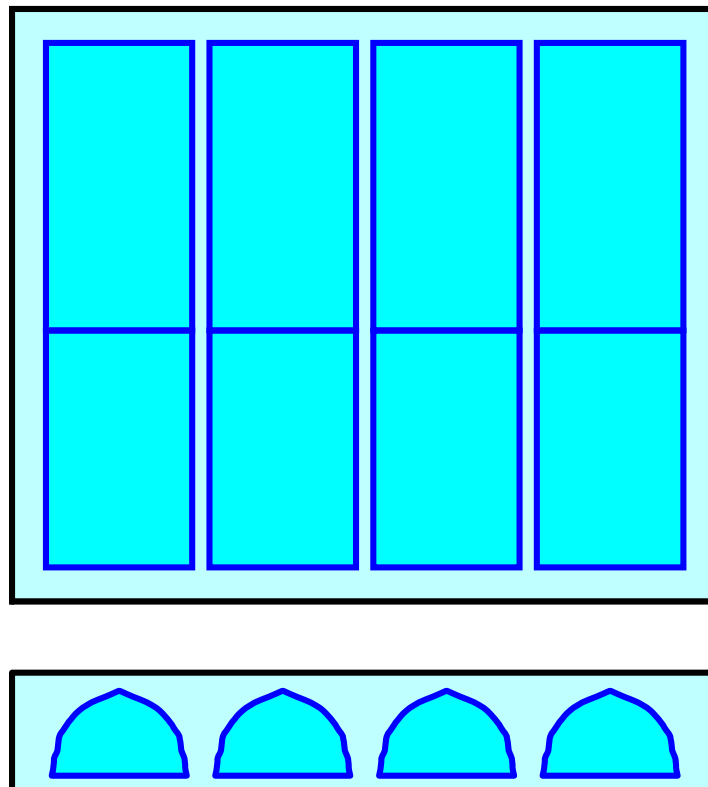
Overall Storage Efficiency = 61.5%

Overall System Size = 17.50' x 20.83' x 3.54'

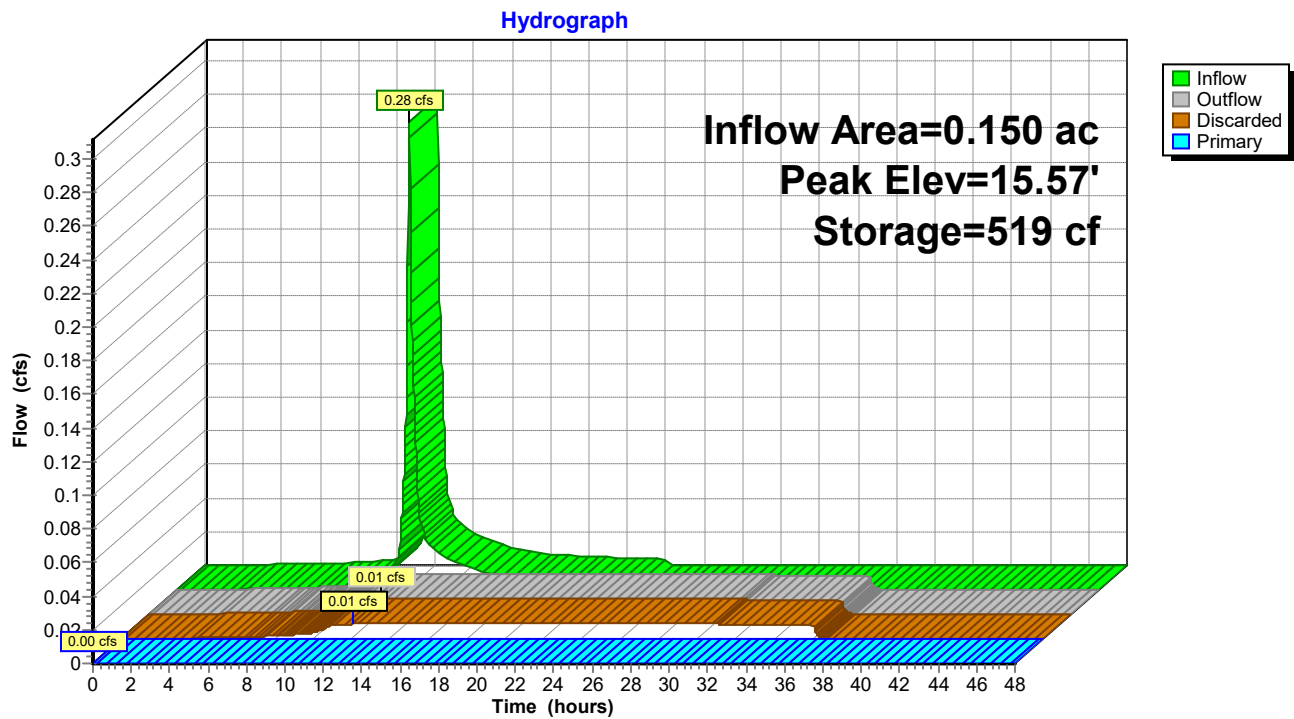
8 Chambers

47.8 cy Field

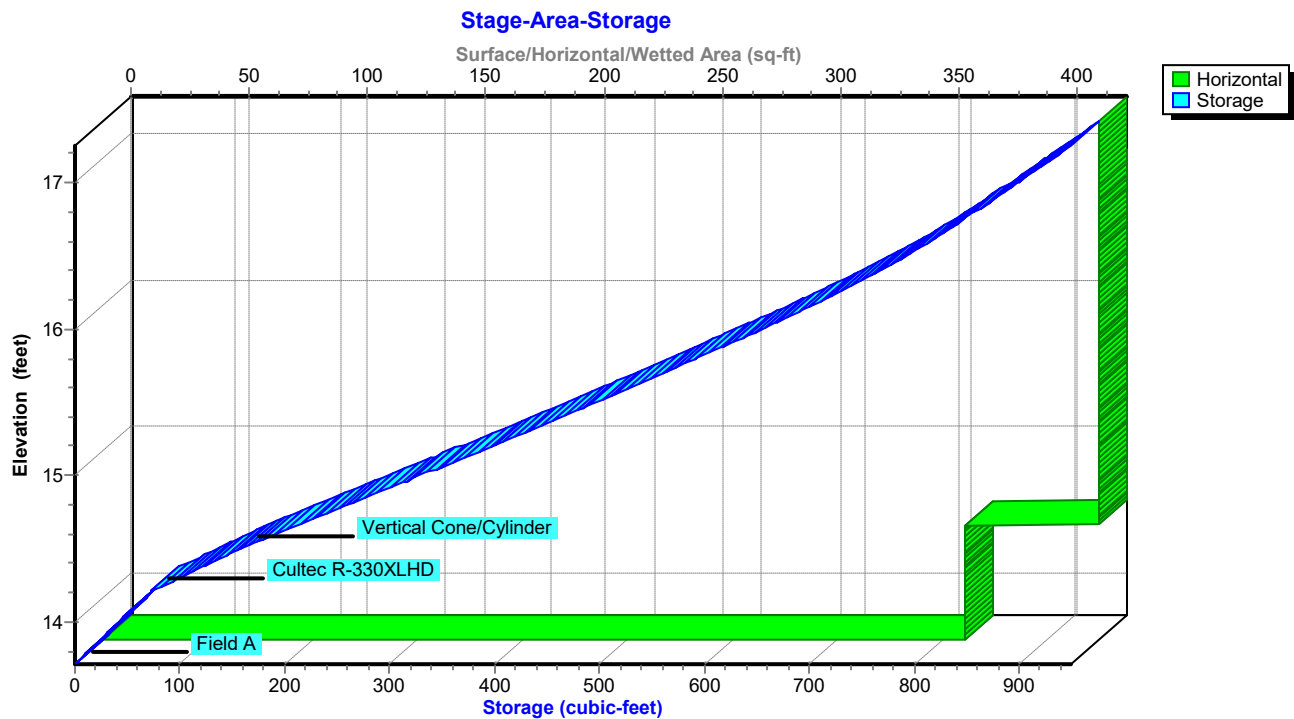
30.7 cy Stone



Pond 4P: SW MGMT PRACTICE



Pond 4P: SW MGMT PRACTICE



Summary for Pond 6P: Diversion Structure 2A

[57] Hint: Peaked at 17.61' (Flood elevation advised)

Inflow Area = 0.126 ac, 43.41% Impervious, Inflow Depth = 1.39" for 2-year event
 Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.015 af
 Outflow = 0.20 cfs @ 12.09 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.20 cfs @ 12.09 hrs, Volume= 0.015 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.00 cfs @ 12.09 hrs, Volume= 0.000 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 17.61' @ 12.09 hrs

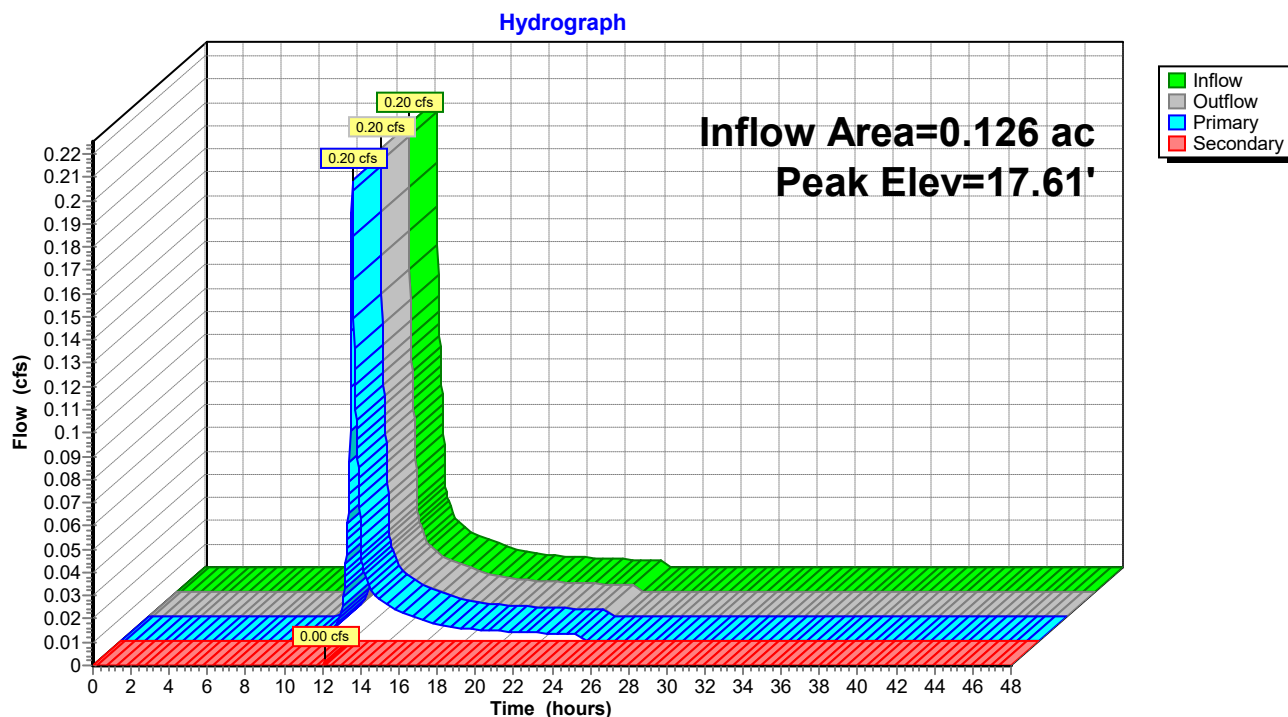
Device	Routing	Invert	Outlet Devices
#1	Primary	17.33'	8.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.33' / 15.92' S= 0.4029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	17.58'	8.0" Round Culvert to Flow Spreader L= 30.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.58' / 15.08' S= 0.0820 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.20 cfs @ 12.09 hrs HW=17.61' (Free Discharge)

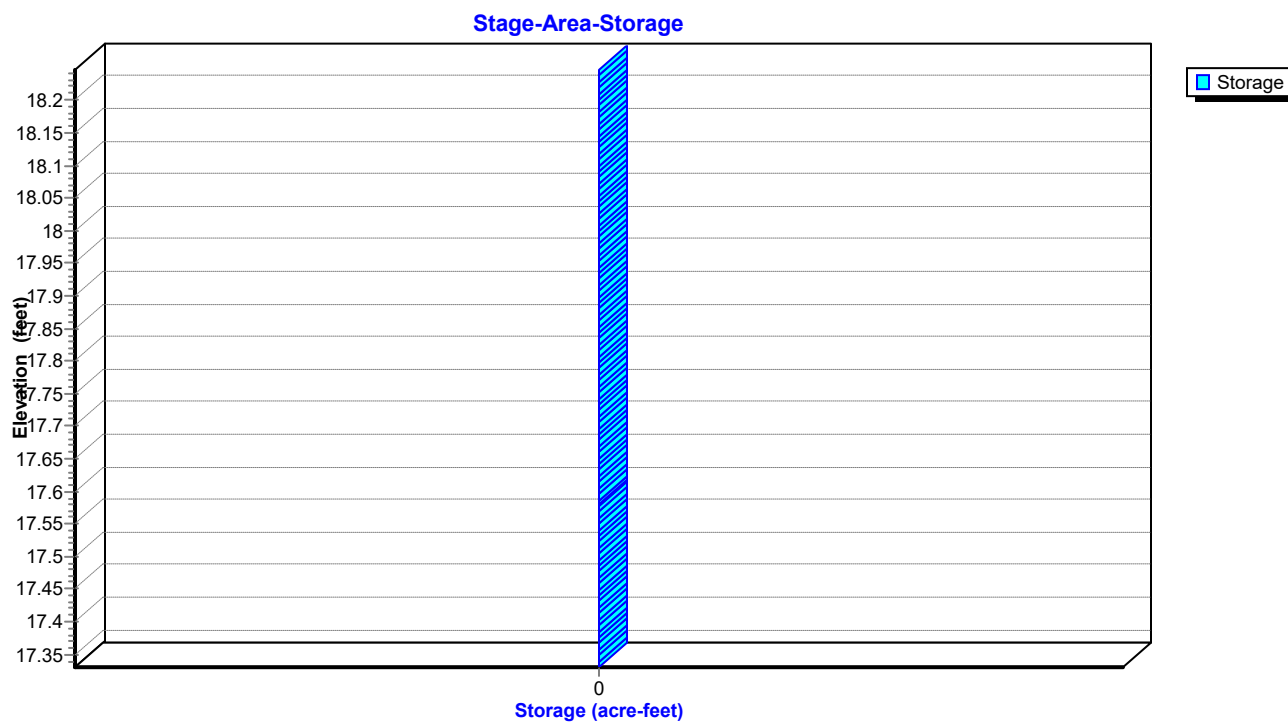
1=Culvert to SW Mgmt Facility (Inlet Controls 0.20 cfs @ 1.42 fps)
Secondary OutFlow Max=0.00 cfs @ 12.09 hrs HW=17.61' (Free Discharge)

2=Culvert to Flow Spreader (Inlet Controls 0.00 cfs @ 0.46 fps)

Pond 6P: Diversion Structure 2A



Pond 6P: Diversion Structure 2A



Summary for Pond 7P: Diversion Structure 2B

[57] Hint: Peaked at 17.94' (Flood elevation advised)

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 3.22" for 2-year event
 Inflow = 0.08 cfs @ 12.08 hrs, Volume= 0.006 af
 Outflow = 0.08 cfs @ 12.08 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.08 cfs @ 12.08 hrs, Volume= 0.006 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 17.94' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.75'	6.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.75' / 16.25' S= 0.4286 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	18.00'	6.0" Round Culvert to Flow Spreader L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.00' / 15.25' S= 0.1019 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

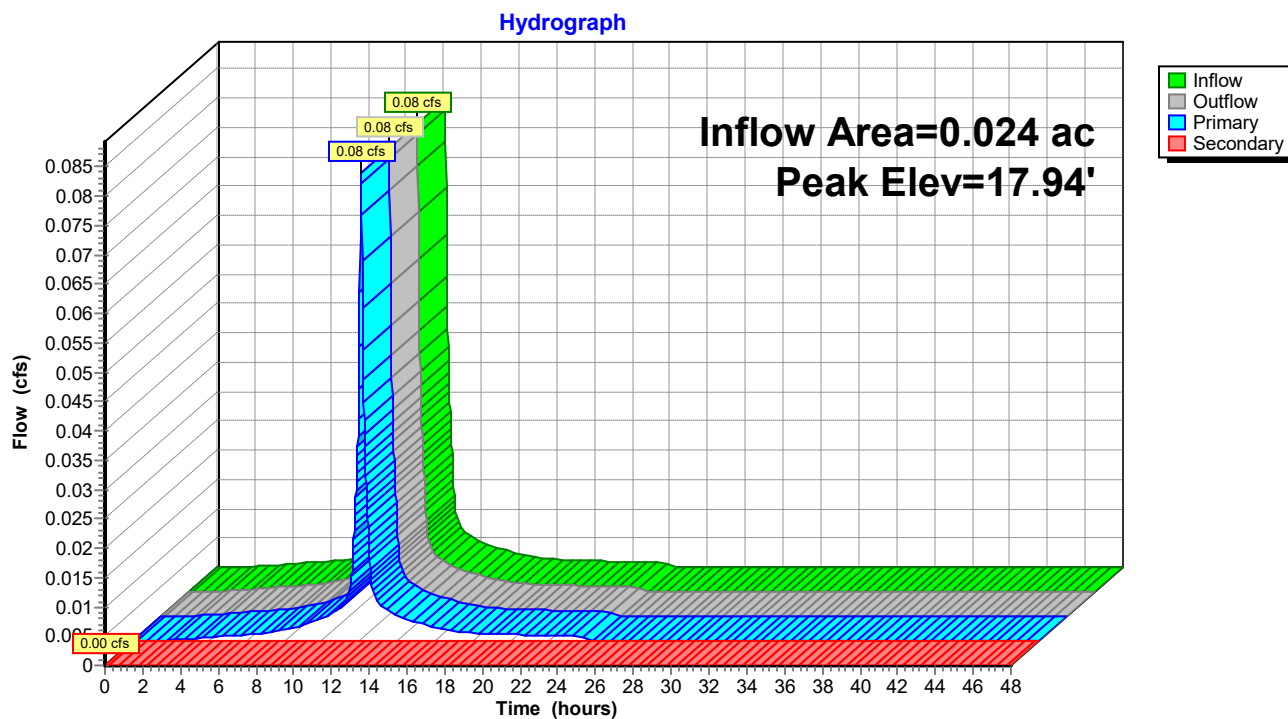
Primary OutFlow Max=0.08 cfs @ 12.08 hrs HW=17.94' (Free Discharge)

↑1=Culvert to SW Mgmt Facility (Inlet Controls 0.08 cfs @ 1.17 fps)

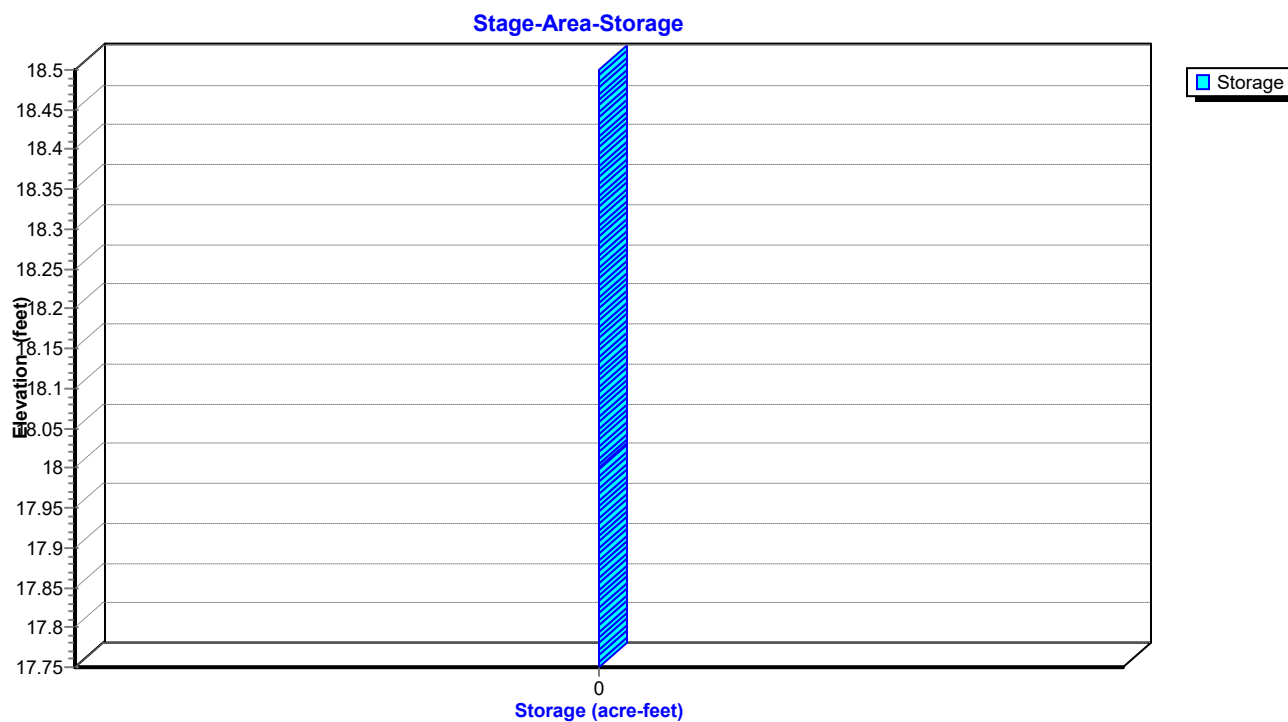
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.75' (Free Discharge)

↑2=Culvert to Flow Spreader (Controls 0.00 cfs)

Pond 7P: Diversion Structure 2B



Pond 7P: Diversion Structure 2B



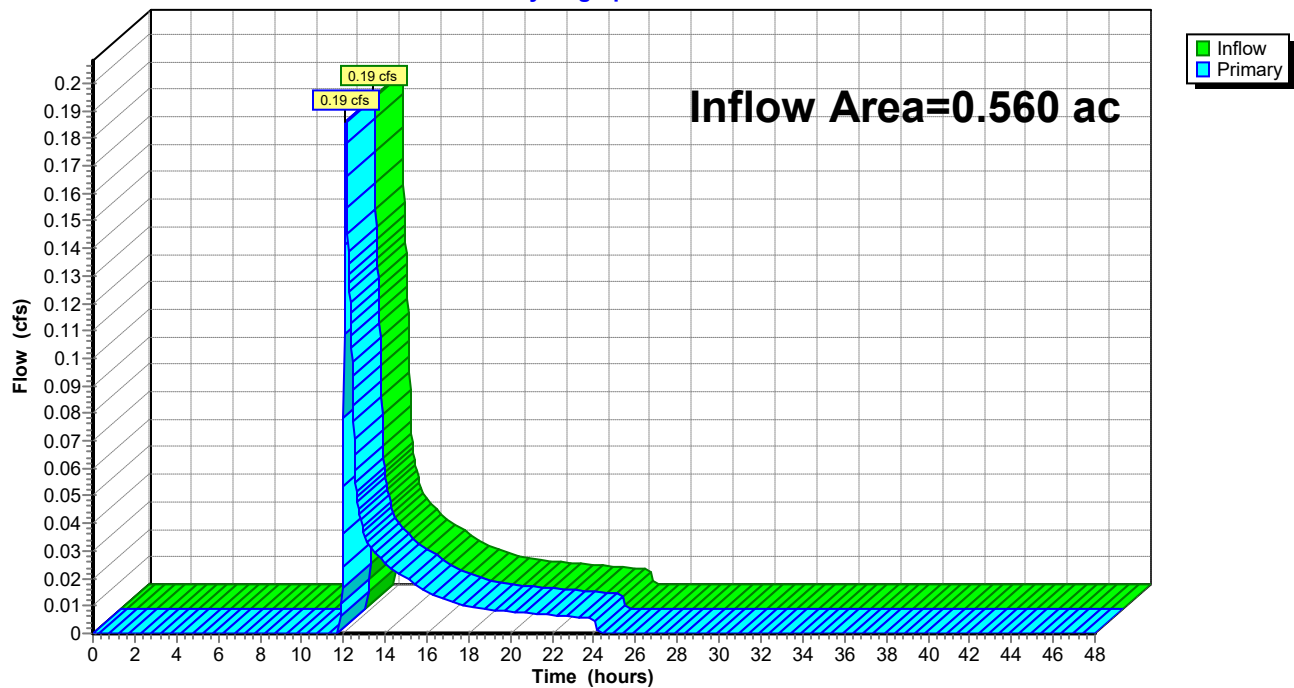
Summary for Link 5L: DESIGN LINE

Inflow Area = 0.560 ac, 15.61% Impervious, Inflow Depth = 0.40" for 2-year event
Inflow = 0.19 cfs @ 12.12 hrs, Volume= 0.019 af
Primary = 0.19 cfs @ 12.12 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Link 5L: DESIGN LINE

Hydrograph



921 Soundview SW Mgmt_12-28-2021.2*Type III 24-hr 10-year Rainfall=5.12"*

Prepared by ALP Engineering & Land. Arch. PLLC

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Time span=0.00-48.00 hrs, dt=0.02 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: XDA-1 TO DESIGN LINE Runoff Area=24,402 sf 0.00% Impervious Runoff Depth=1.37"
Flow Length=260' Tc=6.0 min CN=60 Runoff=0.81 cfs 0.064 af

Subcatchment 2S: FDA-1 TO DESIGN LINE Runoff Area=17,884 sf 2.19% Impervious Runoff Depth=1.44"
Flow Length=399' Tc=6.0 min CN=61 Runoff=0.63 cfs 0.049 af

Subcatchment 3S: FDA-2A TO SW Runoff Area=5,480 sf 43.41% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=77 Runoff=0.40 cfs 0.029 af

Subcatchment 6S: FDA-2B Runoff Area=1,037 sf 100.00% Impervious Runoff Depth=4.88"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Reach 7R: Reach-1 Avg. Flow Depth=0.02' Max Vel=0.10 fps Inflow=0.05 cfs 0.006 af
n=0.400 L=55.0' S=0.1273 '/' Capacity=0.43 cfs Outflow=0.03 cfs 0.006 af

Reach 8R: Reach-2 Avg. Flow Depth=0.03' Max Vel=0.07 fps Inflow=0.03 cfs 0.006 af
n=0.400 L=64.0' S=0.0391 '/' Capacity=0.24 cfs Outflow=0.03 cfs 0.006 af

Pond 4P: SW MGMT PRACTICE Peak Elev=17.02' Storage=902 cf Inflow=0.47 cfs 0.038 af
Discarded=0.01 cfs 0.032 af Primary=0.03 cfs 0.005 af Outflow=0.04 cfs 0.037 af

Pond 6P: Diversion Structure 2A Peak Elev=17.72' Inflow=0.40 cfs 0.029 af
Primary=0.35 cfs 0.028 af Secondary=0.05 cfs 0.001 af Outflow=0.40 cfs 0.029 af

Pond 7P: Diversion Structure 2B Peak Elev=17.99' Inflow=0.12 cfs 0.010 af
Primary=0.12 cfs 0.010 af Secondary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.010 af

Link 5L: DESIGN LINE Inflow=0.63 cfs 0.055 af
Primary=0.63 cfs 0.055 af

Total Runoff Area = 1.120 ac Runoff Volume = 0.152 af Average Runoff Depth = 1.62"
92.20% Pervious = 1.033 ac 7.80% Impervious = 0.087 ac

Summary for Subcatchment 1S: XDA-1 TO DESIGN LINE

Runoff = 0.81 cfs @ 12.10 hrs, Volume= 0.064 af, Depth= 1.37"

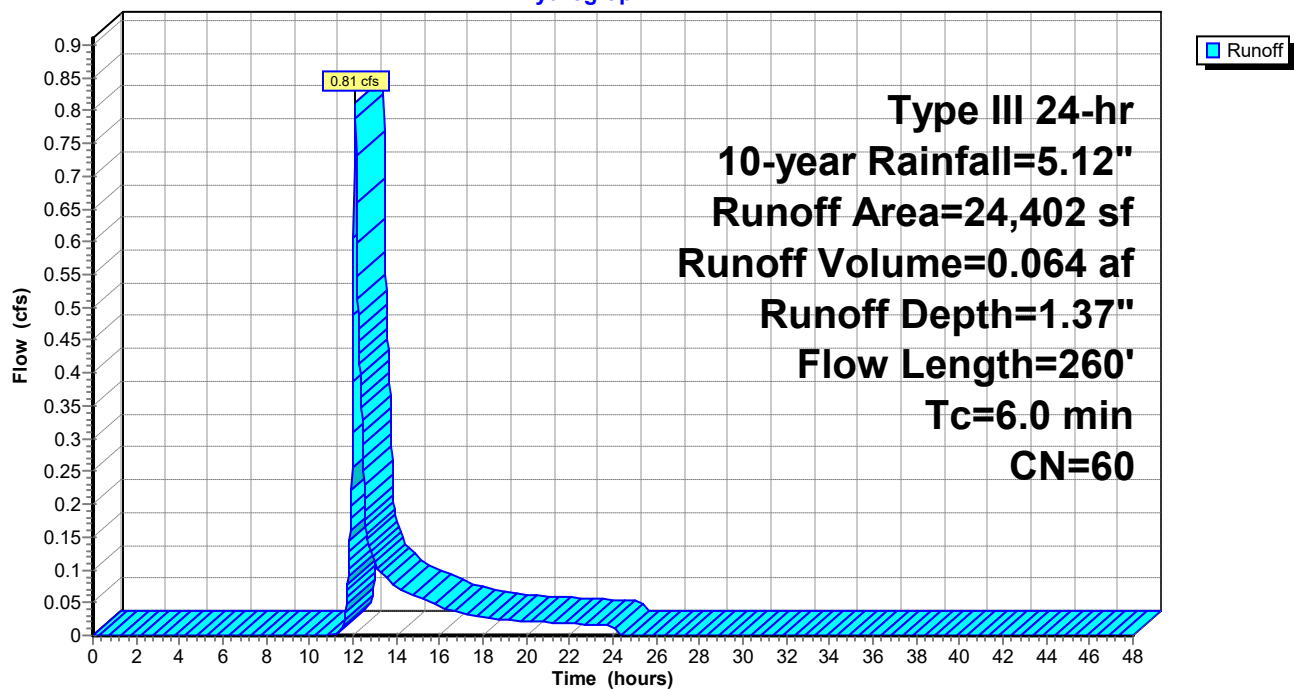
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-year Rainfall=5.12"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
19,374	56	Brush, Fair, HSG B
24,402	60	Weighted Average
24,402		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	31	0.0516	0.14		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
0.2	36	0.2000	3.13		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
0.2	44	0.1954	3.09		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0786	1.96		Shallow Concentrated Flow, D-E
					Short Grass Pasture Kv= 7.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.9					Direct Entry, Tc Factor
6.0	260	Total			

Subcatchment 1S: XDA-1 TO DESIGN LINE

Hydrograph



Summary for Subcatchment 2S: FDA-1 TO DESIGN LINE

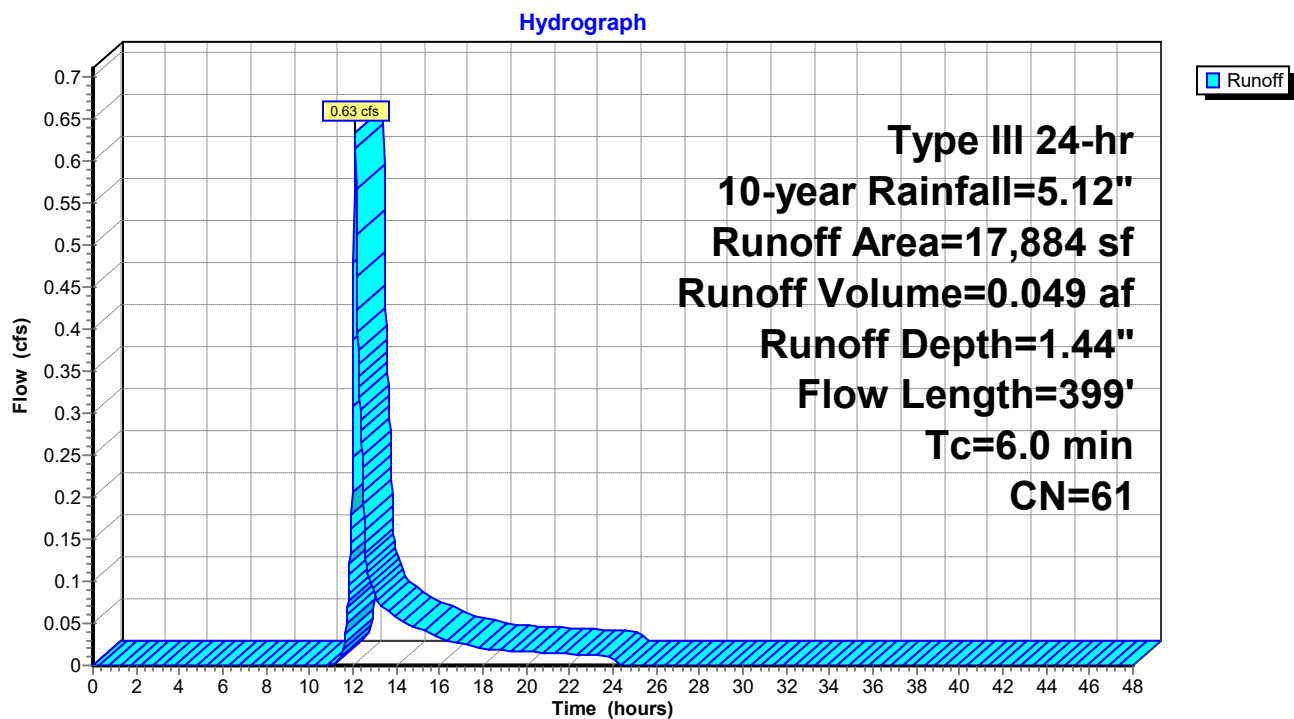
Runoff = 0.63 cfs @ 12.10 hrs, Volume= 0.049 af, Depth= 1.44"
 Routed to Link 5L : DESIGN LINE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 10-year Rainfall=5.12"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
5,993	48	Brush, Good, HSG B
5,229	61	>75% Grass cover, Good, HSG B
* 1,242	61	Deck (use lawn for under deck), HSG B
* 392	98	Pool, HSG B
17,884	61	Weighted Average
17,492		97.81% Pervious Area
392		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	35	0.0657	0.16		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
1.0	220	0.0659	3.85		Shallow Concentrated Flow, B-C
					Grassed Waterway Kv= 15.0 fps
0.3	65	0.0769	4.16		Shallow Concentrated Flow, C-D
					Grassed Waterway Kv= 15.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.6					Direct Entry, Tc Factor
6.0	399	Total			

Subcatchment 2S: FDA-1 TO DESIGN LINE



Summary for Subcatchment 3S: FDA-2A TO SW PRACTICE

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af, Depth= 2.72"
 Routed to Pond 6P : Diversion Structure 2A

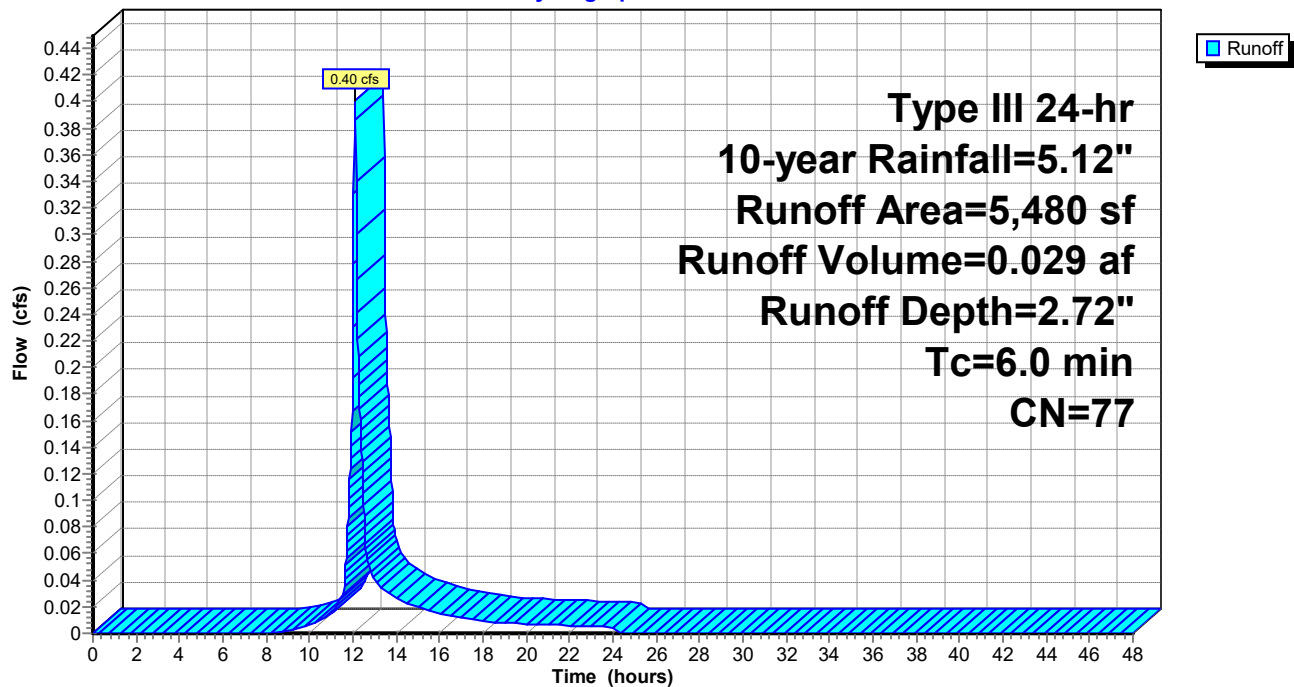
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 10-year Rainfall=5.12"

	Area (sf)	CN	Description
*	2,379	98	Impervious surfaces, HSG B
	3,101	61	>75% Grass cover, Good, HSG B
	5,480	77	Weighted Average
	3,101		56.59% Pervious Area
	2,379		43.41% Impervious Area

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

Subcatchment 3S: FDA-2A TO SW PRACTICE

Hydrograph



Summary for Subcatchment 6S: FDA-2B

Runoff = 0.12 cfs @ 12.08 hrs, Volume= 0.010 af, Depth= 4.88"
 Routed to Pond 7P : Diversion Structure 2B

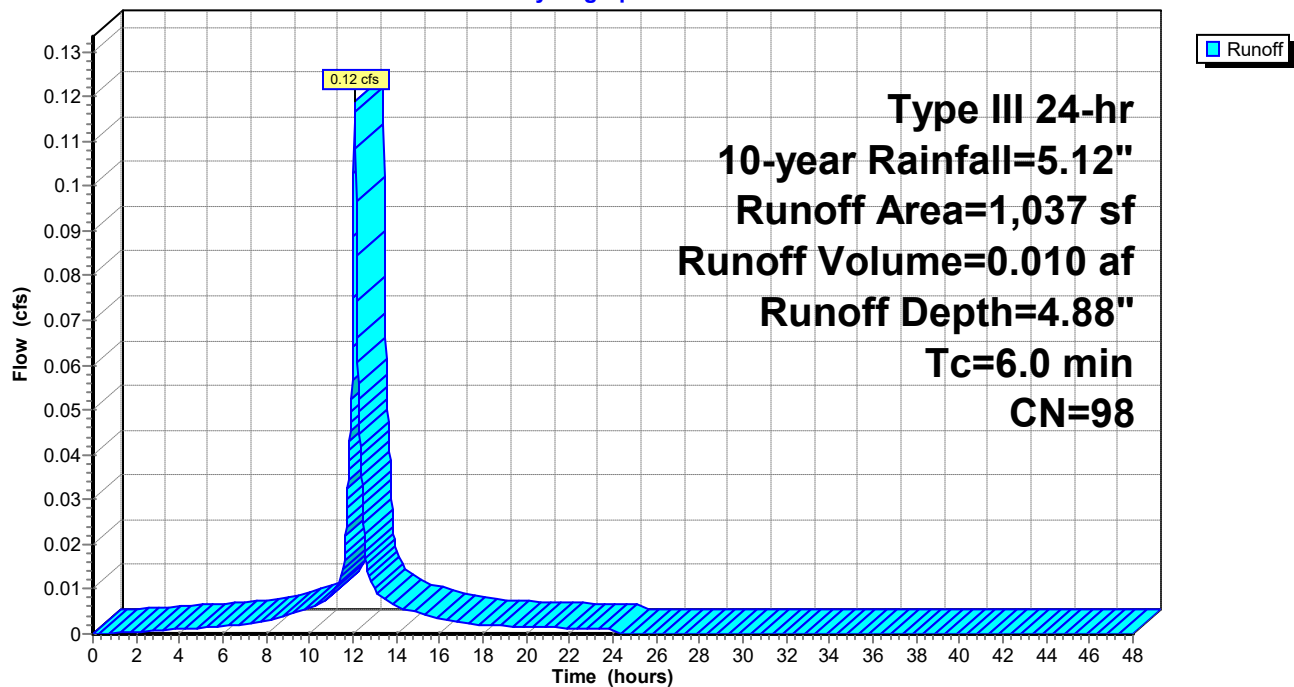
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 10-year Rainfall=5.12"

Area (sf)	CN	Description
1,037	98	Roofs, HSG B
1,037		100.00% Impervious Area

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

Subcatchment 6S: FDA-2B

Hydrograph



Summary for Reach 7R: Reach-1

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 0.46" for 10-year event
 Inflow = 0.05 cfs @ 12.09 hrs, Volume= 0.006 af
 Outflow = 0.03 cfs @ 13.75 hrs, Volume= 0.006 af, Atten= 43%, Lag= 99.4 min
 Routed to Reach 8R : Reach-2

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Max. Velocity= 0.10 fps, Min. Travel Time= 9.4 min
 Avg. Velocity= 0.04 fps, Avg. Travel Time= 25.5 min

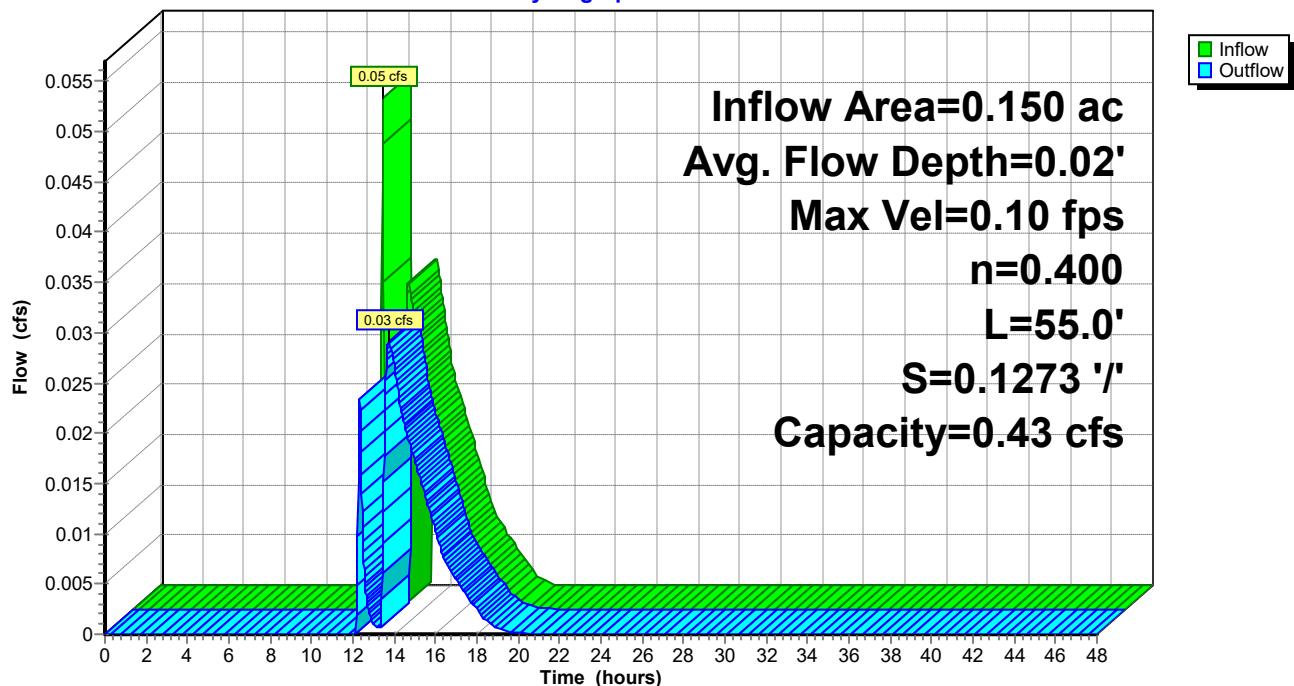
Peak Storage= 17 cf @ 13.59 hrs
 Average Depth at Peak Storage= 0.02', Surface Width= 15.12'
 Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.43 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush
 Side Slope Z-value= 3.0 '/' Top Width= 15.60'
 Length= 55.0' Slope= 0.1273 '/'
 Inlet Invert= 15.00', Outlet Invert= 8.00'



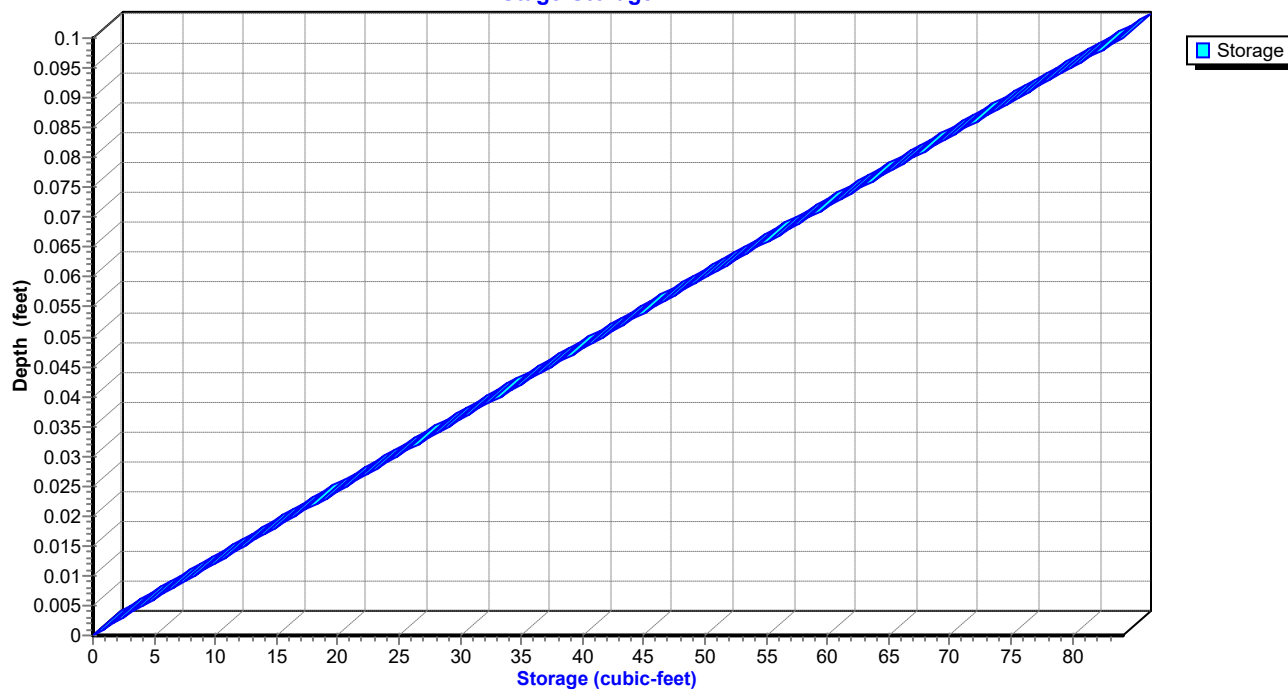
Reach 7R: Reach-1

Hydrograph



Reach 7R: Reach-1

Stage-Storage



Summary for Reach 8R: Reach-2

[62] Hint: Exceeded Reach 7R OUTLET depth by 0.01' @ 14.20 hrs

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 0.46" for 10-year event
Inflow = 0.03 cfs @ 13.75 hrs, Volume= 0.006 af
Outflow = 0.03 cfs @ 14.33 hrs, Volume= 0.006 af, Atten= 11%, Lag= 35.0 min
Routed to Link 5L : DESIGN LINE

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 0.07 fps, Min. Travel Time= 16.4 min
Avg. Velocity= 0.02 fps, Avg. Travel Time= 58.7 min

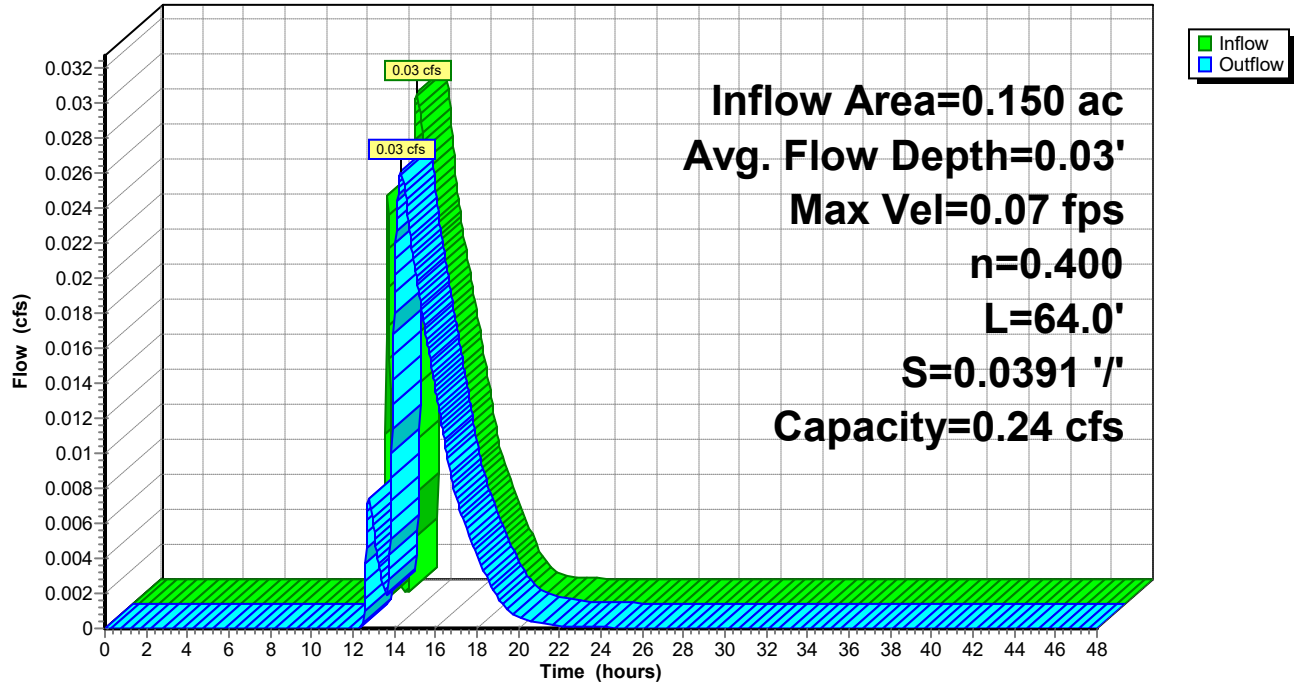
Peak Storage= 26 cf @ 14.06 hrs
Average Depth at Peak Storage= 0.03', Surface Width= 15.16'
Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.24 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 3.0 '/' Top Width= 15.60'
Length= 64.0' Slope= 0.0391 '/'
Inlet Invert= 8.00', Outlet Invert= 5.50'



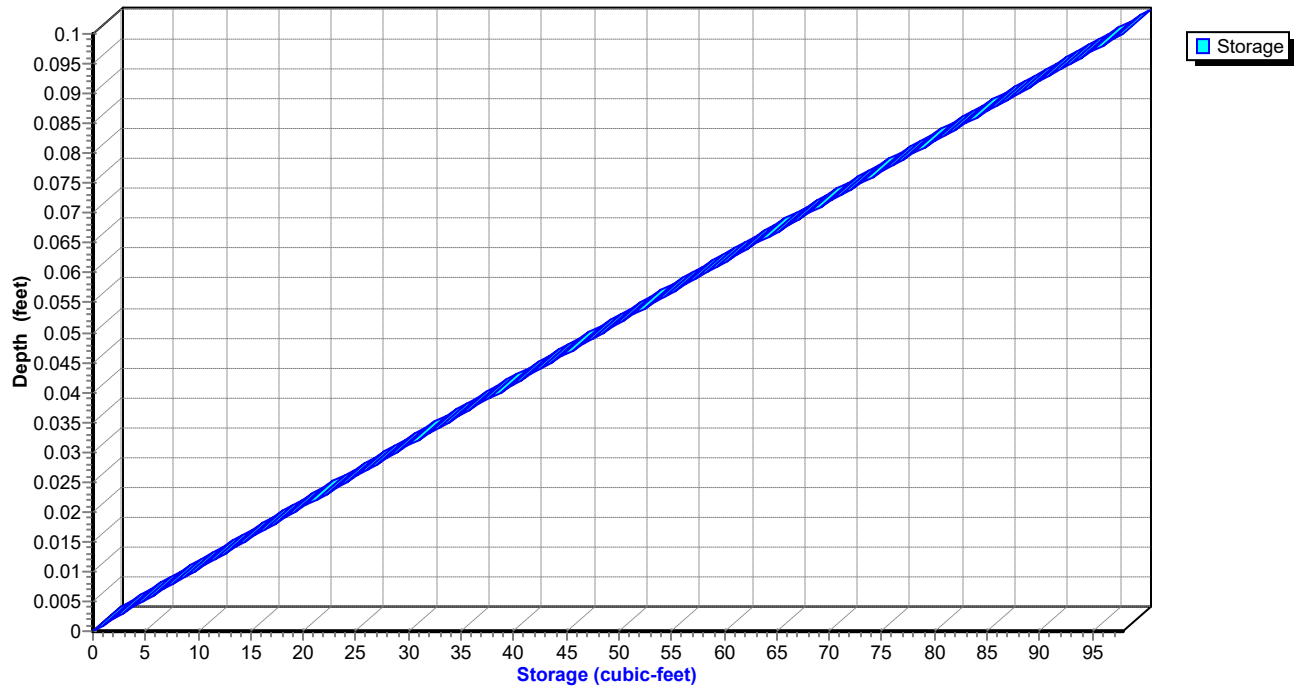
Reach 8R: Reach-2

Hydrograph



Reach 8R: Reach-2

Stage-Storage



Summary for Pond 4P: SW MGMT PRACTICE

[79] Warning: Submerged Pond 6P Primary device # 1 OUTLET by 1.10'

[79] Warning: Submerged Pond 7P Primary device # 1 OUTLET by 0.77'

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 3.02" for 10-year event
 Inflow = 0.47 cfs @ 12.09 hrs, Volume= 0.038 af
 Outflow = 0.04 cfs @ 13.31 hrs, Volume= 0.037 af, Atten= 91%, Lag= 73.2 min
 Discarded = 0.01 cfs @ 11.82 hrs, Volume= 0.032 af
 Primary = 0.03 cfs @ 13.31 hrs, Volume= 0.005 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 17.02' @ 13.31 hrs Surf.Area= 421 sf Storage= 902 cf

Plug-Flow detention time= 760.8 min calculated for 0.037 af (98% of inflow)

Center-of-Mass det. time= 747.0 min (1,556.4 - 809.3)

Volume	Invert	Avail.Storage	Storage Description
#1B	13.71'	332 cf	20.83'W x 17.50'L x 3.54'H Field A 1,291 cf Overall - 462 cf Embedded = 829 cf x 40.0% Voids
#2B	14.21'	462 cf	Cultec R-330XLHD x 8 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
#3	14.50'	156 cf	6.00'D x 2.75'H Vertical Cone/Cylinder x 2
		949 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.00'	6.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Discarded	13.71'	1.000 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.01 cfs @ 11.82 hrs HW=14.51' (Free Discharge)↑ **2=Exfiltration** (Exfiltration Controls 0.01 cfs)**Primary OutFlow** Max=0.02 cfs @ 13.31 hrs HW=17.02' (Free Discharge)↑ **1=Orifice/Grate** (Weir Controls 0.02 cfs @ 0.43 fps)

Pond 4P: SW MGMT PRACTICE - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Stone Base + 30.5" Chamber Height + 6.0" Stone Cover = 3.54' Field Height

8 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 462.0 cf Chamber Storage

1,291.2 cf Field - 462.0 cf Chambers = 829.3 cf Stone x 40.0% Voids = 331.7 cf Stone Storage

Chamber Storage + Stone Storage = 793.7 cf = 0.018 af

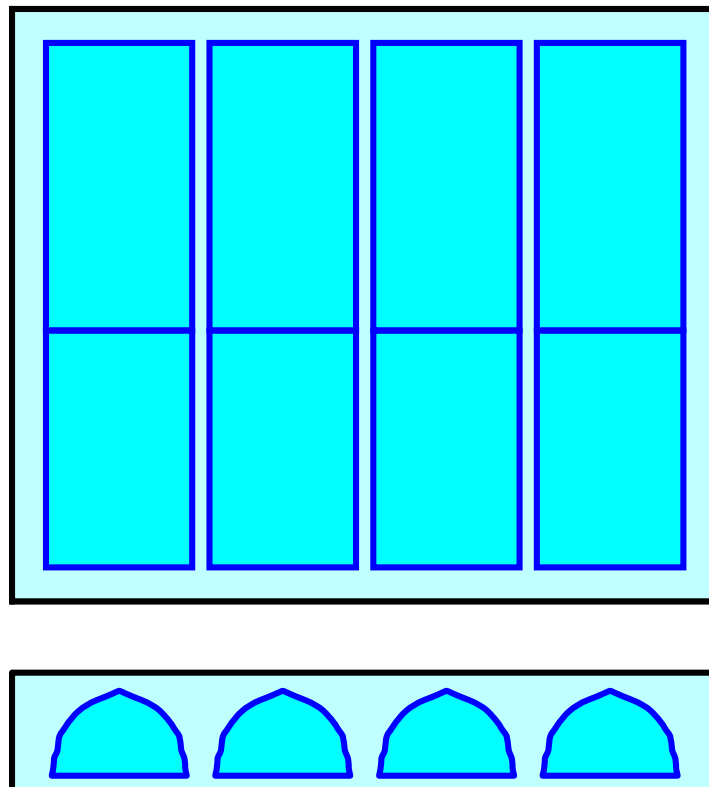
Overall Storage Efficiency = 61.5%

Overall System Size = 17.50' x 20.83' x 3.54'

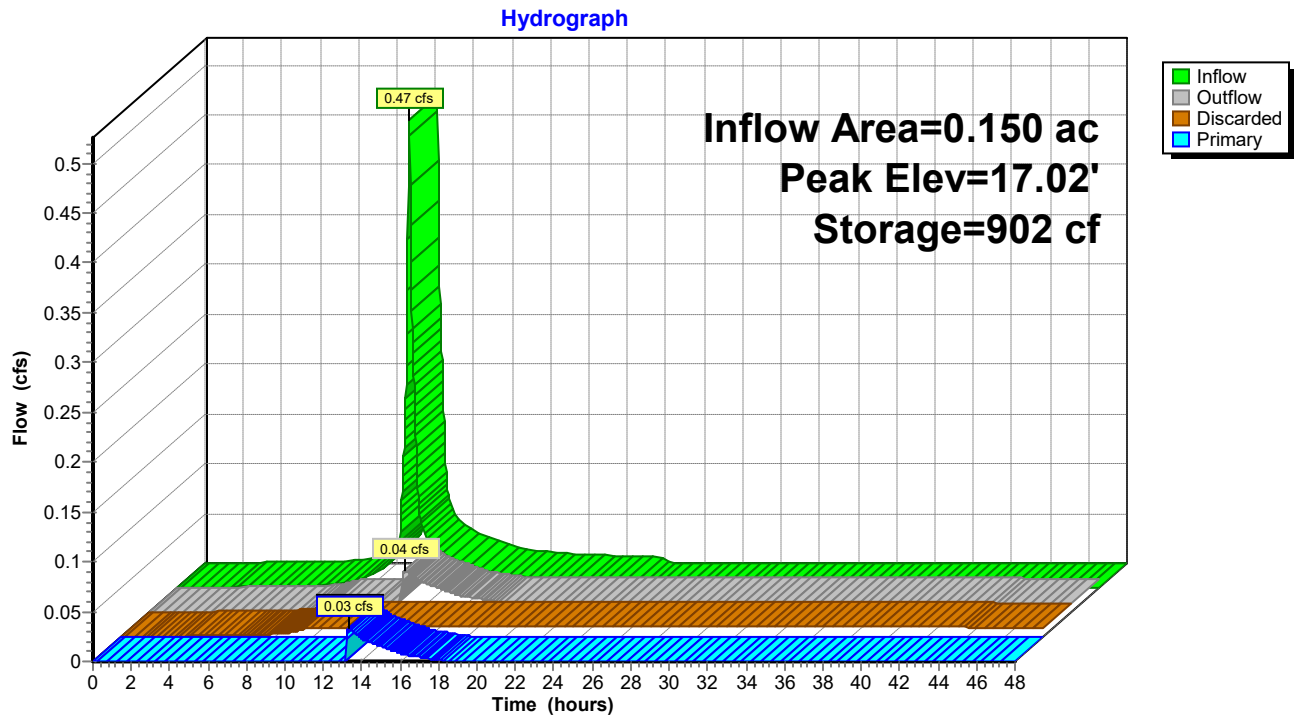
8 Chambers

47.8 cy Field

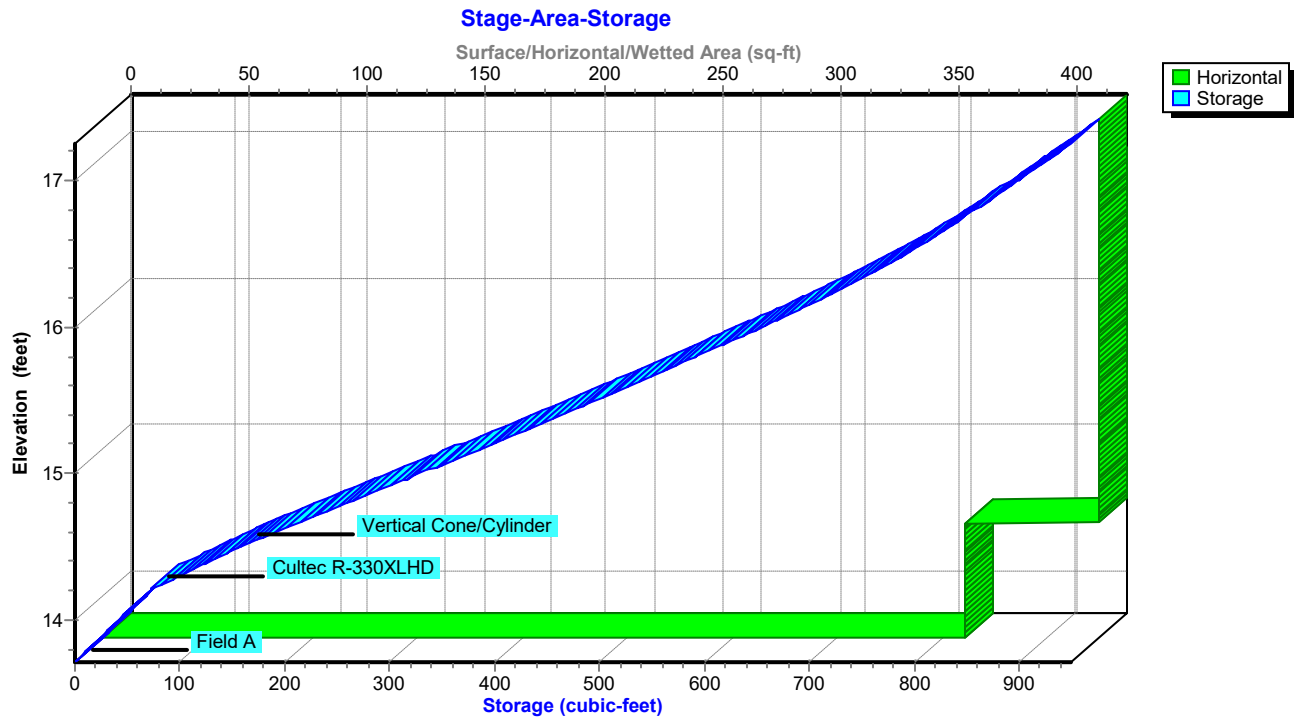
30.7 cy Stone



Pond 4P: SW MGMT PRACTICE



Pond 4P: SW MGMT PRACTICE



Summary for Pond 6P: Diversion Structure 2A

[57] Hint: Peaked at 17.72' (Flood elevation advised)

Inflow Area = 0.126 ac, 43.41% Impervious, Inflow Depth = 2.72" for 10-year event
 Inflow = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af
 Outflow = 0.40 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.35 cfs @ 12.09 hrs, Volume= 0.028 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.05 cfs @ 12.09 hrs, Volume= 0.001 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 17.72' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	17.33'	8.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.33' / 15.92' S= 0.4029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	17.58'	8.0" Round Culvert to Flow Spreader L= 30.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.58' / 15.08' S= 0.0820 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

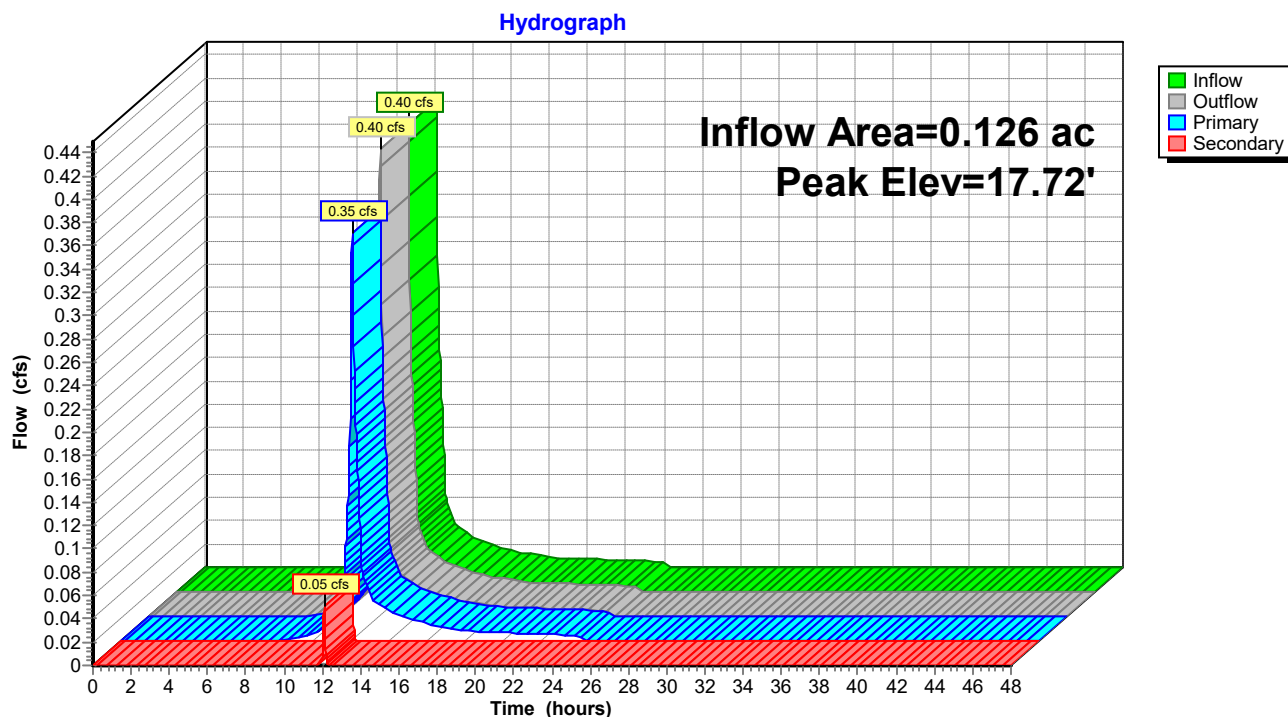
Primary OutFlow Max=0.35 cfs @ 12.09 hrs HW=17.71' (Free Discharge)

↑1=Culvert to SW Mgmt Facility (Inlet Controls 0.35 cfs @ 1.67 fps)

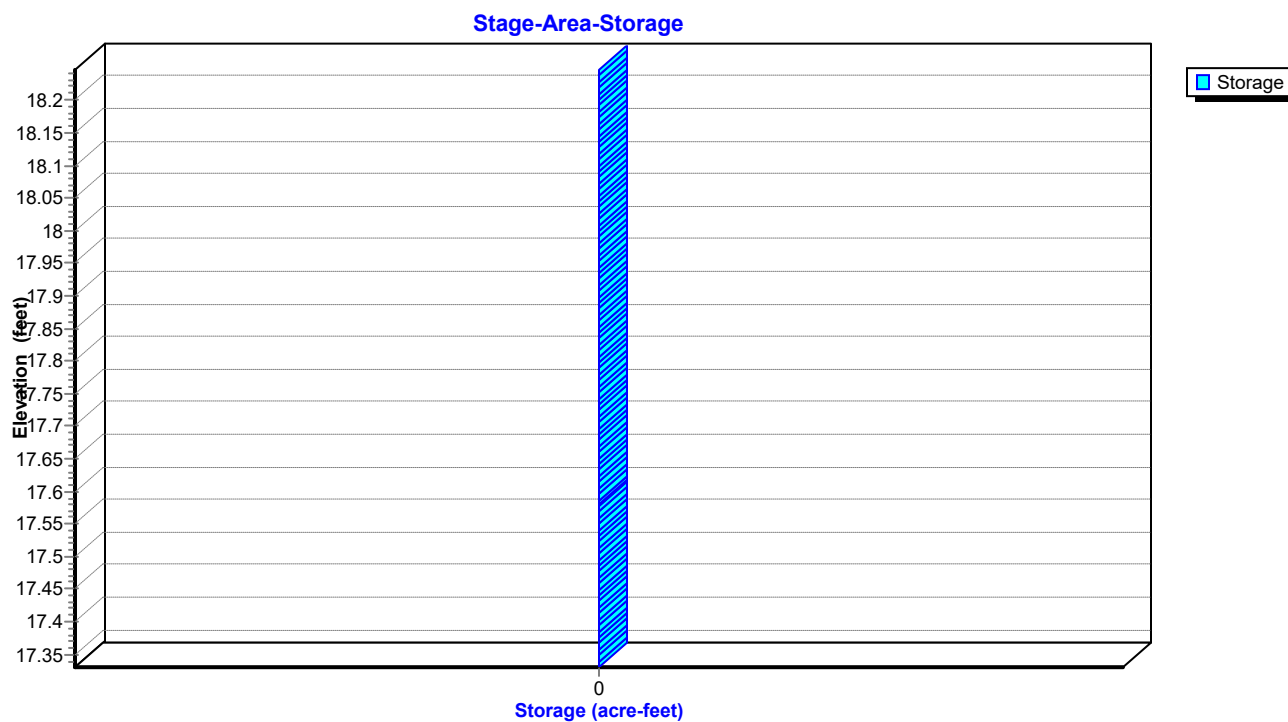
Secondary OutFlow Max=0.05 cfs @ 12.09 hrs HW=17.71' (Free Discharge)

↑2=Culvert to Flow Spreader (Inlet Controls 0.05 cfs @ 0.99 fps)

Pond 6P: Diversion Structure 2A



Pond 6P: Diversion Structure 2A



Summary for Pond 7P: Diversion Structure 2B

[57] Hint: Peaked at 17.99' (Flood elevation advised)

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 4.88" for 10-year event
 Inflow = 0.12 cfs @ 12.08 hrs, Volume= 0.010 af
 Outflow = 0.12 cfs @ 12.08 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.12 cfs @ 12.08 hrs, Volume= 0.010 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 17.99' @ 12.08 hrs

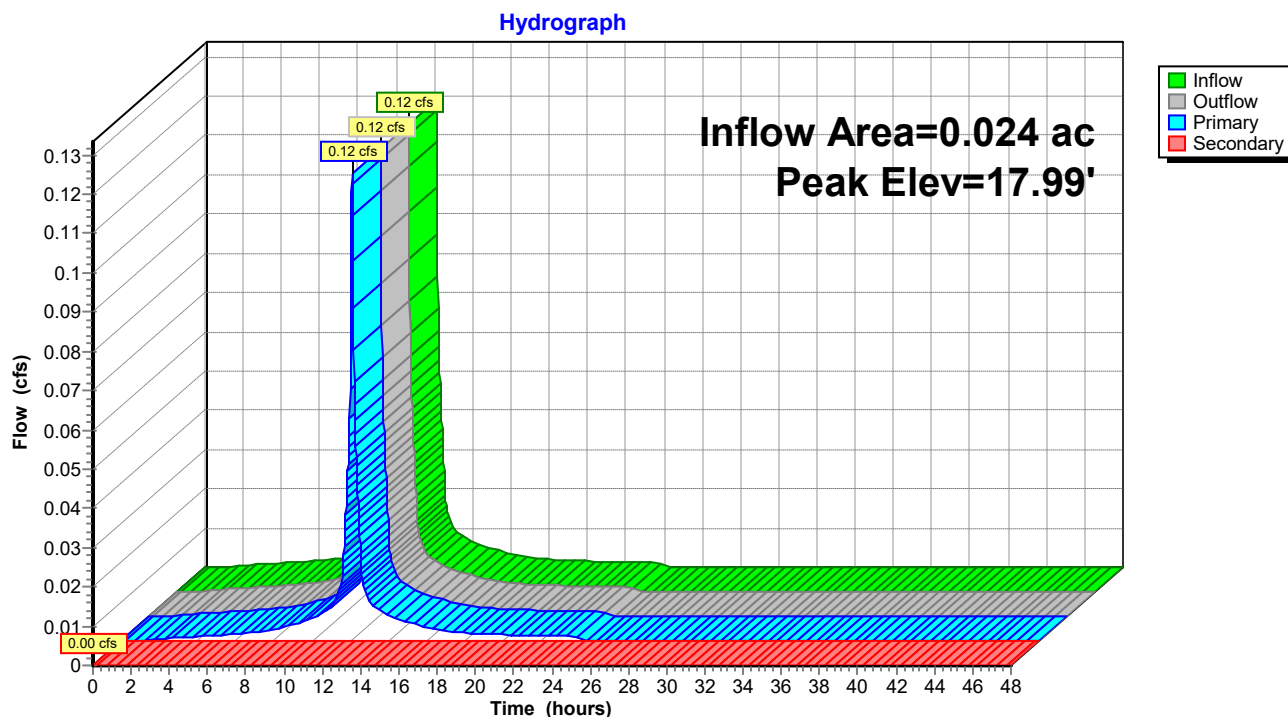
Device	Routing	Invert	Outlet Devices
#1	Primary	17.75'	6.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.75' / 16.25' S= 0.4286 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	18.00'	6.0" Round Culvert to Flow Spreader L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.00' / 15.25' S= 0.1019 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.12 cfs @ 12.08 hrs HW=17.99' (Free Discharge)

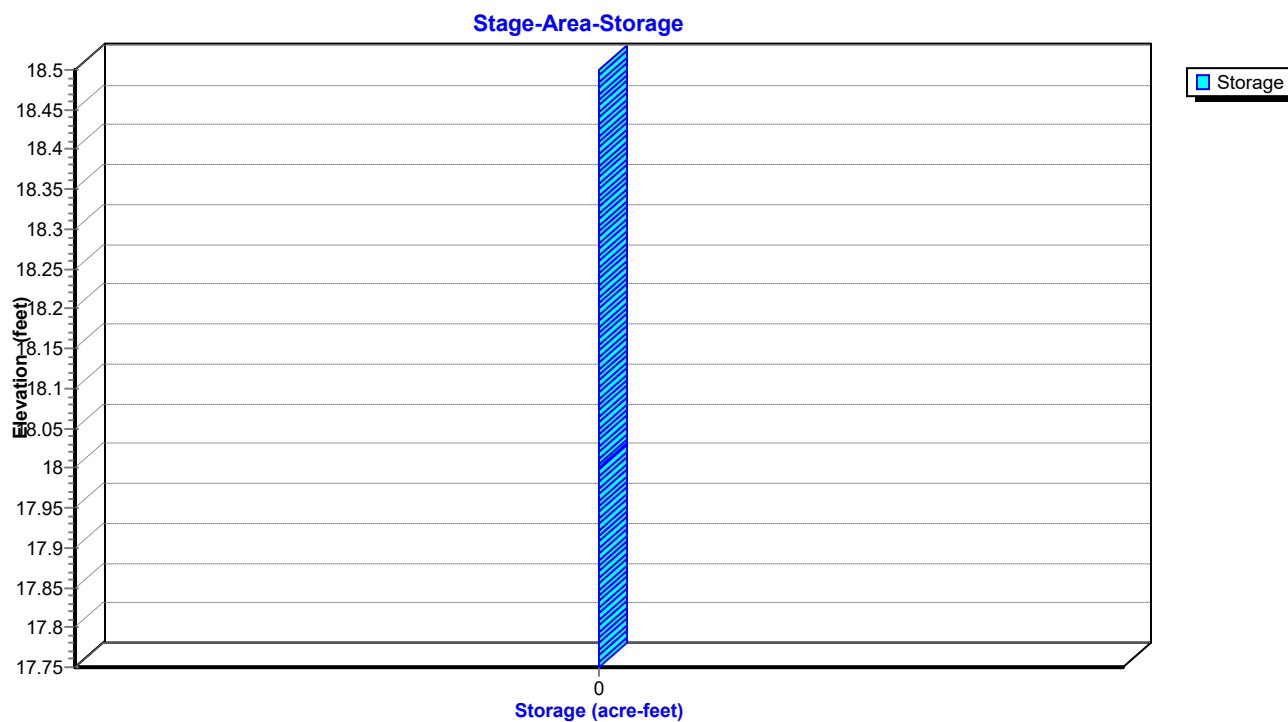
1=Culvert to SW Mgmt Facility (Inlet Controls 0.12 cfs @ 1.30 fps)
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.75' (Free Discharge)

2=Culvert to Flow Spreader (Controls 0.00 cfs)

Pond 7P: Diversion Structure 2B



Pond 7P: Diversion Structure 2B



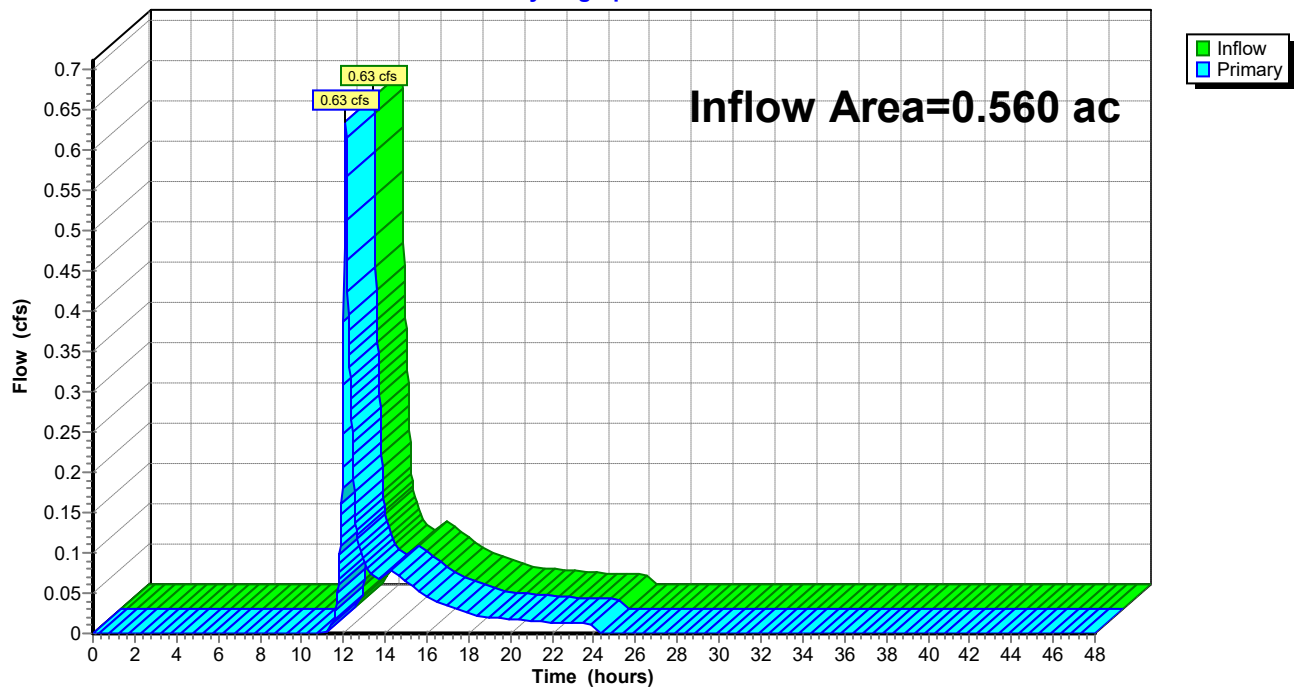
Summary for Link 5L: DESIGN LINE

Inflow Area = 0.560 ac, 15.61% Impervious, Inflow Depth = 1.18" for 10-year event
Inflow = 0.63 cfs @ 12.10 hrs, Volume= 0.055 af
Primary = 0.63 cfs @ 12.10 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Link 5L: DESIGN LINE

Hydrograph



921 Soundview SW Mgmt_12-28-2021.2*Type III 24-hr 25-year Rainfall=6.41"*

Prepared by ALP Engineering & Land. Arch. PLLC

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Time span=0.00-48.00 hrs, dt=0.02 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: XDA-1 TO DESIGN LINE Runoff Area=24,402 sf 0.00% Impervious Runoff Depth=2.19"
Flow Length=260' Tc=6.0 min CN=60 Runoff=1.38 cfs 0.102 af

Subcatchment 2S: FDA-1 TO DESIGN LINE Runoff Area=17,884 sf 2.19% Impervious Runoff Depth=2.28"
Flow Length=399' Tc=6.0 min CN=61 Runoff=1.06 cfs 0.078 af

Subcatchment 3S: FDA-2A TO SW Runoff Area=5,480 sf 43.41% Impervious Runoff Depth=3.84"
Tc=6.0 min CN=77 Runoff=0.56 cfs 0.040 af

Subcatchment 6S: FDA-2B Runoff Area=1,037 sf 100.00% Impervious Runoff Depth=6.17"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Reach 7R: Reach-1 Avg. Flow Depth=0.07' Max Vel=0.22 fps Inflow=0.28 cfs 0.019 af
n=0.400 L=55.0' S=0.1273 '/' Capacity=0.43 cfs Outflow=0.23 cfs 0.019 af

Reach 8R: Reach-2 Avg. Flow Depth=0.09' Max Vel=0.14 fps Inflow=0.23 cfs 0.019 af
n=0.400 L=64.0' S=0.0391 '/' Capacity=0.24 cfs Outflow=0.19 cfs 0.019 af

Pond 4P: SW MGMT PRACTICE Peak Elev=17.09' Storage=916 cf Inflow=0.60 cfs 0.051 af
Discarded=0.01 cfs 0.032 af Primary=0.28 cfs 0.017 af Outflow=0.28 cfs 0.050 af

Pond 6P: Diversion Structure 2A Peak Elev=17.78' Inflow=0.56 cfs 0.040 af
Primary=0.46 cfs 0.039 af Secondary=0.11 cfs 0.001 af Outflow=0.56 cfs 0.040 af

Pond 7P: Diversion Structure 2B Peak Elev=18.02' Inflow=0.15 cfs 0.012 af
Primary=0.15 cfs 0.012 af Secondary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.012 af

Link 5L: DESIGN LINE Inflow=1.06 cfs 0.097 af
Primary=1.06 cfs 0.097 af

Total Runoff Area = 1.120 ac Runoff Volume = 0.233 af Average Runoff Depth = 2.50"
92.20% Pervious = 1.033 ac 7.80% Impervious = 0.087 ac

Summary for Subcatchment 1S: XDA-1 TO DESIGN LINE

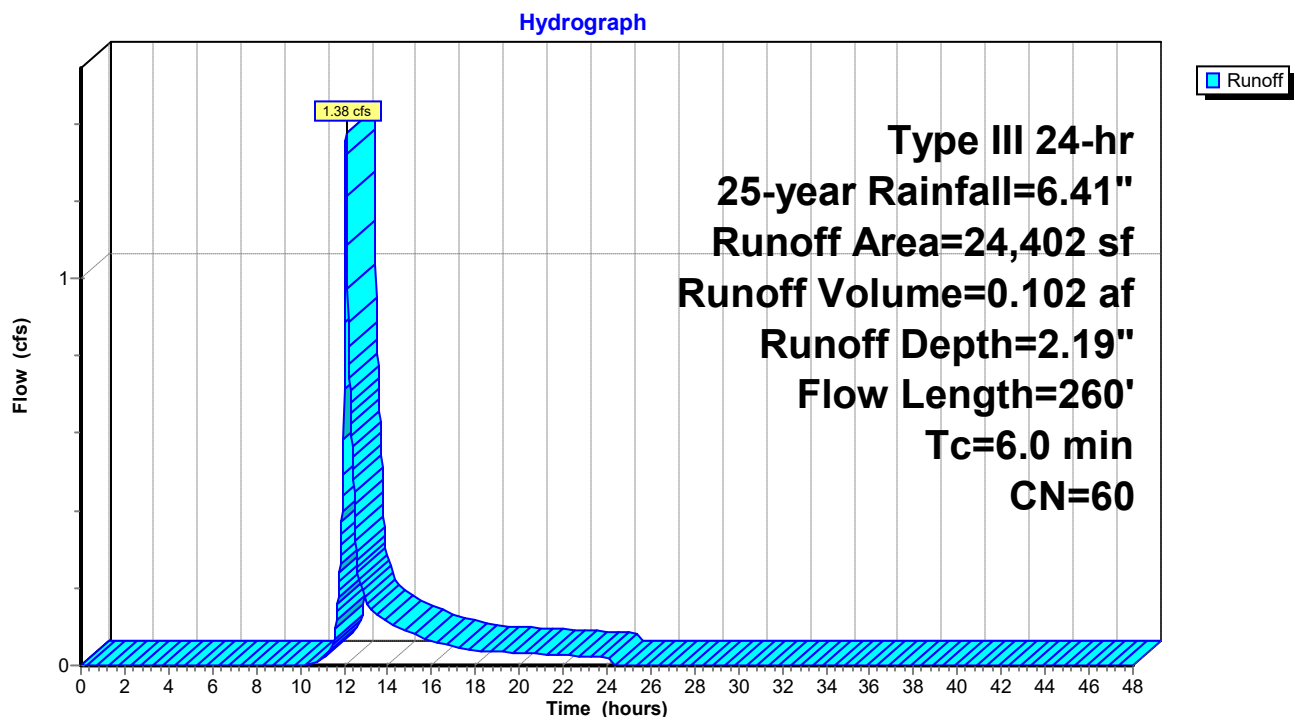
Runoff = 1.38 cfs @ 12.10 hrs, Volume= 0.102 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-year Rainfall=6.41"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
19,374	56	Brush, Fair, HSG B
24,402	60	Weighted Average
24,402		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	31	0.0516	0.14		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
0.2	36	0.2000	3.13		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
0.2	44	0.1954	3.09		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0786	1.96		Shallow Concentrated Flow, D-E
					Short Grass Pasture Kv= 7.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.9					Direct Entry, Tc Factor
6.0	260	Total			

Subcatchment 1S: XDA-1 TO DESIGN LINE



Summary for Subcatchment 2S: FDA-1 TO DESIGN LINE

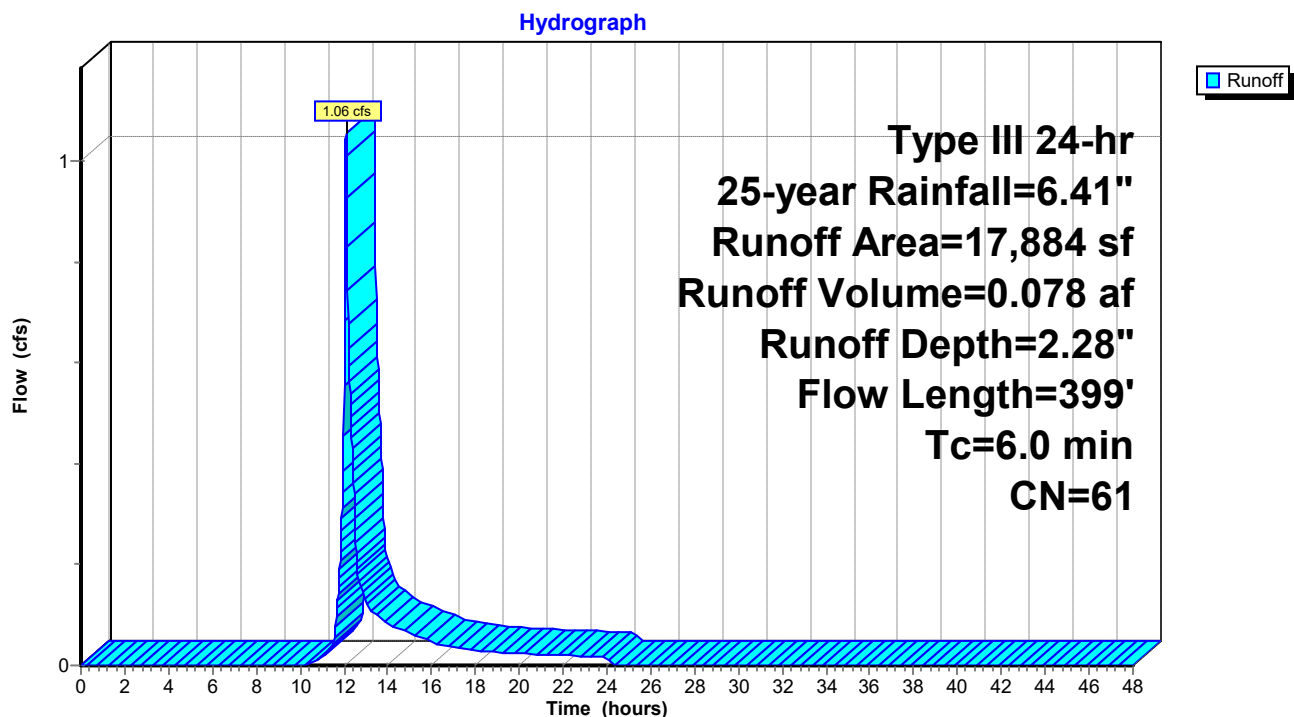
Runoff = 1.06 cfs @ 12.09 hrs, Volume= 0.078 af, Depth= 2.28"
Routed to Link 5L : DESIGN LINE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-year Rainfall=6.41"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
5,993	48	Brush, Good, HSG B
5,229	61	>75% Grass cover, Good, HSG B
* 1,242	61	Deck (use lawn for under deck), HSG B
* 392	98	Pool, HSG B
17,884	61	Weighted Average
17,492		97.81% Pervious Area
392		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	35	0.0657	0.16		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
1.0	220	0.0659	3.85		Shallow Concentrated Flow, B-C
					Grassed Waterway Kv= 15.0 fps
0.3	65	0.0769	4.16		Shallow Concentrated Flow, C-D
					Grassed Waterway Kv= 15.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.6					Direct Entry, Tc Factor
6.0	399	Total			

Subcatchment 2S: FDA-1 TO DESIGN LINE



Summary for Subcatchment 3S: FDA-2A TO SW PRACTICE

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 3.84"
Routed to Pond 6P : Diversion Structure 2A

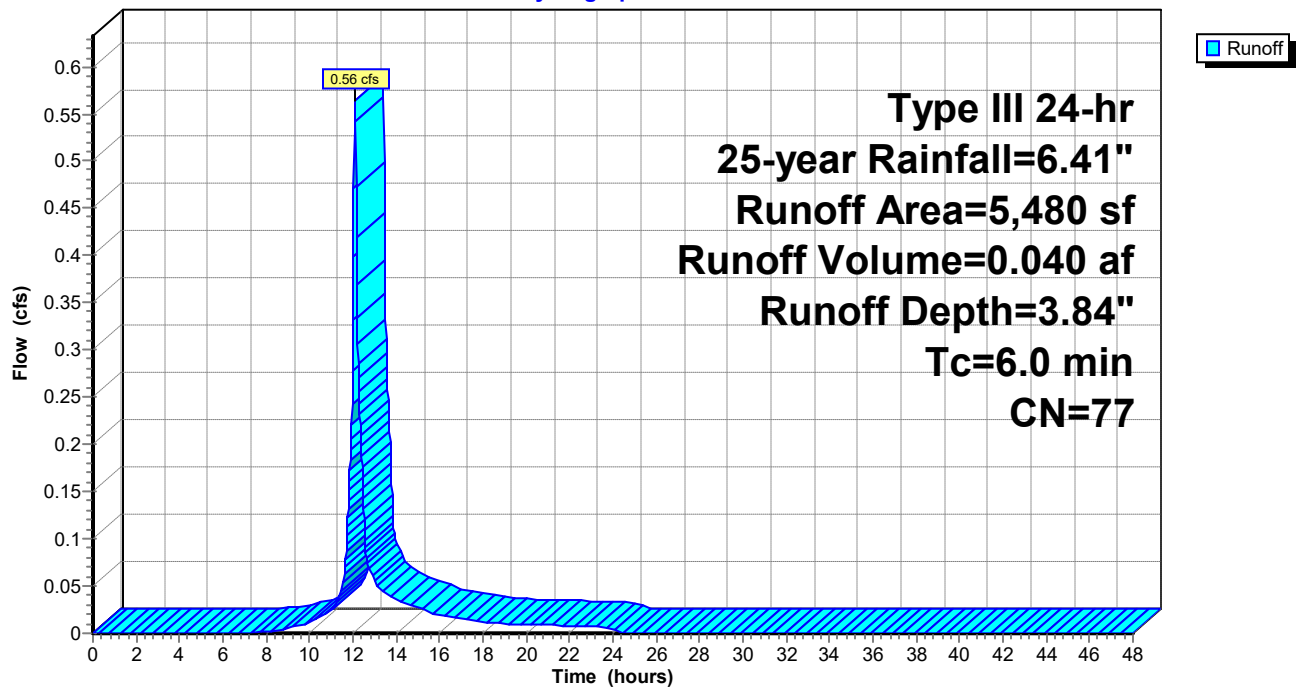
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-year Rainfall=6.41"

	Area (sf)	CN	Description
*	2,379	98	Impervious surfaces, HSG B
	3,101	61	>75% Grass cover, Good, HSG B
	5,480	77	Weighted Average
	3,101		56.59% Pervious Area
	2,379		43.41% Impervious Area

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

Subcatchment 3S: FDA-2A TO SW PRACTICE

Hydrograph



Summary for Subcatchment 6S: FDA-2B

Runoff = 0.15 cfs @ 12.08 hrs, Volume= 0.012 af, Depth= 6.17"
 Routed to Pond 7P : Diversion Structure 2B

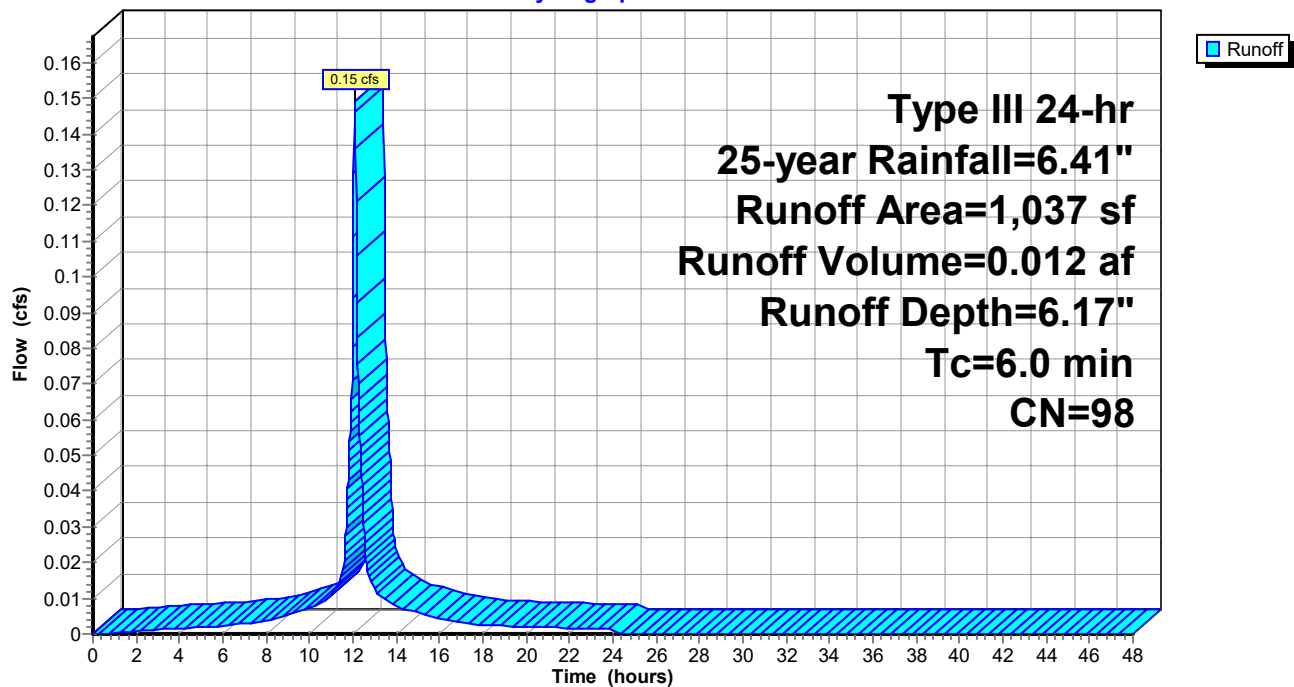
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 25-year Rainfall=6.41"

Area (sf)	CN	Description
1,037	98	Roofs, HSG B
1,037		100.00% Impervious Area

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

Subcatchment 6S: FDA-2B

Hydrograph



Summary for Reach 7R: Reach-1

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 1.50" for 25-year event
 Inflow = 0.28 cfs @ 12.32 hrs, Volume= 0.019 af
 Outflow = 0.23 cfs @ 12.47 hrs, Volume= 0.019 af, Atten= 19%, Lag= 8.9 min
 Routed to Reach 8R : Reach-2

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Max. Velocity= 0.22 fps, Min. Travel Time= 4.2 min
 Avg. Velocity= 0.05 fps, Avg. Travel Time= 18.8 min

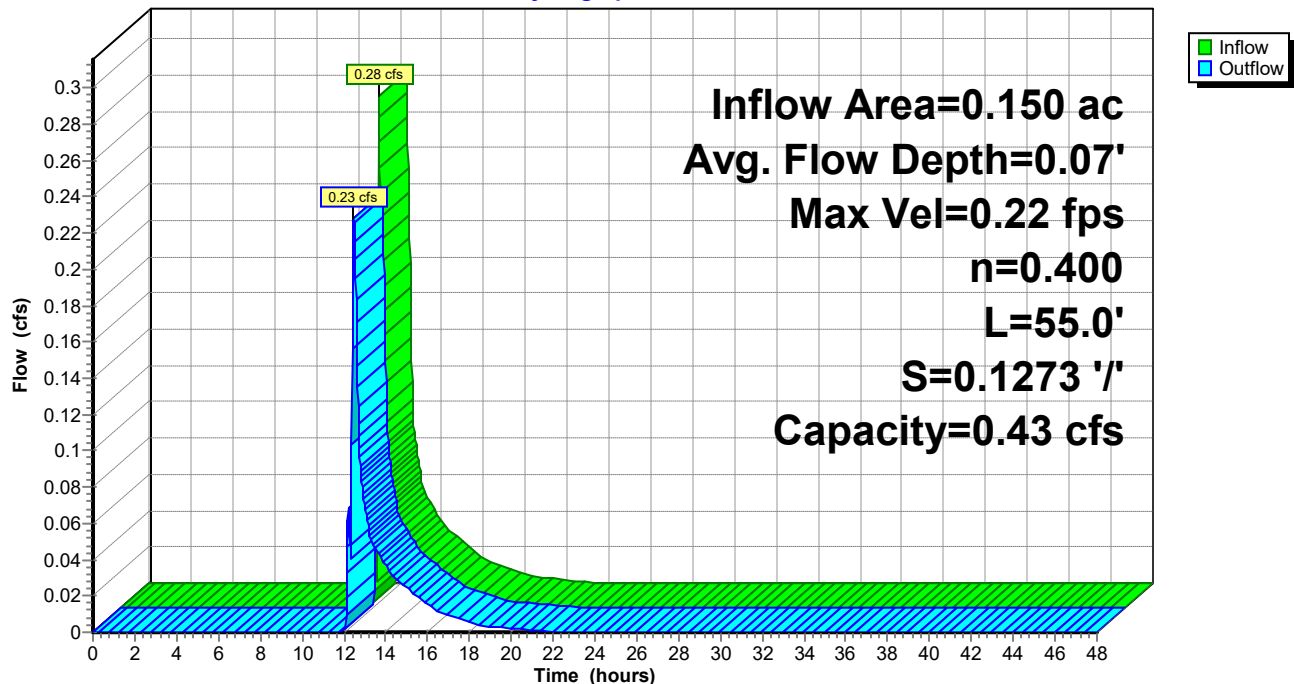
Peak Storage= 57 cf @ 12.40 hrs
 Average Depth at Peak Storage= 0.07' , Surface Width= 15.41'
 Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.43 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush
 Side Slope Z-value= 3.0 '/' Top Width= 15.60'
 Length= 55.0' Slope= 0.1273 '/'
 Inlet Invert= 15.00', Outlet Invert= 8.00'



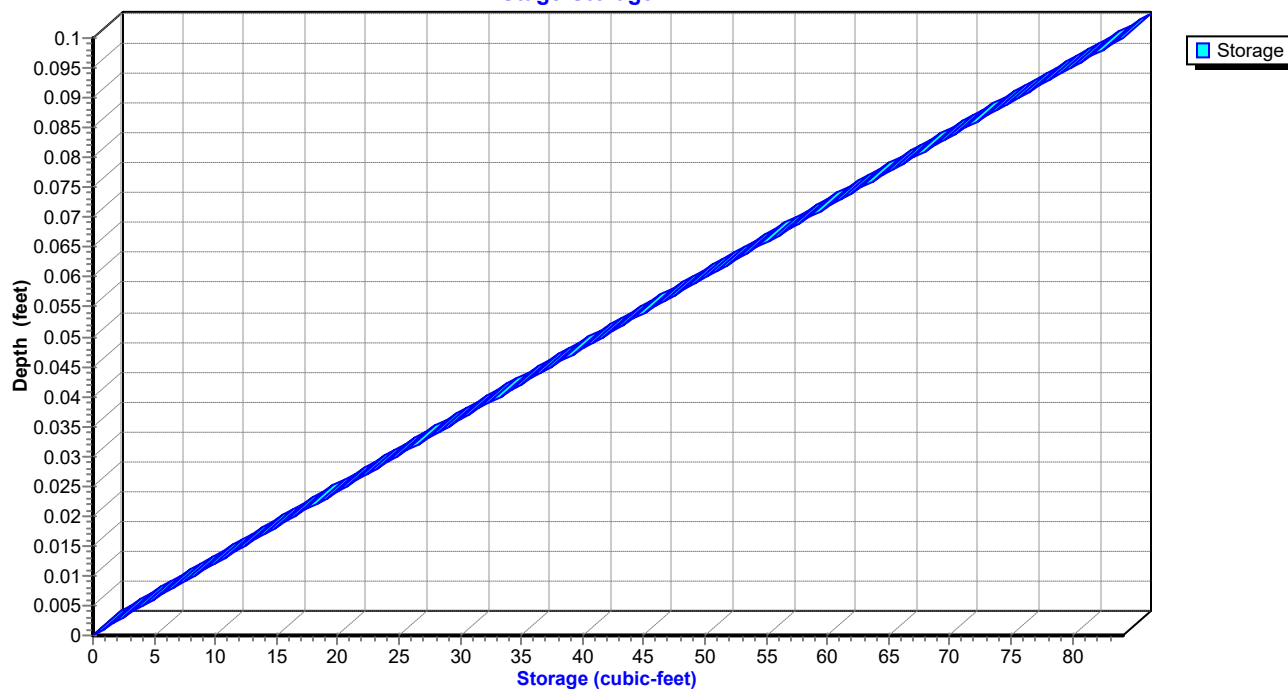
Reach 7R: Reach-1

Hydrograph



Reach 7R: Reach-1

Stage-Storage



Summary for Reach 8R: Reach-2

[62] Hint: Exceeded Reach 7R OUTLET depth by 0.04' @ 12.64 hrs

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 1.50" for 25-year event
Inflow = 0.23 cfs @ 12.47 hrs, Volume= 0.019 af
Outflow = 0.19 cfs @ 12.70 hrs, Volume= 0.019 af, Atten= 18%, Lag= 13.7 min
Routed to Link 5L : DESIGN LINE

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Max. Velocity= 0.14 fps, Min. Travel Time= 7.5 min
Avg. Velocity= 0.02 fps, Avg. Travel Time= 43.1 min

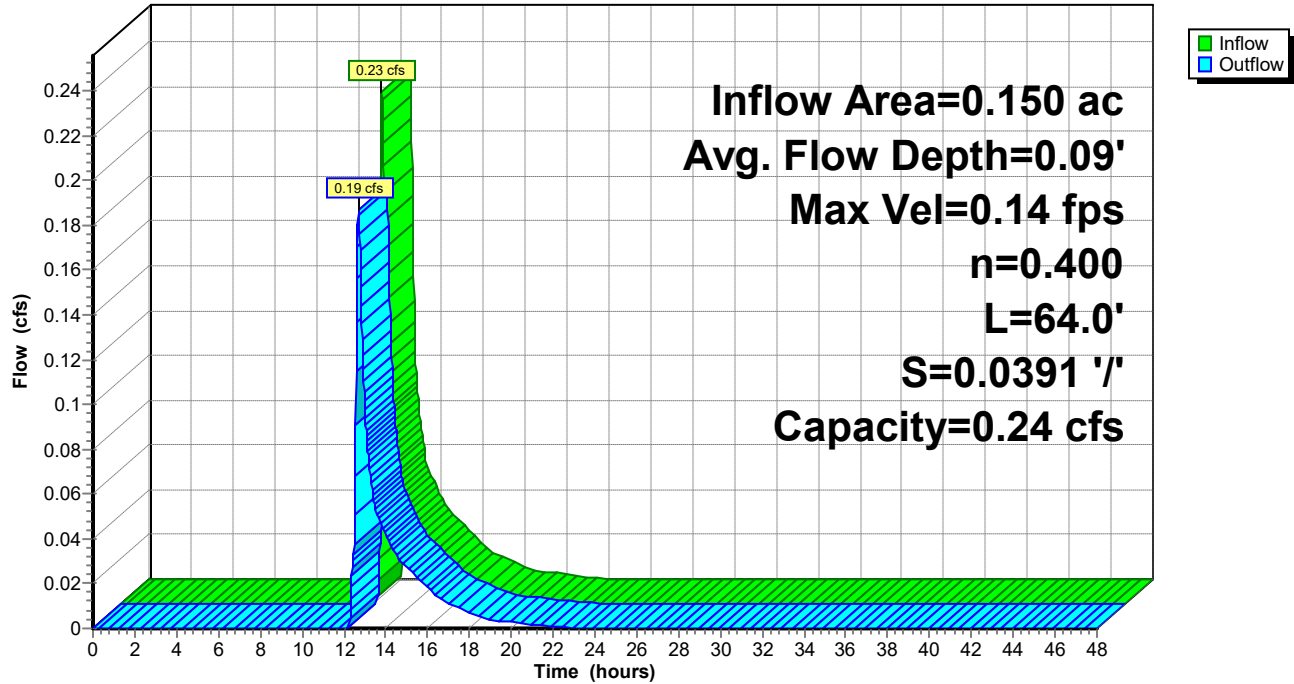
Peak Storage= 84 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.09', Surface Width= 15.52'
Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.24 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush
Side Slope Z-value= 3.0 '/' Top Width= 15.60'
Length= 64.0' Slope= 0.0391 '/'
Inlet Invert= 8.00', Outlet Invert= 5.50'



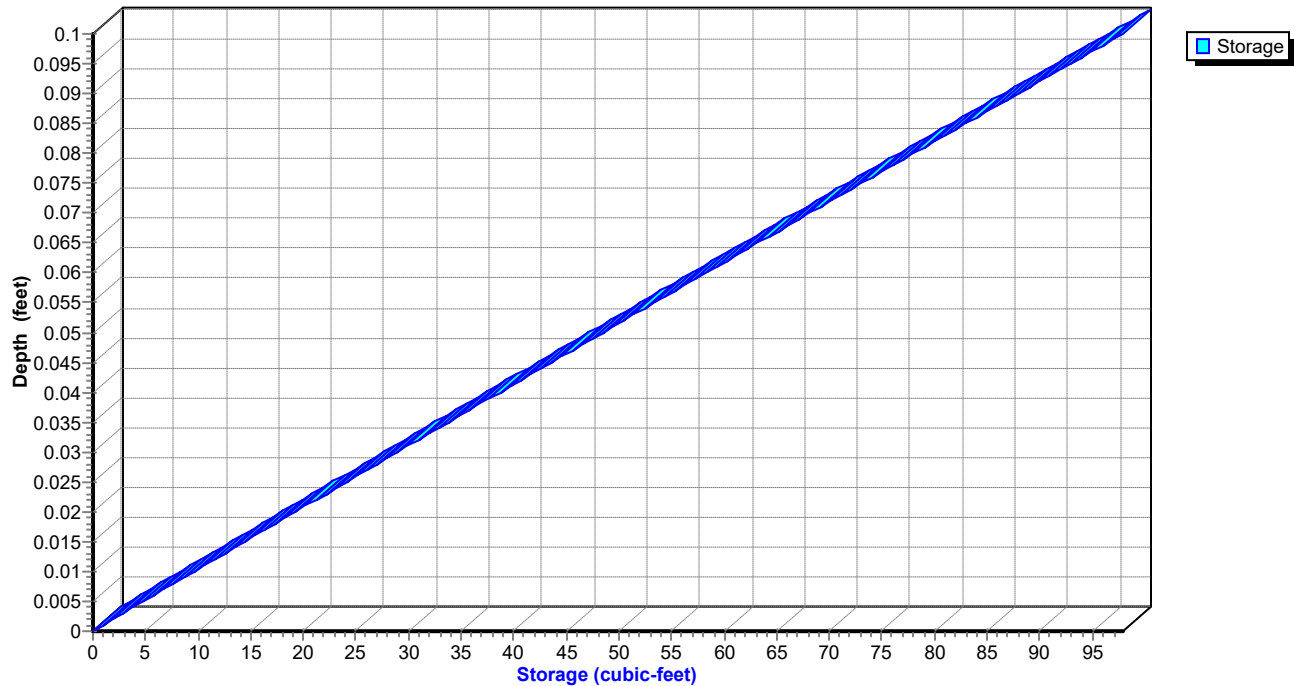
Reach 8R: Reach-2

Hydrograph



Reach 8R: Reach-2

Stage-Storage



Summary for Pond 4P: SW MGMT PRACTICE

[79] Warning: Submerged Pond 6P Primary device # 1 OUTLET by 1.17'

[79] Warning: Submerged Pond 7P Primary device # 1 OUTLET by 0.84'

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 4.09" for 25-year event
 Inflow = 0.60 cfs @ 12.09 hrs, Volume= 0.051 af
 Outflow = 0.28 cfs @ 12.32 hrs, Volume= 0.050 af, Atten= 53%, Lag= 14.3 min
 Discarded = 0.01 cfs @ 11.48 hrs, Volume= 0.032 af
 Primary = 0.28 cfs @ 12.32 hrs, Volume= 0.017 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 17.09' @ 12.32 hrs Surf.Area= 421 sf Storage= 916 cf

Plug-Flow detention time= 576.6 min calculated for 0.050 af (97% of inflow)

Center-of-Mass det. time= 559.7 min (1,363.3 - 803.6)

Volume	Invert	Avail.Storage	Storage Description
#1B	13.71'	332 cf	20.83'W x 17.50'L x 3.54'H Field A 1,291 cf Overall - 462 cf Embedded = 829 cf x 40.0% Voids
#2B	14.21'	462 cf	Cultec R-330XLHD x 8 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
#3	14.50'	156 cf	6.00'D x 2.75'H Vertical Cone/Cylinder x 2
		949 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.00'	6.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Discarded	13.71'	1.000 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.01 cfs @ 11.48 hrs HW=14.50' (Free Discharge)↑ **2=Exfiltration** (Exfiltration Controls 0.01 cfs)**Primary OutFlow** Max=0.27 cfs @ 12.32 hrs HW=17.09' (Free Discharge)↑ **1=Orifice/Grate** (Weir Controls 0.27 cfs @ 0.97 fps)

Pond 4P: SW MGMT PRACTICE - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Stone Base + 30.5" Chamber Height + 6.0" Stone Cover = 3.54' Field Height

8 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 462.0 cf Chamber Storage

1,291.2 cf Field - 462.0 cf Chambers = 829.3 cf Stone x 40.0% Voids = 331.7 cf Stone Storage

Chamber Storage + Stone Storage = 793.7 cf = 0.018 af

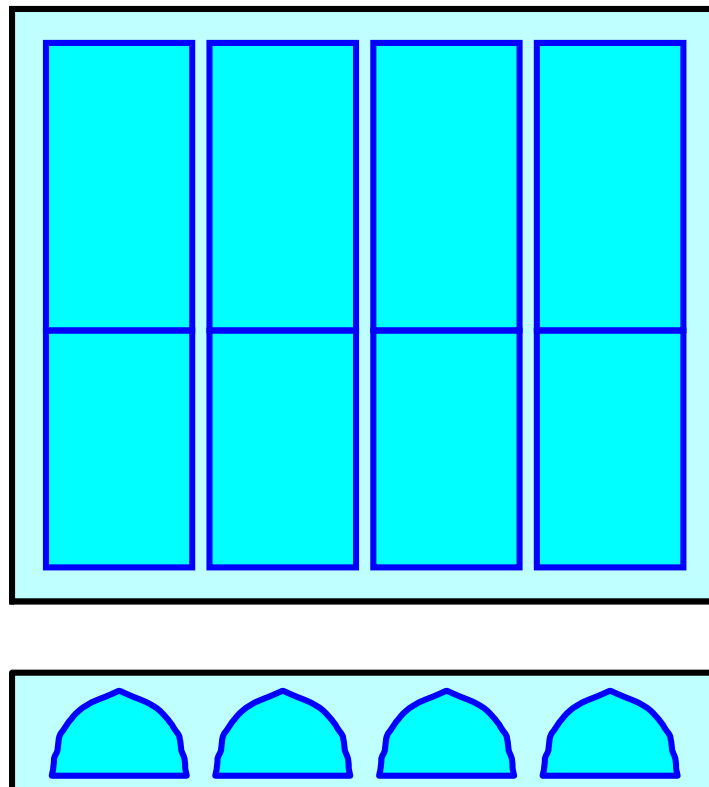
Overall Storage Efficiency = 61.5%

Overall System Size = 17.50' x 20.83' x 3.54'

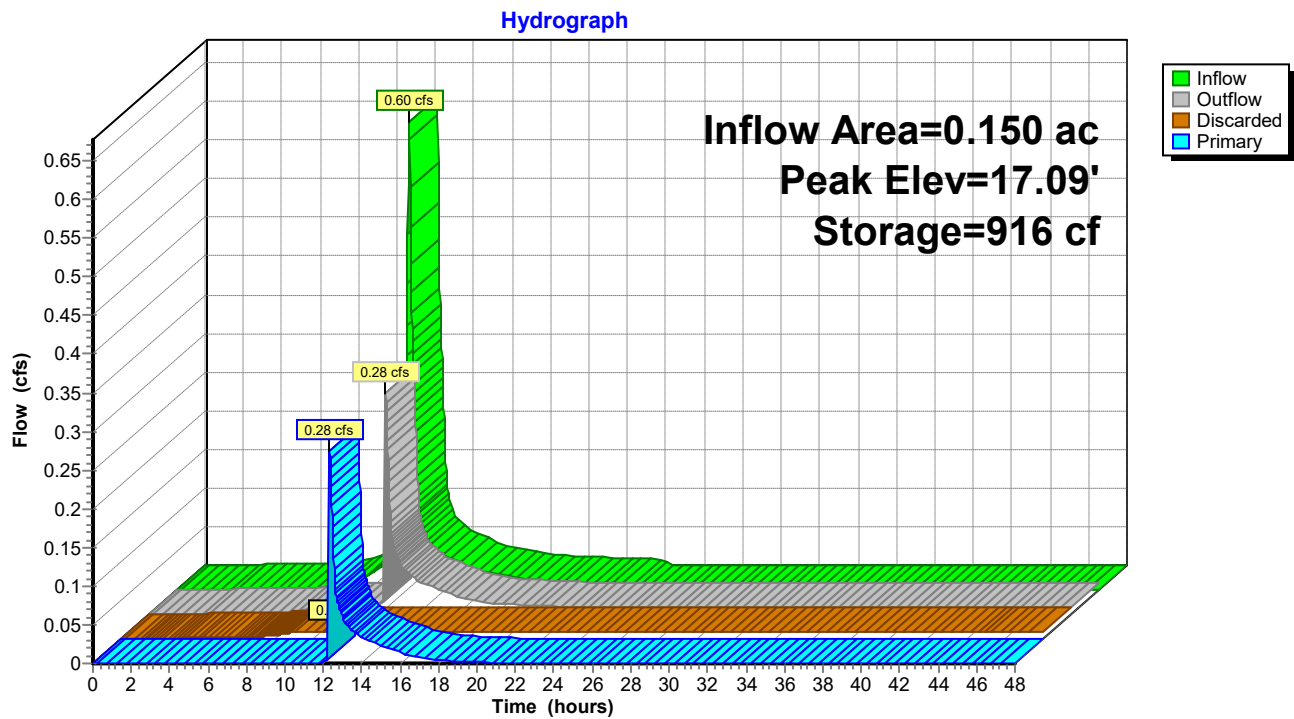
8 Chambers

47.8 cy Field

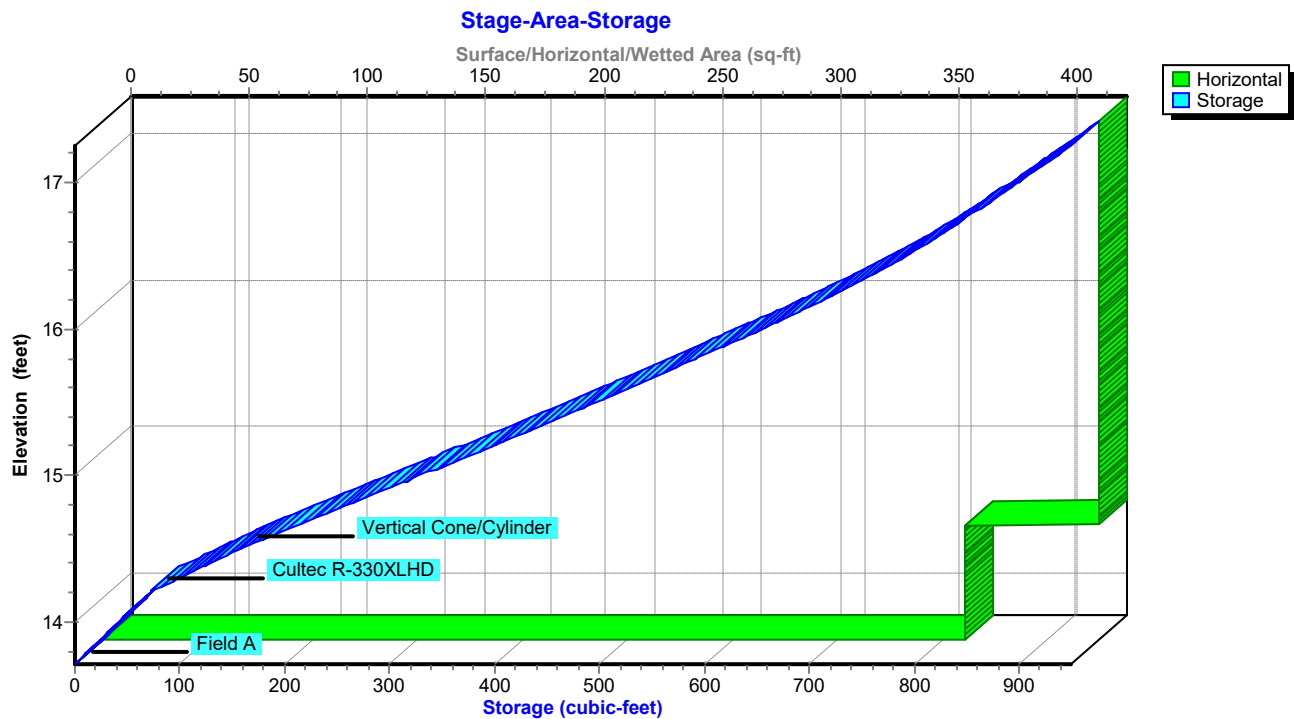
30.7 cy Stone



Pond 4P: SW MGMT PRACTICE



Pond 4P: SW MGMT PRACTICE



Summary for Pond 6P: Diversion Structure 2A

[57] Hint: Peaked at 17.78' (Flood elevation advised)

Inflow Area = 0.126 ac, 43.41% Impervious, Inflow Depth = 3.84" for 25-year event
 Inflow = 0.56 cfs @ 12.09 hrs, Volume= 0.040 af
 Outflow = 0.56 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.46 cfs @ 12.09 hrs, Volume= 0.039 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.11 cfs @ 12.09 hrs, Volume= 0.001 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 17.78' @ 12.09 hrs

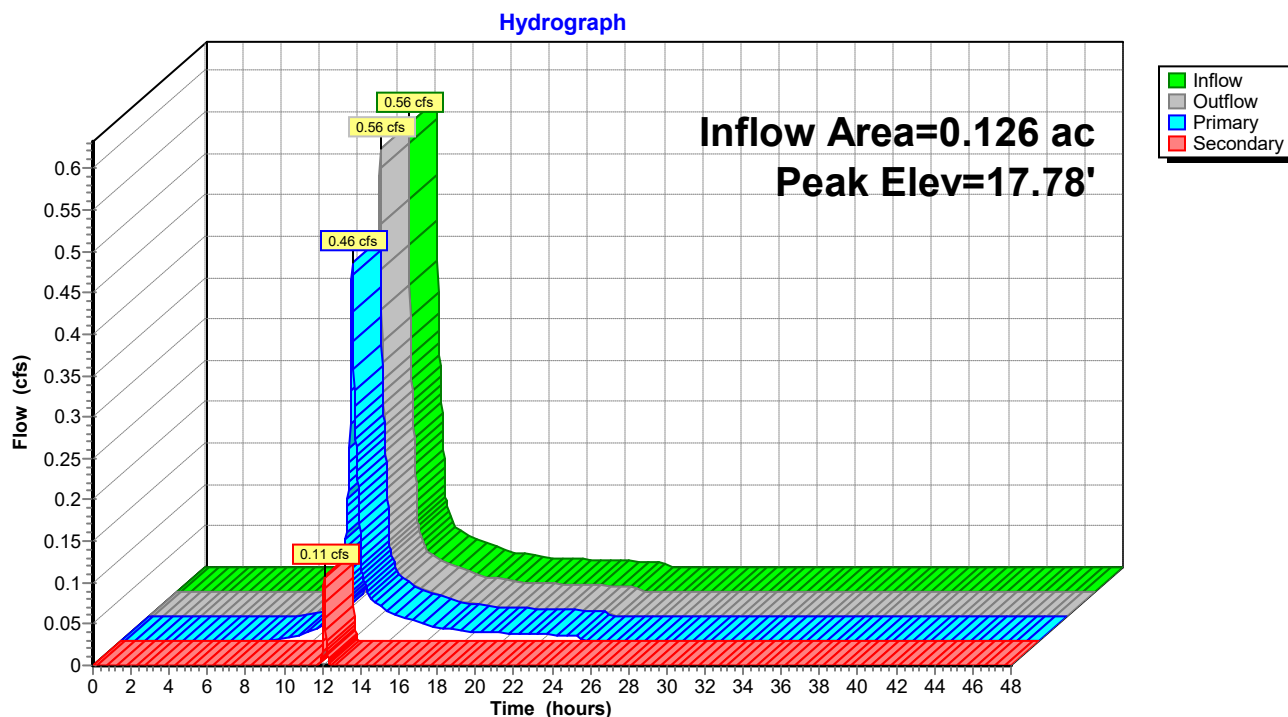
Device	Routing	Invert	Outlet Devices
#1	Primary	17.33'	8.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.33' / 15.92' S= 0.4029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	17.58'	8.0" Round Culvert to Flow Spreader L= 30.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.58' / 15.08' S= 0.0820 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.45 cfs @ 12.09 hrs HW=17.78' (Free Discharge)

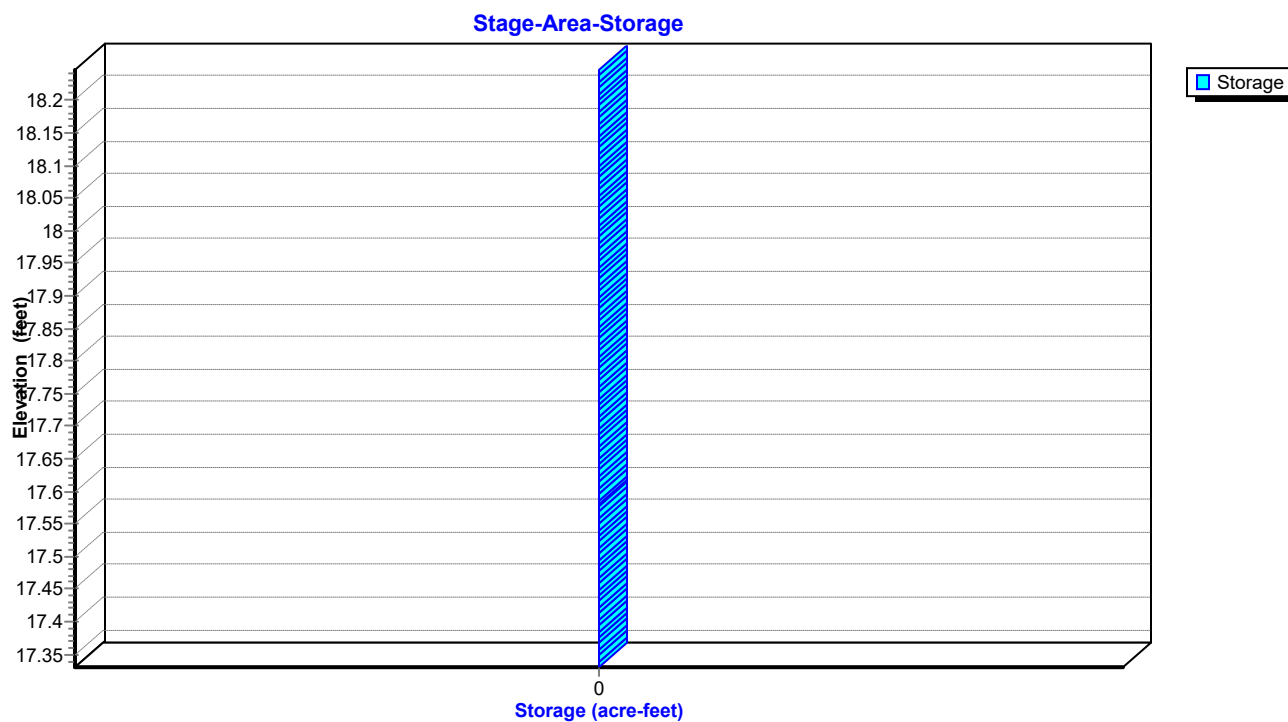
1=Culvert to SW Mgmt Facility (Inlet Controls 0.45 cfs @ 1.81 fps)
Secondary OutFlow Max=0.11 cfs @ 12.09 hrs HW=17.78' (Free Discharge)

2=Culvert to Flow Spreader (Inlet Controls 0.11 cfs @ 1.21 fps)

Pond 6P: Diversion Structure 2A



Pond 6P: Diversion Structure 2A



Summary for Pond 7P: Diversion Structure 2B

[57] Hint: Peaked at 18.02' (Flood elevation advised)

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 6.17" for 25-year event
 Inflow = 0.15 cfs @ 12.08 hrs, Volume= 0.012 af
 Outflow = 0.15 cfs @ 12.08 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 12.08 hrs, Volume= 0.012 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.00 cfs @ 12.08 hrs, Volume= 0.000 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 18.02' @ 12.08 hrs

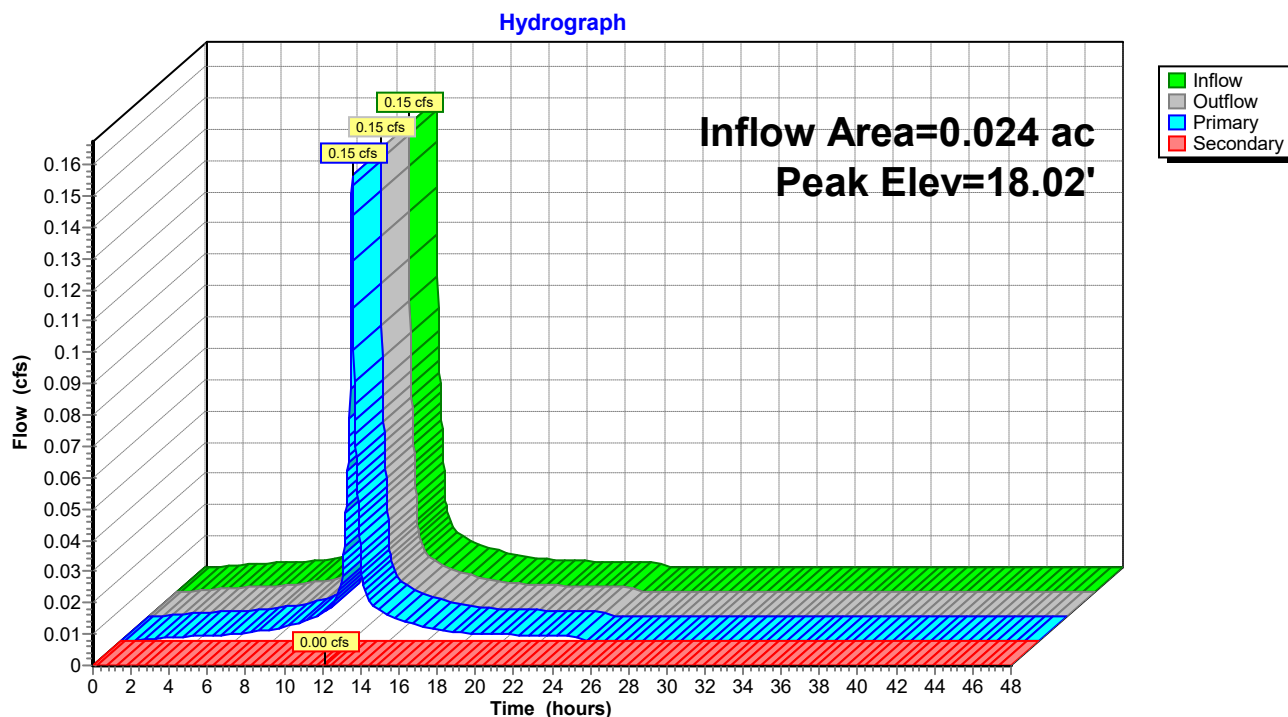
Device	Routing	Invert	Outlet Devices
#1	Primary	17.75'	6.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.75' / 16.25' S= 0.4286 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	18.00'	6.0" Round Culvert to Flow Spreader L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.00' / 15.25' S= 0.1019 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.15 cfs @ 12.08 hrs HW=18.02' (Free Discharge)

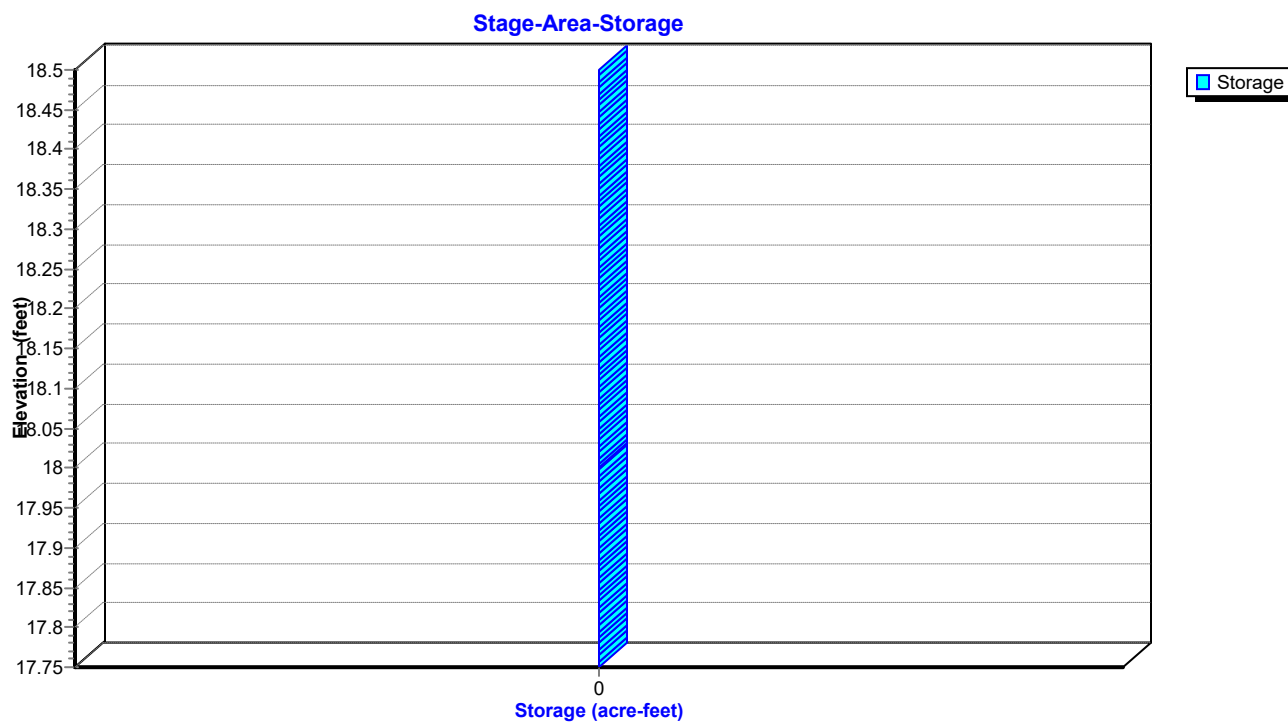
1=Culvert to SW Mgmt Facility (Inlet Controls 0.15 cfs @ 1.39 fps)
Secondary OutFlow Max=0.00 cfs @ 12.08 hrs HW=18.02' (Free Discharge)

2=Culvert to Flow Spreader (Inlet Controls 0.00 cfs @ 0.35 fps)

Pond 7P: Diversion Structure 2B



Pond 7P: Diversion Structure 2B

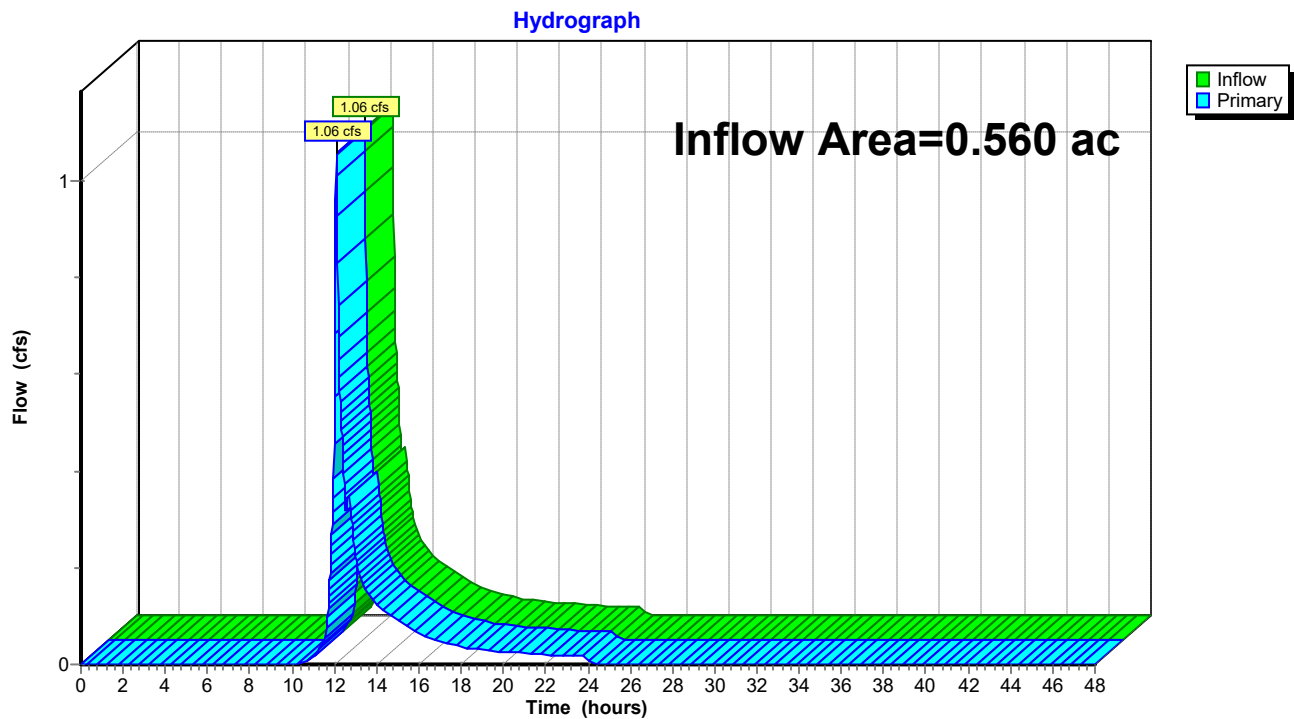


Summary for Link 5L: DESIGN LINE

Inflow Area = 0.560 ac, 15.61% Impervious, Inflow Depth = 2.07" for 25-year event
 Inflow = 1.06 cfs @ 12.09 hrs, Volume= 0.097 af
 Primary = 1.06 cfs @ 12.09 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Link 5L: DESIGN LINE



921 Soundview SW Mgmt_12-28-2021.2*Type III 24-hr 100-year Rainfall=9.03"*

Prepared by ALP Engineering & Land. Arch. PLLC

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Time span=0.00-48.00 hrs, dt=0.02 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: XDA-1 TO DESIGN LINE Runoff Area=24,402 sf 0.00% Impervious Runoff Depth=4.12"
Flow Length=260' Tc=6.0 min CN=60 Runoff=2.68 cfs 0.193 af

Subcatchment 2S: FDA-1 TO DESIGN LINE Runoff Area=17,884 sf 2.19% Impervious Runoff Depth=4.25"
Flow Length=399' Tc=6.0 min CN=61 Runoff=2.03 cfs 0.145 af

Subcatchment 3S: FDA-2A TO SW Runoff Area=5,480 sf 43.41% Impervious Runoff Depth=6.23"
Tc=6.0 min CN=77 Runoff=0.91 cfs 0.065 af

Subcatchment 6S: FDA-2B Runoff Area=1,037 sf 100.00% Impervious Runoff Depth=8.79"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.017 af

Reach 7R: Reach-1 Avg. Flow Depth=0.18' Max Vel=0.36 fps Inflow=1.09 cfs 0.047 af
n=0.400 L=55.0' S=0.1273 '/' Capacity=0.43 cfs Outflow=0.98 cfs 0.047 af

Reach 8R: Reach-2 Avg. Flow Depth=0.23' Max Vel=0.21 fps Inflow=0.98 cfs 0.047 af
n=0.400 L=64.0' S=0.0391 '/' Capacity=0.24 cfs Outflow=0.75 cfs 0.047 af

Pond 4P: SW MGMT PRACTICE Peak Elev=17.19' Storage=938 cf Inflow=0.85 cfs 0.078 af
Discarded=0.01 cfs 0.034 af Primary=0.82 cfs 0.043 af Outflow=0.83 cfs 0.076 af

Pond 6P: Diversion Structure 2A Peak Elev=17.90' Inflow=0.91 cfs 0.065 af
Primary=0.65 cfs 0.061 af Secondary=0.26 cfs 0.005 af Outflow=0.91 cfs 0.065 af

Pond 7P: Diversion Structure 2B Peak Elev=18.07' Inflow=0.21 cfs 0.017 af
Primary=0.20 cfs 0.017 af Secondary=0.01 cfs 0.000 af Outflow=0.21 cfs 0.017 af

Link 5L: DESIGN LINE Inflow=2.03 cfs 0.193 af
Primary=2.03 cfs 0.193 af

Total Runoff Area = 1.120 ac Runoff Volume = 0.421 af Average Runoff Depth = 4.50"
92.20% Pervious = 1.033 ac 7.80% Impervious = 0.087 ac

Summary for Subcatchment 1S: XDA-1 TO DESIGN LINE

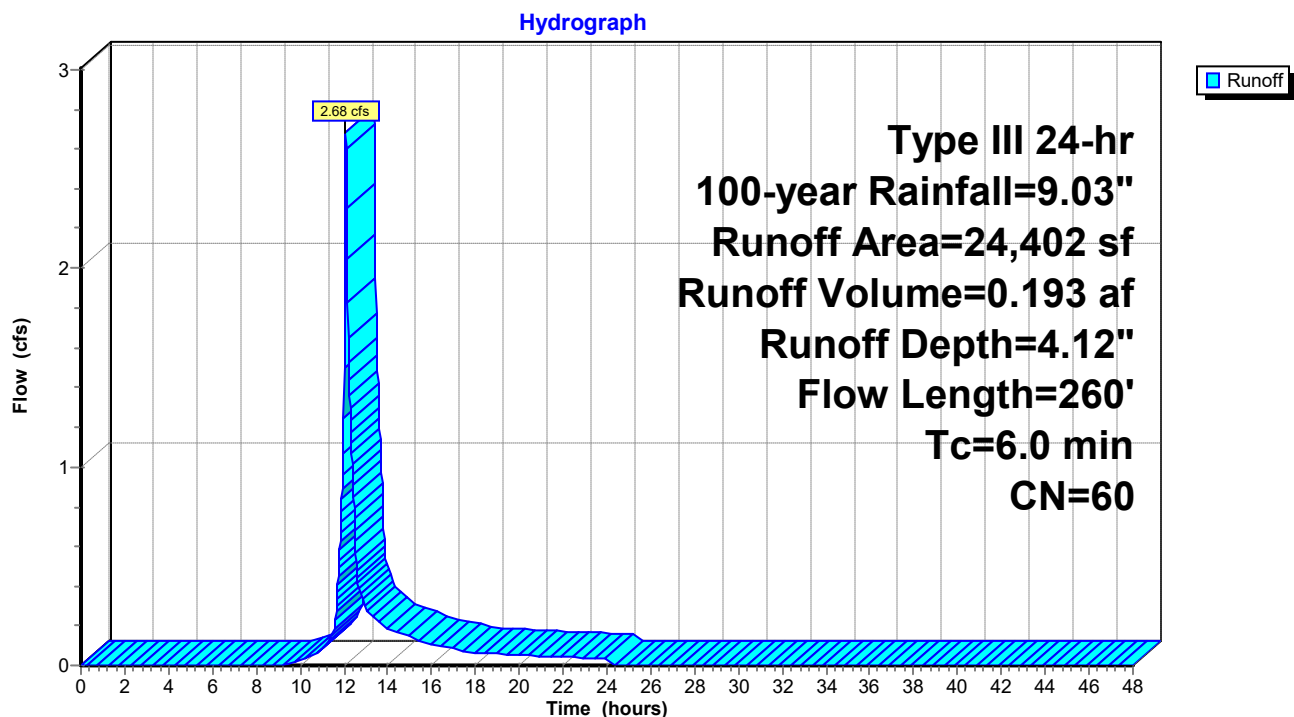
Runoff = 2.68 cfs @ 12.09 hrs, Volume= 0.193 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
Type III 24-hr 100-year Rainfall=9.03"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
19,374	56	Brush, Fair, HSG B
24,402	60	Weighted Average
24,402		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	31	0.0516	0.14		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
0.2	36	0.2000	3.13		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
0.2	44	0.1954	3.09		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps
0.6	70	0.0786	1.96		Shallow Concentrated Flow, D-E
					Short Grass Pasture Kv= 7.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.9					Direct Entry, Tc Factor
6.0	260	Total			

Subcatchment 1S: XDA-1 TO DESIGN LINE



Summary for Subcatchment 2S: FDA-1 TO DESIGN LINE

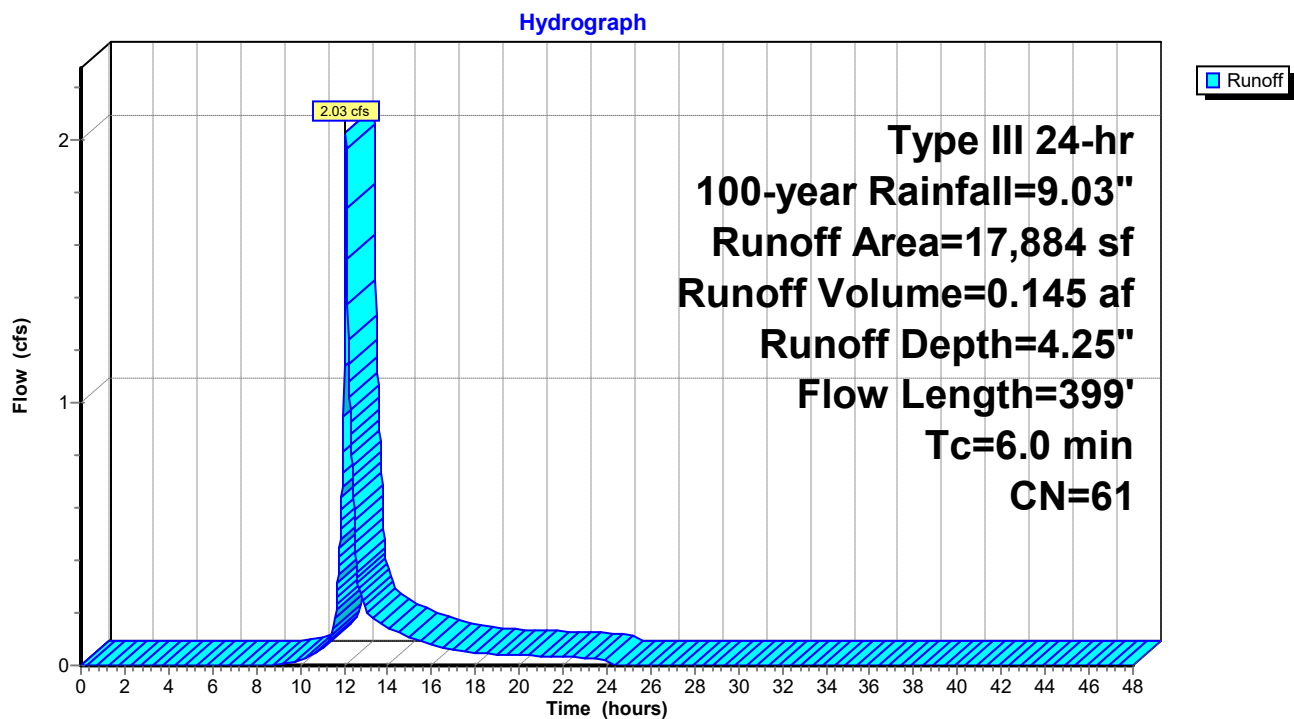
Runoff = 2.03 cfs @ 12.09 hrs, Volume= 0.145 af, Depth= 4.25"
 Routed to Link 5L : DESIGN LINE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 100-year Rainfall=9.03"

Area (sf)	CN	Description
5,028	73	Brush, Good, HSG D
5,993	48	Brush, Good, HSG B
5,229	61	>75% Grass cover, Good, HSG B
* 1,242	61	Deck (use lawn for under deck), HSG B
* 392	98	Pool, HSG B
17,884	61	Weighted Average
17,492		97.81% Pervious Area
392		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	35	0.0657	0.16		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.45"
1.0	220	0.0659	3.85		Shallow Concentrated Flow, B-C
					Grassed Waterway Kv= 15.0 fps
0.3	65	0.0769	4.16		Shallow Concentrated Flow, C-D
					Grassed Waterway Kv= 15.0 fps
0.2	30	0.2166	3.26		Shallow Concentrated Flow, E-F
					Short Grass Pasture Kv= 7.0 fps
0.2	49	0.0667	3.87		Shallow Concentrated Flow, F-G
					Grassed Waterway Kv= 15.0 fps
0.6					Direct Entry, Tc Factor
6.0	399	Total			

Subcatchment 2S: FDA-1 TO DESIGN LINE



Summary for Subcatchment 3S: FDA-2A TO SW PRACTICE

Runoff = 0.91 cfs @ 12.09 hrs, Volume= 0.065 af, Depth= 6.23"
 Routed to Pond 6P : Diversion Structure 2A

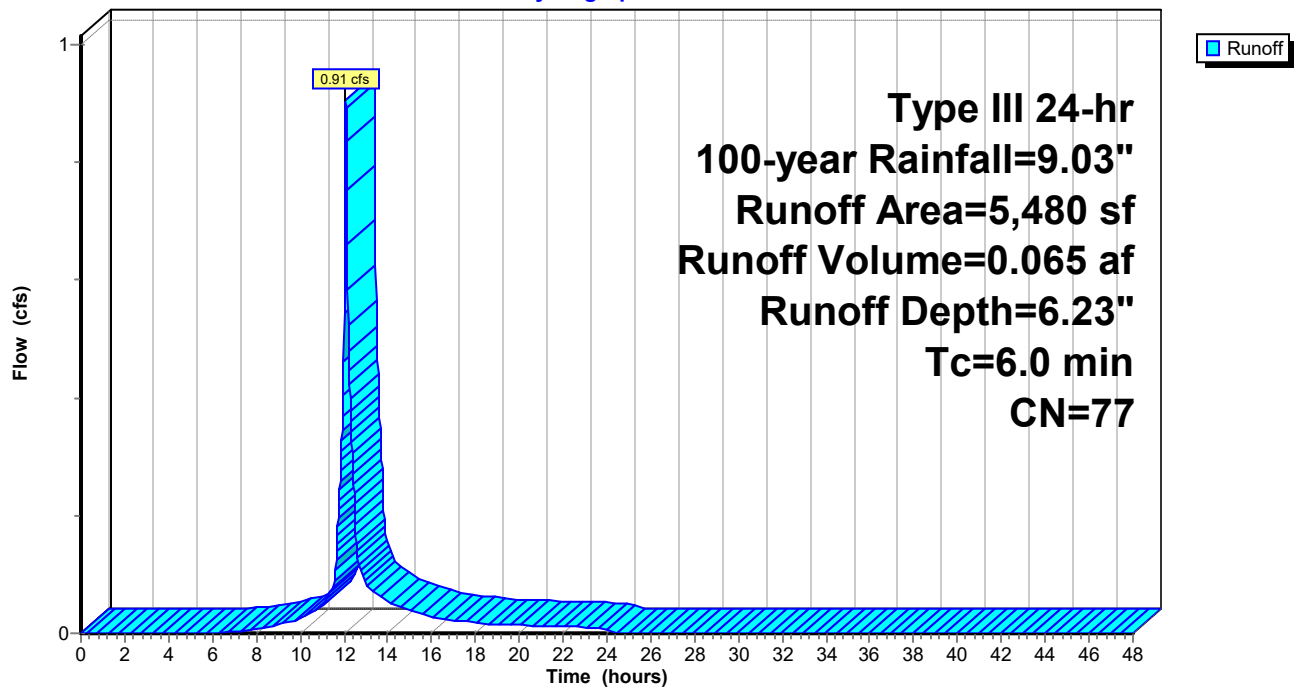
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 100-year Rainfall=9.03"

	Area (sf)	CN	Description
*	2,379	98	Impervious surfaces, HSG B
	3,101	61	>75% Grass cover, Good, HSG B
	5,480	77	Weighted Average
	3,101		56.59% Pervious Area
	2,379		43.41% Impervious Area

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

Subcatchment 3S: FDA-2A TO SW PRACTICE

Hydrograph



Summary for Subcatchment 6S: FDA-2B

Runoff = 0.21 cfs @ 12.08 hrs, Volume= 0.017 af, Depth= 8.79"
 Routed to Pond 7P : Diversion Structure 2B

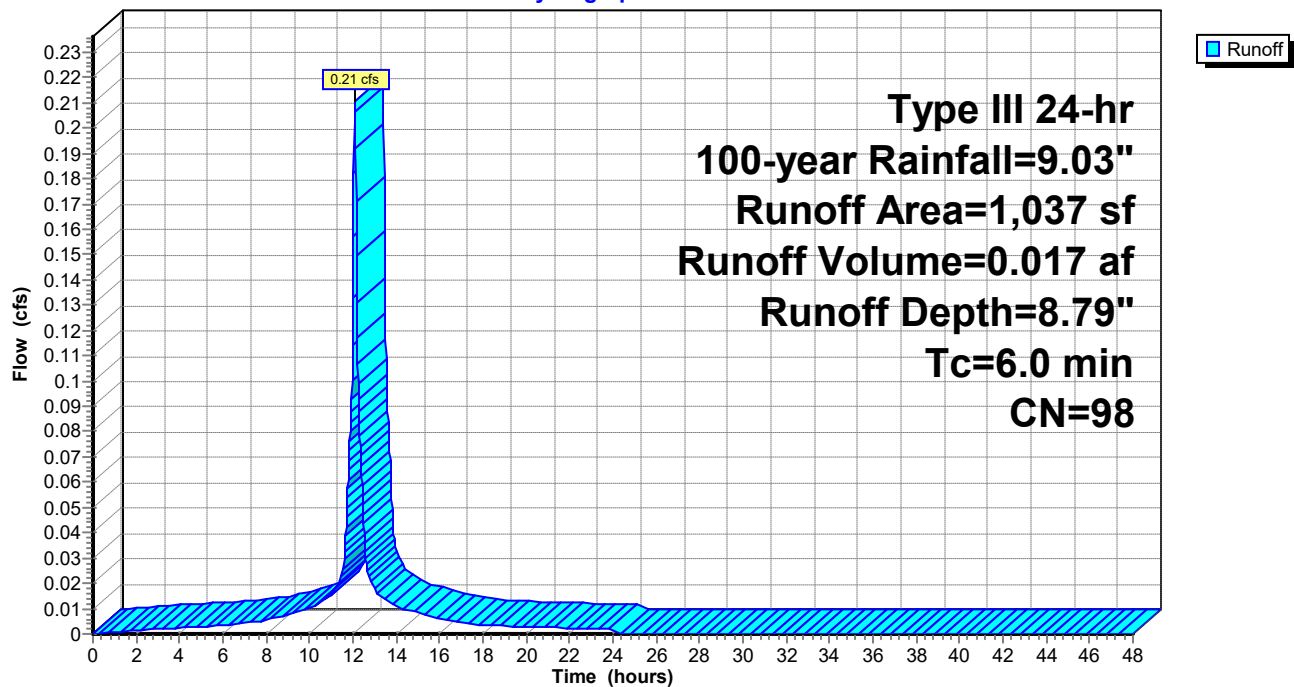
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Type III 24-hr 100-year Rainfall=9.03"

Area (sf)	CN	Description
1,037	98	Roofs, HSG B
1,037		100.00% Impervious Area

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

Subcatchment 6S: FDA-2B

Hydrograph



Summary for Reach 7R: Reach-1

[91] Warning: Storage range exceeded by 0.08'

[55] Hint: Peak inflow is 252% of Manning's capacity

[79] Warning: Submerged Pond 6P Secondary device # 2 OUTLET by 0.10'

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 3.81" for 100-year event
Inflow = 1.09 cfs @ 12.09 hrs, Volume= 0.047 af
Outflow = 0.98 cfs @ 12.18 hrs, Volume= 0.047 af, Atten= 10%, Lag= 5.1 min
Routed to Reach 8R : Reach-2

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Max. Velocity= 0.36 fps, Min. Travel Time= 2.5 min

Avg. Velocity= 0.06 fps, Avg. Travel Time= 14.9 min

Peak Storage= 150 cf @ 12.14 hrs

Average Depth at Peak Storage= 0.18', Surface Width= 16.06'

Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.43 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 3.0 '/' Top Width= 15.60'

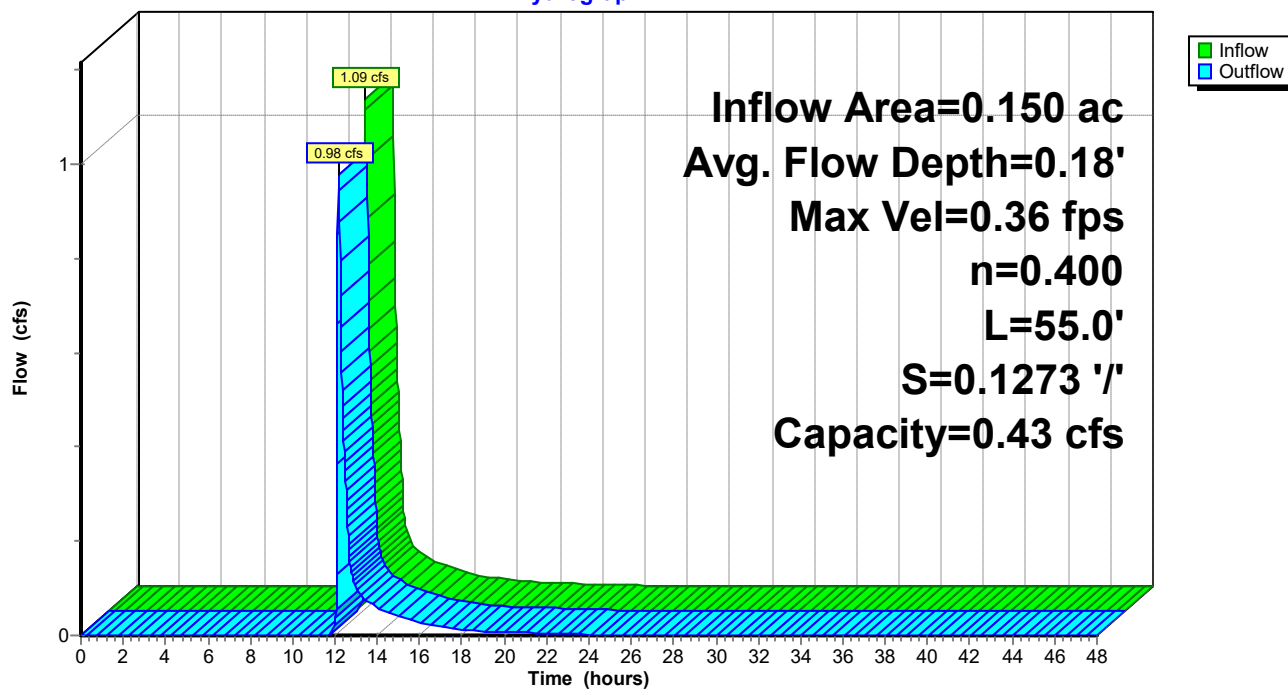
Length= 55.0' Slope= 0.1273 '/'

Inlet Invert= 15.00', Outlet Invert= 8.00'



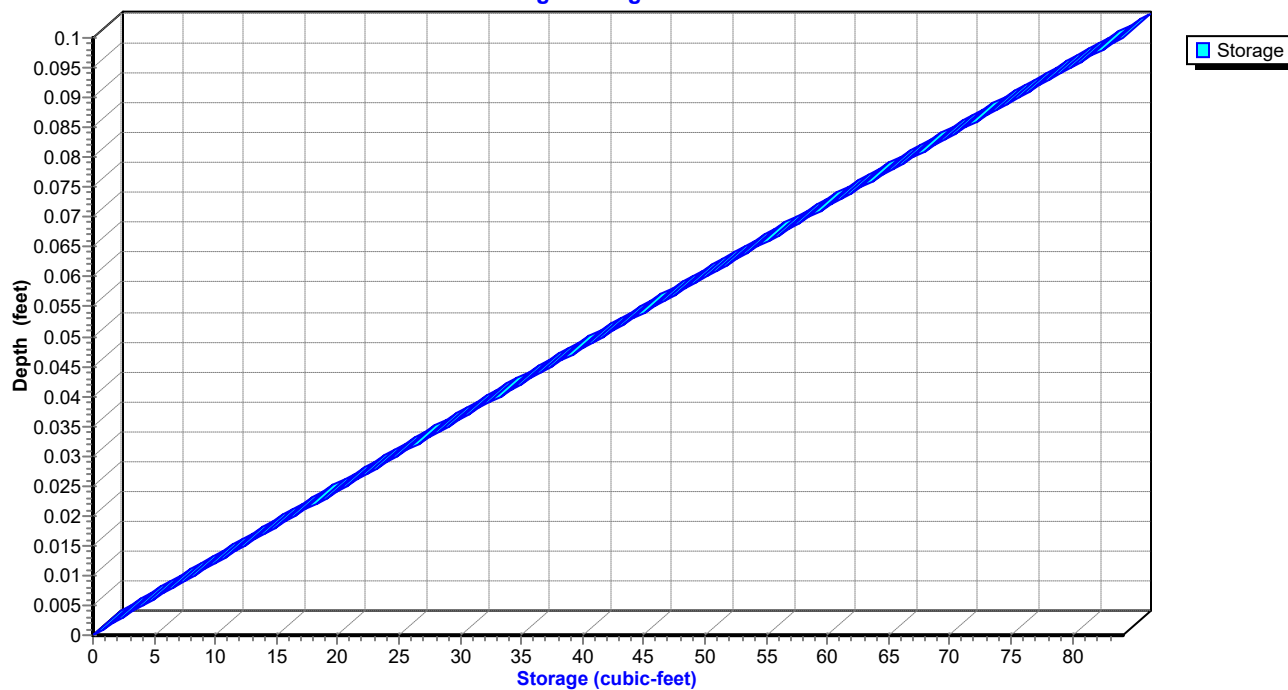
Reach 7R: Reach-1

Hydrograph



Reach 7R: Reach-1

Stage-Storage



Summary for Reach 8R: Reach-2

[91] Warning: Storage range exceeded by 0.13'

[55] Hint: Peak inflow is 410% of Manning's capacity

[62] Hint: Exceeded Reach 7R OUTLET depth by 0.11' @ 12.28 hrs

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 3.81" for 100-year event
Inflow = 0.98 cfs @ 12.18 hrs, Volume= 0.047 af
Outflow = 0.75 cfs @ 12.34 hrs, Volume= 0.047 af, Atten= 23%, Lag= 9.5 min
Routed to Link 5L : DESIGN LINE

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Max. Velocity= 0.21 fps, Min. Travel Time= 5.0 min

Avg. Velocity= 0.03 fps, Avg. Travel Time= 33.7 min

Peak Storage= 228 cf @ 12.25 hrs

Average Depth at Peak Storage= 0.23', Surface Width= 16.38'

Bank-Full Depth= 0.10' Flow Area= 1.5 sf, Capacity= 0.24 cfs

15.00' x 0.10' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 3.0 '/' Top Width= 15.60'

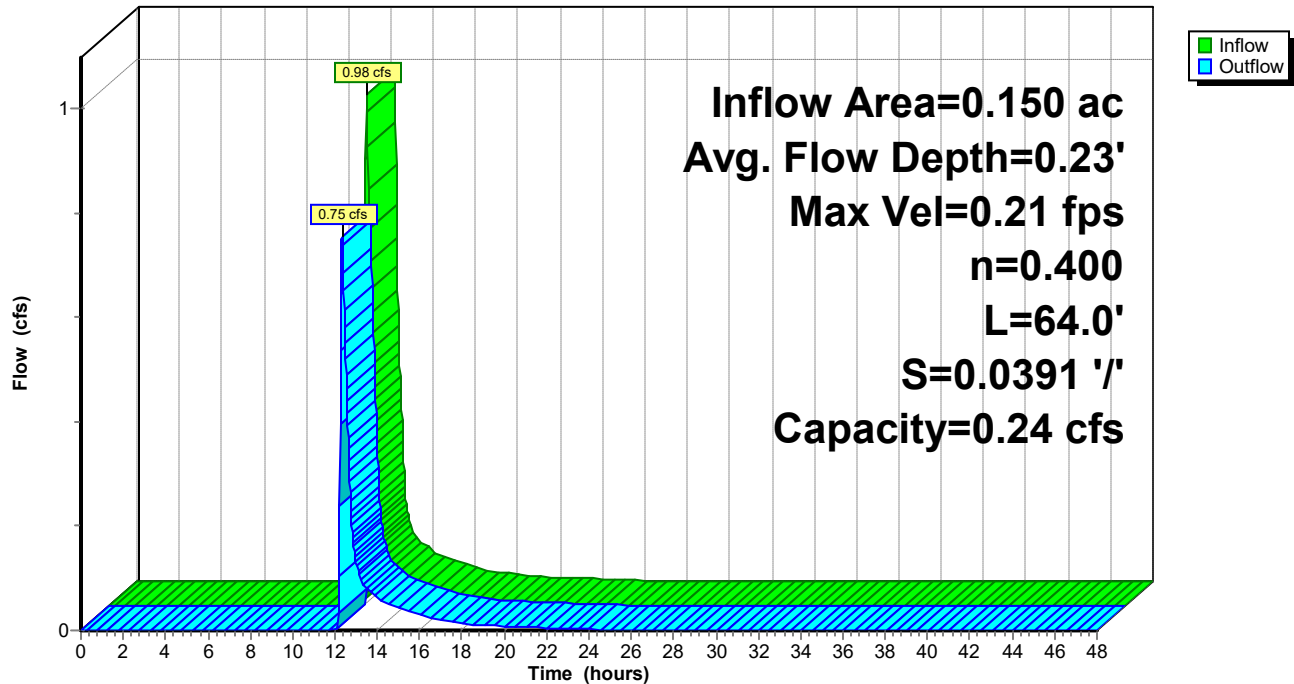
Length= 64.0' Slope= 0.0391 '/'

Inlet Invert= 8.00', Outlet Invert= 5.50'



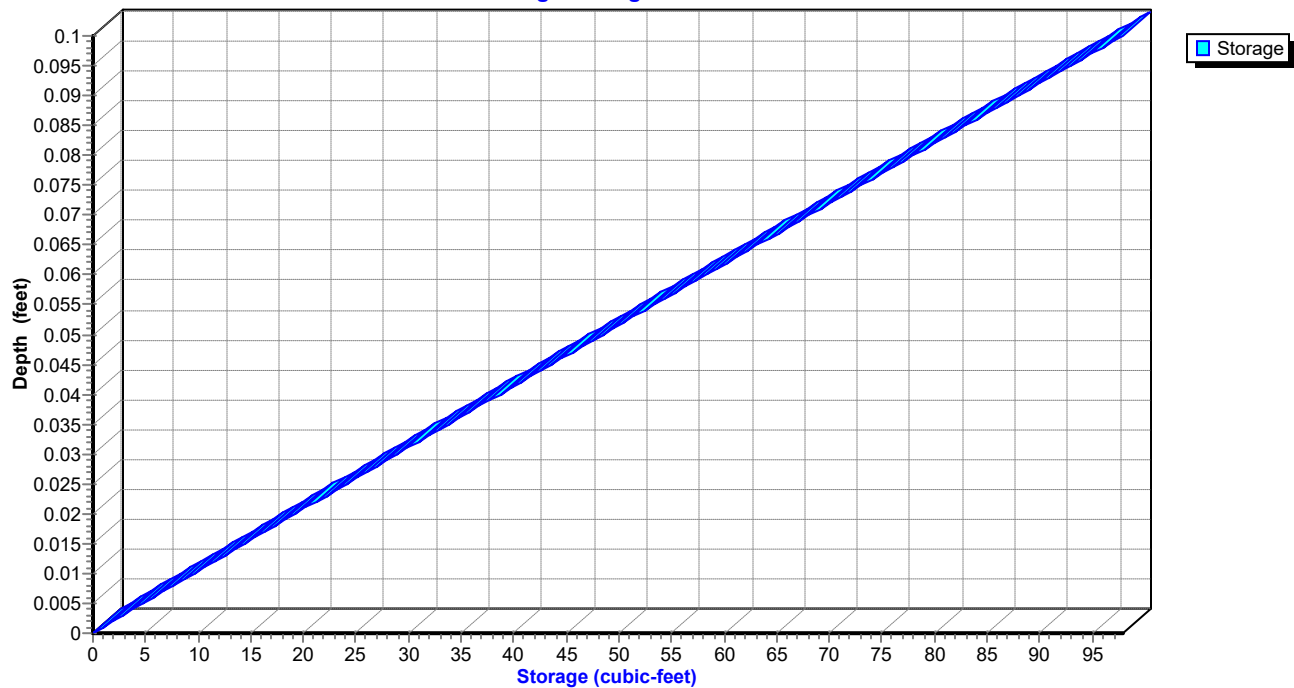
Reach 8R: Reach-2

Hydrograph



Reach 8R: Reach-2

Stage-Storage



Summary for Pond 4P: SW MGMT PRACTICE

[79] Warning: Submerged Pond 6P Primary device # 1 OUTLET by 1.27'

[79] Warning: Submerged Pond 7P Primary device # 1 OUTLET by 0.94'

Inflow Area = 0.150 ac, 52.42% Impervious, Inflow Depth = 6.27" for 100-year event
 Inflow = 0.85 cfs @ 12.09 hrs, Volume= 0.078 af
 Outflow = 0.83 cfs @ 12.10 hrs, Volume= 0.076 af, Atten= 2%, Lag= 1.0 min
 Discarded = 0.01 cfs @ 10.42 hrs, Volume= 0.034 af
 Primary = 0.82 cfs @ 12.10 hrs, Volume= 0.043 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs
 Peak Elev= 17.19' @ 12.10 hrs Surf.Area= 421 sf Storage= 938 cf

Plug-Flow detention time= 383.6 min calculated for 0.076 af (98% of inflow)
 Center-of-Mass det. time= 370.6 min (1,165.7 - 795.1)

Volume	Invert	Avail.Storage	Storage Description
#1B	13.71'	332 cf	20.83'W x 17.50'L x 3.54'H Field A 1,291 cf Overall - 462 cf Embedded = 829 cf x 40.0% Voids
#2B	14.21'	462 cf	Cultec R-330XLHD x 8 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
#3	14.50'	156 cf	6.00'D x 2.75'H Vertical Cone/Cylinder x 2
		949 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	17.00'	6.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Discarded	13.71'	1.000 in/hr Exfiltration over Horizontal area

Discarded OutFlow Max=0.01 cfs @ 10.42 hrs HW=14.50' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.83 cfs @ 12.10 hrs HW=17.19' (Free Discharge)
 ↑ **1=Orifice/Grate** (Orifice Controls 0.83 cfs @ 2.12 fps)

Pond 4P: SW MGMT PRACTICE - Chamber Wizard Field A**Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)**

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Stone Base + 30.5" Chamber Height + 6.0" Stone Cover = 3.54' Field Height

8 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 462.0 cf Chamber Storage

1,291.2 cf Field - 462.0 cf Chambers = 829.3 cf Stone x 40.0% Voids = 331.7 cf Stone Storage

Chamber Storage + Stone Storage = 793.7 cf = 0.018 af

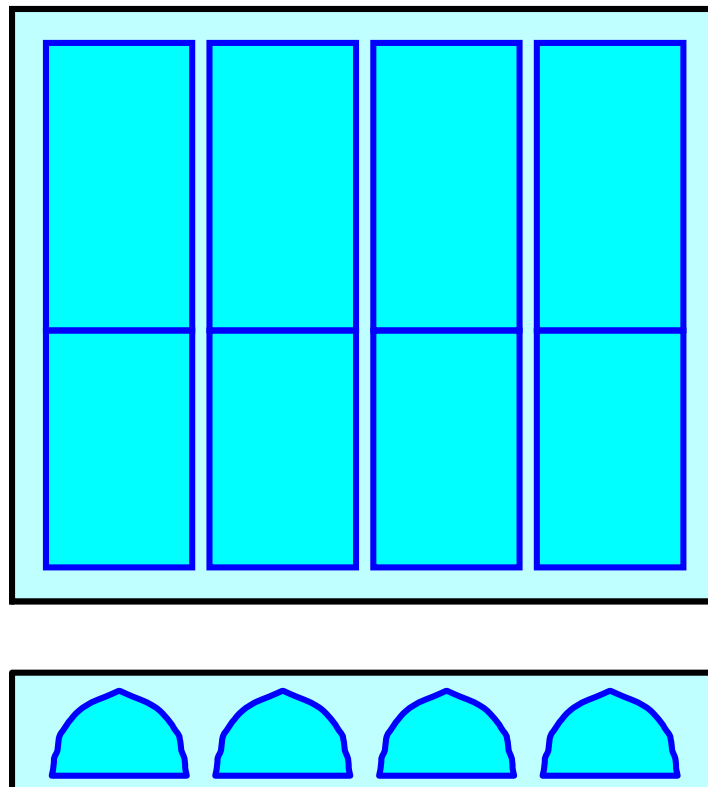
Overall Storage Efficiency = 61.5%

Overall System Size = 17.50' x 20.83' x 3.54'

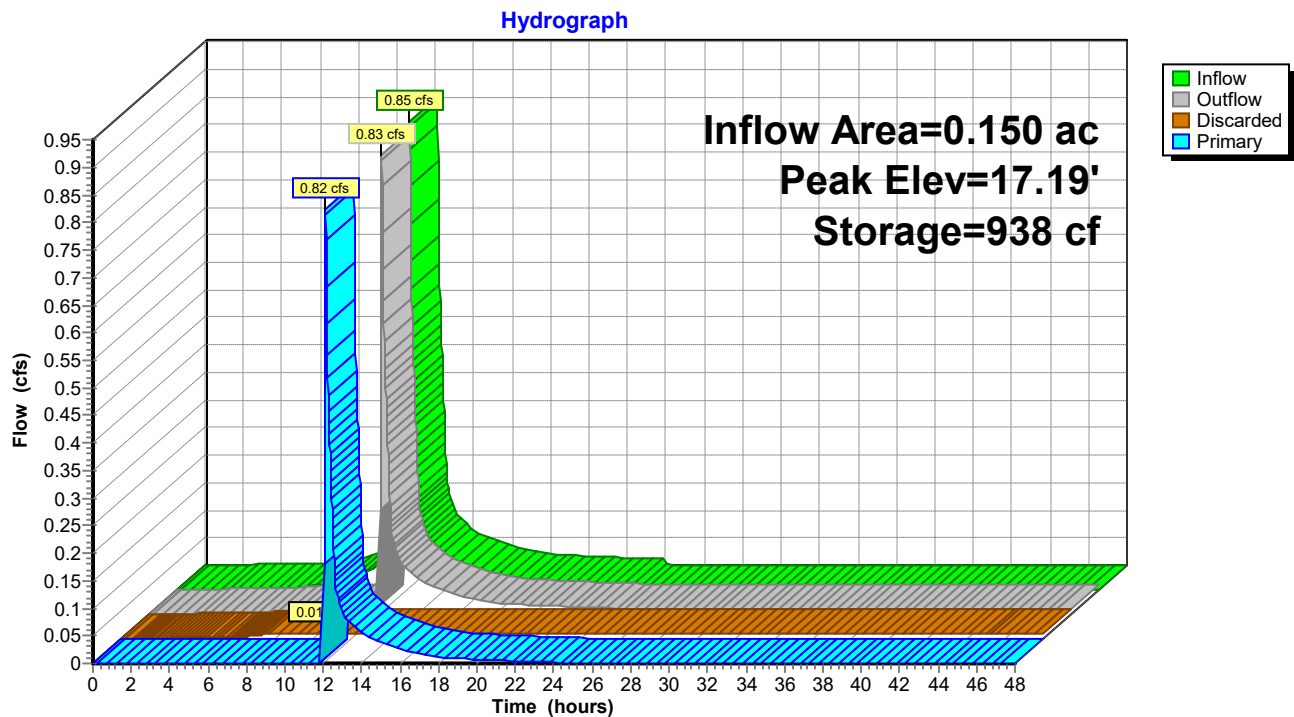
8 Chambers

47.8 cy Field

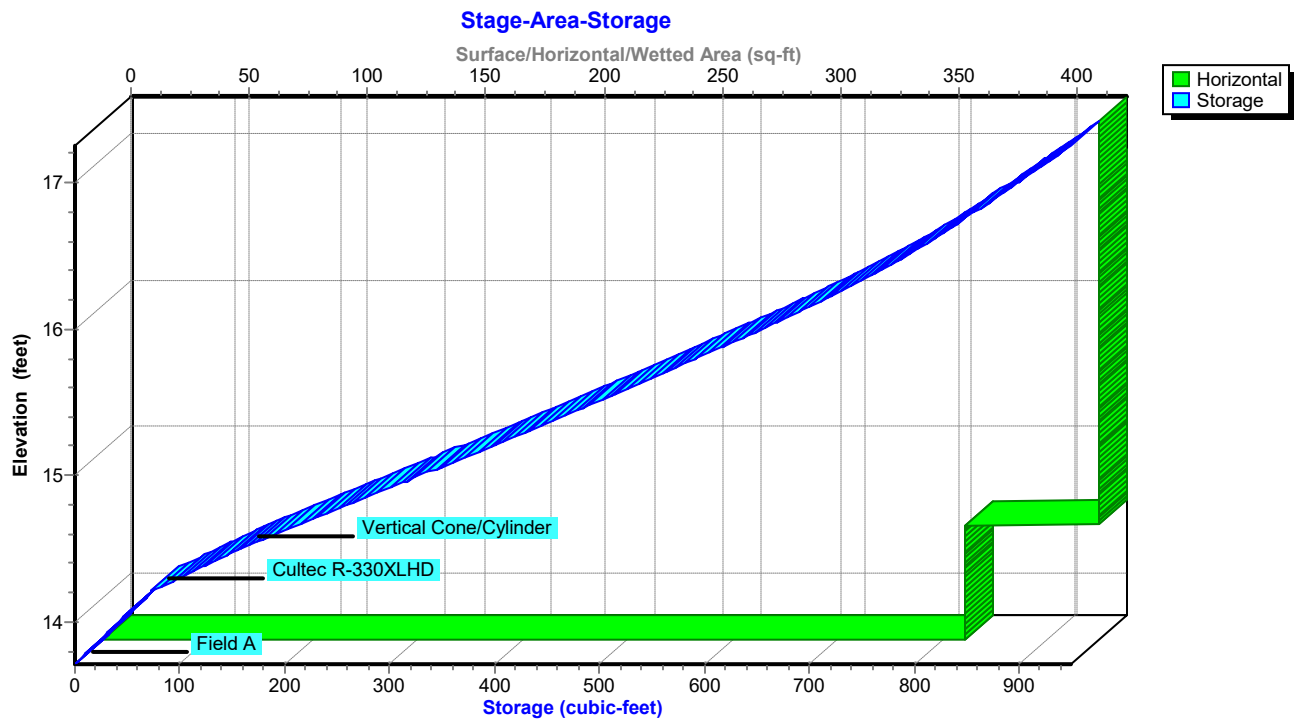
30.7 cy Stone



Pond 4P: SW MGMT PRACTICE



Pond 4P: SW MGMT PRACTICE



Summary for Pond 6P: Diversion Structure 2A

[57] Hint: Peaked at 17.90' (Flood elevation advised)

Inflow Area = 0.126 ac, 43.41% Impervious, Inflow Depth = 6.23" for 100-year event
 Inflow = 0.91 cfs @ 12.09 hrs, Volume= 0.065 af
 Outflow = 0.91 cfs @ 12.09 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.65 cfs @ 12.09 hrs, Volume= 0.061 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.26 cfs @ 12.09 hrs, Volume= 0.005 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 17.90' @ 12.09 hrs

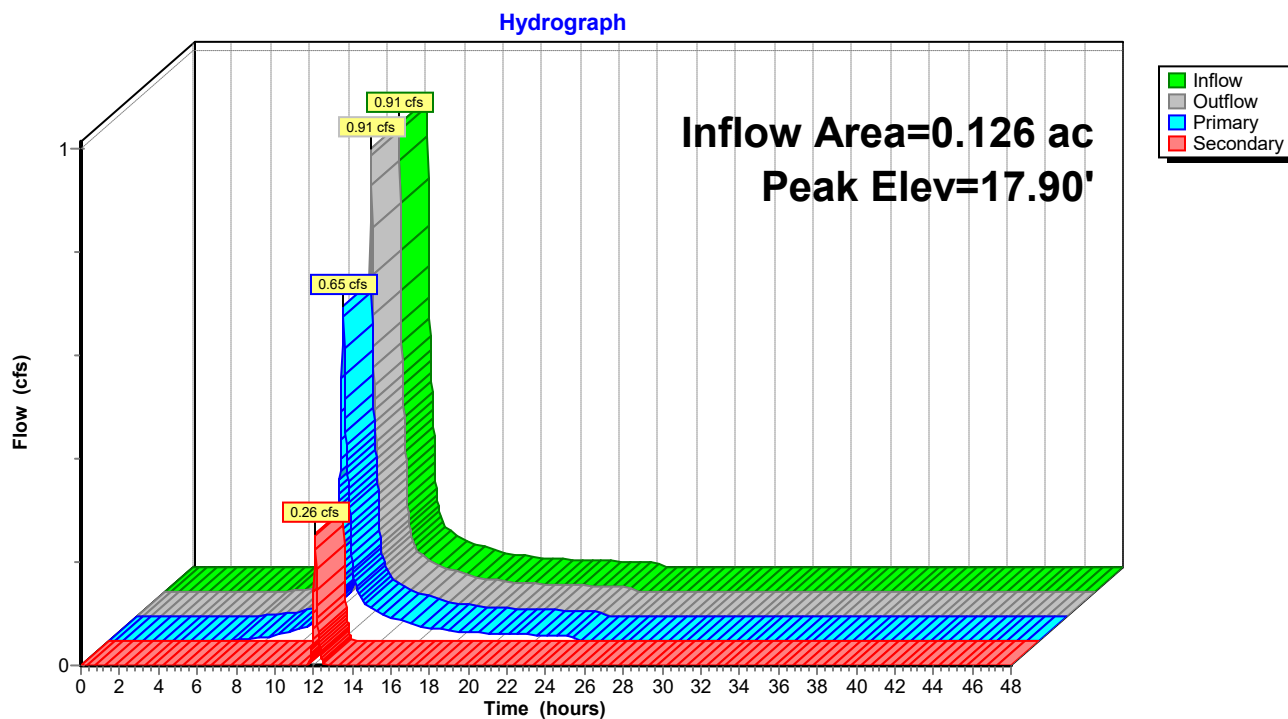
Device	Routing	Invert	Outlet Devices
#1	Primary	17.33'	8.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.33' / 15.92' S= 0.4029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Secondary	17.58'	8.0" Round Culvert to Flow Spreader L= 30.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.58' / 15.08' S= 0.0820 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Primary OutFlow Max=0.65 cfs @ 12.09 hrs HW=17.90' (Free Discharge)

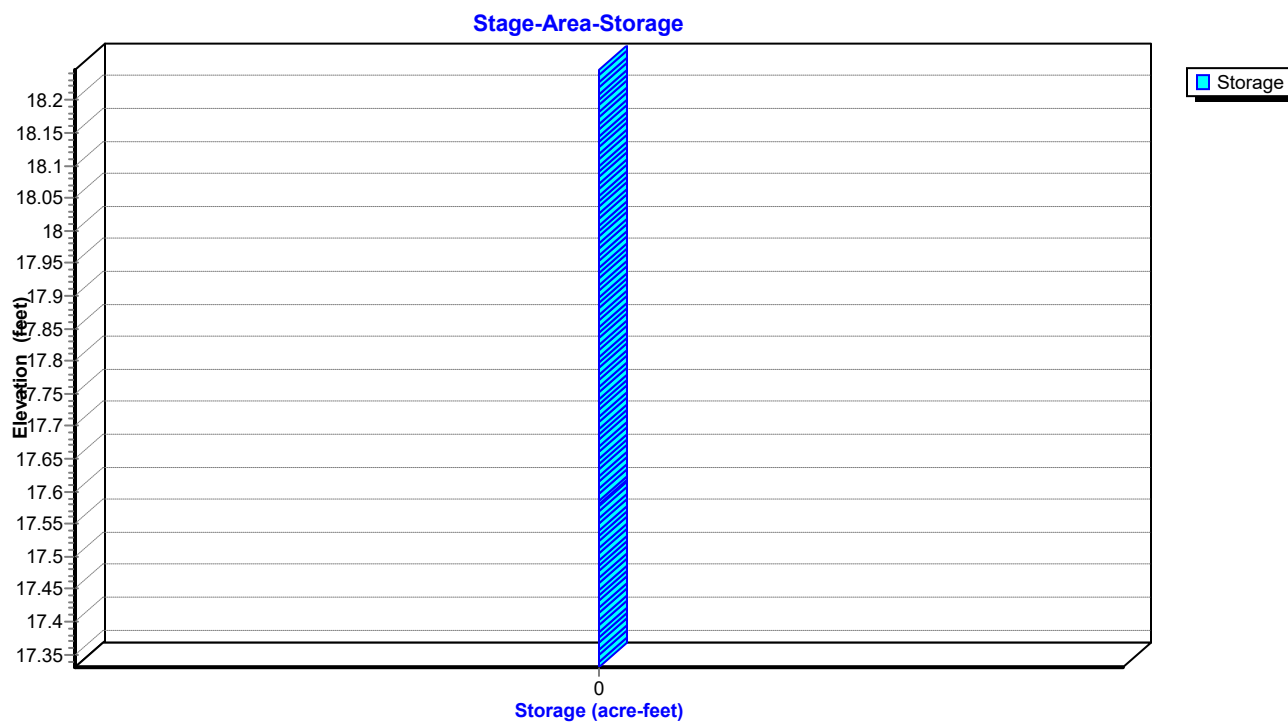
1=Culvert to SW Mgmt Facility (Inlet Controls 0.65 cfs @ 2.03 fps)
Secondary OutFlow Max=0.25 cfs @ 12.09 hrs HW=17.90' (Free Discharge)

2=Culvert to Flow Spreader (Inlet Controls 0.25 cfs @ 1.52 fps)

Pond 6P: Diversion Structure 2A



Pond 6P: Diversion Structure 2A



Summary for Pond 7P: Diversion Structure 2B

[57] Hint: Peaked at 18.07' (Flood elevation advised)

Inflow Area = 0.024 ac, 100.00% Impervious, Inflow Depth = 8.79" for 100-year event
 Inflow = 0.21 cfs @ 12.08 hrs, Volume= 0.017 af
 Outflow = 0.21 cfs @ 12.08 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.20 cfs @ 12.08 hrs, Volume= 0.017 af
 Routed to Pond 4P : SW MGMT PRACTICE
 Secondary = 0.01 cfs @ 12.08 hrs, Volume= 0.000 af
 Routed to Reach 7R : Reach-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Peak Elev= 18.07' @ 12.08 hrs

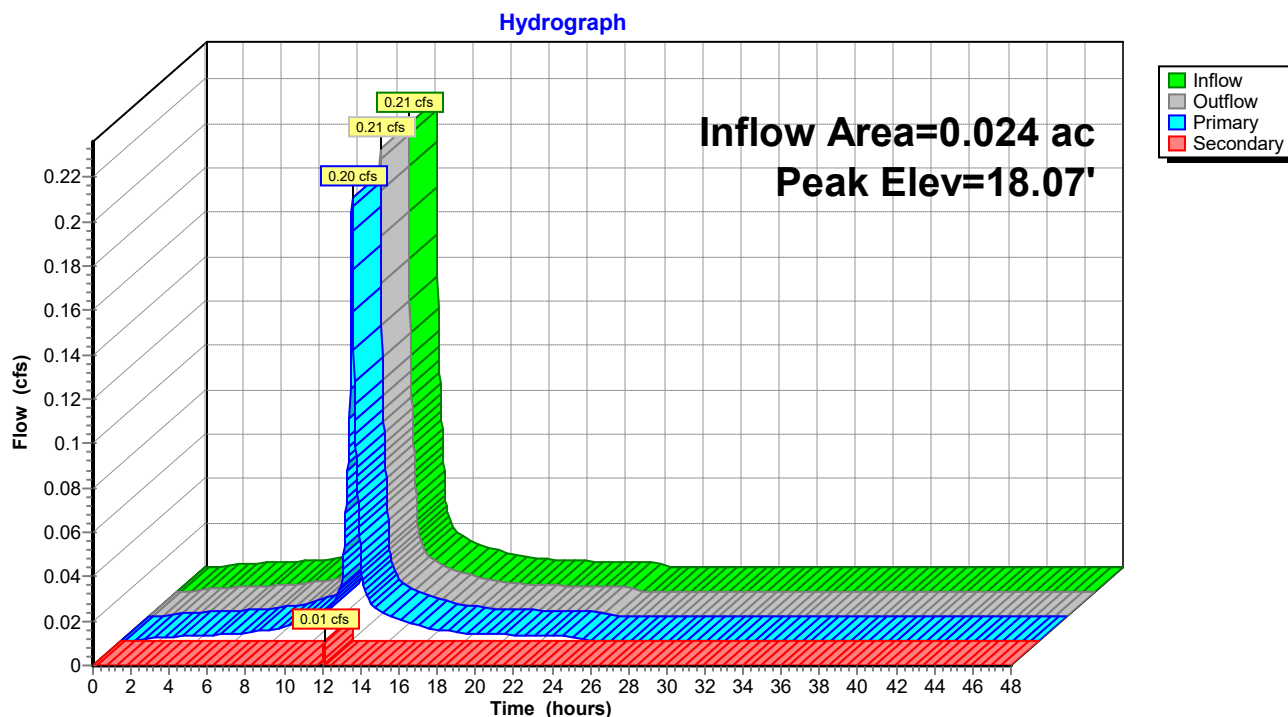
Device	Routing	Invert	Outlet Devices
#1	Primary	17.75'	6.0" Round Culvert to SW Mgmt Facility L= 3.5' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 17.75' / 16.25' S= 0.4286 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	18.00'	6.0" Round Culvert to Flow Spreader L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.00' / 15.25' S= 0.1019 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.20 cfs @ 12.08 hrs HW=18.07' (Free Discharge)

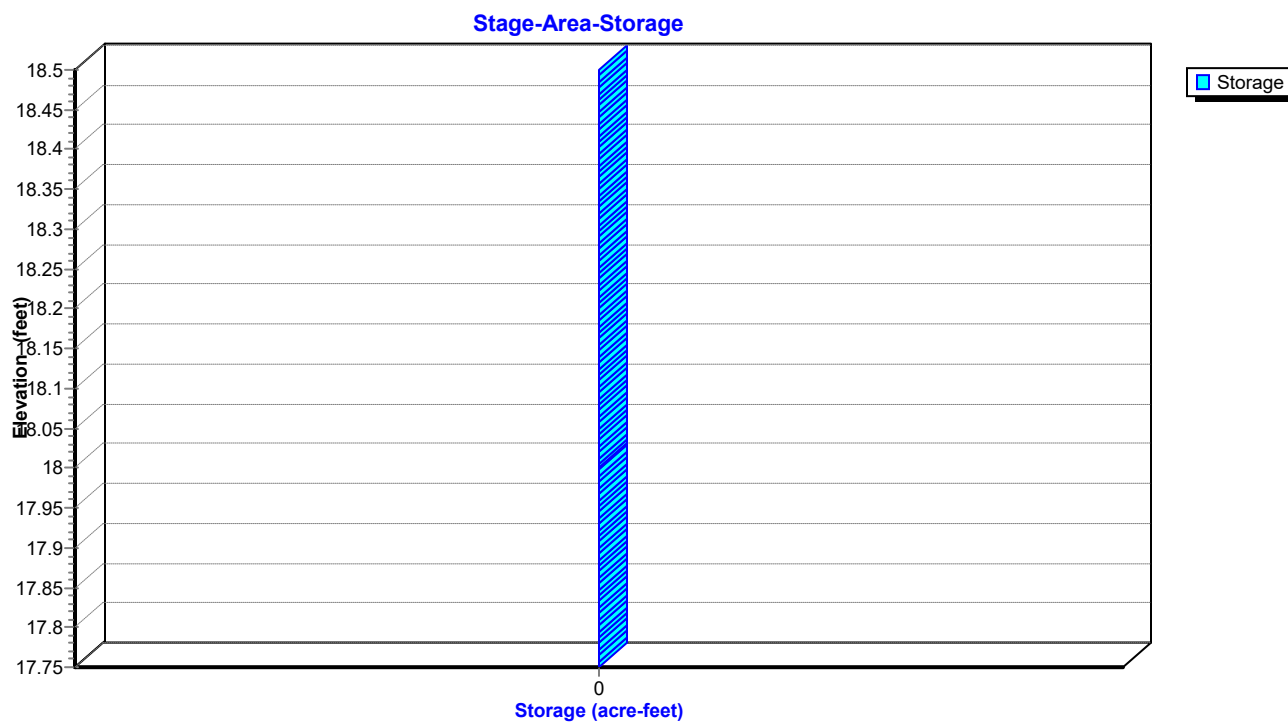
1=Culvert to SW Mgmt Facility (Inlet Controls 0.20 cfs @ 1.51 fps)
Secondary OutFlow Max=0.01 cfs @ 12.08 hrs HW=18.07' (Free Discharge)

2=Culvert to Flow Spreader (Inlet Controls 0.01 cfs @ 0.70 fps)

Pond 7P: Diversion Structure 2B



Pond 7P: Diversion Structure 2B



Summary for Link 5L: DESIGN LINE

Inflow Area = 0.560 ac, 15.61% Impervious, Inflow Depth = 4.13" for 100-year event
Inflow = 2.03 cfs @ 12.09 hrs, Volume= 0.193 af
Primary = 2.03 cfs @ 12.09 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.02 hrs

Link 5L: DESIGN LINE