APPLICATION REVIEW - DRAINAGE
Edgewater Hill Development; MS-2 Building
East High Street (CT Route 66)
East Hampton, CT
June 11, 2020

Review Comments prepared by:
Anchor Engineering Services, Inc.

Documents Reviewed:

Application Drawings:	Site Development Plan, Proposed Mixed Use Building (MS-2) prepared for Edgewater Hill Enterprises, LLC Sheets 1-12, dated May 20, 2020 prepared by Boundaries LLC, 179 Pachaug River Drive, P.O. Box 184, Griswold, CT 06351
Stormwater Analysis:	Stormwater Management Report prepared by Boundaries LLC, 179 Pachaug River Drive, P.O. Box 184, Griswold, CT 06351; dated May 2020.

Anchor Engineering has completed a drainage review of the documents listed above. Based upon this review, we have the following comments:

The comparative flow analysis for the pre and post development includes a much larger area within the Edgewater Hills Development than the proposed subject parcel. The discharge point for the analysis is the existing 30" diameter culvert in CT Route 66 that ultimately discharges to Lake Pocotopaug. The calculations include an existing manmade pond in both the pre and post development conditions and an existing detention basin at the apartment buildings in the development included in the post development condition. The analyses appear complete but detailed information for these pond features were not submitted and could not be reviewed. The conclusions from the submitted analysis represent a decrease in peak flow for the post-development condition for the 2, 10, 25, 50 and 100 year peak flows. Please provide clarifications/responses for the following:

1. The total area provided for the post development is inconsistent between the watershed map (55.8 acres) and the analysis (50.9 acres). The existing conditions includes 52.2 acres. Please confirm.
2. The information included for the existing manmade pond varies between the pre and post development conditions. The pond bottom is 1 foot higher and the top of the pond analyzed is 2 feet higher providing 6 acre-feet of additional storage available for the post-condition. This information cannot be verified. The earlier Fuss & O'Neill analyses did not include modifications to this pond for the post development conditions. Will there be any impacts to features within the development due to the approximate one foot increase of water elevation in this pond in the post development conditions?
3. Three outlet devices below the bottom of the manmade pond are included in the post development condition, please clarify.
4. Regarding the proposed Water Quality Swale:

a. The proposed analysis includes storage volume for an underdrain two feet below the bottom of the basin and an additional 1.75 feet of above ground storage in the basin which is below the lowest orifice on the outlet structure. This storage volume relies entirely upon infiltration to drain between storms. Per the 2004 CT Stormwater Quality Manual, the bottom of the infiltration facility should be located at least 3 feet above the seasonally high water table or bedrock. The underlying soils need good infiltration properties yet this is located within type "C" soil group.
b. The bottom of the proposed water quality swale may be into the existing groundwater based on the test pits conducted on the site. Only test pit #1 was in the area of the basin, additional testing is necessary to determine the ability of the basin to perform as designed.
c. The underdrain is shown on the plans as "future" and not to be installed with this contract. The underdrain should be installed with the development of this building as it is an integral part of the stormwater design and the basin's function.
d. The Water Quality Basin is to be used for a temporary sediment trap during construction. Since this basin is designed to include infiltration, it is recommended that the basin not be excavated to its final bottom elevation but that a minimum of 1 foot of native soil remain during its use as a sediment trap. A note should be added to the plans that the conversion of temporary sediment trap to water quality swale shall involve removing the accumulated sediment, final excavation and installation of the underdrain. Final grading and application of permanent seeding must be completed in a timely manner during dry weather conditions to ensure stabilization.

APPLICATION REVIEW - DRAINAGE

Edgewater Hill Development; MS-2 Building
East High Street (CT Route 66)
East Hampton, CT
June 23, 2020

Review Comments prepared by:
Anchor Engineering Services, Inc.

Documents Reviewed:

Application Drawings:	Site Development Plan, Proposed Mixed Use Building (MS-2) prepared for Edgewater Hill Enterprises, LLC Sheets 1-12, dated May 20, 2020 prepared by Boundaries LLC, 179 Pachaug River Drive, P.O. Box 184, Griswold, CT 06351 **Revised: June 15, 2020;** Also revised Figure 4 from the Stormwater Report.
Comment Response Letter:	Dated June 15, 2020 from Boundaries LLC, 179 Pachaug River Drive, P.O. Box 184, Griswold, CT 06351

Anchor Engineering has completed a review of the information listed above. Based upon this review, we have the following comments:

1. Regarding the proposed Water Quality Swale:
    a. The future stormwater quality basin is proposed to be much larger than the temporary sediment trap included on the plans and the analysis includes the full build out. An analysis should be run to confirm that the smaller basin as included with the MS-2 building is adequate for the current proposed conditions (MS-2 only).
    b. It appears that the intent of the design is to promote extended detention for the stormwater below the outlet elevation to provide the necessary stormwater treatment. Provide calculations that the ponded water will drain within 48 hours. The infiltration trench should be designed to completely dewater the bottom of the basin between storms.
    c. It is recommended that a sediment forebay be included at the pipe outlet to provide pretreatment.
    d. After construction of the MS-2 basin it should be inspected after major storms to establish the duration of standing water and any evidence of clogging. This information should be included with the future submission of the TS-2 and MS-3 buildings. This information along with the additional soil testing referred to in the comment responses at the time of the Market Square buildout can be used to determine the final configuration of the future stormwater quality basin at that time.

John U. Faulise, Jr., L.S.
Gerald J. Stefon, L.S.
Demian A. Sorrentino, AICP, C.S.S.
David C. McKay, P.E.
Jacob S. Faulise, E.I.T.

CIVIL ENGINEERING LAND SURVEYING LAND USE PLANNING SOIL SCIENCE

BOUNDARIES

Boundaries LLC
179 Pachaug River Drive
P.O. Box 184
Griswold, CT 06351
T 860.376.2006 | F 860.376.5899

www.boundariesllc.net

June 23, 2020

Jeremy DeCarli, AICP
Planning & Zoning Official
Town of East Hampton
1 Community Drive
East Hampton, CT 06424

RE: **Edgewater Hill Development; MS-2 Building**
Additional Town Engineer Review Comment Response

Dear Mr. DeCarli,

Please see below for a summary of the additional comments provided via email on June 23, 2020 prepared by Anchor Engineering Services, Inc. followed by Boundaries' responses.

1. The future stormwater quality basin is proposed to be much larger than the temporary sediment trap included on the plans and the analysis includes the full build out. An analysis should be run to confirm that the smaller basin as included with the MS-2 building is adequate for the current proposed conditions (MS-2 only).
    a. The 1.546 acre area that contributes runoff to the MS-2 temporary sediment trap was evaluated for both pre-development and post-development conditions. The CN value of 87 is the same for both conditions as the proposed impervious area for the MS-2 building and associated parking area is roughly equivalent to the former motel and associated parking areas. Also, some gravel surfaces will be replaced with grassed areas as part of the MS-2 development. Pre- and post-development peak runoff rates of the contributing watershed are compared in Table 1.

Table 1
Peak Runoff Rates – Post-Development Conditions vs. Pre-Development Conditions

Storm Event	Post-Development Conditions Peak Runoff Rate (CFS)	Pre-Development Conditions Peak Runoff Rate (CFS)	Change in Peak Runoff Rate (CFS)
2-Year	1.42	3.28	-1.86
10-Year	4.03	5.83	-1.80
25-Year	5.12	7.41	-2.29
50-Year	6.19	8.60	-2.41
100-Year	8.59	9.86	-1.27

As demonstrated in Table 1, post-development peak runoff rates are less than pre-development rates under all modeled design storms. Watershed delineation figures are attached to this letter along with pre- and post-development conditions modeling results. Water quality volume calculations for the temporary sediment trap and the MS-2 building are included in the original Stormwater Management Report. The storage available below the lowest above-grade outlet orifice is greater than the calculated water quality volume for the MS-2 development.

2. It appears that the intent of the design is to promote extended detention for the stormwater below the outlet elevation to provide the necessary stormwater treatment. Provide calculations that the ponded water will drain within 48 hours. The infiltration trench should be designed to completely dewater the bottom of the basin between storms.
    a. Time to drain calculations are presented below. The proposed underdrain has adequate surface area to drain the stored volume within 48 hours of a storm event.

$$A_f = \frac{(WQV)(d)}{[(k)(t)(h+d)]}$$

where:
A_f = filter bed surface area (ft2)
WQV = water quality volume (ft3)
d = filter bed depth (ft)
k = hydraulic conductivity of filter media (ft/day)
t = time for the water quality volume to drain from the system (24 hours)
h = average height of water above filter bed during water quality design storm

WQV = Stored Volume = **1,772 cubic feet** (Below elevation 526.50 – lowest outlet orifice)
d = Filter Bed Depth = **2.5 feet** (crushed stone, sand, and amended topsoil depth)
k = Hydraulic Conductivity of Filter Media = **1 foot/day** (Standard value for medium sand per Stormwater Quality Manual is 3.5 feet/day)
T = Time to Drain = **24 hours**
h = Average height of water above filter bed = **0.5 ft** (average depth from bottom of basin to lowest outlet orifice)
A_f = Required filter surface area = **61.5 square feet**
Filter surface area provided = 2 feet wide X 92 feet long = **184 square feet**

The filter surface area provided exceeds the calculated area required to draw down the stormwater in 24 hours (factor of safety of 2) therefore the stormwater basin is expected to drain between storm events.

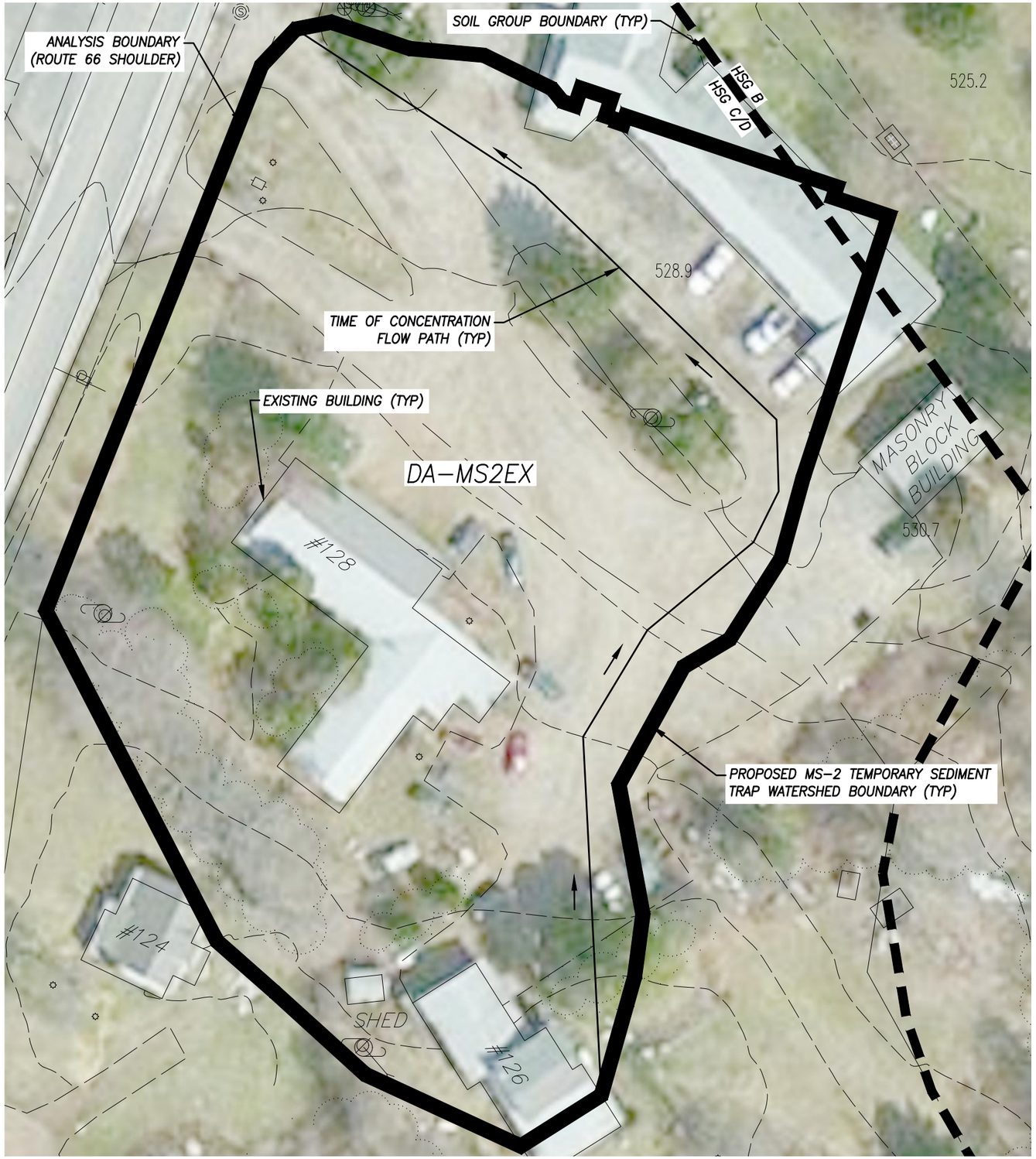
3. It is recommended that a sediment forebay be included at the pipe outlet to provide pretreatment.
    a. Pre-treatment of the stormwater discharge during this phase of the development is provided by the deep sump catch basin with hooded outlet upstream of the water quality basin. A sediment forebay is intended to be incorporated during the buildout of the full stormwater basin as part of the TS-2/MS-3 development. At that time stormwater is intended to be routed to the far end of the water quality basin from the outlet and discharge to a sediment forebay sized for 25% of the water quality volume from the contributing area.

4. After construction of the MS-2 basin it should be inspected after major storms to establish the duration of standing water and any evidence of clogging. This information should be included with the future submission of the TS-2 and MS-3 buildings. This information along with the additional soil testing referred to in the comment responses at the time of the Market Square buildout can be used to determine the final configuration of the future stormwater quality basin at that time.
    a. I agree with the recommendations included above.

We trust that the responses provided above, and the enclosed additional modeling results address the comments. Please do not hesitate to contact us if you would like to discuss these items further.

Thank you,

David C. McKay, P.E.



Pre-Development Conditions

Watershed	Area (acres)	CN Value	Description
DA-MS2EX	1.546	87	Residences, former motel and associated parking lot that will contribute post-development runoff to the MS-2 Temporary Sediment Trap

GRAPHIC SCALE

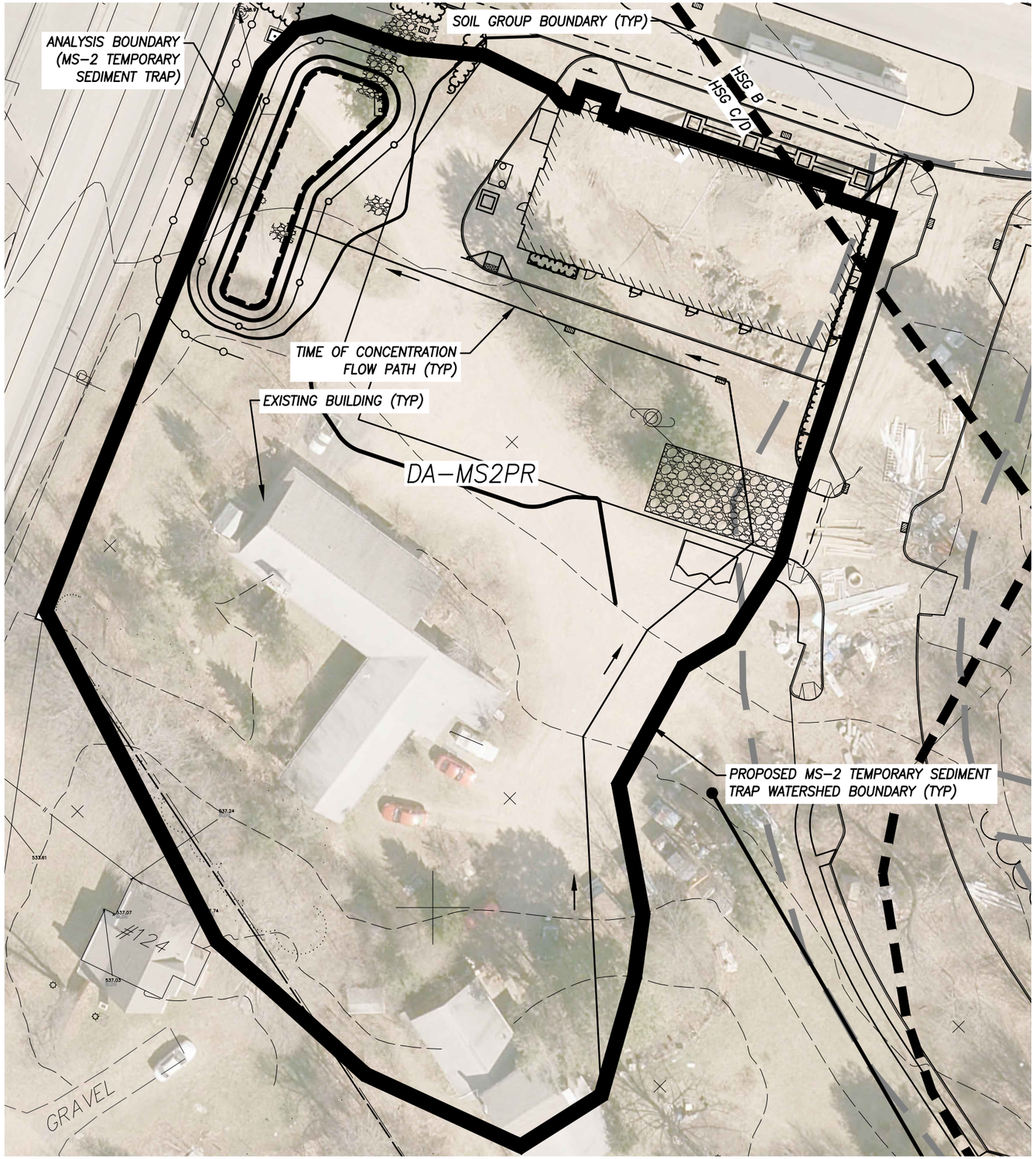
500 250 125 0 250

(IN FEET)
1 inch = 40 ft.

BOUNDARIES
CIVIL ENGINEERING LAND SURVEYING LAND USE PLANNING SOIL SCIENCE
Boundaries LLC
179 Pachaug River Drive, Griswold, CT 06351
T 860.376.2006 | www.boundariesllc.net

Pre-Development Conditions Watershed
Proposed MS-2 Development Site
Edgewater Hill Enterprises LLC
East High Street, East Hampton, Connecticut

SCALE: 1"=40'
DATE: June 2020
FIGURE A



Pre-Development Conditions

Watershed	Area (acres)	CN Value	Description
DA-MS2PR	1.546	87	Residences, MS-2 Building and associated parking lot that contribute runoff to the MS-2 Temporary Sediment Trap

GRAPHIC SCALE

500 250 125 0 250

(IN FEET)
1 inch = 40 ft.

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Post-Development Conditions Watershed Proposed MS-2 Development Site

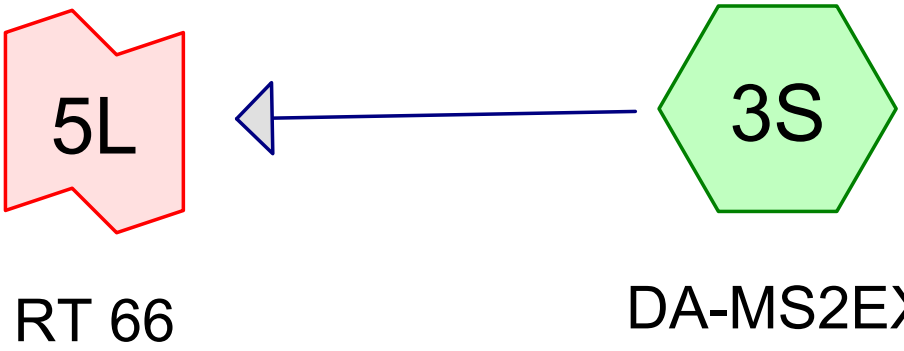
Edgewater Hill Enterprises LLC

East High Street, East Hampton, Connecticut

SCALE: 1"=40'

DATE: June 2020

FIGURE B



Subcat Reach Pond Link

Routing Diagram for Existing to RT 66 - MS2 Only
Prepared by {enter your company name here}, Printed 6/23/2020

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.37	2
2	10-Year	Type III 24-hr		Default	24.00	1	5.18	2
3	25-Year	Type III 24-hr		Default	24.00	1	6.30	2
4	50-Year	Type III 24-hr		Default	24.00	1	7.14	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.04	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.530	74	>75% Grass cover, Good, HSG C (3S)
0.232	96	Gravel surface, HSG C (3S)
0.649	98	Paved parking, HSG C (3S)
0.135	70	Woods, Good, HSG C (3S)
1.546	**87**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.546	HSG C	3S
0.000	HSG D	
0.000	Other	
1.546		**TOTAL AREA**

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	0.000	0.530	0.000	0.000	0.530	>75% Grass cover, Good	3S
0.000	0.000	0.232	0.000	0.000	0.232	Gravel surface	3S
0.000	0.000	0.649	0.000	0.000	0.649	Paved parking	3S
0.000	0.000	0.135	0.000	0.000	0.135	Woods, Good	3S
0.000	**0.000**	**1.546**	**0.000**	**0.000**	**1.546**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2EX Runoff Area=67,338 sf 41.98% Impervious Runoff Depth=2.07"
Flow Length=467' Tc=9.3 min CN=87 Runoff=3.28 cfs 0.266 af

Link 5L: RT 66 Inflow=3.28 cfs 0.266 af
Primary=3.28 cfs 0.266 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.266 af Average Runoff Depth = 2.07"
58.02% Pervious = 0.897 ac 41.98% Impervious = 0.649 ac

Summary for Subcatchment 3S: DA-MS2EX

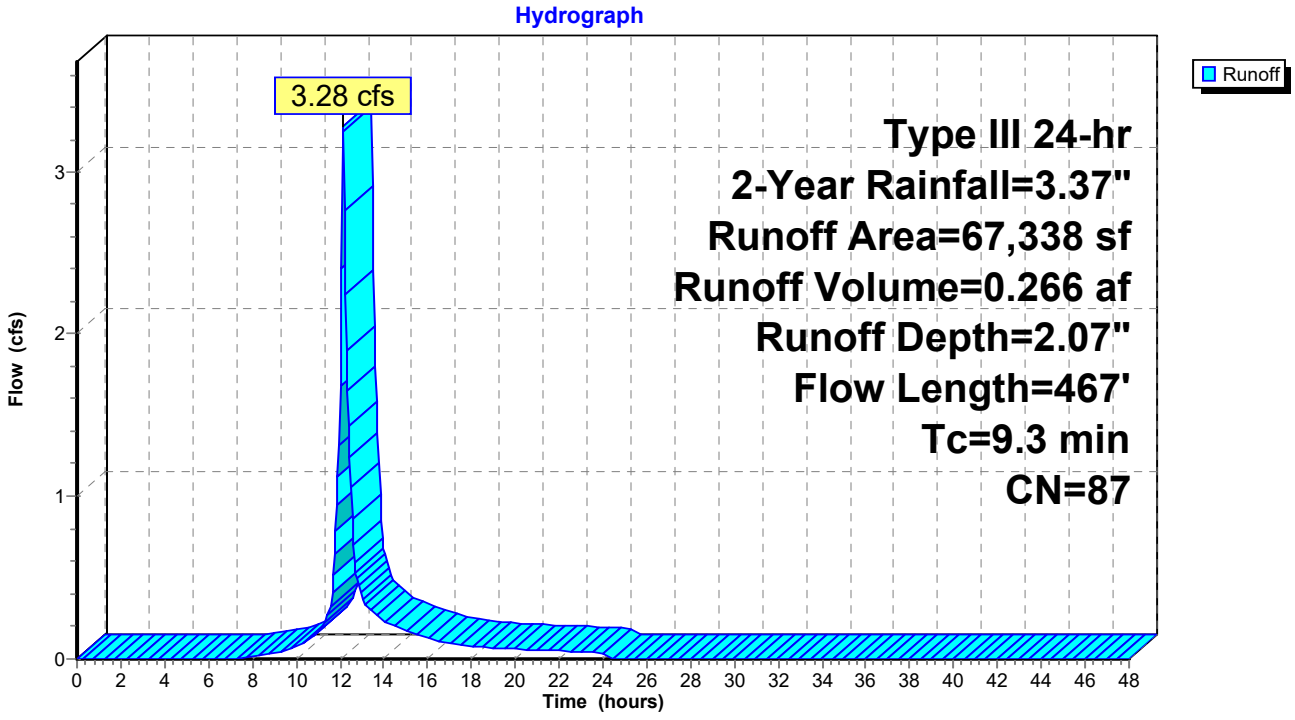
Runoff = 3.28 cfs @ 12.13 hrs, Volume= 0.266 af, Depth= 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
10,110	96	Gravel surface, HSG C
28,271	98	Paved parking, HSG C
23,096	74	>75% Grass cover, Good, HSG C
67,338	87	Weighted Average
39,067		58.02% Pervious Area
28,271		41.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.6	123	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
2.6	294	0.0085	1.87		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
9.3	467	Total			

Subcatchment 3S: DA-MS2EX

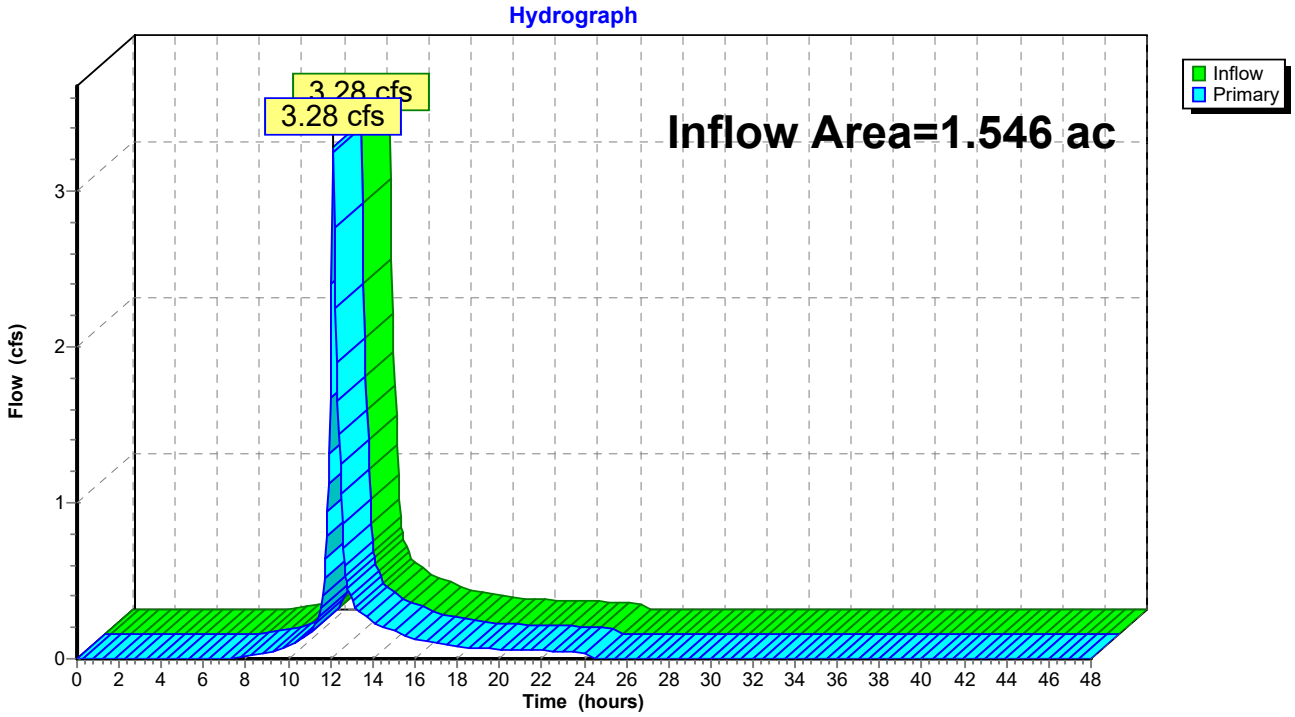


Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 41.98% Impervious, Inflow Depth = 2.07" for 2-Year event
Inflow = 3.28 cfs @ 12.13 hrs, Volume= 0.266 af
Primary = 3.28 cfs @ 12.13 hrs, Volume= 0.266 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2EX Runoff Area=67,338 sf 41.98% Impervious Runoff Depth=3.74"
Flow Length=467' Tc=9.3 min CN=87 Runoff=5.83 cfs 0.481 af

Link 5L: RT 66 Inflow=5.83 cfs 0.481 af
Primary=5.83 cfs 0.481 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.481 af Average Runoff Depth = 3.74"
58.02% Pervious = 0.897 ac 41.98% Impervious = 0.649 ac

Summary for Subcatchment 3S: DA-MS2EX

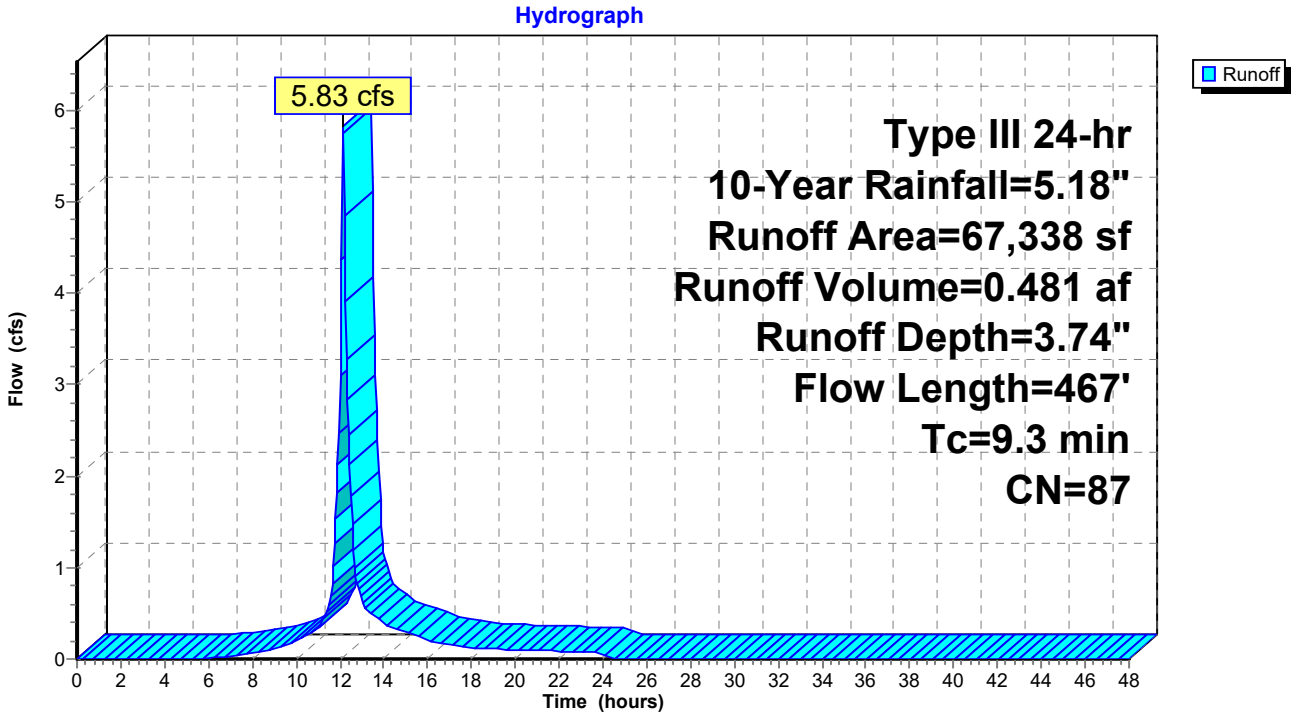
Runoff = 5.83 cfs @ 12.13 hrs, Volume= 0.481 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
10,110	96	Gravel surface, HSG C
28,271	98	Paved parking, HSG C
23,096	74	>75% Grass cover, Good, HSG C
67,338	87	Weighted Average
39,067		58.02% Pervious Area
28,271		41.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.6	123	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
2.6	294	0.0085	1.87		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
9.3	467	Total			

Subcatchment 3S: DA-MS2EX

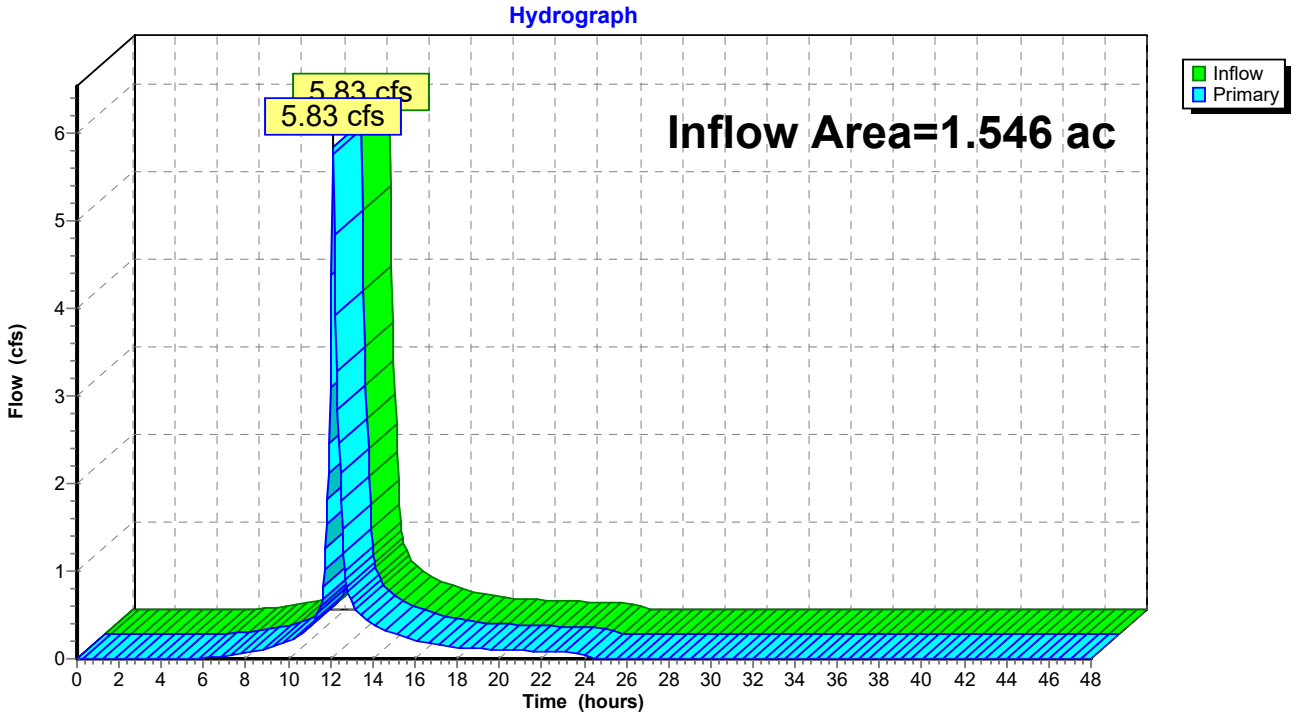


Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 41.98% Impervious, Inflow Depth = 3.74" for 10-Year event
Inflow = 5.83 cfs @ 12.13 hrs, Volume= 0.481 af
Primary = 5.83 cfs @ 12.13 hrs, Volume= 0.481 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2EX Runoff Area=67,338 sf 41.98% Impervious Runoff Depth=4.80"
Flow Length=467' Tc=9.3 min CN=87 Runoff=7.41 cfs 0.619 af

Link 5L: RT 66 Inflow=7.41 cfs 0.619 af
Primary=7.41 cfs 0.619 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.619 af Average Runoff Depth = 4.80"
58.02% Pervious = 0.897 ac 41.98% Impervious = 0.649 ac

Summary for Subcatchment 3S: DA-MS2EX

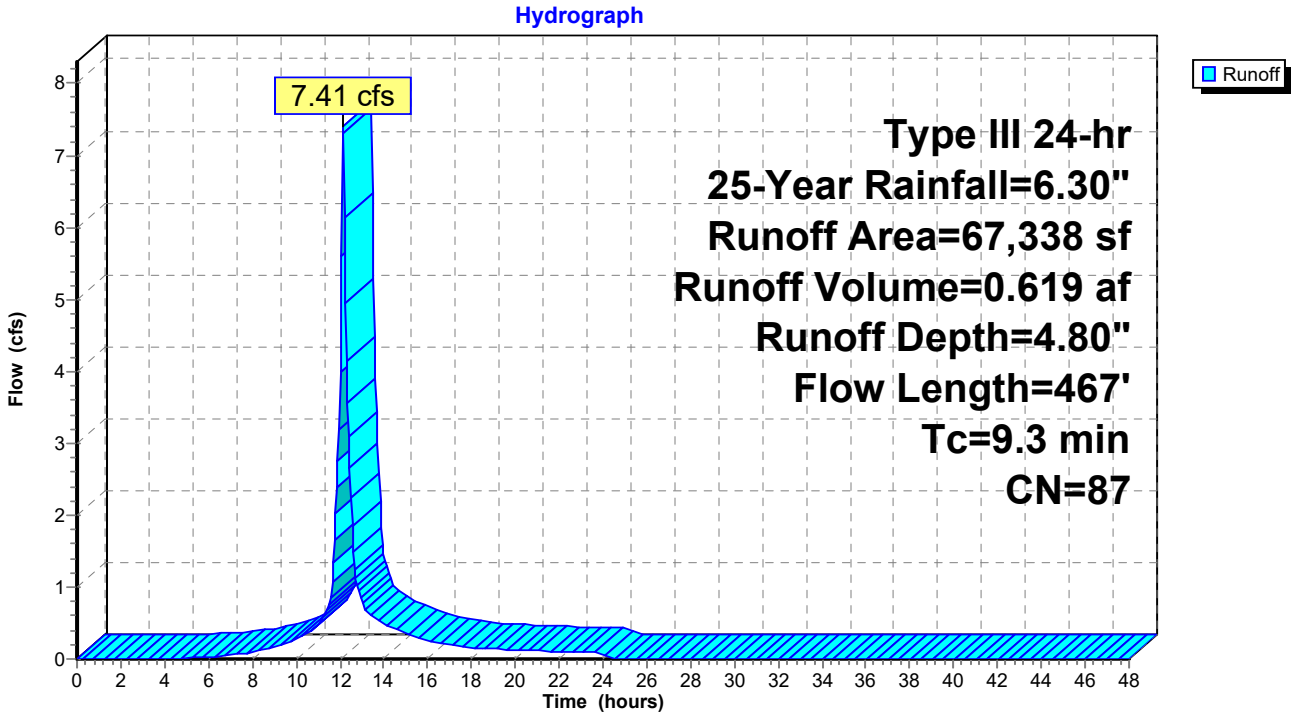
Runoff = 7.41 cfs @ 12.13 hrs, Volume= 0.619 af, Depth= 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
10,110	96	Gravel surface, HSG C
28,271	98	Paved parking, HSG C
23,096	74	>75% Grass cover, Good, HSG C
67,338	87	Weighted Average
39,067		58.02% Pervious Area
28,271		41.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.6	123	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
2.6	294	0.0085	1.87		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
9.3	467	Total			

Subcatchment 3S: DA-MS2EX

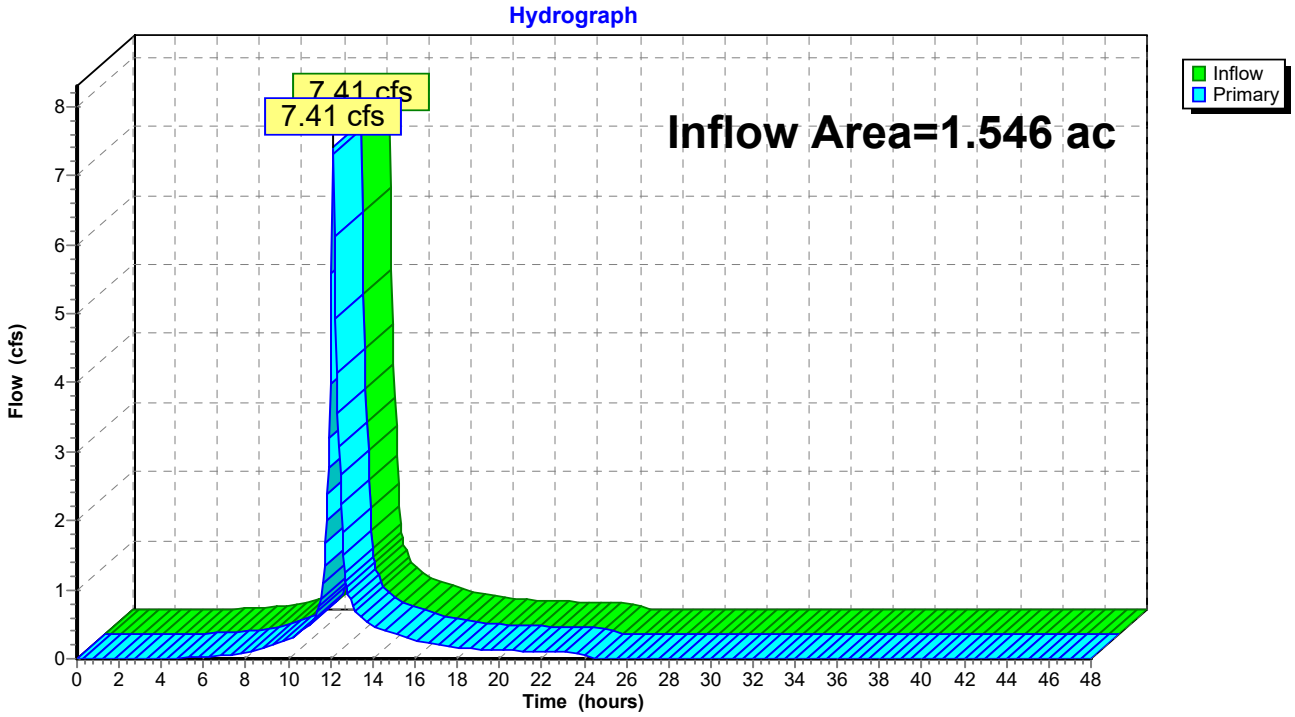


Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 41.98% Impervious, Inflow Depth = 4.80" for 25-Year event
Inflow = 7.41 cfs @ 12.13 hrs, Volume= 0.619 af
Primary = 7.41 cfs @ 12.13 hrs, Volume= 0.619 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2EX Runoff Area=67,338 sf 41.98% Impervious Runoff Depth=5.61"
Flow Length=467' Tc=9.3 min CN=87 Runoff=8.60 cfs 0.723 af

Link 5L: RT 66 Inflow=8.60 cfs 0.723 af
Primary=8.60 cfs 0.723 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.723 af Average Runoff Depth = 5.61"
58.02% Pervious = 0.897 ac 41.98% Impervious = 0.649 ac

Summary for Subcatchment 3S: DA-MS2EX

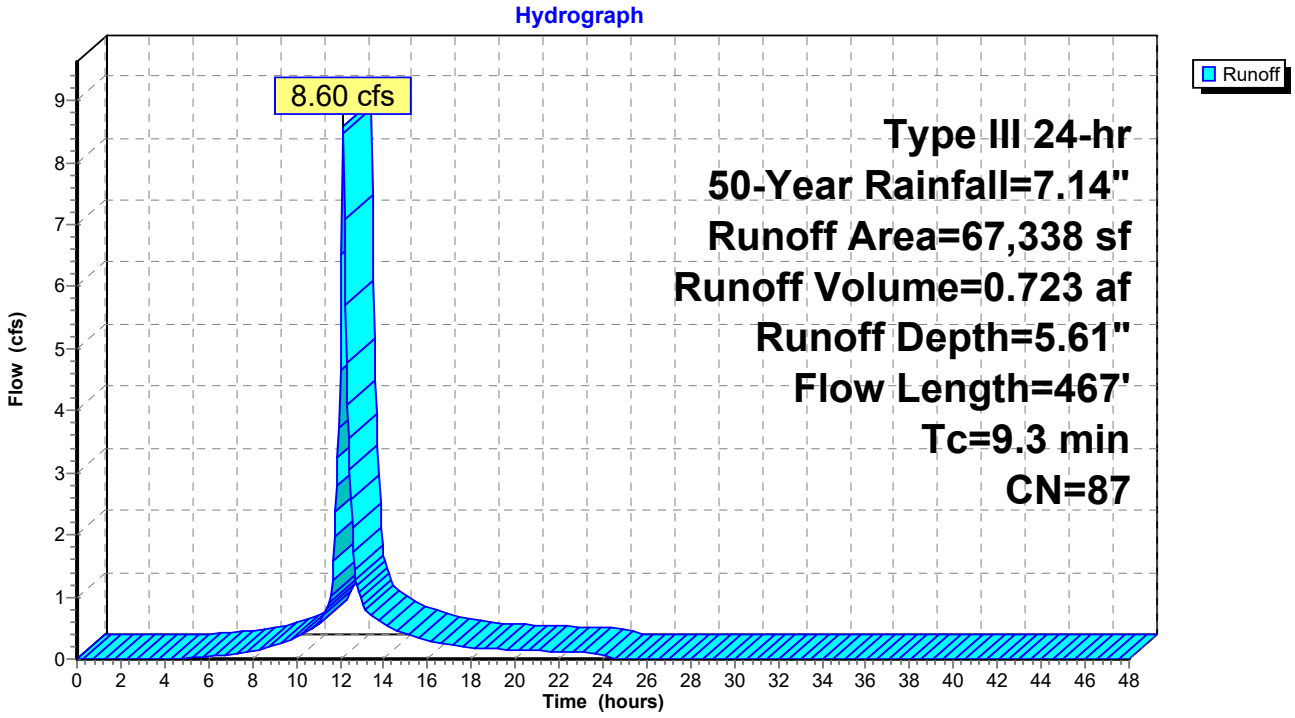
Runoff = 8.60 cfs @ 12.13 hrs, Volume= 0.723 af, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
10,110	96	Gravel surface, HSG C
28,271	98	Paved parking, HSG C
23,096	74	>75% Grass cover, Good, HSG C
67,338	87	Weighted Average
39,067		58.02% Pervious Area
28,271		41.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.6	123	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
2.6	294	0.0085	1.87		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
9.3	467	Total			

Subcatchment 3S: DA-MS2EX

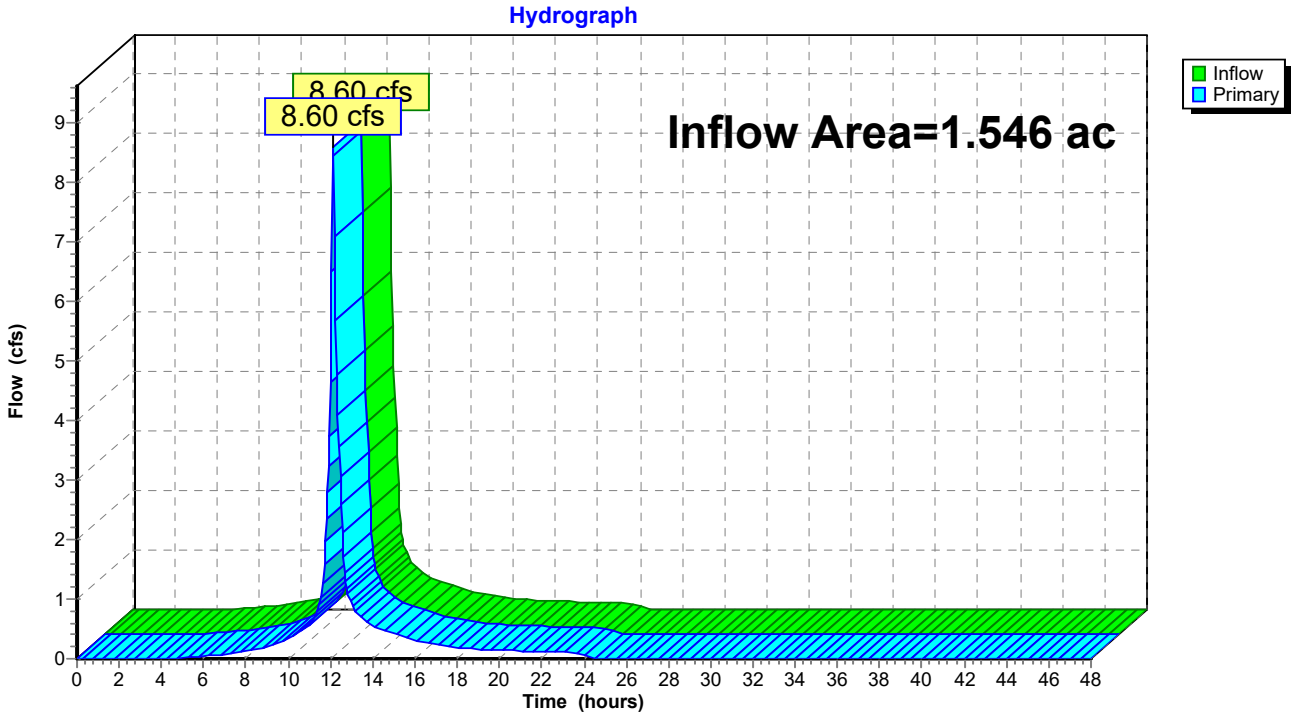


Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 41.98% Impervious, Inflow Depth = 5.61" for 50-Year event
Inflow = 8.60 cfs @ 12.13 hrs, Volume= 0.723 af
Primary = 8.60 cfs @ 12.13 hrs, Volume= 0.723 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2EX Runoff Area=67,338 sf 41.98% Impervious Runoff Depth=6.49"
Flow Length=467' Tc=9.3 min CN=87 Runoff=9.86 cfs 0.836 af

Link 5L: RT 66 Inflow=9.86 cfs 0.836 af
Primary=9.86 cfs 0.836 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.836 af Average Runoff Depth = 6.49"
58.02% Pervious = 0.897 ac 41.98% Impervious = 0.649 ac

Summary for Subcatchment 3S: DA-MS2EX

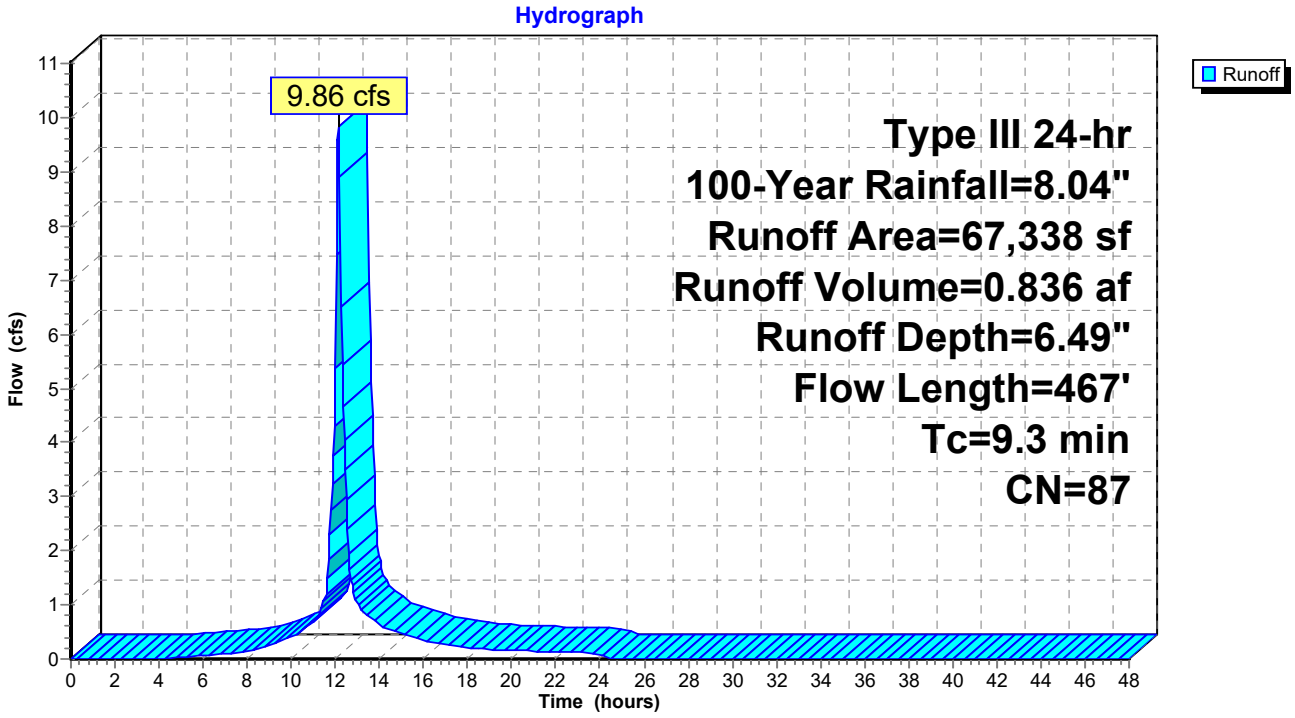
Runoff = 9.86 cfs @ 12.13 hrs, Volume= 0.836 af, Depth= 6.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
10,110	96	Gravel surface, HSG C
28,271	98	Paved parking, HSG C
23,096	74	>75% Grass cover, Good, HSG C
67,338	87	Weighted Average
39,067		58.02% Pervious Area
28,271		41.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.6	123	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
2.6	294	0.0085	1.87		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
9.3	467	Total			

Subcatchment 3S: DA-MS2EX

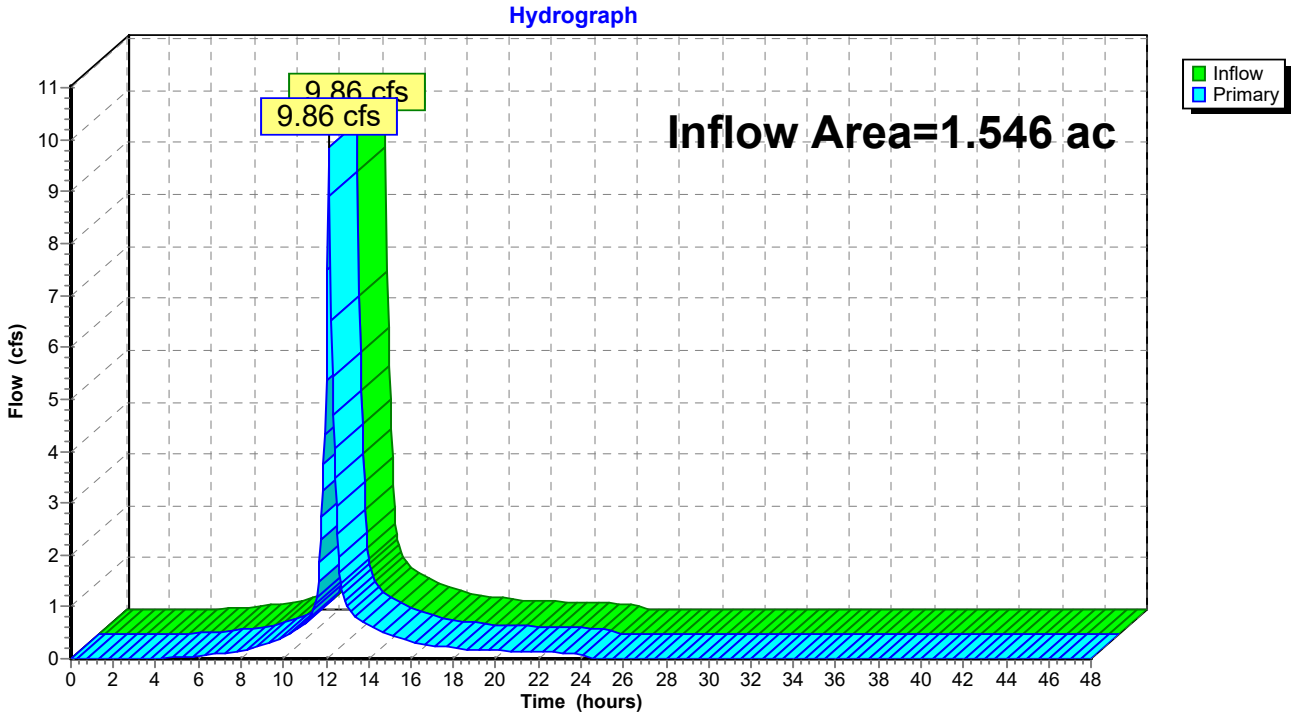


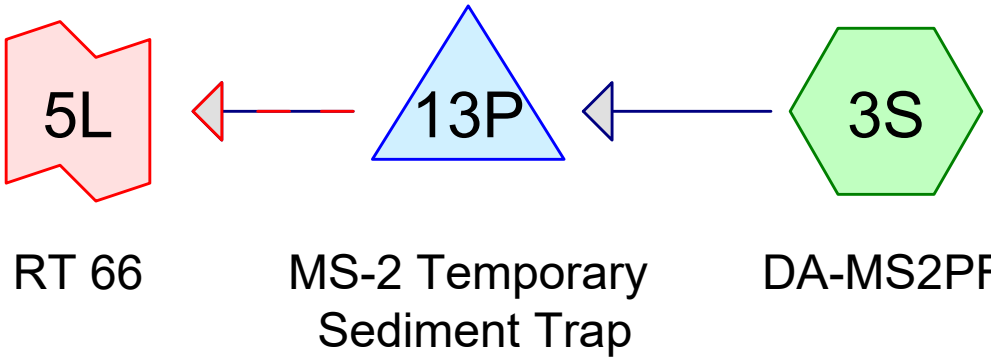
Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 41.98% Impervious, Inflow Depth = 6.49" for 100-Year event
Inflow = 9.86 cfs @ 12.13 hrs, Volume= 0.836 af
Primary = 9.86 cfs @ 12.13 hrs, Volume= 0.836 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66





Subcat Reach Pond Link

Routing Diagram for Proposed - MS2 Only
Prepared by {enter your company name here}, Printed 6/23/2020

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.37	2
2	10-Year	Type III 24-hr		Default	24.00	1	5.18	2
3	25-Year	Type III 24-hr		Default	24.00	1	6.30	2
4	50-Year	Type III 24-hr		Default	24.00	1	7.14	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.04	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.539	74	>75% Grass cover, Good, HSG C (3S)
0.193	96	Gravel surface, HSG C (3S)
0.621	98	Paved parking, HSG C (3S)
0.058	98	Water Surface, 0% imp, HSG C (3S)
0.135	70	Woods, Good, HSG C (3S)
1.546	**87**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.546	HSG C	3S
0.000	HSG D	
0.000	Other	
1.546		**TOTAL AREA**

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	0.000	0.539	0.000	0.000	0.539	>75% Grass cover, Good	3S
0.000	0.000	0.193	0.000	0.000	0.193	Gravel surface	3S
0.000	0.000	0.621	0.000	0.000	0.621	Paved parking	3S
0.000	0.000	0.058	0.000	0.000	0.058	Water Surface, 0% imp	3S
0.000	0.000	0.135	0.000	0.000	0.135	Woods, Good	3S
0.000	**0.000**	**1.546**	**0.000**	**0.000**	**1.546**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3S	0.00	0.00	154.0	0.0100	0.013	15.0	0.0	0.0
2	13P	522.50	521.75	75.0	0.0100	0.013	24.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2PR Runoff Area=67,338 sf 40.18% Impervious Runoff Depth=2.07"
Flow Length=421' Tc=8.0 min CN=87 Runoff=3.44 cfs 0.266 af

Pond 13P: MS-2 Temporary Sediment Trap Peak Elev=527.12' Storage=3,001 cf Inflow=3.44 cfs 0.266 af
Primary=1.42 cfs 0.265 af Secondary=0.00 cfs 0.000 af Outflow=1.42 cfs 0.265 af

Link 5L: RT 66 Inflow=1.42 cfs 0.265 af
Primary=1.42 cfs 0.265 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.266 af Average Runoff Depth = 2.07"
59.82% Pervious = 0.925 ac 40.18% Impervious = 0.621 ac

Summary for Subcatchment 3S: DA-MS2PR

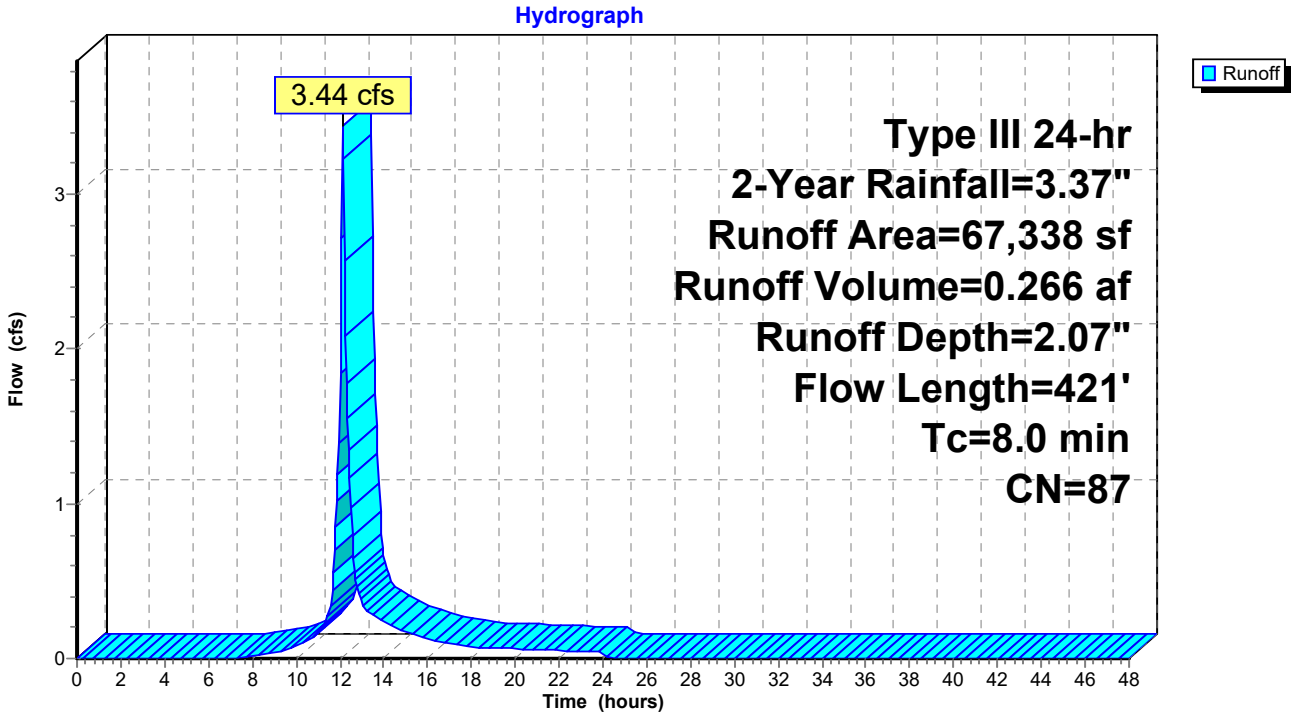
Runoff = 3.44 cfs @ 12.11 hrs, Volume= 0.266 af, Depth= 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
8,417	96	Gravel surface, HSG C
27,054	98	Paved parking, HSG C
23,483	74	>75% Grass cover, Good, HSG C
2,523	98	Water Surface, 0% imp, HSG C
67,338	87	Weighted Average
40,284		59.82% Pervious Area
27,054		40.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.7	137	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.5	154	0.0100	5.26	6.46	**Pipe Channel, 15" HDPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
8.0	421	Total			

Subcatchment 3S: DA-MS2PR



Summary for Pond 13P: MS-2 Temporary Sediment Trap

[42] Hint: Gap in defined storage above volume #1 at 524.25'

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 2.07" for 2-Year event
Inflow = 3.44 cfs @ 12.11 hrs, Volume= 0.266 af
Outflow = 1.42 cfs @ 12.38 hrs, Volume= 0.265 af, Atten= 59%, Lag= 16.2 min
Primary = 1.42 cfs @ 12.38 hrs, Volume= 0.265 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 527.12' @ 12.38 hrs Surf.Area= 2,291 sf Storage= 3,001 cf

Plug-Flow detention time= 33.9 min calculated for 0.265 af (100% of inflow)
Center-of-Mass det. time= 31.9 min (850.5 - 818.6)

Volume	Invert	Avail.Storage	Storage Description
#1	522.25'	147 cf	**2.00'W x 92.00'L x 2.00'H Underdrain Trench** 368 cf Overall x 40.0% Voids
#2	525.50'	10,036 cf	**Temporary Sediment Trap (Irregular)** Listed below (Recalc)
		10,183 cf	Total Available Storage

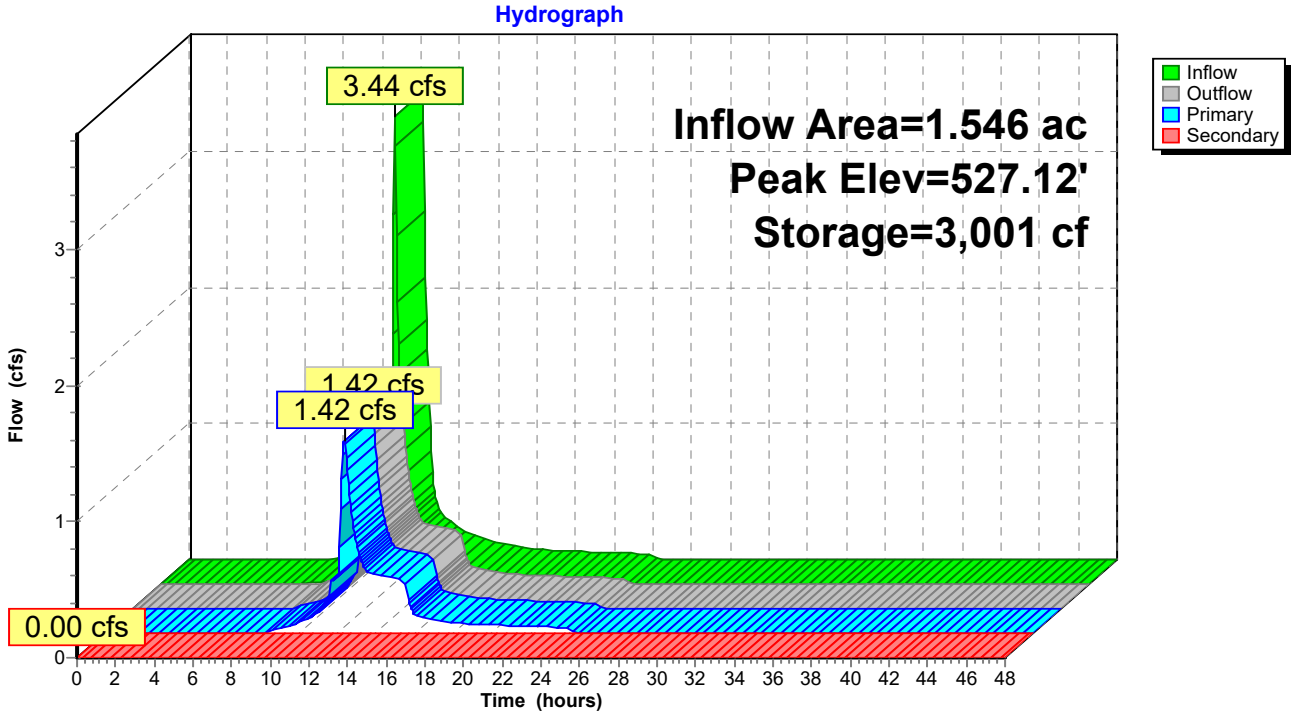
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
525.50	1,417	205.8	0	0	1,417
526.00	1,626	212.1	760	760	1,651
528.00	2,524	237.2	4,117	4,877	2,655
529.75	3,393	259.2	5,159	10,036	3,626

Device	Routing	Invert	Outlet Devices
#1	Primary	522.50'	**24.0" Round 24" HDPE** L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.50' / 521.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	522.75'	**3.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.50'	**6.0" W x 6.0" H Vert. 6" Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.00'	**18.0" W x 6.0" H Vert. 18x6 Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.25'	**2.0" x 2.0" Horiz. Top of Frame X 20.00 columns** X 20 rows C= 0.600 in 48.0" x 48.0" Grate (69% open area) Limited to weir flow at low heads
#6	Secondary	528.75'	**10.0' long x 8.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.42 cfs @ 12.38 hrs HW=527.12' TW=0.00' (Dynamic Tailwater)
- **1=24" HDPE** (Passes 1.42 cfs of 28.79 cfs potential flow)
  - **2=Underdrain** (Orifice Controls 0.49 cfs @ 9.92 fps)
  - **3=6" Orifice** (Orifice Controls 0.72 cfs @ 2.88 fps)
  - **4=18x6 Orifice** (Orifice Controls 0.21 cfs @ 1.13 fps)
  - **5=Top of Frame** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=522.25' TW=0.00' (Dynamic Tailwater)
- **6=Emergency Spillway** (Controls 0.00 cfs)

Pond 13P: MS-2 Temporary Sediment Trap

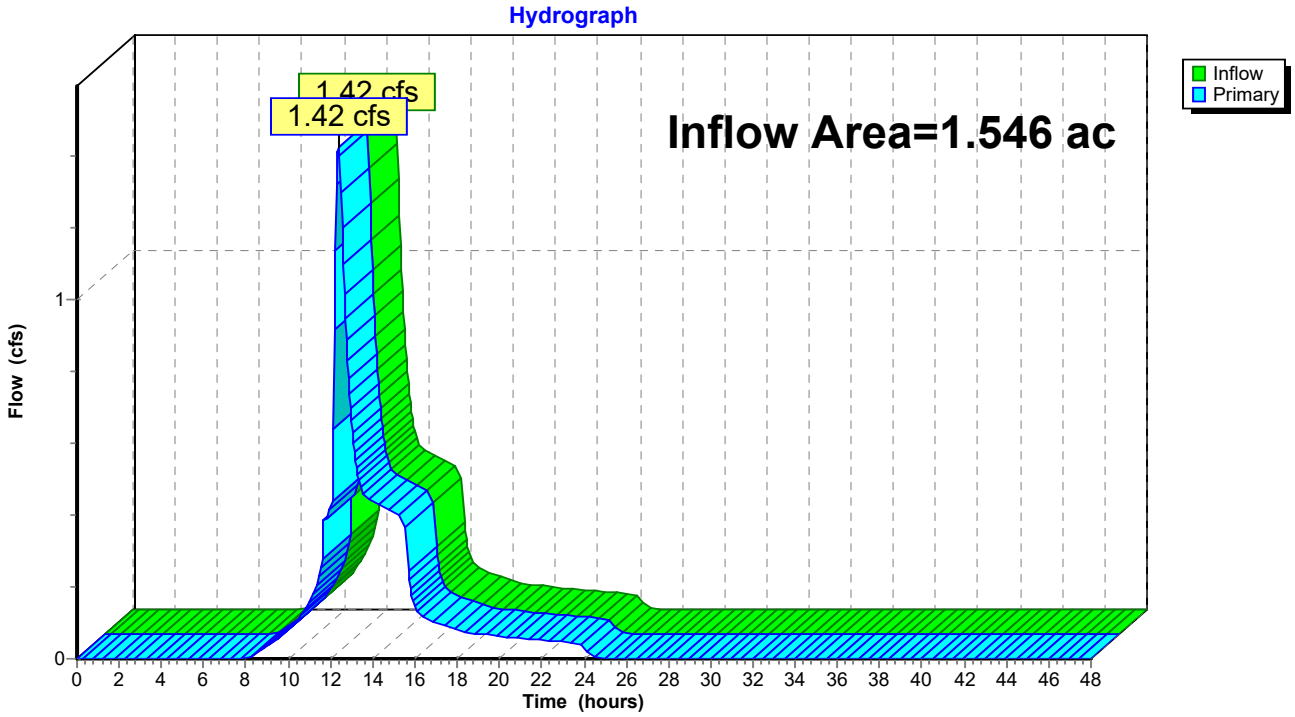


Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 2.06" for 2-Year event
Inflow = 1.42 cfs @ 12.38 hrs, Volume= 0.265 af
Primary = 1.42 cfs @ 12.38 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2PR Runoff Area=67,338 sf 40.18% Impervious Runoff Depth=3.74"
Flow Length=421' Tc=8.0 min CN=87 Runoff=6.12 cfs 0.481 af

Pond 13P: MS-2 Temporary Sediment Trap Peak Elev=527.69' Storage=4,254 cf Inflow=6.12 cfs 0.481 af
Primary=4.03 cfs 0.481 af Secondary=0.00 cfs 0.000 af Outflow=4.03 cfs 0.481 af

Link 5L: RT 66 Inflow=4.03 cfs 0.481 af
Primary=4.03 cfs 0.481 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.481 af Average Runoff Depth = 3.74"
59.82% Pervious = 0.925 ac 40.18% Impervious = 0.621 ac

Summary for Subcatchment 3S: DA-MS2PR

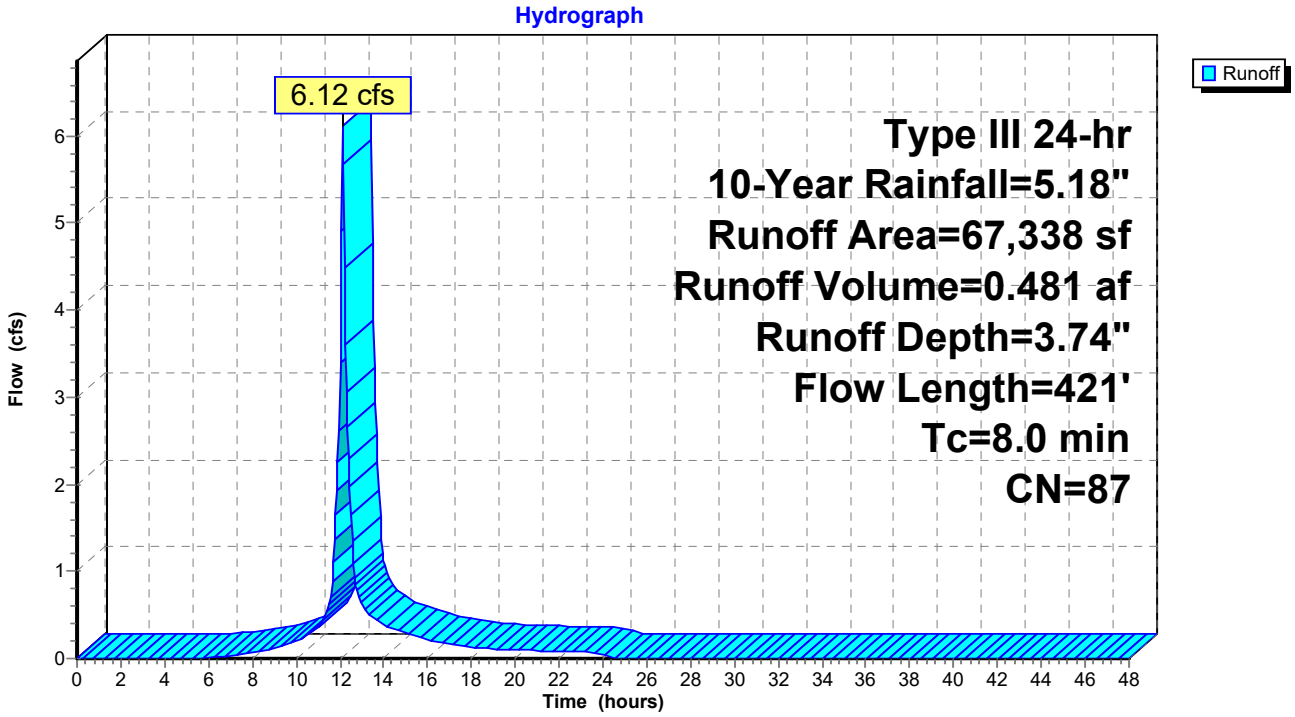
Runoff = 6.12 cfs @ 12.11 hrs, Volume= 0.481 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.18"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
8,417	96	Gravel surface, HSG C
27,054	98	Paved parking, HSG C
23,483	74	>75% Grass cover, Good, HSG C
2,523	98	Water Surface, 0% imp, HSG C
67,338	87	Weighted Average
40,284		59.82% Pervious Area
27,054		40.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.7	137	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.5	154	0.0100	5.26	6.46	**Pipe Channel, 15" HDPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
8.0	421	Total			

Subcatchment 3S: DA-MS2PR



Summary for Pond 13P: MS-2 Temporary Sediment Trap

[42] Hint: Gap in defined storage above volume #1 at 524.25'
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 3.74" for 10-Year event
Inflow = 6.12 cfs @ 12.11 hrs, Volume= 0.481 af
Outflow = 4.03 cfs @ 12.23 hrs, Volume= 0.481 af, Atten= 34%, Lag= 7.0 min
Primary = 4.03 cfs @ 12.23 hrs, Volume= 0.481 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 527.69' @ 12.23 hrs Surf.Area= 2,554 sf Storage= 4,254 cf

Plug-Flow detention time= 29.4 min calculated for 0.480 af (100% of inflow)
Center-of-Mass det. time= 28.3 min (830.1 - 801.8)

Volume	Invert	Avail.Storage	Storage Description
#1	522.25'	147 cf	**2.00'W x 92.00'L x 2.00'H Underdrain Trench** 368 cf Overall x 40.0% Voids
#2	525.50'	10,036 cf	**Temporary Sediment Trap (Irregular)** Listed below (Recalc)
		10,183 cf	Total Available Storage

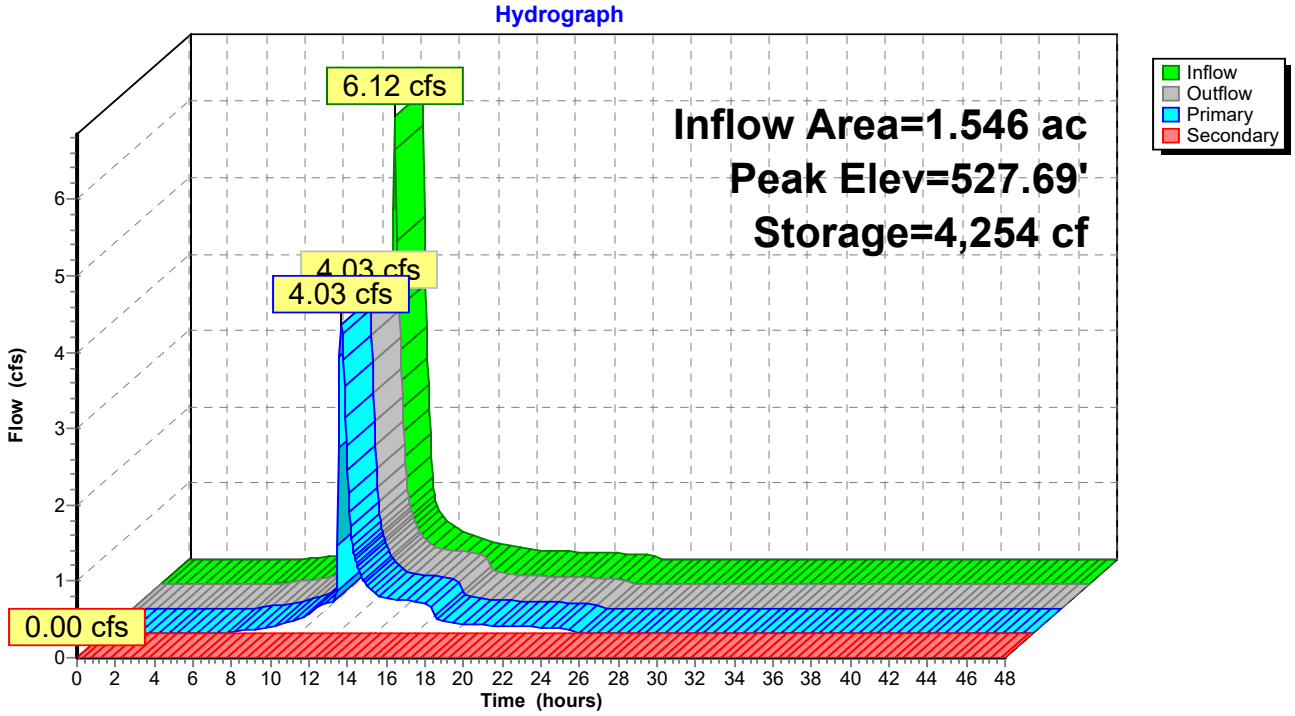
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
525.50	1,417	205.8	0	0	1,417
526.00	1,626	212.1	760	760	1,651
528.00	2,524	237.2	4,117	4,877	2,655
529.75	3,393	259.2	5,159	10,036	3,626

Device	Routing	Invert	Outlet Devices
#1	Primary	522.50'	**24.0" Round 24" HDPE** L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.50' / 521.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	522.75'	**3.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.50'	**6.0" W x 6.0" H Vert. 6" Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.00'	**18.0" W x 6.0" H Vert. 18x6 Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.25'	**2.0" x 2.0" Horiz. Top of Frame X 20.00 columns** X 20 rows C= 0.600 in 48.0" x 48.0" Grate (69% open area) Limited to weir flow at low heads
#6	Secondary	528.75'	**10.0' long x 8.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=4.00 cfs @ 12.23 hrs HW=527.68' TW=0.00' (Dynamic Tailwater)
└─**1=24" HDPE** (Passes 4.00 cfs of 30.92 cfs potential flow)
  └─**2=Underdrain** (Orifice Controls 0.52 cfs @ 10.55 fps)
  └─**3=6" Orifice** (Orifice Controls 1.16 cfs @ 4.63 fps)
  └─**4=18x6 Orifice** (Orifice Controls 2.33 cfs @ 3.11 fps)
  └─**5=Top of Frame** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=522.25' TW=0.00' (Dynamic Tailwater)
└─**6=Emergency Spillway** (Controls 0.00 cfs)

Pond 13P: MS-2 Temporary Sediment Trap

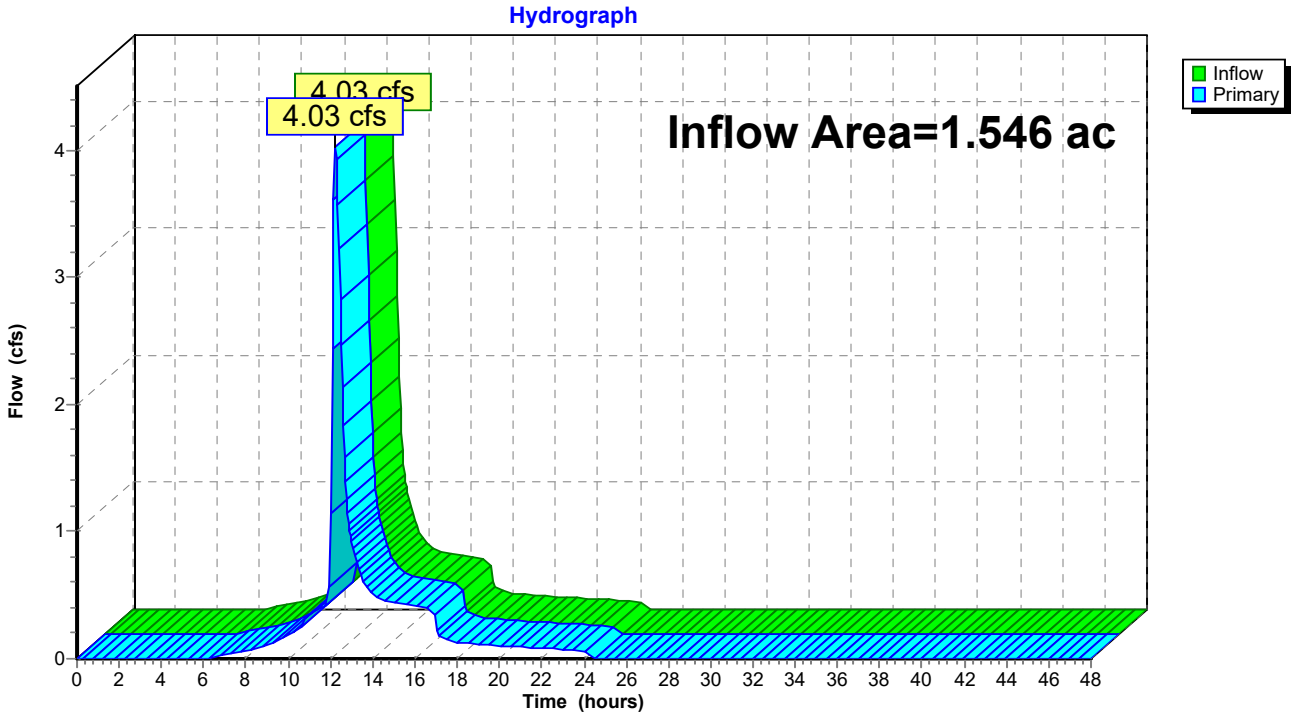


Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 3.73" for 10-Year event
Inflow = 4.03 cfs @ 12.23 hrs, Volume= 0.481 af
Primary = 4.03 cfs @ 12.23 hrs, Volume= 0.481 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2PR Runoff Area=67,338 sf 40.18% Impervious Runoff Depth=4.80"
Flow Length=421' Tc=8.0 min CN=87 Runoff=7.79 cfs 0.619 af

Pond 13P: MS-2 Temporary Sediment Trap Peak Elev=528.05' Storage=5,143 cf Inflow=7.79 cfs 0.619 af
Primary=5.12 cfs 0.618 af Secondary=0.00 cfs 0.000 af Outflow=5.12 cfs 0.618 af

Link 5L: RT 66 Inflow=5.12 cfs 0.618 af
Primary=5.12 cfs 0.618 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.619 af Average Runoff Depth = 4.80"
59.82% Pervious = 0.925 ac 40.18% Impervious = 0.621 ac

Summary for Subcatchment 3S: DA-MS2PR

[47] Hint: Peak is 121% of capacity of segment #4

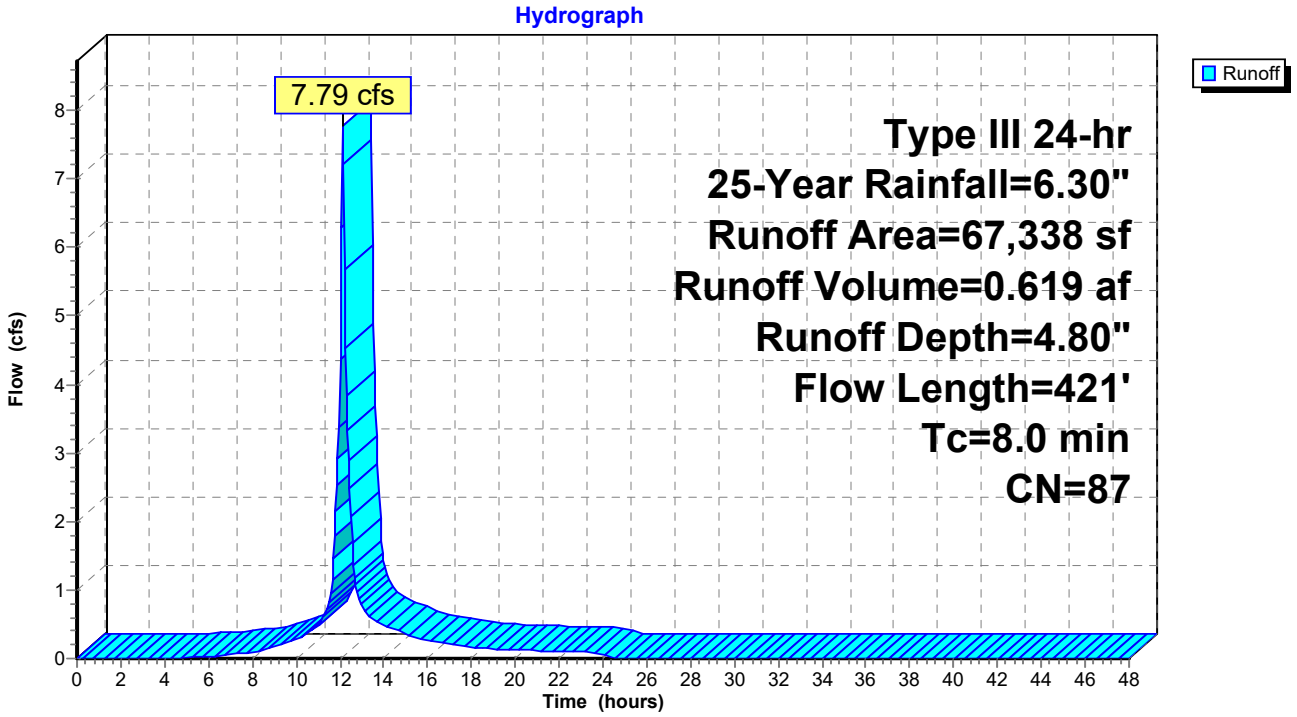
Runoff = 7.79 cfs @ 12.11 hrs, Volume= 0.619 af, Depth= 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.30"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
8,417	96	Gravel surface, HSG C
27,054	98	Paved parking, HSG C
23,483	74	>75% Grass cover, Good, HSG C
2,523	98	Water Surface, 0% imp, HSG C
67,338	87	Weighted Average
40,284		59.82% Pervious Area
27,054		40.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.7	137	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.5	154	0.0100	5.26	6.46	**Pipe Channel, 15" HDPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
8.0	421	Total			

Subcatchment 3S: DA-MS2PR



Summary for Pond 13P: MS-2 Temporary Sediment Trap

[42] Hint: Gap in defined storage above volume #1 at 524.25'

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 4.80" for 25-Year event
Inflow = 7.79 cfs @ 12.11 hrs, Volume= 0.619 af
Outflow = 5.12 cfs @ 12.23 hrs, Volume= 0.618 af, Atten= 34%, Lag= 6.8 min
Primary = 5.12 cfs @ 12.23 hrs, Volume= 0.618 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 528.05' @ 12.23 hrs Surf.Area= 2,730 sf Storage= 5,143 cf

Plug-Flow detention time= 29.2 min calculated for 0.618 af (100% of inflow)
Center-of-Mass det. time= 27.6 min (822.4 - 794.8)

Volume	Invert	Avail.Storage	Storage Description
#1	522.25'	147 cf	**2.00'W x 92.00'L x 2.00'H Underdrain Trench** 368 cf Overall x 40.0% Voids
#2	525.50'	10,036 cf	**Temporary Sediment Trap (Irregular)** Listed below (Recalc)
		10,183 cf	Total Available Storage

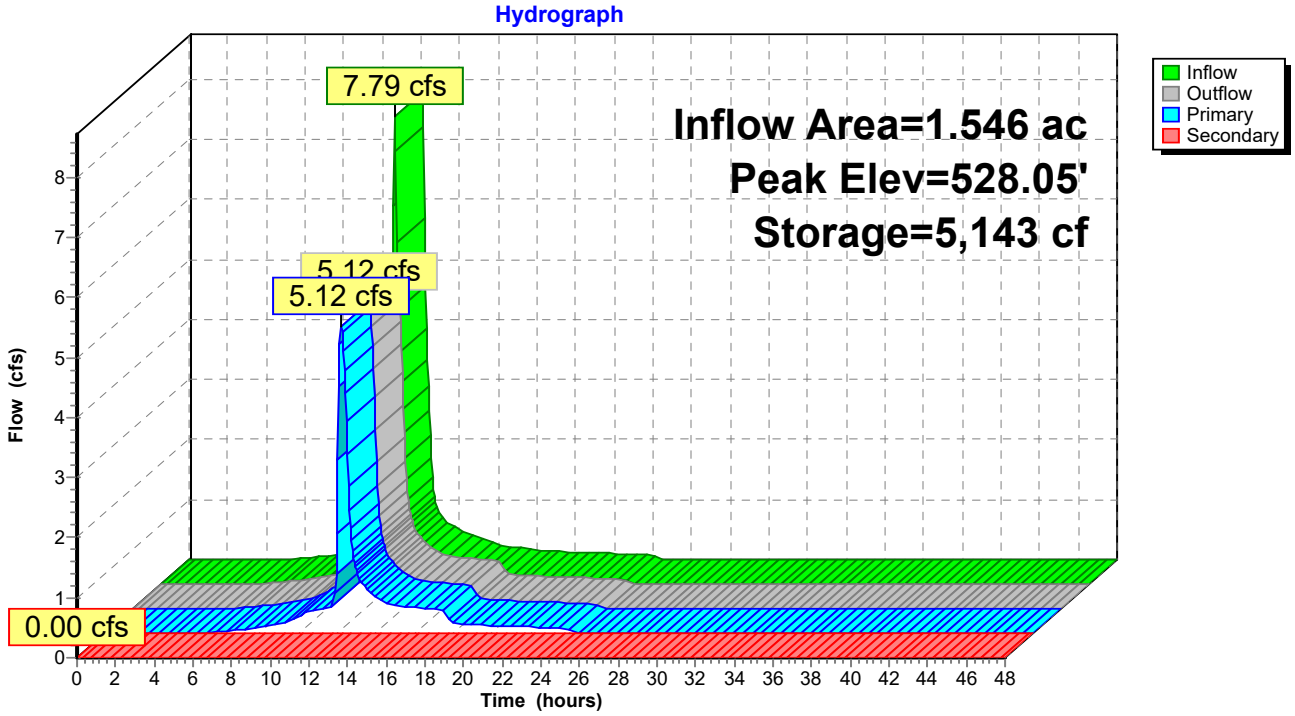
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
525.50	1,417	205.8	0	0	1,417
526.00	1,626	212.1	760	760	1,651
528.00	2,524	237.2	4,117	4,877	2,655
529.75	3,393	259.2	5,159	10,036	3,626

Device	Routing	Invert	Outlet Devices
#1	Primary	522.50'	**24.0" Round 24" HDPE** L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.50' / 521.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	522.75'	**3.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.50'	**6.0" W x 6.0" H Vert. 6" Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.00'	**18.0" W x 6.0" H Vert. 18x6 Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.25'	**2.0" x 2.0" Horiz. Top of Frame X 20.00 columns** X 20 rows C= 0.600 in 48.0" x 48.0" Grate (69% open area) Limited to weir flow at low heads
#6	Secondary	528.75'	**10.0' long x 8.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=5.10 cfs @ 12.23 hrs HW=528.04' TW=0.00' (Dynamic Tailwater)
└─**1=24" HDPE** (Passes 5.10 cfs of 32.23 cfs potential flow)
  └─**2=Underdrain** (Orifice Controls 0.54 cfs @ 10.94 fps)
  └─**3=6" Orifice** (Orifice Controls 1.36 cfs @ 5.46 fps)
  └─**4=18x6 Orifice** (Orifice Controls 3.19 cfs @ 4.26 fps)
  └─**5=Top of Frame** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=522.25' TW=0.00' (Dynamic Tailwater)
└─**6=Emergency Spillway** (Controls 0.00 cfs)

Pond 13P: MS-2 Temporary Sediment Trap

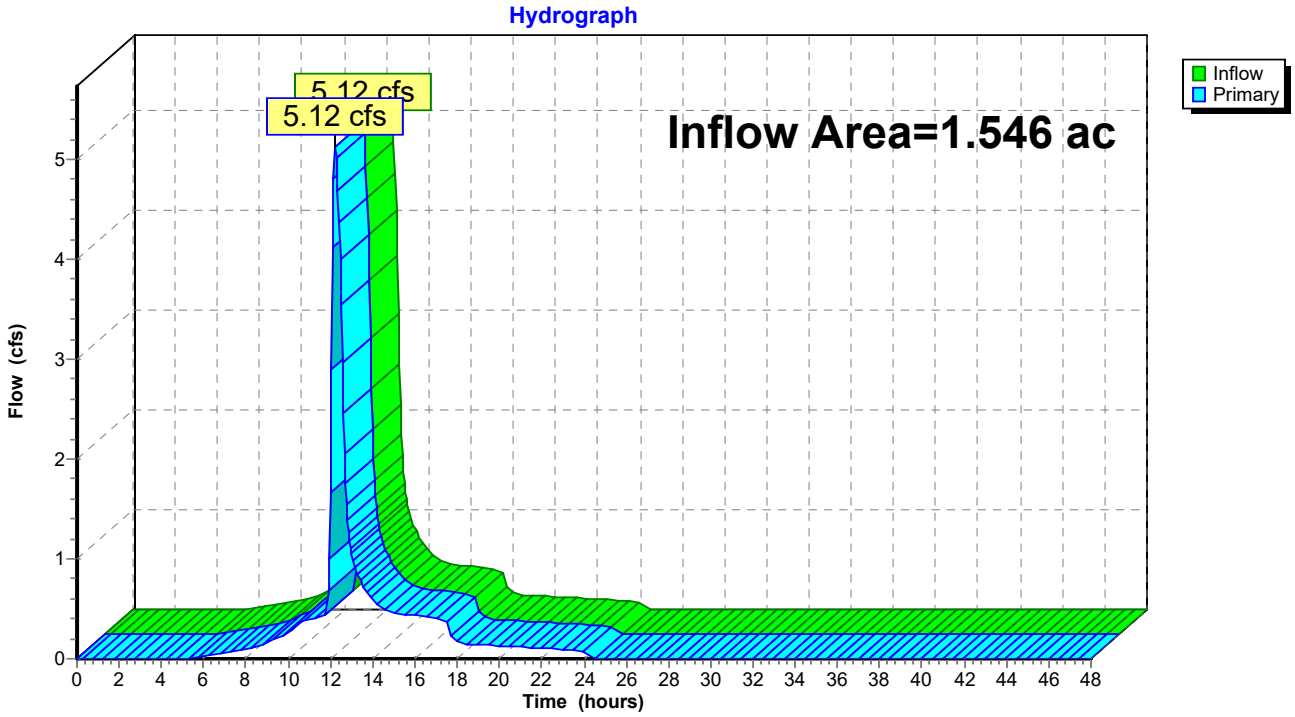


Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 4.80" for 25-Year event
Inflow = 5.12 cfs @ 12.23 hrs, Volume= 0.618 af
Primary = 5.12 cfs @ 12.23 hrs, Volume= 0.618 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2PR Runoff Area=67,338 sf 40.18% Impervious Runoff Depth=5.61"
Flow Length=421' Tc=8.0 min CN=87 Runoff=9.03 cfs 0.723 af

Pond 13P: MS-2 Temporary Sediment Trap Peak Elev=528.30' Storage=5,806 cf Inflow=9.03 cfs 0.723 af
Primary=6.19 cfs 0.722 af Secondary=0.00 cfs 0.000 af Outflow=6.19 cfs 0.722 af

Link 5L: RT 66 Inflow=6.19 cfs 0.722 af
Primary=6.19 cfs 0.722 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.723 af Average Runoff Depth = 5.61"
59.82% Pervious = 0.925 ac 40.18% Impervious = 0.621 ac

Summary for Subcatchment 3S: DA-MS2PR

[47] Hint: Peak is 140% of capacity of segment #4

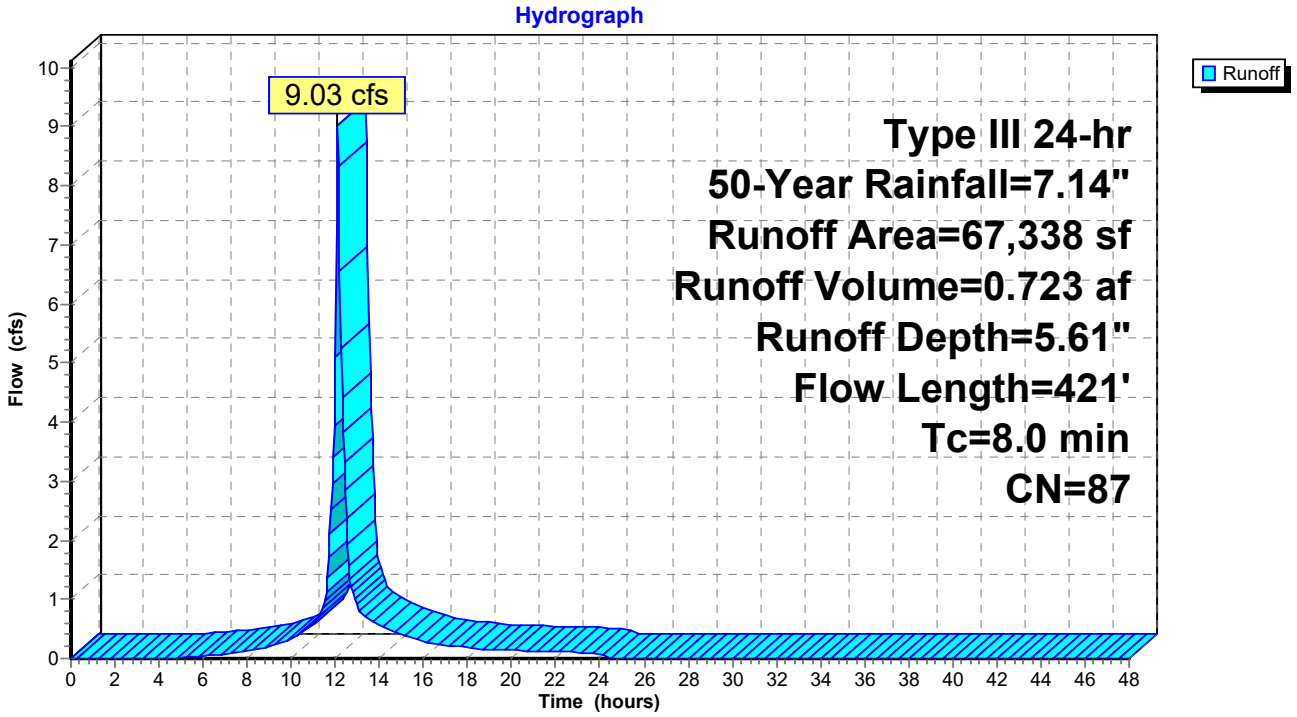
Runoff = 9.03 cfs @ 12.11 hrs, Volume= 0.723 af, Depth= 5.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.14"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
8,417	96	Gravel surface, HSG C
27,054	98	Paved parking, HSG C
23,483	74	>75% Grass cover, Good, HSG C
2,523	98	Water Surface, 0% imp, HSG C
67,338	87	Weighted Average
40,284		59.82% Pervious Area
27,054		40.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.7	137	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.5	154	0.0100	5.26	6.46	**Pipe Channel, 15" HDPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
8.0	421	Total			

Subcatchment 3S: DA-MS2PR



Summary for Pond 13P: MS-2 Temporary Sediment Trap

[42] Hint: Gap in defined storage above volume #1 at 524.25'

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 5.61" for 50-Year event
Inflow = 9.03 cfs @ 12.11 hrs, Volume= 0.723 af
Outflow = 6.19 cfs @ 12.21 hrs, Volume= 0.722 af, Atten= 31%, Lag= 6.2 min
Primary = 6.19 cfs @ 12.21 hrs, Volume= 0.722 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 528.30' @ 12.22 hrs Surf.Area= 2,848 sf Storage= 5,806 cf

Plug-Flow detention time= 28.7 min calculated for 0.722 af (100% of inflow)
Center-of-Mass det. time= 27.3 min (817.8 - 790.6)

Volume	Invert	Avail.Storage	Storage Description
#1	522.25'	147 cf	**2.00'W x 92.00'L x 2.00'H Underdrain Trench** 368 cf Overall x 40.0% Voids
#2	525.50'	10,036 cf	**Temporary Sediment Trap (Irregular)** Listed below (Recalc)
		10,183 cf	Total Available Storage

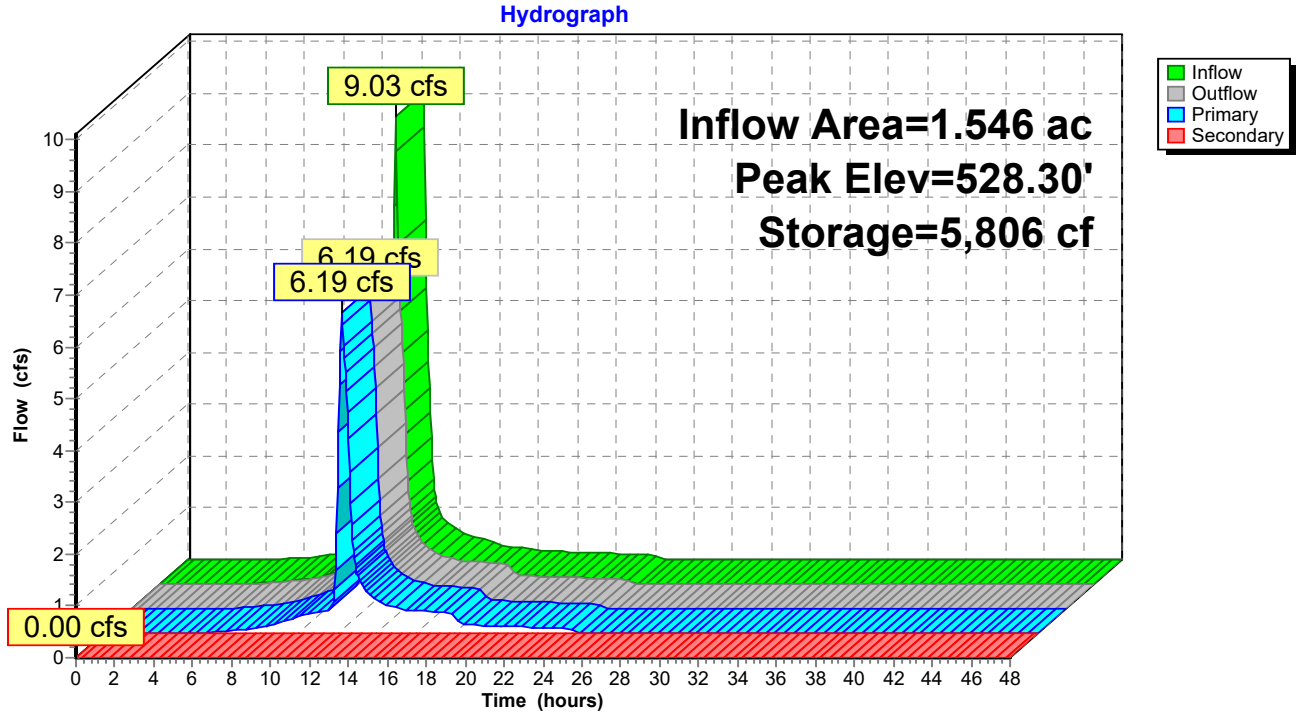
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
525.50	1,417	205.8	0	0	1,417
526.00	1,626	212.1	760	760	1,651
528.00	2,524	237.2	4,117	4,877	2,655
529.75	3,393	259.2	5,159	10,036	3,626

Device	Routing	Invert	Outlet Devices
#1	Primary	522.50'	**24.0" Round 24" HDPE** L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.50' / 521.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	522.75'	**3.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.50'	**6.0" W x 6.0" H Vert. 6" Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.00'	**18.0" W x 6.0" H Vert. 18x6 Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.25'	**2.0" x 2.0" Horiz. Top of Frame X 20.00 columns** X 20 rows C= 0.600 in 48.0" x 48.0" Grate (69% open area) Limited to weir flow at low heads
#6	Secondary	528.75'	**10.0' long x 8.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=6.09 cfs @ 12.21 hrs HW=528.29' TW=0.00' (Dynamic Tailwater)
- **1=24" HDPE** (Passes 6.09 cfs of 33.10 cfs potential flow)
  - **2=Underdrain** (Orifice Controls 0.55 cfs @ 11.20 fps)
  - **3=6" Orifice** (Orifice Controls 1.49 cfs @ 5.96 fps)
  - **4=18x6 Orifice** (Orifice Controls 3.67 cfs @ 4.89 fps)
  - **5=Top of Frame** (Weir Controls 0.38 cfs @ 0.63 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=522.25' TW=0.00' (Dynamic Tailwater)
- **6=Emergency Spillway** (Controls 0.00 cfs)

Pond 13P: MS-2 Temporary Sediment Trap

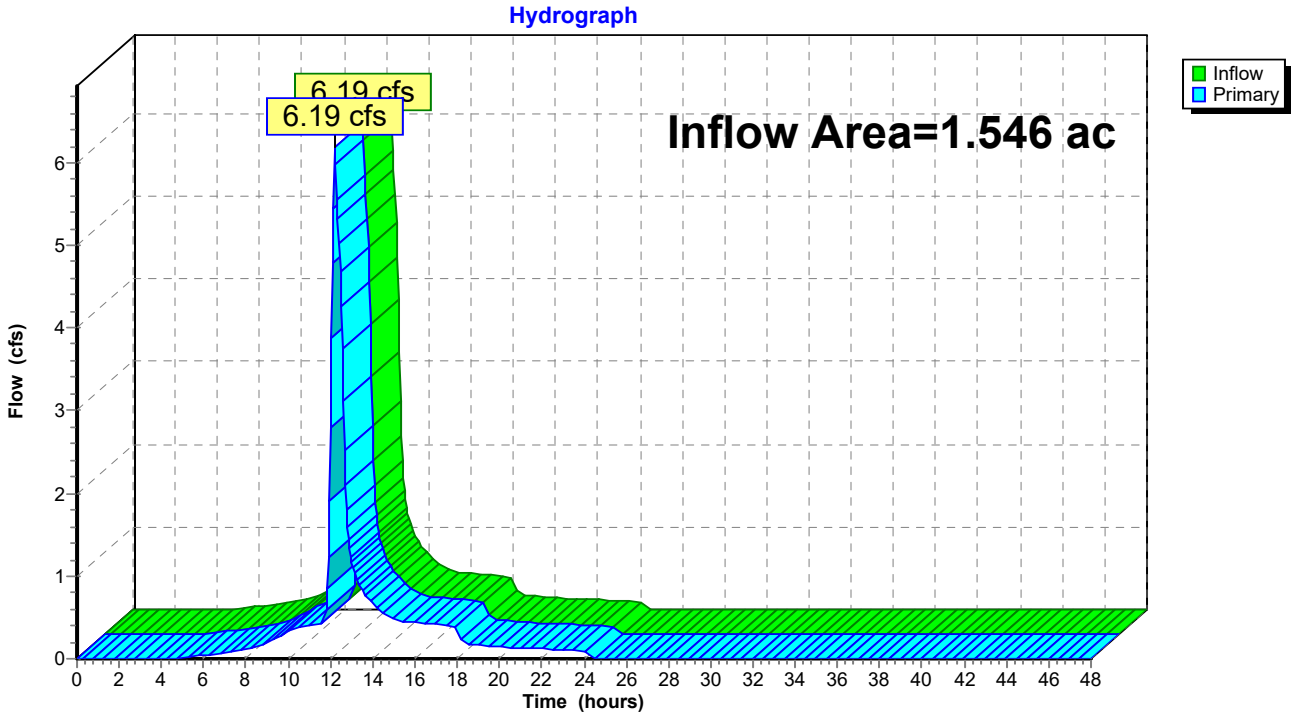


Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 5.61" for 50-Year event
Inflow = 6.19 cfs @ 12.21 hrs, Volume= 0.722 af
Primary = 6.19 cfs @ 12.21 hrs, Volume= 0.722 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: DA-MS2PR Runoff Area=67,338 sf 40.18% Impervious Runoff Depth=6.49"
Flow Length=421' Tc=8.0 min CN=87 Runoff=10.35 cfs 0.836 af

Pond 13P: MS-2 Temporary Sediment Trap Peak Elev=528.39' Storage=6,038 cf Inflow=10.35 cfs 0.836 af
Primary=8.59 cfs 0.835 af Secondary=0.00 cfs 0.000 af Outflow=8.59 cfs 0.835 af

Link 5L: RT 66 Inflow=8.59 cfs 0.835 af
Primary=8.59 cfs 0.835 af

Total Runoff Area = 1.546 ac Runoff Volume = 0.836 af Average Runoff Depth = 6.49"
59.82% Pervious = 0.925 ac 40.18% Impervious = 0.621 ac

Summary for Subcatchment 3S: DA-MS2PR

[47] Hint: Peak is 160% of capacity of segment #4

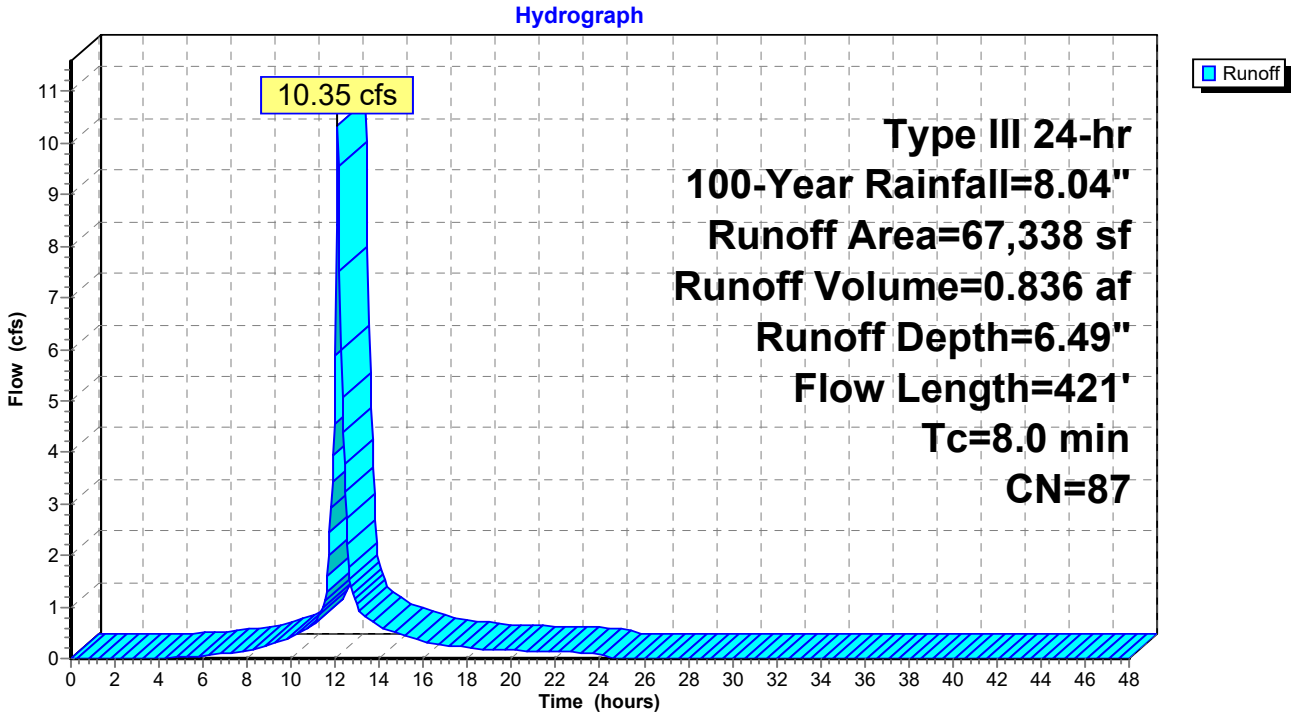
Runoff = 10.35 cfs @ 12.11 hrs, Volume= 0.836 af, Depth= 6.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.04"

Area (sf)	CN	Description
5,861	70	Woods, Good, HSG C
8,417	96	Gravel surface, HSG C
27,054	98	Paved parking, HSG C
23,483	74	>75% Grass cover, Good, HSG C
2,523	98	Water Surface, 0% imp, HSG C
67,338	87	Weighted Average
40,284		59.82% Pervious Area
27,054		40.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.37"
0.7	137	0.0427	3.33		**Shallow Concentrated Flow, Gravel** Unpaved Kv= 16.1 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
0.5	154	0.0100	5.26	6.46	**Pipe Channel, 15" HDPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
8.0	421	Total			

Subcatchment 3S: DA-MS2PR



Summary for Pond 13P: MS-2 Temporary Sediment Trap

[42] Hint: Gap in defined storage above volume #1 at 524.25'

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 6.49" for 100-Year event
Inflow = 10.35 cfs @ 12.11 hrs, Volume= 0.836 af
Outflow = 8.59 cfs @ 12.19 hrs, Volume= 0.835 af, Atten= 17%, Lag= 4.6 min
Primary = 8.59 cfs @ 12.19 hrs, Volume= 0.835 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 528.39' @ 12.19 hrs Surf.Area= 2,889 sf Storage= 6,038 cf

Plug-Flow detention time= 28.1 min calculated for 0.835 af (100% of inflow)
Center-of-Mass det. time= 26.7 min (813.4 - 786.7)

Volume	Invert	Avail.Storage	Storage Description
#1	522.25'	147 cf	**2.00'W x 92.00'L x 2.00'H Underdrain Trench** 368 cf Overall x 40.0% Voids
#2	525.50'	10,036 cf	**Temporary Sediment Trap (Irregular)** Listed below (Recalc)
		10,183 cf	Total Available Storage

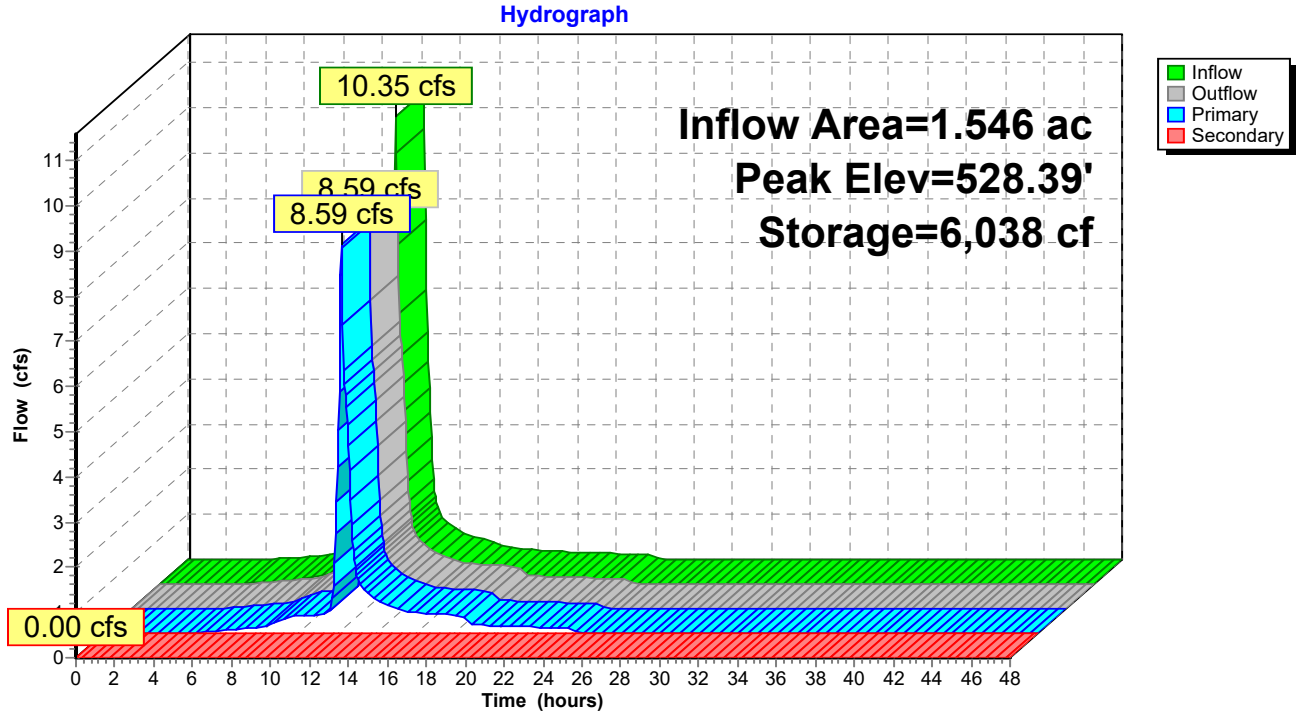
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
525.50	1,417	205.8	0	0	1,417
526.00	1,626	212.1	760	760	1,651
528.00	2,524	237.2	4,117	4,877	2,655
529.75	3,393	259.2	5,159	10,036	3,626

Device	Routing	Invert	Outlet Devices
#1	Primary	522.50'	**24.0" Round 24" HDPE** L= 75.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 522.50' / 521.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	522.75'	**3.0" Vert. Underdrain** C= 0.600 Limited to weir flow at low heads
#3	Device 1	526.50'	**6.0" W x 6.0" H Vert. 6" Orifice** C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.00'	**18.0" W x 6.0" H Vert. 18x6 Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 1	528.25'	**2.0" x 2.0" Horiz. Top of Frame X 20.00 columns** X 20 rows C= 0.600 in 48.0" x 48.0" Grate (69% open area) Limited to weir flow at low heads
#6	Secondary	528.75'	**10.0' long x 8.0' breadth Emergency Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=8.38 cfs @ 12.19 hrs HW=528.38' TW=0.00' (Dynamic Tailwater)
└─**1=24" HDPE** (Passes 8.38 cfs of 33.42 cfs potential flow)
  └─**2=Underdrain** (Orifice Controls 0.55 cfs @ 11.30 fps)
  └─**3=6" Orifice** (Orifice Controls 1.54 cfs @ 6.14 fps)
  └─**4=18x6 Orifice** (Orifice Controls 3.83 cfs @ 5.11 fps)
  └─**5=Top of Frame** (Weir Controls 2.46 cfs @ 1.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=522.25' TW=0.00' (Dynamic Tailwater)
└─**6=Emergency Spillway** (Controls 0.00 cfs)

Pond 13P: MS-2 Temporary Sediment Trap



Summary for Link 5L: RT 66

Inflow Area = 1.546 ac, 40.18% Impervious, Inflow Depth = 6.48" for 100-Year event
Inflow = 8.59 cfs @ 12.19 hrs, Volume= 0.835 af
Primary = 8.59 cfs @ 12.19 hrs, Volume= 0.835 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 5L: RT 66