PRELIMINARY STORMWATER MANAGEMENT SUMMARY

CITY OF DUBLIN
UNION COUNTY, OHIO

Prepared for:

PULTE HOMES OF OHIO

Prepared by:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
COLUMBUS, OHIO

AUTUMN ROSE WOODS
CEC PROJECT 150-620

SEPTEMBER 2016

Civil & Environmental Consultants, Inc.

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APPENDICES

Civil and Environmental Consultants, Inc. (CEC) has evaluated the current site conditions and the proposed development plan of Autumn Rose Woods (site) and offers the following for stormwater management design considerations to the City of Dublin.

1.0 EXISTING CONDITIONS STORM CALCULATIONS

CEC studied the existing site drainage conditions for the proposed Autumn Rose Woods Development. The proposed disturbed area's existing onsite conditions consist of mostly agricultural crop use with some portions of wooded areas in the eastern part of the site. A horse stable, barns and single family residence exists on the southern part of the development.

The onsite watershed is 37.23 acres and is comprised of row crops with Type C soils. The site drains to the existing storm sewer system in the Park Place Development. A weighted curve number of 75 and time of concentration of 73.9 minutes were calculated for the site.

An additional 21.48 acres of land on the west side of Highland Croy Road is tributary to the site. The offsite area will be routed through the proposed storm sewer system as part of the development.

The existing storm calculation including peak flows for critical storms is included in Appendix A.

2.0 STORMWATER MANAGEMENT

CEC proposes to construct a single wet basin on the east side of the proposed development, providing water quantity and water quality control in accordance with the City and Ohio EPA regulations. The basin will have an outlet into the existing storm sewer system in Park Place on the south side of the site.

CEC will meet or exceed the requirements of the Stormwater Management Design Manual and will hold the release rate of the critical year post developed storm event to the existing release rate for the 1-year storm event. CEC will design the basins to provide water quality treatment for the onsite and offsite areas tributary to them. The cumulative release from the basin will be less than the allowable release rate.

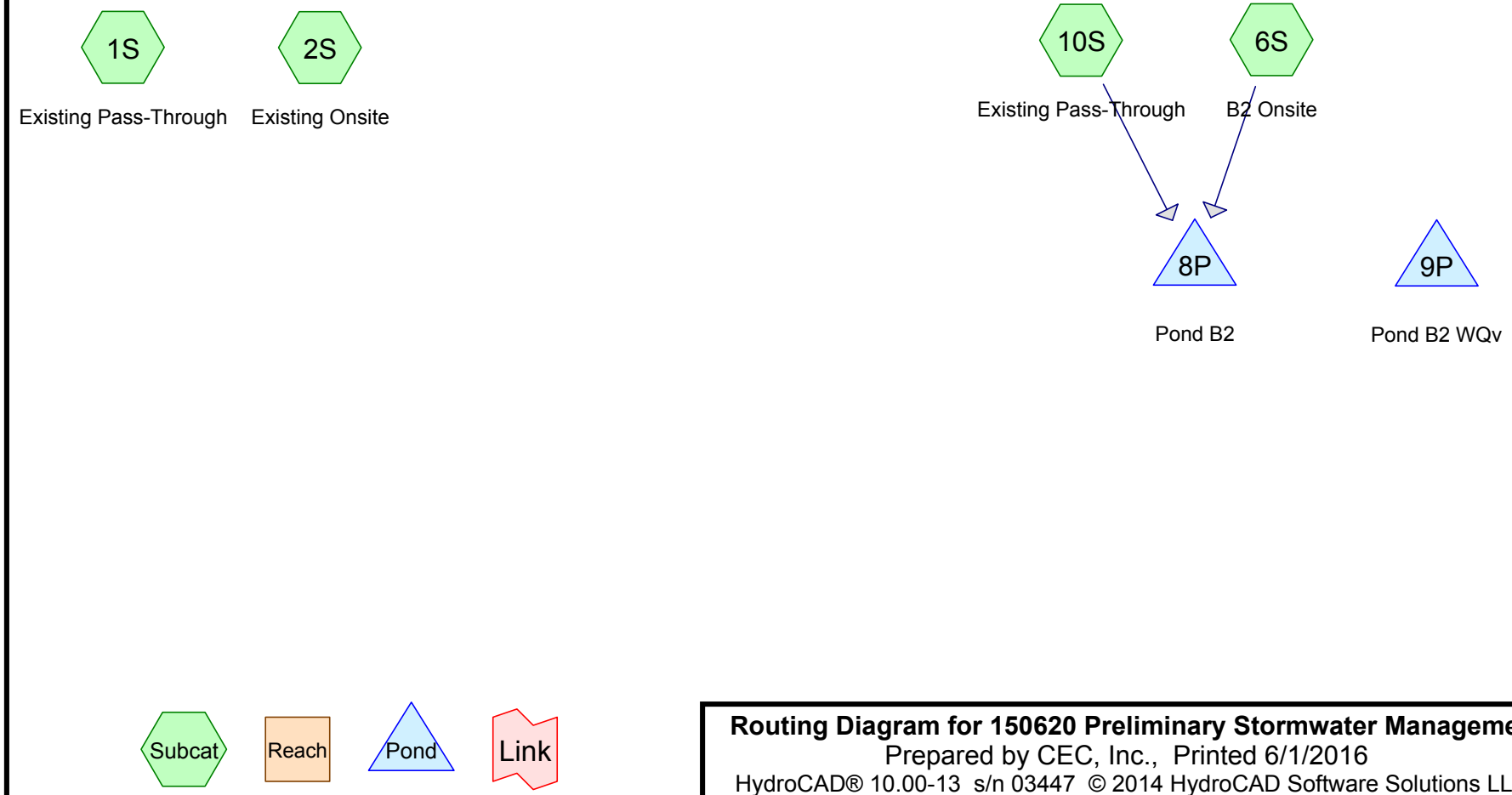
Table 1: Allowable Discharge Summary
Proposed Basin

Storm Event (year)	$Q_{existing}$ (cfs)	$Q_{pass\ through}$ (cfs)	*$Q_{allowable}$ (cfs)	Q_{actual} (cfs)	Max W.S.E. A (cfs)
1	6.64	2.39	9.03	3.51	922.57
2	10.86	3.87	10.51	5.07	923.10
5	17.76	6.34	12.98	9.42	923.66
10	23.99	8.57	15.21	13.33	924.04
25	33.32	11.91	45.23	20.09	924.68
50	41.44	14.83	56.27	27.41	925.22
100	50.25	17.99	68.24	33.51	925.79

*Allowable Q for 1-10 Year Storm = 1-Year Existing Conditions Q + Qpass through
*Allowable Q for 10-100 Year Storm = Existing Conditions Q + Qpass through

APPENDIX A

PRE-DEVELOPED FLOWS



Routing Diagram for 150620 Preliminary Stormwater Management2

Prepared by CEC, Inc., Printed 6/1/2016

Summary for Subcatchment 2S: Existing Onsite

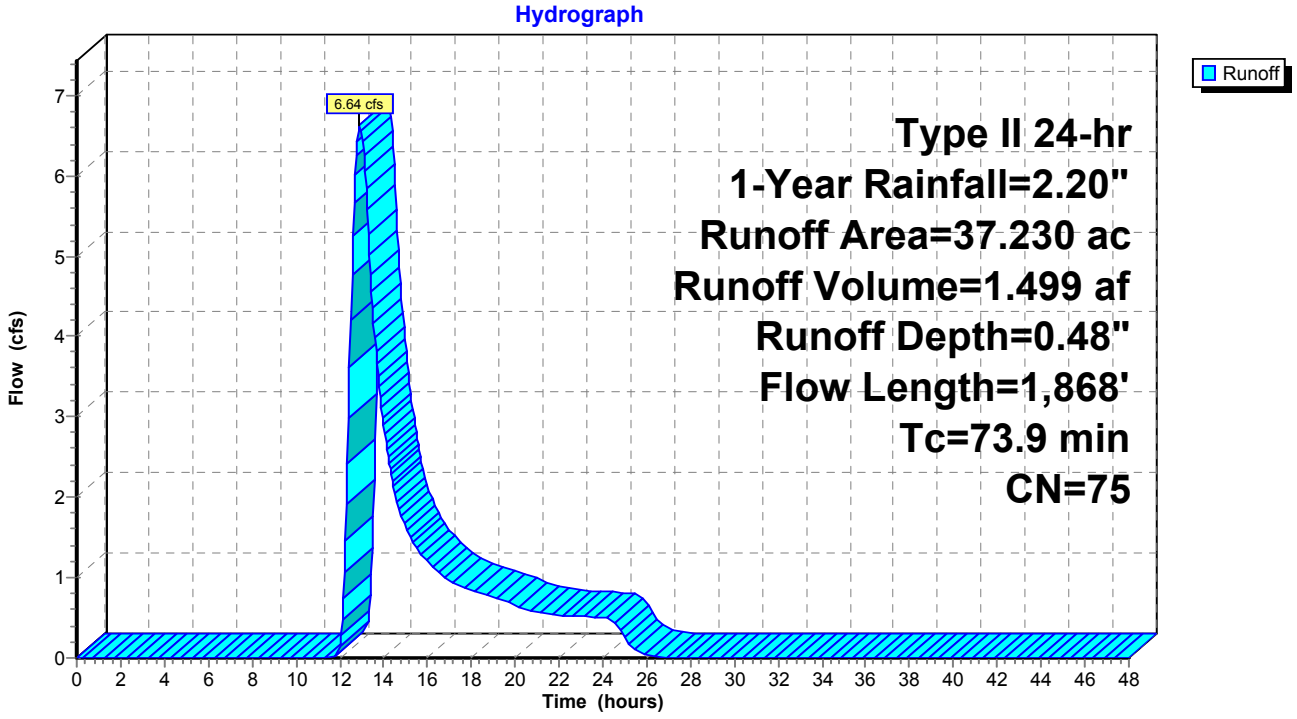
Runoff = 6.64 cfs @ 12.91 hrs, Volume= 1.499 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

Area (ac)	CN	Description
7.810	70	Woods, Good, HSG C
21.190	74	Pasture/grassland/range, Good, HSG C
3.370	98	Paved parking, HSG C
3.010	74	Pasture/grassland/range, Good, HSG C
1.850	74	>75% Grass cover, Good, HSG C
37.230	75	Weighted Average
33.860		90.95% Pervious Area
3.370		9.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0200	0.14		**Sheet Flow, Sheet Flow** Cultivated: Residue>20% n= 0.170 P2= 2.60"
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow, SCF** Cultivated Straight Rows Kv= 9.0 fps
73.9	1,868	Total			

Subcatchment 2S: Existing Onsite



Summary for Subcatchment 2S: Existing Onsite

Runoff = 10.86 cfs @ 12.89 hrs, Volume= 2.258 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

Area (ac)	CN	Description
7.810	70	Woods, Good, HSG C
21.190	74	Pasture/grassland/range, Good, HSG C
3.370	98	Paved parking, HSG C
3.010	74	Pasture/grassland/range, Good, HSG C
1.850	74	>75% Grass cover, Good, HSG C
37.230	75	Weighted Average
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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
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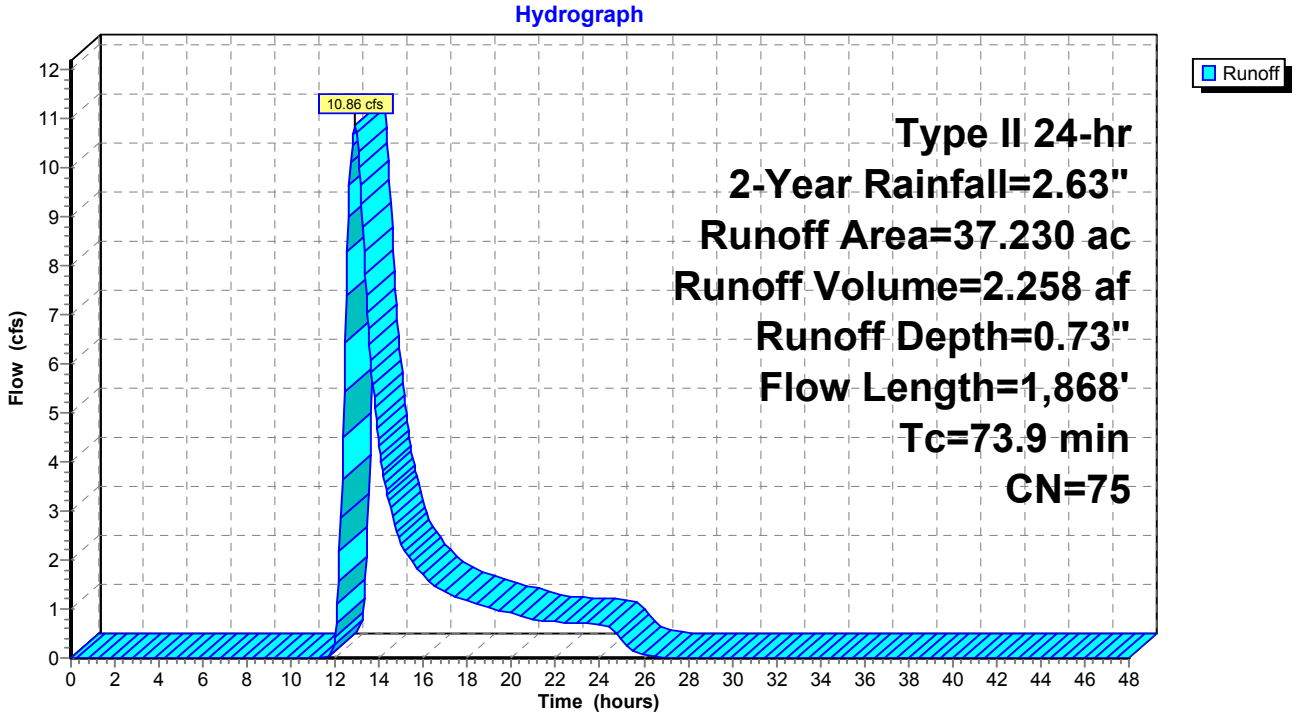
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow, SCF** Cultivated Straight Rows Kv= 9.0 fps
73.9	1,868	Total			

Subcatchment 2S: Existing Onsite



Summary for Subcatchment 2S: Existing Onsite

Runoff = 17.76 cfs @ 12.87 hrs, Volume= 3.478 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

Area (ac)	CN	Description
7.810	70	Woods, Good, HSG C
21.190	74	Pasture/grassland/range, Good, HSG C
3.370	98	Paved parking, HSG C
3.010	74	Pasture/grassland/range, Good, HSG C
1.850	74	>75% Grass cover, Good, HSG C
37.230	75	Weighted Average
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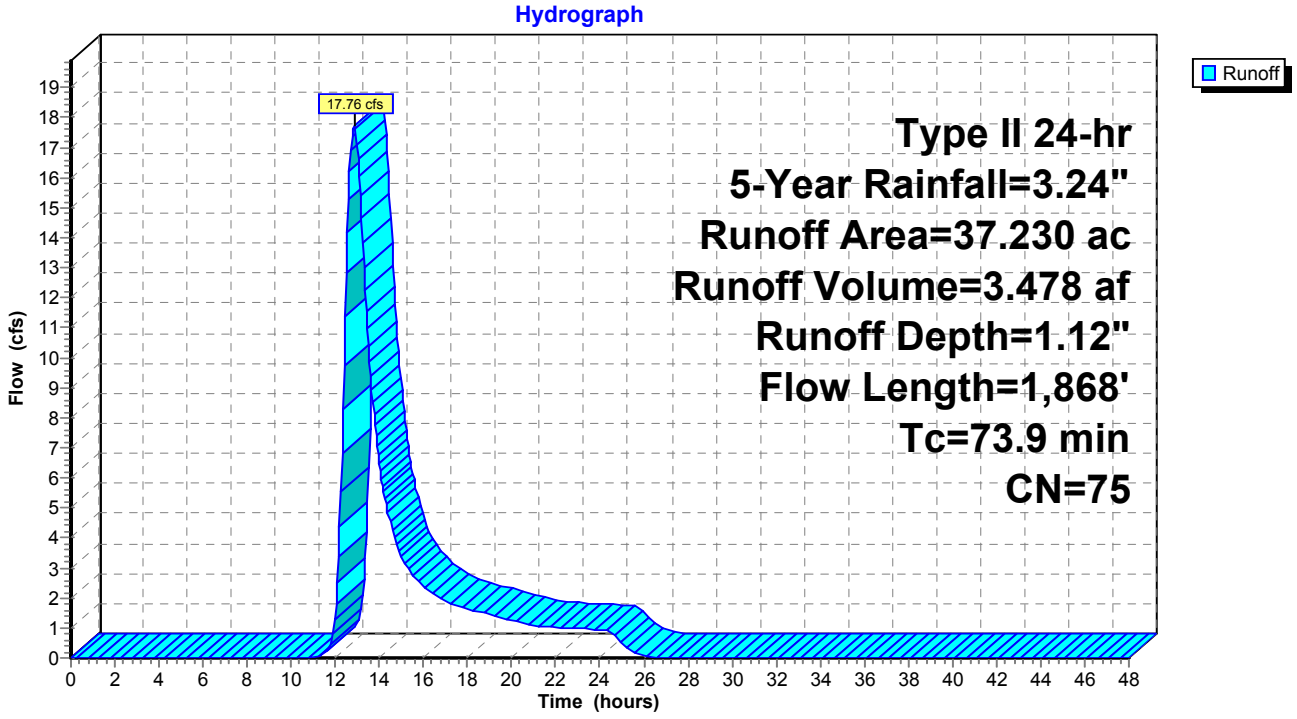
12.0	100	0.0200	0.14		**Sheet Flow, Sheet Flow** Cultivated: Residue>20% n= 0.170 P2= 2.60"
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow, SCF** Cultivated Straight Rows Kv= 9.0 fps
73.9	1,868	Total			

Subcatchment 2S: Existing Onsite



Summary for Subcatchment 2S: Existing Onsite

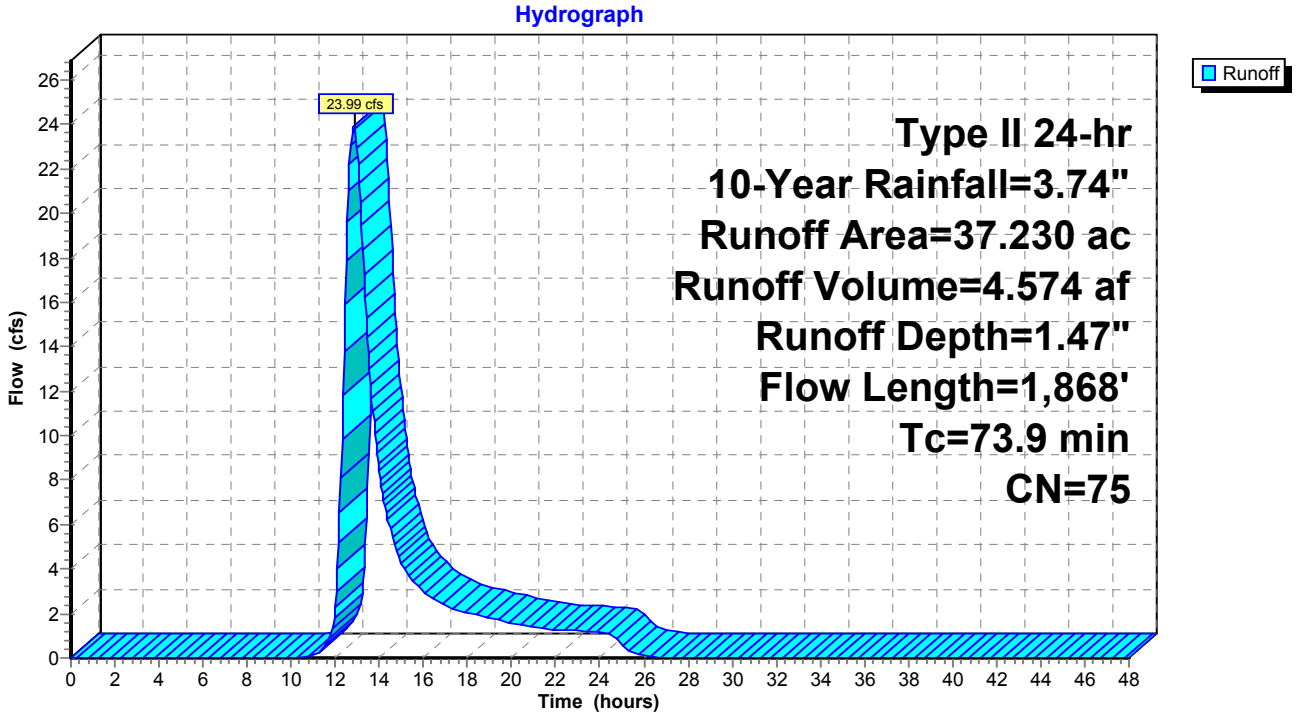
Runoff = 23.99 cfs @ 12.85 hrs, Volume= 4.574 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

Area (ac)	CN	Description
7.810	70	Woods, Good, HSG C
21.190	74	Pasture/grassland/range, Good, HSG C
3.370	98	Paved parking, HSG C
3.010	74	Pasture/grassland/range, Good, HSG C
1.850	74	>75% Grass cover, Good, HSG C
37.230	75	Weighted Average
33.860		90.95% Pervious Area
3.370		9.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0200	0.14		**Sheet Flow, Sheet Flow** Cultivated: Residue>20% n= 0.170 P2= 2.60"
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow, SCF** Cultivated Straight Rows Kv= 9.0 fps
73.9	1,868	Total			

Subcatchment 2S: Existing Onsite



Summary for Subcatchment 2S: Existing Onsite

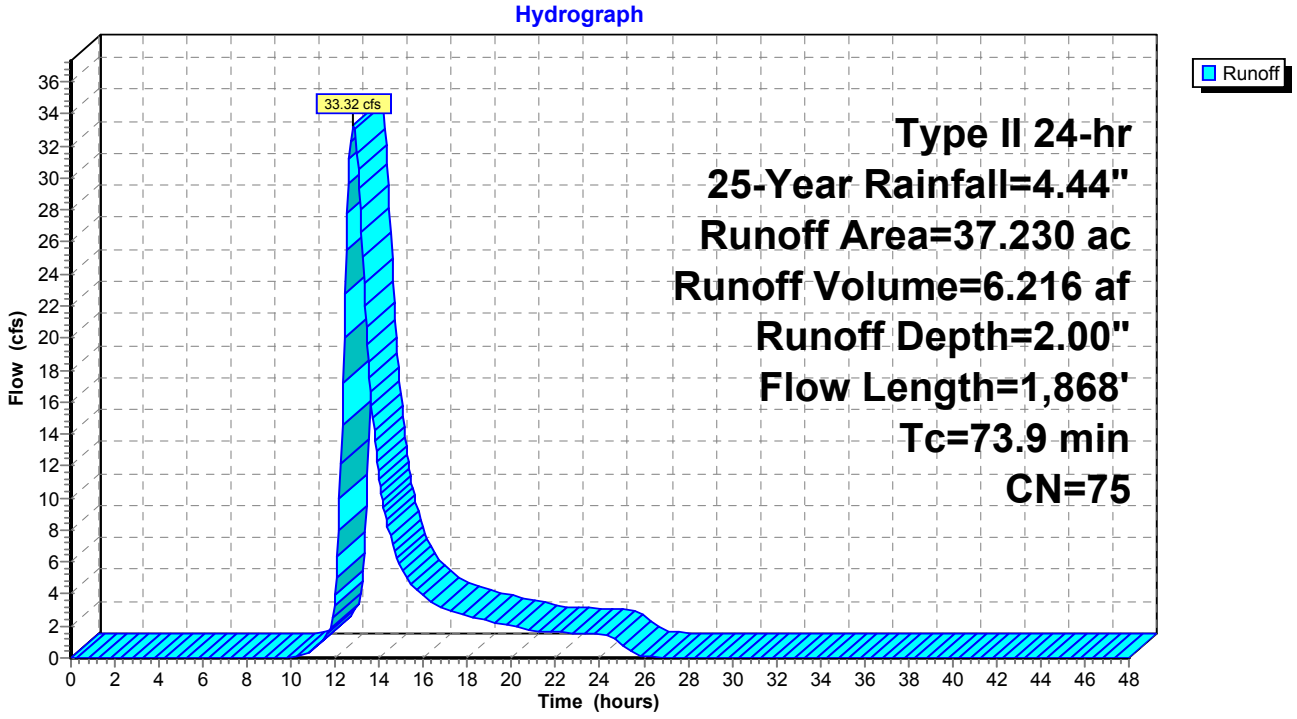
Runoff = 33.32 cfs @ 12.83 hrs, Volume= 6.216 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

Area (ac)	CN	Description
7.810	70	Woods, Good, HSG C
21.190	74	Pasture/grassland/range, Good, HSG C
3.370	98	Paved parking, HSG C
3.010	74	Pasture/grassland/range, Good, HSG C
1.850	74	>75% Grass cover, Good, HSG C
37.230	75	Weighted Average
33.860		90.95% Pervious Area
3.370		9.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0200	0.14		**Sheet Flow, Sheet Flow** Cultivated: Residue>20% n= 0.170 P2= 2.60"
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow, SCF** Cultivated Straight Rows Kv= 9.0 fps
73.9	1,868	Total			

Subcatchment 2S: Existing Onsite



Summary for Subcatchment 2S: Existing Onsite

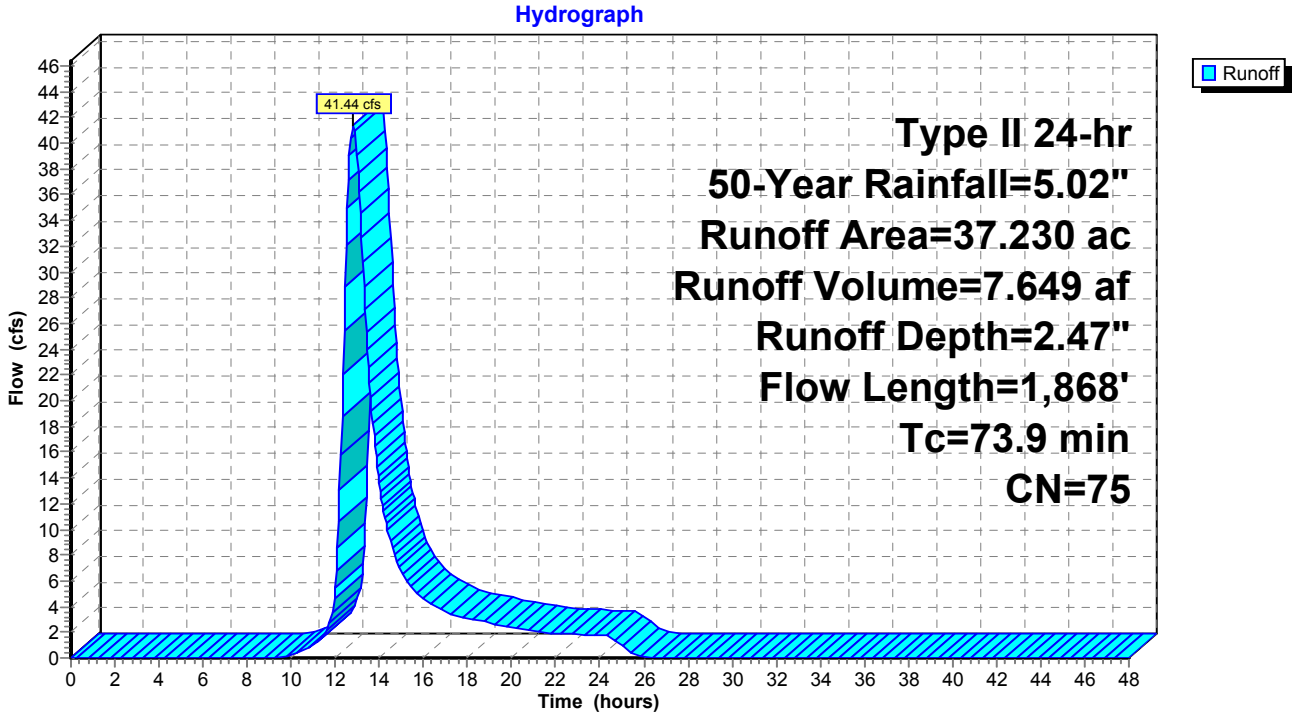
Runoff = 41.44 cfs @ 12.82 hrs, Volume= 7.649 af, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

Area (ac)	CN	Description
7.810	70	Woods, Good, HSG C
21.190	74	Pasture/grassland/range, Good, HSG C
3.370	98	Paved parking, HSG C
3.010	74	Pasture/grassland/range, Good, HSG C
1.850	74	>75% Grass cover, Good, HSG C
37.230	75	Weighted Average
33.860		90.95% Pervious Area
3.370		9.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0200	0.14		**Sheet Flow, Sheet Flow** Cultivated: Residue>20% n= 0.170 P2= 2.60"
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow, SCF** Cultivated Straight Rows Kv= 9.0 fps
73.9	1,868	Total			

Subcatchment 2S: Existing Onsite



Summary for Subcatchment 2S: Existing Onsite

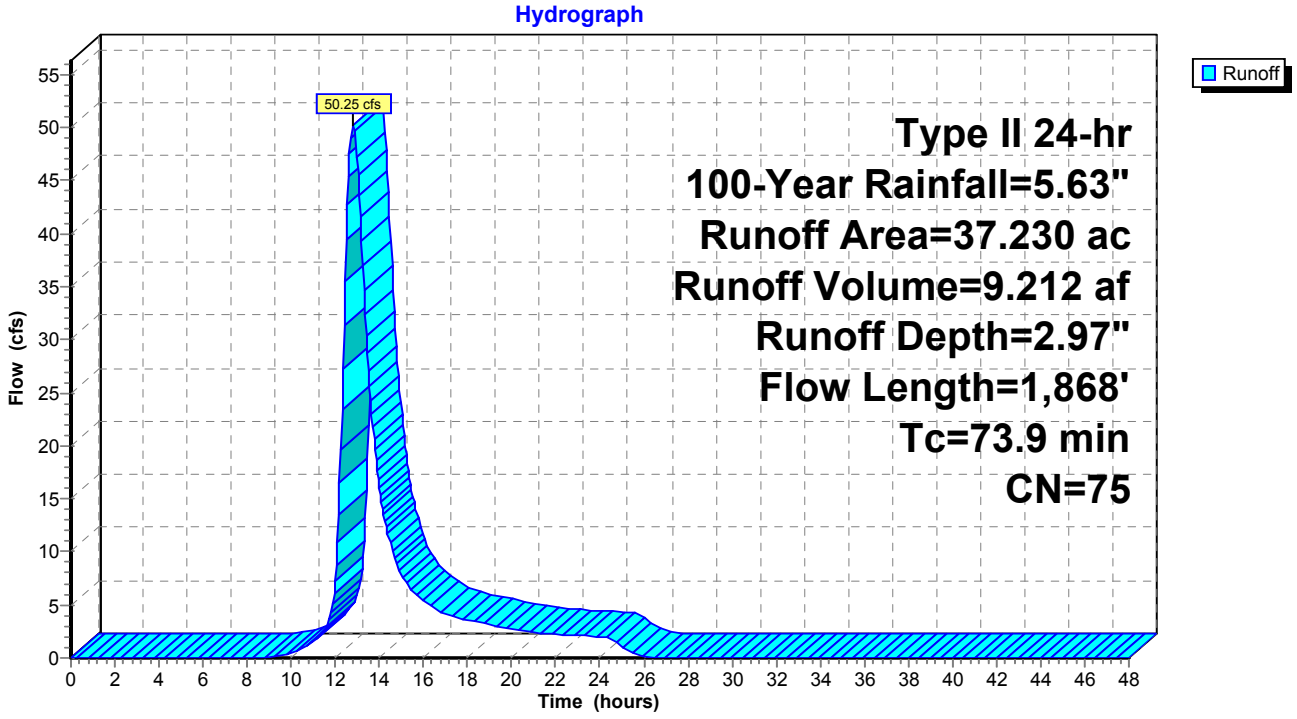
Runoff = 50.25 cfs @ 12.81 hrs, Volume= 9.212 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

Area (ac)	CN	Description
7.810	70	Woods, Good, HSG C
21.190	74	Pasture/grassland/range, Good, HSG C
3.370	98	Paved parking, HSG C
3.010	74	Pasture/grassland/range, Good, HSG C
1.850	74	>75% Grass cover, Good, HSG C
37.230	75	Weighted Average
33.860		90.95% Pervious Area
3.370		9.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0200	0.14		**Sheet Flow, Sheet Flow** Cultivated: Residue>20% n= 0.170 P2= 2.60"
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow, SCF** Cultivated Straight Rows Kv= 9.0 fps
73.9	1,868	Total			

Subcatchment 2S: Existing Onsite



Summary for Subcatchment 1S: Existing Pass-Through

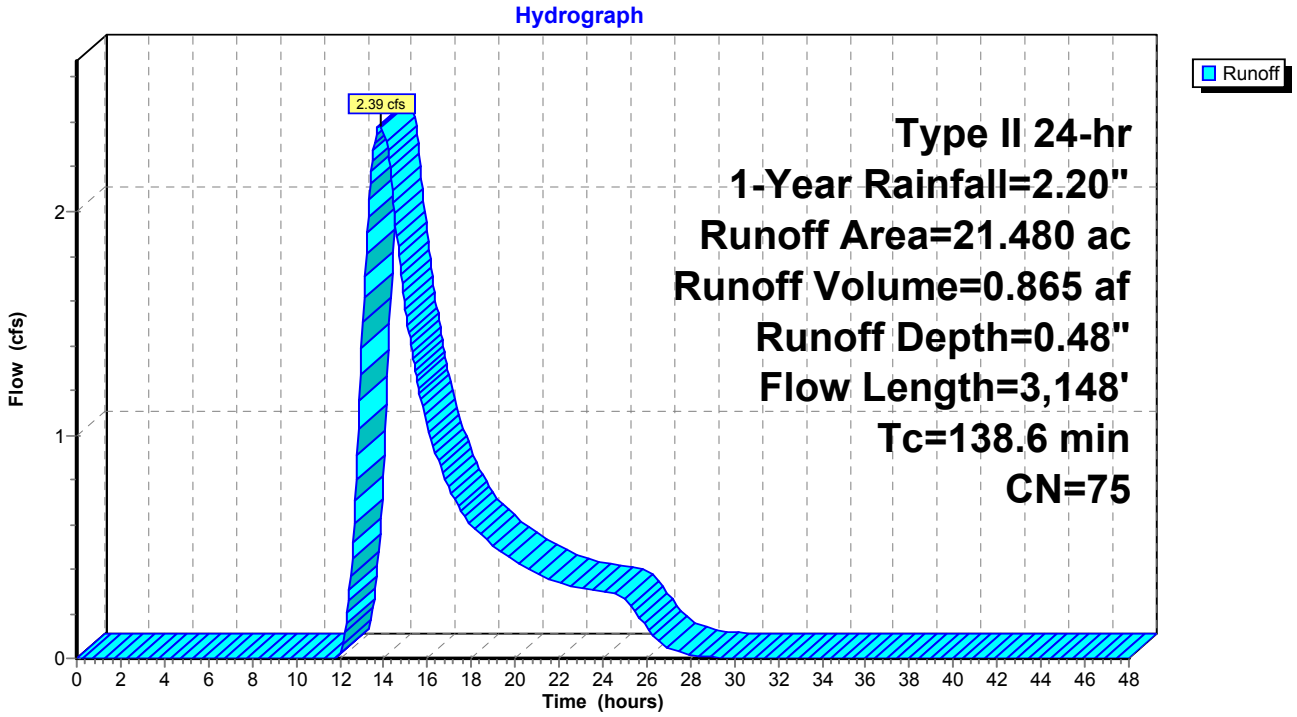
Runoff = 2.39 cfs @ 13.84 hrs, Volume= 0.865 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 1S: Existing Pass-Through



Summary for Subcatchment 1S: Existing Pass-Through

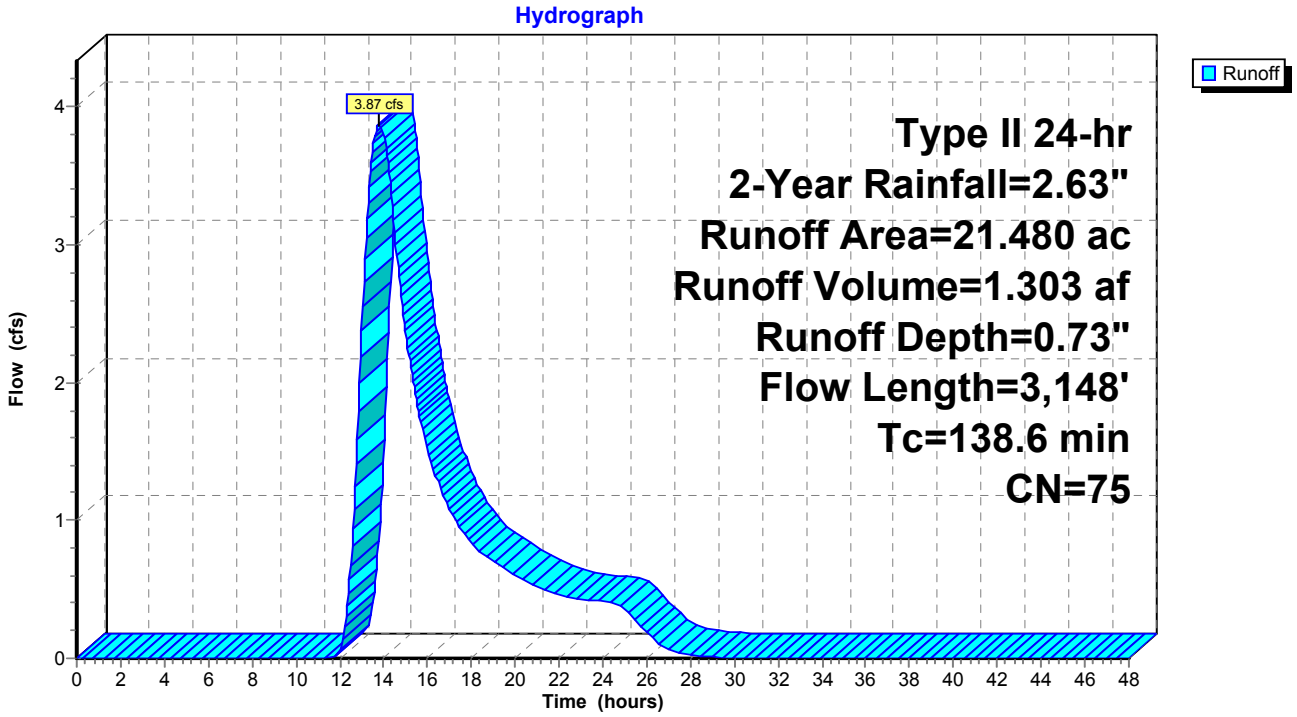
Runoff = 3.87 cfs @ 13.74 hrs, Volume= 1.303 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 1S: Existing Pass-Through



Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 6.34 cfs @ 13.72 hrs, Volume= 2.007 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
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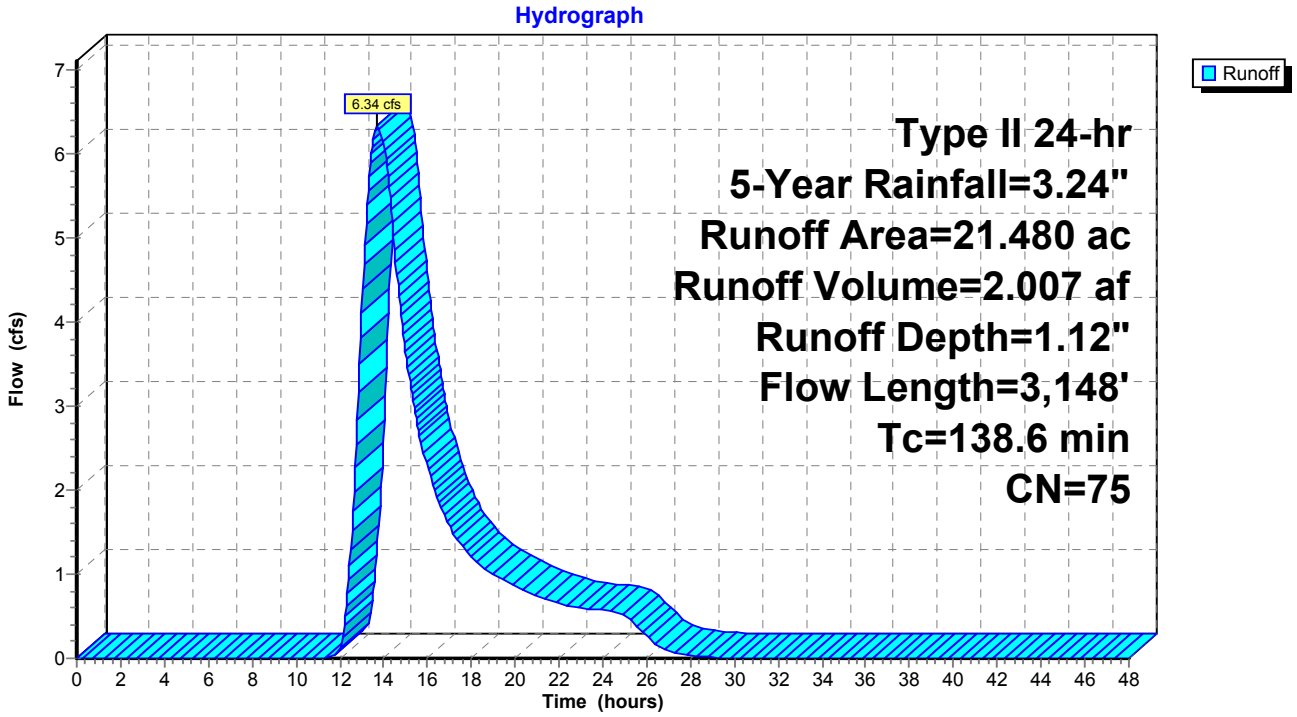
138.6	3,148	Total			

Subcatchment 1S: Existing Pass-Through



Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 8.57 cfs @ 13.71 hrs, Volume= 2.639 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
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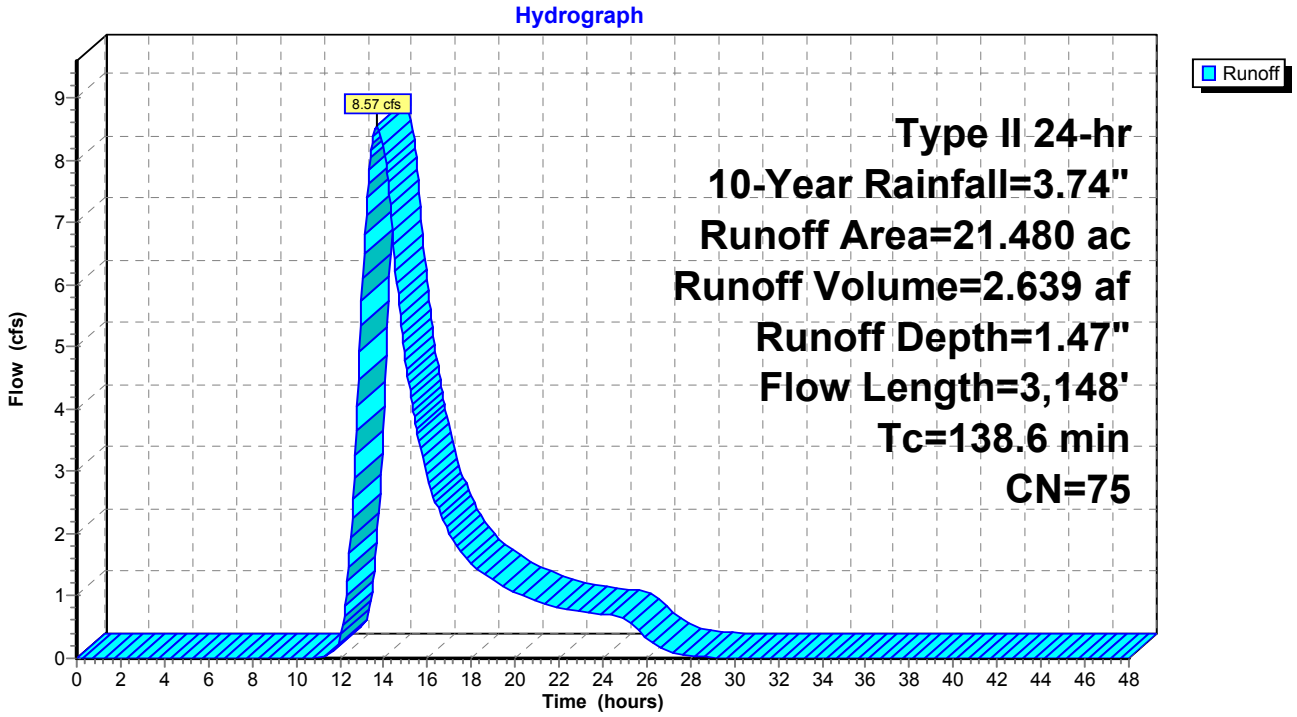
138.6	3,148	Total			

Subcatchment 1S: Existing Pass-Through



Summary for Subcatchment 1S: Existing Pass-Through

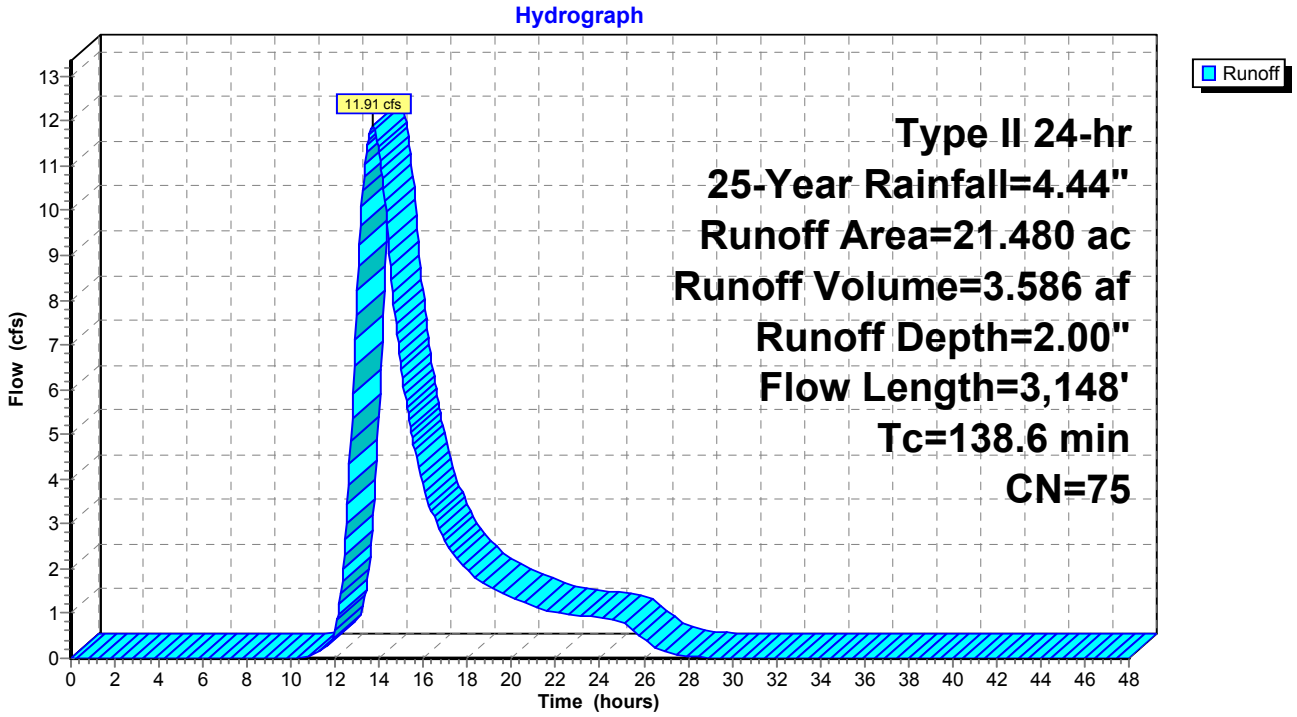
Runoff = 11.91 cfs @ 13.70 hrs, Volume= 3.586 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 1S: Existing Pass-Through



Summary for Subcatchment 1S: Existing Pass-Through

Runoff = 14.83 cfs @ 13.69 hrs, Volume= 4.413 af, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
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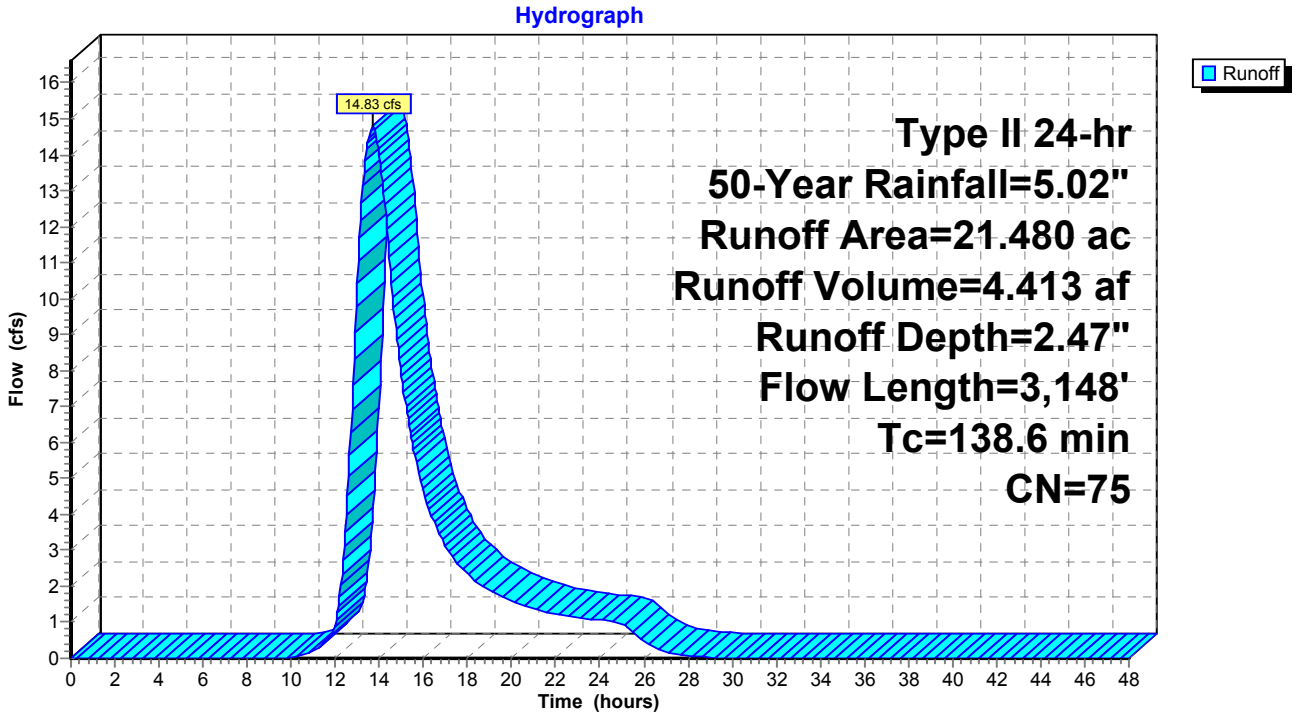
Subcatchment 1S: Existing Pass-Through



Summary for Subcatchment 1S: Existing Pass-Through

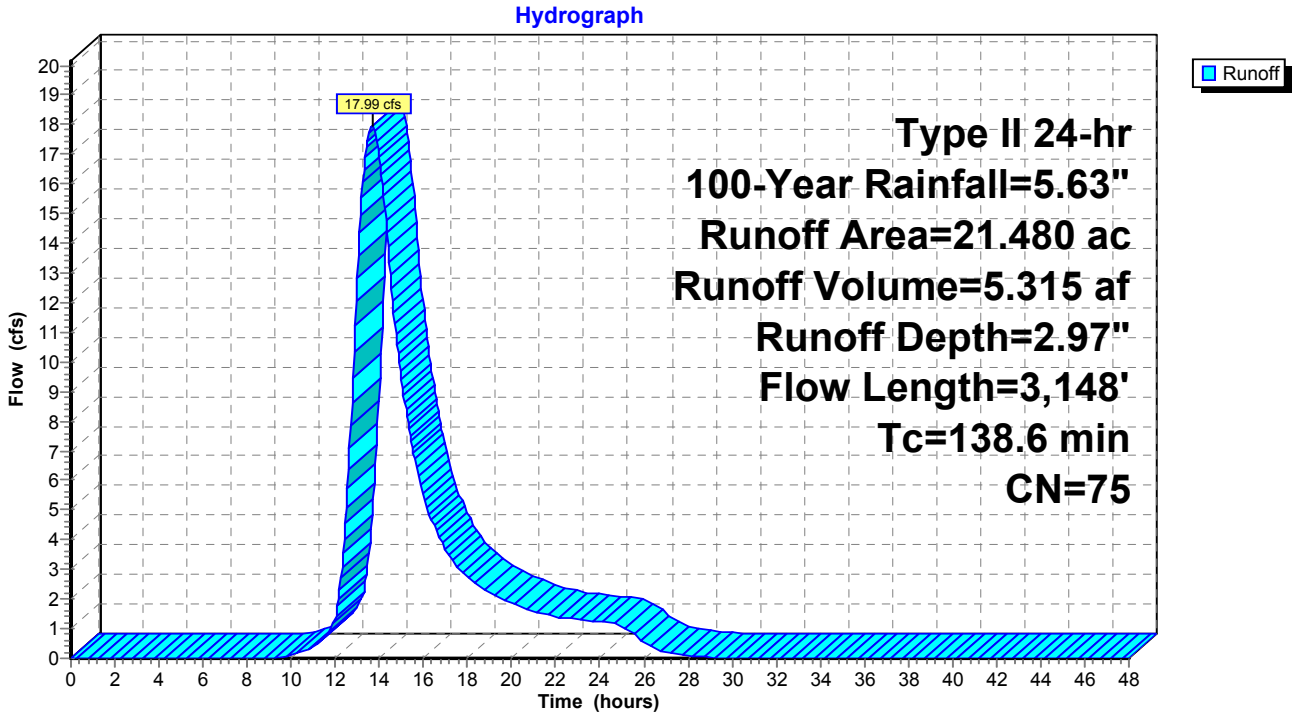
Runoff = 17.99 cfs @ 13.69 hrs, Volume= 5.315 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 1S: Existing Pass-Through



APPENDIX B

POST-DEVELOPED FLOWS

Summary for Subcatchment 6S: B2 Onsite

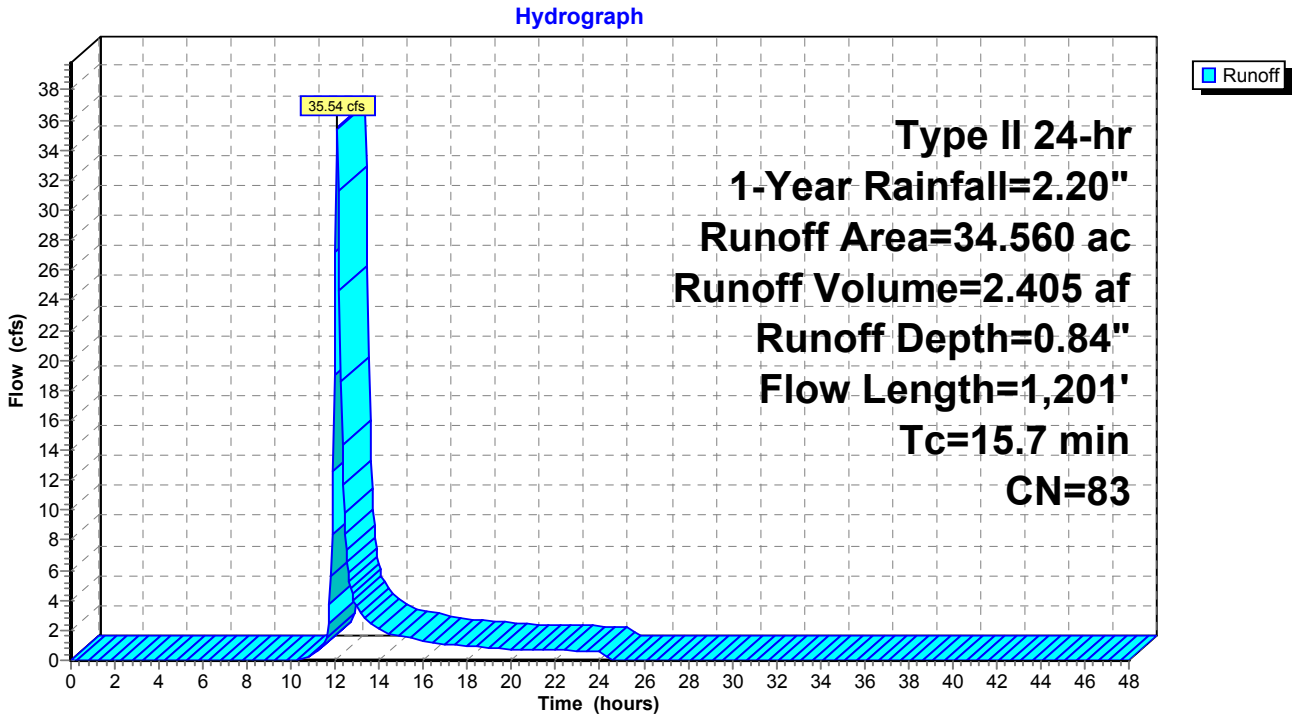
Runoff = 35.54 cfs @ 12.09 hrs, Volume= 2.405 af, Depth= 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

Area (ac)	CN	Description
34.560	83	1/4 acre lots, 38% imp, HSG C
21.427		62.00% Pervious Area
13.133		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	72	0.0150	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.60"
2.1	185	0.0050	1.44		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
4.2	944	0.0040	3.73	2.93	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
15.7	1,201	Total			

Subcatchment 6S: B2 Onsite



Summary for Subcatchment 6S: B2 Onsite

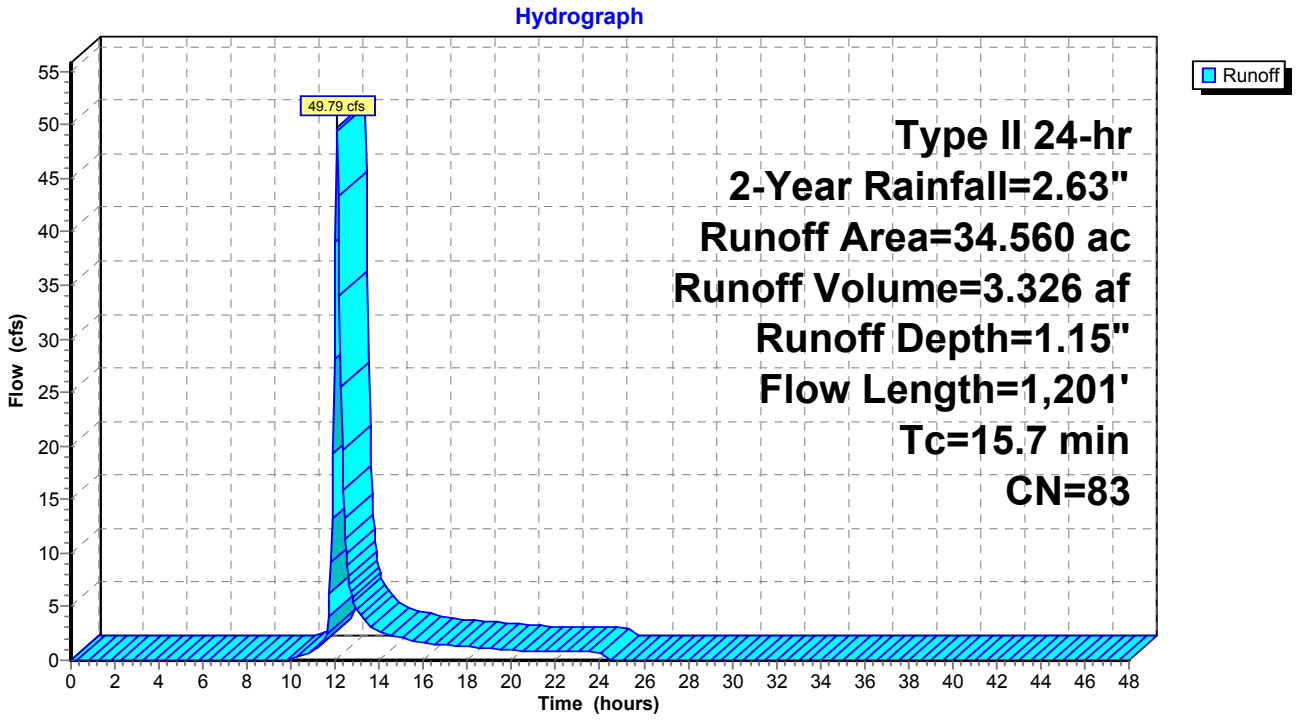
Runoff = 49.79 cfs @ 12.08 hrs, Volume= 3.326 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

Area (ac)	CN	Description
34.560	83	1/4 acre lots, 38% imp, HSG C
21.427		62.00% Pervious Area
13.133		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	72	0.0150	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.60"
2.1	185	0.0050	1.44		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
4.2	944	0.0040	3.73	2.93	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
15.7	1,201	Total			

Subcatchment 6S: B2 Onsite



Summary for Subcatchment 6S: B2 Onsite

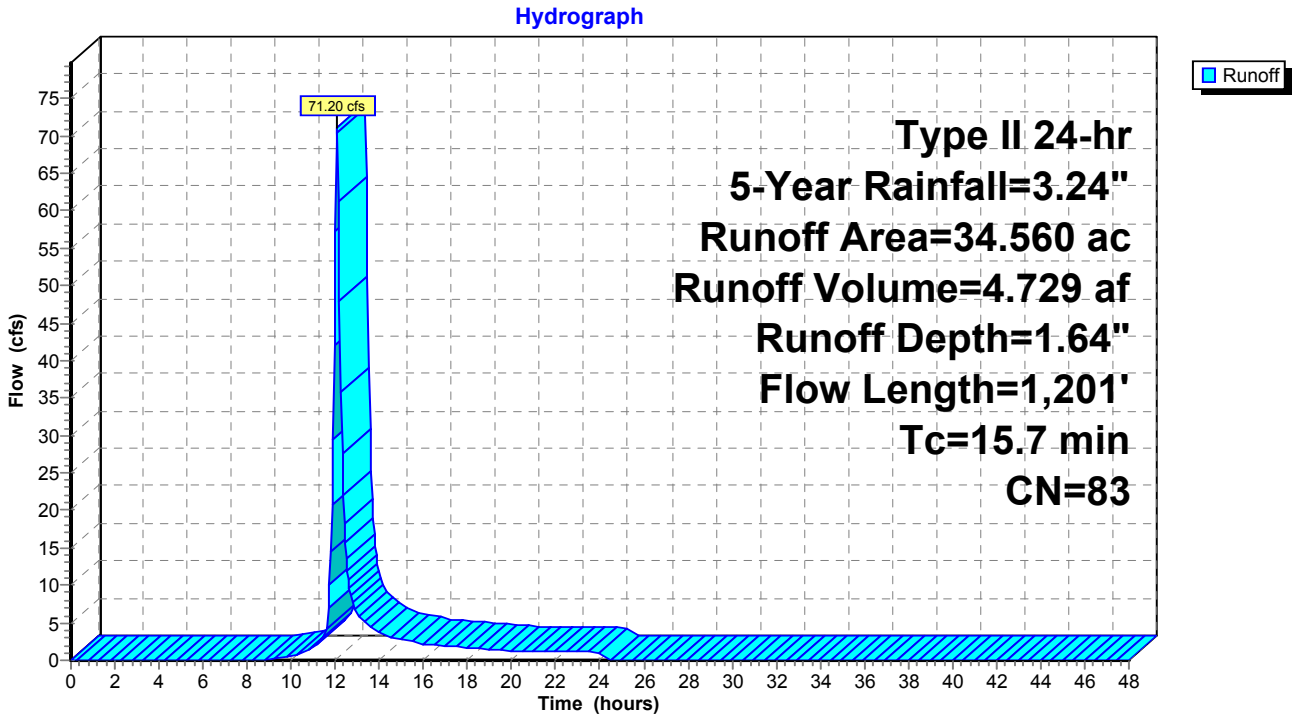
Runoff = 71.20 cfs @ 12.08 hrs, Volume= 4.729 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

Area (ac)	CN	Description
34.560	83	1/4 acre lots, 38% imp, HSG C
21.427		62.00% Pervious Area
13.133		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	72	0.0150	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.60"
2.1	185	0.0050	1.44		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
4.2	944	0.0040	3.73	2.93	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
15.7	1,201	Total			

Subcatchment 6S: B2 Onsite



Summary for Subcatchment 6S: B2 Onsite

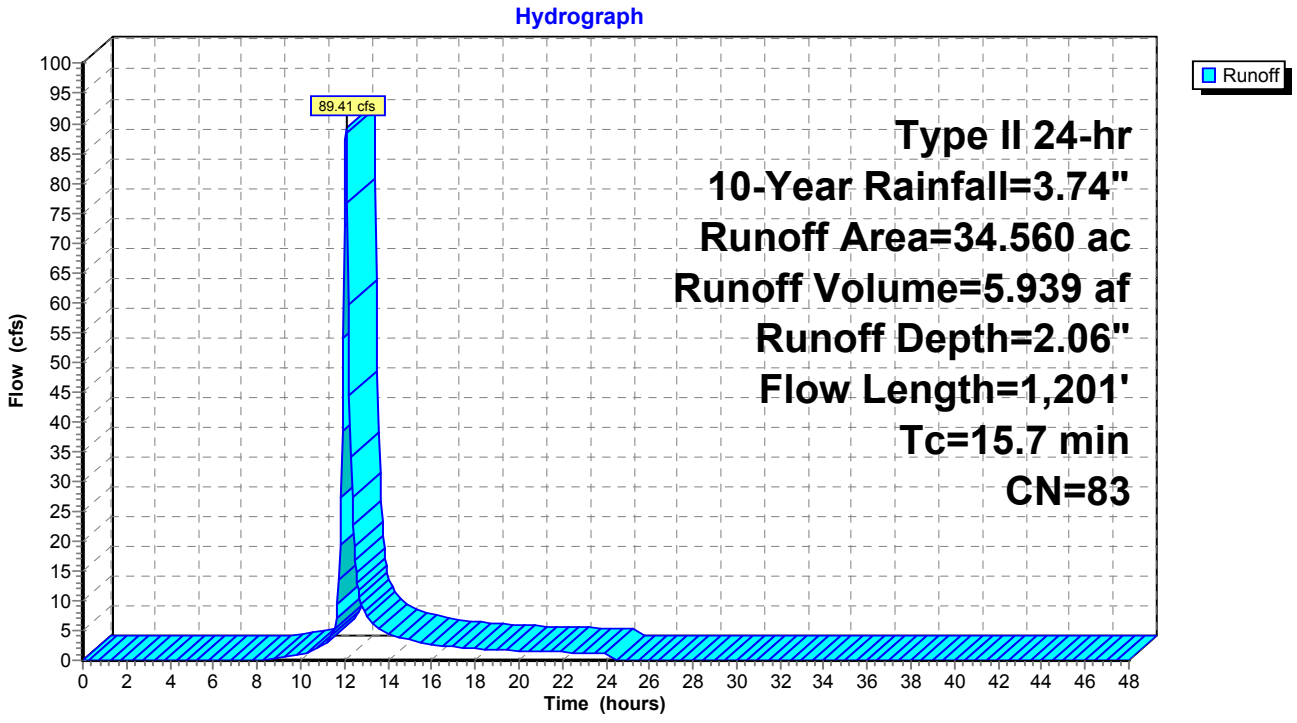
Runoff = 89.41 cfs @ 12.08 hrs, Volume= 5.939 af, Depth= 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

Area (ac)	CN	Description
34.560	83	1/4 acre lots, 38% imp, HSG C
21.427		62.00% Pervious Area
13.133		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	72	0.0150	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.60"
2.1	185	0.0050	1.44		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
4.2	944	0.0040	3.73	2.93	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
15.7	1,201	Total			

Subcatchment 6S: B2 Onsite



Summary for Subcatchment 6S: B2 Onsite

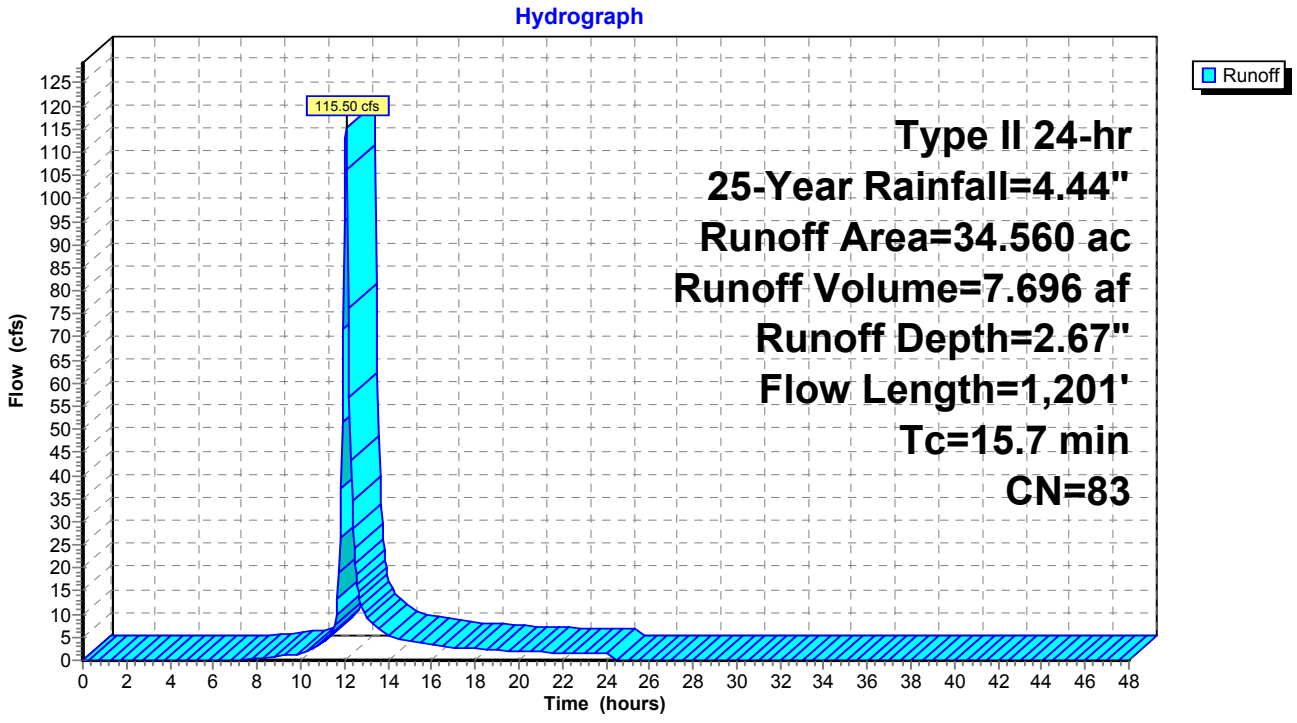
Runoff = 115.50 cfs @ 12.08 hrs, Volume= 7.696 af, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

Area (ac)	CN	Description
34.560	83	1/4 acre lots, 38% imp, HSG C
21.427		62.00% Pervious Area
13.133		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	72	0.0150	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.60"
2.1	185	0.0050	1.44		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
4.2	944	0.0040	3.73	2.93	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
15.7	1,201	Total			

Subcatchment 6S: B2 Onsite



Summary for Subcatchment 6S: B2 Onsite

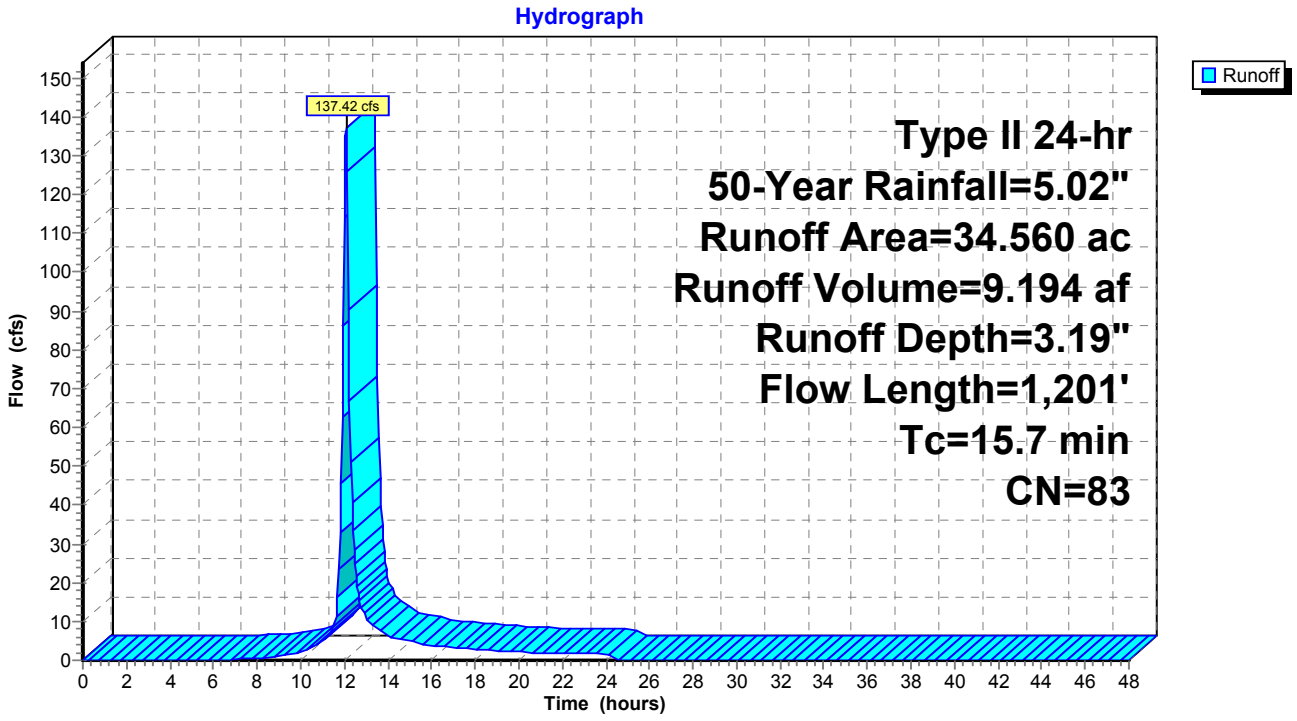
Runoff = 137.42 cfs @ 12.08 hrs, Volume= 9.194 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

Area (ac)	CN	Description
34.560	83	1/4 acre lots, 38% imp, HSG C
21.427		62.00% Pervious Area
13.133		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	72	0.0150	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.60"
2.1	185	0.0050	1.44		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
4.2	944	0.0040	3.73	2.93	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
15.7	1,201	Total			

Subcatchment 6S: B2 Onsite



Summary for Subcatchment 6S: B2 Onsite

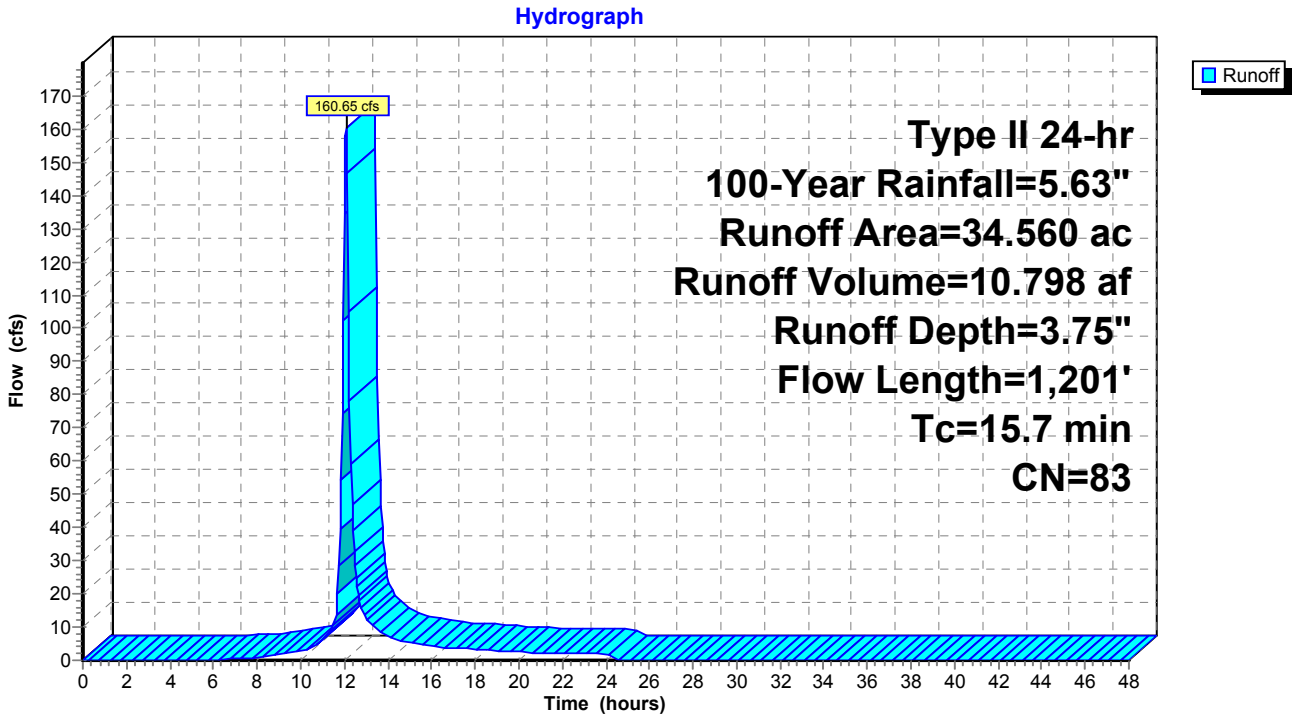
Runoff = 160.65 cfs @ 12.08 hrs, Volume= 10.798 af, Depth= 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

Area (ac)	CN	Description
34.560	83	1/4 acre lots, 38% imp, HSG C
21.427		62.00% Pervious Area
13.133		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	72	0.0150	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.60"
2.1	185	0.0050	1.44		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
4.2	944	0.0040	3.73	2.93	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
15.7	1,201	Total			

Subcatchment 6S: B2 Onsite



Summary for Subcatchment 10S: Existing Pass-Through

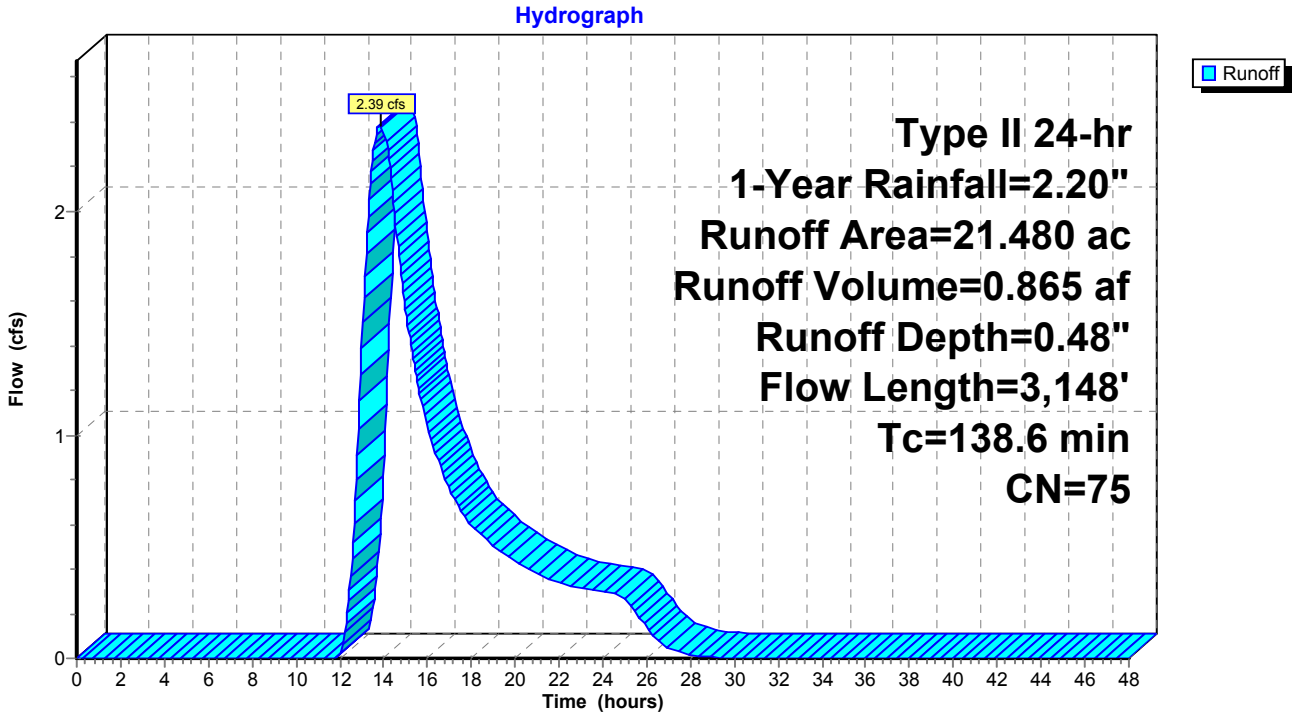
Runoff = 2.39 cfs @ 13.84 hrs, Volume= 0.865 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=2.20"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 10S: Existing Pass-Through



Summary for Subcatchment 10S: Existing Pass-Through

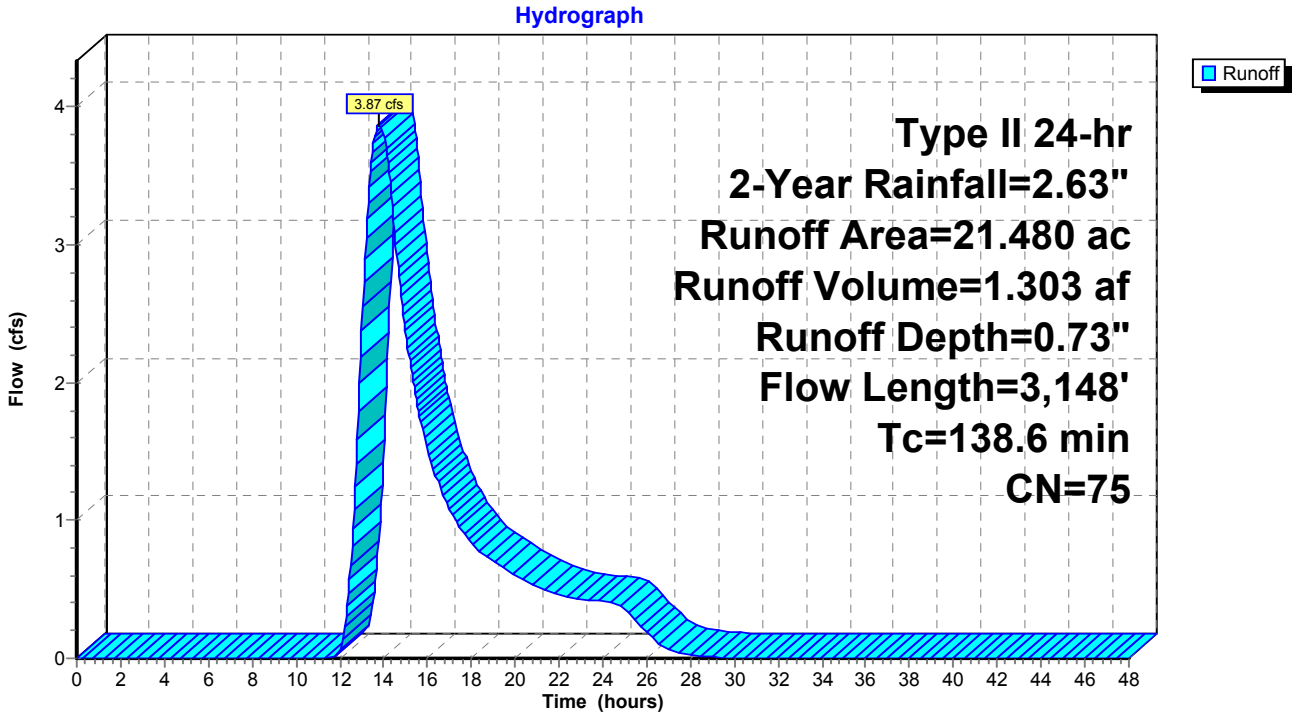
Runoff = 3.87 cfs @ 13.74 hrs, Volume= 1.303 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.63"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 10S: Existing Pass-Through



Summary for Subcatchment 10S: Existing Pass-Through

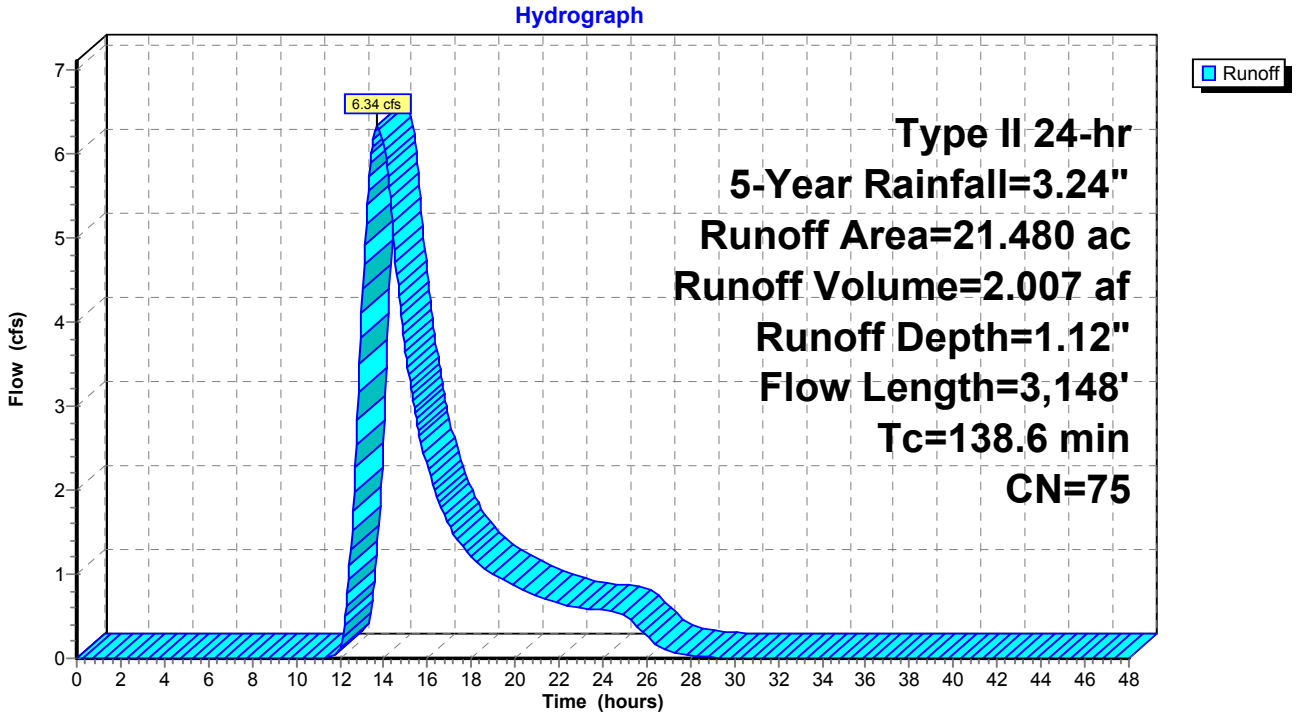
Runoff = 6.34 cfs @ 13.72 hrs, Volume= 2.007 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=3.24"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 10S: Existing Pass-Through



Summary for Subcatchment 10S: Existing Pass-Through

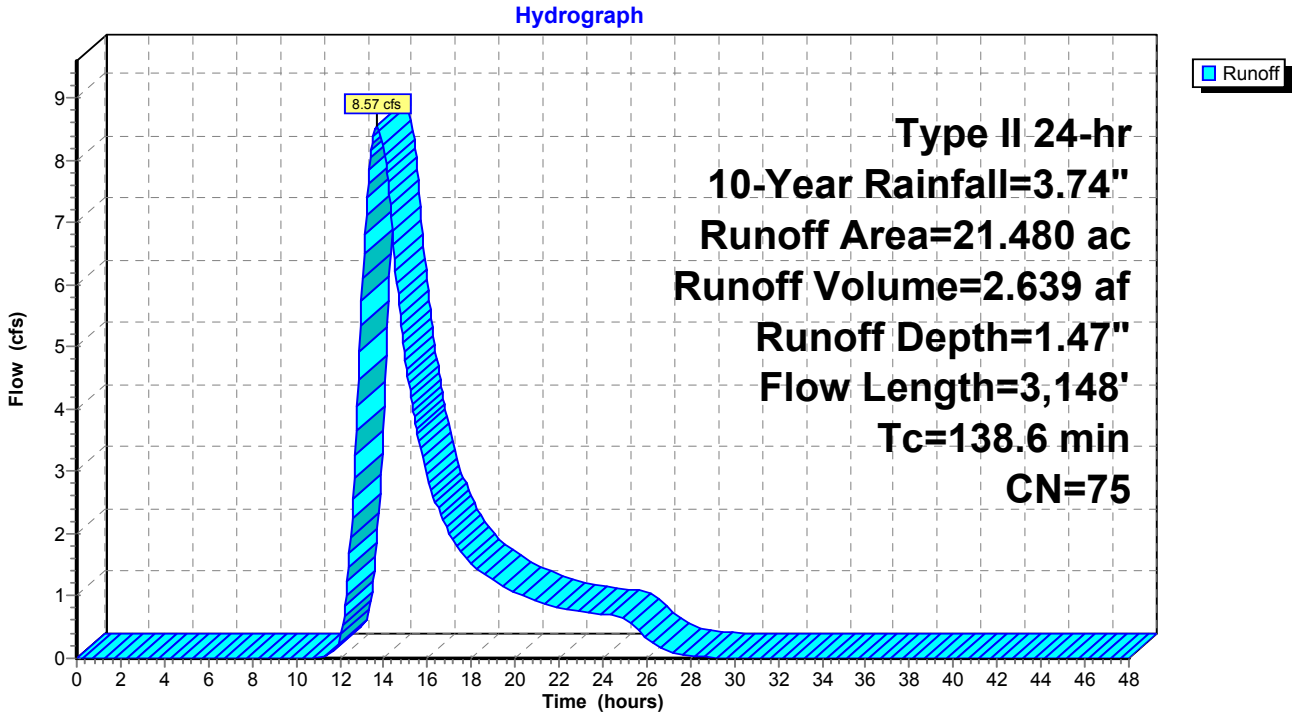
Runoff = 8.57 cfs @ 13.71 hrs, Volume= 2.639 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.74"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 10S: Existing Pass-Through



Summary for Subcatchment 10S: Existing Pass-Through

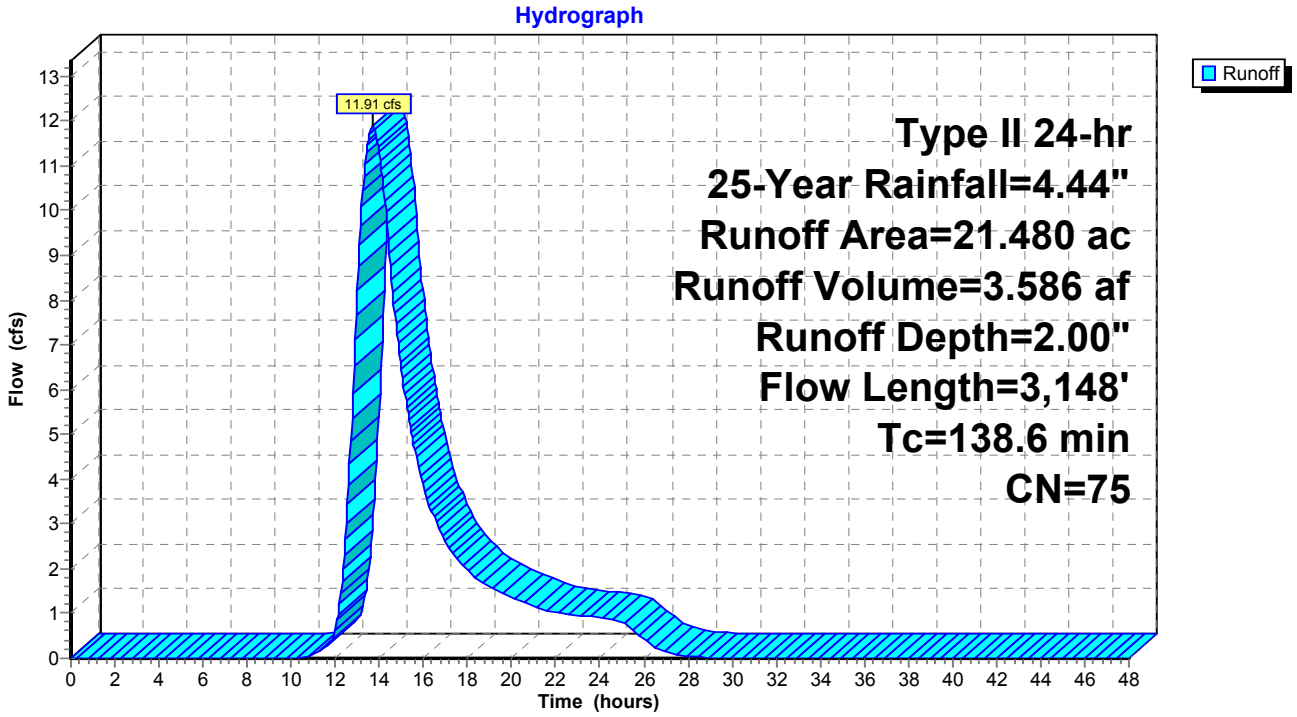
Runoff = 11.91 cfs @ 13.70 hrs, Volume= 3.586 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=4.44"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 10S: Existing Pass-Through



Summary for Subcatchment 10S: Existing Pass-Through

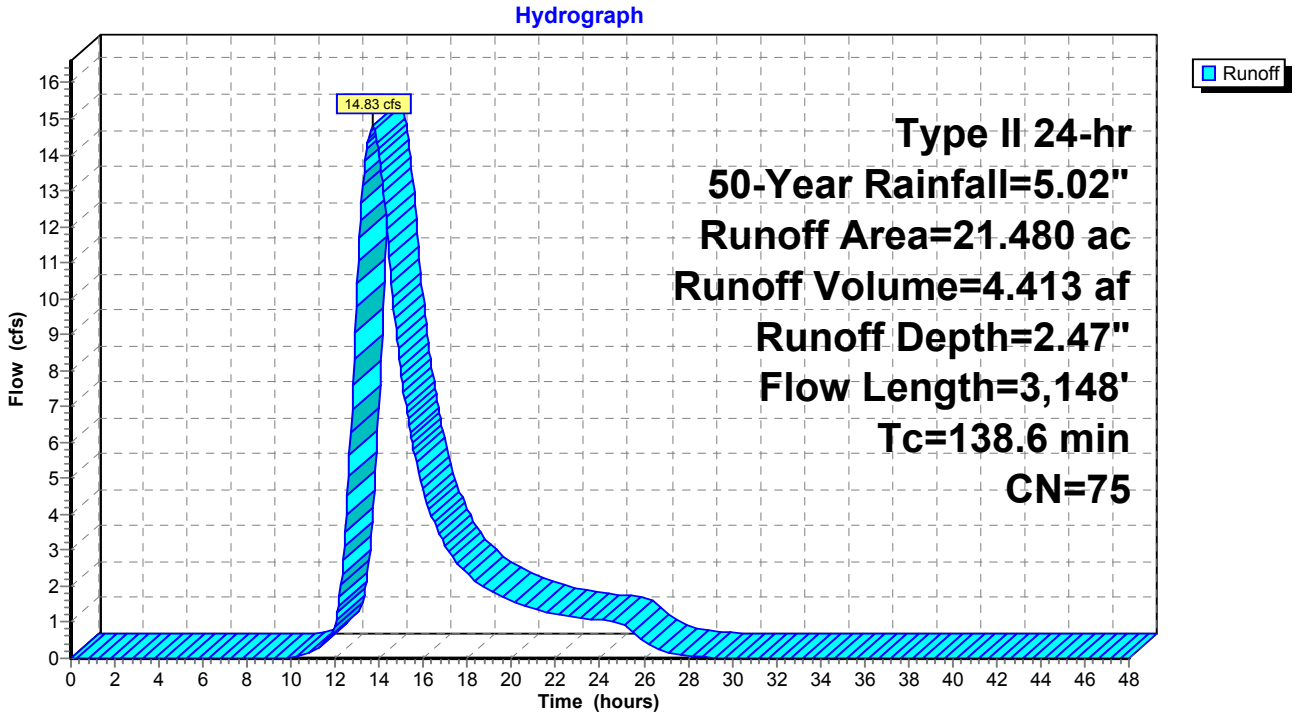
Runoff = 14.83 cfs @ 13.69 hrs, Volume= 4.413 af, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=5.02"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 10S: Existing Pass-Through



Summary for Subcatchment 10S: Existing Pass-Through

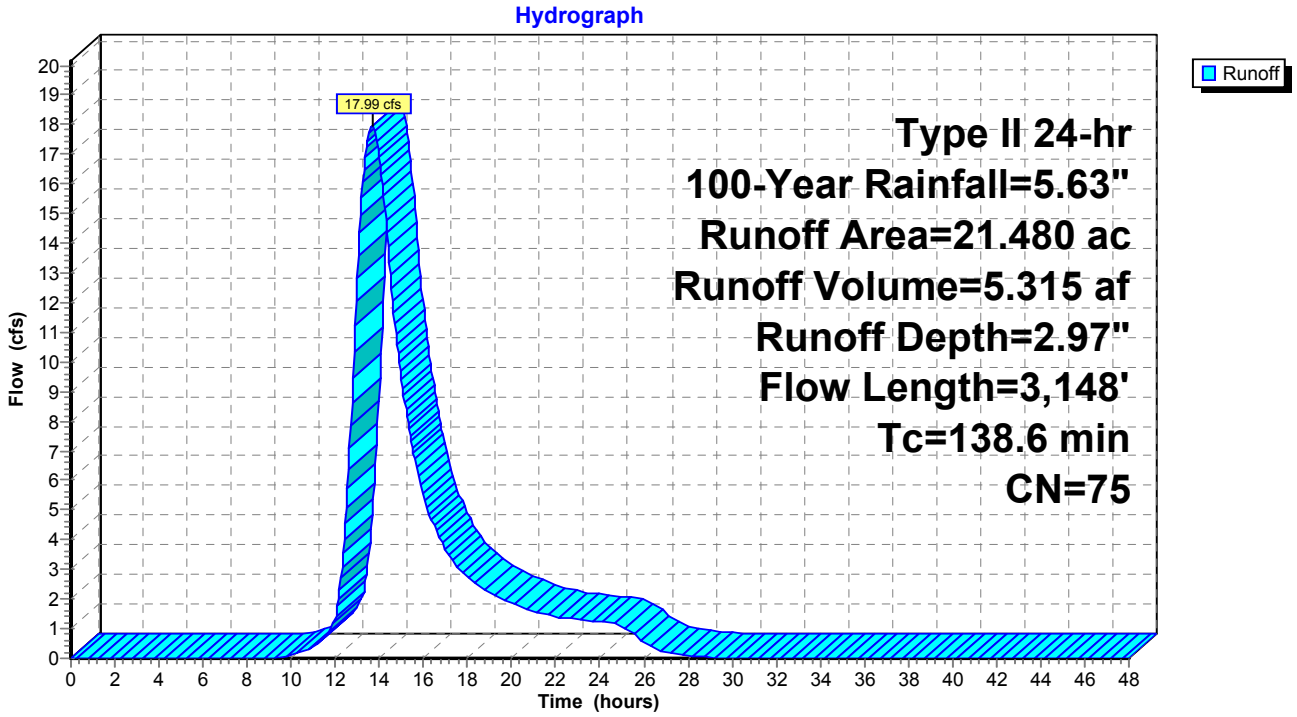
Runoff = 17.99 cfs @ 13.69 hrs, Volume= 5.315 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.63"

Area (ac)	CN	Description
13.650	74	>75% Grass cover, Good, HSG C
5.730	70	Woods, Good, HSG C
2.100	98	Paved parking, HSG C
21.480	75	Weighted Average
19.380		90.22% Pervious Area
2.100		9.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	100	0.0110	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.60"
24.5	947	0.0085	0.65		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
21.9	333	0.0065	0.25	1.65	**Channel Flow, Channel Flow** Area= 6.5 sf Perim= 18.0' r= 0.36' n= 0.240 Sheet flow over Dense Grass
61.9	1,768	0.0028	0.48		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
138.6	3,148	Total			

Subcatchment 10S: Existing Pass-Through



Summary for Pond 8P: Pond B2

Inflow Area = 56.040 ac, 27.18% Impervious, Inflow Depth = 0.70" for 1-Year event
Inflow = 35.57 cfs @ 12.09 hrs, Volume= 3.270 af
Outflow = 3.51 cfs @ 14.69 hrs, Volume= 3.068 af, Atten= 90%, Lag= 155.9 min
Primary = 3.51 cfs @ 14.69 hrs, Volume= 3.068 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 922.57' @ 14.69 hrs Surf.Area= 44,149 sf Storage= 62,925 cf

Plug-Flow detention time= 445.7 min calculated for 3.065 af (94% of inflow)
Center-of-Mass det. time= 412.3 min (1,309.2 - 896.9)

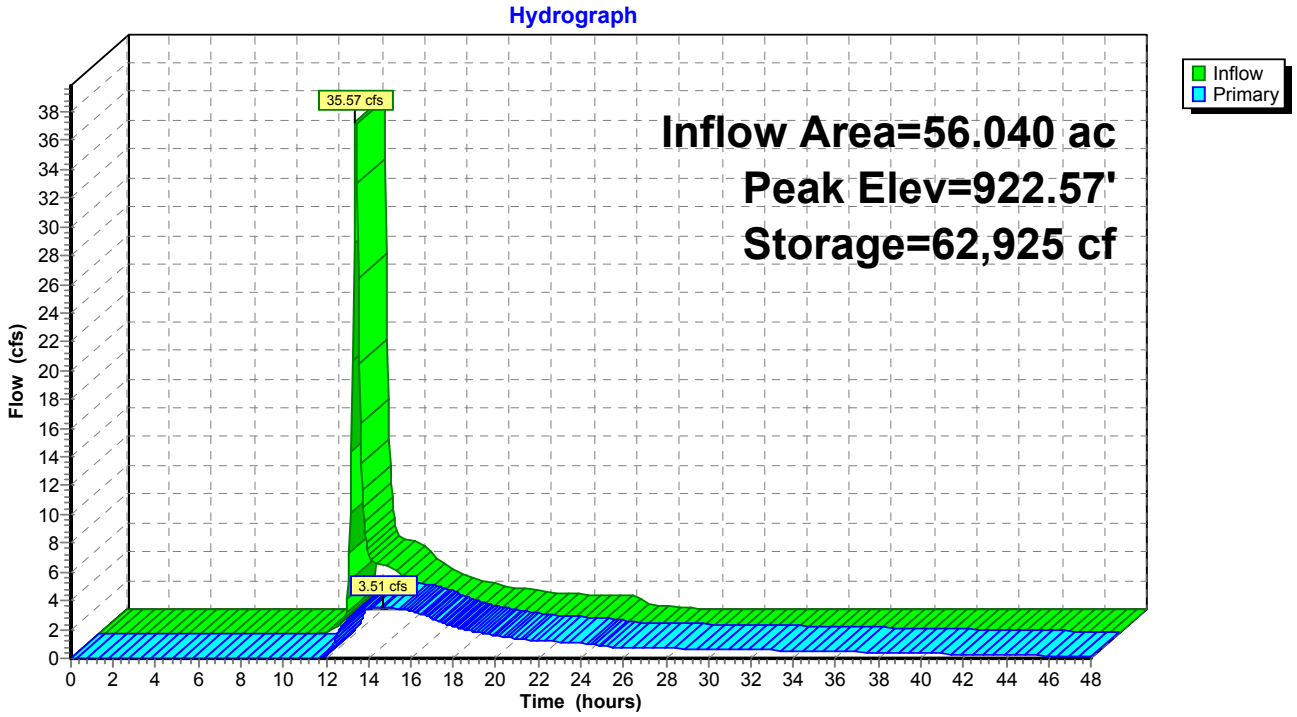
Volume	Invert	Avail.Storage	Storage Description
#1	921.00'	308,913 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
921.00	36,080	0	0
922.00	41,185	38,633	38,633
923.00	46,391	43,788	82,421
924.00	52,403	49,397	131,818
925.00	56,766	54,585	186,402
926.00	61,230	58,998	245,400
927.00	65,795	63,513	308,913

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**48.0" Round Culvert** L= 108.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.68' S= 0.0030 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 12.57 sf
#2	Device 1	921.00'	**5.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	922.10'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	924.20'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	926.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.51 cfs @ 14.69 hrs HW=922.57' (Free Discharge)
└─**1=Culvert** (Passes 3.51 cfs of 14.65 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.92 cfs @ 5.57 fps)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  ├─**4=Orifice/Grate** (Orifice Controls 2.59 cfs @ 3.30 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 8P: Pond B2



Summary for Pond 8P: Pond B2

Inflow Area = 56.040 ac, 27.18% Impervious, Inflow Depth = 0.99" for 2-Year event
Inflow = 49.85 cfs @ 12.08 hrs, Volume= 4.629 af
Outflow = 5.07 cfs @ 14.65 hrs, Volume= 4.419 af, Atten= 90%, Lag= 154.1 min
Primary = 5.07 cfs @ 14.65 hrs, Volume= 4.419 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 923.10' @ 14.65 hrs Surf.Area= 46,993 sf Storage= 87,094 cf

Plug-Flow detention time= 369.4 min calculated for 4.414 af (95% of inflow)
Center-of-Mass det. time= 344.2 min (1,232.7 - 888.5)

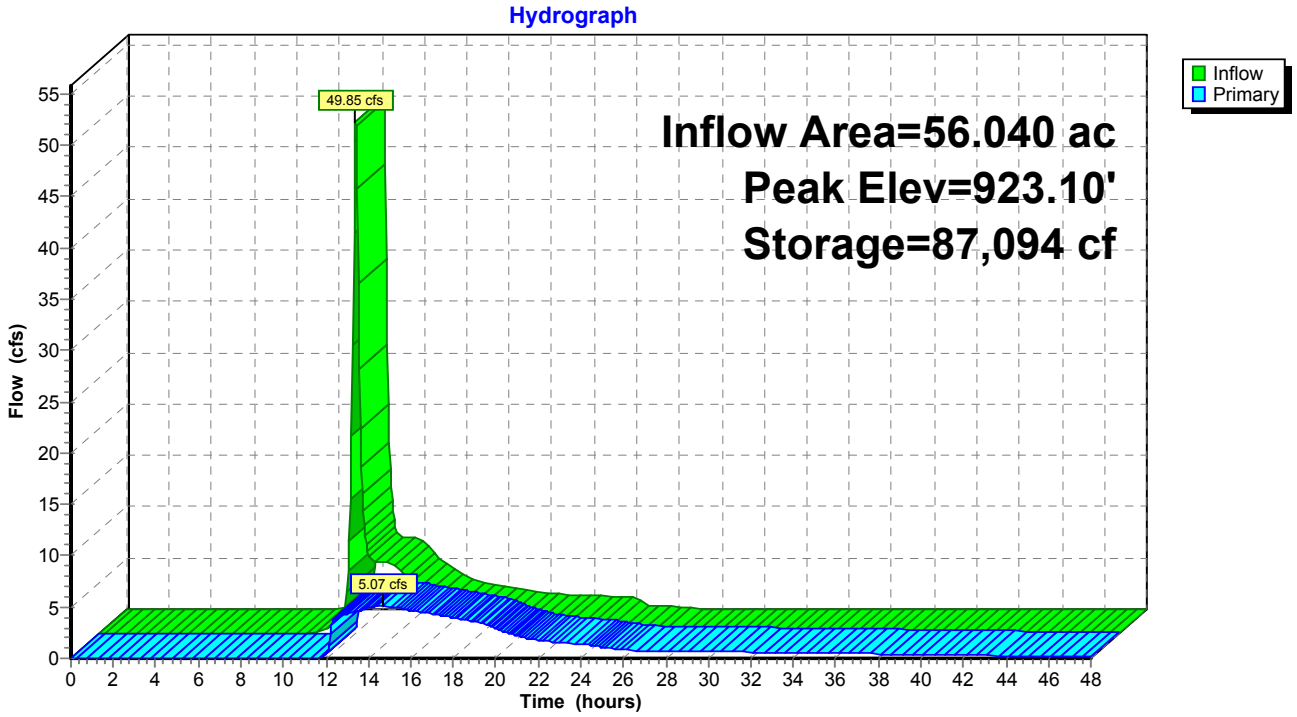
Volume	Invert	Avail.Storage	Storage Description
#1	921.00'	308,913 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
921.00	36,080	0	0
922.00	41,185	38,633	38,633
923.00	46,391	43,788	82,421
924.00	52,403	49,397	131,818
925.00	56,766	54,585	186,402
926.00	61,230	58,998	245,400
927.00	65,795	63,513	308,913

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**48.0" Round Culvert** L= 108.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.68' S= 0.0030 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 12.57 sf
#2	Device 1	921.00'	**5.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	922.10'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	924.20'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	926.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.07 cfs @ 14.65 hrs HW=923.10' (Free Discharge)
└**1=Culvert** (Passes 5.07 cfs of 24.63 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.09 cfs @ 6.59 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.20 cfs @ 1.02 fps)
  ├**4=Orifice/Grate** (Orifice Controls 3.78 cfs @ 4.82 fps)
  ├**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 8P: Pond B2



Summary for Pond 8P: Pond B2

Inflow Area = 56.040 ac, 27.18% Impervious, Inflow Depth = 1.44" for 5-Year event
Inflow = 71.39 cfs @ 12.08 hrs, Volume= 6.736 af
Outflow = 9.42 cfs @ 14.10 hrs, Volume= 6.517 af, Atten= 87%, Lag= 120.9 min
Primary = 9.42 cfs @ 14.10 hrs, Volume= 6.517 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 923.66' @ 14.10 hrs Surf.Area= 50,368 sf Storage= 114,422 cf

Plug-Flow detention time= 299.3 min calculated for 6.510 af (97% of inflow)
Center-of-Mass det. time= 280.9 min (1,160.5 - 879.6)

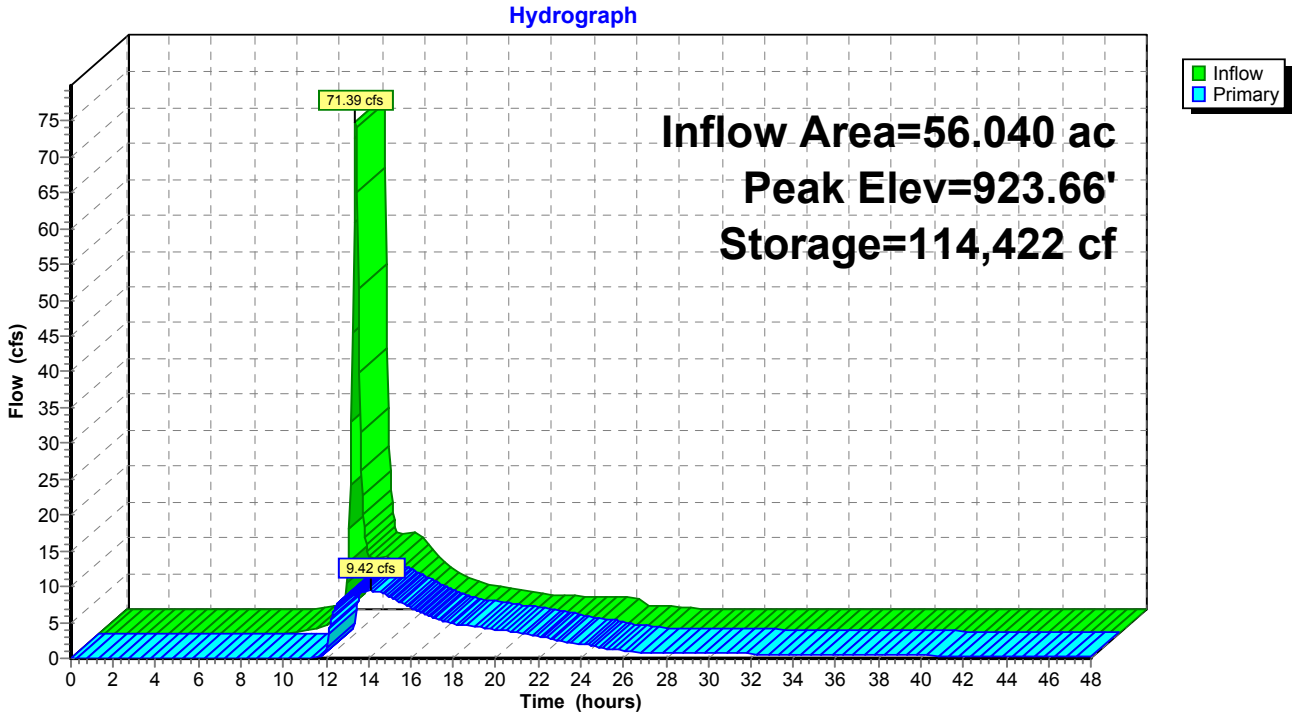
Volume	Invert	Avail.Storage	Storage Description
#1	921.00'	308,913 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
921.00	36,080	0	0
922.00	41,185	38,633	38,633
923.00	46,391	43,788	82,421
924.00	52,403	49,397	131,818
925.00	56,766	54,585	186,402
926.00	61,230	58,998	245,400
927.00	65,795	63,513	308,913

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**48.0" Round Culvert** L= 108.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.68' S= 0.0030 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 12.57 sf
#2	Device 1	921.00'	**5.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	922.10'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	924.20'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	926.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=9.42 cfs @ 14.10 hrs HW=923.66' (Free Discharge)
└─**1=Culvert** (Passes 9.42 cfs of 37.04 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.24 cfs @ 7.51 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 3.45 cfs @ 2.61 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 4.73 cfs @ 6.02 fps)
  ├─**5=Orifice/Grate** (Controls 0.00 cfs)
  └─**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 8P: Pond B2



Summary for Pond 8P: Pond B2

Inflow Area = 56.040 ac, 27.18% Impervious, Inflow Depth = 1.84" for 10-Year event
Inflow = 89.81 cfs @ 12.08 hrs, Volume= 8.578 af
Outflow = 13.33 cfs @ 13.80 hrs, Volume= 8.353 af, Atten= 85%, Lag= 103.1 min
Primary = 13.33 cfs @ 13.80 hrs, Volume= 8.353 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 924.04' @ 13.80 hrs Surf.Area= 52,569 sf Storage= 133,808 cf

Plug-Flow detention time= 261.1 min calculated for 8.353 af (97% of inflow)
Center-of-Mass det. time= 244.9 min (1,118.8 - 873.9)

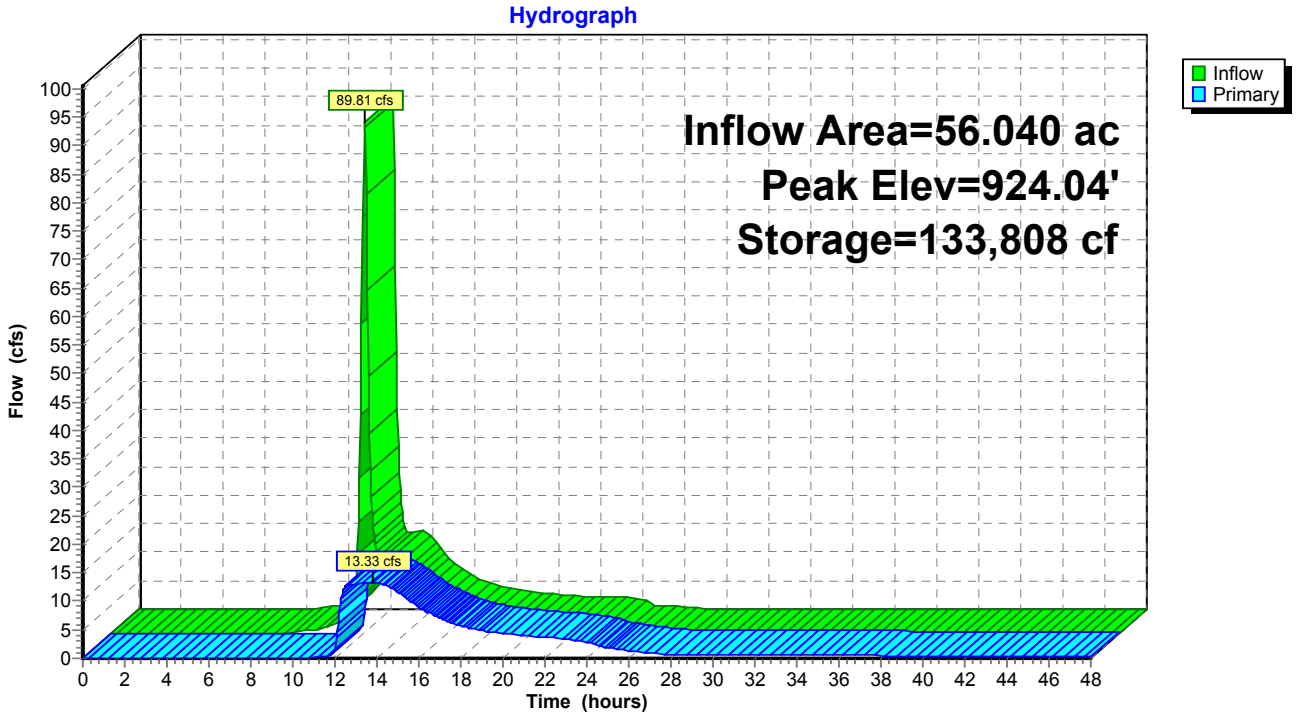
Volume	Invert	Avail.Storage	Storage Description
#1	921.00'	308,913 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
921.00	36,080	0	0
922.00	41,185	38,633	38,633
923.00	46,391	43,788	82,421
924.00	52,403	49,397	131,818
925.00	56,766	54,585	186,402
926.00	61,230	58,998	245,400
927.00	65,795	63,513	308,913

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**48.0" Round Culvert** L= 108.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.68' S= 0.0030 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 12.57 sf
#2	Device 1	921.00'	**5.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	922.10'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	924.20'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	926.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=13.34 cfs @ 13.80 hrs HW=924.04' (Free Discharge)
└**1=Culvert** (Passes 13.34 cfs of 46.14 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.33 cfs @ 8.07 fps)
  ├**3=Orifice/Grate** (Orifice Controls 6.74 cfs @ 3.37 fps)
  ├**4=Orifice/Grate** (Orifice Controls 5.26 cfs @ 6.70 fps)
  ├**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 8P: Pond B2



Summary for Pond 8P: Pond B2

Inflow Area = 56.040 ac, 27.18% Impervious, Inflow Depth = 2.42" for 25-Year event
Inflow = 116.29 cfs @ 12.08 hrs, Volume= 11.282 af
Outflow = 20.09 cfs @ 12.61 hrs, Volume= 11.048 af, Atten= 83%, Lag= 31.9 min
Primary = 20.09 cfs @ 12.61 hrs, Volume= 11.048 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 924.68' @ 12.61 hrs Surf.Area= 55,379 sf Storage= 168,576 cf

Plug-Flow detention time= 226.4 min calculated for 11.048 af (98% of inflow)
Center-of-Mass det. time= 213.3 min (1,080.7 - 867.4)

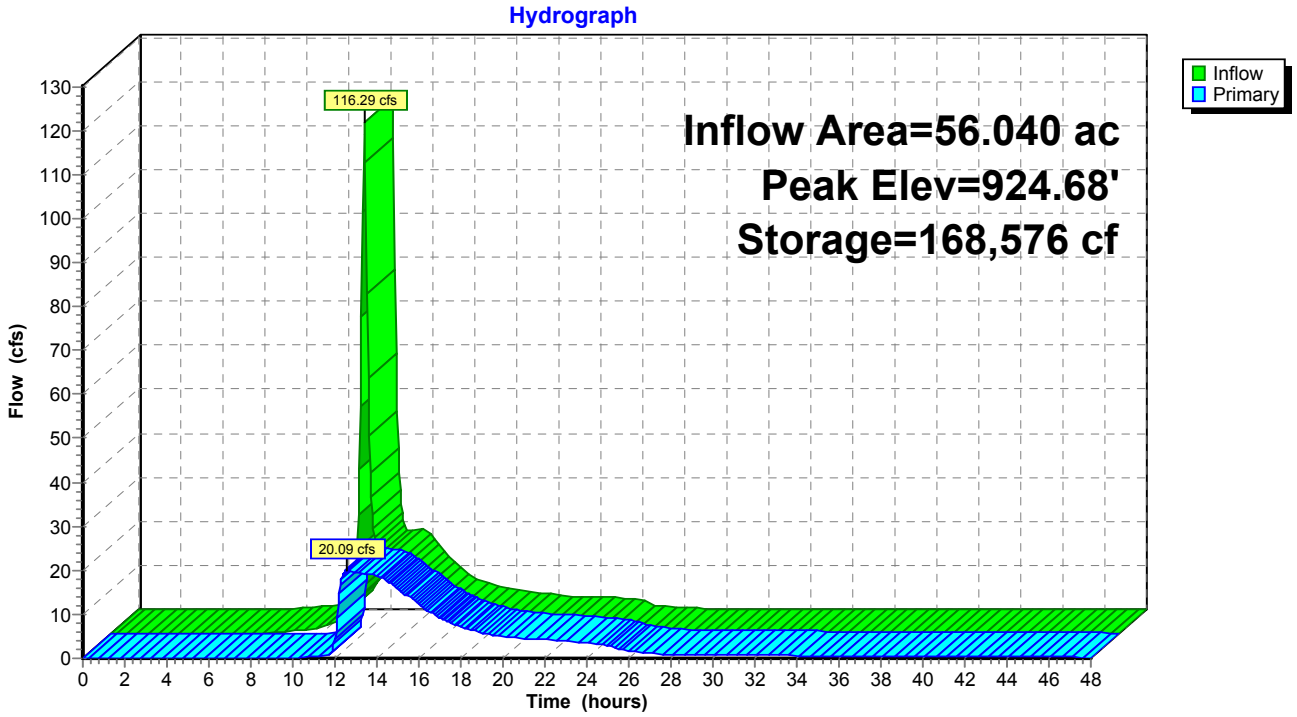
Volume	Invert	Avail.Storage	Storage Description
#1	921.00'	308,913 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
921.00	36,080	0	0
922.00	41,185	38,633	38,633
923.00	46,391	43,788	82,421
924.00	52,403	49,397	131,818
925.00	56,766	54,585	186,402
926.00	61,230	58,998	245,400
927.00	65,795	63,513	308,913

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**48.0" Round Culvert** L= 108.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.68' S= 0.0030 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 12.57 sf
#2	Device 1	921.00'	**5.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	922.10'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	924.20'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	926.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=20.09 cfs @ 12.61 hrs HW=924.68' (Free Discharge)
└**1=Culvert** (Passes 20.09 cfs of 62.45 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.48 cfs @ 8.95 fps)
  ├**3=Orifice/Grate** (Orifice Controls 10.39 cfs @ 5.19 fps)
  ├**4=Orifice/Grate** (Orifice Controls 6.08 cfs @ 7.74 fps)
  ├**5=Orifice/Grate** (Orifice Controls 2.15 cfs @ 2.23 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 8P: Pond B2



Summary for Pond 8P: Pond B2

Inflow Area = 56.040 ac, 27.18% Impervious, Inflow Depth = 2.91" for 50-Year event
Inflow = 138.61 cfs @ 12.08 hrs, Volume= 13.607 af
Outflow = 27.41 cfs @ 12.53 hrs, Volume= 13.366 af, Atten= 80%, Lag= 26.9 min
Primary = 27.41 cfs @ 12.53 hrs, Volume= 13.366 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 925.22' @ 12.53 hrs Surf.Area= 57,741 sf Storage= 198,907 cf

Plug-Flow detention time= 204.4 min calculated for 13.352 af (98% of inflow)
Center-of-Mass det. time= 194.2 min (1,057.2 - 863.0)

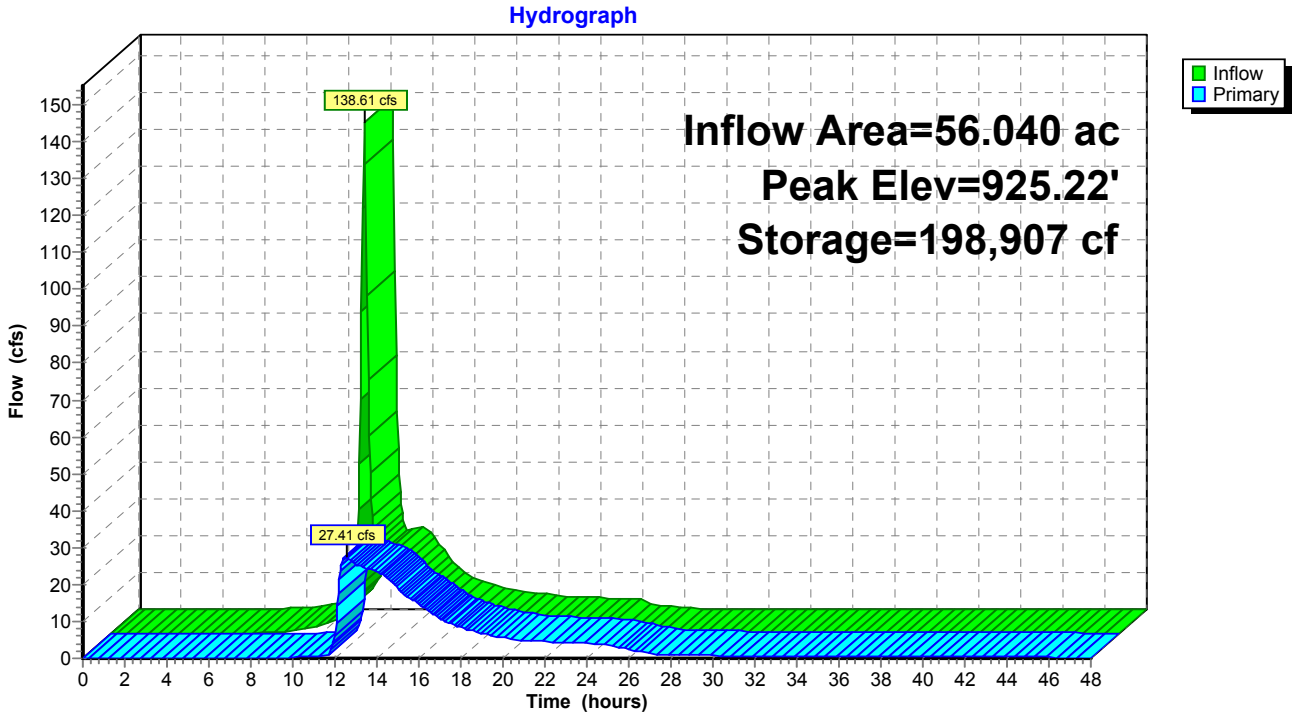
Volume	Invert	Avail.Storage	Storage Description
#1	921.00'	308,913 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
921.00	36,080	0	0
922.00	41,185	38,633	38,633
923.00	46,391	43,788	82,421
924.00	52,403	49,397	131,818
925.00	56,766	54,585	186,402
926.00	61,230	58,998	245,400
927.00	65,795	63,513	308,913

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**48.0" Round Culvert** L= 108.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.68' S= 0.0030 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 12.57 sf
#2	Device 1	921.00'	**5.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	922.10'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	924.20'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	926.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=27.41 cfs @ 12.53 hrs HW=925.22' (Free Discharge)
└**1=Culvert** (Passes 27.41 cfs of 75.94 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.59 cfs @ 9.62 fps)
  ├**3=Orifice/Grate** (Orifice Controls 12.58 cfs @ 6.29 fps)
  ├**4=Orifice/Grate** (Orifice Controls 6.68 cfs @ 8.50 fps)
  ├**5=Orifice/Grate** (Orifice Controls 6.57 cfs @ 3.29 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 8P: Pond B2



Summary for Pond 8P: Pond B2

Inflow Area = 56.040 ac, 27.18% Impervious, Inflow Depth = 3.45" for 100-Year event
Inflow = 162.30 cfs @ 12.08 hrs, Volume= 16.113 af
Outflow = 33.51 cfs @ 12.50 hrs, Volume= 15.866 af, Atten= 79%, Lag= 25.8 min
Primary = 33.51 cfs @ 12.50 hrs, Volume= 15.866 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 925.79' @ 12.50 hrs Surf.Area= 60,313 sf Storage= 232,911 cf

Plug-Flow detention time= 189.9 min calculated for 15.866 af (98% of inflow)
Center-of-Mass det. time= 179.9 min (1,038.8 - 858.9)

Volume	Invert	Avail.Storage	Storage Description
#1	921.00'	308,913 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
921.00	36,080	0	0
922.00	41,185	38,633	38,633
923.00	46,391	43,788	82,421
924.00	52,403	49,397	131,818
925.00	56,766	54,585	186,402
926.00	61,230	58,998	245,400
927.00	65,795	63,513	308,913

Device	Routing	Invert	Outlet Devices
#1	Primary	921.00'	**48.0" Round Culvert** L= 108.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 921.00' / 920.68' S= 0.0030 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 12.57 sf
#2	Device 1	921.00'	**5.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	923.00'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	922.10'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	924.20'	**24.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	926.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=33.50 cfs @ 12.50 hrs HW=925.79' (Free Discharge)
└**1=Culvert** (Passes 33.50 cfs of 88.97 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.70 cfs @ 10.29 fps)
  ├**3=Orifice/Grate** (Orifice Controls 14.56 cfs @ 7.28 fps)
  ├**4=Orifice/Grate** (Orifice Controls 7.27 cfs @ 9.25 fps)
  ├**5=Orifice/Grate** (Orifice Controls 9.98 cfs @ 4.99 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 8P: Pond B2