

**Stormwater Management Report  
67 Kennedy Road Warehouse & Distribution Center  
352 Sullivan Ave, 67 & 68 Kennedy Road  
South Windsor, Connecticut**

Prepared by:

**Design Professionals, Inc.  
21 Jeffrey Drive  
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March 30, 2022



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## **Introduction**

UW Vintage Lane II, LLC is proposing an industrial development of a tract of land comprised of four properties located at 5 & 25 Talbot Lane and 475 & 551 Governor's Highway, South Windsor, Connecticut. The properties are referenced on the Town of South Windsor Tax Assessors map as GIS#: 88900005, 88900025, 36900475 and 36900551, respectively. The proposed development will include the construction of one 359,640 SF industrial building. Associated site improvements will include but not be limited to new access driveways, parking areas for vehicles, sidewalks, landscaping, lighting, utilities, and stormwater management BMP's.

The total combined tract area is 30.37 acres. 27.1± acres of this area are proposed to be disturbed during construction. For more information, please refer to the plans entitled "25 Talbot Lane ~ Site Plan Application ~ 5 & 25 Talbot Lane and 475 & 551 Governor's Highway ~ South Windsor, Ct ~ GIS#: 88900005, 88900025, 36900475 and 36900551" prepared by Design Professionals, Inc., and dated July 02, 2021, as amended.

## **Pre-Development Site Conditions**

The existing surficial characteristics of the area to be developed can be primarily classified as undisturbed woodland area surrounded by industrial development. The property shares its northern property boundary with Connecticut Southern Rail line. The center of this rail line was identified as the sites northern drainage limit. Further review of the site topography indicated a ridgeline exists spanning east to west across the center of the property. Stormwater that falls north of this boundary would flow to the rail line property. Stormwater that falls south of this boundary would flow to drainage system in Sullivan Ave and Kennedy Road. All stormwater runoff generated across the tract would flow to one of four design points. These four design points were identified as follows:

1. **Design Point 1 (DP#1):** Existing depression on Rail Line Property. Conveys water to a swale tributary to the Scantic River via an 18" CMP culvert.
2. **Design Point 2 (DP#2):** Sheet flow across the North-West Property corner to the Rail Line property.
3. **Design Point 3 (DP#3):** Sheet flow runoff to Sullivan Ave (via subsurface stormwater conveyance system on 330 Sullivan Ave in existing conditions).
4. **Design Point 4 (DP#4):** Sheet flow runoff to Kennedy Road.
5. **Design Point 5 (DP#5):** Existing roadway drainage to catchbasin in Kennedy Road.

All design points ultimately drain to The Scantic River, and is a part of local basin ID 4200-00-4-R18. Existing conditions watershed delineations are identified in the Existing Conditions Drainage Map located in **Appendix F**.

Based on Natural Resources Conservation Service (NRCS) Hydrologic Soil Group (HSG) mapping, soils types A, B, C, D, & B/D are located on site. See **Appendix C** for The NRCS Soil Map & Data.

An evaluation was performed to quantify the peak rate of stormwater discharge offsite to the design points identified. The Natural Resources Conservation Service's TR-55 Manual was followed in predicting the peak rates of runoff and volumes. HydroCAD computer modeling software was utilized.

Peak rates of stormwater runoff were evaluated for the 2-, 10-, 25-, 50- and 100-year storm events. For more information, please refer to the enclosed Pre-Development Drainage HydroCAD Report located in **Appendix A**.

### **Post-Development Site Conditions**

The proposed development will include the construction of one 241,800 SF industrial building. Associated site improvements will include but not be limited to new access driveways, parking areas for vehicles, sidewalks, landscaping, lighting, utilities, and stormwater management BMP's. Site generated runoff from all proposed roofs, roadways, parking, and landscaped areas will be either collected in an underground storm water conveyance system or allowed to sheet flow to one of eight proposed detention systems. A general description of each detention system is included below:

1. Proposed Pond 1 (PP1) : 101,025± cft underground storage system collecting runoff from the proposed roof area and detained flow from pond water quality basin PP2. Detained discharge from this pond will be released to a proposed preformed scour hole near the 18" Pipe outlet (DP1) adjacent to the Rail Road Property.
2. Proposed Pond 2 (PP2) : 136,855± cft Water quality basin collecting runoff from the west truck parking and loading area. Detained discharge from this pond will be released pond underground chamber system PP1.
3. Proposed Pond 3 (PP3) : 5,027± cft underground storage system collecting runoff from the grass areas south of the proposed berm along Sullivan Ave. Detained discharge from this pond will be released to an Existing CB in Sullivan Ave.
4. Proposed Pond 4 (PP4) : 62,769± cft Water quality basin collecting runoff from the northern perimeter drive and detained flow from pond underground chamber system PP5. Detained discharge from this pond will be released to the proposed mitigation area within the existing railroad depression area.
5. Proposed Pond 5 (PP5) : 5,682± cft underground storage system collecting runoff from the eastern standard parking areas. Detained discharge from this pond will be released to a splitter structure conveying detained flows to pond PP4 and a 6" outlet pipe proposed to send runoff directly to the mitigation area.

6. Proposed Pond 6 (PP6) : 42,367± cft Water quality basin collecting runoff from the proposed cul-de-sac and existing Kennedy Road runoff. Detained runoff from this basin will be released to the existing stormwater collection system in Kennedy Road.
7. Proposed Pond 7 (PP7) : 15,391± cft underground storage system collecting runoff from the grass area on the east side of the site adjacent to Kennedy Road. Detained runoff from this basin will be released to the existing stormwater collection system in Kennedy Road.
8. Proposed Pond 8 (PP7) : 3,839± cft underground storage system collecting runoff from the grass areas south the proposed building and north of the proposed berm along Sullivan Ave. Detained discharge from this pond will be released to an Existing CB in Sullivan Ave.

See **Appendix B** for the Post Development Condition and Pond summary HydroCAD reports. The Proposed Conditions Drainage Map for the site can be found in **Appendix F**.

### **Analysis of Results**

The pre-development and post-development conditions were analyzed using HydroCAD consistent with National Resource Conservation Service (NRCS) hydrology methods. Four discharge locations (**Design Point #1 - 4**) were identified as points of interest for assessing downstream effects. The following table contains the data generated from the HydroCAD software:

Reach		2 year	10 year	25 year	50 year	100 year
DP#1 – Rail Road Pond (North of site)	Pre	2.92	8.35	10.74	11.67	12.42
	Post	2.86	7.18	10.35	11.48	12.38
DP#2 – North West Corner of Site	Pre	0.02	0.29	0.68	1.05	1.52
	Post	0.02	0.15	0.28	0.38	0.51
DP#3 – Overland Flow to Sullivan Ave	Pre	0.00	0.74	1.77	2.73	3.90
	Post	0.00	0.33	1.27	2.14	3.07
DP#4 – Flow to Kennedy Road Drainage System	Pre	0.37	0.74	0.99	1.17	1.38
	Post	0.34	0.52	0.61	0.67	0.82

As seen in the table above, most of the storm events evaluated for the subject project will result in peak runoff rates in the proposed condition that are less than the peak runoff rates of the existing condition for 2-, 10-, 25-, 50- and 100-year design storms. There was a small 0.03 cfs increase in peak flow to DP#3 in the 2-yr storm. This increase to DP#3 is offset by reductions in the peak flow to DP#2 & 4, all of which ultimately drain to the Podunk River. It is our opinion that this increase is negligible and will not cause any detrimental downstream impacts.

### **Storm Sewer Collection System**

The proposed subsurface stormwater collection and conveyance system was designed to adequately convey proposed runoff under 10- year storm event conditions. The design of the storm sewers followed the guidelines set forth in the Connecticut Department of Transportation's Drainage Manual. It is estimated that during a 10-year storm event, all proposed subsurface culverts will convey storm runoff without resulting in any unacceptable flooding conditions.

### **Water Quality**

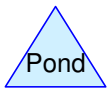
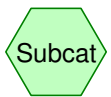
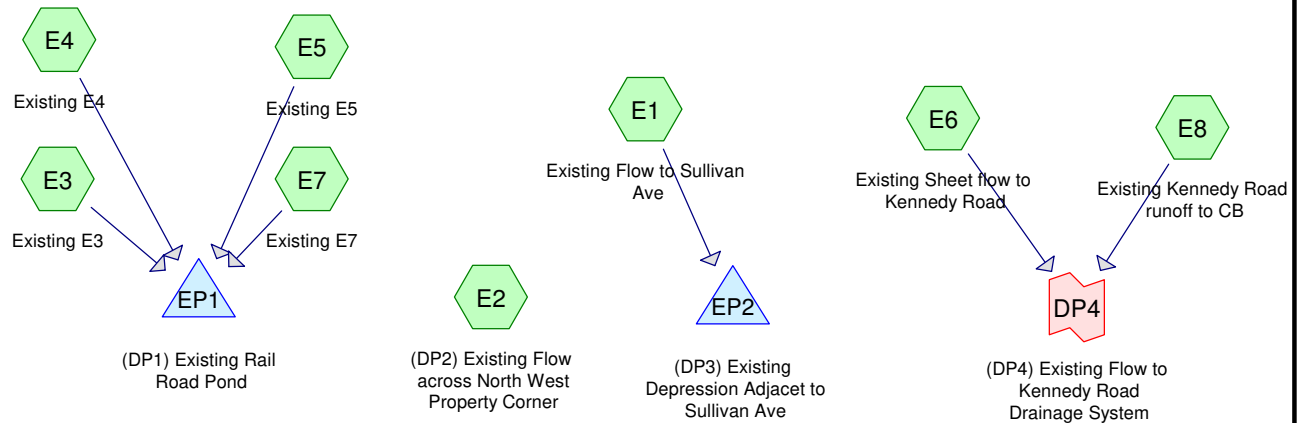
The proposed water quality basin's and forebay's were sized to treat a 1" rain event as recommended in the 2004 Connecticut Stormwater Quality Manual. The proposed forebay was sized to store over 10% of this water quality volume as recommended by the 2004 Connecticut Stormwater Quality Manual.

Stormtech Isolator rows will also be utilized to address water quality for all other areas draining to one of the proposed underground chamber systems. The number of isolator rows provided will be more than adequate to treat the required water quality flow rate based on the determined water quality flow and manufacture specs for treated flow rate per chamber. The required water quality flow was also calculated considering recommended equations provided in the 2004 Connecticut Stormwater Quality Manual.

### **Conclusion**

The proposed stormwater management system as discussed herein and shown on the referenced plans is appropriate for the proposed development on the subject site and should not pose any detrimental impacts to the environment.

**APPENDIX A**  
**Watershed Computations**  
**(Pre-Development Drainage HydroCAD Report)**



**4670 Hydrocad**

Prepared by Design Professionals, Inc.

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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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Page 2

Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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 E1: Existing Flow to** Runoff Area=321,193 sf 0.59% Impervious Runoff Depth=0.46"  
Flow Length=887' Tc=65.5 min CN=62 Runoff=1.04 cfs 0.283 af

**Subcatchment E2: (DP2) Existing Flow** Runoff Area=76,582 sf 0.00% Impervious Runoff Depth=0.07"  
Flow Length=421' Tc=47.3 min CN=47 Runoff=0.02 cfs 0.010 af

**Subcatchment E3: Existing E3** Runoff Area=194,866 sf 0.00% Impervious Runoff Depth=0.58"  
Flow Length=716' Tc=62.2 min CN=65 Runoff=0.91 cfs 0.215 af

**Subcatchment E4: Existing E4** Runoff Area=56,986 sf 0.00% Impervious Runoff Depth=0.75"  
Flow Length=388' Tc=38.6 min CN=69 Runoff=0.50 cfs 0.082 af

**Subcatchment E5: Existing E5** Runoff Area=282,537 sf 14.41% Impervious Runoff Depth=0.90"  
Flow Length=1,310' Tc=91.0 min CN=72 Runoff=1.87 cfs 0.486 af

**Subcatchment E6: Existing Sheet flow to** Runoff Area=2,937 sf 0.00% Impervious Runoff Depth=0.24"  
Flow Length=26' Slope=0.0200 '/' Tc=7.3 min CN=55 Runoff=0.01 cfs 0.001 af

**Subcatchment E7: Existing E7** Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=0.62"  
Flow Length=197' Tc=25.0 min CN=66 Runoff=0.07 cfs 0.010 af

**Subcatchment E8: Existing Kennedy Road** Runoff Area=7,294 sf 69.19% Impervious Runoff Depth=1.87"  
Tc=6.0 min CN=87 Runoff=0.37 cfs 0.026 af

**Pond EP1: (DP1) Existing Rail Road Pond** Peak Elev=80.74' Storage=551 cf Inflow=2.94 cfs 0.793 af  
18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=2.92 cfs 0.793 af

**Pond EP2: (DP3) Existing Depression** Peak Elev=82.75' Storage=12,306 cf Inflow=1.04 cfs 0.283 af  
Outflow=0.00 cfs 0.000 af

**Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System** Inflow=0.37 cfs 0.027 af  
Primary=0.37 cfs 0.027 af

**Total Runoff Area = 21.828 ac Runoff Volume = 1.112 af Average Runoff Depth = 0.61"**  
**94.80% Pervious = 20.694 ac 5.20% Impervious = 1.135 ac**

**4670 Hydrocad**

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Existing Condition  
Type III 24-hr 10-yr Rainfall=4.99"

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Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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 E1: Existing Flow to** Runoff Area=321,193 sf 0.59% Impervious Runoff Depth=1.43"  
Flow Length=887' Tc=65.5 min CN=62 Runoff=4.21 cfs 0.880 af

**Subcatchment E2: (DP2) Existing Flow** Runoff Area=76,582 sf 0.00% Impervious Runoff Depth=0.53"  
Flow Length=421' Tc=47.3 min CN=47 Runoff=0.29 cfs 0.078 af

**Subcatchment E3: Existing E3** Runoff Area=194,866 sf 0.00% Impervious Runoff Depth=1.65"  
Flow Length=716' Tc=62.2 min CN=65 Runoff=3.13 cfs 0.614 af

**Subcatchment E4: Existing E4** Runoff Area=56,986 sf 0.00% Impervious Runoff Depth=1.95"  
Flow Length=388' Tc=38.6 min CN=69 Runoff=1.46 cfs 0.213 af

**Subcatchment E5: Existing E5** Runoff Area=282,537 sf 14.41% Impervious Runoff Depth=2.19"  
Flow Length=1,310' Tc=91.0 min CN=72 Runoff=4.96 cfs 1.184 af

**Subcatchment E6: Existing Sheet flow to** Runoff Area=2,937 sf 0.00% Impervious Runoff Depth=0.97"  
Flow Length=26' Slope=0.0200 '/' Tc=7.3 min CN=55 Runoff=0.06 cfs 0.005 af

**Subcatchment E7: Existing E7** Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=1.72"  
Flow Length=197' Tc=25.0 min CN=66 Runoff=0.23 cfs 0.028 af

**Subcatchment E8: Existing Kennedy Road** Runoff Area=7,294 sf 69.19% Impervious Runoff Depth=3.56"  
Tc=6.0 min CN=87 Runoff=0.69 cfs 0.050 af

**Pond EP1: (DP1) Existing Rail Road Pond** Peak Elev=81.92' Storage=2,326 cf Inflow=8.49 cfs 2.038 af  
18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=8.35 cfs 2.038 af

**Pond EP2: (DP3) Existing Depression** Peak Elev=83.02' Storage=22,833 cf Inflow=4.21 cfs 0.880 af  
Outflow=0.74 cfs 0.487 af

**Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System** Inflow=0.74 cfs 0.055 af  
Primary=0.74 cfs 0.055 af

**Total Runoff Area = 21.828 ac Runoff Volume = 3.052 af Average Runoff Depth = 1.68"**  
**94.80% Pervious = 20.694 ac 5.20% Impervious = 1.135 ac**

**4670 Hydrocad**

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Existing Condition  
Type III 24-hr 25-yr Rainfall=6.13"

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Page 4

Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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

<b>Subcatchment E1: Existing Flow to</b>	Runoff Area=321,193 sf 0.59% Impervious Runoff Depth=2.18" Flow Length=887' Tc=65.5 min CN=62 Runoff=6.70 cfs 1.339 af
<b>Subcatchment E2: (DP2) Existing Flow</b>	Runoff Area=76,582 sf 0.00% Impervious Runoff Depth=0.99" Flow Length=421' Tc=47.3 min CN=47 Runoff=0.68 cfs 0.145 af
<b>Subcatchment E3: Existing E3</b>	Runoff Area=194,866 sf 0.00% Impervious Runoff Depth=2.45" Flow Length=716' Tc=62.2 min CN=65 Runoff=4.79 cfs 0.912 af
<b>Subcatchment E4: Existing E4</b>	Runoff Area=56,986 sf 0.00% Impervious Runoff Depth=2.81" Flow Length=388' Tc=38.6 min CN=69 Runoff=2.15 cfs 0.307 af
<b>Subcatchment E5: Existing E5</b>	Runoff Area=282,537 sf 14.41% Impervious Runoff Depth=3.10" Flow Length=1,310' Tc=91.0 min CN=72 Runoff=7.11 cfs 1.676 af
<b>Subcatchment E6: Existing Sheet flow to</b>	Runoff Area=2,937 sf 0.00% Impervious Runoff Depth=1.59" Flow Length=26' Slope=0.0200 '/' Tc=7.3 min CN=55 Runoff=0.11 cfs 0.009 af
<b>Subcatchment E7: Existing E7</b>	Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=2.54" Flow Length=197' Tc=25.0 min CN=66 Runoff=0.35 cfs 0.041 af
<b>Subcatchment E8: Existing Kennedy Road</b>	Runoff Area=7,294 sf 69.19% Impervious Runoff Depth=4.64" Tc=6.0 min CN=87 Runoff=0.89 cfs 0.065 af
<b>Pond EP1: (DP1) Existing Rail Road Pond</b>	Peak Elev=82.50' Storage=6,867 cf Inflow=12.49 cfs 2.935 af 18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=10.74 cfs 2.935 af
<b>Pond EP2: (DP3) Existing Depression</b>	Peak Elev=83.12' Storage=28,614 cf Inflow=6.70 cfs 1.339 af Outflow=1.77 cfs 0.946 af
<b>Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System</b>	Inflow=0.99 cfs 0.074 af Primary=0.99 cfs 0.074 af

**Total Runoff Area = 21.828 ac Runoff Volume = 4.494 af Average Runoff Depth = 2.47"**  
**94.80% Pervious = 20.694 ac 5.20% Impervious = 1.135 ac**

**4670 Hydrocad**

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Existing Condition  
Type III 24-hr 50-yr Rainfall=6.97"

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Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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 E1: Existing Flow to** Runoff Area=321,193 sf 0.59% Impervious Runoff Depth=2.78"  
Flow Length=887' Tc=65.5 min CN=62 Runoff=8.72 cfs 1.708 af

**Subcatchment E2: (DP2) Existing Flow** Runoff Area=76,582 sf 0.00% Impervious Runoff Depth=1.39"  
Flow Length=421' Tc=47.3 min CN=47 Runoff=1.05 cfs 0.204 af

**Subcatchment E3: Existing E3** Runoff Area=194,866 sf 0.00% Impervious Runoff Depth=3.08"  
Flow Length=716' Tc=62.2 min CN=65 Runoff=6.11 cfs 1.148 af

**Subcatchment E4: Existing E4** Runoff Area=56,986 sf 0.00% Impervious Runoff Depth=3.49"  
Flow Length=388' Tc=38.6 min CN=69 Runoff=2.67 cfs 0.380 af

**Subcatchment E5: Existing E5** Runoff Area=282,537 sf 14.41% Impervious Runoff Depth=3.80"  
Flow Length=1,310' Tc=91.0 min CN=72 Runoff=8.76 cfs 2.056 af

**Subcatchment E6: Existing Sheet flow to** Runoff Area=2,937 sf 0.00% Impervious Runoff Depth=2.10"  
Flow Length=26' Slope=0.0200 '/' Tc=7.3 min CN=55 Runoff=0.15 cfs 0.012 af

**Subcatchment E7: Existing E7** Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=3.18"  
Flow Length=197' Tc=25.0 min CN=66 Runoff=0.44 cfs 0.051 af

**Subcatchment E8: Existing Kennedy Road** Runoff Area=7,294 sf 69.19% Impervious Runoff Depth=5.45"  
Tc=6.0 min CN=87 Runoff=1.03 cfs 0.076 af

**Pond EP1: (DP1) Existing Rail Road Pond** Peak Elev=82.87' Storage=14,445 cf Inflow=15.61 cfs 3.636 af  
18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=11.67 cfs 3.636 af

**Pond EP2: (DP3) Existing Depression** Peak Elev=83.20' Storage=33,927 cf Inflow=8.72 cfs 1.708 af  
Outflow=2.73 cfs 1.314 af

**Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System** Inflow=1.17 cfs 0.088 af  
Primary=1.17 cfs 0.088 af

**Total Runoff Area = 21.828 ac Runoff Volume = 5.635 af Average Runoff Depth = 3.10"**  
**94.80% Pervious = 20.694 ac 5.20% Impervious = 1.135 ac**

**4670 Hydrocad**

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Existing Condition  
Type III 24-hr 100-yr Rainfall=7.90"

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Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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 E1: Existing Flow to** Runoff Area=321,193 sf 0.59% Impervious Runoff Depth=3.48"  
Flow Length=887' Tc=65.5 min CN=62 Runoff=11.07 cfs 2.138 af

**Subcatchment E2: (DP2) Existing Flow** Runoff Area=76,582 sf 0.00% Impervious Runoff Depth=1.88"  
Flow Length=421' Tc=47.3 min CN=47 Runoff=1.52 cfs 0.276 af

**Subcatchment E3: Existing E3** Runoff Area=194,866 sf 0.00% Impervious Runoff Depth=3.81"  
Flow Length=716' Tc=62.2 min CN=65 Runoff=7.63 cfs 1.422 af

**Subcatchment E4: Existing E4** Runoff Area=56,986 sf 0.00% Impervious Runoff Depth=4.26"  
Flow Length=388' Tc=38.6 min CN=69 Runoff=3.27 cfs 0.465 af

**Subcatchment E5: Existing E5** Runoff Area=282,537 sf 14.41% Impervious Runoff Depth=4.61"  
Flow Length=1,310' Tc=91.0 min CN=72 Runoff=10.63 cfs 2.490 af

**Subcatchment E6: Existing Sheet flow to** Runoff Area=2,937 sf 0.00% Impervious Runoff Depth=2.72"  
Flow Length=26' Slope=0.0200 '/' Tc=7.3 min CN=55 Runoff=0.20 cfs 0.015 af

**Subcatchment E7: Existing E7** Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=3.93"  
Flow Length=197' Tc=25.0 min CN=66 Runoff=0.55 cfs 0.063 af

**Subcatchment E8: Existing Kennedy Road** Runoff Area=7,294 sf 69.19% Impervious Runoff Depth=6.35"  
Tc=6.0 min CN=87 Runoff=1.19 cfs 0.089 af

**Pond EP1: (DP1) Existing Rail Road Pond** Peak Elev=83.19' Storage=25,625 cf Inflow=19.19 cfs 4.440 af  
18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=12.42 cfs 4.440 af

**Pond EP2: (DP3) Existing Depression** Peak Elev=83.28' Storage=40,432 cf Inflow=11.07 cfs 2.138 af  
Outflow=3.90 cfs 1.745 af

**Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System** Inflow=1.38 cfs 0.104 af  
Primary=1.38 cfs 0.104 af

**Total Runoff Area = 21.828 ac Runoff Volume = 6.958 af Average Runoff Depth = 3.82"**  
**94.80% Pervious = 20.694 ac 5.20% Impervious = 1.135 ac**

**4670 Hydrocad**

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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment E1: Existing Flow to Sullivan Ave**

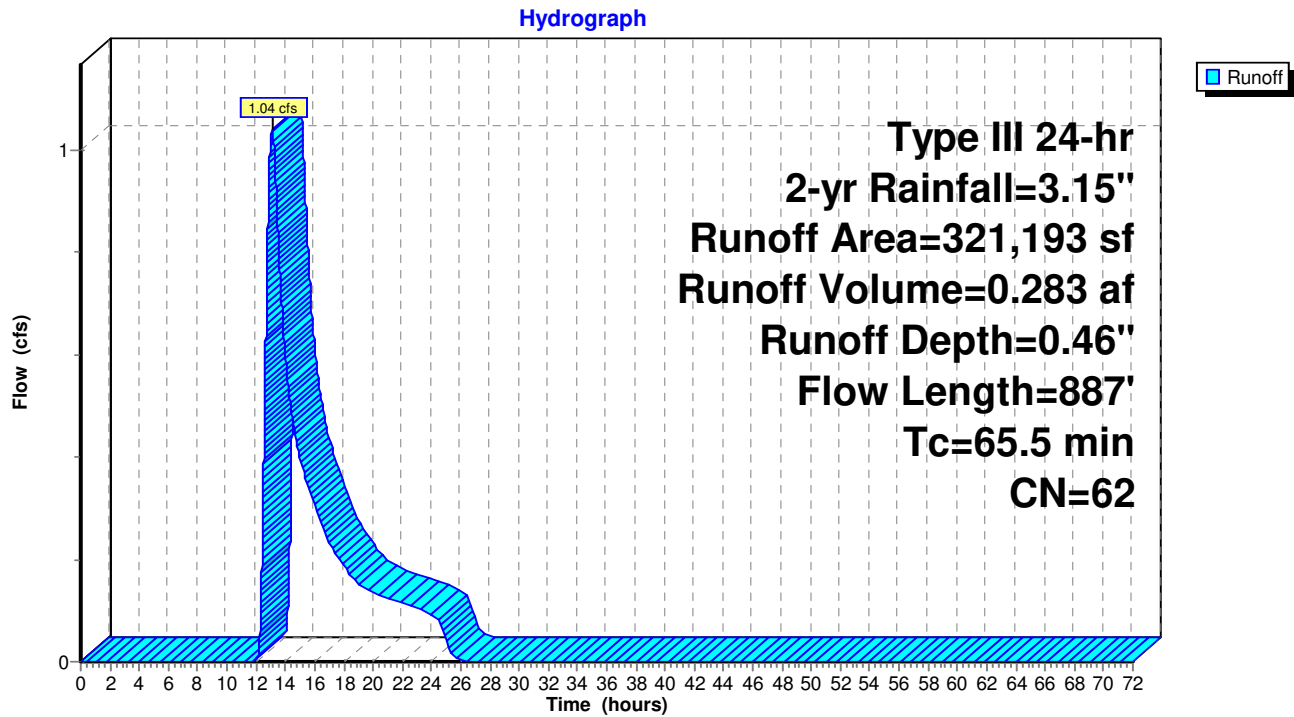
Runoff = 1.04 cfs @ 13.10 hrs, Volume= 0.283 af, Depth= 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
23,040	61	>75% Grass cover, Good, HSG B
3,445	80	>75% Grass cover, Good, HSG D
* 3,223	71	>75% Grass cover, Good, HSG B/D
* 1,879	98	IMPERVIOUS
3,151	30	Woods, Good, HSG A
121,413	55	Woods, Good, HSG B
* 103,315	66	Woods, Good, HSG B/D
61,727	70	Woods, Good, HSG C
321,193	62	Weighted Average
319,314		99.41% Pervious Area
1,879		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	100	0.0150	0.07		<b>Sheet Flow, Woodland Sheet Flow</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
41.5	787	0.0040	0.32		<b>Shallow Concentrated Flow, Woodland SCF</b>
					Woodland Kv= 5.0 fps
65.5	887	Total			

**Subcatchment E1: Existing Flow to Sullivan Ave**

**4670 Hydrocad**

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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment E2: (DP2) Existing Flow across North West Property Corner**

Runoff = 0.02 cfs @ 15.50 hrs, Volume= 0.010 af, Depth= 0.07"

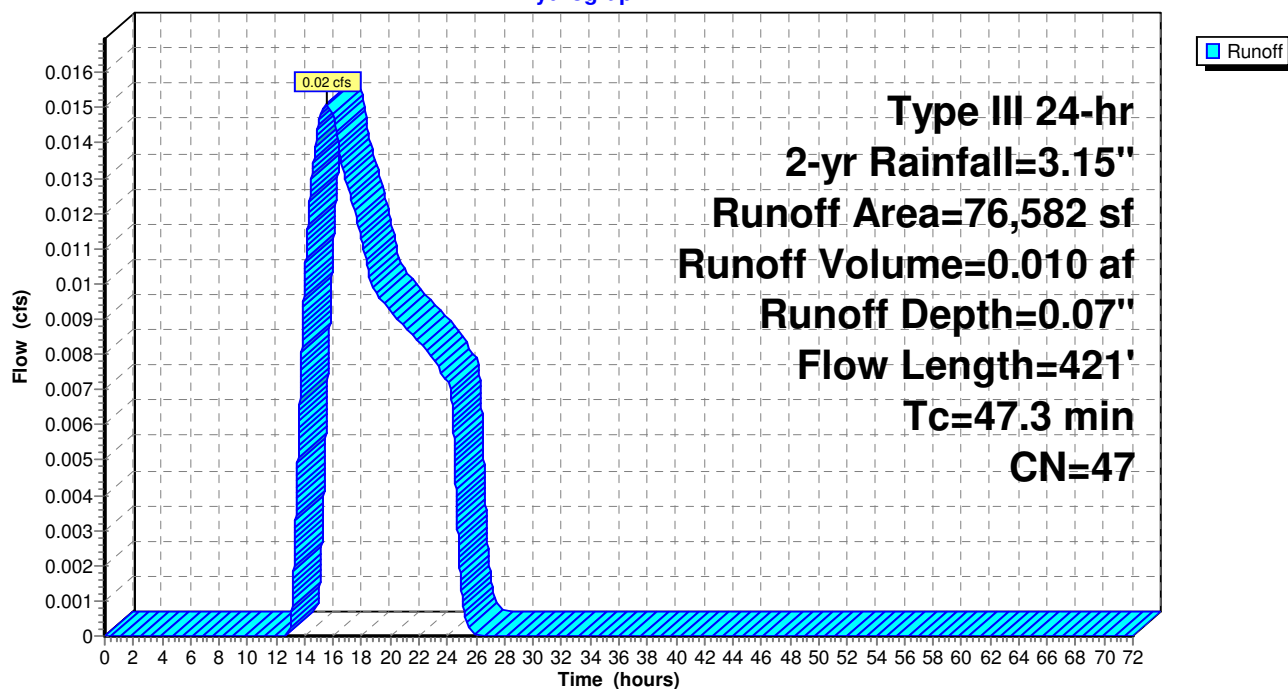
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
1,541	39	>75% Grass cover, Good, HSG A
3,329	61	>75% Grass cover, Good, HSG B
* 285	71	>75% Grass cover, Good, HSG B/D
37,312	30	Woods, Good, HSG A
2,030	55	Woods, Good, HSG B
* 31,307	66	Woods, Good, HSG B/D
778	70	Woods, Good, HSG C
76,582	47	Weighted Average
76,582		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0160	0.07		<b>Sheet Flow, Woodland SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
23.9	321	0.0020	0.22		<b>Shallow Concentrated Flow, Woodland SCF</b>
					Woodland Kv= 5.0 fps
47.3	421	Total			

**Subcatchment E2: (DP2) Existing Flow across North West Property Corner**

Hydrograph



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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment E3: Existing E3**

Runoff = 0.91 cfs @ 12.99 hrs, Volume= 0.215 af, Depth= 0.58"

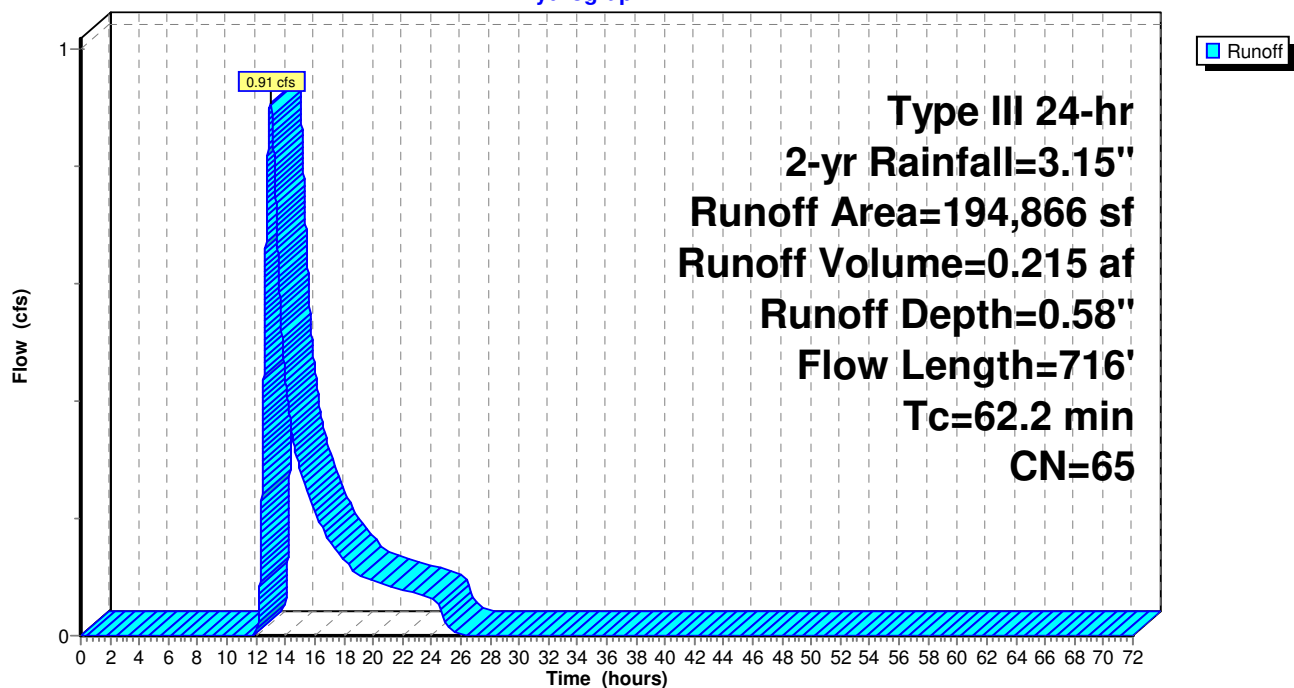
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

	Area (sf)	CN	Description
*	2,034	71	>75% Grass cover, Good, HSG B/D
	19,302	30	Woods, Good, HSG A
*	44,406	66	Woods, Good, HSG B/D
	129,124	70	Woods, Good, HSG C
	194,866	65	Weighted Average
	194,866		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	100	0.0140	0.07		<b>Sheet Flow, Woodland SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
37.5	616	0.0030	0.27		<b>Shallow Concentrated Flow, Woodland SCF</b>
					Woodland Kv= 5.0 fps
62.2	716	Total			

**Subcatchment E3: Existing E3**

Hydrograph



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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment E4: Existing E4**

Runoff = 0.50 cfs @ 12.61 hrs, Volume= 0.082 af, Depth= 0.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

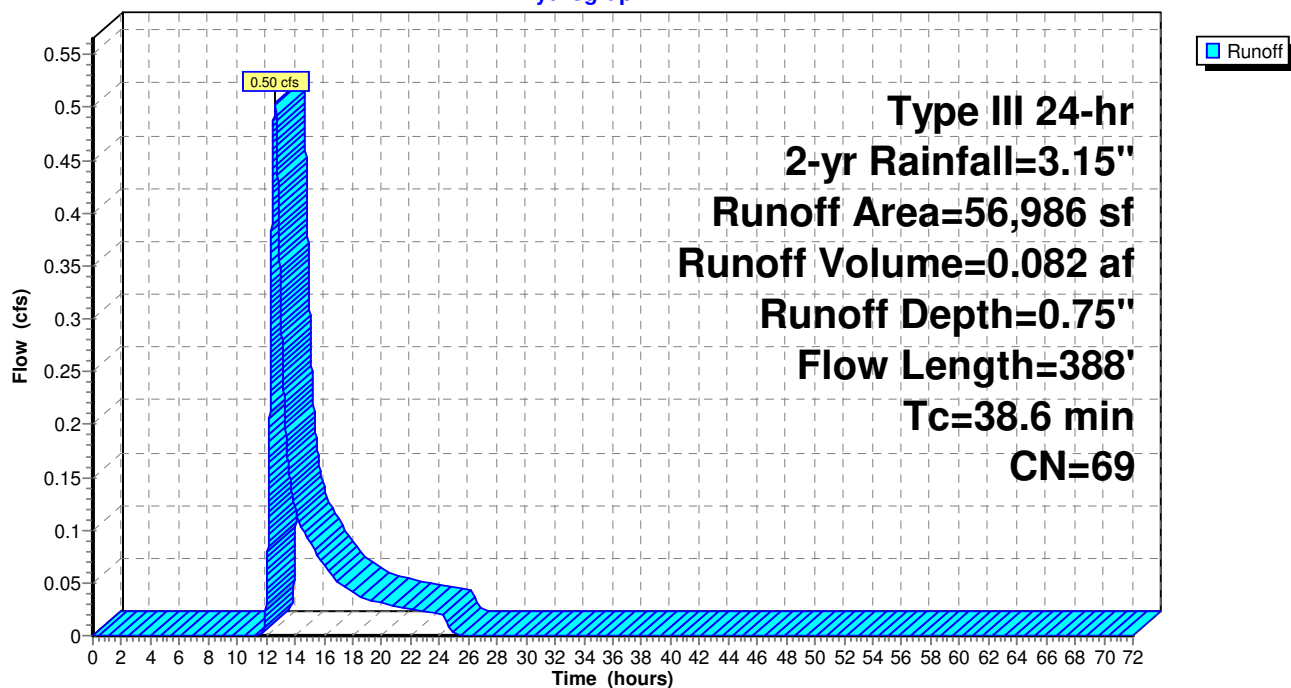
	Area (sf)	CN	Description
*	20,899	66	Woods, Good, HSG B/D
	36,087	70	Woods, Good, HSG C
	56,986	69	Weighted Average
	56,986		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0160	0.07		<b>Sheet Flow, Woodland SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
15.2	288	0.0040	0.32		<b>Shallow Concentrated Flow, Woodland SCF</b>
					Woodland Kv= 5.0 fps
38.6	388	Total			

**Subcatchment E4: Existing E4**

Hydrograph



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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment E5: Existing E5**

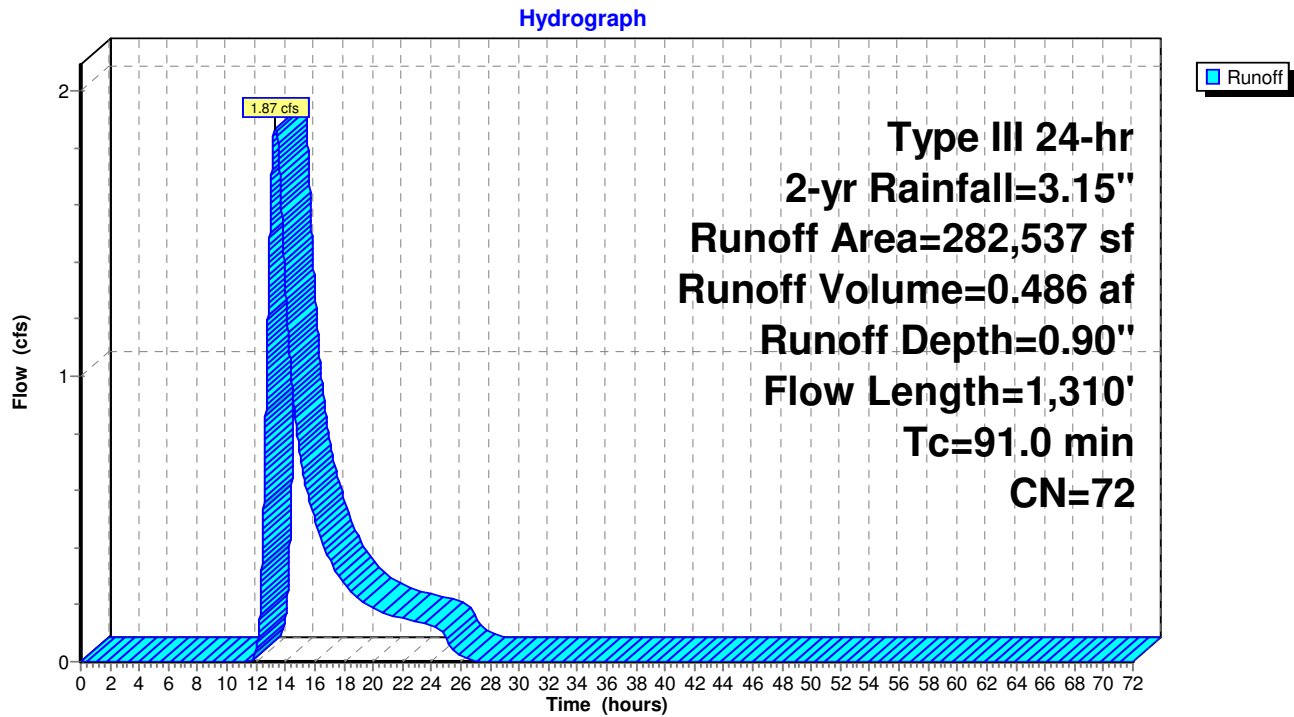
Runoff = 1.87 cfs @ 13.35 hrs, Volume= 0.486 af, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

	Area (sf)	CN	Description
*	7,449	71	>75% Grass cover, Good, HSG B/D
	5,261	74	>75% Grass cover, Good, HSG C
*	40,707	98	IMPERVIOUS
	456	55	Woods, Good, HSG B
*	158,845	66	Woods, Good, HSG B/D
	27,388	70	Woods, Good, HSG C
	28,470	71	Meadow, non-grazed, HSG C
*	13,961	68	Meadow, non-grazed, HSG B/D
	282,537	72	Weighted Average
	241,830		85.59% Pervious Area
	40,707		14.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	100	0.0110	0.06		<b>Sheet Flow, Woodland Sheet Flow</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
63.8	1,210	0.0040	0.32		<b>Shallow Concentrated Flow, Woodland SCF</b>
					Woodland Kv= 5.0 fps
91.0	1,310	Total			

## Subcatchment E5: Existing E5



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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment E6: Existing Sheet flow to Kennedy Road**

Runoff = 0.01 cfs @ 12.37 hrs, Volume= 0.001 af, Depth= 0.24"

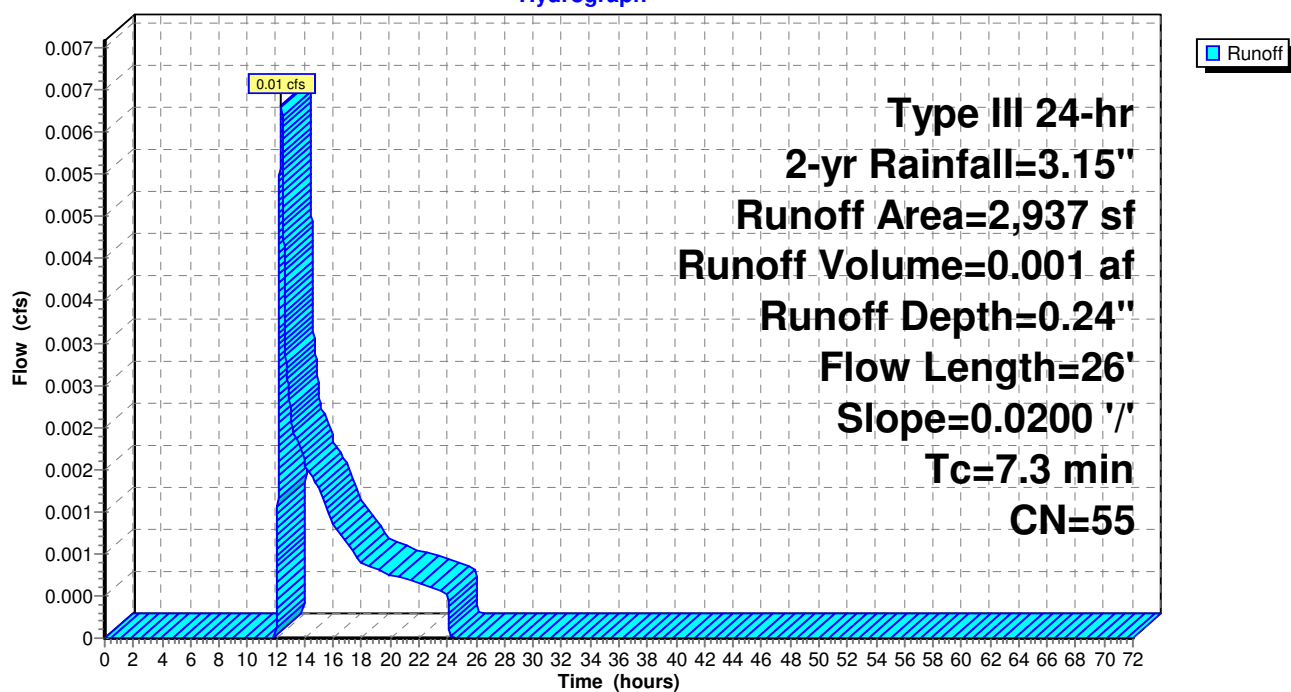
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
2,937	55	Woods, Good, HSG B
2,937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	26	0.0200	0.06		<b>Sheet Flow, Woodland SF</b> Woods: Light underbrush n= 0.400 P2= 3.22"

**Subcatchment E6: Existing Sheet flow to Kennedy Road**

Hydrograph



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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment E7: Existing E7**

Runoff = 0.07 cfs @ 12.42 hrs, Volume= 0.010 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

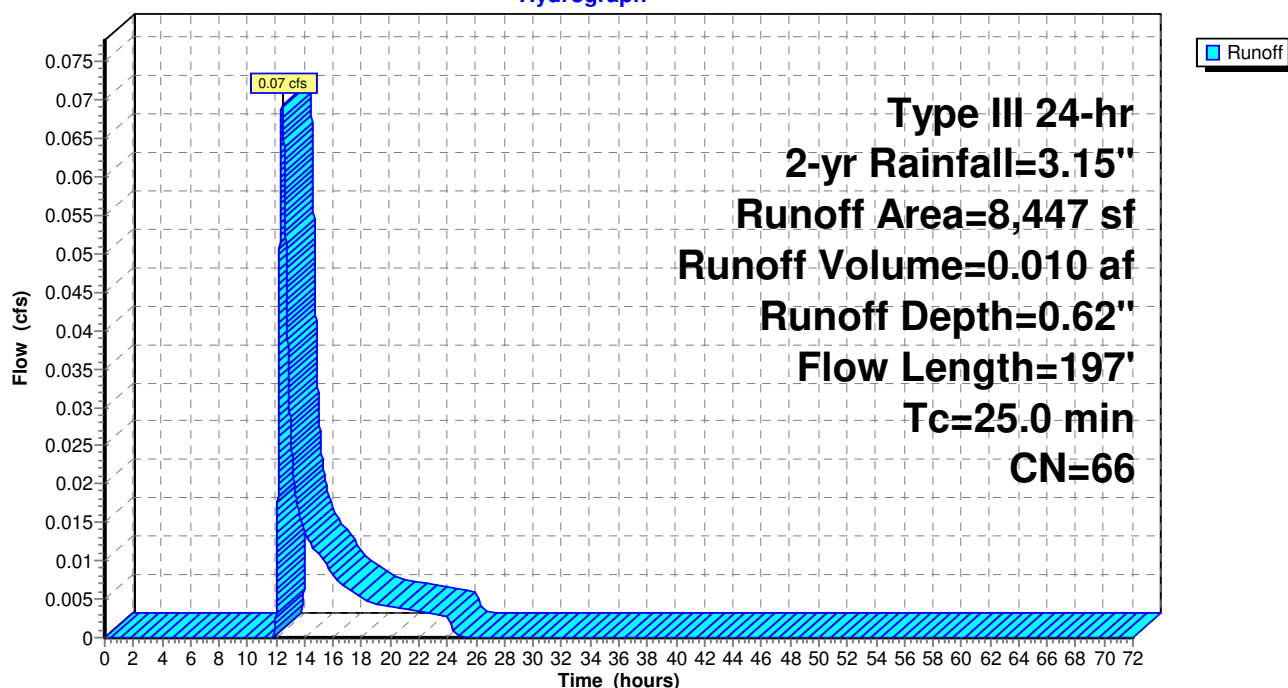
Area (sf)	CN	Description
2,335	39	>75% Grass cover, Good, HSG A
1,709	74	>75% Grass cover, Good, HSG C
* 1,796	98	IMPERVIOUS
450	30	Meadow, non-grazed, HSG A
2,157	71	Meadow, non-grazed, HSG C
8,447	66	Weighted Average
6,651		78.74% Pervious Area
1,796		21.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0160	0.07		<b>Sheet Flow, Woodland SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
1.6	97	0.0420	1.02		<b>Shallow Concentrated Flow, Woodlan SCF</b>
					Woodland Kv= 5.0 fps
25.0	197	Total			

**Subcatchment E7: Existing E7**

Hydrograph



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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment E8: Existing Kennedy Road runoff to CB**

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 1.87"

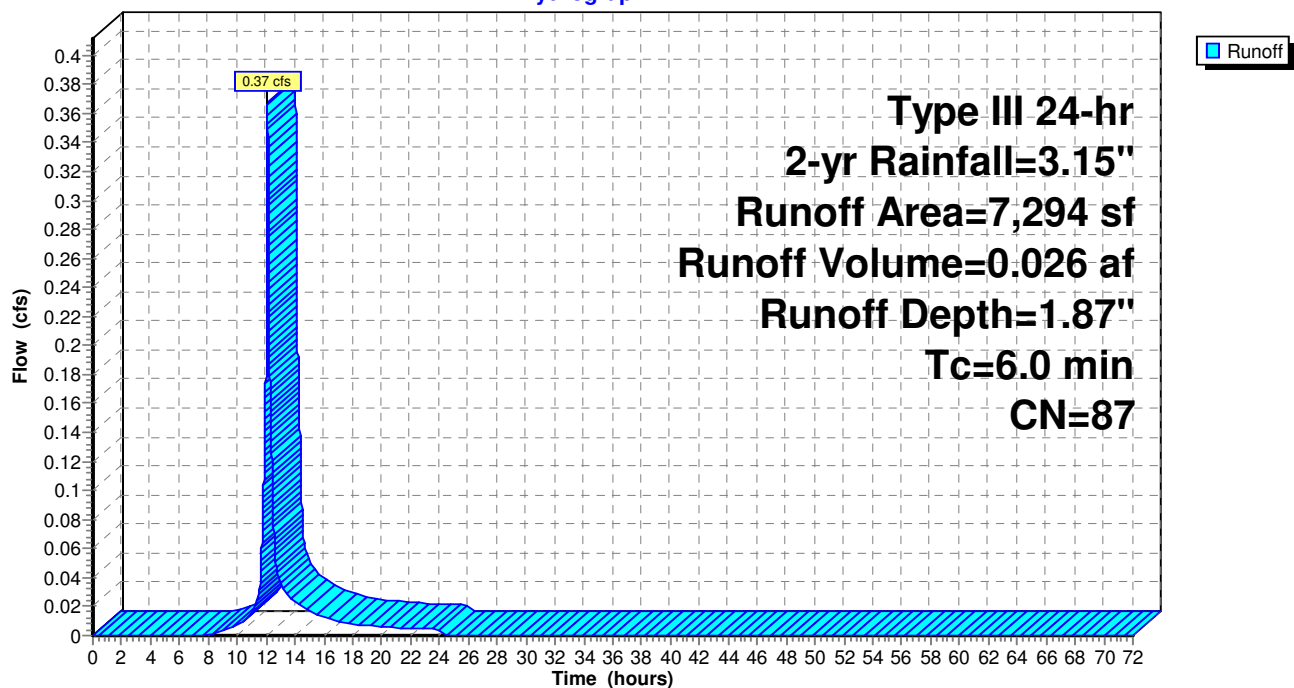
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

	Area (sf)	CN	Description
*	5,047	98	IMPERVIOUS
	2,047	61	>75% Grass cover, Good, HSG B
*	200	71	>75% Grass cover, Good, HSG B/D
	7,294	87	Weighted Average
	2,247		30.81% Pervious Area
	5,047		69.19% Impervious Area

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

**Subcatchment E8: Existing Kennedy Road runoff to CB**

Hydrograph



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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond EP1: (DP1) Existing Rail Road Pond**

Inflow Area = 12.462 ac, 7.83% Impervious, Inflow Depth = 0.76" for 2-yr event  
 Inflow = 2.94 cfs @ 13.14 hrs, Volume= 0.793 af  
 Outflow = 2.92 cfs @ 13.20 hrs, Volume= 0.793 af, Atten= 0%, Lag= 3.4 min  
 Primary = 2.92 cfs @ 13.20 hrs, Volume= 0.793 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.74' @ 13.20 hrs Surf.Area= 953 sf Storage= 551 cf

Plug-Flow detention time= 3.0 min calculated for 0.793 af (100% of inflow)

Center-of-Mass det. time= 3.0 min ( 947.4 - 944.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	79.70'	107,037 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

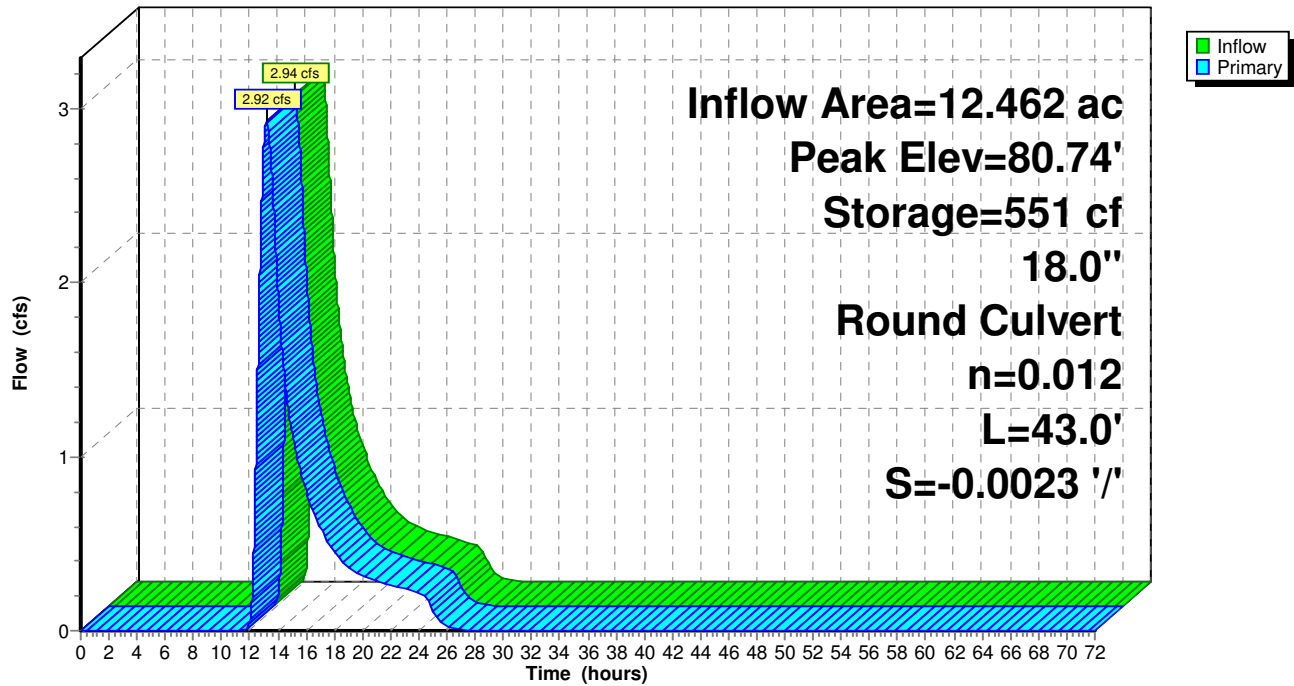
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.70	10	0	0
80.00	382	59	59
81.00	1,156	769	828
82.00	2,173	1,665	2,492
83.00	29,086	15,630	18,122
84.00	148,744	88,915	107,037

Device	Routing	Invert	Outlet Devices
#1	Primary	79.70'	<b>18.0" Round Culvert</b> L= 43.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 79.60' / 79.70' S= -0.0023 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

**Primary OutFlow** Max=2.92 cfs @ 13.20 hrs HW=80.74' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.92 cfs @ 2.82 fps)

# Pond EP1: (DP1) Existing Rail Road Pond

Hydrograph



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Existing Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond EP2: (DP3) Existing Depression Adjacent to Sullivan Ave**

Inflow Area = 7.374 ac, 0.59% Impervious, Inflow Depth = 0.46" for 2-yr event  
 Inflow = 1.04 cfs @ 13.10 hrs, Volume= 0.283 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 82.75' @ 27.66 hrs Surf.Area= 32,896 sf Storage= 12,306 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	82.00'	144,179 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.00	81	0	0
83.00	44,050	22,066	22,066
84.00	200,176	122,113	144,179

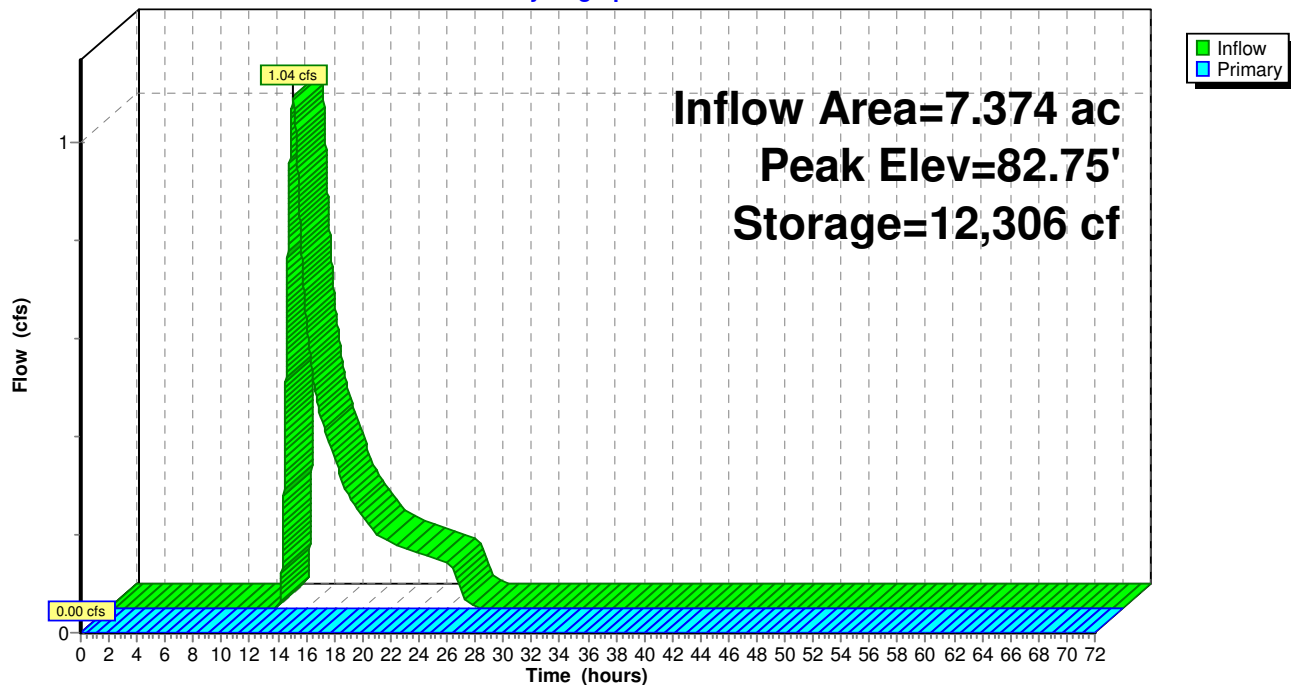
Device	Routing	Invert	Outlet Devices
#1	Primary	82.88'	<b>6.0' long x 3.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=82.00' (Free Discharge)

↑1=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond EP2: (DP3) Existing Depression Adjacent to Sullivan Ave**

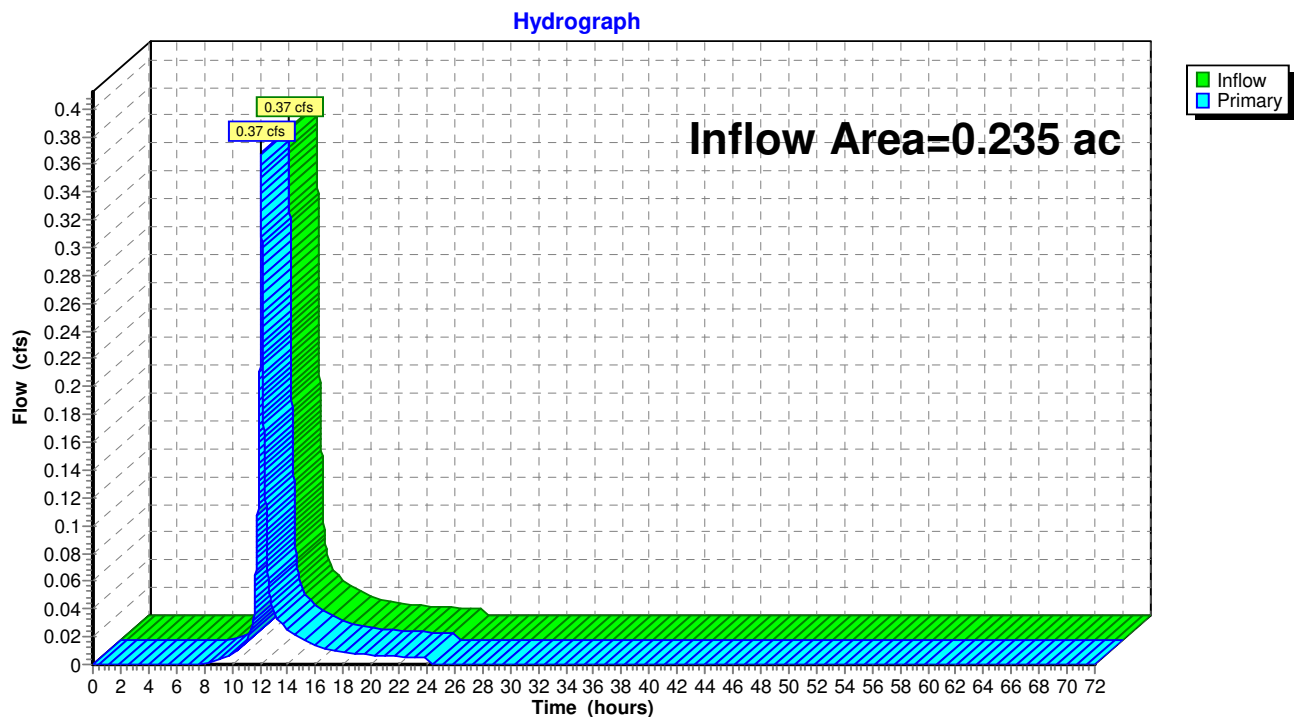
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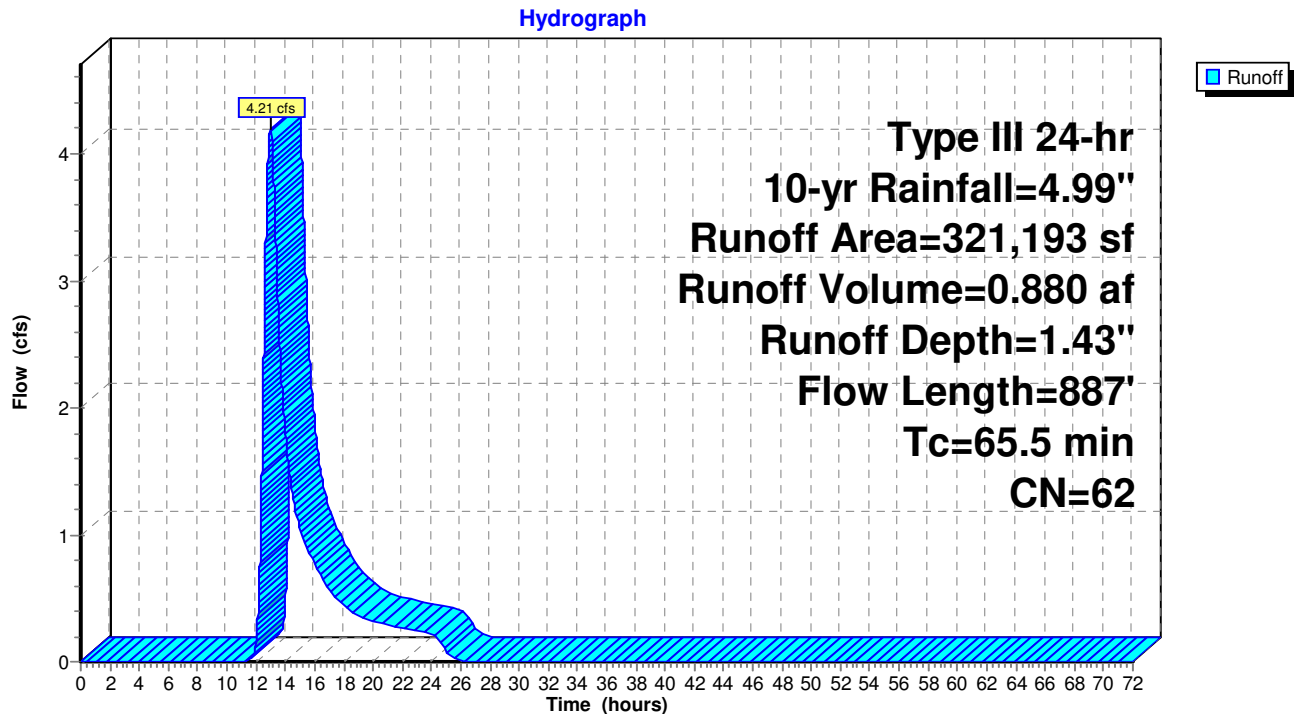
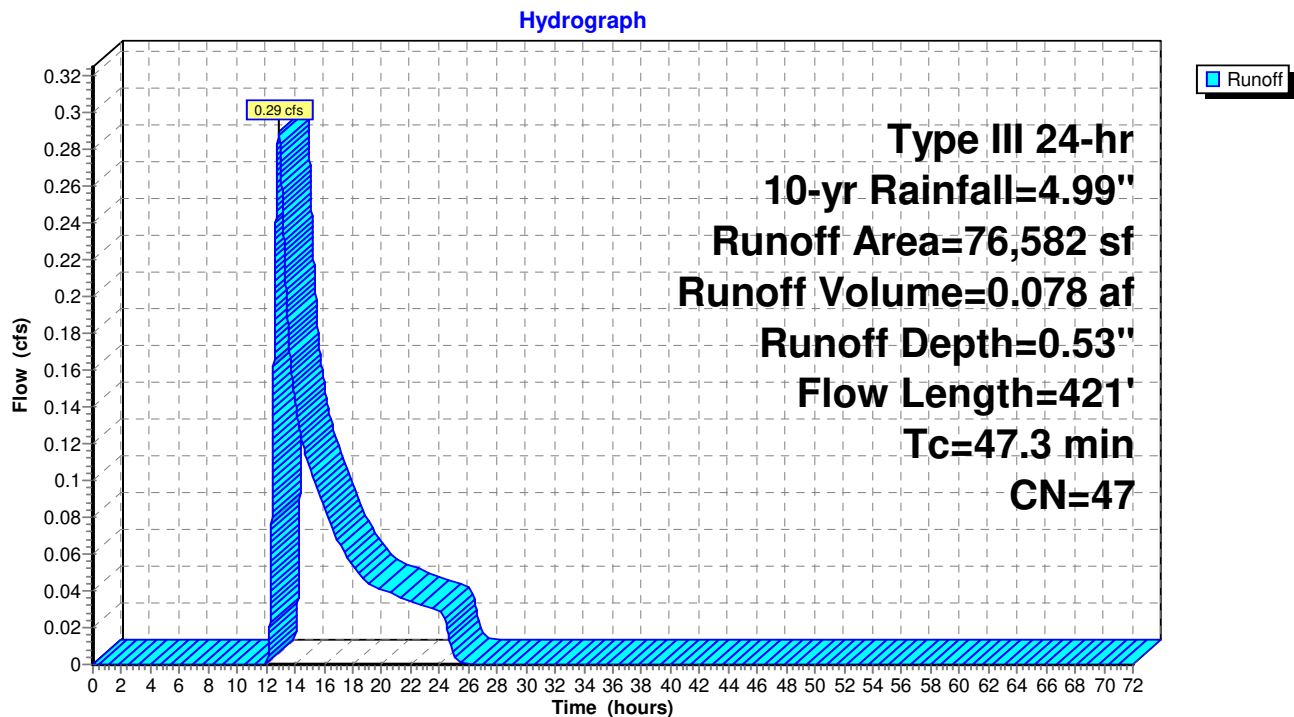


**Summary for Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System**

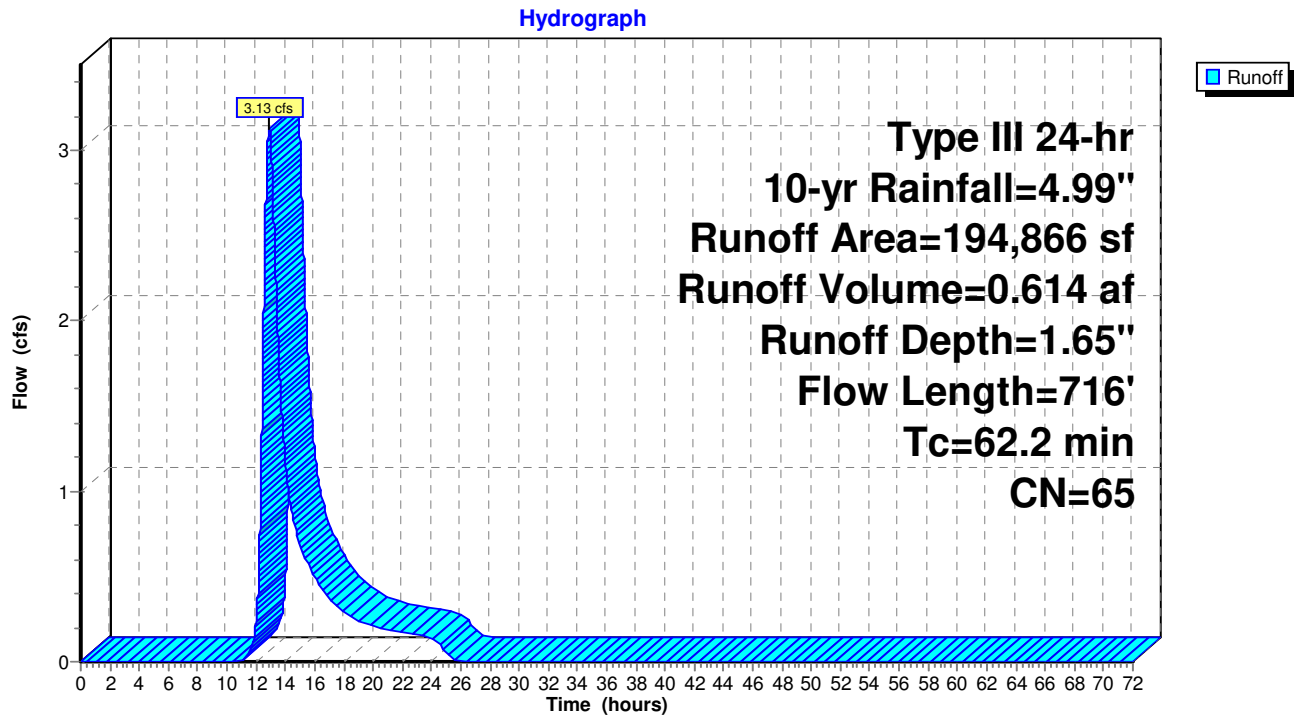
Inflow Area = 0.235 ac, 49.33% Impervious, Inflow Depth = 1.40" for 2-yr event  
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.027 af  
Primary = 0.37 cfs @ 12.09 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

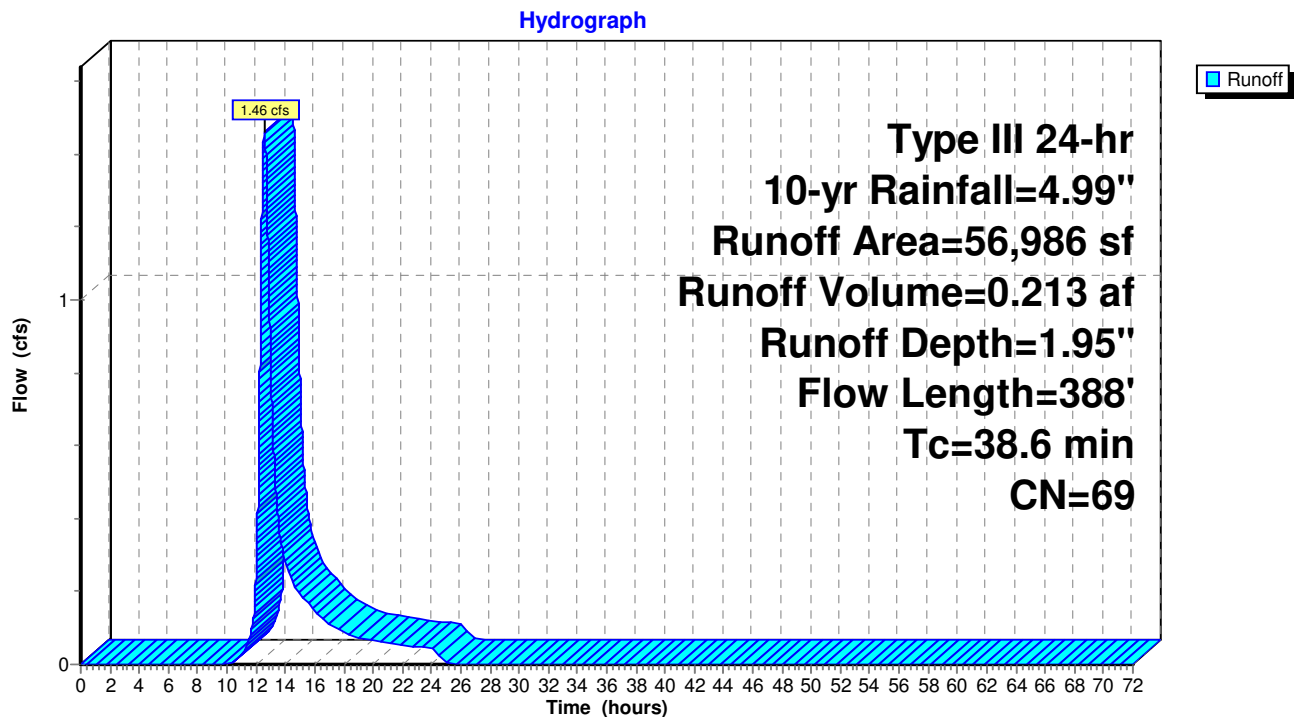
**Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System**

**Subcatchment E1: Existing Flow to Sullivan Ave****Subcatchment E2: (DP2) Existing Flow across North West Property Corner**

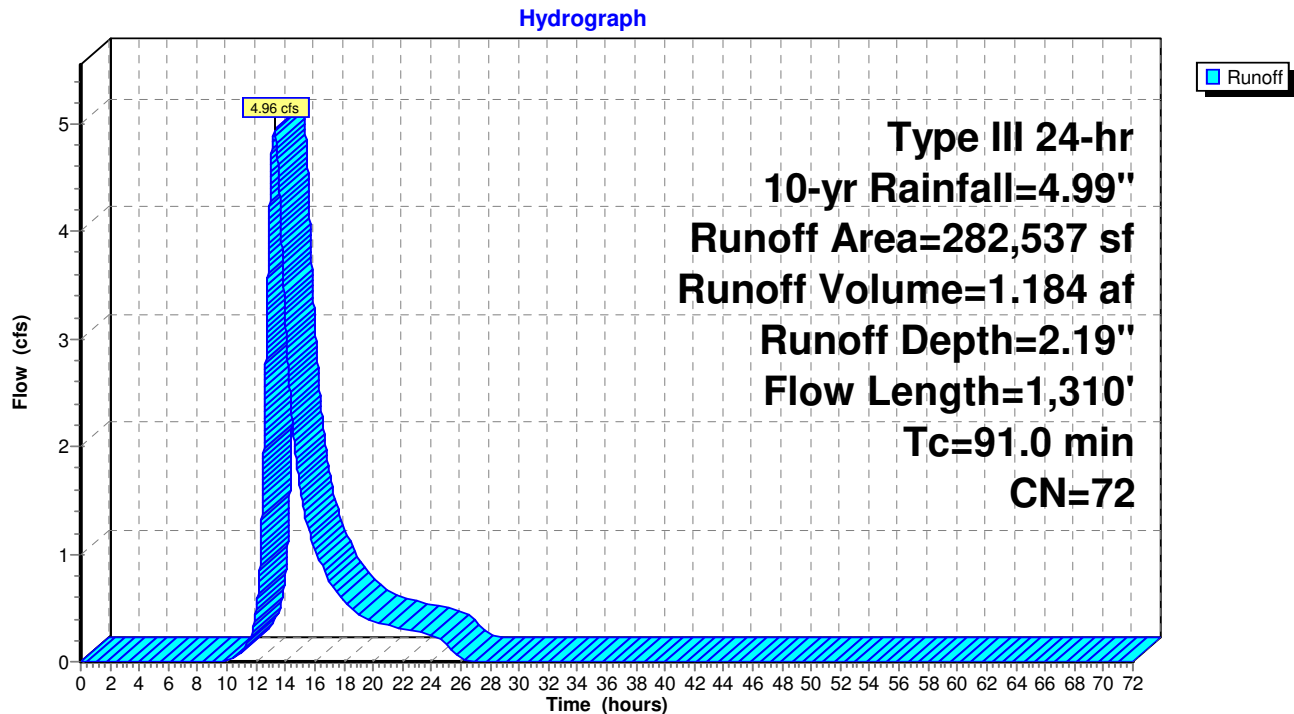
## Subcatchment E3: Existing E3



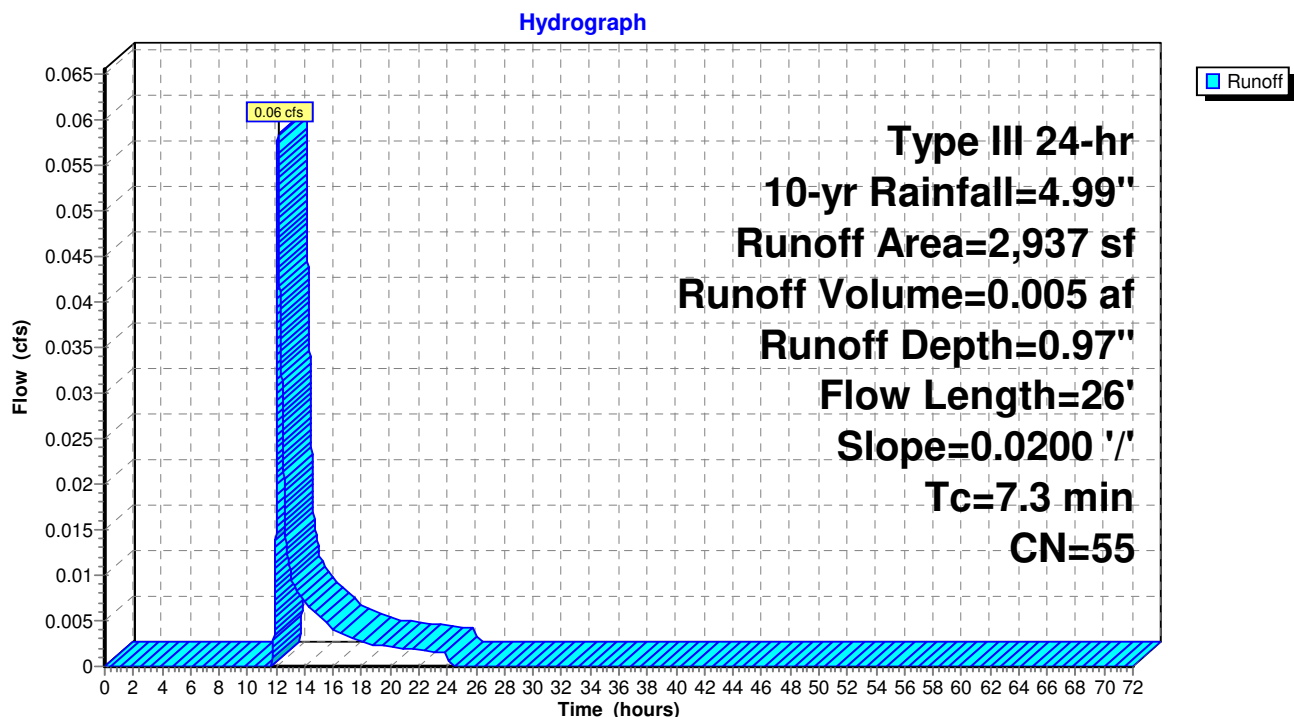
## Subcatchment E4: Existing E4



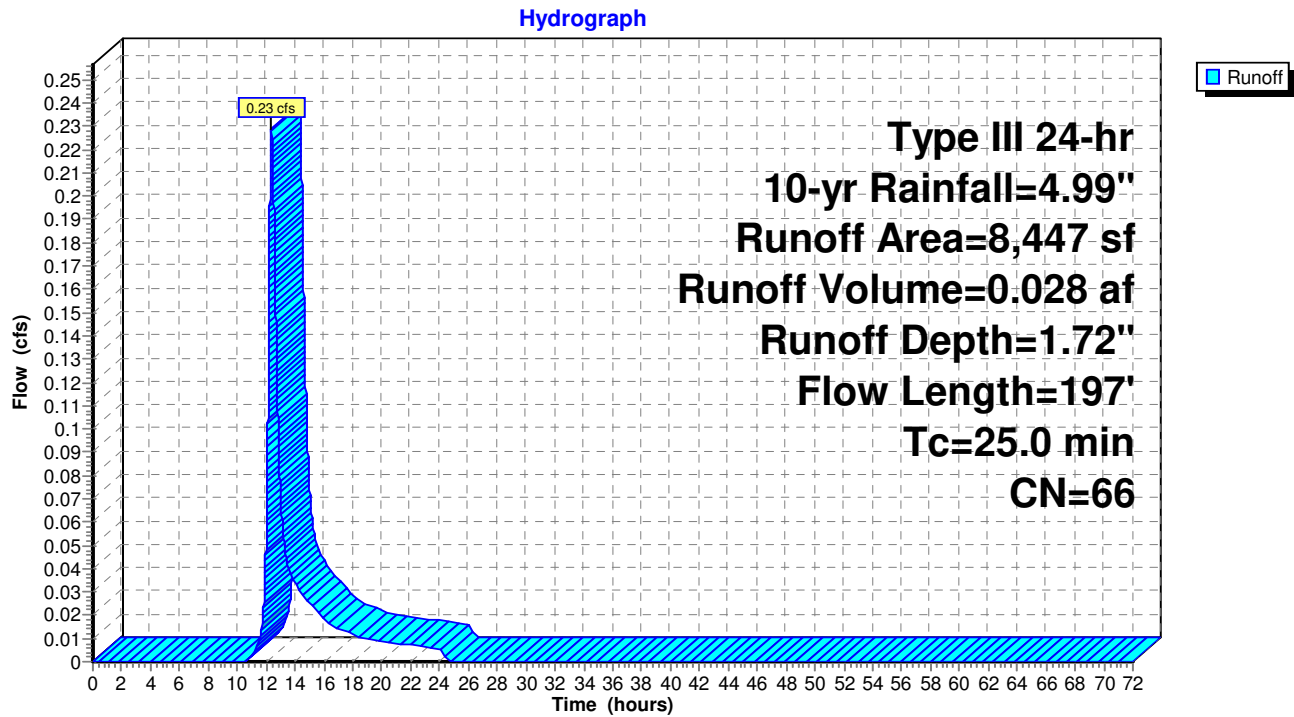
### Subcatchment E5: Existing E5



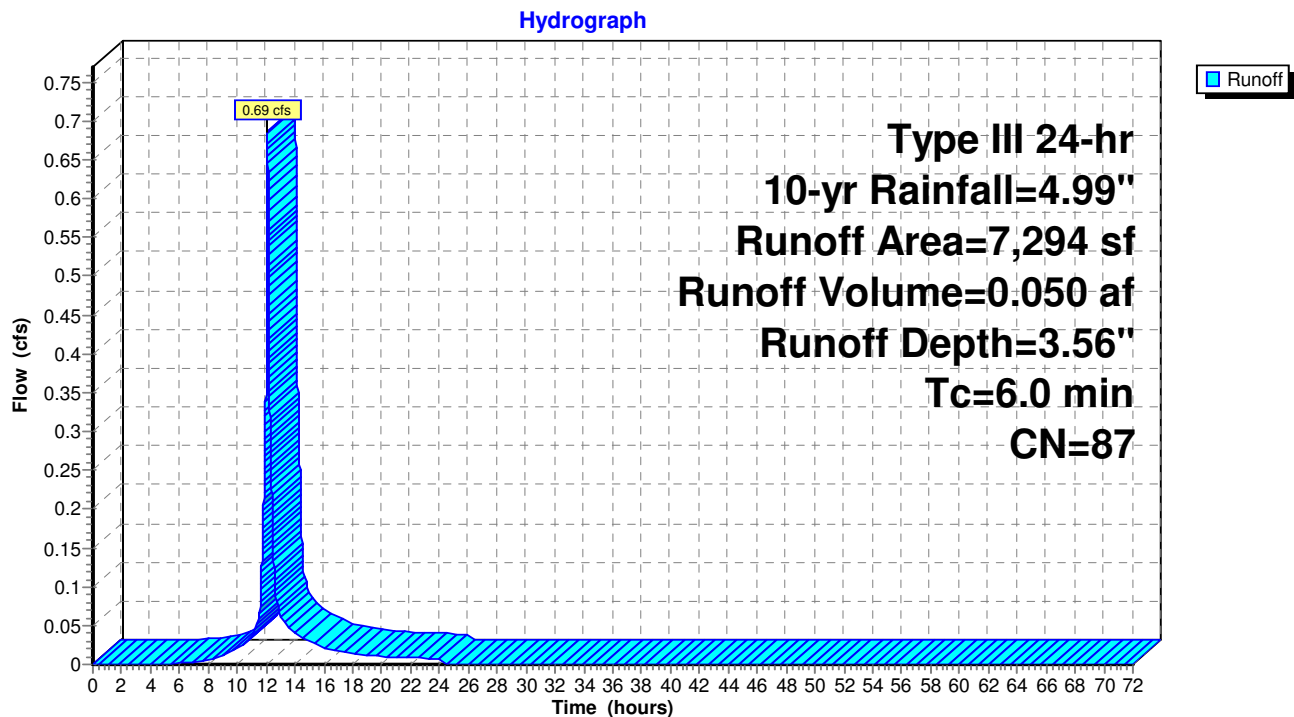
### Subcatchment E6: Existing Sheet flow to Kennedy Road



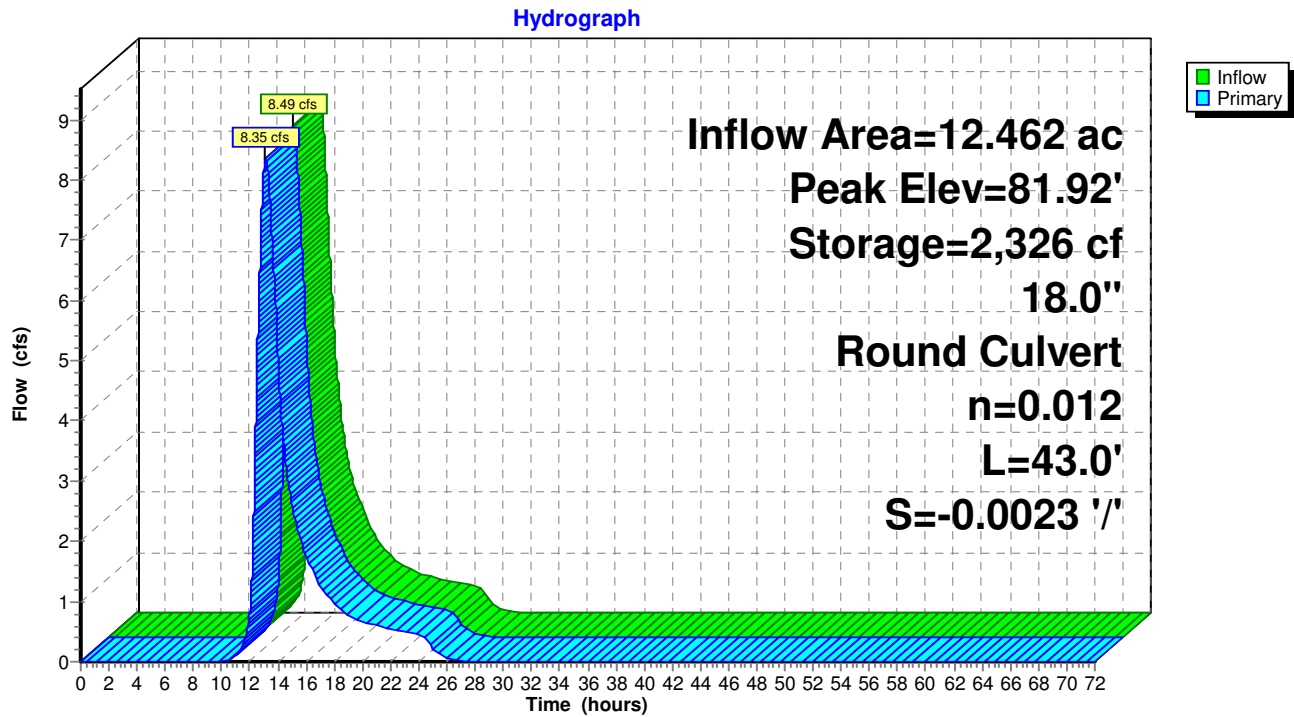
## Subcatchment E7: Existing E7



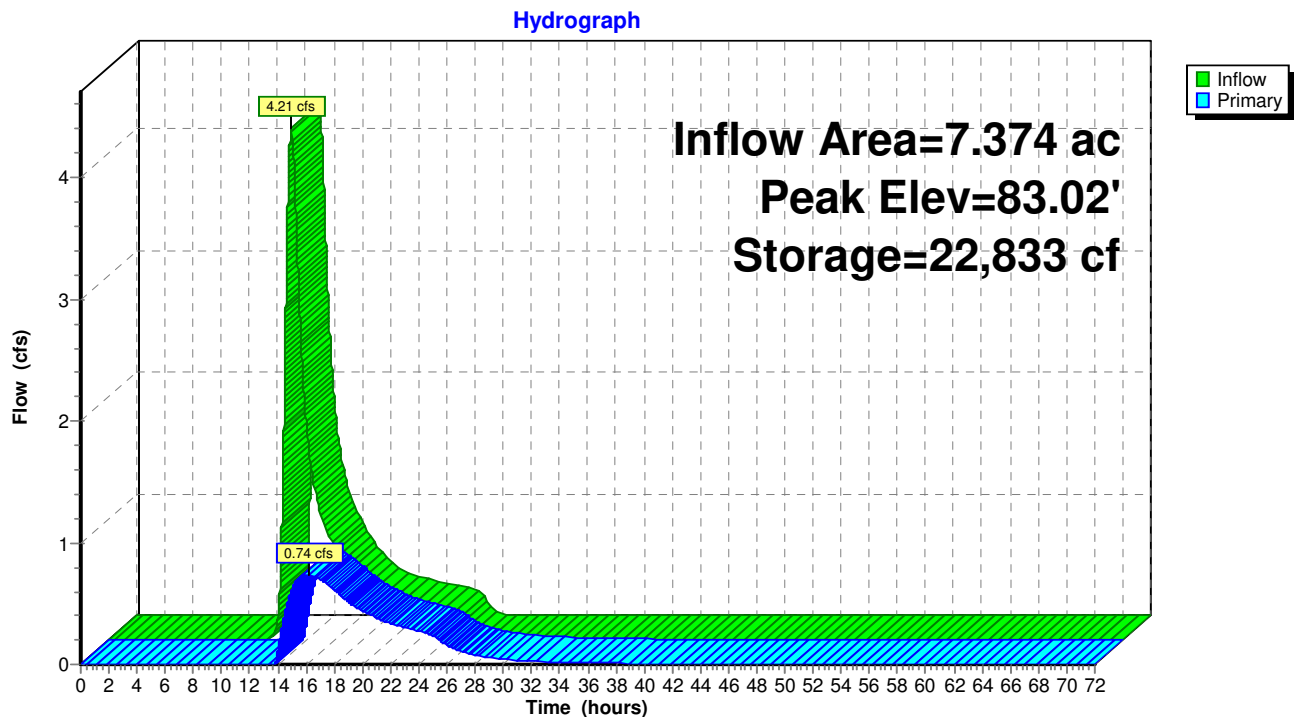
## Subcatchment E8: Existing Kennedy Road runoff to CB

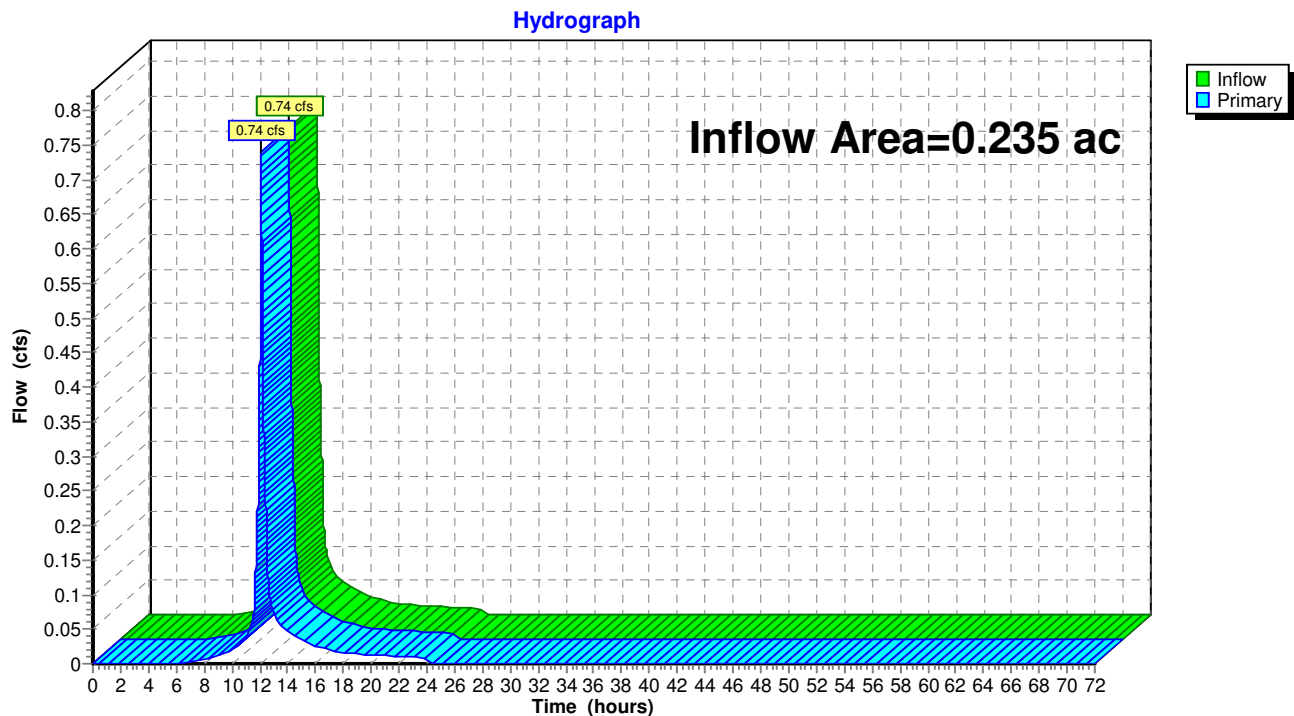


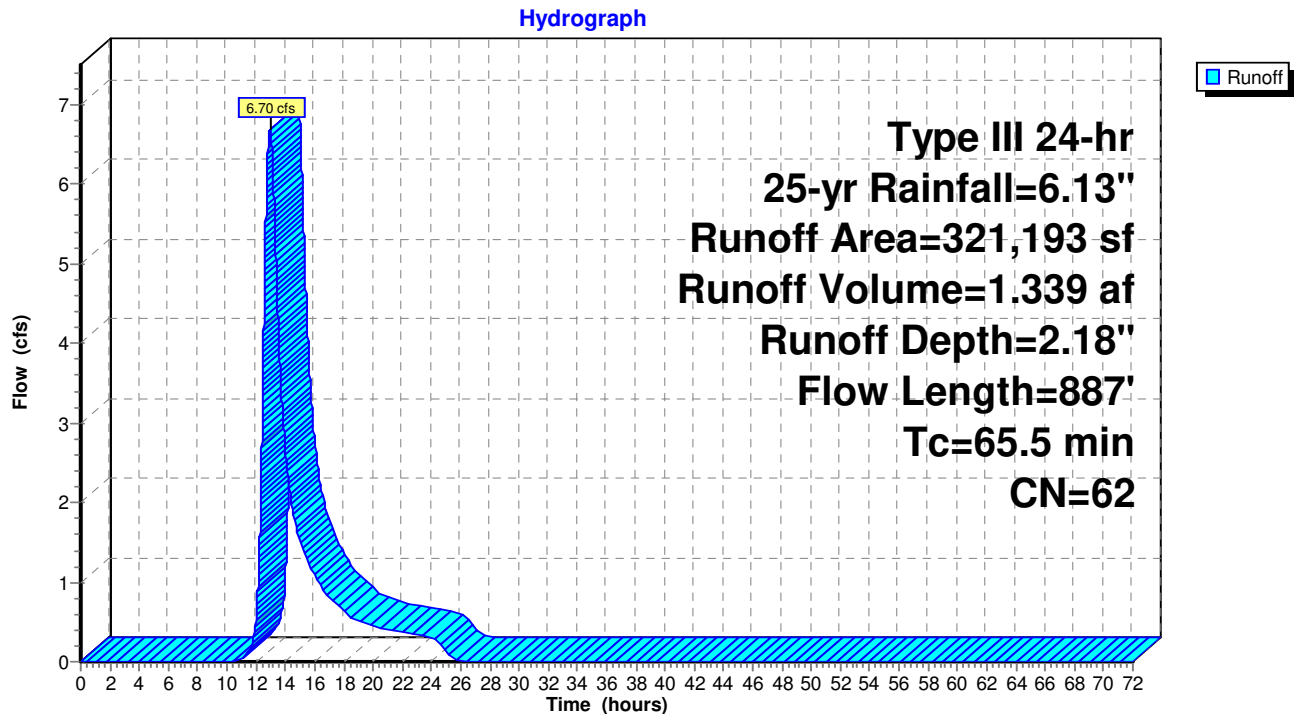
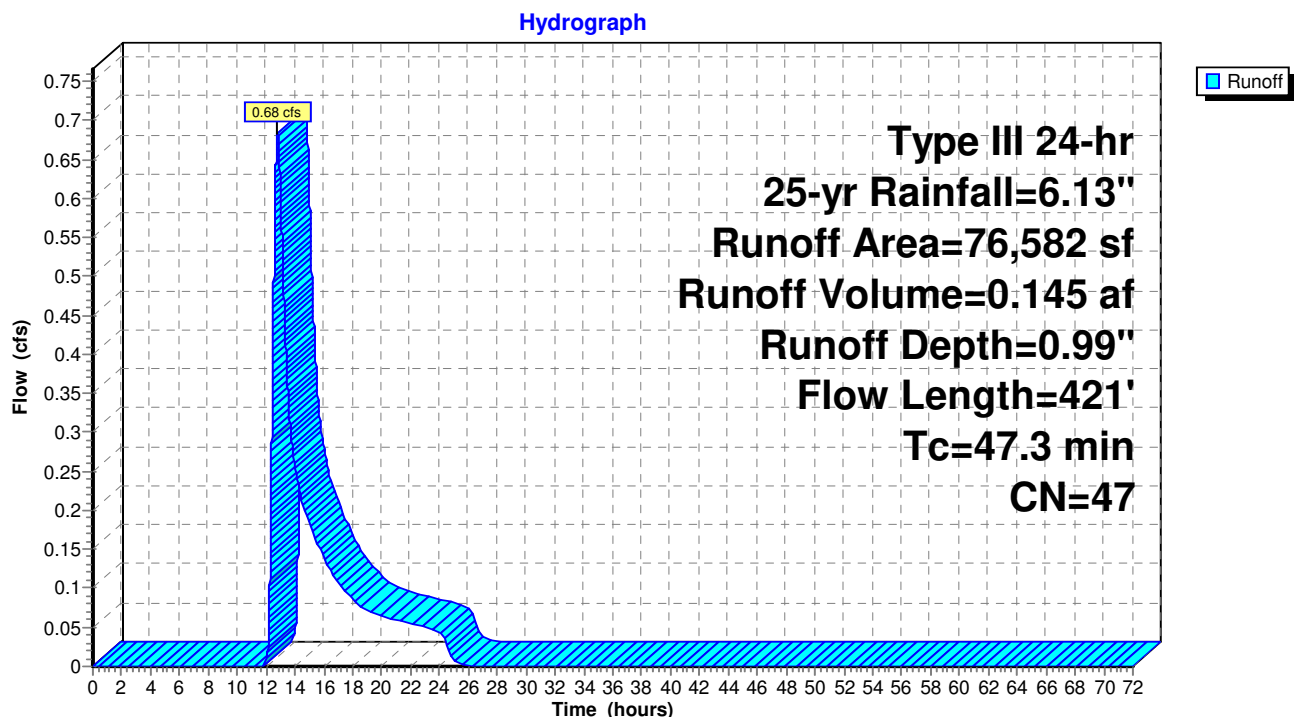
### Pond EP1: (DP1) Existing Rail Road Pond



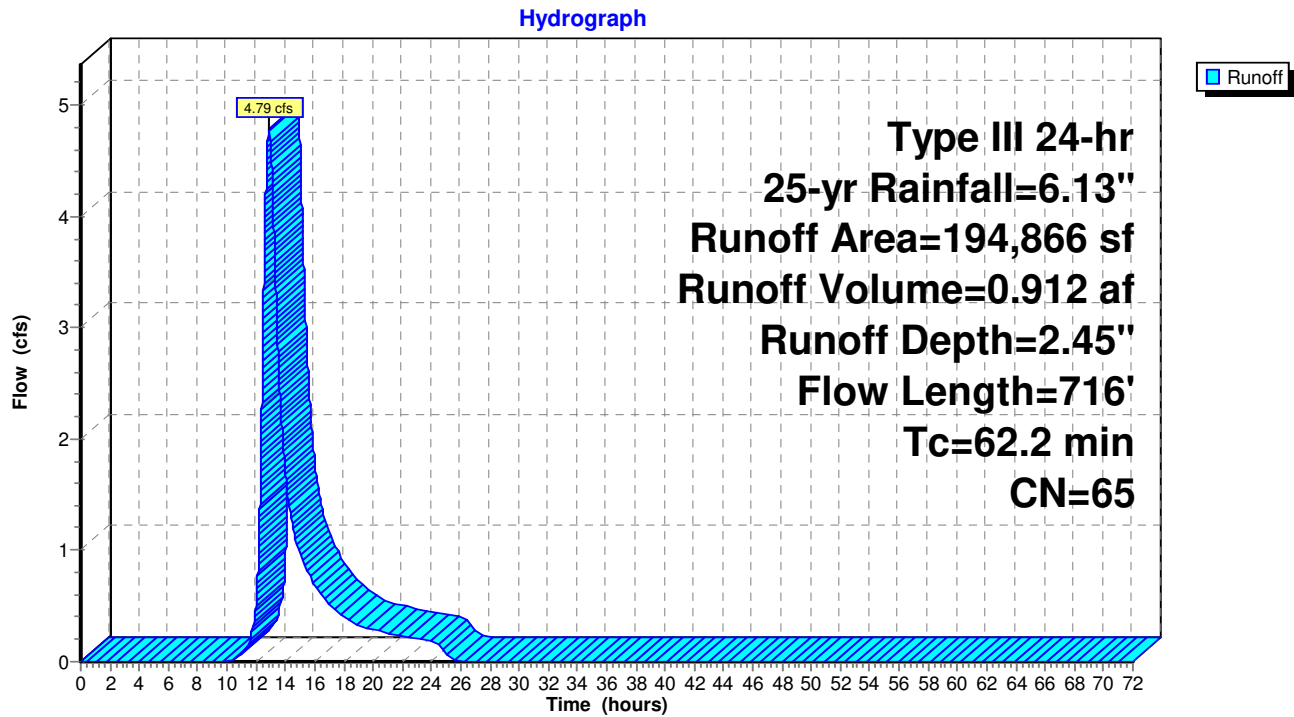
### Pond EP2: (DP3) Existing Depression Adjacent to Sullivan Ave



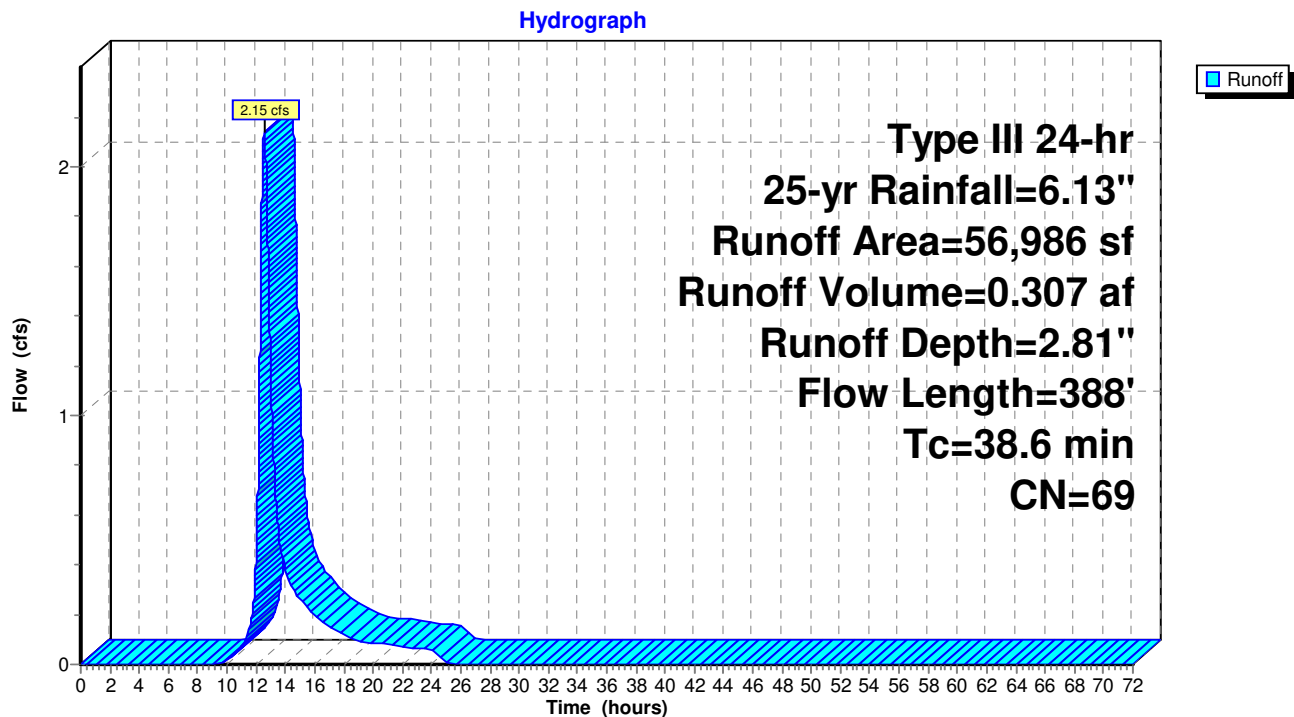
**Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System**

**Subcatchment E1: Existing Flow to Sullivan Ave****Subcatchment E2: (DP2) Existing Flow across North West Property Corner**

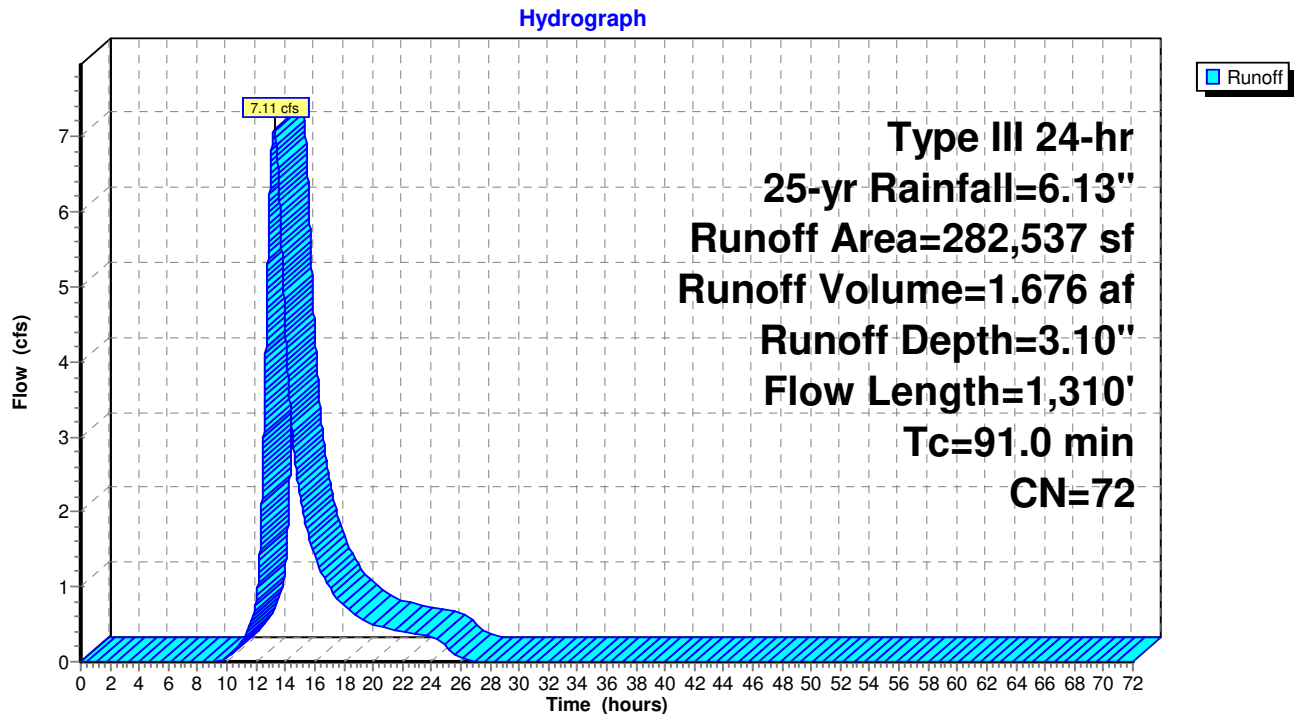
### Subcatchment E3: Existing E3



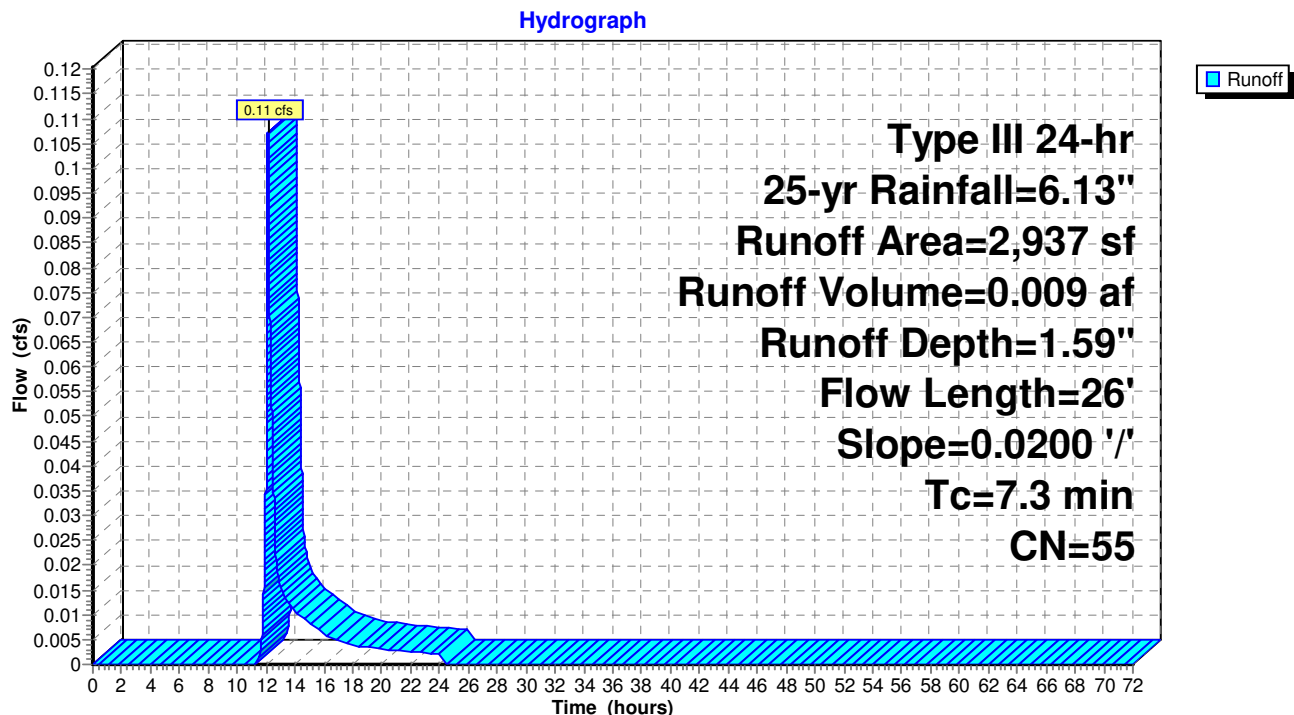
### Subcatchment E4: Existing E4



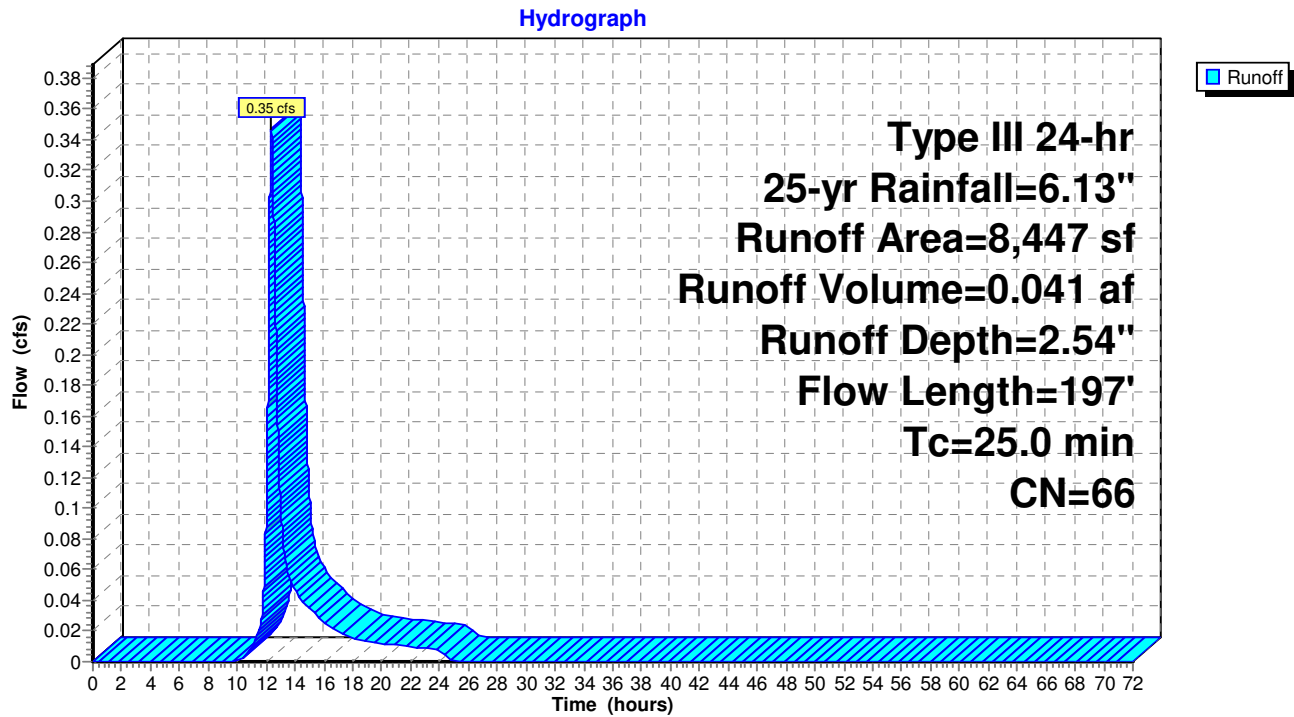
## Subcatchment E5: Existing E5



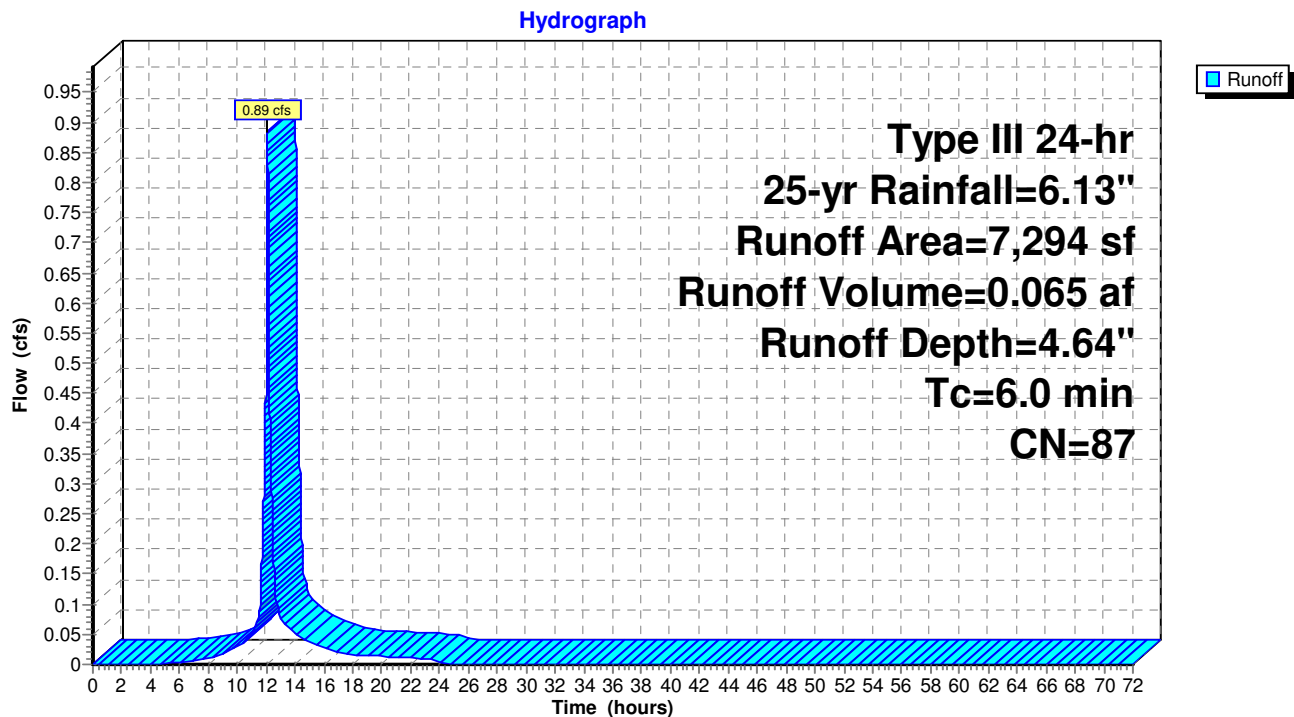
## Subcatchment E6: Existing Sheet flow to Kennedy Road



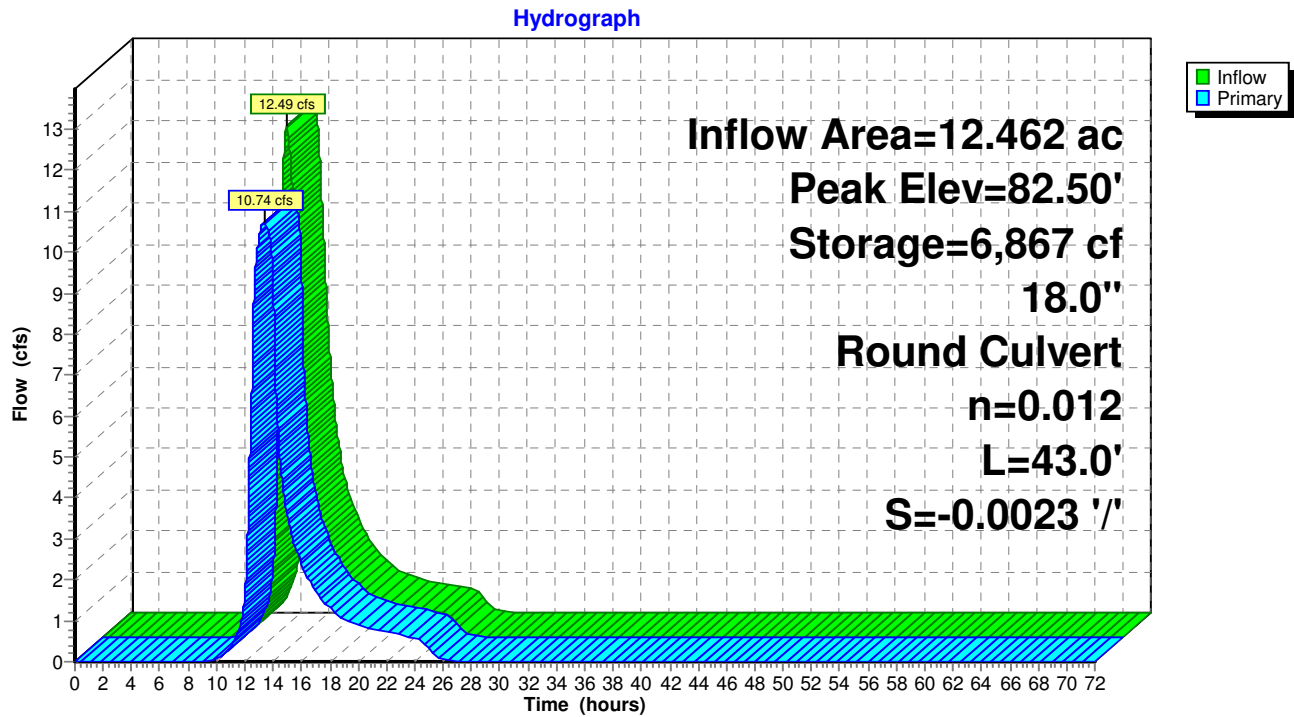
### Subcatchment E7: Existing E7



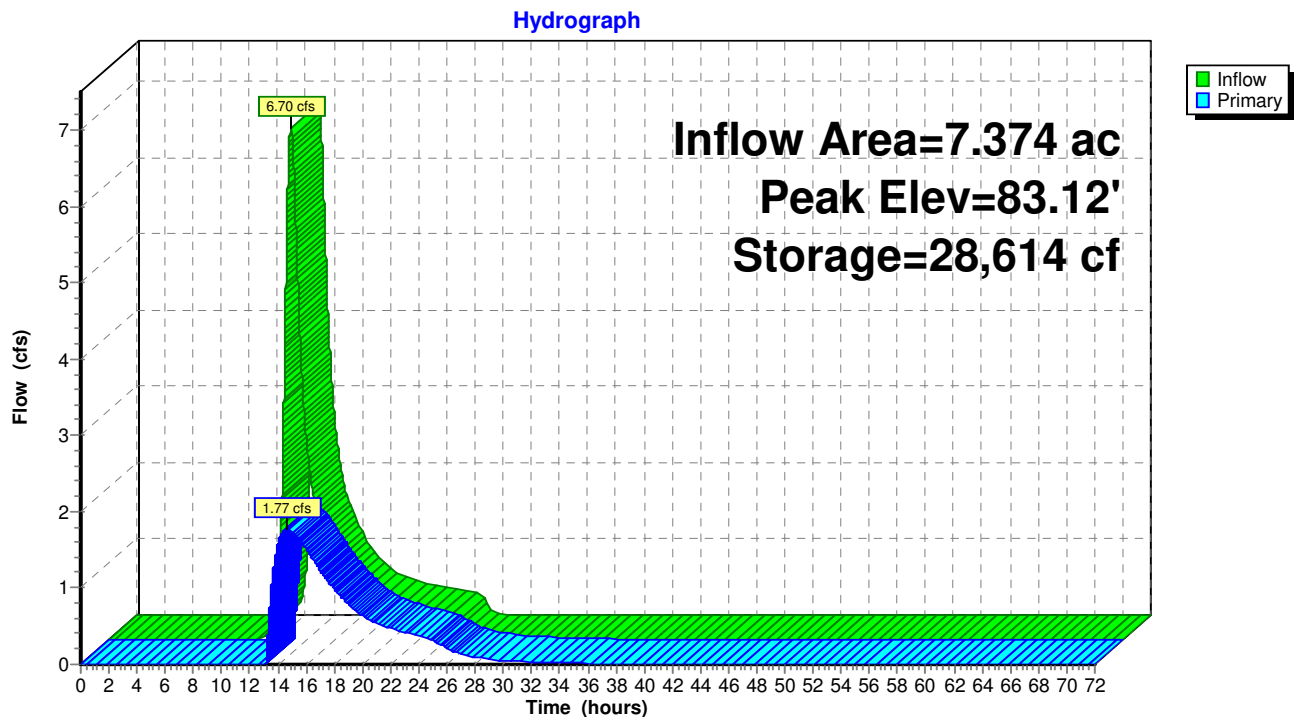
### Subcatchment E8: Existing Kennedy Road runoff to CB

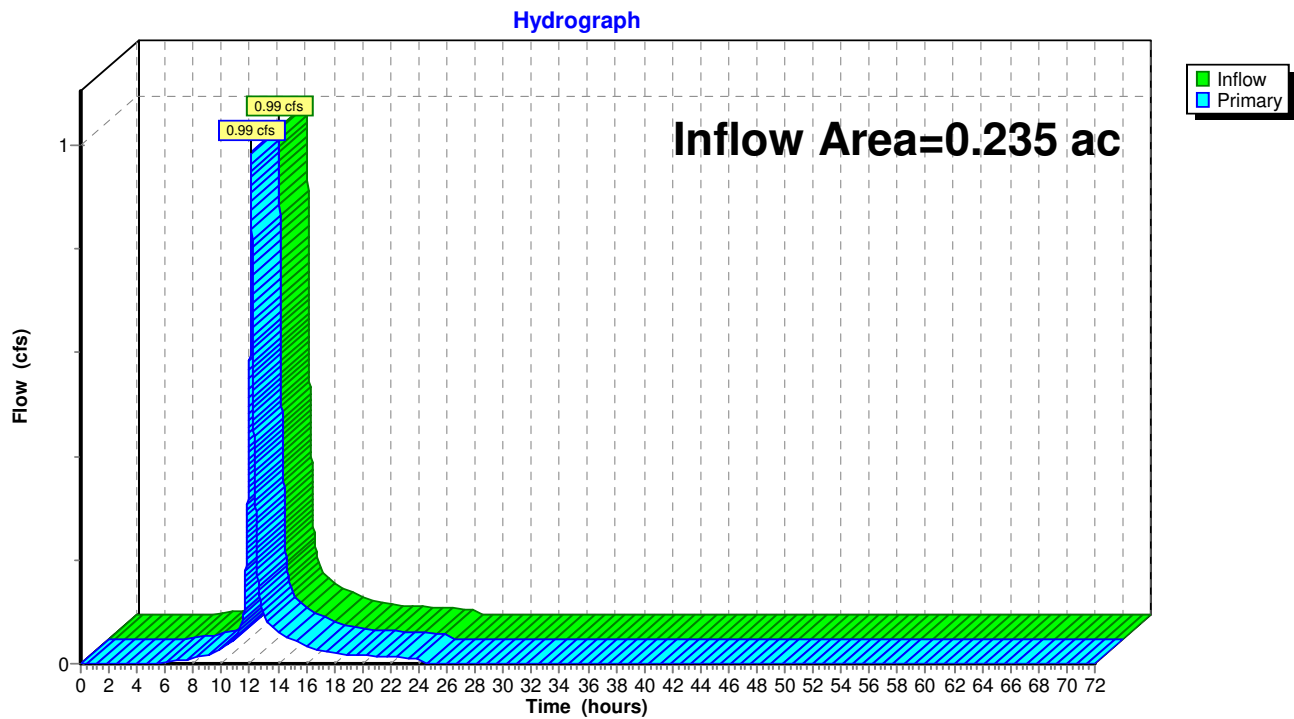


### Pond EP1: (DP1) Existing Rail Road Pond



### Pond EP2: (DP3) Existing Depression Adjacent to Sullivan Ave



**Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System**

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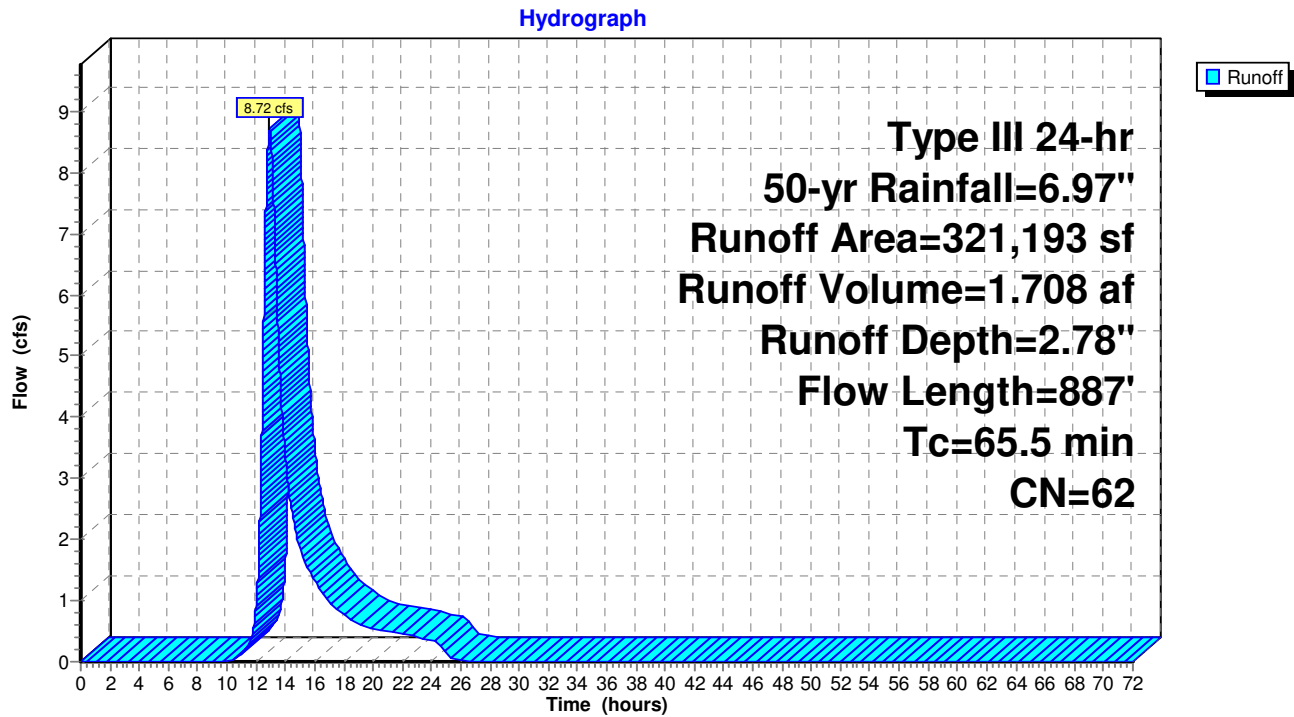
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Existing Condition  
Type III 24-hr 50-yr Rainfall=6.97"

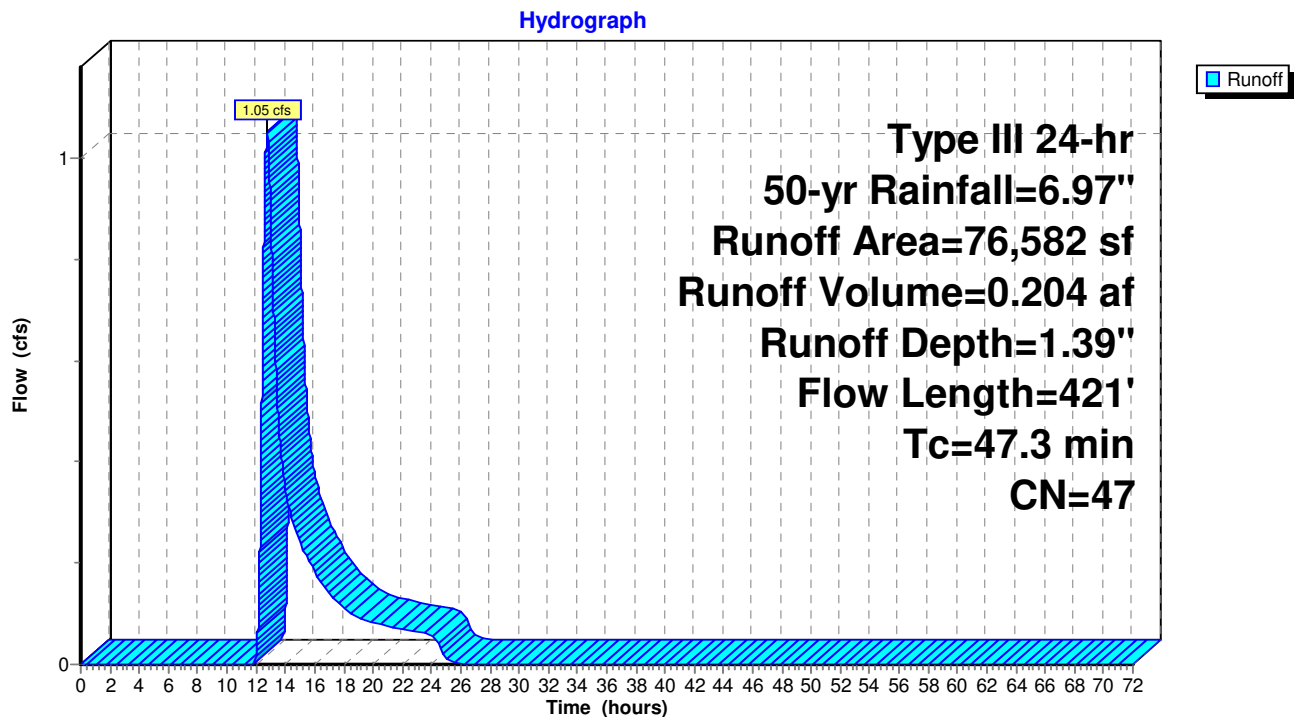
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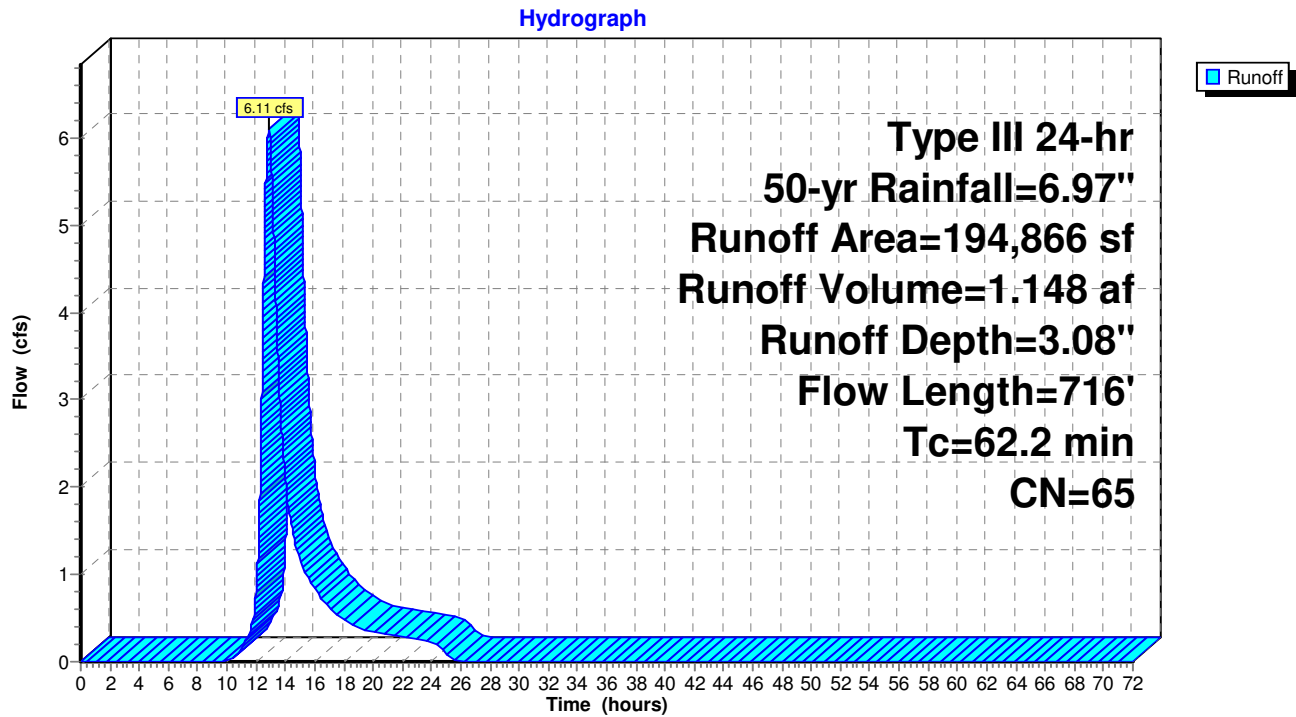
### Subcatchment E1: Existing Flow to Sullivan Ave



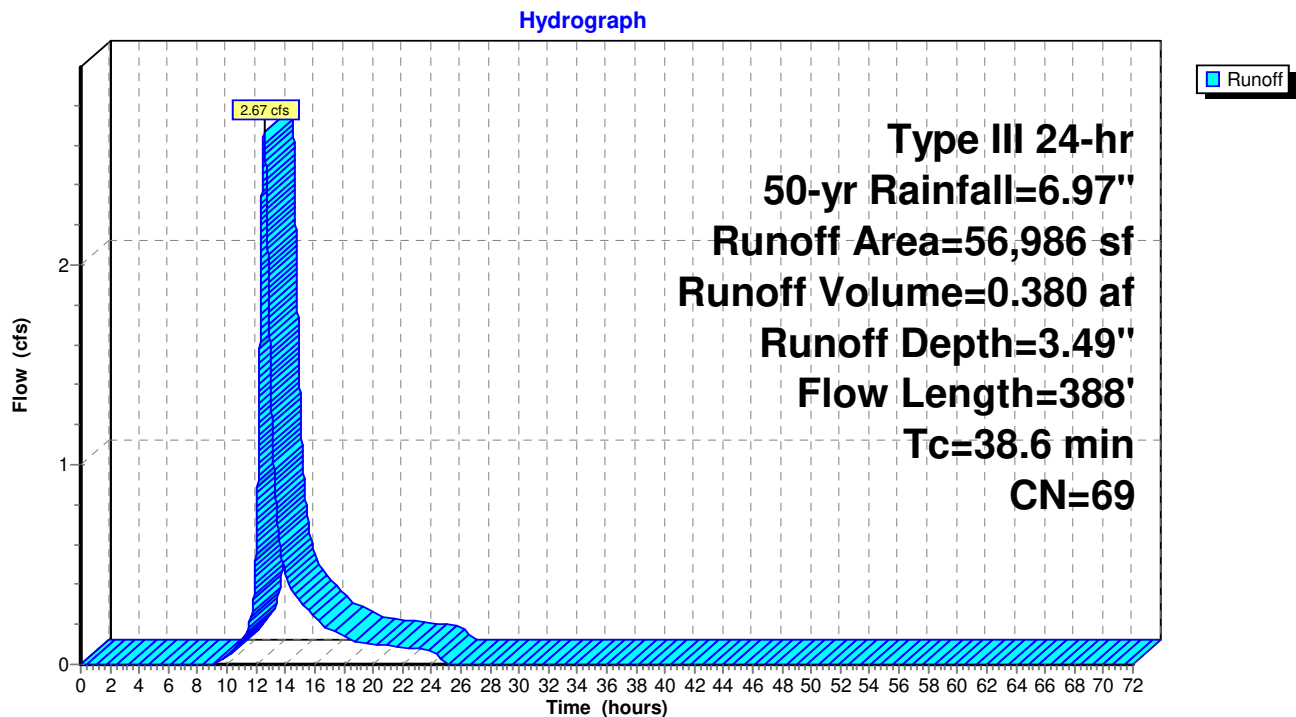
### Subcatchment E2: (DP2) Existing Flow across North West Property Corner



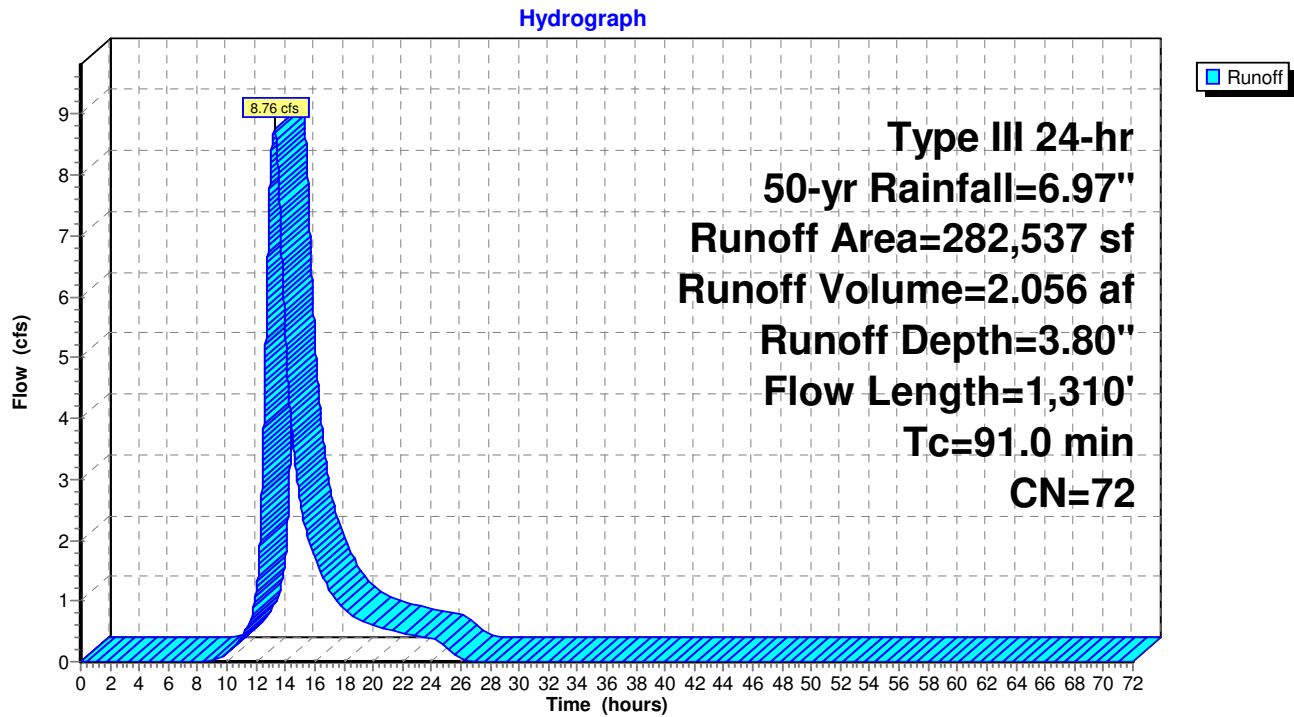
### Subcatchment E3: Existing E3



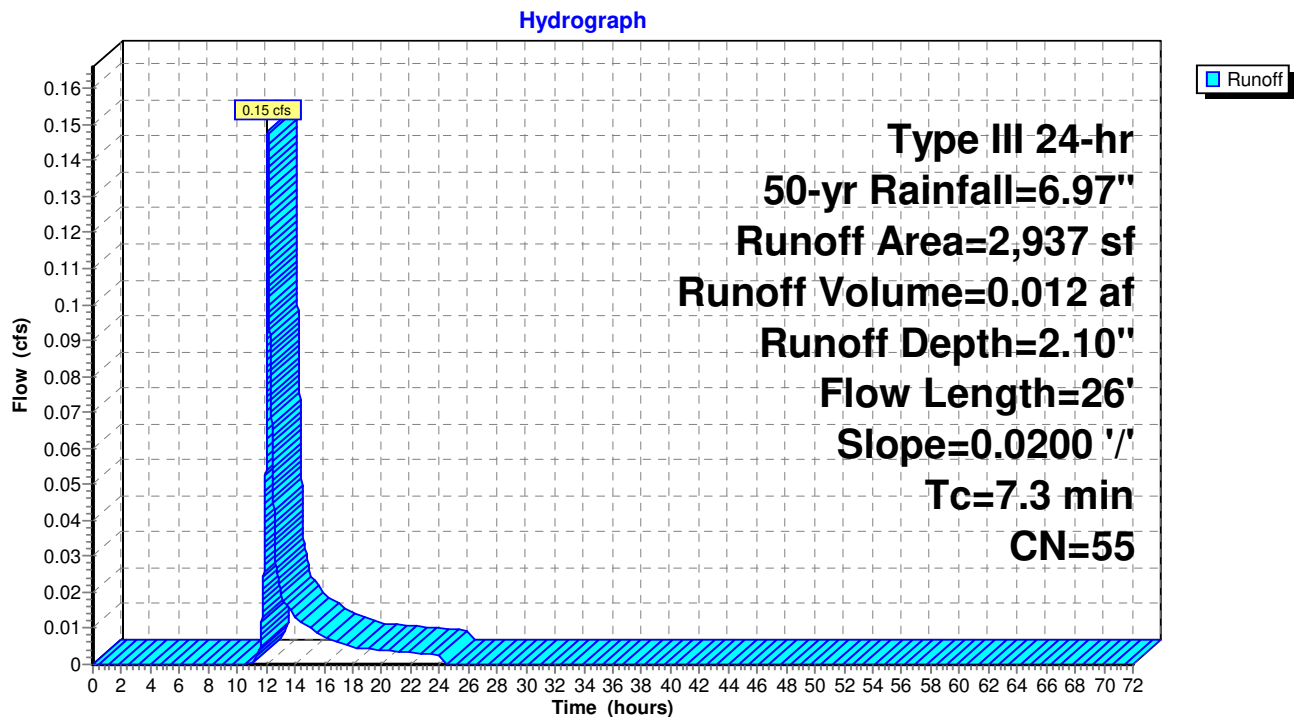
### Subcatchment E4: Existing E4



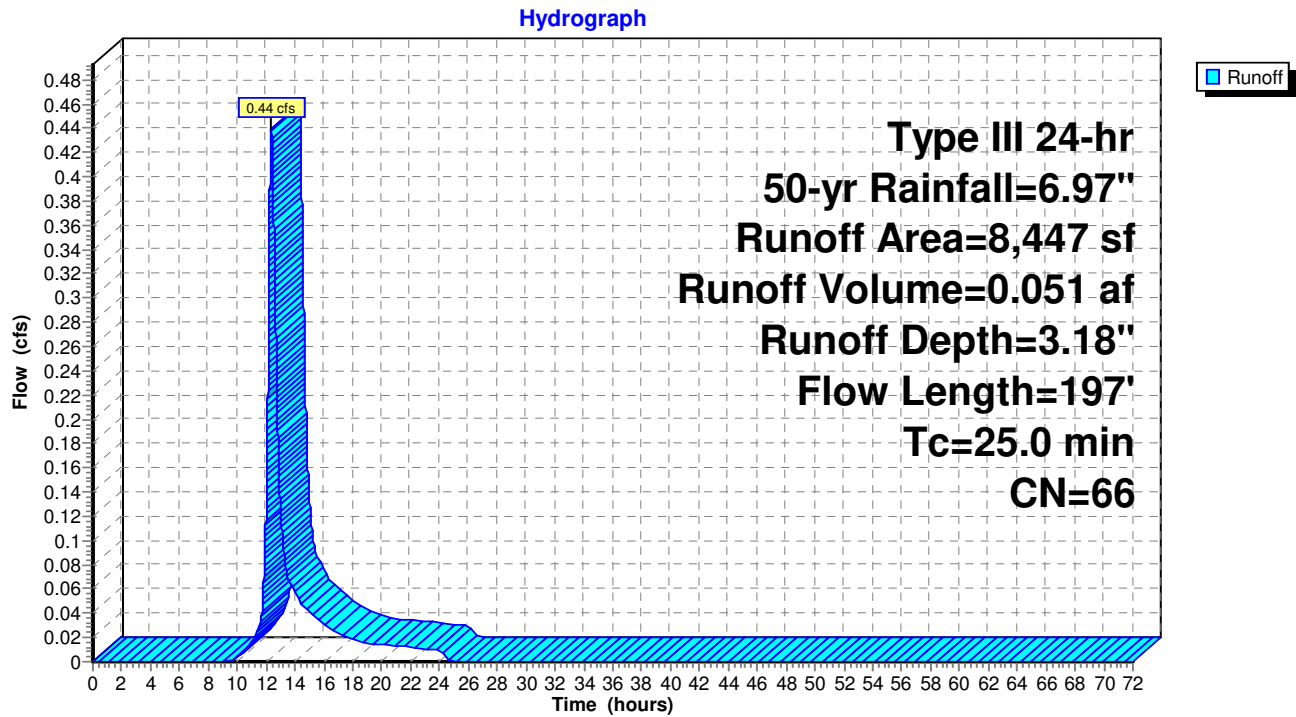
### Subcatchment E5: Existing E5



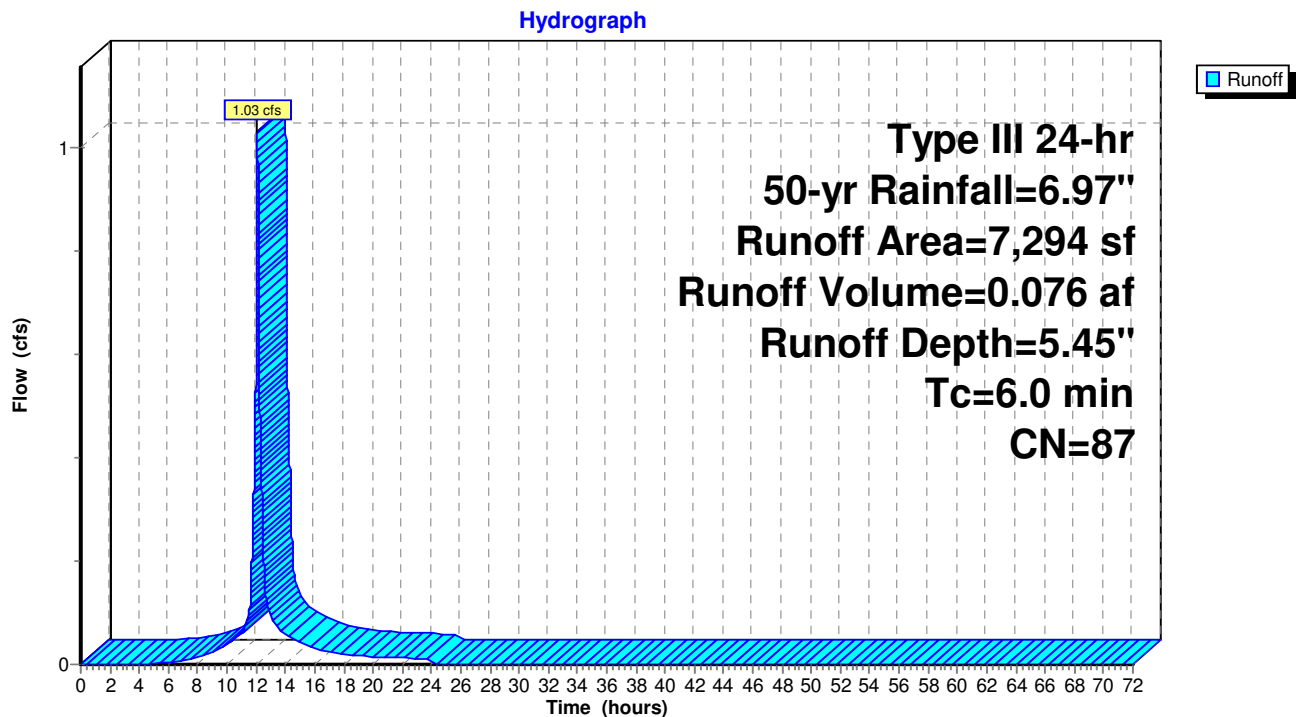
### Subcatchment E6: Existing Sheet flow to Kennedy Road



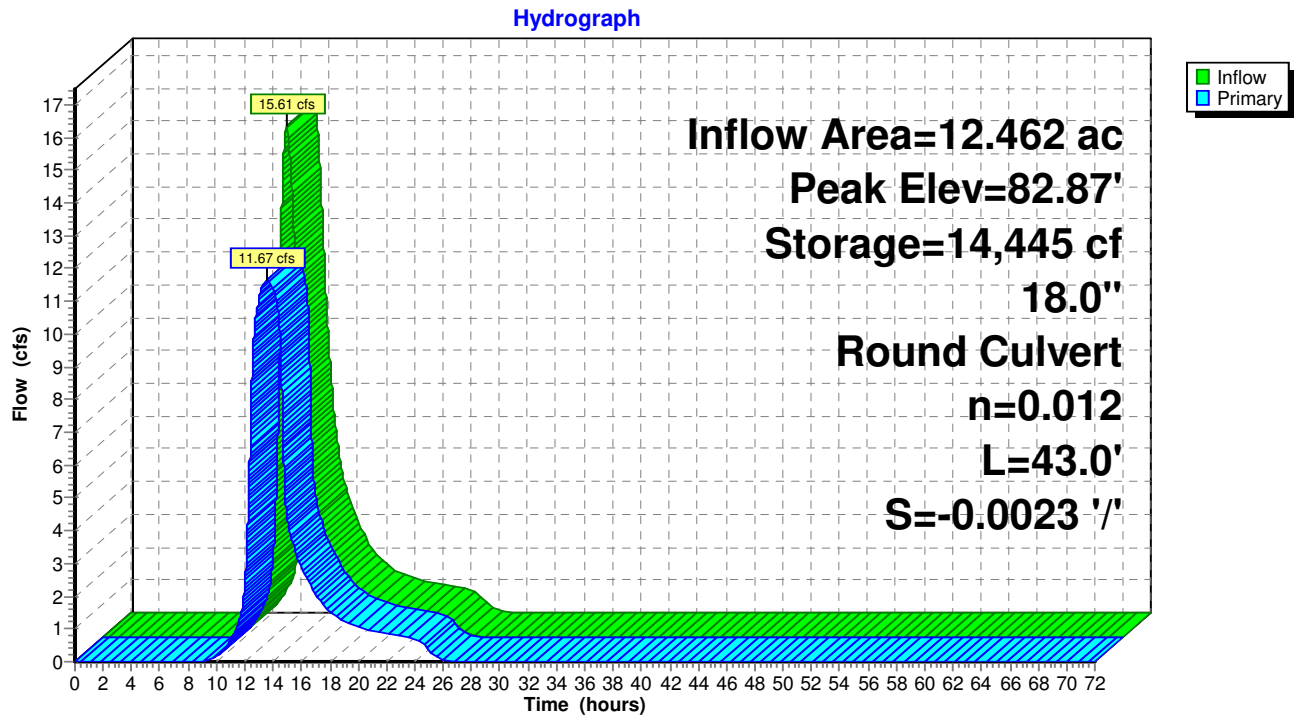
### Subcatchment E7: Existing E7



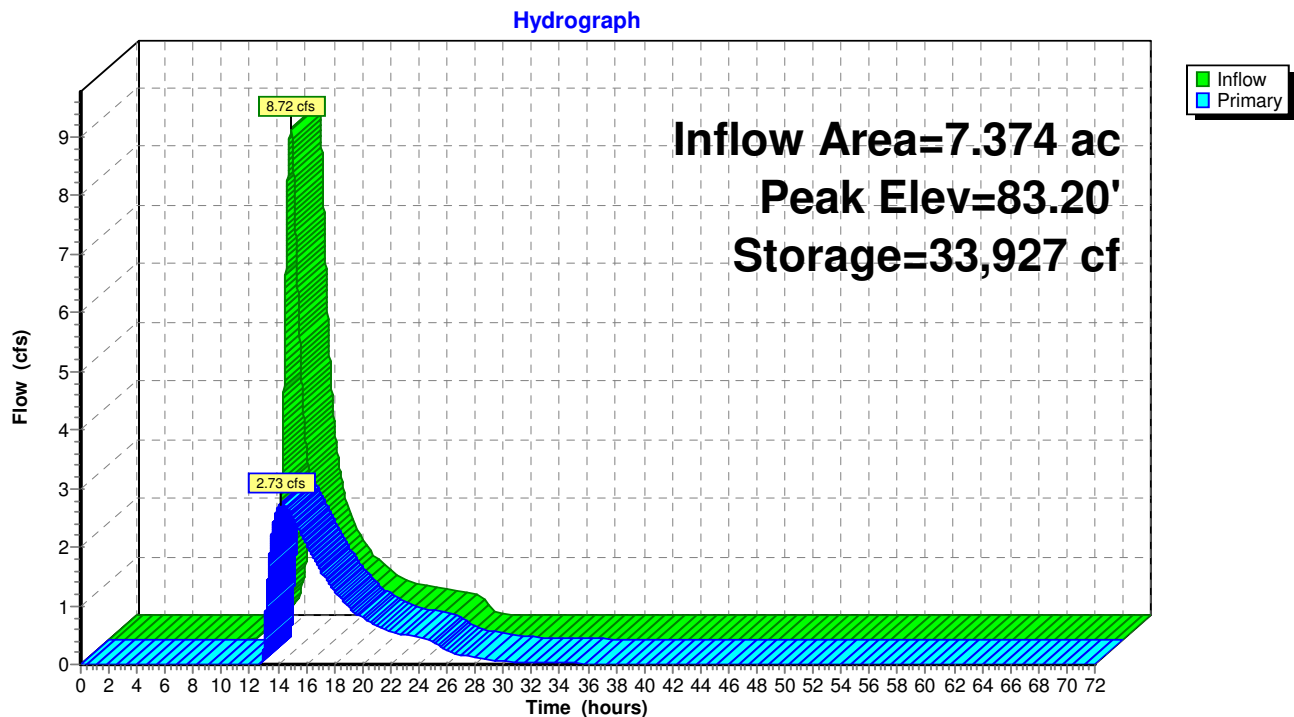
### Subcatchment E8: Existing Kennedy Road runoff to CB



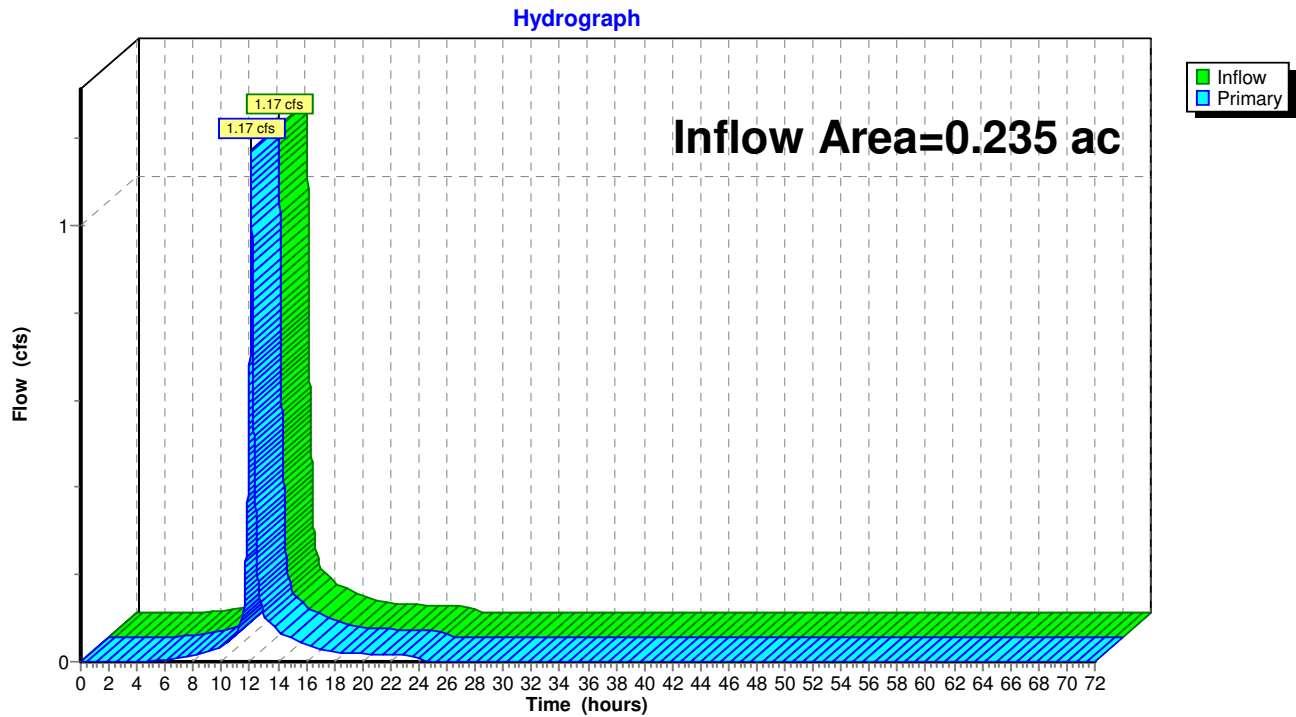
### Pond EP1: (DP1) Existing Rail Road Pond

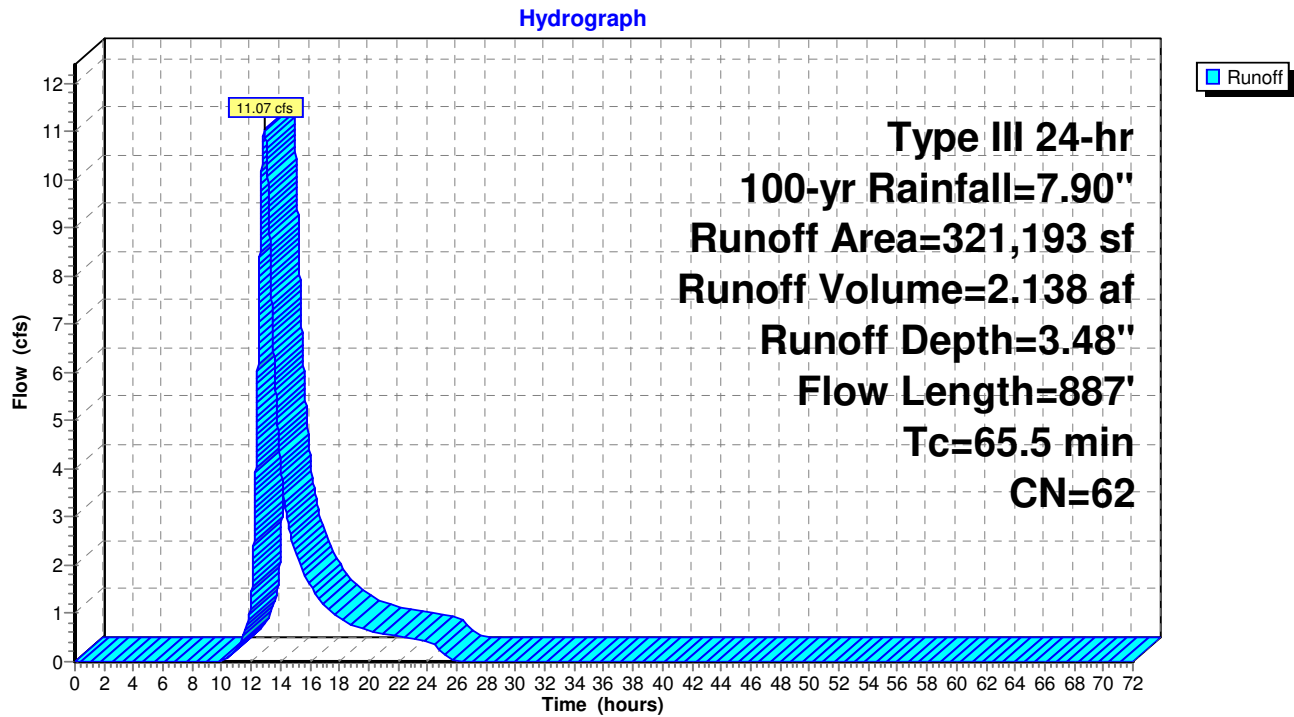
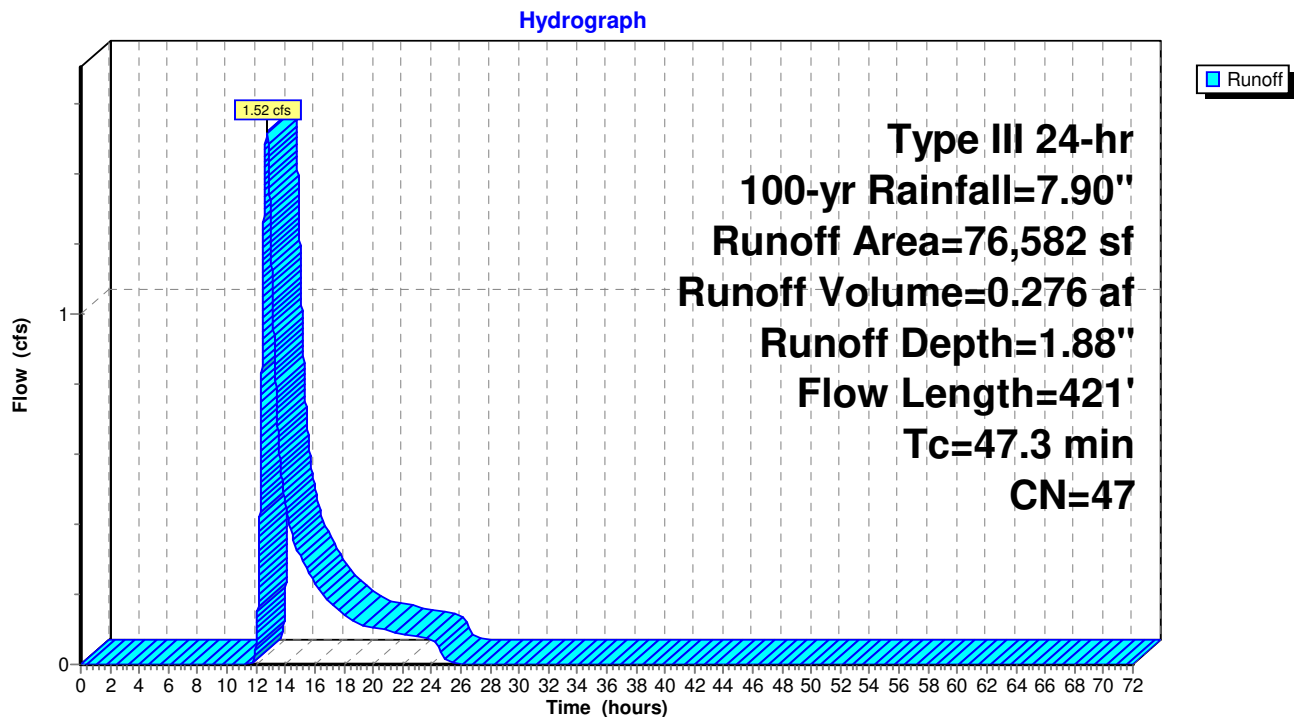


### Pond EP2: (DP3) Existing Depression Adjacent to Sullivan Ave

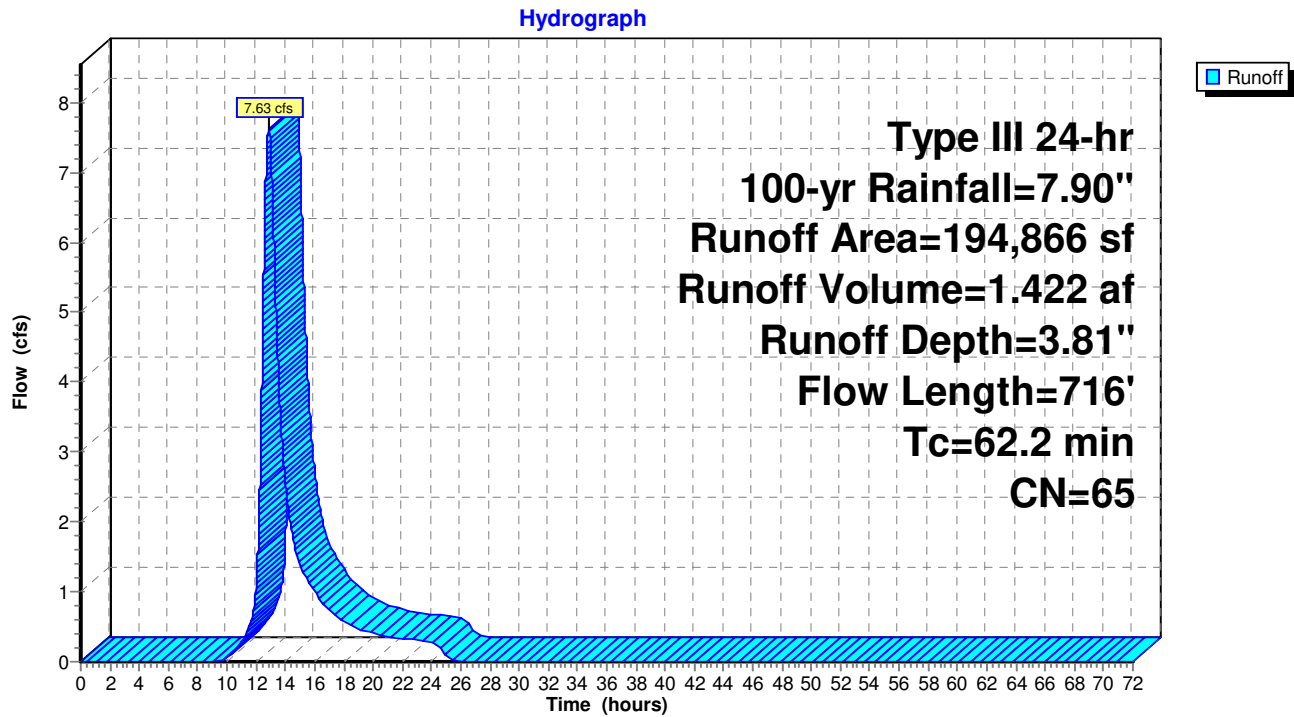


# Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System

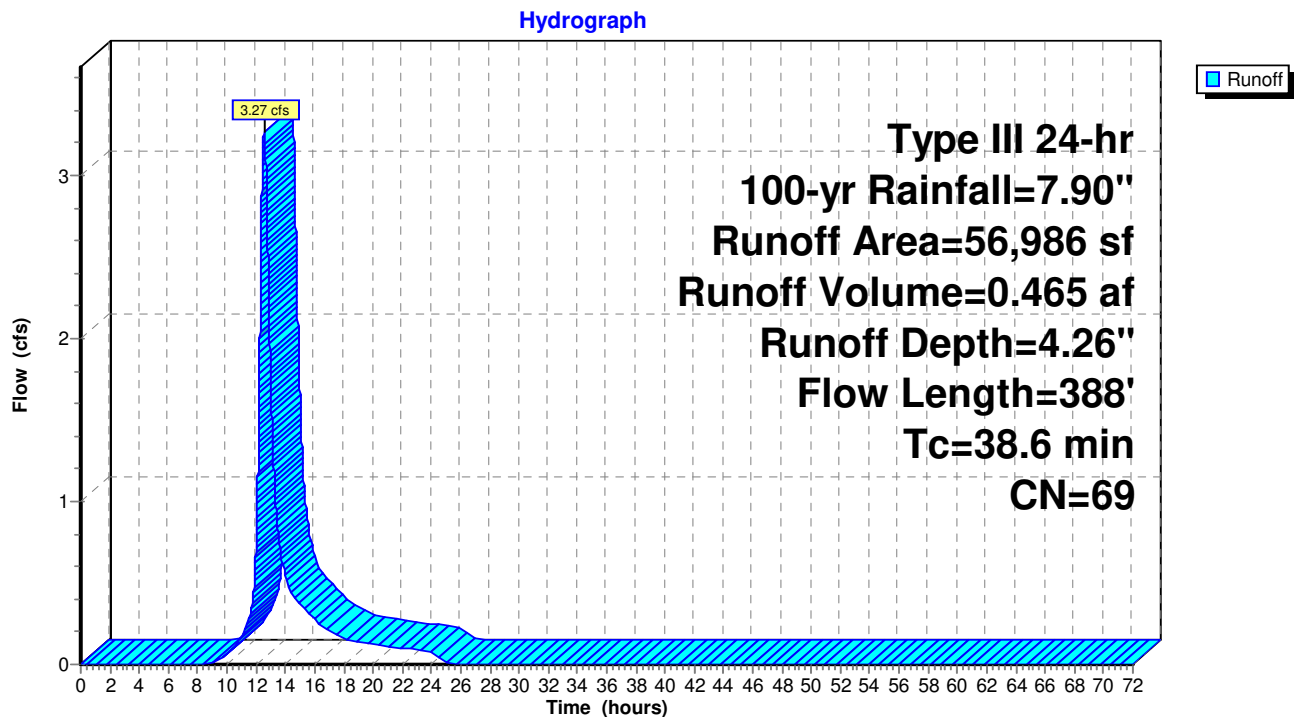


**Subcatchment E1: Existing Flow to Sullivan Ave****Subcatchment E2: (DP2) Existing Flow across North West Property Corner**

### Subcatchment E3: Existing E3

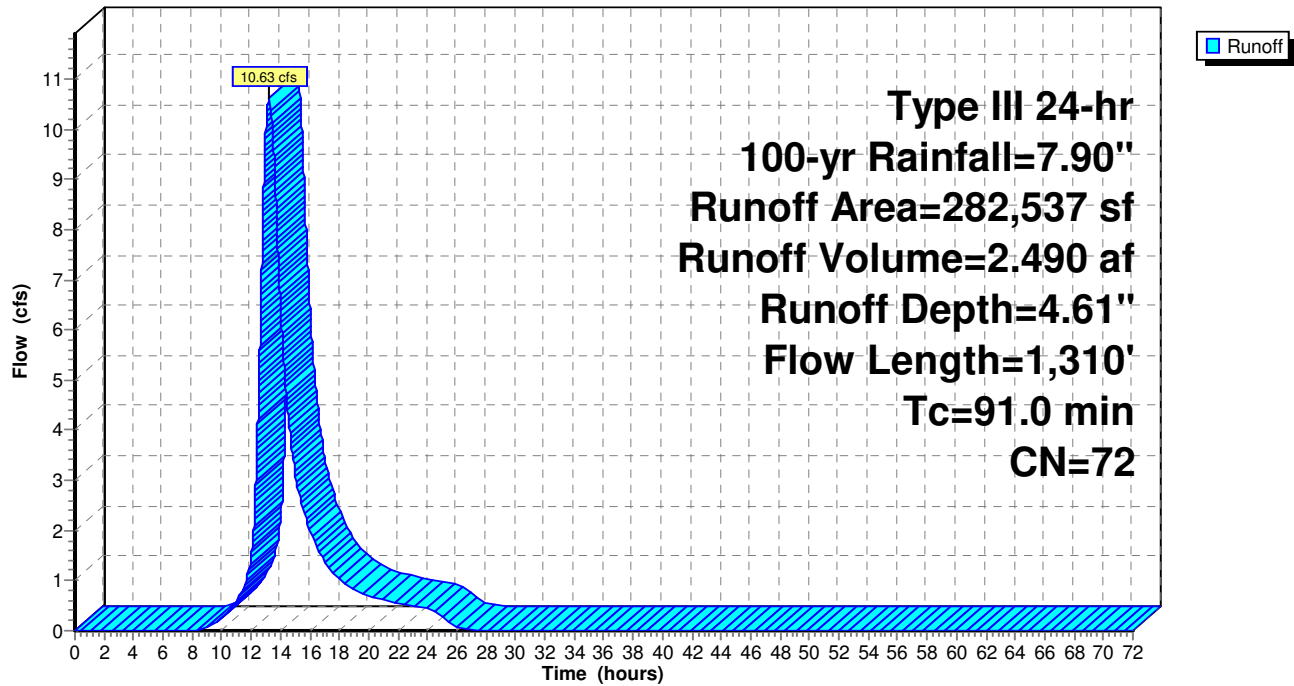


### Subcatchment E4: Existing E4



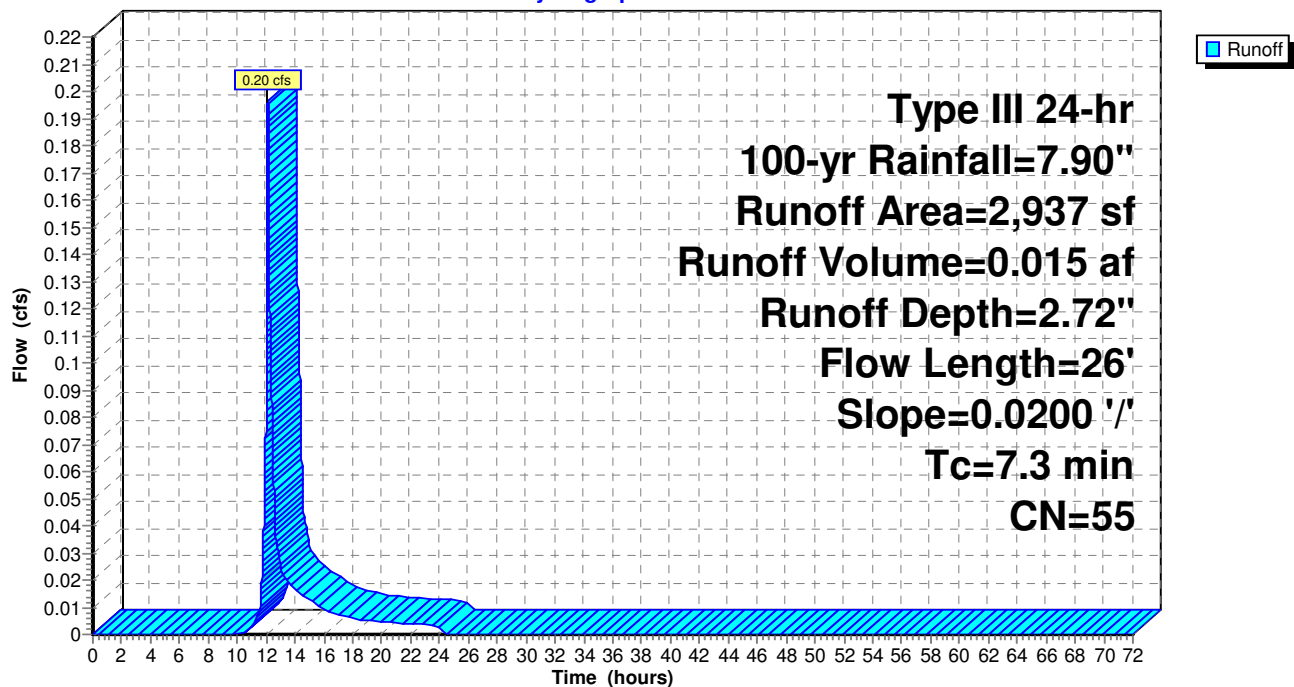
## Subcatchment E5: Existing E5

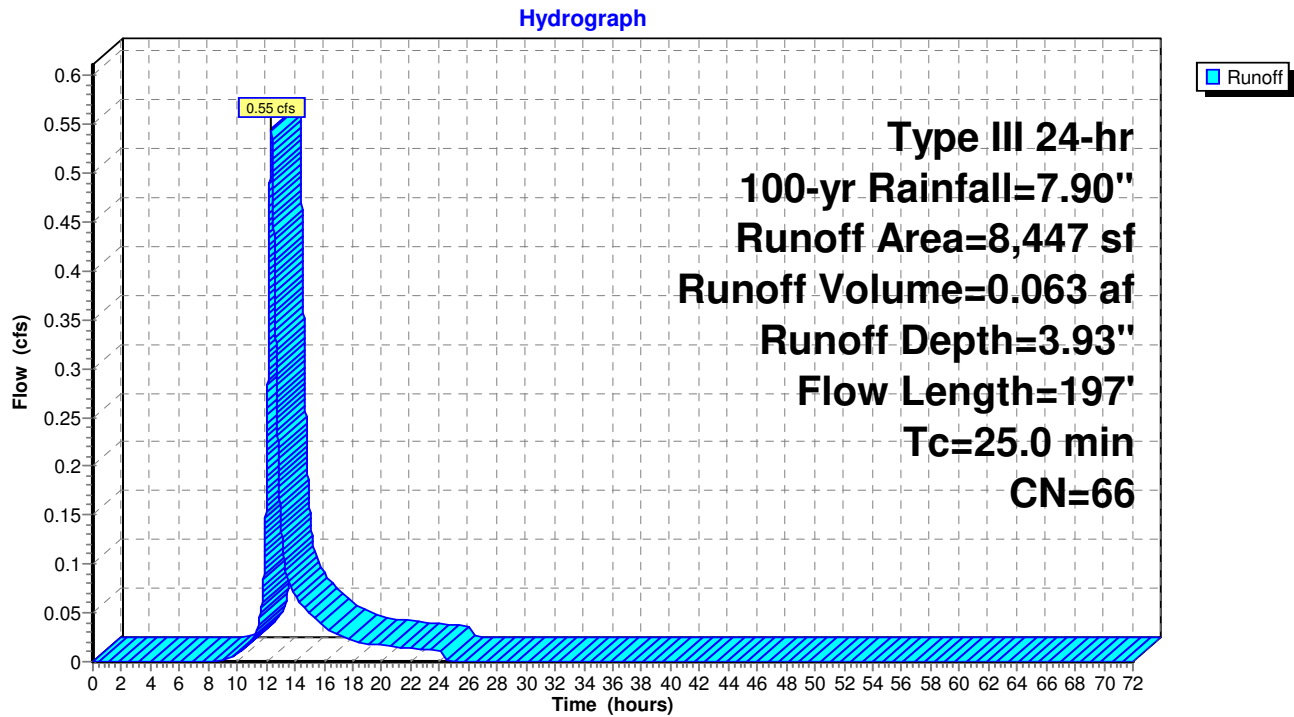
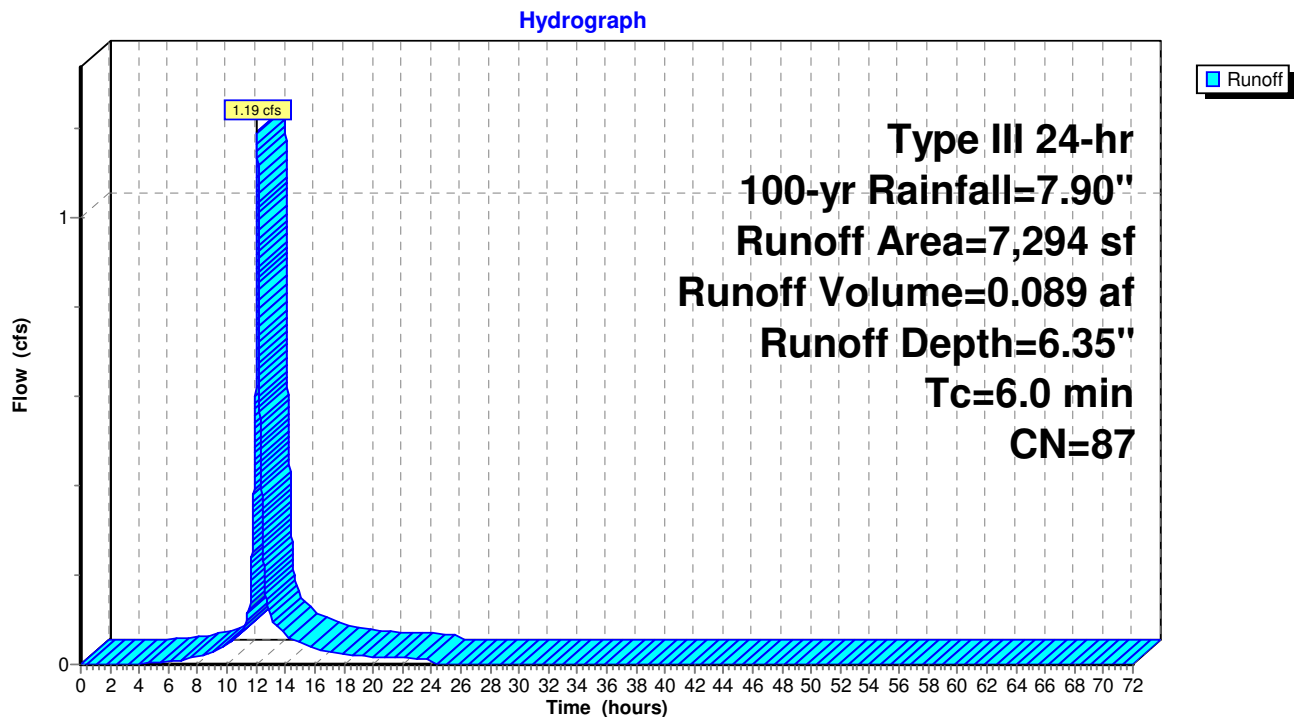
Hydrograph



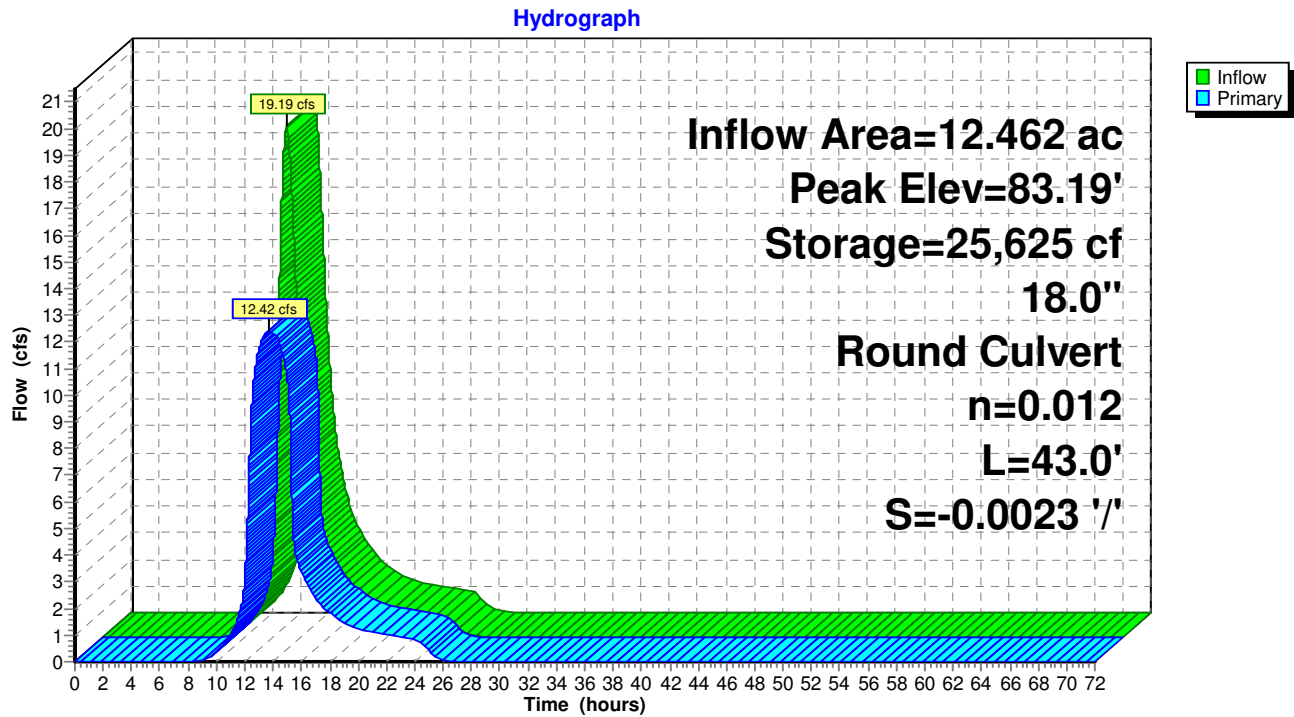
## Subcatchment E6: Existing Sheet flow to Kennedy Road

Hydrograph

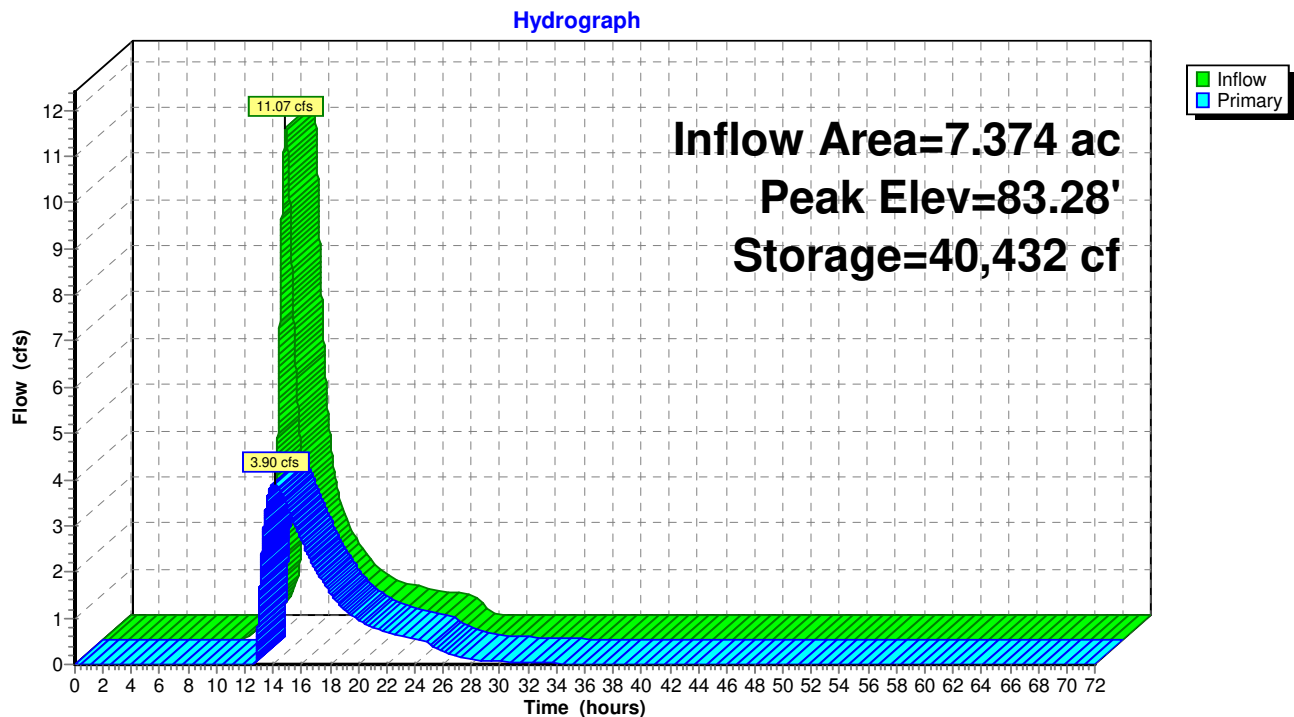


**Subcatchment E7: Existing E7****Subcatchment E8: Existing Kennedy Road runoff to CB**

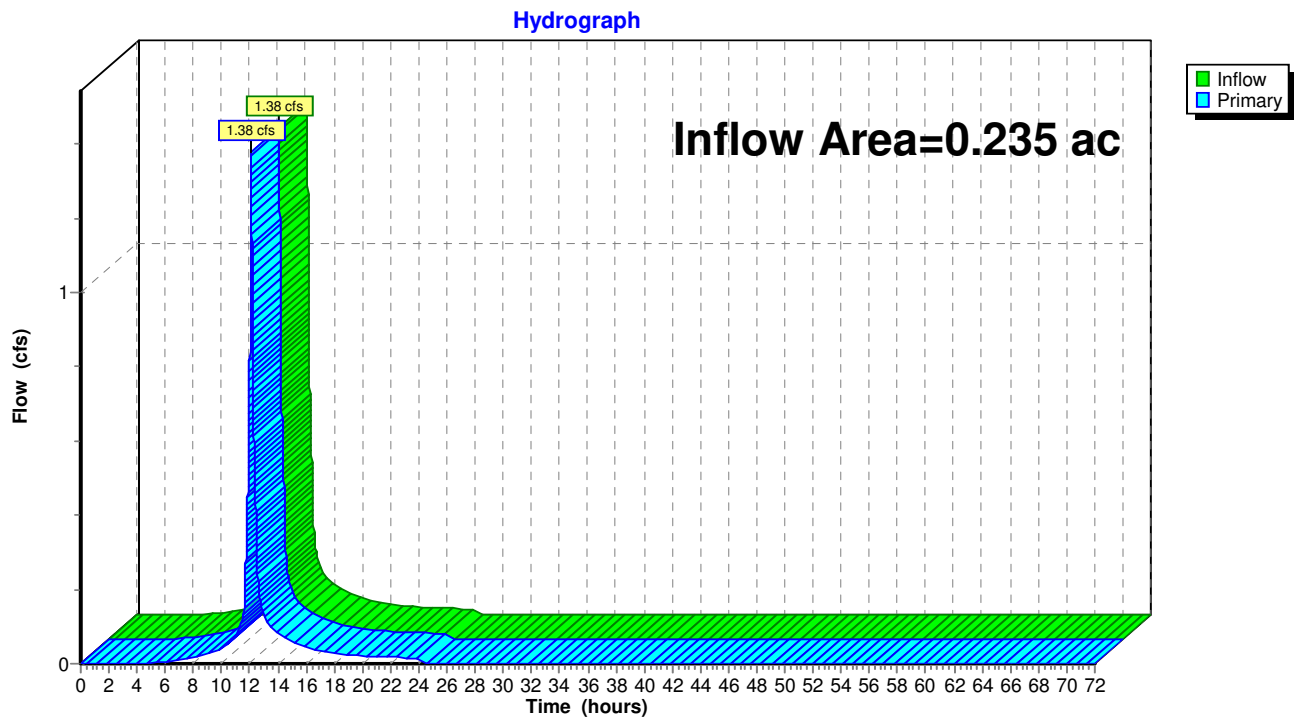
### Pond EP1: (DP1) Existing Rail Road Pond



### Pond EP2: (DP3) Existing Depression Adjacent to Sullivan Ave



# Link DP4: (DP4) Existing Flow to Kennedy Road Drainage System



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Existing Condition  
Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Pond EP1: (DP1) Existing Rail Road Pond**

Inflow Area = 12.462 ac, 7.83% Impervious, Inflow Depth = 4.28" for 100-yr event  
 Inflow = 19.19 cfs @ 12.94 hrs, Volume= 4.440 af  
 Outflow = 12.42 cfs @ 13.71 hrs, Volume= 4.440 af, Atten= 35%, Lag= 46.0 min  
 Primary = 12.42 cfs @ 13.71 hrs, Volume= 4.440 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 83.19' @ 13.71 hrs Surf.Area= 51,397 sf Storage= 25,625 cf

Plug-Flow detention time= 15.1 min calculated for 4.440 af (100% of inflow)  
 Center-of-Mass det. time= 15.1 min ( 906.2 - 891.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	79.70'	107,037 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.70	10	0	0
80.00	382	59	59
81.00	1,156	769	828
82.00	2,173	1,665	2,492
83.00	29,086	15,630	18,122
84.00	148,744	88,915	107,037

Device	Routing	Invert	Outlet Devices
#1	Primary	79.70'	<b>18.0" Round Culvert</b> L= 43.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 79.60' / 79.70' S= -0.0023 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

**Primary OutFlow** Max=12.42 cfs @ 13.71 hrs HW=83.19' (Free Discharge)

↑**1=Culvert** (Inlet Controls 12.42 cfs @ 7.03 fps)

**Summary for Pond EP2: (DP3) Existing Depression Adjacent to Sullivan Ave**

Inflow Area = 7.374 ac, 0.59% Impervious, Inflow Depth = 3.48" for 100-yr event  
 Inflow = 11.07 cfs @ 12.88 hrs, Volume= 2.138 af  
 Outflow = 3.90 cfs @ 14.06 hrs, Volume= 1.745 af, Atten= 65%, Lag= 70.5 min  
 Primary = 3.90 cfs @ 14.06 hrs, Volume= 1.745 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 83.28' @ 14.06 hrs Surf.Area= 87,610 sf Storage= 40,432 cf

Plug-Flow detention time= 227.2 min calculated for 1.745 af (82% of inflow)  
 Center-of-Mass det. time= 151.4 min ( 1,049.0 - 897.6 )

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Existing Condition  
Type III 24-hr 100-yr Rainfall=7.90"

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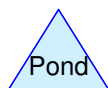
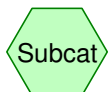
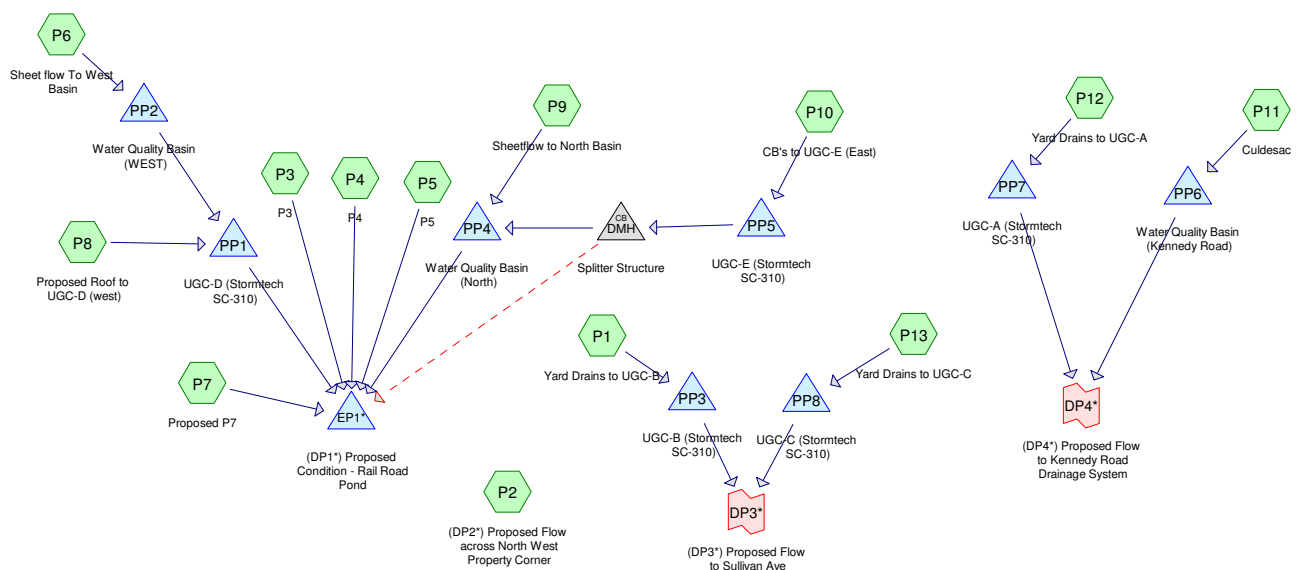
Volume	Invert	Avail.Storage	Storage Description
#1	82.00'	144,179 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
82.00	81	0	0
83.00	44,050	22,066	22,066
84.00	200,176	122,113	144,179

Device	Routing	Invert	Outlet Devices
#1	Primary	82.88'	<b>6.0' long x 3.0' breadth Broad-Crested Rectangular Weir</b> 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

**Primary OutFlow** Max=3.90 cfs @ 14.06 hrs HW=83.28' (Free Discharge)
 **1=Broad-Crested Rectangular Weir** (Weir Controls 3.90 cfs @ 1.63 fps)

**APPENDIX B**  
**Watershed Computations**  
**(Post-Development Drainage HydroCAD Report)**



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Proposed Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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

<b>Subcatchment P1: Yard Drains to UGC-B</b>	Runoff Area=53,290 sf 8.92% Impervious Runoff Depth=0.58" Tc=7.0 min CN=65 Runoff=0.61 cfs 0.059 af
<b>Subcatchment P10: CB's to UGC-E (East)</b>	Runoff Area=50,163 sf 84.49% Impervious Runoff Depth=2.40" Tc=6.0 min CN=93 Runoff=3.14 cfs 0.230 af
<b>Subcatchment P11: Culdesac</b>	Runoff Area=41,659 sf 70.56% Impervious Runoff Depth=2.04" Tc=6.0 min CN=89 Runoff=2.27 cfs 0.162 af
<b>Subcatchment P12: Yard Drains to UGC-A</b>	Runoff Area=50,556 sf 17.93% Impervious Runoff Depth=1.00" Tc=7.0 min CN=74 Runoff=1.25 cfs 0.097 af
<b>Subcatchment P13: Yard Drains to UGC-C</b>	Runoff Area=11,086 sf 6.38% Impervious Runoff Depth=0.50" Tc=7.0 min CN=63 Runoff=0.10 cfs 0.011 af
<b>Subcatchment P2: (DP2*) Proposed Flow</b>	Runoff Area=7,789 sf 0.00% Impervious Runoff Depth=0.24" Tc=8.0 min CN=55 Runoff=0.02 cfs 0.004 af
<b>Subcatchment P3: P3</b>	Runoff Area=10,240 sf 0.00% Impervious Runoff Depth=0.58" Tc=8.0 min CN=65 Runoff=0.11 cfs 0.011 af
<b>Subcatchment P4: P4</b>	Runoff Area=24,823 sf 0.00% Impervious Runoff Depth=0.75" Flow Length=94' Slope=0.0014 '/' Tc=59.0 min CN=69 Runoff=0.17 cfs 0.036 af
<b>Subcatchment P5: P5</b>	Runoff Area=215,643 sf 4.13% Impervious Runoff Depth=0.75" Flow Length=400' Tc=44.4 min CN=69 Runoff=1.78 cfs 0.310 af
<b>Subcatchment P6: Sheet flow To West</b>	Runoff Area=203,856 sf 86.83% Impervious Runoff Depth=2.40" Tc=6.0 min CN=93 Runoff=12.77 cfs 0.935 af
<b>Subcatchment P7: Proposed P7</b>	Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=0.62" Flow Length=197' Tc=25.0 min CN=66 Runoff=0.07 cfs 0.010 af
<b>Subcatchment P8: Proposed Roof to</b>	Runoff Area=241,800 sf 100.00% Impervious Runoff Depth=2.92" Tc=6.0 min CN=98 Runoff=16.99 cfs 1.350 af
<b>Subcatchment P9: Sheetflow to North</b>	Runoff Area=44,272 sf 63.74% Impervious Runoff Depth=2.04" Tc=7.0 min CN=89 Runoff=2.33 cfs 0.172 af
<b>Pond DMH: Splitter Structure</b>	Peak Elev=85.17' Inflow=1.63 cfs 0.229 af Primary=1.14 cfs 0.149 af Secondary=0.48 cfs 0.081 af Outflow=1.63 cfs 0.229 af
<b>Pond EP1*: (DP1*) Proposed Condition - Rail</b>	Peak Elev=80.72' Storage=537 cf Inflow=2.88 cfs 2.871 af 18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=2.86 cfs 2.871 af
<b>Pond PP1: UGC-D (Stormtech SC-310)</b>	Peak Elev=83.92' Storage=54,354 cf Inflow=17.37 cfs 2.219 af Outflow=0.62 cfs 2.142 af

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<b>Pond PP2: Water Quality Basin (WEST)</b>	Peak Elev=84.10' Storage=43,812 cf Inflow=12.77 cfs 0.935 af 10.0" Round Culvert n=0.012 L=19.0' S=0.0063 ' / Outflow=0.87 cfs 0.869 af
<b>Pond PP3: UGC-B (Stormtech SC-310)</b>	Peak Elev=80.83' Storage=2,549 cf Inflow=0.61 cfs 0.059 af Outflow=0.00 cfs 0.002 af
<b>Pond PP4: Water Quality Basin (North)</b>	Peak Elev=84.10' Storage=29,492 cf Inflow=3.17 cfs 0.321 af Outflow=0.08 cfs 0.282 af
<b>Pond PP5: UGC-E (Stormtech SC-310)</b>	Peak Elev=86.41' Storage=2,671 cf Inflow=3.14 cfs 0.230 af Outflow=1.63 cfs 0.229 af
<b>Pond PP6: Water Quality Basin (Kennedy)</b>	Peak Elev=80.57' Storage=14,381 cf Inflow=2.27 cfs 0.162 af Outflow=0.33 cfs 0.161 af
<b>Pond PP7: UGC-A (Stormtech SC-310)</b>	Peak Elev=80.33' Storage=3,421 cf Inflow=1.25 cfs 0.097 af Outflow=0.02 cfs 0.078 af
<b>Pond PP8: UGC-C (Stormtech SC-310)</b>	Peak Elev=80.09' Storage=459 cf Inflow=0.10 cfs 0.011 af Outflow=0.00 cfs 0.000 af
<b>Link DP3*: (DP3*) Proposed Flow to Sullivan Ave</b>	Inflow=0.00 cfs 0.002 af Primary=0.00 cfs 0.002 af
<b>Link DP4*: (DP4*) Proposed Flow to Kennedy Road Drainage System</b>	Inflow=0.34 cfs 0.239 af Primary=0.34 cfs 0.239 af

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Type III 24-hr 10-yr Rainfall=4.99"

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Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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 P1: Yard Drains to UGC-B** Runoff Area=53,290 sf 8.92% Impervious Runoff Depth=1.65"  
 Tc=7.0 min CN=65 Runoff=2.17 cfs 0.168 af

**Subcatchment P10: CB's to UGC-E (East)** Runoff Area=50,163 sf 84.49% Impervious Runoff Depth=4.19"  
 Tc=6.0 min CN=93 Runoff=5.32 cfs 0.402 af

**Subcatchment P11: Culdesac** Runoff Area=41,659 sf 70.56% Impervious Runoff Depth=3.76"  
 Tc=6.0 min CN=89 Runoff=4.10 cfs 0.300 af

**Subcatchment P12: Yard Drains to UGC-A** Runoff Area=50,556 sf 17.93% Impervious Runoff Depth=2.36"  
 Tc=7.0 min CN=74 Runoff=3.08 cfs 0.228 af

**Subcatchment P13: Yard Drains to UGC-C** Runoff Area=11,086 sf 6.38% Impervious Runoff Depth=1.50"  
 Tc=7.0 min CN=63 Runoff=0.40 cfs 0.032 af

**Subcatchment P2: (DP2\*) Proposed Flow** Runoff Area=7,789 sf 0.00% Impervious Runoff Depth=0.97"  
 Tc=8.0 min CN=55 Runoff=0.15 cfs 0.015 af

**Subcatchment P3: P3** Runoff Area=10,240 sf 0.00% Impervious Runoff Depth=1.65"  
 Tc=8.0 min CN=65 Runoff=0.40 cfs 0.032 af

**Subcatchment P4: P4** Runoff Area=24,823 sf 0.00% Impervious Runoff Depth=1.95"  
 Flow Length=94' Slope=0.0014 '/' Tc=59.0 min CN=69 Runoff=0.50 cfs 0.093 af

**Subcatchment P5: P5** Runoff Area=215,643 sf 4.13% Impervious Runoff Depth=1.95"  
 Flow Length=400' Tc=44.4 min CN=69 Runoff=5.13 cfs 0.804 af

**Subcatchment P6: Sheet flow To West** Runoff Area=203,856 sf 86.83% Impervious Runoff Depth=4.19"  
 Tc=6.0 min CN=93 Runoff=21.63 cfs 1.633 af

**Subcatchment P7: Proposed P7** Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=1.72"  
 Flow Length=197' Tc=25.0 min CN=66 Runoff=0.23 cfs 0.028 af

**Subcatchment P8: Proposed Roof to** Runoff Area=241,800 sf 100.00% Impervious Runoff Depth=4.75"  
 Tc=6.0 min CN=98 Runoff=27.13 cfs 2.199 af

**Subcatchment P9: Sheetflow to North** Runoff Area=44,272 sf 63.74% Impervious Runoff Depth=3.76"  
 Tc=7.0 min CN=89 Runoff=4.21 cfs 0.319 af

**Pond DMH: Splitter Structure** Peak Elev=85.56' Inflow=3.48 cfs 0.401 af  
 Primary=2.68 cfs 0.258 af Secondary=0.80 cfs 0.143 af Outflow=3.48 cfs 0.401 af

**Pond EP1\*: (DP1\*) Proposed Condition - Rail** Peak Elev=81.71' Storage=1,900 cf Inflow=7.39 cfs 5.187 af  
 18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=7.18 cfs 5.186 af

**Pond PP1: UGC-D (Stormtech SC-310)** Peak Elev=84.31' Storage=74,556 cf Inflow=28.16 cfs 3.753 af  
 Outflow=2.14 cfs 3.631 af

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Type III 24-hr 10-yr Rainfall=4.99"

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<b>Pond PP2: Water Quality Basin (WEST)</b>	Peak Elev=84.51' Storage=61,924 cf Inflow=21.63 cfs 1.633 af 10.0" Round Culvert n=0.012 L=19.0' S=0.0063 ' /' Outflow=1.70 cfs 1.554 af
<b>Pond PP3: UGC-B (Stormtech SC-310)</b>	Peak Elev=81.08' Storage=3,199 cf Inflow=2.17 cfs 0.168 af Outflow=0.33 cfs 0.111 af
<b>Pond PP4: Water Quality Basin (North)</b>	Peak Elev=84.70' Storage=39,224 cf Inflow=6.51 cfs 0.577 af Outflow=0.12 cfs 0.455 af
<b>Pond PP5: UGC-E (Stormtech SC-310)</b>	Peak Elev=86.78' Storage=3,748 cf Inflow=5.32 cfs 0.402 af Outflow=3.48 cfs 0.401 af
<b>Pond PP6: Water Quality Basin (Kennedy)</b>	Peak Elev=81.03' Storage=17,386 cf Inflow=4.10 cfs 0.300 af Outflow=0.49 cfs 0.298 af
<b>Pond PP7: UGC-A (Stormtech SC-310)</b>	Peak Elev=80.85' Storage=8,079 cf Inflow=3.08 cfs 0.228 af Outflow=0.05 cfs 0.161 af
<b>Pond PP8: UGC-C (Stormtech SC-310)</b>	Peak Elev=80.56' Storage=1,388 cf Inflow=0.40 cfs 0.032 af Outflow=0.00 cfs 0.000 af
<b>Link DP3*: (DP3*) Proposed Flow to Sullivan Ave</b>	Inflow=0.33 cfs 0.111 af Primary=0.33 cfs 0.111 af
<b>Link DP4*: (DP4*) Proposed Flow to Kennedy Road Drainage System</b>	Inflow=0.52 cfs 0.460 af Primary=0.52 cfs 0.460 af

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Type III 24-hr 25-yr Rainfall=6.13"

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Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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

<b>Subcatchment P1: Yard Drains to UGC-B</b>	Runoff Area=53,290 sf 8.92% Impervious Runoff Depth=2.45" Tc=7.0 min CN=65 Runoff=3.32 cfs 0.249 af
<b>Subcatchment P10: CB's to UGC-E (East)</b>	Runoff Area=50,163 sf 84.49% Impervious Runoff Depth=5.31" Tc=6.0 min CN=93 Runoff=6.66 cfs 0.510 af
<b>Subcatchment P11: Culdesac</b>	Runoff Area=41,659 sf 70.56% Impervious Runoff Depth=4.86" Tc=6.0 min CN=89 Runoff=5.23 cfs 0.387 af
<b>Subcatchment P12: Yard Drains to UGC-A</b>	Runoff Area=50,556 sf 17.93% Impervious Runoff Depth=3.29" Tc=7.0 min CN=74 Runoff=4.33 cfs 0.319 af
<b>Subcatchment P13: Yard Drains to UGC-C</b>	Runoff Area=11,086 sf 6.38% Impervious Runoff Depth=2.27" Tc=7.0 min CN=63 Runoff=0.63 cfs 0.048 af
<b>Subcatchment P2: (DP2*) Proposed Flow</b>	Runoff Area=7,789 sf 0.00% Impervious Runoff Depth=1.59" Tc=8.0 min CN=55 Runoff=0.28 cfs 0.024 af
<b>Subcatchment P3: P3</b>	Runoff Area=10,240 sf 0.00% Impervious Runoff Depth=2.45" Tc=8.0 min CN=65 Runoff=0.62 cfs 0.048 af
<b>Subcatchment P4: P4</b>	Runoff Area=24,823 sf 0.00% Impervious Runoff Depth=2.81" Flow Length=94' Slope=0.0014 '/' Tc=59.0 min CN=69 Runoff=0.74 cfs 0.134 af
<b>Subcatchment P5: P5</b>	Runoff Area=215,643 sf 4.13% Impervious Runoff Depth=2.81" Flow Length=400' Tc=44.4 min CN=69 Runoff=7.54 cfs 1.161 af
<b>Subcatchment P6: Sheet flow To West</b>	Runoff Area=203,856 sf 86.83% Impervious Runoff Depth=5.31" Tc=6.0 min CN=93 Runoff=27.06 cfs 2.071 af
<b>Subcatchment P7: Proposed P7</b>	Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=2.54" Flow Length=197' Tc=25.0 min CN=66 Runoff=0.35 cfs 0.041 af
<b>Subcatchment P8: Proposed Roof to</b>	Runoff Area=241,800 sf 100.00% Impervious Runoff Depth=5.89" Tc=6.0 min CN=98 Runoff=33.39 cfs 2.725 af
<b>Subcatchment P9: Sheetflow to North</b>	Runoff Area=44,272 sf 63.74% Impervious Runoff Depth=4.86" Tc=7.0 min CN=89 Runoff=5.37 cfs 0.412 af
<b>Pond DMH: Splitter Structure</b>	Peak Elev=85.77' Inflow=4.53 cfs 0.509 af Primary=3.60 cfs 0.271 af Secondary=0.93 cfs 0.238 af Outflow=4.53 cfs 0.509 af
<b>Pond EP1*: (DP1*) Proposed Condition -</b>	Peak Elev=82.36' Storage=5,032 cf Inflow=11.92 cfs 6.709 af 18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=10.35 cfs 6.708 af
<b>Pond PP1: UGC-D (Stormtech SC-310)</b>	Peak Elev=84.50' Storage=81,831 cf Inflow=34.84 cfs 4.714 af Outflow=3.42 cfs 4.572 af

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Type III 24-hr 25-yr Rainfall=6.13"

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<b>Pond PP2: Water Quality Basin (WEST)</b>	Peak Elev=84.80' Storage=75,445 cf Inflow=27.06 cfs 2.071 af 10.0" Round Culvert n=0.012 L=19.0' S=0.0063 ' / ' Outflow=1.74 cfs 1.989 af
<b>Pond PP3: UGC-B (Stormtech SC-310)</b>	Peak Elev=81.39' Storage=3,874 cf Inflow=3.32 cfs 0.249 af Outflow=1.27 cfs 0.193 af
<b>Pond PP4: Water Quality Basin (North)</b>	Peak Elev=84.97' Storage=43,878 cf Inflow=8.58 cfs 0.683 af Outflow=0.13 cfs 0.516 af
<b>Pond PP5: UGC-E (Stormtech SC-310)</b>	Peak Elev=87.01' Storage=4,312 cf Inflow=6.66 cfs 0.510 af Outflow=4.53 cfs 0.509 af
<b>Pond PP6: Water Quality Basin (Kennedy)</b>	Peak Elev=81.32' Storage=19,328 cf Inflow=5.23 cfs 0.387 af Outflow=0.57 cfs 0.386 af
<b>Pond PP7: UGC-A (Stormtech SC-310)</b>	Peak Elev=81.31' Storage=11,485 cf Inflow=4.33 cfs 0.319 af Outflow=0.06 cfs 0.221 af
<b>Pond PP8: UGC-C (Stormtech SC-310)</b>	Peak Elev=80.85' Storage=1,981 cf Inflow=0.63 cfs 0.048 af Outflow=0.01 cfs 0.005 af
<b>Link DP3*: (DP3*) Proposed Flow to Sullivan Ave</b>	Inflow=1.27 cfs 0.197 af Primary=1.27 cfs 0.197 af
<b>Link DP4*: (DP4*) Proposed Flow to Kennedy Road Drainage System</b>	Inflow=0.61 cfs 0.606 af Primary=0.61 cfs 0.606 af

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Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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

<b>Subcatchment P1: Yard Drains to UGC-B</b>	Runoff Area=53,290 sf 8.92% Impervious Runoff Depth=3.08" Tc=7.0 min CN=65 Runoff=4.22 cfs 0.314 af
<b>Subcatchment P10: CB's to UGC-E (East)</b>	Runoff Area=50,163 sf 84.49% Impervious Runoff Depth=6.14" Tc=6.0 min CN=93 Runoff=7.64 cfs 0.589 af
<b>Subcatchment P11: Culdesac</b>	Runoff Area=41,659 sf 70.56% Impervious Runoff Depth=5.68" Tc=6.0 min CN=89 Runoff=6.06 cfs 0.453 af
<b>Subcatchment P12: Yard Drains to UGC-A</b>	Runoff Area=50,556 sf 17.93% Impervious Runoff Depth=4.02" Tc=7.0 min CN=74 Runoff=5.28 cfs 0.388 af
<b>Subcatchment P13: Yard Drains to UGC-C</b>	Runoff Area=11,086 sf 6.38% Impervious Runoff Depth=2.88" Tc=7.0 min CN=63 Runoff=0.82 cfs 0.061 af
<b>Subcatchment P2: (DP2*) Proposed Flow</b>	Runoff Area=7,789 sf 0.00% Impervious Runoff Depth=2.10" Tc=8.0 min CN=55 Runoff=0.38 cfs 0.031 af
<b>Subcatchment P3: P3</b>	Runoff Area=10,240 sf 0.00% Impervious Runoff Depth=3.08" Tc=8.0 min CN=65 Runoff=0.78 cfs 0.060 af
<b>Subcatchment P4: P4</b>	Runoff Area=24,823 sf 0.00% Impervious Runoff Depth=3.49" Flow Length=94' Slope=0.0014 '/' Tc=59.0 min CN=69 Runoff=0.92 cfs 0.166 af
<b>Subcatchment P5: P5</b>	Runoff Area=215,643 sf 4.13% Impervious Runoff Depth=3.49" Flow Length=400' Tc=44.4 min CN=69 Runoff=9.40 cfs 1.440 af
<b>Subcatchment P6: Sheet flow To West</b>	Runoff Area=203,856 sf 86.83% Impervious Runoff Depth=6.14" Tc=6.0 min CN=93 Runoff=31.04 cfs 2.395 af
<b>Subcatchment P7: Proposed P7</b>	Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=3.18" Flow Length=197' Tc=25.0 min CN=66 Runoff=0.44 cfs 0.051 af
<b>Subcatchment P8: Proposed Roof to</b>	Runoff Area=241,800 sf 100.00% Impervious Runoff Depth=6.73" Tc=6.0 min CN=98 Runoff=38.00 cfs 3.114 af
<b>Subcatchment P9: Sheetflow to North</b>	Runoff Area=44,272 sf 63.74% Impervious Runoff Depth=5.68" Tc=7.0 min CN=89 Runoff=6.22 cfs 0.481 af
<b>Pond DMH: Splitter Structure</b>	Peak Elev=85.96' Inflow=5.40 cfs 0.589 af Primary=4.38 cfs 0.291 af Secondary=1.02 cfs 0.298 af Outflow=5.40 cfs 0.589 af
<b>Pond EP1*: (DP1*) Proposed Condition -</b>	Peak Elev=82.79' Storage=12,517 cf Inflow=16.11 cfs 7.841 af 18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=11.48 cfs 7.840 af
<b>Pond PP1: UGC-D (Stormtech SC-310)</b>	Peak Elev=84.69' Storage=87,872 cf Inflow=39.72 cfs 5.424 af Outflow=4.92 cfs 5.264 af

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Type III 24-hr 50-yr Rainfall=6.97"

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<b>Pond PP2: Water Quality Basin (WEST)</b>	Peak Elev=85.01' Storage=85,566 cf Inflow=31.04 cfs 2.395 af 10.0" Round Culvert n=0.012 L=19.0' S=0.0063 ' /' Outflow=1.76 cfs 2.310 af
<b>Pond PP3: UGC-B (Stormtech SC-310)</b>	Peak Elev=81.62' Storage=4,282 cf Inflow=4.22 cfs 0.314 af Outflow=2.14 cfs 0.257 af
<b>Pond PP4: Water Quality Basin (North)</b>	Peak Elev=85.16' Storage=47,203 cf Inflow=10.07 cfs 0.772 af Outflow=0.14 cfs 0.562 af
<b>Pond PP5: UGC-E (Stormtech SC-310)</b>	Peak Elev=87.20' Storage=4,692 cf Inflow=7.64 cfs 0.589 af Outflow=5.40 cfs 0.589 af
<b>Pond PP6: Water Quality Basin (Kennedy)</b>	Peak Elev=81.52' Storage=20,797 cf Inflow=6.06 cfs 0.453 af Outflow=0.61 cfs 0.451 af
<b>Pond PP7: UGC-A (Stormtech SC-310)</b>	Peak Elev=81.80' Storage=14,075 cf Inflow=5.28 cfs 0.388 af Outflow=0.07 cfs 0.262 af
<b>Pond PP8: UGC-C (Stormtech SC-310)</b>	Peak Elev=80.88' Storage=2,050 cf Inflow=0.82 cfs 0.061 af Outflow=0.03 cfs 0.018 af
<b>Link DP3*: (DP3*) Proposed Flow to Sullivan Ave</b>	Inflow=2.14 cfs 0.275 af Primary=2.14 cfs 0.275 af
<b>Link DP4*: (DP4*) Proposed Flow to Kennedy Road Drainage System</b>	Inflow=0.67 cfs 0.713 af Primary=0.67 cfs 0.713 af

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Type III 24-hr 100-yr Rainfall=7.90"

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Time span=0.00-72.00 hrs, dt=0.002 hrs, 36001 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 P1: Yard Drains to UGC-B** Runoff Area=53,290 sf 8.92% Impervious Runoff Depth=3.81"  
 Tc=7.0 min CN=65 Runoff=5.26 cfs 0.389 af

**Subcatchment P10: CB's to UGC-E (East)** Runoff Area=50,163 sf 84.49% Impervious Runoff Depth=7.06"  
 Tc=6.0 min CN=93 Runoff=8.72 cfs 0.678 af

**Subcatchment P11: Culdesac** Runoff Area=41,659 sf 70.56% Impervious Runoff Depth=6.59"  
 Tc=6.0 min CN=89 Runoff=6.97 cfs 0.525 af

**Subcatchment P12: Yard Drains to UGC-A** Runoff Area=50,556 sf 17.93% Impervious Runoff Depth=4.84"  
 Tc=7.0 min CN=74 Runoff=6.34 cfs 0.468 af

**Subcatchment P13: Yard Drains to UGC-C** Runoff Area=11,086 sf 6.38% Impervious Runoff Depth=3.59"  
 Tc=7.0 min CN=63 Runoff=1.03 cfs 0.076 af

**Subcatchment P2: (DP2\*) Proposed Flow** Runoff Area=7,789 sf 0.00% Impervious Runoff Depth=2.72"  
 Tc=8.0 min CN=55 Runoff=0.51 cfs 0.040 af

**Subcatchment P3: P3** Runoff Area=10,240 sf 0.00% Impervious Runoff Depth=3.81"  
 Tc=8.0 min CN=65 Runoff=0.98 cfs 0.075 af

**Subcatchment P4: P4** Runoff Area=24,823 sf 0.00% Impervious Runoff Depth=4.26"  
 Flow Length=94' Slope=0.0014 '/' Tc=59.0 min CN=69 Runoff=1.13 cfs 0.203 af

**Subcatchment P5: P5** Runoff Area=215,643 sf 4.13% Impervious Runoff Depth=4.26"  
 Flow Length=400' Tc=44.4 min CN=69 Runoff=11.52 cfs 1.759 af

**Subcatchment P6: Sheet flow To West** Runoff Area=203,856 sf 86.83% Impervious Runoff Depth=7.06"  
 Tc=6.0 min CN=93 Runoff=35.42 cfs 2.755 af

**Subcatchment P7: Proposed P7** Runoff Area=8,447 sf 21.26% Impervious Runoff Depth=3.93"  
 Flow Length=197' Tc=25.0 min CN=66 Runoff=0.55 cfs 0.063 af

**Subcatchment P8: Proposed Roof to** Runoff Area=241,800 sf 100.00% Impervious Runoff Depth=7.66"  
 Tc=6.0 min CN=98 Runoff=43.10 cfs 3.543 af

**Subcatchment P9: Sheetflow to North** Runoff Area=44,272 sf 63.74% Impervious Runoff Depth=6.59"  
 Tc=7.0 min CN=89 Runoff=7.16 cfs 0.558 af

**Pond DMH: Splitter Structure** Peak Elev=86.18' Inflow=6.22 cfs 0.677 af  
 Primary=5.11 cfs 0.327 af Secondary=1.11 cfs 0.350 af Outflow=6.22 cfs 0.677 af

**Pond EP1\*: (DP1\*) Proposed Condition -** Peak Elev=83.17' Storage=24,454 cf Inflow=20.75 cfs 9.096 af  
 18.0" Round Culvert n=0.012 L=43.0' S=-0.0023 '/' Outflow=12.38 cfs 9.095 af

**Pond PP1: UGC-D (Stormtech SC-310)** Peak Elev=84.96' Storage=96,103 cf Inflow=44.70 cfs 6.210 af  
 Outflow=6.89 cfs 6.031 af

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Proposed Condition  
Type III 24-hr 100-yr Rainfall=7.90"

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<b>Pond PP2: Water Quality Basin (WEST)</b>	Peak Elev=85.24' Storage=96,918 cf Inflow=35.42 cfs 2.755 af 10.0" Round Culvert n=0.012 L=19.0' S=0.0063 '/' Outflow=2.04 cfs 2.667 af
<b>Pond PP3: UGC-B (Stormtech SC-310)</b>	Peak Elev=81.96' Storage=4,850 cf Inflow=5.26 cfs 0.389 af Outflow=3.07 cfs 0.332 af
<b>Pond PP4: Water Quality Basin (North)</b>	Peak Elev=85.40' Storage=51,569 cf Inflow=11.87 cfs 0.885 af Outflow=0.15 cfs 0.616 af
<b>Pond PP5: UGC-E (Stormtech SC-310)</b>	Peak Elev=87.40' Storage=5,078 cf Inflow=8.72 cfs 0.678 af Outflow=6.22 cfs 0.677 af
<b>Pond PP6: Water Quality Basin (Kennedy)</b>	Peak Elev=81.75' Storage=22,458 cf Inflow=6.97 cfs 0.525 af Outflow=0.66 cfs 0.523 af
<b>Pond PP7: UGC-A (Stormtech SC-310)</b>	Peak Elev=82.02' Storage=15,195 cf Inflow=6.34 cfs 0.468 af Outflow=0.23 cfs 0.336 af
<b>Pond PP8: UGC-C (Stormtech SC-310)</b>	Peak Elev=80.92' Storage=2,133 cf Inflow=1.03 cfs 0.076 af Outflow=0.07 cfs 0.033 af
<b>Link DP3*: (DP3*) Proposed Flow to Sullivan Ave</b>	Inflow=3.07 cfs 0.365 af Primary=3.07 cfs 0.365 af
<b>Link DP4*: (DP4*) Proposed Flow to Kennedy Road Drainage System</b>	Inflow=0.82 cfs 0.859 af Primary=0.82 cfs 0.859 af

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Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment P1: Yard Drains to UGC-B**

Runoff = 0.61 cfs @ 12.13 hrs, Volume= 0.059 af, Depth= 0.58"

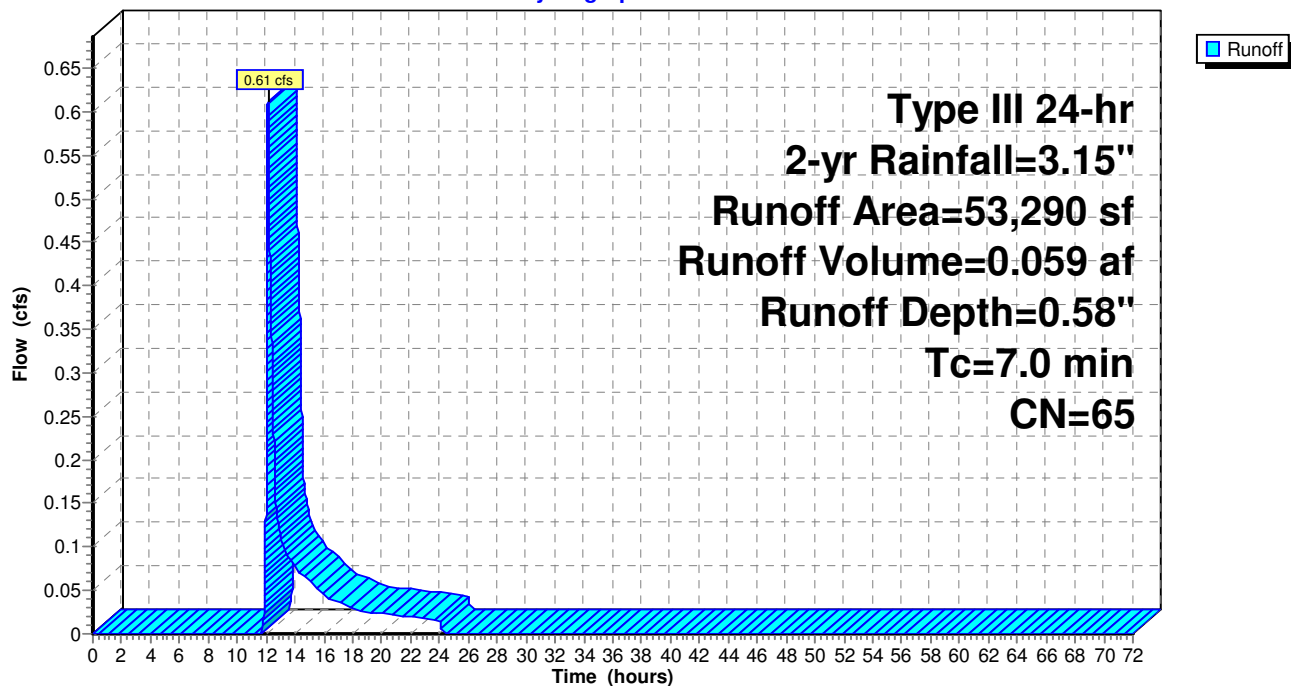
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
45,366	61	>75% Grass cover, Good, HSG B
3,169	80	>75% Grass cover, Good, HSG D
* 2	71	>75% Grass cover, Good, HSG B/D
* 4,753	98	IMPERVIOUS
53,290	65	Weighted Average
48,537		91.08% Pervious Area
4,753		8.92% Impervious Area

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

**Subcatchment P1: Yard Drains to UGC-B**

Hydrograph



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**Summary for Subcatchment P10: CB's to UGC-E (East)**

Runoff = 3.14 cfs @ 12.09 hrs, Volume= 0.230 af, Depth= 2.40"

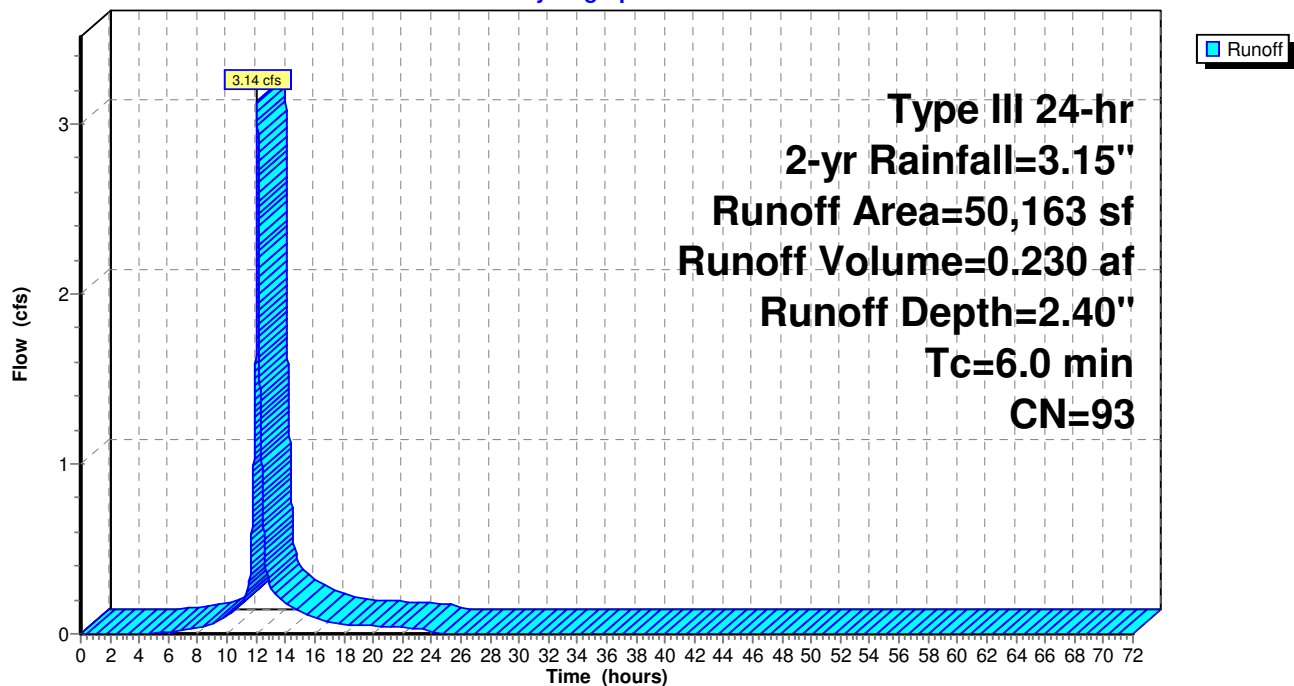
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
922	74	>75% Grass cover, Good, HSG C
2,430	61	>75% Grass cover, Good, HSG B
* 4,429	71	>75% Grass cover, Good, HSG B/D
* 42,382	98	IMPERVIOUS
50,163	93	Weighted Average
7,781		15.51% Pervious Area
42,382		84.49% Impervious Area

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

**Subcatchment P10: CB's to UGC-E (East)**

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**Summary for Subcatchment P11: Culdesac**

Runoff = 2.27 cfs @ 12.09 hrs, Volume= 0.162 af, Depth= 2.04"

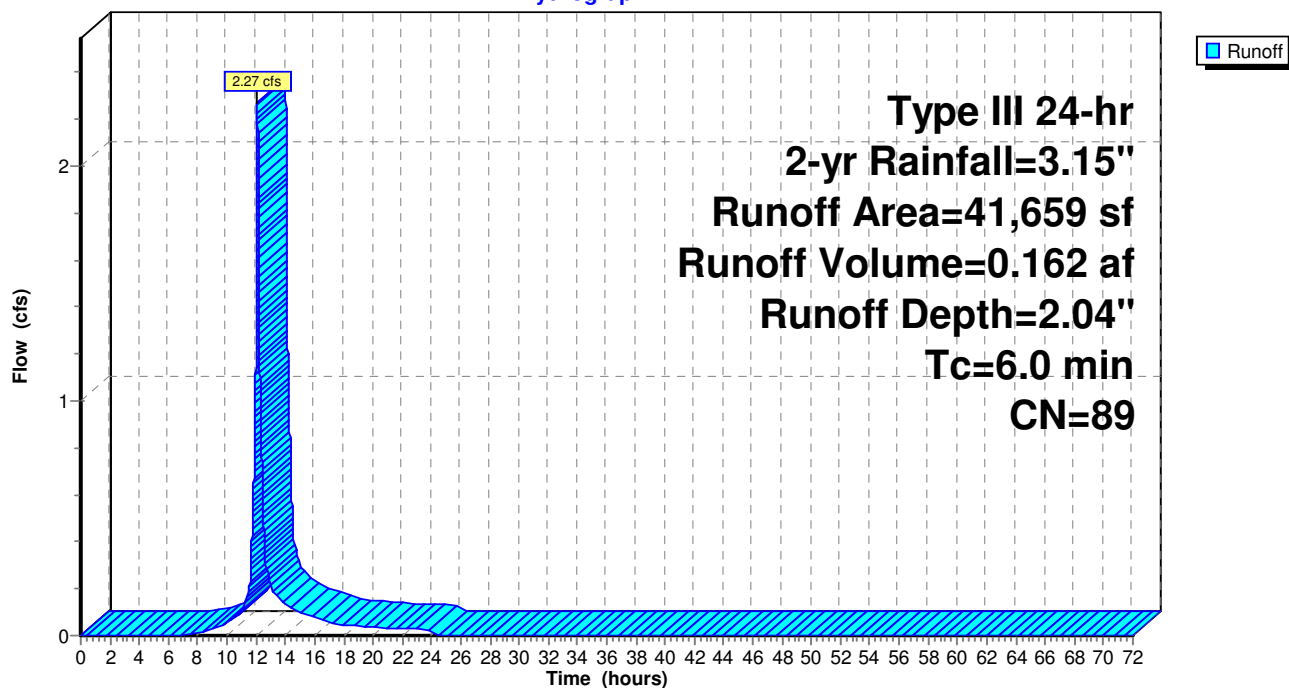
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

	Area (sf)	CN	Description
*	29,394	98	IMPERVIOUS
	2,607	61	>75% Grass cover, Good, HSG B
*	9,658	71	>75% Grass cover, Good, HSG B/D
	41,659	89	Weighted Average
	12,265		29.44% Pervious Area
	29,394		70.56% Impervious Area

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

**Subcatchment P11: Culdesac**

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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### Summary for Subcatchment P12: Yard Drains to UGC-A

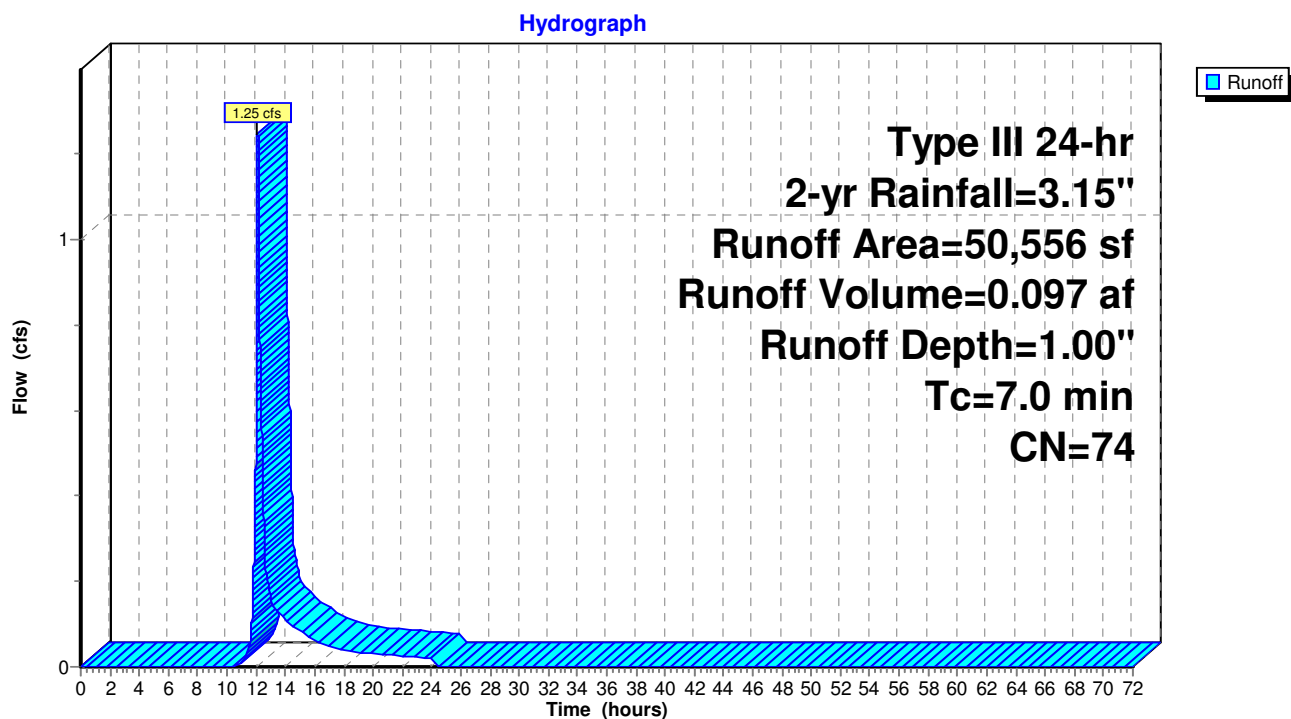
Runoff = 1.25 cfs @ 12.11 hrs, Volume= 0.097 af, Depth= 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

	Area (sf)	CN	Description
*	9,067	98	IMPERVIOUS
	12,690	61	>75% Grass cover, Good, HSG B
	4,707	74	>75% Grass cover, Good, HSG C
*	24,092	71	>75% Grass cover, Good, HSG B/D
	50,556	74	Weighted Average
	41,489		82.07% Pervious Area
	9,067		17.93% Impervious Area

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

### Subcatchment P12: Yard Drains to UGC-A



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**Summary for Subcatchment P13: Yard Drains to UGC-C**

Runoff = 0.10 cfs @ 12.13 hrs, Volume= 0.011 af, Depth= 0.50"

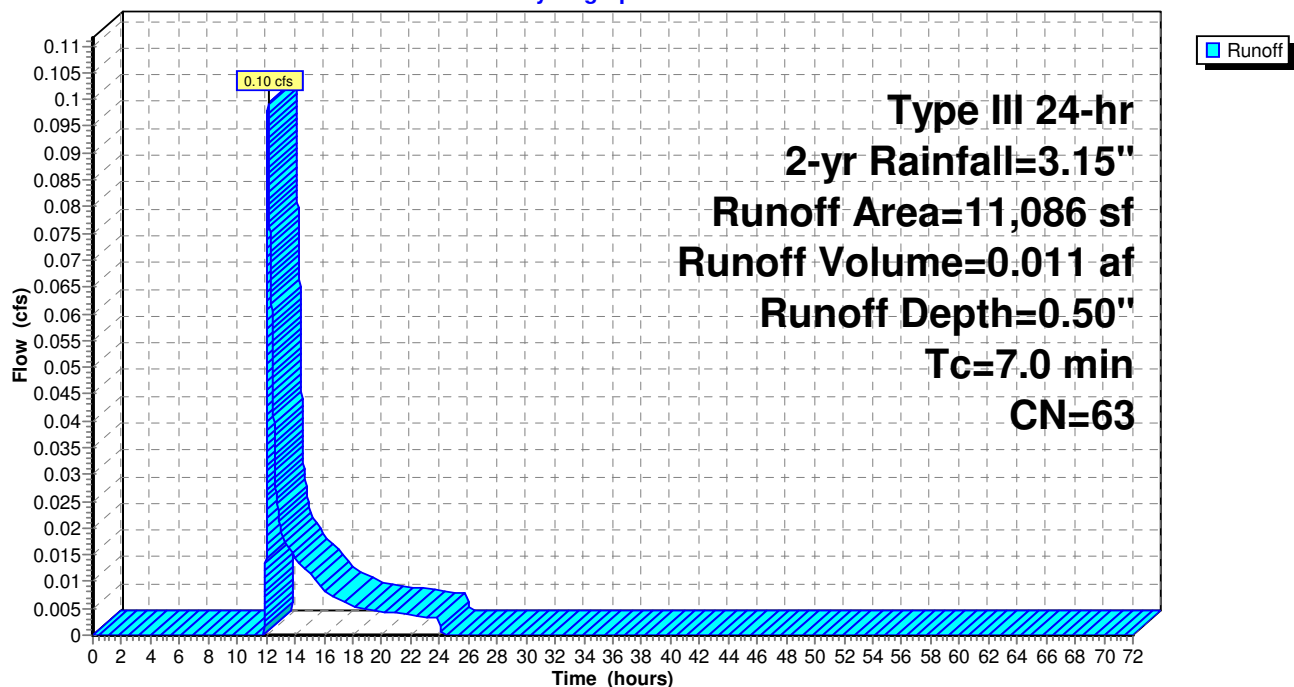
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

	Area (sf)	CN	Description
*	707	98	IMPERVIOUS
	10,379	61	>75% Grass cover, Good, HSG B
	11,086	63	Weighted Average
	10,379		93.62% Pervious Area
	707		6.38% Impervious Area

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

**Subcatchment P13: Yard Drains to UGC-C**

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Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Runoff = 0.02 cfs @ 12.38 hrs, Volume= 0.004 af, Depth= 0.24"

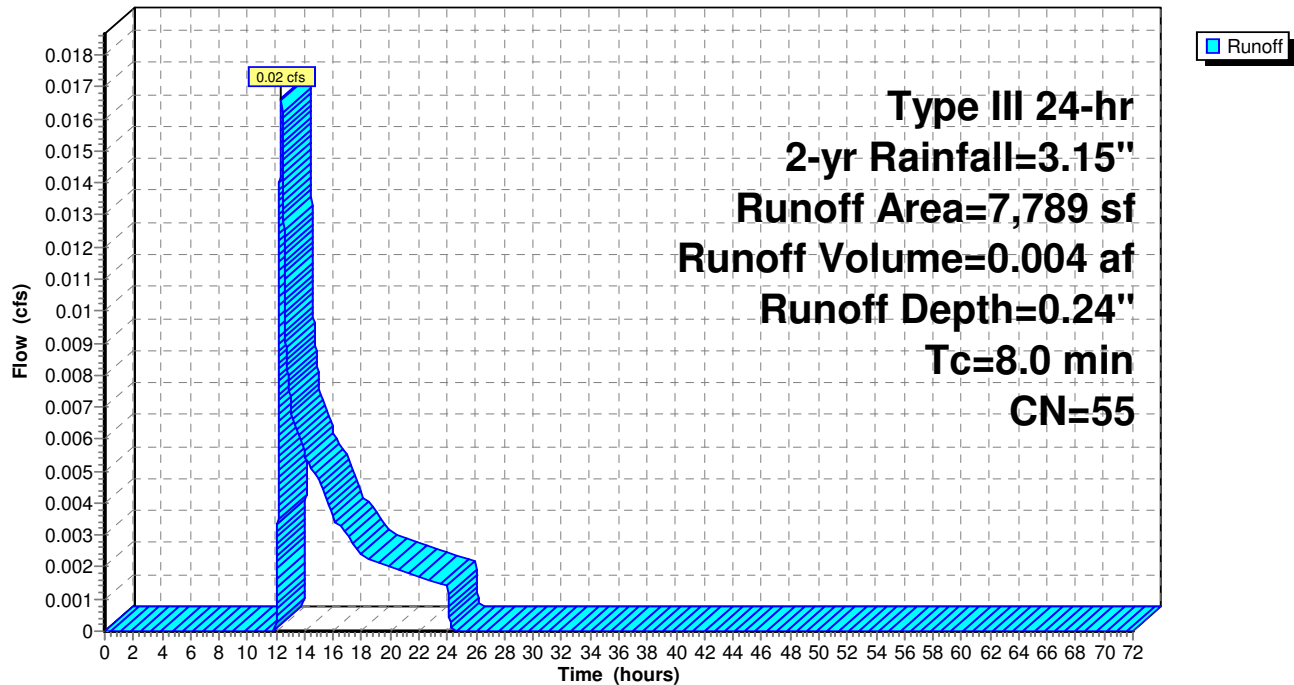
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
2,334	39	>75% Grass cover, Good, HSG A
5,236	61	>75% Grass cover, Good, HSG B
* 219	71	>75% Grass cover, Good, HSG B/D
7,789	55	Weighted Average
7,789		100.00% Pervious Area

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

**Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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### Summary for Subcatchment P3: P3

Runoff = 0.11 cfs @ 12.13 hrs, Volume= 0.011 af, Depth= 0.58"

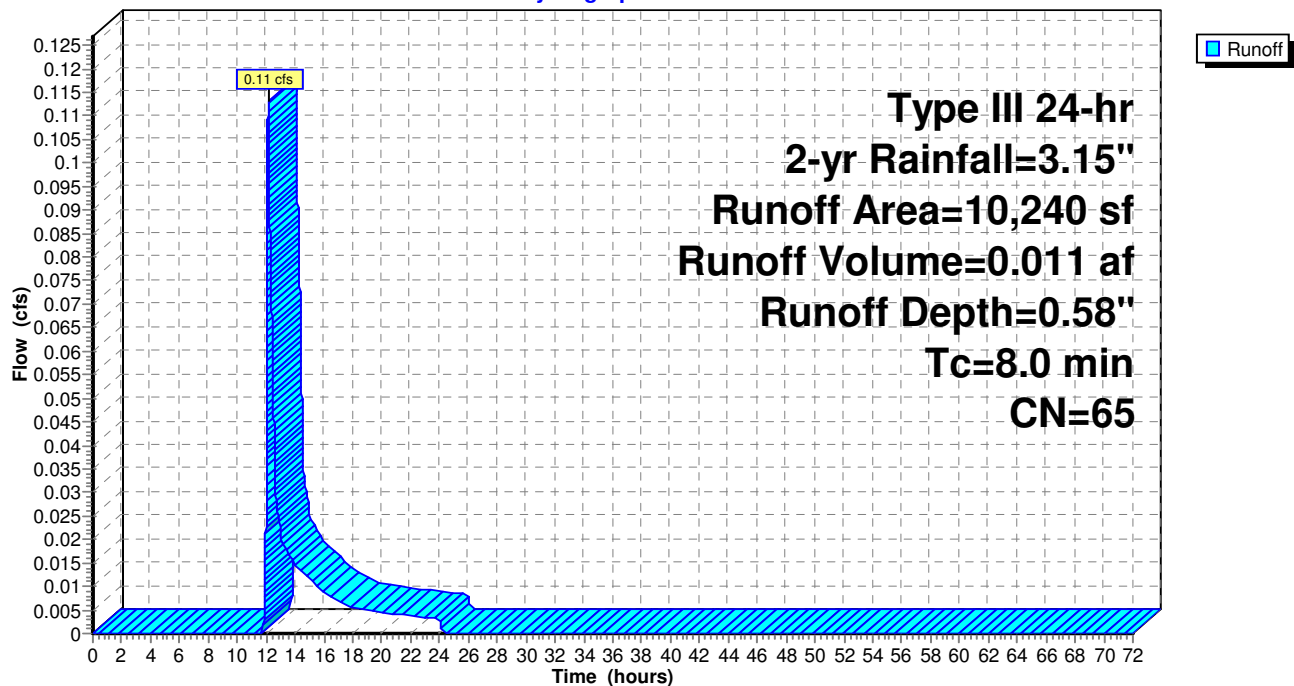
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
2,646	39	>75% Grass cover, Good, HSG A
7,594	74	>75% Grass cover, Good, HSG C
10,240	65	Weighted Average
10,240		100.00% Pervious Area

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

### Subcatchment P3: P3

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Proposed Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment P4: P4**

Runoff = 0.17 cfs @ 12.91 hrs, Volume= 0.036 af, Depth= 0.75"

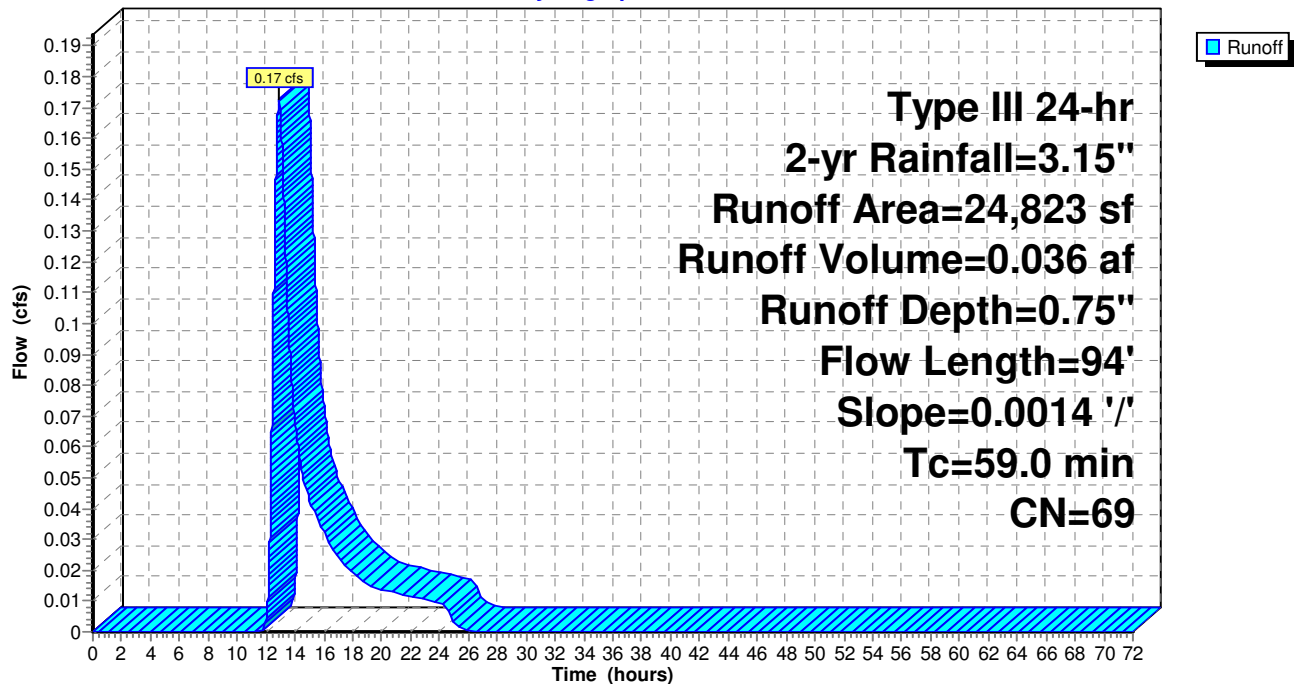
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
4,911	74	>75% Grass cover, Good, HSG C
* 2,000	71	>75% Grass cover, Good, HSG B/D
* 14,330	66	Woods, Good, HSG B/D
3,582	70	Woods, Good, HSG C
24,823	69	Weighted Average
24,823		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
59.0	94	0.0014	0.03		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.22"

**Subcatchment P4: P4**

Hydrograph



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Proposed Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment P5: P5**

Runoff = 1.78 cfs @ 12.68 hrs, Volume= 0.310 af, Depth= 0.75"

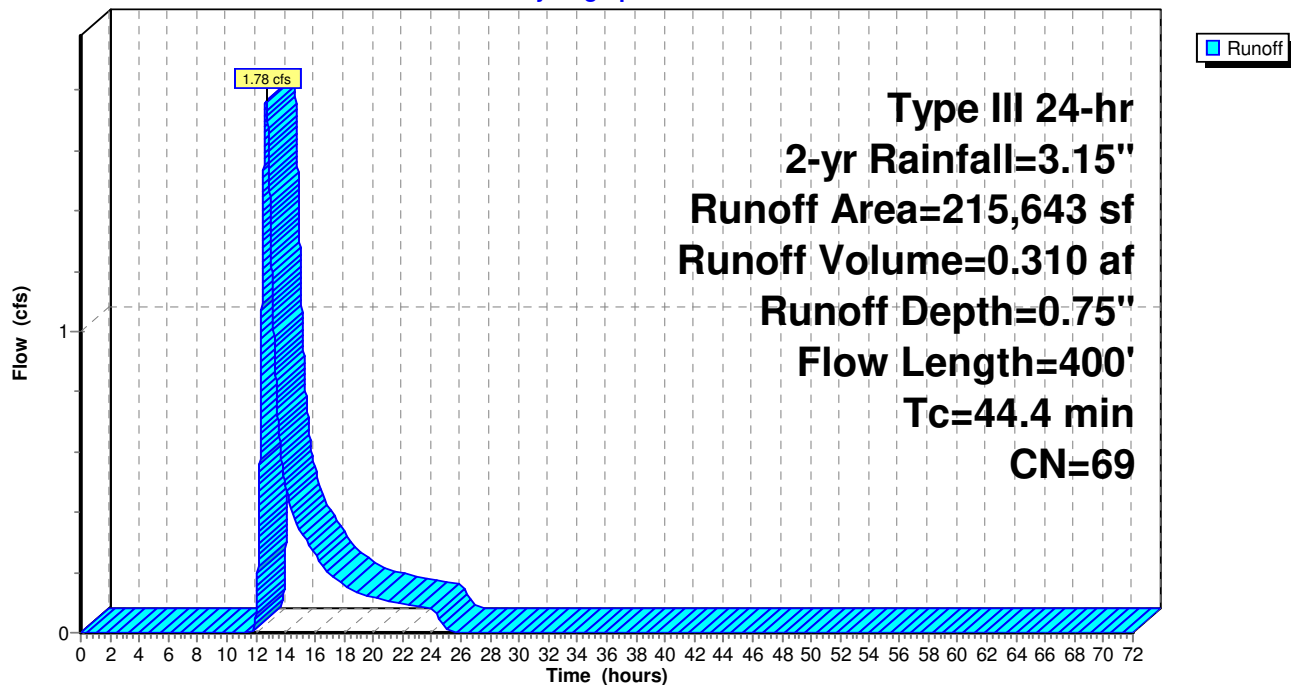
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
1,504	74	>75% Grass cover, Good, HSG C
* 9,745	71	>75% Grass cover, Good, HSG B/D
25,599	70	Woods, Good, HSG C
* 127,460	66	Woods, Good, HSG B/D
* 8,904	98	IMPERVIOUS
* 13,961	68	Meadow, non-grazed, HSG B/D
28,470	71	Meadow, non-grazed, HSG C
215,643	69	Weighted Average
206,739		95.87% Pervious Area
8,904		4.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	23	0.2900	0.25		<b>Sheet Flow, GRASS SF</b> Grass: Dense n= 0.240 P2= 3.22"
22.4	82	0.0120	0.06		<b>Sheet Flow, WOODLAND SF</b> Woods: Light underbrush n= 0.400 P2= 3.22"
20.5	295	0.0023	0.24		<b>Shallow Concentrated Flow, WOOD SCF</b> Woodland Kv= 5.0 fps
44.4	400	Total			

# Subcatchment P5: P5

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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### Summary for Subcatchment P6: Sheet flow To West Basin

Runoff = 12.77 cfs @ 12.09 hrs, Volume= 0.935 af, Depth= 2.40"

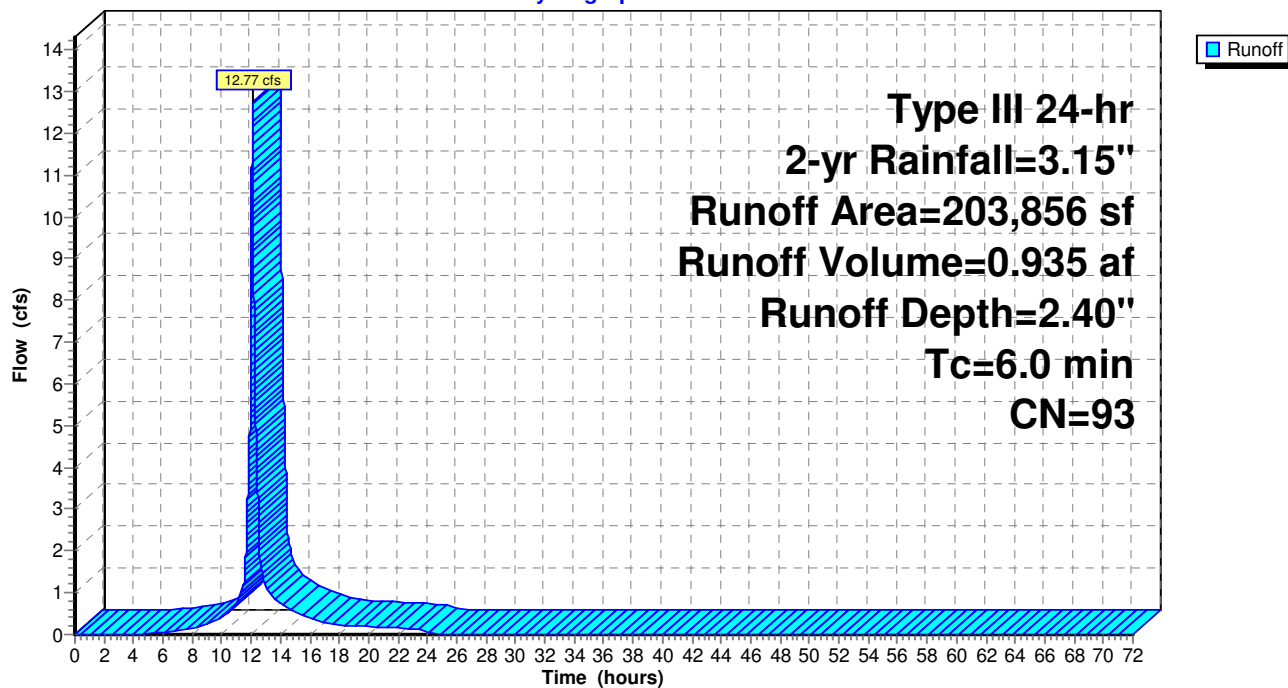
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

Area (sf)	CN	Description
4,918	39	>75% Grass cover, Good, HSG A
6,710	61	>75% Grass cover, Good, HSG B
6,131	74	>75% Grass cover, Good, HSG C
* 9,090	71	>75% Grass cover, Good, HSG B/D
* 177,007	98	IMPERVIOUS
203,856	93	Weighted Average
26,849		13.17% Pervious Area
177,007		86.83% Impervious Area

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

### Subcatchment P6: Sheet flow To West Basin

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment P7: Proposed P7**

Runoff = 0.07 cfs @ 12.42 hrs, Volume= 0.010 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

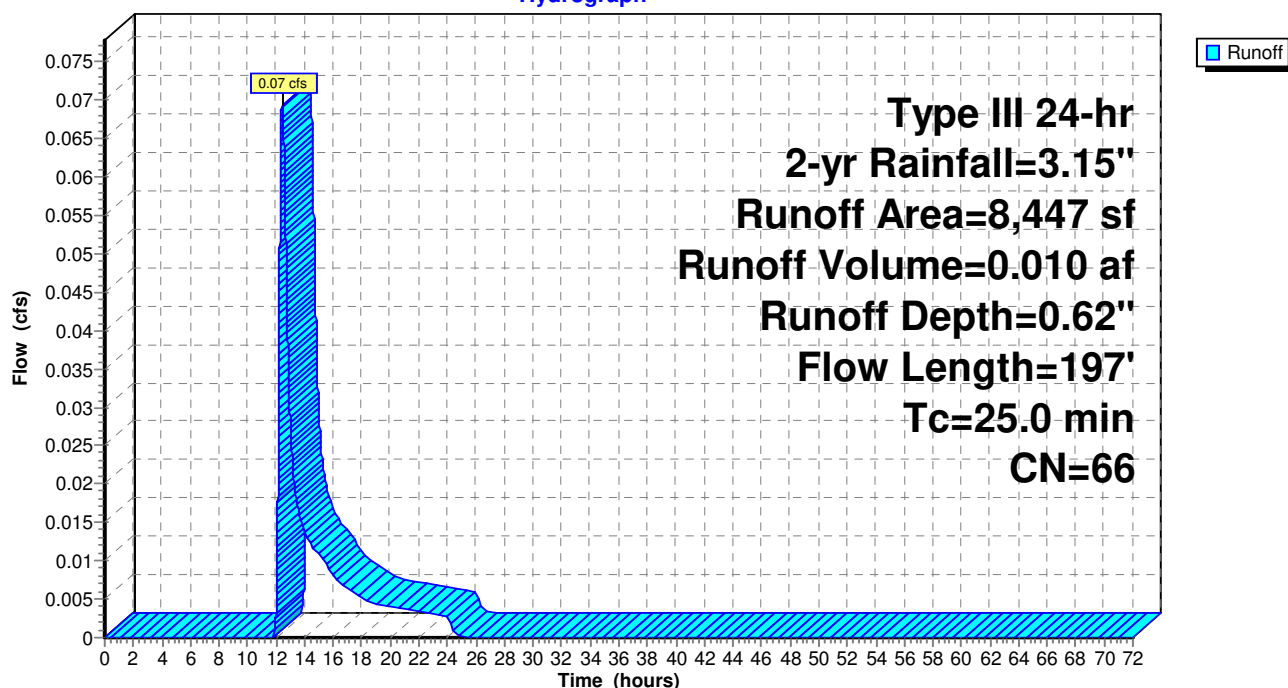
Area (sf)	CN	Description
2,335	39	>75% Grass cover, Good, HSG A
1,709	74	>75% Grass cover, Good, HSG C
* 1,796	98	IMPERVIOUS
450	30	Meadow, non-grazed, HSG A
2,157	71	Meadow, non-grazed, HSG C
8,447	66	Weighted Average
6,651		78.74% Pervious Area
1,796		21.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0160	0.07		<b>Sheet Flow, Woodland SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
1.6	97	0.0420	1.02		<b>Shallow Concentrated Flow, Woodlan SCF</b>
					Woodland Kv= 5.0 fps
25.0	197	Total			

**Subcatchment P7: Proposed P7**

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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### Summary for Subcatchment P8: Proposed Roof to UGC-D (west)

Runoff = 16.99 cfs @ 12.09 hrs, Volume= 1.350 af, Depth= 2.92"

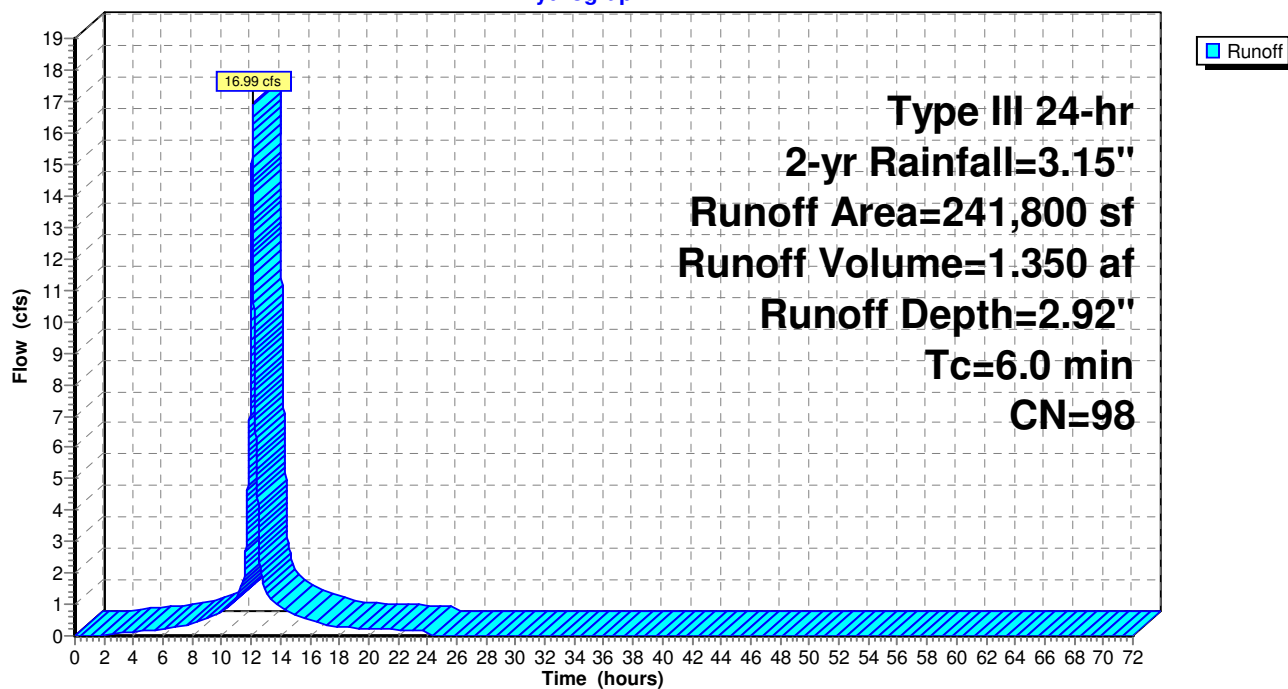
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

	Area (sf)	CN	Description
*	241,800	98	IMPERVIOUS
	241,800		100.00% Impervious Area

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

### Subcatchment P8: Proposed Roof to UGC-D (west)

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Subcatchment P9: Sheetflow to North Basin**

Runoff = 2.33 cfs @ 12.10 hrs, Volume= 0.172 af, Depth= 2.04"

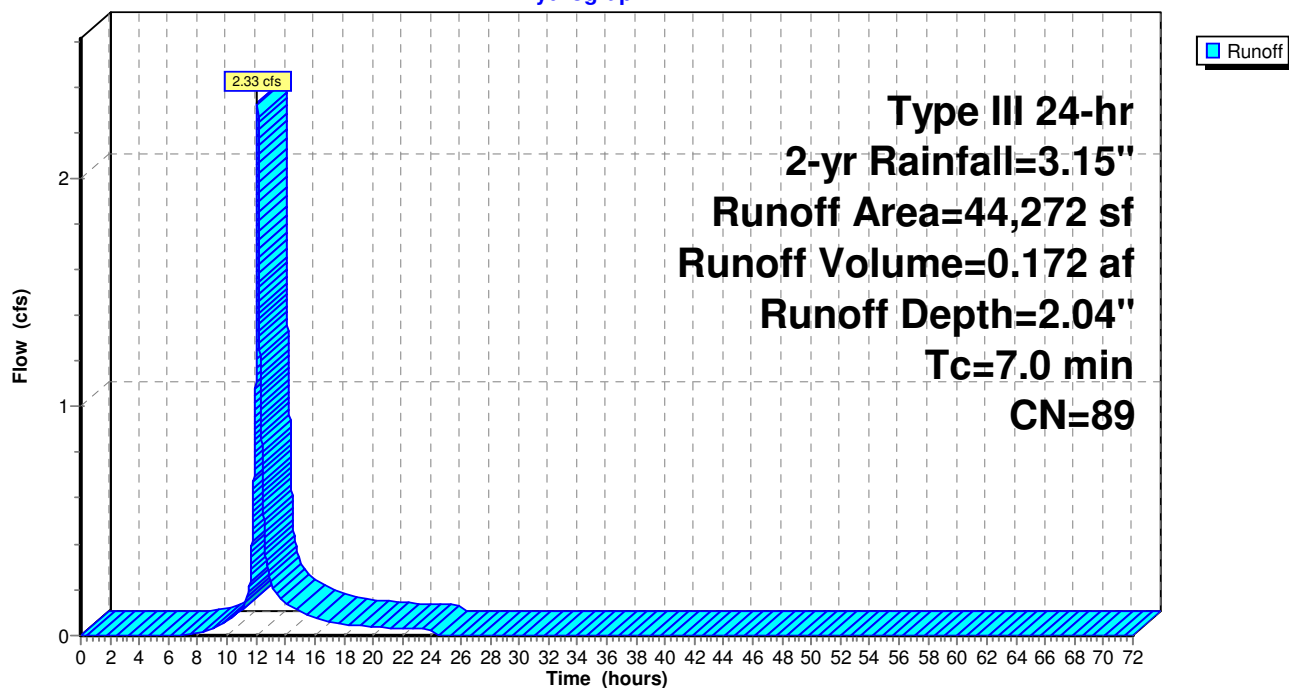
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 2-yr Rainfall=3.15"

	Area (sf)	CN	Description
	14,312	74	>75% Grass cover, Good, HSG C
*	1,743	71	>75% Grass cover, Good, HSG B/D
*	28,217	98	IMPERVIOUS
	44,272	89	Weighted Average
	16,055		36.26% Pervious Area
	28,217		63.74% Impervious Area

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

**Subcatchment P9: Sheetflow to North Basin**

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond DMH: Splitter Structure**



Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 2.39" for 2-yr event  
 Inflow = 1.63 cfs @ 12.22 hrs, Volume= 0.229 af  
 Outflow = 1.63 cfs @ 12.22 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min  
 Primary = 1.14 cfs @ 12.22 hrs, Volume= 0.149 af  
 Secondary = 0.48 cfs @ 12.22 hrs, Volume= 0.081 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 85.17' @ 12.22 hrs

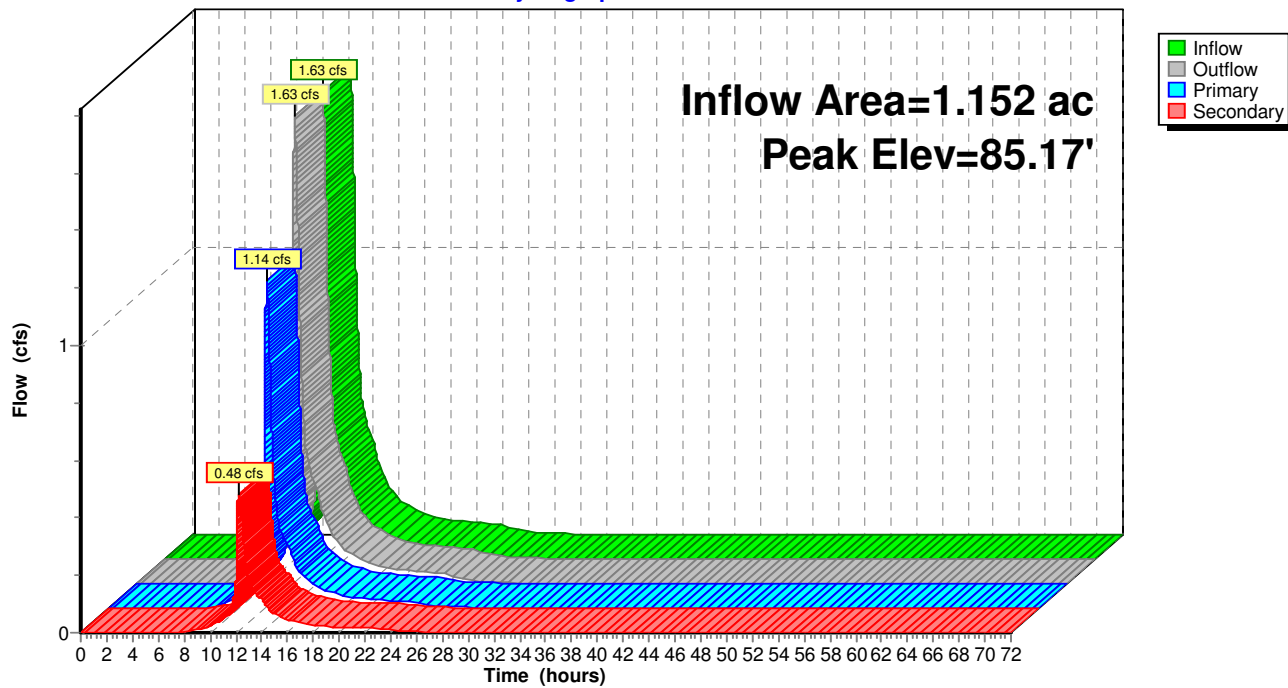
Flood Elev= 85.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	84.55'	<b>15.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	84.55'	<b>6.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.20 sf

**Primary OutFlow** Max=1.14 cfs @ 12.22 hrs HW=85.17' TW=83.72' (Dynamic Tailwater)
 **1=Culvert** (Barrel Controls 1.14 cfs @ 2.74 fps)
**Secondary OutFlow** Max=0.48 cfs @ 12.22 hrs HW=85.17' TW=80.39' (Dynamic Tailwater)
 **2=Culvert** (Barrel Controls 0.48 cfs @ 2.54 fps)

# Pond DMH: Splitter Structure

Hydrograph



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Proposed Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**

Inflow Area = 18.348 ac, 62.57% Impervious, Inflow Depth > 1.88" for 2-yr event  
 Inflow = 2.88 cfs @ 12.68 hrs, Volume= 2.871 af  
 Outflow = 2.86 cfs @ 12.73 hrs, Volume= 2.871 af, Atten= 1%, Lag= 3.0 min  
 Primary = 2.86 cfs @ 12.73 hrs, Volume= 2.871 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.72' @ 12.73 hrs Surf.Area= 942 sf Storage= 537 cf

Plug-Flow detention time= 3.0 min calculated for 2.871 af (100% of inflow)

Center-of-Mass det. time= 2.8 min ( 1,879.9 - 1,877.1 )

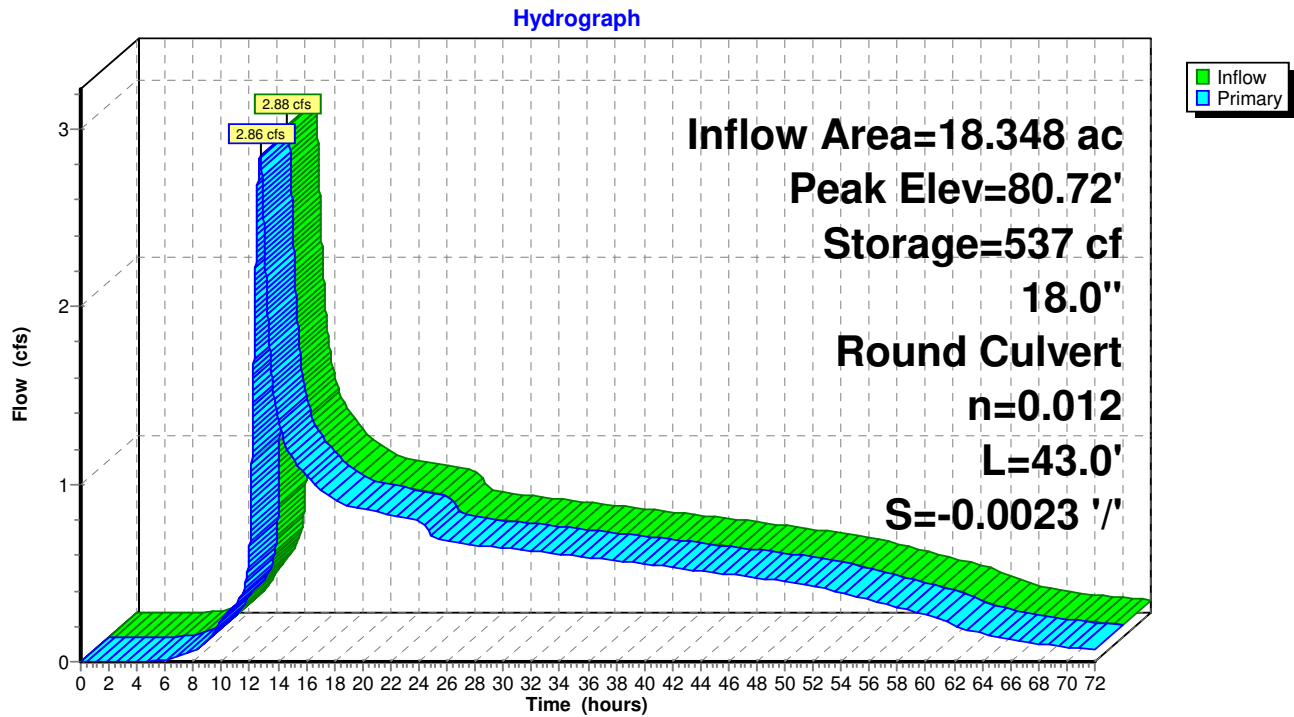
Volume	Invert	Avail.Storage	Storage Description
#1	79.70'	94,801 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.70	10	0	0
80.00	382	59	59
81.00	1,156	769	828
82.00	2,173	1,665	2,492
83.00	29,061	15,617	18,109
84.00	124,323	76,692	94,801

Device	Routing	Invert	Outlet Devices
#1	Primary	79.70'	<b>18.0" Round Culvert</b> L= 43.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 79.60' / 79.70' S= -0.0023 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

**Primary OutFlow** Max=2.86 cfs @ 12.73 hrs HW=80.72' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.86 cfs @ 2.80 fps)

**Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**



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Proposed Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond PP1: UGC-D (Stormtech SC-310)**

Inflow Area = 10.231 ac, 93.98% Impervious, Inflow Depth > 2.60" for 2-yr event  
 Inflow = 17.37 cfs @ 12.09 hrs, Volume= 2.219 af  
 Outflow = 0.62 cfs @ 19.30 hrs, Volume= 2.142 af, Atten= 96%, Lag= 433.0 min  
 Primary = 0.62 cfs @ 19.30 hrs, Volume= 2.142 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 83.92' @ 19.30 hrs Surf.Area= 78,048 sf Storage= 54,354 cf

Plug-Flow detention time= 1,078.0 min calculated for 2.142 af (97% of inflow)  
 Center-of-Mass det. time= 997.1 min ( 2,042.6 - 1,045.5 )

Volume	Invert	Avail.Storage	Storage Description
#1A	82.78'	48,033 cf	<b>108.17'W x 644.00'L x 2.33'H Field A</b> 162,538 cf Overall - 42,457 cf Embedded = 120,082 cf x 40.0% Voids
#2A	83.28'	42,457 cf	<b>ADS_StormTech RC-310 +Cap</b> x 2880 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 2880 Chambers in 32 Rows
#3B	82.78'	6,025 cf	<b>11.50'W x 729.44'L x 2.33'H Field B</b> 19,573 cf Overall - 4,511 cf Embedded = 15,062 cf x 40.0% Voids
#4B	83.28'	4,511 cf	<b>ADS_StormTech SC-310 +Cap</b> x 306 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 306 Chambers in 3 Rows
101,025 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

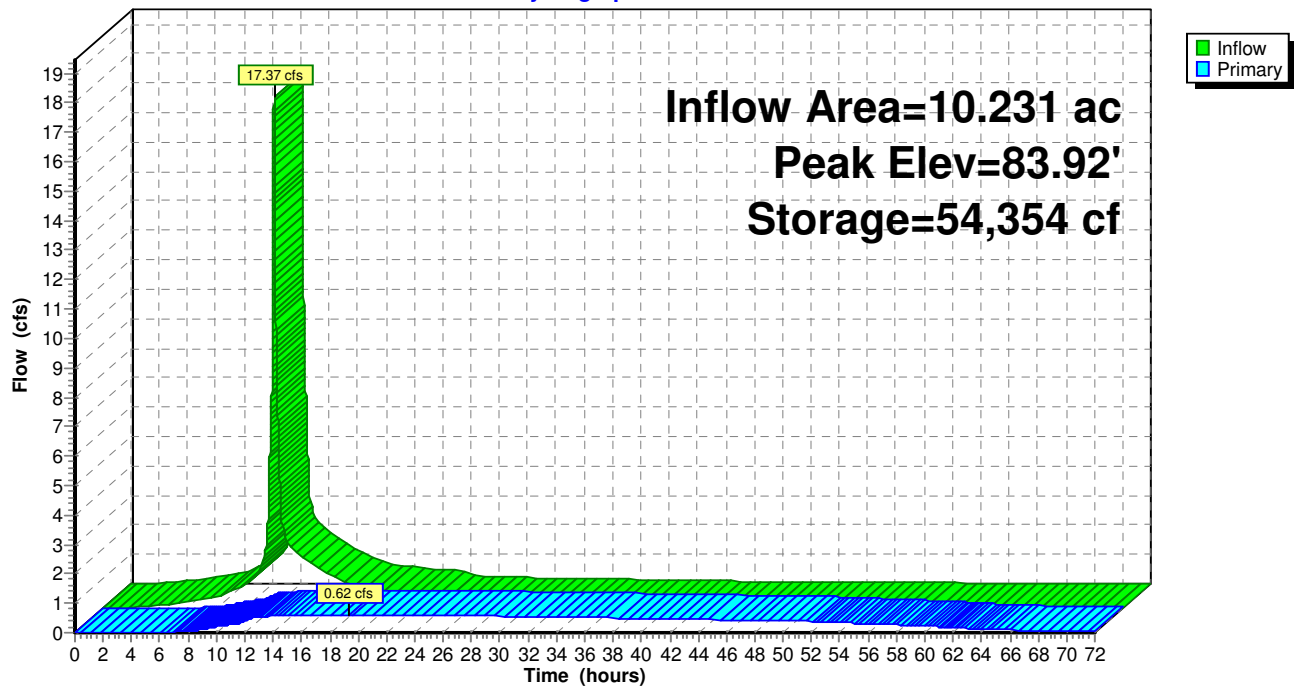
Device	Routing	Invert	Outlet Devices
#1	Primary	82.78'	<b>24.0" Round 24" RCP</b> L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.78' / 82.70' S= 0.0057 ' S= 0.0057 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	82.78'	<b>9.0" W x 2.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	83.95'	<b>24.0" W x 10.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.62 cfs @ 19.30 hrs HW=83.92' TW=80.22' (Dynamic Tailwater)

1=24" RCP (Passes 0.62 cfs of 4.78 cfs potential flow)  
 2=Orifice/Grate (Orifice Controls 0.62 cfs @ 4.94 fps)  
 3=Orifice/Grate ( Controls 0.00 cfs)

**Pond PP1: UGC-D (Stormtech SC-310)**

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Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond PP2: Water Quality Basin (WEST)**

Inflow Area = 4.680 ac, 86.83% Impervious, Inflow Depth = 2.40" for 2-yr event  
 Inflow = 12.77 cfs @ 12.09 hrs, Volume= 0.935 af  
 Outflow = 0.87 cfs @ 13.53 hrs, Volume= 0.869 af, Atten= 93%, Lag= 86.7 min  
 Primary = 0.87 cfs @ 13.53 hrs, Volume= 0.869 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.50' Surf.Area= 39,354 sf Storage= 18,954 cf

Peak Elev= 84.10' @ 13.53 hrs Surf.Area= 42,980 sf Storage= 43,812 cf (24,857 cf above start)

Plug-Flow detention time= 1,387.5 min calculated for 0.434 af (46% of inflow)

Center-of-Mass det. time= 700.8 min ( 1,494.0 - 793.2 )

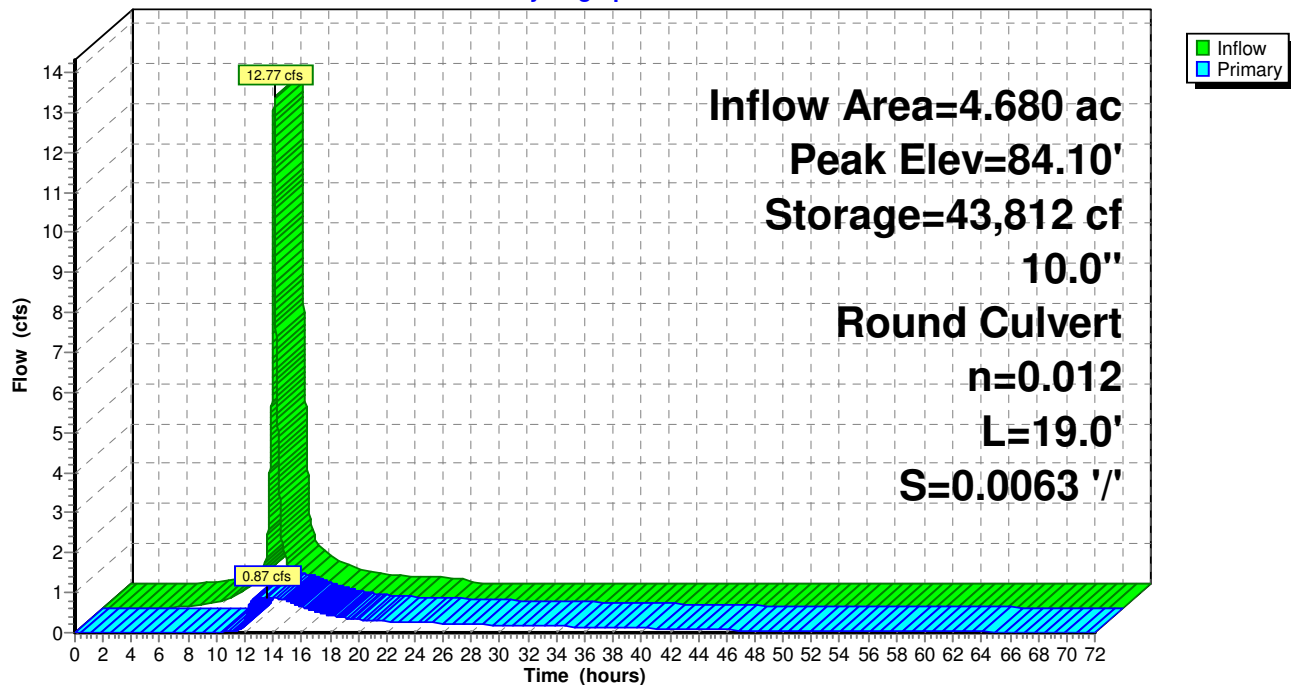
Volume	Invert	Avail.Storage	Storage Description	
#1	83.00'	136,855 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
83.00	36,482	0	0	36,482
84.00	42,335	39,372	39,372	42,377
85.00	48,730	45,495	84,867	48,817
86.00	55,314	51,987	136,855	55,450

Device	Routing	Invert	Outlet Devices
#1	Primary	83.50'	<b>10.0" Round Culvert</b> L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.50' / 83.38' S= 0.0063 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

**Primary OutFlow** Max=0.87 cfs @ 13.53 hrs HW=84.10' TW=83.73' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 0.87 cfs @ 2.88 fps)

# Pond PP2: Water Quality Basin (WEST)

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond PP3: UGC-B (Stormtech SC-310)**

Inflow Area = 1.223 ac, 8.92% Impervious, Inflow Depth = 0.58" for 2-yr event  
 Inflow = 0.61 cfs @ 12.13 hrs, Volume= 0.059 af  
 Outflow = 0.00 cfs @ 24.13 hrs, Volume= 0.002 af, Atten= 99%, Lag= 720.3 min  
 Primary = 0.00 cfs @ 24.13 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.83' @ 24.13 hrs Surf.Area= 4,229 sf Storage= 2,549 cf

Plug-Flow detention time= 1,172.4 min calculated for 0.002 af (3% of inflow)

Center-of-Mass det. time= 993.2 min ( 1,891.1 - 897.9 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,745 cf	<b>4.83'W x 473.12'L x 2.33'H Field A</b> 5,336 cf Overall - 973 cf Embedded = 4,363 cf x 40.0% Voids
#2A	80.23'	973 cf	<b>ADS_StormTech SC-310 +Cap</b> x 66 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,483 cf	<b>4.83'W x 401.92'L x 2.33'H Field B</b> 4,533 cf Overall - 826 cf Embedded = 3,707 cf x 40.0% Voids
#4B	80.23'	826 cf	<b>ADS_StormTech SC-310 +Cap</b> x 56 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,027 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.66'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.66' / 79.27' S= 0.0195 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.00 cfs @ 24.13 hrs HW=80.83' TW=0.00' (Dynamic Tailwater)

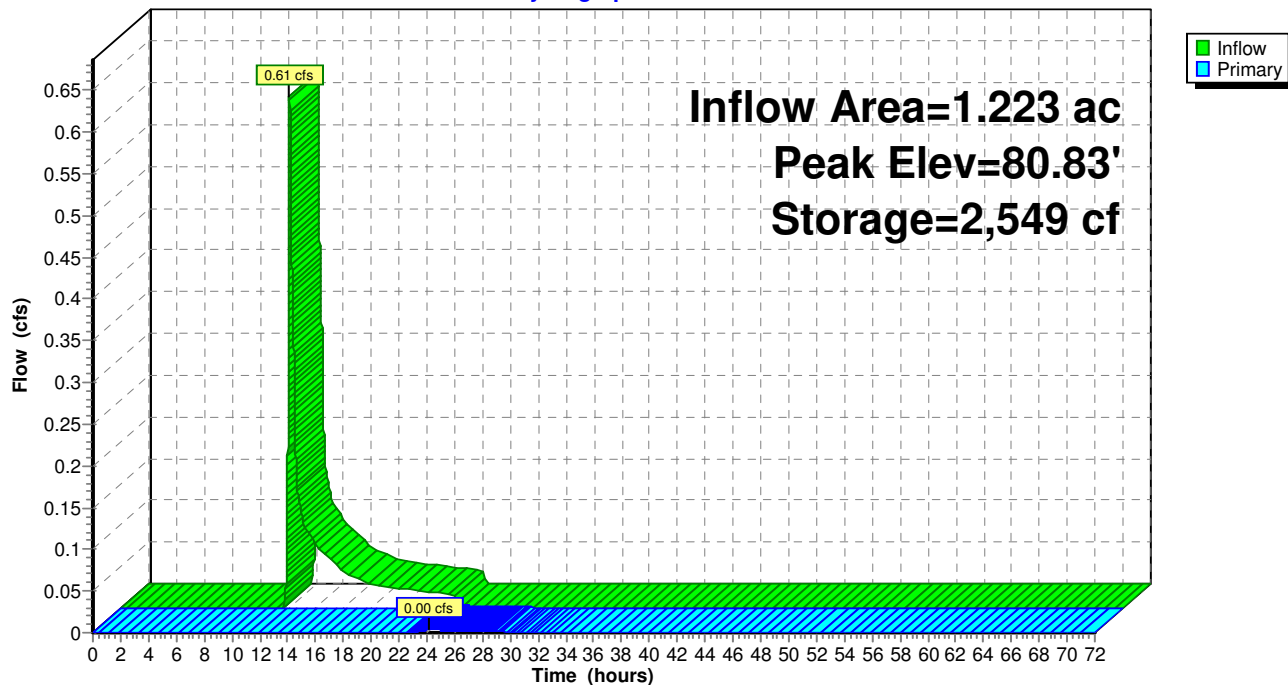
1=12" HDPE OUT (Passes 0.00 cfs of 3.10 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.60 fps)

3=12" HDPE (Passes 0.00 cfs of 0.30 cfs potential flow)

**Pond PP3: UGC-B (Stormtech SC-310)**

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Proposed Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond PP4: Water Quality Basin (North)**

Inflow Area = 2.168 ac, 74.76% Impervious, Inflow Depth = 1.78" for 2-yr event  
 Inflow = 3.17 cfs @ 12.12 hrs, Volume= 0.321 af  
 Outflow = 0.08 cfs @ 18.71 hrs, Volume= 0.282 af, Atten= 97%, Lag= 395.5 min  
 Primary = 0.08 cfs @ 18.71 hrs, Volume= 0.282 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.40' Surf.Area= 14,585 sf Storage= 18,791 cf

Peak Elev= 84.10' @ 18.71 hrs Surf.Area= 15,836 sf Storage= 29,492 cf (10,701 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 1,326.0 min ( 2,158.6 - 832.6 )

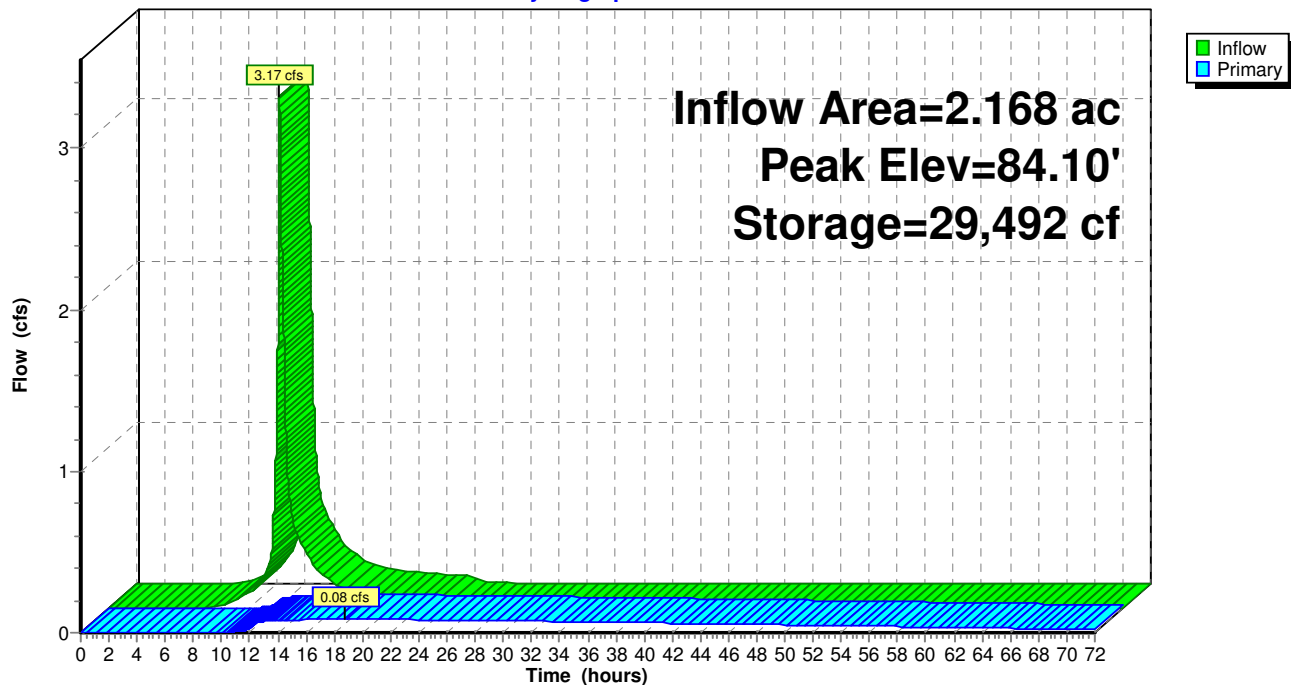
Volume	Invert	Avail.Storage	Storage Description	
#1	82.00'	62,769 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.00	12,313	0	0	12,313
83.00	13,894	13,096	13,096	13,945
84.00	15,654	14,765	27,861	15,757
85.00	17,454	16,546	44,407	17,614
86.00	19,286	18,362	62,769	19,508

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.40' / 83.31' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Device 1	83.40'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.08 cfs @ 18.71 hrs HW=84.10' TW=80.22' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.08 cfs of 1.23 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.08 cfs @ 3.79 fps)

# Pond PP4: Water Quality Basin (North)

Hydrograph



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Proposed Condition  
Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond PP5: UGC-E (Stormtech SC-310)**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 2.40" for 2-yr event  
 Inflow = 3.14 cfs @ 12.09 hrs, Volume= 0.230 af  
 Outflow = 1.63 cfs @ 12.22 hrs, Volume= 0.229 af, Atten= 48%, Lag= 8.1 min  
 Primary = 1.63 cfs @ 12.22 hrs, Volume= 0.229 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 86.41' @ 12.22 hrs Surf.Area= 4,780 sf Storage= 2,671 cf

Plug-Flow detention time= 68.5 min calculated for 0.229 af (100% of inflow)  
 Center-of-Mass det. time= 66.8 min ( 860.1 - 793.2 )

Volume	Invert	Avail.Storage	Storage Description
#1A	85.38'	1,929 cf	<b>4.83'W x 522.96'L x 2.33'H Field A</b> 5,898 cf Overall - 1,076 cf Embedded = 4,822 cf x 40.0% Voids
#2A	85.88'	1,076 cf	<b>ADS_StormTech SC-310 +Cap</b> x 73 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	85.38'	1,719 cf	<b>4.83'W x 466.00'L x 2.33'H Field B</b> 5,255 cf Overall - 958 cf Embedded = 4,297 cf x 40.0% Voids
#4B	85.88'	958 cf	<b>ADS_StormTech SC-310 +Cap</b> x 65 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,682 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.38'	<b>15.0" Round 15" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.28' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	85.95'	<b>10.0" Round ORIFICE A X 2.00</b> L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.95' / 85.92' S= 0.0060 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf
#3	Device 1	85.38'	<b>6.0" Round ORIFICE B</b> L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.31' S= 0.0020 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=1.63 cfs @ 12.22 hrs HW=86.41' TW=85.17' (Dynamic Tailwater)

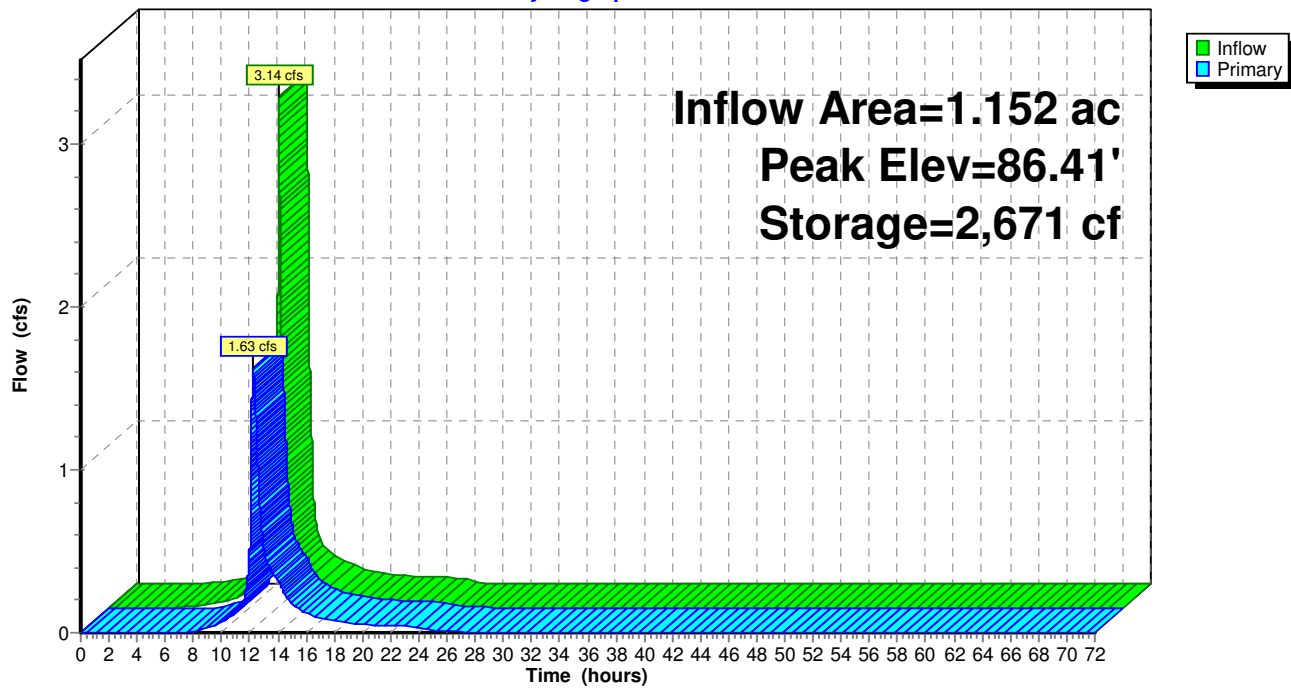
1=15" HDPE OUT (Passes 1.63 cfs of 2.82 cfs potential flow)

2=ORIFICE A (Barrel Controls 1.00 cfs @ 2.34 fps)

3=ORIFICE B (Barrel Controls 0.62 cfs @ 3.17 fps)

**Pond PP5: UGC-E (Stormtech SC-310)**

Hydrograph



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**Summary for Pond PP6: Water Quality Basin (Kennedy Road)**

Inflow Area = 0.956 ac, 70.56% Impervious, Inflow Depth = 2.04" for 2-yr event  
 Inflow = 2.27 cfs @ 12.09 hrs, Volume= 0.162 af  
 Outflow = 0.33 cfs @ 12.61 hrs, Volume= 0.161 af, Atten= 86%, Lag= 31.2 min  
 Primary = 0.33 cfs @ 12.61 hrs, Volume= 0.161 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 80.00' Surf.Area= 5,601 sf Storage= 11,033 cf

Peak Elev= 80.57' @ 12.61 hrs Surf.Area= 6,196 sf Storage= 14,381 cf (3,348 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 208.2 min ( 1,019.9 - 811.7 )

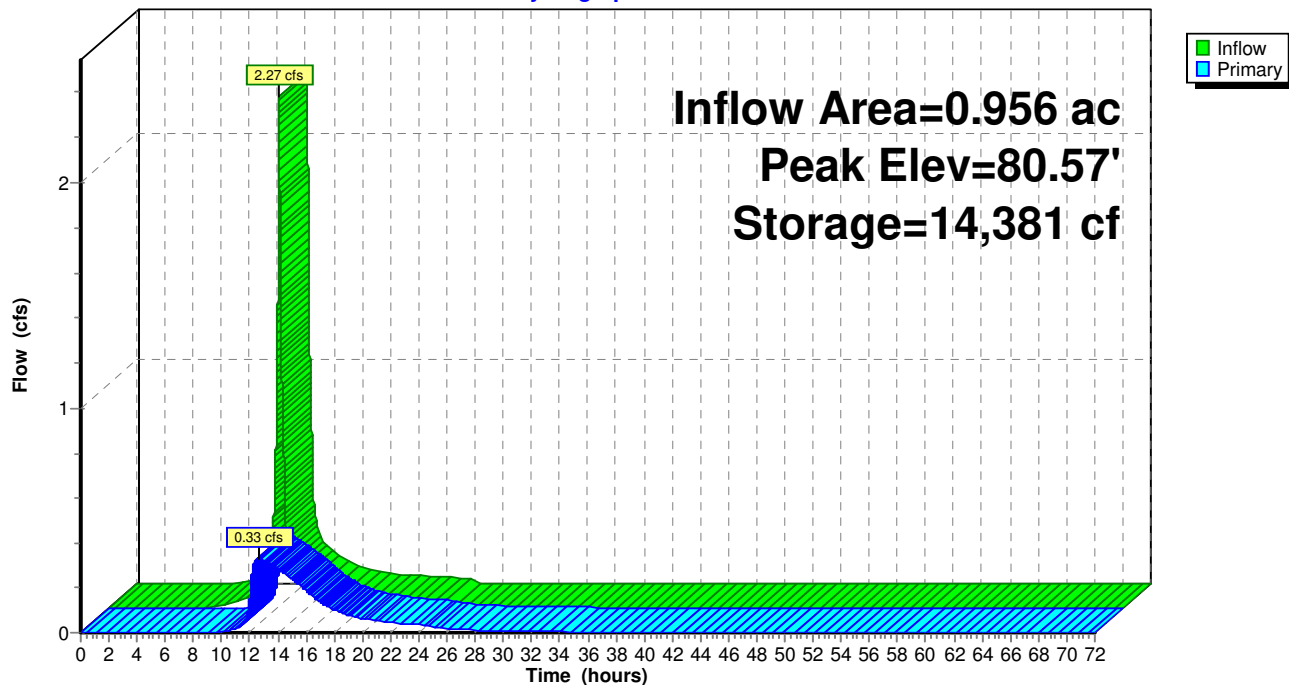
Volume	Invert	Avail.Storage	Storage Description	
#1	75.00'	42,367 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.00	239	0	0	239
76.00	786	486	486	791
77.00	1,382	1,070	1,556	1,399
78.00	2,063	1,711	3,267	2,095
78.80	2,824	1,947	5,214	2,869
79.00	4,585	734	5,948	4,630
80.00	5,601	5,085	11,033	5,677
81.00	6,669	6,127	17,160	6,781
82.00	7,793	7,224	24,384	7,944
83.00	8,973	8,376	32,760	9,168
84.00	10,257	9,608	42,367	10,498

Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 79.91' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	80.00'	<b>4.5" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.33 cfs @ 12.61 hrs HW=80.57' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.33 cfs of 0.83 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.33 cfs @ 2.97 fps)

**Pond PP6: Water Quality Basin (Kennedy Road)**

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond PP7: UGC-A (Stormtech SC-310)**

Inflow Area = 1.161 ac, 17.93% Impervious, Inflow Depth = 1.00" for 2-yr event  
 Inflow = 1.25 cfs @ 12.11 hrs, Volume= 0.097 af  
 Outflow = 0.02 cfs @ 24.04 hrs, Volume= 0.078 af, Atten= 98%, Lag= 716.0 min  
 Primary = 0.02 cfs @ 24.04 hrs, Volume= 0.078 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.33' @ 24.04 hrs Surf.Area= 12,415 sf Storage= 3,421 cf

Plug-Flow detention time= 1,542.7 min calculated for 0.078 af (80% of inflow)

Center-of-Mass det. time= 1,462.1 min ( 2,326.1 - 864.0 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	6,730 cf	<b>11.50'W x 814.88'L x 2.33'H Field A</b> 21,866 cf Overall - 5,042 cf Embedded = 16,824 cf x 40.0% Voids
#2A	80.23'	5,042 cf	<b>ADS_StormTech SC-310 +Cap</b> x 342 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 342 Chambers in 3 Rows
#3B	79.73'	2,322 cf	<b>4.83'W x 629.76'L x 2.33'H Field B</b> 7,102 cf Overall - 1,297 cf Embedded = 5,805 cf x 40.0% Voids
#4B	80.23'	1,297 cf	<b>ADS_StormTech SC-310 +Cap</b> x 88 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		15,391 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

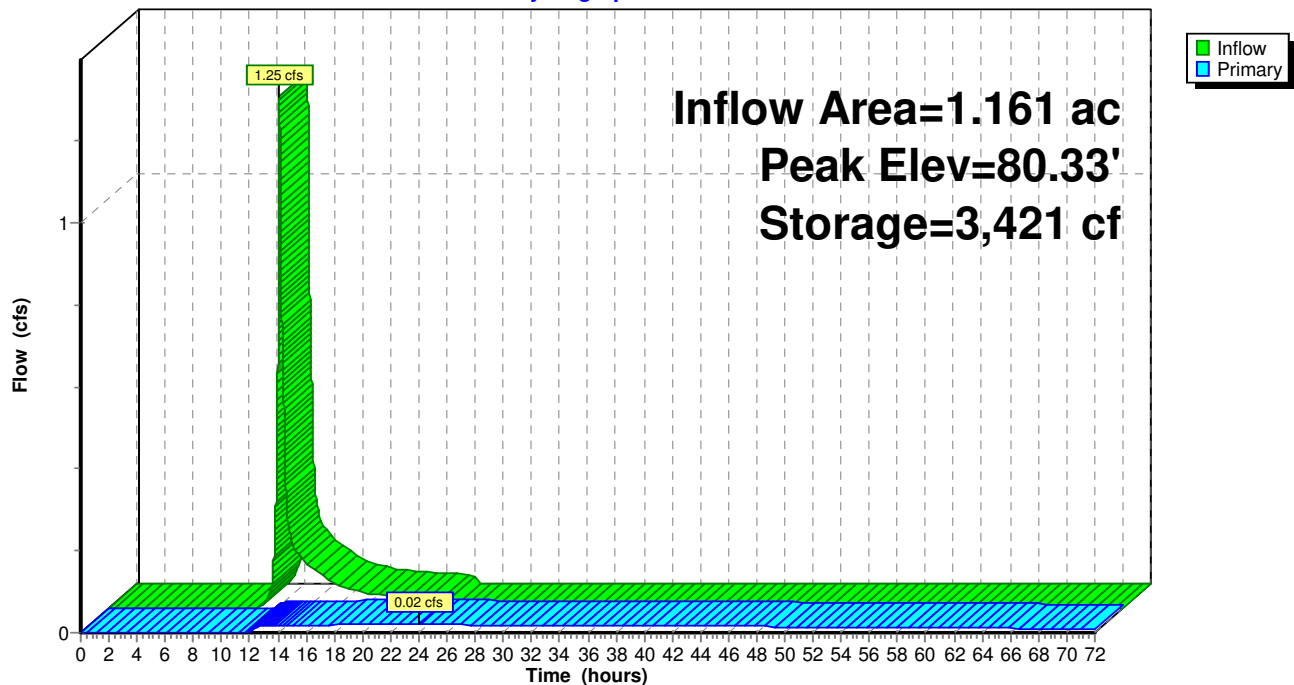
Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.35'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	79.73'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	81.86'	<b>9.0" W x 3.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.02 cfs @ 24.04 hrs HW=80.33' TW=0.00' (Dynamic Tailwater)

1=12" HDPE (Passes 0.02 cfs of 0.95 cfs potential flow)  
 2=Orifice/Grate ( Controls 0.00 cfs)  
 3=Orifice/Grate (Orifice Controls 0.02 cfs @ 3.60 fps)  
 4=Orifice/Grate ( Controls 0.00 cfs)

**Pond PP7: UGC-A (Stormtech SC-310)**

Hydrograph



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Type III 24-hr 2-yr Rainfall=3.15"

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**Summary for Pond PP8: UGC-C (Stormtech SC-310)**

Inflow Area = 0.254 ac, 6.38% Impervious, Inflow Depth = 0.50" for 2-yr event  
 Inflow = 0.10 cfs @ 12.13 hrs, Volume= 0.011 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.09' @ 24.39 hrs Surf.Area= 3,231 sf Storage= 459 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,299 cf	<b>4.83'W x 352.08'L x 2.33'H Field A</b> 3,971 cf Overall - 722 cf Embedded = 3,248 cf x 40.0% Voids
#2A	80.23'	722 cf	<b>ADS_StormTech SC-310 +Cap</b> x 49 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,168 cf	<b>4.83'W x 316.48'L x 2.33'H Field B</b> 3,569 cf Overall - 649 cf Embedded = 2,921 cf x 40.0% Voids
#4B	80.23'	649 cf	<b>ADS_StormTech SC-310 +Cap</b> x 44 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		3,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=79.73' TW=0.00' (Dynamic Tailwater)

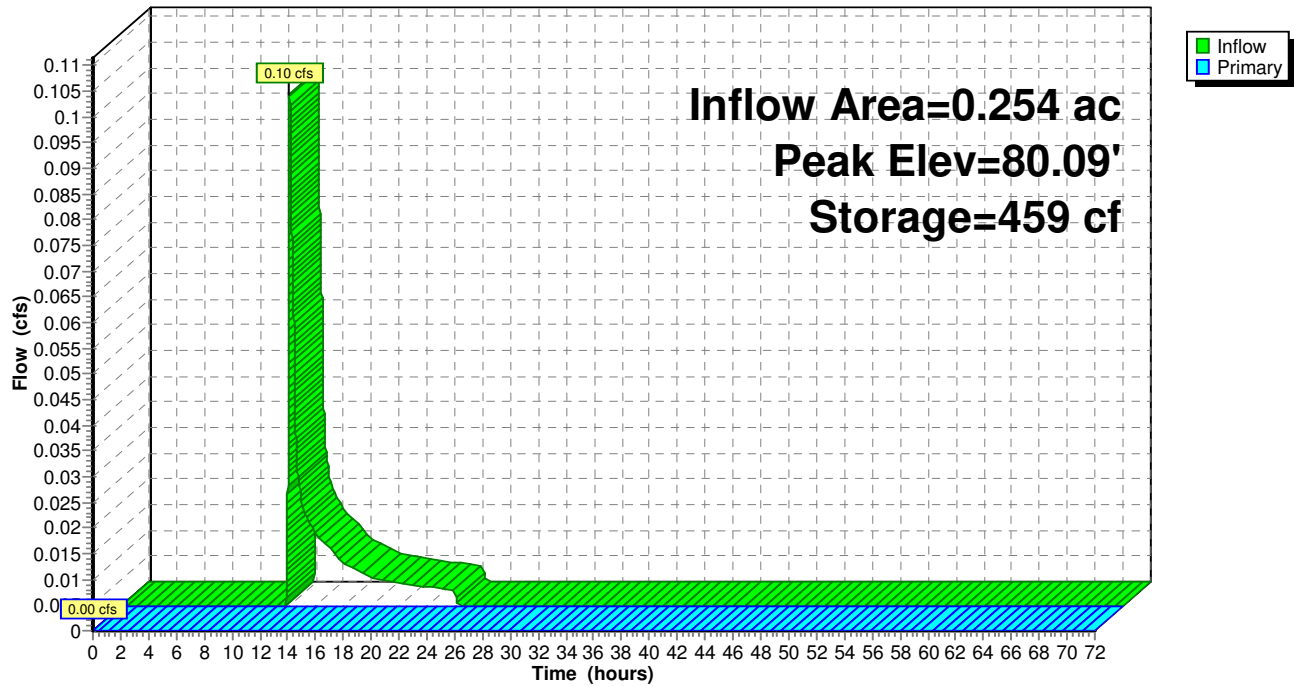
1=12" HDPE OUT ( Controls 0.00 cfs)

2=Orifice/Grate ( Controls 0.00 cfs)

3=12" HDPE ( Controls 0.00 cfs)

**Pond PP8: UGC-C (Stormtech SC-310)**

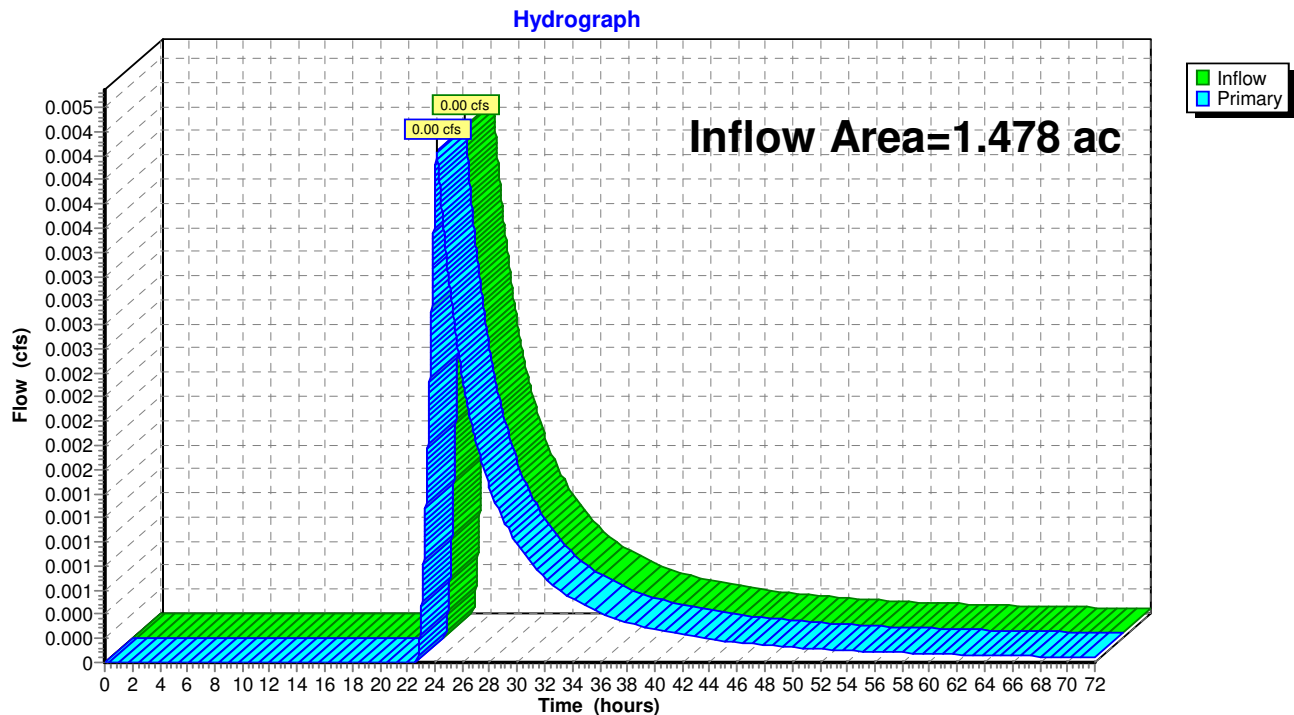
Hydrograph



**Summary for Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

Inflow Area = 1.478 ac, 8.48% Impervious, Inflow Depth > 0.02" for 2-yr event  
Inflow = 0.00 cfs @ 24.13 hrs, Volume= 0.002 af  
Primary = 0.00 cfs @ 24.13 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

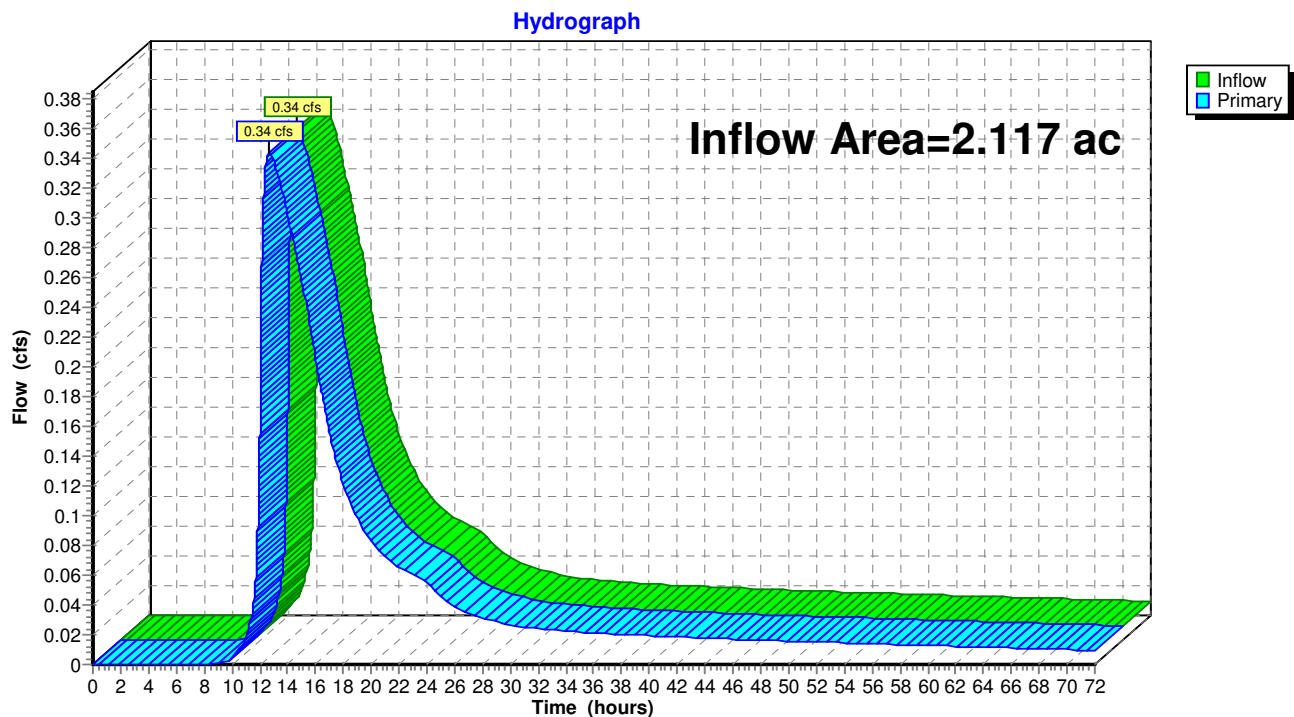
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

**Summary for Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

Inflow Area = 2.117 ac, 41.71% Impervious, Inflow Depth > 1.35" for 2-yr event  
Inflow = 0.34 cfs @ 12.63 hrs, Volume= 0.239 af  
Primary = 0.34 cfs @ 12.63 hrs, Volume= 0.239 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Subcatchment P1: Yard Drains to UGC-B**

Runoff = 2.17 cfs @ 12.11 hrs, Volume= 0.168 af, Depth= 1.65"

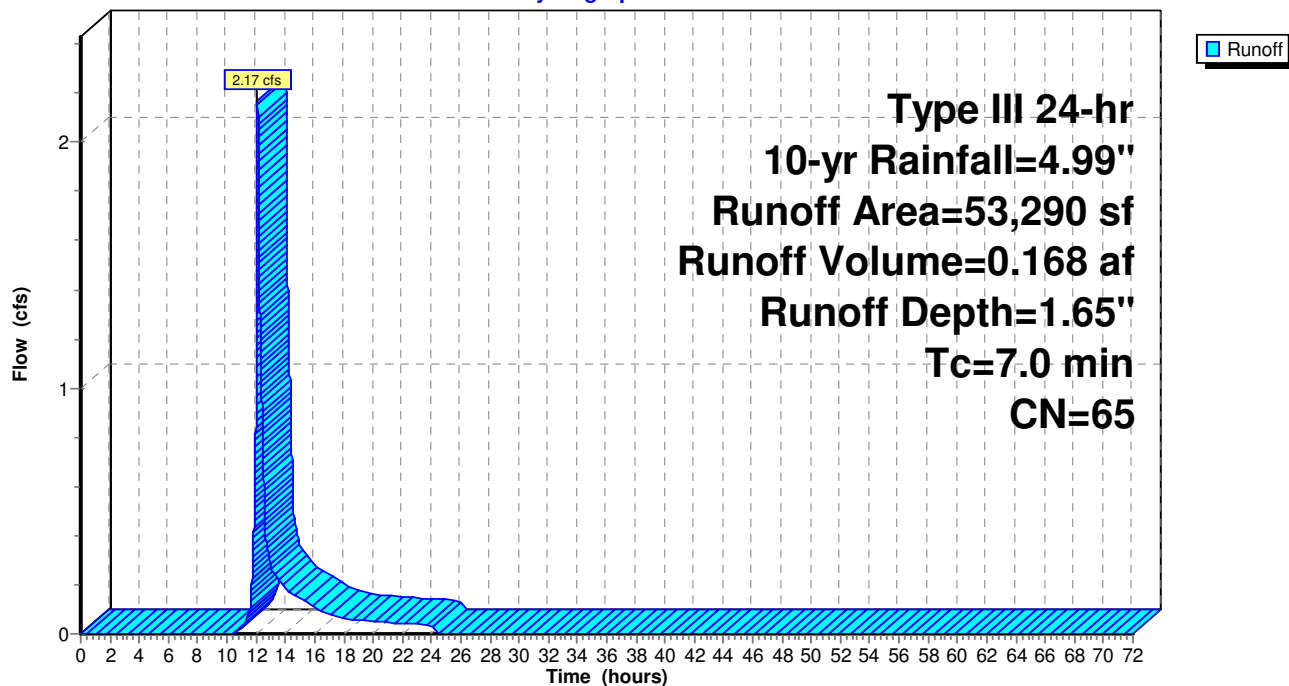
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

Area (sf)	CN	Description
45,366	61	>75% Grass cover, Good, HSG B
3,169	80	>75% Grass cover, Good, HSG D
* 2	71	>75% Grass cover, Good, HSG B/D
* 4,753	98	IMPERVIOUS
53,290	65	Weighted Average
48,537		91.08% Pervious Area
4,753		8.92% Impervious Area

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

**Subcatchment P1: Yard Drains to UGC-B**

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Subcatchment P10: CB's to UGC-E (East)**

Runoff = 5.32 cfs @ 12.09 hrs, Volume= 0.402 af, Depth= 4.19"

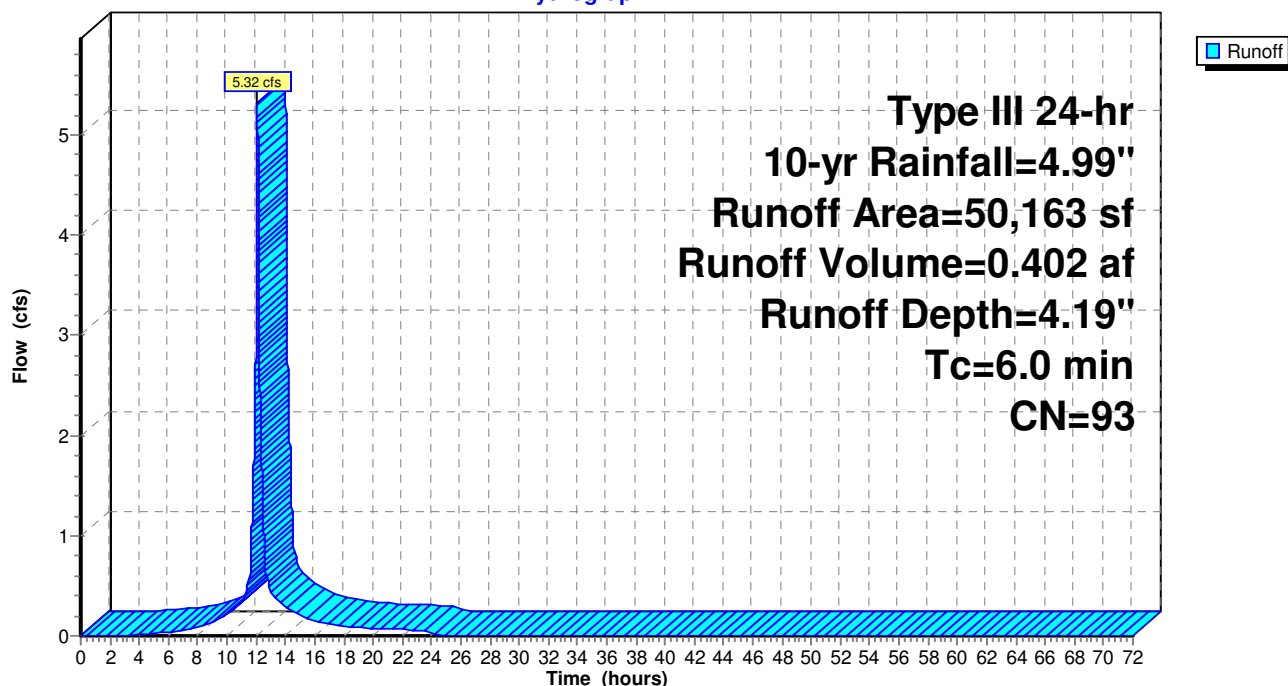
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

Area (sf)	CN	Description
922	74	>75% Grass cover, Good, HSG C
2,430	61	>75% Grass cover, Good, HSG B
* 4,429	71	>75% Grass cover, Good, HSG B/D
* 42,382	98	IMPERVIOUS
50,163	93	Weighted Average
7,781		15.51% Pervious Area
42,382		84.49% Impervious Area

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

**Subcatchment P10: CB's to UGC-E (East)**

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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### Summary for Subcatchment P11: Culdesac

Runoff = 4.10 cfs @ 12.09 hrs, Volume= 0.300 af, Depth= 3.76"

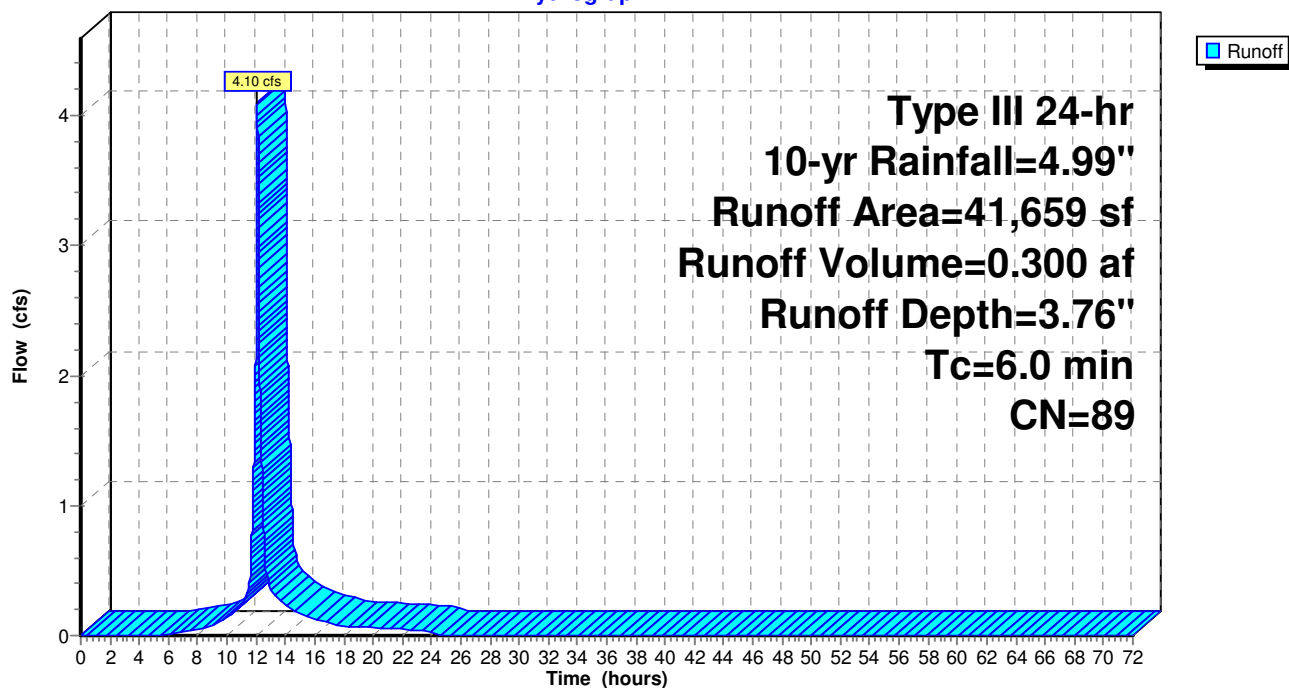
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

	Area (sf)	CN	Description
*	29,394	98	IMPERVIOUS
	2,607	61	>75% Grass cover, Good, HSG B
*	9,658	71	>75% Grass cover, Good, HSG B/D
	41,659	89	Weighted Average
	12,265		29.44% Pervious Area
	29,394		70.56% Impervious Area

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

### Subcatchment P11: Culdesac

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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### Summary for Subcatchment P12: Yard Drains to UGC-A

Runoff = 3.08 cfs @ 12.10 hrs, Volume= 0.228 af, Depth= 2.36"

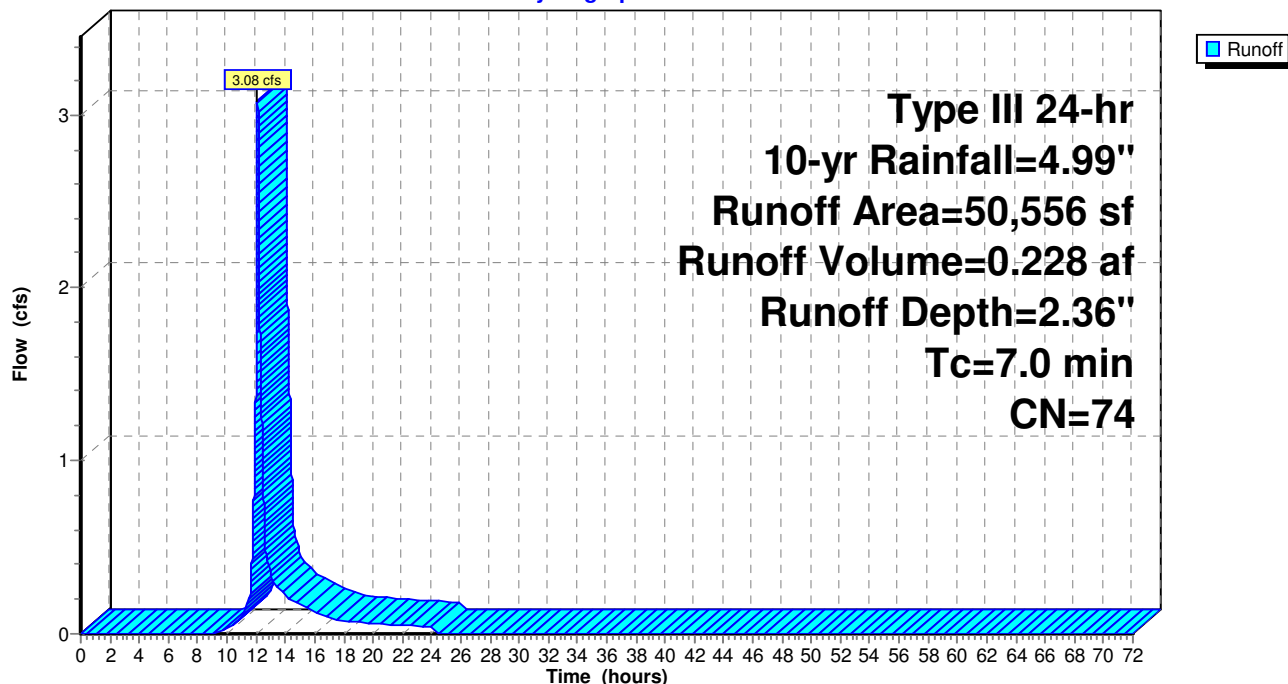
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

	Area (sf)	CN	Description
*	9,067	98	IMPERVIOUS
	12,690	61	>75% Grass cover, Good, HSG B
	4,707	74	>75% Grass cover, Good, HSG C
*	24,092	71	>75% Grass cover, Good, HSG B/D
	50,556	74	Weighted Average
	41,489		82.07% Pervious Area
	9,067		17.93% Impervious Area

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

### Subcatchment P12: Yard Drains to UGC-A

Hydrograph



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**Summary for Subcatchment P13: Yard Drains to UGC-C**

Runoff = 0.40 cfs @ 12.11 hrs, Volume= 0.032 af, Depth= 1.50"

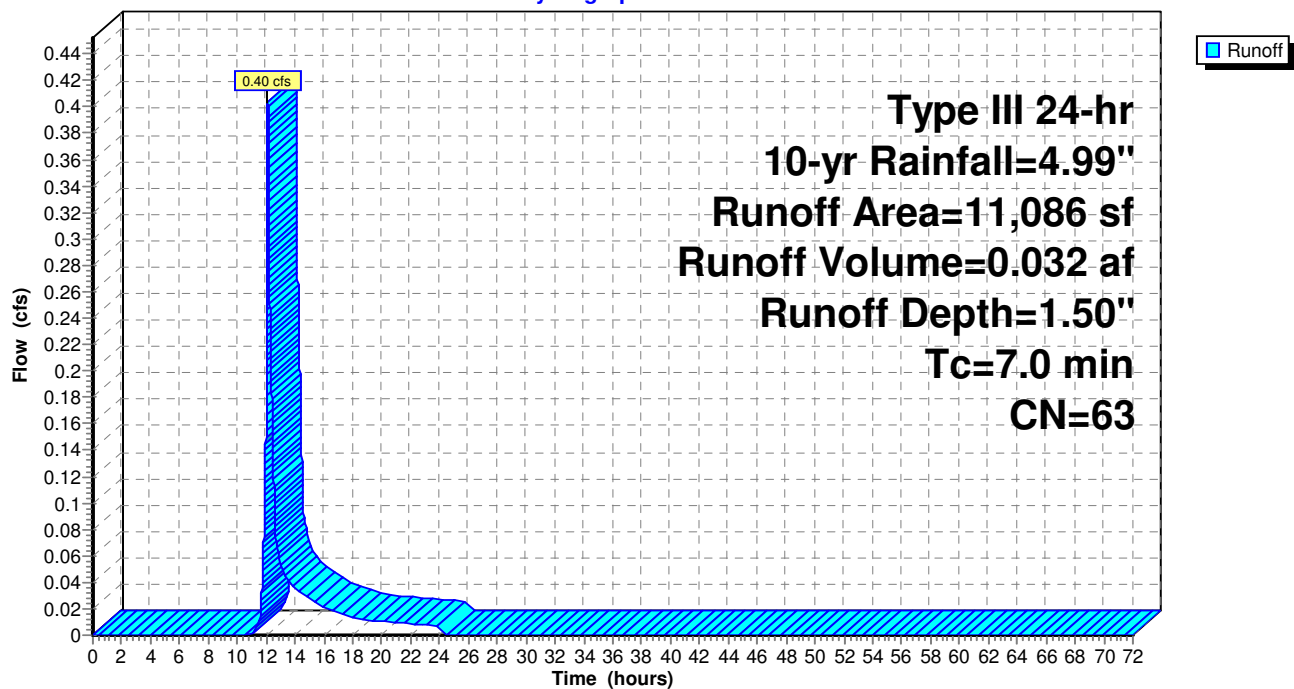
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

	Area (sf)	CN	Description
*	707	98	IMPERVIOUS
	10,379	61	>75% Grass cover, Good, HSG B
	11,086	63	Weighted Average
	10,379		93.62% Pervious Area
	707		6.38% Impervious Area

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

**Subcatchment P13: Yard Drains to UGC-C**

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Runoff = 0.15 cfs @ 12.13 hrs, Volume= 0.015 af, Depth= 0.97"

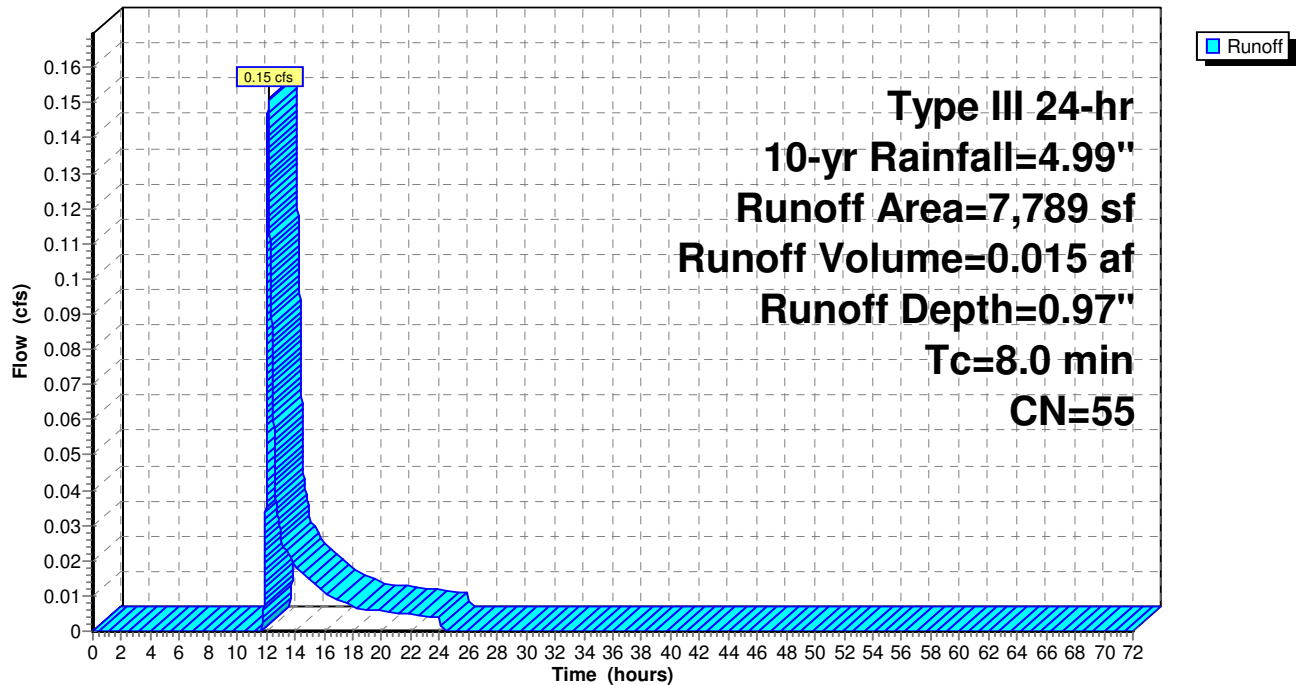
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

Area (sf)	CN	Description
2,334	39	>75% Grass cover, Good, HSG A
5,236	61	>75% Grass cover, Good, HSG B
* 219	71	>75% Grass cover, Good, HSG B/D
7,789	55	Weighted Average
7,789		100.00% Pervious Area

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

**Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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### Summary for Subcatchment P3: P3

Runoff = 0.40 cfs @ 12.12 hrs, Volume= 0.032 af, Depth= 1.65"

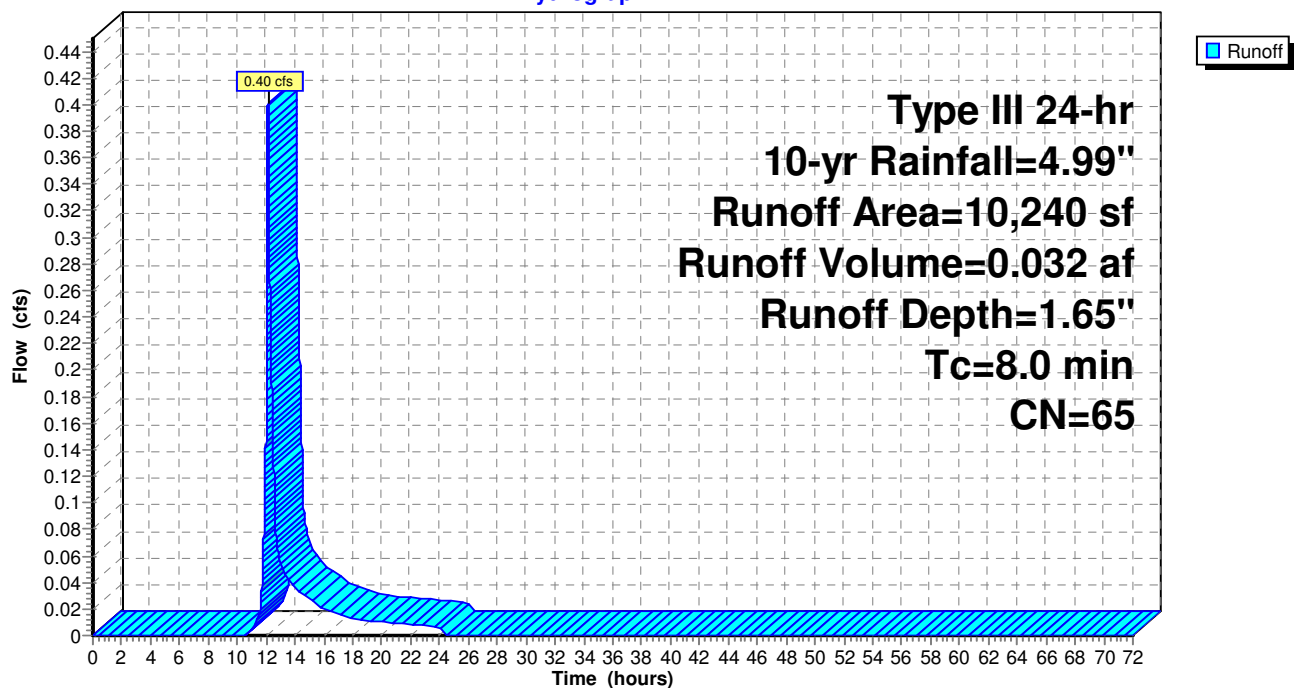
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

Area (sf)	CN	Description
2,646	39	>75% Grass cover, Good, HSG A
7,594	74	>75% Grass cover, Good, HSG C
10,240	65	Weighted Average
10,240		100.00% Pervious Area

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

### Subcatchment P3: P3

Hydrograph



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Proposed Condition  
Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Subcatchment P4: P4**

Runoff = 0.50 cfs @ 12.85 hrs, Volume= 0.093 af, Depth= 1.95"

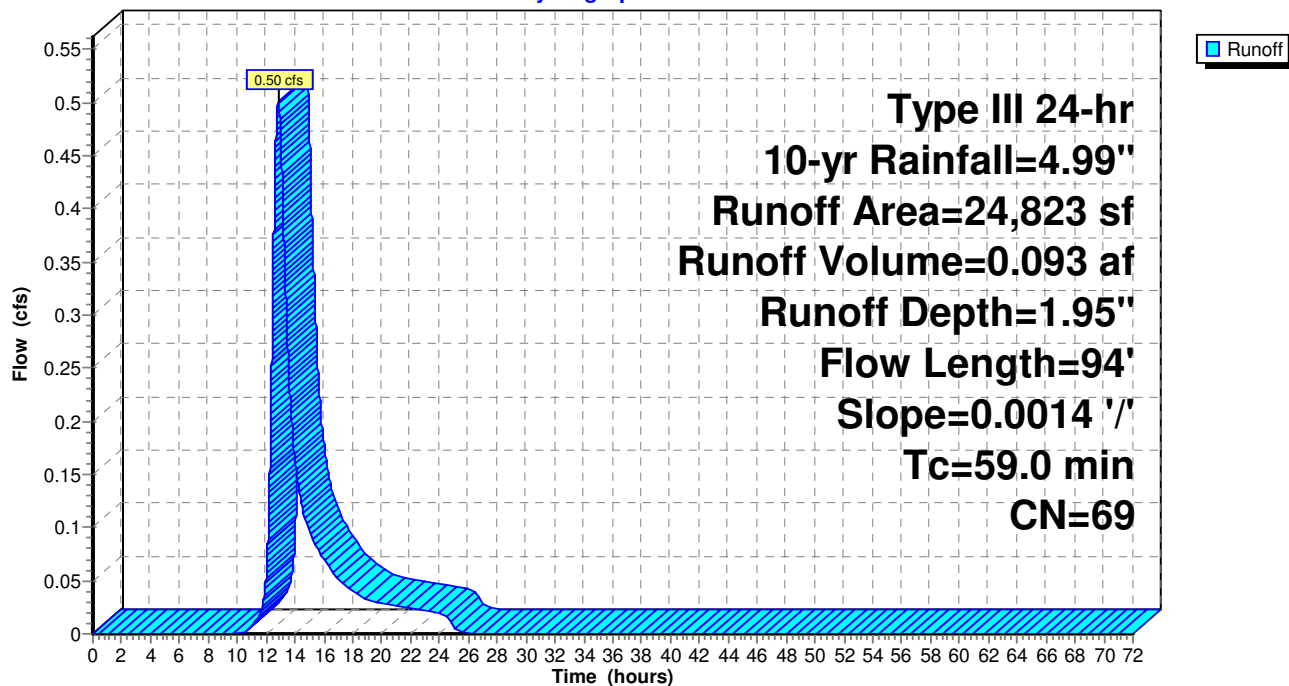
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

Area (sf)	CN	Description
4,911	74	>75% Grass cover, Good, HSG C
* 2,000	71	>75% Grass cover, Good, HSG B/D
* 14,330	66	Woods, Good, HSG B/D
3,582	70	Woods, Good, HSG C
24,823	69	Weighted Average
24,823		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
59.0	94	0.0014	0.03		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.22"

**Subcatchment P4: P4**

Hydrograph



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**Summary for Subcatchment P5: P5**

Runoff = 5.13 cfs @ 12.63 hrs, Volume= 0.804 af, Depth= 1.95"

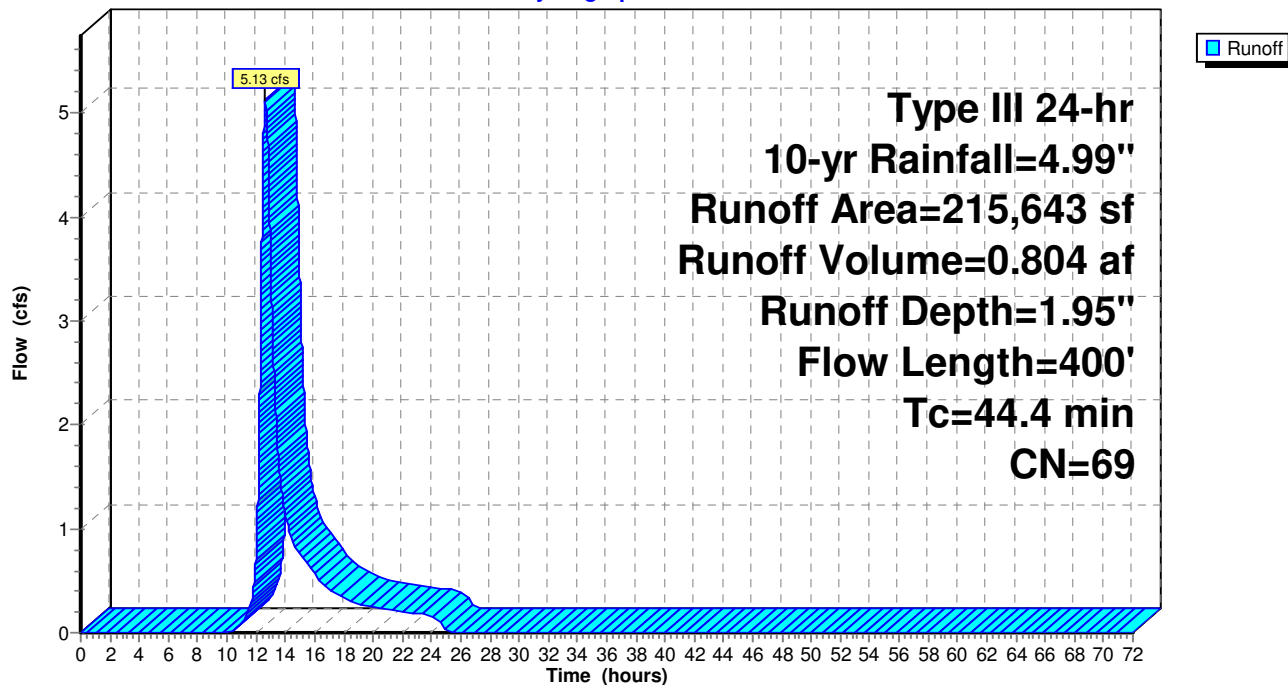
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

Area (sf)	CN	Description
1,504	74	>75% Grass cover, Good, HSG C
* 9,745	71	>75% Grass cover, Good, HSG B/D
25,599	70	Woods, Good, HSG C
* 127,460	66	Woods, Good, HSG B/D
* 8,904	98	IMPERVIOUS
* 13,961	68	Meadow, non-grazed, HSG B/D
28,470	71	Meadow, non-grazed, HSG C
215,643	69	Weighted Average
206,739		95.87% Pervious Area
8,904		4.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	23	0.2900	0.25		<b>Sheet Flow, GRASS SF</b> Grass: Dense n= 0.240 P2= 3.22"
22.4	82	0.0120	0.06		<b>Sheet Flow, WOODLAND SF</b> Woods: Light underbrush n= 0.400 P2= 3.22"
20.5	295	0.0023	0.24		<b>Shallow Concentrated Flow, WOOD SCF</b> Woodland Kv= 5.0 fps
44.4	400	Total			

## Subcatchment P5: P5

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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### Summary for Subcatchment P6: Sheet flow To West Basin

Runoff = 21.63 cfs @ 12.09 hrs, Volume= 1.633 af, Depth= 4.19"

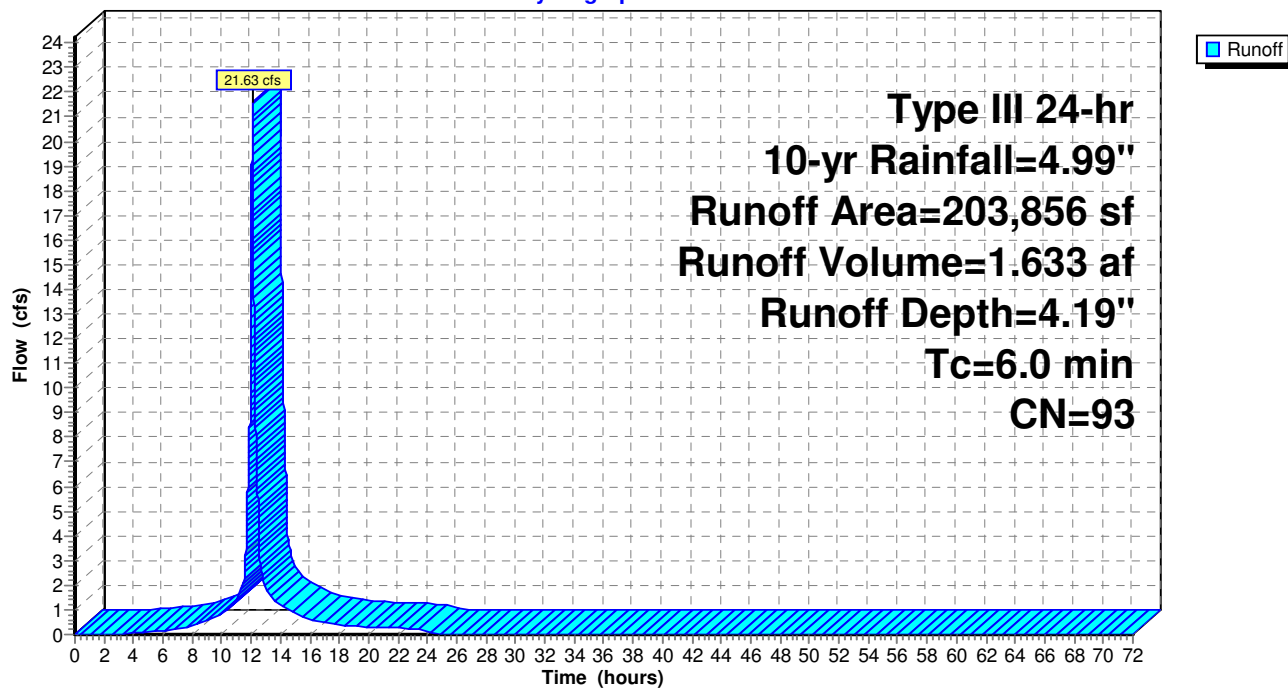
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

Area (sf)	CN	Description
4,918	39	>75% Grass cover, Good, HSG A
6,710	61	>75% Grass cover, Good, HSG B
6,131	74	>75% Grass cover, Good, HSG C
* 9,090	71	>75% Grass cover, Good, HSG B/D
* 177,007	98	IMPERVIOUS
203,856	93	Weighted Average
26,849		13.17% Pervious Area
177,007		86.83% Impervious Area

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

### Subcatchment P6: Sheet flow To West Basin

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Subcatchment P7: Proposed P7**

Runoff = 0.23 cfs @ 12.36 hrs, Volume= 0.028 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

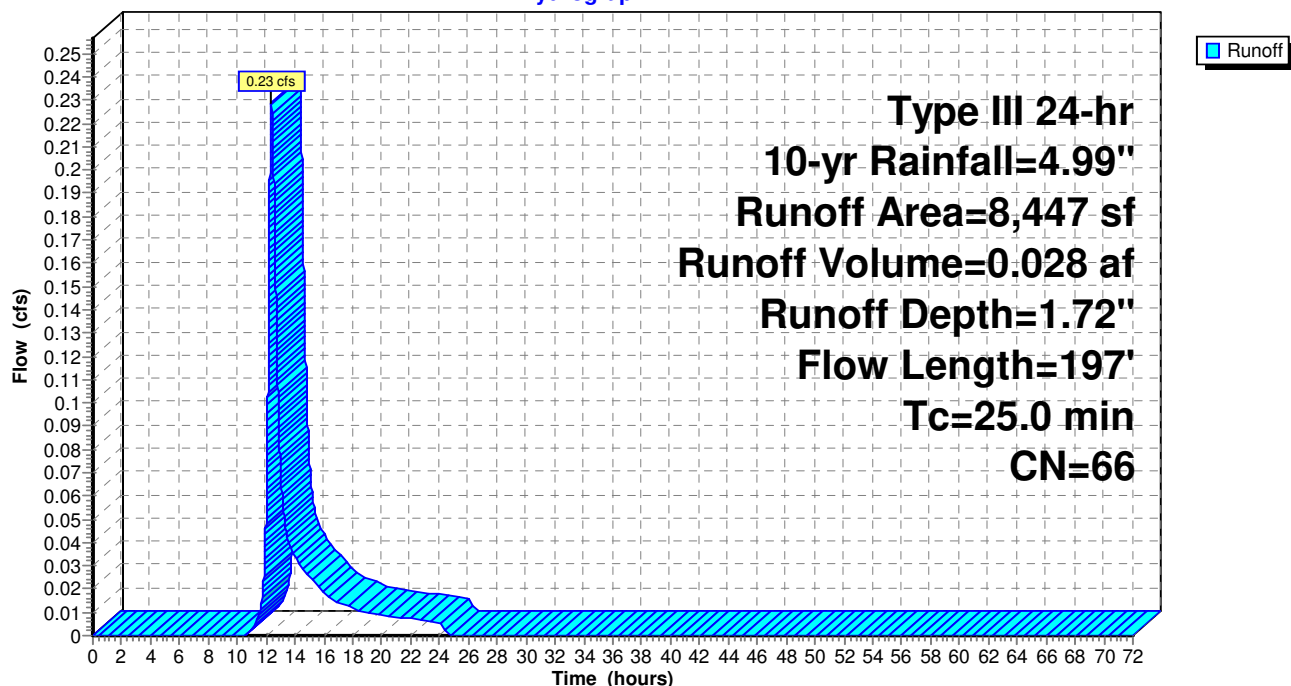
Area (sf)	CN	Description
2,335	39	>75% Grass cover, Good, HSG A
1,709	74	>75% Grass cover, Good, HSG C
* 1,796	98	IMPERVIOUS
450	30	Meadow, non-grazed, HSG A
2,157	71	Meadow, non-grazed, HSG C
8,447	66	Weighted Average
6,651		78.74% Pervious Area
1,796		21.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0160	0.07		<b>Sheet Flow, Woodland SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
1.6	97	0.0420	1.02		<b>Shallow Concentrated Flow, Woodlan SCF</b>
					Woodland Kv= 5.0 fps
25.0	197	Total			

**Subcatchment P7: Proposed P7**

Hydrograph



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Proposed Condition  
Type III 24-hr 10-yr Rainfall=4.99"

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### Summary for Subcatchment P8: Proposed Roof to UGC-D (west)

Runoff = 27.13 cfs @ 12.09 hrs, Volume= 2.199 af, Depth= 4.75"

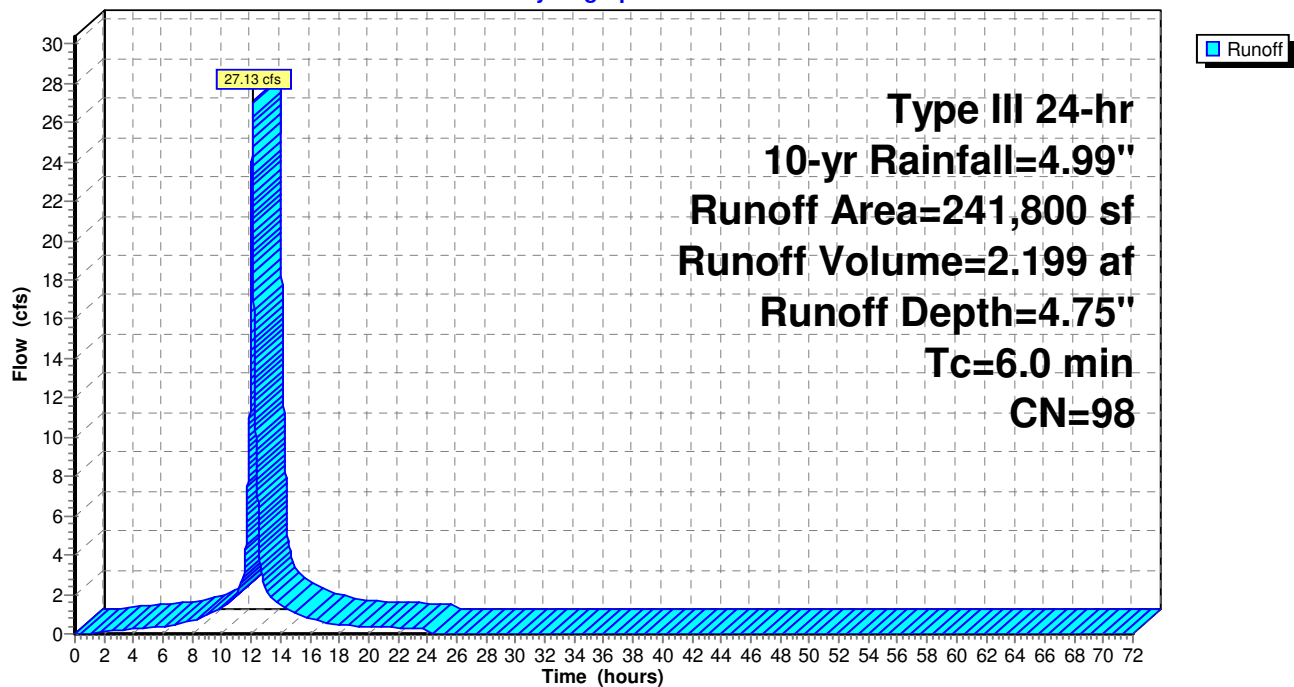
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

	Area (sf)	CN	Description
*	241,800	98	IMPERVIOUS
	241,800		100.00% Impervious Area

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

### Subcatchment P8: Proposed Roof to UGC-D (west)

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Subcatchment P9: Sheetflow to North Basin**

Runoff = 4.21 cfs @ 12.10 hrs, Volume= 0.319 af, Depth= 3.76"

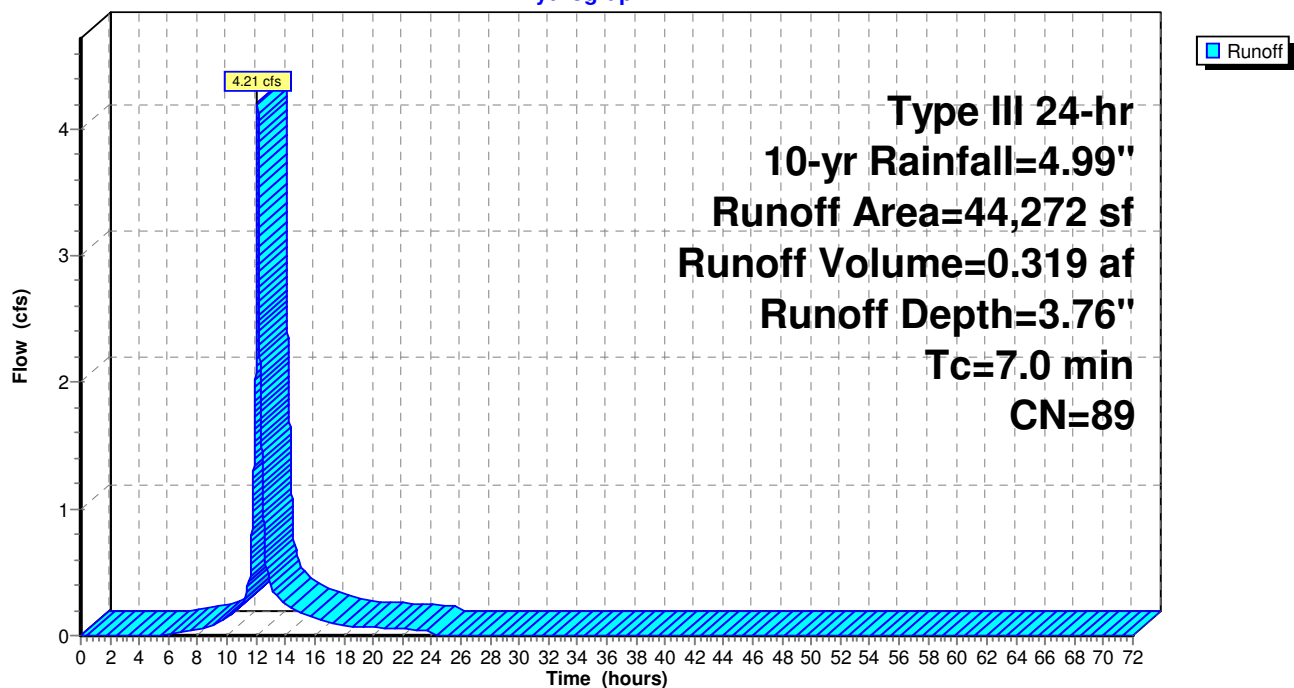
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 10-yr Rainfall=4.99"

	Area (sf)	CN	Description
	14,312	74	>75% Grass cover, Good, HSG C
*	1,743	71	>75% Grass cover, Good, HSG B/D
*	28,217	98	IMPERVIOUS
	44,272	89	Weighted Average
	16,055		36.26% Pervious Area
	28,217		63.74% Impervious Area

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

**Subcatchment P9: Sheetflow to North Basin**

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Pond DMH: Splitter Structure**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 4.18" for 10-yr event  
 Inflow = 3.48 cfs @ 12.17 hrs, Volume= 0.401 af  
 Outflow = 3.48 cfs @ 12.17 hrs, Volume= 0.401 af, Atten= 0%, Lag= 0.0 min  
 Primary = 2.68 cfs @ 12.17 hrs, Volume= 0.258 af  
 Secondary = 0.80 cfs @ 12.17 hrs, Volume= 0.143 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

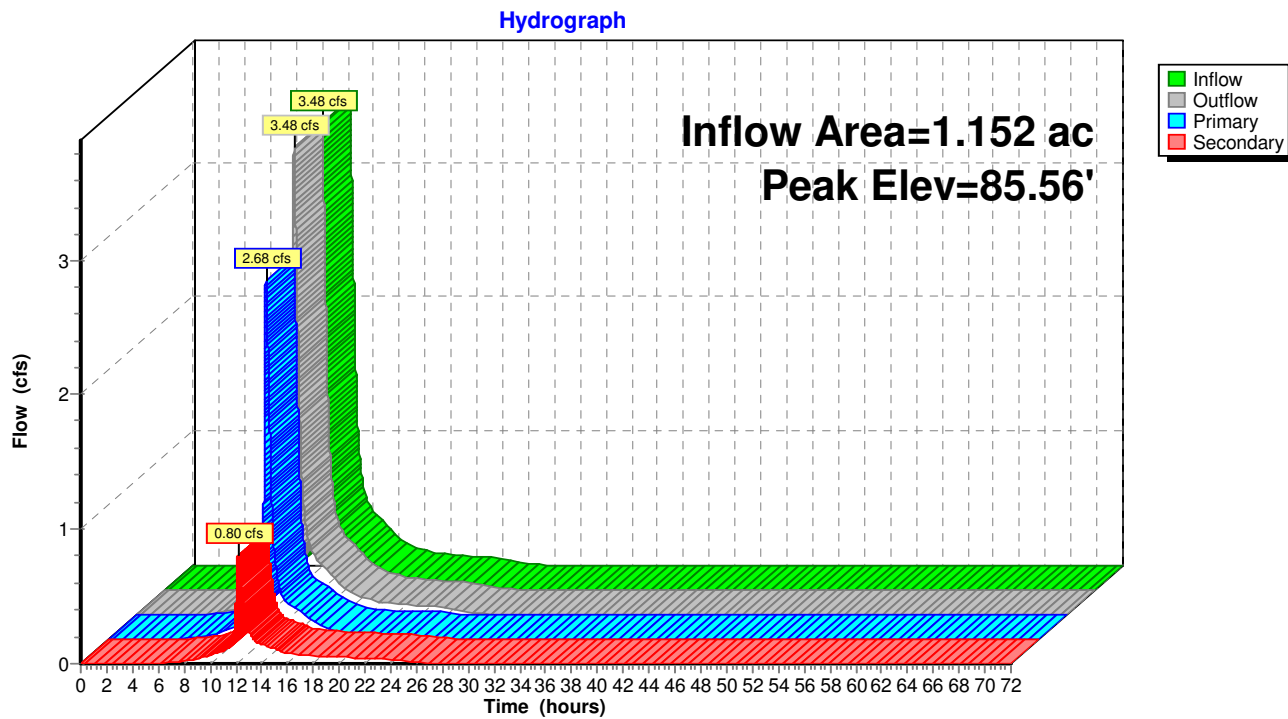
Peak Elev= 85.56' @ 12.17 hrs

Flood Elev= 85.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	84.55'	<b>15.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	84.55'	<b>6.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.20 sf

**Primary OutFlow** Max=2.68 cfs @ 12.17 hrs HW=85.56' TW=84.02' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 2.68 cfs @ 3.42 fps)**Secondary OutFlow** Max=0.80 cfs @ 12.17 hrs HW=85.56' TW=80.80' (Dynamic Tailwater)↑ **2=Culvert** (Barrel Controls 0.80 cfs @ 4.09 fps)

## Pond DMH: Splitter Structure



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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**

Inflow Area = 18.348 ac, 62.57% Impervious, Inflow Depth > 3.39" for 10-yr event  
 Inflow = 7.39 cfs @ 12.68 hrs, Volume= 5.187 af  
 Outflow = 7.18 cfs @ 12.76 hrs, Volume= 5.186 af, Atten= 3%, Lag= 4.9 min  
 Primary = 7.18 cfs @ 12.76 hrs, Volume= 5.186 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 81.71' @ 12.76 hrs Surf.Area= 1,875 sf Storage= 1,900 cf

Plug-Flow detention time= 3.1 min calculated for 5.186 af (100% of inflow)

Center-of-Mass det. time= 2.8 min ( 1,694.2 - 1,691.3 )

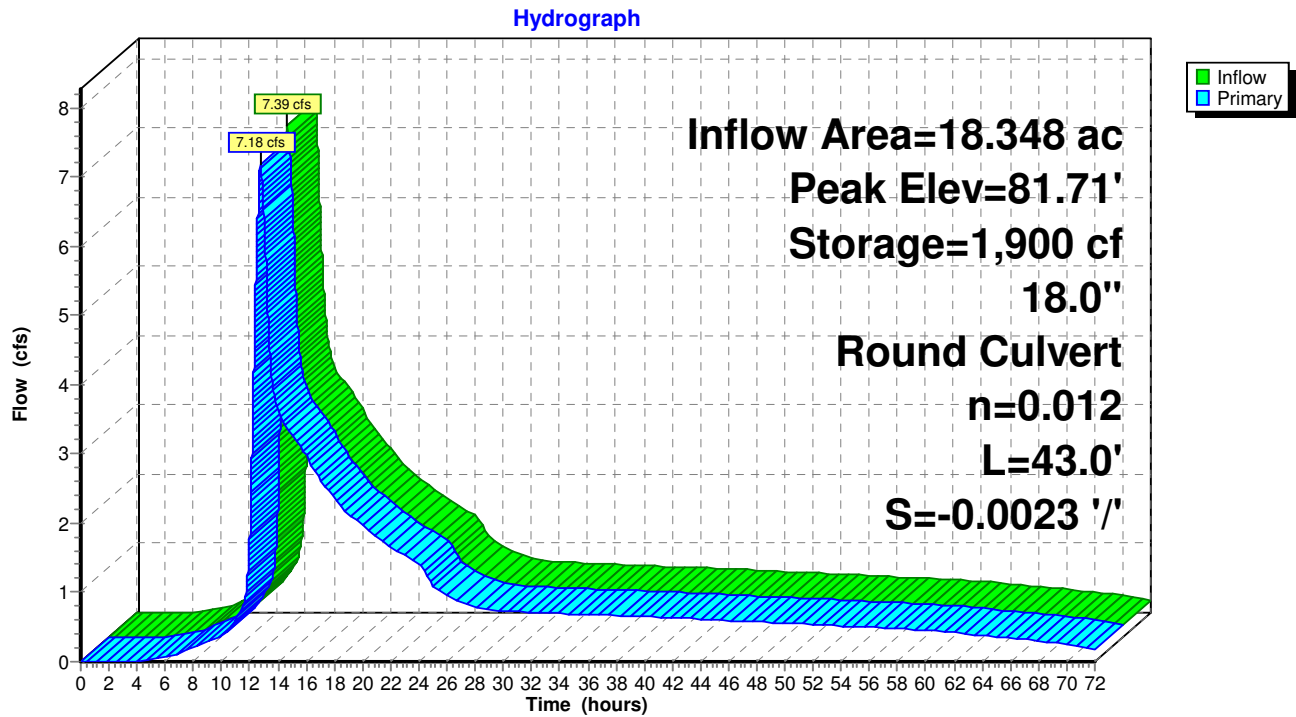
Volume	Invert	Avail.Storage	Storage Description
#1	79.70'	94,801 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.70	10	0	0
80.00	382	59	59
81.00	1,156	769	828
82.00	2,173	1,665	2,492
83.00	29,061	15,617	18,109
84.00	124,323	76,692	94,801

Device	Routing	Invert	Outlet Devices
#1	Primary	79.70'	<b>18.0" Round Culvert</b> L= 43.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 79.60' / 79.70' S= -0.0023 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

**Primary OutFlow** Max=7.18 cfs @ 12.76 hrs HW=81.71' (Free Discharge)↑ **1=Culvert** (Barrel Controls 7.18 cfs @ 4.06 fps)

**Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**



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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Pond PP1: UGC-D (Stormtech SC-310)**

Inflow Area = 10.231 ac, 93.98% Impervious, Inflow Depth > 4.40" for 10-yr event  
 Inflow = 28.16 cfs @ 12.09 hrs, Volume= 3.753 af  
 Outflow = 2.14 cfs @ 15.17 hrs, Volume= 3.631 af, Atten= 92%, Lag= 185.4 min  
 Primary = 2.14 cfs @ 15.17 hrs, Volume= 3.631 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 84.31' @ 15.17 hrs Surf.Area= 78,048 sf Storage= 74,556 cf

Plug-Flow detention time= 894.4 min calculated for 3.631 af (97% of inflow)  
 Center-of-Mass det. time= 818.2 min ( 1,860.8 - 1,042.6 )

Volume	Invert	Avail.Storage	Storage Description
#1A	82.78'	48,033 cf	<b>108.17'W x 644.00'L x 2.33'H Field A</b> 162,538 cf Overall - 42,457 cf Embedded = 120,082 cf x 40.0% Voids
#2A	83.28'	42,457 cf	<b>ADS_StormTech RC-310 +Cap</b> x 2880 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 2880 Chambers in 32 Rows
#3B	82.78'	6,025 cf	<b>11.50'W x 729.44'L x 2.33'H Field B</b> 19,573 cf Overall - 4,511 cf Embedded = 15,062 cf x 40.0% Voids
#4B	83.28'	4,511 cf	<b>ADS_StormTech SC-310 +Cap</b> x 306 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 306 Chambers in 3 Rows
			101,025 cf Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

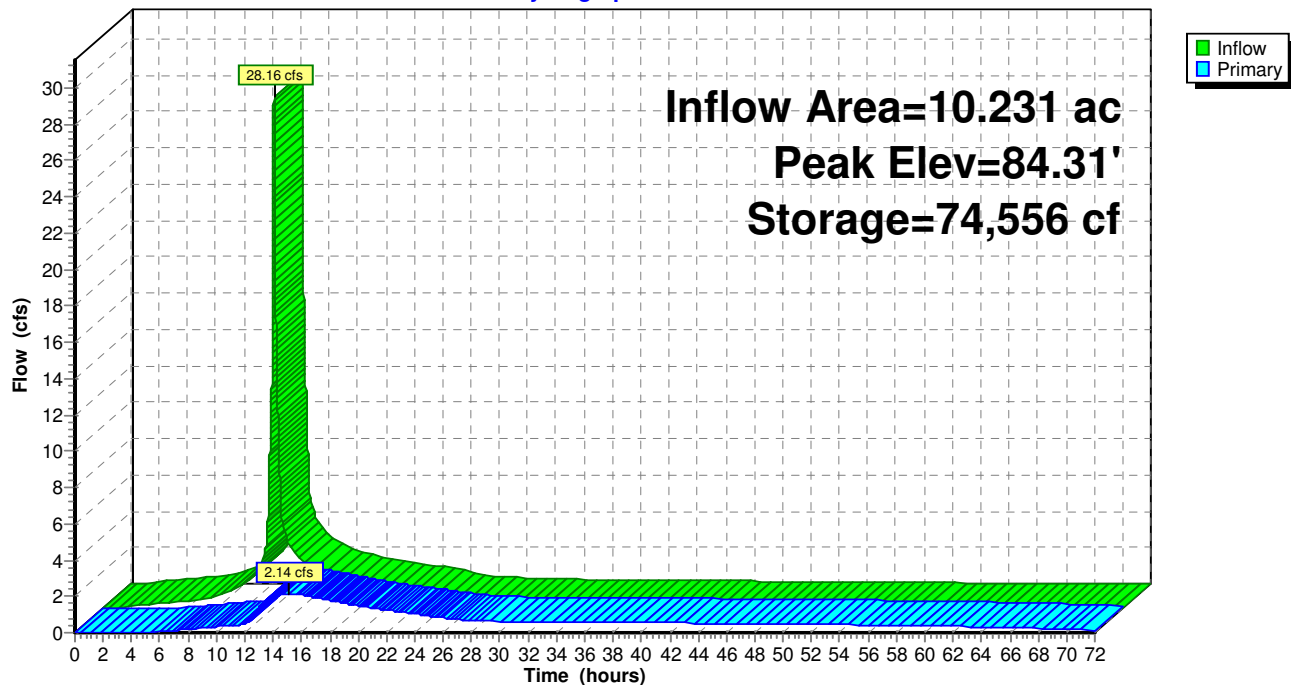
Device	Routing	Invert	Outlet Devices
#1	Primary	82.78'	<b>24.0" Round 24" RCP</b> L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.78' / 82.70' S= 0.0057 ' S= 0.0057 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	82.78'	<b>9.0" W x 2.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	83.95'	<b>24.0" W x 10.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=2.14 cfs @ 15.17 hrs HW=84.31' TW=80.80' (Dynamic Tailwater)

1=24" RCP (Passes 2.14 cfs of 8.00 cfs potential flow)  
 2=Orifice/Grate (Orifice Controls 0.72 cfs @ 5.80 fps)  
 3=Orifice/Grate (Orifice Controls 1.41 cfs @ 1.94 fps)

**Pond PP1: UGC-D (Stormtech SC-310)**

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Pond PP2: Water Quality Basin (WEST)**

Inflow Area = 4.680 ac, 86.83% Impervious, Inflow Depth = 4.19" for 10-yr event  
 Inflow = 21.63 cfs @ 12.09 hrs, Volume= 1.633 af  
 Outflow = 1.70 cfs @ 12.47 hrs, Volume= 1.554 af, Atten= 92%, Lag= 23.3 min  
 Primary = 1.70 cfs @ 12.47 hrs, Volume= 1.554 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.50' Surf.Area= 39,354 sf Storage= 18,954 cf

Peak Elev= 84.51' @ 13.78 hrs Surf.Area= 45,561 sf Storage= 61,924 cf (42,969 cf above start)

Plug-Flow detention time= 1,028.7 min calculated for 1.119 af (69% of inflow)

Center-of-Mass det. time= 680.9 min ( 1,459.3 - 778.3 )

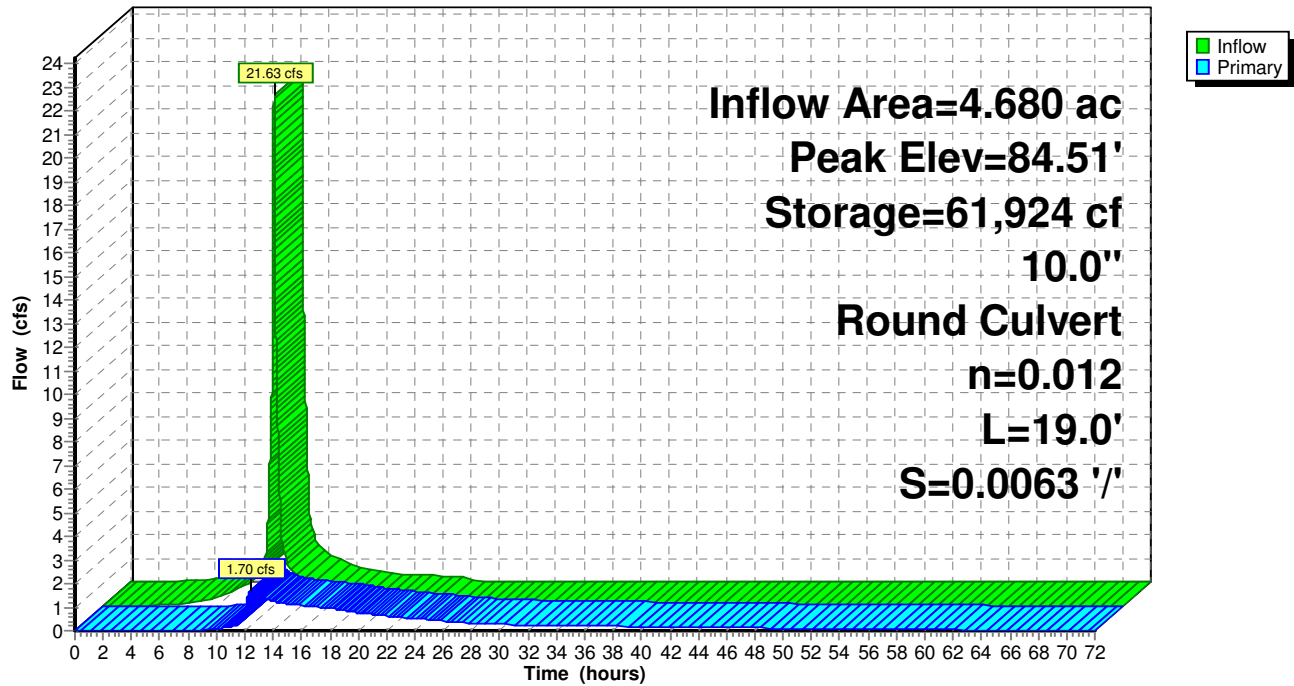
Volume	Invert	Avail.Storage	Storage Description	
#1	83.00'	136,855 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
83.00	36,482	0	0	36,482
84.00	42,335	39,372	39,372	42,377
85.00	48,730	45,495	84,867	48,817
86.00	55,314	51,987	136,855	55,450

Device	Routing	Invert	Outlet Devices
#1	Primary	83.50'	<b>10.0" Round Culvert</b> L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.50' / 83.38' S= 0.0063 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

**Primary OutFlow** Max=1.70 cfs @ 12.47 hrs HW=84.46' TW=84.04' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 1.70 cfs @ 3.12 fps)

# Pond PP2: Water Quality Basin (WEST)

Hydrograph



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**Summary for Pond PP3: UGC-B (Stormtech SC-310)**

Inflow Area = 1.223 ac, 8.92% Impervious, Inflow Depth = 1.65" for 10-yr event  
 Inflow = 2.17 cfs @ 12.11 hrs, Volume= 0.168 af  
 Outflow = 0.33 cfs @ 12.81 hrs, Volume= 0.111 af, Atten= 85%, Lag= 41.8 min  
 Primary = 0.33 cfs @ 12.81 hrs, Volume= 0.111 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 81.08' @ 12.81 hrs Surf.Area= 4,229 sf Storage= 3,199 cf

Plug-Flow detention time= 251.7 min calculated for 0.111 af (66% of inflow)

Center-of-Mass det. time= 140.8 min ( 1,002.7 - 861.9 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,745 cf	<b>4.83'W x 473.12'L x 2.33'H Field A</b> 5,336 cf Overall - 973 cf Embedded = 4,363 cf x 40.0% Voids
#2A	80.23'	973 cf	<b>ADS_StormTech SC-310 +Cap</b> x 66 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,483 cf	<b>4.83'W x 401.92'L x 2.33'H Field B</b> 4,533 cf Overall - 826 cf Embedded = 3,707 cf x 40.0% Voids
#4B	80.23'	826 cf	<b>ADS_StormTech SC-310 +Cap</b> x 56 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,027 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.66'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.66' / 79.27' S= 0.0195 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.33 cfs @ 12.81 hrs HW=81.08' TW=0.00' (Dynamic Tailwater)

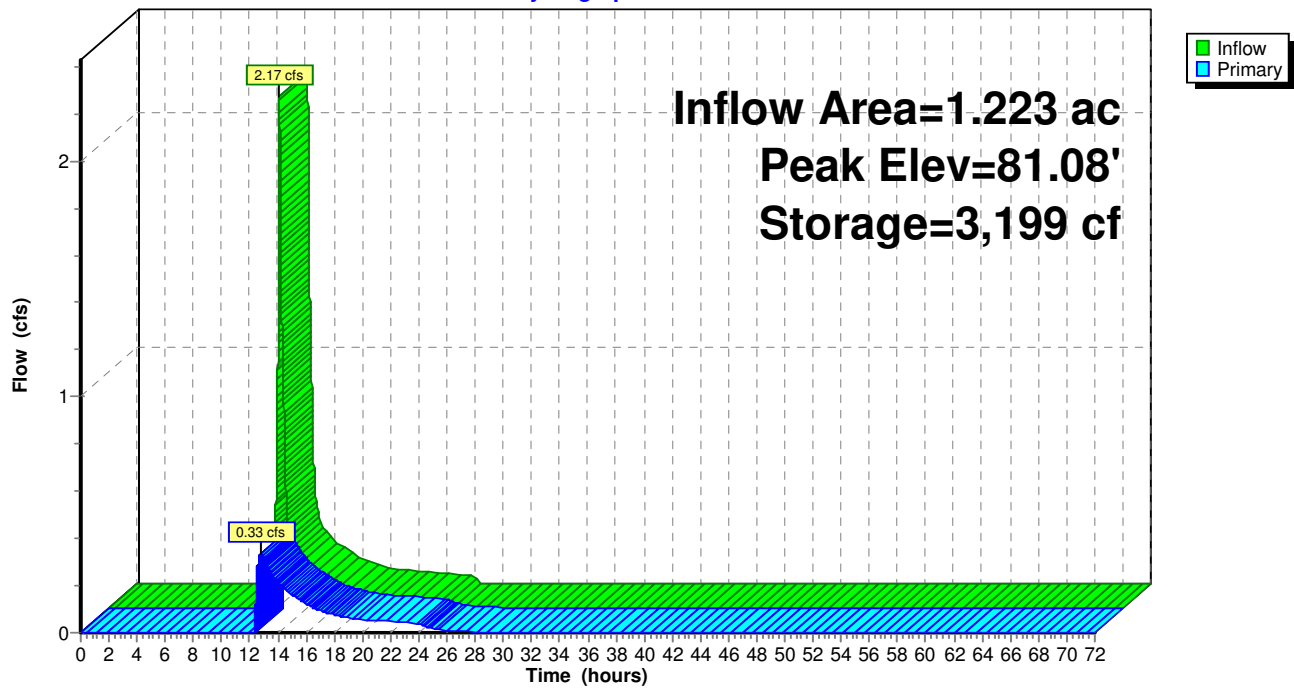
1=12" HDPE OUT (Passes 0.33 cfs of 3.64 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.33 cfs @ 1.82 fps)

3=12" HDPE (Passes 0.33 cfs of 1.54 cfs potential flow)

**Pond PP3: UGC-B (Stormtech SC-310)**

Hydrograph



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Type III 24-hr 10-yr Rainfall=4.99"

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**Summary for Pond PP4: Water Quality Basin (North)**

Inflow Area = 2.168 ac, 74.76% Impervious, Inflow Depth = 3.19" for 10-yr event  
 Inflow = 6.51 cfs @ 12.12 hrs, Volume= 0.577 af  
 Outflow = 0.12 cfs @ 18.72 hrs, Volume= 0.455 af, Atten= 98%, Lag= 396.2 min  
 Primary = 0.12 cfs @ 18.72 hrs, Volume= 0.455 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.40' Surf.Area= 14,585 sf Storage= 18,791 cf

Peak Elev= 84.70' @ 18.72 hrs Surf.Area= 16,901 sf Storage= 39,224 cf (20,433 cf above start)

Plug-Flow detention time= 3,678.9 min calculated for 0.024 af (4% of inflow)

Center-of-Mass det. time= 1,489.3 min ( 2,288.3 - 799.0 )

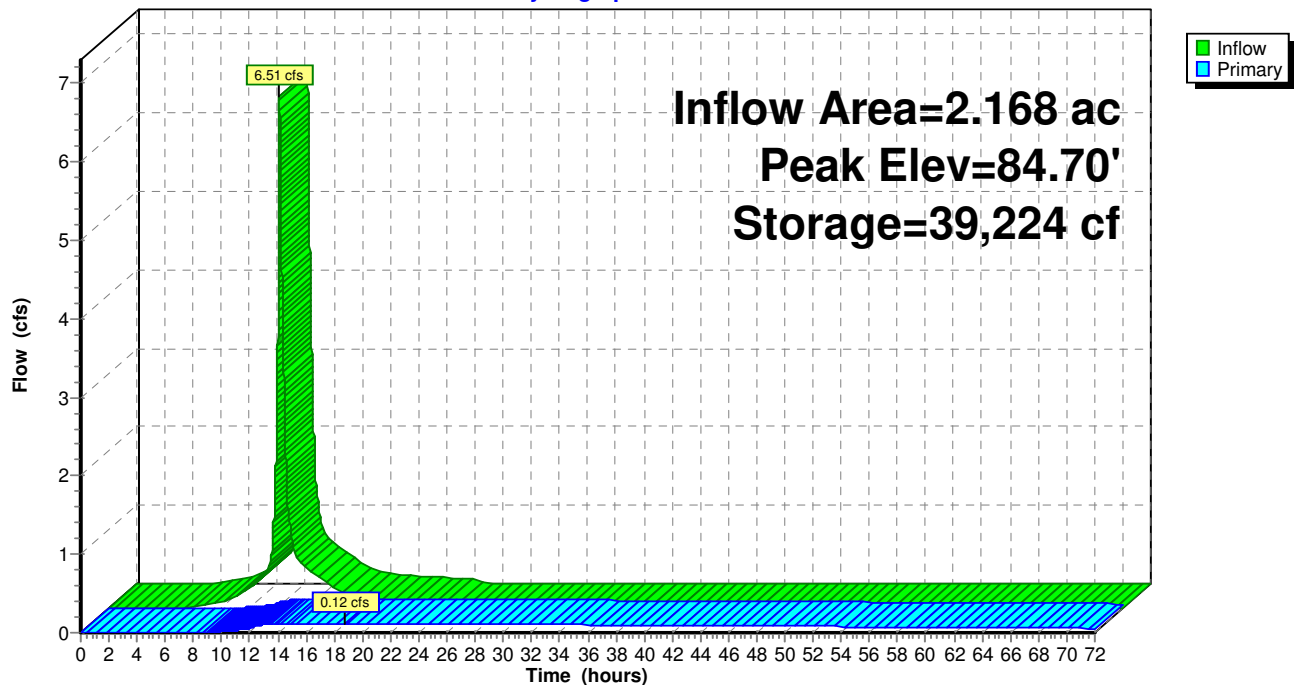
Volume	Invert	Avail.Storage	Storage Description	
#1	82.00'	62,769 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.00	12,313	0	0	12,313
83.00	13,894	13,096	13,096	13,945
84.00	15,654	14,765	27,861	15,757
85.00	17,454	16,546	44,407	17,614
86.00	19,286	18,362	62,769	19,508

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.40' / 83.31' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Device 1	83.40'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.12 cfs @ 18.72 hrs HW=84.70' TW=80.58' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.12 cfs of 2.89 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.12 cfs @ 5.31 fps)

# Pond PP4: Water Quality Basin (North)

Hydrograph



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**Summary for Pond PP5: UGC-E (Stormtech SC-310)**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 4.19" for 10-yr event  
 Inflow = 5.32 cfs @ 12.09 hrs, Volume= 0.402 af  
 Outflow = 3.48 cfs @ 12.17 hrs, Volume= 0.401 af, Atten= 35%, Lag= 5.3 min  
 Primary = 3.48 cfs @ 12.17 hrs, Volume= 0.401 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 86.78' @ 12.17 hrs Surf.Area= 4,780 sf Storage= 3,748 cf

Plug-Flow detention time= 53.5 min calculated for 0.401 af (100% of inflow)  
 Center-of-Mass det. time= 52.5 min ( 830.9 - 778.3 )

Volume	Invert	Avail.Storage	Storage Description
#1A	85.38'	1,929 cf	<b>4.83'W x 522.96'L x 2.33'H Field A</b> 5,898 cf Overall - 1,076 cf Embedded = 4,822 cf x 40.0% Voids
#2A	85.88'	1,076 cf	<b>ADS_StormTech SC-310 +Cap</b> x 73 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	85.38'	1,719 cf	<b>4.83'W x 466.00'L x 2.33'H Field B</b> 5,255 cf Overall - 958 cf Embedded = 4,297 cf x 40.0% Voids
#4B	85.88'	958 cf	<b>ADS_StormTech SC-310 +Cap</b> x 65 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,682 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.38'	<b>15.0" Round 15" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.28' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	85.95'	<b>10.0" Round ORIFICE A X 2.00</b> L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.95' / 85.92' S= 0.0060 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf
#3	Device 1	85.38'	<b>6.0" Round ORIFICE B</b> L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.31' S= 0.0020 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=3.48 cfs @ 12.17 hrs HW=86.78' TW=85.56' (Dynamic Tailwater)

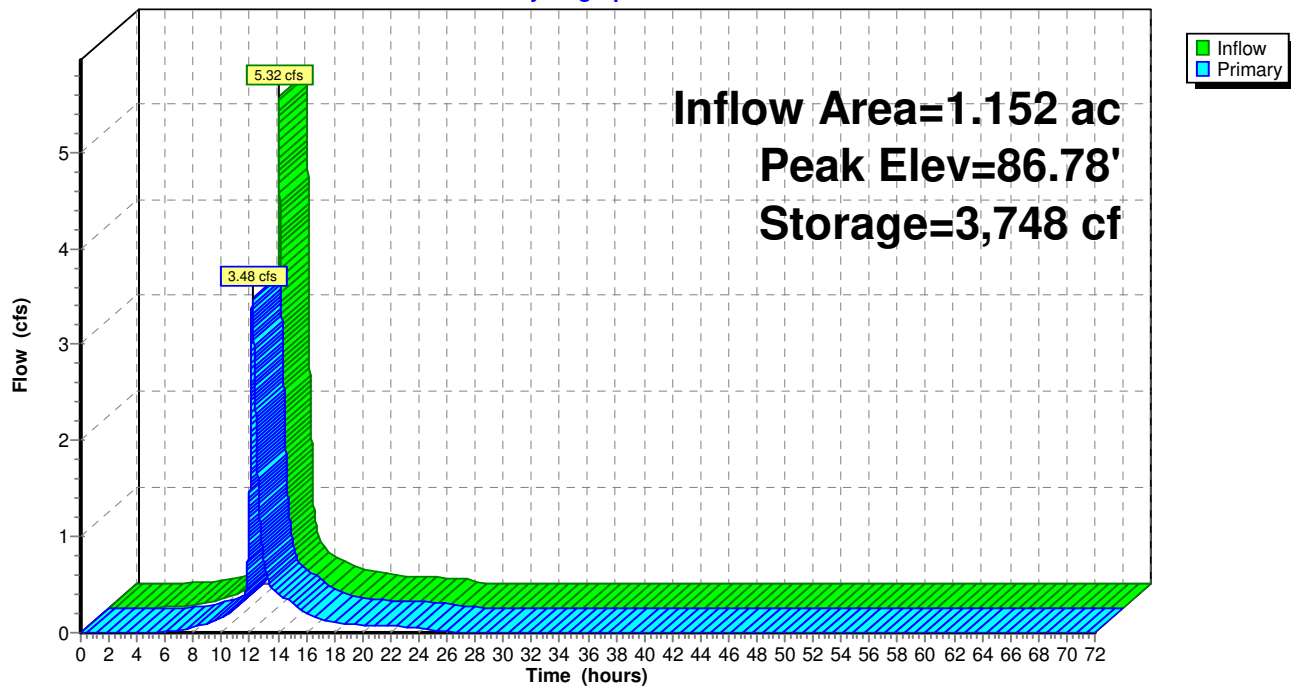
1=15" HDPE OUT (Passes 3.48 cfs of 4.42 cfs potential flow)

2=ORIFICE A (Barrel Controls 2.69 cfs @ 3.06 fps)

3=ORIFICE B (Barrel Controls 0.79 cfs @ 4.03 fps)

**Pond PP5: UGC-E (Stormtech SC-310)**

Hydrograph



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**Summary for Pond PP6: Water Quality Basin (Kennedy Road)**

Inflow Area = 0.956 ac, 70.56% Impervious, Inflow Depth = 3.76" for 10-yr event  
 Inflow = 4.10 cfs @ 12.09 hrs, Volume= 0.300 af  
 Outflow = 0.49 cfs @ 12.70 hrs, Volume= 0.298 af, Atten= 88%, Lag= 37.0 min  
 Primary = 0.49 cfs @ 12.70 hrs, Volume= 0.298 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 80.00' Surf.Area= 5,601 sf Storage= 11,033 cf

Peak Elev= 81.03' @ 12.70 hrs Surf.Area= 6,706 sf Storage= 17,386 cf (6,353 cf above start)

Plug-Flow detention time= 953.1 min calculated for 0.045 af (15% of inflow)

Center-of-Mass det. time= 204.5 min ( 999.0 - 794.5 )

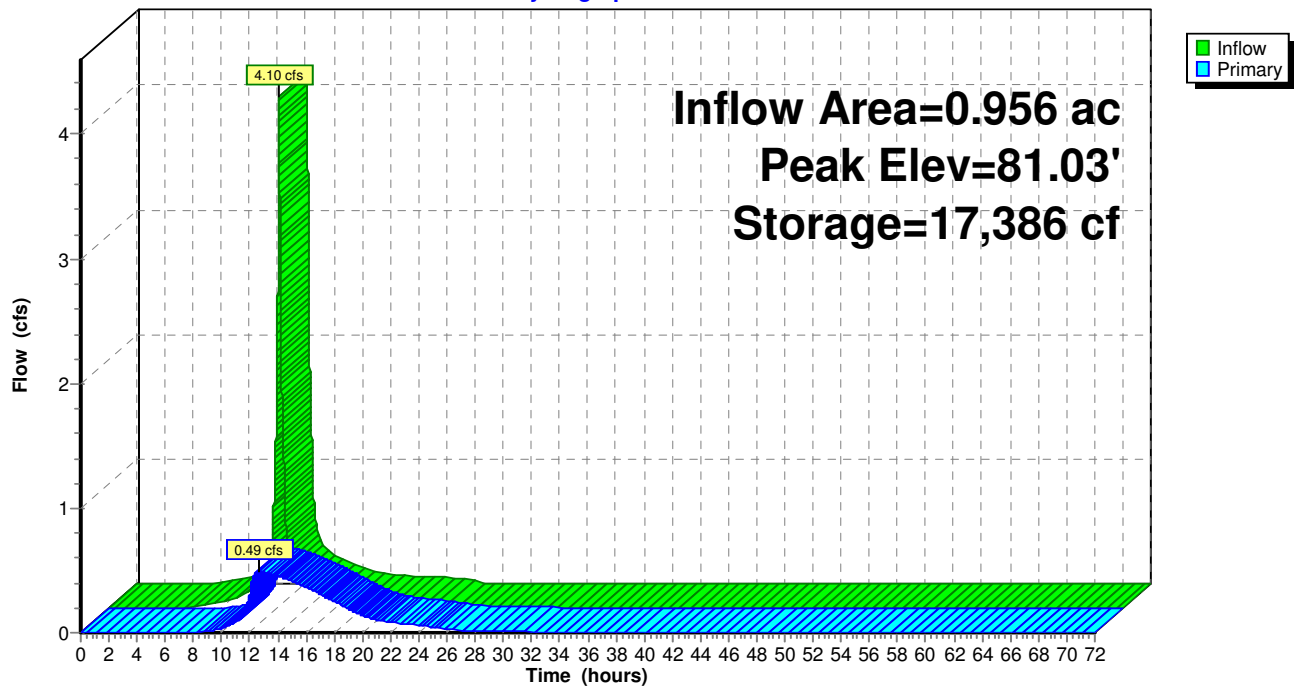
Volume	Invert	Avail.Storage	Storage Description	
#1	75.00'	42,367 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.00	239	0	0	239
76.00	786	486	486	791
77.00	1,382	1,070	1,556	1,399
78.00	2,063	1,711	3,267	2,095
78.80	2,824	1,947	5,214	2,869
79.00	4,585	734	5,948	4,630
80.00	5,601	5,085	11,033	5,677
81.00	6,669	6,127	17,160	6,781
82.00	7,793	7,224	24,384	7,944
83.00	8,973	8,376	32,760	9,168
84.00	10,257	9,608	42,367	10,498

Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 79.91' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	80.00'	<b>4.5" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.49 cfs @ 12.70 hrs HW=81.03' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.49 cfs of 2.21 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.49 cfs @ 4.43 fps)

**Pond PP6: Water Quality Basin (Kennedy Road)**

Hydrograph



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**Summary for Pond PP7: UGC-A (Stormtech SC-310)**

Inflow Area = 1.161 ac, 17.93% Impervious, Inflow Depth = 2.36" for 10-yr event  
 Inflow = 3.08 cfs @ 12.10 hrs, Volume= 0.228 af  
 Outflow = 0.05 cfs @ 23.02 hrs, Volume= 0.161 af, Atten= 99%, Lag= 654.7 min  
 Primary = 0.05 cfs @ 23.02 hrs, Volume= 0.161 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.85' @ 23.02 hrs Surf.Area= 12,415 sf Storage= 8,079 cf

Plug-Flow detention time= 1,494.9 min calculated for 0.161 af (71% of inflow)

Center-of-Mass det. time= 1,397.4 min ( 2,235.8 - 838.5 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	6,730 cf	<b>11.50'W x 814.88'L x 2.33'H Field A</b> 21,866 cf Overall - 5,042 cf Embedded = 16,824 cf x 40.0% Voids
#2A	80.23'	5,042 cf	<b>ADS_StormTech SC-310 +Cap</b> x 342 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 342 Chambers in 3 Rows
#3B	79.73'	2,322 cf	<b>4.83'W x 629.76'L x 2.33'H Field B</b> 7,102 cf Overall - 1,297 cf Embedded = 5,805 cf x 40.0% Voids
#4B	80.23'	1,297 cf	<b>ADS_StormTech SC-310 +Cap</b> x 88 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		15,391 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

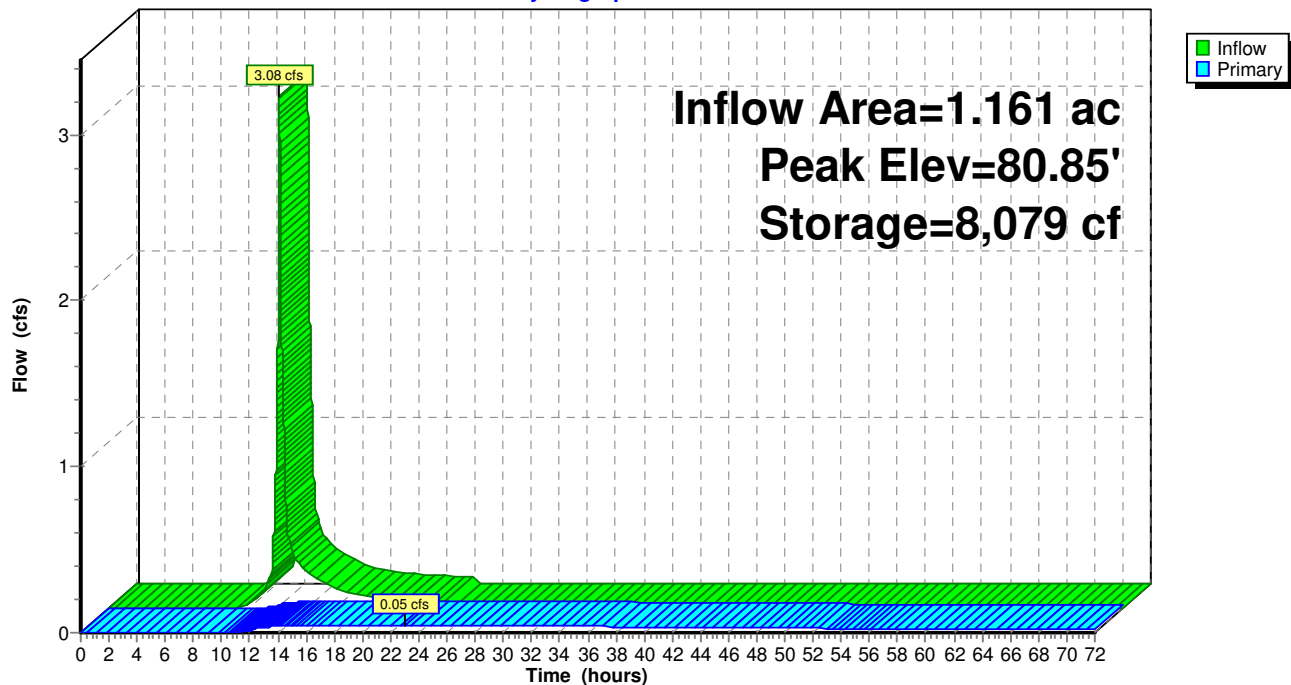
Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.35'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	79.73'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	81.86'	<b>9.0" W x 3.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.05 cfs @ 23.02 hrs HW=80.85' TW=0.00' (Dynamic Tailwater)

- 1=12" HDPE (Passes 0.05 cfs of 2.53 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.02 cfs @ 3.27 fps)
- 3=Orifice/Grate (Orifice Controls 0.03 cfs @ 5.01 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

**Pond PP7: UGC-A (Stormtech SC-310)**

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**Summary for Pond PP8: UGC-C (Stormtech SC-310)**

Inflow Area = 0.254 ac, 6.38% Impervious, Inflow Depth = 1.50" for 10-yr event  
 Inflow = 0.40 cfs @ 12.11 hrs, Volume= 0.032 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.56' @ 24.39 hrs Surf.Area= 3,231 sf Storage= 1,388 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,299 cf	<b>4.83'W x 352.08'L x 2.33'H Field A</b> 3,971 cf Overall - 722 cf Embedded = 3,248 cf x 40.0% Voids
#2A	80.23'	722 cf	<b>ADS_StormTech SC-310 +Cap</b> x 49 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,168 cf	<b>4.83'W x 316.48'L x 2.33'H Field B</b> 3,569 cf Overall - 649 cf Embedded = 2,921 cf x 40.0% Voids
#4B	80.23'	649 cf	<b>ADS_StormTech SC-310 +Cap</b> x 44 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		3,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=79.73' TW=0.00' (Dynamic Tailwater)

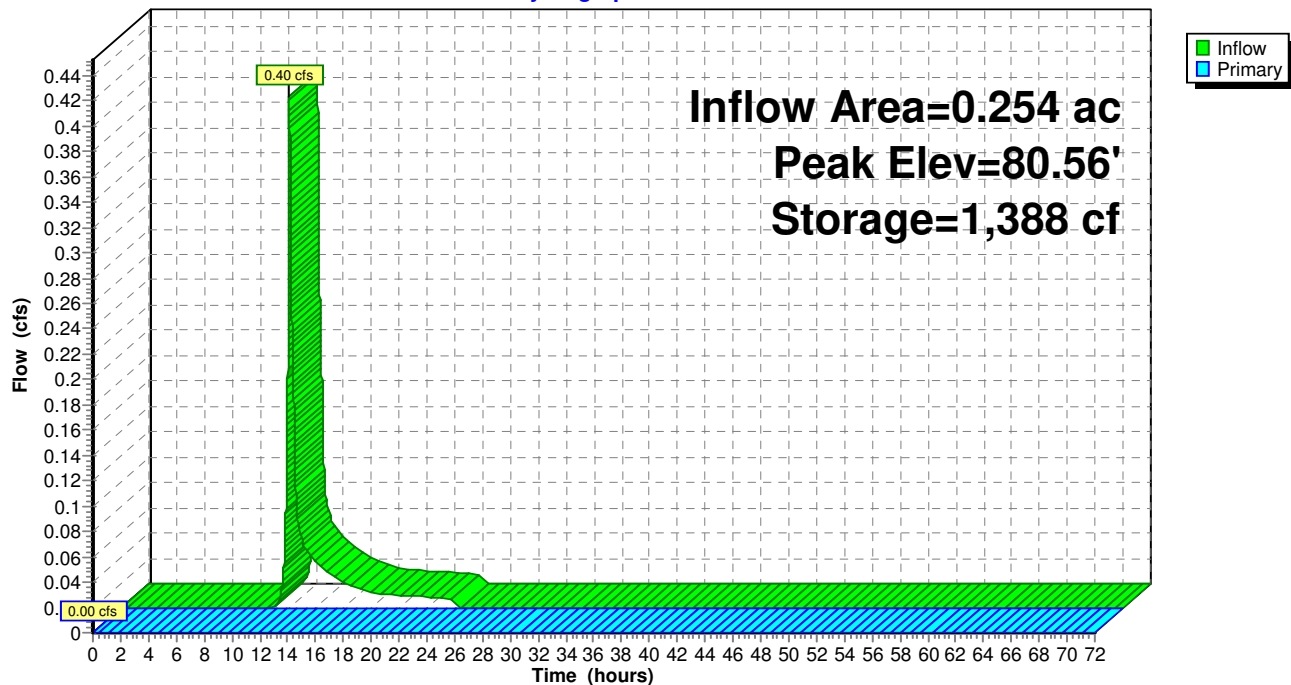
1=12" HDPE OUT ( Controls 0.00 cfs)

2=Orifice/Grate ( Controls 0.00 cfs)

3=12" HDPE ( Controls 0.00 cfs)

**Pond PP8: UGC-C (Stormtech SC-310)**

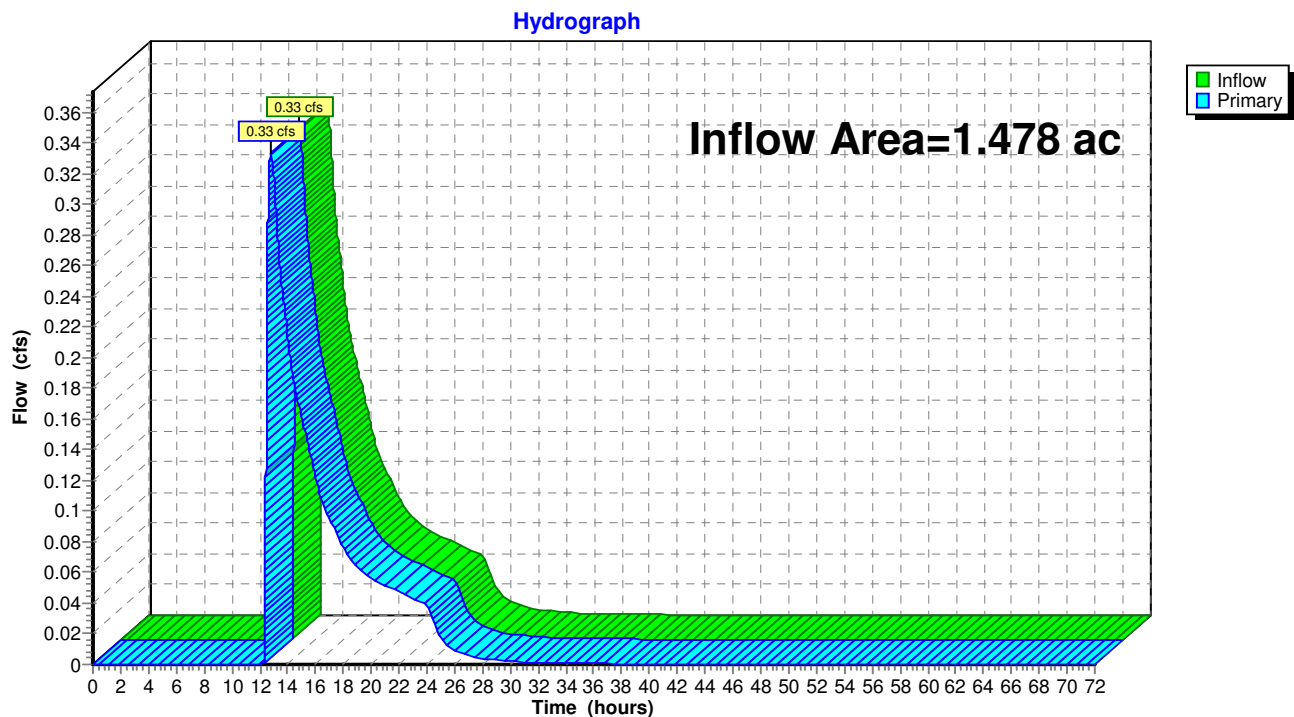
Hydrograph



**Summary for Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

Inflow Area = 1.478 ac, 8.48% Impervious, Inflow Depth > 0.90" for 10-yr event  
Inflow = 0.33 cfs @ 12.81 hrs, Volume= 0.111 af  
Primary = 0.33 cfs @ 12.81 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min

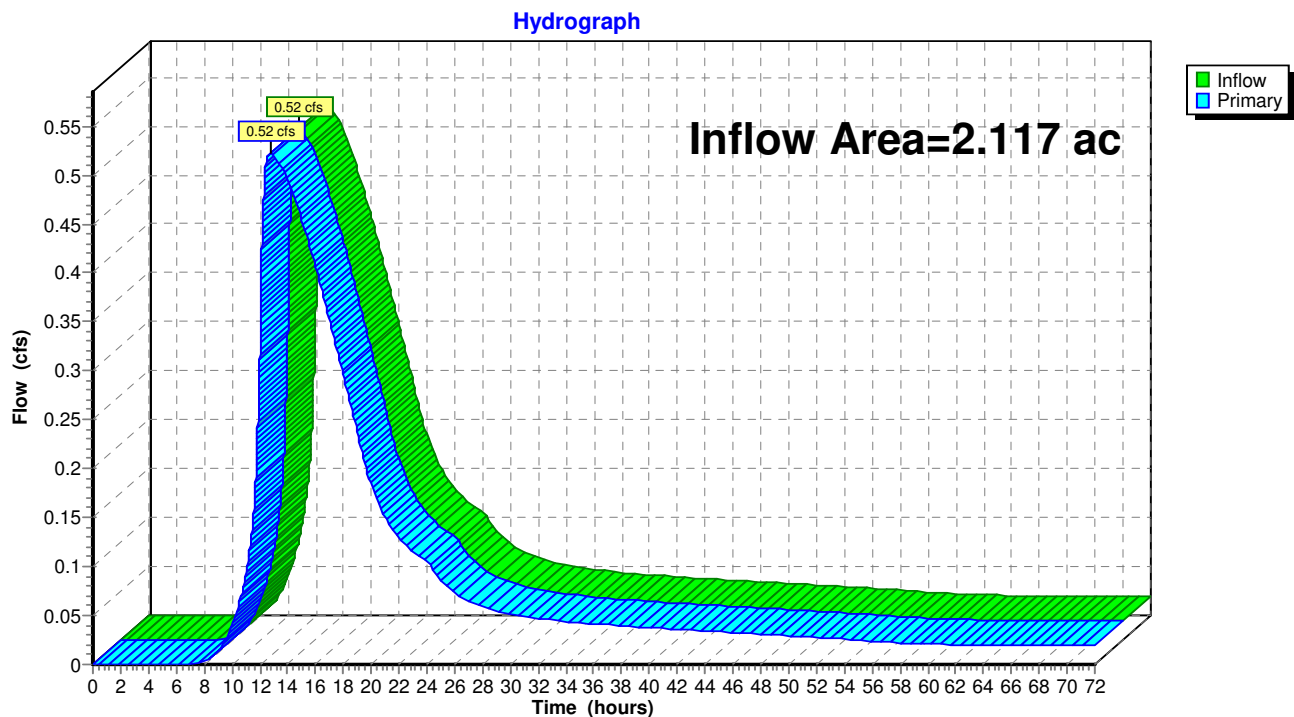
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

**Summary for Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

Inflow Area = 2.117 ac, 41.71% Impervious, Inflow Depth > 2.60" for 10-yr event  
Inflow = 0.52 cfs @ 12.81 hrs, Volume= 0.460 af  
Primary = 0.52 cfs @ 12.81 hrs, Volume= 0.460 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

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Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Subcatchment P1: Yard Drains to UGC-B**

Runoff = 3.32 cfs @ 12.11 hrs, Volume= 0.249 af, Depth= 2.45"

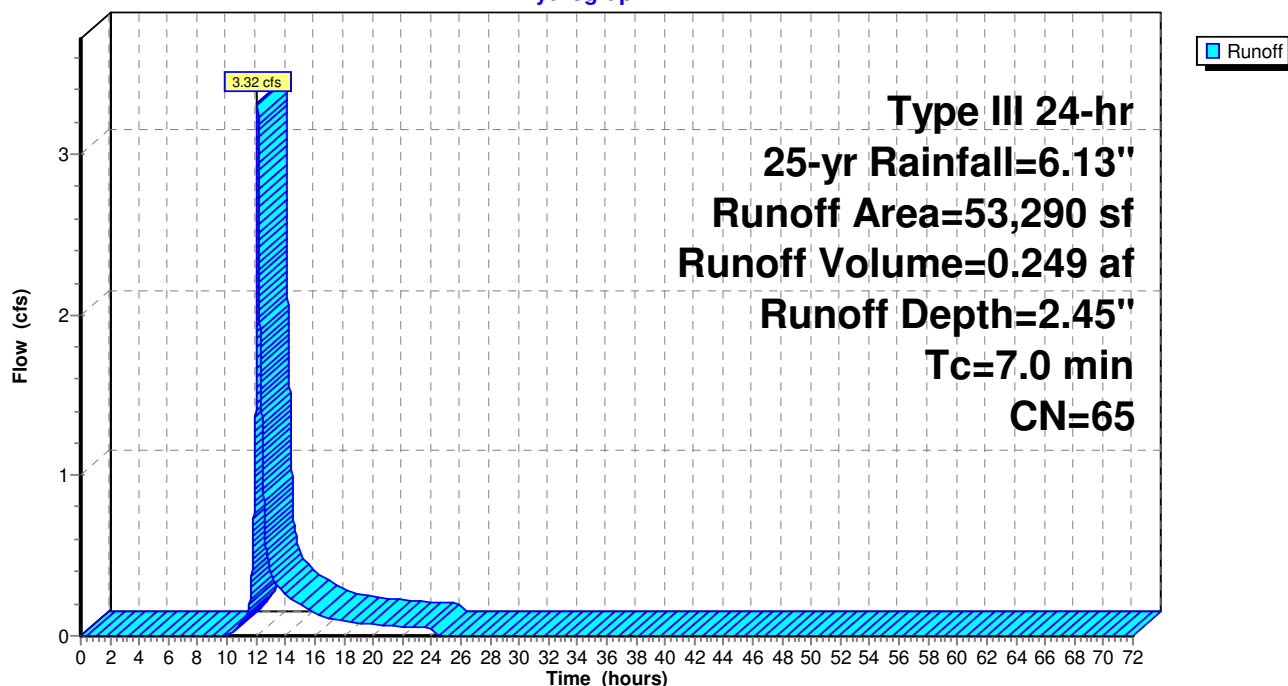
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

Area (sf)	CN	Description
45,366	61	>75% Grass cover, Good, HSG B
3,169	80	>75% Grass cover, Good, HSG D
* 2	71	>75% Grass cover, Good, HSG B/D
* 4,753	98	IMPERVIOUS
53,290	65	Weighted Average
48,537		91.08% Pervious Area
4,753		8.92% Impervious Area

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

**Subcatchment P1: Yard Drains to UGC-B**

Hydrograph



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**Summary for Subcatchment P10: CB's to UGC-E (East)**

Runoff = 6.66 cfs @ 12.09 hrs, Volume= 0.510 af, Depth= 5.31"

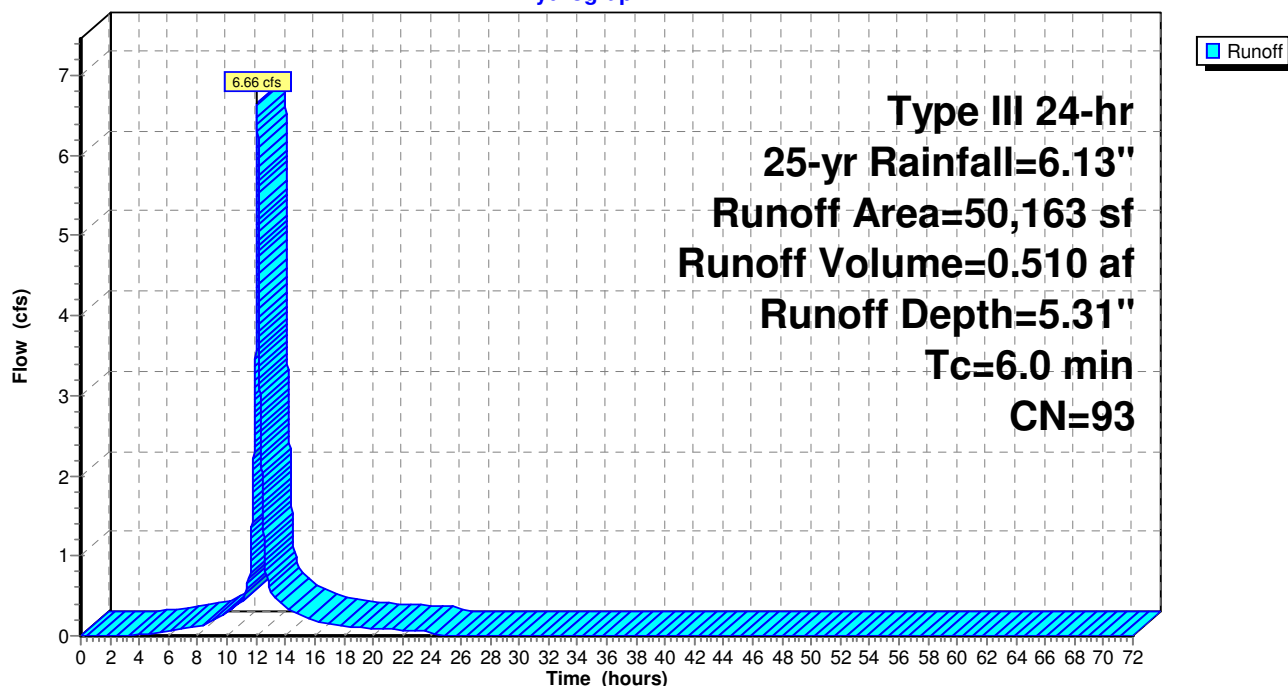
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

Area (sf)	CN	Description
922	74	>75% Grass cover, Good, HSG C
2,430	61	>75% Grass cover, Good, HSG B
* 4,429	71	>75% Grass cover, Good, HSG B/D
* 42,382	98	IMPERVIOUS
50,163	93	Weighted Average
7,781		15.51% Pervious Area
42,382		84.49% Impervious Area

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

**Subcatchment P10: CB's to UGC-E (East)**

Hydrograph



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Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Subcatchment P11: Culdesac**

Runoff = 5.23 cfs @ 12.09 hrs, Volume= 0.387 af, Depth= 4.86"

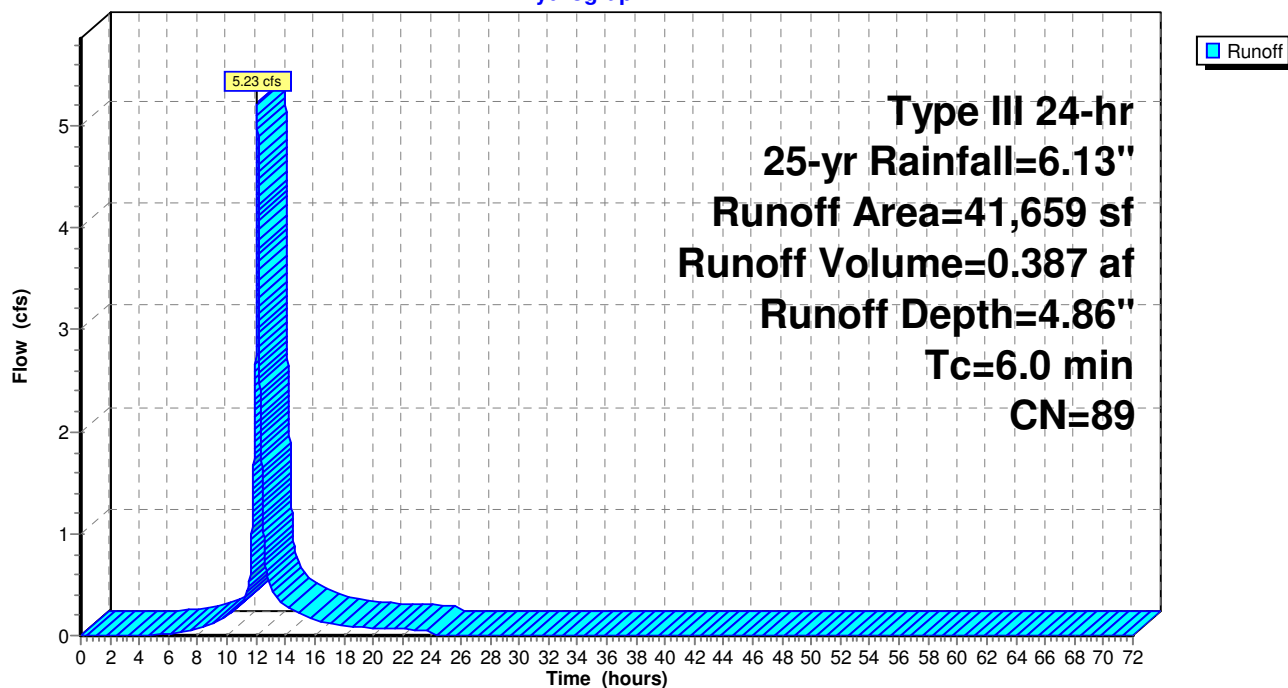
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

	Area (sf)	CN	Description
*	29,394	98	IMPERVIOUS
	2,607	61	>75% Grass cover, Good, HSG B
*	9,658	71	>75% Grass cover, Good, HSG B/D
	41,659	89	Weighted Average
	12,265		29.44% Pervious Area
	29,394		70.56% Impervious Area

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

**Subcatchment P11: Culdesac**

Hydrograph



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Type III 24-hr 25-yr Rainfall=6.13"

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### Summary for Subcatchment P12: Yard Drains to UGC-A

Runoff = 4.33 cfs @ 12.10 hrs, Volume= 0.319 af, Depth= 3.29"

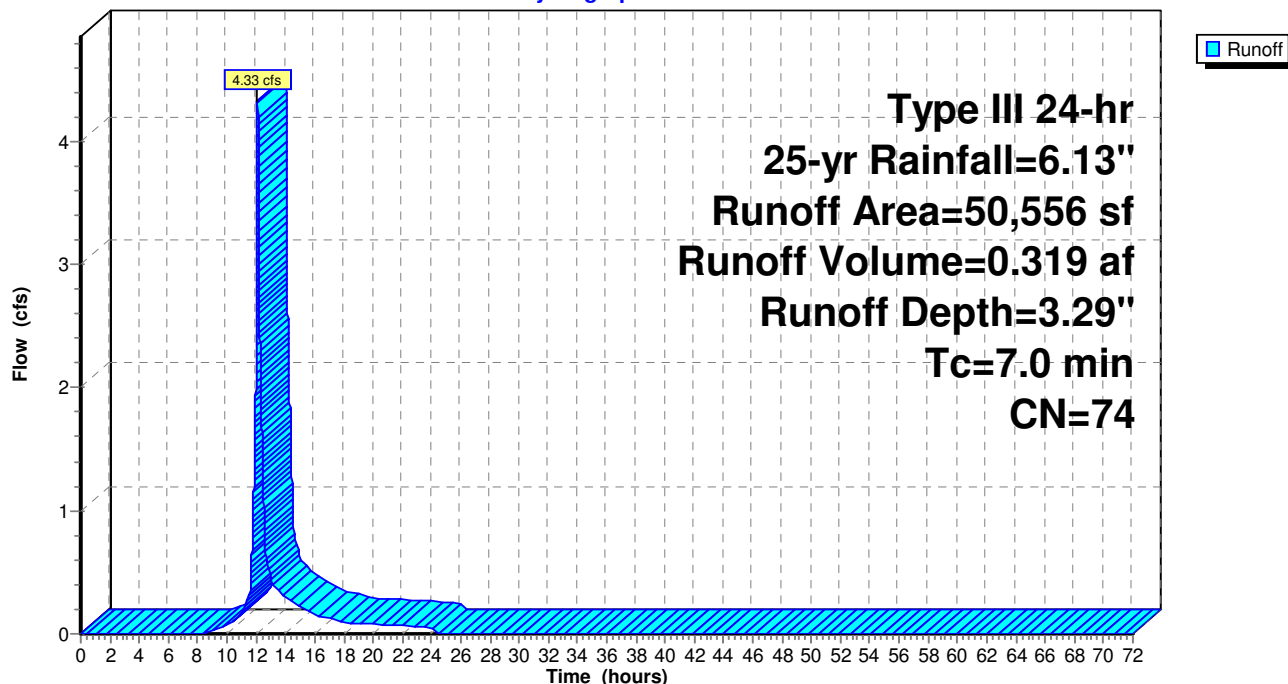
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

	Area (sf)	CN	Description
*	9,067	98	IMPERVIOUS
	12,690	61	>75% Grass cover, Good, HSG B
	4,707	74	>75% Grass cover, Good, HSG C
*	24,092	71	>75% Grass cover, Good, HSG B/D
	50,556	74	Weighted Average
	41,489		82.07% Pervious Area
	9,067		17.93% Impervious Area

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

### Subcatchment P12: Yard Drains to UGC-A

Hydrograph



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### Summary for Subcatchment P13: Yard Drains to UGC-C

Runoff = 0.63 cfs @ 12.11 hrs, Volume= 0.048 af, Depth= 2.27"

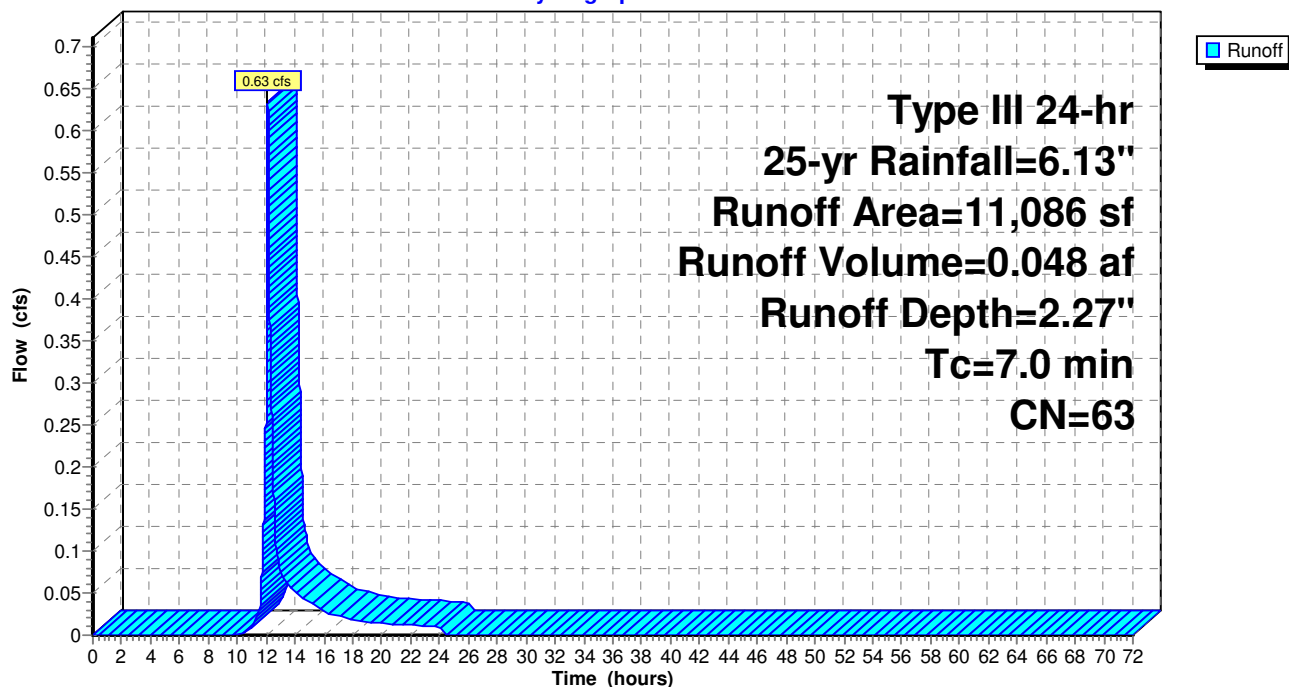
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

	Area (sf)	CN	Description
*	707	98	IMPERVIOUS
	10,379	61	>75% Grass cover, Good, HSG B
	11,086	63	Weighted Average
	10,379		93.62% Pervious Area
	707		6.38% Impervious Area

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

### Subcatchment P13: Yard Drains to UGC-C

Hydrograph



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**Summary for Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Runoff = 0.28 cfs @ 12.13 hrs, Volume= 0.024 af, Depth= 1.59"

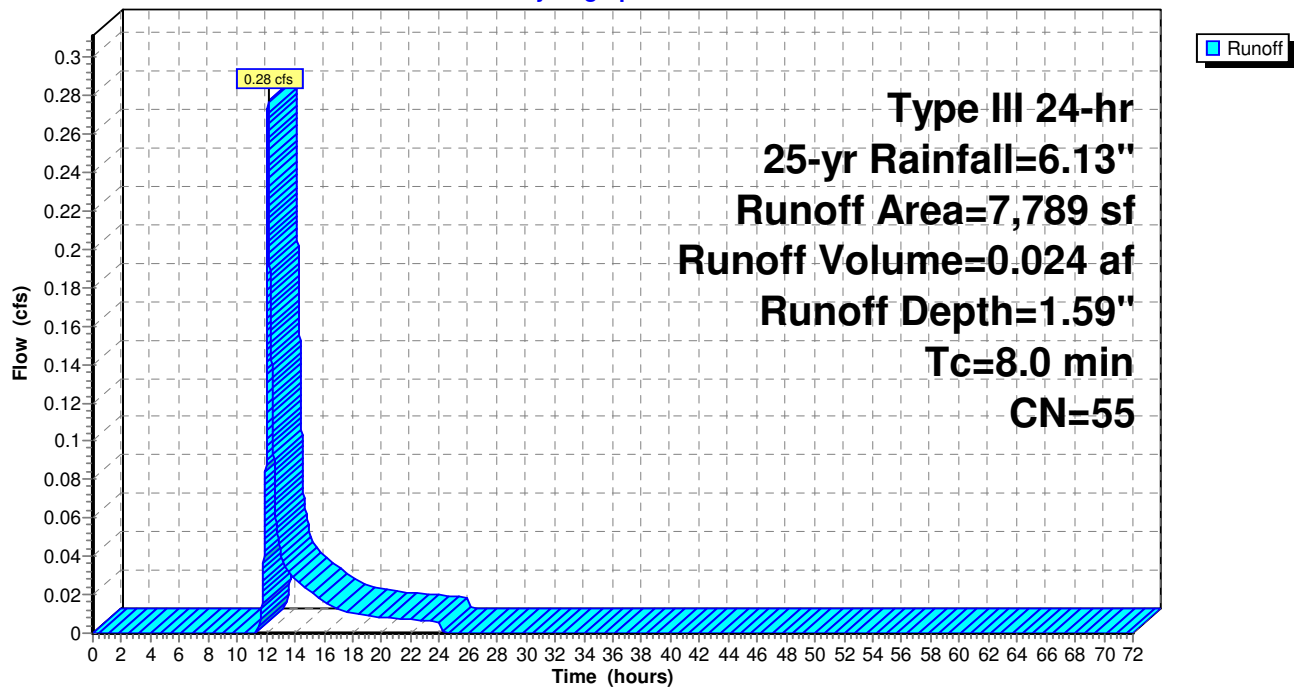
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

Area (sf)	CN	Description
2,334	39	>75% Grass cover, Good, HSG A
5,236	61	>75% Grass cover, Good, HSG B
* 219	71	>75% Grass cover, Good, HSG B/D
7,789	55	Weighted Average
7,789		100.00% Pervious Area

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

**Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Hydrograph



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Proposed Condition  
Type III 24-hr 25-yr Rainfall=6.13"

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### Summary for Subcatchment P3: P3

Runoff = 0.62 cfs @ 12.12 hrs, Volume= 0.048 af, Depth= 2.45"

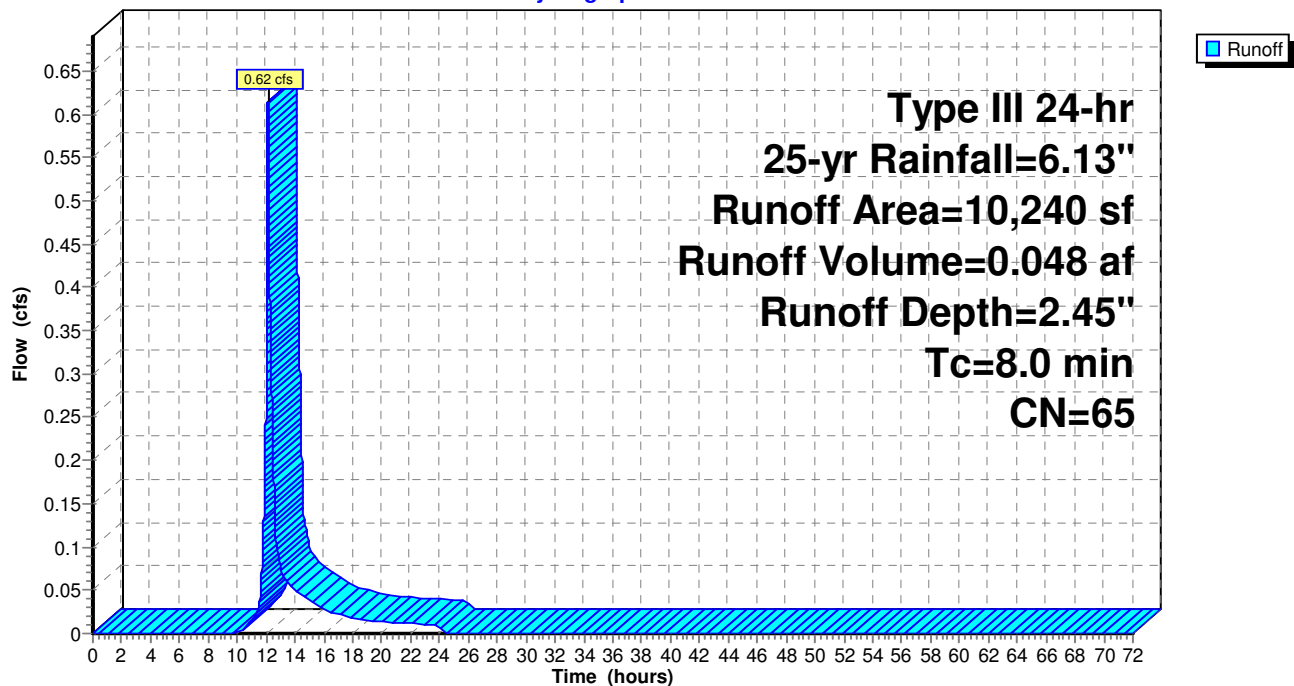
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

Area (sf)	CN	Description
2,646	39	>75% Grass cover, Good, HSG A
7,594	74	>75% Grass cover, Good, HSG C
10,240	65	Weighted Average
10,240		100.00% Pervious Area

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

### Subcatchment P3: P3

Hydrograph



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Proposed Condition  
Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Subcatchment P4: P4**

Runoff = 0.74 cfs @ 12.78 hrs, Volume= 0.134 af, Depth= 2.81"

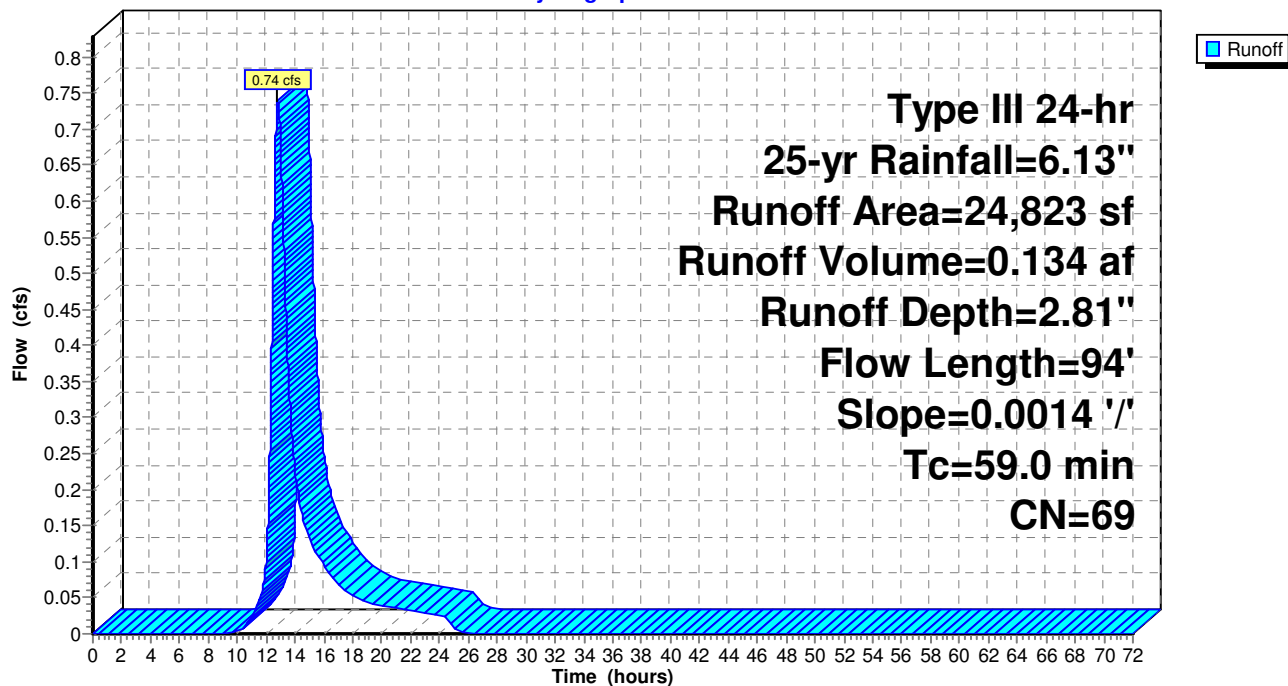
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

Area (sf)	CN	Description
4,911	74	>75% Grass cover, Good, HSG C
* 2,000	71	>75% Grass cover, Good, HSG B/D
* 14,330	66	Woods, Good, HSG B/D
3,582	70	Woods, Good, HSG C
24,823	69	Weighted Average
24,823		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
59.0	94	0.0014	0.03		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.22"

**Subcatchment P4: P4**

Hydrograph



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Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Subcatchment P5: P5**

Runoff = 7.54 cfs @ 12.63 hrs, Volume= 1.161 af, Depth= 2.81"

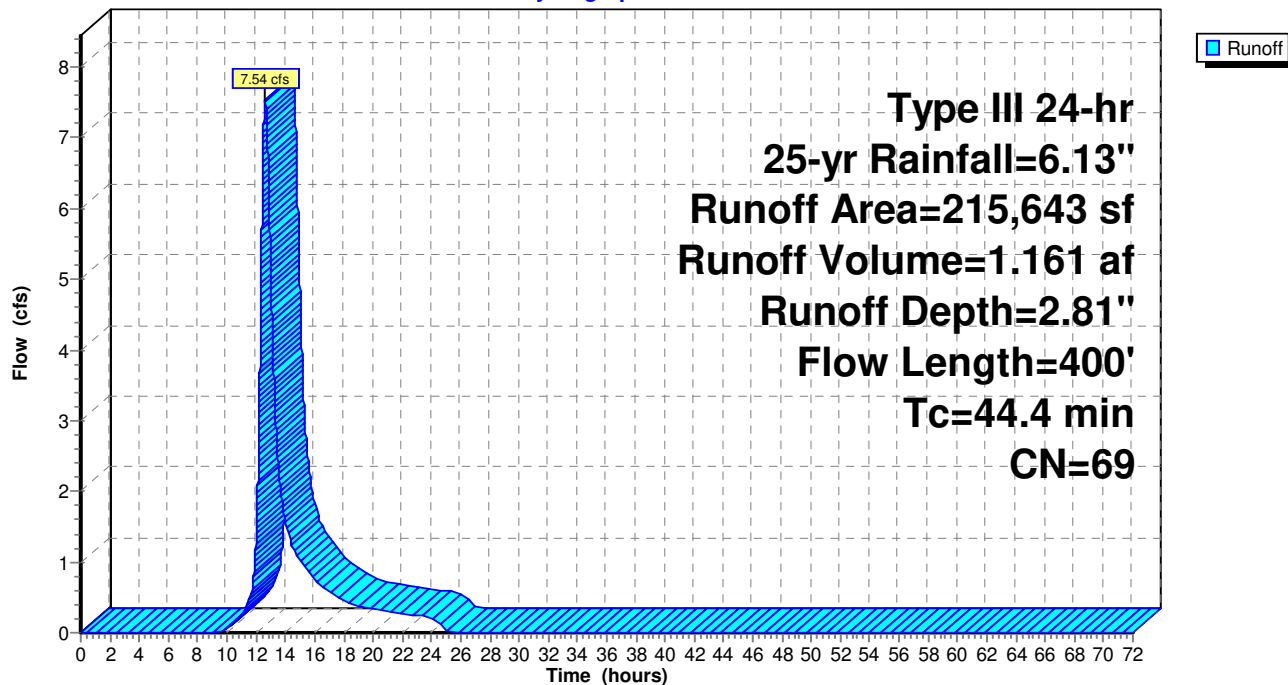
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

Area (sf)	CN	Description
1,504	74	>75% Grass cover, Good, HSG C
* 9,745	71	>75% Grass cover, Good, HSG B/D
25,599	70	Woods, Good, HSG C
* 127,460	66	Woods, Good, HSG B/D
* 8,904	98	IMPERVIOUS
* 13,961	68	Meadow, non-grazed, HSG B/D
28,470	71	Meadow, non-grazed, HSG C
215,643	69	Weighted Average
206,739		95.87% Pervious Area
8,904		4.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	23	0.2900	0.25		<b>Sheet Flow, GRASS SF</b> Grass: Dense n= 0.240 P2= 3.22"
22.4	82	0.0120	0.06		<b>Sheet Flow, WOODLAND SF</b> Woods: Light underbrush n= 0.400 P2= 3.22"
20.5	295	0.0023	0.24		<b>Shallow Concentrated Flow, WOOD SCF</b> Woodland Kv= 5.0 fps
44.4	400	Total			

# Subcatchment P5: P5

Hydrograph



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Proposed Condition  
Type III 24-hr 25-yr Rainfall=6.13"

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### Summary for Subcatchment P6: Sheet flow To West Basin

Runoff = 27.06 cfs @ 12.09 hrs, Volume= 2.071 af, Depth= 5.31"

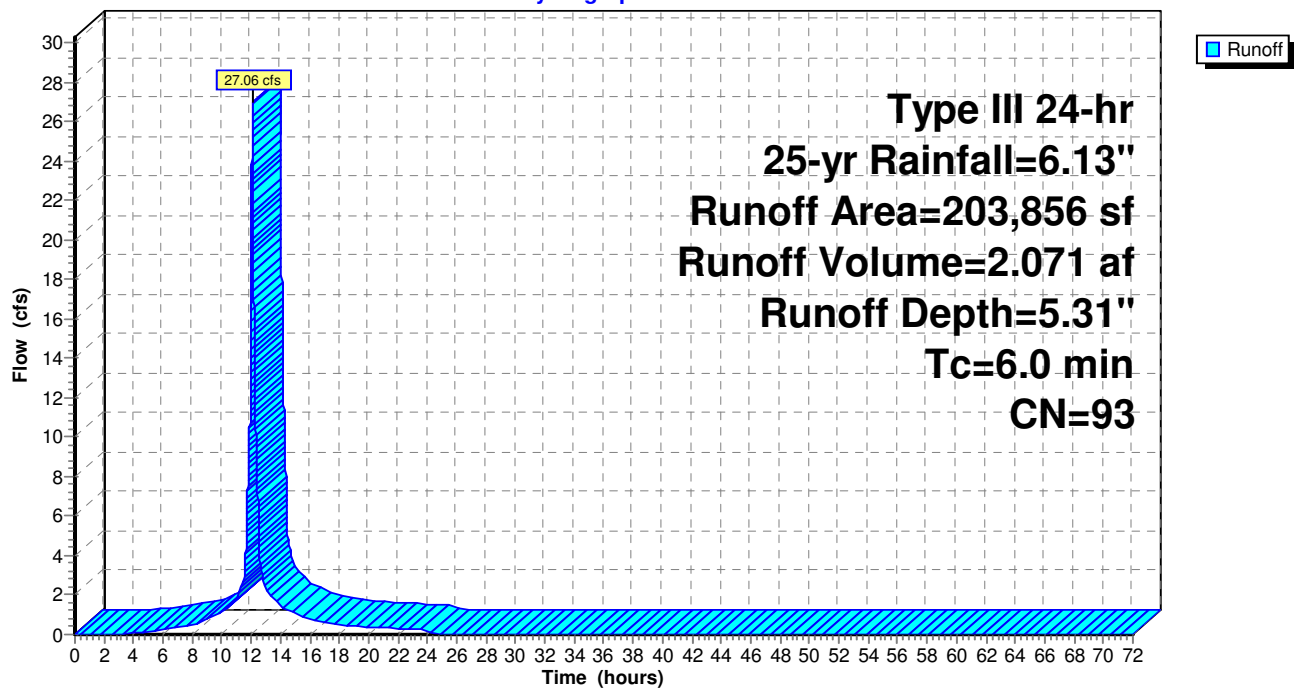
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

Area (sf)	CN	Description
4,918	39	>75% Grass cover, Good, HSG A
6,710	61	>75% Grass cover, Good, HSG B
6,131	74	>75% Grass cover, Good, HSG C
* 9,090	71	>75% Grass cover, Good, HSG B/D
* 177,007	98	IMPERVIOUS
203,856	93	Weighted Average
26,849		13.17% Pervious Area
177,007		86.83% Impervious Area

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

### Subcatchment P6: Sheet flow To West Basin

Hydrograph



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Proposed Condition  
Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Subcatchment P7: Proposed P7**

Runoff = 0.35 cfs @ 12.36 hrs, Volume= 0.041 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

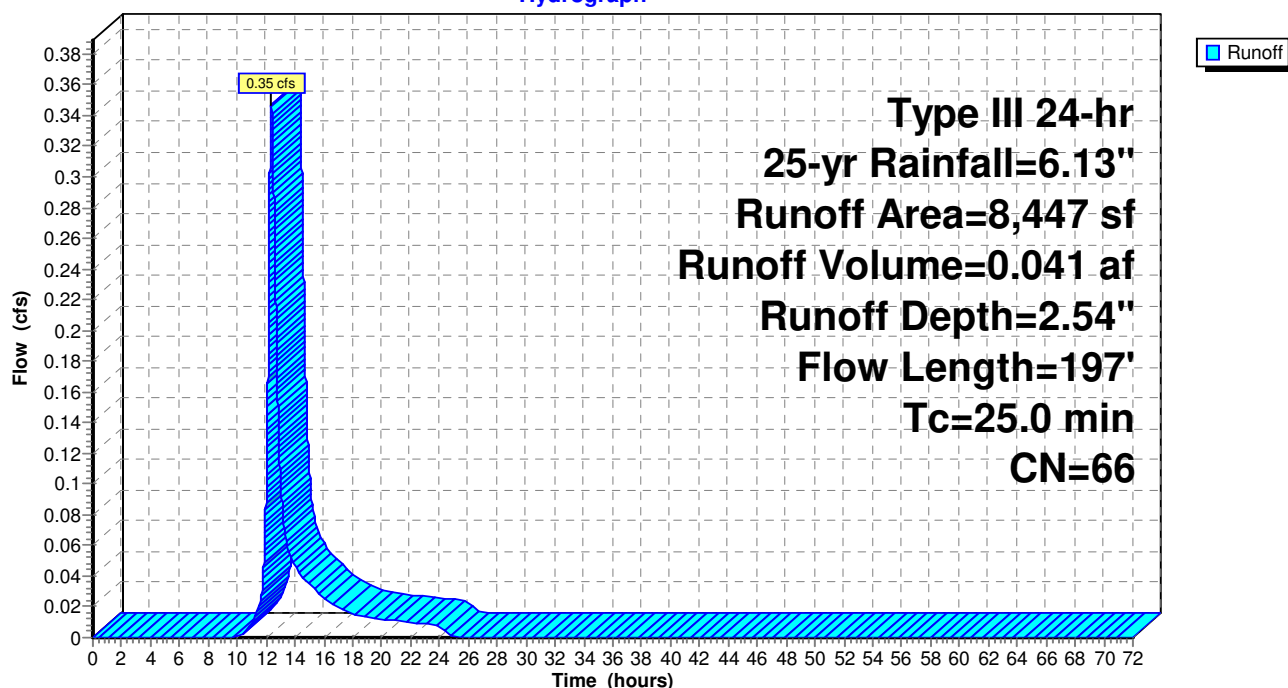
Area (sf)	CN	Description
2,335	39	>75% Grass cover, Good, HSG A
1,709	74	>75% Grass cover, Good, HSG C
* 1,796	98	IMPERVIOUS
450	30	Meadow, non-grazed, HSG A
2,157	71	Meadow, non-grazed, HSG C
8,447	66	Weighted Average
6,651		78.74% Pervious Area
1,796		21.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0160	0.07		<b>Sheet Flow, Woodland SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
1.6	97	0.0420	1.02		<b>Shallow Concentrated Flow, Woodlan SCF</b>
					Woodland Kv= 5.0 fps
25.0	197	Total			

**Subcatchment P7: Proposed P7**

Hydrograph



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Proposed Condition

Type III 24-hr 25-yr Rainfall=6.13"

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### Summary for Subcatchment P8: Proposed Roof to UGC-D (west)

Runoff = 33.39 cfs @ 12.09 hrs, Volume= 2.725 af, Depth= 5.89"

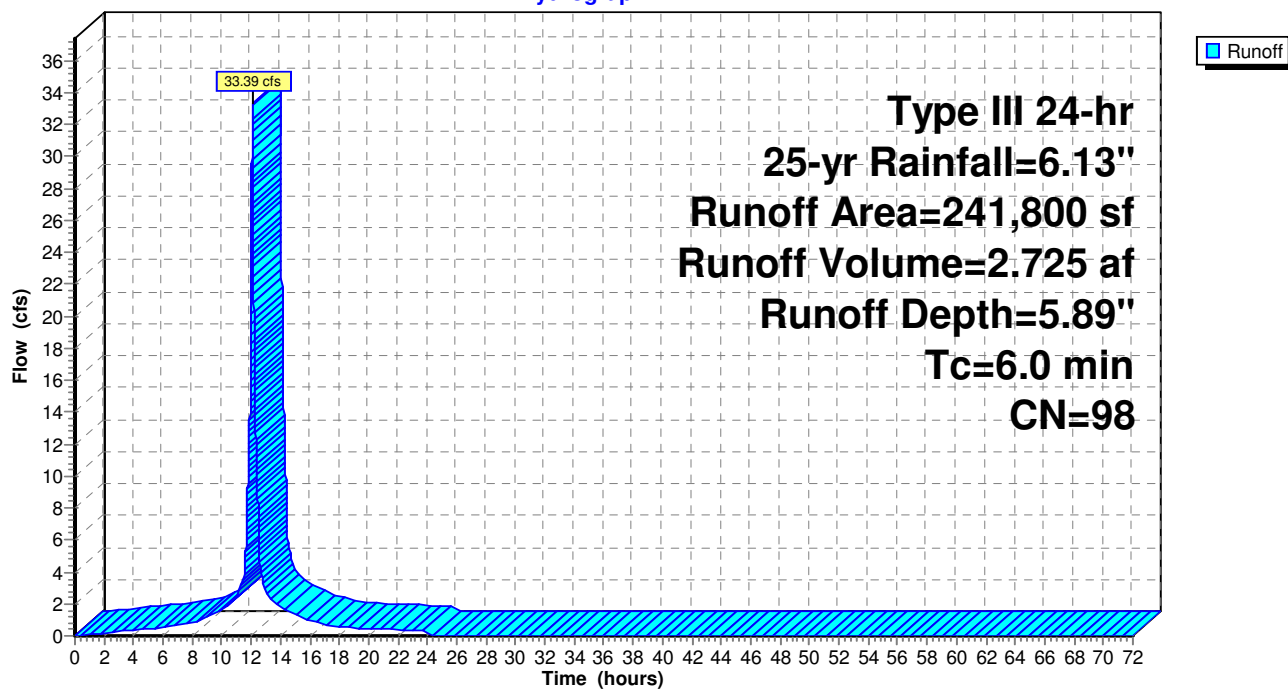
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

	Area (sf)	CN	Description
*	241,800	98	IMPERVIOUS
	241,800		100.00% Impervious Area

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

### Subcatchment P8: Proposed Roof to UGC-D (west)

Hydrograph



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Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Subcatchment P9: Sheetflow to North Basin**

Runoff = 5.37 cfs @ 12.10 hrs, Volume= 0.412 af, Depth= 4.86"

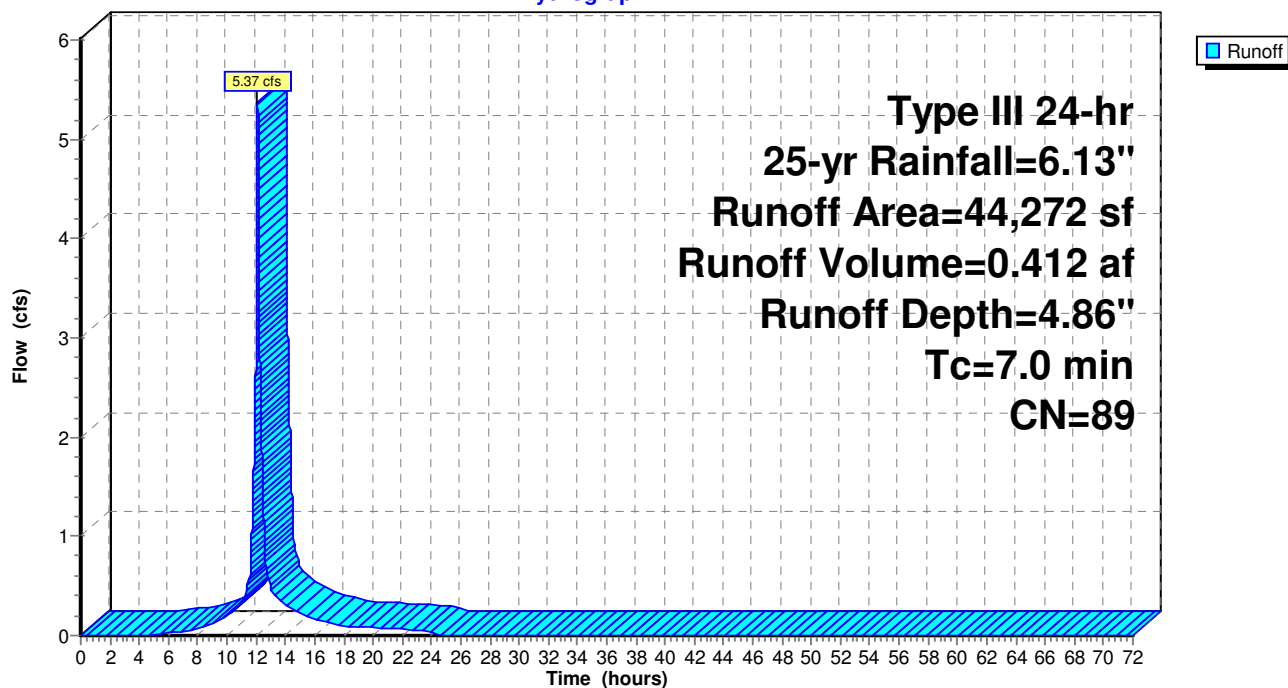
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 25-yr Rainfall=6.13"

	Area (sf)	CN	Description
	14,312	74	>75% Grass cover, Good, HSG C
*	1,743	71	>75% Grass cover, Good, HSG B/D
*	28,217	98	IMPERVIOUS
	44,272	89	Weighted Average
	16,055		36.26% Pervious Area
	28,217		63.74% Impervious Area

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

**Subcatchment P9: Sheetflow to North Basin**

Hydrograph



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Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Pond DMH: Splitter Structure**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 5.30" for 25-yr event  
 Inflow = 4.53 cfs @ 12.17 hrs, Volume= 0.509 af  
 Outflow = 4.53 cfs @ 12.17 hrs, Volume= 0.509 af, Atten= 0%, Lag= 0.0 min  
 Primary = 3.60 cfs @ 12.17 hrs, Volume= 0.271 af  
 Secondary = 0.93 cfs @ 12.17 hrs, Volume= 0.238 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

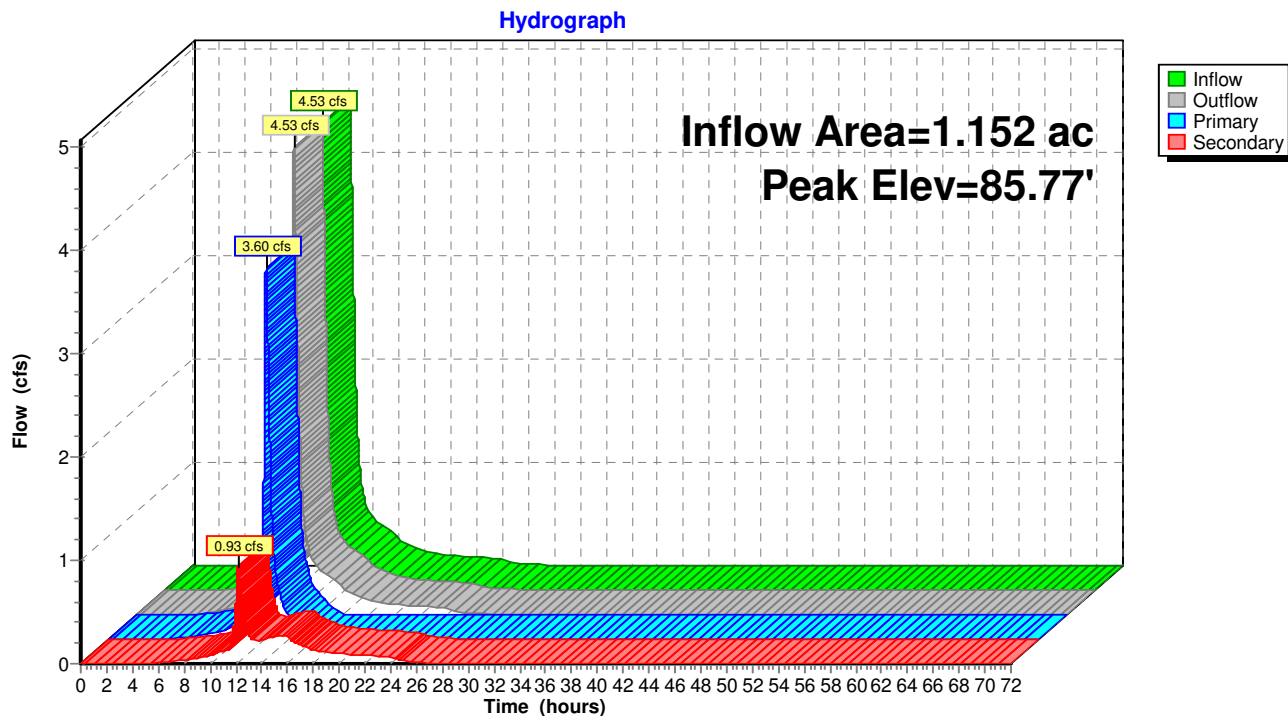
Peak Elev= 85.77' @ 12.17 hrs

Flood Elev= 85.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	84.55'	<b>15.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	84.55'	<b>6.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.20 sf

**Primary OutFlow** Max=3.60 cfs @ 12.17 hrs HW=85.77' TW=84.22' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 3.60 cfs @ 3.72 fps)**Secondary OutFlow** Max=0.93 cfs @ 12.17 hrs HW=85.77' TW=81.07' (Dynamic Tailwater)↑ **2=Culvert** (Inlet Controls 0.93 cfs @ 4.75 fps)

# Pond DMH: Splitter Structure



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Proposed Condition  
Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**

Inflow Area = 18.348 ac, 62.57% Impervious, Inflow Depth > 4.39" for 25-yr event  
 Inflow = 11.92 cfs @ 12.65 hrs, Volume= 6.709 af  
 Outflow = 10.35 cfs @ 12.91 hrs, Volume= 6.708 af, Atten= 13%, Lag= 15.6 min  
 Primary = 10.35 cfs @ 12.91 hrs, Volume= 6.708 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 82.36' @ 12.91 hrs Surf.Area= 11,888 sf Storage= 5,032 cf

Plug-Flow detention time= 3.6 min calculated for 6.708 af (100% of inflow)

Center-of-Mass det. time= 3.2 min ( 1,570.5 - 1,567.3 )

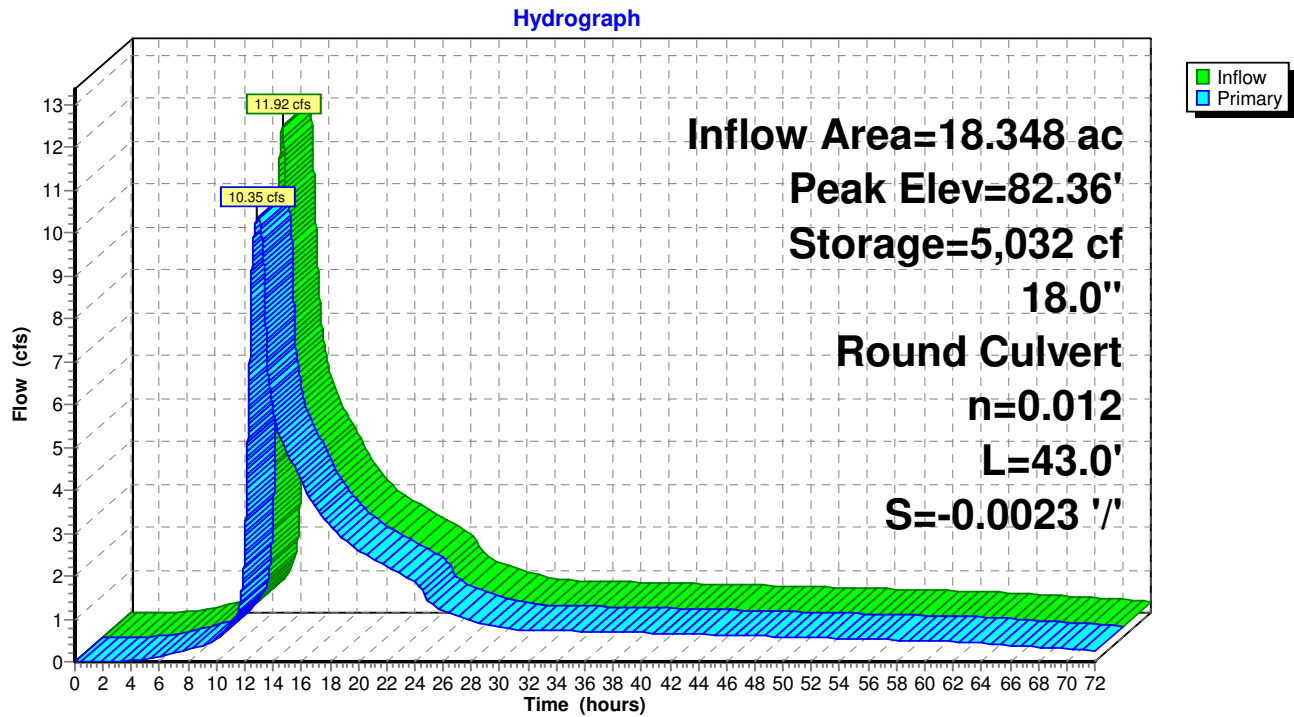
Volume	Invert	Avail.Storage	Storage Description
#1	79.70'	94,801 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.70	10	0	0
80.00	382	59	59
81.00	1,156	769	828
82.00	2,173	1,665	2,492
83.00	29,061	15,617	18,109
84.00	124,323	76,692	94,801

Device	Routing	Invert	Outlet Devices
#1	Primary	79.70'	<b>18.0" Round Culvert</b> L= 43.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 79.60' / 79.70' S= -0.0023 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

**Primary OutFlow** Max=10.35 cfs @ 12.91 hrs HW=82.36' (Free Discharge)↑ **1=Culvert** (Barrel Controls 10.35 cfs @ 5.85 fps)

**Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**



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Proposed Condition  
Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Pond PP1: UGC-D (Stormtech SC-310)**

Inflow Area = 10.231 ac, 93.98% Impervious, Inflow Depth > 5.53" for 25-yr event  
 Inflow = 34.84 cfs @ 12.09 hrs, Volume= 4.714 af  
 Outflow = 3.42 cfs @ 13.72 hrs, Volume= 4.572 af, Atten= 90%, Lag= 97.8 min  
 Primary = 3.42 cfs @ 13.72 hrs, Volume= 4.572 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 84.50' @ 13.72 hrs Surf.Area= 78,048 sf Storage= 81,831 cf

Plug-Flow detention time= 767.3 min calculated for 4.572 af (97% of inflow)  
 Center-of-Mass det. time= 696.6 min ( 1,727.6 - 1,031.0 )

Volume	Invert	Avail.Storage	Storage Description
#1A	82.78'	48,033 cf	<b>108.17'W x 644.00'L x 2.33'H Field A</b> 162,538 cf Overall - 42,457 cf Embedded = 120,082 cf x 40.0% Voids
#2A	83.28'	42,457 cf	<b>ADS_StormTech RC-310 +Cap</b> x 2880 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 2880 Chambers in 32 Rows
#3B	82.78'	6,025 cf	<b>11.50'W x 729.44'L x 2.33'H Field B</b> 19,573 cf Overall - 4,511 cf Embedded = 15,062 cf x 40.0% Voids
#4B	83.28'	4,511 cf	<b>ADS_StormTech SC-310 +Cap</b> x 306 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 306 Chambers in 3 Rows
101,025 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

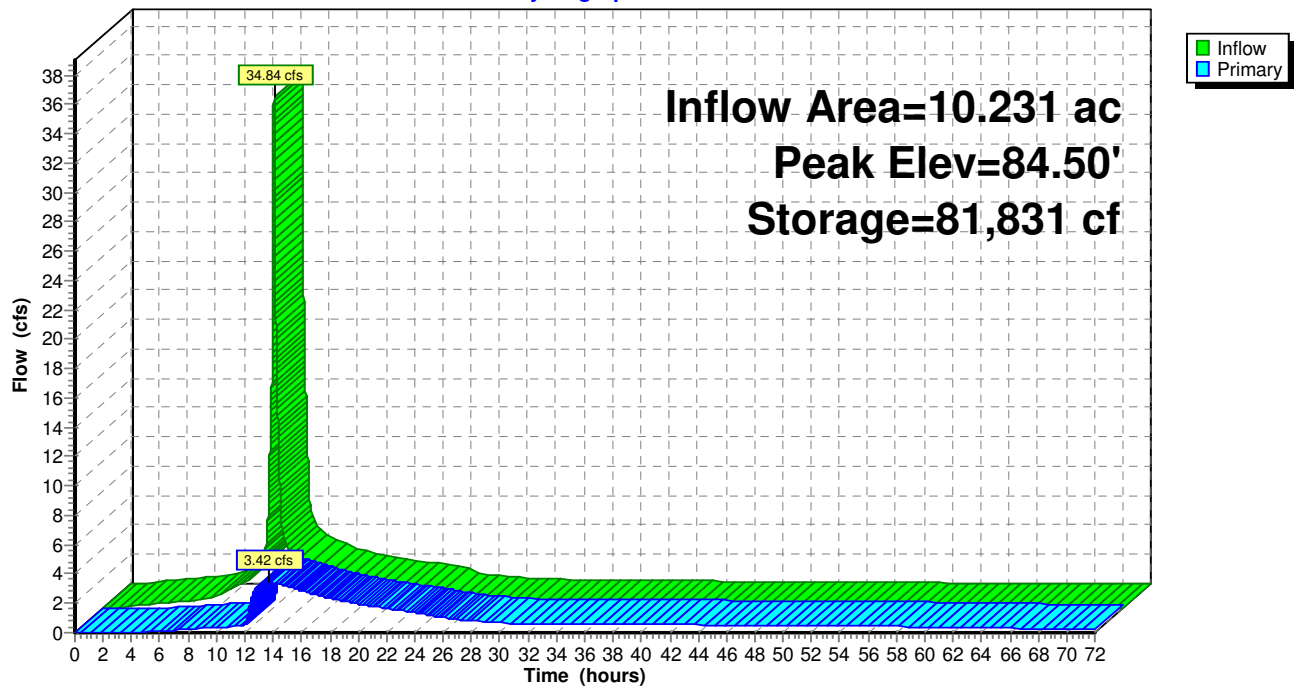
Device	Routing	Invert	Outlet Devices
#1	Primary	82.78'	<b>24.0" Round 24" RCP</b> L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.78' / 82.70' S= 0.0057 ' S= 0.0057 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	82.78'	<b>9.0" W x 2.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	83.95'	<b>24.0" W x 10.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=3.42 cfs @ 13.72 hrs HW=84.50' TW=81.56' (Dynamic Tailwater)

1=24" RCP (Passes 3.42 cfs of 9.68 cfs potential flow)  
 2=Orifice/Grate (Orifice Controls 0.77 cfs @ 6.17 fps)  
 3=Orifice/Grate (Orifice Controls 2.65 cfs @ 2.39 fps)

**Pond PP1: UGC-D (Stormtech SC-310)**

Hydrograph



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Proposed Condition  
Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Pond PP2: Water Quality Basin (WEST)**

Inflow Area = 4.680 ac, 86.83% Impervious, Inflow Depth = 5.31" for 25-yr event  
 Inflow = 27.06 cfs @ 12.09 hrs, Volume= 2.071 af  
 Outflow = 1.74 cfs @ 12.16 hrs, Volume= 1.989 af, Atten= 94%, Lag= 4.8 min  
 Primary = 1.74 cfs @ 12.16 hrs, Volume= 1.989 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.50' Surf.Area= 39,354 sf Storage= 18,954 cf

Peak Elev= 84.80' @ 14.01 hrs Surf.Area= 47,442 sf Storage= 75,445 cf (56,491 cf above start)

Plug-Flow detention time= 915.3 min calculated for 1.553 af (75% of inflow)

Center-of-Mass det. time= 650.8 min ( 1,423.2 - 772.4 )

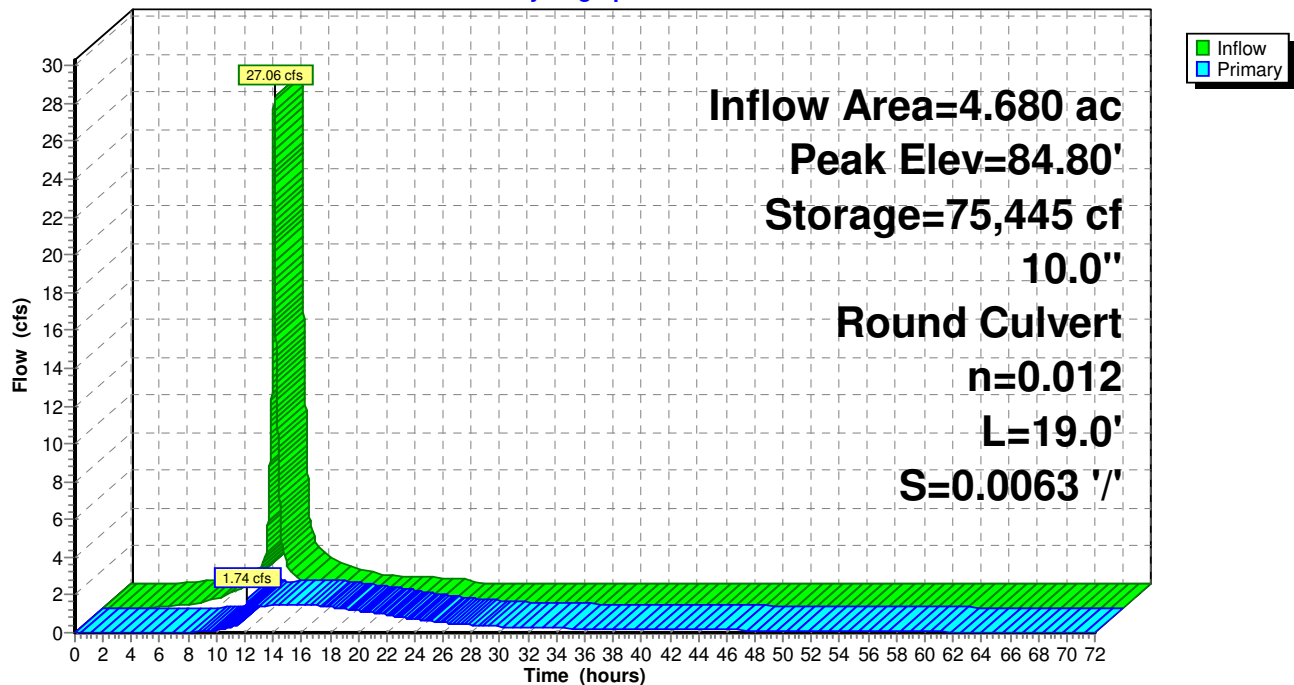
Volume	Invert	Avail.Storage	Storage Description	
#1	83.00'	136,855 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
83.00	36,482	0	0	36,482
84.00	42,335	39,372	39,372	42,377
85.00	48,730	45,495	84,867	48,817
86.00	55,314	51,987	136,855	55,450

Device	Routing	Invert	Outlet Devices
#1	Primary	83.50'	<b>10.0" Round Culvert</b> L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.50' / 83.38' S= 0.0063 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

**Primary OutFlow** Max=1.74 cfs @ 12.16 hrs HW=84.48' TW=84.04' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 1.74 cfs @ 3.19 fps)

# Pond PP2: Water Quality Basin (WEST)

Hydrograph



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Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Pond PP3: UGC-B (Stormtech SC-310)**

Inflow Area = 1.223 ac, 8.92% Impervious, Inflow Depth = 2.45" for 25-yr event  
 Inflow = 3.32 cfs @ 12.11 hrs, Volume= 0.249 af  
 Outflow = 1.27 cfs @ 12.42 hrs, Volume= 0.193 af, Atten= 62%, Lag= 18.5 min  
 Primary = 1.27 cfs @ 12.42 hrs, Volume= 0.193 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 81.39' @ 12.42 hrs Surf.Area= 4,229 sf Storage= 3,874 cf

Plug-Flow detention time= 177.9 min calculated for 0.193 af (77% of inflow)

Center-of-Mass det. time= 90.9 min ( 940.9 - 849.9 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,745 cf	<b>4.83'W x 473.12'L x 2.33'H Field A</b> 5,336 cf Overall - 973 cf Embedded = 4,363 cf x 40.0% Voids
#2A	80.23'	973 cf	<b>ADS_StormTech SC-310 +Cap</b> x 66 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,483 cf	<b>4.83'W x 401.92'L x 2.33'H Field B</b> 4,533 cf Overall - 826 cf Embedded = 3,707 cf x 40.0% Voids
#4B	80.23'	826 cf	<b>ADS_StormTech SC-310 +Cap</b> x 56 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,027 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.66'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.66' / 79.27' S= 0.0195 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.27 cfs @ 12.42 hrs HW=81.39' TW=0.00' (Dynamic Tailwater)

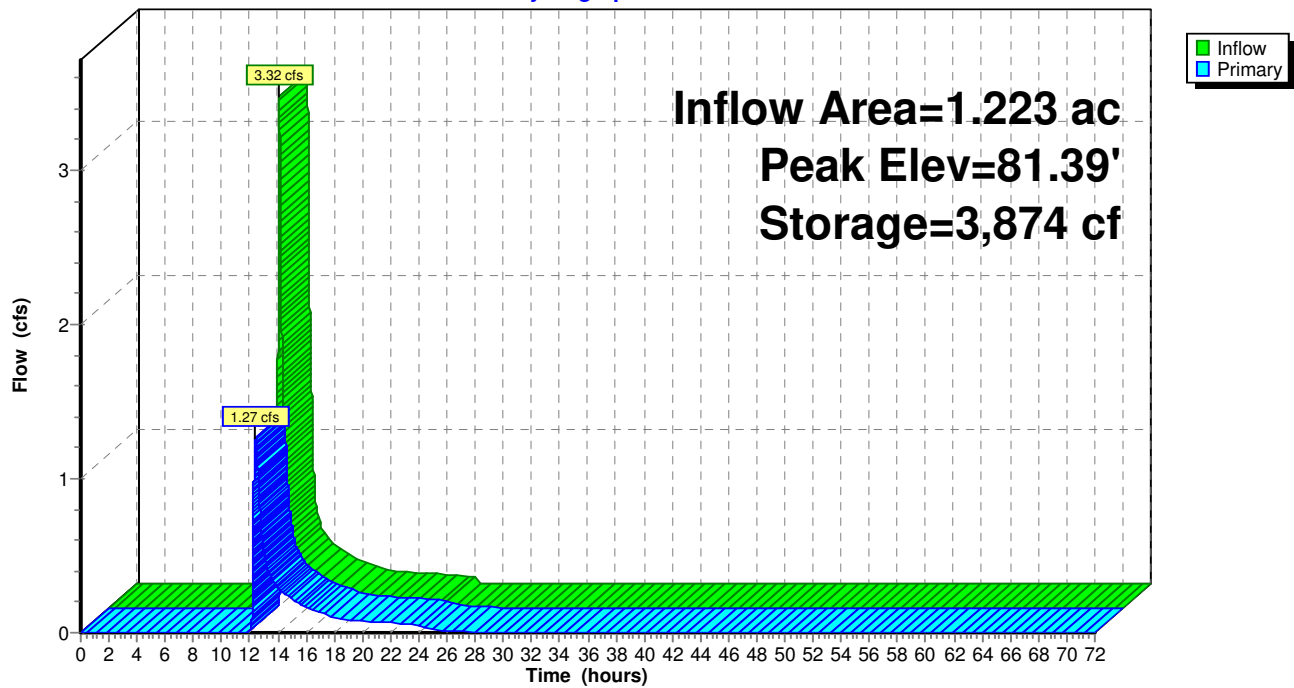
1=12" HDPE OUT (Passes 1.27 cfs of 4.20 cfs potential flow)

2=Orifice/Grate (Orifice Controls 1.27 cfs @ 2.62 fps)

3=12" HDPE (Passes 1.27 cfs of 2.55 cfs potential flow)

**Pond PP3: UGC-B (Stormtech SC-310)**

Hydrograph



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Type III 24-hr 25-yr Rainfall=6.13"

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**Summary for Pond PP4: Water Quality Basin (North)**

Inflow Area = 2.168 ac, 74.76% Impervious, Inflow Depth = 3.78" for 25-yr event  
 Inflow = 8.58 cfs @ 12.11 hrs, Volume= 0.683 af  
 Outflow = 0.13 cfs @ 17.08 hrs, Volume= 0.516 af, Atten= 99%, Lag= 298.0 min  
 Primary = 0.13 cfs @ 17.08 hrs, Volume= 0.516 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.40' Surf.Area= 14,585 sf Storage= 18,791 cf

Peak Elev= 84.97' @ 17.08 hrs Surf.Area= 17,398 sf Storage= 43,878 cf (25,087 cf above start)

Plug-Flow detention time= 3,345.6 min calculated for 0.084 af (12% of inflow)

Center-of-Mass det. time= 1,534.4 min ( 2,299.9 - 765.4 )

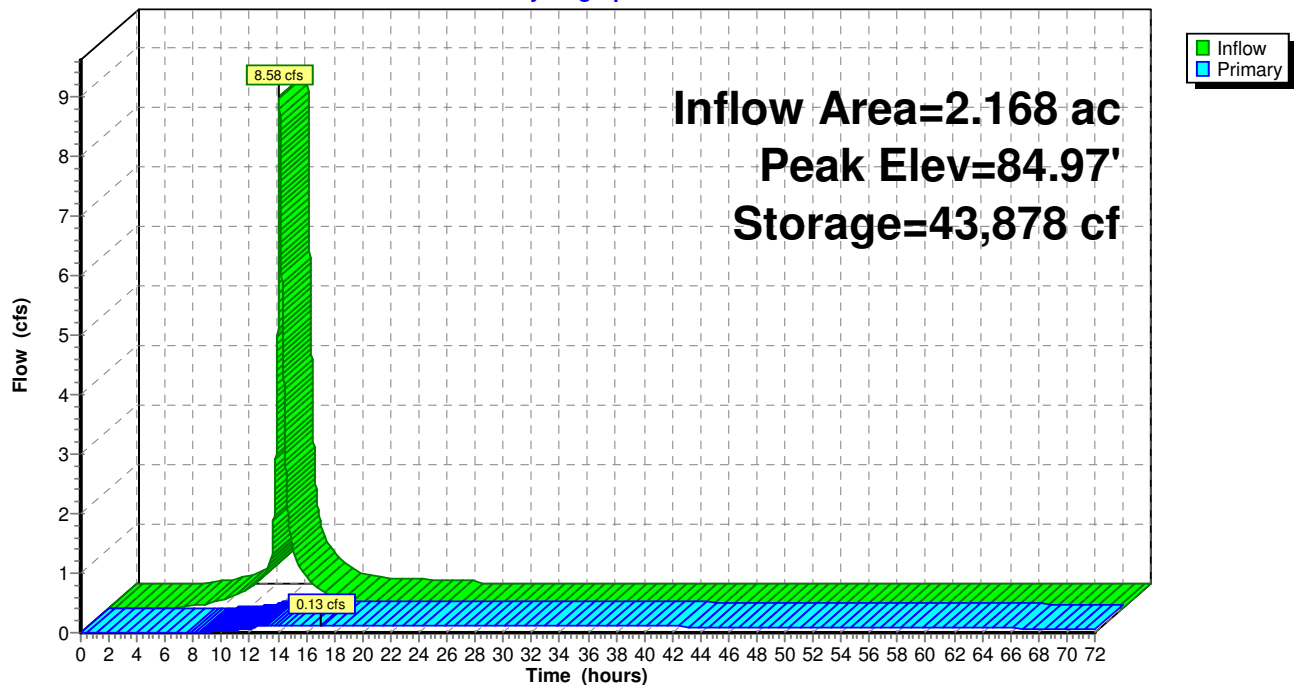
Volume	Invert	Avail.Storage	Storage Description	
#1	82.00'	62,769 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.00	12,313	0	0	12,313
83.00	13,894	13,096	13,096	13,945
84.00	15,654	14,765	27,861	15,757
85.00	17,454	16,546	44,407	17,614
86.00	19,286	18,362	62,769	19,508

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.40' / 83.31' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Device 1	83.40'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.13 cfs @ 17.08 hrs HW=84.97' TW=80.87' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.13 cfs of 3.61 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.13 cfs @ 5.87 fps)

# Pond PP4: Water Quality Basin (North)

Hydrograph



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**Summary for Pond PP5: UGC-E (Stormtech SC-310)**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 5.31" for 25-yr event  
 Inflow = 6.66 cfs @ 12.09 hrs, Volume= 0.510 af  
 Outflow = 4.53 cfs @ 12.17 hrs, Volume= 0.509 af, Atten= 32%, Lag= 4.9 min  
 Primary = 4.53 cfs @ 12.17 hrs, Volume= 0.509 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 87.01' @ 12.17 hrs Surf.Area= 4,780 sf Storage= 4,312 cf

Plug-Flow detention time= 48.6 min calculated for 0.509 af (100% of inflow)  
 Center-of-Mass det. time= 47.7 min ( 820.1 - 772.4 )

Volume	Invert	Avail.Storage	Storage Description
#1A	85.38'	1,929 cf	<b>4.83'W x 522.96'L x 2.33'H Field A</b> 5,898 cf Overall - 1,076 cf Embedded = 4,822 cf x 40.0% Voids
#2A	85.88'	1,076 cf	<b>ADS_StormTech SC-310 +Cap</b> x 73 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	85.38'	1,719 cf	<b>4.83'W x 466.00'L x 2.33'H Field B</b> 5,255 cf Overall - 958 cf Embedded = 4,297 cf x 40.0% Voids
#4B	85.88'	958 cf	<b>ADS_StormTech SC-310 +Cap</b> x 65 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,682 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.38'	<b>15.0" Round 15" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.28' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	85.95'	<b>10.0" Round ORIFICE A X 2.00</b> L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.95' / 85.92' S= 0.0060 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf
#3	Device 1	85.38'	<b>6.0" Round ORIFICE B</b> L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.31' S= 0.0020 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=4.53 cfs @ 12.17 hrs HW=87.01' TW=85.77' (Dynamic Tailwater)

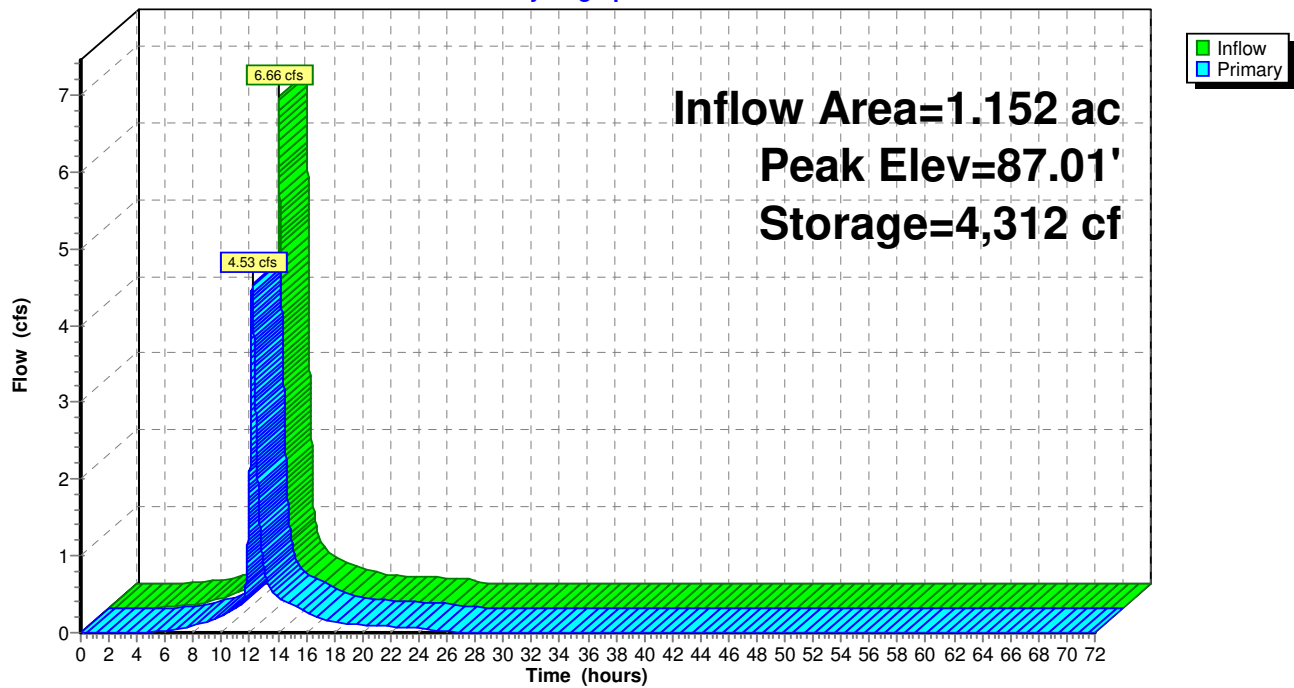
1=15" HDPE OUT (Passes 4.53 cfs of 5.13 cfs potential flow)

2=ORIFICE A (Barrel Controls 3.65 cfs @ 3.40 fps)

3=ORIFICE B (Barrel Controls 0.88 cfs @ 4.48 fps)

**Pond PP5: UGC-E (Stormtech SC-310)**

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**Summary for Pond PP6: Water Quality Basin (Kennedy Road)**

Inflow Area = 0.956 ac, 70.56% Impervious, Inflow Depth = 4.86" for 25-yr event  
 Inflow = 5.23 cfs @ 12.09 hrs, Volume= 0.387 af  
 Outflow = 0.57 cfs @ 12.79 hrs, Volume= 0.386 af, Atten= 89%, Lag= 42.3 min  
 Primary = 0.57 cfs @ 12.79 hrs, Volume= 0.386 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 80.00' Surf.Area= 5,601 sf Storage= 11,033 cf

Peak Elev= 81.32' @ 12.79 hrs Surf.Area= 7,016 sf Storage= 19,328 cf (8,296 cf above start)

Plug-Flow detention time= 650.6 min calculated for 0.132 af (34% of inflow)

Center-of-Mass det. time= 212.9 min ( 1,000.3 - 787.5 )

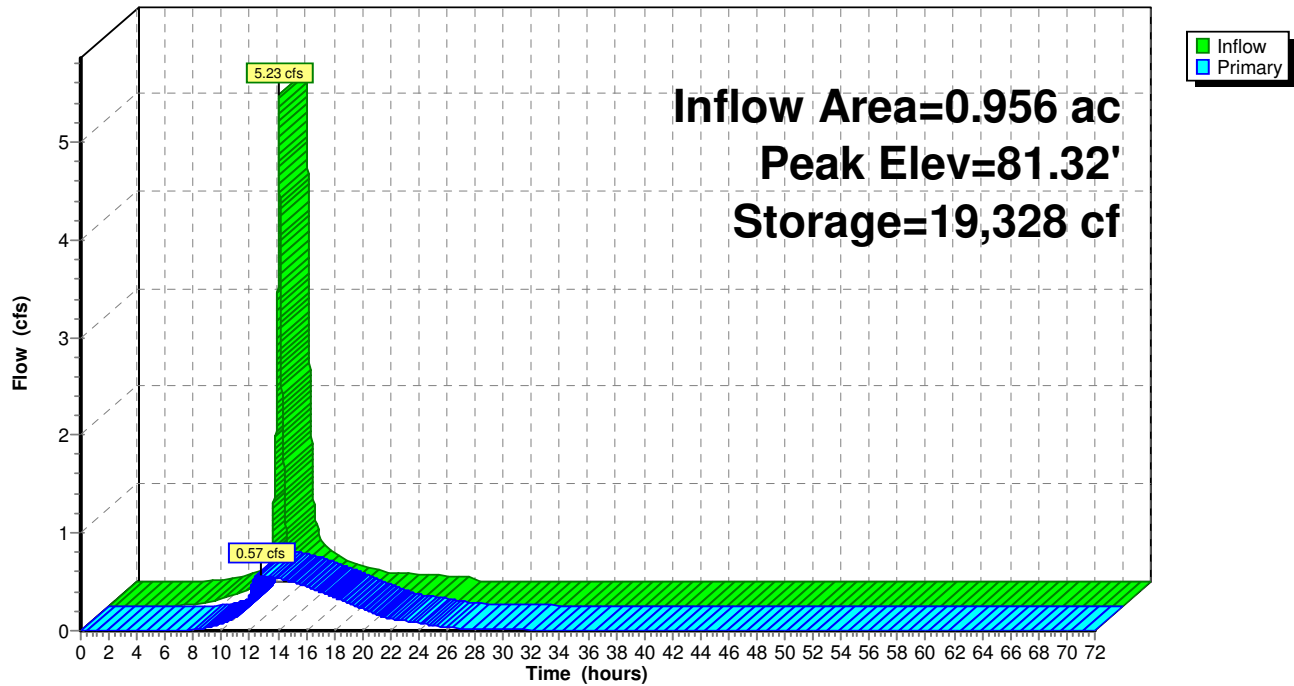
Volume	Invert	Avail.Storage	Storage Description	
#1	75.00'	42,367 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.00	239	0	0	239
76.00	786	486	486	791
77.00	1,382	1,070	1,556	1,399
78.00	2,063	1,711	3,267	2,095
78.80	2,824	1,947	5,214	2,869
79.00	4,585	734	5,948	4,630
80.00	5,601	5,085	11,033	5,677
81.00	6,669	6,127	17,160	6,781
82.00	7,793	7,224	24,384	7,944
83.00	8,973	8,376	32,760	9,168
84.00	10,257	9,608	42,367	10,498

Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 79.91' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	80.00'	<b>4.5" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.57 cfs @ 12.79 hrs HW=81.32' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.57 cfs of 2.85 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 5.12 fps)

**Pond PP6: Water Quality Basin (Kennedy Road)**

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**Summary for Pond PP7: UGC-A (Stormtech SC-310)**

Inflow Area = 1.161 ac, 17.93% Impervious, Inflow Depth = 3.29" for 25-yr event  
 Inflow = 4.33 cfs @ 12.10 hrs, Volume= 0.319 af  
 Outflow = 0.06 cfs @ 23.20 hrs, Volume= 0.221 af, Atten= 99%, Lag= 666.1 min  
 Primary = 0.06 cfs @ 23.20 hrs, Volume= 0.221 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 81.31' @ 23.20 hrs Surf.Area= 12,415 sf Storage= 11,485 cf

Plug-Flow detention time= 1,572.1 min calculated for 0.221 af (69% of inflow)

Center-of-Mass det. time= 1,474.1 min ( 2,302.8 - 828.8 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	6,730 cf	<b>11.50'W x 814.88'L x 2.33'H Field A</b> 21,866 cf Overall - 5,042 cf Embedded = 16,824 cf x 40.0% Voids
#2A	80.23'	5,042 cf	<b>ADS_StormTech SC-310 +Cap</b> x 342 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 342 Chambers in 3 Rows
#3B	79.73'	2,322 cf	<b>4.83'W x 629.76'L x 2.33'H Field B</b> 7,102 cf Overall - 1,297 cf Embedded = 5,805 cf x 40.0% Voids
#4B	80.23'	1,297 cf	<b>ADS_StormTech SC-310 +Cap</b> x 88 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
			15,391 cf Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

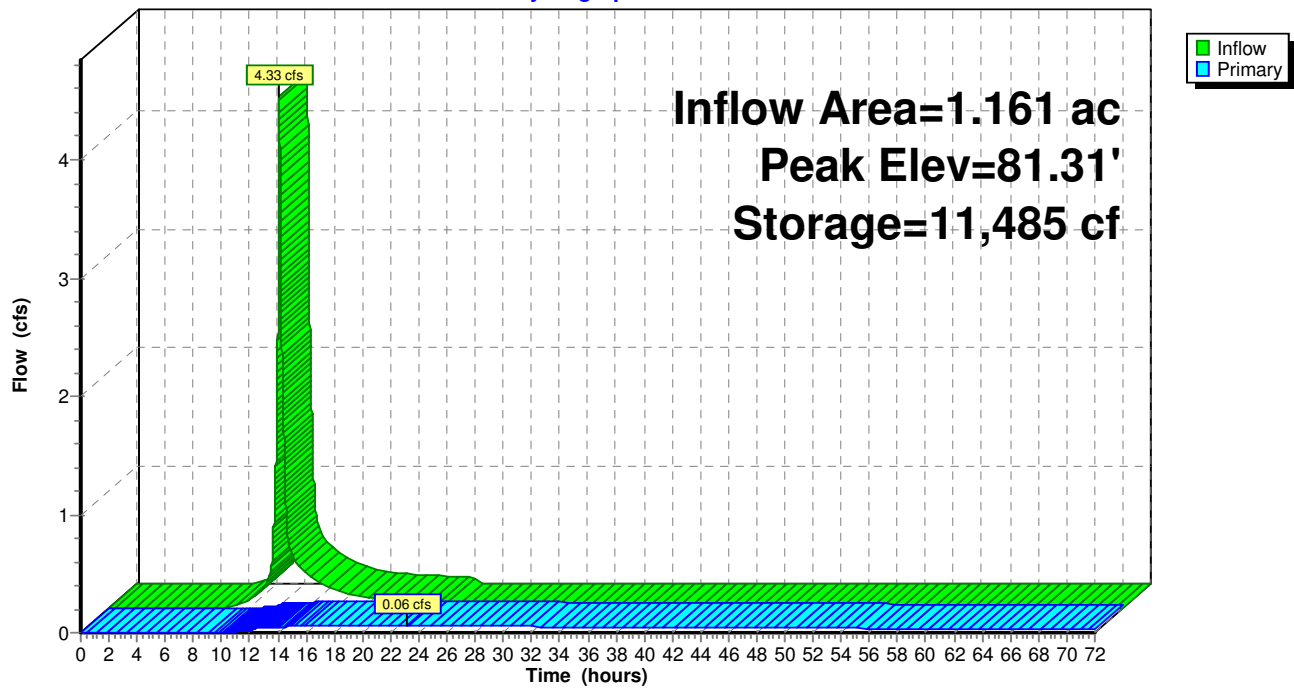
Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.35'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	79.73'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	81.86'	<b>9.0" W x 3.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.06 cfs @ 23.20 hrs HW=81.31' TW=0.00' (Dynamic Tailwater)

- 1=12" HDPE (Passes 0.06 cfs of 3.63 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.03 cfs @ 4.60 fps)
- 3=Orifice/Grate (Orifice Controls 0.03 cfs @ 5.96 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

**Pond PP7: UGC-A (Stormtech SC-310)**

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**Summary for Pond PP8: UGC-C (Stormtech SC-310)**

Inflow Area = 0.254 ac, 6.38% Impervious, Inflow Depth = 2.27" for 25-yr event  
 Inflow = 0.63 cfs @ 12.11 hrs, Volume= 0.048 af  
 Outflow = 0.01 cfs @ 23.48 hrs, Volume= 0.005 af, Atten= 98%, Lag= 682.4 min  
 Primary = 0.01 cfs @ 23.48 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.85' @ 23.48 hrs Surf.Area= 3,231 sf Storage= 1,981 cf

Plug-Flow detention time= 842.4 min calculated for 0.005 af (10% of inflow)

Center-of-Mass det. time= 686.6 min ( 1,541.4 - 854.8 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,299 cf	<b>4.83'W x 352.08'L x 2.33'H Field A</b> 3,971 cf Overall - 722 cf Embedded = 3,248 cf x 40.0% Voids
#2A	80.23'	722 cf	<b>ADS_StormTech SC-310 +Cap</b> x 49 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,168 cf	<b>4.83'W x 316.48'L x 2.33'H Field B</b> 3,569 cf Overall - 649 cf Embedded = 2,921 cf x 40.0% Voids
#4B	80.23'	649 cf	<b>ADS_StormTech SC-310 +Cap</b> x 44 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		3,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.01 cfs @ 23.48 hrs HW=80.85' TW=0.00' (Dynamic Tailwater)

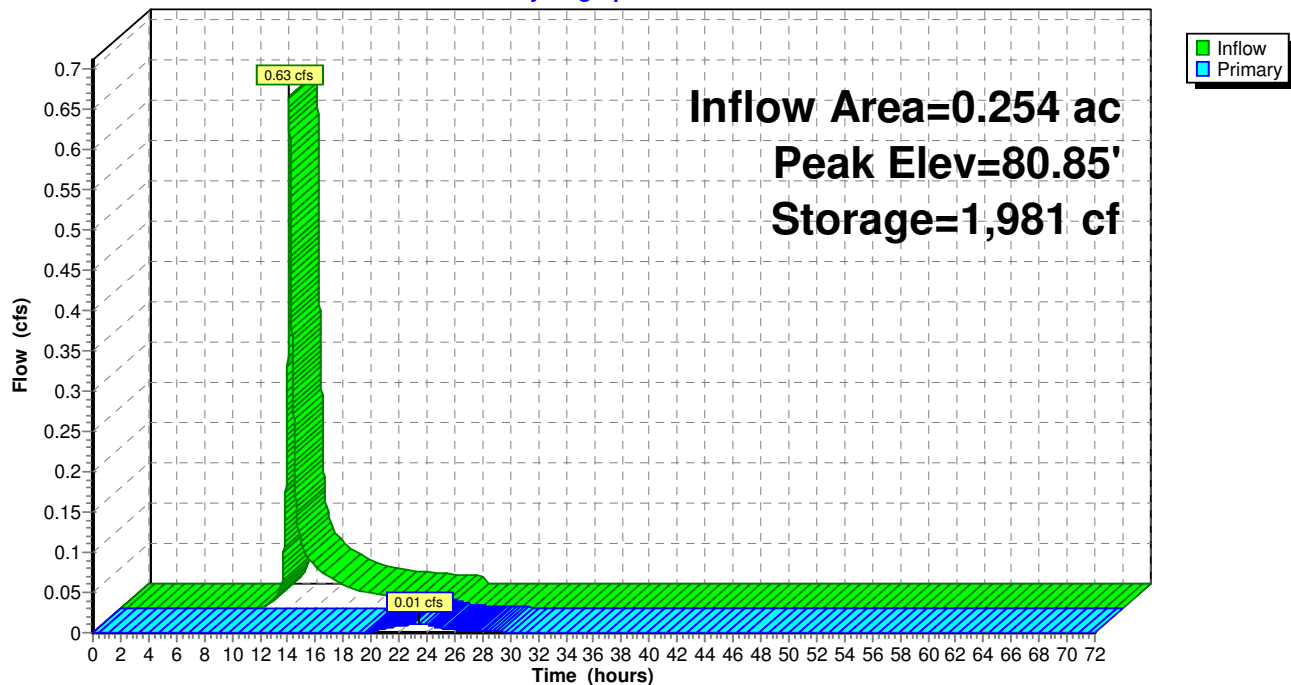
1=12" HDPE OUT (Passes 0.01 cfs of 2.51 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.01 cfs @ 0.74 fps)

3=12" HDPE (Passes 0.01 cfs of 0.39 cfs potential flow)

**Pond PP8: UGC-C (Stormtech SC-310)**

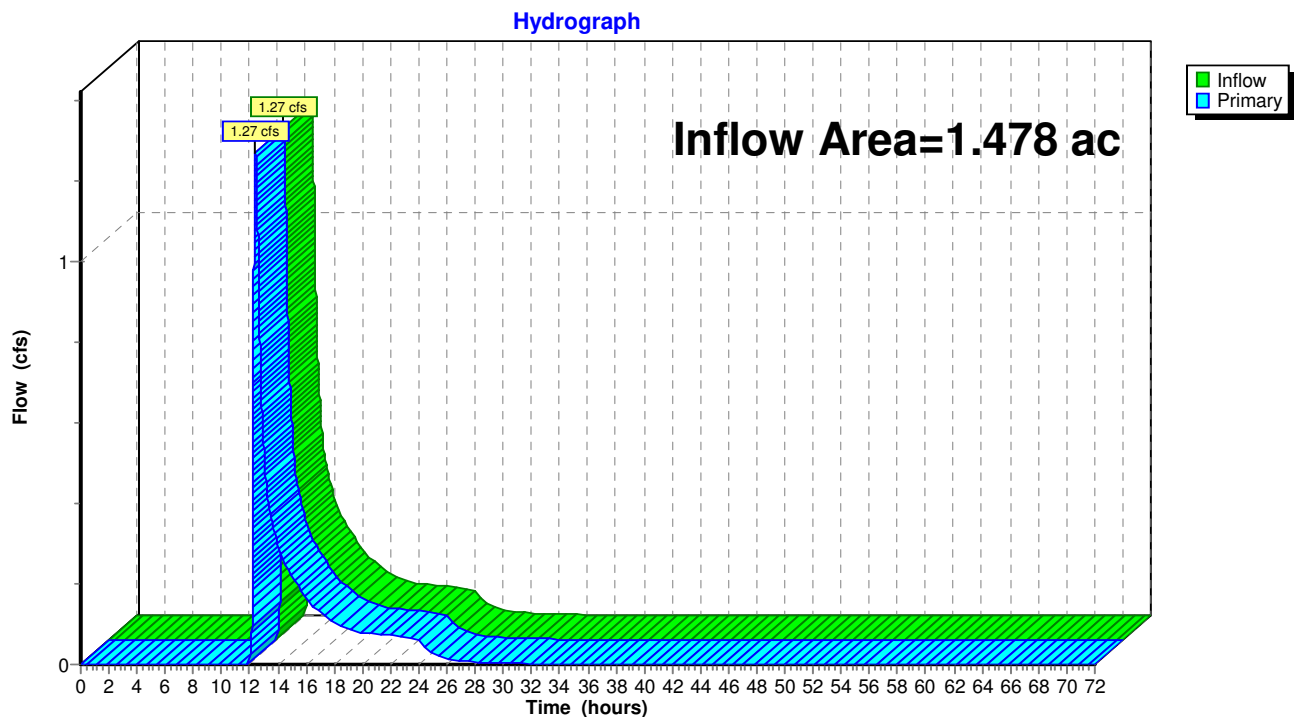
Hydrograph



**Summary for Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

Inflow Area = 1.478 ac, 8.48% Impervious, Inflow Depth = 1.60" for 25-yr event  
Inflow = 1.27 cfs @ 12.42 hrs, Volume= 0.197 af  
Primary = 1.27 cfs @ 12.42 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min

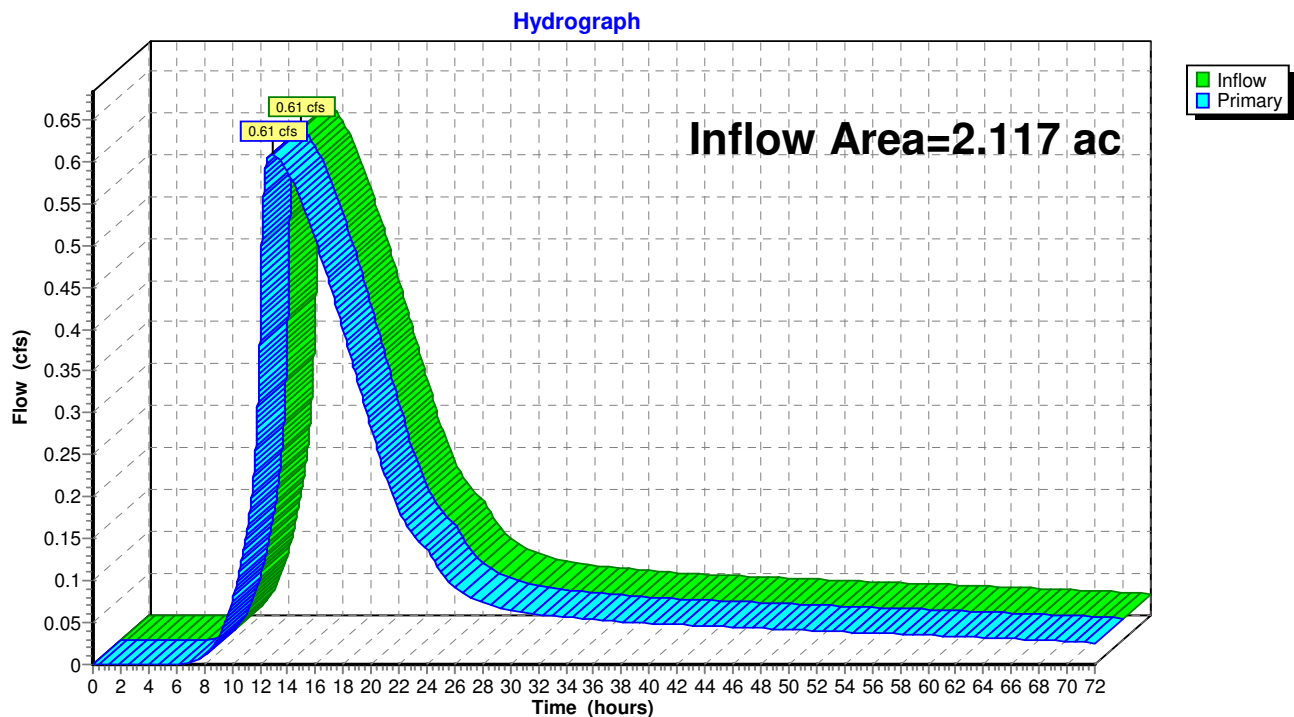
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

**Summary for Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

Inflow Area = 2.117 ac, 41.71% Impervious, Inflow Depth > 3.44" for 25-yr event  
Inflow = 0.61 cfs @ 12.89 hrs, Volume= 0.606 af  
Primary = 0.61 cfs @ 12.89 hrs, Volume= 0.606 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

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**Summary for Subcatchment P1: Yard Drains to UGC-B**

Runoff = 4.22 cfs @ 12.11 hrs, Volume= 0.314 af, Depth= 3.08"

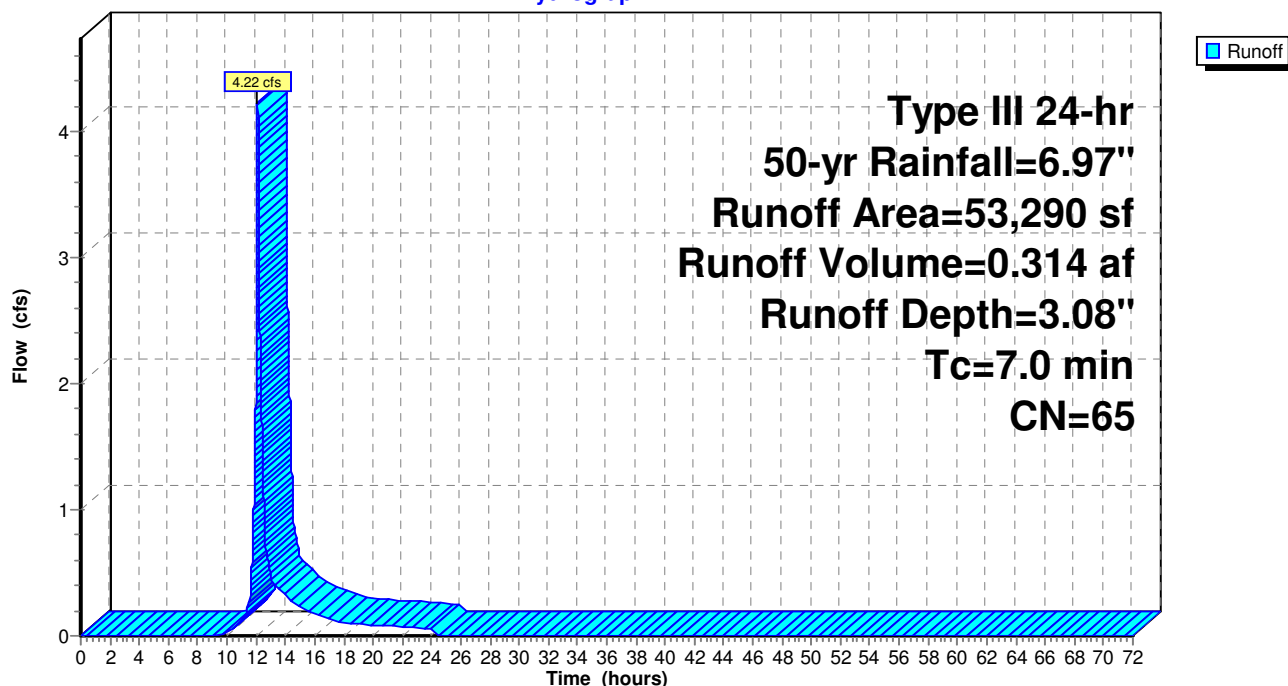
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

Area (sf)	CN	Description
45,366	61	>75% Grass cover, Good, HSG B
3,169	80	>75% Grass cover, Good, HSG D
* 2	71	>75% Grass cover, Good, HSG B/D
* 4,753	98	IMPERVIOUS
53,290	65	Weighted Average
48,537		91.08% Pervious Area
4,753		8.92% Impervious Area

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

**Subcatchment P1: Yard Drains to UGC-B**

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**Summary for Subcatchment P10: CB's to UGC-E (East)**

Runoff = 7.64 cfs @ 12.09 hrs, Volume= 0.589 af, Depth= 6.14"

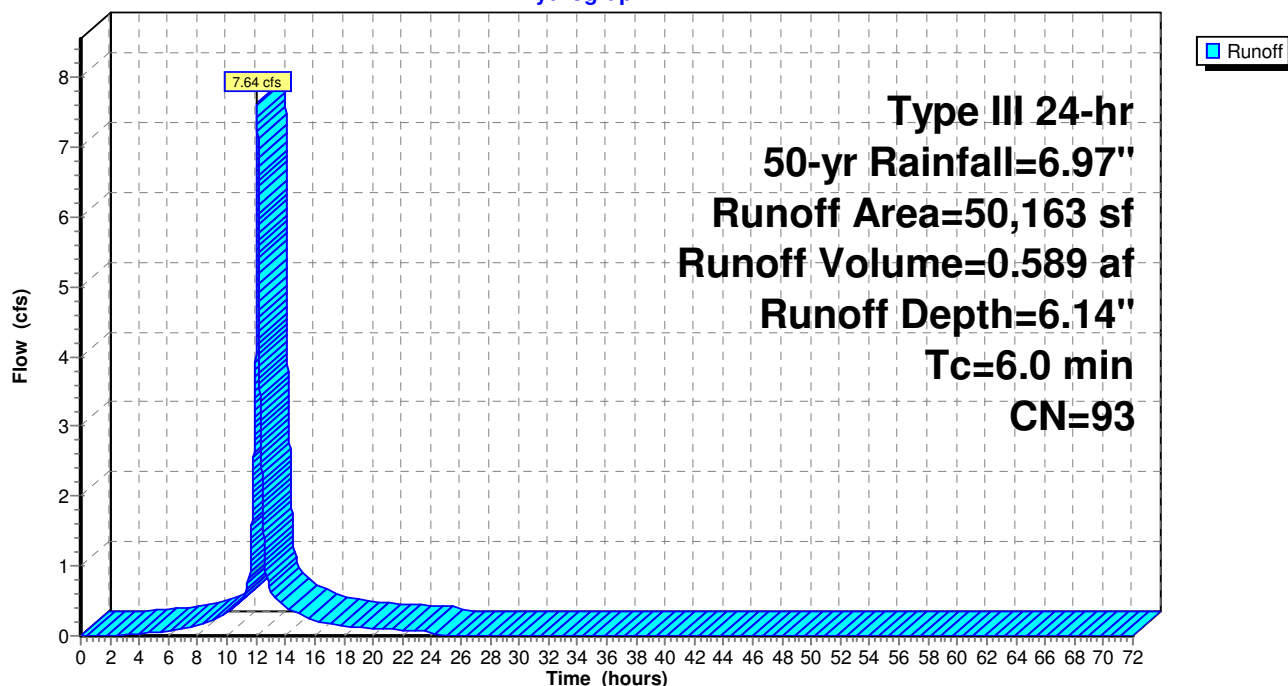
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

Area (sf)	CN	Description
922	74	>75% Grass cover, Good, HSG C
2,430	61	>75% Grass cover, Good, HSG B
* 4,429	71	>75% Grass cover, Good, HSG B/D
* 42,382	98	IMPERVIOUS
50,163	93	Weighted Average
7,781		15.51% Pervious Area
42,382		84.49% Impervious Area

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

**Subcatchment P10: CB's to UGC-E (East)**

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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### Summary for Subcatchment P11: Culdesac

Runoff = 6.06 cfs @ 12.09 hrs, Volume= 0.453 af, Depth= 5.68"

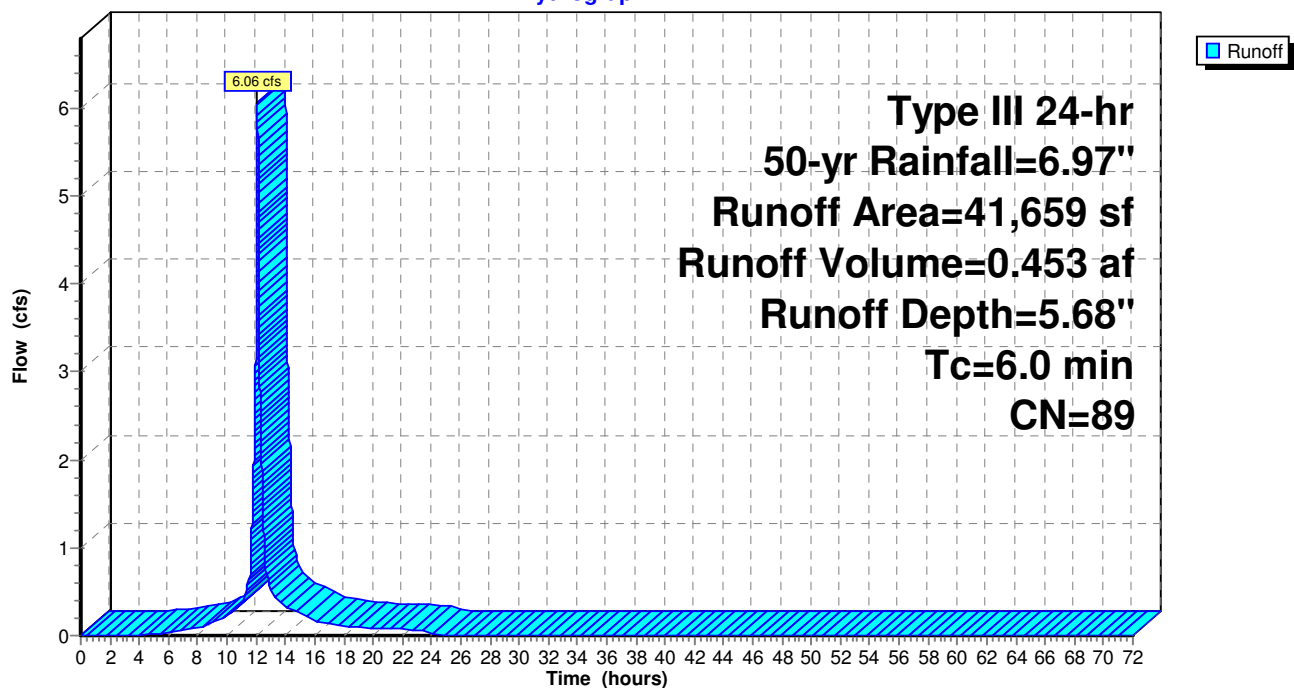
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

	Area (sf)	CN	Description
*	29,394	98	IMPERVIOUS
	2,607	61	>75% Grass cover, Good, HSG B
*	9,658	71	>75% Grass cover, Good, HSG B/D
	41,659	89	Weighted Average
	12,265		29.44% Pervious Area
	29,394		70.56% Impervious Area

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

### Subcatchment P11: Culdesac

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Type III 24-hr 50-yr Rainfall=6.97"

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### Summary for Subcatchment P12: Yard Drains to UGC-A

Runoff = 5.28 cfs @ 12.10 hrs, Volume= 0.388 af, Depth= 4.02"

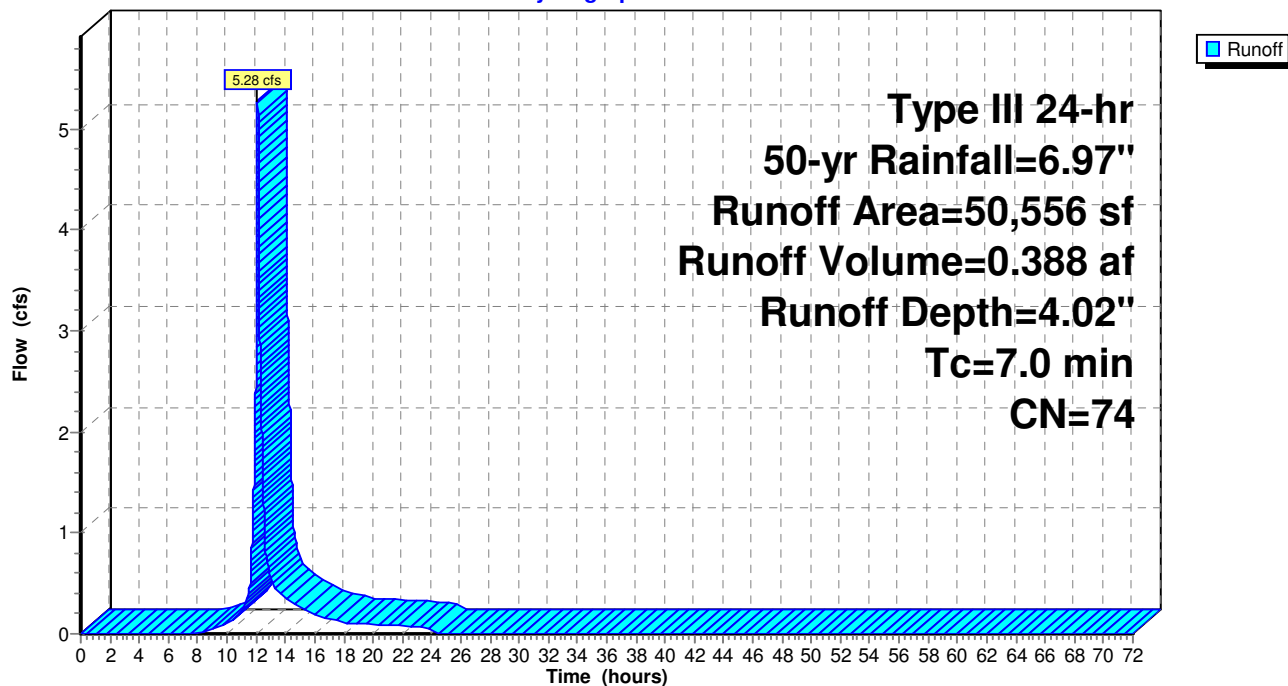
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

	Area (sf)	CN	Description
*	9,067	98	IMPERVIOUS
	12,690	61	>75% Grass cover, Good, HSG B
	4,707	74	>75% Grass cover, Good, HSG C
*	24,092	71	>75% Grass cover, Good, HSG B/D
	50,556	74	Weighted Average
	41,489		82.07% Pervious Area
	9,067		17.93% Impervious Area

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

### Subcatchment P12: Yard Drains to UGC-A

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### Summary for Subcatchment P13: Yard Drains to UGC-C

Runoff = 0.82 cfs @ 12.11 hrs, Volume= 0.061 af, Depth= 2.88"

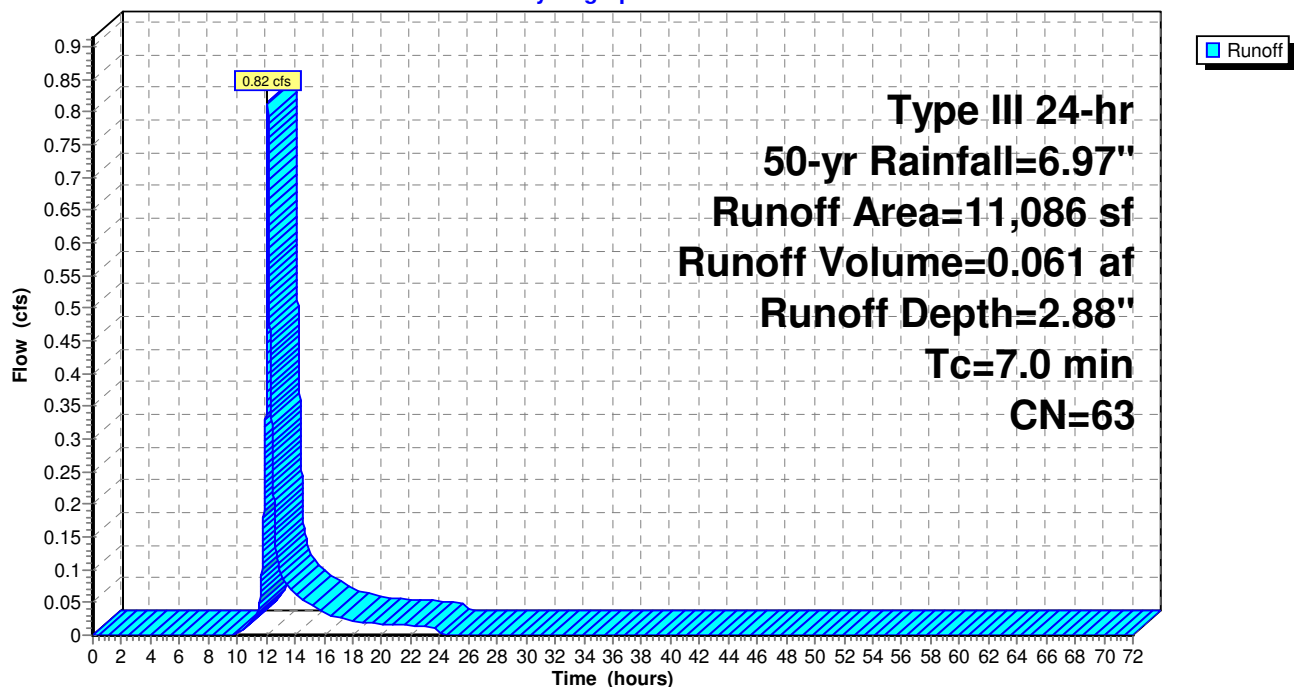
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

	Area (sf)	CN	Description
*	707	98	IMPERVIOUS
	10,379	61	>75% Grass cover, Good, HSG B
	11,086	63	Weighted Average
	10,379		93.62% Pervious Area
	707		6.38% Impervious Area

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

### Subcatchment P13: Yard Drains to UGC-C

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Runoff = 0.38 cfs @ 12.12 hrs, Volume= 0.031 af, Depth= 2.10"

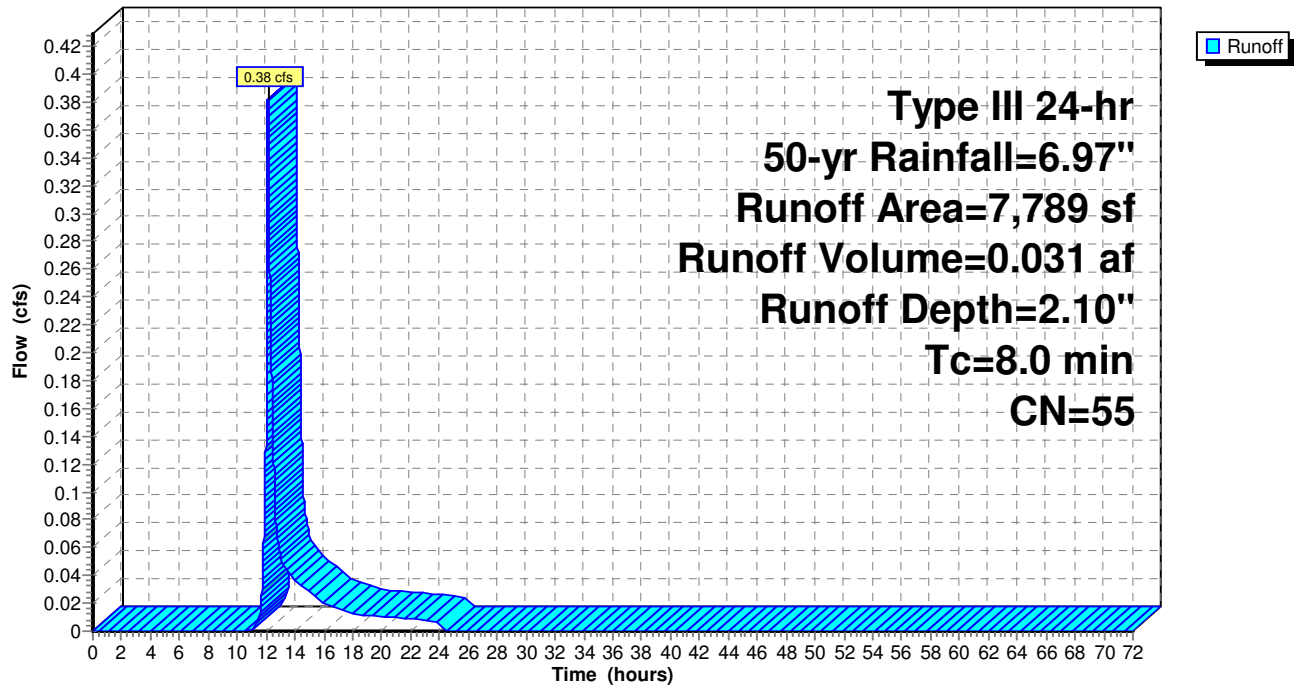
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

Area (sf)	CN	Description
2,334	39	>75% Grass cover, Good, HSG A
5,236	61	>75% Grass cover, Good, HSG B
* 219	71	>75% Grass cover, Good, HSG B/D
7,789	55	Weighted Average
7,789		100.00% Pervious Area

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

**Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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### Summary for Subcatchment P3: P3

Runoff = 0.78 cfs @ 12.12 hrs, Volume= 0.060 af, Depth= 3.08"

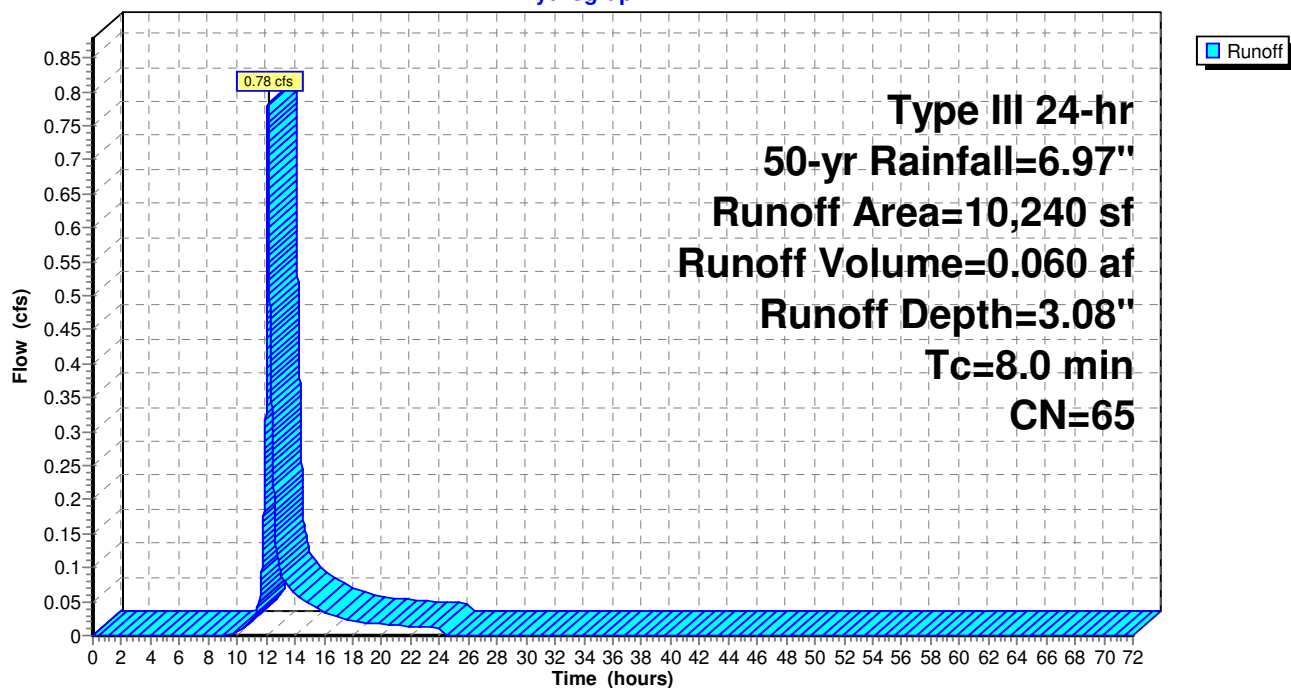
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

Area (sf)	CN	Description
2,646	39	>75% Grass cover, Good, HSG A
7,594	74	>75% Grass cover, Good, HSG C
10,240	65	Weighted Average
10,240		100.00% Pervious Area

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

### Subcatchment P3: P3

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Subcatchment P4: P4**

Runoff = 0.92 cfs @ 12.78 hrs, Volume= 0.166 af, Depth= 3.49"

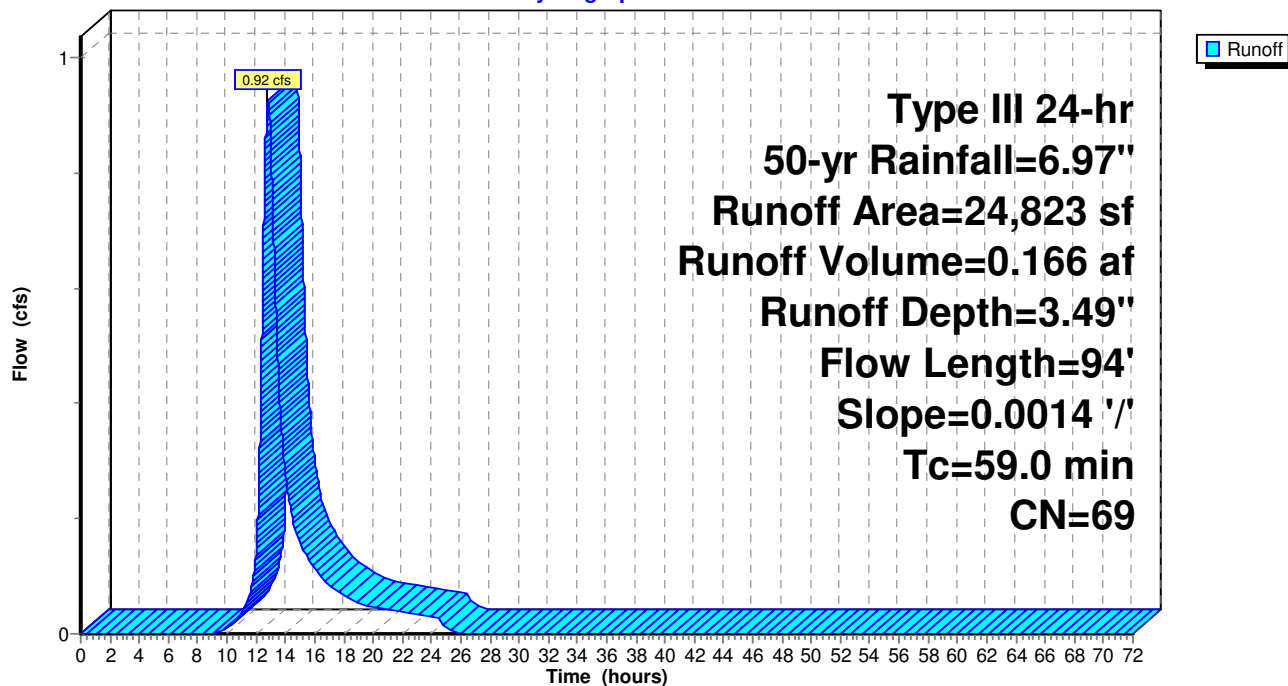
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

Area (sf)	CN	Description
4,911	74	>75% Grass cover, Good, HSG C
* 2,000	71	>75% Grass cover, Good, HSG B/D
* 14,330	66	Woods, Good, HSG B/D
3,582	70	Woods, Good, HSG C
24,823	69	Weighted Average
24,823		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
59.0	94	0.0014	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"

**Subcatchment P4: P4**

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Subcatchment P5: P5**

Runoff = 9.40 cfs @ 12.63 hrs, Volume= 1.440 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

Area (sf)	CN	Description
1,504	74	>75% Grass cover, Good, HSG C
* 9,745	71	>75% Grass cover, Good, HSG B/D
25,599	70	Woods, Good, HSG C
* 127,460	66	Woods, Good, HSG B/D
* 8,904	98	IMPERVIOUS
* 13,961	68	Meadow, non-grazed, HSG B/D
28,470	71	Meadow, non-grazed, HSG C
215,643	69	Weighted Average
206,739		95.87% Pervious Area
8,904		4.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	23	0.2900	0.25		<b>Sheet Flow, GRASS SF</b> Grass: Dense n= 0.240 P2= 3.22"
22.4	82	0.0120	0.06		<b>Sheet Flow, WOODLAND SF</b> Woods: Light underbrush n= 0.400 P2= 3.22"
20.5	295	0.0023	0.24		<b>Shallow Concentrated Flow, WOOD SCF</b> Woodland Kv= 5.0 fps
44.4	400	Total			

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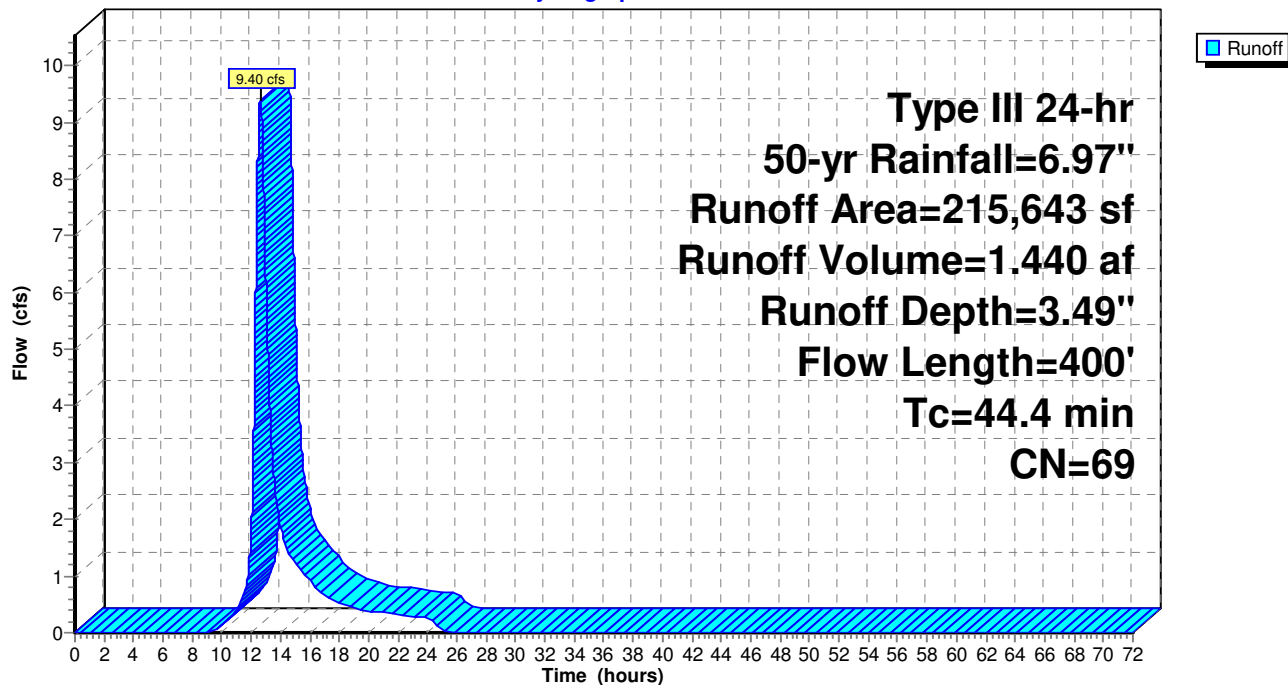
Type III 24-hr 50-yr Rainfall=6.97"

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### Subcatchment P5: P5

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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### Summary for Subcatchment P6: Sheet flow To West Basin

Runoff = 31.04 cfs @ 12.09 hrs, Volume= 2.395 af, Depth= 6.14"

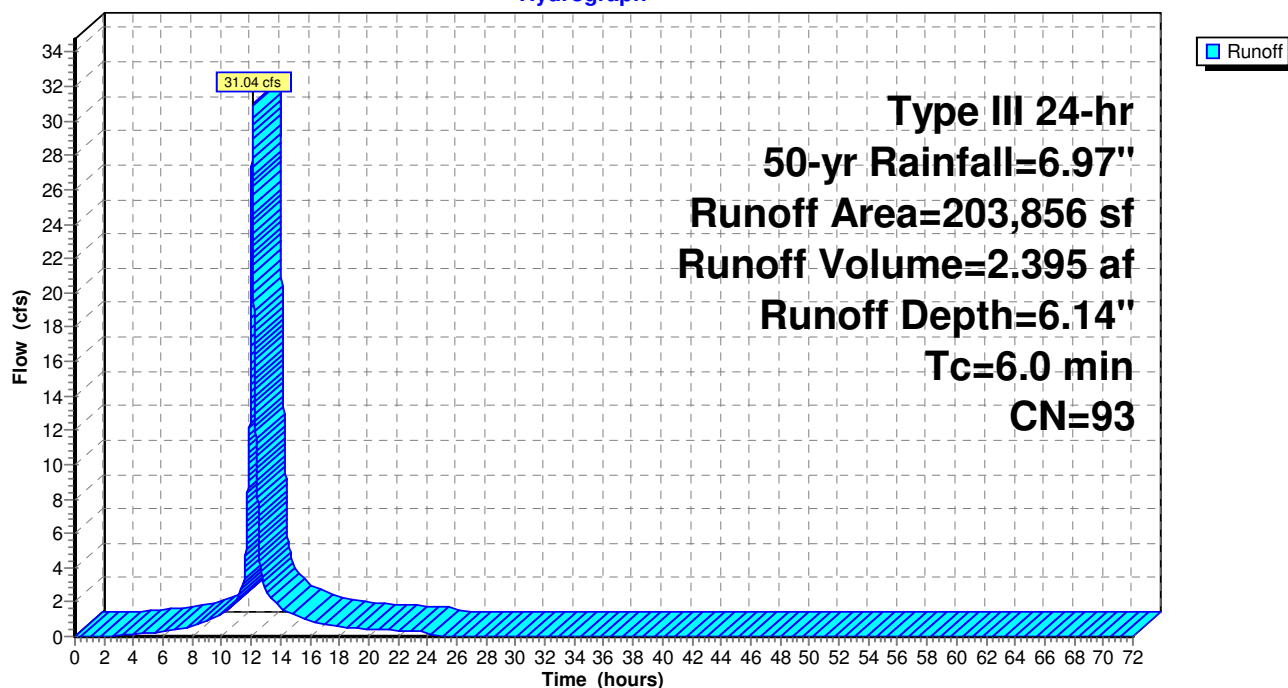
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

Area (sf)	CN	Description
4,918	39	>75% Grass cover, Good, HSG A
6,710	61	>75% Grass cover, Good, HSG B
6,131	74	>75% Grass cover, Good, HSG C
* 9,090	71	>75% Grass cover, Good, HSG B/D
* 177,007	98	IMPERVIOUS
203,856	93	Weighted Average
26,849		13.17% Pervious Area
177,007		86.83% Impervious Area

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

### Subcatchment P6: Sheet flow To West Basin

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Subcatchment P7: Proposed P7**

Runoff = 0.44 cfs @ 12.36 hrs, Volume= 0.051 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

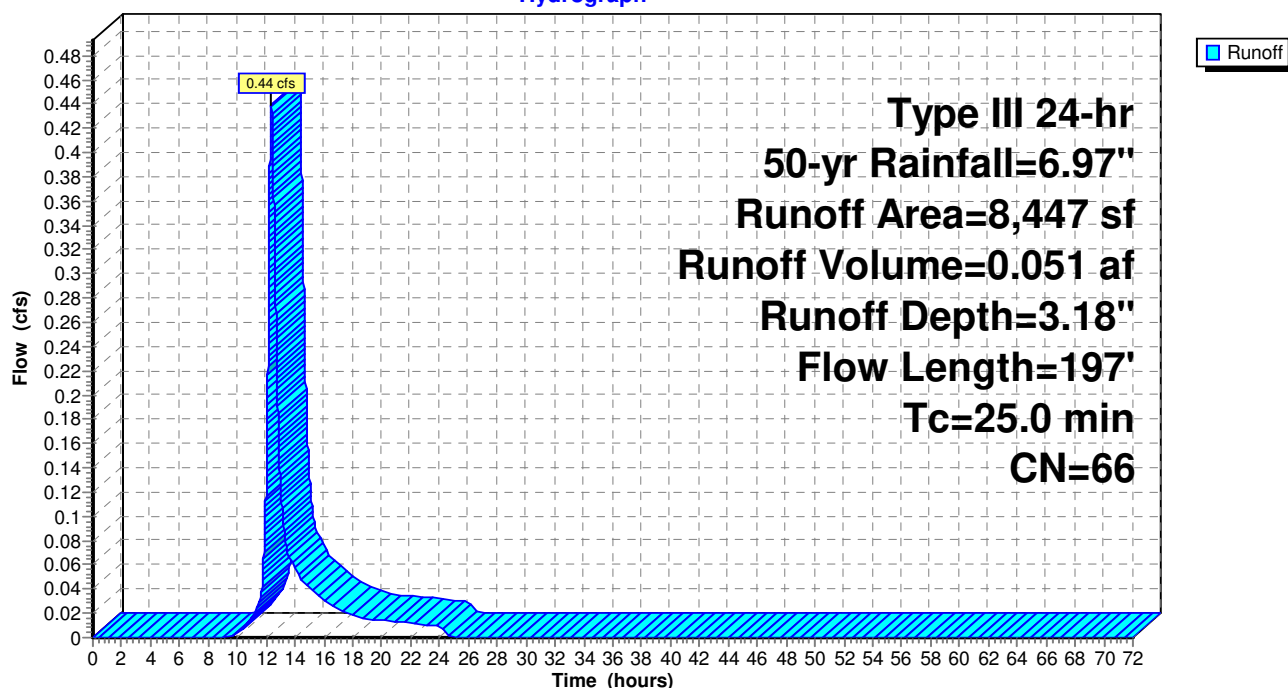
Area (sf)	CN	Description
2,335	39	>75% Grass cover, Good, HSG A
1,709	74	>75% Grass cover, Good, HSG C
* 1,796	98	IMPERVIOUS
450	30	Meadow, non-grazed, HSG A
2,157	71	Meadow, non-grazed, HSG C
8,447	66	Weighted Average
6,651		78.74% Pervious Area
1,796		21.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0160	0.07		<b>Sheet Flow, Woodland SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
1.6	97	0.0420	1.02		<b>Shallow Concentrated Flow, Woodlan SCF</b>
					Woodland Kv= 5.0 fps
25.0	197	Total			

**Subcatchment P7: Proposed P7**

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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### Summary for Subcatchment P8: Proposed Roof to UGC-D (west)

Runoff = 38.00 cfs @ 12.09 hrs, Volume= 3.114 af, Depth= 6.73"

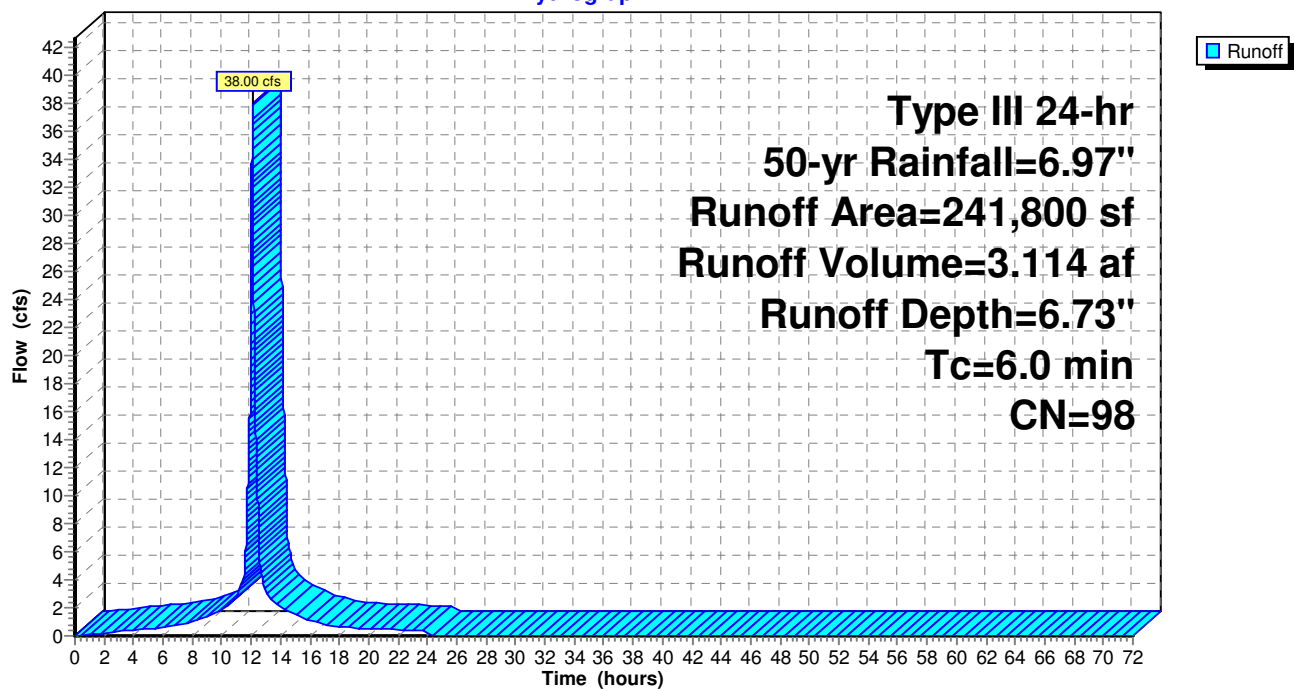
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

	Area (sf)	CN	Description
*	241,800	98	IMPERVIOUS
	241,800		100.00% Impervious Area

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

### Subcatchment P8: Proposed Roof to UGC-D (west)

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Subcatchment P9: Sheetflow to North Basin**

Runoff = 6.22 cfs @ 12.10 hrs, Volume= 0.481 af, Depth= 5.68"

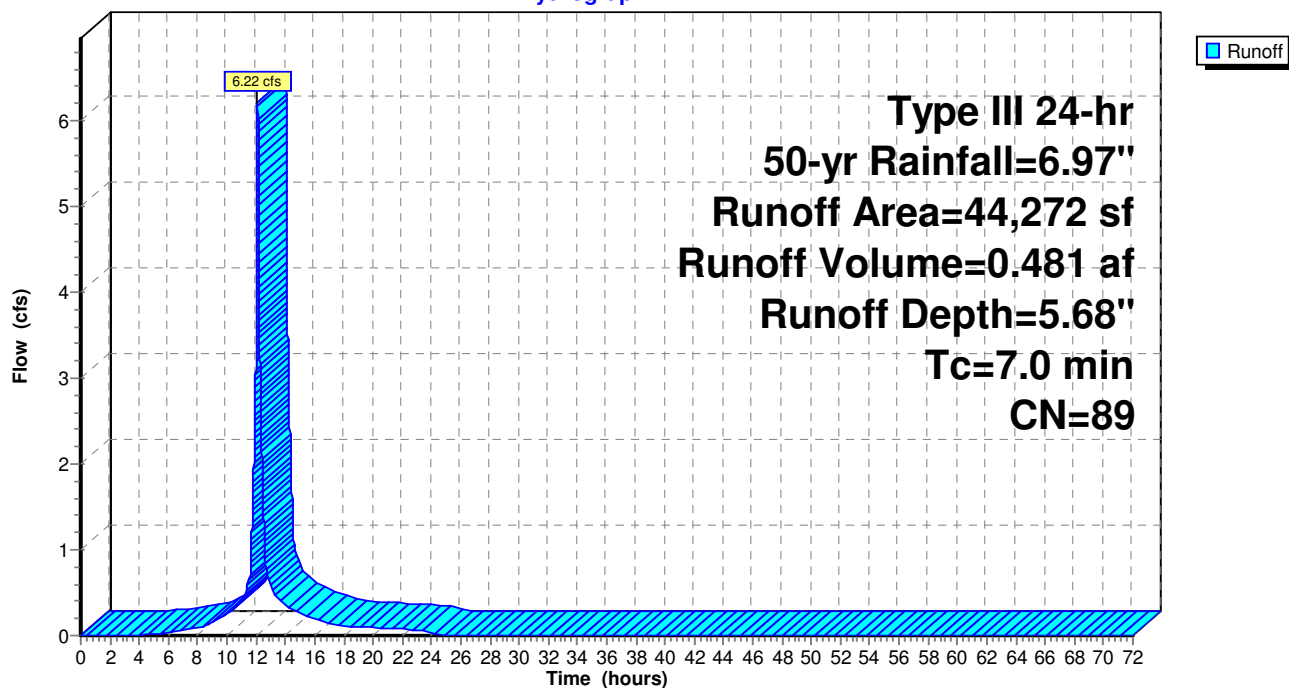
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 50-yr Rainfall=6.97"

	Area (sf)	CN	Description
	14,312	74	>75% Grass cover, Good, HSG C
*	1,743	71	>75% Grass cover, Good, HSG B/D
*	28,217	98	IMPERVIOUS
	44,272	89	Weighted Average
	16,055		36.26% Pervious Area
	28,217		63.74% Impervious Area

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

**Subcatchment P9: Sheetflow to North Basin**

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Pond DMH: Splitter Structure**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 6.13" for 50-yr event  
 Inflow = 5.40 cfs @ 12.16 hrs, Volume= 0.589 af  
 Outflow = 5.40 cfs @ 12.16 hrs, Volume= 0.589 af, Atten= 0%, Lag= 0.0 min  
 Primary = 4.38 cfs @ 12.16 hrs, Volume= 0.291 af  
 Secondary = 1.02 cfs @ 12.16 hrs, Volume= 0.298 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

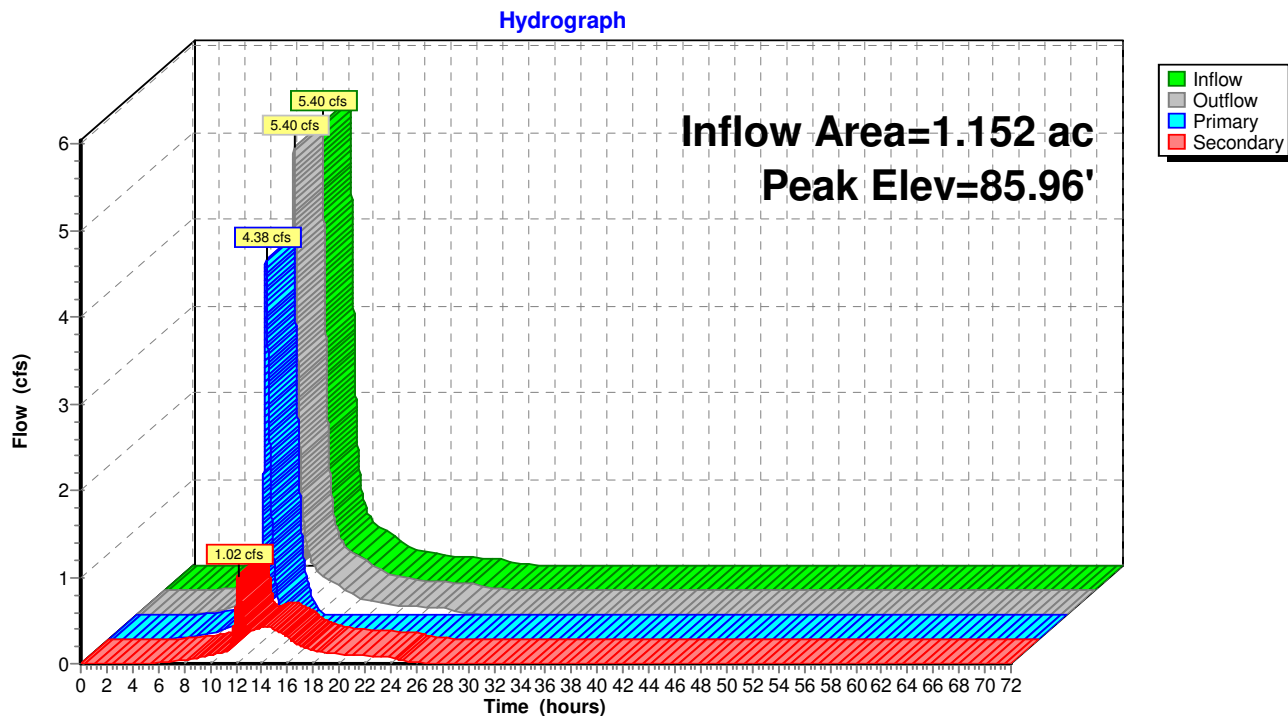
Peak Elev= 85.96' @ 12.16 hrs

Flood Elev= 85.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	84.55'	<b>15.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	84.55'	<b>6.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.20 sf

**Primary OutFlow** Max=4.38 cfs @ 12.16 hrs HW=85.96' TW=84.37' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 4.38 cfs @ 3.96 fps)**Secondary OutFlow** Max=1.02 cfs @ 12.16 hrs HW=85.96' TW=81.31' (Dynamic Tailwater)↑ **2=Culvert** (Inlet Controls 1.02 cfs @ 5.18 fps)

## Pond DMH: Splitter Structure



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**

Inflow Area = 18.348 ac, 62.57% Impervious, Inflow Depth > 5.13" for 50-yr event  
 Inflow = 16.11 cfs @ 12.63 hrs, Volume= 7.841 af  
 Outflow = 11.48 cfs @ 13.11 hrs, Volume= 7.840 af, Atten= 29%, Lag= 29.0 min  
 Primary = 11.48 cfs @ 13.11 hrs, Volume= 7.840 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 82.79' @ 13.11 hrs Surf.Area= 23,319 sf Storage= 12,517 cf

Plug-Flow detention time= 5.3 min calculated for 7.840 af (100% of inflow)  
 Center-of-Mass det. time= 4.9 min ( 1,505.5 - 1,500.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	79.70'	94,801 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

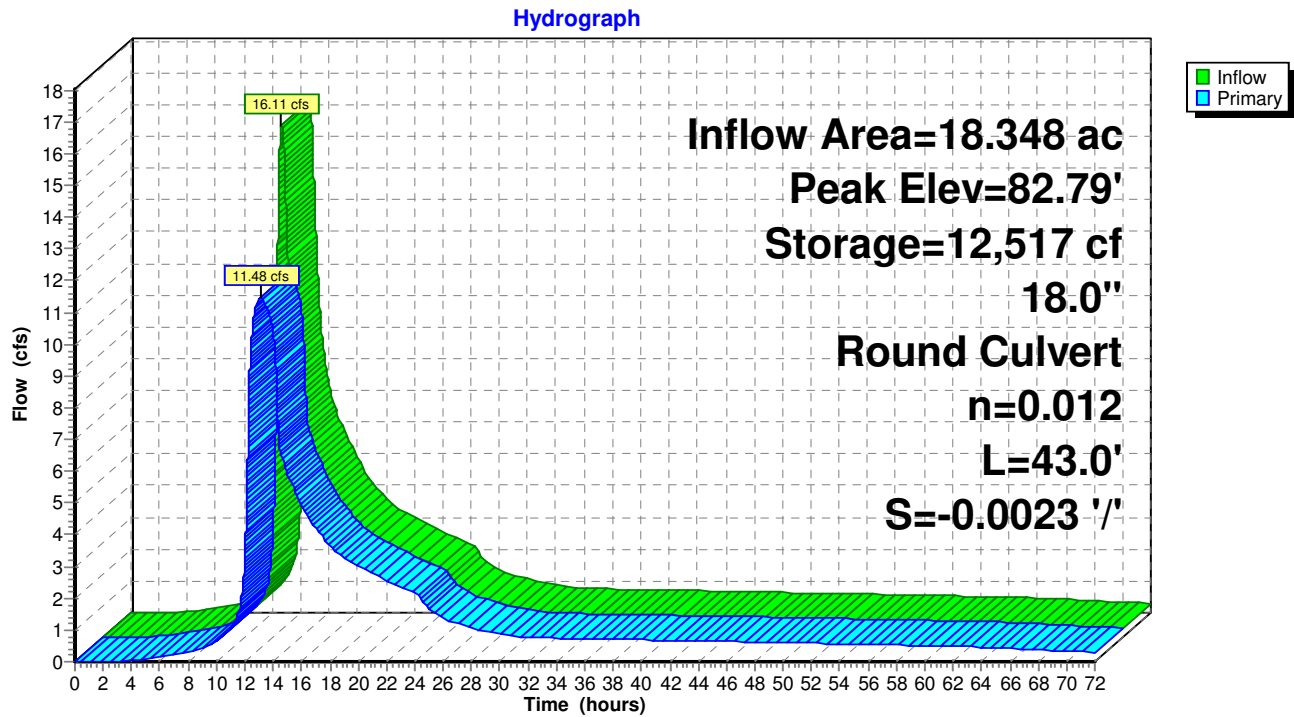
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.70	10	0	0
80.00	382	59	59
81.00	1,156	769	828
82.00	2,173	1,665	2,492
83.00	29,061	15,617	18,109
84.00	124,323	76,692	94,801

Device	Routing	Invert	Outlet Devices
#1	Primary	79.70'	<b>18.0" Round Culvert</b> L= 43.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 79.60' / 79.70' S= -0.0023 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

**Primary OutFlow** Max=11.48 cfs @ 13.11 hrs HW=82.79' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 11.48 cfs @ 6.49 fps)

**Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Pond PP1: UGC-D (Stormtech SC-310)**

Inflow Area = 10.231 ac, 93.98% Impervious, Inflow Depth > 6.36" for 50-yr event  
 Inflow = 39.72 cfs @ 12.09 hrs, Volume= 5.424 af  
 Outflow = 4.92 cfs @ 12.90 hrs, Volume= 5.264 af, Atten= 88%, Lag= 48.7 min  
 Primary = 4.92 cfs @ 12.90 hrs, Volume= 5.264 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 84.69' @ 12.90 hrs Surf.Area= 78,048 sf Storage= 87,872 cf

Plug-Flow detention time= 695.8 min calculated for 5.264 af (97% of inflow)  
 Center-of-Mass det. time= 627.4 min ( 1,653.2 - 1,025.8 )

Volume	Invert	Avail.Storage	Storage Description
#1A	82.78'	48,033 cf	<b>108.17'W x 644.00'L x 2.33'H Field A</b> 162,538 cf Overall - 42,457 cf Embedded = 120,082 cf x 40.0% Voids
#2A	83.28'	42,457 cf	<b>ADS_StormTech RC-310 +Cap</b> x 2880 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 2880 Chambers in 32 Rows
#3B	82.78'	6,025 cf	<b>11.50'W x 729.44'L x 2.33'H Field B</b> 19,573 cf Overall - 4,511 cf Embedded = 15,062 cf x 40.0% Voids
#4B	83.28'	4,511 cf	<b>ADS_StormTech SC-310 +Cap</b> x 306 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 306 Chambers in 3 Rows
101,025 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

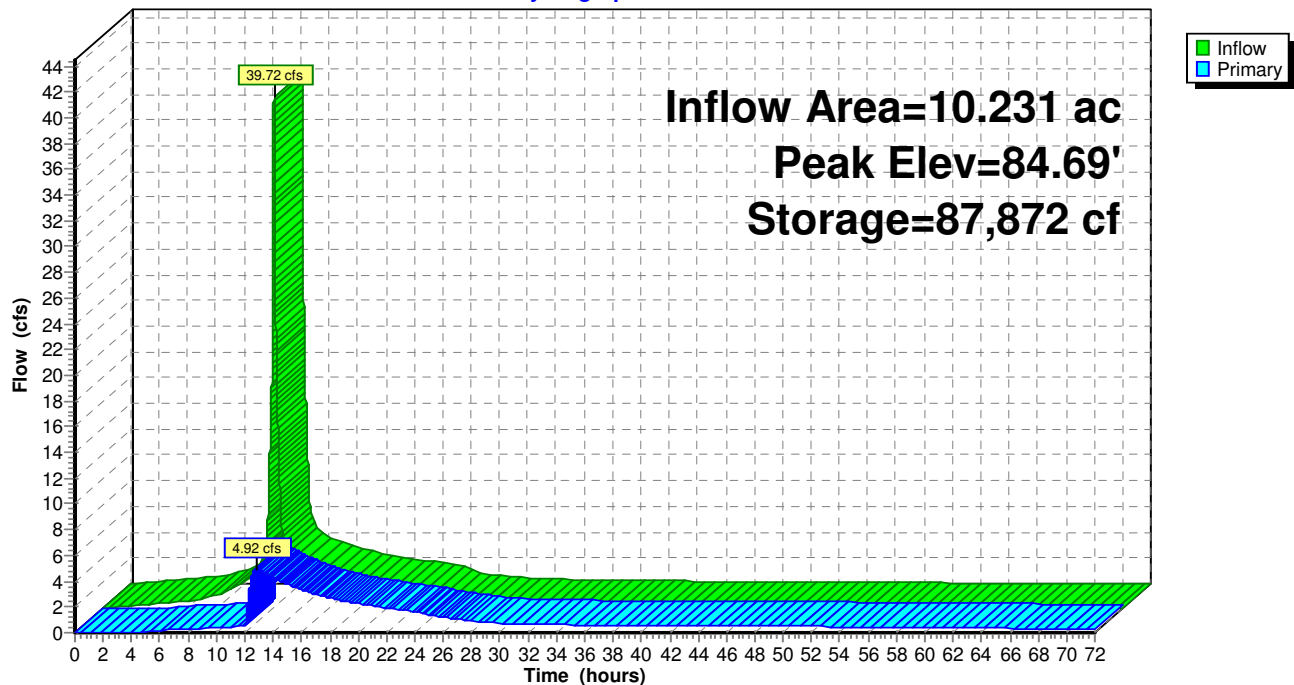
Device	Routing	Invert	Outlet Devices
#1	Primary	82.78'	<b>24.0" Round 24" RCP</b> L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.78' / 82.70' S= 0.0057 ' S= 0.0057 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	82.78'	<b>9.0" W x 2.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	83.95'	<b>24.0" W x 10.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=4.92 cfs @ 12.90 hrs HW=84.69' TW=82.74' (Dynamic Tailwater)

1=24" RCP (Passes 4.92 cfs of 11.36 cfs potential flow)  
 2=Orifice/Grate (Orifice Controls 0.81 cfs @ 6.51 fps)  
 3=Orifice/Grate (Orifice Controls 4.10 cfs @ 2.77 fps)

**Pond PP1: UGC-D (Stormtech SC-310)**

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Pond PP2: Water Quality Basin (WEST)**

Inflow Area = 4.680 ac, 86.83% Impervious, Inflow Depth = 6.14" for 50-yr event  
 Inflow = 31.04 cfs @ 12.09 hrs, Volume= 2.395 af  
 Outflow = 1.76 cfs @ 15.68 hrs, Volume= 2.310 af, Atten= 94%, Lag= 215.5 min  
 Primary = 1.76 cfs @ 15.68 hrs, Volume= 2.310 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.50' Surf.Area= 39,354 sf Storage= 18,954 cf

Peak Elev= 85.01' @ 14.01 hrs Surf.Area= 48,821 sf Storage= 85,566 cf (66,612 cf above start)

Plug-Flow detention time= 865.9 min calculated for 1.875 af (78% of inflow)

Center-of-Mass det. time= 638.1 min ( 1,407.0 - 768.9 )

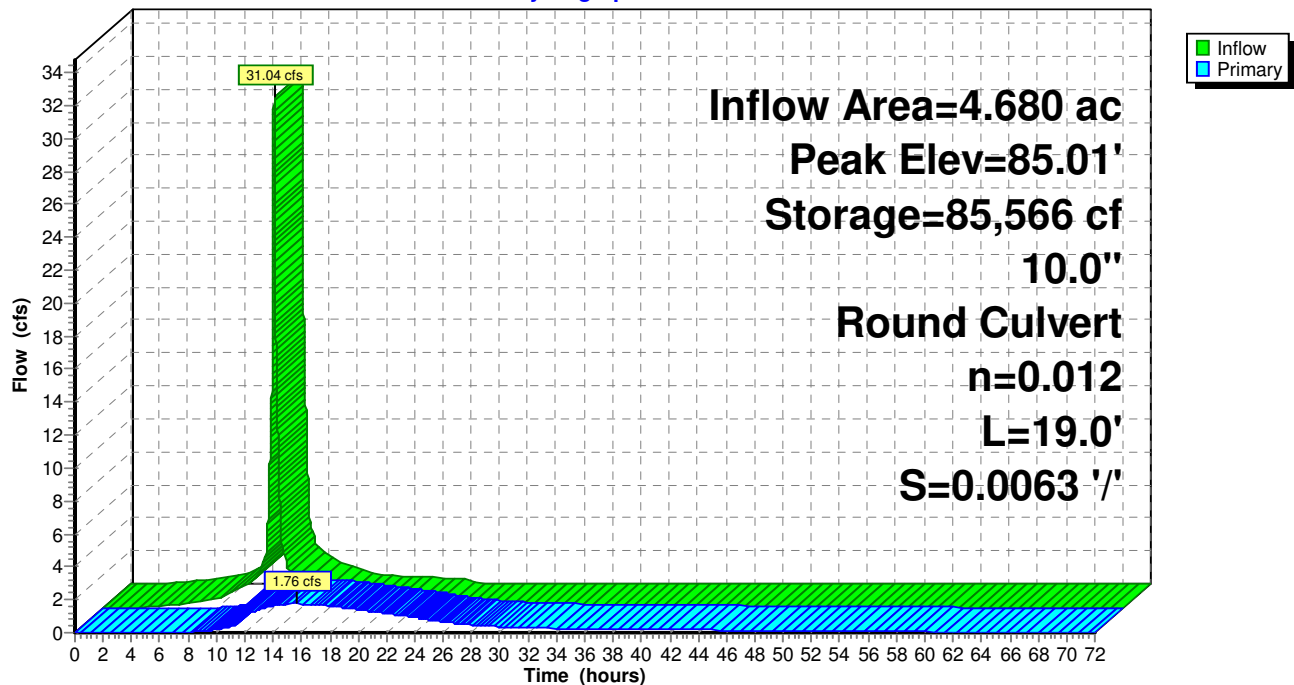
Volume	Invert	Avail.Storage	Storage Description	
#1	83.00'	136,855 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
83.00	36,482	0	0	36,482
84.00	42,335	39,372	39,372	42,377
85.00	48,730	45,495	84,867	48,817
86.00	55,314	51,987	136,855	55,450

Device	Routing	Invert	Outlet Devices
#1	Primary	83.50'	<b>10.0" Round Culvert</b> L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.50' / 83.38' S= 0.0063 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

**Primary OutFlow** Max=1.76 cfs @ 15.68 hrs HW=84.96' TW=84.51' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 1.76 cfs @ 3.23 fps)

# Pond PP2: Water Quality Basin (WEST)

Hydrograph



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**Summary for Pond PP3: UGC-B (Stormtech SC-310)**

Inflow Area = 1.223 ac, 8.92% Impervious, Inflow Depth = 3.08" for 50-yr event  
 Inflow = 4.22 cfs @ 12.11 hrs, Volume= 0.314 af  
 Outflow = 2.14 cfs @ 12.30 hrs, Volume= 0.257 af, Atten= 49%, Lag= 11.3 min  
 Primary = 2.14 cfs @ 12.30 hrs, Volume= 0.257 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 81.62' @ 12.30 hrs Surf.Area= 4,229 sf Storage= 4,282 cf

Plug-Flow detention time= 147.9 min calculated for 0.257 af (82% of inflow)  
 Center-of-Mass det. time= 73.3 min ( 916.4 - 843.1 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,745 cf	<b>4.83'W x 473.12'L x 2.33'H Field A</b> 5,336 cf Overall - 973 cf Embedded = 4,363 cf x 40.0% Voids
#2A	80.23'	973 cf	<b>ADS_StormTech SC-310 +Cap</b> x 66 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,483 cf	<b>4.83'W x 401.92'L x 2.33'H Field B</b> 4,533 cf Overall - 826 cf Embedded = 3,707 cf x 40.0% Voids
#4B	80.23'	826 cf	<b>ADS_StormTech SC-310 +Cap</b> x 56 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,027 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.66'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.66' / 79.27' S= 0.0195 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=2.14 cfs @ 12.30 hrs HW=81.62' TW=0.00' (Dynamic Tailwater)

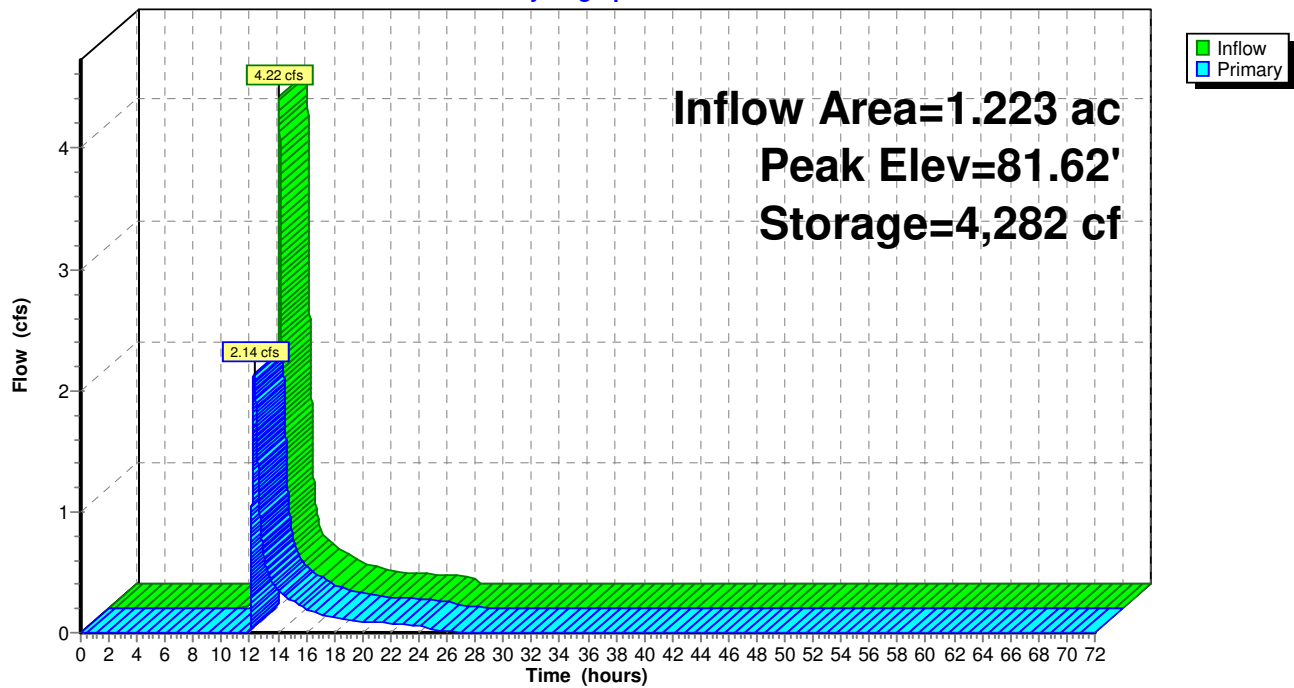
1=12" HDPE OUT (Passes 2.14 cfs of 4.57 cfs potential flow)

2=Orifice/Grate (Orifice Controls 2.14 cfs @ 3.09 fps)

3=12" HDPE (Passes 2.14 cfs of 3.08 cfs potential flow)

**Pond PP3: UGC-B (Stormtech SC-310)**

Hydrograph



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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Pond PP4: Water Quality Basin (North)**

Inflow Area = 2.168 ac, 74.76% Impervious, Inflow Depth = 4.27" for 50-yr event  
 Inflow = 10.07 cfs @ 12.12 hrs, Volume= 0.772 af  
 Outflow = 0.14 cfs @ 17.39 hrs, Volume= 0.562 af, Atten= 99%, Lag= 316.2 min  
 Primary = 0.14 cfs @ 17.39 hrs, Volume= 0.562 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.40' Surf.Area= 14,585 sf Storage= 18,791 cf

Peak Elev= 85.16' @ 17.39 hrs Surf.Area= 17,739 sf Storage= 47,203 cf (28,413 cf above start)

Plug-Flow detention time= 3,186.3 min calculated for 0.130 af (17% of inflow)

Center-of-Mass det. time= 1,554.7 min ( 2,311.9 - 757.2 )

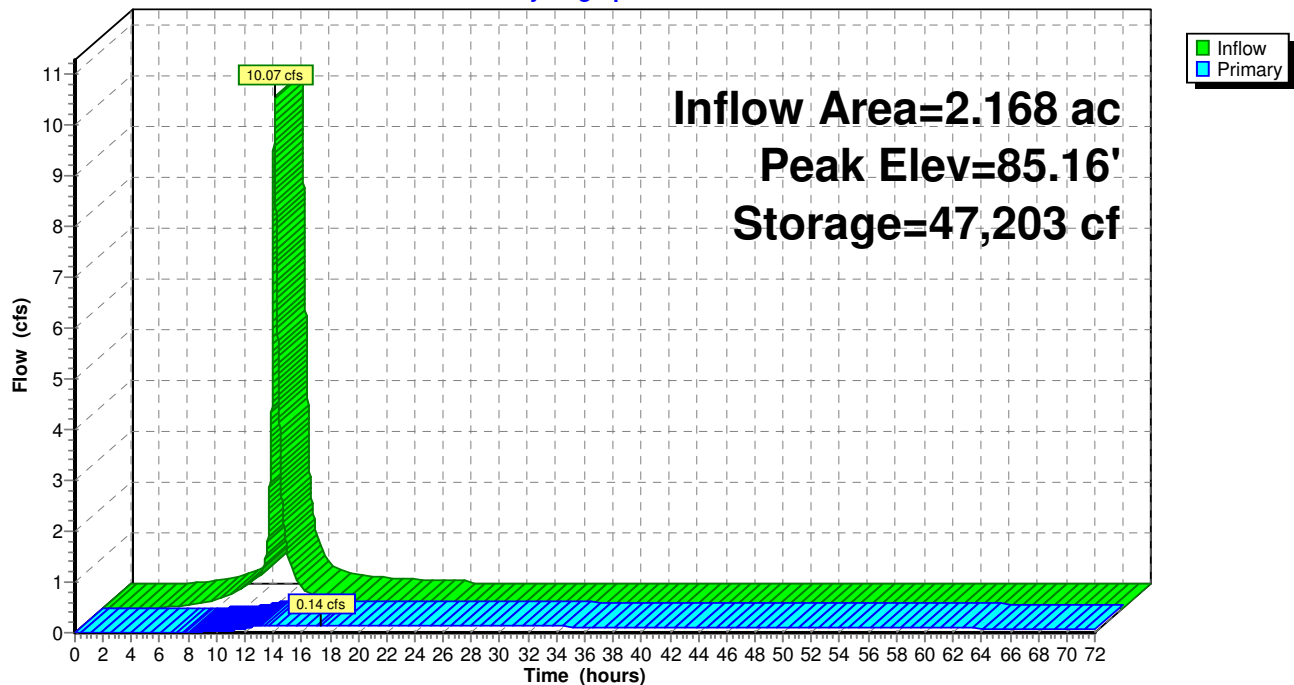
Volume	Invert	Avail.Storage	Storage Description	
#1	82.00'	62,769 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.00	12,313	0	0	12,313
83.00	13,894	13,096	13,096	13,945
84.00	15,654	14,765	27,861	15,757
85.00	17,454	16,546	44,407	17,614
86.00	19,286	18,362	62,769	19,508

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.40' / 83.31' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Device 1	83.40'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.14 cfs @ 17.39 hrs HW=85.16' TW=80.96' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.14 cfs of 4.10 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.23 fps)

# Pond PP4: Water Quality Basin (North)

Hydrograph



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**Summary for Pond PP5: UGC-E (Stormtech SC-310)**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 6.14" for 50-yr event  
 Inflow = 7.64 cfs @ 12.09 hrs, Volume= 0.589 af  
 Outflow = 5.40 cfs @ 12.16 hrs, Volume= 0.589 af, Atten= 29%, Lag= 4.5 min  
 Primary = 5.40 cfs @ 12.16 hrs, Volume= 0.589 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 87.20' @ 12.16 hrs Surf.Area= 4,780 sf Storage= 4,692 cf

Plug-Flow detention time= 45.9 min calculated for 0.589 af (100% of inflow)  
 Center-of-Mass det. time= 45.1 min ( 814.0 - 768.9 )

Volume	Invert	Avail.Storage	Storage Description
#1A	85.38'	1,929 cf	<b>4.83'W x 522.96'L x 2.33'H Field A</b> 5,898 cf Overall - 1,076 cf Embedded = 4,822 cf x 40.0% Voids
#2A	85.88'	1,076 cf	<b>ADS_StormTech SC-310 +Cap</b> x 73 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	85.38'	1,719 cf	<b>4.83'W x 466.00'L x 2.33'H Field B</b> 5,255 cf Overall - 958 cf Embedded = 4,297 cf x 40.0% Voids
#4B	85.88'	958 cf	<b>ADS_StormTech SC-310 +Cap</b> x 65 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,682 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.38'	<b>15.0" Round 15" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.28' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	85.95'	<b>10.0" Round ORIFICE A X 2.00</b> L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.95' / 85.92' S= 0.0060 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf
#3	Device 1	85.38'	<b>6.0" Round ORIFICE B</b> L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.31' S= 0.0020 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=5.40 cfs @ 12.16 hrs HW=87.20' TW=85.96' (Dynamic Tailwater)

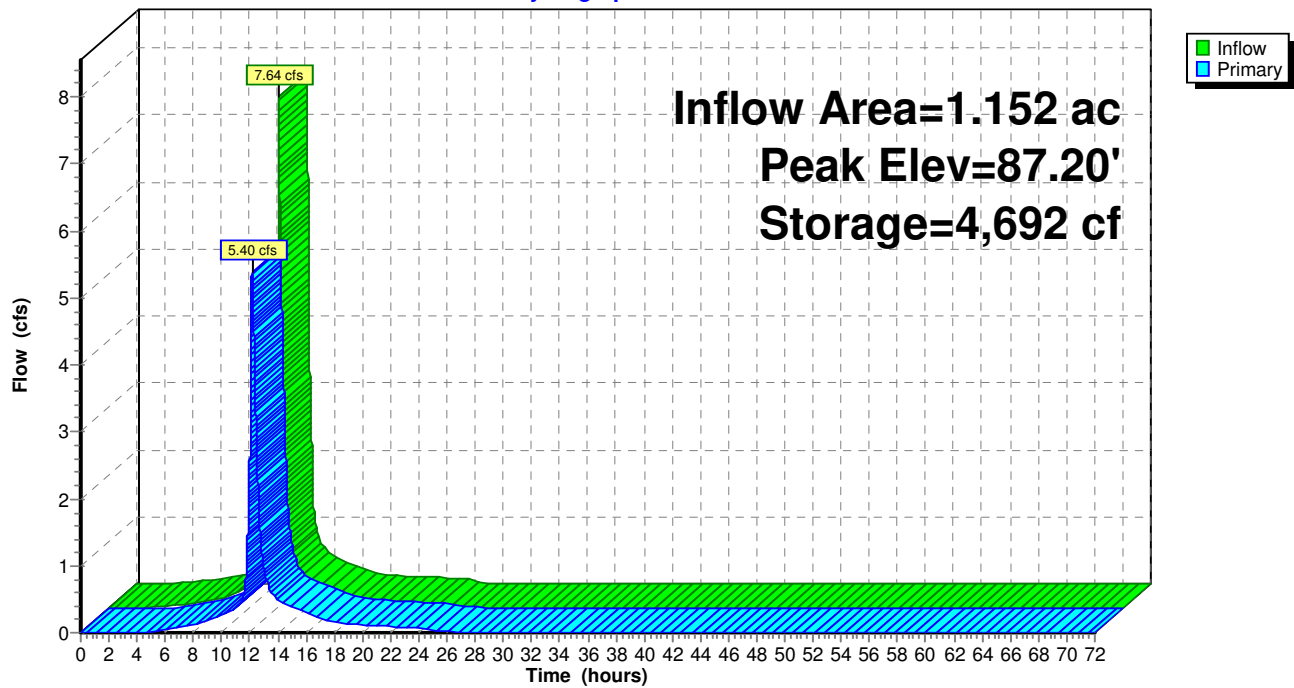
1=15" HDPE OUT (Passes 5.40 cfs of 5.83 cfs potential flow)

2=ORIFICE A (Barrel Controls 4.50 cfs @ 4.13 fps)

3=ORIFICE B (Outlet Controls 0.89 cfs @ 4.54 fps)

**Pond PP5: UGC-E (Stormtech SC-310)**

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**Summary for Pond PP6: Water Quality Basin (Kennedy Road)**

Inflow Area = 0.956 ac, 70.56% Impervious, Inflow Depth = 5.68" for 50-yr event  
 Inflow = 6.06 cfs @ 12.09 hrs, Volume= 0.453 af  
 Outflow = 0.61 cfs @ 12.85 hrs, Volume= 0.451 af, Atten= 90%, Lag= 45.8 min  
 Primary = 0.61 cfs @ 12.85 hrs, Volume= 0.451 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 80.00' Surf.Area= 5,601 sf Storage= 11,033 cf

Peak Elev= 81.52' @ 12.85 hrs Surf.Area= 7,246 sf Storage= 20,797 cf (9,764 cf above start)

Plug-Flow detention time= 585.3 min calculated for 0.198 af (44% of inflow)

Center-of-Mass det. time= 220.9 min ( 1,004.3 - 783.3 )

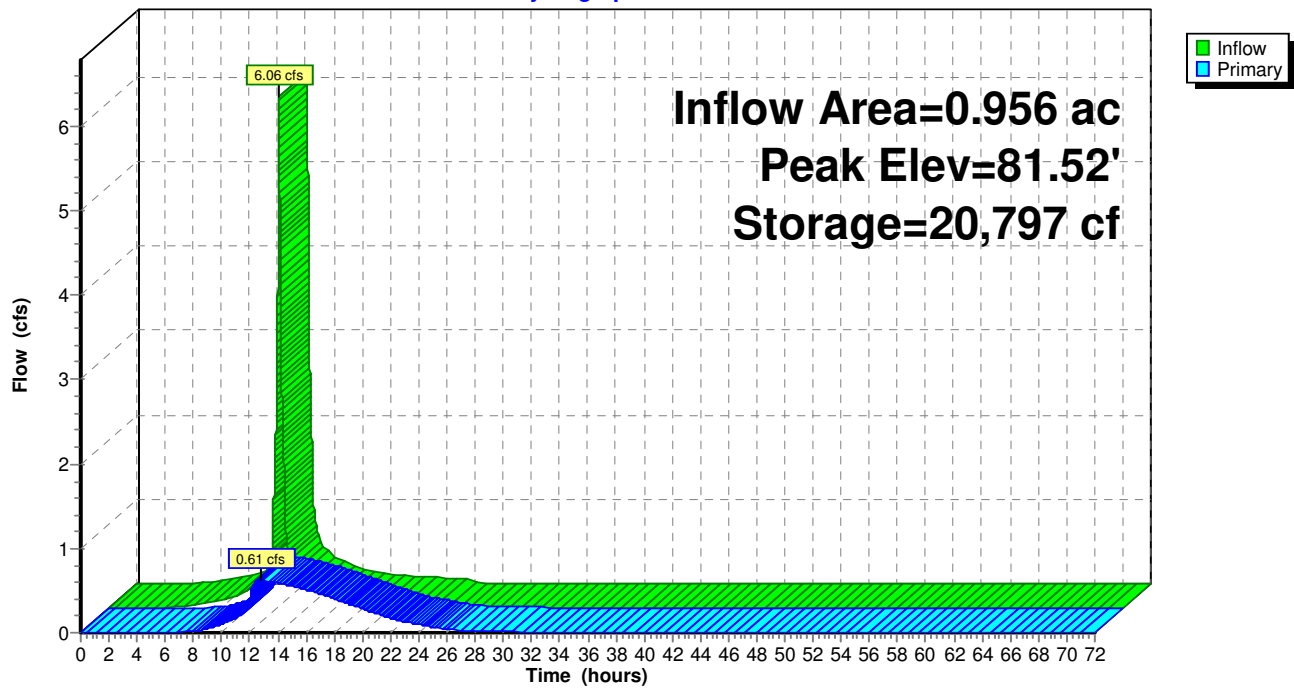
Volume	Invert	Avail.Storage	Storage Description	
#1	75.00'	42,367 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.00	239	0	0	239
76.00	786	486	486	791
77.00	1,382	1,070	1,556	1,399
78.00	2,063	1,711	3,267	2,095
78.80	2,824	1,947	5,214	2,869
79.00	4,585	734	5,948	4,630
80.00	5,601	5,085	11,033	5,677
81.00	6,669	6,127	17,160	6,781
82.00	7,793	7,224	24,384	7,944
83.00	8,973	8,376	32,760	9,168
84.00	10,257	9,608	42,367	10,498

Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 79.91' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	80.00'	<b>4.5" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.61 cfs @ 12.85 hrs HW=81.52' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.61 cfs of 3.41 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.61 cfs @ 5.56 fps)

# Pond PP6: Water Quality Basin (Kennedy Road)

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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Pond PP7: UGC-A (Stormtech SC-310)**

Inflow Area = 1.161 ac, 17.93% Impervious, Inflow Depth = 4.02" for 50-yr event  
 Inflow = 5.28 cfs @ 12.10 hrs, Volume= 0.388 af  
 Outflow = 0.07 cfs @ 23.07 hrs, Volume= 0.262 af, Atten= 99%, Lag= 658.0 min  
 Primary = 0.07 cfs @ 23.07 hrs, Volume= 0.262 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 81.80' @ 23.07 hrs Surf.Area= 12,415 sf Storage= 14,075 cf

Plug-Flow detention time= 1,590.4 min calculated for 0.262 af (67% of inflow)

Center-of-Mass det. time= 1,491.1 min ( 2,314.1 - 823.1 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	6,730 cf	<b>11.50'W x 814.88'L x 2.33'H Field A</b> 21,866 cf Overall - 5,042 cf Embedded = 16,824 cf x 40.0% Voids
#2A	80.23'	5,042 cf	<b>ADS_StormTech SC-310 +Cap</b> x 342 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 342 Chambers in 3 Rows
#3B	79.73'	2,322 cf	<b>4.83'W x 629.76'L x 2.33'H Field B</b> 7,102 cf Overall - 1,297 cf Embedded = 5,805 cf x 40.0% Voids
#4B	80.23'	1,297 cf	<b>ADS_StormTech SC-310 +Cap</b> x 88 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
			15,391 cf Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

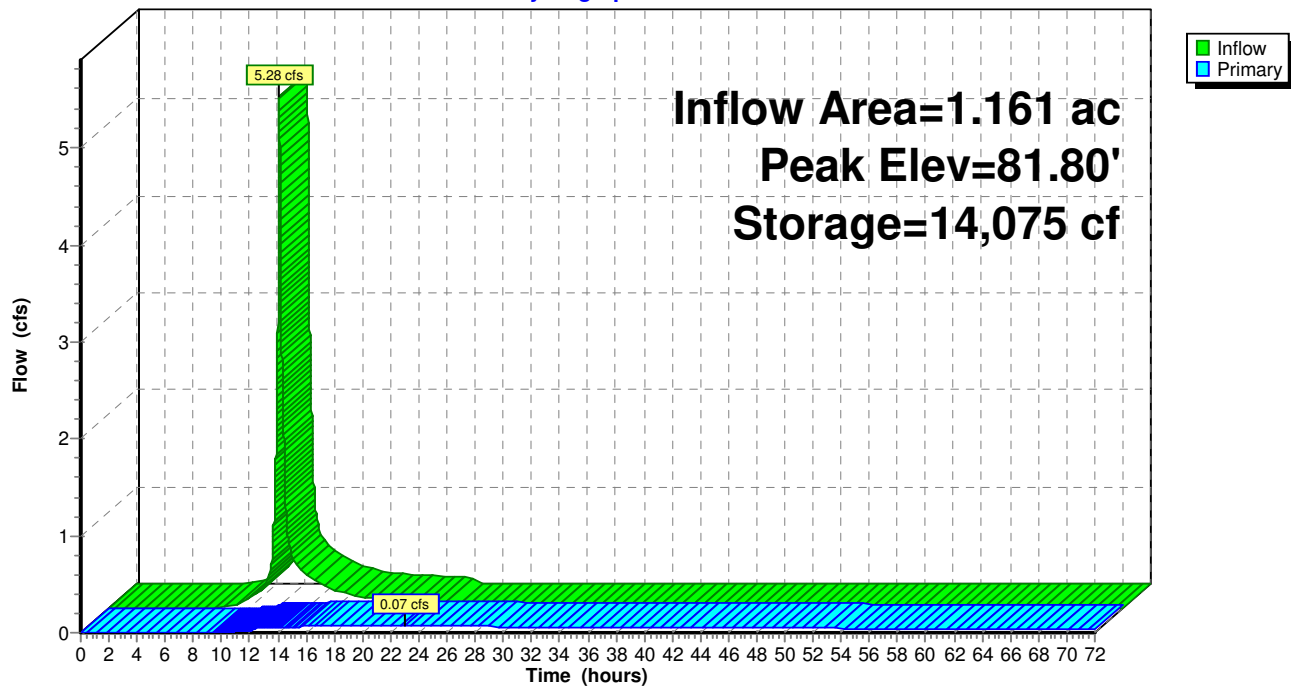
Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 ' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.35'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	79.73'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	81.86'	<b>9.0" W x 3.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.07 cfs @ 23.07 hrs HW=81.80' TW=0.00' (Dynamic Tailwater)

- 1=12" HDPE (Passes 0.07 cfs of 4.74 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.03 cfs @ 5.71 fps)
- 3=Orifice/Grate (Orifice Controls 0.04 cfs @ 6.85 fps)
- 4=Orifice/Grate ( Controls 0.00 cfs)

**Pond PP7: UGC-A (Stormtech SC-310)**

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Type III 24-hr 50-yr Rainfall=6.97"

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**Summary for Pond PP8: UGC-C (Stormtech SC-310)**

Inflow Area = 0.254 ac, 6.38% Impervious, Inflow Depth = 2.88" for 50-yr event  
 Inflow = 0.82 cfs @ 12.11 hrs, Volume= 0.061 af  
 Outflow = 0.03 cfs @ 16.68 hrs, Volume= 0.018 af, Atten= 96%, Lag= 274.4 min  
 Primary = 0.03 cfs @ 16.68 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.88' @ 16.68 hrs Surf.Area= 3,231 sf Storage= 2,050 cf

Plug-Flow detention time= 515.0 min calculated for 0.018 af (29% of inflow)

Center-of-Mass det. time= 379.5 min ( 1,227.2 - 847.7 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,299 cf	<b>4.83'W x 352.08'L x 2.33'H Field A</b> 3,971 cf Overall - 722 cf Embedded = 3,248 cf x 40.0% Voids
#2A	80.23'	722 cf	<b>ADS_StormTech SC-310 +Cap</b> x 49 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,168 cf	<b>4.83'W x 316.48'L x 2.33'H Field B</b> 3,569 cf Overall - 649 cf Embedded = 2,921 cf x 40.0% Voids
#4B	80.23'	649 cf	<b>ADS_StormTech SC-310 +Cap</b> x 44 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		3,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.03 cfs @ 16.68 hrs HW=80.88' TW=0.00' (Dynamic Tailwater)

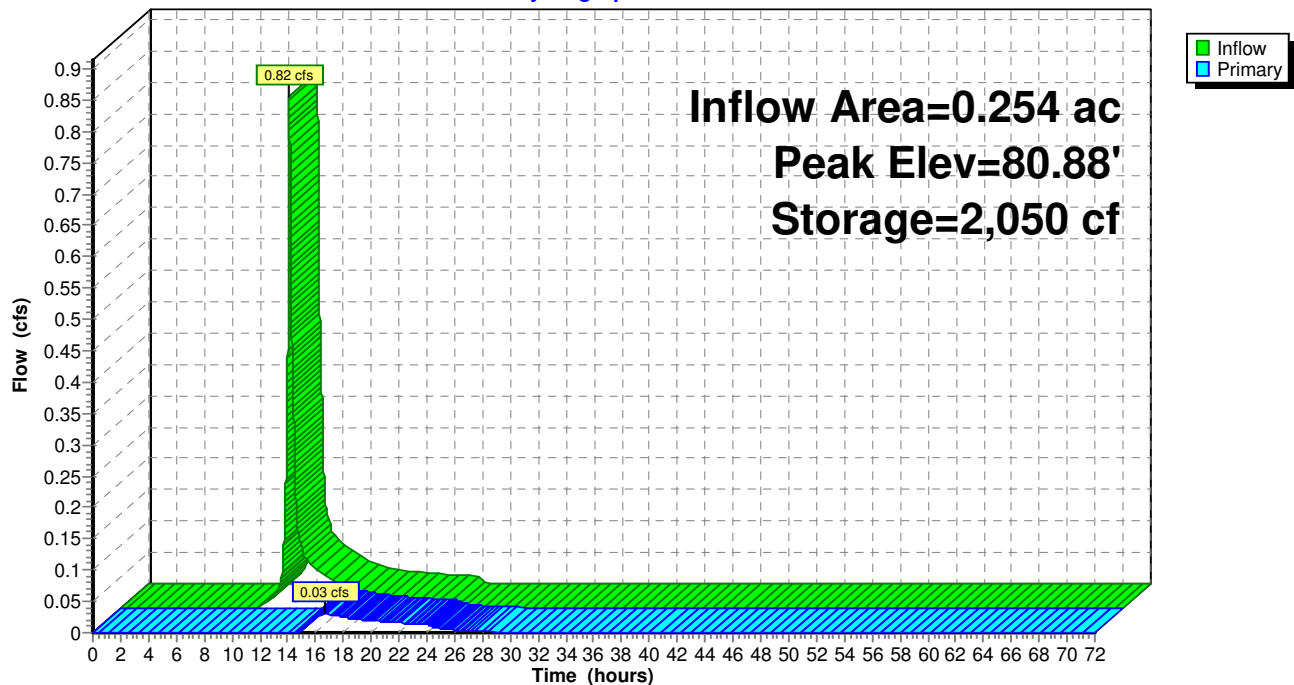
1=12" HDPE OUT (Passes 0.03 cfs of 2.60 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.03 cfs @ 0.97 fps)

3=12" HDPE (Passes 0.03 cfs of 0.55 cfs potential flow)

**Pond PP8: UGC-C (Stormtech SC-310)**

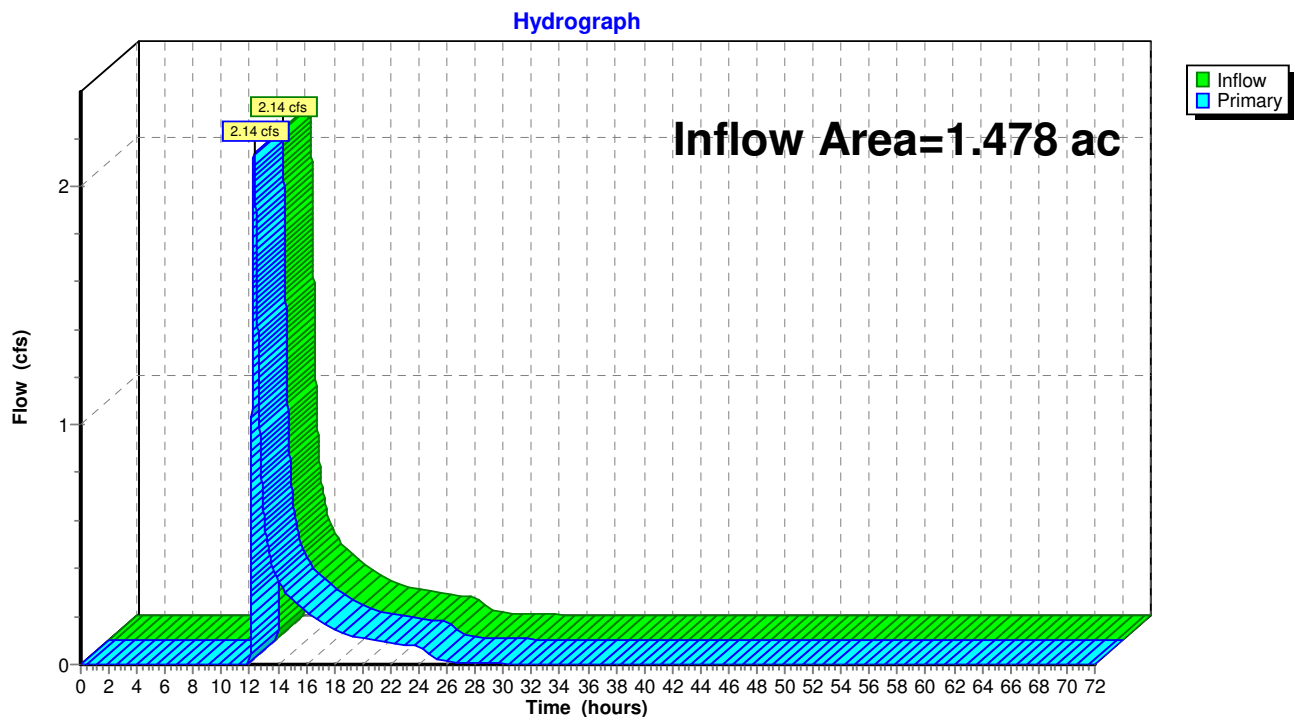
Hydrograph



**Summary for Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

Inflow Area = 1.478 ac, 8.48% Impervious, Inflow Depth = 2.23" for 50-yr event  
Inflow = 2.14 cfs @ 12.30 hrs, Volume= 0.275 af  
Primary = 2.14 cfs @ 12.30 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.0 min

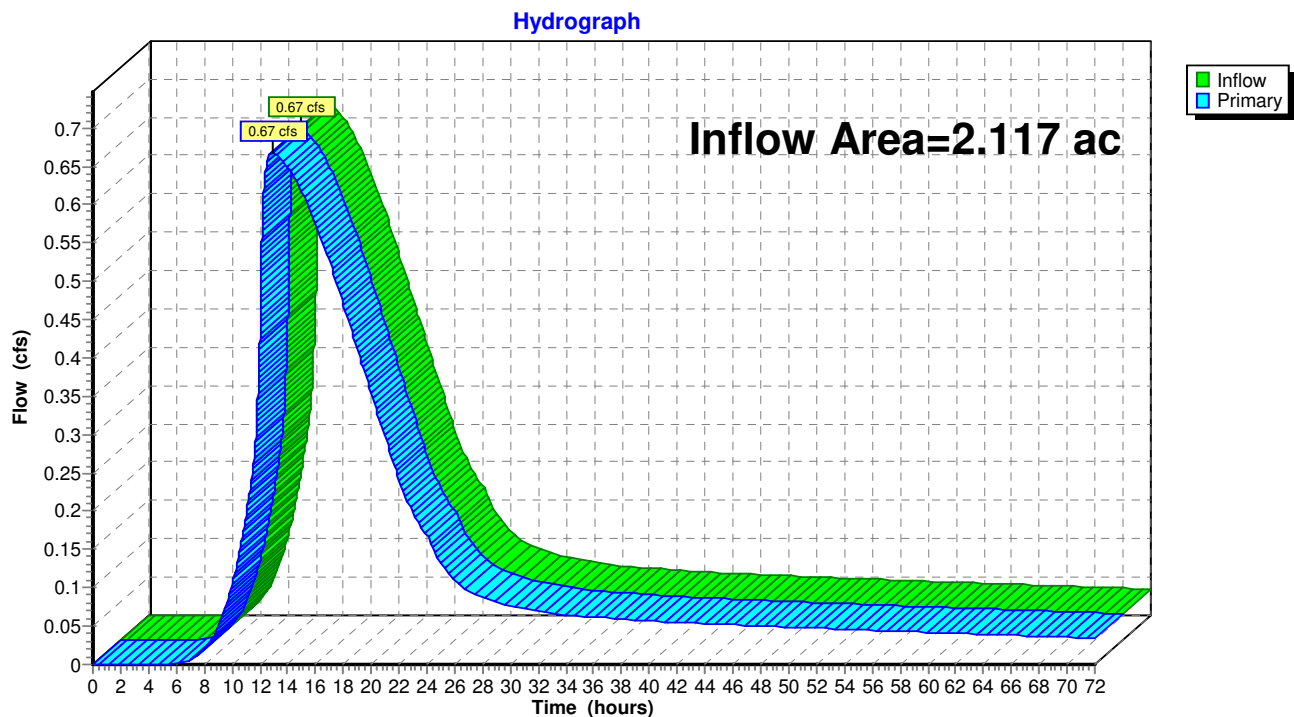
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

**Summary for Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

Inflow Area = 2.117 ac, 41.71% Impervious, Inflow Depth > 4.04" for 50-yr event  
Inflow = 0.67 cfs @ 12.95 hrs, Volume= 0.713 af  
Primary = 0.67 cfs @ 12.95 hrs, Volume= 0.713 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Subcatchment P1: Yard Drains to UGC-B**

Runoff = 5.26 cfs @ 12.10 hrs, Volume= 0.389 af, Depth= 3.81"

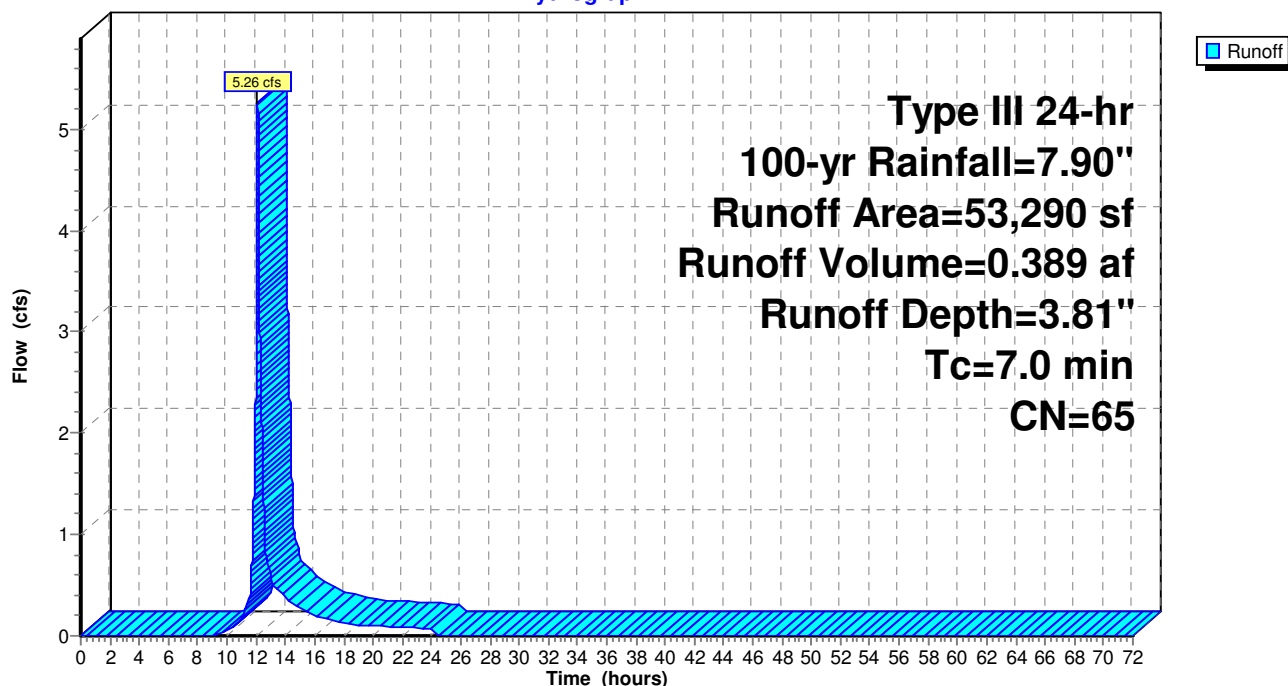
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

Area (sf)	CN	Description
45,366	61	>75% Grass cover, Good, HSG B
3,169	80	>75% Grass cover, Good, HSG D
* 2	71	>75% Grass cover, Good, HSG B/D
* 4,753	98	IMPERVIOUS
53,290	65	Weighted Average
48,537		91.08% Pervious Area
4,753		8.92% Impervious Area

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

**Subcatchment P1: Yard Drains to UGC-B**

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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Subcatchment P10: CB's to UGC-E (East)**

Runoff = 8.72 cfs @ 12.09 hrs, Volume= 0.678 af, Depth= 7.06"

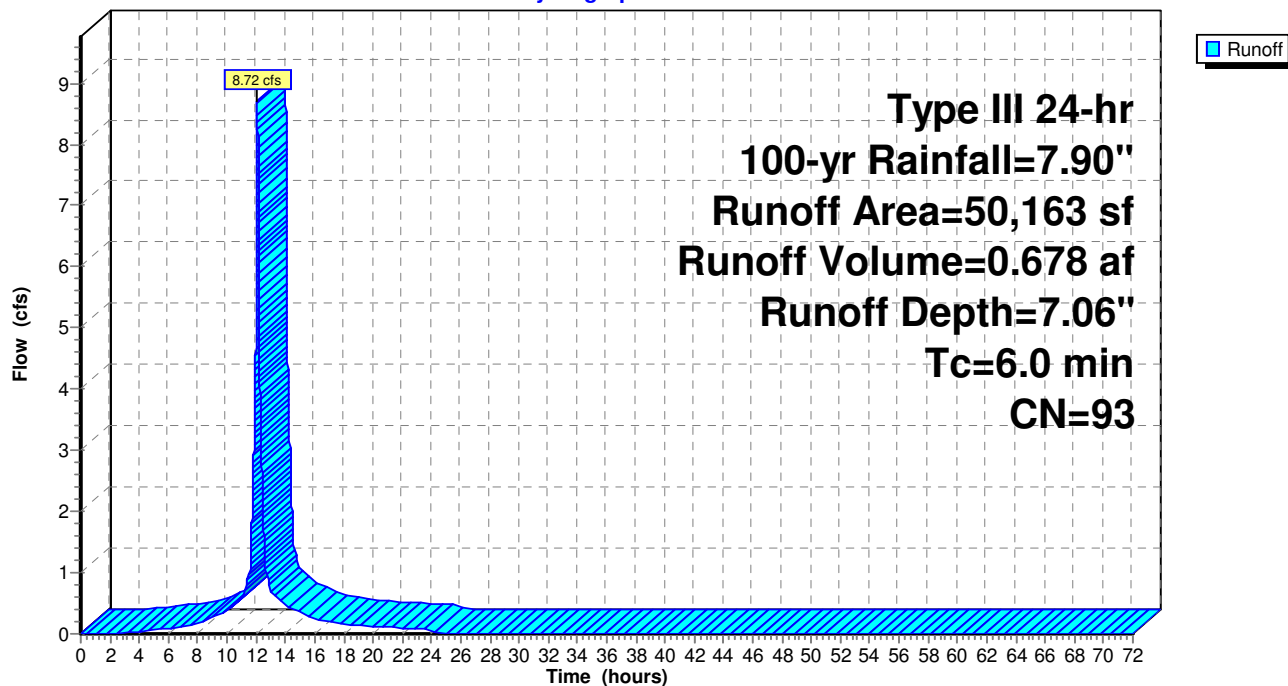
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

Area (sf)	CN	Description
922	74	>75% Grass cover, Good, HSG C
2,430	61	>75% Grass cover, Good, HSG B
* 4,429	71	>75% Grass cover, Good, HSG B/D
* 42,382	98	IMPERVIOUS
50,163	93	Weighted Average
7,781		15.51% Pervious Area
42,382		84.49% Impervious Area

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

**Subcatchment P10: CB's to UGC-E (East)**

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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### Summary for Subcatchment P11: Culdesac

Runoff = 6.97 cfs @ 12.09 hrs, Volume= 0.525 af, Depth= 6.59"

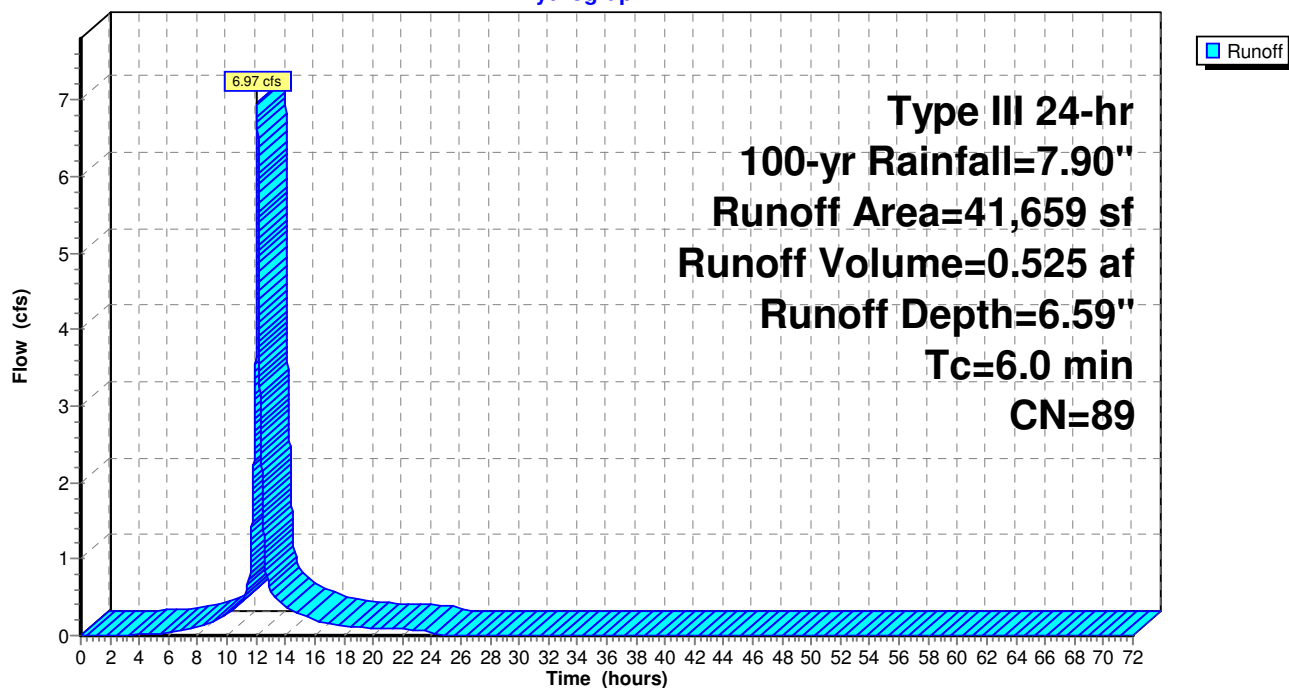
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

	Area (sf)	CN	Description
*	29,394	98	IMPERVIOUS
	2,607	61	>75% Grass cover, Good, HSG B
*	9,658	71	>75% Grass cover, Good, HSG B/D
	41,659	89	Weighted Average
	12,265		29.44% Pervious Area
	29,394		70.56% Impervious Area

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

### Subcatchment P11: Culdesac

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Type III 24-hr 100-yr Rainfall=7.90"

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### Summary for Subcatchment P12: Yard Drains to UGC-A

Runoff = 6.34 cfs @ 12.10 hrs, Volume= 0.468 af, Depth= 4.84"

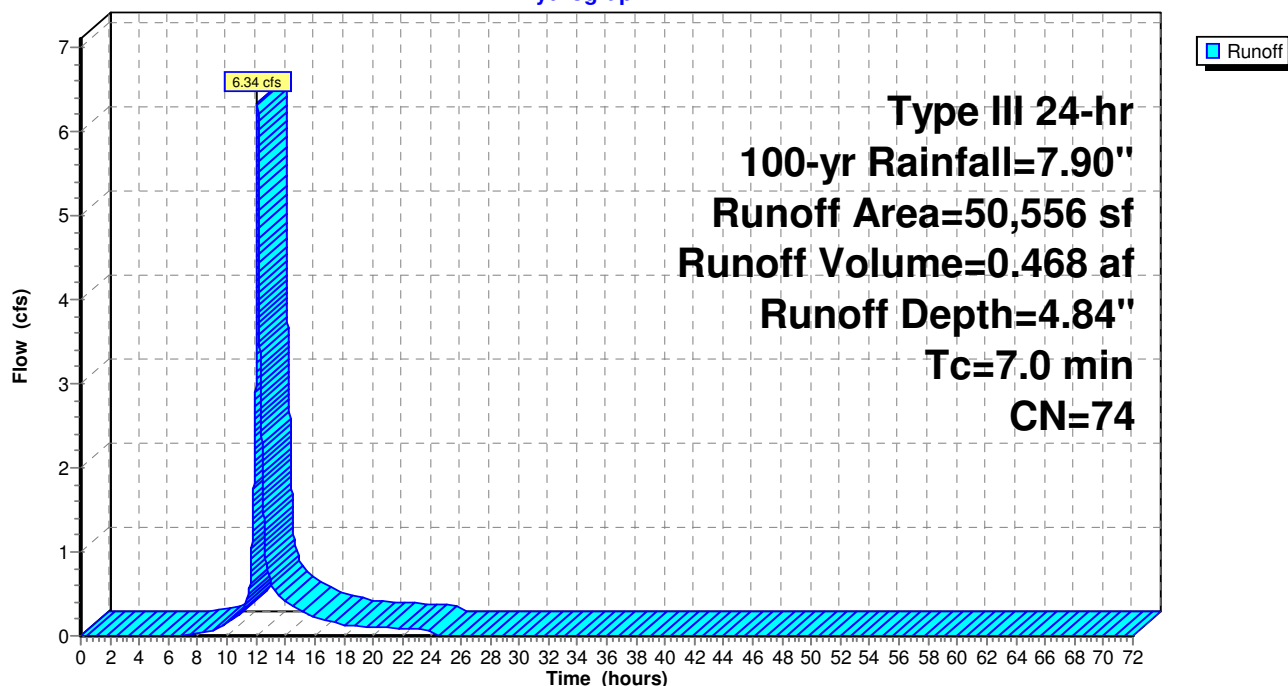
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

	Area (sf)	CN	Description
*	9,067	98	IMPERVIOUS
	12,690	61	>75% Grass cover, Good, HSG B
	4,707	74	>75% Grass cover, Good, HSG C
*	24,092	71	>75% Grass cover, Good, HSG B/D
	50,556	74	Weighted Average
	41,489		82.07% Pervious Area
	9,067		17.93% Impervious Area

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

### Subcatchment P12: Yard Drains to UGC-A

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Subcatchment P13: Yard Drains to UGC-C**

Runoff = 1.03 cfs @ 12.10 hrs, Volume= 0.076 af, Depth= 3.59"

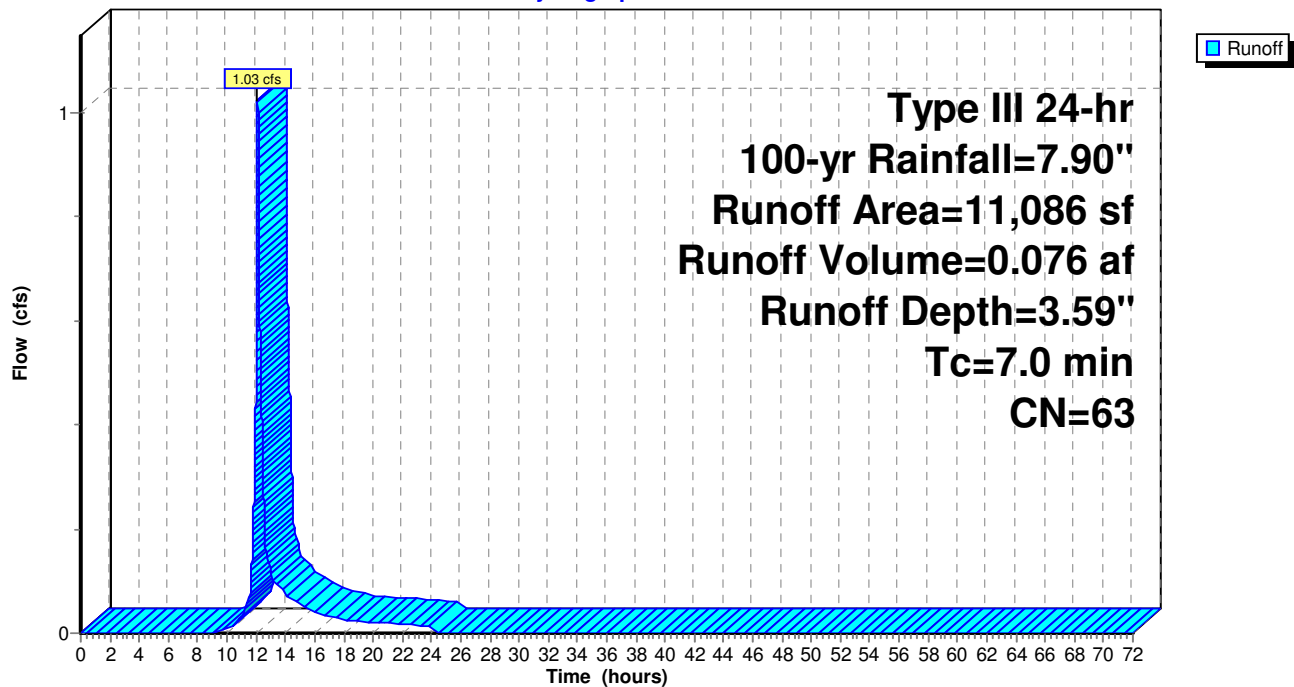
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

	Area (sf)	CN	Description
*	707	98	IMPERVIOUS
	10,379	61	>75% Grass cover, Good, HSG B
	11,086	63	Weighted Average
	10,379		93.62% Pervious Area
	707		6.38% Impervious Area

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

**Subcatchment P13: Yard Drains to UGC-C**

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Runoff = 0.51 cfs @ 12.12 hrs, Volume= 0.040 af, Depth= 2.72"

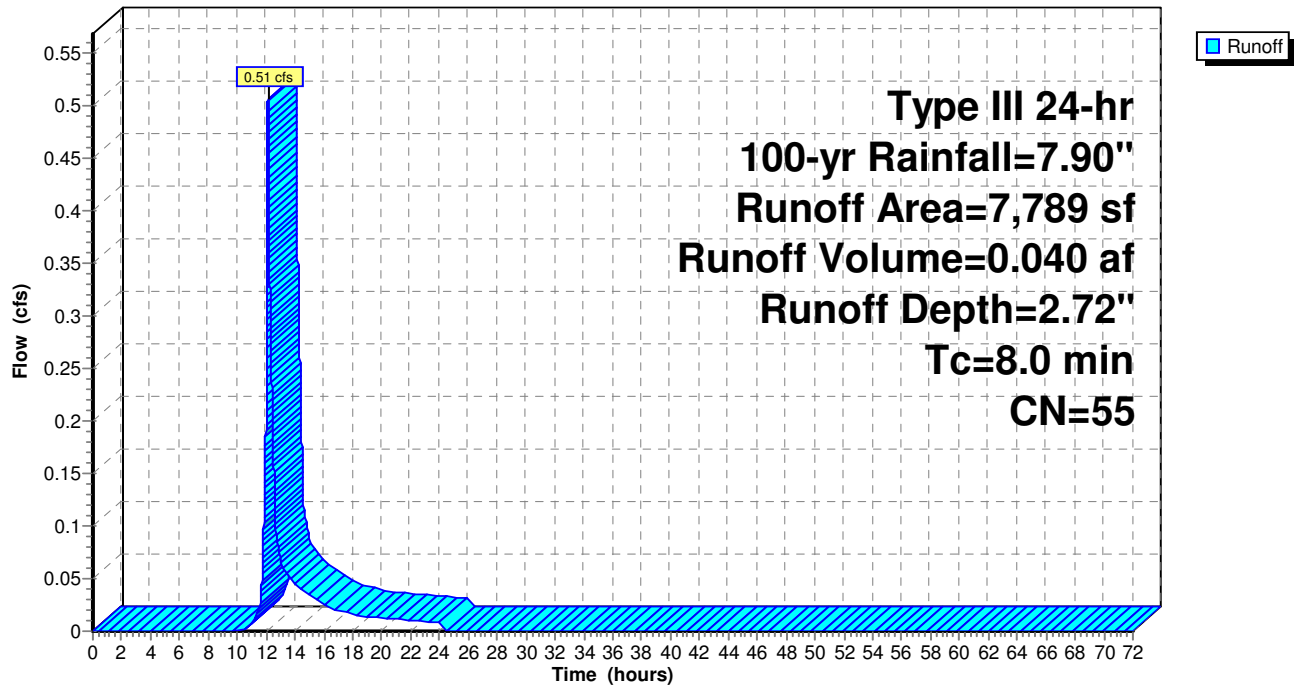
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

Area (sf)	CN	Description
2,334	39	>75% Grass cover, Good, HSG A
5,236	61	>75% Grass cover, Good, HSG B
* 219	71	>75% Grass cover, Good, HSG B/D
7,789	55	Weighted Average
7,789		100.00% Pervious Area

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

**Subcatchment P2: (DP2\*) Proposed Flow across North West Property Corner**

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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### Summary for Subcatchment P3: P3

Runoff = 0.98 cfs @ 12.12 hrs, Volume= 0.075 af, Depth= 3.81"

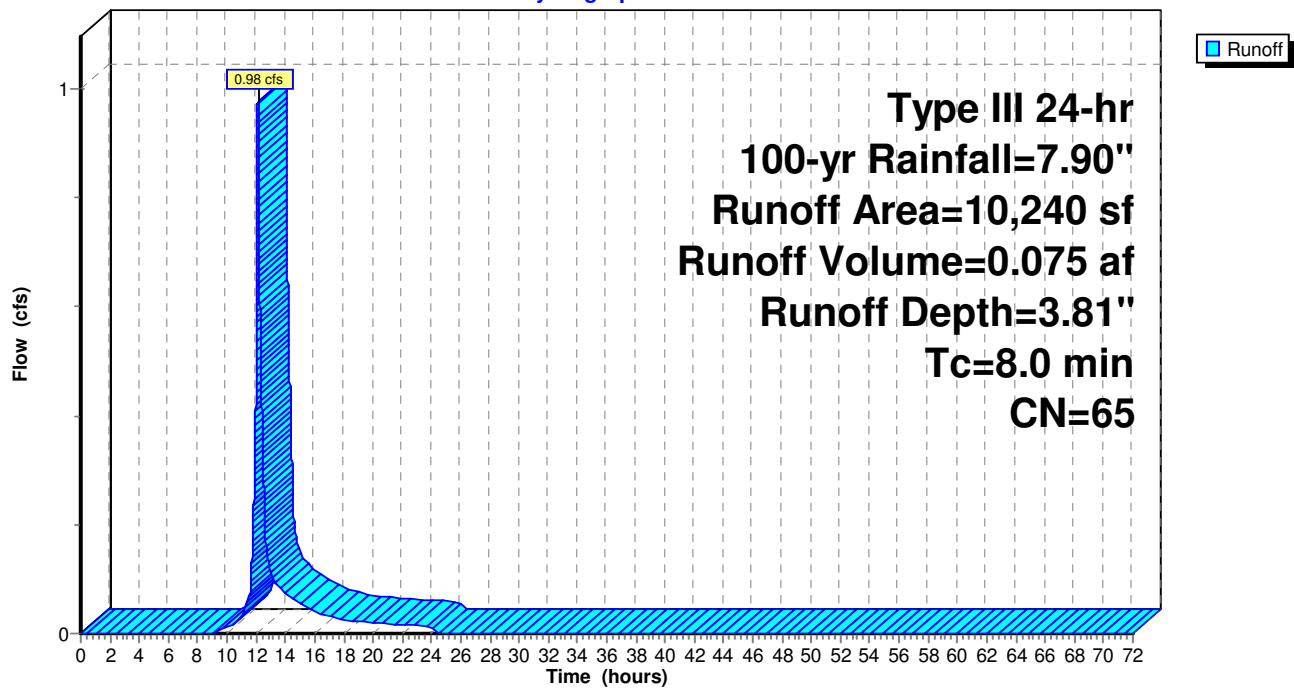
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

Area (sf)	CN	Description
2,646	39	>75% Grass cover, Good, HSG A
7,594	74	>75% Grass cover, Good, HSG C
10,240	65	Weighted Average
10,240		100.00% Pervious Area

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

### Subcatchment P3: P3

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Subcatchment P4: P4**

Runoff = 1.13 cfs @ 12.78 hrs, Volume= 0.203 af, Depth= 4.26"

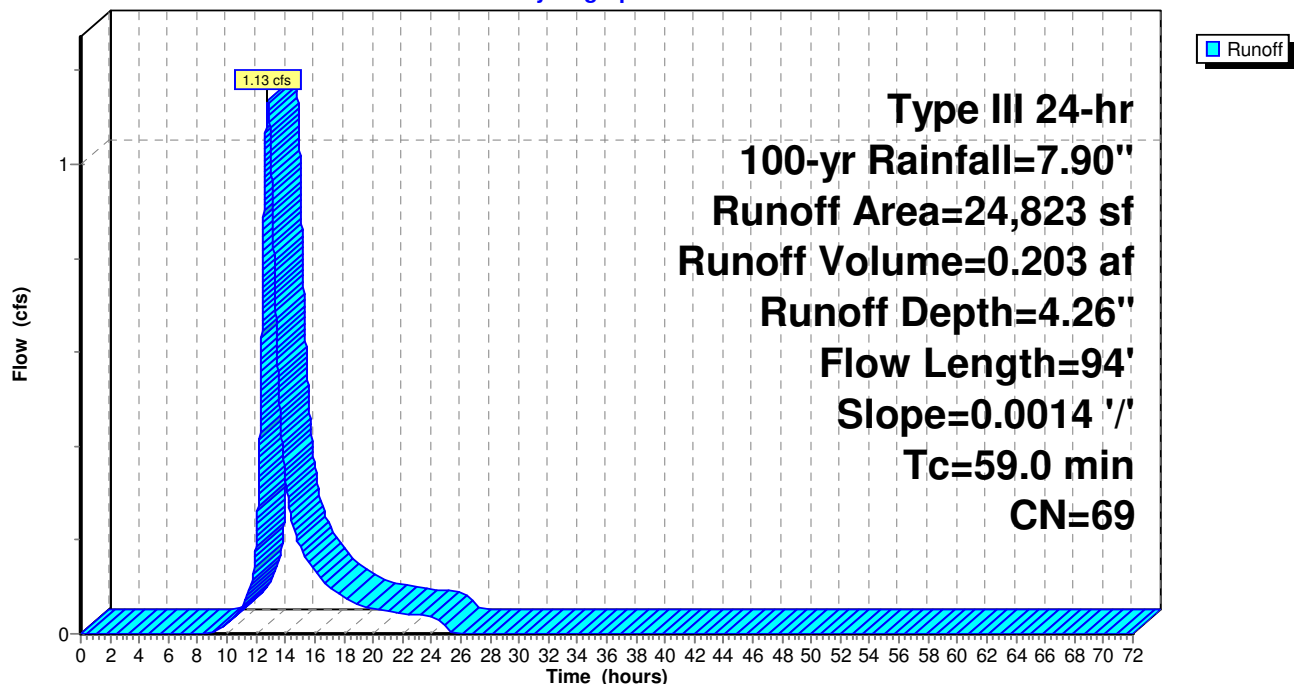
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

Area (sf)	CN	Description
4,911	74	>75% Grass cover, Good, HSG C
* 2,000	71	>75% Grass cover, Good, HSG B/D
* 14,330	66	Woods, Good, HSG B/D
3,582	70	Woods, Good, HSG C
24,823	69	Weighted Average
24,823		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
59.0	94	0.0014	0.03		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.22"

**Subcatchment P4: P4**

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Subcatchment P5: P5**

Runoff = 11.52 cfs @ 12.63 hrs, Volume= 1.759 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

Area (sf)	CN	Description
1,504	74	>75% Grass cover, Good, HSG C
* 9,745	71	>75% Grass cover, Good, HSG B/D
25,599	70	Woods, Good, HSG C
* 127,460	66	Woods, Good, HSG B/D
* 8,904	98	IMPERVIOUS
* 13,961	68	Meadow, non-grazed, HSG B/D
28,470	71	Meadow, non-grazed, HSG C
215,643	69	Weighted Average
206,739		95.87% Pervious Area
8,904		4.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	23	0.2900	0.25		<b>Sheet Flow, GRASS SF</b>
					Grass: Dense n= 0.240 P2= 3.22"
22.4	82	0.0120	0.06		<b>Sheet Flow, WOODLAND SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
20.5	295	0.0023	0.24		<b>Shallow Concentrated Flow, WOOD SCF</b>
					Woodland Kv= 5.0 fps
44.4	400	Total			

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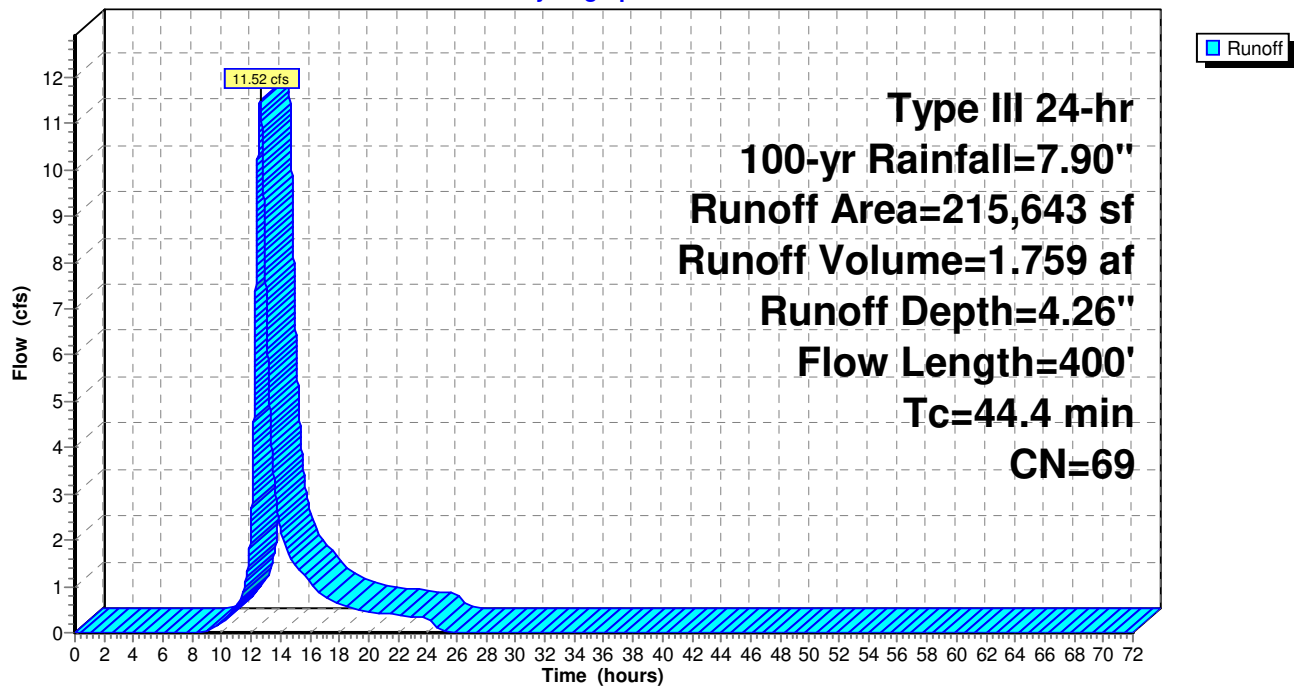
Type III 24-hr 100-yr Rainfall=7.90"

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### Subcatchment P5: P5

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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### Summary for Subcatchment P6: Sheet flow To West Basin

Runoff = 35.42 cfs @ 12.09 hrs, Volume= 2.755 af, Depth= 7.06"

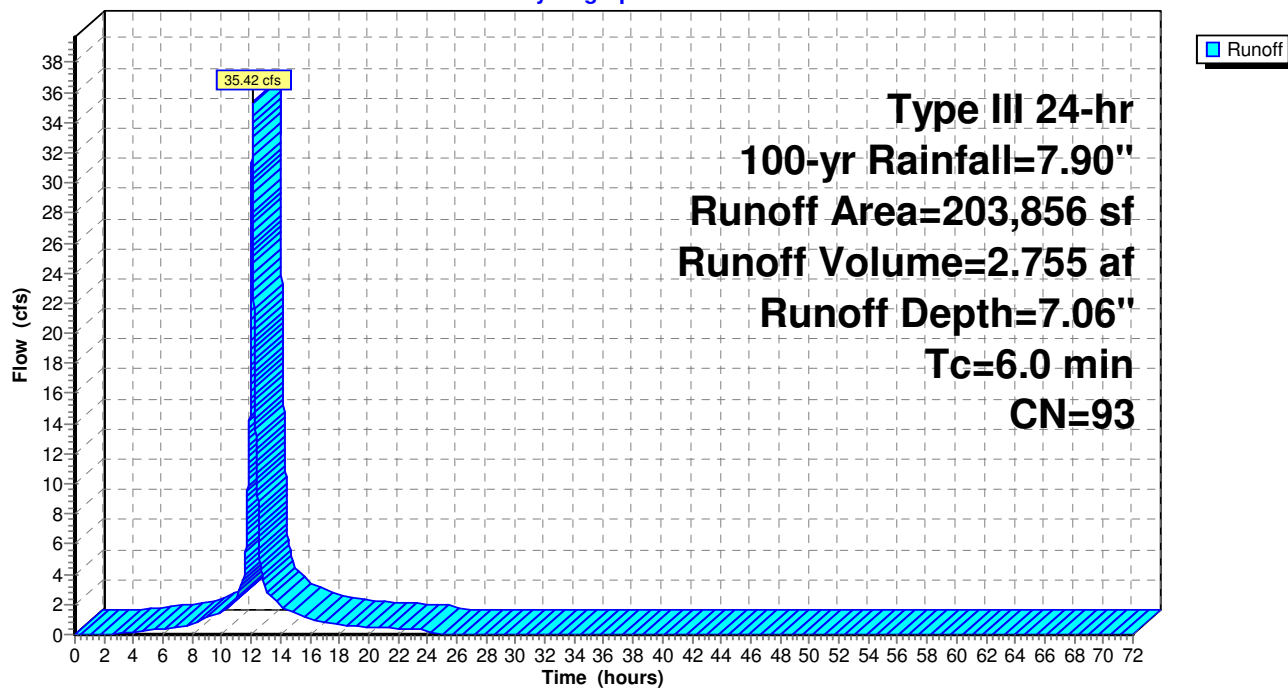
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

Area (sf)	CN	Description
4,918	39	>75% Grass cover, Good, HSG A
6,710	61	>75% Grass cover, Good, HSG B
6,131	74	>75% Grass cover, Good, HSG C
* 9,090	71	>75% Grass cover, Good, HSG B/D
* 177,007	98	IMPERVIOUS
203,856	93	Weighted Average
26,849		13.17% Pervious Area
177,007		86.83% Impervious Area

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

### Subcatchment P6: Sheet flow To West Basin

Hydrograph



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**Summary for Subcatchment P7: Proposed P7**

Runoff = 0.55 cfs @ 12.36 hrs, Volume= 0.063 af, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

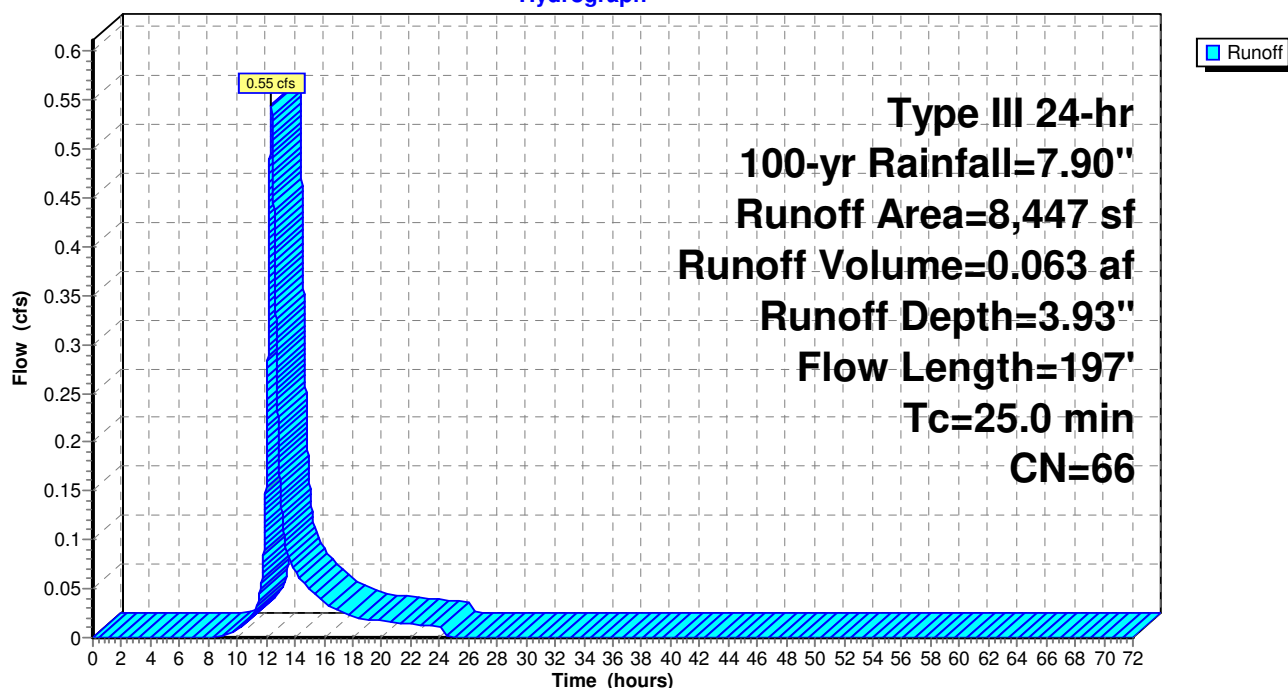
Area (sf)	CN	Description
2,335	39	>75% Grass cover, Good, HSG A
1,709	74	>75% Grass cover, Good, HSG C
* 1,796	98	IMPERVIOUS
450	30	Meadow, non-grazed, HSG A
2,157	71	Meadow, non-grazed, HSG C
8,447	66	Weighted Average
6,651		78.74% Pervious Area
1,796		21.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0160	0.07		<b>Sheet Flow, Woodland SF</b>
					Woods: Light underbrush n= 0.400 P2= 3.22"
1.6	97	0.0420	1.02		<b>Shallow Concentrated Flow, Woodlan SCF</b>
					Woodland Kv= 5.0 fps
25.0	197	Total			

**Subcatchment P7: Proposed P7**

Hydrograph



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### Summary for Subcatchment P8: Proposed Roof to UGC-D (west)

Runoff = 43.10 cfs @ 12.09 hrs, Volume= 3.543 af, Depth= 7.66"

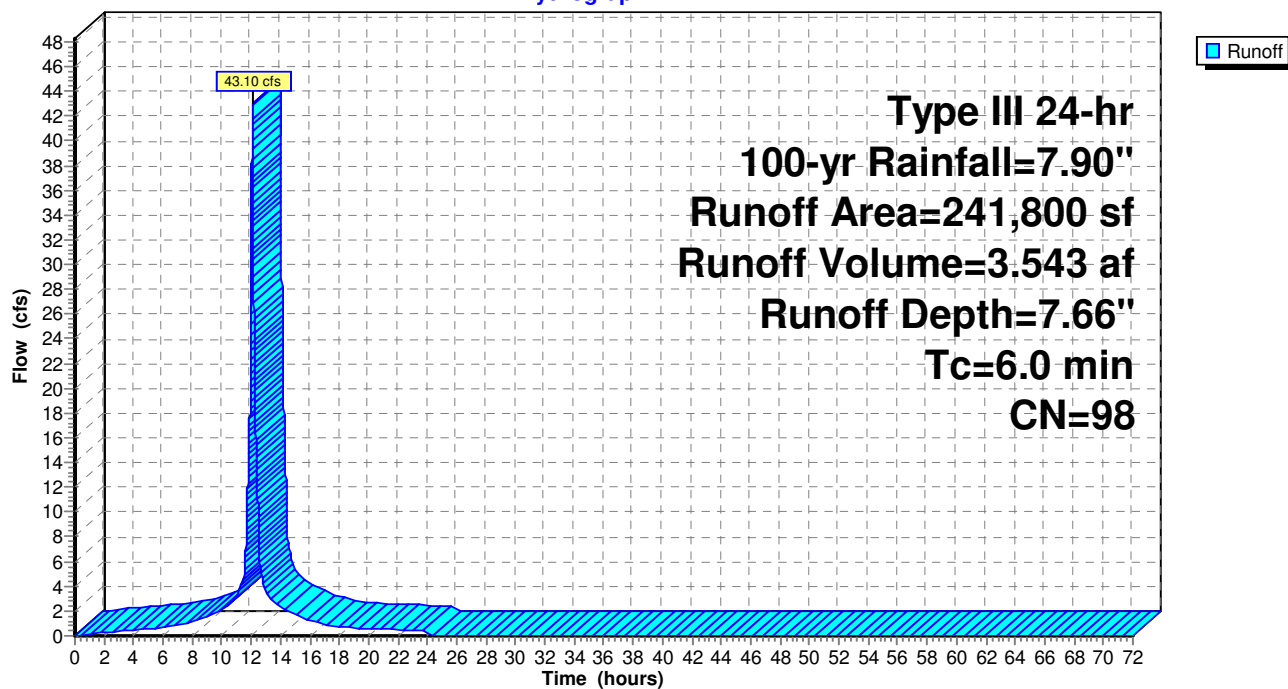
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

	Area (sf)	CN	Description
*	241,800	98	IMPERVIOUS
	241,800		100.00% Impervious Area

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

### Subcatchment P8: Proposed Roof to UGC-D (west)

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Subcatchment P9: Sheetflow to North Basin**

Runoff = 7.16 cfs @ 12.09 hrs, Volume= 0.558 af, Depth= 6.59"

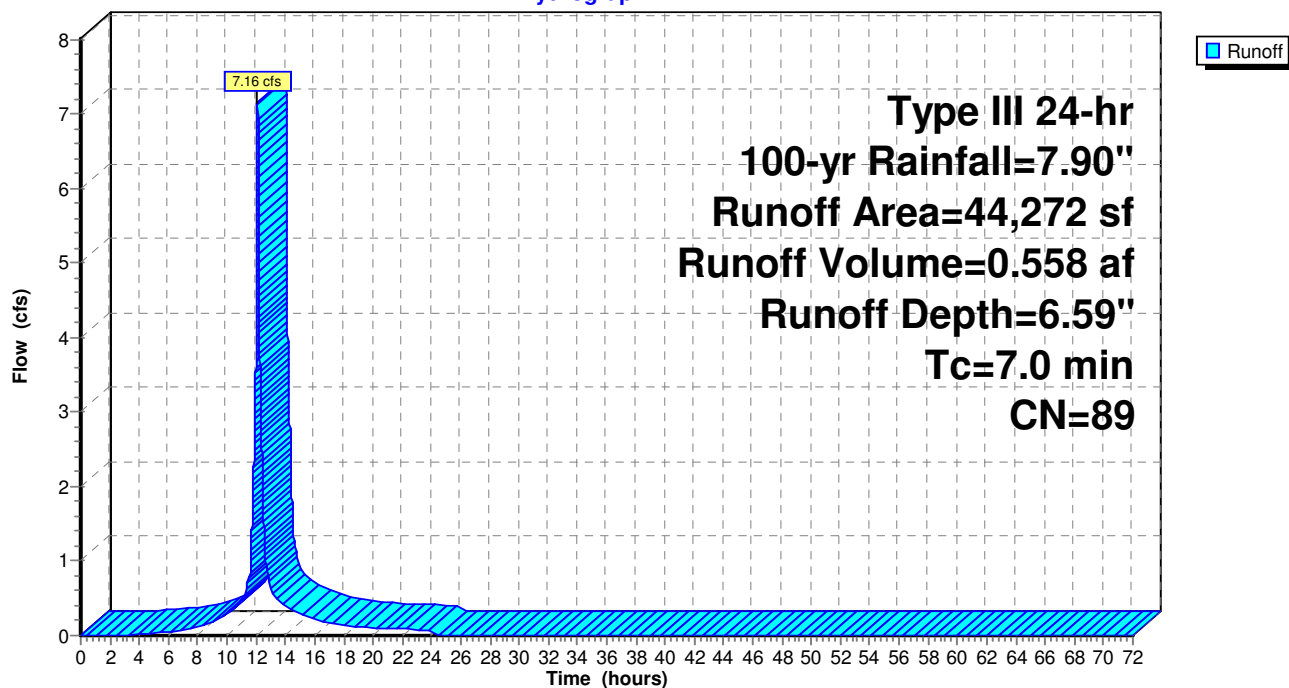
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
Type III 24-hr 100-yr Rainfall=7.90"

	Area (sf)	CN	Description
	14,312	74	>75% Grass cover, Good, HSG C
*	1,743	71	>75% Grass cover, Good, HSG B/D
*	28,217	98	IMPERVIOUS
	44,272	89	Weighted Average
	16,055		36.26% Pervious Area
	28,217		63.74% Impervious Area

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

**Subcatchment P9: Sheetflow to North Basin**

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Pond DMH: Splitter Structure**



Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 7.06" for 100-yr event  
 Inflow = 6.22 cfs @ 12.16 hrs, Volume= 0.677 af  
 Outflow = 6.22 cfs @ 12.16 hrs, Volume= 0.677 af, Atten= 0%, Lag= 0.0 min  
 Primary = 5.11 cfs @ 12.16 hrs, Volume= 0.327 af  
 Secondary = 1.11 cfs @ 12.16 hrs, Volume= 0.350 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 86.18' @ 12.16 hrs

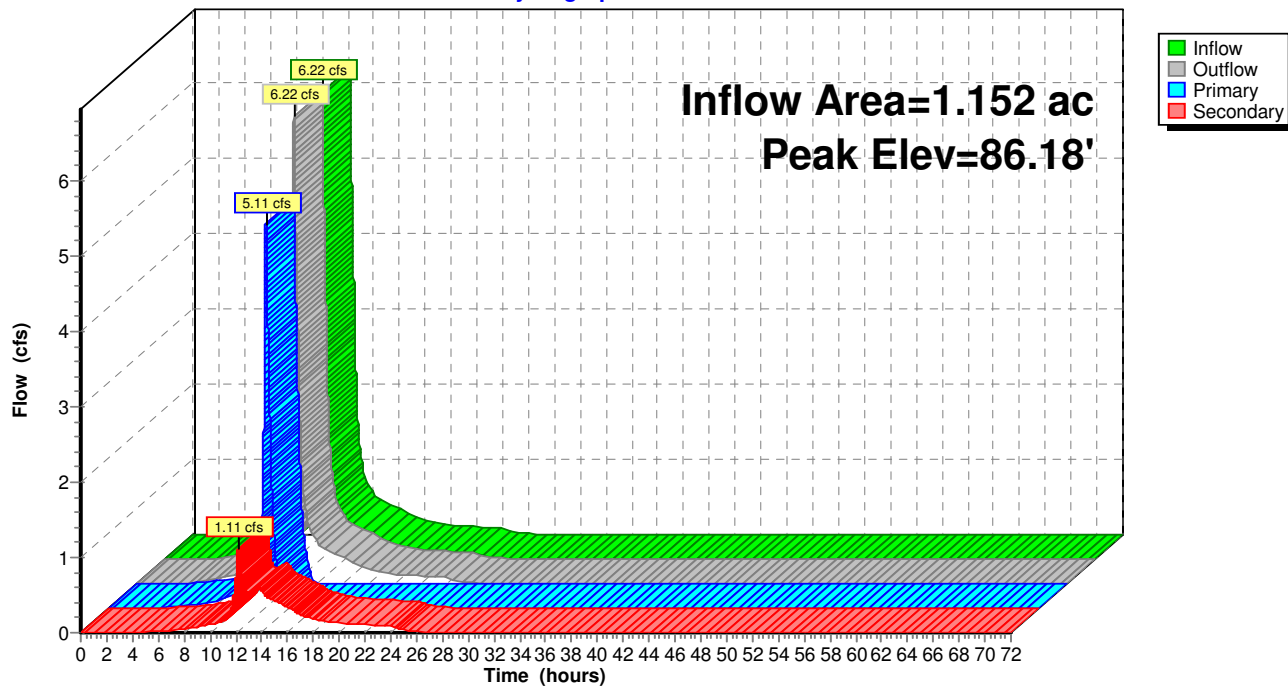
Flood Elev= 85.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	84.55'	<b>15.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	84.55'	<b>6.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.20 sf

**Primary OutFlow** Max=5.11 cfs @ 12.16 hrs HW=86.18' TW=84.54' (Dynamic Tailwater)

**1=Culvert** (Barrel Controls 5.11 cfs @ 4.19 fps)
**Secondary OutFlow** Max=1.11 cfs @ 12.16 hrs HW=86.18' TW=81.68' (Dynamic Tailwater)

**2=Culvert** (Inlet Controls 1.11 cfs @ 5.65 fps)

## Pond DMH: Splitter Structure

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**

Inflow Area = 18.348 ac, 62.57% Impervious, Inflow Depth > 5.95" for 100-yr event  
 Inflow = 20.75 cfs @ 12.58 hrs, Volume= 9.096 af  
 Outflow = 12.38 cfs @ 13.30 hrs, Volume= 9.095 af, Atten= 40%, Lag= 43.2 min  
 Primary = 12.38 cfs @ 13.30 hrs, Volume= 9.095 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 83.17' @ 13.30 hrs Surf.Area= 45,313 sf Storage= 24,454 cf

Plug-Flow detention time= 9.2 min calculated for 9.095 af (100% of inflow)

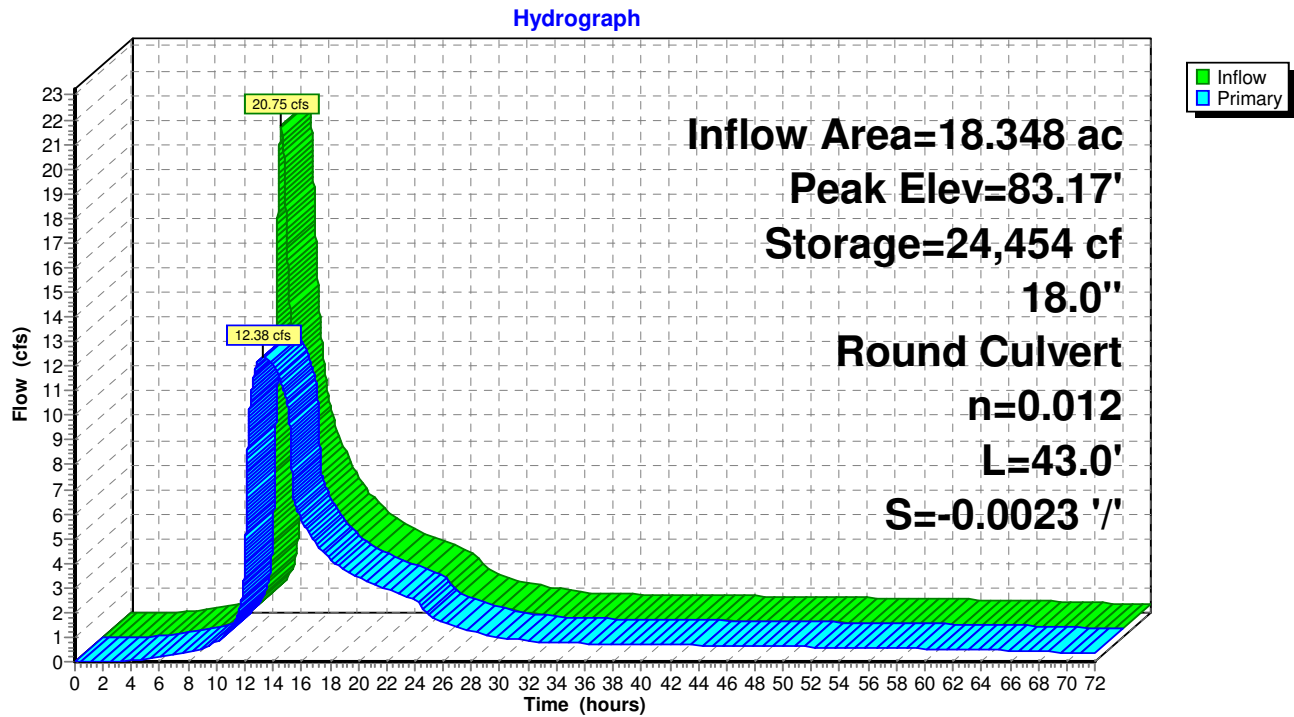
Center-of-Mass det. time= 8.8 min ( 1,454.2 - 1,445.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	79.70'	94,801 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.70	10	0	0
80.00	382	59	59
81.00	1,156	769	828
82.00	2,173	1,665	2,492
83.00	29,061	15,617	18,109
84.00	124,323	76,692	94,801

Device	Routing	Invert	Outlet Devices
#1	Primary	79.70'	<b>18.0" Round Culvert</b> L= 43.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 79.60' / 79.70' S= -0.0023 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

**Primary OutFlow** Max=12.38 cfs @ 13.30 hrs HW=83.17' (Free Discharge)↑ **1=Culvert** (Inlet Controls 12.38 cfs @ 7.01 fps)

**Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**

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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Pond PP1: UGC-D (Stormtech SC-310)**

Inflow Area = 10.231 ac, 93.98% Impervious, Inflow Depth > 7.28" for 100-yr event  
 Inflow = 44.70 cfs @ 12.09 hrs, Volume= 6.210 af  
 Outflow = 6.89 cfs @ 12.59 hrs, Volume= 6.031 af, Atten= 85%, Lag= 30.5 min  
 Primary = 6.89 cfs @ 12.59 hrs, Volume= 6.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 84.96' @ 12.59 hrs Surf.Area= 78,048 sf Storage= 96,103 cf

Plug-Flow detention time= 633.2 min calculated for 6.031 af (97% of inflow)  
 Center-of-Mass det. time= 566.4 min ( 1,589.5 - 1,023.1 )

Volume	Invert	Avail.Storage	Storage Description
#1A	82.78'	48,033 cf	<b>108.17'W x 644.00'L x 2.33'H Field A</b> 162,538 cf Overall - 42,457 cf Embedded = 120,082 cf x 40.0% Voids
#2A	83.28'	42,457 cf	<b>ADS_StormTech RC-310 +Cap</b> x 2880 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 2880 Chambers in 32 Rows
#3B	82.78'	6,025 cf	<b>11.50'W x 729.44'L x 2.33'H Field B</b> 19,573 cf Overall - 4,511 cf Embedded = 15,062 cf x 40.0% Voids
#4B	83.28'	4,511 cf	<b>ADS_StormTech SC-310 +Cap</b> x 306 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 306 Chambers in 3 Rows
101,025 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

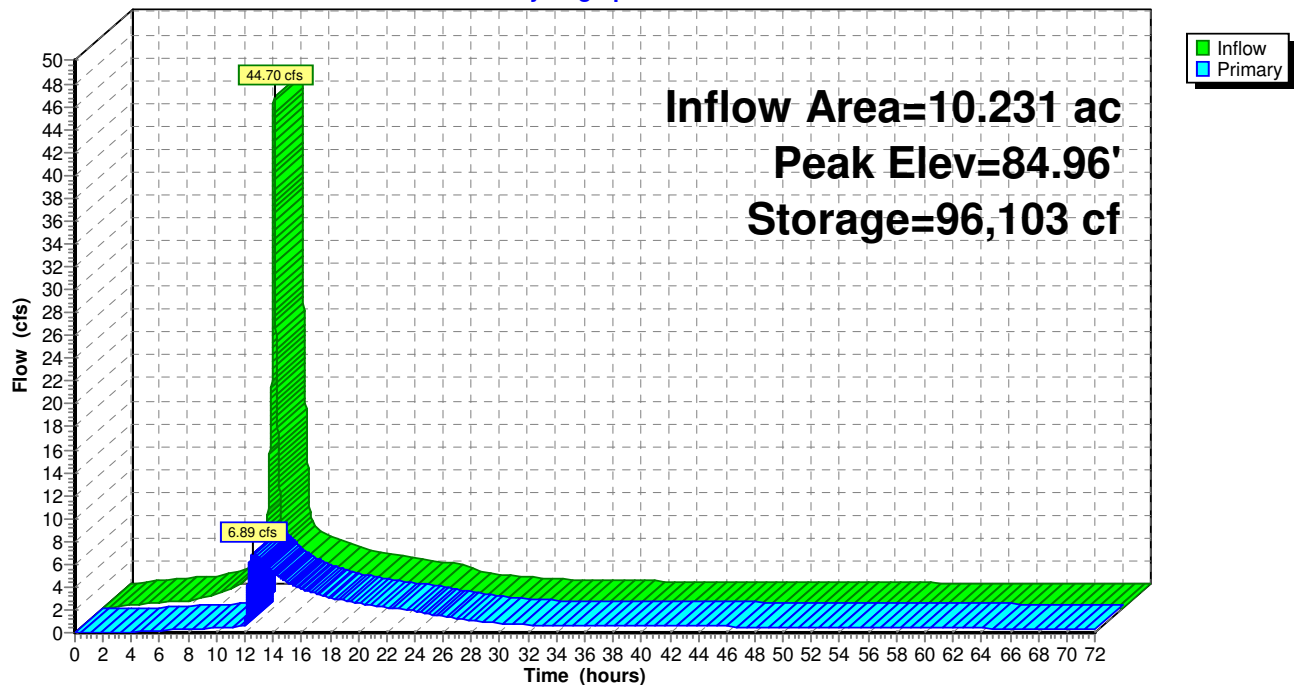
Device	Routing	Invert	Outlet Devices
#1	Primary	82.78'	<b>24.0" Round 24" RCP</b> L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.78' / 82.70' S= 0.0057 ' S= 0.0057 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	82.78'	<b>9.0" W x 2.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	83.95'	<b>24.0" W x 10.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=6.89 cfs @ 12.59 hrs HW=84.96' TW=82.78' (Dynamic Tailwater)

1=24" RCP (Passes 6.89 cfs of 13.69 cfs potential flow)  
 2=Orifice/Grate (Orifice Controls 0.87 cfs @ 6.96 fps)  
 3=Orifice/Grate (Orifice Controls 6.02 cfs @ 3.61 fps)

**Pond PP1: UGC-D (Stormtech SC-310)**

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Pond PP2: Water Quality Basin (WEST)**

Inflow Area = 4.680 ac, 86.83% Impervious, Inflow Depth = 7.06" for 100-yr event  
 Inflow = 35.42 cfs @ 12.09 hrs, Volume= 2.755 af  
 Outflow = 2.04 cfs @ 15.81 hrs, Volume= 2.667 af, Atten= 94%, Lag= 223.4 min  
 Primary = 2.04 cfs @ 15.81 hrs, Volume= 2.667 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.50' Surf.Area= 39,354 sf Storage= 18,954 cf

Peak Elev= 85.24' @ 14.02 hrs Surf.Area= 50,294 sf Storage= 96,918 cf (77,964 cf above start)

Plug-Flow detention time= 831.4 min calculated for 2.232 af (81% of inflow)

Center-of-Mass det. time= 631.7 min ( 1,397.4 - 765.7 )

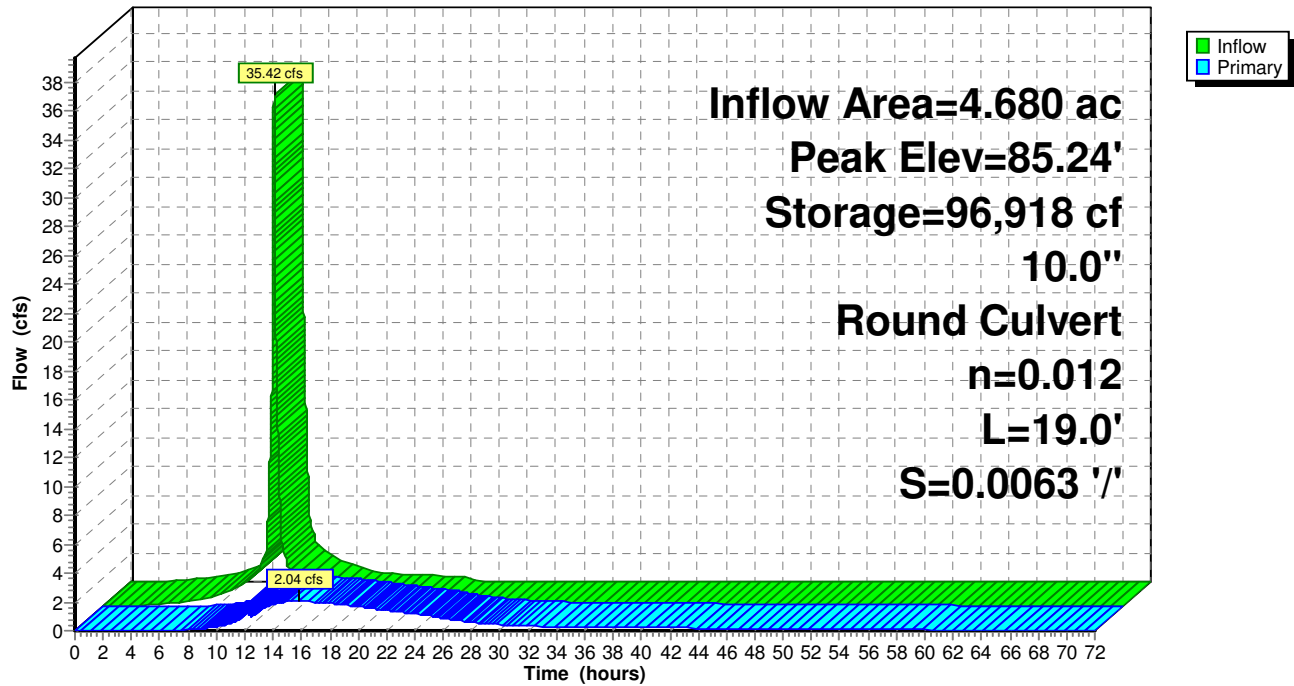
Volume	Invert	Avail.Storage	Storage Description	
#1	83.00'	136,855 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
83.00	36,482	0	0	36,482
84.00	42,335	39,372	39,372	42,377
85.00	48,730	45,495	84,867	48,817
86.00	55,314	51,987	136,855	55,450

Device	Routing	Invert	Outlet Devices
#1	Primary	83.50'	<b>10.0" Round Culvert</b> L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.50' / 83.38' S= 0.0063 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

**Primary OutFlow** Max=2.04 cfs @ 15.81 hrs HW=85.18' TW=84.57' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 2.04 cfs @ 3.73 fps)

# Pond PP2: Water Quality Basin (WEST)

Hydrograph



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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Pond PP3: UGC-B (Stormtech SC-310)**

Inflow Area = 1.223 ac, 8.92% Impervious, Inflow Depth = 3.81" for 100-yr event  
 Inflow = 5.26 cfs @ 12.10 hrs, Volume= 0.389 af  
 Outflow = 3.07 cfs @ 12.24 hrs, Volume= 0.332 af, Atten= 42%, Lag= 8.1 min  
 Primary = 3.07 cfs @ 12.24 hrs, Volume= 0.332 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 81.96' @ 12.24 hrs Surf.Area= 4,229 sf Storage= 4,850 cf

Plug-Flow detention time= 125.9 min calculated for 0.332 af (85% of inflow)

Center-of-Mass det. time= 61.6 min ( 898.5 - 836.9 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,745 cf	<b>4.83'W x 473.12'L x 2.33'H Field A</b> 5,336 cf Overall - 973 cf Embedded = 4,363 cf x 40.0% Voids
#2A	80.23'	973 cf	<b>ADS_StormTech SC-310 +Cap</b> x 66 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,483 cf	<b>4.83'W x 401.92'L x 2.33'H Field B</b> 4,533 cf Overall - 826 cf Embedded = 3,707 cf x 40.0% Voids
#4B	80.23'	826 cf	<b>ADS_StormTech SC-310 +Cap</b> x 56 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,027 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.66'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.66' / 79.27' S= 0.0195 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=3.07 cfs @ 12.24 hrs HW=81.96' TW=0.00' (Dynamic Tailwater)

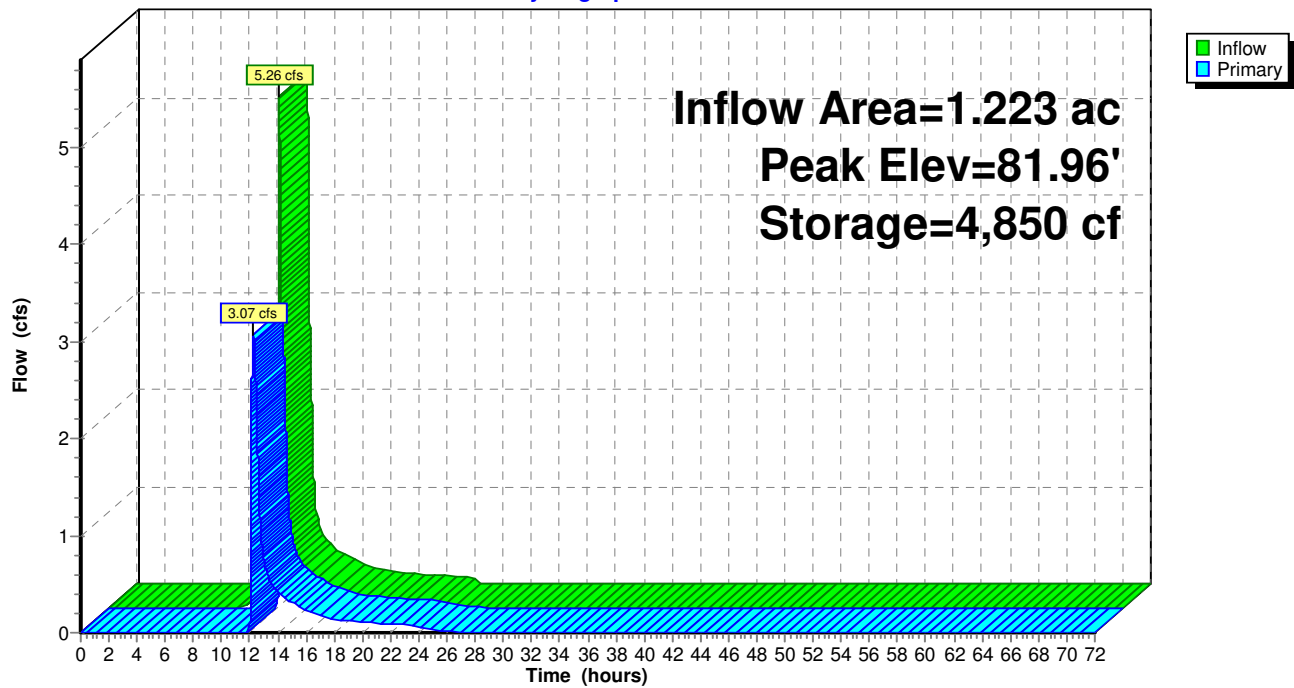
1=12" HDPE OUT (Passes 3.07 cfs of 5.07 cfs potential flow)

2=Orifice/Grate (Orifice Controls 3.07 cfs @ 3.91 fps)

3=12" HDPE (Passes 3.07 cfs of 4.07 cfs potential flow)

**Pond PP3: UGC-B (Stormtech SC-310)**

Hydrograph



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**Summary for Pond PP4: Water Quality Basin (North)**

Inflow Area = 2.168 ac, 74.76% Impervious, Inflow Depth = 4.90" for 100-yr event  
 Inflow = 11.87 cfs @ 12.11 hrs, Volume= 0.885 af  
 Outflow = 0.15 cfs @ 17.63 hrs, Volume= 0.616 af, Atten= 99%, Lag= 331.2 min  
 Primary = 0.15 cfs @ 17.63 hrs, Volume= 0.616 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.40' Surf.Area= 14,585 sf Storage= 18,791 cf

Peak Elev= 85.40' @ 17.63 hrs Surf.Area= 18,180 sf Storage= 51,569 cf (32,778 cf above start)

Plug-Flow detention time= 3,045.6 min calculated for 0.184 af (21% of inflow)

Center-of-Mass det. time= 1,573.4 min ( 2,325.5 - 752.1 )

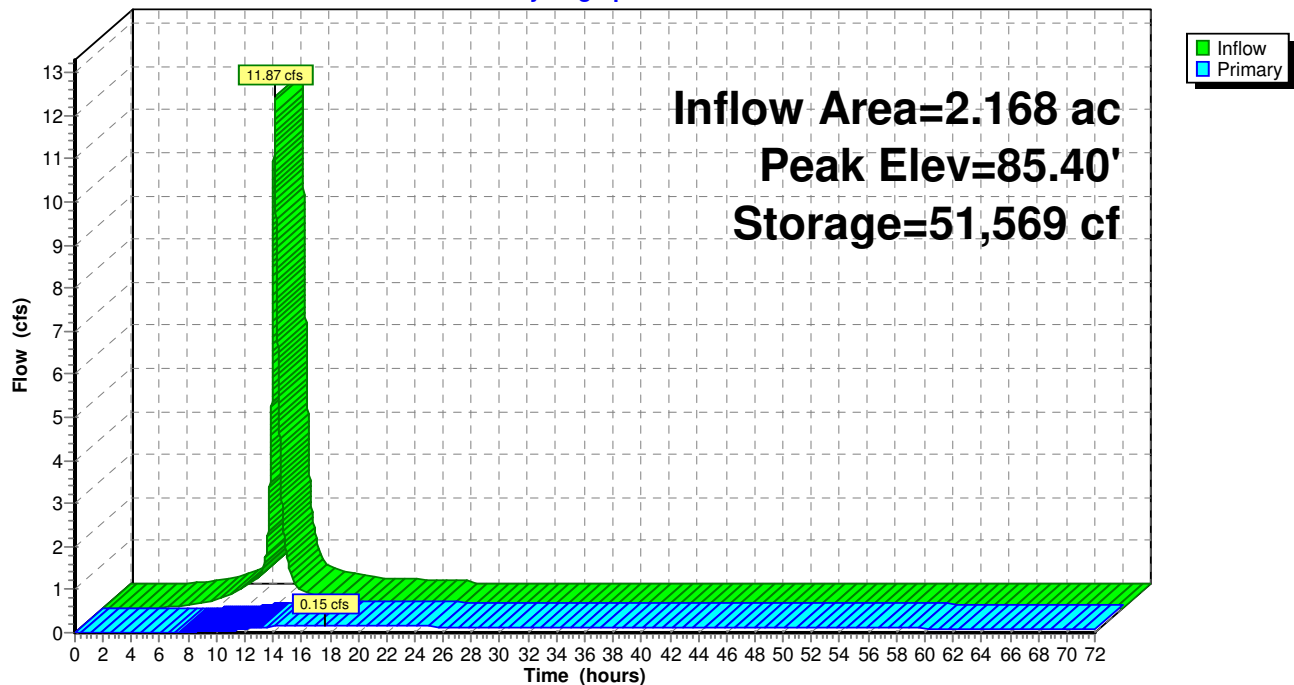
Volume	Invert	Avail.Storage	Storage Description	
#1	82.00'	62,769 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.00	12,313	0	0	12,313
83.00	13,894	13,096	13,096	13,945
84.00	15,654	14,765	27,861	15,757
85.00	17,454	16,546	44,407	17,614
86.00	19,286	18,362	62,769	19,508

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.40' / 83.31' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Device 1	83.40'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.15 cfs @ 17.63 hrs HW=85.40' TW=81.04' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.15 cfs of 4.63 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 6.67 fps)

### Pond PP4: Water Quality Basin (North)

Hydrograph



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**Summary for Pond PP5: UGC-E (Stormtech SC-310)**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 7.06" for 100-yr event  
 Inflow = 8.72 cfs @ 12.09 hrs, Volume= 0.678 af  
 Outflow = 6.22 cfs @ 12.16 hrs, Volume= 0.677 af, Atten= 29%, Lag= 4.4 min  
 Primary = 6.22 cfs @ 12.16 hrs, Volume= 0.677 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 87.40' @ 12.16 hrs Surf.Area= 4,780 sf Storage= 5,078 cf

Plug-Flow detention time= 43.4 min calculated for 0.677 af (100% of inflow)  
 Center-of-Mass det. time= 42.8 min ( 808.5 - 765.7 )

Volume	Invert	Avail.Storage	Storage Description
#1A	85.38'	1,929 cf	<b>4.83'W x 522.96'L x 2.33'H Field A</b> 5,898 cf Overall - 1,076 cf Embedded = 4,822 cf x 40.0% Voids
#2A	85.88'	1,076 cf	<b>ADS_StormTech SC-310 +Cap</b> x 73 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	85.38'	1,719 cf	<b>4.83'W x 466.00'L x 2.33'H Field B</b> 5,255 cf Overall - 958 cf Embedded = 4,297 cf x 40.0% Voids
#4B	85.88'	958 cf	<b>ADS_StormTech SC-310 +Cap</b> x 65 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,682 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.38'	<b>15.0" Round 15" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.28' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	85.95'	<b>10.0" Round ORIFICE A X 2.00</b> L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.95' / 85.92' S= 0.0060 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf
#3	Device 1	85.38'	<b>6.0" Round ORIFICE B</b> L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.31' S= 0.0020 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=6.22 cfs @ 12.16 hrs HW=87.40' TW=86.18' (Dynamic Tailwater)

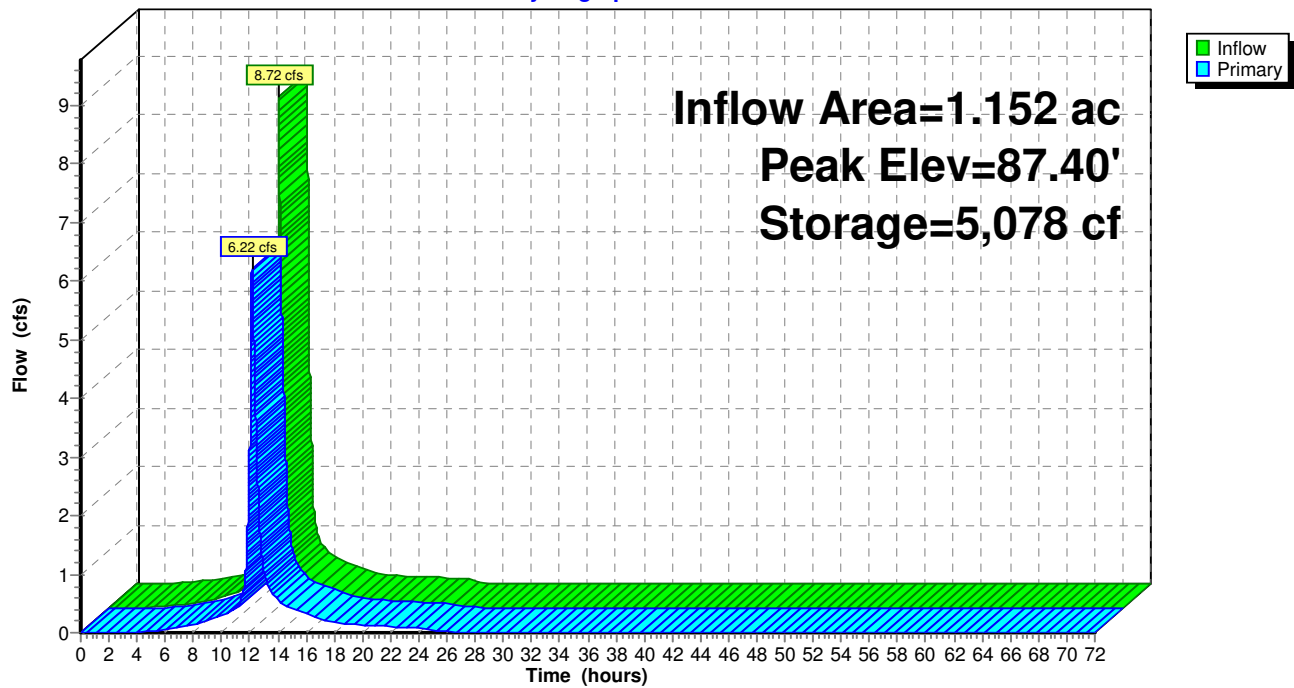
1=15" HDPE OUT (Passes 6.22 cfs of 6.53 cfs potential flow)

2=ORIFICE A (Inlet Controls 5.33 cfs @ 4.89 fps)

3=ORIFICE B (Outlet Controls 0.89 cfs @ 4.51 fps)

**Pond PP5: UGC-E (Stormtech SC-310)**

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**Summary for Pond PP6: Water Quality Basin (Kennedy Road)**

Inflow Area = 0.956 ac, 70.56% Impervious, Inflow Depth = 6.59" for 100-yr event  
 Inflow = 6.97 cfs @ 12.09 hrs, Volume= 0.525 af  
 Outflow = 0.66 cfs @ 12.91 hrs, Volume= 0.523 af, Atten= 90%, Lag= 49.2 min  
 Primary = 0.66 cfs @ 12.91 hrs, Volume= 0.523 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 80.00' Surf.Area= 5,601 sf Storage= 11,033 cf

Peak Elev= 81.75' @ 12.91 hrs Surf.Area= 7,502 sf Storage= 22,458 cf (11,425 cf above start)

Plug-Flow detention time= 549.8 min calculated for 0.270 af (51% of inflow)

Center-of-Mass det. time= 231.0 min ( 1,010.5 - 779.4 )

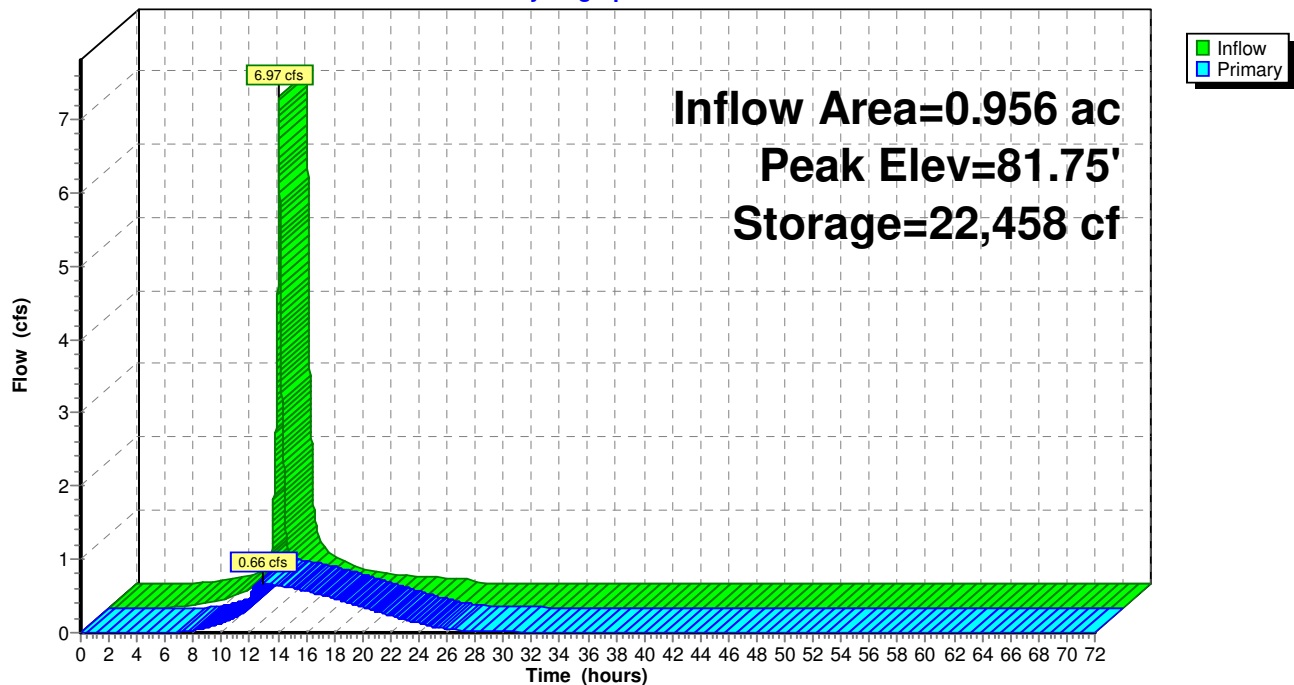
Volume	Invert	Avail.Storage	Storage Description	
#1	75.00'	42,367 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.00	239	0	0	239
76.00	786	486	486	791
77.00	1,382	1,070	1,556	1,399
78.00	2,063	1,711	3,267	2,095
78.80	2,824	1,947	5,214	2,869
79.00	4,585	734	5,948	4,630
80.00	5,601	5,085	11,033	5,677
81.00	6,669	6,127	17,160	6,781
82.00	7,793	7,224	24,384	7,944
83.00	8,973	8,376	32,760	9,168
84.00	10,257	9,608	42,367	10,498

Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 79.91' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	80.00'	<b>4.5" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.66 cfs @ 12.91 hrs HW=81.75' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.66 cfs of 3.99 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.66 cfs @ 6.02 fps)

**Pond PP6: Water Quality Basin (Kennedy Road)**

Hydrograph



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**Summary for Pond PP7: UGC-A (Stormtech SC-310)**

Inflow Area = 1.161 ac, 17.93% Impervious, Inflow Depth = 4.84" for 100-yr event  
 Inflow = 6.34 cfs @ 12.10 hrs, Volume= 0.468 af  
 Outflow = 0.23 cfs @ 15.85 hrs, Volume= 0.336 af, Atten= 96%, Lag= 224.9 min  
 Primary = 0.23 cfs @ 15.85 hrs, Volume= 0.336 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 82.02' @ 15.85 hrs Surf.Area= 12,415 sf Storage= 15,195 cf

Plug-Flow detention time= 1,339.7 min calculated for 0.336 af (72% of inflow)

Center-of-Mass det. time= 1,247.4 min ( 2,065.2 - 817.8 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	6,730 cf	<b>11.50'W x 814.88'L x 2.33'H Field A</b> 21,866 cf Overall - 5,042 cf Embedded = 16,824 cf x 40.0% Voids
#2A	80.23'	5,042 cf	<b>ADS_StormTech SC-310 +Cap</b> x 342 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 342 Chambers in 3 Rows
#3B	79.73'	2,322 cf	<b>4.83'W x 629.76'L x 2.33'H Field B</b> 7,102 cf Overall - 1,297 cf Embedded = 5,805 cf x 40.0% Voids
#4B	80.23'	1,297 cf	<b>ADS_StormTech SC-310 +Cap</b> x 88 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		15,391 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

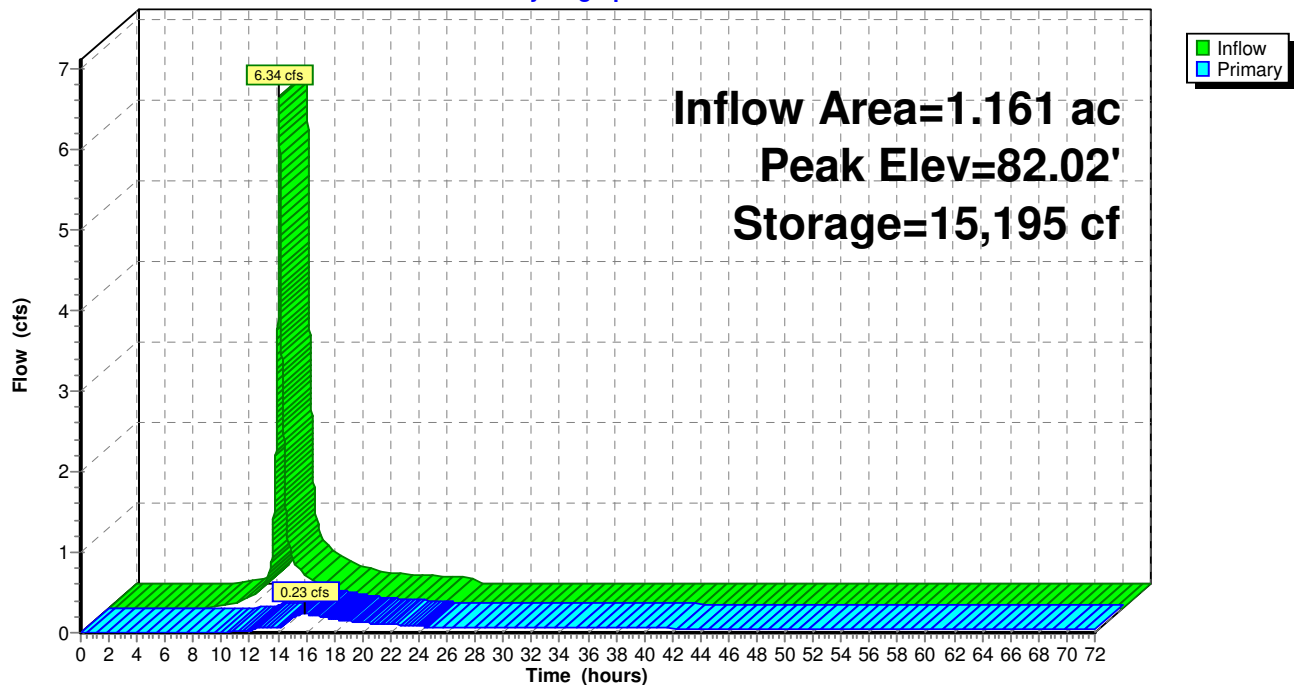
Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.35'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	79.73'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	81.86'	<b>9.0" W x 3.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.23 cfs @ 15.85 hrs HW=82.02' TW=0.00' (Dynamic Tailwater)

1=12" HDPE (Passes 0.23 cfs of 5.07 cfs potential flow)  
 2=Orifice/Grate (Orifice Controls 0.03 cfs @ 6.15 fps)  
 3=Orifice/Grate (Orifice Controls 0.04 cfs @ 7.23 fps)  
 4=Orifice/Grate (Orifice Controls 0.16 cfs @ 1.30 fps)

**Pond PP7: UGC-A (Stormtech SC-310)**

Hydrograph



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**Summary for Pond PP8: UGC-C (Stormtech SC-310)**

Inflow Area = 0.254 ac, 6.38% Impervious, Inflow Depth = 3.59" for 100-yr event  
 Inflow = 1.03 cfs @ 12.10 hrs, Volume= 0.076 af  
 Outflow = 0.07 cfs @ 14.45 hrs, Volume= 0.033 af, Atten= 94%, Lag= 140.6 min  
 Primary = 0.07 cfs @ 14.45 hrs, Volume= 0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 80.92' @ 14.45 hrs Surf.Area= 3,231 sf Storage= 2,133 cf

Plug-Flow detention time= 378.6 min calculated for 0.033 af (43% of inflow)

Center-of-Mass det. time= 253.7 min ( 1,094.9 - 841.2 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,299 cf	<b>4.83'W x 352.08'L x 2.33'H Field A</b> 3,971 cf Overall - 722 cf Embedded = 3,248 cf x 40.0% Voids
#2A	80.23'	722 cf	<b>ADS_StormTech SC-310 +Cap</b> x 49 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,168 cf	<b>4.83'W x 316.48'L x 2.33'H Field B</b> 3,569 cf Overall - 649 cf Embedded = 2,921 cf x 40.0% Voids
#4B	80.23'	649 cf	<b>ADS_StormTech SC-310 +Cap</b> x 44 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		3,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

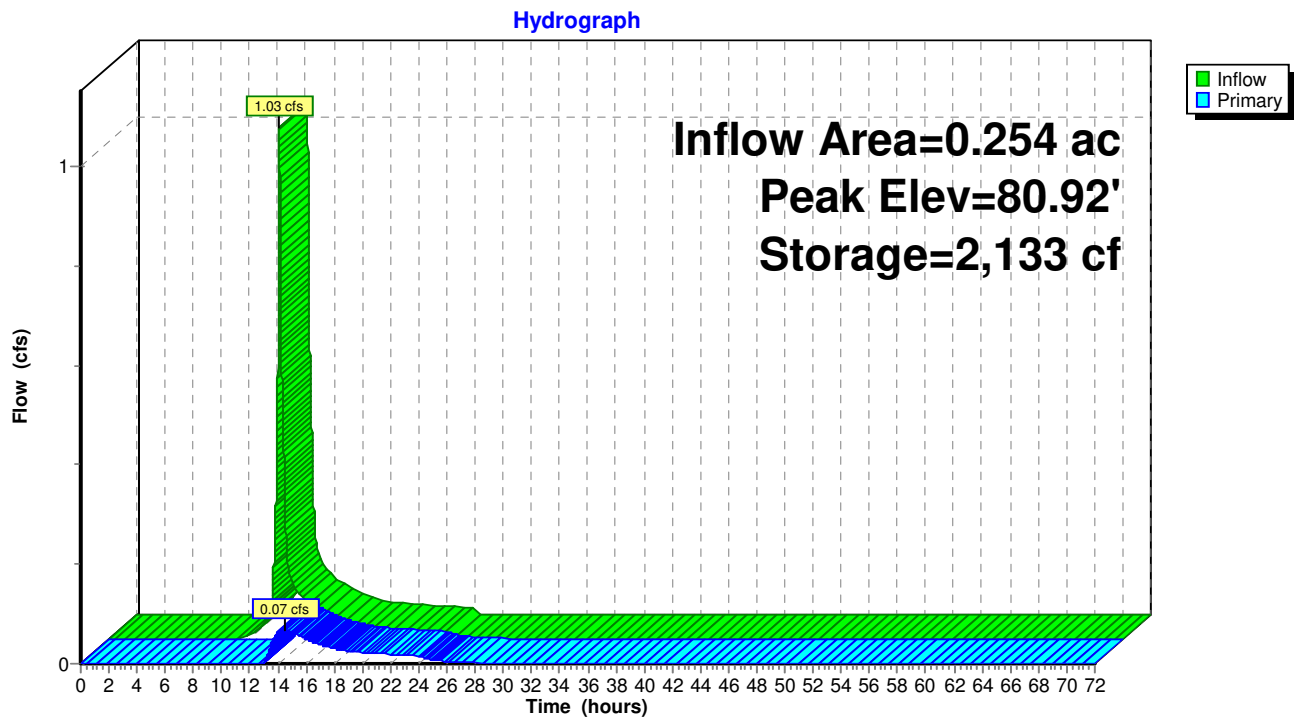
**Primary OutFlow** Max=0.07 cfs @ 14.45 hrs HW=80.92' TW=0.00' (Dynamic Tailwater)

1=12" HDPE OUT (Passes 0.07 cfs of 2.71 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.07 cfs @ 1.20 fps)

3=12" HDPE (Passes 0.07 cfs of 0.75 cfs potential flow)

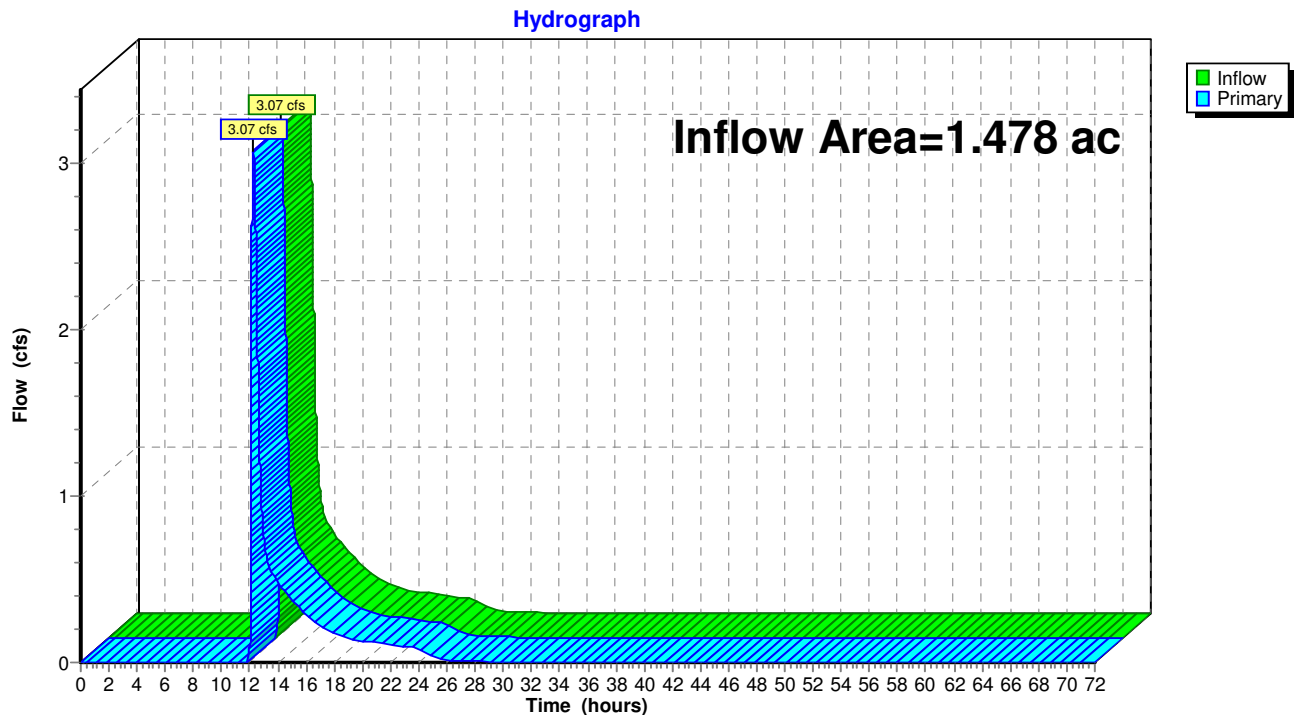
**Pond PP8: UGC-C (Stormtech SC-310)**



**Summary for Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

Inflow Area = 1.478 ac, 8.48% Impervious, Inflow Depth = 2.96" for 100-yr event  
Inflow = 3.07 cfs @ 12.24 hrs, Volume= 0.365 af  
Primary = 3.07 cfs @ 12.24 hrs, Volume= 0.365 af, Atten= 0%, Lag= 0.0 min

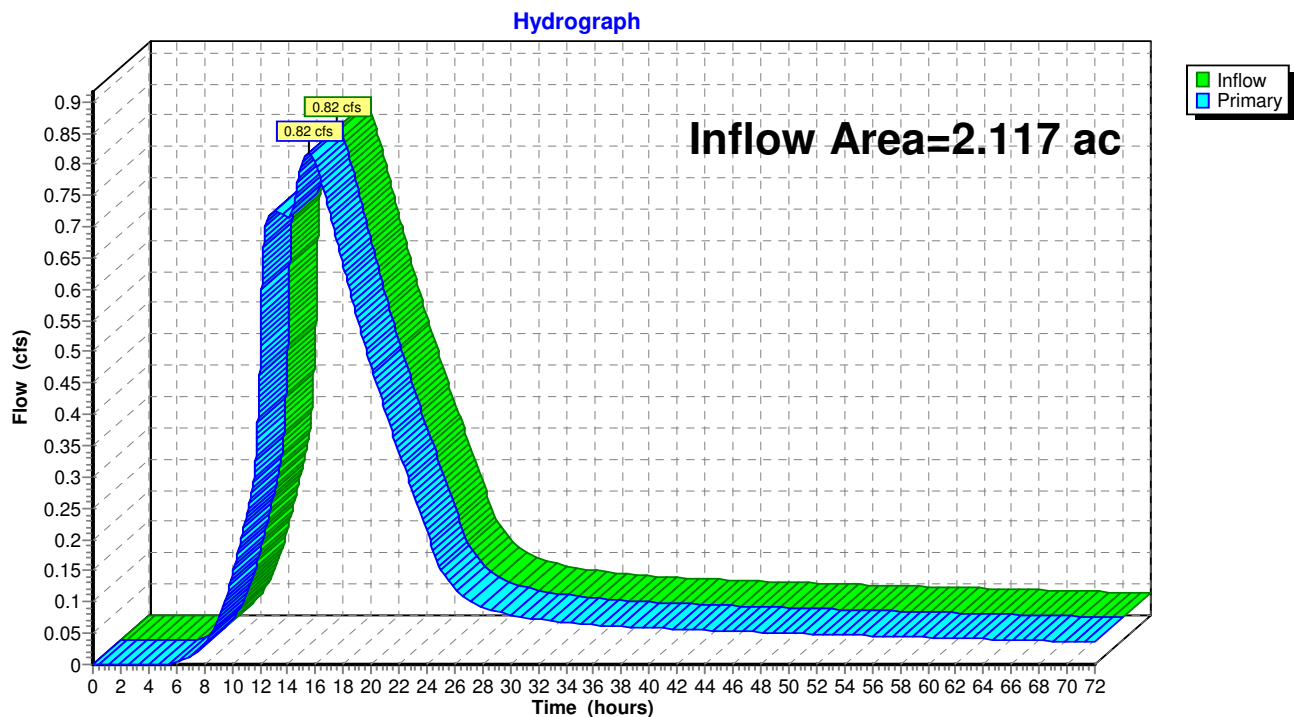
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP3\*: (DP3\*) Proposed Flow to Sullivan Ave**

**Summary for Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

Inflow Area = 2.117 ac, 41.71% Impervious, Inflow Depth > 4.87" for 100-yr event  
Inflow = 0.82 cfs @ 15.50 hrs, Volume= 0.859 af  
Primary = 0.82 cfs @ 15.50 hrs, Volume= 0.859 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

**Link DP4\*: (DP4\*) Proposed Flow to Kennedy Road Drainage System**

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Type III 24-hr 100-yr Rainfall=7.90"

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**Summary for Pond DMH: Splitter Structure**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 7.06" for 100-yr event  
 Inflow = 6.22 cfs @ 12.16 hrs, Volume= 0.677 af  
 Outflow = 6.22 cfs @ 12.16 hrs, Volume= 0.677 af, Atten= 0%, Lag= 0.0 min  
 Primary = 5.11 cfs @ 12.16 hrs, Volume= 0.327 af  
 Secondary = 1.11 cfs @ 12.16 hrs, Volume= 0.350 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 86.18' @ 12.16 hrs

Flood Elev= 85.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	84.55'	<b>15.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	84.55'	<b>6.0" Round Culvert</b> L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 84.55' / 84.50' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.20 sf

**Primary OutFlow** Max=5.11 cfs @ 12.16 hrs HW=86.18' TW=84.54' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 5.11 cfs @ 4.19 fps)**Secondary OutFlow** Max=1.11 cfs @ 12.16 hrs HW=86.18' TW=81.68' (Dynamic Tailwater)↑**2=Culvert** (Inlet Controls 1.11 cfs @ 5.65 fps)**Summary for Pond EP1\*: (DP1\*) Proposed Condition - Rail Road Pond**

Inflow Area = 18.348 ac, 62.57% Impervious, Inflow Depth > 5.95" for 100-yr event  
 Inflow = 20.75 cfs @ 12.58 hrs, Volume= 9.096 af  
 Outflow = 12.38 cfs @ 13.30 hrs, Volume= 9.095 af, Atten= 40%, Lag= 43.2 min  
 Primary = 12.38 cfs @ 13.30 hrs, Volume= 9.095 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 83.17' @ 13.30 hrs Surf.Area= 45,313 sf Storage= 24,454 cf

Plug-Flow detention time= 9.2 min calculated for 9.095 af (100% of inflow)

Center-of-Mass det. time= 8.8 min ( 1,454.2 - 1,445.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	79.70'	94,801 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.70	10	0	0
80.00	382	59	59
81.00	1,156	769	828
82.00	2,173	1,665	2,492
83.00	29,061	15,617	18,109
84.00	124,323	76,692	94,801

Device	Routing	Invert	Outlet Devices
#1	Primary	79.70'	<b>18.0" Round Culvert</b> L= 43.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 79.60' / 79.70' S= -0.0023 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

**Primary OutFlow** Max=12.38 cfs @ 13.30 hrs HW=83.17' (Free Discharge)↑**1=Culvert** (Inlet Controls 12.38 cfs @ 7.01 fps)**Summary for Pond PP1: UGC-D (Stormtech SC-310)**

Inflow Area = 10.231 ac, 93.98% Impervious, Inflow Depth > 7.28" for 100-yr event  
 Inflow = 44.70 cfs @ 12.09 hrs, Volume= 6.210 af  
 Outflow = 6.89 cfs @ 12.59 hrs, Volume= 6.031 af, Atten= 85%, Lag= 30.5 min  
 Primary = 6.89 cfs @ 12.59 hrs, Volume= 6.031 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 84.96' @ 12.59 hrs Surf.Area= 78,048 sf Storage= 96,103 cf

Plug-Flow detention time= 633.2 min calculated for 6.031 af (97% of inflow)  
 Center-of-Mass det. time= 566.4 min ( 1,589.5 - 1,023.1 )

Volume	Invert	Avail.Storage	Storage Description
#1A	82.78'	48,033 cf	<b>108.17'W x 644.00'L x 2.33'H Field A</b> 162,538 cf Overall - 42,457 cf Embedded = 120,082 cf x 40.0% Voids
#2A	83.28'	42,457 cf	<b>ADS StormTech RC-310 +Cap</b> x 2880 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 2880 Chambers in 32 Rows
#3B	82.78'	6,025 cf	<b>11.50'W x 729.44'L x 2.33'H Field B</b> 19,573 cf Overall - 4,511 cf Embedded = 15,062 cf x 40.0% Voids
#4B	83.28'	4,511 cf	<b>ADS StormTech SC-310 +Cap</b> x 306 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 306 Chambers in 3 Rows
101,025 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

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Device	Routing	Invert	Outlet Devices
#1	Primary	82.78'	<b>24.0" Round 24" RCP</b> L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.78' / 82.70' S= 0.0057 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	82.78'	<b>9.0" W x 2.0" H Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	83.95'	<b>24.0" W x 10.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=6.89 cfs @ 12.59 hrs HW=84.96' TW=82.78' (Dynamic Tailwater)↑ **1=24" RCP** (Passes 6.89 cfs of 13.69 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.87 cfs @ 6.96 fps)↑ **3=Orifice/Grate** (Orifice Controls 6.02 cfs @ 3.61 fps)**Summary for Pond PP2: Water Quality Basin (WEST)**

Inflow Area = 4.680 ac, 86.83% Impervious, Inflow Depth = 7.06" for 100-yr event  
 Inflow = 35.42 cfs @ 12.09 hrs, Volume= 2.755 af  
 Outflow = 2.04 cfs @ 15.81 hrs, Volume= 2.667 af, Atten= 94%, Lag= 223.4 min  
 Primary = 2.04 cfs @ 15.81 hrs, Volume= 2.667 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 83.50' Surf.Area= 39,354 sf Storage= 18,954 cf

Peak Elev= 85.24' @ 14.02 hrs Surf.Area= 50,294 sf Storage= 96,918 cf (77,964 cf above start)

Plug-Flow detention time= 831.4 min calculated for 2.232 af (81% of inflow)

Center-of-Mass det. time= 631.7 min ( 1,397.4 - 765.7 )

Volume	Invert	Avail.Storage	Storage Description	
#1	83.00'	136,855 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
83.00	36,482	0	0	36,482
84.00	42,335	39,372	39,372	42,377
85.00	48,730	45,495	84,867	48,817
86.00	55,314	51,987	136,855	55,450

Device	Routing	Invert	Outlet Devices
#1	Primary	83.50'	<b>10.0" Round Culvert</b> L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.50' / 83.38' S= 0.0063 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf

**Primary OutFlow** Max=2.04 cfs @ 15.81 hrs HW=85.18' TW=84.57' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 2.04 cfs @ 3.73 fps)

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**Summary for Pond PP3: UGC-B (Stormtech SC-310)**

Inflow Area = 1.223 ac, 8.92% Impervious, Inflow Depth = 3.81" for 100-yr event  
 Inflow = 5.26 cfs @ 12.10 hrs, Volume= 0.389 af  
 Outflow = 3.07 cfs @ 12.24 hrs, Volume= 0.332 af, Atten= 42%, Lag= 8.1 min  
 Primary = 3.07 cfs @ 12.24 hrs, Volume= 0.332 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 81.96' @ 12.24 hrs Surf.Area= 4,229 sf Storage= 4,850 cf

Plug-Flow detention time= 125.9 min calculated for 0.332 af (85% of inflow)  
 Center-of-Mass det. time= 61.6 min ( 898.5 - 836.9 )

Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,745 cf	<b>4.83'W x 473.12'L x 2.33'H Field A</b> 5,336 cf Overall - 973 cf Embedded = 4,363 cf x 40.0% Voids
#2A	80.23'	973 cf	<b>ADS StormTech SC-310 +Cap</b> x 66 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,483 cf	<b>4.83'W x 401.92'L x 2.33'H Field B</b> 4,533 cf Overall - 826 cf Embedded = 3,707 cf x 40.0% Voids
#4B	80.23'	826 cf	<b>ADS StormTech SC-310 +Cap</b> x 56 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,027 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.66'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.66' / 79.27' S= 0.0195 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=3.07 cfs @ 12.24 hrs HW=81.96' TW=0.00' (Dynamic Tailwater)

1=12" HDPE OUT (Passes 3.07 cfs of 5.07 cfs potential flow)

2=Orifice/Grate (Orifice Controls 3.07 cfs @ 3.91 fps)

3=12" HDPE (Passes 3.07 cfs of 4.07 cfs potential flow)

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**Summary for Pond PP4: Water Quality Basin (North)**

Inflow Area = 2.168 ac, 74.76% Impervious, Inflow Depth = 4.90" for 100-yr event  
 Inflow = 11.87 cfs @ 12.11 hrs, Volume= 0.885 af  
 Outflow = 0.15 cfs @ 17.63 hrs, Volume= 0.616 af, Atten= 99%, Lag= 331.2 min  
 Primary = 0.15 cfs @ 17.63 hrs, Volume= 0.616 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Starting Elev= 83.40' Surf.Area= 14,585 sf Storage= 18,791 cf  
 Peak Elev= 85.40' @ 17.63 hrs Surf.Area= 18,180 sf Storage= 51,569 cf (32,778 cf above start)

Plug-Flow detention time= 3,045.6 min calculated for 0.184 af (21% of inflow)  
 Center-of-Mass det. time= 1,573.4 min ( 2,325.5 - 752.1 )

Volume	Invert	Avail.Storage	Storage Description	
#1	82.00'	62,769 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
82.00	12,313	0	0	12,313
83.00	13,894	13,096	13,096	13,945
84.00	15,654	14,765	27,861	15,757
85.00	17,454	16,546	44,407	17,614
86.00	19,286	18,362	62,769	19,508

Device	Routing	Invert	Outlet Devices
#1	Primary	83.40'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 83.40' / 83.31' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2	Device 1	83.40'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.15 cfs @ 17.63 hrs HW=85.40' TW=81.04' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.15 cfs of 4.63 cfs potential flow)  
 ↑ **2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 6.67 fps)

**Summary for Pond PP5: UGC-E (Stormtech SC-310)**

Inflow Area = 1.152 ac, 84.49% Impervious, Inflow Depth = 7.06" for 100-yr event  
 Inflow = 8.72 cfs @ 12.09 hrs, Volume= 0.678 af  
 Outflow = 6.22 cfs @ 12.16 hrs, Volume= 0.677 af, Atten= 29%, Lag= 4.4 min  
 Primary = 6.22 cfs @ 12.16 hrs, Volume= 0.677 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 87.40' @ 12.16 hrs Surf.Area= 4,780 sf Storage= 5,078 cf

Plug-Flow detention time= 43.4 min calculated for 0.677 af (100% of inflow)  
 Center-of-Mass det. time= 42.8 min ( 808.5 - 765.7 )

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Volume	Invert	Avail.Storage	Storage Description
#1A	85.38'	1,929 cf	<b>4.83'W x 522.96'L x 2.33'H Field A</b> 5,898 cf Overall - 1,076 cf Embedded = 4,822 cf x 40.0% Voids
#2A	85.88'	1,076 cf	<b>ADS_StormTech SC-310 +Cap</b> x 73 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	85.38'	1,719 cf	<b>4.83'W x 466.00'L x 2.33'H Field B</b> 5,255 cf Overall - 958 cf Embedded = 4,297 cf x 40.0% Voids
#4B	85.88'	958 cf	<b>ADS_StormTech SC-310 +Cap</b> x 65 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		5,682 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.38'	<b>15.0" Round 15" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.28' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Device 1	85.95'	<b>10.0" Round ORIFICE A X 2.00</b> L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.95' / 85.92' S= 0.0060 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.55 sf
#3	Device 1	85.38'	<b>6.0" Round ORIFICE B</b> L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 85.38' / 85.31' S= 0.0020 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.20 sf

**Primary OutFlow** Max=6.22 cfs @ 12.16 hrs HW=87.40' TW=86.18' (Dynamic Tailwater)

1=15" HDPE OUT (Passes 6.22 cfs of 6.53 cfs potential flow)

2=ORIFICE A (Inlet Controls 5.33 cfs @ 4.89 fps)

3=ORIFICE B (Outlet Controls 0.89 cfs @ 4.51 fps)

**Summary for Pond PP6: Water Quality Basin (Kennedy Road)**

Inflow Area = 0.956 ac, 70.56% Impervious, Inflow Depth = 6.59" for 100-yr event  
 Inflow = 6.97 cfs @ 12.09 hrs, Volume= 0.525 af  
 Outflow = 0.66 cfs @ 12.91 hrs, Volume= 0.523 af, Atten= 90%, Lag= 49.2 min  
 Primary = 0.66 cfs @ 12.91 hrs, Volume= 0.523 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Starting Elev= 80.00' Surf.Area= 5,601 sf Storage= 11,033 cf

Peak Elev= 81.75' @ 12.91 hrs Surf.Area= 7,502 sf Storage= 22,458 cf (11,425 cf above start)

Plug-Flow detention time= 549.8 min calculated for 0.270 af (51% of inflow)

Center-of-Mass det. time= 231.0 min ( 1,010.5 - 779.4 )

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Volume	Invert	Avail.Storage	Storage Description
#1	75.00'	42,367 cf	<b>Custom Stage Data (Conic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.00	239	0	0	239
76.00	786	486	486	791
77.00	1,382	1,070	1,556	1,399
78.00	2,063	1,711	3,267	2,095
78.80	2,824	1,947	5,214	2,869
79.00	4,585	734	5,948	4,630
80.00	5,601	5,085	11,033	5,677
81.00	6,669	6,127	17,160	6,781
82.00	7,793	7,224	24,384	7,944
83.00	8,973	8,376	32,760	9,168
84.00	10,257	9,608	42,367	10,498

Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	<b>12.0" Round Culvert</b> L= 19.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 79.91' S= 0.0047 ' S= 0.0047 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	80.00'	<b>4.5" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.66 cfs @ 12.91 hrs HW=81.75' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 0.66 cfs of 3.99 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.66 cfs @ 6.02 fps)

**Summary for Pond PP7: UGC-A (Stormtech SC-310)**

Inflow Area = 1.161 ac, 17.93% Impervious, Inflow Depth = 4.84" for 100-yr event  
 Inflow = 6.34 cfs @ 12.10 hrs, Volume= 0.468 af  
 Outflow = 0.23 cfs @ 15.85 hrs, Volume= 0.336 af, Atten= 96%, Lag= 224.9 min  
 Primary = 0.23 cfs @ 15.85 hrs, Volume= 0.336 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs

Peak Elev= 82.02' @ 15.85 hrs Surf.Area= 12,415 sf Storage= 15,195 cf

Plug-Flow detention time= 1,339.7 min calculated for 0.336 af (72% of inflow)

Center-of-Mass det. time= 1,247.4 min ( 2,065.2 - 817.8 )

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Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	6,730 cf	<b>11.50'W x 814.88'L x 2.33'H Field A</b> 21,866 cf Overall - 5,042 cf Embedded = 16,824 cf x 40.0% Voids
#2A	80.23'	5,042 cf	<b>ADS_StormTech SC-310 +Cap</b> x 342 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 342 Chambers in 3 Rows
#3B	79.73'	2,322 cf	<b>4.83'W x 629.76'L x 2.33'H Field B</b> 7,102 cf Overall - 1,297 cf Embedded = 5,805 cf x 40.0% Voids
#4B	80.23'	1,297 cf	<b>ADS_StormTech SC-310 +Cap</b> x 88 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		15,391 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.35'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 1	79.73'	<b>1.0" Vert. Orifice/Grate</b> C= 0.600
#4	Device 1	81.86'	<b>9.0" W x 3.0" H Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.23 cfs @ 15.85 hrs HW=82.02' TW=0.00' (Dynamic Tailwater)

1=12" HDPE (Passes 0.23 cfs of 5.07 cfs potential flow)  
 2=Orifice/Grate (Orifice Controls 0.03 cfs @ 6.15 fps)  
 3=Orifice/Grate (Orifice Controls 0.04 cfs @ 7.23 fps)  
 4=Orifice/Grate (Orifice Controls 0.16 cfs @ 1.30 fps)

**Summary for Pond PP8: UGC-C (Stormtech SC-310)**

Inflow Area = 0.254 ac, 6.38% Impervious, Inflow Depth = 3.59" for 100-yr event  
 Inflow = 1.03 cfs @ 12.10 hrs, Volume= 0.076 af  
 Outflow = 0.07 cfs @ 14.45 hrs, Volume= 0.033 af, Atten= 94%, Lag= 140.6 min  
 Primary = 0.07 cfs @ 14.45 hrs, Volume= 0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.002 hrs  
 Peak Elev= 80.92' @ 14.45 hrs Surf.Area= 3,231 sf Storage= 2,133 cf

Plug-Flow detention time= 378.6 min calculated for 0.033 af (43% of inflow)  
 Center-of-Mass det. time= 253.7 min ( 1,094.9 - 841.2 )

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Volume	Invert	Avail.Storage	Storage Description
#1A	79.73'	1,299 cf	<b>4.83'W x 352.08'L x 2.33'H Field A</b> 3,971 cf Overall - 722 cf Embedded = 3,248 cf x 40.0% Voids
#2A	80.23'	722 cf	<b>ADS_StormTech SC-310 +Cap</b> x 49 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3B	79.73'	1,168 cf	<b>4.83'W x 316.48'L x 2.33'H Field B</b> 3,569 cf Overall - 649 cf Embedded = 2,921 cf x 40.0% Voids
#4B	80.23'	649 cf	<b>ADS_StormTech SC-310 +Cap</b> x 44 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
		3,839 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	79.73'	<b>12.0" Round 12" HDPE OUT</b> L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.73' / 79.63' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	80.80'	<b>12.0" Vert. Orifice/Grate</b> C= 0.600
#3	Device 2	80.30'	<b>12.0" Round 12" HDPE</b> L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.20' S= 0.0083 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.07 cfs @ 14.45 hrs HW=80.92' TW=0.00' (Dynamic Tailwater)↑ **1=12" HDPE OUT** (Passes 0.07 cfs of 2.71 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.20 fps)↑ **3=12" HDPE** (Passes 0.07 cfs of 0.75 cfs potential flow)

**APPENDIX C**  
**NRCS Soil Map & Data**



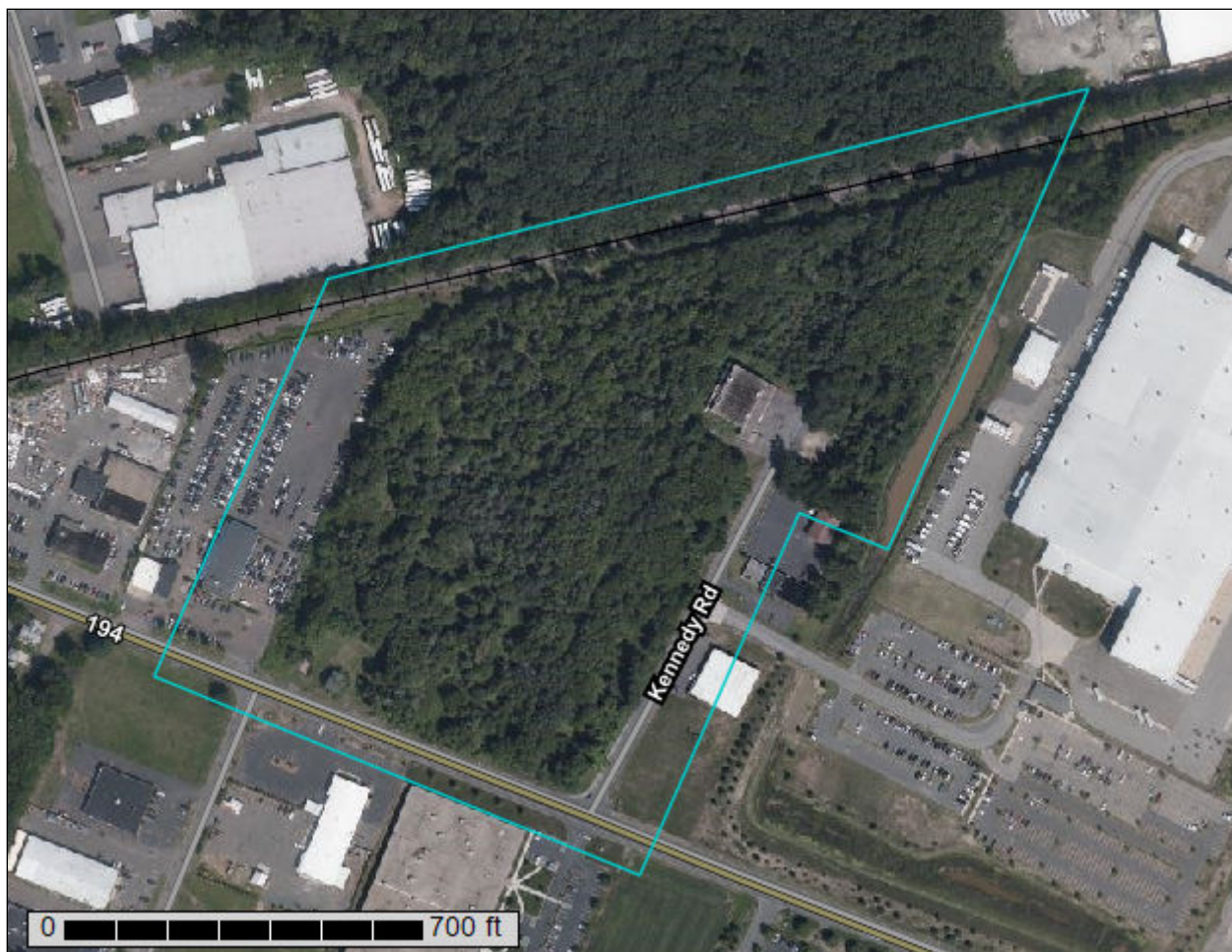
United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for State of Connecticut



March 18, 2022

# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map




## MAP LEGEND


### Area of Interest (AOI)

 Area of Interest (AOI)


### Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

### Special Point Features

 Blowout

 Borrow Pit


 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip

 Sodic Spot


 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

### Water Features

 Streams and Canals


### Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut  
Survey Area Data: Version 21, Sep 7, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 24, 2019—Oct 24, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13	Walpole sandy loam, 0 to 3 percent slopes	10.6	32.3%
23A	Sudbury sandy loam, 0 to 5 percent slopes	3.7	11.4%
36A	Windsor loamy sand, 0 to 3 percent slopes	1.9	5.8%
304	Udorthents, loamy, very steep	0.1	0.2%
306	Udorthents-Urban land complex	5.7	17.2%
307	Urban land	1.4	4.2%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	9.5	28.8%
<b>Totals for Area of Interest</b>		<b>32.9</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## State of Connecticut

### 13—Walpole sandy loam, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2svkl

*Elevation:* 0 to 1,020 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 250 days

*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*Walpole and similar soils:* 80 percent

*Minor components:* 20 percent

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

#### Description of Walpole

##### Setting

*Landform:* Depressions, outwash plains, outwash terraces, depressions, deltas

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread, dip, talf

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Sandy glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

##### Typical profile

*Oe - 0 to 1 inches:* mucky peat

*A - 1 to 7 inches:* sandy loam

*Bg - 7 to 21 inches:* sandy loam

*BC - 21 to 25 inches:* gravelly sandy loam

*C - 25 to 65 inches:* very gravelly sand

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Poorly drained

*Runoff class:* Very high

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high  
(0.14 to 14.17 in/hr)

*Depth to water table:* About 0 to 4 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Moderate (about 6.4 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4w

*Hydrologic Soil Group:* B/D

*Ecological site:* F144AY028MA - Wet Outwash

*Hydric soil rating:* Yes

## Minor Components

### Sudbury

*Percent of map unit:* 10 percent  
*Landform:* Outwash plains, deltas, terraces  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Tread, dip  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

### Scarboro

*Percent of map unit:* 10 percent  
*Landform:* Outwash plains, deltas, outwash terraces  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Tread, dip  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

## 23A—Sudbury sandy loam, 0 to 5 percent slopes

### Map Unit Setting

*National map unit symbol:* 9lkv  
*Elevation:* 0 to 1,200 feet  
*Mean annual precipitation:* 43 to 54 inches  
*Mean annual air temperature:* 45 to 55 degrees F  
*Frost-free period:* 140 to 185 days  
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Sudbury and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Sudbury

#### Setting

*Landform:* Terraces, outwash plains  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Parent material:* Sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

#### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material  
*A - 1 to 5 inches:* sandy loam  
*Bw1 - 5 to 17 inches:* gravelly sandy loam  
*Bw2 - 17 to 25 inches:* sandy loam  
*2C - 25 to 60 inches:* stratified gravel to sand

**Properties and qualities**

*Slope:* 0 to 5 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)  
*Depth to water table:* About 18 to 36 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 4.2 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2w  
*Hydrologic Soil Group:* B  
*Ecological site:* F144AY027MA - Moist Sandy Outwash  
*Hydric soil rating:* No

**Minor Components**

**Agawam**

*Percent of map unit:* 5 percent  
*Landform:* Terraces, outwash plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Merrimac**

*Percent of map unit:* 5 percent  
*Landform:* Terraces, outwash plains, kames  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Ninigret**

*Percent of map unit:* 5 percent  
*Landform:* Terraces, outwash plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave  
*Hydric soil rating:* No

**Tisbury**

*Percent of map unit:* 3 percent  
*Landform:* Terraces, outwash plains  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Walpole**

*Percent of map unit:* 2 percent  
*Landform:* Drainageways on terraces, depressions on terraces  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

### 36A—Windsor loamy sand, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2svkg

*Elevation:* 0 to 990 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*Windsor, loamy sand, and similar soils:* 85 percent

*Minor components:* 15 percent

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

#### Description of Windsor, Loamy Sand

##### Setting

*Landform:* Outwash plains, outwash terraces, deltas, dunes

*Landform position (three-dimensional):* Tread, riser

*Down-slope shape:* Linear, convex

*Across-slope shape:* Linear, convex

*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

##### Typical profile

*O - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 3 inches:* loamy sand

*Bw - 3 to 25 inches:* loamy sand

*C - 25 to 65 inches:* sand

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Excessively drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

*Ecological site:* F144AY022MA - Dry Outwash

*Hydric soil rating:* No

**Minor Components**

**Deerfield, loamy sand**

*Percent of map unit:* 10 percent  
*Landform:* Deltas, terraces, outwash plains  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Tread, talf  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Hinckley, loamy sand**

*Percent of map unit:* 5 percent  
*Landform:* Deltas, kames, eskers, outwash plains  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, rise  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex, linear  
*Hydric soil rating:* No

**304—Udorthents, loamy, very steep**

**Map Unit Setting**

*National map unit symbol:* 9lmd  
*Elevation:* 0 to 1,200 feet  
*Mean annual precipitation:* 37 to 52 inches  
*Mean annual air temperature:* 45 to 55 degrees F  
*Frost-free period:* 140 to 185 days  
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Udorthents and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Udorthents**

**Setting**

*Landform:* Escarpments  
*Landform position (three-dimensional):* Riser  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Parent material:* Glaciolacustrine deposits

**Typical profile**

*A - 0 to 5 inches:* loam  
*C1 - 5 to 21 inches:* gravelly loam  
*C2 - 21 to 80 inches:* very gravelly sandy loam

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### Properties and qualities

*Slope:* 25 to 70 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to high (0.00 to 1.98 in/hr)  
*Depth to water table:* About 54 to 72 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Moderate (about 6.8 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7e  
*Hydrologic Soil Group:* B  
*Hydric soil rating:* No

### Minor Components

#### Shaker

*Percent of map unit:* 3 percent  
*Landform:* Terraces, drainageways, depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

#### Scitico

*Percent of map unit:* 3 percent  
*Landform:* Terraces, drainageways, depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

#### Maybid

*Percent of map unit:* 2 percent  
*Landform:* Terraces, drainageways, depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

#### Raynham

*Percent of map unit:* 1 percent  
*Landform:* Drainageways, depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

#### Unnamed, frequently flooded

*Percent of map unit:* 1 percent  
*Landform:* Drainageways  
*Hydric soil rating:* Yes

### **306—Udorthents-Urban land complex**

#### **Map Unit Setting**

*National map unit symbol:* 9lmg  
*Elevation:* 0 to 2,000 feet  
*Mean annual precipitation:* 43 to 56 inches  
*Mean annual air temperature:* 45 to 55 degrees F  
*Frost-free period:* 120 to 185 days  
*Farmland classification:* Not prime farmland

#### **Map Unit Composition**

*Udorthents and similar soils:* 50 percent  
*Urban land:* 35 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Udorthents**

##### **Setting**

*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Parent material:* Drift

##### **Typical profile**

*A - 0 to 5 inches:* loam  
*C1 - 5 to 21 inches:* gravelly loam  
*C2 - 21 to 80 inches:* very gravelly sandy loam

##### **Properties and qualities**

*Slope:* 0 to 25 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to high (0.00 to 1.98 in/hr)  
*Depth to water table:* About 54 to 72 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Moderate (about 6.8 inches)

##### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3e  
*Hydrologic Soil Group:* B  
*Hydric soil rating:* No

#### **Description of Urban Land**

##### **Typical profile**

*H - 0 to 6 inches:* material

**Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8

*Hydrologic Soil Group:* D

*Hydric soil rating:* Unranked

**Minor Components**

**Unnamed, undisturbed soils**

*Percent of map unit:* 8 percent

*Hydric soil rating:* No

**Udorthents, wet substratum**

*Percent of map unit:* 5 percent

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Hydric soil rating:* No

**Rock outcrop**

*Percent of map unit:* 2 percent

*Hydric soil rating:* No

**307—Urban land**

**Map Unit Setting**

*National map unit symbol:* 9lmh

*Elevation:* 0 to 2,000 feet

*Mean annual precipitation:* 43 to 56 inches

*Mean annual air temperature:* 45 to 55 degrees F

*Frost-free period:* 120 to 185 days

*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Urban land:* 80 percent

*Minor components:* 20 percent

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

**Description of Urban Land**

**Typical profile**

*H - 0 to 6 inches:* material

**Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8

*Hydrologic Soil Group:* D

*Hydric soil rating:* Unranked

**Minor Components**

**Udorthents, wet substratum**

*Percent of map unit:* 10 percent

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Hydric soil rating:* No

**Unnamed, undisturbed soils**

*Percent of map unit:* 10 percent

*Hydric soil rating:* No

**701A—Ninigret fine sandy loam, 0 to 3 percent slopes**

**Map Unit Setting**

*National map unit symbol:* 2y07d

*Elevation:* 0 to 1,260 feet

*Mean annual precipitation:* 43 to 54 inches

*Mean annual air temperature:* 45 to 55 degrees F

*Frost-free period:* 140 to 185 days

*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

*Ninigret and similar soils:* 85 percent

*Minor components:* 15 percent

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

**Description of Ninigret**

**Setting**

*Landform:* Kame terraces, outwash plains, moraines, kames, outwash terraces

*Landform position (two-dimensional):* Footslope, toeslope

*Landform position (three-dimensional):* Base slope, tread

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex, concave

*Parent material:* Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

**Typical profile**

*Ap - 0 to 8 inches:* fine sandy loam

*Bw1 - 8 to 16 inches:* fine sandy loam

*Bw2 - 16 to 26 inches:* fine sandy loam

*2C - 26 to 65 inches:* stratified loamy sand to loamy fine sand

**Properties and qualities**

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* 18 to 38 inches to strongly contrasting textural stratification

*Drainage class:* Moderately well drained

*Runoff class:* Very low

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*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high  
(0.14 to 14.17 in/hr)

*Depth to water table:* About 17 to 39 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.4 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* C

*Ecological site:* F144AY026CT - Moist Silty Outwash

*Hydric soil rating:* No

### Minor Components

#### Merrimac

*Percent of map unit:* 5 percent

*Landform:* Outwash plains, outwash terraces, eskers, kames, moraines

*Landform position (two-dimensional):* Summit, shoulder

*Landform position (three-dimensional):* Side slope, crest, tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No

#### Agawam

*Percent of map unit:* 5 percent

*Landform:* Kame terraces, outwash plains, outwash terraces, moraines, kames

*Landform position (two-dimensional):* Summit, shoulder

*Landform position (three-dimensional):* Side slope, crest, tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No

#### Tisbury

*Percent of map unit:* 3 percent

*Landform:* Outwash terraces, valley trains, deltas, outwash plains

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* No

#### Raypol

*Percent of map unit:* 2 percent

*Landform:* Drainageways, depressions

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

# **Soil Information for All Uses**

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## **Soil Properties and Qualities**

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

## **Soil Qualities and Features**

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

## **Hydrologic Soil Group**

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

# Custom Soil Resource Report Map—Hydrologic Soil Group



Map Scale: 1:3,950 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters


0 150 300 600 900 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

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### MAP LEGEND

#### Area of Interest (AOI)









 Area of Interest (AOI)

#### Soils

##### Soil Rating Polygons





 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

##### Soil Rating Lines


 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

##### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available


#### Water Features

 Streams and Canals

#### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

#### Background

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut  
Survey Area Data: Version 21, Sep 7, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 24, 2019—Oct 24, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

**Table—Hydrologic Soil Group**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
13	Walpole sandy loam, 0 to 3 percent slopes	B/D	10.6	32.3%
23A	Sudbury sandy loam, 0 to 5 percent slopes	B	3.7	11.4%
36A	Windsor loamy sand, 0 to 3 percent slopes	A	1.9	5.8%
304	Udorthents, loamy, very steep	B	0.1	0.2%
306	Udorthents-Urban land complex	B	5.7	17.2%
307	Urban land	D	1.4	4.2%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	C	9.5	28.8%
<b>Totals for Area of Interest</b>			<b>32.9</b>	<b>100.0%</b>

**Rating Options—Hydrologic Soil Group***Aggregation Method: Dominant Condition**Component Percent Cutoff: None Specified**Tie-break Rule: Higher*

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- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

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**APPENDIX D**  
**Drainage Area Maps**

REFERENCES:  
THIS PLAN REFERS TO THE FOLLOWING:  
1. PLAN ENTITLED "PROPERTY & TOPOGRAPHIC SURVEY, 67 KENNEDY ROAD & 352 SULLIVAN AVENUE, SOUTH WINDSOR, CONNECTICUT" DATED 9/20/2021, PREPARED BY DESIGN PROFESSIONALS, INC.

DESIGN POINT 1  
18" CORRUGATED METAL PIPE  
FROM EXISTING POND IN RAIL ROAD R.O.W.

DESIGN POINT 2  
FLOW ACROSS NORTH  
WEST PROPERTY CORNER

EP2 OUTLET  
18" ACCMP  
ELEV.=79.60±

DESIGN POINT 4  
FLOW TO KENNEDY ROAD  
DRAINAGE SYSTEM

DESIGN POINT 3  
TO SULLIVAN AVE VIA 330  
SULLIVAN AVE SUBSURFACE  
STORMWATER CONVEYANCE  
SYSTEM

EP1 SPILLWAY  
ELEV.=82.88±

67 KENNEDY ROAD  
WAREHOUSE &  
DISTRIBUTION CENTER  
352 SULLIVAN AVENUE, 67 & 68 KENNEDY ROAD  
SOUTH WINDSOR, CONNECTICUT 06074  
GIS NOS: 87300352, 49800067, & 49800068

NO. DATE

REVISIONS

BY

EXISTING  
DRAINAGE MAP

SCALE: 0 30' 60' 120'  
1" = 60'

SHEET 1 OF 24

PREPARED FOR:  
Scannell Properties #644, LLC  
294 Grove Lane East  
Suite 140  
Wayzata, MN 55391  
763-331-8851 T

PROJECT NO.  
4670

DATE  
3/30/2022

DESIGN BY  
DJI/BPW

CHECKED BY  
CDA

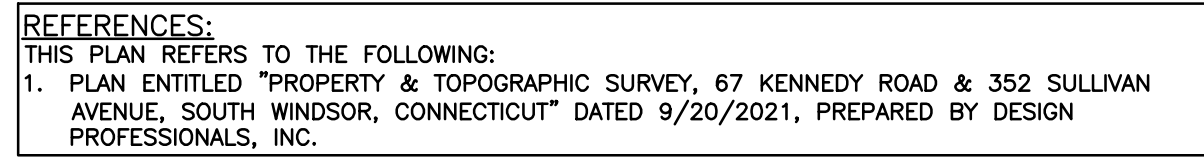
CONVERTED BY  
BPW

design  
professionals

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DESIGN POINT 3  
TO SULLIVAN AVE VIA 330  
SULLIVAN AVE SUBSURFACE  
STORMWATER CONVEYANCE  
SYSTEM

DESIGN POINT 1  
18" CORRUGATED METAL PIPE  
FROM EXISTING POND IN RAIL ROAD R.O.W.

DESIGN POINT 4  
FLOW TO KENNEDY ROAD  
DRAINAGE SYSTEM

[illegible]

**67 KENNEDY ROAD  
WAREHOUSE &  
DISTRIBUTION CENTER**  
352 SULLIVAN AVENUE, 67 & 68 KENNEDY ROAD  
SOUTH WINDSOR, CONNECTICUT 06074  
GIS NOS. 87300352, 49800067, & 49800068

PROJECT NO.: 4670	DATE: 3/30/2022	PROJECT FOR: Scannell Properties #644, LLC 294 Grove Lane East Suite 140 Wayzata, MN 55391 763-331-8851 T
	DESIGN BY: DHL/BPW	
	DRAWN BY: DHL/BPW	
	CHECKED BY: BPW	

[illegible]