

STORM WATER MANAGEMENT REPORT

APRIL 28, 2016

PREPARED FOR:
RITE RUG
LONDON-GROVEPORT RD
GROVE CITY, OHIO

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Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10



Legend

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
1	SCS Runoff	Pre-Development
2	SCS Runoff	Post Developed
3	Reservoir	Post Dev Routing

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Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	1.015	1.468	-----	2.159	2.761	3.632	4.370	5.156	Pre-Development
2	SCS Runoff	-----	3.034	3.875	-----	5.073	6.054	7.423	8.551	9.732	Post Developed
3	Reservoir	2	0.459	0.524	-----	0.606	0.667	0.736	0.788	0.840	Post Dev Routing

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	1.015	2	728	3,693	-----	-----	-----	Pre-Development	
2	SCS Runoff	3.034	2	716	6,203	-----	-----	-----	Post Developed	
3	Reservoir	0.459	2	728	5,802	2	813.70	2,873	Post Dev Routing	
Rite Rug Grove City.gpw					Return Period: 1 Year			Thursday, 04 / 28 / 2016		

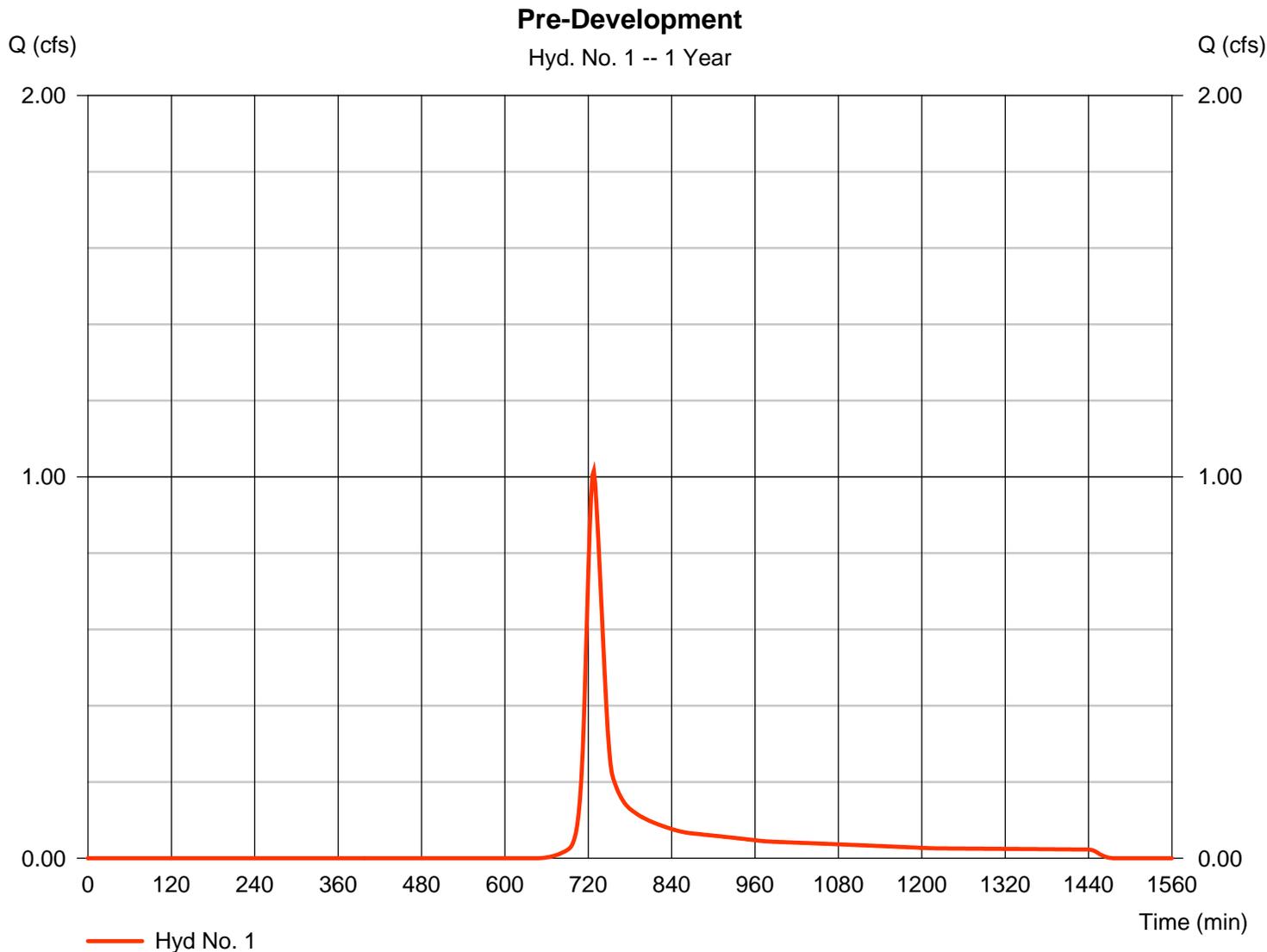
Hydrograph Report

Hyd. No. 1

Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 1.015 cfs
Storm frequency	= 1 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 3,693 cuft
Drainage area	= 1.360 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.30 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 98) + (1.320 x 80)] / 1.360



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No. 1

Pre-Development

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.63	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
Travel Time (min)	= 20.77	+ 0.00	+ 0.00	= 20.77
Shallow Concentrated Flow				
Flow length (ft)	= 150.00	0.00	0.00	
Watercourse slope (%)	= 1.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.61	0.00	0.00	
Travel Time (min)	= 1.55	+ 0.00	+ 0.00	= 1.55
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	{{0}}0.0	0.0	0.0	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				22.30 min

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

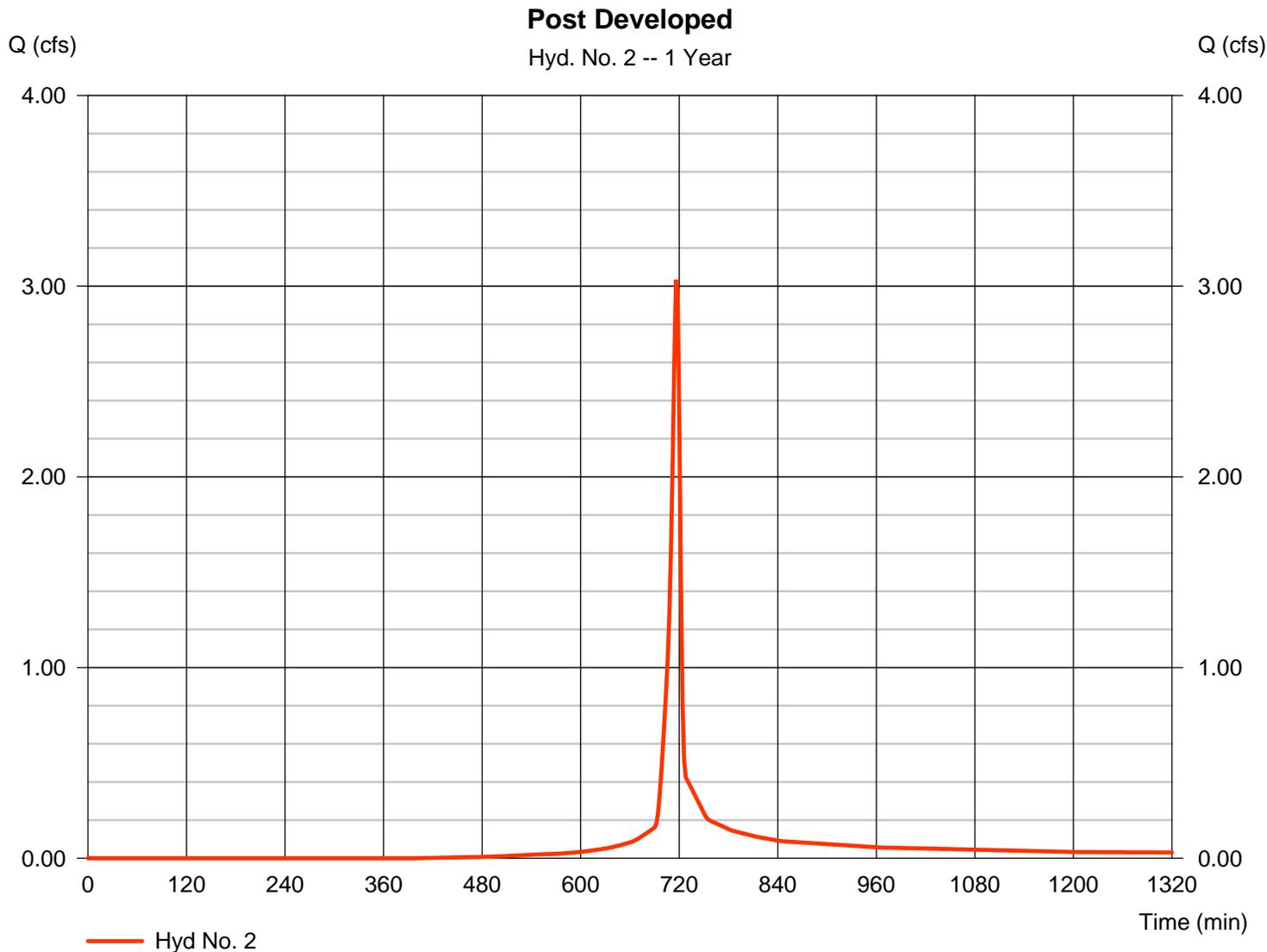
Thursday, 04 / 28 / 2016

Hyd. No. 2

Post Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 3.034 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 6,203 cuft
Drainage area	= 1.360 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.510 x 80) + (0.850 x 98)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

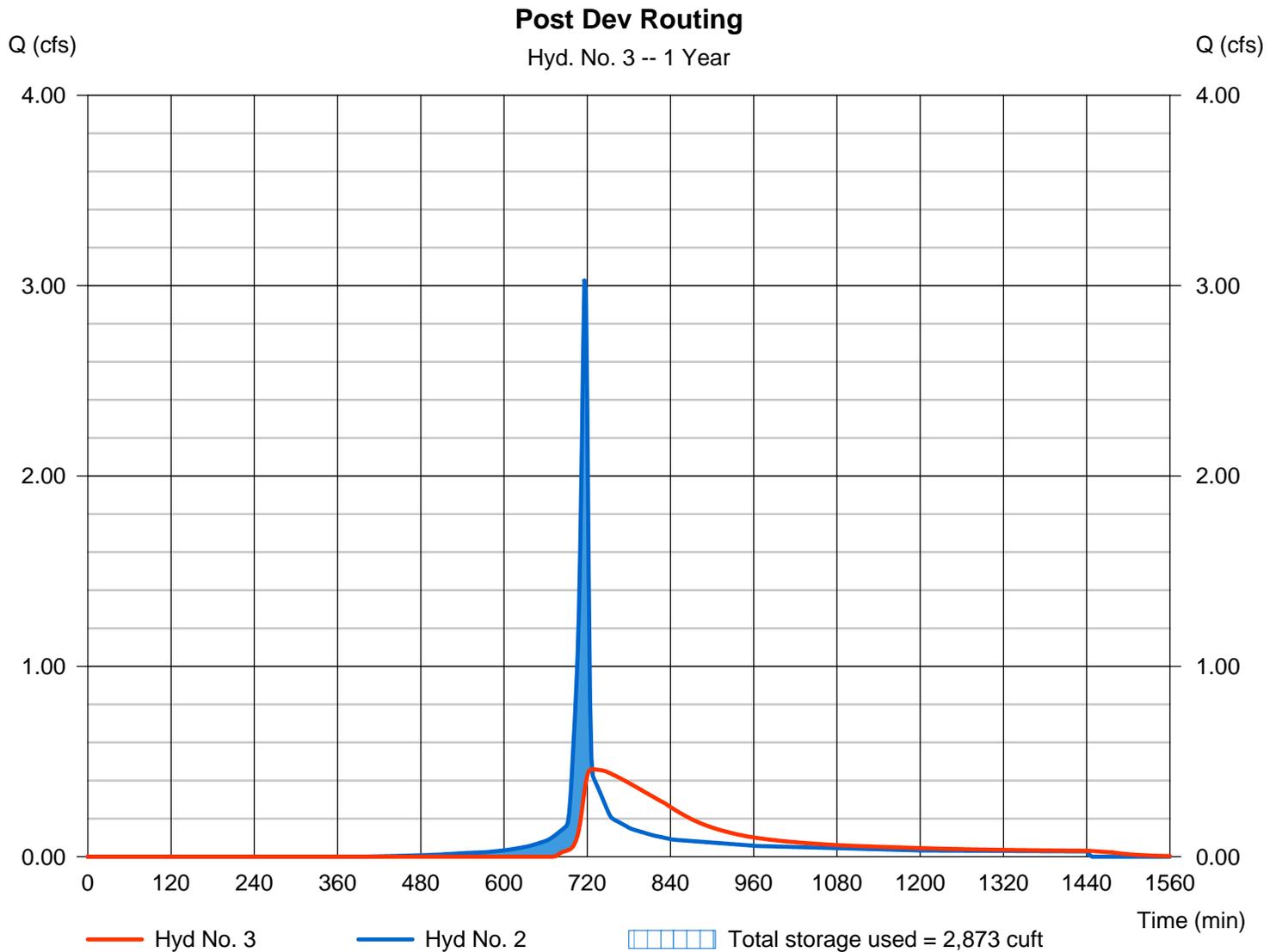
Thursday, 04 / 28 / 2016

Hyd. No. 3

Post Dev Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.459 cfs
Storm frequency	= 1 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 5,802 cuft
Inflow hyd. No.	= 2 - Post Developed	Max. Elevation	= 813.70 ft
Reservoir name	= UG Storage	Max. Storage	= 2,873 cuft

Storage Indication method used.



Pond No. 1 - UG Storage

Pond Data

UG Chambers -Invert elev. = 812.50 ft, Rise x Span = 5.00 x 5.00 ft, Barrel Len = 300.00 ft, No. Barrels = 5, Slope = 0.30%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	812.50	n/a	0	0
0.59	813.09	n/a	481	481
1.18	813.68	n/a	2,292	2,773
1.77	814.27	n/a	3,503	6,277
2.36	814.86	n/a	4,100	10,376
2.95	815.45	n/a	4,356	14,733
3.54	816.04	n/a	4,362	19,094
4.13	816.63	n/a	4,093	23,188
4.72	817.22	n/a	3,505	26,693
5.31	817.81	n/a	2,285	28,978
5.90	818.40	n/a	480	29,458

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	5.00	0.00	0.00
Span (in)	= 12.00	5.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 812.50	813.00	0.00	0.00
Length (ft)	= 15.00	0.00	0.00	0.00
Slope (%)	= 0.40	0.20	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 6.00	0.00	0.00	0.00
Crest El. (ft)	= 815.77	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	812.50	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.06	48	812.56	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.12	96	812.62	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.18	144	812.68	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.24	192	812.74	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.29	241	812.80	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.35	289	812.85	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.41	337	812.91	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.47	385	812.97	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.53	433	813.03	0.00 oc	0.00 ic	---	---	0.00	---	---	---	---	---	0.003
0.59	481	813.09	0.02 oc	0.02 ic	---	---	0.00	---	---	---	---	---	0.023
0.65	710	813.15	0.06 oc	0.06 ic	---	---	0.00	---	---	---	---	---	0.058
0.71	940	813.21	0.11 oc	0.11 ic	---	---	0.00	---	---	---	---	---	0.106
0.77	1,169	813.27	0.17 oc	0.16 ic	---	---	0.00	---	---	---	---	---	0.164
0.83	1,398	813.33	0.23 oc	0.22 ic	---	---	0.00	---	---	---	---	---	0.224
0.89	1,627	813.39	0.28 oc	0.28 ic	---	---	0.00	---	---	---	---	---	0.279
0.94	1,856	813.44	0.32 oc	0.32 ic	---	---	0.00	---	---	---	---	---	0.319
1.00	2,085	813.50	0.37 oc	0.36 ic	---	---	0.00	---	---	---	---	---	0.356
1.06	2,315	813.56	0.40 oc	0.39 ic	---	---	0.00	---	---	---	---	---	0.391
1.12	2,544	813.62	0.43 oc	0.42 ic	---	---	0.00	---	---	---	---	---	0.422
1.18	2,773	813.68	0.46 oc	0.45 ic	---	---	0.00	---	---	---	---	---	0.451
1.24	3,123	813.74	0.48 oc	0.48 ic	---	---	0.00	---	---	---	---	---	0.478
1.30	3,474	813.80	0.52 oc	0.50 ic	---	---	0.00	---	---	---	---	---	0.504
1.36	3,824	813.86	0.54 oc	0.53 ic	---	---	0.00	---	---	---	---	---	0.529
1.42	4,174	813.92	0.56 oc	0.55 ic	---	---	0.00	---	---	---	---	---	0.552
1.48	4,525	813.98	0.59 oc	0.57 ic	---	---	0.00	---	---	---	---	---	0.575
1.53	4,875	814.03	0.60 oc	0.60 ic	---	---	0.00	---	---	---	---	---	0.597
1.59	5,225	814.09	0.62 oc	0.62 ic	---	---	0.00	---	---	---	---	---	0.617
1.65	5,576	814.15	0.65 oc	0.64 ic	---	---	0.00	---	---	---	---	---	0.638
1.71	5,926	814.21	0.67 oc	0.66 ic	---	---	0.00	---	---	---	---	---	0.657
1.77	6,277	814.27	0.68 oc	0.68 ic	---	---	0.00	---	---	---	---	---	0.676
1.83	6,686	814.33	0.70 oc	0.69 ic	---	---	0.00	---	---	---	---	---	0.695

Continues on next page...

UG Storage

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.89	7,096	814.39	0.71 oc	0.71 ic	---	---	0.00	---	---	---	---	---	0.713
1.95	7,506	814.45	0.74 oc	0.73 ic	---	---	0.00	---	---	---	---	---	0.731
2.01	7,916	814.51	0.76 oc	0.75 ic	---	---	0.00	---	---	---	---	---	0.748
2.07	8,326	814.57	0.77 oc	0.76 ic	---	---	0.00	---	---	---	---	---	0.765
2.12	8,736	814.62	0.79 oc	0.78 ic	---	---	0.00	---	---	---	---	---	0.781
2.18	9,146	814.68	0.80 oc	0.80 ic	---	---	0.00	---	---	---	---	---	0.797
2.24	9,556	814.74	0.82 oc	0.81 ic	---	---	0.00	---	---	---	---	---	0.813
2.30	9,966	814.80	0.83 oc	0.83 ic	---	---	0.00	---	---	---	---	---	0.829
2.36	10,376	814.86	0.85 oc	0.84 ic	---	---	0.00	---	---	---	---	---	0.844
2.42	10,812	814.92	0.86 oc	0.86 ic	---	---	0.00	---	---	---	---	---	0.859
2.48	11,247	814.98	0.87 oc	0.87 ic	---	---	0.00	---	---	---	---	---	0.871
2.54	11,683	815.04	0.89 oc	0.88 ic	---	---	0.00	---	---	---	---	---	0.883
2.60	12,119	815.10	0.90 oc	0.90 ic	---	---	0.00	---	---	---	---	---	0.896
2.65	12,554	815.16	0.91 oc	0.91 ic	---	---	0.00	---	---	---	---	---	0.907
2.71	12,990	815.21	0.92 oc	0.92 ic	---	---	0.00	---	---	---	---	---	0.919
2.77	13,426	815.27	0.93 oc	0.93 ic	---	---	0.00	---	---	---	---	---	0.931
2.83	13,861	815.33	0.95 oc	0.94 ic	---	---	0.00	---	---	---	---	---	0.942
2.89	14,297	815.39	0.96 oc	0.95 ic	---	---	0.00	---	---	---	---	---	0.954
2.95	14,733	815.45	0.96 oc	0.96 ic	---	---	0.00	---	---	---	---	---	0.964
3.01	15,169	815.51	0.98 oc	0.98 ic	---	---	0.00	---	---	---	---	---	0.976
3.07	15,605	815.57	0.99 oc	0.99 ic	---	---	0.00	---	---	---	---	---	0.986
3.13	16,041	815.63	1.00 oc	1.00 ic	---	---	0.00	---	---	---	---	---	0.997
3.19	16,477	815.69	1.01 oc	1.01 ic	---	---	0.00	---	---	---	---	---	1.007
3.24	16,913	815.75	1.02 oc	1.02 ic	---	---	0.00	---	---	---	---	---	1.018
3.30	17,350	815.80	1.12 oc	1.00 ic	---	---	0.13	---	---	---	---	---	1.122
3.36	17,786	815.86	1.57 oc	1.00 ic	---	---	0.57	---	---	---	---	---	1.565
3.42	18,222	815.92	2.17 oc	0.98 ic	---	---	1.19	---	---	---	---	---	2.170
3.48	18,658	815.98	2.90 oc	0.96 ic	---	---	1.94	---	---	---	---	---	2.896
3.54	19,094	816.04	3.71 oc	0.91 ic	---	---	2.80	---	---	---	---	---	3.712
3.60	19,504	816.10	4.60 oc	0.83 ic	---	---	3.77	---	---	---	---	---	4.603
3.66	19,913	816.16	5.50 ic	0.67 ic	---	---	4.83	---	---	---	---	---	5.499
3.72	20,322	816.22	6.34 ic	0.42 ic	---	---	5.91 s	---	---	---	---	---	6.335
3.78	20,732	816.28	6.55 ic	0.34 ic	---	---	6.21 s	---	---	---	---	---	6.554
3.84	21,141	816.34	6.70 ic	0.29 ic	---	---	6.40 s	---	---	---	---	---	6.694
3.89	21,551	816.39	6.81 ic	0.26 ic	---	---	6.55 s	---	---	---	---	---	6.806
3.95	21,960	816.45	6.90 ic	0.23 ic	---	---	6.67 s	---	---	---	---	---	6.901
4.01	22,369	816.51	6.99 ic	0.21 ic	---	---	6.78 s	---	---	---	---	---	6.984
4.07	22,779	816.57	7.06 ic	0.19 ic	---	---	6.88 s	---	---	---	---	---	7.063
4.13	23,188	816.63	7.14 ic	0.17 ic	---	---	6.96 s	---	---	---	---	---	7.133
4.19	23,538	816.69	7.21 ic	0.16 ic	---	---	7.04 s	---	---	---	---	---	7.203
4.25	23,889	816.75	7.27 ic	0.15 ic	---	---	7.12 s	---	---	---	---	---	7.269
4.31	24,239	816.81	7.34 ic	0.14 ic	---	---	7.20 s	---	---	---	---	---	7.331
4.37	24,590	816.87	7.40 ic	0.13 ic	---	---	7.26 s	---	---	---	---	---	7.391
4.43	24,940	816.93	7.46 ic	0.12 ic	---	---	7.33 s	---	---	---	---	---	7.452
4.48	25,291	816.98	7.52 ic	0.11 ic	---	---	7.40 s	---	---	---	---	---	7.512
4.54	25,641	817.04	7.58 ic	0.11 ic	---	---	7.47 s	---	---	---	---	---	7.574
4.60	25,992	817.10	7.64 ic	0.10 ic	---	---	7.53 s	---	---	---	---	---	7.628
4.66	26,342	817.16	7.69 ic	0.09 ic	---	---	7.59 s	---	---	---	---	---	7.687
4.72	26,693	817.22	7.75 ic	0.09 ic	---	---	7.65 s	---	---	---	---	---	7.736
4.78	26,921	817.28	7.81 ic	0.09 ic	---	---	7.72 s	---	---	---	---	---	7.803
4.84	27,150	817.34	7.86 ic	0.08 ic	---	---	7.77 s	---	---	---	---	---	7.848
4.90	27,378	817.40	7.92 ic	0.08 ic	---	---	7.82 s	---	---	---	---	---	7.898
4.96	27,607	817.46	7.97 ic	0.08 ic	---	---	7.88 s	---	---	---	---	---	7.953
5.01	27,835	817.52	8.02 ic	0.07 ic	---	---	7.93 s	---	---	---	---	---	8.002
5.07	28,064	817.57	8.08 ic	0.07 ic	---	---	8.00 s	---	---	---	---	---	8.065
5.13	28,292	817.63	8.13 ic	0.07 ic	---	---	8.06 s	---	---	---	---	---	8.129
5.19	28,521	817.69	8.18 ic	0.06 ic	---	---	8.11 s	---	---	---	---	---	8.179
5.25	28,749	817.75	8.23 ic	0.06 ic	---	---	8.17 s	---	---	---	---	---	8.233
5.31	28,978	817.81	8.29 ic	0.06 ic	---	---	8.19 s	---	---	---	---	---	8.250
5.37	29,026	817.87	8.34 ic	0.06 ic	---	---	8.24 s	---	---	---	---	---	8.299
5.43	29,074	817.93	8.39 ic	0.06 ic	---	---	8.31 s	---	---	---	---	---	8.369
5.49	29,122	817.99	8.44 ic	0.05 ic	---	---	8.36 s	---	---	---	---	---	8.415
5.55	29,170	818.05	8.49 ic	0.05 ic	---	---	8.41 s	---	---	---	---	---	8.467
5.61	29,218	818.11	8.54 ic	0.05 ic	---	---	8.48 s	---	---	---	---	---	8.533
5.66	29,266	818.16	8.59 ic	0.05 ic	---	---	8.51 s	---	---	---	---	---	8.563
5.72	29,314	818.22	8.64 ic	0.05 ic	---	---	8.57 s	---	---	---	---	---	8.618
5.78	29,362	818.28	8.69 ic	0.05 ic	---	---	8.58 s	---	---	---	---	---	8.625
5.84	29,410	818.34	8.73 ic	0.05 ic	---	---	8.67 s	---	---	---	---	---	8.716
5.90	29,458	818.40	8.78 ic	0.05 ic	---	---	8.74 s	---	---	---	---	---	8.780

...End

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	1.468	2	728	5,206	-----	-----	-----	Pre-Development	
2	SCS Runoff	3.875	2	716	8,003	-----	-----	-----	Post Developed	
3	Reservoir	0.524	2	728	7,601	2	813.85	3,755	Post Dev Routing	
Rite Rug Grove City.gpw					Return Period: 2 Year			Thursday, 04 / 28 / 2016		

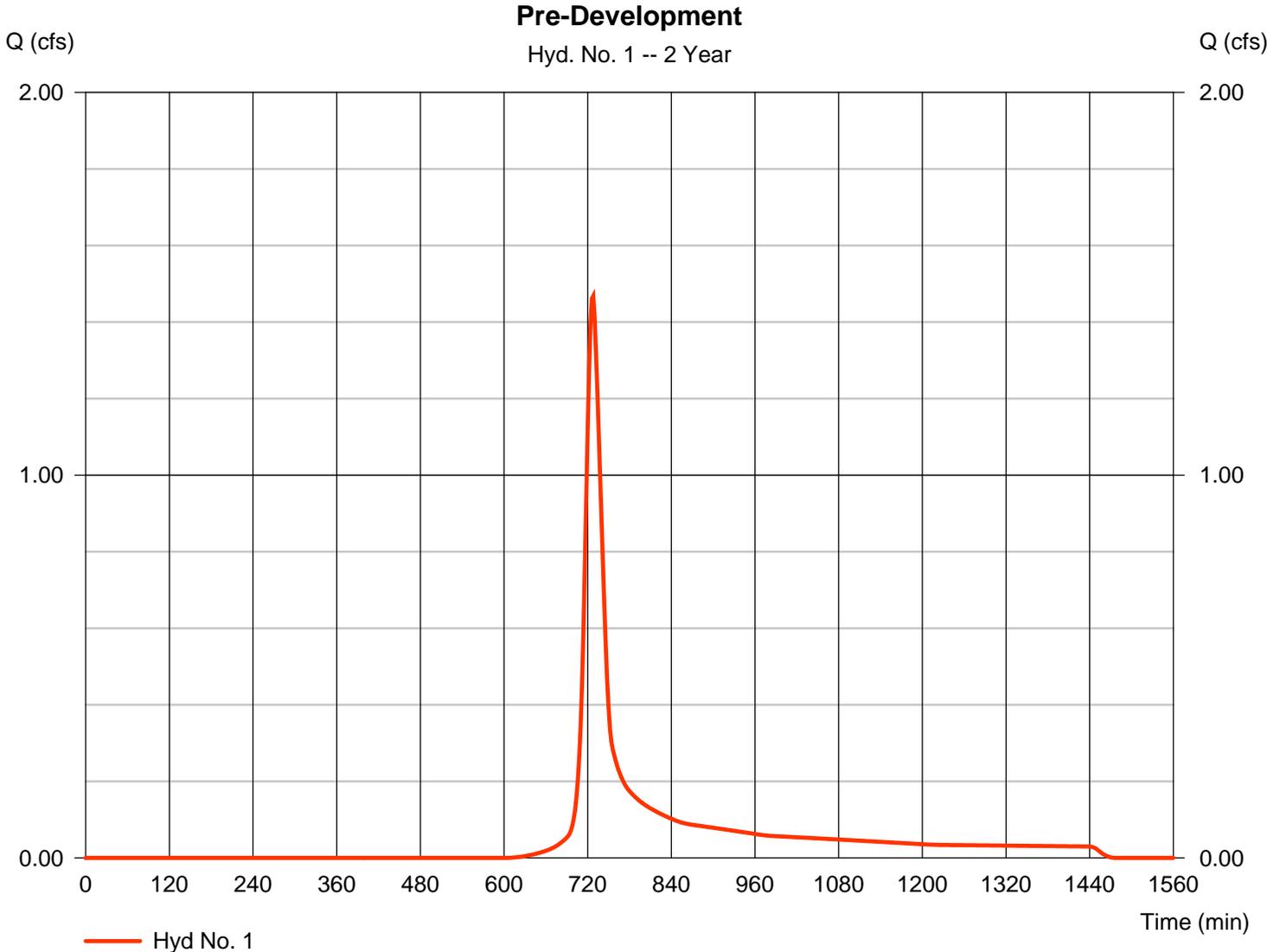
Hydrograph Report

Hyd. No. 1

Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 1.468 cfs
Storm frequency	= 2 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 5,206 cuft
Drainage area	= 1.360 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.30 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 98) + (1.320 x 80)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

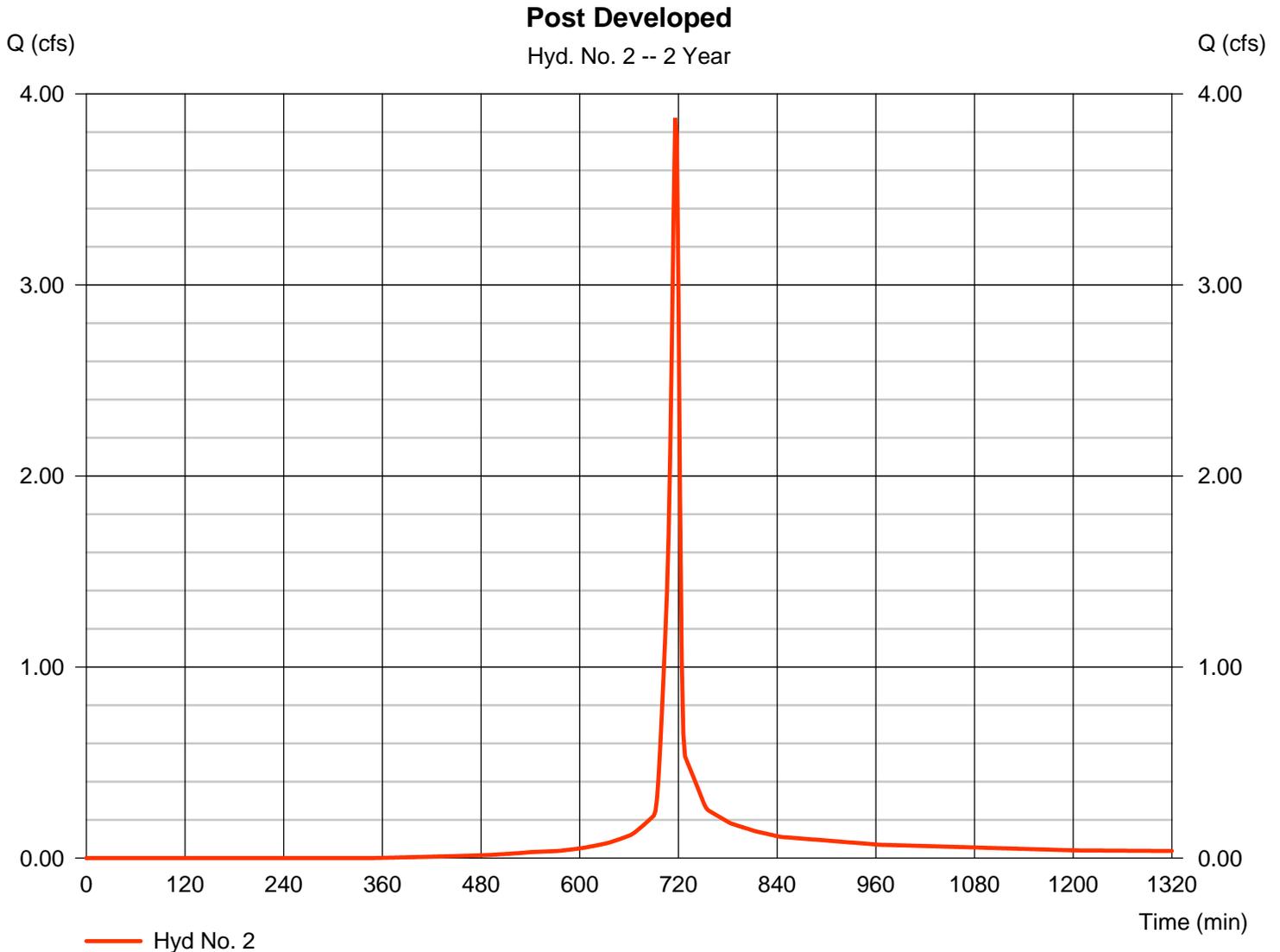
Thursday, 04 / 28 / 2016

Hyd. No. 2

Post Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 3.875 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 8,003 cuft
Drainage area	= 1.360 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.510 x 80) + (0.850 x 98)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

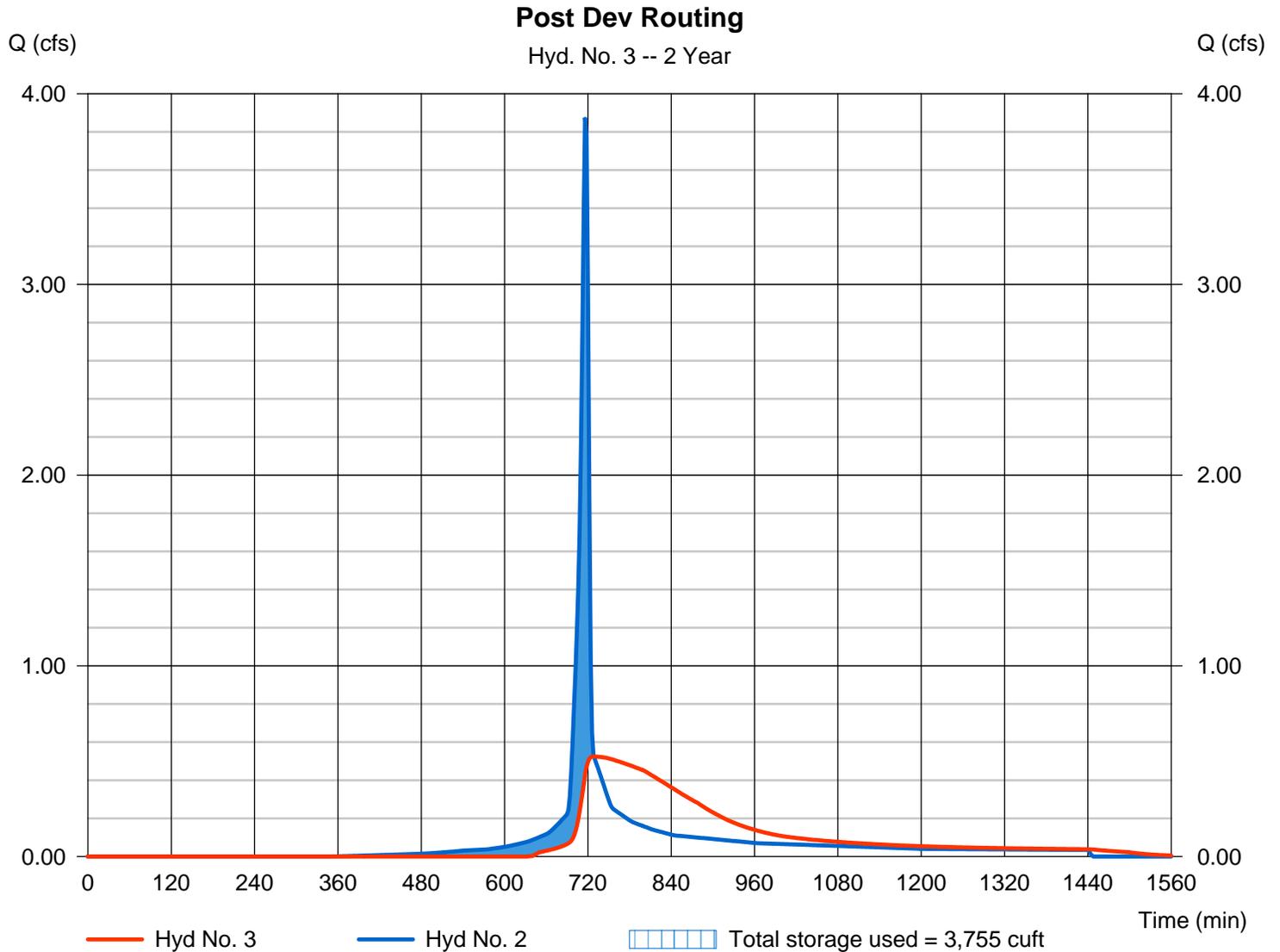
Thursday, 04 / 28 / 2016

Hyd. No. 3

Post Dev Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.524 cfs
Storm frequency	= 2 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 7,601 cuft
Inflow hyd. No.	= 2 - Post Developed	Max. Elevation	= 813.85 ft
Reservoir name	= UG Storage	Max. Storage	= 3,755 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	2.159	2	726	7,540	-----	-----	-----	Pre-Development	
2	SCS Runoff	5.073	2	716	10,626	-----	-----	-----	Post Developed	
3	Reservoir	0.606	2	734	10,224	2	814.06	5,034	Post Dev Routing	
Rite Rug Grove City.gpw					Return Period: 5 Year			Thursday, 04 / 28 / 2016		

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

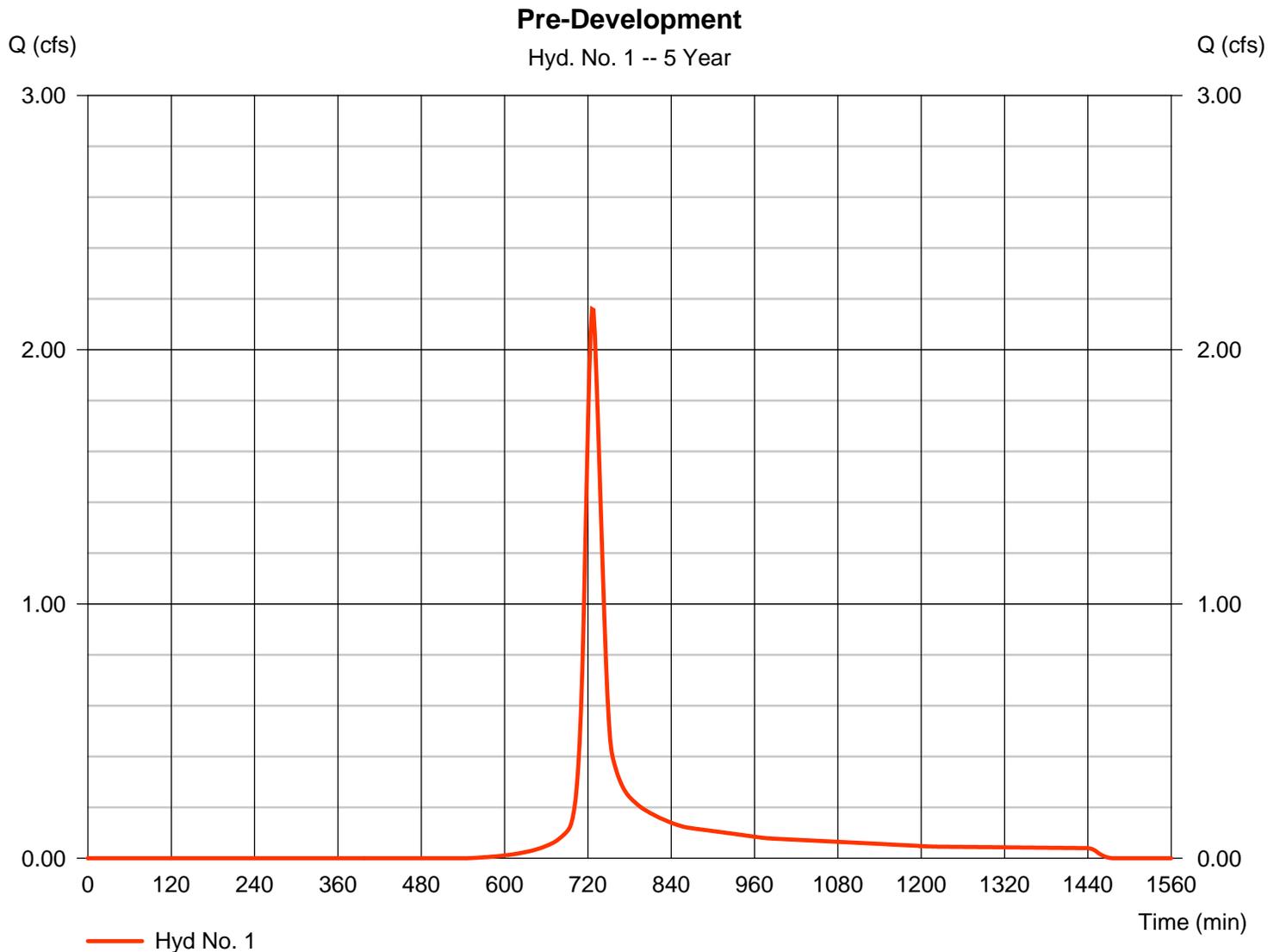
Thursday, 04 / 28 / 2016

Hyd. No. 1

Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 2.159 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 7,540 cuft
Drainage area	= 1.360 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.30 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 98) + (1.320 x 80)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

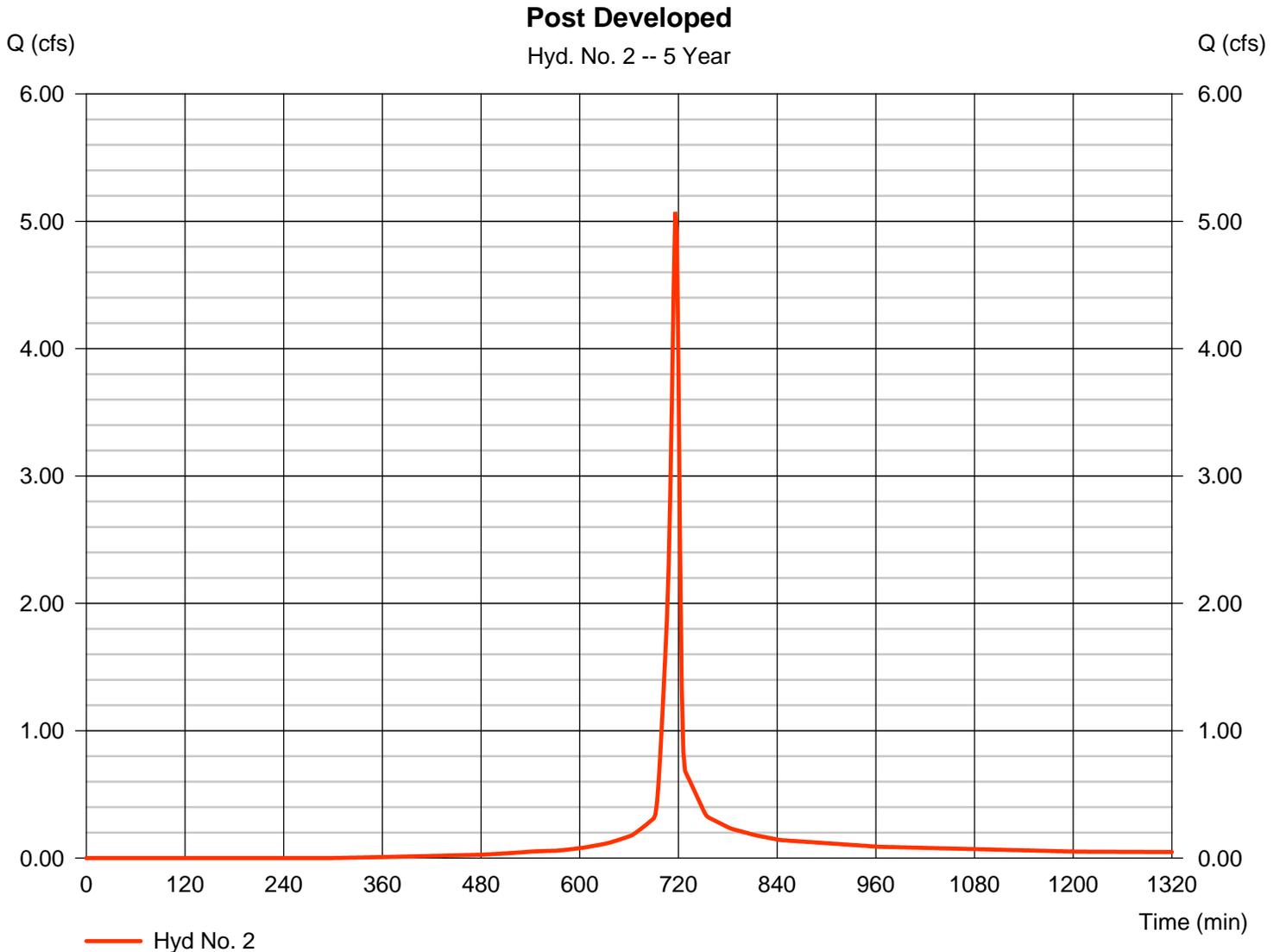
Thursday, 04 / 28 / 2016

Hyd. No. 2

Post Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 5.073 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 10,626 cuft
Drainage area	= 1.360 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.510 x 80) + (0.850 x 98)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

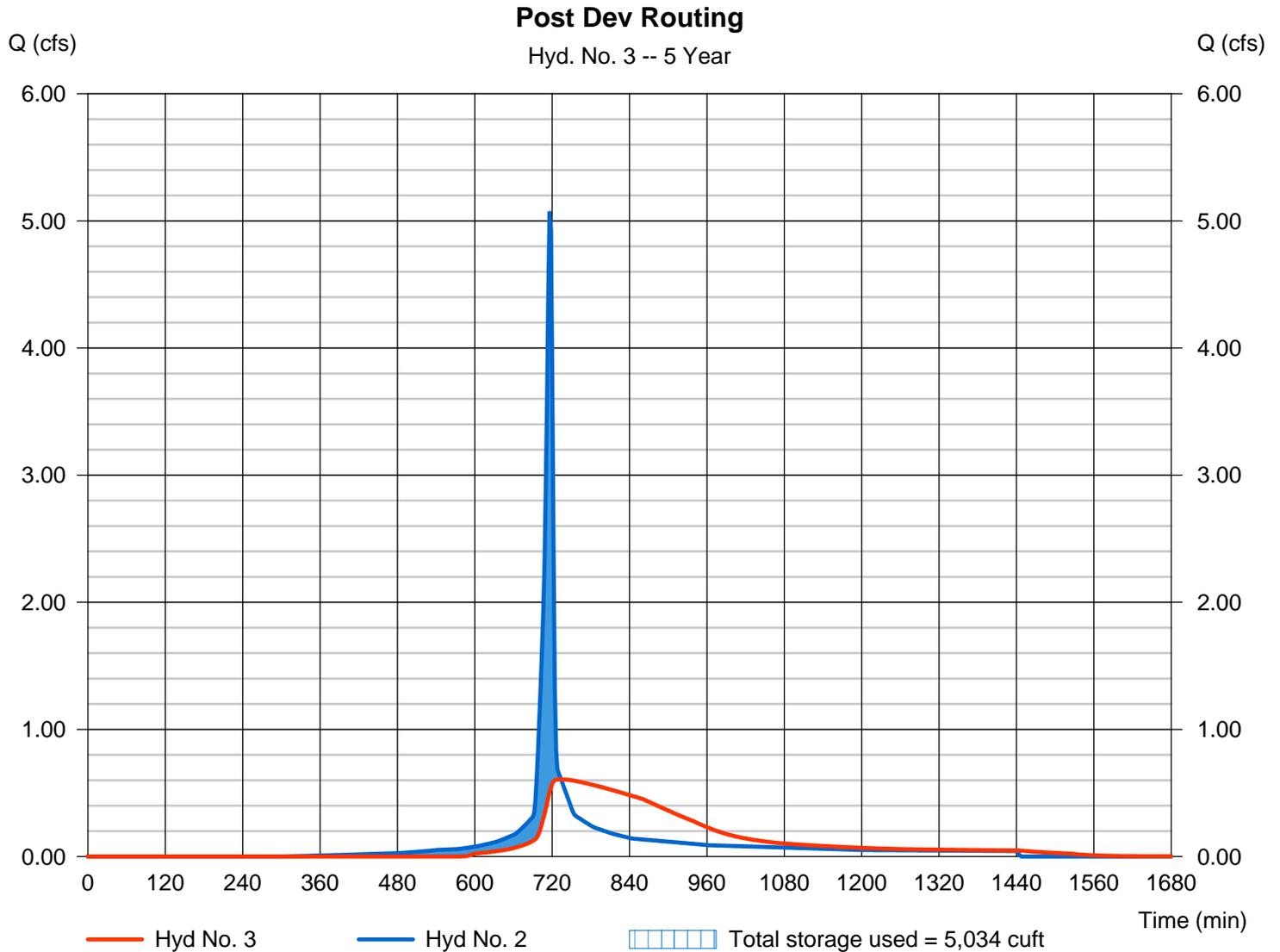
Thursday, 04 / 28 / 2016

Hyd. No. 3

Post Dev Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.606 cfs
Storm frequency	= 5 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 10,224 cuft
Inflow hyd. No.	= 2 - Post Developed	Max. Elevation	= 814.06 ft
Reservoir name	= UG Storage	Max. Storage	= 5,034 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	2.761	2	726	9,572	-----	-----	-----	Pre-Development	
2	SCS Runoff	6.054	2	716	12,816	-----	-----	-----	Post Developed	
3	Reservoir	0.667	2	736	12,415	2	814.24	6,100	Post Dev Routing	
Rite Rug Grove City.gpw					Return Period: 10 Year			Thursday, 04 / 28 / 2016		

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

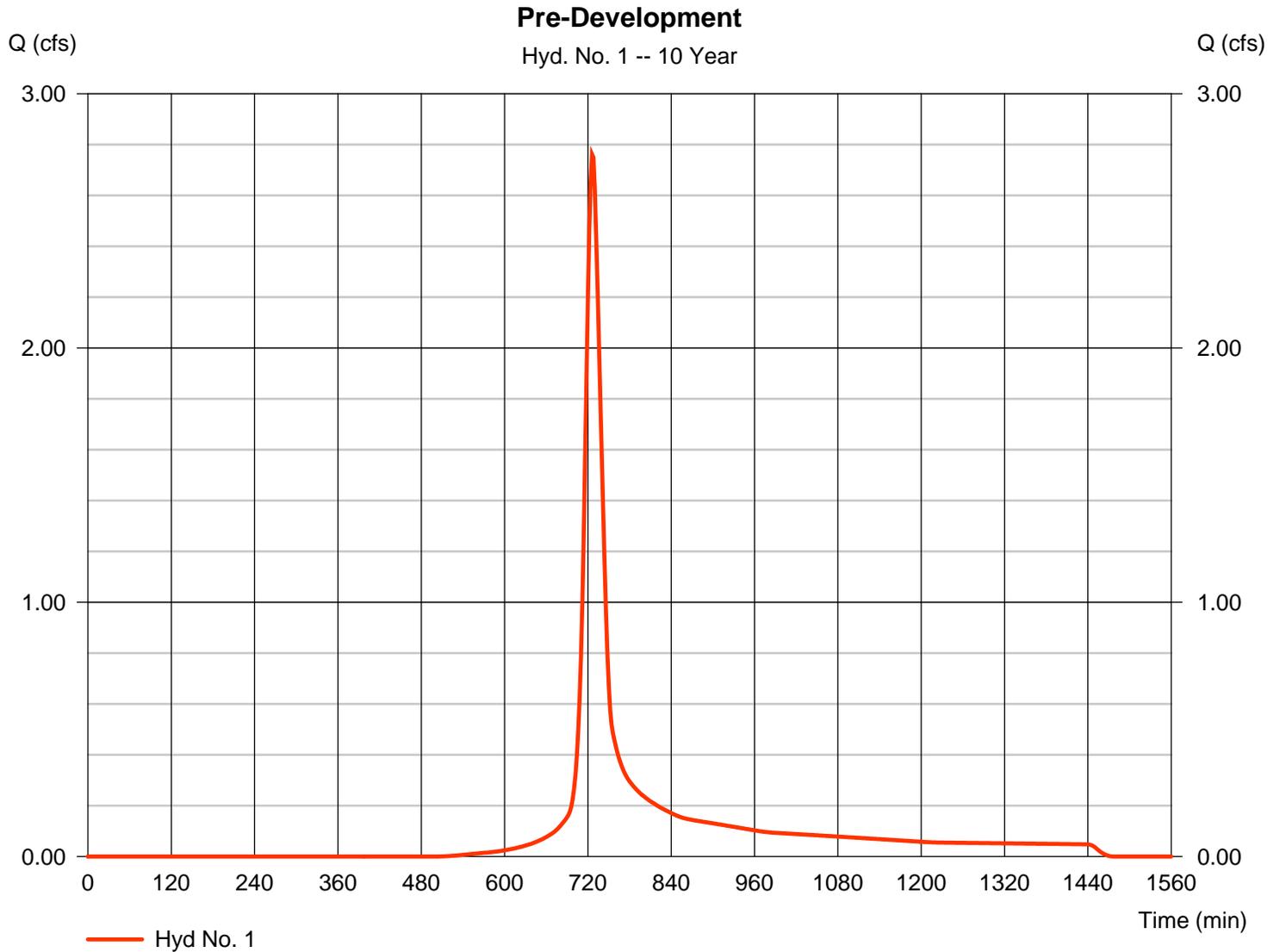
Thursday, 04 / 28 / 2016

Hyd. No. 1

Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 2.761 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 9,572 cuft
Drainage area	= 1.360 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.30 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 98) + (1.320 x 80)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

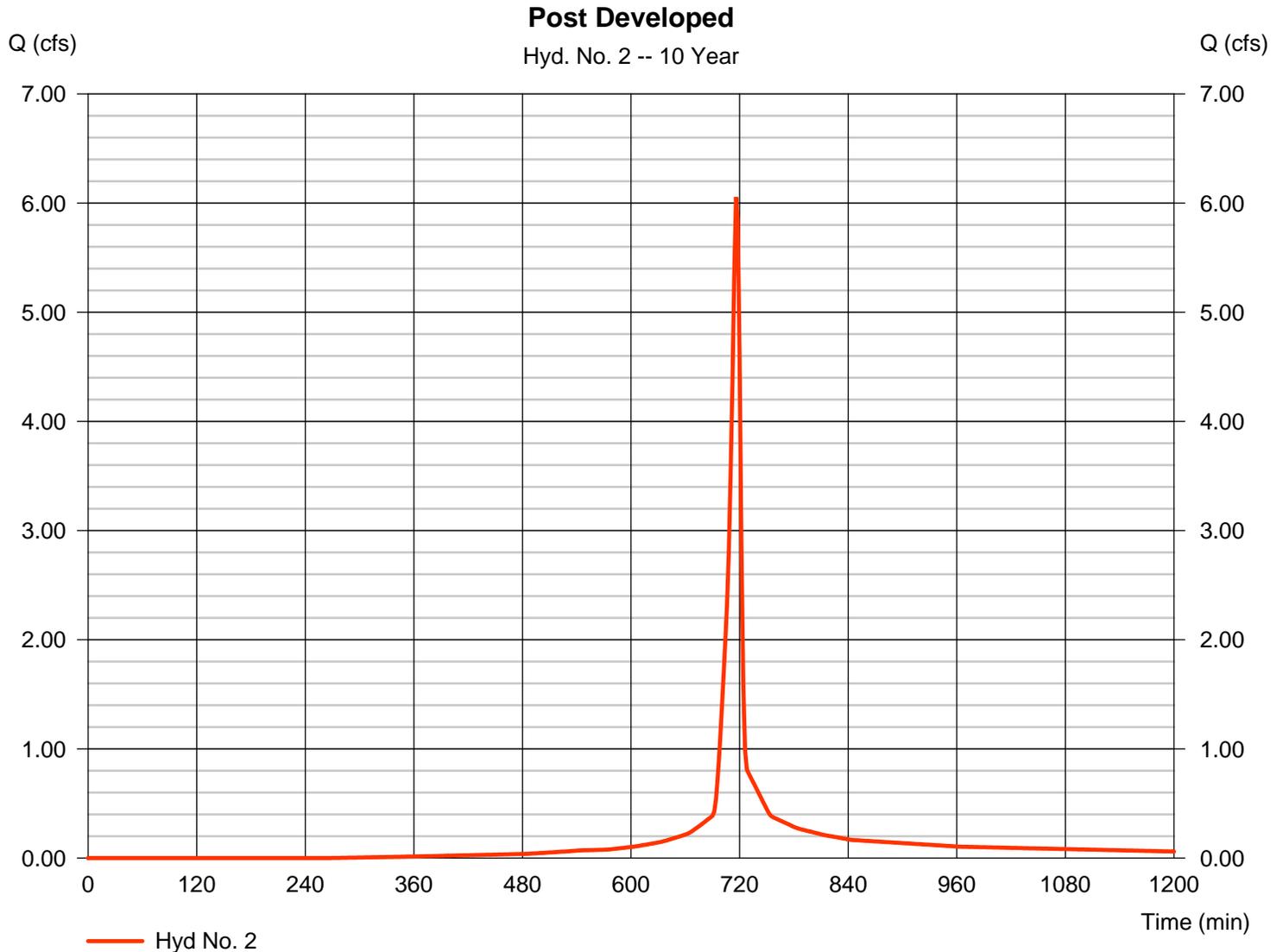
Thursday, 04 / 28 / 2016

Hyd. No. 2

Post Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 6.054 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 12,816 cuft
Drainage area	= 1.360 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.74 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.510 x 80) + (0.850 x 98)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

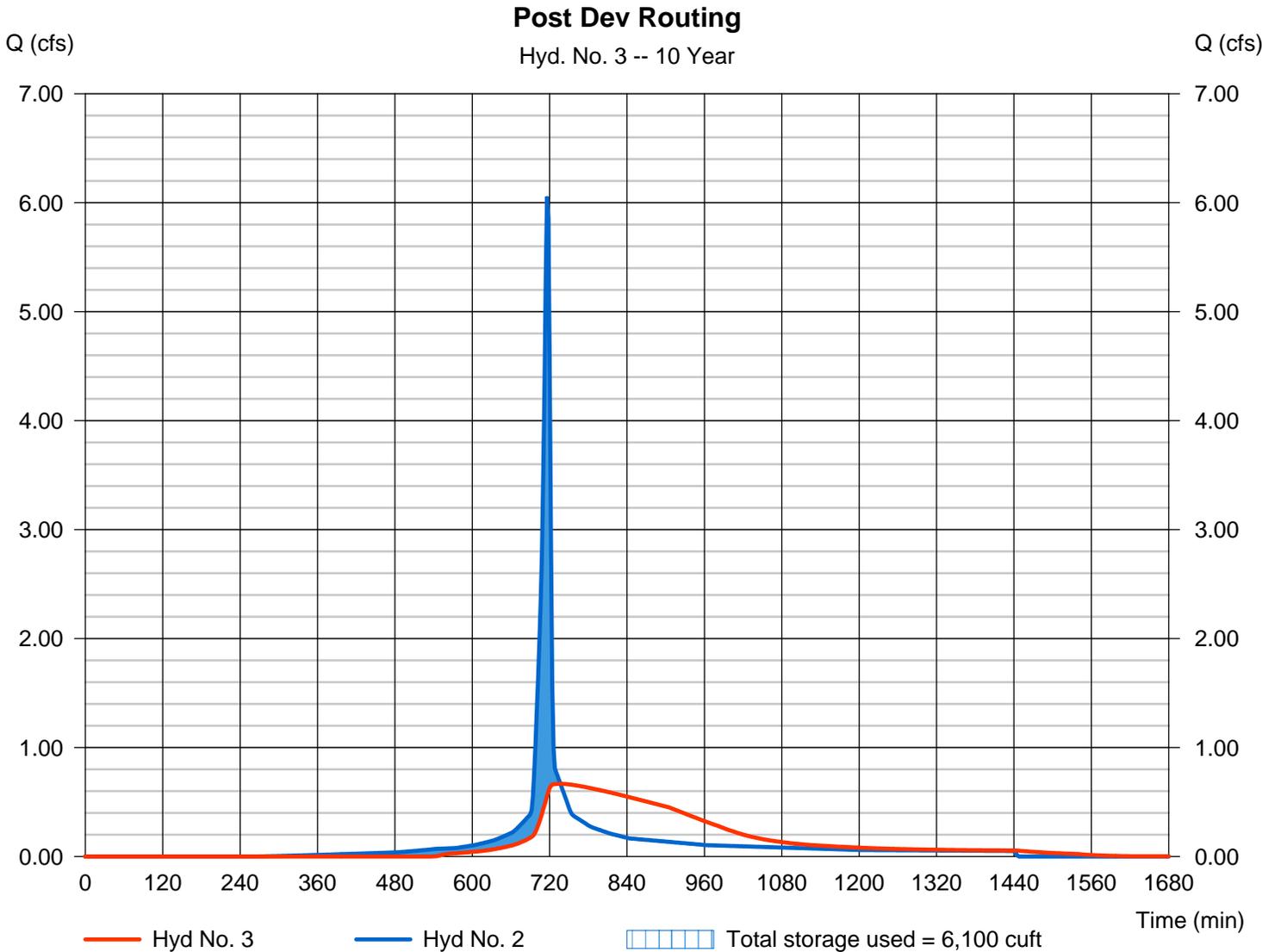
Thursday, 04 / 28 / 2016

Hyd. No. 3

Post Dev Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.667 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 12,415 cuft
Inflow hyd. No.	= 2 - Post Developed	Max. Elevation	= 814.24 ft
Reservoir name	= UG Storage	Max. Storage	= 6,100 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	3.632	2	726	12,544	-----	-----	-----	Pre-Development	
2	SCS Runoff	7.423	2	716	15,922	-----	-----	-----	Post Developed	
3	Reservoir	0.736	2	740	15,521	2	814.46	7,625	Post Dev Routing	
Rite Rug Grove City.gpw					Return Period: 25 Year			Thursday, 04 / 28 / 2016		

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

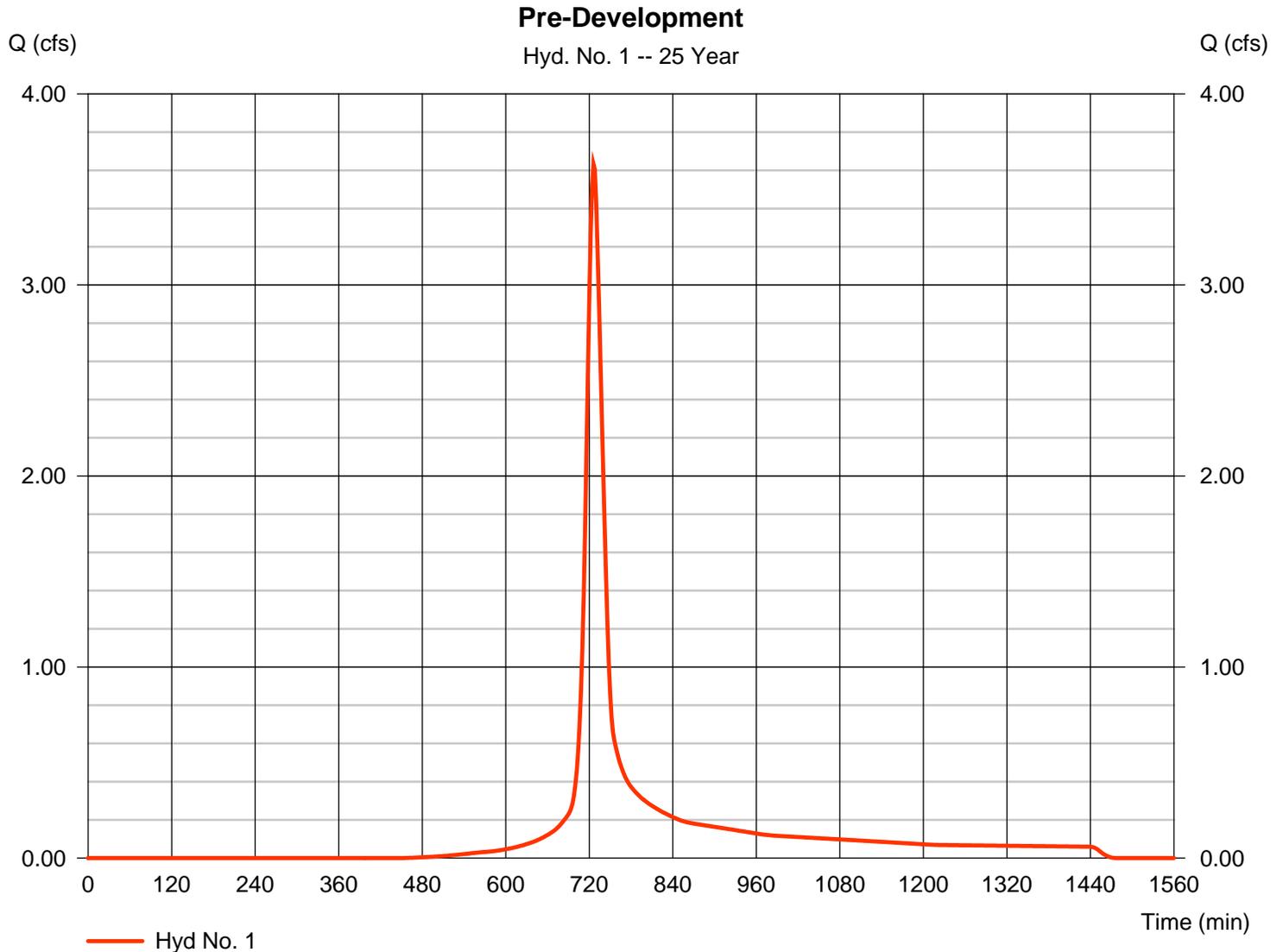
Thursday, 04 / 28 / 2016

Hyd. No. 1

Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 3.632 cfs
Storm frequency	= 25 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 12,544 cuft
Drainage area	= 1.360 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.30 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 98) + (1.320 x 80)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

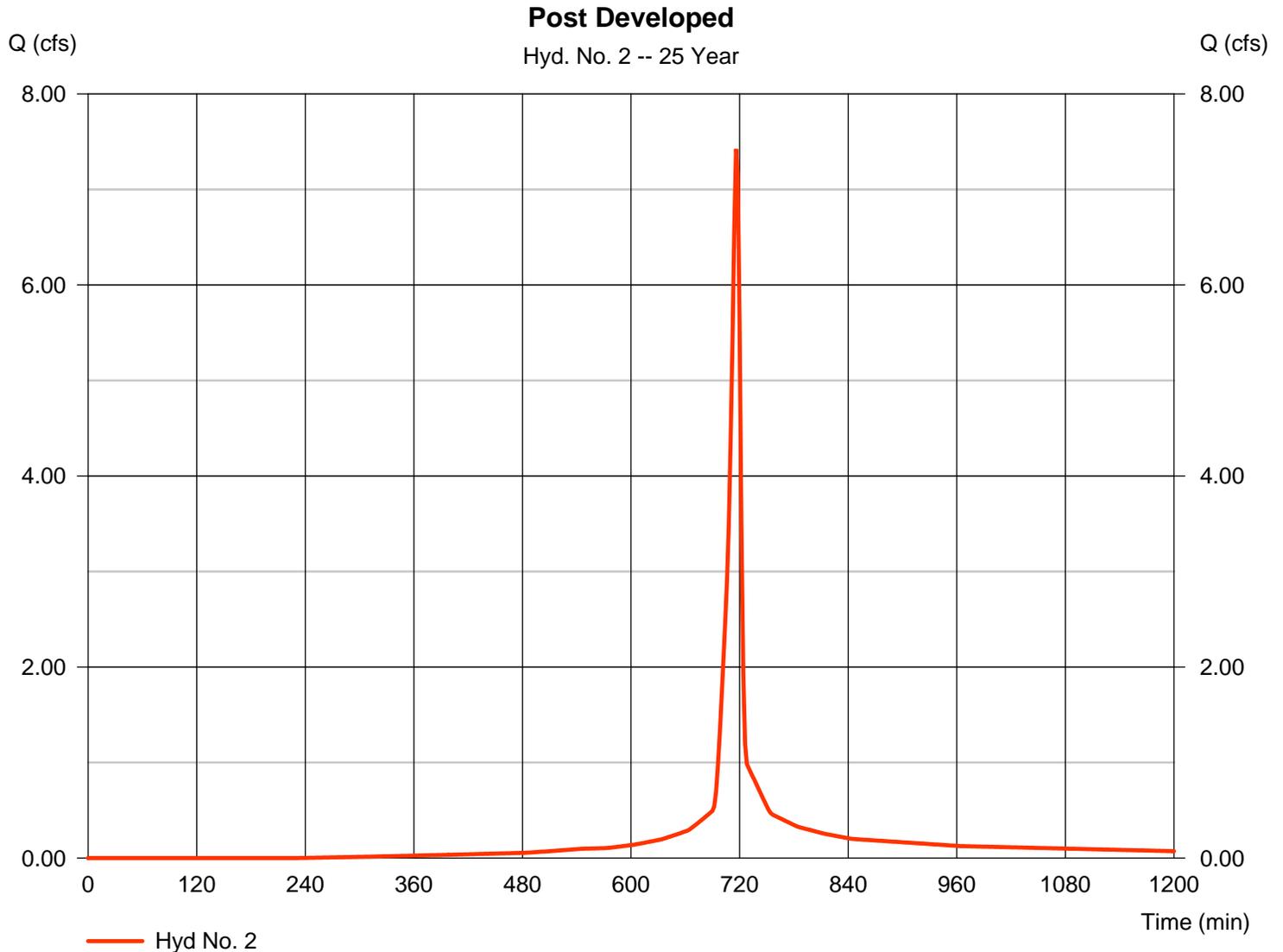
Thursday, 04 / 28 / 2016

Hyd. No. 2

Post Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 7.423 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 15,922 cuft
Drainage area	= 1.360 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.44 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.510 x 80) + (0.850 x 98)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

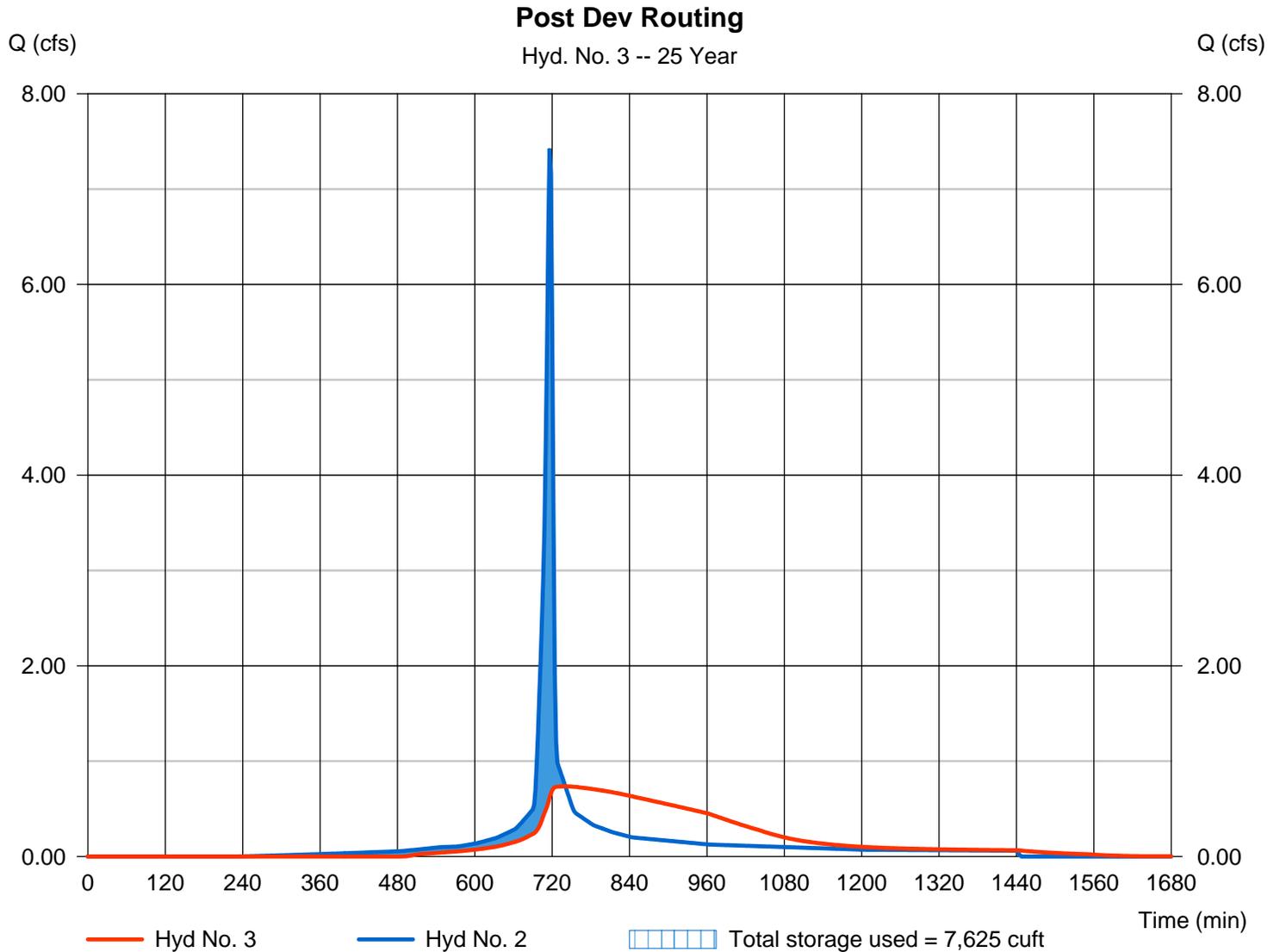
Thursday, 04 / 28 / 2016

Hyd. No. 3

Post Dev Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.736 cfs
Storm frequency	= 25 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 15,521 cuft
Inflow hyd. No.	= 2 - Post Developed	Max. Elevation	= 814.46 ft
Reservoir name	= UG Storage	Max. Storage	= 7,625 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	4.370	2	726	15,090	-----	-----	-----	Pre-Development	
2	SCS Runoff	8.551	2	716	18,520	-----	-----	-----	Post Developed	
3	Reservoir	0.788	2	742	18,119	2	814.65	8,912	Post Dev Routing	
Rite Rug Grove City.gpw					Return Period: 50 Year			Thursday, 04 / 28 / 2016		

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

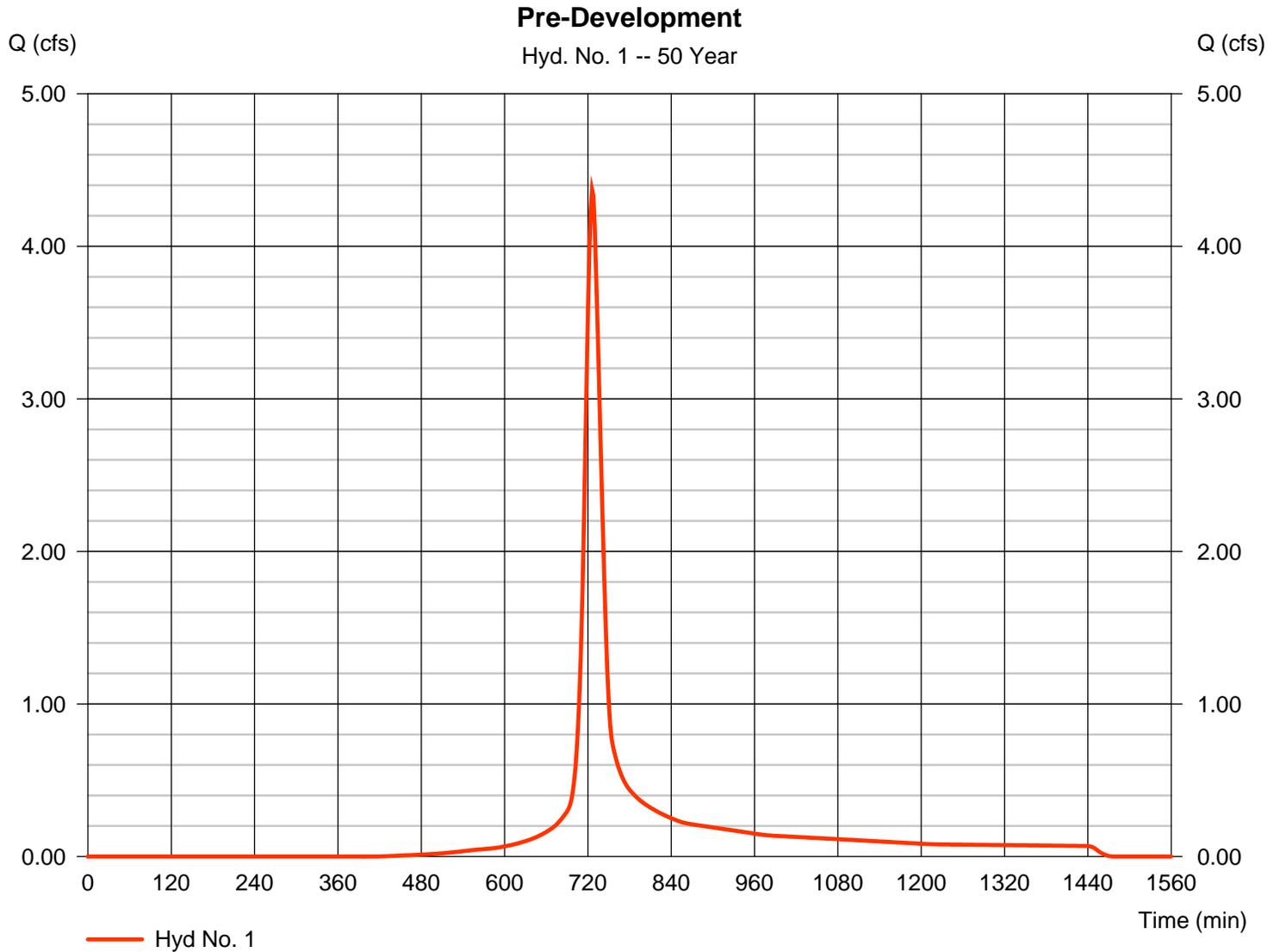
Thursday, 04 / 28 / 2016

Hyd. No. 1

Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 4.370 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 15,090 cuft
Drainage area	= 1.360 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.30 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 98) + (1.320 x 80)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

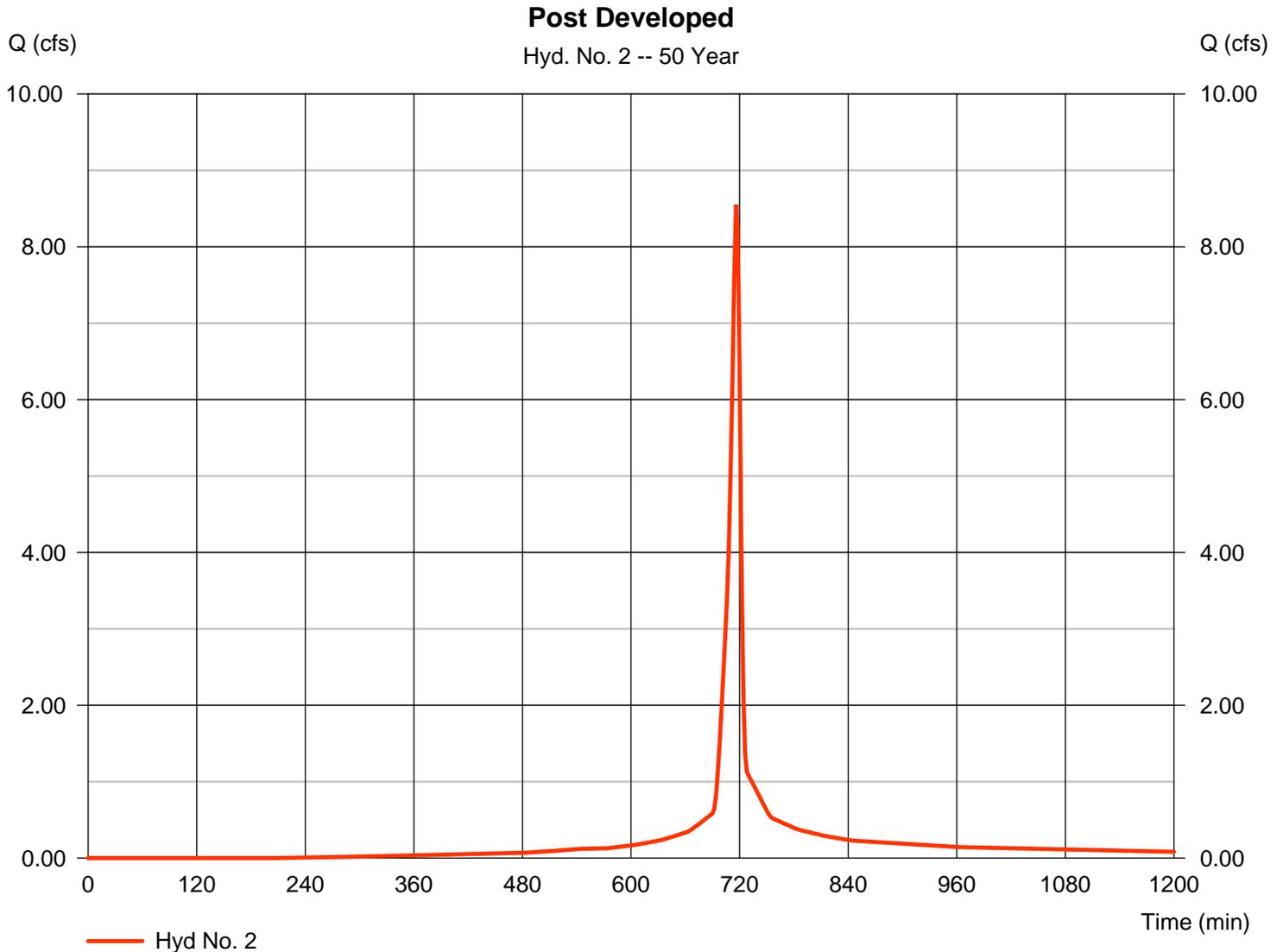
Thursday, 04 / 28 / 2016

Hyd. No. 2

Post Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 8.551 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 18,520 cuft
Drainage area	= 1.360 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.02 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.510 x 80) + (0.850 x 98)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

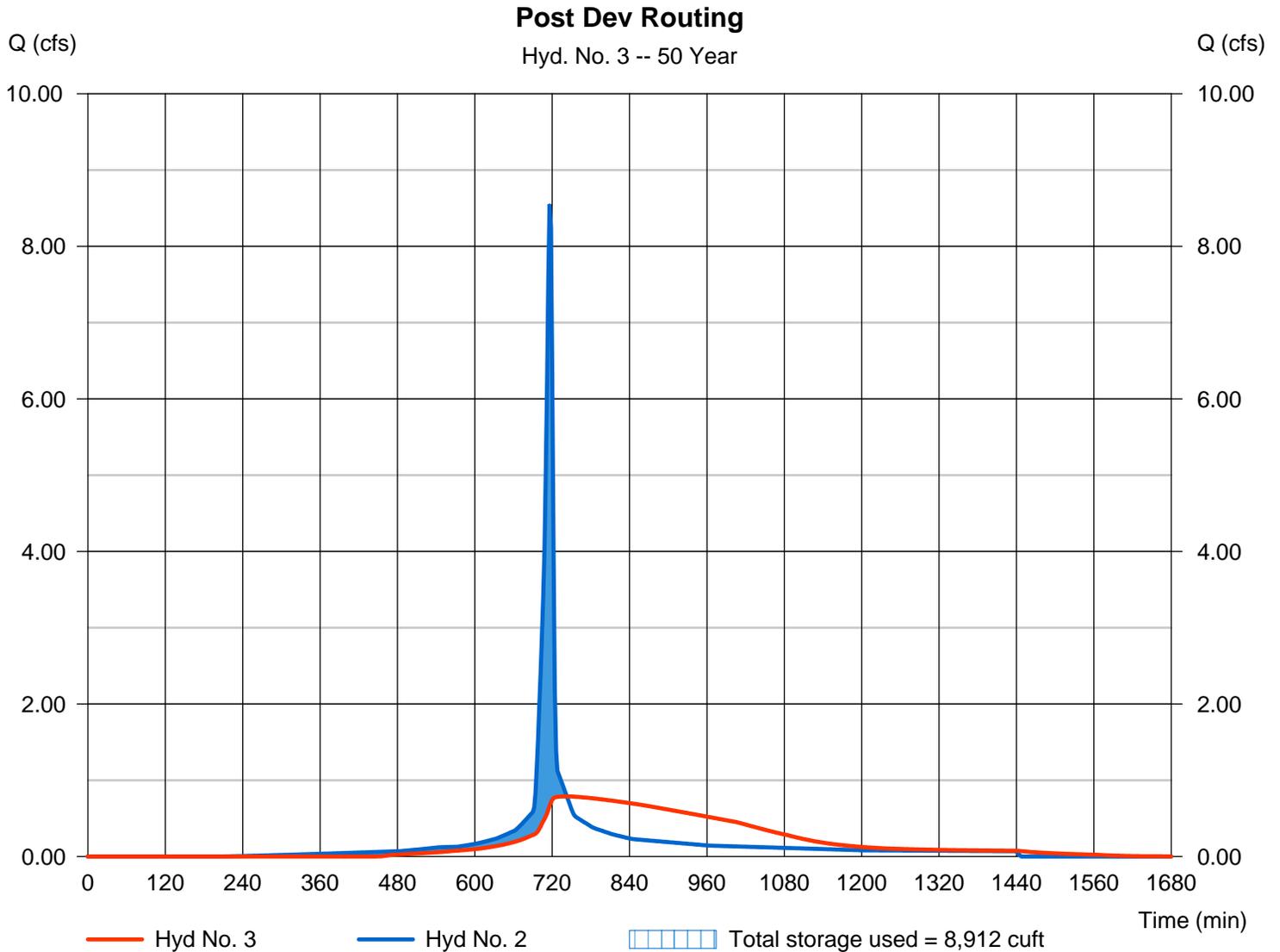
Thursday, 04 / 28 / 2016

Hyd. No. 3

Post Dev Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.788 cfs
Storm frequency	= 50 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 18,119 cuft
Inflow hyd. No.	= 2 - Post Developed	Max. Elevation	= 814.65 ft
Reservoir name	= UG Storage	Max. Storage	= 8,912 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	5.156	2	726	17,829	-----	-----	-----	Pre-Development	
2	SCS Runoff	9.732	2	716	21,269	-----	-----	-----	Post Developed	
3	Reservoir	0.840	2	744	20,868	2	814.85	10,285	Post Dev Routing	
Rite Rug Grove City.gpw					Return Period: 100 Year			Thursday, 04 / 28 / 2016		

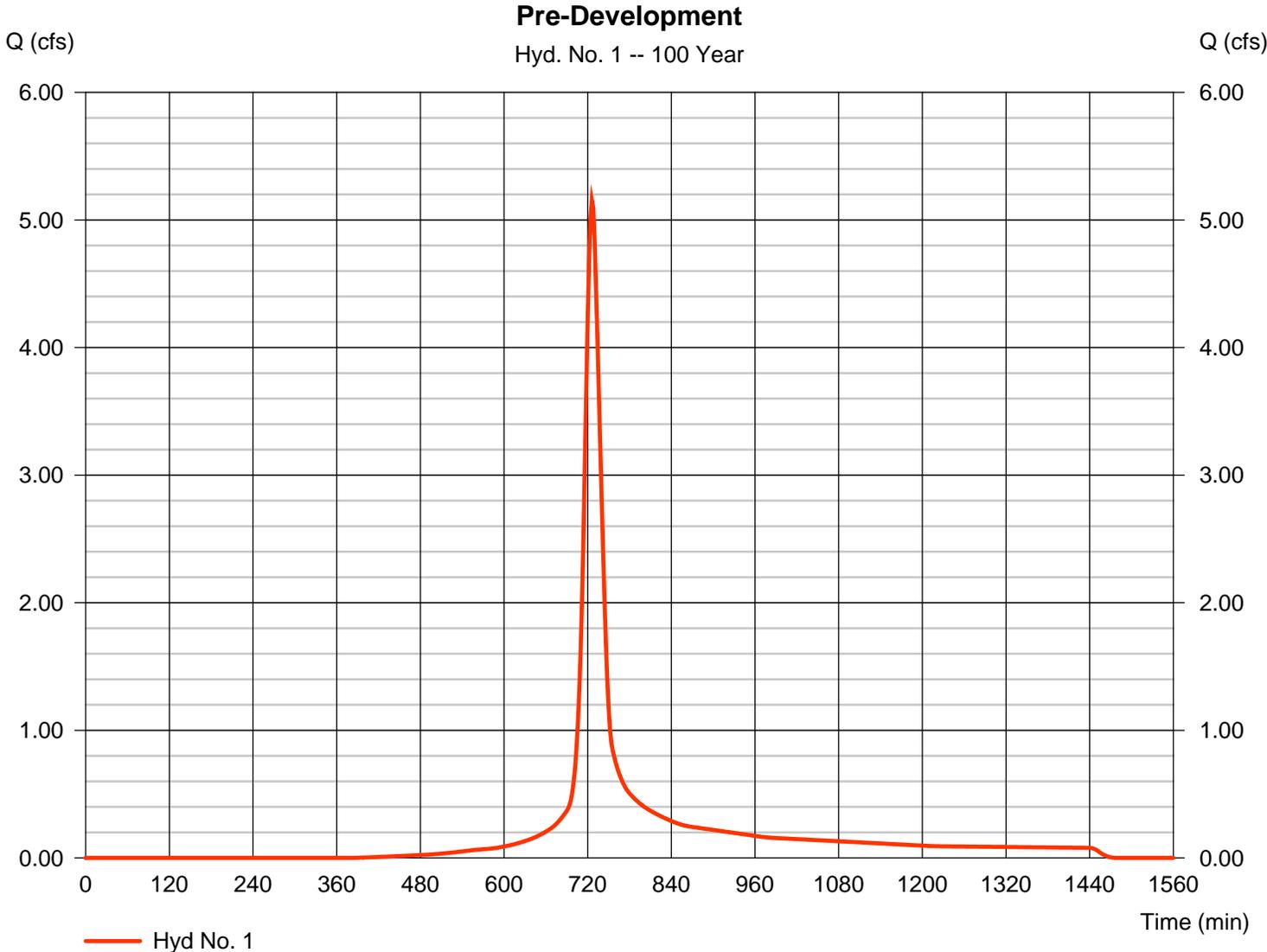
Hydrograph Report

Hyd. No. 1

Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 5.156 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 17,829 cuft
Drainage area	= 1.360 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.30 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 98) + (1.320 x 80)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

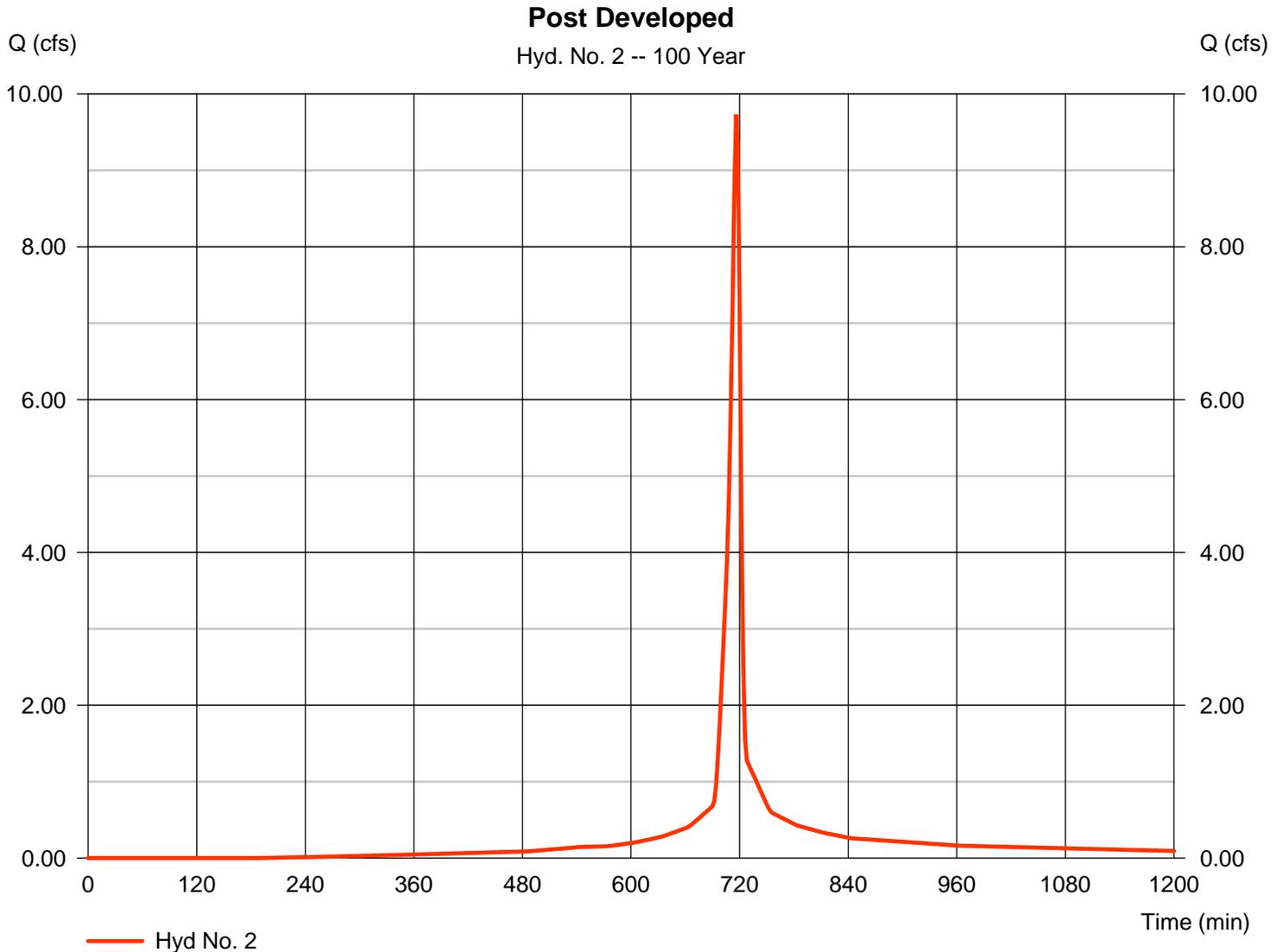
Thursday, 04 / 28 / 2016

Hyd. No. 2

Post Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 9.732 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 21,269 cuft
Drainage area	= 1.360 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.63 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.510 x 80) + (0.850 x 98)] / 1.360



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Thursday, 04 / 28 / 2016

Hyd. No. 3

Post Dev Routing

Hydrograph type	= Reservoir	Peak discharge	= 0.840 cfs
Storm frequency	= 100 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 20,868 cuft
Inflow hyd. No.	= 2 - Post Developed	Max. Elevation	= 814.85 ft
Reservoir name	= UG Storage	Max. Storage	= 10,285 cuft

Storage Indication method used.

