SUMMARY OF DATA

Method of Hydrograph Development: TR-55

Software: Autodesk Storm and Sanitary Stand Alone

Design Criteria: Control the post development storms of a frequency between one year and the critical storm so as to be equal to or less than the pre-development peak runoff rate for a 24 hour-one year frequency storm. Control post development storms less frequent than the critical storm so as to be equal to or less than the pre-development peak runoff rate for the next most frequent storm event.

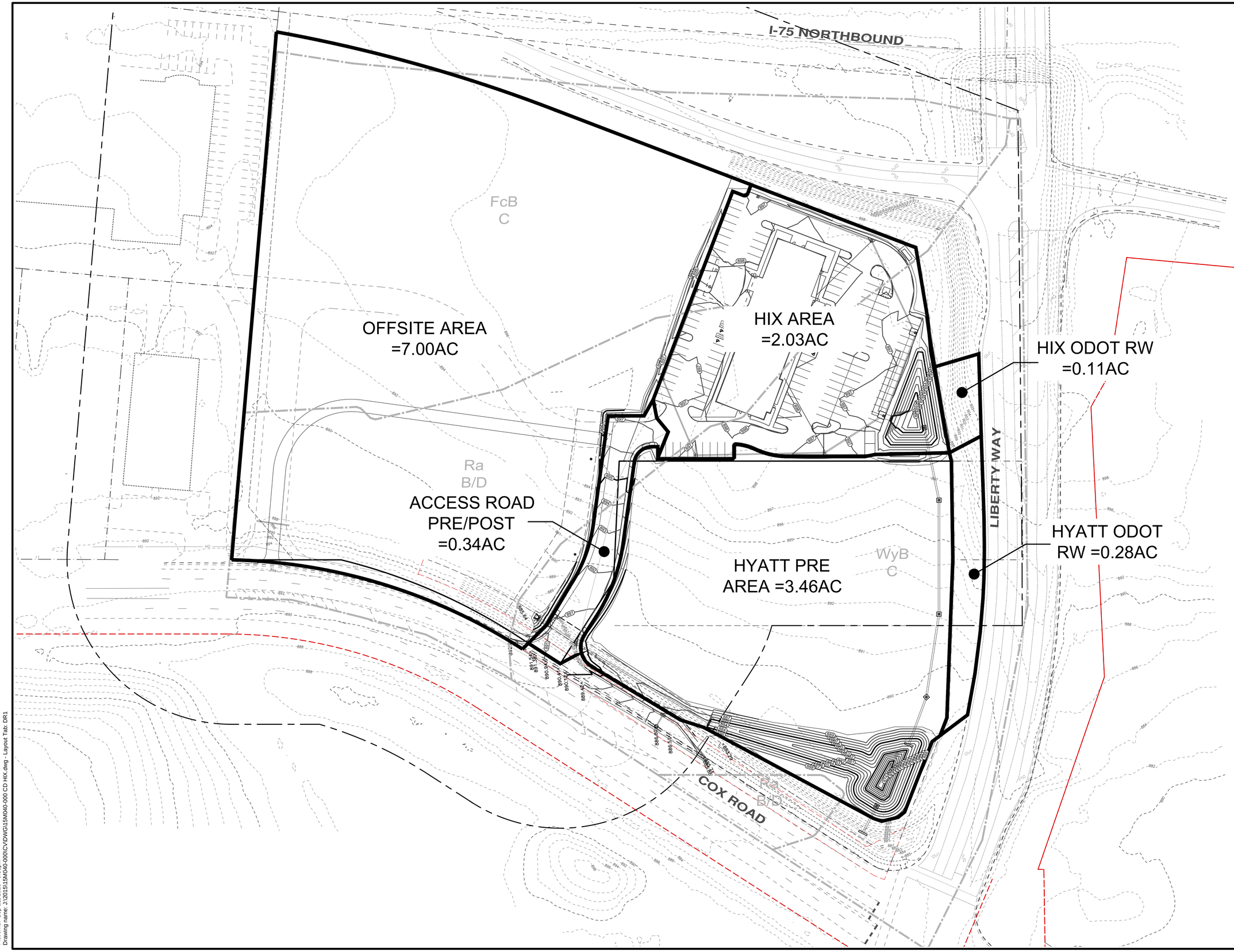
Drainage Area Descriptions	Drainage Area (Acres)	CN	Tc (Mins)	Q1 (cfs)	Q1 (ft^3)	Q25 (cfs)	Q50 (cfs)	Q100 (cfs)
Pre Developed Areas								
HIX Site	2.03	73.6	14.85	0.93 See 6	3,115	5.64	6.36	7.36
Access Drive	0.34	72.8	19.11	0.13 See 26	502	0.84	0.95	1.10
Hyatt Site	3.46	65.0	16.50	0.38		6.49	7.54 See 32	8.99 See 38
Post Developed Areas								
HIX Site	2.03	92.0	12.00	4.12 See 7	10,773	10.93 See 10	11.82 See 14	13.01 See 18
Access Drive	0.34	98.0	12.00	0.88 See 27	2,511	1.97	2.12 See 31	2.31 See 37
Offsite Areas								
Lot 1 Offsite	7.00	76.0	23.25	3.37		17.97	20.18 See 33	23.18 See 39
HIX ODOT RW	0.11	65.0	12.00	0.01		0.24 See 11	0.28 See 15	0.33 See 19
Hyatt ODOT RW	0.28	65.0	12.00	0.04		0.61	0.71 See 34	0.84 See 40

HIX Critical Storm = 25 yr.

HIX Allowable Release Rate= **Q1 HIX Site Pre Developed +** **Q25 HIX ODOT RW** See 5	**0.93 + 0.24 = 1.17 CFS**

Access Rd. Critical Storm = 50 yr.

Access Rd. Allowable Release Rate= **Q50 Hyatt Pre Developed +** **Q50 HIX +** **Q1 Access Drive Pre Developed + Q50** **Lot 1 Offsite +** **Q50 Hyatt ODOT RW**	**7.54 + 1.02 + 0.13 + 20.18 + 0.71 = 29.58CFS** See 24



Basis of Bearing:
State Plane NAD83 (2011)

0 50 75

SCALE: 1" = 50'

Item	Revision Description	Date	Drwn	Chk
1				
2				
3				
4				
5				
6				
7				
8				
9				

THE FIELDS AT LIBERTY WAY
PRELIMINARY DEVELOPMENT PLAN

COX ROAD & LIBERTY WAY
WEST CHESTER TOWNSHIP
BUTLER COUNTY, OH
SECTION 12, 18, TOWN 3, RANGE 2

DRAINAGE PLAN

bayer becker
www.bayerbecker.com
6070 Hamilton Road, Suite A
Mason, OH 45040 - 513.336.6600

Drawing: 15M040-000 CD HIX
Drawn by: MJL
Checked By:
Issue Date: 09-13-16
Sheet: **DR1**

Plot time: Sep 12, 2016 - 6:33pm
Drawing name: J:\2015\15M040-000\CIVIL\DWG\15M040-000 CD HIX.dwg - Layout Tab: DR1

Project: **The Fields at Liberty Way**

Drainage Area Description:

HIX Site Pre-Developed

Job #: 15M040.000
Initials: BJS
Date: 9/13/2016
Revised:

Drainage Area = 2.03 Acres

Soil Types:

22 %	Type 'B'	*0.5 acres*
78 %	Type 'C'	*1.6 acres*

Land Use: Woods - Grass 2.0 Acres

Composite Runoff Curve Number:

Ground Cover	Soil Type	CN	Soil Type %	Land Use %	CN*Soil %*Land %
Woods - Grass	**B**	65	22	100.0	14.41
Woods - Grass	**C**	76	78	100.0	59.15

Composite CN = 73.6

Time of Concentration:

Sheet Flow: **Tc**

Length = 72 Slope(ft/ft) = 0.0108 Manning's, n = 0.24 **0.248** *hr*

Tc = 0.25 ***hr***
15 min

Project: **The Fields at Liberty Way**

Drainage Area Description:

HIX Site Post-Developed

Job #: 15M040.000
Initials: BJS
Date: 9/13/2016
Revised:

Drainage Area = 2.03 Acres

Soil Types:

22 %	Type 'B'	*0.5 acres*
78 %	Type 'C'	*1.6 acres*

Land Use:

Impervious	1.6 Acres
Open Space - Good	0.4 Acres

Composite Runoff Curve Number:

Ground Cover	Soil Type	CN	Soil Type %	Land Use %	CN*Soil %*Land %
Impervious	**B**	98	22	77.9	16.91
Impervious	**C**	98	78	77.9	59.39
Open Space - Good	**B**	61	22	22.1	2.99
Open Space - Good	**C**	74	78	22.1	12.75

Composite CN = 92.0

Time of Concentration:

Tc

Tc = 12.00 *min*
12 min

SUMMARY OF DATA

Method of Hydrograph Development: TR-55

Software: Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2011

Design Criteria: Control the post development storms of a frequency between one year and the critical storm so as to be equal to or less than the pre-development peak runoff rate for a 24 hour one year frequency storm.

HIX Basin **100YR=894.77** **T/Dike=898.00**		**Outlet: 24" Pipe @ 0.58%** **4" Orifice Inv=887.06** **T/Grate @ 895.06, Spillway = 896.82**			
Frequency	**Inflow**	**Outflow**	**Storage**		**Elevation**
(yr)	(cfs)	(cfs)	(ft^3)	(ac-ft)	(ft)
1	4.13	0.78	3,821	0.09	890.74
5	7.84	0.95	8,498	0.20	892.46
10	9.30	1.01	10,504	0.24	893.10
25	11.16 See 12	1.07 See 13	13,153	0.30	893.89
50	12.09 See 16	1.10 See 17	14,515	0.33	894.27
100	13.34 See 20	1.14 See 21	16,377	0.38	894.77

Release Rate - Basin		
Critical Storm = 25 yr		
Storm Frequency	**Pre-Developed Allowable Release Rate**	**Post-Developed Release Rate**
(yr)	(cfs)	(cfs)
1	1.17	0.78
5	1.17	0.95
10	1.17	1.01
25	1.17	1.07 See 13
50	5.92	1.10 See 17
100	6.69	1.14 See 21

Note: Water Quality to be provided by Hyatt House pond.

See 25

AS-BUILT

Spillway		$Q_{100}=CLH^{3/2}$	
Q_{100}=13.34	C=3.0	L=30	H=0.28
Spillway Invert		896.82	
100 Year Weir Flow		897.10	
Top of Dike Elevation		898.00	
Freeboard		0.90'	
Spillway Side Slope		3:1	
Velocity		1.58	

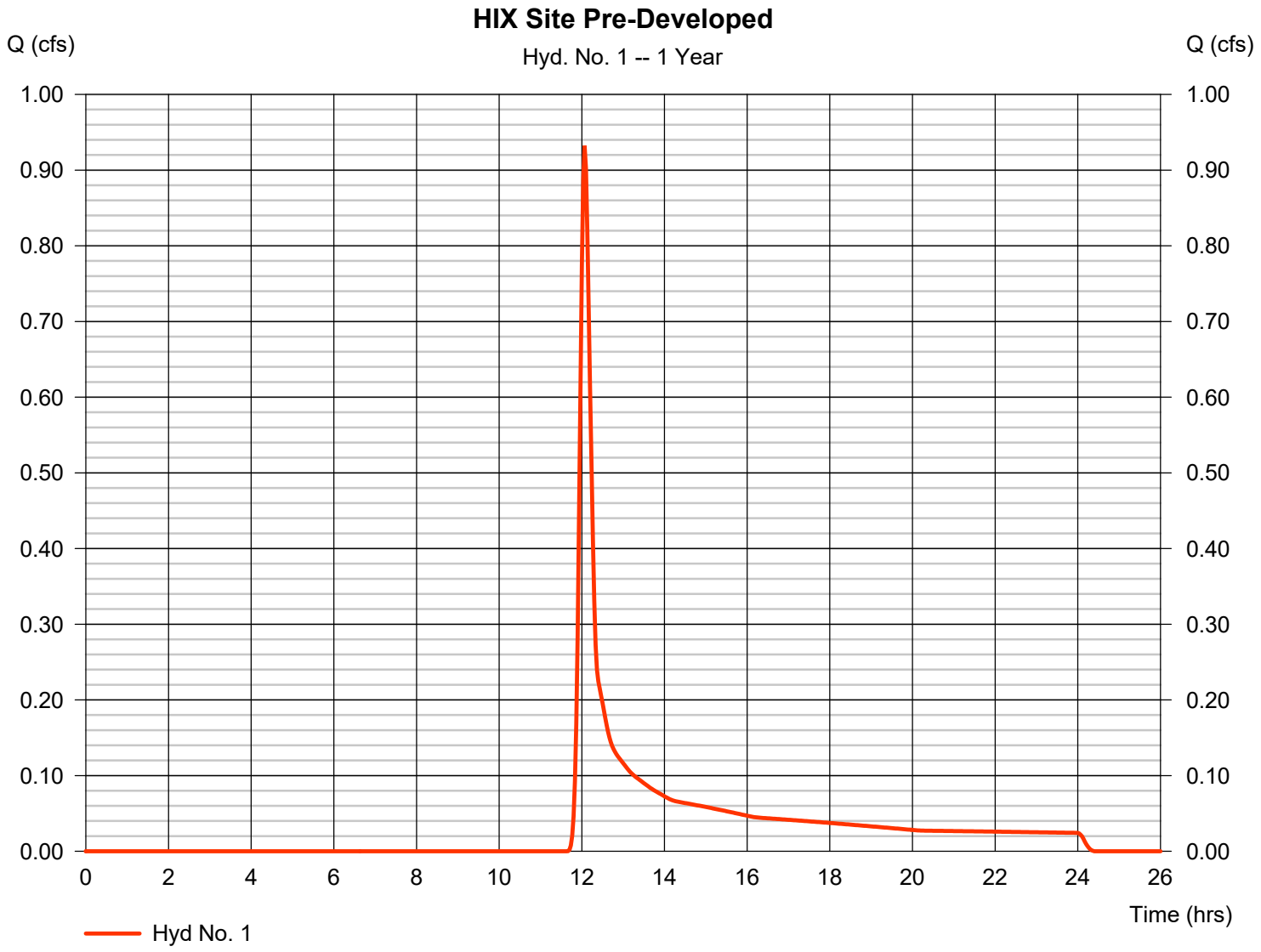
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Tuesday, 09 / 13 / 2016

Hyd. No. 1

HIX Site Pre-Developed

Hydrograph type	= SCS Runoff	Peak discharge	= 0.932 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 3,115 cuft
Drainage area	= 2.030 ac	Curve number	= 73.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 2.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

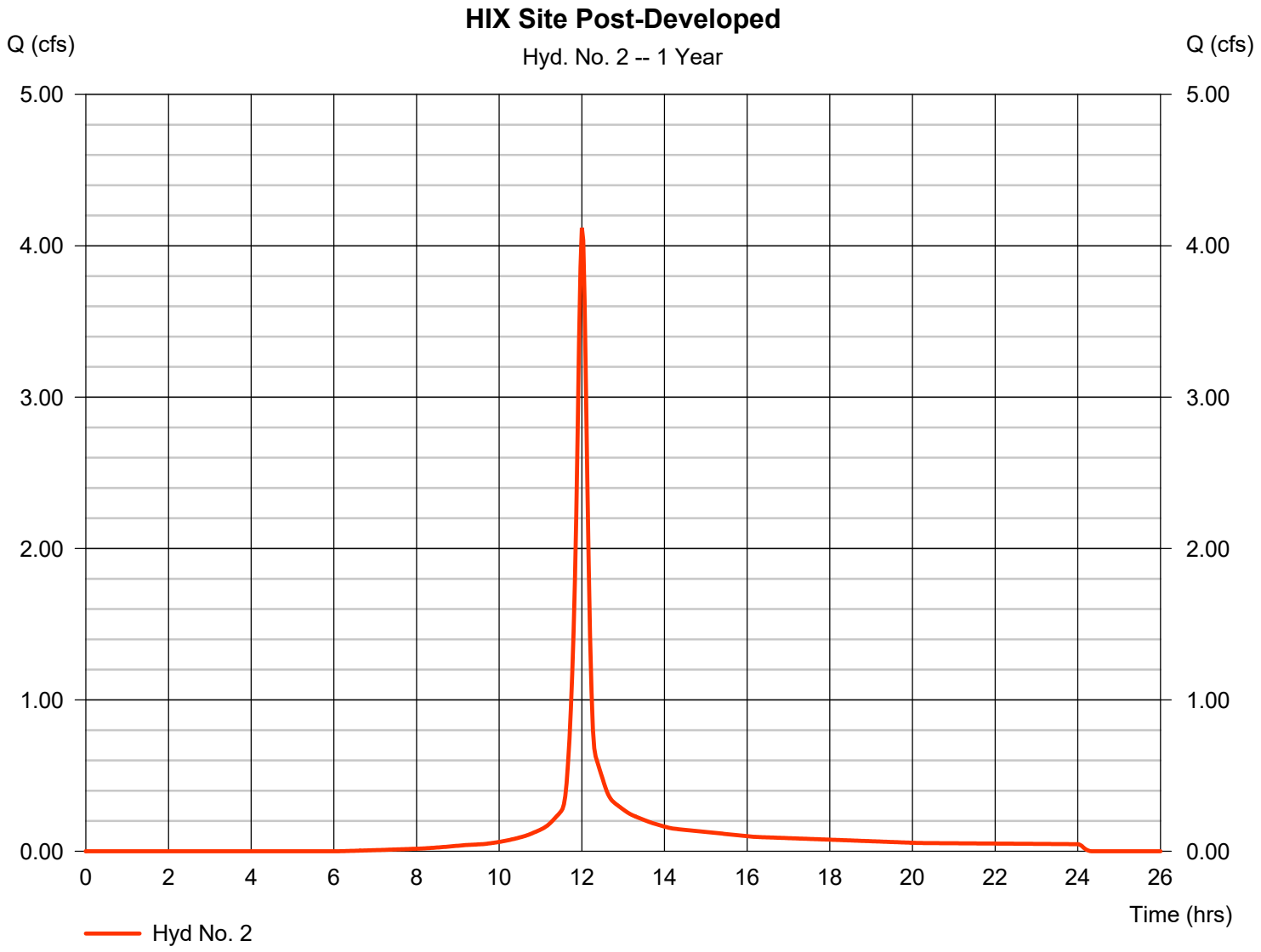


Hydrograph Report

Hyd. No. 2

HIX Site Post-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.120 cfs
Storm frequency	=	1 yrs	Time to peak	=	12.00 hrs
Time interval	=	2 min	Hyd. volume	=	10,773 cuft
Drainage area	=	2.030 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	2.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.514 Wednesday, 08 / 23 / 2017

Pond No. 2 - HIX Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 887.06 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	887.06	00	0	0
1.94	889.00	1,148	742	742
2.94	890.00	1,873	1,496	2,238
3.94	891.00	2,440	2,150	4,388
4.94	892.00	2,904	2,668	7,056
5.94	893.00	3,314	3,106	10,163
6.94	894.00	3,412	3,363	13,525
7.94	895.00	4,004	3,704	17,229
8.94	896.00	5,677	4,816	22,045

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	0.00	4.00	0.00
Span (in)	= 24.00	0.00	4.00	0.00
No. Barrels	= 1	0	1	0
Invert El. (ft)	= 886.96	0.00	887.06	0.00
Length (ft)	= 92.00	0.00	0.00	0.00
Slope (%)	= 0.58	0.00	0.00	n/a
N-Value	= .013	.013	.015	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 8.00	30.00	0.00	0.00
Crest El. (ft)	= 895.06	896.82	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

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	887.06	0.00	---	0.00	---	0.00	0.00	---	---	---	---	0.000
0.19	74	887.25	0.08 ic	---	0.08 ic	---	0.00	0.00	---	---	---	---	0.080
0.39	148	887.45	0.20 ic	---	0.20 ic	---	0.00	0.00	---	---	---	---	0.198
0.58	223	887.64	0.27 ic	---	0.27 ic	---	0.00	0.00	---	---	---	---	0.271
0.78	297	887.84	0.35 ic	---	0.33 ic	---	0.00	0.00	---	---	---	---	0.328
0.97	371	888.03	0.38 ic	---	0.38 ic	---	0.00	0.00	---	---	---	---	0.377
1.16	445	888.22	0.44 ic	---	0.42 ic	---	0.00	0.00	---	---	---	---	0.420
1.36	520	888.42	0.48 ic	---	0.46 ic	---	0.00	0.00	---	---	---	---	0.458
1.55	594	888.61	0.52 ic	---	0.49 ic	---	0.00	0.00	---	---	---	---	0.492
1.75	668	888.81	0.52 ic	---	0.52 ic	---	0.00	0.00	---	---	---	---	0.524
1.94	742	889.00	0.56 ic	---	0.56 ic	---	0.00	0.00	---	---	---	---	0.555
2.04	892	889.10	0.60 ic	---	0.57 ic	---	0.00	0.00	---	---	---	---	0.569
2.14	1,041	889.20	0.60 ic	---	0.58 ic	---	0.00	0.00	---	---	---	---	0.585
2.24	1,191	889.30	0.60 ic	---	0.60 ic	---	0.00	0.00	---	---	---	---	0.599
2.34	1,341	889.40	0.64 ic	---	0.61 ic	---	0.00	0.00	---	---	---	---	0.612
2.44	1,490	889.50	0.64 ic	---	0.63 ic	---	0.00	0.00	---	---	---	---	0.627
2.54	1,640	889.60	0.64 ic	---	0.64 ic	---	0.00	0.00	---	---	---	---	0.640
2.64	1,789	889.70	0.69 ic	---	0.65 ic	---	0.00	0.00	---	---	---	---	0.653
2.74	1,939	889.80	0.69 ic	---	0.67 ic	---	0.00	0.00	---	---	---	---	0.666
2.84	2,088	889.90	0.69 ic	---	0.68 ic	---	0.00	0.00	---	---	---	---	0.679
2.94	2,238	890.00	0.69 ic	---	0.69 ic	---	0.00	0.00	---	---	---	---	0.691
3.04	2,453	890.10	0.73 ic	---	0.70 ic	---	0.00	0.00	---	---	---	---	0.703
3.14	2,668	890.20	0.73 ic	---	0.72 ic	---	0.00	0.00	---	---	---	---	0.716
3.24	2,883	890.30	0.73 ic	---	0.73 ic	---	0.00	0.00	---	---	---	---	0.728
3.34	3,098	890.40	0.74 ic	---	0.74 ic	---	0.00	0.00	---	---	---	---	0.739
3.44	3,313	890.50	0.78 ic	---	0.75 ic	---	0.00	0.00	---	---	---	---	0.750
3.54	3,528	890.60	0.78 ic	---	0.76 ic	---	0.00	0.00	---	---	---	---	0.762
3.64	3,743	890.70	0.78 ic	---	0.77 ic	---	0.00	0.00	---	---	---	---	0.773
3.74	3,958	890.80	0.78 ic	---	0.78 ic	---	0.00	0.00	---	---	---	---	0.785
3.84	4,173	890.90	0.79 ic	---	0.79 ic	---	0.00	0.00	---	---	---	---	0.795
3.94	4,388	891.00	0.84 ic	---	0.81 ic	---	0.00	0.00	---	---	---	---	0.806
4.04	4,655	891.10	0.84 ic	---	0.82 ic	---	0.00	0.00	---	---	---	---	0.817
4.14	4,922	891.20	0.84 ic	---	0.83 ic	---	0.00	0.00	---	---	---	---	0.827
4.24	5,188	891.30	0.84 ic	---	0.84 ic	---	0.00	0.00	---	---	---	---	0.838

Continues on next page...

HIX Pond

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
3.20	5,230	891.20	0.73 ic	---	0.71 ic	---	0.00	0.00	---	---	---	---	0.711
3.30	5,512	891.30	0.73 ic	---	0.72 ic	---	0.00	0.00	---	---	---	---	0.723
3.40	5,793	891.40	0.73 ic	---	0.73 ic	---	0.00	0.00	---	---	---	---	0.735
3.50	6,075	891.50	0.75 ic	---	0.75 ic	---	0.00	0.00	---	---	---	---	0.746
3.60	6,357	891.60	0.78 ic	---	0.76 ic	---	0.00	0.00	---	---	---	---	0.757
3.70	6,639	891.70	0.78 ic	---	0.77 ic	---	0.00	0.00	---	---	---	---	0.769
3.80	6,921	891.80	0.78 ic	---	0.78 ic	---	0.00	0.00	---	---	---	---	0.780
3.90	7,202	891.90	0.79 ic	---	0.79 ic	---	0.00	0.00	---	---	---	---	0.791
4.00	7,484	892.00	0.84 ic	---	0.80 ic	---	0.00	0.00	---	---	---	---	0.801
4.10	7,811	892.10	0.84 ic	---	0.81 ic	---	0.00	0.00	---	---	---	---	0.812
4.20	8,137	892.20	0.84 ic	---	0.82 ic	---	0.00	0.00	---	---	---	---	0.823
4.30	8,464	892.30	0.84 ic	---	0.83 ic	---	0.00	0.00	---	---	---	---	0.834
4.40	8,790	892.40	0.84 ic	---	0.84 ic	---	0.00	0.00	---	---	---	---	0.843
4.50	9,117	892.50	0.89 ic	---	0.85 ic	---	0.00	0.00	---	---	---	---	0.853
4.60	9,443	892.60	0.89 ic	---	0.86 ic	---	0.00	0.00	---	---	---	---	0.864
4.70	9,770	892.70	0.89 ic	---	0.87 ic	---	0.00	0.00	---	---	---	---	0.874
4.80	10,097	892.80	0.89 ic	---	0.88 ic	---	0.00	0.00	---	---	---	---	0.884
4.90	10,423	892.90	0.89 ic	---	0.89 ic	---	0.00	0.00	---	---	---	---	0.893
5.00	10,750	893.00	0.90 ic	---	0.90 ic	---	0.00	0.00	---	---	---	---	0.902
5.10	11,106	893.10	0.95 ic	---	0.91 ic	---	0.00	0.00	---	---	---	---	0.912
5.20	11,462	893.20	0.95 ic	---	0.92 ic	---	0.00	0.00	---	---	---	---	0.922
5.30	11,818	893.30	0.95 ic	---	0.93 ic	---	0.00	0.00	---	---	---	---	0.931
5.40	12,175	893.40	0.95 ic	---	0.94 ic	---	0.00	0.00	---	---	---	---	0.941
5.50	12,531	893.50	0.95 ic	---	0.95 ic	---	0.00	0.00	---	---	---	---	0.950
5.60	12,887	893.60	0.96 ic	---	0.96 ic	---	0.00	0.00	---	---	---	---	0.958
5.70	13,244	893.70	1.01 ic	---	0.97 ic	---	0.00	0.00	---	---	---	---	0.967
5.80	13,600	893.80	1.01 ic	---	0.98 ic	---	0.00	0.00	---	---	---	---	0.976
5.90	13,956	893.90	1.01 ic	---	0.99 ic	---	0.00	0.00	---	---	---	---	0.985
6.00	14,312	894.00	1.01 ic	---	0.99 ic	---	0.00	0.00	---	---	---	---	0.994
6.10	14,699	894.10	1.01 ic	---	1.00 ic	---	0.00	0.00	---	---	---	---	1.003
6.20	15,085	894.20	1.01 ic	---	1.01 ic	---	0.00	0.00	---	---	---	---	1.011
6.30	15,471	894.30	1.02 ic	---	1.02 ic	---	0.00	0.00	---	---	---	---	1.020
6.40	15,857	894.40	1.07 ic	---	1.03 ic	---	0.00	0.00	---	---	---	---	1.028
6.50	16,243	894.50	1.07 ic	---	1.04 ic	---	0.00	0.00	---	---	---	---	1.037
6.60	16,630	894.60	1.07 ic	---	1.05 ic	---	0.00	0.00	---	---	---	---	1.045
6.70	17,016	894.70	1.07 ic	---	1.05 ic	---	0.00	0.00	---	---	---	---	1.053
6.80	17,402	894.80	1.07 ic	---	1.06 ic	---	0.00	0.00	---	---	---	---	1.062
6.90	17,788	894.90	1.07 ic	---	1.07 ic	---	0.00	0.00	---	---	---	---	1.070
7.00	18,175	895.00	1.08 ic	---	1.08 ic	---	0.00	0.00	---	---	---	---	1.078
7.10	18,628	895.10	1.92 ic	---	1.07 ic	---	0.84	0.00	---	---	---	---	1.916
7.20	19,082	895.20	3.52 ic	---	1.06 ic	---	2.38	0.00	---	---	---	---	3.446
7.30	19,536	895.30	5.46 ic	---	1.05 ic	---	4.38	0.00	---	---	---	---	5.430
7.40	19,990	895.40	7.80 ic	---	1.04 ic	---	6.74	0.00	---	---	---	---	7.780
7.50	20,444	895.50	10.45 ic	---	1.03 ic	---	9.42	0.00	---	---	---	---	10.45
7.60	20,898	895.60	13.39 ic	---	1.01 ic	---	12.38	0.00	---	---	---	---	13.39
7.70	21,352	895.70	16.53 oc	---	0.93 ic	---	15.60	0.00	---	---	---	---	16.53
7.80	21,806	895.80	19.89 oc	---	0.83 ic	---	19.06	0.00	---	---	---	---	19.89
7.90	22,260	895.90	23.41 oc	---	0.67 ic	---	22.74	0.00	---	---	---	---	23.41
8.00	22,714	896.00	27.01 oc	---	0.41 ic	---	26.60 s	0.00	---	---	---	---	27.01
8.10	23,215	896.10	27.82 oc	---	0.34 ic	---	27.48 s	0.00	---	---	---	---	27.82
8.20	23,716	896.20	28.30 oc	---	0.30 ic	---	28.00 s	2.47	---	---	---	---	30.77
8.30	24,218	896.30	28.69 oc	---	0.27 ic	---	28.42 s	6.97	---	---	---	---	35.66
8.40	24,719	896.40	29.01 oc	---	0.24 ic	---	28.77 s	12.81	---	---	---	---	41.82
8.50	25,221	896.50	29.29 oc	---	0.22 ic	---	29.07 s	19.73	---	---	---	---	49.02
8.60	25,722	896.60	29.55 oc	---	0.20 ic	---	29.35 s	27.57	---	---	---	---	57.12
8.70	26,224	896.70	29.79 oc	---	0.19 ic	---	29.61 s	36.24	---	---	---	---	66.03
8.80	26,725	896.80	30.02 oc	---	0.17 ic	---	29.85 s	45.66	---	---	---	---	75.68
8.90	27,227	896.90	30.24 oc	---	0.16 ic	---	30.07 s	55.79	---	---	---	---	86.02
9.00	27,728	897.00	30.45 oc	---	0.15 ic	---	30.29 s	66.60	---	---	---	---	97.04
9.10	28,229	897.10	30.65 oc	---	0.14 ic	---	30.50 s	78.00	---	---	---	---	108.64
9.20	28,731	897.20	30.84 oc	---	0.13 ic	---	30.71 s	89.98	---	---	---	---	120.82
9.30	29,232	897.30	31.03 oc	---	0.13 ic	---	30.90 s	102.53	---	---	---	---	133.56
9.40	29,734	897.40	31.22 oc	---	0.12 ic	---	31.09 s	115.60	---	---	---	---	146.81
9.50	30,235	897.50	31.41 oc	---	0.11 ic	---	31.28 s	129.19	---	---	---	---	160.59
9.60	30,737	897.60	31.59 oc	---	0.11 ic	---	31.47 s	143.28	---	---	---	---	174.85
9.70	31,238	897.70	31.76 oc	---	0.10 ic	---	31.65 s	157.84	---	---	---	---	189.59
9.80	31,740	897.80	31.94 oc	---	0.10 ic	---	31.83 s	172.86	---	---	---	---	204.79
9.90	32,241	897.90	32.12 oc	---	0.09 ic	---	32.00 s	188.34	---	---	---	---	220.43
10.00	32,743	898.00	32.29 oc	---	0.09 ic	---	32.19 s	204.28	---	---	---	---	236.56

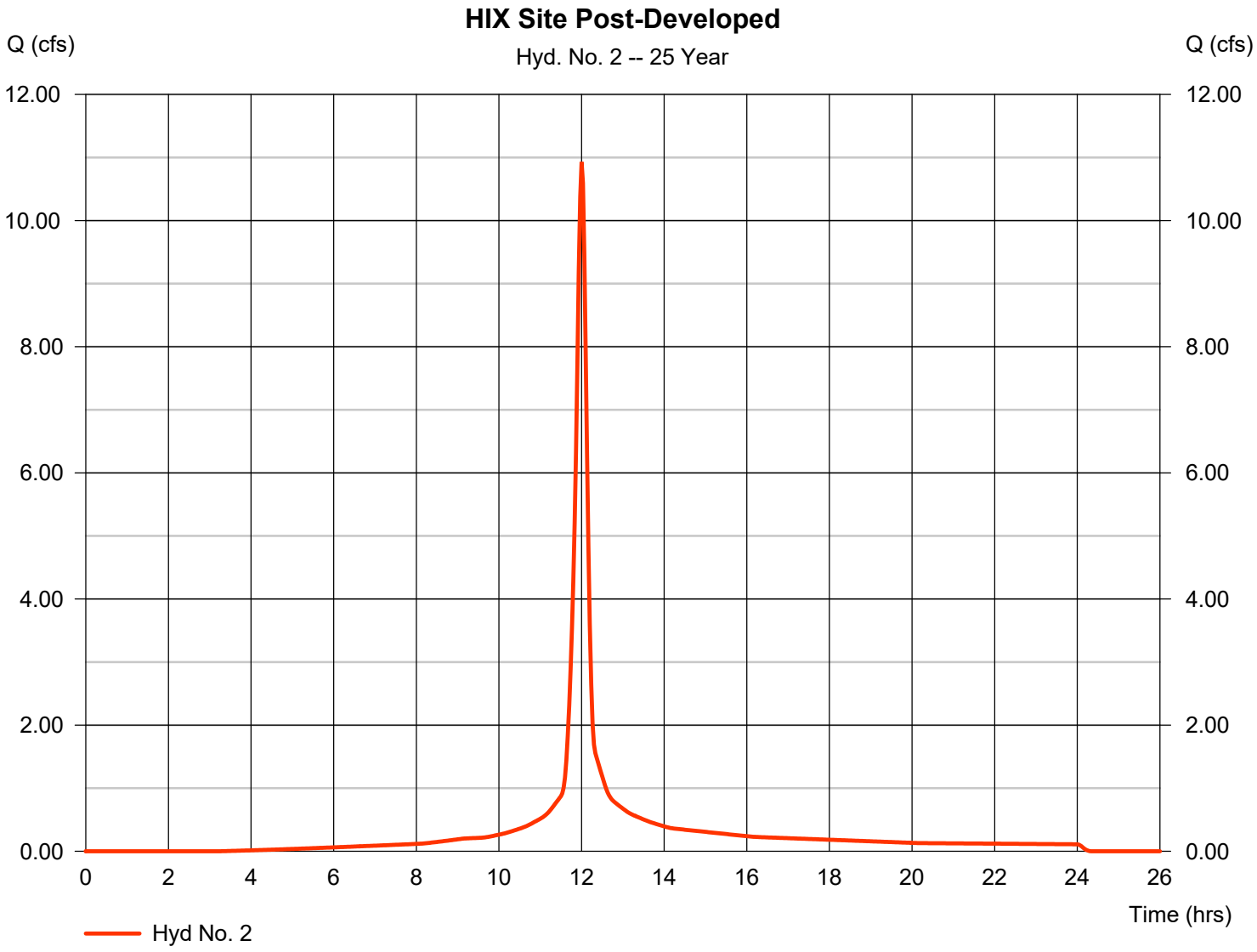
...End

Hydrograph Report

Hyd. No. 2

HIX Site Post-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.93 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.00 hrs
Time interval	=	2 min	Hyd. volume	=	29,963 cuft
Drainage area	=	2.030 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	4.85 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



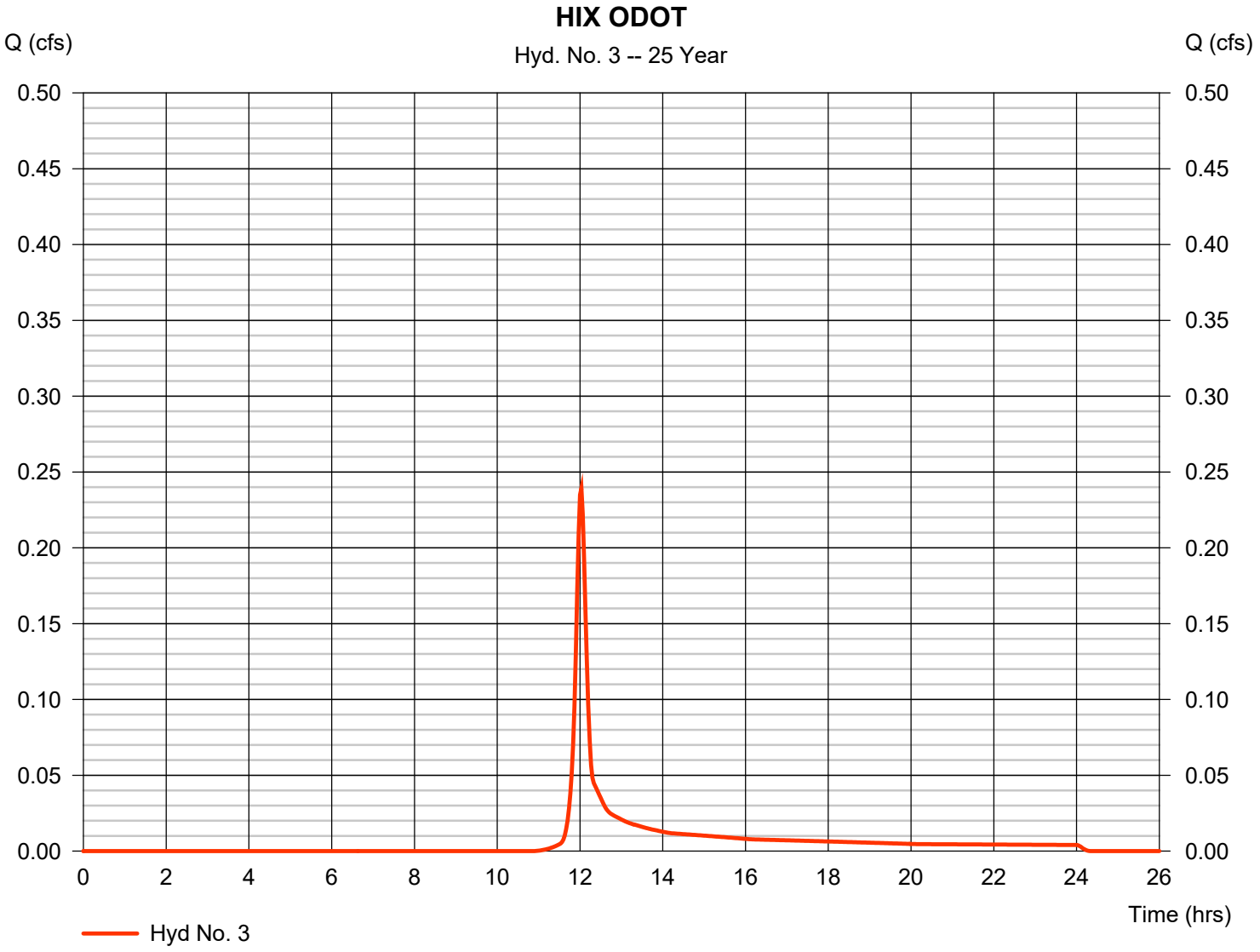
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Tuesday, 09 / 13 / 2016

Hyd. No. 3

HIX ODOT

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.239 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	640 cuft
Drainage area	=	0.110 ac	Curve number	=	65
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	4.85 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

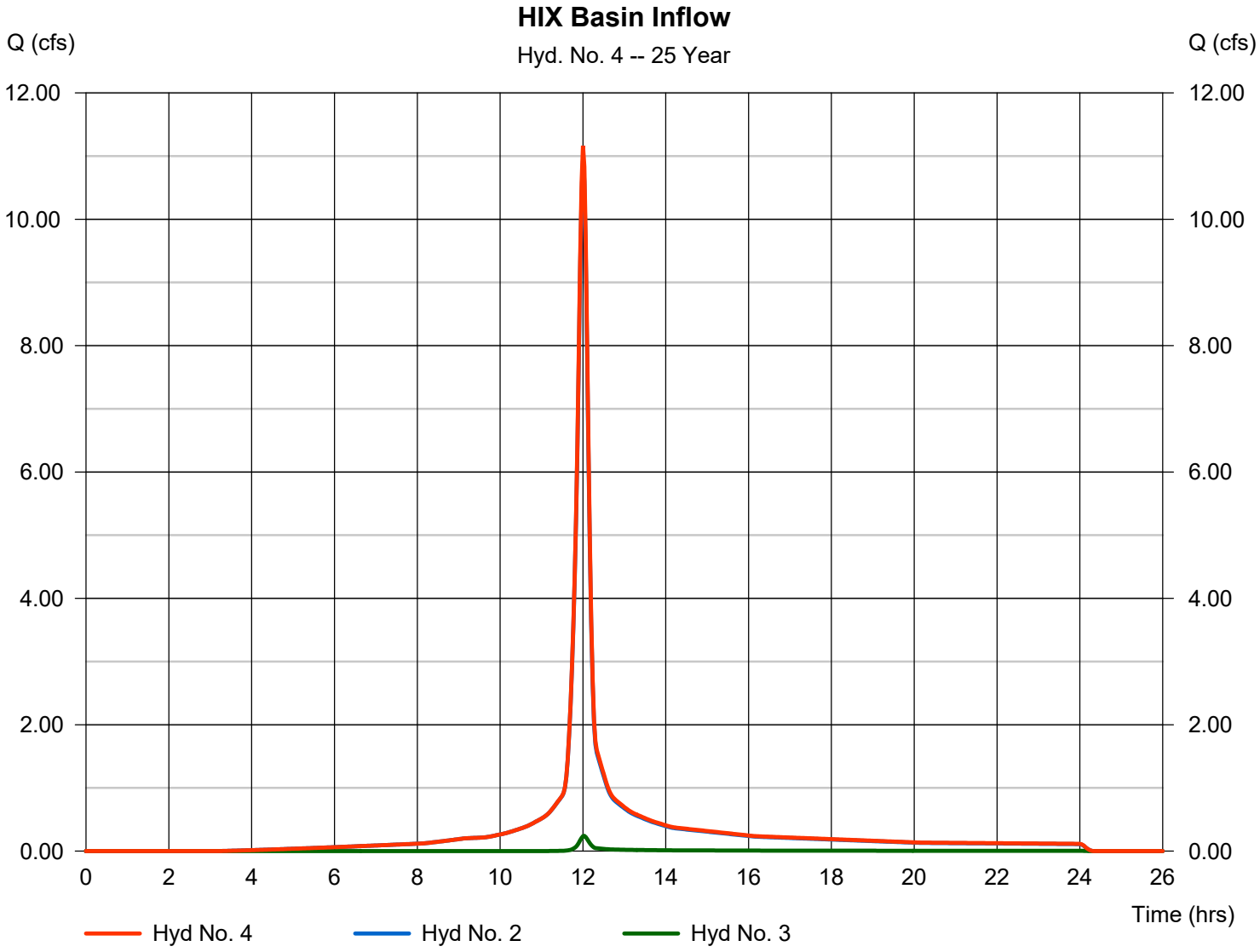


Hydrograph Report

Hyd. No. 4

HIX Basin Inflow

Hydrograph type	=	Combine	Peak discharge	=	11.16 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.00 hrs
Time interval	=	2 min	Hyd. volume	=	30,603 cuft
Inflow hyds.	=	2, 3	Contrib. drain. area	=	2.140 ac



Hydrograph Report

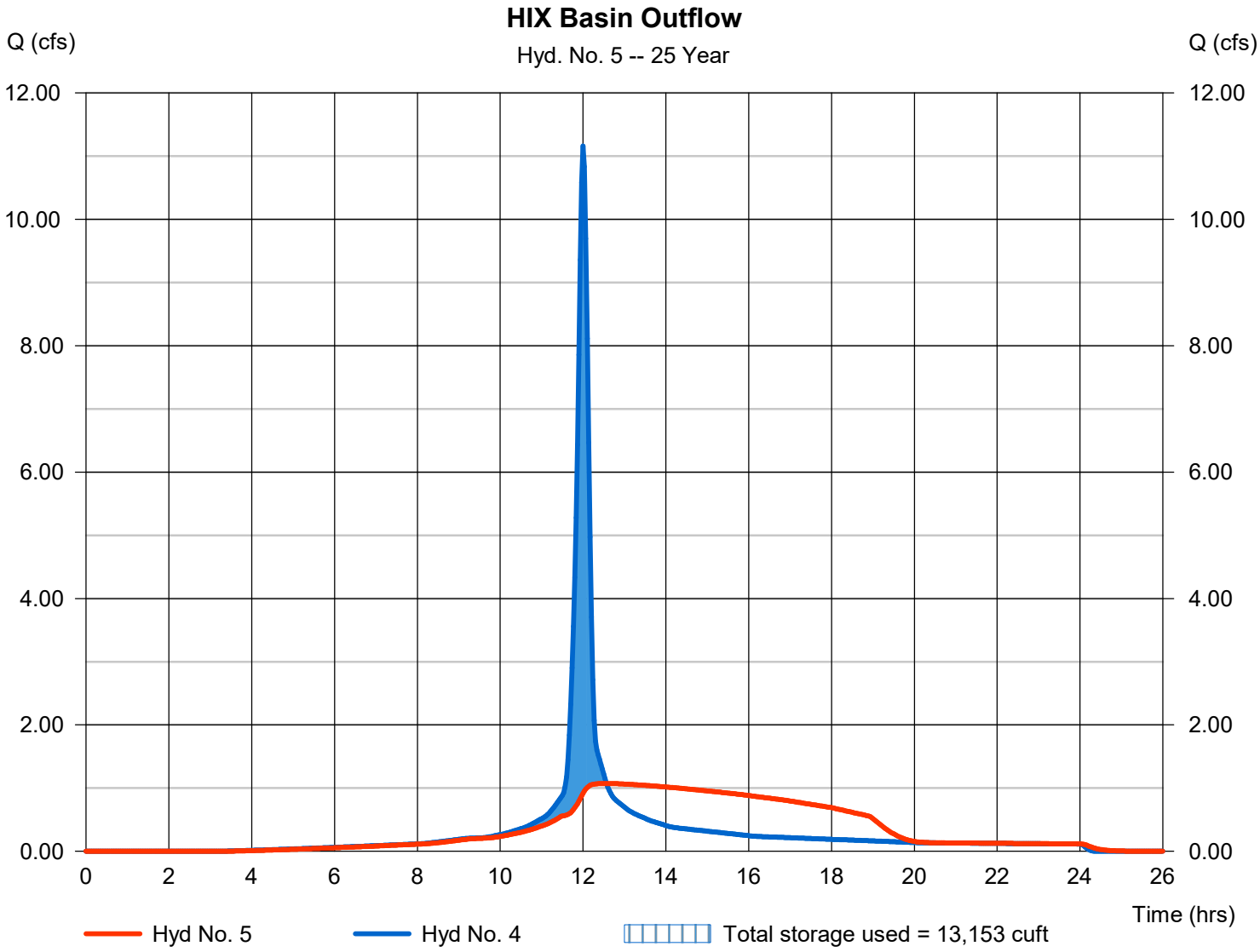
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.514 Tuesday, 08 / 22 / 2017

Hyd. No. 5

HIX Basin Outflow

Hydrograph type	=	Reservoir	Peak discharge	=	1.072 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.57 hrs
Time interval	=	2 min	Hyd. volume	=	30,602 cuft
Inflow hyd. No.	=	4 - HIX Basin Inflow	Max. Elevation	=	893.89 ft
Reservoir name	=	HIX Pond	Max. Storage	=	13,153 cuft

Storage Indication method used.

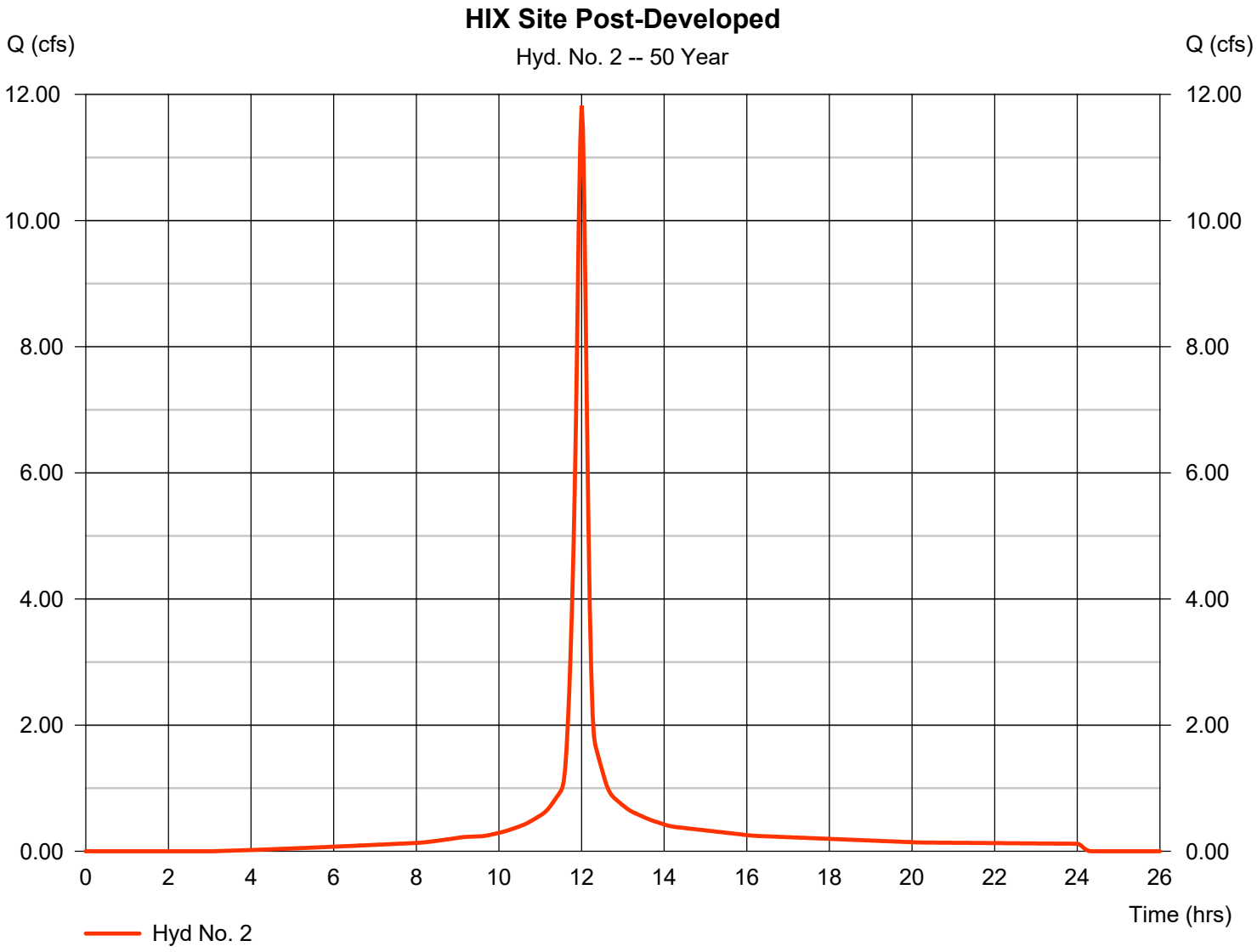


Hydrograph Report

Hyd. No. 2

HIX Site Post-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.82 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.00 hrs
Time interval	=	2 min	Hyd. volume	=	32,561 cuft
Drainage area	=	2.030 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

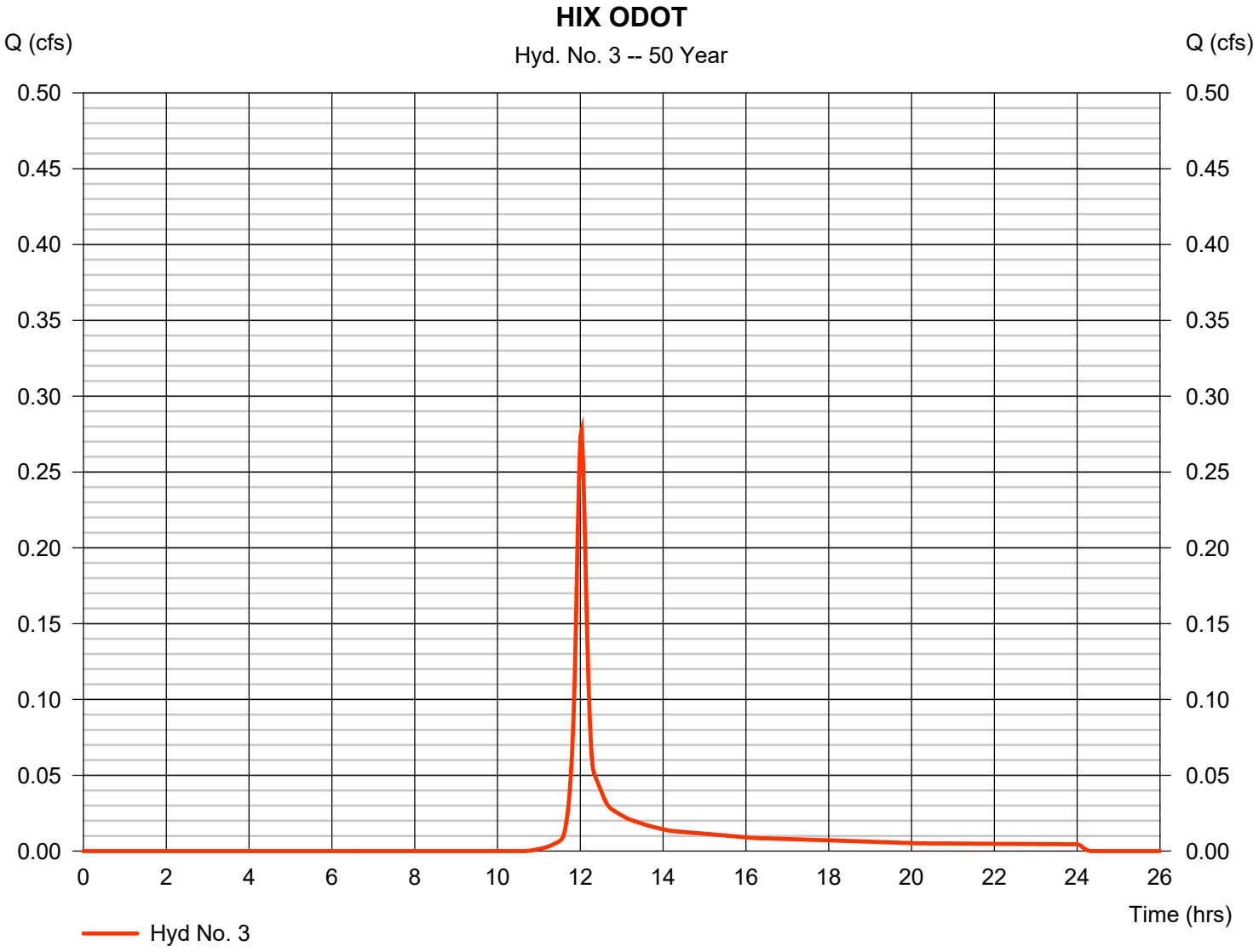


Hydrograph Report

Hyd. No. 3

HIX ODOT

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.277 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	736 cuft
Drainage area	=	0.110 ac	Curve number	=	65
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

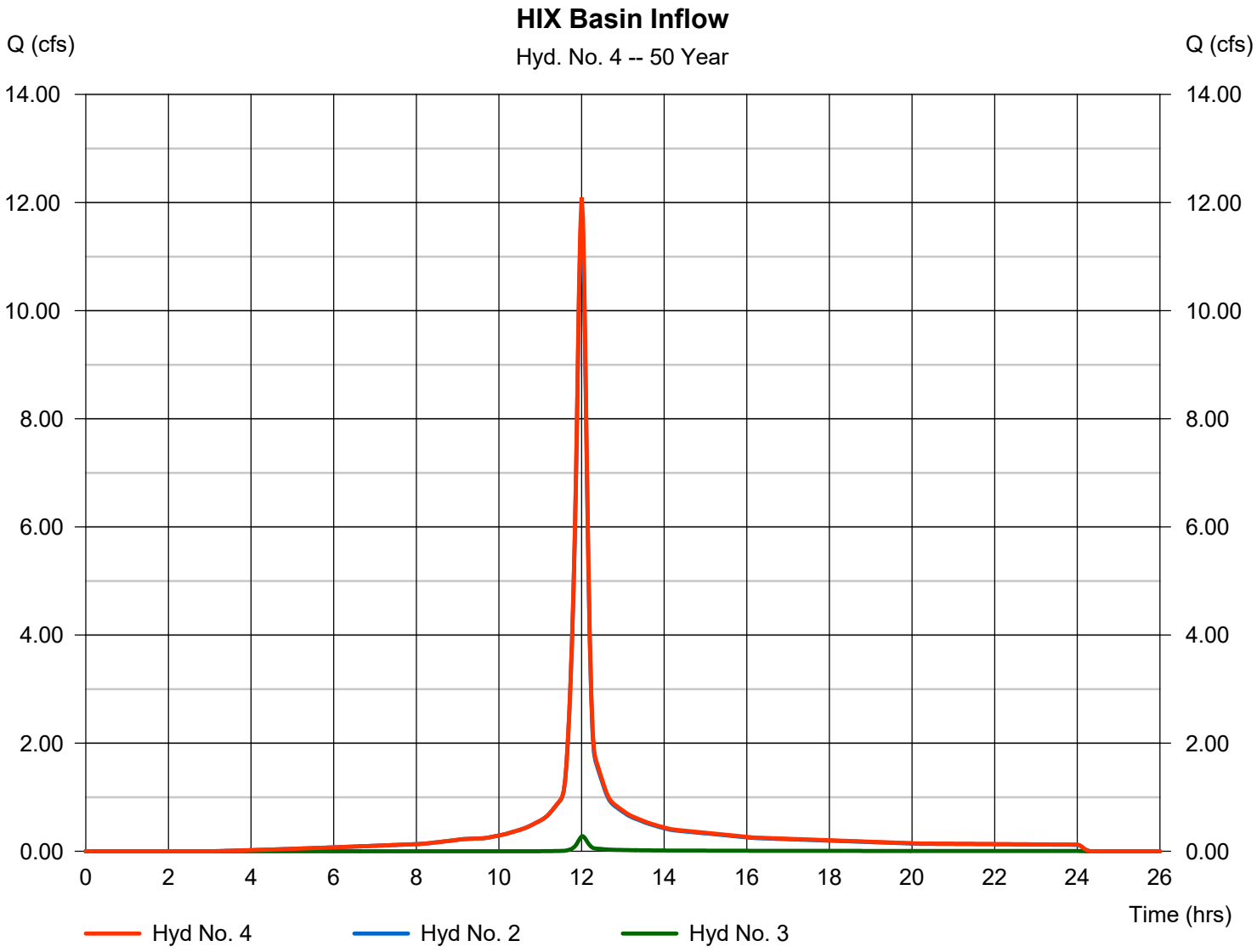


Hydrograph Report

Hyd. No. 4

HIX Basin Inflow

Hydrograph type	=	Combine	Peak discharge	=	12.09 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.00 hrs
Time interval	=	2 min	Hyd. volume	=	33,297 cuft
Inflow hyds.	=	2, 3	Contrib. drain. area	=	2.140 ac



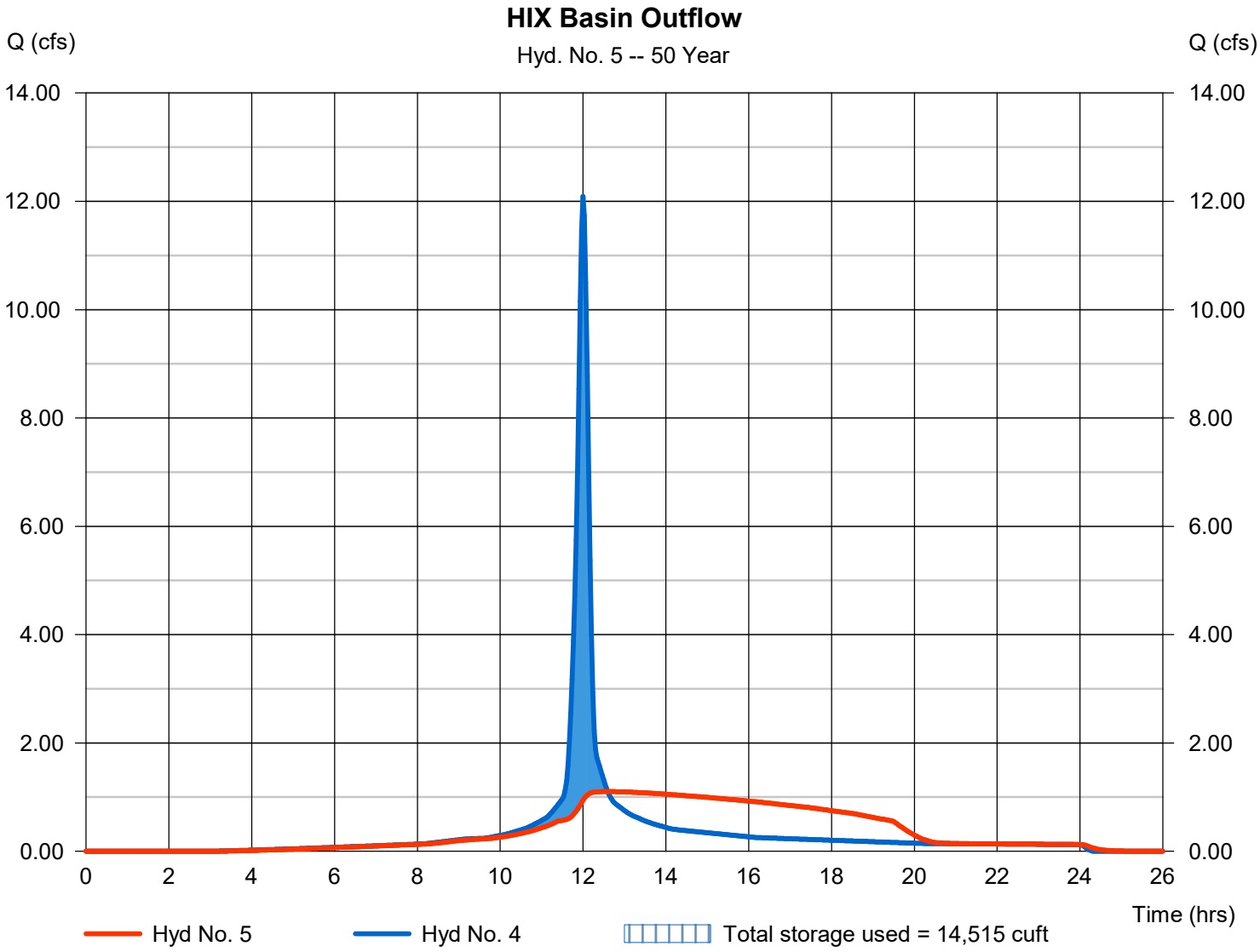
Hydrograph Report

Hyd. No. 5

HIX Basin Outflow

Hydrograph type	=	Reservoir	Peak discharge	=	1.102 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.60 hrs
Time interval	=	2 min	Hyd. volume	=	33,296 cuft
Inflow hyd. No.	=	4 - HIX Basin Inflow	Max. Elevation	=	894.27 ft
Reservoir name	=	HIX Pond	Max. Storage	=	14,515 cuft

Storage Indication method used.

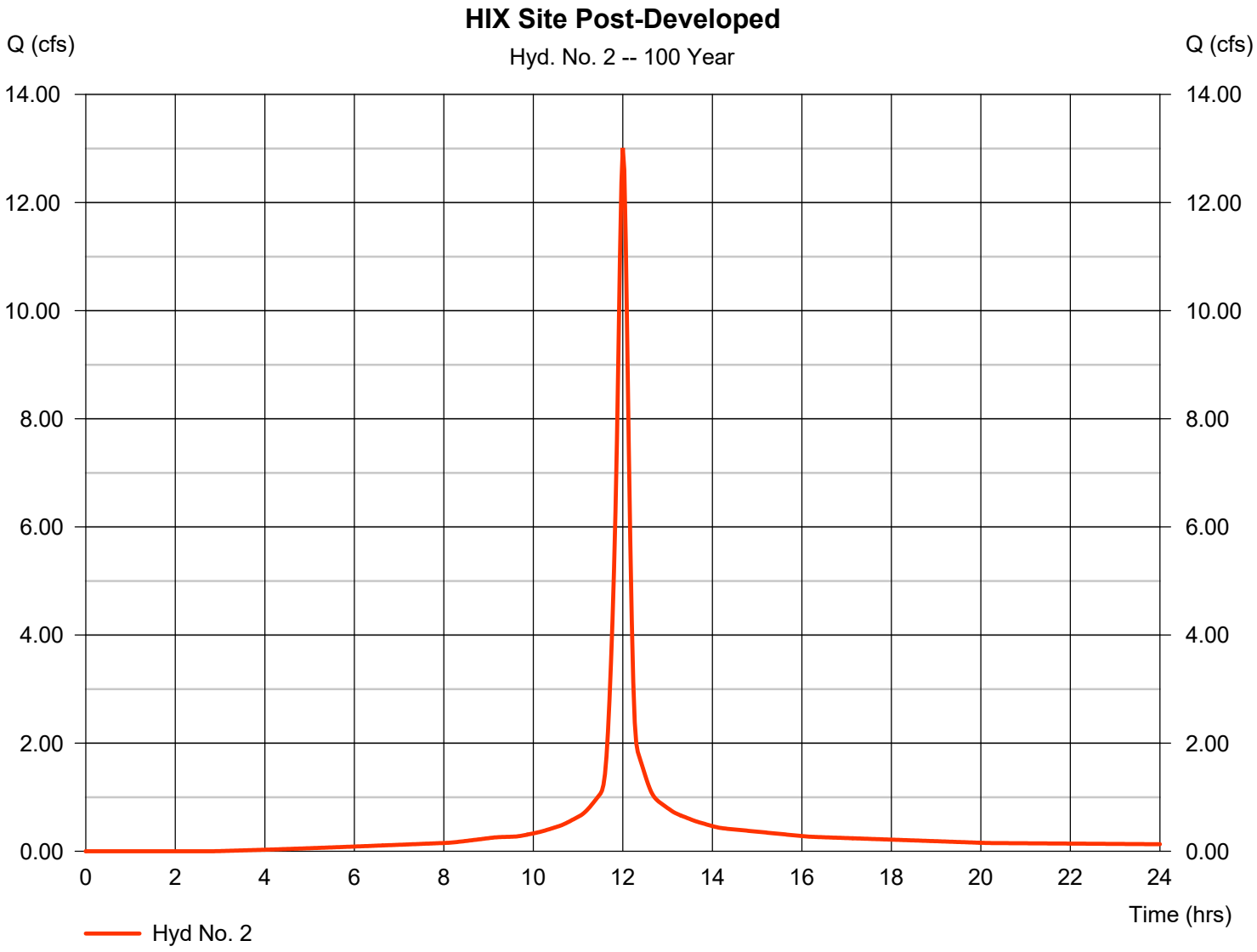


Hydrograph Report

Hyd. No. 2

HIX Site Post-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.01 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.00 hrs
Time interval	=	2 min	Hyd. volume	=	36,060 cuft
Drainage area	=	2.030 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	5.67 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

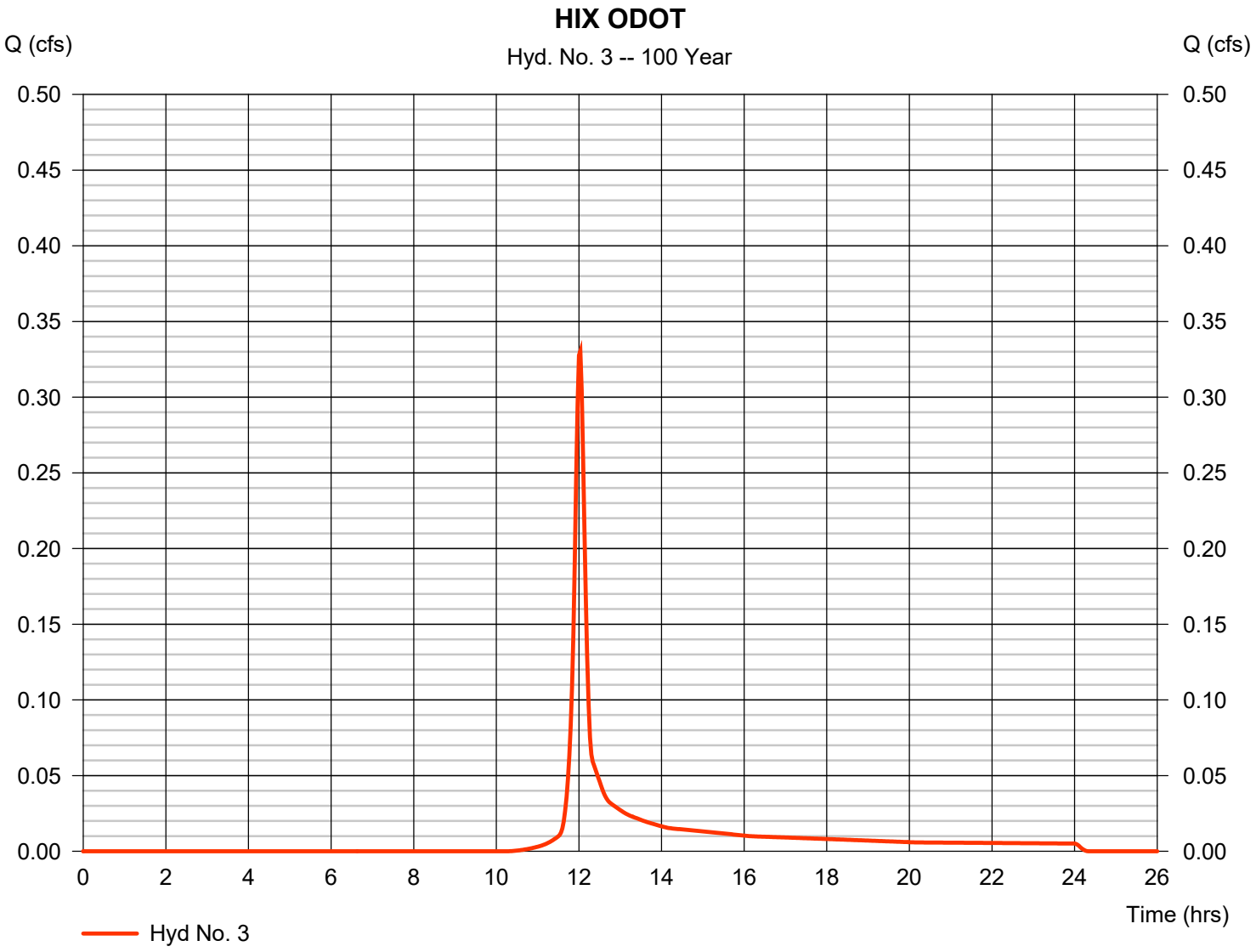


Hydrograph Report

Hyd. No. 3

HIX ODOT

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.330 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	871 cuft
Drainage area	=	0.110 ac	Curve number	=	65
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	5.67 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

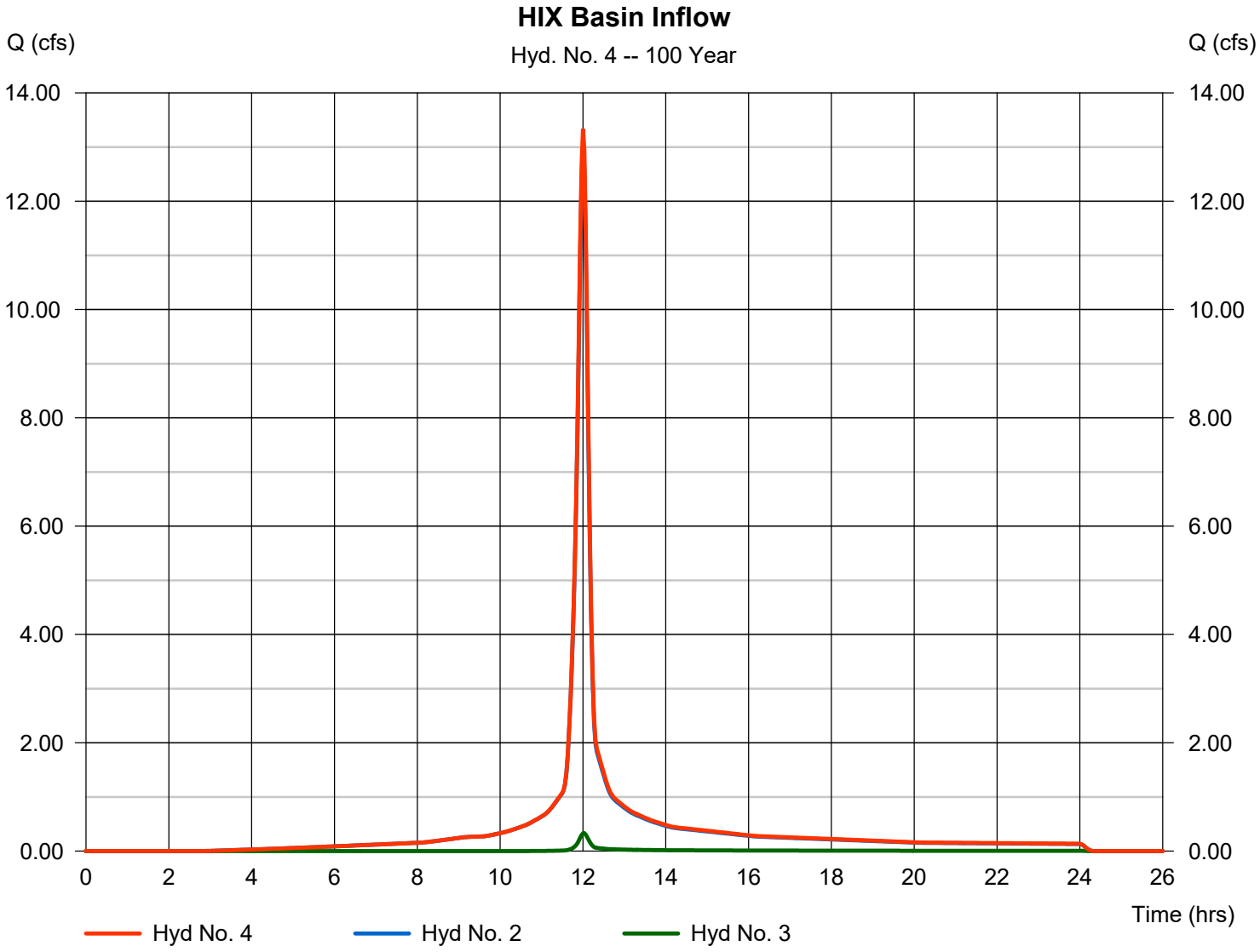


Hydrograph Report

Hyd. No. 4

HIX Basin Inflow

Hydrograph type	= Combine	Peak discharge	= 13.34 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 36,931 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 2.140 ac



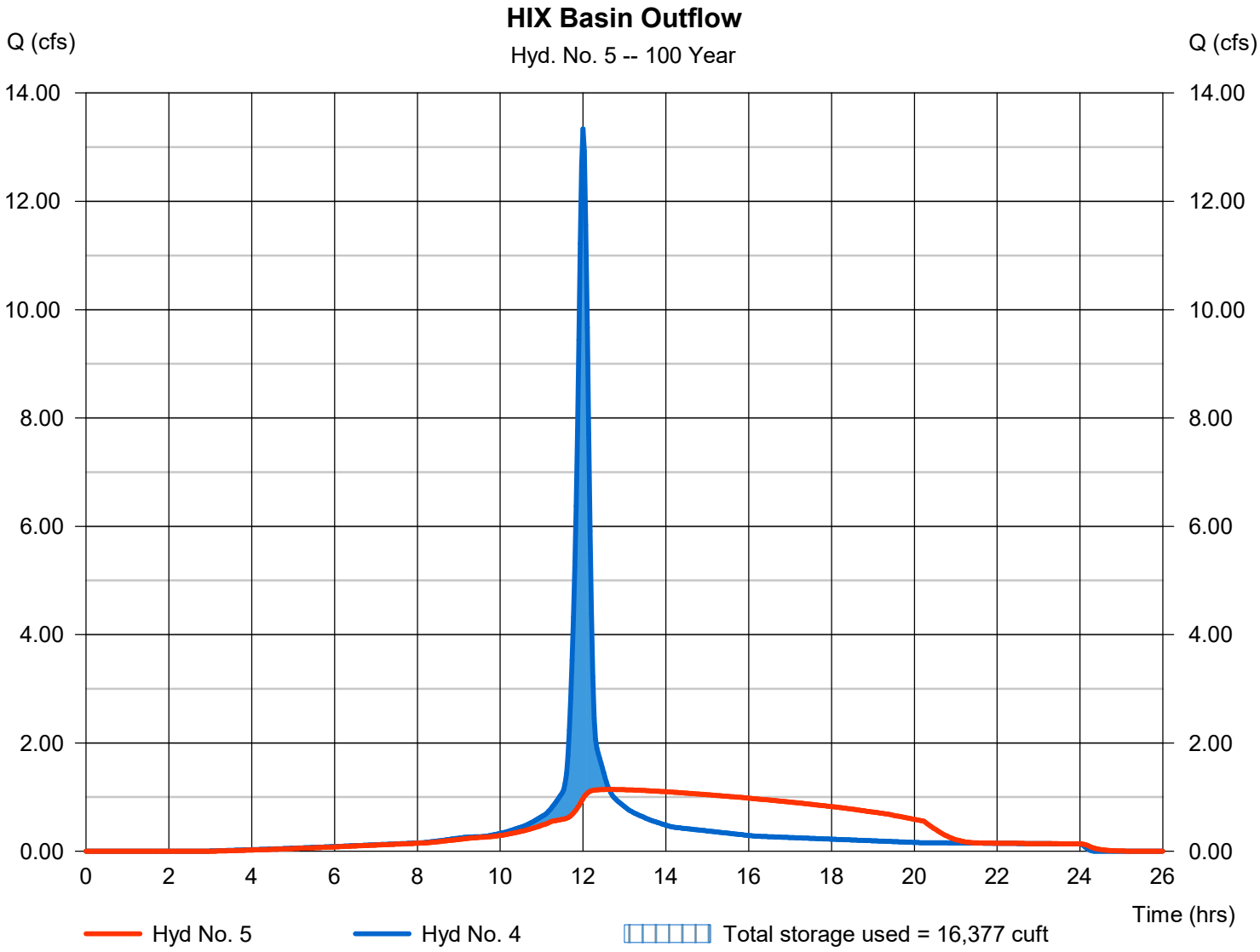
Hydrograph Report

Hyd. No. 5

HIX Basin Outflow

Hydrograph type	=	Reservoir	Peak discharge	=	1.141 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.63 hrs
Time interval	=	2 min	Hyd. volume	=	36,930 cuft
Inflow hyd. No.	=	4 - HIX Basin Inflow	Max. Elevation	=	894.77 ft
Reservoir name	=	HIX Pond	Max. Storage	=	16,377 cuft

Storage Indication method used.



Project: **The Fields at Liberty Way**

Drainage Area Description:

Access Drive Pre-Developed

Job #: 15M040.000
Initials: BJS
Date: 9/13/2016
Revised:

Drainage Area = 0.34 Acres

Soil Types:

29 %	Type 'B'	*0.1 acres*
71 %	Type 'C'	*0.2 acres*

Land Use: Woods - Grass 0.3 Acres

Composite Runoff Curve Number:

Ground Cover	Soil Type	CN	Soil Type %	Land Use %	CN*Soil %*Land %
Woods - Grass	**B**	65	29	100.0	19.12
Woods - Grass	**C**	76	71	100.0	53.65

Composite CN = 72.8

Time of Concentration:

Sheet Flow: **Tc**

Length = 100 Slope(ft/ft) = 0.0175 Manning's, n = 0.24 **0.265** *hr*

Shallow Concentrated Flow:

Length = 191 Slope(ft/ft) = 0.042 Velocity (fps) = 1 **0.053** *hr*

Channel Flow:

Tc = 0.32 ***hr***
19 min

Project: **The Fields at Liberty Way**

Drainage Area Description:

Access Drive Post-Devloped

Job #: 15M040.000
Initials: BJS
Date: 9/13/2016
Revised:

Drainage Area = 0.34 Acres

Soil Types:

29 %	Type 'B'	*0.1 acres*
71 %	Type 'C'	*0.2 acres*

Land Use: Impervious 0.3 Acres

Composite Runoff Curve Number:

Ground Cover	Soil Type	CN	Soil Type %	Land Use %	CN*Soil %*Land %
Impervious	**B**	98	29	100.0	28.82
Impervious	**C**	98	71	100.0	69.18

Composite CN = 98.0

Time of Concentration:

Tc

Tc = 12.00 *min*
12 min

See 25

Hyatt Basin 100YR=885.78 T/Dike=889.00		Outlet: 24" Pipe @ 1.09% 2" WQ Orifice Inv=881.96, 30" Orifice Inv=883.46 T/Grate @ 886.86, Spillway = 887.00			
Frequency	**Inflow**	**Outflow**	**Storage**		**Elevation**
(yr)	(cfs)	(cfs)	(ft^3)	(ac-ft)	(ft)
1	5.05	2.93	16,073	0.37	884.12
5	15.62	10.85	22,725	0.52	884.82
10	20.46	14.17 See 36	25,676	0.59	885.11
25	27.03	18.01 See 42	30,125	0.69	885.51
50	30.47	19.82	32,606	0.75	885.74
100	35.18	21.77	36,300	0.83	886.06

Release Rate - Basin		
Critical Storm = 50 yr		
Storm Frequency	**Pre-Developed Allowable Release Rate**	**Post-Developed Release Rate**
(yr)	(cfs)	(cfs)
1	4.57	2.93
5	14.87	10.85
10	19.66	14.17
25	26.18	18.01
50	29.58 See 1	19.82 See 36
100	35.02	21.77 See 42

Note: Pond to be expanded when Hyatt develops.

AS-BUILT

Spillway		$Q_{100}=CLH^{3/2}$	
Q_{100}=35.09	C=3.0	L=40	H=0.44
Spillway Invert		888.00	
100 Year Weir Flow		888.44	
Top of Dike Elevation		889.00	
Freeboard		0.56	
Spillway Side Slope		3:1	
Velocity		1.99	

bayer becker

Water Quality Volume

Project:	The Fields of Liberty	Designed By:	BJS	Date:	9/13/16
Job No.:	15M040-000	Checked By:		Date:	
Basin ID:	Access Drive Pond	Revised By:	MJL	Date:	8/21/17
					ASB

Required Water Quality Volume

$WQ_v = P\ C\ A/12$

Site Drainage Area (A) = 2.37 acres (To Basin) WQ_v = 0.098 acre-ft.

Rainfall Depth (P) = 0.75 in. Wet Pond Allowance = 0.75

Wet Pond Allowance = 0.07 Ac-ft

Runoff Coefficient (C) = 0.66 **Total WQ_v =** 0.073 Ac-ft

C = 0.858i3 - 0.78i2 + 0.774i + 0.04 (85% impervious) = 3,193 cu.ft.

Water Quality Release Rate

Q_{wqv} = Total WQ_v/RT

Required Retention Time (RT) = 24 hours Q_{wqv} = 0.037 cfs

Provided Retention Time (PT) = 23.29 hours

Water Quality Outlet Orifice

Contour Areas

	Elevation ft	Area ft^2	Volume ft^3	Cum. Vol. ft^3	Elevation at V	Storage at Elev
Basin Inv. =	875.00	0	0.00	0.00		
Contour 1 =	876.00	2,128	1064.00	1064.00		
Contour 2 =	877.00	2,789	2458.50	3522.50	876.87	
Contour 3 =	878.00	3,537	3163.00	6685.50		
Contour 4 =	879.00	4,364	3950.50	10636.00		
Contour 5 =	880.00	5,258	4811.00	15447.00		
Contour 5 =	881.00	5,500	5379.00	20826.00		
Contour 5 =	882.00	5,931	5715.50	0.00		
Contour 5 =	883.00	7,355	6643.00	6643.00	882.48	3193.05
Contour 5 =	884.00	8,750	8052.50	14695.50		
Contour 5 =	885.00	10,293	9521.50	24217.00		
Contour 5 =	886.00	11,998	11145.50	35362.50		
Contour 5 =	887.00	13,821	12909.50	48272.00		
Contour 5 =	888.00	16,600	15210.50	63482.50		
Contour 5 =						

$Q = N\ C_d\ A_o\ (2\ g\ \Delta h)^{1/2}$

C_d = 0.61

A_o = 0.02 $\pi\ D^2/4$ for circular orifices; = h * w for rectangular orifices

g = 32.20 ft/sec^2

Q = 0.042 cfs

Orifice h = 2.000 inch Orifice w = 0.00 inch (= 0 for circular orifice)

Number of orifices = N = 1

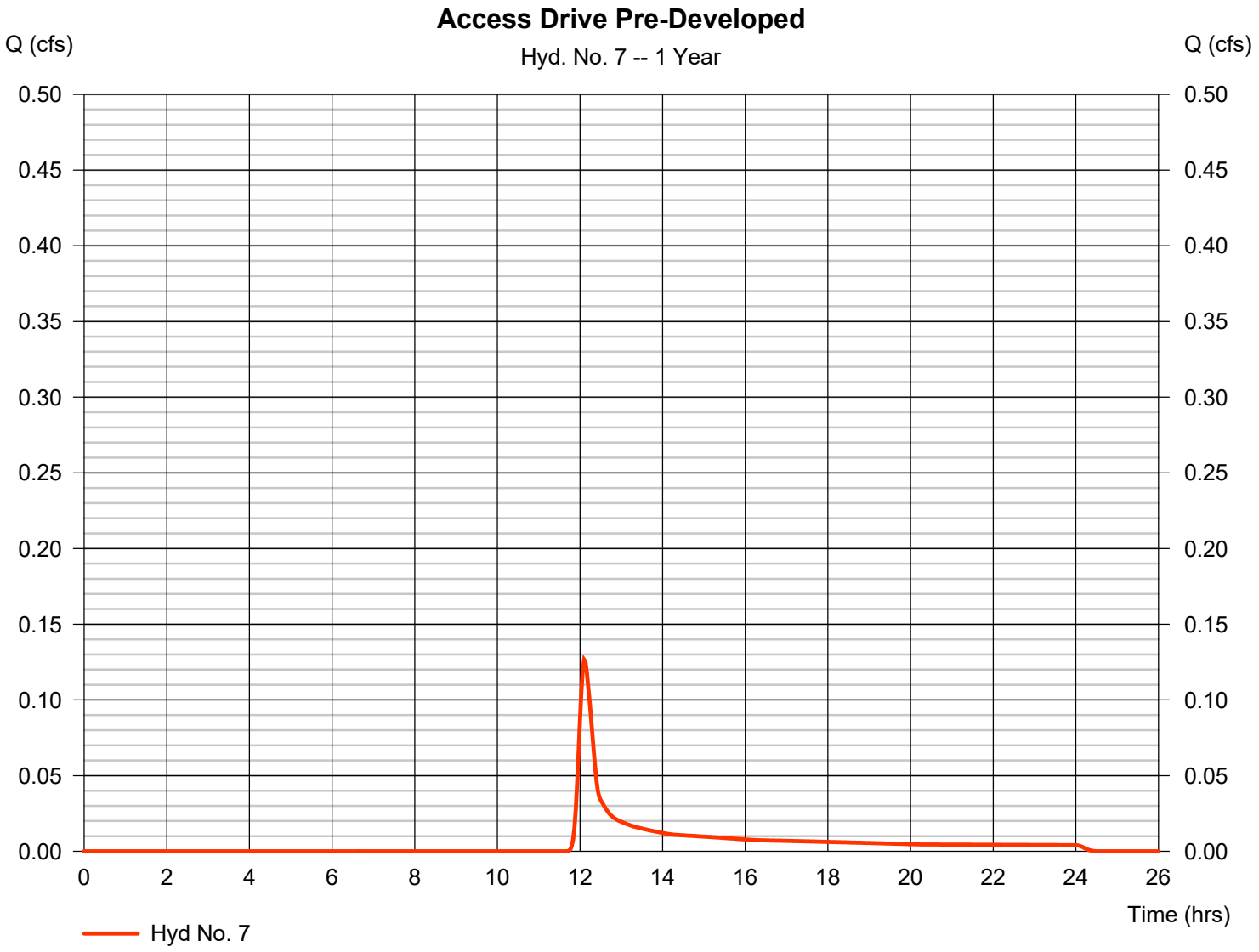
Δh_{avg} = (Elev at V - Basin Inv)/2 - 1/2 h = 0.16 ft

Hydrograph Report

Hyd. No. 7

Access Drive Pre-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.126 cfs
Storm frequency	=	1 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	502 cuft
Drainage area	=	0.340 ac	Curve number	=	72.8
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	19.00 min
Total precip.	=	2.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

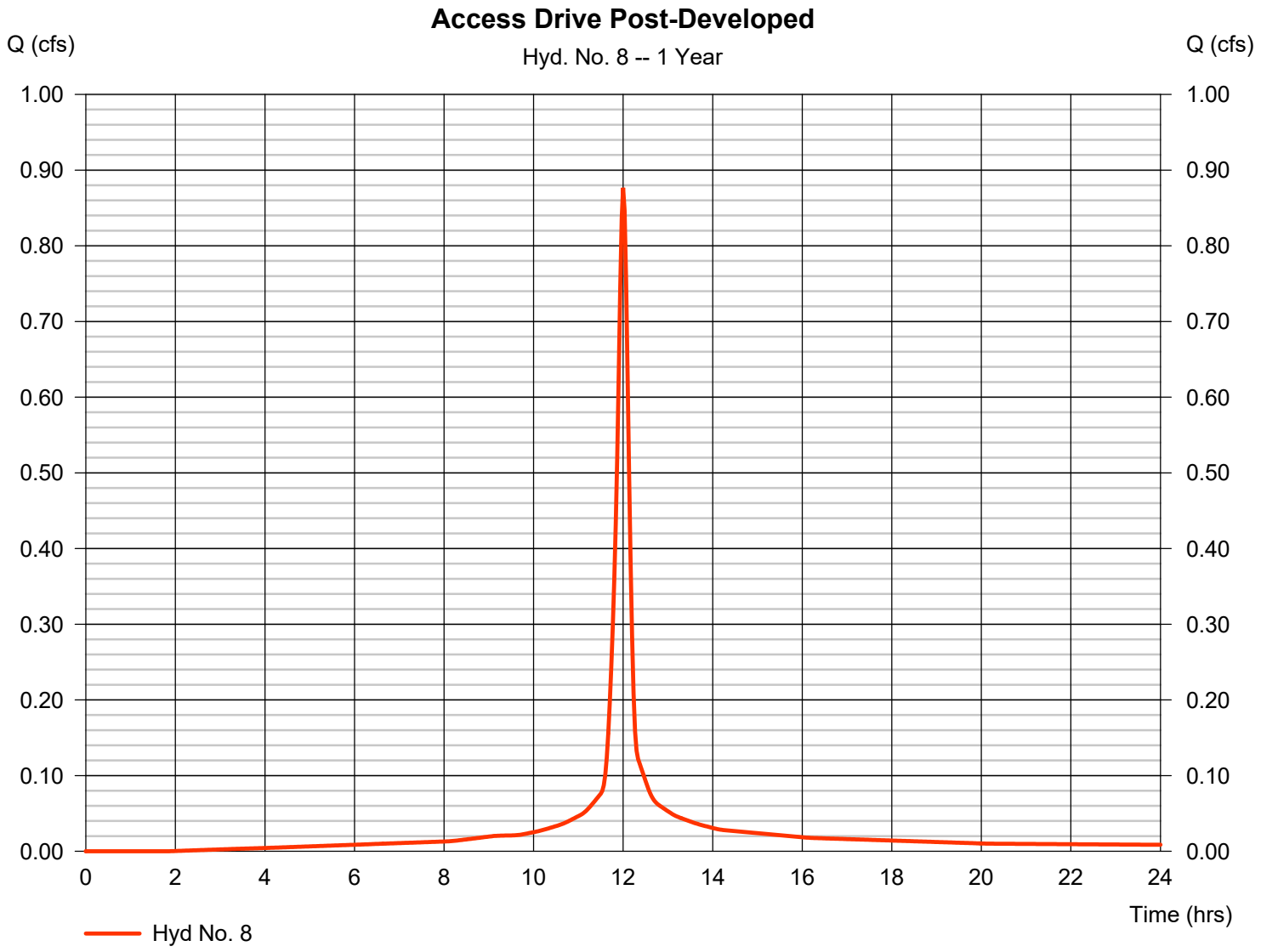


Hydrograph Report

Hyd. No. 8

Access Drive Post-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.877 cfs
Storm frequency	=	1 yrs	Time to peak	=	12.00 hrs
Time interval	=	2 min	Hyd. volume	=	2,511 cuft
Drainage area	=	0.340 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	2.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Pond Report

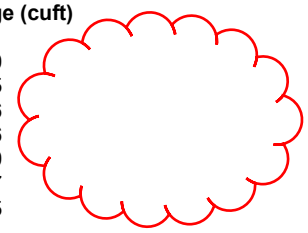
Pond No. 1 - Hyatt House Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 881.96 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	881.96	5,931	0	0
1.04	883.00	7,355	6,895	6,895
2.04	884.00	8,750	8,042	14,936
3.04	885.00	10,293	9,510	24,446
4.04	886.00	11,998	11,134	35,580
5.04	887.00	13,821	12,897	48,477
6.04	888.00	16,600	15,188	63,665



Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	Inactive	30.00	0.00
Span (in)	= 24.00	2.00	30.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 881.96	881.96	883.46	0.00
Length (ft)	= 32.00	0.00	0.00	0.00
Slope (%)	= 1.09	0.00	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	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 8.00	40.00	0.00	0.00
Crest El. (ft)	= 886.86	887.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
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	881.96	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.10	689	882.06	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.21	1,379	882.17	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.31	2,068	882.27	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.42	2,758	882.38	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.52	3,447	882.48	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.62	4,137	882.58	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.73	4,826	882.69	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.83	5,516	882.79	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.94	6,205	882.90	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.04	6,895	883.00	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.14	7,699	883.10	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.24	8,503	883.20	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.34	9,307	883.30	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.44	10,111	883.40	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.54	10,916	883.50	0.01 ic	0.00	0.01 ic	---	0.00	0.00	---	---	---	---	0.013
1.64	11,720	883.60	0.15 ic	0.00	0.15 ic	---	0.00	0.00	---	---	---	---	0.146
1.74	12,524	883.70	0.44 ic	0.00	0.43 ic	---	0.00	0.00	---	---	---	---	0.427
1.84	13,328	883.80	0.84 ic	0.00	0.84 ic	---	0.00	0.00	---	---	---	---	0.837
1.94	14,132	883.90	1.41 ic	0.00	1.37 ic	---	0.00	0.00	---	---	---	---	1.371
2.04	14,936	884.00	1.99 ic	0.00	1.99 ic	---	0.00	0.00	---	---	---	---	1.990
2.14	15,887	884.10	2.81 ic	0.00	2.75 ic	---	0.00	0.00	---	---	---	---	2.749
2.24	16,838	884.20	3.65 ic	0.00	3.65 ic	---	0.00	0.00	---	---	---	---	3.651
2.34	17,789	884.30	4.58 ic	0.00	4.56 ic	---	0.00	0.00	---	---	---	---	4.556
2.44	18,740	884.40	5.76 oc	0.00	5.72 ic	---	0.00	0.00	---	---	---	---	5.715
2.54	19,691	884.50	6.89 oc	0.00	6.83 ic	---	0.00	0.00	---	---	---	---	6.831
2.64	20,642	884.60	8.05 oc	0.00	8.03 ic	---	0.00	0.00	---	---	---	---	8.031
2.74	21,593	884.70	9.36 oc	0.00	9.30 ic	---	0.00	0.00	---	---	---	---	9.305
2.84	22,544	884.80	10.65 oc	0.00	10.64 ic	---	0.00	0.00	---	---	---	---	10.64
2.94	23,495	884.90	12.02 oc	0.00	12.02 ic	---	0.00	0.00	---	---	---	---	12.02
3.04	24,446	885.00	13.42 oc	0.00	13.42 ic	---	0.00	0.00	---	---	---	---	13.42
3.14	25,560	885.10	15.01 oc	0.00	15.01 ic	---	0.00	0.00	---	---	---	---	15.01
3.24	26,673	885.20	16.01 oc	0.00	16.01 ic	---	0.00	0.00	---	---	---	---	16.01
3.34	27,786	885.30	17.04 oc	0.00	17.04 ic	---	0.00	0.00	---	---	---	---	17.04
3.44	28,900	885.40	17.98 oc	0.00	17.98 ic	---	0.00	0.00	---	---	---	---	17.98
3.54	30,013	885.50	18.86 oc	0.00	18.86 ic	---	0.00	0.00	---	---	---	---	18.86

Continues on next page...

Hyatt House Pond

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
3.64	31,127	885.60	19.70 oc	0.00	19.70 ic	---	0.00	0.00	---	---	---	---	19.70
3.74	32,240	885.70	20.49 oc	0.00	20.49 ic	---	0.00	0.00	---	---	---	---	20.49
3.84	33,353	885.80	21.21 oc	0.00	21.21 ic	---	0.00	0.00	---	---	---	---	21.21
3.94	34,467	885.90	21.81 ic	0.00	21.81 ic	---	0.00	0.00	---	---	---	---	21.81
4.04	35,580	886.00	22.21 ic	0.00	22.21 ic	---	0.00	0.00	---	---	---	---	22.21
4.14	36,870	886.10	22.57 ic	0.00	22.57 ic	---	0.00	0.00	---	---	---	---	22.57
4.24	38,160	886.20	22.93 ic	0.00	22.93 ic	---	0.00	0.00	---	---	---	---	22.93
4.34	39,449	886.30	23.28 ic	0.00	23.28 ic	---	0.00	0.00	---	---	---	---	23.28
4.44	40,739	886.40	23.63 ic	0.00	23.63 ic	---	0.00	0.00	---	---	---	---	23.63
4.54	42,029	886.50	23.97 ic	0.00	23.97 ic	---	0.00	0.00	---	---	---	---	23.97
4.64	43,319	886.60	24.30 ic	0.00	24.30 ic	---	0.00	0.00	---	---	---	---	24.30
4.74	44,608	886.70	24.64 ic	0.00	24.63 ic	---	0.00	0.00	---	---	---	---	24.63
4.84	45,898	886.80	24.96 ic	0.00	24.96 ic	---	0.00	0.00	---	---	---	---	24.96
4.94	47,188	886.90	25.35 ic	0.00	25.14 ic	---	0.21	0.00	---	---	---	---	25.35
5.04	48,477	887.00	26.00 ic	0.00	24.61 ic	---	1.40	0.00	---	---	---	---	26.00
5.14	49,996	887.10	26.79 ic	0.00	23.66 ic	---	3.13	3.29	---	---	---	---	30.08
5.24	51,515	887.20	27.66 ic	0.00	22.37 ic	---	5.28	9.30	---	---	---	---	36.96
5.34	53,034	887.30	28.56 ic	0.00	20.79 ic	---	7.77	17.08	---	---	---	---	45.64
5.44	54,553	887.40	29.48 ic	0.00	18.91 ic	---	10.57	26.30	---	---	---	---	55.78
5.54	56,071	887.50	30.31 ic	0.00	17.09 ic	---	13.22 s	36.76	---	---	---	---	67.07
5.64	57,590	887.60	30.97 ic	0.00	15.79 ic	---	15.18 s	48.32	---	---	---	---	79.30
5.74	59,109	887.70	31.56 ic	0.00	14.68 ic	---	16.87 s	60.89	---	---	---	---	92.44
5.84	60,628	887.80	32.10 ic	0.00	13.71 ic	---	18.38 s	74.39	---	---	---	---	106.48
5.94	62,146	887.90	32.59 ic	0.00	12.85 ic	---	19.74 s	88.76	---	---	---	---	121.35
6.04	63,665	888.00	33.06 ic	0.00	12.07 ic	---	20.99 s	104.00	---	---	---	---	137.06

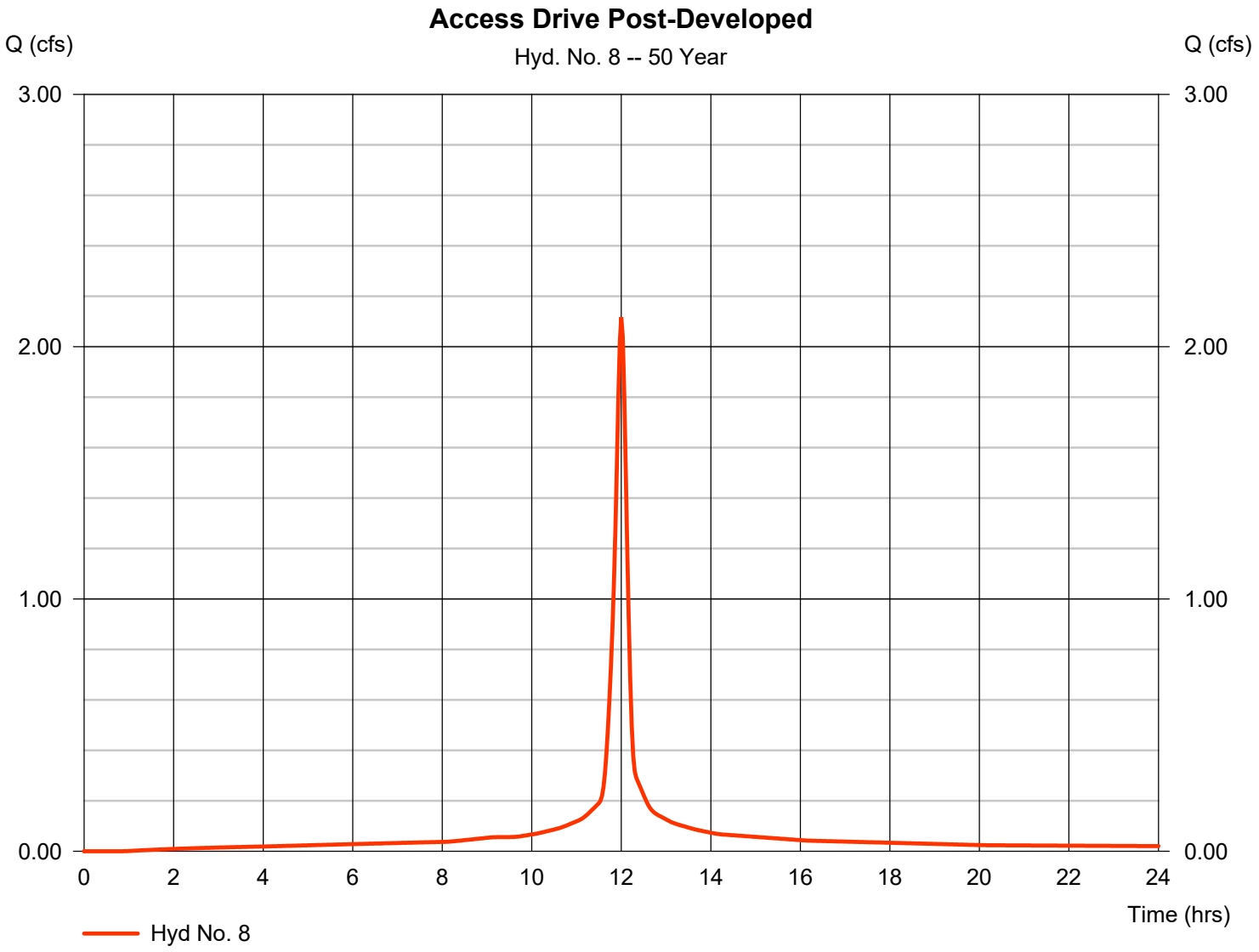
...End

Hydrograph Report

Hyd. No. 8

Access Drive Post-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.117 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.00 hrs
Time interval	=	2 min	Hyd. volume	=	6,317 cuft
Drainage area	=	0.340 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

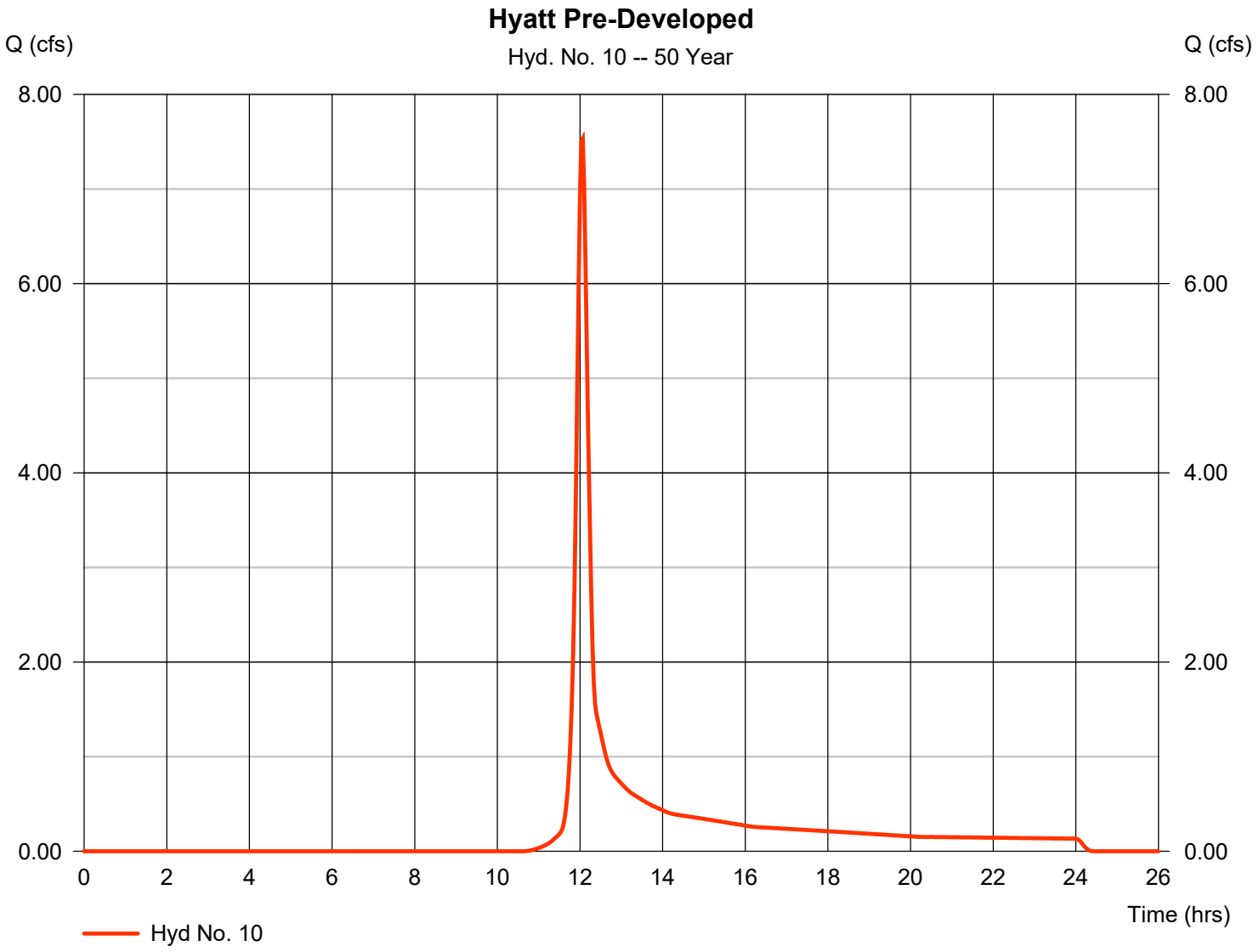


Hydrograph Report

Hyd. No. 10

Hyatt Pre-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.535 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	21,896 cuft
Drainage area	=	3.460 ac	Curve number	=	65
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	16.50 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

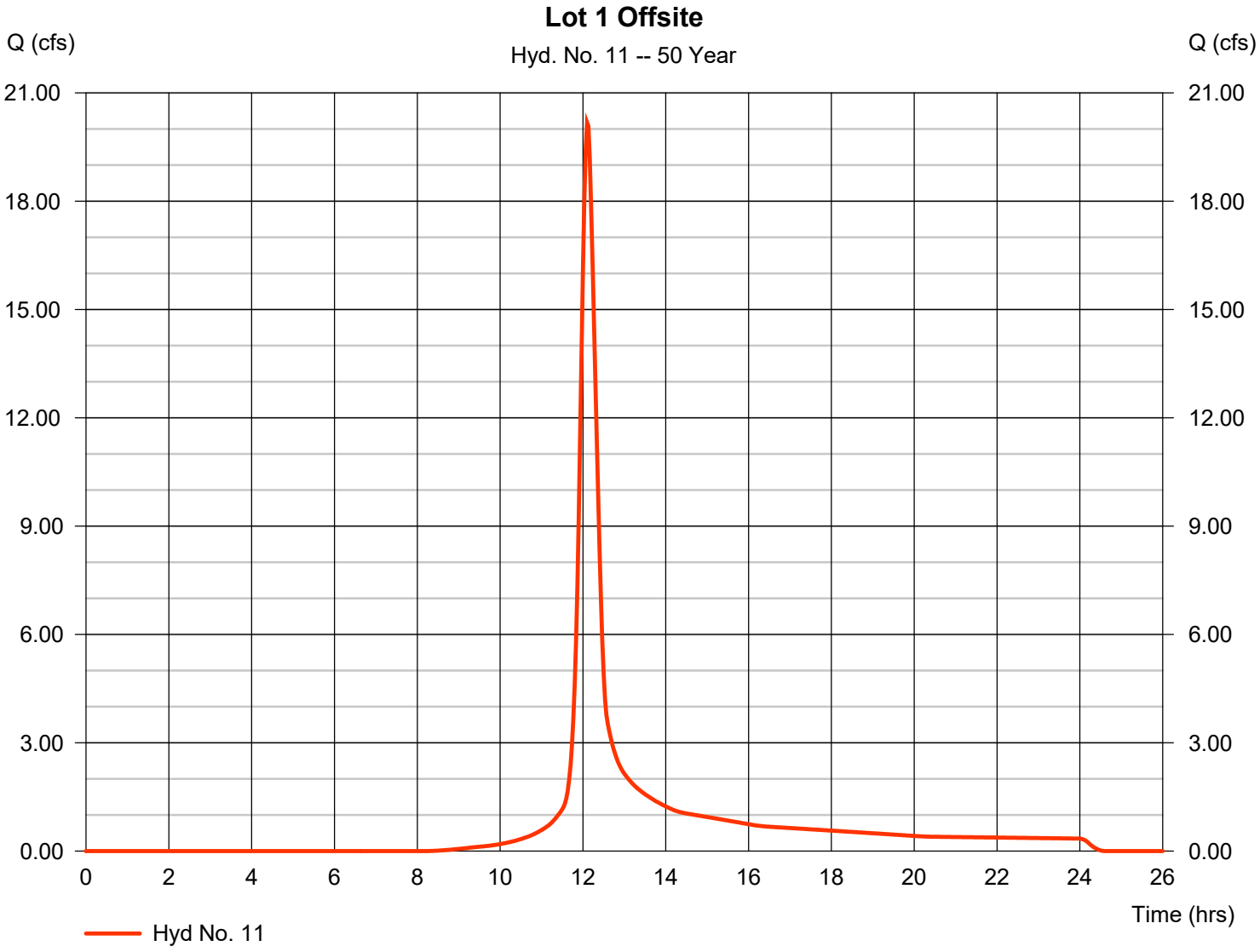


Hydrograph Report

Hyd. No. 11

Lot 1 Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	20.18 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	69,864 cuft
Drainage area	=	7.000 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	23.25 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

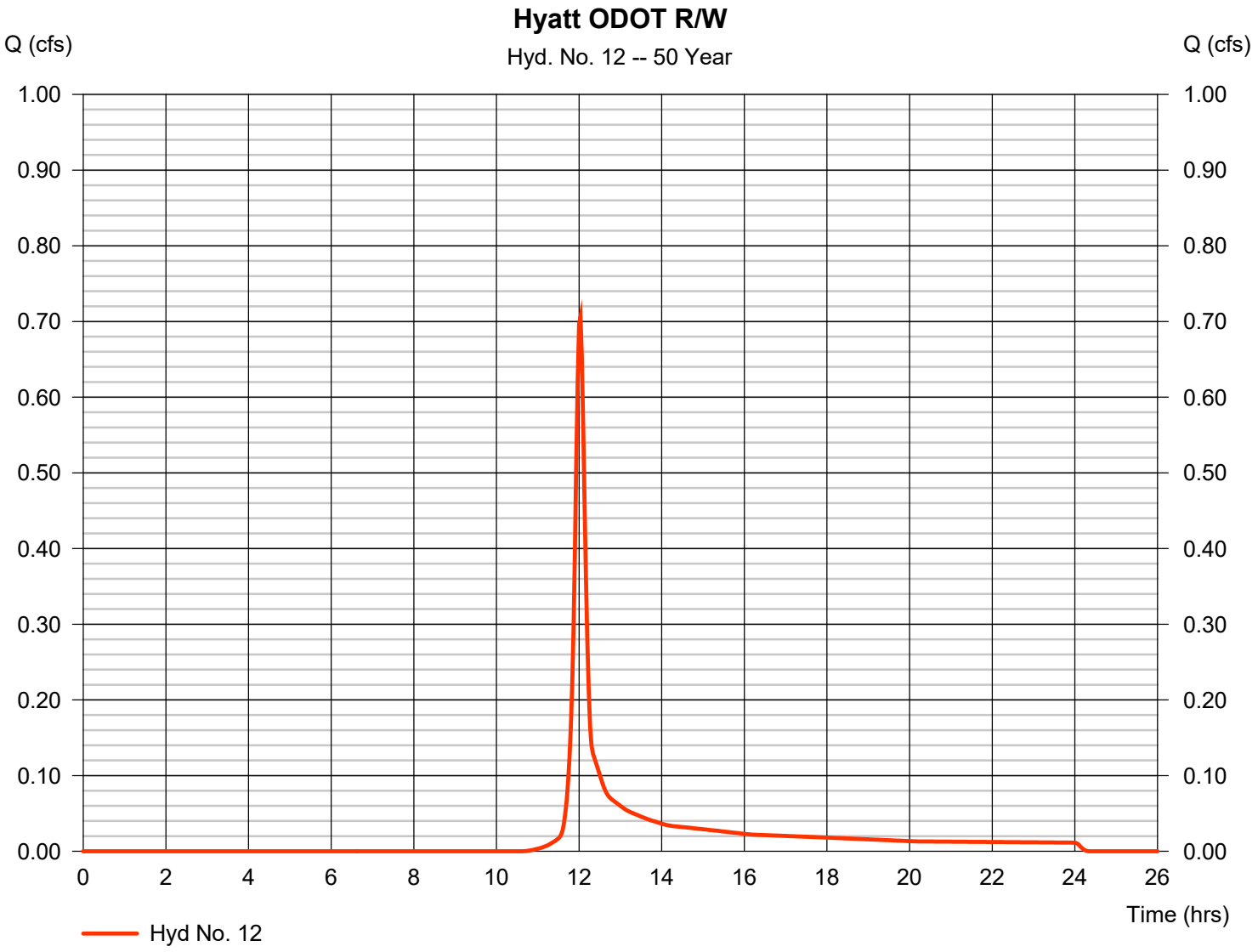


Hydrograph Report

Hyd. No. 12

Hyatt ODOT R/W

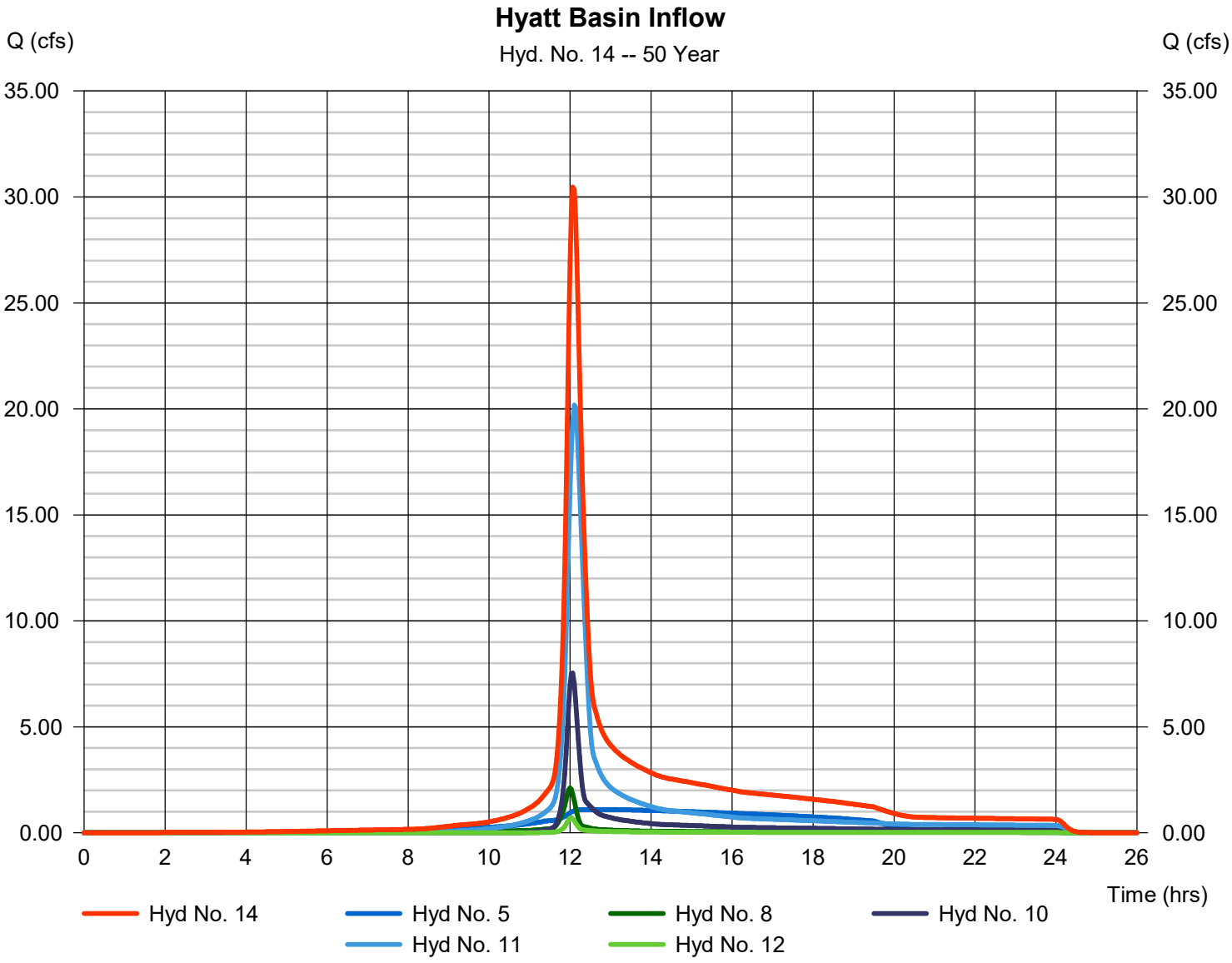
Hydrograph type	=	SCS Runoff	Peak discharge	=	0.706 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	1,874 cuft
Drainage area	=	0.280 ac	Curve number	=	65
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hyd. No. 14

Hyatt Basin Inflow

Hydrograph type	=	Combine	Peak discharge	=	30.47 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	133,246 cuft
Inflow hyds.	=	5, 8, 10, 11, 12	Contrib. drain. area	=	11.080 ac



Hydrograph Report

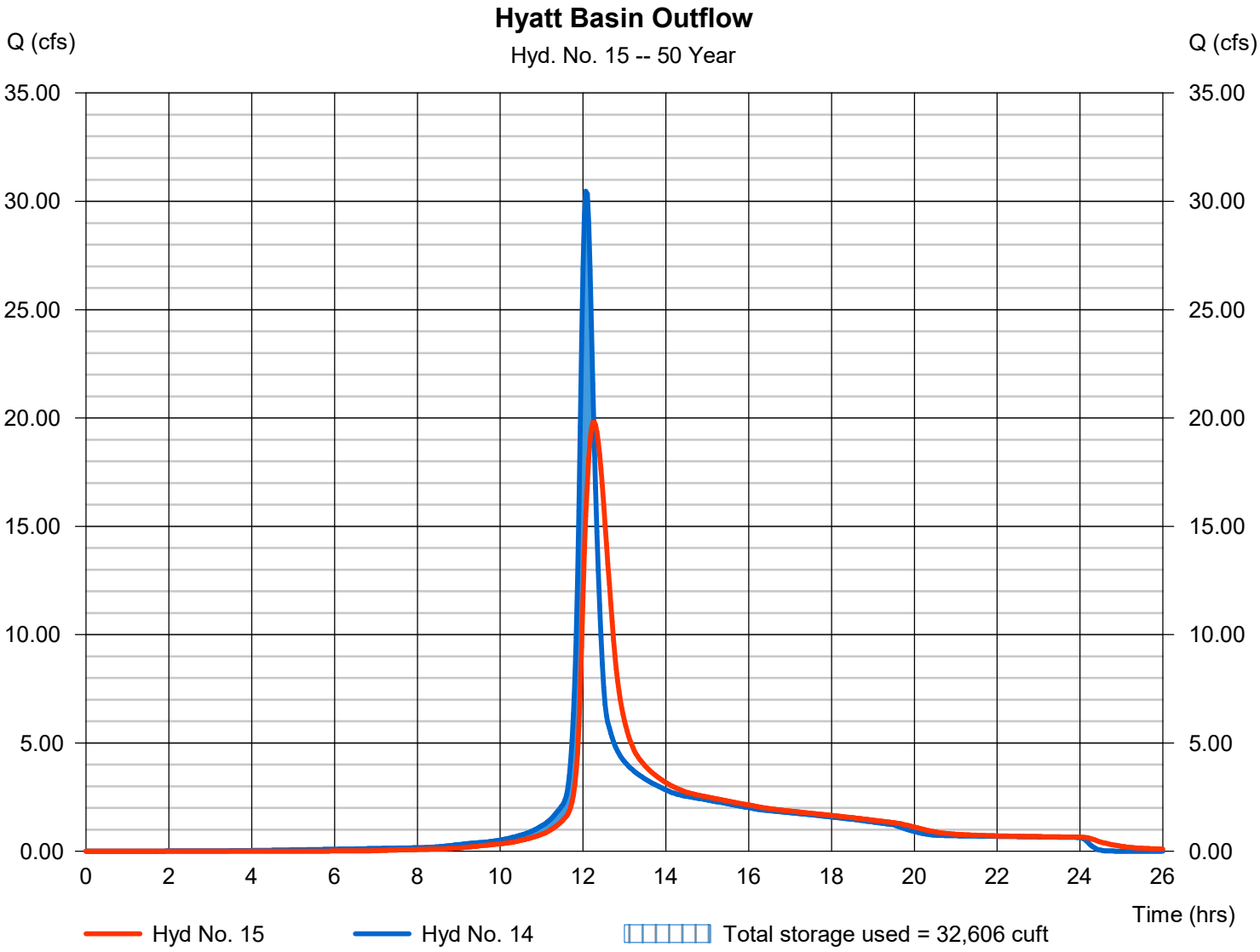
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.514 Tuesday, 08 / 22 / 2017

Hyd. No. 15

Hyatt Basin Outflow

Hydrograph type	=	Reservoir	Peak discharge	=	19.82 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.27 hrs
Time interval	=	2 min	Hyd. volume	=	133,186 cuft
Inflow hyd. No.	=	14 - Hyatt Basin Inflow	Max. Elevation	=	885.74 ft
Reservoir name	=	Hyatt House Pond	Max. Storage	=	32,606 cuft

Storage Indication method used. Wet pond routing start elevation = 883.40 ft.

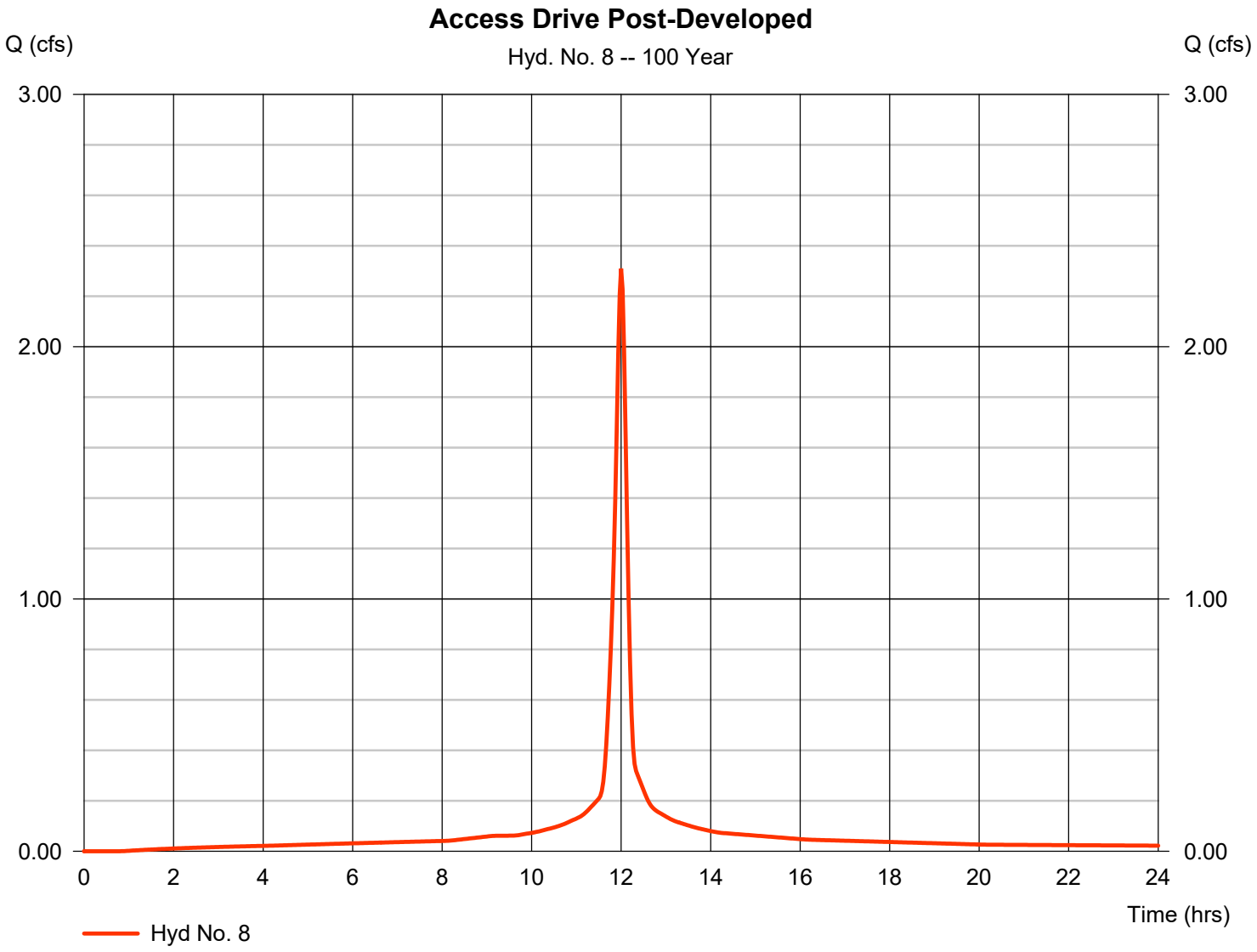


Hydrograph Report

Hyd. No. 8

Access Drive Post-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.310 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.00 hrs
Time interval	=	2 min	Hyd. volume	=	6,914 cuft
Drainage area	=	0.340 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	5.67 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

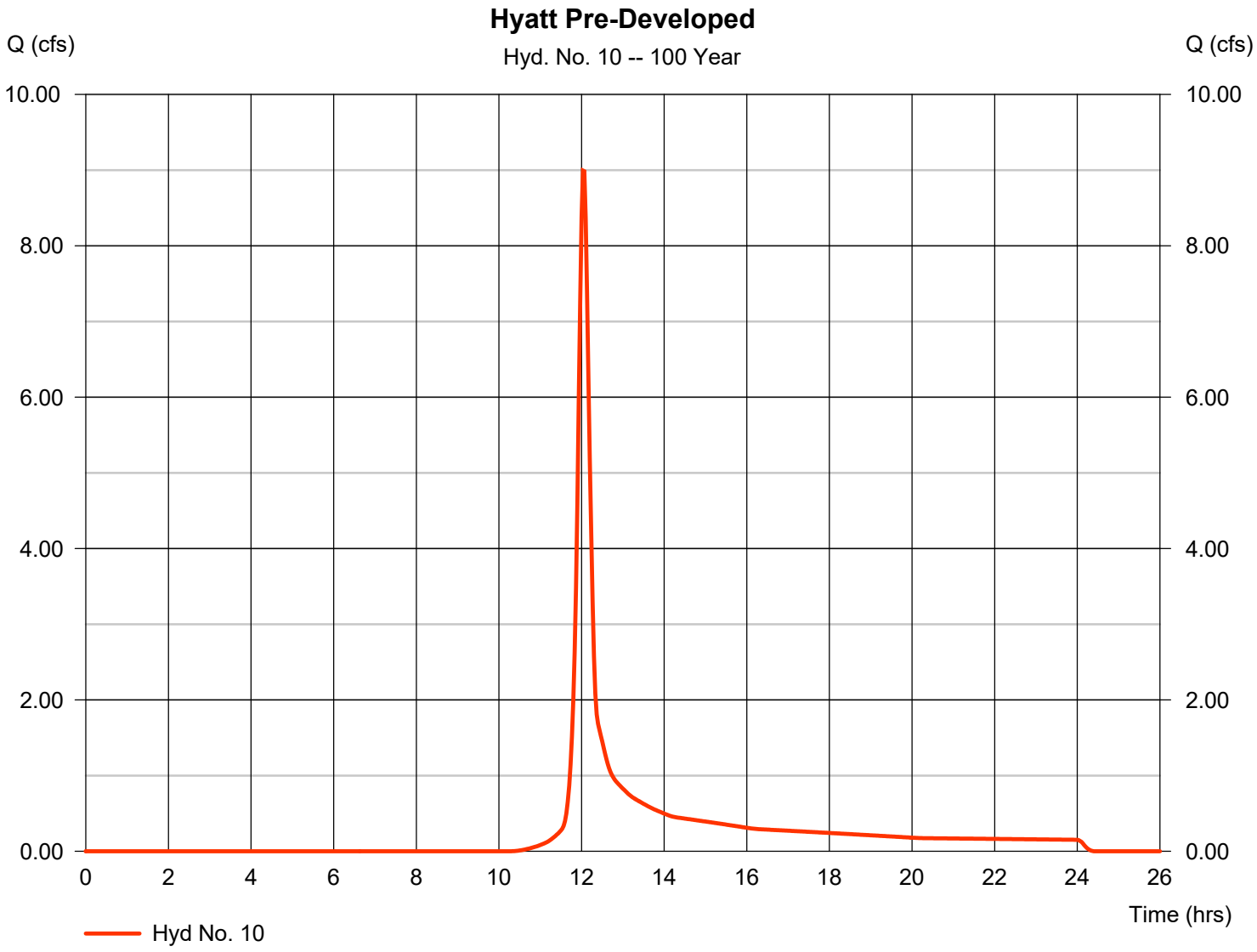


Hydrograph Report

Hyd. No. 10

Hyatt Pre-Developed

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.994 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	25,892 cuft
Drainage area	=	3.460 ac	Curve number	=	65
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	16.50 min
Total precip.	=	5.67 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

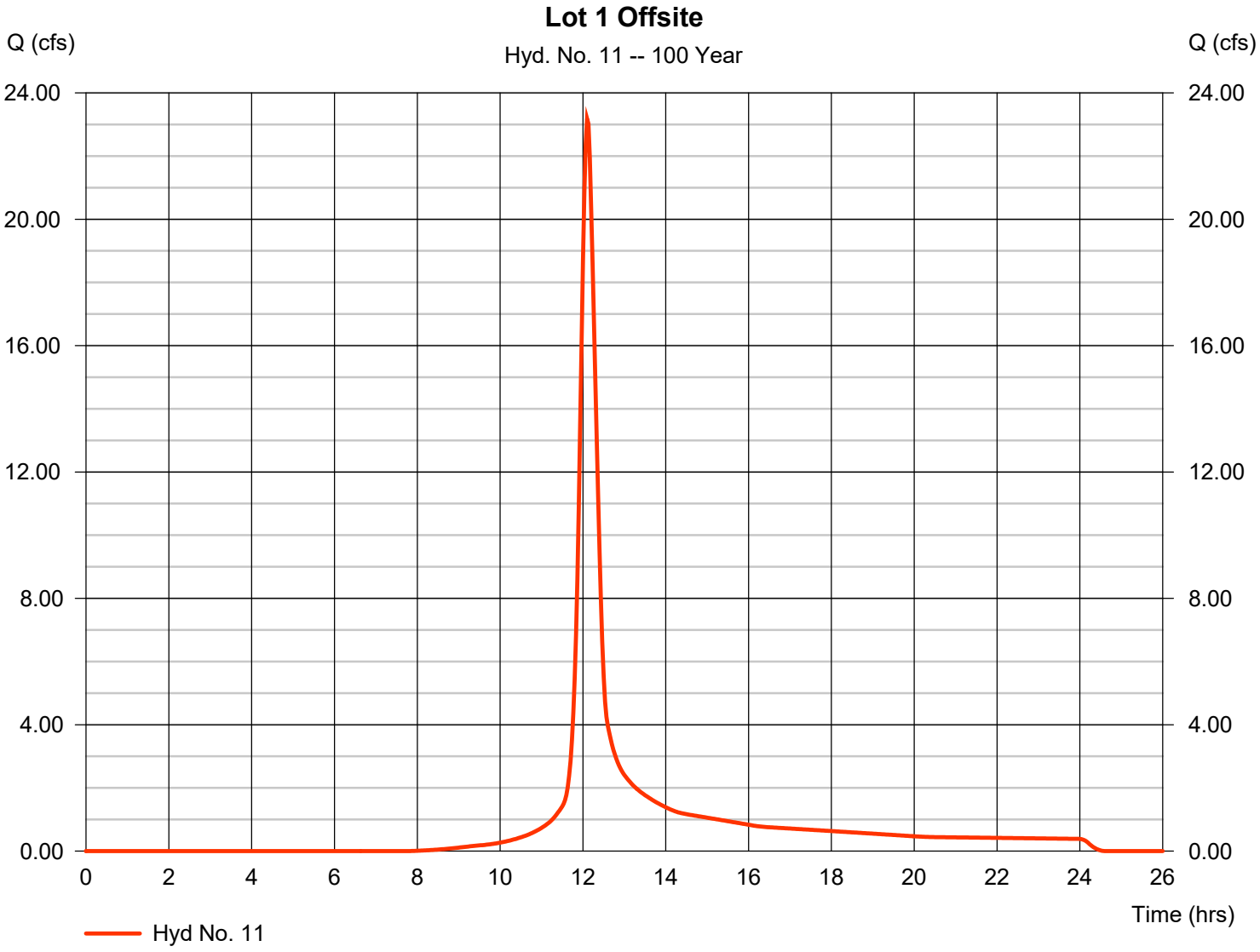


Hydrograph Report

Hyd. No. 11

Lot 1 Offsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	23.18 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	80,105 cuft
Drainage area	=	7.000 ac	Curve number	=	76
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	23.25 min
Total precip.	=	5.67 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

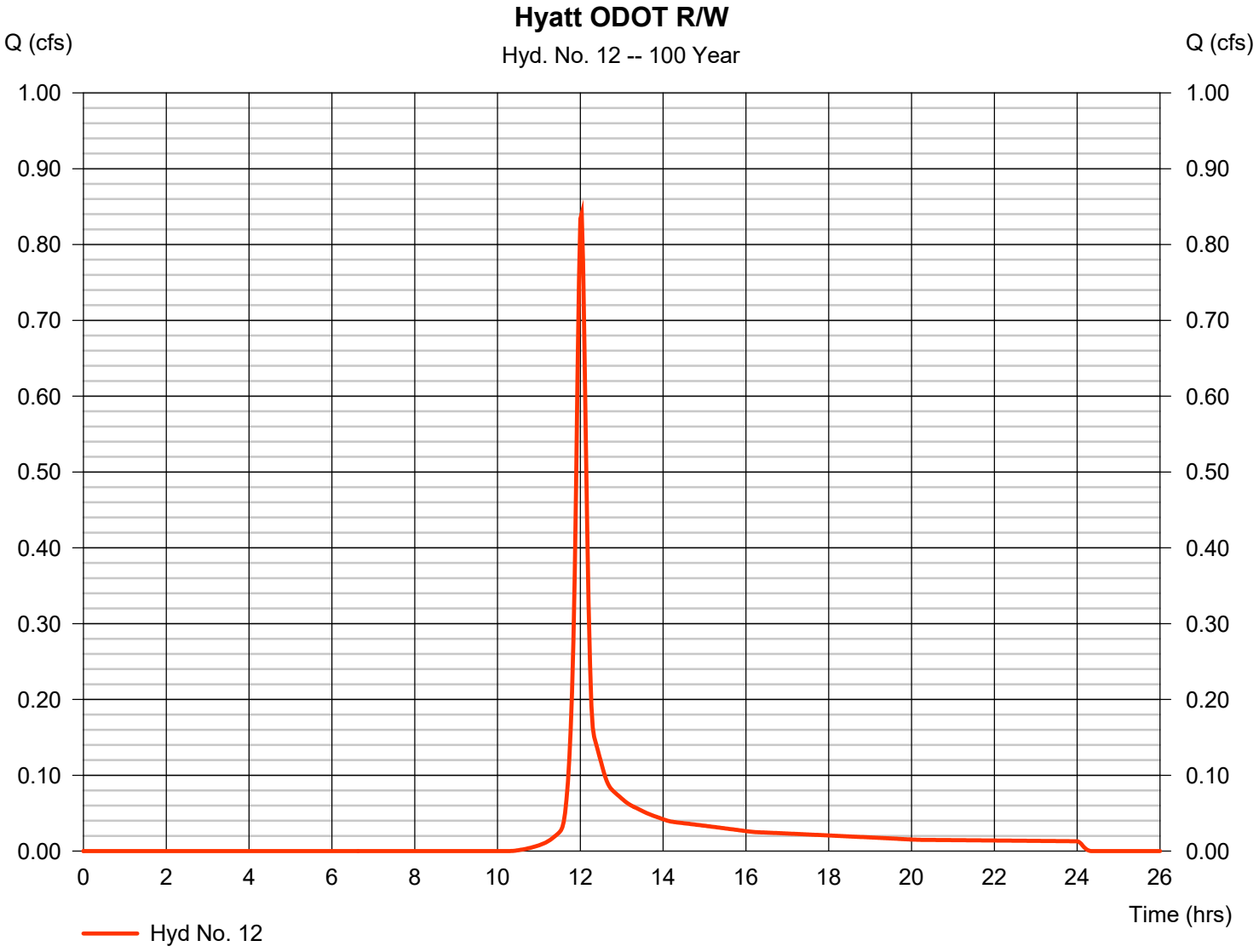


Hydrograph Report

Hyd. No. 12

Hyatt ODOT R/W

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.841 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	2,216 cuft
Drainage area	=	0.280 ac	Curve number	=	65
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.00 min
Total precip.	=	5.67 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

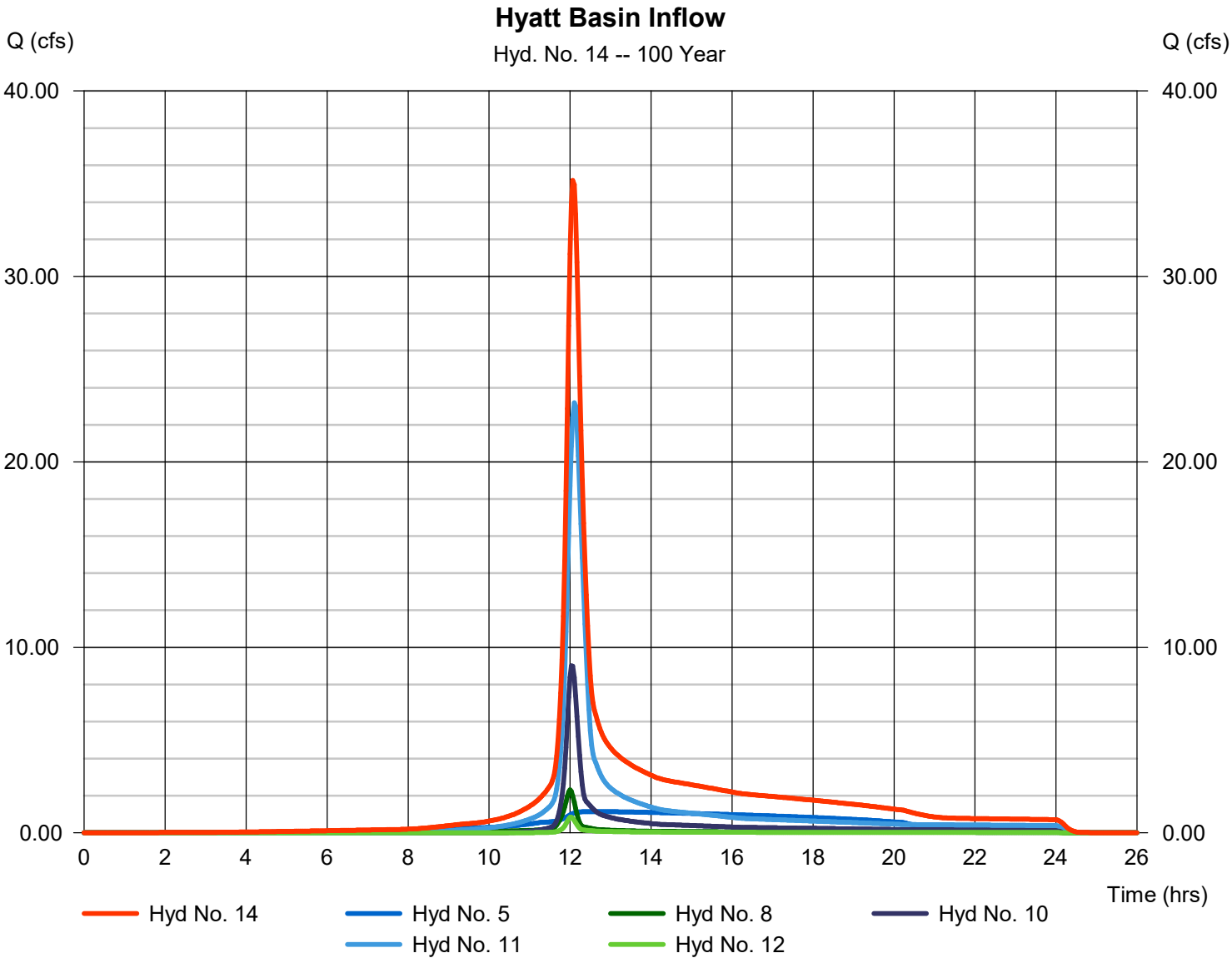


Hydrograph Report

Hyd. No. 14

Hyatt Basin Inflow

Hydrograph type	=	Combine	Peak discharge	=	35.18 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	152,058 cuft
Inflow hyds.	=	5, 8, 10, 11, 12	Contrib. drain. area	=	11.080 ac



Hydrograph Report

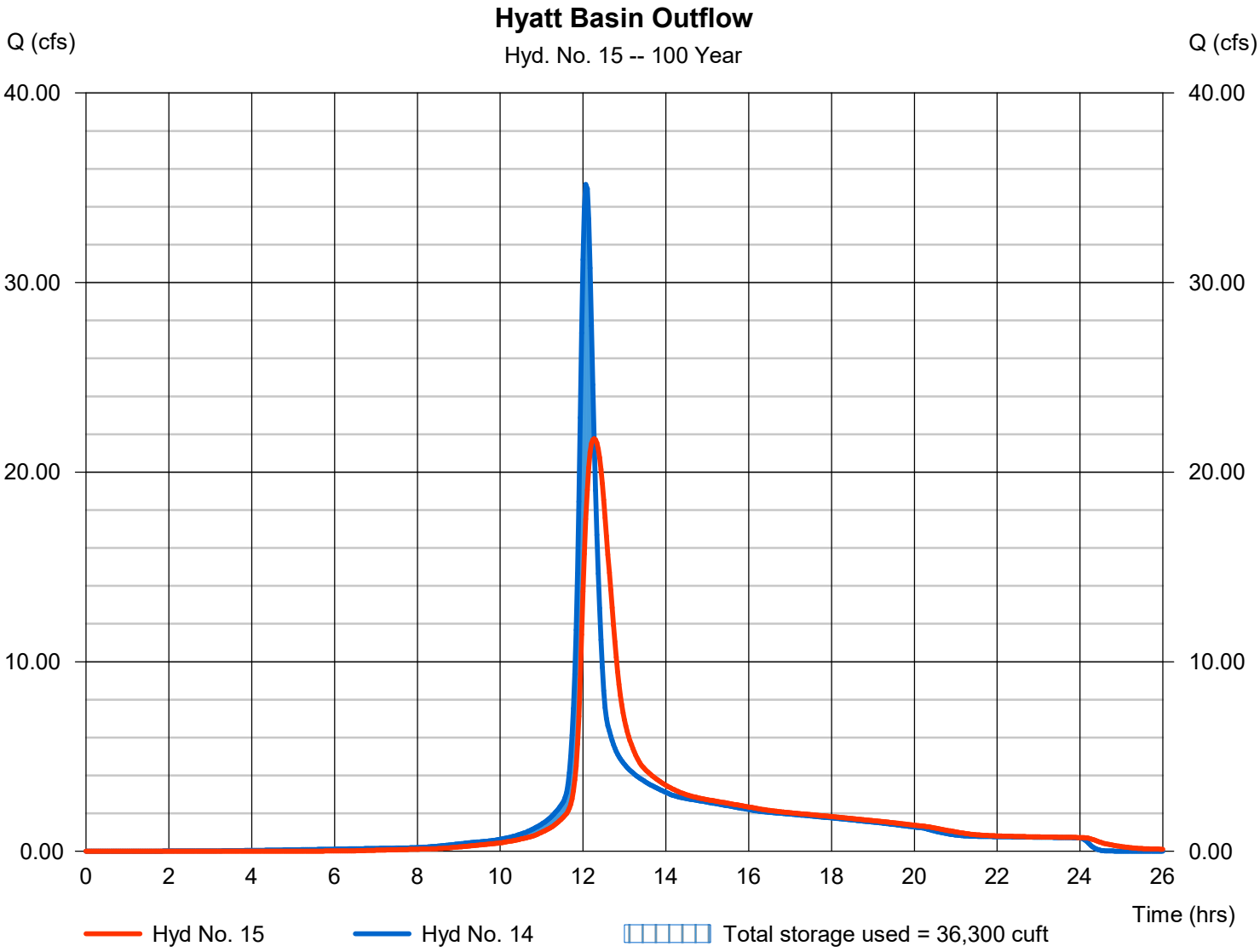
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.514 Tuesday, 08 / 22 / 2017

Hyd. No. 15

Hyatt Basin Outflow

Hydrograph type	=	Reservoir	Peak discharge	=	21.77 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.27 hrs
Time interval	=	2 min	Hyd. volume	=	151,997 cuft
Inflow hyd. No.	=	14 - Hyatt Basin Inflow	Max. Elevation	=	886.06 ft
Reservoir name	=	Hyatt House Pond	Max. Storage	=	36,300 cuft

Storage Indication method used. Wet pond routing start elevation = 883.40 ft.



Detention Volume

Project:	The Fields of Liberty	Designed By:	BJS	Date:	9/13/16
Job No.:	15M040-000	Checked By:		Date:	
Basin ID:	HIX Pond	Revised By:	MJL	Date:	8/21/17
					ASB

Detention Basin Storage

Contour Areas

	Elevation ft	Basin Area ft^2	Pipe Area	Total Area	Volume ft^3	Cum. Vol. ft^3
Basin Inv. =	887.06	0	0	0	0.00	0.00
Contour 1 =	888.00	0	0	0	0.00	0.00
Contour 2 =	889.00	300	848	1,148	574.00	574.00
Contour 3 =	890.00	749	1,124	1,873	1510.50	2084.50
Contour 4 =	891.00	1,230	1,210	2,440	2156.50	4241.00
Contour 5 =	892.00	1,747	1,157	2,904	2672.00	6913.00
Contour 6 =	893.00	2,371	943	3,314	3109.17	10022.17
Contour 7 =	894.00	3,073	339	3,412	3363.17	13385.34
Contour 8 =	895.00	4,004		4,004	3708.00	17093.34
Contour 9 =	896.00	5,676		5,676	4840.00	21933.34
Contour 10 =						
Contour 11 =						
Contour 12 =						
Contour 13 =						
Contour 14 =						