Stormwater Management Report

TLC Drain and Sewer Headquarters

West Norriton Township

Montgomery County, PA

Prepared for:

Prestige Worldwide Property Investments, LLC

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Bridgeport, PA 19405

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Original – 09/28/2018

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1.0 EXECUTIVE SUMMARY

1.1 PROJECT OVERVIEW

The following report provides details on how the proposed stormwater management design for the TLC Drain and Sewer headquarters will be utilized to achieve compliance with the West Norriton Township Stormwater Management Ordinance.

The subject property is situated in West Norriton Township, Montgomery County, PA on approximately 3.20 acres of land. The property has public street frontage on West Main Street to the north. Along the rear of the property lies several residential properties and along the western property boundary lies a mixture of residential and commercial properties. To the east of the property lies a shopping center. The prior use of the site was a diner and two other buildings.

The applicant is proposing to redevelop the existing lot into a headquarters for their drain and sewer company with an office, contractor's shop, and yard area. The proposed site improvements will also include the addition of landscaped islands in the parking area, green space around the perimeter of the site, utility services, landscaping, and stormwater management controls necessary to support the project.

1.2 SITE DESCRIPTION AND CONSIDERATIONS

The existing site was previously developed and includes two (2) primary buildings and an accessory structure (shed) along with affiliated site improvements. There is an existing concrete curb along West Main Street. The bulk of the non-building area consists of existing landscape that has yet to be developed. The property contains two (2) points of interest, both of which are located along the western property boundary. The majority of the water leaving the site sheet flows off of the site towards the western property boundary between the existing 7-Eleven and the southwest corner of the lot. The remaining water sheet flows off the western property boundary towards West Main Street. No significant stormwater runoff from adjacent properties passes through the development site.

The existing asphalt and pavement is to be sawcut and excavated to accommodate a new driveway, parking lot, building, and asphalt milling yard area. Landscaped islands will divide the two front parking areas. The remainder of the site will be improved as grass and landscaped area to continue to reduce the rate of stormwater runoff from the site and improve water quality. The existing buildings will be removed to accommodate the proposed site developments. Runoff from the building will be collected in a roof drain collection system and piped to a rainwater harvesting system, which will overflow to a subsurface infiltration basin located under the proposed parking area. All runoff collected from the parking lot will be routed through proposed rain gardens and then piped to the subsurface infiltration basin. Water runoff collected from the rear asphalt milling yard will be collected by a vegetated swale located along the rear property line and then piped to a second subsurface infiltration basin. Both basins will discharge to their respective level spreaders where the water will then sheet flow off the property. All stormwater management facilities will be constructed to manage peak rate reductions in accordance with the West Norriton Township Stormwater Management Ordinance prior to releasing stormwater off-site.

2.0 METHODOLOGY AND PARAMETER DEVELOPMENT

A hydrologic analysis was performed of the subject property for both existing and proposed conditions to determine flow patterns, peak flows rates, and stormwater management requirements. The Hydraflow Hydrographs for AutoCAD® Civil 3D® 2018 computer program was used to perform the hydrologic analysis for this project for the peak flow mitigation for the 1, 2, 5, 10, 25, 50 and 100-year, 24-hour design storms. The SCS Method was utilized to estimate peak discharges for the associated drainage areas. All calculations utilized the rainfall intensities obtained from Section A.5 of Appendix A in Chapter 26 of the West Norriton Township Ordinance.

- For all areas that are not woods or not Impervious surfaces, pre-development calculations shall assume a ground cover of meadow.

- For all areas that are impervious surfaces, one hundred percent (100%) of the existing impervious surface areas shall be considered “meadow” ground cover, or it’s assumed natural condition.

3.0 PRE-DEVELOPMENT CONDITIONS

The pre-development condition of the site consists of two (2) points of interest that flow off-site and ultimately drain to the Schuylkill River (Pa. Chapter 93 designation: TSF, MF) as shown on the provided Pre-Development Drainage Area Plan in Appendix B.

Point of Interest 1 – Stormwater sheet flows off the western property boundary between West Main Street and the northern face of the existing 7-Eleven on the adjacent property. The water discharges onto West Main Street and flows toward the intersection to the west until it enters the municipal sewer system where it ultimately drains into the Schuylkill River.

Point of Interest 2 – Stormwater sheet flows off the western property boundary between the southern face of the existing 7-Eleven and the southern property boundary. The water discharges towards the neighboring residential properties until it enters the municipal storm system and ultimately drains into the Schuylkill River.

Tributary area to the points of interest has been delineated and hydrographs have been generated for the 1, 2, 5, 10, 25, 50 and 100-year design storms. The pre-development conditions were analyzed based on existing conditions for the areas tributary to the points of interest.

4.0 POST-DEVELOPMENT CONDITIONS

The post development conditions of the site maintain the same Points of Interest and relative drainage patterns. Runoff from the building will be collected in a roof drain collection system and piped to a rainwater harvesting system, which will overflow to a subsurface infiltration basin located under the proposed parking area. All runoff collected from the parking lot will be routed through proposed rain gardens and then piped to the subsurface infiltration basin. Water runoff collected from the rear asphalt milling yard will be collected by a vegetated swale located along the rear property line and then piped to a second subsurface infiltration basin. Both basins will discharge to their respective level spreaders where the water will then sheet flow off the property. All stormwater management facilities will be constructed to manage peak rate reductions in accordance with the West Norriton Township Stormwater Management Ordinance prior to releasing stormwater off-site.

Tributary area to the points of interest has been delineated and hydrographs have been generated for the 1, 2, 5, 10, 25, 50 and 100-year design storms These hydrographs have been routed through the BMP and added to the hydrographs generated for any bypass areas to determine the total post development discharge rates. Refer to the provided Post Development Drainage Area Plan in Appendix B.

5.0 STORMWATER MANAGEMENT ORDINANCE COMPLIANCE

5.1 WATER QUALITY AND RUNOFF VOLUME REQUIREMENTS

The stormwater management system has been designed to comply with requires for NPDES as the project is a regulated earth disturbance (>1.0 acres). Each subsurface infiltration basin provides the required minimum volume reduction for the 2-Year 24-Hour storm. See Appendix A for volume reduction calculations.

Water Quality on the site is provided by rain gardens in the front parking area islands, along with a vegetated swale to collect the bulk of the asphalt milling yard area. Additionally, the rain garden and swale outlet structures will be water quality inlet combination storm sewer underdrain BMP's.

5.2 STORMWATER PEAK RATE CONTROL REQUIREMENTS

Per Appendix A of Chapter 26 of the West Norriton Township Ordinance, peak rate reduction is provided for all storm events up to the 100-year storm. The following is a breakdown of Peak Rate Control Standards:

Table 5-3.1 - Peak Rate Summary POI #1

Hydrograph	1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Pre-Development Flow (cfs)	1.395	1.838	2.577	3.165	3.677	4.187	4.694
Allowable Total Post Dev. Flow (cfs)*	**1.395**	**1.838**	**2.577**	**3.165**	**3.677**	**4.187**	**4.694**
	1 Yr Pre*	**2 Yr Pre ***	**5Yr Pre***	**10 Yr Pre***	**25 Yr Pre***	**50Yr Pre***	**100Yr Pre***
Provided Post Development Flow (cfs)	**0.920**	**1.276**	**1.888**	**2.383**	**2.817**	**3.250**	**3.682**
Difference (cfs)	**-0.475**	**-0.562**	**-0.689**	**-0.782**	**-0.860**	**-0.937**	**-1.012**

Table 5-3.2 - Peak Rate Summary POI #2

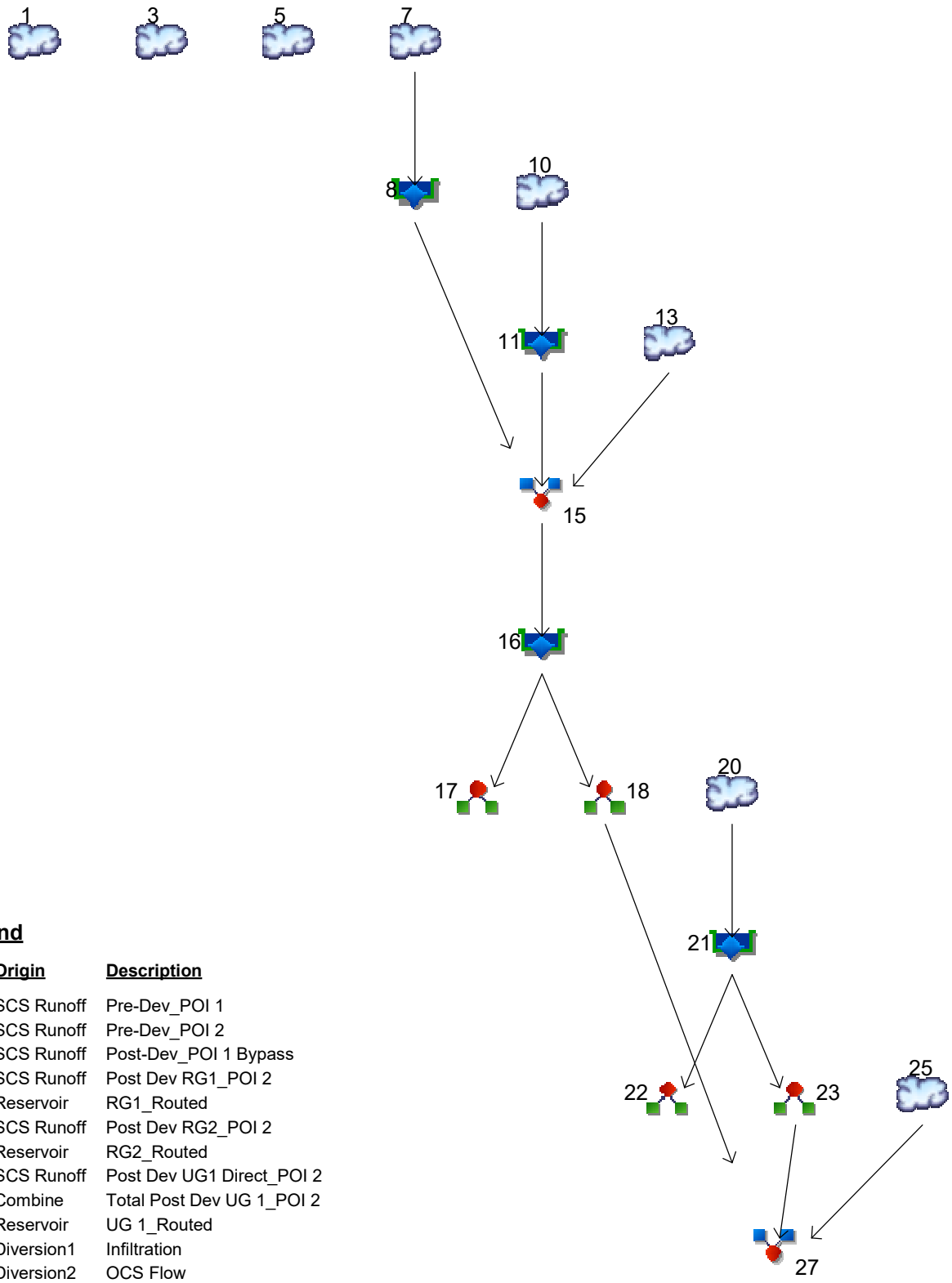
Hydrograph	1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Pre-Development Flow (cfs)	1.492	2.955	5.833	8.409	10.800	13.290	15.840
Allowable Total Post Dev. Flow (cfs)*	**1.492**	**2.955**	**5.833**	**8.409**	**10.800**	**13.290**	**15.840**
	1 Yr Pre*	**2 Yr Pre ***	**5Yr Pre***	**10 Yr Pre***	**25 Yr Pre***	**50Yr Pre***	**100Yr Pre***
Provided Post Development Flow (cfs)	**1.190**	**1.849**	**3.050**	**4.214**	**5.272**	**6.297**	**9.363**
Difference (cfs)	**-0.302**	**-1.106**	**-2.783**	**-4.195**	**-5.528**	**-6.693**	**-6.477**

6.0 CONCLUSIONS

The results of the analysis indicated that the following stormwater management program, described within this report, has been designed to meet the requirements of the West Norriton Township Stormwater Management criteria for Peak Rate Control standards and the NPDES requirements for volume reduction and water quality through the implementation of two (2) Underground Infiltration Basins, two (2) Rain Gardens, and one (1) Bio-Swale.

APPENDIX A – STORMWATER PEAK RATE CONTROL ANALYSIS

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Pre-Dev_POI 1
3	SCS Runoff	Pre-Dev_POI 2
5	SCS Runoff	Post-Dev_POI 1 Bypass
7	SCS Runoff	Post Dev RG1_POI 2
8	Reservoir	RG1_Routed
10	SCS Runoff	Post Dev RG2_POI 2
11	Reservoir	RG2_Routed
13	SCS Runoff	Post Dev UG1 Direct_POI 2
15	Combine	Total Post Dev UG 1_POI 2
16	Reservoir	UG 1_Routed
17	Diversion1	Infiltration
18	Diversion2	OCS Flow
20	SCS Runoff	Post Dev UG 2_POI 2
21	Reservoir	Underground #2_Routed
22	Diversion1	Infiltration
23	Diversion2	OCS Flow
25	SCS Runoff	Post-Dev Bypass_POI 2
27	Combine	Total Post-Dev_POI 2

PROJECT: ***TLC Headquarters***
1956-1968 West Main Street, Norristown, PA
West Norriton Township, Montgomery County

DATE: ***9/24/2018***
BY: ***GJB***
CHECKED BY: ***-***
REVISION: ***0***

Point of Interest #1 - Stormwater Peak Rate Summary

	Storm Event (years)						
Hydrograph	1	2	5	10	25	50	100
Pre-Development Flow (cfs)	1.395	1.838	2.577	3.165	3.677	4.187	4.694
Allowable Total Post Development Flow (cfs)*	1.395	**1.838**	**2.577**	**3.165**	**3.677**	**4.187**	**4.694**
	1 Yr Pre *	**2 Yr Pre ***	**5Yr Pre***	**10 Yr Pre***	**25 Yr Pre***	**50Yr Pre***	**100Yr Pre***
Provided Post Development Flow (cfs)	**0.920**	**1.276**	**1.888**	**2.383**	**2.817**	**3.250**	**3.682**
Difference (cfs)	**-0.475**	**-0.562**	**-0.689**	**-0.782**	**-0.860**	**-0.937**	**-1.012**

Point of Interest #2 - Stormwater Peak Rate Summary

	Storm Event (years)						
Hydrograph	1	2	5	10	25	50	100
Pre-Development Flow (cfs)	1.492	2.955	5.833	8.409	10.800	13.290	15.840
Allowable Total Post Development Flow (cfs)*	1.492	**2.955**	**5.833**	**8.409**	**10.800**	**13.290**	**15.840**
	1 Yr Pre *	**2 Yr Pre ***	**5Yr Pre***	**10 Yr Pre***	**25 Yr Pre***	**50Yr Pre***	**100Yr Pre***
Provided Post Development Flow (cfs)	**1.190**	**1.849**	**3.050**	**4.214**	**5.272**	**6.297**	**9.363**
Difference (cfs)	**-0.302**	**-1.106**	**-2.783**	**-4.195**	**-5.528**	**-6.993**	**-6.477**

COMPUTATION SHEET: SCS RUNOFF COEFFICIENT (CN)

PROJECT: ***TLC Headquarters***
1956-1968 West Main Street, Norristown, PA
West Norriton Township, Montgomery County

DATE: ***9/9/2018***
BY: ***MRP***
CHECKED BY: ***-***
REVISION: ***0***

PRE-DEVELOPMENT DRAINAGE AREAS

Cover Type Description	Soil HSG	CN	Pre-Dev (POI #1) (Acres)	Pre-Dev (POI #2) (Acres)	(Acres)	(Acres)
Meadow	B	58				
Wooded	B	55				
Lawn	B	61		2.360		
Meadow	C	71				
Wooded	C	70				
Lawn	C	74				
Meadow	D	78				
Wooded	D	77				
Lawn	D	80	0.220	0.194		
Impervious	ALL	98	0.292	0.295		
		Total Area	0.512	2.849		
		SCS Runoff Coefficient (CN)	90.3	66.1		
		Time of Concentration (Tc)	5.0	5.0	5.0	5.0

COMPUTATION SHEET: SCS RUNOFF COEFFICIENT (CN)

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CHECKED BY: **-**
REVISION: **-**

POST DEVELOPMENT DRAINAGE AREAS

Cover Type Description	Soil HSG	CN	Post-Dev RG 1 (POI #2) (Acres)	Post-Dev RG 2 (POI #2) (Acres)	Post-Dev UG 1 Direct (POI #2) (Acres)	Post-Dev UG 2 (POI #2) (Acres)
Meadow	B	58				
Wooded	B	55				
Lawn	B	61	0.038	0.027		
Meadow	C	71				
Wooded	C	70				
Lawn	C	74				
Meadow	D	78				
Wooded	D	77				
Lawn	D	80	0.015	0.010		0.314
Impervious	ALL	98	0.329	0.176	0.353	0.691
		Total Area	0.382	0.214	0.353	1.005
		SCS Runoff Coefficient (CN)	93.7	92.4	98.0	92.4
		Time of Concentration (Tc)	5.0	5.0	5.0	5.0

POST DEVELOPMENT DRAINAGE AREAS

Cover Type Description	Soil HSG	CN	Post-Dev Bypass 1 (POI #1) (Acres)	Post-Dev Bypass 2 (POI #2) (Acres)	(Acres)	(Acres)
Meadow	B	58				
Wooded	B	55				
Lawn	B	61	0.010	0.453		
Meadow	C	71				
Wooded	C	70				
Lawn	C	74				
Meadow	D	78				
Wooded	D	77				
Lawn	D	80	0.286	0.301		
Impervious	ALL	98	0.134	0.224		
		Total Area	0.429	0.978		
		SCS Runoff Coefficient (CN)	85.2	75.3		
		Time of Concentration (Tc)	5.0	5.0	5.0	5.0

UNDERGROUND BASIN #1 LEVEL SPREADER DESIGN

Design requirements taken from Section VII, page 440 of the PA DEP E&S Pollution Control Program Manual which states *"The primary reference of the information in this section has been taken from Designing Level Spreaders to Treat Stormwater Runoff. (W.F. Hunt, D.E. Line, R.A. McLaughlin, N.B. Rajbhandari, R.E. Sheffield; North Carolina State University, 2001)".*

Design Storms:

Level spreaders are to be constructed to effectively diffuse anticipated flows up the 100-yr storm

Required Design Storm = 100 -year
Provided Design Storm = **100** -year

Maximum drainage area to be controlled by a level spreader shall not exceed 5 acres.

Maximum Allowable Drainage Area = 5.000 Acres
Provided Maximum Drainage Area = **0.948** **Acres**

Allowable Velocities:

The maximum allowable velocity is a function of ground cover. The maximum allowable velocities for down slope soil covers are listed in Table G.1.

Ground Cover	Allowable Velocity
Grass	4 fps
Gravel	5 fps
Mulch	1-2 fps

Provided down slope ground cover = **Gravel** **5** ft/sec

Maximum allowable discharge velocity from level spreaders = 33% allowable down slope velocities based on cover

Max. allowable downslope discharge velvocity = 1.667 ft/sec Gravel
Provided downslope discharge velvocity = 1.225 ft/sec Gravel

Do

Downslope Velocity Design Parameters:

$V = Q \div A$

Where: $Q =$ 1.35 cfs Post Development 100-year Flow
$A =$ 1.653 sf. Area (A = L * depth of flow)

Solve for: $V =$ 0.817 ft/sec

R-3 Riprap = 6.50 ft/sec * **(complies)**

* Refer to page 135, table 6.6 of E&S Manual for maximum allowable velocity.

Calculating Level Spreader Length:

Using Allowable Velocities to Establish Level Spreader Length. With an allowable velocity selected based upon down slope ground cover, it is now possible to calculate the necessary level spreader length. The calculation is based on two equations: (1) the Weir Equation and (2) the Continuity Equation, both of which are described below.

Weir Equation: It is assumed that the level spreader functions as a long weir. Flow over a weir is described by the following equation and illustrated in Figure G.8.

$$Q = C_w * L * H^{3/2}$$

Where:	Q =	1.35	cfs	100-year Flow (Per Stormsewer Calc.'s)
	L =	22.3	ft.	Length of Level Spreader (feet)
	C_w =	3.0		Weir Coefficient (assume 3.0)
	H =	unkown	ft.	Driving Head (feet)
Solve for:	H =	0.074	ft.	

Flow over the level spreader is a function of its length and the height of water upslope. Increasing the length of the weir reduces the height of water for a given flow rate, as they are directly related. This is important because the combination of water height and weir length dictate the level spreader discharge velocity. This relationship is shown in the second equation, the continuity equation.

Continutiy Equation:

$$Q = V * A$$

Where:
Q = Flow (cfs)
V = Velocity (ft./sec.)
A = Cross-Sectional Area of Flow (ft^2) = $L * {}^{2/3}H$

Again, the allowable velocity is selected based on the type of cover down slope of the level spreader (e.g., grass, gravel, mulch). Therefore, the above two equations can be combined to solve for V as follows:

$$V = 1.5 * C_w * H^{½}$$

Where:	V =	unkown	fps	Velocity (fps)
	H =	0.07	ft.	Driving Head (feet)
	C_w =	3.0		Weir Coefficient (assume 3.0)
Solve for:	V =	1.23	ft./sec.	

Table G.2. Maximum Velocities of Flow Across Level Spreader

Down Slope Ground Cover	Velocity at Level Spreader V (fps)	Driving Head H (feet)	"Equivalent" Water Height over Level Spreader, H*=2/3H
Grass	1.33	0.09	0.058
Gravel	1.50	0.11	0.074
Mulch	0.67	0.02	0.015

Max. allowable discharge velocity at level spreader =	1.50	ft./sec.	Gravel
Provided discharge velocity at level spreader =	**1.23**	ft./sec.	Gravel

UNDERGROUND BASIN #2 LEVEL SPREADER DESIGN

Design requirements taken from Section VII, page 440 of the PA DEP E&S Pollution Control Program Manual which states *"The primary reference of the information in this section has been taken from Designing Level Spreaders to Treat Stormwater Runoff. (W.F. Hunt, D.E. Line, R.A. McLaughlin, N.B. Rajbhandari, R.E. Sheffield; North Carolina State University, 2001)".*

Design Storms:

Level spreaders are to be constructed to effectively diffuse anticipated flows up the 100-yr storm

Required Design Storm = 100 -year
Provided Design Storm = **100** -year

Maximum drainage area to be controlled by a level spreader shall not exceed 5 acres.

Maximum Allowable Drainage Area = 5.000 Acres
Provided Maximum Drainage Area = **1.005** **Acres**

Allowable Velocities:

The maximum allowable velocity is a function of ground cover. The maximum allowable velocities for down slope soil covers are listed in Table G.1.

Ground Cover	Allowable Velocity
Grass	4 fps
Gravel	5 fps
Mulch	1-2 fps

Provided down slope ground cover = **Gravel** **5** ft/sec

Maximum allowable discharge velocity from level spreaders = 33% allowable down slope velocities based on cover

Max. allowable downslope discharge velvocity = 1.667 ft/sec Gravel
Provided downslope discharge velvocity = 1.412 ft/sec Gravel

Do

Downslope Velocity Design Parameters:

V = Q ÷ A

Where: Q = 4.932 cfs Post Development 100-year Flow
A = 5.239 sf. Area (A = L * depth of flow)

Solve for: V = 0.941 ft/sec

R-3 Riprap = 6.50 ft/sec * **(complies)**

* Refer to page 135, table 6.6 of E&S Manual for maximum allowable velocity.

Calculating Level Spreader Length:

Using Allowable Velocities to Establish Level Spreader Length. With an allowable velocity selected based upon down slope ground cover, it is now possible to calculate the necessary level spreader length. The calculation is based on two equations: (1) the Weir Equation and (2) the Continuity Equation, both of which are described below.

Weir Equation: It is assumed that the level spreader functions as a long weir. Flow over a weir is described by the following equation and illustrated in Figure G.8.

$$Q = C_w * L * H^{3/2}$$

Where:	Q =	4.932	cfs	100-year Flow (Per Hydroflow Calc.'s)
	L =	53.2	ft.	Length of Level Spreader (feet)
	C_w =	3.0		Weir Coefficient (assume 3.0)
	H =	unkown	ft.	Driving Head (feet)
Solve for:	H =	0.098	ft.	

Flow over the level spreader is a function of its length and the height of water upslope. Increasing the length of the weir reduces the height of water for a given flow rate, as they are directly related. This is important because the combination of water height and weir length dictate the level spreader discharge velocity. This relationship is shown in the second equation, the continuity equation.

Continutiy Equation:

$$Q = V * A$$

Where:
Q = Flow (cfs)
V = Velocity (ft./sec.)
A = Cross-Sectional Area of Flow (ft^2) = $L * {}^{2/3}H$

Again, the allowable velocity is selected based on the type of cover down slope of the level spreader (e.g., grass, gravel, mulch). Therefore, the above two equations can be combined to solve for V as follows:

$$V = 1.5 * C_w * H^{½}$$

Where:	V =	unkown	fps	Velocity (fps)
	H =	0.10	ft.	Driving Head (feet)
	C_w =	3.0		Weir Coefficient (assume 3.0)
Solve for:	V =	1.41	ft./sec.	

Table G.2. Maximum Velocities of Flow Across Level Spreader

Down Slope Ground Cover	Velocity at Level Spreader V (fps)	Driving Head H (feet)	"Equivalent" Water Height over Level Spreader, H*=2/3H
Grass	1.33	0.09	0.058
Gravel	1.50	0.11	0.074
Mulch	0.67	0.02	0.015

Max. allowable discharge velocity at level spreader =	1.50	ft./sec.	Gravel
Provided discharge velocity at level spreader =	**1.41**	ft./sec.	Gravel

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	1.395	2	716	2,865	------	------	------	Pre-Dev_POI 1
3	SCS Runoff	1.492	2	718	3,585	------	------	------	Pre-Dev_POI 2
5	SCS Runoff	0.920	2	716	1,857	------	------	------	Post-Dev_POI 1 Bypass
7	SCS Runoff	1.188	2	716	2,518	------	------	------	Post Dev RG1_POI 2
8	Reservoir	1.170	2	718	2,515	7	236.64	284	RG1_Routed
10	SCS Runoff	0.617	2	716	1,256	------	------	------	Post Dev RG2_POI 2
11	Reservoir	0.620	2	718	1,254	10	237.80	179	RG2_Routed
13	SCS Runoff	1.232	2	716	2,847	------	------	------	Post Dev UG1 Direct_POI 2
15	Combine	2.976	2	716	6,617	8, 11, 13,	------	------	Total Post Dev UG 1_POI 2
16	Reservoir	0.173	2	774	6,617	15	231.42	2,719	UG 1_Routed
17	Diversion1	0.173	2	774	6,617	16	------	------	Infiltration
18	Diversion2	0.000	2	894	0	16	------	------	OCS Flow
20	SCS Runoff	2.981	2	716	6,227	------	------	------	Post Dev UG 2_POI 2
21	Reservoir	0.069	2	900	6,226	20	232.24	3,699	Underground #2_Routed
22	Diversion1	0.069	2	900	6,226	21	------	------	Infiltration
23	Diversion2	0.000	2	746	0	21	------	------	OCS Flow
25	SCS Runoff	1.190	2	718	2,408	------	------	------	Post-Dev Bypass_POI 2
27	Combine	1.190	2	718	2,408	18, 23, 25,	------	------	Total Post-Dev_POI 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	1.838	2	716	3,825	------	------	------	Pre-Dev_POI 1
3	SCS Runoff	2.955	2	718	6,276	------	------	------	Pre-Dev_POI 2
5	SCS Runoff	1.276	2	716	2,588	------	------	------	Post-Dev_POI 1 Bypass
7	SCS Runoff	1.517	2	716	3,268	------	------	------	Post Dev RG1_POI 2
8	Reservoir	1.489	2	716	3,265	7	236.66	292	RG1_Routed
10	SCS Runoff	0.827	2	716	1,700	------	------	------	Post Dev RG2_POI 2
11	Reservoir	0.833	2	716	1,699	10	237.81	181	RG2_Routed
13	SCS Runoff	1.524	2	716	3,565	------	------	------	Post Dev UG1 Direct_POI 2
15	Combine	3.847	2	716	8,529	8, 11, 13,	------	------	Total Post Dev UG 1_POI 2
16	Reservoir	0.186	2	786	8,529	15	231.67	3,781	UG 1_Routed
17	Diversion1	0.186	2	786	8,529	16	------	------	Infiltration
18	Diversion2	0.000	2	1086	0	16	------	------	OCS Flow
20	SCS Runoff	3.850	2	716	8,168	------	------	------	Post Dev UG 2_POI 2
21	Reservoir	0.091	2	886	8,167	20	232.59	4,996	Underground #2_Routed
22	Diversion1	0.075	2	886	7,972	21	------	------	Infiltration
23	Diversion2	0.016	2	886	195	21	------	------	OCS Flow
25	SCS Runoff	1.849	2	718	3,698	------	------	------	Post-Dev Bypass_POI 2
27	Combine	1.849	2	718	3,894	18, 23, 25,	------	------	Total Post-Dev_POI 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	2.577	2	716	5,469	------	------	------	Pre-Dev_POI 1
3	SCS Runoff	5.833	2	718	11,766	------	------	------	Pre-Dev_POI 2
5	SCS Runoff	1.888	2	716	3,877	------	------	------	Post-Dev_POI 1 Bypass
7	SCS Runoff	2.060	2	716	4,535	------	------	------	Post Dev RG1_POI 2
8	Reservoir	2.024	2	716	4,532	7	236.71	304	RG1_Routed
10	SCS Runoff	1.179	2	716	2,468	------	------	------	Post Dev RG2_POI 2
11	Reservoir	1.190	2	716	2,467	10	237.82	184	RG2_Routed
13	SCS Runoff	2.011	2	716	4,763	------	------	------	Post Dev UG1 Direct_POI 2
15	Combine	5.225	2	716	11,762	8, 11, 13,	------	------	Total Post Dev UG 1_POI 2
16	Reservoir	0.304	2	768	11,762	15	232.05	5,338	UG 1_Routed
17	Diversion1	0.205	2	768	10,926	16	------	------	Infiltration
18	Diversion2	0.098	2	768	835	16	------	------	OCS Flow
20	SCS Runoff	5.291	2	716	11,465	------	------	------	Post Dev UG 2_POI 2
21	Reservoir	0.229	2	786	11,464	20	233.01	6,496	Underground #2_Routed
22	Diversion1	0.083	2	786	8,871	21	------	------	Infiltration
23	Diversion2	0.146	2	786	2,593	21	------	------	OCS Flow
25	SCS Runoff	3.050	2	718	6,126	------	------	------	Post-Dev Bypass_POI 2
27	Combine	3.050	2	718	9,554	18, 23, 25,	------	------	Total Post-Dev_POI 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	3.165	2	716	6,809	------	------	------	Pre-Dev_POI 1
3	SCS Runoff	8.409	2	718	16,823	------	------	------	Pre-Dev_POI 2
5	SCS Runoff	2.383	2	716	4,946	------	------	------	Post-Dev_POI 1 Bypass
7	SCS Runoff	2.492	2	716	5,557	------	------	------	Post Dev RG1_POI 2
8	Reservoir	2.484	2	716	5,554	7	236.72	310	RG1_Routed
10	SCS Runoff	1.460	2	716	3,098	------	------	------	Post Dev RG2_POI 2
11	Reservoir	1.444	2	716	3,096	10	237.83	186	RG2_Routed
13	SCS Runoff	2.399	2	716	5,722	------	------	------	Post Dev UG1 Direct_POI 2
15	Combine	6.326	2	716	14,373	8, 11, 13,	------	------	Total Post Dev UG 1_POI 2
16	Reservoir	0.388	2	760	14,372	15	232.37	6,624	UG 1_Routed
17	Diversion1	0.222	2	760	12,350	16	------	------	Infiltration
18	Diversion2	0.166	2	760	2,022	16	------	------	OCS Flow
20	SCS Runoff	6.435	2	716	14,134	------	------	------	Post Dev UG 2_POI 2
21	Reservoir	0.308	2	776	14,133	20	233.46	8,007	Underground #2_Routed
22	Diversion1	0.092	2	776	9,472	21	------	------	Infiltration
23	Diversion2	0.216	2	776	4,661	21	------	------	OCS Flow
25	SCS Runoff	4.079	2	716	8,237	------	------	------	Post-Dev Bypass_POI 2
27	Combine	4.214	2	718	14,920	18, 23, 25,	------	------	Total Post-Dev_POI 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	3.677	2	716	7,992	------	------	------	Pre-Dev_POI 1
3	SCS Runoff	10.80	2	718	21,610	------	------	------	Pre-Dev_POI 2
5	SCS Runoff	2.817	2	716	5,900	------	------	------	Post-Dev_POI 1 Bypass
7	SCS Runoff	2.867	2	716	6,455	------	------	------	Post Dev RG1_POI 2
8	Reservoir	2.829	2	716	6,452	7	236.74	315	RG1_Routed
10	SCS Runoff	1.706	2	716	3,655	------	------	------	Post Dev RG2_POI 2
11	Reservoir	1.703	2	716	3,654	10	237.84	188	RG2_Routed
13	SCS Runoff	2.738	2	716	6,562	------	------	------	Post Dev UG1 Direct_POI 2
15	Combine	7.270	2	716	16,668	8, 11, 13,	------	------	Total Post Dev UG 1_POI 2
16	Reservoir	0.451	2	758	16,668	15	232.69	7,822	UG 1_Routed
17	Diversion1	0.238	2	758	13,539	16	------	------	Infiltration
18	Diversion2	0.213	2	758	3,129	16	------	------	OCS Flow
20	SCS Runoff	7.429	2	716	16,483	------	------	------	Post Dev UG 2_POI 2
21	Reservoir	0.385	2	770	16,482	20	233.99	9,385	Underground #2_Routed
22	Diversion1	0.102	2	770	9,956	21	------	------	Infiltration
23	Diversion2	0.283	2	770	6,525	21	------	------	OCS Flow
25	SCS Runoff	5.025	2	716	10,172	------	------	------	Post-Dev Bypass_POI 2
27	Combine	5.272	2	718	19,827	18, 23, 25,	------	------	Total Post-Dev_POI 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	4.187	2	716	9,182	------	------	------	Pre-Dev_POI 1
3	SCS Runoff	13.29	2	718	26,663	------	------	------	Pre-Dev_POI 2
5	SCS Runoff	3.250	2	716	6,866	------	------	------	Post-Dev_POI 1 Bypass
7	SCS Runoff	3.241	2	716	7,356	------	------	------	Post Dev RG1_POI 2
8	Reservoir	3.215	2	716	7,353	7	236.75	319	RG1_Routed
10	SCS Runoff	1.950	2	716	4,217	------	------	------	Post Dev RG2_POI 2
11	Reservoir	1.934	2	716	4,216	10	237.85	190	RG2_Routed
13	SCS Runoff	3.077	2	716	7,402	------	------	------	Post Dev UG1 Direct_POI 2
15	Combine	8.226	2	716	18,971	8, 11, 13,	------	------	Total Post Dev UG 1_POI 2
16	Reservoir	0.585	2	750	18,970	15	233.03	9,017	UG 1_Routed
17	Diversion1	0.256	2	750	14,650	16	------	------	Infiltration
18	Diversion2	0.329	2	750	4,320	16	------	------	OCS Flow
20	SCS Runoff	8.420	2	716	18,841	------	------	------	Post Dev UG 2_POI 2
21	Reservoir	1.718	2	726	18,840	20	234.23	9,816	Underground #2_Routed
22	Diversion1	0.106	2	726	10,210	21	------	------	Infiltration
23	Diversion2	1.612	2	726	8,630	21	------	------	OCS Flow
25	SCS Runoff	5.988	2	716	12,168	------	------	------	Post-Dev Bypass_POI 2
27	Combine	6.297	2	718	25,118	18, 23, 25,	------	------	Total Post-Dev_POI 2

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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	4.694	2	716	10,378	------	------	------	Pre-Dev_POI 1
3	SCS Runoff	15.84	2	718	31,932	------	------	------	Pre-Dev_POI 2
5	SCS Runoff	3.682	2	716	7,841	------	------	------	Post-Dev_POI 1 Bypass
7	SCS Runoff	3.614	2	716	8,258	------	------	------	Post Dev RG1_POI 2
8	Reservoir	3.594	2	716	8,255	7	236.77	324	RG1_Routed
10	SCS Runoff	2.194	2	716	4,783	------	------	------	Post Dev RG2_POI 2
11	Reservoir	2.185	2	716	4,781	10	237.86	192	RG2_Routed
13	SCS Runoff	3.415	2	716	8,242	------	------	------	Post Dev UG1 Direct_POI 2
15	Combine	9.195	2	716	21,278	8, 11, 13,	------	------	Total Post Dev UG 1_POI 2
16	Reservoir	1.614	2	726	21,278	15	233.19	9,511	UG 1_Routed
17	Diversion1	0.264	2	726	15,287	16	------	------	Infiltration
18	Diversion2	1.350	2	726	5,991	16	------	------	OCS Flow
20	SCS Runoff	9.406	2	716	21,206	------	------	------	Post Dev UG 2_POI 2
21	Reservoir	5.043	2	722	21,204	20	234.52	10,281	Underground #2_Routed
22	Diversion1	0.111	2	722	10,427	21	------	------	Infiltration
23	Diversion2	4.932	2	722	10,777	21	------	------	OCS Flow
25	SCS Runoff	6.962	2	716	14,212	------	------	------	Post-Dev Bypass_POI 2
27	Combine	9.363	2	720	30,981	18, 23, 25,	------	------	Total Post-Dev_POI 2

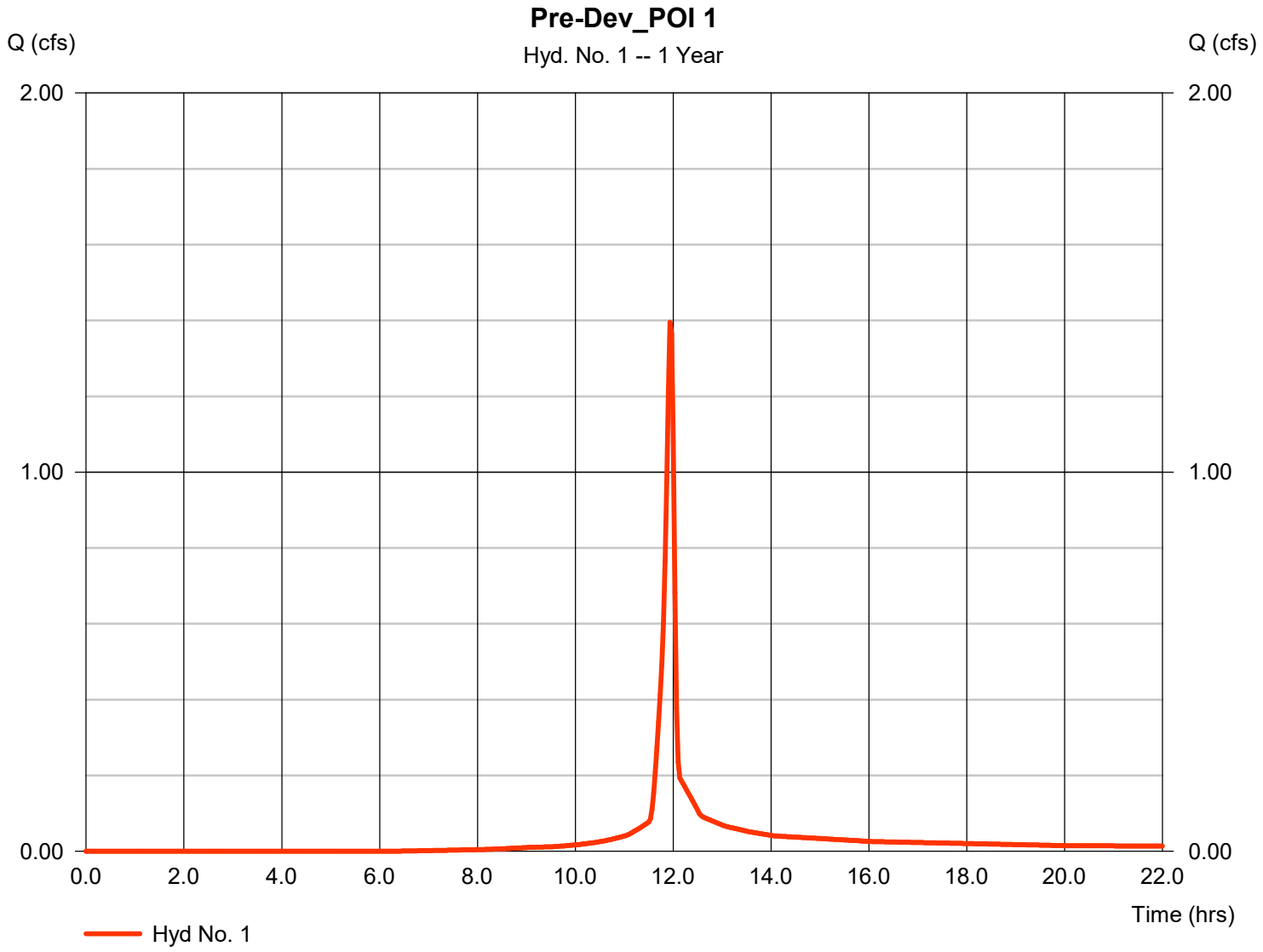
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 1

Pre-Dev_POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.395 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 2,865 cuft
Drainage area	= 0.512 ac	Curve number	= 90.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



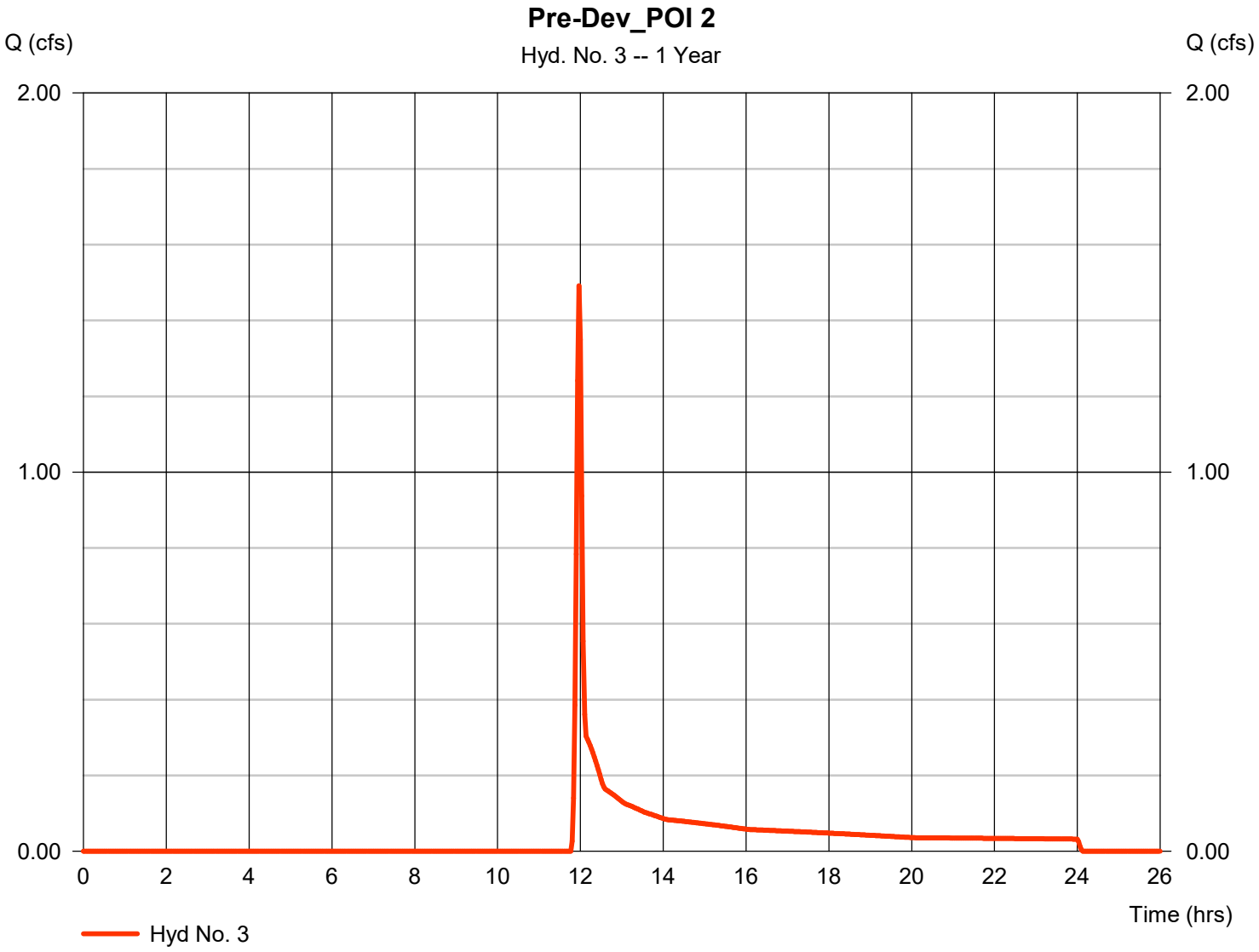
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 3

Pre-Dev_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.492 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 3,585 cuft
Drainage area	= 2.849 ac	Curve number	= 66.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



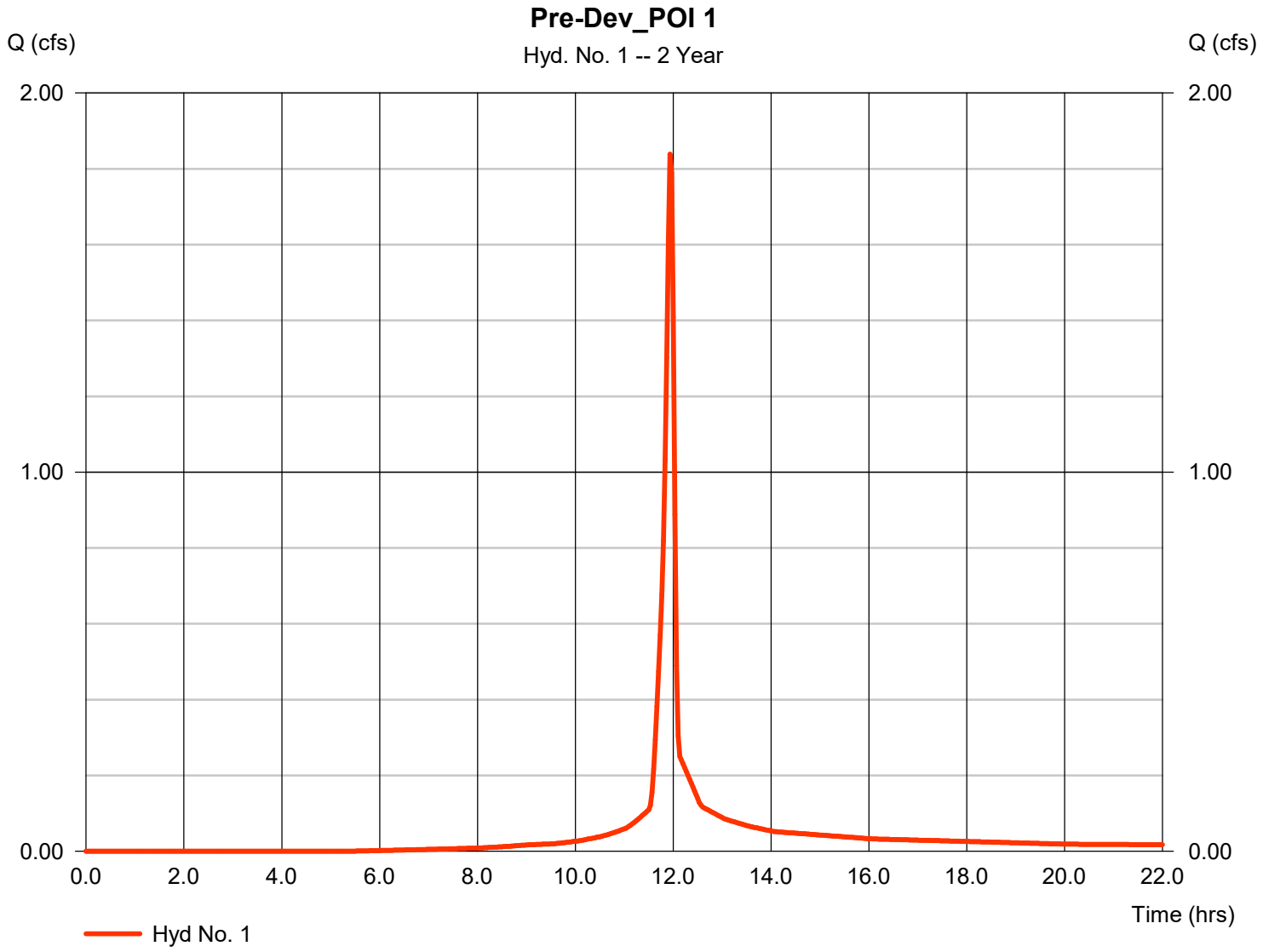
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 1

Pre-Dev_POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.838 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 3,825 cuft
Drainage area	= 0.512 ac	Curve number	= 90.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



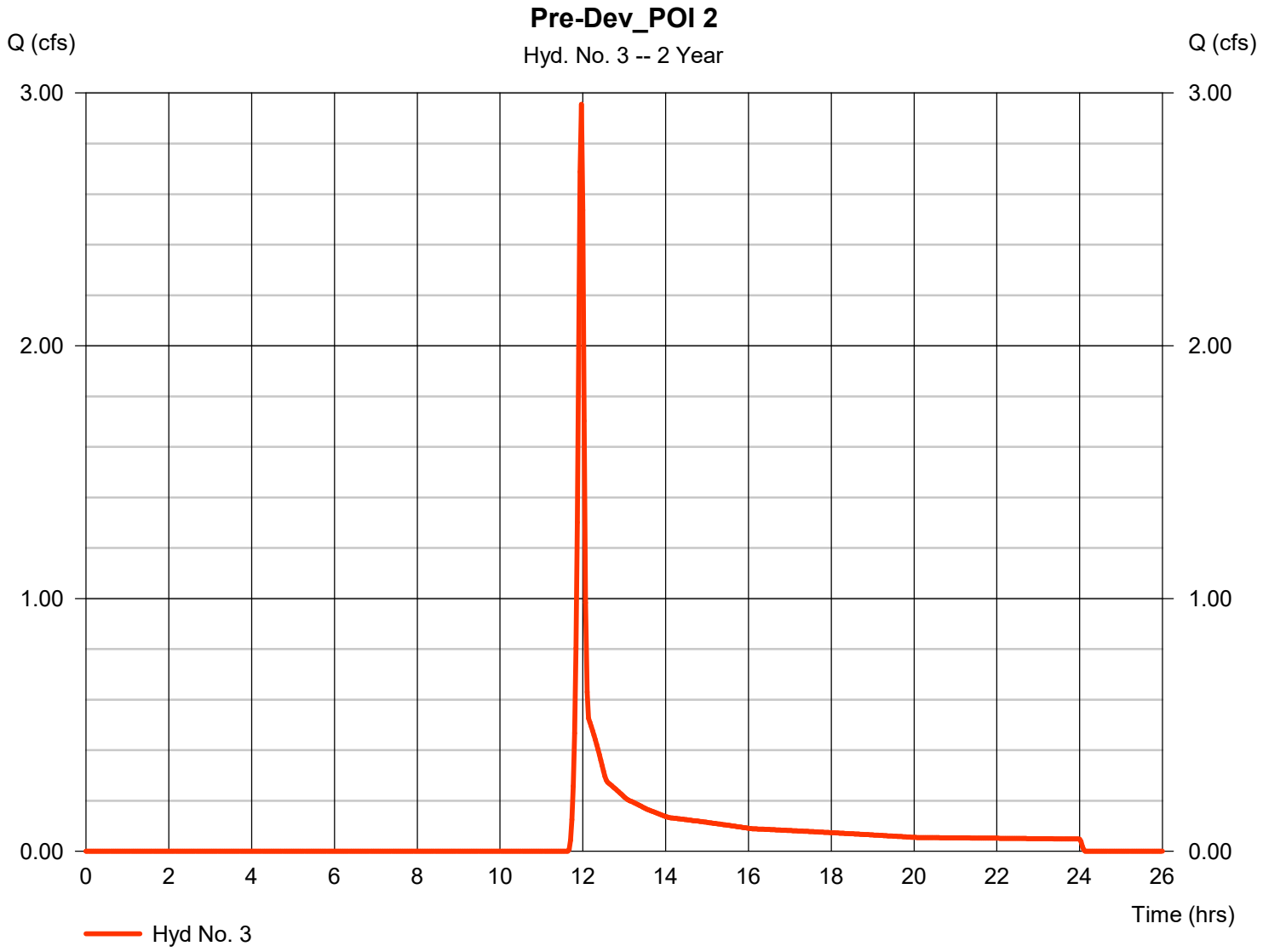
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 3

Pre-Dev_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.955 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 6,276 cuft
Drainage area	= 2.849 ac	Curve number	= 66.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



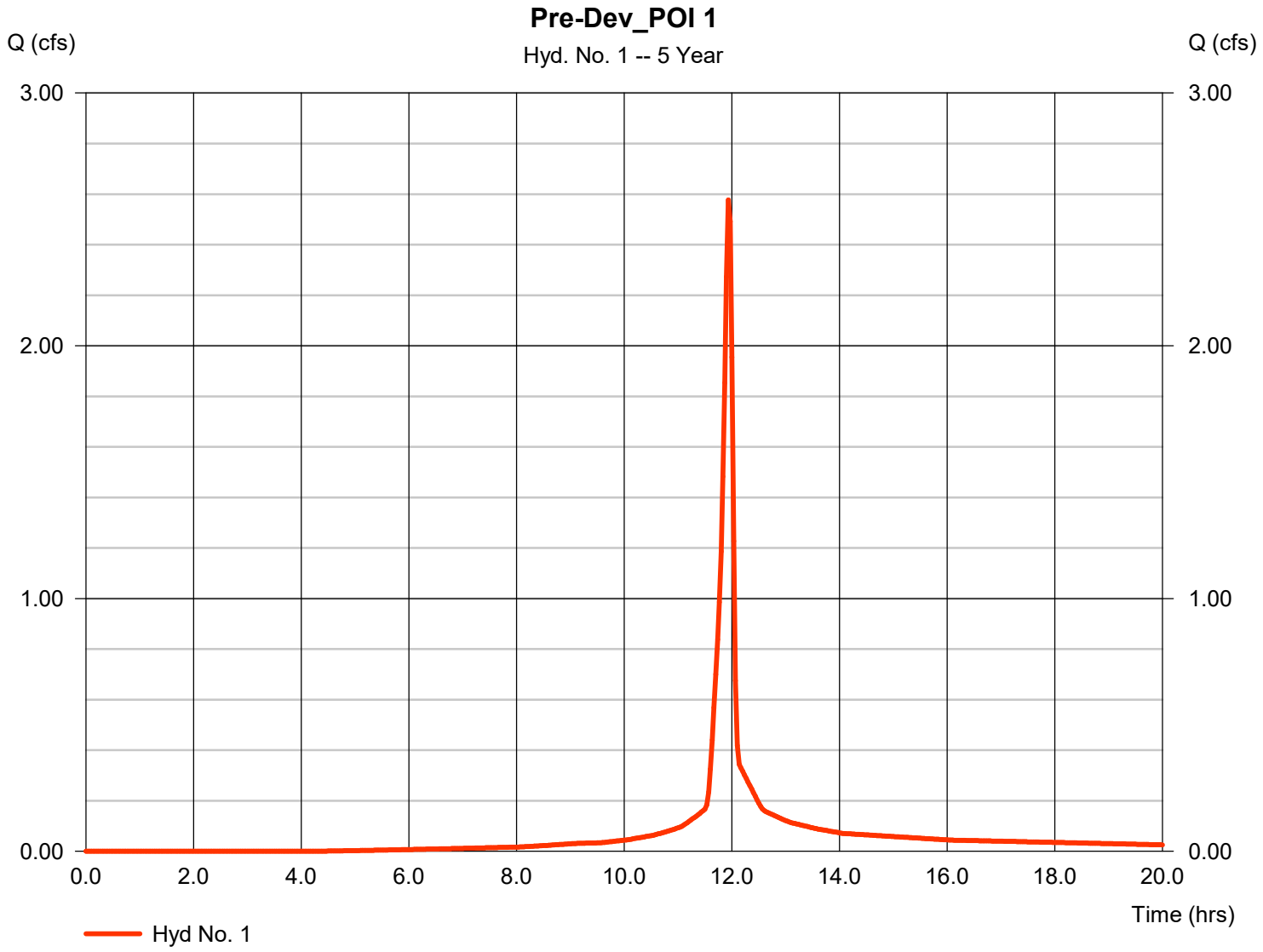
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 1

Pre-Dev_POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.577 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 5,469 cuft
Drainage area	= 0.512 ac	Curve number	= 90.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

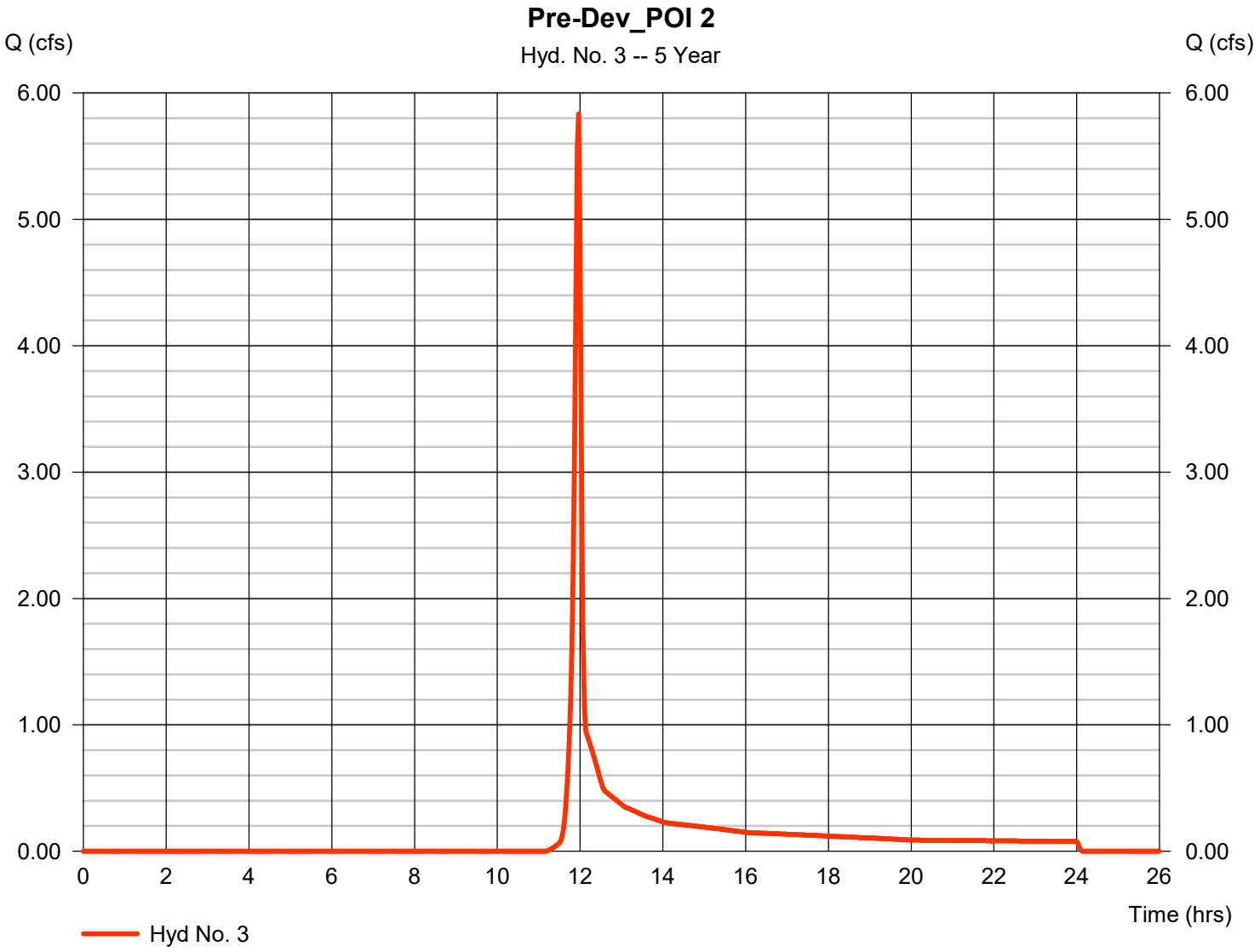


Hydrograph Report

Hyd. No. 3

Pre-Dev_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 5.833 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 11,766 cuft
Drainage area	= 2.849 ac	Curve number	= 66.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



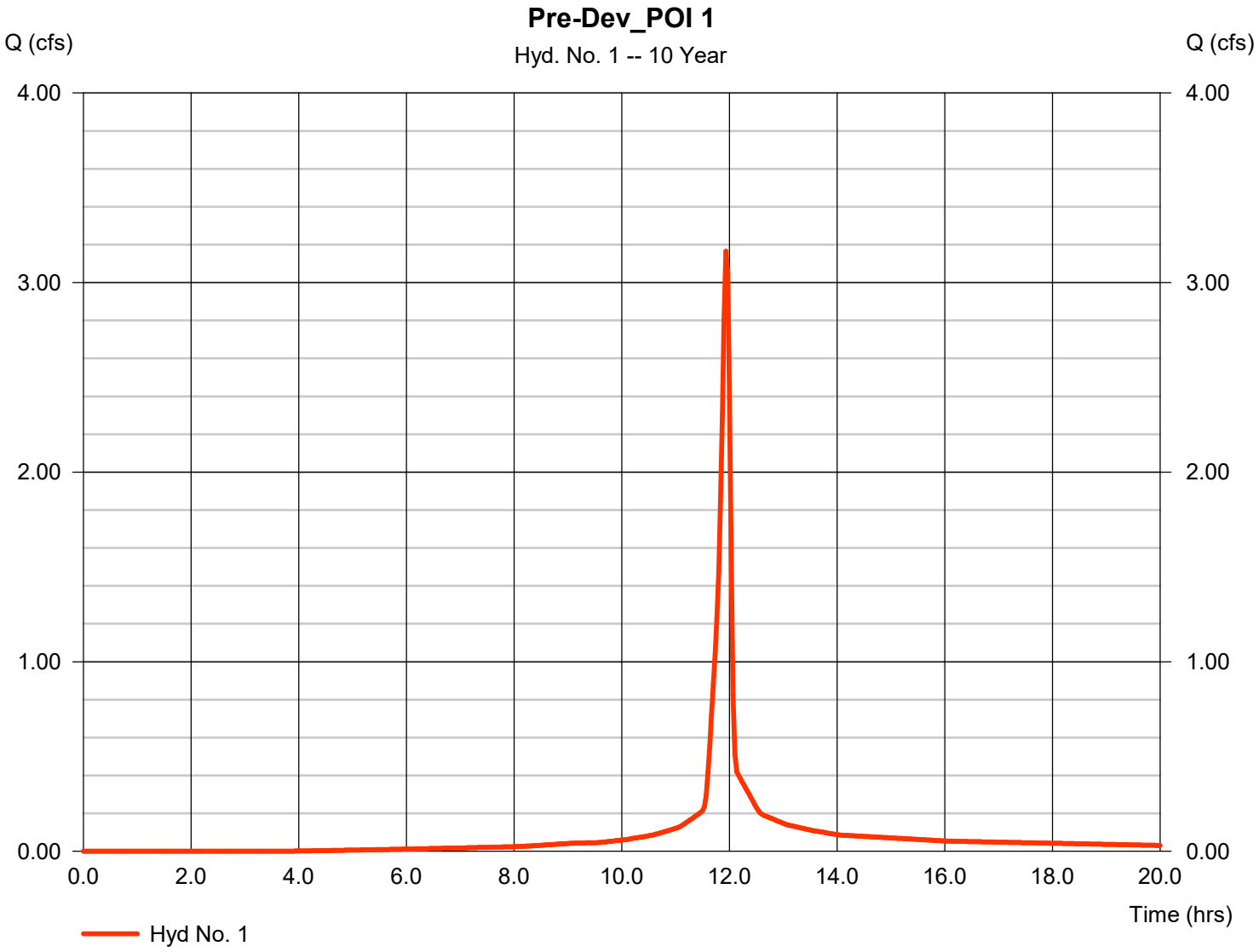
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 1

Pre-Dev_POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 3.165 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 6,809 cuft
Drainage area	= 0.512 ac	Curve number	= 90.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



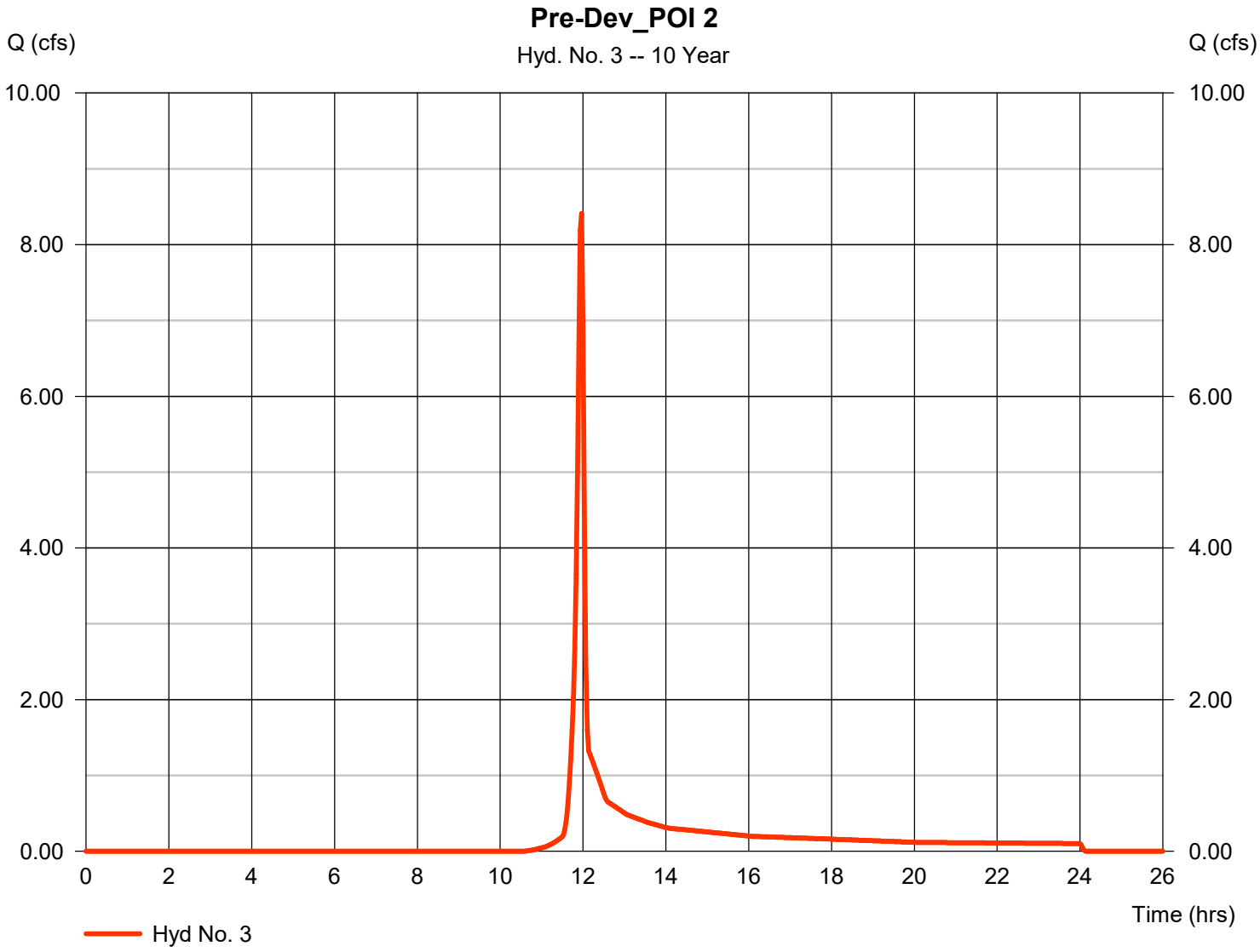
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 3

Pre-Dev_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 8.409 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 16,823 cuft
Drainage area	= 2.849 ac	Curve number	= 66.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



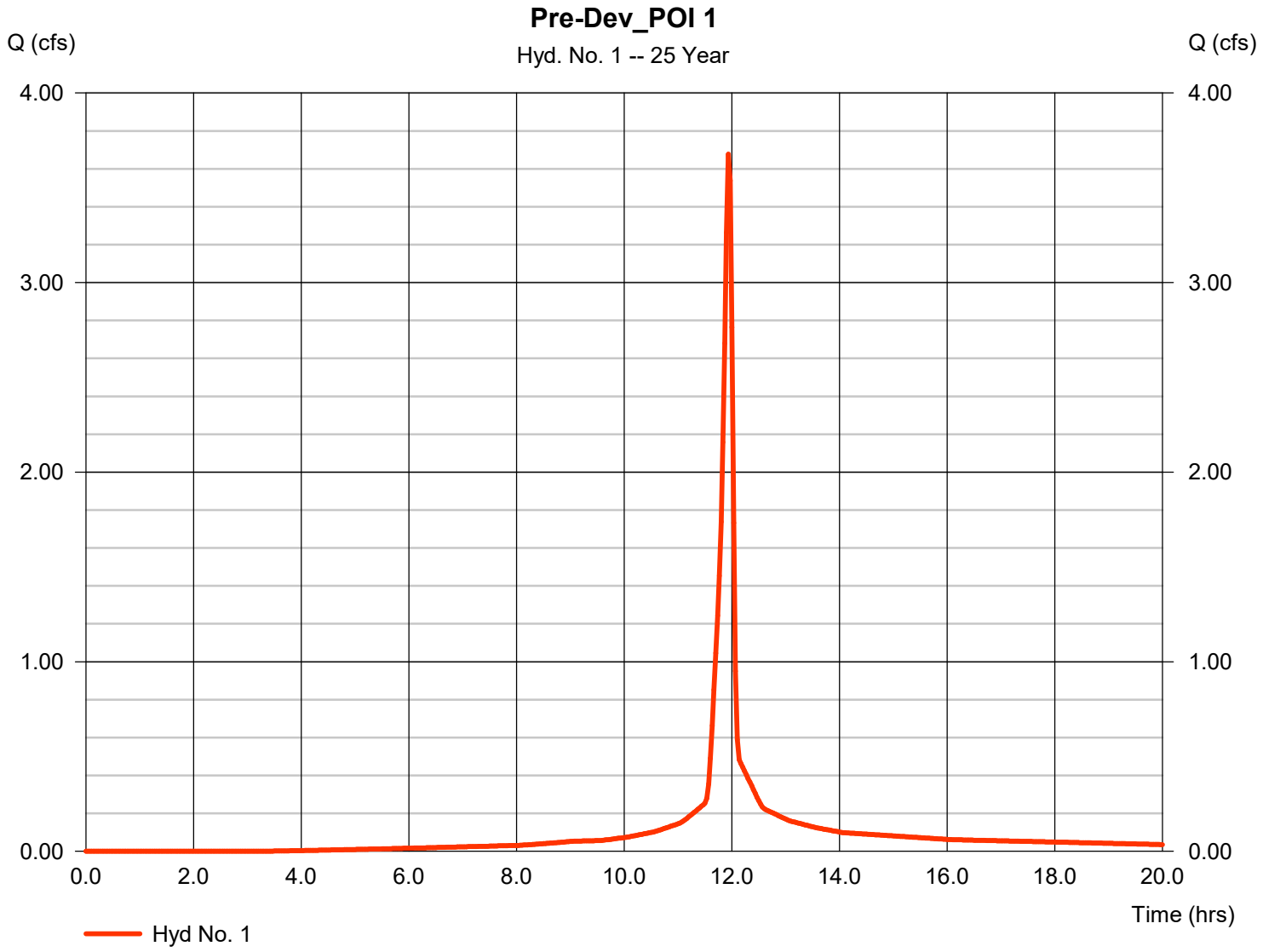
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 1

Pre-Dev_POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 3.677 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 7,992 cuft
Drainage area	= 0.512 ac	Curve number	= 90.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



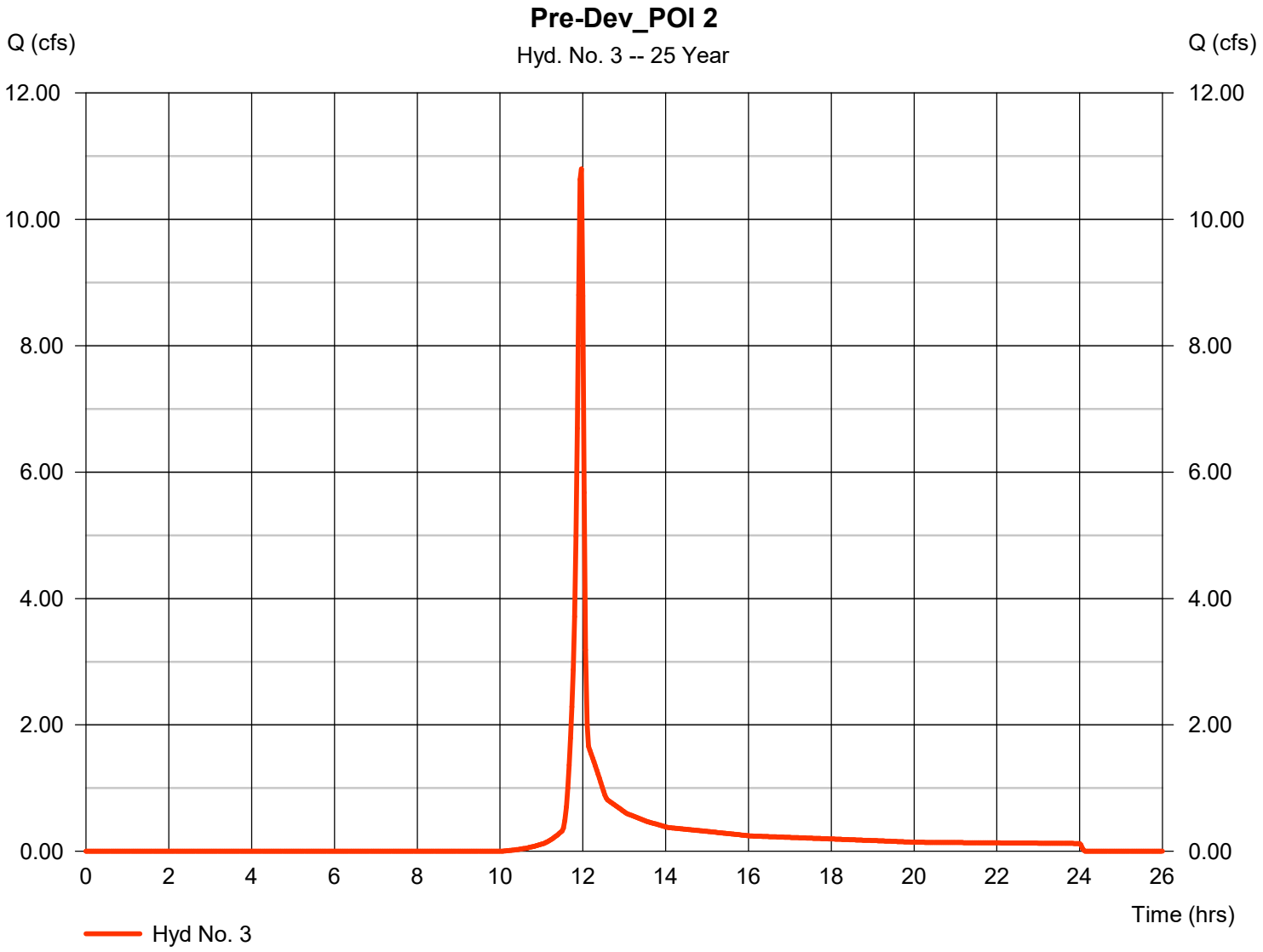
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 3

Pre-Dev_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 10.80 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 21,610 cuft
Drainage area	= 2.849 ac	Curve number	= 66.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



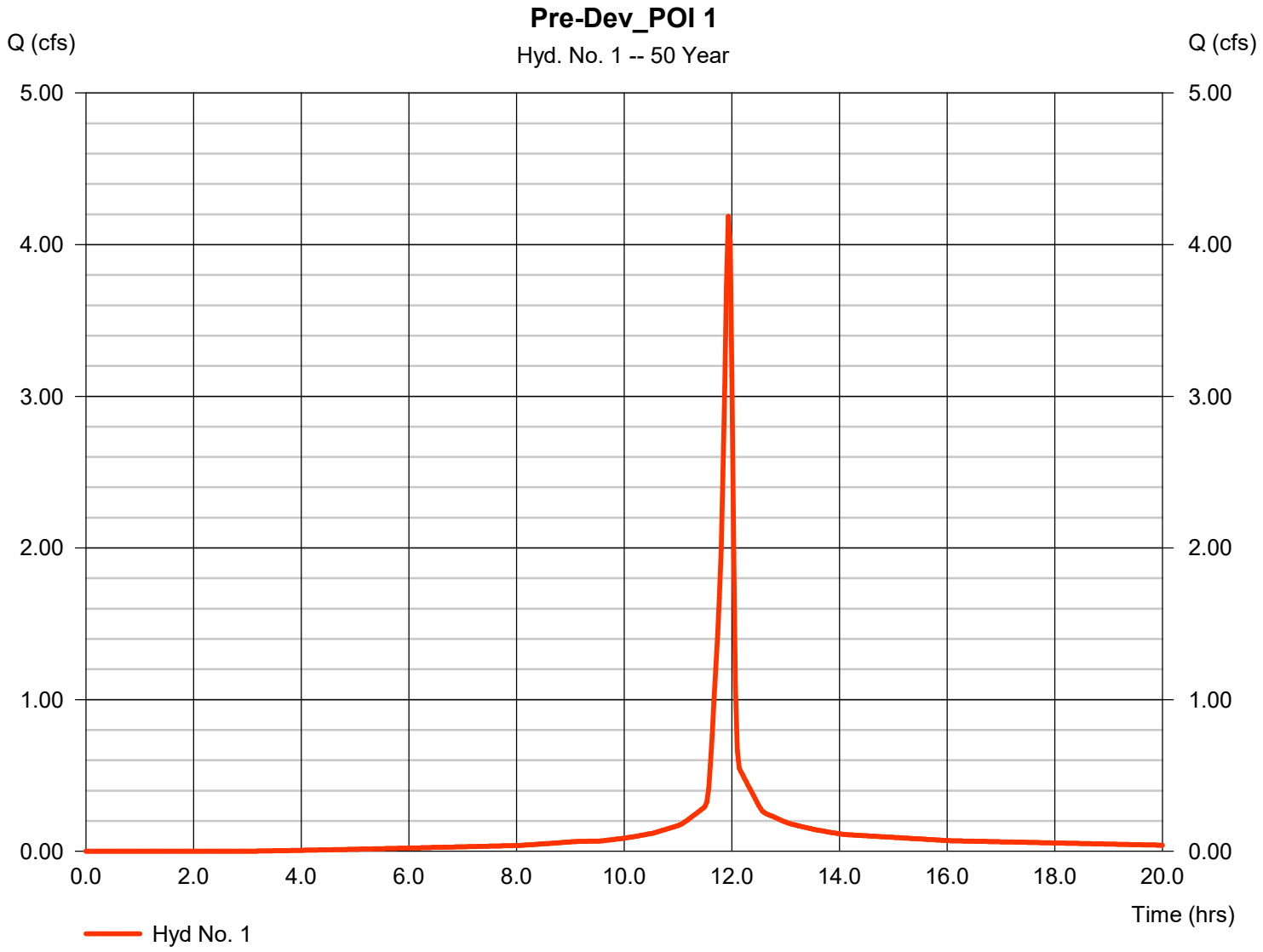
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 1

Pre-Dev_POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 4.187 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 9,182 cuft
Drainage area	= 0.512 ac	Curve number	= 90.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

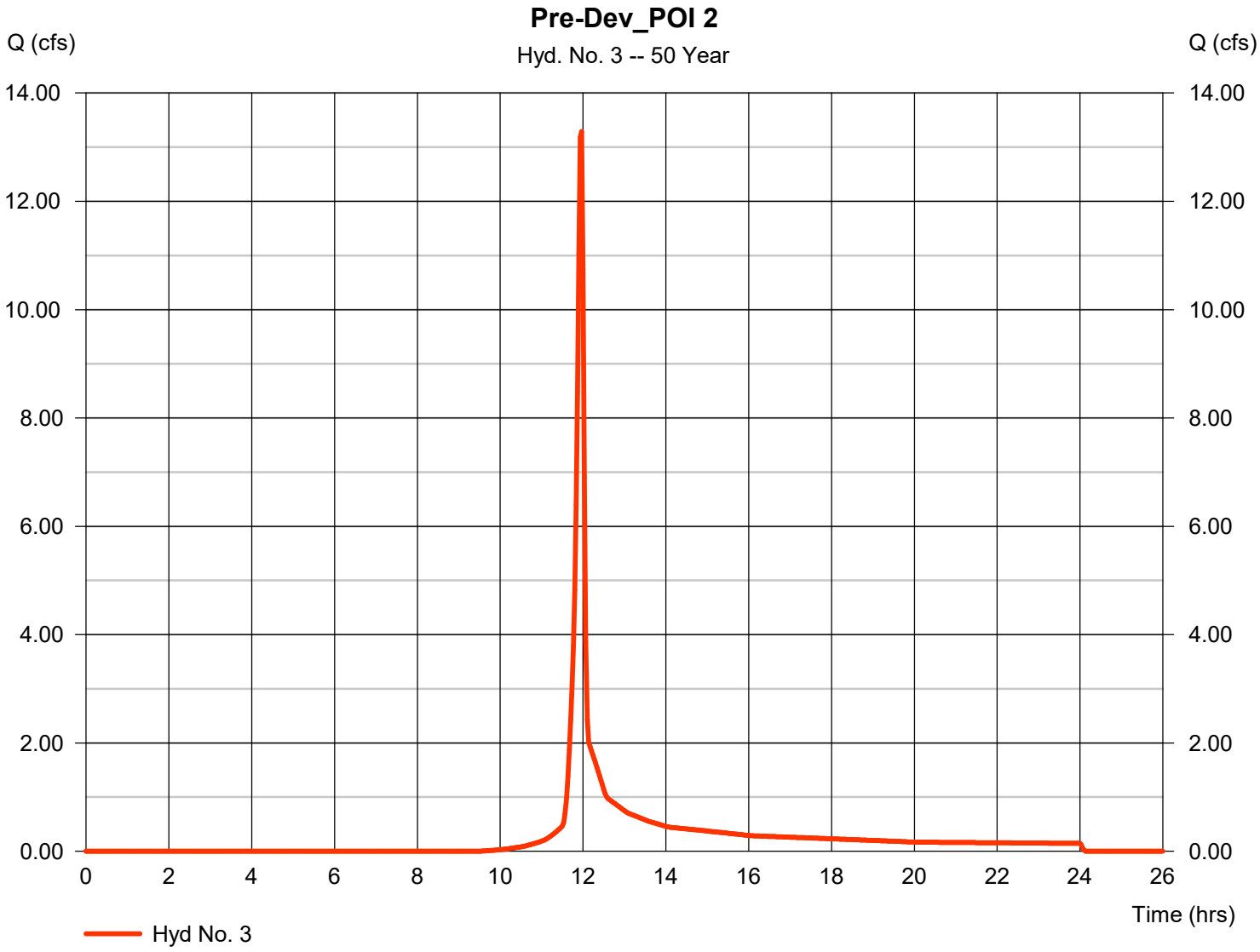


Hydrograph Report

Hyd. No. 3

Pre-Dev_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 13.29 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 26,663 cuft
Drainage area	= 2.849 ac	Curve number	= 66.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



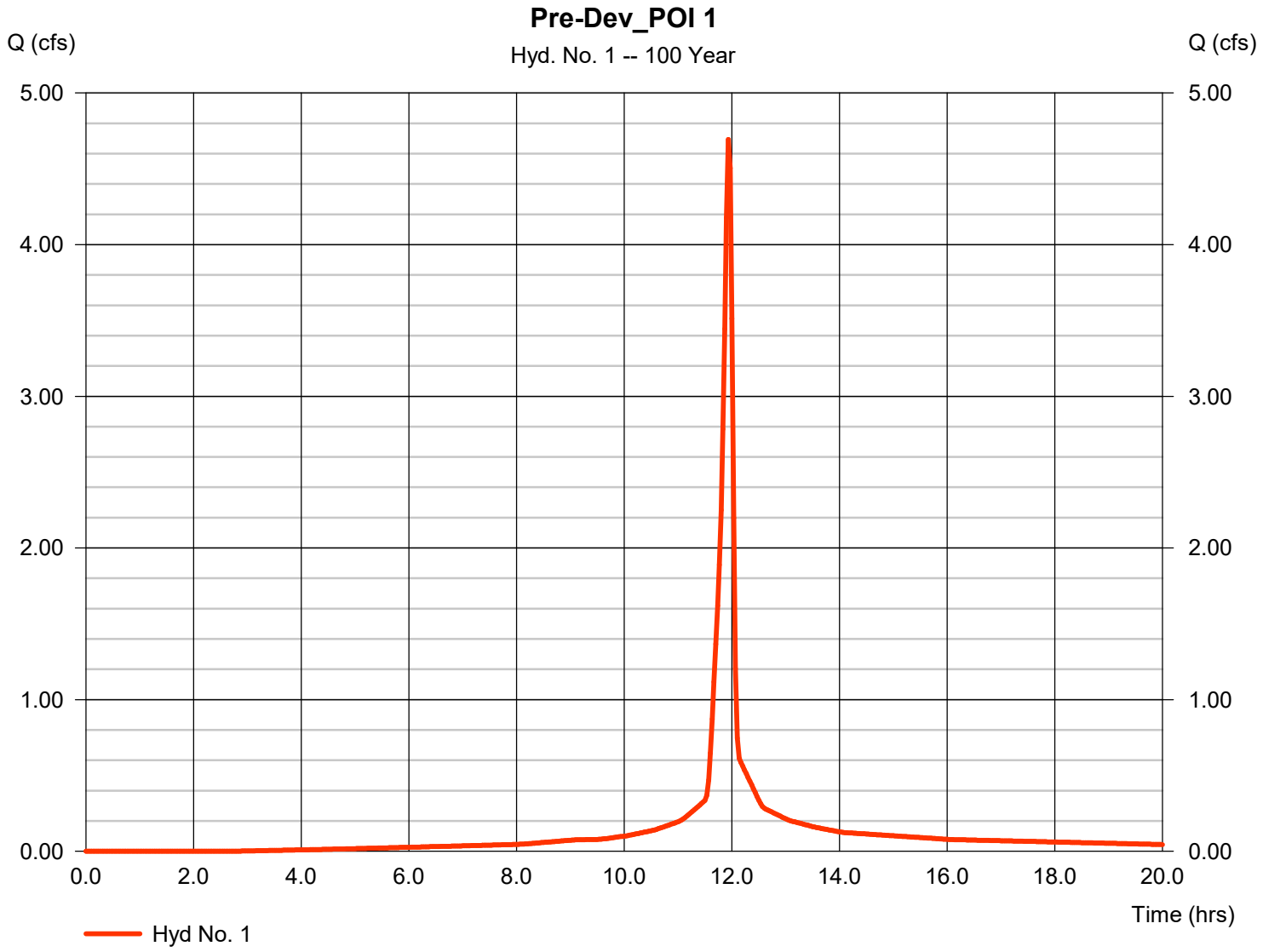
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 1

Pre-Dev_POI 1

Hydrograph type	= SCS Runoff	Peak discharge	= 4.694 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 10,378 cuft
Drainage area	= 0.512 ac	Curve number	= 90.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

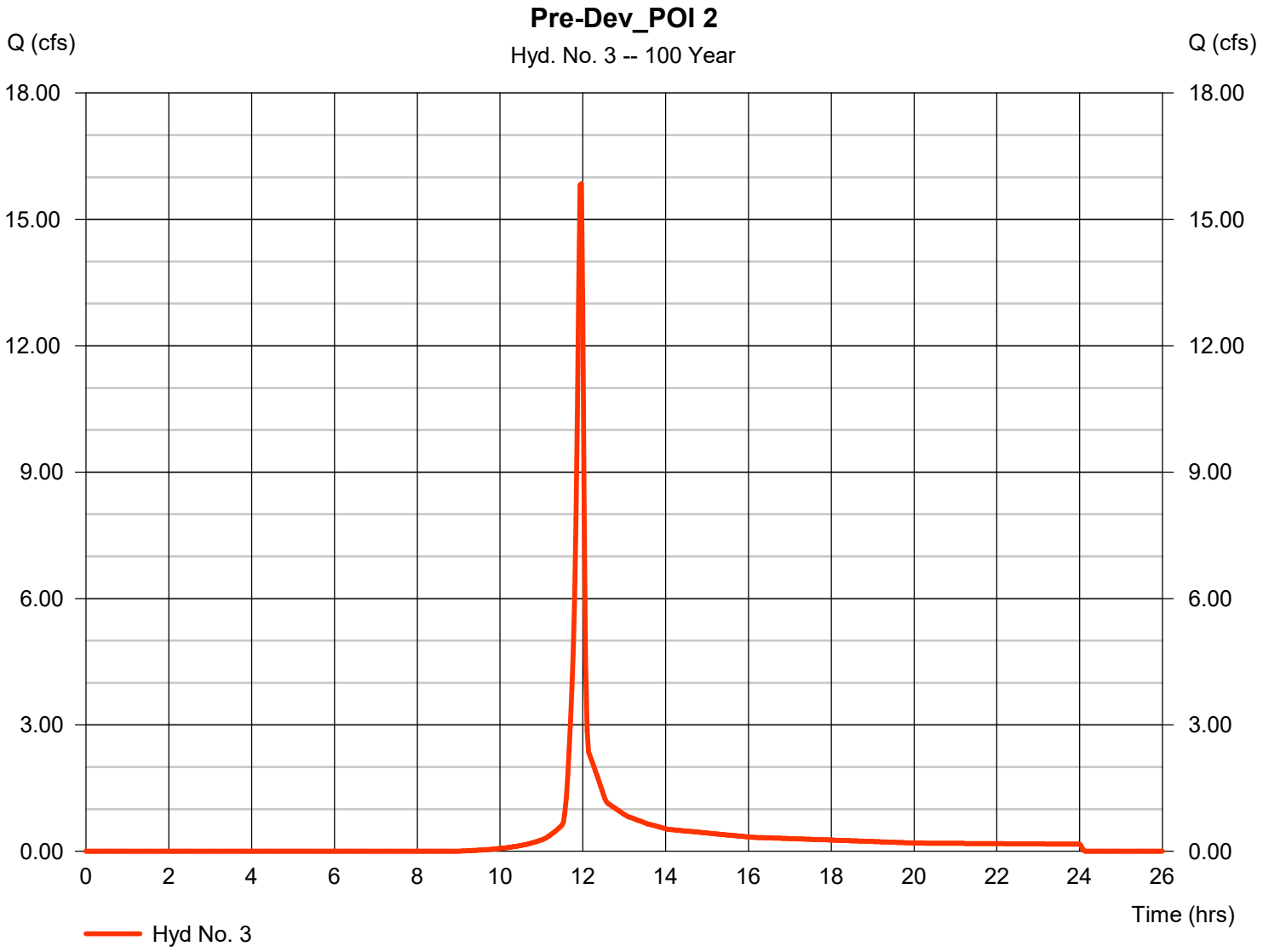


Hydrograph Report

Hyd. No. 3

Pre-Dev_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 15.84 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 31,932 cuft
Drainage area	= 2.849 ac	Curve number	= 66.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

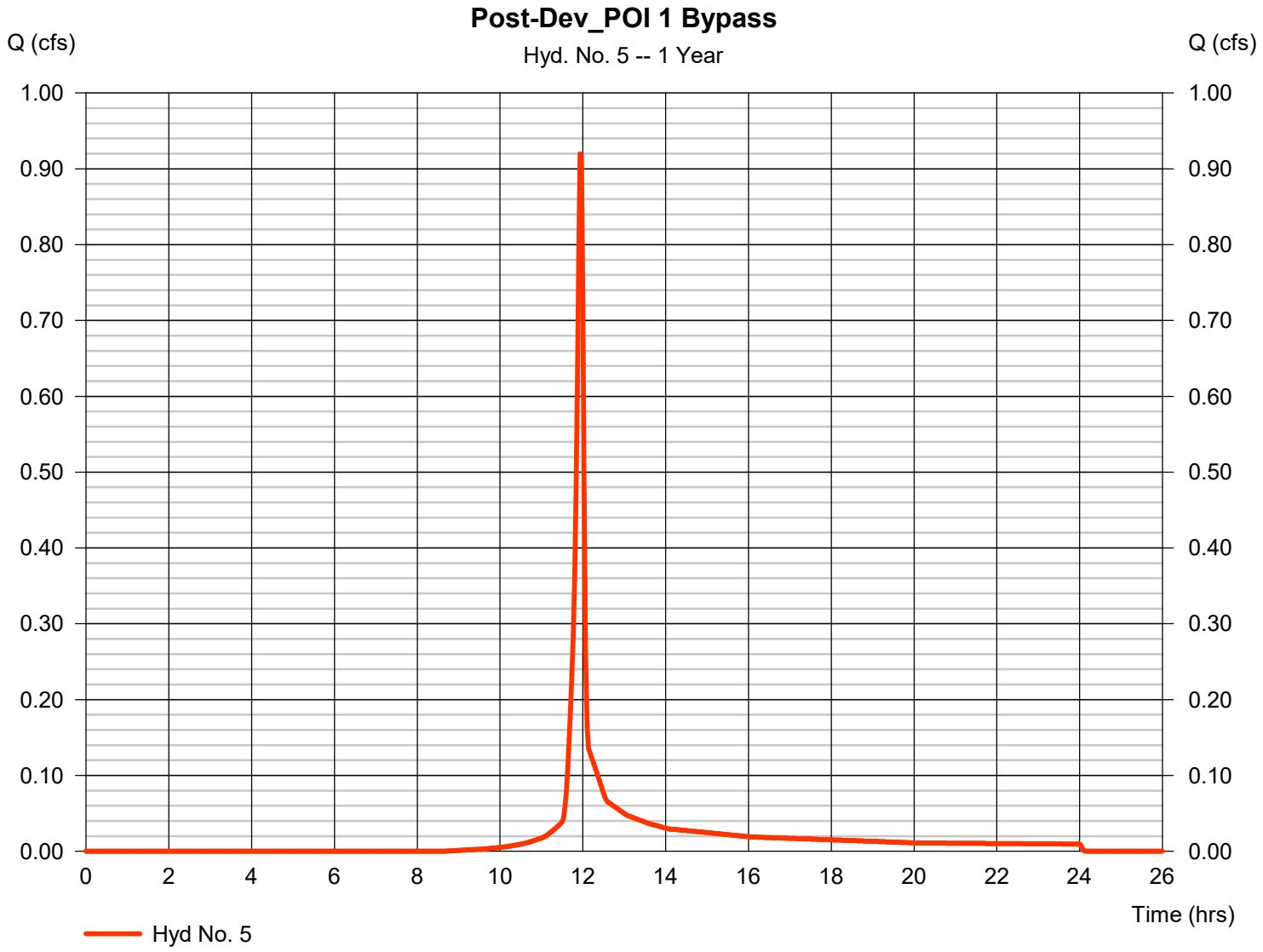


Hydrograph Report

Hyd. No. 5

Post-Dev_POI 1 Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 0.920 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 1,857 cuft
Drainage area	= 0.429 ac	Curve number	= 85.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



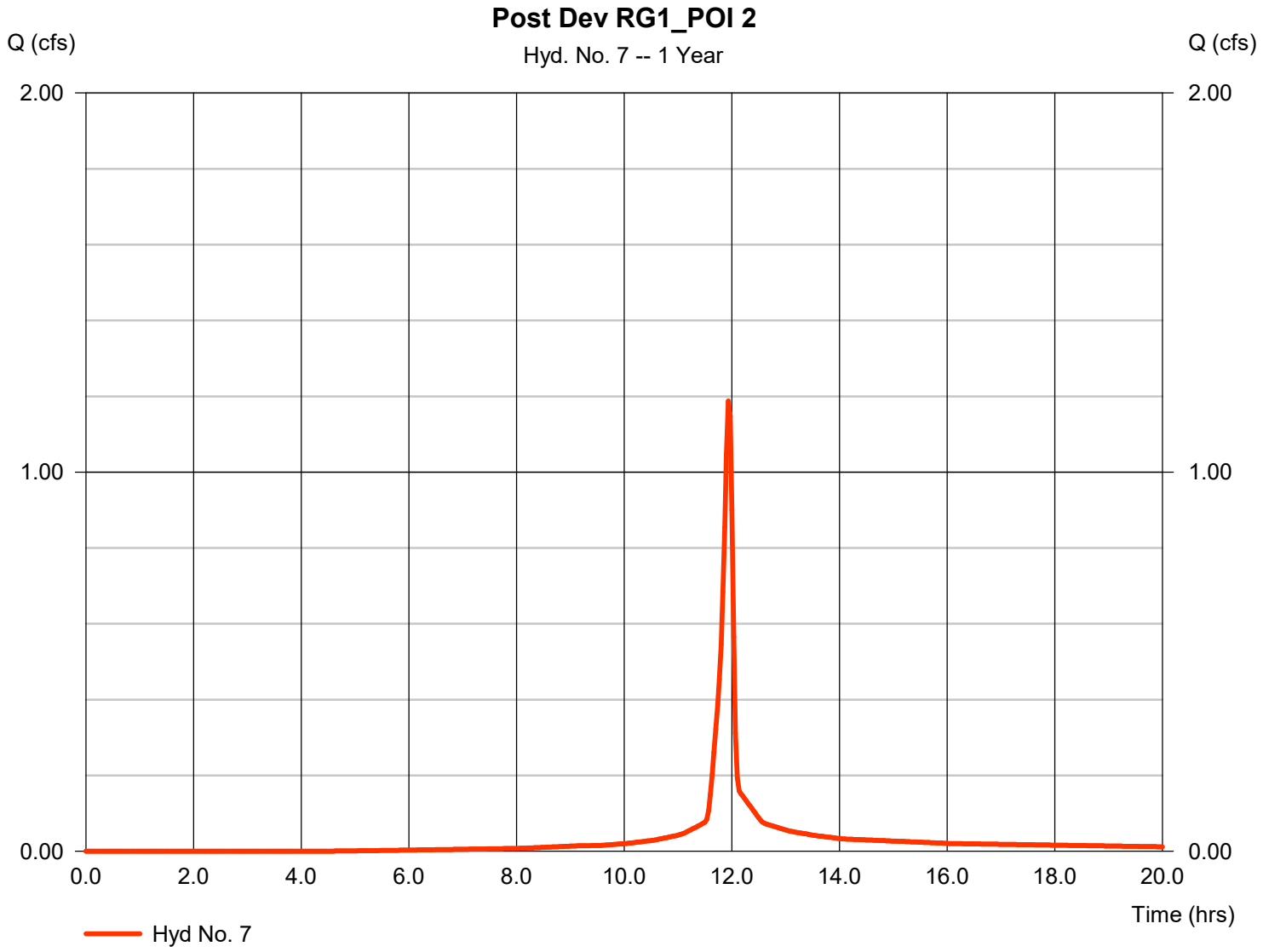
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 7

Post Dev RG1_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.188 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 2,518 cuft
Drainage area	= 0.382 ac	Curve number	= 93.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

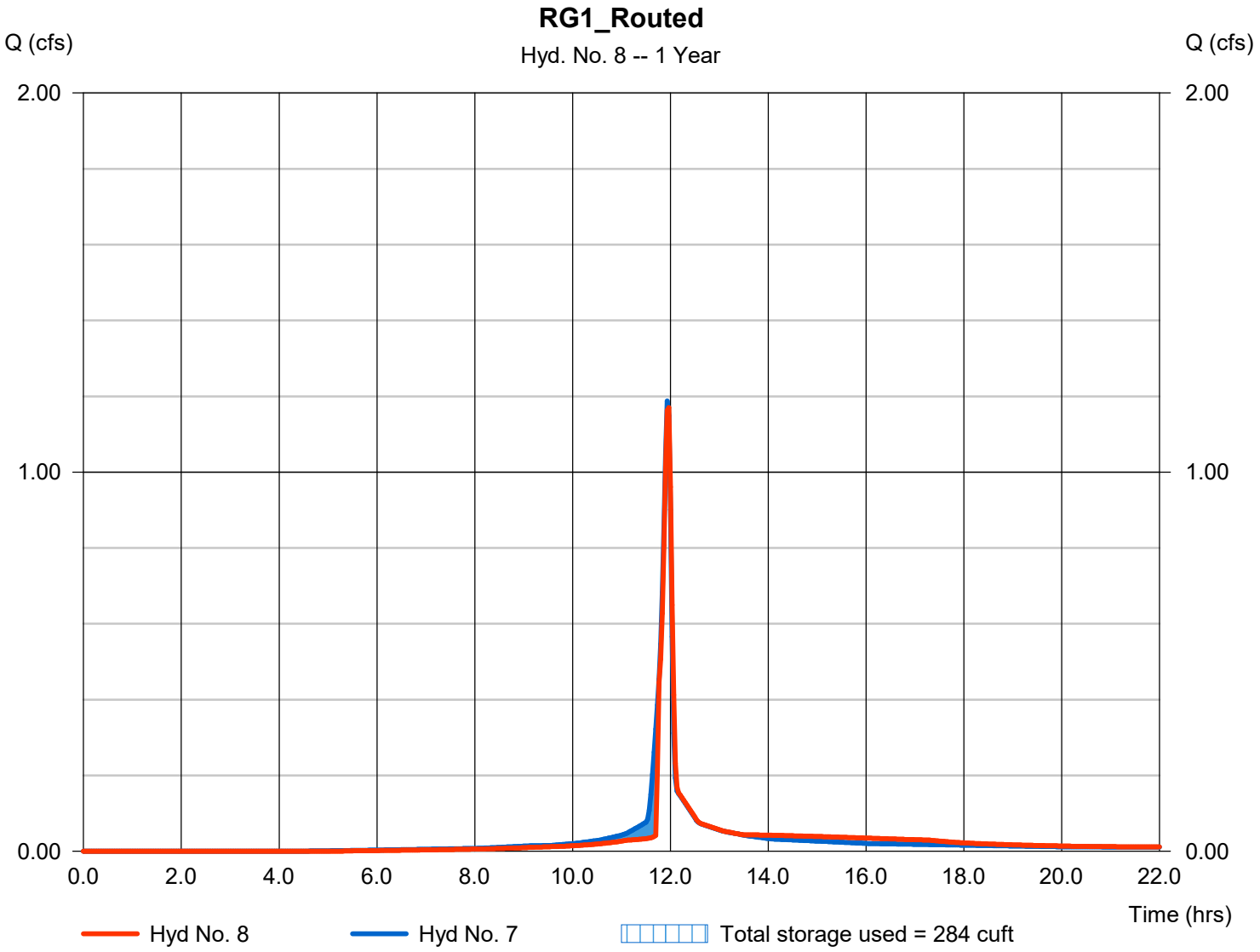
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 8

RG1_Routed

Hydrograph type	= Reservoir	Peak discharge	= 1.170 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 2,515 cuft
Inflow hyd. No.	= 7 - Post Dev RG1_POI 2	Max. Elevation	= 236.64 ft
Reservoir name	= RG#1	Max. Storage	= 284 cuft

Storage Indication method used. Outflow includes exfiltration.

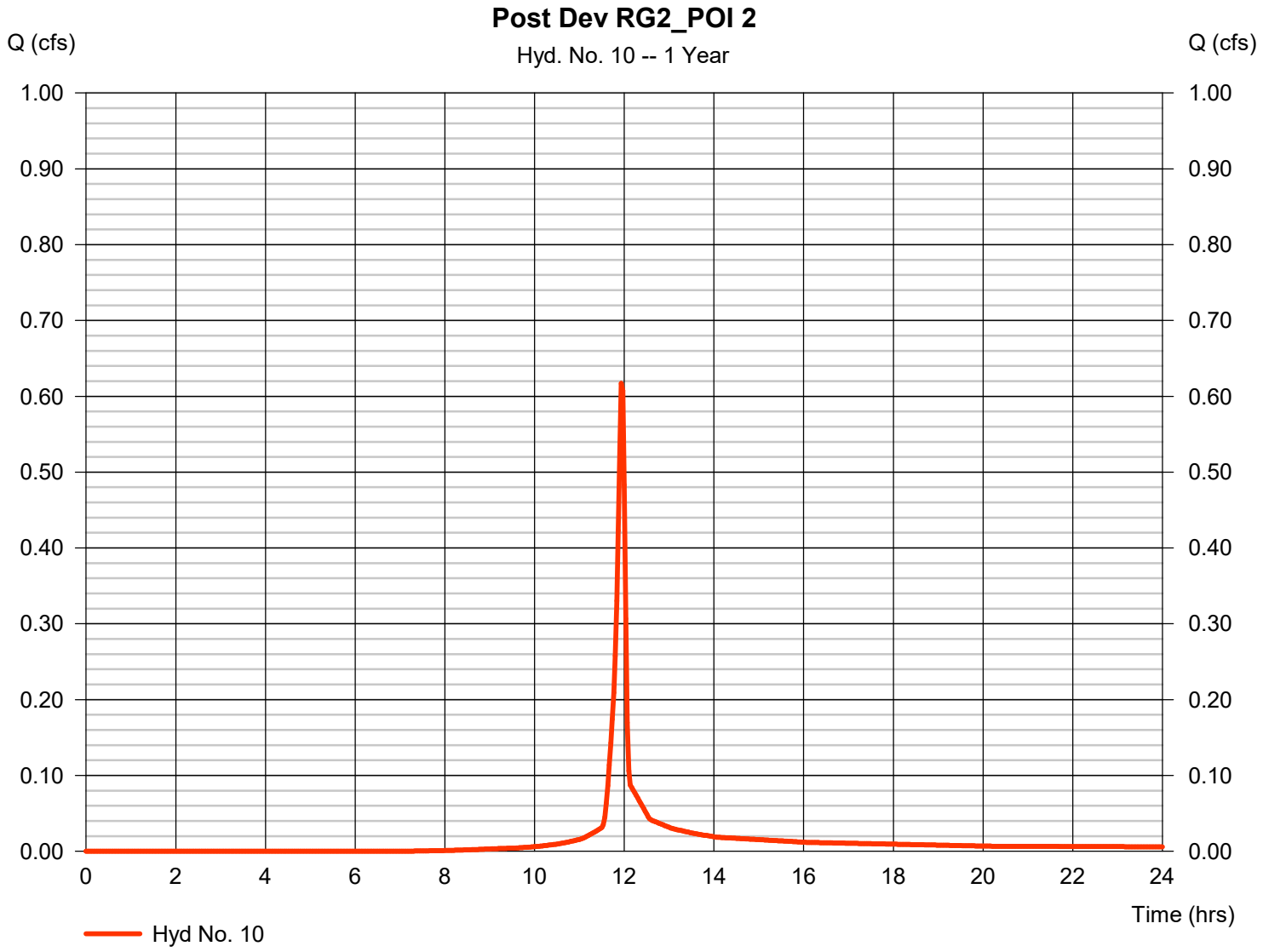


Hydrograph Report

Hyd. No. 10

Post Dev RG2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.617 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 1,256 cuft
Drainage area	= 0.244 ac	Curve number	= 88.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

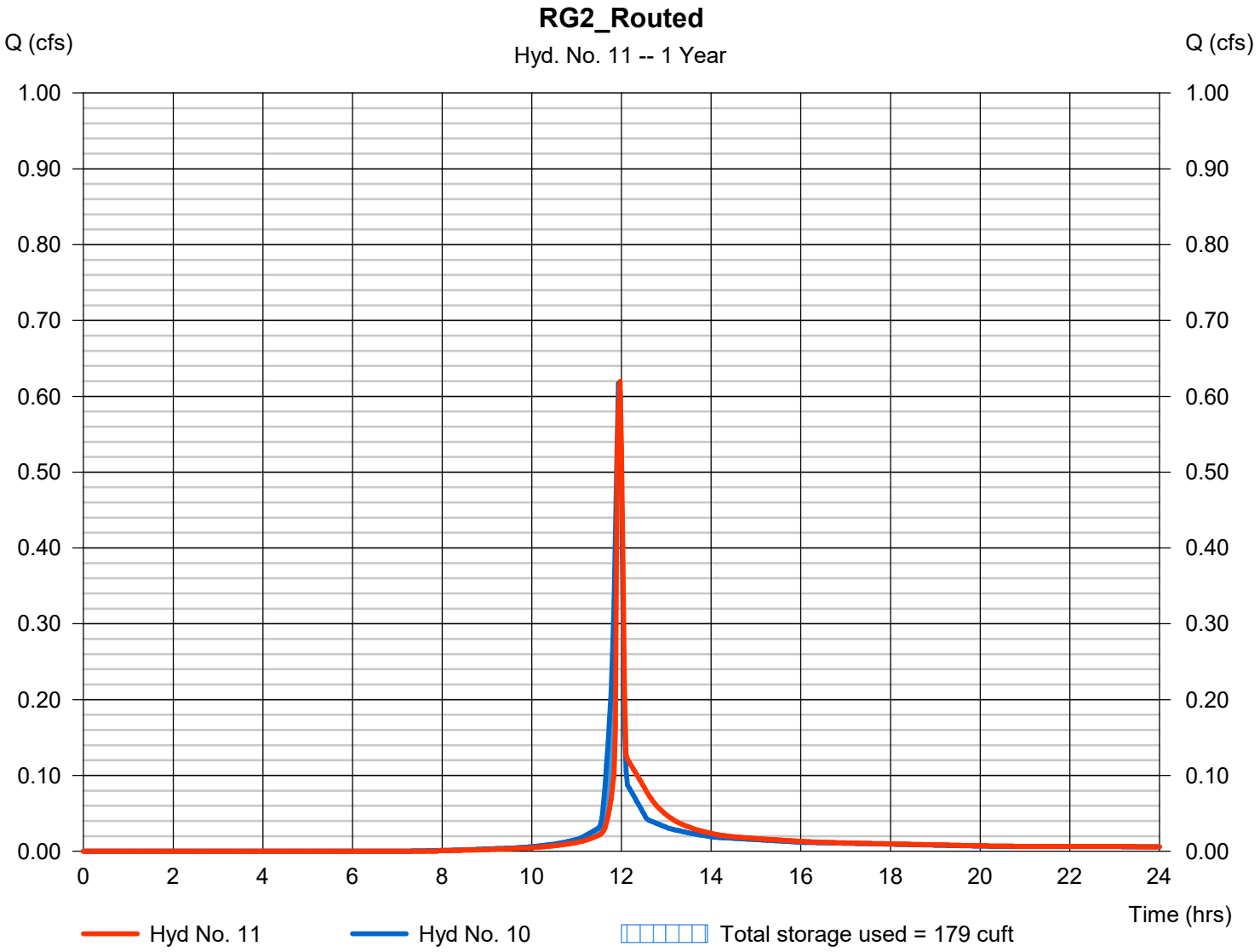
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 11

RG2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.620 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 1,254 cuft
Inflow hyd. No.	= 10 - Post Dev RG2_POI 2	Max. Elevation	= 237.80 ft
Reservoir name	= RG#2	Max. Storage	= 179 cuft

Storage Indication method used. Outflow includes exfiltration.

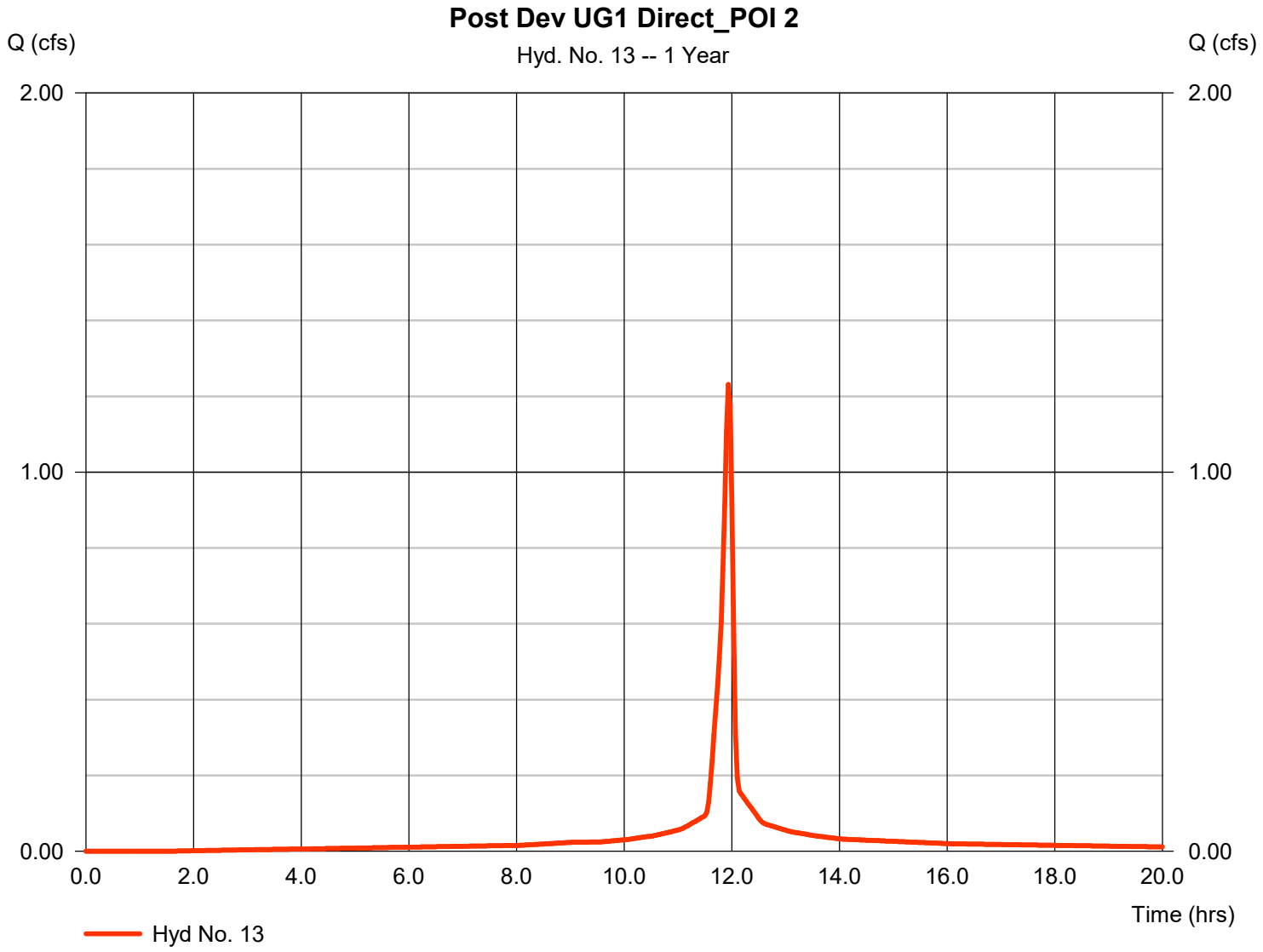


Hydrograph Report

Hyd. No. 13

Post Dev UG1 Direct_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.232 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 2,847 cuft
Drainage area	= 0.353 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

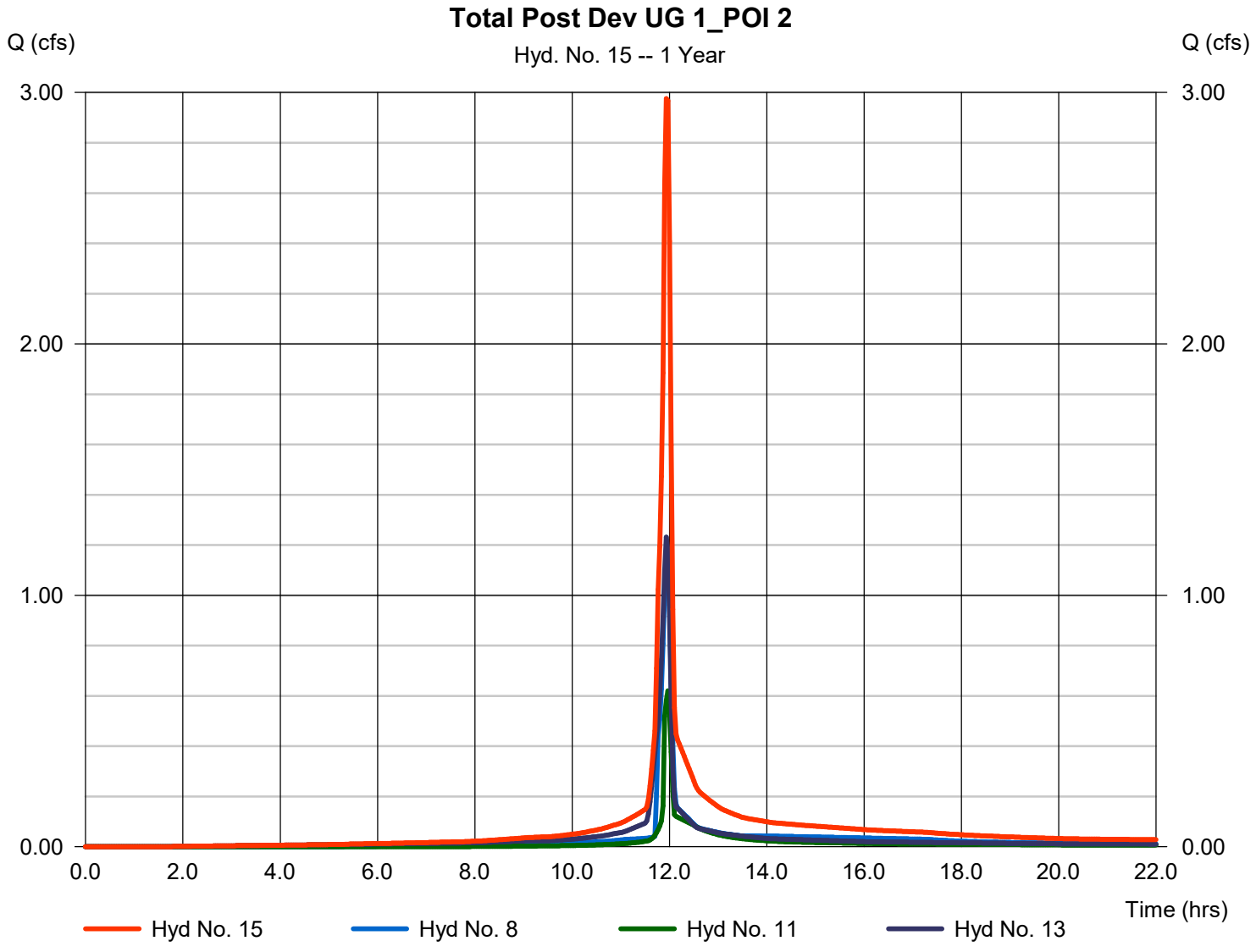


Hydrograph Report

Hyd. No. 15

Total Post Dev UG 1_POI 2

Hydrograph type	= Combine	Peak discharge	= 2.976 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 6,617 cuft
Inflow hyds.	= 8, 11, 13	Contrib. drain. area	= 0.353 ac



Hydrograph Report

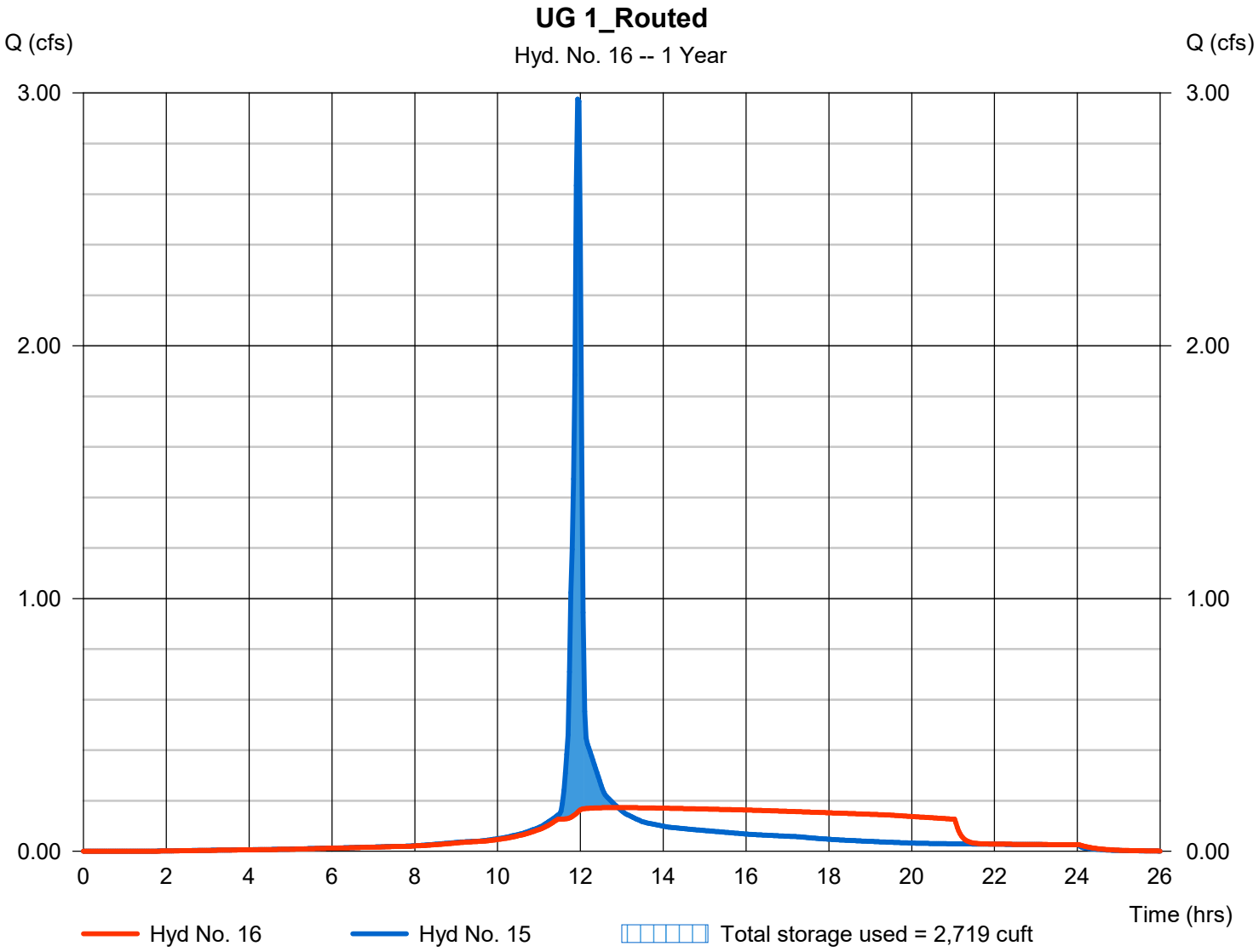
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 16

UG 1_Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.173 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.90 hrs
Time interval	= 2 min	Hyd. volume	= 6,617 cuft
Inflow hyd. No.	= 15 - Total Post Dev UG 1_POI2	Max. Elevation	= 231.42 ft
Reservoir name	= UG #1	Max. Storage	= 2,719 cuft

Storage Indication method used. Outflow includes exfiltration.

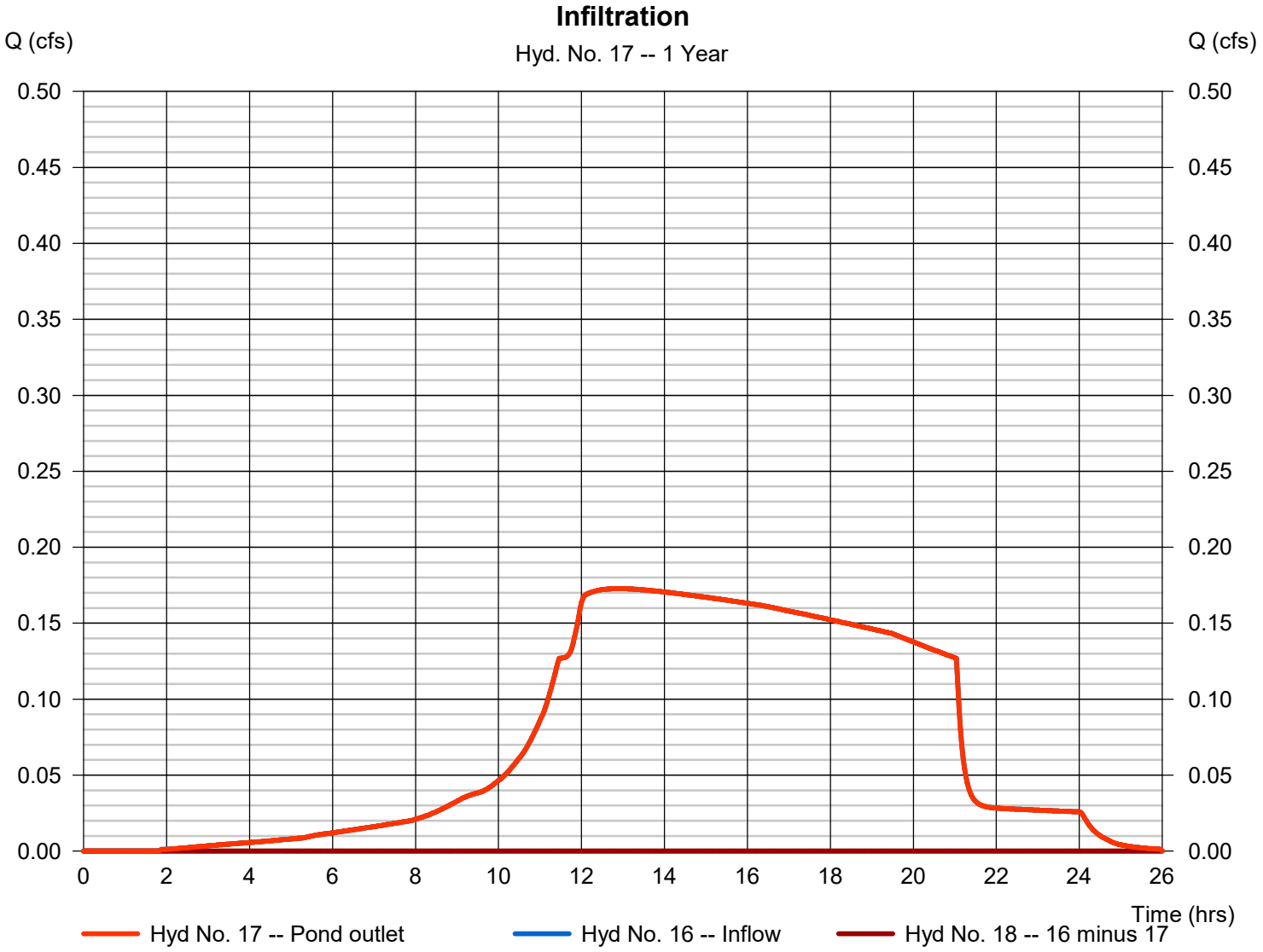


Hydrograph Report

Hyd. No. 17

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.173 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.90 hrs
Time interval	= 2 min	Hyd. volume	= 6,617 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 18
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration

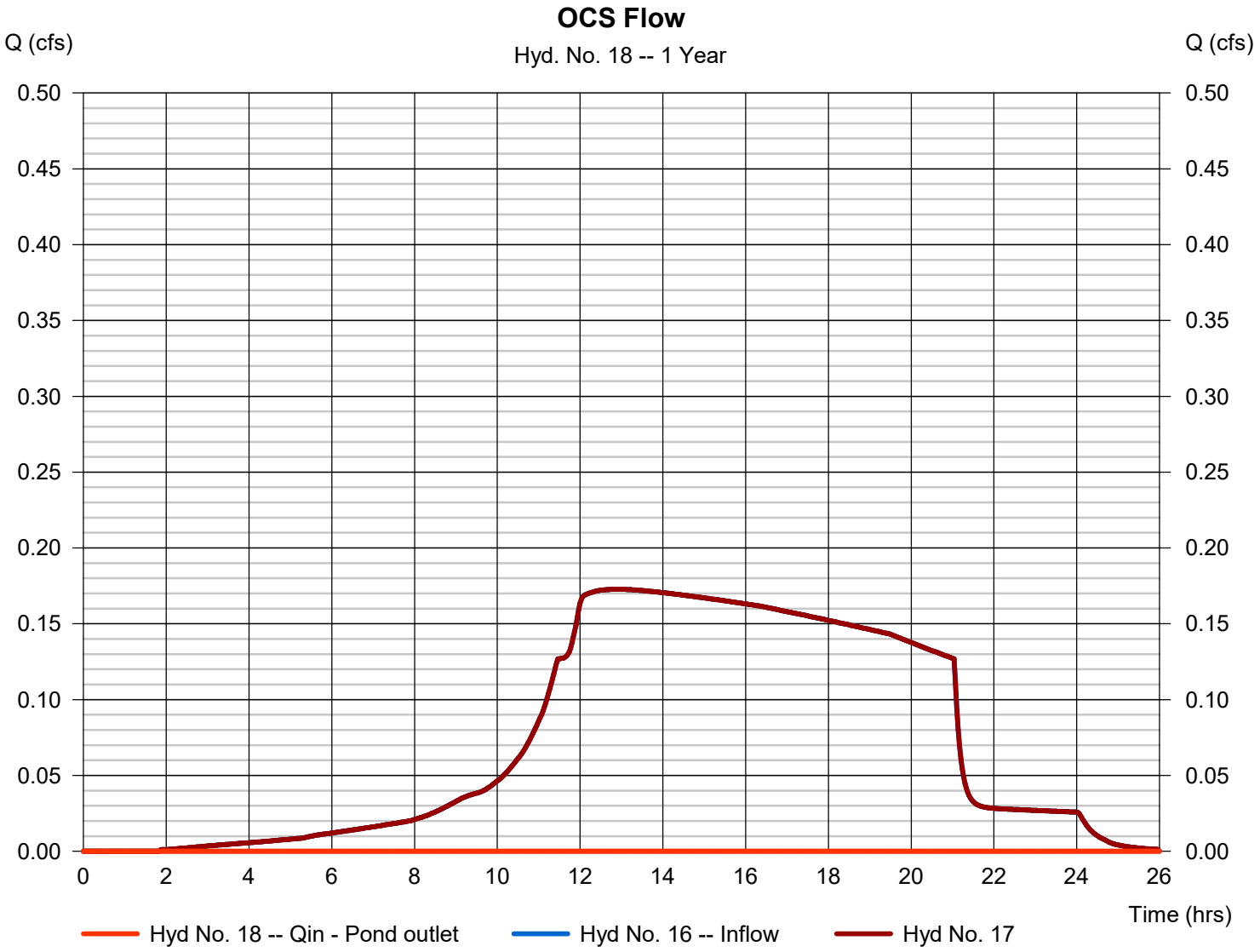


Hydrograph Report

Hyd. No. 18

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 14.90 hrs
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 17
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration

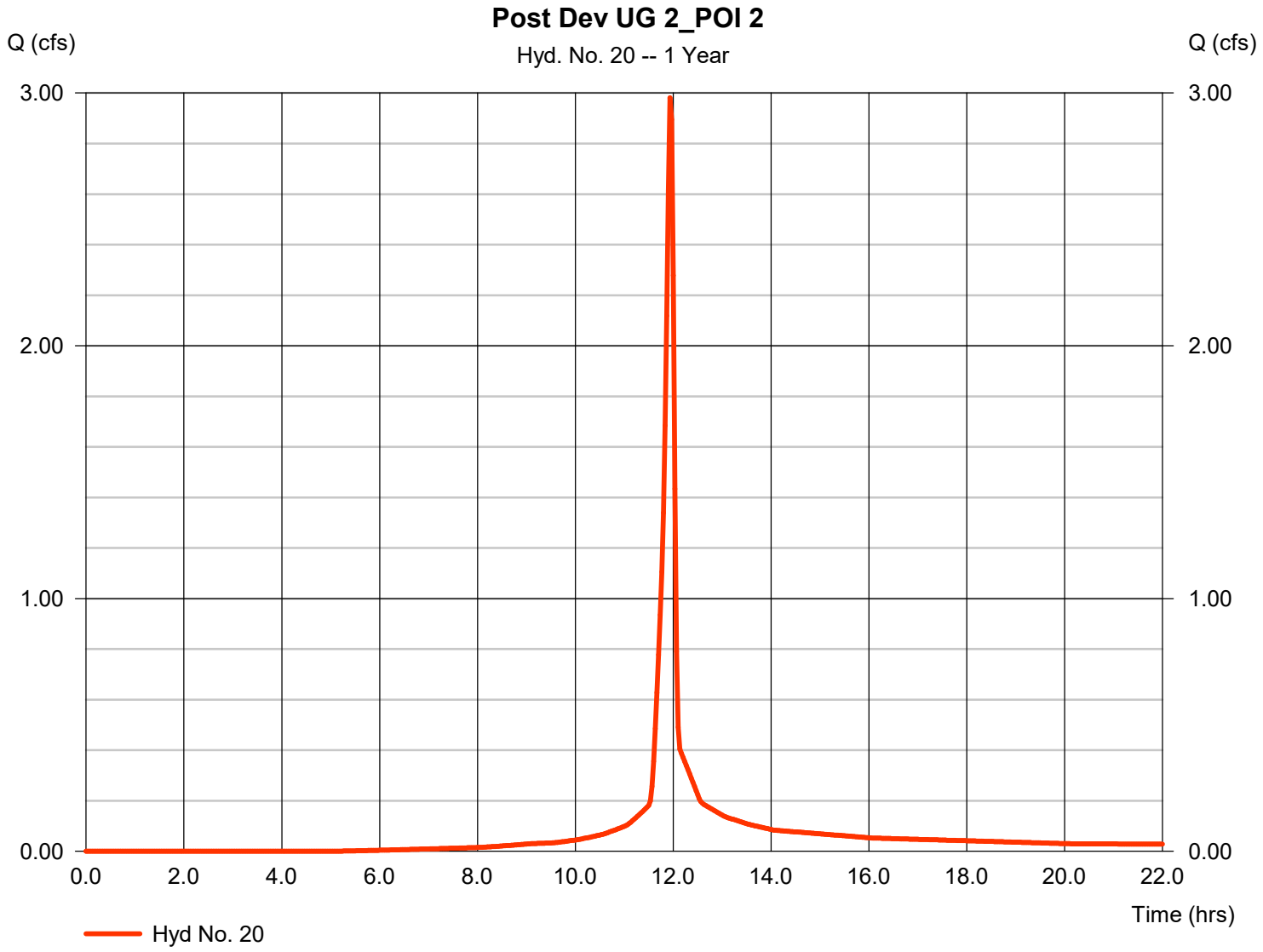


Hydrograph Report

Hyd. No. 20

Post Dev UG 2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.981 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 6,227 cuft
Drainage area	= 1.005 ac	Curve number	= 92.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

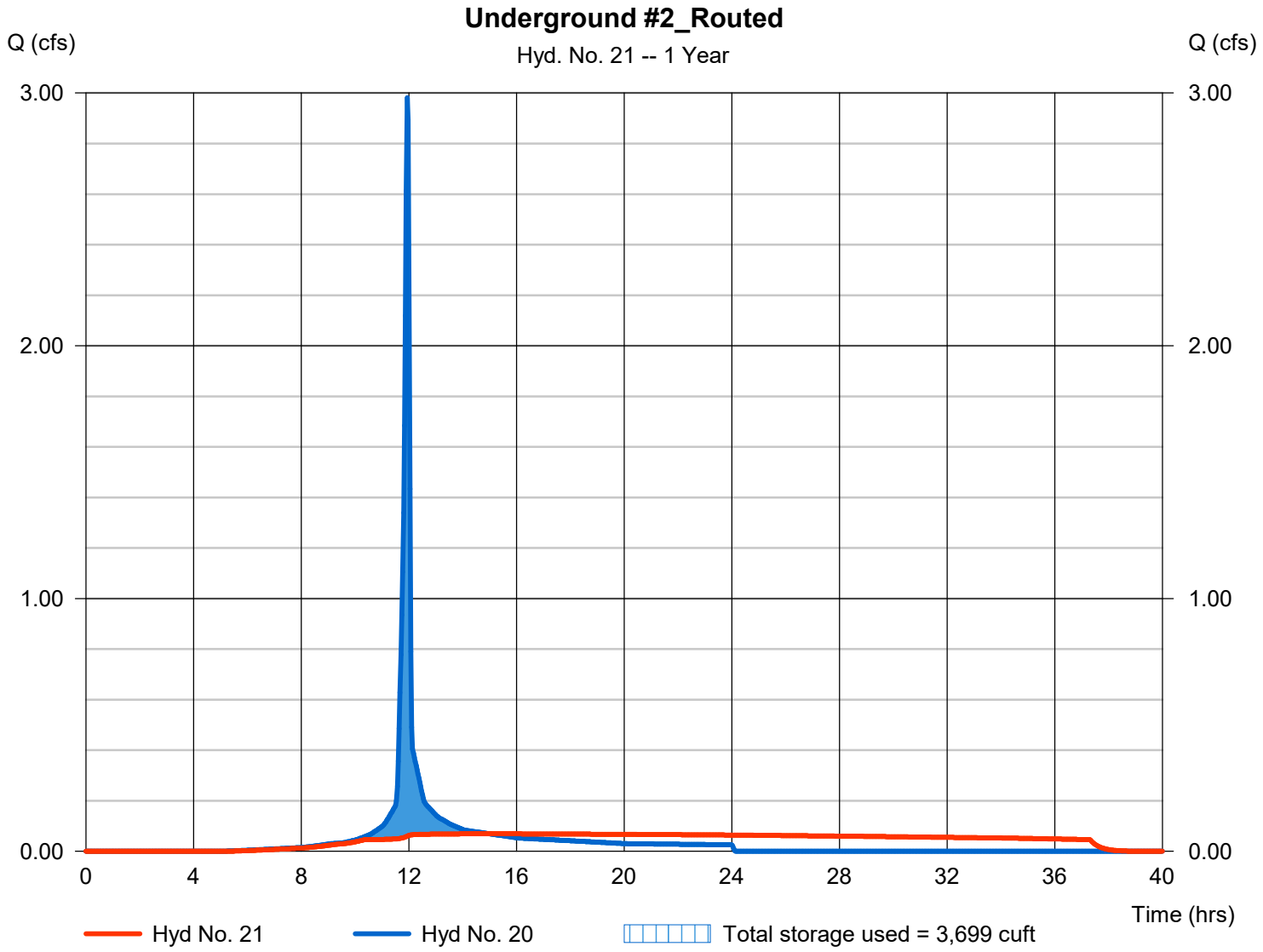
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 21

Underground #2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.069 cfs
Storm frequency	= 1 yrs	Time to peak	= 15.00 hrs
Time interval	= 2 min	Hyd. volume	= 6,226 cuft
Inflow hyd. No.	= 20 - Post Dev UG 2_POI 2	Max. Elevation	= 232.24 ft
Reservoir name	= UG #2	Max. Storage	= 3,699 cuft

Storage Indication method used. Outflow includes exfiltration.

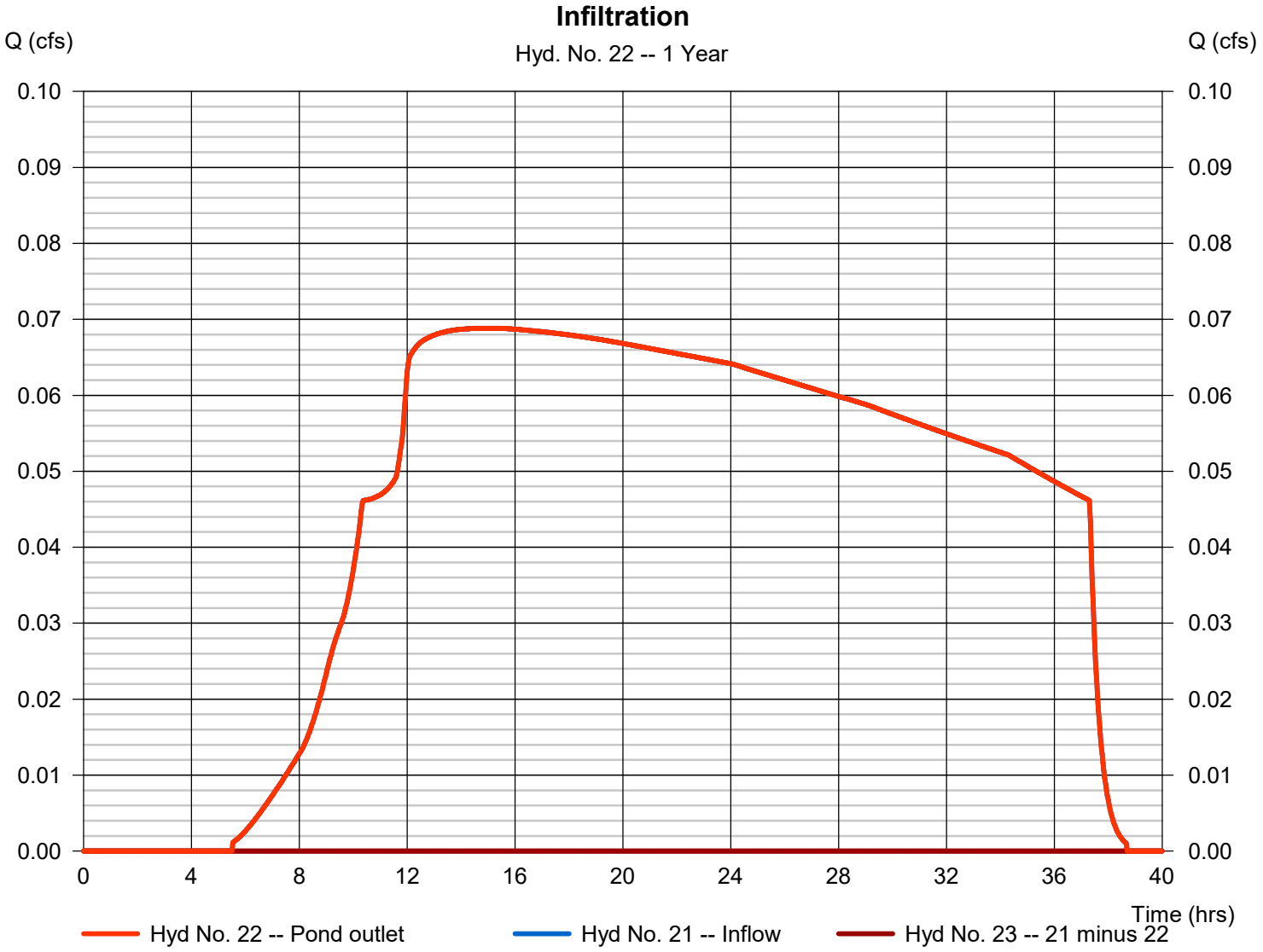


Hydrograph Report

Hyd. No. 22

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.069 cfs
Storm frequency	= 1 yrs	Time to peak	= 15.00 hrs
Time interval	= 2 min	Hyd. volume	= 6,226 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 23
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration

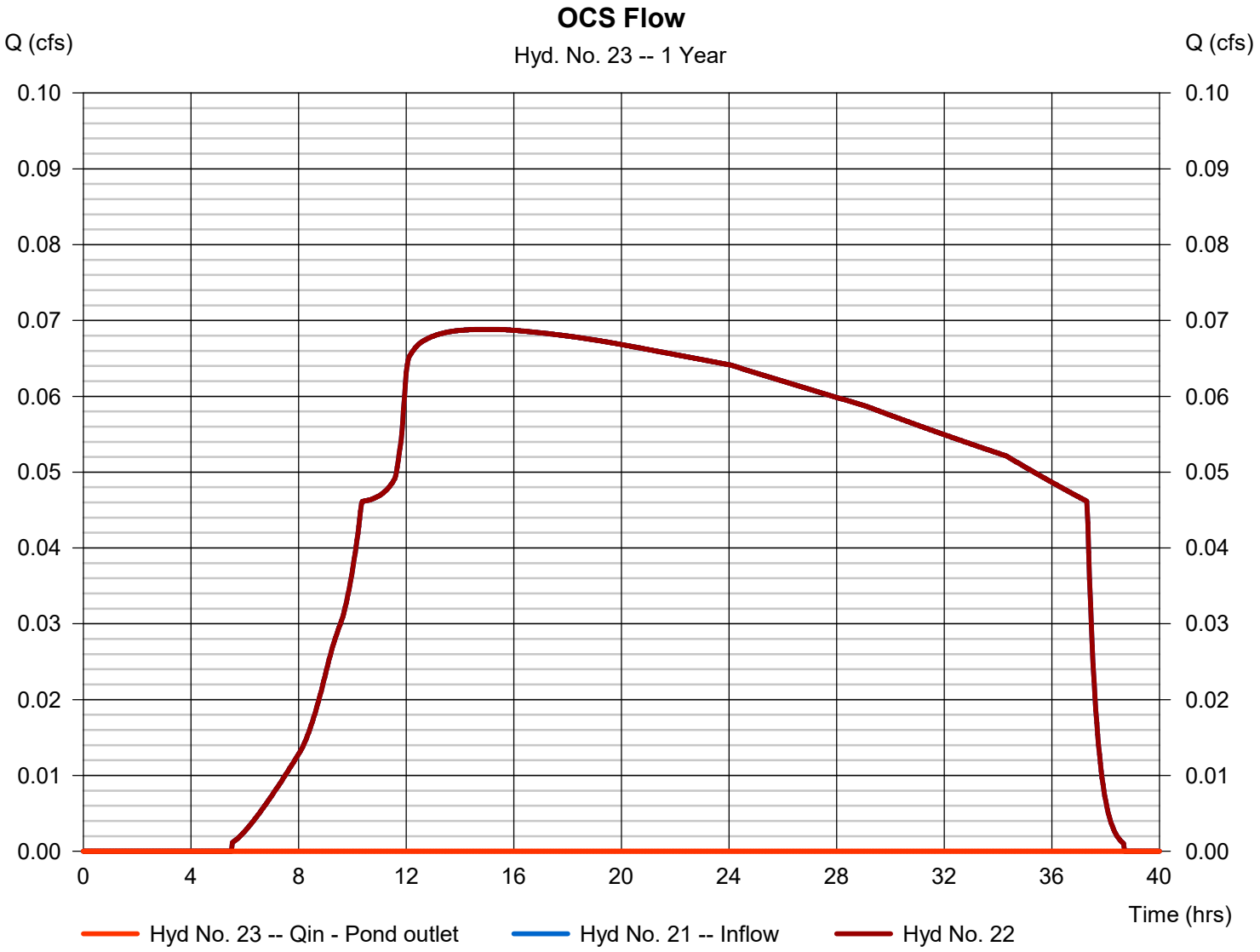


Hydrograph Report

Hyd. No. 23

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.43 hrs
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 22
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration



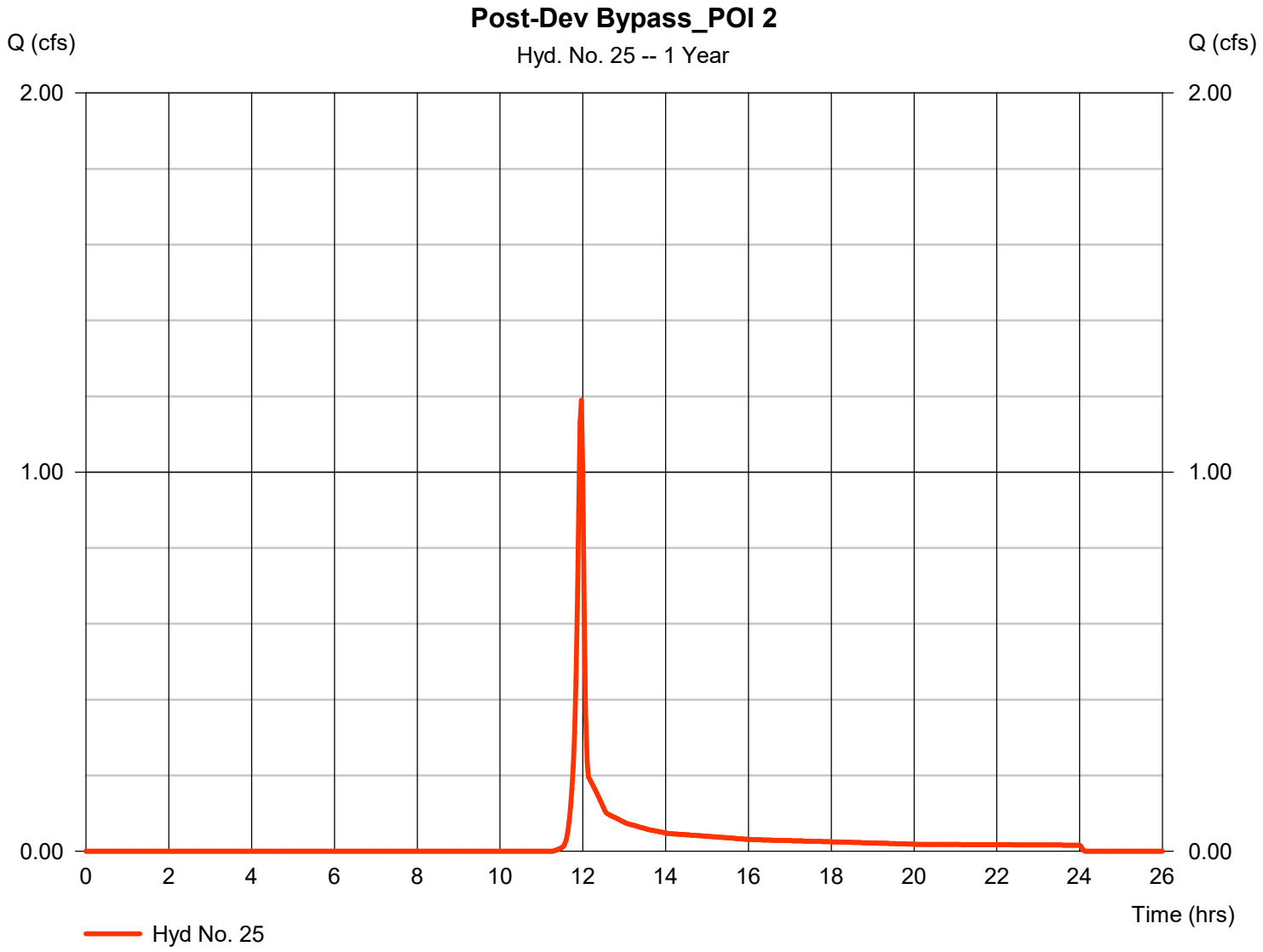
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 25

Post-Dev Bypass_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.190 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 2,408 cuft
Drainage area	= 0.978 ac	Curve number	= 75.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



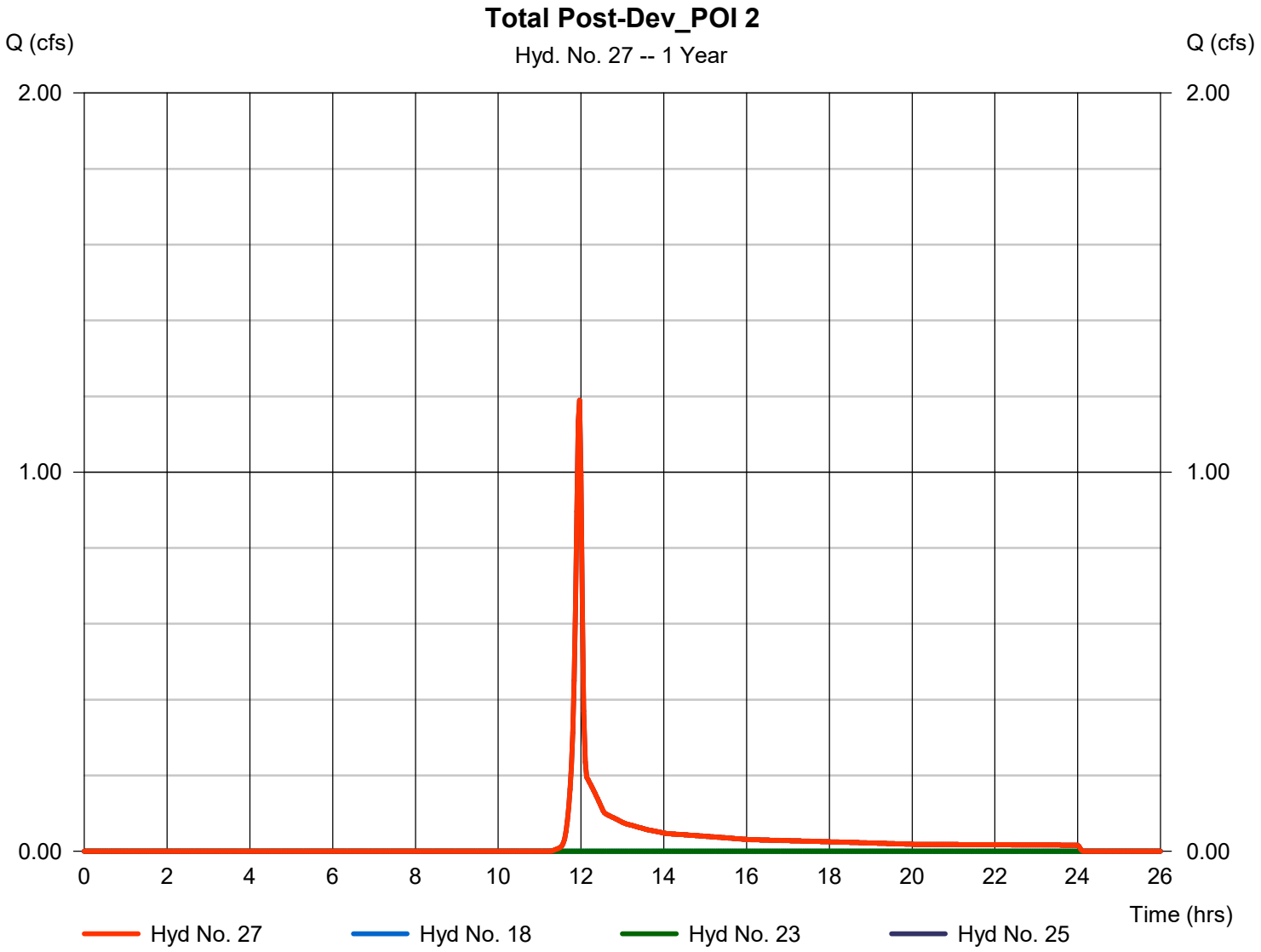
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 27

Total Post-Dev_POI 2

Hydrograph type	= Combine	Peak discharge	= 1.190 cfs
Storm frequency	= 1 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 2,408 cuft
Inflow hyds.	= 18, 23, 25	Contrib. drain. area	= 0.978 ac



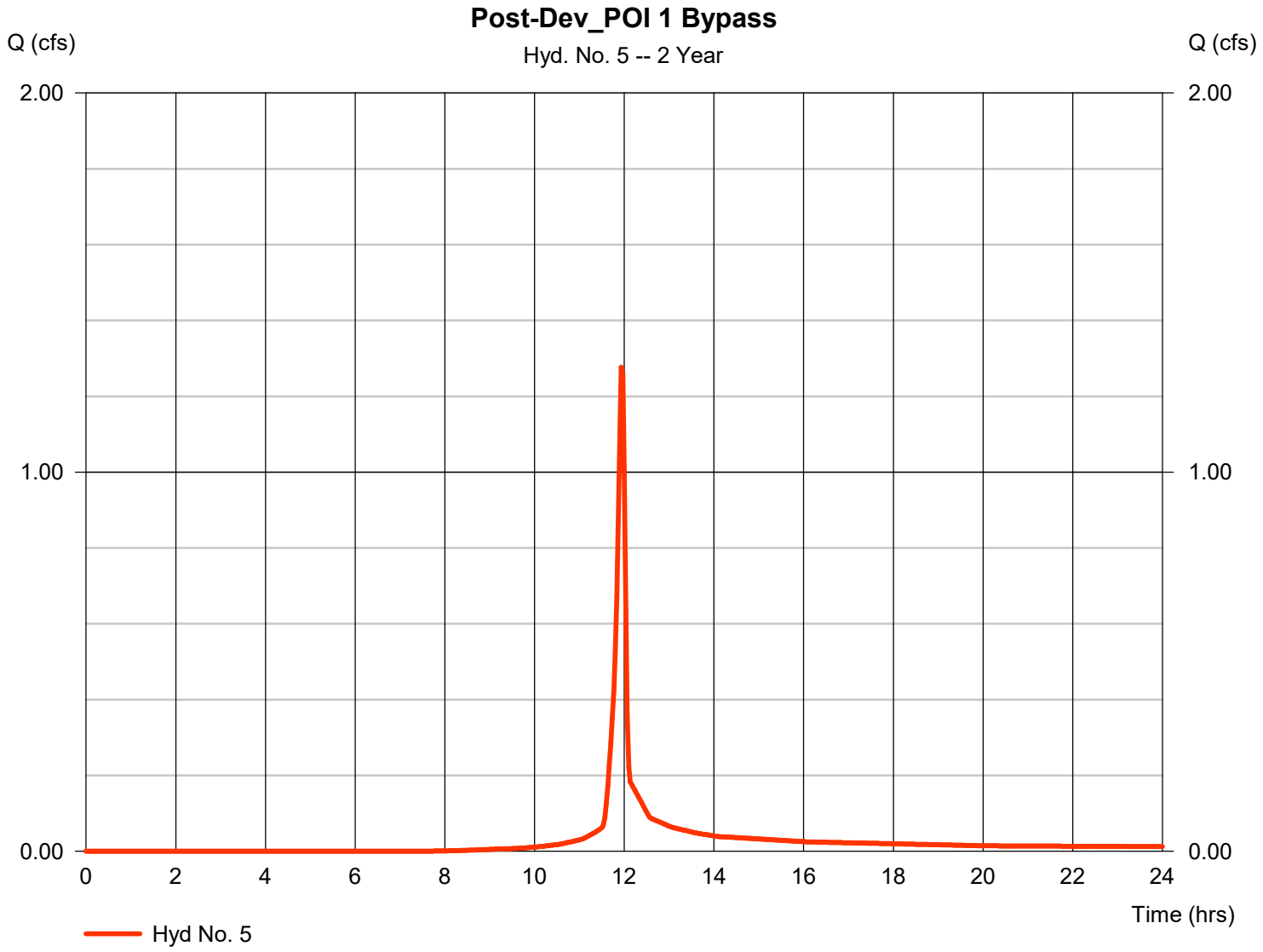
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 5

Post-Dev_POI 1 Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 1.276 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 2,588 cuft
Drainage area	= 0.429 ac	Curve number	= 85.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



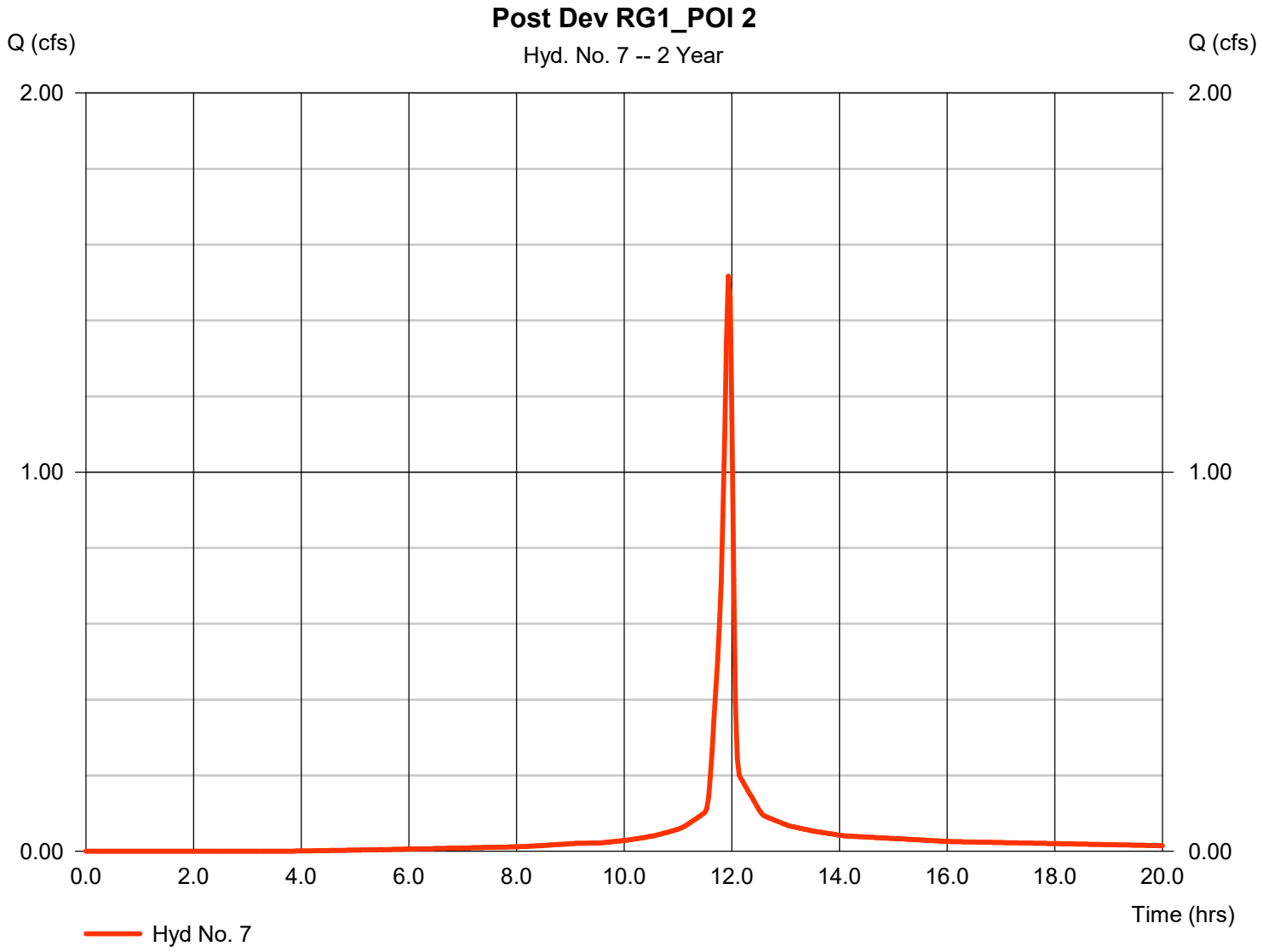
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 7

Post Dev RG1_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.517 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 3,268 cuft
Drainage area	= 0.382 ac	Curve number	= 93.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

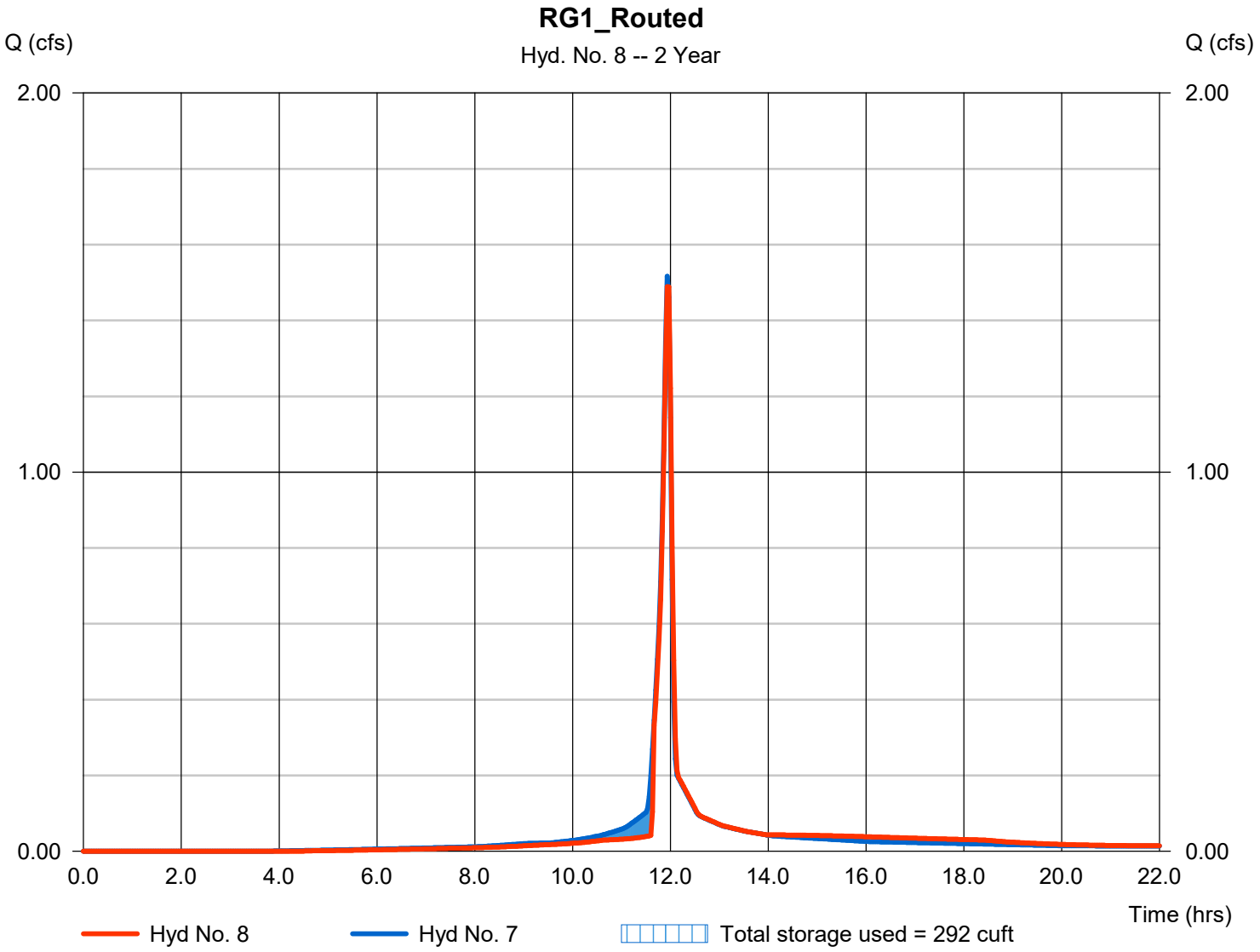
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 8

RG1_Routed

Hydrograph type	= Reservoir	Peak discharge	= 1.489 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 3,265 cuft
Inflow hyd. No.	= 7 - Post Dev RG1_POI 2	Max. Elevation	= 236.66 ft
Reservoir name	= RG#1	Max. Storage	= 292 cuft

Storage Indication method used. Outflow includes exfiltration.



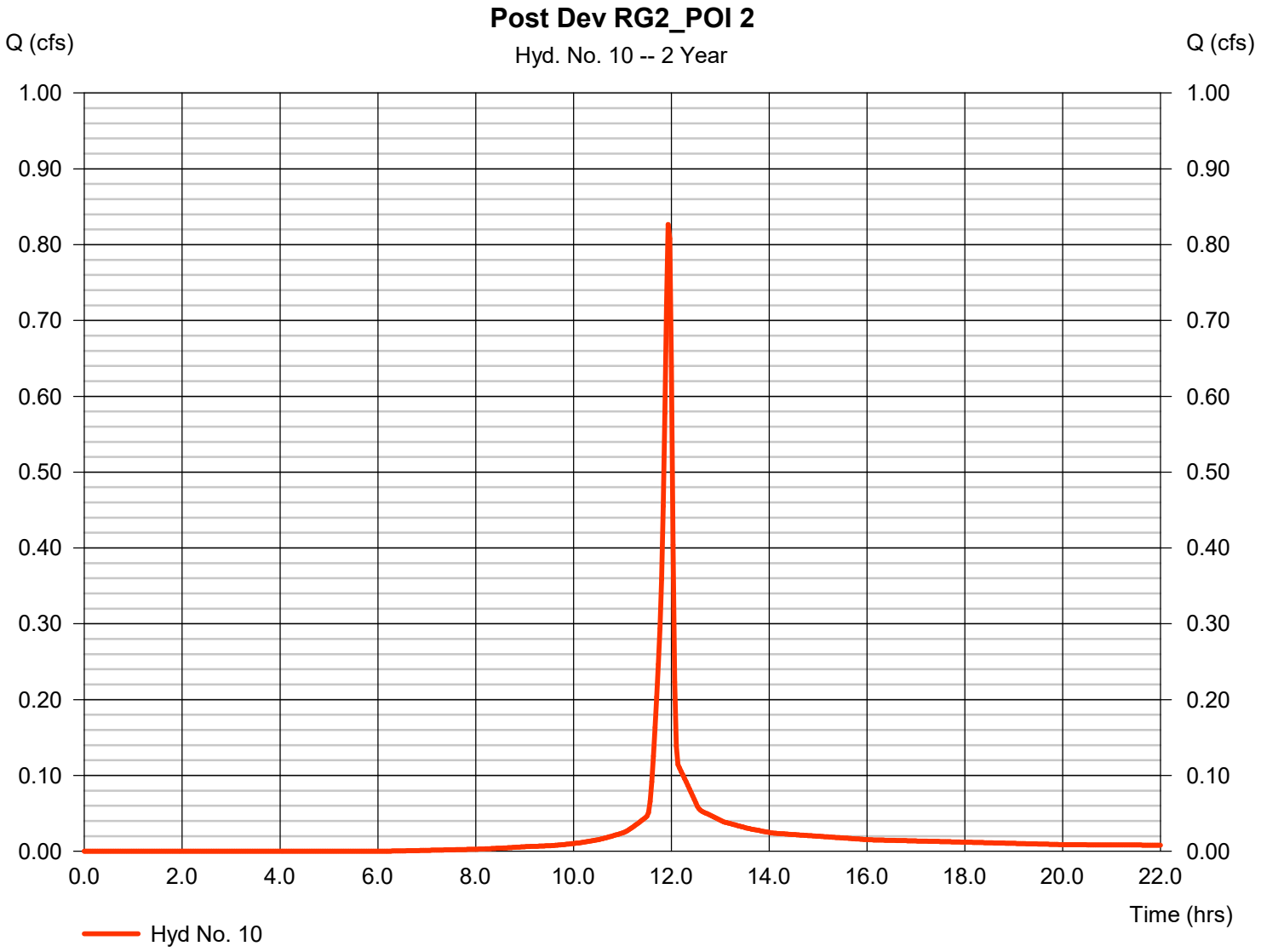
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 10

Post Dev RG2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.827 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 1,700 cuft
Drainage area	= 0.244 ac	Curve number	= 88.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

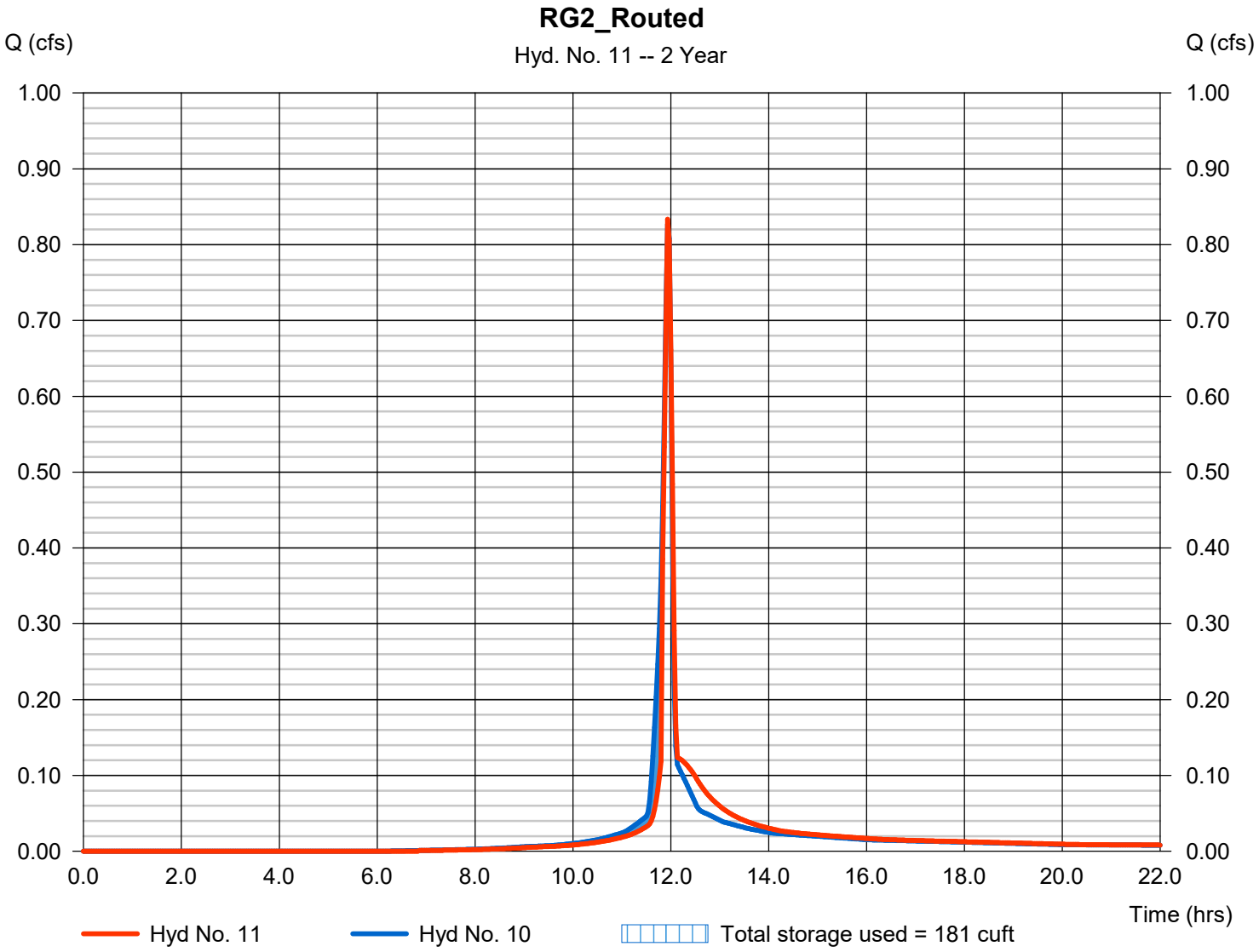
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 11

RG2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.833 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 1,699 cuft
Inflow hyd. No.	= 10 - Post Dev RG2_POI 2	Max. Elevation	= 237.81 ft
Reservoir name	= RG#2	Max. Storage	= 181 cuft

Storage Indication method used. Outflow includes exfiltration.



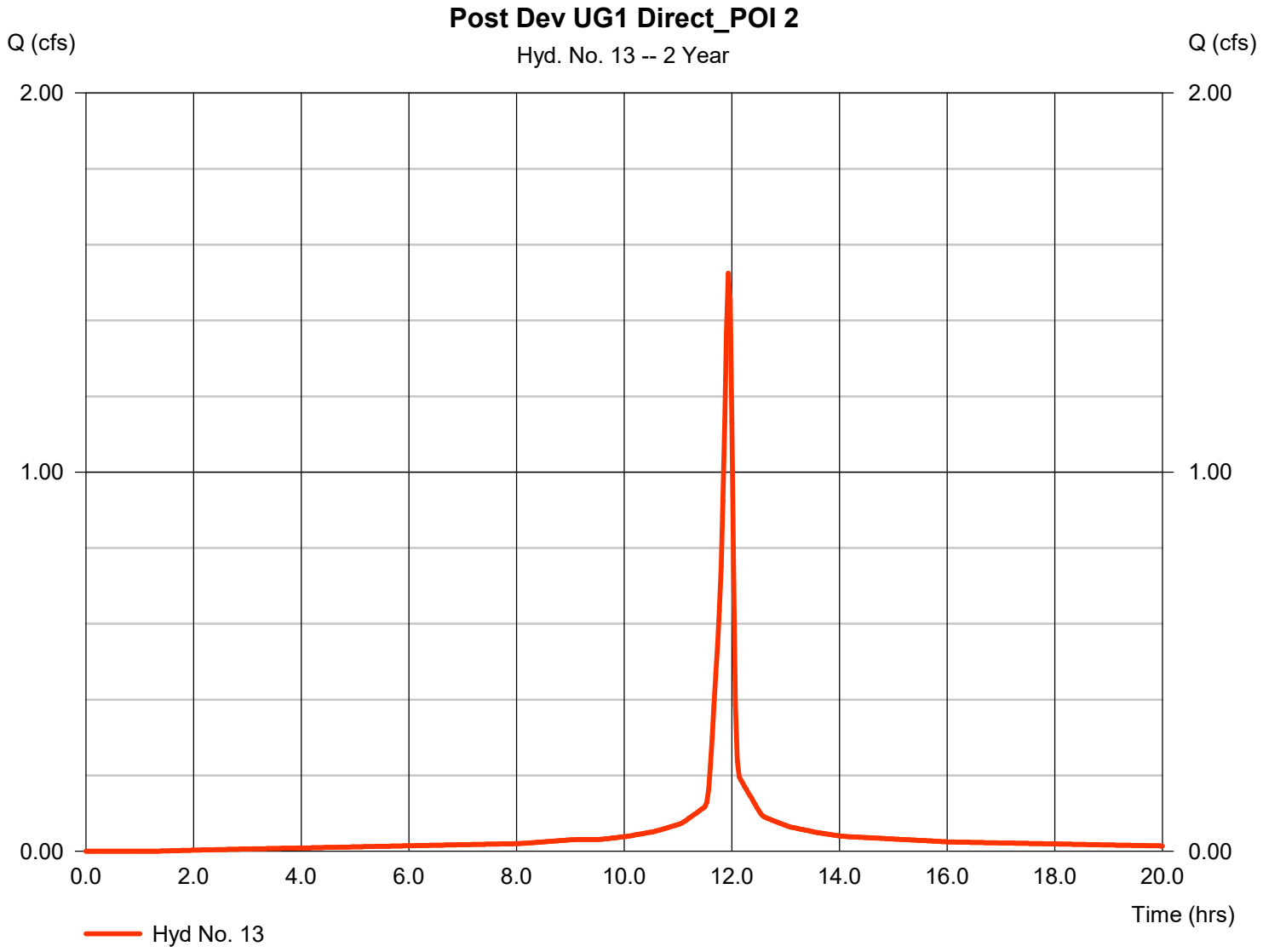
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 13

Post Dev UG1 Direct_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.524 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 3,565 cuft
Drainage area	= 0.353 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

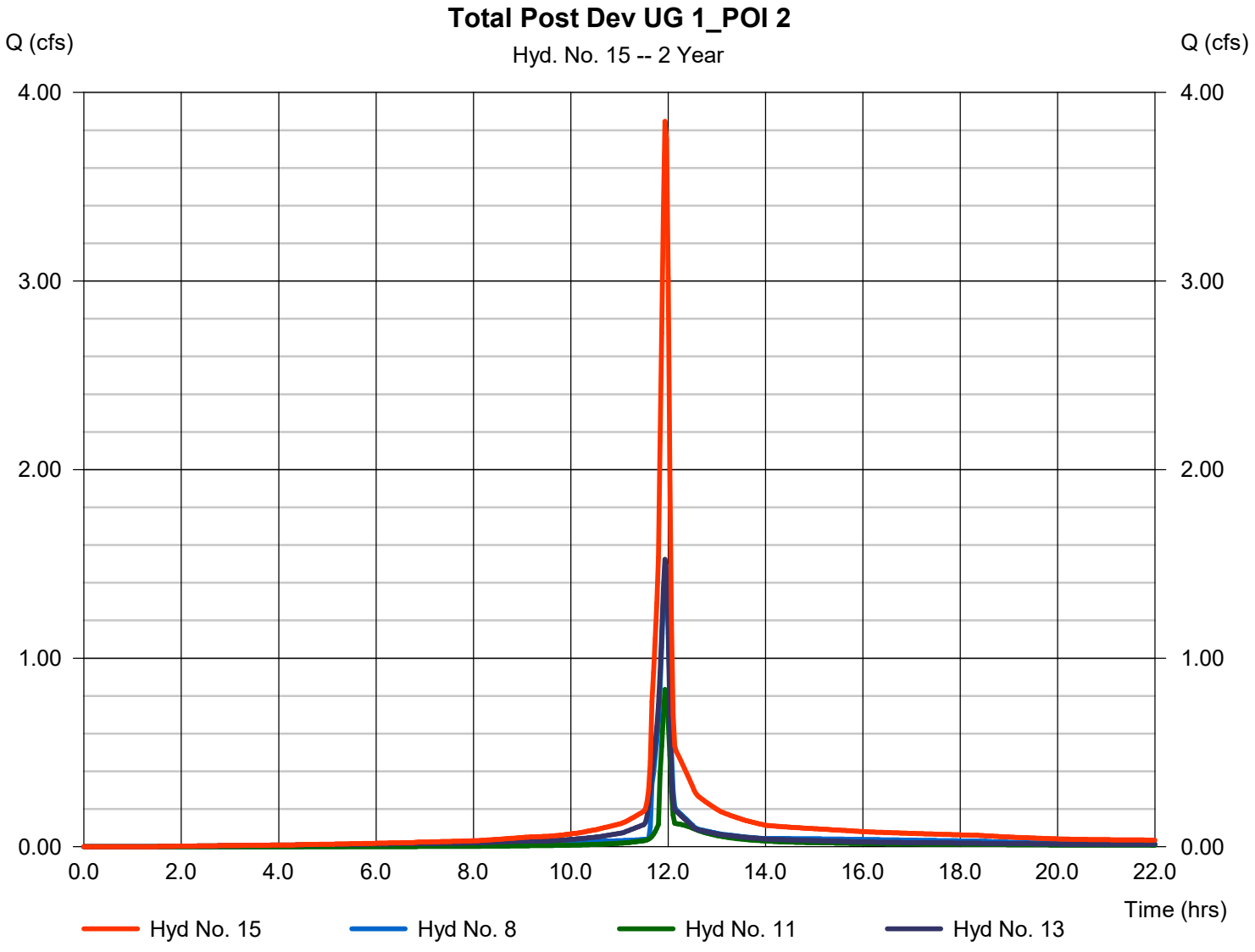


Hydrograph Report

Hyd. No. 15

Total Post Dev UG 1_POI 2

Hydrograph type	= Combine	Peak discharge	= 3.847 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 8,529 cuft
Inflow hyds.	= 8, 11, 13	Contrib. drain. area	= 0.353 ac



Hydrograph Report

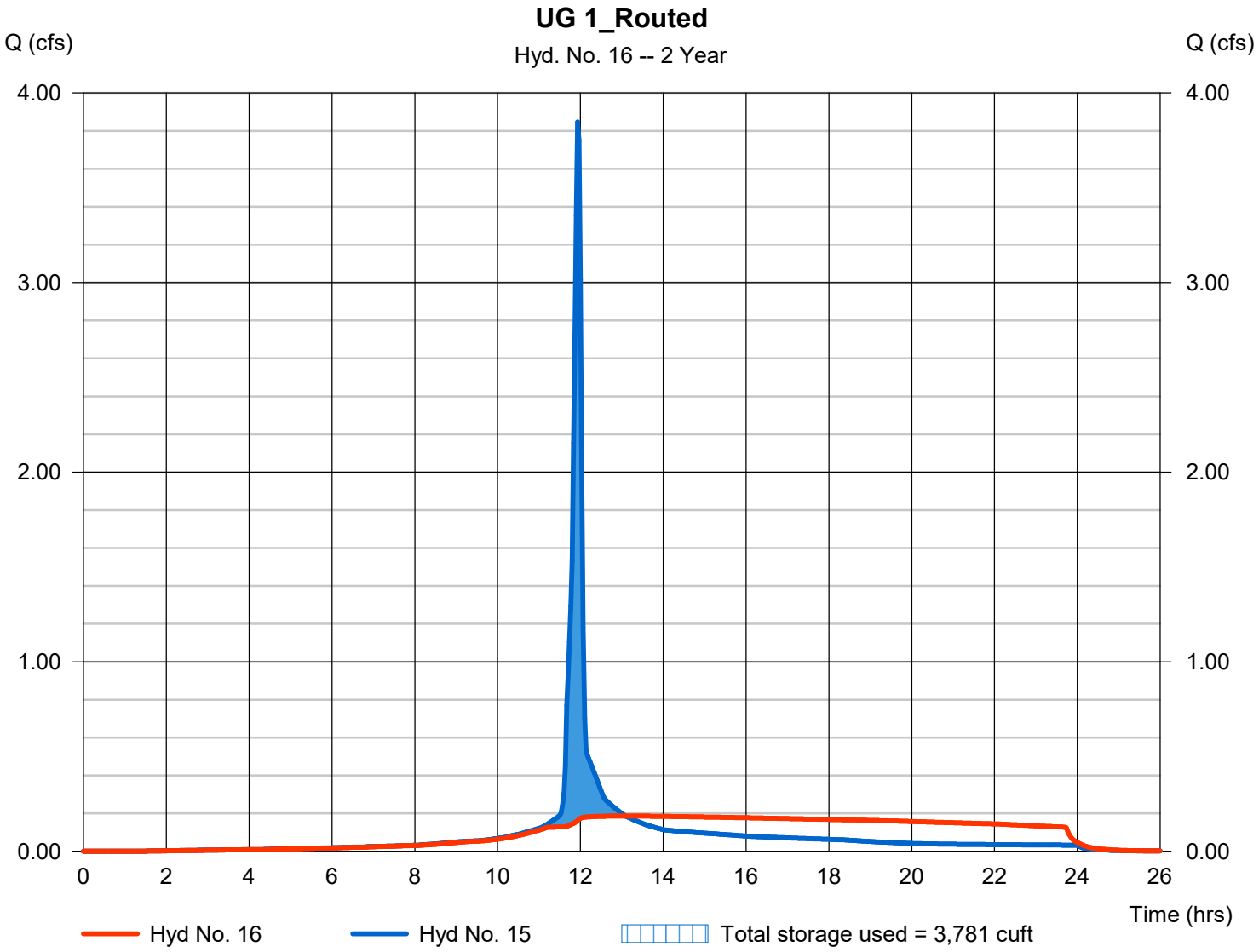
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 16

UG 1_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	0.186 cfs
Storm frequency	=	2 yrs	Time to peak	=	13.10 hrs
Time interval	=	2 min	Hyd. volume	=	8,529 cuft
Inflow hyd. No.	=	15 - Total Post Dev UG 1_POI2	Max. Elevation	=	231.67 ft
Reservoir name	=	UG #1	Max. Storage	=	3,781 cuft

Storage Indication method used. Outflow includes exfiltration.

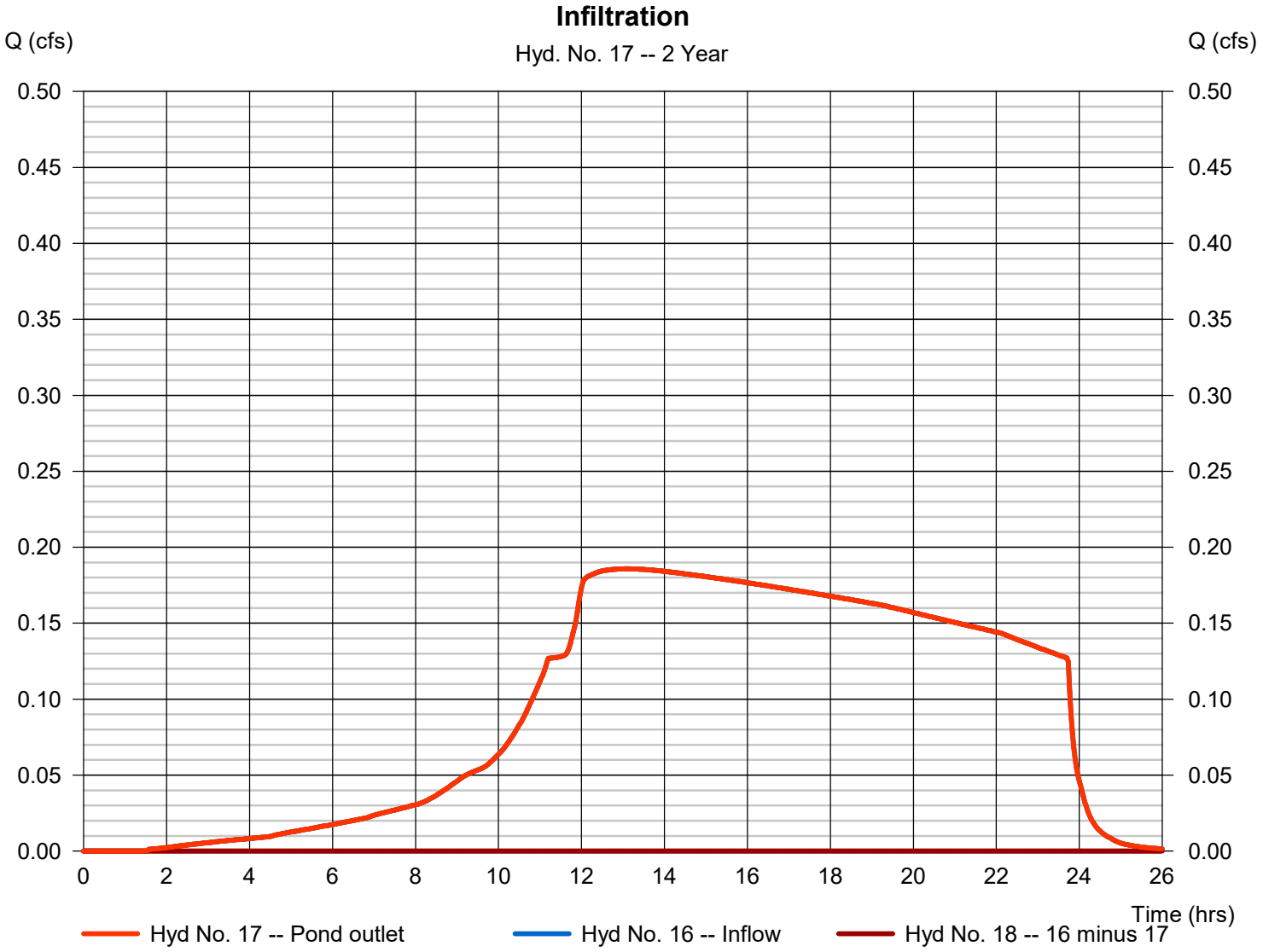


Hydrograph Report

Hyd. No. 17

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.186 cfs
Storm frequency	= 2 yrs	Time to peak	= 13.10 hrs
Time interval	= 2 min	Hyd. volume	= 8,529 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 18
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration

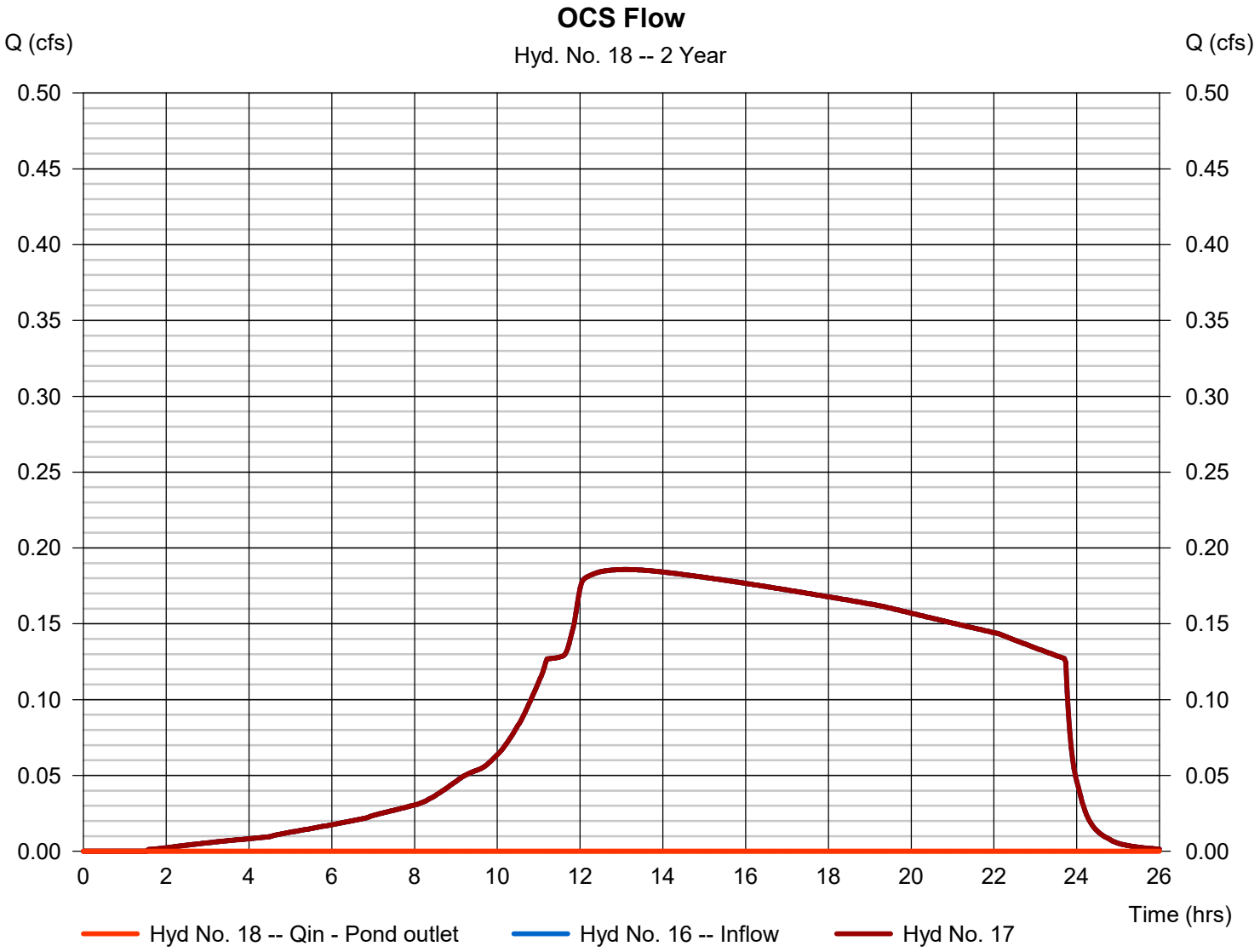


Hydrograph Report

Hyd. No. 18

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 18.10 hrs
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 17
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration



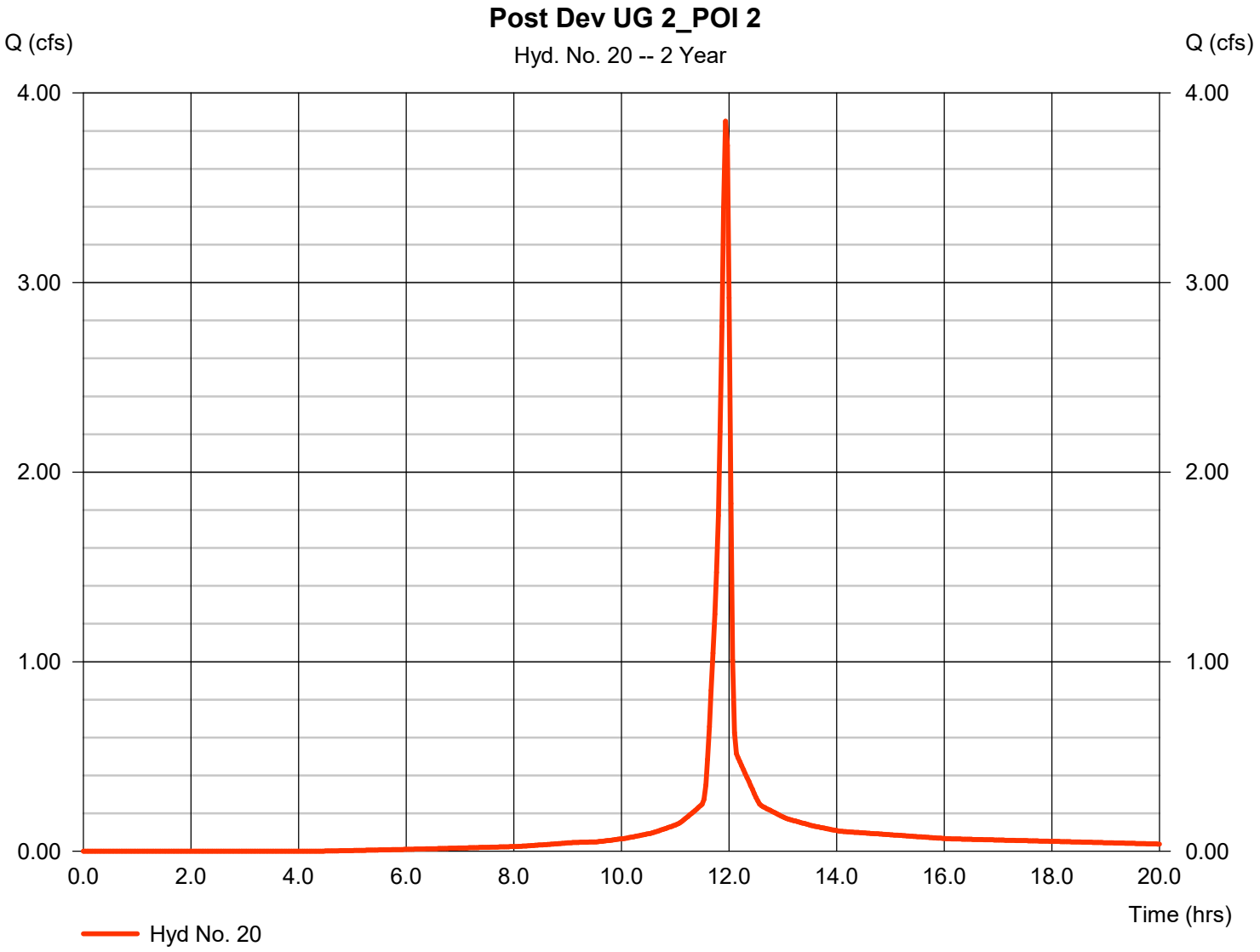
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 20

Post Dev UG 2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 3.850 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 8,168 cuft
Drainage area	= 1.005 ac	Curve number	= 92.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

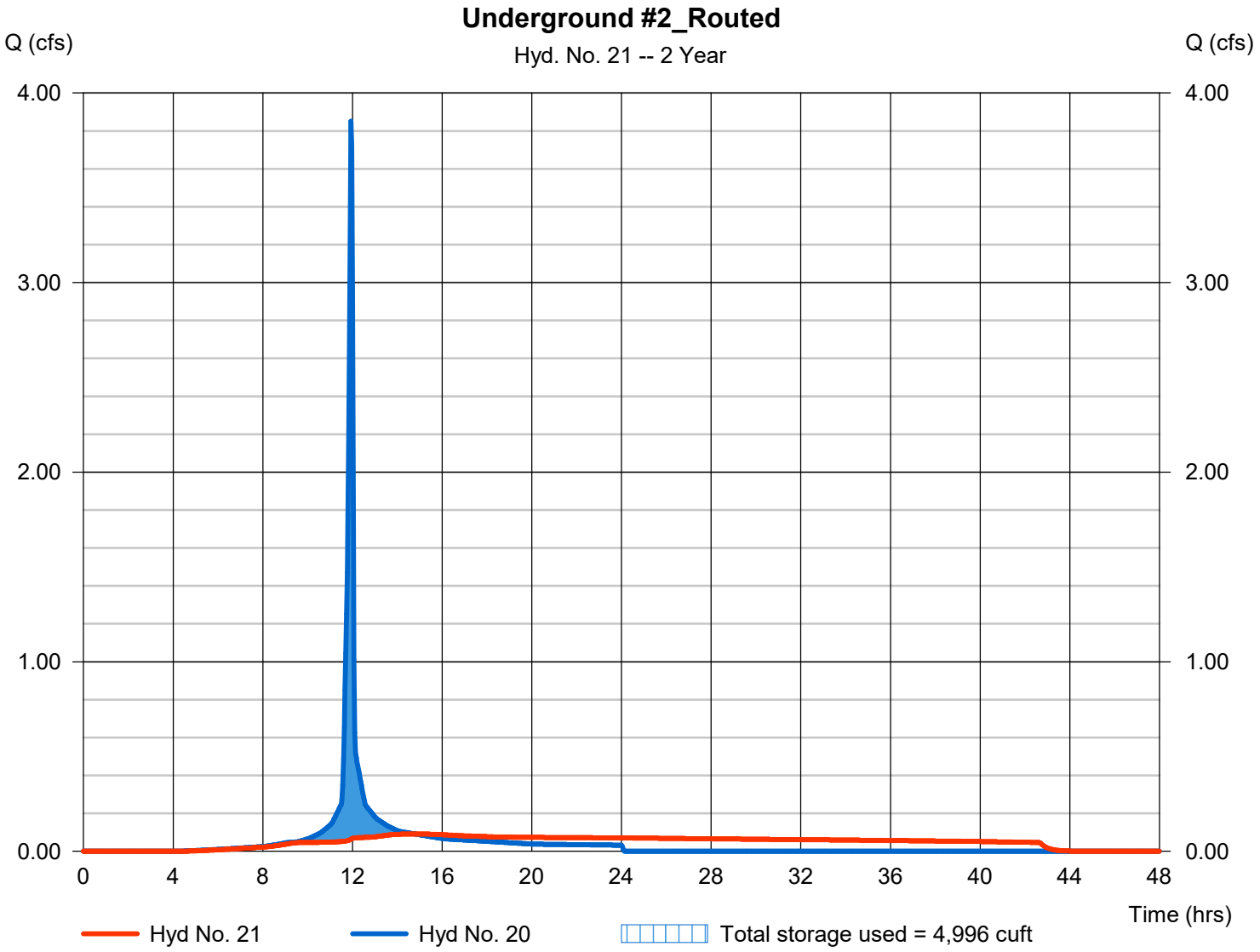
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 21

Underground #2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.091 cfs
Storm frequency	= 2 yrs	Time to peak	= 14.77 hrs
Time interval	= 2 min	Hyd. volume	= 8,167 cuft
Inflow hyd. No.	= 20 - Post Dev UG 2_POI 2	Max. Elevation	= 232.59 ft
Reservoir name	= UG #2	Max. Storage	= 4,996 cuft

Storage Indication method used. Outflow includes exfiltration.

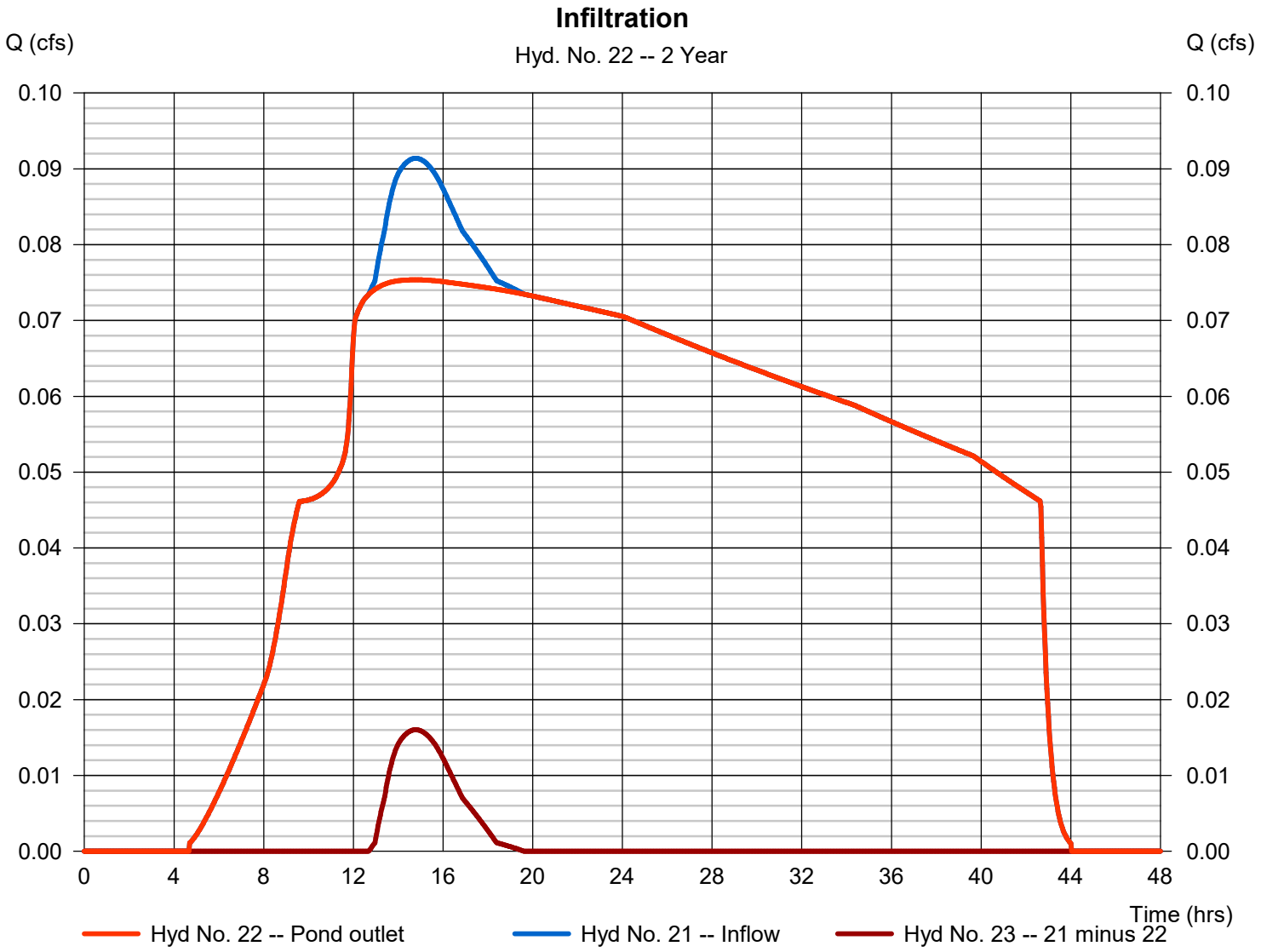


Hydrograph Report

Hyd. No. 22

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.075 cfs
Storm frequency	= 2 yrs	Time to peak	= 14.77 hrs
Time interval	= 2 min	Hyd. volume	= 7,972 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 23
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration

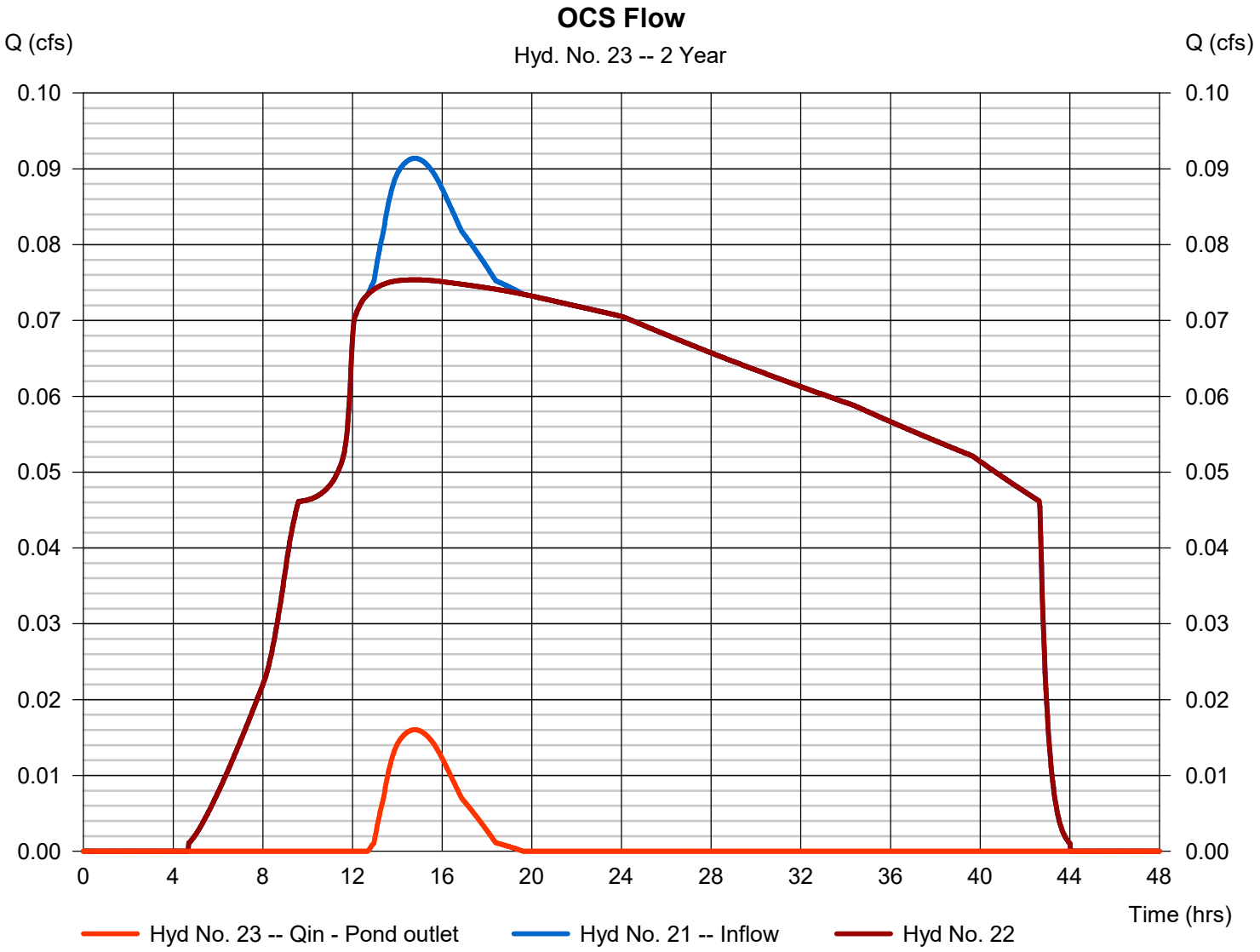


Hydrograph Report

Hyd. No. 23

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.016 cfs
Storm frequency	= 2 yrs	Time to peak	= 14.77 hrs
Time interval	= 2 min	Hyd. volume	= 195 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 22
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration



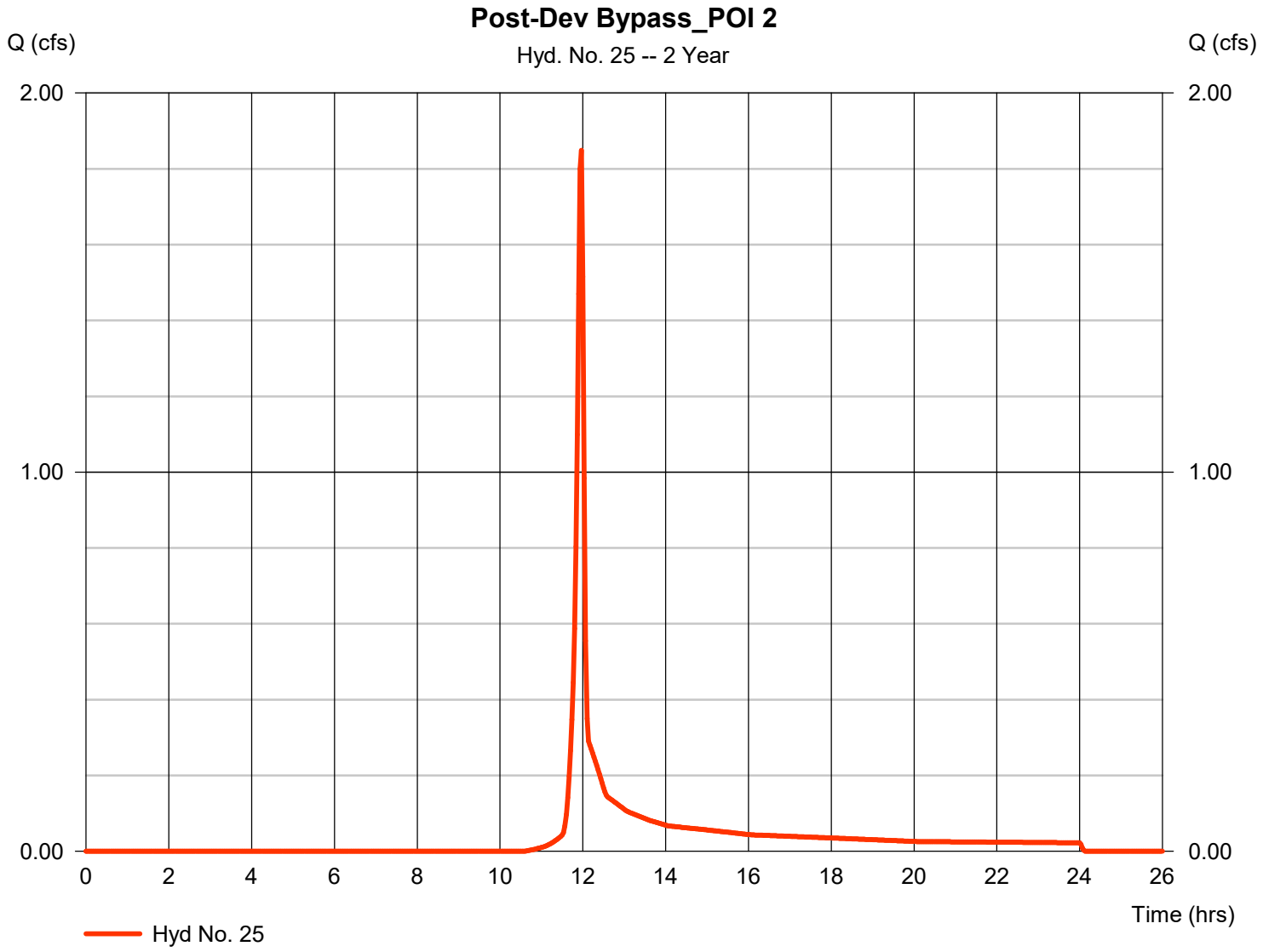
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 25

Post-Dev Bypass_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.849 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 3,698 cuft
Drainage area	= 0.978 ac	Curve number	= 75.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

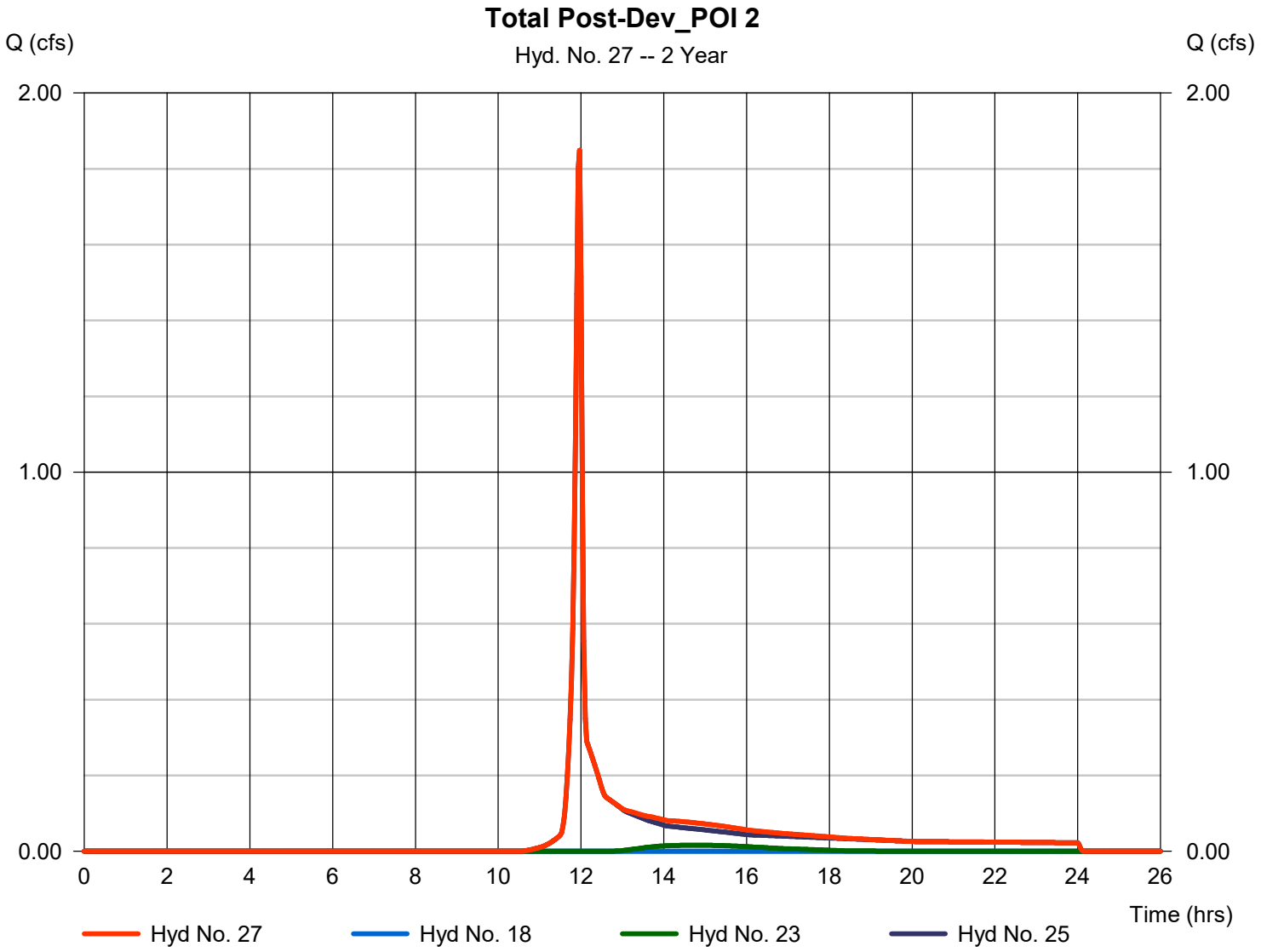


Hydrograph Report

Hyd. No. 27

Total Post-Dev_POI 2

Hydrograph type	= Combine	Peak discharge	= 1.849 cfs
Storm frequency	= 2 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 3,894 cuft
Inflow hyds.	= 18, 23, 25	Contrib. drain. area	= 0.978 ac

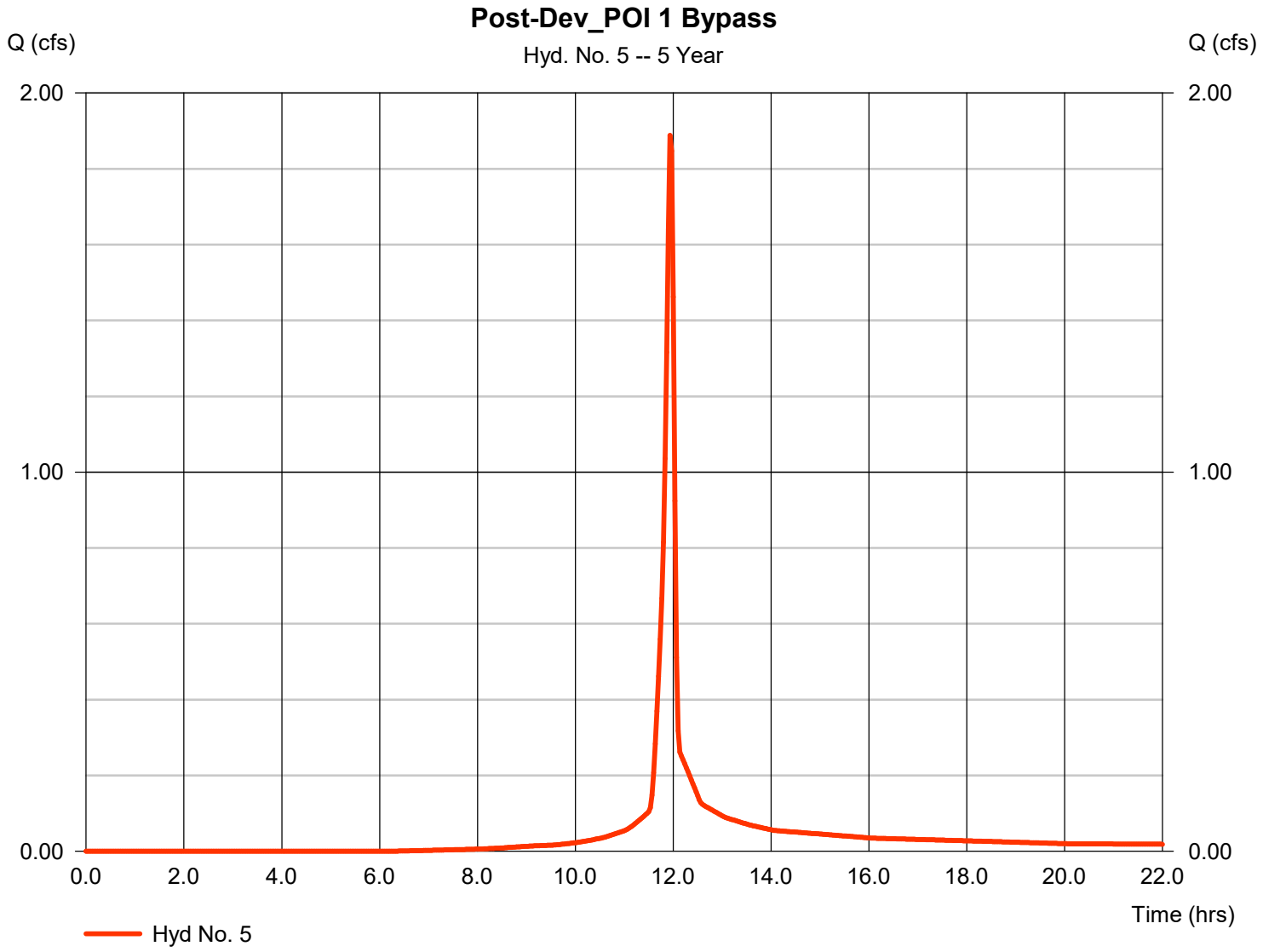


Hydrograph Report

Hyd. No. 5

Post-Dev_POI 1 Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 1.888 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 3,877 cuft
Drainage area	= 0.429 ac	Curve number	= 85.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



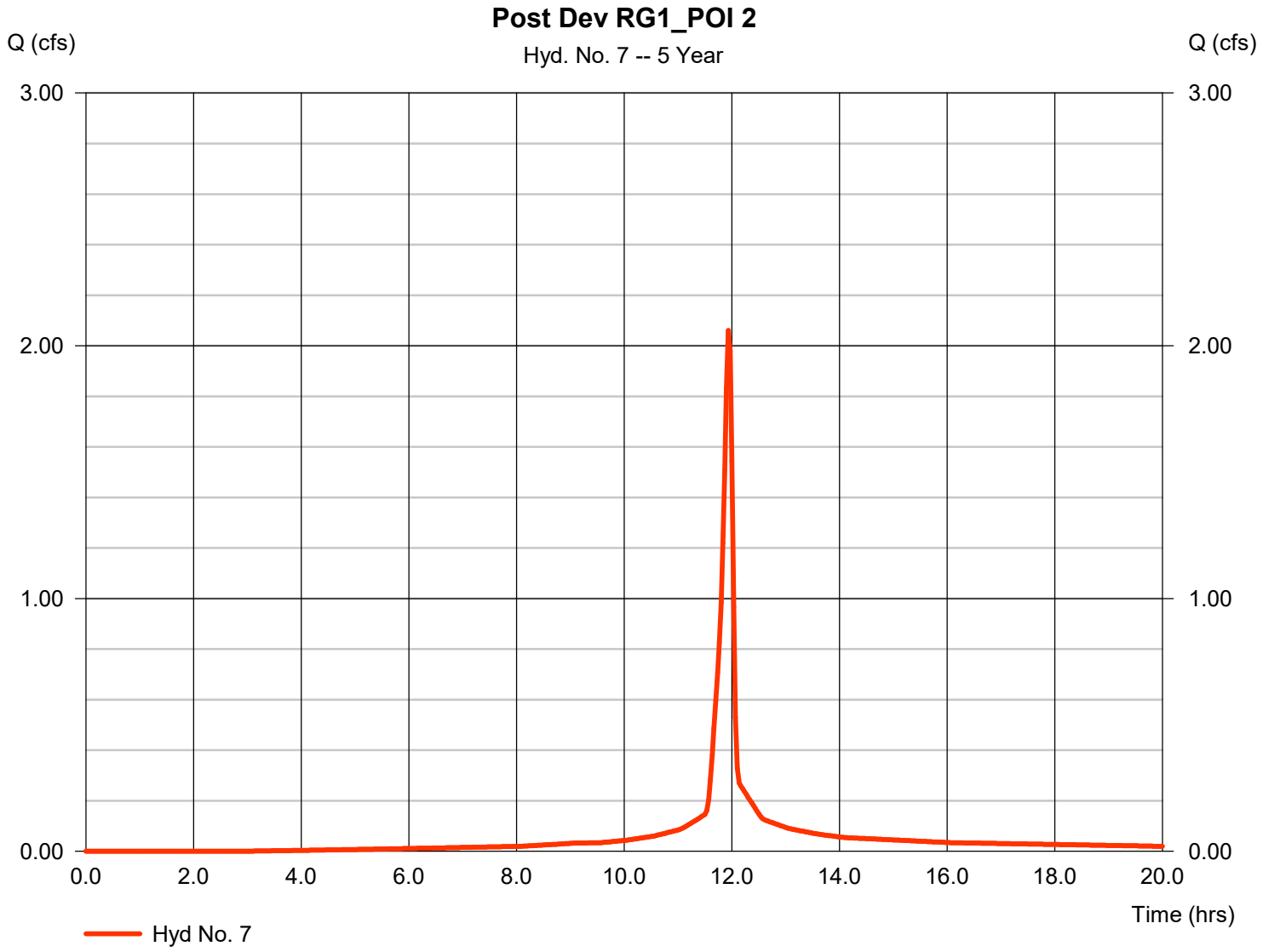
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 7

Post Dev RG1_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.060 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 4,535 cuft
Drainage area	= 0.382 ac	Curve number	= 93.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

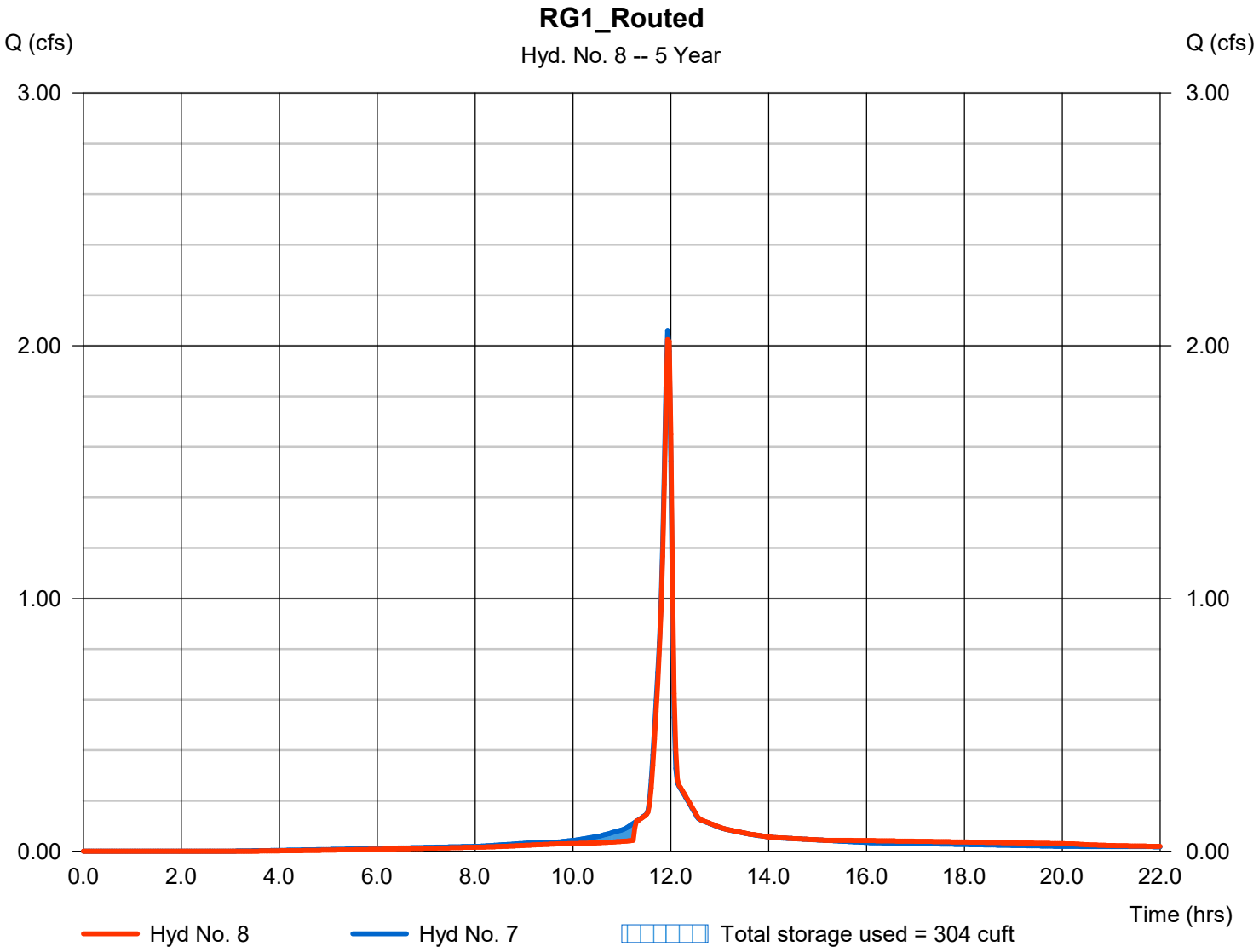
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 8

RG1_Routed

Hydrograph type	= Reservoir	Peak discharge	= 2.024 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 4,532 cuft
Inflow hyd. No.	= 7 - Post Dev RG1_POI 2	Max. Elevation	= 236.71 ft
Reservoir name	= RG#1	Max. Storage	= 304 cuft

Storage Indication method used. Outflow includes exfiltration.



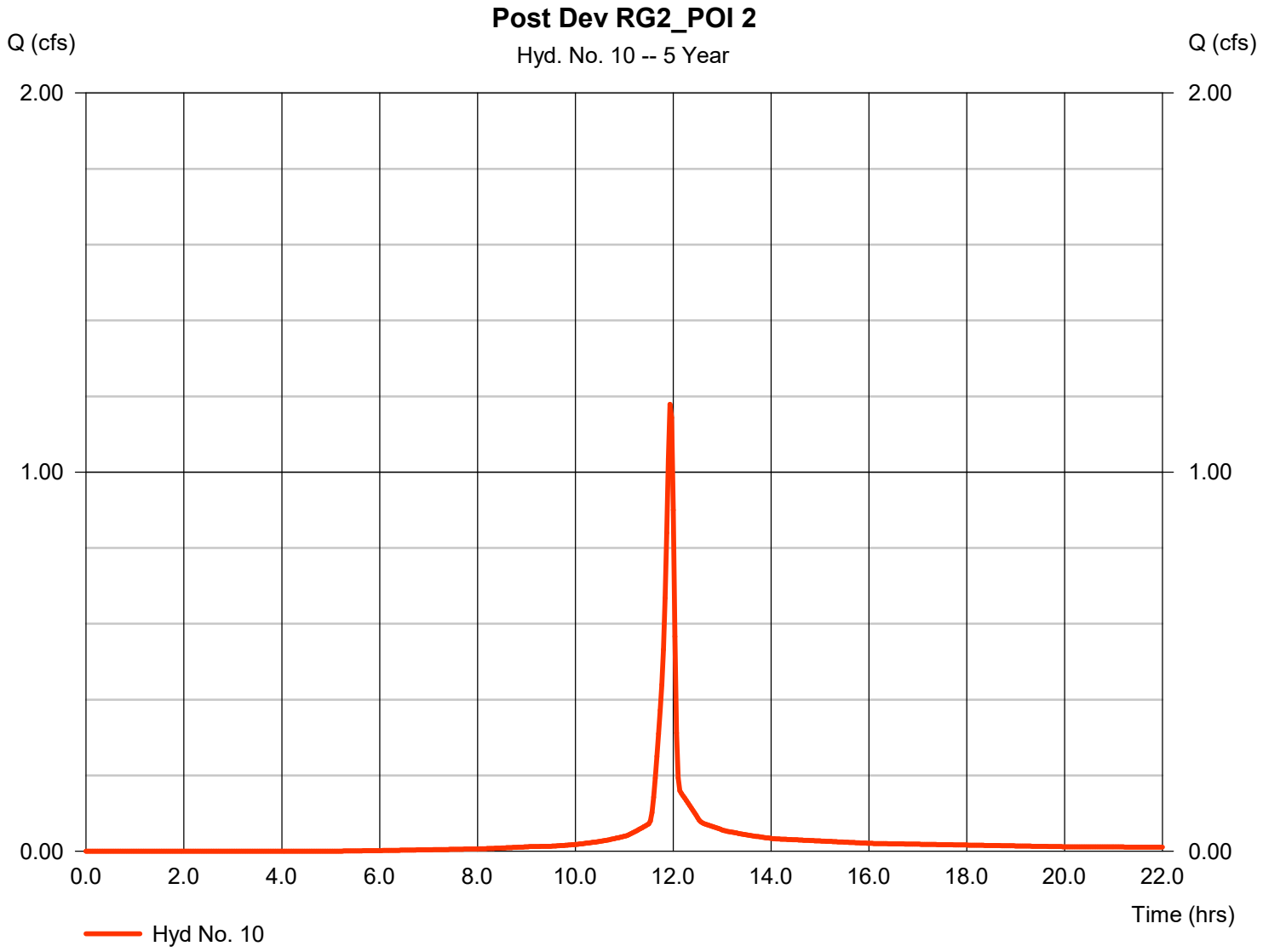
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 10

Post Dev RG2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.179 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 2,468 cuft
Drainage area	= 0.244 ac	Curve number	= 88.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

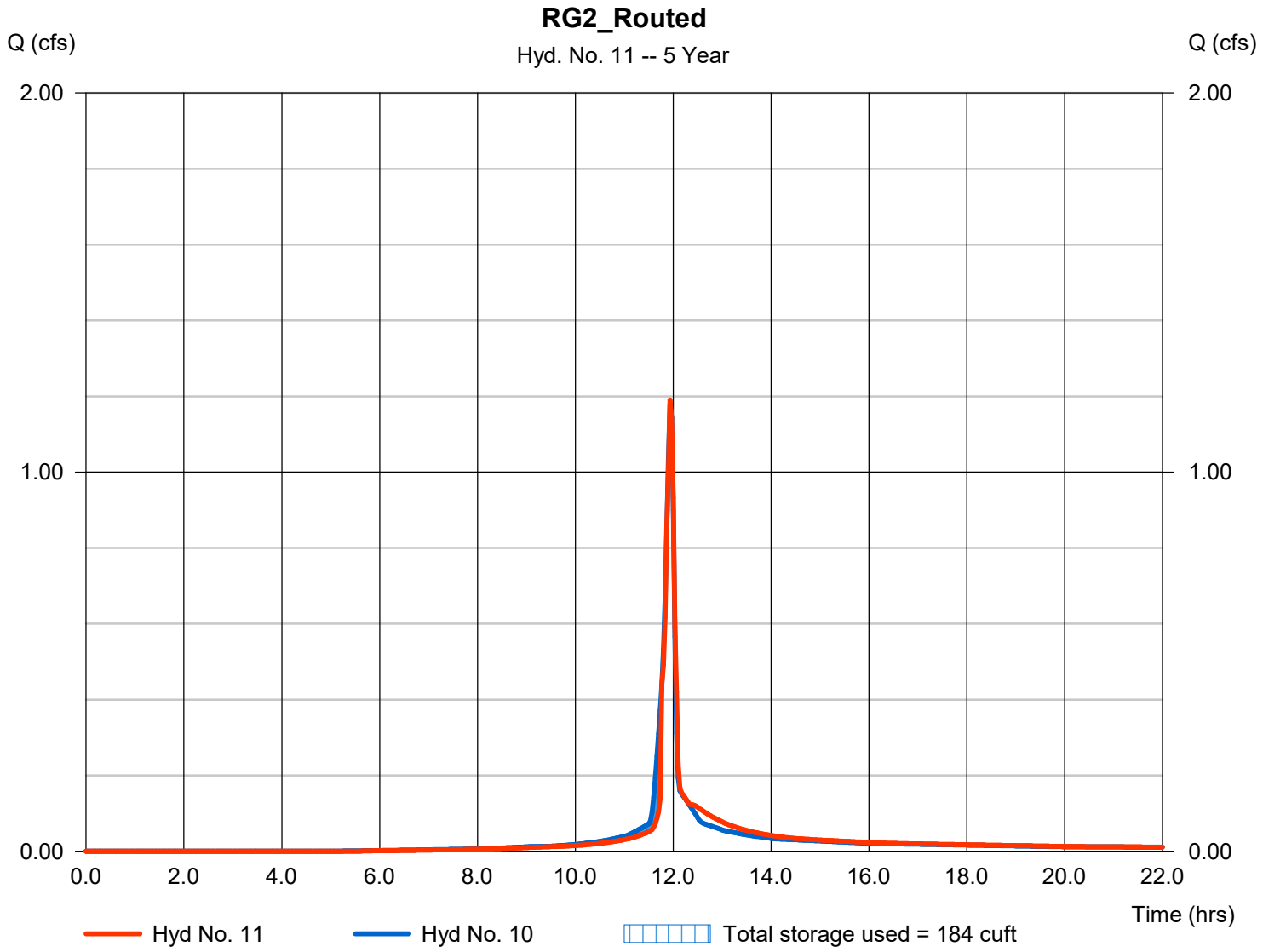
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 11

RG2_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	1.190 cfs
Storm frequency	=	5 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	2,467 cuft
Inflow hyd. No.	=	10 - Post Dev RG2_POI 2	Max. Elevation	=	237.82 ft
Reservoir name	=	RG#2	Max. Storage	=	184 cuft

Storage Indication method used. Outflow includes exfiltration.



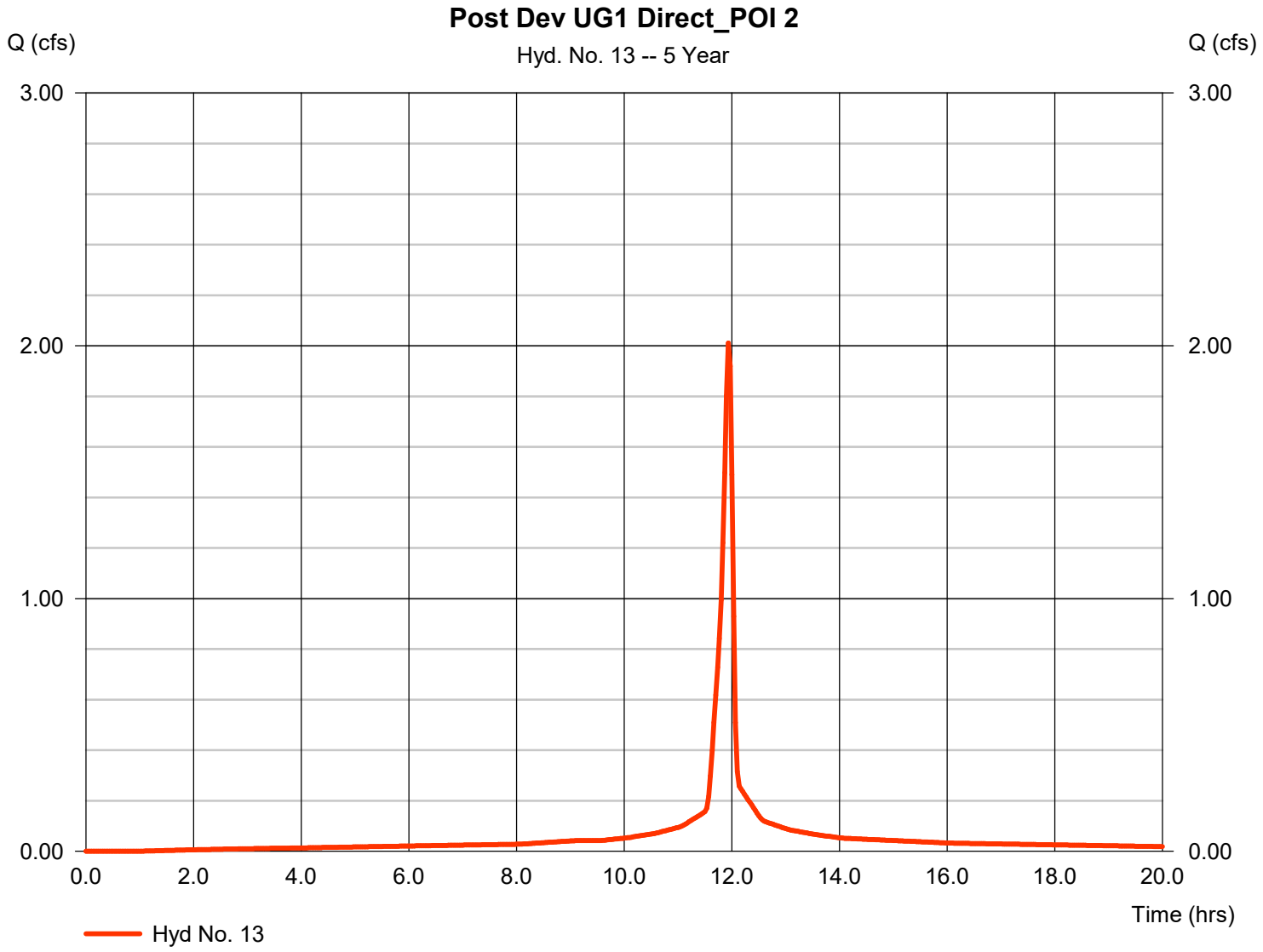
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 13

Post Dev UG1 Direct_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.011 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 4,763 cuft
Drainage area	= 0.353 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

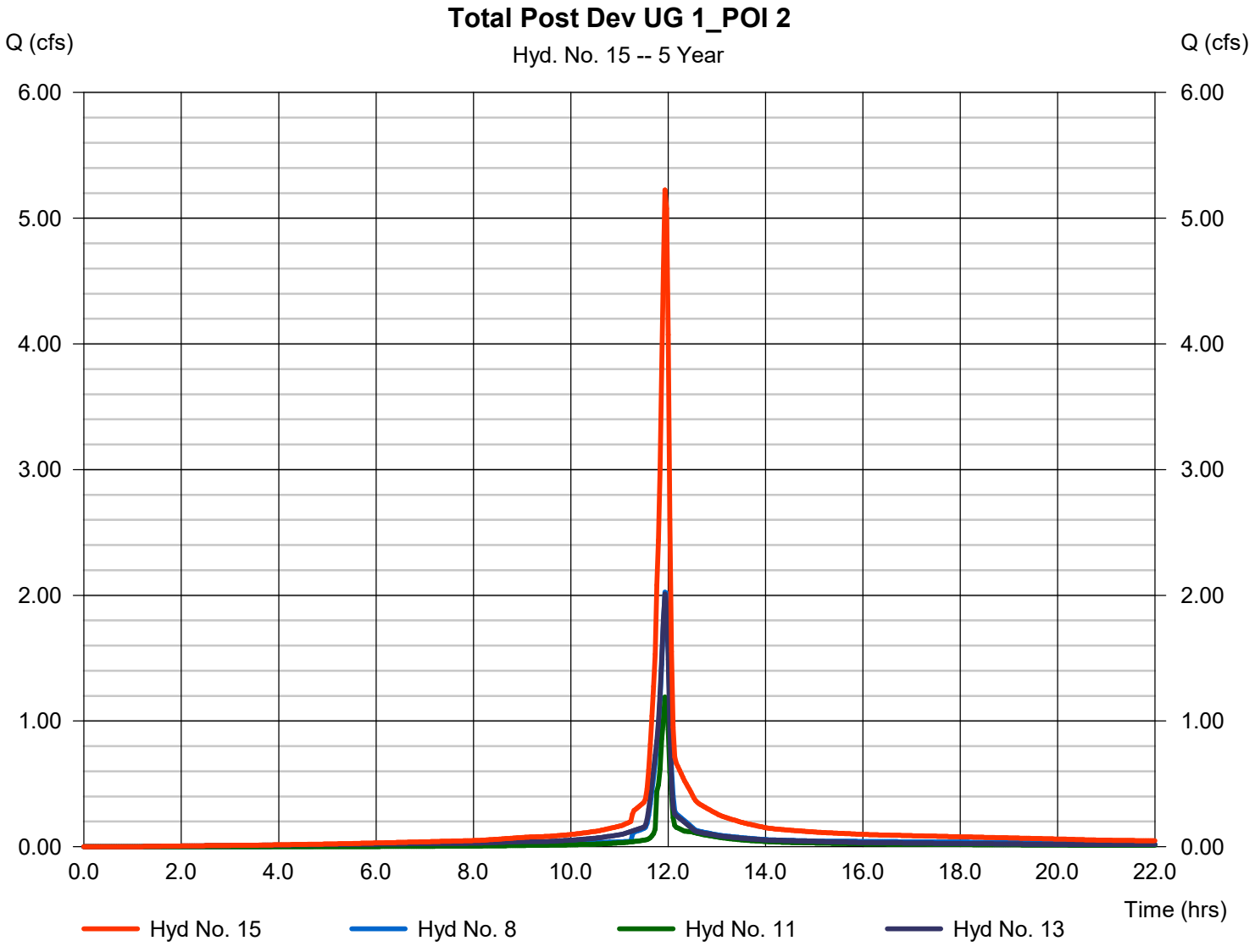


Hydrograph Report

Hyd. No. 15

Total Post Dev UG 1_POI 2

Hydrograph type	= Combine	Peak discharge	= 5.225 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 11,762 cuft
Inflow hyds.	= 8, 11, 13	Contrib. drain. area	= 0.353 ac



Hydrograph Report

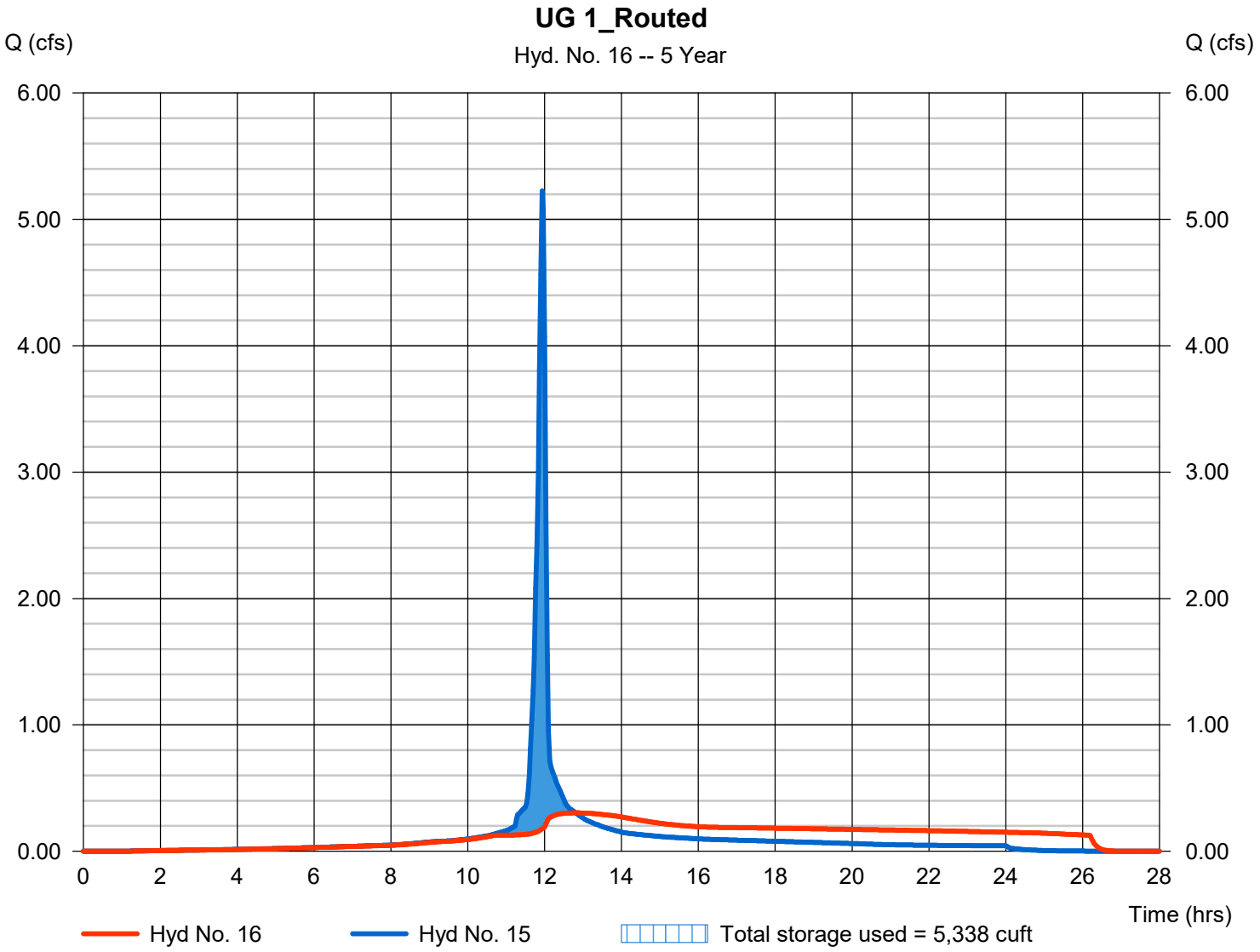
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 16

UG 1_Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.304 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.80 hrs
Time interval	= 2 min	Hyd. volume	= 11,762 cuft
Inflow hyd. No.	= 15 - Total Post Dev UG 1_POI2	Max. Elevation	= 232.05 ft
Reservoir name	= UG #1	Max. Storage	= 5,338 cuft

Storage Indication method used. Outflow includes exfiltration.

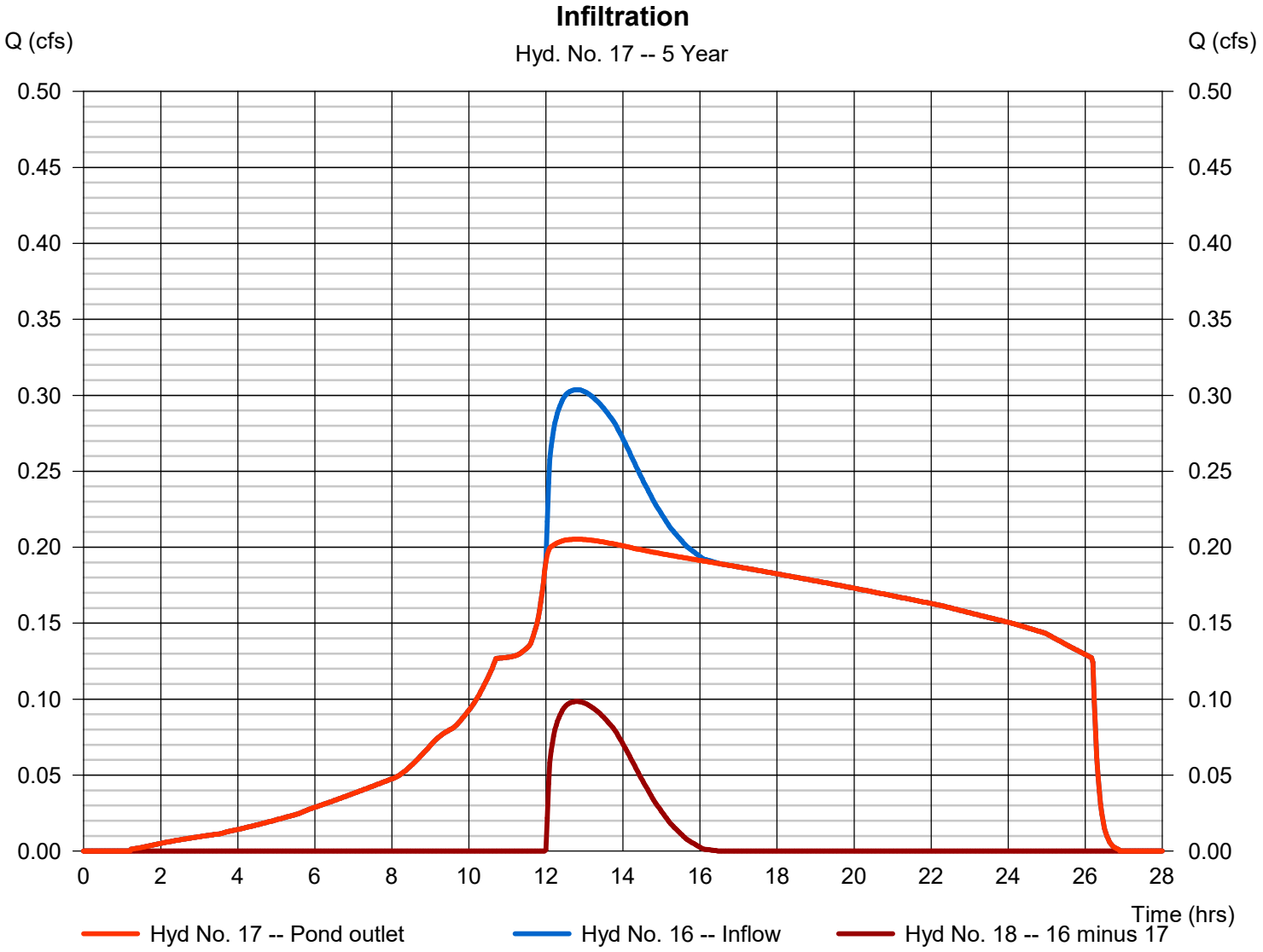


Hydrograph Report

Hyd. No. 17

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.205 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.80 hrs
Time interval	= 2 min	Hyd. volume	= 10,926 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 18
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration

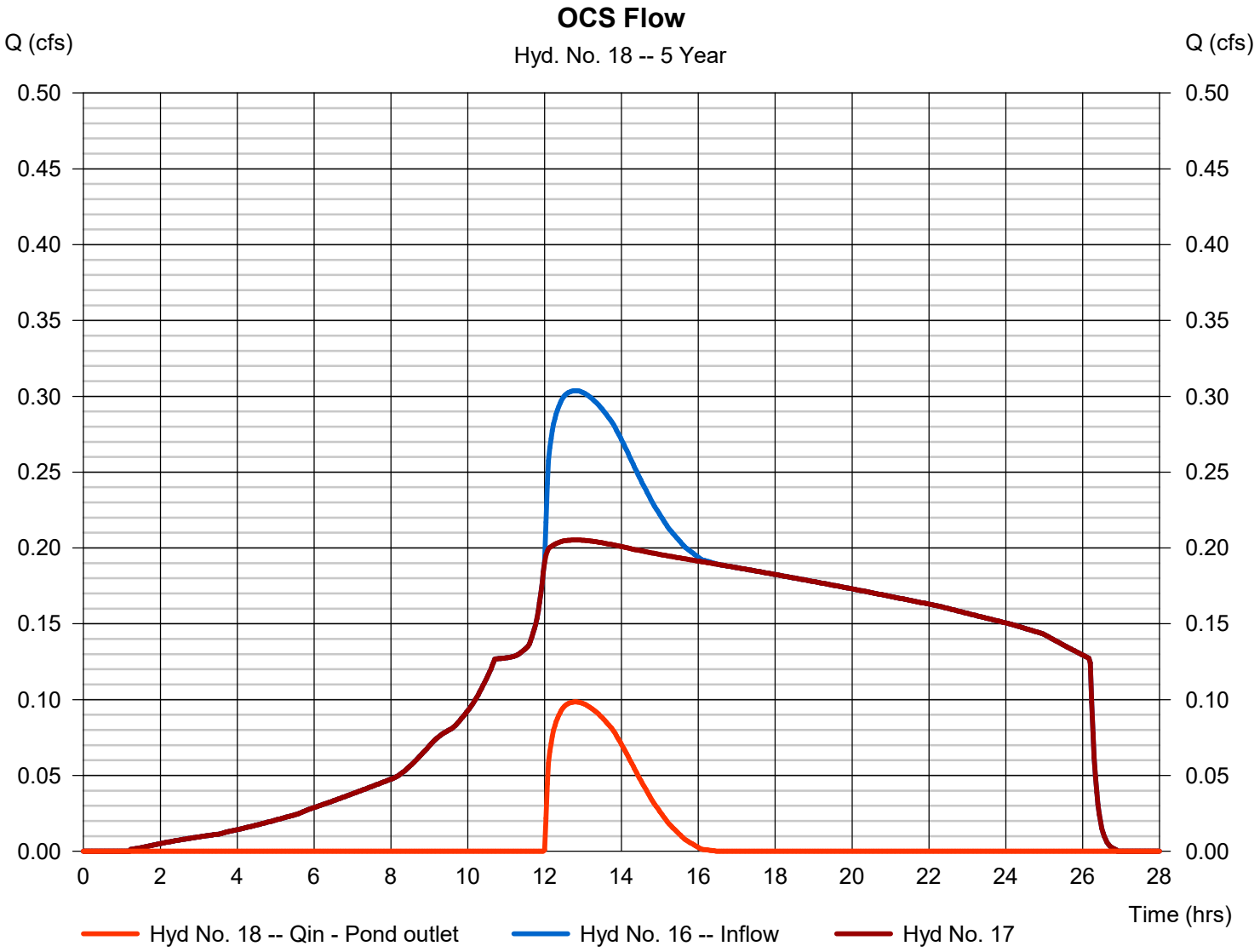


Hydrograph Report

Hyd. No. 18

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.098 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.80 hrs
Time interval	= 2 min	Hyd. volume	= 835 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 17
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration



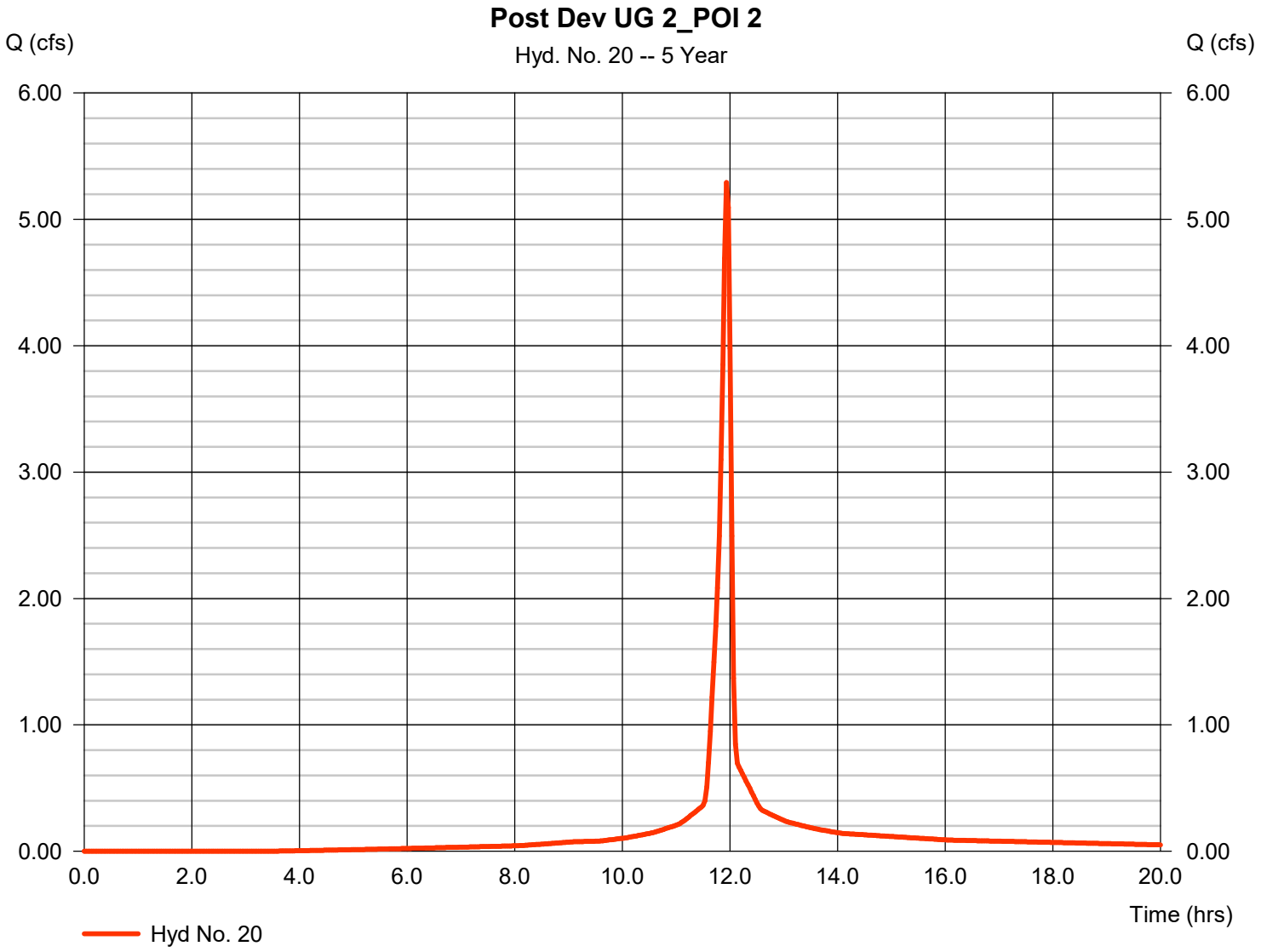
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 20

Post Dev UG 2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 5.291 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 11,465 cuft
Drainage area	= 1.005 ac	Curve number	= 92.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

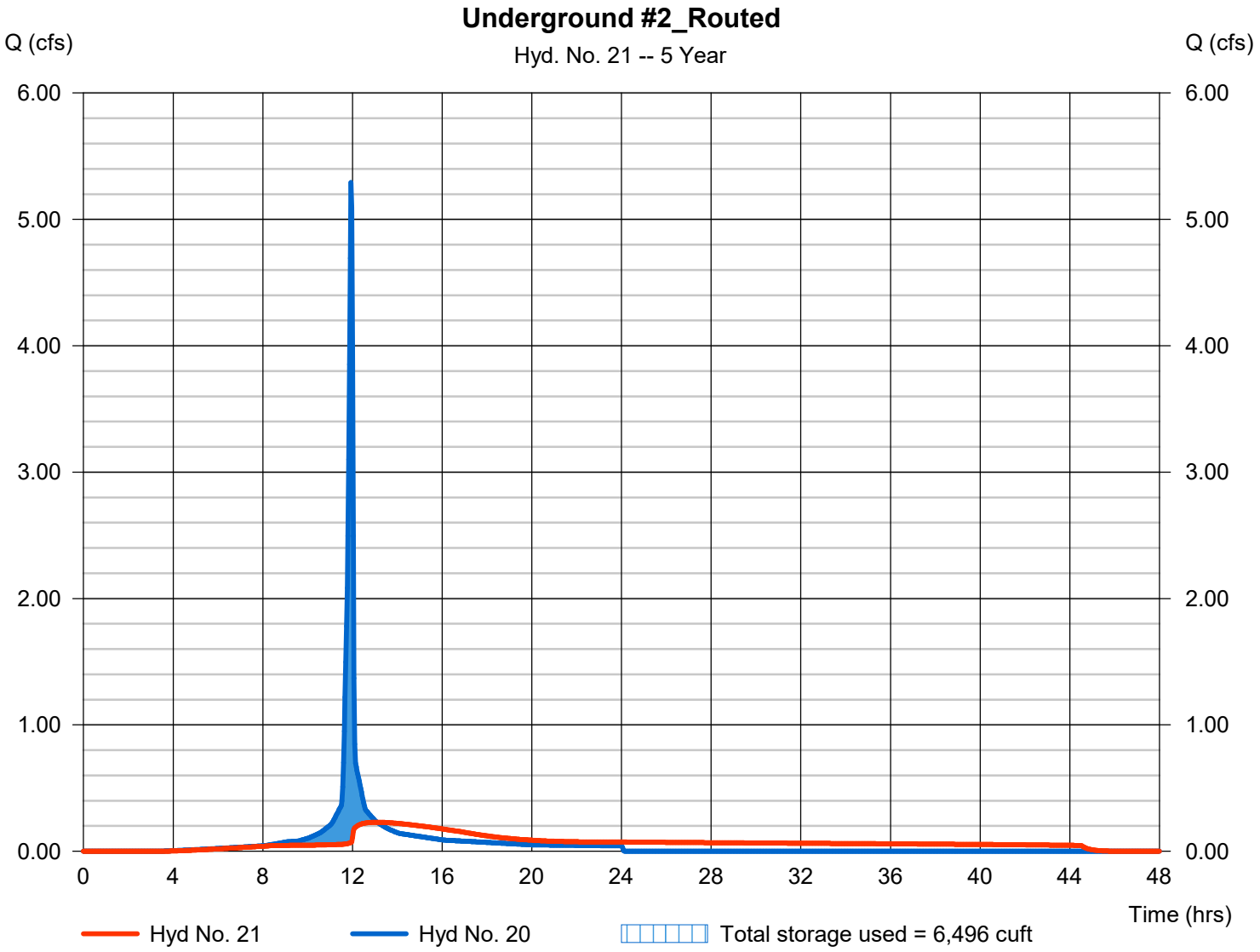
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 21

Underground #2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.229 cfs
Storm frequency	= 5 yrs	Time to peak	= 13.10 hrs
Time interval	= 2 min	Hyd. volume	= 11,464 cuft
Inflow hyd. No.	= 20 - Post Dev UG 2_POI 2	Max. Elevation	= 233.01 ft
Reservoir name	= UG #2	Max. Storage	= 6,496 cuft

Storage Indication method used. Outflow includes exfiltration.

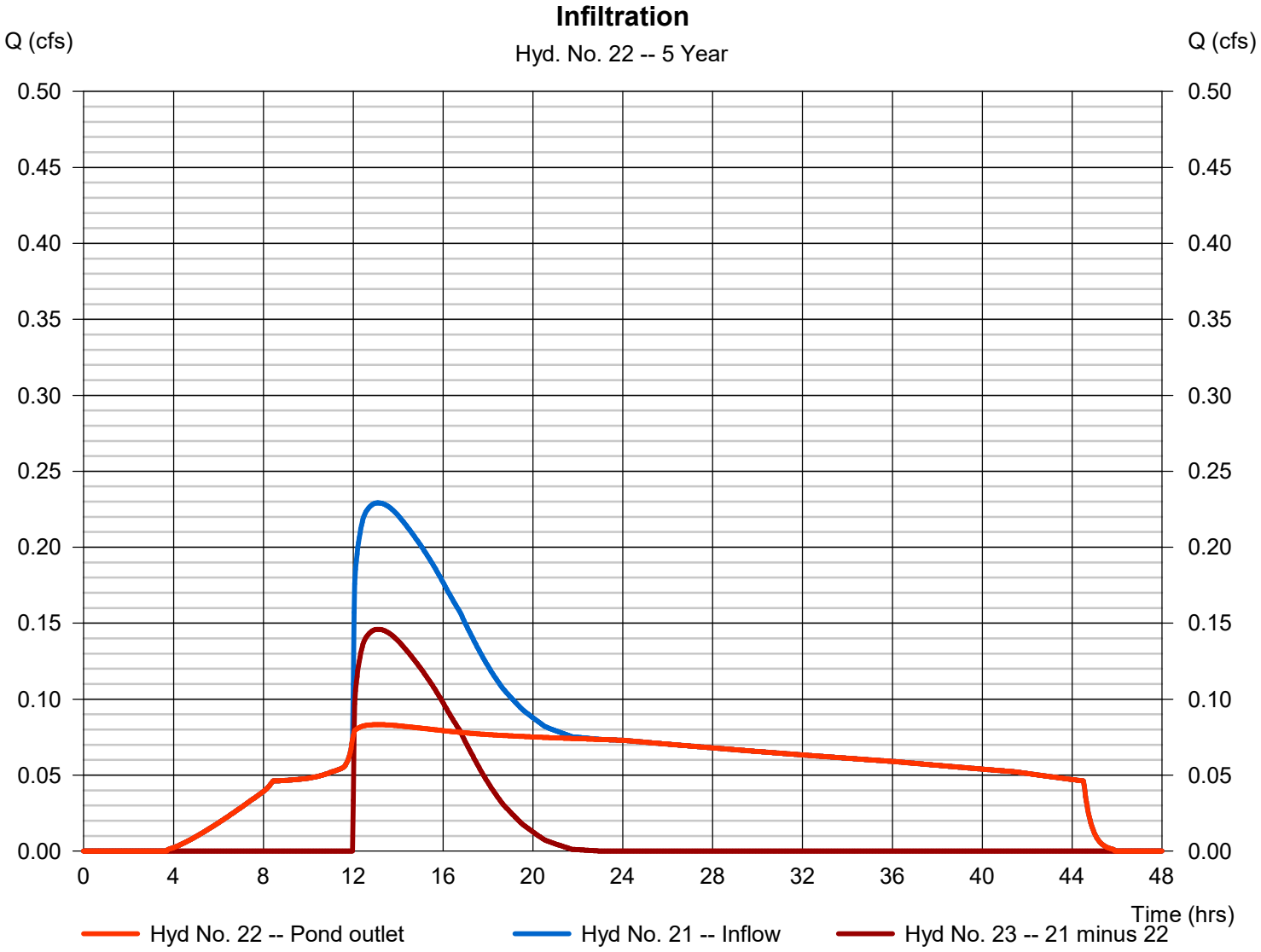


Hydrograph Report

Hyd. No. 22

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.083 cfs
Storm frequency	= 5 yrs	Time to peak	= 13.10 hrs
Time interval	= 2 min	Hyd. volume	= 8,871 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 23
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration

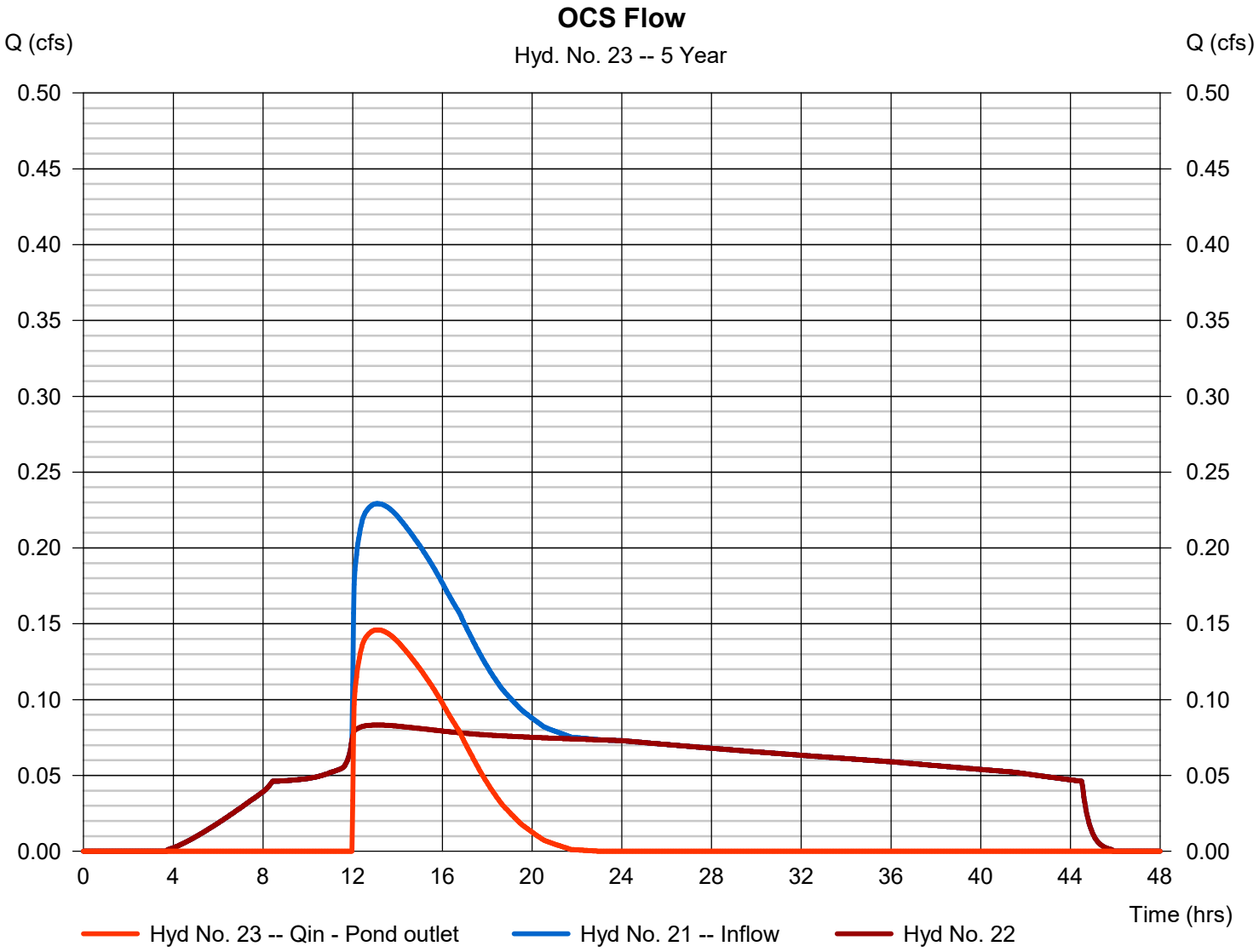


Hydrograph Report

Hyd. No. 23

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.146 cfs
Storm frequency	= 5 yrs	Time to peak	= 13.10 hrs
Time interval	= 2 min	Hyd. volume	= 2,593 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 22
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration



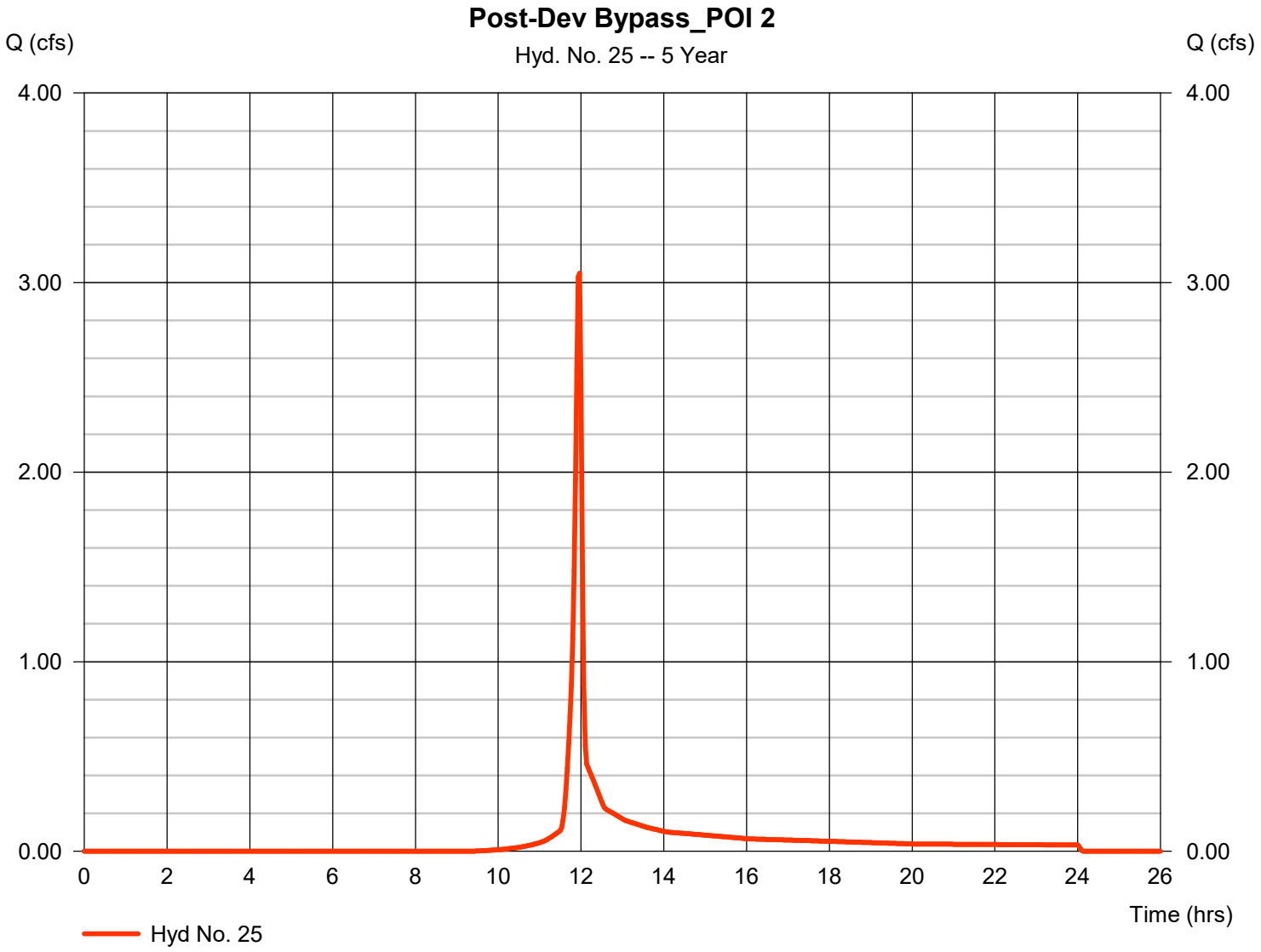
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 25

Post-Dev Bypass_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 3.050 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 6,126 cuft
Drainage area	= 0.978 ac	Curve number	= 75.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.20 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

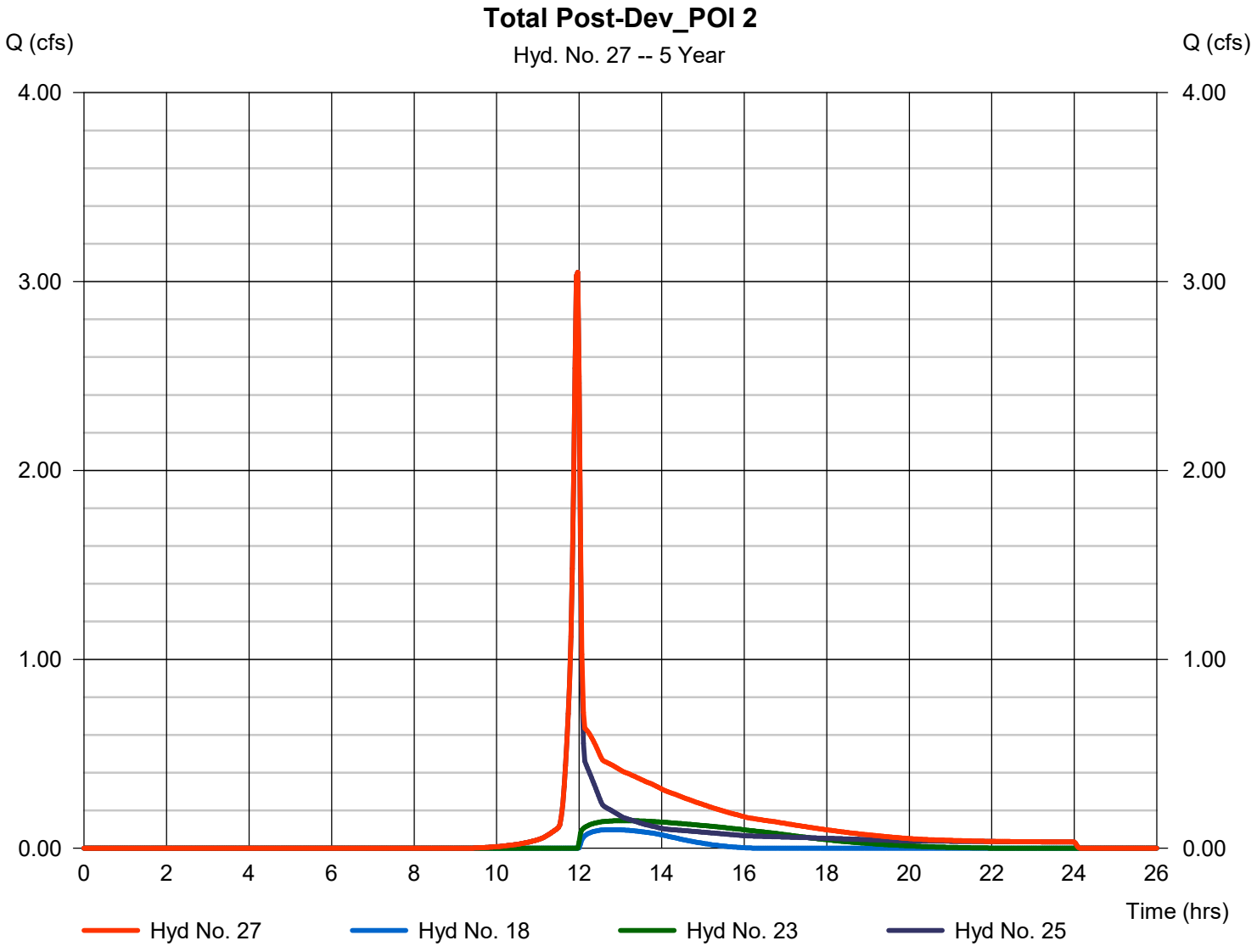


Hydrograph Report

Hyd. No. 27

Total Post-Dev_POI 2

Hydrograph type	= Combine	Peak discharge	= 3.050 cfs
Storm frequency	= 5 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 9,554 cuft
Inflow hyds.	= 18, 23, 25	Contrib. drain. area	= 0.978 ac

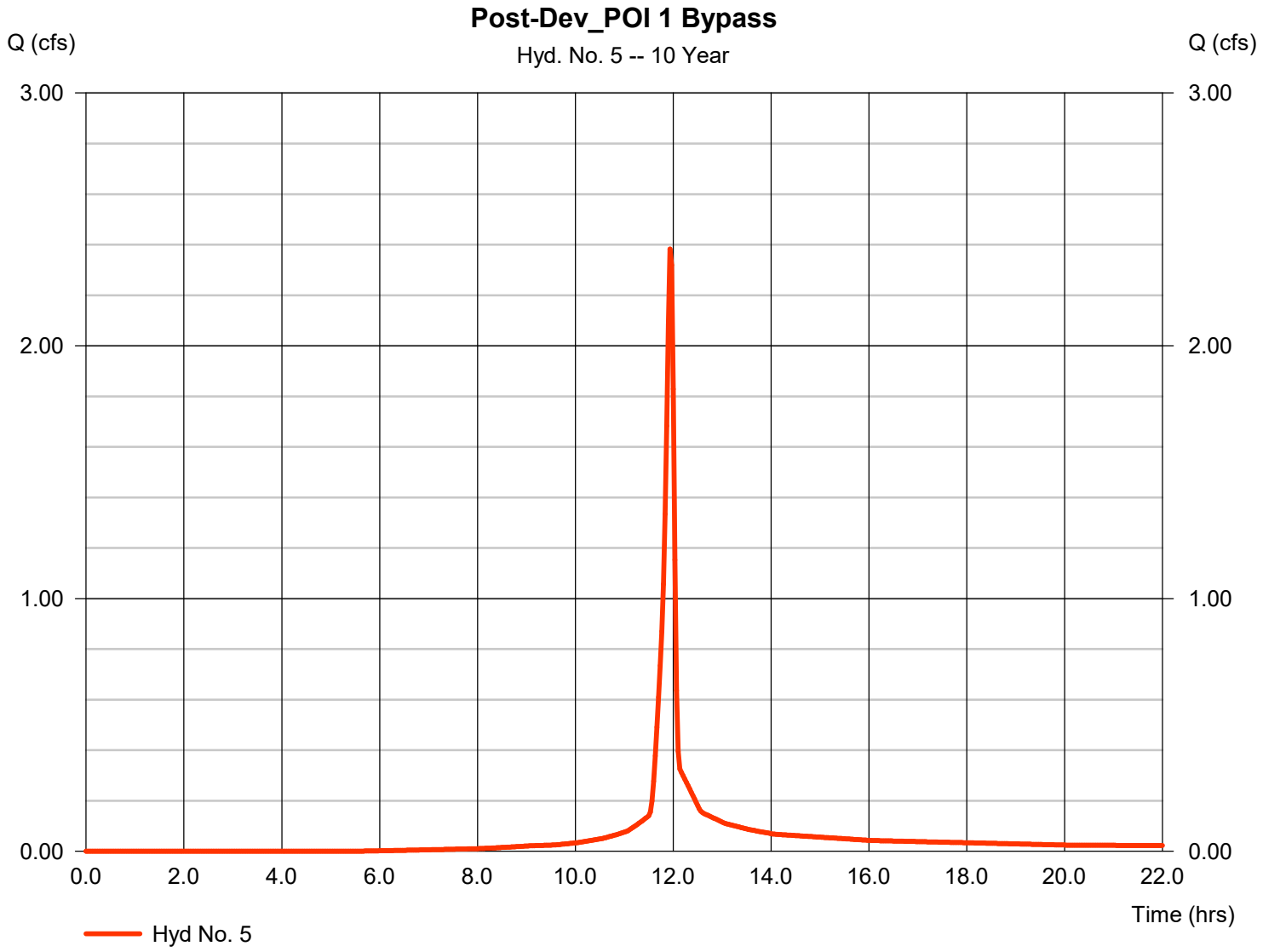


Hydrograph Report

Hyd. No. 5

Post-Dev_POI 1 Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 2.383 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 4,946 cuft
Drainage area	= 0.429 ac	Curve number	= 85.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



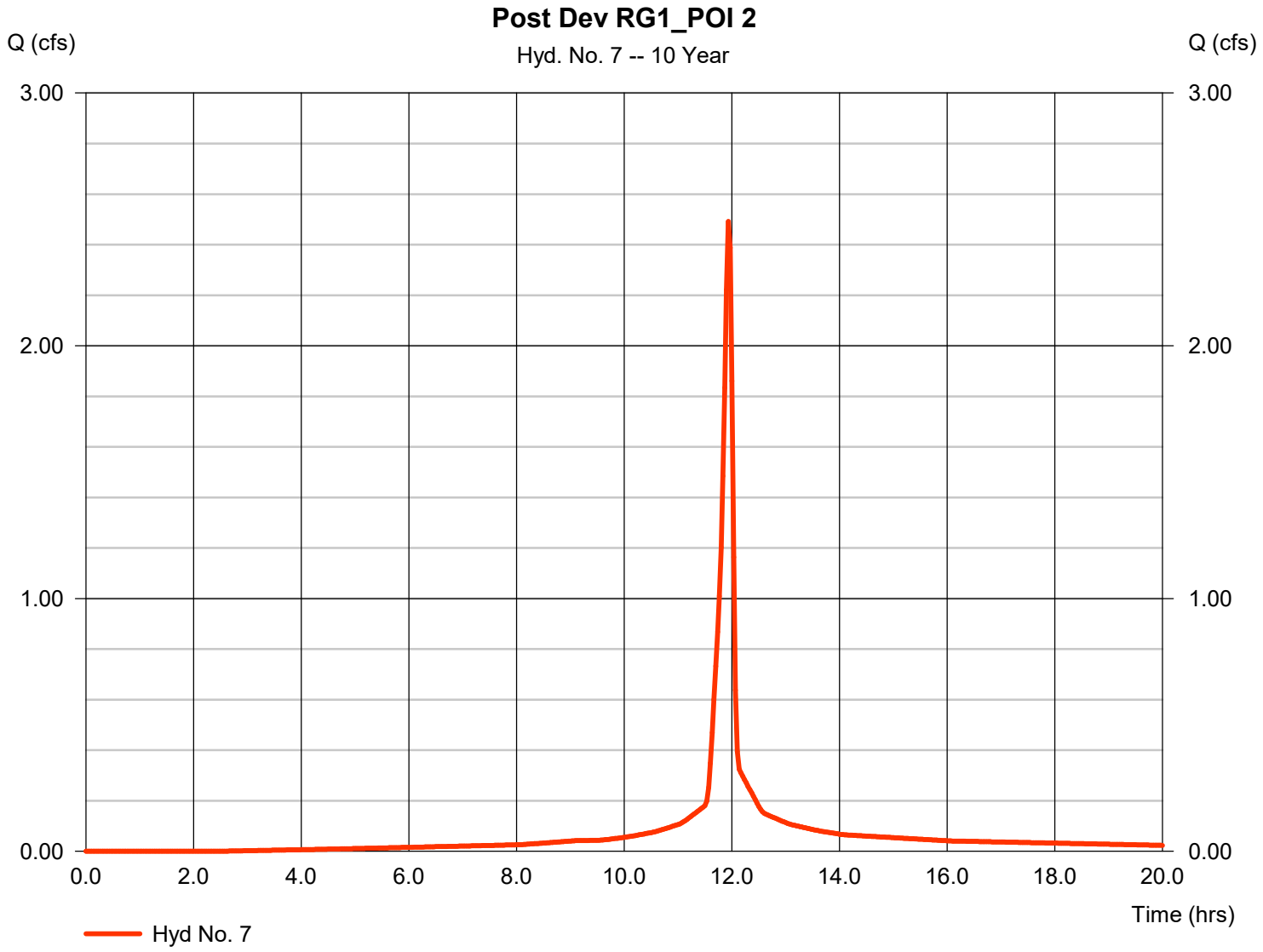
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 7

Post Dev RG1_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.492 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 5,557 cuft
Drainage area	= 0.382 ac	Curve number	= 93.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

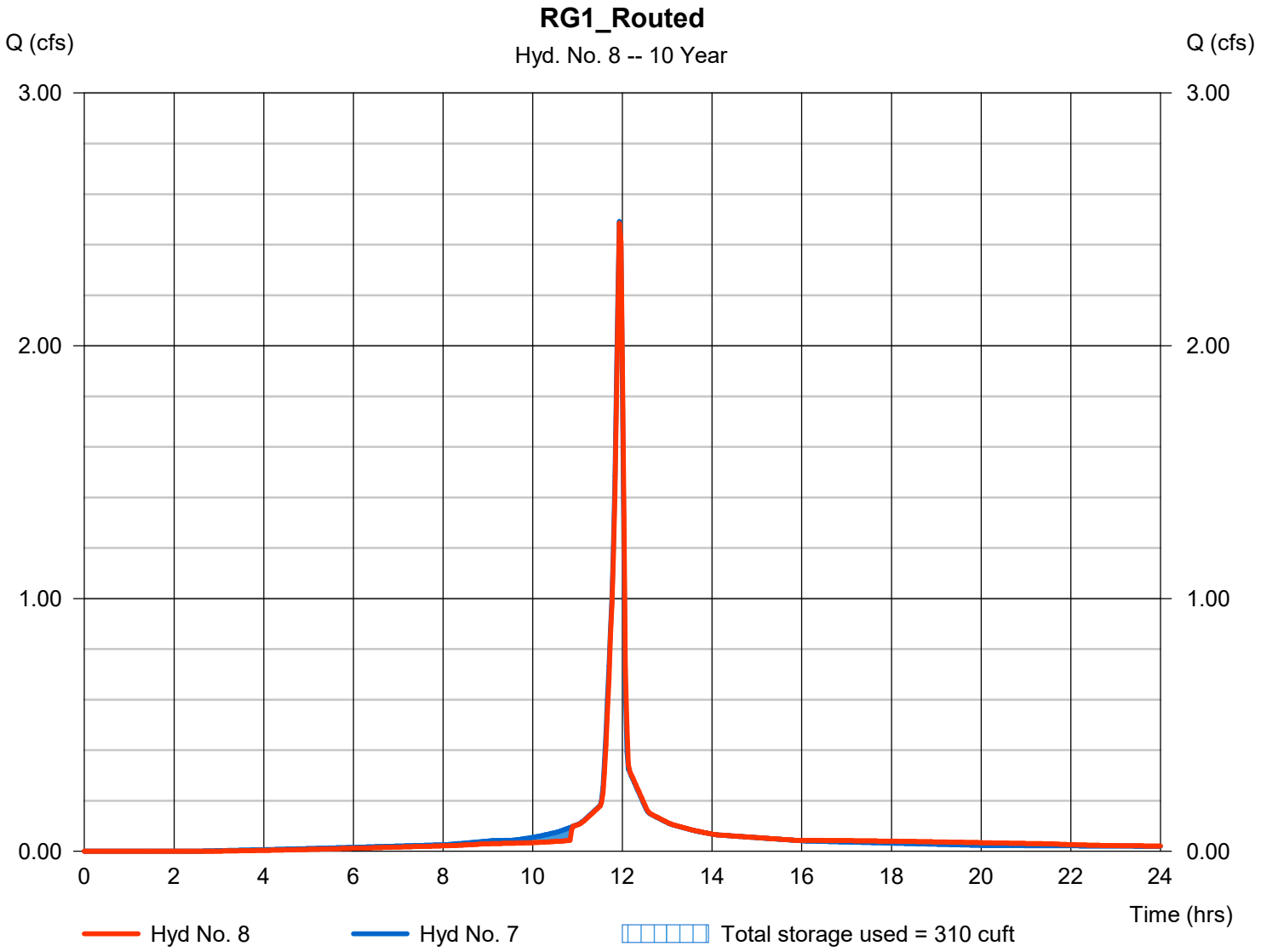
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 8

RG1_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	2.484 cfs
Storm frequency	=	10 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	5,554 cuft
Inflow hyd. No.	=	7 - Post Dev RG1_POI 2	Max. Elevation	=	236.72 ft
Reservoir name	=	RG#1	Max. Storage	=	310 cuft

Storage Indication method used. Outflow includes exfiltration.



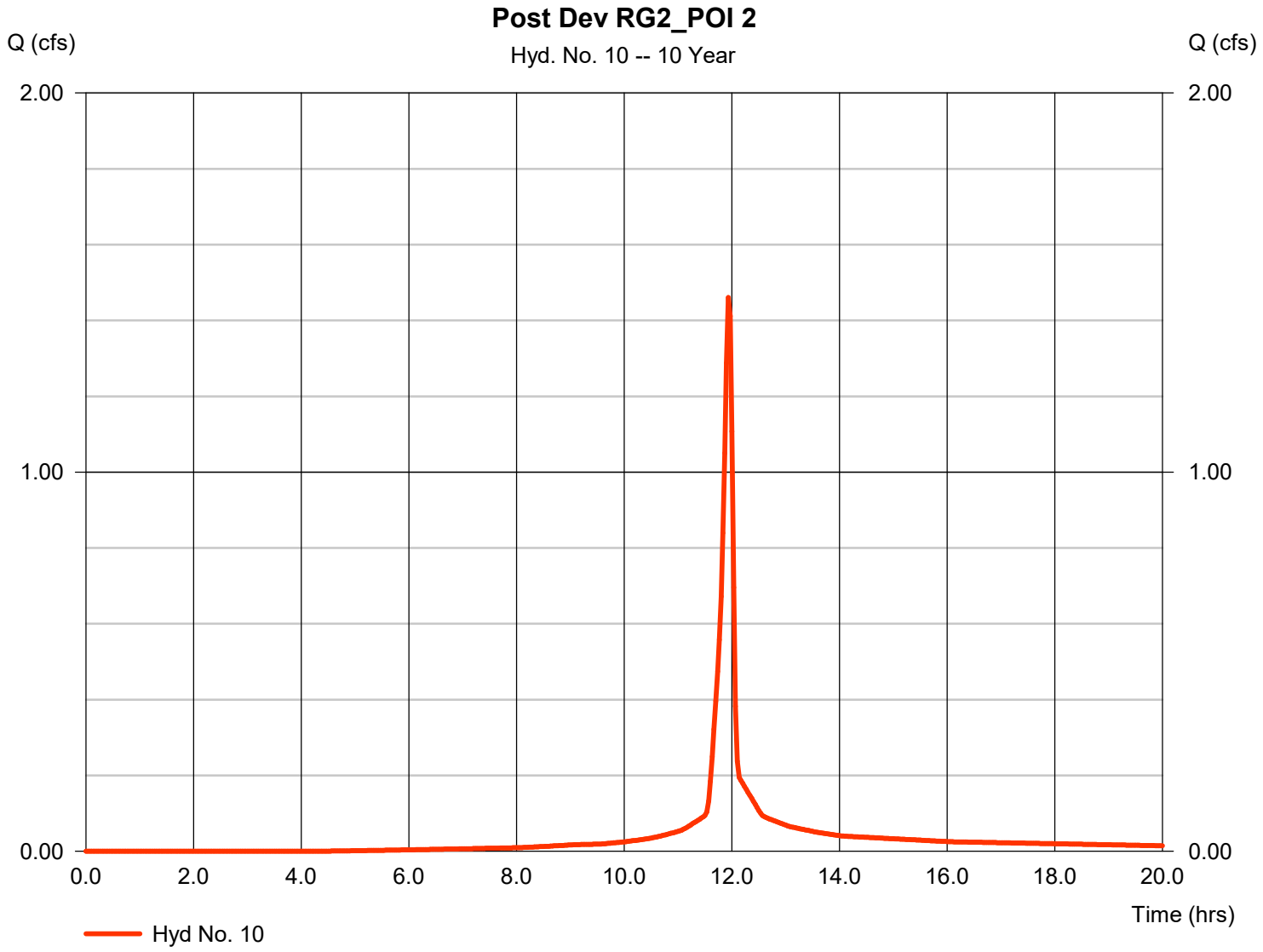
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 10

Post Dev RG2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.460 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 3,098 cuft
Drainage area	= 0.244 ac	Curve number	= 88.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

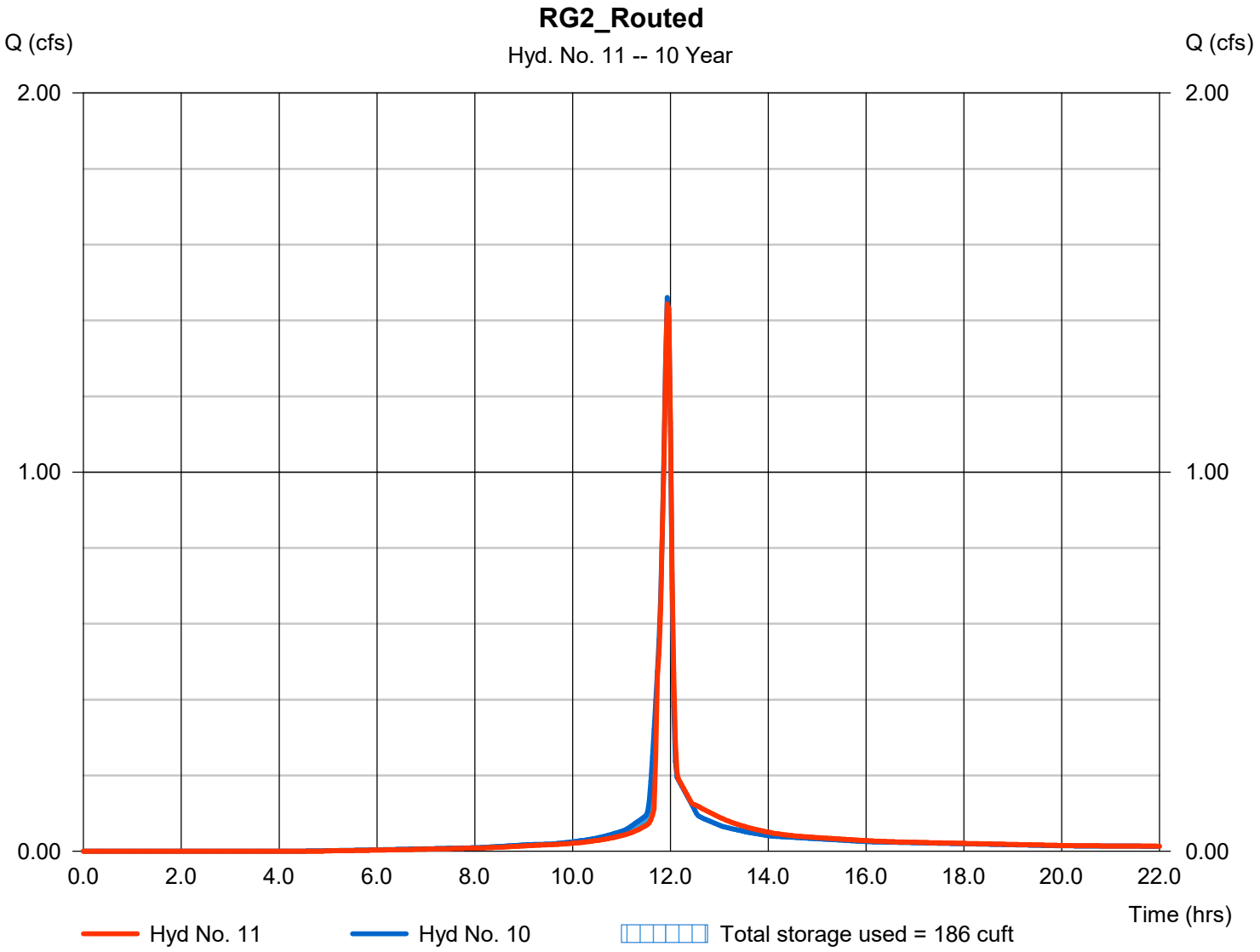
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 11

RG2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 1.444 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 3,096 cuft
Inflow hyd. No.	= 10 - Post Dev RG2_POI 2	Max. Elevation	= 237.83 ft
Reservoir name	= RG#2	Max. Storage	= 186 cuft

Storage Indication method used. Outflow includes exfiltration.



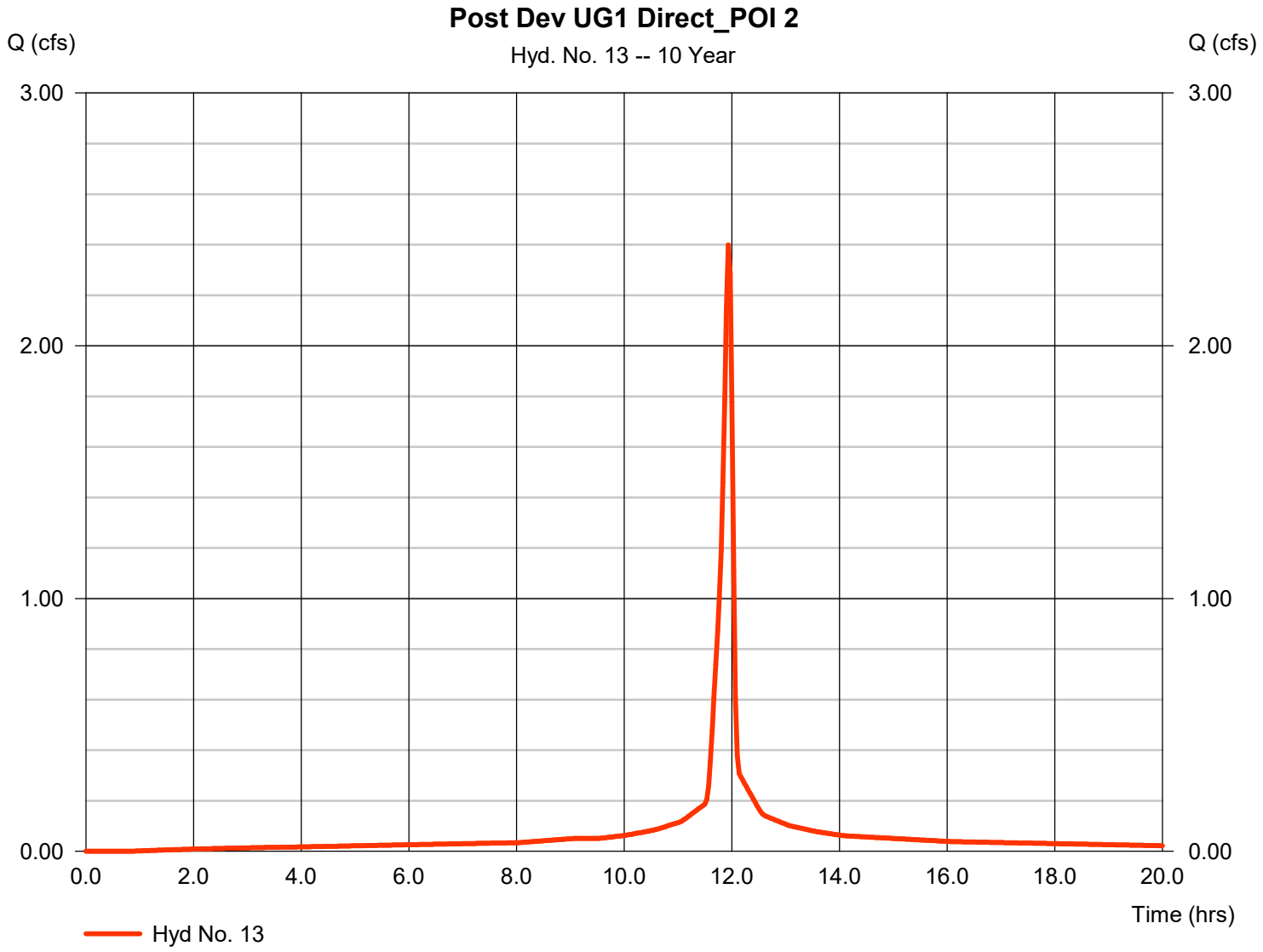
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 13

Post Dev UG1 Direct_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.399 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 5,722 cuft
Drainage area	= 0.353 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

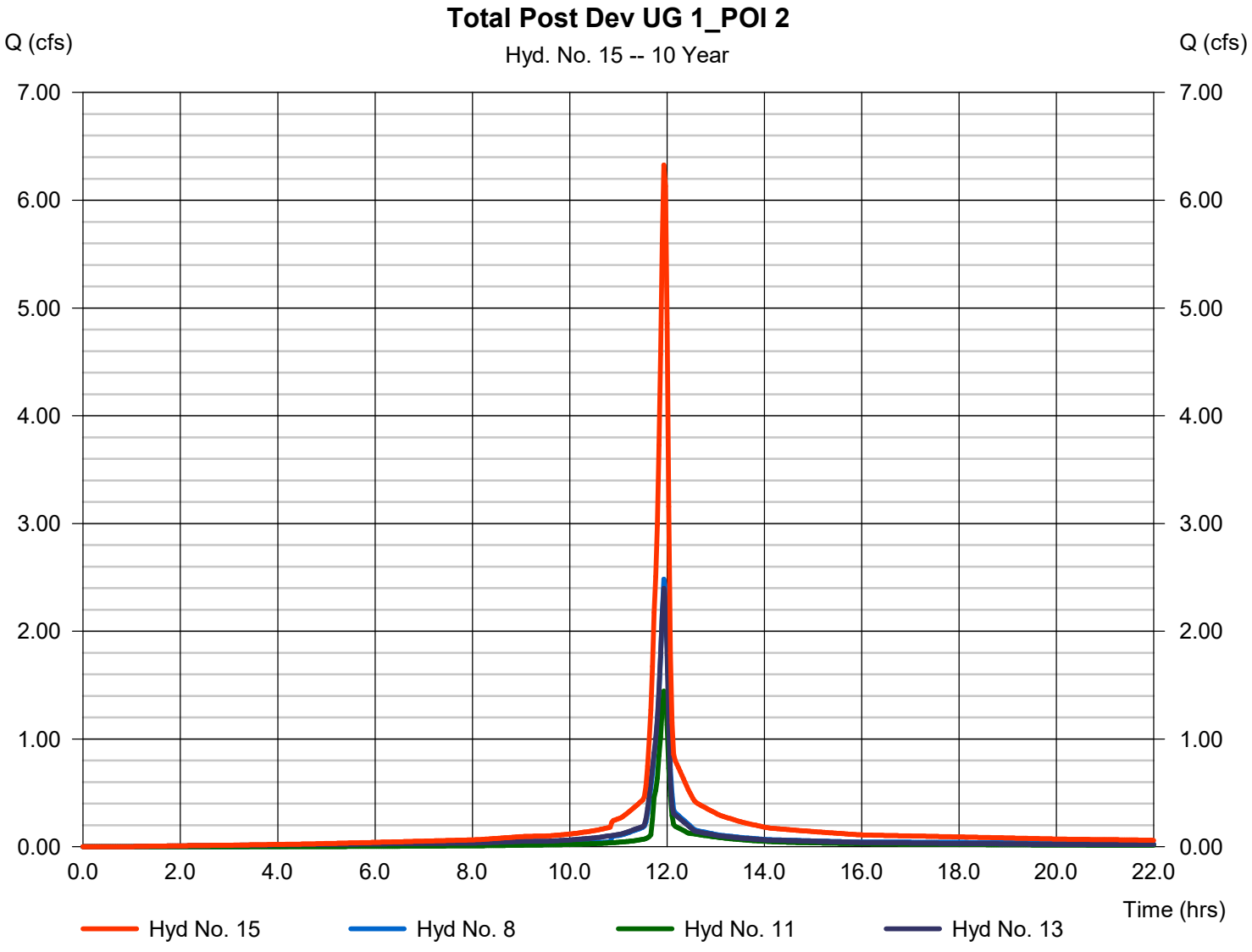


Hydrograph Report

Hyd. No. 15

Total Post Dev UG 1_POI 2

Hydrograph type	= Combine	Peak discharge	= 6.326 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 14,373 cuft
Inflow hyds.	= 8, 11, 13	Contrib. drain. area	= 0.353 ac



Hydrograph Report

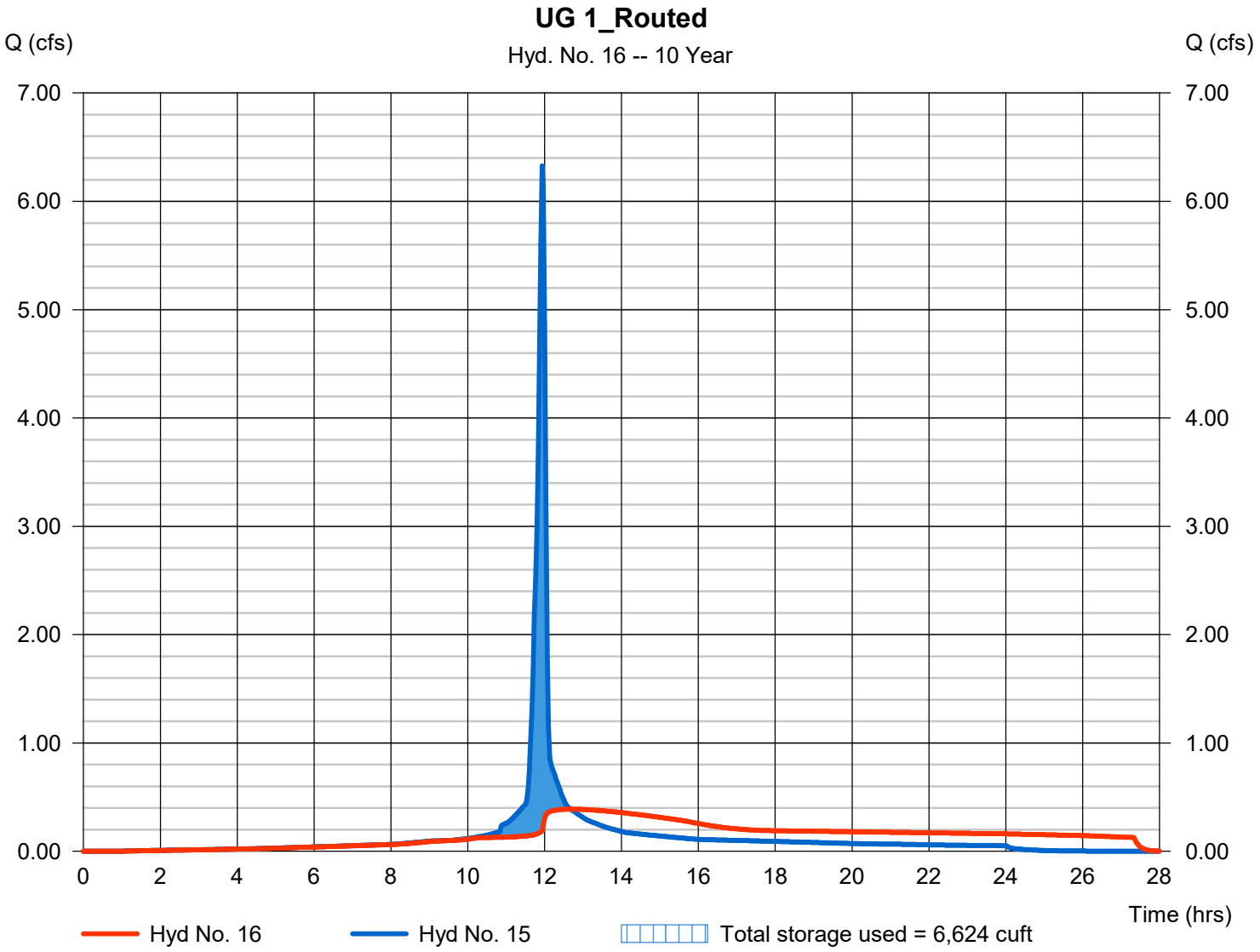
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 16

UG 1_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	0.388 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.67 hrs
Time interval	=	2 min	Hyd. volume	=	14,372 cuft
Inflow hyd. No.	=	15 - Total Post Dev UG 1_POI2	Max. Elevation	=	232.37 ft
Reservoir name	=	UG #1	Max. Storage	=	6,624 cuft

Storage Indication method used. Outflow includes exfiltration.

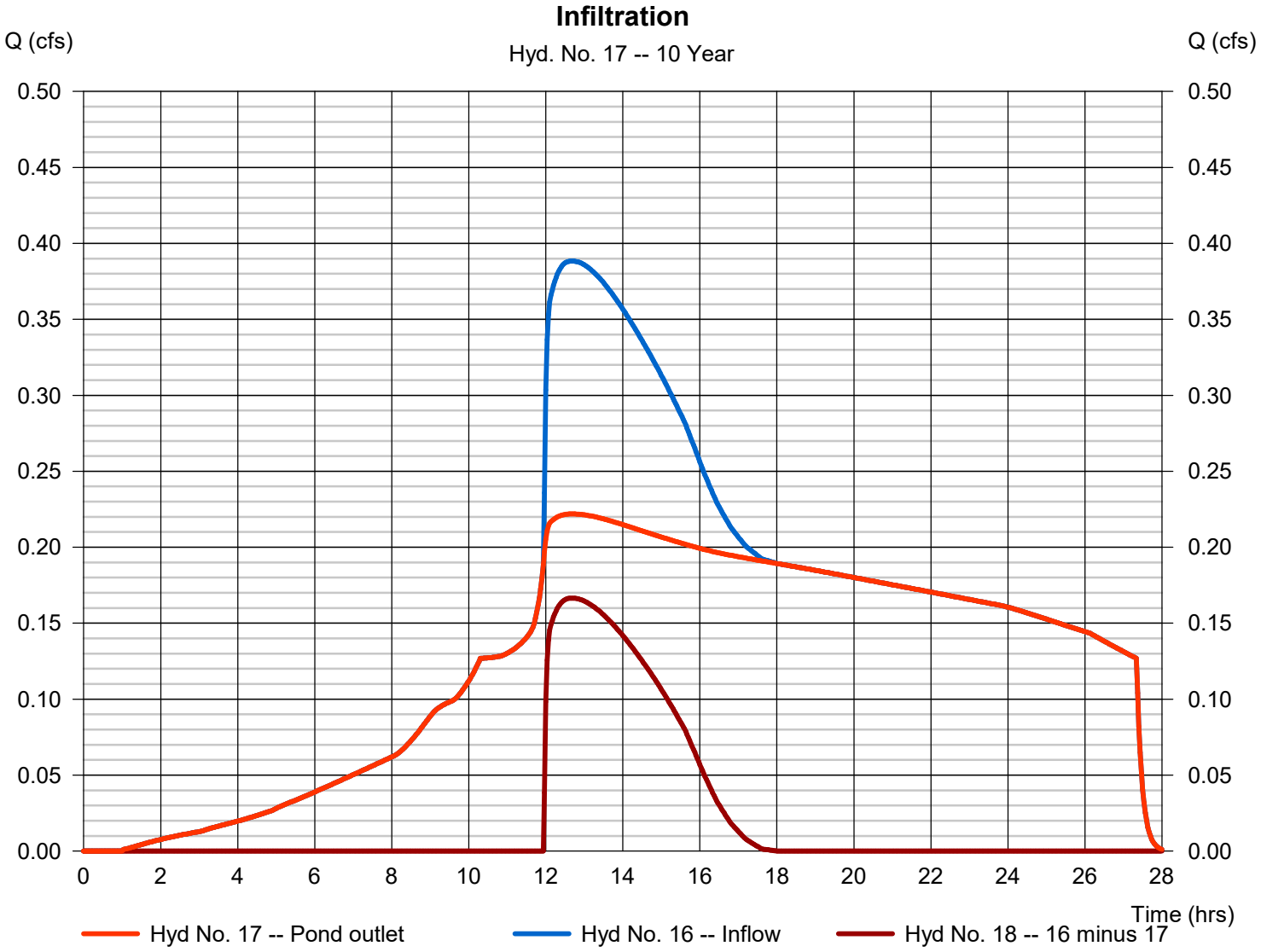


Hydrograph Report

Hyd. No. 17

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.222 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.67 hrs
Time interval	= 2 min	Hyd. volume	= 12,350 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 18
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration

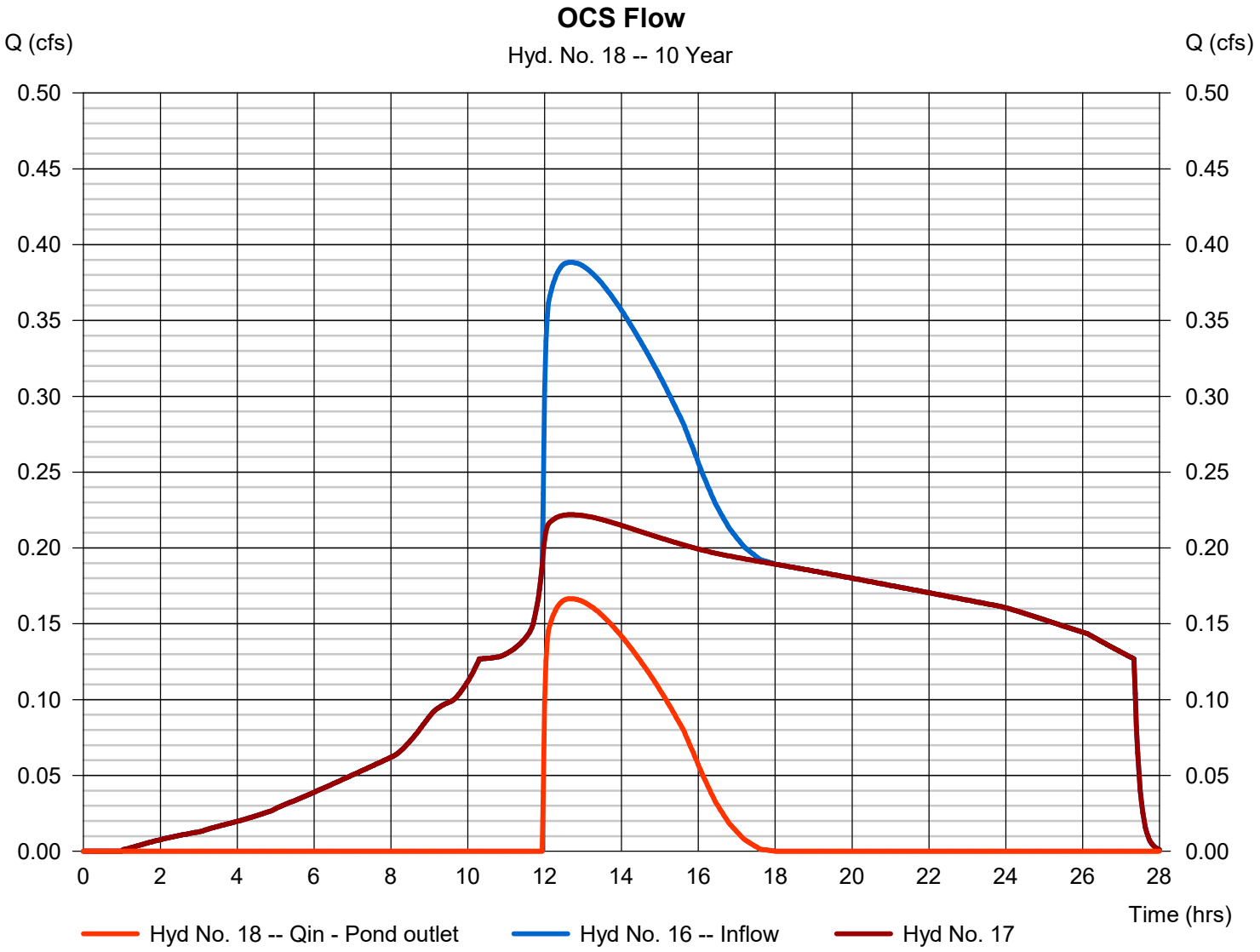


Hydrograph Report

Hyd. No. 18

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.166 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.67 hrs
Time interval	= 2 min	Hyd. volume	= 2,022 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 17
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration



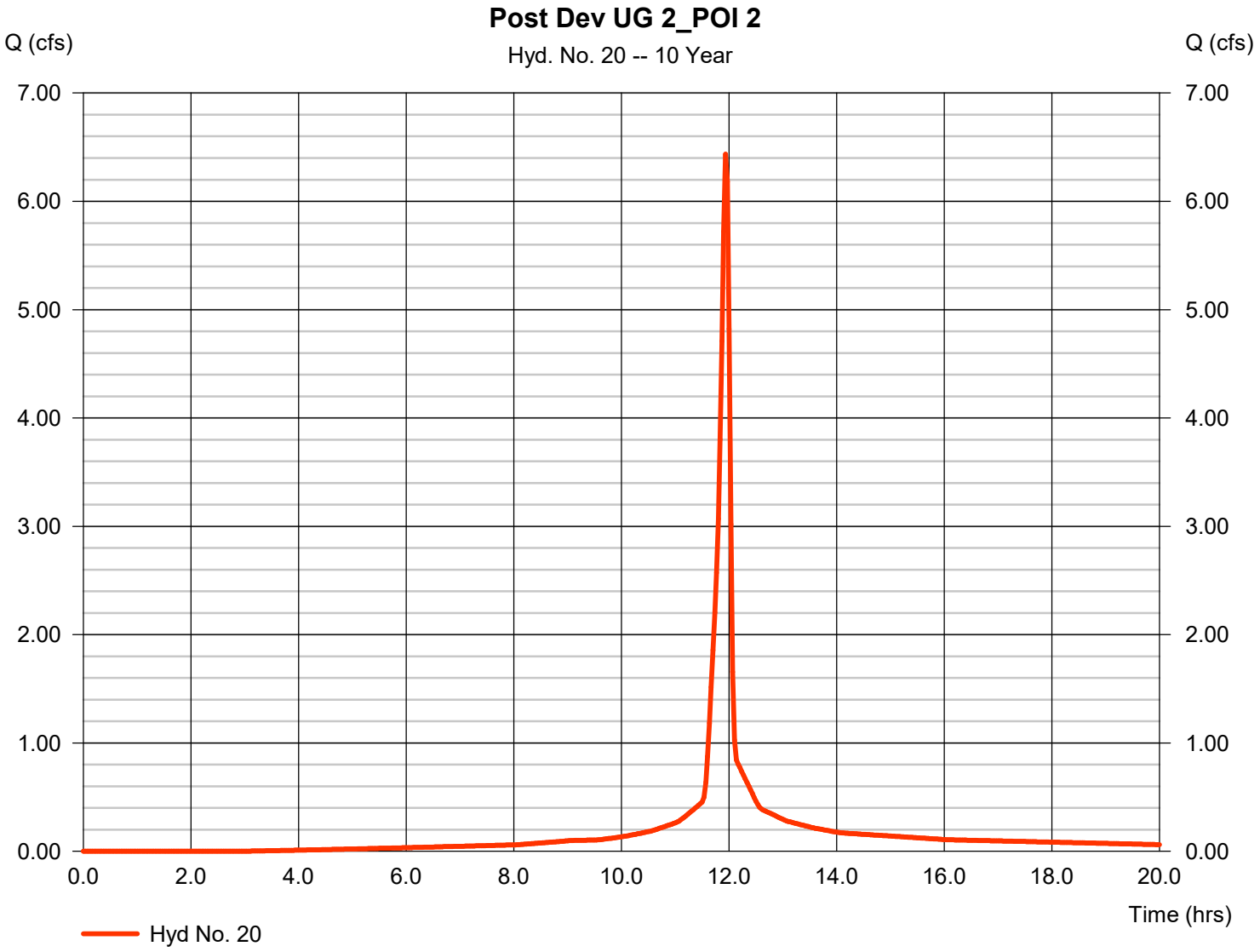
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 20

Post Dev UG 2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 6.435 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 14,134 cuft
Drainage area	= 1.005 ac	Curve number	= 92.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

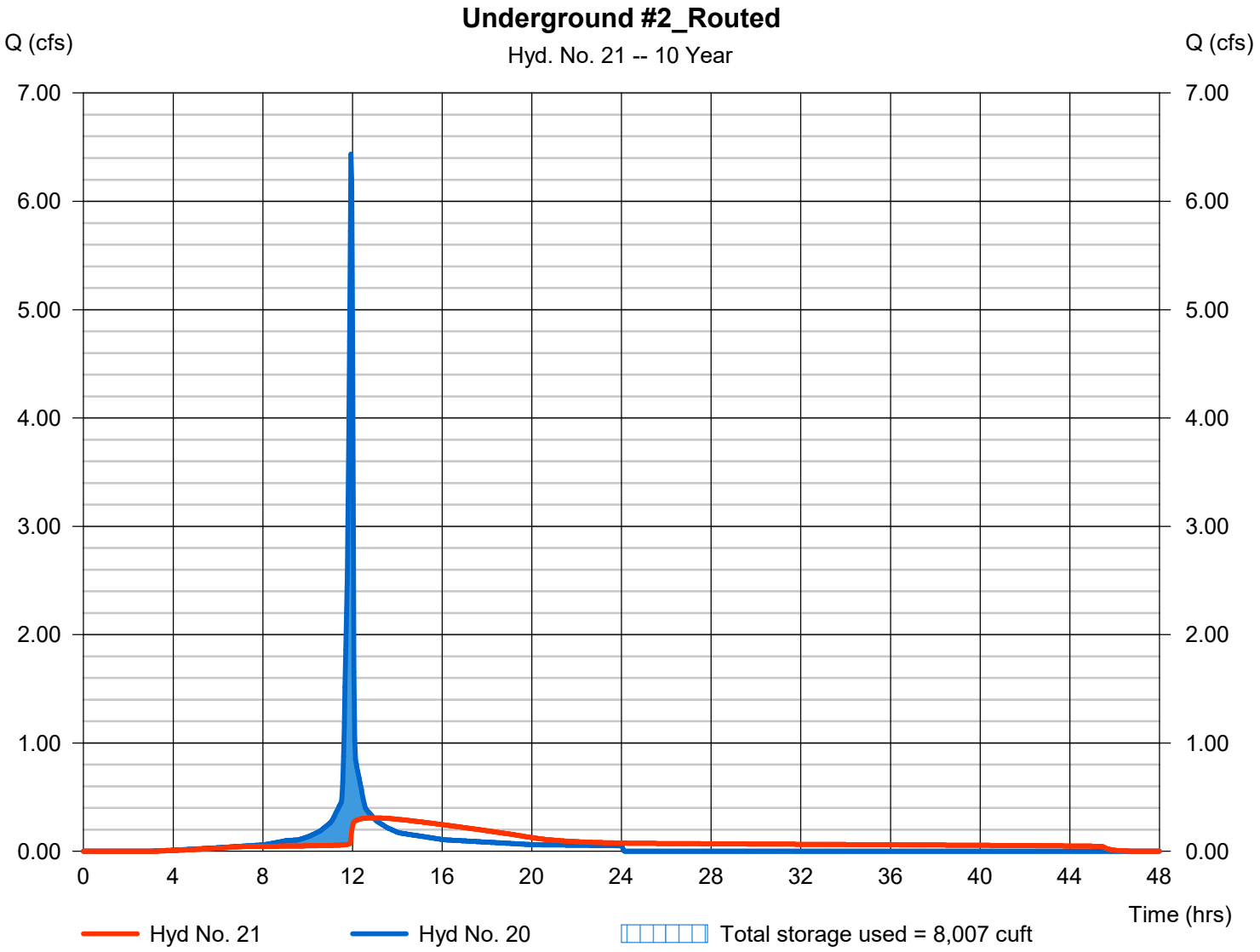
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 21

Underground #2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.308 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.93 hrs
Time interval	= 2 min	Hyd. volume	= 14,133 cuft
Inflow hyd. No.	= 20 - Post Dev UG 2_POI 2	Max. Elevation	= 233.46 ft
Reservoir name	= UG #2	Max. Storage	= 8,007 cuft

Storage Indication method used. Outflow includes exfiltration.

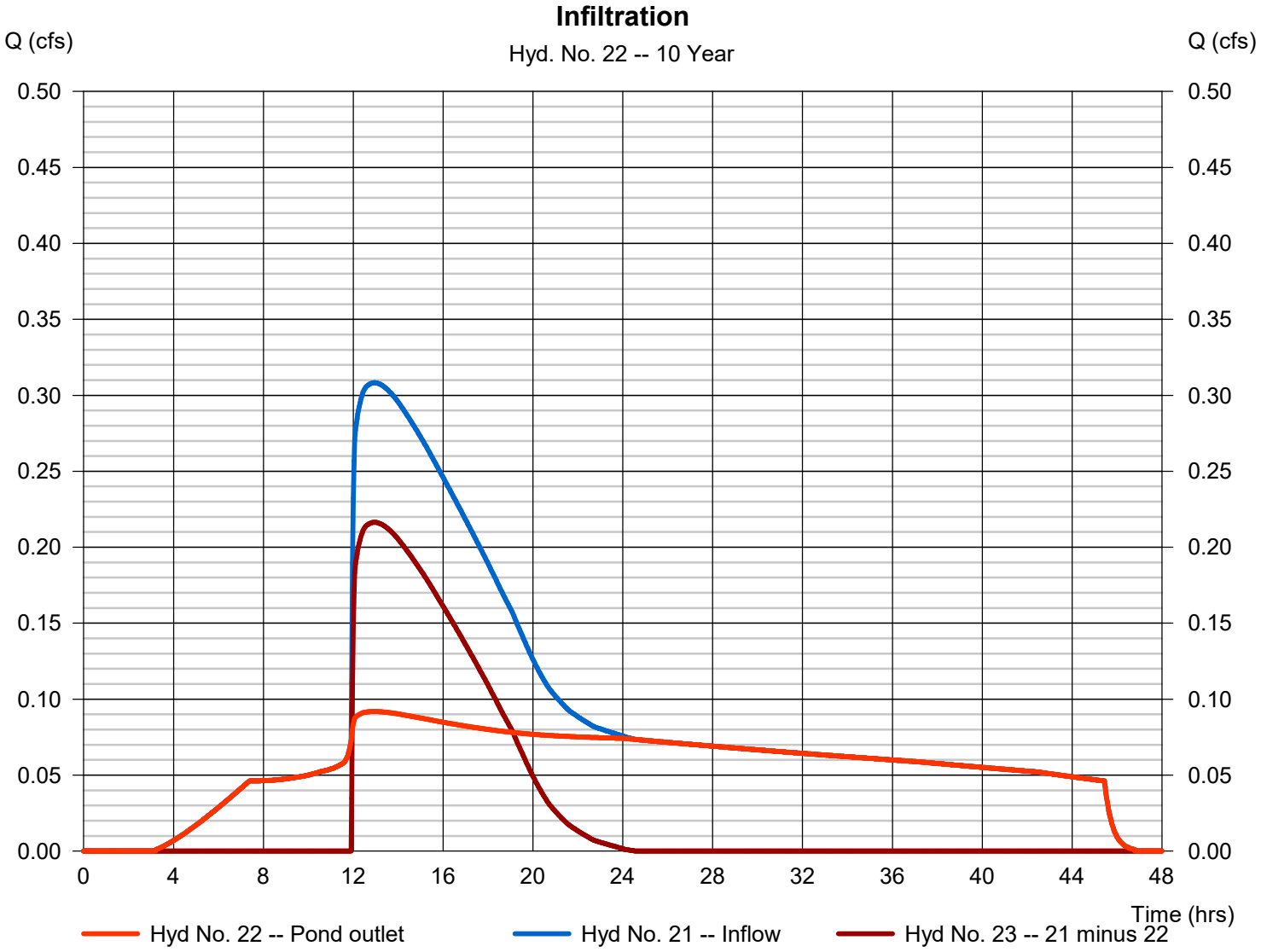


Hydrograph Report

Hyd. No. 22

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.092 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.93 hrs
Time interval	= 2 min	Hyd. volume	= 9,472 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 23
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration

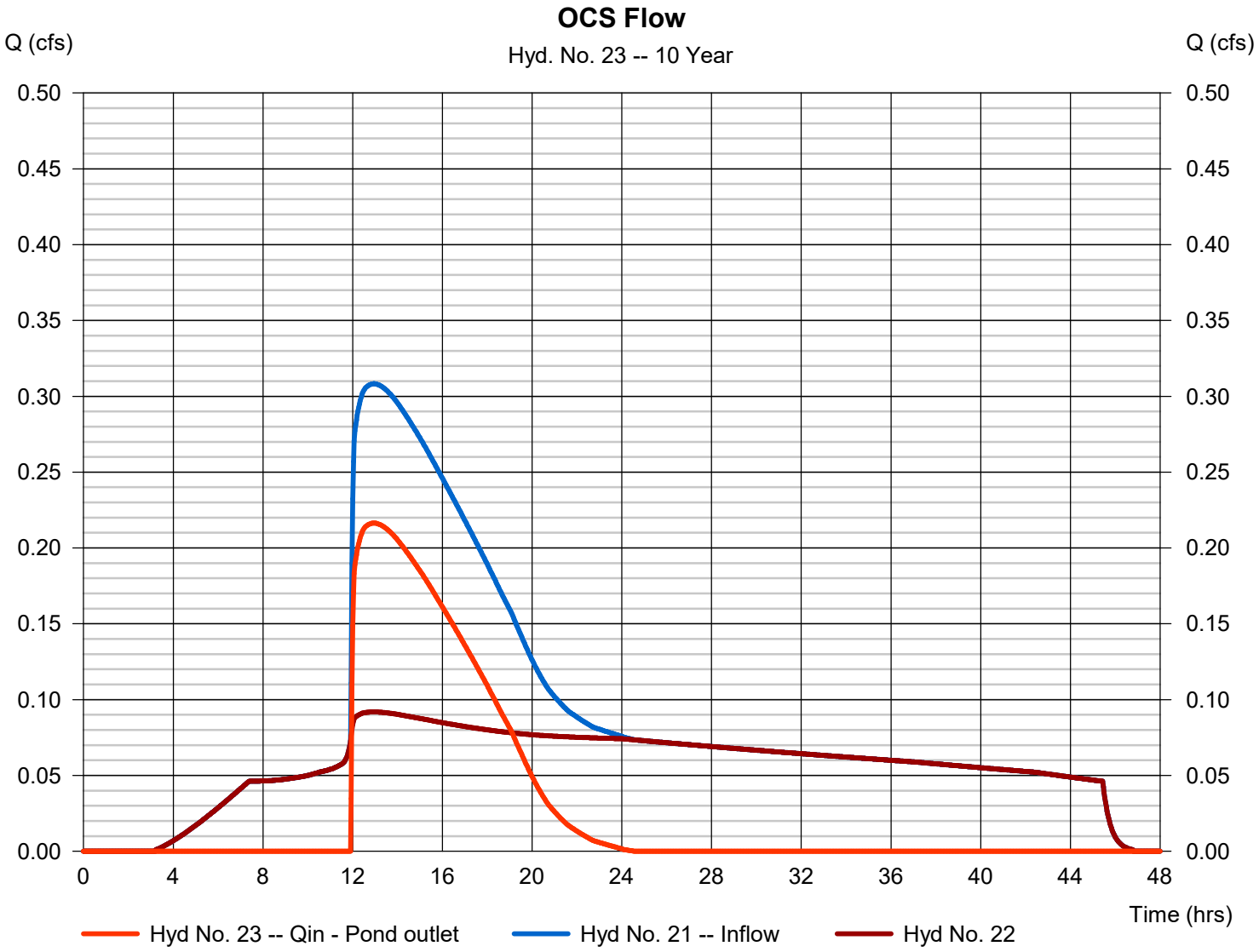


Hydrograph Report

Hyd. No. 23

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.216 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.93 hrs
Time interval	= 2 min	Hyd. volume	= 4,661 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 22
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration

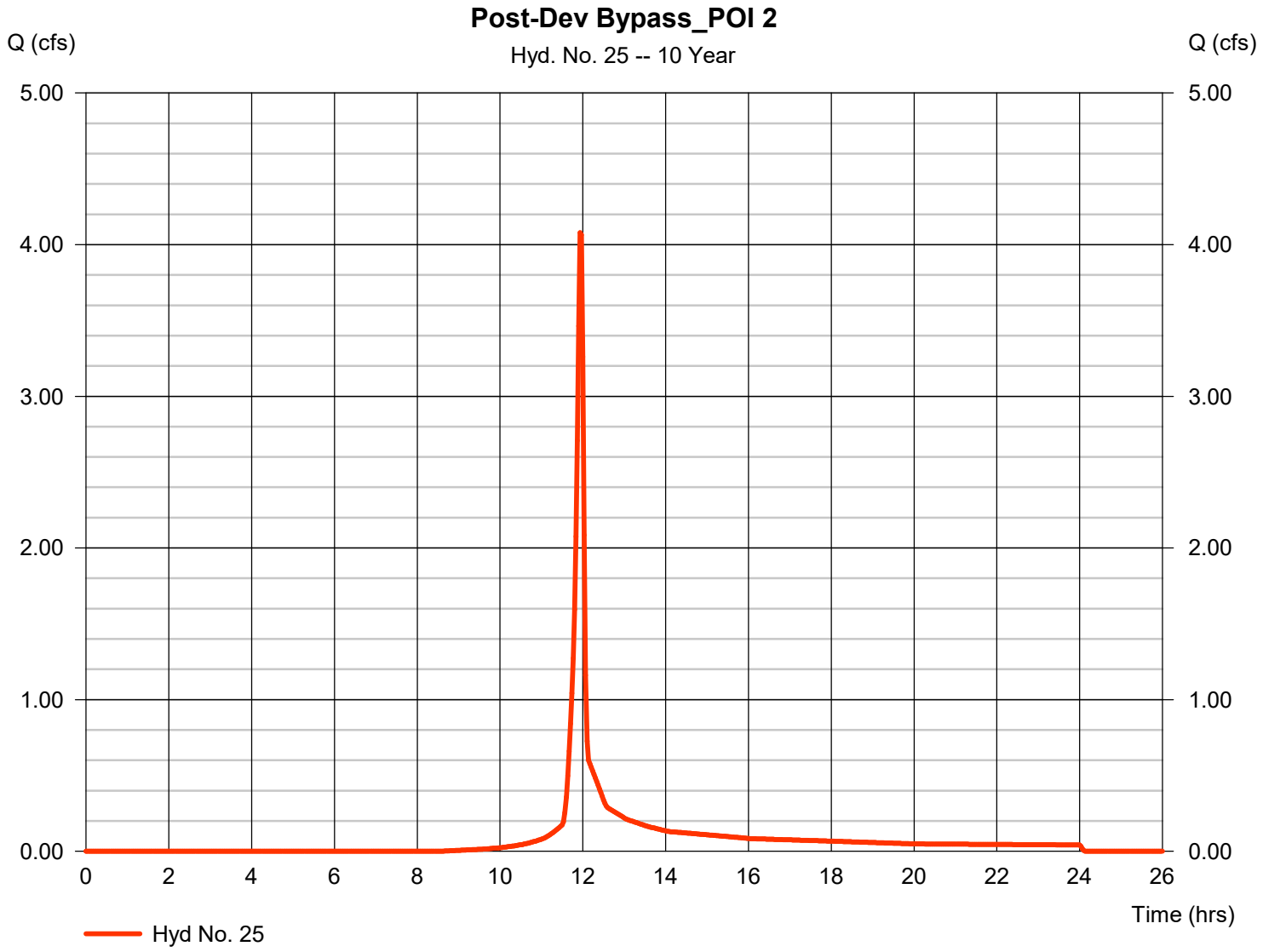


Hydrograph Report

Hyd. No. 25

Post-Dev Bypass_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 4.079 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 8,237 cuft
Drainage area	= 0.978 ac	Curve number	= 75.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

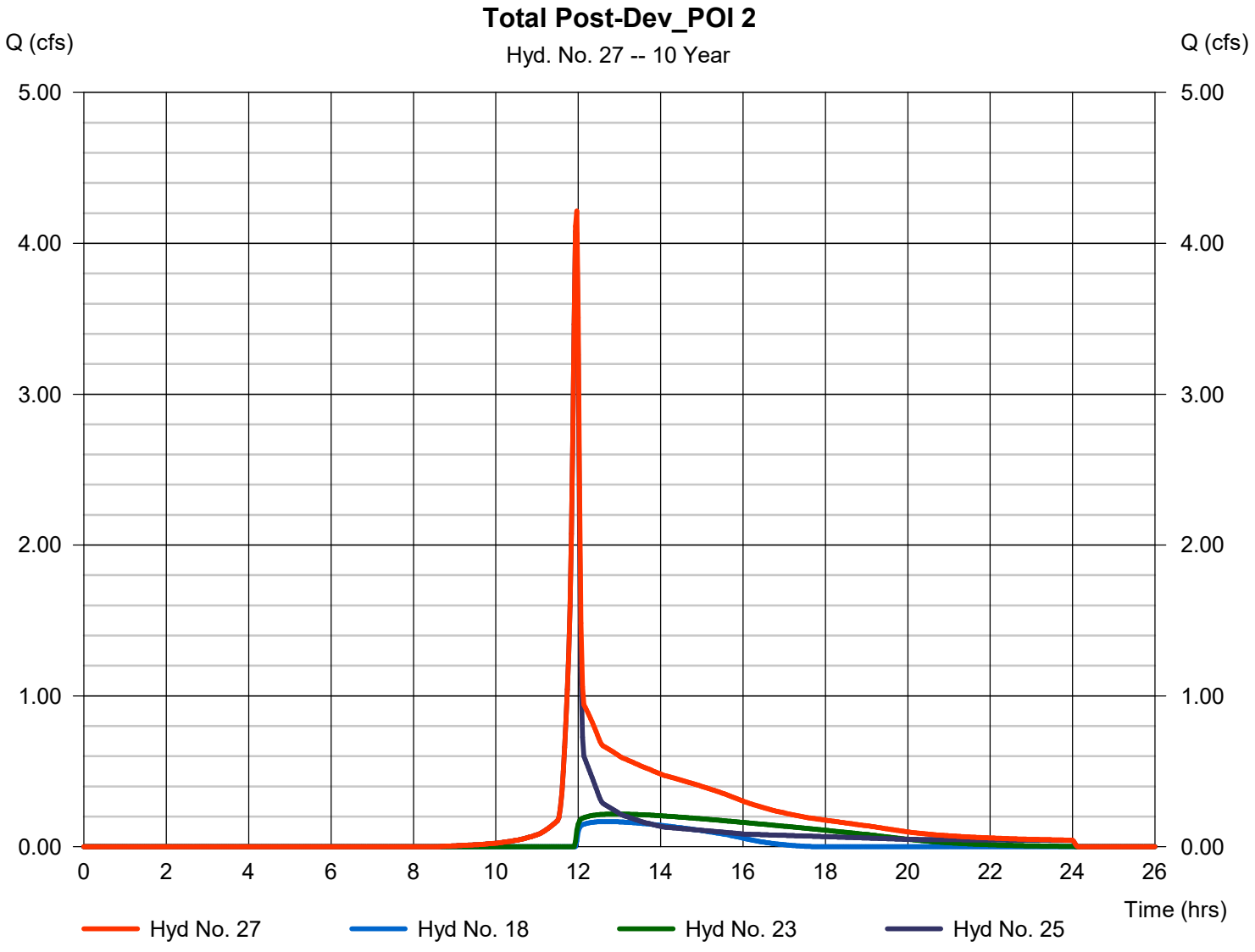


Hydrograph Report

Hyd. No. 27

Total Post-Dev_POI 2

Hydrograph type	= Combine	Peak discharge	= 4.214 cfs
Storm frequency	= 10 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 14,920 cuft
Inflow hyds.	= 18, 23, 25	Contrib. drain. area	= 0.978 ac

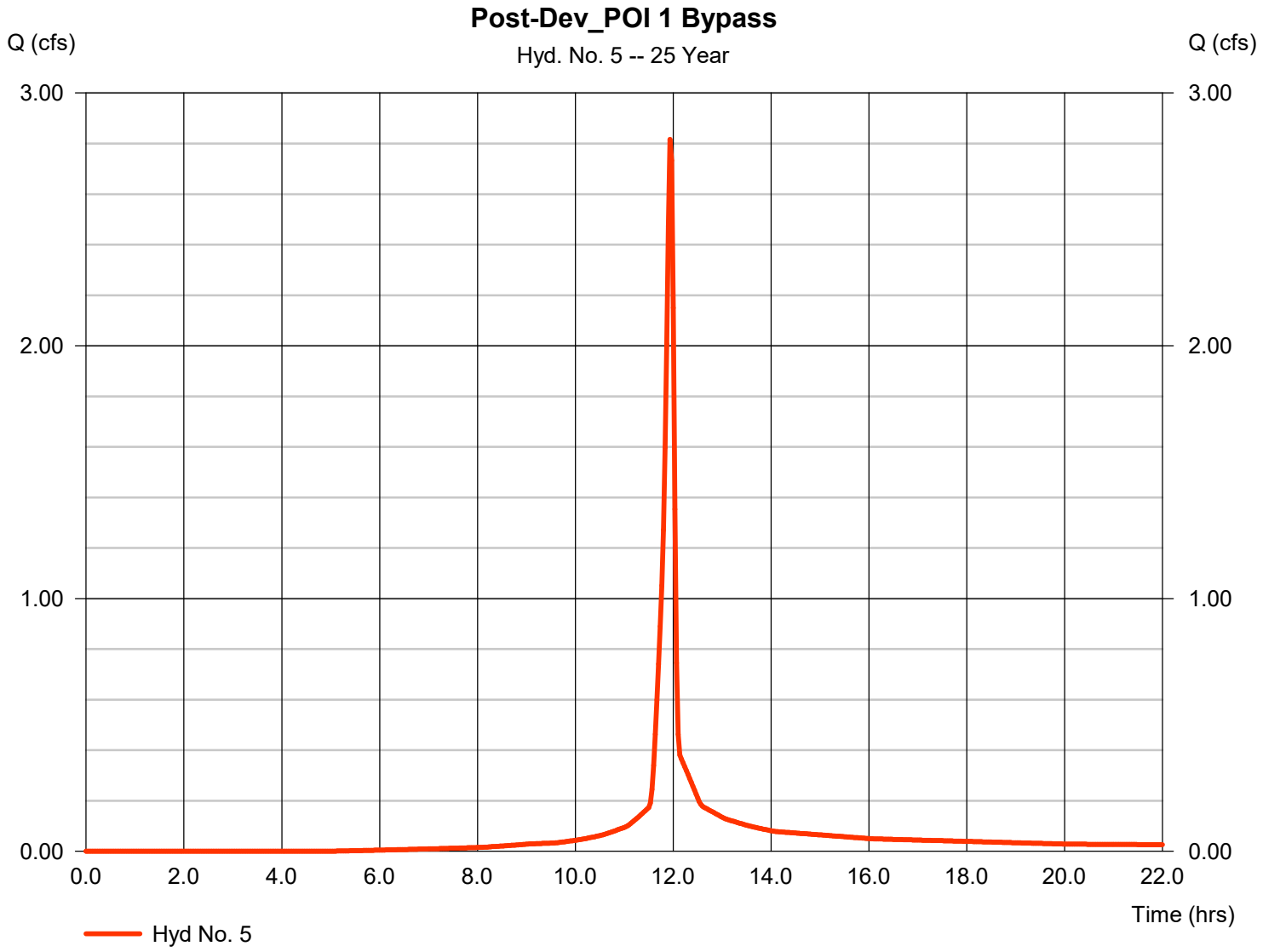


Hydrograph Report

Hyd. No. 5

Post-Dev_POI 1 Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 2.817 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 5,900 cuft
Drainage area	= 0.429 ac	Curve number	= 85.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



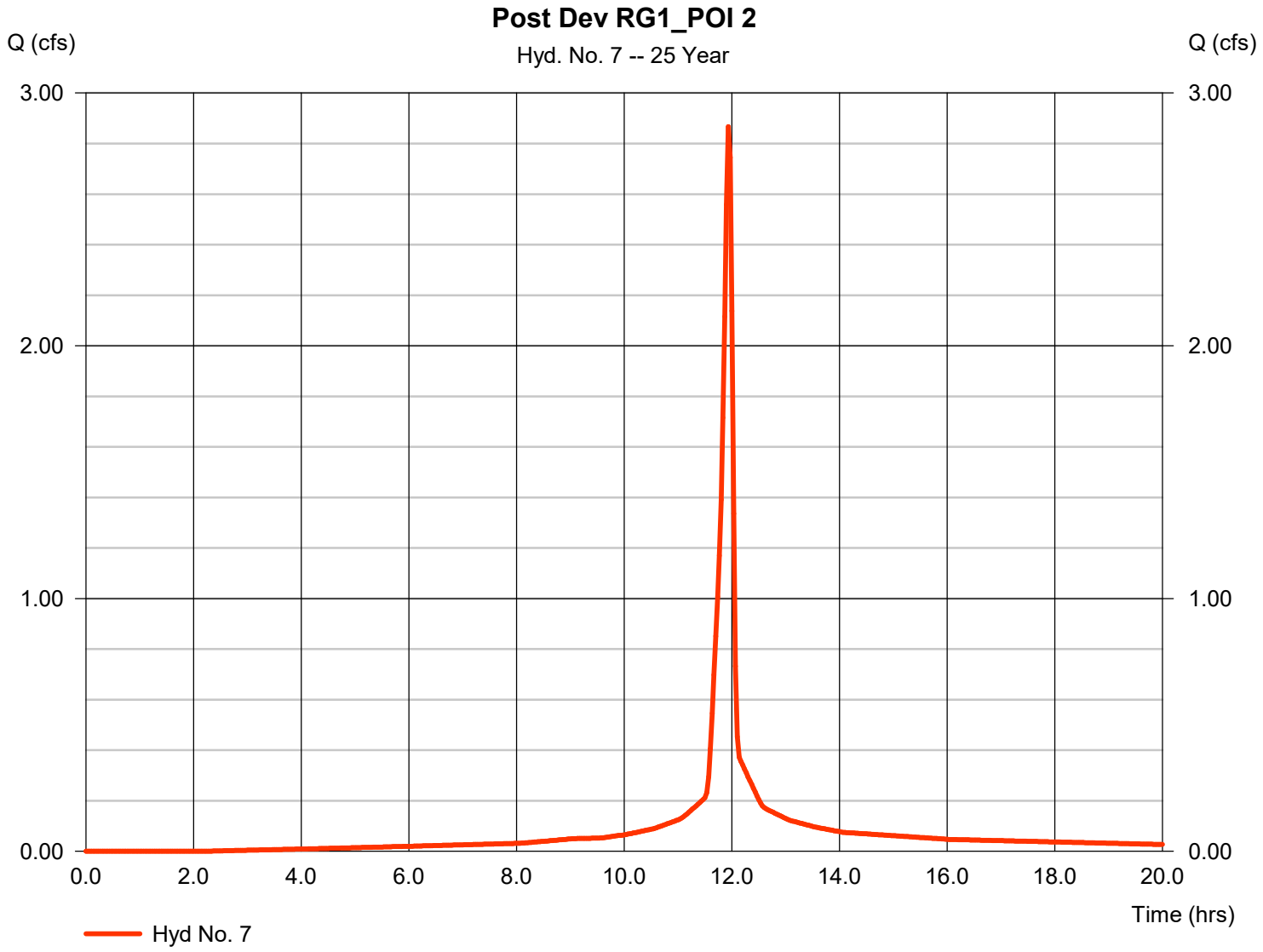
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 7

Post Dev RG1_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.867 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 6,455 cuft
Drainage area	= 0.382 ac	Curve number	= 93.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

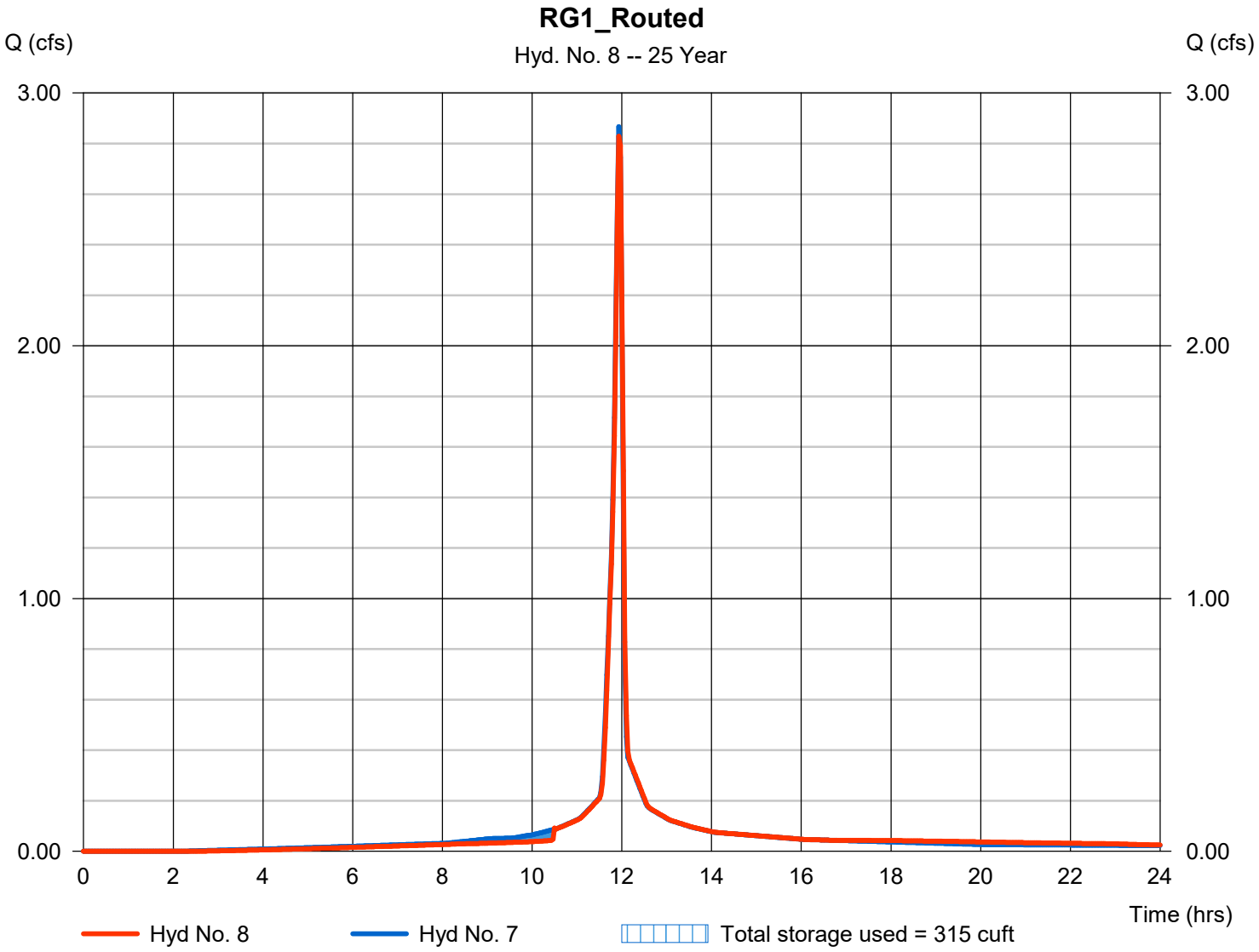
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 8

RG1_Routed

Hydrograph type	= Reservoir	Peak discharge	= 2.829 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 6,452 cuft
Inflow hyd. No.	= 7 - Post Dev RG1_POI 2	Max. Elevation	= 236.74 ft
Reservoir name	= RG#1	Max. Storage	= 315 cuft

Storage Indication method used. Outflow includes exfiltration.



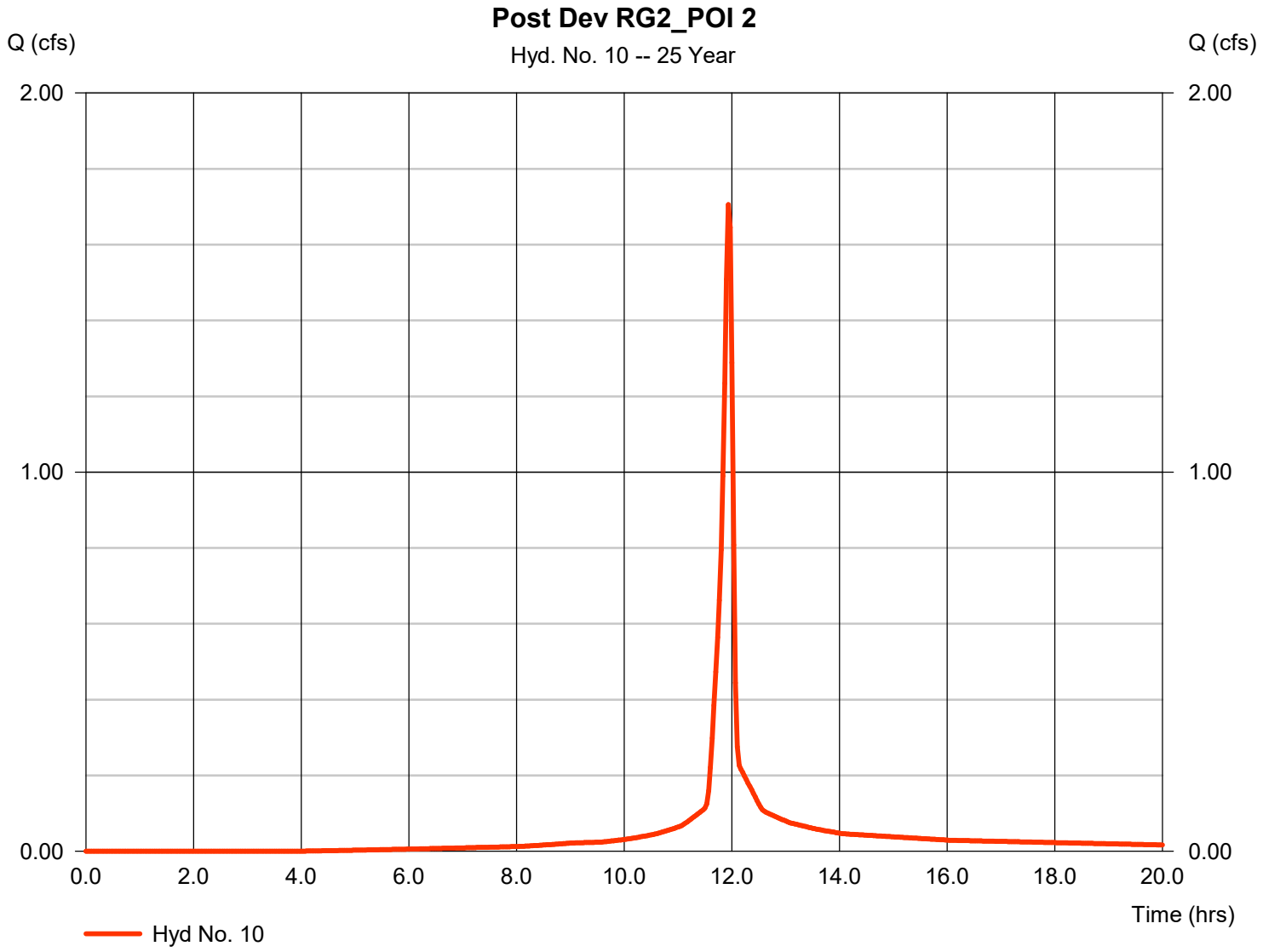
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 10

Post Dev RG2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.706 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 3,655 cuft
Drainage area	= 0.244 ac	Curve number	= 88.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

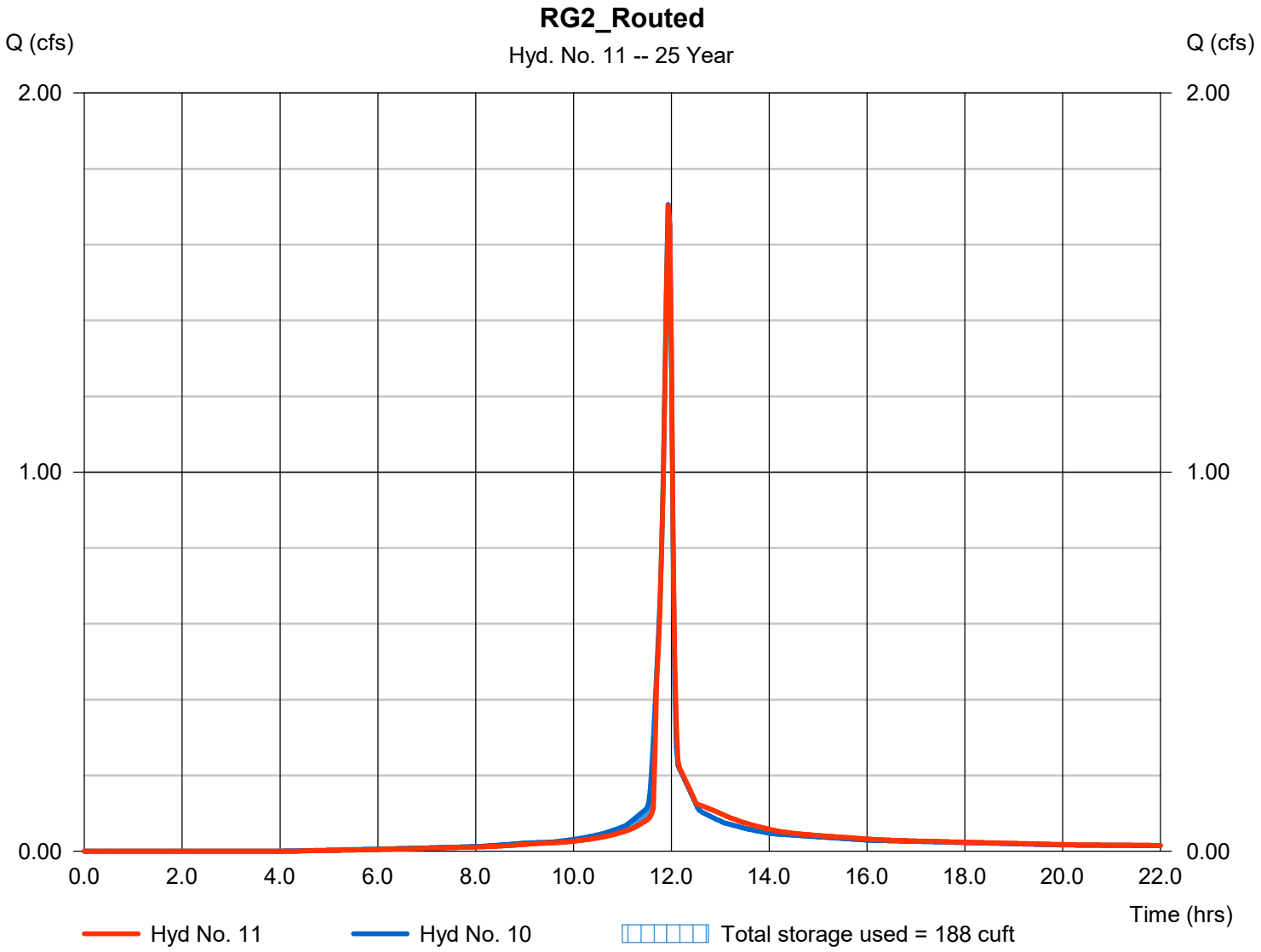
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 11

RG2_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	1.703 cfs
Storm frequency	=	25 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	3,654 cuft
Inflow hyd. No.	=	10 - Post Dev RG2_POI 2	Max. Elevation	=	237.84 ft
Reservoir name	=	RG#2	Max. Storage	=	188 cuft

Storage Indication method used. Outflow includes exfiltration.



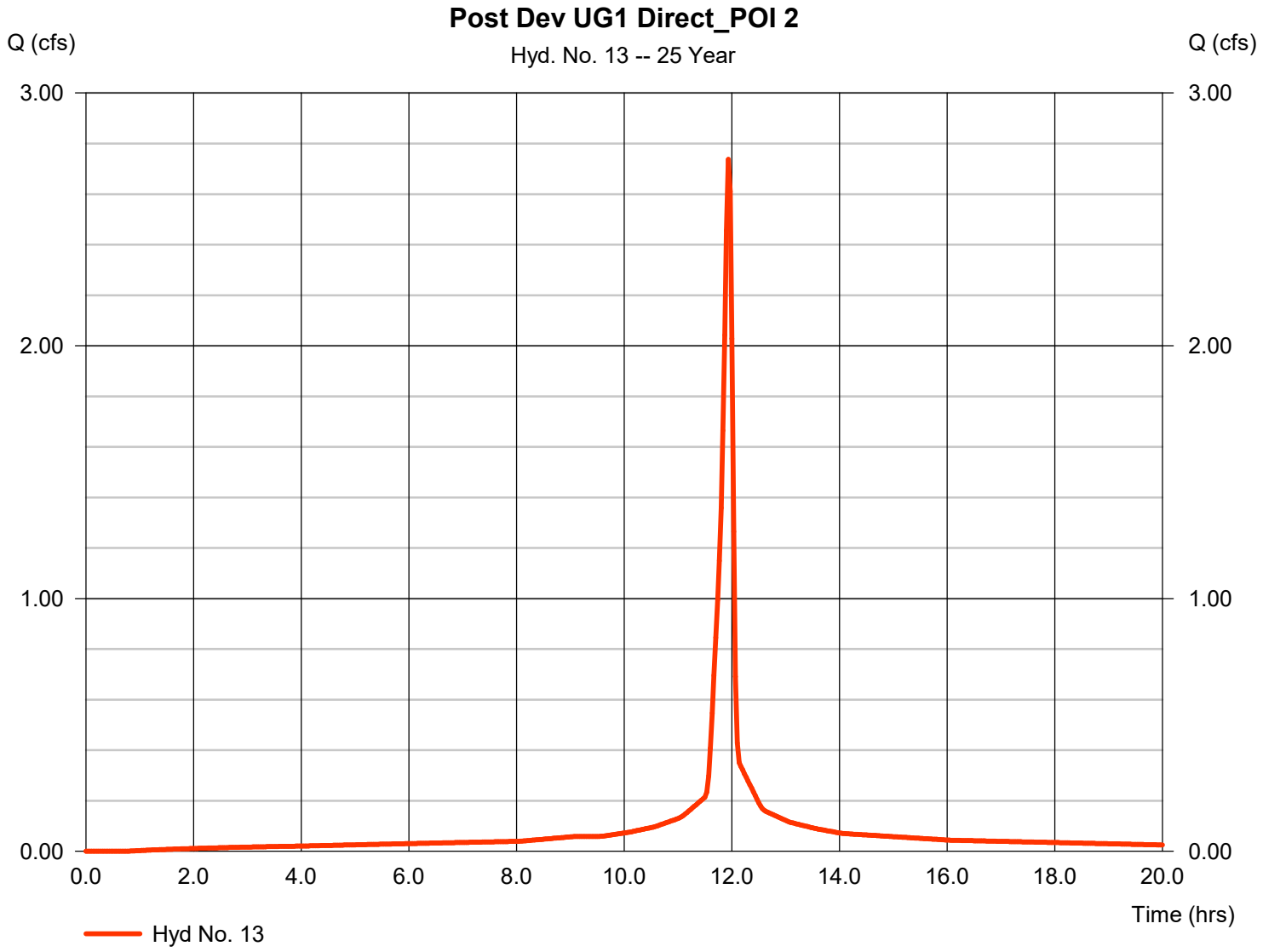
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 13

Post Dev UG1 Direct_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.738 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 6,562 cuft
Drainage area	= 0.353 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

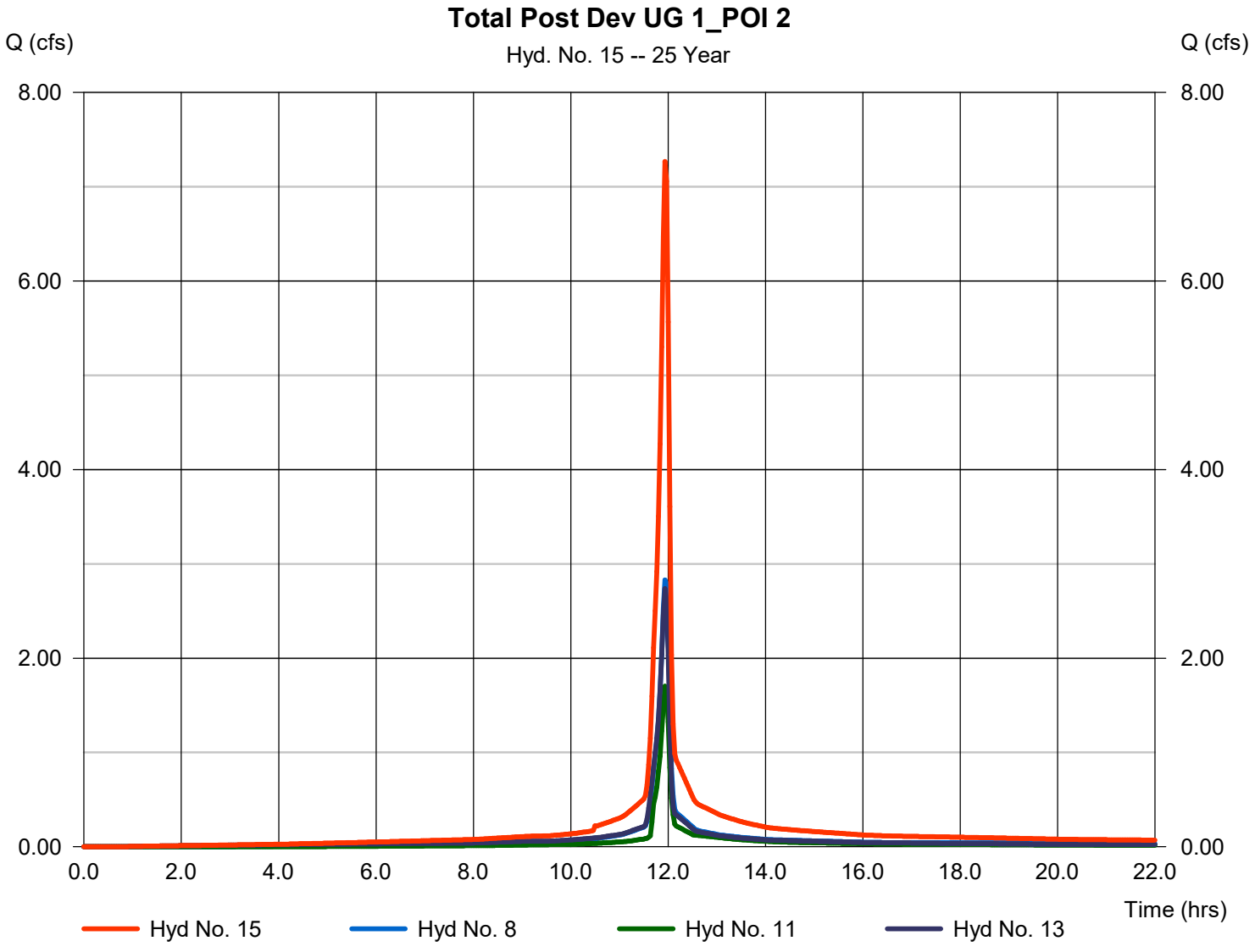


Hydrograph Report

Hyd. No. 15

Total Post Dev UG 1_POI 2

Hydrograph type	= Combine	Peak discharge	= 7.270 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 16,668 cuft
Inflow hyds.	= 8, 11, 13	Contrib. drain. area	= 0.353 ac



Hydrograph Report

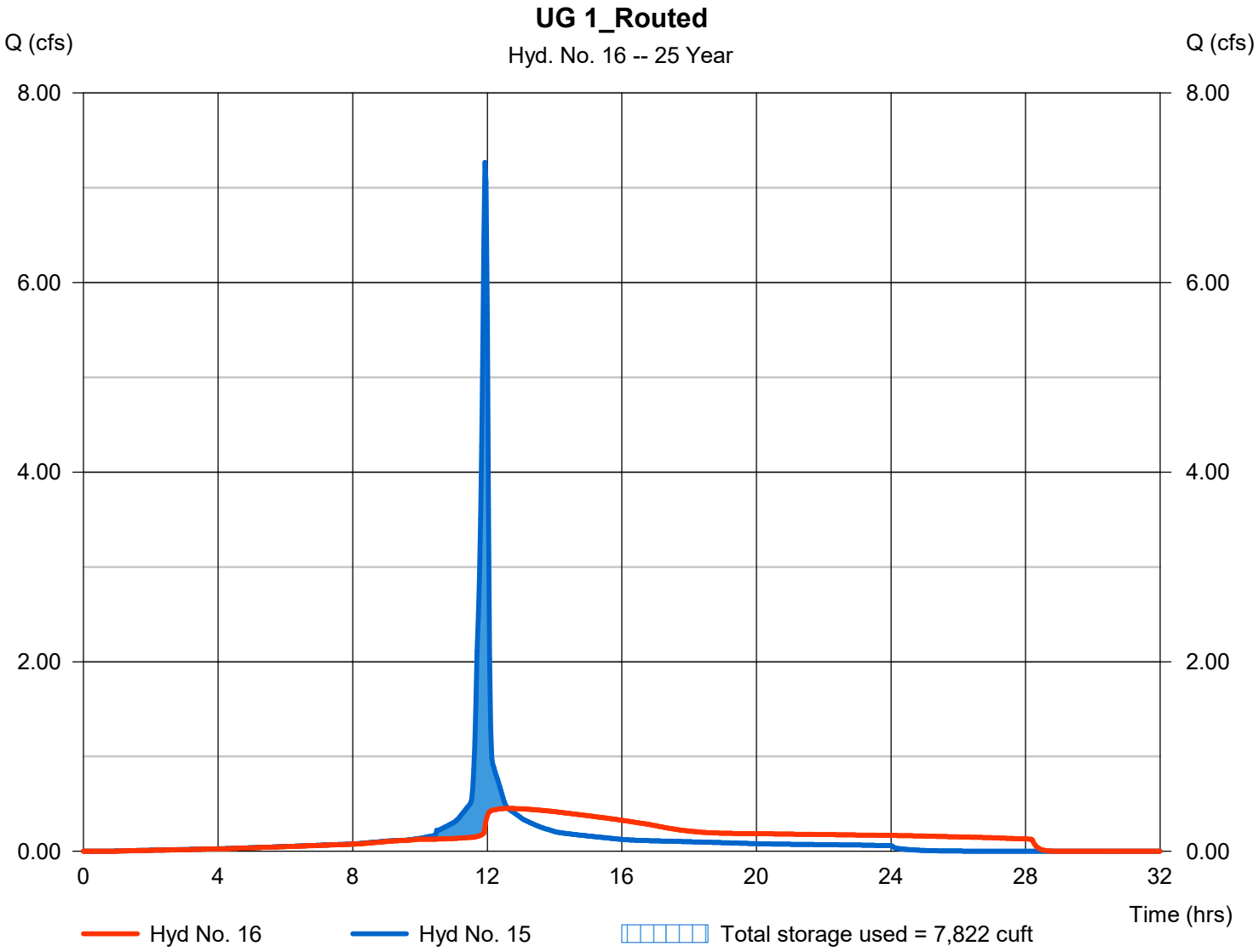
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 16

UG 1_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	0.451 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.63 hrs
Time interval	=	2 min	Hyd. volume	=	16,668 cuft
Inflow hyd. No.	=	15 - Total Post Dev UG 1_POI2	Max. Elevation	=	232.69 ft
Reservoir name	=	UG #1	Max. Storage	=	7,822 cuft

Storage Indication method used. Outflow includes exfiltration.

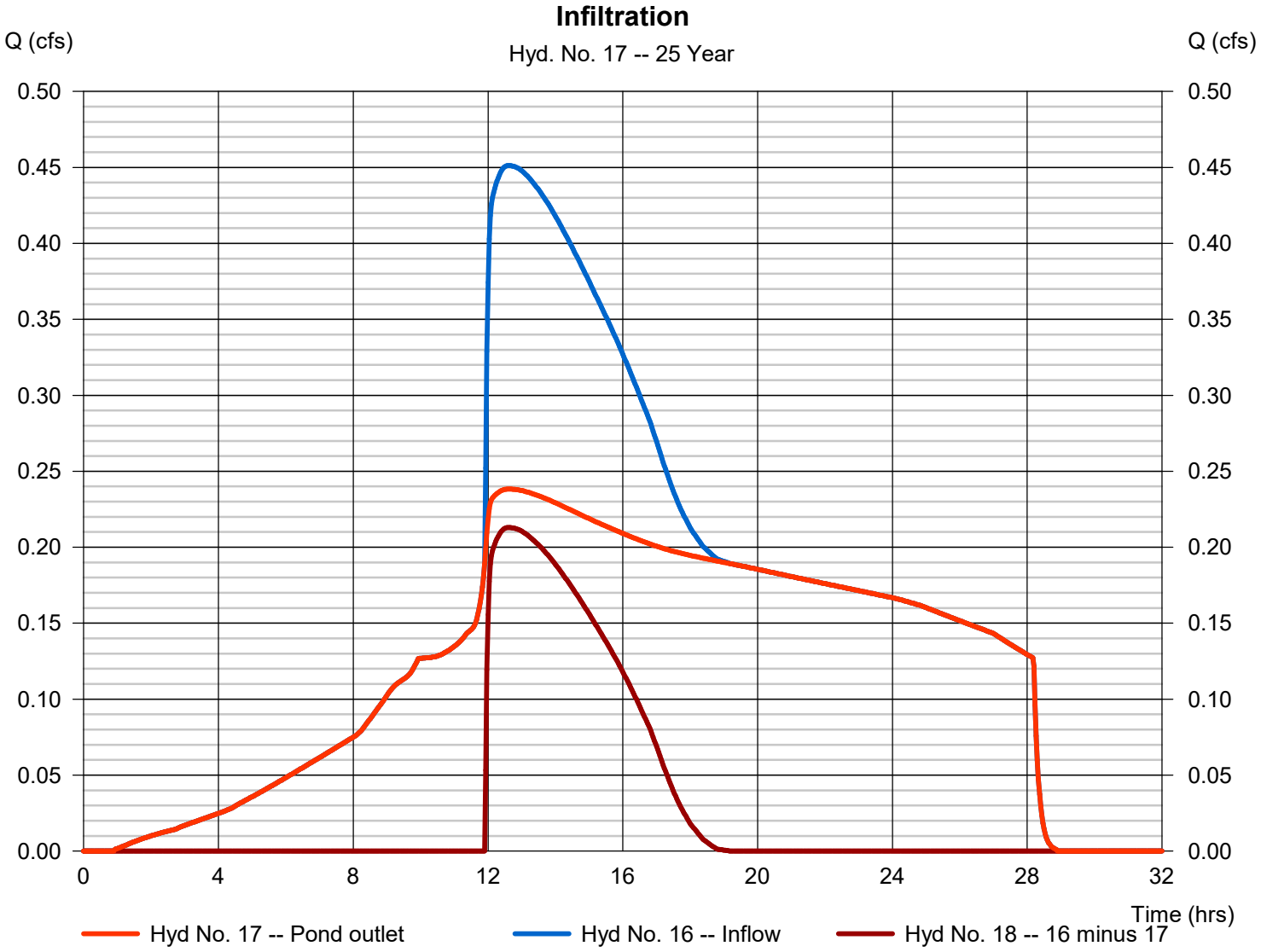


Hydrograph Report

Hyd. No. 17

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.238 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.63 hrs
Time interval	= 2 min	Hyd. volume	= 13,539 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 18
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration

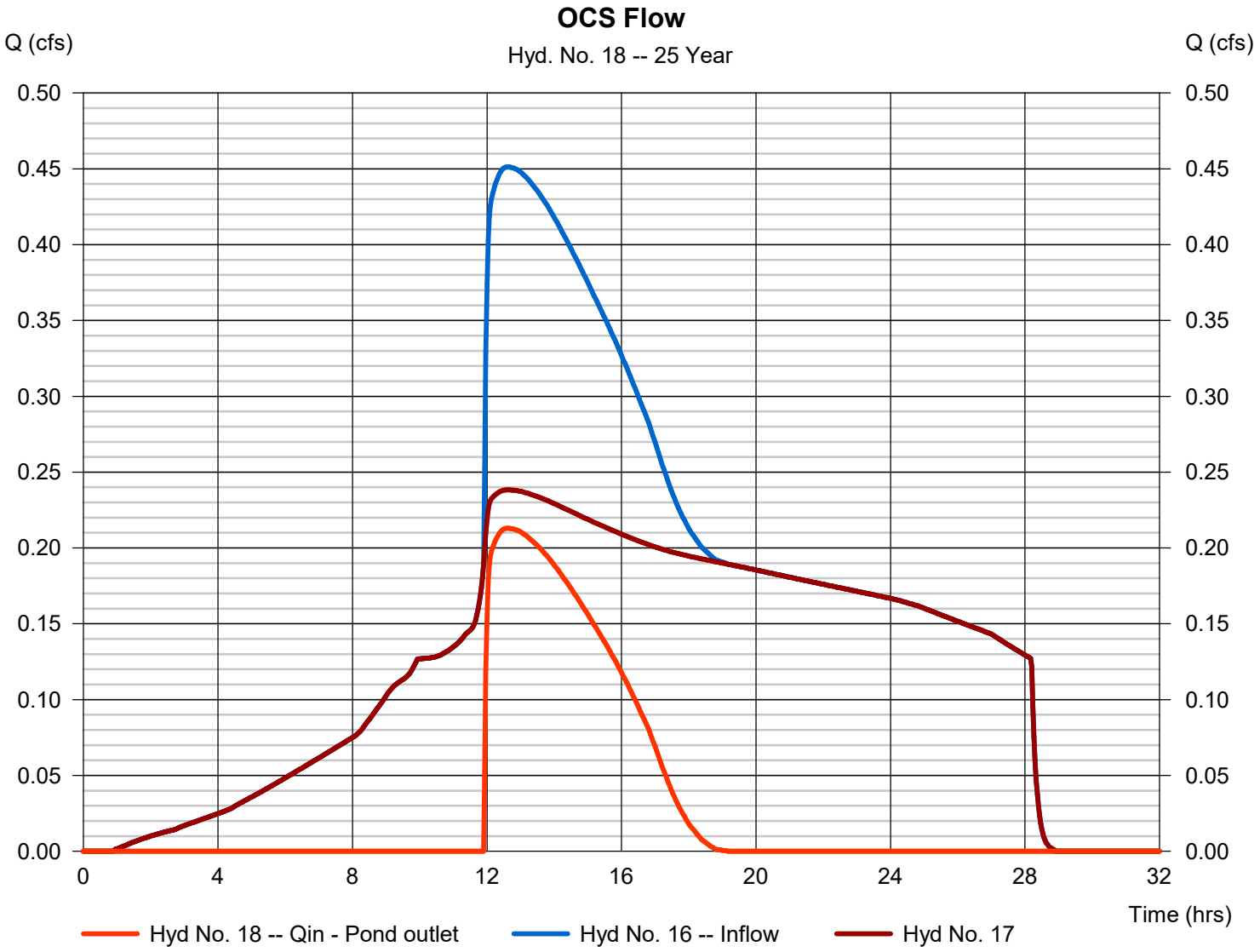


Hydrograph Report

Hyd. No. 18

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.213 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.63 hrs
Time interval	= 2 min	Hyd. volume	= 3,129 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 17
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration



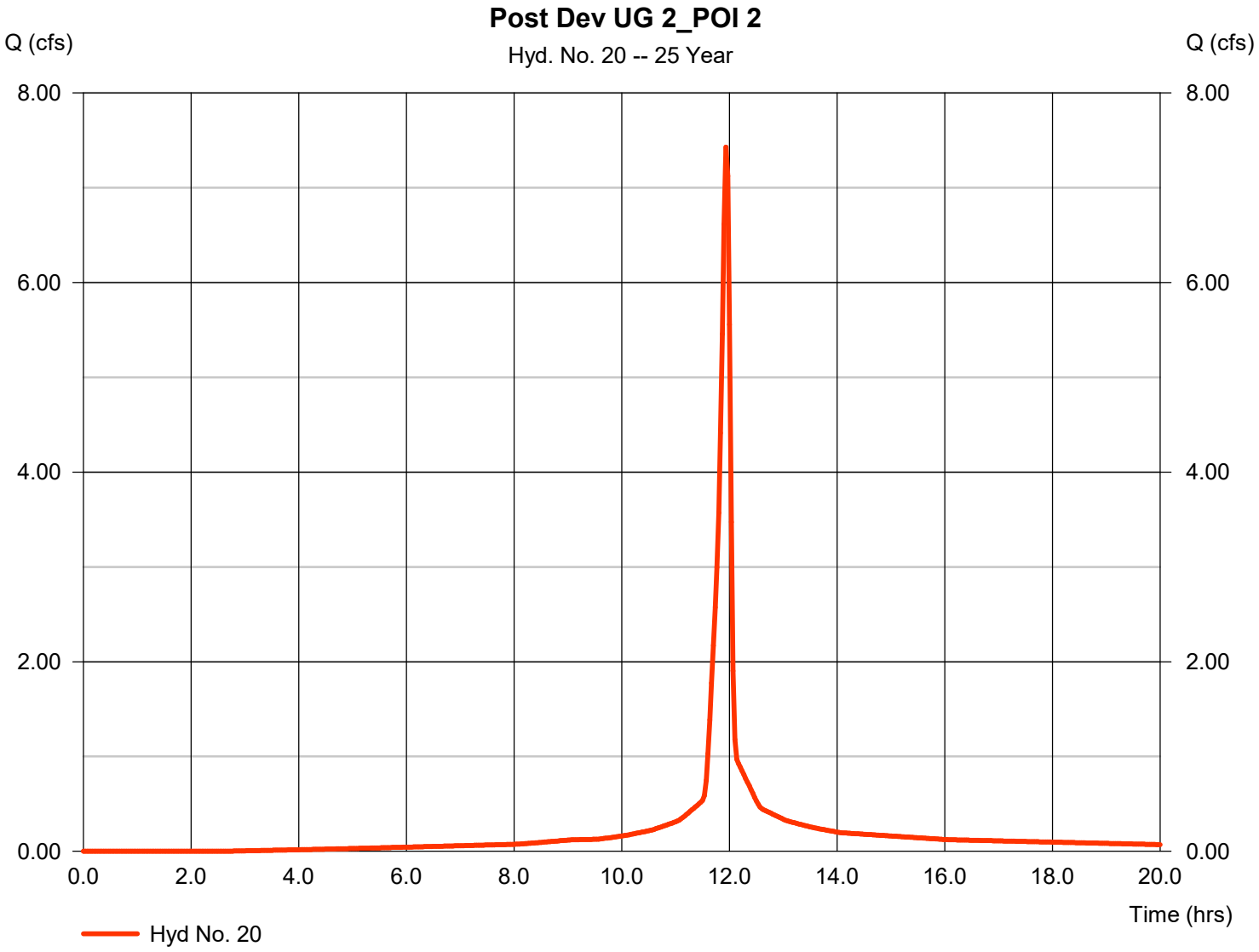
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 20

Post Dev UG 2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 7.429 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 16,483 cuft
Drainage area	= 1.005 ac	Curve number	= 92.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

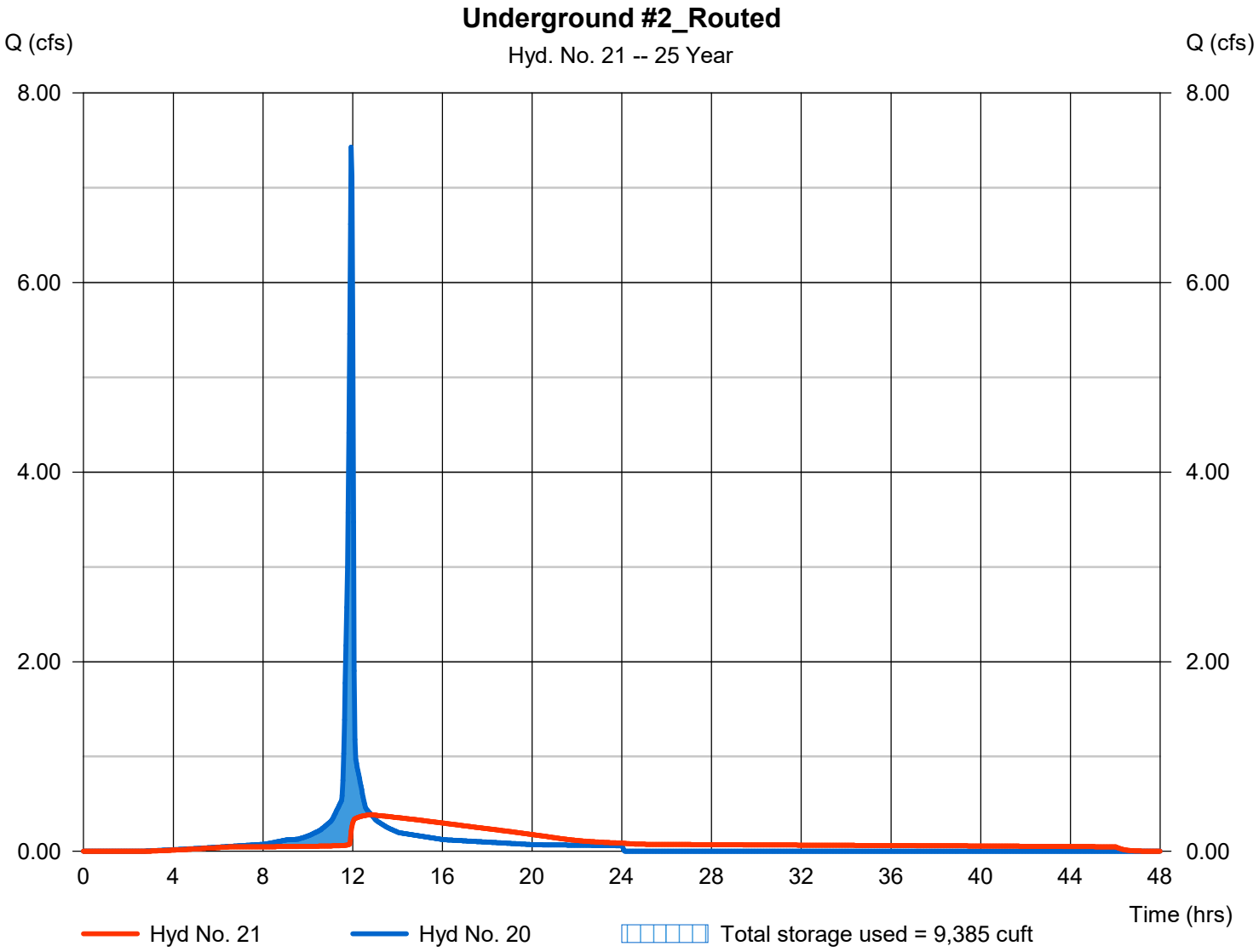
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 21

Underground #2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 0.385 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.83 hrs
Time interval	= 2 min	Hyd. volume	= 16,482 cuft
Inflow hyd. No.	= 20 - Post Dev UG 2_POI 2	Max. Elevation	= 233.99 ft
Reservoir name	= UG #2	Max. Storage	= 9,385 cuft

Storage Indication method used. Outflow includes exfiltration.



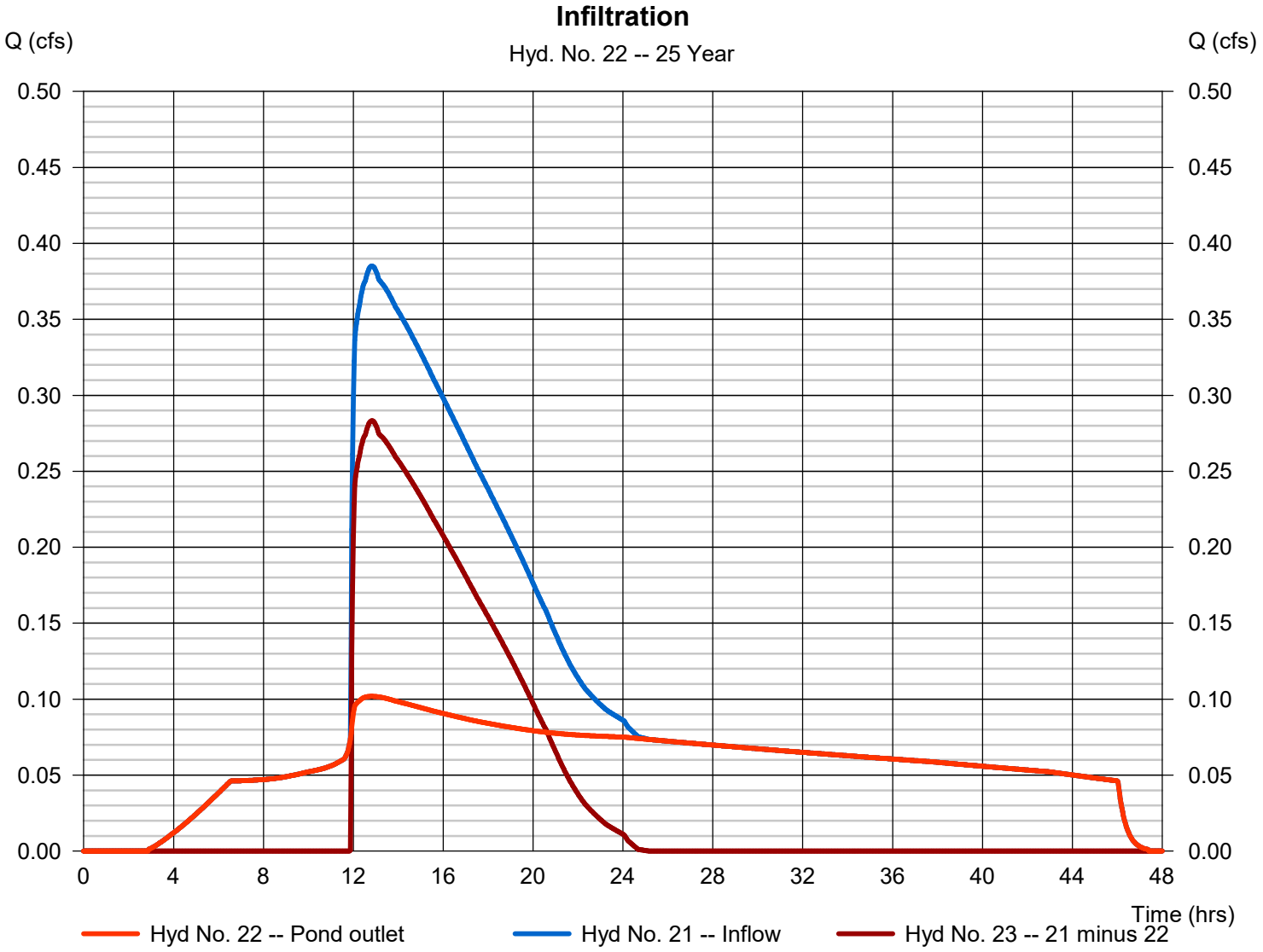
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 22

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.102 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.83 hrs
Time interval	= 2 min	Hyd. volume	= 9,956 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 23
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration



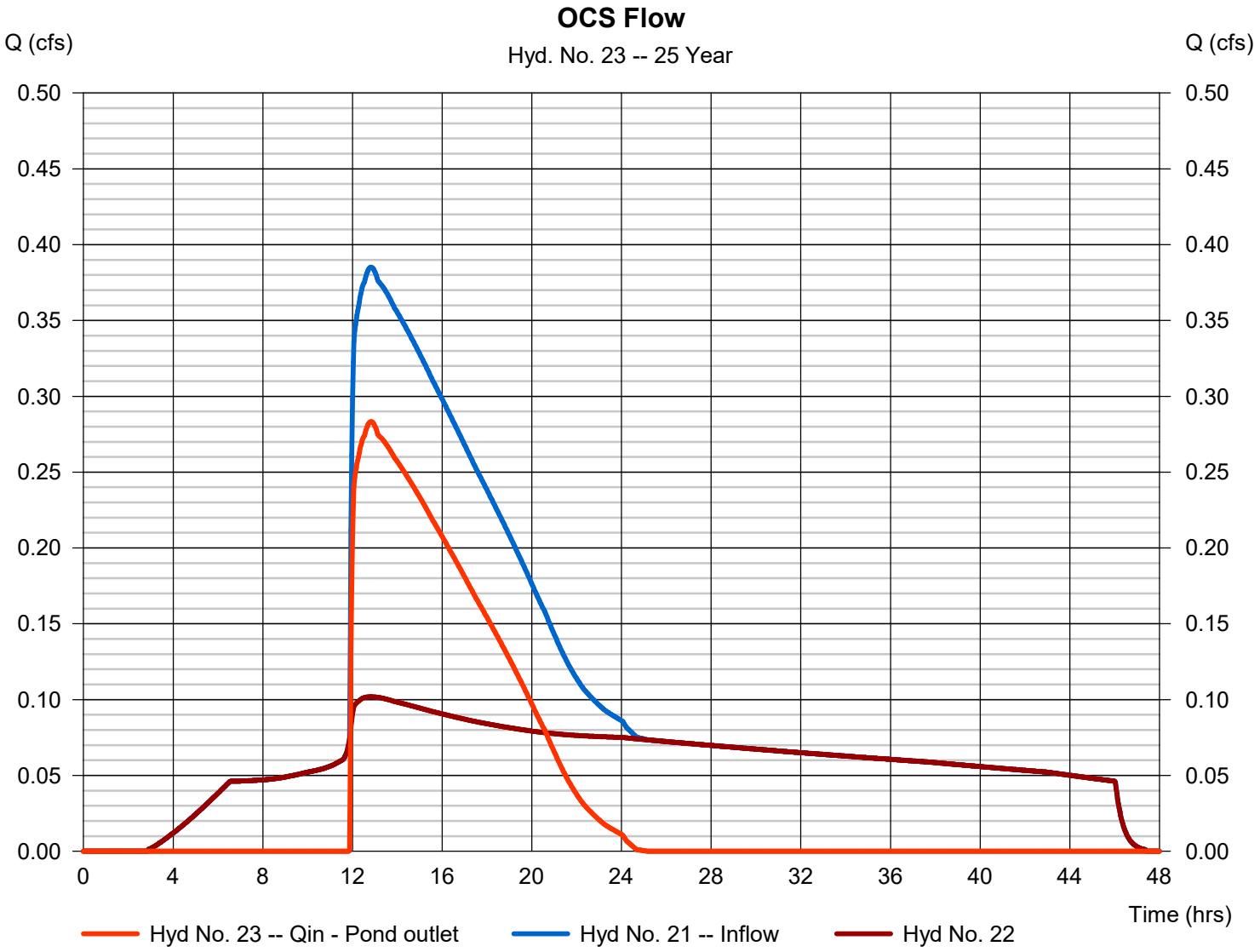
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 23

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.283 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.83 hrs
Time interval	= 2 min	Hyd. volume	= 6,525 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 22
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration



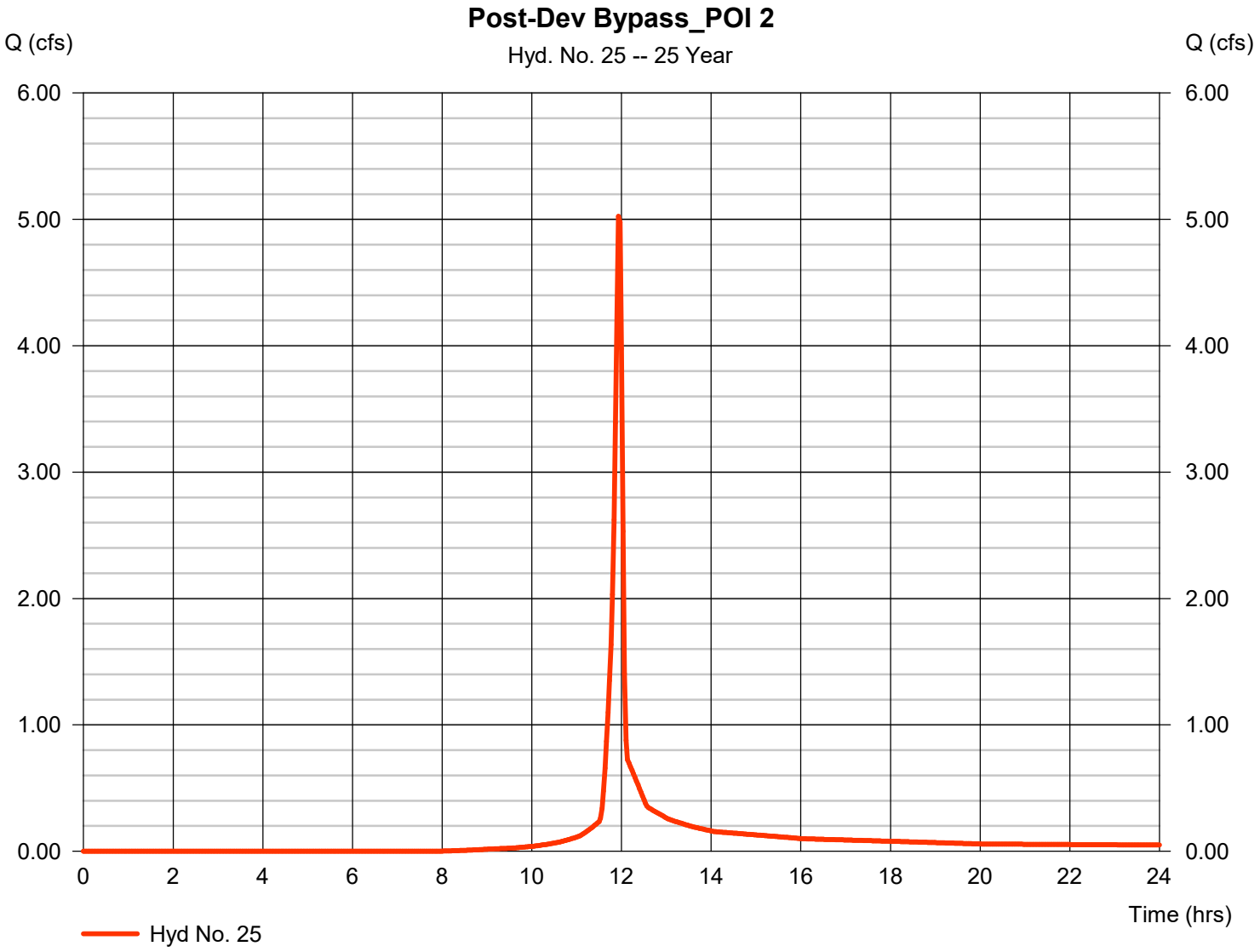
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 25

Post-Dev Bypass_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 5.025 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 10,172 cuft
Drainage area	= 0.978 ac	Curve number	= 75.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.70 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

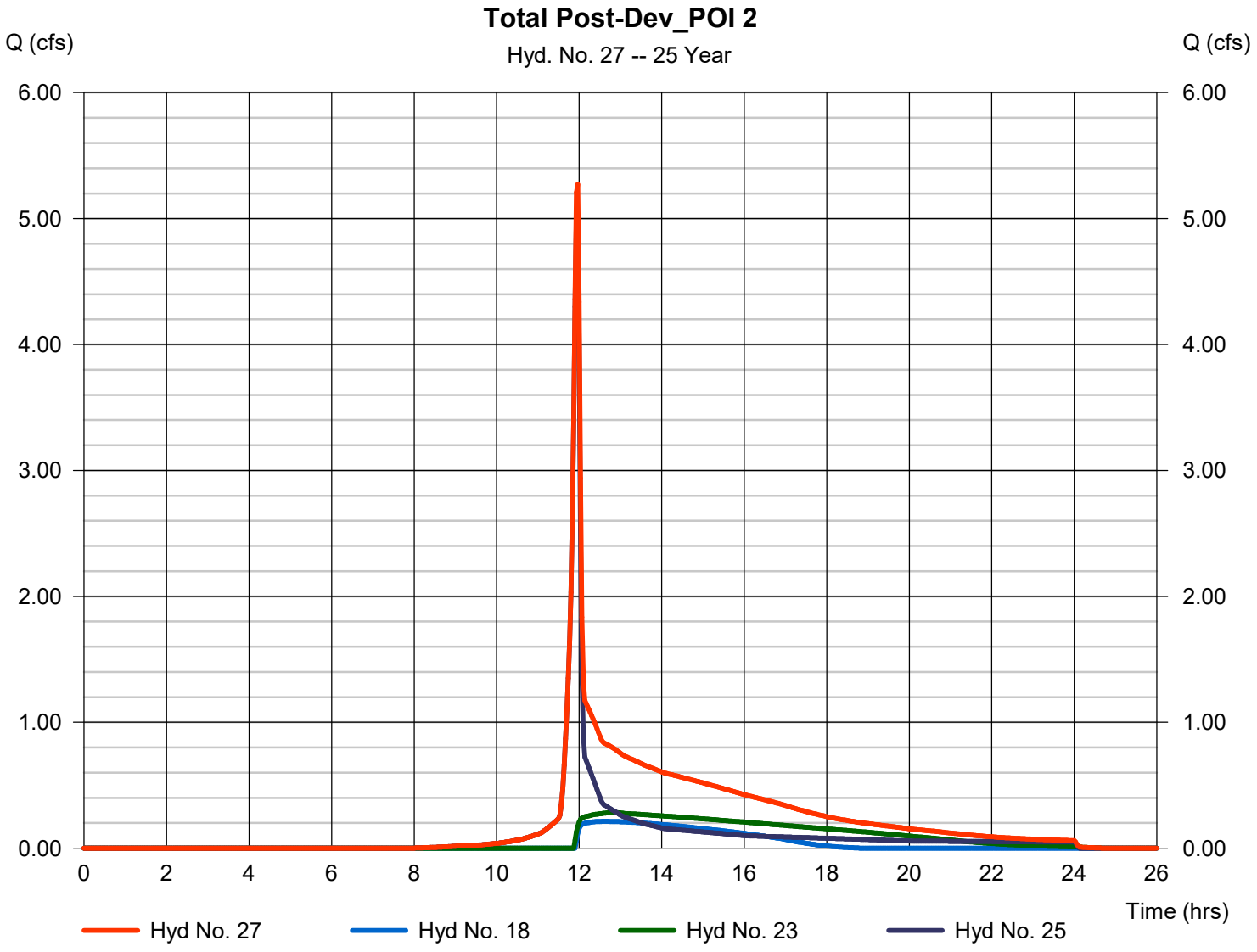


Hydrograph Report

Hyd. No. 27

Total Post-Dev_POI 2

Hydrograph type	= Combine	Peak discharge	= 5.272 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 19,827 cuft
Inflow hyds.	= 18, 23, 25	Contrib. drain. area	= 0.978 ac

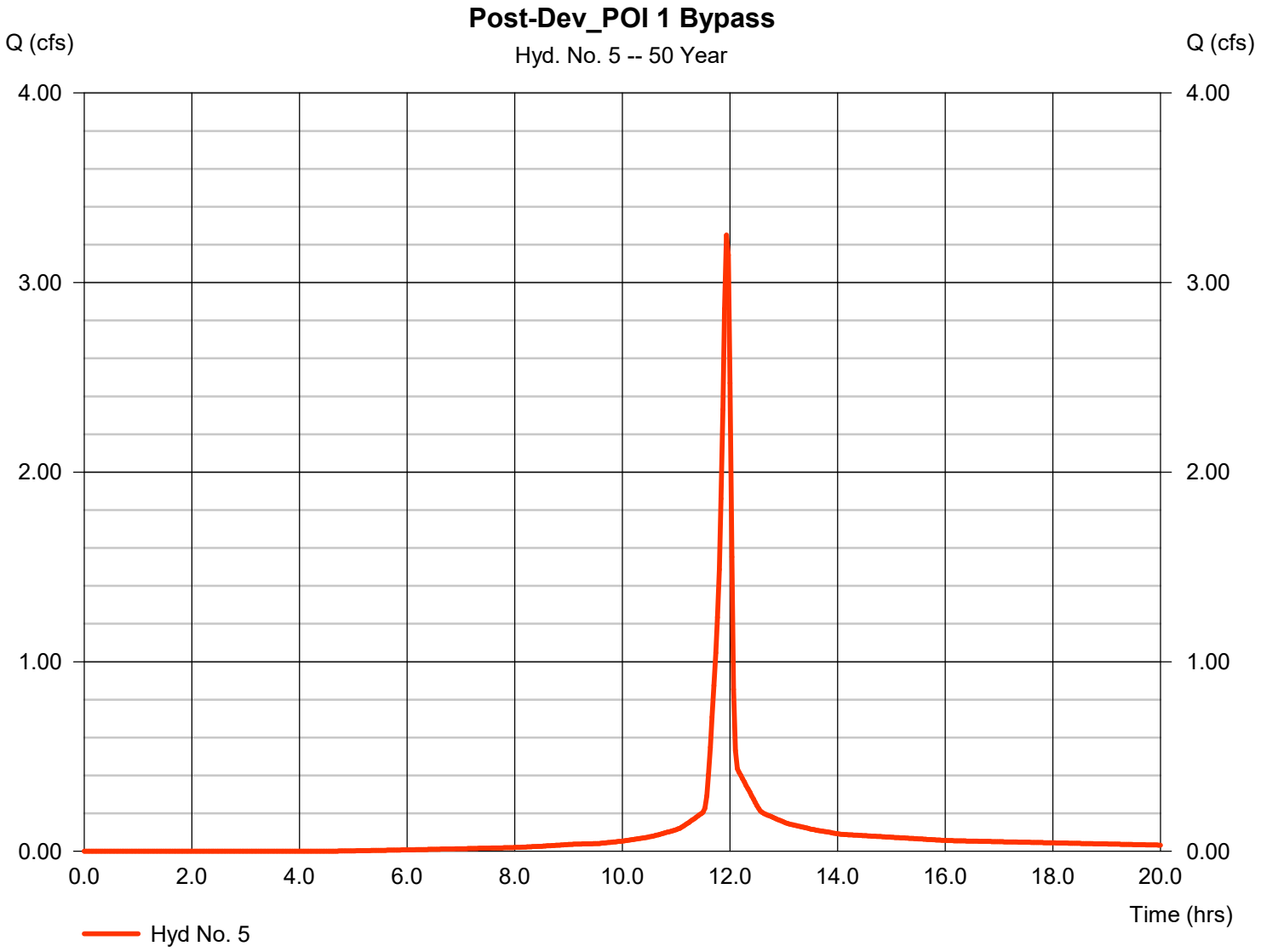


Hydrograph Report

Hyd. No. 5

Post-Dev_POI 1 Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 3.250 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 6,866 cuft
Drainage area	= 0.429 ac	Curve number	= 85.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



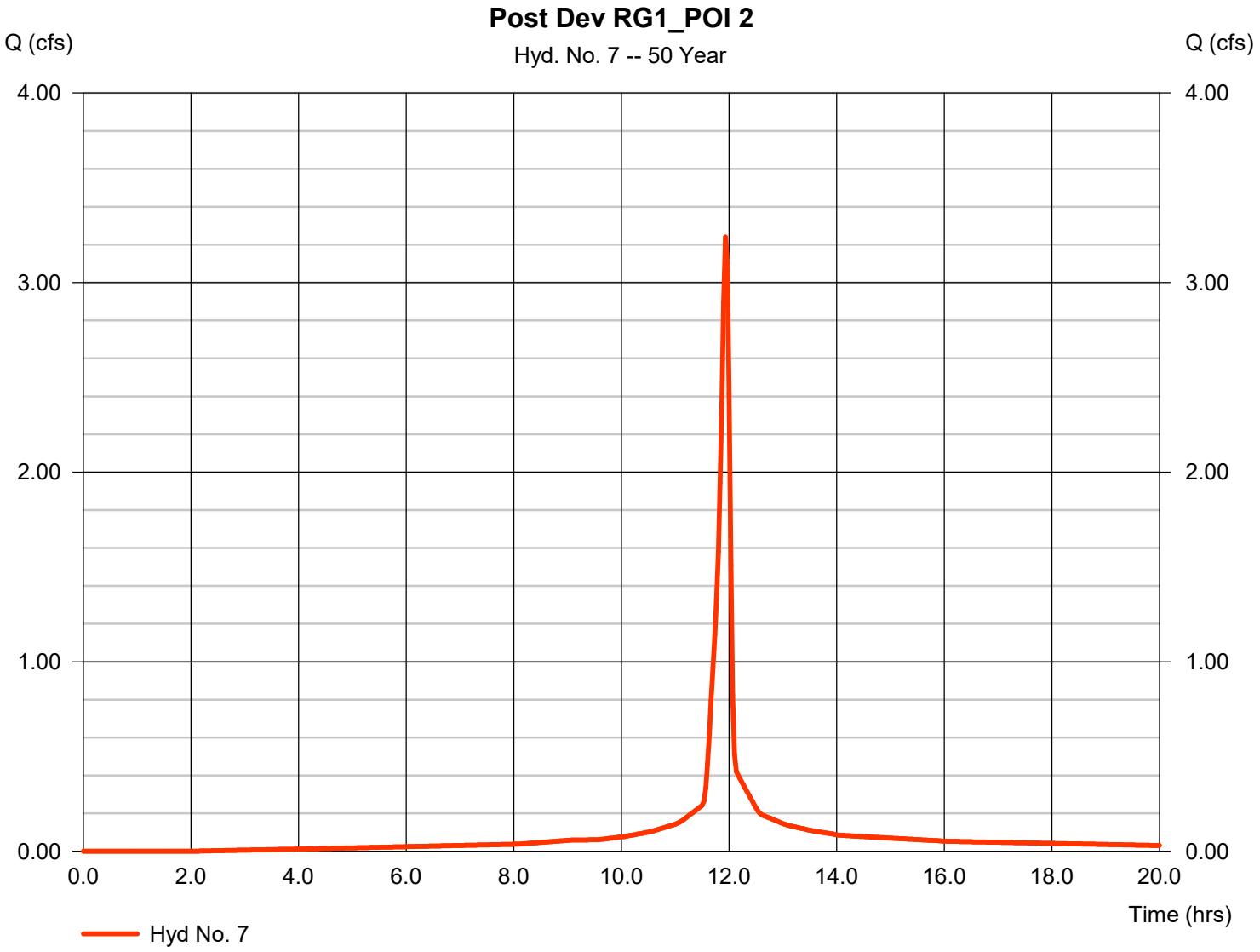
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 7

Post Dev RG1_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 3.241 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 7,356 cuft
Drainage area	= 0.382 ac	Curve number	= 93.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

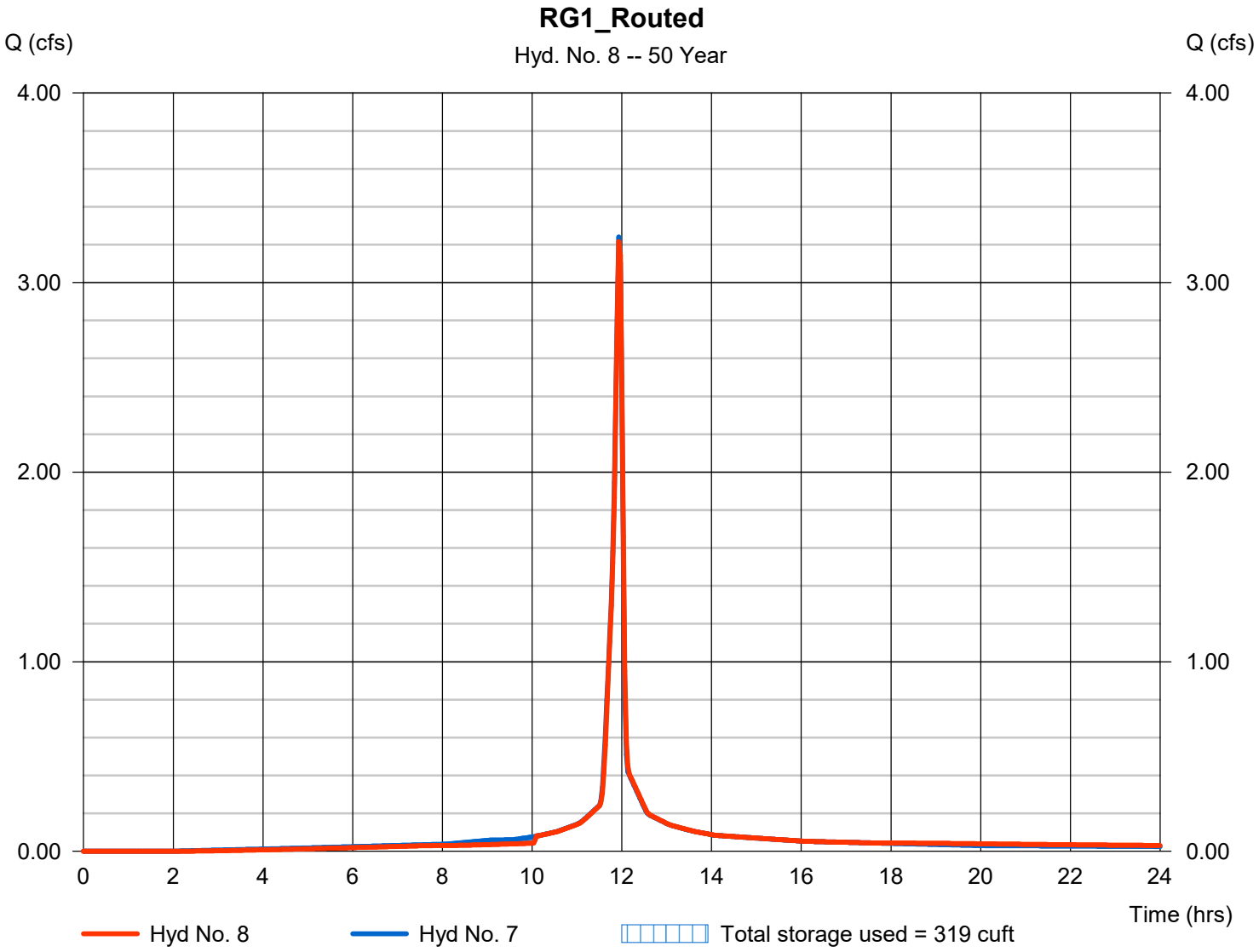
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 8

RG1_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	3.215 cfs
Storm frequency	=	50 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	7,353 cuft
Inflow hyd. No.	=	7 - Post Dev RG1_POI 2	Max. Elevation	=	236.75 ft
Reservoir name	=	RG#1	Max. Storage	=	319 cuft

Storage Indication method used. Outflow includes exfiltration.



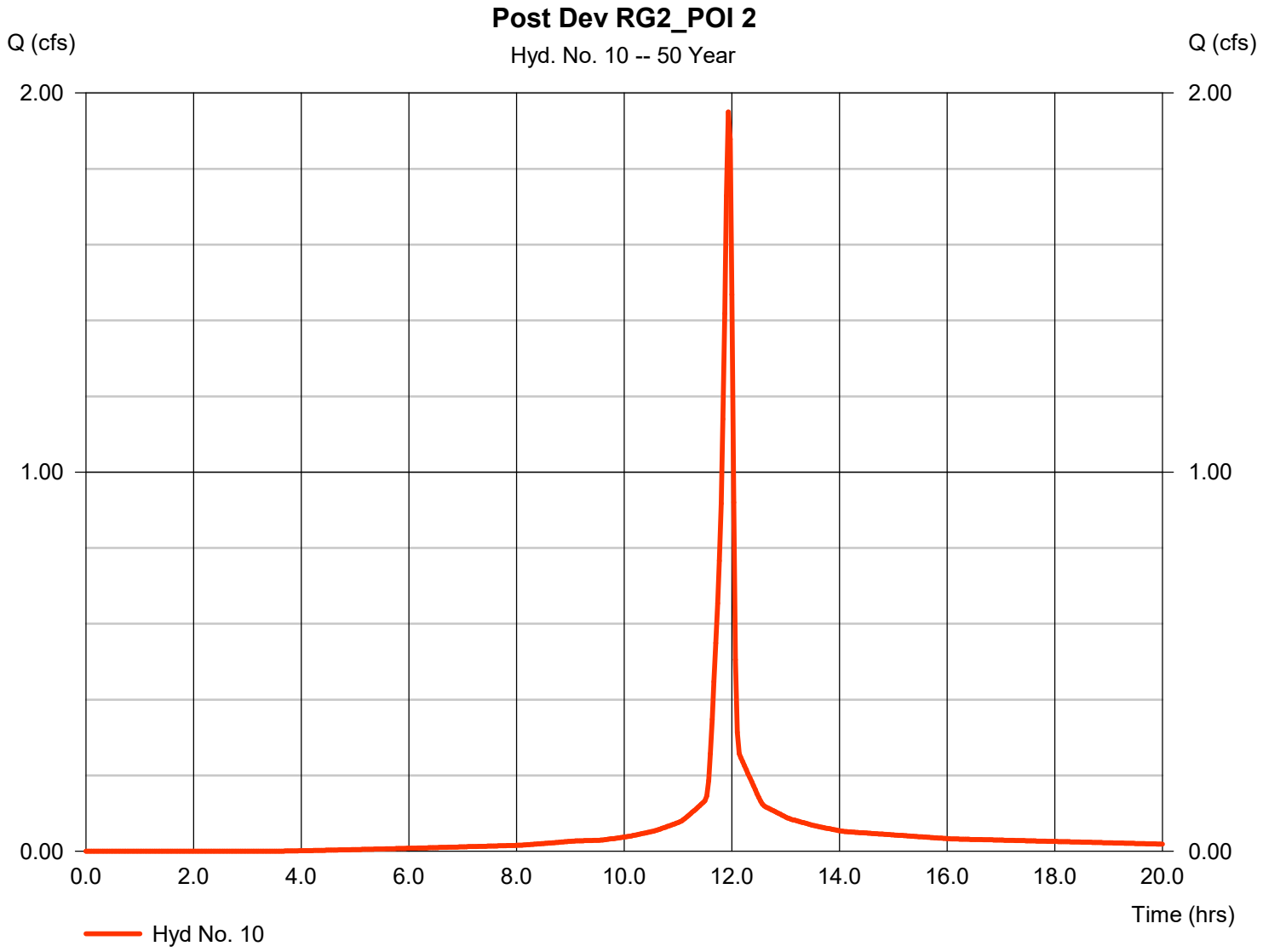
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 10

Post Dev RG2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.950 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 4,217 cuft
Drainage area	= 0.244 ac	Curve number	= 88.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

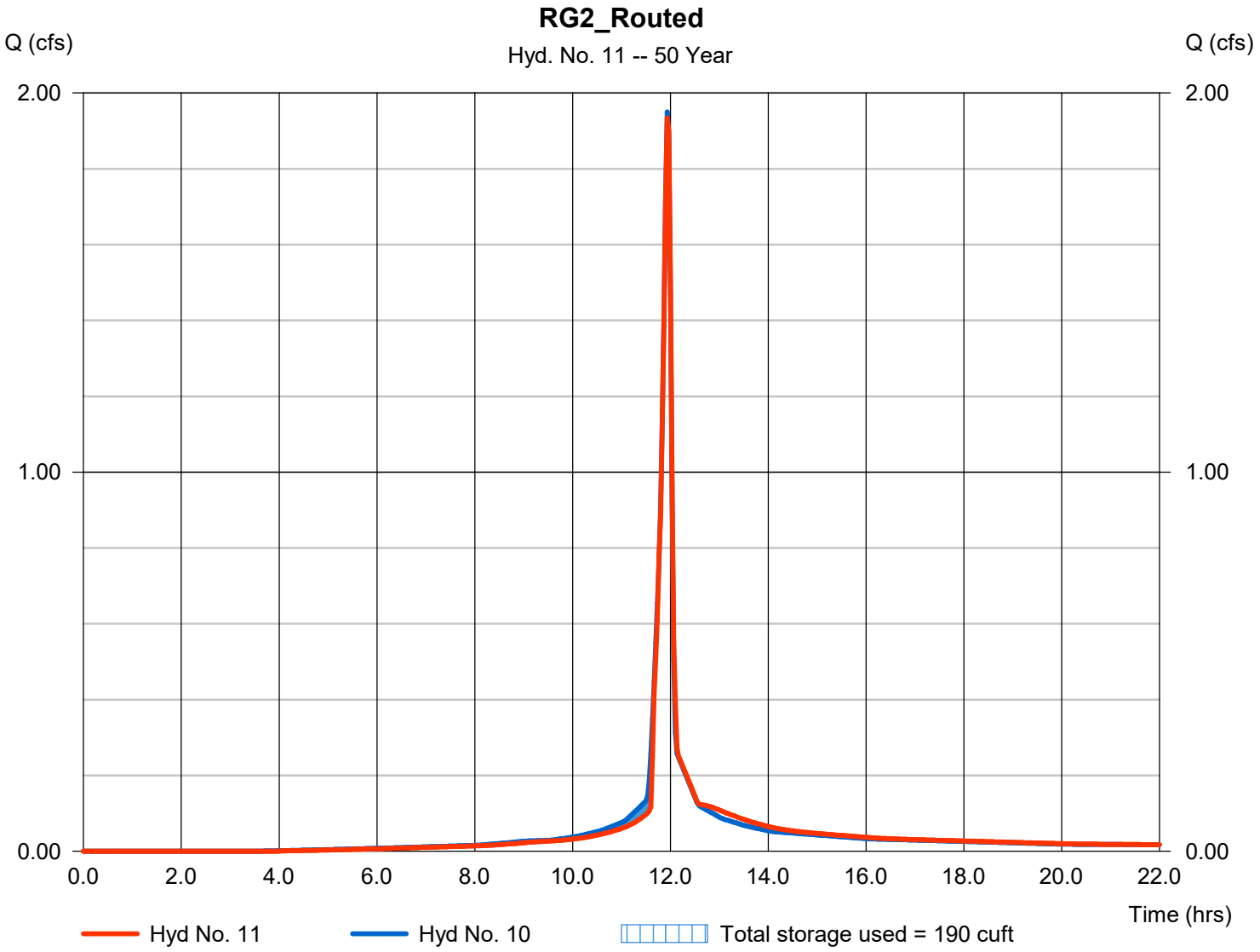
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 11

RG2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 1.934 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 4,216 cuft
Inflow hyd. No.	= 10 - Post Dev RG2_POI 2	Max. Elevation	= 237.85 ft
Reservoir name	= RG#2	Max. Storage	= 190 cuft

Storage Indication method used. Outflow includes exfiltration.



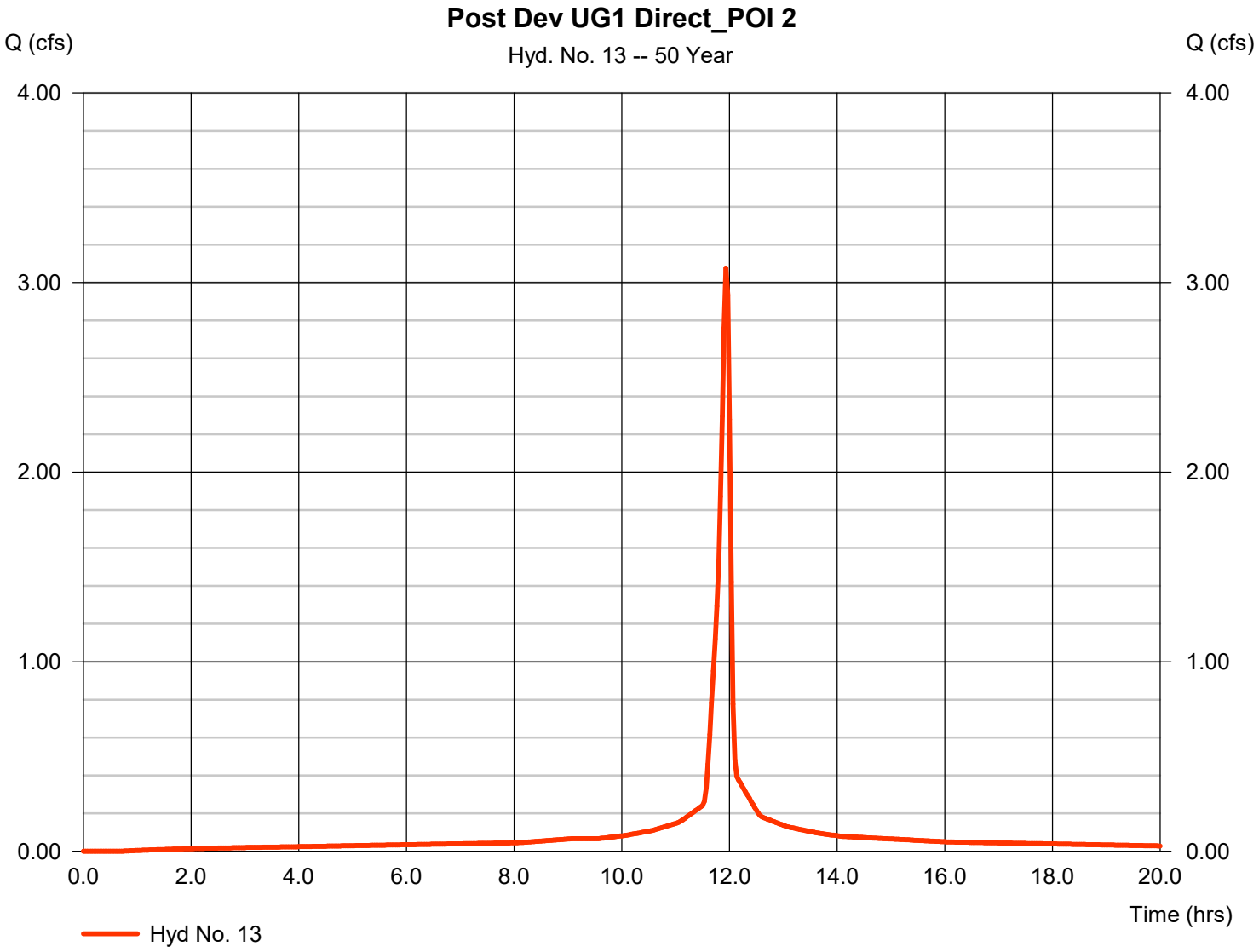
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 13

Post Dev UG1 Direct_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 3.077 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 7,402 cuft
Drainage area	= 0.353 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

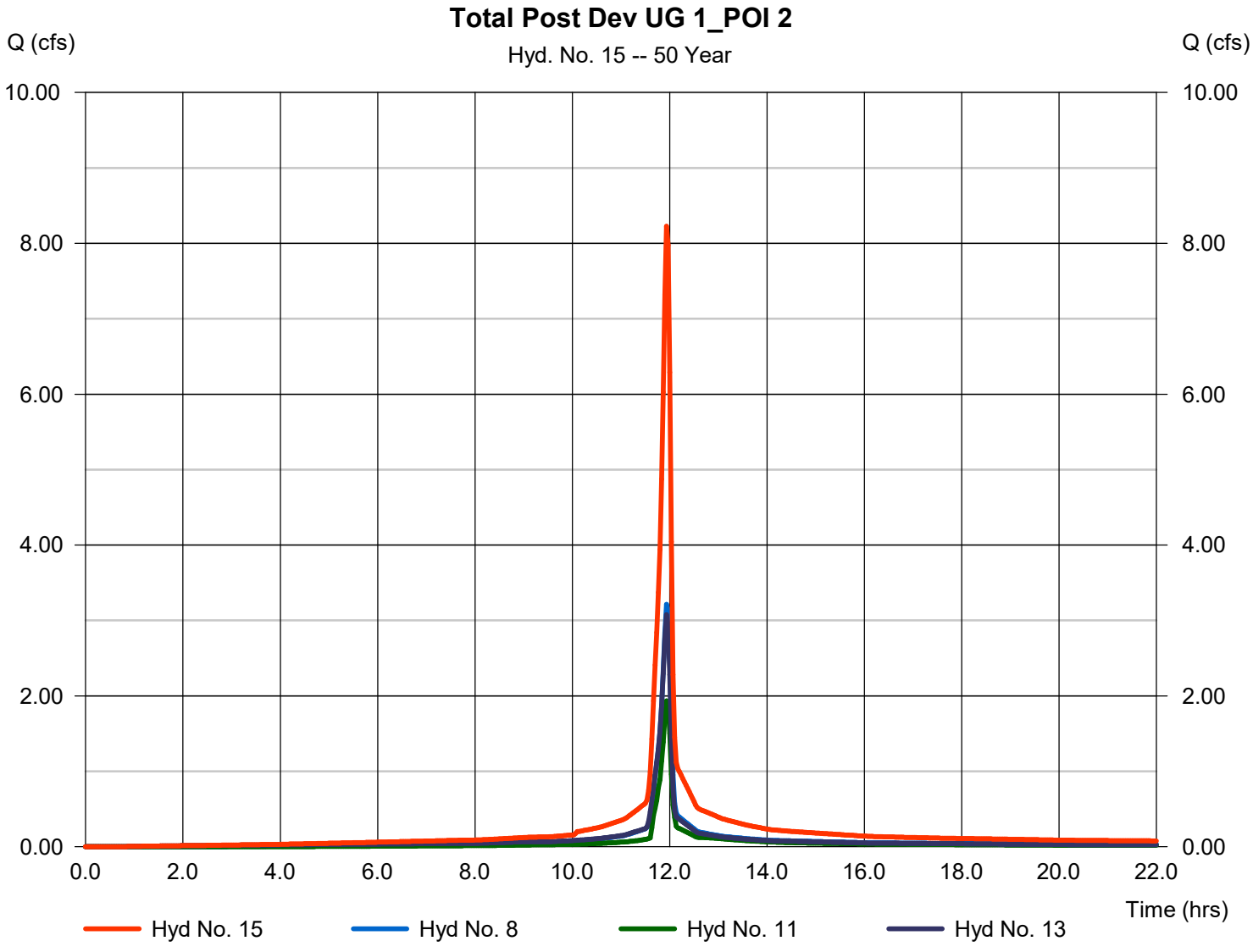


Hydrograph Report

Hyd. No. 15

Total Post Dev UG 1_POI 2

Hydrograph type	= Combine	Peak discharge	= 8.226 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 18,971 cuft
Inflow hyds.	= 8, 11, 13	Contrib. drain. area	= 0.353 ac



Hydrograph Report

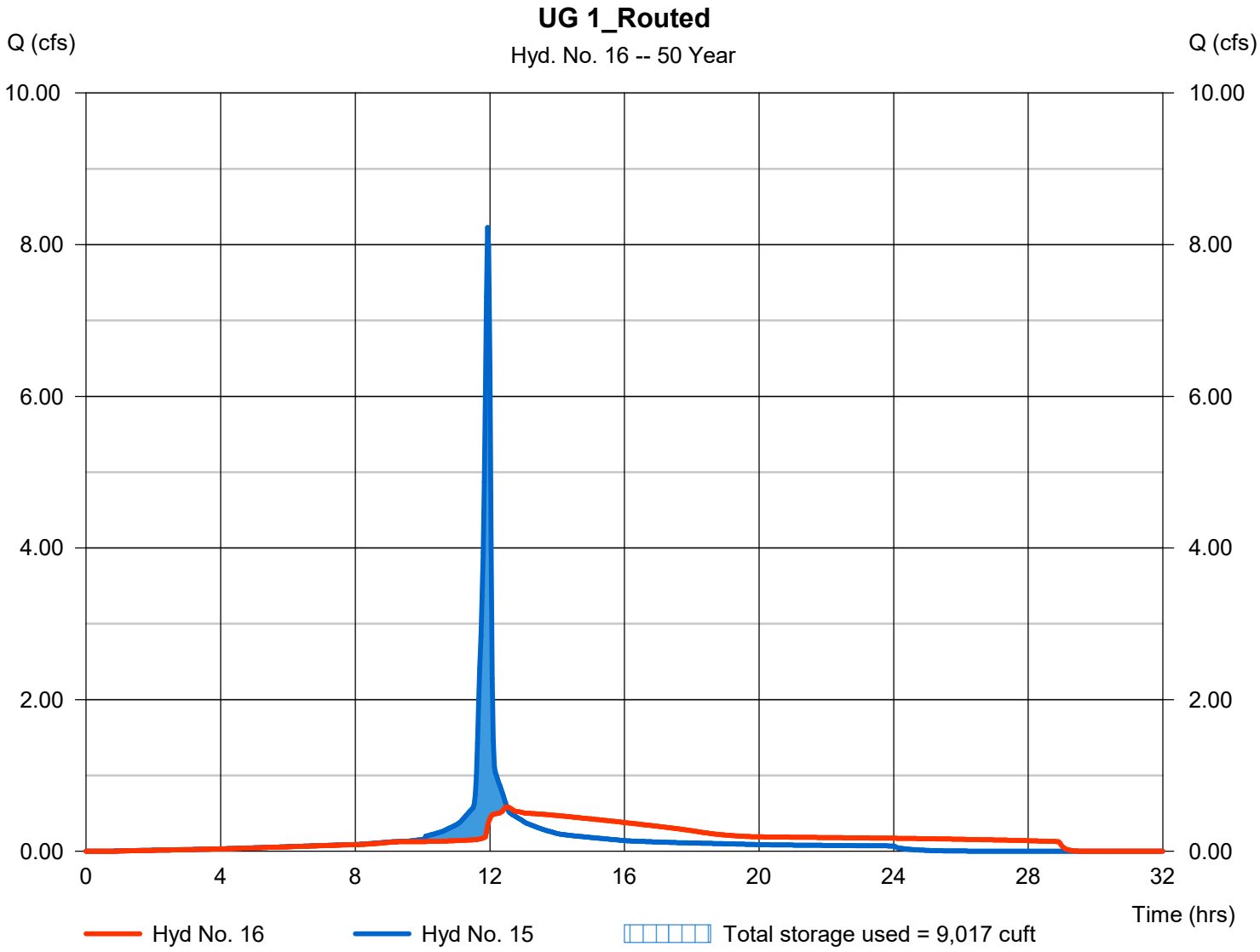
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 16

UG 1_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	0.585 cfs
Storm frequency	=	50 yrs	Time to peak	=	12.50 hrs
Time interval	=	2 min	Hyd. volume	=	18,970 cuft
Inflow hyd. No.	=	15 - Total Post Dev UG 1_POI2	Max. Elevation	=	233.03 ft
Reservoir name	=	UG #1	Max. Storage	=	9,017 cuft

Storage Indication method used. Outflow includes exfiltration.



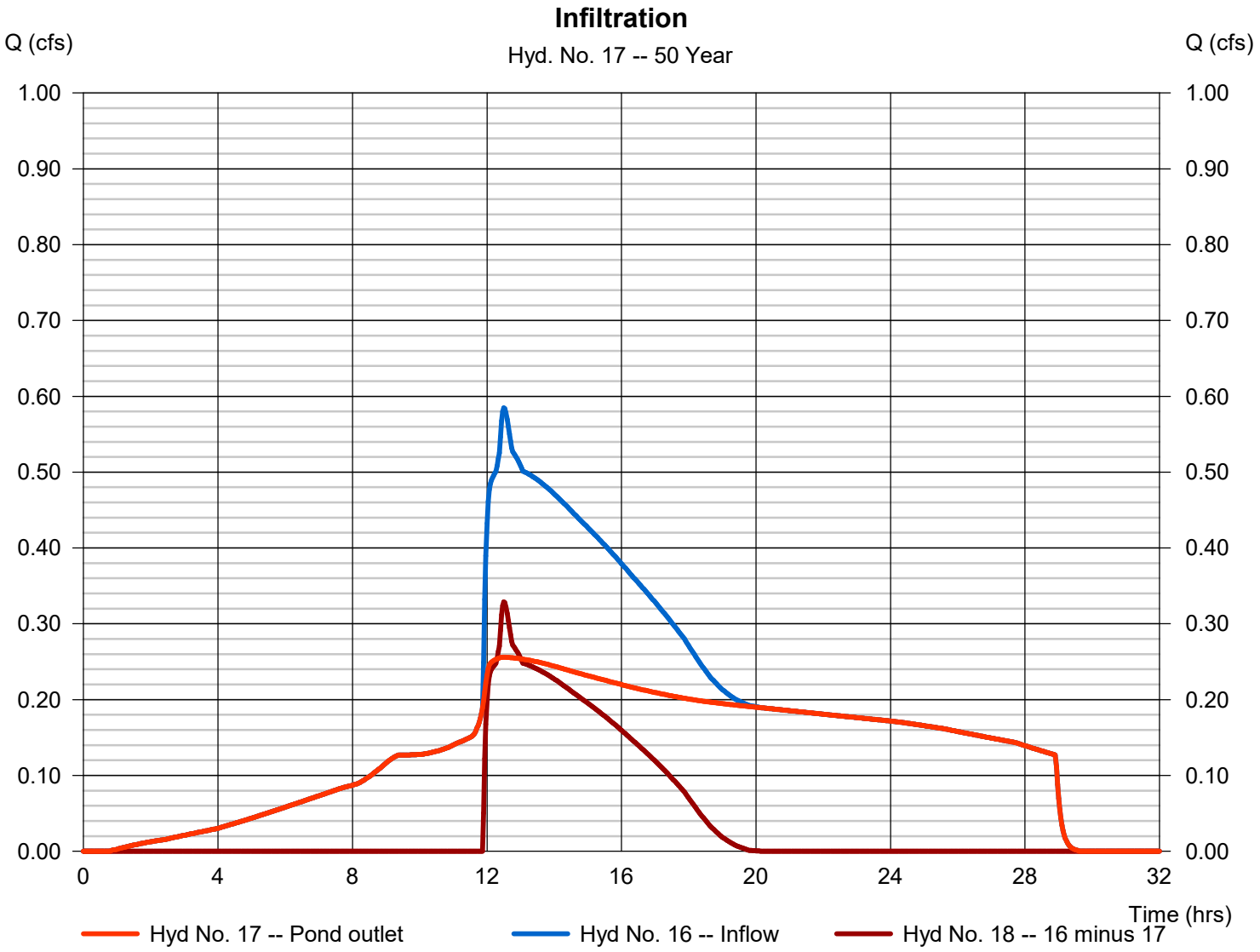
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 17

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.256 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.50 hrs
Time interval	= 2 min	Hyd. volume	= 14,650 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 18
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration

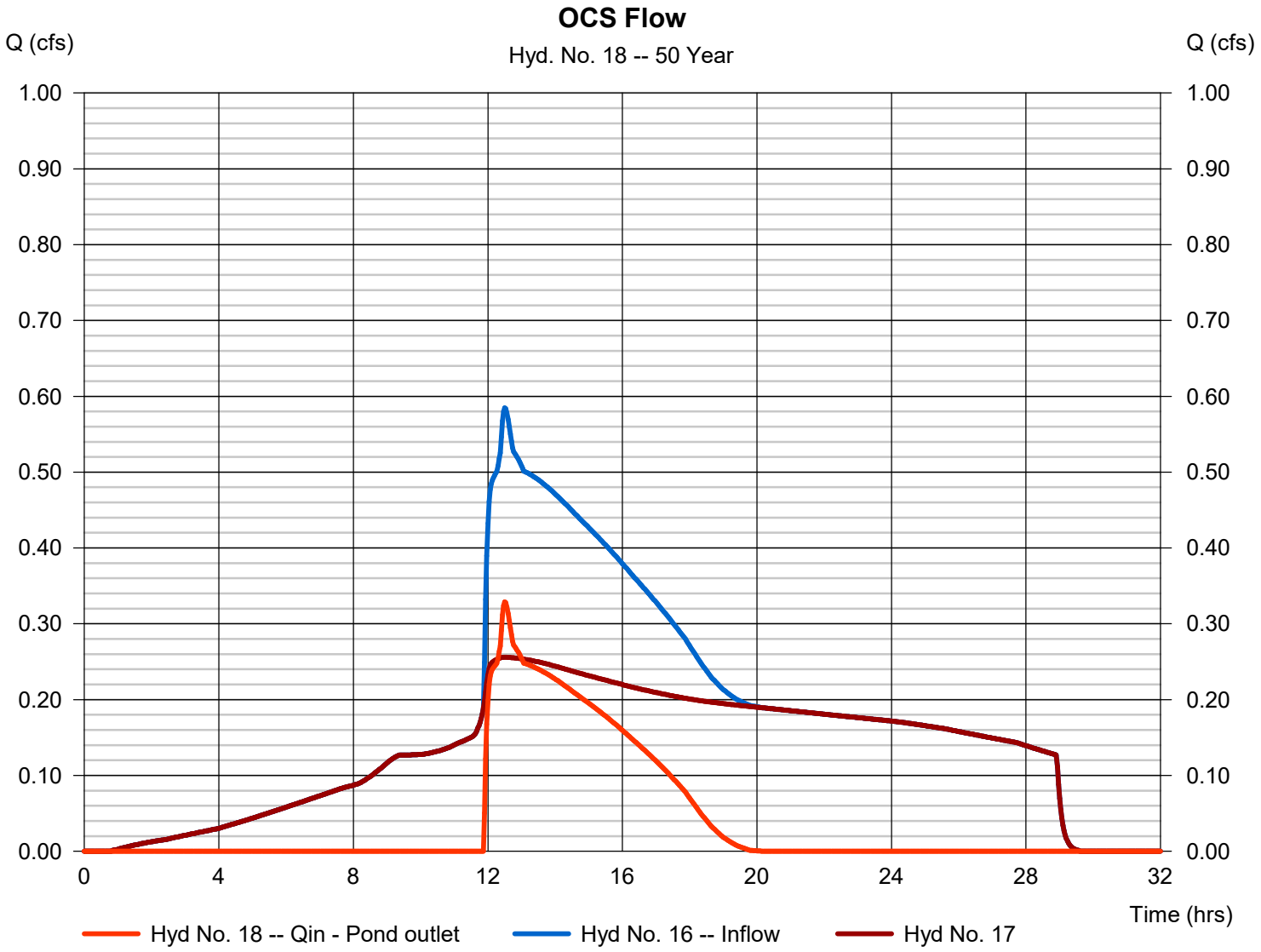


Hydrograph Report

Hyd. No. 18

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 0.329 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.50 hrs
Time interval	= 2 min	Hyd. volume	= 4,320 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 17
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration



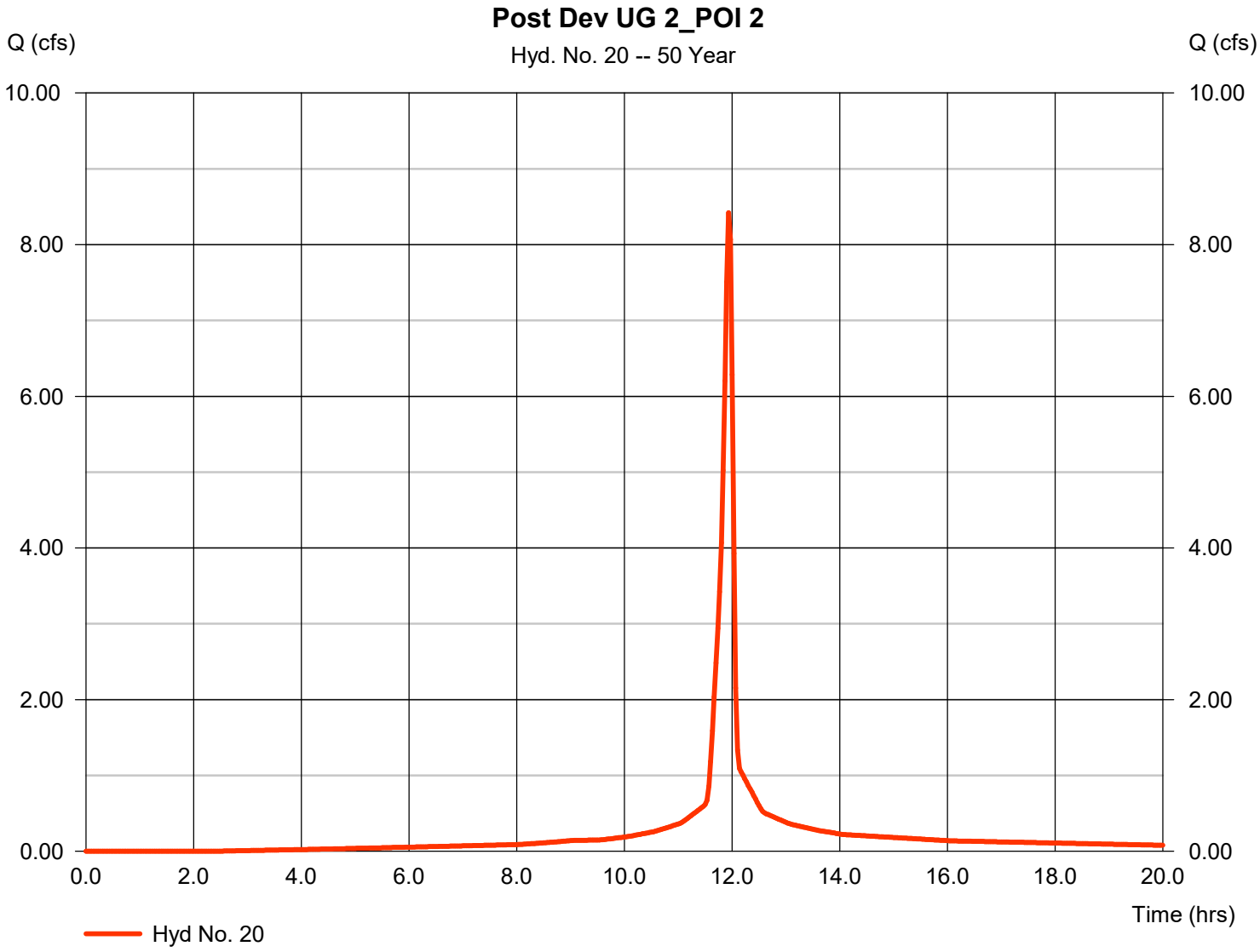
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 20

Post Dev UG 2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 8.420 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 18,841 cuft
Drainage area	= 1.005 ac	Curve number	= 92.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

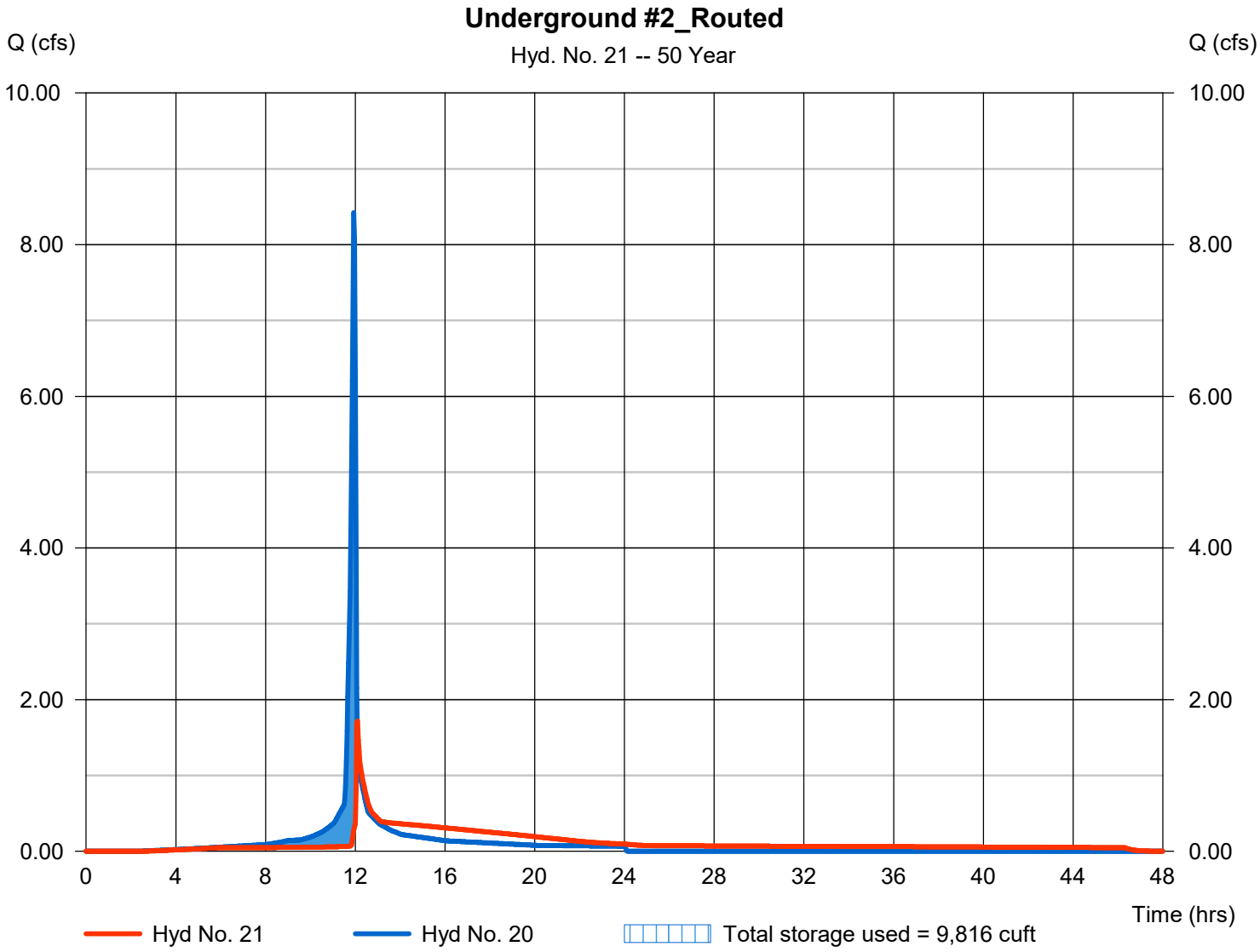
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 21

Underground #2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 1.718 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 18,840 cuft
Inflow hyd. No.	= 20 - Post Dev UG 2_POI 2	Max. Elevation	= 234.23 ft
Reservoir name	= UG #2	Max. Storage	= 9,816 cuft

Storage Indication method used. Outflow includes exfiltration.

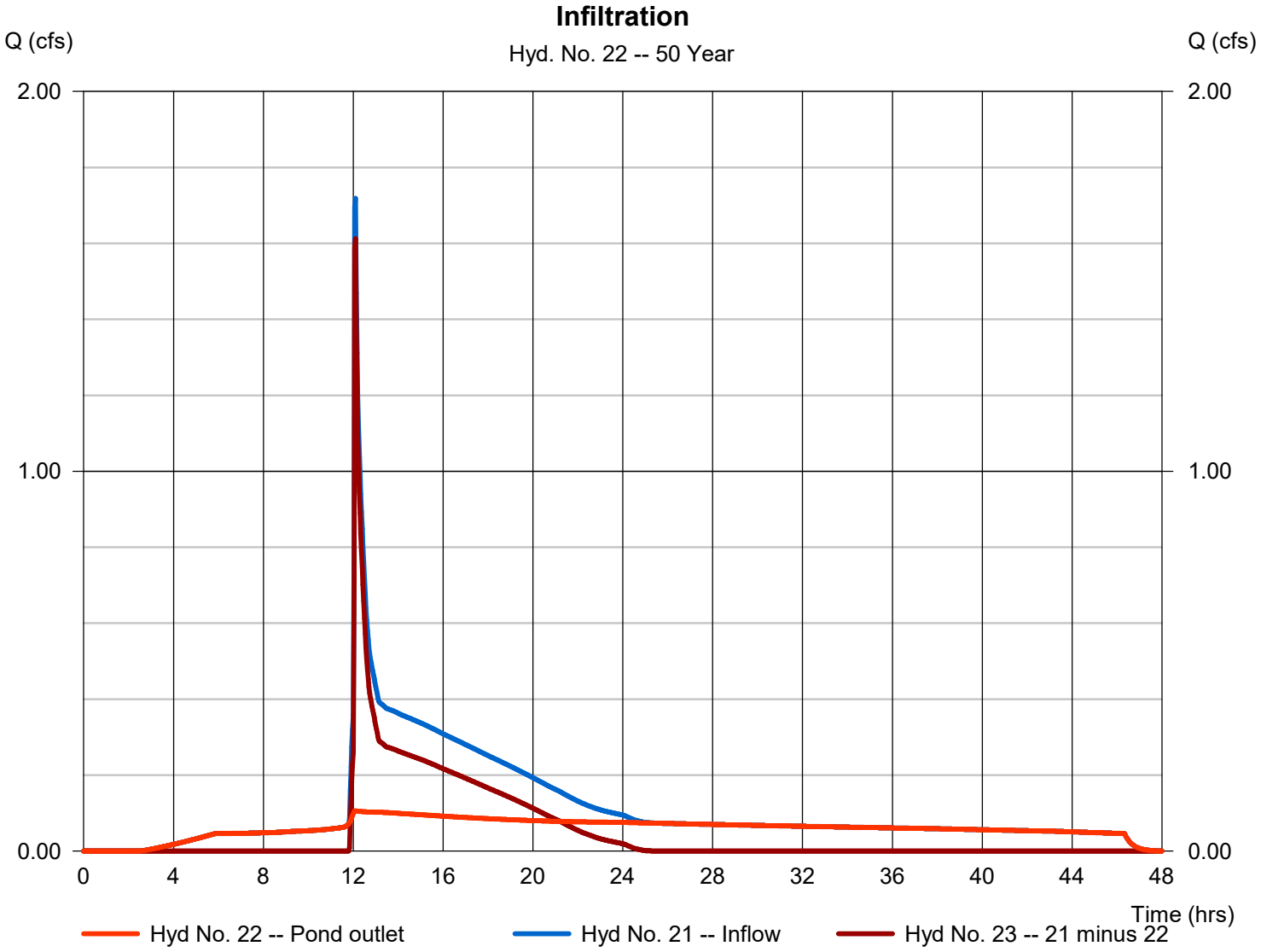


Hydrograph Report

Hyd. No. 22

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.106 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 10,210 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 23
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration

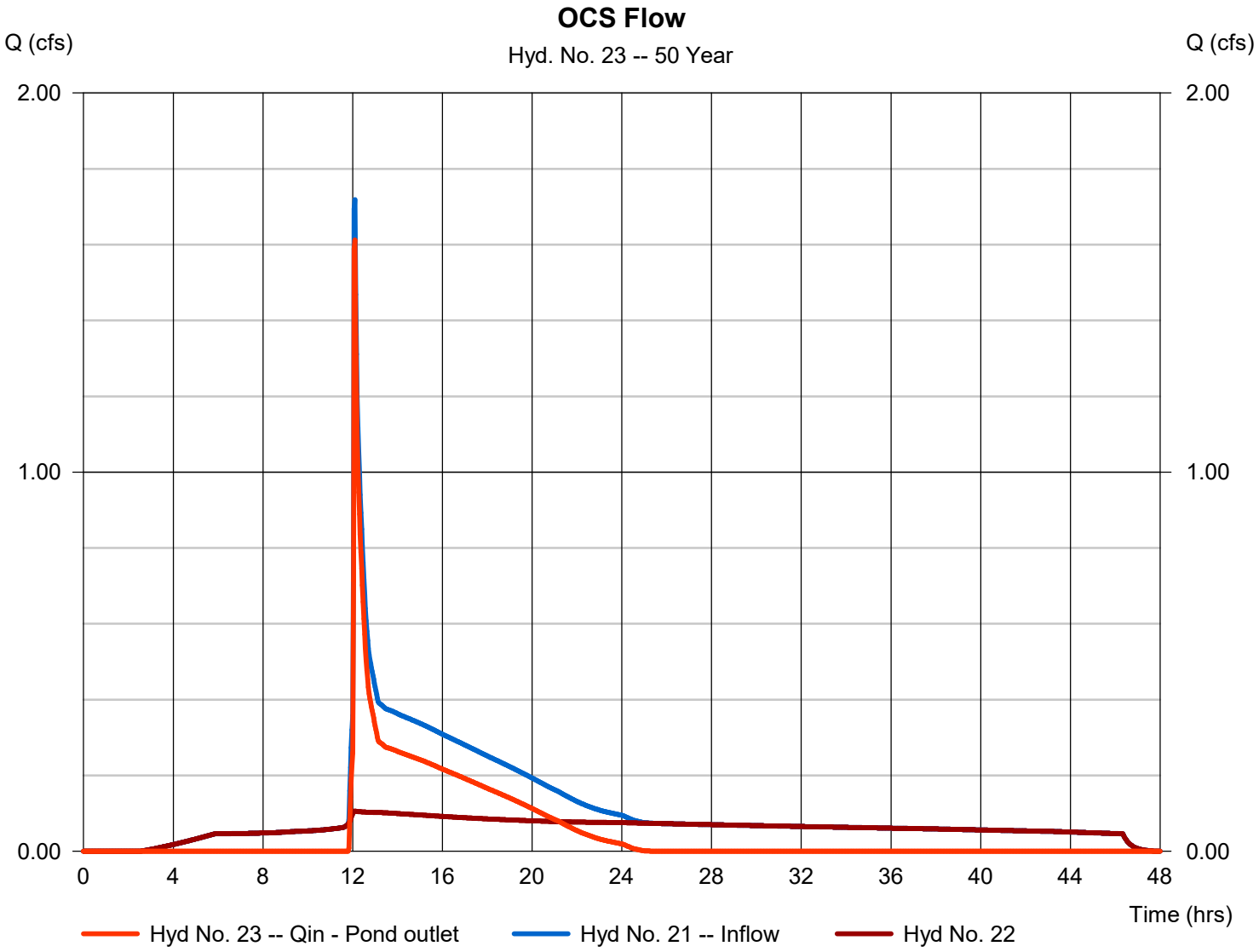


Hydrograph Report

Hyd. No. 23

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 1.612 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 8,630 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 22
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration



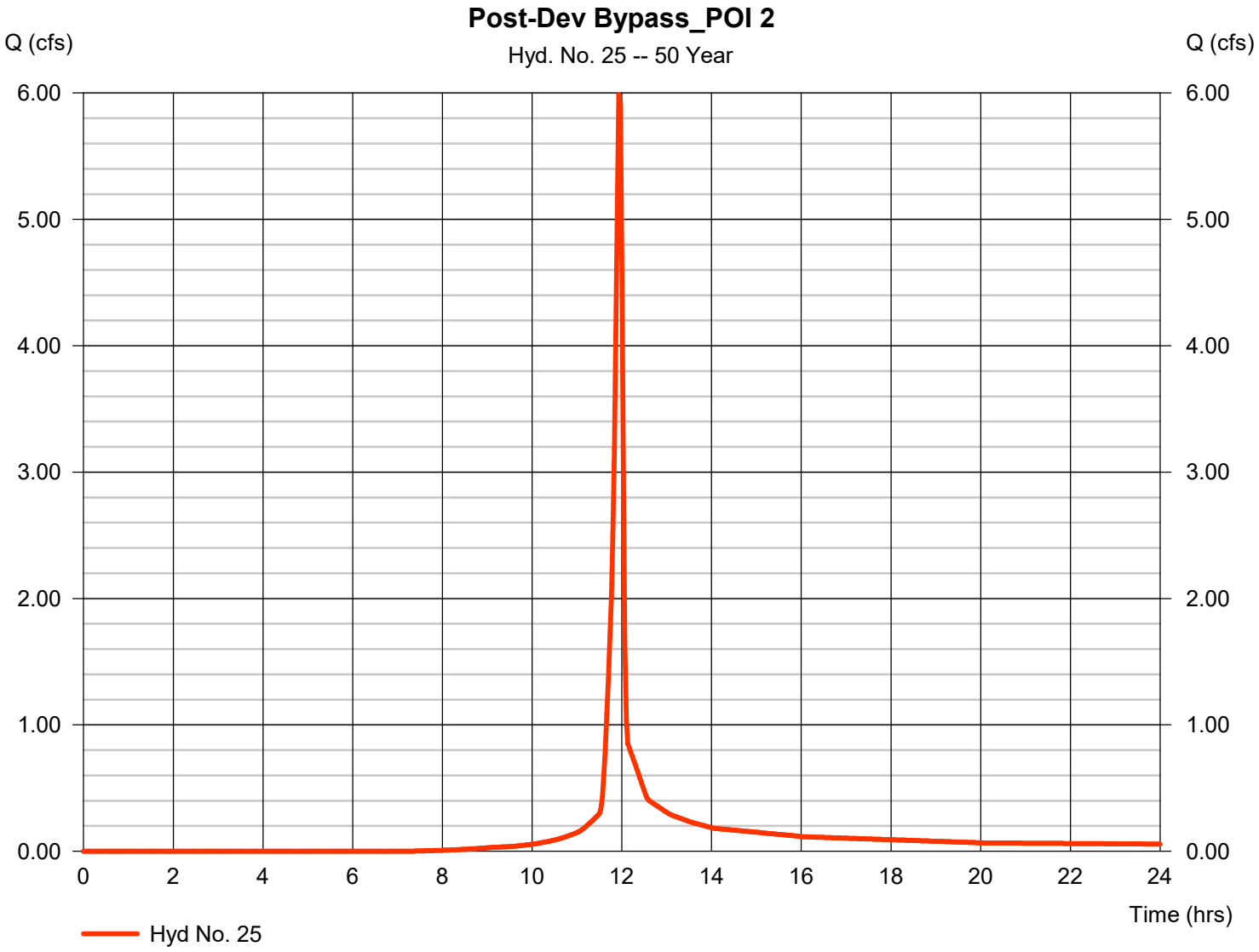
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 25

Post-Dev Bypass_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 5.988 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 12,168 cuft
Drainage area	= 0.978 ac	Curve number	= 75.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



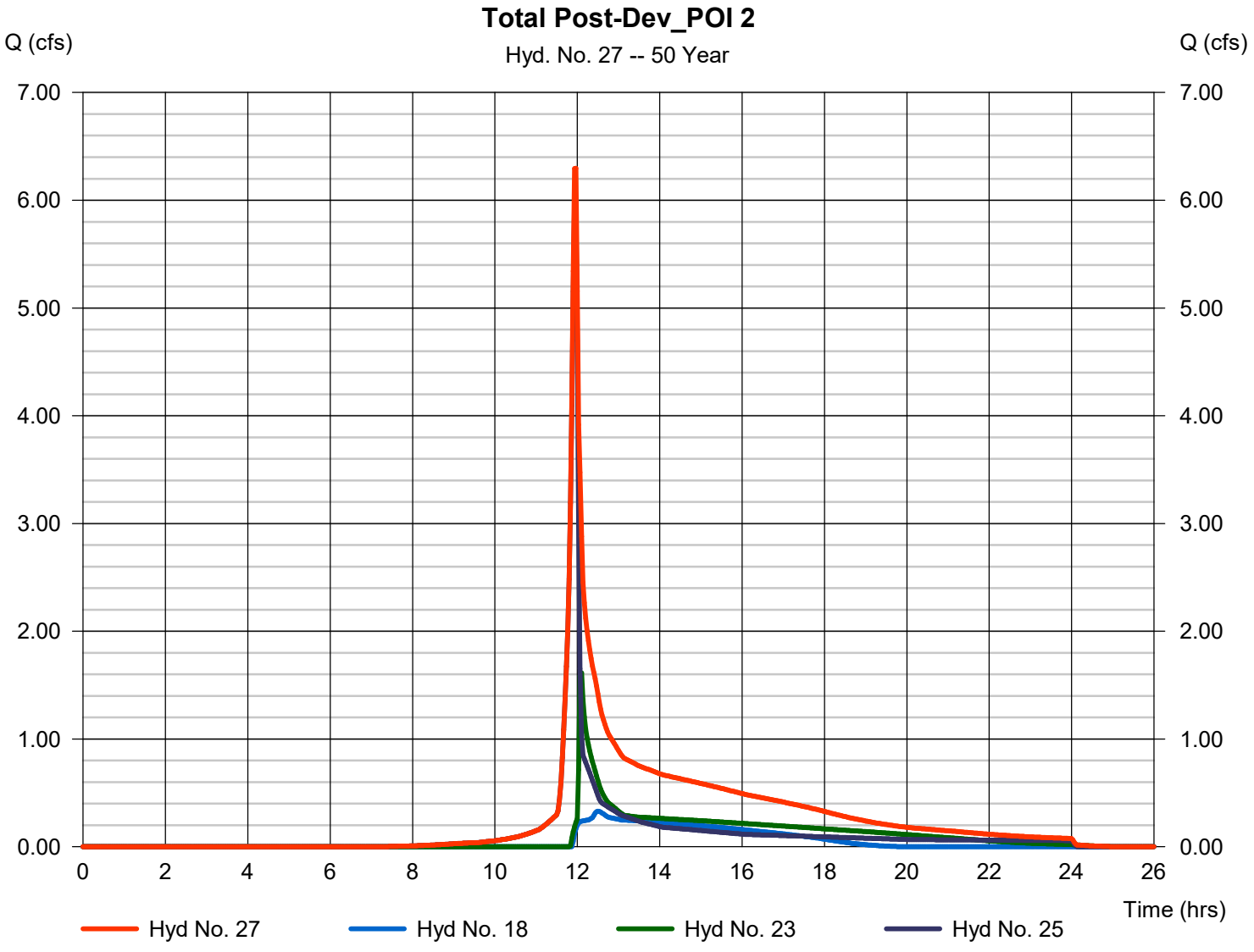
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 27

Total Post-Dev_POI 2

Hydrograph type	= Combine	Peak discharge	= 6.297 cfs
Storm frequency	= 50 yrs	Time to peak	= 11.97 hrs
Time interval	= 2 min	Hyd. volume	= 25,118 cuft
Inflow hyds.	= 18, 23, 25	Contrib. drain. area	= 0.978 ac



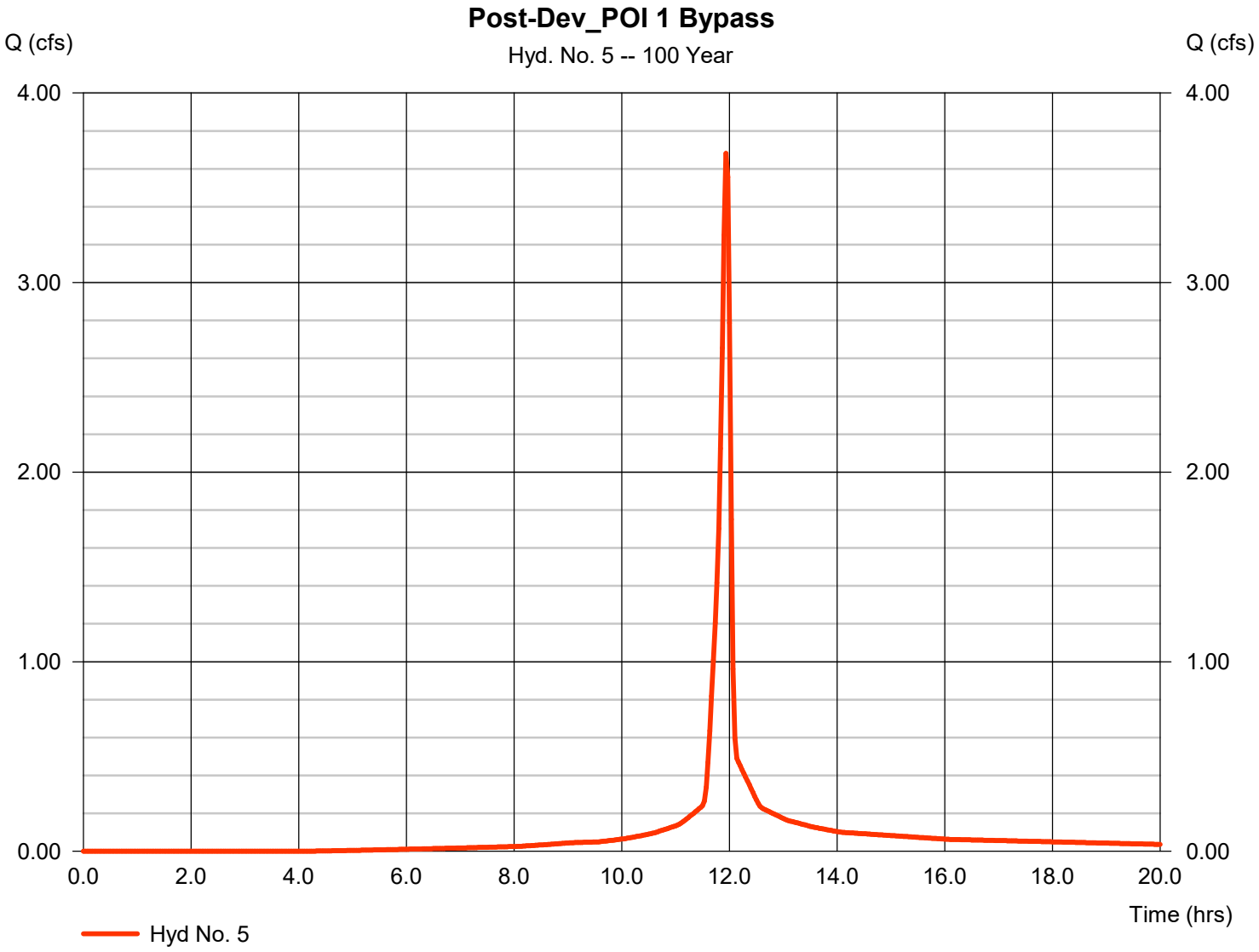
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 5

Post-Dev_POI 1 Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 3.682 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 7,841 cuft
Drainage area	= 0.429 ac	Curve number	= 85.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



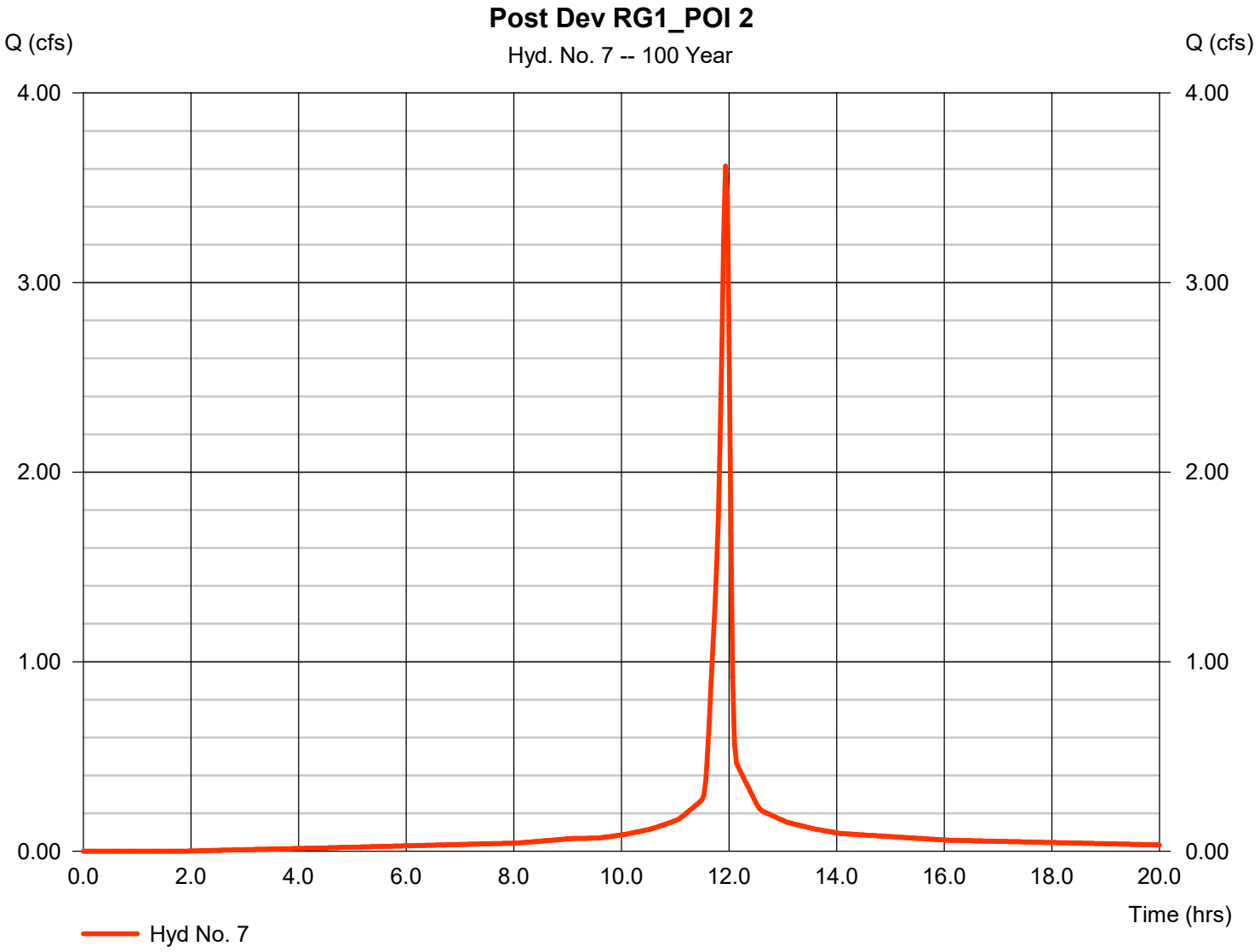
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 7

Post Dev RG1_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 3.614 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 8,258 cuft
Drainage area	= 0.382 ac	Curve number	= 93.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

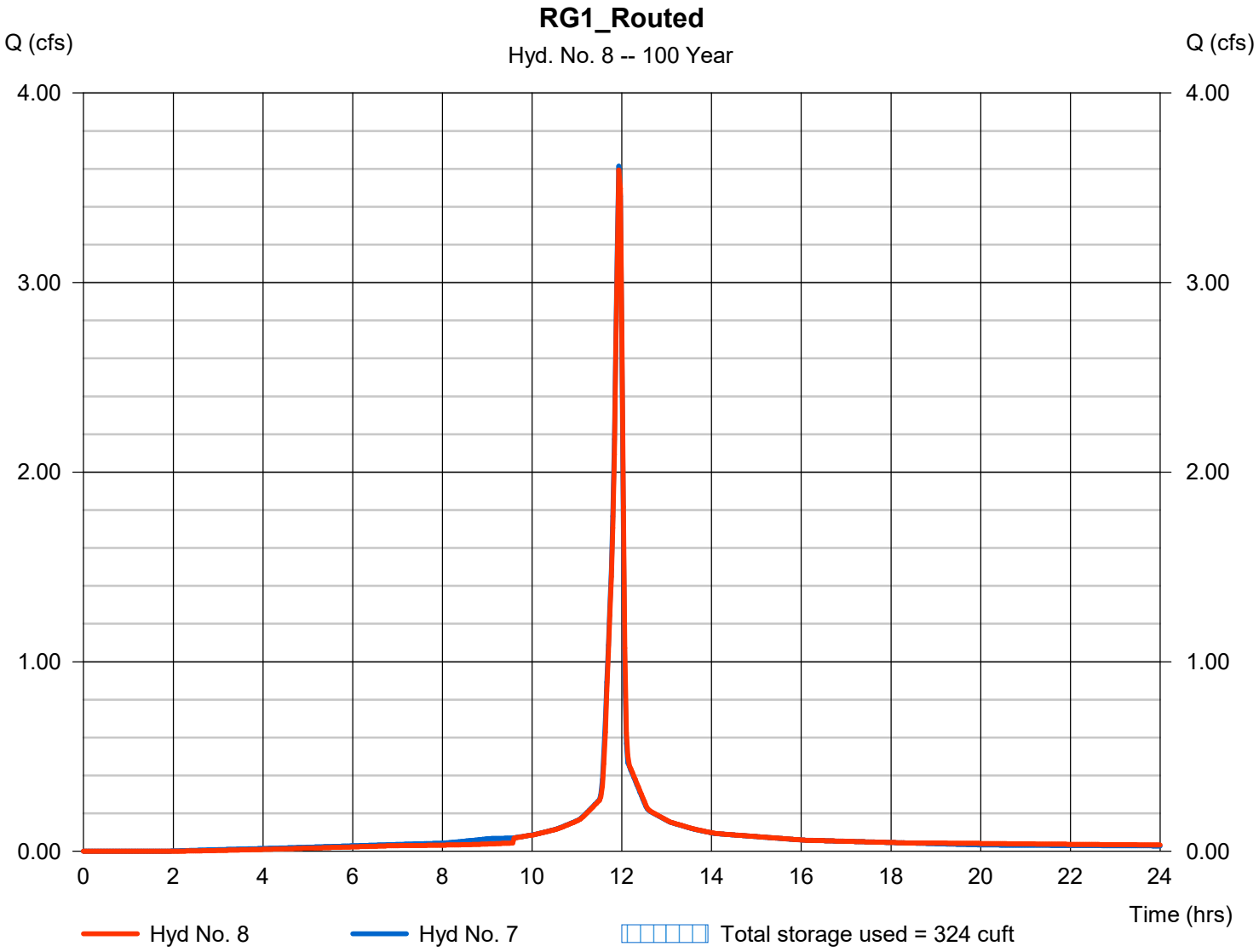
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 8

RG1_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	3.594 cfs
Storm frequency	=	100 yrs	Time to peak	=	11.93 hrs
Time interval	=	2 min	Hyd. volume	=	8,255 cuft
Inflow hyd. No.	=	7 - Post Dev RG1_POI 2	Max. Elevation	=	236.77 ft
Reservoir name	=	RG#1	Max. Storage	=	324 cuft

Storage Indication method used. Outflow includes exfiltration.



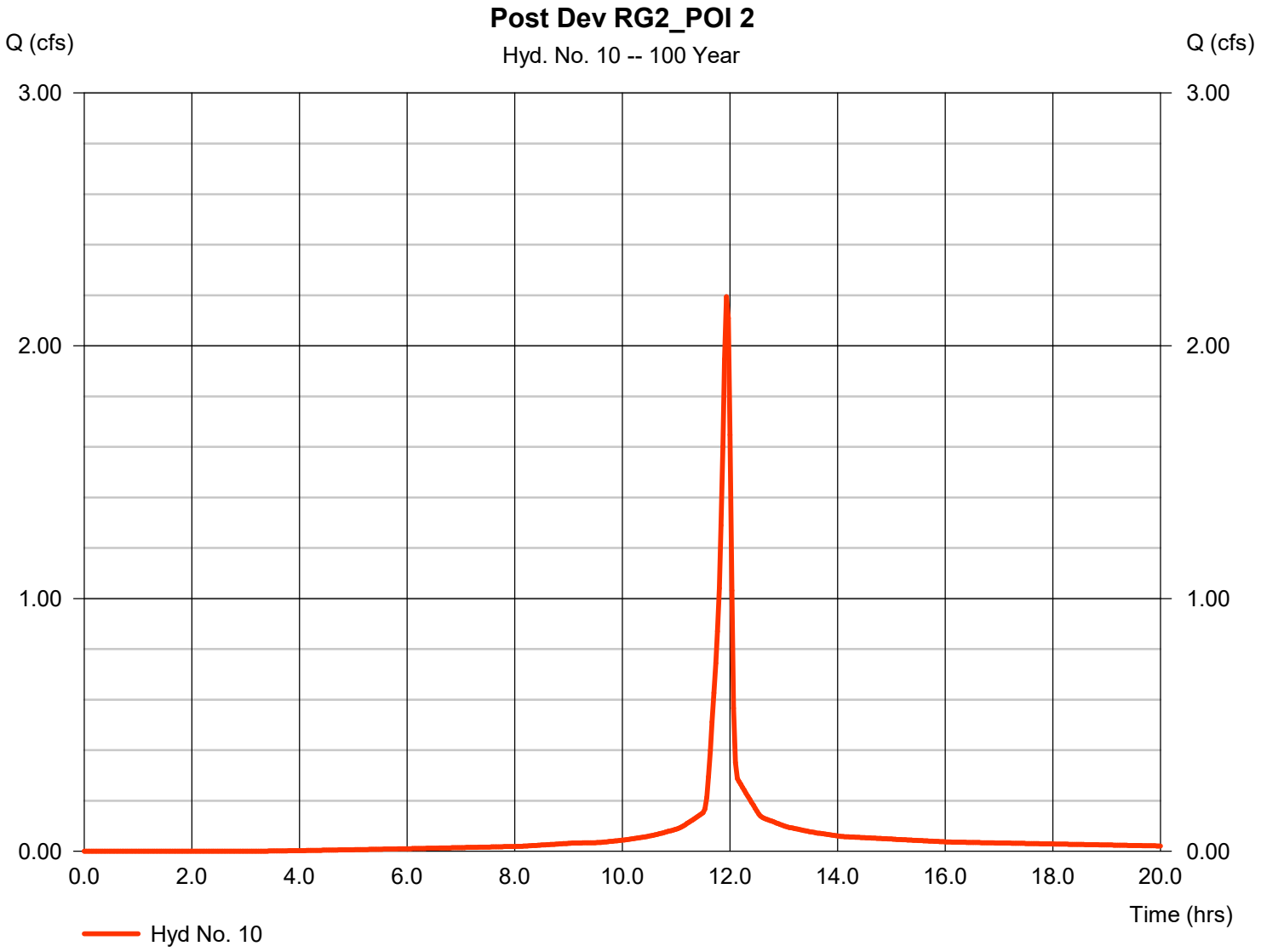
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 10

Post Dev RG2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.194 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 4,783 cuft
Drainage area	= 0.244 ac	Curve number	= 88.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

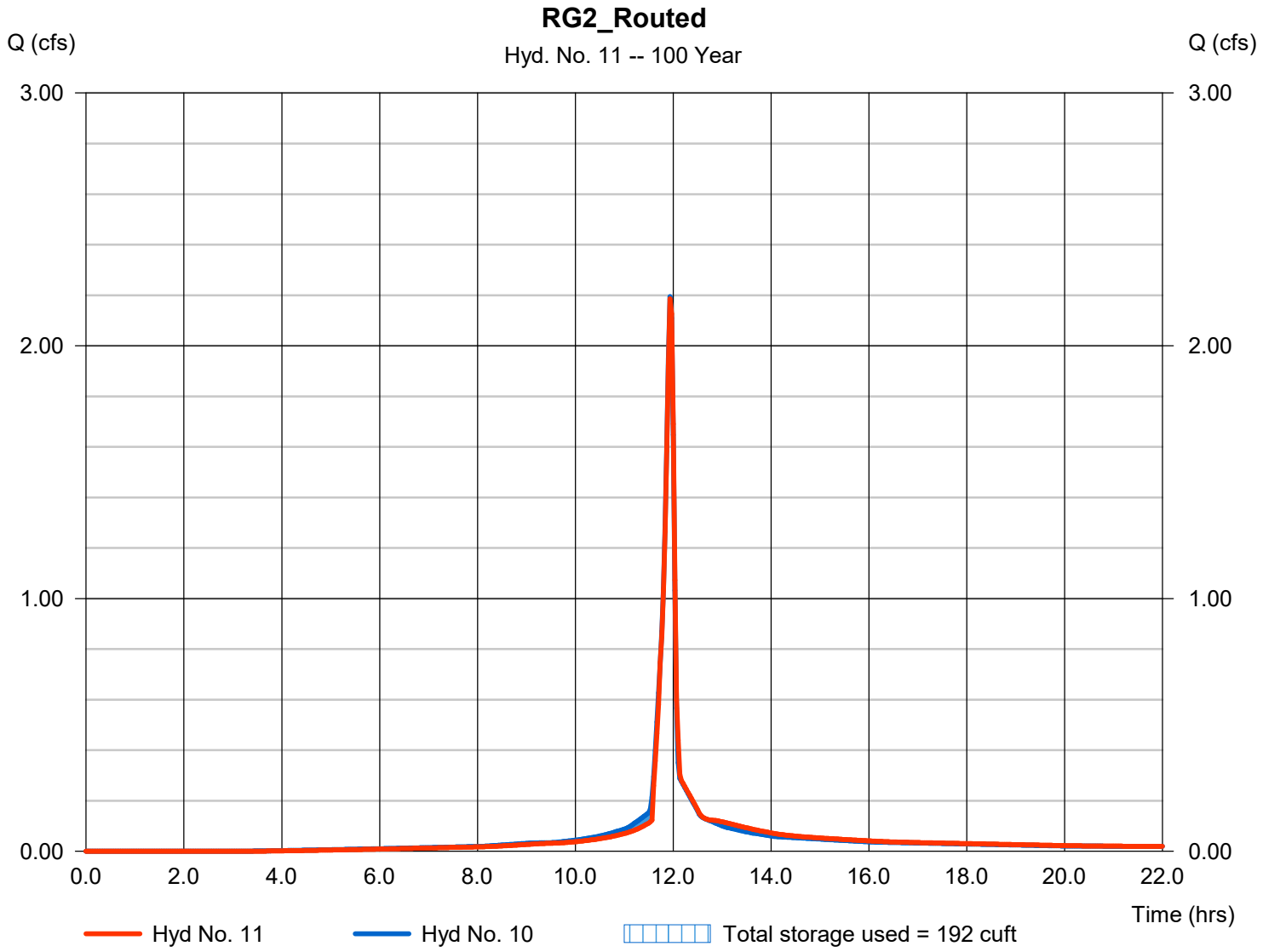
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 11

RG2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 2.185 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 4,781 cuft
Inflow hyd. No.	= 10 - Post Dev RG2_POI 2	Max. Elevation	= 237.86 ft
Reservoir name	= RG#2	Max. Storage	= 192 cuft

Storage Indication method used. Outflow includes exfiltration.



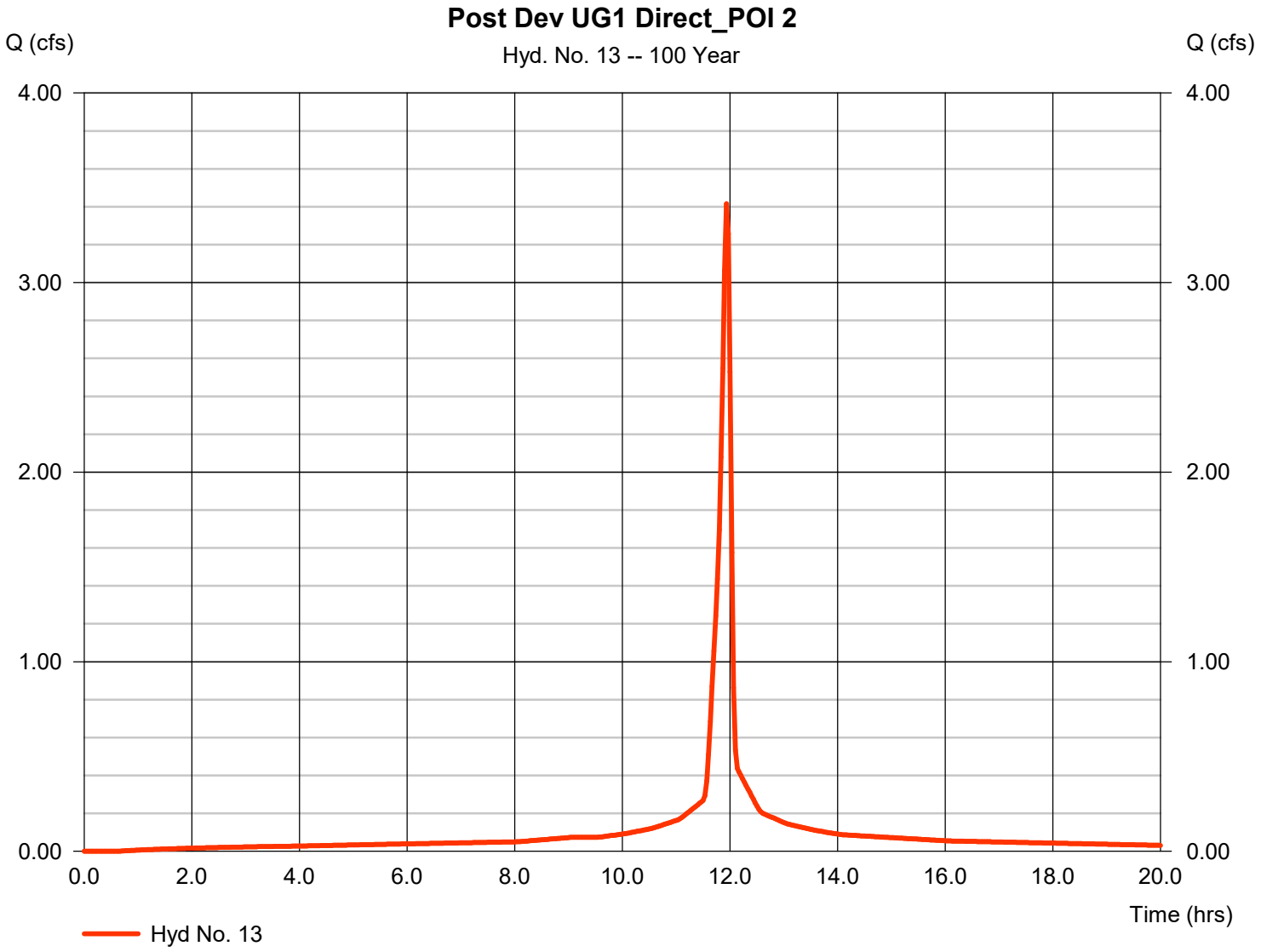
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 13

Post Dev UG1 Direct_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 3.415 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 8,242 cuft
Drainage area	= 0.353 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

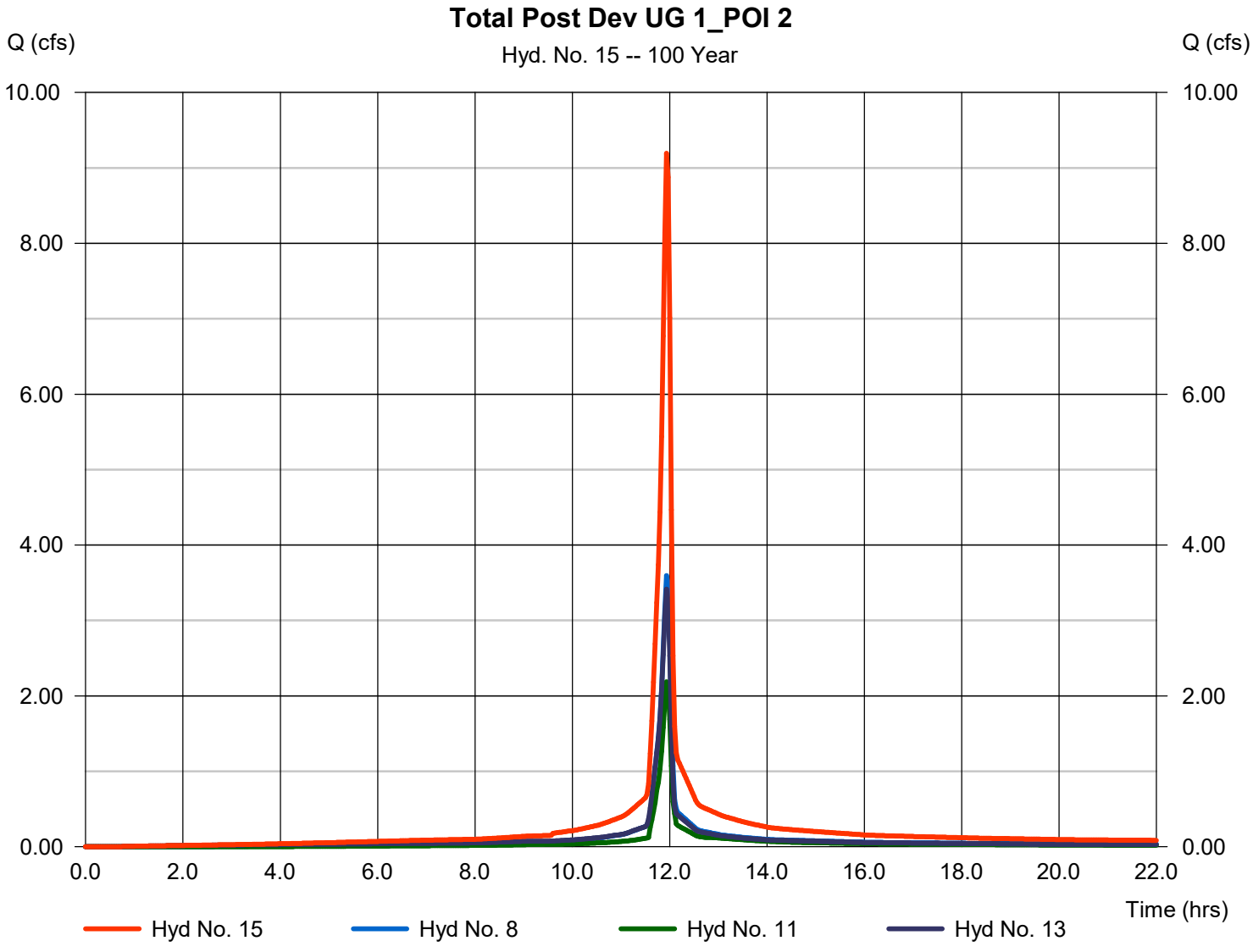


Hydrograph Report

Hyd. No. 15

Total Post Dev UG 1_POI 2

Hydrograph type	= Combine	Peak discharge	= 9.195 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 21,278 cuft
Inflow hyds.	= 8, 11, 13	Contrib. drain. area	= 0.353 ac



Hydrograph Report

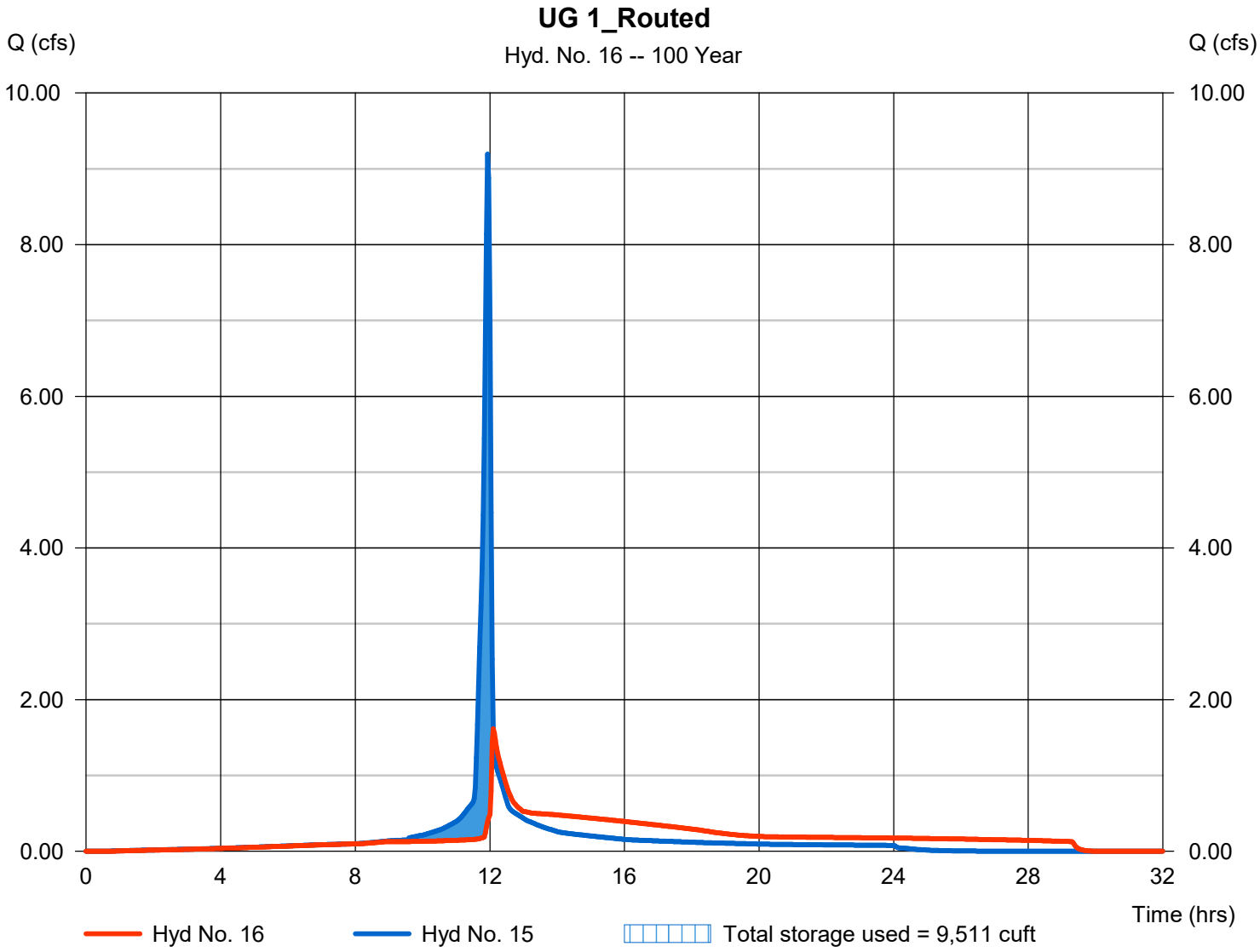
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 16

UG 1_Routed

Hydrograph type	=	Reservoir	Peak discharge	=	1.614 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	21,278 cuft
Inflow hyd. No.	=	15 - Total Post Dev UG 1_POI2	Max. Elevation	=	233.19 ft
Reservoir name	=	UG #1	Max. Storage	=	9,511 cuft

Storage Indication method used. Outflow includes exfiltration.

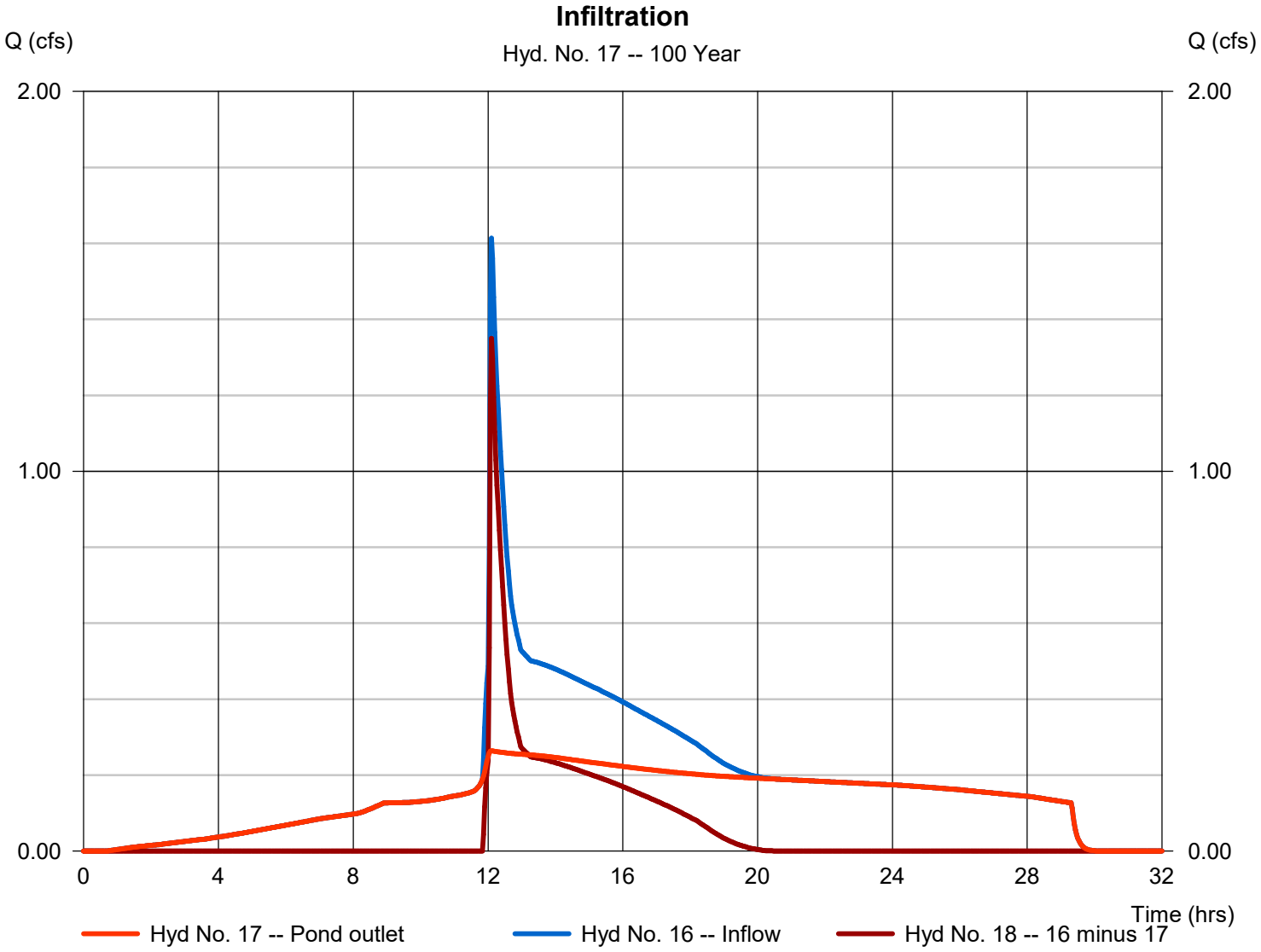


Hydrograph Report

Hyd. No. 17

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.264 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 15,287 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 18
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration

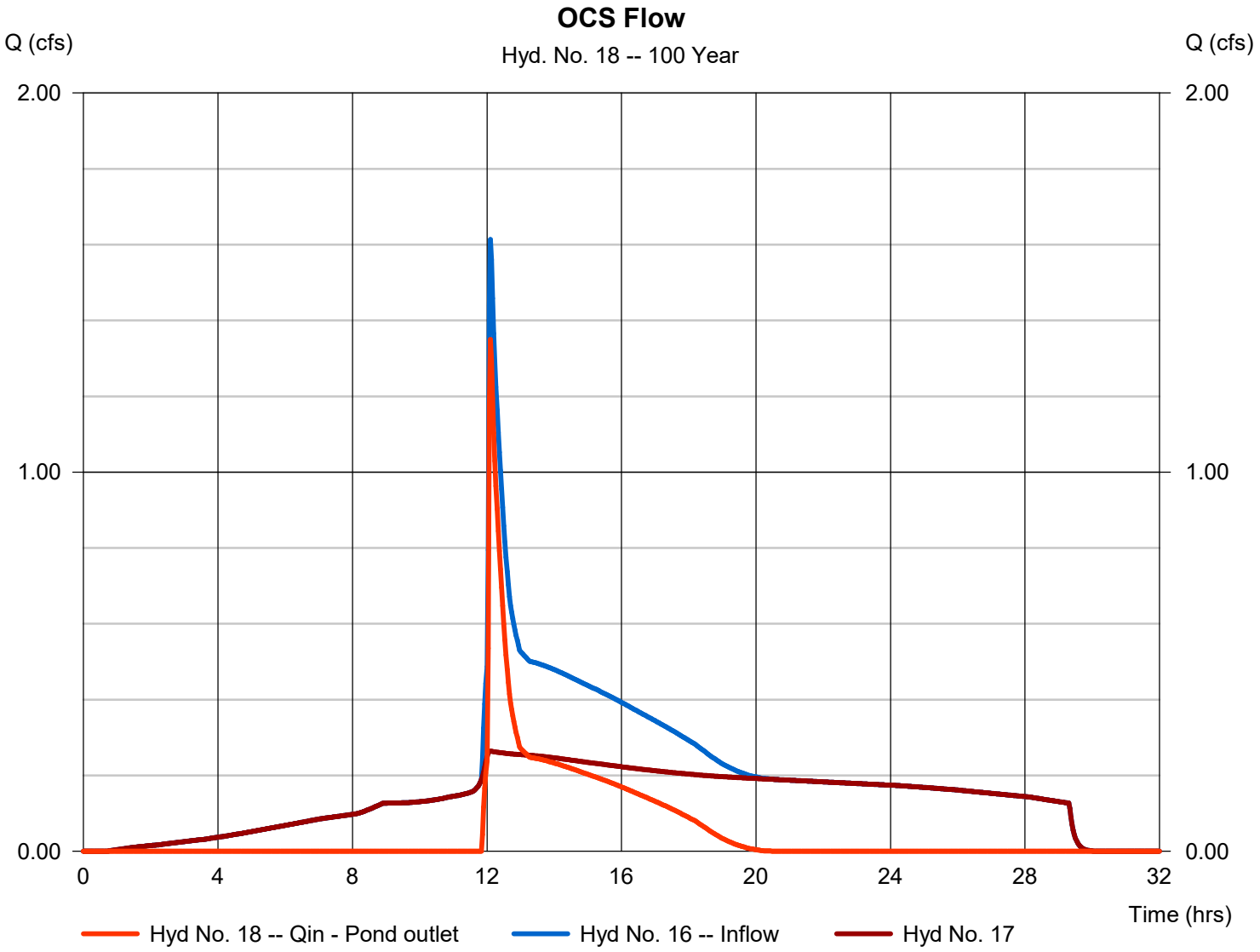


Hydrograph Report

Hyd. No. 18

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 1.350 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 5,991 cuft
Inflow hydrograph	= 16 - UG 1_Routed	2nd diverted hyd.	= 17
Diversion method	= Pond - UG #1	Pond structure	= Exfiltration



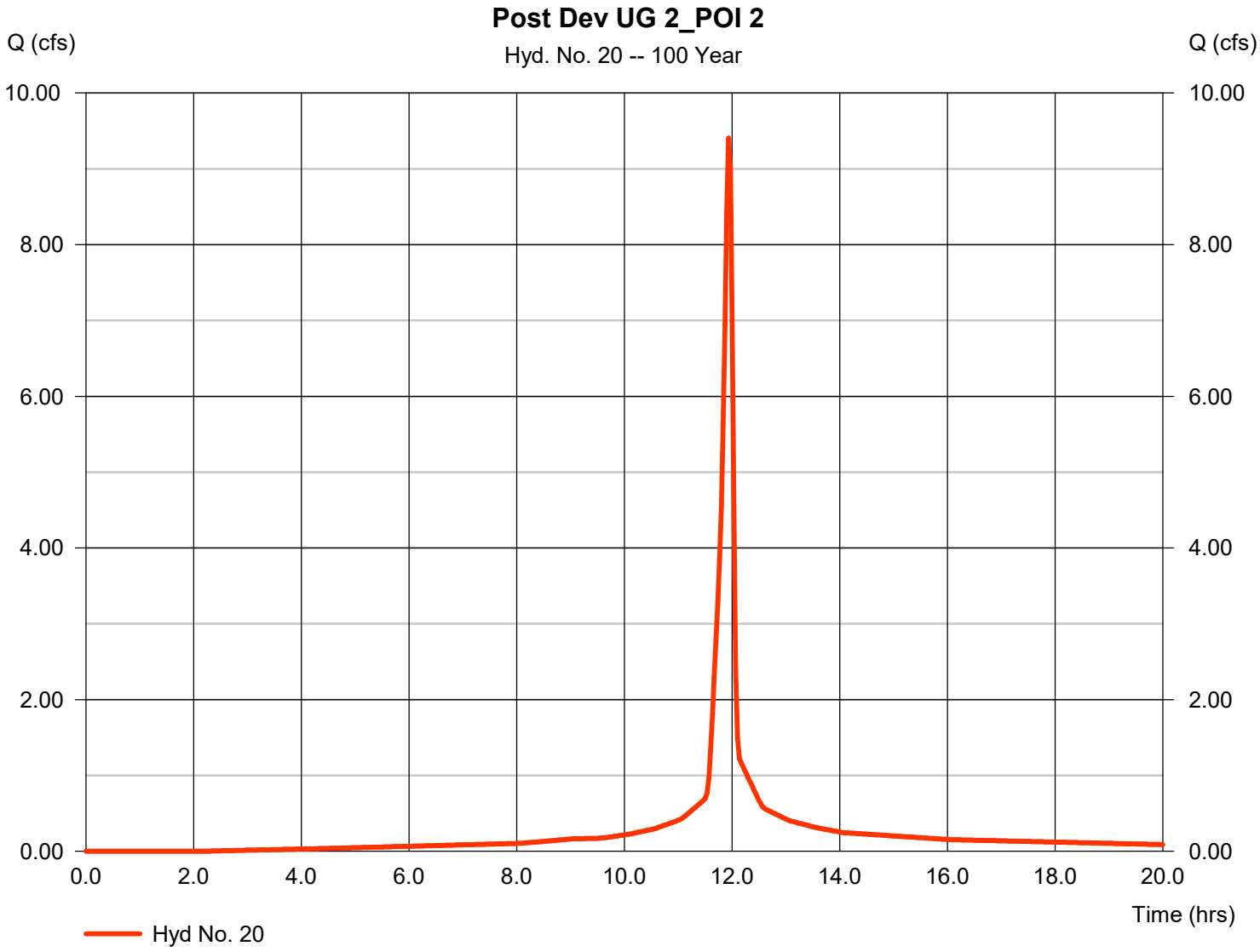
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 20

Post Dev UG 2_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 9.406 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 21,206 cuft
Drainage area	= 1.005 ac	Curve number	= 92.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

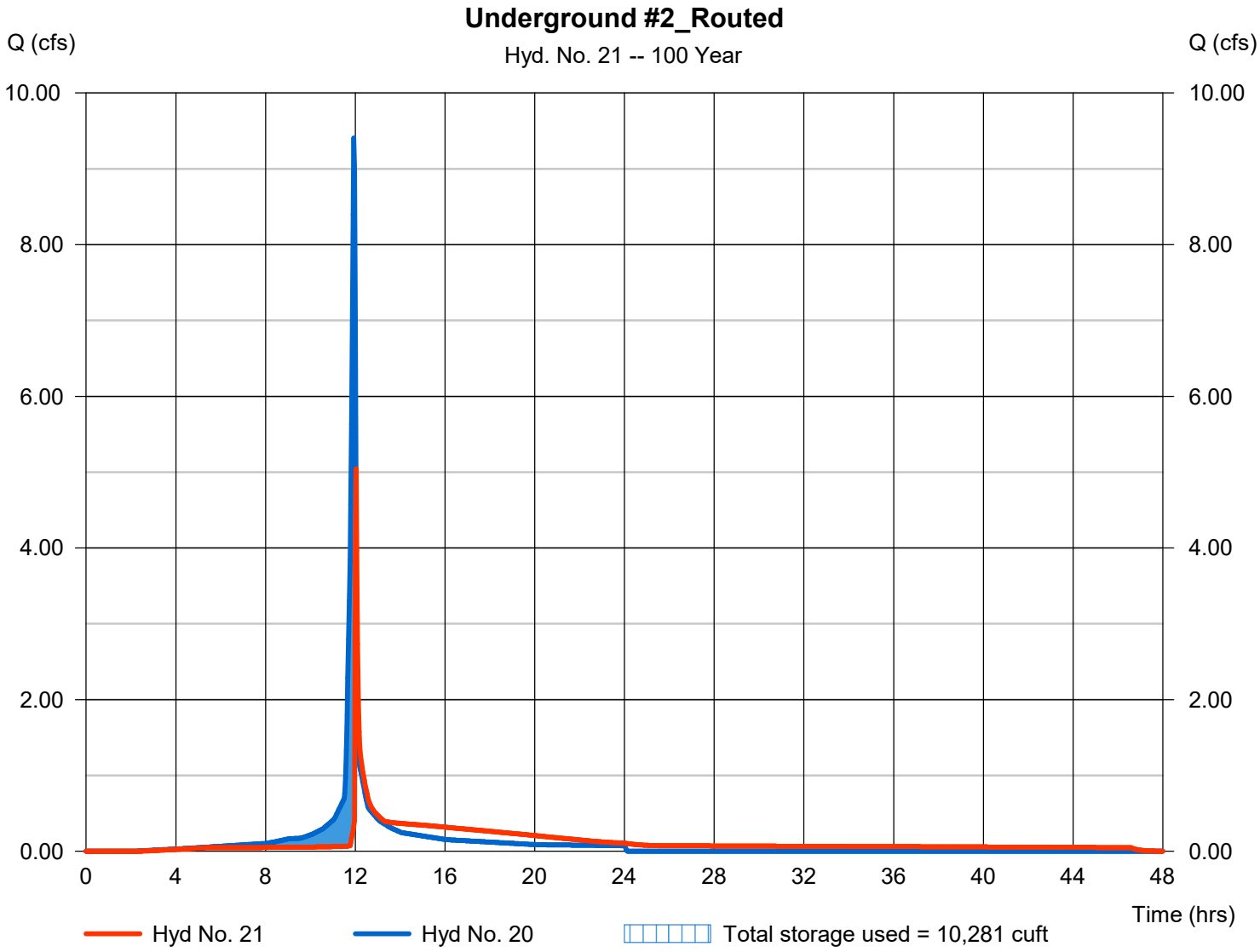
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 21

Underground #2_Routed

Hydrograph type	= Reservoir	Peak discharge	= 5.043 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 21,204 cuft
Inflow hyd. No.	= 20 - Post Dev UG 2_POI 2	Max. Elevation	= 234.52 ft
Reservoir name	= UG #2	Max. Storage	= 10,281 cuft

Storage Indication method used. Outflow includes exfiltration.



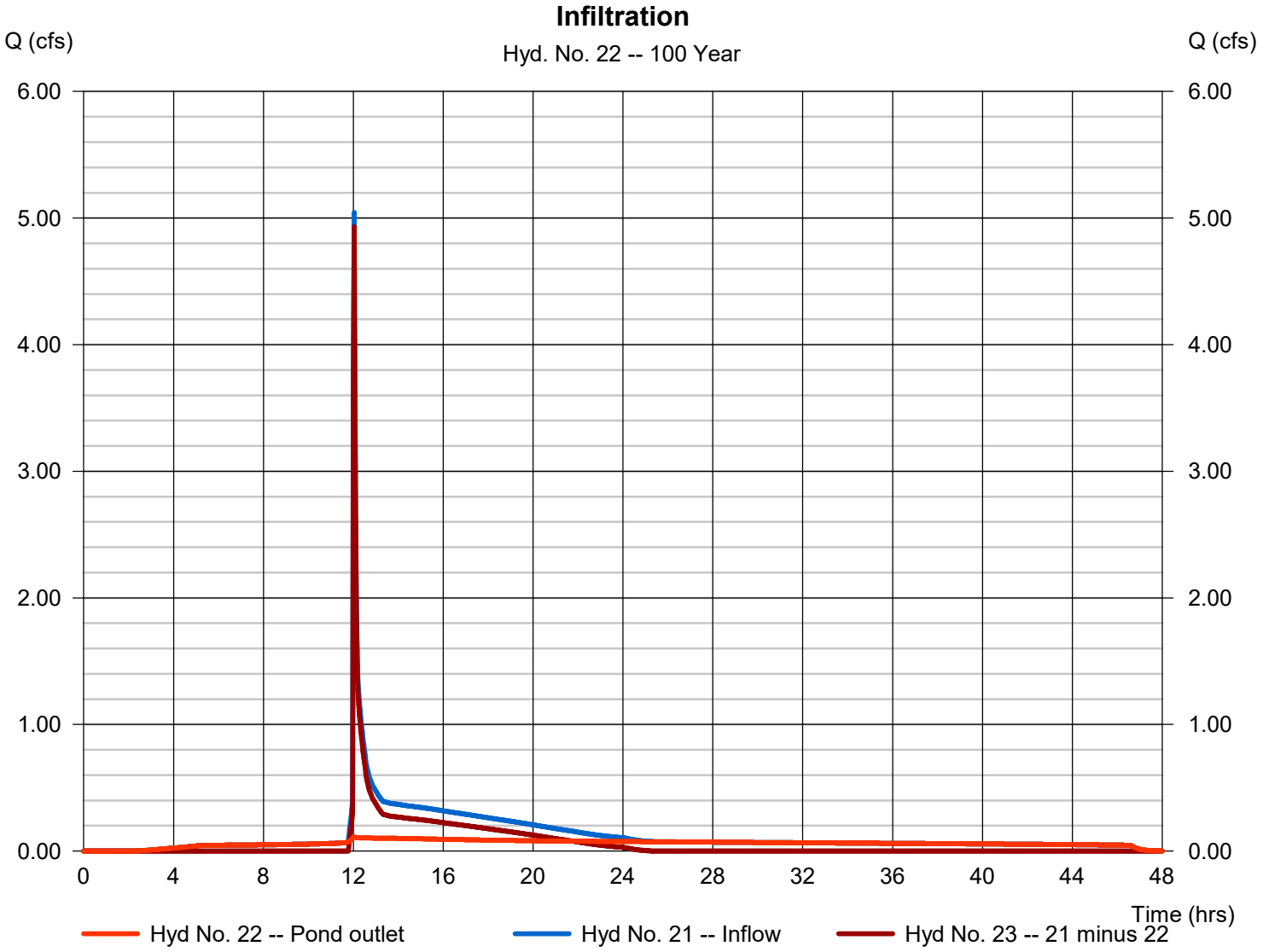
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 22

Infiltration

Hydrograph type	= Diversion1	Peak discharge	= 0.111 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 10,427 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 23
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration

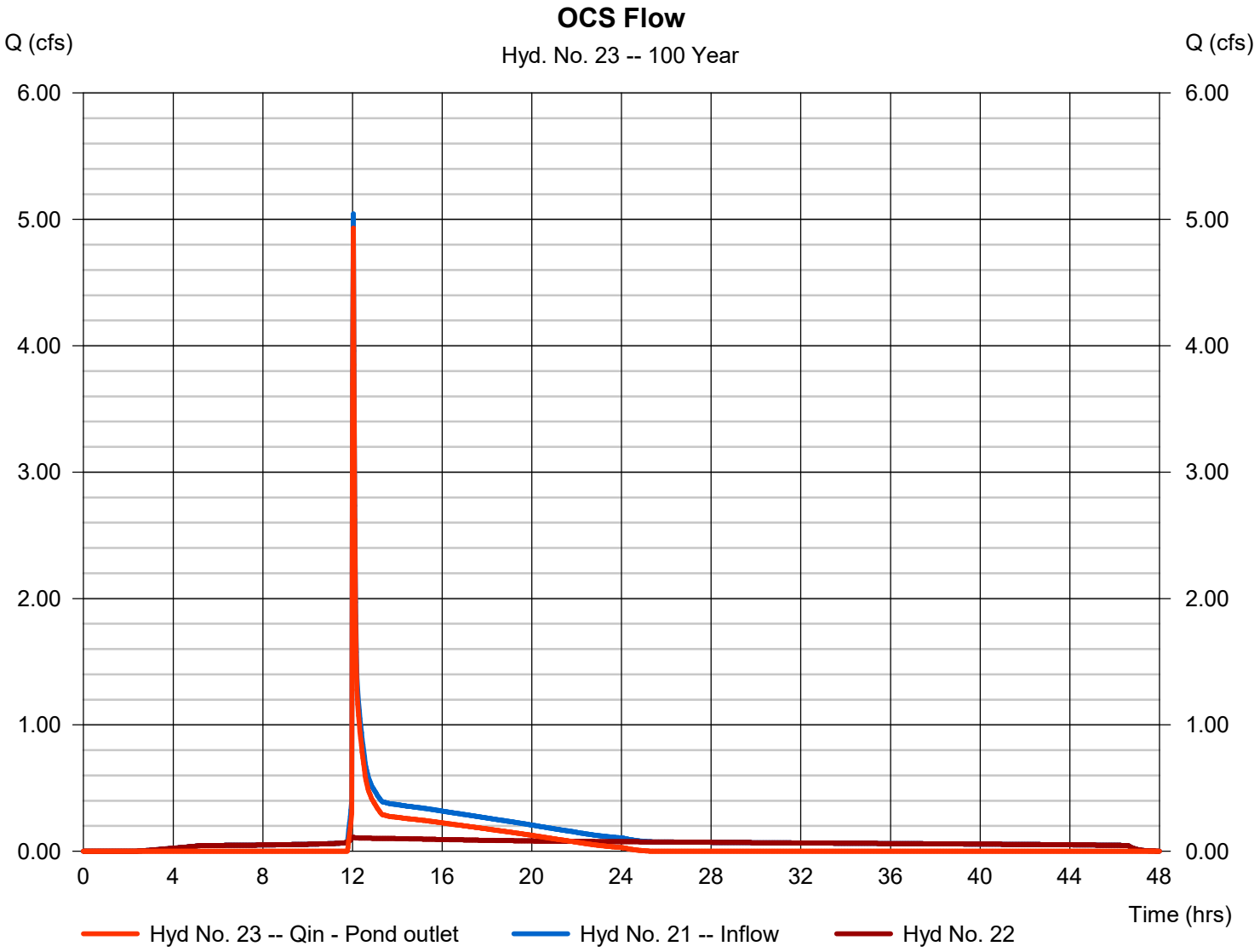


Hydrograph Report

Hyd. No. 23

OCS Flow

Hydrograph type	= Diversion2	Peak discharge	= 4.932 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 10,777 cuft
Inflow hydrograph	= 21 - Underground #2_Routed	2nd diverted hyd.	= 22
Diversion method	= Pond - UG #2	Pond structure	= Exfiltration



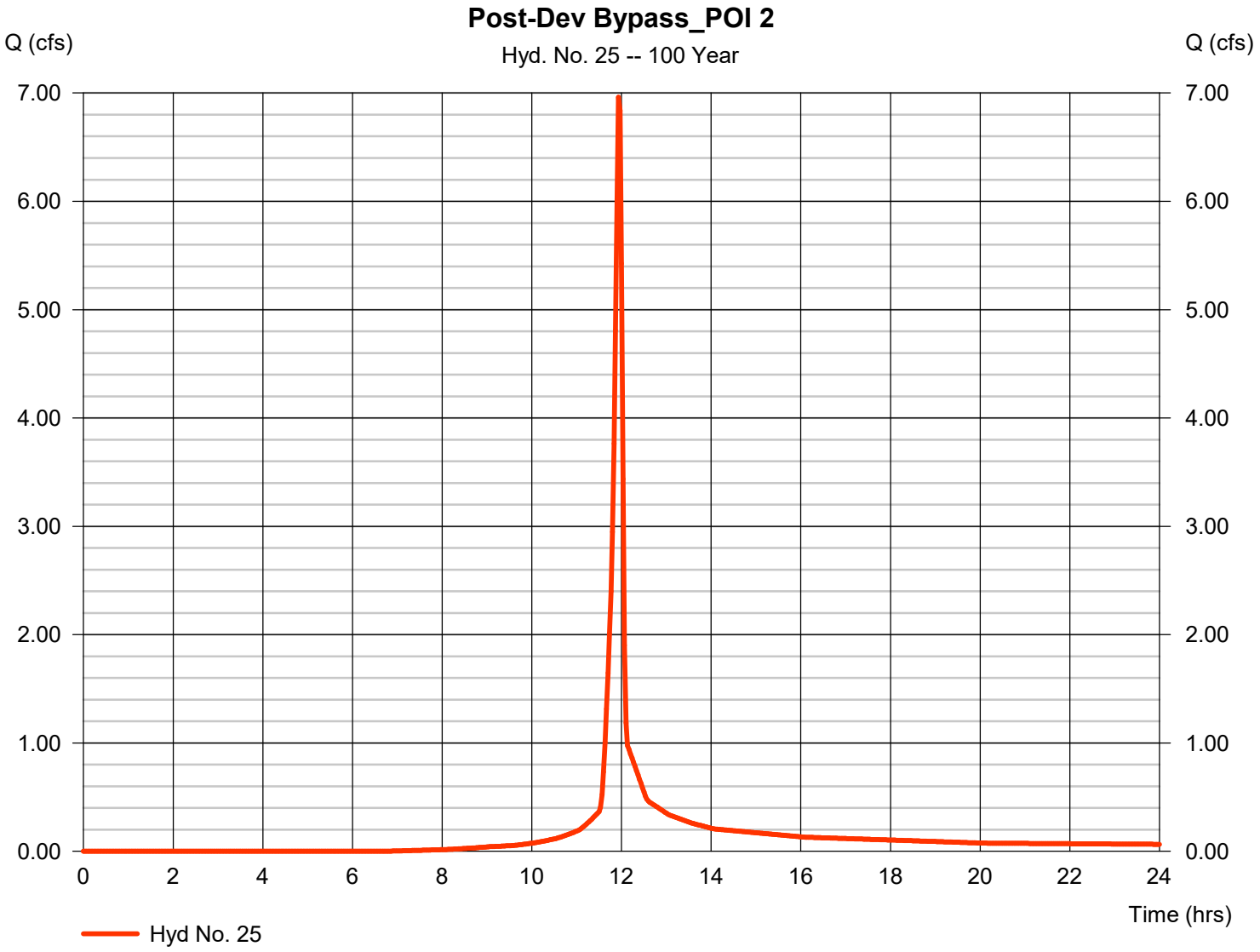
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 25

Post-Dev Bypass_POI 2

Hydrograph type	= SCS Runoff	Peak discharge	= 6.962 cfs
Storm frequency	= 100 yrs	Time to peak	= 11.93 hrs
Time interval	= 2 min	Hyd. volume	= 14,212 cuft
Drainage area	= 0.978 ac	Curve number	= 75.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.10 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



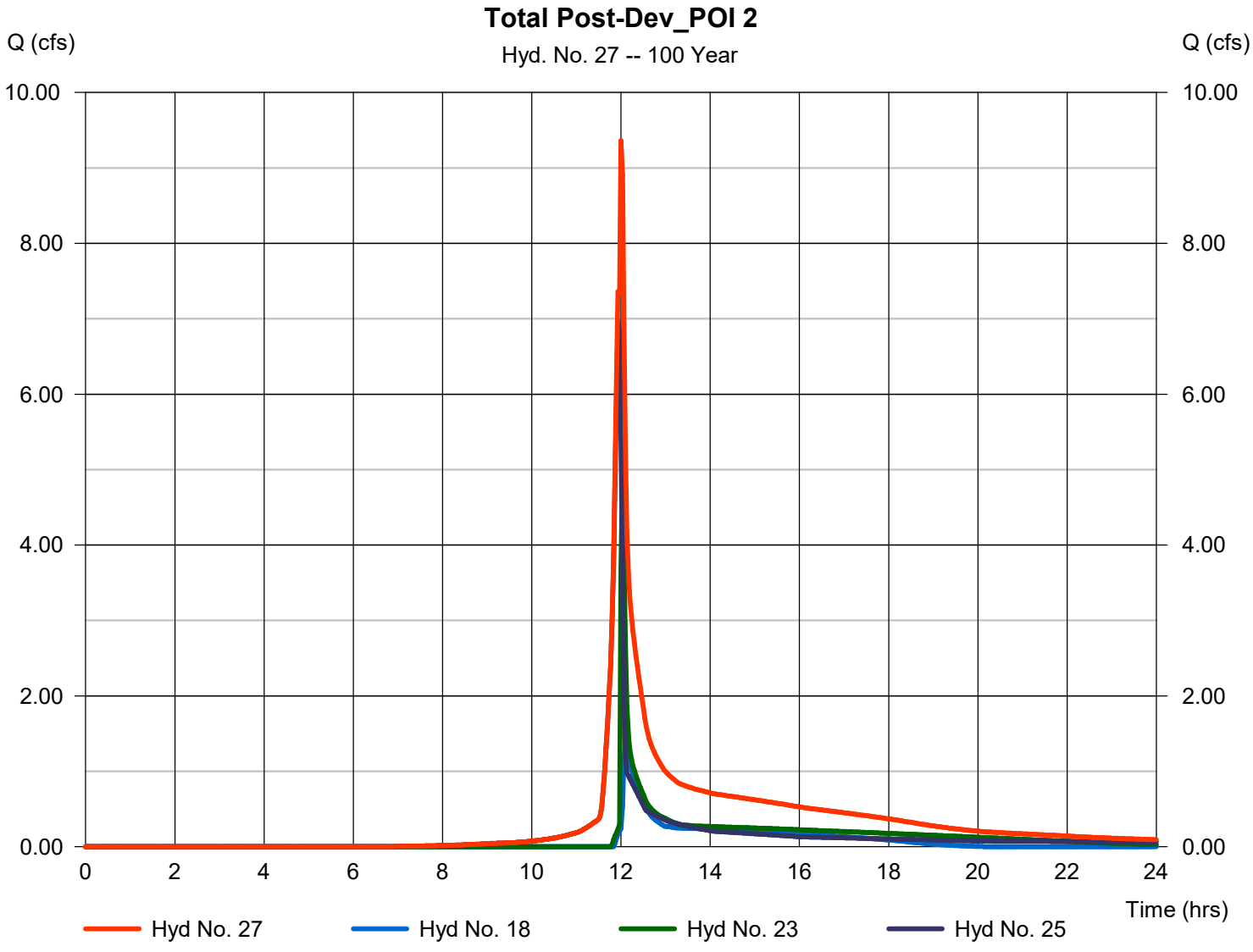
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 09 / 27 / 2018

Hyd. No. 27

Total Post-Dev_POI 2

Hydrograph type	= Combine	Peak discharge	= 9.363 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 30,981 cuft
Inflow hyds.	= 18, 23, 25	Contrib. drain. area	= 0.978 ac



Actual Runoff Volume for 2-Year Storm Event

BMP: **Underground Infiltration Basin #1**
Drainage Area: **0.95**
2-Year Rainfall: **3.20** in.

Developed Conditions

Cover Type/Condition	Soil Type	Area (Ac)	CN	S	Ia (0.2 x S)	Q Runoff[1] (in)	Runoff Volume[2] (cuft)
Open Space (Lawns), Good Condition	B	0.065	61	6.393	1.279	0.444	105
Open Space (Lawns), Good Condition	D	0.025	98	0.204	0.041	2.967	272
Impervious		0.858	98	0.204	0.041	2.967	9,244
	Total	**0.948**					**9,620**

1. Runoff (in) = Q = (P - 0.2S)^2 / (P + 0.8S) where:
P = 2-year Rainfall (in)
S = (1000/CN) - 10

2. Runoff Volume (cf) = Q x Area x 1/12
Q = Runoff (in)
Area = Land use area (s.f.)

			Design	NPDES Recommended Maximum
Bottom Contour Area	**4,617**	S.F.	**Impervious Loading Ratio =**	**8.1**	5.0
Impervious Area to BMP	**37,380**	S.F.	**Total Area Loading Ratio =**	**8.9**	8.0
Total Area to BMP	**41,309**	S.F.			

Volume Credit for Infiltration Capacity

Basin Storage Volume = (Area (sf) x Depth (ft)) x 40% voids

Bottom Stone Area =	4,617	sf
Basin Ponding Depth =	1.25	ft
Total Volume of Stone =	5,771	CF

Infiltration Volume = (Infil. Rate (in./hr.)) x Area (sf) x Infil. Time)

Infiltration Rate =	1.25	in./hr.
Bottom Stone Area =	4,617	sf
Infiltration Time =	24	hr.
Infiltration Volume =	11,543	CF

Max. Available Storage/Infiltration Volume =	17,314	CF	***
Max. Credited Storage/Infiltration Volume =	9,620	CF	***

*** Basin Inflow due to tributary drainage area is less than the basin total storage and infiltration volume and, thus, the Basin Inflow is the determining volume credit for Worksheet #5.

Actual Runoff Volume for 2-Year Storm Event

BMP: **Underground Infiltration Basin #2**
Drainage Area: **1.00**
2-Year Rainfall: **3.20** in.

Developed Conditions

Cover Type/Condition	Soil Type	Area (Ac)	CN	S	Ia (0.2 x S)	Q Runoff[1] (in)	Runoff Volume[2] (cuft)
Open Space (Lawns), Good Condition	B	0.31	61	6.393	1.279	0.444	506
Open Space (Lawns), Good Condition	D	0.00	98	0.204	0.041	2.967	0
Impervious		0.69	98	0.204	0.041	2.967	7,441
	Total	**1.00**					**7,947**

1. Runoff (in) = Q = (P - 0.2S)^2 / (P + 0.8S) where:
P = 2-year Rainfall (in)
S = (1000/CN) - 10

2. Runoff Volume (cf) = Q x Area x 1/12
Q = Runoff (in)
Area = Land use area (s.f.)

			Design	NPDES Recommended Maximum
Bottom Contour Area	**4,208**	S.F.	**Impervious Loading Ratio =**	**7.2**	5.0
Impervious Area to BMP	**30,089**	S.F.	**Total Area Loading Ratio =**	**10.4**	8.0
Total Area to BMP	**43,774**	S.F.			

Volume Credit for Infiltration Capacity

Basin Storage Volume = (Area (sf) x Depth (ft)) x 40% voids

Bottom Stone Area =	4,208	sf
Basin Ponding Depth =	1.50	ft
Total Volume of Stone =	6,312	CF

Infiltration Volume = (Infil. Rate (in./hr.)) x Area (sf) x Infil. Time)

Infiltration Rate =	0.50	in./hr.
Bottom Stone Area =	4,208	sf
Infiltration Time =	24	hr.
Infiltration Volume =	4,208	CF

Max. Available Storage/Infiltration Volume =	10,520	CF	***
Max. Credited Storage/Infiltration Volume =	7,947	CF	***

*** Basin Inflow due to tributary drainage area is less than the basin total storage and infiltration volume and, thus, the Basin Inflow is the determining volume credit for Worksheet #5.

CULTEC Recharger® 330XLHD Stormwater Chamber

The Recharger® 330XLHD is a 30.5" (775 mm) tall, high capacity chamber. Typically when using this model, fewer chambers are required resulting in less labor and a smaller installation area. The Recharger® 330XLHD has the side portal internal manifold feature. HVLV® FC-24 Feed Connectors are inserted into the side portals to create the internal manifold.

Size (L x W x H)	8.5' x 52" x 30.5" 2.59 m x 1321 mm x 775 mm
Installed Length	7' 2.13 m
Length Adjustment per Run	1.50' 0.46 m
Chamber Storage	7.46 ft³/ft 0.69 m³/m 52.21 ft³/unit 1.48 m³/unit
Min. Installed Storage	11.32 ft³/ft 1.05 m³/m 79.26 ft³/unit 2.24 m³/unit
Min. Area Required	33.83 ft² 3.14 m²
Min. Center-to-Center Spacing	4.83' 1.47 m
Max. Allowable Cover	12' 3.66 m
Max. Inlet Opening in End Wall	24" 600 mm
Max. Allowable O.D. in Side Portal	11.75" 298 mm
Compatible Feed Connector	HVLV FC-24 Feed Connector

Calculations are based on installed chamber length.
Min. installed storage includes 6" (152 mm) stone base, 6" (152 mm) stone above crown of chamber and typical stone surround at 58" (1473 mm) center-to-center spacing.

	Stone Foundation Depth		
	6" 152 mm	12" 305 mm	18" 457 mm
Chamber and Stone Storage Per Chamber	79.26 ft³ 2.24 m³	86.03 ft³ 2.44 m³	92.79 ft³ 2.63 m³
Min. Effective Depth	3.54' 1.08 m	4.04' 1.23 m	4.54' 1.38 m
Stone Required Per Chamber	2.50 yd³ 1.91 m³	3.13 yd³ 2.39 m³	3.76 yd³ 2.87 m³

Calculations are based on installed chamber length.
Includes 6" (305 mm) stone above crown of chamber and typical stone surround at 58"(1473 mm) center-to-center spacing and stone foundation as listed in table.
Stone void calculated at 40%.

Recharger® 330XLHD Bare Chamber Storage Volumes

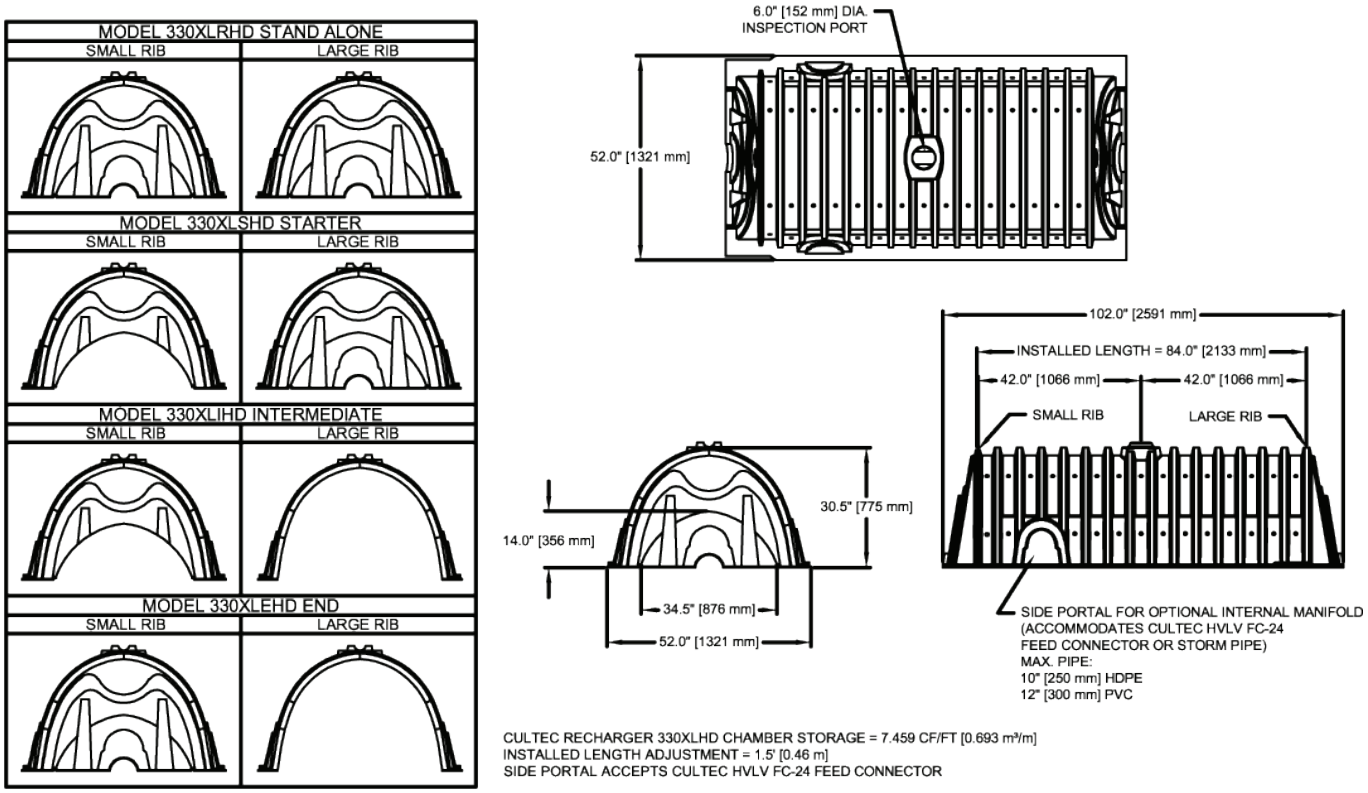
Elevation		Incremental Storage Volume				Cumulative Storage	
in.	mm	ft³/ft	m³/m	ft³	m³	ft³	m³
30.5	775	0.000	0.000	0.000	0.000	52.213	1.479
30	762	0.019	0.002	0.133	0.004	52.213	1.479
29	737	0.051	0.005	0.357	0.010	52.080	1.475
28	711	0.084	0.008	0.588	0.017	51.723	1.465
27	686	0.124	0.012	0.868	0.025	51.135	1.448
26	660	0.150	0.014	1.05	0.030	50.267	1.424
25	635	0.173	0.016	1.211	0.034	49.217	1.394
24	609	0.191	0.018	1.337	0.038	48.006	1.360
23	584	0.207	0.019	1.449	0.041	46.669	1.322
22	559	0.221	0.021	1.547	0.044	45.220	1.281
21	533	0.233	0.022	1.631	0.046	43.673	1.237
20	508	0.244	0.023	1.708	0.048	42.042	1.191
19	483	0.254	0.024	1.778	0.050	40.334	1.142
18	457	0.264	0.025	1.848	0.052	38.556	1.092
17	432	0.271	0.025	1.897	0.054	36.708	1.040
16	406	0.283	0.026	1.981	0.056	34.811	0.986
15	381	0.294	0.027	2.058	0.058	32.830	0.930
14	356	0.296	0.027	2.072	0.059	30.772	0.871
13	330	0.299	0.028	2.093	0.059	28.700	0.813
12	305	0.301	0.028	2.107	0.060	26.607	0.754
11	279	0.303	0.028	2.121	0.060	24.500	0.694
10	254	0.304	0.028	2.128	0.060	22.379	0.634
9	229	0.306	0.028	2.142	0.061	20.251	0.574
8	203	0.313	0.029	2.191	0.062	18.109	0.513
7	178	0.321	0.030	2.247	0.064	15.918	0.451
6	152	0.322	0.030	2.254	0.064	13.671	0.387
5	127	0.323	0.030	2.261	0.064	11.417	0.323
4	102	0.324	0.030	2.268	0.064	9.156	0.259
3	76	0.325	0.030	2.275	0.064	6.888	0.195
2	51	0.327	0.030	2.289	0.065	4.613	0.131
1	25	0.332	0.031	2.324	0.066	2.324	0.066
Total		**7.459**	**0.693**	**52.213**	**1.479**	**52.213**	**1.479**

Calculations are based on installed chamber length.

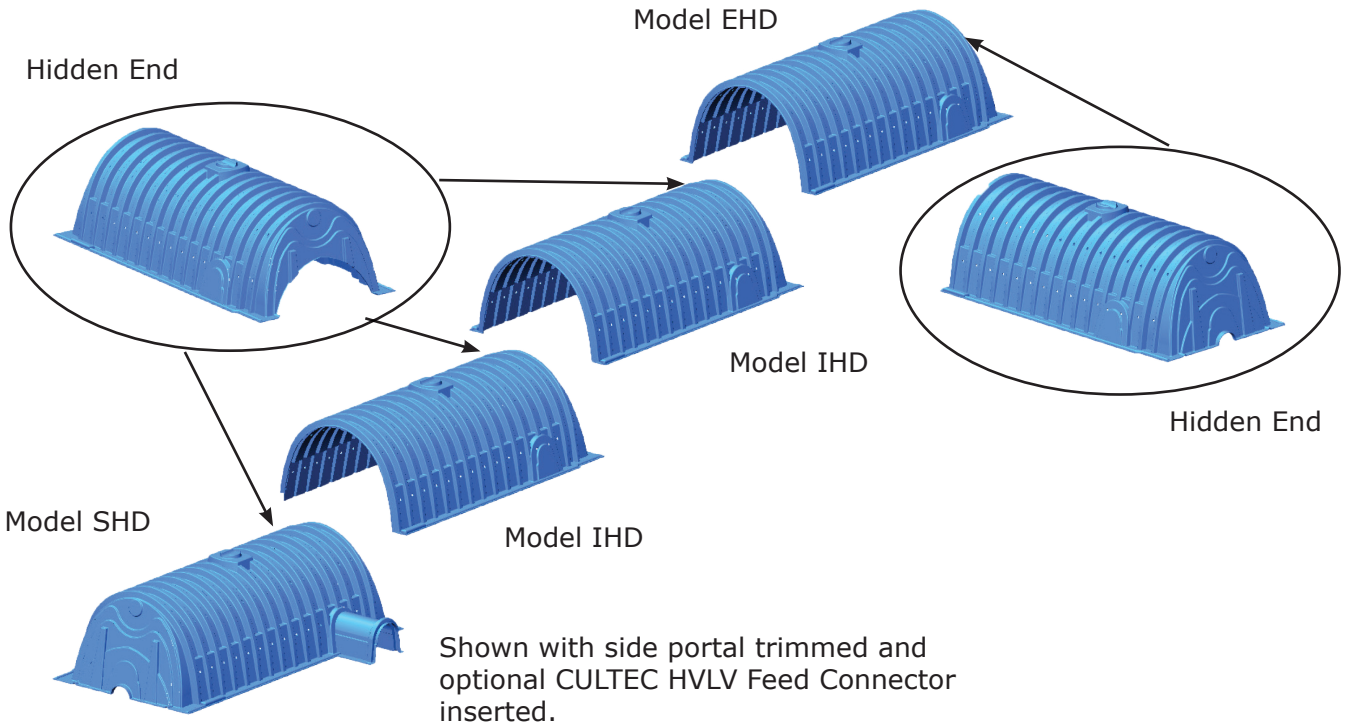
Visit http://cultec.com/downloads/
for Product Downloads and CAD details.

For more information, contact CULTEC at (203) 775-4416 or visit www.cultec.com.

Three View Drawing

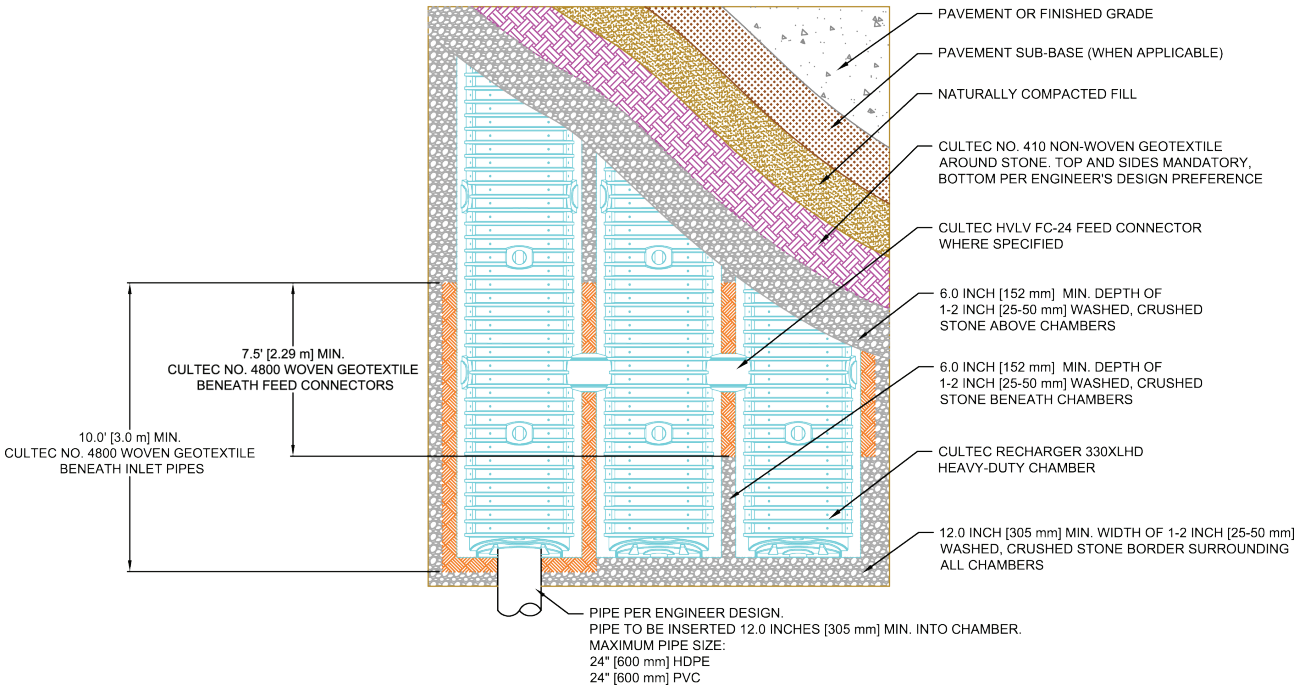


Typical Interlock Installation

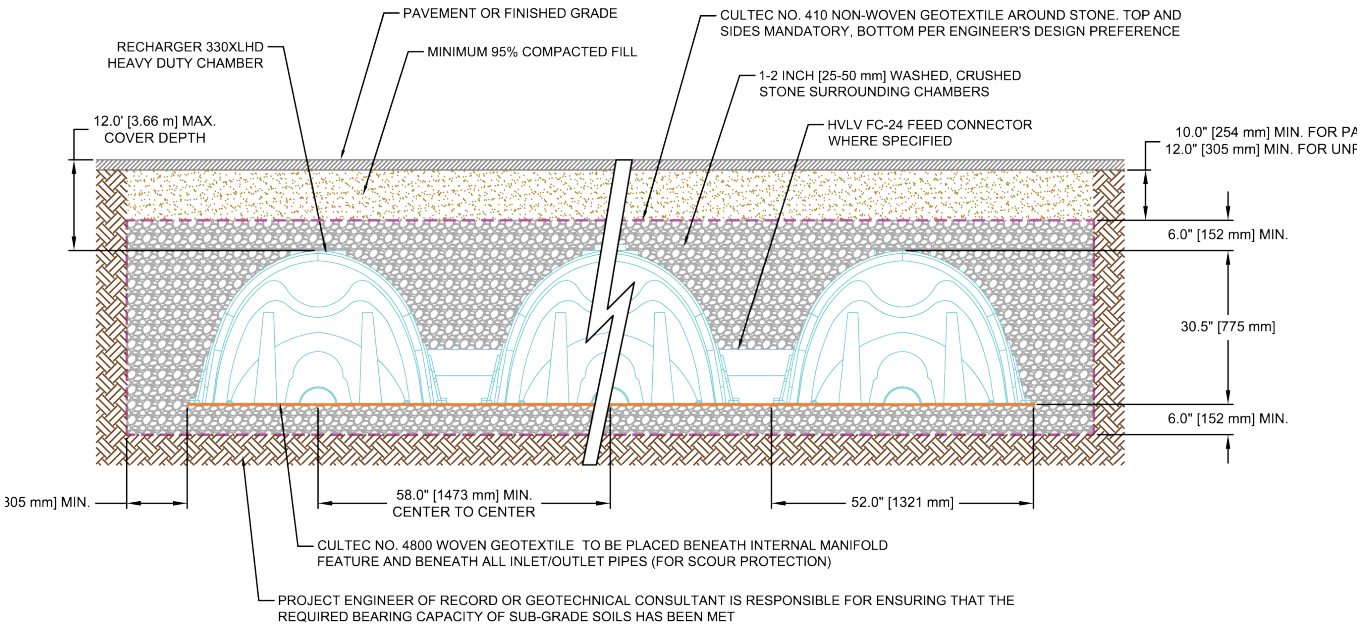


Shown with side portal trimmed and optional CULTEC HVLV Feed Connector inserted.

Plan View Drawing



Typical Cross Section for Traffic Application



For more information, contact CULTEC at (203) 775-4416 or visit www.cultec.com.

CULTEC Recharger® 330XLHD Specifications

GENERAL

CULTEC Recharger® 330XLHD chambers are designed for underground stormwater management. The chambers may be used for retention, recharging, detention or controlling the flow of on-site stormwater runoff.

CHAMBER PARAMETERS

1. The chambers shall be manufactured in the U.S.A. by CULTEC, Inc. of Brookfield, CT (cultec.com, 203-775-4416).
2. The chamber shall be vacuum thermoformed of polyethylene with a black interior and blue exterior.
3. The chamber shall be arched in shape.
4. The chamber shall be open-bottomed.
5. The chamber shall be joined using an interlocking overlapping rib method. Connections must be fully shouldered overlapping ribs, having no separate couplings or separate end walls.
6. The nominal chamber dimensions of the CULTEC Recharger® 330XLHD shall be 30.5 inches (775 mm) tall, 52 inches (1321 mm) wide and 8.5 feet (2.59 m) long. The installed length of a joined Recharger® 330XLHD shall be 7 feet (2.13 m).
7. Maximum inlet opening on the chamber end wall is 24 inches (600 mm).
8. The chamber shall have two side portals to accept CULTEC HVLV® FC-24 Feed Connectors to create an internal manifold. Maximum allowable O.D. in the side portal is 11.75 inches (298 mm).
9. The nominal chamber dimensions of the CULTEC HVLV® FC-24 Feed Connector shall be 12 inches (305 mm) tall, 16 inches (406 mm) wide and 24.2 inches (614 mm) long.
10. The nominal storage volume of the Recharger® 330XLHD chamber shall be 7.459 ft^3 / ft (0.693 m^3 / m) - without stone. The nominal storage volume of a single Recharger® 330XLRHD Stand Alone unit shall be 63.40 ft^3 (1.80 m^3) - without stone. The nominal storage volume of a joined Recharger® 330XLIHD Intermediate unit shall be 52.213 ft^3 (1.478 m^3) - without stone. The nominal storage volume of the length adjustment amount per run shall be 11.19 ft^3 (1.04 m^3) - without stone.
11. The nominal storage volume of the HVLV® FC-24 Feed Connector shall be 0.913 ft^3 / ft (0.026 m^3 / m) - without stone.
12. The Recharger® 330XLHD chamber shall have fifty-six discharge holes bored into the sidewalls of the unit's core to promote lateral conveyance of water.
13. The Recharger® 330XLHD chamber shall have 16 corrugations.
14. The end wall of the chamber, when present, shall be an integral part of the continuously formed unit. Separate end plates cannot be used with this unit.
15. The Recharger® 330XLRHD Stand Alone unit must be formed as a whole chamber having two fully formed integral end walls and having no separate end plates or separate end walls.
16. The Recharger® 330XLSHD Starter unit must be formed as a whole chamber having one fully formed integral end wall and one partially formed integral end wall with a lower transfer opening of 14 inches (356 mm) high x 34.5 inches (876 mm) wide.
17. The Recharger® 330XLIHD Intermediate unit must be formed as a whole chamber having one fully open end wall and one partially formed integral end wall with a lower transfer opening of 14 inches (356 mm) high x 34.5 inches (876 mm) wide.
18. The Recharger® 330XLEHD End unit must be formed as a whole chamber having one fully formed integral end wall and one fully open end wall and having no separate end plates or end walls.
19. The HVLV® FC-24 Feed Connector must be formed as a whole chamber having two open end walls and having no separate end plates or separate end walls. The unit shall fit into the side portals of the Recharger® 330XLHD and act as cross feed connections.
20. Chambers must have horizontal stiffening flex reduction steps between the ribs.
21. Heavy duty units are designated by a colored stripe formed into the part along the length of the chamber.
22. The chamber shall have a raised integral cap at the top of the arch in the center of each unit to be used as an optional inspection port or clean-out.
23. The units may be trimmed to custom lengths by cutting back to any corrugation on the large rib end.
24. The chamber shall be manufactured in an ISO 9001:2008 certified facility.
25. Maximum allowable cover over the top of the chamber shall be 12' (3.66 m).
26. The chamber shall be designed to withstand traffic loads when installed according to CULTEC's recommended installation instructions.

APPENDIX B – DRAINAGE AREA PLANS