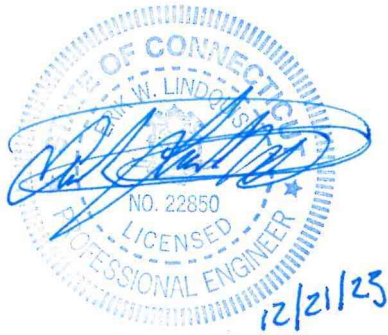
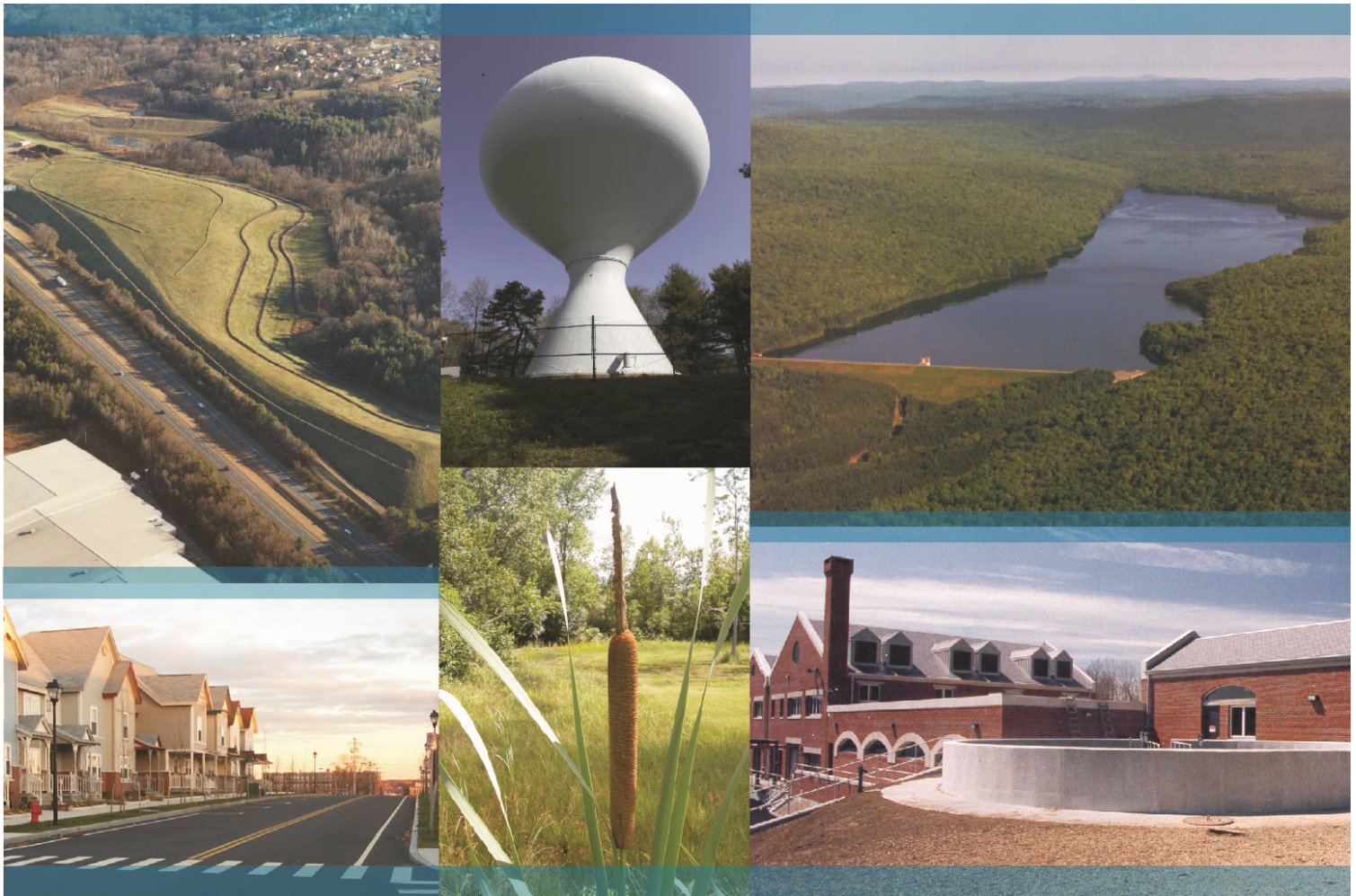




Tighe & Bond

64 Danbury Road
Wilton, CT 06897

Engineering Report

Prepared For:

**Town of Wilton,
Planning and Zoning Commission**

December 2023

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Section 1

Introduction and Site Conditions

Tighe & Bond has prepared this report at the request of Fuller Development, LLC ("Applicant"), to support their applications to the Town of Wilton Planning & Zoning Commission and Inlands Wetlands Commission for a proposed 8-building residential development with 93 units.

The 64 Danbury Road site is an approximately 4.84-acre unit located on the northern extents of a larger 22.27-acre parcel of land, the entirety of which is bounded by Danbury Road to the west, wooded area and residential properties to the east, and commercial properties to the north and south. The proposed development consists of the construction of a 93-unit residential development, at-grade parking, stormwater management systems, utility services, lighting, and associated landscaping. Refer to **Figure 1**, Site Location Map, in **Appendix A**.

Tighe & Bond has inspected the property and analyzed available soils, drainage, utility, wetland, and topographic information. Drainage calculations and stormwater management design have been prepared in accordance with the 2000 Connecticut Department of Transportation (CTDOT) Drainage Manual, and the Connecticut Department of Energy and Environmental (DEEP) Protection 2004 Stormwater Quality Manual. The drainage calculations include a hydrologic and hydraulic analysis of the existing conditions and the proposed development. Specifically, the calculations include an analysis of the on-site stormwater management measures and their performance in handling peak flow attenuation and pollutant removals. The report also includes a summary of the site floodplain management for Copts Brook, the available existing and proposed utilities to service the property, and the proposed soil erosion and sedimentation control measures incorporated during construction.

1.1 Existing Conditions

The existing site consists of an office building with a 15,500 square-foot footprint and at-grade parking. The development site is located within Wilton's DE-5R (East) Design Enterprise District Zone. A significant portion of the site is impervious, including paved parking areas, sidewalks, and building roof area, with landscaping and lawns generally around the perimeter of the site. Utility services include underground water, natural gas, electric, and tele-data, which ultimately connect to service mains and overhead lines in Danbury Road.

The site is located on Danbury Road (Route 7) which is a north-south four lane State maintained major arterial roadway, with dedicated left turn lanes for a traffic light at the main entrance. The roadway is generally 50 feet wide and widens to roughly 60-feet along the frontage of the site to accommodate the aforementioned left turn lanes.

The topography of the site slopes primarily from east to west towards Copts Brook and Route 7. There is a series of catch basins and inlet structures on the existing site, which capture runoff and discharges to 54" RCP along the northern end of the site. The front yard of the property partially lies within the 500-year flood plain for the Norwalk River, while a small part of the middle of the property lies within the 100-year floodplain for

Copts Brook. This floodplain and site hydrology will be discussed in greater detail later in this report.

1.2 Project Proposal

The 8-building residential development with 93 units includes driveways and parking areas throughout the site. The development will use the current entry drive and the same point of access to Danbury Road as the other properties at 50 and 60 Danbury Road. A centrally located clubhouse and pool is proposed for the development immediately adjacent to the existing entry loop roadway. The site development plan also includes a network of sidewalks for pedestrian circulation and retaining walls to minimize the overall development footprint and grading impacts, as well as to establish required finished floor elevations. New utility services for the property are proposed including underground water, natural gas, electric, tel-com and sanitary sewer.

Stormwater management will be accommodated on-site. Surface runoff will be collected in catch basins and inlet structures located throughout the site and tie into the existing drainage infrastructure to be maintained. Underground infiltration systems have been designed to reduce peak flows and provide stormwater treatment, prior to discharge. The stormwater management system has been designed to treat the 0.5-inch water quality volume and remove a high level of pollutants. This will be discussed in greater detail later in the report.

1.3 Site Soils

The U.S. Department of Agriculture's National Resource Conservation Service (NRCS) Web Soil Survey indicates the following soil types are present on the site:

Urban Land (307): Urban land is mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 33 percent. No drainage class is assigned, and the complex does not meet hydric criteria.

Udorthents-Urban Land Complex (306): Udorthents is a miscellaneous land type used to denote moderately well to excessively drained earthen material which has been so disturbed by cutting, filling, or grading that the original soil profile can no longer be discerned. Udorthents consist of very deep, moderately well drained to excessively drained soils on uplands, terraces and plains. They are highly disturbed soils commonly associated with construction and building or surface mining. Typically, more than 2 feet of the original soil has been removed or it has been covered with more than 2 feet of earthy fill. Texture to a depth of 60 inches, varies from silt loam to extremely gravelly sand. Slopes range from 0 to 35 percent.

Canton and Charlton Fine Sandy Loams (60C & 61C): The Charlton component is typically found on hills, uplands while the Chatfield component is typically found on bedrock-controlled ridges, uplands, bedrock-controlled hills. The parent material of both soils consists of coarse-loamy melt-out till derived from granite and/or schist and/or gneiss with a natural drainage class of well drained. These soil does not meet hydric criteria. Slope ranges from 8 to 15 percent.

A copy of the NRCS Soil Resource Report is included in **Appendix B** of this report.

Soil permeability for the site was estimated to be 1-inch per hour for the design of the proposed stormwater management systems and are in part based on historic design assumptions used for the site. We believe the estimate is conservative given the soil classifications, furthermore permeability estimates will be field verified at the site prior to the completion of construction documents to confirm the design assumptions are accurate.

1.4 Wetlands

Wetlands soils were delineated and flagged by Otto Theall, professional soil scientist on February and March, 2017 and located in the field by D'Andrea Surveying & Engineering, P.C. Wetland flags and limits are depicted on the project drawing sheets.

Section 2

Stormwater Management

2.1 Existing Site Hydrologic Analysis

To review the impact of the proposed development on the existing site, an existing conditions hydrologic analysis was performed. Under existing conditions, stormwater runoff from the site generally flows from east to west towards Copts Brook and Danbury Road (US Route 7). There are a series of catch basins and inlet structures on the 64 Danbury Road site that capture runoff and discharge to a 54" RCP culvert that crosses Danbury Road and outlets to the Norwalk River. This culvert takes the majority of runoff from 64 Danbury Road as well as from 60 Danbury Road and the recently expanded parking garage. There are three oversized perforated pipes within this existing drainage network that provide nominal storage/infiltration for runoff from the parking areas and one water quality structure that treats a small portion of the parking area as well. In addition, there is an existing subsurface retention system near the site entry from Danbury Road that collects runoff from most of the circular entry drive before discharging it to the 54-inch RCP culvert. Lastly, the culvert also receives flow from Copts Brook and ultimately conveys the aggregate runoff from all these areas to the Norwalk River. The last segment of the 54" RCP culvert along the southern edge of the property has been designated as Design Point B for our analysis.

There are 2 additional design points in the northeastern portion of the site which are used to analyze overland flow to Copts Brook and overland flow offsite to the northeast. These are denoted as Design Points A & C respectively.

The drainage areas for the existing site and contributing areas have been delineated into sub-watershed areas and are shown on the Existing Conditions Watershed Map (Figure EX-WS), which is included in **Appendix C** of this report.

Impervious and pervious areas, weighted curve number, and time of concentration were calculated for each watershed area and developed into hydrologic model to determine the project's peak flow and volume, as part of the comparative hydrology analysis. Precipitation data for the hydrologic modeling were developed from NOAA's Atlas 14 Point Precipitation Frequency Estimates online utility. The site-specific precipitation depths for a 24-hour durations storm are shown in **Table 2-1** below.

Table 2-1
24-hour Duration Precipitation Depth

	2-Year	10-Year	25-Year	50-Year	100-Year
Depth (in)	3.52	5.38	6.54	7.41	8.34

A breakdown of existing watershed areas, existing volumetric hydrographs, and the existing watershed map are included in **Appendix C** of this report.

2.1.1 Floodplain Management

The Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) for Fairfield County, effective June 18, 2010 shows a portion of the site within Zone X

(shaded) Norwalk River 500-year floodplain along Danbury Road, and the floodway and Zone A of Copts Brook, as shown in **Figure 2** in **Appendix A**.

Zone A is studied by approximate methods, and therefore does not have established base flood elevations or a regulatory floodway. Since there is no available base flood data for Copt's Brook, we prepared a hydrologic and hydraulic analysis of the Copt's Brook watershed contributing to the drainage inlet on the site to establish a base flood elevation. Please refer to Section 3, Floodplain Management, for more details.

2.2 Proposed Site Hydrologic and Hydraulic Analysis

A stormwater management system has been designed for the proposed development to reduce or maintain existing peak flows and improve water quality for the site. The proposed stormwater management system consists of catch basins and inlets throughout the development site as well as water quality structures, underground infiltration systems, and outlet protection. The stormwater management system will maintain existing drainage piping to maximum extent practical and utilize Best Management Practices for stormwater treatment.

Under proposed conditions, drainage patterns will generally remain the same, largely flowing in a westerly direction and ultimately discharging to the 54" RCP culvert for Copts Brook. Drainage structures have been located throughout the site to collect stormwater runoff from paved and landscaped surfaces. Due to the various locations of the proposed buildings and the need to maintain a significant portion of the existing drainage network, the proposed drainage system has been split into six different sub-systems around the site. Infiltration systems have been designed for each area to promote infiltration and provide treatment of stormwater runoff. The bottom elevation of each system was also designed to be at or above the elevations for the existing infiltration pipes on site to ensure they are above the known ground water table. Ultimately, these systems converge into a single piped location at the western edge of the site. The existing retention system located adjacent to the main entry at Danbury Road will remain in place and unchanged. The contributing area for this system is minimally impacted by the proposed development plan and any changes to discharge flows will be negligible. Likewise, the 42-inch perforated pipe which receives runoff from 60 Danbury Road will remain in place as well and the proposed stormwater management system has been designed around it.

Lastly, a small portion of the site consisting of lawn area and 7 patios behind Buildings 7 and 8 is captured using area drains and discharged directly to the hillside adjacent to Copts Brook. A riprap apron and level spreader have been designed to reduce outlet velocities and provide erosion control prior to this discharge.

2.2.1 Proposed Site Hydrology

The proposed conditions hydrologic analysis consists of sub-watershed areas at each inlet structure of the development property. For each proposed watershed area, weighted curve numbers and times of concentration were calculated and utilized in the proposed conditions hydrologic model. The infiltration systems were also modeled to determine the effectiveness in reducing peak discharges from the site. **Table 2-2** below provides a summary of the peak discharges under existing and proposed conditions for the 2, 10, 25, 50, and 100 year storm events.

Table 2-2
Summary of Stormwater Peak Discharge (cfs)

Discharge Location	Condition	Storm Frequency (Years)				
		2	10	25	50	100
Copts Brook (DP-A)	Existing	1.083	3.109	4.569	5.724	7.011
	Proposed	1.044	2.888	4.203	5.239	6.398
	% Reduction	-3.6%	-7.1%	-8.0%	-8.5%	-8.7%
54" RCP Culvert (DP-B)	Existing	16.45	27.7	36.49	42.76	49.09
	Proposed	15.38	27.64	35.87	42.12	49.08
	% Reduction	-6.5%	-0.2%	-1.7%	-1.5%	0.0%
Offsite Runoff (DP-C)	Existing	0.05	0.199	0.314	0.408	0.513
	Proposed	0.039	0.138	0.212	0.272	0.339
	% Reduction	-22.0%	-30.7%	-32.5%	-33.3%	-33.9%

Table 2-3 provides a summary of the peak volumetric runoff under existing and proposed conditions for the 2, 10, 25, 50, and 100 year storm events.

Table 2-3
Summary of Stormwater Peak Discharge (cfs)

Discharge Location	Condition	Storm Frequency (Years)				
		2	10	25	50	100
Copts Brook (DP-A)	Existing	5,241	13,137	18,910	23,526	28,668
	Proposed	4,941	12,129	17,344	21,499	26,117
	% Reduction	-5.7%	-7.7%	-8.3%	-8.6%	-8.9%
54" RCP Culvert (DP-B)	Existing	59,393	112,913	147,095	172,958	200,754
	Proposed	53,163	105,995	140,665	167,137	195,622
	% Reduction	-10.5%	-6.1%	-4.4%	-3.4%	-2.6%
Offsite Runoff (DP-C)	Existing	288	839	1,264	1,611	2,003
	Proposed	160	442	655	827	1,022
	% Reduction	-44.4%	-47.3%	-48.2%	-48.7%	-49.0%

The proposed conditions watershed map, curve number and time of concentration worksheets, and volumetric hydrographs are included in **Appendix D**.

2.2.2 Water Quality Volume

The design includes capturing and treating one-half inch of rainfall for the water quality volume to remove stormwater pollutants on an average annual basis.

Section 6(B)(i) of the Connecticut DEEP General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems "MS4 General Permit" requires where an existing site exceeds 40 percent directly connected impervious area (DCIA), that one-half of the water quality volume is to be retained onsite. The Town of Wilton is registered under the MS4 General Permit (Registration #GSM000040), and therefore is subject to its provisions and requirements. The project site contains more than 40 percent directly connected impervious area. As a result, the standard for water quality treatment is one half of the water quality volume.

The infiltration systems have been designed to provide the required treatment volume. **Table 2-4** below summarizes the required and provided treatment volume for the site.

Table 2-4

Summary of Treatment Volume (cu ft)

Infiltration System - 1	Required Treatment Volume	749
	Provided Treatment Volume	1,370
Infiltration System - 2	Required Treatment Volume	704
	Provided Treatment Volume	1,022
Infiltration System - 3	Required Treatment Volume	1,265
	Provided Treatment Volume	2,240
Infiltration System - 4	Required Treatment Volume	308
	Provided Treatment Volume	520
Infiltration System - 5	Required Treatment Volume	1,442
	Provided Treatment Volume	1,450
Infiltration System - 6	Required Treatment Volume	1,349
	Provided Treatment Volume	4,069

The water quality volume calculation sheets are included in **Appendix F**.

2.2.3 Hydraulic Capacity and Outlet Velocity

The stormwater collection system has been designed to convey the 25-year storm event as required by the CTDOT 2000 Drainage Manual. The system was designed by analyzing sub-areas corresponding to each inlet structure and calculating weighted runoff coefficients and times of concentration. The discharge from the six infiltration systems as well as the inlet flow for Copts Brook to the culvert are modeled as known constant flows, and do not take into account offsetting peaks between their respective hydrographs. Therefore, the analyzed flows within the piped drainage system are very conservative and the available capacity and hydraulic grade lines would only improve when accounting for the delayed time for flow in Copts Brook to peak. These values were entered into a storm sewers model using Hydraflow Storm Sewers Extension for AutoCAD Civil 3D 2018, Version 2018.3. Based upon this analysis, the proposed storm system has the capacity to convey the 25-year storm event. Hydraulic calculation worksheets and storm sewers output results are included in **Appendix E**.

2.3 Method of Hydrology and Hydraulic Analysis

The following storm drainage design criteria were used for all drainage pipe systems:

1. Design storm rainfall data from NOAA Atlas 14 Point Precipitation Frequency Estimates
2. Piped storm drainage system and the outlets are designed for a 25-year storm event.
3. Minimum time of concentration = 5 minutes
4. For SCS peak flow calculations, Curve Number were as follows:
 - a. Impervious (Pavement/Roof Areas) = 98
 - b. Landscaped and Lawn Areas (HSG-B) = 69
 - c. Landscaped and Lawn Areas (HSG-D) = 84
 - d. Wooded Areas (HSG-B) = 55
 - e. Wooded Areas (HSG-D) = 77
5. For rational peak flow calculations, runoff coefficients were as follows:
 - a. Impervious (Pavement/Roof) areas = 0.90
 - b. Landscaped and Lawn Areas = 0.30
6. Minimum diameter of pipes = 12 inches, excluding roof leaders, underdrains, yard drains and foundation drains
7. Minimum pipe slope = 0.5 percent

8. Watershed areas delineated using polylines in AutoCAD Civil 3D 2018.
9. Comparative hydrology analyzed using Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2018, Version 2018.3
10. Storm drainage system analyzed using Hydraflow Storm Sewers Extension for AutoCAD Civil 3D 2018, Version 2018.3

2.4 Best Management Practices

The stormwater management plan for the proposed site uses "Best Management Practices" (BMPs) to remove a high percentage of sediments in accordance with the Connecticut Department of Energy and Environmental Protection "Stormwater General Permit Criteria".

The BMPs include:

Catch Basins and Yard Drains with Sumps and Bell Traps: Catch basins and yard drains with sumps and bell traps collect sediment and prevent discharge of oil and other pollutants into the storm drainage system. All new catch basins and yard drains on-site will have 24-inch sumps with several also maintaining bell traps.

Hydrodynamic Separators: Hydrodynamic separators serve as pretreatment and prevent transport of oils and sediment further downstream. The proposed stormwater management system utilizes Contech CDS units prior to discharge into the underground infiltration systems. The Contech CDS units have been sized in accordance with the 2004 CTDEEP Stormwater Quality Manual. Sizing calculations are provided in **Appendix F**.

Underground Infiltration: Underground Infiltration serves as a primary treatment practice, reduces peak flow rates, and promotes groundwater recharge. The proposed stormwater management system utilizes plastic chambers surrounded by stone and filter fabric and an outlet control structure designed to attenuate peak flows.

Level Spreader: Level Spreaders serve as a secondary treatment practice that are utilized to reduce stormwater discharge velocities to non-erosive levels.

2.5 Pollutant Loading Analysis

Pollutant loadings for the existing and proposed conditions were calculated using the method prescribed by Debo and Reese in "Municipal Stormwater Management", 1995. This method determines the mass of pollutant loading by inputting the fraction of impervious area, the contributing area, the mean annual rainfall, and the event mean concentration of pollutant (EMC). The EMC is based upon the pollutant analyzed and the general characteristic of the contributing area – residential, commercial, or open space.

For the proposed conditions, the contributing area was further broken down into contributing areas to certain best management practices (BMPs). Pollutant loading reductions were taken at certain BMPs, depending upon the removal efficiency of the BMP as stated in the 2003 edition of Debo and Reese. Pollutant removal efficiencies for

proprietary products were taken from a report entitled "Final Report: Stormwater Treatment Devices Section 319 Project" submitted to the Connecticut Department of Environmental Protection, Bureau of Water Management by the University of Connecticut Department of Natural Resources Management and Engineering, April 15, 2002. This report provides results of field testing for pollutant removal on different types of proprietary stormwater treatment devices installed throughout the State of Connecticut. Based upon these pollutant reductions, we have determined that pollutant loadings will be less for the proposed conditions, as shown in **Table 2-5** below. The pollutant loading calculation sheets are included in **Appendix F**.

Table 2-5
Pollutant Loading Summary

Item	Units	Pollutant					
		TKN	P	TSS	Pb	Cu	Zn
Proposed, Pre-Treatment	lb/yr/1-in	2.534	0.511	134.694	0.192	0.044	0.180
Proposed, Post-Treatment	lb/yr/1-in	1.680	0.224	11.403	0.099	0.021	0.068
Reduction, Pre to Post Treat	---	34%	56%	92%	48%	52%	62%

2.6 Stormwater Maintenance and Inspection Schedule

Stormwater management systems require periodic maintenance to ensure they function as designed. The initial inspection will be made during an intense rainfall to check the adequacy of the catch basins, roof leaders, piping, hydrodynamic separators, underground infiltration systems, and system outlet.

The following is a checklist of items that will be checked and maintained during scheduled maintenance operations.

Drainage Structures: The Owner will be responsible for cleaning the catch basins, yard drains, manholes, piping, and outlet protection on their property. A Connecticut licensed hauler shall clean the sumps, and legally dispose of removed sand at an off-site location. The road sand may not be reused or stored on-site. As part of the hauling contract, the hauler shall notify the Owner in writing where the material is being disposed.

Each catch basin and yard drain shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment. Maintain a log of inspections. Remove organic matter, sand, and debris from catch basins as necessary and dispose of legally.

Hydrodynamic Separator: The Contech CDS Units (hydrodynamic separator) will be skimmed and oil and scum removed. In a separate operation, silt, sand, and sediment will be removed. Once the structure is cleaned of debris, the chamber will be refilled with clean water to prevent wash through of debris and oil during next storm event.

Underground Infiltration: The underground infiltration system will be cleaned of all silt, debris and sediment from the inlet structure, outlet structure and the chamber lengths. The outlet control structure will be inspected and cleaned to make sure nothing is clogging the discharge pipe.

Level Spreader: The level spreader shall be inspected two times annually. Regular maintenance includes removing accumulated debris and sediment, checking for erosion, vegetative bare spots, and removing invasive plant species or tree saplings.

Stormwater System Outfalls: The stormwater system outfalls shall be inspected two times annually as well as after every major storm, for slope integrity, soil moisture, vegetated health, soil stability, soil compaction, soil erosion, ponding and sediment accumulation. If the rip rap has been displaced, undermined or damaged, it should be replaced immediately. The channel immediately below the outlet should be checked to see that erosion is not occurring. The downstream channel will be kept clear of obstructions, such as fallen trees, debris, leaves and sediment that could change flow patterns and/or tail water depths in pipes. Repairs must be carried out immediately to avoid additional damage to the outlet protection apron.

Maintenance & Inspection Forms are included in **Appendix G**.

Section 3

Floodplain Management & Hydraulics

3.0 Background

FEMA studied Copts Brook using approximate methods as a part of the Flood Insurance Study (FIS) for Fairfield County, dated June 18, 2010. Therefore, the entire length of the watercourse was assigned Zone A, with no defined base flood elevation or floodway.

3.1 Basis of Modeling

Since no detailed base flood elevations are available on Copts Brook, Tighe & Bond prepared a hydrologic study of the 435-acre watershed contributory to the 54-inch RCP inlet on the site. We utilized the HEC-HMS hydrologic model, which includes inputs for land coverage, basin area, time of concentration, travel time, and areas of storage. See **Appendix H** for further additional information.

We subdivided the watershed into three watershed subarea, and included two areas of storage. One located on-site immediately upstream of the 54-inch RCP inlet, and the area behind Wilton Acres Road, extending northeasterly to Clover Drive and Westport Road. Storage available on-site was computed using topographic survey data, while storage at Wilton Acres Road was determined using available LiDAR topographic data.

3.2 Flow Rates

Since the FIS did not study Copts Brook using detailed methods, there are no published discharges for the watercourse. The purpose of the hydrologic model was to develop a discharge for the 25- and 100-year events, as well as a corresponding water surface elevation at the inlet to the 54-inch RCP.

Table 3-1
Computed Flow Rates to the 54" RCP Inlet

Return Frequency (years)	Annual Chance Probability	Flow Rate (cfs)
25	4%	120.3
100	1%	163.1

3.3 Water Surface Elevations

We used the storage-discharge feature in concert with the incoming flow rate to develop water surface elevations at the 54-inch RCP inlet for the purposes of creating a base flood elevation for design purposes. **Table 3-2** summarizes the resulting water surface elevations for the 25-year and 100-year events:

Table 3-2
Computed Water Surface Elevations at the 54" RCP Inlet

Return Frequency (years)	Annual Chance Probability	WSEL (NAVD88)
25	4%	137.9
100	1%	139.6

3.4 Compliance with Local Floodplain Regulations

Section 29-9.F.7 of the Wilton Zoning Regulations requires the following:

- k. **Equal Conveyance:** Within the floodplain, except those areas which are tidally influenced, as designated on the Flood Insurance Rate Map (FIRM) for the community, encroachments resulting from filling, new construction or substantial improvements involving an increase in footprint of the structure, are prohibited unless the applicant provides certification by a registered professional engineer demonstrating, with supporting hydrologic and hydraulic analyses performed in accordance with standard engineering practice, that such encroachments shall not result in any (0.00 feet) increase in flood levels (base flood elevation). Work within the floodplain and the land adjacent to the floodplain, including work to provide compensatory storage shall not be constructed in such a way so as to cause an increase in flood stage or flood velocity.
- l. **Compensatory Storage:** The water holding capacity of the floodplain, except those areas which are tidally influenced, shall not be reduced. Any reduction caused by filling, new construction or substantial improvements involving an increase in footprint to the structure, shall be compensated for by deepening and/or widening of the floodplain, storage shall be provided on-site, unless easements have been gained from adjacent property owners; it shall be provided within the same hydraulic reach and a volume not previously used for flood storage; it shall be hydraulically comparable and incrementally equal to the theoretical volume of flood water at each elevation, up to and including the 100-year flood elevation, which would be displaced by the proposed project. Such compensatory volume shall have an unrestricted hydraulic connection to the same waterway or water body. Compensatory storage can be provided off-site if approved by the municipality.

3.4.1 Equal Conveyance

The proposal does not diminish floodplain storage, and therefore base flood elevations will not increase as a result of the proposal. The additional floodplain storage provided would have the effect of reducing base flood elevations by a de minimis amount.

3.4.2 Compensatory Storage

The footprint for Building 4 is proposed to be within the existing paved parking lot immediately west of Copts Brook. This area is also within the calculated floodplain for Copts Brook. In order to mitigate the impacts of the proposed development, the residential portion of the building which extends over the floodplain will be elevated on

columns to allow potential floodwaters to go under the building while allowing the garage portion outside the floodplain to remain at grade. Since the placement of building columns and a retaining wall within the floodplain would result in a loss of floodplain storage volume, we have proposed revised grading beneath the building footprint to provide additional flood storage. The grading as proposed results in a net cut of approximately 250 CF within the floodplain boundary, compensating for the approximately 40 CF occupied by the columns and retaining walls of the proposed building. The development plan as proposed would therefore increase floodplain storage on-site. Provided in **Table 3-3** below is a summary of the Compensatory Flood Storage volumes being proposed for Copts Brook.

Table 3-3
Compensatory Flood Storage (NAVD88)

Elevation (NAVD88)	100-year Water Surface Elevation (NAVD88)		
	Existing (CF)	Proposed (CF)	Difference (CF)
134.0	-	-	-
135.0	1,112	1,112	0
136.0	2,707	2,707	0
137.0	4,910	4,910	0
138.0	8,101	8,101	0
139.0	12,633	12,633	0
140.0	19,028	19,278	250

Section 4 Site Utility Services

4.1 Water and Fire Protection Services

Water and fire protection services to the site will be provided by The Aquarion Water Company (Aquarion). Services to the proposed buildings will be fed from the reported 12-inch main located in Danbury Road. An existing hydrant is located just north of the site on Danbury Road and a second hydrant is located just south of the main entry to the site. In addition, two new hydrants are proposed within the site to service the proposed development.

The estimated daily water demand for the proposed residential development is approximately 24,300 gallons per day (GPD). The estimated peak hour demand is 68 gallons per minute (GPM), determined using a maximum-to-average-day ratio of 4.0.

4.2 Electric and Tel-Data Service

Electric service to the site is provided by Eversource Electric Company and telephone and cable are provided by Altice and Frontier. Underground primary service lines are located within the main entry loop driveway with an existing electric vault located near the southeastern corner of the existing building.

4.3 Gas Service

Eversource Gas Company provides natural gas service to the site. Eversource Gas Company maintains a gas main in Danbury Road and a service lateral to 60 Danbury Road thru the easement in the main entry loop. The current development plan shows the replacement of the existing gas service lateral within the Eversource easement; however, once service loads are better understood the existing lateral will be evaluated to determine if it can be re-used to service the entire development area.

Furthermore, once the estimated peak demand for the total project is determined, Eversource Gas Company will provide a letter of service availability.

4.4 Sanitary Sewer Service

The project site is located within the Wilton WPCA Sewershed.

Based on available Town maps, there is a 24-inch gravity sanitary sewer located in Danbury Road. The proposed development will connect to the sewer main at the existing manhole in front of the site. WPCA approval will be required for all sewer connections.

The projected wastewater flows associated with the proposed development were calculated based on the 93 residential units – comprised of 31 one-bedroom units, 55 two-bedroom units, and 7 three-bedroom units – for a total of 162 bedrooms and a flow rate of 150 gallons per day (GPD) per bedroom. A peaking factor of 4 was applied to the average daily flows to estimate peak flows. **Table 4-1** below summarizes the projected average and peak daily sanitary sewer flows for the site.

Table 4-1 - Projected Average and Peak Daily Sanitary Sewer Flows

Wastewater Requirements					
Development		Design Criteria		Average Daily Flow (GPD)	Peak Flow (GPM)*
Use	Units / Bedrooms	GPD	Unit		
Residential	93 / 162	150	Per Bedroom	24,300	68

* Peak factor of 4 was applied to average daily flows to estimate peak flows; New England Interstate Water Pollution Control Commission, 2011.

Section 5

Soil Erosion and Sedimentation Control

5.1 SESC Narrative

General

The proposed development is entitled "64 Danbury Road" in Wilton, Connecticut.

Estimated:

Project Start: Spring 2024

Project Completion: Summer 2026

Erosion Control Narrative refers to drawings C-501 through C-504.

The proposed site development will consist of building demolition, clearing and grubbing the existing site, excavation, construction of stormwater management, utilities, and rough grading of building, parking areas, sidewalks and curbing.

The development is located on Danbury Road in Wilton, Connecticut.

The stormwater management measures will address the stormwater quality once the site has been constructed and stabilized. Sedimentation and erosion control measures will be installed during construction which will minimize adverse impacts from construction activities.

All sedimentation and erosion control measures proposed for this development have been designed in accordance with the "2024 Connecticut Guidelines for Soil Erosion and Sedimentation Control" as published by the Connecticut Council on Soil Erosion and Water Conservation. Additional guidelines have also been followed that are available from the Connecticut Department of Environmental Protection as recommended for sedimentation control during construction activities.

Construction Sequence – Initial Phase

1. Conduct a pre-construction meeting with the Owner or Owner's Representative, Town Engineer, Design Engineer, Site Engineer, Contractor and Site Superintendent to establish the limits of construction, construction procedures and material stockpile areas.
2. Field stake the limits of construction.
3. Install all applicable soil and erosion control measures around the perimeter of the site to the extent possible. this will include siltation fence around the project as shown on the plans.
4. Install construction access road and anti-tracking pavement in the areas as shown on the plans. All construction access shall be into the site through the anti-tracking pads.

5. Establish temporary staging area.
6. Begin building demolition and pavement removal.
7. Construct the initial storm drainage as shown on the drainage plans.
8. Install water quality systems and associated drainage network to the maximum extent practicable. Grade the area around the storm drainage system as necessary.
9. Begin rough roadway grading.
10. Install remaining drainage system to the extent necessary to provide positive drainage.
11. Begin installation of sanitary sewer system, water, and other utilities to extent necessary.
12. Provide silt fence/haybale barrier around soil stockpile area. Provide temporary vegetative cover (defined in erosion control notes) on all exposed surfaces.
13. Begin building construction.
14. Pave binder course on parking and driveways for non-porous pavement areas.
15. Establish temporary vegetative cover.

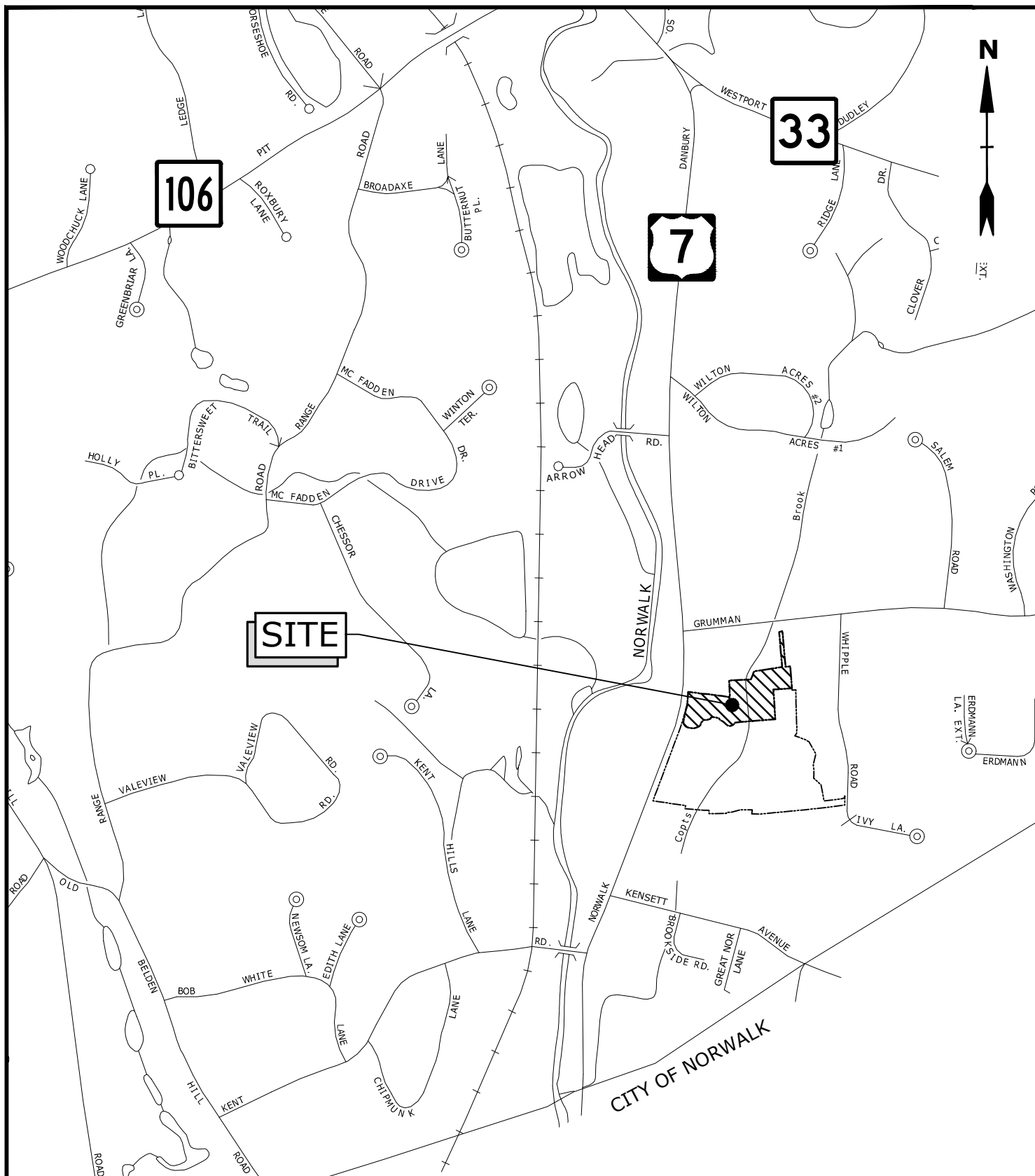
Construction Sequence – Final Phase

1. Repair perimeter sediment & erosion controls as needed.
2. Clean/replace controls from previous phase as needed.
3. Fine grade site.
4. Continue construction of building.
5. Complete construction of sidewalks.
6. Establish final vegetative cover and landscaping.
7. Pave surface course on roadways.
8. Remove erosion controls when site is stabilized.

5.2 Soil Erosion and Sedimentation Control Notes

1. All sedimentation and erosion control measures shall be constructed in accordance with the standards and specifications of the "2024 Connecticut Guidelines for Soil Erosion and Sediment Control", DEP Bulletin No. 34, and all amendments and addenda thereto as published by the Connecticut Department of Environmental Protection.
2. Land disturbance shall be kept to the minimum necessary for construction operations.
3. All erosion control measures shall be installed as shown on the plan and elsewhere as ordered by the engineer.
4. All catch basins shall be protected with a silt sacks, haybale ring, silt fence or block and stone inlet protection throughout the construction period and until all disturbed areas are thoroughly stabilized.
5. Whenever possible, erosion and sediment control measures shall be installed prior to construction. See "Erosion Control Narrative".
6. Additional control measures shall be installed during the construction period as ordered by the engineer.
7. All sedimentation and erosion control measures shall be maintained in effective condition throughout the construction period.
8. Sediment removed shall be disposed of offsite or in a manner as required by the Engineer.
9. The construction contractor shall be responsible for construction and maintenance of all control measures throughout the construction period.
10. All disturbed areas to be left exposed for more than 30 days shall be protected with a temporary vegetative cover. Seed these areas with perennial ryegrass at the rate of 40 lbs. per acre (1 lb. per 1,000 sq. ft). Apply soil amendments and mulch as required to establish a uniform stand of vegetation over all disturbed areas.
11. The construction contractor shall utilize approved methods/materials for preventing the blowing and movement of dust from exposed soil surfaces onto adjacent properties and site areas.
12. The construction contractor shall maintain a supply of silt fence/haybales and anti-tracking crushed stone on site for emergency repairs.
13. All drainage structures shall be periodically inspected weekly by the construction contractor and cleaned to prevent the build-up of silt.
14. The construction contractor shall carefully coordinate the placement of erosion control measures with the phasing of construction.
15. Keep all paved surfaces clean. Sweep and scrape before forecasted storms.

16. Treat all unpaved surface with 4" minimum of topsoil prior to final stabilization.
17. Haybale barriers and silt fencing shall be installed along the toe of critical cut and fill slopes.
18. The contractor shall notify the Town officials prior to the installation of erosion controls, cutting of trees, or any excavation.
19. All trucks leaving the site must be covered.
20. Some control measures are permanent. These structures shall be cleaned and replenished at the end of construction. locations of the permanent control structures are shown on the drainage plans.
21. All sedimentation and erosion controls shall be checked weekly and/or after each rain fall event. Necessary repairs shall be made without delay.
22. Prior to any forecasted rainfall, erosion and sediment controls shall be inspected and repaired as necessary.
23. After all disturbed areas have been stabilized, erosion controls may be removed once authorization to do so has been secured from the Owner. Disturbed areas shall be seeded and mulched.
24. All embankment slopes 3:1 or greater to be stabilized with erosion control blanket, North American Green SC150BN or approved equivalent, unless otherwise noted on plans.



106

33

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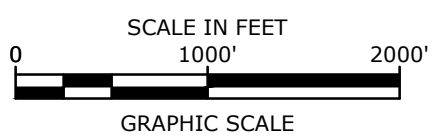
SITE

64 DANBURY ROAD
WILTON, CT

SITE LOCATION MAP

DATE: 12/04/2023
SCALE: 1"=1000'
FIGURE: 1

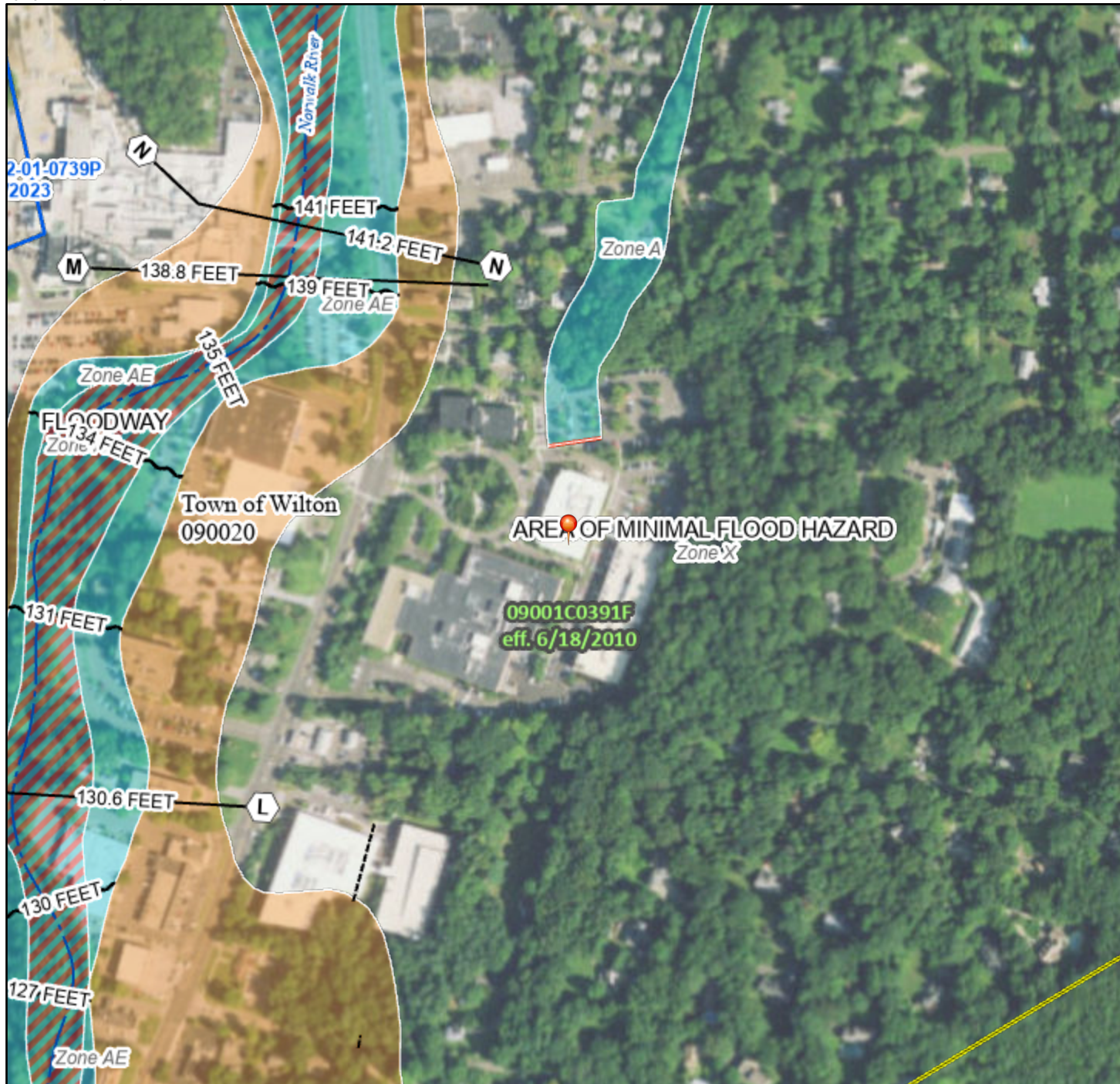
Tighe&Bond



National Flood Hazard Layer FIRMMette



73°25'11"W 41°10'18"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

73°24'34"W 41°9'51"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



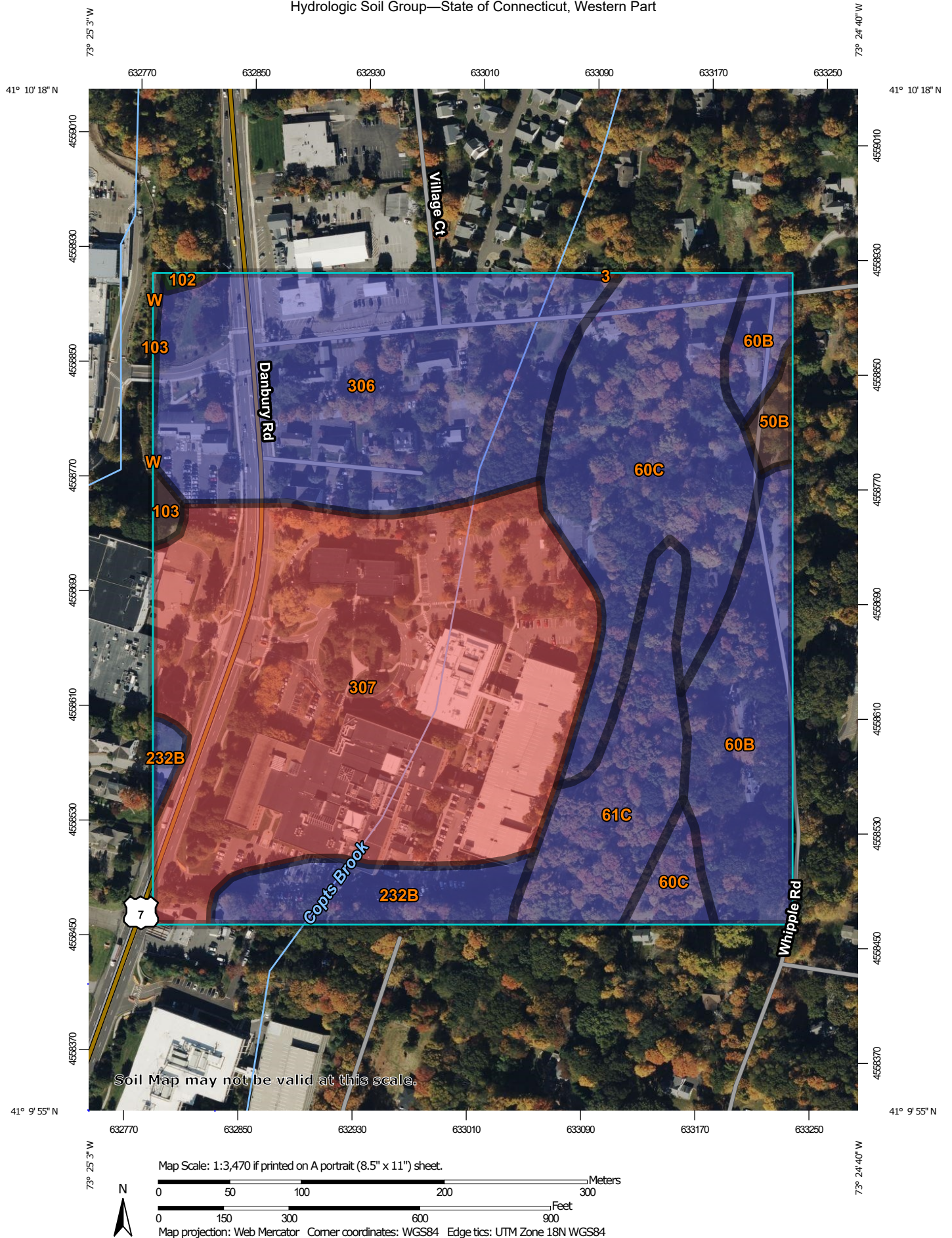
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **12/4/2023 at 12:02 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Hydrologic Soil Group—State of Connecticut, Western Part



MAP LEGEND**Area of Interest (AOI)**
 Area of Interest (AOI)
Soils**Soil Rating Polygons**

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Lines

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Points

-  A
-  A/D
-  B
-  B/D

-  C
-  C/D
-  D
-  Not rated or not available

Water Features
 Streams and Canals
Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background
 Aerial Photography
MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 21, 2022—Oct 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	0.0	0.0%
50B	Sutton fine sandy loam, 3 to 8 percent slopes	B/D	0.4	0.9%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B	5.4	10.6%
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	B	8.4	16.7%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	B	3.8	7.4%
102	Pootatuck fine sandy loam	A/D	0.1	0.1%
103	Rippowam fine sandy loam	B/D	0.2	0.5%
232B	Haven-Urban land complex, 0 to 8 percent slopes	B	2.5	4.9%
306	Udorthents-Urban land complex	B	11.3	22.4%
307	Urban land	D	18.4	36.3%
W	Water		0.0	0.1%
Totals for Area of Interest			50.5	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.365 (0.286-0.461)	0.425 (0.333-0.537)	0.523 (0.408-0.663)	0.604 (0.468-0.770)	0.716 (0.536-0.946)	0.801 (0.586-1.08)	0.888 (0.629-1.23)	0.981 (0.662-1.40)	1.11 (0.719-1.63)	1.21 (0.766-1.82)
10-min	0.518 (0.405-0.654)	0.602 (0.471-0.761)	0.740 (0.577-0.938)	0.855 (0.664-1.09)	1.01 (0.759-1.34)	1.14 (0.831-1.53)	1.26 (0.892-1.75)	1.39 (0.938-1.98)	1.57 (1.02-2.31)	1.71 (1.08-2.57)
15-min	0.609 (0.477-0.769)	0.709 (0.555-0.896)	0.872 (0.680-1.10)	1.01 (0.781-1.28)	1.19 (0.894-1.58)	1.34 (0.977-1.80)	1.48 (1.05-2.06)	1.64 (1.10-2.33)	1.85 (1.20-2.72)	2.02 (1.28-3.03)
30-min	0.849 (0.665-1.07)	0.987 (0.772-1.25)	1.21 (0.946-1.54)	1.40 (1.08-1.78)	1.66 (1.24-2.19)	1.86 (1.36-2.49)	2.06 (1.45-2.84)	2.26 (1.53-3.22)	2.53 (1.64-3.73)	2.74 (1.74-4.12)
60-min	1.09 (0.853-1.38)	1.26 (0.990-1.60)	1.55 (1.21-1.97)	1.79 (1.39-2.28)	2.12 (1.59-2.80)	2.38 (1.74-3.19)	2.63 (1.85-3.63)	2.88 (1.95-4.11)	3.22 (2.09-4.73)	3.47 (2.20-5.20)
2-hr	1.39 (1.10-1.75)	1.64 (1.29-2.06)	2.05 (1.61-2.59)	2.39 (1.87-3.03)	2.86 (2.16-3.76)	3.22 (2.37-4.31)	3.58 (2.56-4.96)	3.98 (2.70-5.64)	4.54 (2.96-6.64)	4.99 (3.17-7.44)
3-hr	1.60 (1.26-2.00)	1.90 (1.50-2.38)	2.39 (1.88-3.00)	2.80 (2.20-3.54)	3.37 (2.55-4.42)	3.79 (2.81-5.08)	4.24 (3.04-5.86)	4.74 (3.21-6.69)	5.45 (3.55-7.94)	6.03 (3.84-8.96)
6-hr	2.01 (1.60-2.50)	2.41 (1.92-2.99)	3.06 (2.42-3.81)	3.60 (2.83-4.51)	4.34 (3.30-5.67)	4.90 (3.65-6.52)	5.48 (3.97-7.57)	6.16 (4.20-8.65)	7.15 (4.68-10.4)	7.98 (5.09-11.8)
12-hr	2.48 (1.99-3.06)	2.99 (2.39-3.69)	3.80 (3.03-4.71)	4.48 (3.55-5.58)	5.42 (4.15-7.04)	6.12 (4.59-8.11)	6.86 (4.99-9.42)	7.72 (5.28-10.8)	8.99 (5.90-12.9)	10.0 (6.43-14.7)
24-hr	2.90 (2.34-3.55)	3.52 (2.84-4.32)	4.54 (3.64-5.58)	5.38 (4.29-6.66)	6.54 (5.05-8.45)	7.41 (5.59-9.77)	8.34 (6.11-11.4)	9.43 (6.47-13.1)	11.1 (7.28-15.8)	12.4 (7.99-18.1)
2-day	3.20 (2.60-3.90)	3.97 (3.22-4.83)	5.21 (4.21-6.36)	6.24 (5.01-7.67)	7.67 (5.95-9.86)	8.72 (6.63-11.5)	9.86 (7.29-13.5)	11.2 (7.74-15.5)	13.4 (8.83-19.0)	15.2 (9.78-22.0)
3-day	3.44 (2.80-4.17)	4.28 (3.48-5.19)	5.65 (4.58-6.87)	6.78 (5.46-8.29)	8.34 (6.50-10.7)	9.50 (7.24-12.4)	10.8 (7.98-14.7)	12.3 (8.47-16.8)	14.6 (9.68-20.7)	16.7 (10.7-24.0)
4-day	3.67 (3.00-4.44)	4.56 (3.72-5.51)	6.00 (4.88-7.28)	7.20 (5.81-8.78)	8.85 (6.91-11.3)	10.1 (7.70-13.1)	11.4 (8.46-15.5)	13.0 (8.98-17.8)	15.5 (10.2-21.8)	17.6 (11.3-25.2)
7-day	4.36 (3.58-5.24)	5.33 (4.37-6.41)	6.90 (5.64-8.32)	8.20 (6.66-9.94)	10.0 (7.83-12.7)	11.3 (8.68-14.7)	12.8 (9.48-17.1)	14.5 (10.0-19.6)	17.0 (11.3-23.8)	19.1 (12.4-27.3)
10-day	5.05 (4.16-6.04)	6.06 (4.99-7.26)	7.71 (6.32-9.27)	9.09 (7.40-11.0)	11.0 (8.61-13.8)	12.4 (9.50-15.9)	13.9 (10.3-18.5)	15.6 (10.9-21.1)	18.1 (12.1-25.3)	20.2 (13.1-28.8)
20-day	7.12 (5.91-8.47)	8.26 (6.84-9.82)	10.1 (8.34-12.1)	11.6 (9.54-14.0)	13.8 (10.8-17.1)	15.4 (11.8-19.5)	17.0 (12.6-22.3)	18.8 (13.2-25.2)	21.2 (14.2-29.4)	23.2 (15.1-32.7)
30-day	8.85 (7.36-10.5)	10.1 (8.37-11.9)	12.1 (9.99-14.3)	13.7 (11.3-16.4)	16.0 (12.6-19.8)	17.8 (13.7-22.3)	19.5 (14.4-25.3)	21.3 (15.0-28.5)	23.7 (15.9-32.7)	25.5 (16.6-36.0)
45-day	11.0 (9.18-13.0)	12.3 (10.3-14.5)	14.5 (12.0-17.1)	16.3 (13.4-19.4)	18.7 (14.8-23.0)	20.7 (15.9-25.8)	22.6 (16.7-29.0)	24.4 (17.2-32.4)	26.8 (18.0-36.8)	28.5 (18.6-39.9)
60-day	12.8 (10.7-15.0)	14.2 (11.9-16.7)	16.5 (13.7-19.5)	18.4 (15.2-21.8)	21.0 (16.7-25.7)	23.1 (17.8-28.7)	25.0 (18.5-32.0)	26.9 (19.0-35.7)	29.3 (19.8-40.1)	31.0 (20.3-43.3)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

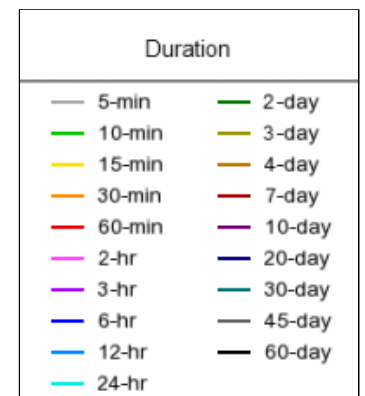
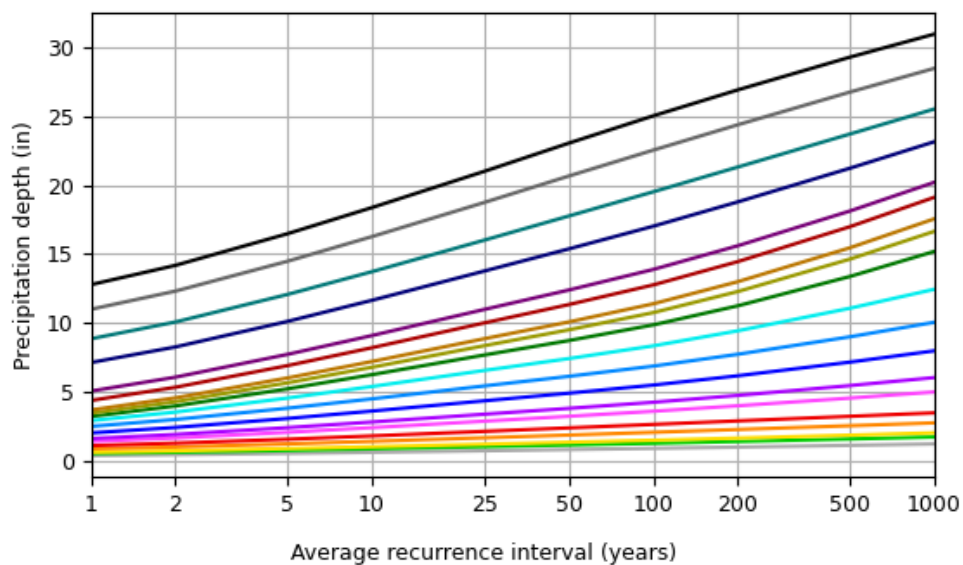
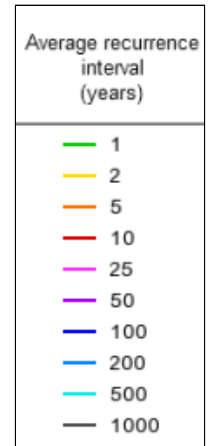
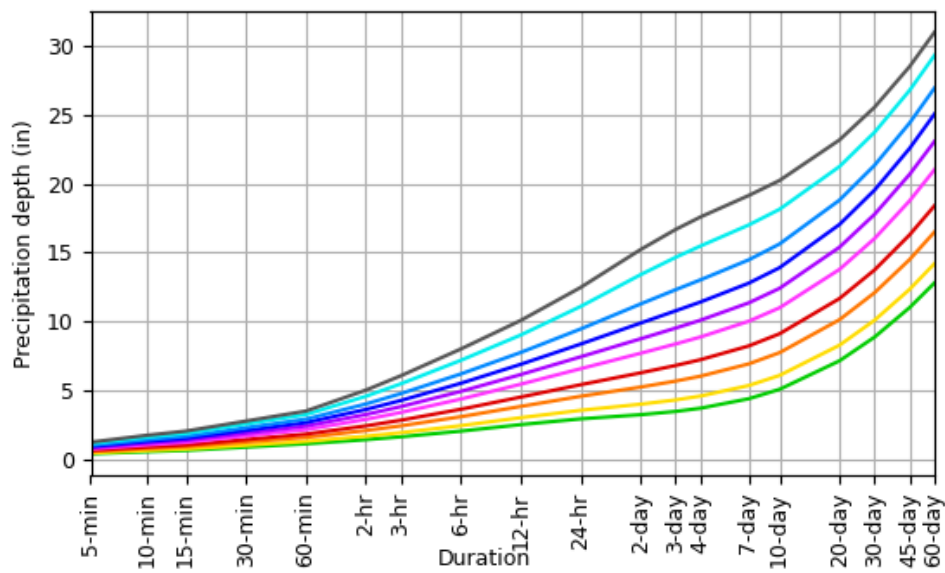
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 41.1679°, Longitude: -73.4146°



Maps & aerials

Small scale terrain



NOAA Atlas 14, Volume 10, Version 3
Location name: Wilton, Connecticut, USA*
Latitude: 41.1679°, Longitude: -73.4146°
Elevation: 141 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.38 (3.43-5.53)	5.10 (4.00-6.44)	6.28 (4.90-7.96)	7.25 (5.62-9.24)	8.59 (6.43-11.4)	9.61 (7.03-12.9)	10.7 (7.55-14.8)	11.8 (7.94-16.8)	13.3 (8.63-19.6)	14.5 (9.19-21.8)
10-min	3.11 (2.43-3.92)	3.61 (2.83-4.57)	4.44 (3.46-5.63)	5.13 (3.98-6.54)	6.08 (4.55-8.04)	6.81 (4.99-9.16)	7.55 (5.35-10.5)	8.34 (5.63-11.9)	9.43 (6.11-13.9)	10.3 (6.51-15.4)
15-min	2.44 (1.91-3.08)	2.84 (2.22-3.58)	3.49 (2.72-4.42)	4.03 (3.12-5.13)	4.77 (3.58-6.31)	5.34 (3.91-7.18)	5.92 (4.20-8.22)	6.54 (4.42-9.32)	7.39 (4.80-10.9)	8.07 (5.10-12.1)
30-min	1.70 (1.33-2.14)	1.97 (1.54-2.50)	2.42 (1.89-3.07)	2.80 (2.17-3.57)	3.31 (2.48-4.37)	3.71 (2.71-4.98)	4.11 (2.90-5.68)	4.52 (3.05-6.44)	5.07 (3.29-7.46)	5.48 (3.47-8.23)
60-min	1.09 (0.853-1.38)	1.26 (0.990-1.60)	1.55 (1.21-1.97)	1.79 (1.39-2.28)	2.12 (1.59-2.80)	2.38 (1.74-3.19)	2.63 (1.85-3.63)	2.88 (1.95-4.11)	3.22 (2.09-4.73)	3.47 (2.20-5.20)
2-hr	0.696 (0.549-0.873)	0.821 (0.647-1.03)	1.03 (0.805-1.29)	1.20 (0.933-1.52)	1.43 (1.08-1.88)	1.61 (1.18-2.16)	1.79 (1.28-2.48)	1.99 (1.35-2.82)	2.27 (1.48-3.32)	2.49 (1.58-3.72)
3-hr	0.532 (0.421-0.665)	0.632 (0.500-0.791)	0.797 (0.627-1.00)	0.933 (0.730-1.18)	1.12 (0.848-1.47)	1.26 (0.935-1.69)	1.41 (1.01-1.95)	1.58 (1.07-2.23)	1.81 (1.18-2.64)	2.01 (1.28-2.98)
6-hr	0.335 (0.267-0.416)	0.402 (0.319-0.499)	0.510 (0.404-0.636)	0.600 (0.473-0.752)	0.724 (0.551-0.946)	0.817 (0.609-1.09)	0.915 (0.662-1.26)	1.03 (0.701-1.44)	1.19 (0.781-1.73)	1.33 (0.849-1.96)
12-hr	0.206 (0.165-0.254)	0.247 (0.198-0.305)	0.315 (0.251-0.391)	0.372 (0.294-0.463)	0.449 (0.344-0.583)	0.507 (0.380-0.672)	0.569 (0.414-0.782)	0.641 (0.438-0.893)	0.746 (0.489-1.07)	0.834 (0.533-1.22)
24-hr	0.120 (0.097-0.148)	0.146 (0.118-0.180)	0.189 (0.151-0.232)	0.224 (0.178-0.277)	0.272 (0.210-0.352)	0.308 (0.233-0.407)	0.347 (0.254-0.475)	0.392 (0.269-0.544)	0.461 (0.303-0.659)	0.518 (0.332-0.755)
2-day	0.066 (0.054-0.081)	0.082 (0.066-0.100)	0.108 (0.087-0.132)	0.130 (0.104-0.159)	0.159 (0.123-0.205)	0.181 (0.138-0.238)	0.205 (0.151-0.280)	0.234 (0.161-0.322)	0.278 (0.183-0.395)	0.316 (0.203-0.457)
3-day	0.047 (0.038-0.057)	0.059 (0.048-0.072)	0.078 (0.063-0.095)	0.094 (0.075-0.115)	0.115 (0.090-0.148)	0.131 (0.100-0.172)	0.149 (0.110-0.203)	0.170 (0.117-0.233)	0.203 (0.134-0.287)	0.231 (0.149-0.333)
4-day	0.038 (0.031-0.046)	0.047 (0.038-0.057)	0.062 (0.050-0.075)	0.075 (0.060-0.091)	0.092 (0.071-0.117)	0.104 (0.080-0.136)	0.118 (0.088-0.161)	0.135 (0.093-0.185)	0.161 (0.106-0.227)	0.183 (0.118-0.262)
7-day	0.025 (0.021-0.031)	0.031 (0.025-0.038)	0.041 (0.033-0.049)	0.048 (0.039-0.059)	0.059 (0.046-0.075)	0.067 (0.051-0.087)	0.075 (0.056-0.102)	0.086 (0.059-0.116)	0.101 (0.067-0.141)	0.113 (0.073-0.162)
10-day	0.021 (0.017-0.025)	0.025 (0.020-0.030)	0.032 (0.026-0.038)	0.037 (0.030-0.045)	0.045 (0.035-0.057)	0.051 (0.039-0.066)	0.057 (0.042-0.077)	0.065 (0.045-0.088)	0.075 (0.050-0.105)	0.084 (0.054-0.119)
20-day	0.014 (0.012-0.017)	0.017 (0.014-0.020)	0.021 (0.017-0.025)	0.024 (0.019-0.029)	0.028 (0.022-0.035)	0.032 (0.024-0.040)	0.035 (0.026-0.046)	0.039 (0.027-0.052)	0.044 (0.029-0.061)	0.048 (0.031-0.068)
30-day	0.012 (0.010-0.014)	0.013 (0.011-0.016)	0.016 (0.013-0.019)	0.019 (0.015-0.022)	0.022 (0.017-0.027)	0.024 (0.018-0.031)	0.027 (0.020-0.035)	0.029 (0.020-0.039)	0.032 (0.022-0.045)	0.035 (0.023-0.049)
45-day	0.010 (0.008-0.011)	0.011 (0.009-0.013)	0.013 (0.011-0.015)	0.015 (0.012-0.017)	0.017 (0.013-0.021)	0.019 (0.014-0.023)	0.020 (0.015-0.026)	0.022 (0.015-0.030)	0.024 (0.016-0.034)	0.026 (0.017-0.036)
60-day	0.008 (0.007-0.010)	0.009 (0.008-0.011)	0.011 (0.009-0.013)	0.012 (0.010-0.015)	0.014 (0.011-0.017)	0.016 (0.012-0.019)	0.017 (0.012-0.022)	0.018 (0.013-0.024)	0.020 (0.013-0.027)	0.021 (0.014-0.030)

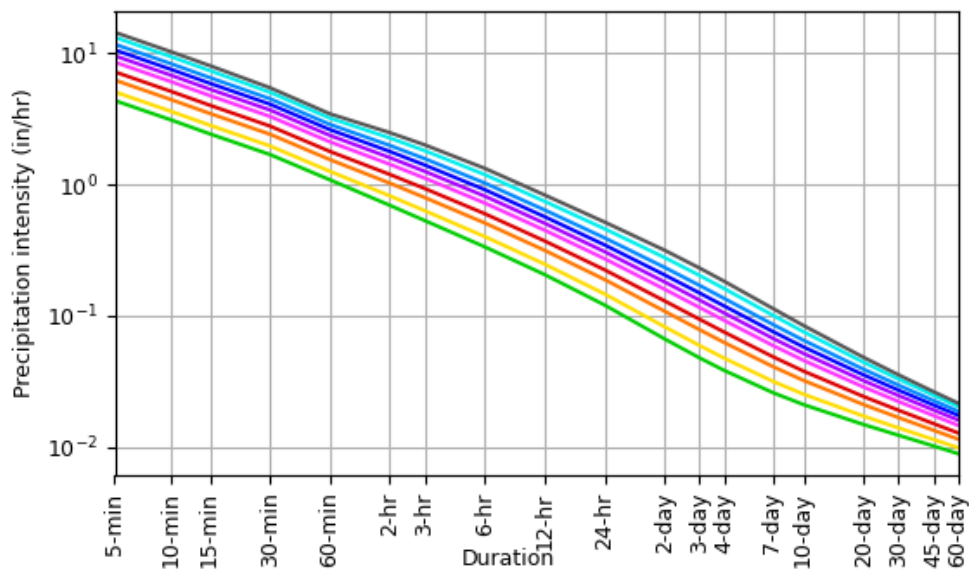
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.
Please refer to NOAA Atlas 14 document for more information.

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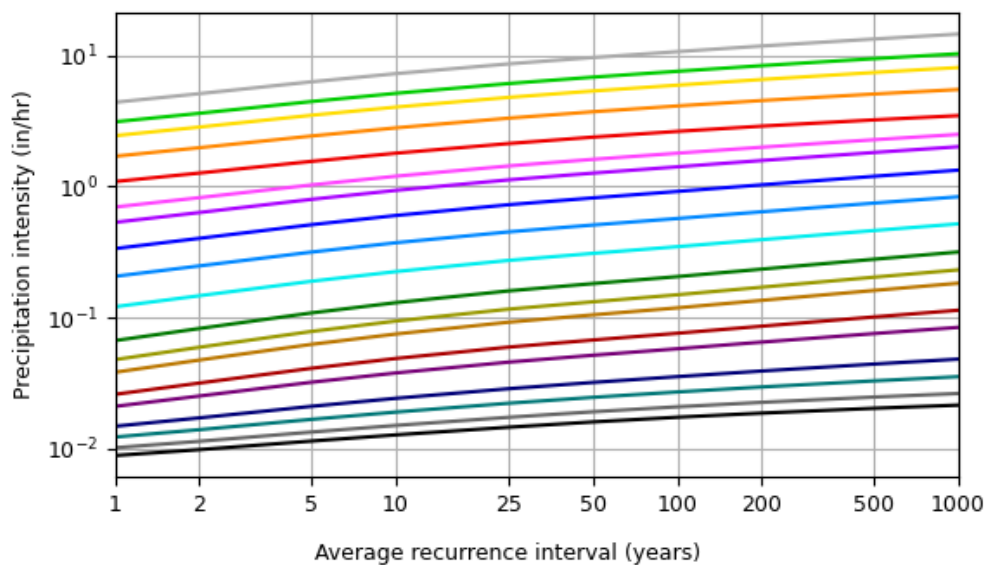
PF graphical

PDS-based intensity-duration-frequency (IDF) curves

Latitude: 41.1679°, Longitude: -73.4146°



Average recurrence interval (years)
1
2
5
10
25
50
100
200
500
1000

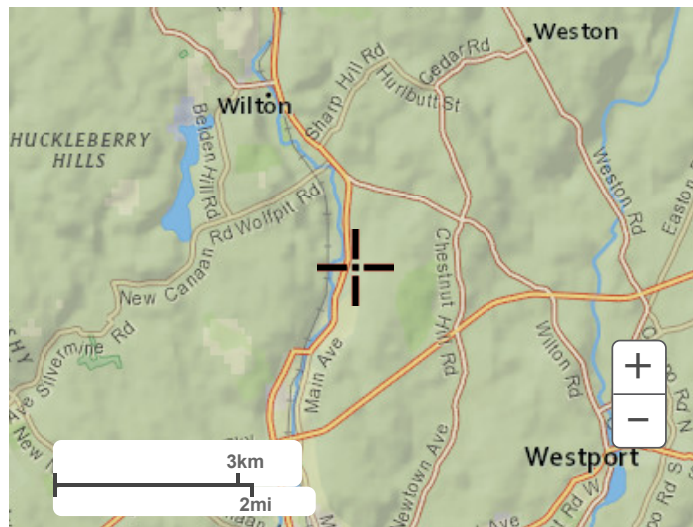


Duration	
5-min	2-day
10-min	3-day
15-min	4-day
30-min	7-day
60-min	10-day
2-hr	20-day
3-hr	30-day
6-hr	45-day
12-hr	60-day
24-hr	

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Maps & aerials

Small scale terrain



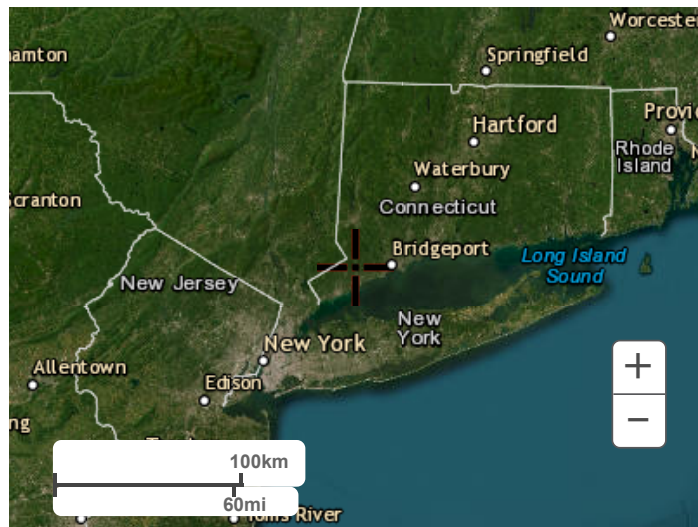
Large scale terrain



Large scale map



Large scale aerial

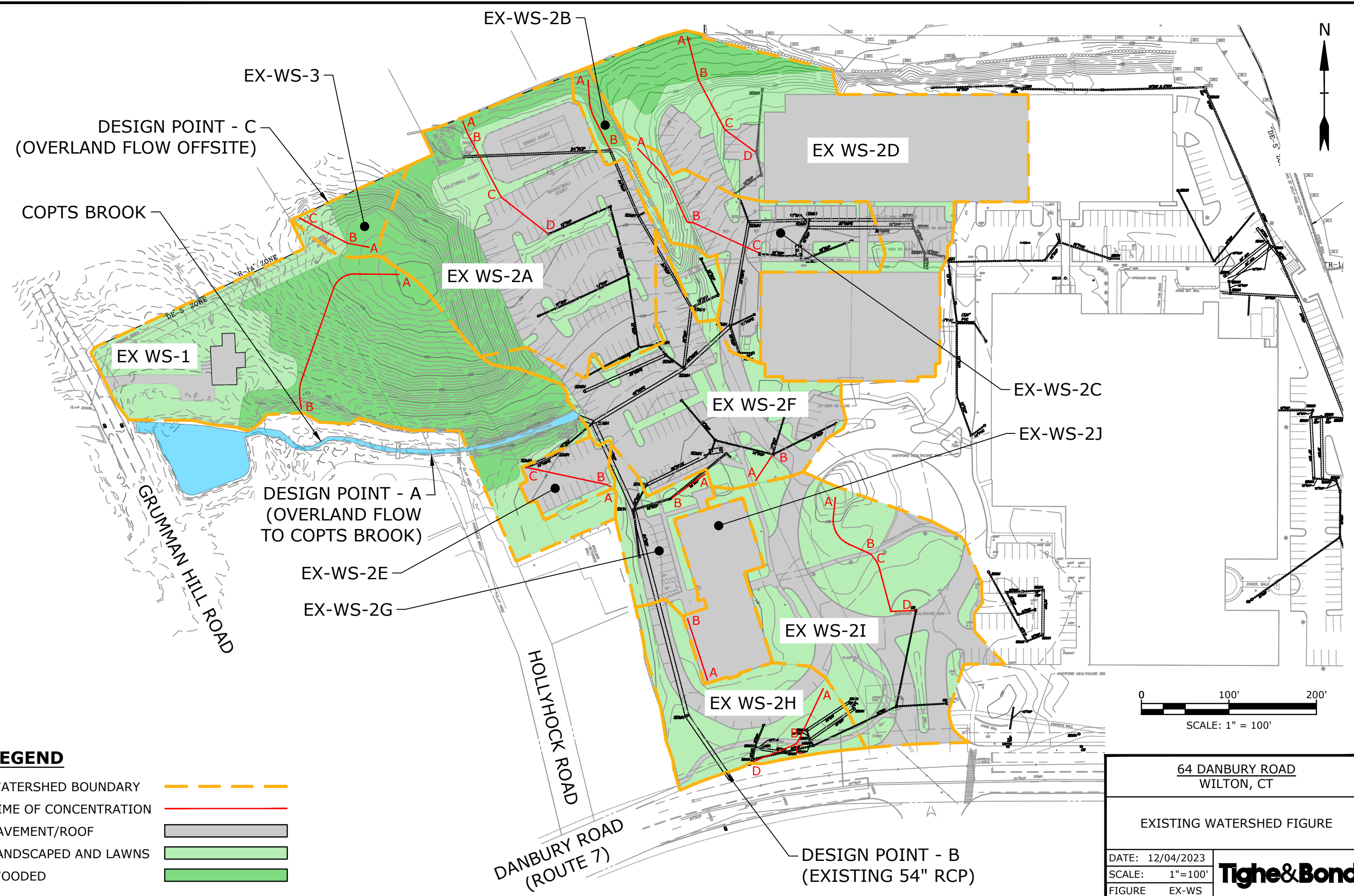


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Tighe & Bond; J:\F0173 Fuller\001 64 Danbury Rd\Calculations\Stormwater\Figures\F0173-001-EX-WS-FIGURE.dwg



LEGEND

- WATERSHED BOUNDARY
- TIME OF CONCENTRATION
- PAVEMENT/ROOF
- LANDSCAPED AND LAWN
- WOODED

0 100' 200'
SCALE: 1" = 100'

64 DANBURY ROAD WILTON, CT	
EXISTING WATERSHED FIGURE	
DATE: 12/04/2023	Tighe&Bond
SCALE: 1"=100'	
FIGURE EX-WS	

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Existing CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **EX WS-01**
Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.091	98	8.8866
Landscaped and Lawns (HSG-B)	0.622	69	42.8858
Landscaped and Lawns (HSG-D)	0.080	84	6.6818
Wooded (HSG-B)	0.916	55	50.3750
Wooded (HSG-D)	0.235	77	18.0621
	1.942		126.891

Weighted CN: 65

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	225	0.2	16.11

Total Tc = 16.1 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **EX WS-02A**
Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.906	98	88.7872
Landscaped and Lawns (HSG-B)	0.154	69	10.6367
Landscaped and Lawns (HSG-D)	0.138	84	11.5895
Wooded (HSG-B)	0.350	55	19.2753
Wooded (HSG-D)	0.129	77	9.9414
	1.678		140.230

Weighted CN: 84

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	10	0.02	3.35
Segment B - C	0.24	84	0.02	12.22
Segment C - D	0.015	67	0.033	0.91

Total Tc = 16.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Existing CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **EX WS-02B**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.006	98	0.5917
Landscaped and Lawns (HSG-B)	0.005	69	0.3738
Landscaped and Lawns (HSG-D)	0.120	84	10.0545
Wooded (HSG-B)	0.029	55	1.6061
Wooded (HSG-D)	0.025	77	1.9604
	0.186		14.586

Weighted CN: 79**Time of Concentration**

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	84	0.072	11.02

Total Tc = 11.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **EX WS-02C**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.391	98	38.3293
Landscaped and Lawns (HSG-D)	0.199	84	16.7287
	0.590		55.058

Weighted CN: 93**Time of Concentration**

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	108	0.08	8.58
Segment B - C	0.015	82	0.067	0.80

Total Tc = 9.4 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Existing CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **EX WS-02D**
Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	1.683	98	164.9397
Landscaped and Lawns (HSG-D)	0.313	84	26.3300
Wooded (HSG-B)	0.231	55	12.7096
Wooded (HSG-D)	0.018	77	1.3823
	2.246		205.362

Weighted CN: **91**

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	52	0.11	6.34
Segment B - C	0.24	65	0.17	4.23
Segment C - D	0.015	43	0.045	0.56

Total Tc = **11.1 Min.**

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **EX WS-02E**
Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.126	98	12.3580
Landscaped and Lawns (HSG-D)	0.020	84	1.6430
	0.146		14.001

Weighted CN: **96**

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	6	0.02	1.48
Segment B - C	0.015	94	0.01	1.92

Total Tc = **3.4 Min.**
USE 5.0 Min. (MIN)

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Existing CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **EX WS-02F**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.704	98	68.9667
Landscaped and Lawns (HSG-D)	0.274	84	23.0229
Wooded (HSG-D)	0.034	77	2.6356
	1.012		94.625

Weighted CN: 93**Time of Concentration**

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	35	0.025	5.55

Total Tc = 5.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **EX WS-02G**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.159	98	15.5459
Landscaped and Lawns (HSG-D)	0.124	84	10.3997
	0.282		25.946

Weighted CN: 92**Time of Concentration**

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	46	0.025	6.91

Total Tc = 6.9 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Existing CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **EX WS-02H**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.166	98	16.2591
Landscaped and Lawns (HSG-D)	0.450	84	37.8309
	0.616		54.090

Weighted CN: 88

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	65	0.025	9.11
Segment B - C	0.015	6	0.02	0.16
Segment C - D	0.25	53	0.025	7.99

Total Tc = 17.3 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **EX WS-02I**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.577	98	56.5165
Landscaped and Lawns (HSG-D)	0.810	84	68.0311
	1.387		124.548

Weighted CN: 90

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	82	0.06	7.73
Segment B - C	0.015	6	0.02	0.16
Segment C - D	0.25	97	0.04	10.74

Total Tc = 18.6 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Existing CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **EX WS-02J**
Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.343	98	33.5756
	0.343		33.576

Weighted CN: 98

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.015	75	0.02	1.21

Total Tc = 1.2 Min.
USE 5.0 Min. (MIN)

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **EX WS-03**
Location:

Cover Type	Area, ac	CN	A x CN
Landscaped and Lawns (HSG-B)	0.043	69	2.9542
Wooded (HSG-B)	0.111	55	6.0909
	0.154		9.045

Weighted CN: 59

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

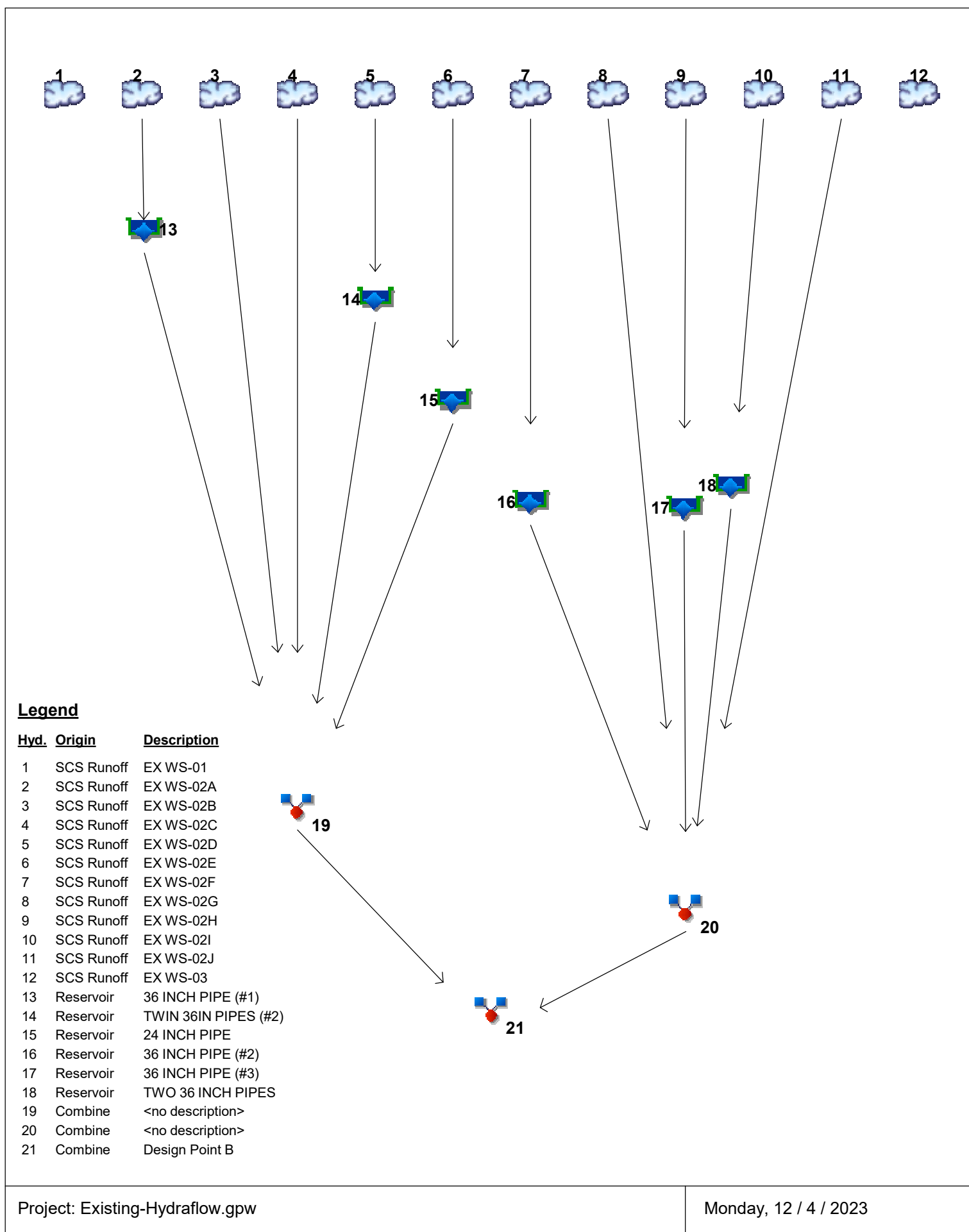
Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	25	0.08	4.01
Segment B - C	0.24	60	0.05	6.47

Total Tc = 10.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021



Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	-----	1.083	-----	-----	3.109	4.569	5.724	7.011	EX WS-01
2	SCS Runoff	-----	-----	2.850	-----	-----	5.245	6.758	7.893	9.103	EX WS-02A
3	SCS Runoff	-----	-----	0.283	-----	-----	0.569	0.755	0.895	1.046	EX WS-02B
4	SCS Runoff	-----	-----	1.664	-----	-----	2.685	3.315	3.785	4.285	EX WS-02C
5	SCS Runoff	-----	-----	5.519	-----	-----	9.148	11.39	13.06	14.84	EX WS-02D
6	SCS Runoff	-----	-----	0.468	-----	-----	0.731	0.894	1.015	1.145	EX WS-02E
7	SCS Runoff	-----	-----	3.039	-----	-----	4.896	6.042	6.897	7.807	EX WS-02F
8	SCS Runoff	-----	-----	0.774	-----	-----	1.265	1.567	1.793	2.033	EX WS-02G
9	SCS Runoff	-----	-----	1.152	-----	-----	1.996	2.521	2.913	3.330	EX WS-02H
10	SCS Runoff	-----	-----	2.779	-----	-----	4.677	5.852	6.727	7.659	EX WS-02I
11	SCS Runoff	-----	-----	1.132	-----	-----	1.741	2.120	2.404	2.707	EX WS-02J
12	SCS Runoff	-----	-----	0.050	-----	-----	0.199	0.314	0.408	0.513	EX WS-03
13	Reservoir	2	-----	2.833	-----	-----	5.228	6.739	7.874	8.866	36 INCH PIPE (#1)
14	Reservoir	5	-----	5.358	-----	-----	8.916	11.13	12.78	14.56	TWIN 36IN PIPES (#2)
15	Reservoir	6	-----	0.449	-----	-----	0.704	0.908	1.042	1.129	24 INCH PIPE
16	Reservoir	7	-----	2.993	-----	-----	4.822	5.901	6.741	7.332	36 INCH PIPE (#2)
17	Reservoir	9	-----	0.105	-----	-----	2.300	2.826	2.899	3.311	36 INCH PIPE (#3)
18	Reservoir	10	-----	2.761	-----	-----	4.647	5.822	6.701	7.629	TWO 36 INCH PIPES
19	Combine	3, 4, 13, 14, 15,	-----	10.17	-----	-----	17.43	21.96	25.35	28.95	<no description>
20	Combine	8, 11, 16, 17, 18,	-----	6.802	-----	-----	11.11	14.53	18.18	20.65	<no description>
21	Combine	19, 20	-----	16.45	-----	-----	27.70	36.49	42.76	49.09	Design Point B
Proj. file: Existing-Hydraflow.gpw										Monday, 12 / 4 / 2023	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

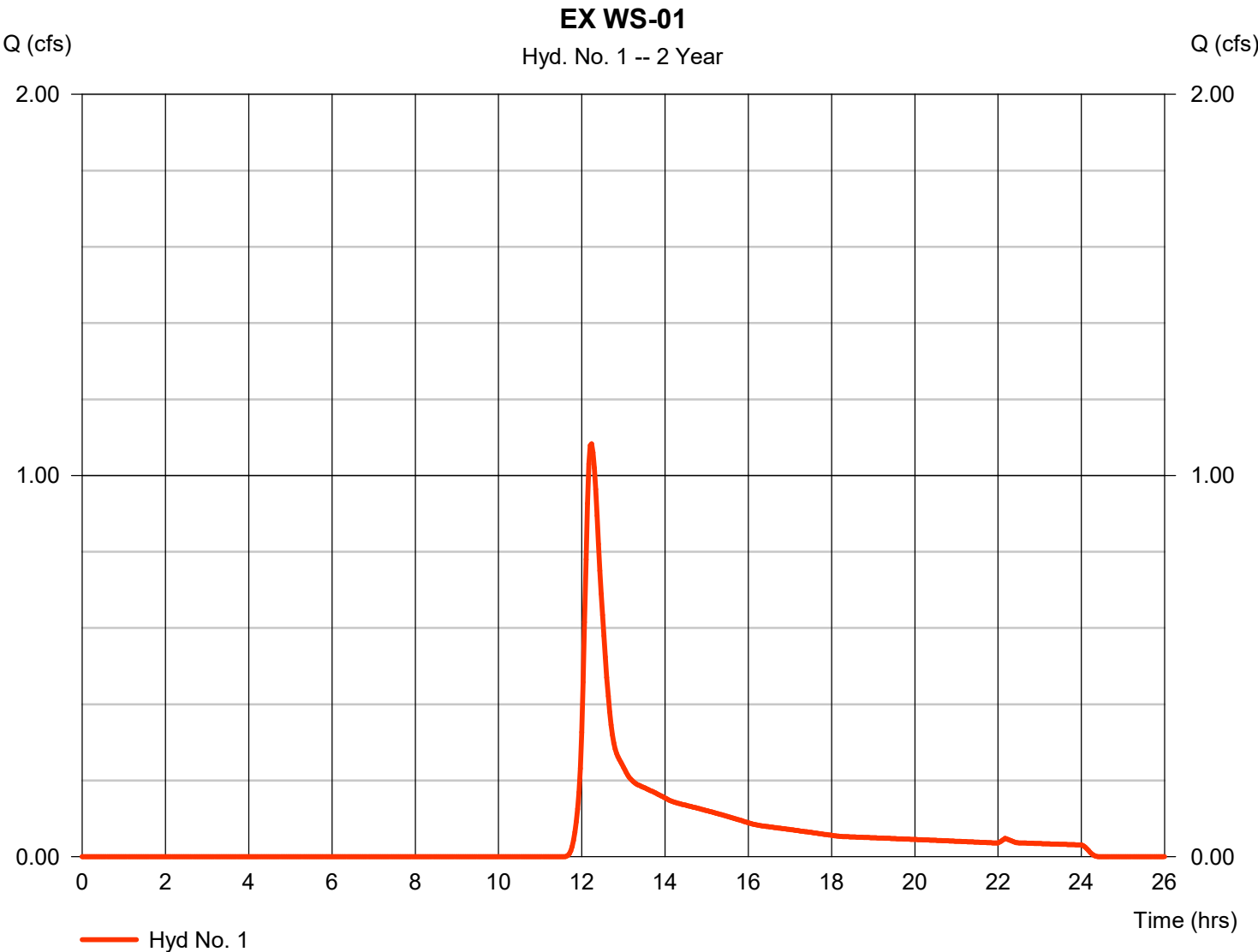
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.083	2	734	5,241	-----	-----	-----	EX WS-01
2	SCS Runoff	2.850	2	730	11,602	-----	-----	-----	EX WS-02A
3	SCS Runoff	0.283	2	730	1,101	-----	-----	-----	EX WS-02B
4	SCS Runoff	1.664	2	726	5,899	-----	-----	-----	EX WS-02C
5	SCS Runoff	5.519	2	728	21,524	-----	-----	-----	EX WS-02D
6	SCS Runoff	0.468	2	724	1,523	-----	-----	-----	EX WS-02E
7	SCS Runoff	3.039	2	724	9,485	-----	-----	-----	EX WS-02F
8	SCS Runoff	0.774	2	726	2,719	-----	-----	-----	EX WS-02G
9	SCS Runoff	1.152	2	732	5,114	-----	-----	-----	EX WS-02H
10	SCS Runoff	2.779	2	732	12,419	-----	-----	-----	EX WS-02I
11	SCS Runoff	1.132	2	724	3,836	-----	-----	-----	EX WS-02J
12	SCS Runoff	0.050	2	734	288	-----	-----	-----	EX WS-03
13	Reservoir	2.833	2	732	9,516	2	143.56	1,493	36 INCH PIPE (#1)
14	Reservoir	5.358	2	730	16,803	5	139.02	3,243	TWIN 36IN PIPES (#2)
15	Reservoir	0.449	2	724	891	6	139.60	475	24 INCH PIPE
16	Reservoir	2.993	2	724	8,038	7	139.42	1,181	36 INCH PIPE (#2)
17	Reservoir	0.105	2	848	1,259	9	137.46	3,651	36 INCH PIPE (#3)
18	Reservoir	2.761	2	734	9,331	10	135.68	2,406	TWO 36 INCH PIPES
19	Combine	10.17	2	730	34,210	3, 4, 13, 14, 15,	-----	-----	<no description>
20	Combine	6.802	2	726	25,182	8, 11, 16, 17, 18,	-----	-----	<no description>
21	Combine	16.45	2	728	59,393	19, 20	-----	-----	Design Point B
Existing-Hydraflow.gpw					Return Period: 2 Year			Monday, 12 / 4 / 2023	

Hydrograph Report

Hyd. No. 1

EX WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 1.083 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 5,241 cuft
Drainage area	= 1.942 ac	Curve number	= 65
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.10 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

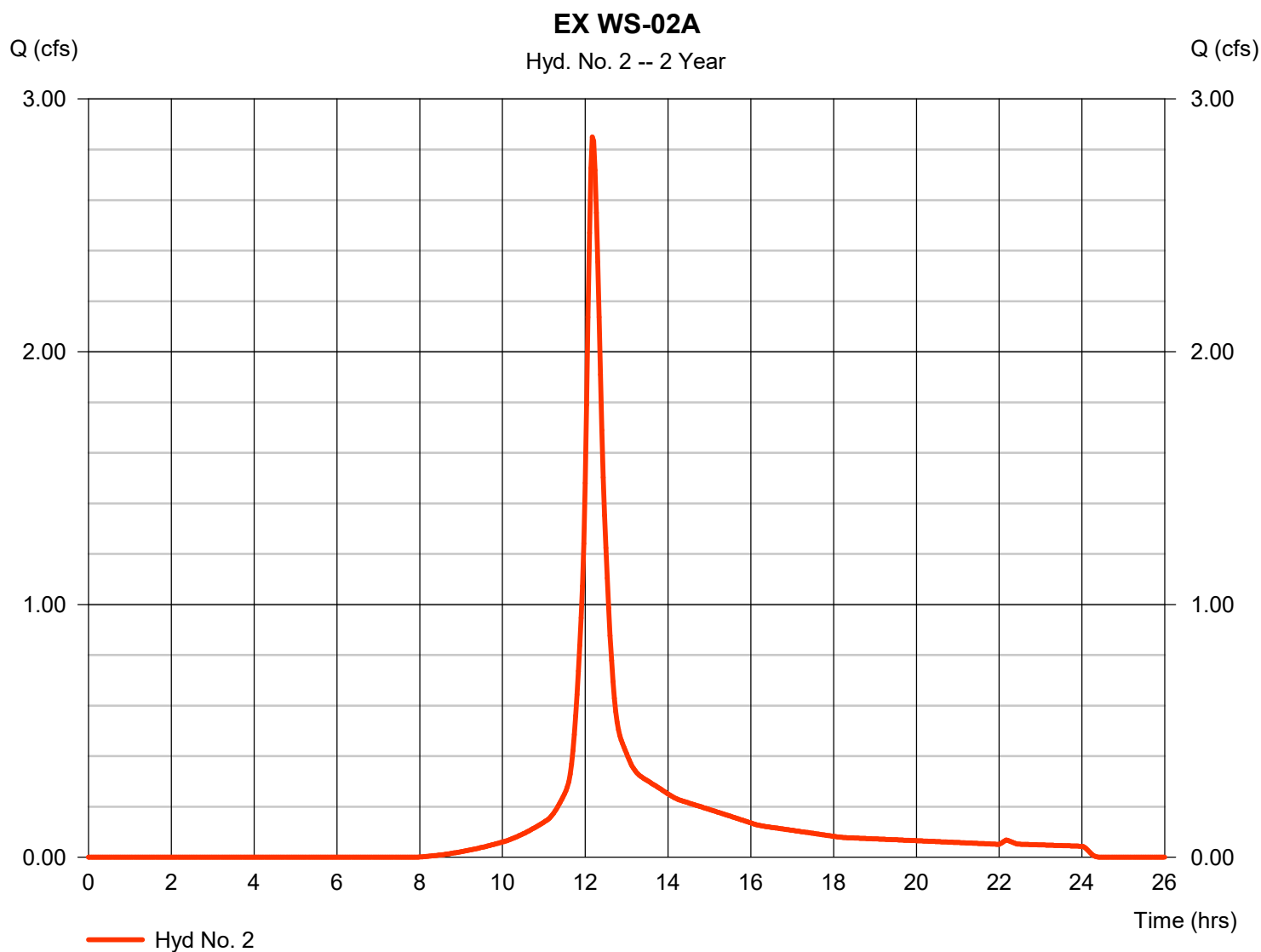
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 2

EX WS-02A

Hydrograph type	= SCS Runoff	Peak discharge	= 2.850 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 11,602 cuft
Drainage area	= 1.678 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.50 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

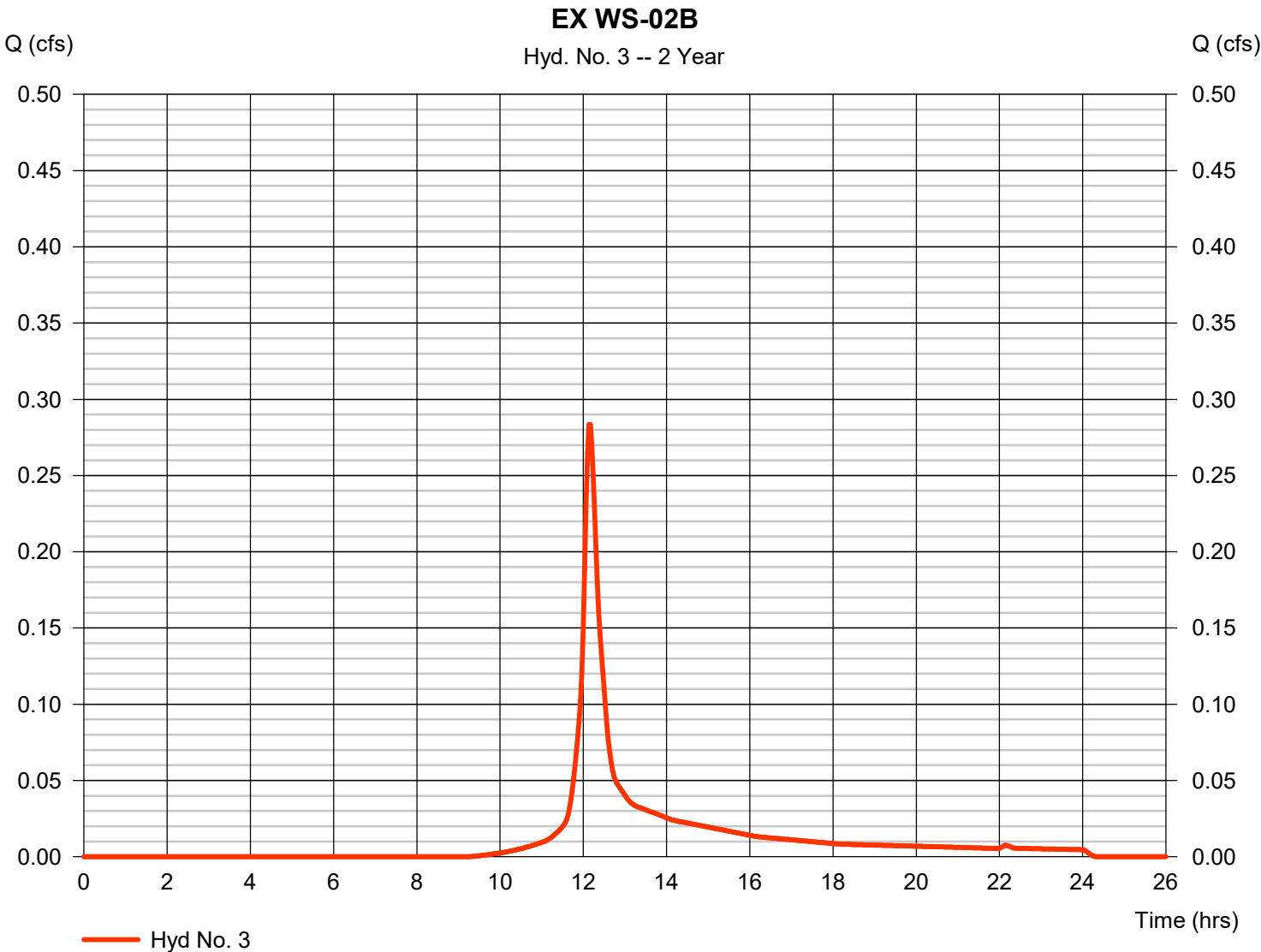
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 3

EX WS-02B

Hydrograph type	= SCS Runoff	Peak discharge	= 0.283 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 1,101 cuft
Drainage area	= 0.186 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 11.00 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

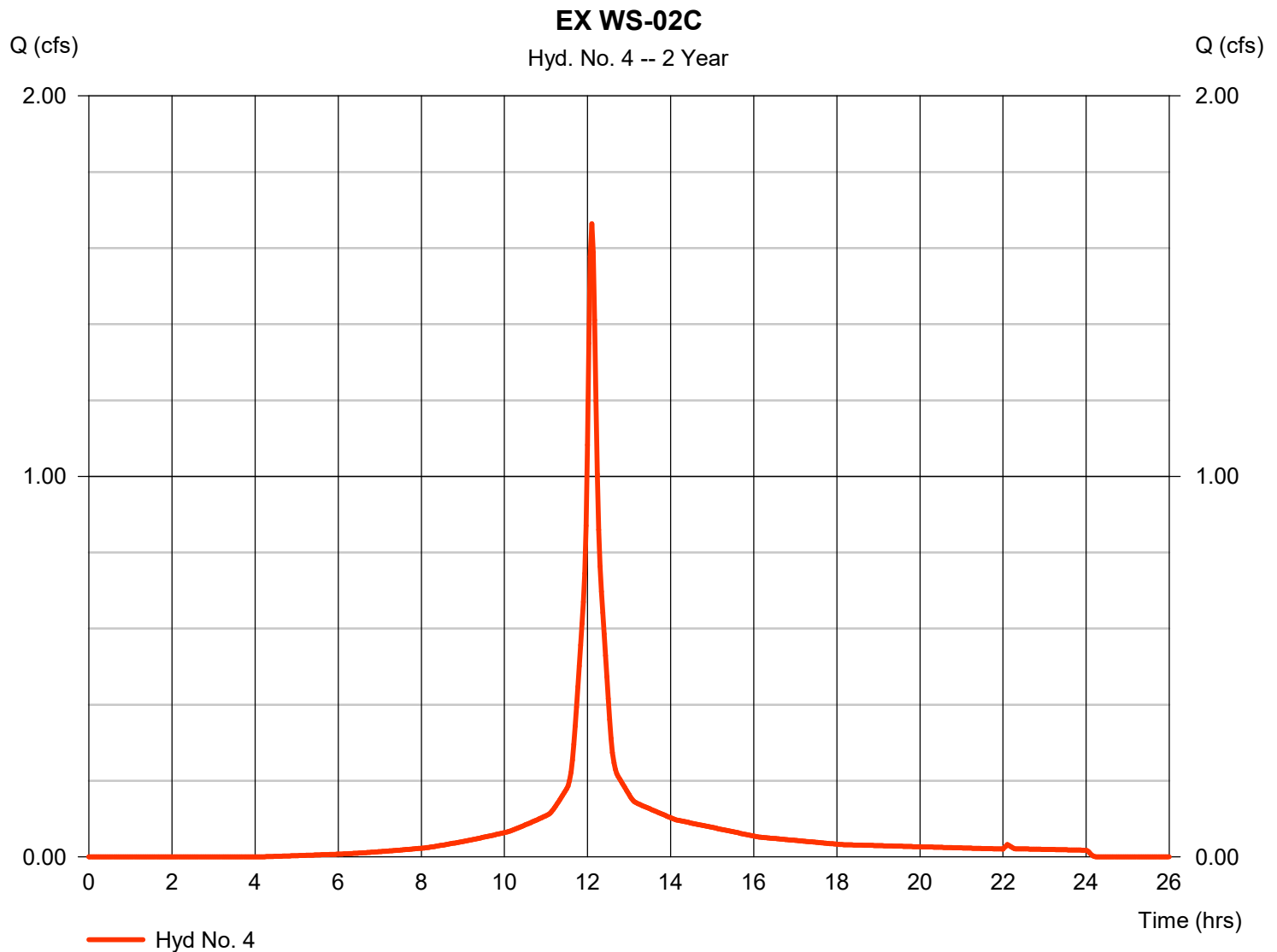
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 4

EX WS-02C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.664 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 5,899 cuft
Drainage area	= 0.590 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.40 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

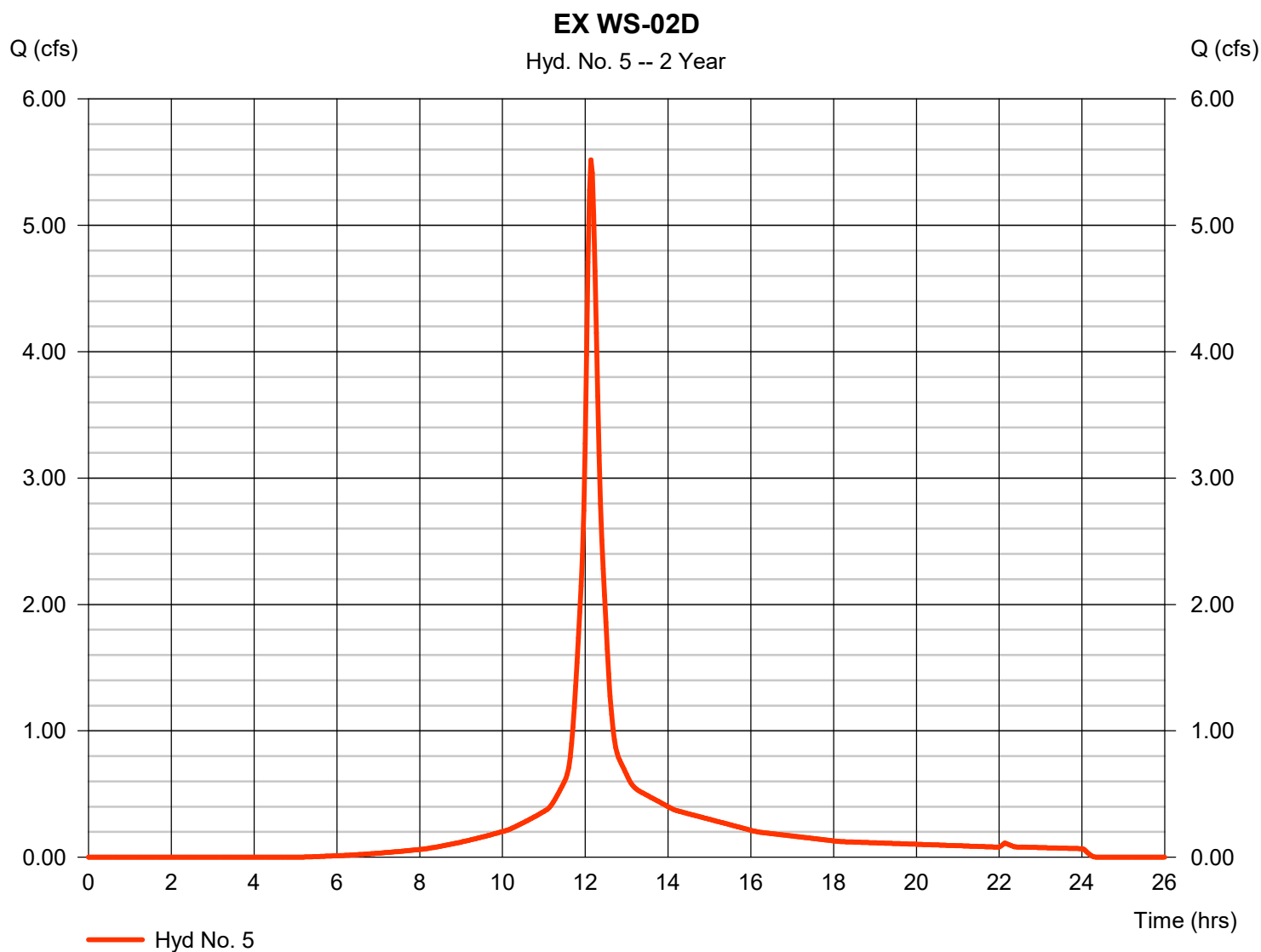
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 5

EX WS-02D

Hydrograph type	= SCS Runoff	Peak discharge	= 5.519 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 21,524 cuft
Drainage area	= 2.246 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 11.10 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

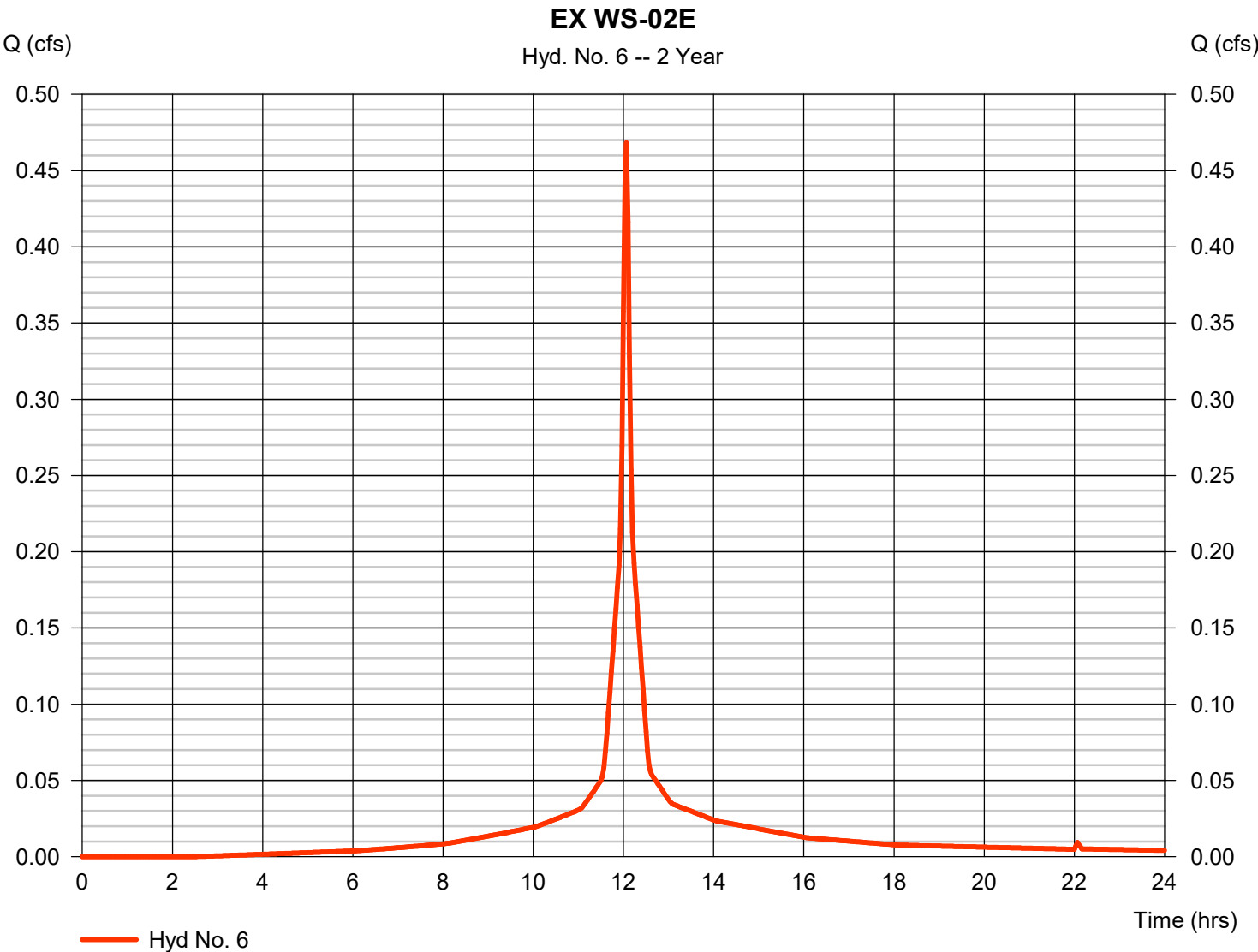
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 6

EX WS-02E

Hydrograph type	= SCS Runoff	Peak discharge	= 0.468 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 1,523 cuft
Drainage area	= 0.146 ac	Curve number	= 96
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

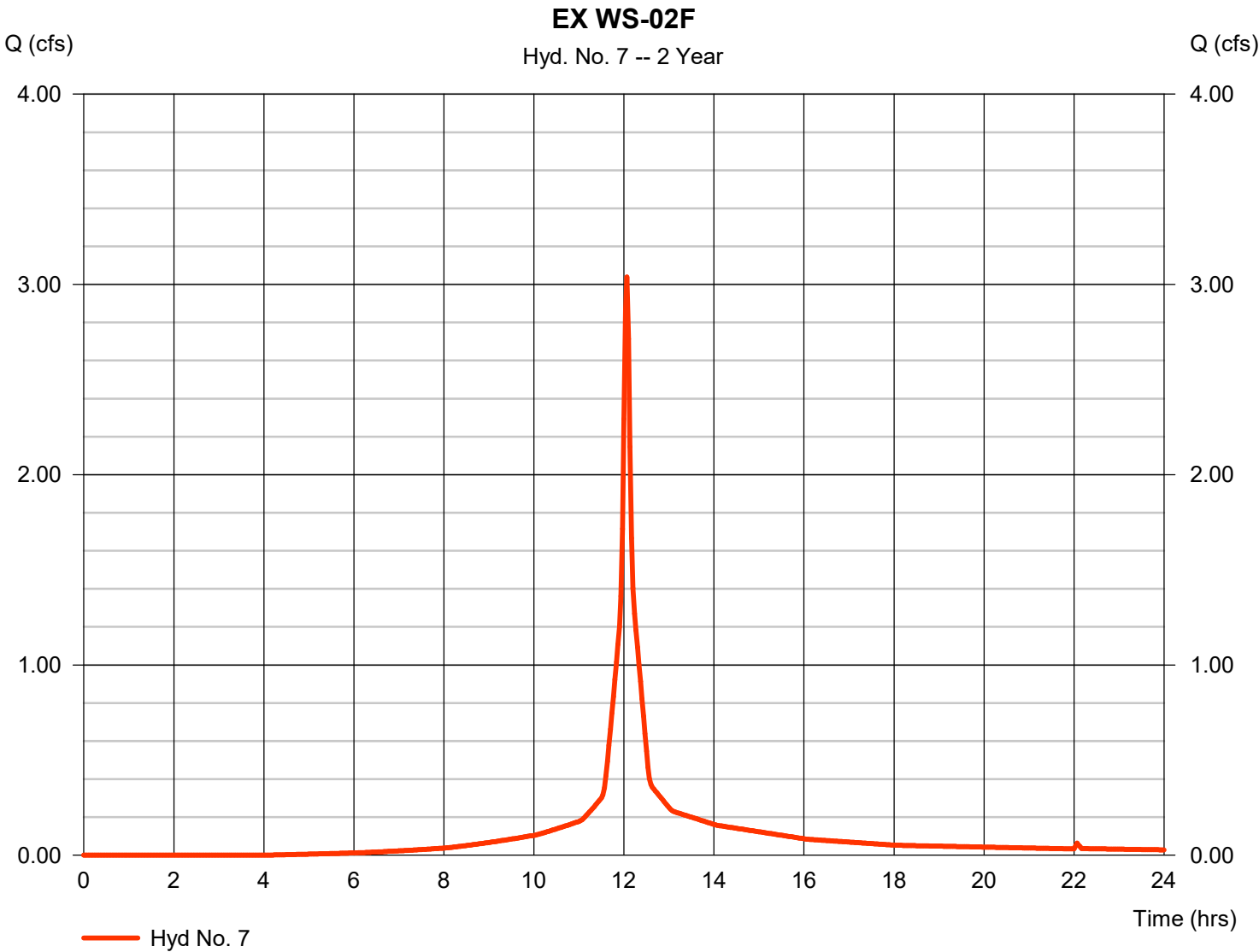
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 7

EX WS-02F

Hydrograph type	= SCS Runoff	Peak discharge	= 3.039 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 9,485 cuft
Drainage area	= 1.012 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.50 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

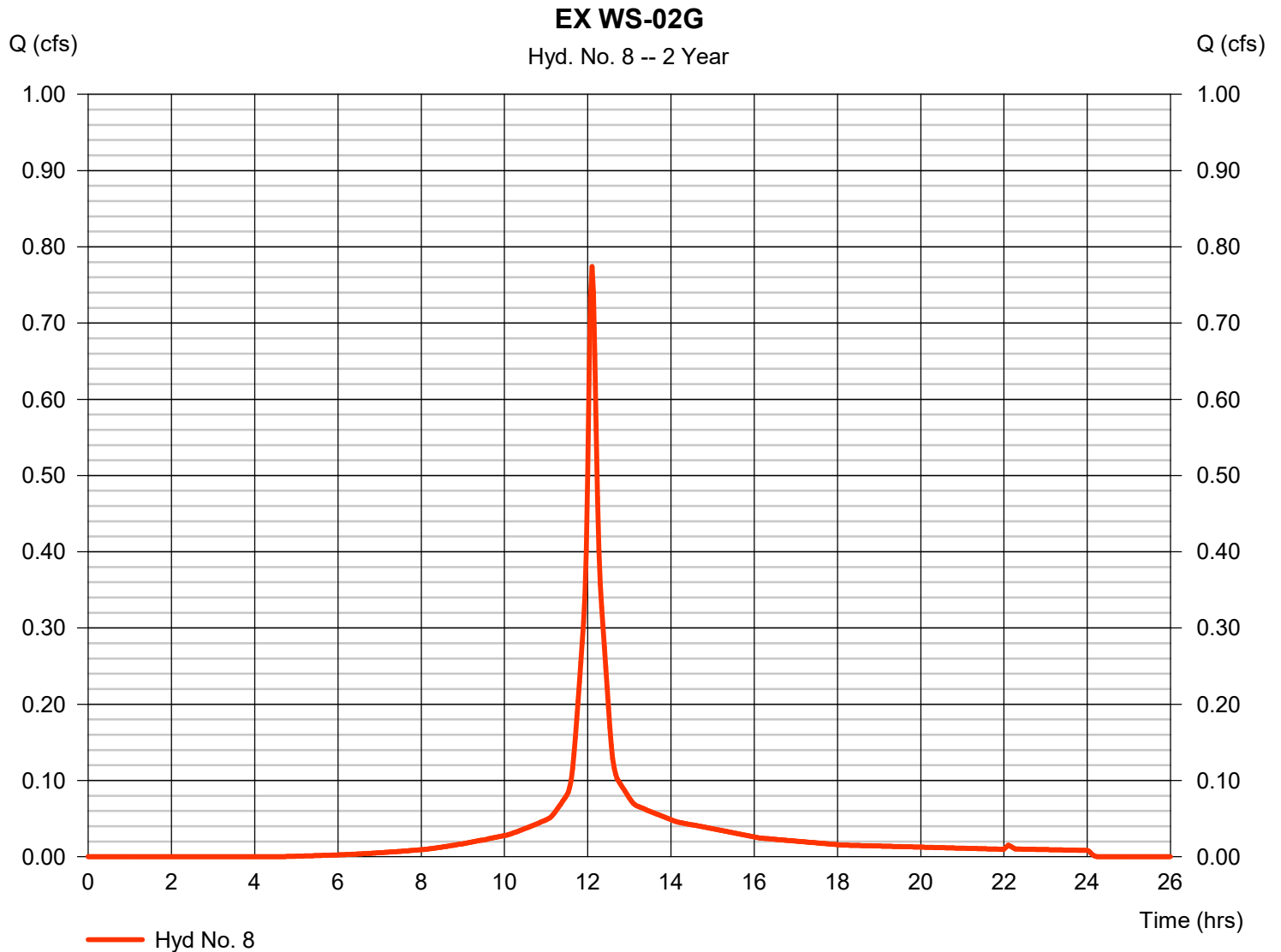
Monday, 12 / 4 / 2023

Hyd. No. 8

EX WS-02G

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 0.282 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 3.52 in
 Storm duration = 24 hrs

Peak discharge = 0.774 cfs
 Time to peak = 12.10 hrs
 Hyd. volume = 2,719 cuft
 Curve number = 92
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 6.90 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

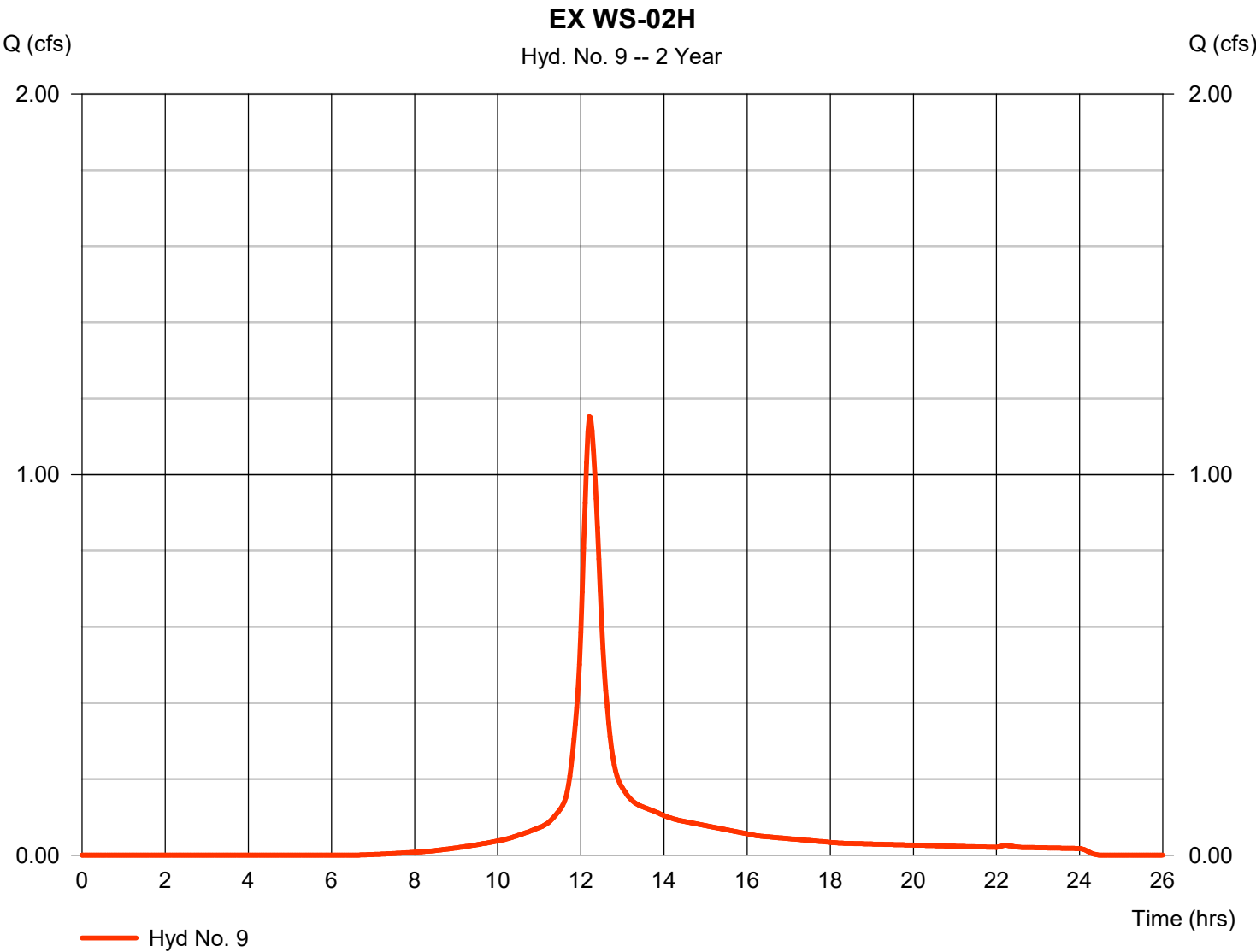
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 9

EX WS-02H

Hydrograph type	= SCS Runoff	Peak discharge	= 1.152 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 5,114 cuft
Drainage area	= 0.616 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.30 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

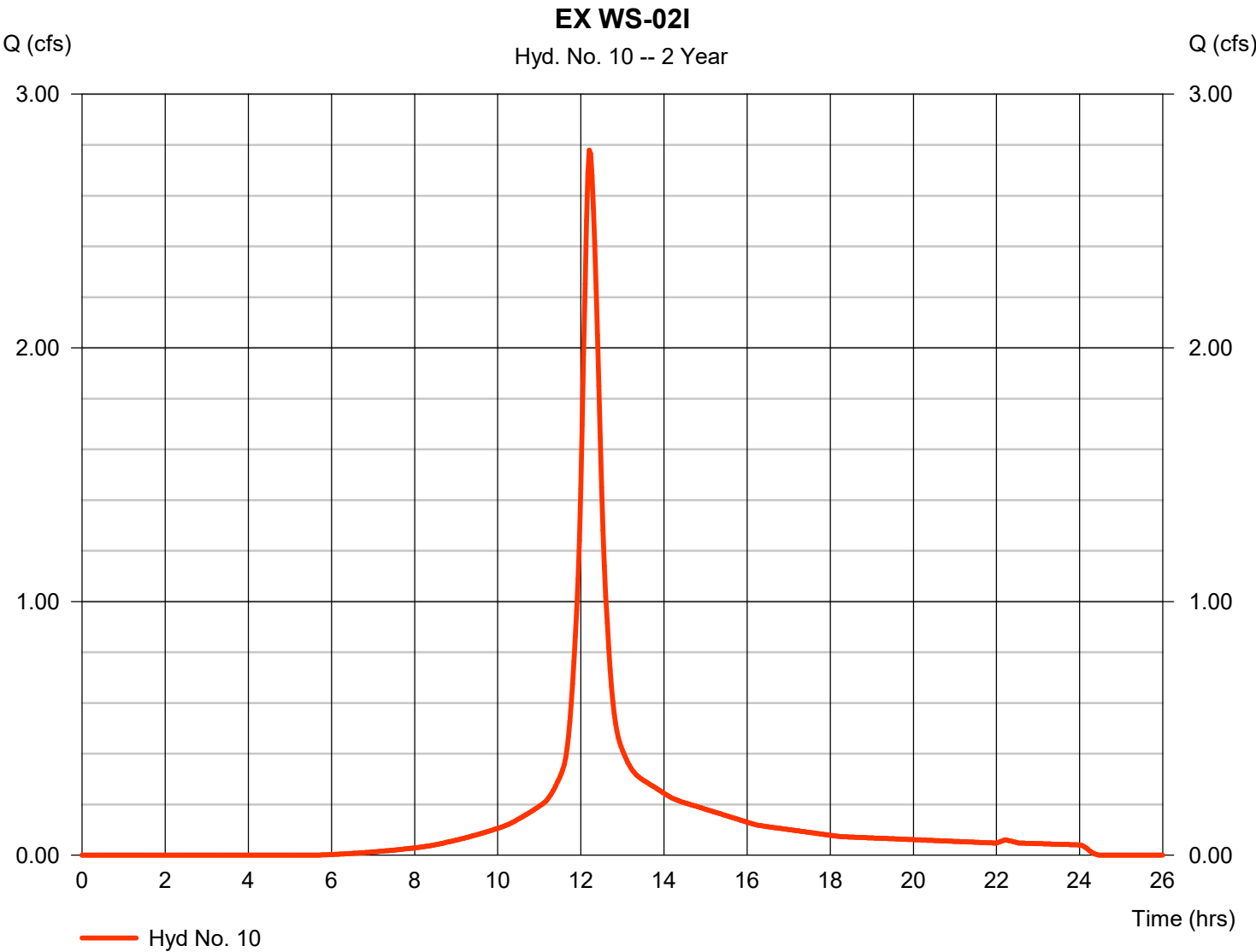


Hydrograph Report

Hyd. No. 10

EX WS-02I

Hydrograph type	= SCS Runoff	Peak discharge	= 2.779 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 12,419 cuft
Drainage area	= 1.387 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.60 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

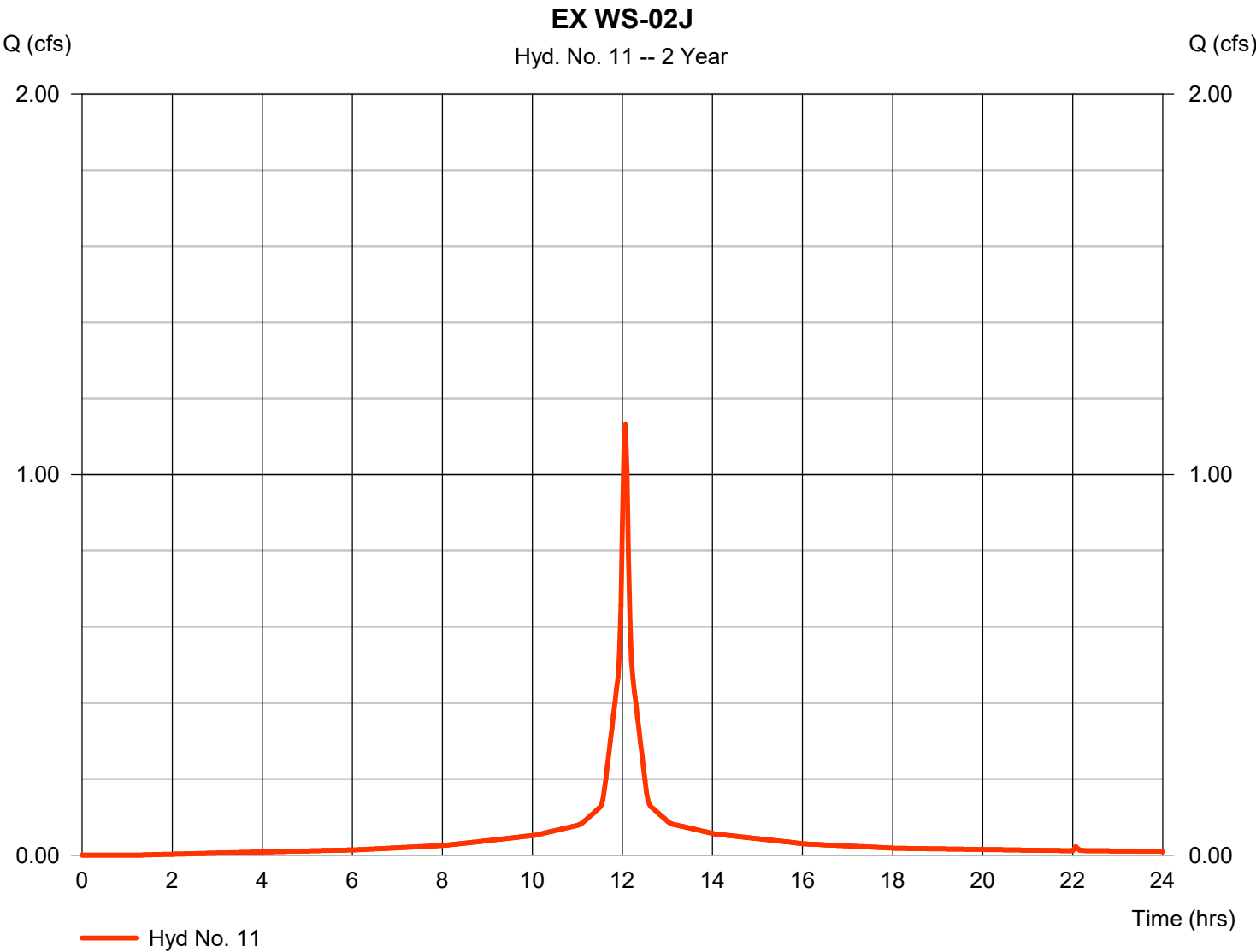
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 11

EX WS-02J

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.132 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,836 cuft
Drainage area	=	0.343 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.52 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

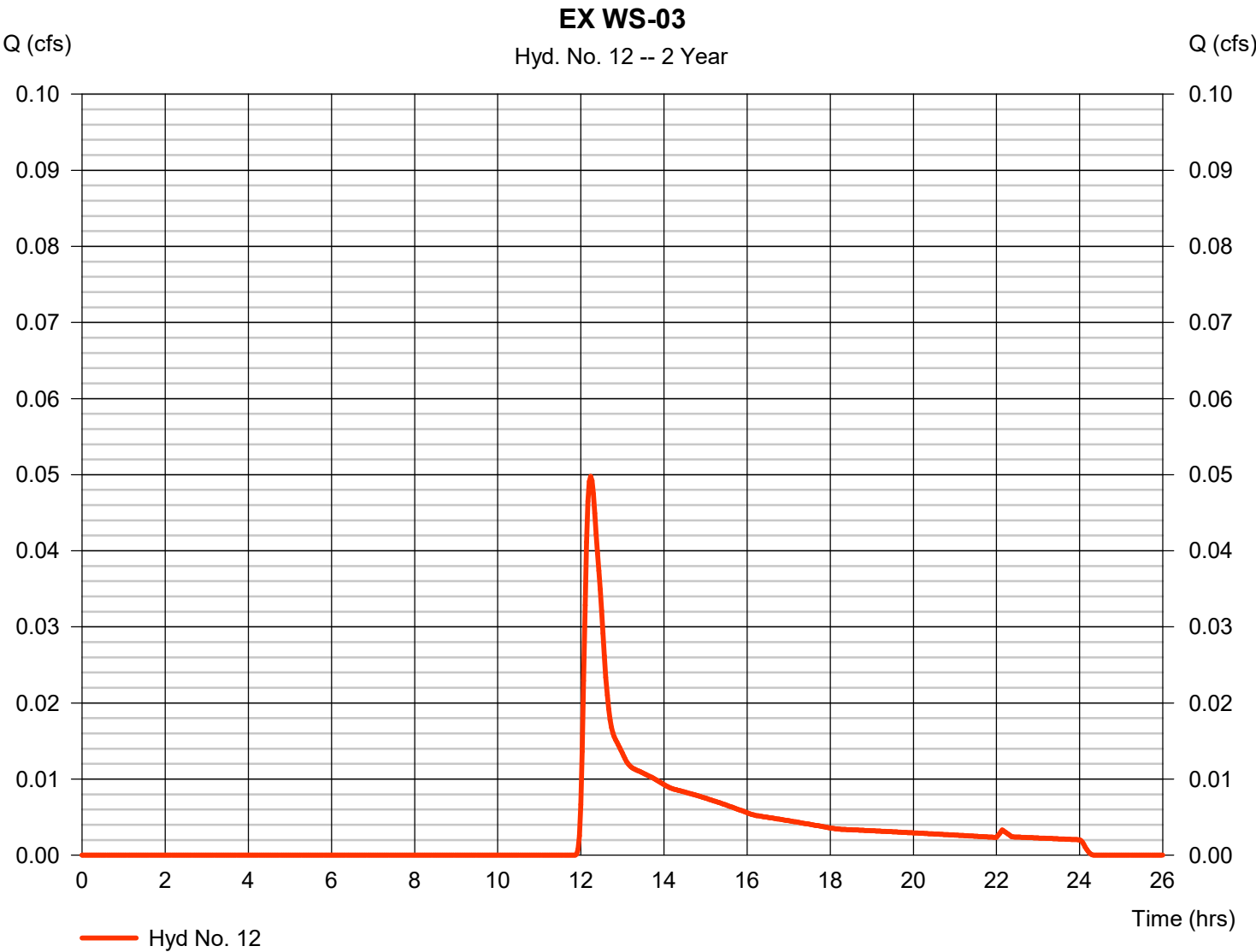
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 12

EX WS-03

Hydrograph type	= SCS Runoff	Peak discharge	= 0.050 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 288 cuft
Drainage area	= 0.154 ac	Curve number	= 59
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.50 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

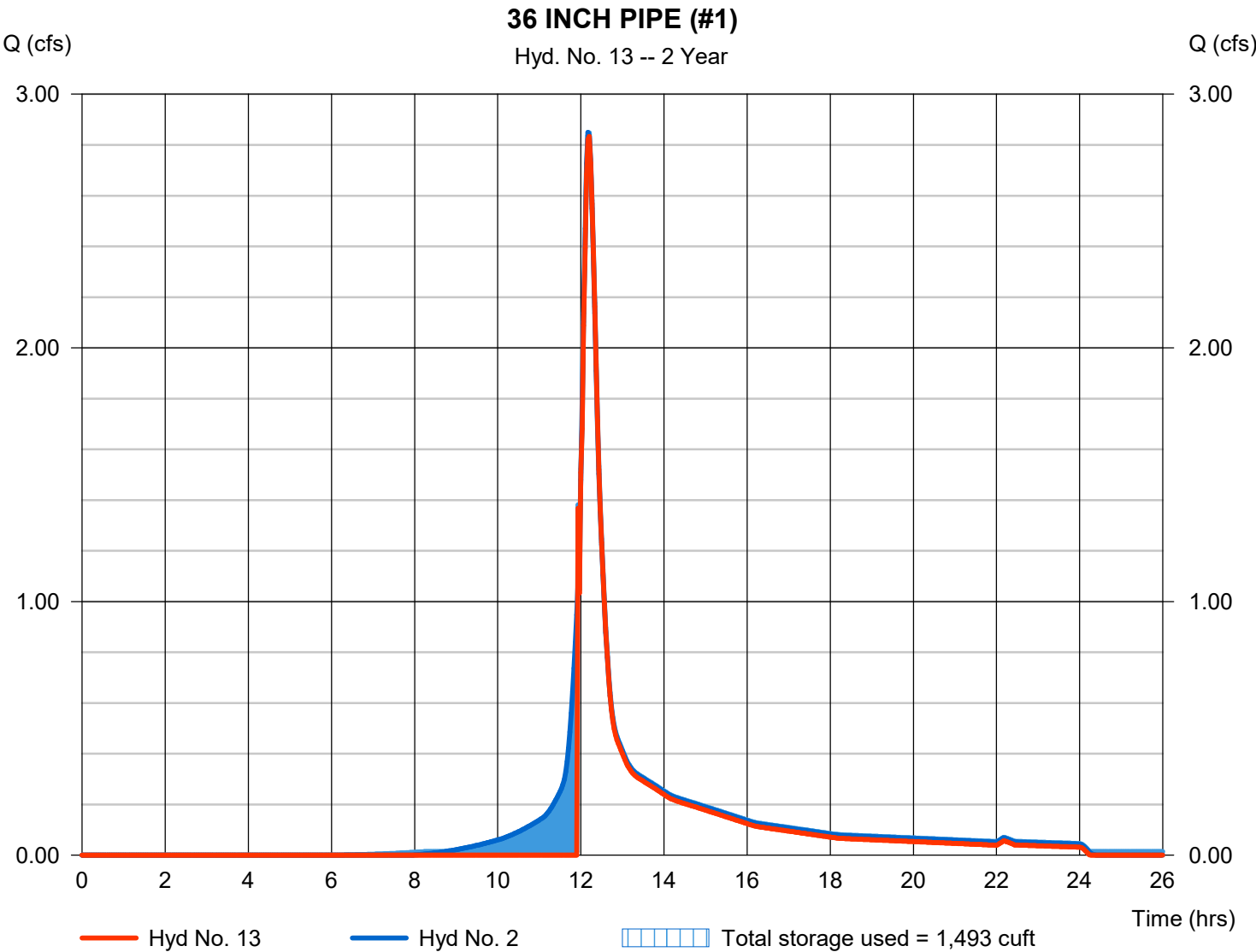
Monday, 12 / 4 / 2023

Hyd. No. 13

36 INCH PIPE (#1)

Hydrograph type	= Reservoir	Peak discharge	= 2.833 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 9,516 cuft
Inflow hyd. No.	= 2 - EX WS-02A	Max. Elevation	= 143.56 ft
Reservoir name	= 36IN - 1	Max. Storage	= 1,493 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

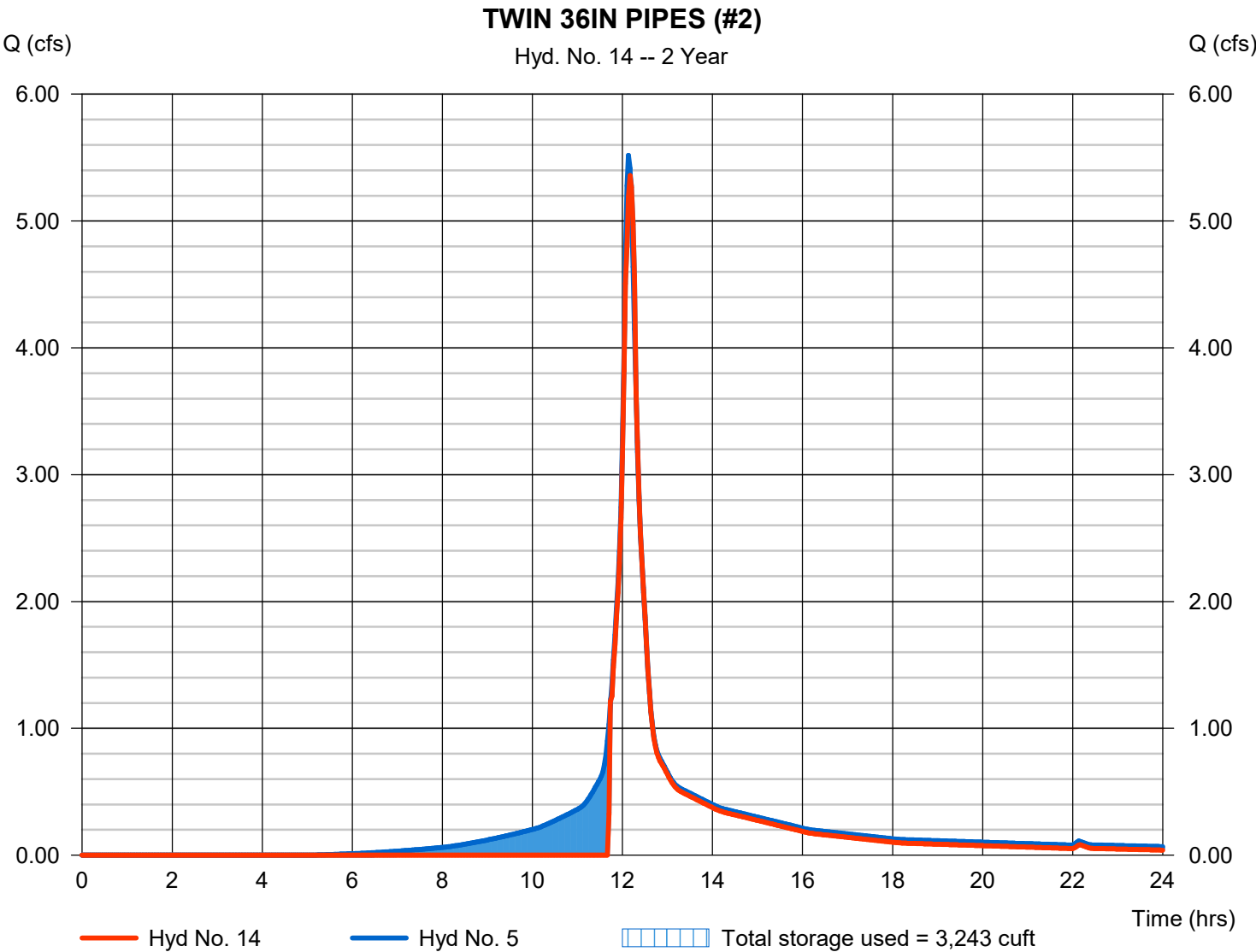
Monday, 12 / 4 / 2023

Hyd. No. 14

TWIN 36IN PIPES (#2)

Hydrograph type	= Reservoir	Peak discharge	= 5.358 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 16,803 cuft
Inflow hyd. No.	= 5 - EX WS-02D	Max. Elevation	= 139.02 ft
Reservoir name	= Northern Twin 36IN	Max. Storage	= 3,243 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 6 - Northern Twin 36IN

Pond Data

UG Chambers -Invert elev. = 131.00 ft, Rise x Span = 3.00 x 3.00 ft, Barrel Len = 120.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = No Headers, Culvert defined by centerline, width = 5.00 ft, height = 0.50 ft, No. of voids = 4, 0.00% slope, Beginning Elevation = 138.30 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	130.50	n/a	0	0
0.35	130.85	n/a	168	168
0.70	131.20	n/a	197	365
1.05	131.55	n/a	267	632
1.40	131.90	n/a	297	929
1.75	132.25	n/a	313	1,242
2.10	132.60	n/a	319	1,561
2.45	132.95	n/a	316	1,877
2.80	133.30	n/a	305	2,182
3.15	133.65	n/a	282	2,464
3.50	134.00	n/a	234	2,698
7.80	138.30	01	2	2,701
8.50	139.00	1,250	438	3,138
9.50	140.00	7,570	4,410	7,548

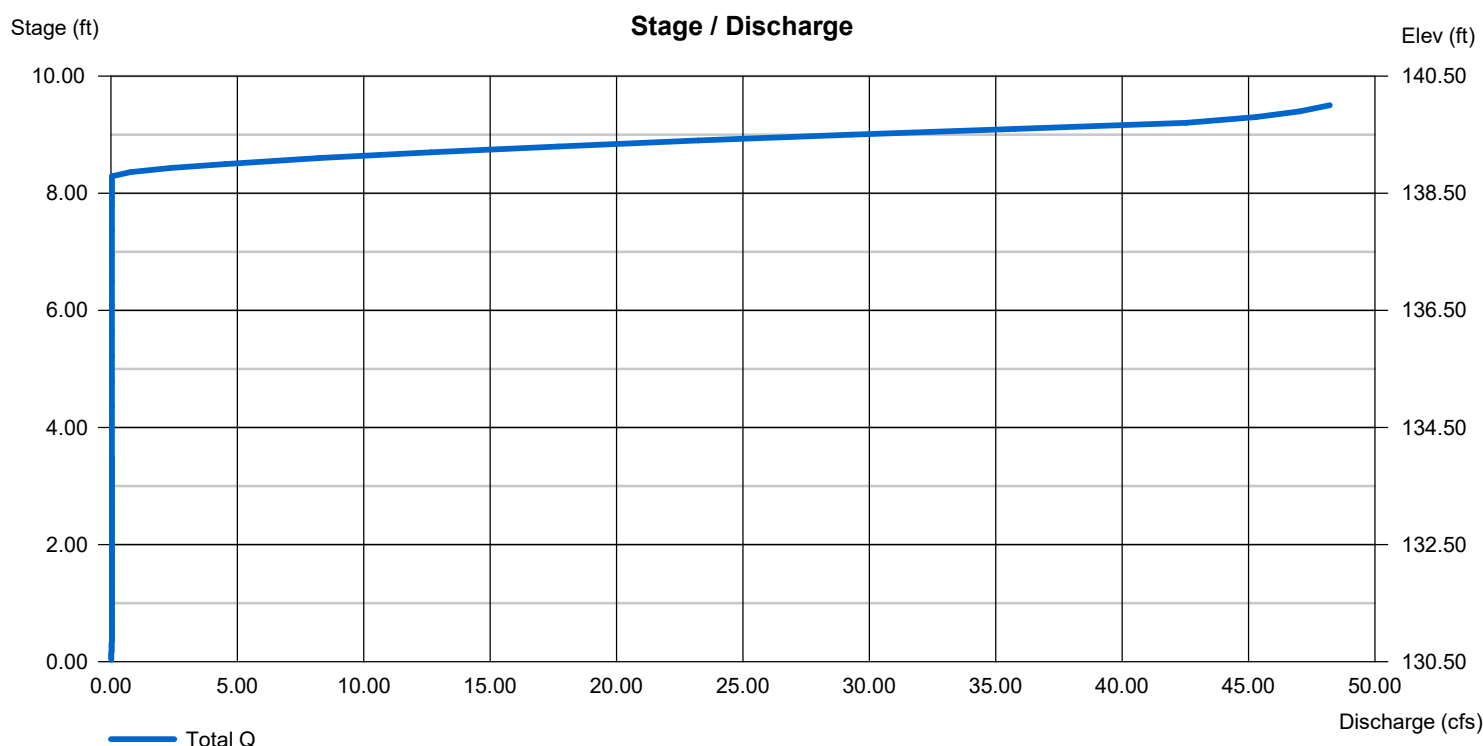
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRs _r]
Rise (in)	= 30.00	0.00	0.00	0.00
Span (in)	= 30.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 134.20	0.00	0.00	0.00
Length (ft)	= 69.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.00	0.00	0.00	0.00
Crest El. (ft)	= 138.80	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

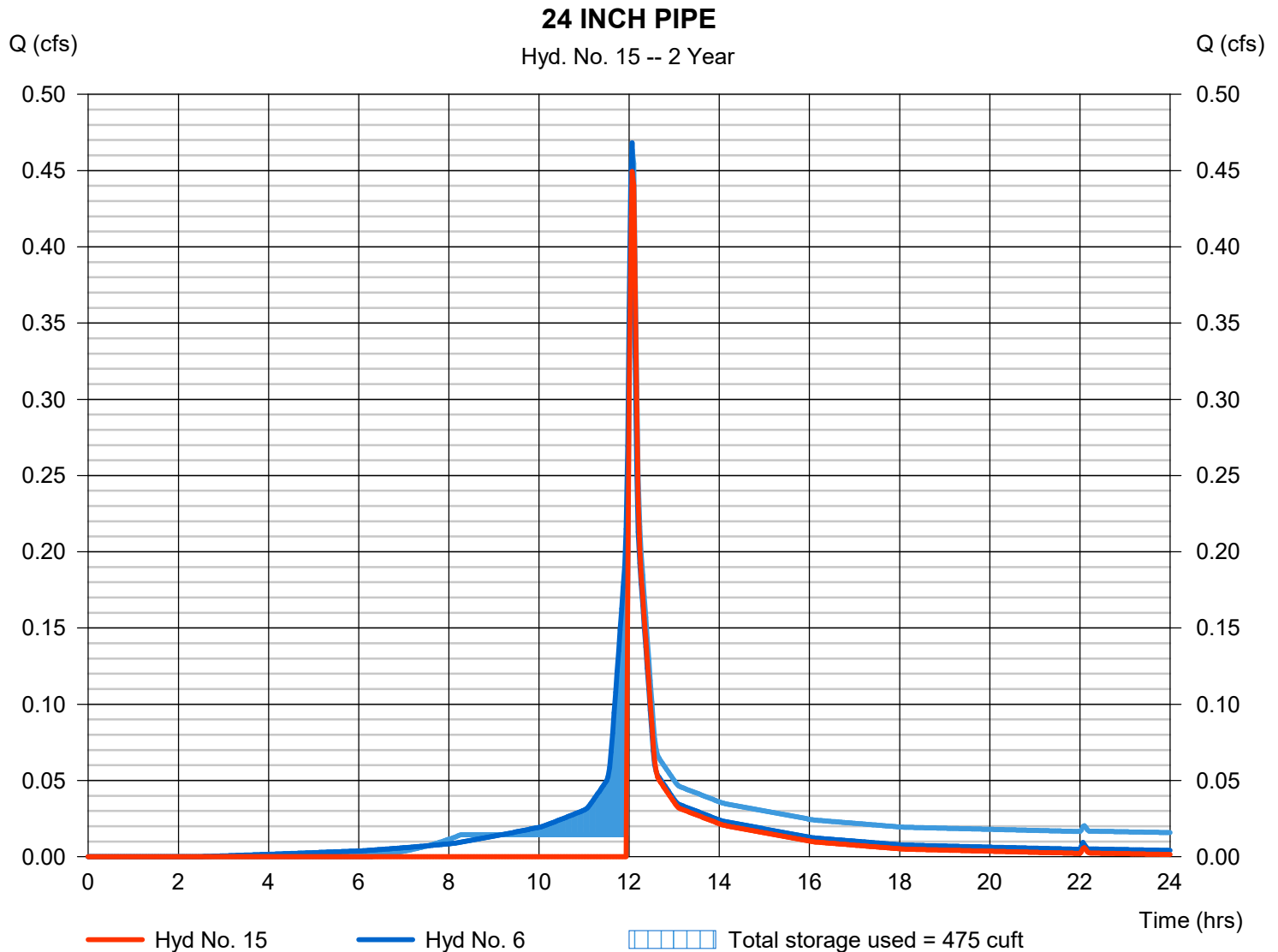
Hyd. No. 15

24 INCH PIPE

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - EX WS-02E
 Reservoir name = 24IN

Peak discharge = 0.449 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 891 cuft
 Max. Elevation = 139.60 ft
 Max. Storage = 475 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 5 - 24IN

Pond Data

UG Chambers -Invert elev. = 135.00 ft, Rise x Span = 2.00 x 2.00 ft, Barrel Len = 29.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Box culverts -Invert elev. = 134.50 ft, Rise x Span = 4.00 x 4.00 ft, Barrel Len = 25.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Box culverts -Invert elev. = 140.00 ft, Rise x Span = 4.00 x 4.00 ft, Barrel Len = 25.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Beginning Elevation = 139.10 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	134.50	n/a	0	0
0.25	134.75	n/a	12	12
0.50	135.00	n/a	12	23
0.75	135.25	n/a	16	39
1.00	135.50	n/a	18	57
1.25	135.75	n/a	20	77
1.50	136.00	n/a	20	97
1.75	136.25	n/a	20	117
2.00	136.50	n/a	20	137
2.25	136.75	n/a	18	155
2.50	137.00	n/a	16	171
4.60	139.10	01	1	172
5.50	140.00	1,212	546	718

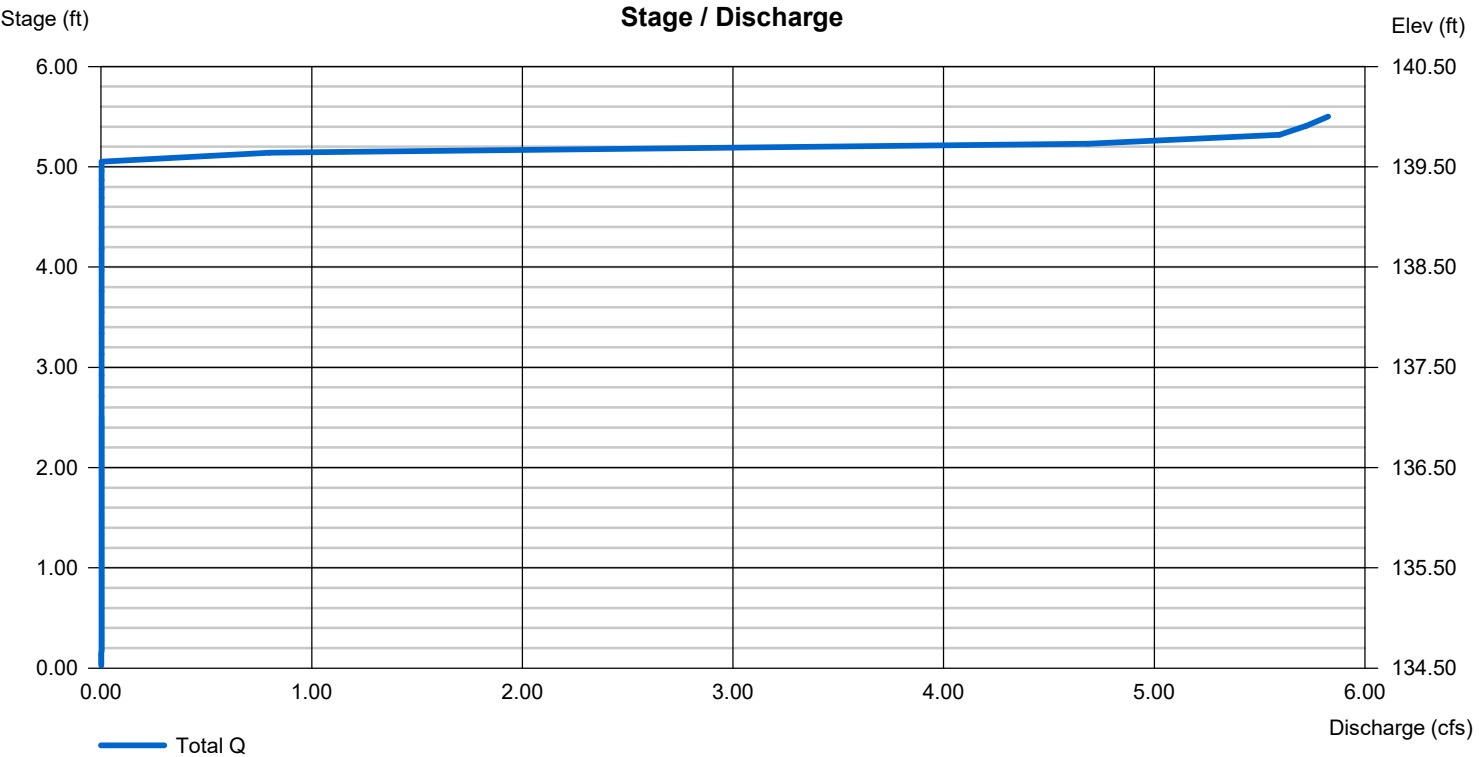
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	Inactive	Inactive	Inactive
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 137.10	0.00	0.00	0.00
Length (ft)	= 55.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 30.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 139.60	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

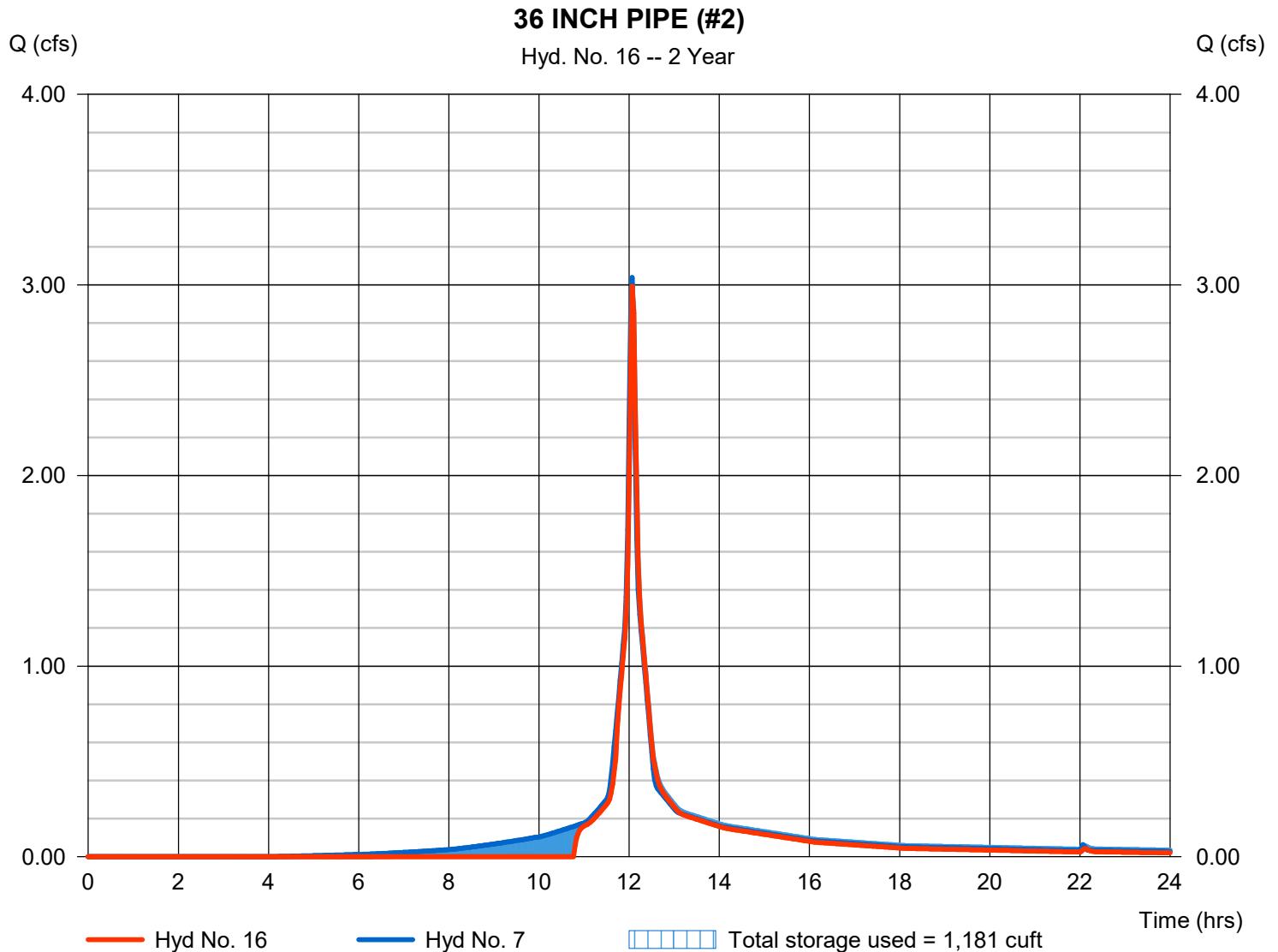
Hyd. No. 16

36 INCH PIPE (#2)

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - EX WS-02F
 Reservoir name = 36in - 2

Peak discharge = 2.993 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 8,038 cuft
 Max. Elevation = 139.42 ft
 Max. Storage = 1,181 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

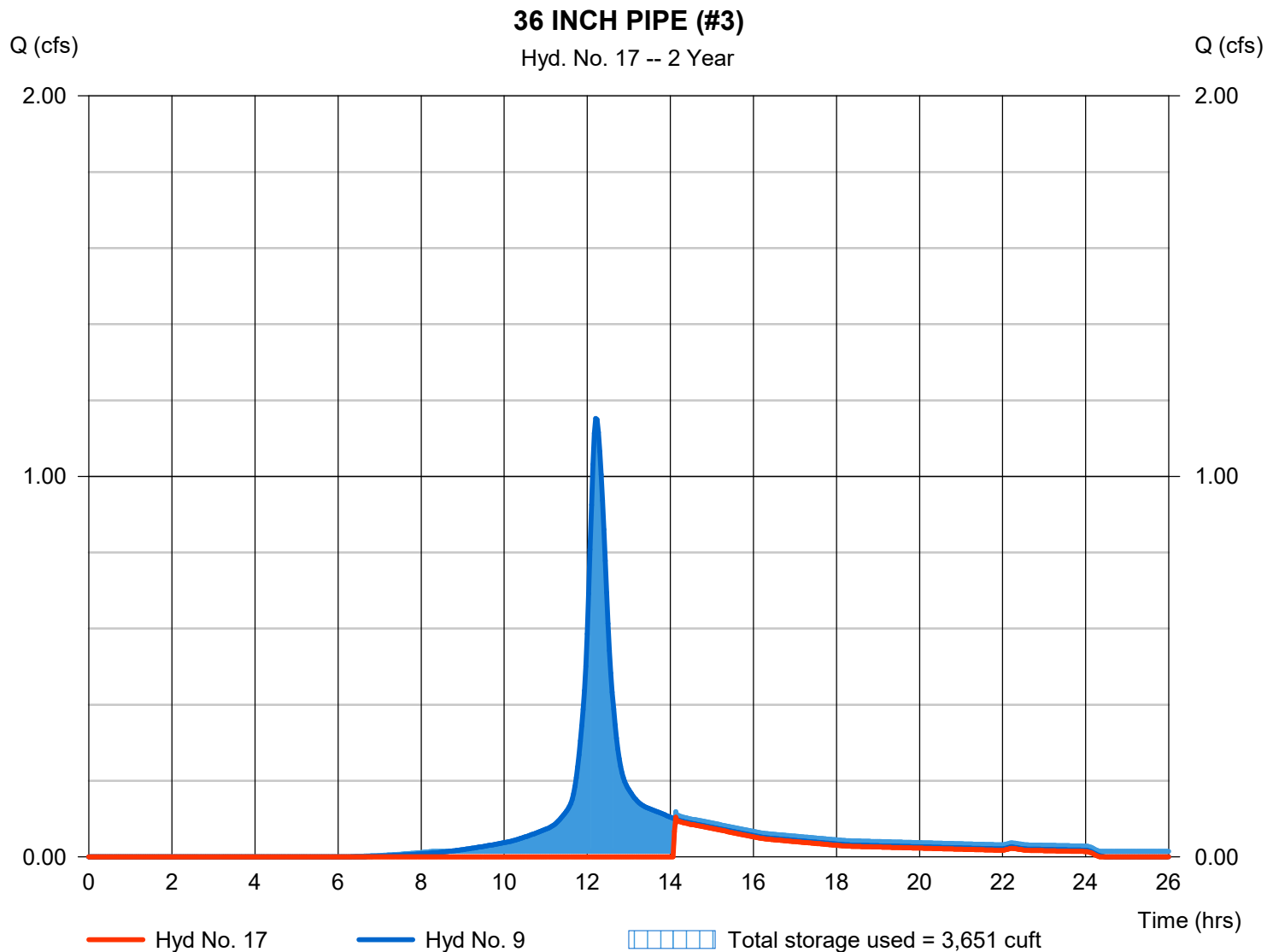
Monday, 12 / 4 / 2023

Hyd. No. 17

36 INCH PIPE (#3)

Hydrograph type	= Reservoir	Peak discharge	= 0.105 cfs
Storm frequency	= 2 yrs	Time to peak	= 14.13 hrs
Time interval	= 2 min	Hyd. volume	= 1,259 cuft
Inflow hyd. No.	= 9 - EX WS-02H	Max. Elevation	= 137.46 ft
Reservoir name	= 36in - 3	Max. Storage	= 3,651 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 3 - 36in - 3

Pond Data

UG Chambers - Invert elev. = 129.00 ft, Rise x Span = 3.00 x 3.00 ft, Barrel Len = 30.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Eccles - Invert elev. = 128.50 ft, Width = 6.00 ft, Height = 3.50 ft, No. of Stormwater Pipes = 1, Culvert Length = 30.00 ft, Beginning Elevation = 136.20 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	128.50	n/a	0	0
0.35	128.85	n/a	21	21
0.70	129.20	n/a	25	46
1.05	129.55	n/a	33	79
1.40	129.90	n/a	37	116
1.75	130.25	n/a	39	155
2.10	130.60	n/a	40	195
2.45	130.95	n/a	40	235
2.80	131.30	n/a	38	273
3.15	131.65	n/a	35	308
3.50	132.00	n/a	29	337
7.20	136.20	01	2	339
9.00	138.00	5,250	4,726	5,065

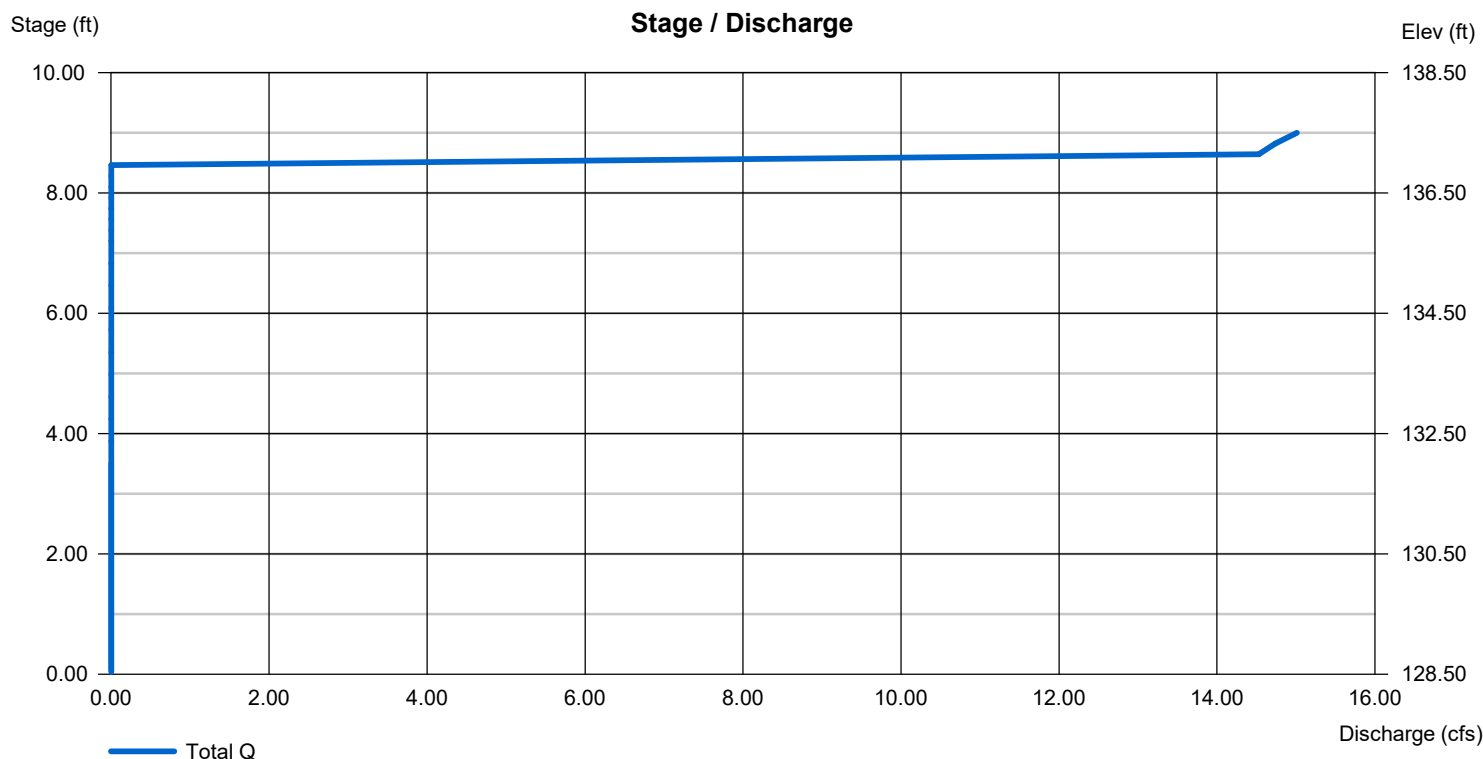
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	Inactive	Inactive	Inactive
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 130.90	0.00	0.00	0.00
Length (ft)	= 13.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 137.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

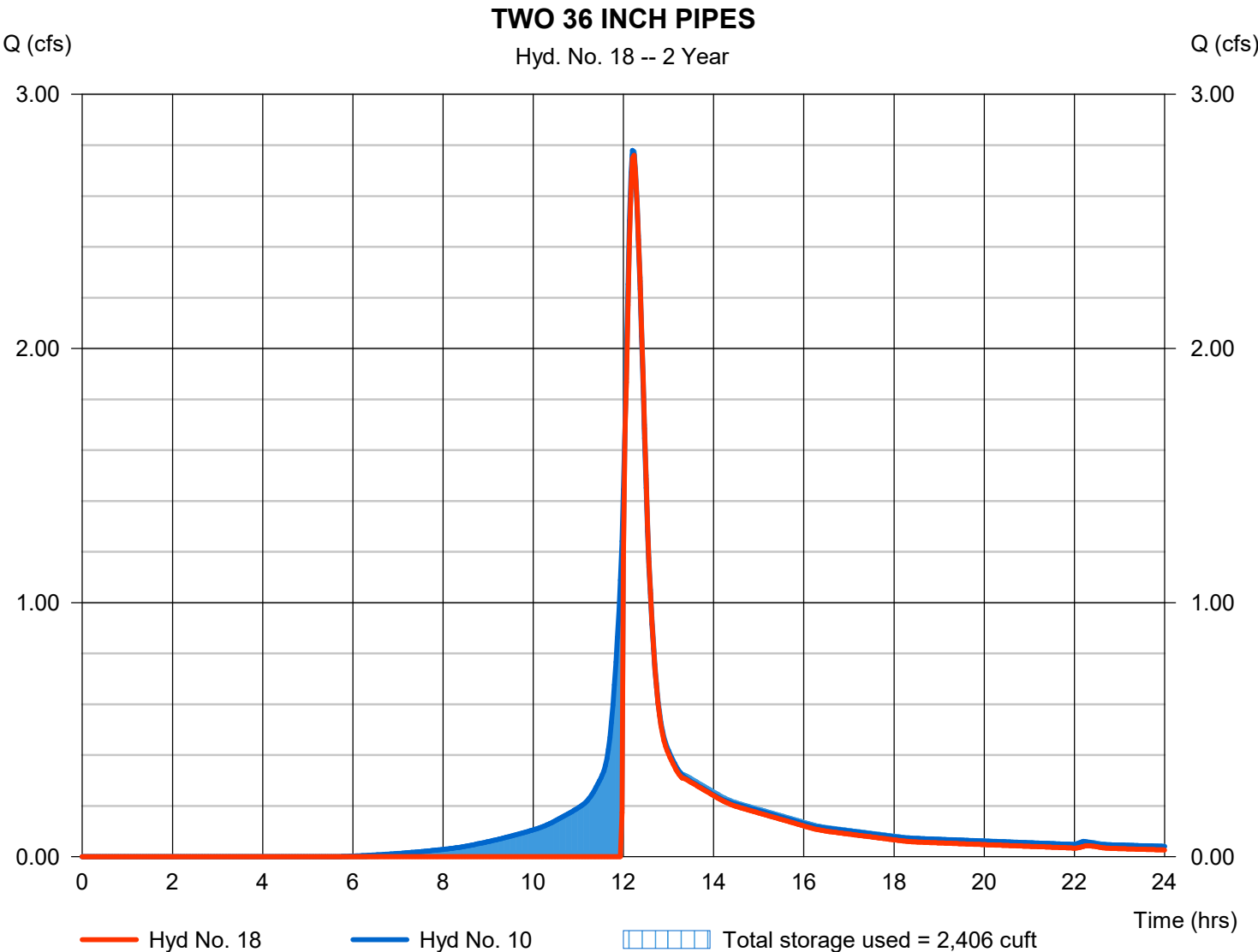
Monday, 12 / 4 / 2023

Hyd. No. 18

TWO 36 INCH PIPES

Hydrograph type	= Reservoir	Peak discharge	= 2.761 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 9,331 cuft
Inflow hyd. No.	= 10 - EX WS-02I	Max. Elevation	= 135.68 ft
Reservoir name	= TWIN 36IN	Max. Storage	= 2,406 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 2 - TWIN 36IN

Pond Data

UG Chambers -Invert elev. = 127.50 ft, Rise x Span = 3.00 x 3.00 ft, Barrel Len = 62.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Erosion -Invert elev. = 127.00 ft, Rise x Span = 3.00 x 3.00 ft, Barrel Len = 62.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Bioscience -Invert elev. = 127.00 ft, Rise x Span = 3.00 x 3.00 ft, Barrel Len = 62.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Beginning Elevation = 134.90 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	127.00	n/a	0	0
0.35	127.35	n/a	87	87
0.70	127.70	n/a	102	189
1.05	128.05	n/a	138	327
1.40	128.40	n/a	153	480
1.75	128.75	n/a	162	642
2.10	129.10	n/a	165	806
2.45	129.45	n/a	163	970
2.80	129.80	n/a	157	1,127
3.15	130.15	n/a	146	1,273
3.50	130.50	n/a	121	1,394
7.90	134.90	01	2	1,396
8.80	135.80	2,590	1,166	2,562

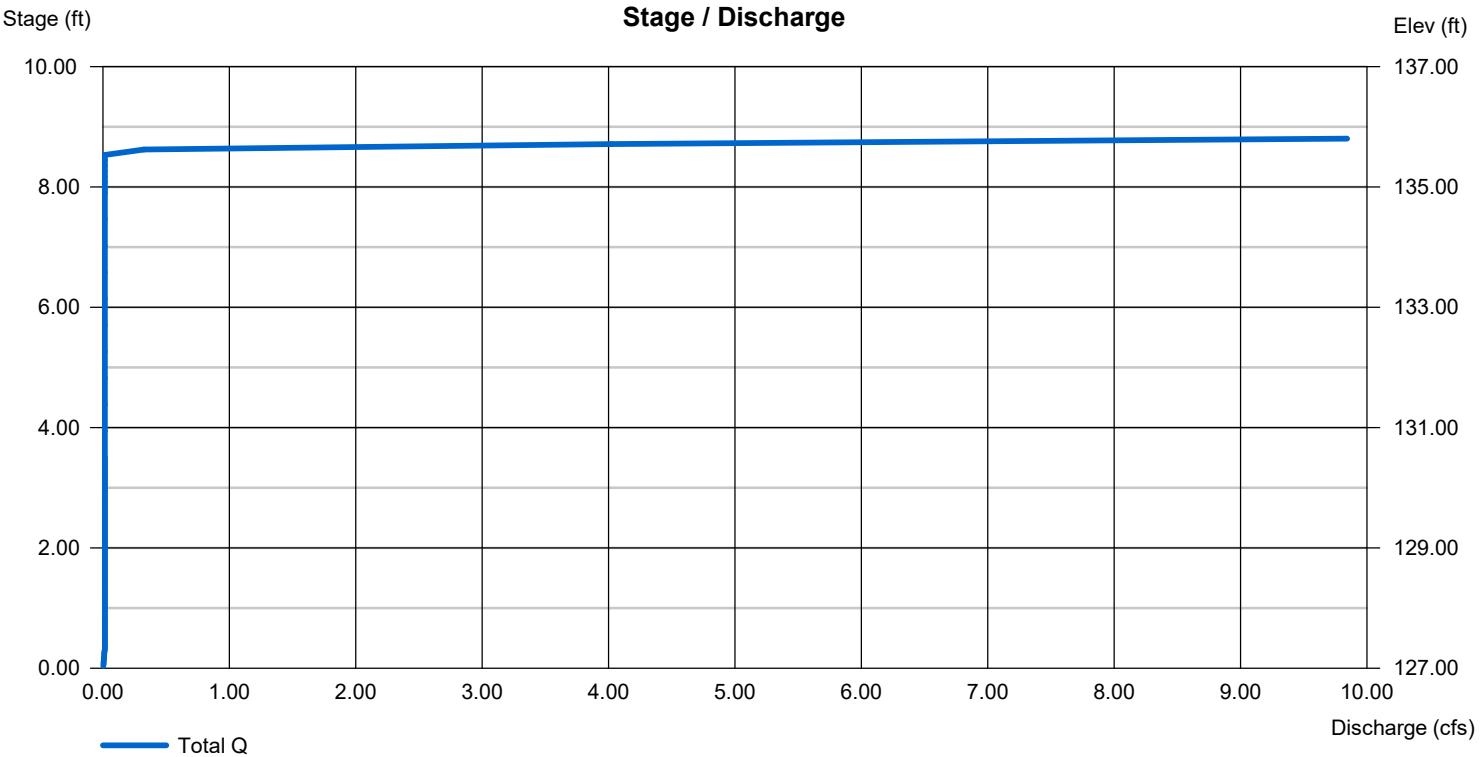
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	Inactive	Inactive	Inactive
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 129.60	0.00	0.00	0.00
Length (ft)	= 70.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 33.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 135.60	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

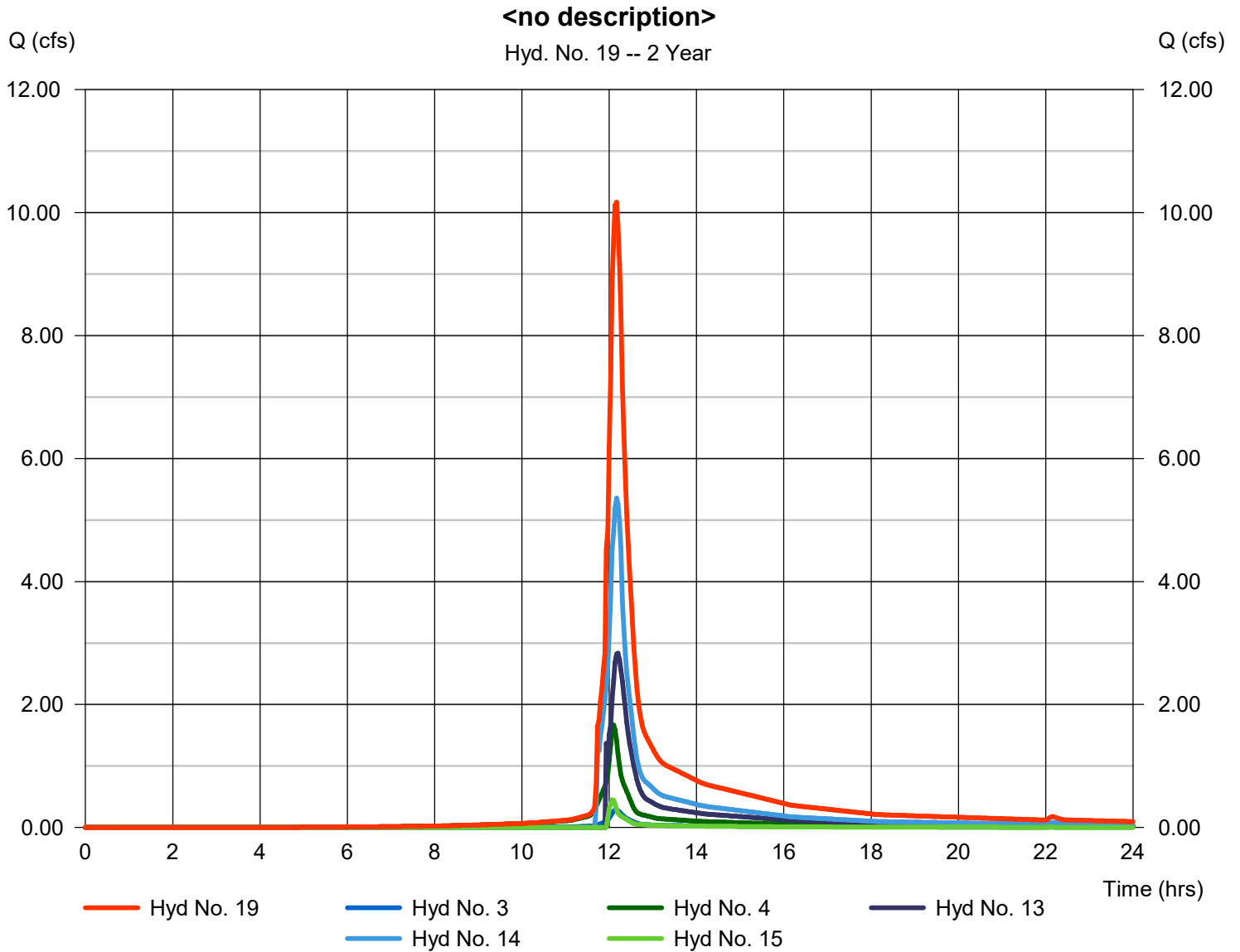
Monday, 12 / 4 / 2023

Hyd. No. 19

<no description>

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 3, 4, 13, 14, 15

Peak discharge = 10.17 cfs
 Time to peak = 12.17 hrs
 Hyd. volume = 34,210 cuft
 Contrib. drain. area = 0.776 ac



Hydrograph Report

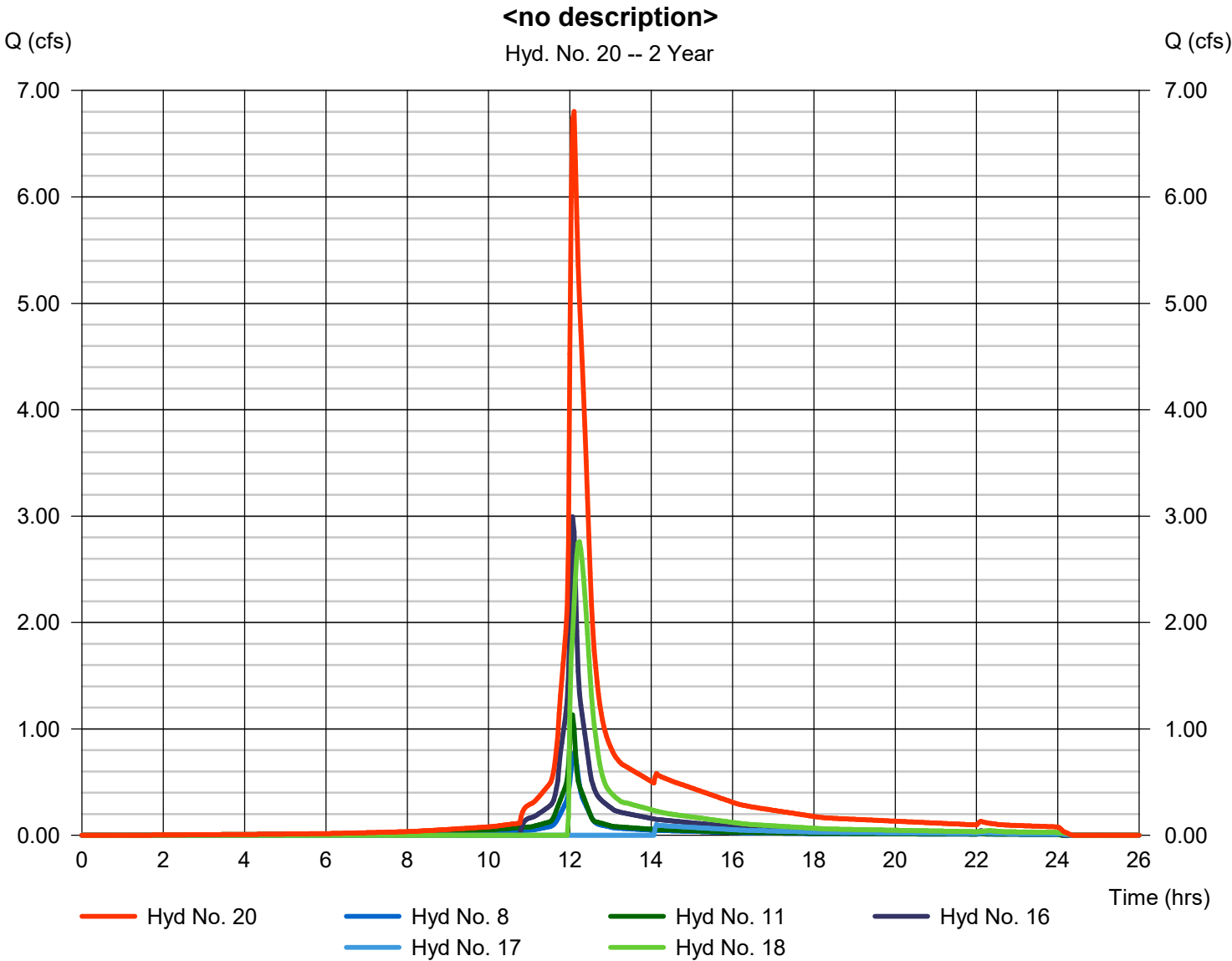
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 20

<no description>

Hydrograph type	= Combine	Peak discharge	= 6.802 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 25,182 cuft
Inflow hyds.	= 8, 11, 16, 17, 18	Contrib. drain. area	= 0.625 ac



Hydrograph Report

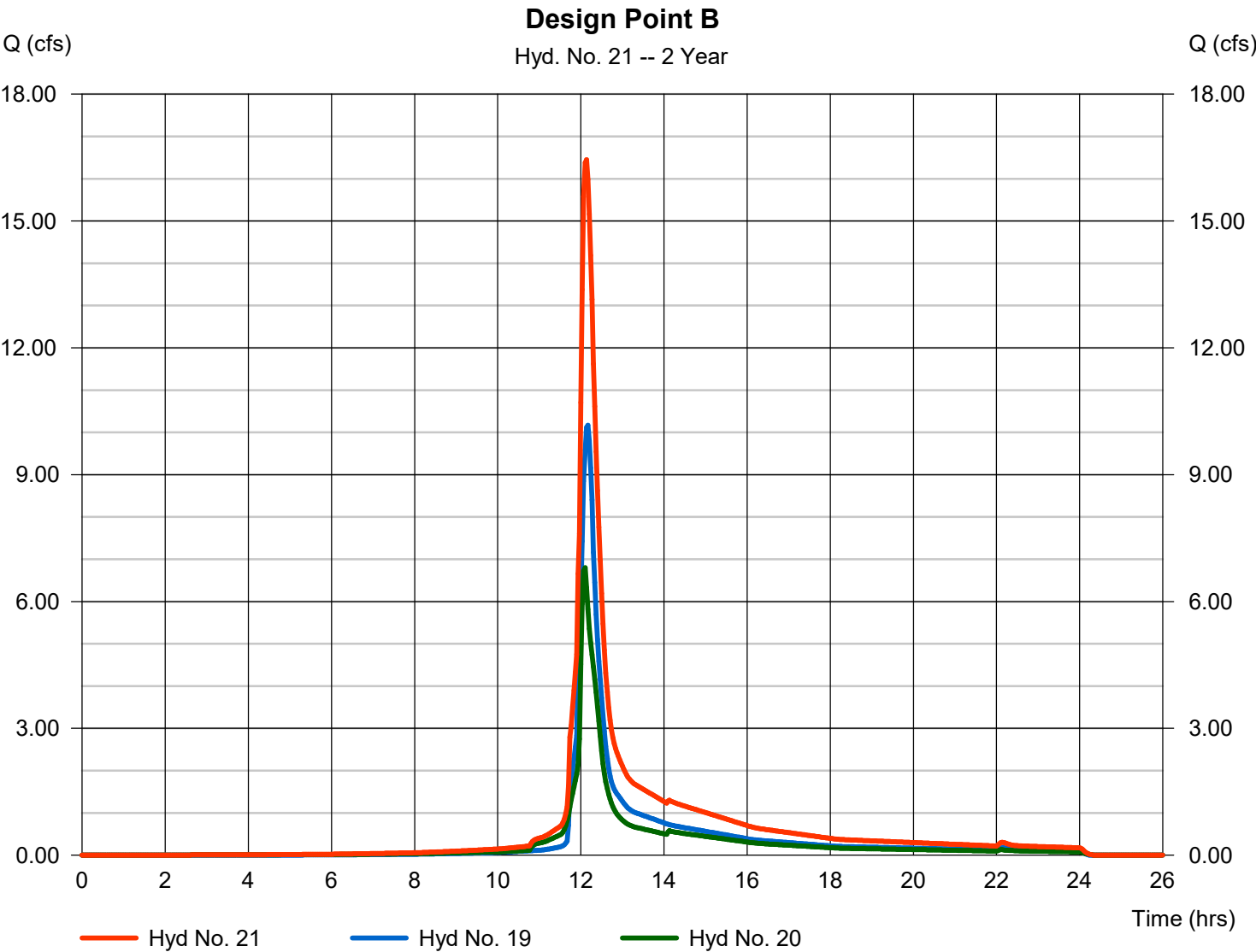
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 21

Design Point B

Hydrograph type	= Combine	Peak discharge	= 16.45 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 59,393 cuft
Inflow hyds.	= 19, 20	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	3.109	2	732	13,137	-----	-----	-----	EX WS-01
2	SCS Runoff	5.245	2	730	21,498	-----	-----	-----	EX WS-02A
3	SCS Runoff	0.569	2	728	2,180	-----	-----	-----	EX WS-02B
4	SCS Runoff	2.685	2	726	9,791	-----	-----	-----	EX WS-02C
5	SCS Runoff	9.148	2	728	36,588	-----	-----	-----	EX WS-02D
6	SCS Runoff	0.731	2	724	2,440	-----	-----	-----	EX WS-02E
7	SCS Runoff	4.896	2	724	15,744	-----	-----	-----	EX WS-02F
8	SCS Runoff	1.265	2	726	4,567	-----	-----	-----	EX WS-02G
9	SCS Runoff	1.996	2	732	9,014	-----	-----	-----	EX WS-02H
10	SCS Runoff	4.677	2	732	21,366	-----	-----	-----	EX WS-02I
11	SCS Runoff	1.741	2	724	6,003	-----	-----	-----	EX WS-02J
12	SCS Runoff	0.199	2	730	839	-----	-----	-----	EX WS-03
13	Reservoir	5.228	2	730	19,335	2	143.60	1,518	36 INCH PIPE (#1)
14	Reservoir	8.916	2	730	31,682	5	139.12	3,650	TWIN 36IN PIPES (#2)
15	Reservoir	0.704	2	724	1,793	6	139.63	493	24 INCH PIPE
16	Reservoir	4.822	2	724	14,247	7	139.47	1,266	36 INCH PIPE (#2)
17	Reservoir	2.300	2	738	5,135	9	137.49	3,722	36 INCH PIPE (#3)
18	Reservoir	4.647	2	732	18,180	10	135.72	2,459	TWO 36 INCH PIPES
19	Combine	17.43	2	730	64,781	3, 4, 13, 14, 15,	-----	-----	<no description>
20	Combine	11.11	2	726	48,132	8, 11, 16, 17, 18,	-----	-----	<no description>
21	Combine	27.70	2	728	112,913	19, 20	-----	-----	Design Point B
Existing-Hydraflow.gpw					Return Period: 10 Year			Monday, 12 / 4 / 2023	

Hydrograph Report

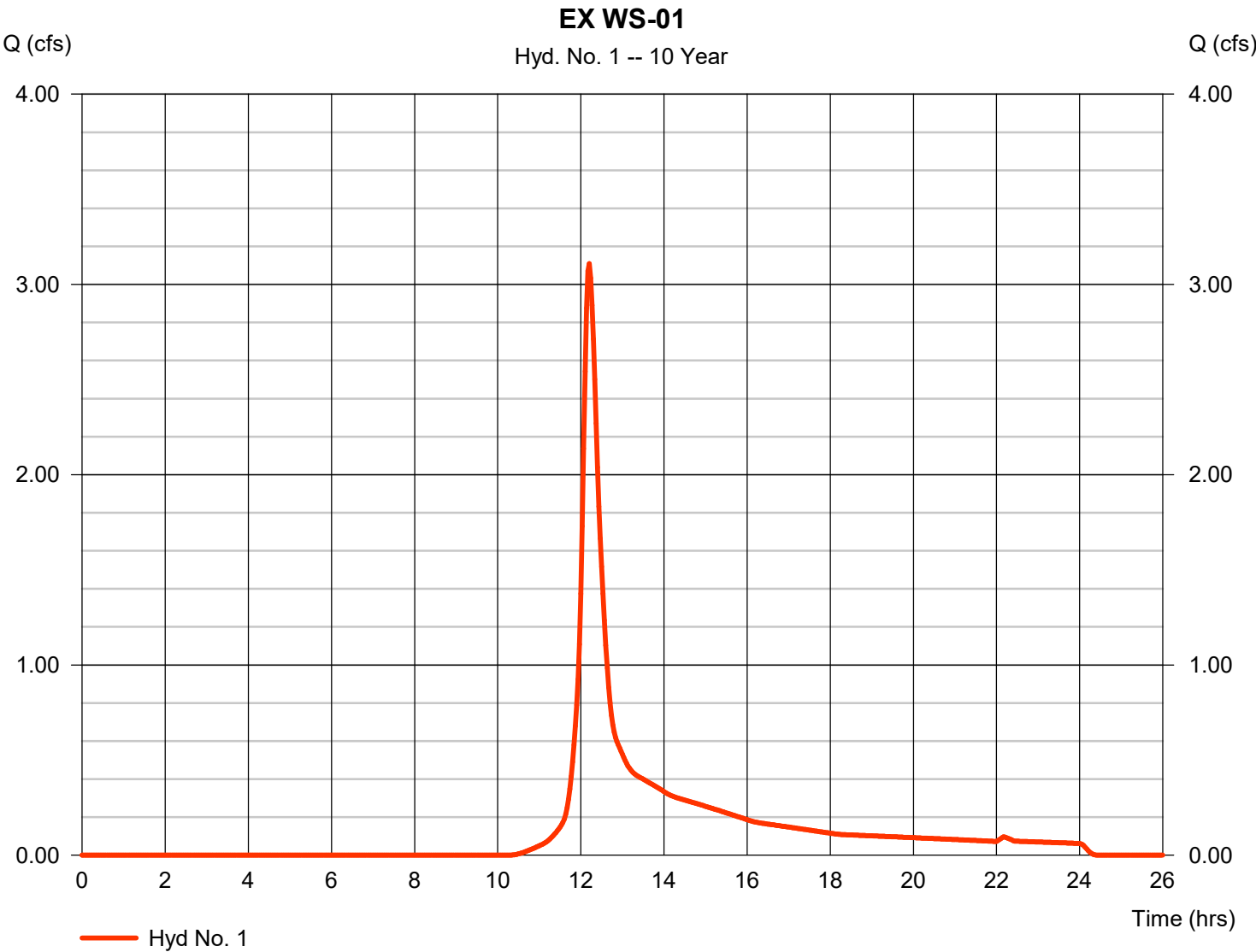
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 1

EX WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 3.109 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 13,137 cuft
Drainage area	= 1.942 ac	Curve number	= 65
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.10 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

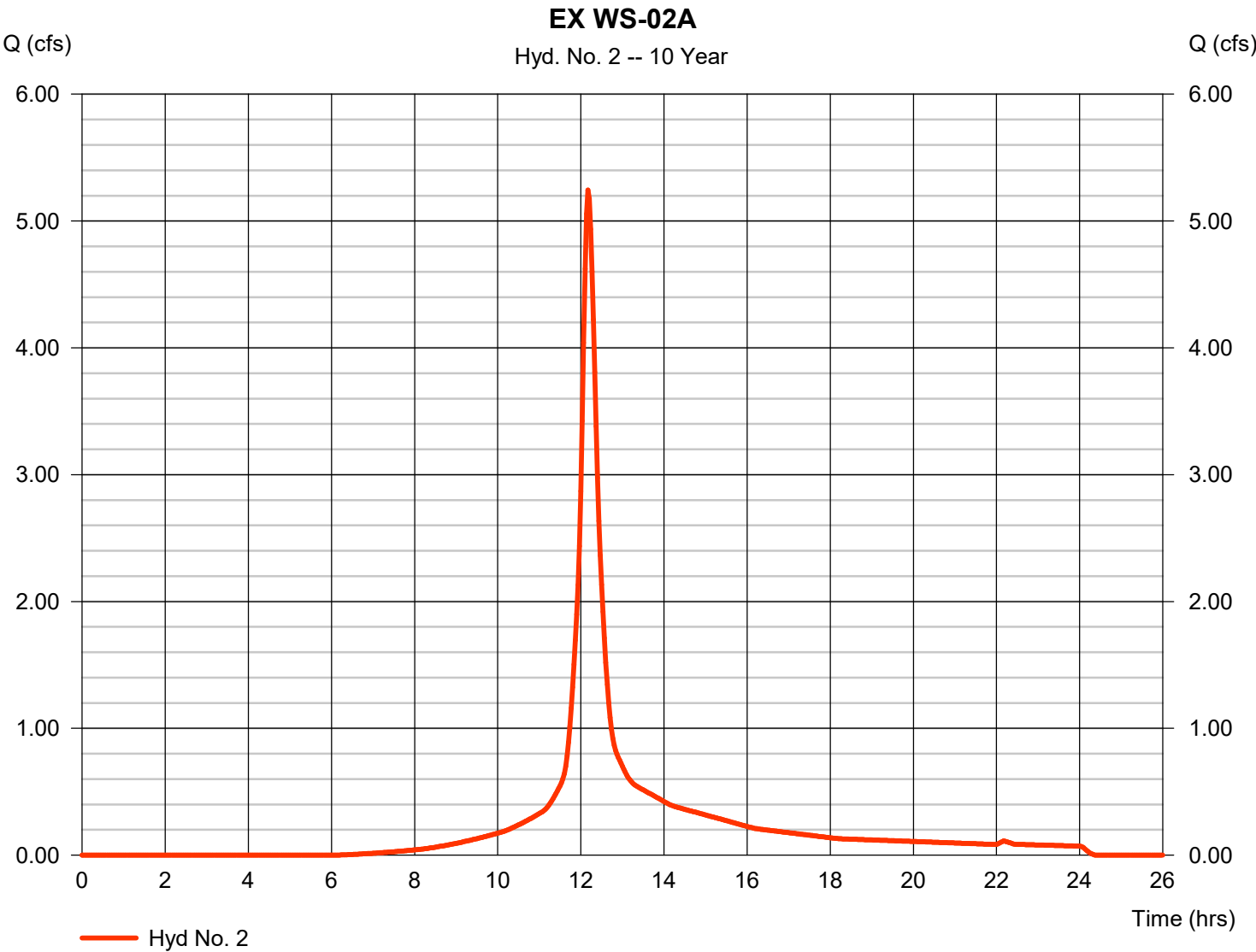
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 2

EX WS-02A

Hydrograph type	= SCS Runoff	Peak discharge	= 5.245 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 21,498 cuft
Drainage area	= 1.678 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.50 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

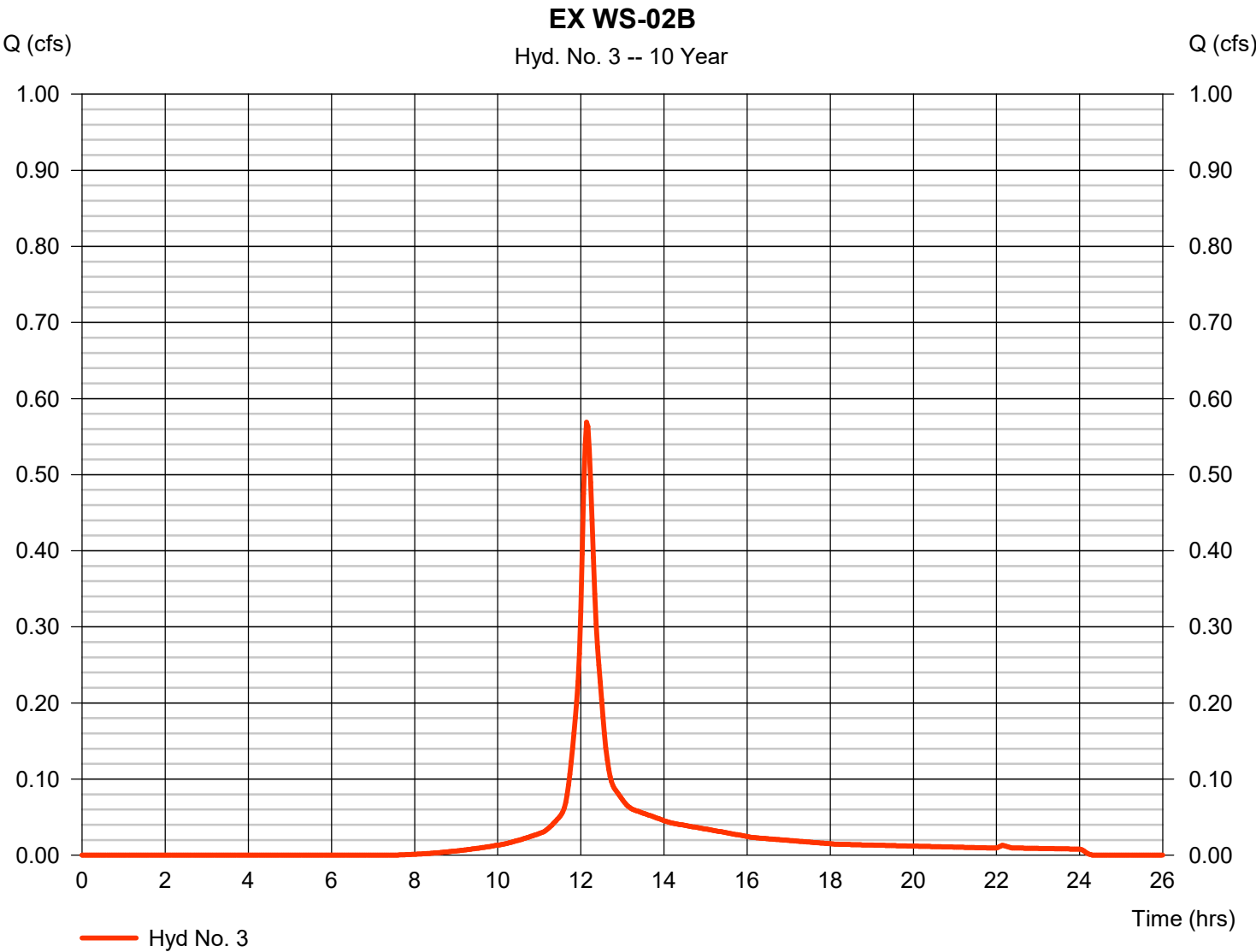
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 3

EX WS-02B

Hydrograph type	= SCS Runoff	Peak discharge	= 0.569 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 2,180 cuft
Drainage area	= 0.186 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 11.00 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

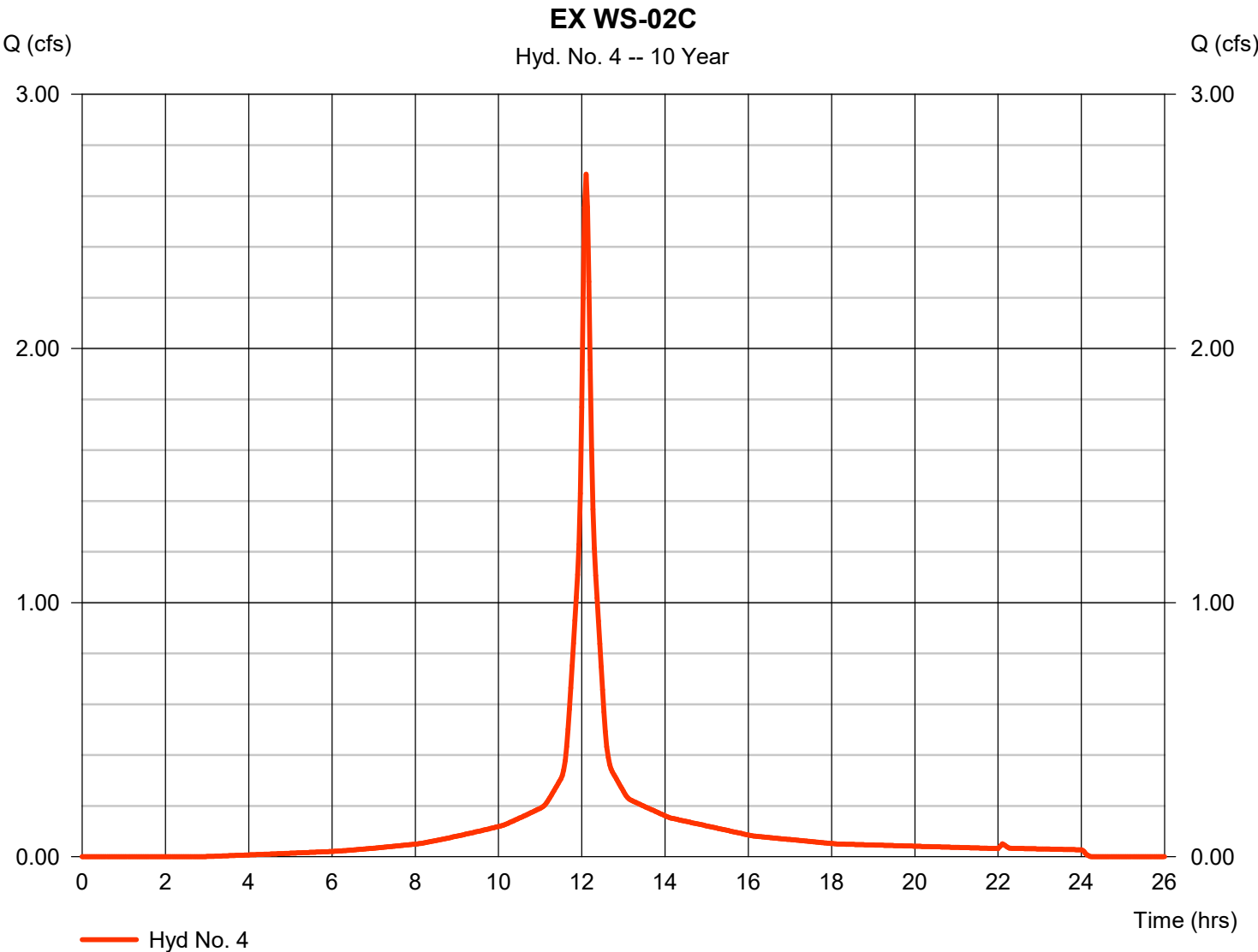


Hydrograph Report

Hyd. No. 4

EX WS-02C

Hydrograph type	= SCS Runoff	Peak discharge	= 2.685 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 9,791 cuft
Drainage area	= 0.590 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.40 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

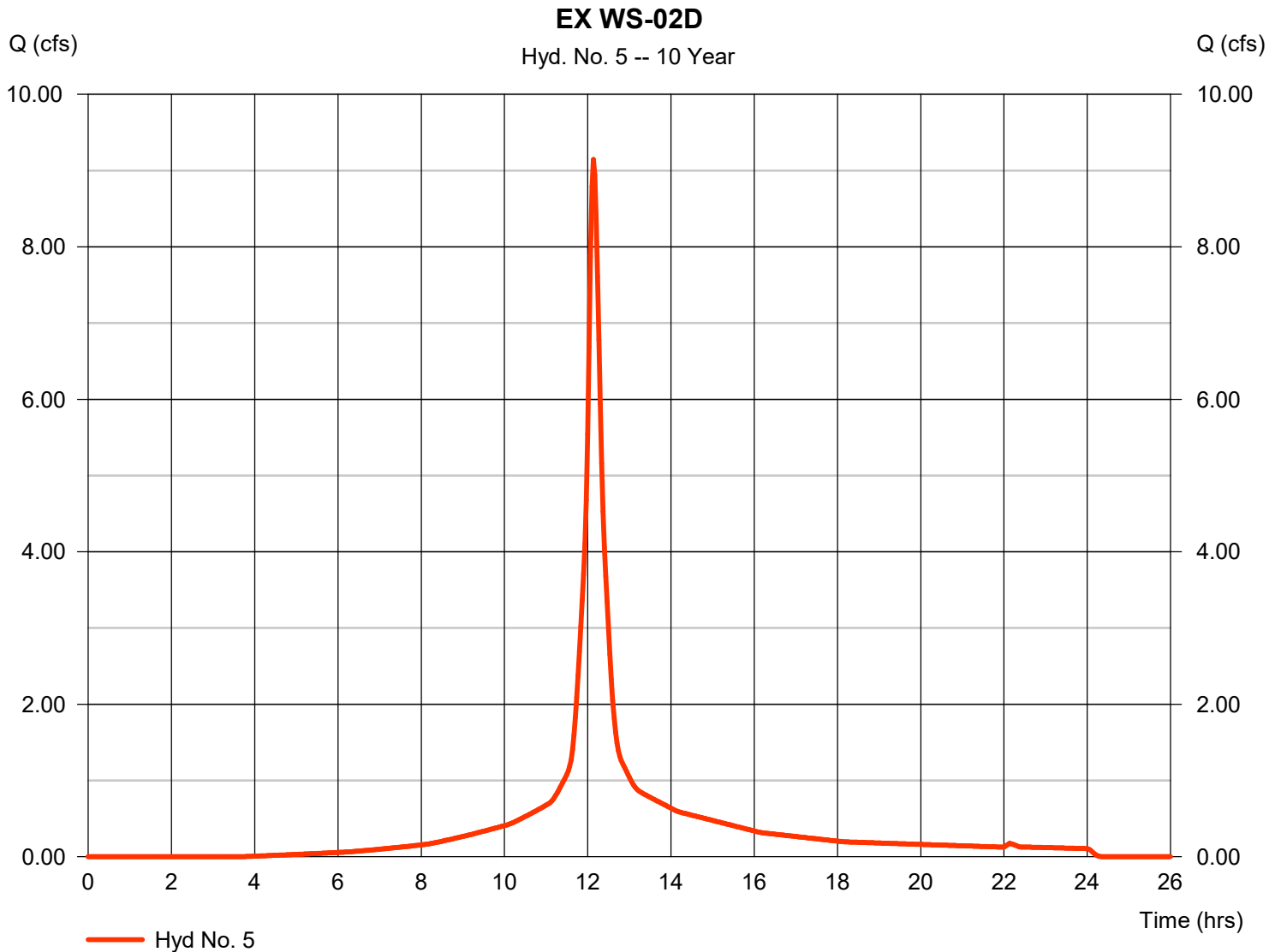
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 5

EX WS-02D

Hydrograph type	= SCS Runoff	Peak discharge	= 9.148 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 36,588 cuft
Drainage area	= 2.246 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 11.10 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

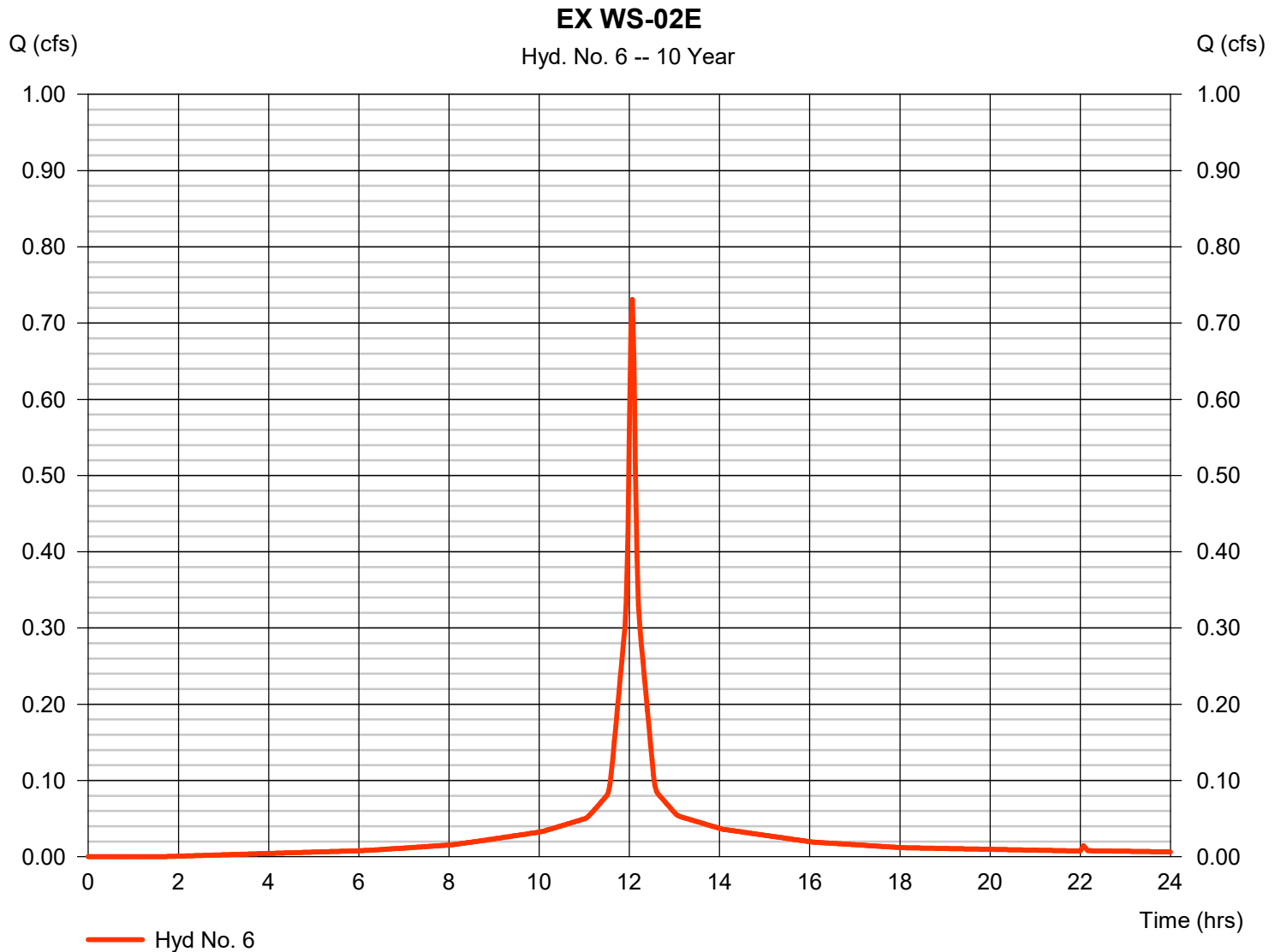
Monday, 12 / 4 / 2023

Hyd. No. 6

EX WS-02E

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 0.146 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 5.38 in
 Storm duration = 24 hrs

Peak discharge = 0.731 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 2,440 cuft
 Curve number = 96
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 5.00 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

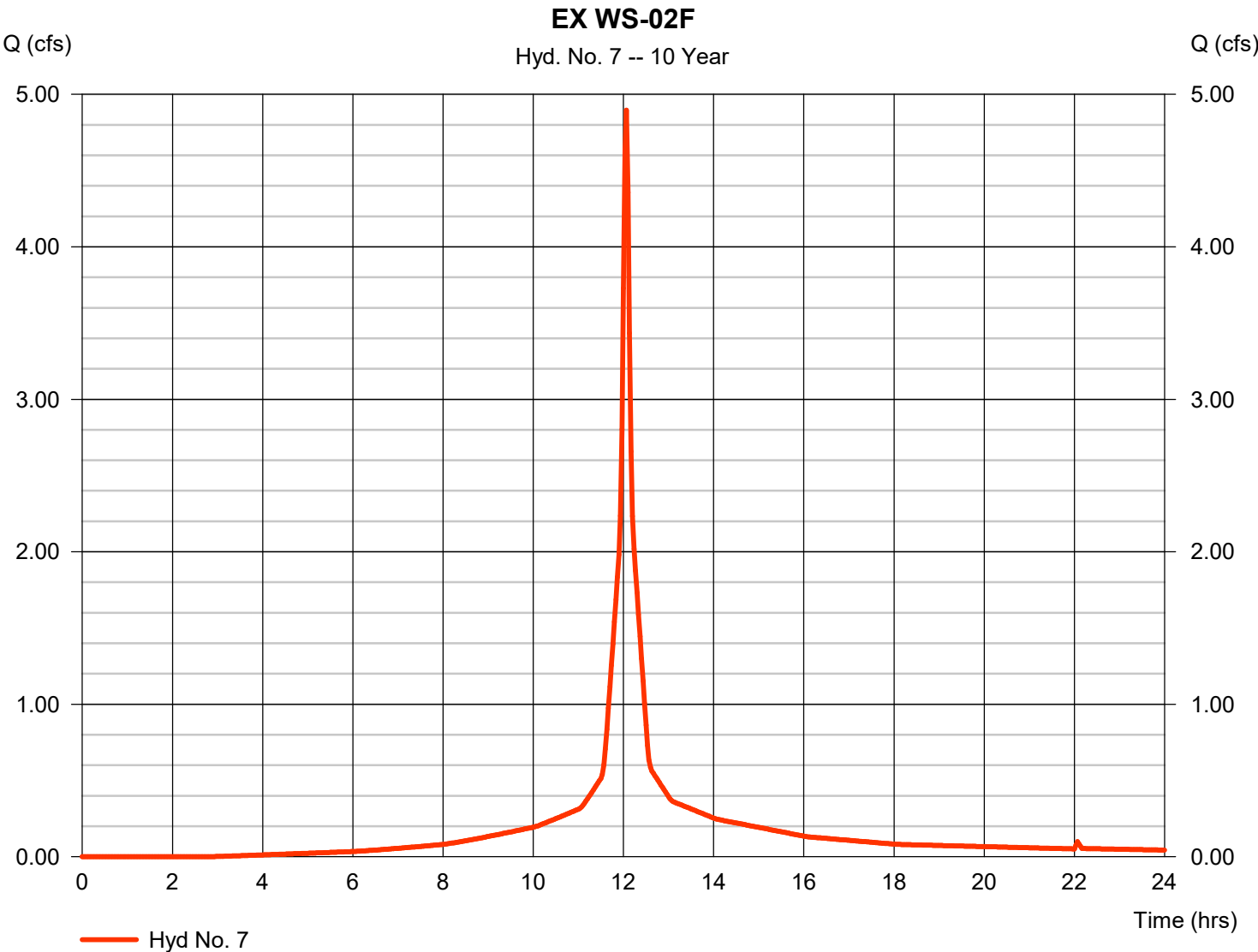
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 7

EX WS-02F

Hydrograph type	= SCS Runoff	Peak discharge	= 4.896 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 15,744 cuft
Drainage area	= 1.012 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.50 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

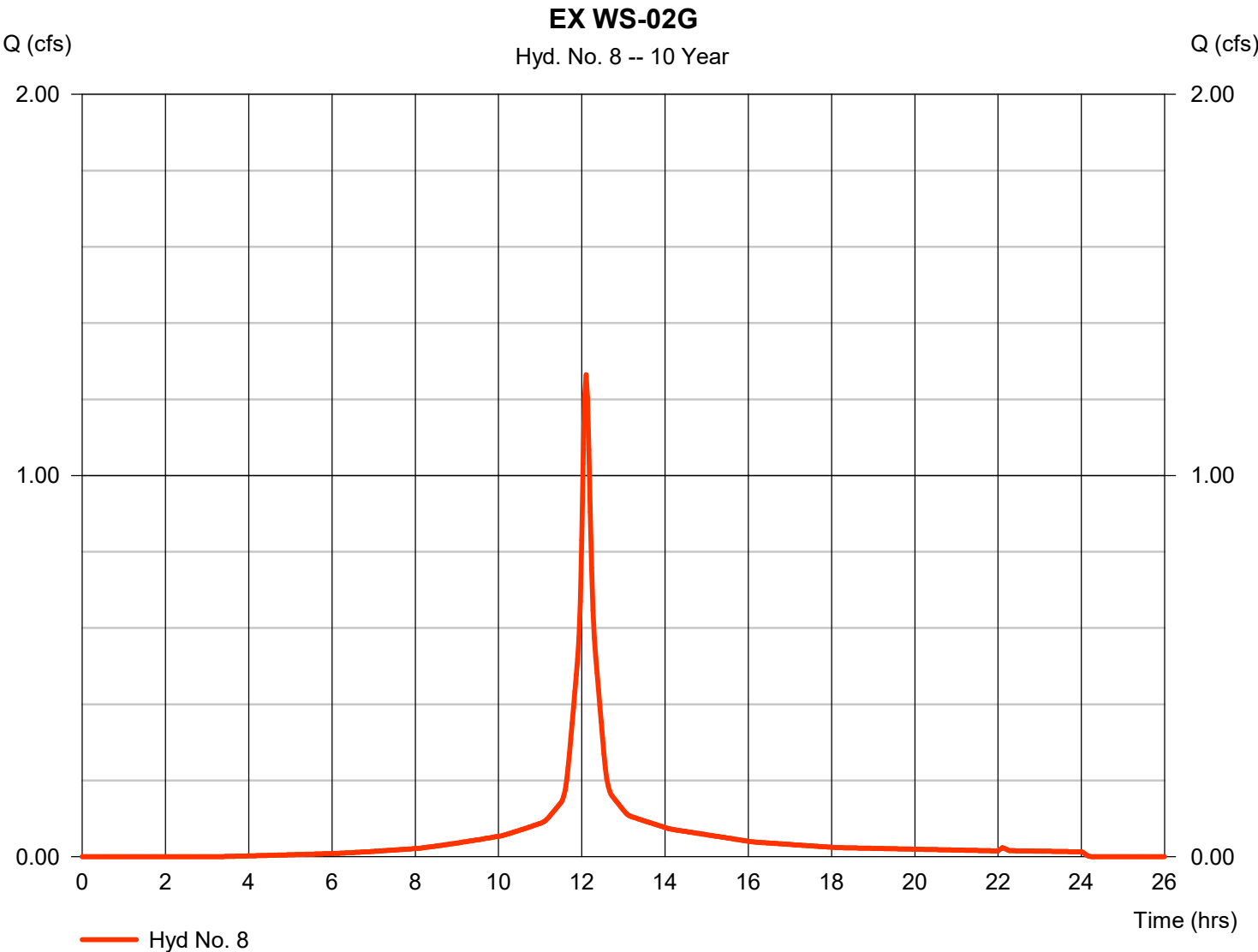
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 8

EX WS-02G

Hydrograph type	= SCS Runoff	Peak discharge	= 1.265 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 4,567 cuft
Drainage area	= 0.282 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.90 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

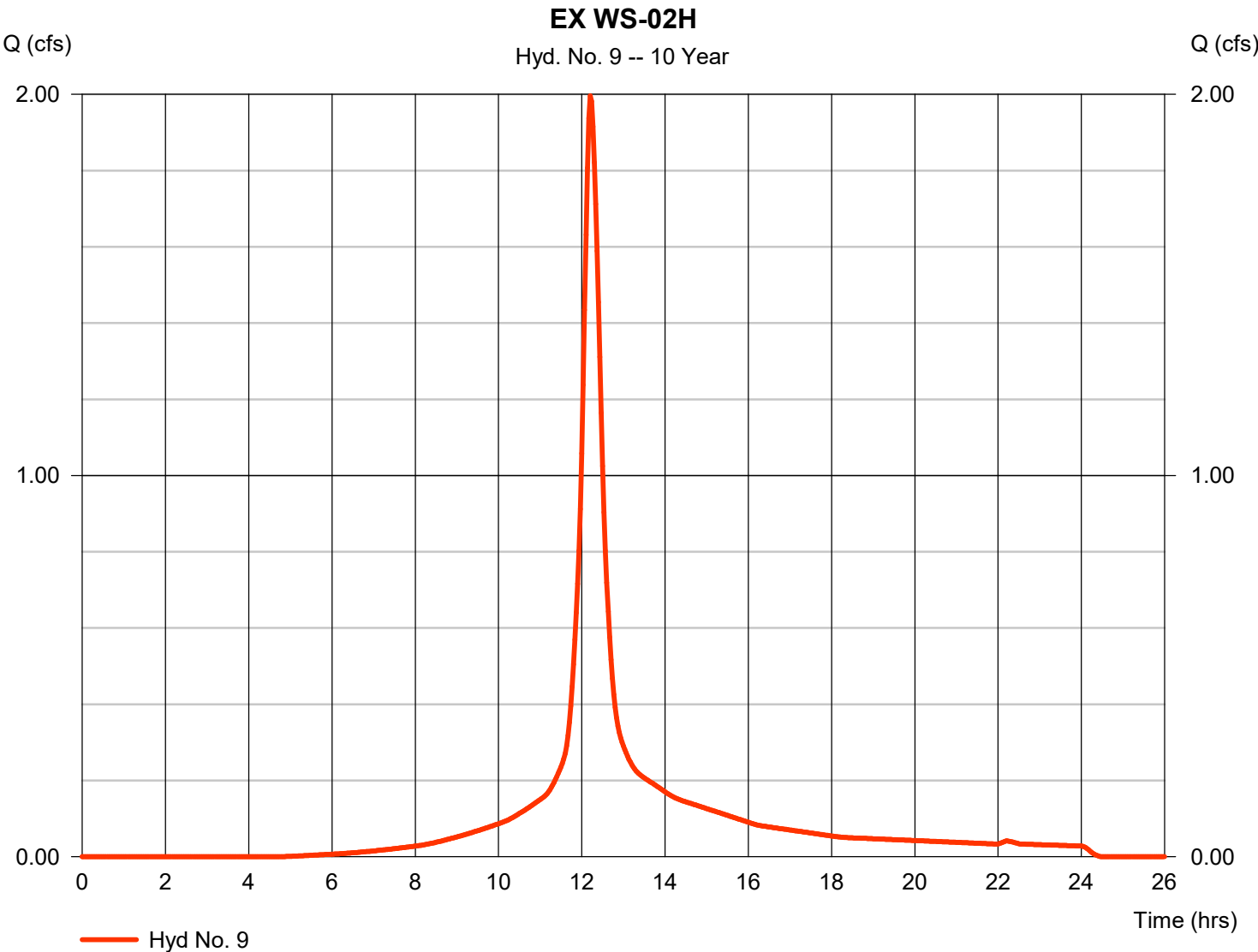
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 9

EX WS-02H

Hydrograph type	= SCS Runoff	Peak discharge	= 1.996 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 9,014 cuft
Drainage area	= 0.616 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.30 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

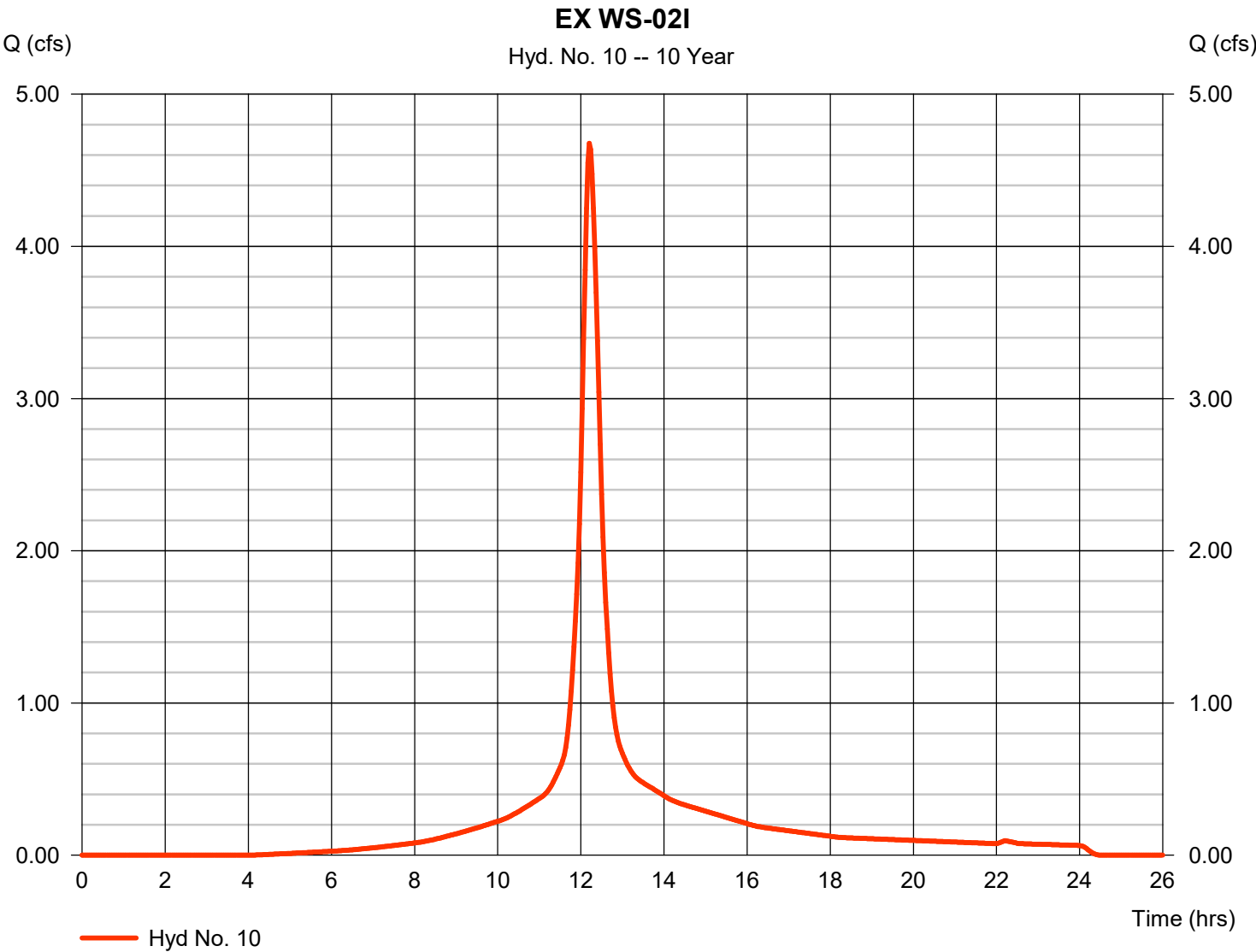


Hydrograph Report

Hyd. No. 10

EX WS-02I

Hydrograph type	= SCS Runoff	Peak discharge	= 4.677 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 21,366 cuft
Drainage area	= 1.387 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.60 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

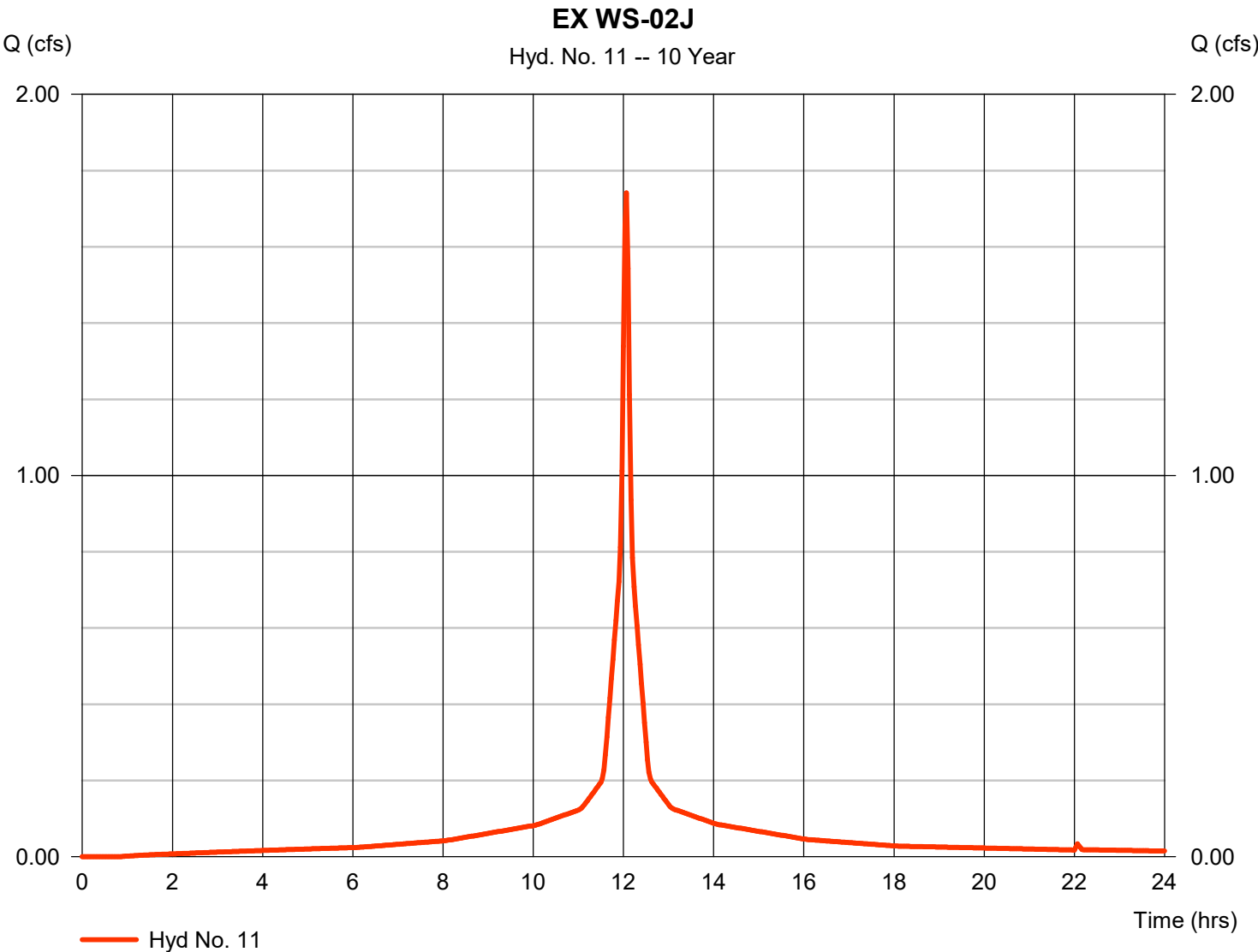


Hydrograph Report

Hyd. No. 11

EX WS-02J

Hydrograph type	= SCS Runoff	Peak discharge	= 1.741 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 6,003 cuft
Drainage area	= 0.343 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

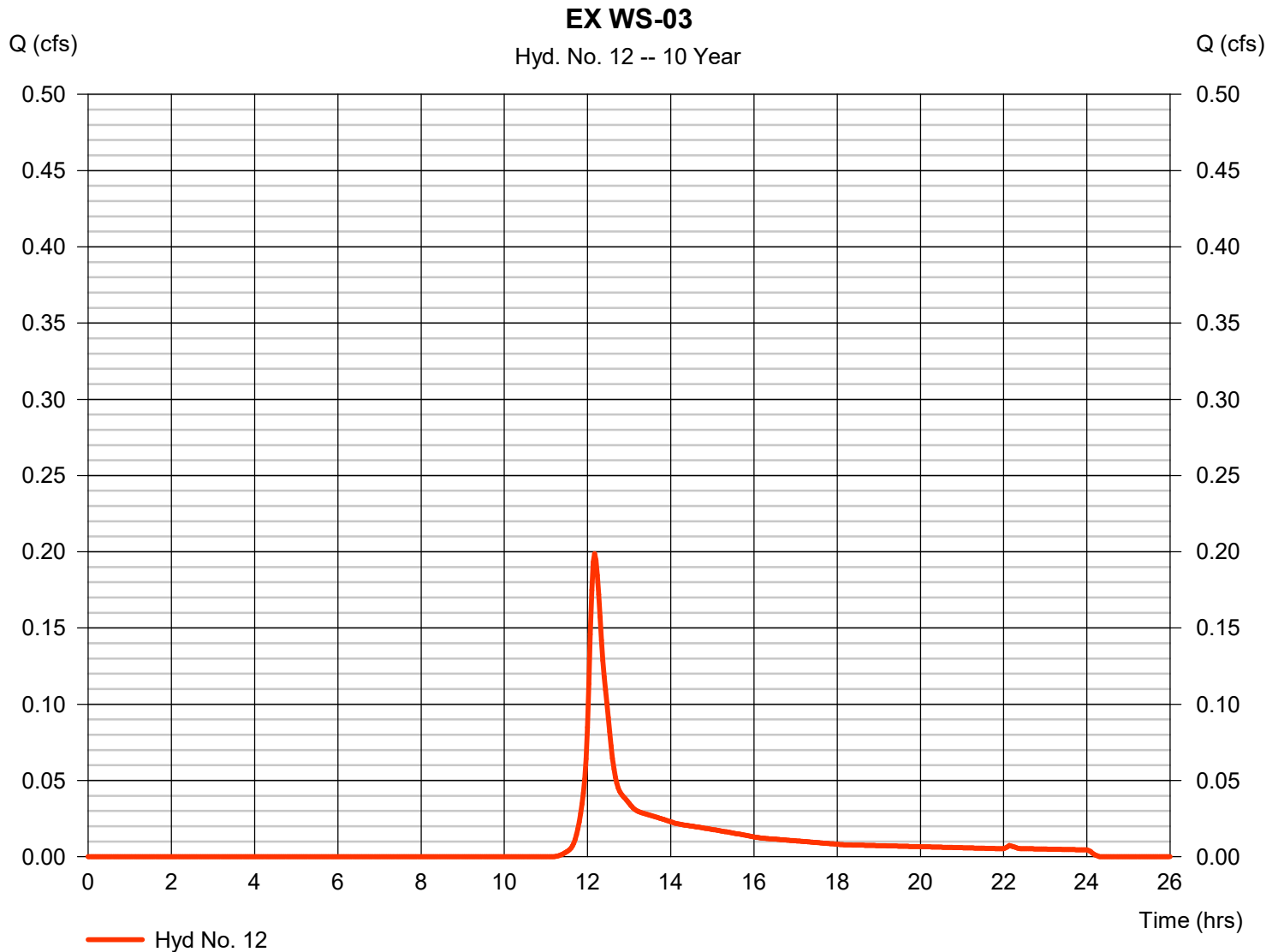
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 12

EX WS-03

Hydrograph type	= SCS Runoff	Peak discharge	= 0.199 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 839 cuft
Drainage area	= 0.154 ac	Curve number	= 59
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.50 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

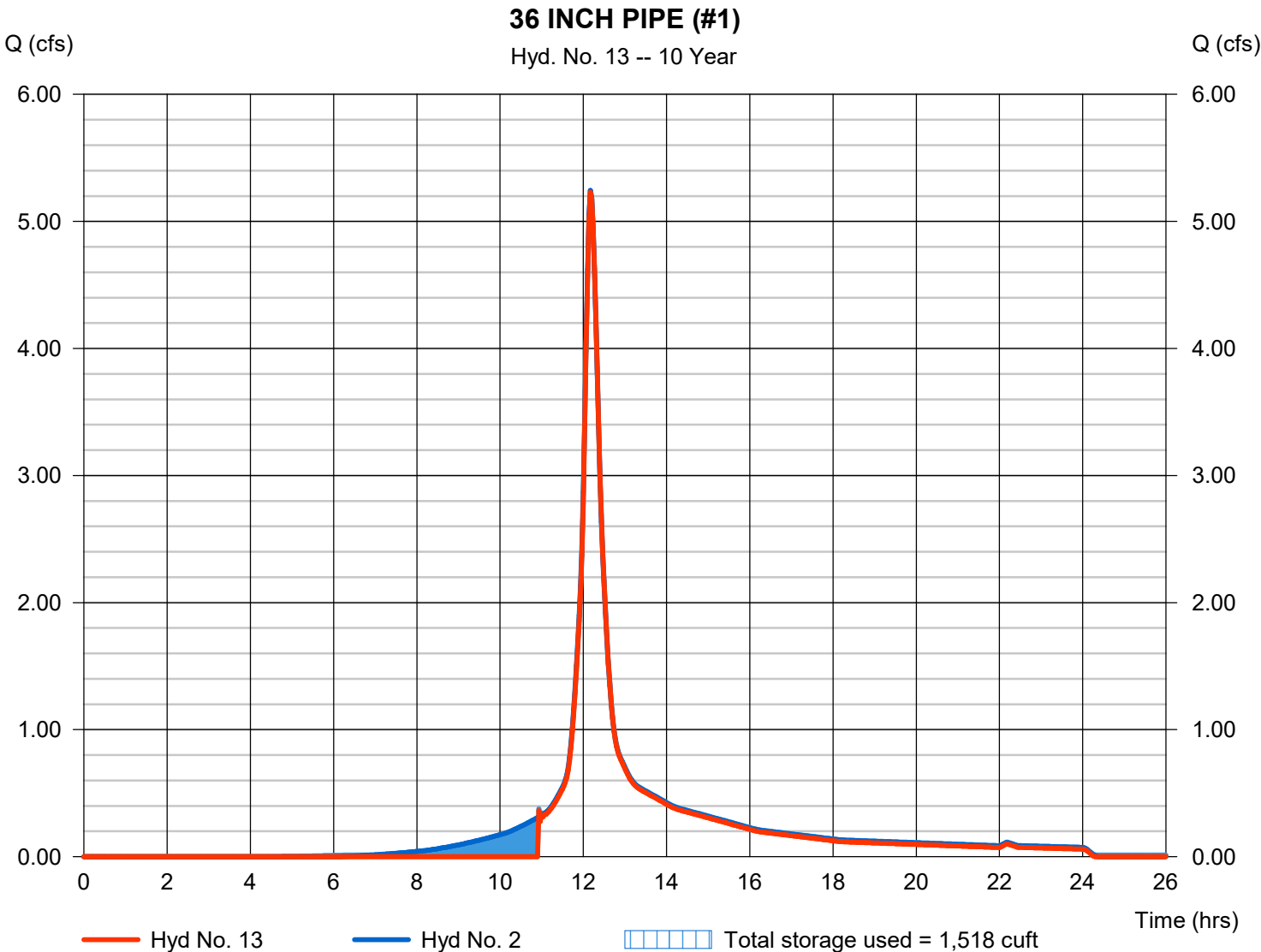
Monday, 12 / 4 / 2023

Hyd. No. 13

36 INCH PIPE (#1)

Hydrograph type	= Reservoir	Peak discharge	= 5.228 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 19,335 cuft
Inflow hyd. No.	= 2 - EX WS-02A	Max. Elevation	= 143.60 ft
Reservoir name	= 36IN - 1	Max. Storage	= 1,518 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

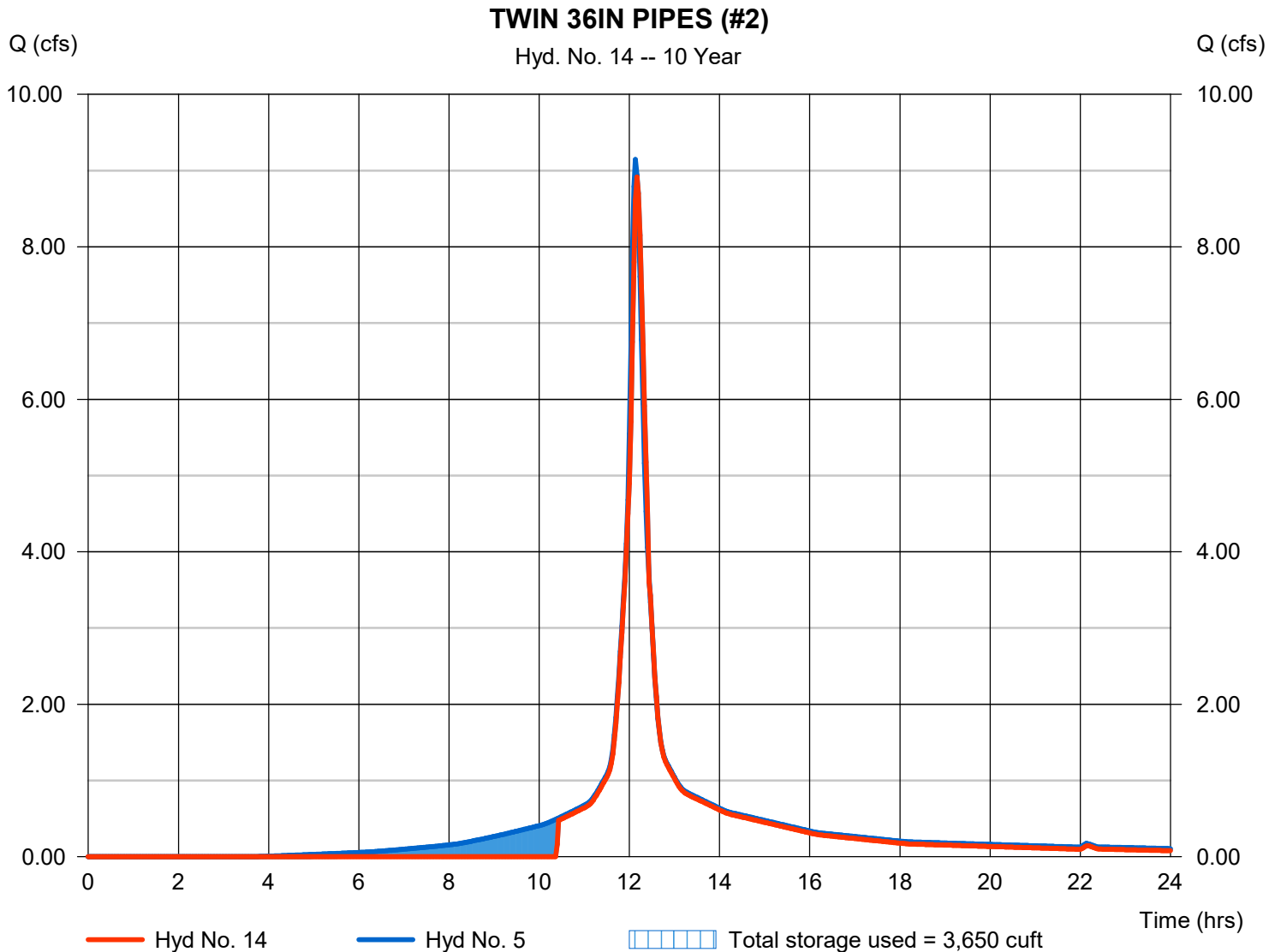
Monday, 12 / 4 / 2023

Hyd. No. 14

TWIN 36IN PIPES (#2)

Hydrograph type	= Reservoir	Peak discharge	= 8.916 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 31,682 cuft
Inflow hyd. No.	= 5 - EX WS-02D	Max. Elevation	= 139.12 ft
Reservoir name	= Northern Twin 36IN	Max. Storage	= 3,650 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

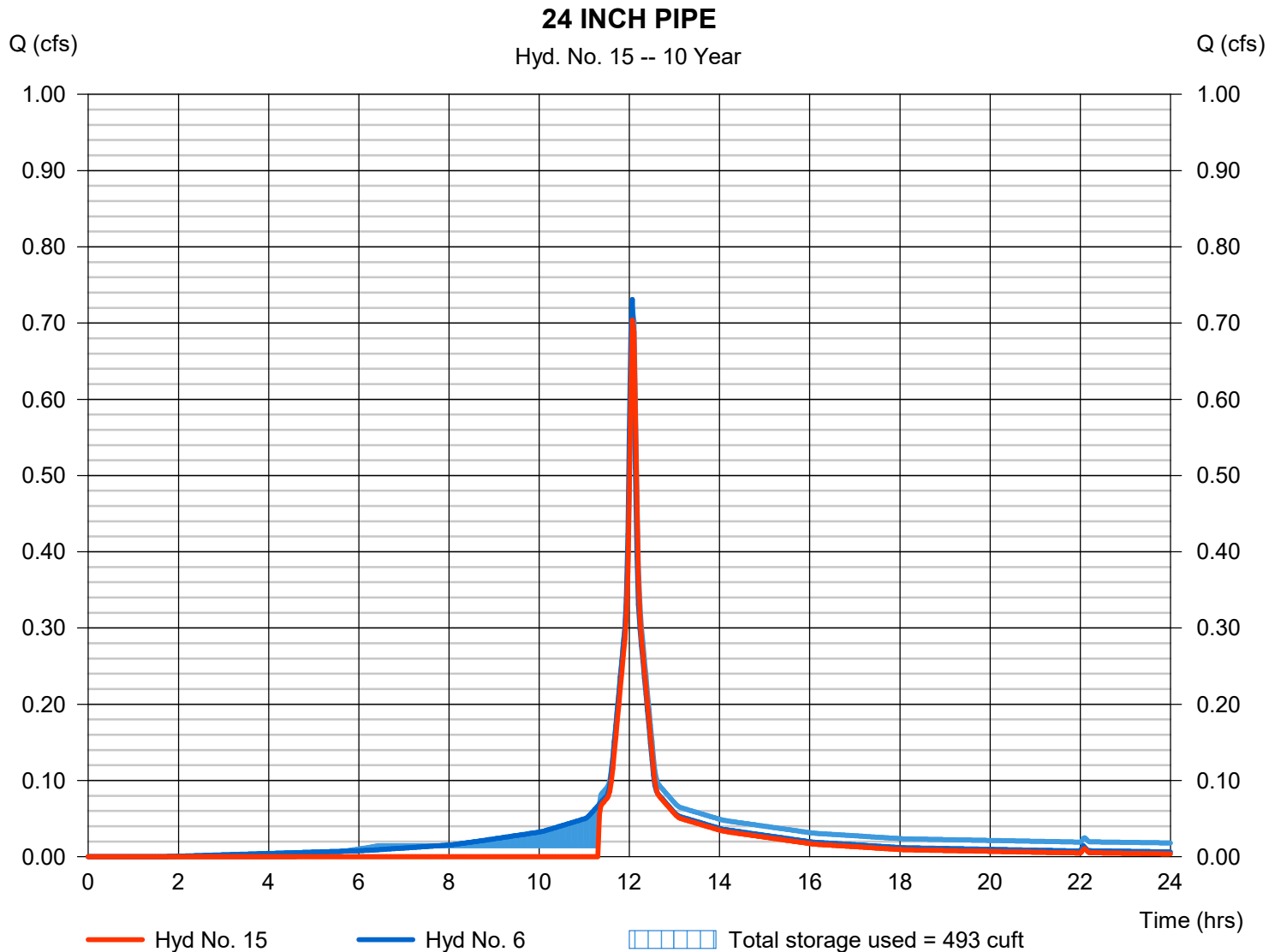
Hyd. No. 15

24 INCH PIPE

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - EX WS-02E
 Reservoir name = 24IN

Peak discharge = 0.704 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 1,793 cuft
 Max. Elevation = 139.63 ft
 Max. Storage = 493 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

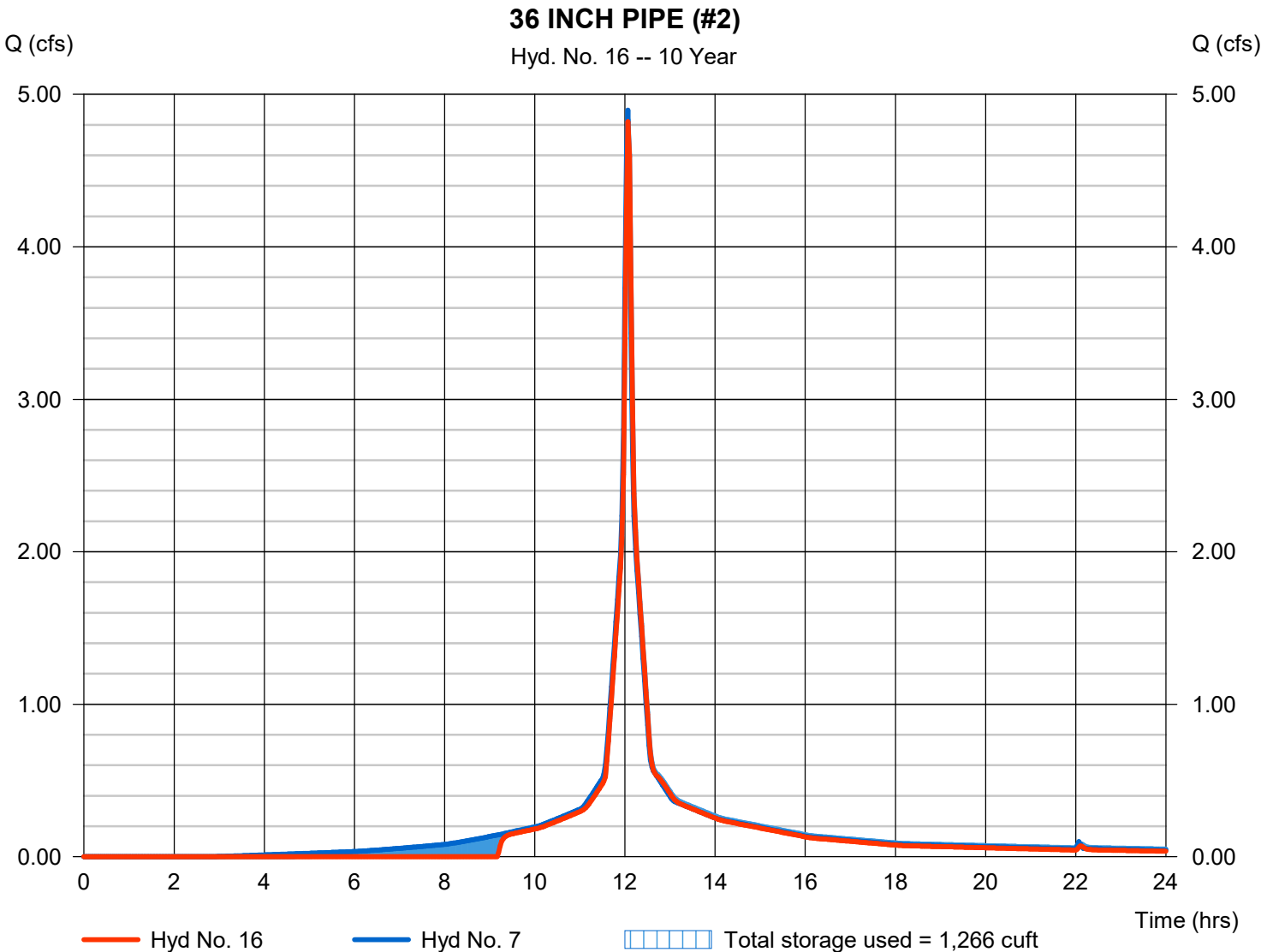
Monday, 12 / 4 / 2023

Hyd. No. 16

36 INCH PIPE (#2)

Hydrograph type	= Reservoir	Peak discharge	= 4.822 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 14,247 cuft
Inflow hyd. No.	= 7 - EX WS-02F	Max. Elevation	= 139.47 ft
Reservoir name	= 36in - 2	Max. Storage	= 1,266 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

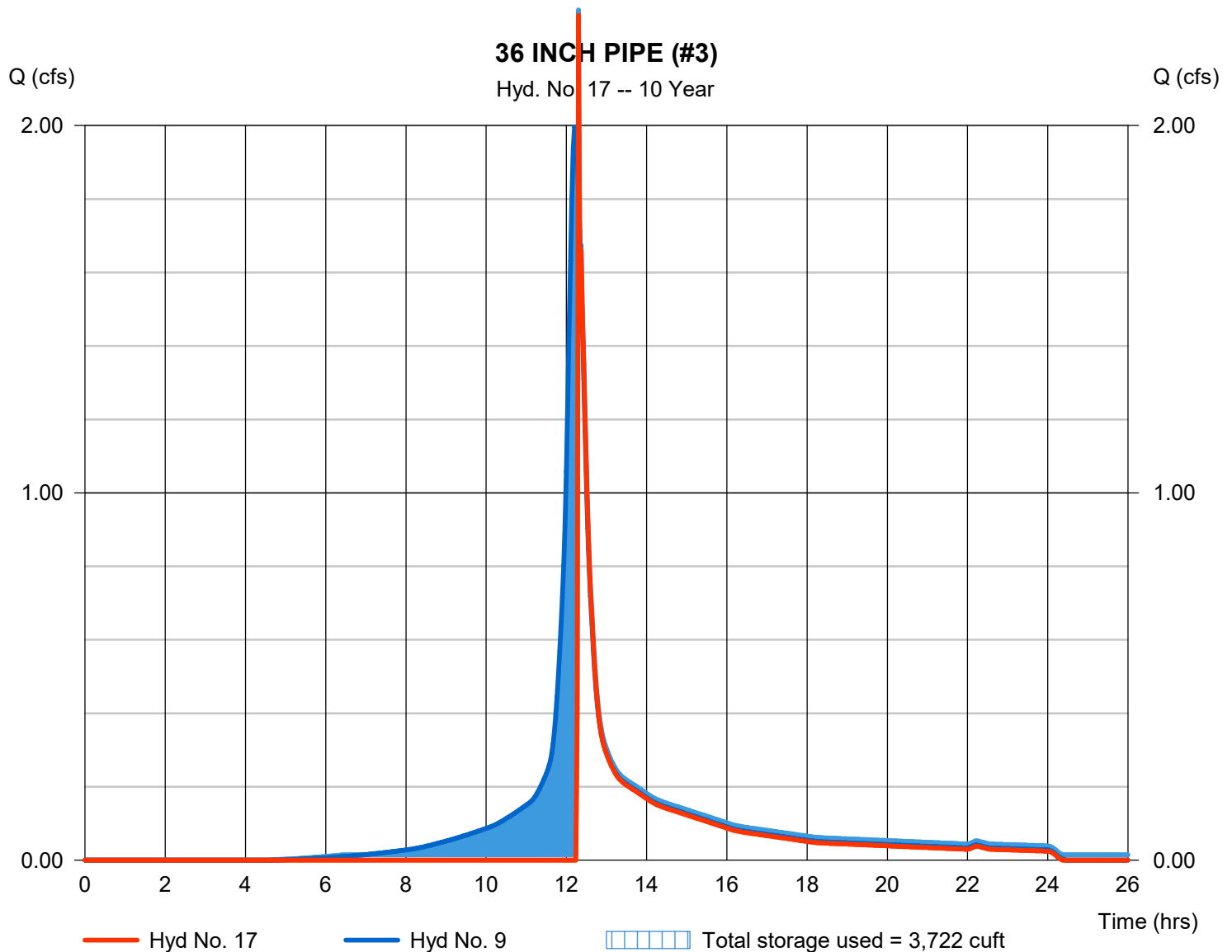
Hyd. No. 17

36 INCH PIPE (#3)

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 9 - EX WS-02H
 Reservoir name = 36in - 3

Peak discharge = 2.300 cfs
 Time to peak = 12.30 hrs
 Hyd. volume = 5,135 cuft
 Max. Elevation = 137.49 ft
 Max. Storage = 3,722 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

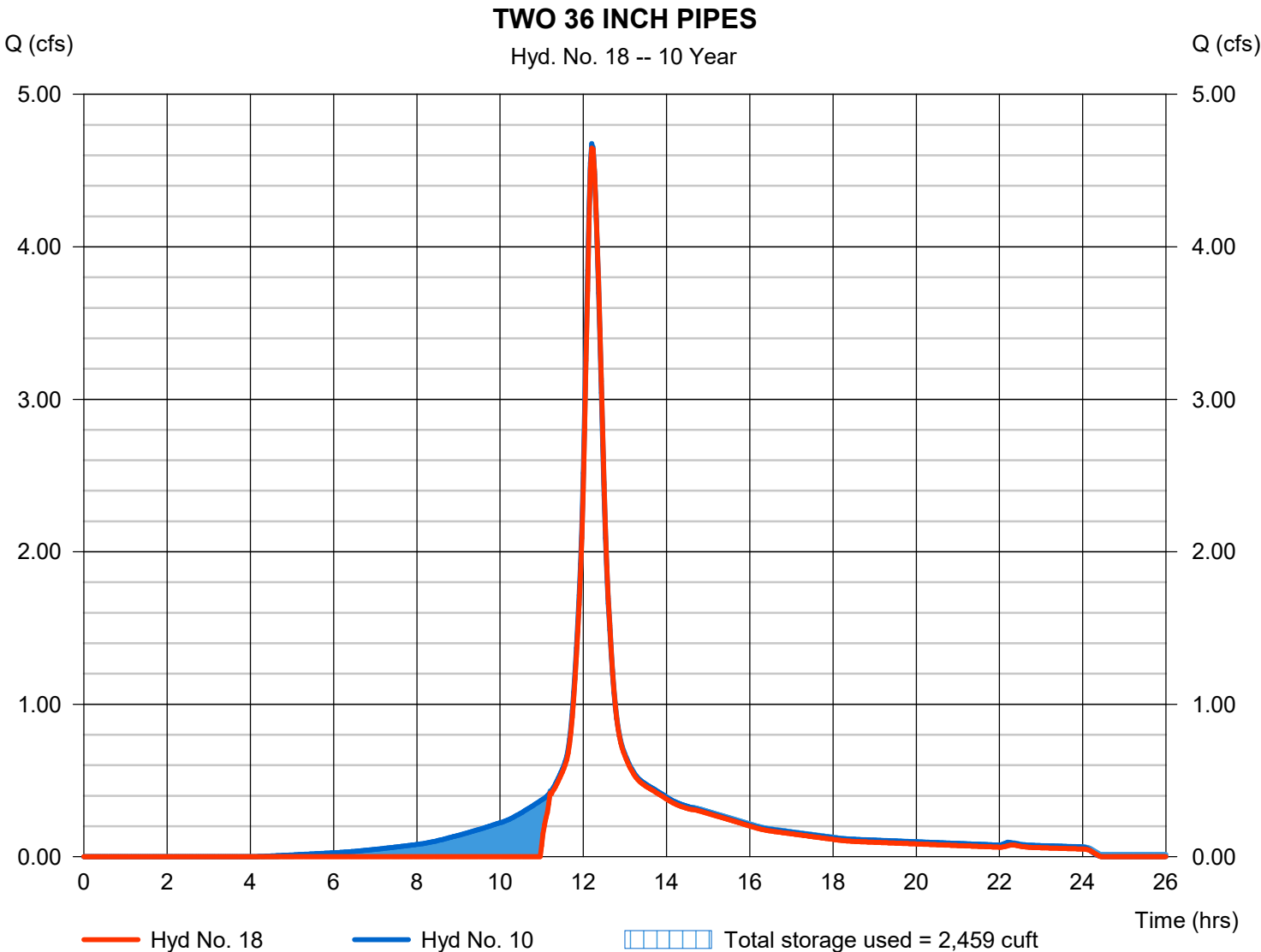
Monday, 12 / 4 / 2023

Hyd. No. 18

TWO 36 INCH PIPES

Hydrograph type	= Reservoir	Peak discharge	= 4.647 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 18,180 cuft
Inflow hyd. No.	= 10 - EX WS-02I	Max. Elevation	= 135.72 ft
Reservoir name	= TWIN 36IN	Max. Storage	= 2,459 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

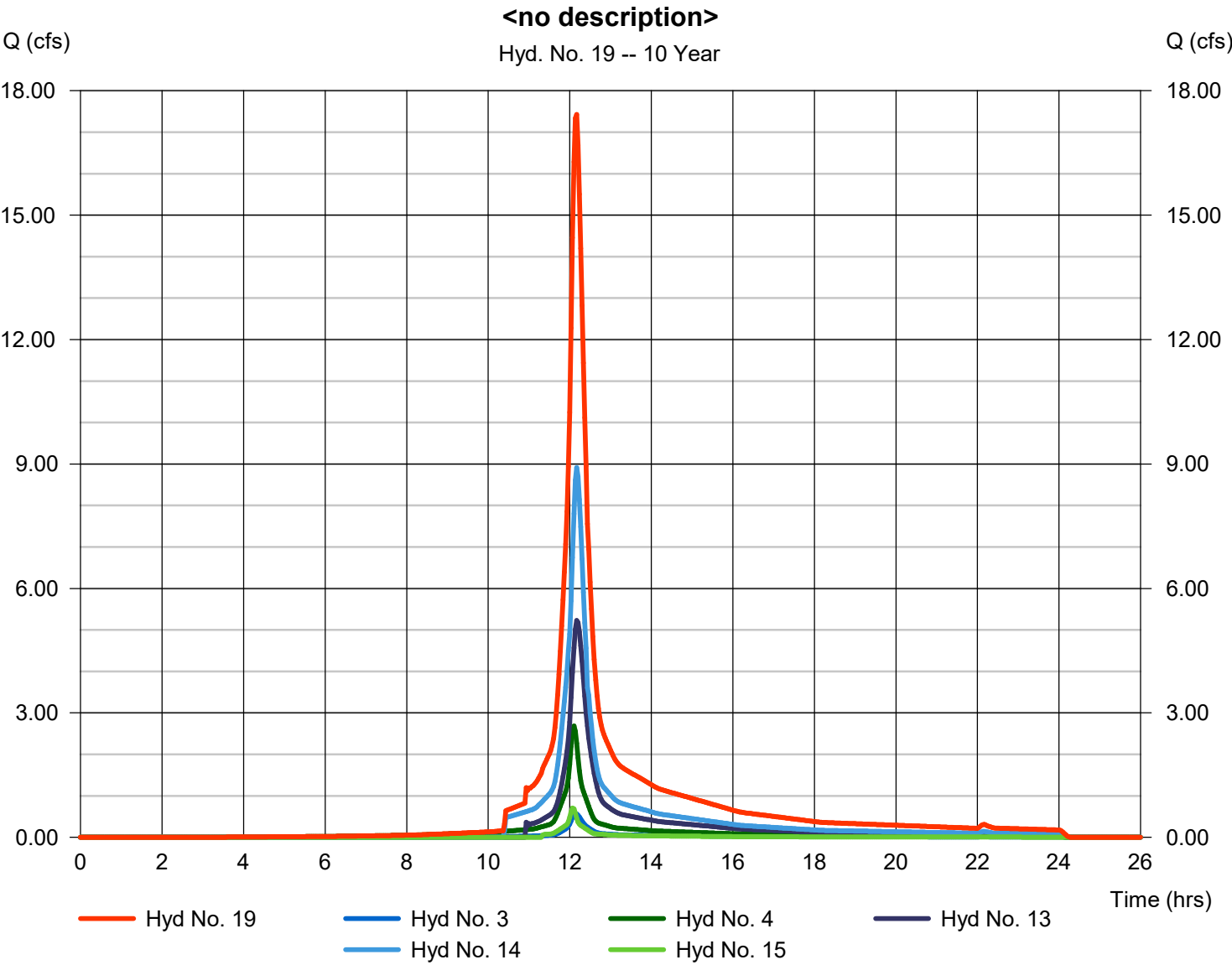
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 19

<no description>

Hydrograph type	= Combine	Peak discharge	= 17.43 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 64,781 cuft
Inflow hyds.	= 3, 4, 13, 14, 15	Contrib. drain. area	= 0.776 ac

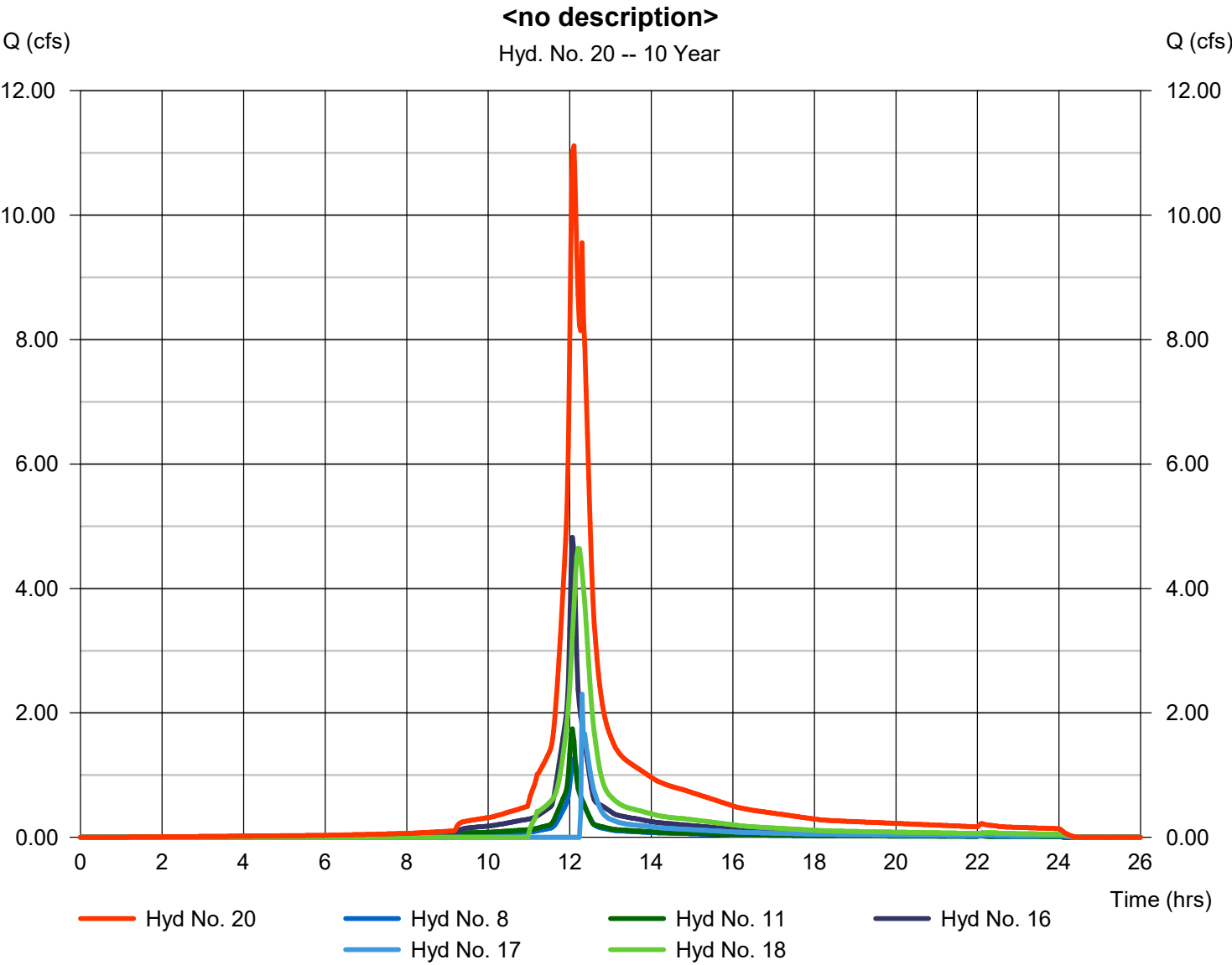


Hydrograph Report

Hyd. No. 20

<no description>

Hydrograph type	= Combine	Peak discharge	= 11.11 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 48,132 cuft
Inflow hyds.	= 8, 11, 16, 17, 18	Contrib. drain. area	= 0.625 ac



Hydrograph Report

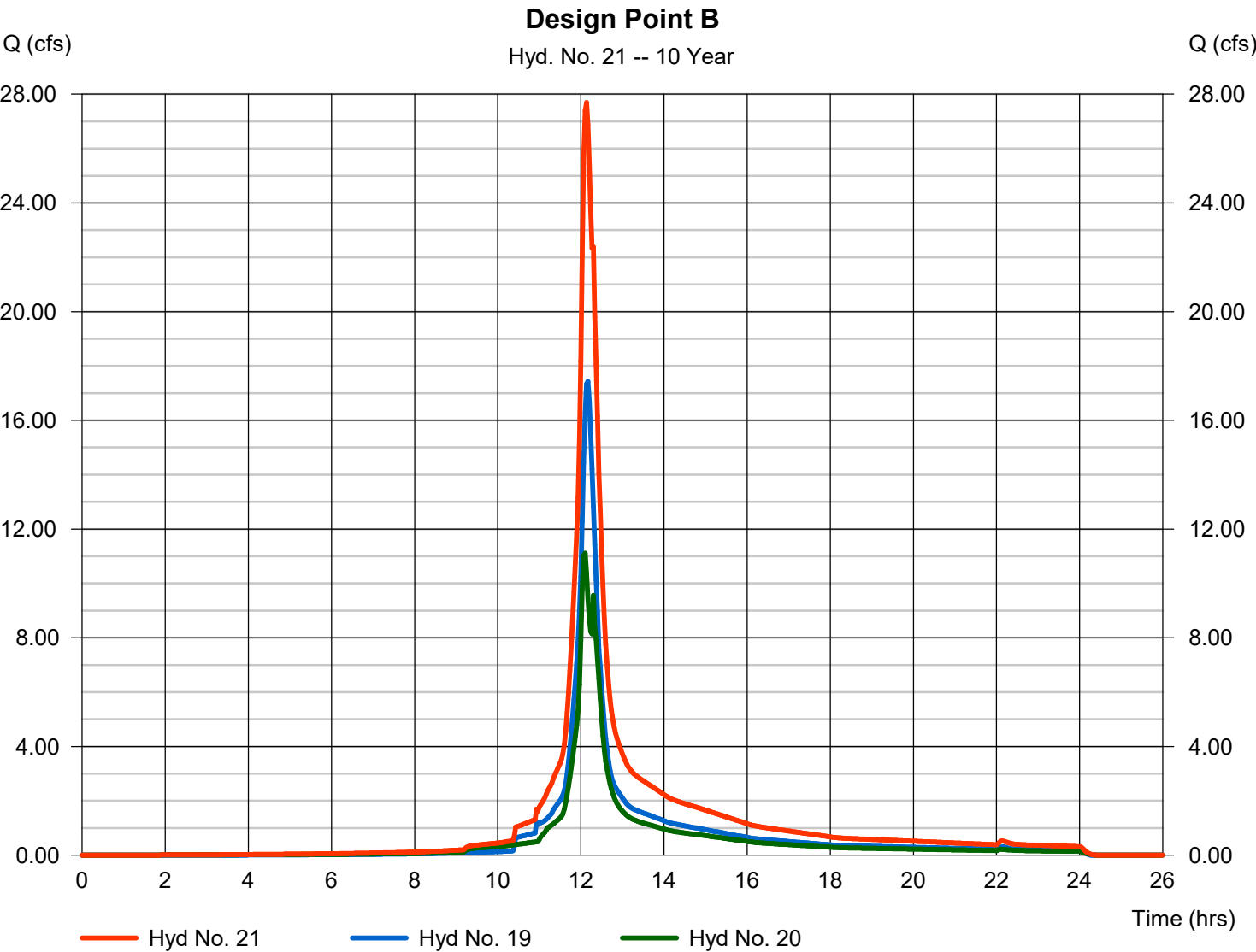
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 21

Design Point B

Hydrograph type	= Combine	Peak discharge	= 27.70 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 112,913 cuft
Inflow hyds.	= 19, 20	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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	4.569	2	732	18,910	-----	-----	-----	EX WS-01
2	SCS Runoff	6.758	2	730	27,938	-----	-----	-----	EX WS-02A
3	SCS Runoff	0.755	2	728	2,900	-----	-----	-----	EX WS-02B
4	SCS Runoff	3.315	2	726	12,242	-----	-----	-----	EX WS-02C
5	SCS Runoff	11.39	2	728	46,130	-----	-----	-----	EX WS-02D
6	SCS Runoff	0.894	2	724	3,014	-----	-----	-----	EX WS-02E
7	SCS Runoff	6.042	2	724	19,686	-----	-----	-----	EX WS-02F
8	SCS Runoff	1.567	2	726	5,734	-----	-----	-----	EX WS-02G
9	SCS Runoff	2.521	2	732	11,510	-----	-----	-----	EX WS-02H
10	SCS Runoff	5.852	2	732	27,051	-----	-----	-----	EX WS-02I
11	SCS Runoff	2.120	2	724	7,355	-----	-----	-----	EX WS-02J
12	SCS Runoff	0.314	2	730	1,264	-----	-----	-----	EX WS-03
13	Reservoir	6.739	2	730	25,739	2	143.63	1,533	36 INCH PIPE (#1)
14	Reservoir	11.13	2	730	41,147	5	139.17	3,870	TWIN 36IN PIPES (#2)
15	Reservoir	0.908	2	724	2,362	6	139.64	501	24 INCH PIPE
16	Reservoir	5.901	2	724	18,171	7	139.51	1,323	36 INCH PIPE (#2)
17	Reservoir	2.826	2	730	7,621	9	137.50	3,739	36 INCH PIPE (#3)
18	Reservoir	5.822	2	732	23,823	10	135.74	2,482	TWO 36 INCH PIPES
19	Combine	21.96	2	730	84,390	3, 4, 13, 14, 15,	-----	-----	<no description>
20	Combine	14.53	2	730	62,704	8, 11, 16, 17, 18,	-----	-----	<no description>
21	Combine	36.49	2	730	147,095	19, 20	-----	-----	Design Point B
Existing-Hydraflow.gpw					Return Period: 25 Year			Monday, 12 / 4 / 2023	

Hydrograph Report

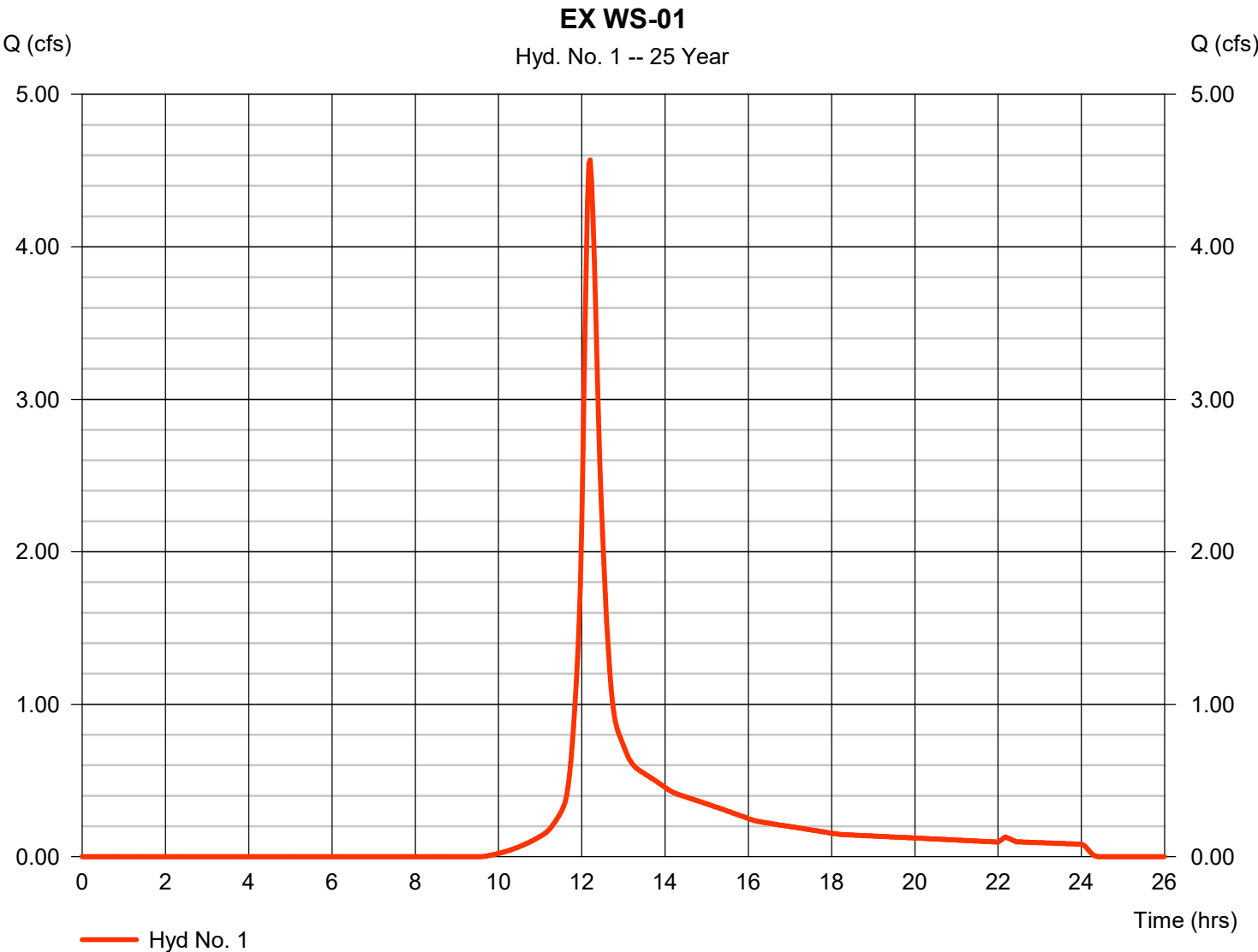
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 1

EX WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 4.569 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 18,910 cuft
Drainage area	= 1.942 ac	Curve number	= 65
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.10 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

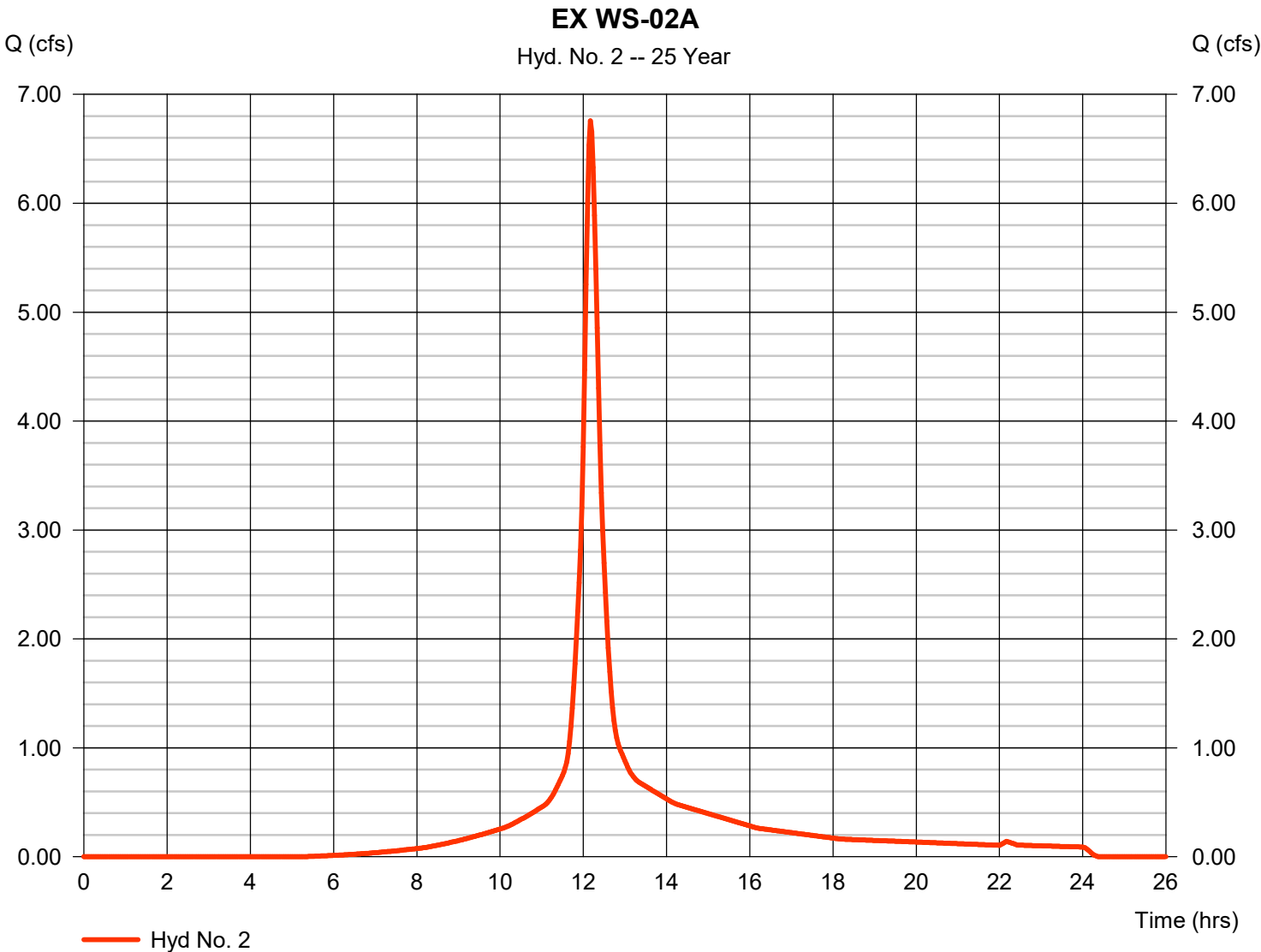
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 2

EX WS-02A

Hydrograph type	= SCS Runoff	Peak discharge	= 6.758 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 27,938 cuft
Drainage area	= 1.678 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.50 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

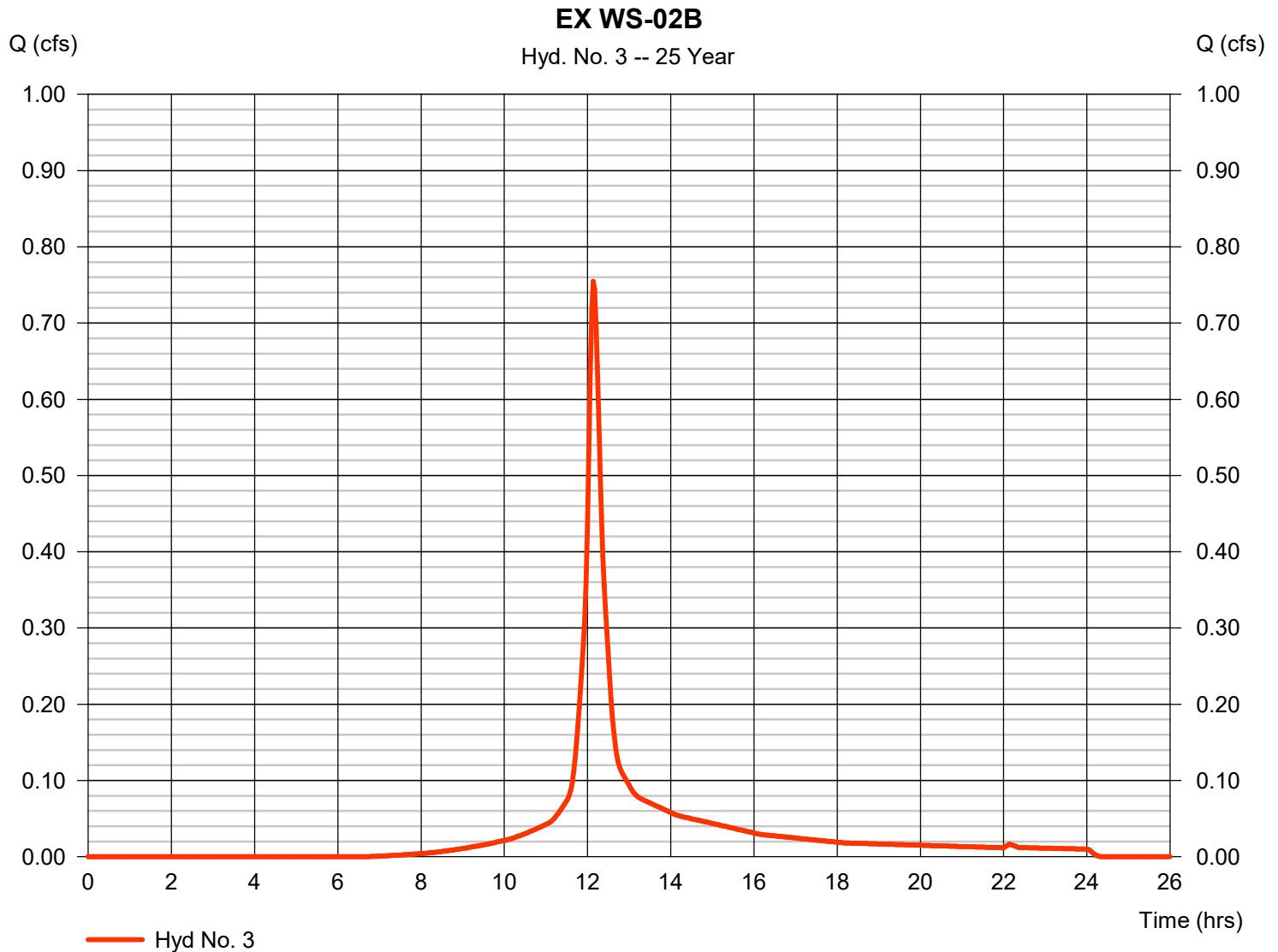
Monday, 12 / 4 / 2023

Hyd. No. 3

EX WS-02B

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 0.186 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 6.54 in
 Storm duration = 24 hrs

Peak discharge = 0.755 cfs
 Time to peak = 12.13 hrs
 Hyd. volume = 2,900 cuft
 Curve number = 79
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 11.00 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

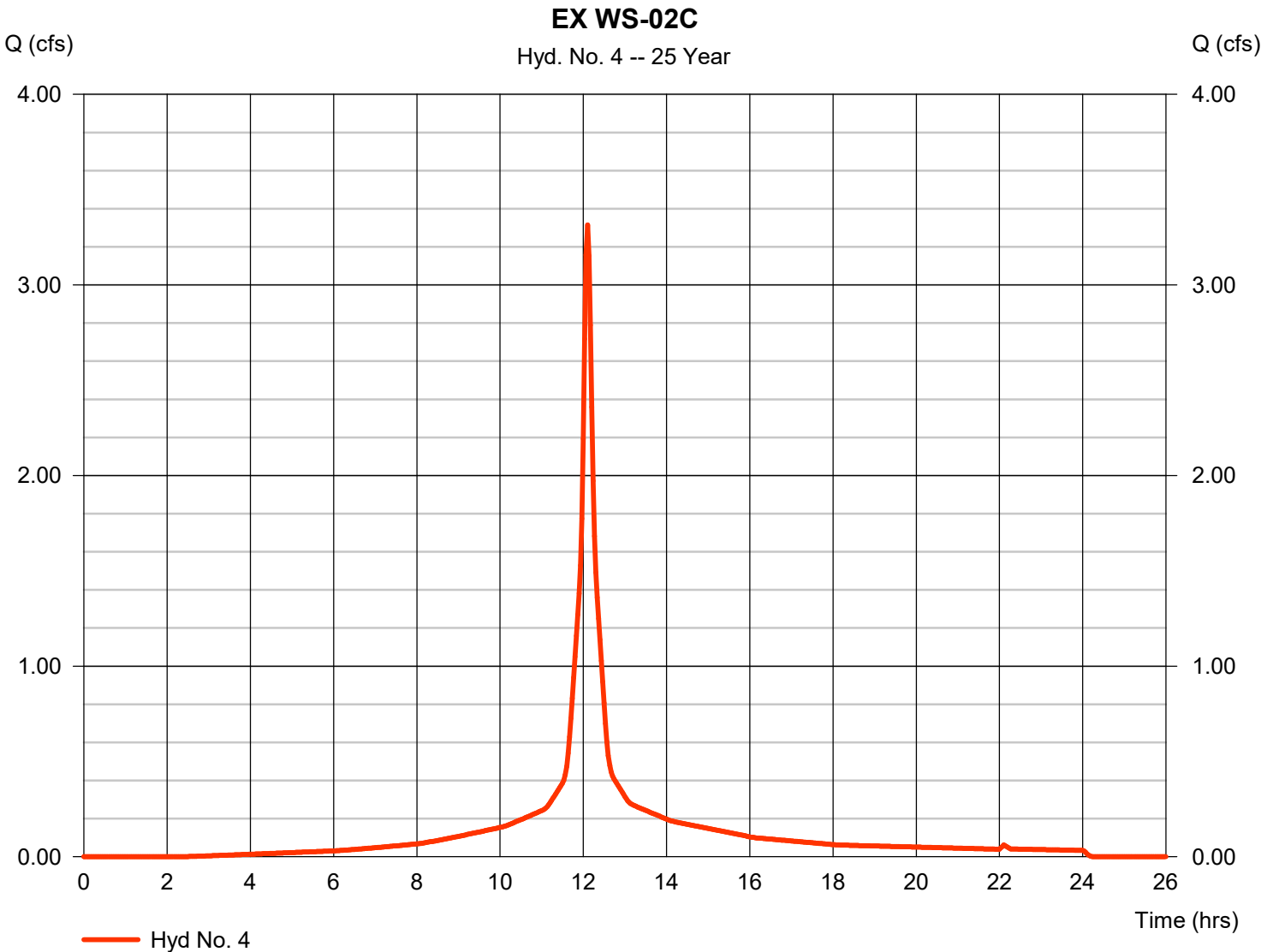
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 4

EX WS-02C

Hydrograph type	= SCS Runoff	Peak discharge	= 3.315 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 12,242 cuft
Drainage area	= 0.590 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.40 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

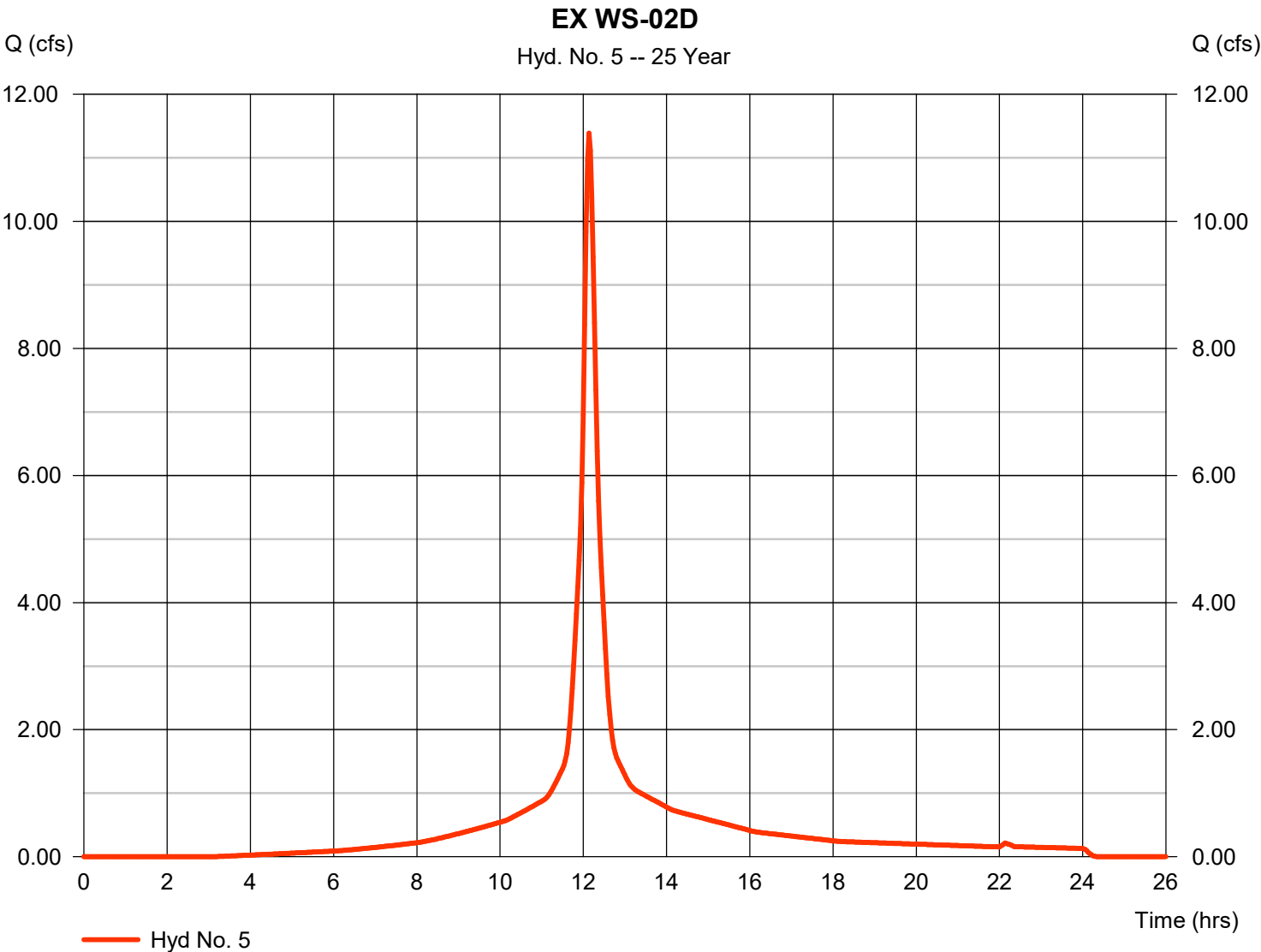
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 5

EX WS-02D

Hydrograph type	= SCS Runoff	Peak discharge	= 11.39 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 46,130 cuft
Drainage area	= 2.246 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 11.10 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

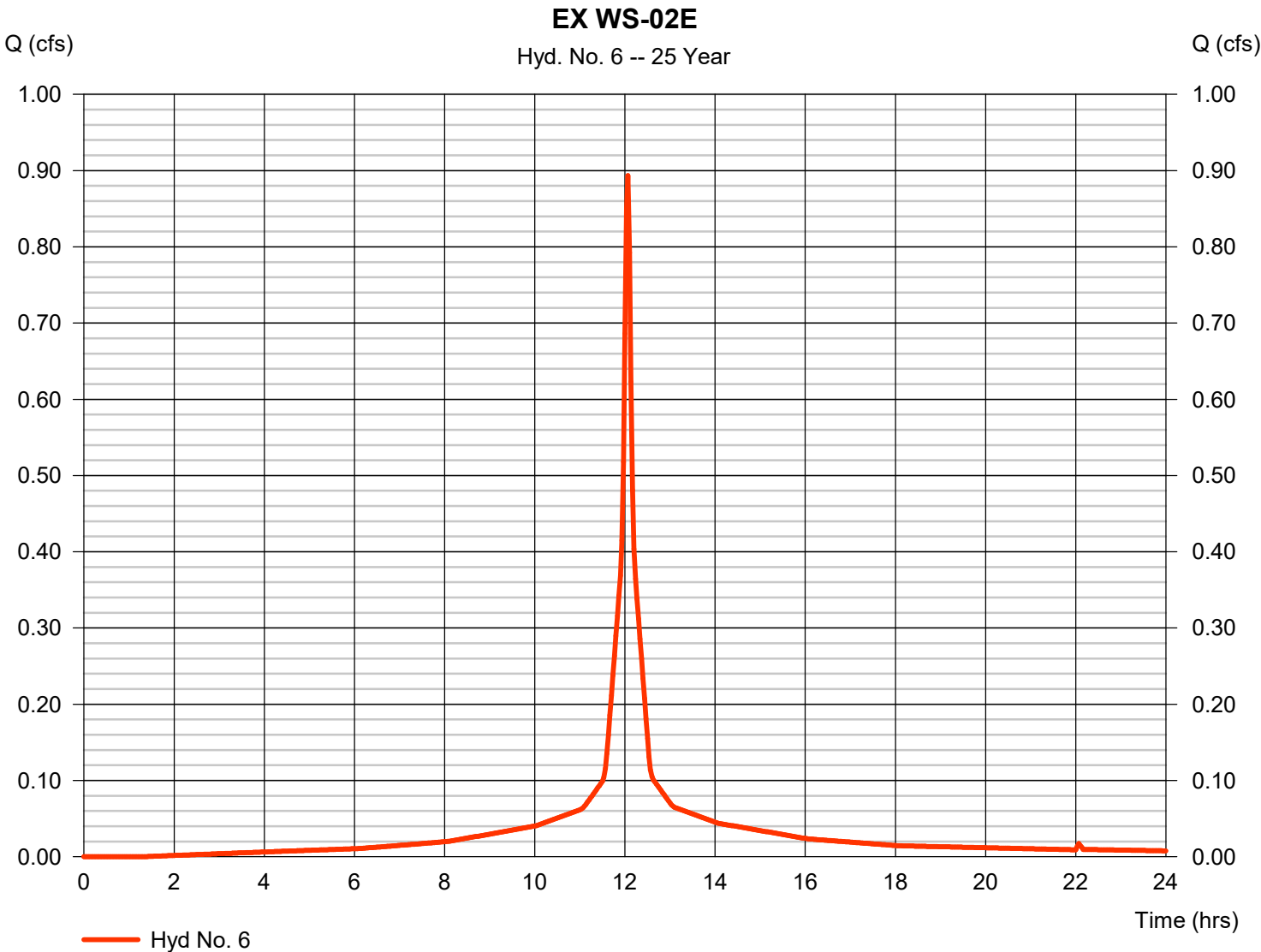
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 6

EX WS-02E

Hydrograph type	= SCS Runoff	Peak discharge	= 0.894 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 3,014 cuft
Drainage area	= 0.146 ac	Curve number	= 96
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

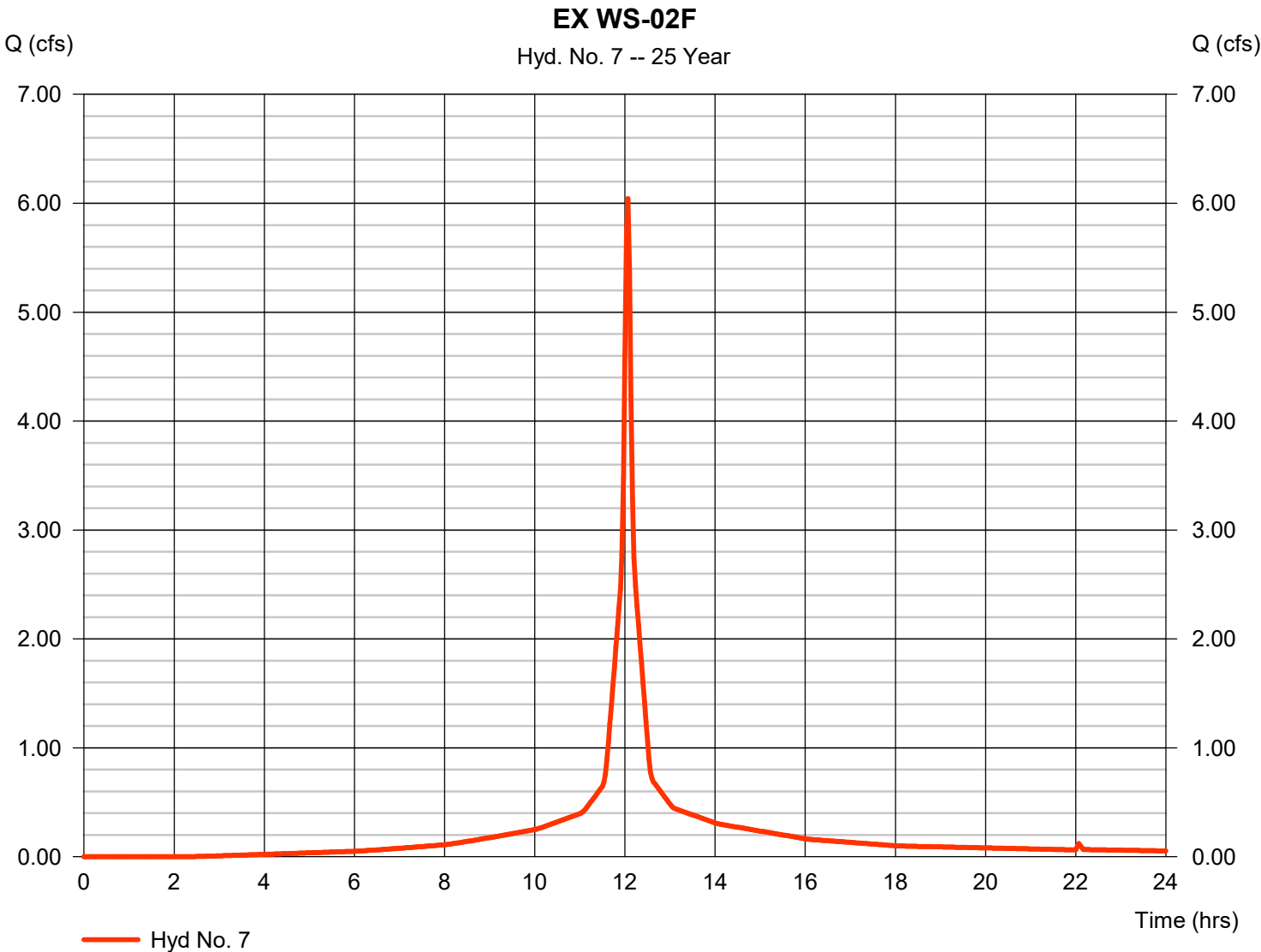
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 7

EX WS-02F

Hydrograph type	= SCS Runoff	Peak discharge	= 6.042 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 19,686 cuft
Drainage area	= 1.012 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.50 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

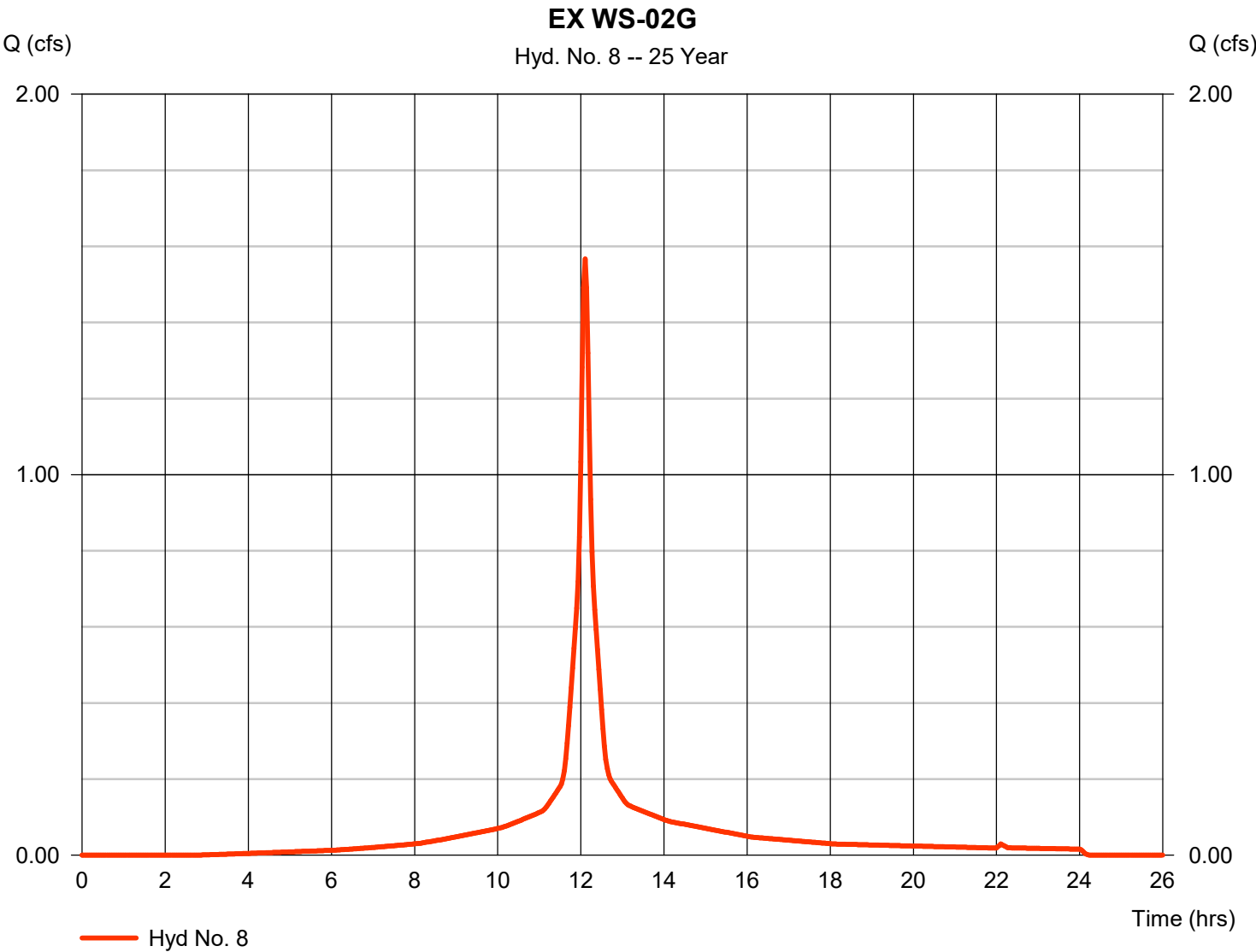
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 8

EX WS-02G

Hydrograph type	= SCS Runoff	Peak discharge	= 1.567 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 5,734 cuft
Drainage area	= 0.282 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.90 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

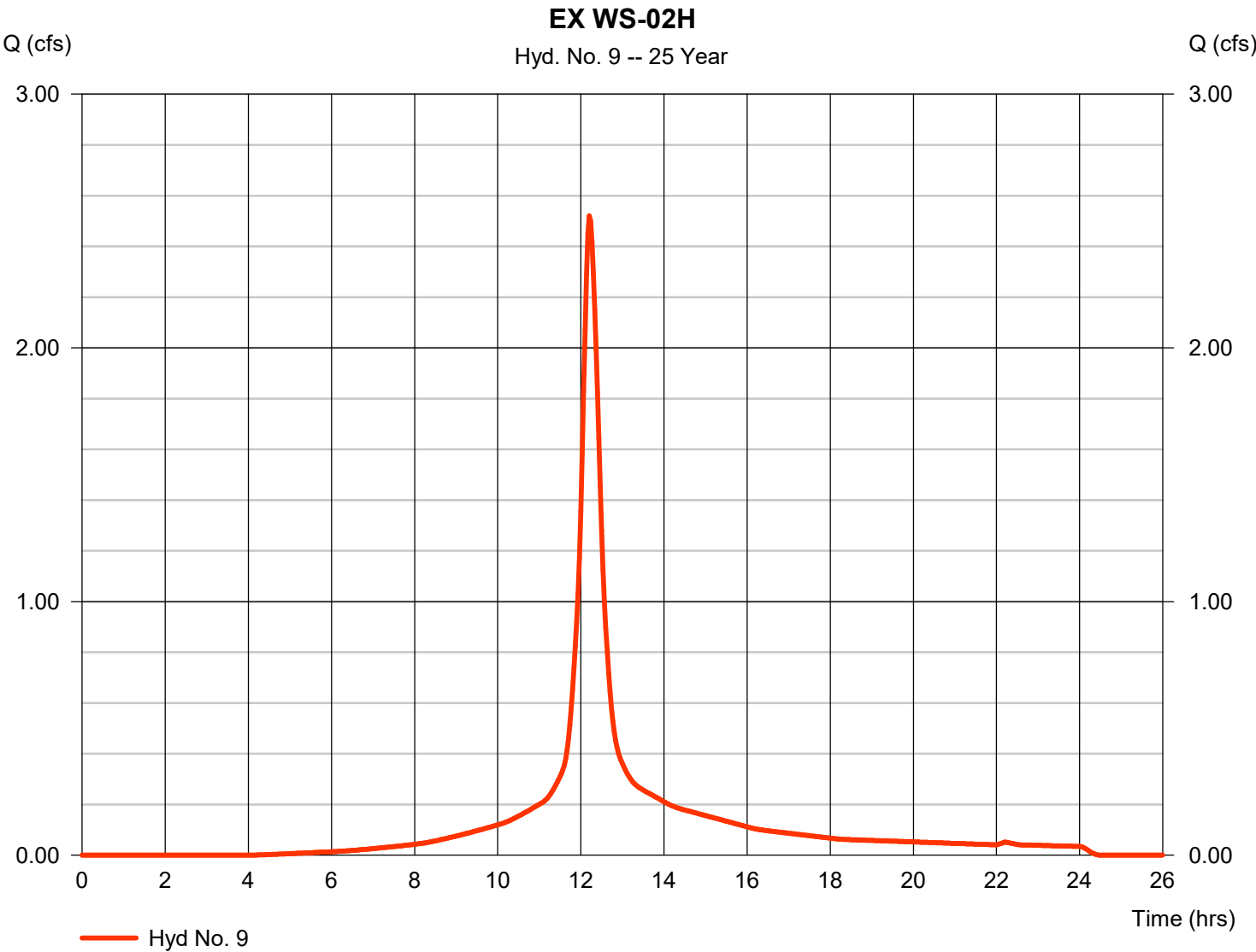


Hydrograph Report

Hyd. No. 9

EX WS-02H

Hydrograph type	= SCS Runoff	Peak discharge	= 2.521 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 11,510 cuft
Drainage area	= 0.616 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.30 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

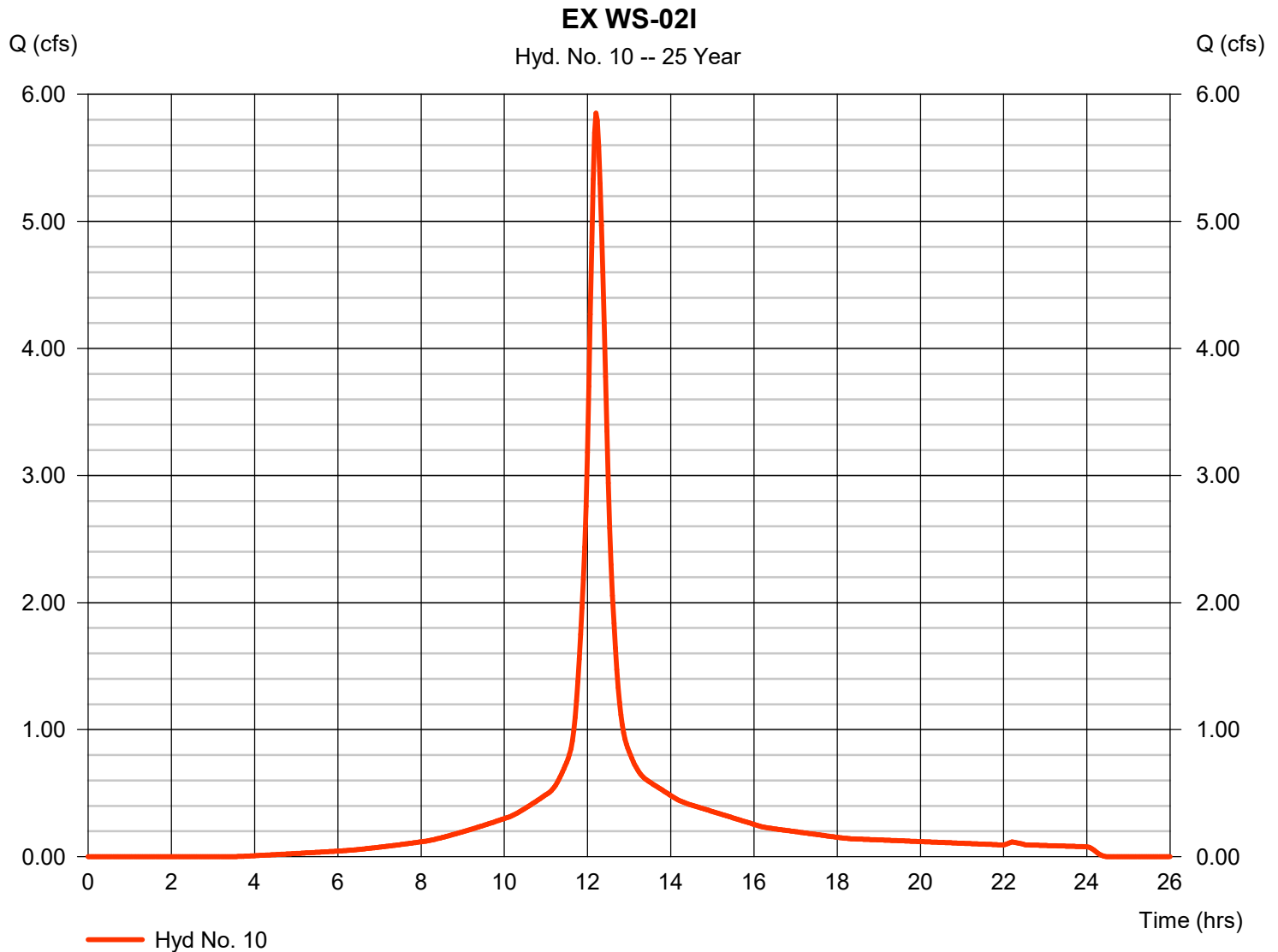
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 10

EX WS-02I

Hydrograph type	= SCS Runoff	Peak discharge	= 5.852 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 27,051 cuft
Drainage area	= 1.387 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.60 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

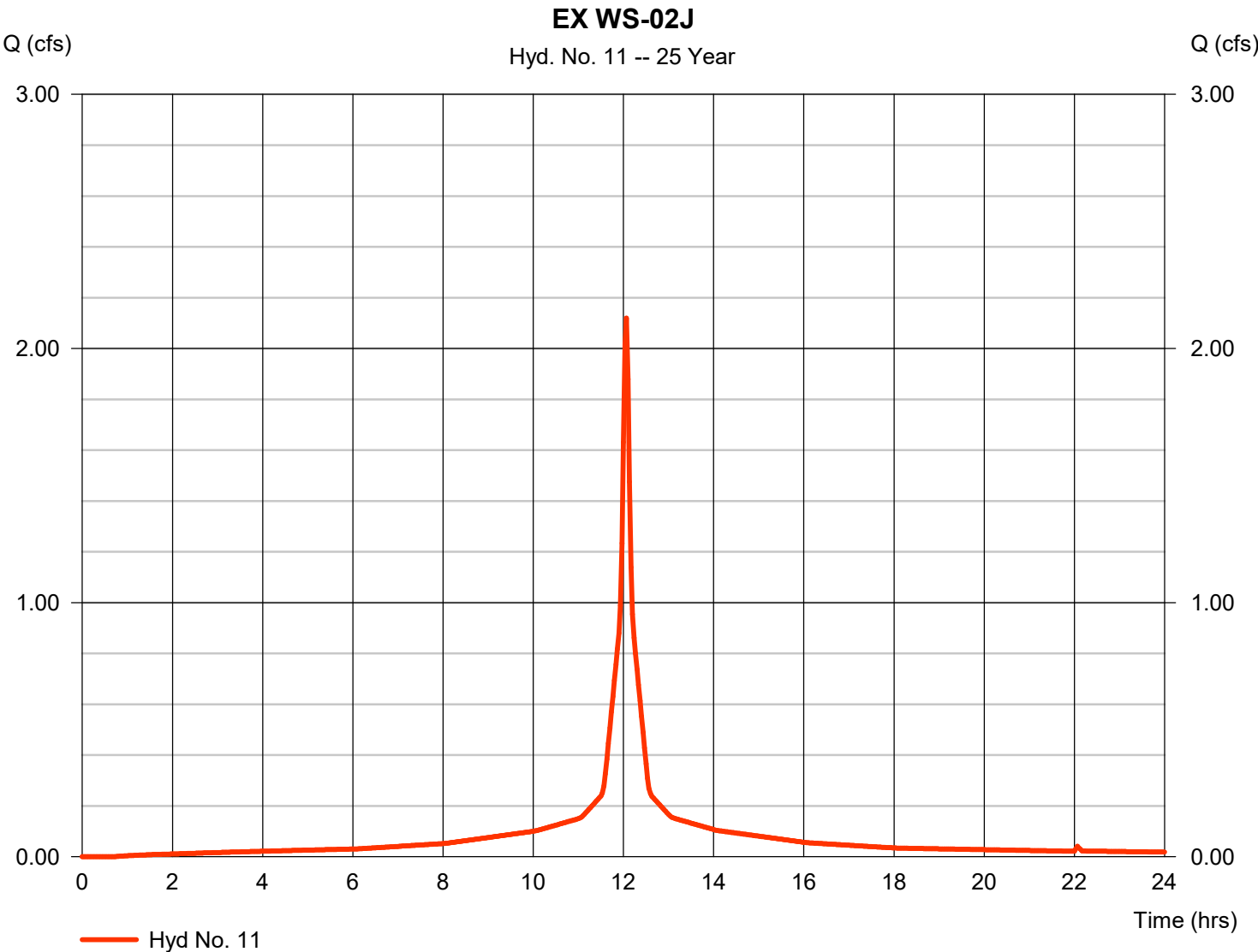


Hydrograph Report

Hyd. No. 11

EX WS-02J

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.120 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	7,355 cuft
Drainage area	=	0.343 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.54 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

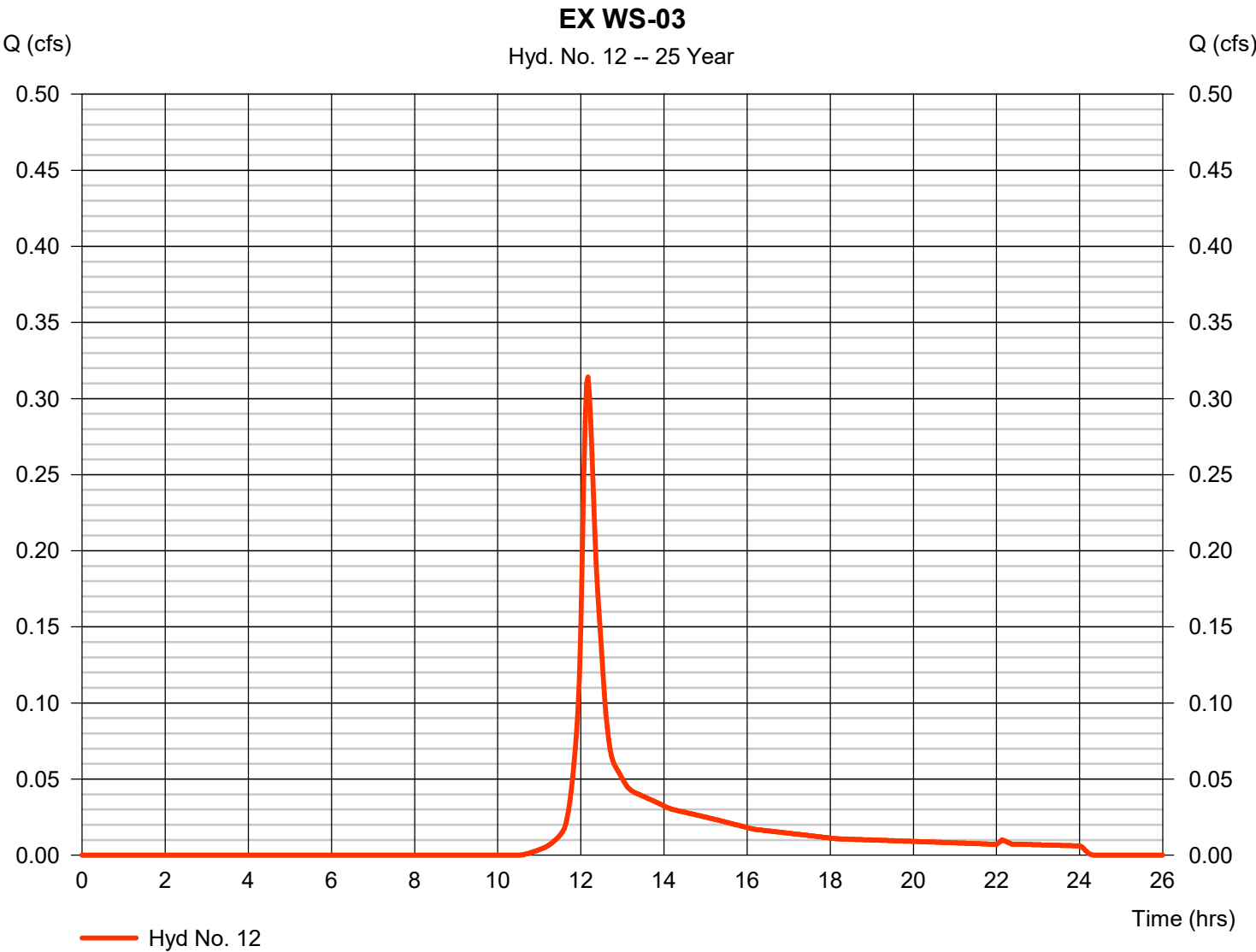
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 12

EX WS-03

Hydrograph type	= SCS Runoff	Peak discharge	= 0.314 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 1,264 cuft
Drainage area	= 0.154 ac	Curve number	= 59
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.50 min
Total precip.	= 6.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

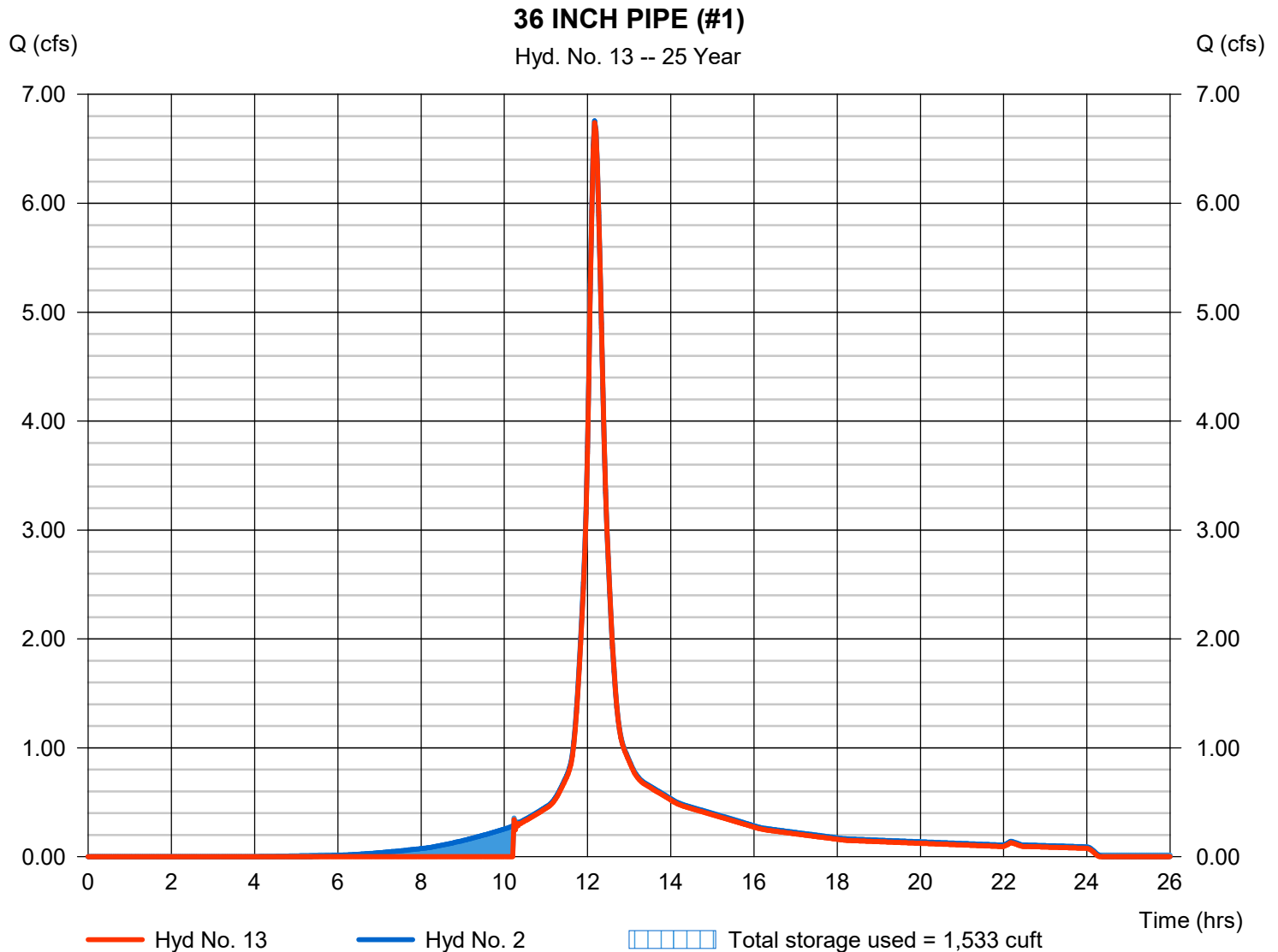
Hyd. No. 13

36 INCH PIPE (#1)

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyd. No. = 2 - EX WS-02A
 Reservoir name = 36IN - 1

Peak discharge = 6.739 cfs
 Time to peak = 12.17 hrs
 Hyd. volume = 25,739 cuft
 Max. Elevation = 143.63 ft
 Max. Storage = 1,533 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

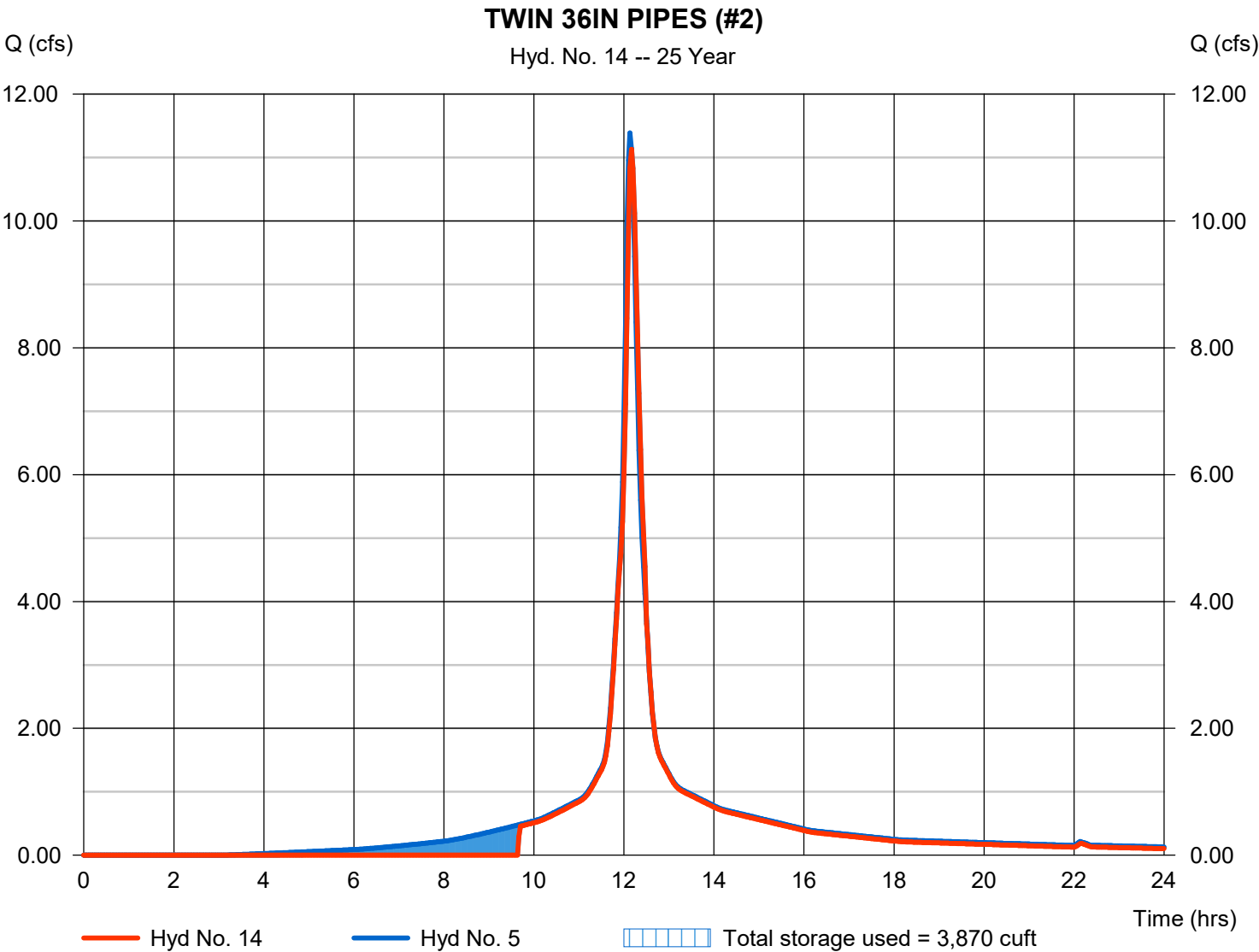
Monday, 12 / 4 / 2023

Hyd. No. 14

TWIN 36IN PIPES (#2)

Hydrograph type	= Reservoir	Peak discharge	= 11.13 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 41,147 cuft
Inflow hyd. No.	= 5 - EX WS-02D	Max. Elevation	= 139.17 ft
Reservoir name	= Northern Twin 36IN	Max. Storage	= 3,870 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

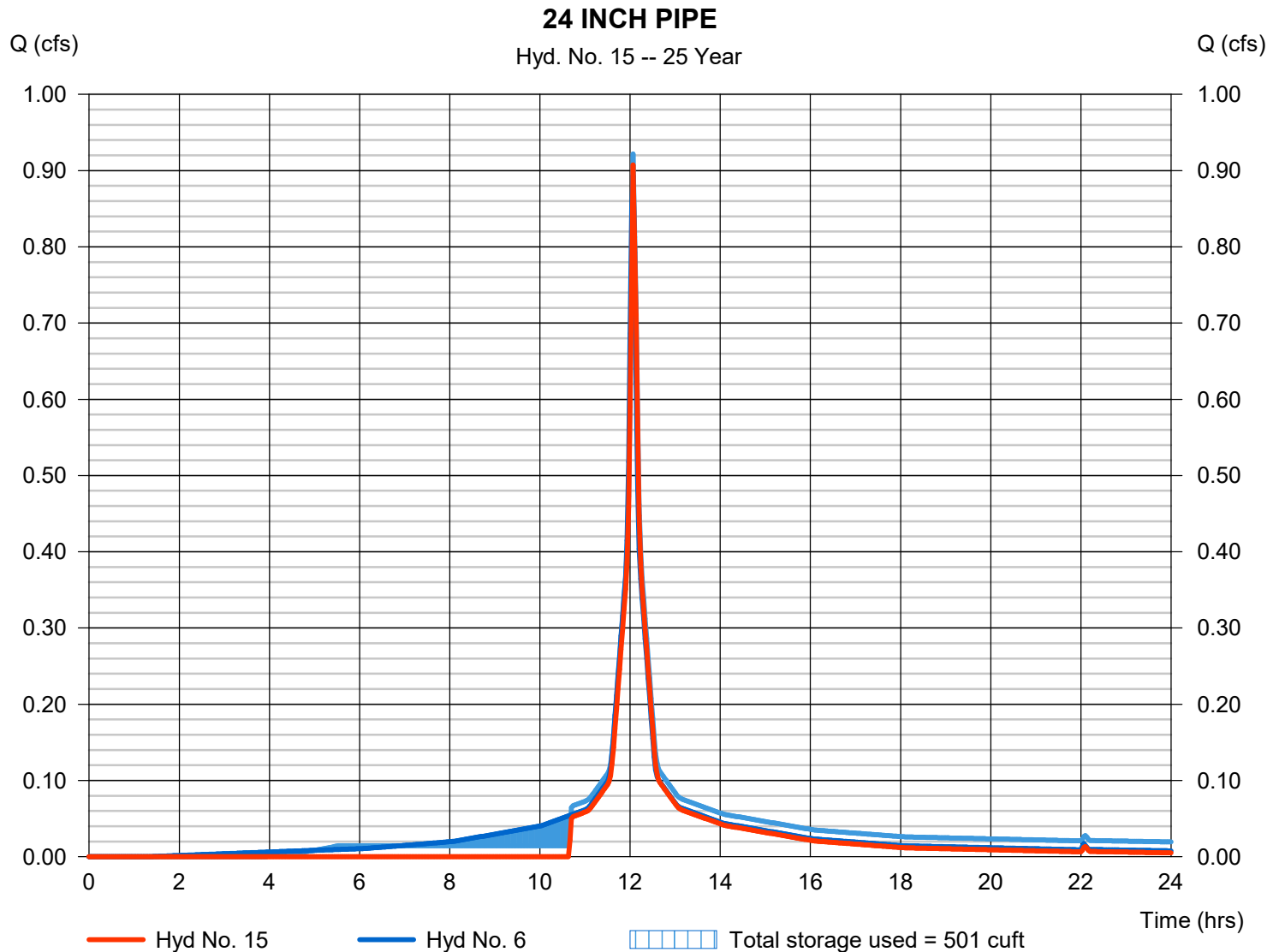
Hyd. No. 15

24 INCH PIPE

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - EX WS-02E
 Reservoir name = 24IN

Peak discharge = 0.908 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 2,362 cuft
 Max. Elevation = 139.64 ft
 Max. Storage = 501 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

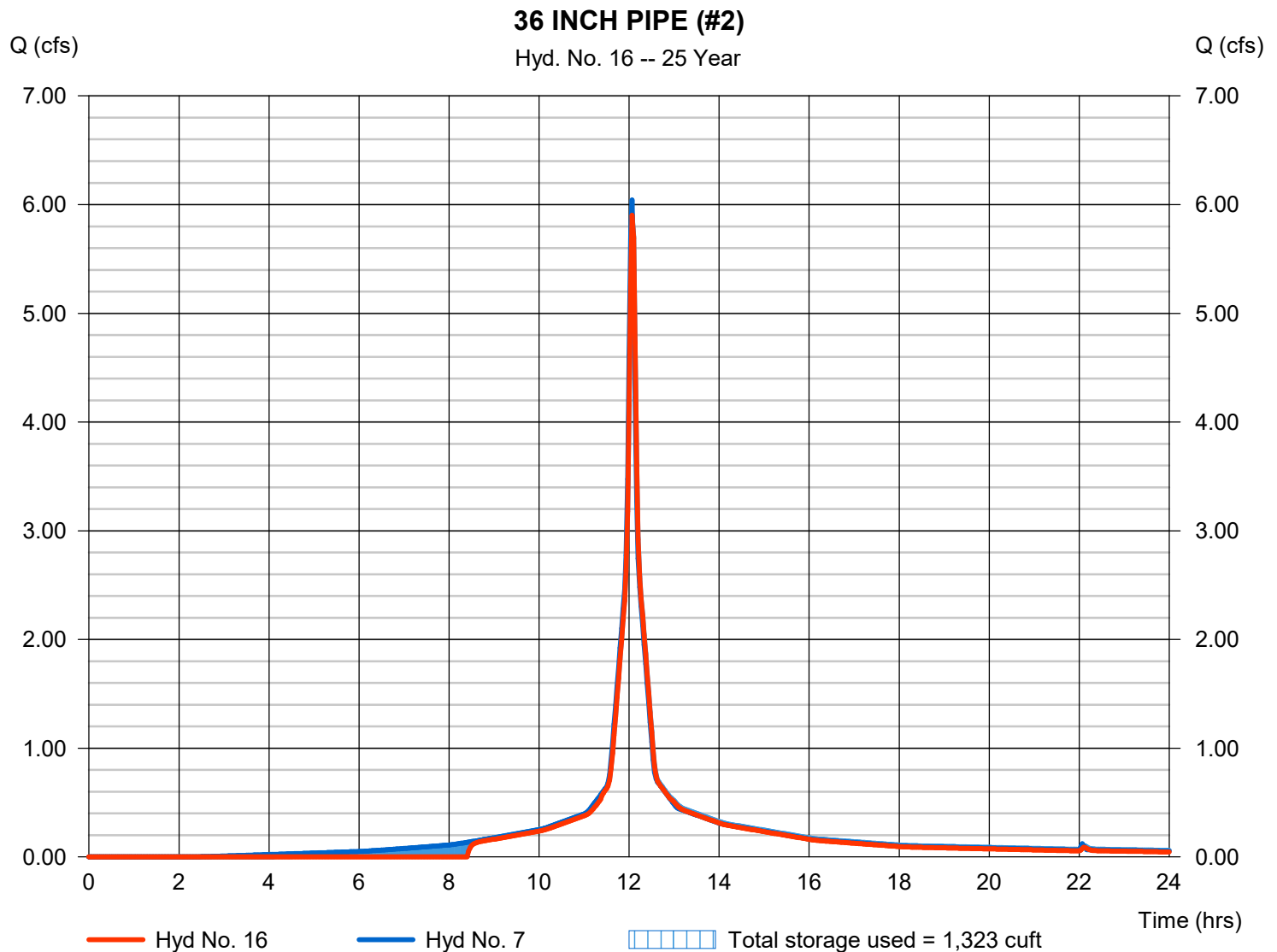
Hyd. No. 16

36 INCH PIPE (#2)

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - EX WS-02F
 Reservoir name = 36in - 2

Peak discharge = 5.901 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 18,171 cuft
 Max. Elevation = 139.51 ft
 Max. Storage = 1,323 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

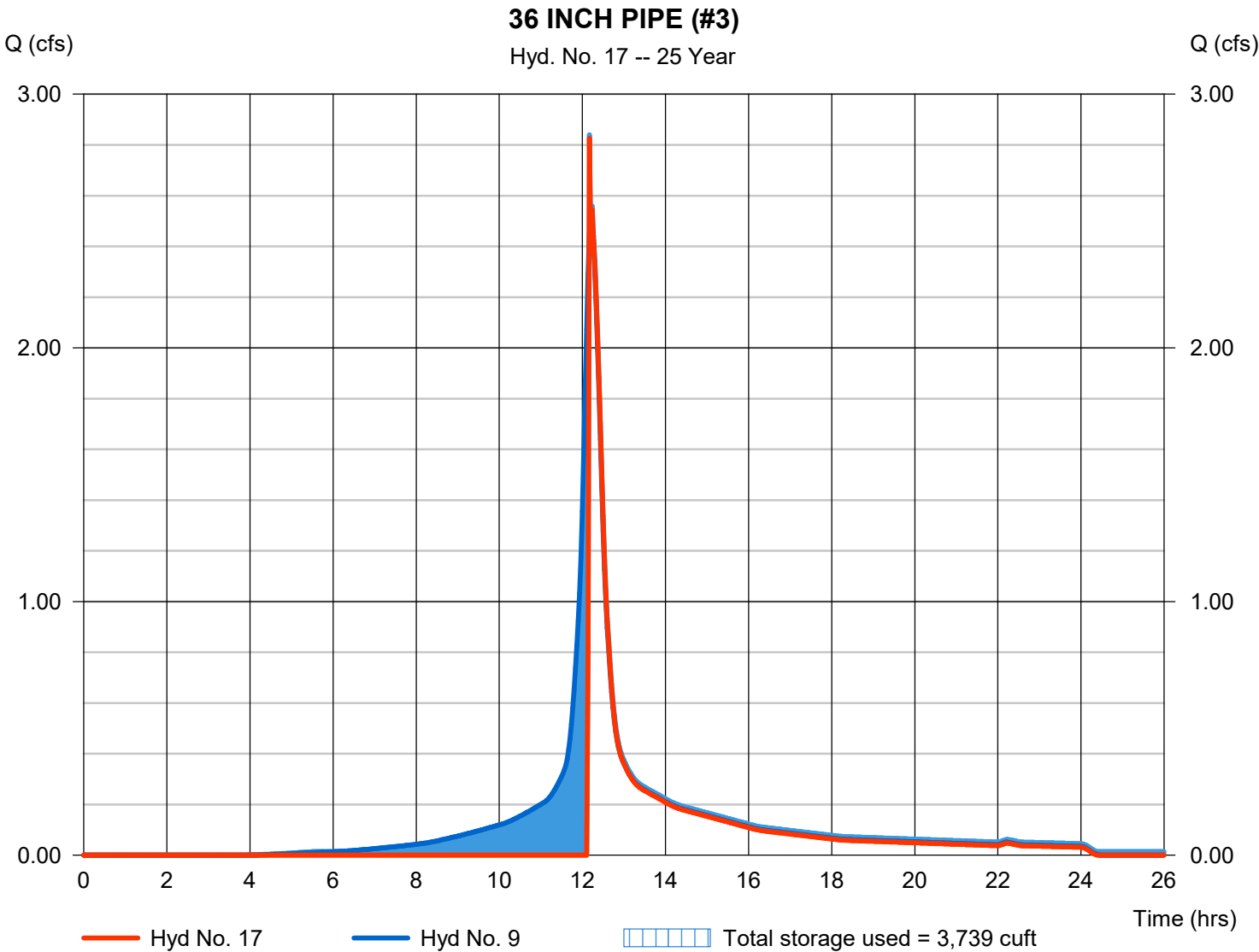
Monday, 12 / 4 / 2023

Hyd. No. 17

36 INCH PIPE (#3)

Hydrograph type	= Reservoir	Peak discharge	= 2.826 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 7,621 cuft
Inflow hyd. No.	= 9 - EX WS-02H	Max. Elevation	= 137.50 ft
Reservoir name	= 36in - 3	Max. Storage	= 3,739 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

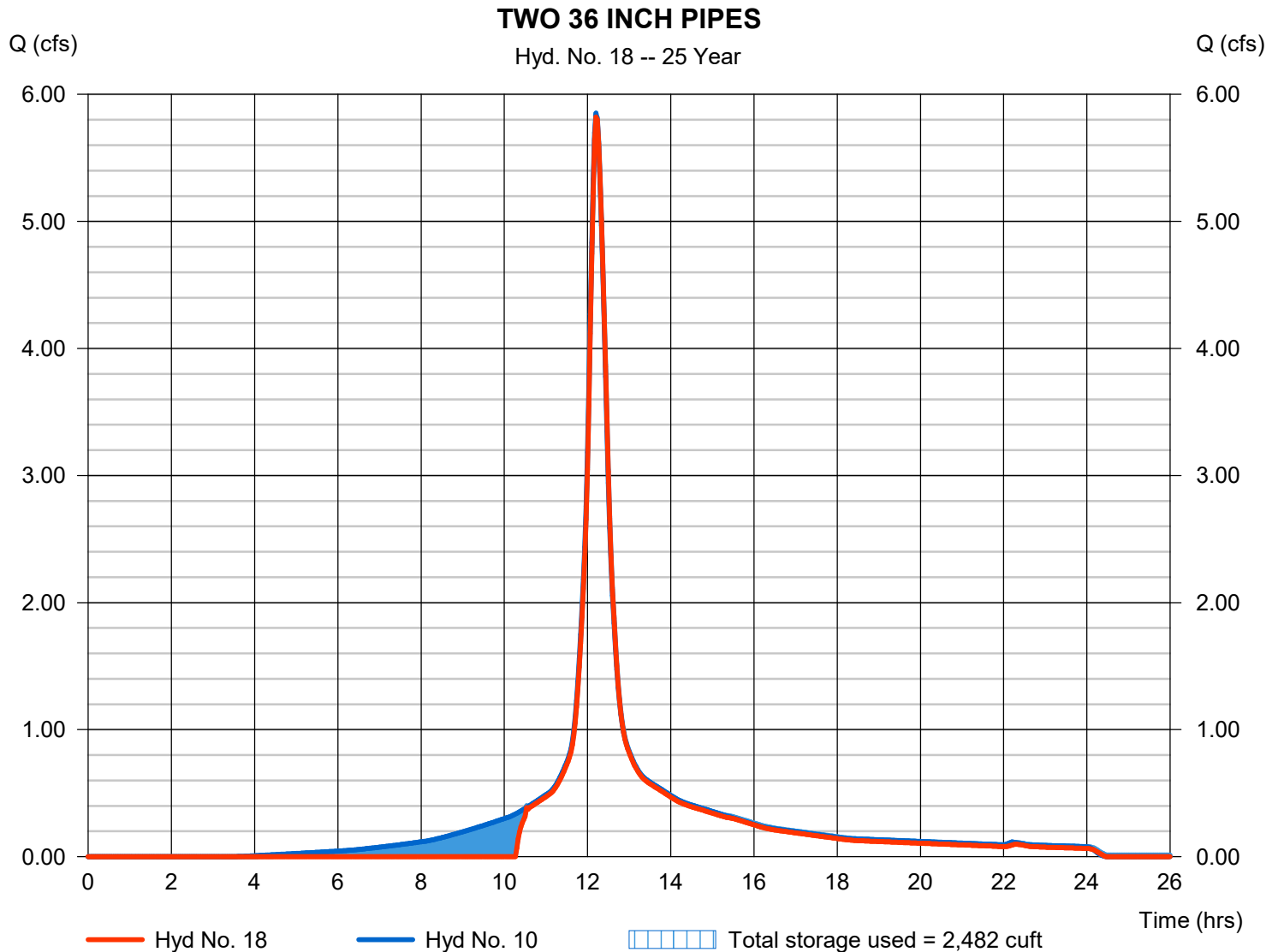
Monday, 12 / 4 / 2023

Hyd. No. 18

TWO 36 INCH PIPES

Hydrograph type	= Reservoir	Peak discharge	= 5.822 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 23,823 cuft
Inflow hyd. No.	= 10 - EX WS-02I	Max. Elevation	= 135.74 ft
Reservoir name	= TWIN 36IN	Max. Storage	= 2,482 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

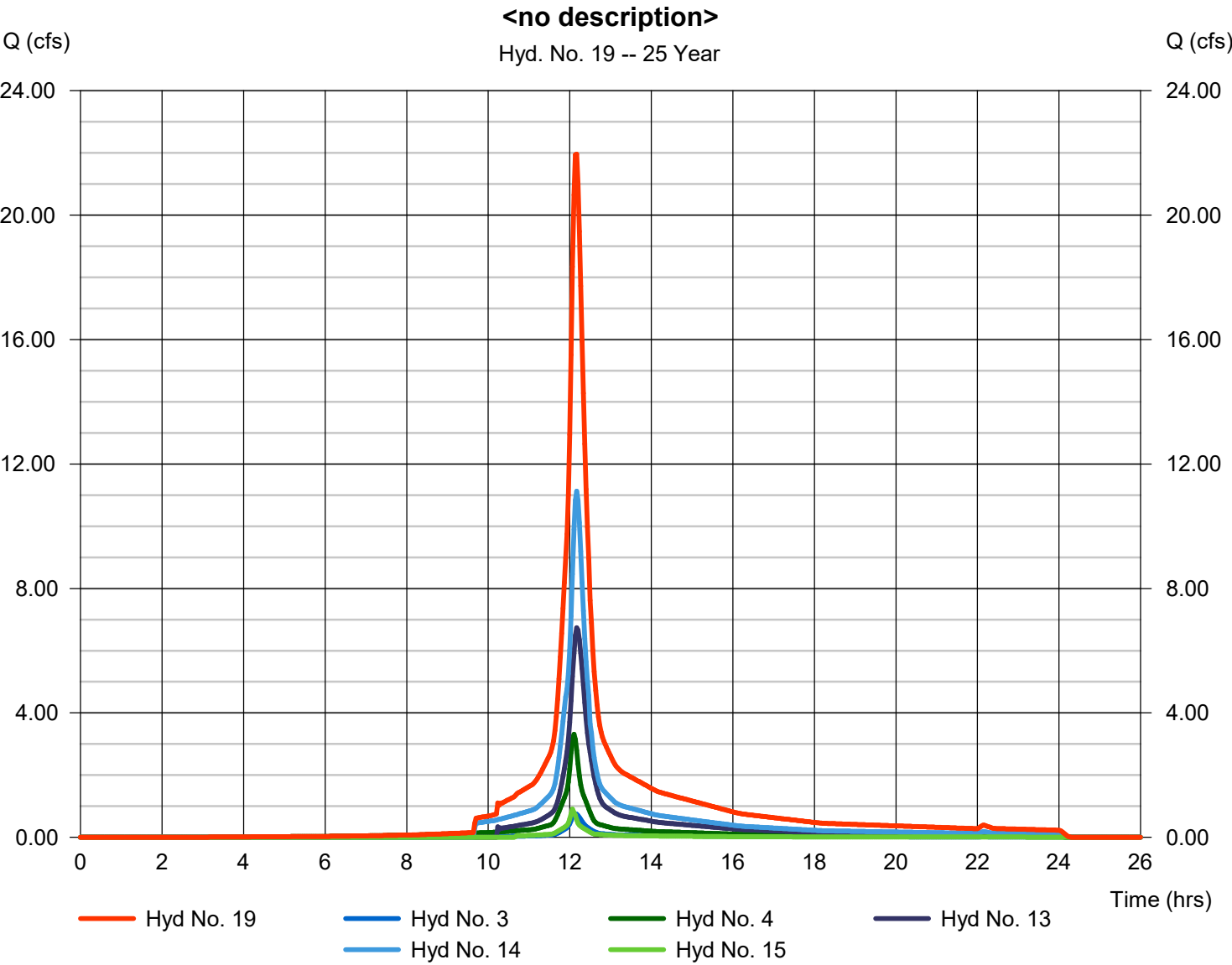


Hydrograph Report

Hyd. No. 19

<no description>

Hydrograph type	= Combine	Peak discharge	= 21.96 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 84,390 cuft
Inflow hyds.	= 3, 4, 13, 14, 15	Contrib. drain. area	= 0.776 ac



Hydrograph Report

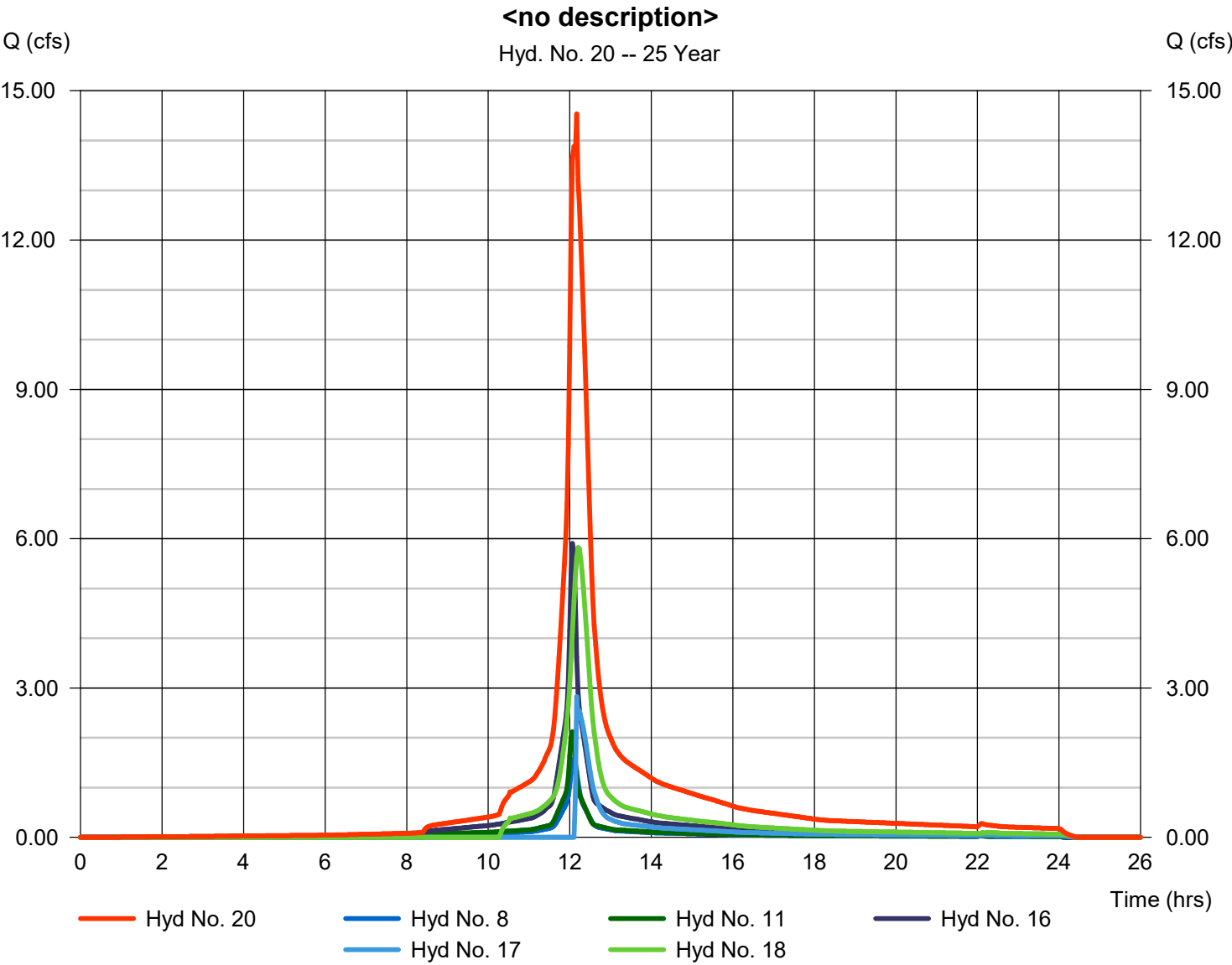
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 20

<no description>

Hydrograph type	= Combine	Peak discharge	= 14.53 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 62,704 cuft
Inflow hyds.	= 8, 11, 16, 17, 18	Contrib. drain. area	= 0.625 ac

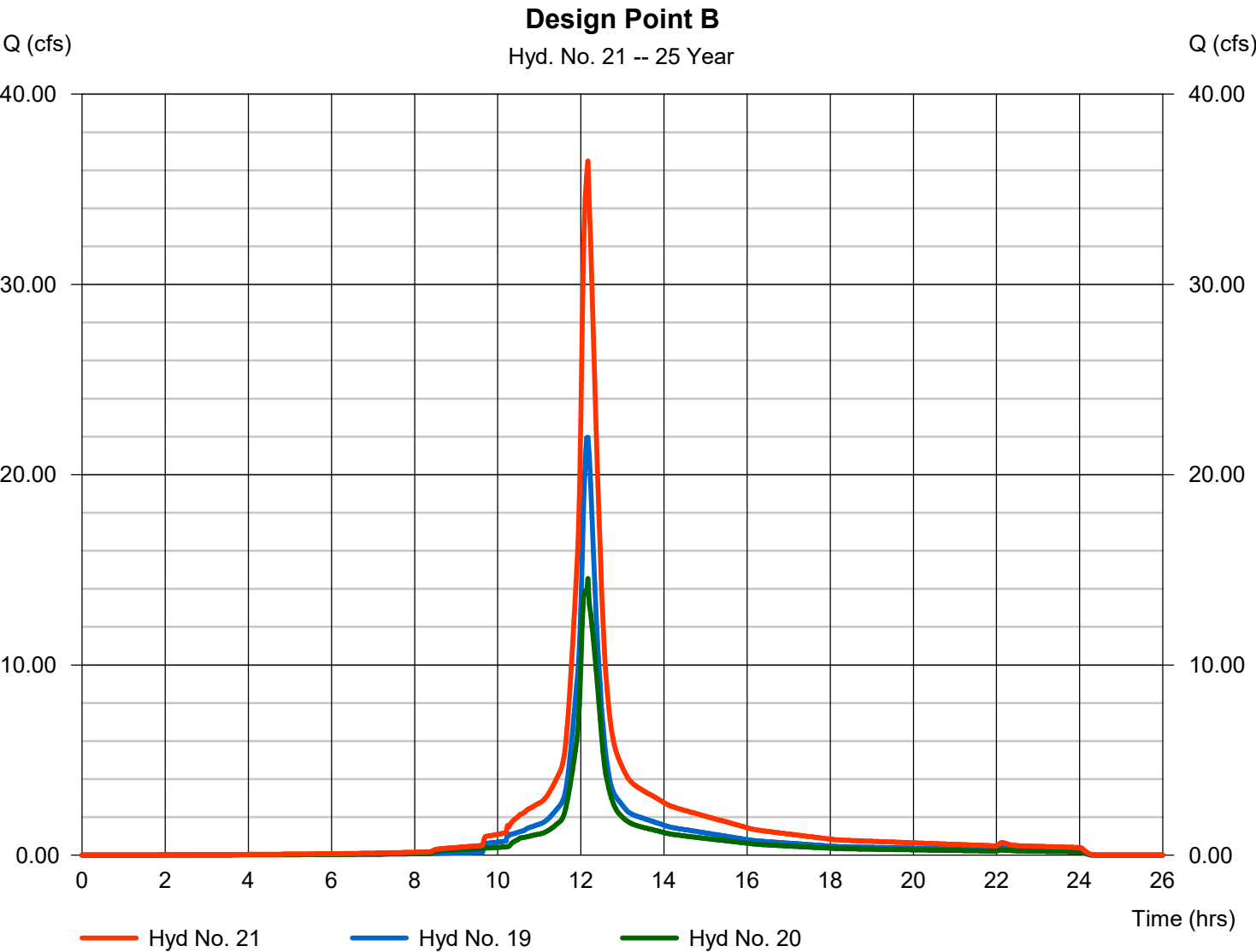


Hydrograph Report

Hyd. No. 21

Design Point B

Hydrograph type	= Combine	Peak discharge	= 36.49 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 147,095 cuft
Inflow hyds.	= 19, 20	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	5.724	2	732	23,526	-----	-----	-----	EX WS-01
2	SCS Runoff	7.893	2	730	32,844	-----	-----	-----	EX WS-02A
3	SCS Runoff	0.895	2	728	3,454	-----	-----	-----	EX WS-02B
4	SCS Runoff	3.785	2	726	14,087	-----	-----	-----	EX WS-02C
5	SCS Runoff	13.06	2	728	53,326	-----	-----	-----	EX WS-02D
6	SCS Runoff	1.015	2	724	3,444	-----	-----	-----	EX WS-02E
7	SCS Runoff	6.897	2	724	22,653	-----	-----	-----	EX WS-02F
8	SCS Runoff	1.793	2	726	6,613	-----	-----	-----	EX WS-02G
9	SCS Runoff	2.913	2	732	13,399	-----	-----	-----	EX WS-02H
10	SCS Runoff	6.727	2	732	31,344	-----	-----	-----	EX WS-02I
11	SCS Runoff	2.404	2	724	8,370	-----	-----	-----	EX WS-02J
12	SCS Runoff	0.408	2	730	1,611	-----	-----	-----	EX WS-03
13	Reservoir	7.874	2	730	30,622	2	143.65	1,544	36 INCH PIPE (#1)
14	Reservoir	12.78	2	730	48,298	5	139.20	4,033	TWIN 36IN PIPES (#2)
15	Reservoir	1.042	2	724	2,790	6	139.65	503	24 INCH PIPE
16	Reservoir	6.741	2	724	21,127	7	139.53	1,370	36 INCH PIPE (#2)
17	Reservoir	2.899	2	732	9,505	9	137.50	3,742	36 INCH PIPE (#3)
18	Reservoir	6.701	2	732	28,092	10	135.75	2,500	TWO 36 INCH PIPES
19	Combine	25.35	2	730	99,252	3, 4, 13, 14, 15,	-----	-----	<no description>
20	Combine	18.18	2	724	73,706	8, 11, 16, 17, 18,	-----	-----	<no description>
21	Combine	42.76	2	728	172,958	19, 20	-----	-----	Design Point B
Existing-Hydraflow.gpw					Return Period: 50 Year			Monday, 12 / 4 / 2023	

Hydrograph Report

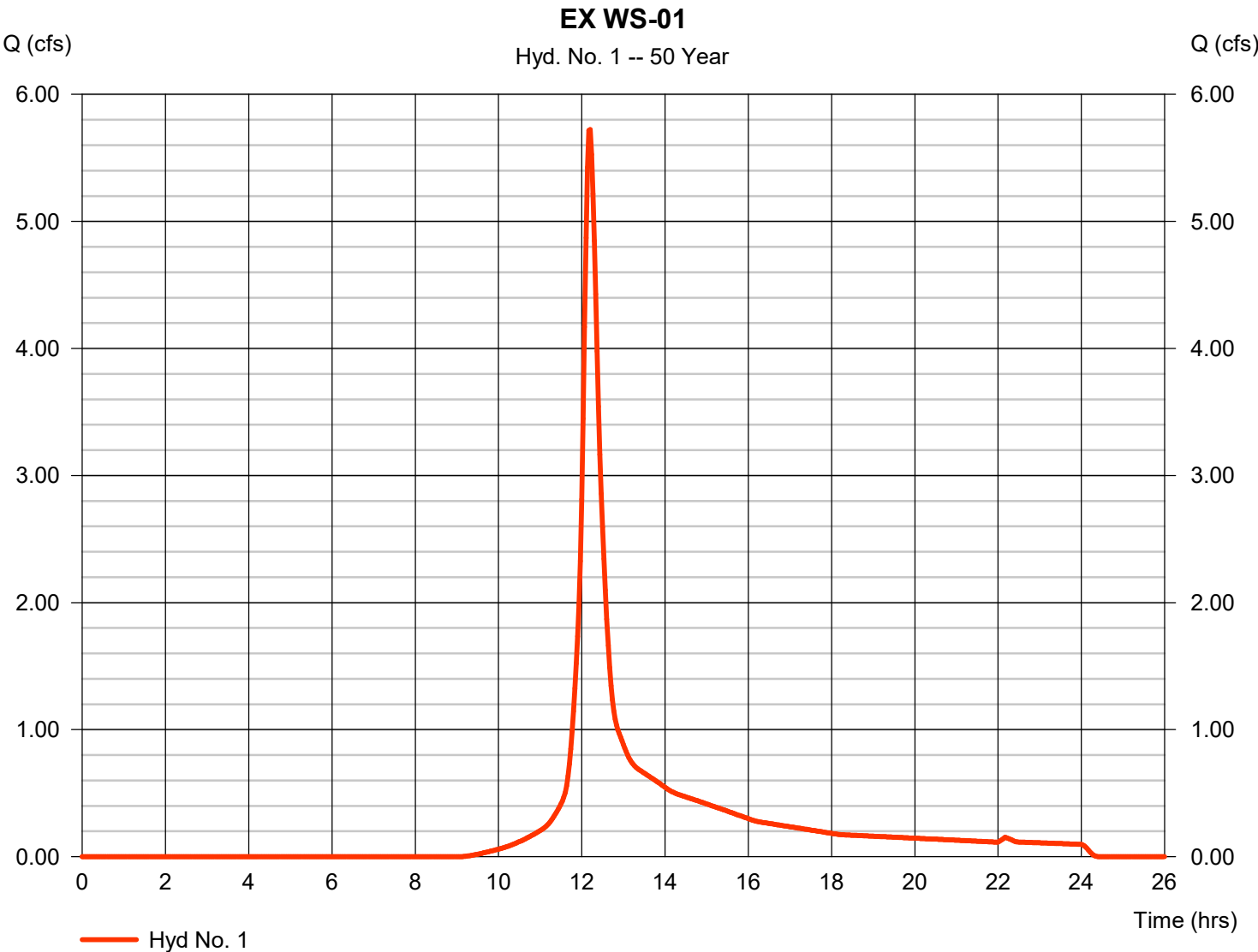
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 1

EX WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 5.724 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 23,526 cuft
Drainage area	= 1.942 ac	Curve number	= 65
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.10 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

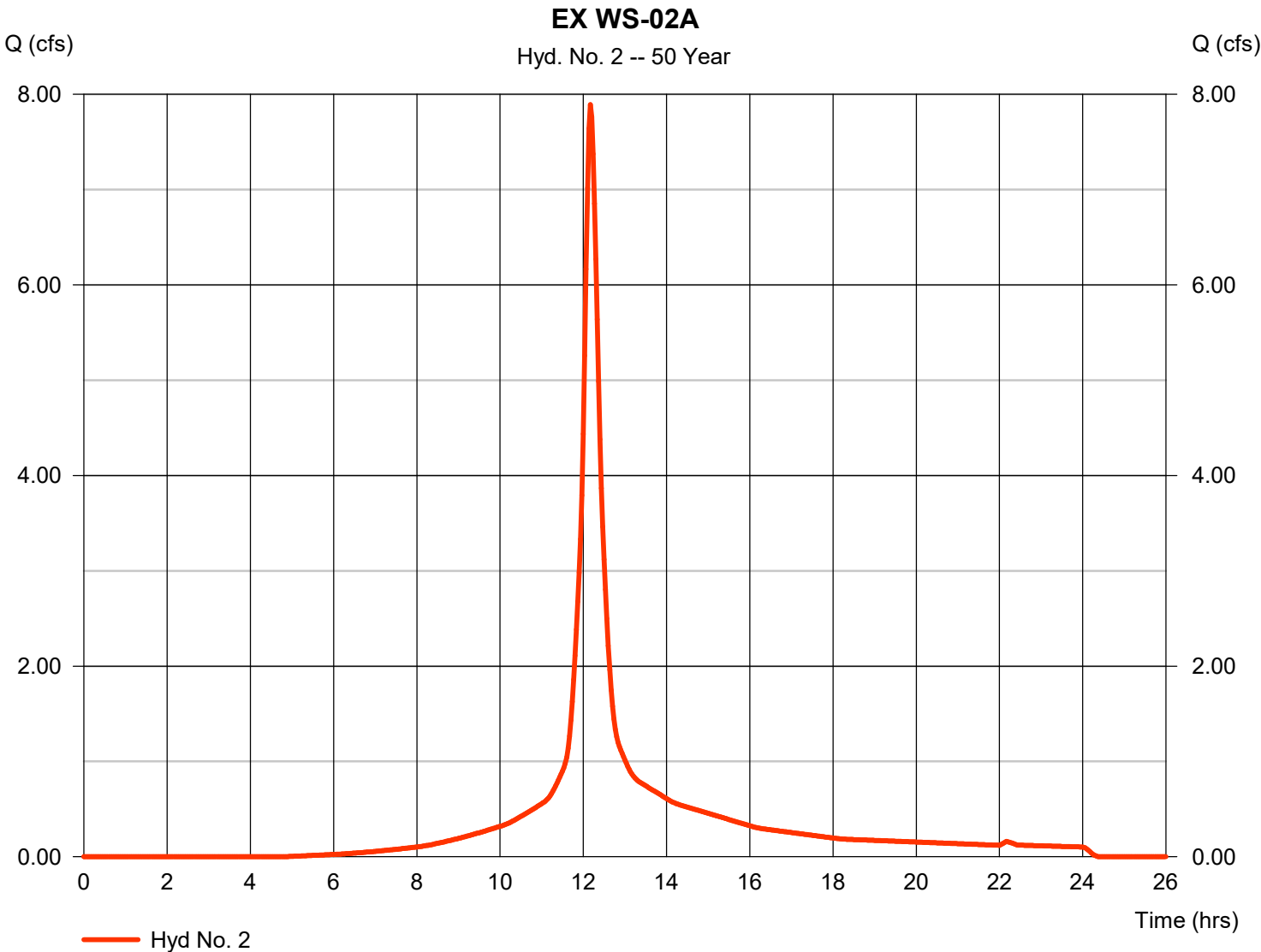
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 2

EX WS-02A

Hydrograph type	= SCS Runoff	Peak discharge	= 7.893 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 32,844 cuft
Drainage area	= 1.678 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.50 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

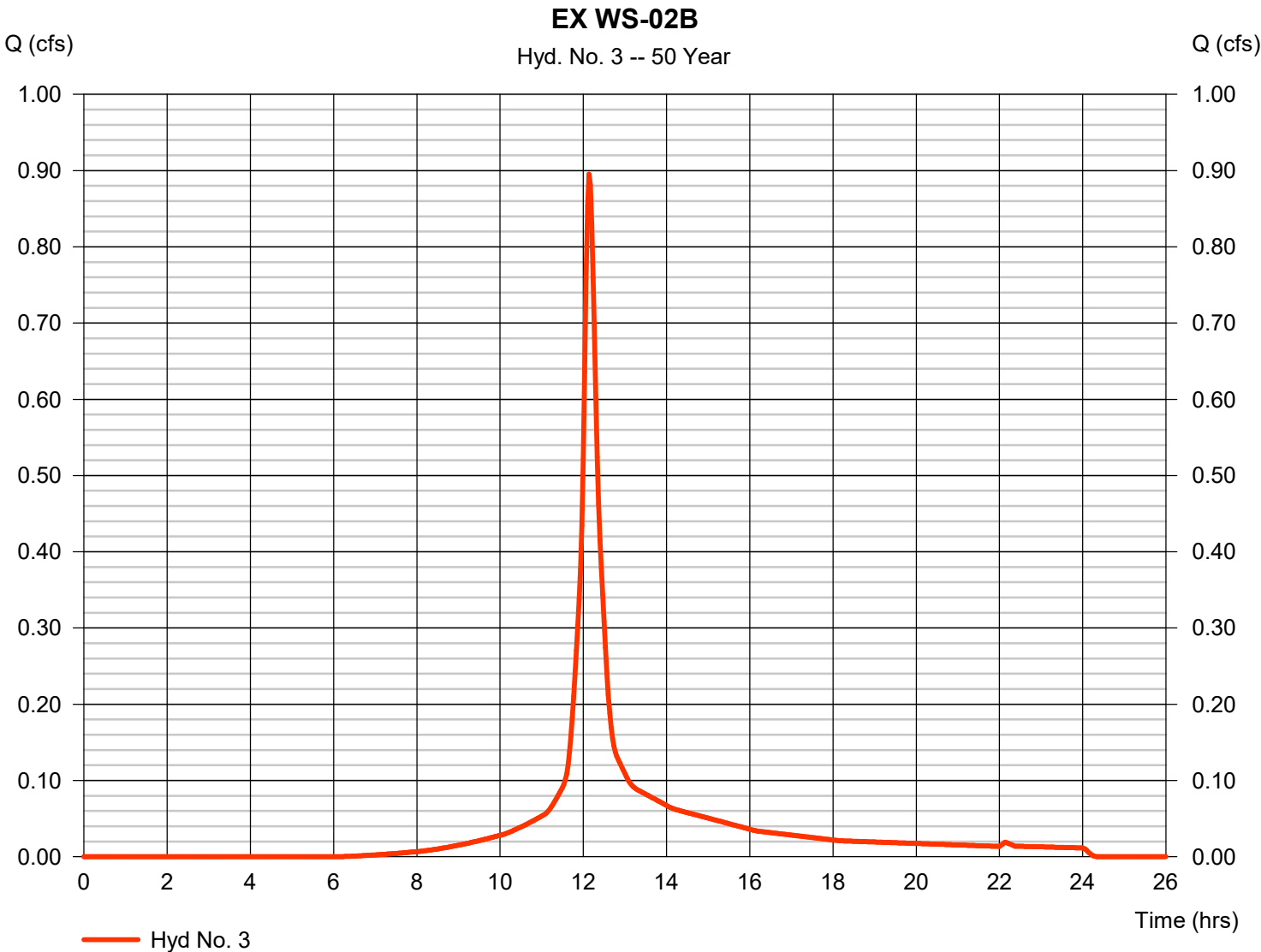
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 3

EX WS-02B

Hydrograph type	= SCS Runoff	Peak discharge	= 0.895 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 3,454 cuft
Drainage area	= 0.186 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 11.00 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

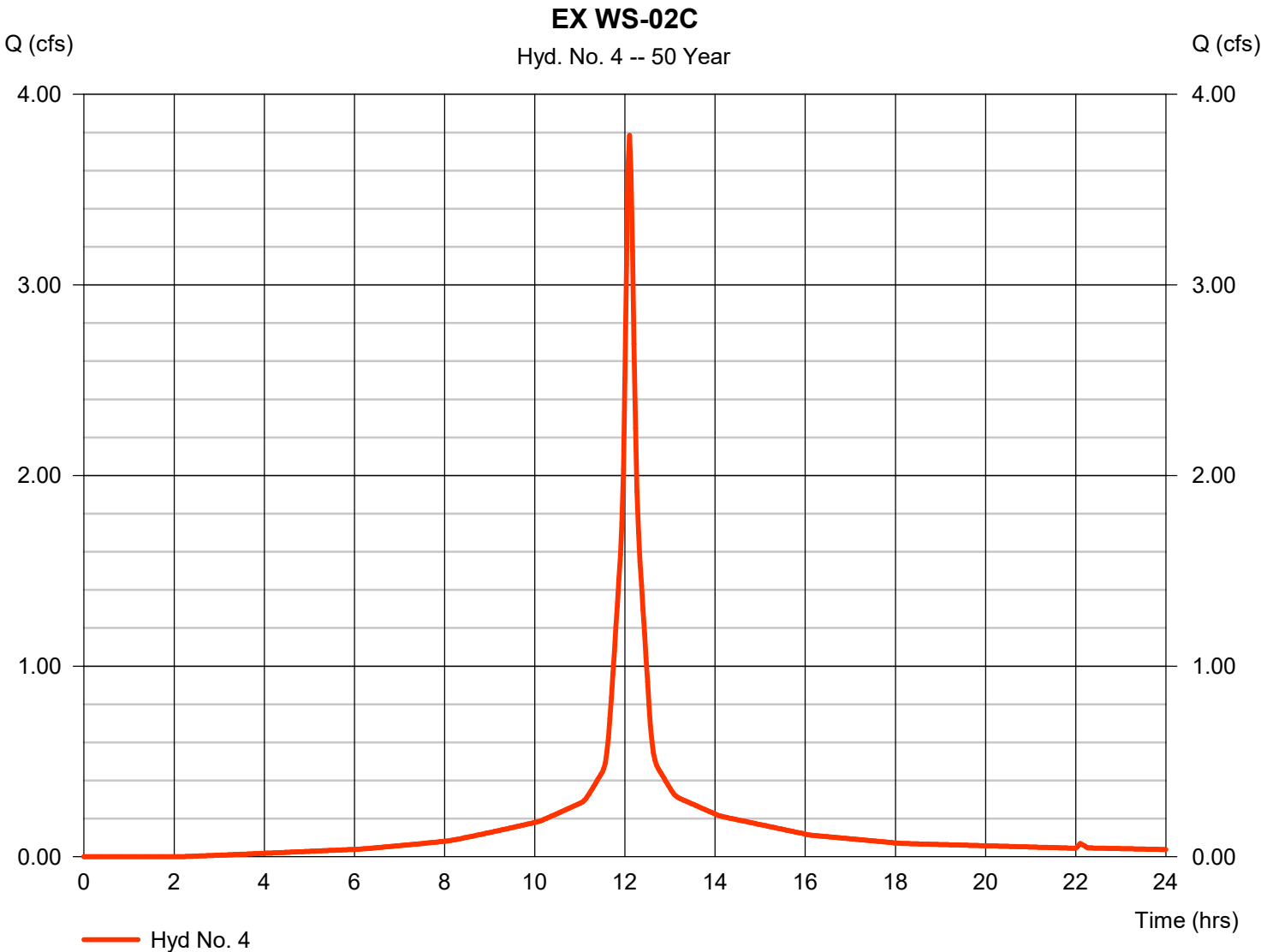
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 4

EX WS-02C

Hydrograph type	= SCS Runoff	Peak discharge	= 3.785 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 14,087 cuft
Drainage area	= 0.590 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.40 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

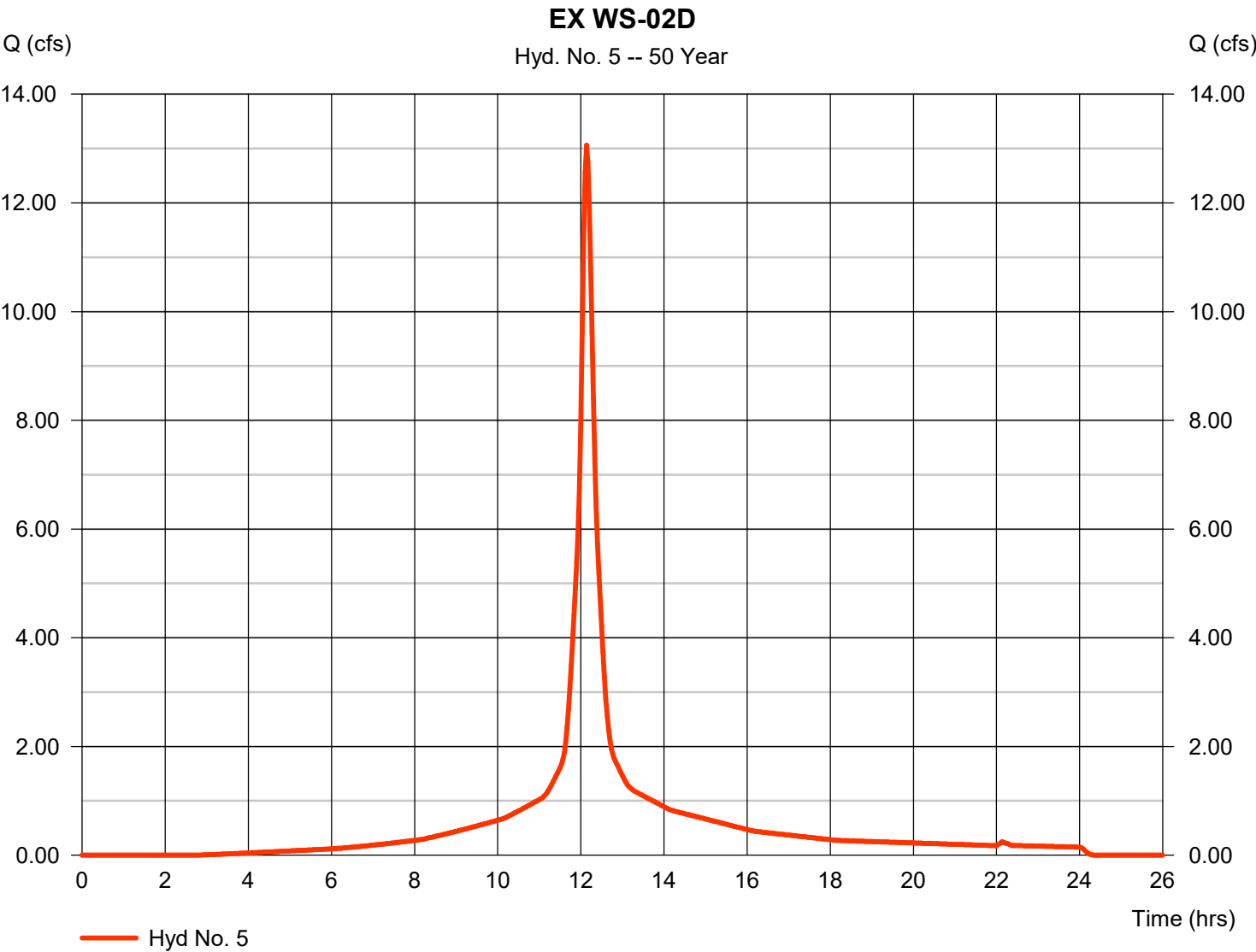
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 5

EX WS-02D

Hydrograph type	= SCS Runoff	Peak discharge	= 13.06 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 53,326 cuft
Drainage area	= 2.246 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 11.10 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

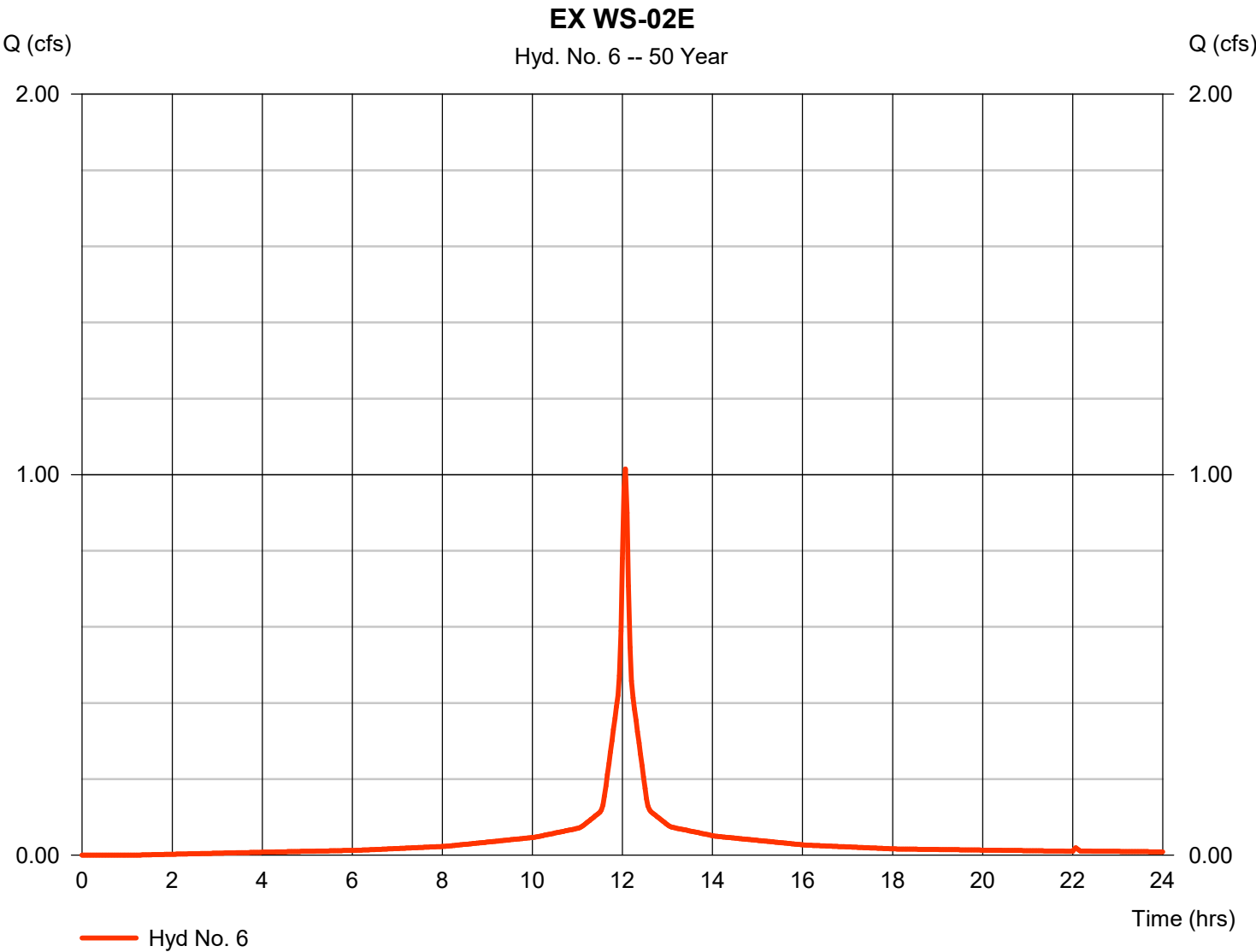
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 6

EX WS-02E

Hydrograph type	= SCS Runoff	Peak discharge	= 1.015 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 3,444 cuft
Drainage area	= 0.146 ac	Curve number	= 96
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

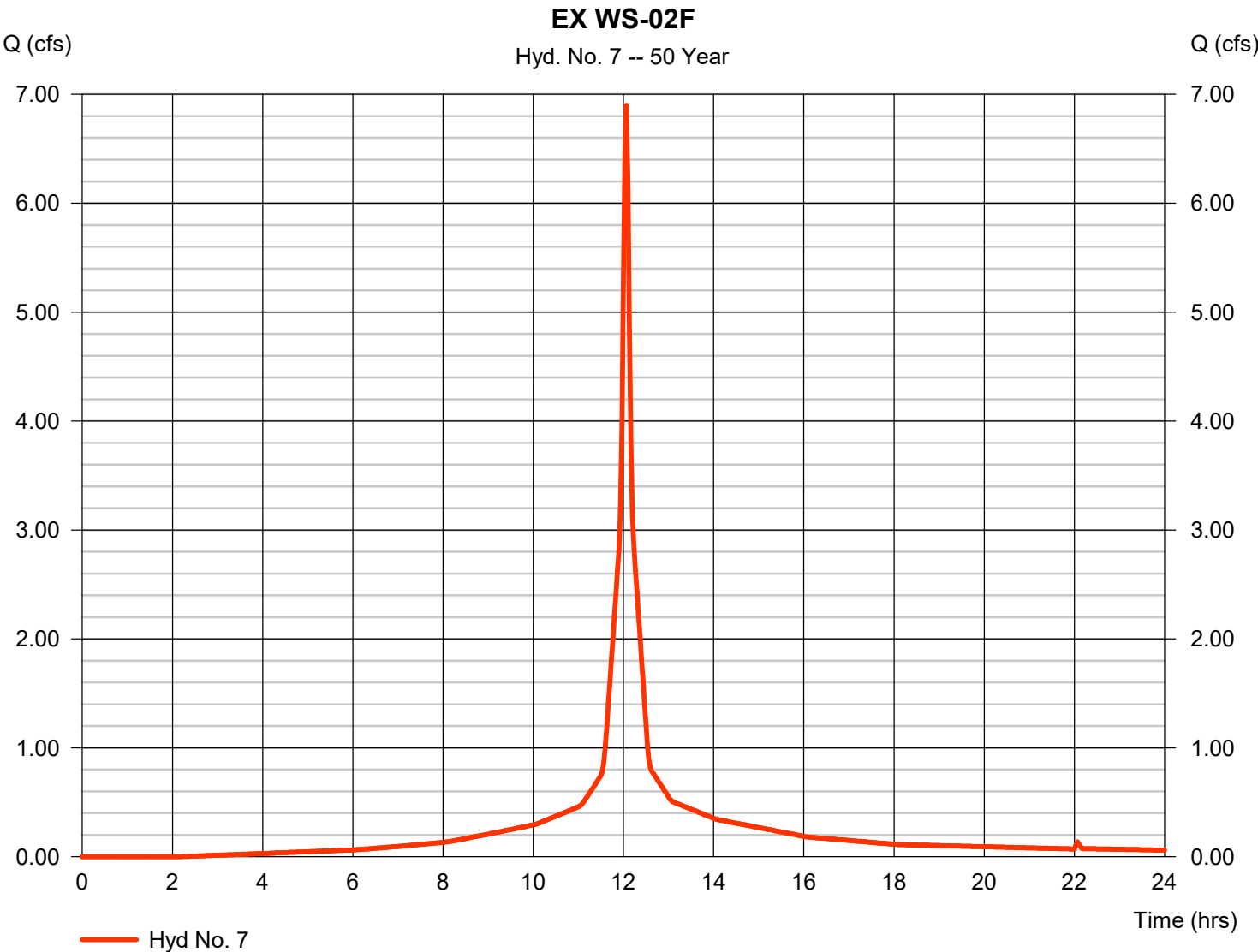
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 7

EX WS-02F

Hydrograph type	= SCS Runoff	Peak discharge	= 6.897 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 22,653 cuft
Drainage area	= 1.012 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.50 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

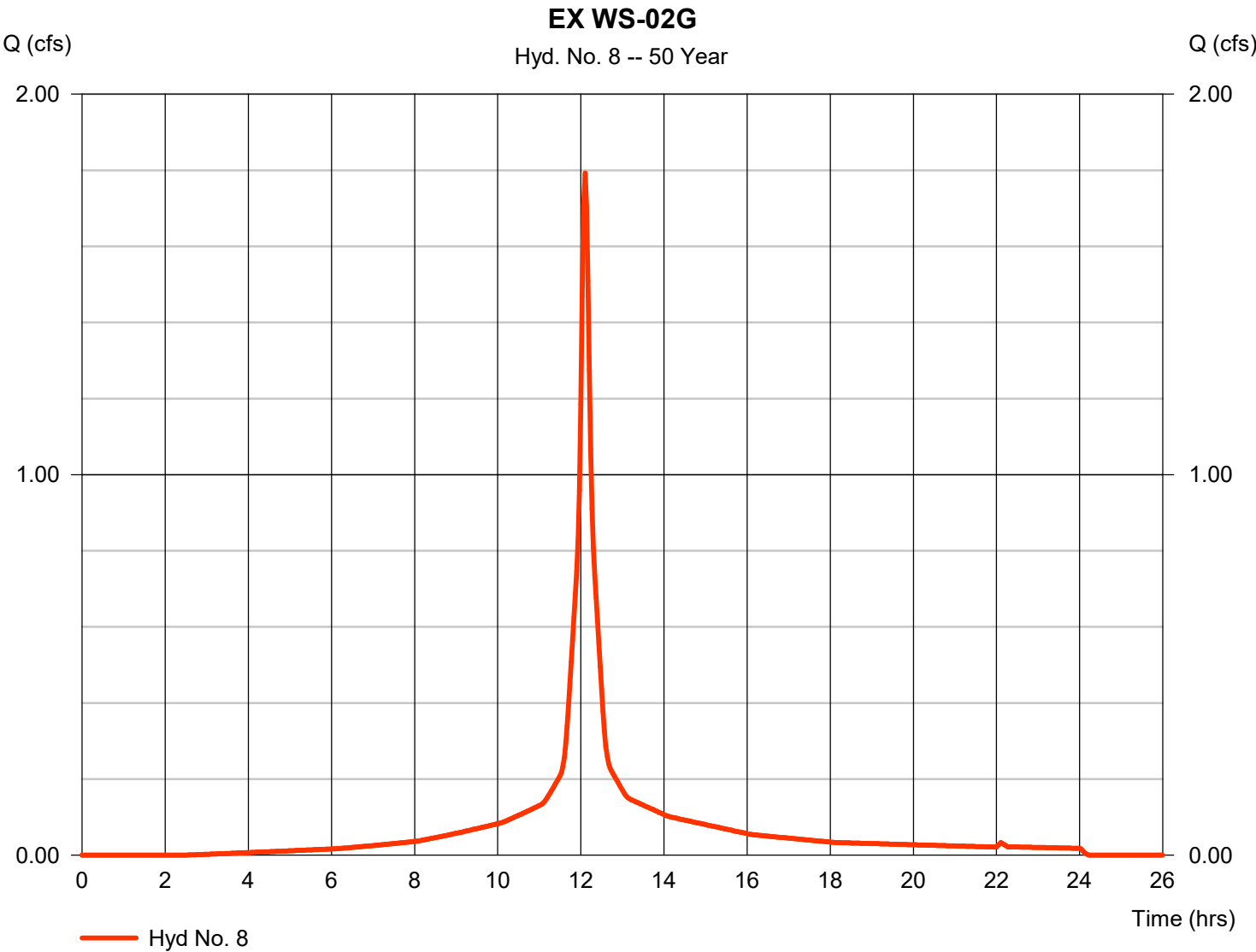


Hydrograph Report

Hyd. No. 8

EX WS-02G

Hydrograph type	= SCS Runoff	Peak discharge	= 1.793 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 6,613 cuft
Drainage area	= 0.282 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.90 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

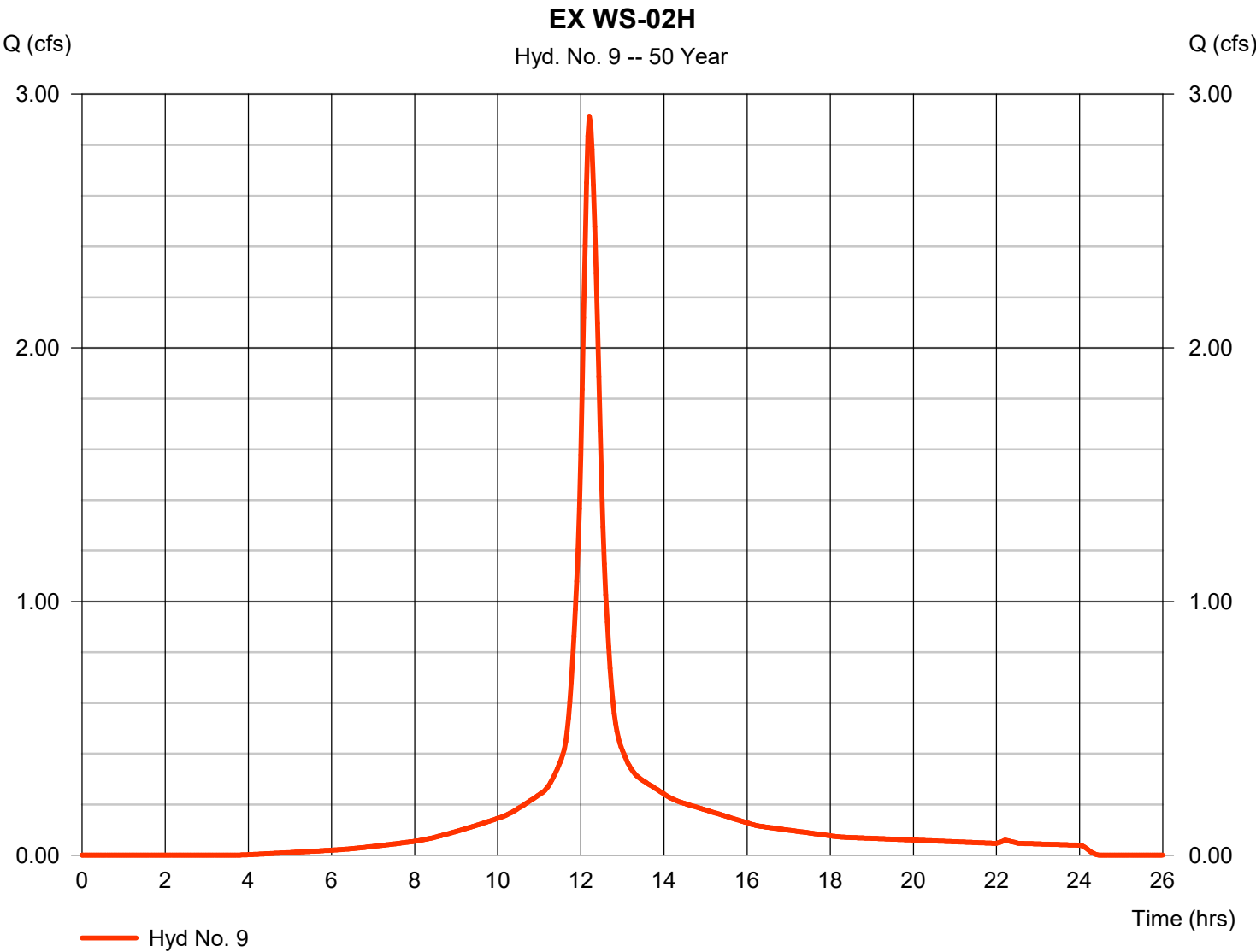


Hydrograph Report

Hyd. No. 9

EX WS-02H

Hydrograph type	= SCS Runoff	Peak discharge	= 2.913 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 13,399 cuft
Drainage area	= 0.616 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.30 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

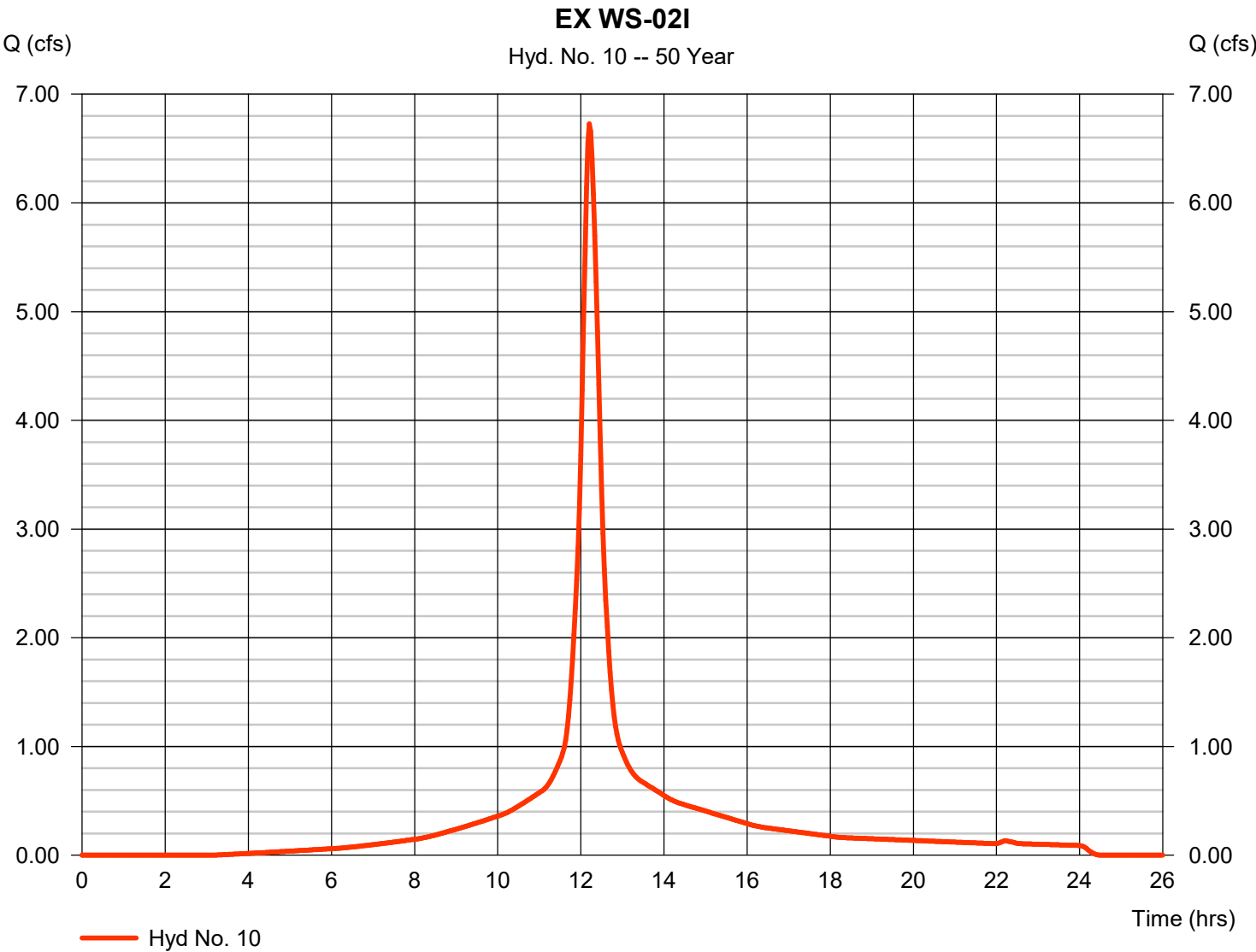
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 10

EX WS-02I

Hydrograph type	= SCS Runoff	Peak discharge	= 6.727 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 31,344 cuft
Drainage area	= 1.387 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.60 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

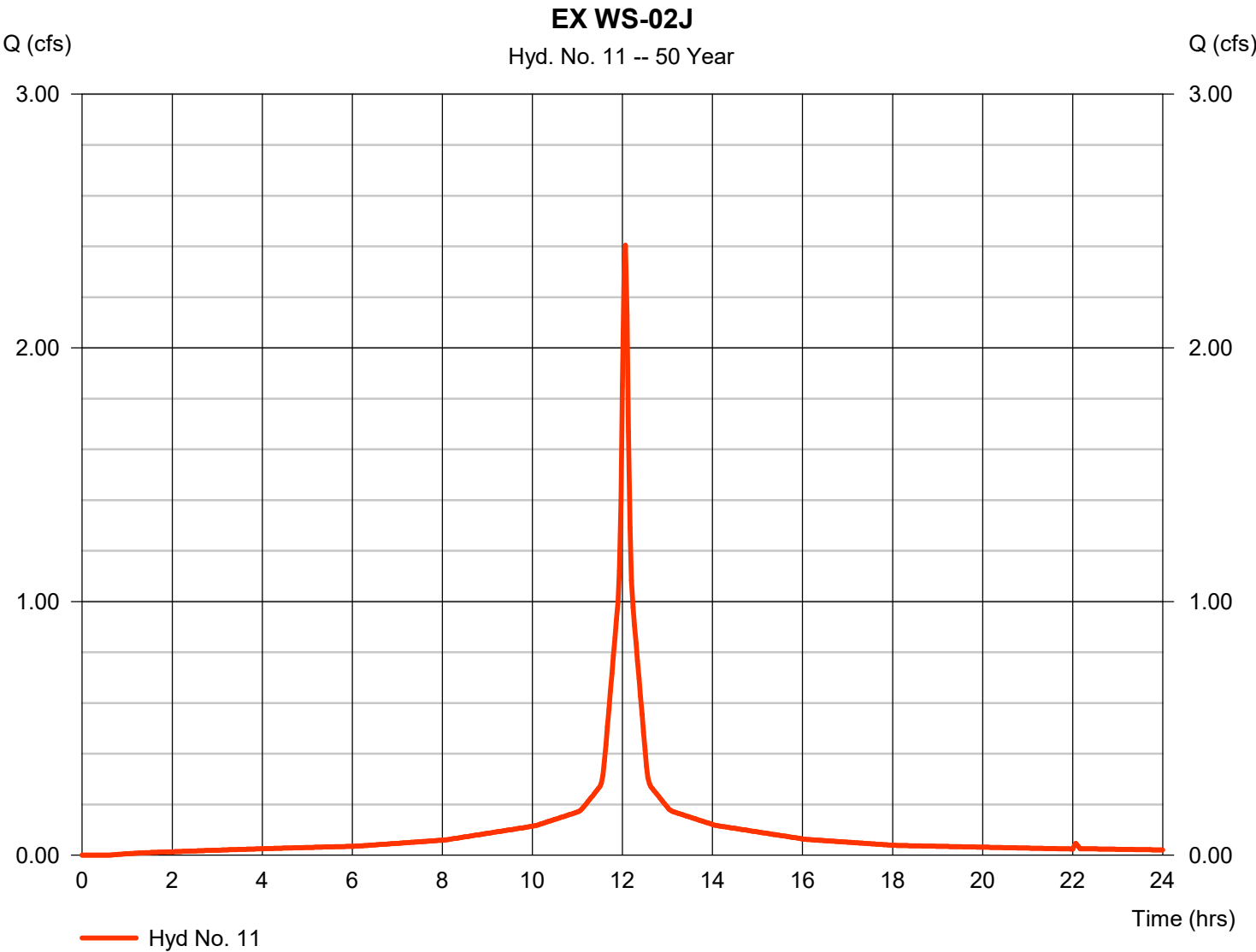


Hydrograph Report

Hyd. No. 11

EX WS-02J

Hydrograph type	= SCS Runoff	Peak discharge	= 2.404 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 8,370 cuft
Drainage area	= 0.343 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

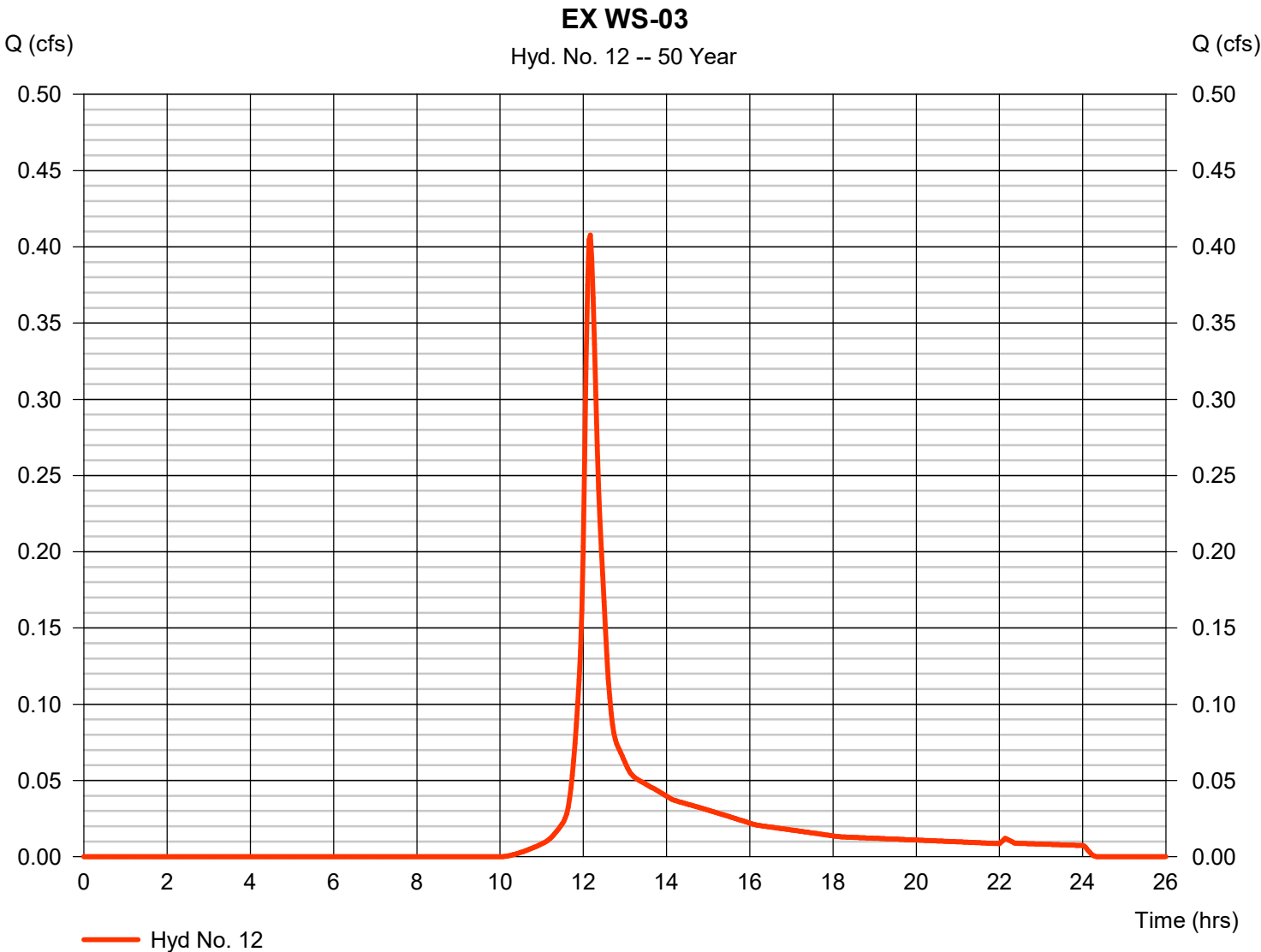
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 12

EX WS-03

Hydrograph type	= SCS Runoff	Peak discharge	= 0.408 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 1,611 cuft
Drainage area	= 0.154 ac	Curve number	= 59
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.50 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

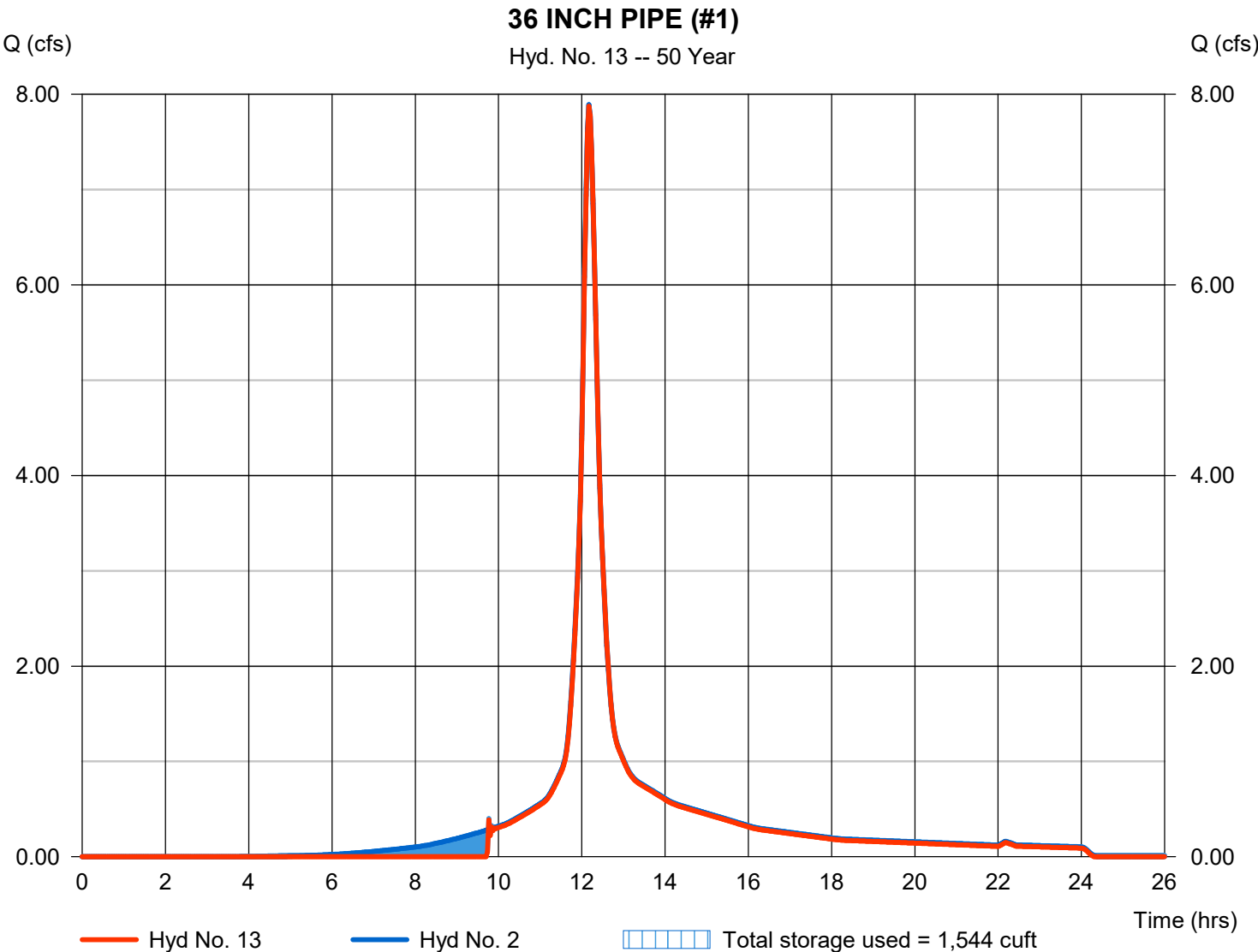
Monday, 12 / 4 / 2023

Hyd. No. 13

36 INCH PIPE (#1)

Hydrograph type	= Reservoir	Peak discharge	= 7.874 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 30,622 cuft
Inflow hyd. No.	= 2 - EX WS-02A	Max. Elevation	= 143.65 ft
Reservoir name	= 36IN - 1	Max. Storage	= 1,544 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

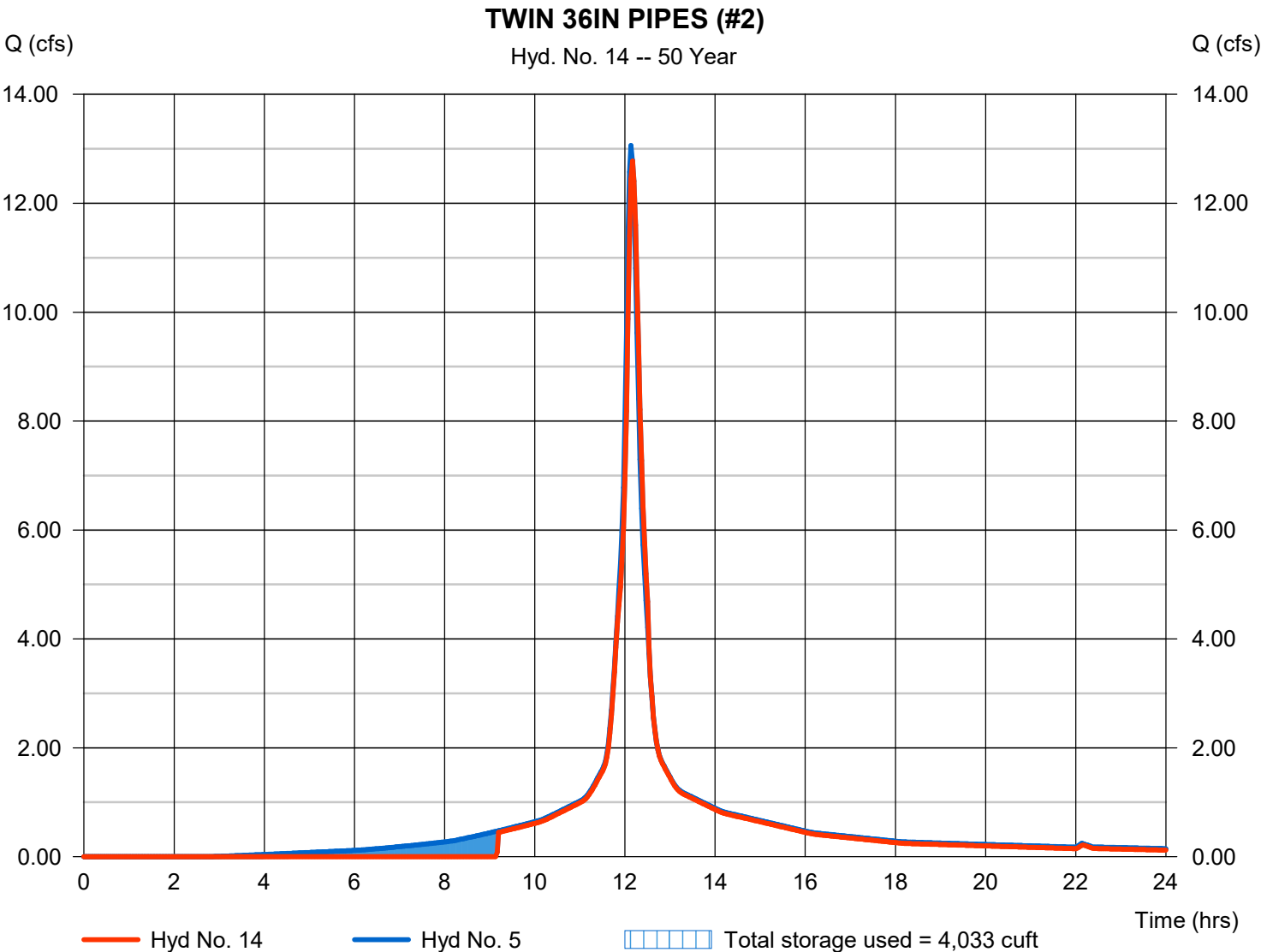
Monday, 12 / 4 / 2023

Hyd. No. 14

TWIN 36IN PIPES (#2)

Hydrograph type	= Reservoir	Peak discharge	= 12.78 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 48,298 cuft
Inflow hyd. No.	= 5 - EX WS-02D	Max. Elevation	= 139.20 ft
Reservoir name	= Northern Twin 36IN	Max. Storage	= 4,033 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



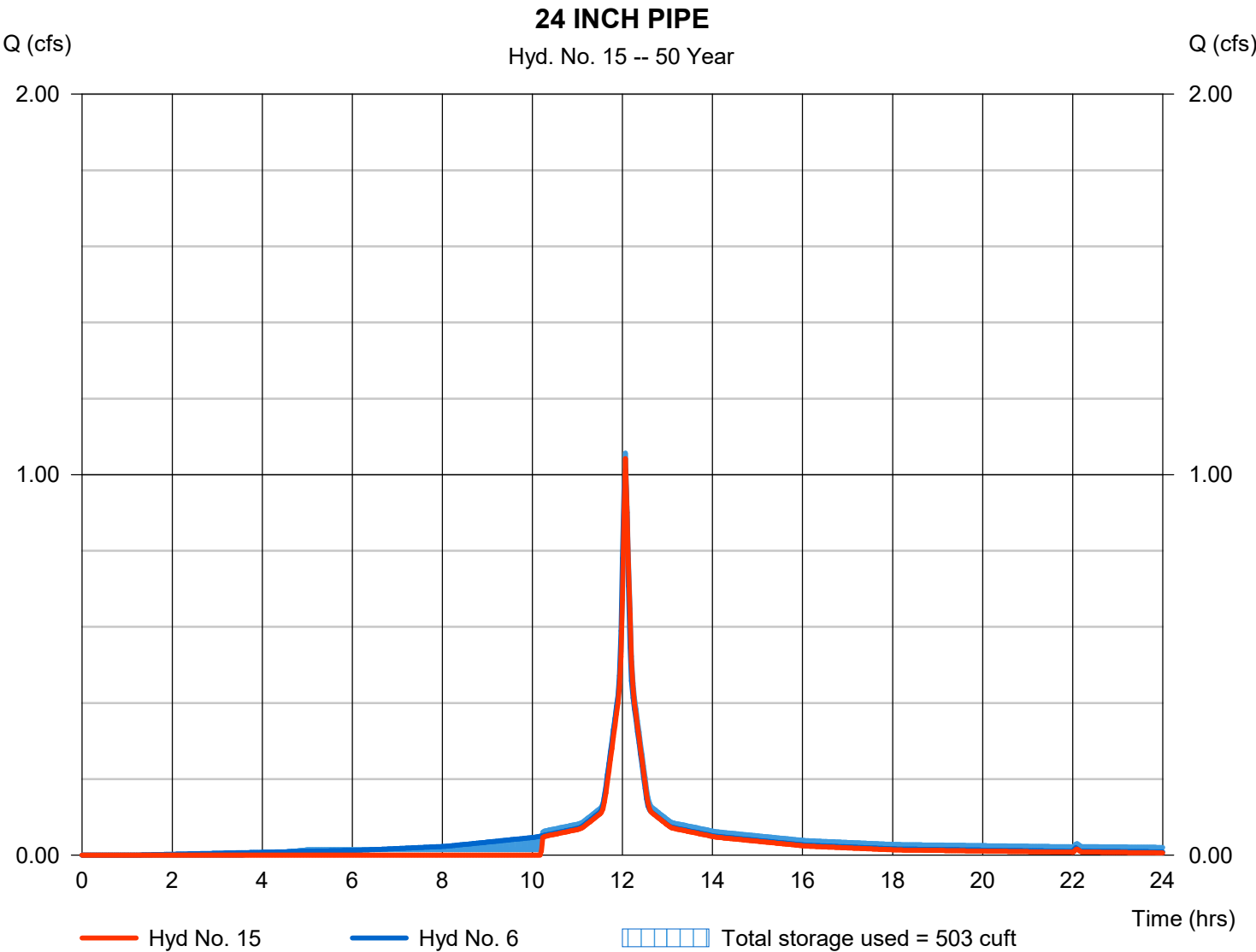
Hydrograph Report

Hyd. No. 15

24 INCH PIPE

Hydrograph type	= Reservoir	Peak discharge	= 1.042 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 2,790 cuft
Inflow hyd. No.	= 6 - EX WS-02E	Max. Elevation	= 139.65 ft
Reservoir name	= 24IN	Max. Storage	= 503 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

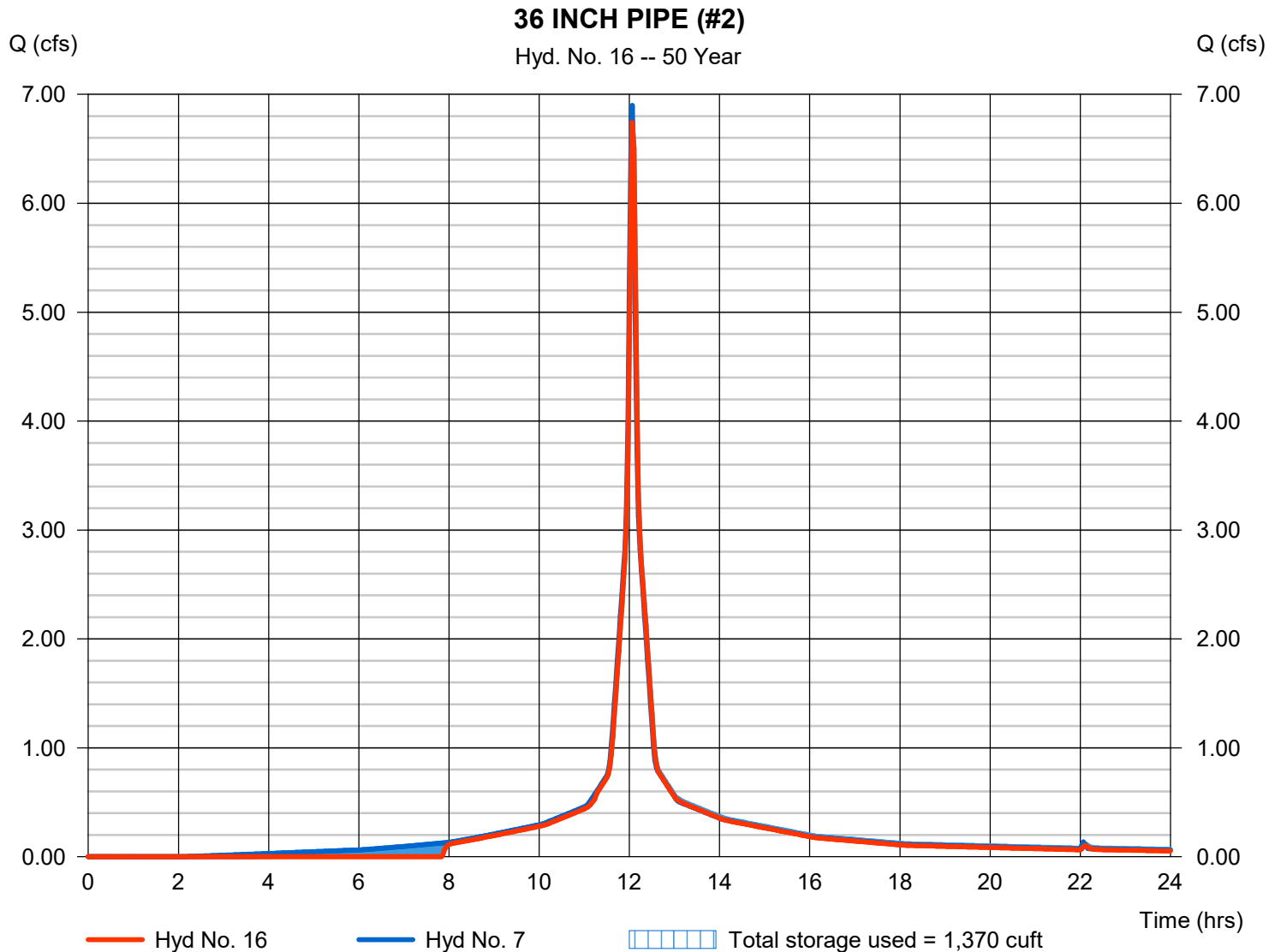
Hyd. No. 16

36 INCH PIPE (#2)

Hydrograph type = Reservoir
 Storm frequency = 50 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - EX WS-02F
 Reservoir name = 36in - 2

Peak discharge = 6.741 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 21,127 cuft
 Max. Elevation = 139.53 ft
 Max. Storage = 1,370 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

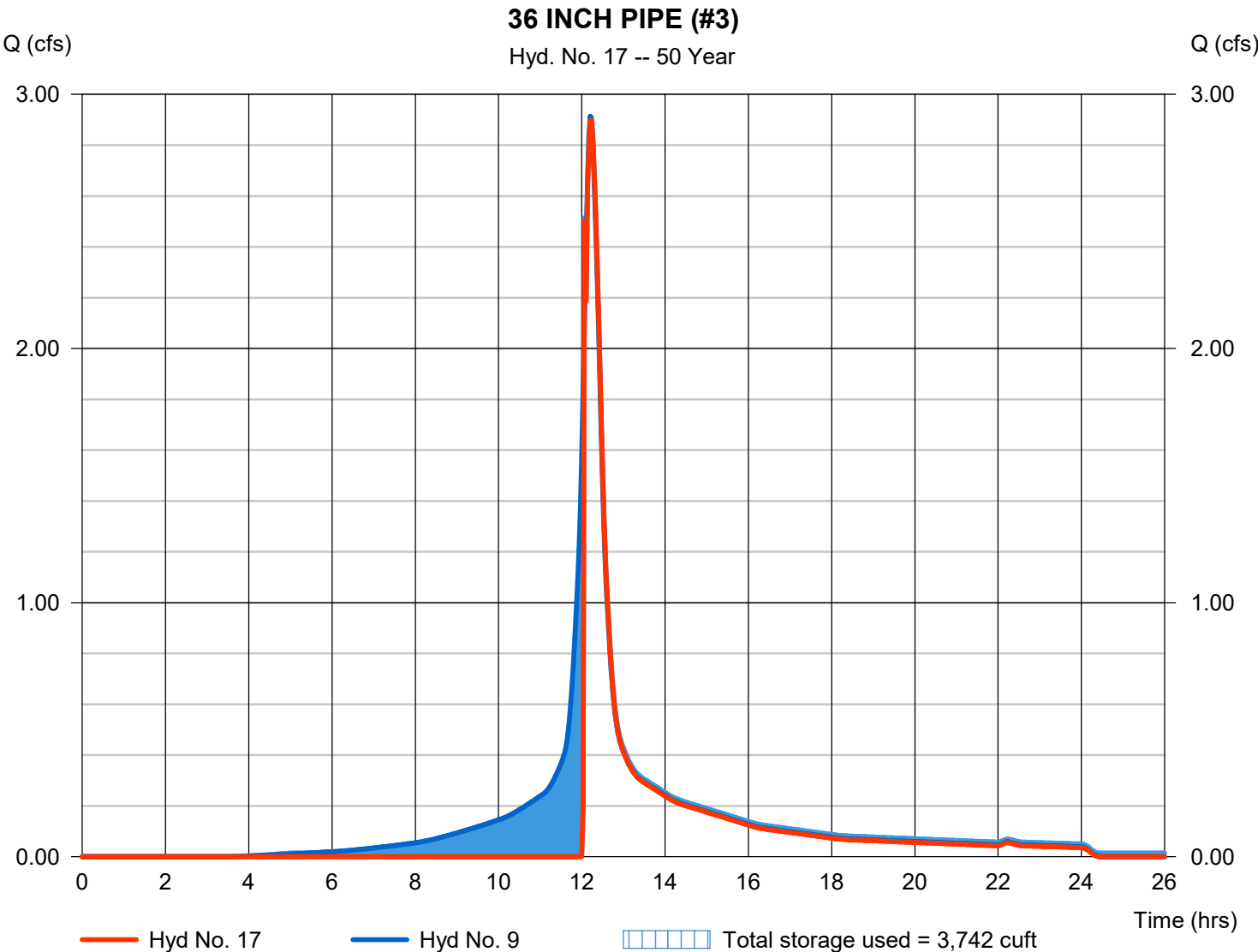
Monday, 12 / 4 / 2023

Hyd. No. 17

36 INCH PIPE (#3)

Hydrograph type	= Reservoir	Peak discharge	= 2.899 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 9,505 cuft
Inflow hyd. No.	= 9 - EX WS-02H	Max. Elevation	= 137.50 ft
Reservoir name	= 36in - 3	Max. Storage	= 3,742 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

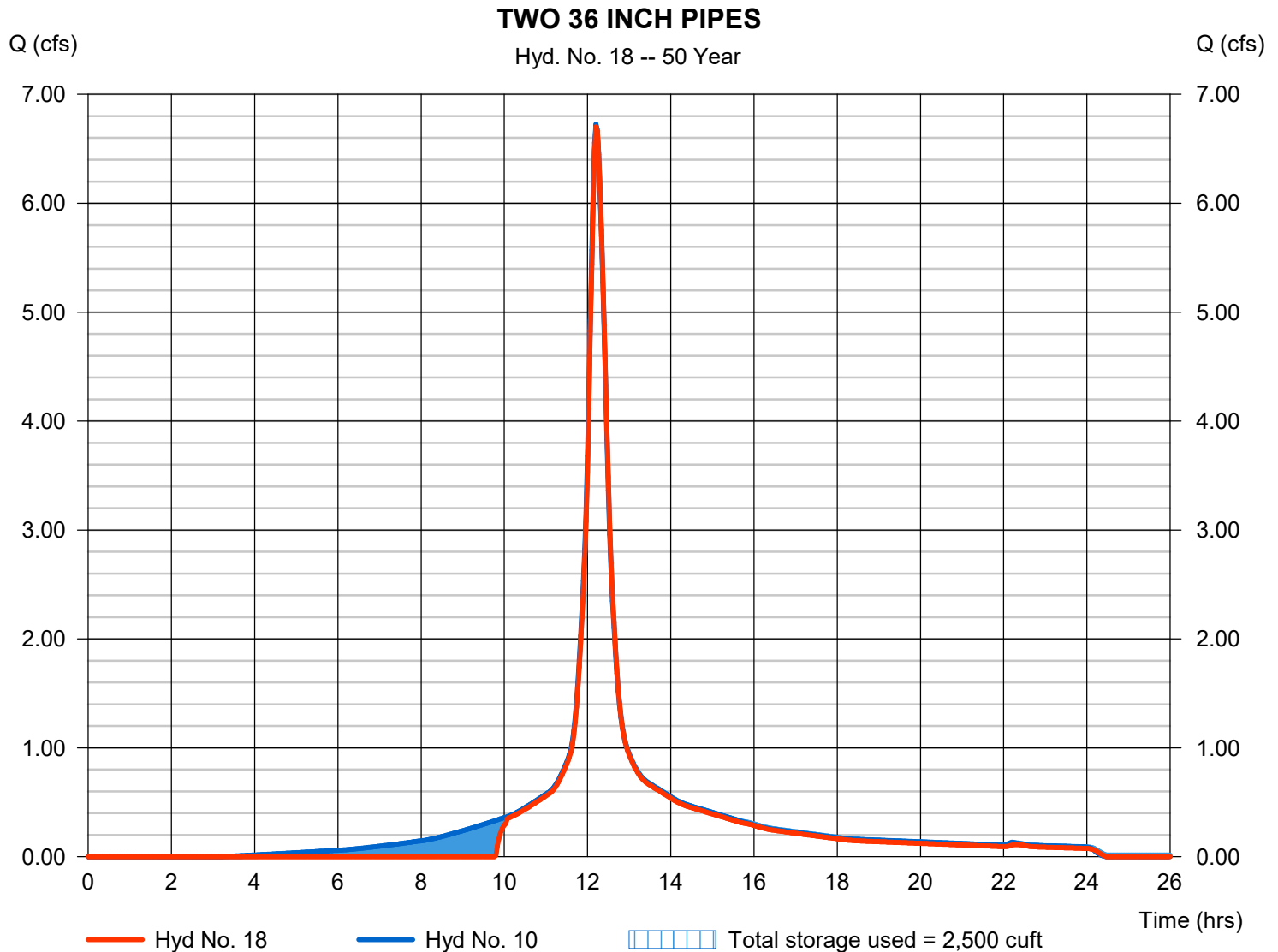
Monday, 12 / 4 / 2023

Hyd. No. 18

TWO 36 INCH PIPES

Hydrograph type	= Reservoir	Peak discharge	= 6.701 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 28,092 cuft
Inflow hyd. No.	= 10 - EX WS-02I	Max. Elevation	= 135.75 ft
Reservoir name	= TWIN 36IN	Max. Storage	= 2,500 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

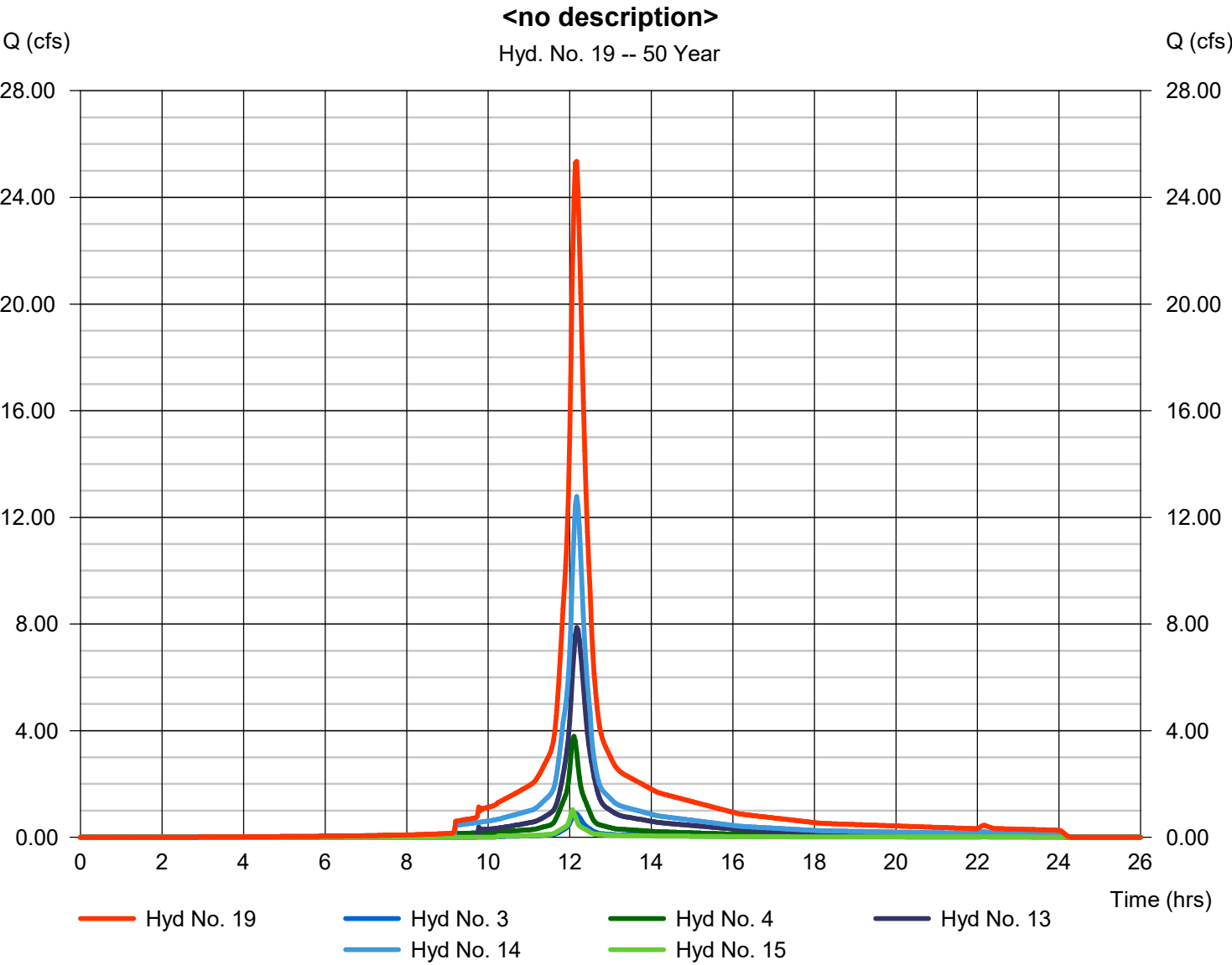


Hydrograph Report

Hyd. No. 19

<no description>

Hydrograph type	= Combine	Peak discharge	= 25.35 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 99,252 cuft
Inflow hyds.	= 3, 4, 13, 14, 15	Contrib. drain. area	= 0.776 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

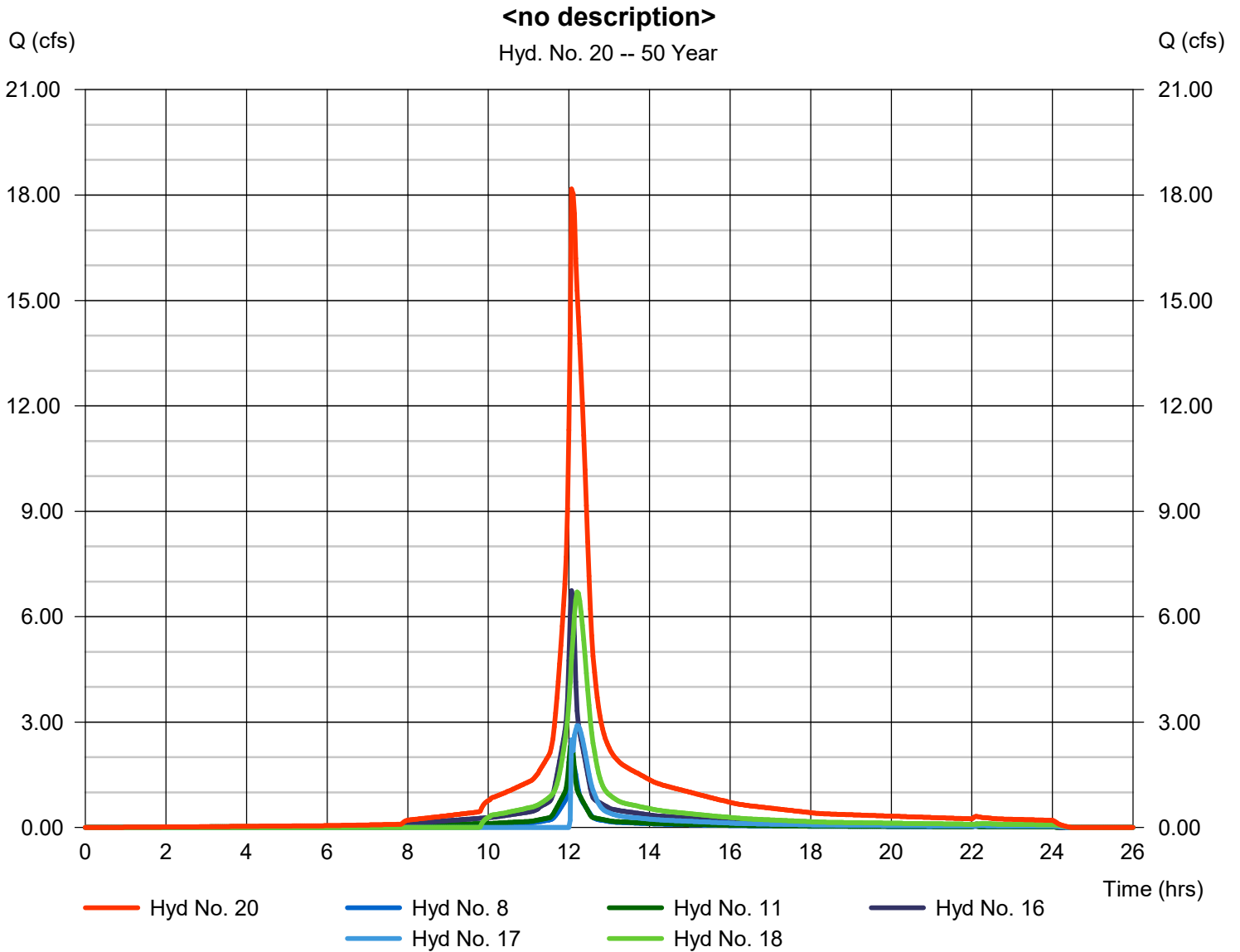
Monday, 12 / 4 / 2023

Hyd. No. 20

<no description>

Hydrograph type = Combine
 Storm frequency = 50 yrs
 Time interval = 2 min
 Inflow hyds. = 8, 11, 16, 17, 18

Peak discharge = 18.18 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 73,706 cuft
 Contrib. drain. area = 0.625 ac

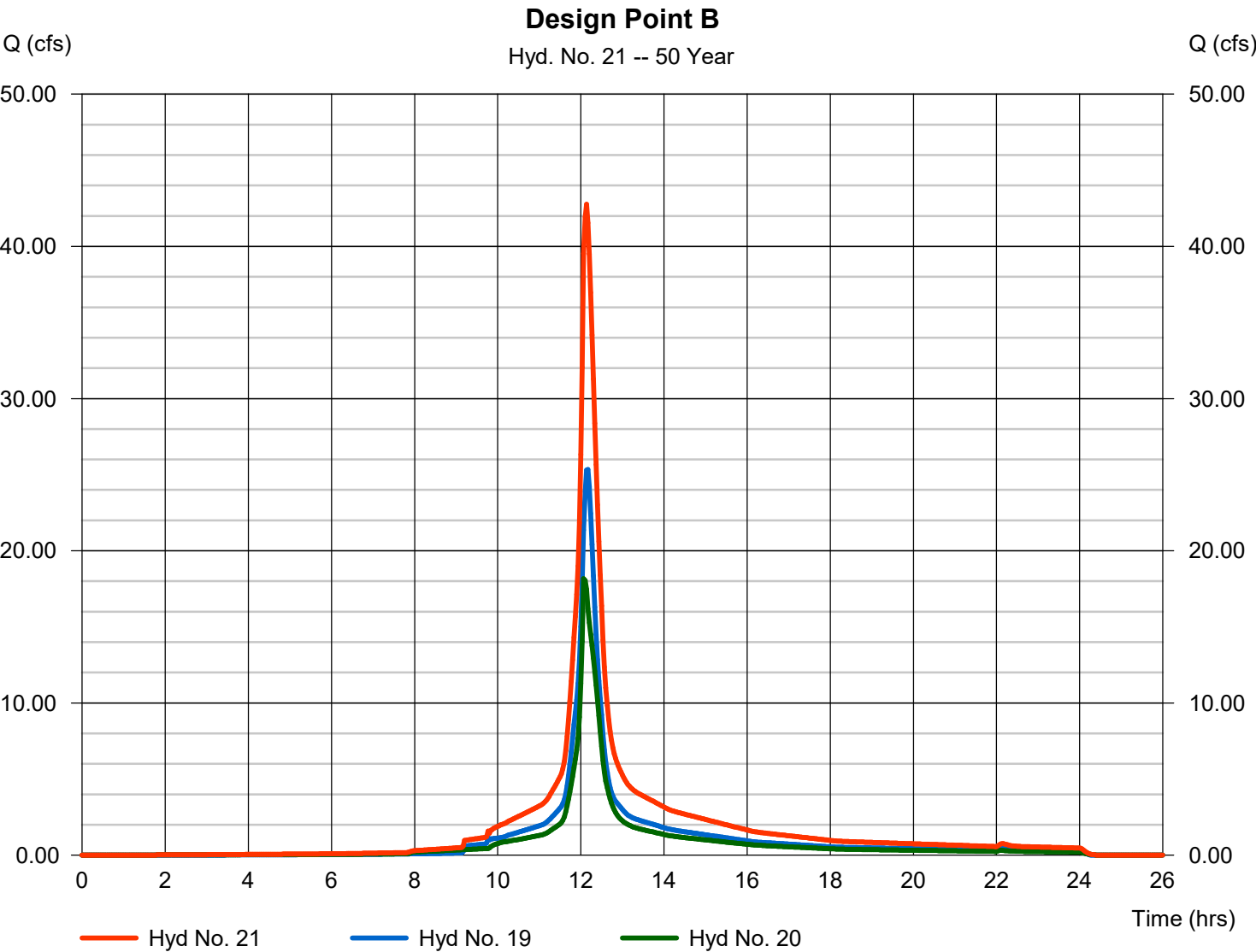


Hydrograph Report

Hyd. No. 21

Design Point B

Hydrograph type	= Combine	Peak discharge	= 42.76 cfs
Storm frequency	= 50 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 172,958 cuft
Inflow hyds.	= 19, 20	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

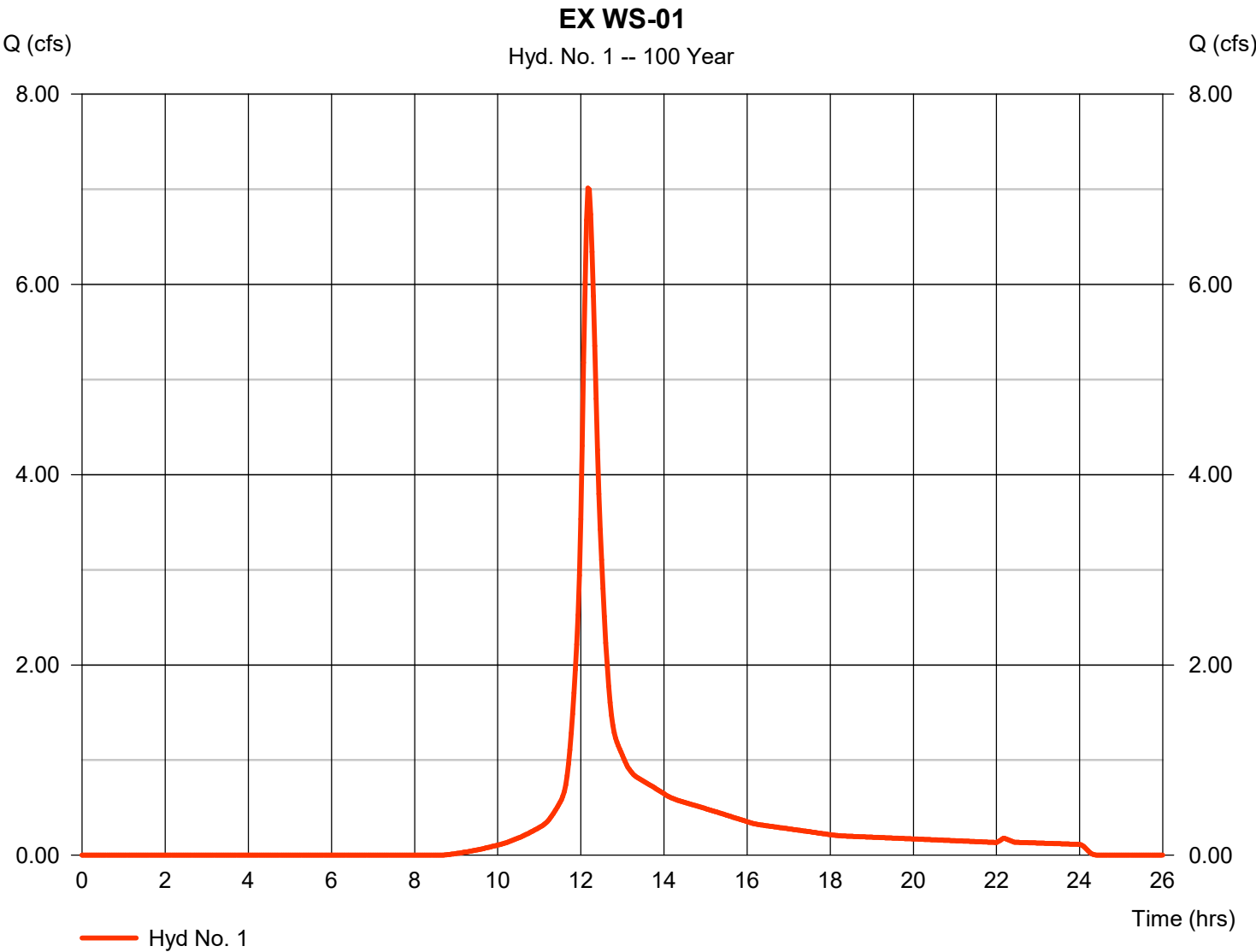
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	7.011	2	730	28,668	-----	-----	-----	EX WS-01
2	SCS Runoff	9.103	2	730	38,140	-----	-----	-----	EX WS-02A
3	SCS Runoff	1.046	2	728	4,056	-----	-----	-----	EX WS-02B
4	SCS Runoff	4.285	2	726	16,063	-----	-----	-----	EX WS-02C
5	SCS Runoff	14.84	2	728	61,043	-----	-----	-----	EX WS-02D
6	SCS Runoff	1.145	2	724	3,905	-----	-----	-----	EX WS-02E
7	SCS Runoff	7.807	2	724	25,830	-----	-----	-----	EX WS-02F
8	SCS Runoff	2.033	2	726	7,555	-----	-----	-----	EX WS-02G
9	SCS Runoff	3.330	2	732	15,431	-----	-----	-----	EX WS-02H
10	SCS Runoff	7.659	2	732	35,951	-----	-----	-----	EX WS-02I
11	SCS Runoff	2.707	2	724	9,455	-----	-----	-----	EX WS-02J
12	SCS Runoff	0.513	2	730	2,003	-----	-----	-----	EX WS-03
13	Reservoir	8.866	2	732	35,896	2	143.74	1,590	36 INCH PIPE (#1)
14	Reservoir	14.56	2	730	55,977	5	139.24	4,189	TWIN 36IN PIPES (#2)
15	Reservoir	1.129	2	724	3,248	6	139.65	504	24 INCH PIPE
16	Reservoir	7.332	2	726	24,295	7	139.57	1,442	36 INCH PIPE (#2)
17	Reservoir	3.311	2	732	11,531	9	137.50	3,755	36 INCH PIPE (#3)
18	Reservoir	7.629	2	732	32,678	10	135.77	2,518	TWO 36 INCH PIPES
19	Combine	28.95	2	728	115,241	3, 4, 13, 14, 15,	-----	-----	<no description>
20	Combine	20.65	2	726	85,513	8, 11, 16, 17, 18,	-----	-----	<no description>
21	Combine	49.09	2	728	200,754	19, 20	-----	-----	Design Point B
Existing-Hydraflow.gpw					Return Period: 100 Year			Monday, 12 / 4 / 2023	

Hydrograph Report

Hyd. No. 1

EX WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 7.011 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 28,668 cuft
Drainage area	= 1.942 ac	Curve number	= 65
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.10 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

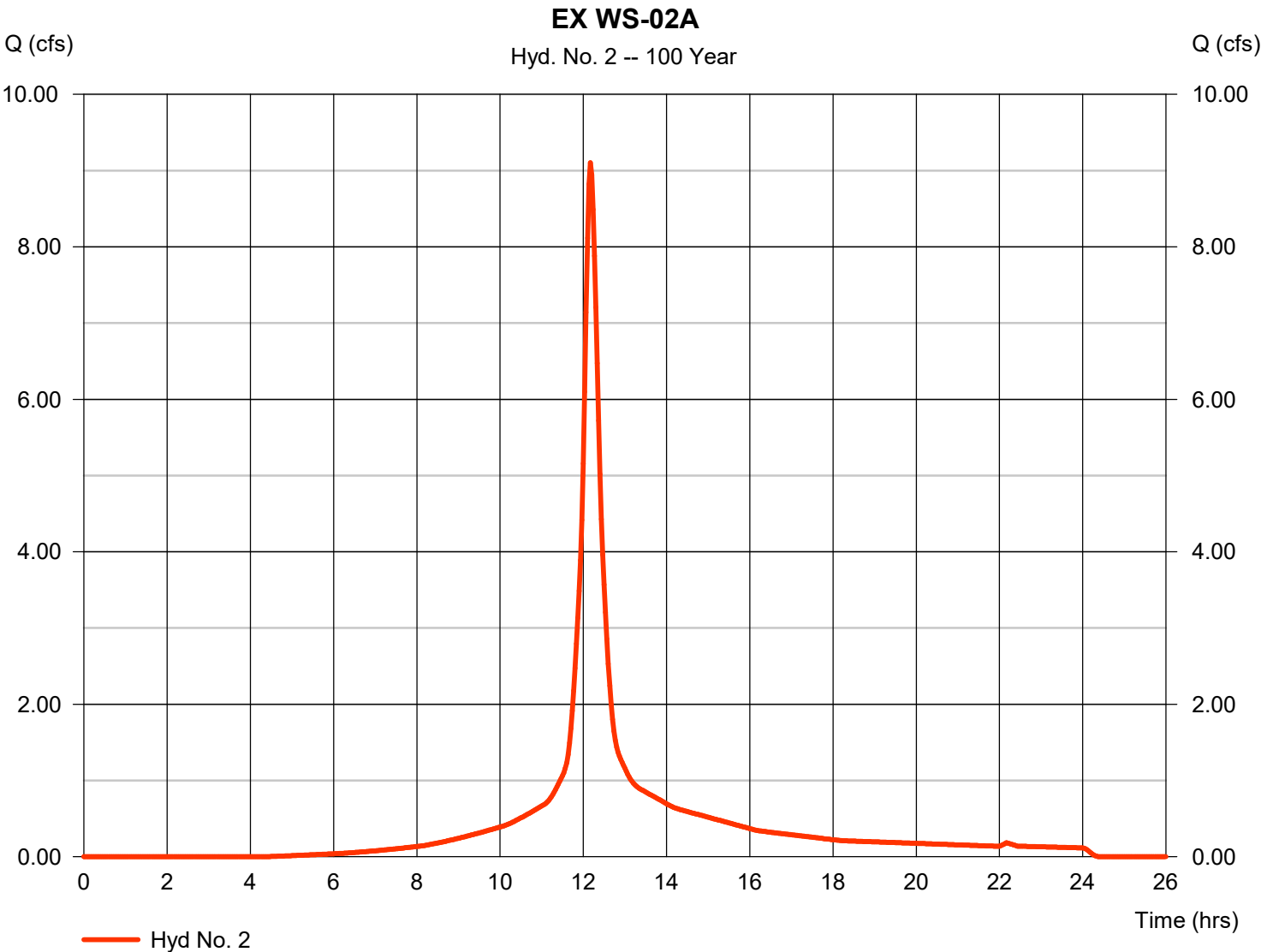
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 2

EX WS-02A

Hydrograph type	= SCS Runoff	Peak discharge	= 9.103 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 38,140 cuft
Drainage area	= 1.678 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.50 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

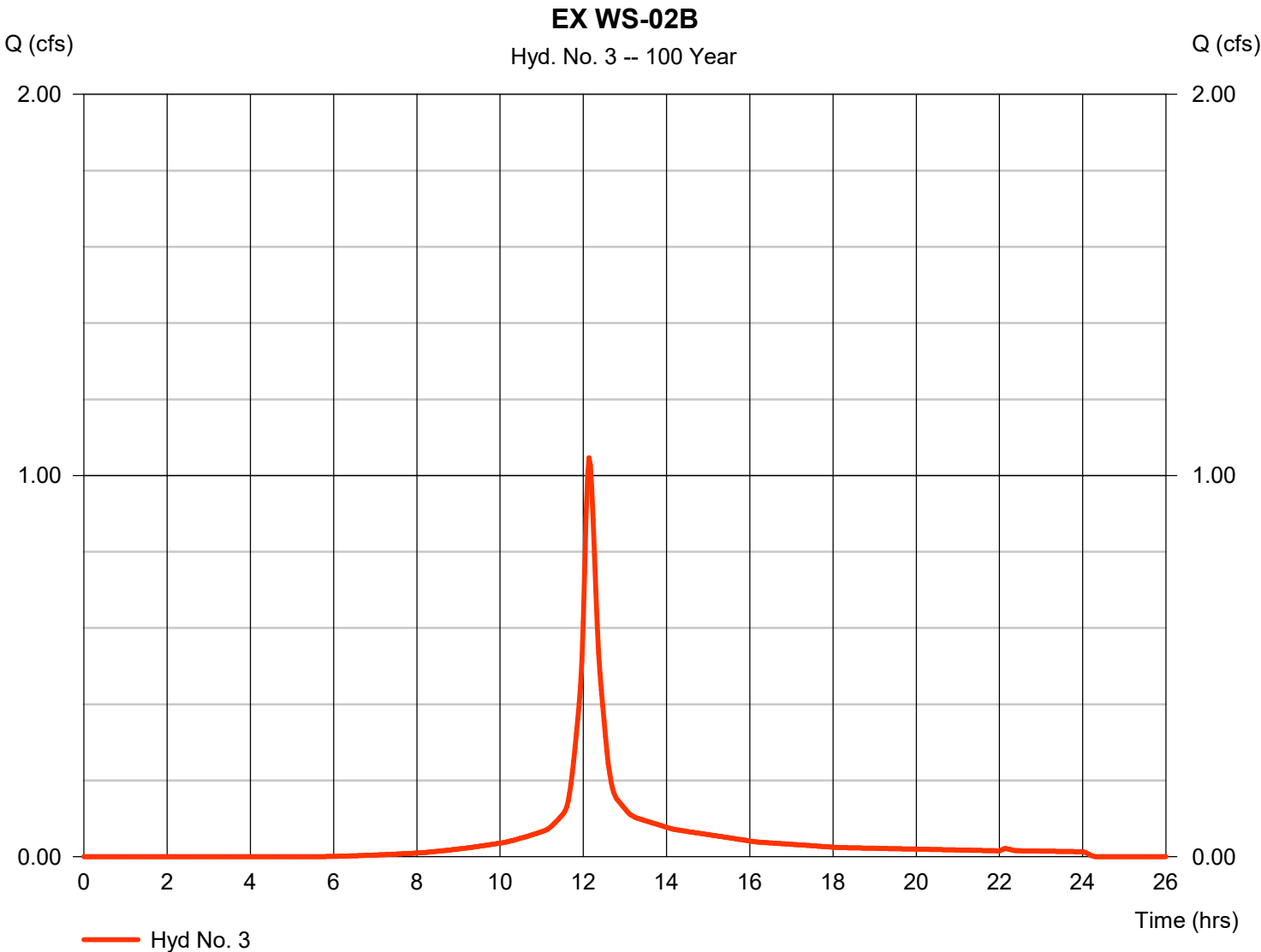
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 3

EX WS-02B

Hydrograph type	= SCS Runoff	Peak discharge	= 1.046 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 4,056 cuft
Drainage area	= 0.186 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 11.00 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

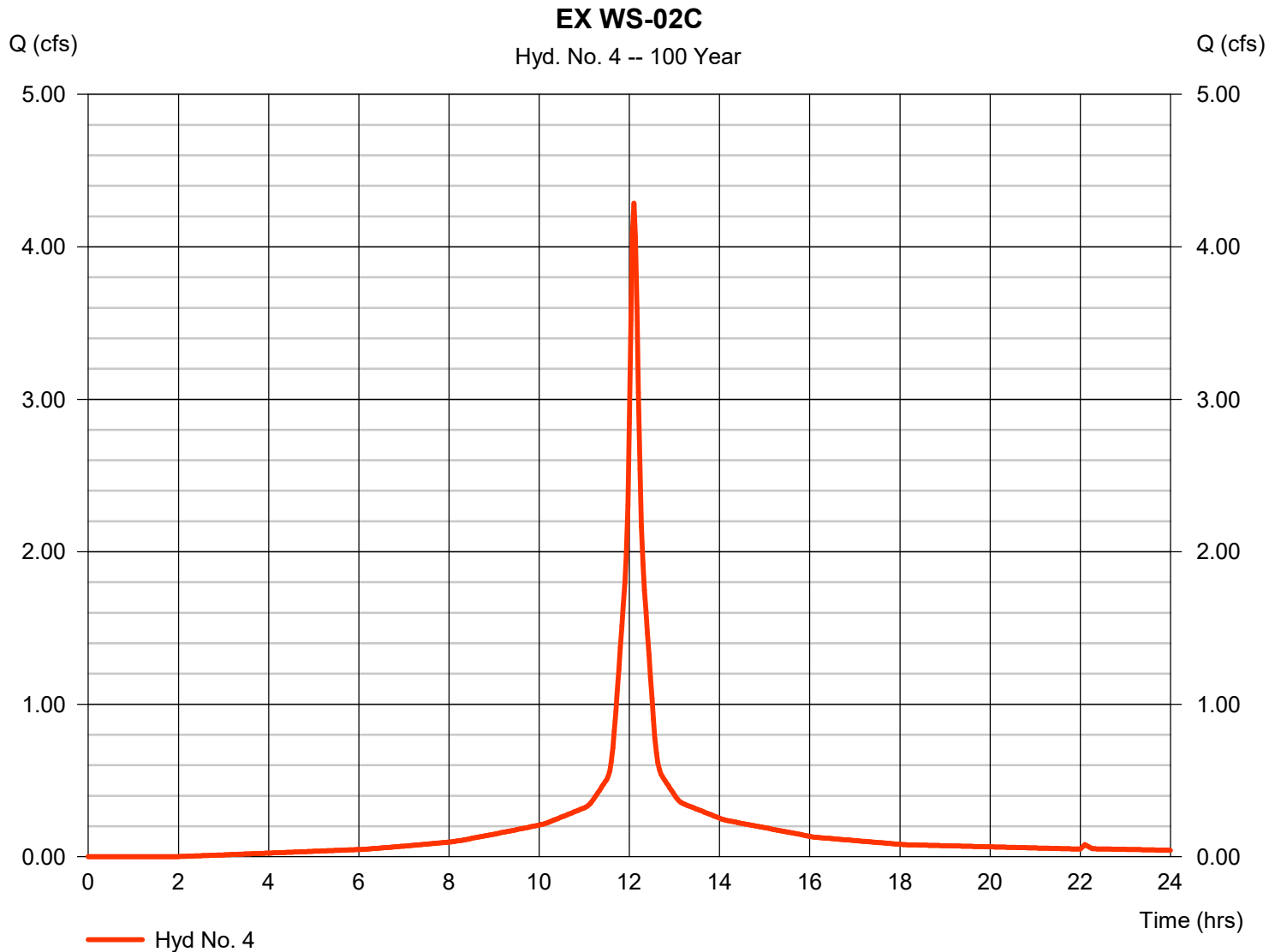
Monday, 12 / 4 / 2023

Hyd. No. 4

EX WS-02C

Hydrograph type = SCS Runoff
Storm frequency = 100 yrs
Time interval = 2 min
Drainage area = 0.590 ac
Basin Slope = 0.0 %
Tc method = User
Total precip. = 8.34 in
Storm duration = 24 hrs

Peak discharge = 4.285 cfs
Time to peak = 12.10 hrs
Hyd. volume = 16,063 cuft
Curve number = 93
Hydraulic length = 0 ft
Time of conc. (Tc) = 9.40 min
Distribution = Type III
Shape factor = 484



Hydrograph Report

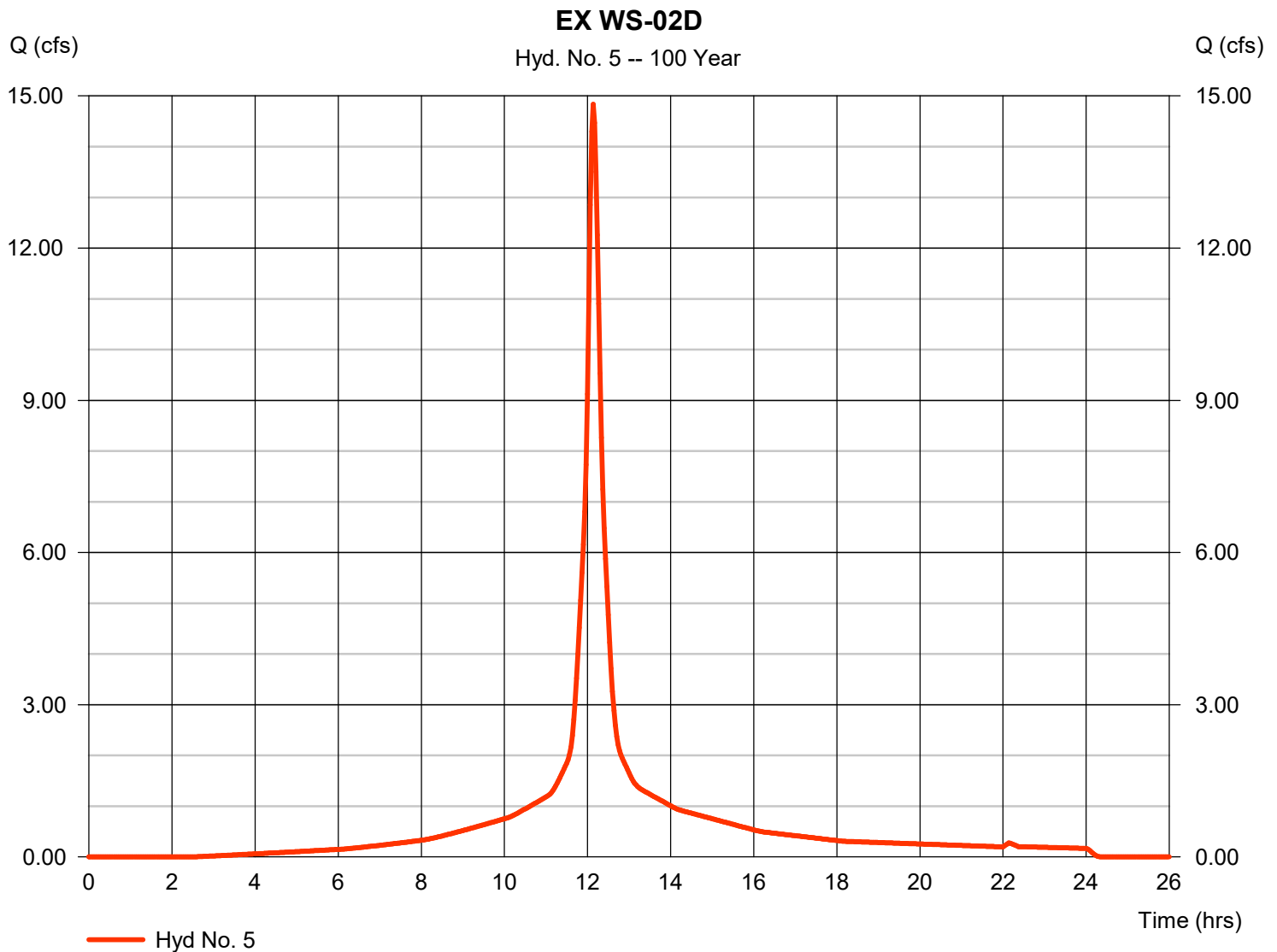
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 5

EX WS-02D

Hydrograph type	= SCS Runoff	Peak discharge	= 14.84 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 61,043 cuft
Drainage area	= 2.246 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 11.10 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

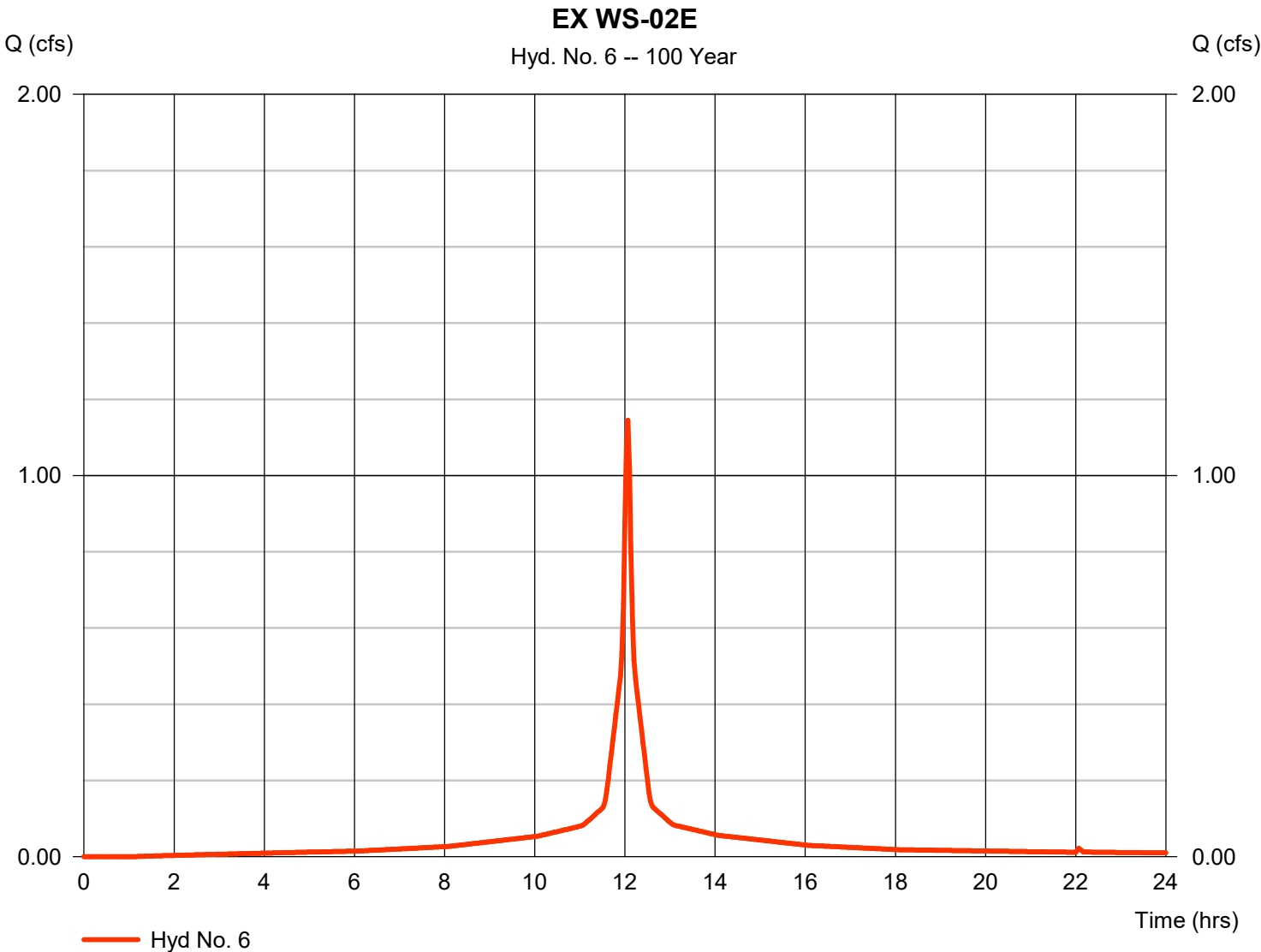
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 6

EX WS-02E

Hydrograph type	= SCS Runoff	Peak discharge	= 1.145 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 3,905 cuft
Drainage area	= 0.146 ac	Curve number	= 96
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

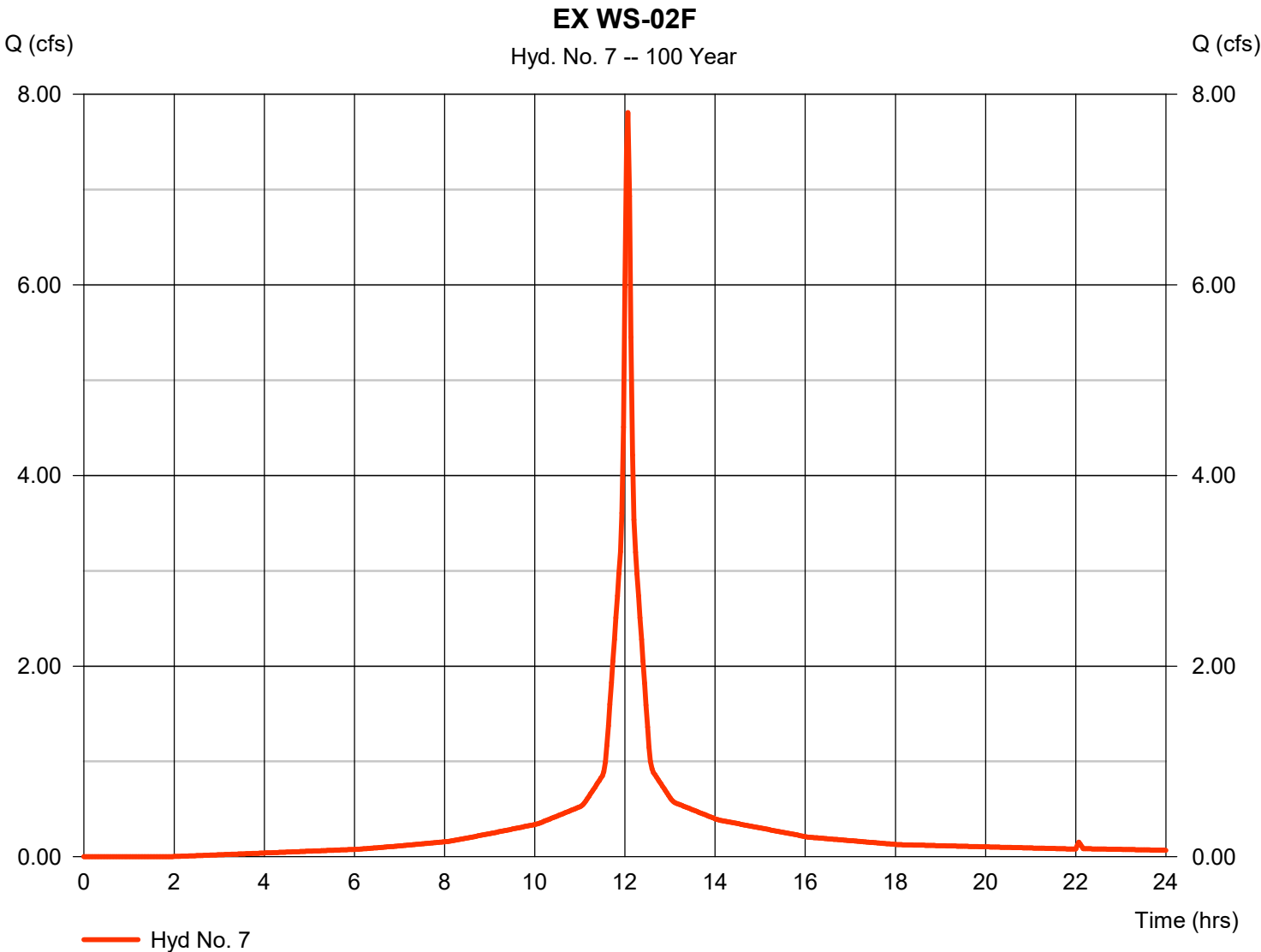
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 7

EX WS-02F

Hydrograph type	= SCS Runoff	Peak discharge	= 7.807 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 25,830 cuft
Drainage area	= 1.012 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.50 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

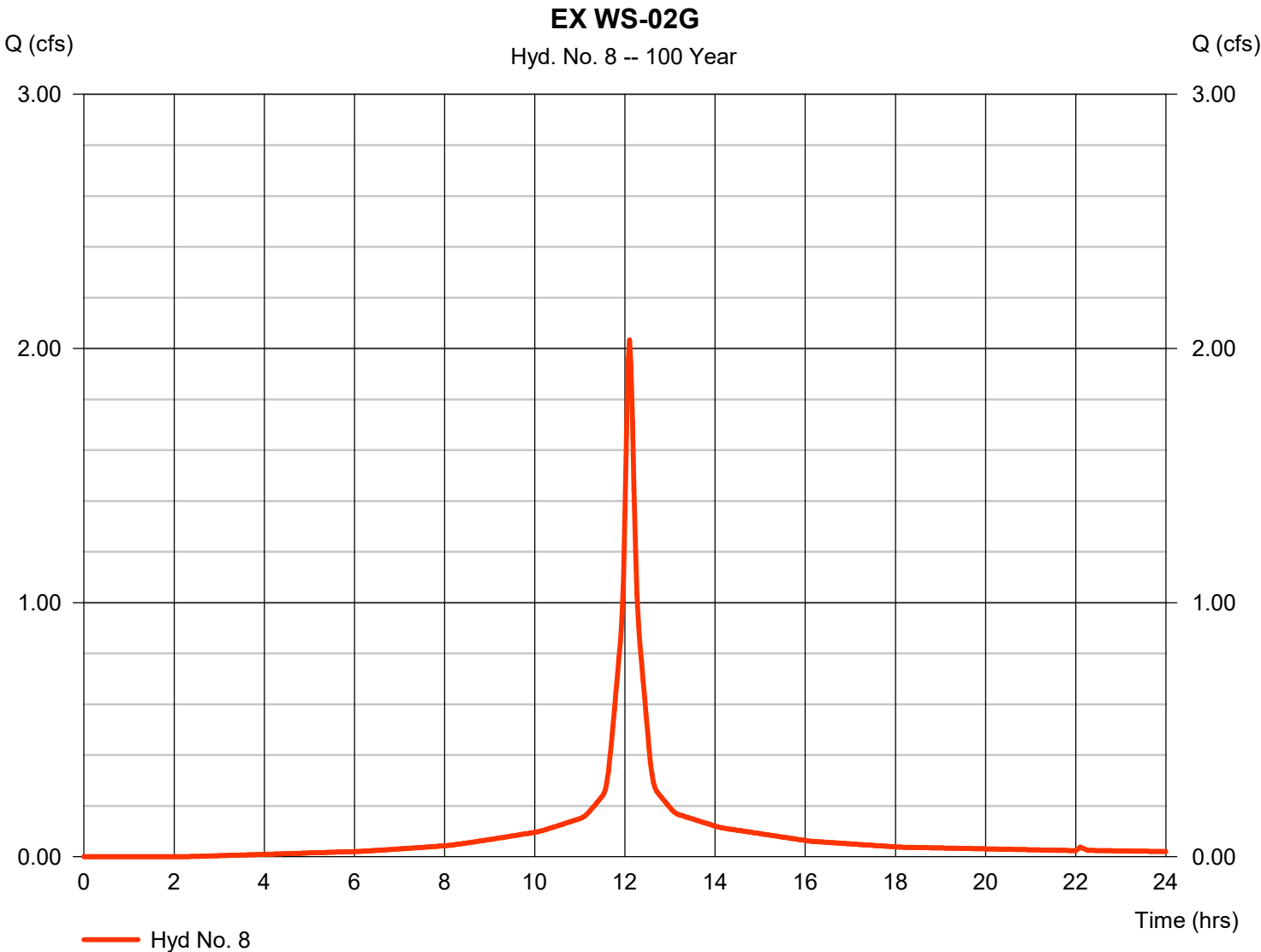
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 8

EX WS-02G

Hydrograph type	= SCS Runoff	Peak discharge	= 2.033 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 7,555 cuft
Drainage area	= 0.282 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.90 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

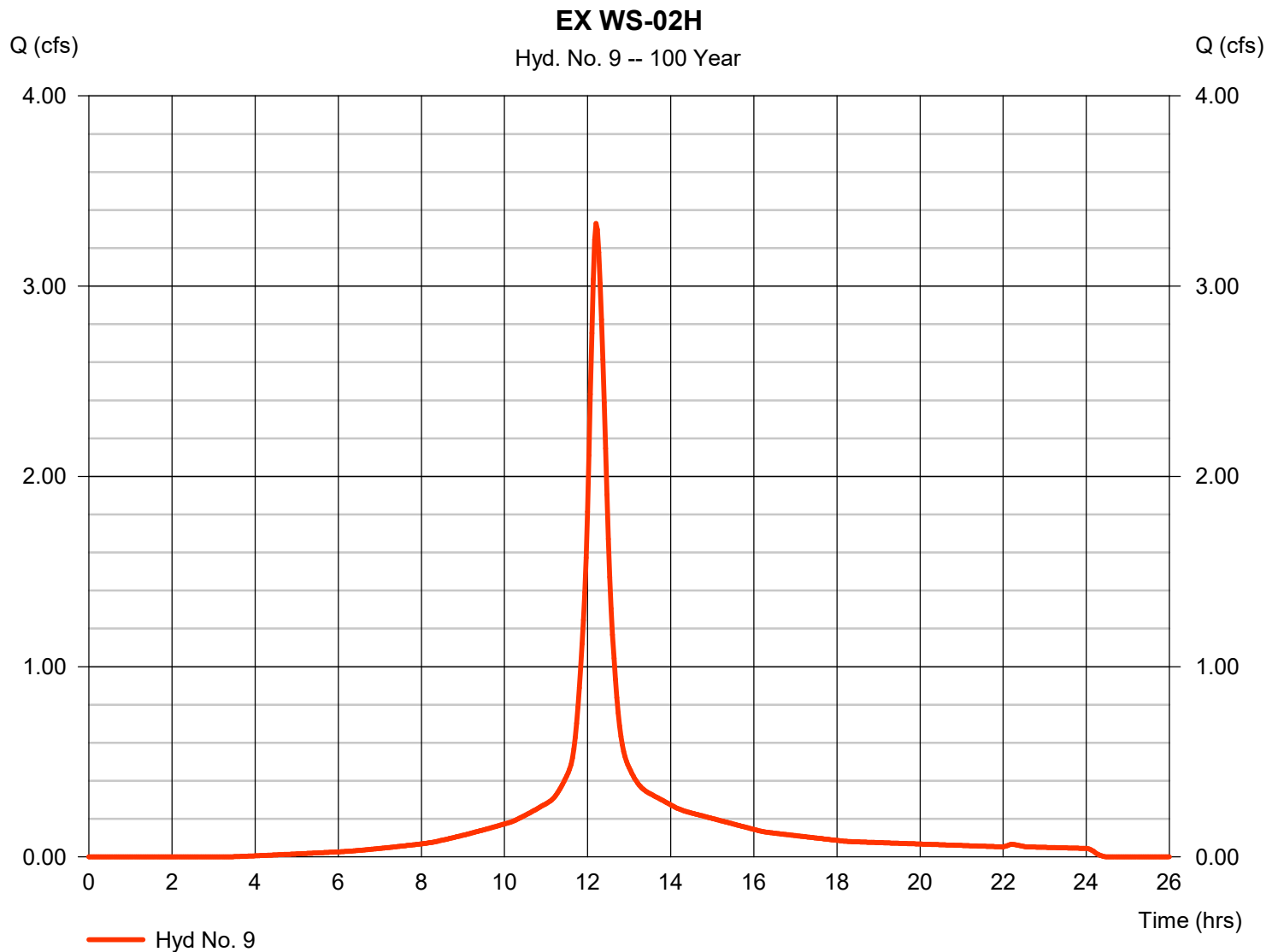
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 9

EX WS-02H

Hydrograph type	= SCS Runoff	Peak discharge	= 3.330 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 15,431 cuft
Drainage area	= 0.616 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.30 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

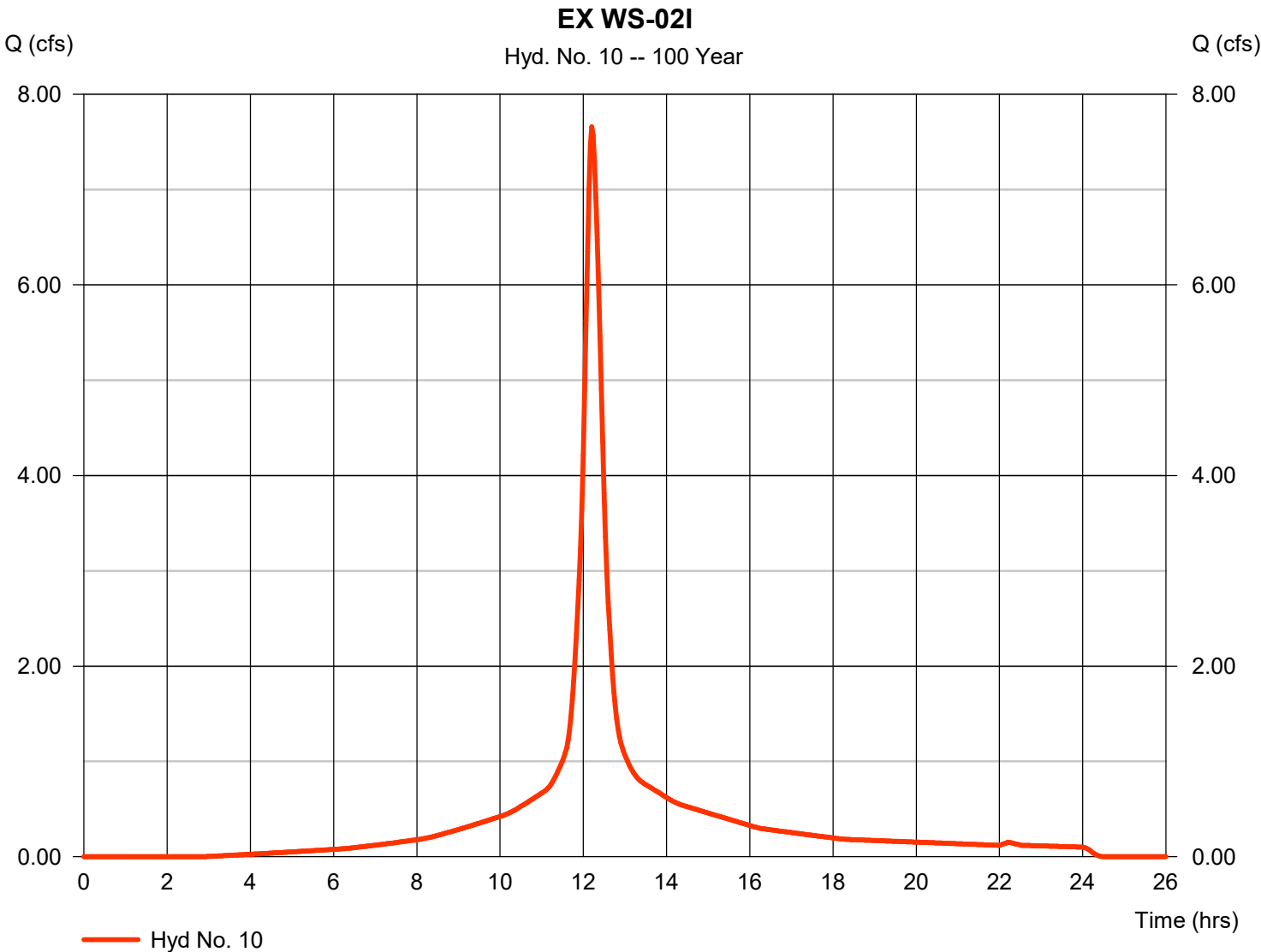
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 10

EX WS-02I

Hydrograph type	= SCS Runoff	Peak discharge	= 7.659 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 35,951 cuft
Drainage area	= 1.387 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.60 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

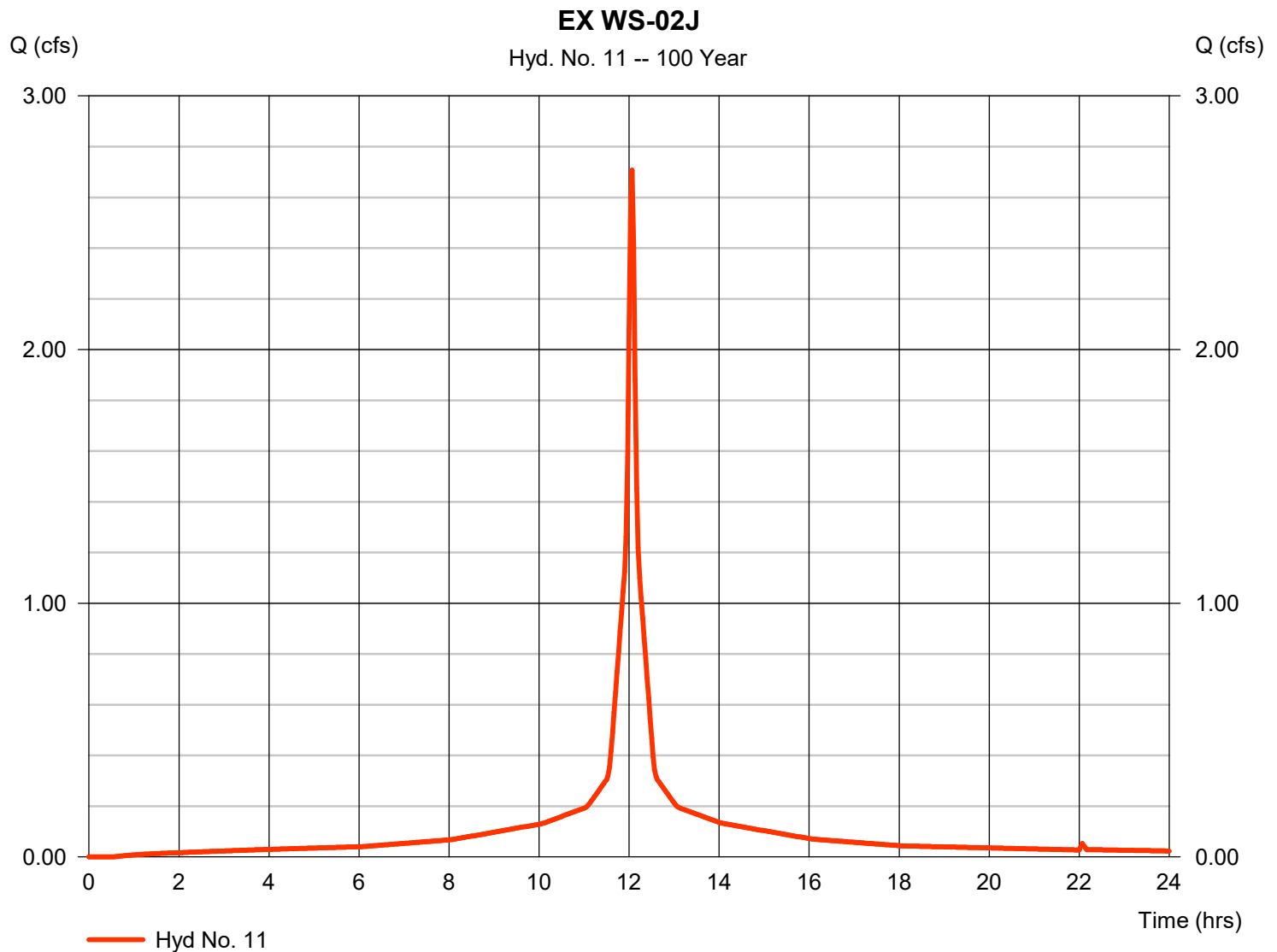
Monday, 12 / 4 / 2023

Hyd. No. 11

EX WS-02J

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 0.343 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 8.34 in
 Storm duration = 24 hrs

Peak discharge = 2.707 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 9,455 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 5.00 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

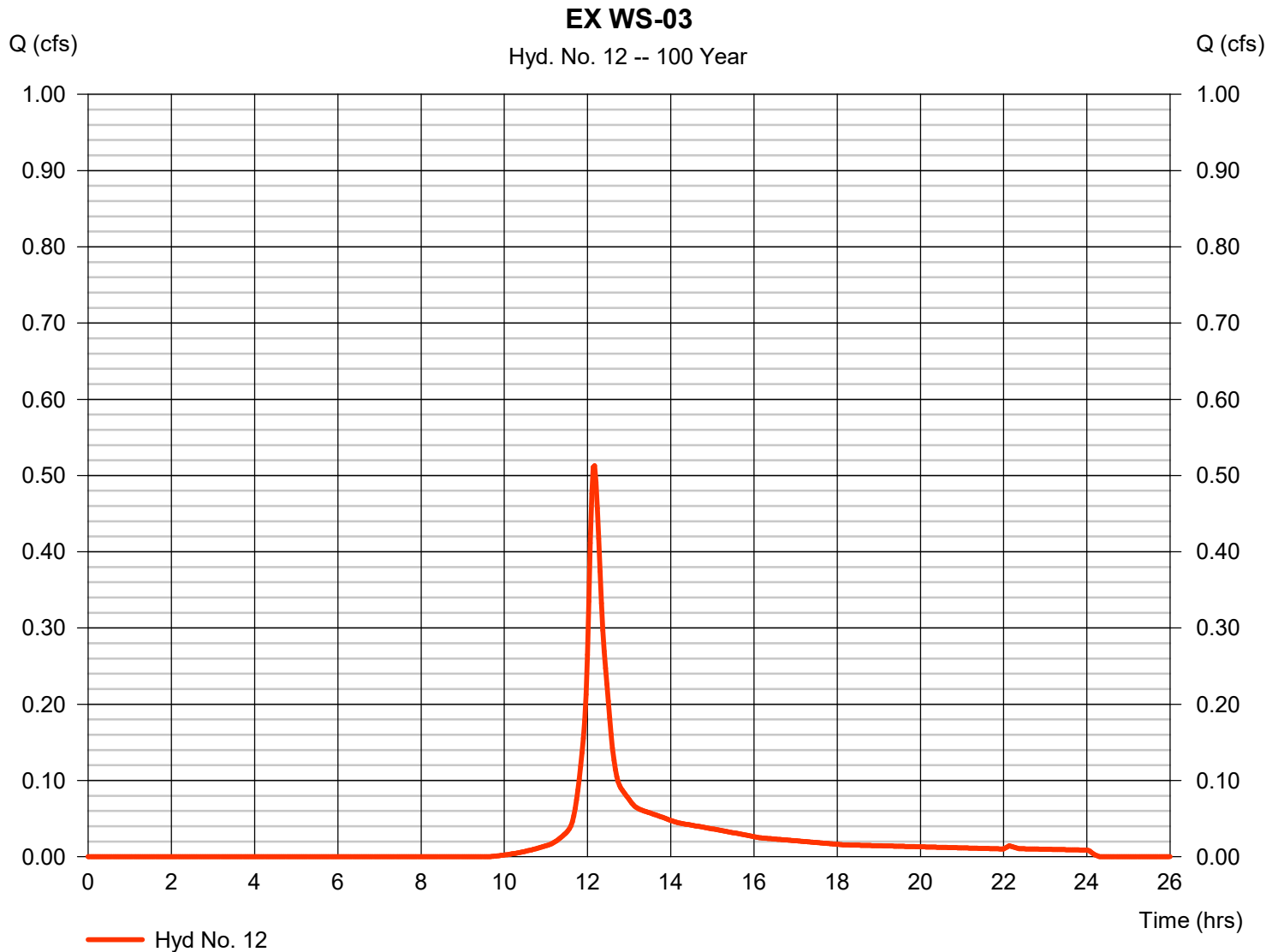
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

Hyd. No. 12

EX WS-03

Hydrograph type	= SCS Runoff	Peak discharge	= 0.513 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 2,003 cuft
Drainage area	= 0.154 ac	Curve number	= 59
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.50 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

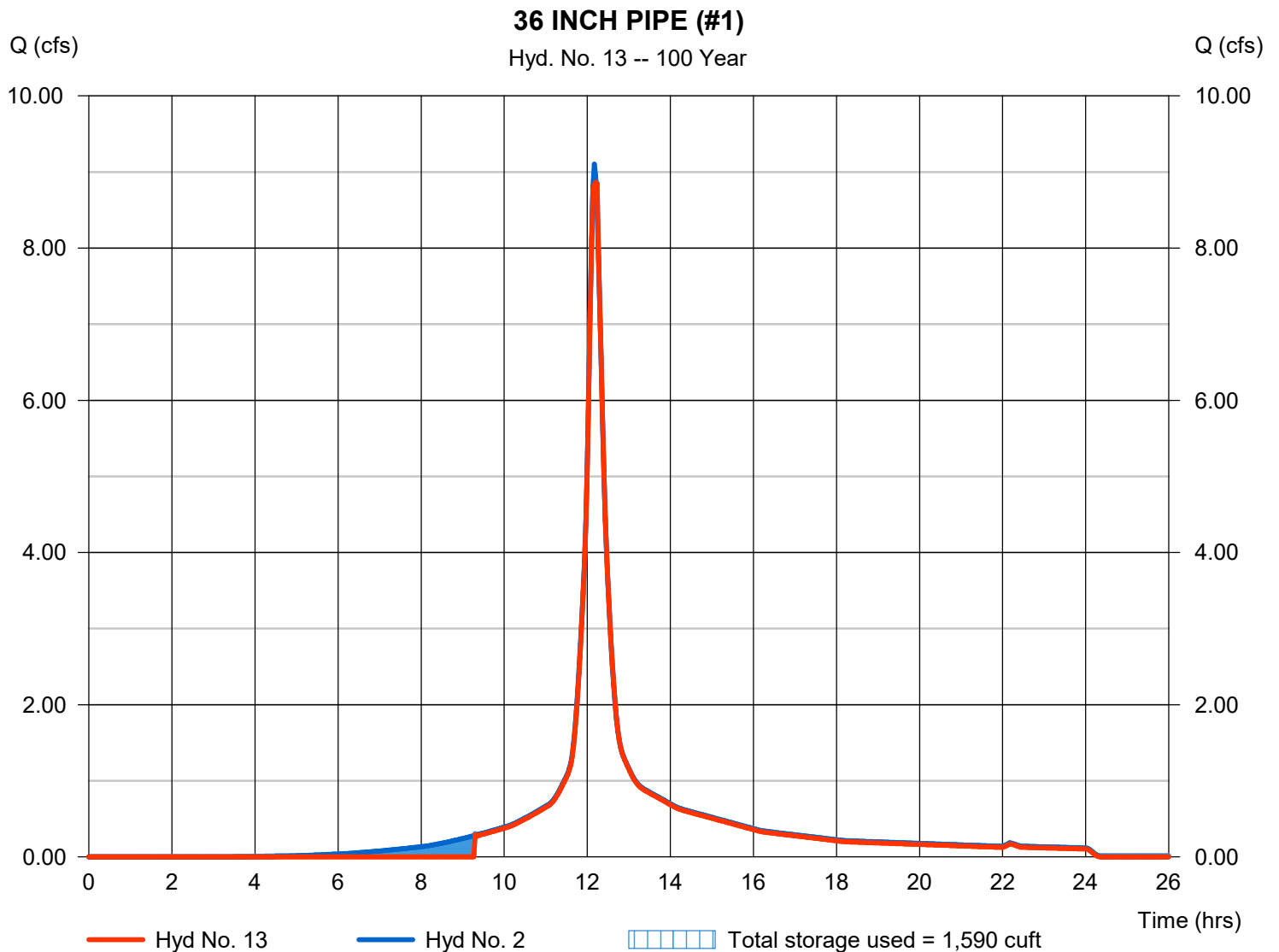
Hyd. No. 13

36 INCH PIPE (#1)

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 2 - EX WS-02A
 Reservoir name = 36IN - 1

Peak discharge = 8.866 cfs
 Time to peak = 12.20 hrs
 Hyd. volume = 35,896 cuft
 Max. Elevation = 143.74 ft
 Max. Storage = 1,590 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

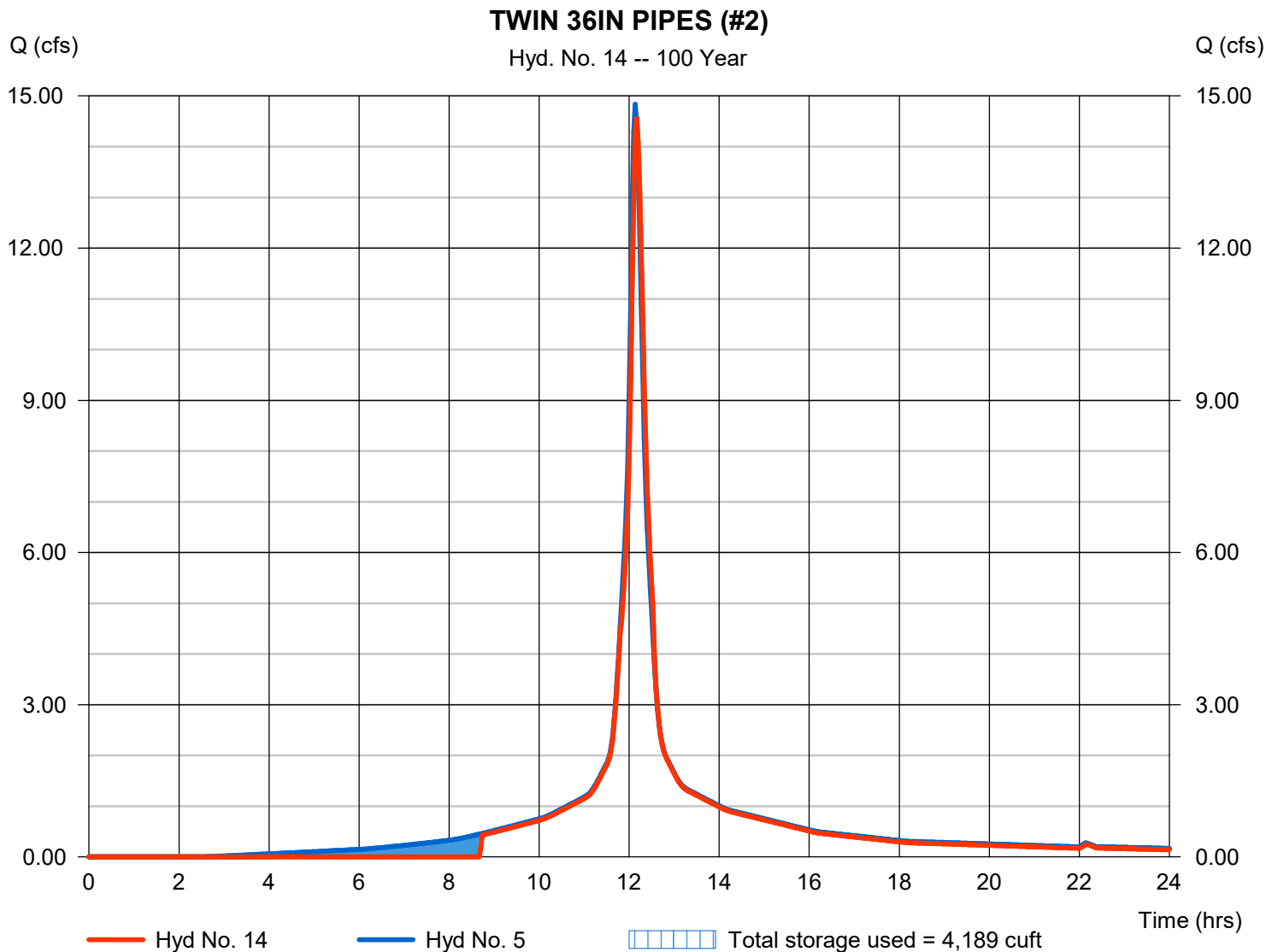
Monday, 12 / 4 / 2023

Hyd. No. 14

TWIN 36IN PIPES (#2)

Hydrograph type	= Reservoir	Peak discharge	= 14.56 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 55,977 cuft
Inflow hyd. No.	= 5 - EX WS-02D	Max. Elevation	= 139.24 ft
Reservoir name	= Northern Twin 36IN	Max. Storage	= 4,189 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

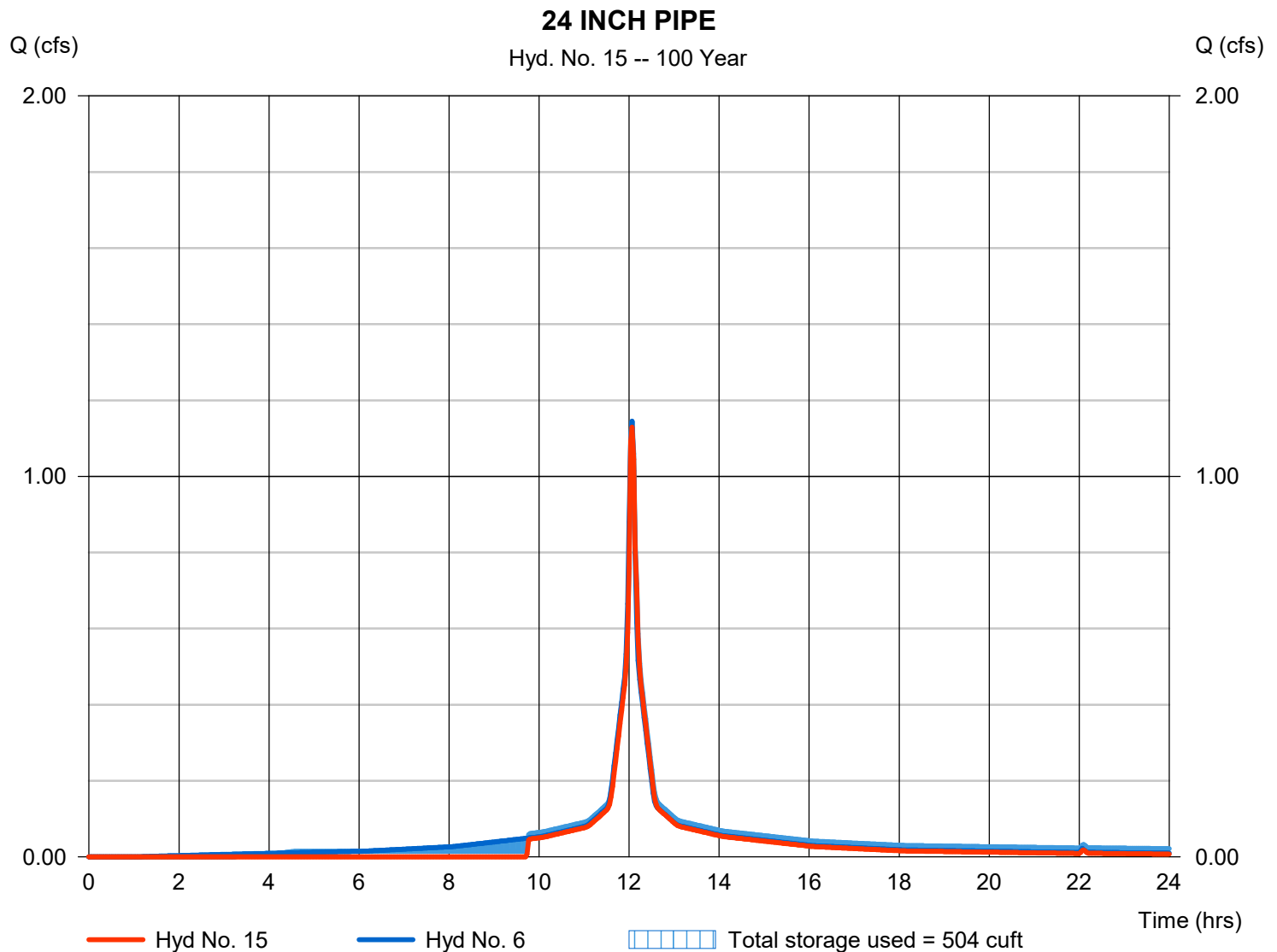
Hyd. No. 15

24 INCH PIPE

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - EX WS-02E
 Reservoir name = 24IN

Peak discharge = 1.129 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 3,248 cuft
 Max. Elevation = 139.65 ft
 Max. Storage = 504 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Monday, 12 / 4 / 2023

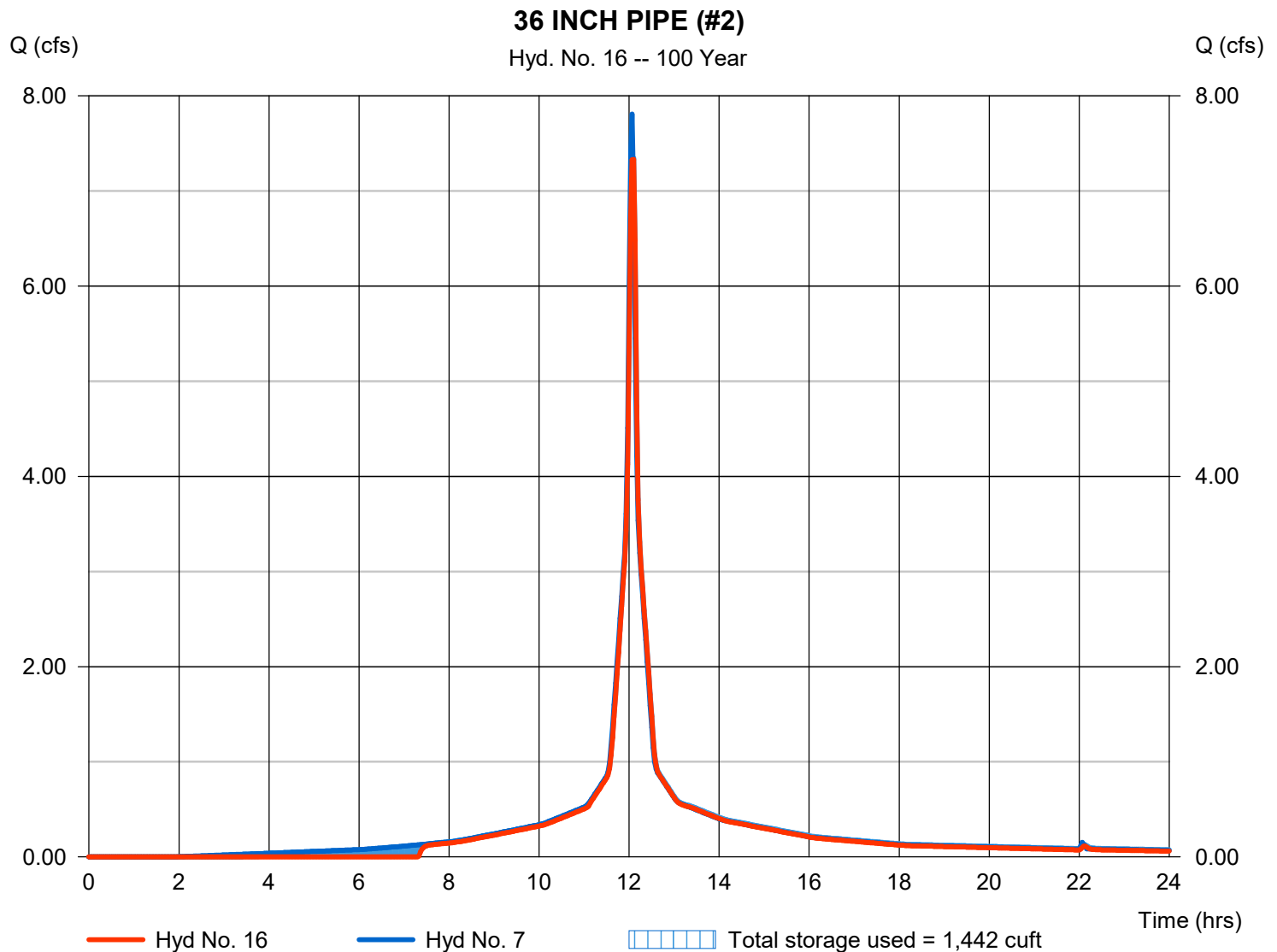
Hyd. No. 16

36 INCH PIPE (#2)

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - EX WS-02F
 Reservoir name = 36in - 2

Peak discharge = 7.332 cfs
 Time to peak = 12.10 hrs
 Hyd. volume = 24,295 cuft
 Max. Elevation = 139.57 ft
 Max. Storage = 1,442 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

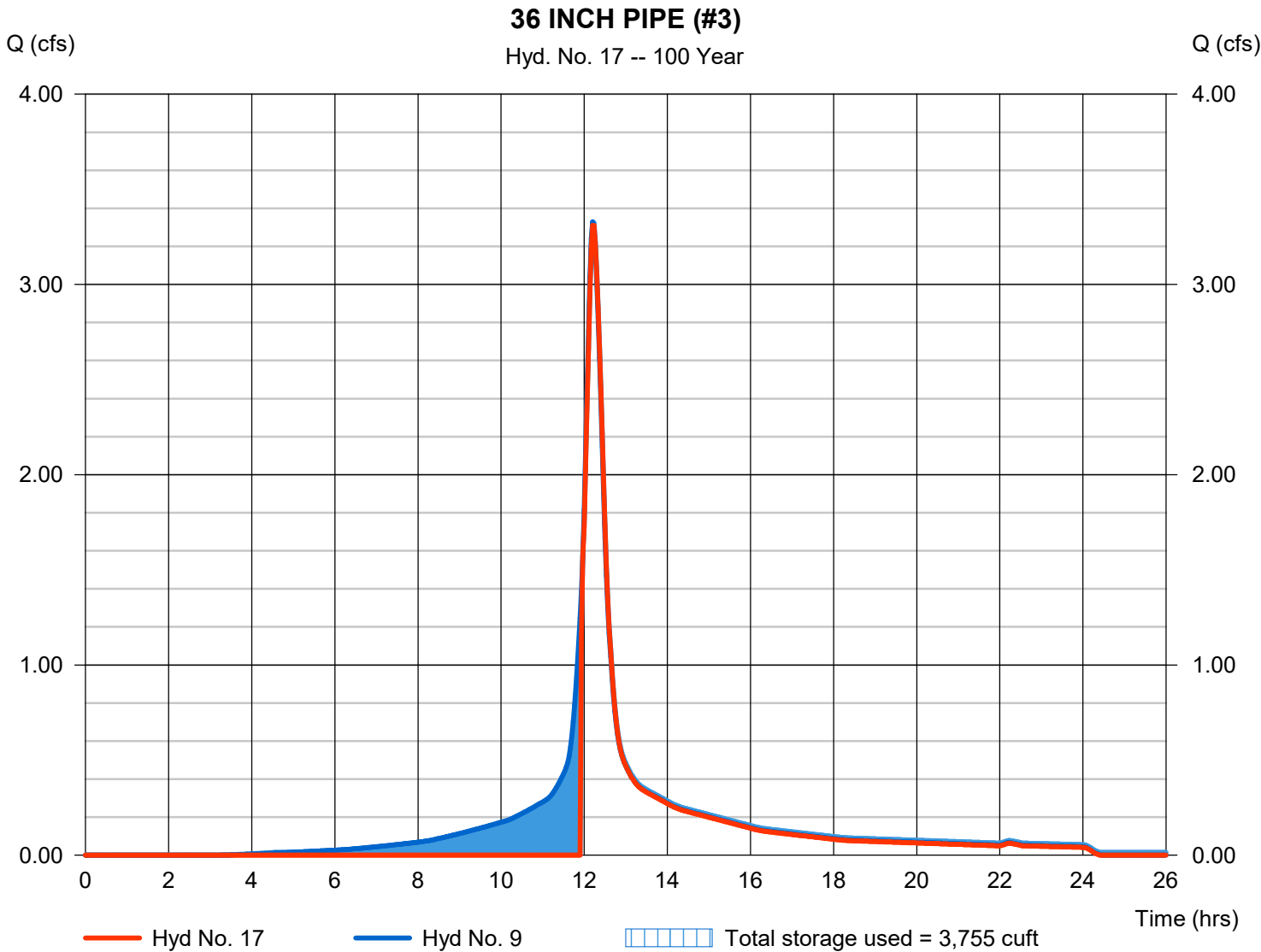
Monday, 12 / 4 / 2023

Hyd. No. 17

36 INCH PIPE (#3)

Hydrograph type	= Reservoir	Peak discharge	= 3.311 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 11,531 cuft
Inflow hyd. No.	= 9 - EX WS-02H	Max. Elevation	= 137.50 ft
Reservoir name	= 36in - 3	Max. Storage	= 3,755 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

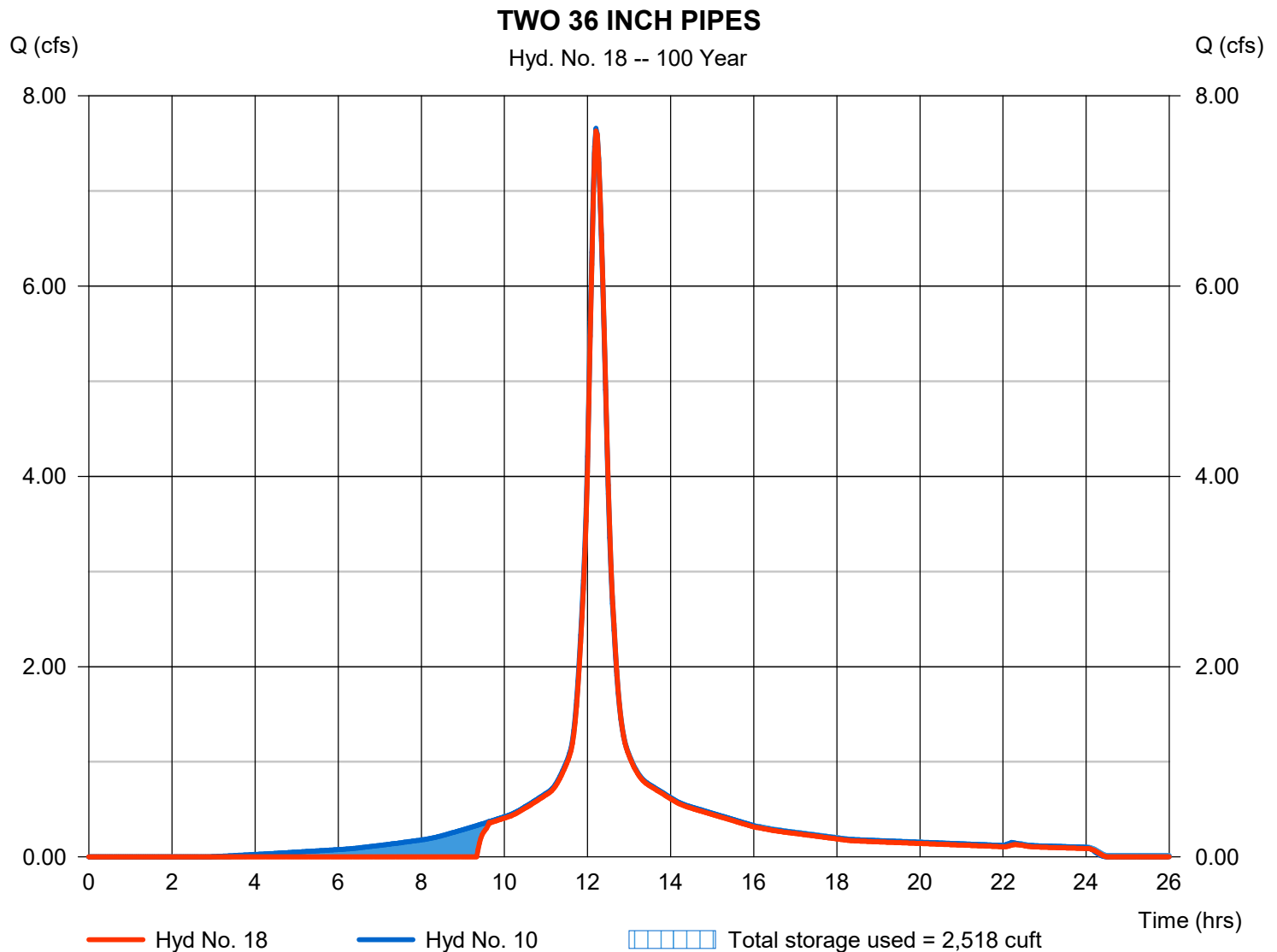
Monday, 12 / 4 / 2023

Hyd. No. 18

TWO 36 INCH PIPES

Hydrograph type	= Reservoir	Peak discharge	= 7.629 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 32,678 cuft
Inflow hyd. No.	= 10 - EX WS-02I	Max. Elevation	= 135.77 ft
Reservoir name	= TWIN 36IN	Max. Storage	= 2,518 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

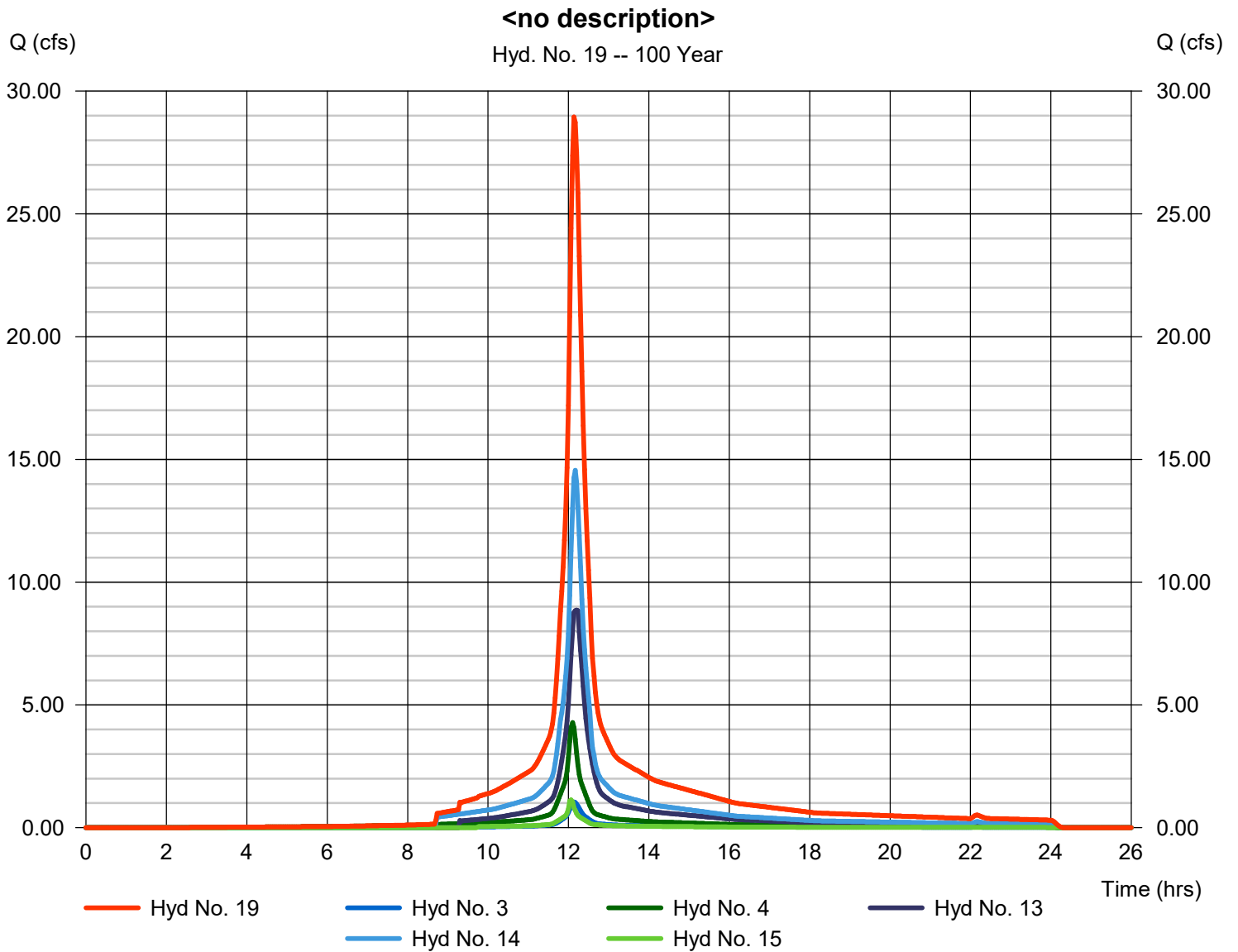
Monday, 12 / 4 / 2023

Hyd. No. 19

<no description>

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 3, 4, 13, 14, 15

Peak discharge = 28.95 cfs
 Time to peak = 12.13 hrs
 Hyd. volume = 115,241 cuft
 Contrib. drain. area = 0.776 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

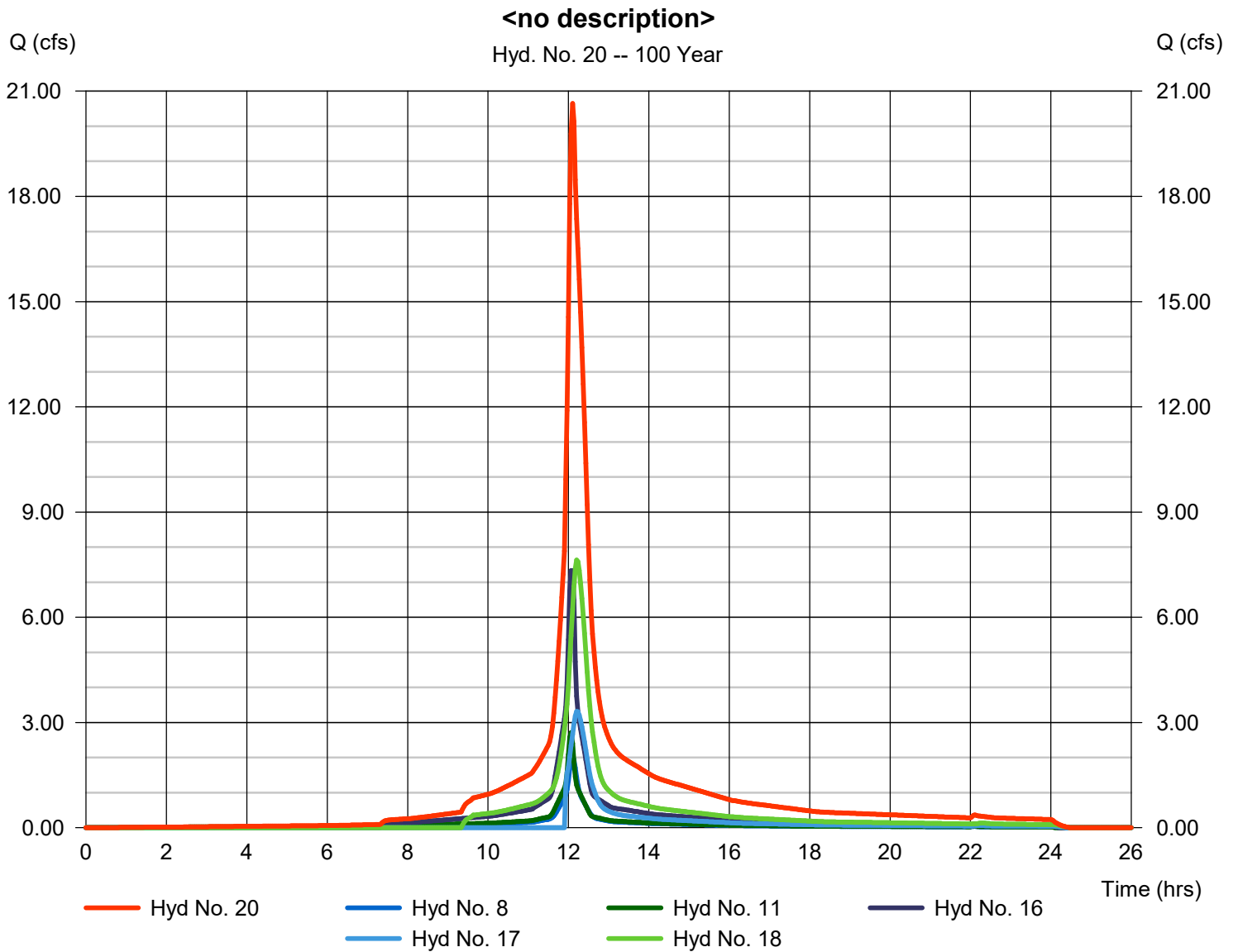
Monday, 12 / 4 / 2023

Hyd. No. 20

<no description>

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 8, 11, 16, 17, 18

Peak discharge = 20.65 cfs
 Time to peak = 12.10 hrs
 Hyd. volume = 85,513 cuft
 Contrib. drain. area = 0.625 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

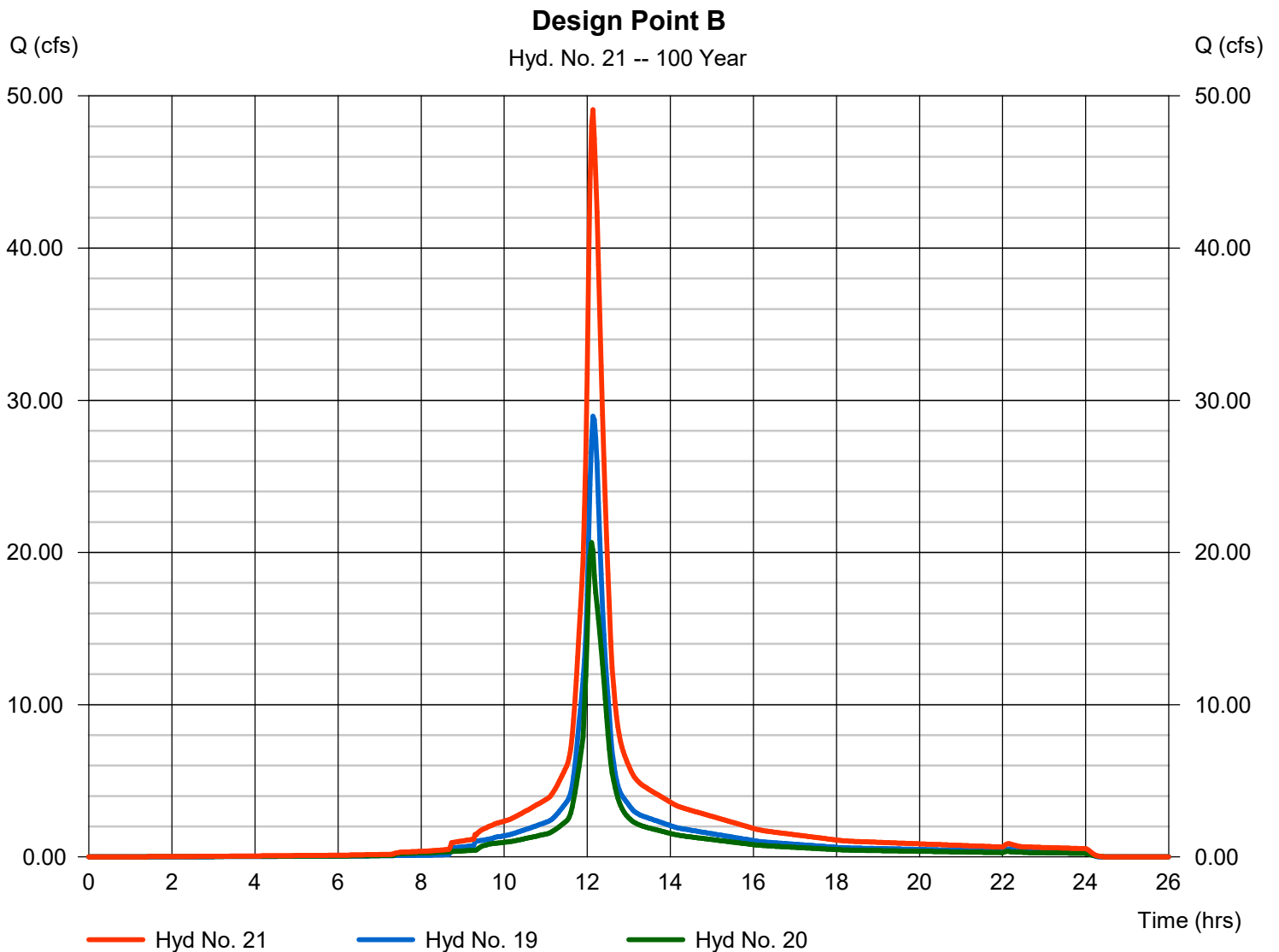
Monday, 12 / 4 / 2023

Hyd. No. 21

Design Point B

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 19, 20

Peak discharge = 49.09 cfs
Time to peak = 12.13 hrs
Hyd. volume = 200,754 cuft
Contrib. drain. area = 0.000 ac



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Tighe & Bond; J:\F0173 Fuller\001 64 Danbury Rd\Calculations\Stormwater\Figures\F0173-001-PR-WS-FIGURE.dwg



LEGEND

WATERSHED BOUNDARY	---
TIME OF CONCENTRATION	---
PAVEMENT/ROOF	■
LANDSCAPED AND LAWNS	■
WOODED	■

0 100' 200'
SCALE: 1" = 100'

64 DANBURY ROAD WILTON, CT	
PROPOSED WATERSHED FIGURE	
DATE: 12/04/2023	Tighe&Bond
SCALE: 1"=100'	
FIGURE PR-WS	

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Proposed CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **PR WS-01**
Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.132	98	12.9317
Landscaped and Lawns (HSG-B)	0.702	69	48.4236
Landscaped and Lawns (HSG-D)	0.049	84	4.1441
Wooded (HSG-B)	0.712	55	39.1338
Wooded (HSG-D)	0.127	77	9.7682
	1.721		114.401

Weighted CN: 66

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	180	0.2	13.47

Total Tc = 13.5 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **PR WS-02A(1)**
Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.433	98	42.4712
Landscaped and Lawns (HSG-B)	0.010	69	0.6621
Landscaped and Lawns (HSG-D)	0.015	84	1.3017
Wooded (HSG-B)	0.000	55	0.0000
	0.458		44.435

Weighted CN: 97

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	10	0.020	2.1
Segment B - C	0.015	15	0.020	0.3
Segment C - D	0.24	6	0.020	1.5

Total Tc = 4.0 Min.
Minimum Tc = 5.0 (MIN)

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Proposed CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **PR WS-02A(II)**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.393	98	38.4756
Landscaped and Lawns (HSG-B)	0.126	69	8.7280
Landscaped and Lawns (HSG-D)	0.061	84	5.1372
Wooded (HSG-B)	0.103	55	5.6465
	0.683		57.987

Weighted CN: 85

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	10	0.02	3.35
Segment B - C	0.24	84	0.02	12.22
Segment C - D	0.015	143	0.04	1.54

Total Tc = 17.1 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **PR WS-02B(I)**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.281	98	27.5462
Landscaped and Lawns (HSG-B)	0.022	69	1.5302
Landscaped and Lawns (HSG-D)	0.166	84	13.9653
Wooded (HSG-B)	0.064	55	3.5341
Wooded (HSG-D)	0.023	77	1.7535
	0.557		48.329

Weighted CN: 87

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	52	0.11	6.34
Segment B - C	0.24	3	0.11	0.43
Segment C - D	0.015	43	0.04	0.59

Total Tc = 7.4 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Proposed CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **PR WS-02B(II)**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.402	98	39.4115
Landscaped and Lawns (HSG-D)	0.001	84	0.0964
	0.403		39.508

Weighted CN: 98

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.015	35	0.045	0.5

Total Tc = 0.5 Min.
Minimum Tc = 5.0 (MIN)

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **PR WS-02B(III)**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.031	98	3.0777
Landscaped and Lawns (HSG-D)	0.101	84	8.4887
	0.132		11.566

Weighted CN: 87

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	15	0.1	1.62

Shallow Concentrated Flow					
Segment		Slope (ft/ft)	V (ft/s)	Length (ft)	Time (min.)
Segment B - C	unpaved	0.045	3.42	125	0.6
Segment C - D	unpaved	0.150	6.25	125	0.3

Total Tc = 2.6 Min.
USE 5.0 Min. (MIN)

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Proposed CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **PR WS-02C**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.391	98	38.3293
Landscaped and Lawns (HSG-D)	0.185	84	15.5697
	0.576		53.899

Weighted CN: 93

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	108	0.08	8.58
Segment B - C	0.015	82	0.067	0.80

Total Tc = 9.4 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **PR WS-02D**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	1.683	98	164.9397
Landscaped and Lawns (HSG-D)	0.313	84	26.3281
Wooded (HSG-B)	0.231	55	12.7096
Wooded (HSG-D)	0.018	77	1.3823
	2.246		205.360

Weighted CN: 91

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	52	0.11	6.34
Segment B - C	0.24	65	0.17	4.23
Segment C - D	0.015	43	0.045	0.56

Total Tc = 11.1 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Proposed CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **PR WS-02E**
Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.177	98	17.3030
Landscaped and Lawns (HSG-B)	0.011	69	0.7793
Landscaped and Lawns (HSG-D)	0.015	84	1.2322
	0.203		19.315

Weighted CN: 95

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	22	0.02	4.18
Segment B - C	0.015	44	0.02	0.79

Total Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **PR WS-02F**
Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.826	98	80.9512
Landscaped and Lawns (HSG-D)	0.197	84	16.5686
	1.023		97.520

Weighted CN: 95

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	31	0.025	5.04

Total Tc = 5.0 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Proposed CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **PR WS-02G**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.774	98	75.8520
Landscaped and Lawns (HSG-D)	0.156	84	13.1380
	0.930		88.990

Weighted CN: 96**Time of Concentration**

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	20	0.05	2.69
Segment B - C	0.015	32	0.04	0.47

Total Tc = 3.2 Min.
USE 5.0 Min. (MIN)

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **PR WS-02H**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.037	98	3.6260
Landscaped and Lawns (HSG-D)	0.230	84	19.3358
	0.267		22.962

Weighted CN: 86**Time of Concentration**

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	45	0.04	5.62
Segment B - C	0.015	6	0.02	0.16
Segment C - D	0.25	53	0.025	7.99

Total Tc = 13.8 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **64 Danbury Road**
Project Number: **F0173-001**
Project Location: **Wilton, CT**
Description: **Proposed CN & Tc Calculations**
Prepared By: **AVC** Date: **December 4, 2023**

Designation: **PR WS-02I**

Location:

Cover Type	Area, ac	CN	A x CN
Pavement/Roof	0.613	98	60.0329
Landscaped and Lawns (HSG-D)	0.684	84	57.4270
	1.296		117.460

Weighted CN: 91**Time of Concentration**

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	82	0.06	7.73
Segment B - C	0.015	6	0.02	0.16
Segment C - D	0.25	97	0.04	10.74

Total Tc = 18.6 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Designation: **PR WS-03**

Location:

Cover Type	Area, ac	CN	A x CN
Landscaped and Lawns (HSG-B)	0.035	69	2.4315
Wooded (HSG-B)	0.046	55	2.5366
	0.081		4.968

Weighted CN: 61**Time of Concentration**

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

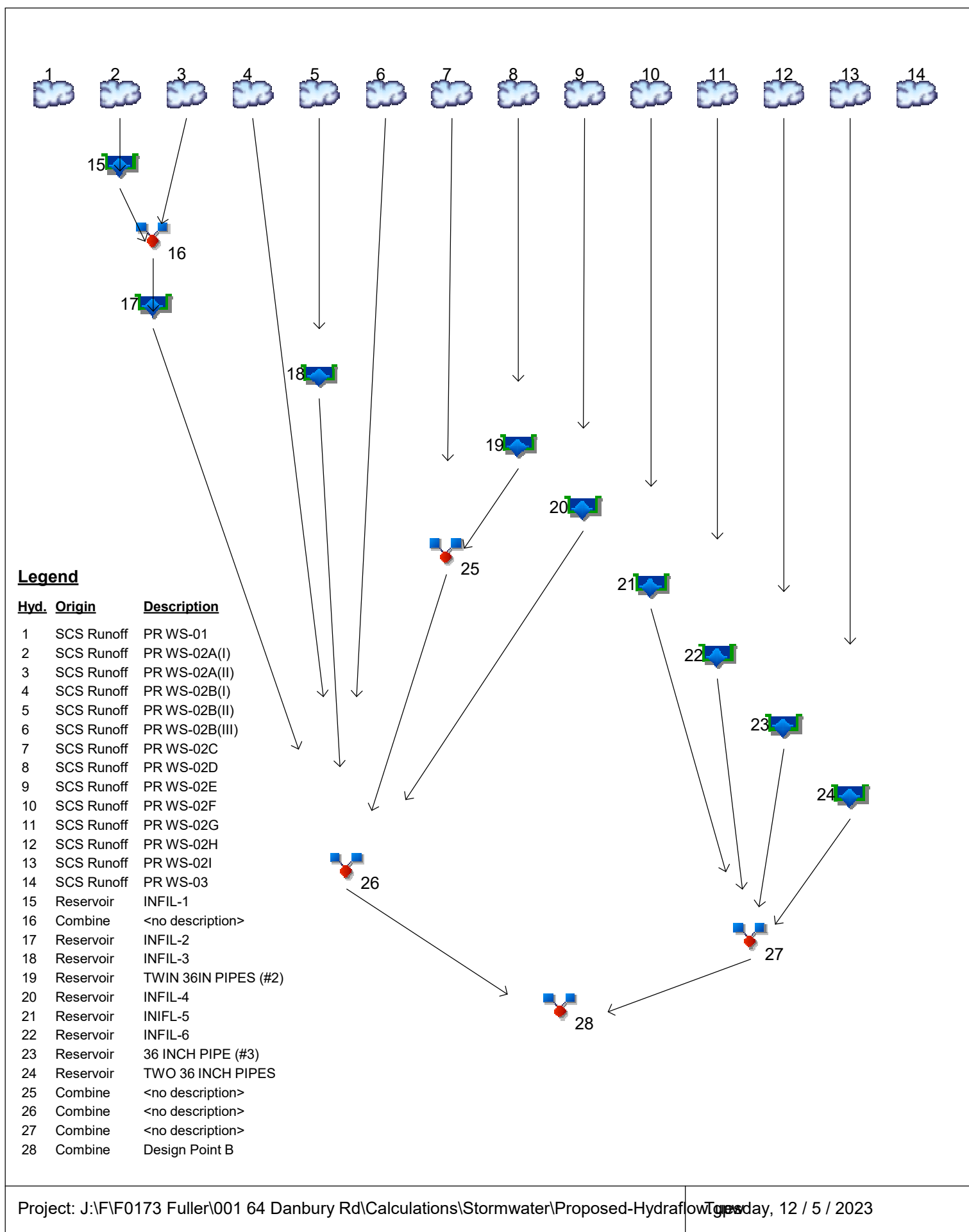
Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.24	44	0.05	5.05

Total Tc = 5.1 Min.

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Watershed Model Schematic

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Hydrograph Summary Report

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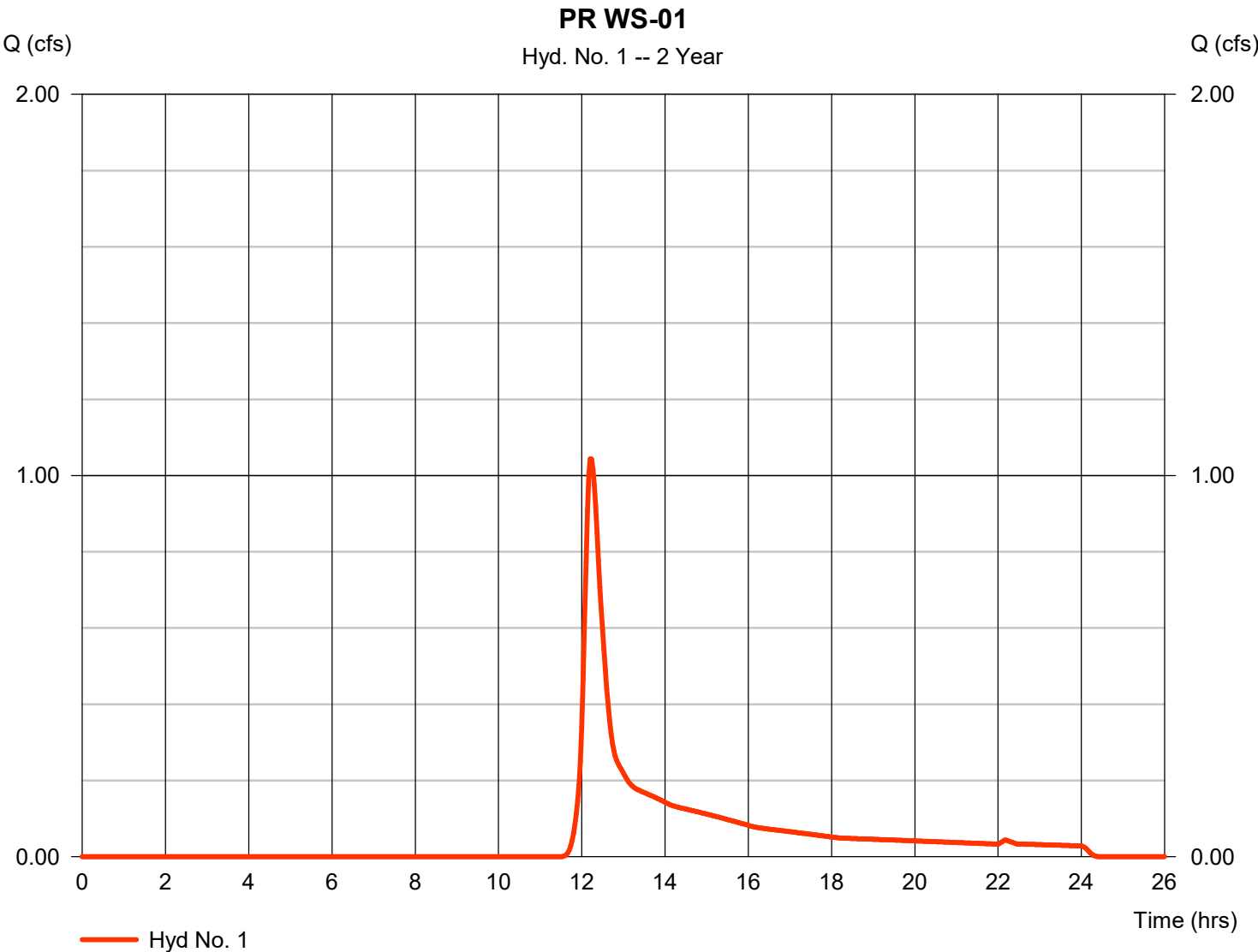
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.044	2	732	4,941	-----	-----	-----	PR WS-01
2	SCS Runoff	1.493	2	724	4,947	-----	-----	-----	PR WS-02A(I)
3	SCS Runoff	1.141	2	734	5,042	-----	-----	-----	PR WS-02A(II)
4	SCS Runoff	1.343	2	726	4,598	-----	-----	-----	PR WS-02B(I)
5	SCS Runoff	1.330	2	724	4,507	-----	-----	-----	PR WS-02B(II)
6	SCS Runoff	0.329	2	724	988	-----	-----	-----	PR WS-02B(III)
7	SCS Runoff	1.625	2	726	5,759	-----	-----	-----	PR WS-02C
8	SCS Runoff	5.519	2	728	21,524	-----	-----	-----	PR WS-02D
9	SCS Runoff	0.639	2	724	2,044	-----	-----	-----	PR WS-02E
10	SCS Runoff	3.218	2	724	10,300	-----	-----	-----	PR WS-02F
11	SCS Runoff	2.983	2	724	9,701	-----	-----	-----	PR WS-02G
12	SCS Runoff	0.491	2	730	2,000	-----	-----	-----	PR WS-02H
13	SCS Runoff	2.681	2	732	12,044	-----	-----	-----	PR WS-02I
14	SCS Runoff	0.039	2	726	160	-----	-----	-----	PR WS-03
15	Reservoir	1.056	2	728	2,364	2	144.98	1,745	INFIL-1
16	Combine	2.109	2	730	7,406	3, 15	-----	-----	<no description>
17	Reservoir	2.076	2	732	5,871	16	136.61	1,233	INFIL-2
18	Reservoir	0.099	2	770	711	5	143.86	2,387	INFIL-3
19	Reservoir	5.358	2	730	16,803	8	139.02	3,243	TWIN 36IN PIPES (#2)
20	Reservoir	0.408	2	728	858	9	137.44	675	INFIL-4
21	Reservoir	2.783	2	726	7,104	10	136.12	2,281	INIFL-5
22	Reservoir	0.109	2	822	1,534	11	134.74	5,293	INFIL-6
23	Reservoir	0.000	2	720	0	12	132.37	1,808	36 INCH PIPE (#3)
24	Reservoir	2.660	2	734	8,938	13	135.68	2,403	TWO 36 INCH PIPES
25	Combine	6.742	2	728	22,562	7, 19,	-----	-----	<no description>
26	Combine	10.48	2	730	35,588	4, 6, 17, 18, 20, 25	-----	-----	<no description>
27	Combine	5.018	2	728	17,576	21, 22, 23, 24,	-----	-----	<no description>
28	Combine	15.38	2	730	53,163	26, 27	-----	-----	Design Point B
J:\F0173 Fuller 001 64 Danbury Rd\Calculations\Private\2 Year\Proposed-Hydrographs					Tuesday, 12 / 5 / 2023				

Hydrograph Report

Hyd. No. 1

PR WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 1.044 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 4,941 cuft
Drainage area	= 1.721 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 13.50 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

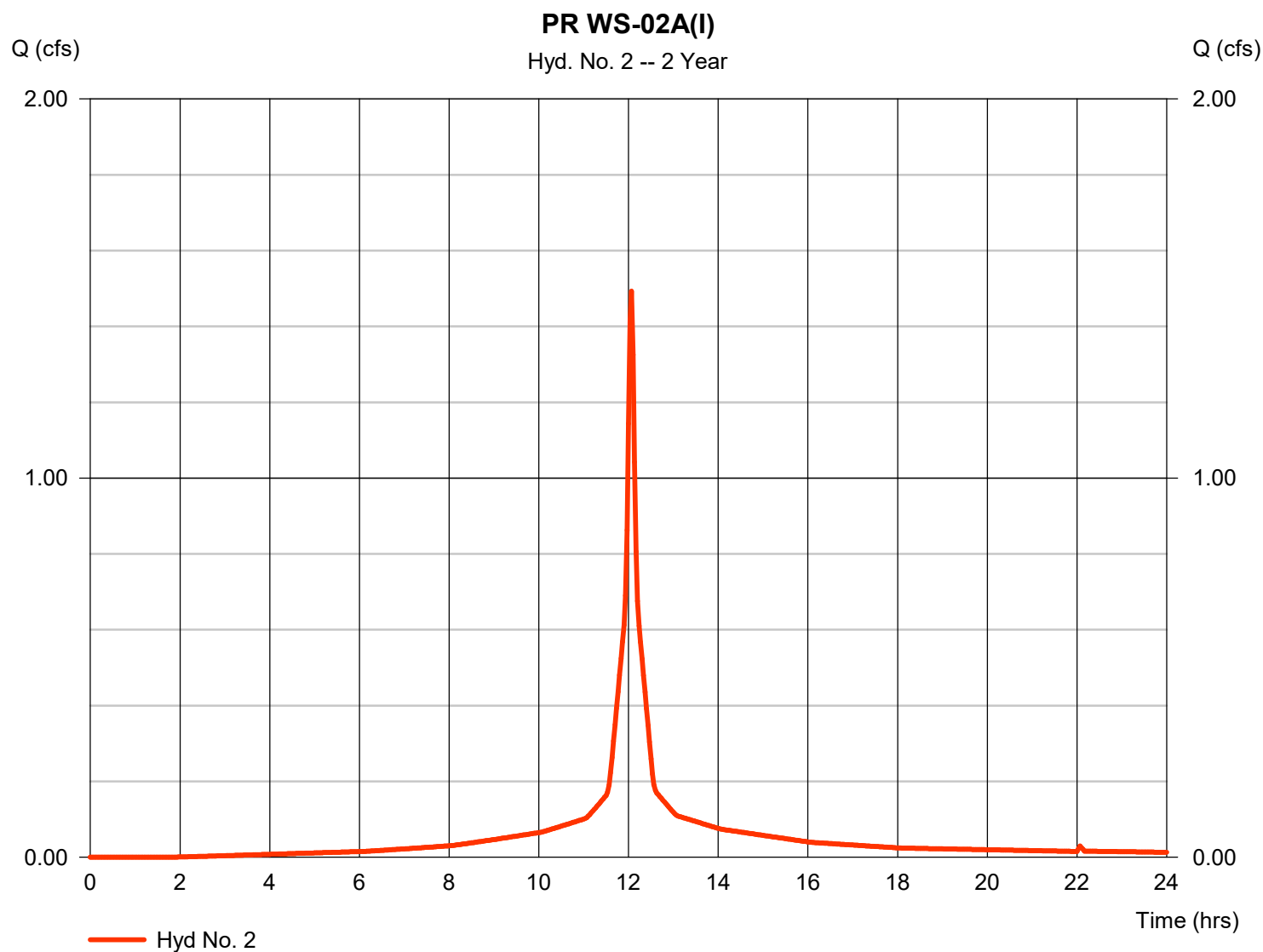
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Tuesday, 12 / 5 / 2023

Hyd. No. 2

PR WS-02A(I)

Hydrograph type	= SCS Runoff	Peak discharge	= 1.493 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 4,947 cuft
Drainage area	= 0.458 ac	Curve number	= 97
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

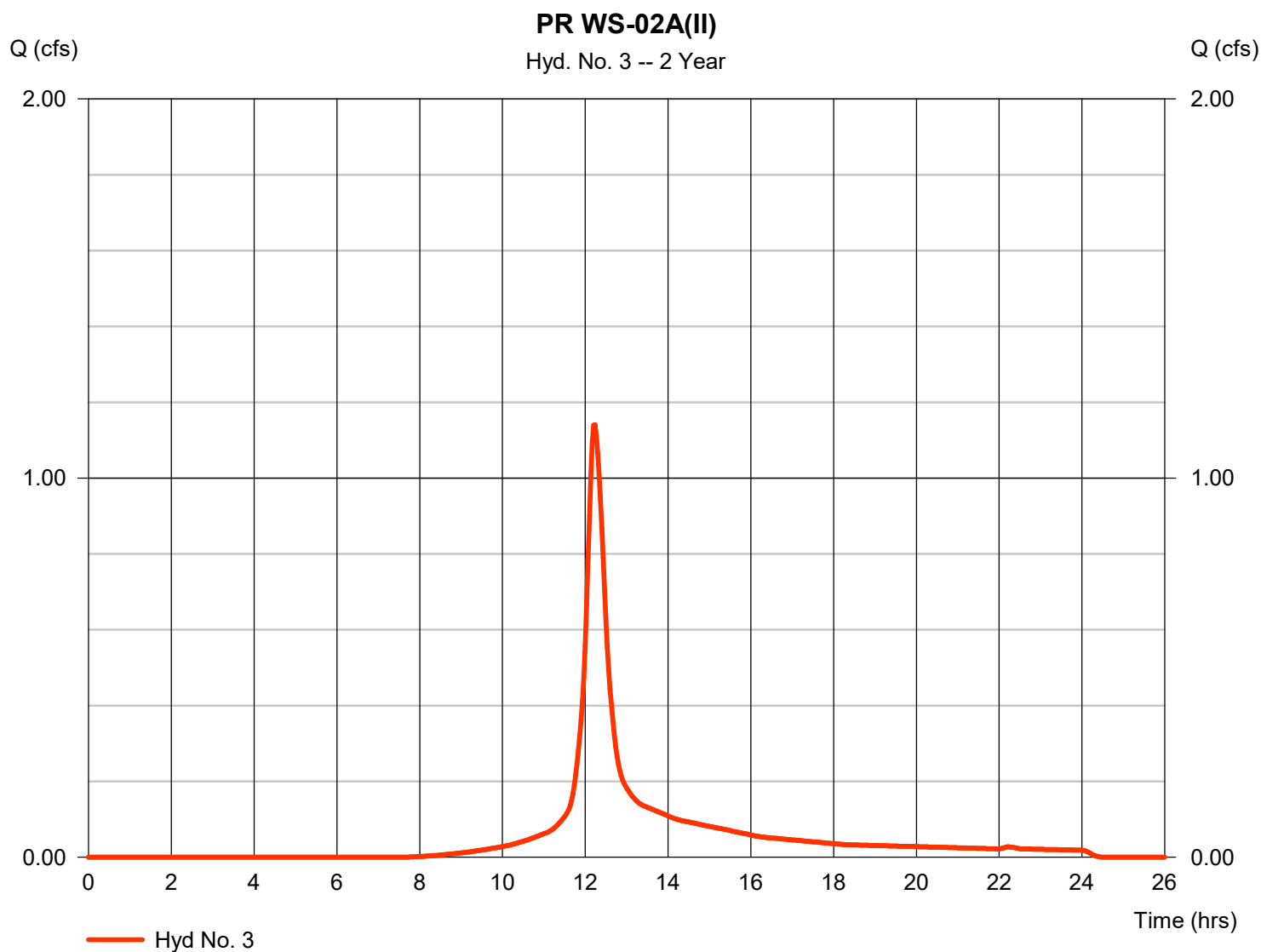
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Tuesday, 12 / 5 / 2023

Hyd. No. 3

PR WS-02A(II)

Hydrograph type	= SCS Runoff	Peak discharge	= 1.141 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 5,042 cuft
Drainage area	= 0.683 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.10 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

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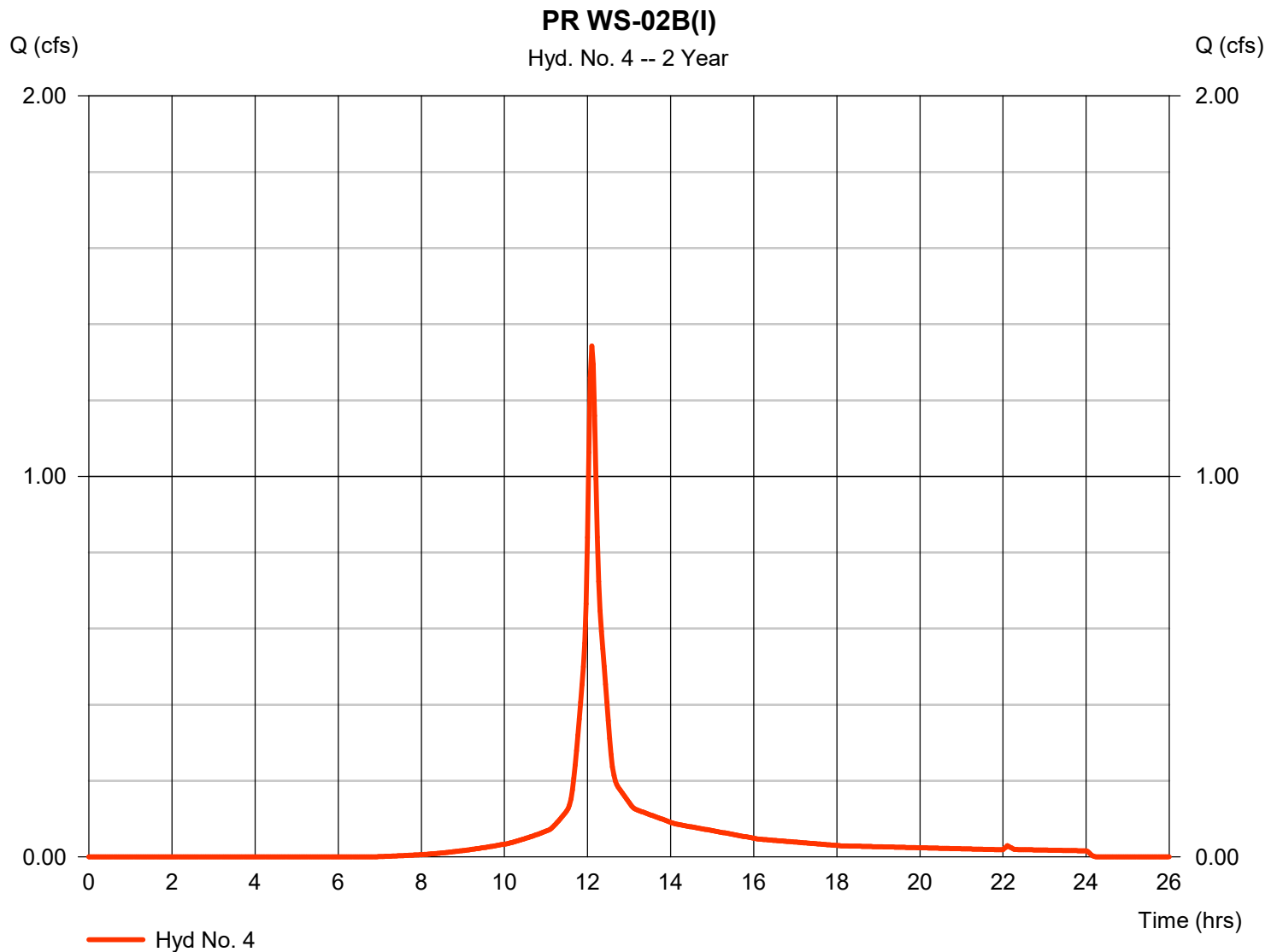
Tuesday, 12 / 5 / 2023

Hyd. No. 4

PR WS-02B(I)

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 0.576 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 3.52 in
 Storm duration = 24 hrs

Peak discharge = 1.343 cfs
 Time to peak = 12.10 hrs
 Hyd. volume = 4,598 cuft
 Curve number = 87
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 7.40 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

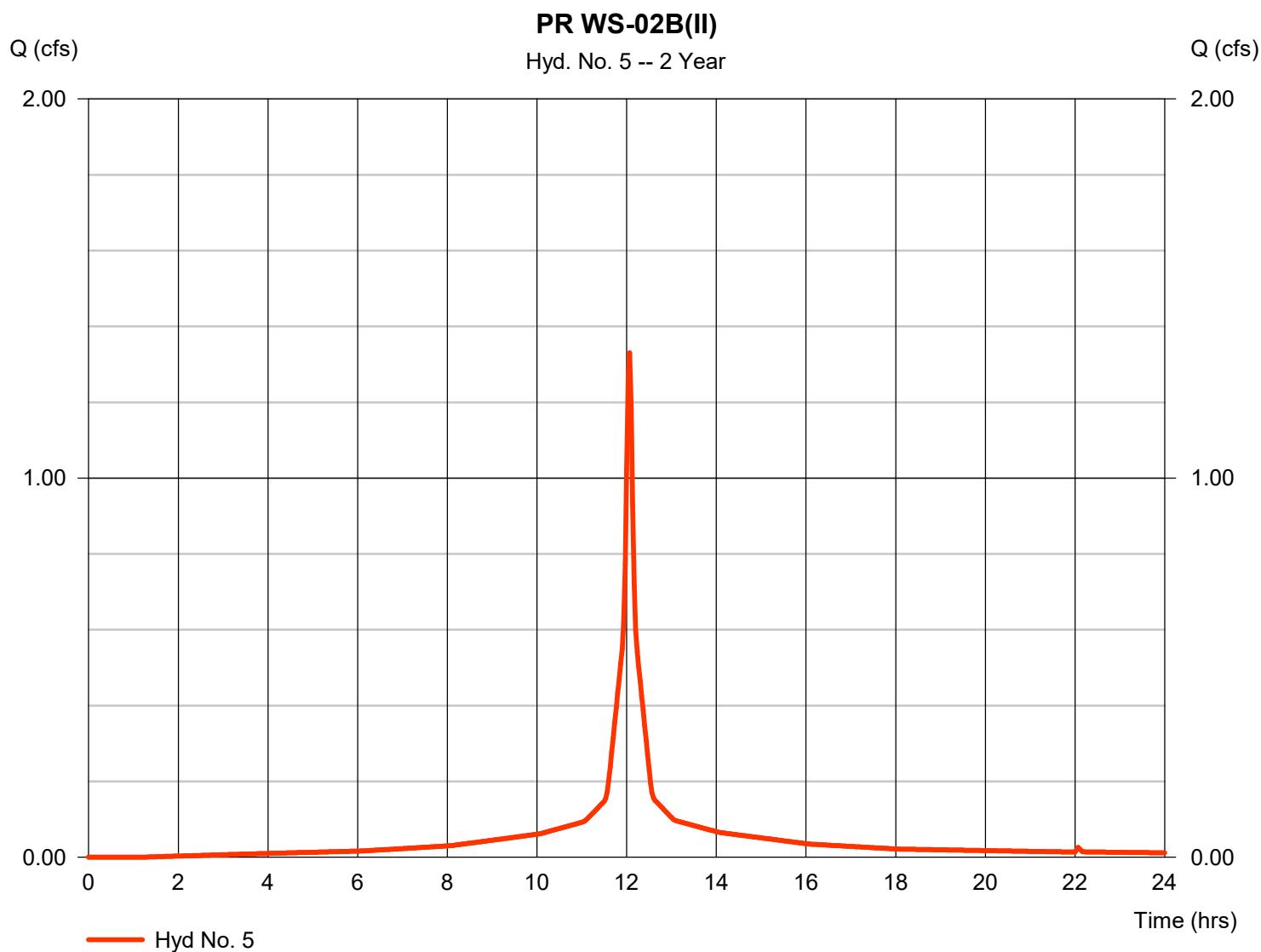
Tuesday, 12 / 5 / 2023

Hyd. No. 5

PR WS-02B(II)

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 0.403 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 3.52 in
 Storm duration = 24 hrs

Peak discharge = 1.330 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 4,507 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 5.00 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

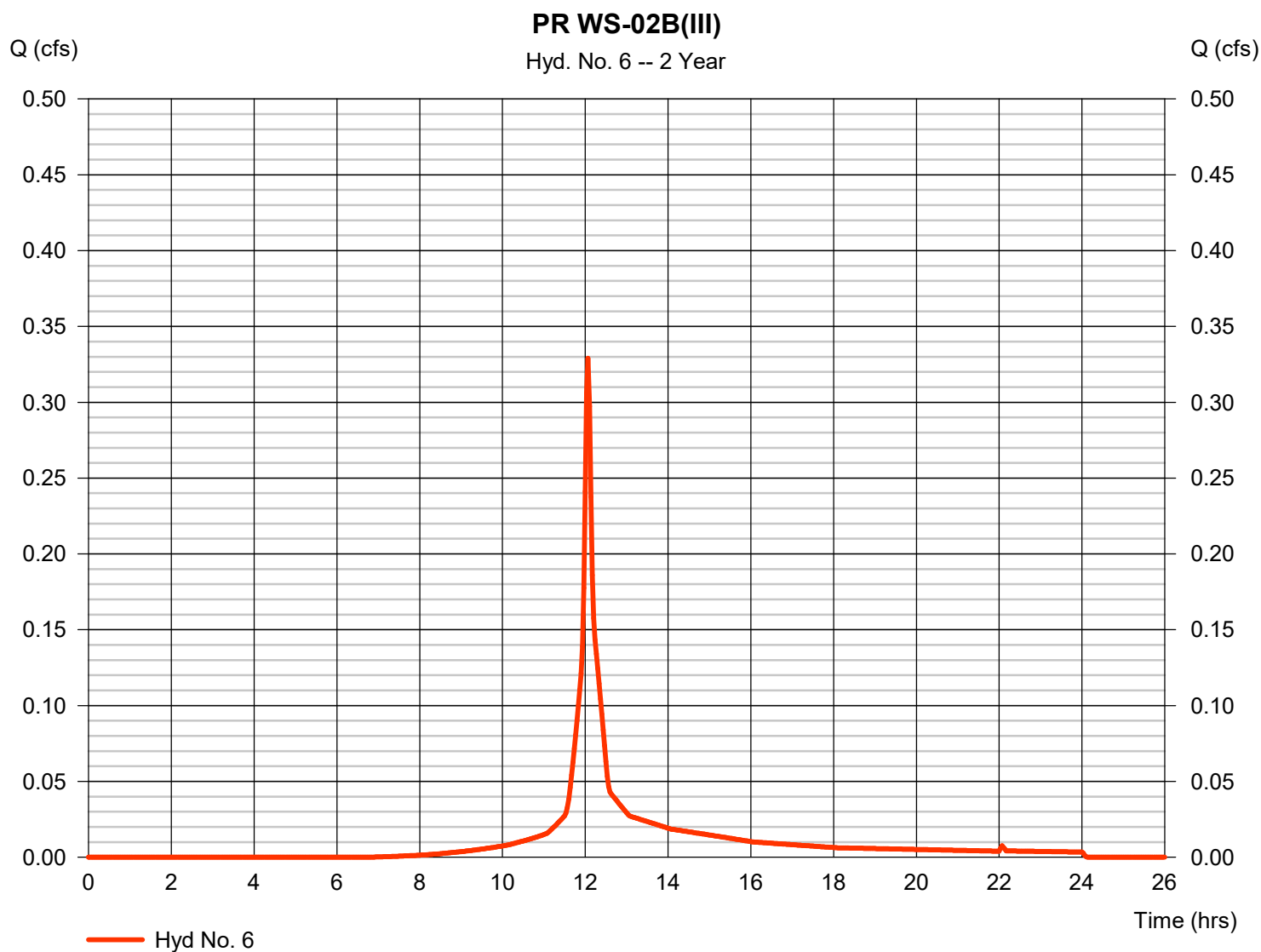
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Tuesday, 12 / 5 / 2023

Hyd. No. 6

PR WS-02B(III)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.329 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 988 cuft
Drainage area	= 0.132 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

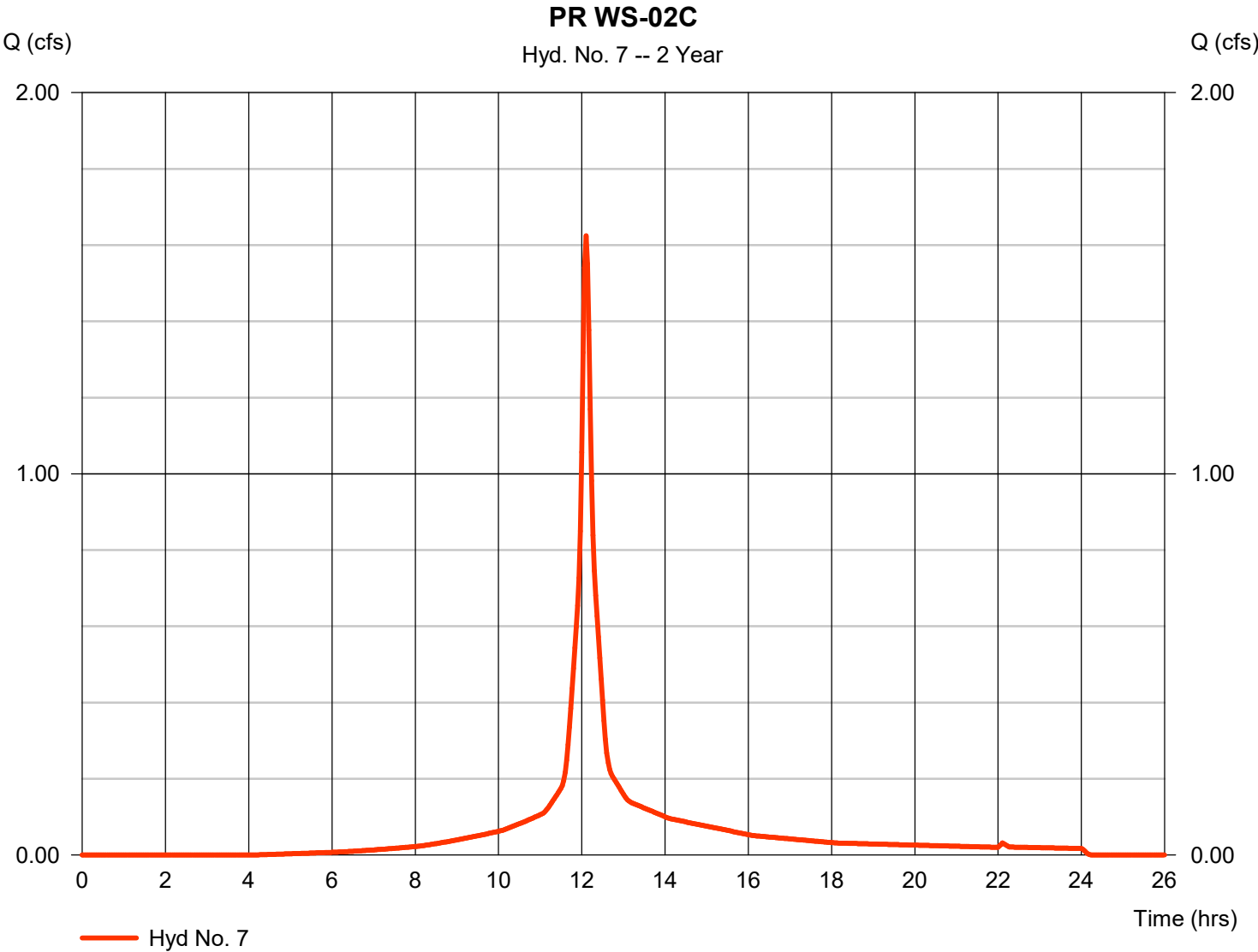
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Tuesday, 12 / 5 / 2023

Hyd. No. 7

PR WS-02C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.625 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 5,759 cuft
Drainage area	= 0.576 ac	Curve number	= 93
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.40 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

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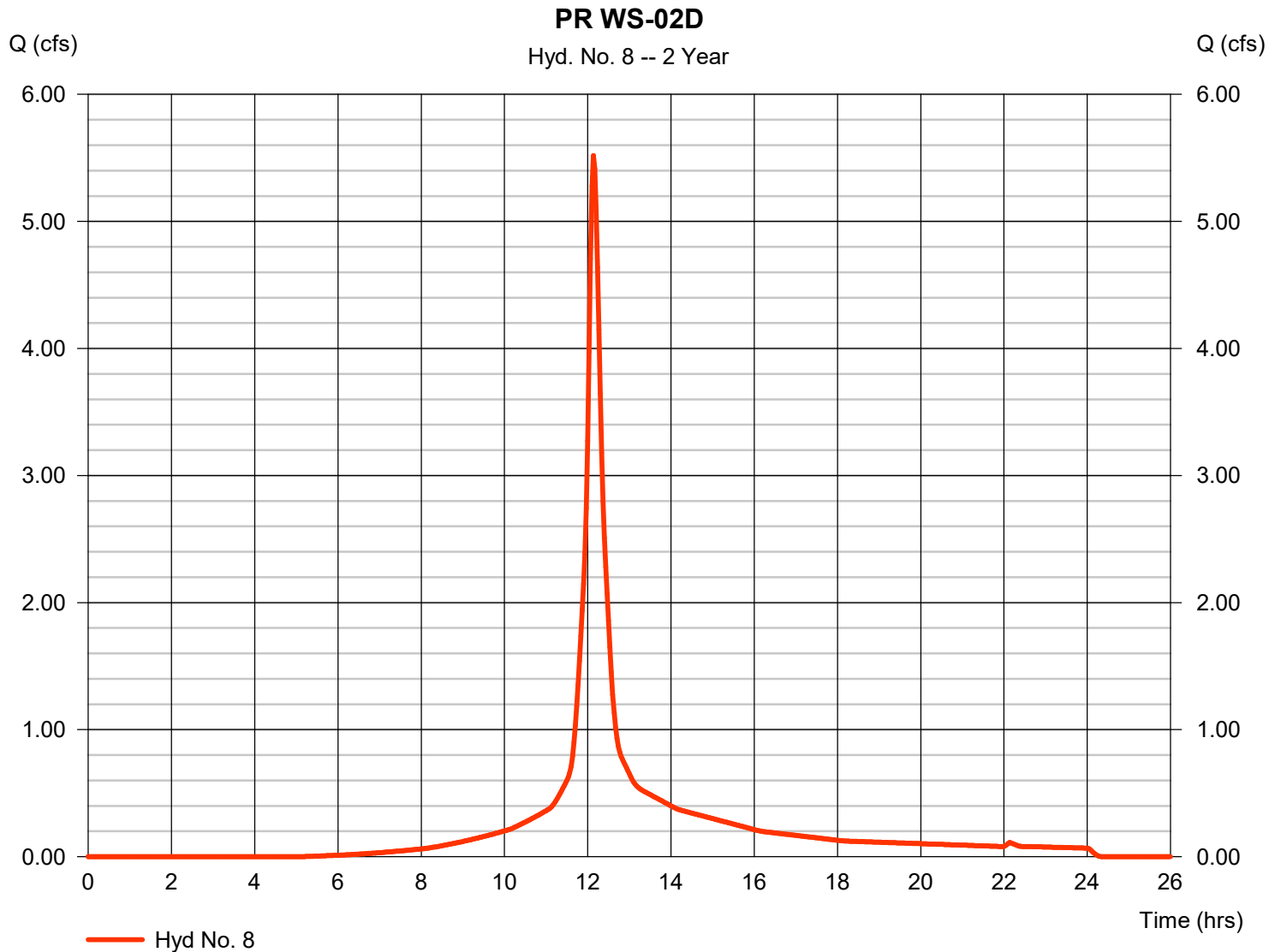
Tuesday, 12 / 5 / 2023

Hyd. No. 8

PR WS-02D

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 2.246 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 3.52 in
 Storm duration = 24 hrs

Peak discharge = 5.519 cfs
 Time to peak = 12.13 hrs
 Hyd. volume = 21,524 cuft
 Curve number = 91
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 11.10 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

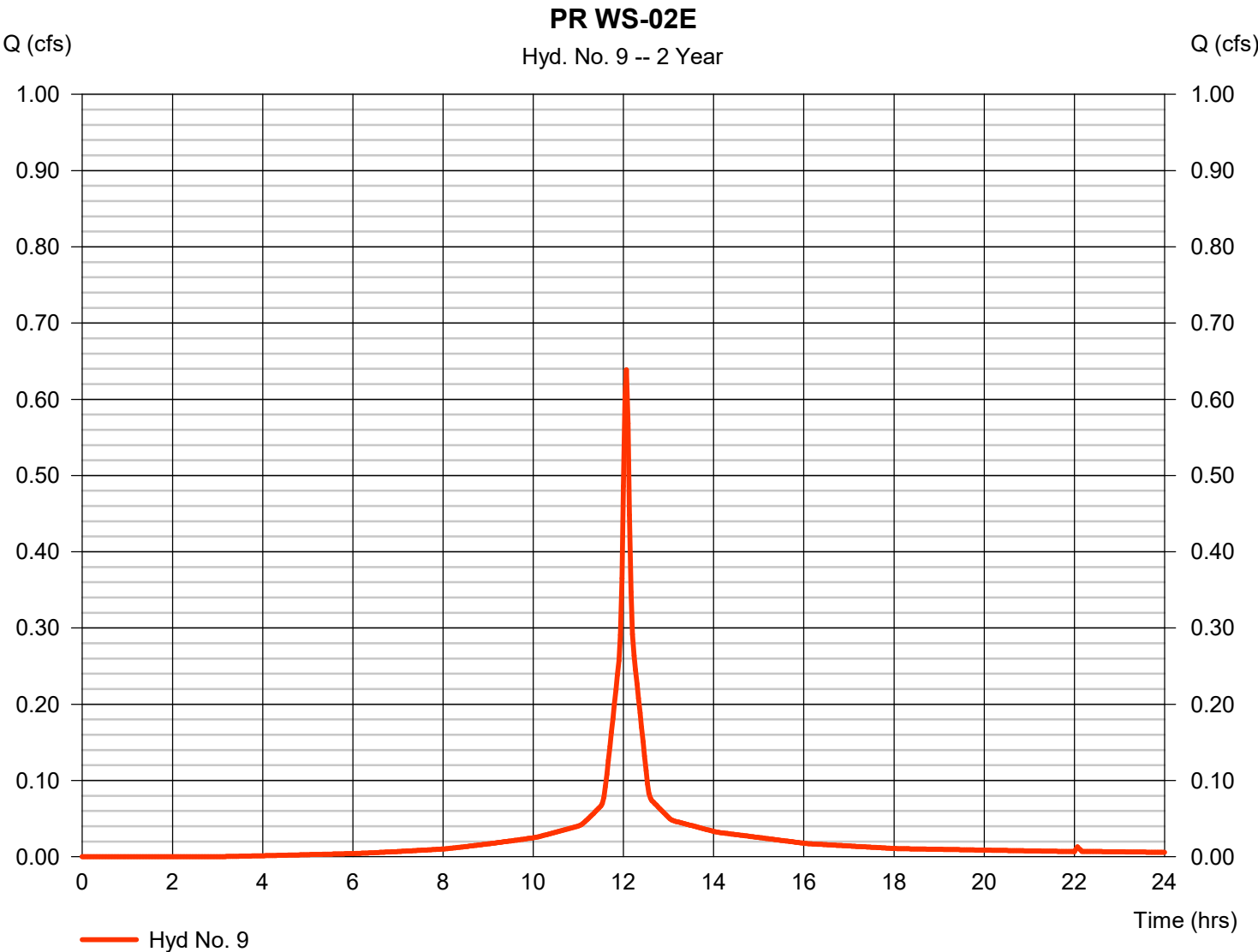
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Tuesday, 12 / 5 / 2023

Hyd. No. 9

PR WS-02E

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.639 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,044 cuft
Drainage area	=	0.203 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.52 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

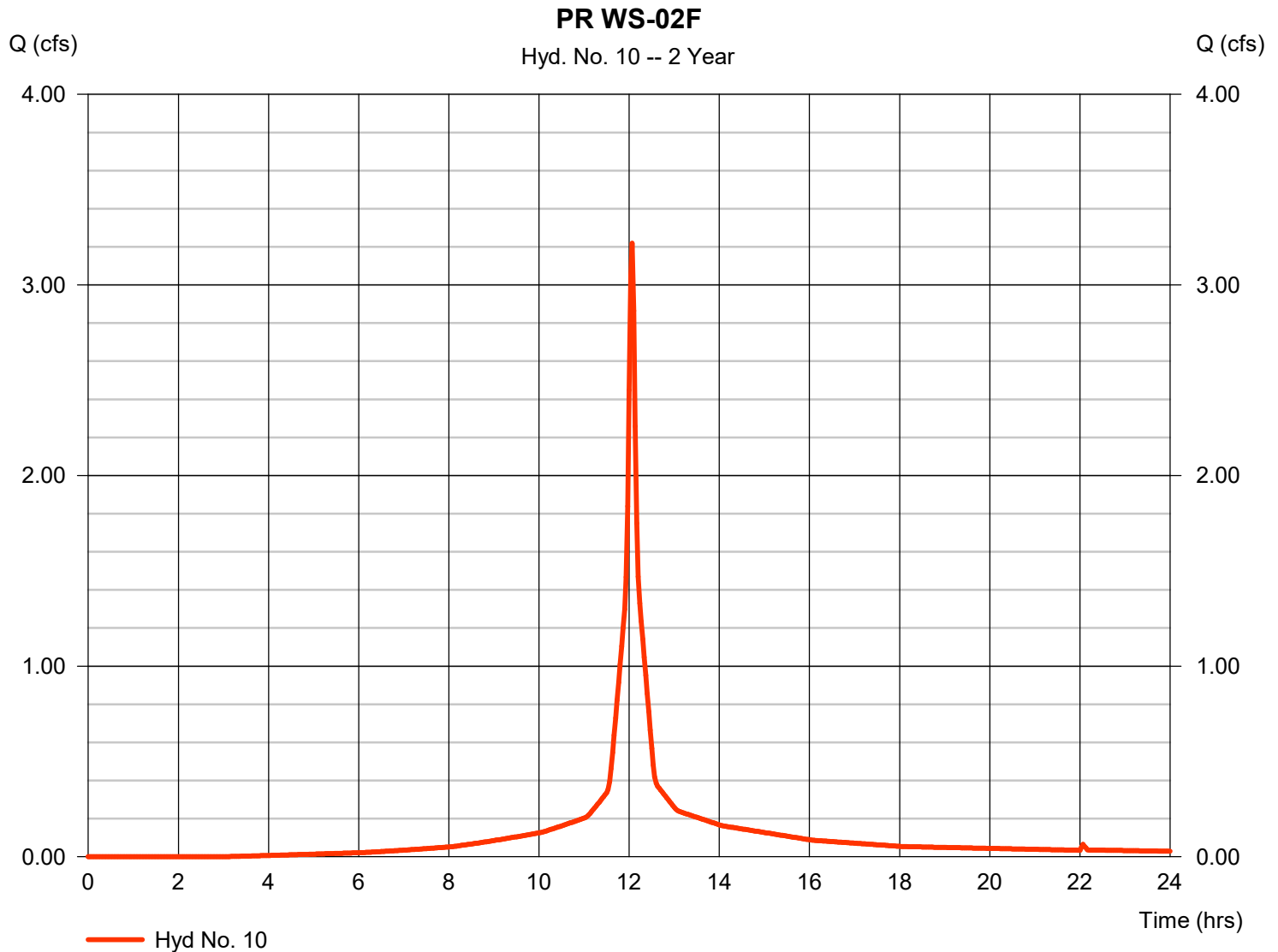
Tuesday, 12 / 5 / 2023

Hyd. No. 10

PR WS-02F

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 1.023 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 3.52 in
 Storm duration = 24 hrs

Peak discharge = 3.218 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 10,300 cuft
 Curve number = 95
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 5.00 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

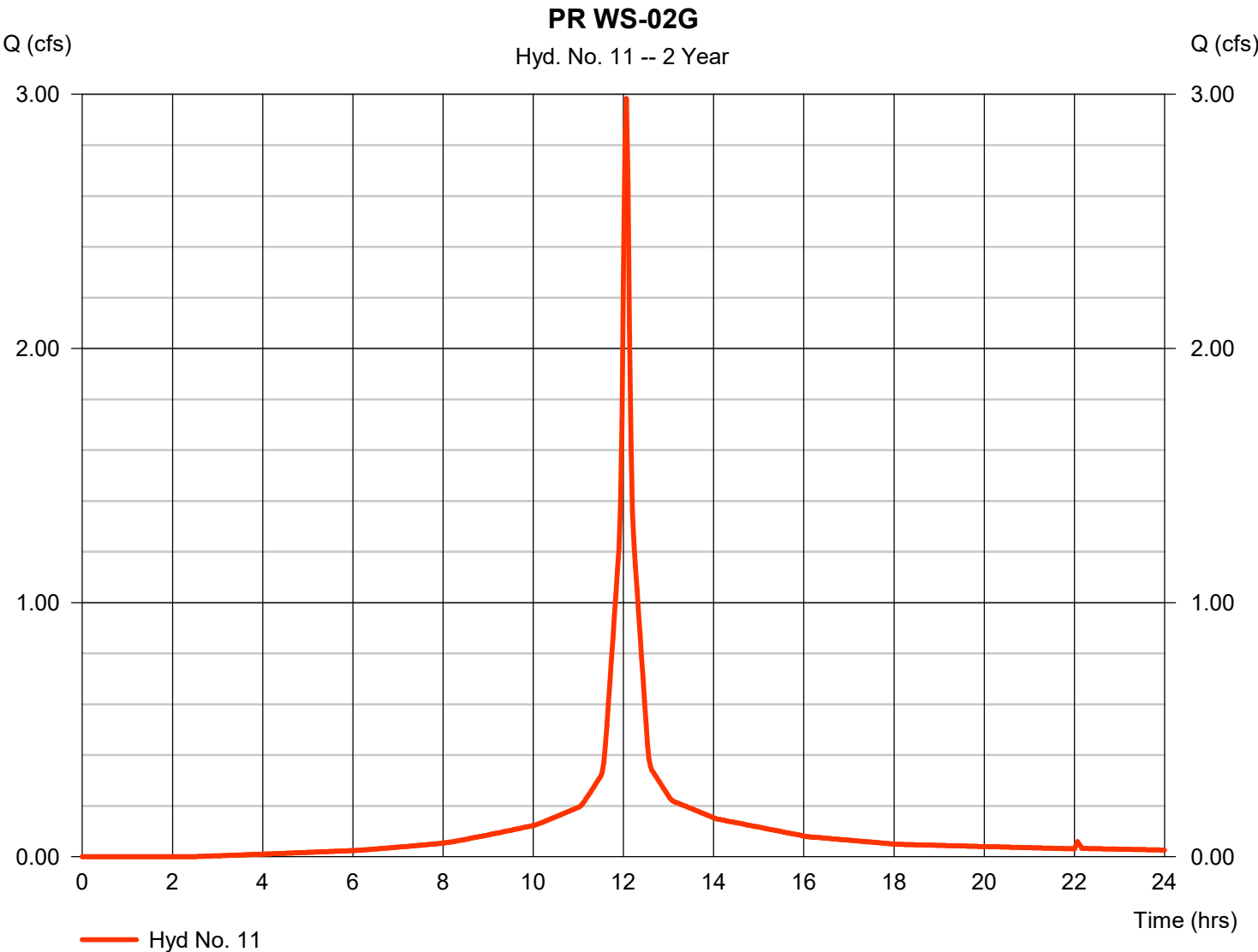
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Tuesday, 12 / 5 / 2023

Hyd. No. 11

PR WS-02G

Hydrograph type	= SCS Runoff	Peak discharge	= 2.983 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 9,701 cuft
Drainage area	= 0.930 ac	Curve number	= 96
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

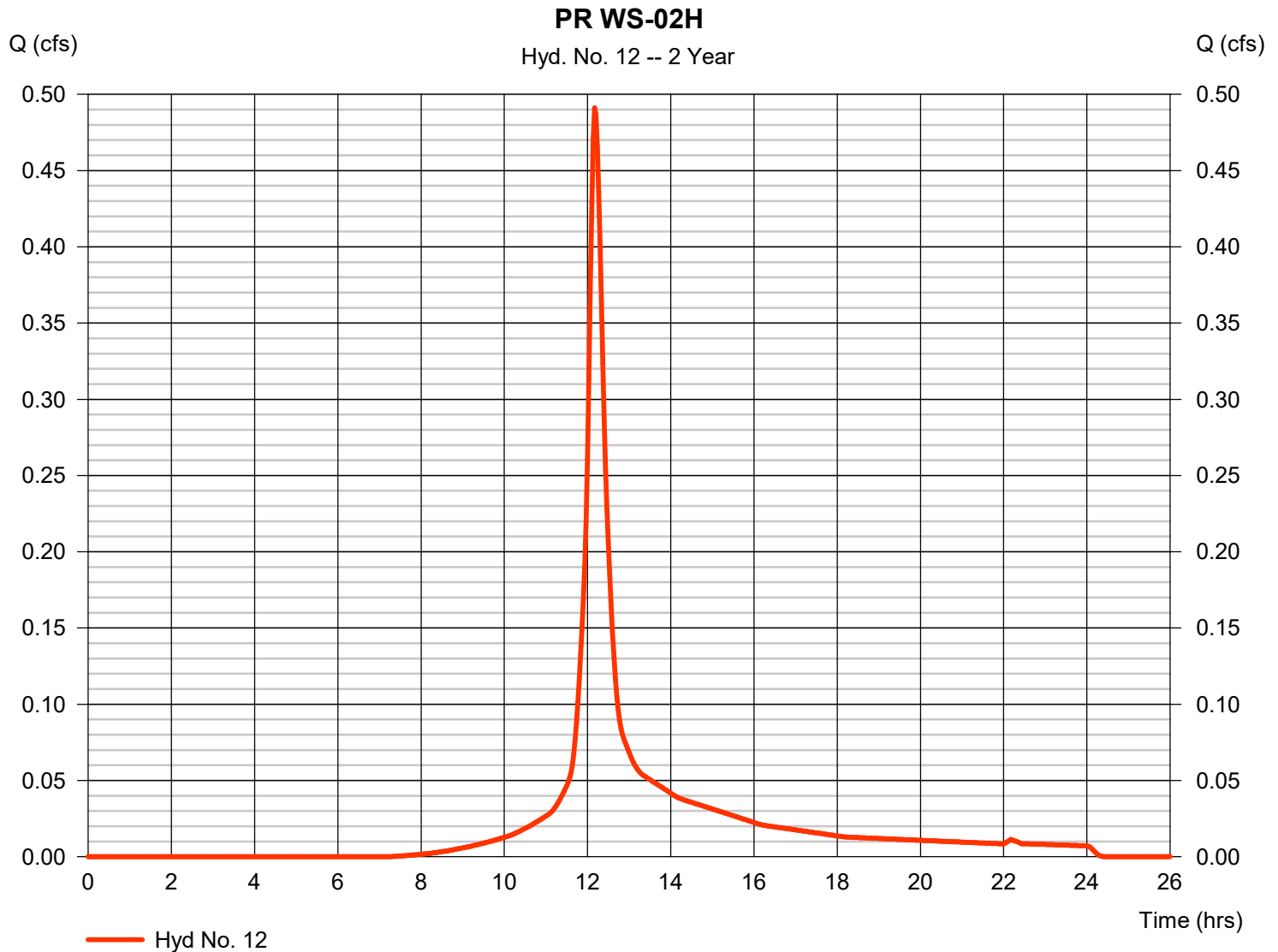
Tuesday, 12 / 5 / 2023

Hyd. No. 12

PR WS-02H

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 0.267 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 3.52 in
 Storm duration = 24 hrs

Peak discharge = 0.491 cfs
 Time to peak = 12.17 hrs
 Hyd. volume = 2,000 cuft
 Curve number = 86
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 13.80 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

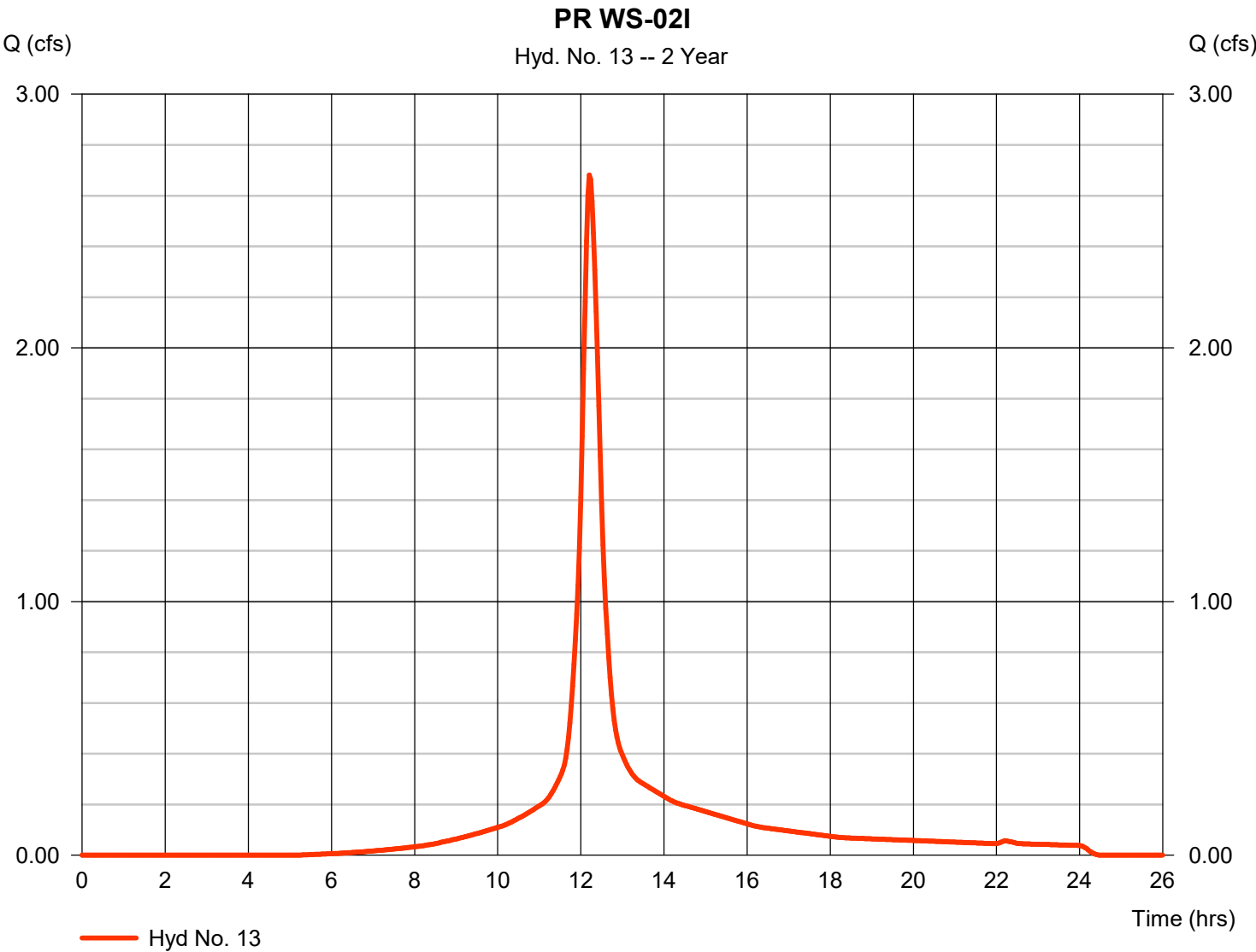
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Tuesday, 12 / 5 / 2023

Hyd. No. 13

PR WS-02I

Hydrograph type	= SCS Runoff	Peak discharge	= 2.681 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 12,044 cuft
Drainage area	= 1.296 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.60 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

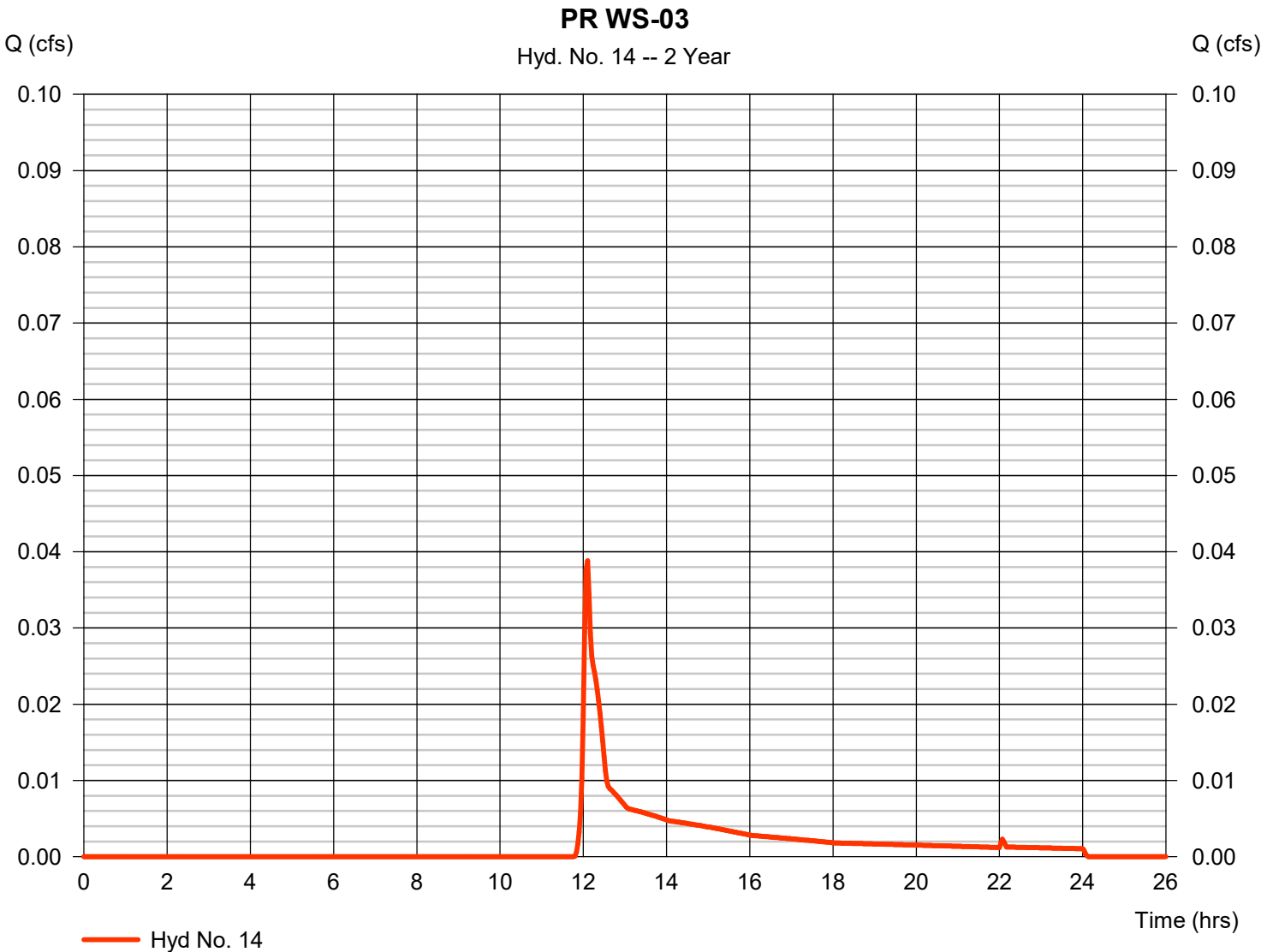
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 5 / 2023

Hyd. No. 14

PR WS-03

Hydrograph type	= SCS Runoff	Peak discharge	= 0.039 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 160 cuft
Drainage area	= 0.081 ac	Curve number	= 61
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.10 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



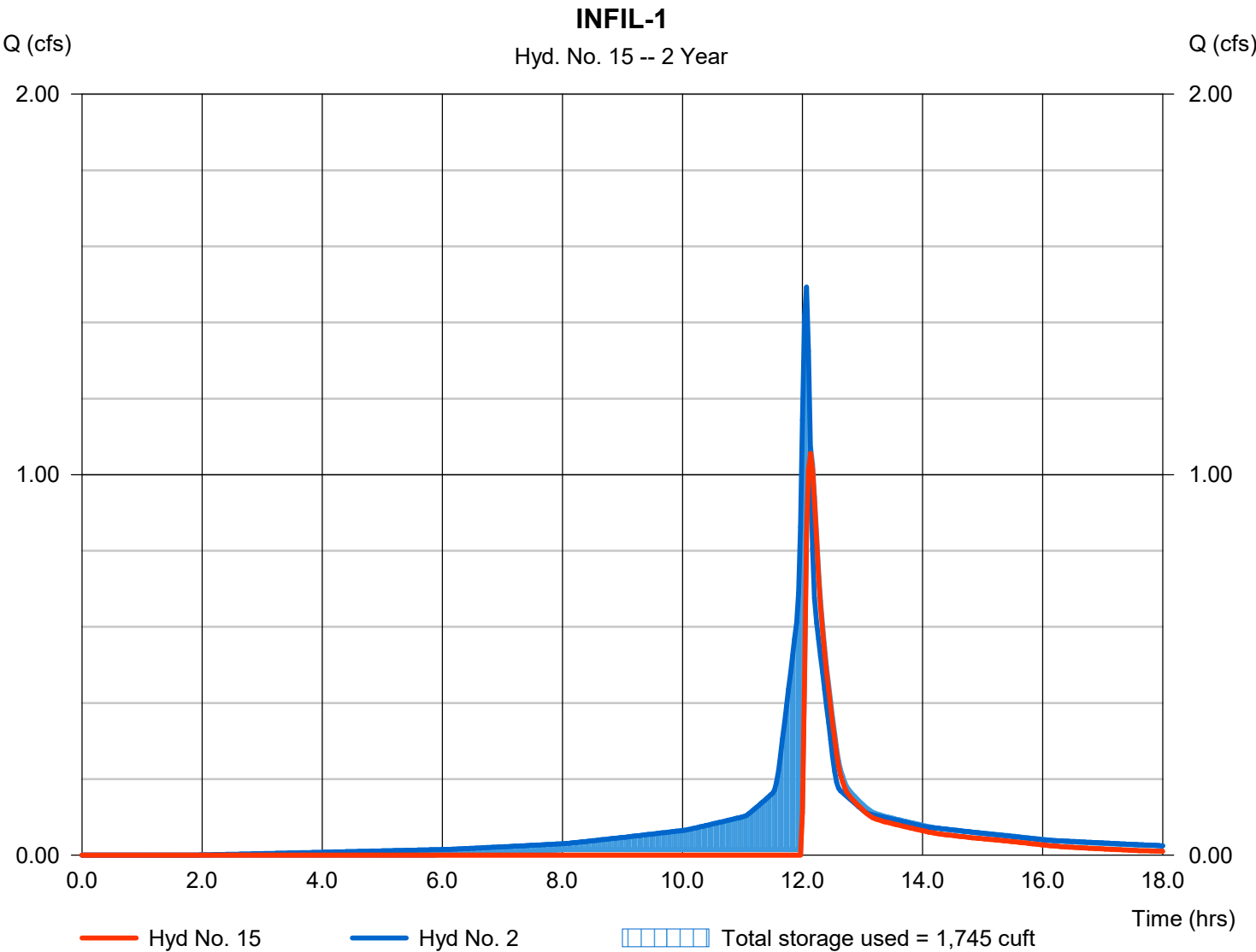
Hydrograph Report

Hyd. No. 15

INFIL-1

Hydrograph type	= Reservoir	Peak discharge	= 1.056 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 2,364 cuft
Inflow hyd. No.	= 2 - PR WS-02A(I)	Max. Elevation	= 144.98 ft
Reservoir name	= INFIL-1	Max. Storage	= 1,745 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 10 - INFIL-1

Pond Data

UG Chambers -Invert elev. = 142.25 ft, Rise x Span = 3.75 x 4.80 ft, Barrel Len = 48.72 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 141.50 ft, Width = 7.79 ft, Height = 5.50 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	141.50	n/a	0	0
0.55	142.05	n/a	167	167
1.10	142.60	n/a	265	432
1.65	143.15	n/a	319	751
2.20	143.70	n/a	313	1,065
2.75	144.25	n/a	304	1,369
3.30	144.80	n/a	289	1,658
3.85	145.35	n/a	268	1,926
4.40	145.90	n/a	232	2,159
4.95	146.45	n/a	171	2,330
5.50	147.00	n/a	167	2,497

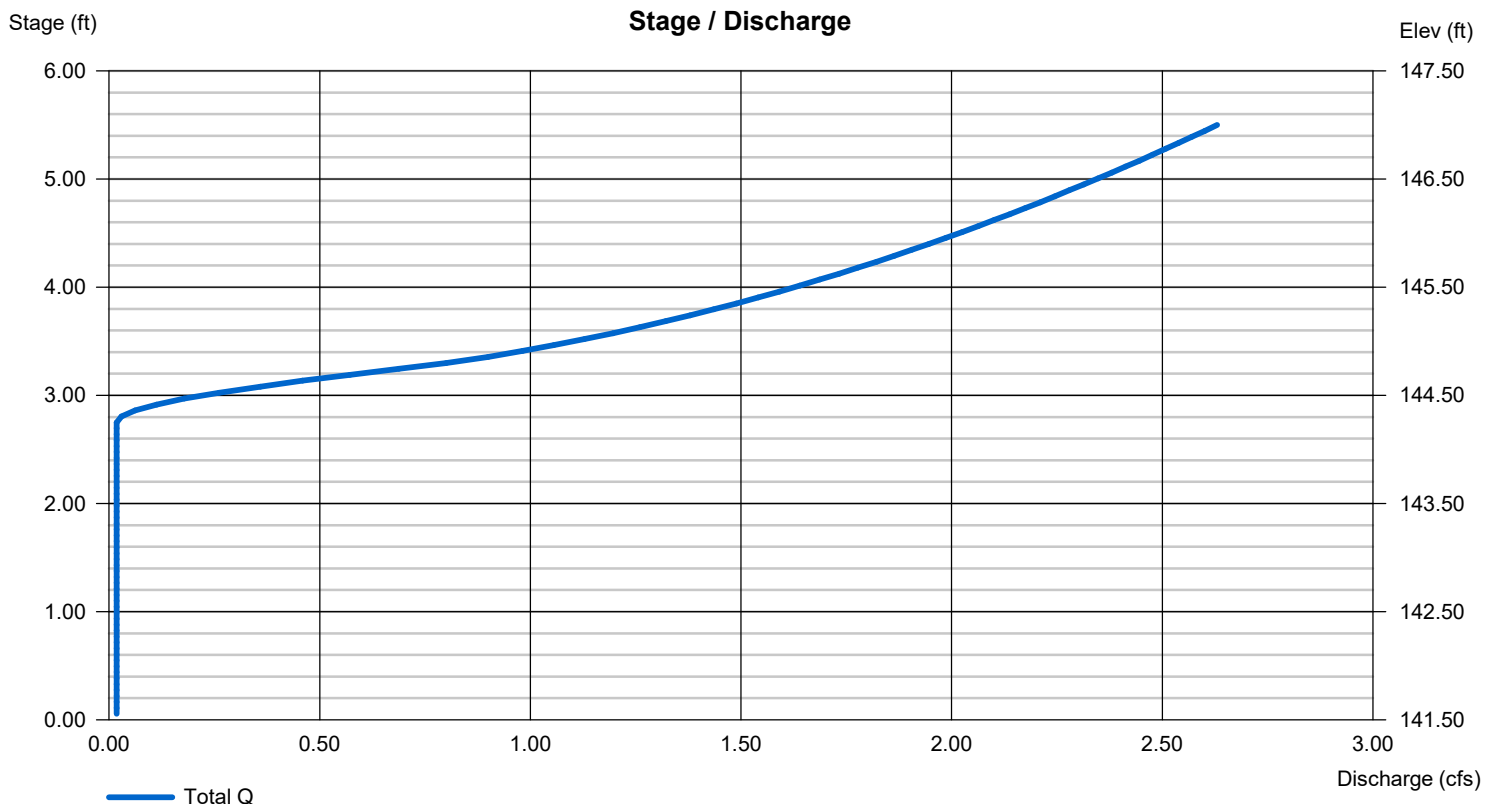
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	8.00	0.00	0.00
Span (in)	= 12.00	8.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 142.95	144.25	0.00	0.00
Length (ft)	= 20.00	0.50	0.00	0.00
Slope (%)	= 1.00	1.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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

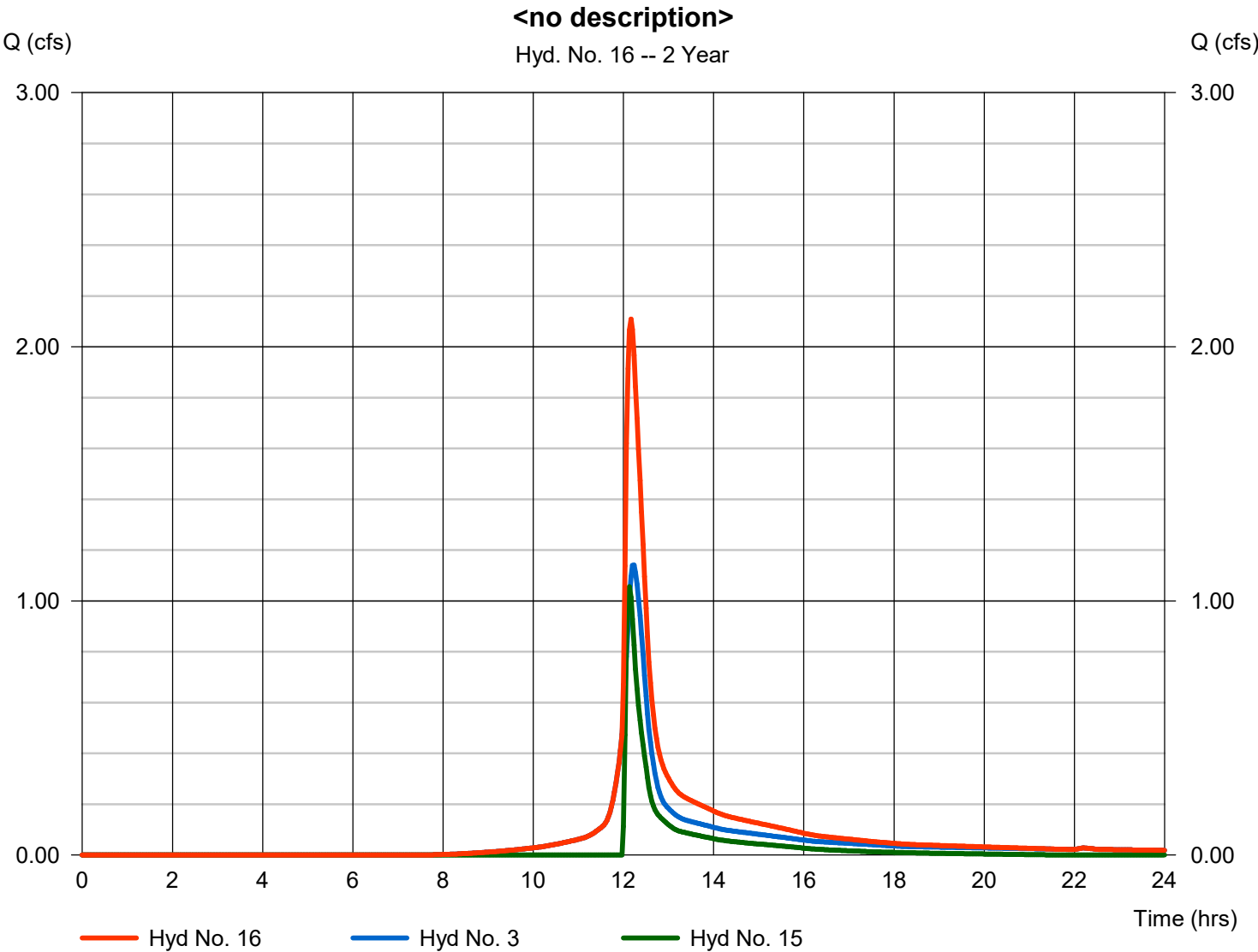


Hydrograph Report

Hyd. No. 16

<no description>

Hydrograph type	= Combine	Peak discharge	= 2.109 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 7,406 cuft
Inflow hyds.	= 3, 15	Contrib. drain. area	= 0.683 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

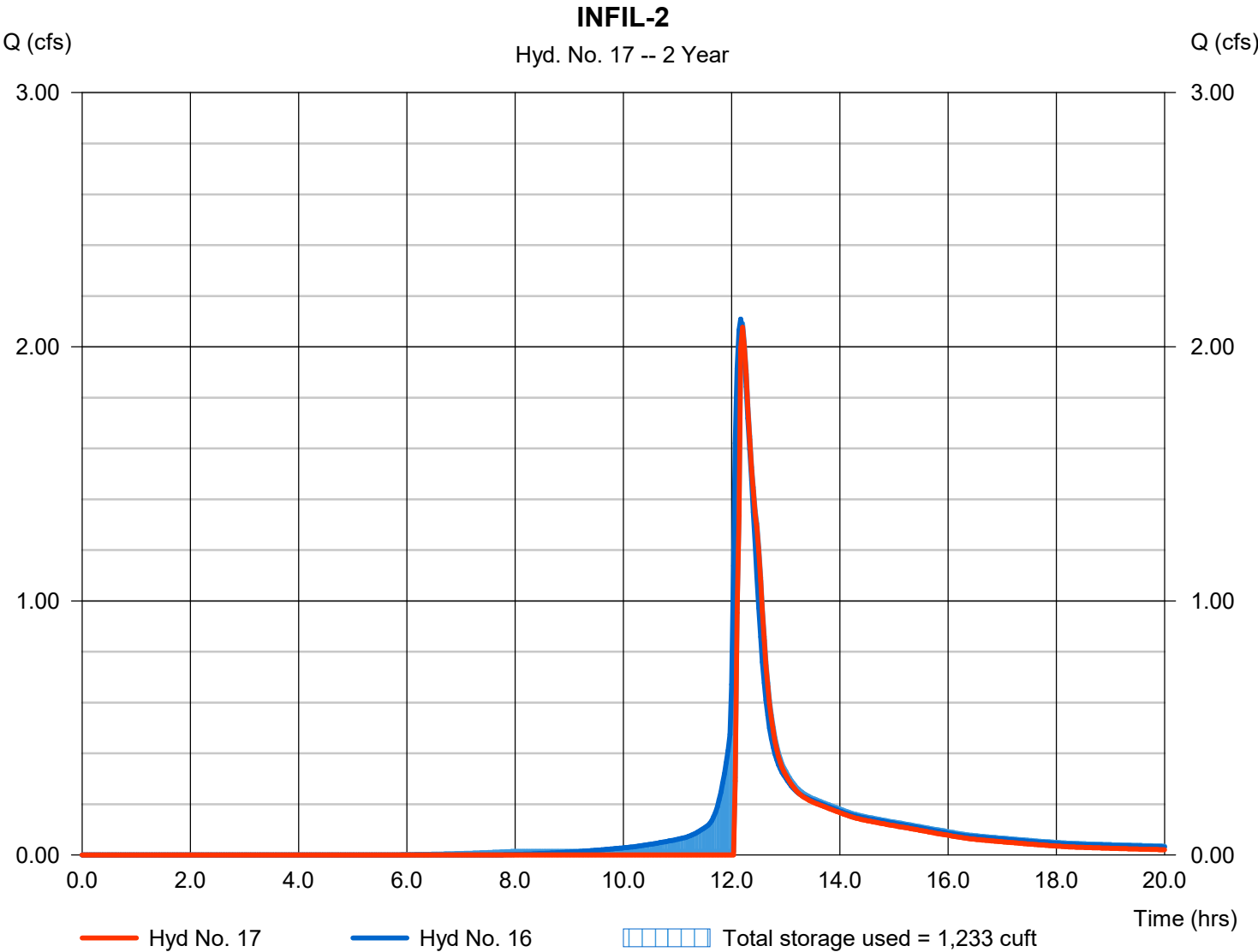
Tuesday, 12 / 5 / 2023

Hyd. No. 17

INFIL-2

Hydrograph type	= Reservoir	Peak discharge	= 2.076 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 5,871 cuft
Inflow hyd. No.	= 16 - <no description>	Max. Elevation	= 136.61 ft
Reservoir name	= INFIL-2	Max. Storage	= 1,233 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - INFIL-2

Pond Data

UG Chambers -Invert elev. = 133.75 ft, Rise x Span = 3.75 x 4.85 ft, Barrel Len = 63.06 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 133.00 ft, Width = 8.42 ft, Height = 5.50 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	133.00	n/a	0	0
0.55	133.55	n/a	117	117
1.10	134.10	n/a	181	298
1.65	134.65	n/a	216	514
2.20	135.20	n/a	213	727
2.75	135.75	n/a	206	933
3.30	136.30	n/a	197	1,130
3.85	136.85	n/a	183	1,313
4.40	137.40	n/a	160	1,472
4.95	137.95	n/a	120	1,592
5.50	138.50	n/a	117	1,709

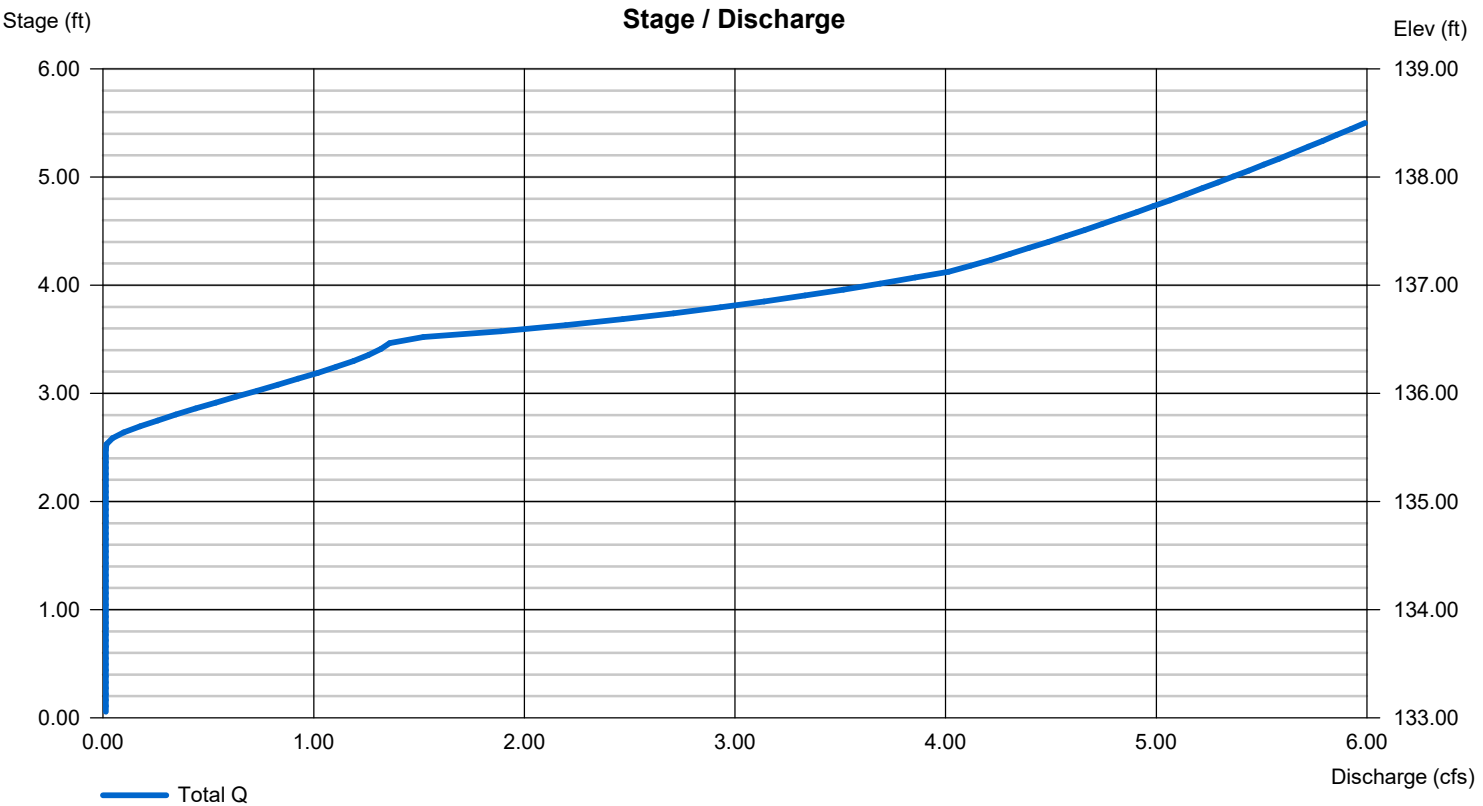
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	Inactive	Inactive	Inactive
Span (in)	= 12.00	10.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 135.50	136.00	0.00	0.00
Length (ft)	= 8.00	0.50	0.00	0.00
Slope (%)	= 1.00	1.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	Inactive	Inactive	Inactive
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

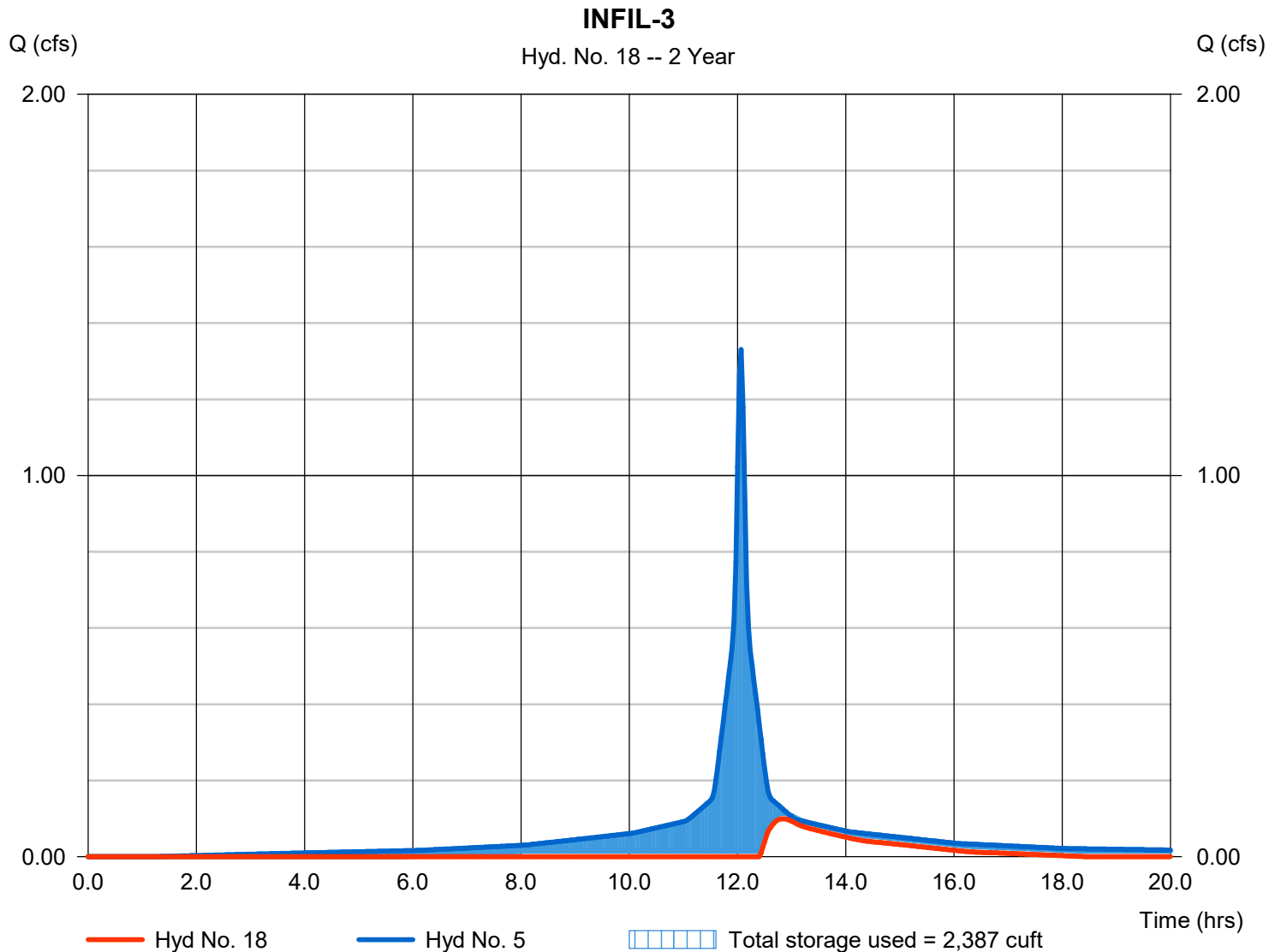
Tuesday, 12 / 5 / 2023

Hyd. No. 18

INFIL-3

Hydrograph type	= Reservoir	Peak discharge	= 0.099 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.83 hrs
Time interval	= 2 min	Hyd. volume	= 711 cuft
Inflow hyd. No.	= 5 - PR WS-02B(II)	Max. Elevation	= 143.86 ft
Reservoir name	= INFIL-3	Max. Storage	= 2,387 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 9 - INFIL-3

Pond Data

UG Chambers -Invert elev. = 141.35 ft, Rise x Span = 3.75 x 4.93 ft, Barrel Len = 70.23 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 140.60 ft, Width = 7.79 ft, Height = 5.50 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	140.60	n/a	0	0
0.55	141.15	n/a	241	241
1.10	141.70	n/a	386	627
1.65	142.25	n/a	466	1,093
2.20	142.80	n/a	458	1,550
2.75	143.35	n/a	443	1,994
3.30	143.90	n/a	422	2,416
3.85	144.45	n/a	390	2,806
4.40	145.00	n/a	338	3,144
4.95	145.55	n/a	247	3,391
5.50	146.10	n/a	241	3,632

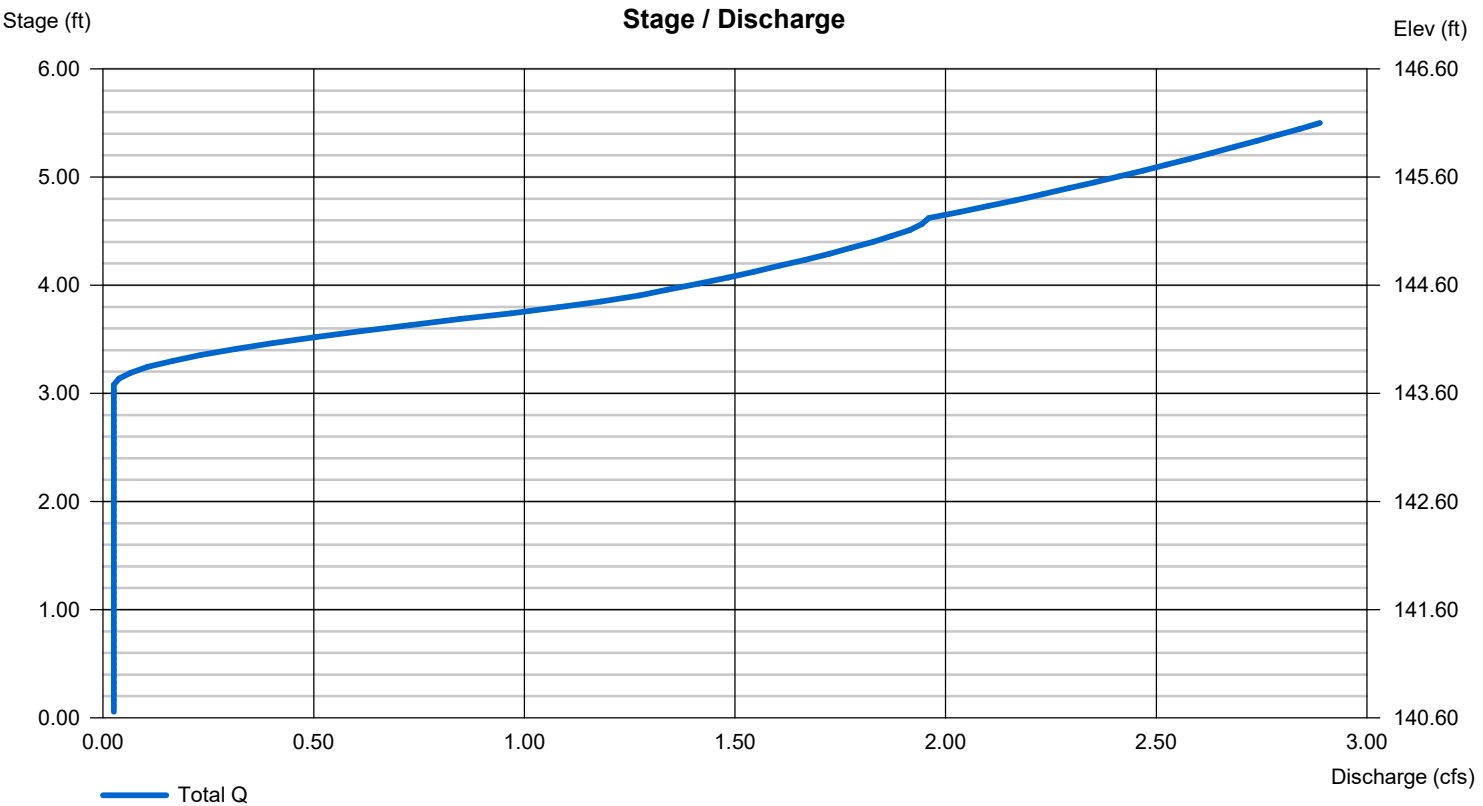
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	10.00	0.00	0.00
Span (in)	= 12.00	10.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 143.67	143.67	0.00	0.00
Length (ft)	= 19.00	0.50	0.00	0.00
Slope (%)	= 1.00	1.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

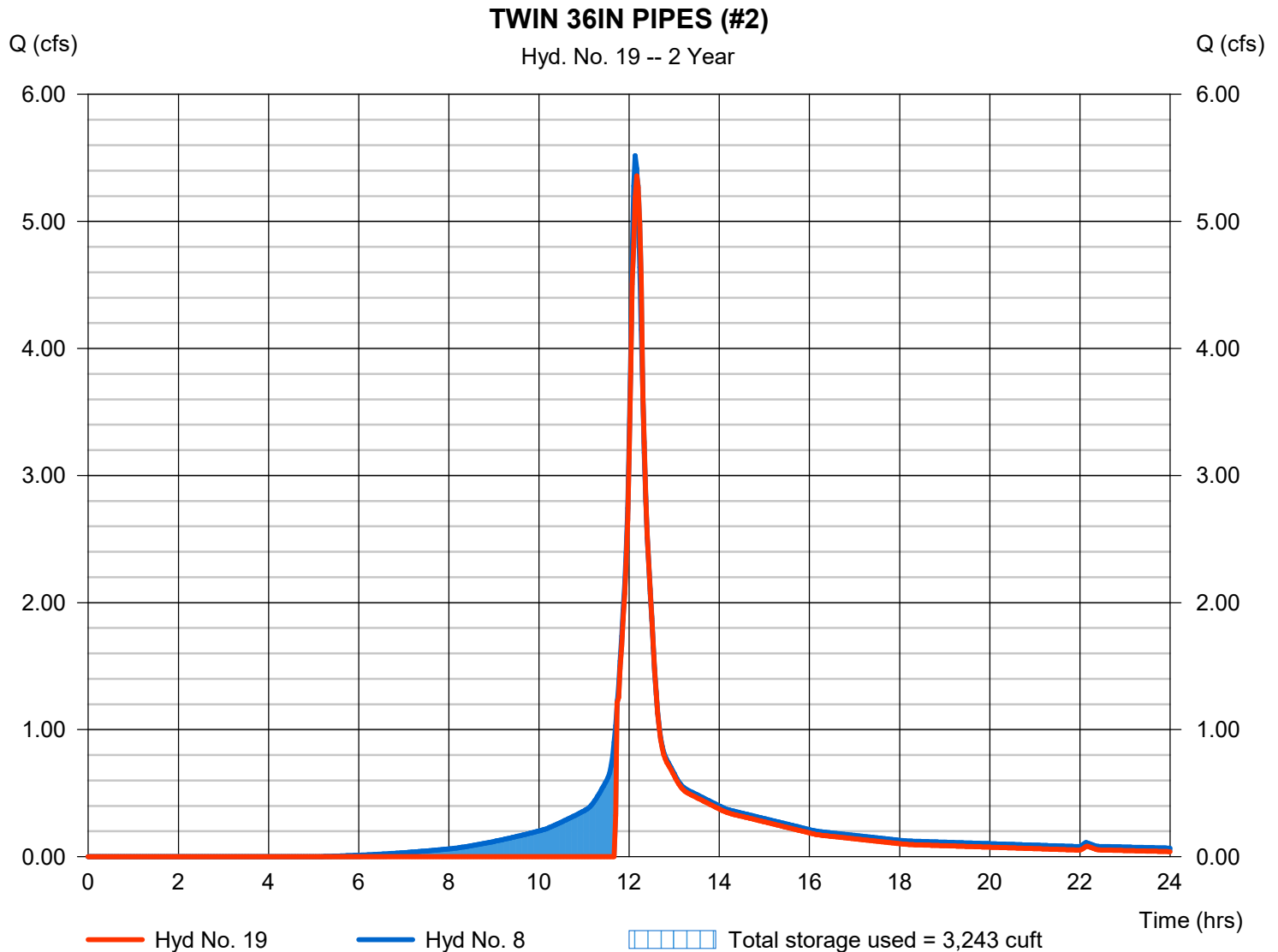
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Hyd. No. 19

TWIN 36IN PIPES (#2)

Hydrograph type	= Reservoir	Peak discharge	= 5.358 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 16,803 cuft
Inflow hyd. No.	= 8 - PR WS-02D	Max. Elevation	= 139.02 ft
Reservoir name	= Northern Twin 36IN	Max. Storage	= 3,243 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 6 - Northern Twin 36IN

Pond Data

UG Chambers -Invert elev. = 131.00 ft, Rise x Span = 3.00 x 3.00 ft, Barrel Len = 120.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = No Headers, Culvert defined w/cent 100.50 ft, Ultra 5.00 ft barrel height, 0.50 ft void sum 40.00 ft
End of section -Beginning Elevation = 138.30 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	130.50	n/a	0	0
0.35	130.85	n/a	168	168
0.70	131.20	n/a	197	365
1.05	131.55	n/a	267	632
1.40	131.90	n/a	297	929
1.75	132.25	n/a	313	1,242
2.10	132.60	n/a	319	1,561
2.45	132.95	n/a	316	1,877
2.80	133.30	n/a	305	2,182
3.15	133.65	n/a	282	2,464
3.50	134.00	n/a	234	2,698
7.80	138.30	01	2	2,701
8.50	139.00	1,250	438	3,138
9.50	140.00	7,570	4,410	7,548

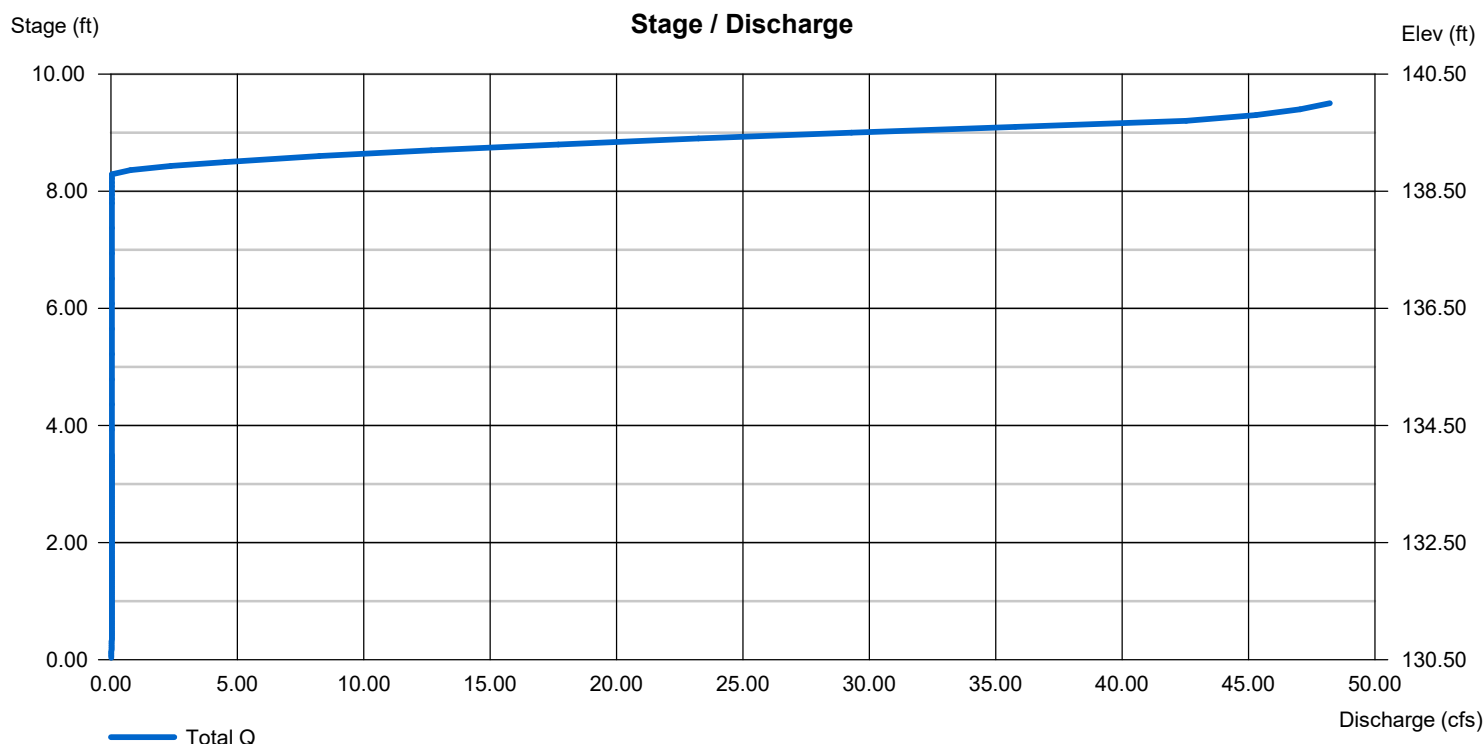
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	Inactive	Inactive	Inactive
Span (in)	= 30.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 134.20	0.00	0.00	0.00
Length (ft)	= 69.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 138.80	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

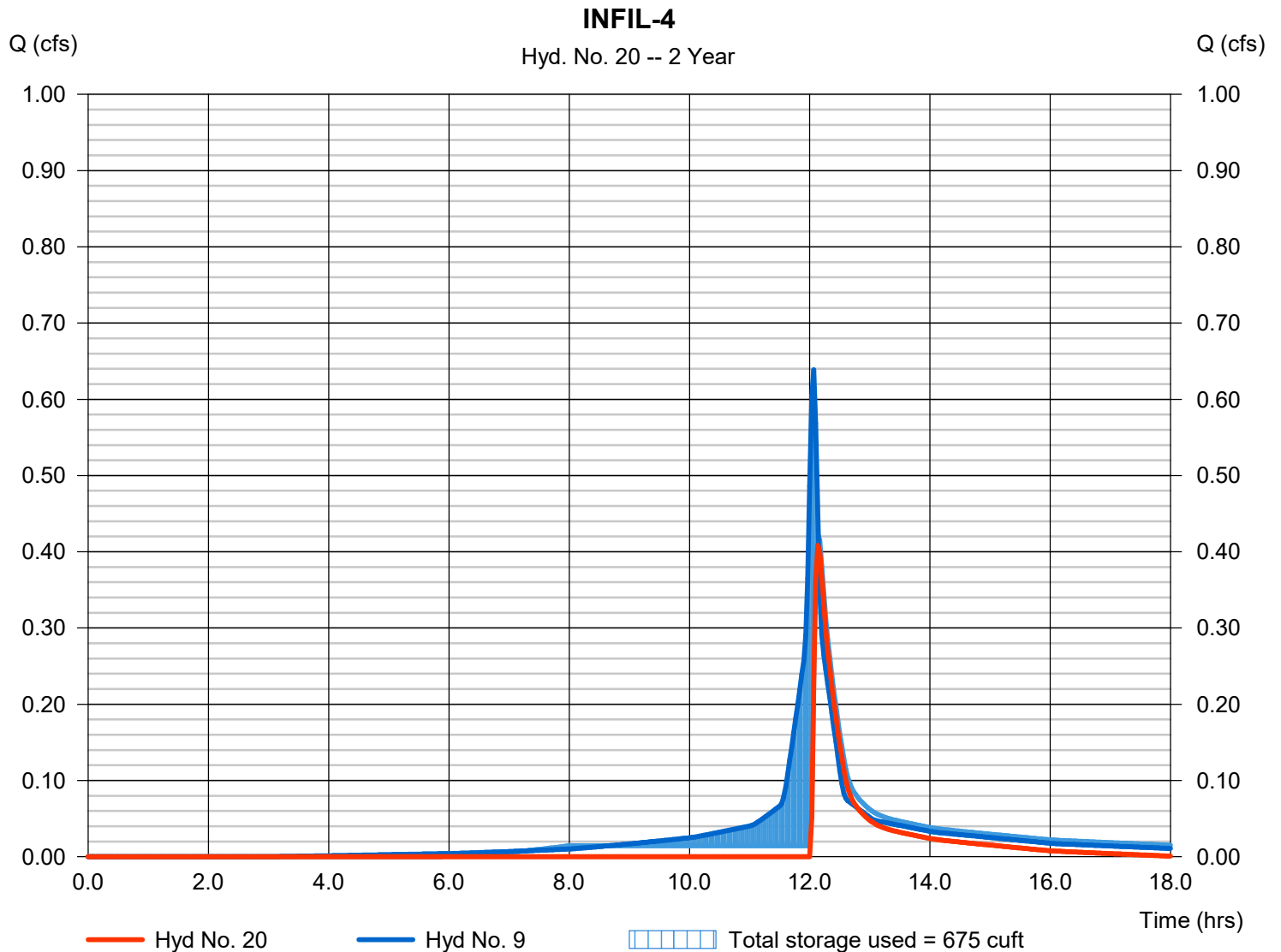
Tuesday, 12 / 5 / 2023

Hyd. No. 20

INFIL-4

Hydrograph type	= Reservoir	Peak discharge	= 0.408 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 858 cuft
Inflow hyd. No.	= 9 - PR WS-02E	Max. Elevation	= 137.44 ft
Reservoir name	= INFIL-4	Max. Storage	= 675 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 2 - INFIL-4

Pond Data

UG Chambers -Invert elev. = 136.00 ft, Rise x Span = 2.50 x 3.05 ft, Barrel Len = 46.34 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 135.25 ft, Width = 5.50 ft, Height = 3.75 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	135.25	n/a	0	0
0.38	135.63	n/a	76	76
0.75	136.00	n/a	76	153
1.13	136.38	n/a	140	293
1.50	136.75	n/a	138	431
1.88	137.13	n/a	135	567
2.25	137.50	n/a	131	697
2.63	137.88	n/a	123	820
3.00	138.25	n/a	112	932
3.38	138.63	n/a	89	1,021
3.75	139.00	n/a	76	1,098

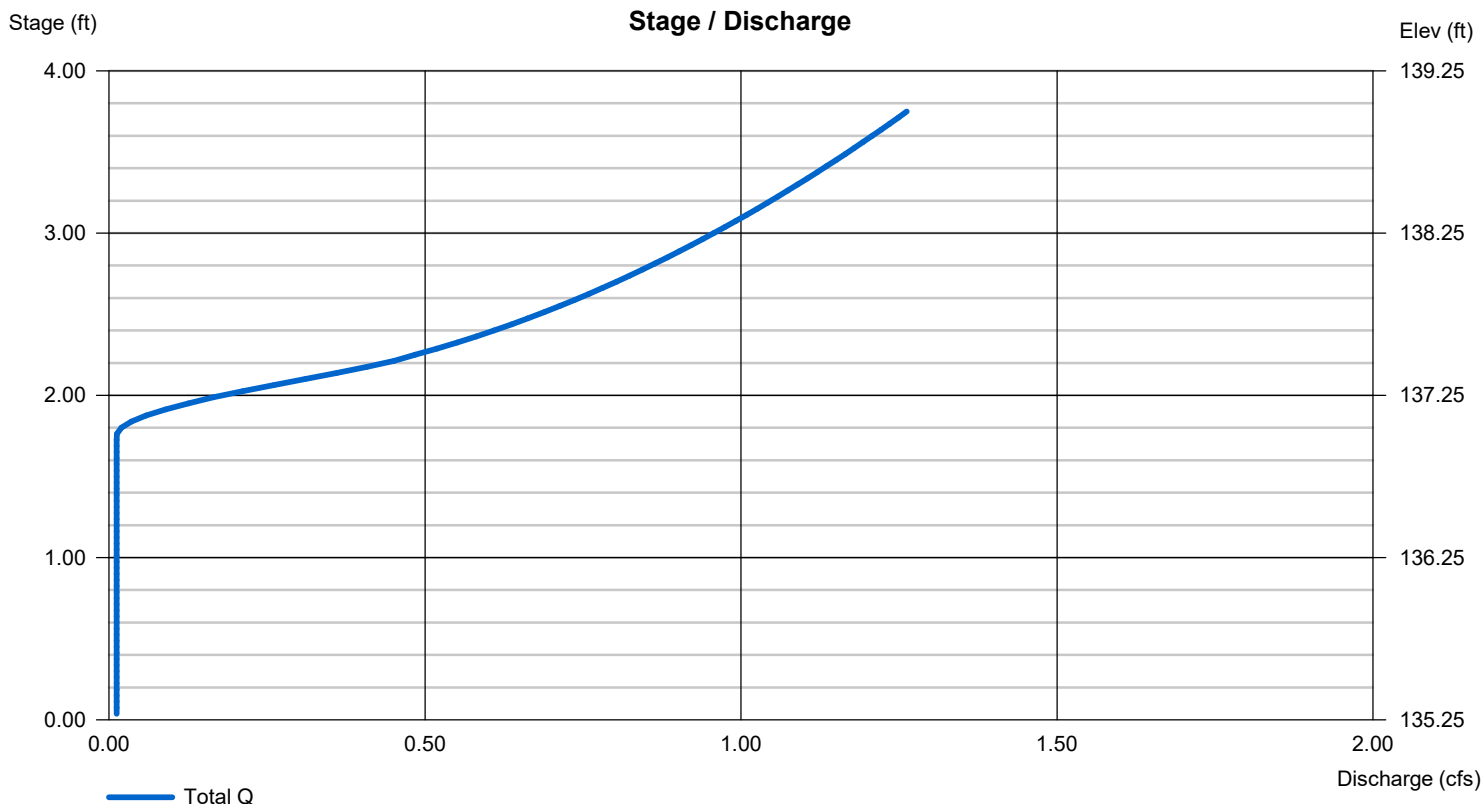
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	6.00	Inactive	Inactive
Span (in)	= 12.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 136.45	137.00	0.00	0.00
Length (ft)	= 28.00	0.50	0.00	0.00
Slope (%)	= 1.00	1.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	Inactive	Inactive	Inactive
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

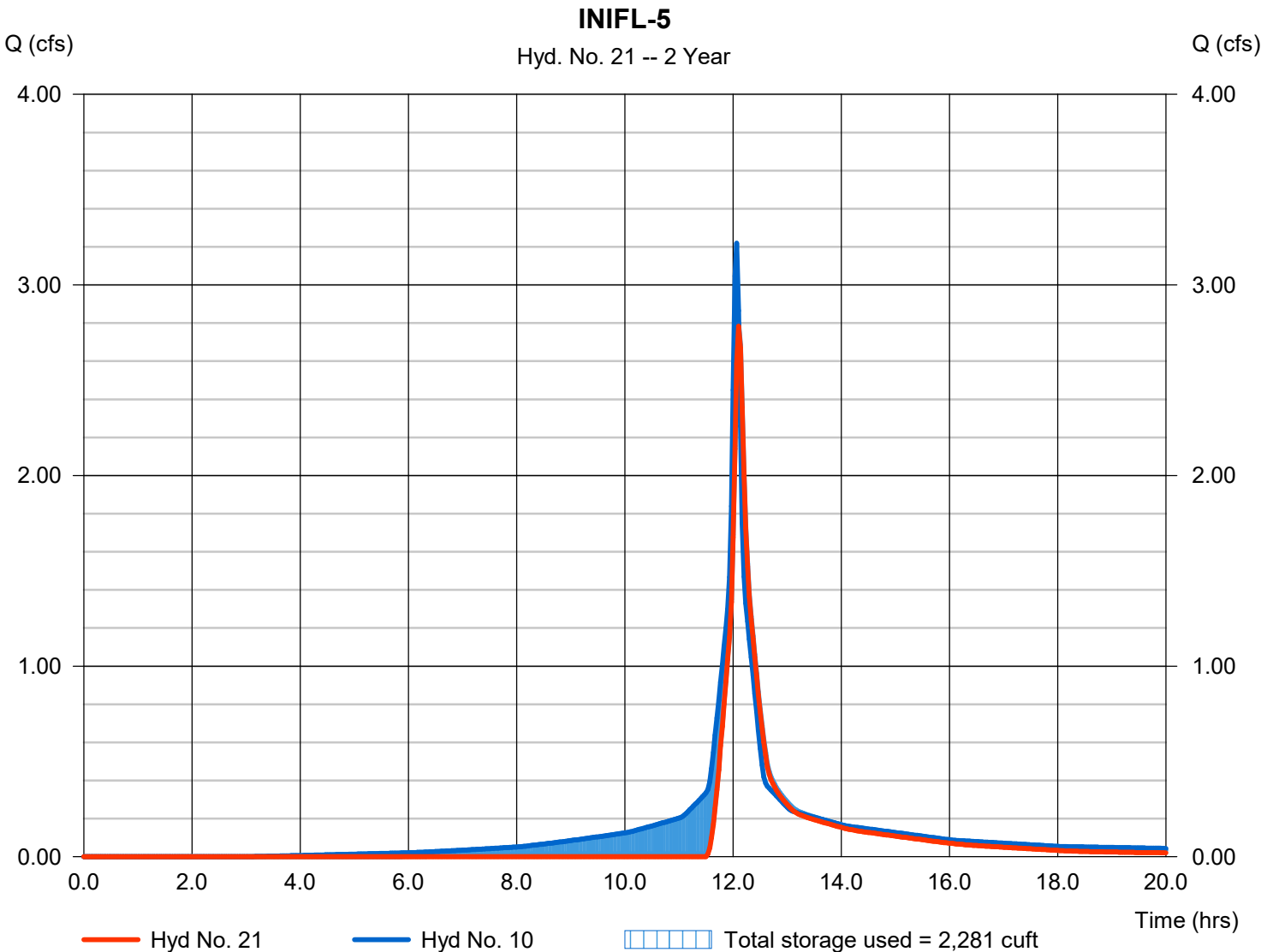
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Hyd. No. 21

INIFL-5

Hydrograph type	= Reservoir	Peak discharge	= 2.783 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 7,104 cuft
Inflow hyd. No.	= 10 - PR WS-02F	Max. Elevation	= 136.12 ft
Reservoir name	= INIFL-5	Max. Storage	= 2,281 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 3 - INIFL-5

Pond Data

UG Chambers -Invert elev. = 133.75 ft, Rise x Span = 3.75 x 4.93 ft, Barrel Len = 70.23 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 133.00 ft, Width = 7.79 ft, Height = 5.50 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	133.00	n/a	0	0
0.55	133.55	n/a	241	241
1.10	134.10	n/a	386	627
1.65	134.65	n/a	466	1,093
2.20	135.20	n/a	458	1,550
2.75	135.75	n/a	443	1,994
3.30	136.30	n/a	422	2,416
3.85	136.85	n/a	390	2,806
4.40	137.40	n/a	338	3,144
4.95	137.95	n/a	247	3,391
5.50	138.50	n/a	241	3,632

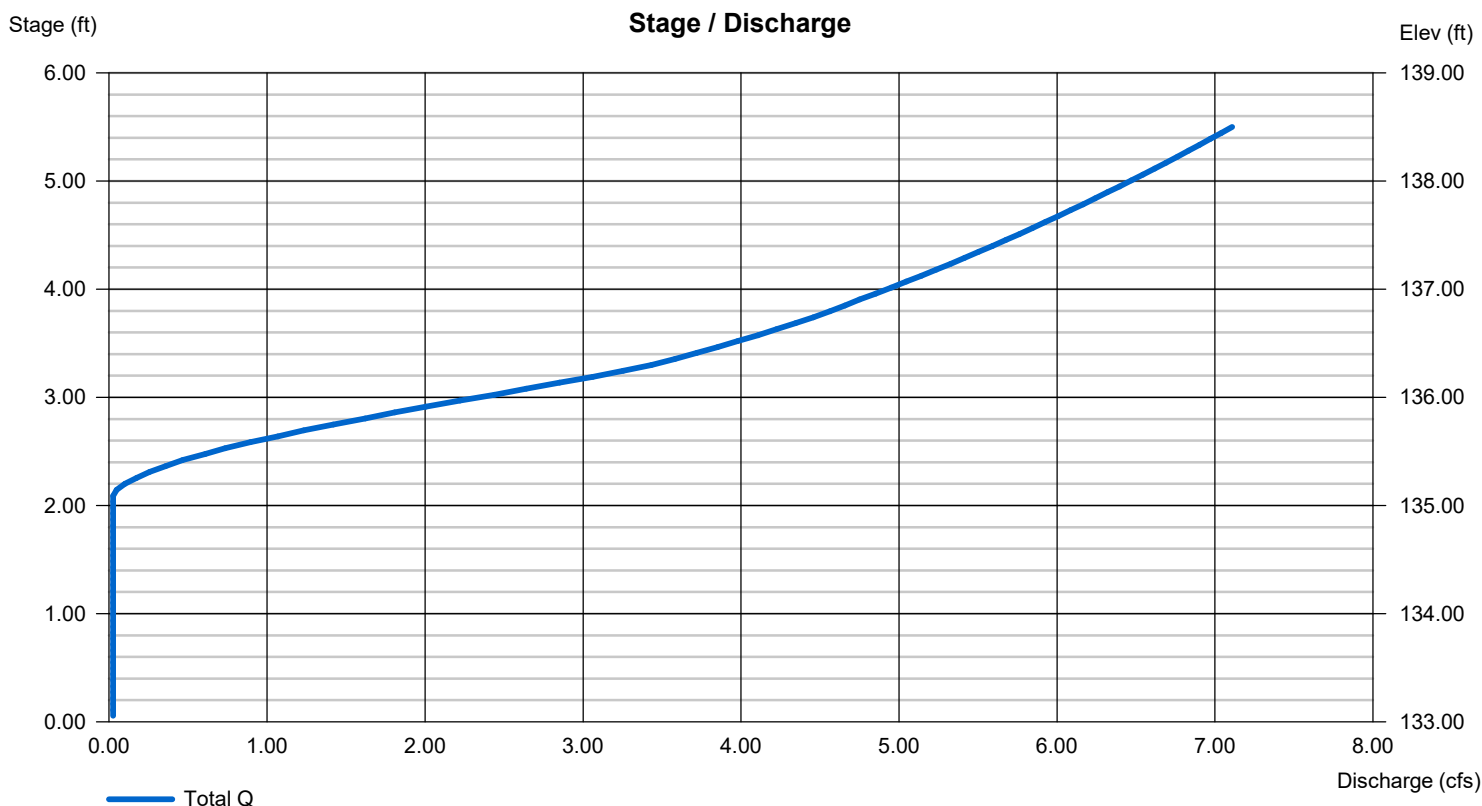
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	15.00	0.00	0.00
Span (in)	= 15.00	15.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 135.00	135.08	0.00	0.00
Length (ft)	= 29.00	0.50	0.00	0.00
Slope (%)	= 2.40	1.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

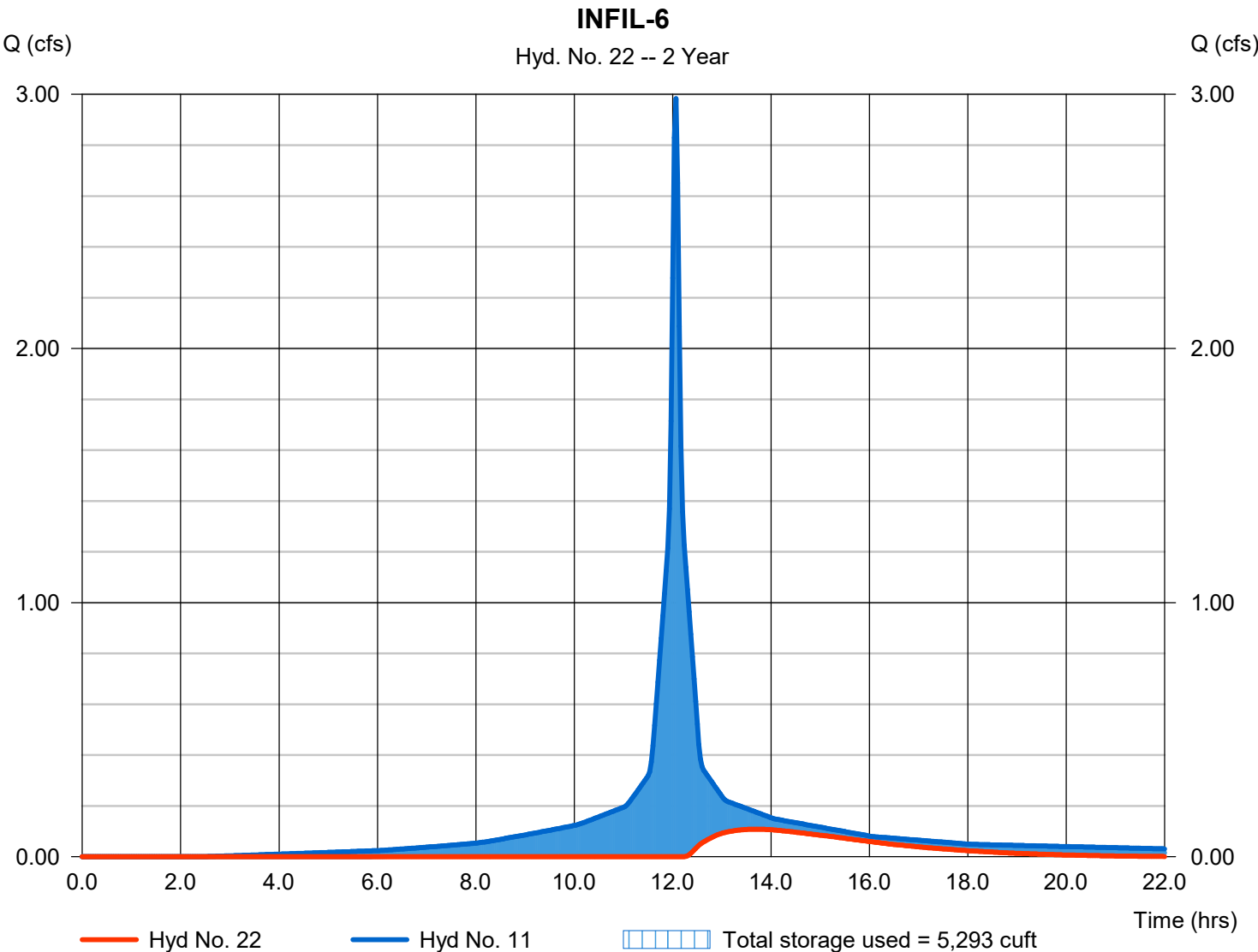
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Hyd. No. 22

INFIL-6

Hydrograph type	= Reservoir	Peak discharge	= 0.109 cfs
Storm frequency	= 2 yrs	Time to peak	= 13.70 hrs
Time interval	= 2 min	Hyd. volume	= 1,534 cuft
Inflow hyd. No.	= 11 - PR WS-02G	Max. Elevation	= 134.74 ft
Reservoir name	= INFIL-6	Max. Storage	= 5,293 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 7 - INFIL-6

Pond Data

UG Chambers -Invert elev. = 132.75 ft, Rise x Span = 3.75 x 5.10 ft, Barrel Len = 184.95 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 132.00 ft, Width = 7.79 ft, Height = 5.50 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	132.00	n/a	0	0
0.55	132.55	n/a	634	634
1.10	133.10	n/a	1,030	1,664
1.65	133.65	n/a	1,247	2,911
2.20	134.20	n/a	1,225	4,136
2.75	134.75	n/a	1,186	5,322
3.30	135.30	n/a	1,128	6,450
3.85	135.85	n/a	1,042	7,492
4.40	136.40	n/a	898	8,389
4.95	136.95	n/a	651	9,041
5.50	137.50	n/a	634	9,675

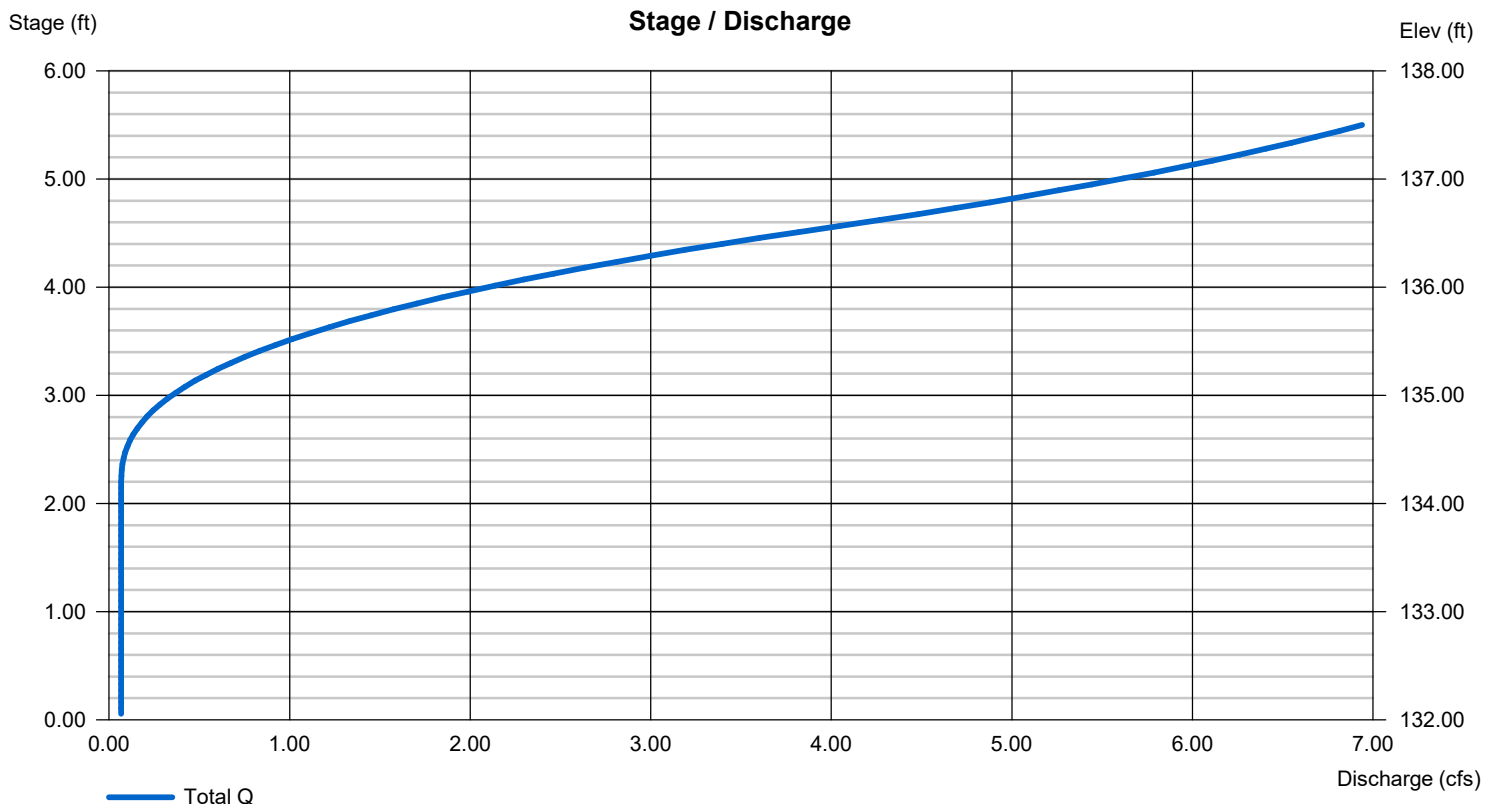
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	Inactive	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 132.50	0.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 4.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 134.17	0.00	0.00	0.00
Weir Coeff.	= 0.45	3.33	3.33	3.33
Weir Type	= 20 degV	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 1.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

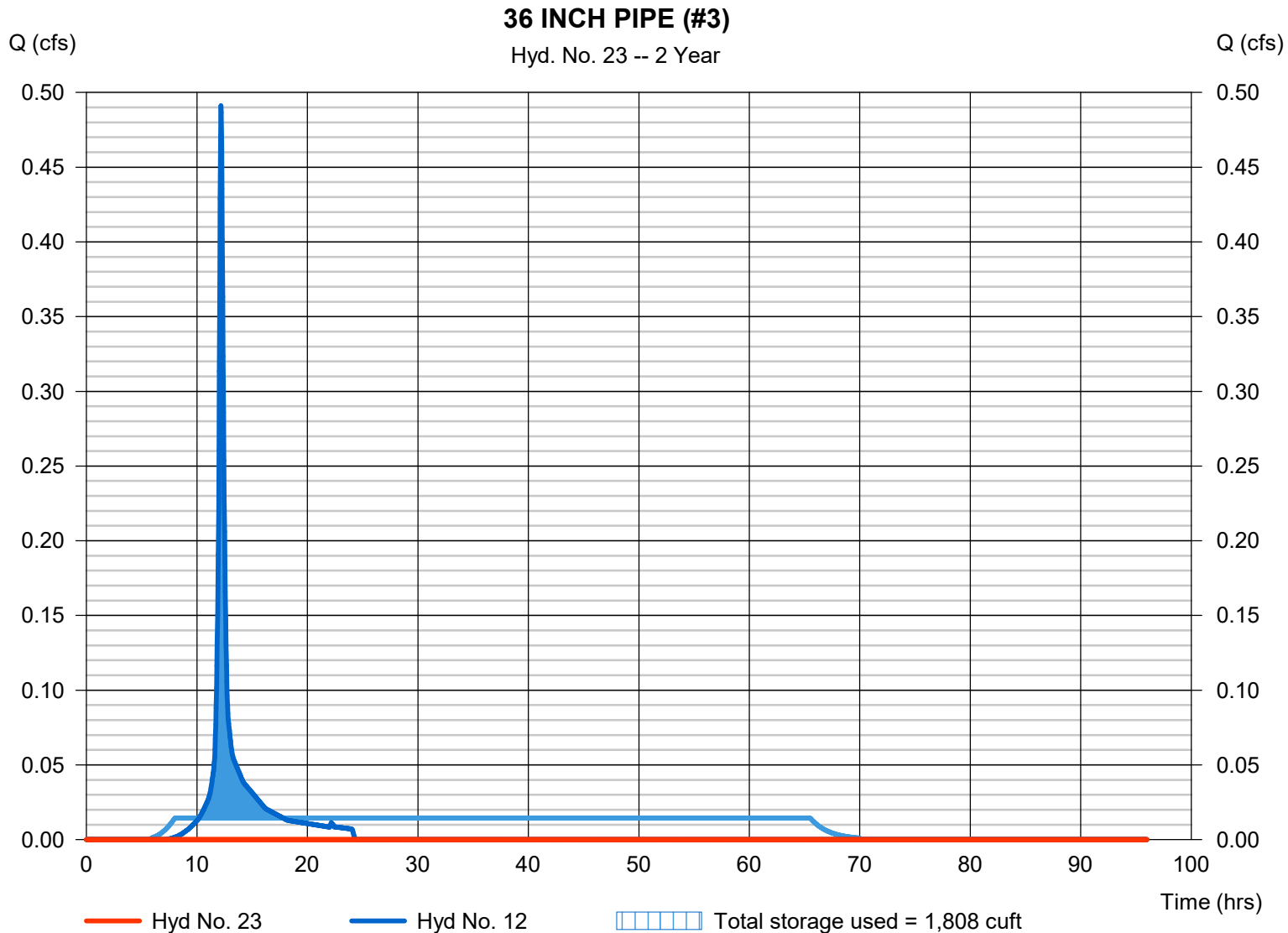
Tuesday, 12 / 5 / 2023

Hyd. No. 23

36 INCH PIPE (#3)

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 12 - PR WS-02H	Max. Elevation	= 132.37 ft
Reservoir name	= 36IN - 3	Max. Storage	= 1,808 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

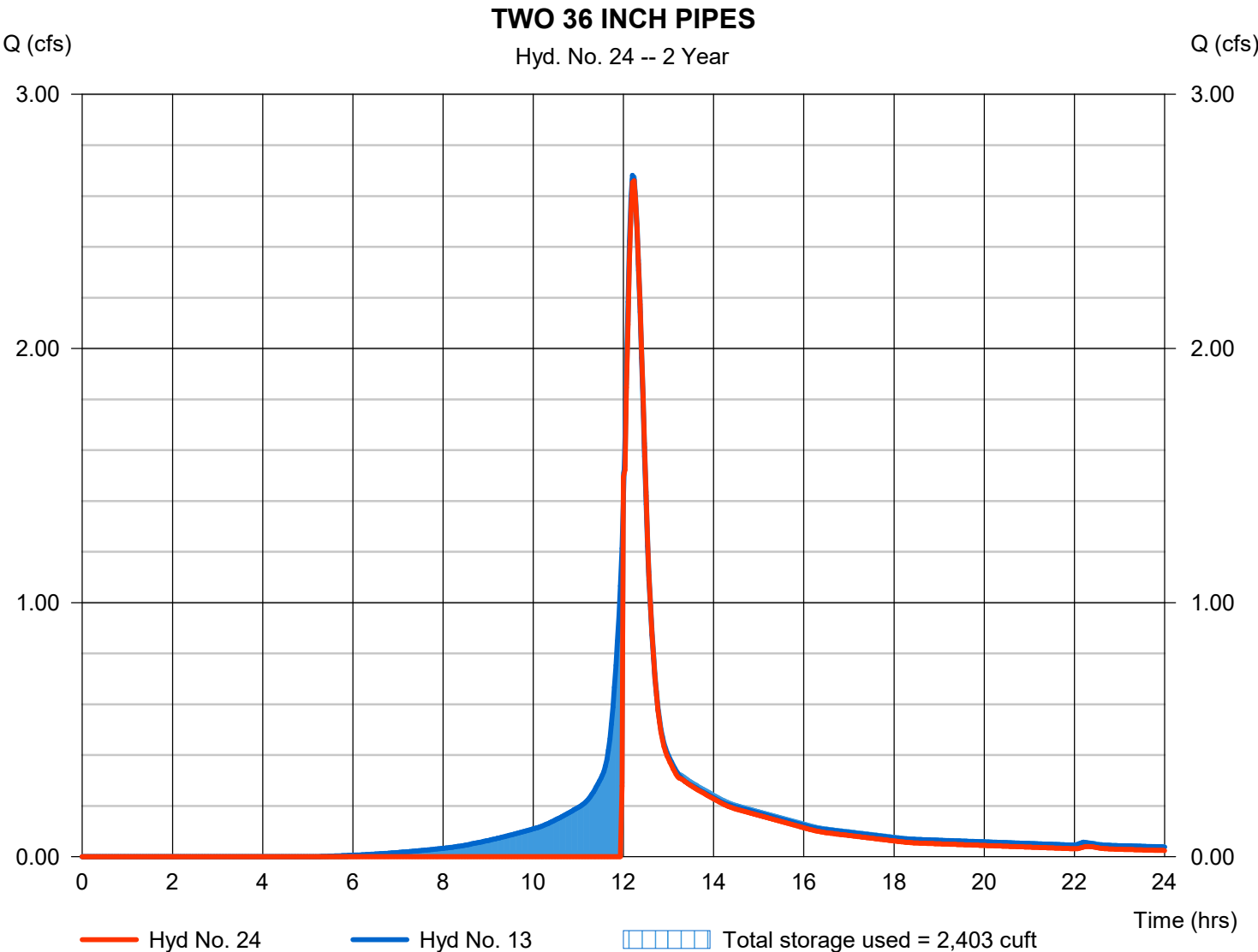
Tuesday, 12 / 5 / 2023

Hyd. No. 24

TWO 36 INCH PIPES

Hydrograph type	= Reservoir	Peak discharge	= 2.660 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 8,938 cuft
Inflow hyd. No.	= 13 - PR WS-02I	Max. Elevation	= 135.68 ft
Reservoir name	= TWIN 36IN	Max. Storage	= 2,403 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

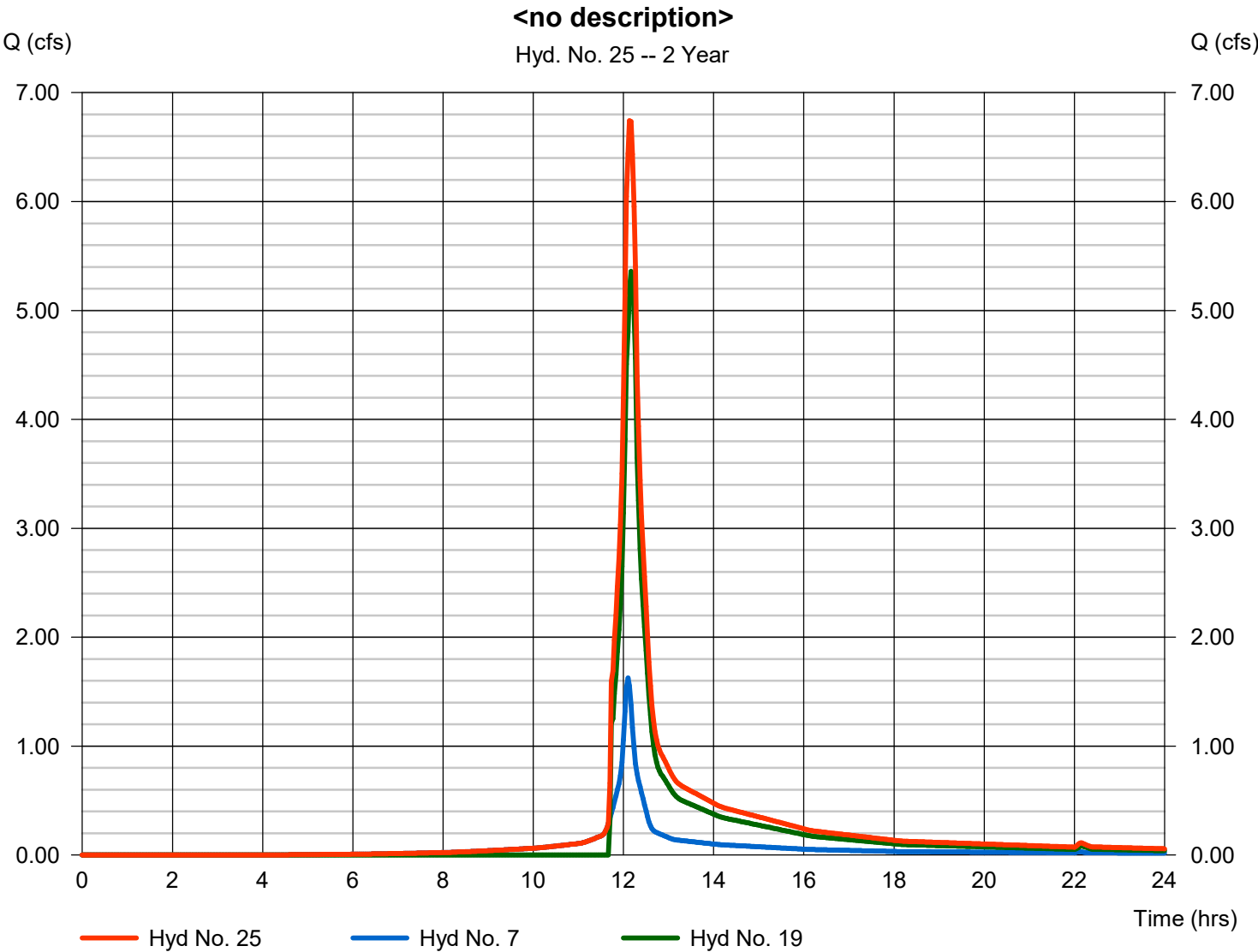
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 5 / 2023

Hyd. No. 25

<no description>

Hydrograph type	= Combine	Peak discharge	= 6.742 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 22,562 cuft
Inflow hyds.	= 7, 19	Contrib. drain. area	= 0.576 ac

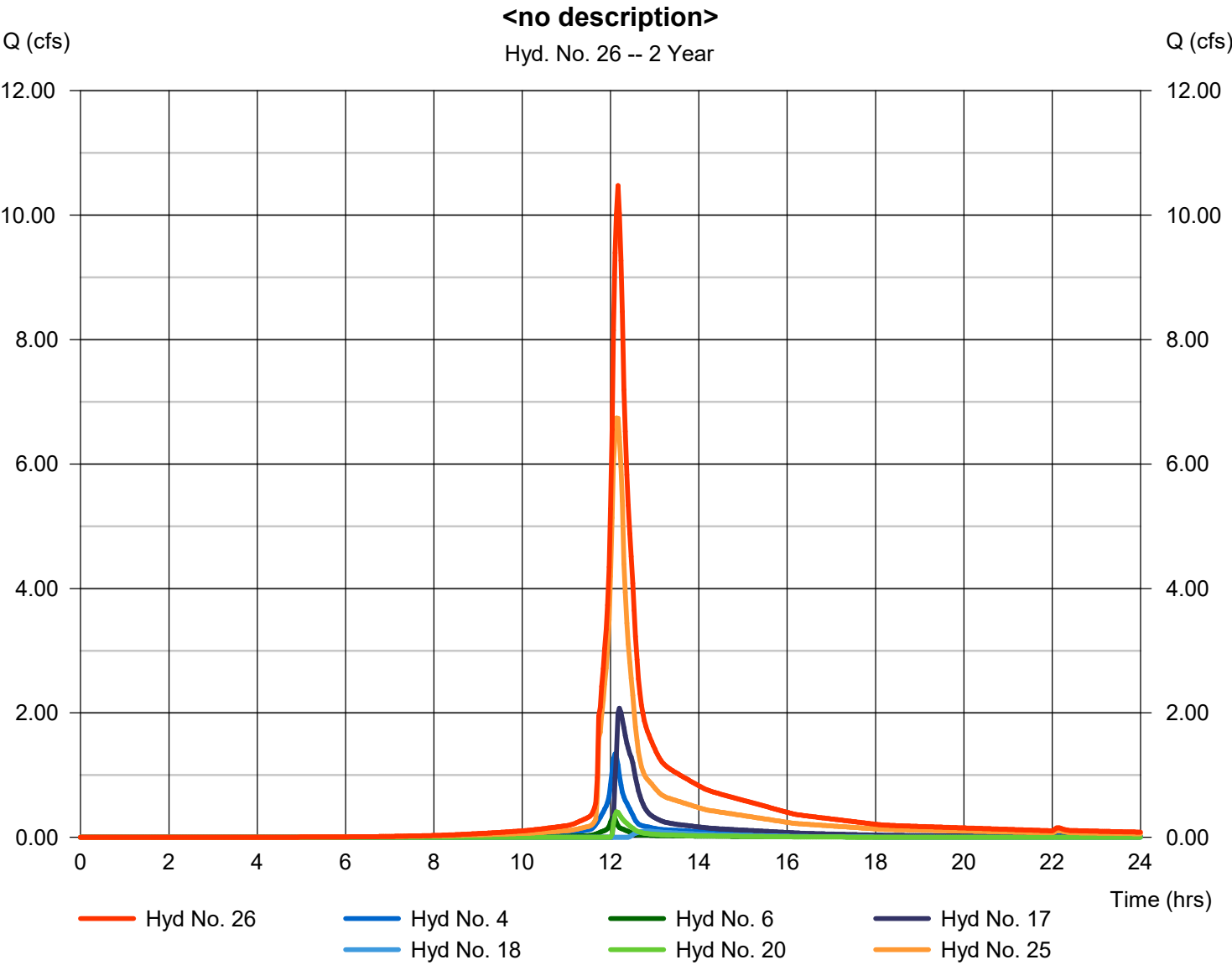


Hydrograph Report

Hyd. No. 26

<no description>

Hydrograph type	= Combine	Peak discharge	= 10.48 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 35,588 cuft
Inflow hyds.	= 4, 6, 17, 18, 20, 25	Contrib. drain. area	= 0.708 ac



Hydrograph Report

Hyd. No. 27

<no description>

Hydrograph type	= Combine	Peak discharge	= 5.018 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 17,576 cuft
Inflow hyds.	= 21, 22, 23, 24	Contrib. drain. area	= 0.000 ac

