

STORMWATER **MANAGEMENT PLAN**

Proposed Trailer Storage **375 Maple Avenue** **Montville, Connecticut**

Prepared For:

Town of Montville / Rand-Whitney Containerboard

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1.0 Introduction

The project is to provide additional trailer storage space for Rand-Whitney Recycling LLC's transportation operations, which are currently at maximum capacity. The project proposes construction of a paved storage area and access road for the storage of box trailers located at 375 Maple Avenue in Montville, CT. The parcel is recorded as Map 031 Block 015 Lot 000 and is recorded on Page 912 of Volume 690. The parcel is currently owned by 349 Maple Ave LLC, a subsidiary company of Rand-Whitney LLC.

The storage area will be accessed primarily by an internal paved driveway that connects the subject parcel to Robertson Road, thus minimizing traffic impact to Maple Avenue. The driveway will be constructed on an adjacent lot to the north, which is also owned by Rand-Whitney LLC. This lot is referenced by the town assessor's records as 'Route 169' and is recorded as Map 031-019-000 on Page 248 of Volume 422. For the purpose of this report, this parcel shall be referred to as 'Parcel Route 169'.

A secondary access from Maple Avenue is proposed to be constructed however, this access is intended for emergency access only and will be chained to prevent general access. The location of both parcels is shown on Figure 1, and in relation to the 2019 Connecticut orthoimagery as Figure 2. A location map is also included on the Site Development Plans.

A secondary component of this project is to extend and realign the Town of Montville's existing 30" stormwater pipe that currently discharges onto 375 Maple Avenue. The location and elevation of the pipe is currently preventing the lot from being developed. The project proposes to adjust the pipe's alignment and create a new drainage easement in favor of the Town of Montville.

This report was prepared to address the Soil Erosion and Sediment Control and Stormwater Management requirements stipulated in the Town of Montville's Planning and Zoning Regulations. The Soil Erosion and Sediment Control Plan has been developed in accordance with the 2023 Connecticut Guidelines for Soil Erosion and Sediment Control. The stormwater management and quality has been designed in accordance with the 2024 Connecticut Stormwater Quality Manual. A full-size Design Plan Set is included separately as Appendix E.

Existing Conditions

Both parcels are located in an industrial zone which straddles the Oxoboxo Brook. Parcel Route 169 is approximately 34.6 acres in area and is mostly comprised of Rockland Pond; a manmade pond formed by the damming of Oxoboxo Brook in 1900. The Rockland Pond Dam (CT00242) is

owned and maintained by Rand Whitney Container. The only developed portion of Parcel Route 169 is located at its northeast corner which is used as a trailer storage area for Rand Whitney.

375 Maple Avenue is approximately 2.94-acres comprised mostly of undeveloped land located on the southwest side of Oxoboxo Brook. A residential house was originally present on the lot but has recently been raised. The land is currently cleared and ready for development. Access is from Maple Avenue only.

Soils

A custom soil resource report for the property was mapped using NRCS Web Soil Survey website and are listed in the table below.

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
23A	Sudbury sandy loam, 0 to 5 percent slopes	1.4	5.3%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	5.1	18.6%
38C	Hinckley loamy sand, 3 to 15 percent slopes	0.5	1.8%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	0.4	1.4%
307	Urban land	7.0	25.4%
W	Water	13.1	47.6%
Totals for Area of Interest		27.5	100.0%

Soil in the area of development mainly consist of Merrimac fine sandy loam (Hydrological Group A) and Urban Fill (Hydrological Group D). Further details of the soils located on site are presented in Appendix A

Wetland hydrology

Two wetland areas have been identified and delineated on the project site. The first is the 13-acre watercourse and pond area comprised of Oxoboxo Brook and Rockland Pond. This wetland is a large but somewhat degraded open water ecosystem. Oxoboxo Brook flows eventually into the Thames River, a major watercourse connected with the Long Island Sound (Atlantic Ocean). No work is proposed within this wetland, but a portion of the development area coincides with the wetland's 50-foot upland review area.

The second wetland area on the project site is a small (<1ac) man-made channelized wetland in the northeast corner of 375 Maple Avenue. The channel formed as a result of the discharge of stormwater over time by the Town of Montville's 30" storm pipe (identified on plans). This wetland appears to have existed for fewer than 50 years based on available online mapping from CTECO (although the pipe itself appears to be older than 50 years) and is not associated with any watercourse. CLA believes it to have a small impact on groundwater recharge. The wetlands principal functions and the impacts to this and downstream wetlands are evaluated and detailed in the Wetland Letter Report.

Existing Watershed Hydrology

An existing conditions watershed map and stormwater flow paths are included as Figure 3. The site is located in CTDEEP Local Stormwater Basin 3004-00 (Oxoboxo Brook) and drains in a northeasterly direction. Run-off from the site is directed to the Oxoboxo Brook both upstream and downstream of the dam. Run-off from the northwest portion of the site drains to Rockland Pond, which is upstream of the dam (Ex Watershed 1). The remaining southeast portion of the site drains to the downstream side of the dam before passing beneath Robertson Road and through the Rand Whitney facility (Ex Watershed 2).



An existing municipal storm drain system originating from Sharp Hill Road enters the property and daylights approximately 200 feet from the southwest property line. The system comprises a 30" corrugated metal pipe that conveys stormwater from the roadway collection system located on Sharp Hill Road and Carol Drive. The drainage system is also used to collect overland flow from upgradient areas.

Over the course of time, the discharge has eroded the surface soils to create a fairly uniform channel that flows east and into the Oxoboxo Brook. The periodic discharge has created a man-made channelized wetland less than 1-acre in area, running directly over the town's sanitary sewer line and, according to the WPCA, causes unwanted infiltration issues. The town has no known rights to drain onto the property and in its current location, will interfere with the proposed

development. The project proposes to extend the pipe through the property and relocate the point of discharge to avoid conflict with the proposed improvements.



Existing Watershed 1 is located at the northwest portion of the property. It comprises cleared woodland and some rock outcrops and remnants of the foundation from the raised residential house. Grades are moderate to slight. Run-off from this watershed is directed overland in a northerly direction where it eventually reaches Rockland Pond. This is considered Analysis Point 1.

Analysis Point 1 – Rockland Pond

Existing Watershed 2 comprises the remainder of the southeast portion of the property. It comprises cleared woodland and brush with moderate to slight slopes. Run-off from this watershed flows northeast and is intercepted by the man-made channel associated with the town's storm drain discharge. It then follows the channel and eventually discharges to the Oxoboxo Brook immediately upstream of the Robertson Road culvert. This is considered Analysis Point 2.



Analysis Point 2 – Oxoboxo Brook

Proposed Conditions

A proposed conditions watershed map and stormwater flow paths are included as Figure 4. The proposed development includes construction of a paved laydown area sufficient to accommodate 61 storage spaces for trailers and paved driveways that access Maple Avenue and Robertson Road. The approximate total area of disturbance is 3.9 acres and impervious area to be constructed is approximately 2.14 acres. The proposed site improvements are depicted on the Site Improvement Plans.

As previously mentioned, the Town of Montville's existing 30" storm drain will be replaced through the limits of the site with the point of discharge relocated to the northeast, beyond the limits of paving. Stormwater

Proposed Watershed Hydrology

The proposed site grading will mimic existing drainage patterns and run-off from the site will continue to be directed to the Oxoboxo Brook both upstream and downstream of the dam. Run-off from the northwest portion of the site will be directed to drain towards Rockland Pond, which is upstream of the dam (Pr Watershed 1) and the southeast portion of the site will continue to drain to Oxoboxo Brook on the downstream side of the dam (Pr Watershed 2).

Pr-Watershed 1

Proposed Watershed 1 comprises the developed area that produces run-off directed towards and discharges to Rockland Pond (Upstream of Rockland Pond Dam). The watershed comprises the newly developed area (Pr Watershed 1a) and the remaining undeveloped area (Pr Watershed 1b). Run-off from the developed portion of the watershed will be directed northeast and intercepted by a perimeter grass-lined swale where it will be conveyed and discharged to Water Quality Basin 1. Stormwater that leaves Basin 1 will discharge over a rip-rap lined level spreader before entering Rockland Pond (Analysis Point 1)

Pr-Watershed 2

Proposed Watershed 2 comprises the remaining developed area that will ultimately discharge to the Oxoboxo Brook downstream of the Rockland Pond Dam. A portion of this watershed will be directed towards Water Quality Basin 2 (Pr Watershed 2a) and the remaining developed area comprising the Robertson Road driveway (Pr Watershed 2b) will discharge directly to Oxoboxo Brook.

Hydrological Analysis:

The site stormwater hydrological analysis was performed for the 2-year, 10-year, 25-year, 50-year and 100-year frequency storms using the USDA/NRCS TR-55 method to determine the peak flow rates from the existing and post development conditions. As recommended by the CT Stormwater Quality Manual, a Type D storm distribution was used. Precipitation data, rainfall intensities, and distribution were acquired from NOAA Atlas 14, Volume 10, Version 3 for the site, and is included in Appendix B. Rainfall data obtained from NOAA Atlas 14 is included in Appendix C.

The soils onsite in the area of development fall into the hydrologic soil groups A and D. A copy of the soil mapping is included in Appendix A. The runoff curve numbers for the site are based on the ground cover and hydrologic soil group and are included in Table 1.

Table 1 – Curve Numbers

Runoff curve numbers for the existing and post development conditions were compiled from Table 2-2 of the USDA/NRCS TR-55 manual. The following curve numbers were used for the calculations. Weighted curve number calculations are included in the hydrograph reports.

<u>Existing Conditions</u>	<u>CN</u>
Fair Condition Woods	36
Fair Condition Open Space	49
Pavement	98
<u>Post Development</u>	<u>CN</u>
Fair Condition Woods	36
Good Open Space	39
Pavement	98

Stormwater Management Standards and Performance Criteria

The design of the stormwater management is required to meet and comply with the standards and performance criteria using non-structural Low Impact Development (LID) site planning and design techniques and structural stormwater Best Management Practices (BMPs), in addition to operational source controls and pollution prevention. The following standards are set out in Chapter 4 of the 2024 Connecticut Stormwater Quality Manual (SQM) and are intended to be consistent with the post-construction stormwater management requirements of the CTDEEP stormwater general permits, as well as local requirements within municipal planning, zoning, and stormwater ordinances and regulations.

2.0 Standard 1 – Runoff Volume and Pollutant Reduction

The purpose of this Standard is to preserve pre-development hydrology and pollutant loads to protect water quality and maintain groundwater recharge. For the purposes of this standard, this project is considered a new development, and therefore the Required Retention Volume (RRV) is equal to 100% of the site's Water Quality Volume (WQV). To meet this standard, a combination of pre-treatment devices and water quality basins have been designed for the site in accordance with the 2024 Connecticut Stormwater Quality Manual to treat the proposed stormwater runoff.

Proposed Watershed 1 (Analysis Point 1)

Stormwater runoff from post development Watershed 1 originates from the combined discharge associated with Pr Watershed 1a and Pr Watershed 1b. Runoff from Pr Watershed 1b comprises open space with landscaping and requires no treatment.

Run-off from new pavement associated with Pr Watershed 1a will sheet flow to vegetated swales that will convey stormwater to two sediment forebays in advance of entering Stormwater Basin 1. Although the vegetated swales will provide some level of pre-treatment, no credit for the stormwater's residency time in the swales has been taken and Pre-treatment will be provided by the two sediment forebays.

Two test pits (TP 1 & TP 9) were performed in the vicinity of Basin 1. TP 1 exhibited the most restrictive conditions where groundwater was observed at elevation 230.3 and mottling at elevation 231. No ledge was observed. To provide sufficient volume to address run-off volume and pollutant reduction, the bottom elevation of Basin 1 was set at elevation 231.0. The basin bottom elevation will therefore be at or close to the seasonally high-water level (SHWL).

The soils in the vicinity of Basin 1 are Hydrological Group A which are conducive for infiltration. While the recommended vertical separation between the basin bottom and the SHWL will not be achieved, infiltration will still occur through the bottom and sides of the basin due to hydraulic pressure head differences. The volume of water required to be treated (WQV) and the available volume provided by the basin is calculated as follows:

Pr Watershed 1a (Basin 1)		
<u>Water Quality Volume (WQV)</u>		
Sizing in Accordance with Chapter 4 of the DEEP 2024 Storm Water Quality Manual Water Quality Volume (WQV) = (P)(R)(A) / 12 P = 1.3" R = 0.05 + 0.009(I) I = percent of impervious cover A = watershed area		
Total Watershed Area (Ac.) :	2.26	
Watershed Impervious Area (Ac.) :	1.39	
I =	0.62	
R =	0.61	
Required WQV =	0.15	Ac.-Ft
=	6,453	CF
Volume Provided =	18,934	CF

Proposed Water Quality Basin 1 contains 18,934 CF of storage below the primary outlet elevation. This is almost three times the volume required. No flow over the primary outlet is predicted to leave the basin during a 2-year storm event and only 0.1 cfs is expected to leave basin during 10-year event. The excess volume provided is required to address Standard 2 – Stormwater Run-off Quantity Control and will be discussed in the next section.

The dimensions and volume of the sediment forebays have been designed in accordance with Chapter 13 of the DEEP 2024 Storm Water Quality Manual as follows:

Based on the combination of the vegetated swales and the oversized sediment forebays and treatment basins, CLA believes that the stormwater system shown on the project plans is consistent with the CTDEEP 2024 Manual.

Sediment Forebay 1a		
<u>Water Quality Volume (WQV)</u>		
Sizing in Accordance with Chapter 4 of the DEEP 2024 Storm Water Quality Manual		
Water Quality Volume (WQV) = (P)(R)(A) / 12		
P = 1.3"		
R = 0.05 + 0.009(I)		
I = percent of impervious cover		
A = watershed area		
Total Watershed Area (Ac.) :	0.94	
Watershed Impervious Area (Ac.) :	0.59	
I =	62.79%	
R =	0.62	
Required WQV =	0.06	Ac.-Ft
	2,742	CF
Bottom Surface Area = 0.066 * %WQV		
Recommended % of WQV to be Treated	25%	
Minimum Bottom Surface Area =	45	sf
Bottom Surface Area Provided =	225	sf
Min. Volume = 25% of the WQV below the outlet invert		
25% of the WQV =	685	cf
Volume Provided =	1,491	cf

Sediment Forebay 1b		
<u>Water Quality Volume (WQV)</u>		
Sizing in Accordance with Chapter 4 of the DEEP 2024 Storm Water Quality Manual		
Water Quality Volume (WQV) = (P)(R)(A) / 12		
P = 1.3"		
R = 0.05 + 0.009(I)		
I = percent of impervious cover		
A = watershed area		
Total Watershed Area (Ac.) :	1.04	
Watershed Impervious Area (Ac.) :	0.79	
I =	76.18%	
R =	0.74	
Required WQV =	0.08	Ac.-Ft
	3,608	CF
Bottom Surface Area = 0.066 * %WQV		
Recommended % of WQV to be Treated	25%	
Minimum Bottom Surface Area =	60	sf
Bottom Surface Area Provided =	337	sf
Min. Volume = 25% of the WQV below the outlet invert		
25% of the WQV =	902	cf
Volume Provided =	1,961	cf

Proposed Watershed 2 (Analysis Point 2)

Stormwater runoff from post development Watershed 2 comprises the combined discharge associated with Pr Watershed 2a and Pr Watershed 2b.

Stormwater runoff from Proposed Watershed 2a will sheet flow to a vegetated swale that will convey stormwater to a sediment forebay in advance of entering Stormwater Basin 2. Similarly, no credit for the stormwater's residency time in the swales has been taken and pre-treatment will be provided by the sediment forebay.

The volume of water required to be treated (WQV) and the available volume provided by the basin is calculated as follows:

Pr Watershed 2a (Basin #2)		
<u>Water Quality Volume (WQV)</u>		
Sizing in Accordance with Chapter 4 of the DEEP 2024 Storm Water Quality Manual Water Quality Volume (WQV) = (P)(R)(A) / 12 P = 1.3" R = 0.05 + 0.009(I) I = percent of impervious cover A = watershed area		
Total Watershed Area (Ac.) :	1.04	
Watershed Impervious Area (Ac.) :	0.79	
I =	76.2%	
R =	0.74	
Required WQV =	0.08	Ac.-Ft
	3,608	CF
Volume Provided =	5,604	cf

Proposed Water Quality Basin 2 contains 5,604 CF of storage below the primary outlet elevation. This is 50% larger than the volume required. Similarly, no flow over the primary outlet is predicted to leave the basin during a 2-year storm event and only 0.1 cfs is expected to leave basin during 10-year event. The excess volume provided is required to address Standard 2 – Stormwater Run-off Quantity Control and will be discussed in the next section.

Pre-treatment for stormwater flow into the basin is achieved by routing flow through an in-line sediment forebay. The dimensions and volume of the sediment forebay have been designed in accordance with Chapter 13 of the DEEP 2024 Storm Water Quality Manual as follows:

Sediment Forebay 2		
<u>Water Quality Volume (WQV)</u>		
Sizing in Accordance with Chapter 4 of the DEEP 2024 Storm Water Quality Manual		
Water Quality Volume (WQV) = (P)(R)(A) / 12		
P = 1.3"		
R = 0.05 + 0.009(I)		
I = percent of impervious cover		
A = watershed area		
Total Watershed Area (Ac.) :	1.04	
Watershed Impervious Area (Ac.) :	0.79	
I =	76.18%	
R =	0.74	
Required WQV =	0.08	Ac.- Ft
	3,608	CF
Bottom Surface Area = 0.066 * %WQV		
Recommended % of WQV to be Treated	25%	
Minimum Bottom Surface Area =	60	sf
Bottom Surface Area Provided =	233	sf
Min. Volume = 25% of the WQV below the outlet invert		
25% of the WQV =	902	cf
Volume Provided =	1,473	cf

Runoff from Pr Watershed 2b comprises the impervious area associated with the driveway between the trailer storage area and Robertson Road. Runoff from this area will be directed to a Qualifying Pervious Area (QPA) adjacent to the driveway. The SQM explains that certain areas of impervious area can be directed to natural or landscaped vegetated areas that are of sufficient size and with adequately permeable soils to disperse and retain runoff without causing erosion or negative impacts to adjacent downgradient properties.

Certain criteria should be met in order for the QPA to qualify for credit. In general, the following criteria of the proposed QPA will be met:

- The proposed QPA is located outside of the regulated wetland
- The QPA is remote from any buildings
- The portion of the QPA disturbed during construction shall receive 6 inches of topsoil and seeded with New England Roadside Matrix Mix to promote healthy vegetative cover. The remainder of the undisturbed QPA currently consists of dense vegetation covering more than 90% of the area.

- To limit unnecessary disturbance to the existing vegetation downgradient of the QPA, grading has been set to 15%. This meets the maximum grade criteria for undisturbed forested areas. Although this area will initially be loamed and seeded to promote vegetative growth, this area will not be maintained as lawn and is expected to quickly repopulate with larger vegetation that will promote sheet flow residency times.

Other criteria specific to driveways include:

- the maximum contributing flow path from the driveway to the QPA will be 30-feet (width of the driveway).
- The length of the QPA will be equal to the length of the driveway and the width of the QPA (min. 64-feet) will be more than twice the width of the driveway.
- Salt tolerant New England Roadside Matrix Upland Seed Mix will be placed immediately next to the roadside.

Additionally, to provide pre-treatment to the run-off, a 2-feet wide, 3-feet deep stone filled choker trench will be installed adjacent to the driveway. This will provide initial pre-treatment through nominal detention (40% stone voids), sediment retention and prevent road edge deterioration.

3.0 Standard 2 – Stormwater Runoff Quantity Control

The purpose of this standard is to ensure that pre-development peak flow rates are not exceeded and manage the volume and timing of runoff to prevent downstream flooding, channel erosion, and other adverse impacts, and safely convey flows into, through and from structural stormwater BMPs.

To mitigate peak stormwater runoff rates due to the proposed increased impervious area onsite, stormwater will be routed through two water quality basins that have been sized to detain sufficient volumes of water to mitigate post-development peak flows. A summary of the existing condition and post development peak flow rates from the site are included in Table 2.

Table 2 – Peak Flow Rates

Analysis Point 1		Peak Flow Rate (CFS) per Storm Event				
		2-Year	10-Year	25-Year	50-Year	100-Year
Existing Conditions		0.01	0.23	0.72	1.22	1.81
Proposed Conditions		0.00	0.12	0.40	0.90	1.72
Difference		-0.01	-0.11	-0.32	-0.32	-0.09
Analysis Point 2		Peak Flow Rate (CFS) per Storm Event				
		2-Year	10-Year	25-Year	50-Year	100-Year
Existing Conditions		0.01	0.17	0.63	1.24	2.08
Proposed Conditions		0.04	0.77	1.55	2.25	3.00
Difference		0.03	0.60	0.92	1.01	0.92
Site Wide		Peak Flow Rate (CFS) per Storm Event				
		2-Year	10-Year	25-Year	50-Year	100-Year
Existing Conditions		0.02	0.32	1.09	2.10	3.43
Proposed Conditions		0.04	0.75	1.59	2.34	3.22
Difference		0.02	0.43	0.50	0.24	-0.21

For Analysis Point 1, the proposed design reduces the peak stormwater flow rates in comparison to the existing conditions across all storm events.

For Analysis Point 2, small increases in run-off will be realized due to the Qualifying Pervious Area not able to sufficiently detain run-off from the driveway. A USGS StreamStats report was generated for the watershed area contributing to the Oxoboxo Brook immediately upstream of

Robertson Road (See Appendix D). The report approximates the watershed area to be 9.66 square miles with the following peak flows using the Area-Averaged Method.

2-Yr (CFS)	10-Yr (CFS)	25-Yr (CFS)	50-Yr (CFS)	100-Yr (CFS)
326	608	805	978	1170

Given the significant watershed area and existing peak flows, the increases in proposed peak flows leaving the site are negligible.

Hydrographs detailing the calculations are included in Appendix B.

4.0 Standard 3 – Construction of Soil Erosion and Sediment Control

The 2023 CT Guidelines for Soil Erosion & Sedimentation Control applies to the construction phase of the project. A detailed erosion and sediment control plan has been provided in the site development plans. Due to the existing topography and the restrictive nature of the site, the proposed stormwater basins have been designed to function as temporary sedimentation traps during stabilization, and then to be converted to provide permanent water quality treatment for the life of the facility. While the guidelines do not recommend locating sediment traps in the proposed locations of permanent, post-construction stormwater BMPs, they recognize in some cases, this is unavoidable and require the sediment traps to be modified after their function is complete, to prepare it for long-term use. In this case, the bottom elevations of the sediment traps are designed to be at least 1-foot above the bottom floor elevation of the permanent stormwater basins, to avoid fine soil particles sealing the underlying soils. Removal of accumulated sediment and, if necessary, restoration of the pre-construction infiltration capacity of the underlying soils will be performed.

Trap Capacity

The temporary sediment trap shall have an initial storage volume of 134 cubic yards per acre of drainage area. Half of this volume shall be in the form of wet storage to provide a stable settling medium. The remaining storage volume shall be in the form of a drawdown (dry storage) which will provide extended settling time during less frequent, larger storm events.

The dimensions and volume of the sediment traps have been designed in accordance with Chapter 5 of the Connecticut Guidelines for Soil Erosion and Sediment Control as follows:

	Sediment Trap 1	Sediment Trap 2
Area of Disturbance (Acres)	1.51	1.62
SSV Required per Acre of Disturbance	134	134
SSV Required = (CY)	202	217
Total Storage Provided = (CY)	675	308
Dry Storage Volume Required CY =	101	109
Dry Storage Volume Provided CY =	370	172
Wet Storage Volume Required CY =	101	109
Wet Storage Volume Provided CY =	305	136

5.0 Standard 4 - Post-Construction Operation and Maintenance

The purpose of this standard is to ensure that long-term maintenance of the structural stormwater management systems is performed so they continue to function as designed and to implement operational source control and pollution prevention measures.

Provisions for the post-construction operation and maintenance of the permanent stormwater management and pollution prevention devices are outlined on the plans and are as follows:

1. Pollution Prevention Team:
The Owner shall be responsible for carrying out the provisions of the plan.
2. Sweeping:
Parking lots, sidewalks, and other impervious surfaces shall be swept clean of sand and litter and any other pollutants at least twice per year
 - a. Between November 15th and December 15th (after leaf fall)
 - b. During April (after snow melt)
3. Outside Storage:
Accessories or equipment stored outside shall be covered or maintained to minimize the possibility of these materials or their residue passing to stormwater.
4. Washing:
No washing of vehicles, accessories, equipment, or appliances onsite.
5. Maintenance and Inspection of Stormwater Infrastructure:
 - a. Monthly inspection of stormwater structures and outfalls.
 - b. Clean sediment and debris from structures at least once per year during April.

- c. Comply with the hydrodynamic separator operations and maintenance requirements in accordance with the Operations and Maintenance Manual provided by the Manufacturer.
 - d. Comply with the rain garden maintenance schedule.
6. Spills or Accidental Discharges:
- a. Comply with State and Federal regulations to contain and clean up any spill or discharge and dispose of materials at an approved facility.
 - b. Contact Connecticut DEEP oil and chemical spill response division 860-424-3338.
 - c. The following steps should be performed as soon as possible
 - Stop the source of the spill
 - Contain the spill
 - Cover the spill with absorbent material such as kitty litter, saw dust, or oil absorbent pads. Do not use straw.
 - Dispose of absorber in accordance with Local and State regulations.

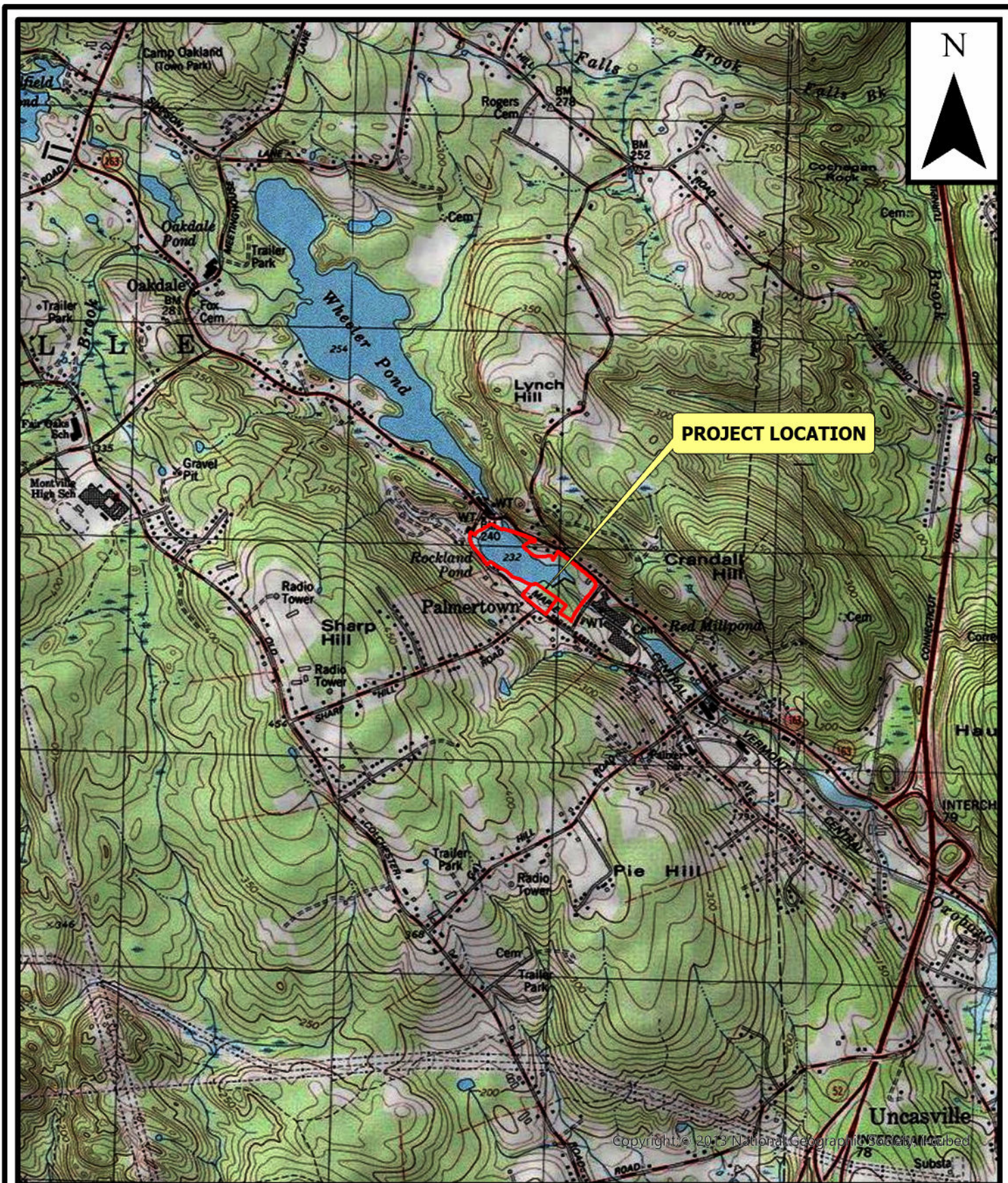
The following is a general operations and maintenance schedule for the stormwater infrastructure and project site.

MAINTENANCE SCHEDULE FOR STORMWATER BASINS	
Activity	Schedule
Prior to new spring growth reaching a height of 2" (e.g., shortly after forsythia or redbud blooms), trim any material standing from the previous year close to the ground (approximately 2").	Second growing season
This will allow the soil to warm more quickly, which will stimulate the emergence and growth of native seedlings and reduce the likelihood of the meadow being invaded by shrubs.	
Problem weeds should be hand pulled or spot sprayed with an approved herbicide, such as Rodeo® or Garlon® 3A.	
If you did not plant vines or spiny plants as part of your mix, be vigilant about controlling them. These are more easily pulled when they are young rather than after they have had two to three months of growth. Examples include bindweed, blackberry, multiflora rose, mile-a-minute and Japanese hops. Be equally vigilant about controlling other invasive species, such as autumn olive and Japanese knotweed.	
Special Circumstances	
If you notice a heavy infestation of ragweed or foxtail in the second growing season, trim the meadow to a height of 8". Trimming should cease by mid-September.	Monthly
For the basin and side slopes, inspect for invasive vegetation.	
Grassy weeds or persistent perennials can re-establish in these soils. Monitor and control weeds by hand pulling or spot spraying.	Semi-Annually
Inspect for damage, undercut, or eroded area	
Inspect Sediment Forebay and monitor for sediment accumulation. Remove any trash and organic debris (leaves) in spring & fall. Remove sediment from the sediment forebay or other pretreatment area when it accumulates to a depth of more than 12 inches or 50% of the design depth. Clean outlet of sediment forebay or other pretreatment measures when drawdown time exceeds 36 hours after the end of a storm event.	
Remove sediment from the infiltration basin surface when the sediment accumulation exceeds 2 inches or when drawdown time exceeds 48 hours after the end of a storm event, indicating that the system is clogged.	
Weed as necessary. Mow grass within infiltration basin to a height of 3 to 6 inches. Maintain a healthy, vigorous stand of grass cover; re-seed as necessary.	
Clean and remove debris & sediment from inlet and outlet structures.	

Mow side slopes. Close mowing throughout the regular growing season or extensive chemical use is not conducive to water quality improvement and wildlife habitat. Spring mowed vegetation can typically remain within basins providing cover for new emerging vegetation.	
Repair undercut or eroded areas.	As needed maintenance

Maintenance Schedule for Trailer Storage Areas	
Activity	Schedule
Sweep parking lots & impervious areas	Between November 15 th and December 15 th (after leaf fall) During April (after snow melt)
Remove and dispose of trash and debris onsite	Daily - As needed maintenance

Maintenance Schedule for Qualifying Pervious Area (QPA)	
Activity	Schedule
Sweep impervious areas	Between November 15 th and December 15 th (after leaf fall)
	During April (after snow melt)
Inspect QPA for erosion and loss of vegetation	Annually - As needed maintenance
Remove and dispose of trash and debris onsite	Annually - As needed maintenance



CLA Engineers, Inc.
 CIVIL • STRUCTURAL • SURVEYING
 317 Main Street Norwich, Connecticut
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 e-mail: cla@claengineers.com

LOCUS MAP

375 MAPLE AVENUE
 MONTVILLE, CT

DATE: 11/7/2024

SCALE: 1"=2,000'

FIGURE

SK-1



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LOCATION MAP

**375 MAPLE AVENUE
MONTVILLE, CT**

DATE: 11/7/2024

SCALE: 1"=200'

FIGURE

SK-2



Ex Watershed 1	Area (s.f.)	Acres	CN
Fair Condition Woods	26,929	0.62	36
Fair Condition Open Space	34,400	0.79	49
Pavement	1,265	0.03	98
Total	62,594	1.44	42

Ex Watershed 2	Area (s.f.)	Acres	CN
Fair Condition Woods	125,188	2.87	36
Fair Condition Open Space	23,512	0.54	49
Pavement	3,893	0.09	98
Total	152,593	3.50	37

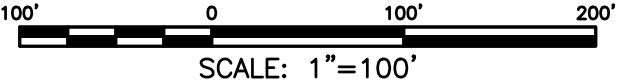
Analysis Point #1	Peak Flow Rate (CFS)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Conditions	0.01	0.23	0.72	1.22	1.81

Analysis Point #2	Peak Flow Rate (CFS)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Conditions	0.01	0.17	0.63	1.24	2.08

Site Wide	Peak Flow Rate (CFS)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Conditions	0.02	0.32	1.09	2.10	3.43

LEGEND

- EXISTING WATERSHED 1
- EXISTING WATERSHED 2
- PROPERTY LINE
- WATERSHED BOUNDARY
- TIME OF CONCENTRATION FLOW PATH
- FLOOD ZONE AE
- REGULATORY FLOODWAY



		CLA Engineers, Inc. CIVIL · STRUCTURAL · SURVEYING	
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No.	DATE	REVISION	
		TOWN OF MONTVILLE / RAND WHITNEY	
		PROPOSED TRAILER STORAGE 375 MAPLE AVENUE MONTVILLE, CT	
		EXISTING WATERSHED PLAN	
		Project No. CLA-7767F	
		Proj. Engineer D.P.H.	
		Date: 11/06/24	
		Sheet No. 3	

Appendix A
NRCS Soil Report



United States
Department of
Agriculture

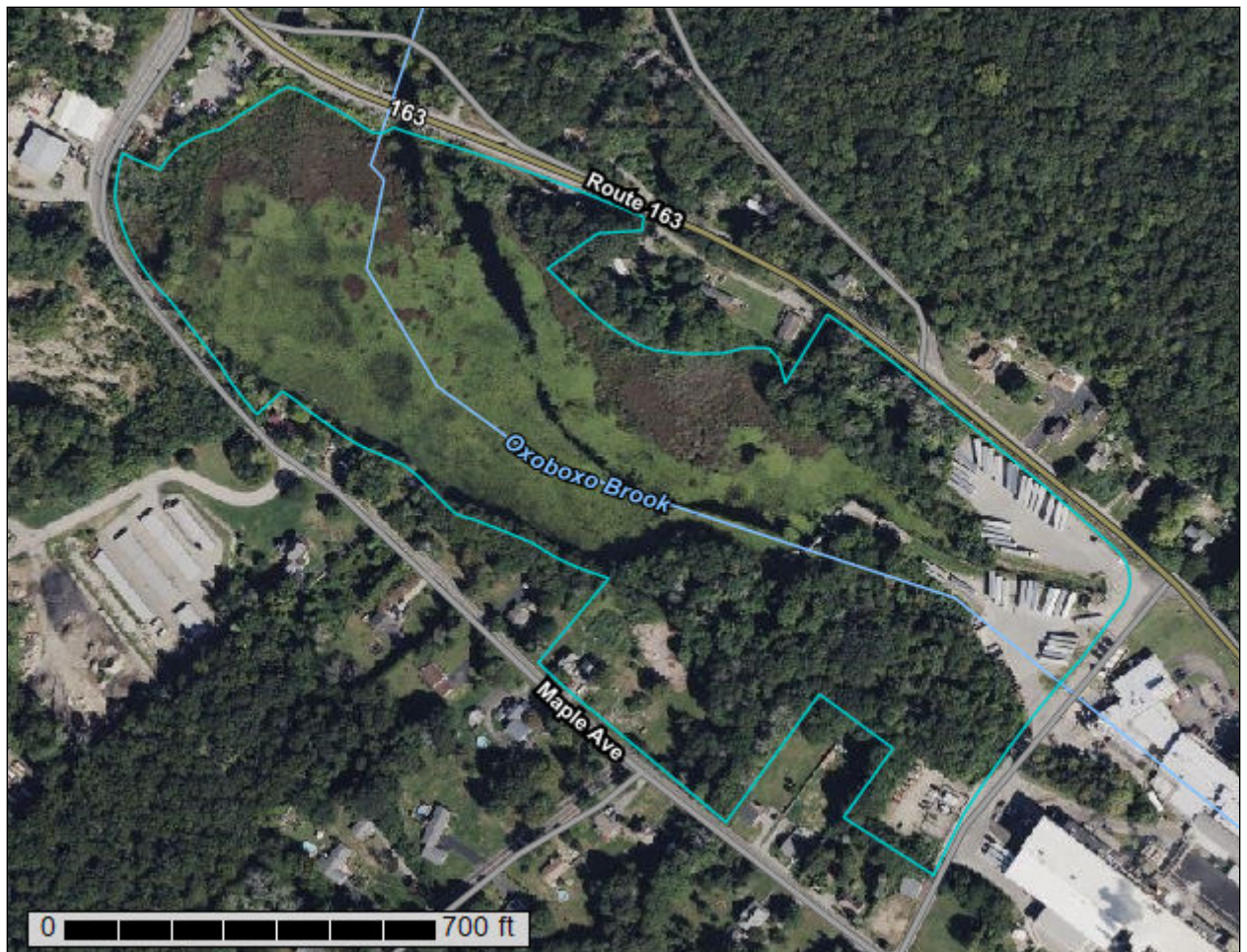
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for State of Connecticut, Eastern Part

7767F Rand Whiney



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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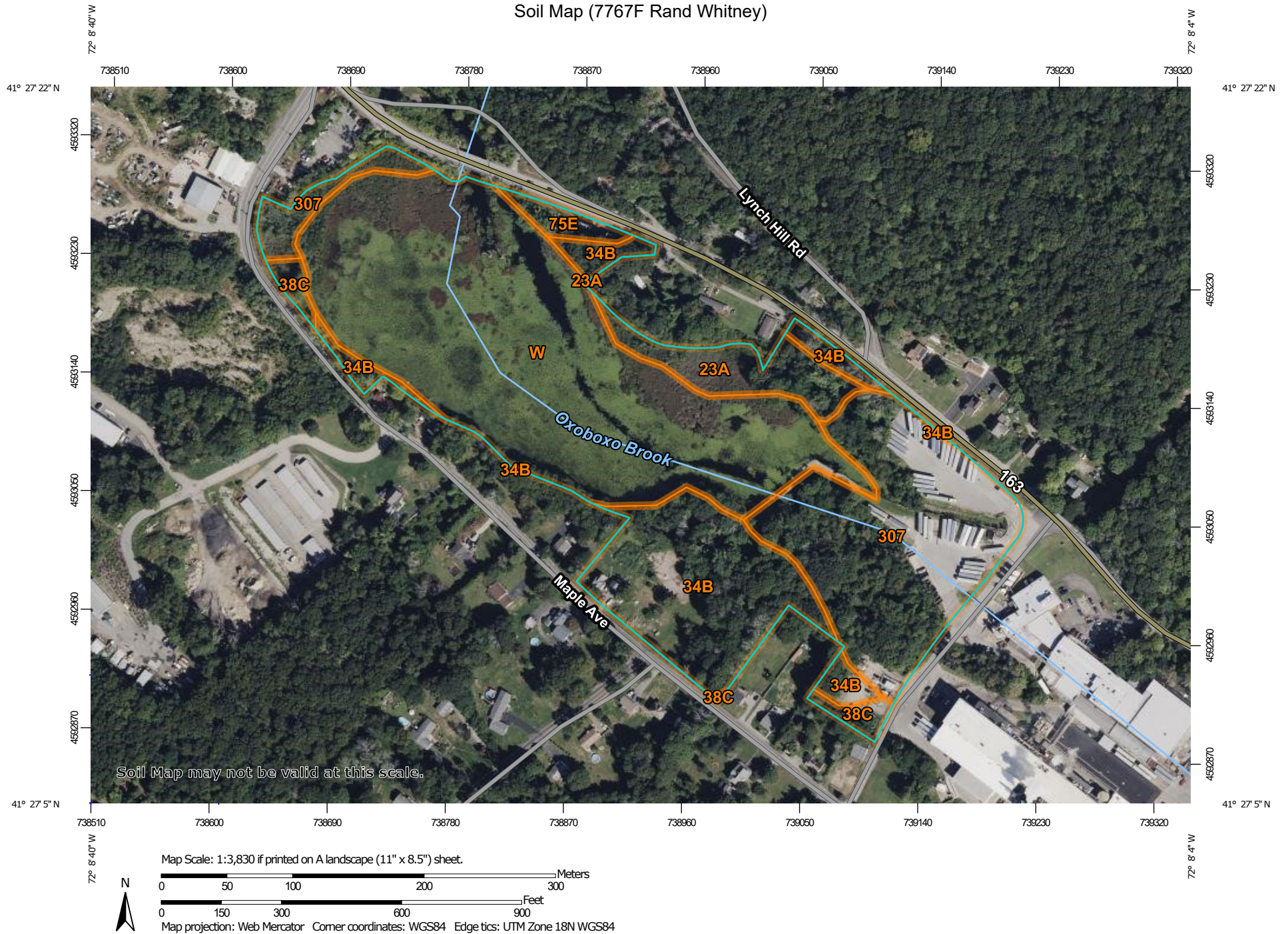
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34B—Merrimac fine sandy loam, 3 to 8 percent slopes.....	11
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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


Custom Soil Resource Report Soil Map (7767F Rand Whitney)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit


 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot


 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry


 Miscellaneous Water


 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip


 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Eastern Part
Survey Area Data: Version 2, Aug 30, 2024

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 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.

Map Unit Legend (7767F Rand Whitney)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
23A	Sudbury sandy loam, 0 to 5 percent slopes	1.4	5.3%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	5.1	18.6%
38C	Hinckley loamy sand, 3 to 15 percent slopes	0.5	1.8%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	0.4	1.4%
307	Urban land	7.0	25.4%
W	Water	13.1	47.6%
Totals for Area of Interest		27.5	100.0%

Map Unit Descriptions (7767F Rand Whitney)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not

mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut, Eastern Part

23A—Sudbury sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9lkv
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sudbury and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sudbury

Setting

Landform: Terraces, outwash plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: sandy loam
Bw1 - 5 to 17 inches: gravelly sandy loam
Bw2 - 17 to 25 inches: sandy loam
2C - 25 to 60 inches: stratified gravel to sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 17 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Agawam

Percent of map unit: 5 percent

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Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Terraces, outwash plains, kames
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ninigret

Percent of map unit: 5 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Tisbury

Percent of map unit: 3 percent
Landform: Terraces, outwash plains
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Walpole

Percent of map unit: 2 percent
Landform: Drainageways on terraces, depressions on terraces
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

34B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash plains, outwash terraces, moraines, eskers, kames

Landform position (two-dimensional): Backslope, footslope, summit, shoulder

Landform position (three-dimensional): Side slope, crest, riser, tread

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam

Bw1 - 10 to 22 inches: fine sandy loam

Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand

2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 2 percent

Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)

Sodium adsorption ratio, maximum: 1.0

Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Ecological site: F145XY008MA - Dry Outwash

Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent

Landform: Deltas, terraces, outwash plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread, dip

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent

Landform: Deltas, kames, eskers, outwash plains

Landform position (two-dimensional): Summit, shoulder, backslope

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Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise

Down-slope shape: Convex

Across-slope shape: Convex, linear

Hydric soil rating: No

Windsor

Percent of map unit: 3 percent

Landform: Dunes, deltas, outwash terraces, outwash plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread, riser

Down-slope shape: Convex, linear

Across-slope shape: Convex, linear

Hydric soil rating: No

Walpole

Percent of map unit: 1 percent

Landform: Depressions

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: F144AY028MA - Wet Outwash

Hydric soil rating: Yes

38C—Hinckley loamy sand, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svmb

Elevation: 0 to 1,290 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces

Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope, summit

Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser, tread

Down-slope shape: Concave, convex, linear

Across-slope shape: Convex, linear, concave

Custom Soil Resource Report

Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, outwash terraces, moraines, eskers
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope, summit
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent

Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces

Landform position (two-dimensional): Shoulder, backslope, toeslope, summit, footslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser, tread

Down-slope shape: Concave, convex, linear

Across-slope shape: Convex, linear, concave

Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent

Landform: Outwash deltas, moraines, outwash plains, kame terraces, outwash terraces

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Base slope, tread

Down-slope shape: Concave, linear

Across-slope shape: Concave, linear

Hydric soil rating: No

75E—Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: 9lqp

Elevation: 0 to 1,200 feet

Mean annual precipitation: 43 to 56 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 185 days

Farmland classification: Not prime farmland

Map Unit Composition

Hollis and similar soils: 35 percent

Chatfield and similar soils: 30 percent

Rock outcrop: 15 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Landform: Ridges, hills

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material

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A - 1 to 6 inches: gravelly fine sandy loam
Bw1 - 6 to 9 inches: channery fine sandy loam
Bw2 - 9 to 15 inches: gravelly fine sandy loam
2R - 15 to 80 inches: bedrock

Properties and qualities

Slope: 15 to 45 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Chatfield

Setting

Landform: Ridges, hills
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material
A - 1 to 6 inches: gravelly fine sandy loam
Bw1 - 6 to 15 inches: gravelly fine sandy loam
Bw2 - 15 to 29 inches: gravelly fine sandy loam
2R - 29 to 80 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Custom Soil Resource Report

Hydrologic Soil Group: B

Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 0 inches: bedrock

Properties and qualities

Slope: 15 to 45 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Runoff class: Very high

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: Unranked

Minor Components

Charlton

Percent of map unit: 7 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Leicester

Percent of map unit: 5 percent

Landform: Drainageways, depressions

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: Yes

Sutton, very stony

Percent of map unit: 5 percent

Landform: Drainageways, depressions

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Unnamed, red parent material

Percent of map unit: 1 percent

Hydric soil rating: No

Unnamed, sandy subsoil

Percent of map unit: 1 percent

Hydric soil rating: No

Brimfield

Percent of map unit: 1 percent

Landform: Ridges, hills

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

307—Urban land

Map Unit Setting

National map unit symbol: 9lmh

Elevation: 0 to 2,000 feet

Mean annual precipitation: 43 to 56 inches

Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 120 to 185 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 10 percent

Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 10 percent

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Custom Soil Resource Report

Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (7767F Rand Whitney)

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.

Custom Soil Resource Report

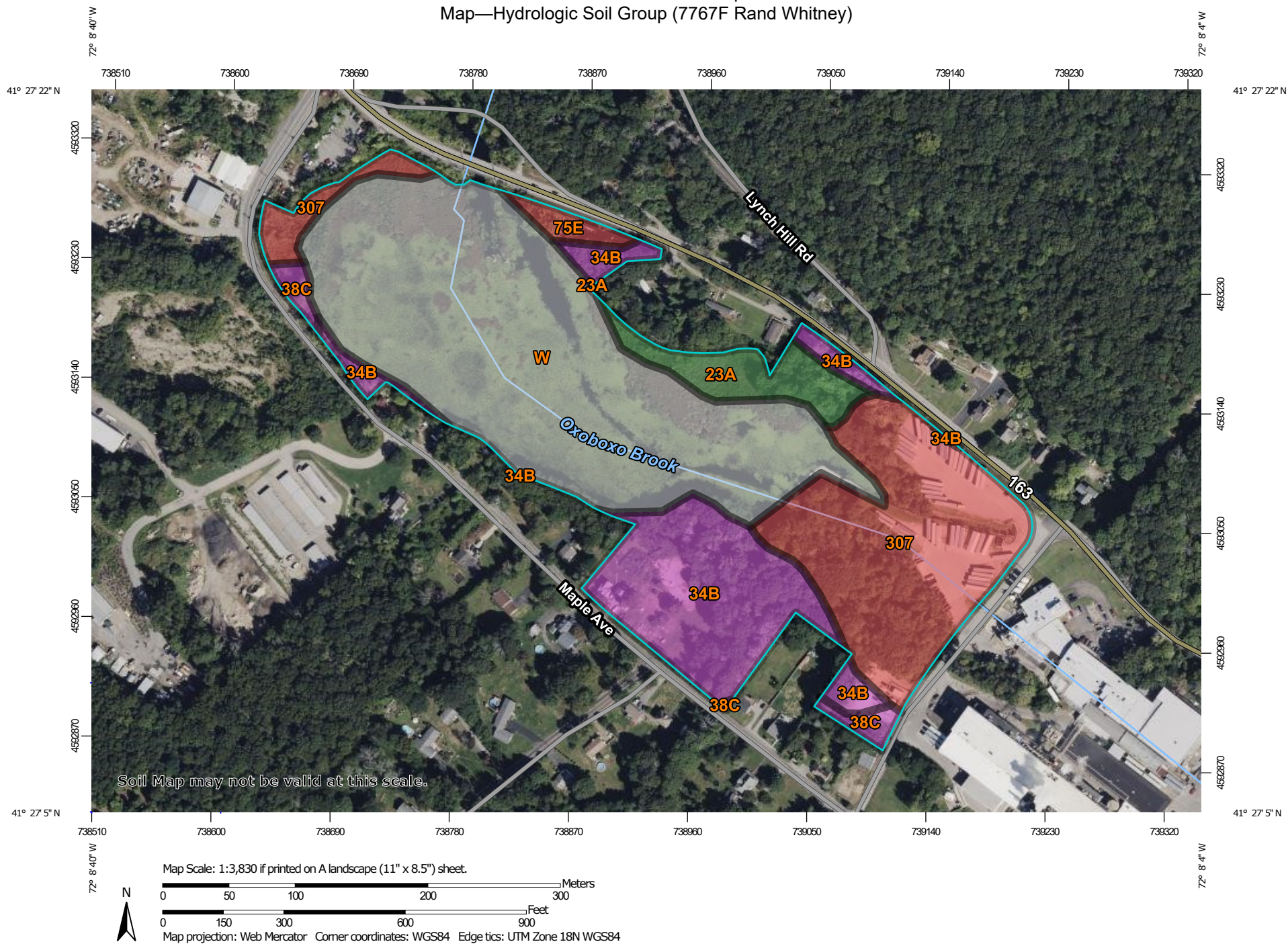
Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

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

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

Custom Soil Resource Report


Map—Hydrologic Soil Group (7767F Rand Whitney)



Custom Soil Resource Report







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, Eastern Part
Survey Area Data: Version 2, Aug 30, 2024

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 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.

Table—Hydrologic Soil Group (7767F Rand Whitney)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
23A	Sudbury sandy loam, 0 to 5 percent slopes	A/D	1.4	5.3%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	5.1	18.6%
38C	Hinckley loamy sand, 3 to 15 percent slopes	A	0.5	1.8%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	D	0.4	1.4%
307	Urban land	D	7.0	25.4%
W	Water		13.1	47.6%
Totals for Area of Interest			27.5	100.0%

Rating Options—Hydrologic Soil Group (7767F Rand Whitney)*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher

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Custom Soil Resource Report

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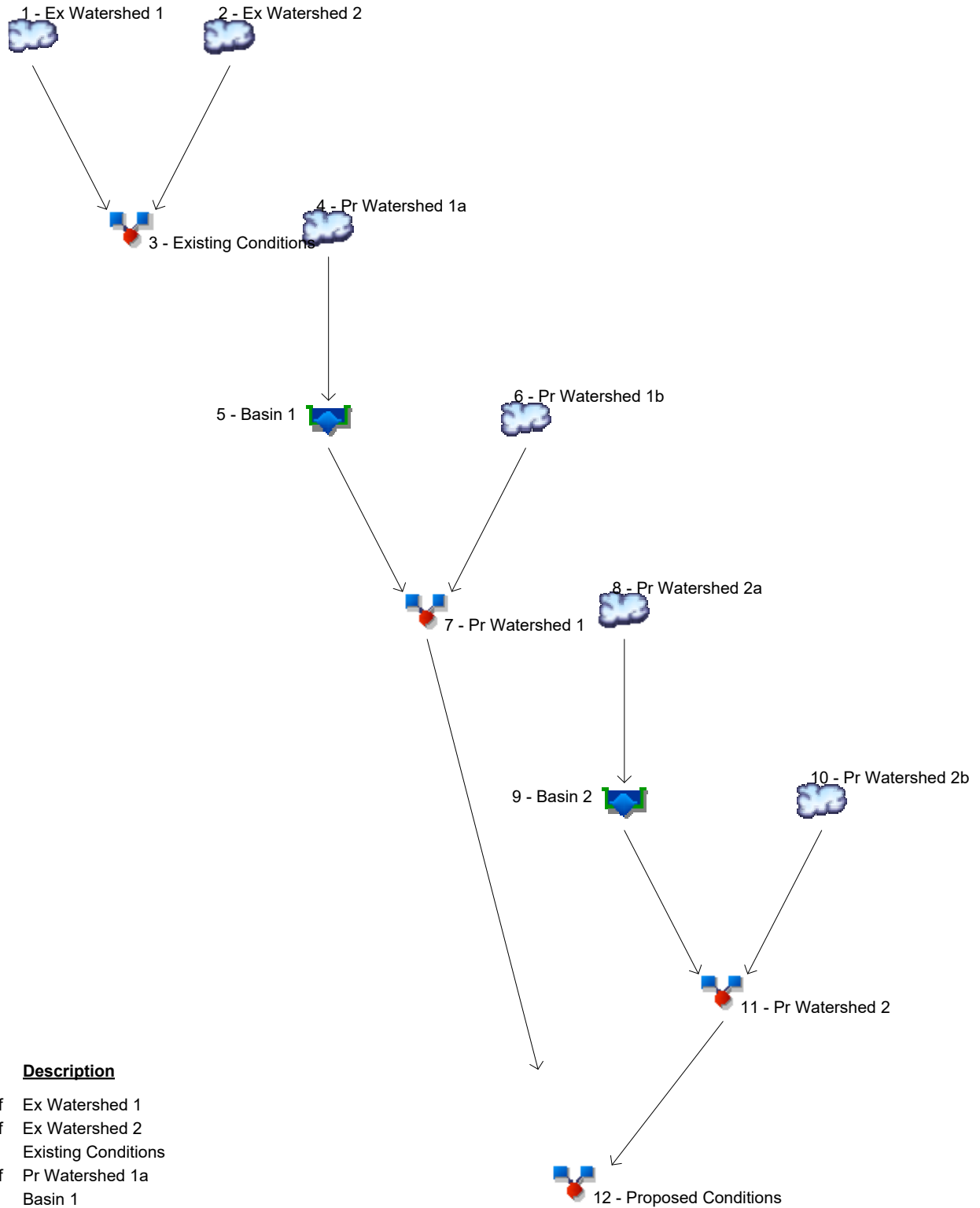
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Appendix B

Hydrograph Reports – 2, 10 & 100-Year Frequencies

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024



Legend

Hyd.	Origin	Description
1	SCS Runoff	Ex Watershed 1
2	SCS Runoff	Ex Watershed 2
3	Combine	Existing Conditions
4	SCS Runoff	Pr Watershed 1a
5	Reservoir	Basin 1
6	SCS Runoff	Pr Watershed 1b
7	Combine	Pr Watershed 1
8	SCS Runoff	Pr Watershed 2a
9	Reservoir	Basin 2
10	SCS Runoff	Pr Watershed 2b
11	Combine	Pr Watershed 2
12	Combine	Proposed Conditions

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Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	-----	-----	0.009	-----	-----	0.227	0.723	1.220	1.814	Ex Watershed 1
2	SCS Runoff	-----	-----	0.008	-----	-----	0.172	0.629	1.235	2.083	Ex Watershed 2
3	Combine	1, 2	-----	0.016	-----	-----	0.317	1.093	2.097	3.427	Existing Conditions
4	SCS Runoff	-----	-----	2.493	-----	-----	5.133	6.888	8.233	9.663	Pr Watershed 1a
5	Reservoir	4	-----	0.000	-----	-----	0.119	0.393	0.874	1.677	Basin 1
6	SCS Runoff	-----	-----	0.000	-----	-----	0.008	0.038	0.102	0.186	Pr Watershed 1b
7	Combine	5, 6	-----	0.000	-----	-----	0.122	0.402	0.896	1.722	Pr Watershed 1
8	SCS Runoff	-----	-----	0.893	-----	-----	1.907	2.590	3.115	3.675	Pr Watershed 2a
9	Reservoir	8	-----	0.000	-----	-----	0.050	0.183	0.428	0.830	Basin 2
10	SCS Runoff	-----	-----	0.044	-----	-----	0.746	1.554	2.246	3.040	Pr Watershed 2b
11	Combine	9, 10	-----	0.044	-----	-----	0.746	1.554	2.246	3.040	Pr Watershed 2
12	Combine	7, 11	-----	0.044	-----	-----	0.746	1.591	2.343	3.224	Proposed Conditions
Proj. file: Analysis.gpw										Wednesday, 12 / 11 / 2024	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	0.009	1	972	319	-----	-----	-----	Ex Watershed 1
2	SCS Runoff	0.008	1	1390	168	-----	-----	-----	Ex Watershed 2
3	Combine	0.016	1	1384	487	1, 2	-----	-----	Existing Conditions
4	SCS Runoff	2.493	1	732	10,344	-----	-----	-----	Pr Watershed 1a
5	Reservoir	0.000	1	n/a	0	4	232.45	10,344	Basin 1
6	SCS Runoff	0.000	1	1424	5	-----	-----	-----	Pr Watershed 1b
7	Combine	0.000	1	1424	5	5, 6	-----	-----	Pr Watershed 1
8	SCS Runoff	0.893	1	729	3,204	-----	-----	-----	Pr Watershed 2a
9	Reservoir	0.000	1	n/a	0	8	232.56	3,204	Basin 2
10	SCS Runoff	0.044	1	773	912	-----	-----	-----	Pr Watershed 2b
11	Combine	0.044	1	773	912	9, 10	-----	-----	Pr Watershed 2
12	Combine	0.044	1	773	917	7, 11	-----	-----	Proposed Conditions
Analysis.gpw					Return Period: 2 Year			Wednesday, 12 / 11 / 2024	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

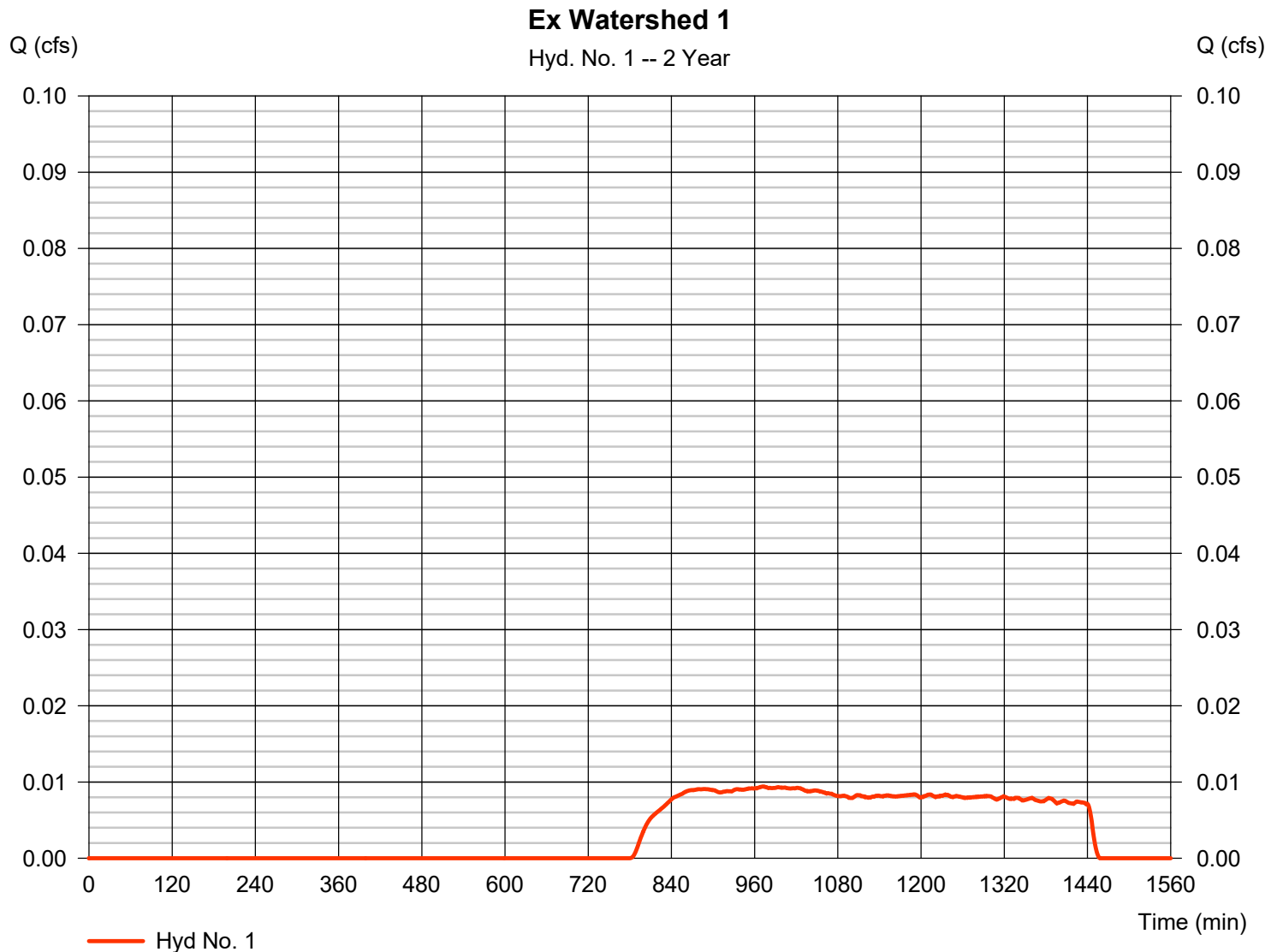
Wednesday, 12 / 11 / 2024

Hyd. No. 1

Ex Watershed 1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.009 cfs
Storm frequency	= 2 yrs	Time to peak	= 972 min
Time interval	= 1 min	Hyd. volume	= 319 cuft
Drainage area	= 1.440 ac	Curve number	= 44*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.30 min
Total precip.	= 3.45 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Water Design Studies-Calculations\Drainage Basin		

* Composite (Area/CN) = $[(0.620 \times 36) + (0.790 \times 49) + (0.030 \times 98)] / 1.440$



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 1

Ex Watershed 1

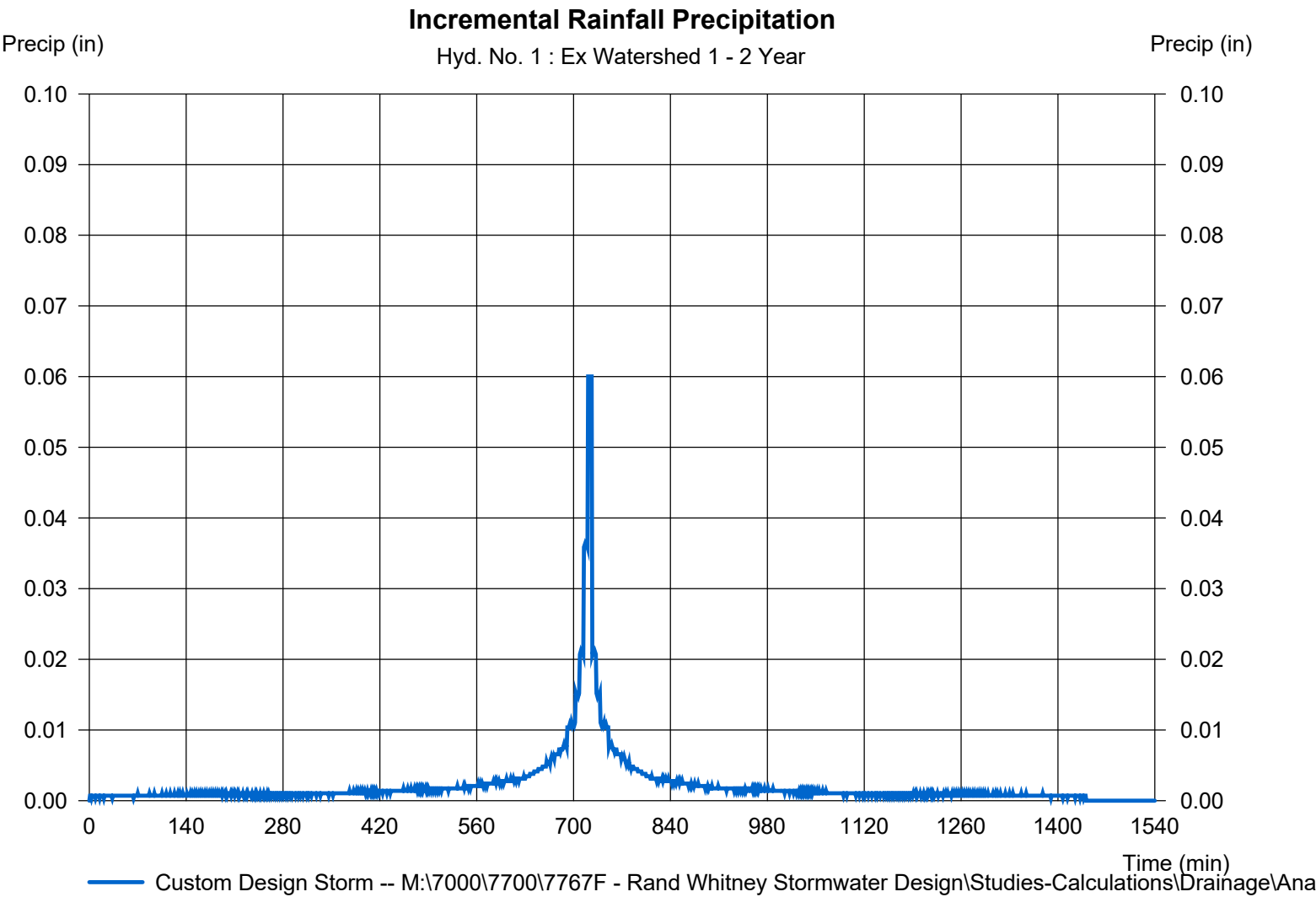
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 40.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.45	0.00	0.00				
Land slope (%)	= 1.10	0.00	0.00				
Travel Time (min)	= 8.39	+	0.00	+	0.00	=	8.39
Shallow Concentrated Flow							
Flow length (ft)	= 65.00	74.00	43.00				
Watercourse slope (%)	= 12.70	5.00	0.10				
Surface description	= Unpaved	Unpaved	Unpaved				
Average velocity (ft/s)	=5.75	3.61	0.51				
Travel Time (min)	= 0.19	+	0.34	+	1.40	=	1.93
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				10.30 min			

Precipitation Report

Hyd. No. 1

Ex Watershed 1

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4500 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

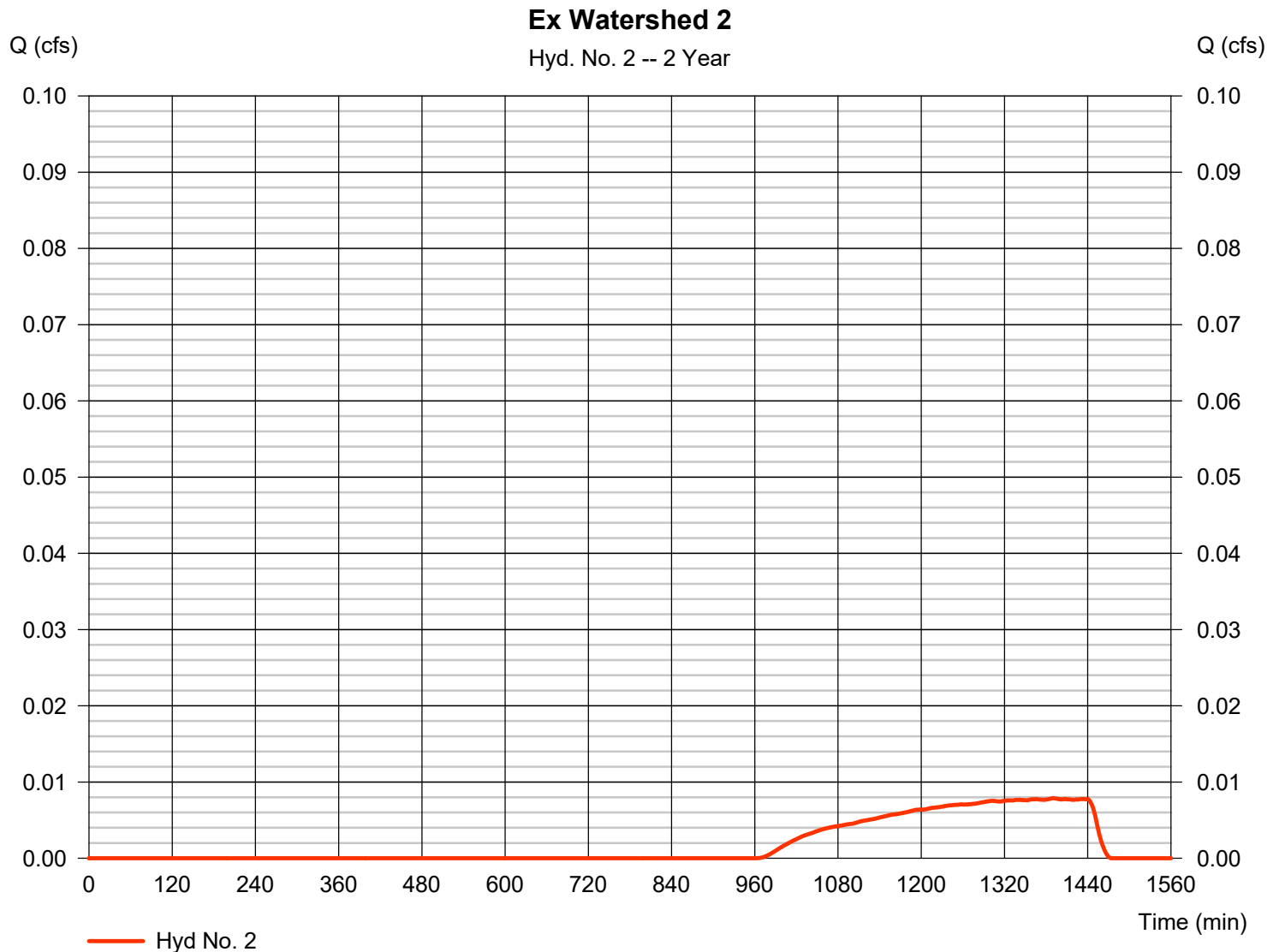
Wednesday, 12 / 11 / 2024

Hyd. No. 2

Ex Watershed 2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.008 cfs
Storm frequency	= 2 yrs	Time to peak	= 1390 min
Time interval	= 1 min	Hyd. volume	= 168 cuft
Drainage area	= 3.500 ac	Curve number	= 40*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.40 min
Total precip.	= 3.45 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Water Design Studies-Calculations\Drainage Basin		

* Composite (Area/CN) = [(2.870 x 36) + (0.540 x 49) + (0.090 x 98)] / 3.500



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 2

Ex Watershed 2

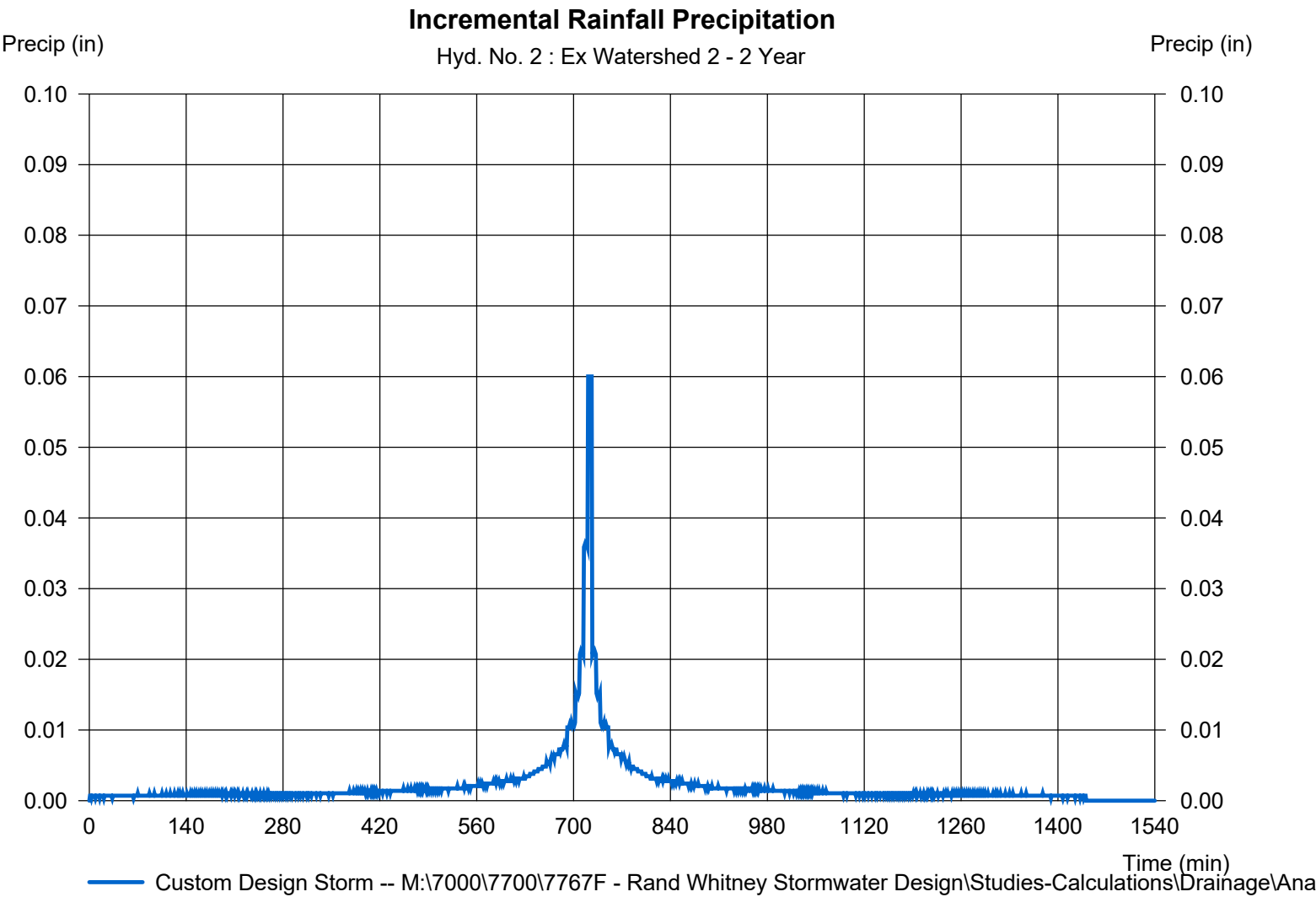
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 138.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.45	0.00	0.00	
Land slope (%)	= 2.40	0.00	0.00	
Travel Time (min)	= 16.53	+	0.00	+
			0.00	= 16.53
Shallow Concentrated Flow				
Flow length (ft)	= 80.00	200.00	181.00	
Watercourse slope (%)	= 6.00	2.40	1.90	
Surface description	= Unpaved	Unpaved	Unpaved	
Average velocity (ft/s)	=3.95	2.50	2.22	
Travel Time (min)	= 0.34	+	1.33	+
			1.36	= 3.03
Channel Flow				
X sectional flow area (sqft)	= 13.00	0.00	0.00	
Wetted perimeter (ft)	= 15.00	0.00	0.00	
Channel slope (%)	= 3.10	0.00	0.00	
Manning's n-value	= 0.040	0.015	0.015	
Velocity (ft/s)	=5.96	0.00	0.00	
Flow length (ft)	({})311.0	0.0	0.0	
Travel Time (min)	= 0.87	+	0.00	+
			0.00	= 0.87
Total Travel Time, Tc				20.40 min

Precipitation Report

Hyd. No. 2

Ex Watershed 2

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4500 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

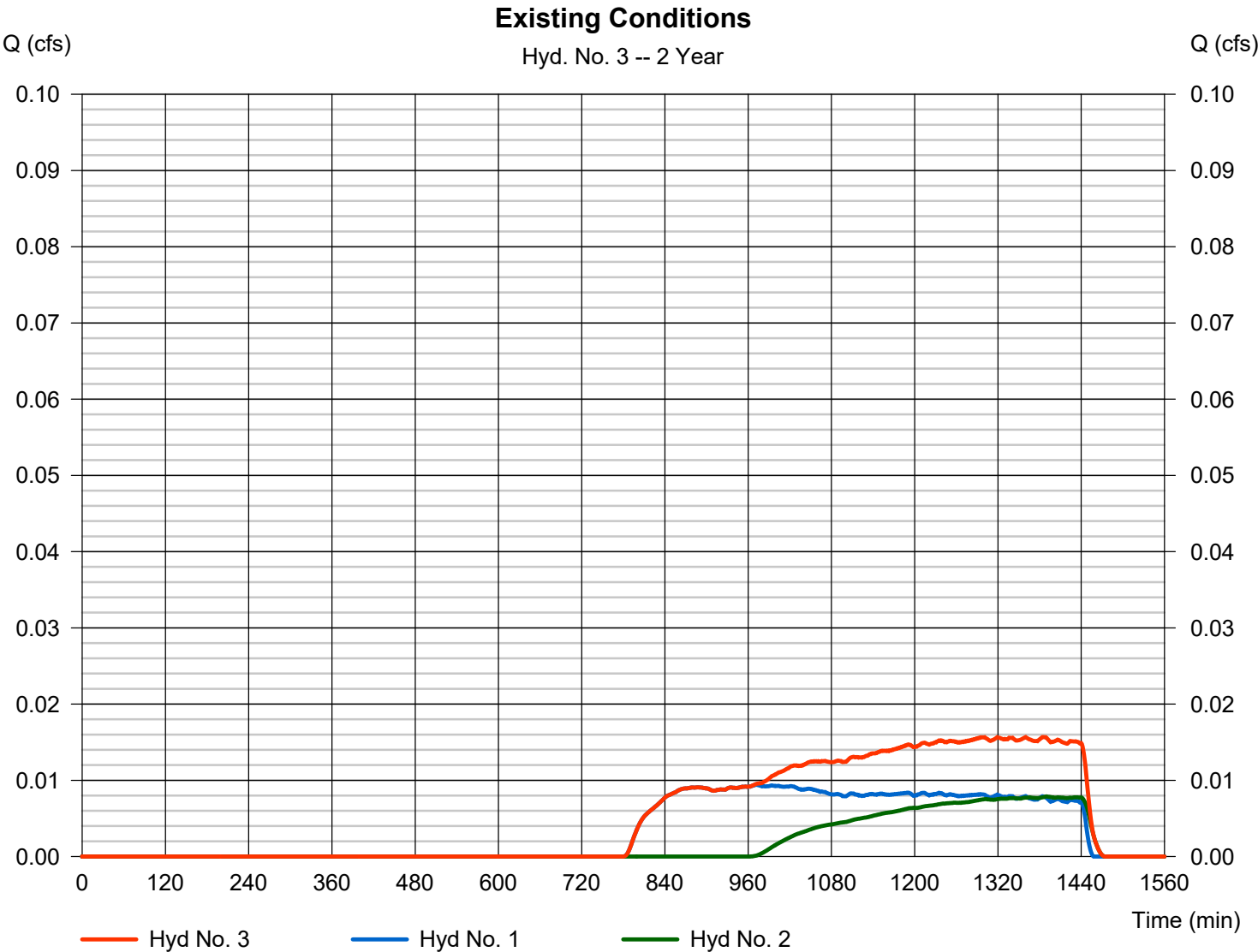
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 3

Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 0.016 cfs
Storm frequency	= 2 yrs	Time to peak	= 1384 min
Time interval	= 1 min	Hyd. volume	= 487 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 4.940 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

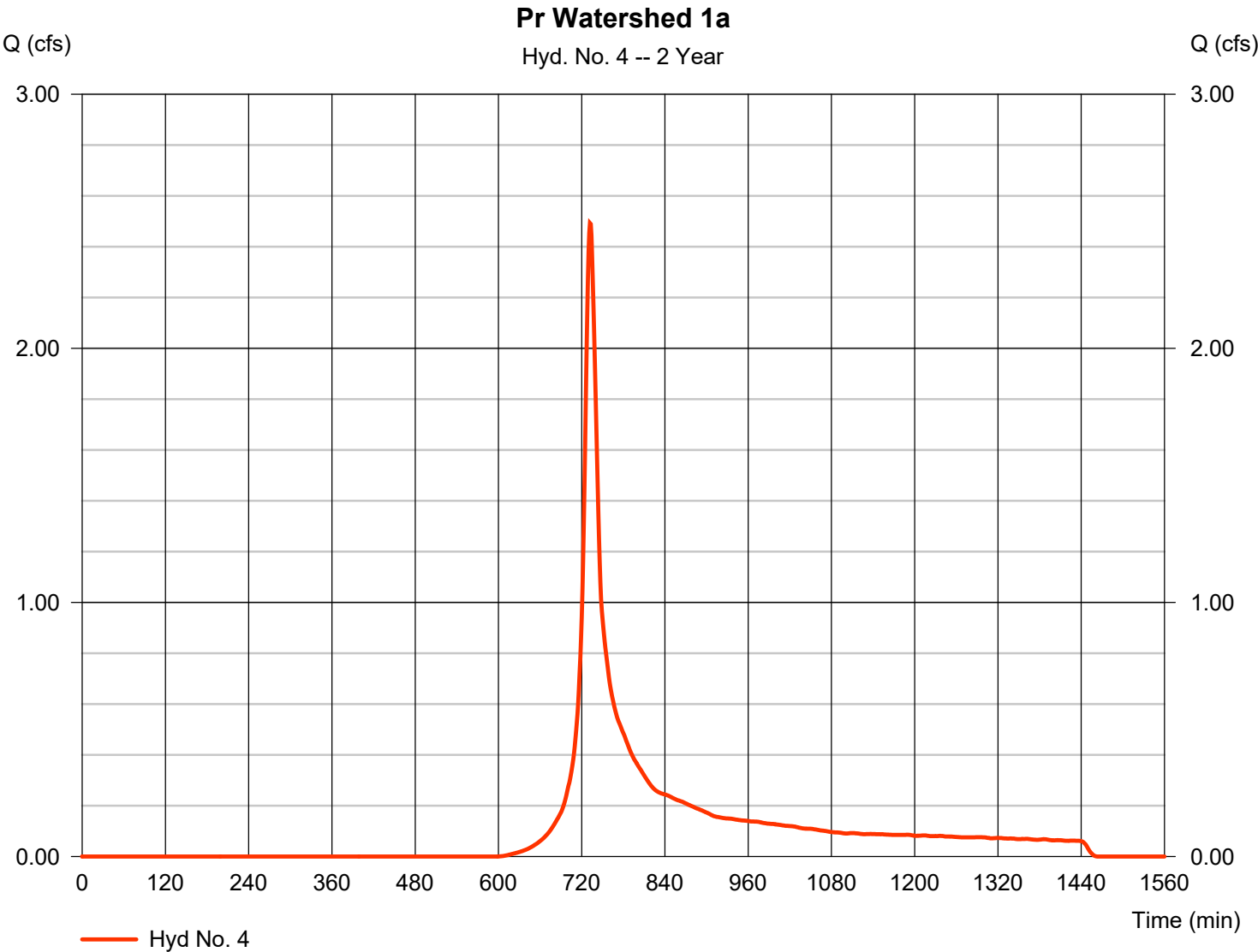
Wednesday, 12 / 11 / 2024

Hyd. No. 4

Pr Watershed 1a

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.493 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	10,344 cuft
Drainage area	=	2.250 ac	Curve number	=	75*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.50 min
Total precip.	=	3.45 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.860 x 39) + (1.390 x 98)] / 2.250



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 4

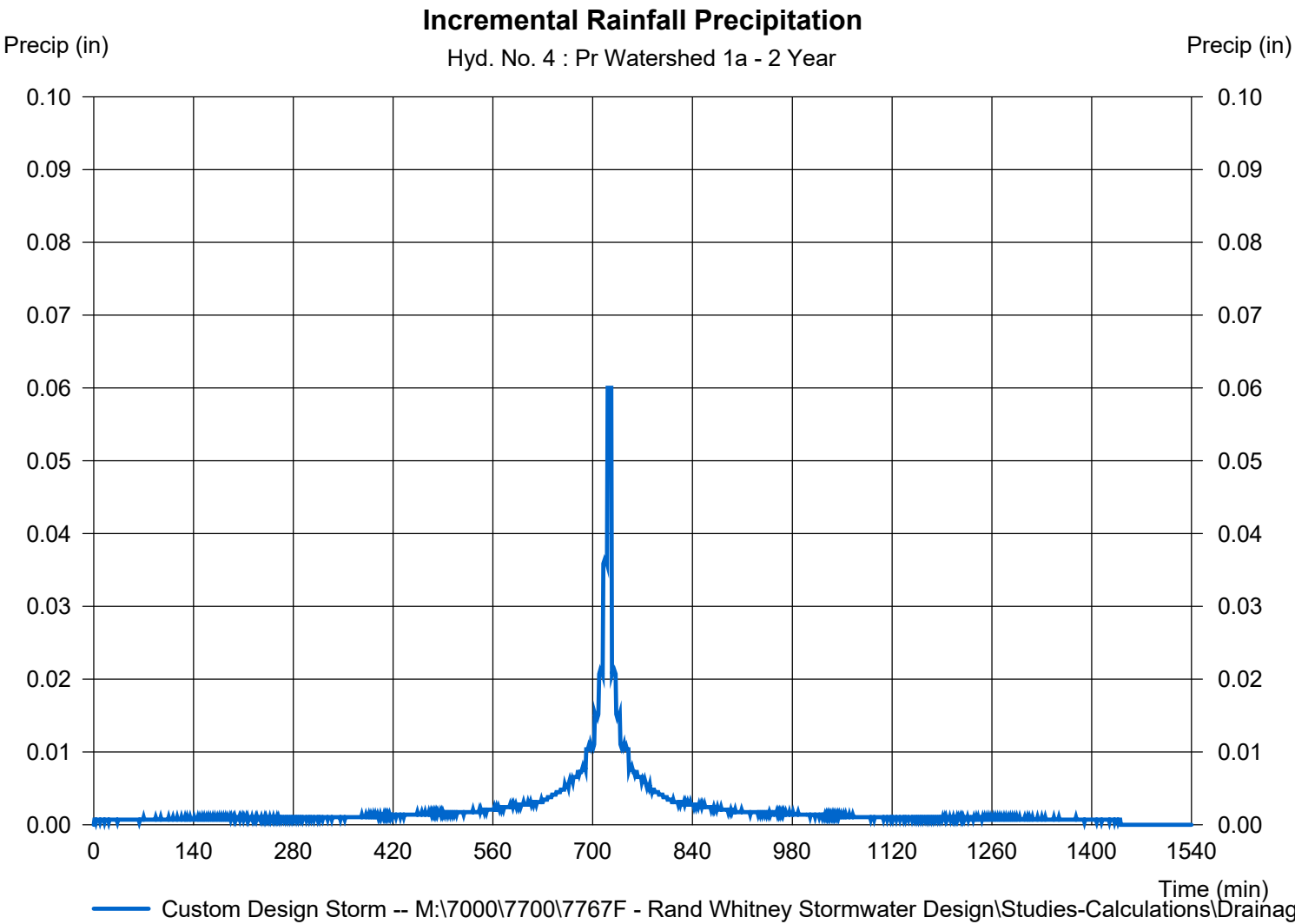
Pr Watershed 1a

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.011	0.011	0.011				
Flow length (ft)	= 151.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.45	0.00	0.00				
Land slope (%)	= 3.70	0.00	0.00				
Travel Time (min)	= 1.27	+	0.00	+	0.00	=	1.27
Shallow Concentrated Flow							
Flow length (ft)	= 0.00	0.00	0.00				
Watercourse slope (%)	= 0.00	0.00	0.00				
Surface description	= Paved	Paved	Paved				
Average velocity (ft/s)	=0.00	0.00	0.00				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Channel Flow							
X sectional flow area (sqft)	= 5.00	0.00	0.00				
Wetted perimeter (ft)	= 8.00	0.00	0.00				
Channel slope (%)	= 0.40	0.00	0.00				
Manning's n-value	= 0.400	0.015	0.015				
Velocity (ft/s)	=0.17	0.00	0.00				
Flow length (ft)	(0)136.0	0.0	0.0				
Travel Time (min)	= 13.18	+	0.00	+	0.00	=	13.18
Total Travel Time, Tc				14.50 min			

Hyd. No. 4

Pr Watershed 1a

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4500 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

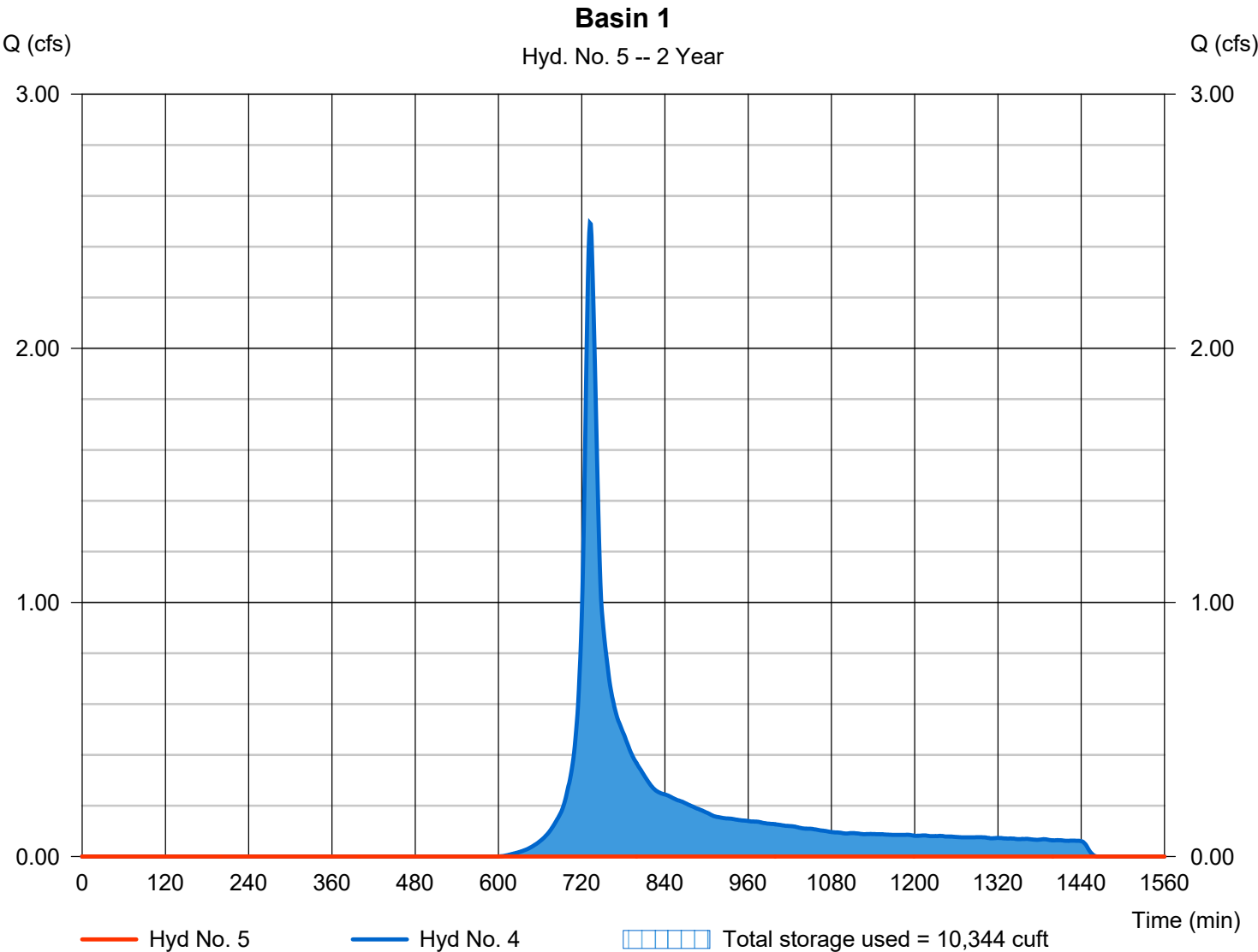
Wednesday, 12 / 11 / 2024

Hyd. No. 5

Basin 1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 4 - Pr Watershed 1a	Max. Elevation	= 232.45 ft
Reservoir name	= Pond 1	Max. Storage	= 10,344 cuft

Storage Indication method used.



Pond No. 1 - Pond 1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 231.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	231.00	5,574	0	0
2.00	233.00	8,849	14,296	14,296
2.50	233.50	9,711	4,638	18,934
3.00	234.00	10,591	5,073	24,007
4.00	235.00	12,615	11,587	35,594

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 4.00	0.00	0.00	0.00
Crest El. (ft)	= 233.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	231.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.00	14,296	233.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.50	18,934	233.50	---	---	---	---	0.00	---	---	---	---	---	0.000
3.00	24,007	234.00	---	---	---	---	4.71	---	---	---	---	---	4.709
4.00	35,594	235.00	---	---	---	---	24.47	---	---	---	---	---	24.47

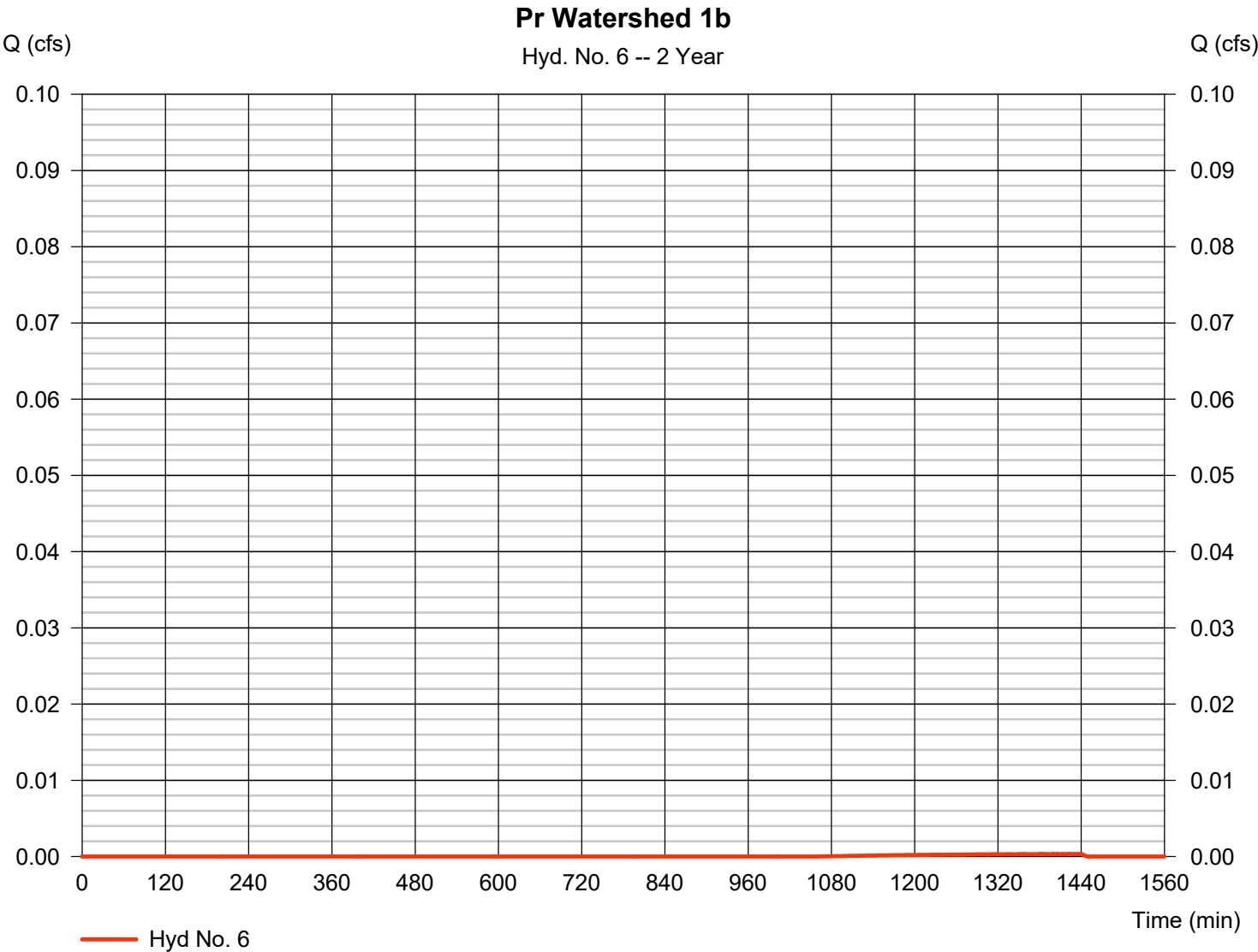
Hydrograph Report

Hyd. No. 6

Pr Watershed 1b

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	1424 min
Time interval	=	1 min	Hyd. volume	=	5 cuft
Drainage area	=	0.210 ac	Curve number	=	39*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.45 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.210 x 39)] / 0.210



Precipitation Report

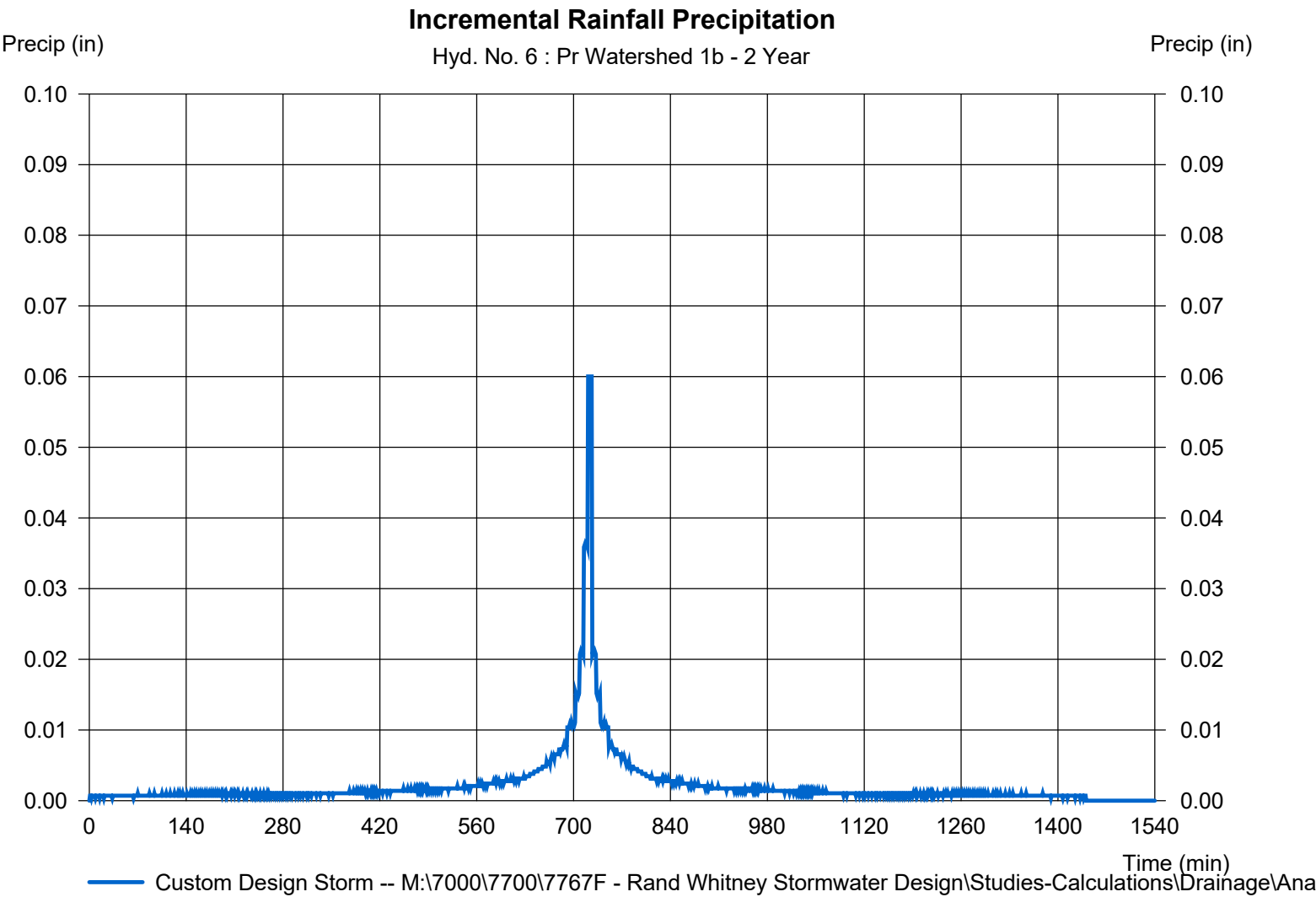
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 6

Pr Watershed 1b

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4500 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		

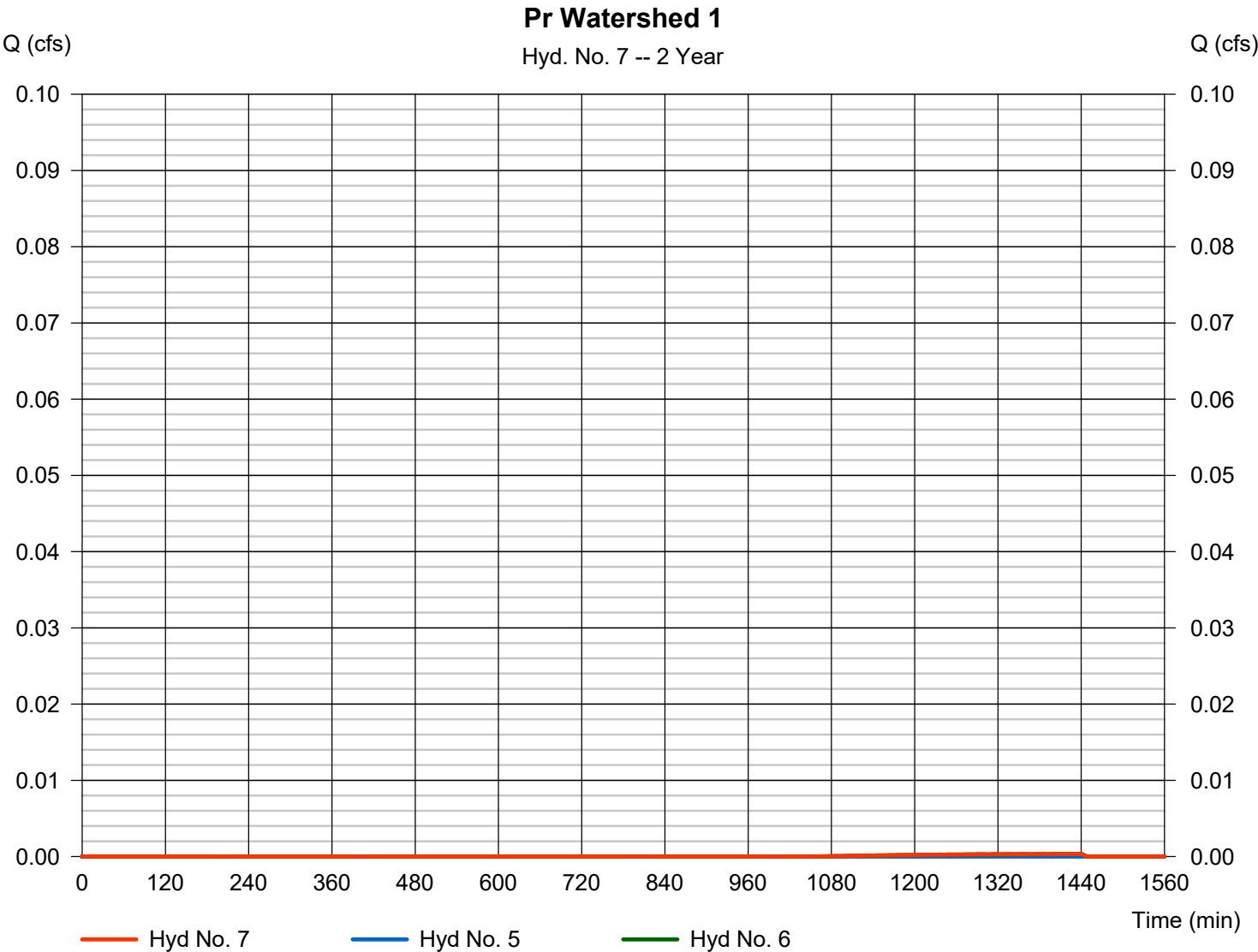


Hydrograph Report

Hyd. No. 7

Pr Watershed 1

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 1424 min
Time interval	= 1 min	Hyd. volume	= 5 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.210 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

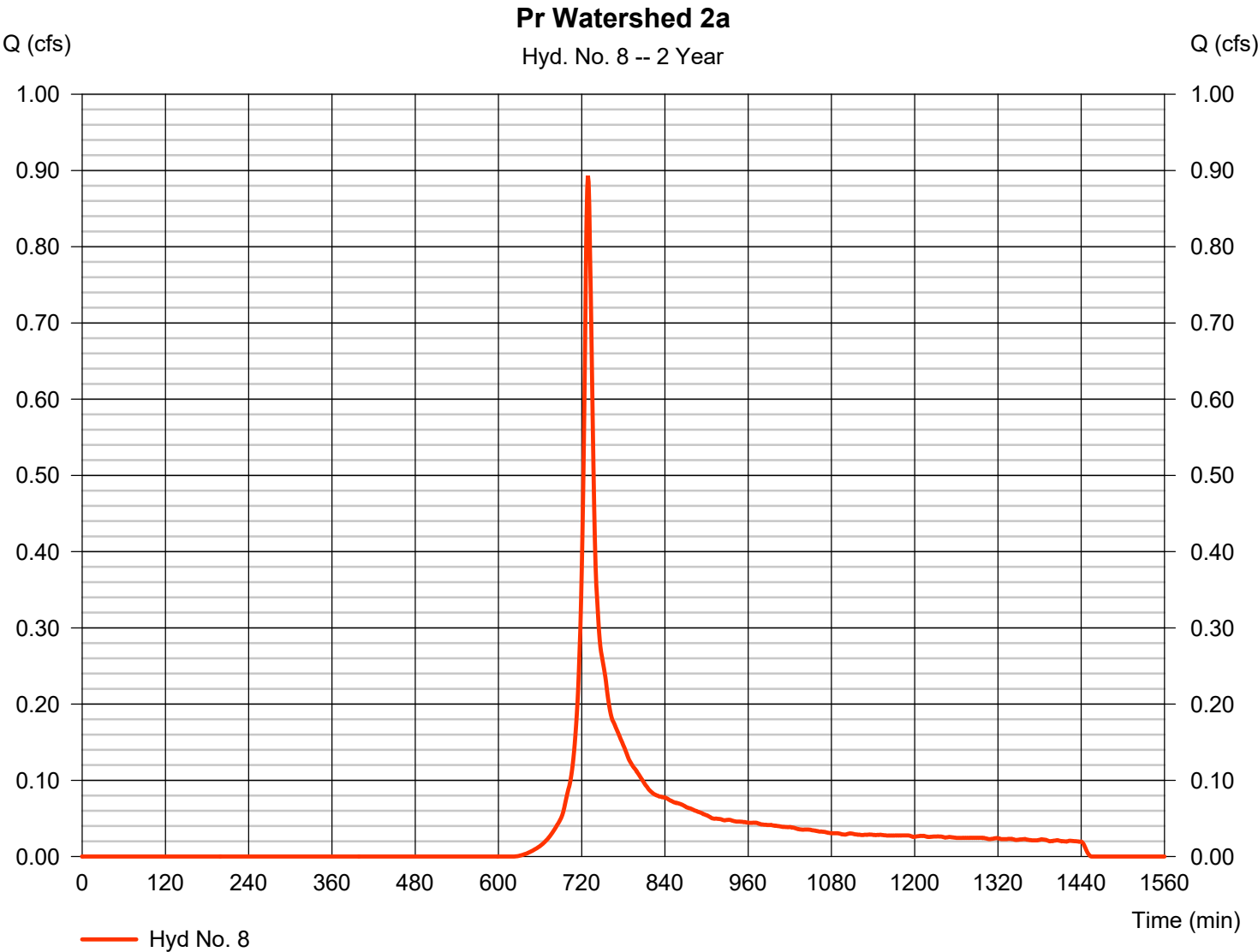
Wednesday, 12 / 11 / 2024

Hyd. No. 8

Pr Watershed 2a

Hydrograph type	= SCS Runoff	Peak discharge	= 0.893 cfs
Storm frequency	= 2 yrs	Time to peak	= 729 min
Time interval	= 1 min	Hyd. volume	= 3,204 cuft
Drainage area	= 0.770 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.80 min
Total precip.	= 3.45 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Dr		

* Composite (Area/CN) = [(0.320 x 39) + (0.450 x 98)] / 0.770



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No. 8

Pr Watershed 2a

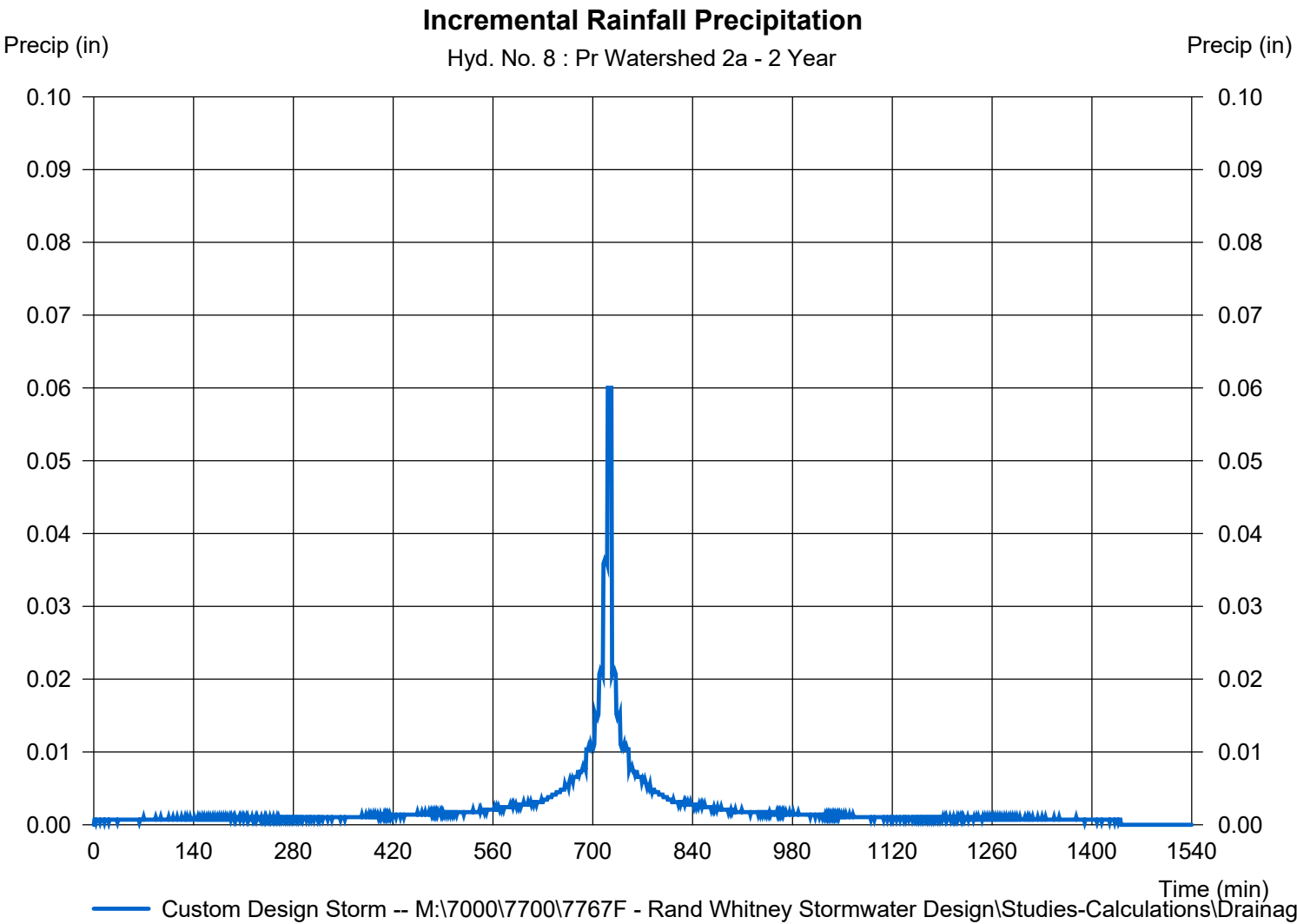
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.011	0.011	0.011				
Flow length (ft)	= 132.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.45	0.00	0.00				
Land slope (%)	= 3.00	0.00	0.00				
Travel Time (min)	= 1.24	+	0.00	+	0.00	=	1.24
Shallow Concentrated Flow							
Flow length (ft)	= 0.00	0.00	0.00				
Watercourse slope (%)	= 0.00	0.00	0.00				
Surface description	= Paved	Paved	Paved				
Average velocity (ft/s)	=0.00	0.00	0.00				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Channel Flow							
X sectional flow area (sqft)	= 5.00	5.00	0.00				
Wetted perimeter (ft)	= 8.00	8.00	0.00				
Channel slope (%)	= 2.80	1.30	0.00				
Manning's n-value	= 0.400	0.400	0.015				
Velocity (ft/s)	=0.45	0.31	0.00				
Flow length (ft)	(0)}120.0	58.0	0.0				
Travel Time (min)	= 4.40	+	3.12	+	0.00	=	7.51
Total Travel Time, Tc				8.80 min			

Precipitation Report

Hyd. No. 8

Pr Watershed 2a

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4500 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

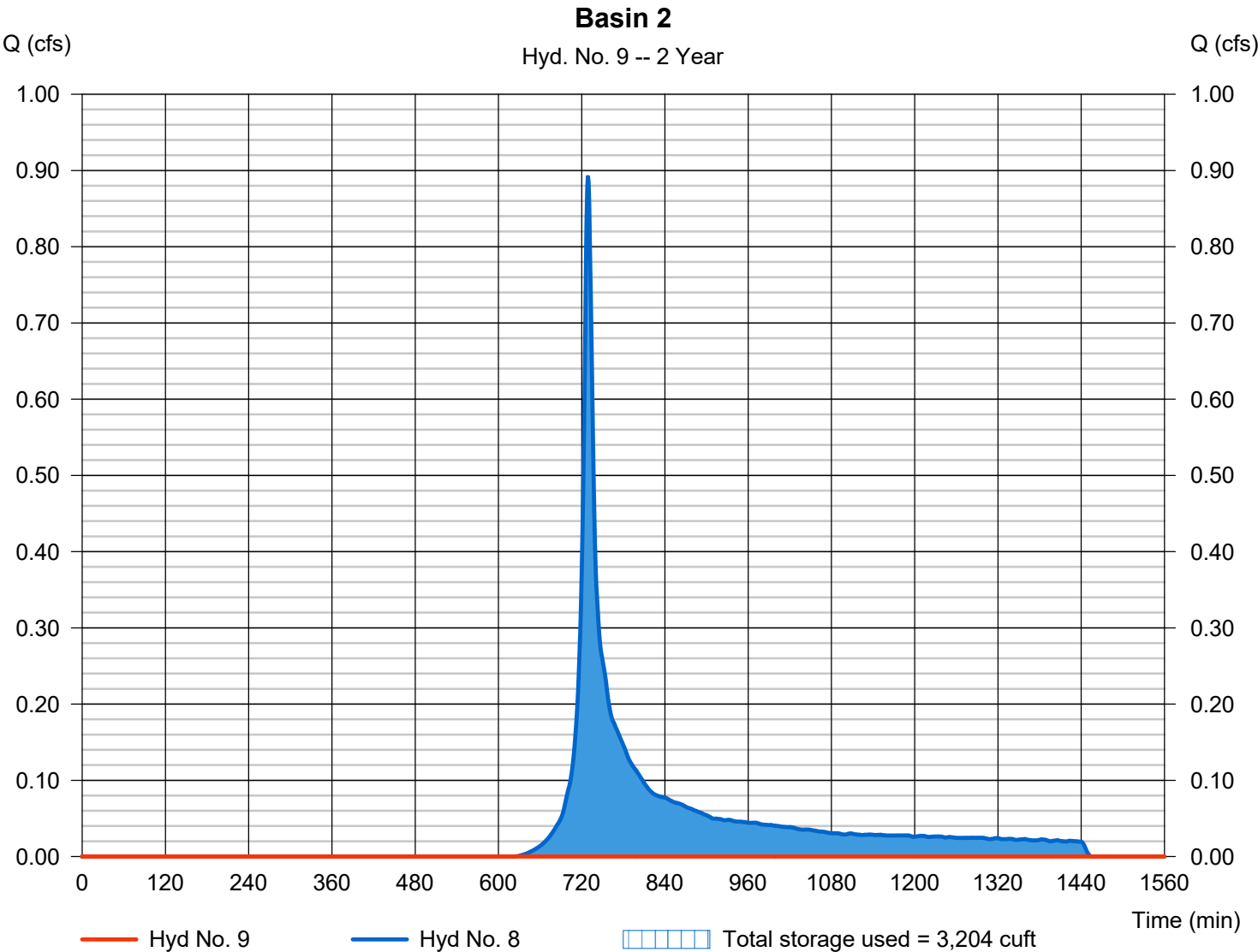
Wednesday, 12 / 11 / 2024

Hyd. No. 9

Basin 2

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 8 - Pr Watershed 2a	Max. Elevation	= 232.56 ft
Reservoir name	= Pond 2	Max. Storage	= 3,204 cuft

Storage Indication method used.



Pond No. 2 - Pond 2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 231.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	231.00	1,370	0	0
2.00	233.00	2,814	4,098	4,098
2.50	233.50	3,215	1,506	5,604
3.00	234.00	3,632	1,711	7,314
4.00	235.00	4,656	4,133	11,447

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	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)	= 3.00	0.00	0.00	0.00
Crest El. (ft)	= 233.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	231.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.00	4,098	233.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.50	5,604	233.50	---	---	---	---	0.00	---	---	---	---	---	0.000
3.00	7,314	234.00	---	---	---	---	3.53	---	---	---	---	---	3.532
4.00	11,447	235.00	---	---	---	---	18.35	---	---	---	---	---	18.35

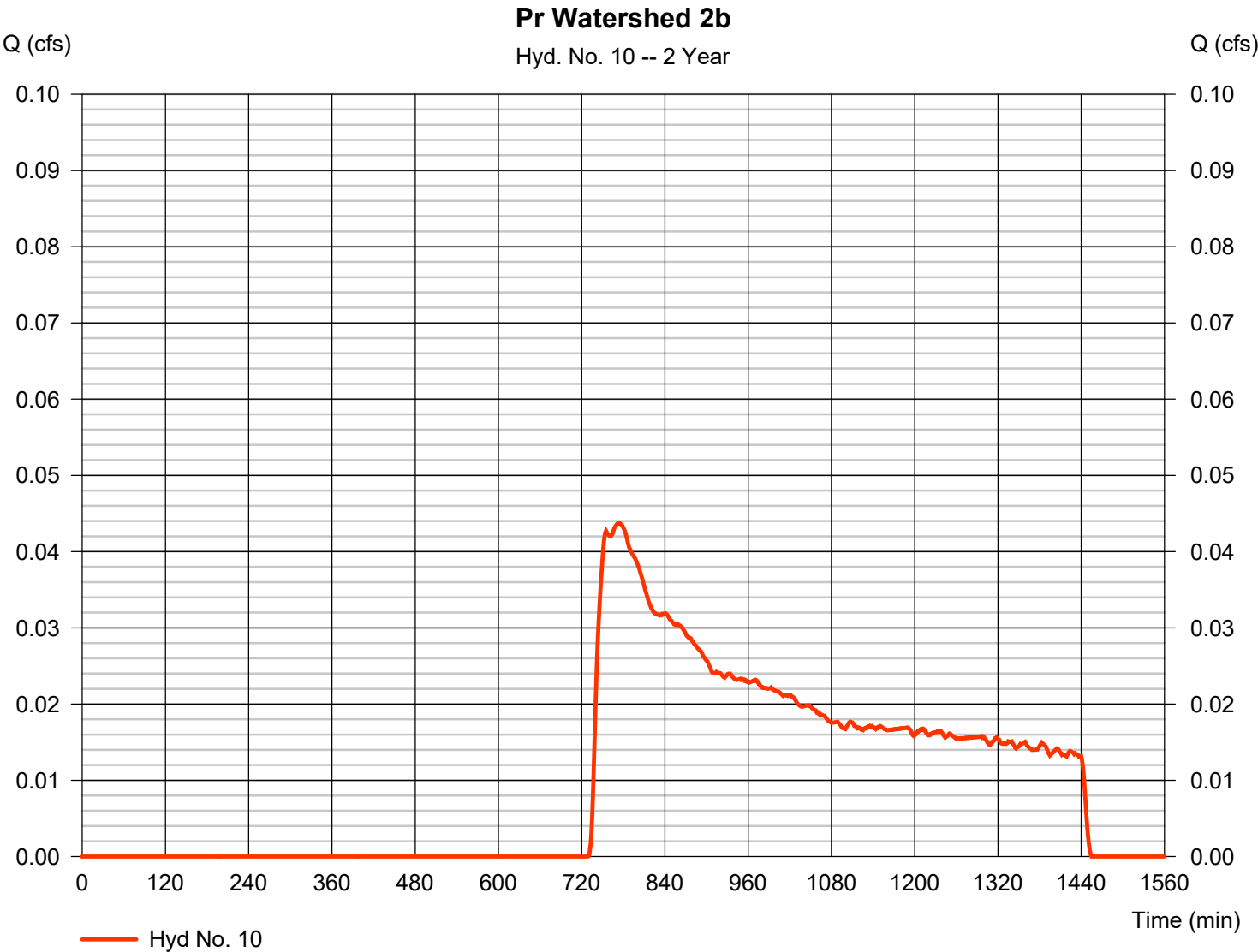
Hydrograph Report

Hyd. No. 10

Pr Watershed 2b

Hydrograph type	= SCS Runoff	Peak discharge	= 0.044 cfs
Storm frequency	= 2 yrs	Time to peak	= 773 min
Time interval	= 1 min	Hyd. volume	= 912 cuft
Drainage area	= 1.580 ac	Curve number	= 49*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.45 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Watershed Design Studies-Calculations\Drainage Basin		

* Composite (Area/CN) = [(0.650 x 36) + (0.640 x 39) + (0.290 x 98)] / 1.580

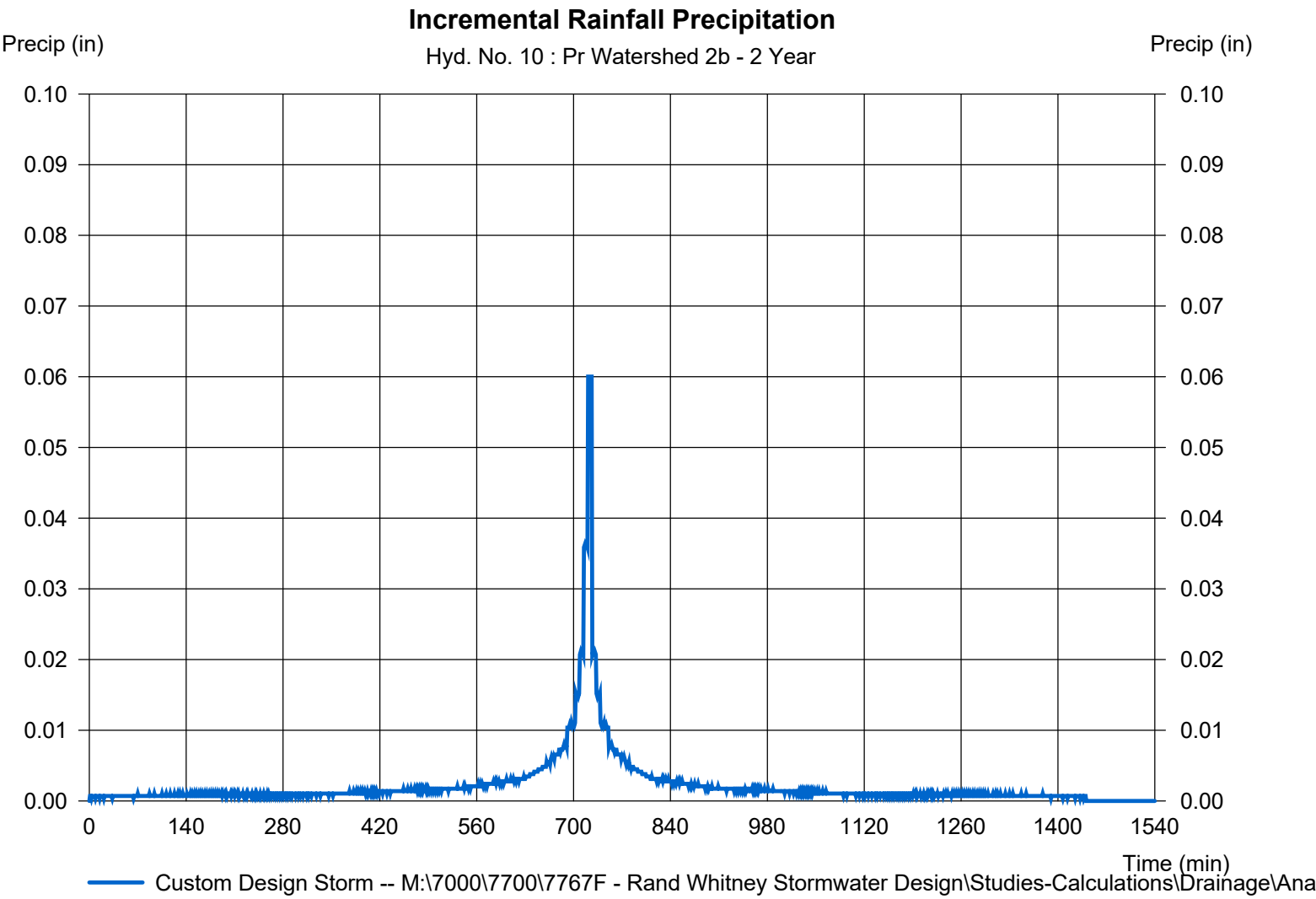


Precipitation Report

Hyd. No. 10

Pr Watershed 2b

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4500 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

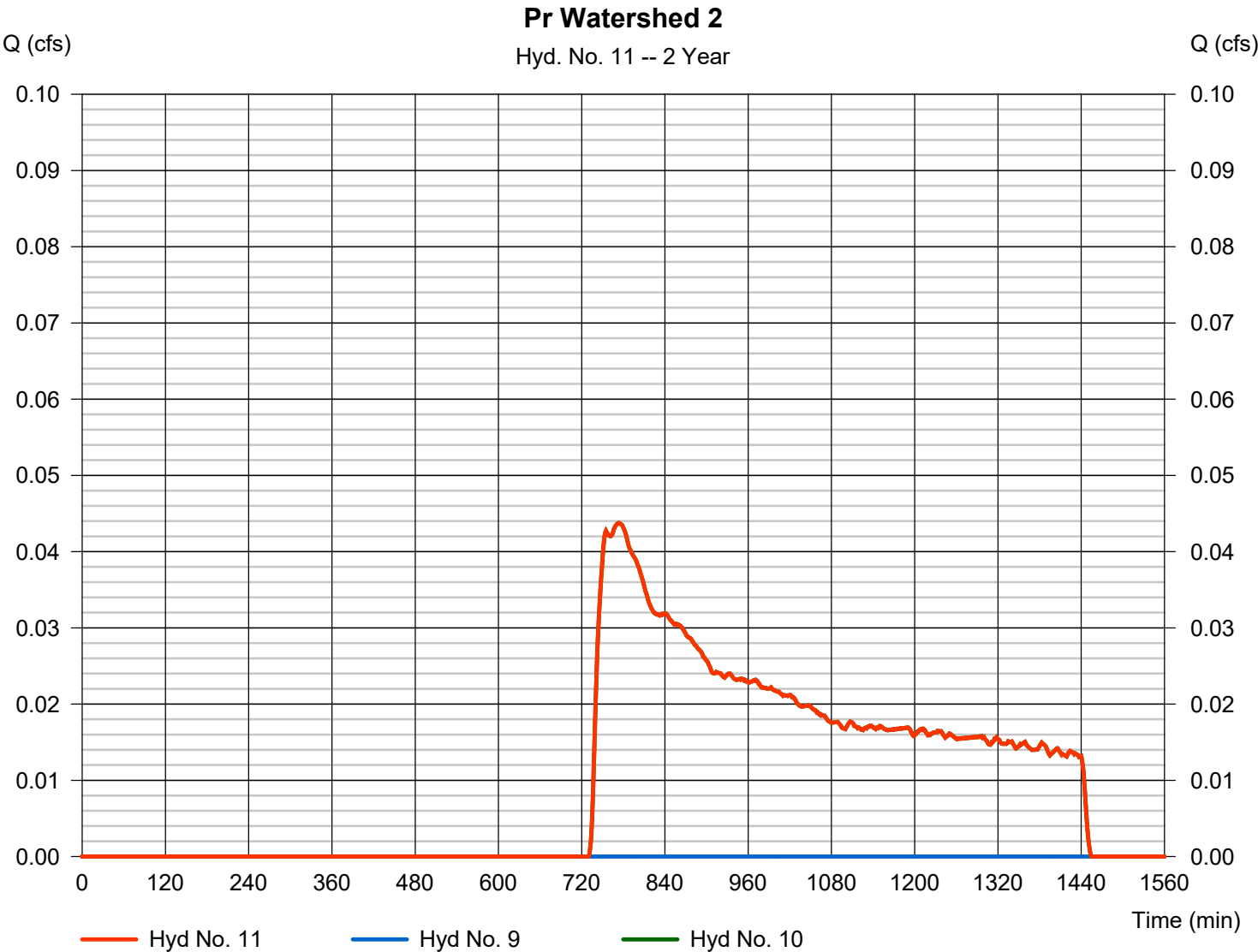
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Wednesday, 12 / 11 / 2024

Hyd. No. 11

Pr Watershed 2

Hydrograph type	= Combine	Peak discharge	= 0.044 cfs
Storm frequency	= 2 yrs	Time to peak	= 773 min
Time interval	= 1 min	Hyd. volume	= 912 cuft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 1.580 ac



Hydrograph Report

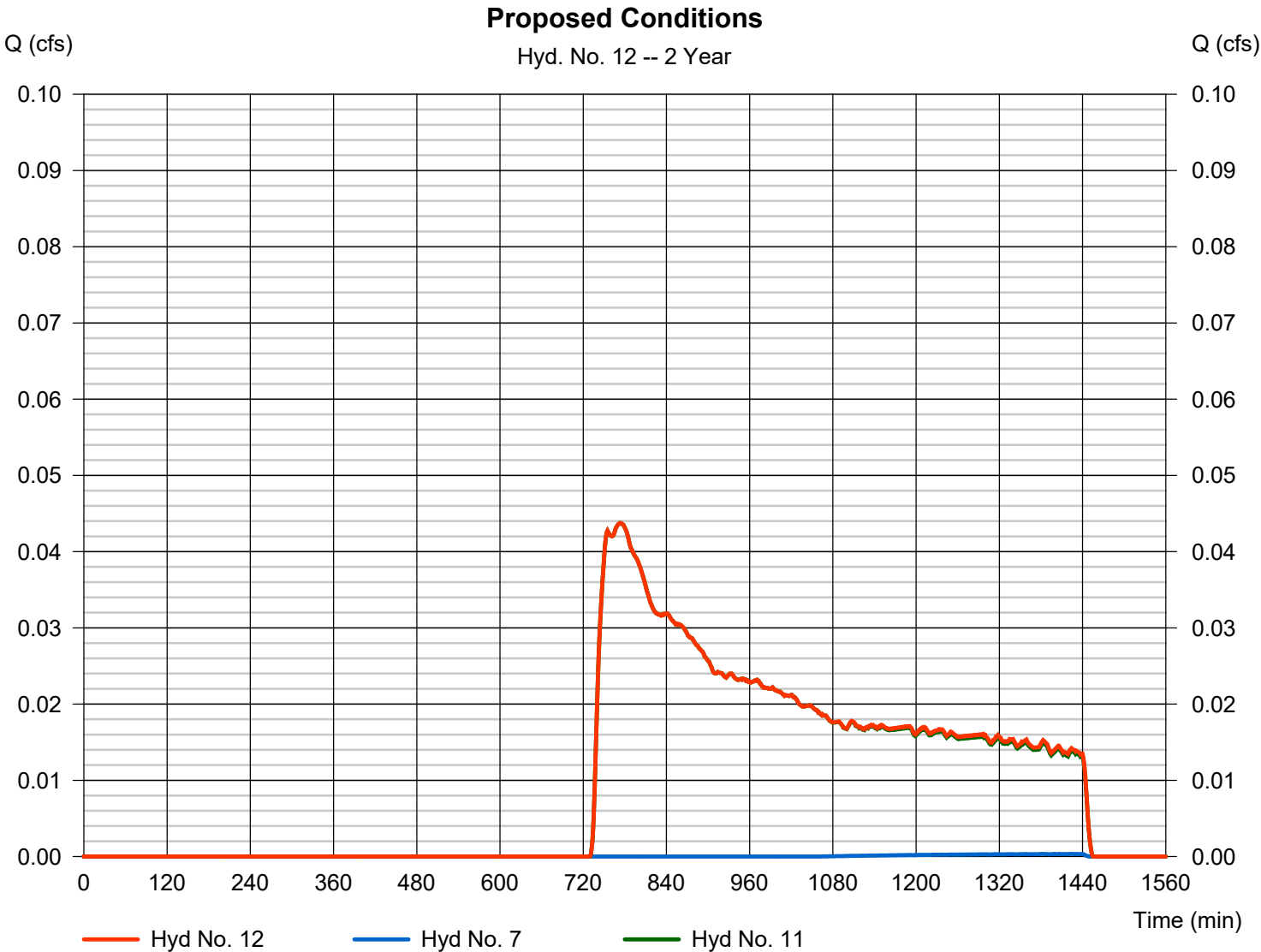
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 12

Proposed Conditions

Hydrograph type	= Combine	Peak discharge	= 0.044 cfs
Storm frequency	= 2 yrs	Time to peak	= 773 min
Time interval	= 1 min	Hyd. volume	= 917 cuft
Inflow hyds.	= 7, 11	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	0.227	1	738	2,305	-----	-----	-----	Ex Watershed 1
2	SCS Runoff	0.172	1	773	3,367	-----	-----	-----	Ex Watershed 2
3	Combine	0.317	1	759	5,672	1, 2	-----	-----	Existing Conditions
4	SCS Runoff	5.133	1	732	20,802	-----	-----	-----	Pr Watershed 1a
5	Reservoir	0.119	1	1365	1,865	4	233.54	19,339	Basin 1
6	SCS Runoff	0.008	1	775	177	-----	-----	-----	Pr Watershed 1b
7	Combine	0.122	1	1357	2,042	5, 6	-----	-----	Pr Watershed 1
8	SCS Runoff	1.907	1	729	6,638	-----	-----	-----	Pr Watershed 2a
9	Reservoir	0.050	1	1155	1,033	8	233.52	5,680	Basin 2
10	SCS Runoff	0.746	1	731	3,938	-----	-----	-----	Pr Watershed 2b
11	Combine	0.746	1	731	4,970	9, 10	-----	-----	Pr Watershed 2
12	Combine	0.746	1	731	7,012	7, 11	-----	-----	Proposed Conditions
Analysis.gpw					Return Period: 10 Year			Wednesday, 12 / 11 / 2024	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

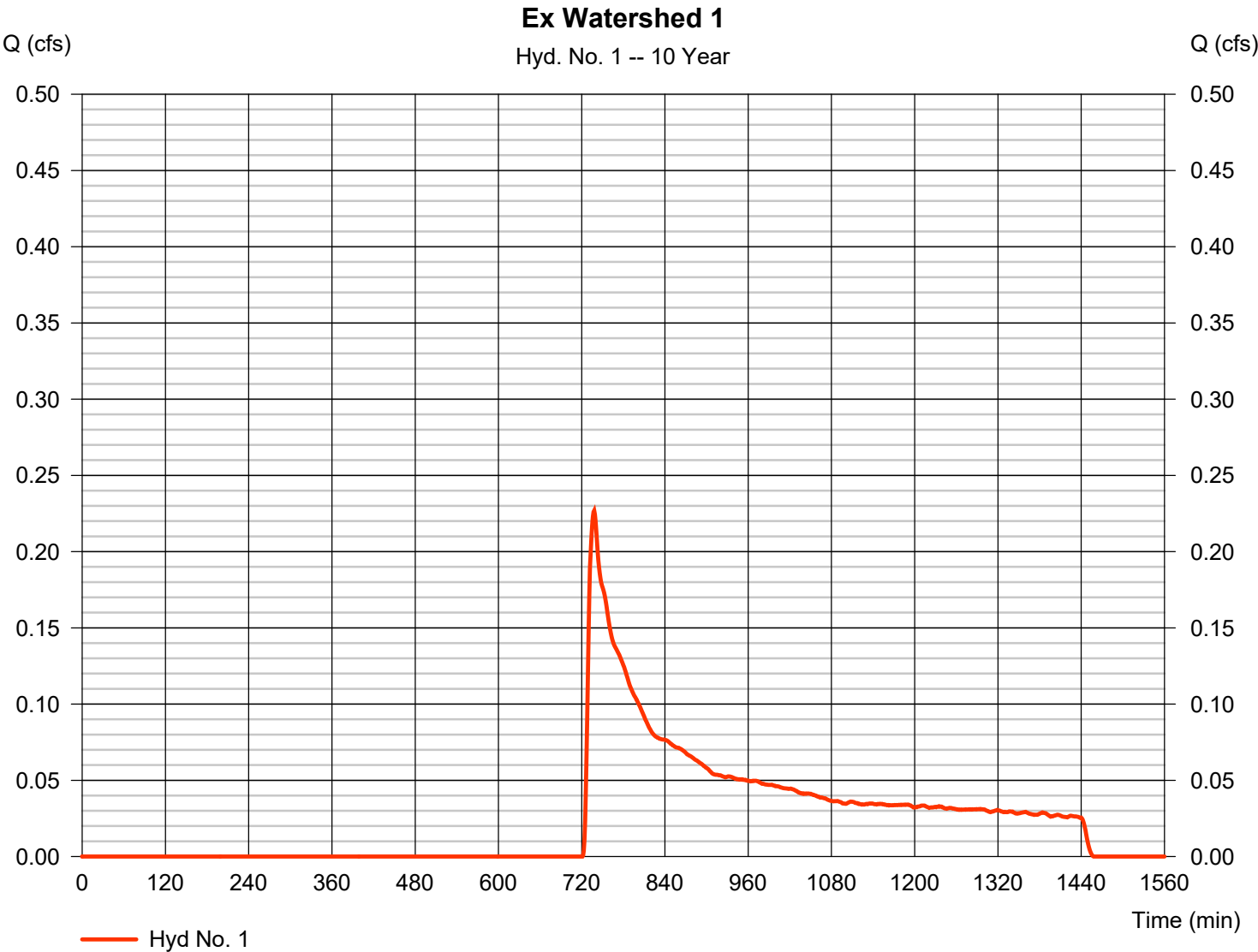
Wednesday, 12 / 11 / 2024

Hyd. No. 1

Ex Watershed 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.227 cfs
Storm frequency	=	10 yrs	Time to peak	=	738 min
Time interval	=	1 min	Hyd. volume	=	2,305 cuft
Drainage area	=	1.440 ac	Curve number	=	44*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.30 min
Total precip.	=	5.12 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Water Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.620 x 36) + (0.790 x 49) + (0.030 x 98)] / 1.440

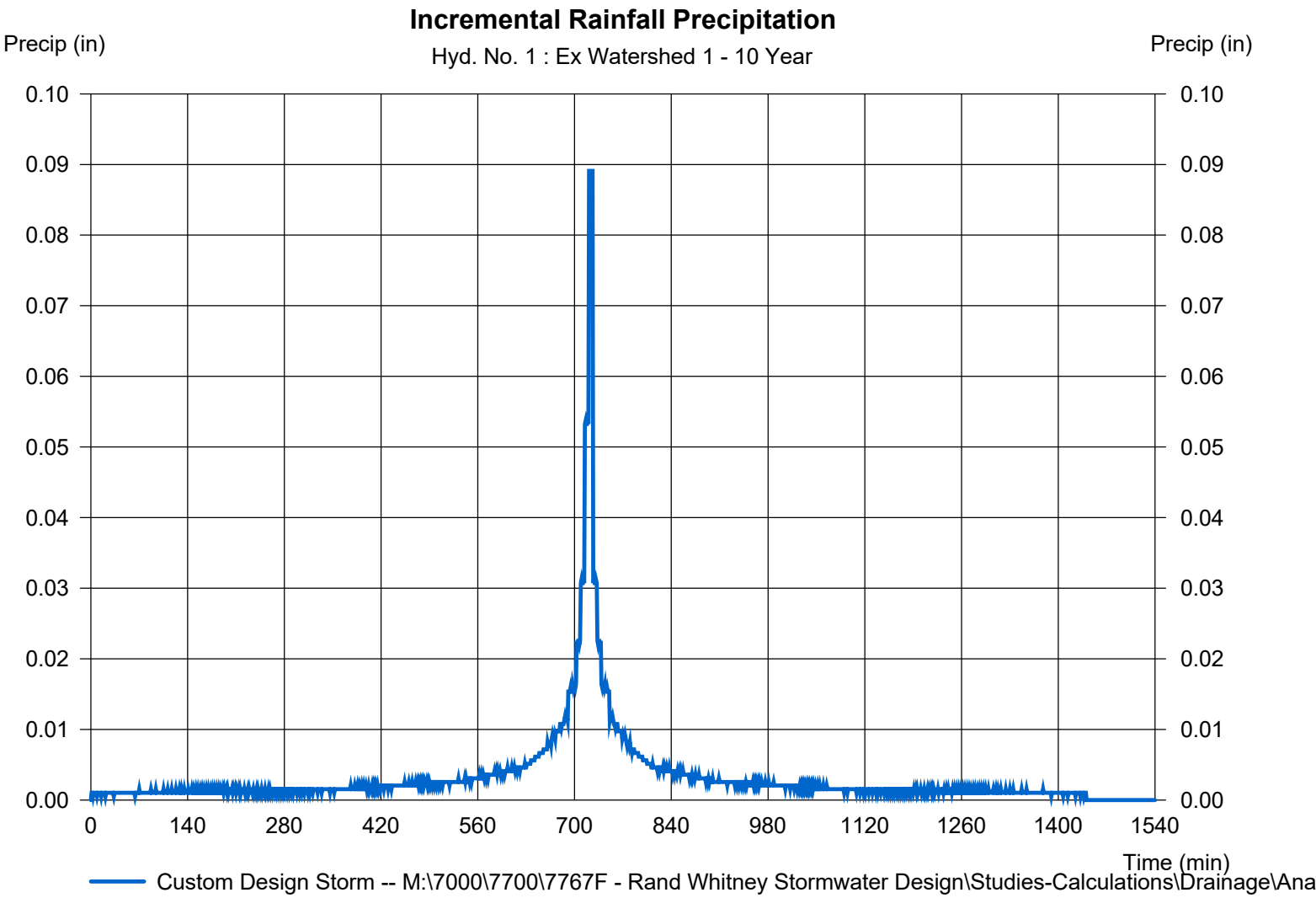


Precipitation Report

Hyd. No. 1

Ex Watershed 1

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.1200 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



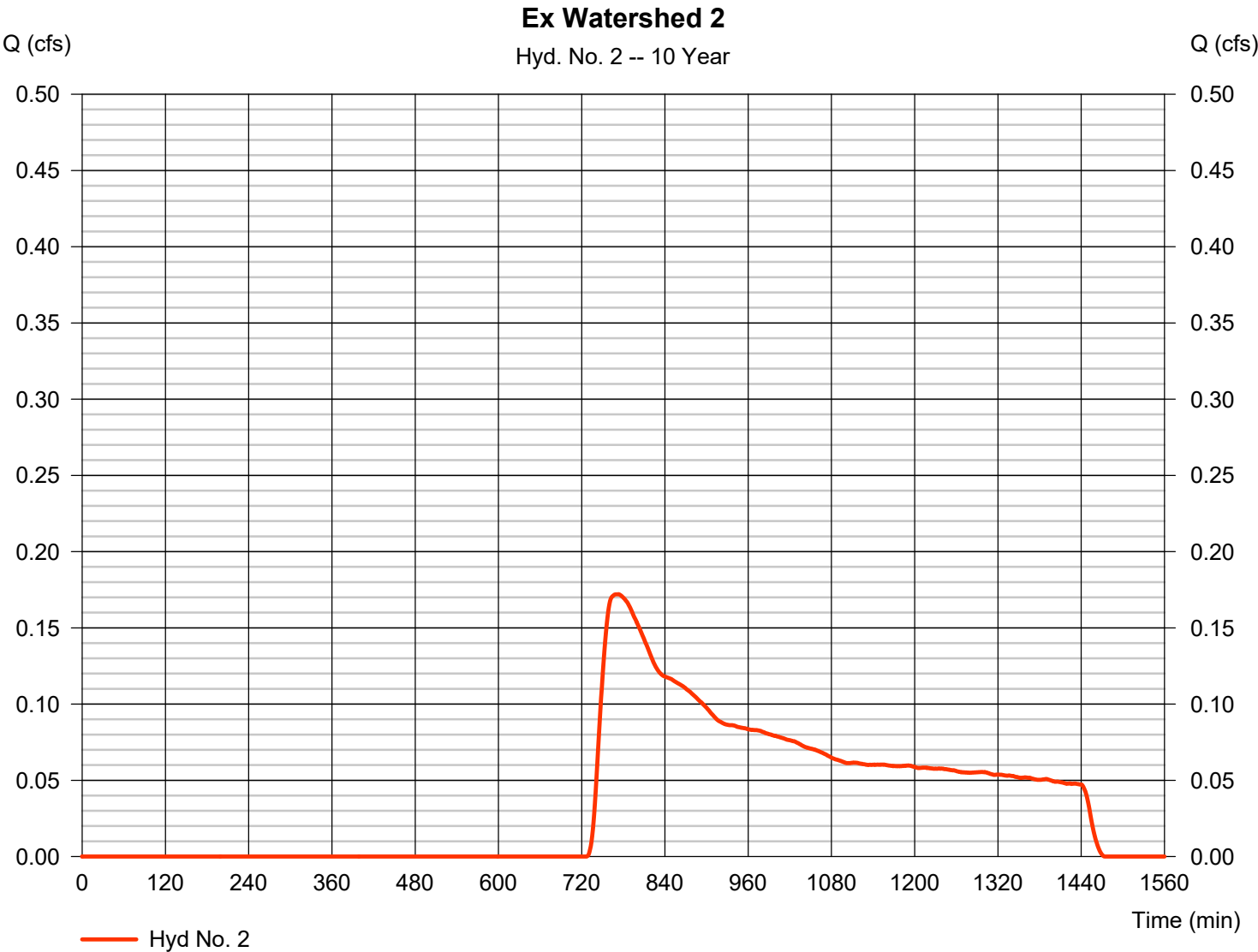
Hydrograph Report

Hyd. No. 2

Ex Watershed 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.172 cfs
Storm frequency	=	10 yrs	Time to peak	=	773 min
Time interval	=	1 min	Hyd. volume	=	3,367 cuft
Drainage area	=	3.500 ac	Curve number	=	40*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	20.40 min
Total precip.	=	5.12 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Water Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(2.870 x 36) + (0.540 x 49) + (0.090 x 98)] / 3.500

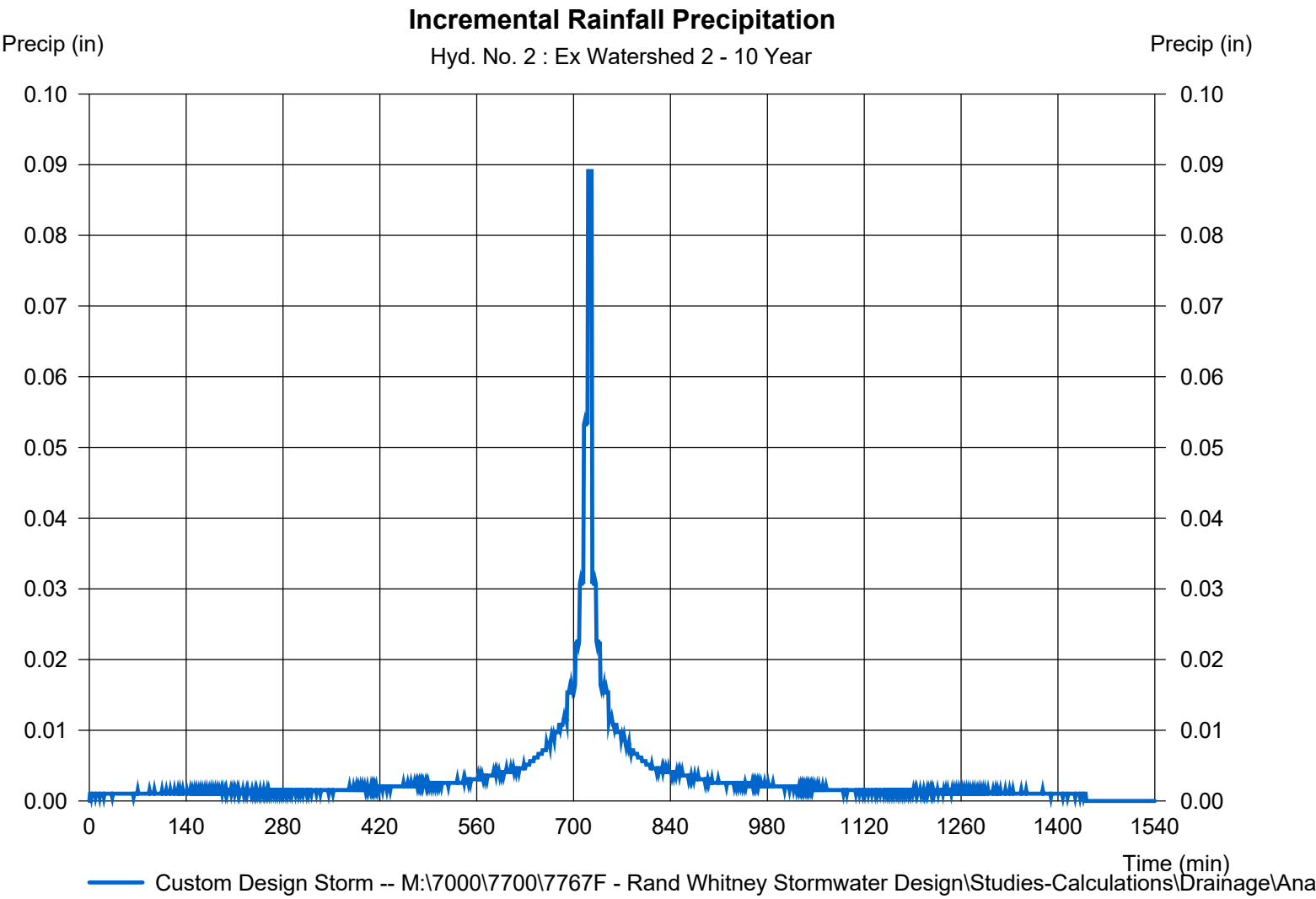


Precipitation Report

Hyd. No. 2

Ex Watershed 2

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.1200 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

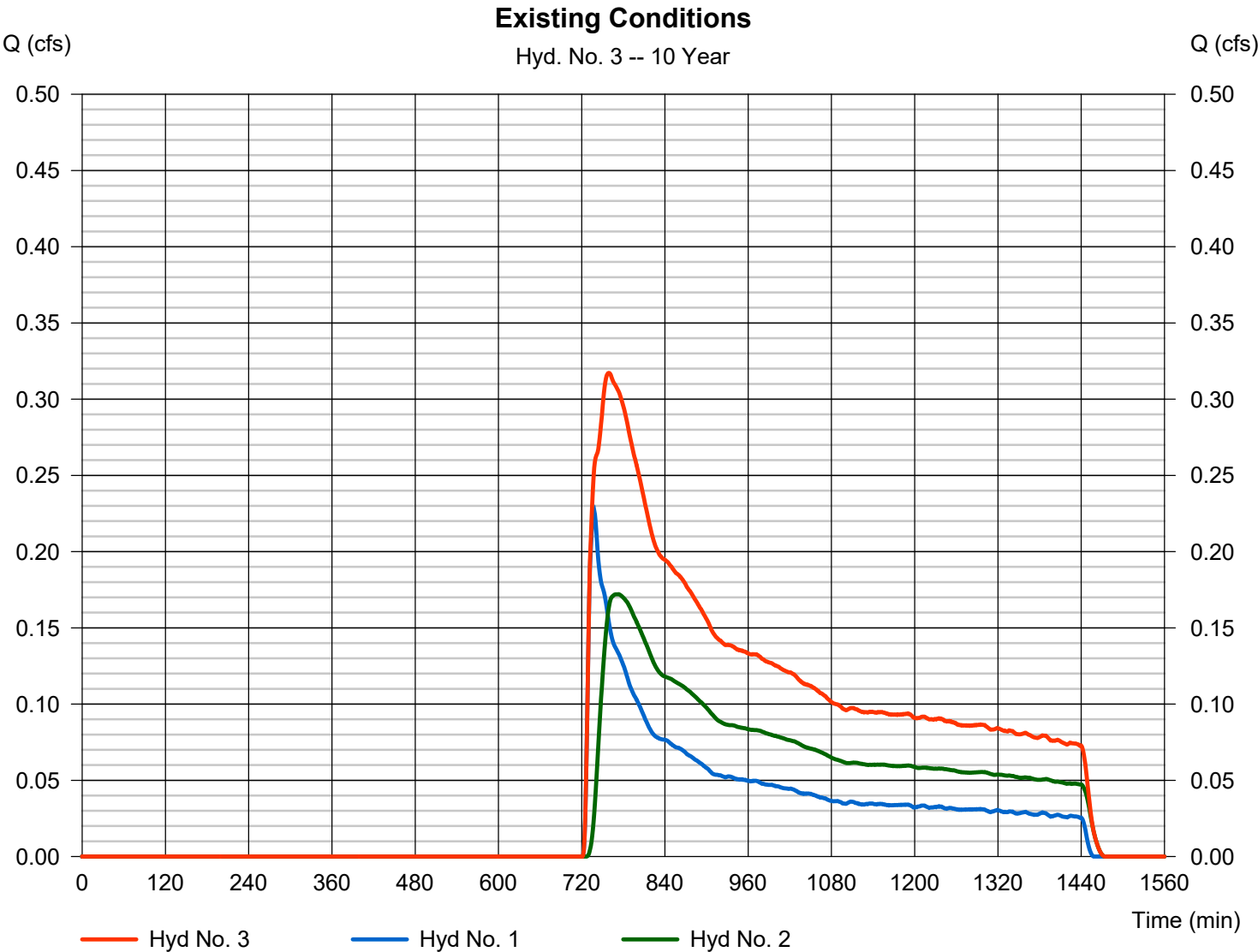
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 3

Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 0.317 cfs
Storm frequency	= 10 yrs	Time to peak	= 759 min
Time interval	= 1 min	Hyd. volume	= 5,672 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 4.940 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

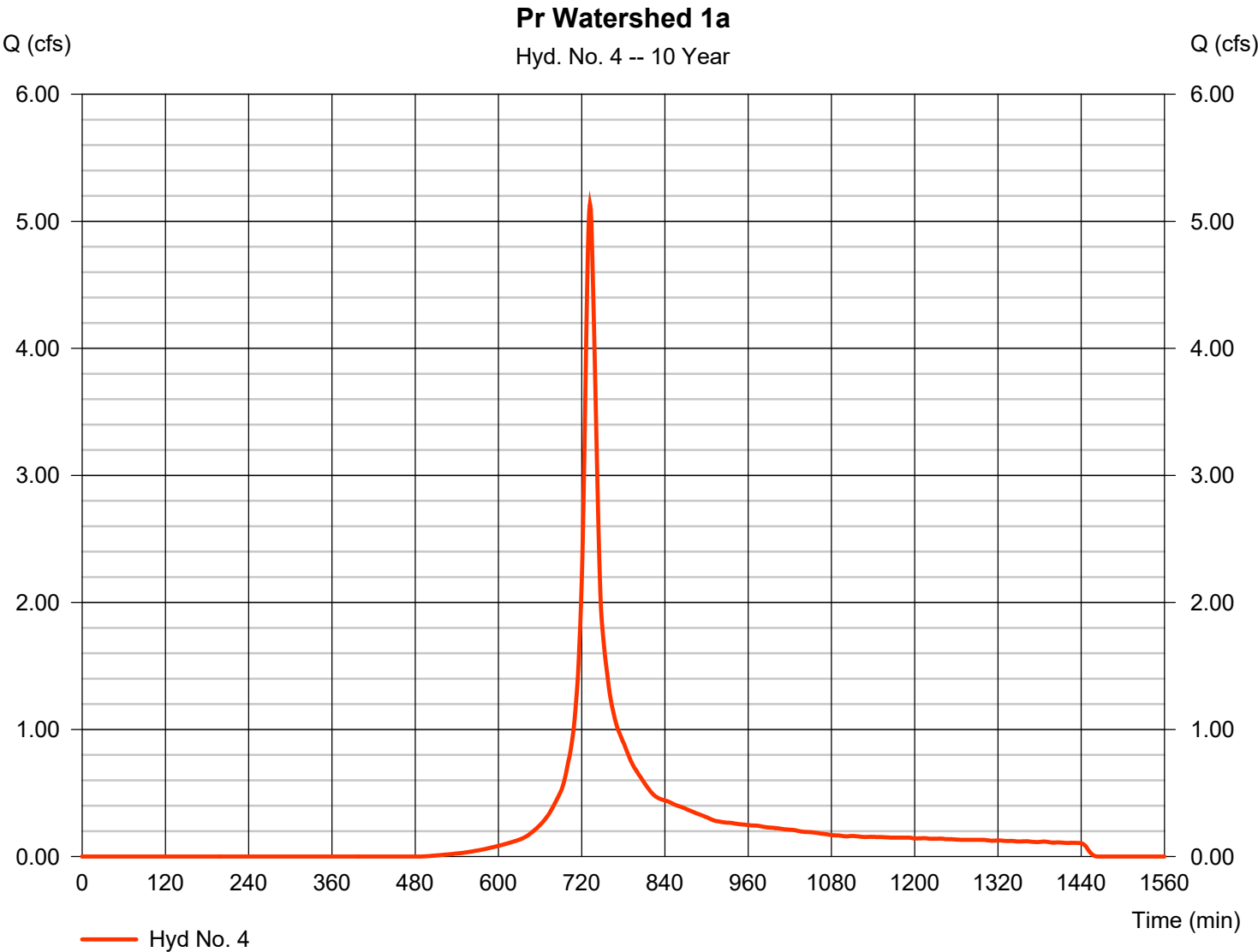
Wednesday, 12 / 11 / 2024

Hyd. No. 4

Pr Watershed 1a

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.133 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	20,802 cuft
Drainage area	=	2.250 ac	Curve number	=	75*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.50 min
Total precip.	=	5.12 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.860 x 39) + (1.390 x 98)] / 2.250

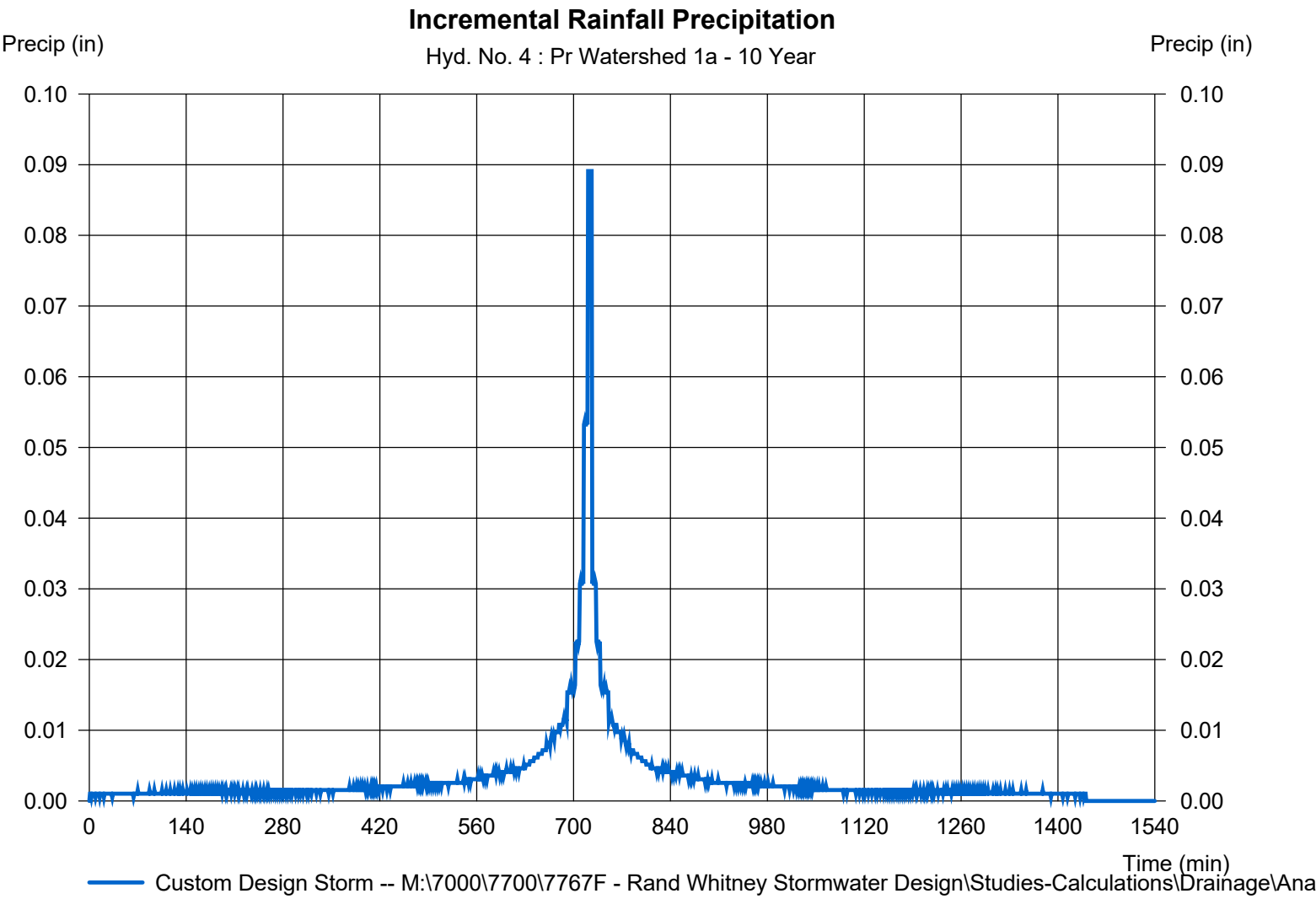


Precipitation Report

Hyd. No. 4

Pr Watershed 1a

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.1200 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

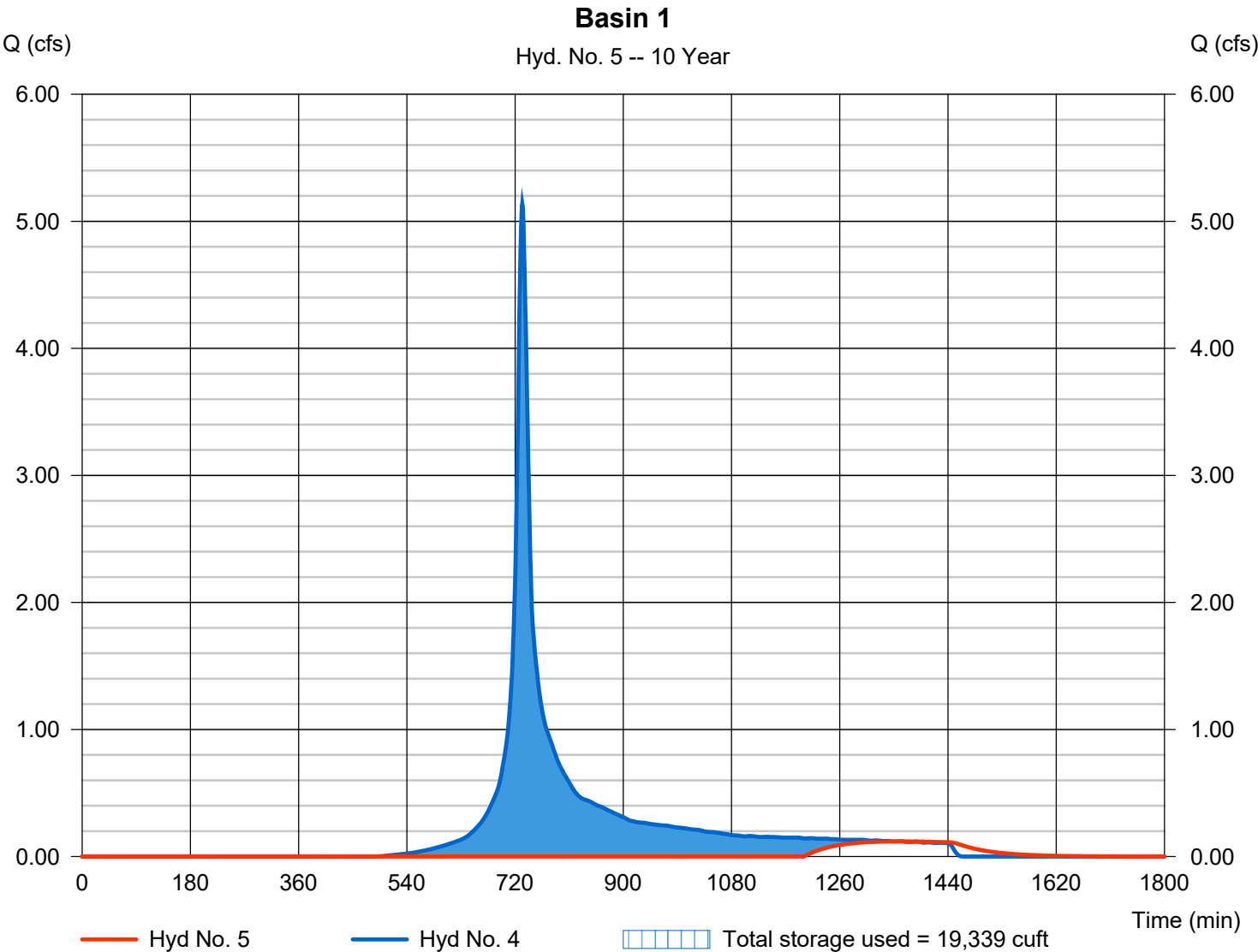
Wednesday, 12 / 11 / 2024

Hyd. No. 5

Basin 1

Hydrograph type	= Reservoir	Peak discharge	= 0.119 cfs
Storm frequency	= 10 yrs	Time to peak	= 1365 min
Time interval	= 1 min	Hyd. volume	= 1,865 cuft
Inflow hyd. No.	= 4 - Pr Watershed 1a	Max. Elevation	= 233.54 ft
Reservoir name	= Pond 1	Max. Storage	= 19,339 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

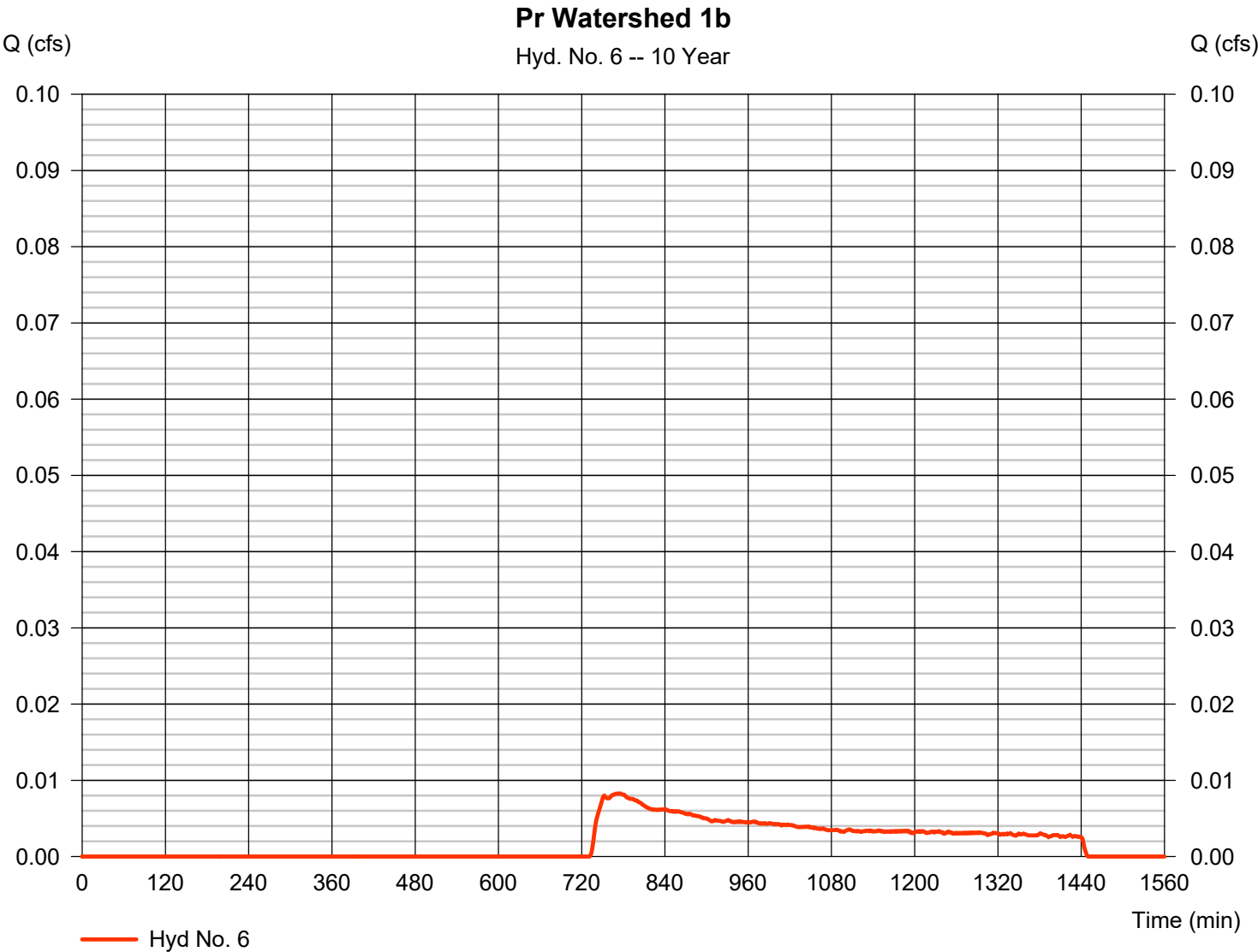
Wednesday, 12 / 11 / 2024

Hyd. No. 6

Pr Watershed 1b

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.008 cfs
Storm frequency	=	10 yrs	Time to peak	=	775 min
Time interval	=	1 min	Hyd. volume	=	177 cuft
Drainage area	=	0.210 ac	Curve number	=	39*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.12 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.210 x 39)] / 0.210



Precipitation Report

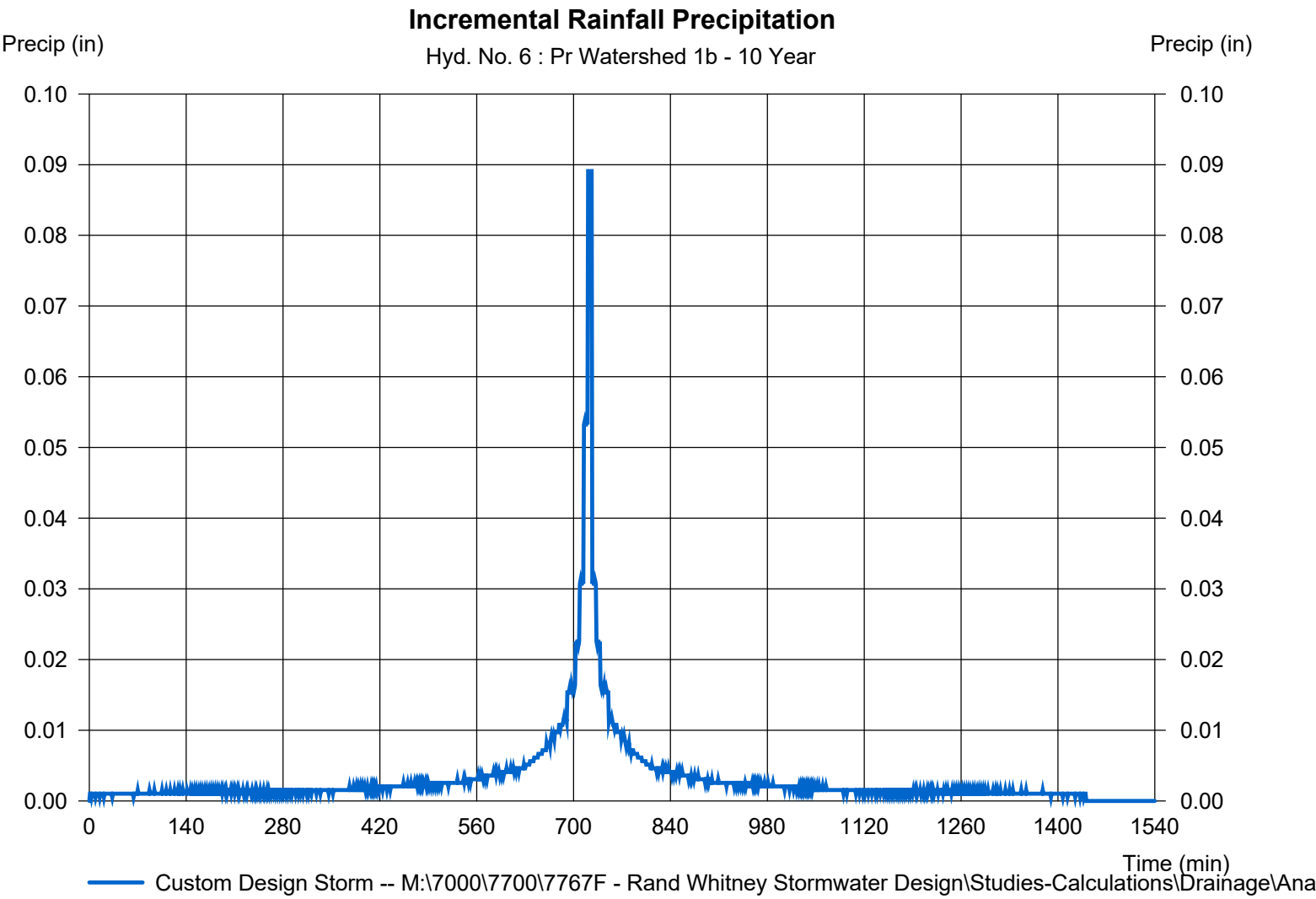
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 6

Pr Watershed 1b

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.1200 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		

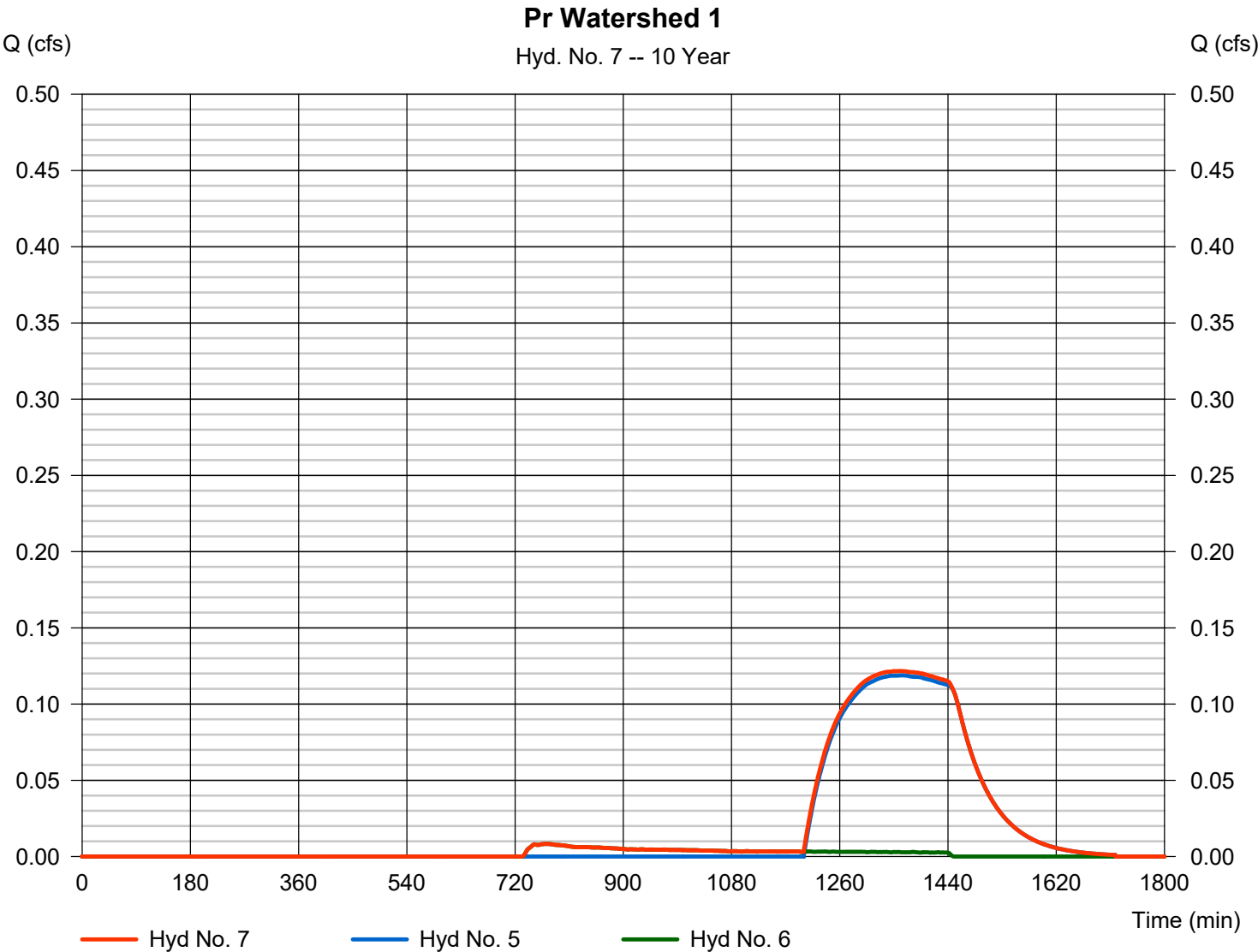


Hydrograph Report

Hyd. No. 7

Pr Watershed 1

Hydrograph type	= Combine	Peak discharge	= 0.122 cfs
Storm frequency	= 10 yrs	Time to peak	= 1357 min
Time interval	= 1 min	Hyd. volume	= 2,042 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.210 ac



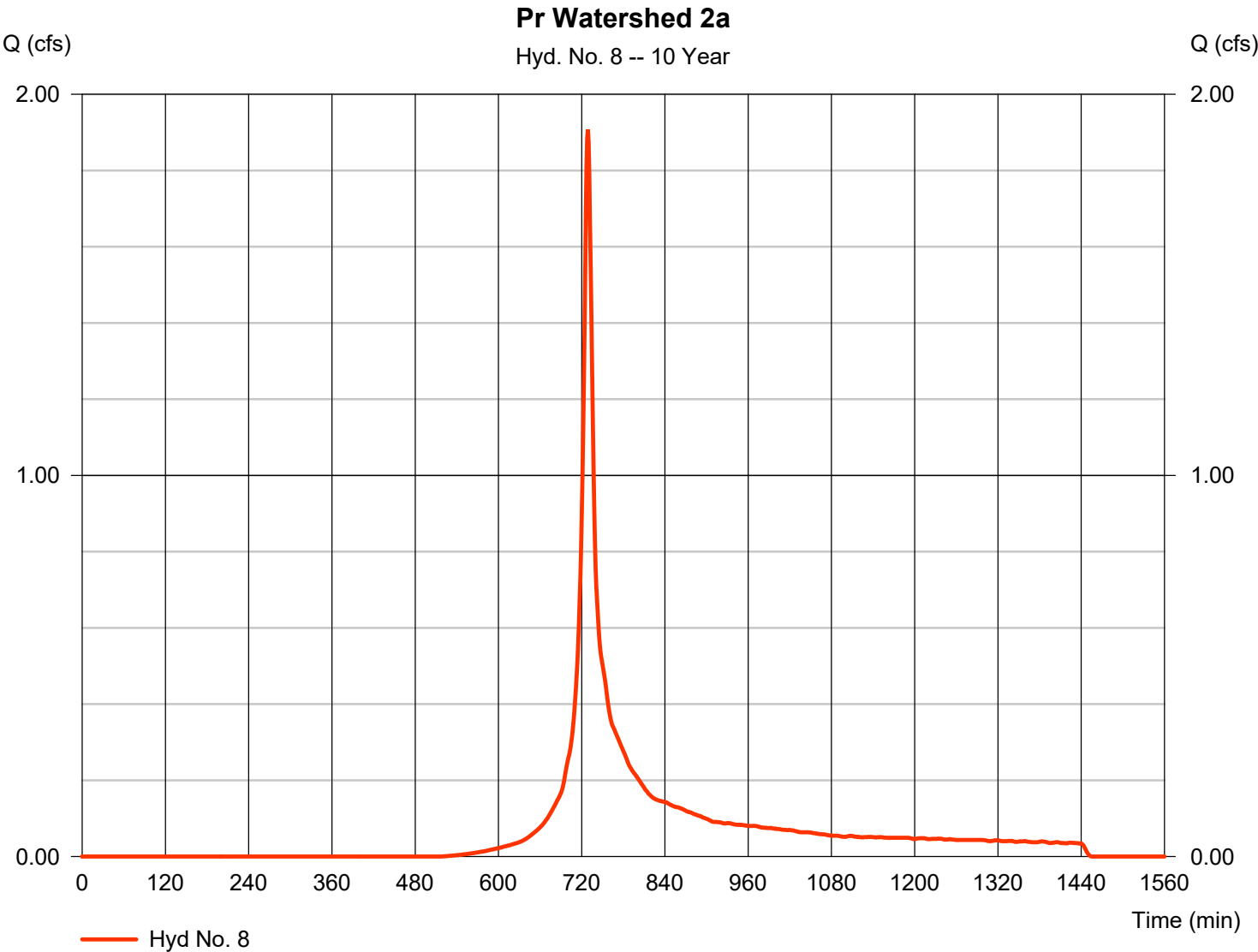
Hydrograph Report

Hyd. No. 8

Pr Watershed 2a

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.907 cfs
Storm frequency	=	10 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	6,638 cuft
Drainage area	=	0.770 ac	Curve number	=	73*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.80 min
Total precip.	=	5.12 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Dr			

* Composite (Area/CN) = [(0.320 x 39) + (0.450 x 98)] / 0.770

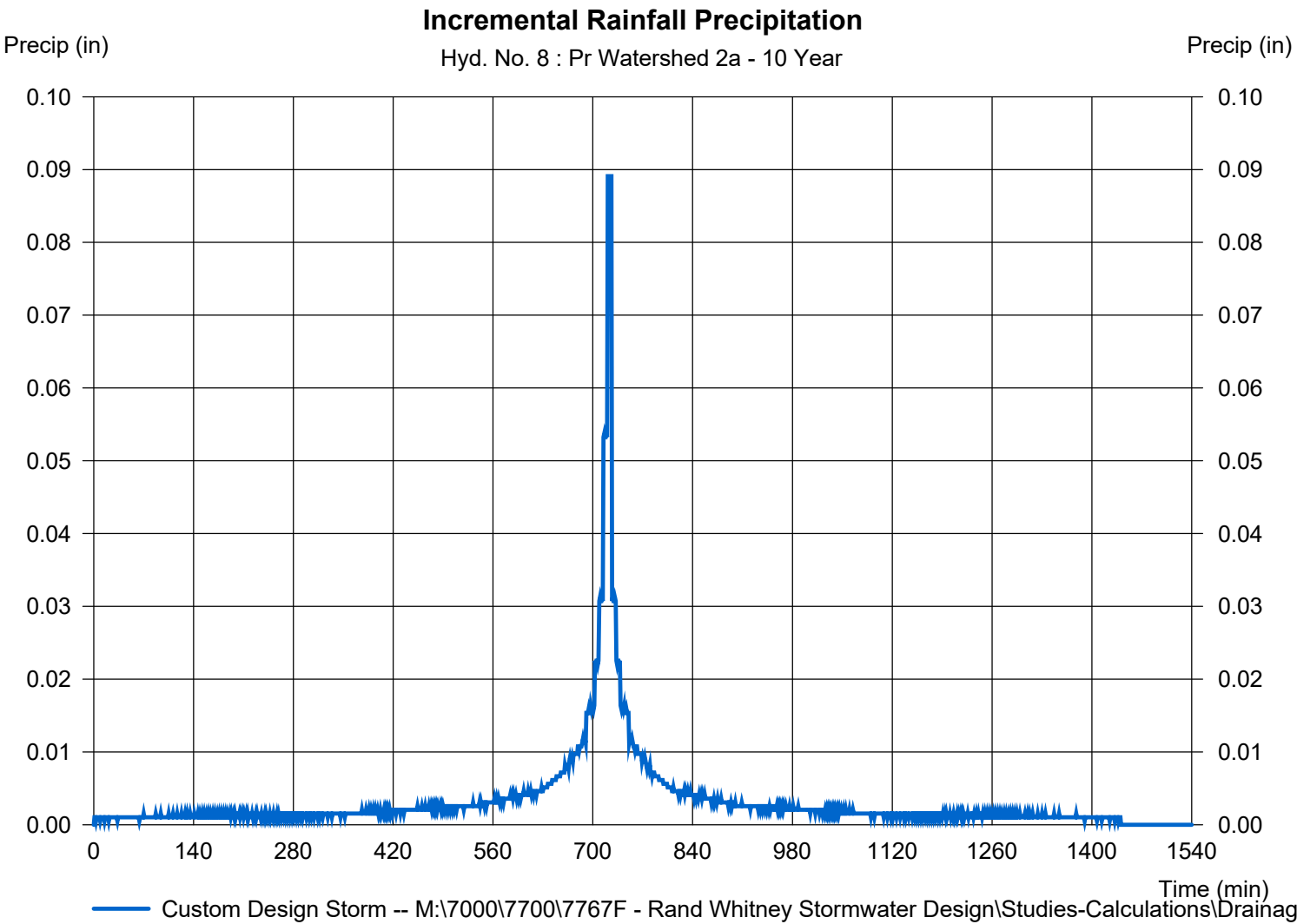


Precipitation Report

Hyd. No. 8

Pr Watershed 2a

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.1200 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

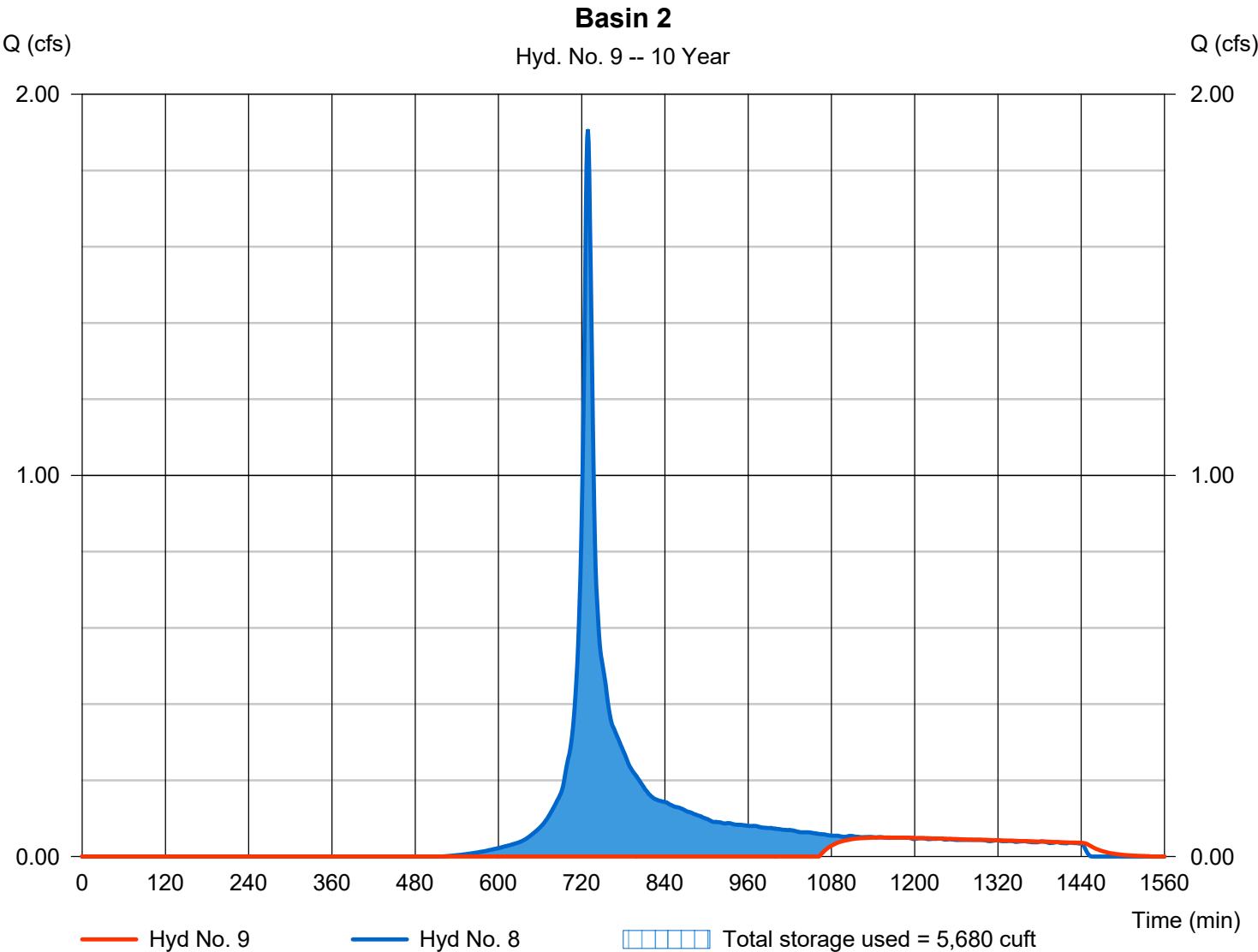
Wednesday, 12 / 11 / 2024

Hyd. No. 9

Basin 2

Hydrograph type	= Reservoir	Peak discharge	= 0.050 cfs
Storm frequency	= 10 yrs	Time to peak	= 1155 min
Time interval	= 1 min	Hyd. volume	= 1,033 cuft
Inflow hyd. No.	= 8 - Pr Watershed 2a	Max. Elevation	= 233.52 ft
Reservoir name	= Pond 2	Max. Storage	= 5,680 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

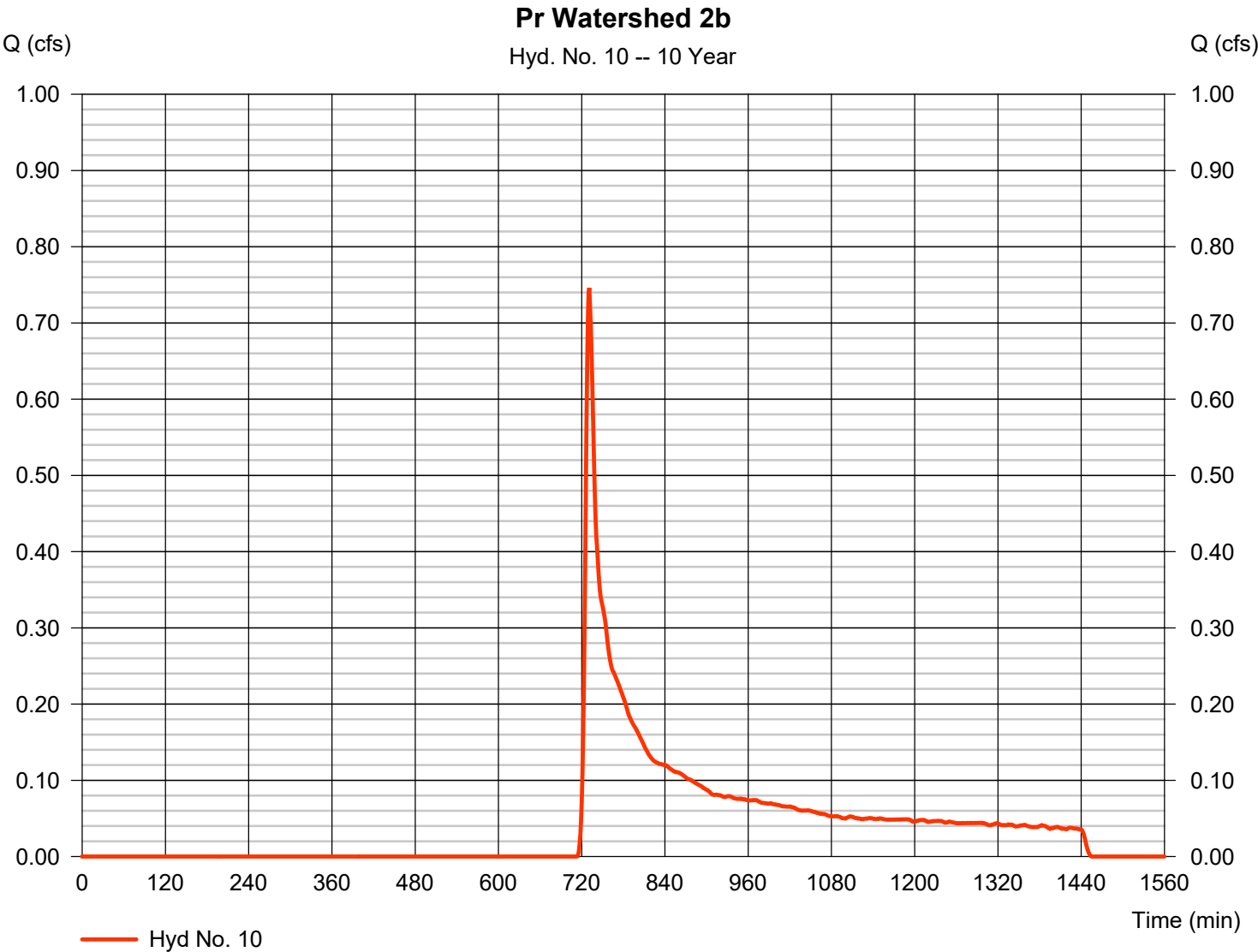
Wednesday, 12 / 11 / 2024

Hyd. No. 10

Pr Watershed 2b

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.746 cfs
Storm frequency	=	10 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	3,938 cuft
Drainage area	=	1.580 ac	Curve number	=	49*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	5.12 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.650 x 36) + (0.640 x 39) + (0.290 x 98)] / 1.580



Precipitation Report

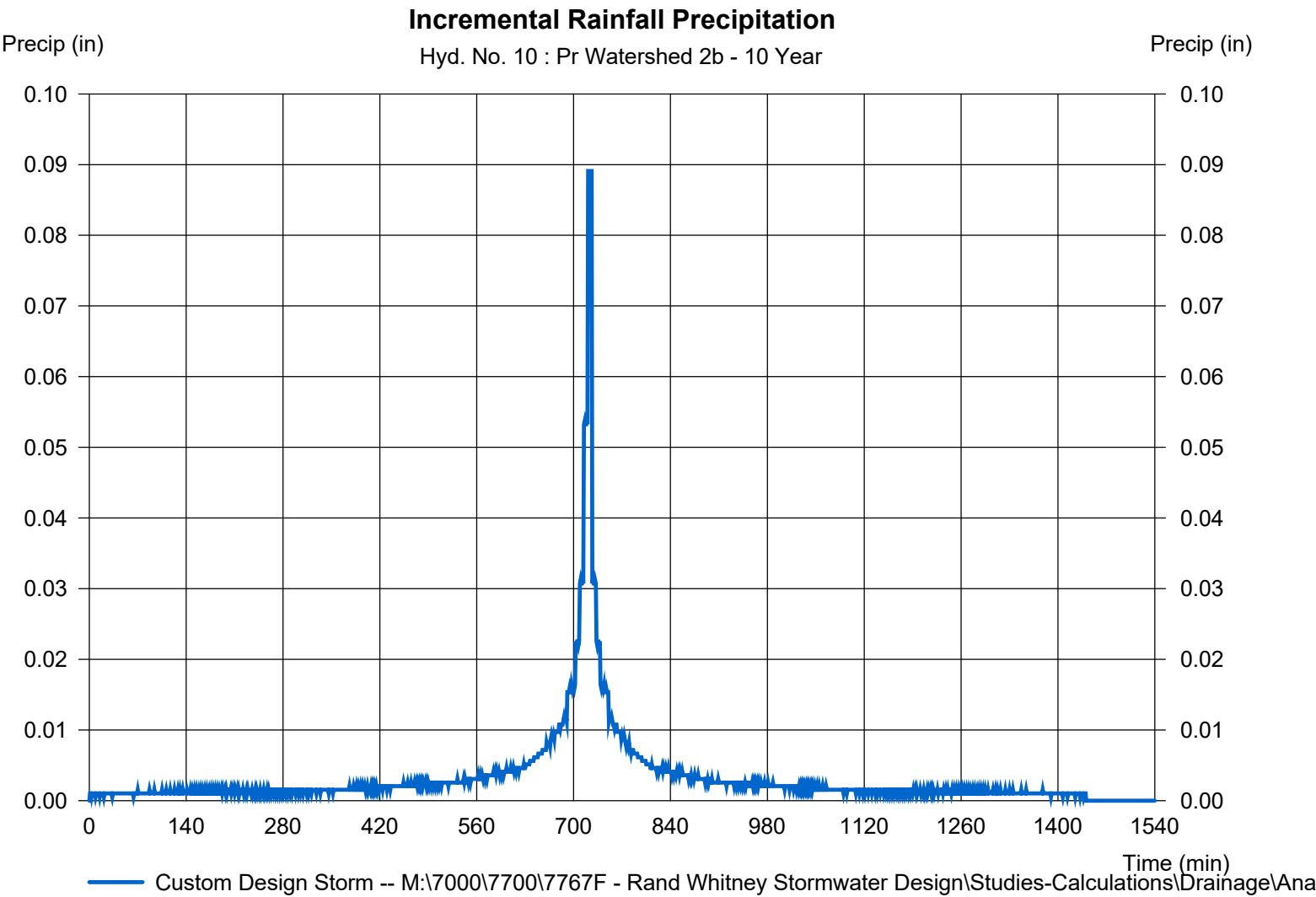
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 10

Pr Watershed 2b

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.1200 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		

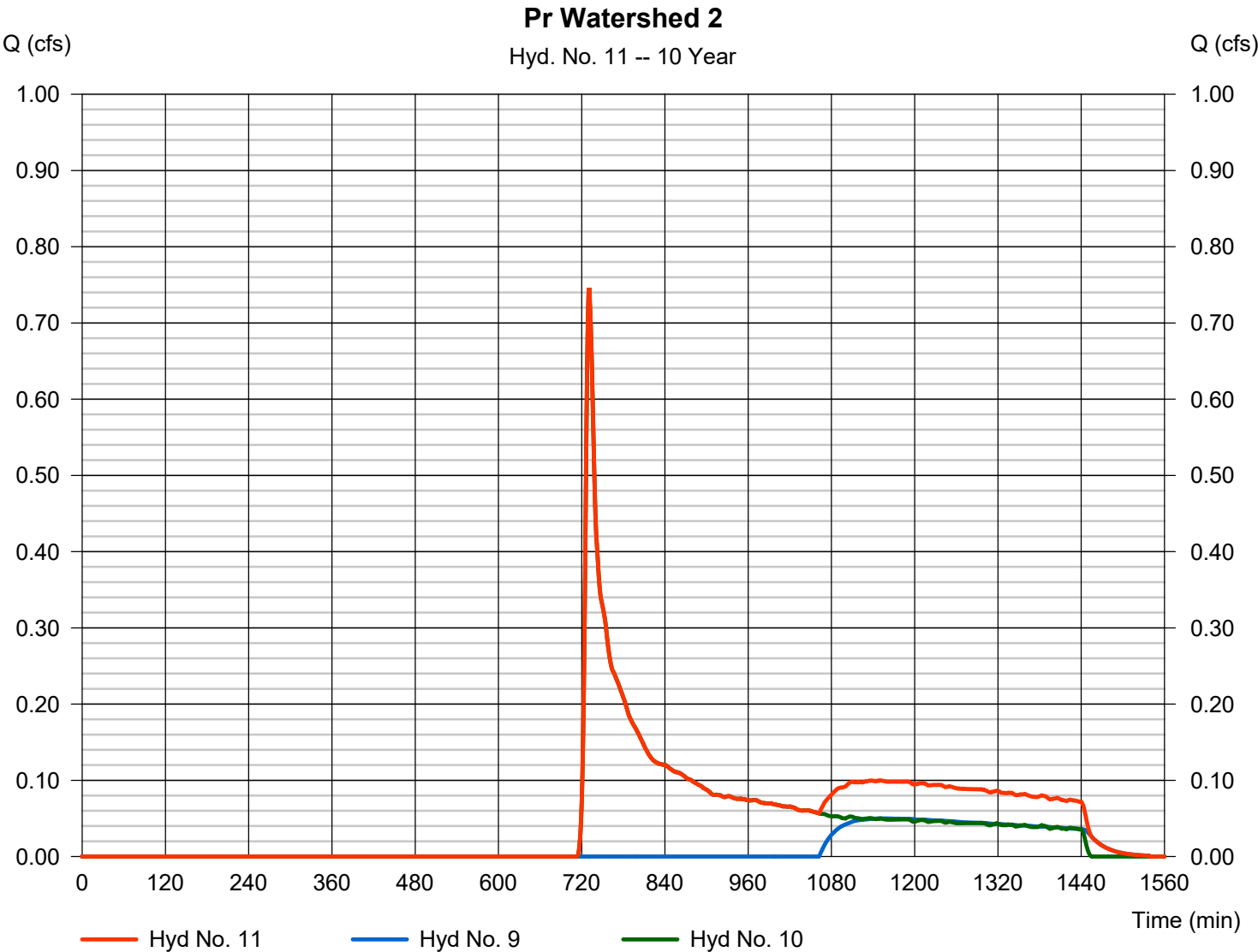


Hydrograph Report

Hyd. No. 11

Pr Watershed 2

Hydrograph type	= Combine	Peak discharge	= 0.746 cfs
Storm frequency	= 10 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 4,970 cuft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 1.580 ac

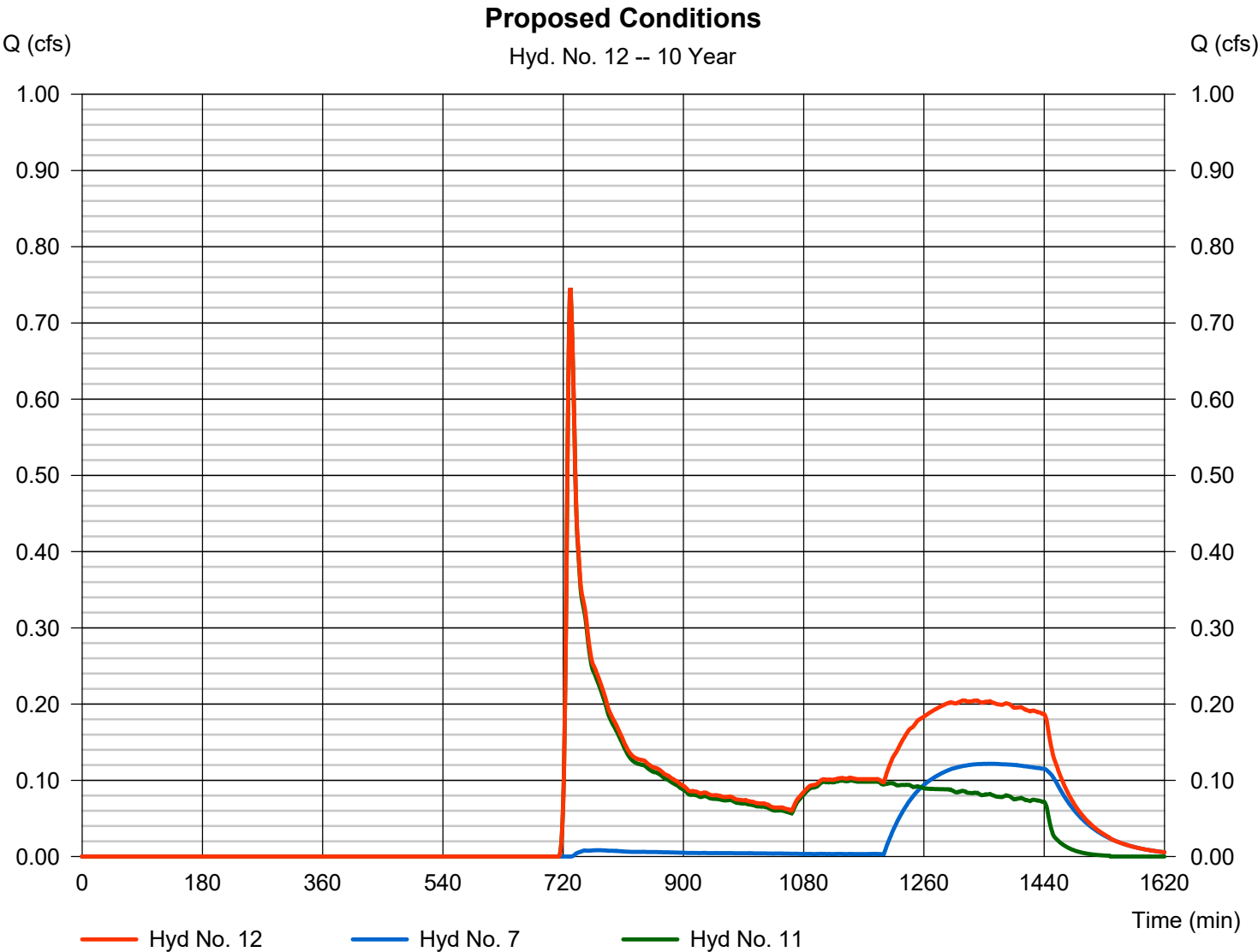


Hydrograph Report

Hyd. No. 12

Proposed Conditions

Hydrograph type	= Combine	Peak discharge	= 0.746 cfs
Storm frequency	= 10 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 7,012 cuft
Inflow hyds.	= 7, 11	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	0.723	1	732	4,254	-----	-----	-----	Ex Watershed 1
2	SCS Runoff	0.629	1	749	7,051	-----	-----	-----	Ex Watershed 2
3	Combine	1.093	1	738	11,305	1, 2	-----	-----	Existing Conditions
4	SCS Runoff	6.888	1	732	27,923	-----	-----	-----	Pr Watershed 1a
5	Reservoir	0.393	1	901	8,986	4	233.59	19,895	Basin 1
6	SCS Runoff	0.038	1	732	387	-----	-----	-----	Pr Watershed 1b
7	Combine	0.402	1	900	9,373	5, 6	-----	-----	Pr Watershed 1
8	SCS Runoff	2.590	1	729	9,005	-----	-----	-----	Pr Watershed 2a
9	Reservoir	0.183	1	843	3,400	8	233.57	5,834	Basin 2
10	SCS Runoff	1.554	1	730	6,585	-----	-----	-----	Pr Watershed 2b
11	Combine	1.554	1	730	9,985	9, 10	-----	-----	Pr Watershed 2
12	Combine	1.591	1	730	19,358	7, 11	-----	-----	Proposed Conditions
Analysis.gpw					Return Period: 25 Year			Wednesday, 12 / 11 / 2024	

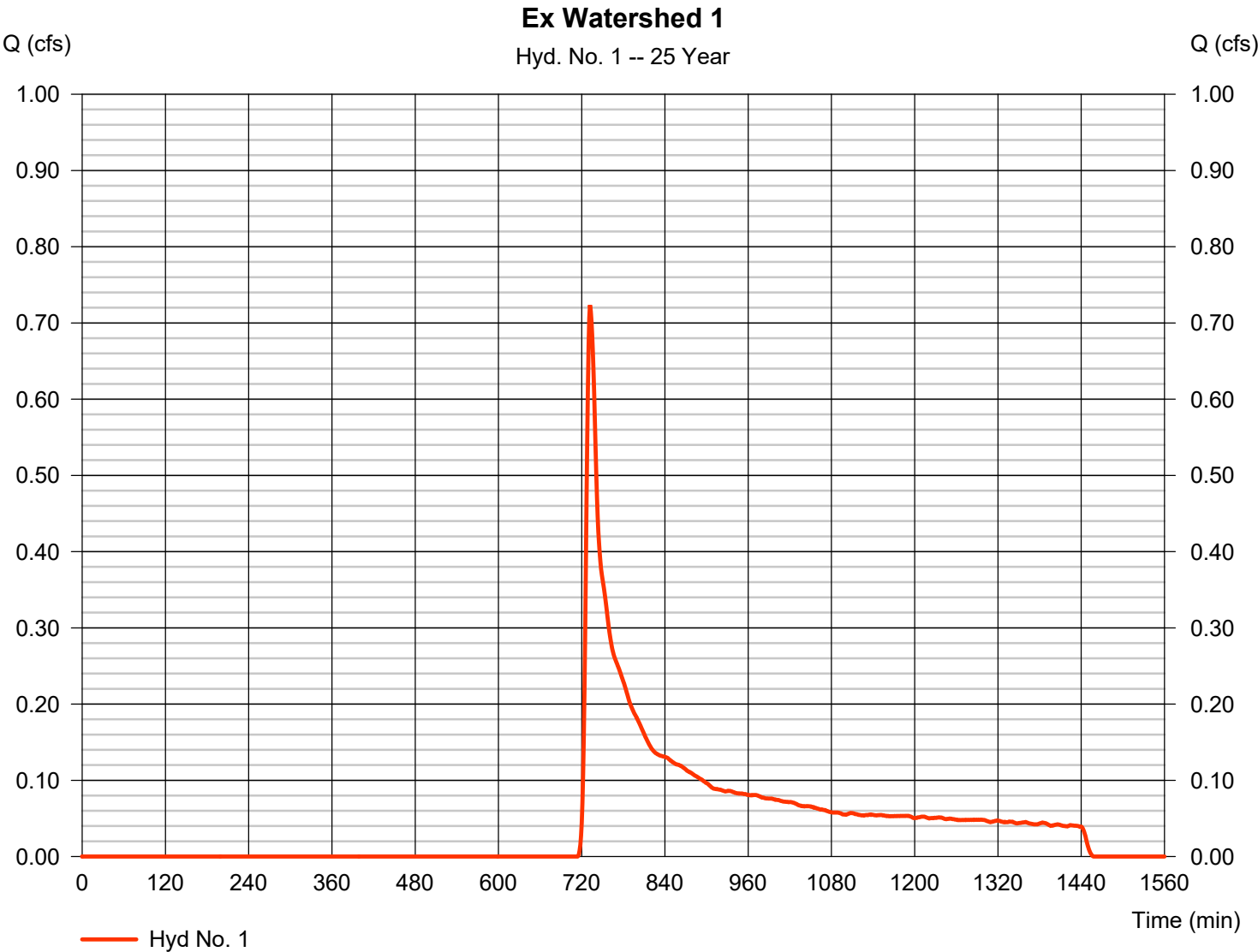
Hydrograph Report

Hyd. No. 1

Ex Watershed 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.723 cfs
Storm frequency	=	25 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	4,254 cuft
Drainage area	=	1.440 ac	Curve number	=	44*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.30 min
Total precip.	=	6.16 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Water Design\Studies-Calculations\Drainage Basin\Hydrographs\Hyd. No. 1			

* Composite (Area/CN) = [(0.620 x 36) + (0.790 x 49) + (0.030 x 98)] / 1.440

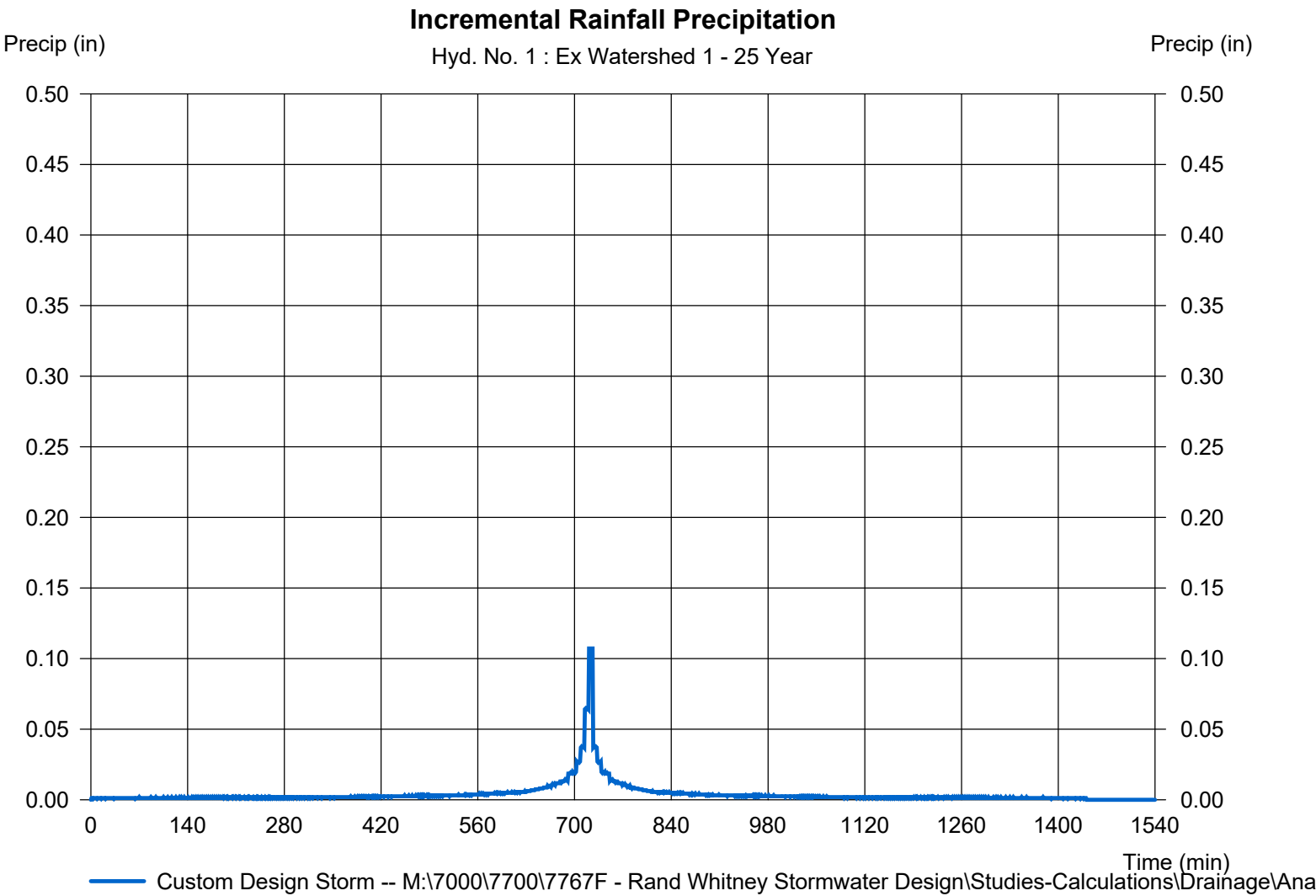


Precipitation Report

Hyd. No. 1

Ex Watershed 1

Storm Frequency	= 25 yrs	Time interval	= 1 min
Total precip.	= 6.1600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

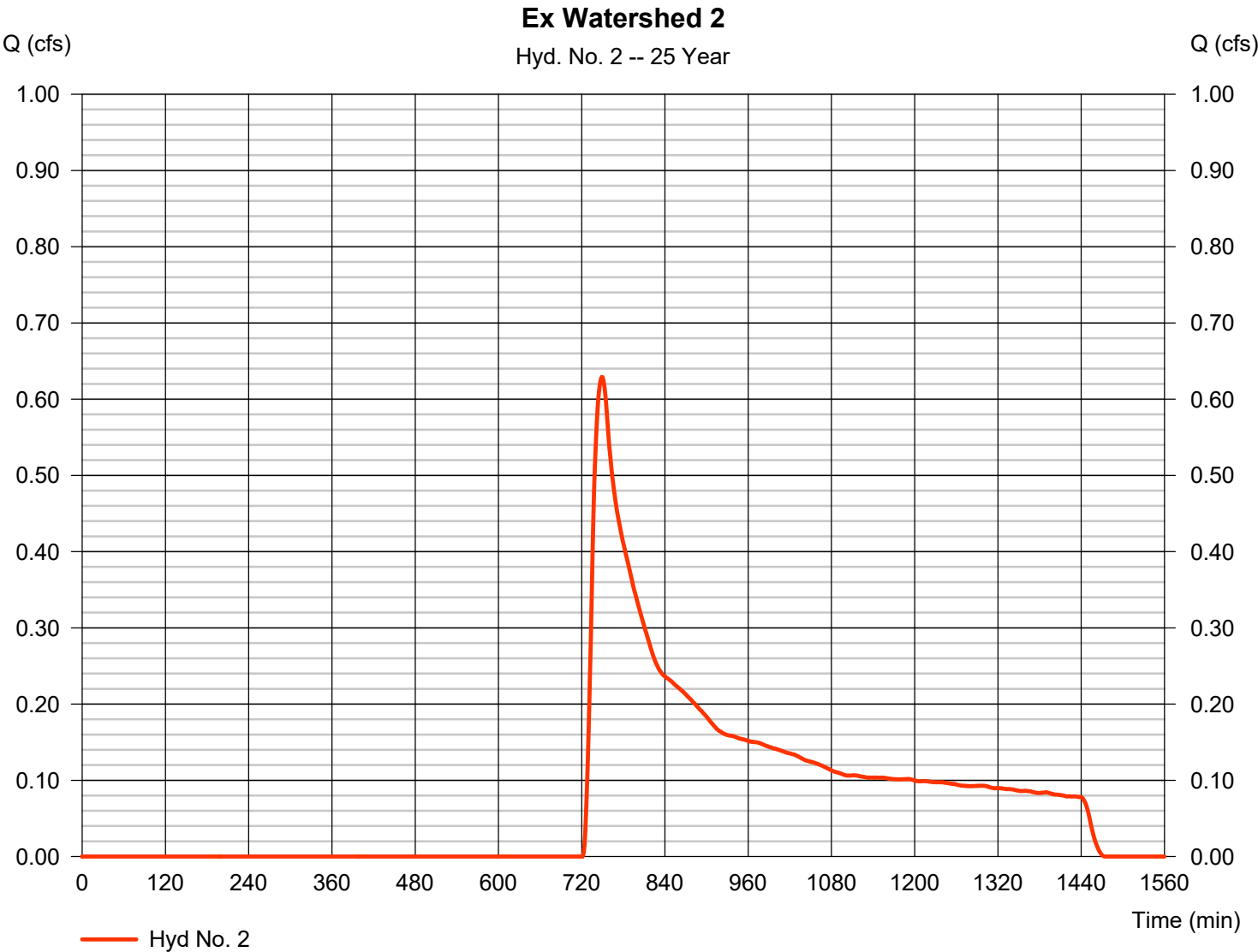
Wednesday, 12 / 11 / 2024

Hyd. No. 2

Ex Watershed 2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.629 cfs
Storm frequency	= 25 yrs	Time to peak	= 749 min
Time interval	= 1 min	Hyd. volume	= 7,051 cuft
Drainage area	= 3.500 ac	Curve number	= 40*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.40 min
Total precip.	= 6.16 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Water Design Studies-Calculations\Dr		

* Composite (Area/CN) = [(2.870 x 36) + (0.540 x 49) + (0.090 x 98)] / 3.500

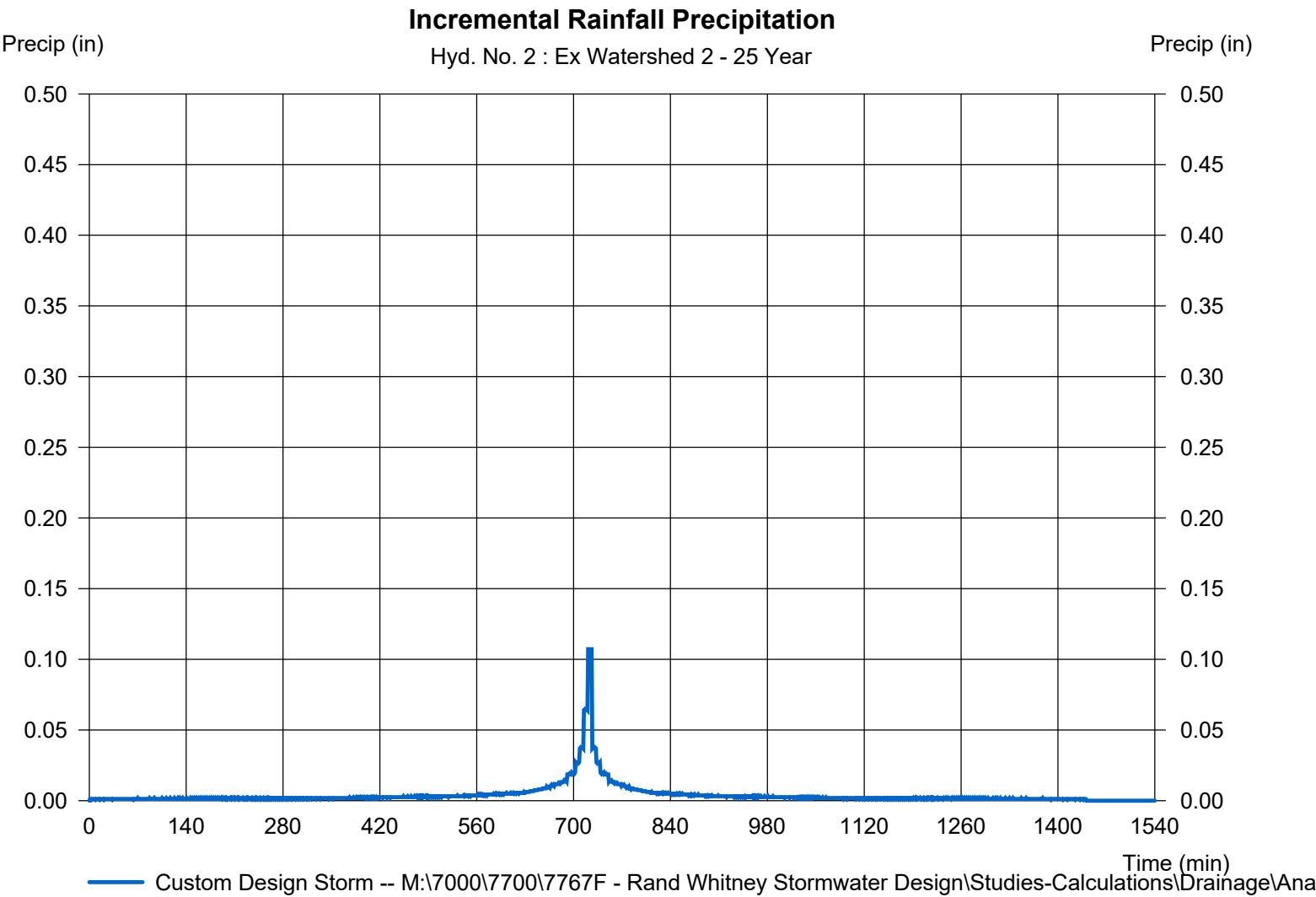


Precipitation Report

Hyd. No. 2

Ex Watershed 2

Storm Frequency	= 25 yrs	Time interval	= 1 min
Total precip.	= 6.1600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

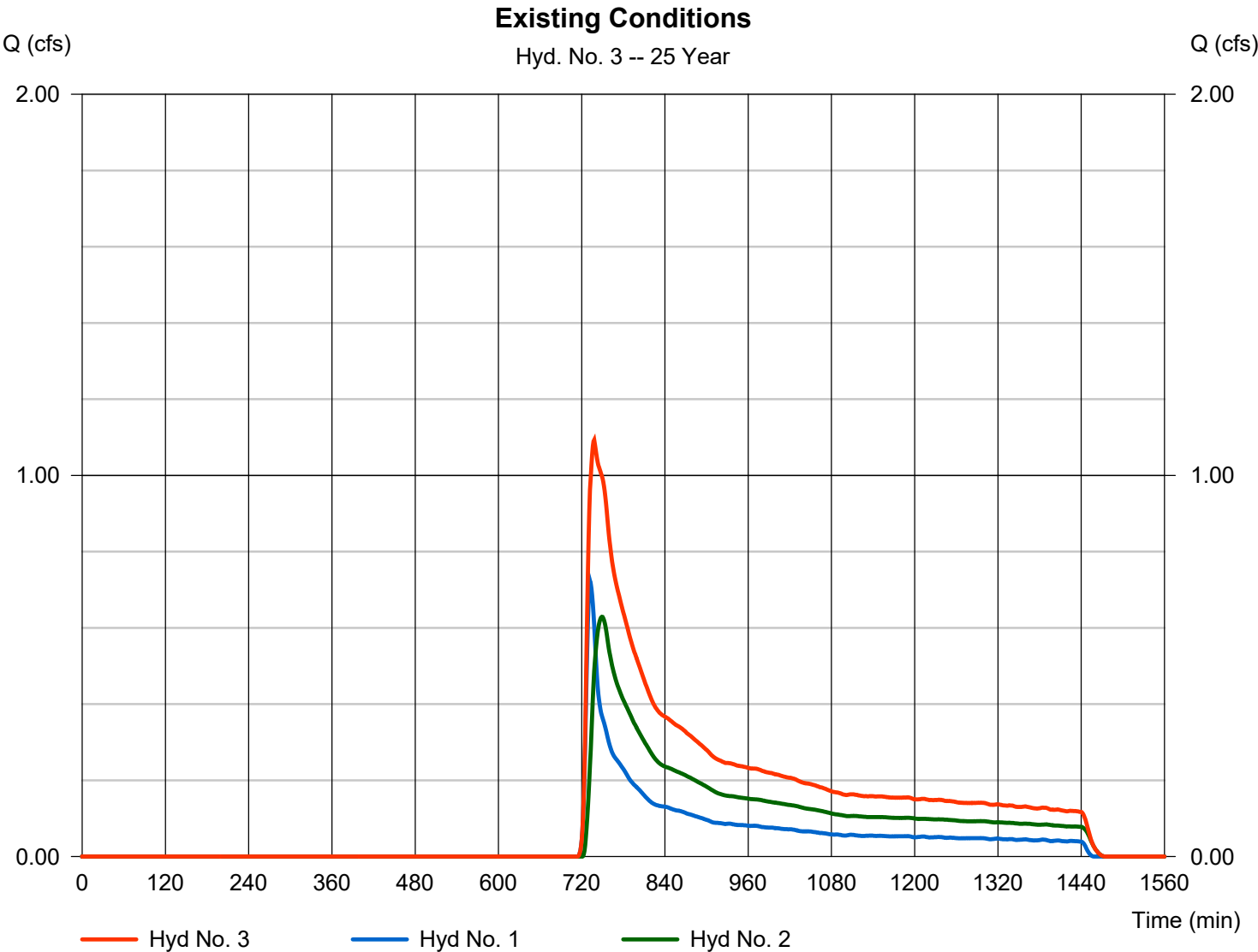
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 3

Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 1.093 cfs
Storm frequency	= 25 yrs	Time to peak	= 738 min
Time interval	= 1 min	Hyd. volume	= 11,305 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 4.940 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

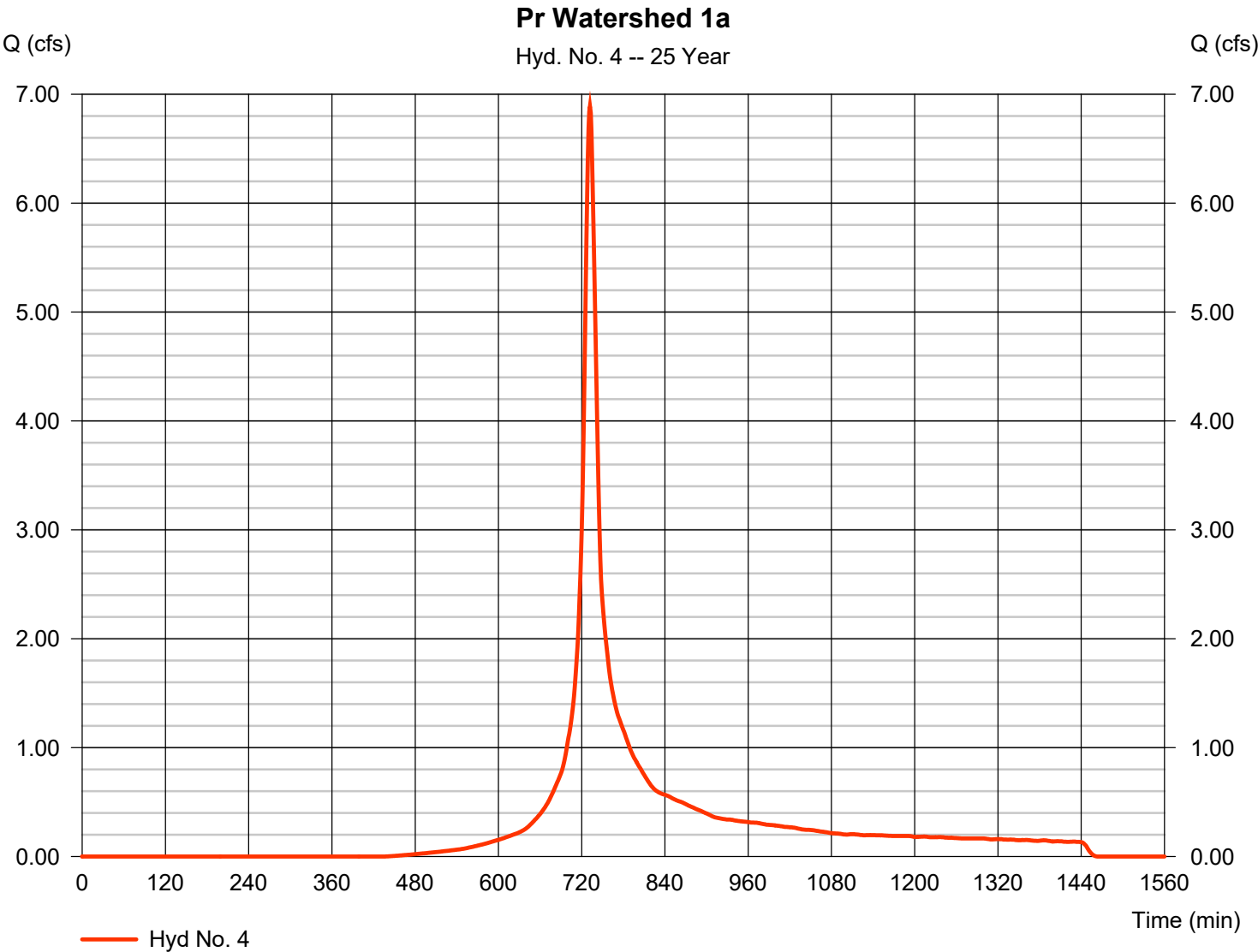
Wednesday, 12 / 11 / 2024

Hyd. No. 4

Pr Watershed 1a

Hydrograph type	= SCS Runoff	Peak discharge	= 6.888 cfs
Storm frequency	= 25 yrs	Time to peak	= 732 min
Time interval	= 1 min	Hyd. volume	= 27,923 cuft
Drainage area	= 2.250 ac	Curve number	= 75*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.50 min
Total precip.	= 6.16 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin		

* Composite (Area/CN) = [(0.860 x 39) + (1.390 x 98)] / 2.250



Precipitation Report

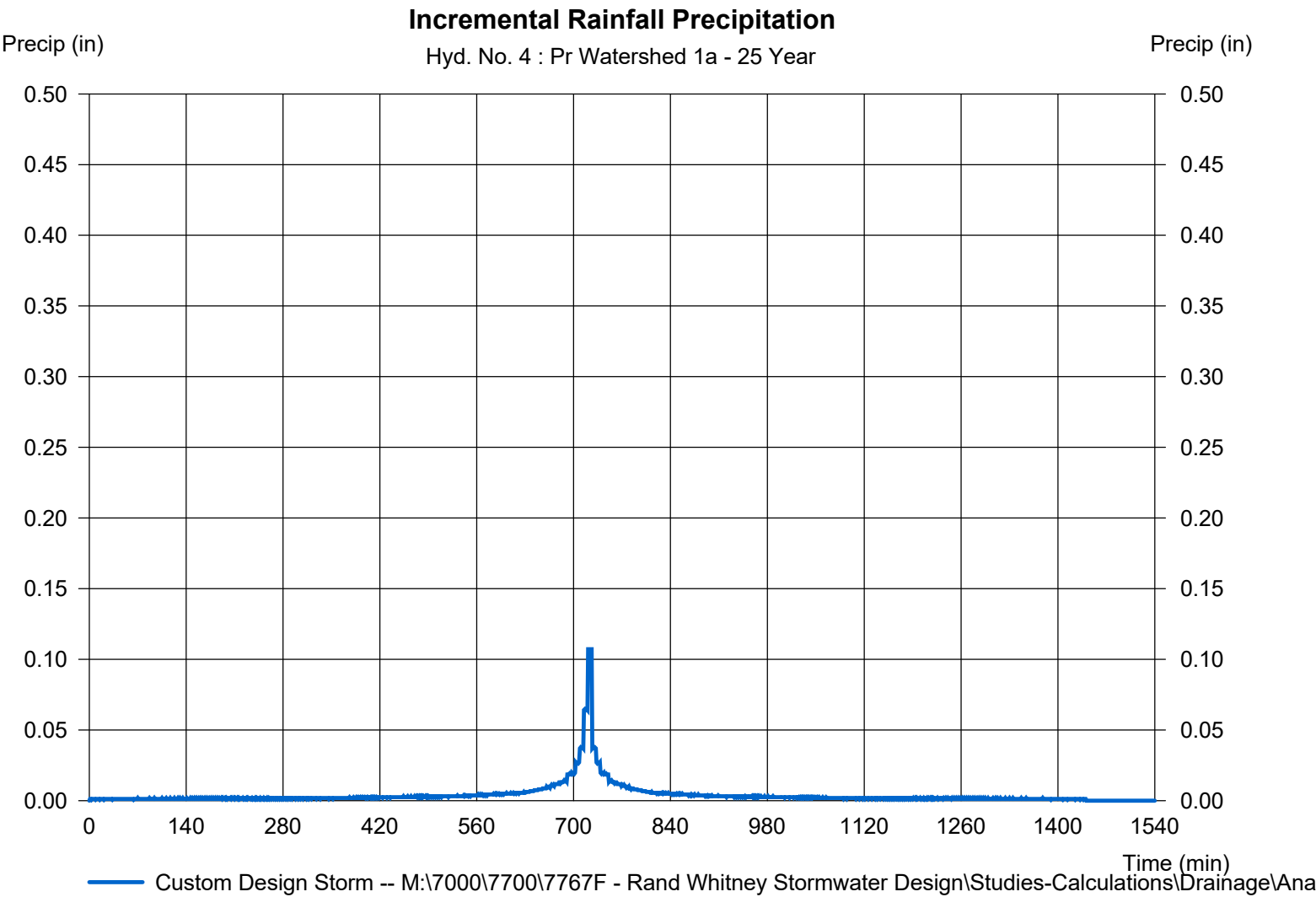
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 4

Pr Watershed 1a

Storm Frequency	= 25 yrs	Time interval	= 1 min
Total precip.	= 6.1600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

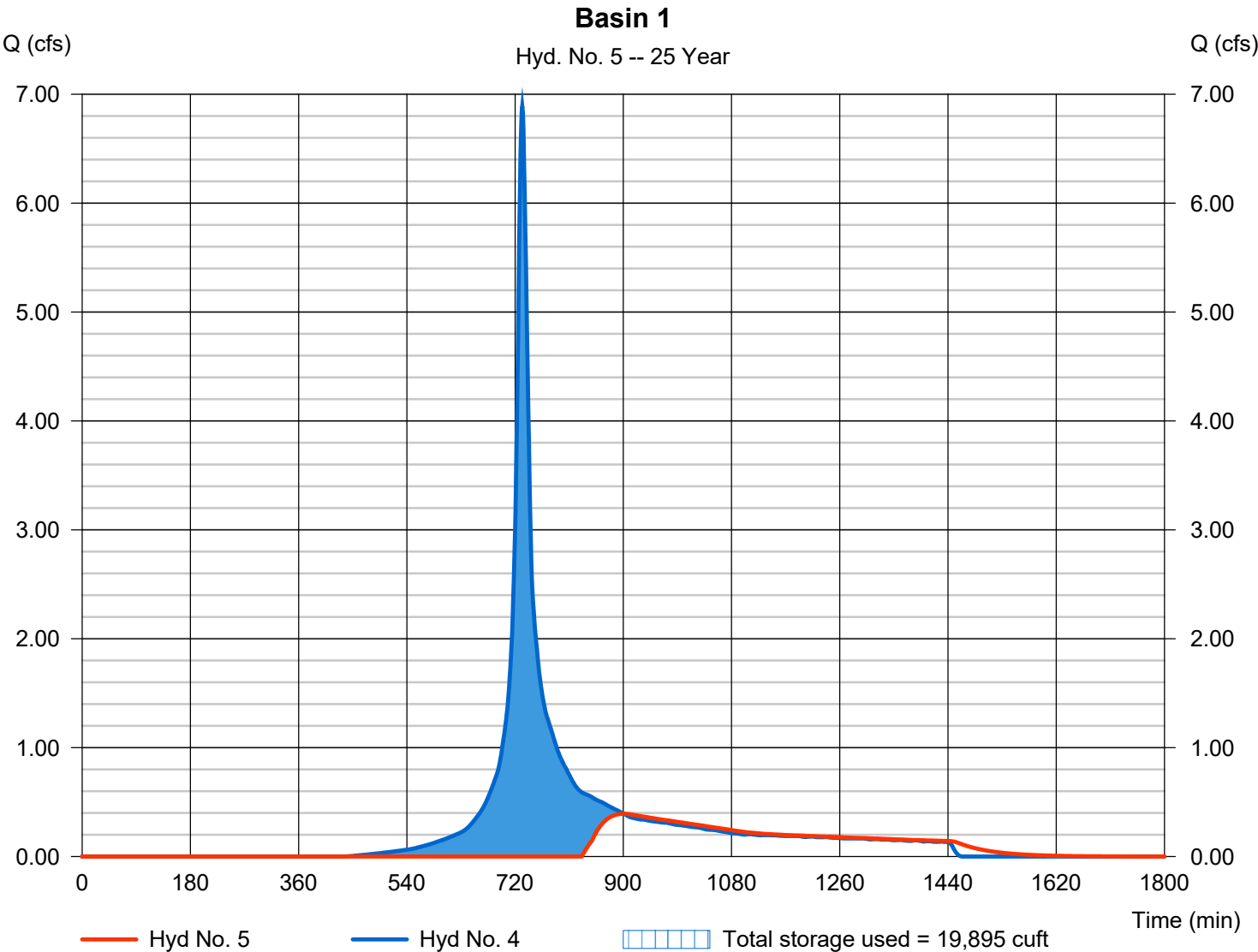
Wednesday, 12 / 11 / 2024

Hyd. No. 5

Basin 1

Hydrograph type	= Reservoir	Peak discharge	= 0.393 cfs
Storm frequency	= 25 yrs	Time to peak	= 901 min
Time interval	= 1 min	Hyd. volume	= 8,986 cuft
Inflow hyd. No.	= 4 - Pr Watershed 1a	Max. Elevation	= 233.59 ft
Reservoir name	= Pond 1	Max. Storage	= 19,895 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

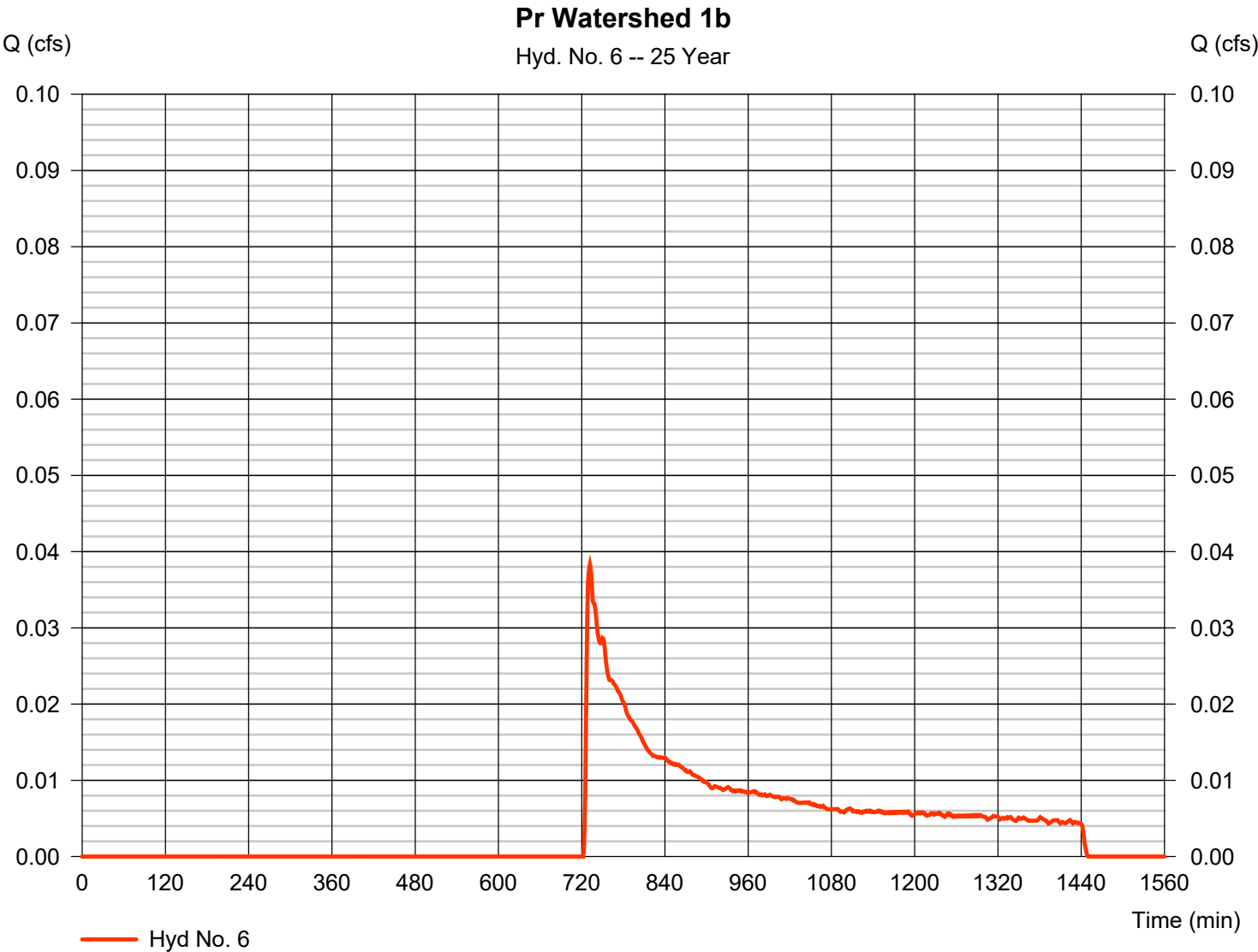
Wednesday, 12 / 11 / 2024

Hyd. No. 6

Pr Watershed 1b

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.038 cfs
Storm frequency	=	25 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	387 cuft
Drainage area	=	0.210 ac	Curve number	=	39*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	6.16 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.210 x 39)] / 0.210



Precipitation Report

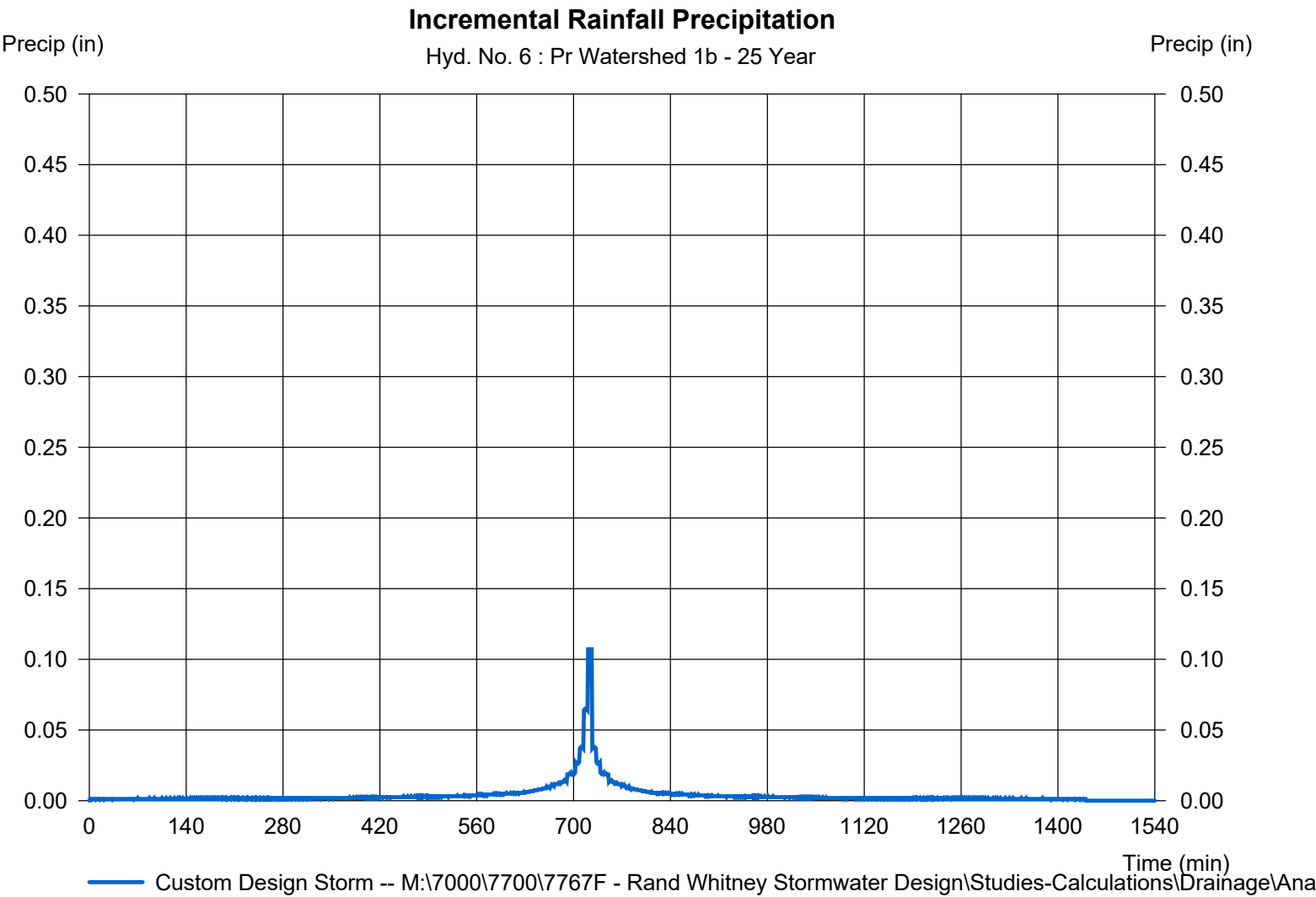
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 6

Pr Watershed 1b

Storm Frequency	= 25 yrs	Time interval	= 1 min
Total precip.	= 6.1600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

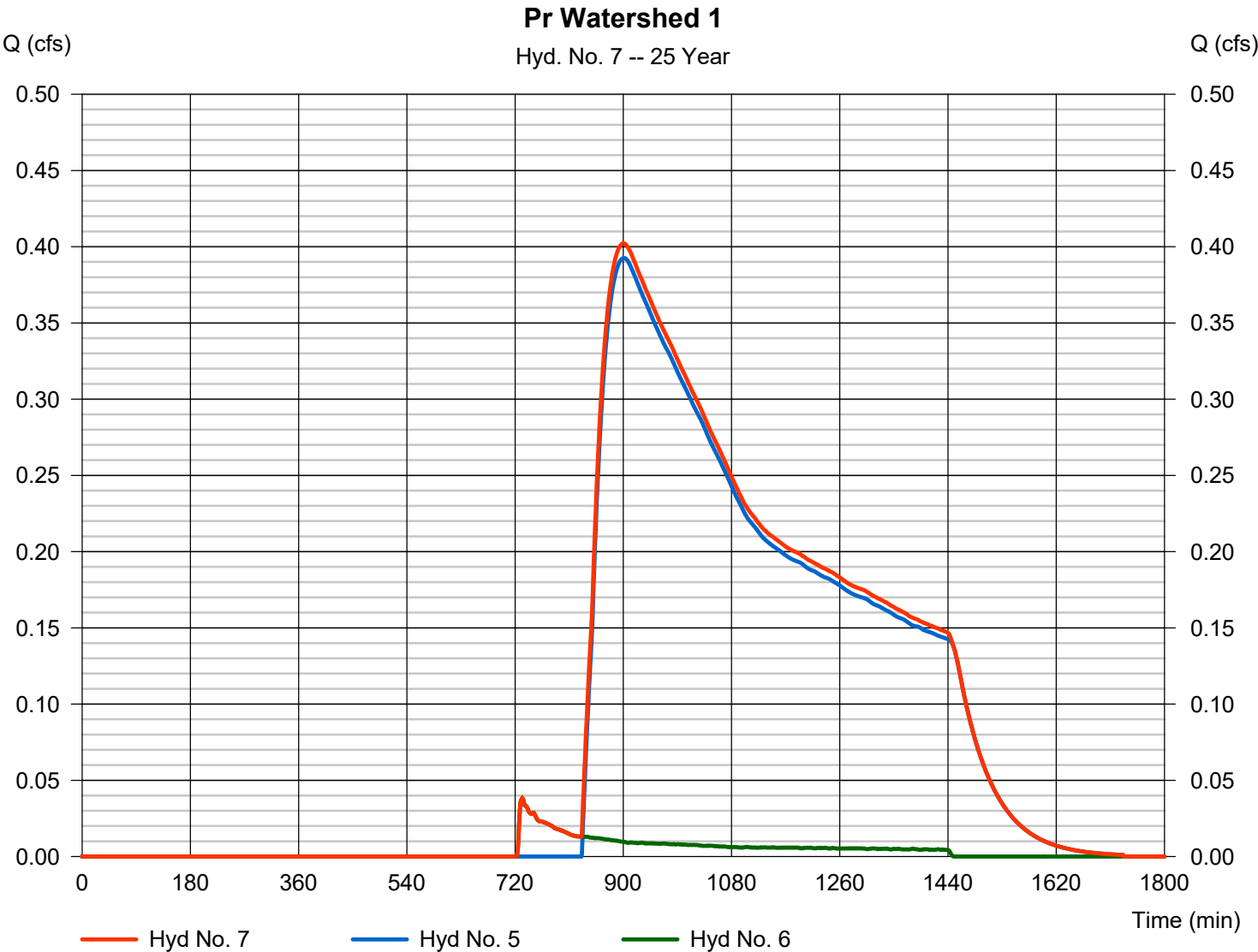
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Wednesday, 12 / 11 / 2024

Hyd. No. 7

Pr Watershed 1

Hydrograph type	= Combine	Peak discharge	= 0.402 cfs
Storm frequency	= 25 yrs	Time to peak	= 900 min
Time interval	= 1 min	Hyd. volume	= 9,373 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.210 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

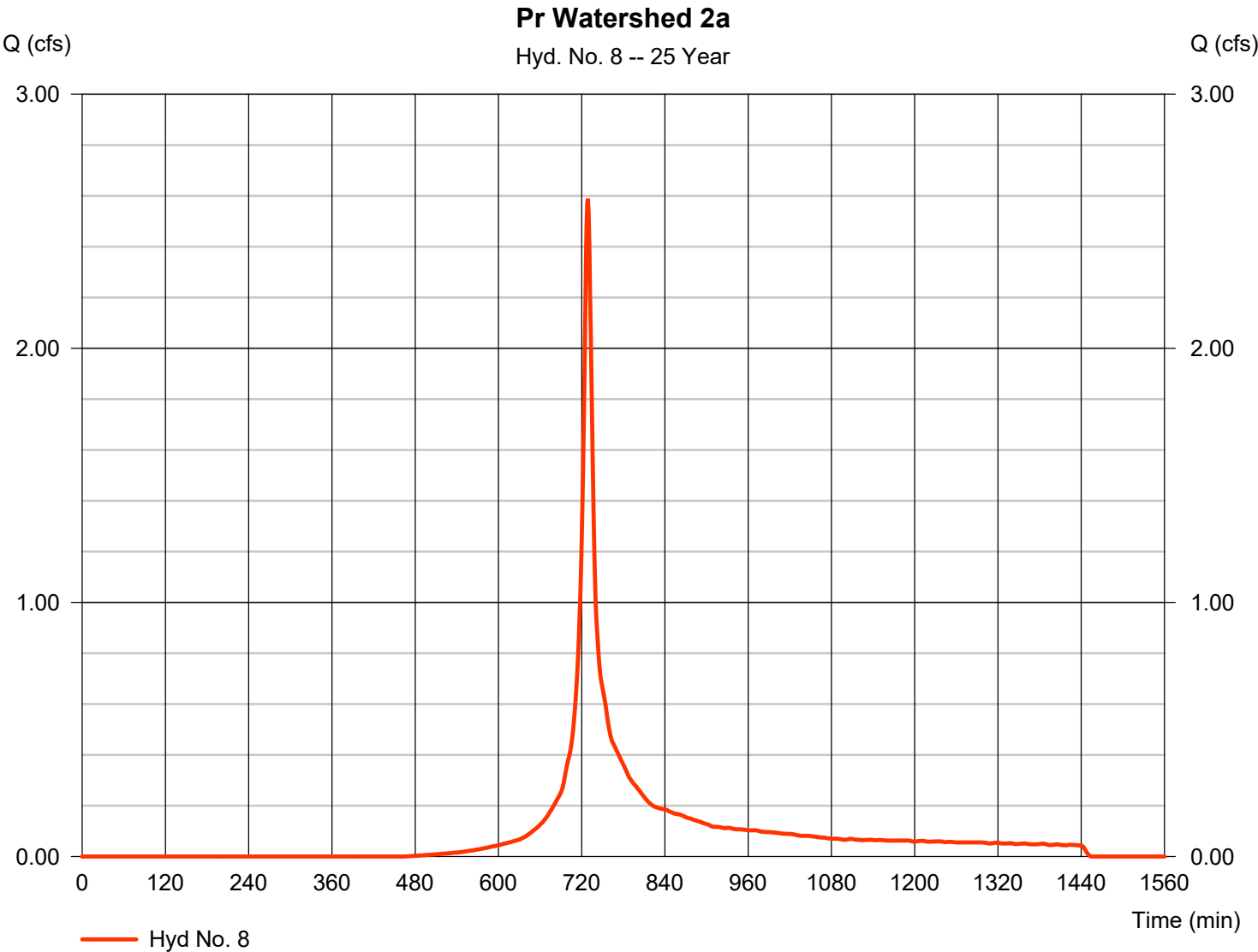
Wednesday, 12 / 11 / 2024

Hyd. No. 8

Pr Watershed 2a

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.590 cfs
Storm frequency	=	25 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	9,005 cuft
Drainage area	=	0.770 ac	Curve number	=	73*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.80 min
Total precip.	=	6.16 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.320 x 39) + (0.450 x 98)] / 0.770



Precipitation Report

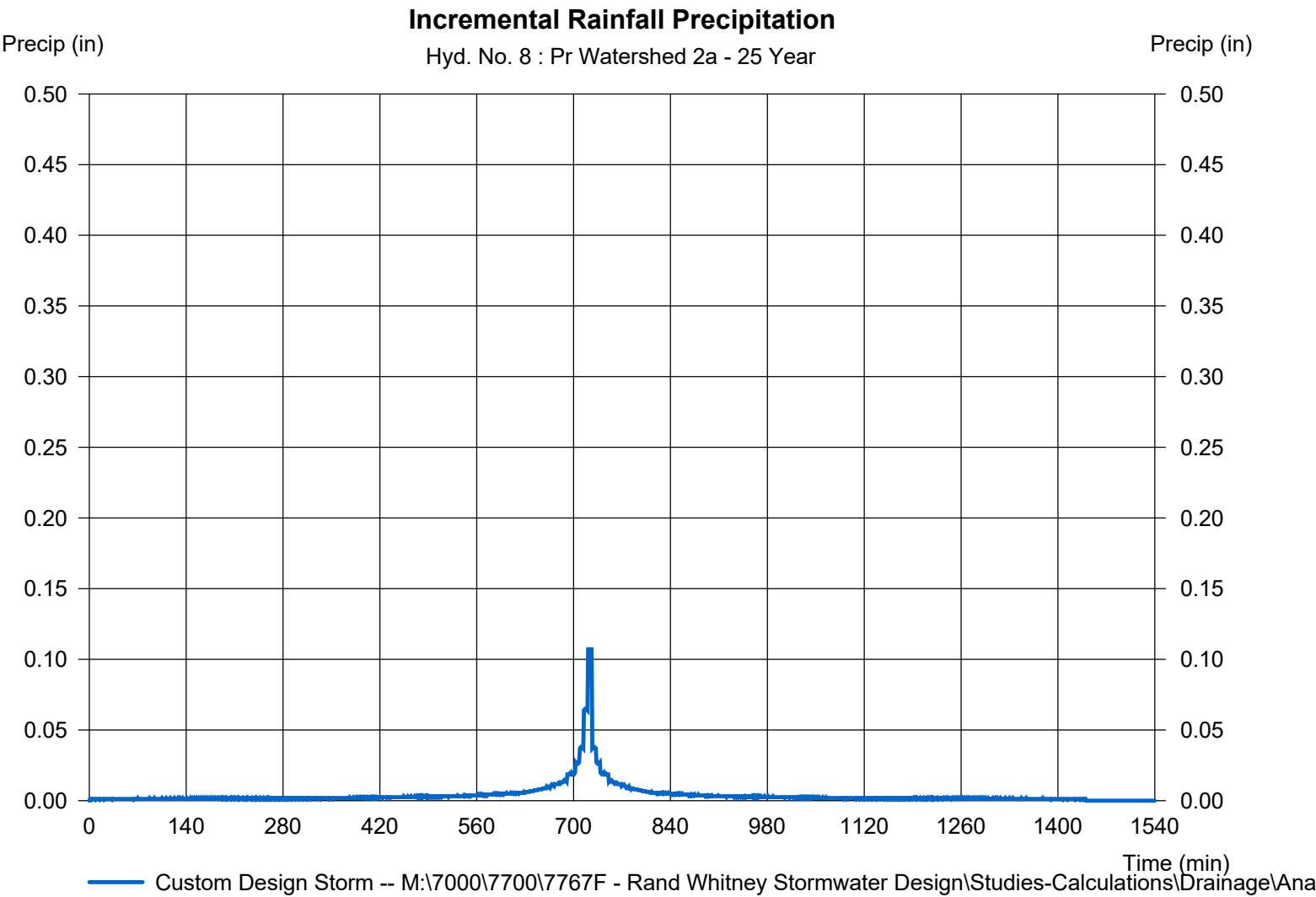
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 8

Pr Watershed 2a

Storm Frequency	= 25 yrs	Time interval	= 1 min
Total precip.	= 6.1600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

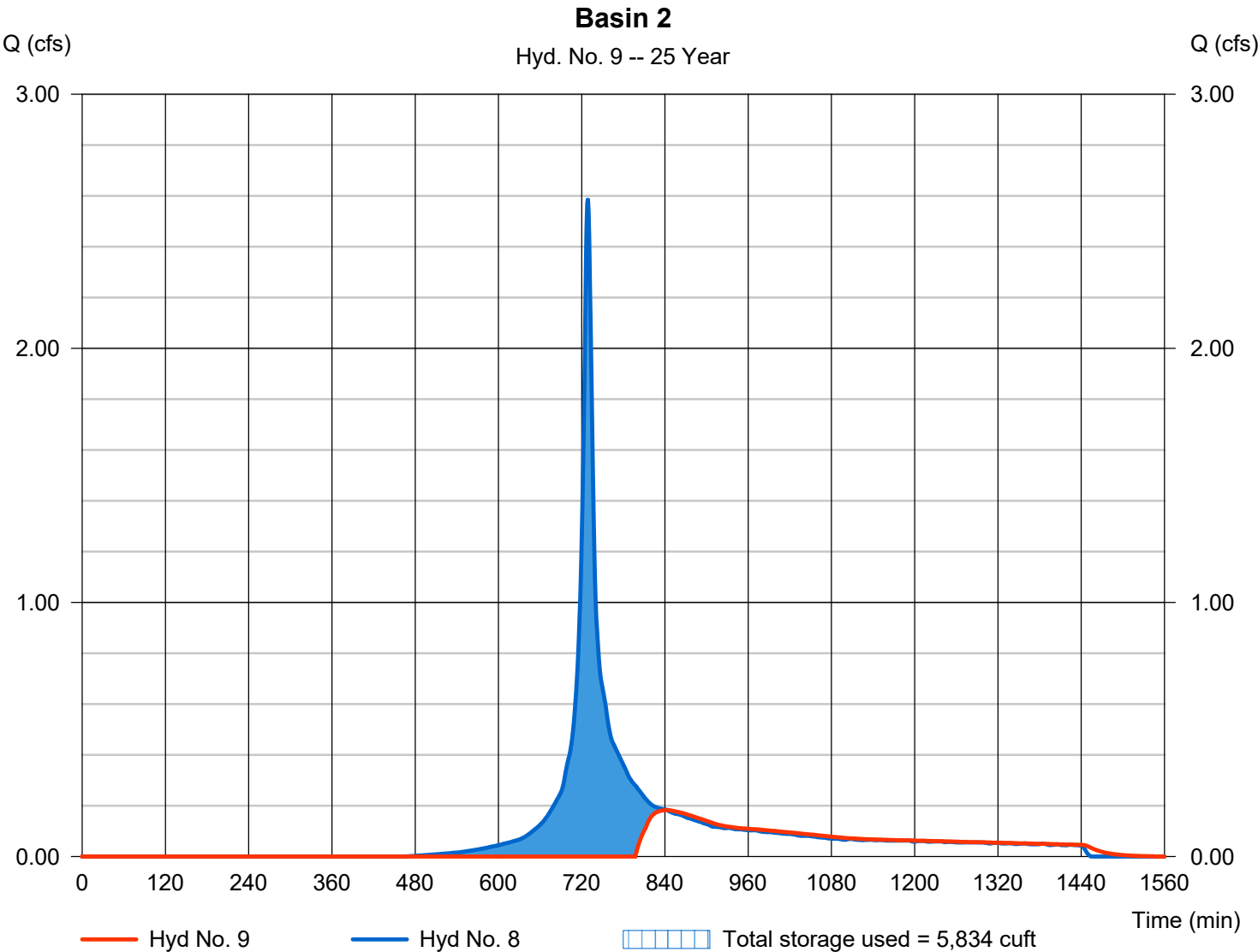
Wednesday, 12 / 11 / 2024

Hyd. No. 9

Basin 2

Hydrograph type	= Reservoir	Peak discharge	= 0.183 cfs
Storm frequency	= 25 yrs	Time to peak	= 843 min
Time interval	= 1 min	Hyd. volume	= 3,400 cuft
Inflow hyd. No.	= 8 - Pr Watershed 2a	Max. Elevation	= 233.57 ft
Reservoir name	= Pond 2	Max. Storage	= 5,834 cuft

Storage Indication method used.



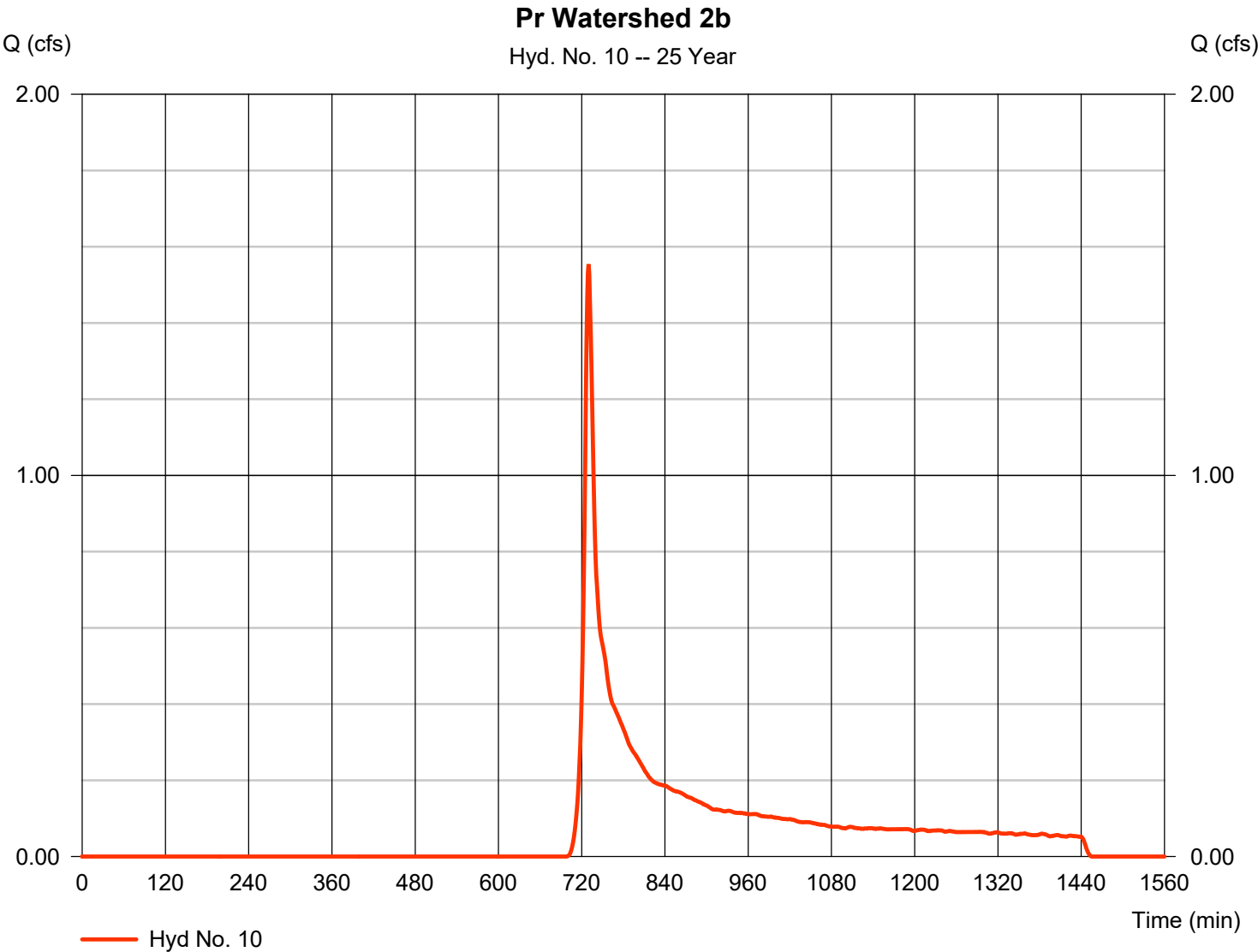
Hydrograph Report

Hyd. No. 10

Pr Watershed 2b

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.554 cfs
Storm frequency	=	25 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	6,585 cuft
Drainage area	=	1.580 ac	Curve number	=	49*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	6.16 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.650 x 36) + (0.640 x 39) + (0.290 x 98)] / 1.580



Precipitation Report

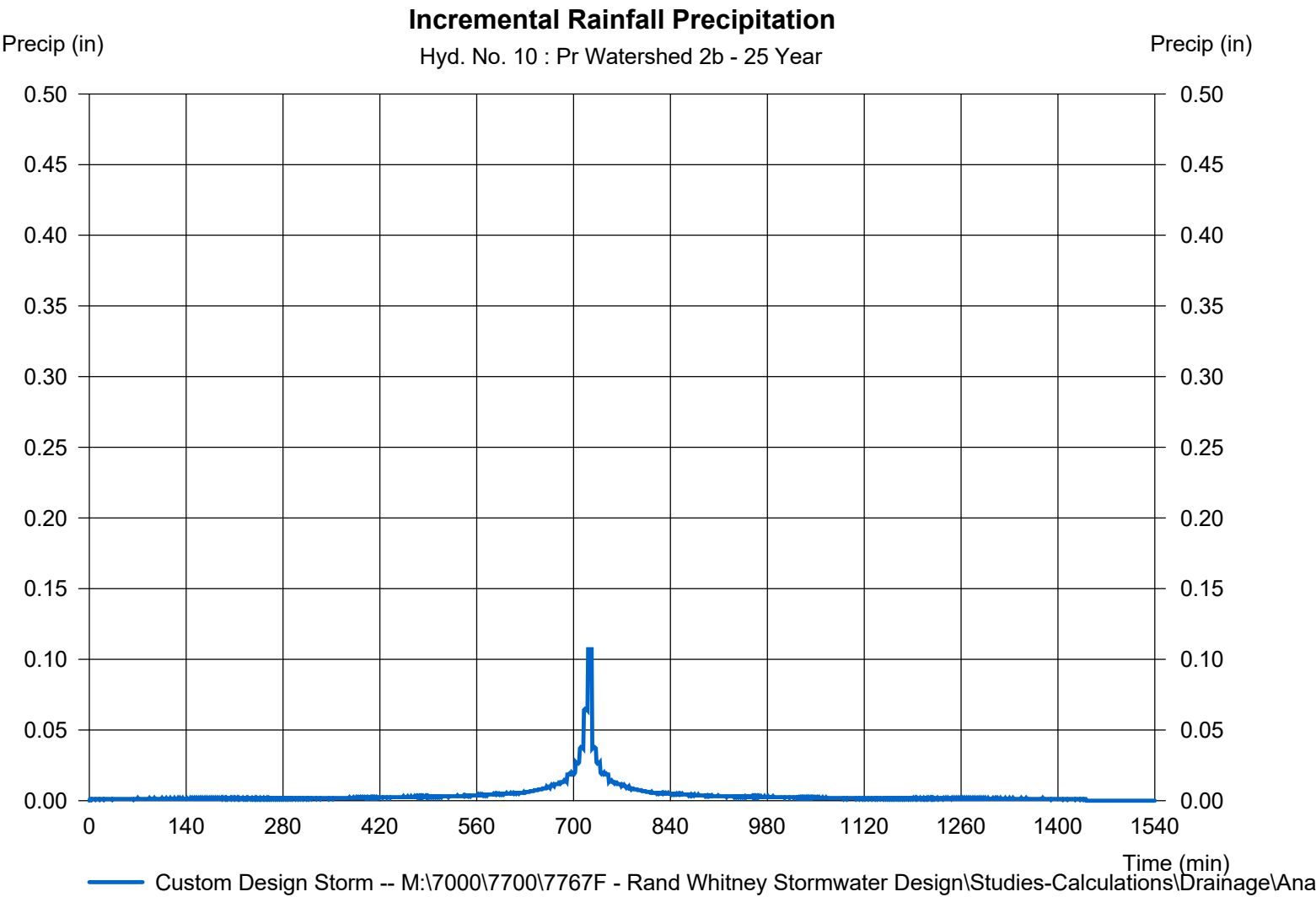
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Wednesday, 12 / 11 / 2024

Hyd. No. 10

Pr Watershed 2b

Storm Frequency	= 25 yrs	Time interval	= 1 min
Total precip.	= 6.1600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		

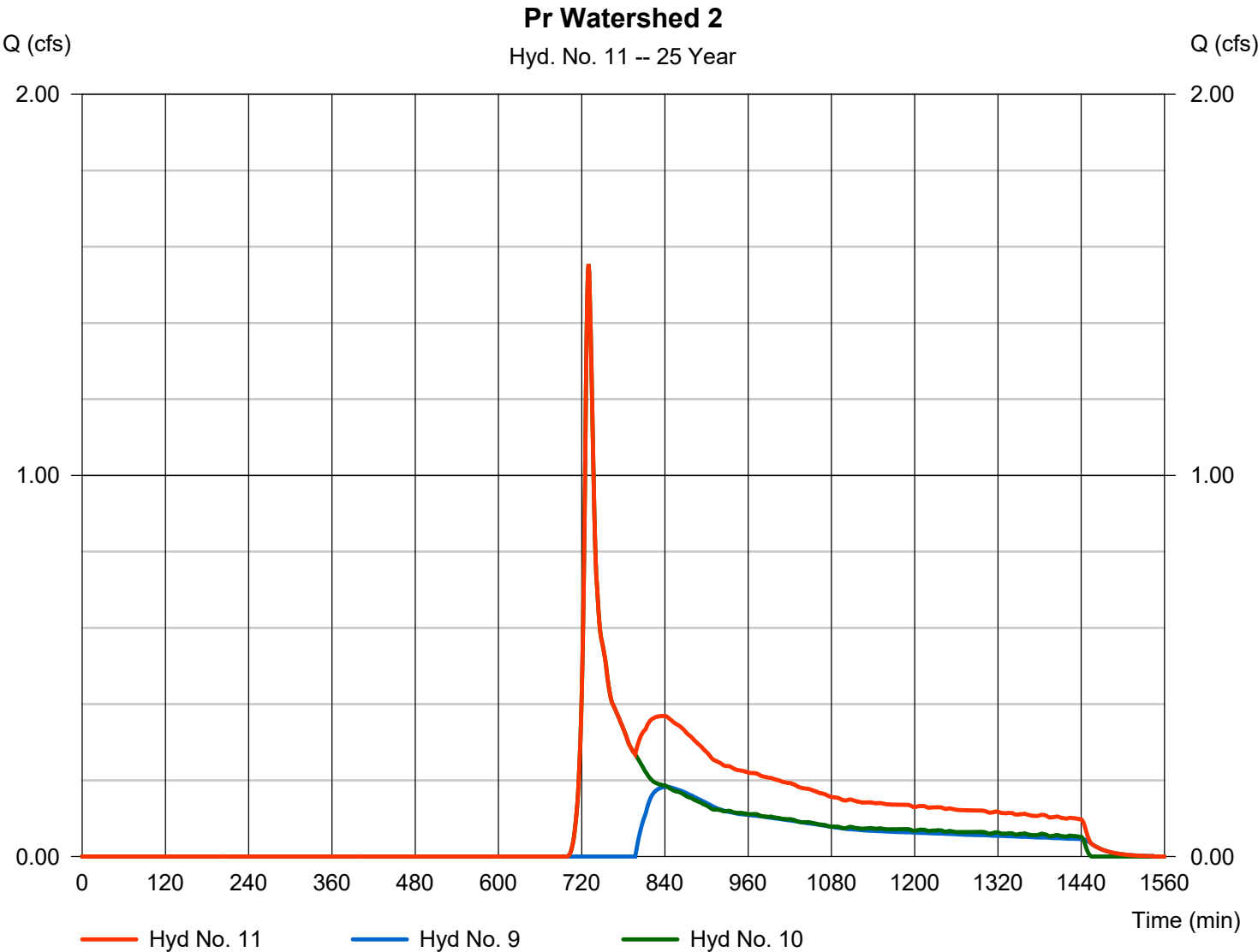


Hydrograph Report

Hyd. No. 11

Pr Watershed 2

Hydrograph type	= Combine	Peak discharge	= 1.554 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 1 min	Hyd. volume	= 9,985 cuft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 1.580 ac



Hydrograph Report

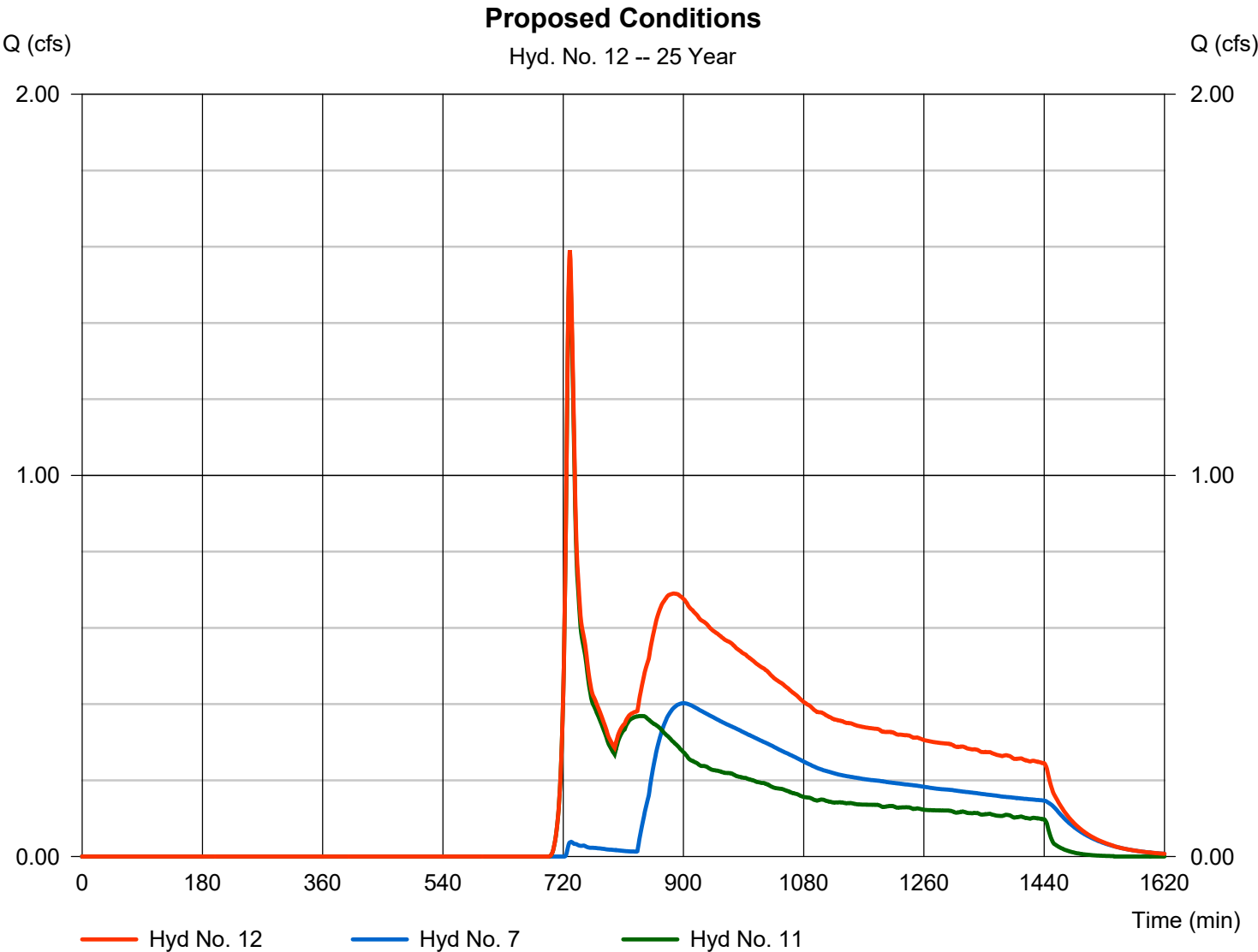
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Wednesday, 12 / 11 / 2024

Hyd. No. 12

Proposed Conditions

Hydrograph type	= Combine	Peak discharge	= 1.591 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 1 min	Hyd. volume	= 19,358 cuft
Inflow hyds.	= 7, 11	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	1.220	1	732	6,001	-----	-----	-----	Ex Watershed 1
2	SCS Runoff	1.235	1	744	10,512	-----	-----	-----	Ex Watershed 2
3	Combine	2.097	1	737	16,513	1, 2	-----	-----	Existing Conditions
4	SCS Runoff	8.233	1	732	33,459	-----	-----	-----	Pr Watershed 1a
5	Reservoir	0.874	1	810	14,522	4	233.66	20,578	Basin 1
6	SCS Runoff	0.102	1	729	587	-----	-----	-----	Pr Watershed 1b
7	Combine	0.896	1	810	15,109	5, 6	-----	-----	Pr Watershed 1
8	SCS Runoff	3.115	1	729	10,855	-----	-----	-----	Pr Watershed 2a
9	Reservoir	0.428	1	780	5,250	8	233.62	6,019	Basin 2
10	SCS Runoff	2.246	1	730	8,868	-----	-----	-----	Pr Watershed 2b
11	Combine	2.246	1	730	14,117	9, 10	-----	-----	Pr Watershed 2
12	Combine	2.343	1	730	29,226	7, 11	-----	-----	Proposed Conditions
Analysis.gpw					Return Period: 50 Year			Wednesday, 12 / 11 / 2024	

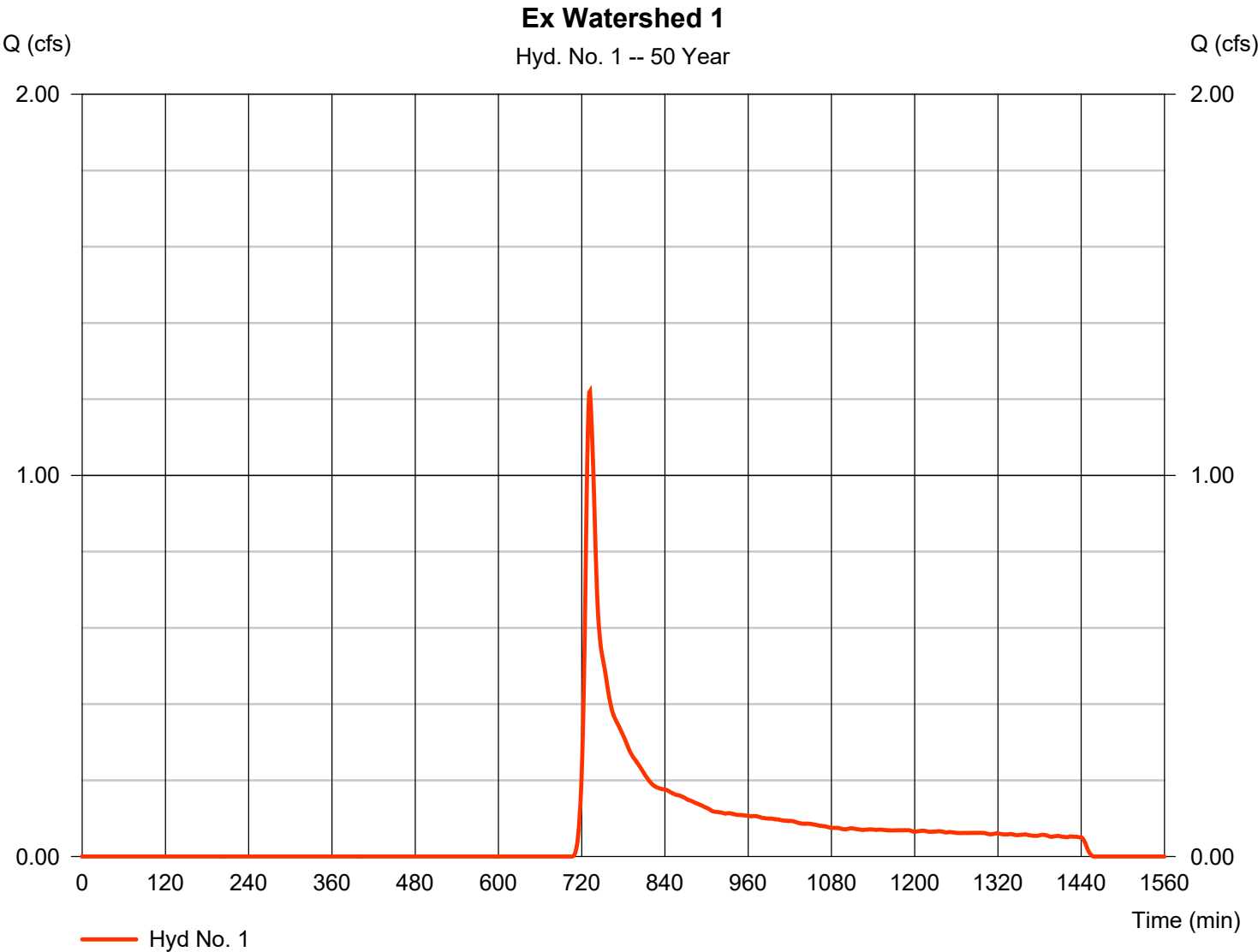
Hydrograph Report

Hyd. No. 1

Ex Watershed 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.220 cfs
Storm frequency	=	50 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	6,001 cuft
Drainage area	=	1.440 ac	Curve number	=	44*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.30 min
Total precip.	=	6.94 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Water Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.620 x 36) + (0.790 x 49) + (0.030 x 98)] / 1.440

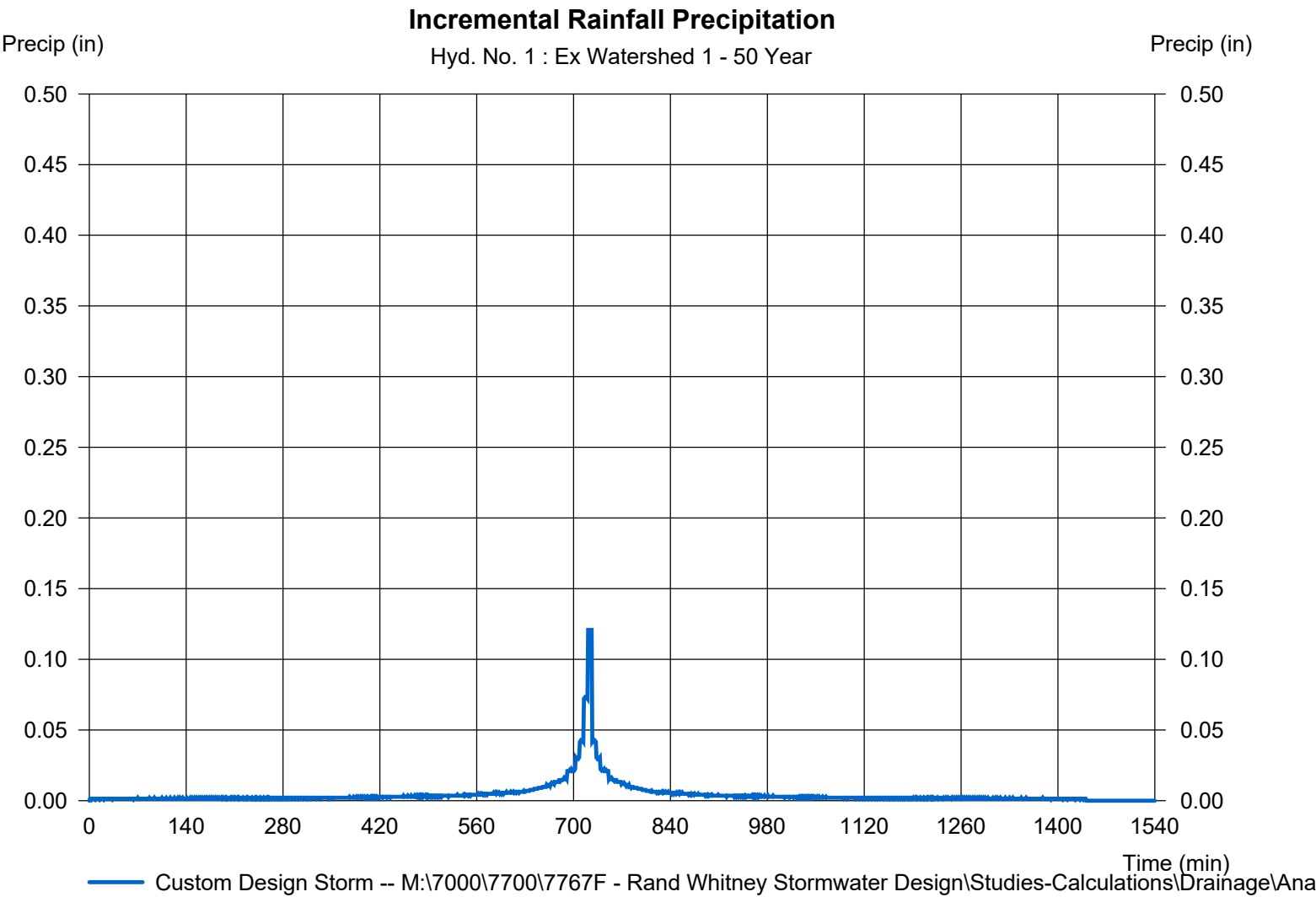


Precipitation Report

Hyd. No. 1

Ex Watershed 1

Storm Frequency	= 50 yrs	Time interval	= 1 min
Total precip.	= 6.9400 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



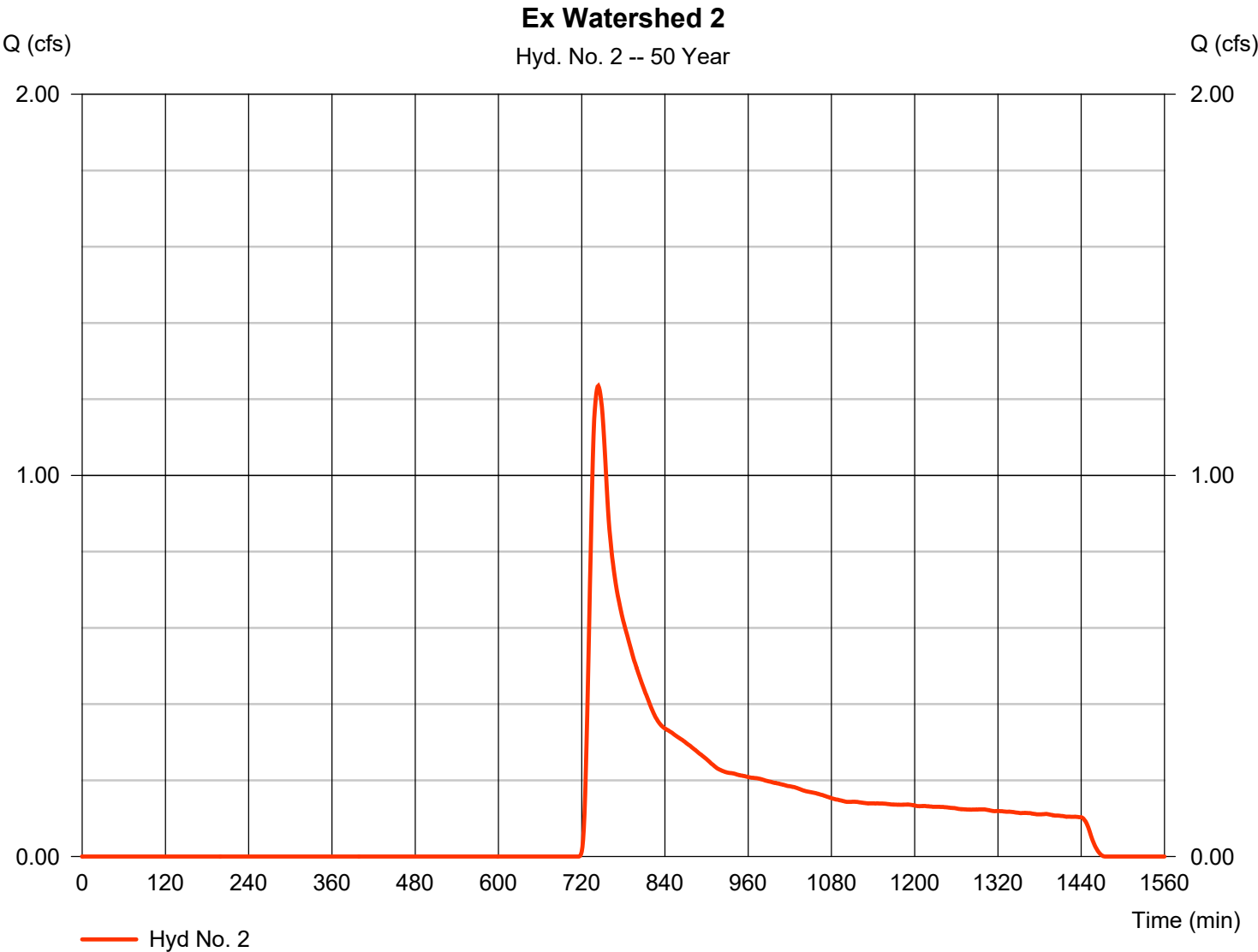
Hydrograph Report

Hyd. No. 2

Ex Watershed 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.235 cfs
Storm frequency	=	50 yrs	Time to peak	=	744 min
Time interval	=	1 min	Hyd. volume	=	10,512 cuft
Drainage area	=	3.500 ac	Curve number	=	40*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	20.40 min
Total precip.	=	6.94 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Water Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(2.870 x 36) + (0.540 x 49) + (0.090 x 98)] / 3.500

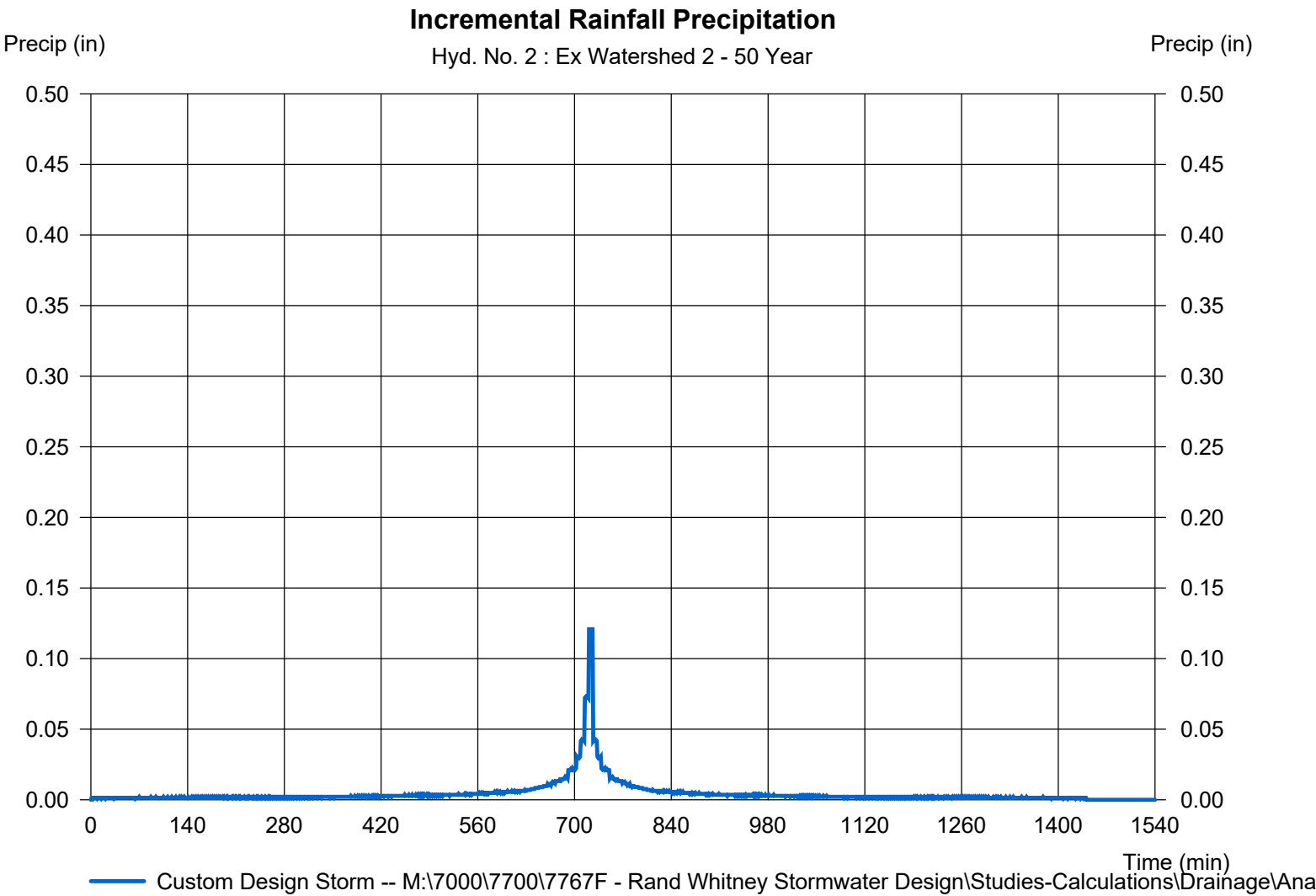


Precipitation Report

Hyd. No. 2

Ex Watershed 2

Storm Frequency	= 50 yrs	Time interval	= 1 min
Total precip.	= 6.9400 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

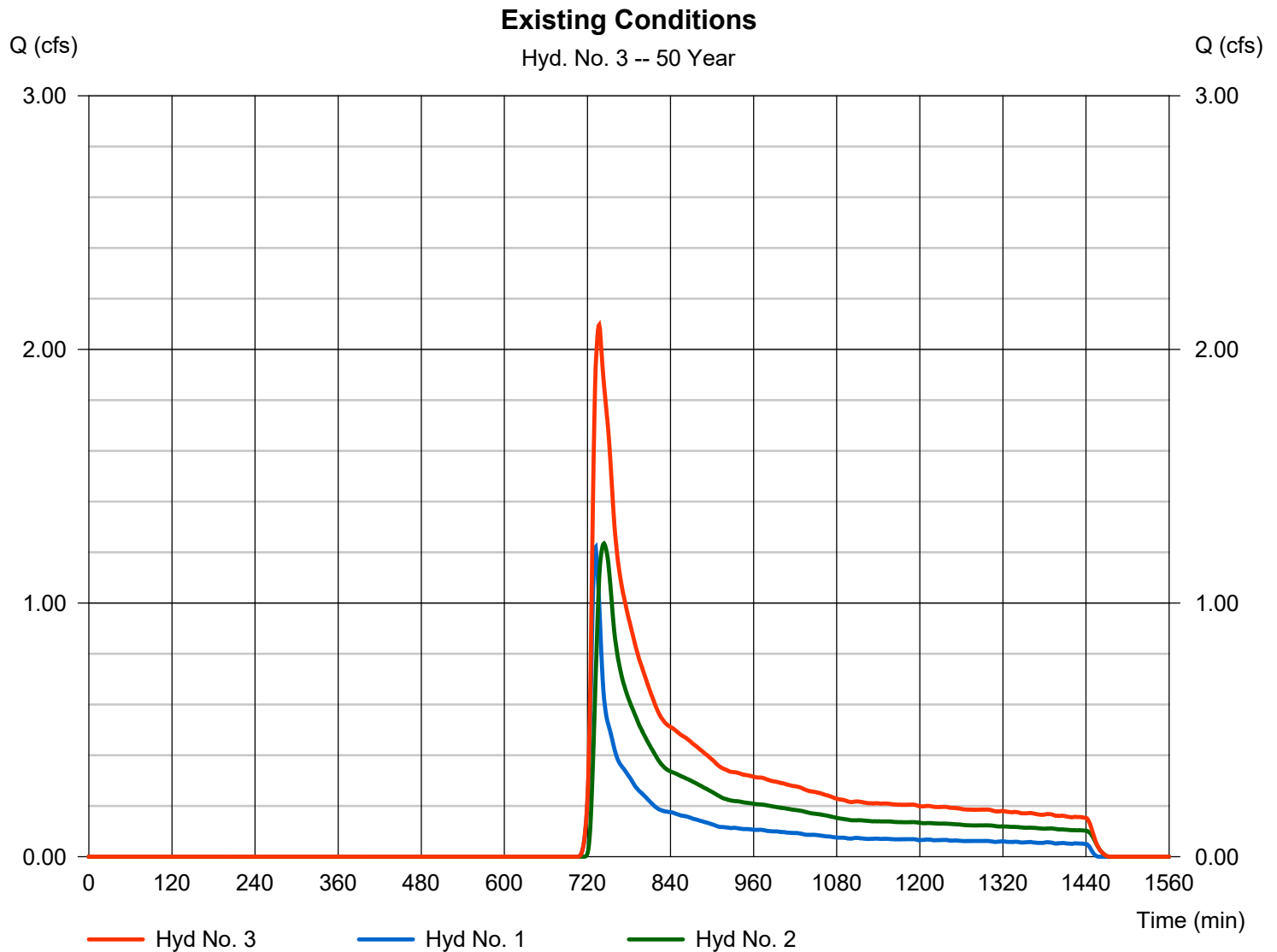
Wednesday, 12 / 11 / 2024

Hyd. No. 3

Existing Conditions

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 2.097 cfs
Time to peak = 737 min
Hyd. volume = 16,513 cuft
Contrib. drain. area = 4.940 ac



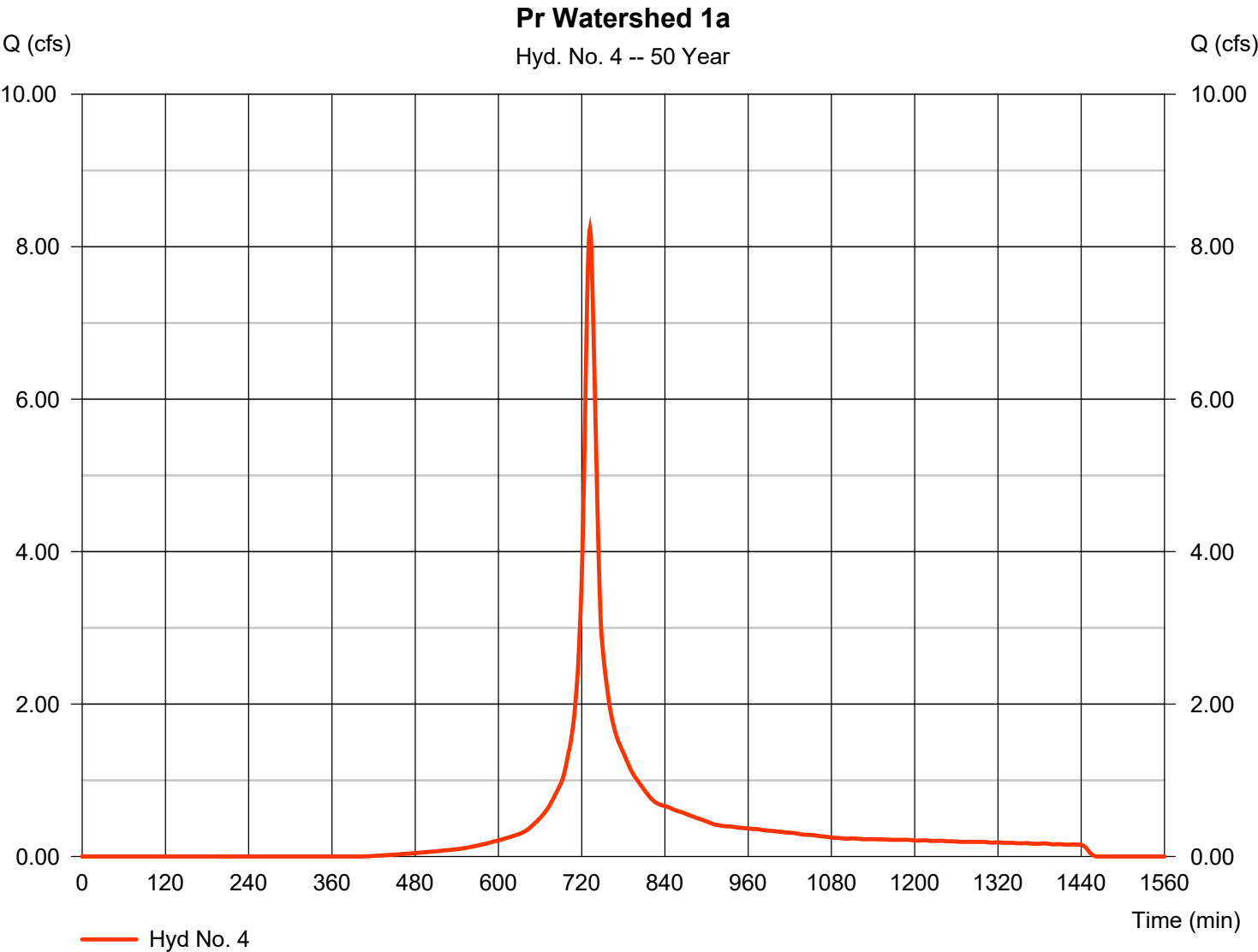
Hydrograph Report

Hyd. No. 4

Pr Watershed 1a

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.233 cfs
Storm frequency	=	50 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	33,459 cuft
Drainage area	=	2.250 ac	Curve number	=	75*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.50 min
Total precip.	=	6.94 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.860 x 39) + (1.390 x 98)] / 2.250



Precipitation Report

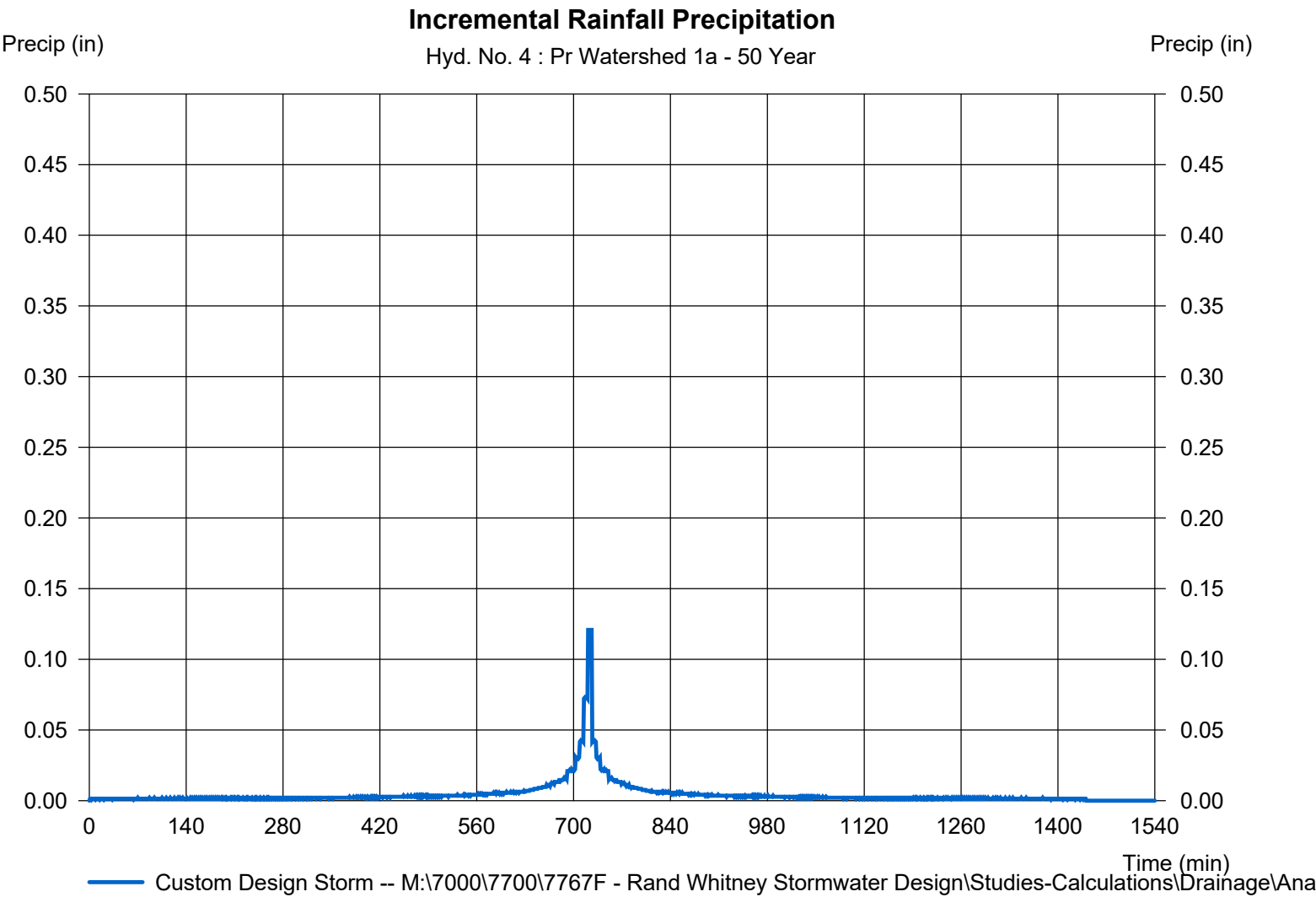
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Wednesday, 12 / 11 / 2024

Hyd. No. 4

Pr Watershed 1a

Storm Frequency	= 50 yrs	Time interval	= 1 min
Total precip.	= 6.9400 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

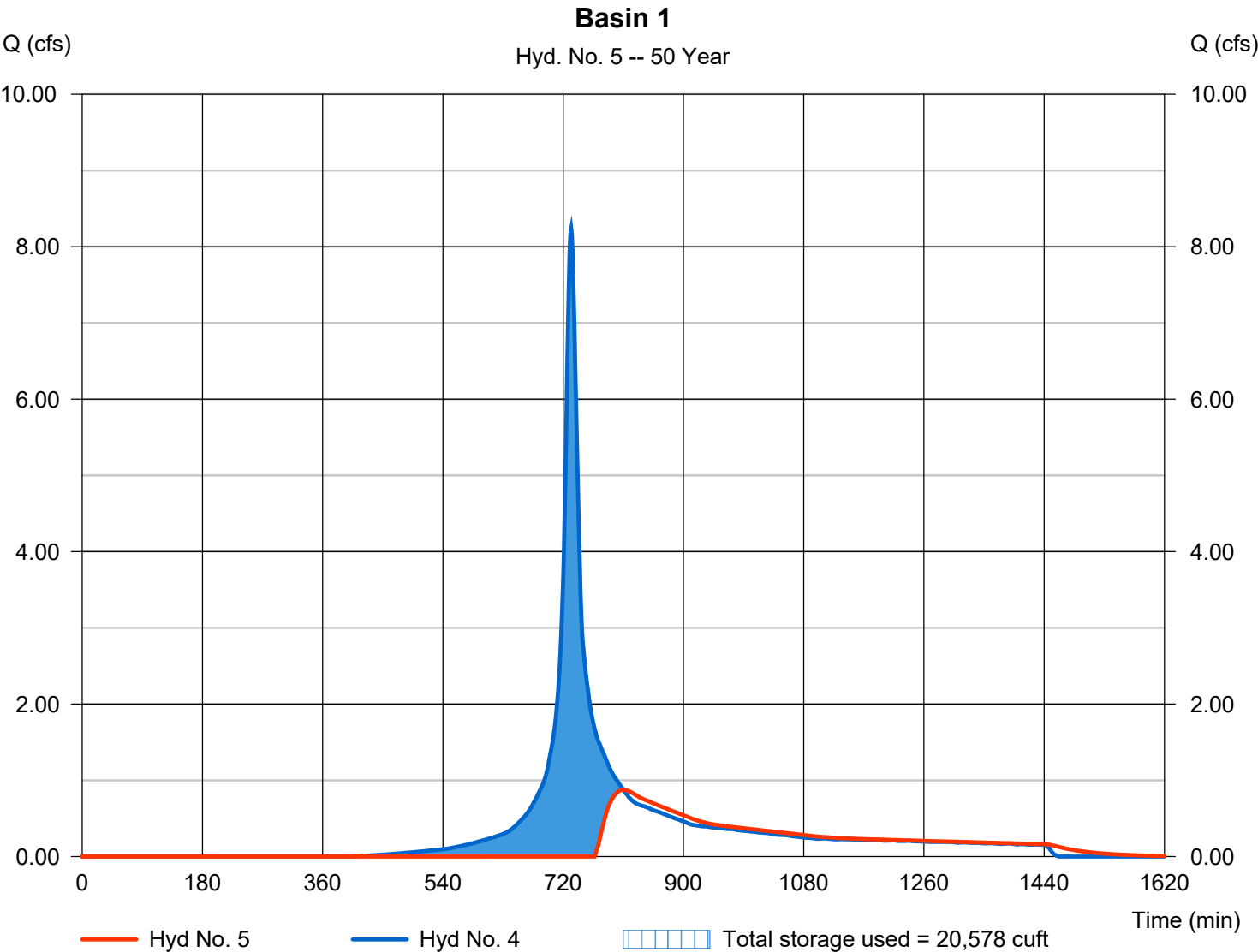
Wednesday, 12 / 11 / 2024

Hyd. No. 5

Basin 1

Hydrograph type	= Reservoir	Peak discharge	= 0.874 cfs
Storm frequency	= 50 yrs	Time to peak	= 810 min
Time interval	= 1 min	Hyd. volume	= 14,522 cuft
Inflow hyd. No.	= 4 - Pr Watershed 1a	Max. Elevation	= 233.66 ft
Reservoir name	= Pond 1	Max. Storage	= 20,578 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

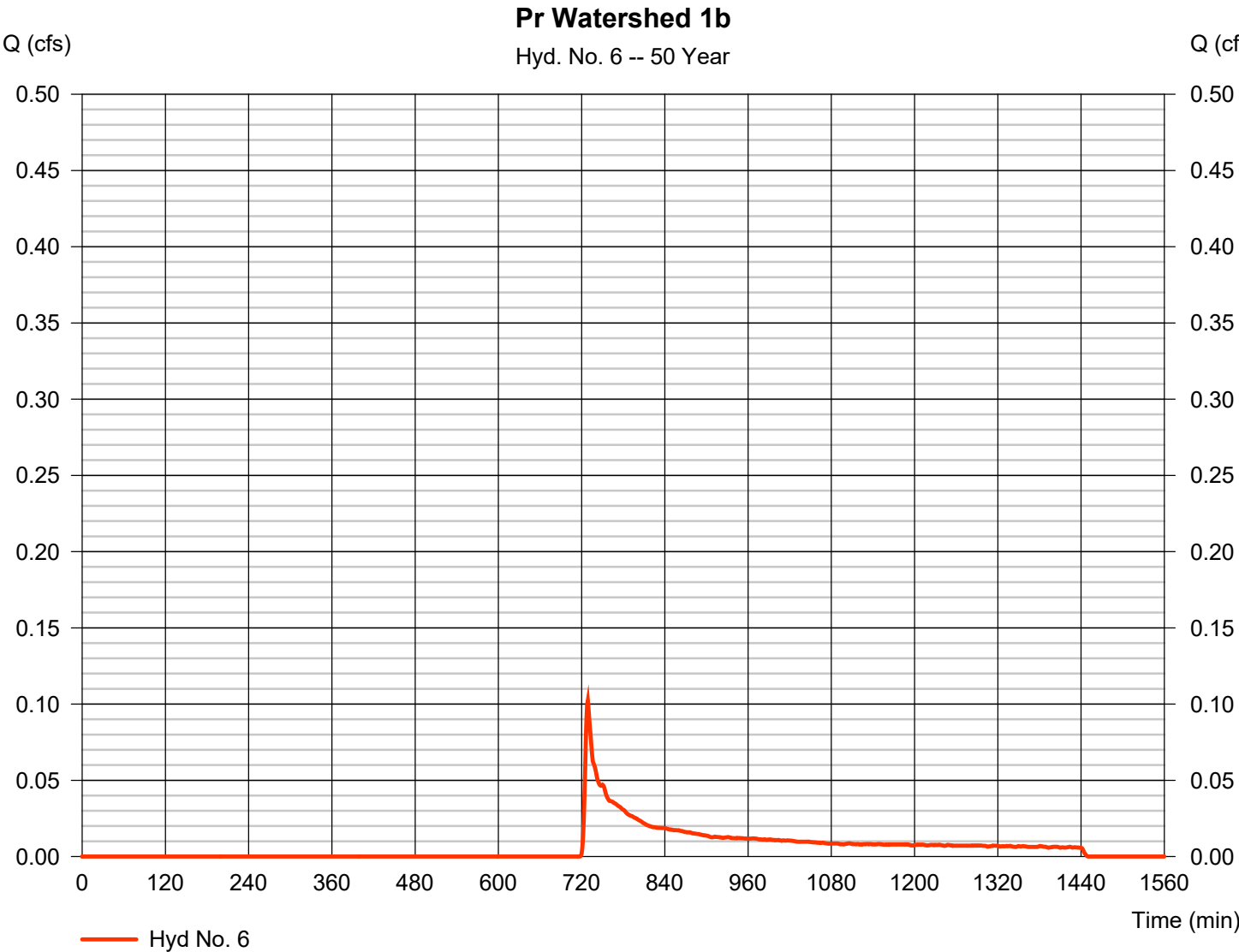
Wednesday, 12 / 11 / 2024

Hyd. No. 6

Pr Watershed 1b

Hydrograph type	= SCS Runoff	Peak discharge	= 0.102 cfs
Storm frequency	= 50 yrs	Time to peak	= 729 min
Time interval	= 1 min	Hyd. volume	= 587 cuft
Drainage area	= 0.210 ac	Curve number	= 39*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.94 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Dr		

* Composite (Area/CN) = [(0.210 x 39)] / 0.210



Precipitation Report

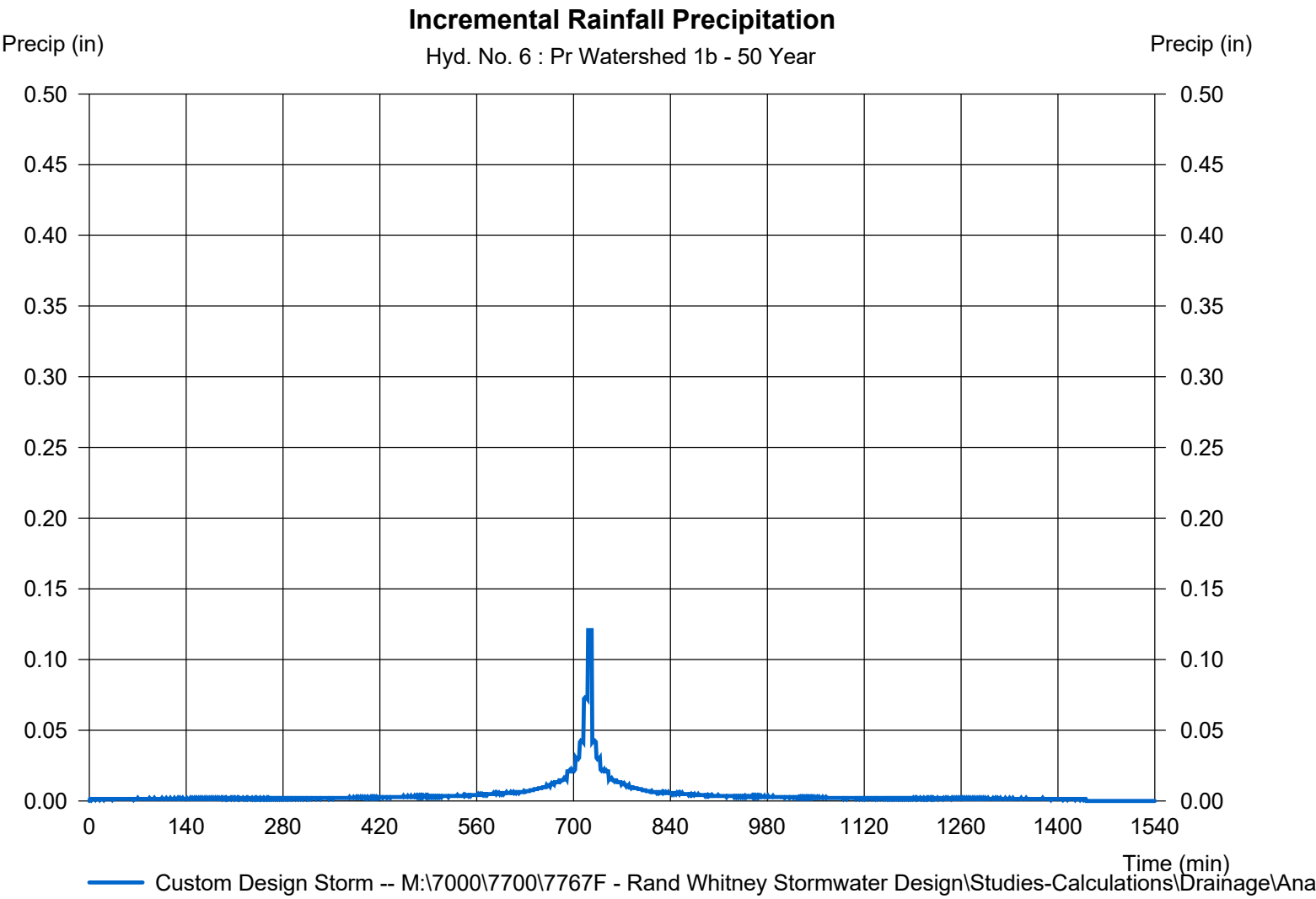
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Wednesday, 12 / 11 / 2024

Hyd. No. 6

Pr Watershed 1b

Storm Frequency	= 50 yrs	Time interval	= 1 min
Total precip.	= 6.9400 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

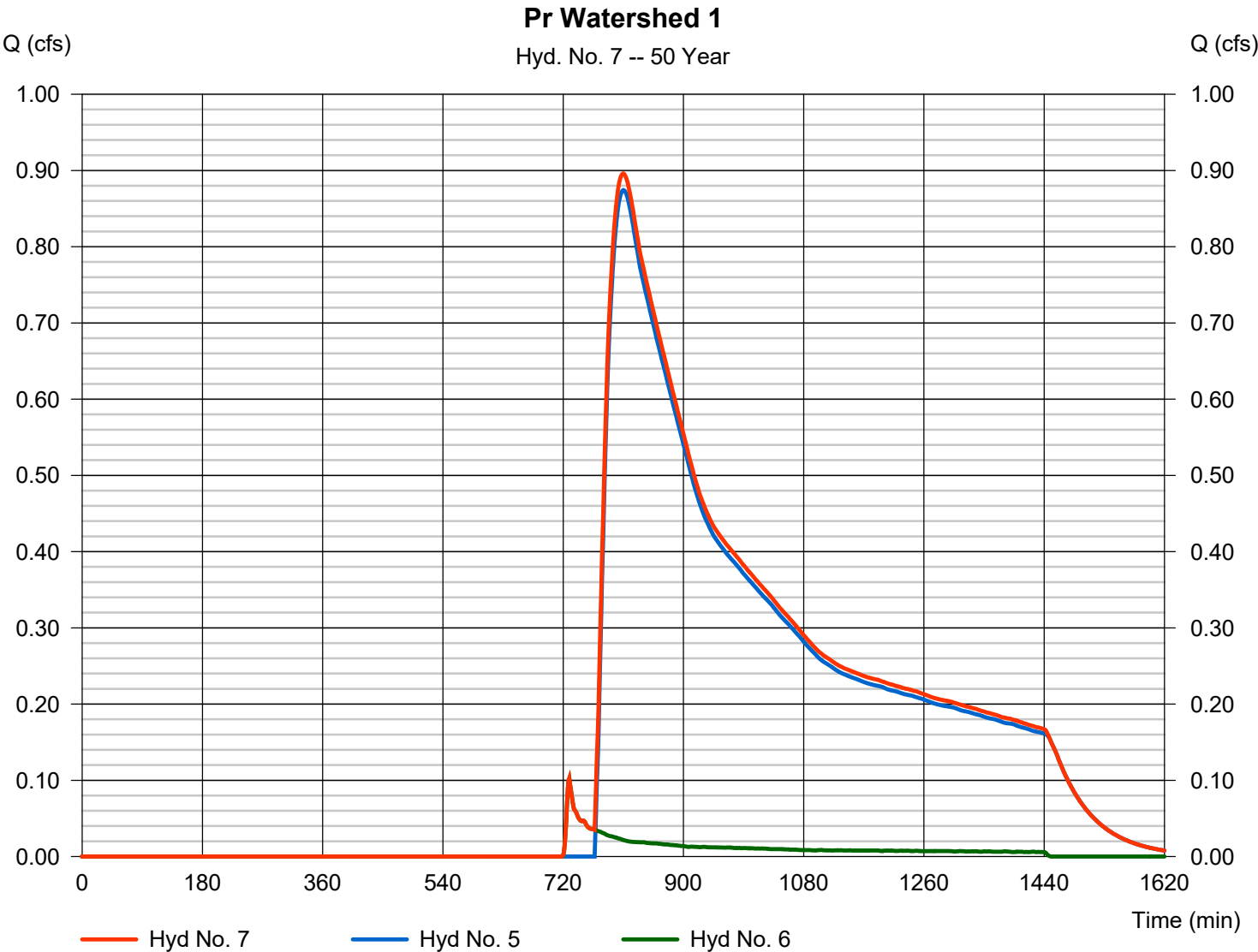
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Wednesday, 12 / 11 / 2024

Hyd. No. 7

Pr Watershed 1

Hydrograph type	= Combine	Peak discharge	= 0.896 cfs
Storm frequency	= 50 yrs	Time to peak	= 810 min
Time interval	= 1 min	Hyd. volume	= 15,109 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.210 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

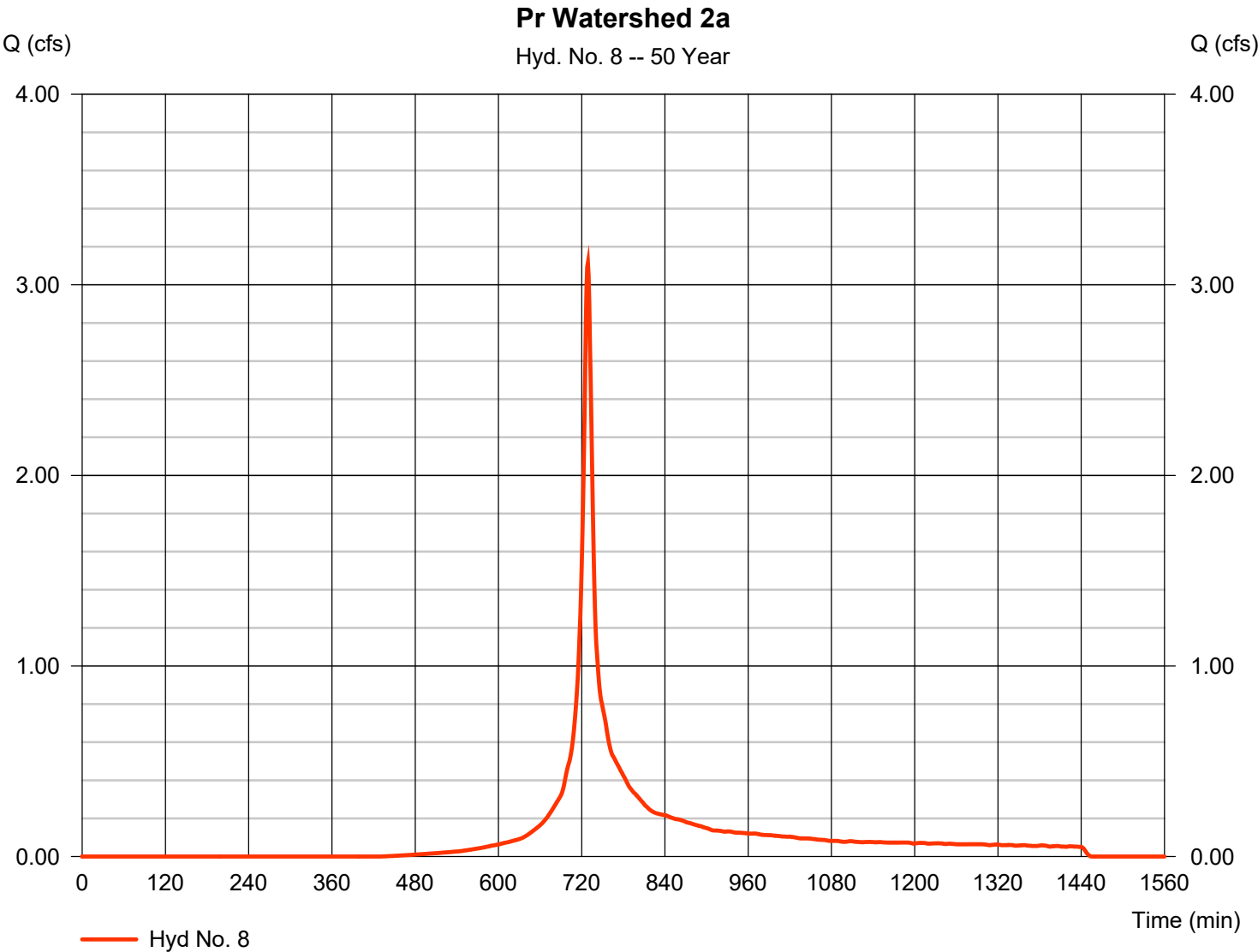
Wednesday, 12 / 11 / 2024

Hyd. No. 8

Pr Watershed 2a

Hydrograph type	= SCS Runoff	Peak discharge	= 3.115 cfs
Storm frequency	= 50 yrs	Time to peak	= 729 min
Time interval	= 1 min	Hyd. volume	= 10,855 cuft
Drainage area	= 0.770 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.80 min
Total precip.	= 6.94 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Dr		

* Composite (Area/CN) = [(0.320 x 39) + (0.450 x 98)] / 0.770

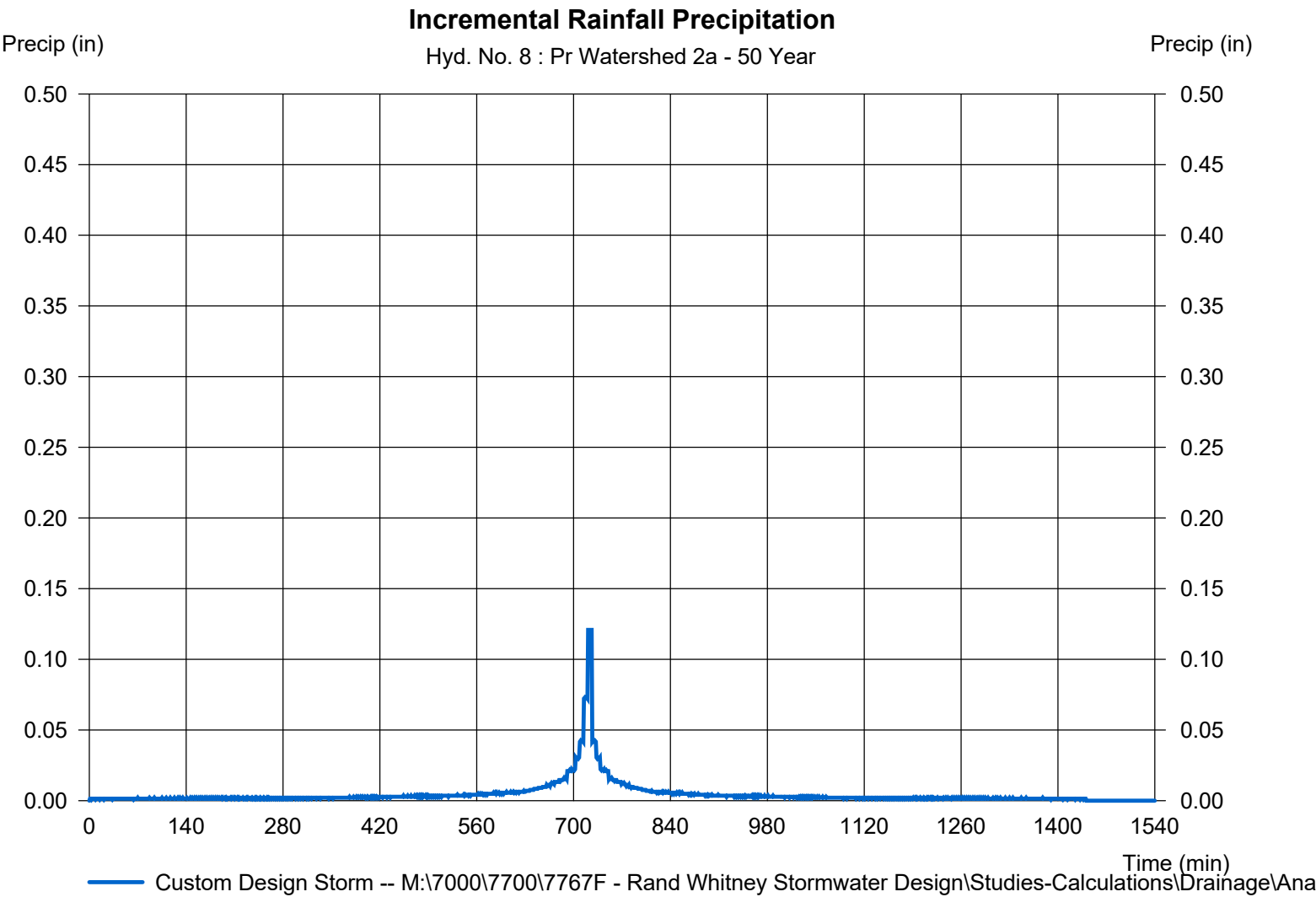


Precipitation Report

Hyd. No. 8

Pr Watershed 2a

Storm Frequency	= 50 yrs	Time interval	= 1 min
Total precip.	= 6.9400 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

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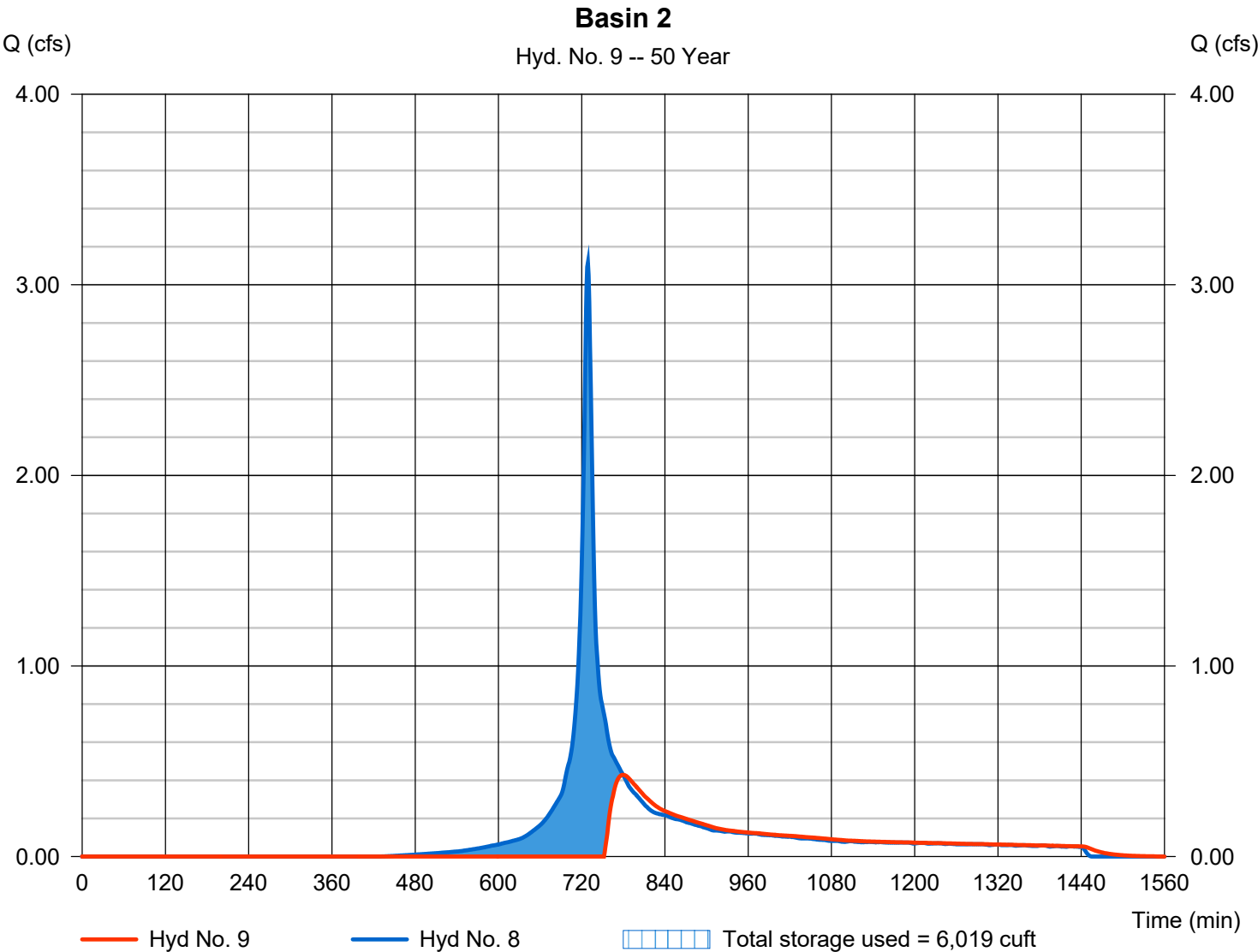
Wednesday, 12 / 11 / 2024

Hyd. No. 9

Basin 2

Hydrograph type	= Reservoir	Peak discharge	= 0.428 cfs
Storm frequency	= 50 yrs	Time to peak	= 780 min
Time interval	= 1 min	Hyd. volume	= 5,250 cuft
Inflow hyd. No.	= 8 - Pr Watershed 2a	Max. Elevation	= 233.62 ft
Reservoir name	= Pond 2	Max. Storage	= 6,019 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

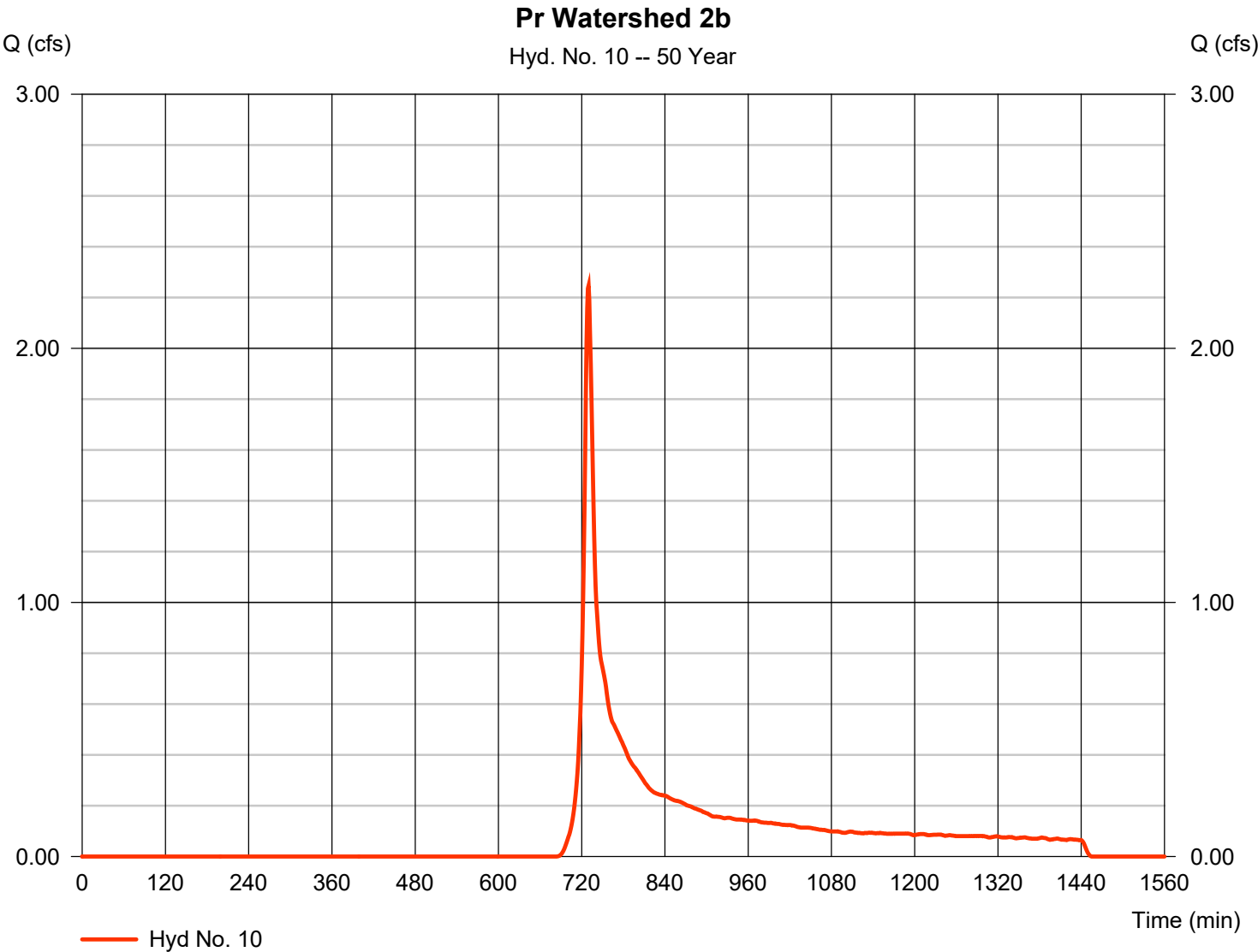
Wednesday, 12 / 11 / 2024

Hyd. No. 10

Pr Watershed 2b

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.246 cfs
Storm frequency	=	50 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	8,868 cuft
Drainage area	=	1.580 ac	Curve number	=	49*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	6.94 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.650 x 36) + (0.640 x 39) + (0.290 x 98)] / 1.580



Precipitation Report

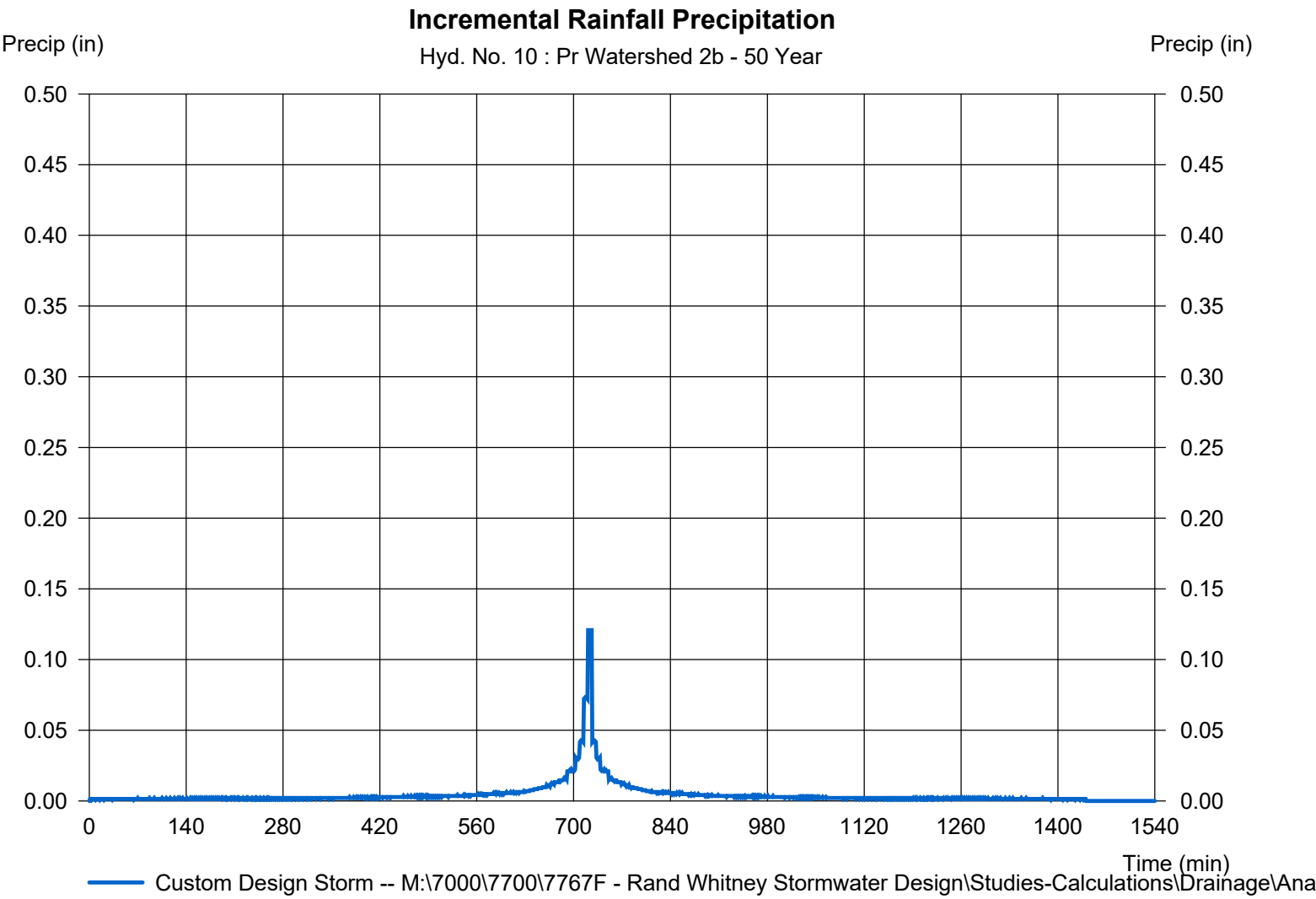
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 10

Pr Watershed 2b

Storm Frequency	= 50 yrs	Time interval	= 1 min
Total precip.	= 6.9400 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		

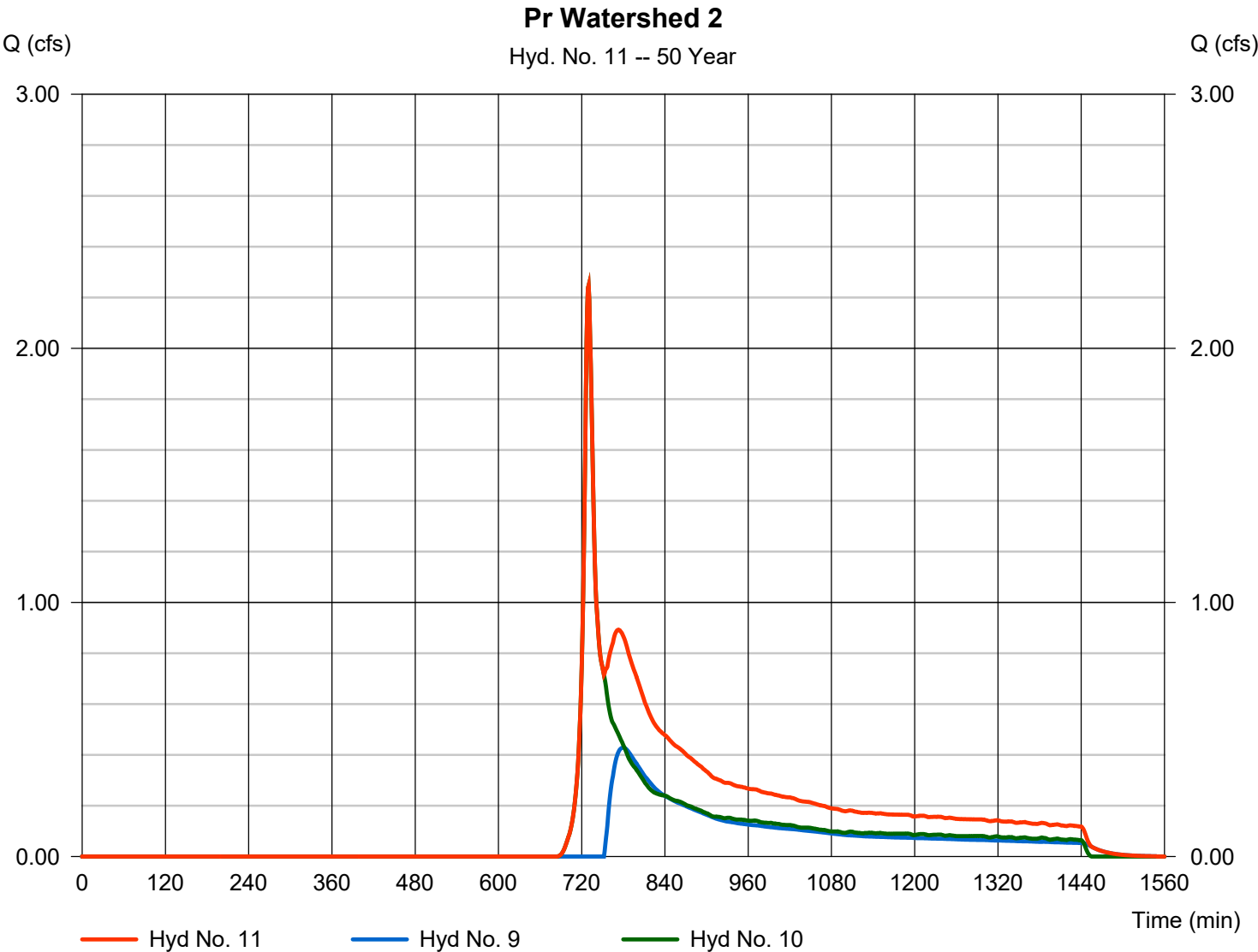


Hydrograph Report

Hyd. No. 11

Pr Watershed 2

Hydrograph type	= Combine	Peak discharge	= 2.246 cfs
Storm frequency	= 50 yrs	Time to peak	= 730 min
Time interval	= 1 min	Hyd. volume	= 14,117 cuft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 1.580 ac

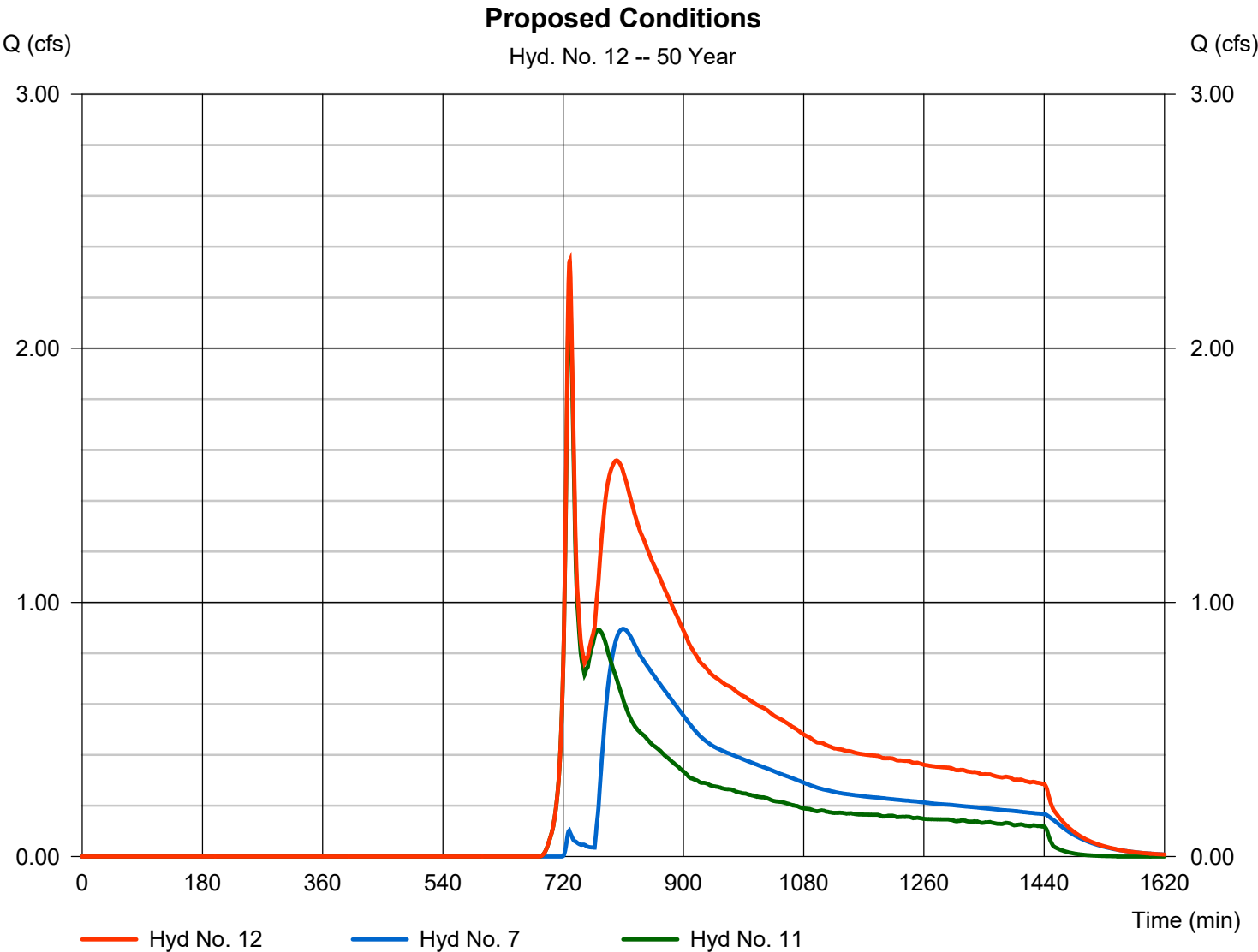


Hydrograph Report

Hyd. No. 12

Proposed Conditions

Hydrograph type	= Combine	Peak discharge	= 2.343 cfs
Storm frequency	= 50 yrs	Time to peak	= 730 min
Time interval	= 1 min	Hyd. volume	= 29,226 cuft
Inflow hyds.	= 7, 11	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

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	1.814	1	731	8,063	-----	-----	-----	Ex Watershed 1
2	SCS Runoff	2.083	1	741	14,708	-----	-----	-----	Ex Watershed 2
3	Combine	3.427	1	736	22,772	1, 2	-----	-----	Existing Conditions
4	SCS Runoff	9.663	1	732	39,413	-----	-----	-----	Pr Watershed 1a
5	Reservoir	1.677	1	776	20,476	4	233.75	21,482	Basin 1
6	SCS Runoff	0.186	1	728	832	-----	-----	-----	Pr Watershed 1b
7	Combine	1.722	1	775	21,308	5, 6	-----	-----	Pr Watershed 1
8	SCS Runoff	3.675	1	729	12,852	-----	-----	-----	Pr Watershed 2a
9	Reservoir	0.830	1	754	7,246	8	233.69	6,254	Basin 2
10	SCS Runoff	3.040	1	729	11,496	-----	-----	-----	Pr Watershed 2b
11	Combine	3.040	1	729	18,742	9, 10	-----	-----	Pr Watershed 2
12	Combine	3.224	1	729	40,050	7, 11	-----	-----	Proposed Conditions
Analysis.gpw					Return Period: 100 Year			Wednesday, 12 / 11 / 2024	

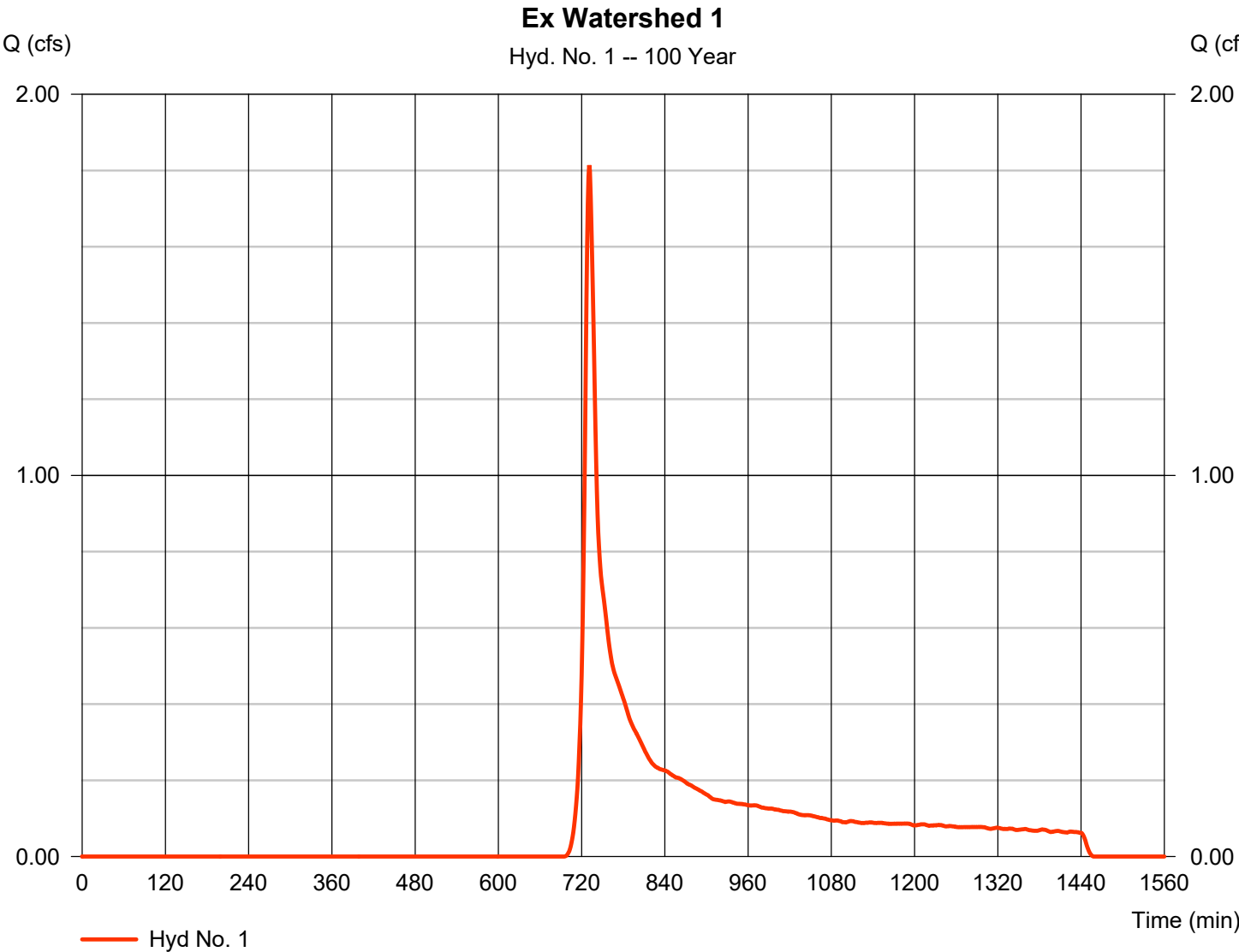
Hydrograph Report

Hyd. No. 1

Ex Watershed 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.814 cfs
Storm frequency	=	100 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	8,063 cuft
Drainage area	=	1.440 ac	Curve number	=	44*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.30 min
Total precip.	=	7.76 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Water Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.620 x 36) + (0.790 x 49) + (0.030 x 98)] / 1.440

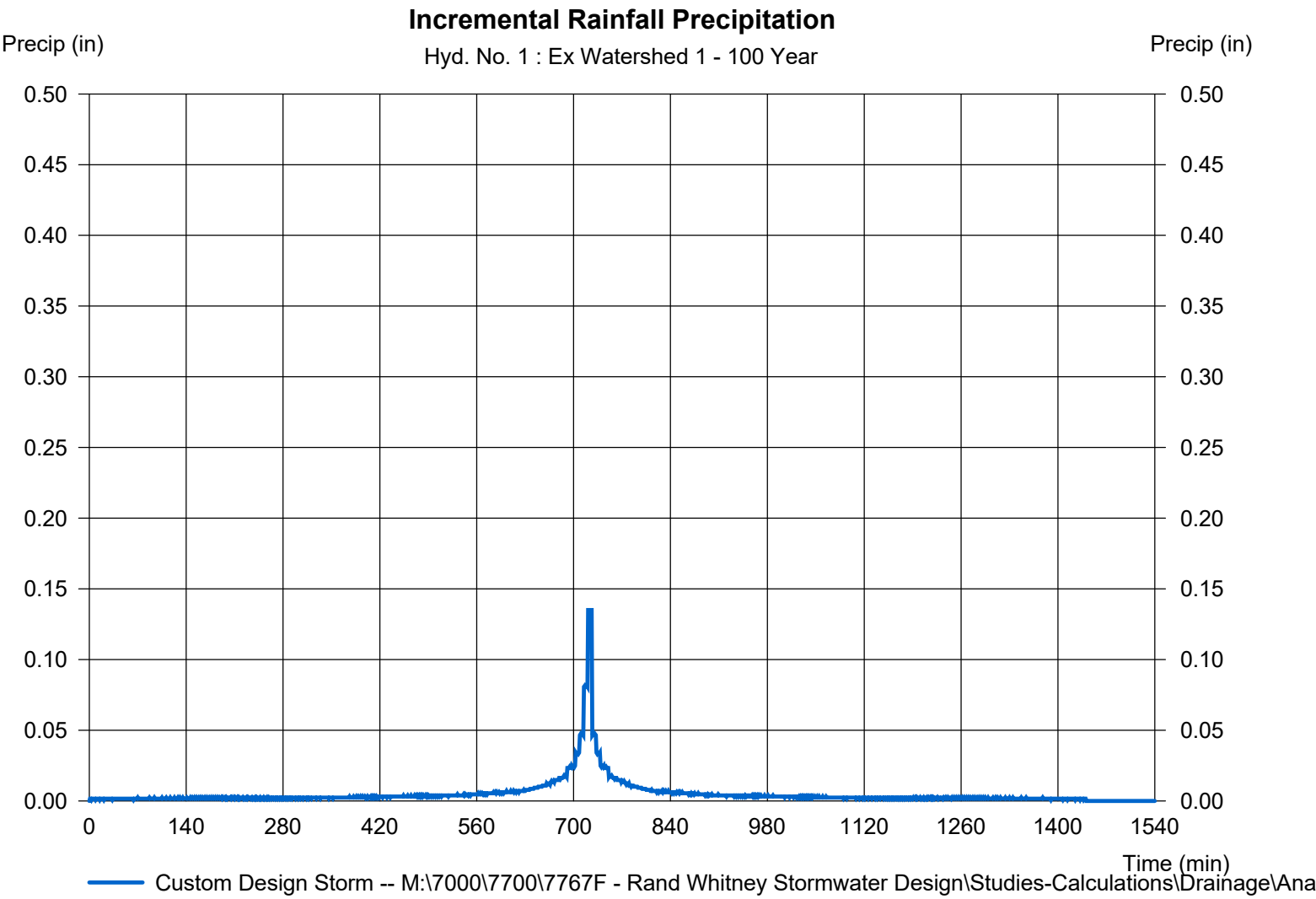


Precipitation Report

Hyd. No. 1

Ex Watershed 1

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 7.7600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

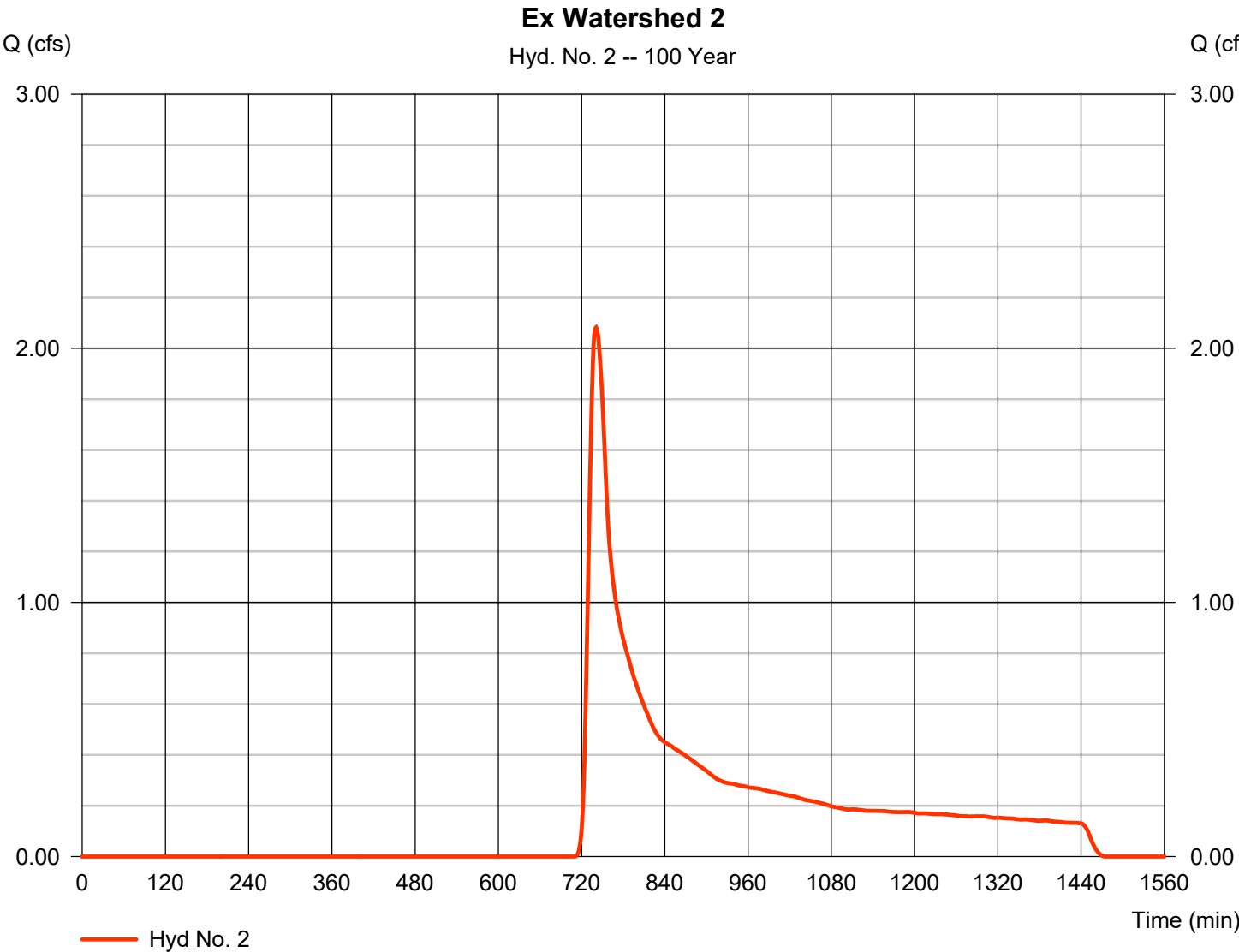
Wednesday, 12 / 11 / 2024

Hyd. No. 2

Ex Watershed 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.083 cfs
Storm frequency	=	100 yrs	Time to peak	=	741 min
Time interval	=	1 min	Hyd. volume	=	14,708 cuft
Drainage area	=	3.500 ac	Curve number	=	40*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	20.40 min
Total precip.	=	7.76 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Water Design Studies-Calculations\Drainage Basin Stormwater Design\184			

* Composite (Area/CN) = [(2.870 x 36) + (0.540 x 49) + (0.090 x 98)] / 3.500

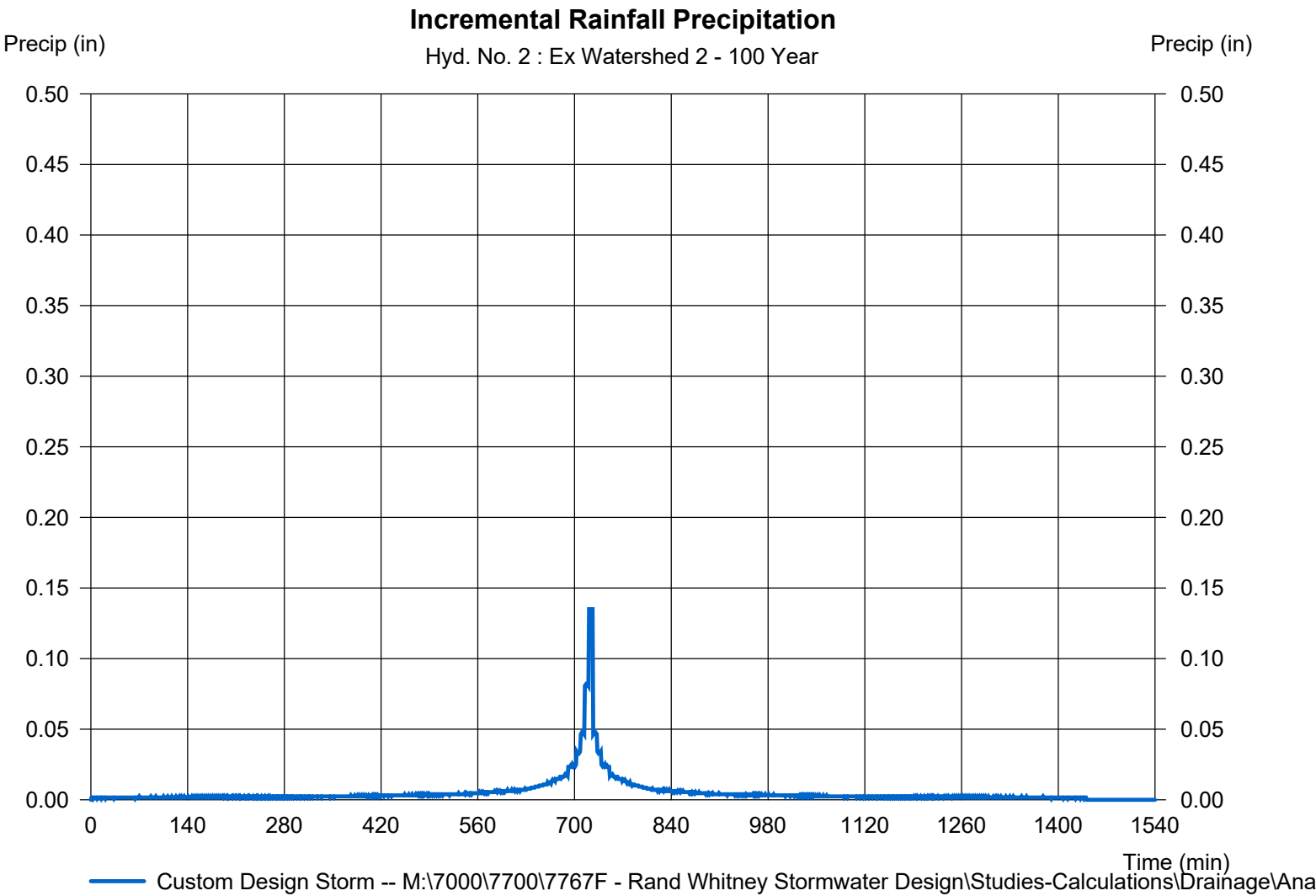


Precipitation Report

Hyd. No. 2

Ex Watershed 2

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 7.7600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

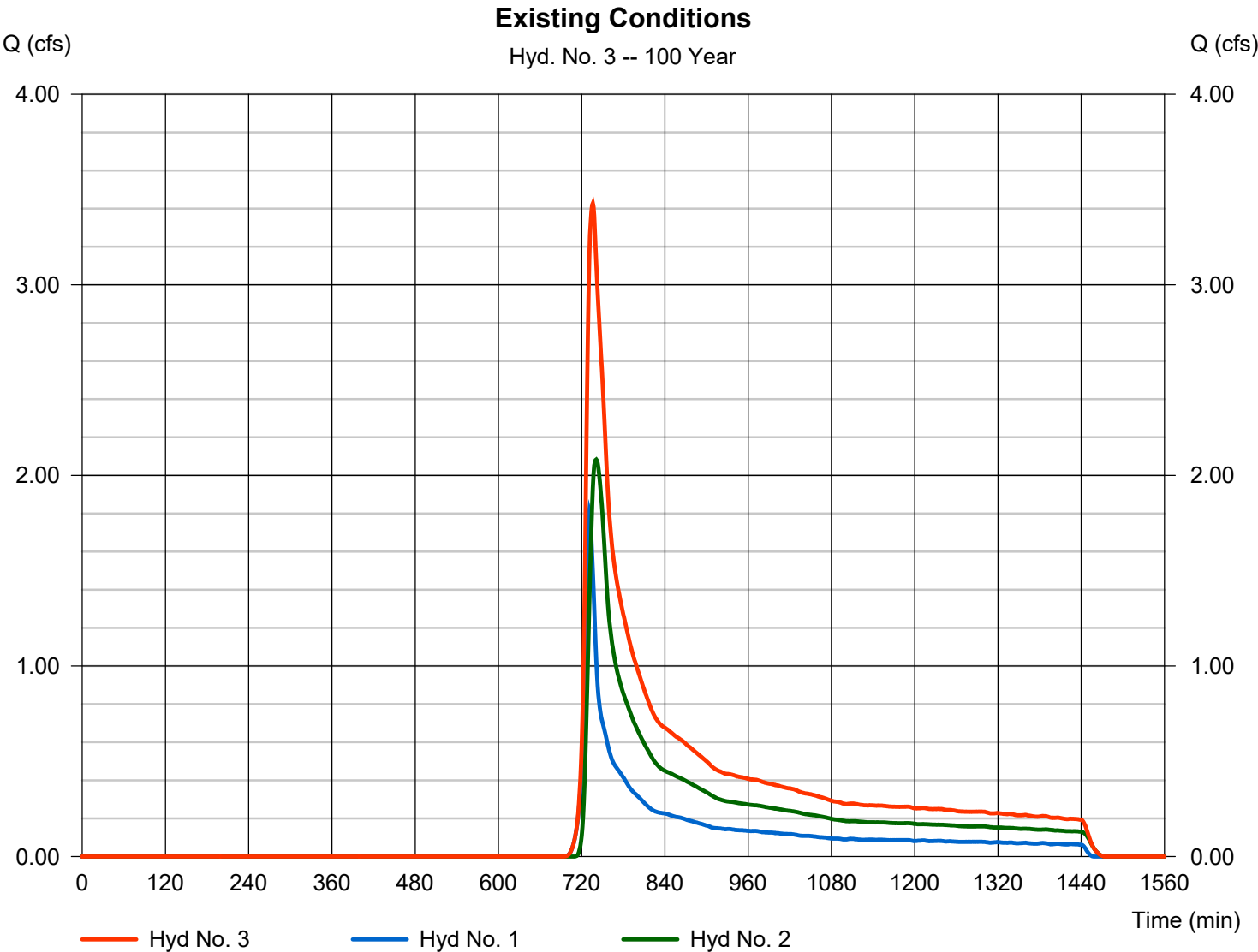
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 3

Existing Conditions

Hydrograph type	= Combine	Peak discharge	= 3.427 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 1 min	Hyd. volume	= 22,772 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 4.940 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

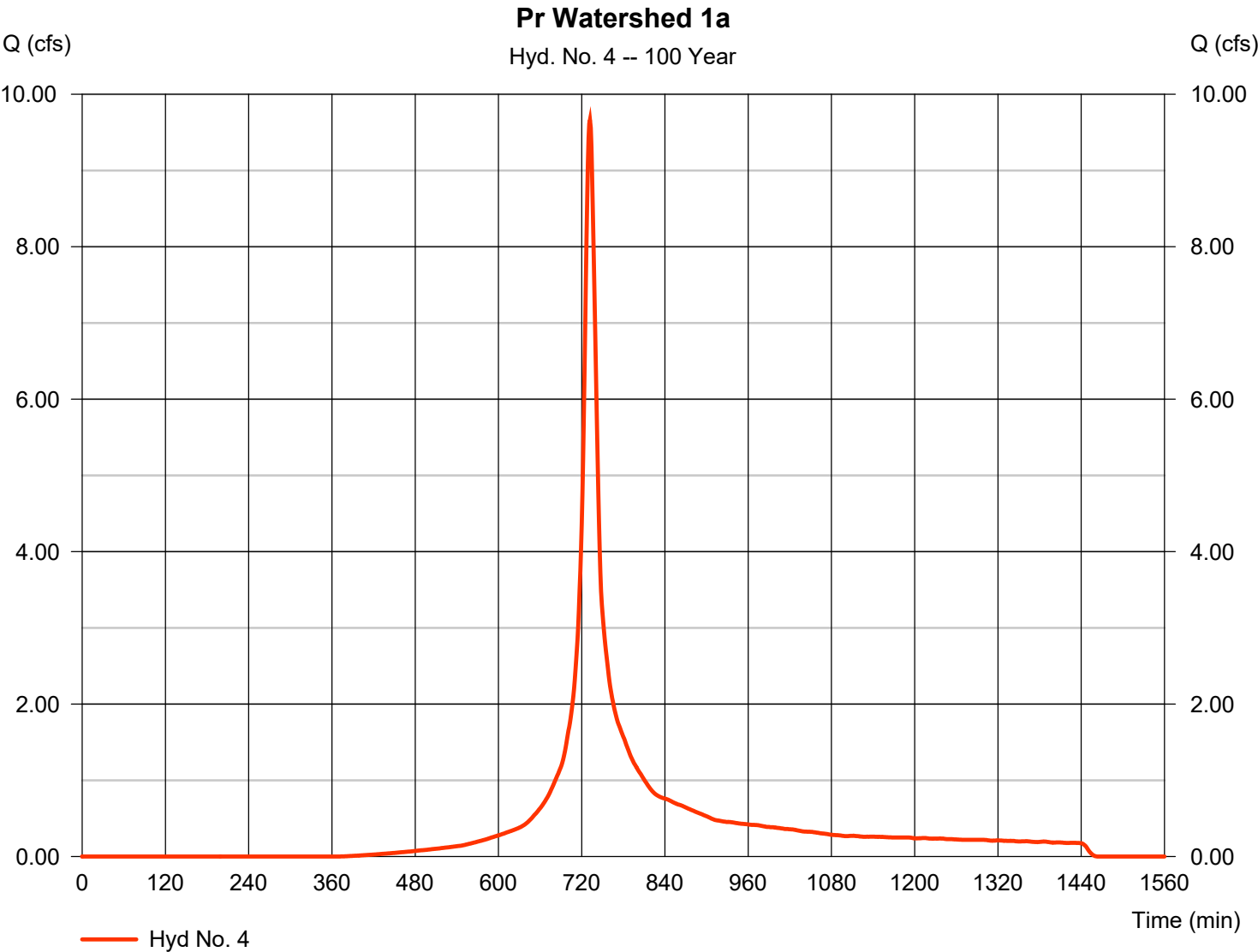
Wednesday, 12 / 11 / 2024

Hyd. No. 4

Pr Watershed 1a

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.663 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	39,413 cuft
Drainage area	=	2.250 ac	Curve number	=	75*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.50 min
Total precip.	=	7.76 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.860 x 39) + (1.390 x 98)] / 2.250



Precipitation Report

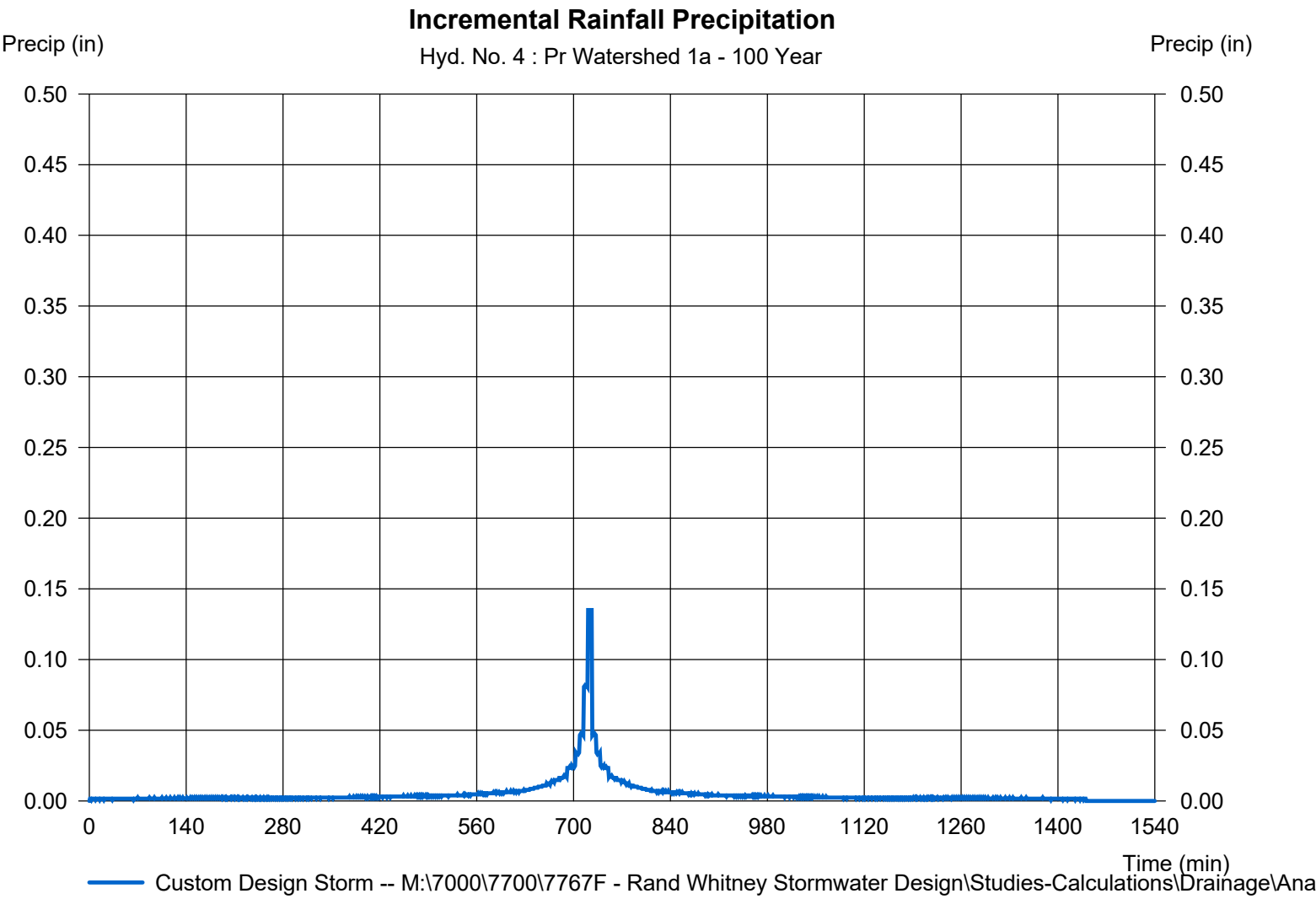
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 4

Pr Watershed 1a

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 7.7600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

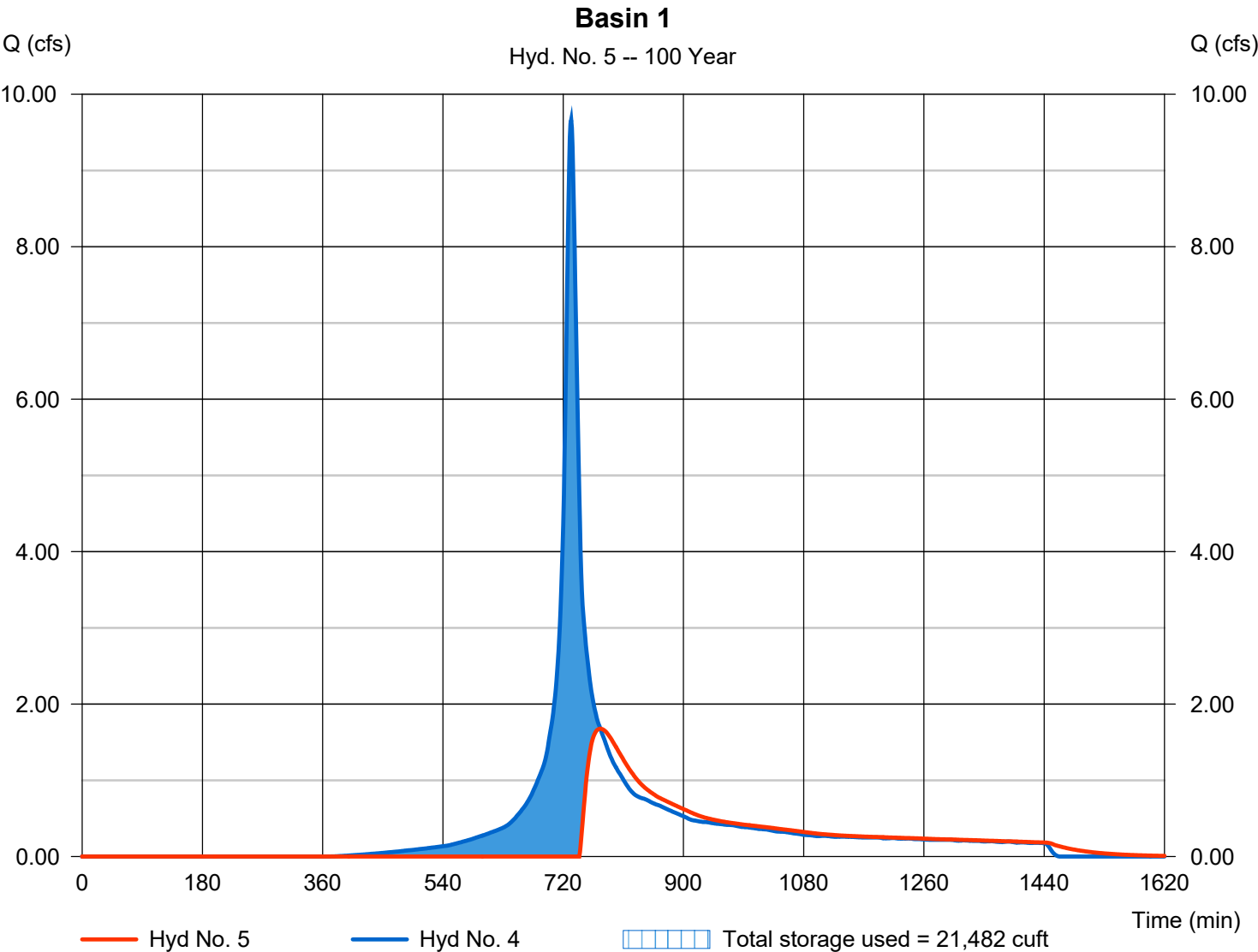
Wednesday, 12 / 11 / 2024

Hyd. No. 5

Basin 1

Hydrograph type	= Reservoir	Peak discharge	= 1.677 cfs
Storm frequency	= 100 yrs	Time to peak	= 776 min
Time interval	= 1 min	Hyd. volume	= 20,476 cuft
Inflow hyd. No.	= 4 - Pr Watershed 1a	Max. Elevation	= 233.75 ft
Reservoir name	= Pond 1	Max. Storage	= 21,482 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

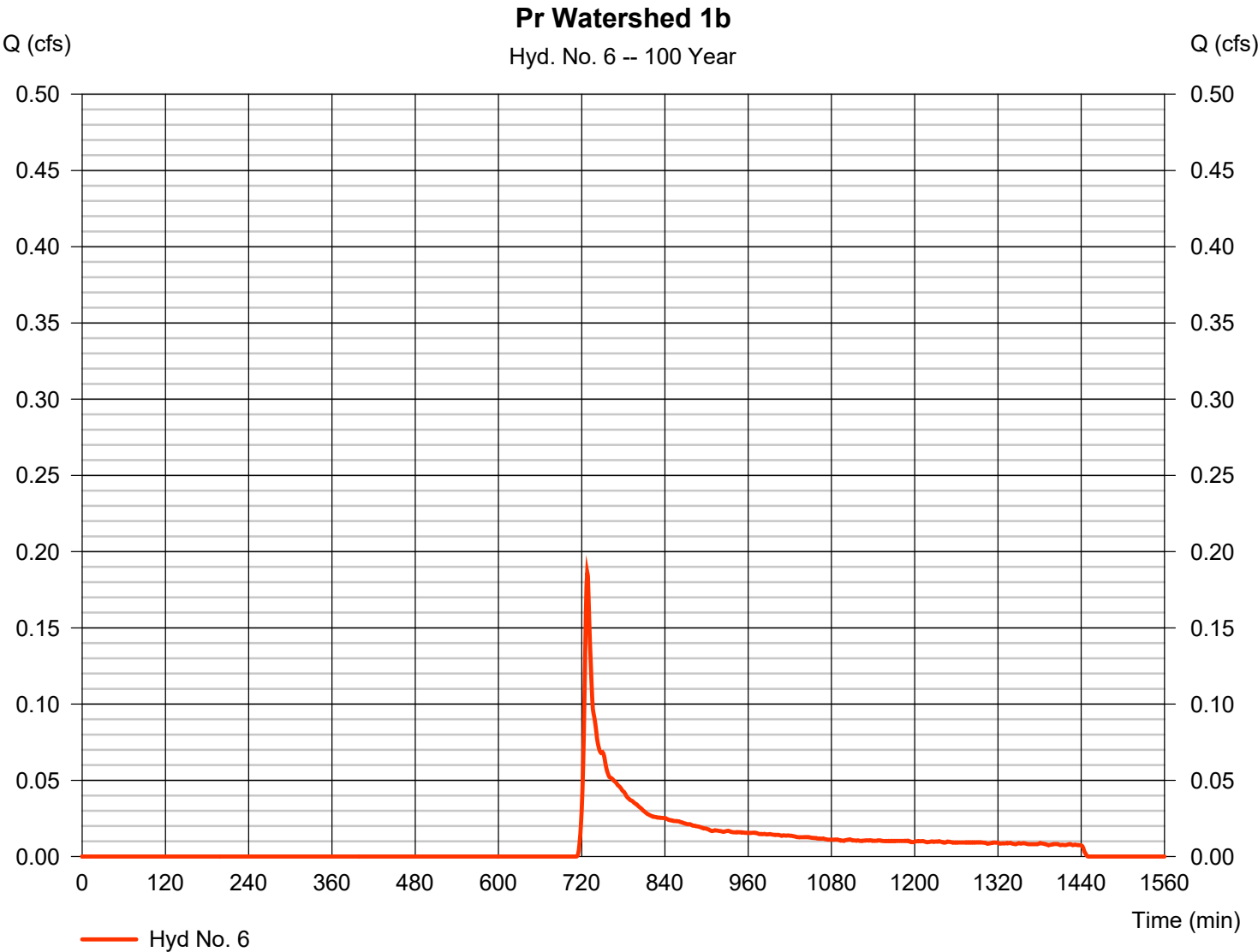
Wednesday, 12 / 11 / 2024

Hyd. No. 6

Pr Watershed 1b

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.186 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	832 cuft
Drainage area	=	0.210 ac	Curve number	=	39*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.76 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Drainage Basin			

* Composite (Area/CN) = [(0.210 x 39)] / 0.210



Precipitation Report

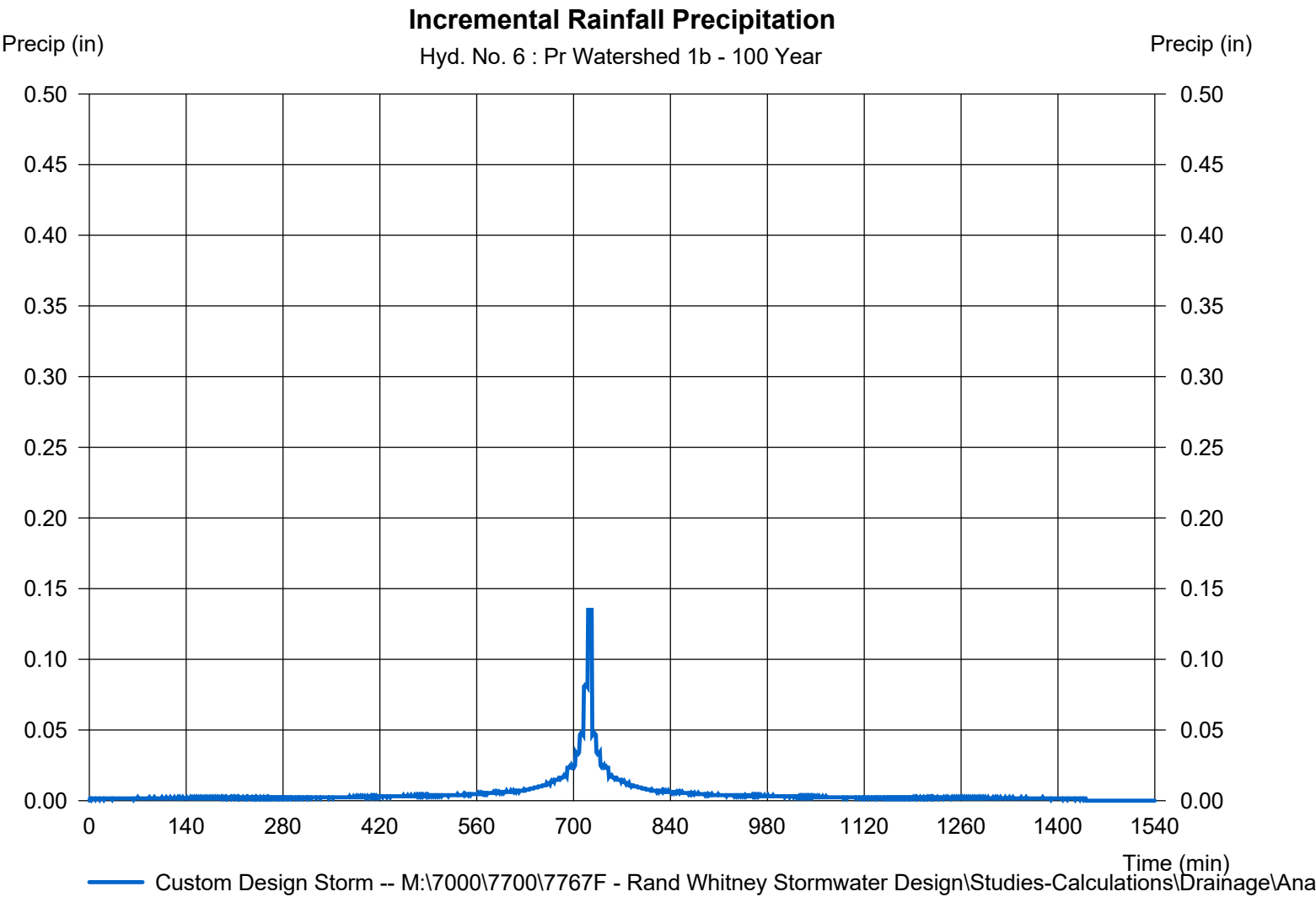
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 6

Pr Watershed 1b

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 7.7600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		

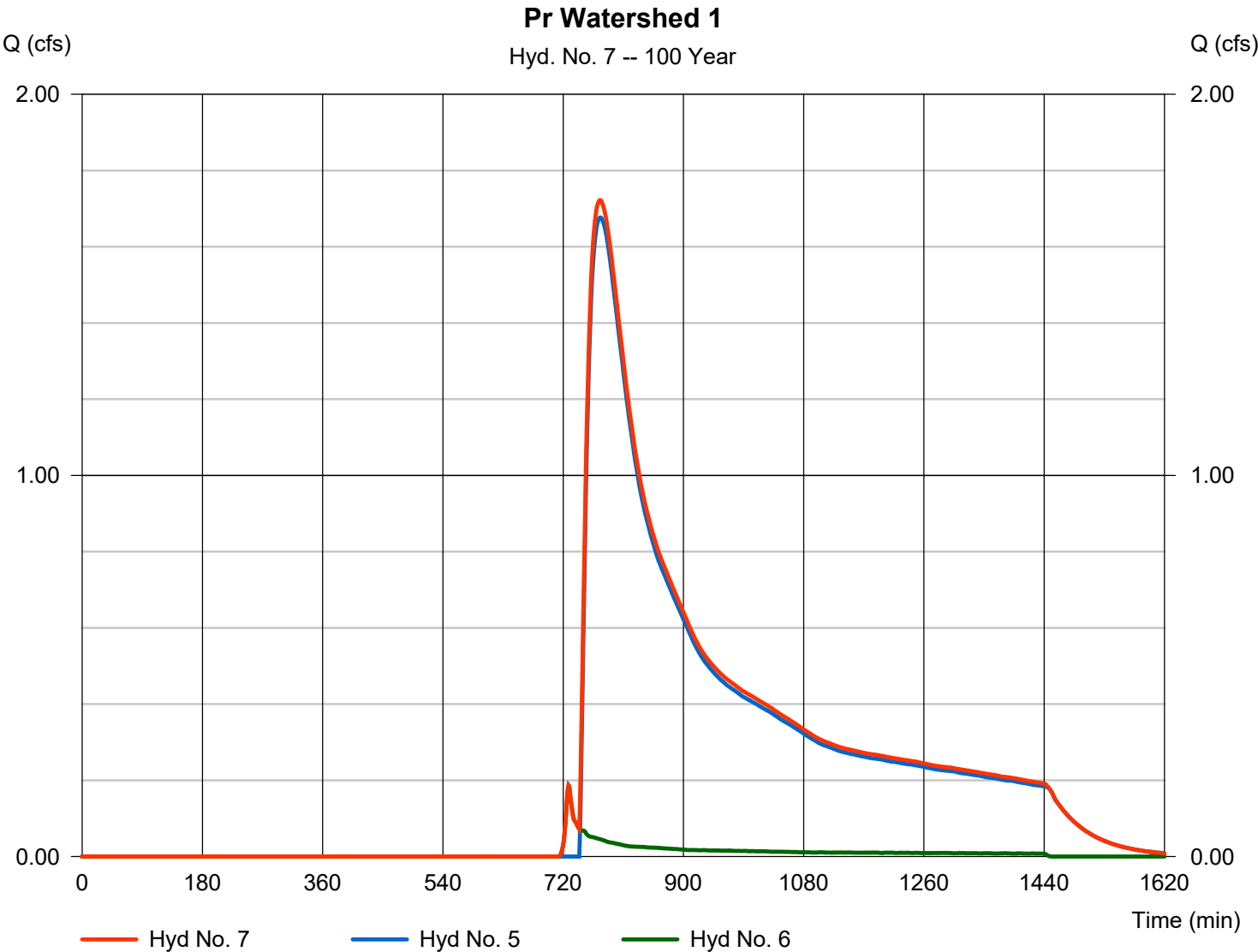


Hydrograph Report

Hyd. No. 7

Pr Watershed 1

Hydrograph type	= Combine	Peak discharge	= 1.722 cfs
Storm frequency	= 100 yrs	Time to peak	= 775 min
Time interval	= 1 min	Hyd. volume	= 21,308 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.210 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

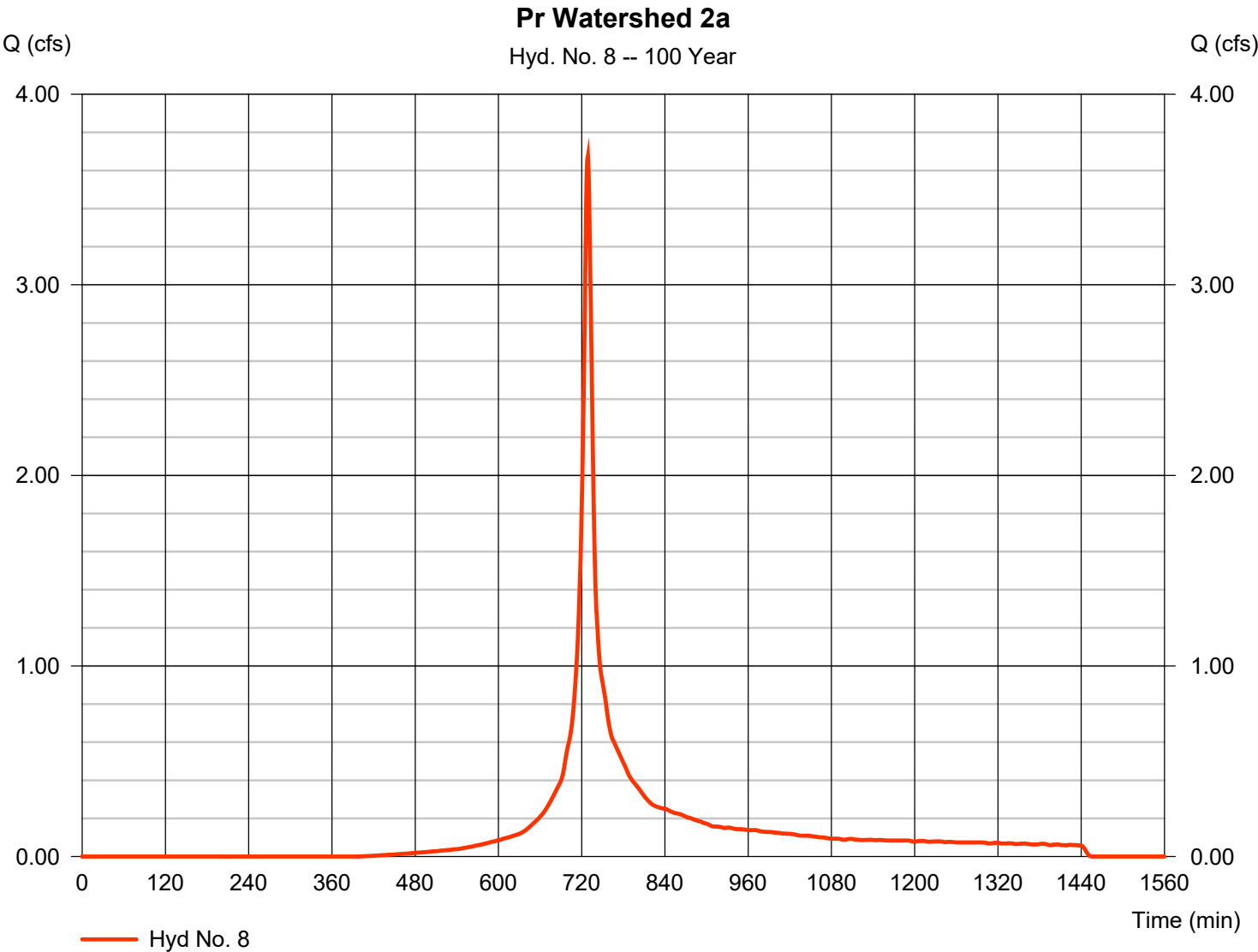
Wednesday, 12 / 11 / 2024

Hyd. No. 8

Pr Watershed 2a

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.675 cfs
Storm frequency	=	100 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	12,852 cuft
Drainage area	=	0.770 ac	Curve number	=	73*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.80 min
Total precip.	=	7.76 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Dr			

* Composite (Area/CN) = [(0.320 x 39) + (0.450 x 98)] / 0.770



Precipitation Report

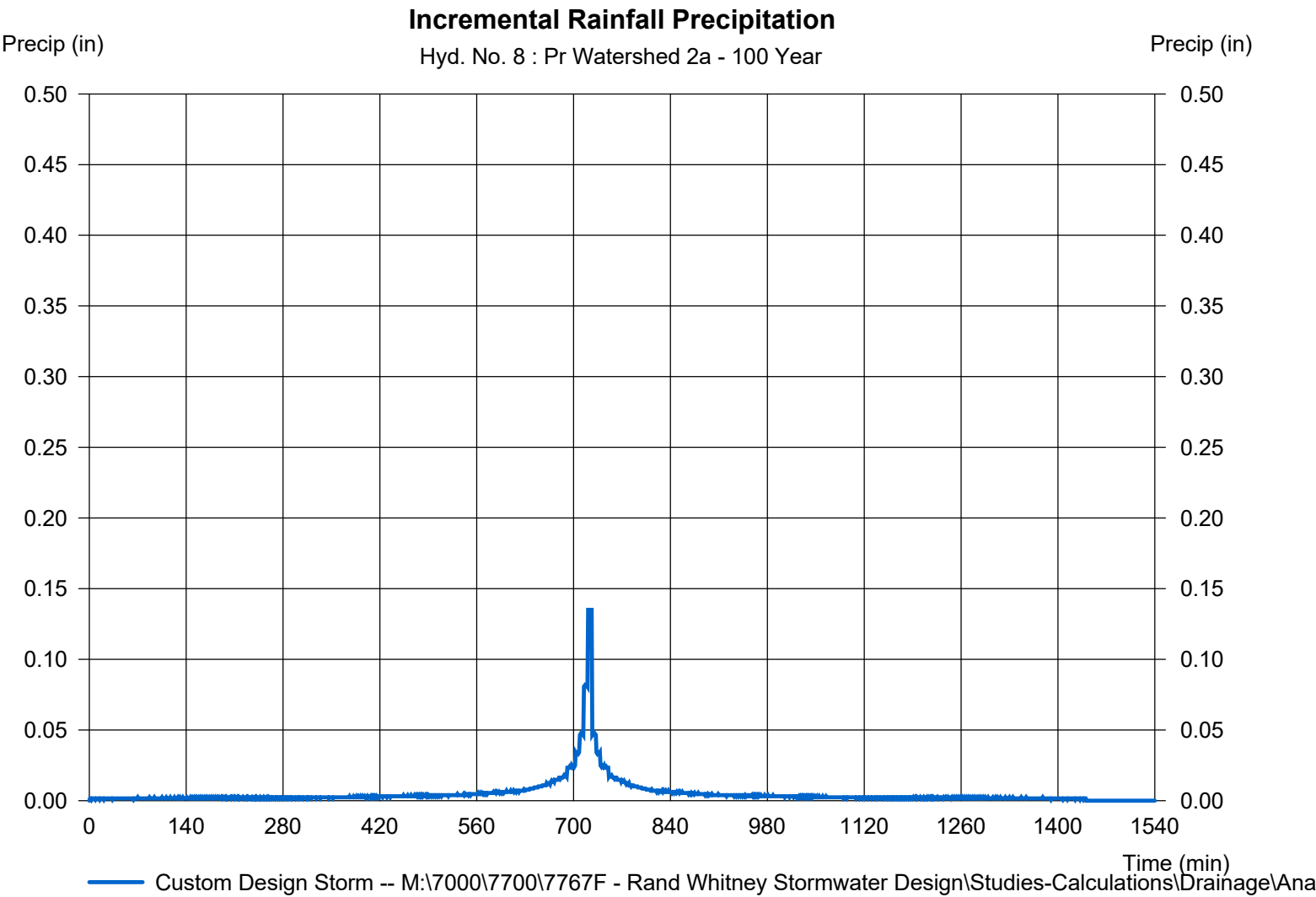
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Wednesday, 12 / 11 / 2024

Hyd. No. 8

Pr Watershed 2a

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 7.7600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

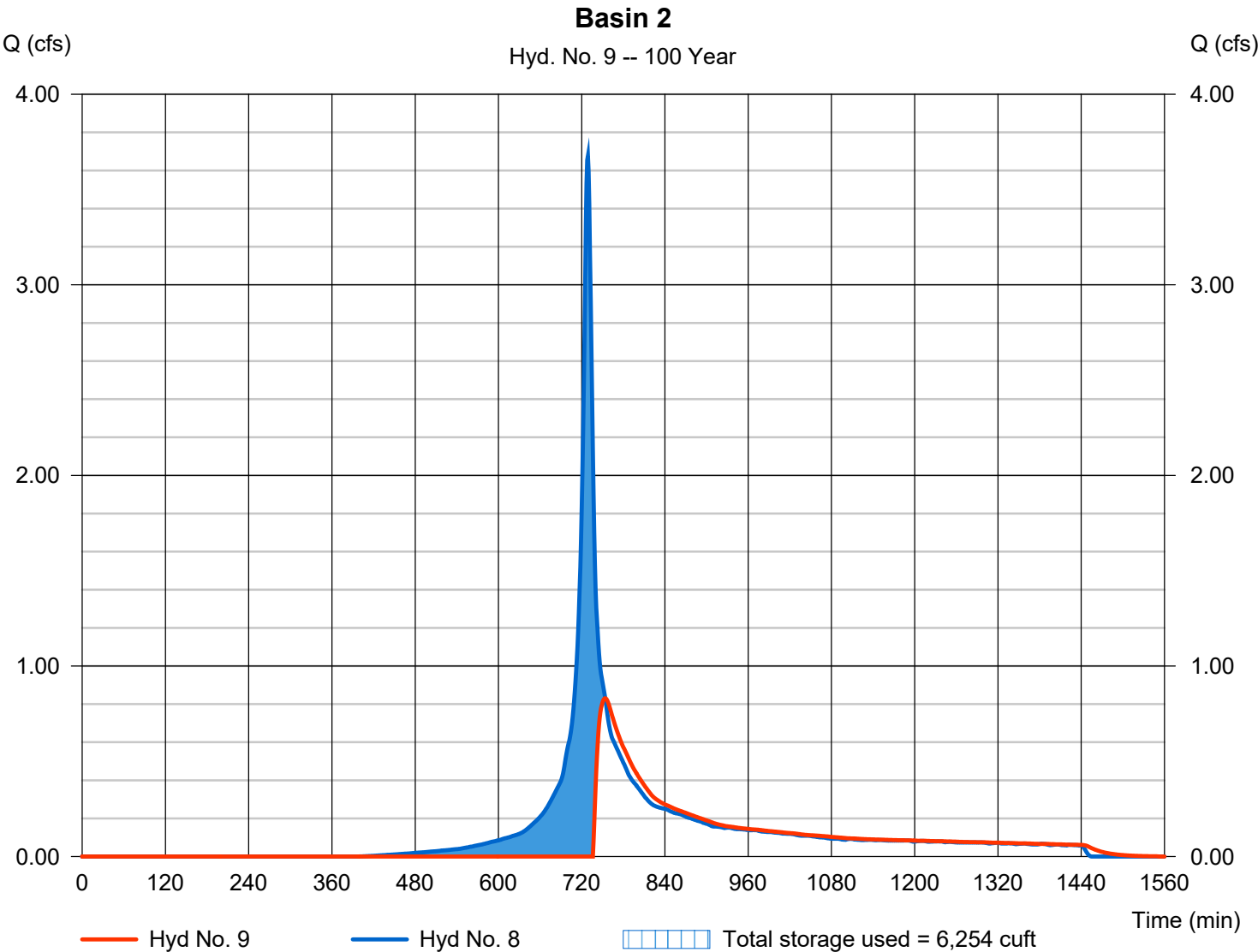
Wednesday, 12 / 11 / 2024

Hyd. No. 9

Basin 2

Hydrograph type	= Reservoir	Peak discharge	= 0.830 cfs
Storm frequency	= 100 yrs	Time to peak	= 754 min
Time interval	= 1 min	Hyd. volume	= 7,246 cuft
Inflow hyd. No.	= 8 - Pr Watershed 2a	Max. Elevation	= 233.69 ft
Reservoir name	= Pond 2	Max. Storage	= 6,254 cuft

Storage Indication method used.



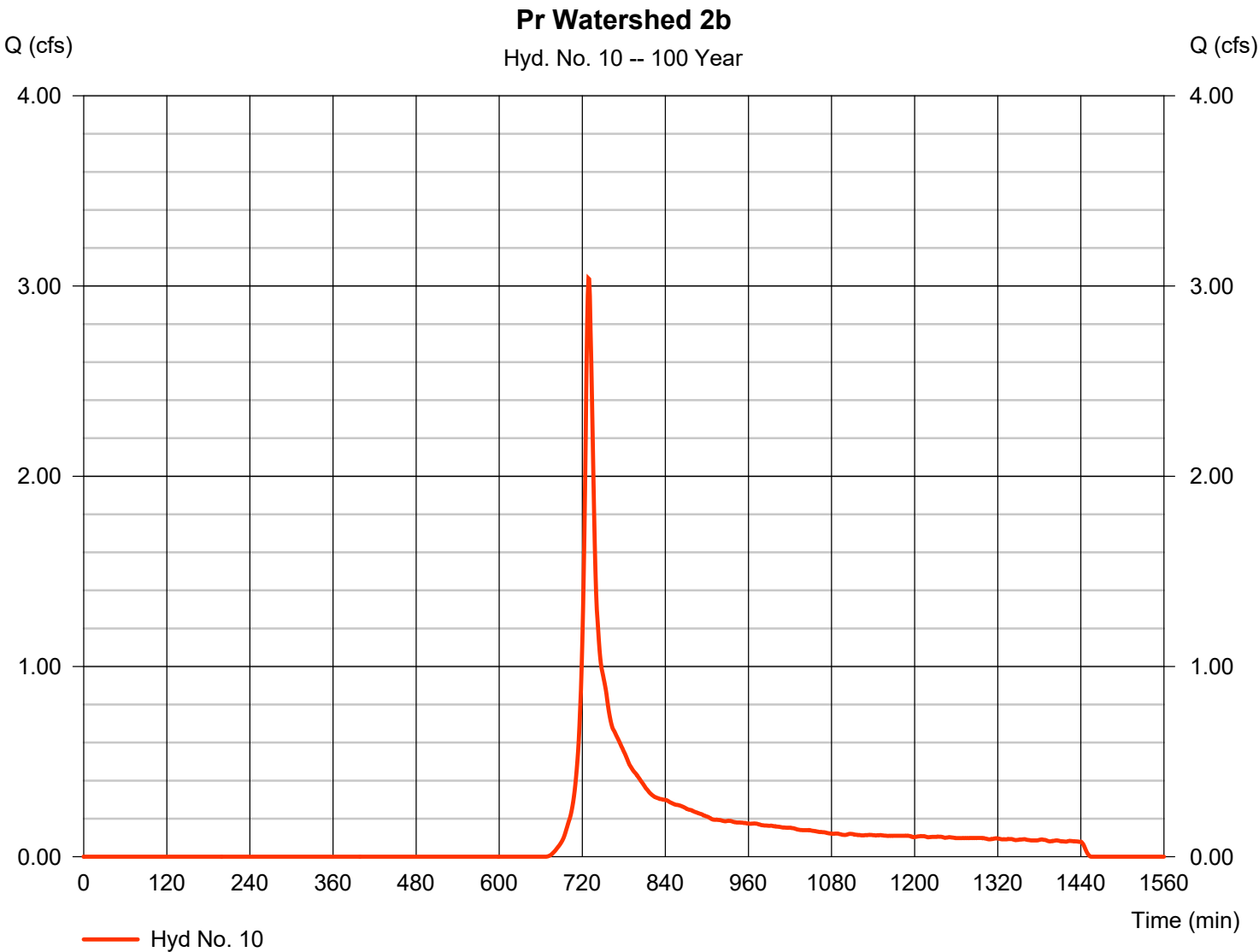
Hydrograph Report

Hyd. No. 10

Pr Watershed 2b

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.040 cfs
Storm frequency	=	100 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	11,496 cuft
Drainage area	=	1.580 ac	Curve number	=	49*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	7.76 in	Distribution	=	Custom
Storm duration	=	M:\7000\7700\7767F - Rand Watershed Stormwater Design Studies-Calculations\Dr			

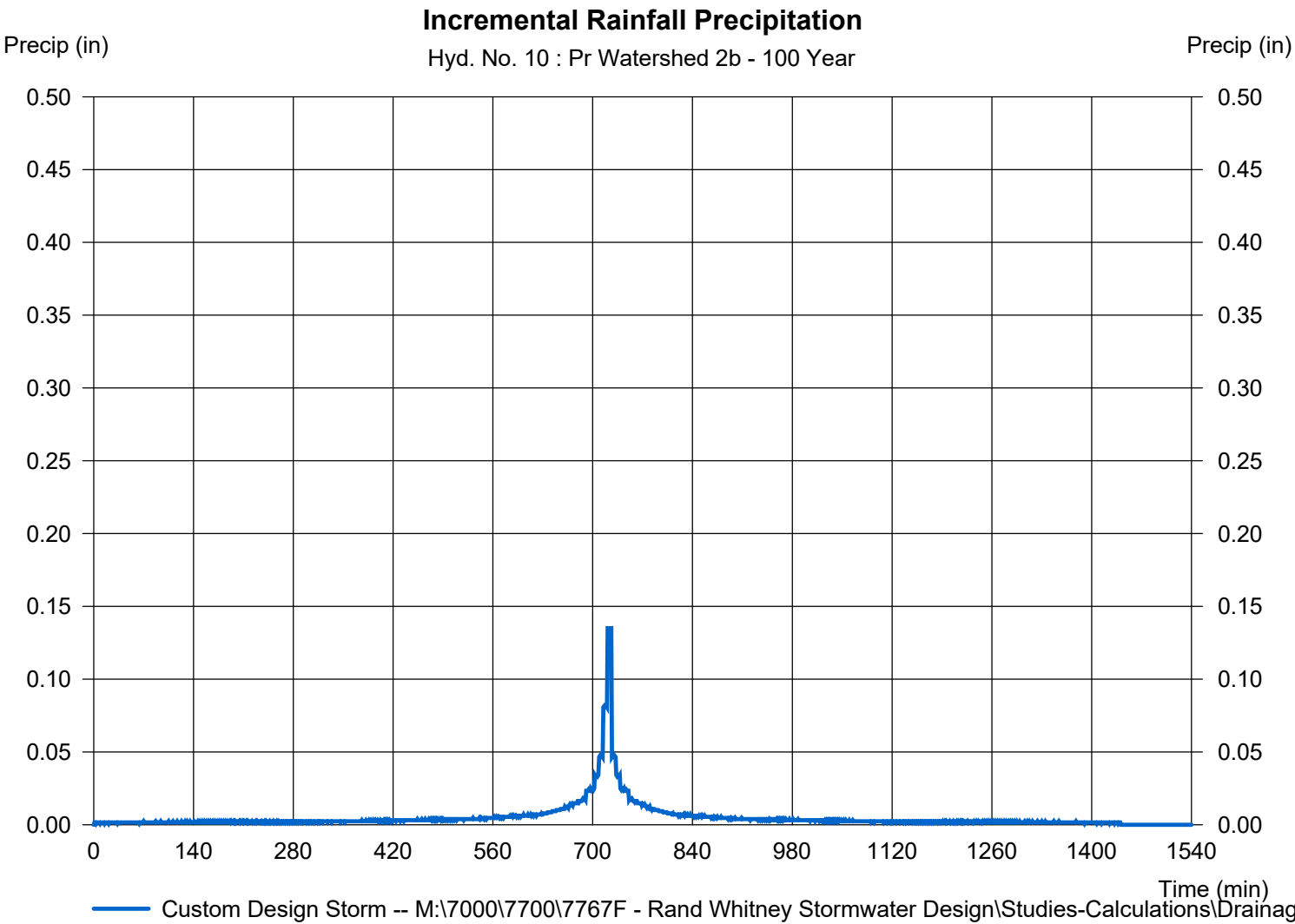
* Composite (Area/CN) = [(0.650 x 36) + (0.640 x 39) + (0.290 x 98)] / 1.580



Hyd. No. 10

Pr Watershed 2b

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 7.7600 in	Distribution	= Custom
Storm duration	= M:\7000\7700\7767F - Rand Whitney Stormwater Design\Studies-Calculations\Drainage\Ana		



Hydrograph Report

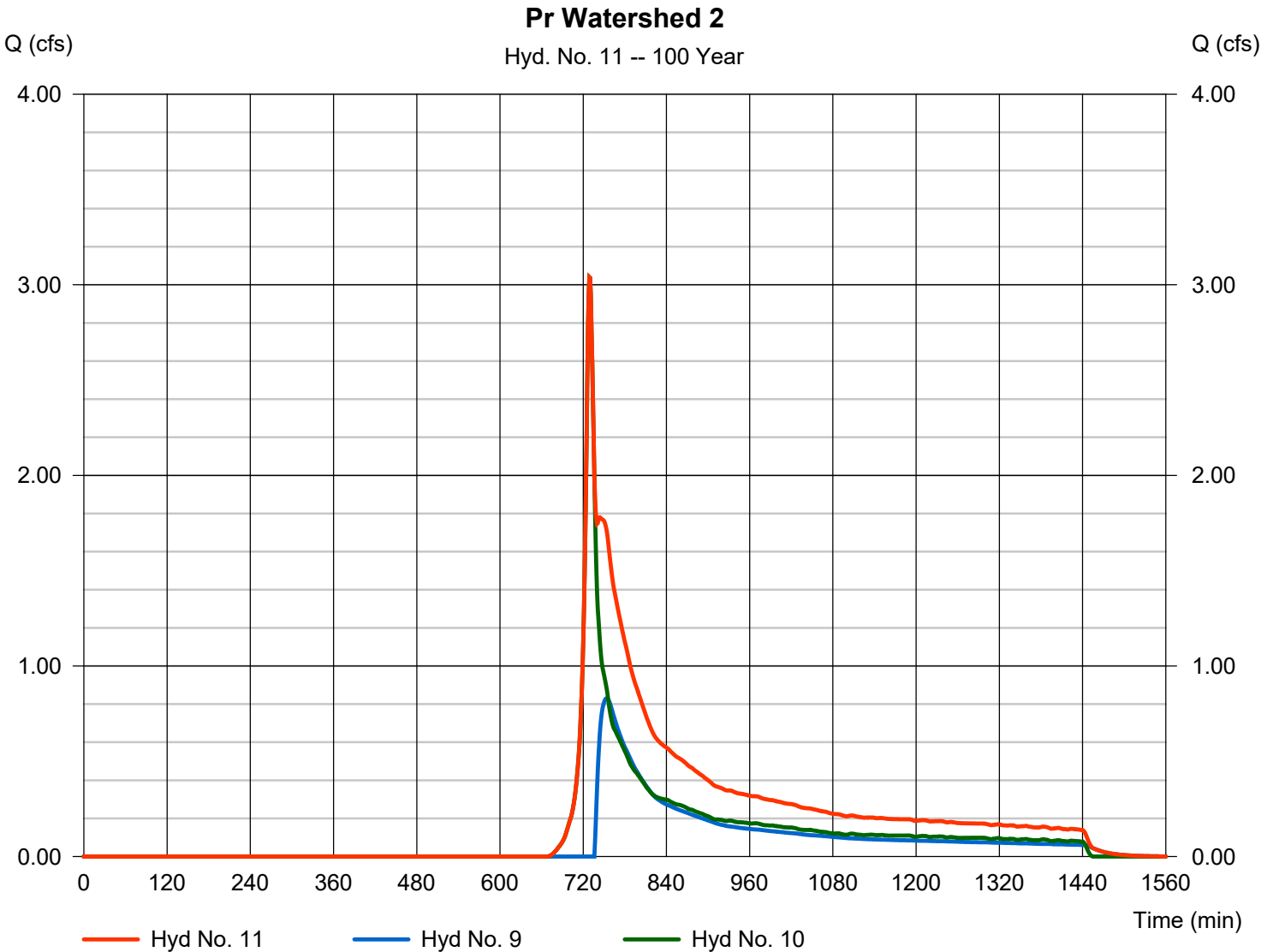
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Wednesday, 12 / 11 / 2024

Hyd. No. 11

Pr Watershed 2

Hydrograph type	= Combine	Peak discharge	= 3.040 cfs
Storm frequency	= 100 yrs	Time to peak	= 729 min
Time interval	= 1 min	Hyd. volume	= 18,742 cuft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 1.580 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

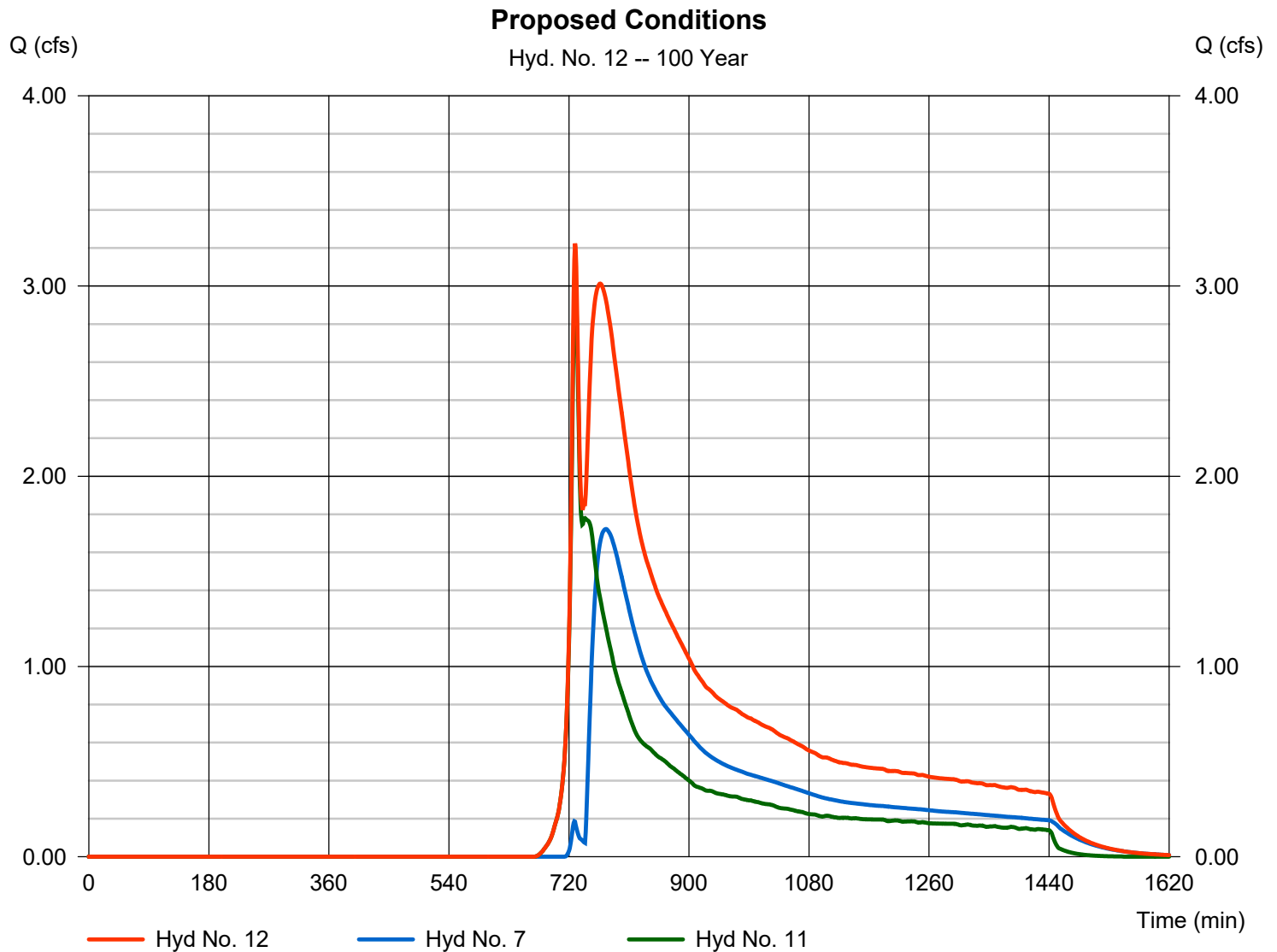
Wednesday, 12 / 11 / 2024

Hyd. No. 12

Proposed Conditions

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 7, 11

Peak discharge = 3.224 cfs
Time to peak = 729 min
Hyd. volume = 40,050 cuft
Contrib. drain. area = 0.000 ac



Appendix B
Rainfall Data



NOAA Atlas 14, Volume 10, Version 3
Location name: Uncasville, Connecticut, USA*
Latitude: 41.453°, Longitude: -72.1399°
Elevation: 240 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) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.340 (0.265-0.426)	0.406 (0.316-0.509)	0.514 (0.399-0.647)	0.604 (0.466-0.763)	0.728 (0.544-0.953)	0.821 (0.601-1.09)	0.918 (0.654-1.26)	1.03 (0.693-1.44)	1.19 (0.770-1.70)	1.32 (0.836-1.93)
10-min	0.482 (0.375-0.603)	0.576 (0.448-0.721)	0.729 (0.566-0.916)	0.856 (0.660-1.08)	1.03 (0.771-1.35)	1.16 (0.852-1.55)	1.30 (0.926-1.79)	1.46 (0.982-2.03)	1.68 (1.09-2.42)	1.87 (1.18-2.73)
15-min	0.567 (0.442-0.710)	0.677 (0.527-0.849)	0.857 (0.665-1.08)	1.01 (0.777-1.27)	1.21 (0.907-1.59)	1.37 (1.00-1.82)	1.53 (1.09-2.10)	1.72 (1.16-2.39)	1.98 (1.28-2.84)	2.20 (1.39-3.21)
30-min	0.798 (0.622-1.00)	0.953 (0.742-1.20)	1.21 (0.937-1.52)	1.42 (1.09-1.79)	1.71 (1.28-2.24)	1.92 (1.41-2.56)	2.15 (1.53-2.96)	2.41 (1.62-3.36)	2.78 (1.80-4.00)	3.09 (1.96-4.51)
60-min	1.03 (0.802-1.29)	1.23 (0.957-1.54)	1.56 (1.21-1.96)	1.83 (1.41-2.31)	2.20 (1.64-2.88)	2.48 (1.82-3.31)	2.78 (1.98-3.82)	3.11 (2.10-4.34)	3.59 (2.33-5.15)	3.98 (2.52-5.81)
2-hr	1.35 (1.06-1.68)	1.61 (1.27-2.01)	2.04 (1.59-2.54)	2.39 (1.86-3.00)	2.88 (2.17-3.74)	3.24 (2.39-4.29)	3.63 (2.60-4.96)	4.07 (2.76-5.63)	4.73 (3.08-6.72)	5.27 (3.35-7.62)
3-hr	1.57 (1.24-1.95)	1.87 (1.48-2.32)	2.36 (1.86-2.94)	2.77 (2.16-3.46)	3.33 (2.52-4.32)	3.75 (2.78-4.94)	4.19 (3.02-5.71)	4.71 (3.20-6.48)	5.48 (3.57-7.75)	6.12 (3.90-8.79)
6-hr	2.00 (1.59-2.46)	2.37 (1.88-2.92)	2.99 (2.36-3.69)	3.50 (2.75-4.33)	4.20 (3.19-5.39)	4.72 (3.52-6.17)	5.27 (3.82-7.12)	5.92 (4.04-8.08)	6.88 (4.51-9.64)	7.68 (4.91-10.9)
12-hr	2.47 (1.98-3.02)	2.93 (2.34-3.58)	3.68 (2.93-4.51)	4.30 (3.41-5.30)	5.16 (3.95-6.58)	5.80 (4.35-7.53)	6.48 (4.72-8.67)	7.27 (4.98-9.83)	8.42 (5.54-11.7)	9.38 (6.02-13.2)
24-hr	2.90 (2.34-3.52)	3.45 (2.78-4.20)	4.36 (3.50-5.31)	5.12 (4.08-6.26)	6.16 (4.75-7.80)	6.94 (5.24-8.93)	7.76 (5.69-10.3)	8.72 (6.01-11.7)	10.1 (6.71-14.0)	11.3 (7.31-15.8)
2-day	3.25 (2.64-3.91)	3.91 (3.18-4.72)	5.00 (4.04-6.04)	5.90 (4.74-7.16)	7.14 (5.55-8.99)	8.06 (6.14-10.3)	9.06 (6.70-12.0)	10.2 (7.09-13.6)	12.0 (7.98-16.4)	13.6 (8.77-18.8)
3-day	3.52 (2.88-4.23)	4.24 (3.46-5.10)	5.42 (4.40-6.53)	6.40 (5.16-7.73)	7.74 (6.05-9.71)	8.74 (6.68-11.2)	9.82 (7.29-12.9)	11.1 (7.71-14.7)	13.1 (8.69-17.7)	14.7 (9.55-20.3)
4-day	3.78 (3.10-4.53)	4.54 (3.72-5.44)	5.78 (4.71-6.94)	6.81 (5.51-8.20)	8.22 (6.44-10.3)	9.27 (7.11-11.8)	10.4 (7.74-13.7)	11.8 (8.18-15.5)	13.8 (9.20-18.7)	15.6 (10.1-21.3)
7-day	4.52 (3.72-5.37)	5.34 (4.40-6.36)	6.70 (5.50-8.00)	7.83 (6.38-9.38)	9.38 (7.38-11.6)	10.5 (8.10-13.3)	11.8 (8.78-15.3)	13.2 (9.24-17.3)	15.4 (10.3-20.6)	17.2 (11.2-23.4)
10-day	5.24 (4.33-6.21)	6.10 (5.05-7.24)	7.53 (6.20-8.95)	8.71 (7.12-10.4)	10.3 (8.15-12.7)	11.5 (8.90-14.5)	12.8 (9.57-16.5)	14.3 (10.0-18.6)	16.5 (11.1-22.0)	18.3 (12.0-24.8)
20-day	7.45 (6.21-8.76)	8.37 (6.98-9.86)	9.89 (8.20-11.7)	11.1 (9.19-13.2)	12.9 (10.2-15.7)	14.2 (11.0-17.5)	15.5 (11.6-19.6)	17.0 (12.0-21.8)	18.9 (12.8-24.9)	20.4 (13.4-27.3)
30-day	9.29 (7.78-10.9)	10.2 (8.58-12.0)	11.8 (9.85-13.9)	13.1 (10.9-15.5)	14.9 (11.9-18.0)	16.3 (12.6-19.9)	17.7 (13.1-22.0)	19.0 (13.5-24.3)	20.7 (14.1-27.2)	22.0 (14.5-29.3)
45-day	11.6 (9.74-13.5)	12.6 (10.6-14.7)	14.2 (11.9-16.6)	15.6 (13.0-18.3)	17.5 (13.9-20.9)	19.0 (14.7-23.0)	20.4 (15.1-25.1)	21.6 (15.4-27.5)	23.2 (15.8-30.2)	24.2 (15.9-32.0)
60-day	13.5 (11.4-15.7)	14.5 (12.2-16.9)	16.2 (13.6-18.9)	17.7 (14.7-20.7)	19.6 (15.7-23.4)	21.2 (16.5-25.6)	22.7 (16.8-27.8)	23.9 (17.1-30.3)	25.3 (17.3-32.9)	26.2 (17.4-34.5)

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.

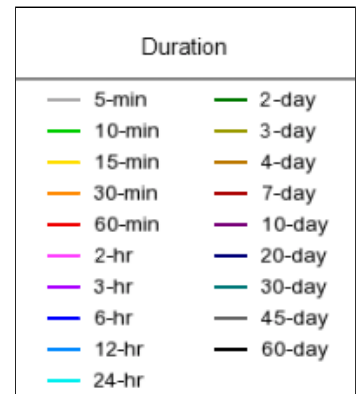
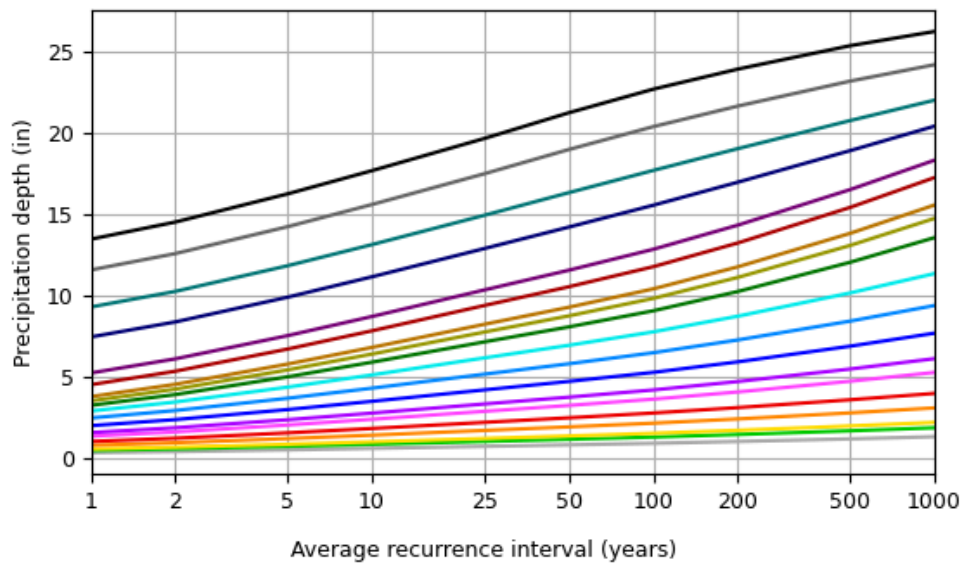
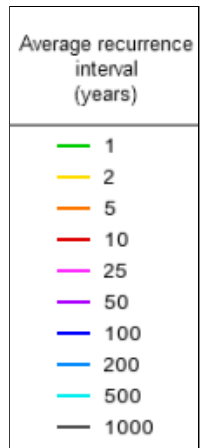
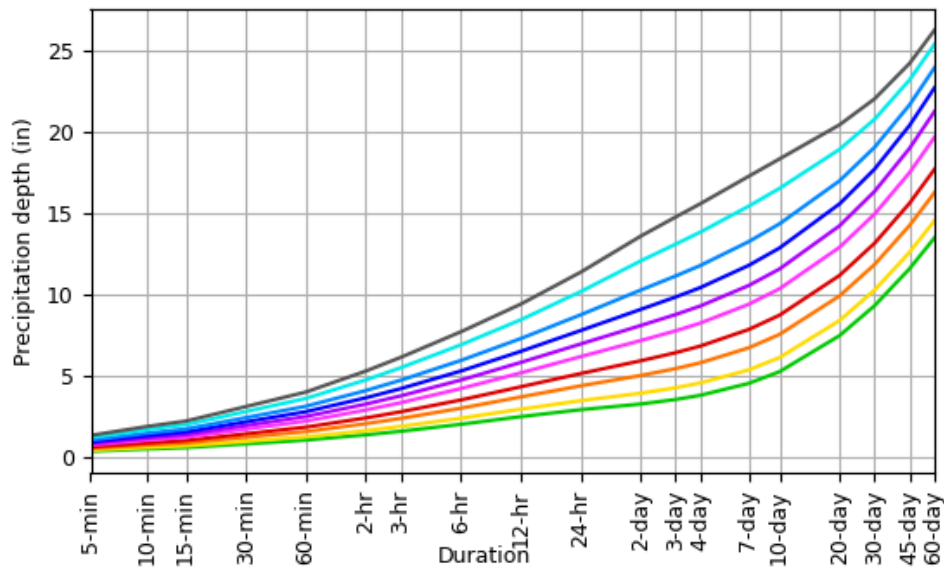
Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based depth-duration-frequency (DDF) curves

Latitude: 41.4530°, Longitude: -72.1399°



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Tue Oct 1 15:47:29 2024

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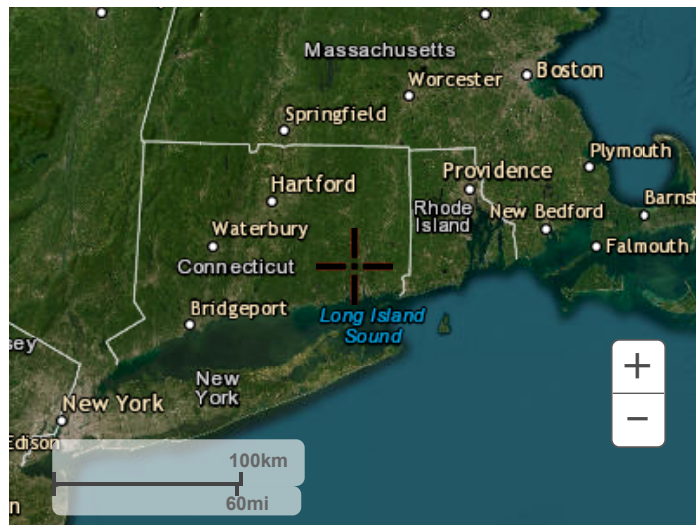
Large scale terrain



Large scale map



Large scale aerial



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Questions?: HDSC.Questions@noaa.gov

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NOAA Atlas 14, Volume 10, Version 3
Location name: Uncasville, Connecticut, USA*
Latitude: 41.453°, Longitude: -72.1399°
Elevation: 240 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	4.08 (3.18-5.11)	4.87 (3.79-6.11)	6.17 (4.79-7.76)	7.25 (5.59-9.16)	8.74 (6.53-11.4)	9.85 (7.21-13.1)	11.0 (7.85-15.1)	12.3 (8.32-17.2)	14.3 (9.24-20.5)	15.9 (10.0-23.1)
10-min	2.89 (2.25-3.62)	3.46 (2.69-4.33)	4.37 (3.40-5.50)	5.14 (3.96-6.49)	6.19 (4.63-8.10)	6.98 (5.11-9.29)	7.81 (5.56-10.7)	8.75 (5.89-12.2)	10.1 (6.55-14.5)	11.2 (7.10-16.4)
15-min	2.27 (1.77-2.84)	2.71 (2.11-3.40)	3.43 (2.66-4.31)	4.03 (3.11-5.08)	4.85 (3.63-6.35)	5.47 (4.01-7.29)	6.12 (4.36-8.42)	6.86 (4.62-9.58)	7.93 (5.14-11.4)	8.80 (5.57-12.8)
30-min	1.60 (1.24-2.00)	1.91 (1.48-2.39)	2.41 (1.87-3.03)	2.83 (2.19-3.58)	3.41 (2.55-4.47)	3.85 (2.82-5.13)	4.31 (3.06-5.92)	4.83 (3.25-6.73)	5.57 (3.61-7.99)	6.18 (3.91-9.02)
60-min	1.03 (0.802-1.29)	1.23 (0.957-1.54)	1.56 (1.21-1.96)	1.83 (1.41-2.31)	2.20 (1.64-2.88)	2.48 (1.82-3.31)	2.78 (1.98-3.82)	3.11 (2.10-4.34)	3.59 (2.33-5.15)	3.98 (2.52-5.81)
2-hr	0.677 (0.531-0.842)	0.807 (0.633-1.00)	1.02 (0.797-1.27)	1.20 (0.930-1.50)	1.44 (1.08-1.87)	1.62 (1.20-2.15)	1.81 (1.30-2.48)	2.04 (1.38-2.82)	2.36 (1.54-3.36)	2.64 (1.67-3.81)
3-hr	0.523 (0.413-0.649)	0.623 (0.491-0.773)	0.787 (0.617-0.978)	0.922 (0.719-1.15)	1.11 (0.838-1.44)	1.25 (0.924-1.65)	1.40 (1.00-1.90)	1.57 (1.06-2.16)	1.82 (1.19-2.58)	2.04 (1.30-2.93)
6-hr	0.334 (0.265-0.410)	0.396 (0.314-0.488)	0.498 (0.394-0.615)	0.583 (0.458-0.723)	0.700 (0.533-0.900)	0.787 (0.587-1.03)	0.880 (0.637-1.19)	0.988 (0.674-1.35)	1.15 (0.752-1.61)	1.28 (0.820-1.83)
12-hr	0.205 (0.164-0.250)	0.243 (0.194-0.297)	0.305 (0.243-0.374)	0.357 (0.282-0.439)	0.428 (0.328-0.546)	0.481 (0.361-0.624)	0.537 (0.391-0.719)	0.603 (0.413-0.815)	0.698 (0.459-0.970)	0.778 (0.499-1.10)
24-hr	0.120 (0.097-0.146)	0.143 (0.115-0.174)	0.181 (0.145-0.221)	0.213 (0.170-0.260)	0.256 (0.197-0.325)	0.288 (0.218-0.372)	0.323 (0.237-0.429)	0.363 (0.250-0.487)	0.422 (0.279-0.582)	0.472 (0.304-0.660)
2-day	0.067 (0.054-0.081)	0.081 (0.066-0.098)	0.104 (0.084-0.125)	0.122 (0.098-0.149)	0.148 (0.115-0.187)	0.167 (0.127-0.215)	0.188 (0.139-0.249)	0.213 (0.147-0.283)	0.250 (0.166-0.341)	0.282 (0.182-0.390)
3-day	0.048 (0.039-0.058)	0.058 (0.048-0.070)	0.075 (0.061-0.090)	0.088 (0.071-0.107)	0.107 (0.083-0.134)	0.121 (0.092-0.154)	0.136 (0.101-0.179)	0.154 (0.107-0.204)	0.181 (0.120-0.246)	0.204 (0.132-0.281)
4-day	0.039 (0.032-0.047)	0.047 (0.038-0.056)	0.060 (0.049-0.072)	0.070 (0.057-0.085)	0.085 (0.067-0.107)	0.096 (0.074-0.122)	0.108 (0.080-0.142)	0.122 (0.085-0.161)	0.143 (0.095-0.194)	0.162 (0.105-0.222)
7-day	0.026 (0.022-0.031)	0.031 (0.026-0.037)	0.039 (0.032-0.047)	0.046 (0.037-0.055)	0.055 (0.043-0.069)	0.062 (0.048-0.078)	0.070 (0.052-0.090)	0.078 (0.054-0.102)	0.091 (0.061-0.122)	0.102 (0.066-0.139)
10-day	0.021 (0.018-0.025)	0.025 (0.021-0.030)	0.031 (0.025-0.037)	0.036 (0.029-0.043)	0.043 (0.033-0.053)	0.048 (0.037-0.060)	0.053 (0.039-0.068)	0.059 (0.041-0.077)	0.068 (0.046-0.091)	0.076 (0.049-0.103)
20-day	0.015 (0.012-0.018)	0.017 (0.014-0.020)	0.020 (0.017-0.024)	0.023 (0.019-0.027)	0.026 (0.021-0.032)	0.029 (0.022-0.036)	0.032 (0.024-0.040)	0.035 (0.024-0.045)	0.039 (0.026-0.051)	0.042 (0.027-0.056)
30-day	0.012 (0.010-0.015)	0.014 (0.011-0.016)	0.016 (0.013-0.019)	0.018 (0.015-0.021)	0.020 (0.016-0.024)	0.022 (0.017-0.027)	0.024 (0.018-0.030)	0.026 (0.018-0.033)	0.028 (0.019-0.037)	0.030 (0.020-0.040)
45-day	0.010 (0.009-0.012)	0.011 (0.009-0.013)	0.013 (0.011-0.015)	0.014 (0.012-0.016)	0.016 (0.012-0.019)	0.017 (0.013-0.021)	0.018 (0.013-0.023)	0.020 (0.014-0.025)	0.021 (0.014-0.027)	0.022 (0.014-0.029)
60-day	0.009 (0.007-0.010)	0.010 (0.008-0.011)	0.011 (0.009-0.013)	0.012 (0.010-0.014)	0.013 (0.010-0.016)	0.014 (0.011-0.017)	0.015 (0.011-0.019)	0.016 (0.011-0.021)	0.017 (0.011-0.022)	0.018 (0.012-0.023)

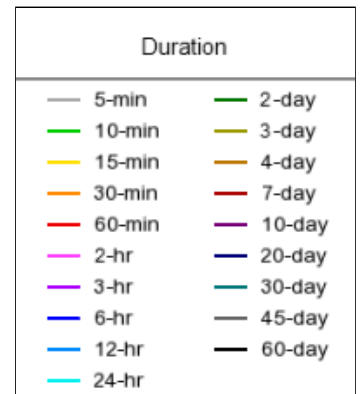
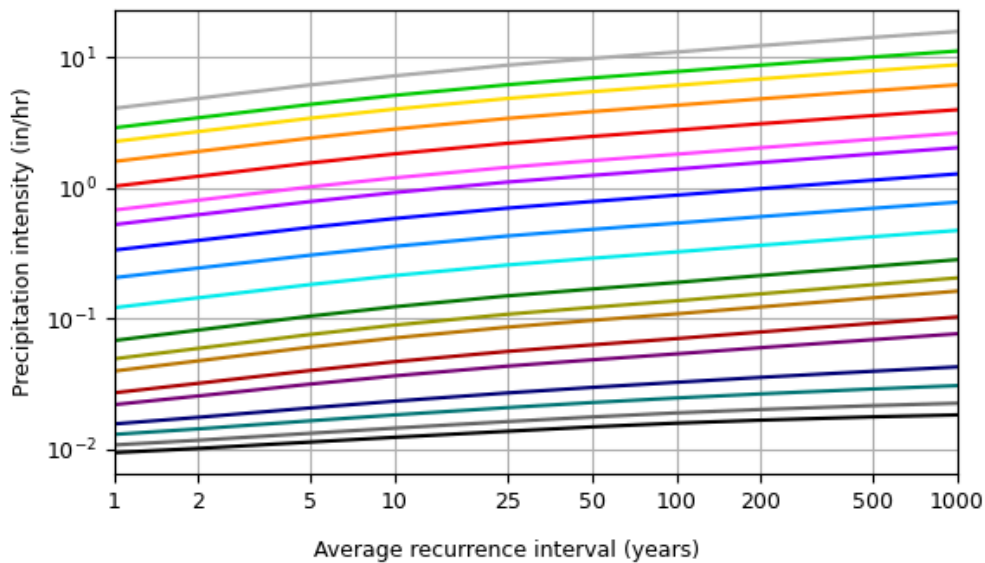
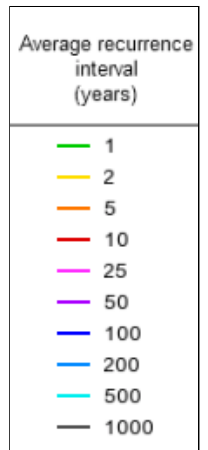
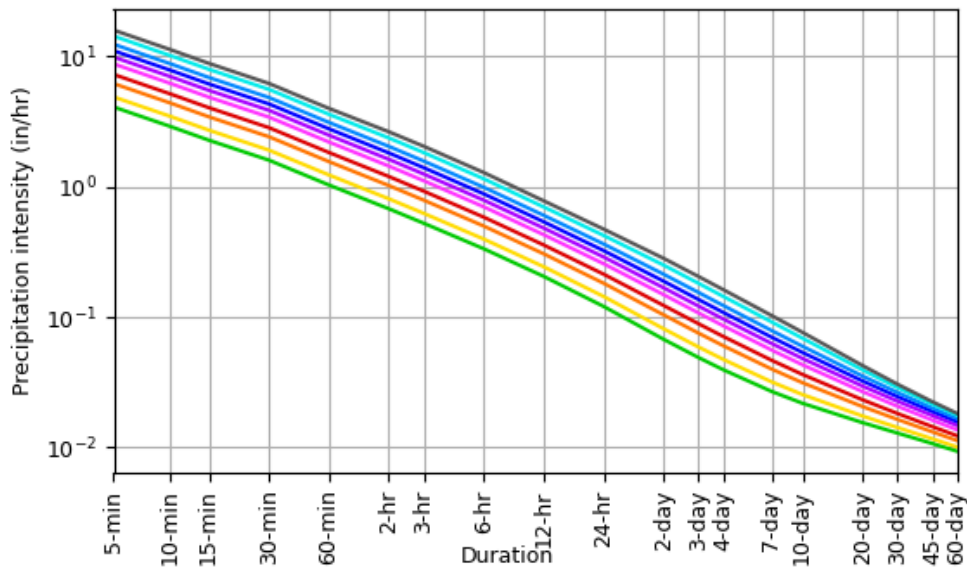
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average 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: 41.4530°, Longitude: -72.1399°



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Tue Oct 1 15:49:40 2024

[Back to Top](#)**Maps & aerials****Small scale terrain**



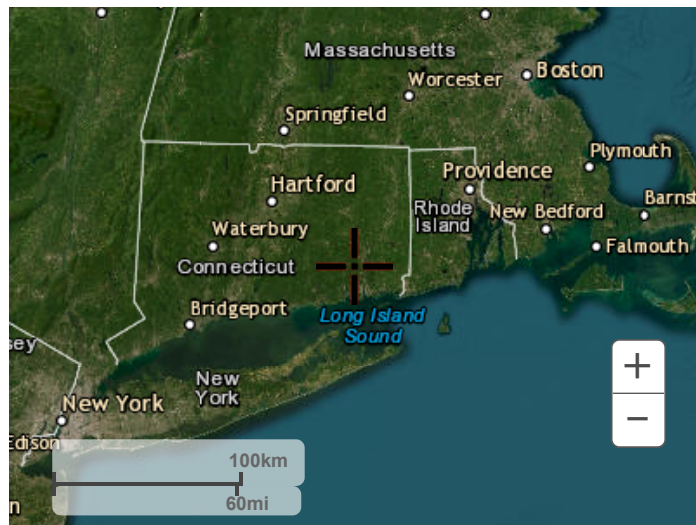
Large scale terrain



Large scale map



Large scale aerial



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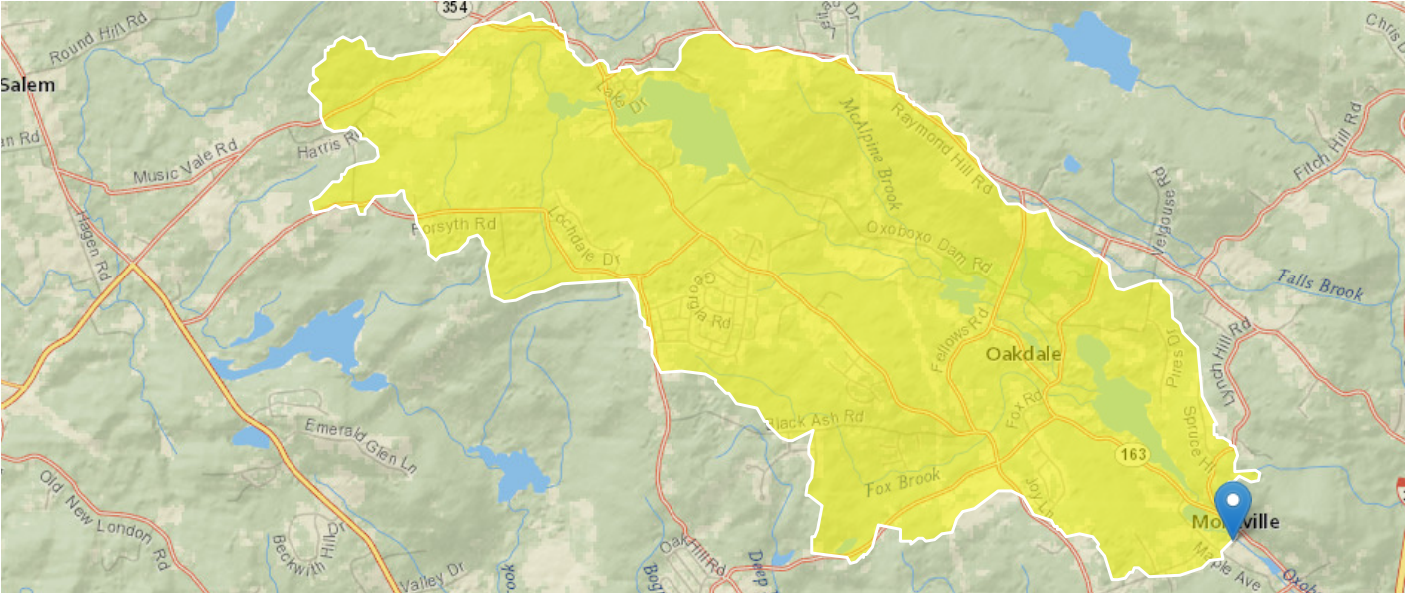
[US Department of Commerce](#)
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[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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Appendix D
StreamStats Report

StreamStats Report

Region ID: CT
Workspace ID: CT20241205180712767000
Clicked Point (Latitude, Longitude): 41.45263, -72.13696
Time: 2024-12-05 13:07:40 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	9.66	square miles
I24H100Y	Maximum 24-hour precipitation that occurs on average once in 100 years	7.79	inches
I24H10Y	Maximum 24-hour precipitation that occurs on average once in 10 years	5.07	inches
I24H200Y	Maximum 24-hour precipitation that occurs on average once in 200 years	8.89	inches
I24H25Y	Maximum 24-hour precipitation that occurs on average once in 25 years	6.15	inches
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	3.16	inches
I24H500Y	Maximum 24-hour precipitation that occurs on average once in 500 years	10.34	inches
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	6.97	inches
I24H5Y	Maximum 24-hour precipitation that occurs on average once in 5 years	4.25	inches
SSURGOCCDD	Percentage of area with hydrologic soil types C, D, or C/D from SSURGO	0.3108	percent

➤ Peak-Flow Statistics

Peak-Flow Statistics Parameters [Statewide DA only SIR 2020 5054]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	9.66	square miles	0.69	325

Peak-Flow Statistics Parameters [Statewide Multiparameter SIR 2020 5054]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	9.66	square miles	0.69	325
I24H2Y	24 Hour 2 Year Precipitation	3.16	inches	2.77	3.32
SSURGOCCDD	Percent soil type C or D from SSURGO	0.3108	percent	0.118	0.945
I24H5Y	24 Hour 5 Year Precipitation	4.25	inches	4	4.7
I24H10Y	24 Hour 10 Year Precipitation	5.07	inches	4.86	5.79
I24H25Y	24 Hour 25 Year Precipitation	6.15	inches	5.99	7.22
I24H50Y	24 Hour 50 Year Precipitation	6.97	inches	6.81	8.3
I24H100Y	24 Hour 100 Year Precipitation	7.79	inches	7.62	9.38
I24H200Y	24 Hour 200 Year Precipitation	8.89	inches	8.7	11.22
I24H500Y	24 Hour 500 Year Precipitation	10.34	inches	10.1	13.64

Peak-Flow Statistics Flow Report [Statewide DA only SIR 2020 5054]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR²: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	ASEp
Drainage Area Only 50-percent AEP flood	374	ft ³ /s	35
Drainage Area Only 20-percent AEP flood	645	ft ³ /s	35
Drainage Area Only 10-percent AEP flood	870	ft ³ /s	36.3
Drainage Area Only 4-percent AEP flood	1210	ft ³ /s	37.8
Drainage Area Only 2-percent AEP flood	1490	ft ³ /s	39.8
Drainage Area Only 1-percent AEP flood	1810	ft ³ /s	42.4
Drainage Area Only 0.5-percent AEP flood	2180	ft ³ /s	44.4
Drainage Area Only 0.2-percent AEP flood	2720	ft ³ /s	48

Peak-Flow Statistics Flow Report [Statewide Multiparameter SIR 2020 5054]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR²: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	326	ft ³ /s	80	1330	26.5
20-percent AEP flood	488	ft ³ /s	109	2190	26.3
10-percent AEP flood	608	ft ³ /s	125	2950	28.4
4-percent AEP flood	805	ft ³ /s	150	4320	31.5
2-percent AEP flood	978	ft ³ /s	166	5760	34.3
1-percent AEP flood	1170	ft ³ /s	181	7580	37.1
0.5-percent AEP flood	1380	ft ³ /s	241	7890	40.6

Statistic	Value	Unit	PIL	PIU	ASEp
0.2-percent AEP flood	1730	ft ³ /s	323	9270	45

Peak-Flow Statistics Flow Report [Area-Averaged]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR²: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	ASEp		
Drainage Area Only 50-percent AEP flood	374	ft ³ /s	35		
Drainage Area Only 20-percent AEP flood	645	ft ³ /s	35		
Drainage Area Only 10-percent AEP flood	870	ft ³ /s	36.3		
Drainage Area Only 4-percent AEP flood	1210	ft ³ /s	37.8		
Drainage Area Only 2-percent AEP flood	1490	ft ³ /s	39.8		
Drainage Area Only 1-percent AEP flood	1810	ft ³ /s	42.4		
Drainage Area Only 0.5-percent AEP flood	2180	ft ³ /s	44.4		
Drainage Area Only 0.2-percent AEP flood	2720	ft ³ /s	48		
50-percent AEP flood	326	ft ³ /s	80	1330	26.5
20-percent AEP flood	488	ft ³ /s	109	2190	26.3
10-percent AEP flood	608	ft ³ /s	125	2950	28.4
4-percent AEP flood	805	ft ³ /s	150	4320	31.5
2-percent AEP flood	978	ft ³ /s	166	5760	34.3
1-percent AEP flood	1170	ft ³ /s	181	7580	37.1
0.5-percent AEP flood	1380	ft ³ /s	241	7890	40.6
0.2-percent AEP flood	1730	ft ³ /s	323	9270	45

Peak-Flow Statistics Citations

Ahearn, E.A., and Hodgkins, G.A., 2020, Estimating flood magnitude and frequency on streams and rivers in Connecticut, based on data through water year 2015: U.S. Geological Survey Scientific Investigations Report 2020–5054, 42 p. (<https://doi.org/10.3133/sir20205054>)

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Application Version: 4.24.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1