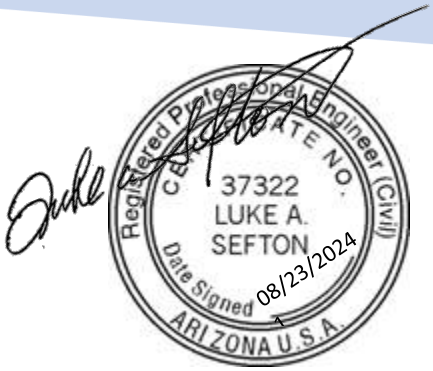
PRELIMINARY DRAINAGE REPORT



Prepared for:

CV DEVELOPMENT Sedona, Inc
463 BREWER RD SEDONA,
AZ 86336

Prepared by:

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

100% Veteran Owned

40 Stutz Bearcat Drive Sedona, Arizona 86336

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

CONTENTS

ENGINEERING CERTIFICATION iii

DEVELOPER CERTIFICATION iv

I. LOCATION AND DESCRIPTION 1

A. Location 1

B. Description of Property 2

II. DRAINAGE BASINS AND SUB-BASINS 2

A. Major Basin 2

B. SUb-Basin description 2

1. On-site Basin: 3

2. Off-site Basin: 3

III. DRAINAGE DESIGN CRITERIA 4

A. Development Criteria and Results 4

B. Hydrologic Criteria and Results 4

1. Design Rainfall 4

2. Runoff Method 4

3. Detention calculation method 6

4. Storm Recurrence Intervals 7

5. Other Hydrologic Criteria / Methods 7

6. Hydrologic Results 8

C. HYDRAULIC CRITERIA 9

IV. DRAINAGE FACILITY DESIGN 10

A. General Concept 10

B. SPECIFIC DETAILS 10

V. CONCLUSIONS 11

VI. REFERENCES 12

VI. APPENDIX A 13

VII. APPENDIX B 15

VIII. APPENDIX C 17

IX. APPENDIX D 18

X. APPENDIX E 19

XI. APPENDIX F 20

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

XII. APPENDIX G.....33
XIII. APPENDIX H.....34

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

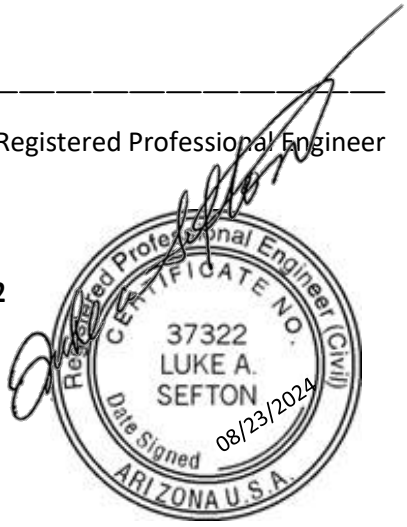
ENGINEERING CERTIFICATION

This report and drainage plan for the Phase III: Drainage Design of Canyon Vista Subdivision was prepared by me (or under my direct supervision) in accordance with the provisions of the "Drainage Planning Submittal Requirements" of Coconino County and other regulations of the Coconino County Flood Control District. I understand that Coconino County does not, and will not, assume liability for the drainage facilities designed by others.

SIGNATURE: ————————————————————————

Luke Sefton, Registered Professional Engineer

State of **ARIZONA** **No: 37322**



140505
40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

DEVELOPER CERTIFICATION

William Heyer hereby certifies that the drainage facilities for Canyon Vista Subdivision shall be constructed according to the design presented in this report.

I understand that the City of Sedona does not, and will not, assume liability for the drainage facilities designed and/or certified by my engineer, and that the City of Sedona review of drainage plans pursuant to the Arizona Revised Statues, Chapter 21, Article 1, 48-3601 to 48-3628; but cannot, on behalf of Canyon Vista Subdivision, guarantee that final drainage design review will absolve William Heyer and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the Final Plat does not imply approval of my engineer's drainage design.

SIGNATURE: ————————————————————————

William Heyer

140505
40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

I. LOCATION AND DESCRIPTION

A. LOCATION

Canyon Vista Subdivision is situated in Coconino County, Arizona, within the City of Sedona. It is specifically located at Assessor's Parcel Number 401-20-027G, which is the NW ¼ of the NE ¼ Section 18, Township 17 North, Range 6 East, and Gila & Salt River Base & Meridian. The property can be accessed from Brewer Road. A primitive road, Denise Lane, travels generally through the center of the property.

1. Project Owner/Developer: CV DEVELOMPMENT Sedona, Inc
   5018 Shoal Creek Blvd
   Austin, Texas 78756

2. Streets and Roadway: Private roadways (Proposed on-site)

3. Major Drainage Ways and Facilities:

A FEMA flood status report shows this property being out of any floodplain area (Map 04025C7657H, March 21, 2023) **(See Appendix A)**.

There are no major drainage ways on the property, but two major ones are located within half a mile. The Oak Creek Floodplain is situated half a mile south of the property, while the Soldier Wash Floodplain is located half a mile east. Two washes, named Juniper Creek Tributary 1 and Juniper Creek Tributary 2, are identified in the City of Sedona Flood Plain Management Study conducted by the United States Department of Agriculture Soil Conservation Service. The wash identified as Juniper Creek Tributary 1 flows in a west to east direction through the southern end of the property and towards Oak Creek Wash. The wash identified as Juniper Creek Tributary 2 is situated just north of the property boundary and flows from west to east direction towards Soldier Wash. These washes are tributaries to Oak Creek.

Les Springs Subdivision lies to the northwest of the property with Coconino National Forest to the west and north of the property. Surrounding zoning is National Forest (NF) to the west, Planned Residential Development (PRD) to the northwest, Single Family Residential (RS-18b) to the north, and Single Family Residential (RS-10b) to the east and south.

The project involves the development of 11 lots within a proposed subdivision. To provide access to these lots, a road will be constructed running uphill through the property, ultimately connecting to Brewer Road. The road will serve as the primary route for accessing the subdivision and has been designed considering the site's topography and drainage requirements.

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

B. DESCRIPTION OF PROPERTY

The proposed development of Canyon Vista Subdivision encompasses 5.71 acres of land. The site has an existing primitive road named Denise Lane that runs through the property from Brewer Road. The project area consists of approximately 50 percent vegetative cover consisting of mesquite, brush and grass. The general area consists of a SCS D type soil which consists of nearly level to very steep, well-drained soils that are only 8 to 20 inches deep over basal, permeability is slow. There are no irrigation ditches or canals on this site. The site is situated at the base of a large ridge which extends along the north and west property boundary with two drainage channels running in a west to east direction through the project area. The drainage channel on the south end of the property can be identified as Juniper Creek Tributary 1 in the City of Sedona 2022 Storm Water Master Plan Update **(Appendix B)**. The area has a high, 10 to 15 percent, slope, with 100% slopes in some areas, which declines in a northwest to southeast direction. The site is currently zoned as Single Family Residential (RS-10b) and it is proposed for a subdivision of 11 residential lots.

II. DRAINAGE BASINS AND SUB-BASINS

A. MAJOR BASIN

City of Sedona 2022 Storm Water Master Plan Update (Appendix B) was referenced and used in this report. A flood status report shows this property being out of any floodplain (See Appendix A).

There are no irrigation facilities, detention basin, or irrigation system, within the project area. Soil data was gathered from Natural Resources Conservation Services (NRCS) website **(Appendix C)**. The soil type consists of Turist soils, Rock outcrop and Urban land and Sedona soils. Turist soils and urban lands with map unit symbol of 405 and 406. Each soil belongs to hydrologic soil group D and soil texture classification is moderately fine texture to sandy texture.

The proposed Canyon Vista Subdivision development will be situated among two major drainage basins as shown in the Appendix B The major drainage basins are identified as Juniper Creek Tributary 1 and Juniper Creek Tributary 2 (See Appendix B). The 5.24 acres of the proposed development will be considered as a portion of drainage basin Juniper Creek Tributary 1. The 0.47 acres located on the northwest corner of the proposed development area, Sub-Basin will be considered as a portion of drainage basin Juniper Creek Tributary 2 3A **(See Appendix D)**. Drainage basins Juniper Creek Tributary 1 and Juniper Creek Tributary 2 typically drain in a west to east direction throughout the property and consist of sheet flow and shallow channel flow.

B. SUB-BASIN DESCRIPTION

The two major drainage basins were sub-divided into on-site and off-site basins to further determine the impact of development on the surrounding areas (See Appendix D).

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

1. On-site Basin:

Four sub-basins were delineated within the boundaries of the proposed development. The sub-basins are identified as sub-basins 3A, 4A, 5A and 6A. Sub-Basin 3A is a portion of the drainage area of Juniper Creek Tributary 2. Drainage in Sub-Basin 3A will typically consist of sheet flow in a southwest to north direction. Sub-Basins 4A, 5A and 6A are portions of the drainage area for Juniper Creek Tributary 1. Drainage in Sub-Basin 4A will consist of sheet flow to localized shallow channel flow which flows in a west to east direction from the western to the eastern property boundaries. Drainage in Sub-Basin 5A will consist of sheet flow to localized shallow channel flow which flows in a west to east direction from the western to the southern property boundaries. Drainage in Sub-Basin 6A will also consist of sheet flow to localized shallow channel flow which flows in a north to south direction within the proposed development area.

2. Off-site Basin:

Two sub-basins were delineated beyond the proposed development area in order to determine the off-site drainage basins which contribute to the on-site basins. Sub-Basin 1A is a portion of the drainage area of Juniper Creek Tributary 1 and is a portion of the western bordering undeveloped area of the Coconino National Forest. Drainage in Sub-Basin 1A is predominately channel flow in a west to east direction entering the site on the existing western property boundary. These stormwaters convey by natural means through the site in concentrated flows and leaves the site on the eastern property boundary. Sub-Basin 2A is also a portion of the drainage area of Juniper Creek Tributary 1 and borders an undeveloped area of the Coconino National Forest. Drainage in Sub-Basin 2A is predominately channel flow in a west to east direction entering the site area on the western property boundary. These stormwaters convey by natural means through the site in concentrated flows and leaves the site on the eastern property boundary.

Table 1 addresses the physical properties of the Sub-Basins delineated for this drainage study (See Pre-Development Map, Appendix D).

Table 1 – Pre-Development Basin Characteristics

Basin Designation	Area	Channel Length	Elevation Delta	Slope
	(Acre)	(Ft)	(Ft)	(Ft/Ft)
1A	20.6	2231	601	0.27
2A	1.34	207	16.7	0.08
3A	1.09	251	61.5	0.25
4A	1.53	334	65	0.19
5A	2.64	276	71.3	0.26
6A	1.06	310	71	0.23
7A	0.25	101	15.4	0.15
8A	0.22	61	5.75	0.09

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

III. DRAINAGE DESIGN CRITERIA

A. DEVELOPMENT CRITERIA AND RESULTS

The development of Canyon Vista Subdivision is within the study area of the "City of Sedona 2022 Stormwater Master Plan, dated June 2022. Development within the proposed project area therefore is constrained in that the natural drainage patterns and networks should not be significantly altered or post-development discharge conditions should not increase beyond pre-development discharge conditions.

B. HYDROLOGIC CRITERIA AND RESULTS

1. Design Rainfall

Information for Intensity-Duration-Frequency curves was gathered from the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service website. The following data from the NOAA National Weather Service website was used for all the calculations for runoff. **(See Appendix E)**

Using the values from the National Weather Service the following table was developed which was then used to create an Intensity-Duration-Frequency curve. The values in the table were then imported and used in the HydraFlow Hydrographs 2024 modeling program to conduct a hydrologic analysis of the area.

2. Runoff Method

a. The Runoff Method is a continuation of the Rational Method with watershed areas less than the 160-acre limit and was conducted as outlined in Chapter 2 Rational Method of the Highway Drainage Design Manual.

b. The Rational Method is based on the equation Q=CIA (Appendix C, equation 2-1) where Q is the peak flow in cubic feet per second, C is the runoff coefficient, i is the average rainfall intensity in inches per hour and A is the contributing drainage area in acres.

c. The intensity in the Rational Method equation is the average rainfall intensity for rainfall of a selected return period for a rainfall duration that is equal to the time of concentration. Minimum rainfall duration of 10 minutes was used if the calculated Time of Concentration was less than 10 minutes.

d. The Time of Concentration was determined by using the equation of Tc=11.4*L0.5 *Kb 0.52 *S-0.31*i-0.38 (Appendix C, equation 2-2) where L is the length of the longest flow path in miles, Kb is the resistance coefficient, S is the slope of the longest flow path in feet per mile and i is the average rainfall intensity in inches per hour. The Resistance Coefficient (Kb) for the undeveloped site was foothills (0.05), and for the developed site, was paved and buildings with undeveloped land (0.03) as per Arizona Department of Transportation (ADOT) hydrology manual

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

Table 2-1 **(Appendix F)**. The results and calculations can be found in Appendix C within this report.

e. For the pre-development condition sub-basins 1A through 8A are undeveloped with 50% vegetative cover and has the SCS Type-D soil. See table 2 for the pre and Post development runoff coefficients.

Table 2 – Pre & Post Development Areas and Runoff Co-Efficient

1A	**Pre-Development**		**Post-Development**	
	Area(Ac)	**C**	**Area(Ac)**	**C**
Undeveloped area	2.60	0.45	0.00	0.00
Pavements and Rooftops	-	-	0.00	0.00
Composite Co-efficient	**2.60**	**0.45**	**0.00**	**0.00**
2A	**Pre-Development**		**Post-Development**	
	Area(Ac)	**C**	**Area(Ac)**	**C**
Undeveloped area	1.34	0.45	1.08	0.45
Pavements and Rooftops	-	-	0.26	0.95
Composite Co-efficient	**1.34**	**0.45**	**1.34**	**0.55**
3A	**Pre-Development**		**Post-Development**	
	Area(Ac)	**C**	**Area(Ac)**	**C**
Undeveloped area	1.09	0.45	0.00	0.00
Pavements and Rooftops	-	-	0.00	0.00
Composite Co-efficient	**1.09**	**0.45**	**0.00**	**0.00**
4A	**Pre-Development**		**Post-Development**	
	Area(Ac)	**C**	**Area(Ac)**	**C**
Undeveloped area	1.53	0.45	1.36	0.45
Pavements and Rooftops	-	-	0.17	0.95
Composite Co-efficient	**1.53**	**0.45**	**1.53**	**0.50**
5A	**Pre-Development**		**Post-Development**	

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

	Area(Ac)	C	Area(Ac)	C
Undeveloped area	2.64	0.45	2.49	0.45
Pavements and Rooftops	-	-	0.15	0.95
Composite Co-efficient	**2.64**	**0.45**	**2.64**	**0.48**
6A	**Pre-Development**		**Post-Development**	
	Area(Ac)	**C**	**Area(Ac)**	**C**
Undeveloped area	1.06	0.45	0.73	0.45
Pavements and Rooftops	-	-	0.33	0.95
Composite Co-efficient	**1.06**	**0.45**	**1.06**	**0.61**
7A	**Pre-Development**		**Post-Development**	
	Area(Ac)	**C**	**Area(Ac)**	**C**
Undeveloped area	0.25	0.45	0.15	0.45
Pavements and Rooftops	-	-	0.10	0.95
Composite Co-efficient	**0.25**	**0.45**	**0.25**	**0.65**
8A	**Pre-Development**		**Post-Development**	
	Area(Ac)	**C**	**Area(Ac)**	**C**
Undeveloped area	0.22	0.45	0.18	0.45
Pavements and Rooftops	-	-	0.04	0.95
Composite Co-efficient	**0.22**	**0.45**	**0.22**	**0.54**

3. Detention calculation method

HydraFlow Hydrographs 2024 were utilized to compute the detention ponds. Five small detention ponds and one large pond was designed to manage excess water. These ponds will make the runoff below the pre-development levels.

For offsite basin 1A and onsite basin 2A, three small ponds are proposed within basin 2A to manage excess runoff generated by the three lots. These ponds vary in depth from 1 to 2 feet. The first pond, located south of Lot 1 along the southern boundary, is 1 foot deep with a weir opening of 0.2 feet and a length of

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

1 foot. The second pond, situated between Lot 1 and Lot 2, is also 1 foot deep with a weir opening of 0.2 feet and a length of 15 feet. The third pond, located at the southwestern corner of Lot 3, is 2 feet deep with a weir opening of 0.2 feet and a length of 10 feet. These ponds are designed to mitigate the excess runoff caused by the development in basin 2A.

Runoff from offsite basin 3A will flow onto the proposed road, where it will be directed toward the pond in onsite basin 6A. Additionally, part of the runoff from onsite basin 4A will also be channeled along the road. The remaining runoff from onsite basins 4A and 5A will follow the natural drainage path, maintaining the existing flow conditions across the site.

Onsite basin 6A will feature a large retention pond with a capacity of 2,187 cubic feet. This pond is designed to accommodate runoff from offsite basin 3A, a portion of onsite basin 4A, and all of onsite basin 6A. The pond ensures effective management of runoff by capturing and controlling the flow from these basins, helping to mitigate potential flooding or excess water discharge. The pond includes a weir outlet with a 0.5-feet thick opening and a length of 15 feet, allowing for controlled release of excess water and ensuring that post-development conditions maintain consistent runoff levels.

For onsite basins 7A and 8A, two separate retention ponds have been proposed to manage the excess runoff generated by these areas. The design of these ponds ensures that post-development runoff levels remain consistent with pre-development conditions, preventing any rise in runoff and maintaining the natural drainage patterns. These ponds are strategically placed to effectively capture and manage the increased water flow, ensuring compliance with stormwater management goals and minimizing the impact on surrounding properties.

For Lot 11, which is not within any designated on-site or off-site drainage basin, a pond has been proposed in accordance with City of Sedona guidelines. The guideline specifies providing 50 cubic feet of storage for every 1,000 square feet of impervious area. A pond with a capacity of 431 cubic feet has been planned between Lot 10 and Lot 11, as depicted in the site plans. This pond is designed to effectively capture the excess runoff generated by Lot 11, ensuring no adverse impact on downstream flow.

This setup aids in managing post-development flows, ensuring they remain below pre-development HydraFlow Hydrographs 2024 were instrumental in the calculation of these detention ponds.

4. Storm Recurrence Intervals

Results are presented for the 2, 5, 10, 25, 50 and 100-year events

5. Other Hydrologic Criteria / Methods

No additional hydrologic criteria / methods are requested or anticipated.

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

6. Hydrologic Results

Using HydraFlow Hydrographs 2024 hydrologic modeling program the first model created was to establish the pre-development drainage of all off-site and on-site sub-basins affecting the project area. The following table summarizes the results of the pre-development model in Appendix G.

Table 3 Pre-Development Discharges

PRE-DEVELOPMENT DISCHARGES (cfs)						
Design Pt.	**2-yr Peak**	**5-yr Peak**	**10-yr Peak**	**25-yr Peak**	**50-yr Peak**	**100-yr Peak**
1	23.56	31.68	38.61	48.35	56.43	65.05
2	1.532	2.061	2.511	3.145	3.67	4.232
3	1.246	1.676	2.043	2.558	2.986	3.442
4	1.75	2.353	2.868	3.591	4.191	4.832
5	3.019	4.06	4.948	6.196	7.231	8.337
6	1.212	1.63	1.987	2.488	2.903	3.347
7A	0.286	0.384	0.469	0.587	0.685	0.789
8A	0.252	0.338	0.412	0.516	0.603	0.695

The second model created was to establish the post-development drainage which takes into account the development of the project area but no drainage mitigation is established. The following table summarizes the results of the post-development model in Appendix G.

Table 4 Post-Development Discharges-no mitigation

POST-DEVELOPMENT DISCHARGES (cfs)						
Design Pt.	**2-yr Peak**	**5-yr Peak**	**10-yr Peak**	**25-yr Peak**	**50-yr Peak**	**100-yr Peak**
1	23.56	31.68	38.61	48.35	56.43	65.05
2	1.873	2.519	3.069	3.844	4.486	5.172
3	1.532	2.061	2.511	3.145	3.67	4.232
4	1.944	2.614	3.186	3.99	4.657	5.368
5	3.22	4.331	5.278	6.609	7.713	8.893
6	1.643	2.21	2.693	3.372	3.936	4.538
7A	0.413	0.555	0.677	0.847	0.989	1.14
8A	0.302	0.406	0.495	0.62	0.723	0.834

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

The third model created was to establish the post-development drainage with the establishment of a drainage network that will mitigate the runoff discharges. The following table summarizes the results of the post-development with detention model in Appendix G.

Table 5 Post-Development with Detention Implementation

POST-DEVELOPMENT W/ DETENTION DISHARGES (cfs)							WITHOUT DETENTION BASIN (cfs)	Difference
Design Pt.	**2-yr Peak**	**5-yr Peak**	**10-yr Peak**	**25-yr Peak**	**50-yr Peak**	**100-yr Peak**	**100-yr Peak**	**100-yr Peak**
1	23.61	31.69	38.61	48.17	56.29	65.05	65.05	0
2	23.84	33.14	40.11	50.19	58.69	68.03	70.22	-2.19
3	1.249	1.677	2.043	2.549	2.978	3.442	3.442	0
4	2.747	3.688	4.493	5.606	6.55	7.571	7.571	0
5	0	1.704	3.84	6.376	8.537	10.59	12.52	-1.93
6	1.757	4.464	0	0.829	1.797	2.714	4.495	-1.781
7A	0	0	0	0.313	0.525	0.726	1.14	-0.414
8A	0	0	0	0	0.17	0.416	0.834	-0.418

The increase in runoff from the Pre-Development to the Post-Development is due to the development of the project area. The decrease in runoff between Pre-Development and Post-Development with detention is due to the implementation of a detention basin that mitigates the off-site and on-site drainage areas. The increase in runoff will have no significant impact to the surrounding areas or drainage ways. Post development drainage map can be accessed in **Appendix H.**

C. HYDRAULIC CRITERIA

The procedure and design criteria outlined in Yavapai County Drainage Manual Chapter 6 and Chapter 8 was followed when performing hydraulic analysis. HydraFlow Express was also used in sizing and designing culverts and channels used in this project. No additional hydrologic criteria/methods are requested or anticipated.

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

IV. DRAINAGE FACILITY DESIGN

A. GENERAL CONCEPT

1. The development of Canyon Vista Subdivision increased the overall runoff as shown when comparing the Post-development discharges (Table 5) to the Pre-development discharges (Table 4). To reduce the Post-development discharges Three detention basins and Two retention basins will be implemented into the development of the site to reduce the overall runoff discharges below the Pre-development levels.

2. To reduce the impact of development on overall runoff peak discharges the Pre-development drainage patterns will typically be followed with little modifications. Areas of development that obstruct the pre-development drainage patterns will be modified with a drainage structure that returns the runoff discharge to a pre-development condition.

3. The following tables and figures were included in this report for further clarification and summarization of data.

a. Table 1: Summarizes the physical characteristics of each sub-basin delineated for this project.

b. Table 2: Shows pre and post developments runoff co efficient and areas

c. Table 3: Shows the calculated Pre-development peak discharge for the required storm recurrence intervals for each sub-basin and concentration point.

d. Table 4: Shows the calculated Post-development peak discharges for the required storm recurrence intervals for each sub-basin and concentration point.

j. Table 5: Shows the calculated Post-development with Detention Implementation peak discharges for the required storm recurrence intervals for each sub-basin and concentration point.

B. SPECIFIC DETAILS

1. Design Point 1, with a 100-year peak discharge (Q100) of 65.05 cfs, represents the influx from off-site sub-basin 1A into on-site sub-basin 2A along the western property boundary. Then this will be directed towards the channel provided at Design Point 2 where the peak discharge reaches (Q100) 69.28 cfs. If the water volume exceeds the capacity of this channel, overflow onto the road will occur, allowing natural drainage through the pre-existing channel.

2. Design Point 3, with a Q100 of 3.442 cfs, represents the 100-year peak discharge from off-site sub-basin 3A into on-site sub-basin 4A along the western property boundary. This discharge will

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

be directed through the proposed road and will be collected in the pond proposed near Brewer Road to reduce its peak.

3. Design Point 4, having a Q100 of 6.947 cfs, denotes the 100-year peak discharge from on-site sub-basin 4A, exiting on-site sub-basin 4A. This discharge will not intervene, and it will follow its natural flow path, passing through on-site sub-basin 5A, and into a pre-existing channel which will be considered as a design point 6.

4. Design Point 5, with a Q100 of 11.40 cfs, signifies the 100-year peak discharge from on-site sub-basin 4A, leaving on-site sub-basin 4A and on site sub-basin 5A. This discharge will be routed through a pre-existing channel, ultimately flowing to the east side of the adjacent property (Design Point 6).

5. Design Point 6 is where the runoff from on-site sub-basins 4A, 5A, and 6A converges before flowing in its natural path. This point plays a crucial role in managing and directing the water from these basins, ensuring that it follows the intended drainage course and minimizes any adverse impacts on the site or surrounding areas. Properly accounting for the flow at this design point helps maintain effective stormwater management and aligns with the overall drainage strategy for the development.

6. Design Point 2 is where the runoff exits the property, making it a critical location for assessing the effectiveness of the drainage system. By comparing the flow rates at Design Points 2 and 6, it can be determined whether the excess runoff generated within the property is being adequately captured and managed on-site. Based on the comparison shown in Tables 3, 4, and 5, it is evident that the designed drainage measures successfully capture the excess runoff, resulting in no increase in the runoff when it exits the property. This confirms that the post-development runoff levels are consistent with pre-development conditions, ensuring compliance with drainage management requirements.

V. CONCLUSIONS

In the engineer's professional assessment, it is recommended that the site be constructed according to the proposed plan. This plan is designed to meet all necessary conditions while ensuring cost-effectiveness and requiring minimal maintenance for drainage facilities. The implemented facilities will effectively mitigate any expected increases in runoff associated with the development. Furthermore, the project fully adheres to the criteria set forth by the City of Sedona.

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

VI. REFERENCES

i. Yavapai County Flood Control District Drainage Criteria Manual, Revised August 2015.

ii. Arizona Department of Transportation, Highway Drainage Design Manual Hydrology, March 2014.

iii. Dibble & Associates Consulting Engineers, City of Sedona Storm Water Master Plan, Volume I, Main Report. March 2005.

iv. 2022 Sorm Water Master Plan Update, Phase 3 – Hydrology & Hydraulics and Floodplain Delineation Technical Support Data Notebook.

v. National Oceanic and Atmospheric Administration's (NOAA) National Weather Service. Office of Hydrologic Development. Silver Spring, Maryland. Last Modified: December 13, 2005.

vi. HydraFlow Hydrographs 2024 program.

vii. HydraFlow Express 2024 program.

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

VI. APPENDIX A

FIRM MAP

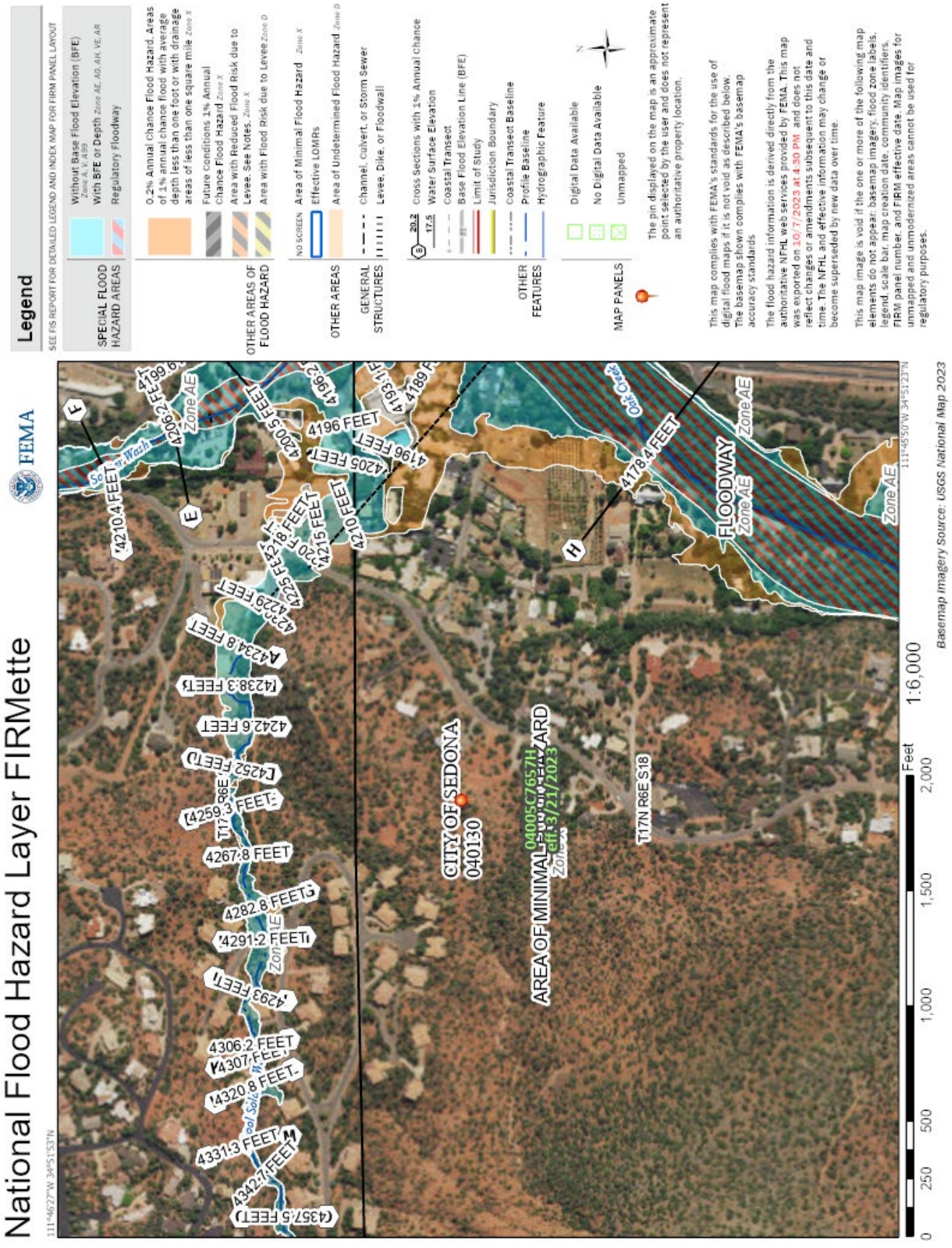
140505
40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants

Your Ideas to Completion

Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner



Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

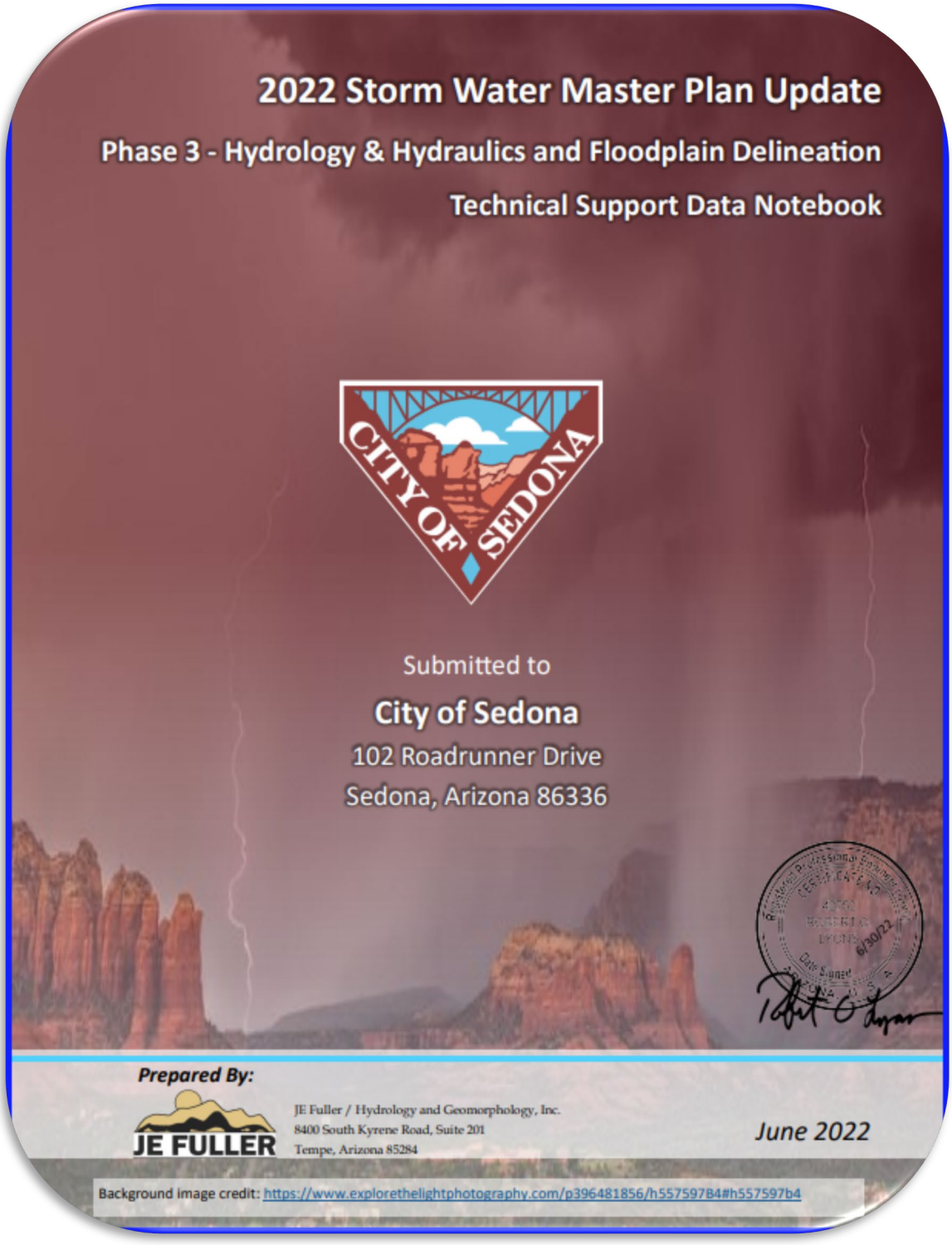
VII. APPENDIX B

City of Sedona Storm Water Master Plan

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner



40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

VIII. APPENDIX C

USDA SOIL MAP

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Map Scale: 1:1,240 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

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 1:24,000.

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: Black Hills-Sedona Area, Arizona, Parts of Coconino and Yavapai Counties
Survey Area Data: Version 13, Sep 8, 2023

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

Date(s) aerial images were photographed: Oct 29, 2022—Oct 31, 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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
405	Turist soils, Rock outcrop and Urban land, 15 to 90 percent slopes	3.2	48.1%
406	Sedona soils, Turist soils and Urban land, 3 to 15 percent slopes	3.5	51.9%
Totals for Area of Interest		**6.7**	**100.0%**

Black Hills-Sedona Area, Arizona, Parts of Coconino and Yavapai Counties

406—Sedona soils, Turist soils and Urban land, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 1yld
Elevation: 3,700 to 5,000 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 57 to 62 degrees F
Frost-free period: 160 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Sedona and similar soils: 34 percent
Turist and similar soils: 33 percent
Urban land: 33 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sedona

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Colluvium and/or residuum weathered from shale and/or mudstone

Typical profile

A - 0 to 2 inches: extremely channery loam
Btk1 - 2 to 10 inches: extremely channery silty clay loam
Btk2 - 10 to 18 inches: extremely flaggy silt loam
Cr - 18 to 60 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 12 to 18 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R038XB218AZ - Sandstone Hills 16-20
Hydric soil rating: No

Description of Turist

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

A - 0 to 1 inches: very channery sandy loam
Bw - 1 to 5 inches: channery clay loam
Bk1 - 5 to 10 inches: extremely channery loam
Bk2 - 10 to 16 inches: extremely channery loam
2R - 16 to 60 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 12 to 18 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R038XB218AZ - Sandstone Hills 16-20
Hydric soil rating: No

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Hydric soil rating: No

Data Source Information

Soil Survey Area: Black Hills-Sedona Area, Arizona, Parts of Coconino and Yavapai Counties
Survey Area Data: Version 13, Sep 8, 2023

Black Hills-Sedona Area, Arizona, Parts of Coconino and Yavapai Counties

405—Turist soils, Rock outcrop and Urban land, 15 to 90 percent slopes

Map Unit Setting

National map unit symbol: 1ylc
Elevation: 3,900 to 5,500 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 57 to 62 degrees F
Frost-free period: 160 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Turist and similar soils: 34 percent
Urban land: 33 percent
Rock outcrop: 33 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Turist

Setting

Landform: Buttes, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

A - 0 to 2 inches: extremely channery sandy loam
Bw - 2 to 12 inches: extremely channery loam
Bk - 12 to 18 inches: extremely channery loam
2R - 18 to 60 inches: bedrock

Properties and qualities

Slope: 15 to 90 percent
Surface area covered with cobbles, stones or boulders: 15.0 percent
Depth to restrictive feature: 12 to 18 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R038XB218AZ - Sandstone Hills 16-20
Hydric soil rating: No

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Description of Rock Outcrop

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Data Source Information

Soil Survey Area: Black Hills-Sedona Area, Arizona, Parts of Coconino and Yavapai Counties
Survey Area Data: Version 13, Sep 8, 2023

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

IX. APPENDIX D

PRE DEVELOPMENT DRAINAGE MAP

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

PRE-DEVELOPMENT DISHARGES (cfs)

Design Pt.	2-yr Peak	5-yr Peak	10-yr Peak	25-yr Peak	50-yr Peak	100-yr Peak
1	23.61	31.69	38.61	48.17	56.29	65.05
2	25.14	33.75	41.12	51.32	59.96	69.28
3	1.249	1.677	2.043	2.549	2.978	3.442
4	2.521	3.384	4.123	5.145	6.011	6.947
5	4.137	5.553	6.766	8.442	9.864	11.4
6	5.891	7.907	9.633	12.02	14.04	16.23
7A	0.287	0.385	0.469	0.585	0.683	0.789
8A	0.252	0.338	0.412	0.514	0.601	0.695

LEGEND

A = BASIN DESIGNATION
B = ARE IN ACRES
C = COMPOSITE RUNOFF COEFFICIENTS
D = DESIGN POINT DESIGNATION

0 50' 100' 200'
HORIZONTAL SCALE IN FEET
1" = 100'

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning
40 STUTZ BEARCAT DR. #8
SEDONA, ARIZONA 86336
PH: (928) 202-3999 LS@SEFENGCO.COM

Registered Professional Engineer
CERTIFICATION NO.
37322
LUKE A.
SEFTON
DATE SIGNED
ARIZONA, U.S.A.

SHEET TITLE: PRE-DEVELOPMENT DRAINAGE MAP

PROJECT TITLE:

CANYON VISTA SUBDIVISION

APN: 401-20-027G COCONINO COUNTY, SEDONA, ARIZONA

DRAWN BY:	TBJ
SCALE:	1" = 100'
DATE:	08/23/2024
PROJECT NO:	140505
SHEET NO.	D-1

© 2021, Sefton Engineering Consultants LLC, All Rights Reserved. This document is protected under the United States Copyright Act. No part may be reproduced in any form or by any means or stored in a database or retrieval system, without the prior written permission of Sefton Engineering Consultants, LLC. These plans/documents have been prepared using technical knowledge that would be applied by other qualified registrants who practice the same profession in the same area and at the same time. Efforts have been made to be as accurate as possible. However, plans/documents could contain unintentional technical inaccuracies, typographical errors or omissions. Users of these plans/documents should understand that it is highly probable that errors and omissions will occur in any plan/document preparation process. The user shall notify the Registrant for clarification.

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

X. APPENDIX E

NOAA RAINFALL DATA

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

NOAA Atlas 14, Volume 1, Version 5
Location name: Sedona, Arizona, USA*
Latitude: 34.8602°, Longitude: -111.7688°
Elevation: 4246 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

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	2.56 (2.12-3.05)	3.29 (2.74-3.92)	4.42 (3.67-5.29)	5.38 (4.48-6.42)	6.73 (5.54-8.00)	7.86 (6.43-9.35)	9.07 (7.37-10.8)	10.4 (8.32-12.4)	12.3 (9.67-14.8)	13.9 (10.8-16.8)
10-min	1.94 (1.62-2.32)	2.50 (2.08-2.99)	3.37 (2.80-4.02)	4.09 (3.40-4.88)	5.12 (4.22-6.08)	5.98 (4.90-7.11)	6.91 (5.60-8.22)	7.90 (6.33-9.43)	9.36 (7.36-11.2)	10.6 (8.21-12.8)
15-min	1.60 (1.34-1.92)	2.07 (1.72-2.47)	2.78 (2.31-3.32)	3.38 (2.81-4.04)	4.23 (3.49-5.03)	4.94 (4.04-5.88)	5.71 (4.63-6.79)	6.53 (5.23-7.79)	7.74 (6.08-9.29)	8.74 (6.79-10.6)
30-min	1.08 (0.900-1.29)	1.39 (1.16-1.66)	1.87 (1.55-2.24)	2.28 (1.89-2.72)	2.85 (2.35-3.39)	3.33 (2.72-3.96)	3.84 (3.12-4.57)	4.40 (3.52-5.24)	5.21 (4.09-6.26)	5.89 (4.57-7.11)
60-min	0.669 (0.557-0.799)	0.862 (0.716-1.03)	1.16 (0.961-1.39)	1.41 (1.17-1.68)	1.76 (1.45-2.10)	2.06 (1.68-2.45)	2.38 (1.93-2.83)	2.72 (2.18-3.24)	3.22 (2.53-3.87)	3.64 (2.83-4.40)
2-hr	0.395 (0.343-0.460)	0.499 (0.430-0.583)	0.659 (0.568-0.768)	0.794 (0.679-0.926)	0.988 (0.841-1.15)	1.15 (0.965-1.34)	1.32 (1.10-1.55)	1.52 (1.24-1.77)	1.80 (1.45-2.10)	2.03 (1.61-2.38)
3-hr	0.282 (0.248-0.327)	0.357 (0.315-0.414)	0.456 (0.400-0.528)	0.544 (0.474-0.629)	0.668 (0.577-0.772)	0.774 (0.665-0.893)	0.892 (0.755-1.03)	1.02 (0.852-1.18)	1.21 (0.991-1.41)	1.36 (1.10-1.60)
6-hr	0.172 (0.154-0.191)	0.214 (0.192-0.237)	0.265 (0.237-0.295)	0.311 (0.278-0.346)	0.377 (0.334-0.419)	0.430 (0.379-0.478)	0.488 (0.425-0.544)	0.549 (0.472-0.615)	0.639 (0.541-0.722)	0.712 (0.594-0.810)
12-hr	0.110 (0.099-0.122)	0.136 (0.123-0.151)	0.166 (0.149-0.183)	0.191 (0.171-0.210)	0.225 (0.202-0.248)	0.252 (0.224-0.277)	0.279 (0.246-0.308)	0.307 (0.268-0.340)	0.346 (0.298-0.385)	0.378 (0.322-0.423)
24-hr	0.069 (0.063-0.076)	0.086 (0.079-0.095)	0.108 (0.098-0.119)	0.125 (0.113-0.138)	0.149 (0.134-0.164)	0.167 (0.151-0.184)	0.186 (0.167-0.206)	0.206 (0.184-0.228)	0.233 (0.206-0.259)	0.255 (0.222-0.284)
2-day	0.040 (0.037-0.045)	0.050 (0.046-0.056)	0.063 (0.057-0.069)	0.073 (0.066-0.080)	0.087 (0.078-0.095)	0.098 (0.088-0.107)	0.109 (0.097-0.120)	0.121 (0.107-0.133)	0.137 (0.120-0.151)	0.149 (0.130-0.165)
3-day	0.029 (0.026-0.032)	0.036 (0.033-0.040)	0.045 (0.041-0.050)	0.052 (0.048-0.058)	0.063 (0.057-0.069)	0.071 (0.064-0.078)	0.079 (0.071-0.087)	0.088 (0.078-0.097)	0.101 (0.089-0.111)	0.110 (0.096-0.122)
4-day	0.023 (0.021-0.025)	0.029 (0.026-0.032)	0.036 (0.033-0.040)	0.042 (0.038-0.046)	0.051 (0.046-0.056)	0.058 (0.052-0.063)	0.065 (0.058-0.071)	0.072 (0.064-0.079)	0.083 (0.073-0.091)	0.091 (0.079-0.101)
7-day	0.015 (0.014-0.017)	0.019 (0.017-0.021)	0.024 (0.022-0.026)	0.028 (0.025-0.030)	0.033 (0.030-0.036)	0.037 (0.034-0.041)	0.042 (0.038-0.046)	0.047 (0.042-0.051)	0.053 (0.047-0.059)	0.058 (0.051-0.064)
10-day	0.012 (0.011-0.013)	0.015 (0.014-0.017)	0.019 (0.017-0.021)	0.022 (0.020-0.024)	0.026 (0.023-0.028)	0.029 (0.026-0.031)	0.032 (0.028-0.035)	0.035 (0.031-0.038)	0.039 (0.034-0.043)	0.042 (0.037-0.046)
20-day	0.008 (0.007-0.008)	0.010 (0.009-0.011)	0.012 (0.011-0.013)	0.013 (0.012-0.015)	0.015 (0.014-0.017)	0.017 (0.015-0.019)	0.019 (0.017-0.020)	0.020 (0.018-0.022)	0.022 (0.020-0.024)	0.023 (0.021-0.026)
30-day	0.006 (0.005-0.007)	0.008 (0.007-0.008)	0.009 (0.008-0.010)	0.011 (0.010-0.011)	0.012 (0.011-0.013)	0.013 (0.012-0.015)	0.014 (0.013-0.016)	0.016 (0.014-0.017)	0.017 (0.015-0.019)	0.018 (0.016-0.020)
45-day	0.005 (0.004-0.005)	0.006 (0.005-0.007)	0.007 (0.007-0.008)	0.008 (0.007-0.009)	0.010 (0.009-0.011)	0.011 (0.010-0.012)	0.011 (0.010-0.013)	0.012 (0.011-0.014)	0.014 (0.012-0.015)	0.014 (0.013-0.016)
60-day	0.004 (0.004-0.004)	0.005 (0.005-0.006)	0.006 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.009-0.011)	0.010 (0.009-0.011)	0.011 (0.010-0.012)	0.012 (0.010-0.013)

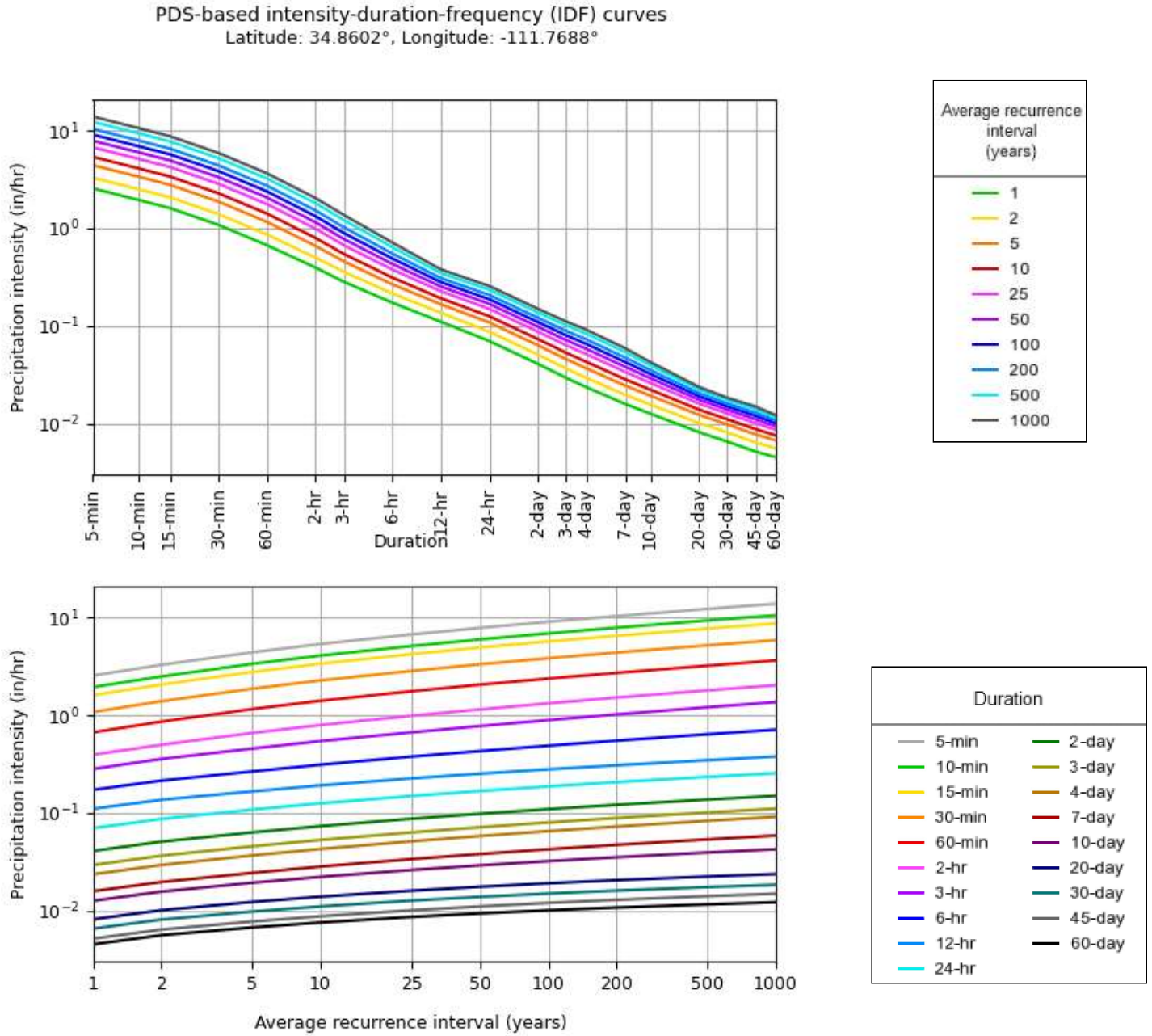
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



NOAA Atlas 14, Volume 1, Version 5

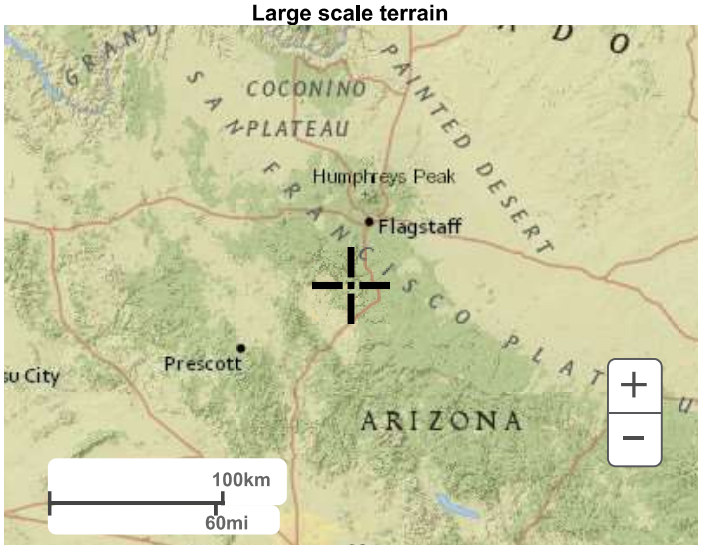
Created (GMT): Thu Oct 19 15:27:08 2023

Back to Top

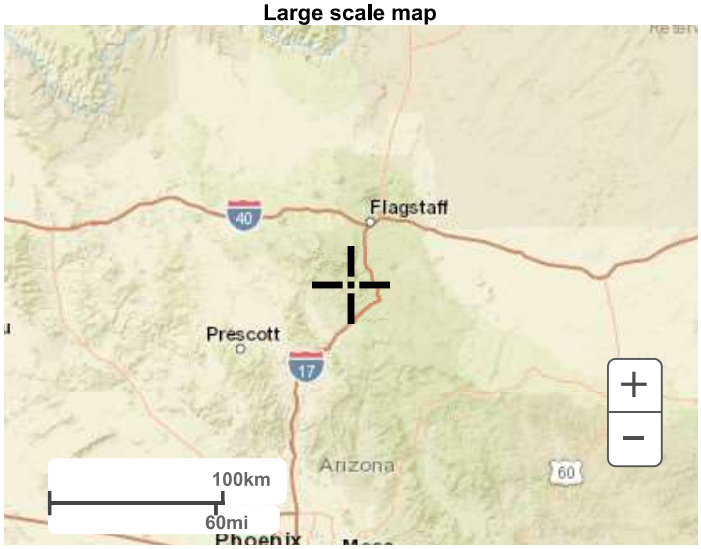
Maps & aerials

Small scale terrain

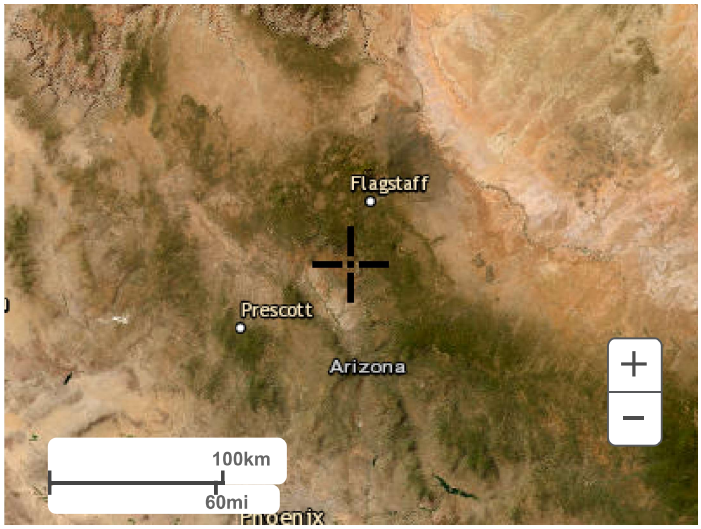
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

XI. APPENDIX F

ADOT DRAINAGE DESIGN MANUAL EXCERPTS AND CALCULATIONS

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

CHAPTER 2
RATIONAL METHOD

2.1 INTRODUCTION

The Rational Method relates rainfall intensity, a runoff coefficient and a drainage area size to the direct runoff from the drainage basin.

Three basic assumptions of the Rational Method are:

a. The frequency of the storm runoff is the same as the frequency of the rainfall producing the runoff (i.e., a 25-year runoff event results from a 25-year rainfall event).

b. The peak runoff occurs when all parts of the drainage basin are contributing to the runoff.

c. Rainfall is uniform over the watershed.

2.1.1 General Discussion

The Rational Method, as presented herein, can be used to estimate peak discharges, the runoff hydrograph shape, and runoff volume for small, uniform drainage areas that are not larger than 160 acres in size. The method is usually used to size drainage structures for the peak discharge of a selected return period. An extension of the basic method is provided to estimate the shape of the runoff hydrograph if it is necessary to design retention/detention facilities and/or to design drainage facilities that will require routing of the runoff hydrograph through the structure.

The Rational Method is based on the equation: $Q = CiA$ (2-1)

where Q = the peak discharge, in cfs, of selected return period,
C = the runoff coefficient,
i = the average rainfall intensity, in inches/hr, of calculated rainfall duration for the selected rainfall return period, and
A = the contributing drainage area, in acres.

Sefton
Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

2.2 PROCEDURE

2.2.1 General Considerations

1. Depending on the intended application, the runoff coefficient (C) should be selected based on the character of the existing land surface or the projected character of the land surface under future development conditions. In some situations, it may be necessary to estimate C for both existing and future conditions.

2. Land-use must be carefully considered because the evaluation of land-use will affect both the estimation of C and also the estimation of the watershed time of concentration (T_C).

3. The peak discharge (Q) is generally quite sensitive to the calculation of T_C and care must be exercised in obtaining the most appropriate estimate of T_C.

4. Both C and the rainfall intensity (i) will vary if peak discharges for different flood return periods are desired.

5. Since the T_C equation is a function of rainfall intensity (i), T_C will also vary for different flood return periods.

2.2.2 Applications and Limitations

1. The total drainage area must be less than or equal to 160 acres.

2. T_C shall not exceed 60 minutes.

3. The land-use of the contributing area must be fairly consistent over the entire area; that is, the area should not consist of a large percentage of two or more land-uses, such as 50 percent commercial and 50 percent undeveloped. This will lead to inconsistent estimates of T_C (and therefore i) and errors in selecting the most appropriate C coefficient.

Email: info@seftengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

4. The contributing drainage area cannot have drainage structures or other facilities in the area that would require flood routing to correctly estimate the discharge at the point of interest.

5. Drainage areas that do not meet the above conditions will require the use of an appropriate rainfall-runoff model (the HEC-1 Program) to estimate flood discharges.

2.2.3 Estimation of Area (A)

An adequate topographic map of the drainage area and surrounding land is needed to define the drainage boundary and to estimate the area (A), in acres. The map should be supplemented with aerial photographs, if available, especially if the area is developed. If the area is presently undeveloped but is to undergo development, then the land development plan and maps should be obtained because these may indicate a change in the drainage boundary due to road construction or land grade changes. If development plans are not available, then land-use should be based on current zoning of the area.

The delineation of the drainage boundary needs to be carefully determined. The contributing drainage area for a lower intensity storm does not always coincide with the drainage area for more intense storms. This is particularly true for urban areas where roads can form a drainage boundary for small storms but more intense storm runoff can cross roadway crowns, curbs, etc. resulting in a larger contributing area. Floods on alluvial fans (active and inactive) and in distributary flow systems can result in increased contributing drainage areas during larger and more intense storms. It is generally prudent to consider the largest reasonable drainage area in such situations.

2.2.4 Estimation of Rainfall Intensity (i)

The intensity (i) in Equation 2-1 is the average rainfall intensity in inches/hour for the period of maximum rainfall of a specified return period (frequency) having a duration equal to the time of concentration (T_C) for the drainage area. The frequency is usually specified according to a design criteria or standard for the intended application. The

Email: info@seleng.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

rainfall intensity (i) is obtained from an intensity-duration-frequency (I-D-F) graph. Two methods can be used for obtaining I-D-F information: 1) two generalized I-D-F graphs are provided that can be used for any site in Arizona, and 2) a site-specific I-D-F graph can be developed, if desired. The two generalized I-D-F graphs are shown in **Figure 2-1** for Zone 6, and **Figure 2-2** for Zone 8, respectively. The delineation of the two rainfall zones for Arizona is shown in **Figure 1-1** of Chapter 1 - Rainfall. Procedures for developing a site-specific I-D-F graph are described in Chapter 1.

The intensity (i) in Equation 2-1 is the average rainfall intensity for rainfall of a selected return period from an I-D-F graph for a rainfall duration that is equal to the time of concentration (T_C) as calculated according to the procedure described below. A minimum rainfall duration of 10 minutes is to be used if the calculated T_C is less than 10 minutes. The Rational Method should not be used if the calculated T_C is greater than 60 minutes.

2.2.5 Estimation of Time of Concentration (T_C)

Time of concentration (T_C) is to be calculated by Equation 2-2:

$$T_C = 11.4\ L^{0.5}\ K_b^{0.52}\ S^{-0.31}\ i^{-0.38} \qquad (2\text{-}2)$$

Note: Reference Papadakis and Kazan, 1987.

where T_C = the time of concentration, in hours,
L = the length of the longest flow path, in miles,
K_b = the watershed resistance coefficient,
S = the slope of the longest flow path, in ft/mile, and
i = the average rainfall intensity, in inches/hr, for a duration of rainfall equal to T_C (the same (i) as Equation 2-1) unless T_C is less than 10 minutes, in which case the (i) of Equation 2-1 is for a 10-minute duration).

The longest flow path will be estimated from the best available map and the length (L) measured from the map.

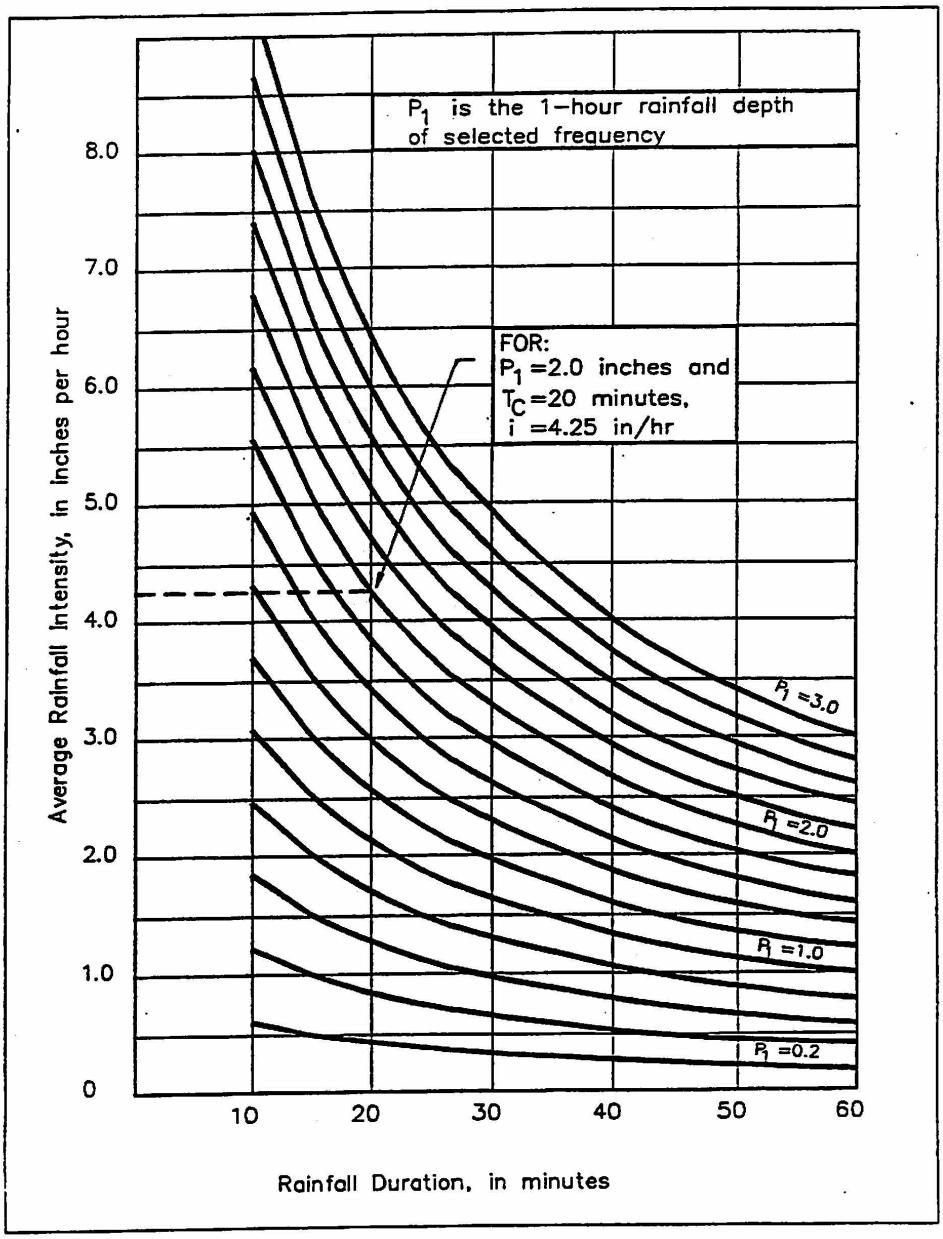
Email: info@seengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

FIGURE 2-1
GENERALIZED I-D-F GRAPH FOR ZONE 6 OF ARIZONA

Example: For a selected 10-year return period, P_1 = 2.0 inches. T_C is calculated as 20 minutes. Therefore, (i) = 4.25 in/hr.

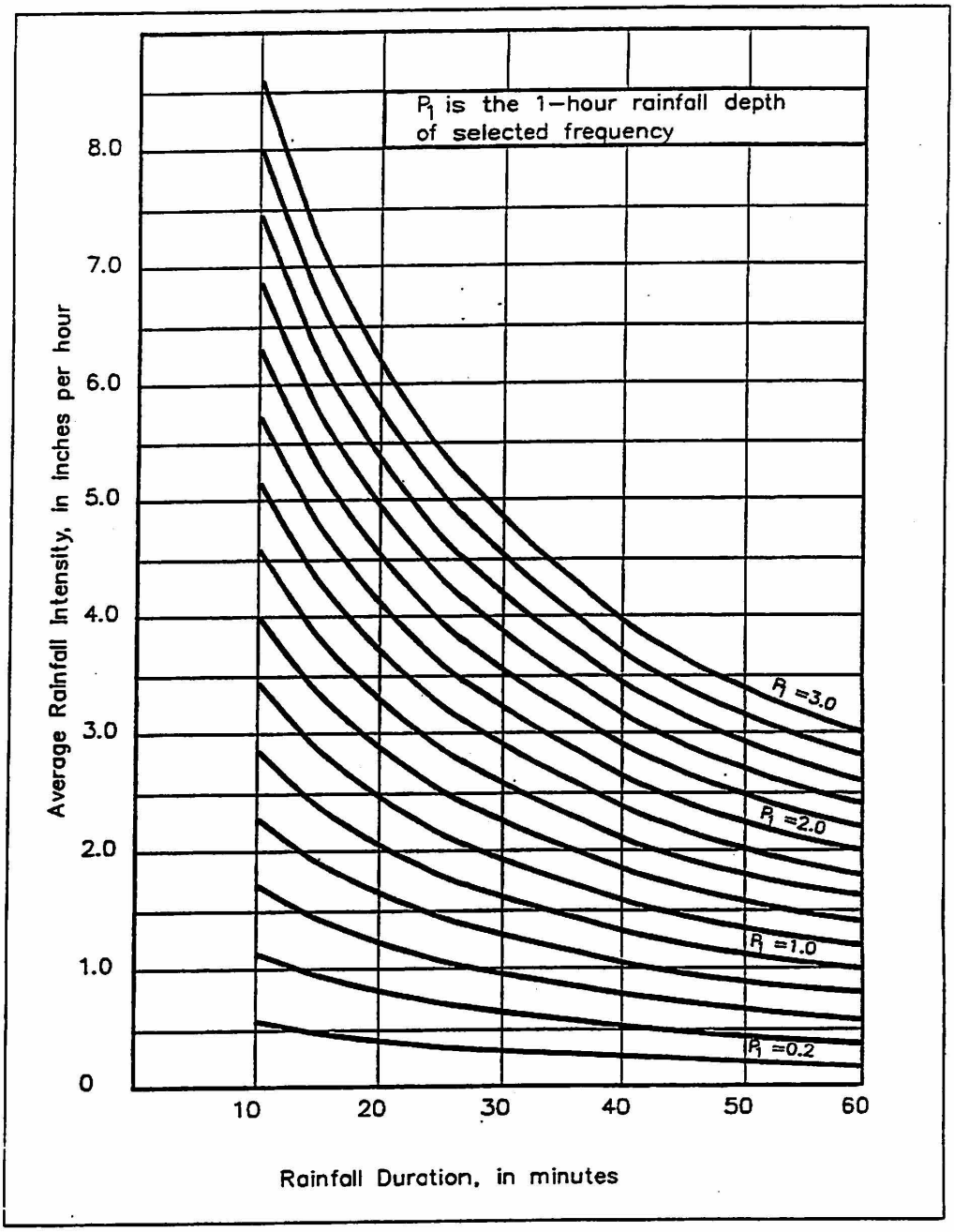


Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

FIGURE 2-2
GENERALIZED I-D-F GRAPH FOR ZONE 8 OF ARIZONA



Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

The slope (S), in ft/mile, will be calculated by one of two methods:

1. If the longest flow path has a uniform gradient with no appreciable grade breaks, then the slope is calculated by Equation 2-3;

$$S = \frac{H}{L} \qquad (2\text{-}3)$$

where H = the change in elevation, in feet, along L, and
L = as defined in Equation 2-2.

2. If the longest flow path does not have a uniform gradient or has distinct grade breaks, then the slope is calculated by Equation 2-4:

$$S = 5{,}280 \left(\frac{d}{j}\right)^2 \qquad (2\text{-}4)$$

where $d = 5{,}280 \times L$

$$j = \sum \left(\frac{d_i^{\,3}}{H_i}\right)^{1/2}$$

Note: Reference, Pima County Department of Transportation and Flood Control District, September 1979.

and d_i = an incremental change in length, in feet, along the longest flowpath and
H_i = an incremental change in elevation, in feet, for each length segment, d_i.

The resistance coefficient (K_b) is selected from **Table 2-1**. Use of **Table 2-1** requires a classification as to the landform and a determination of the nature of runoff; whether in a defined drainage network of rills, gullies, channels, etc., or predominantly as overland flow.

Email: info@seftengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

TABLE 2-1
RESISTANCE COEFFICIENT (K_b) FOR USE WITH THE RATIONAL METHOD T_c EQUATION

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (overland slopes - 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (overland slopes - 50% or greater)	0.12	0.25
Foothills (overland slopes - 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangeland (overland slopes - 10% or less)	0.05	0.10
Irrigated Pasture [a]	—	0.20
Tilled Agricultural Fields [a]	—	0.08
URBAN		
Residential, L is less than 1,000 ft[b]	0.04	—
Residential, L is greater than 1,000 ft[b]	0.025	—
Grass; parks, cemeteries, etc. [a]	—	0.20
Bare ground; playgrounds, etc. [a]	—	0.08
Paved; parking lots, etc. [a]	—	0.02

Notes: a - No defined drainage network.
b - L is length in the T_c equation. Streets serve as drainagae network.

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

The solution of Equation 2-2 is an iterative process since the determination of (i) requires the knowledge of the value of T_C. Therefore, Equation 2-2 will be solved by a trial-and-error procedure. After L, K_b, and S are estimated and after the appropriate I-D-F graph is selected or prepared, a value for T_C will be estimated (a trial value) and (i) will be read from the I-D-F graph for the corresponding value of duration = T_C. That (i) will be used in Equation 2-2 and T_C will be calculated. If the calculated value of T_C does not equal the trial value of T_C, then the process is repeated until the calculated and trial values of T_C are acceptably close (a difference of less than 10 percent should be acceptable).

2.2.6 Selection of Runoff Coefficient (C)

The runoff coefficient (C) is selected from **Figure 2-3** through **Figure 2-8** depending on the classification of the nature of the watershed. **Figure 2-3** is the C graph to be used for urbanized (developed) watersheds. Select the appropriate curve in **Figure 2-3** based on an estimate of the percent of effective impervious area in the watershed. Effective impervious area is that area that will drain directly to the outlet without flowing over pervious area. (Refer to Chapter 3 - Rainfall Losses, 3.1.1 and Table 3-3, for discussion of effective impervious areas.) **Figure 2-4** through **Figure 2-8** are to be used for undeveloped (natural) watersheds in Arizona, and the C graphs are shown as functions of Hydrologic Soil Group (HSG) and percent vegetation cover. The Hydrologic Soil Group is used to classify soil according to its infiltration rate. The Hydrologic Soil Groups, as defined by USDA, Soil Conservation Service (SCS), 1972 are:

HSG	Definition
A	Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands and gravels. These soils have a high rate of water transmission.
B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

Email: info@seftengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

HSG	Definition
C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, c soils with moderately fine to fine texture. These soils have a slow rate of water transmission.
D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

The percent vegetation cover is the percent of land surface that is covered by vegetation. Vegetation cover is evaluated on plant basal area for grasses and forbs, and on canopy cover for trees and shrubs (see Appendix C).

Information on Hydrologic Soil Group and percent vegetation cover can usually be obtained from the detailed soil surveys that are prepared by the SCS. When detailed soil surveys are not available for the watershed, then the general soil maps and accompanying reports by the SCS for each county in Arizona are to be used. A site visit is encouraged to confirm watershed and soil conditions.

It may be required to select the appropriate C value for existing conditions and another C value for anticipated future conditions, if the watershed is undergoing development. Estimation of peak discharges for various conditions of development in the drainage area or for different periods will also require separate estimates of T_C for each existing or assumed land-use condition and for each flood return period.

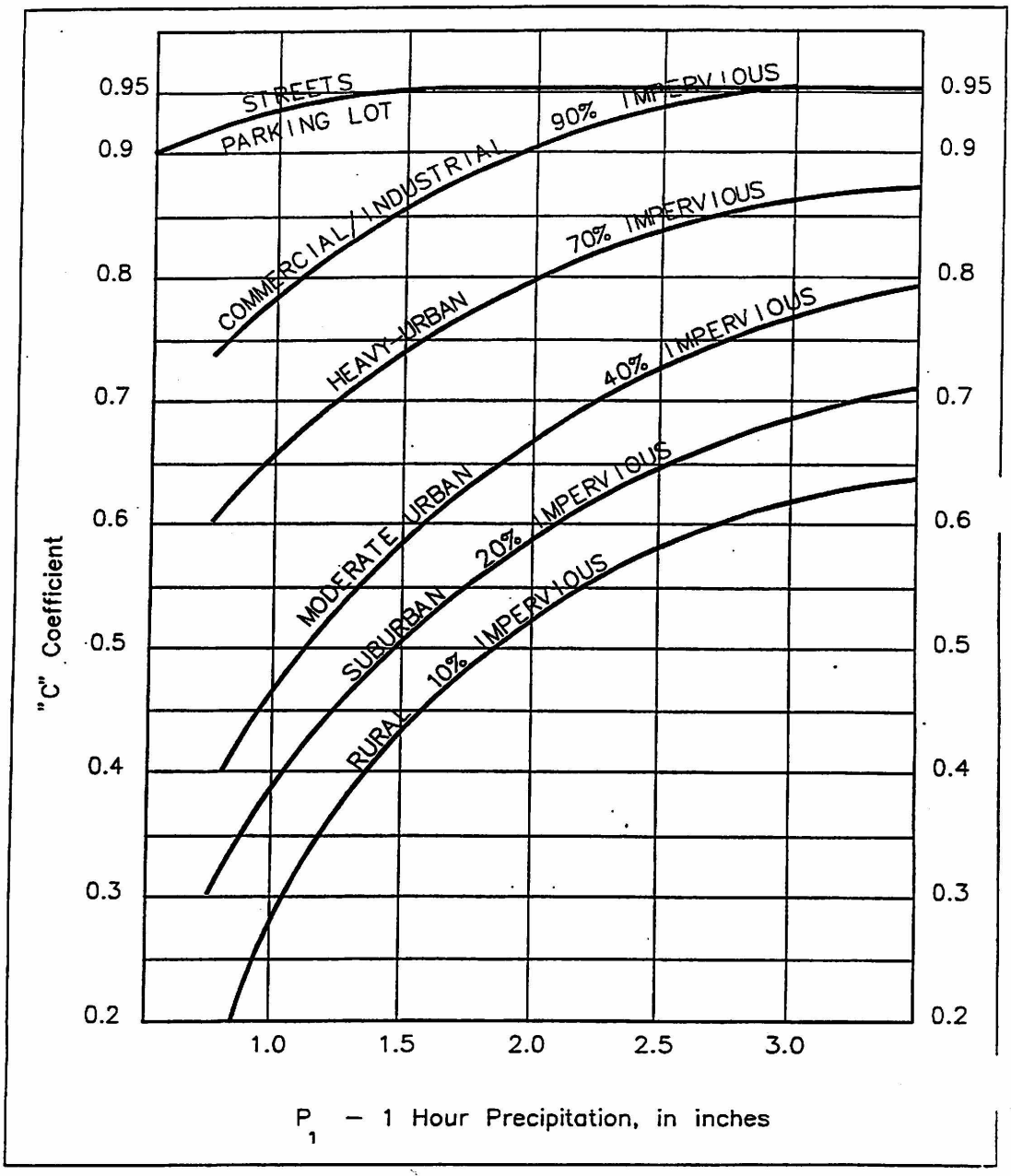
Email: info@seftengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

FIGURE 2-3
RATIONAL "C" COEFFICIENT
DEVELOPED WATERSHEDS

AS A FUNCTION OF RAINFALL DEPTH AND TYPE OF DEVELOPMENT



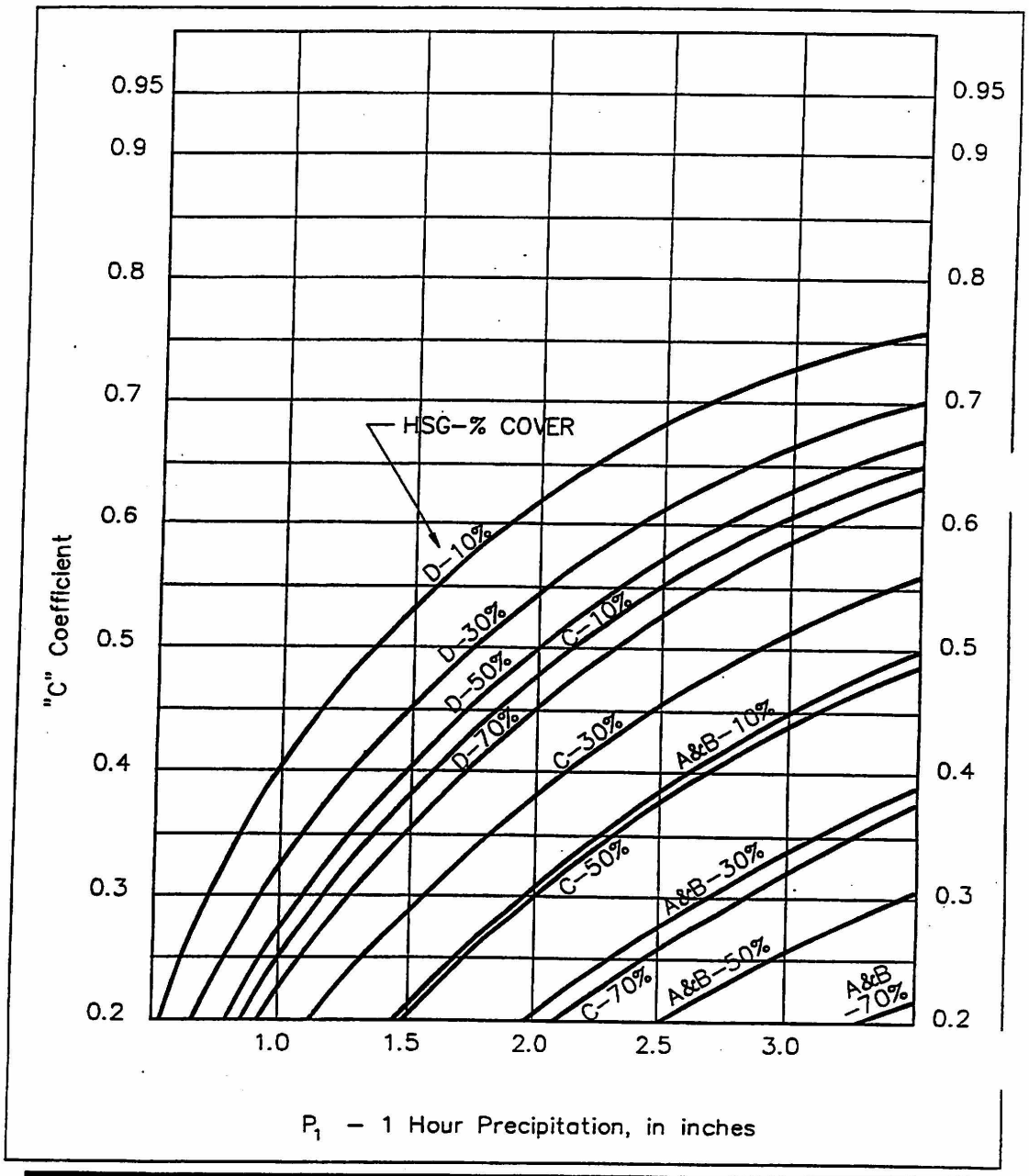
Email: info@seftengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

FIGURE 2-5
RATIONAL "C" COEFFICIENT
UPLAND RANGELAND
(GRASS & BRUSH)

AS A FUNCTION OF RAINFALL DEPTH, HYDROLOGIC SOIL GROUP (HSG), AND % OF VEGETATION COVER



MARCH 1993

Email: info@seftonengineering.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

XII. APPENDIX G

HYDROGRAPH REPORT

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Hydraflow Table of Contents

140505 .gpw

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Watershed Model Schematic 1

Hydrograph Return Period Recap 2

2 - Year

Summary Report 4

Hydrograph Reports 6

Hydrograph No. 1, Rational, 1A Pre 6
Hydrograph No. 2, Rational, 2A Post 7
Hydrograph No. 3, Rational, 3A Pre 8
Hydrograph No. 4, Rational, 4A Pre 9
Hydrograph No. 5, Rational, 5A Pre 10
Hydrograph No. 6, Rational, 6A Pre 11
Hydrograph No. 7, Rational, 6A Post 12
Hydrograph No. 8, Rational, 4A Post 13
Hydrograph No. 9, Rational, 7A Pre 14
Hydrograph No. 10, Rational, 7A Post 15
Hydrograph No. 11, Rational, 8A Pre 16
Hydrograph No. 12, Rational, 8A Post 17
Hydrograph No. 13, Rational, 2A Pre 18
Hydrograph No. 14, Rational, 5A Post 19
Hydrograph No. 15, Rational, 1A Post 20
Hydrograph No. 16, Combine, 1A & 2A Pre Combined 21
Hydrograph No. 17, Combine, 1A & 2A Post Combined 22
Hydrograph No. 18, Combine, 3A & 4A Pre Combined 23
Hydrograph No. 19, Rational, 3A Post 24
Hydrograph No. 20, Combine, 3A & 4A Post Combined 25
Hydrograph No. 21, Combine, Design Point 5 Pre Dev 26
Hydrograph No. 22, Combine, Design Point 5 Post Dev 27
Hydrograph No. 23, Rational, 2A-1 Post Dev with mediation 28
Hydrograph No. 24, Rational, 1A Post Dev With mediation 29
Hydrograph No. 25, Rational, 2A-2 Post Dev With mediation 30
Hydrograph No. 26, Rational, 2A-3 Post Dev with Mediation 31
Hydrograph No. 27, Reservoir, Pond South of Lot 1 32
Pond Report - Pond on South of Lot 1 33
Hydrograph No. 28, Reservoir, Pond b/w 1 & 2 34
Pond Report - Pond B/w 1&2 35
Hydrograph No. 29, Reservoir, Lot 3 Pond 36
Pond Report - Lot 3 Pond 37
Hydrograph No. 30, Combine, Design Point 2 38
Hydrograph No. 31, Rational, 6A post Dev with mediation 39
Hydrograph No. 32, Rational, 7A Post With Mediation 40
Hydrograph No. 33, Rational, 8A Post with Mediation 41
Hydrograph No. 34, Reservoir, Ppond for 7A 42
Pond Report - Pond for 7A 43
Hydrograph No. 35, Reservoir, Pond for 8A 44
Pond Report - Pond for 8A 45
Hydrograph No. 36, Rational, 5A Post wth mediation 46

Hydrograph No. 37, Rational, 3A Post Dev with mediation ... 47
Hydrograph No. 38, Rational, 4A Post Dev with mediation ... 48
Hydrograph No. 39, Combine, Water Towards road ... 49
Hydrograph No. 40, Reservoir, <no description> ... 50
Pond Report - Lot 4 Pond ... 51
Hydrograph No. 41, Combine, Pre Dev Design Point 6 ... 52
Hydrograph No. 42, Reach, <no description> ... 53
Hydrograph No. 43, Combine, <no description> ... 54
Hydrograph No. 44, Reach, <no description> ... 55
Hydrograph No. 45, Combine, Post Dev with mediation Design Point 6 ... 56
Hydrograph No. 46, Combine, <no description> ... 57

5 - Year

Summary Report ... 58
Hydrograph Reports ... 60
Hydrograph No. 1, Rational, 1A Pre ... 60
Hydrograph No. 2, Rational, 2A Post ... 61
Hydrograph No. 3, Rational, 3A Pre ... 62
Hydrograph No. 4, Rational, 4A Pre ... 63
Hydrograph No. 5, Rational, 5A Pre ... 64
Hydrograph No. 6, Rational, 6A Pre ... 65
Hydrograph No. 7, Rational, 6A Post ... 66
Hydrograph No. 8, Rational, 4A Post ... 67
Hydrograph No. 9, Rational, 7A Pre ... 68
Hydrograph No. 10, Rational, 7A Post ... 69
Hydrograph No. 11, Rational, 8A Pre ... 70
Hydrograph No. 12, Rational, 8A Post ... 71
Hydrograph No. 13, Rational, 2A Pre ... 72
Hydrograph No. 14, Rational, 5A Post ... 73
Hydrograph No. 15, Rational, 1A Post ... 74
Hydrograph No. 16, Combine, 1A & 2A Pre Combined ... 75
Hydrograph No. 17, Combine, 1A & 2A Post Combined ... 76
Hydrograph No. 18, Combine, 3A & 4A Pre Combined ... 77
Hydrograph No. 19, Rational, 3A Post ... 78
Hydrograph No. 20, Combine, 3A & 4A Post Combined ... 79
Hydrograph No. 21, Combine, Design Point 5 Pre Dev ... 80
Hydrograph No. 22, Combine, Design Point 5 Post Dev ... 81
Hydrograph No. 23, Rational, 2A-1 Post Dev with mediation ... 82
Hydrograph No. 24, Rational, 1A Post Dev With mediation ... 83
Hydrograph No. 25, Rational, 2A-2 Post Dev With mediation ... 84
Hydrograph No. 26, Rational, 2A-3 Post Dev with Mediation ... 85
Hydrograph No. 27, Reservoir, Pond South of Lot 1 ... 86
Hydrograph No. 28, Reservoir, Pond b/w 1 & 2 ... 87
Hydrograph No. 29, Reservoir, Lot 3 Pond ... 88
Hydrograph No. 30, Combine, Design Point 2 ... 89
Hydrograph No. 31, Rational, 6A post Dev with mediation ... 90
Hydrograph No. 32, Rational, 7A Post With Mediation ... 91
Hydrograph No. 33, Rational, 8A Post with Mediation ... 92
Hydrograph No. 34, Reservoir, Ppond for 7A ... 93
Hydrograph No. 35, Reservoir, Pond for 8A ... 94
Hydrograph No. 36, Rational, 5A Post wth mediation ... 95

Hydrograph No. 37, Rational, 3A Post Dev with mediation ... 96
Hydrograph No. 38, Rational, 4A Post Dev with mediation ... 97
Hydrograph No. 39, Combine, Water Towards road ... 98
Hydrograph No. 40, Reservoir, <no description> ... 99
Hydrograph No. 41, Combine, Pre Dev Design Point 6 ... 100
Hydrograph No. 42, Reach, <no description> ... 101
Hydrograph No. 43, Combine, <no description> ... 102
Hydrograph No. 44, Reach, <no description> ... 103
Hydrograph No. 45, Combine, Post Dev with mediation Design Point 6 ... 104
Hydrograph No. 46, Combine, <no description> ... 105

10 - Year

Summary Report ... 106
Hydrograph Reports ... 108
Hydrograph No. 1, Rational, 1A Pre ... 108
Hydrograph No. 2, Rational, 2A Post ... 109
Hydrograph No. 3, Rational, 3A Pre ... 110
Hydrograph No. 4, Rational, 4A Pre ... 111
Hydrograph No. 5, Rational, 5A Pre ... 112
Hydrograph No. 6, Rational, 6A Pre ... 113
Hydrograph No. 7, Rational, 6A Post ... 114
Hydrograph No. 8, Rational, 4A Post ... 115
Hydrograph No. 9, Rational, 7A Pre ... 116
Hydrograph No. 10, Rational, 7A Post ... 117
Hydrograph No. 11, Rational, 8A Pre ... 118
Hydrograph No. 12, Rational, 8A Post ... 119
Hydrograph No. 13, Rational, 2A Pre ... 120
Hydrograph No. 14, Rational, 5A Post ... 121
Hydrograph No. 15, Rational, 1A Post ... 122
Hydrograph No. 16, Combine, 1A & 2A Pre Combined ... 123
Hydrograph No. 17, Combine, 1A & 2A Post Combined ... 124
Hydrograph No. 18, Combine, 3A & 4A Pre Combined ... 125
Hydrograph No. 19, Rational, 3A Post ... 126
Hydrograph No. 20, Combine, 3A & 4A Post Combined ... 127
Hydrograph No. 21, Combine, Design Point 5 Pre Dev ... 128
Hydrograph No. 22, Combine, Design Point 5 Post Dev ... 129
Hydrograph No. 23, Rational, 2A-1 Post Dev with mediation ... 130
Hydrograph No. 24, Rational, 1A Post Dev With mediation ... 131
Hydrograph No. 25, Rational, 2A-2 Post Dev With mediation ... 132
Hydrograph No. 26, Rational, 2A-3 Post Dev with Mediation ... 133
Hydrograph No. 27, Reservoir, Pond South of Lot 1 ... 134
Hydrograph No. 28, Reservoir, Pond b/w 1 & 2 ... 135
Hydrograph No. 29, Reservoir, Lot 3 Pond ... 136
Hydrograph No. 30, Combine, Design Point 2 ... 137
Hydrograph No. 31, Rational, 6A post Dev with mediation ... 138
Hydrograph No. 32, Rational, 7A Post With Mediation ... 139
Hydrograph No. 33, Rational, 8A Post with Mediation ... 140
Hydrograph No. 34, Reservoir, Ppond for 7A ... 141
Hydrograph No. 35, Reservoir, Pond for 8A ... 142
Hydrograph No. 36, Rational, 5A Post wth mediation ... 143
Hydrograph No. 37, Rational, 3A Post Dev with mediation ... 144

Hydrograph No. 38, Rational, 4A Post Dev with mediation ... 145
Hydrograph No. 39, Combine, Water Towards road ... 146
Hydrograph No. 40, Reservoir, <no description> ... 147
Hydrograph No. 41, Combine, Pre Dev Design Point 6 ... 148
Hydrograph No. 42, Reach, <no description> ... 149
Hydrograph No. 43, Combine, <no description> ... 150
Hydrograph No. 44, Reach, <no description> ... 151
Hydrograph No. 45, Combine, Post Dev with mediation Design Point 6 ... 152
Hydrograph No. 46, Combine, <no description> ... 153

25 - Year

Summary Report ... 154
Hydrograph Reports ... 156
Hydrograph No. 1, Rational, 1A Pre ... 156
Hydrograph No. 2, Rational, 2A Post ... 157
Hydrograph No. 3, Rational, 3A Pre ... 158
Hydrograph No. 4, Rational, 4A Pre ... 159
Hydrograph No. 5, Rational, 5A Pre ... 160
Hydrograph No. 6, Rational, 6A Pre ... 161
Hydrograph No. 7, Rational, 6A Post ... 162
Hydrograph No. 8, Rational, 4A Post ... 163
Hydrograph No. 9, Rational, 7A Pre ... 164
Hydrograph No. 10, Rational, 7A Post ... 165
Hydrograph No. 11, Rational, 8A Pre ... 166
Hydrograph No. 12, Rational, 8A Post ... 167
Hydrograph No. 13, Rational, 2A Pre ... 168
Hydrograph No. 14, Rational, 5A Post ... 169
Hydrograph No. 15, Rational, 1A Post ... 170
Hydrograph No. 16, Combine, 1A & 2A Pre Combined ... 171
Hydrograph No. 17, Combine, 1A & 2A Post Combined ... 172
Hydrograph No. 18, Combine, 3A & 4A Pre Combined ... 173
Hydrograph No. 19, Rational, 3A Post ... 174
Hydrograph No. 20, Combine, 3A & 4A Post Combined ... 175
Hydrograph No. 21, Combine, Design Point 5 Pre Dev ... 176
Hydrograph No. 22, Combine, Design Point 5 Post Dev ... 177
Hydrograph No. 23, Rational, 2A-1 Post Dev with mediation ... 178
Hydrograph No. 24, Rational, 1A Post Dev With mediation ... 179
Hydrograph No. 25, Rational, 2A-2 Post Dev With mediation ... 180
Hydrograph No. 26, Rational, 2A-3 Post Dev with Mediation ... 181
Hydrograph No. 27, Reservoir, Pond South of Lot 1 ... 182
Hydrograph No. 28, Reservoir, Pond b/w 1 & 2 ... 183
Hydrograph No. 29, Reservoir, Lot 3 Pond ... 184
Hydrograph No. 30, Combine, Design Point 2 ... 185
Hydrograph No. 31, Rational, 6A post Dev with mediation ... 186
Hydrograph No. 32, Rational, 7A Post With Mediation ... 187
Hydrograph No. 33, Rational, 8A Post with Mediation ... 188
Hydrograph No. 34, Reservoir, Ppond for 7A ... 189
Hydrograph No. 35, Reservoir, Pond for 8A ... 190
Hydrograph No. 36, Rational, 5A Post wth mediation ... 191
Hydrograph No. 37, Rational, 3A Post Dev with mediation ... 192
Hydrograph No. 38, Rational, 4A Post Dev with mediation ... 193

Hydrograph No. 39, Combine, Water Towards road 194
Hydrograph No. 40, Reservoir, <no description> 195
Hydrograph No. 41, Combine, Pre Dev Design Point 6 196
Hydrograph No. 42, Reach, <no description> 197
Hydrograph No. 43, Combine, <no description> 198
Hydrograph No. 44, Reach, <no description> 199
Hydrograph No. 45, Combine, Post Dev with mediation Design Point 6 200
Hydrograph No. 46, Combine, <no description> 201

50 - Year

Summary Report 202
Hydrograph Reports 204
Hydrograph No. 1, Rational, 1A Pre 204
Hydrograph No. 2, Rational, 2A Post 205
Hydrograph No. 3, Rational, 3A Pre 206
Hydrograph No. 4, Rational, 4A Pre 207
Hydrograph No. 5, Rational, 5A Pre 208
Hydrograph No. 6, Rational, 6A Pre 209
Hydrograph No. 7, Rational, 6A Post 210
Hydrograph No. 8, Rational, 4A Post 211
Hydrograph No. 9, Rational, 7A Pre 212
Hydrograph No. 10, Rational, 7A Post 213
Hydrograph No. 11, Rational, 8A Pre 214
Hydrograph No. 12, Rational, 8A Post 215
Hydrograph No. 13, Rational, 2A Pre 216
Hydrograph No. 14, Rational, 5A Post 217
Hydrograph No. 15, Rational, 1A Post 218
Hydrograph No. 16, Combine, 1A & 2A Pre Combined 219
Hydrograph No. 17, Combine, 1A & 2A Post Combined 220
Hydrograph No. 18, Combine, 3A & 4A Pre Combined 221
Hydrograph No. 19, Rational, 3A Post 222
Hydrograph No. 20, Combine, 3A & 4A Post Combined 223
Hydrograph No. 21, Combine, Design Point 5 Pre Dev 224
Hydrograph No. 22, Combine, Design Point 5 Post Dev 225
Hydrograph No. 23, Rational, 2A-1 Post Dev with mediation 226
Hydrograph No. 24, Rational, 1A Post Dev With mediation 227
Hydrograph No. 25, Rational, 2A-2 Post Dev With mediation 228
Hydrograph No. 26, Rational, 2A-3 Post Dev with Mediation 229
Hydrograph No. 27, Reservoir, Pond South of Lot 1 230
Hydrograph No. 28, Reservoir, Pond b/w 1 & 2 231
Hydrograph No. 29, Reservoir, Lot 3 Pond 232
Hydrograph No. 30, Combine, Design Point 2 233
Hydrograph No. 31, Rational, 6A post Dev with mediation 234
Hydrograph No. 32, Rational, 7A Post With Mediation 235
Hydrograph No. 33, Rational, 8A Post with Mediation 236
Hydrograph No. 34, Reservoir, Ppond for 7A 237
Hydrograph No. 35, Reservoir, Pond for 8A 238
Hydrograph No. 36, Rational, 5A Post wth mediation 239
Hydrograph No. 37, Rational, 3A Post Dev with mediation 240
Hydrograph No. 38, Rational, 4A Post Dev with mediation 241
Hydrograph No. 39, Combine, Water Towards road 242

Hydrograph No. 40, Reservoir, <no description>..... 243
Hydrograph No. 41, Combine, Pre Dev Design Point 6..... 244
Hydrograph No. 42, Reach, <no description>..... 245
Hydrograph No. 43, Combine, <no description>..... 246
Hydrograph No. 44, Reach, <no description>..... 247
Hydrograph No. 45, Combine, Post Dev with mediation Design Point 6..... 248
Hydrograph No. 46, Combine, <no description>..... 249

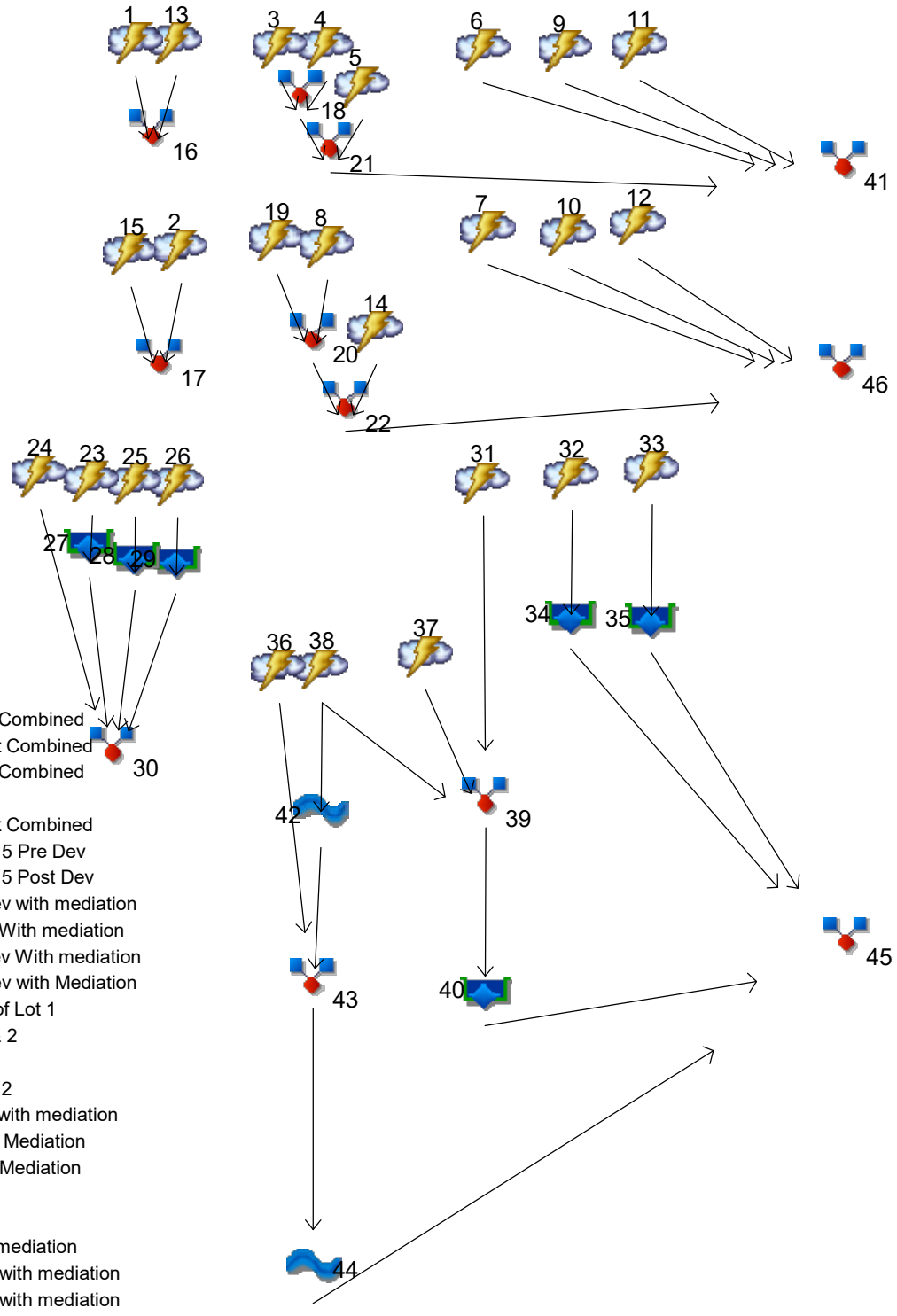
100 - Year

Summary Report..... 250
Hydrograph Reports..... 252
Hydrograph No. 1, Rational, 1A Pre..... 252
Hydrograph No. 2, Rational, 2A Post..... 253
Hydrograph No. 3, Rational, 3A Pre..... 254
Hydrograph No. 4, Rational, 4A Pre..... 255
Hydrograph No. 5, Rational, 5A Pre..... 256
Hydrograph No. 6, Rational, 6A Pre..... 257
Hydrograph No. 7, Rational, 6A Post..... 258
Hydrograph No. 8, Rational, 4A Post..... 259
Hydrograph No. 9, Rational, 7A Pre..... 260
Hydrograph No. 10, Rational, 7A Post..... 261
Hydrograph No. 11, Rational, 8A Pre..... 262
Hydrograph No. 12, Rational, 8A Post..... 263
Hydrograph No. 13, Rational, 2A Pre..... 264
Hydrograph No. 14, Rational, 5A Post..... 265
Hydrograph No. 15, Rational, 1A Post..... 266
Hydrograph No. 16, Combine, 1A & 2A Pre Combined..... 267
Hydrograph No. 17, Combine, 1A & 2A Post Combined..... 268
Hydrograph No. 18, Combine, 3A & 4A Pre Combined..... 269
Hydrograph No. 19, Rational, 3A Post..... 270
Hydrograph No. 20, Combine, 3A & 4A Post Combined..... 271
Hydrograph No. 21, Combine, Design Point 5 Pre Dev..... 272
Hydrograph No. 22, Combine, Design Point 5 Post Dev..... 273
Hydrograph No. 23, Rational, 2A-1 Post Dev with mediation..... 274
Hydrograph No. 24, Rational, 1A Post Dev With mediation..... 275
Hydrograph No. 25, Rational, 2A-2 Post Dev With mediation..... 276
Hydrograph No. 26, Rational, 2A-3 Post Dev with Mediation..... 277
Hydrograph No. 27, Reservoir, Pond South of Lot 1..... 278
Hydrograph No. 28, Reservoir, Pond b/w 1 & 2..... 279
Hydrograph No. 29, Reservoir, Lot 3 Pond..... 280
Hydrograph No. 30, Combine, Design Point 2..... 281
Hydrograph No. 31, Rational, 6A post Dev with mediation..... 282
Hydrograph No. 32, Rational, 7A Post With Mediation..... 283
Hydrograph No. 33, Rational, 8A Post with Mediation..... 284
Hydrograph No. 34, Reservoir, Ppond for 7A..... 285
Hydrograph No. 35, Reservoir, Pond for 8A..... 286
Hydrograph No. 36, Rational, 5A Post wth mediation..... 287
Hydrograph No. 37, Rational, 3A Post Dev with mediation..... 288
Hydrograph No. 38, Rational, 4A Post Dev with mediation..... 289
Hydrograph No. 39, Combine, Water Towards road..... 290
Hydrograph No. 40, Reservoir, <no description>..... 291

Hydrograph No. 41, Combine, Pre Dev Design Point 6..... 292
Hydrograph No. 42, Reach, <no description>..... 293
Hydrograph No. 43, Combine, <no description>..... 294
Hydrograph No. 44, Reach, <no description>..... 295
Hydrograph No. 45, Combine, Post Dev with mediation Design Point 6..... 296
Hydrograph No. 46, Combine, <no description>..... 297

IDF Report..... 298

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	Rational	1A Pre
2	Rational	2A Post
3	Rational	3A Pre
4	Rational	4A Pre
5	Rational	5A Pre
6	Rational	6A Pre
7	Rational	6A Post
8	Rational	4A Post
9	Rational	7A Pre
10	Rational	7A Post
11	Rational	8A Pre
12	Rational	8A Post
13	Rational	2A Pre
14	Rational	5A Post
15	Rational	1A Post
16	Combine	1A & 2A Pre Combined
17	Combine	1A & 2A Post Combined
18	Combine	3A & 4A Pre Combined
19	Rational	3A Post
20	Combine	3A & 4A Post Combined
21	Combine	Design Point 5 Pre Dev
22	Combine	Design Point 5 Post Dev
23	Rational	2A-1 Post Dev with mediation
24	Rational	1A Post Dev With mediation
25	Rational	2A-2 Post Dev With mediation
26	Rational	2A-3 Post Dev with Mediation
27	Reservoir	Pond South of Lot 1
28	Reservoir	Pond b/w 1 & 2
29	Reservoir	Lot 3 Pond
30	Combine	Design Point 2
31	Rational	6A post Dev with mediation
32	Rational	7A Post With Mediation
33	Rational	8A Post with Mediation
34	Reservoir	Ppond for 7A
35	Reservoir	Pond for 8A
36	Rational	5A Post wth mediation
37	Rational	3A Post Dev with mediation
38	Rational	4A Post Dev with mediation
39	Combine	Water Towards road
40	Reservoir	<no description>
41	Combine	Pre Dev Design Point 6
42	Reach	<no description>
43	Combine	<no description>
44	Reach	<no description>
45	Combine	Post Dev with mediation Design Point 6
46	Combine	<no description>

Hydrograph Return Period Recap

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	Rational	------	-------	23.61	-------	31.69	38.61	48.17	56.29	65.05	1A Pre
2	Rational	------	-------	1.877	-------	2.519	3.069	3.830	4.475	5.172	2A Post
3	Rational	------	-------	1.249	-------	1.677	2.043	2.549	2.978	3.442	3A Pre
4	Rational	------	-------	1.272	-------	1.707	2.080	2.596	3.033	3.505	4A Pre
5	Rational	------	-------	1.616	-------	2.169	2.643	3.297	3.853	4.453	5A Pre
6	Rational	------	-------	1.215	-------	1.631	1.987	2.479	2.896	3.347	6A Pre
7	Rational	------	-------	1.631	-------	2.189	2.668	3.328	3.889	4.495	6A Post
8	Rational	------	-------	1.498	-------	2.011	2.450	3.057	3.572	4.128	4A Post
9	Rational	------	-------	0.287	-------	0.385	0.469	0.585	0.683	0.789	7A Pre
10	Rational	------	-------	0.414	-------	0.555	0.677	0.844	0.987	1.140	7A Post
11	Rational	------	-------	0.252	-------	0.338	0.412	0.514	0.601	0.695	8A Pre
12	Rational	------	-------	0.303	-------	0.406	0.495	0.617	0.721	0.834	8A Post
13	Rational	------	-------	1.536	-------	2.061	2.511	3.134	3.661	4.232	2A Pre
14	Rational	------	-------	1.795	-------	2.410	2.936	3.664	4.281	4.947	5A Post
15	Rational	------	-------	23.61	-------	31.69	38.61	48.17	56.29	65.05	1A Post
16	Combine	1, 13,	-------	25.14	-------	33.75	41.12	51.31	59.95	69.28	1A & 2A Pre Combined
17	Combine	2, 15,	-------	25.48	-------	34.21	41.68	52.00	60.76	70.22	1A & 2A Post Combined
18	Combine	3, 4,	-------	2.521	-------	3.384	4.123	5.145	6.011	6.947	3A & 4A Pre Combined
19	Rational	------	-------	1.249	-------	1.677	2.043	2.549	2.978	3.442	3A Post
20	Combine	8, 19	-------	2.747	-------	3.688	4.493	5.606	6.550	7.571	3A & 4A Post Combined
21	Combine	5, 18,	-------	4.137	-------	5.553	6.766	8.442	9.864	11.40	Design Point 5 Pre Dev
22	Combine	14, 20,	-------	4.543	-------	6.098	7.429	9.270	10.83	12.52	Design Point 5 Post Dev
23	Rational	------	-------	0.252	-------	0.338	0.412	0.514	0.601	0.695	2A-1 Post Dev with mediation
24	Rational	------	-------	22.99	-------	30.86	37.60	46.91	54.81	63.35	1A Post Dev With mediation
25	Rational	------	-------	0.868	-------	1.166	1.420	1.772	2.071	2.393	2A-2 Post Dev With mediation
26	Rational	------	-------	0.756	-------	1.015	1.237	1.543	1.803	2.084	2A-3 Post Dev with Mediation
27	Reservoir	23	-------	0.000	-------	0.085	0.227	0.387	0.513	0.665	Pond South of Lot 1
28	Reservoir	25	-------	0.852	-------	1.138	1.395	1.766	2.071	2.371	Pond b/w 1 & 2
29	Reservoir	26	-------	0.646	-------	1.145	1.297	1.511	1.808	2.041	Lot 3 Pond
30	Combine	24, 27, 28, 29	-------	23.84	-------	33.14	40.11	50.19	58.69	68.03	Design Point 2
31	Rational	------	-------	1.631	-------	2.189	2.668	3.328	3.889	4.495	6A post Dev with mediation
32	Rational	------	-------	0.414	-------	0.555	0.677	0.844	0.987	1.140	7A Post With Mediation
33	Rational	------	-------	0.303	-------	0.406	0.495	0.617	0.721	0.834	8A Post with Mediation
34	Reservoir	32	-------	0.000	-------	0.000	0.000	0.000	0.000	0.000	Ppond for 7A

Hydrograph Return Period Recap

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	
35	Reservoir	33	-------	0.000	-------	0.000	0.000	0.000	0.170	0.416	Pond for 8A
36	Rational	------	-------	1.795	-------	2.410	2.936	3.664	4.281	4.947	5A Post wth mediation
37	Rational	------	-------	1.249	-------	1.677	2.043	2.549	2.978	3.442	3A Post Dev with mediation
38	Rational	------	-------	0.148	-------	0.199	0.243	0.303	0.354	0.409	4A Post Dev with mediation
39	Combine	31, 37, 38	-------	3.029	-------	4.065	4.953	6.180	7.221	8.346	Water Towards road
40	Reservoir	39	-------	0.696	-------	2.448	3.661	5.252	6.768	7.925	<no description>
41	Combine	6, 9, 11, 21,	-------	5.891	-------	7.907	9.633	12.02	14.04	16.23	Pre Dev Design Point 6
42	Reach	38	-------	0.146	-------	0.197	0.241	0.301	0.353	0.408	<no description>
43	Combine	36, 42	-------	1.926	-------	2.587	3.152	3.934	4.598	5.315	<no description>
44	Reach	43	-------	1.757	-------	2.379	2.919	3.669	4.309	5.002	<no description>
45	Combine	34, 35, 40, 44	-------	1.757	-------	4.464	6.369	8.907	11.08	12.93	Post Dev with mediation Design Point
46	Combine	7, 10, 12, 22,	-------	6.890	-------	9.249	11.27	14.06	16.43	18.99	<no description>

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	Rational	23.61	1	10	14,165	------	------	------	1A Pre
2	Rational	1.877	1	10	1,126	------	------	------	2A Post
3	Rational	1.249	1	10	749	------	------	------	3A Pre
4	Rational	1.272	1	10	763	------	------	------	4A Pre
5	Rational	1.616	1	10	970	------	------	------	5A Pre
6	Rational	1.215	1	10	729	------	------	------	6A Pre
7	Rational	1.631	1	10	979	------	------	------	6A Post
8	Rational	1.498	1	10	899	------	------	------	4A Post
9	Rational	0.287	1	10	172	------	------	------	7A Pre
10	Rational	0.414	1	10	248	------	------	------	7A Post
11	Rational	0.252	1	10	151	------	------	------	8A Pre
12	Rational	0.303	1	10	182	------	------	------	8A Post
13	Rational	1.536	1	10	921	------	------	------	2A Pre
14	Rational	1.795	1	10	1,077	------	------	------	5A Post
15	Rational	23.61	1	10	14,165	------	------	------	1A Post
16	Combine	25.14	1	10	15,086	1, 13,	------	------	1A & 2A Pre Combined
17	Combine	25.48	1	10	15,291	2, 15,	------	------	1A & 2A Post Combined
18	Combine	2.521	1	10	1,513	3, 4,	------	------	3A & 4A Pre Combined
19	Rational	1.249	1	10	749	------	------	------	3A Post
20	Combine	2.747	1	10	1,648	8, 19	------	------	3A & 4A Post Combined
21	Combine	4.137	1	10	2,482	5, 18,	------	------	Design Point 5 Pre Dev
22	Combine	4.543	1	10	2,726	14, 20,	------	------	Design Point 5 Post Dev
23	Rational	0.252	1	10	151	------	------	------	2A-1 Post Dev with mediation
24	Rational	22.99	1	10	13,793	------	------	------	1A Post Dev With mediation
25	Rational	0.868	1	10	521	------	------	------	2A-2 Post Dev With mediation
26	Rational	0.756	1	10	454	------	------	------	2A-3 Post Dev with Mediation
27	Reservoir	0.000	1	n/a	0	23	100.63	151	Pond South of Lot 1
28	Reservoir	0.852	1	10	385	25	100.87	148	Pond b/w 1 & 2
29	Reservoir	0.646	1	12	216	26	101.88	252	Lot 3 Pond
30	Combine	23.84	1	10	14,395	24, 27, 28, 29	------	------	Design Point 2
31	Rational	1.631	1	10	979	------	------	------	6A post Dev with mediation
32	Rational	0.414	1	10	248	------	------	------	7A Post With Mediation
33	Rational	0.303	1	10	182	------	------	------	8A Post with Mediation
34	Reservoir	0.000	1	n/a	0	32	100.72	248	Ppond for 7A

Hydrograph Summary Report

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

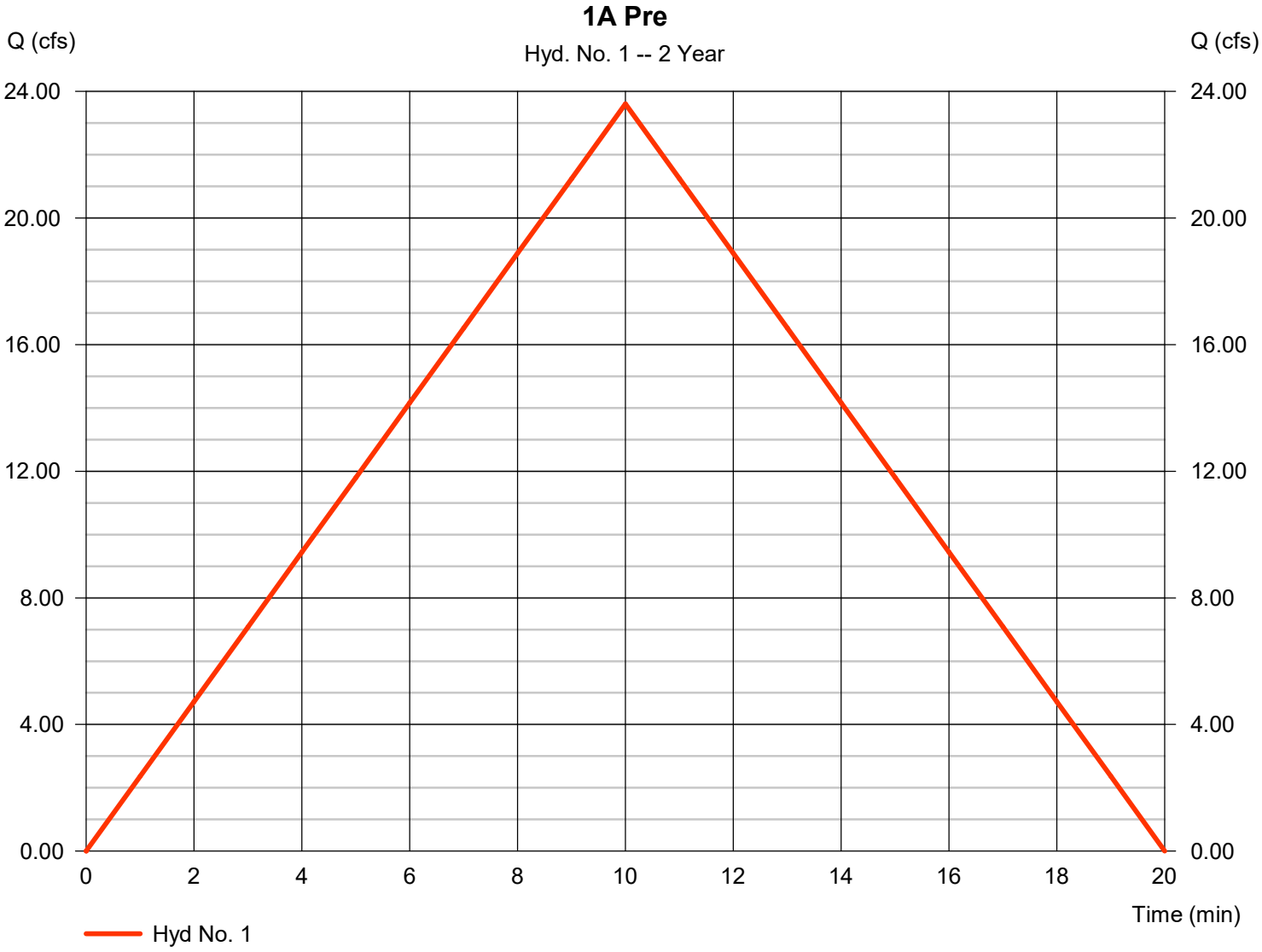
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	Reservoir	0.000	1	n/a	0	33	101.05	182	Pond for 8A
36	Rational	1.795	1	10	1,077	------	------	------	5A Post wth mediation
37	Rational	1.249	1	10	749	------	------	------	3A Post Dev with mediation
38	Rational	0.148	1	10	89	------	------	------	4A Post Dev with mediation
39	Combine	3.029	1	10	1,817	31, 37, 38	------	------	Water Towards road
40	Reservoir	0.696	1	18	166	39	102.56	1,711	<no description>
41	Combine	5.891	1	10	3,534	6, 9, 11, 21,	------	------	Pre Dev Design Point 6
42	Reach	0.146	1	11	90	38	------	------	<no description>
43	Combine	1.926	1	10	1,167	36, 42	------	------	<no description>
44	Reach	1.757	1	12	1,188	43	------	------	<no description>
45	Combine	1.757	1	12	1,355	34, 35, 40, 44	------	------	Post Dev with mediation Design Point
46	Combine	6.890	1	10	4,134	7, 10, 12, 22,	------	------	<no description>

Hydrograph Report

Hyd. No. 1

1A Pre

Hydrograph type	=	Rational	Peak discharge	=	23.61 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	14,165 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

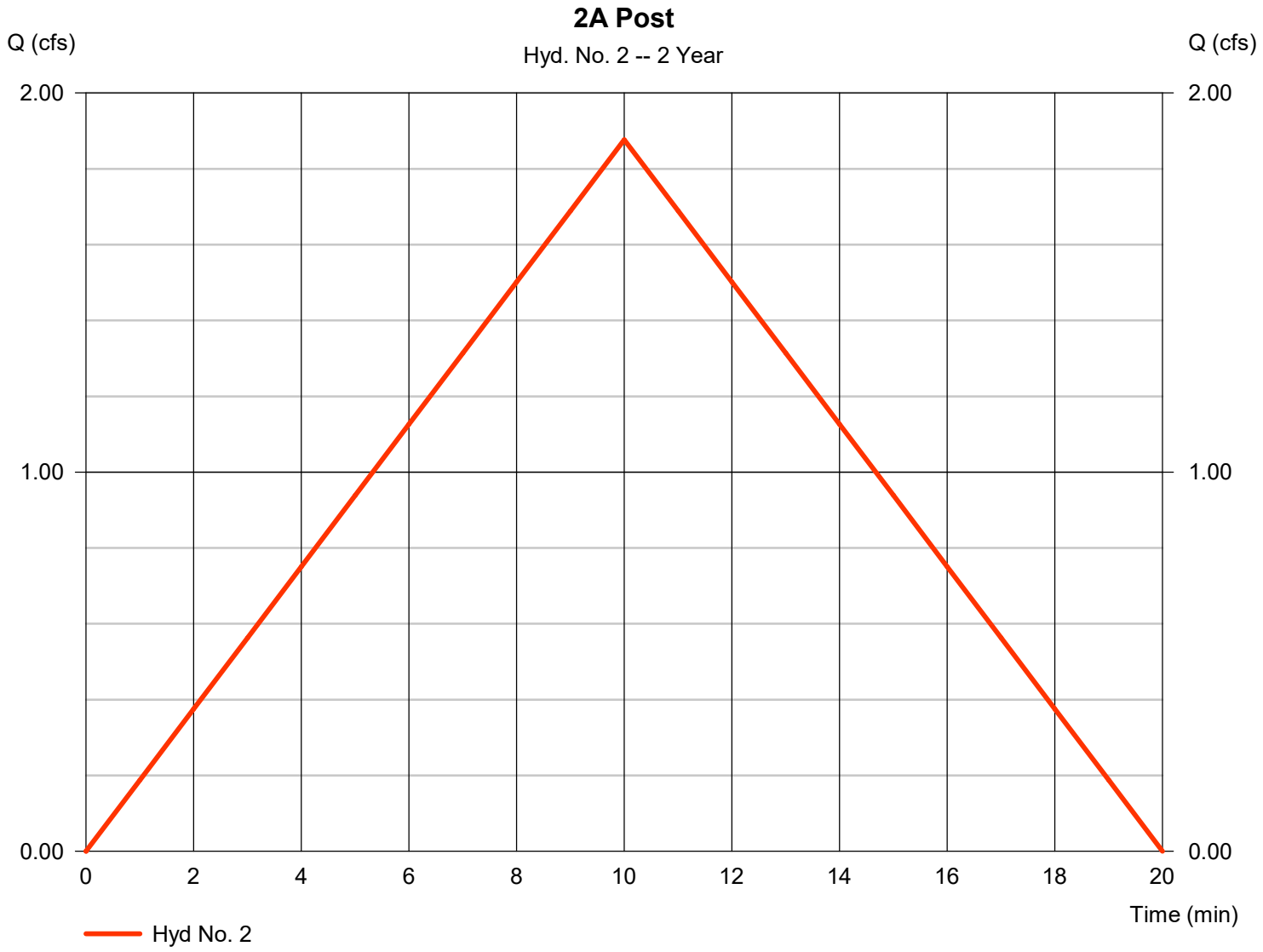


Hydrograph Report

Hyd. No. 2

2A Post

Hydrograph type	=	Rational	Peak discharge	=	1.877 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,126 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.55
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

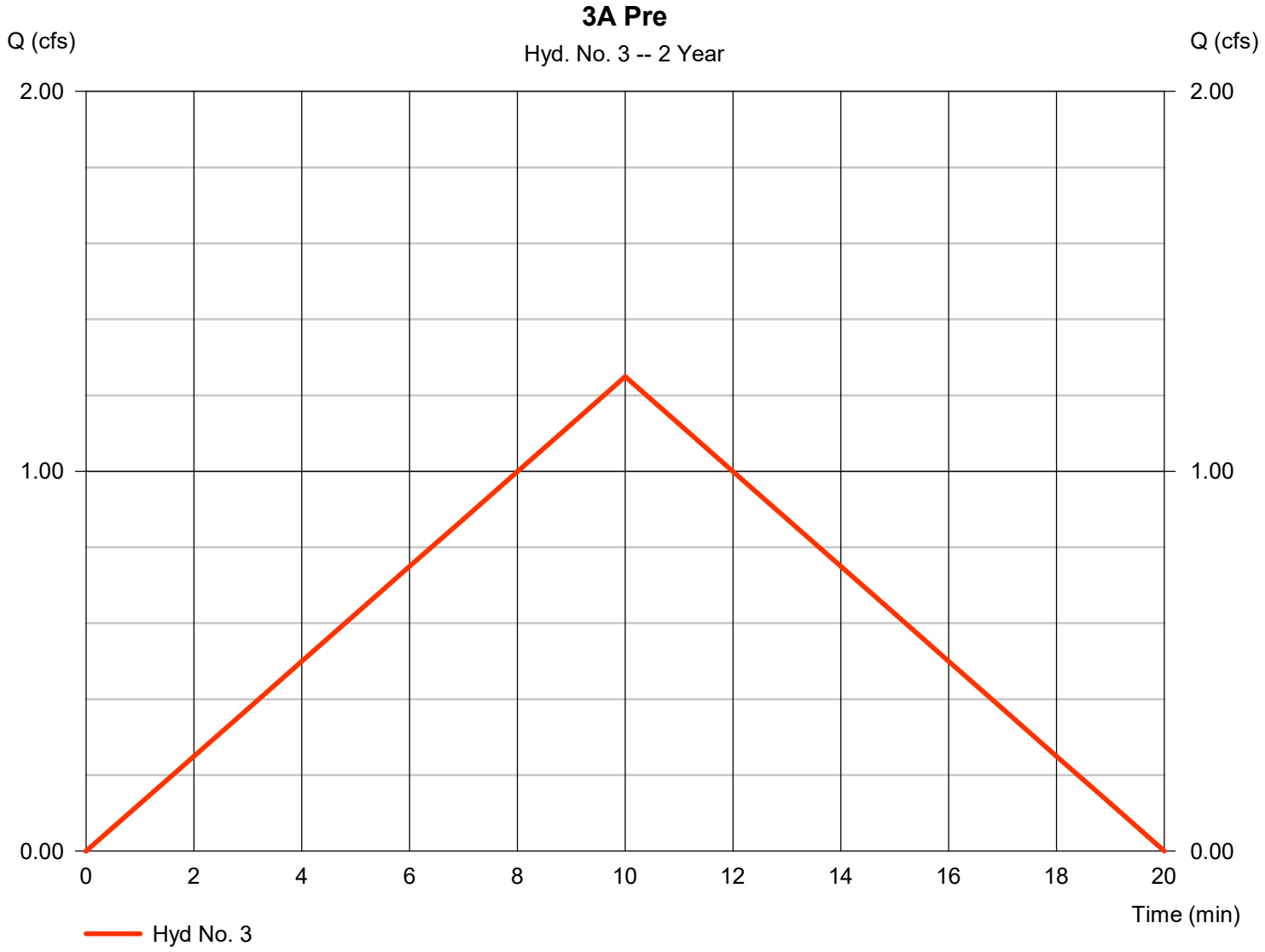


Hydrograph Report

Hyd. No. 3

3A Pre

Hydrograph type	=	Rational	Peak discharge	=	1.249 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	749 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

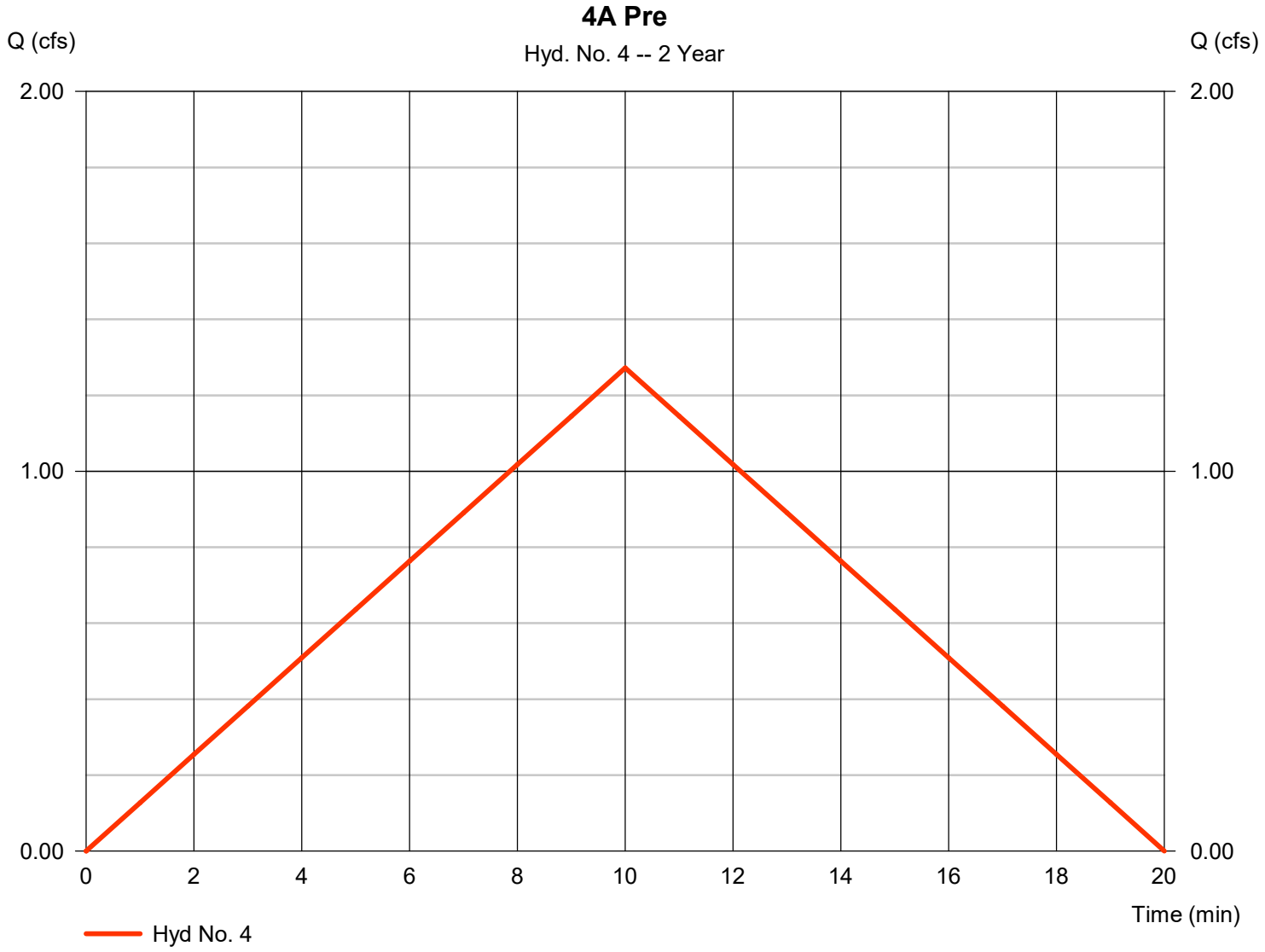


Hydrograph Report

Hyd. No. 4

4A Pre

Hydrograph type	=	Rational	Peak discharge	=	1.272 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	763 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

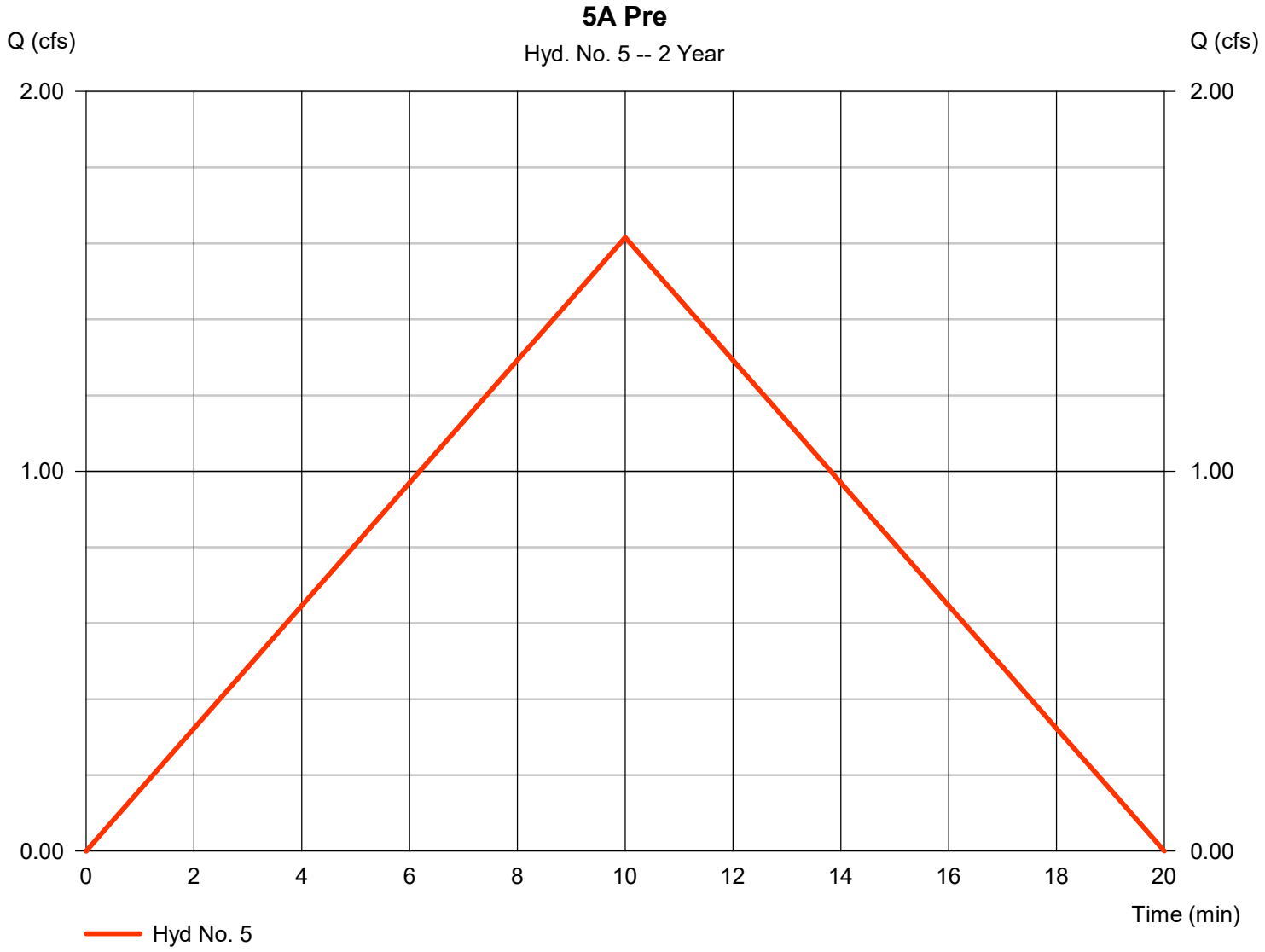


Hydrograph Report

Hyd. No. 5

5A Pre

Hydrograph type	=	Rational	Peak discharge	=	1.616 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	970 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

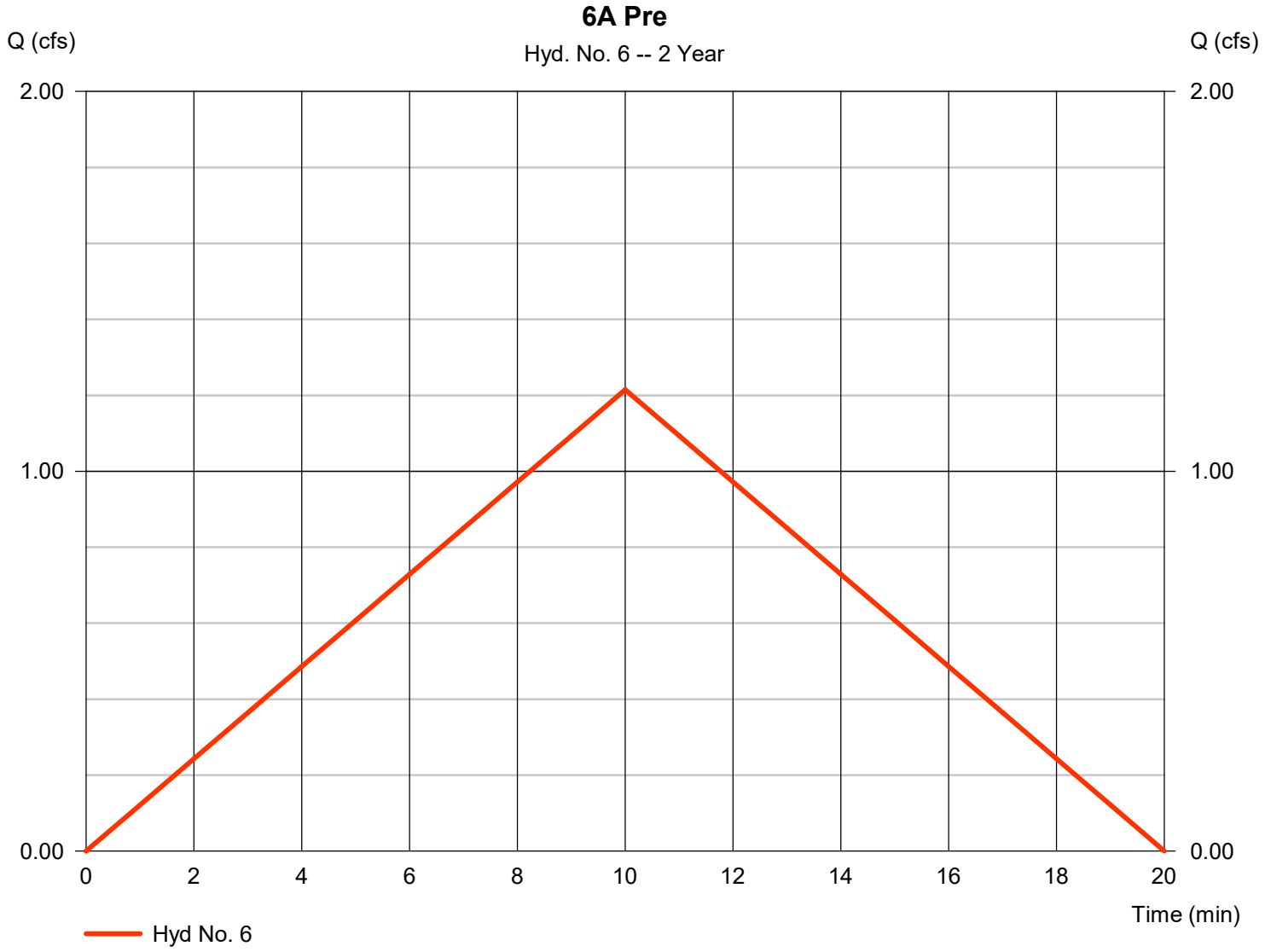


Hydrograph Report

Hyd. No. 6

6A Pre

Hydrograph type	=	Rational	Peak discharge	=	1.215 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	729 cuft
Drainage area	=	1.060 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

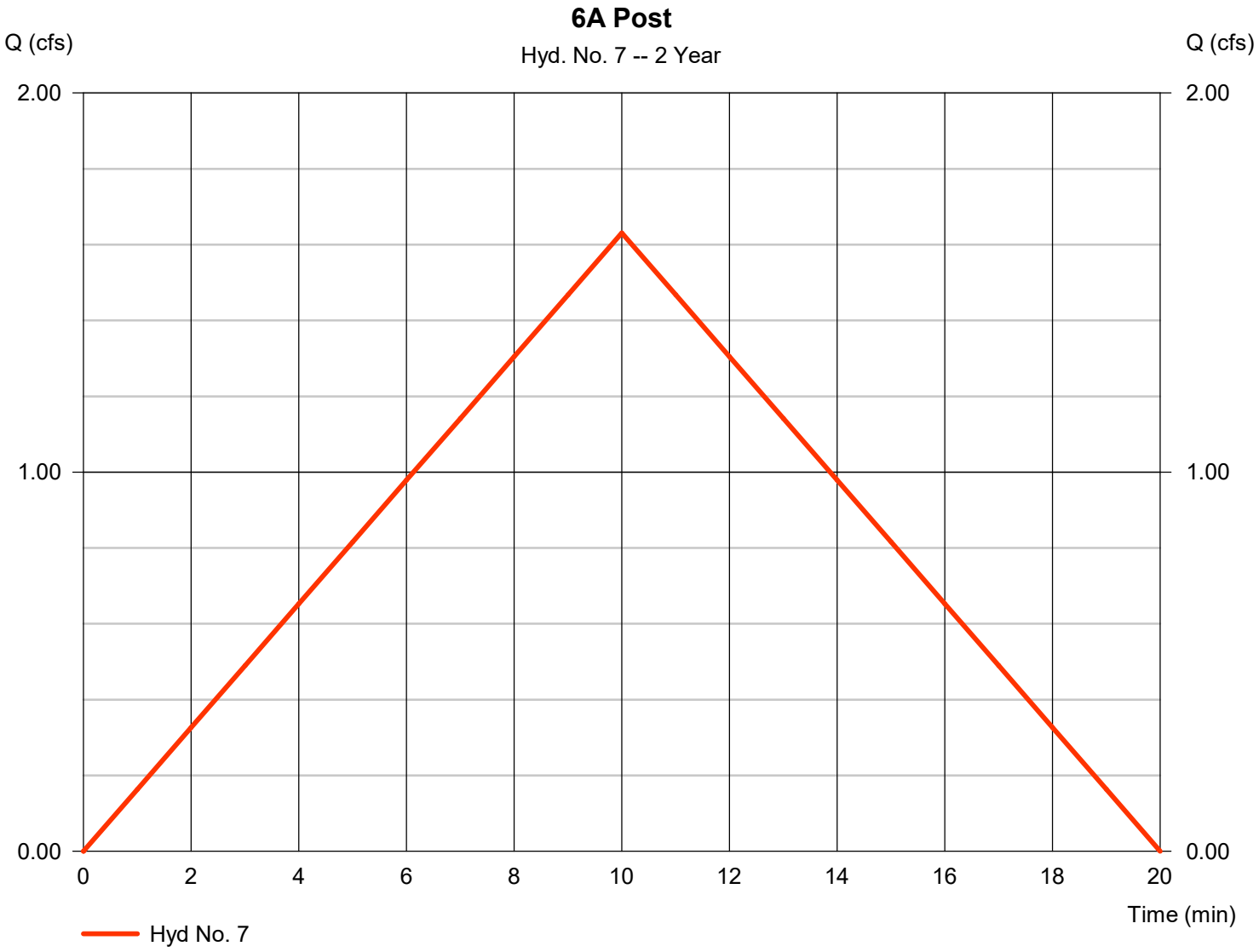


Hydrograph Report

Hyd. No. 7

6A Post

Hydrograph type	=	Rational	Peak discharge	=	1.631 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	979 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

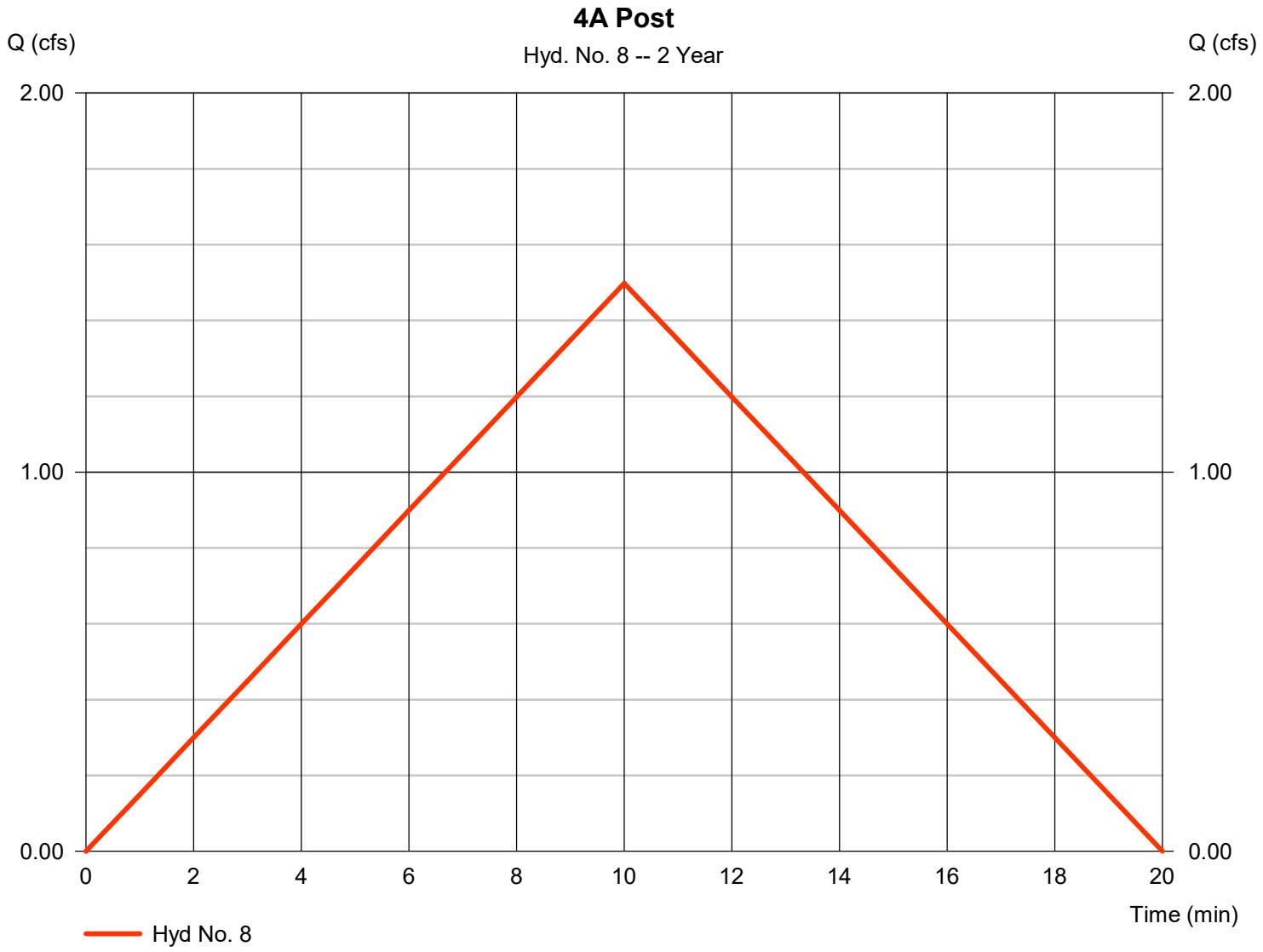


Hydrograph Report

Hyd. No. 8

4A Post

Hydrograph type	=	Rational	Peak discharge	=	1.498 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	899 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.53
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

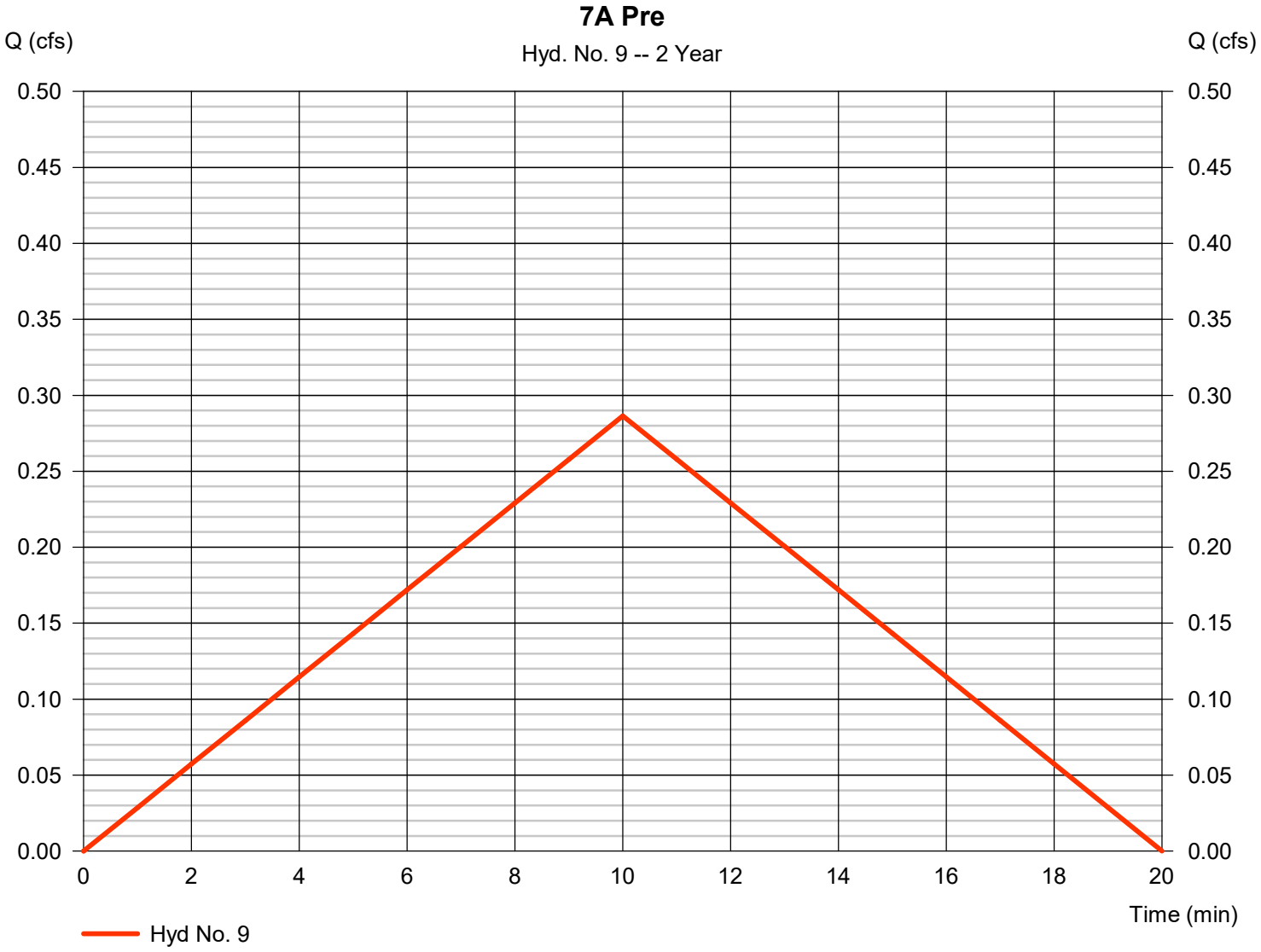


Hydrograph Report

Hyd. No. 9

7A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.287 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	172 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

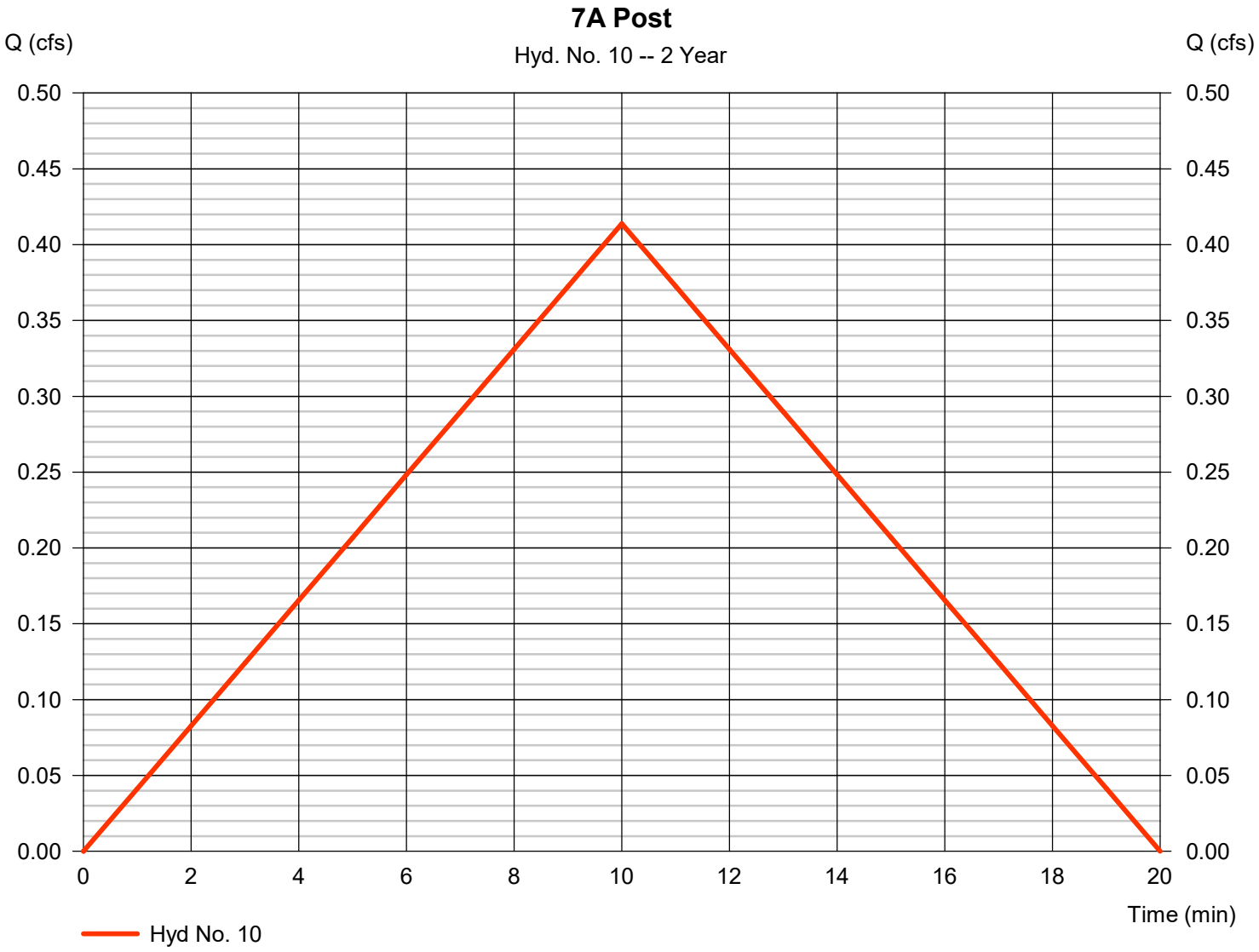


Hydrograph Report

Hyd. No. 10

7A Post

Hydrograph type	=	Rational	Peak discharge	=	0.414 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	248 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

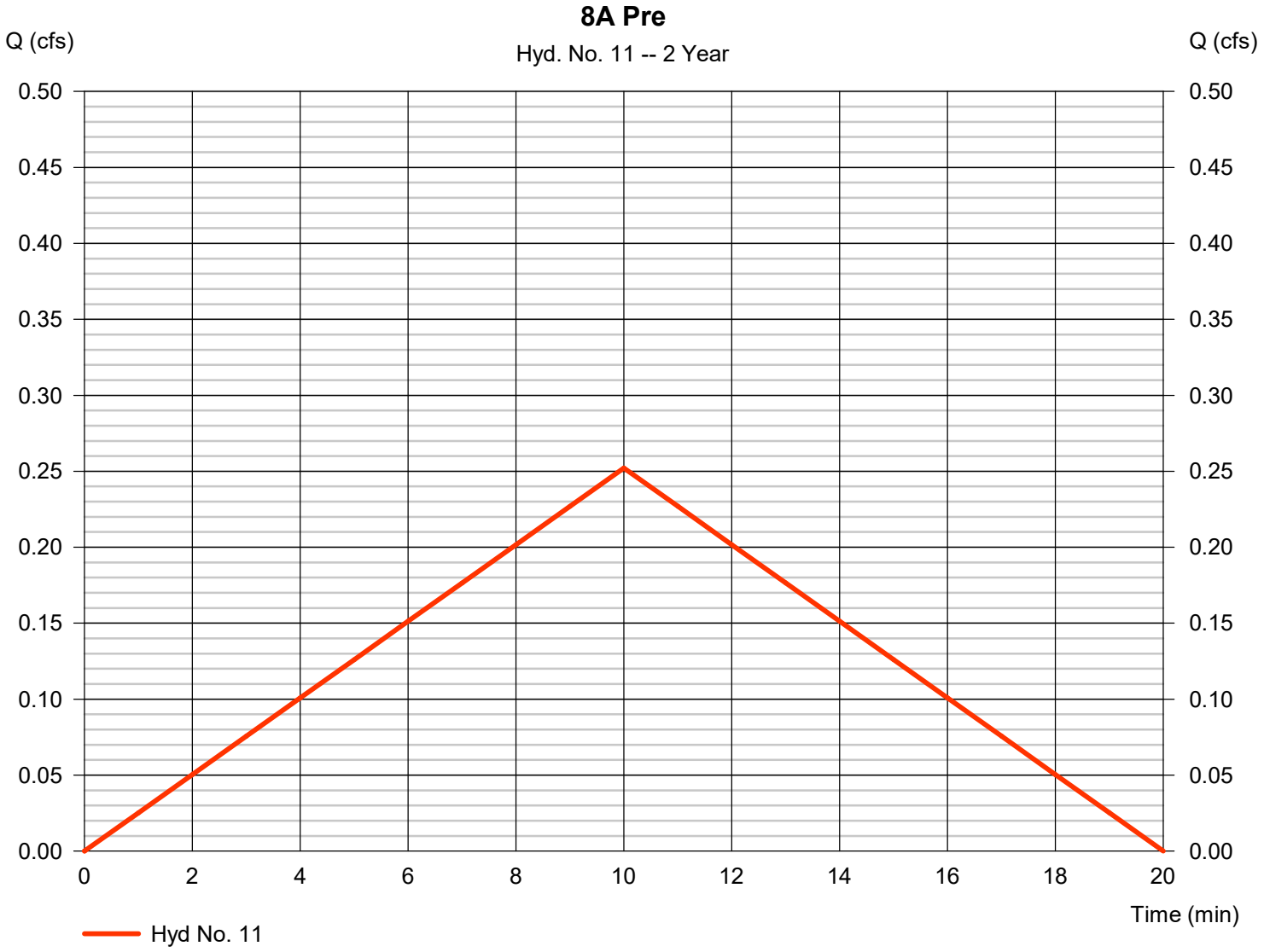


Hydrograph Report

Hyd. No. 11

8A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.252 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	151 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

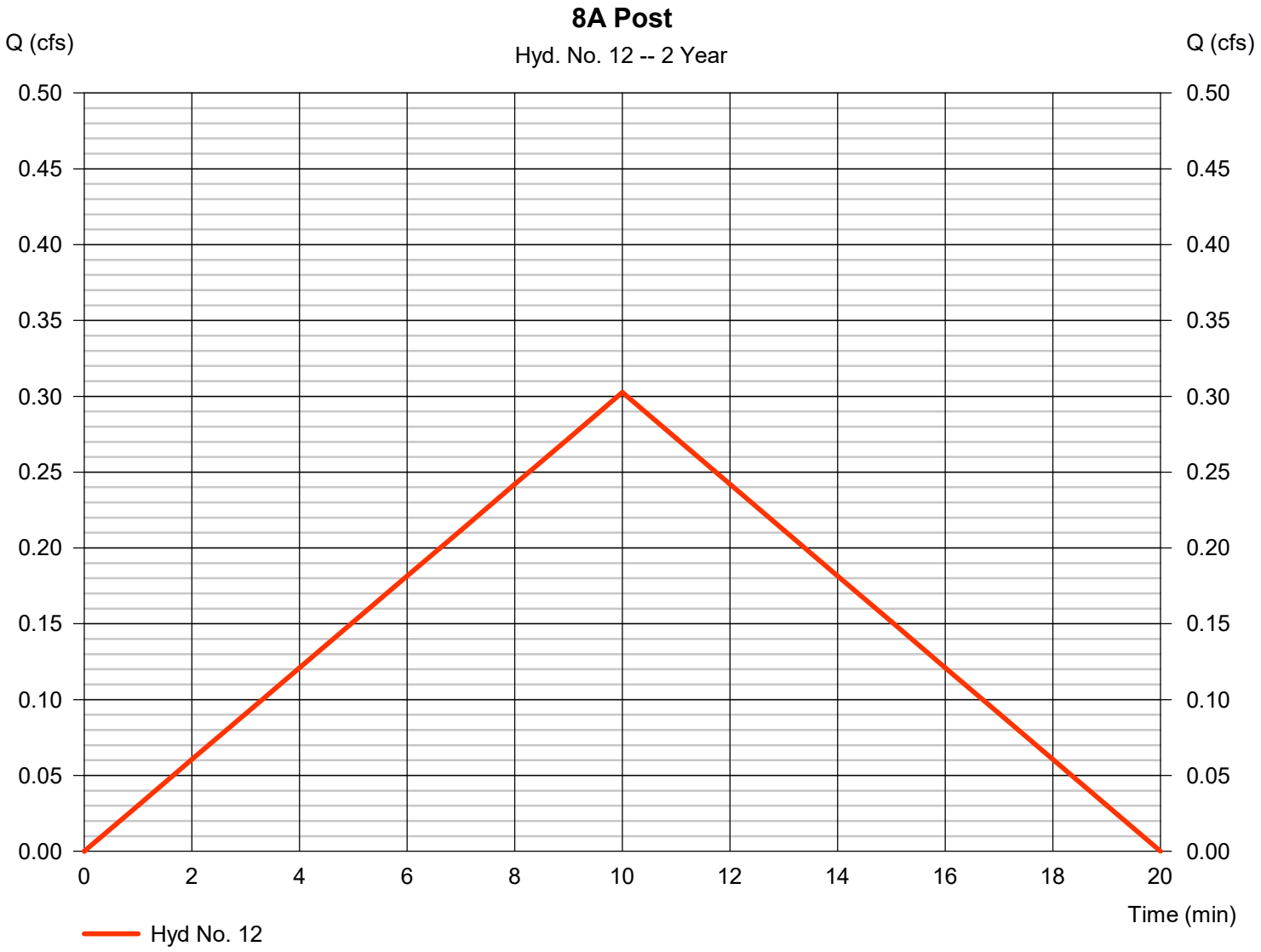


Hydrograph Report

Hyd. No. 12

8A Post

Hydrograph type	=	Rational	Peak discharge	=	0.303 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	182 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

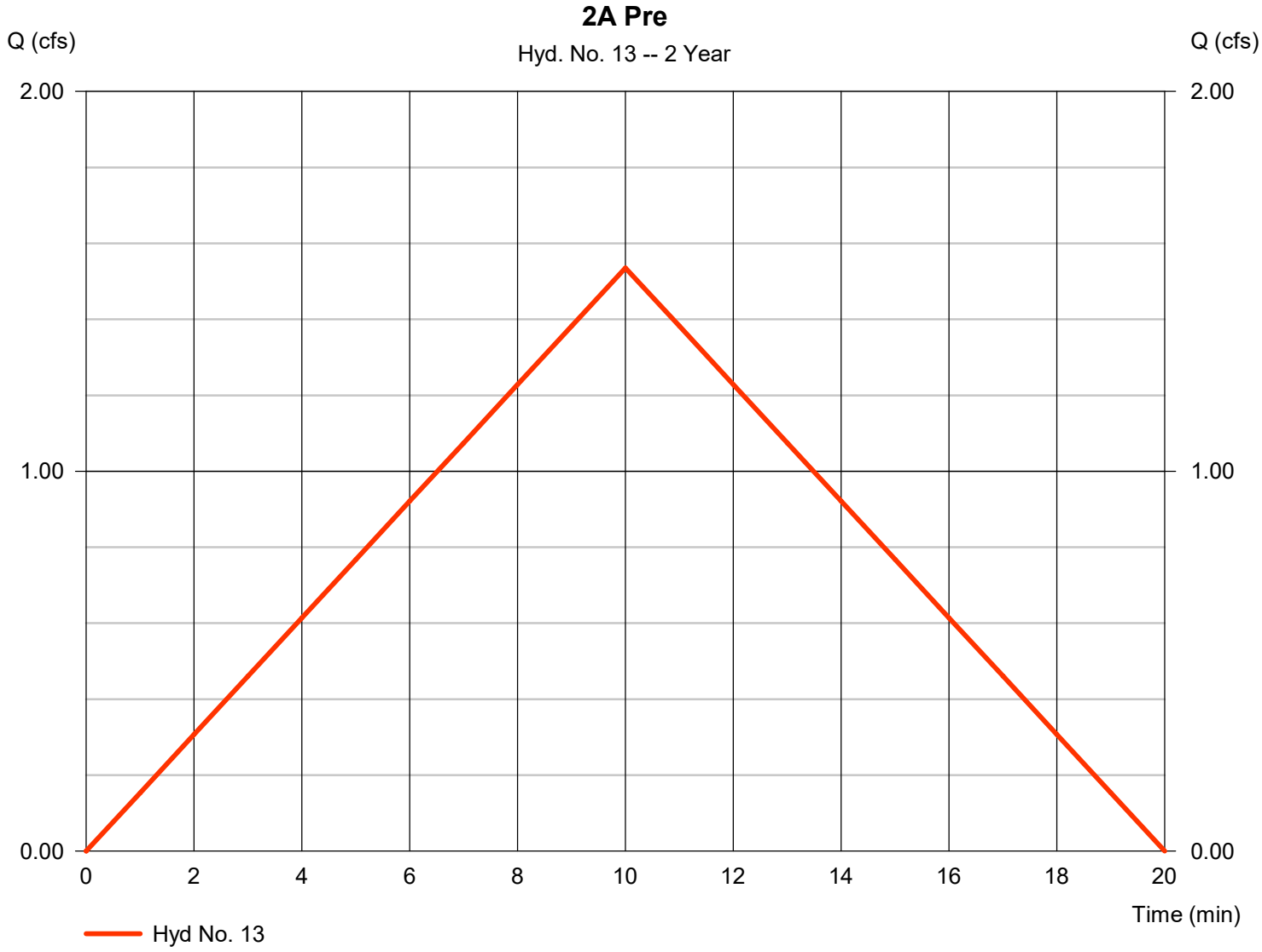


Hydrograph Report

Hyd. No. 13

2A Pre

Hydrograph type	=	Rational	Peak discharge	=	1.536 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	921 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

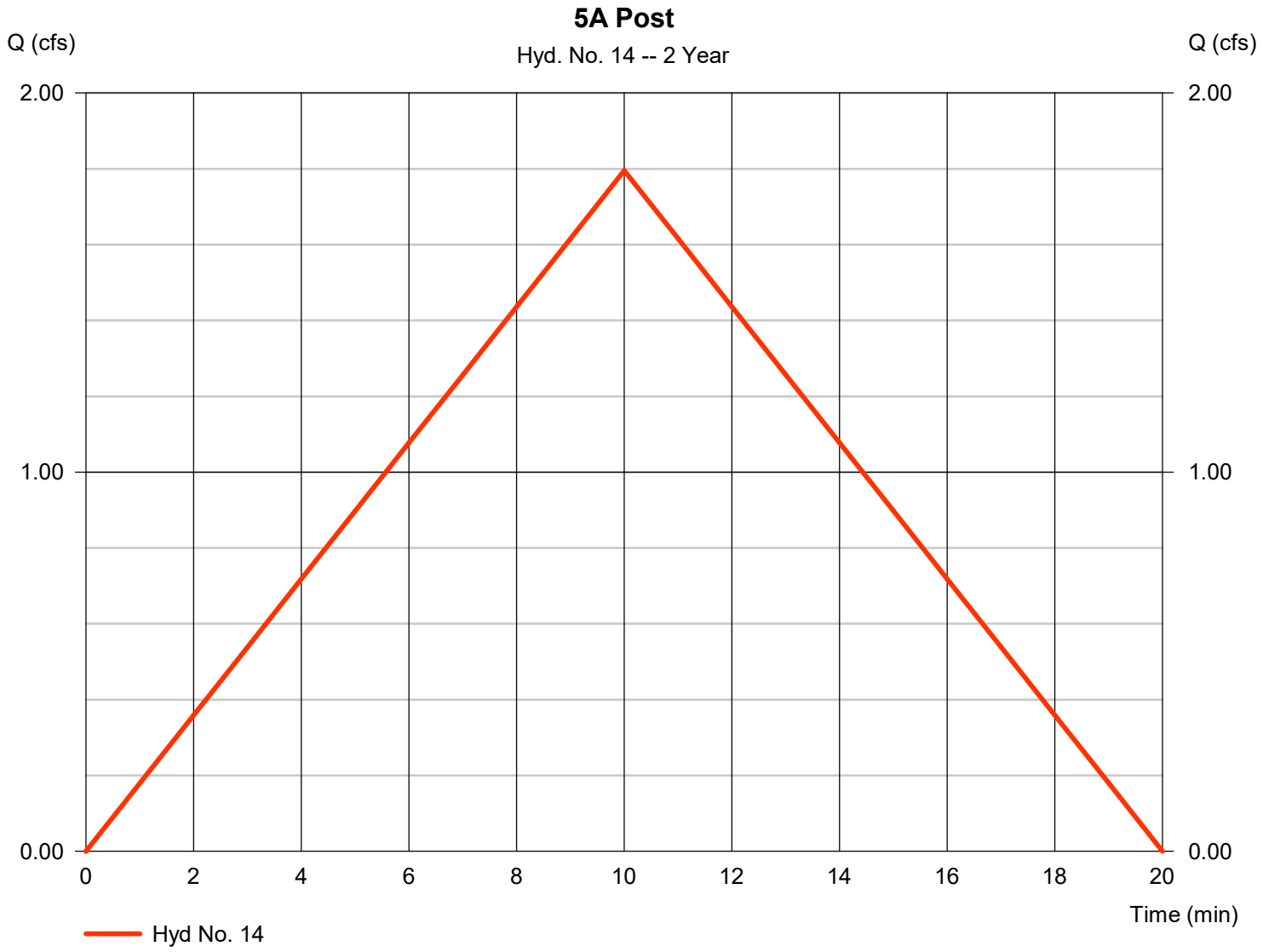


Hydrograph Report

Hyd. No. 14

5A Post

Hydrograph type	=	Rational	Peak discharge	=	1.795 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,077 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

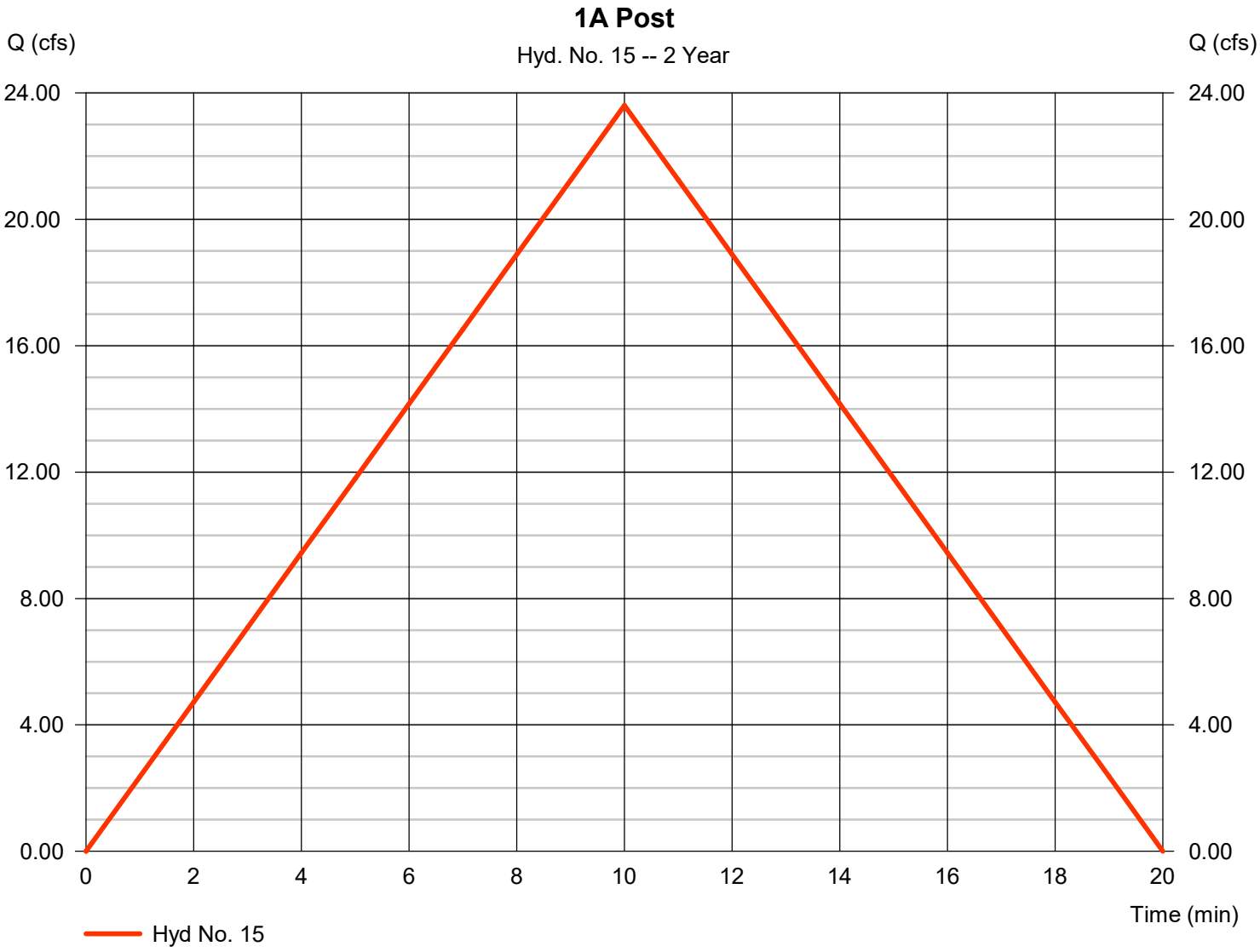


Hydrograph Report

Hyd. No. 15

1A Post

Hydrograph type	=	Rational	Peak discharge	=	23.61 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	14,165 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

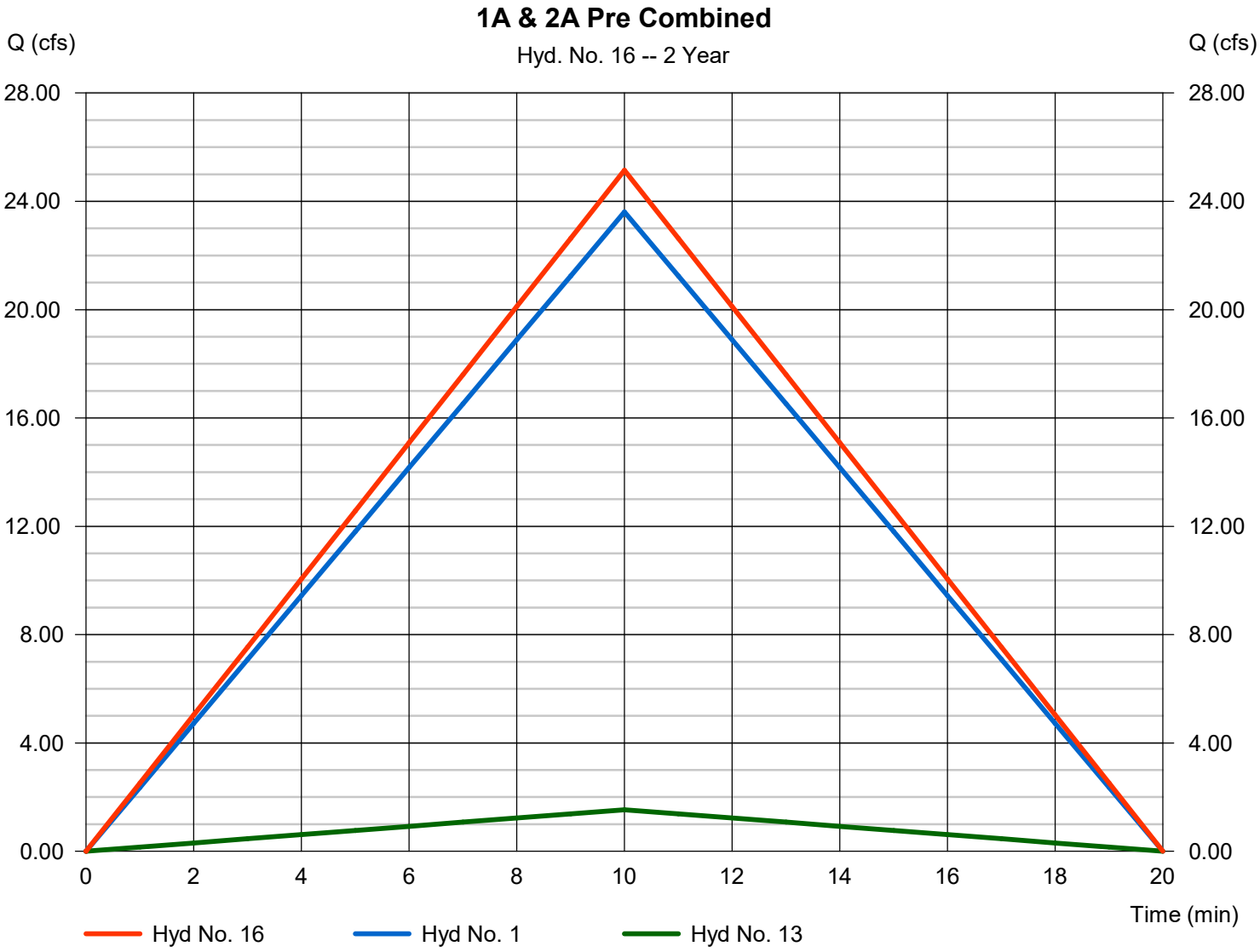


Hydrograph Report

Hyd. No. 16

1A & 2A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 25.14 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 15,086 cuft
Inflow hyds.	= 1, 13	Contrib. drain. area	= 21.940 ac

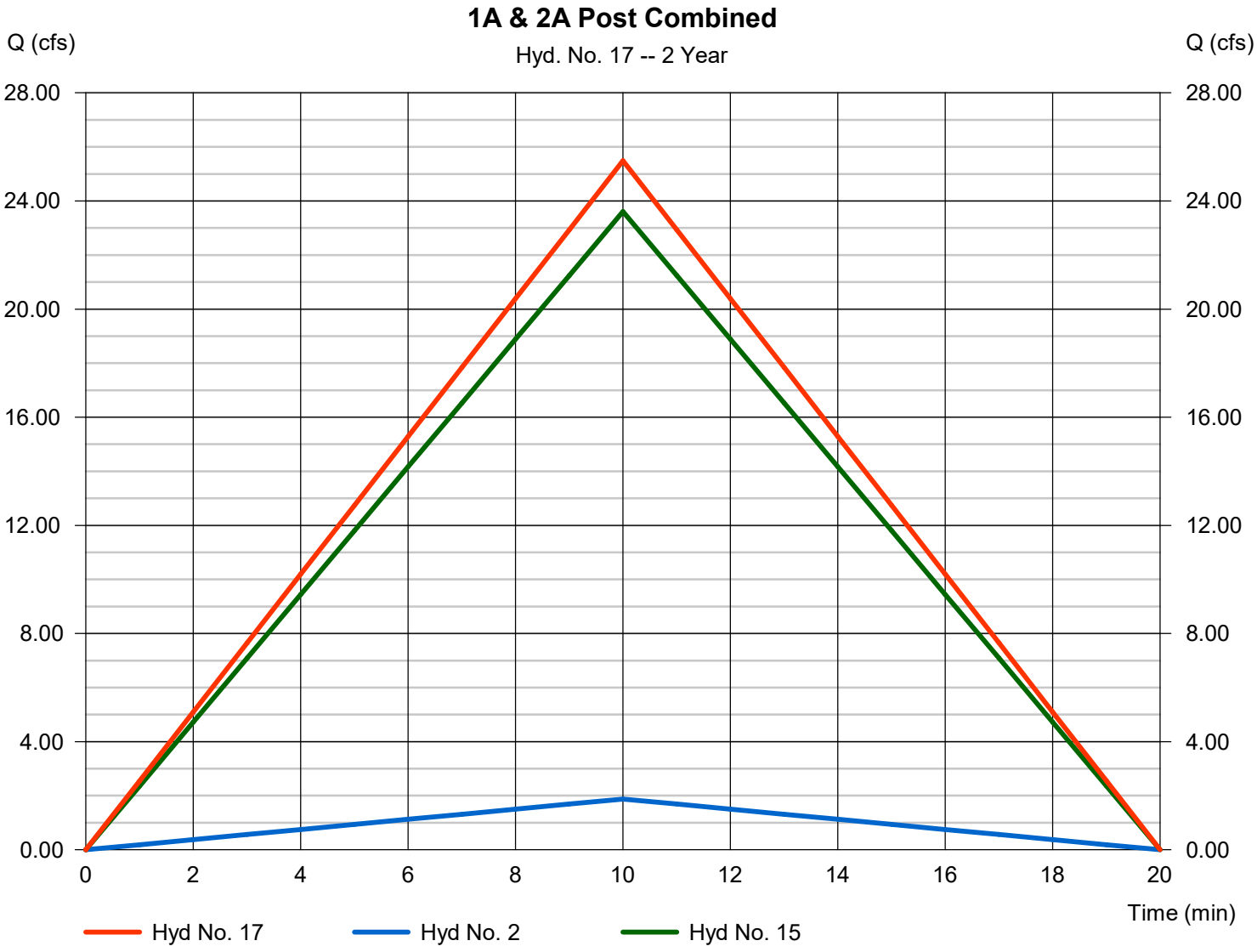


Hydrograph Report

Hyd. No. 17

1A & 2A Post Combined

Hydrograph type	= Combine	Peak discharge	= 25.48 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 15,291 cuft
Inflow hyds.	= 2, 15	Contrib. drain. area	= 21.940 ac

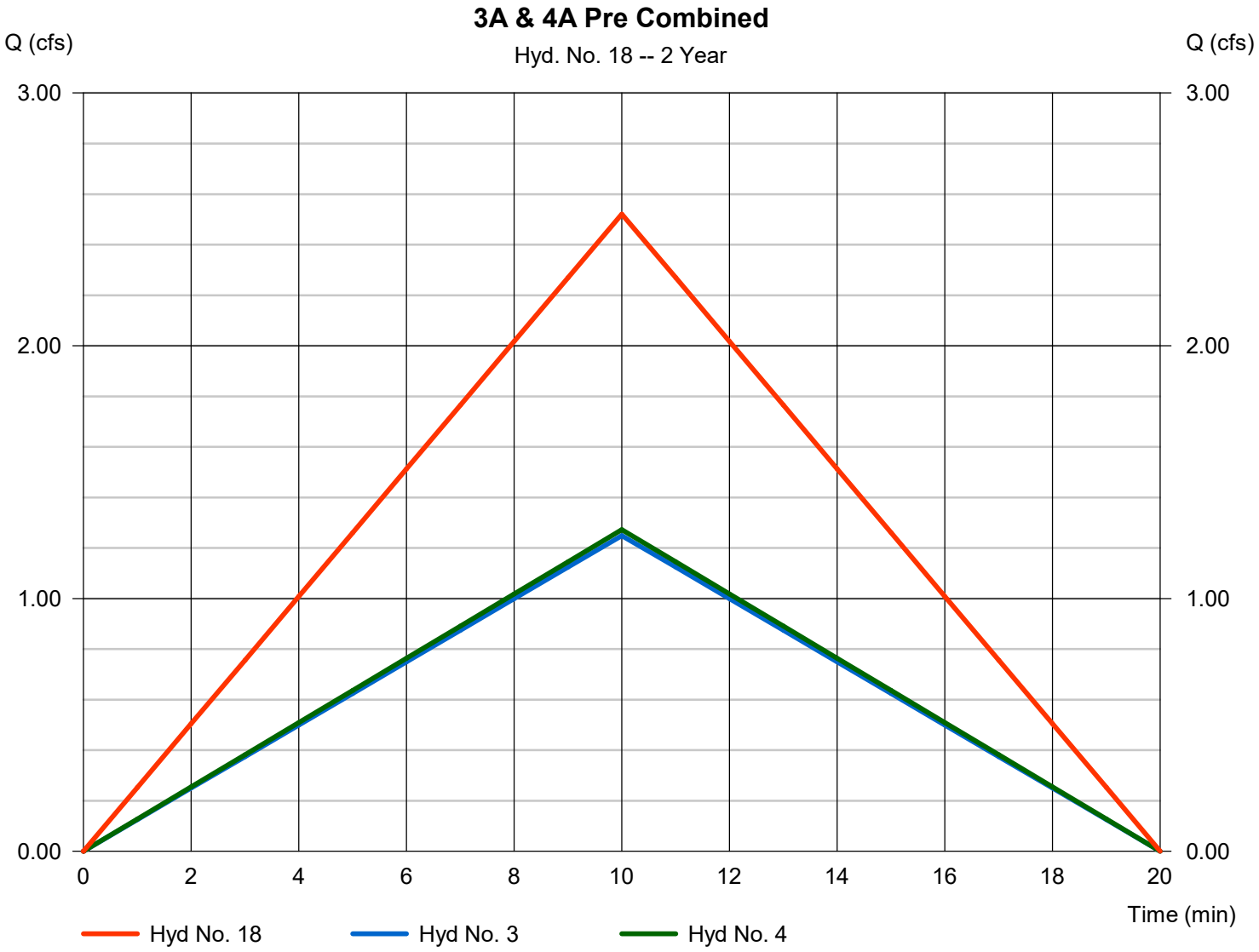


Hydrograph Report

Hyd. No. 18

3A & 4A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 2.521 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,513 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 2.200 ac

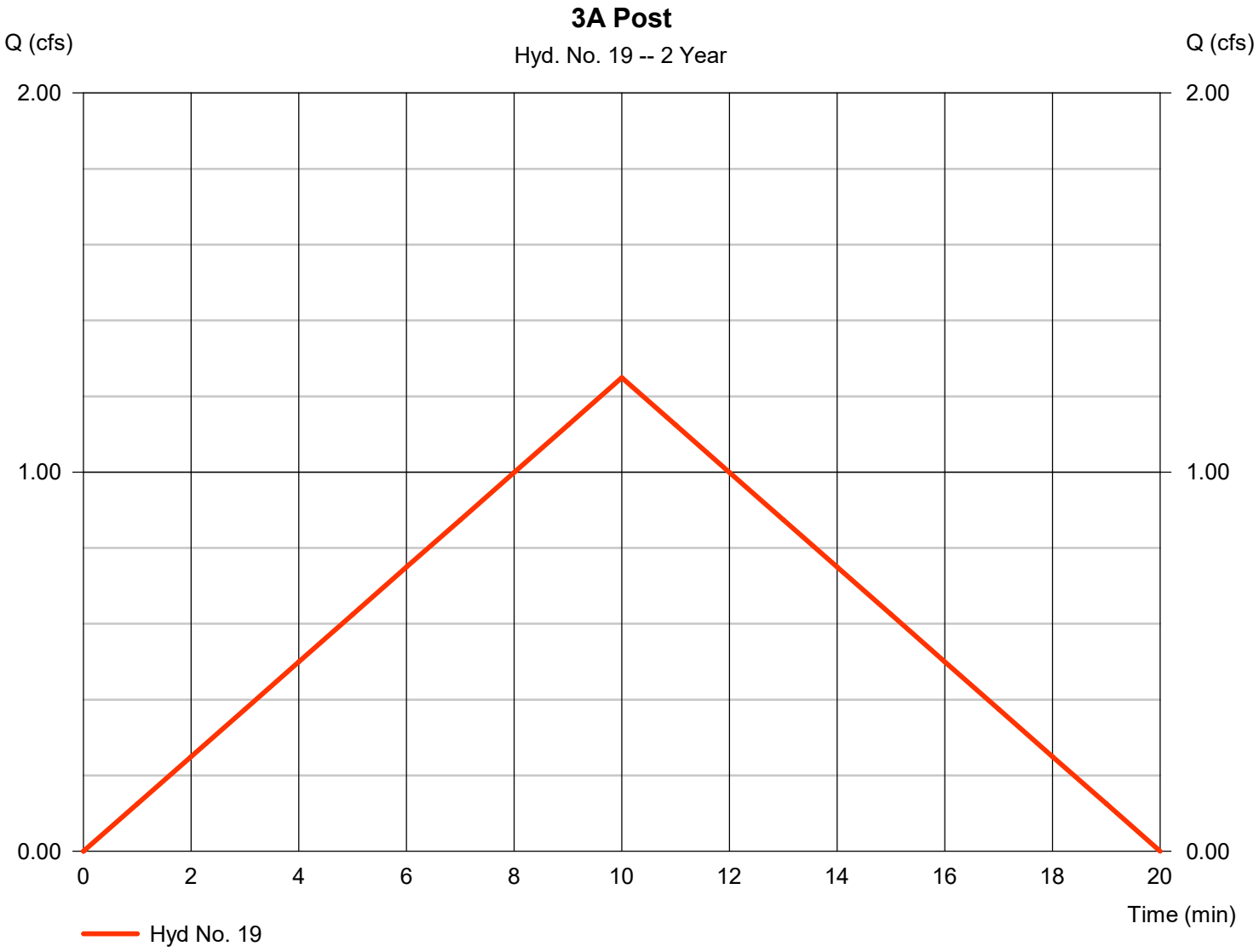


Hydrograph Report

Hyd. No. 19

3A Post

Hydrograph type	=	Rational	Peak discharge	=	1.249 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	749 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

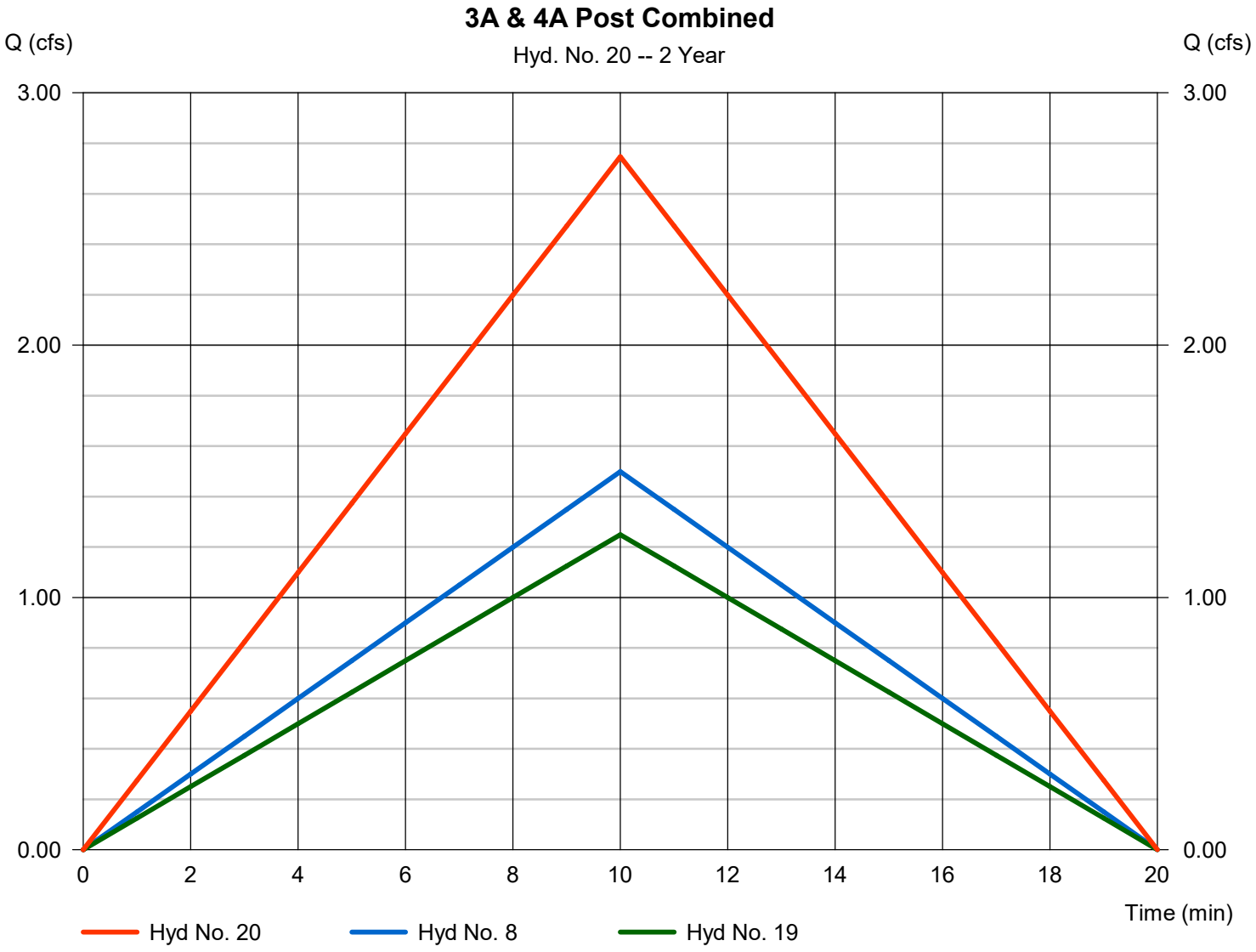


Hydrograph Report

Hyd. No. 20

3A & 4A Post Combined

Hydrograph type	= Combine	Peak discharge	= 2.747 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,648 cuft
Inflow hyds.	= 8, 19	Contrib. drain. area	= 2.200 ac

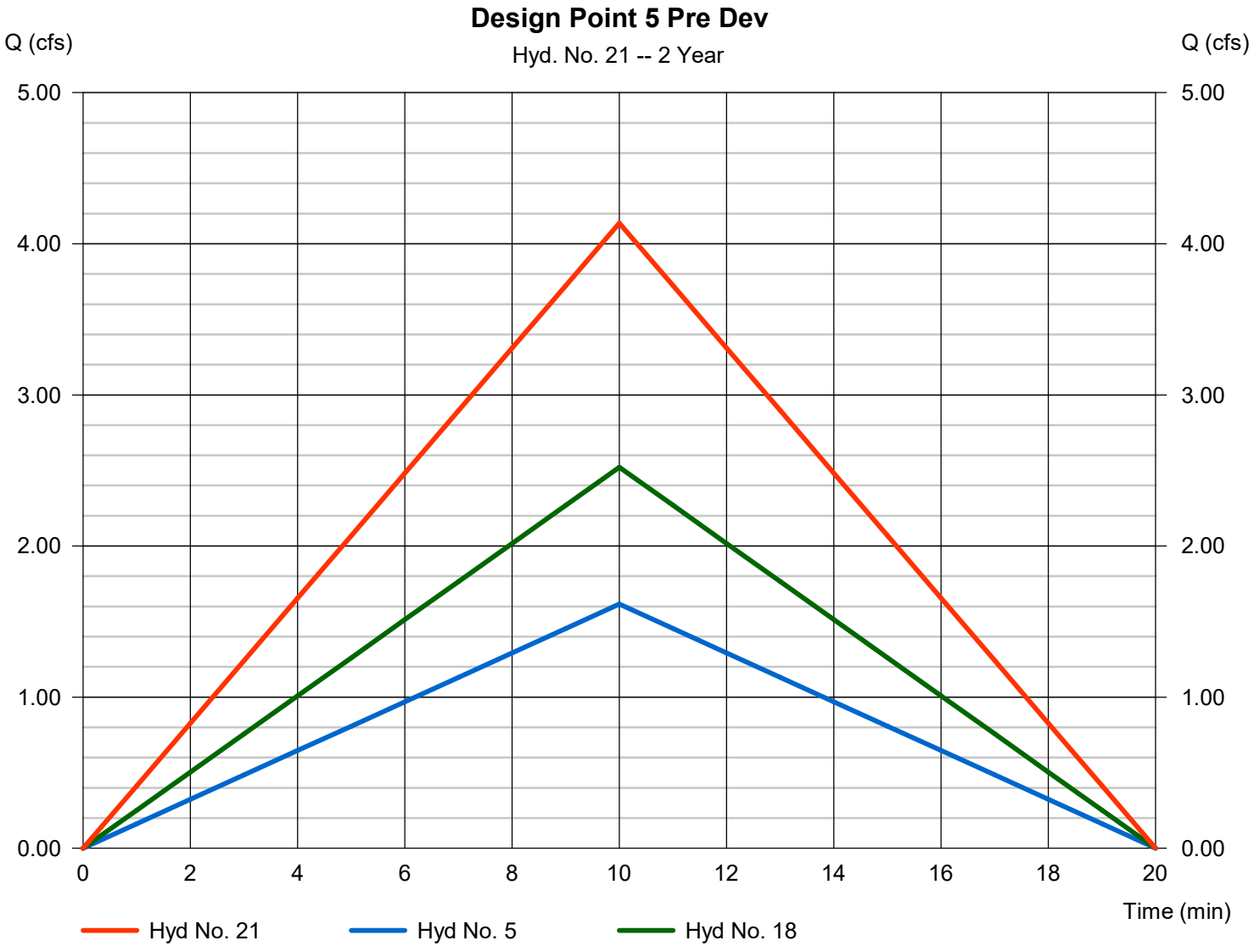


Hydrograph Report

Hyd. No. 21

Design Point 5 Pre Dev

Hydrograph type	= Combine	Peak discharge	= 4.137 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 2,482 cuft
Inflow hyds.	= 5, 18	Contrib. drain. area	= 1.410 ac

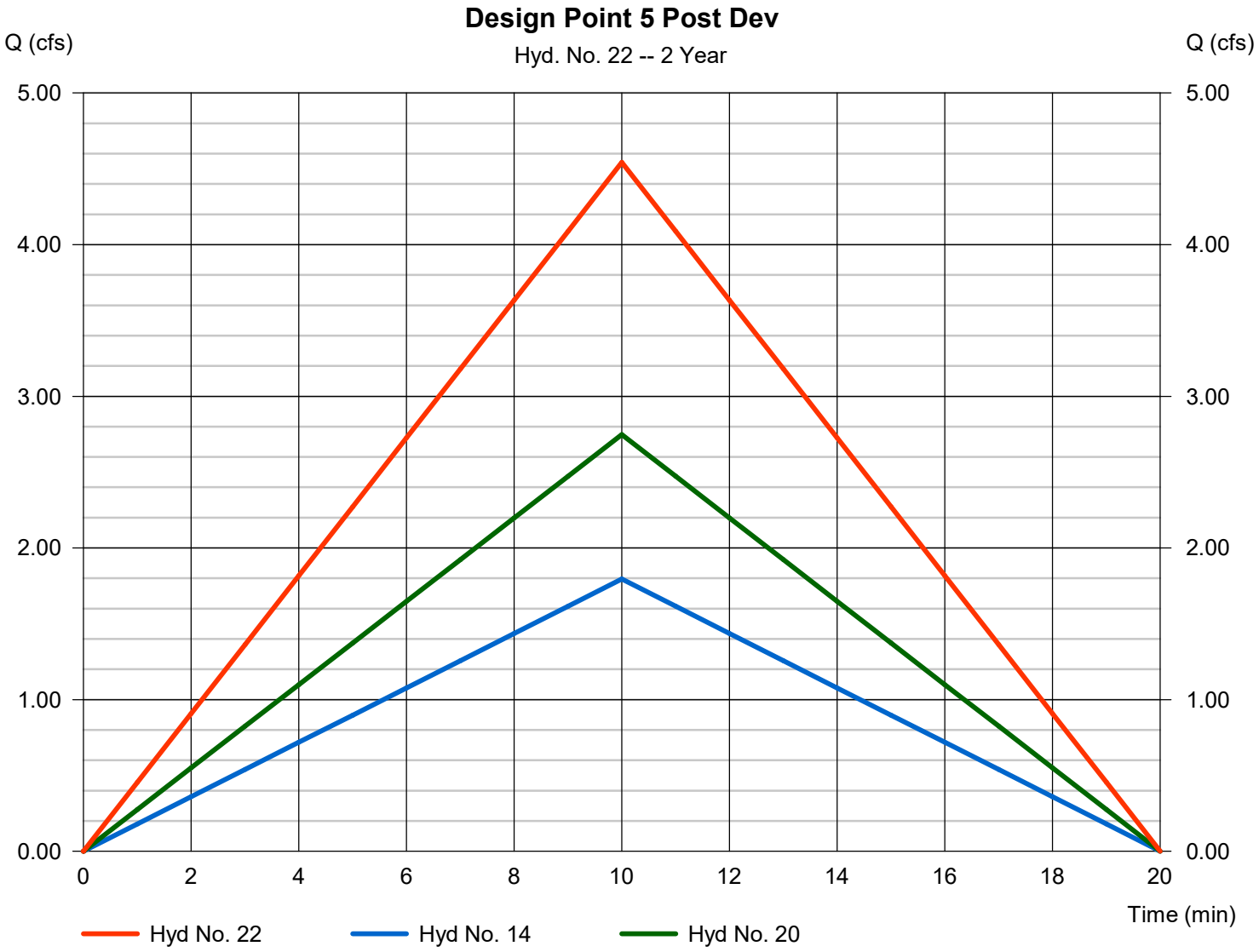


Hydrograph Report

Hyd. No. 22

Design Point 5 Post Dev

Hydrograph type	= Combine	Peak discharge	= 4.543 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 2,726 cuft
Inflow hyds.	= 14, 20	Contrib. drain. area	= 1.410 ac

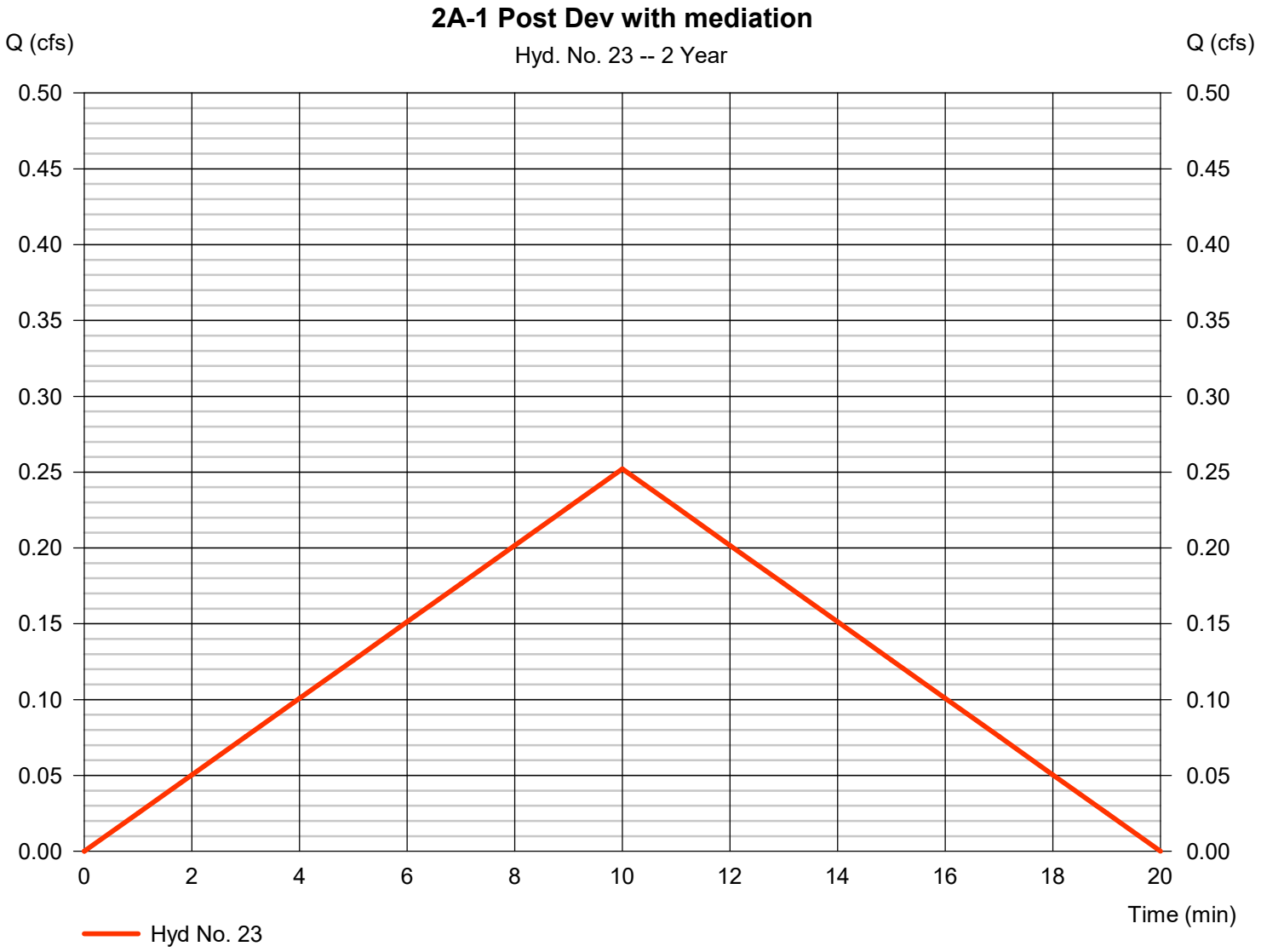


Hydrograph Report

Hyd. No. 23

2A-1 Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.252 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	151 cuft
Drainage area	=	0.180 ac	Runoff coeff.	=	0.55
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

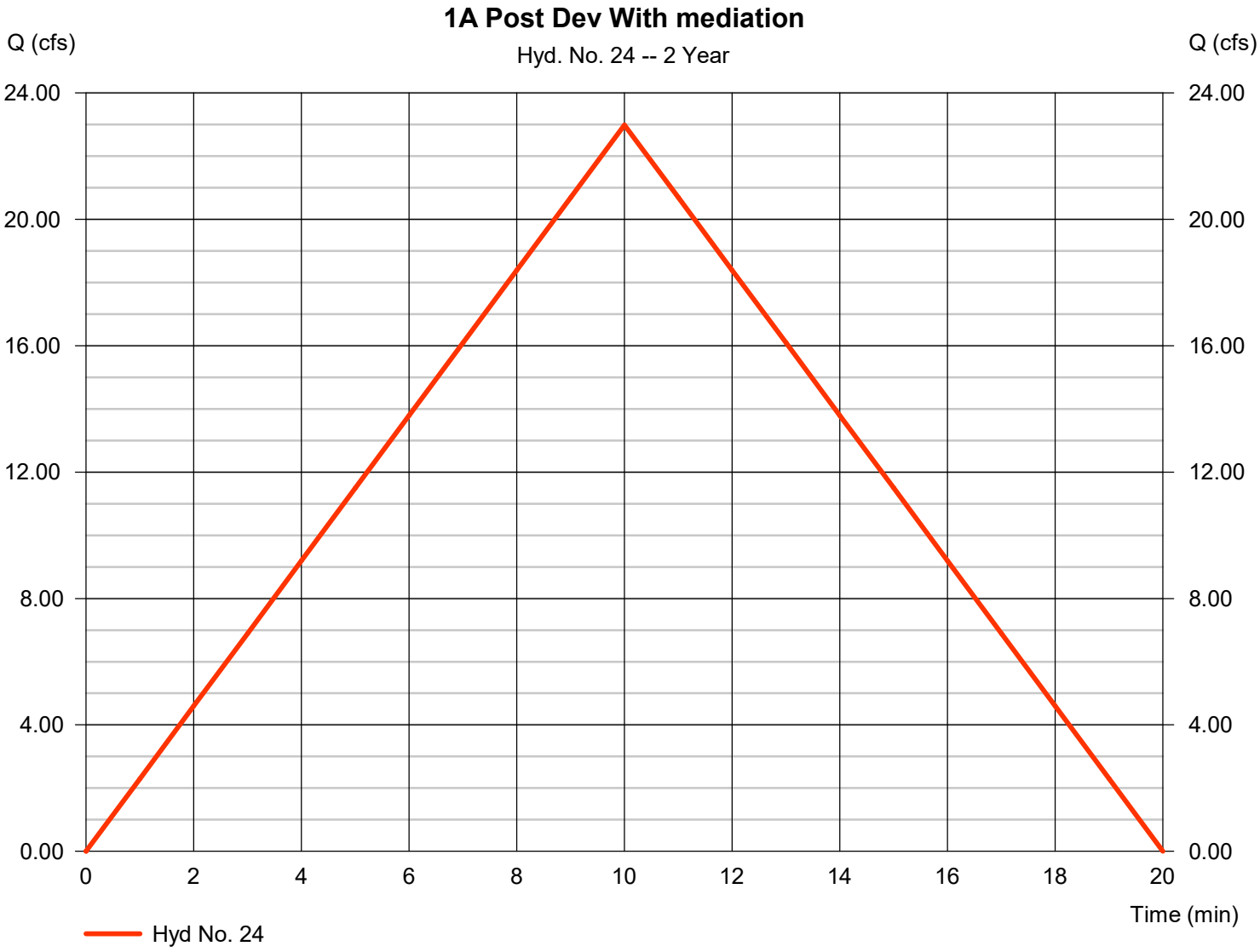


Hydrograph Report

Hyd. No. 24

1A Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	22.99 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	13,793 cuft
Drainage area	=	20.060 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

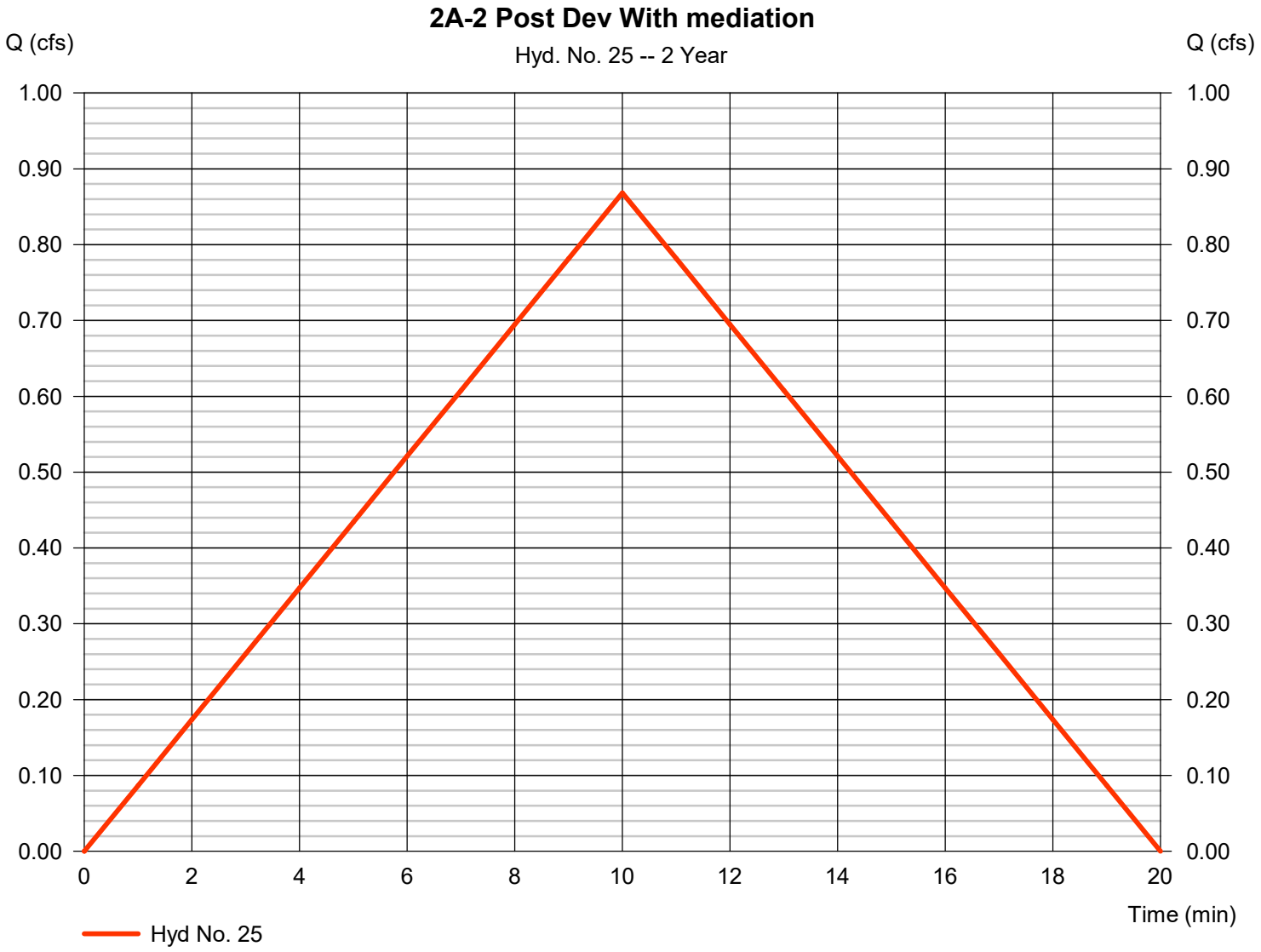


Hydrograph Report

Hyd. No. 25

2A-2 Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	0.868 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	521 cuft
Drainage area	=	0.620 ac	Runoff coeff.	=	0.55
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

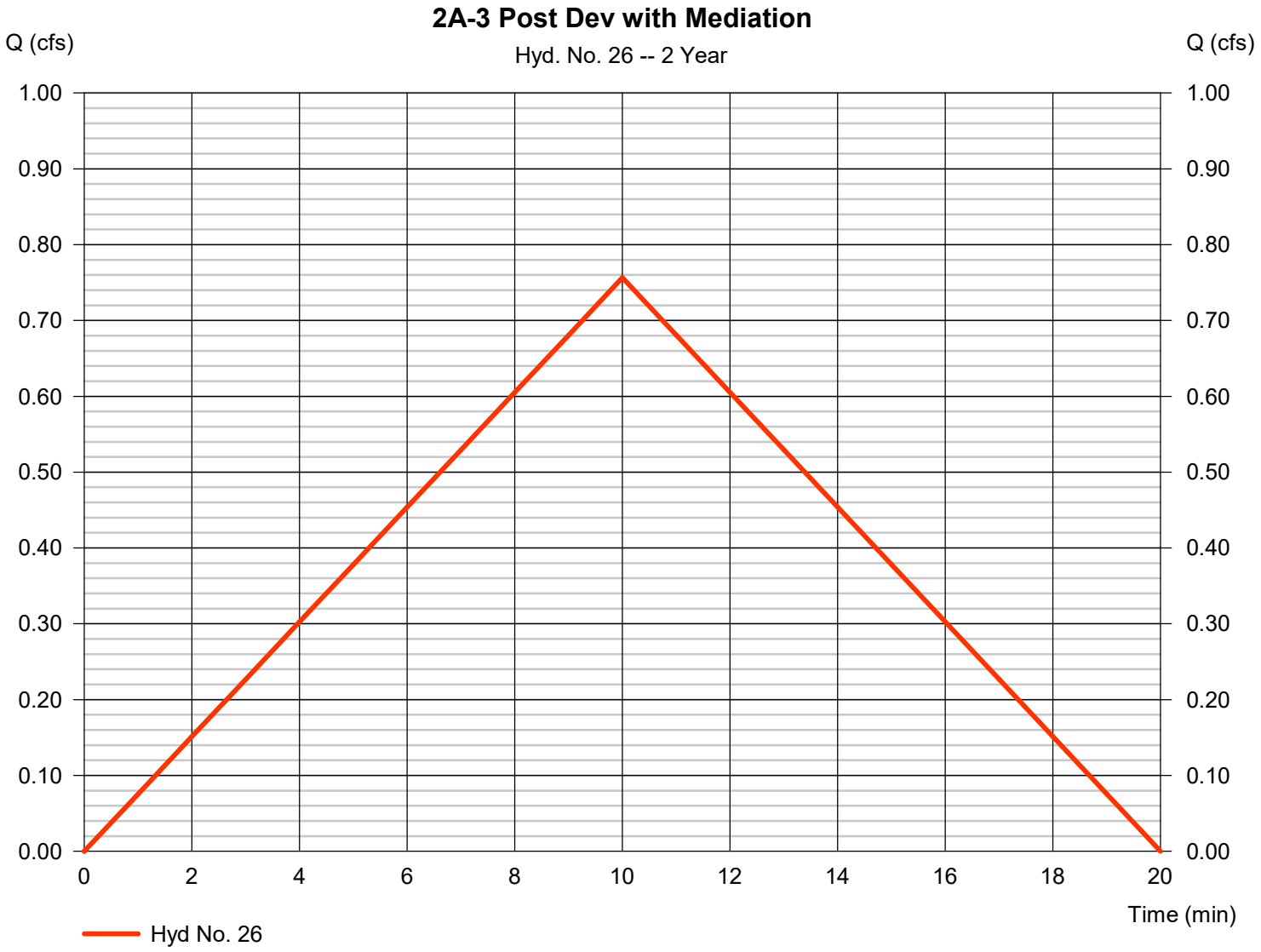


Hydrograph Report

Hyd. No. 26

2A-3 Post Dev with Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.756 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	454 cuft
Drainage area	=	0.540 ac	Runoff coeff.	=	0.55
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



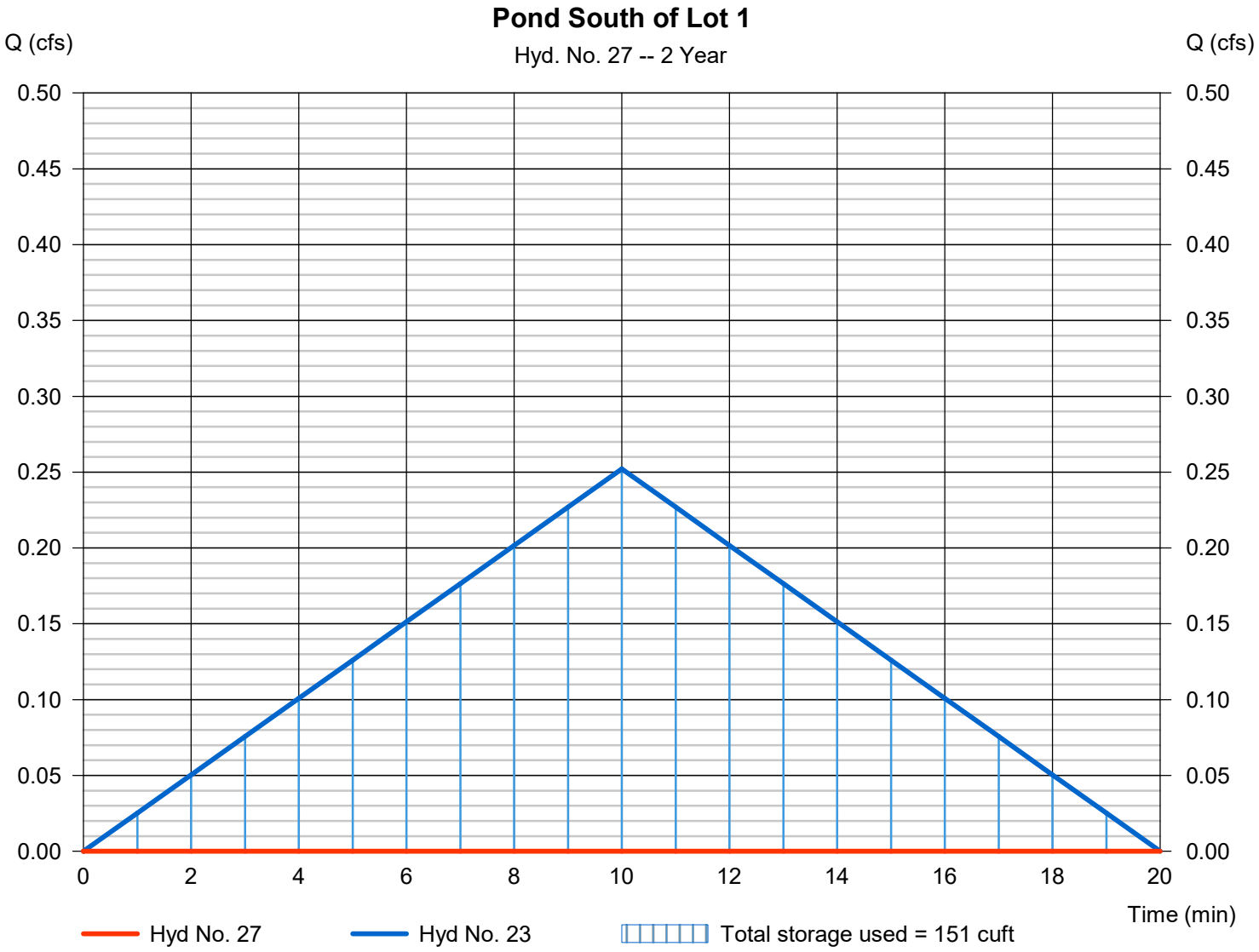
Hydrograph Report

Hyd. No. 27

Pond South of Lot 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.	=	23 - 2A-1 Post Dev with mediation	Max. Elevation	=	100.63 ft
Reservoir name	=	Pond on South of Lot 1	Max. Storage	=	151 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Pond on South of Lot 1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	121	0	0
1.00	101.00	384	240	240

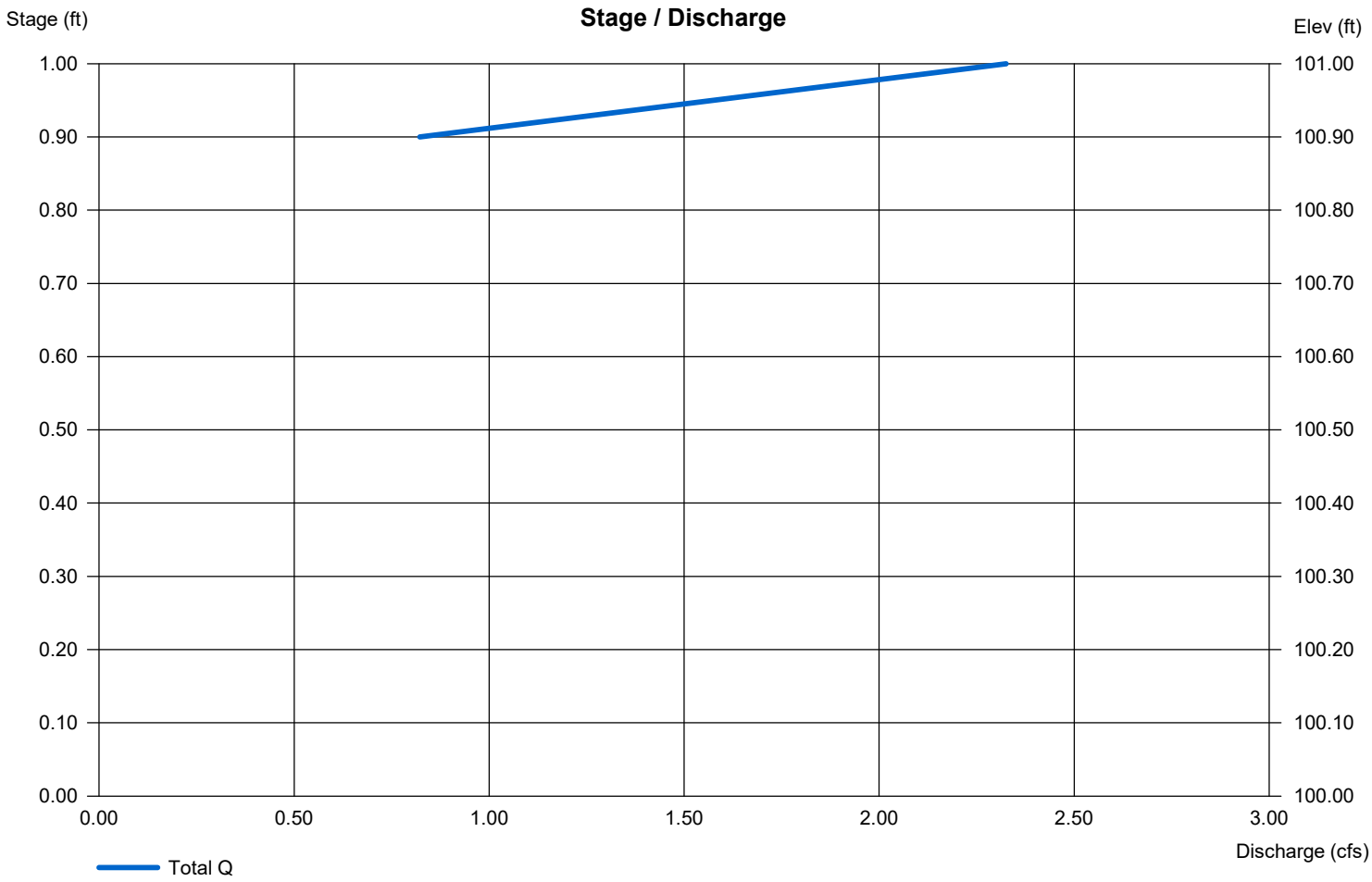
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	0.00
Span (in)	= 2.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 100.80	0.00	0.00	0.00
Length (ft)	= 10.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 100.80	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



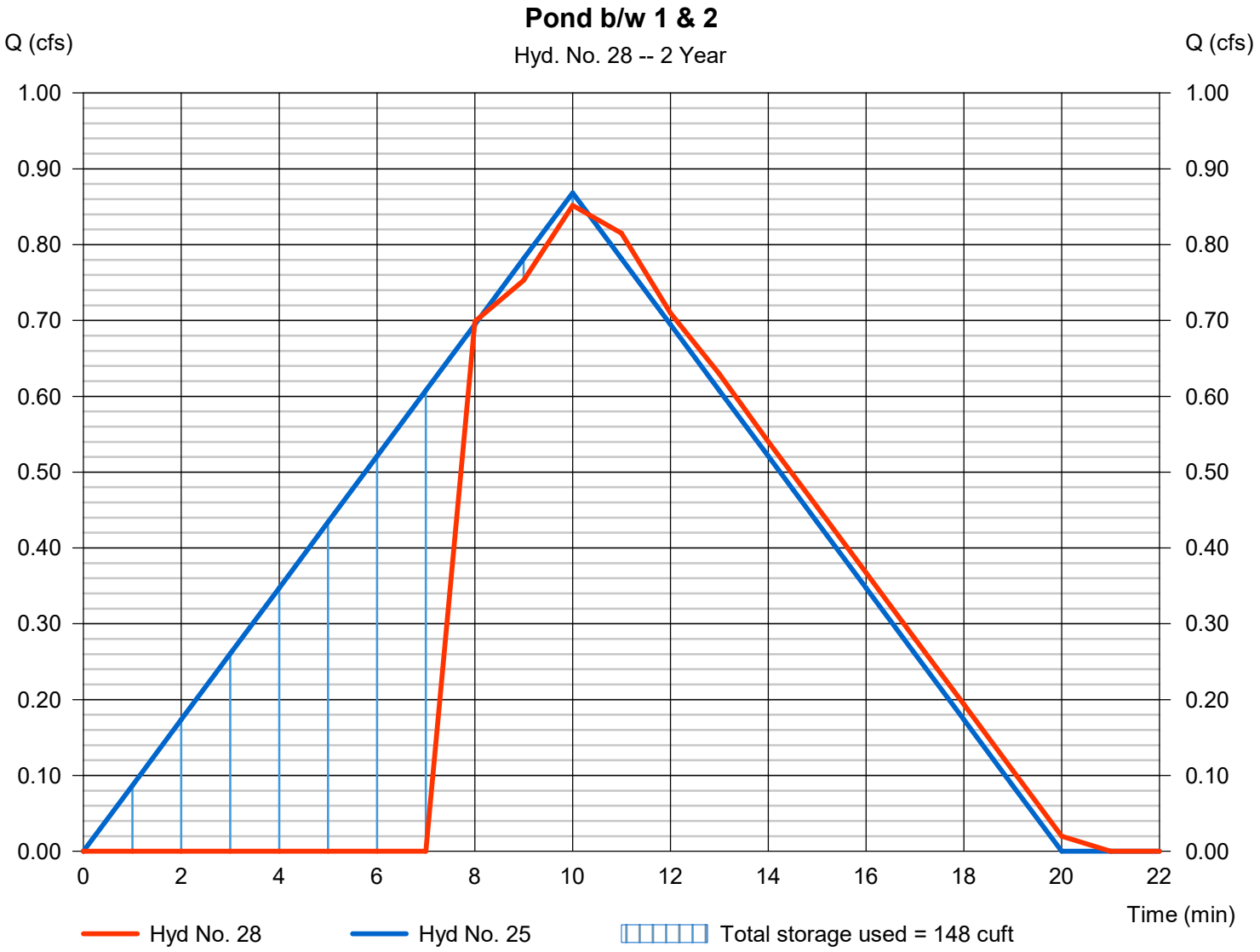
Hydrograph Report

Hyd. No. 28

Pond b/w 1 & 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.852 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	385 cuft
Inflow hyd. No.	=	25 - 2A-2 Post Dev With median	Max. Elevation	=	100.87 ft
Reservoir name	=	Pond B/w 1&2	Max. Storage	=	148 cuft

Storage Indication method used.



Pond Report

Pond No. 2 - Pond B/w 1&2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	85	0	0
1.00	101.00	273	170	170

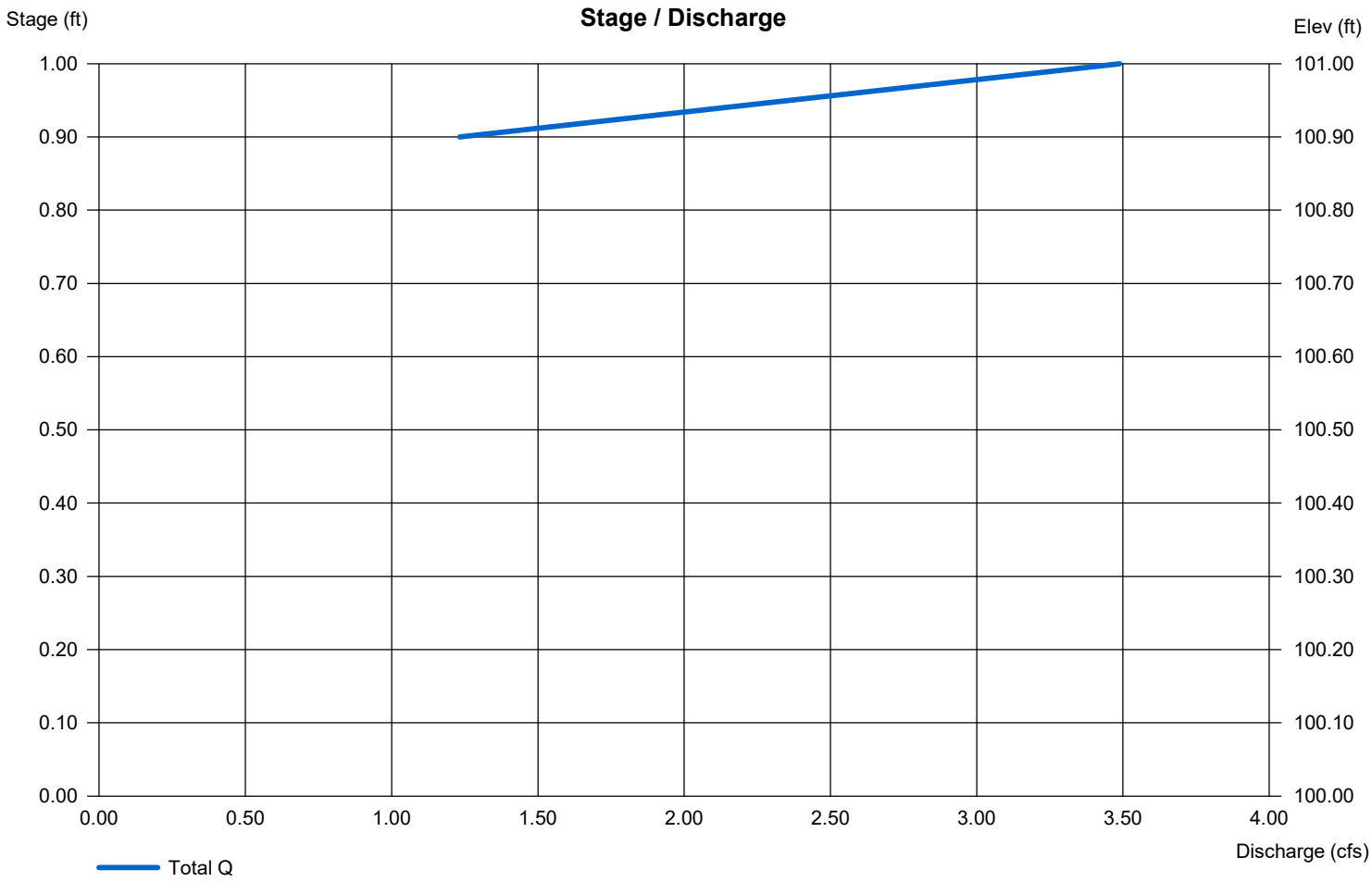
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
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)	= 15.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 100.80	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



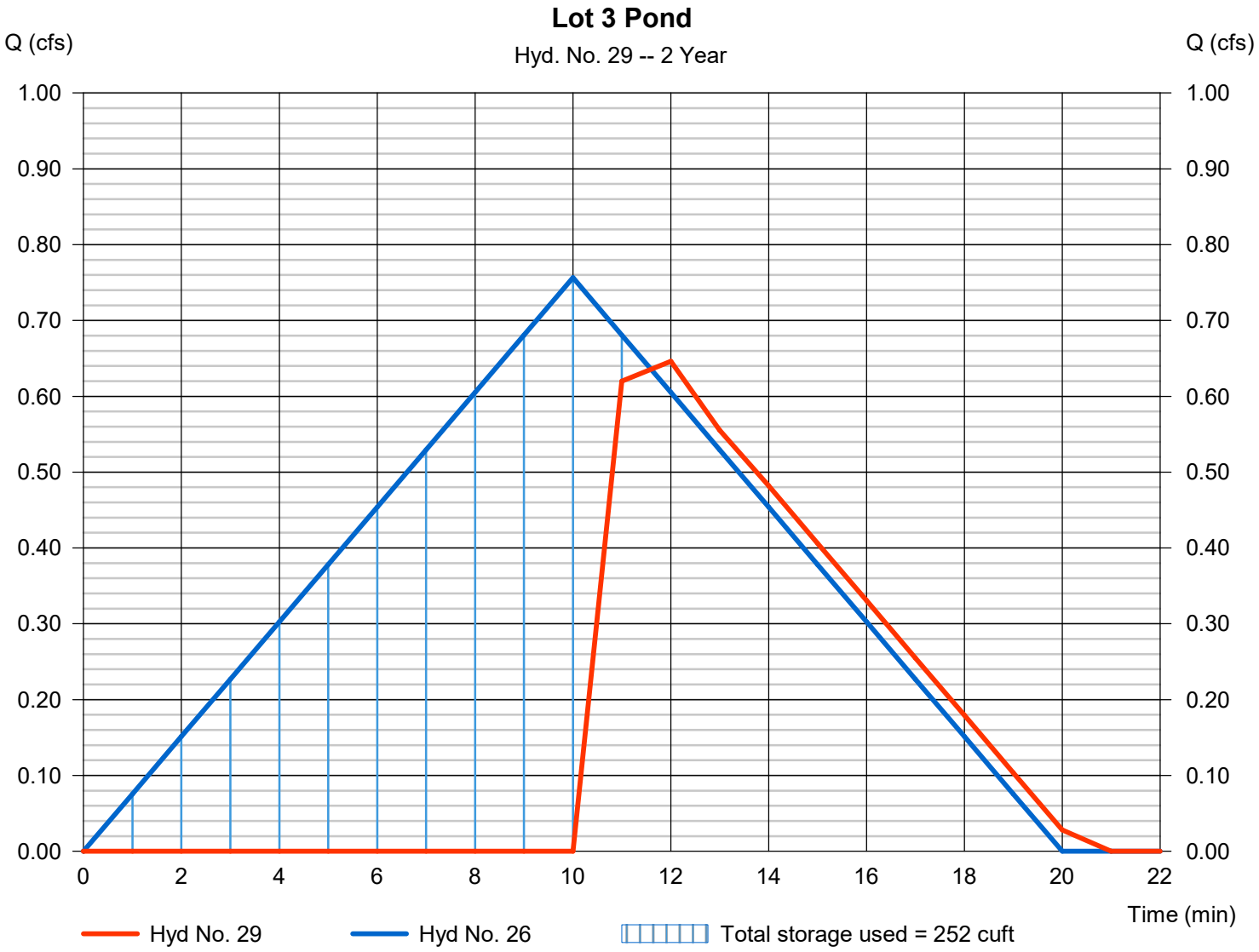
Hydrograph Report

Hyd. No. 29

Lot 3 Pond

Hydrograph type	=	Reservoir	Peak discharge	=	0.646 cfs
Storm frequency	=	2 yrs	Time to peak	=	12 min
Time interval	=	1 min	Hyd. volume	=	216 cuft
Inflow hyd. No.	=	26 - 2A-3 Post Dev with Mediation	Max. Elevation	=	101.88 ft
Reservoir name	=	Lot 3 Pond	Max. Storage	=	252 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Lot 3 Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	56	0	0
1.00	101.00	133	92	92
2.00	102.00	236	182	274

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
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

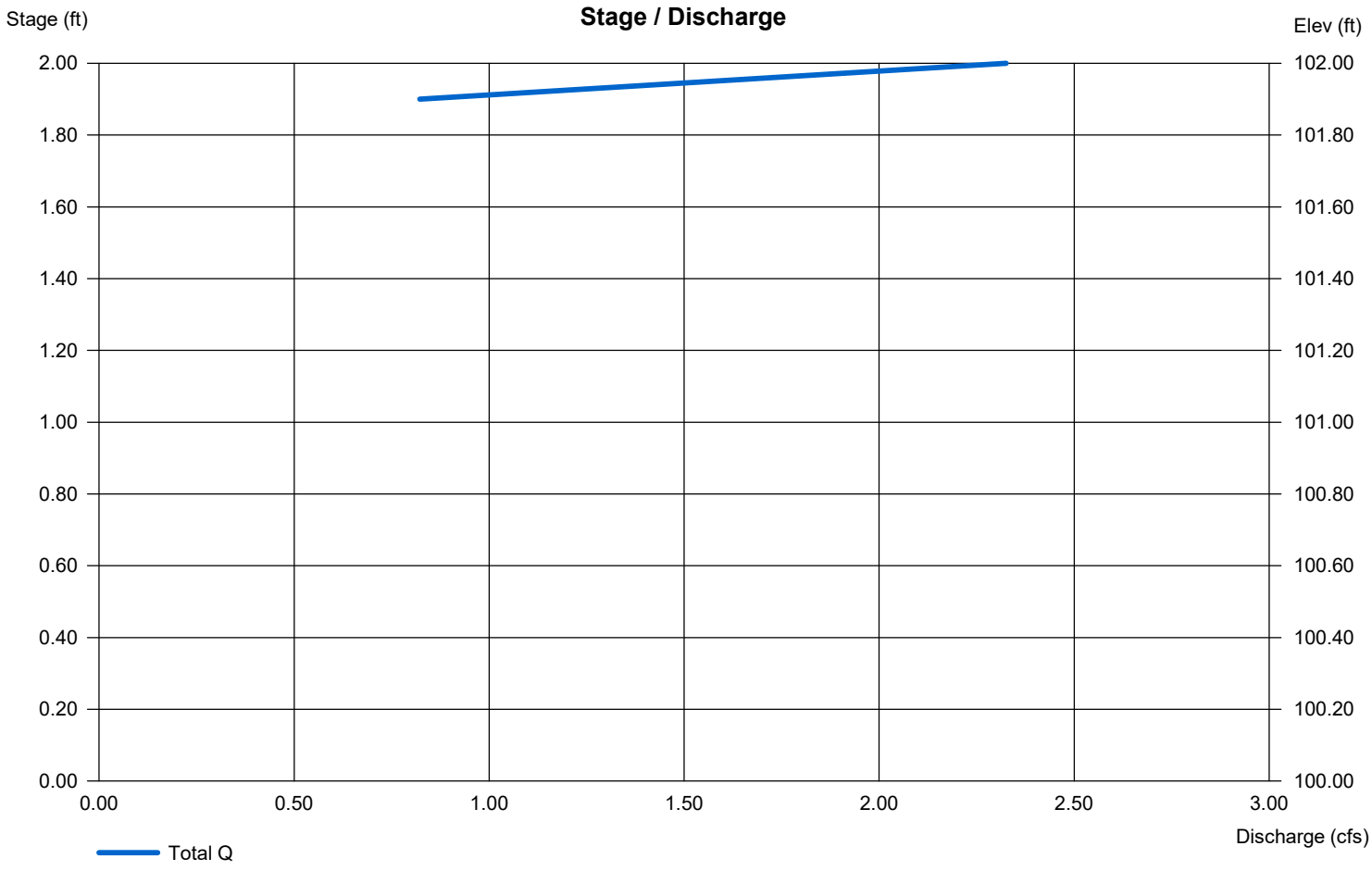
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 101.80	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

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

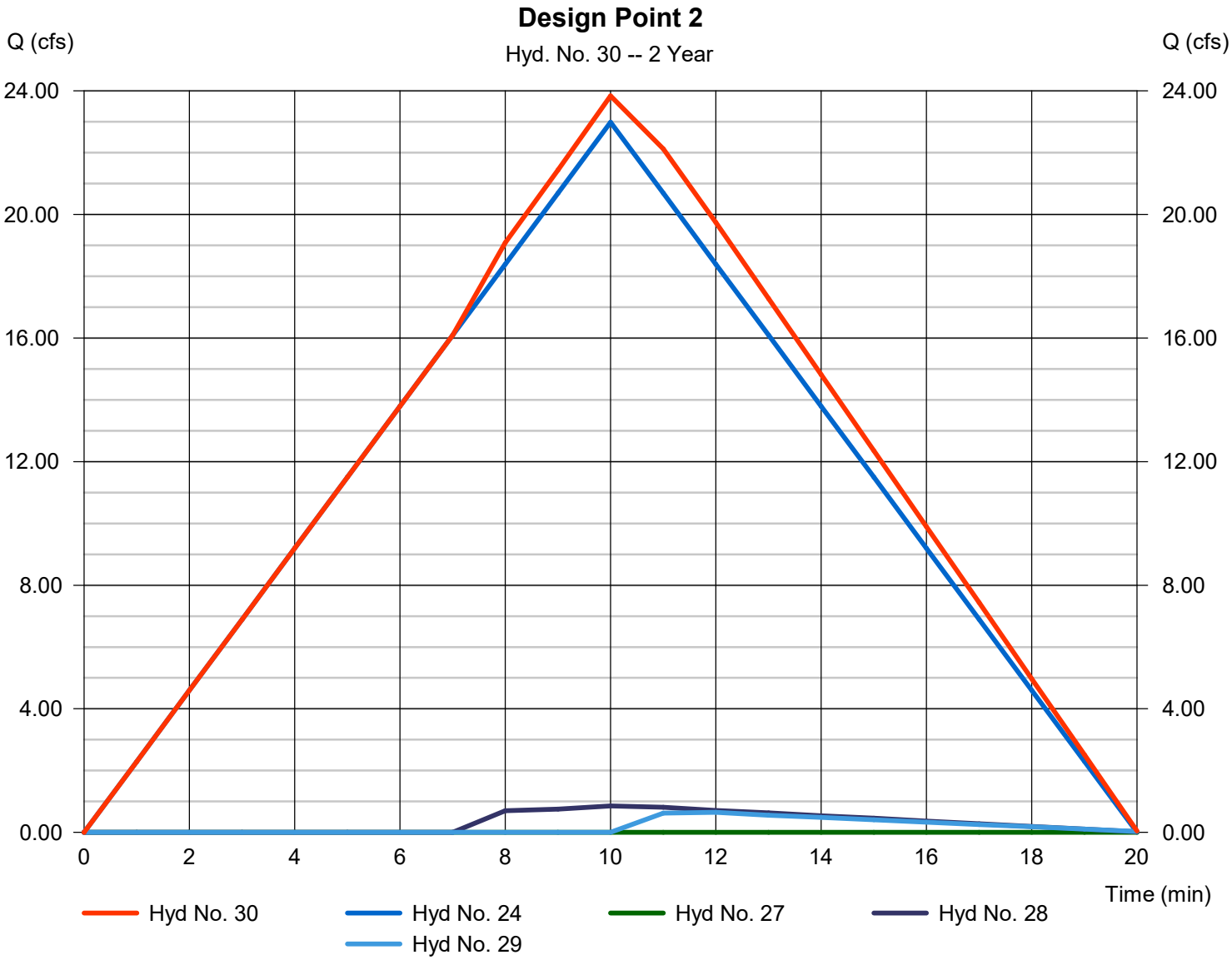


Hydrograph Report

Hyd. No. 30

Design Point 2

Hydrograph type	= Combine	Peak discharge	= 23.84 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 14,395 cuft
Inflow hyds.	= 24, 27, 28, 29	Contrib. drain. area	= 20.060 ac

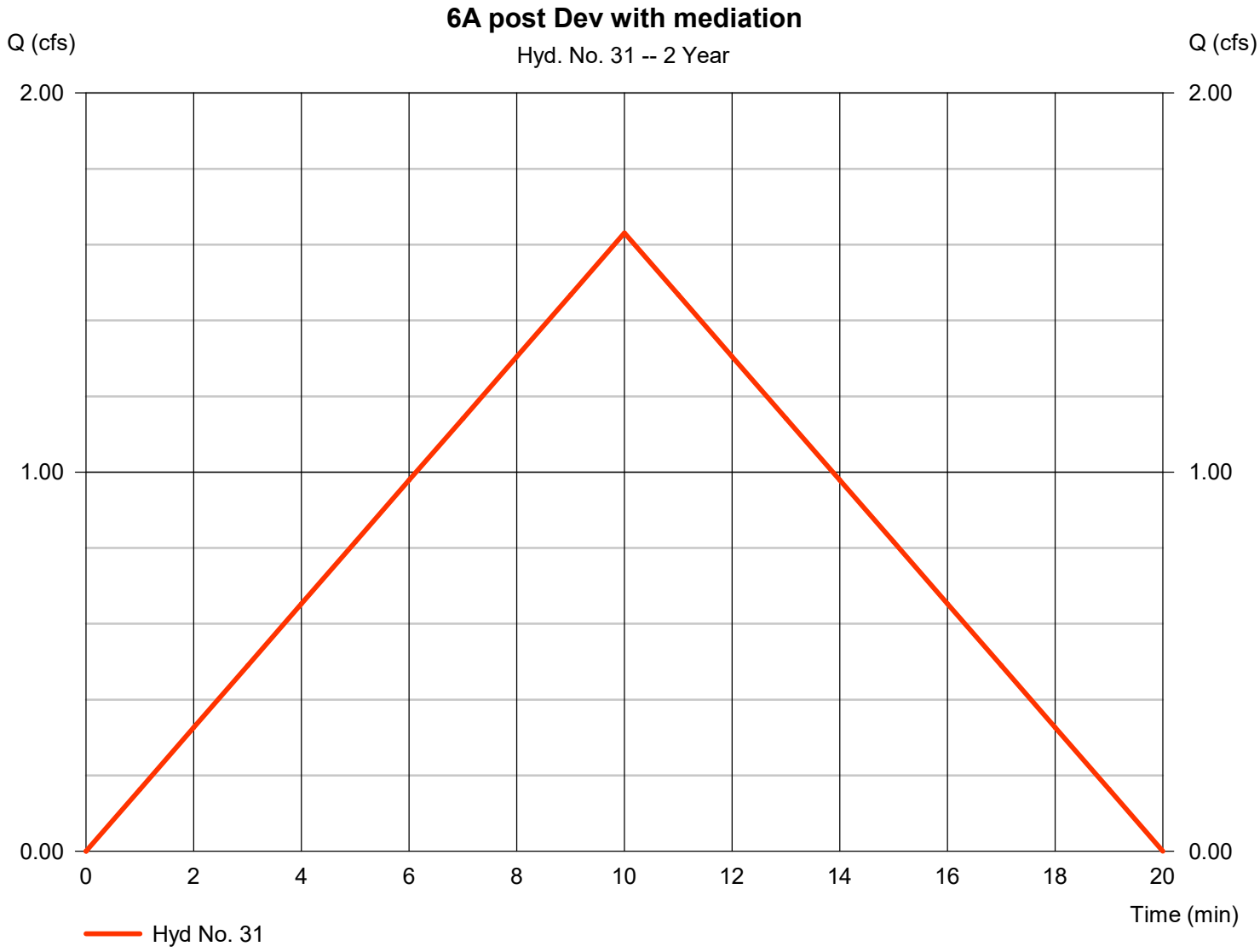


Hydrograph Report

Hyd. No. 31

6A post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	1.631 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	979 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

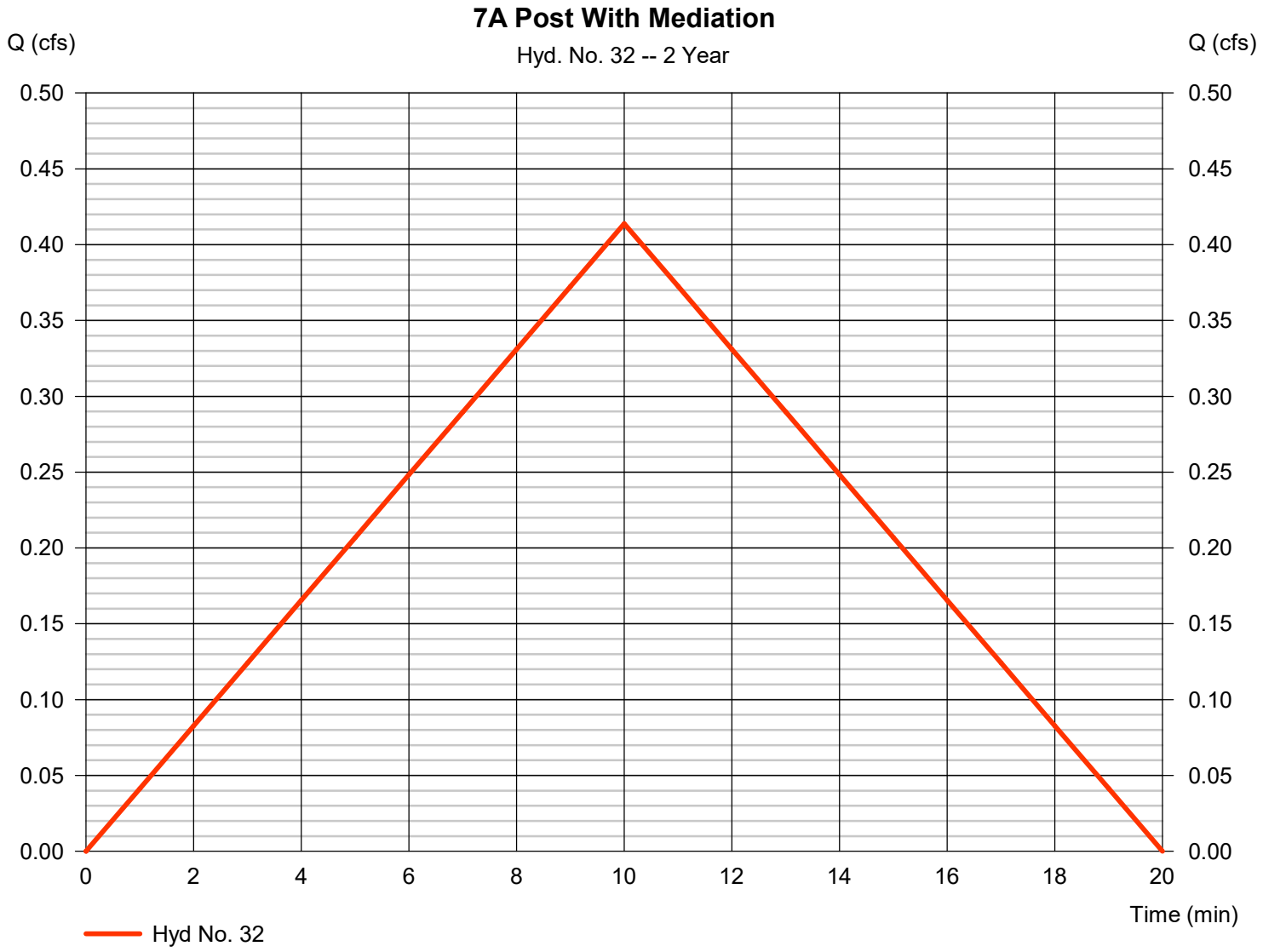


Hydrograph Report

Hyd. No. 32

7A Post With Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.414 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	248 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

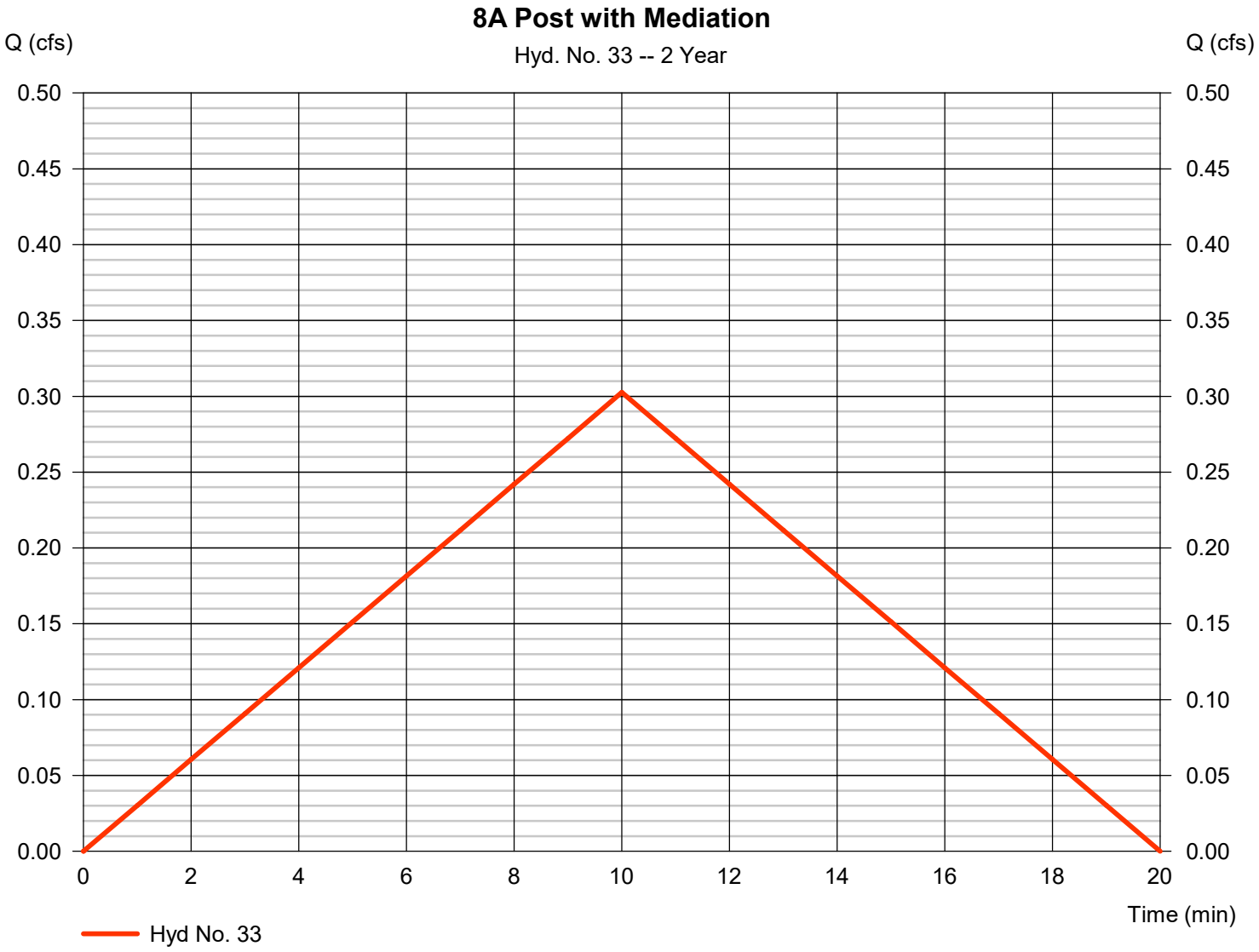


Hydrograph Report

Hyd. No. 33

8A Post with Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.303 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	182 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



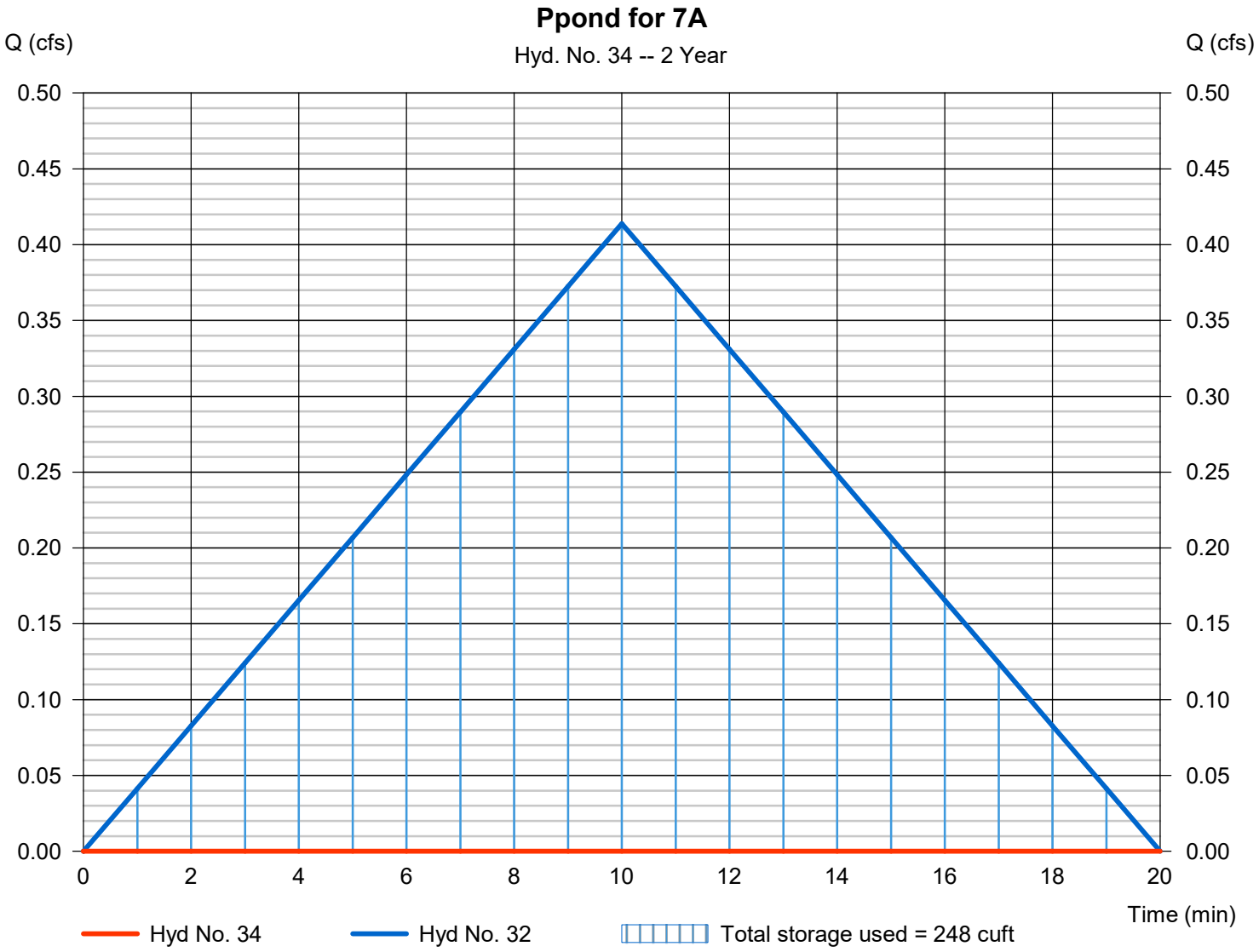
Hydrograph Report

Hyd. No. 34

Ppond for 7A

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.	=	32 - 7A Post With Mediation	Max. Elevation	=	100.72 ft
Reservoir name	=	Pond for 7A	Max. Storage	=	248 cuft

Storage Indication method used.



Pond Report

Pond No. 5 - Pond for 7A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	259	0	0
1.00	101.00	434	343	343
2.00	102.00	634	531	874

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
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

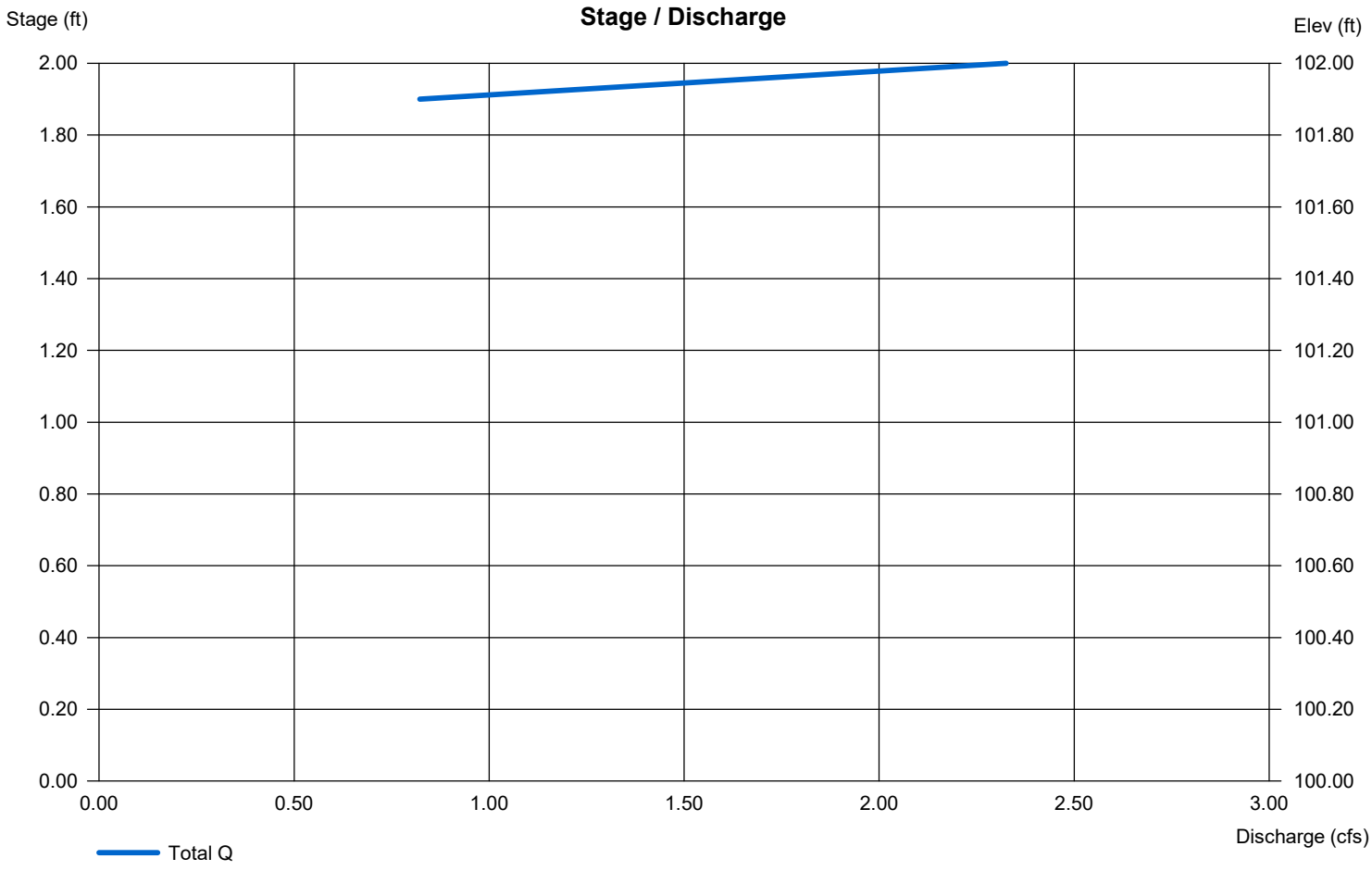
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 101.80	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
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).



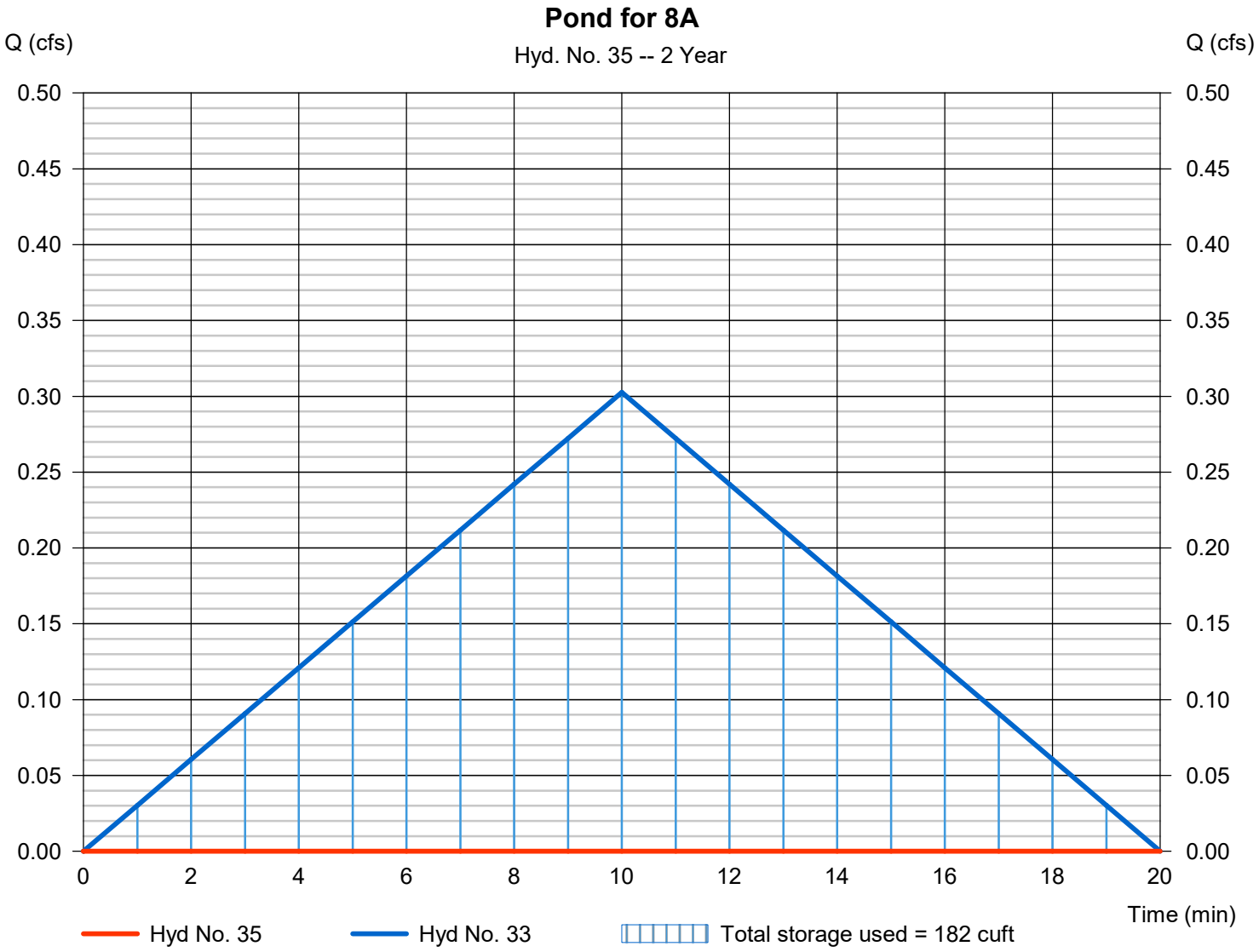
Hydrograph Report

Hyd. No. 35

Pond for 8A

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.	=	33 - 8A Post with Mediation	Max. Elevation	=	101.05 ft
Reservoir name	=	Pond for 8A	Max. Storage	=	182 cuft

Storage Indication method used.



Pond Report

Pond No. 6 - Pond for 8A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	112	0	0
1.00	101.00	231	168	168
2.00	102.00	376	301	468

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
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	Yes

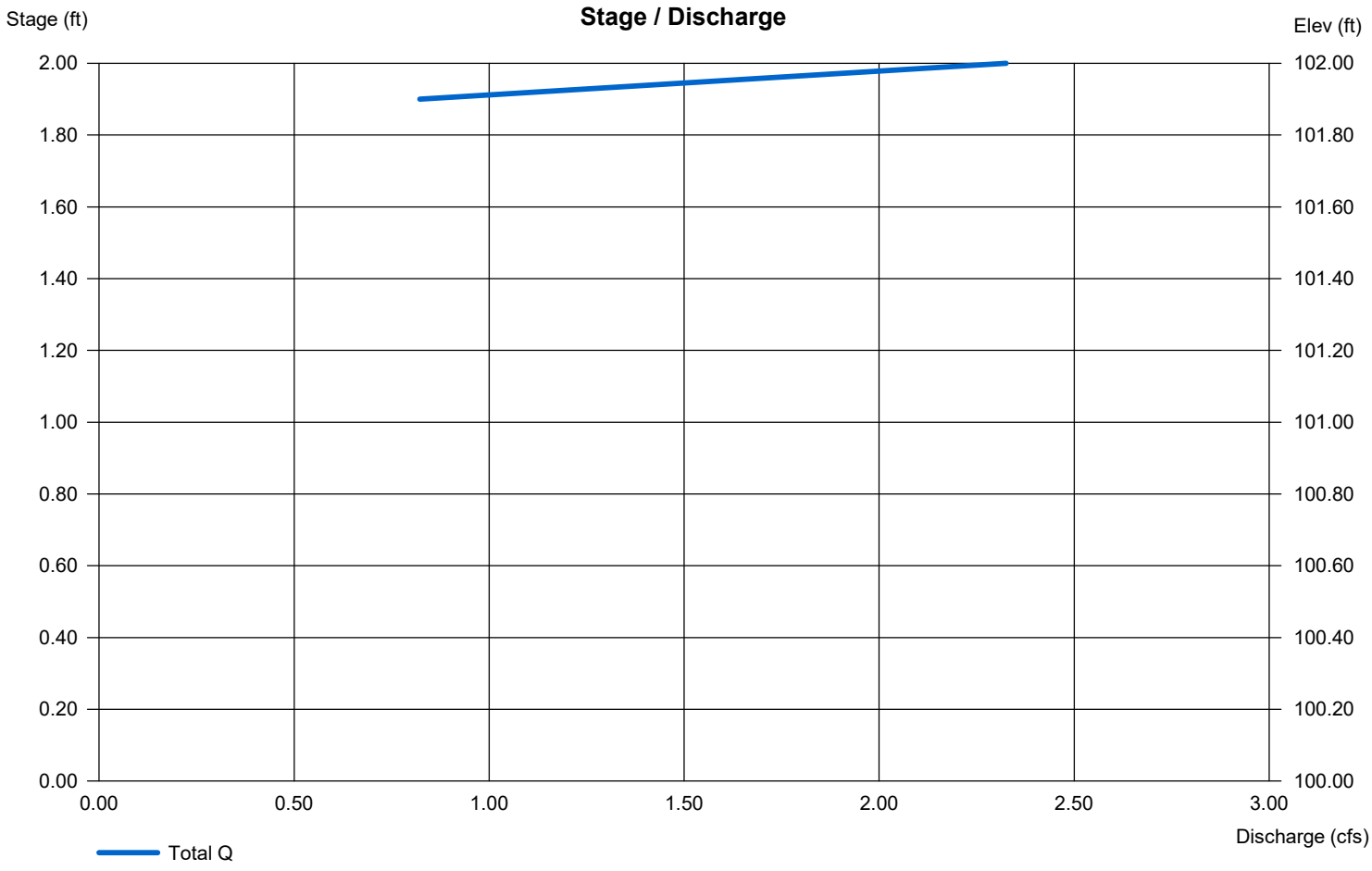
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 101.80	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
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).

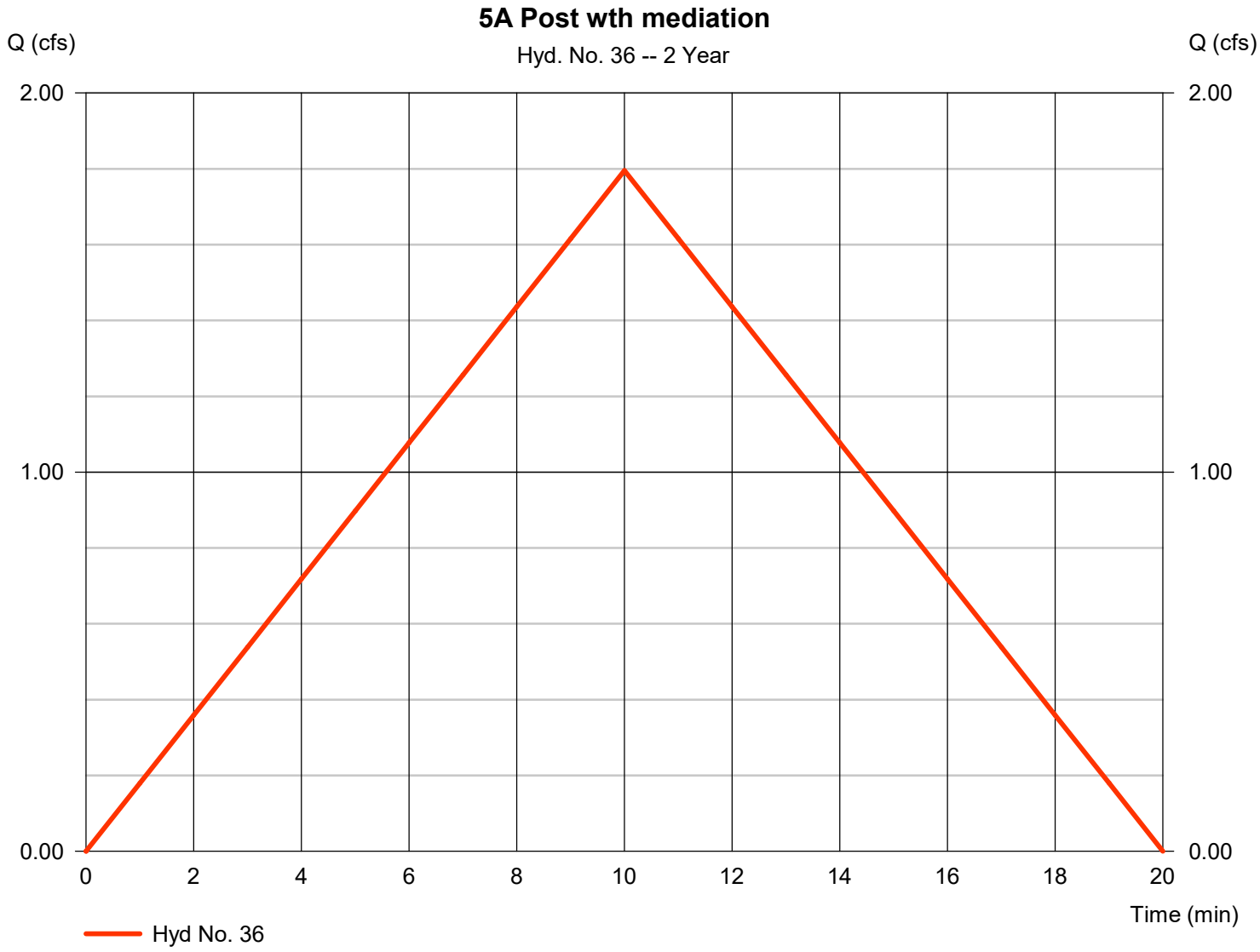


Hydrograph Report

Hyd. No. 36

5A Post wth mediation

Hydrograph type	=	Rational	Peak discharge	=	1.795 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,077 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

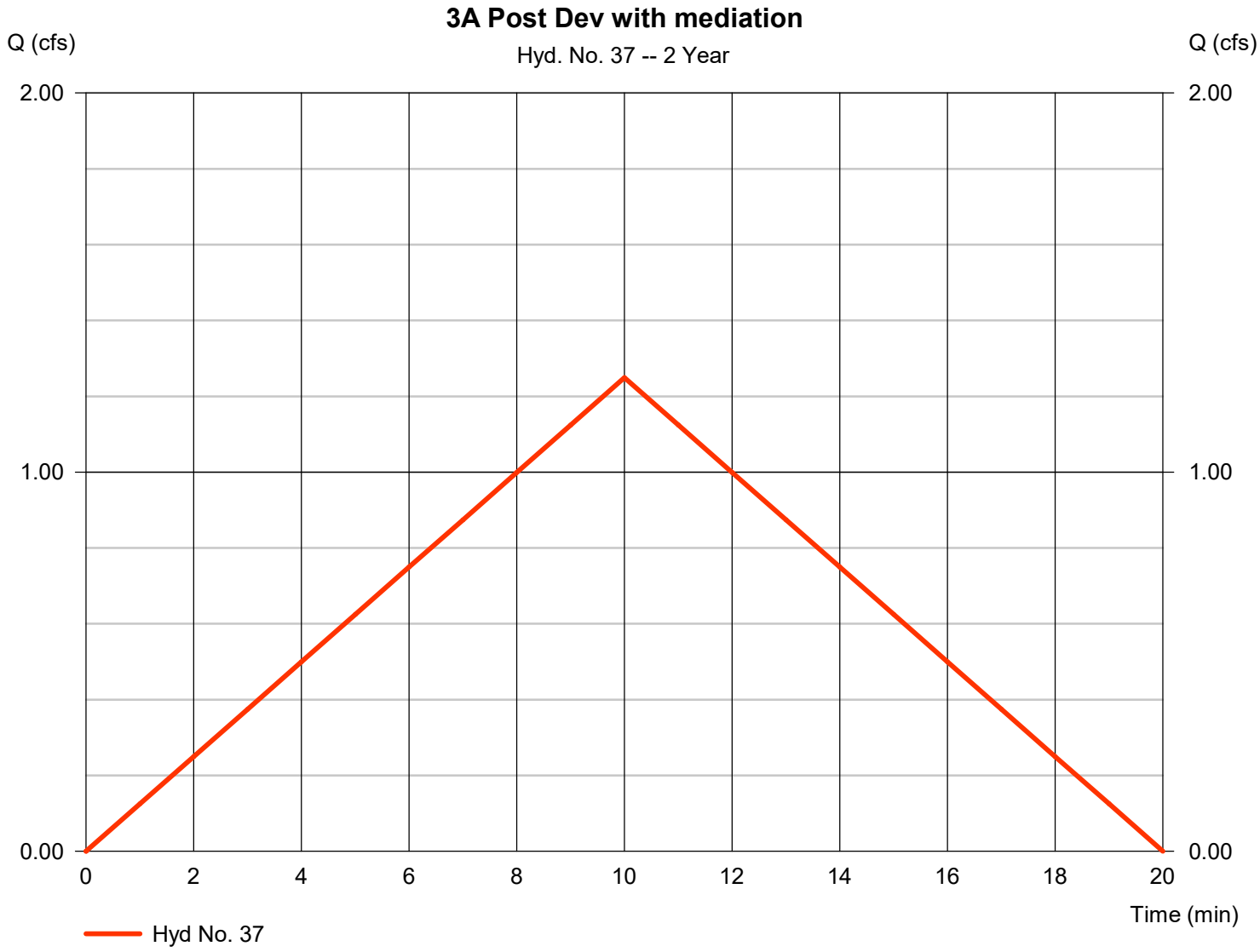


Hydrograph Report

Hyd. No. 37

3A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	1.249 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	749 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

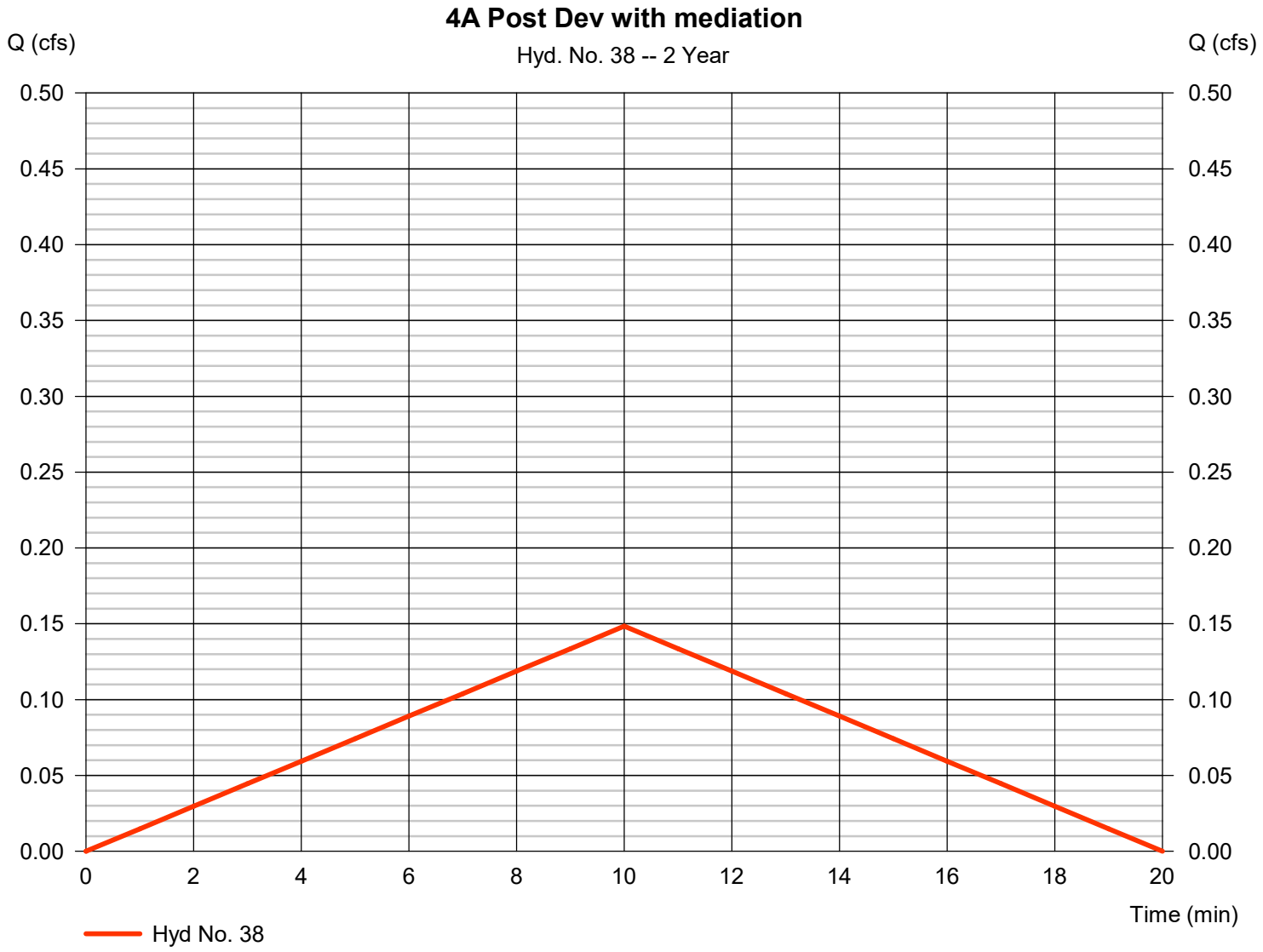


Hydrograph Report

Hyd. No. 38

4A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.148 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	89 cuft
Drainage area	=	0.110 ac	Runoff coeff.	=	0.53
Intensity	=	2.547 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

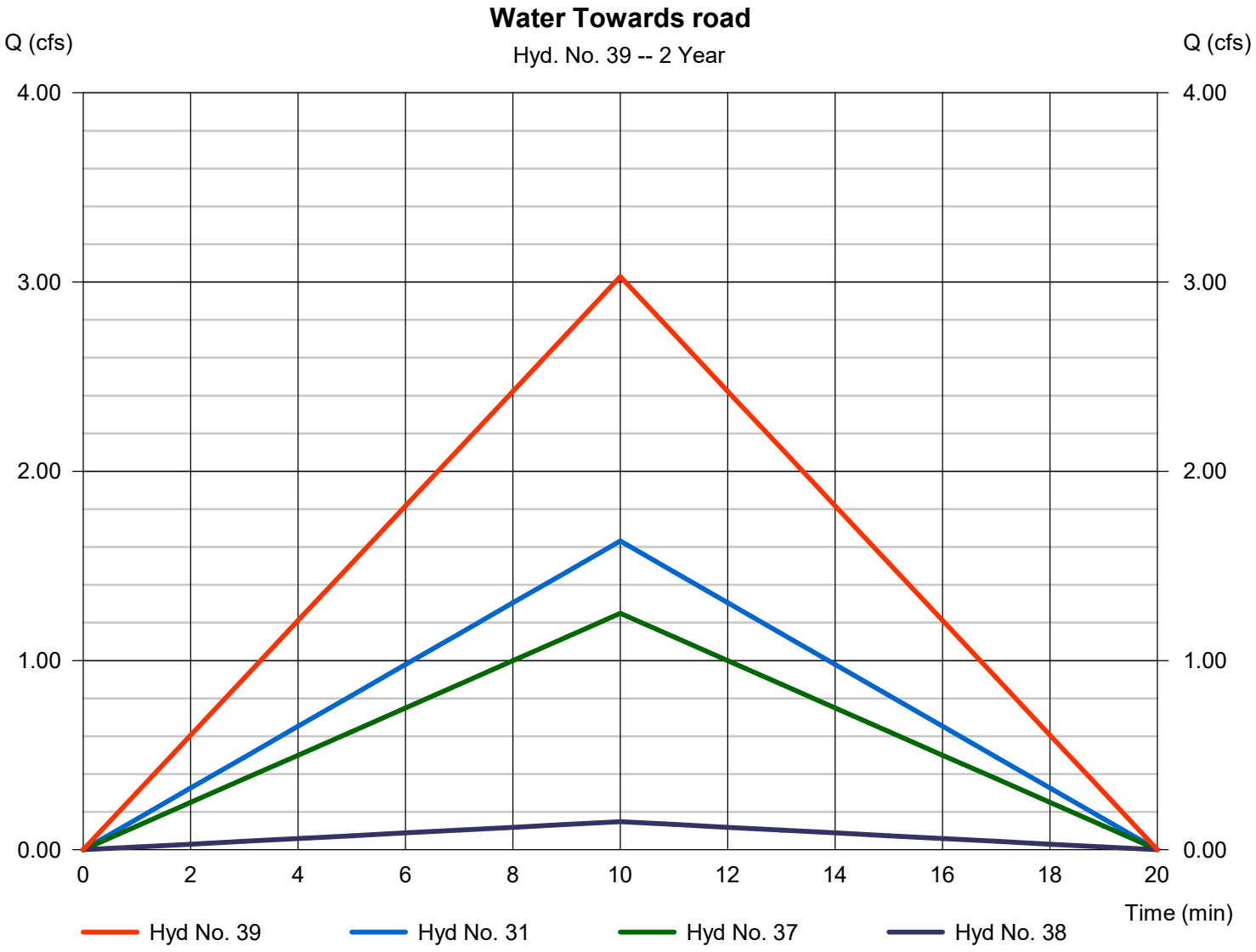


Hydrograph Report

Hyd. No. 39

Water Towards road

Hydrograph type	= Combine	Peak discharge	= 3.029 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,817 cuft
Inflow hyds.	= 31, 37, 38	Contrib. drain. area	= 2.250 ac



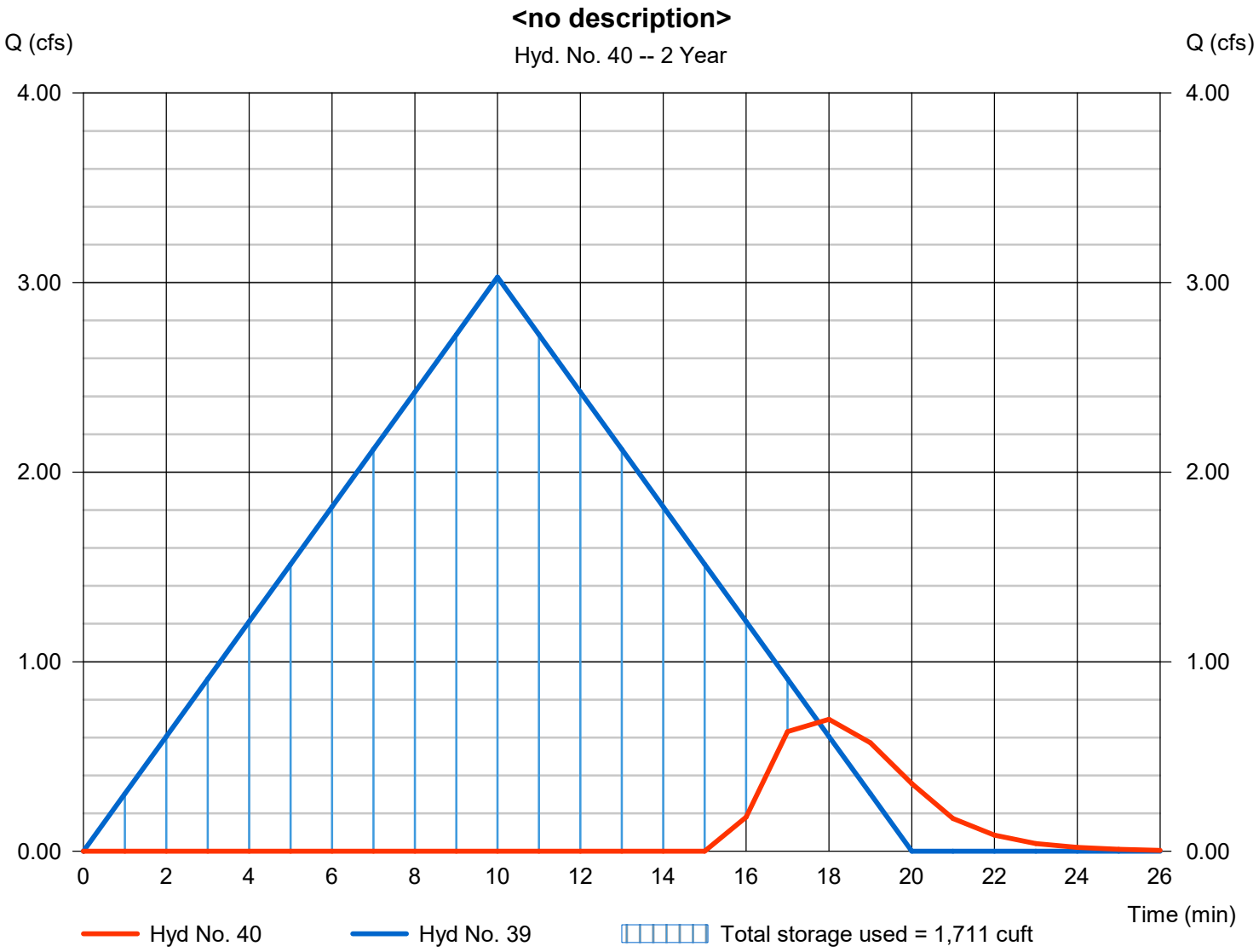
Hydrograph Report

Hyd. No. 40

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	0.696 cfs
Storm frequency	=	2 yrs	Time to peak	=	18 min
Time interval	=	1 min	Hyd. volume	=	166 cuft
Inflow hyd. No.	=	39 - Water Towards road	Max. Elevation	=	102.56 ft
Reservoir name	=	Lot 4 Pond	Max. Storage	=	1,711 cuft

Storage Indication method used.



Pond Report

Pond No. 4 - Lot 4 Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	258	0	0
1.00	101.00	555	397	397
2.00	102.00	894	718	1,115
3.00	103.00	1,261	1,072	2,187

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	Inactive	Inactive	Inactive	Inactive
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

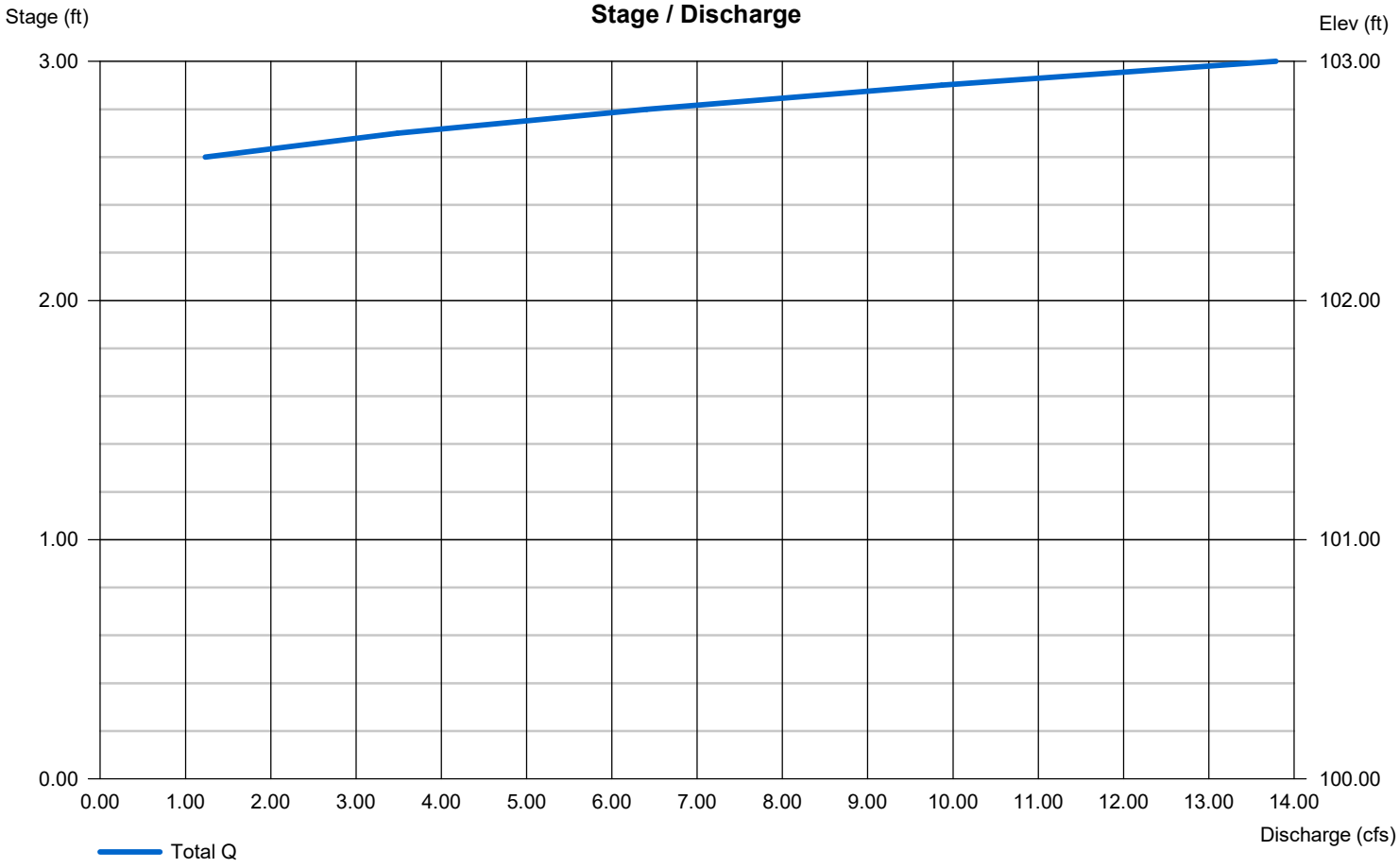
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.00	Inactive	Inactive	Inactive
Crest El. (ft)	= 102.50	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
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).

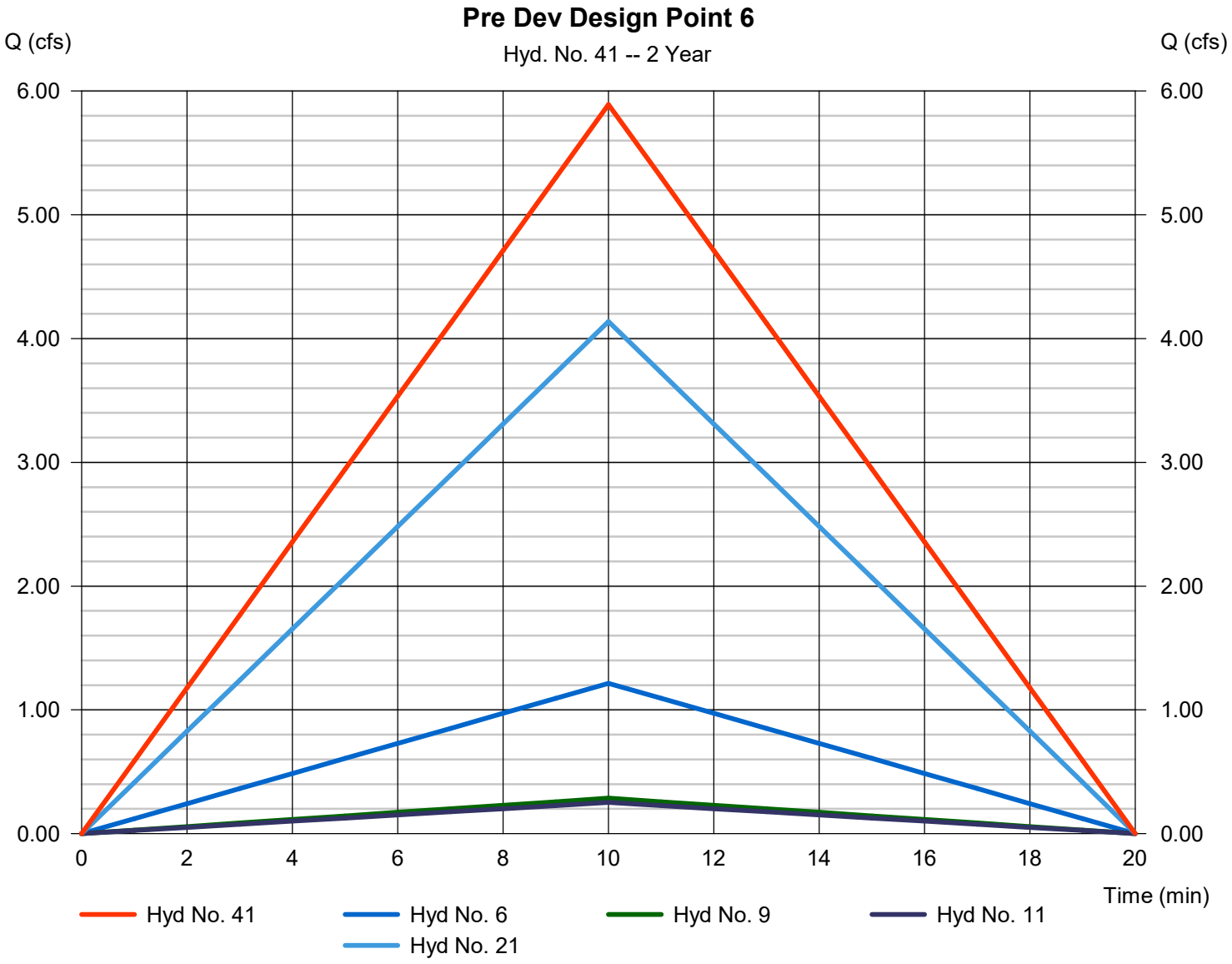


Hydrograph Report

Hyd. No. 41

Pre Dev Design Point 6

Hydrograph type	= Combine	Peak discharge	= 5.891 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 3,534 cuft
Inflow hyds.	= 6, 9, 11, 21	Contrib. drain. area	= 1.530 ac



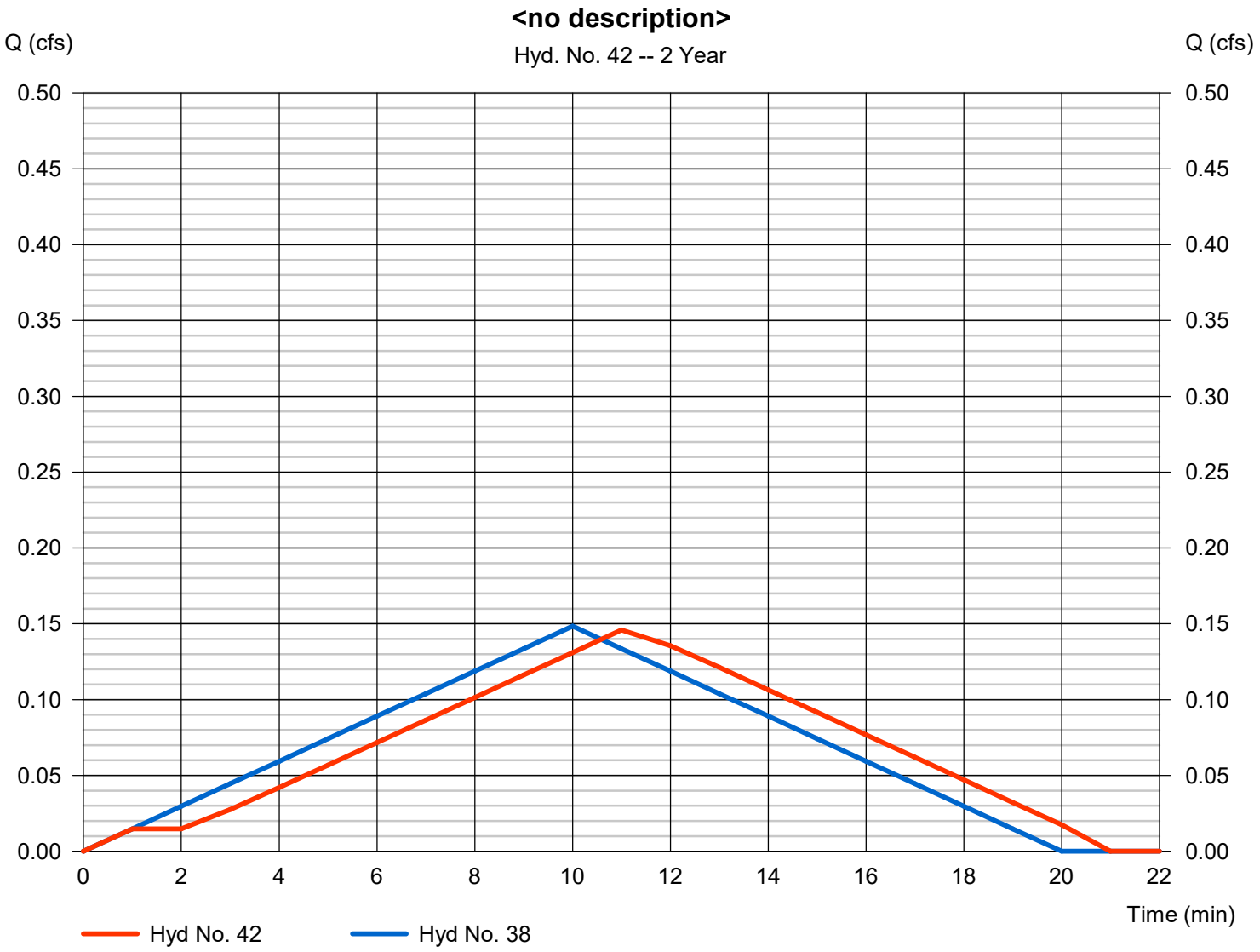
Hydrograph Report

Hyd. No. 42

<no description>

Hydrograph type	=	Reach	Peak discharge	=	0.146 cfs
Storm frequency	=	2 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	90 cuft
Inflow hyd. No.	=	38 - 4A Post Dev with mediation	Section type	=	Triangular
Reach length	=	140.0 ft	Channel slope	=	28.0 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	6.3:1	Max. depth	=	0.0 ft
Rating curve x	=	6.755	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.8526

Modified Att-Kin routing method used.

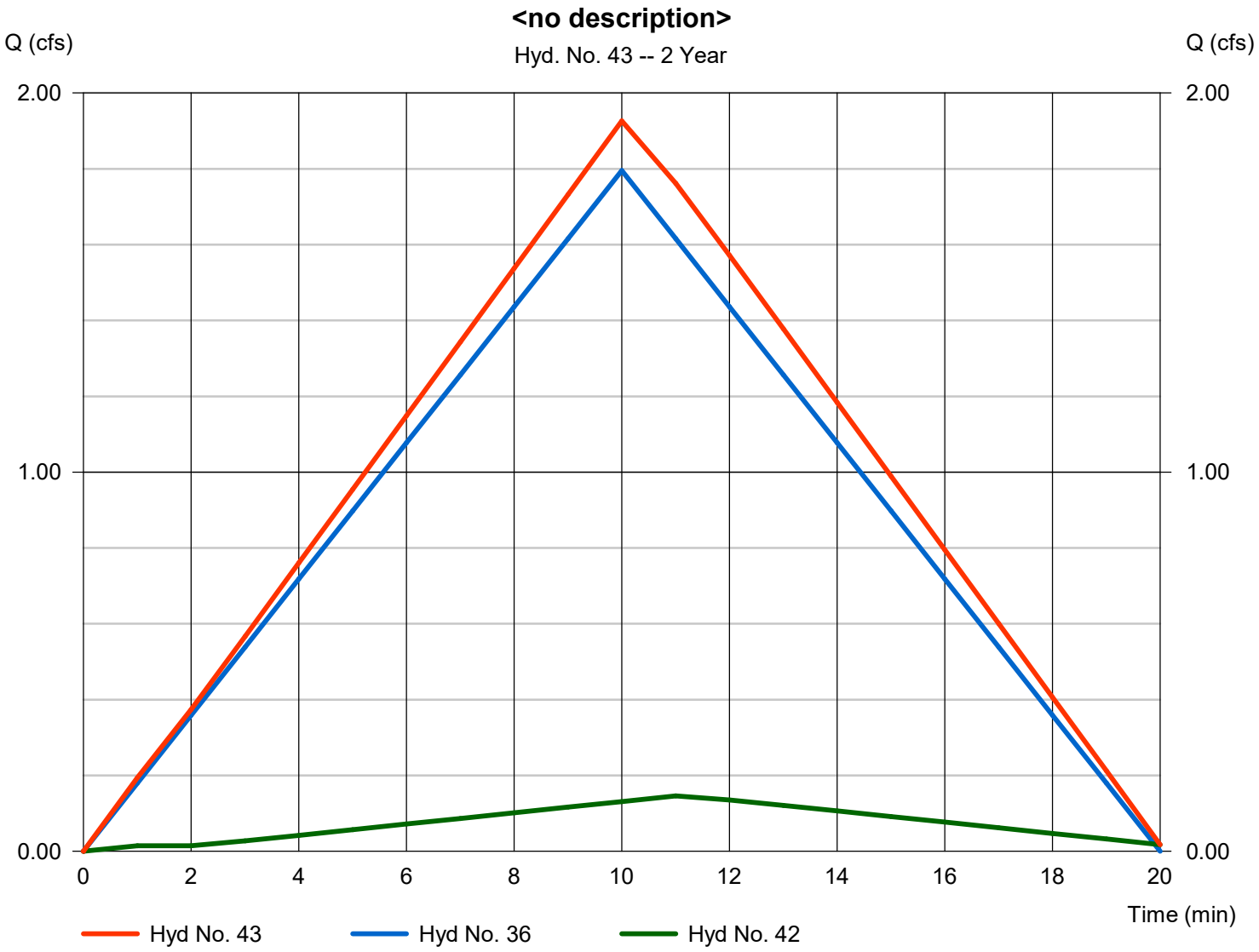


Hydrograph Report

Hyd. No. 43

<no description>

Hydrograph type	=	Combine	Peak discharge	=	1.926 cfs
Storm frequency	=	2 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,167 cuft
Inflow hyds.	=	36, 42	Contrib. drain. area	=	1.410 ac



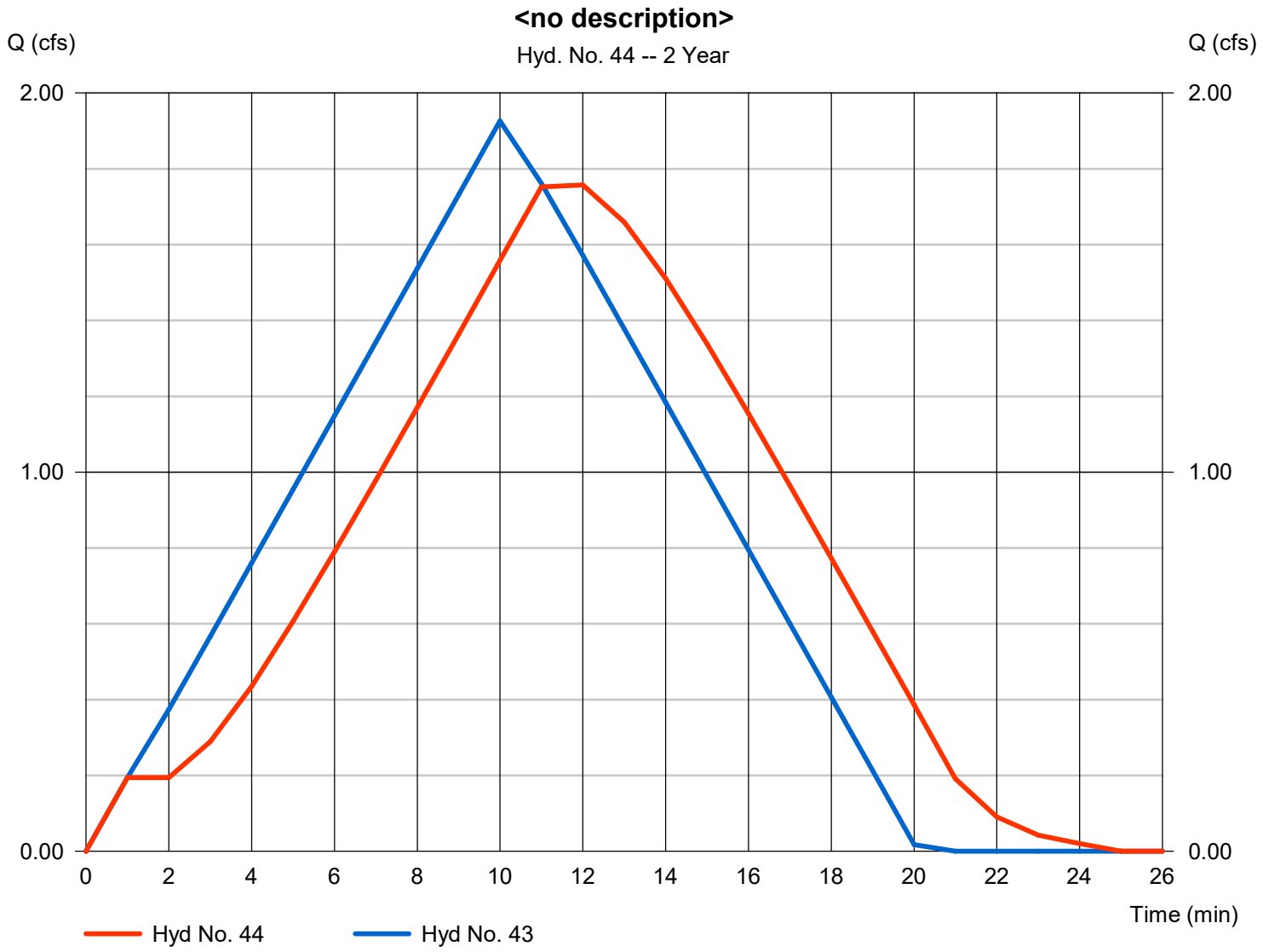
Hydrograph Report

Hyd. No. 44

<no description>

Hydrograph type	=	Reach	Peak discharge	=	1.757 cfs
Storm frequency	=	2 yrs	Time to peak	=	12 min
Time interval	=	1 min	Hyd. volume	=	1,188 cuft
Inflow hyd. No.	=	43 - <no description>	Section type	=	Triangular
Reach length	=	307.0 ft	Channel slope	=	7.1 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	8.3:1	Max. depth	=	0.0 ft
Rating curve x	=	3.091	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.5271

Modified Att-Kin routing method used.

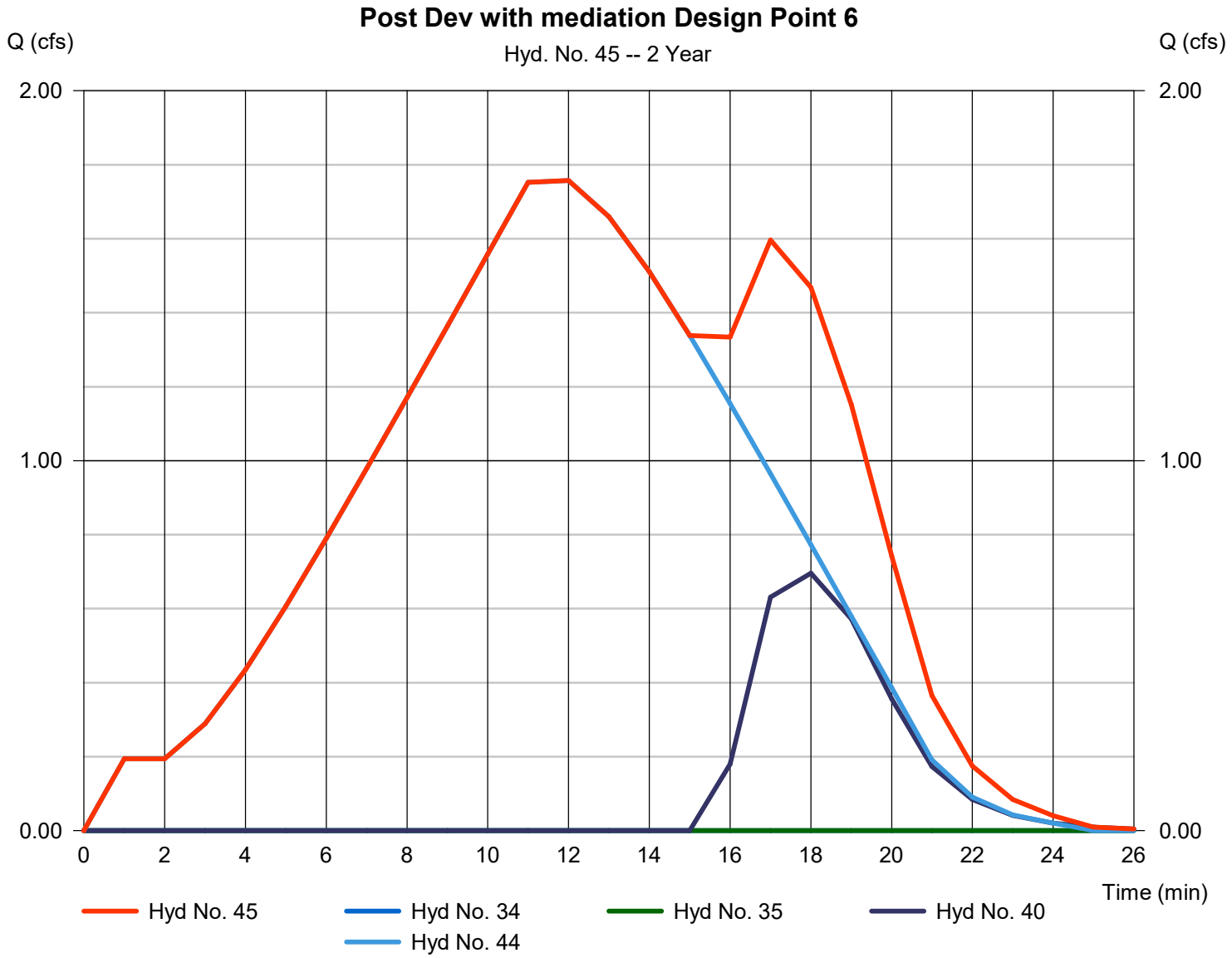


Hydrograph Report

Hyd. No. 45

Post Dev with mediation Design Point 6

Hydrograph type	= Combine	Peak discharge	= 1.757 cfs
Storm frequency	= 2 yrs	Time to peak	= 12 min
Time interval	= 1 min	Hyd. volume	= 1,355 cuft
Inflow hyds.	= 34, 35, 40, 44	Contrib. drain. area	= 0.000 ac

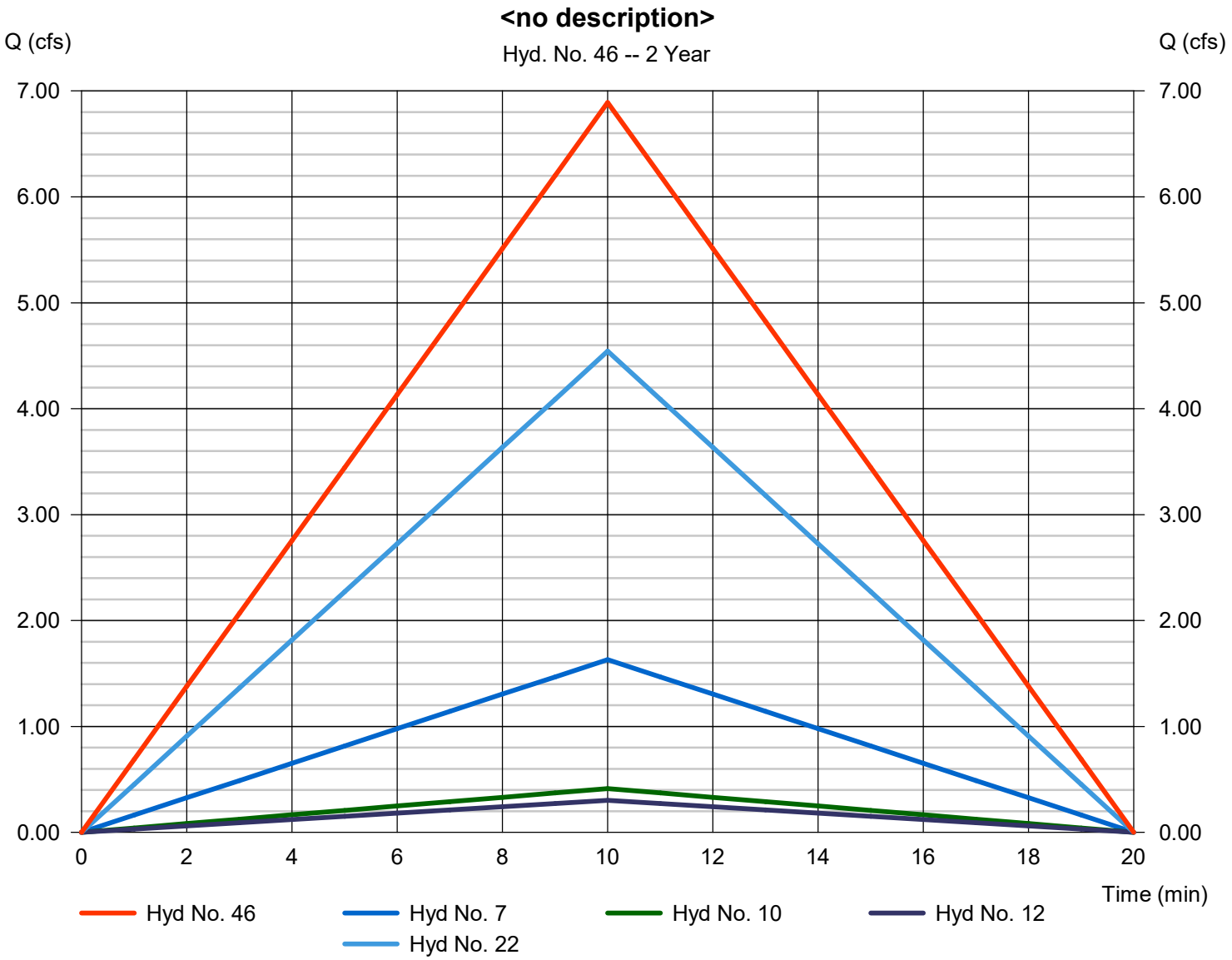


Hydrograph Report

Hyd. No. 46

<no description>

Hydrograph type	= Combine	Peak discharge	= 6.890 cfs
Storm frequency	= 2 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 4,134 cuft
Inflow hyds.	= 7, 10, 12, 22	Contrib. drain. area	= 1.520 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	Rational	31.69	1	10	19,013	------	------	------	1A Pre
2	Rational	2.519	1	10	1,512	------	------	------	2A Post
3	Rational	1.677	1	10	1,006	------	------	------	3A Pre
4	Rational	1.707	1	10	1,024	------	------	------	4A Pre
5	Rational	2.169	1	10	1,301	------	------	------	5A Pre
6	Rational	1.631	1	10	978	------	------	------	6A Pre
7	Rational	2.189	1	10	1,314	------	------	------	6A Post
8	Rational	2.011	1	10	1,207	------	------	------	4A Post
9	Rational	0.385	1	10	231	------	------	------	7A Pre
10	Rational	0.555	1	10	333	------	------	------	7A Post
11	Rational	0.338	1	10	203	------	------	------	8A Pre
12	Rational	0.406	1	10	244	------	------	------	8A Post
13	Rational	2.061	1	10	1,237	------	------	------	2A Pre
14	Rational	2.410	1	10	1,446	------	------	------	5A Post
15	Rational	31.69	1	10	19,013	------	------	------	1A Post
16	Combine	33.75	1	10	20,249	1, 13,	------	------	1A & 2A Pre Combined
17	Combine	34.21	1	10	20,524	2, 15,	------	------	1A & 2A Post Combined
18	Combine	3.384	1	10	2,030	3, 4,	------	------	3A & 4A Pre Combined
19	Rational	1.677	1	10	1,006	------	------	------	3A Post
20	Combine	3.688	1	10	2,213	8, 19	------	------	3A & 4A Post Combined
21	Combine	5.553	1	10	3,332	5, 18,	------	------	Design Point 5 Pre Dev
22	Combine	6.098	1	10	3,659	14, 20,	------	------	Design Point 5 Post Dev
23	Rational	0.338	1	10	203	------	------	------	2A-1 Post Dev with mediation
24	Rational	30.86	1	10	18,514	------	------	------	1A Post Dev With mediation
25	Rational	1.166	1	10	699	------	------	------	2A-2 Post Dev With mediation
26	Rational	1.015	1	10	609	------	------	------	2A-3 Post Dev with Mediation
27	Reservoir	0.085	1	18	11	23	100.81	195	Pond South of Lot 1
28	Reservoir	1.138	1	10	564	25	100.89	152	Pond b/w 1 & 2
29	Reservoir	1.145	1	10	372	26	101.92	260	Lot 3 Pond
30	Combine	33.14	1	10	19,461	24, 27, 28, 29	------	------	Design Point 2
31	Rational	2.189	1	10	1,314	------	------	------	6A post Dev with mediation
32	Rational	0.555	1	10	333	------	------	------	7A Post With Mediation
33	Rational	0.406	1	10	244	------	------	------	8A Post with Mediation
34	Reservoir	0.000	1	n/a	0	32	100.97	333	Ppond for 7A

Hydrograph Summary Report

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

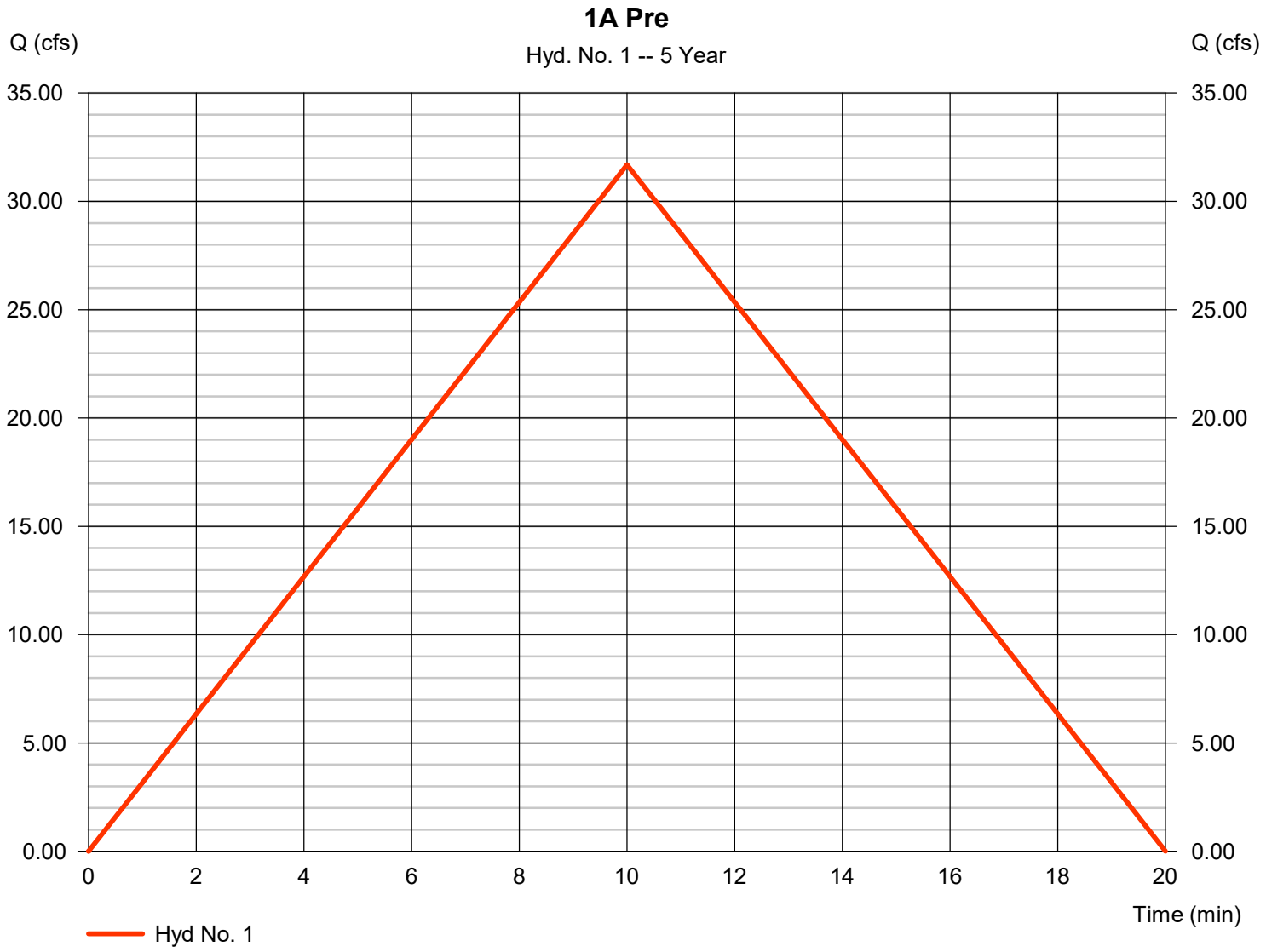
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	Reservoir	0.000	1	n/a	0	33	101.25	244	Pond for 8A
36	Rational	2.410	1	10	1,446	------	------	------	5A Post wth mediation
37	Rational	1.677	1	10	1,006	------	------	------	3A Post Dev with mediation
38	Rational	0.199	1	10	120	------	------	------	4A Post Dev with mediation
39	Combine	4.065	1	10	2,439	31, 37, 38	------	------	Water Towards road
40	Reservoir	2.448	1	14	788	39	102.65	1,816	<no description>
41	Combine	7.907	1	10	4,744	6, 9, 11, 21,	------	------	Pre Dev Design Point 6
42	Reach	0.197	1	11	121	38	------	------	<no description>
43	Combine	2.587	1	10	1,567	36, 42	------	------	<no description>
44	Reach	2.379	1	11	1,594	43	------	------	<no description>
45	Combine	4.464	1	14	2,382	34, 35, 40, 44	------	------	Post Dev with mediation Design Point
46	Combine	9.249	1	10	5,549	7, 10, 12, 22,	------	------	<no description>

Hydrograph Report

Hyd. No. 1

1A Pre

Hydrograph type	=	Rational	Peak discharge	=	31.69 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	19,013 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

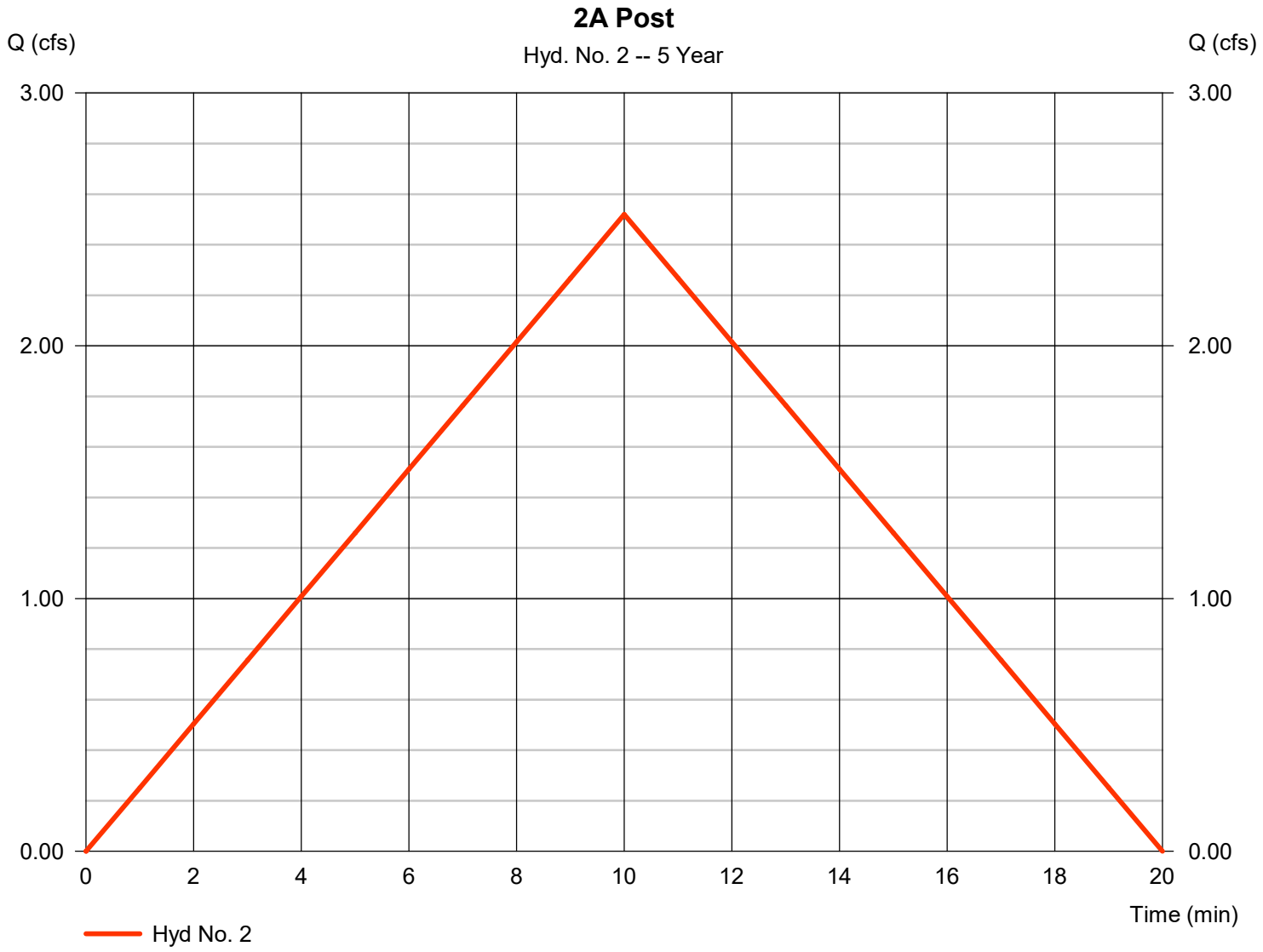


Hydrograph Report

Hyd. No. 2

2A Post

Hydrograph type	=	Rational	Peak discharge	=	2.519 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,512 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.55
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

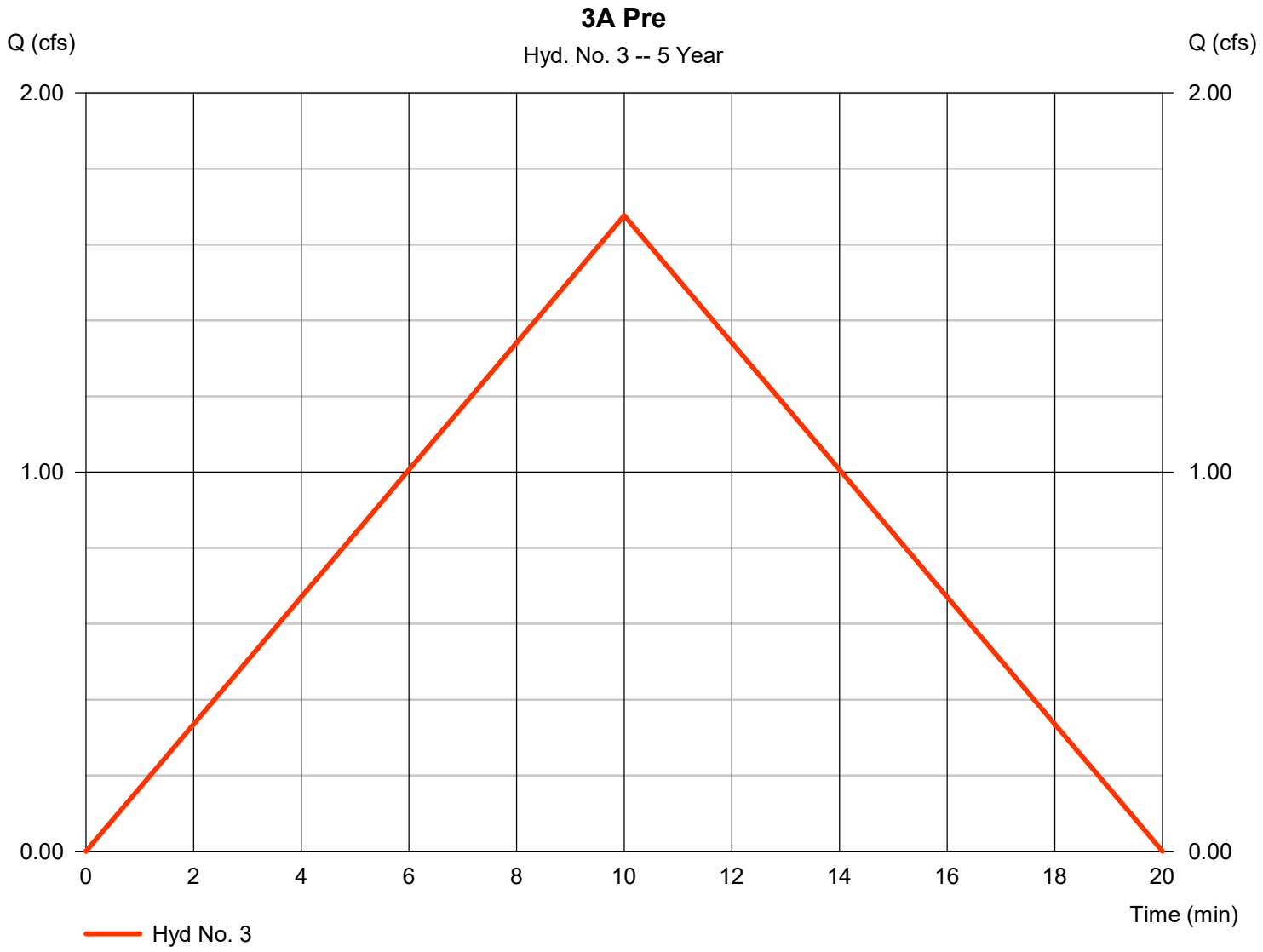


Hydrograph Report

Hyd. No. 3

3A Pre

Hydrograph type	=	Rational	Peak discharge	=	1.677 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,006 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

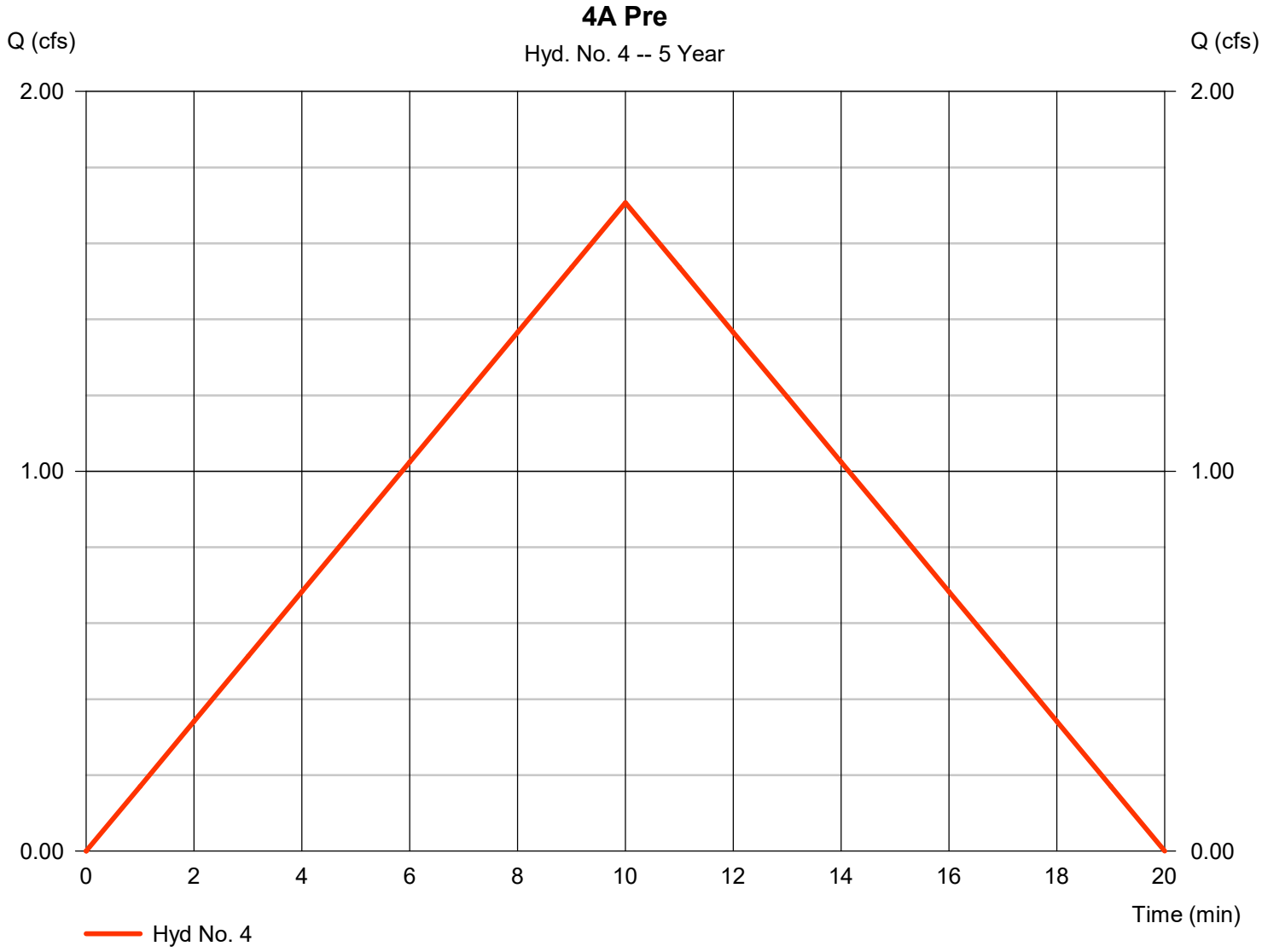


Hydrograph Report

Hyd. No. 4

4A Pre

Hydrograph type	=	Rational	Peak discharge	=	1.707 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,024 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

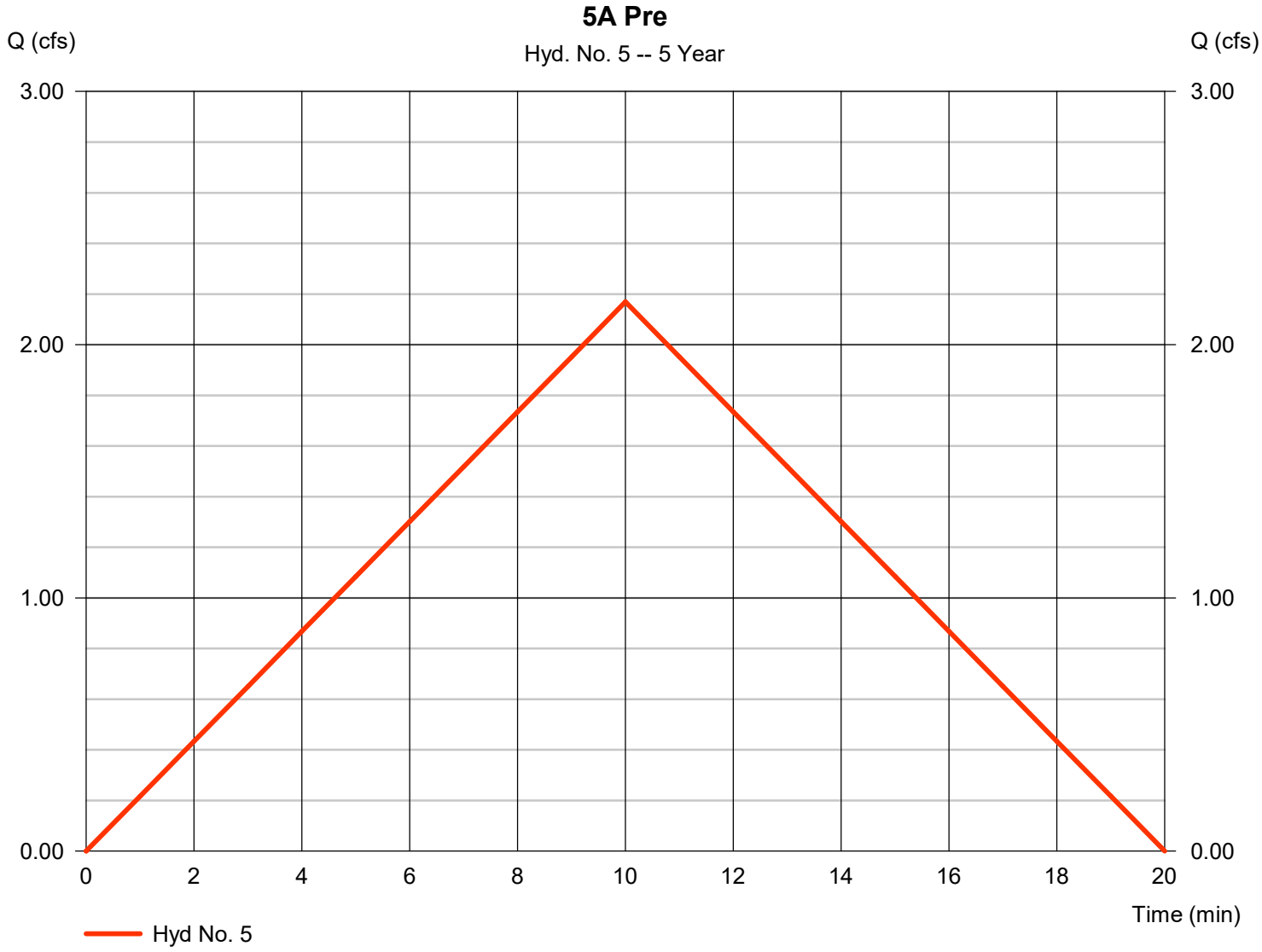


Hydrograph Report

Hyd. No. 5

5A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.169 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,301 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

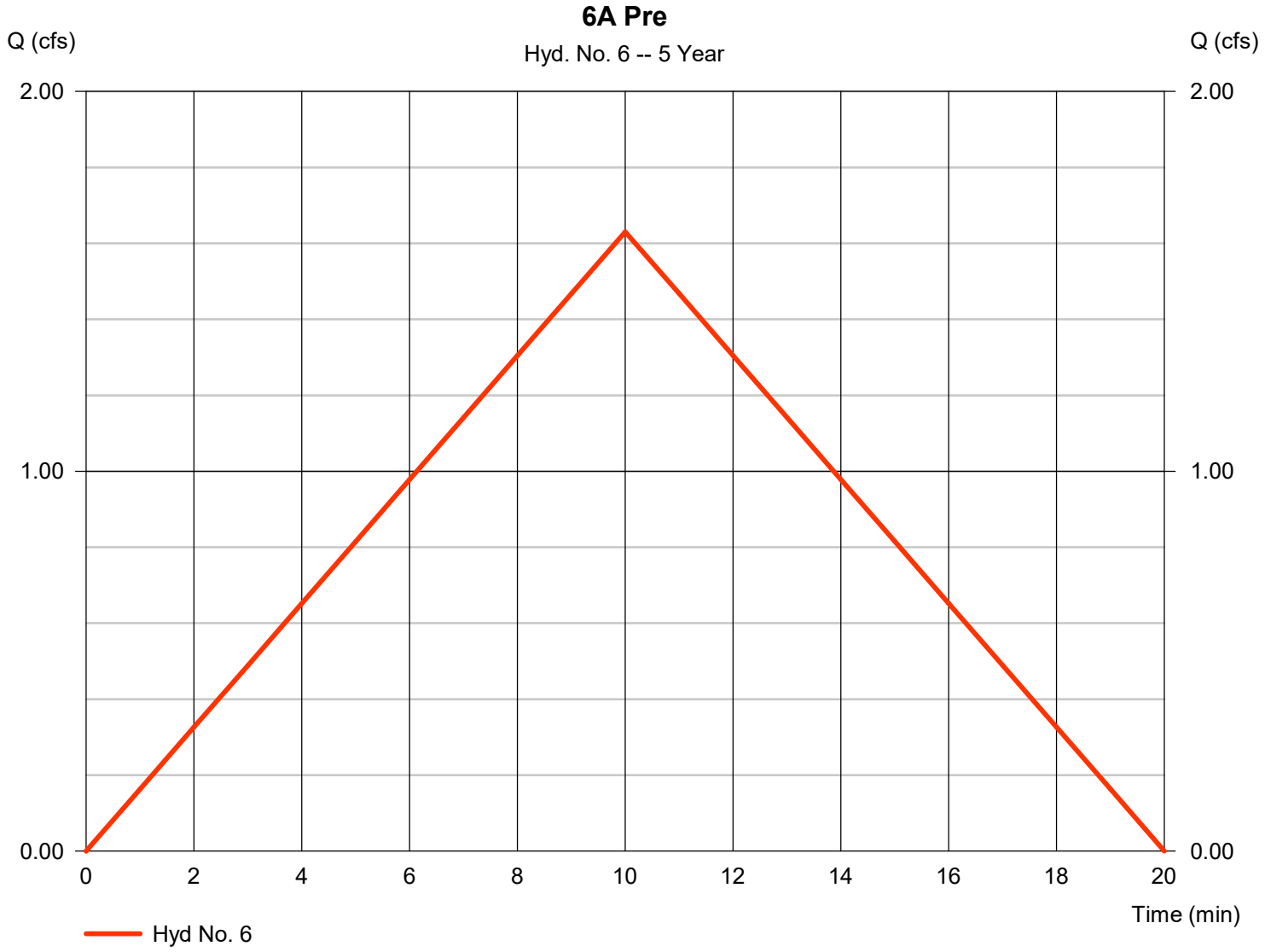


Hydrograph Report

Hyd. No. 6

6A Pre

Hydrograph type	=	Rational	Peak discharge	=	1.631 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	978 cuft
Drainage area	=	1.060 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

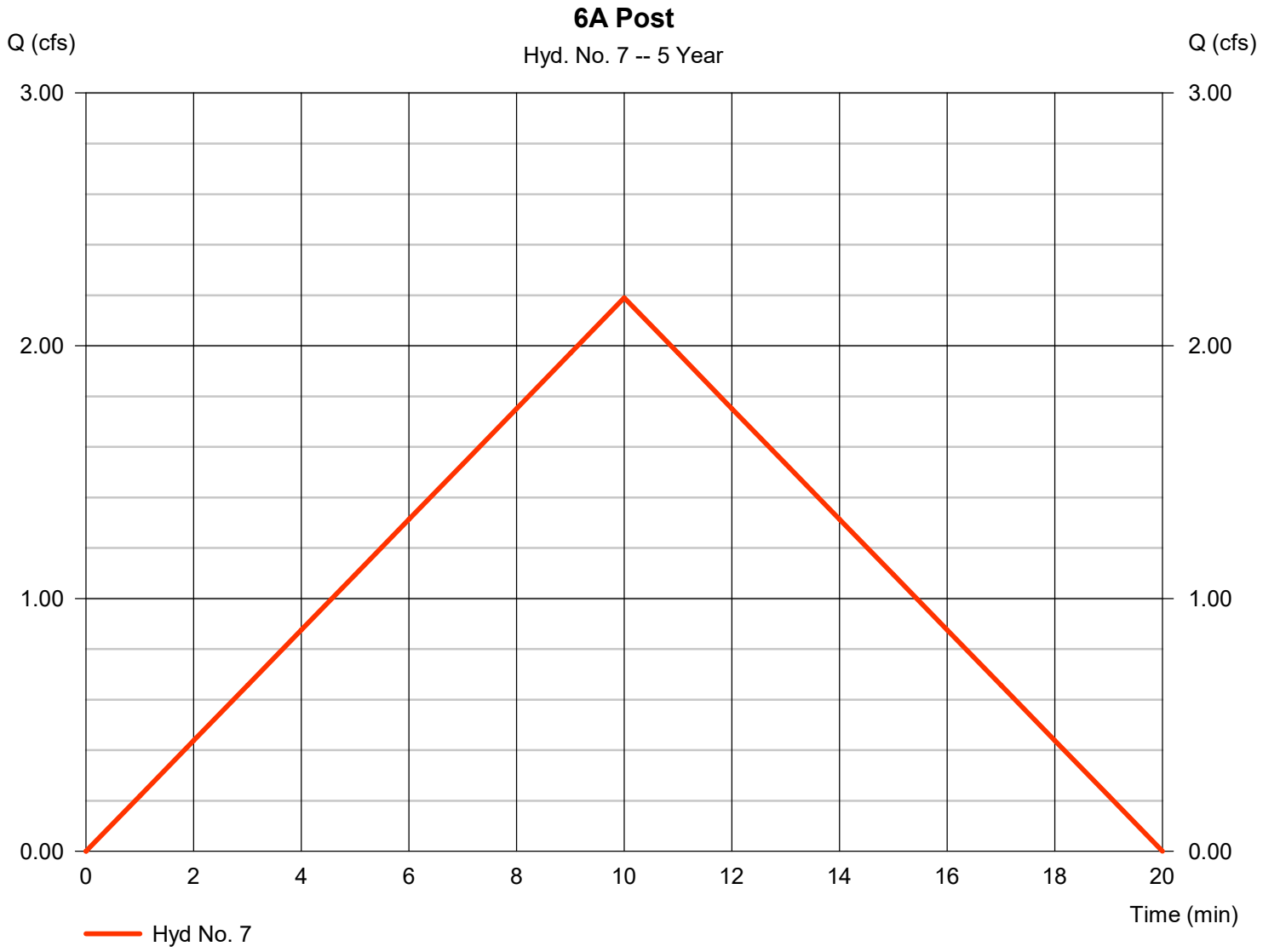


Hydrograph Report

Hyd. No. 7

6A Post

Hydrograph type	=	Rational	Peak discharge	=	2.189 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,314 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

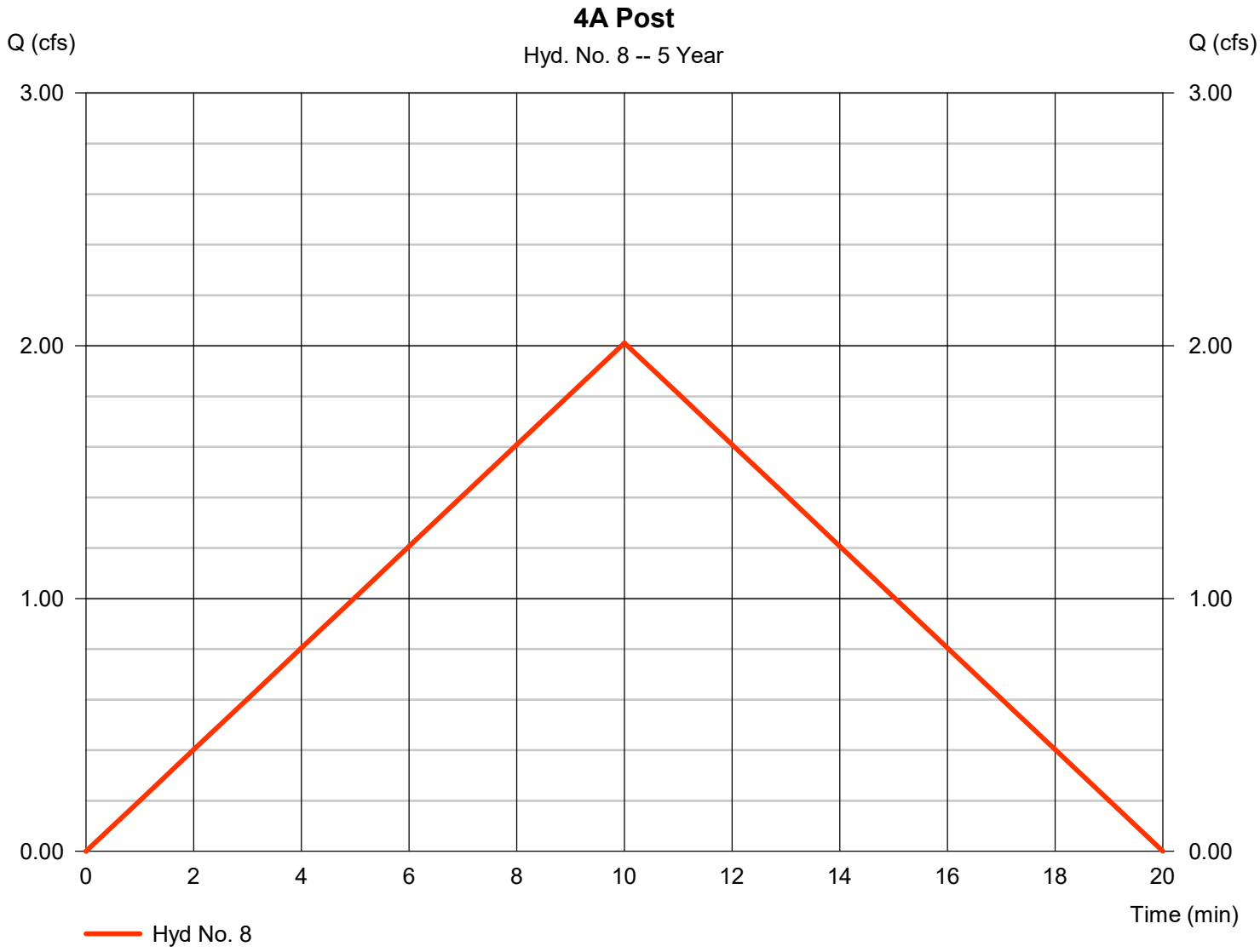


Hydrograph Report

Hyd. No. 8

4A Post

Hydrograph type	=	Rational	Peak discharge	=	2.011 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,207 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.53
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

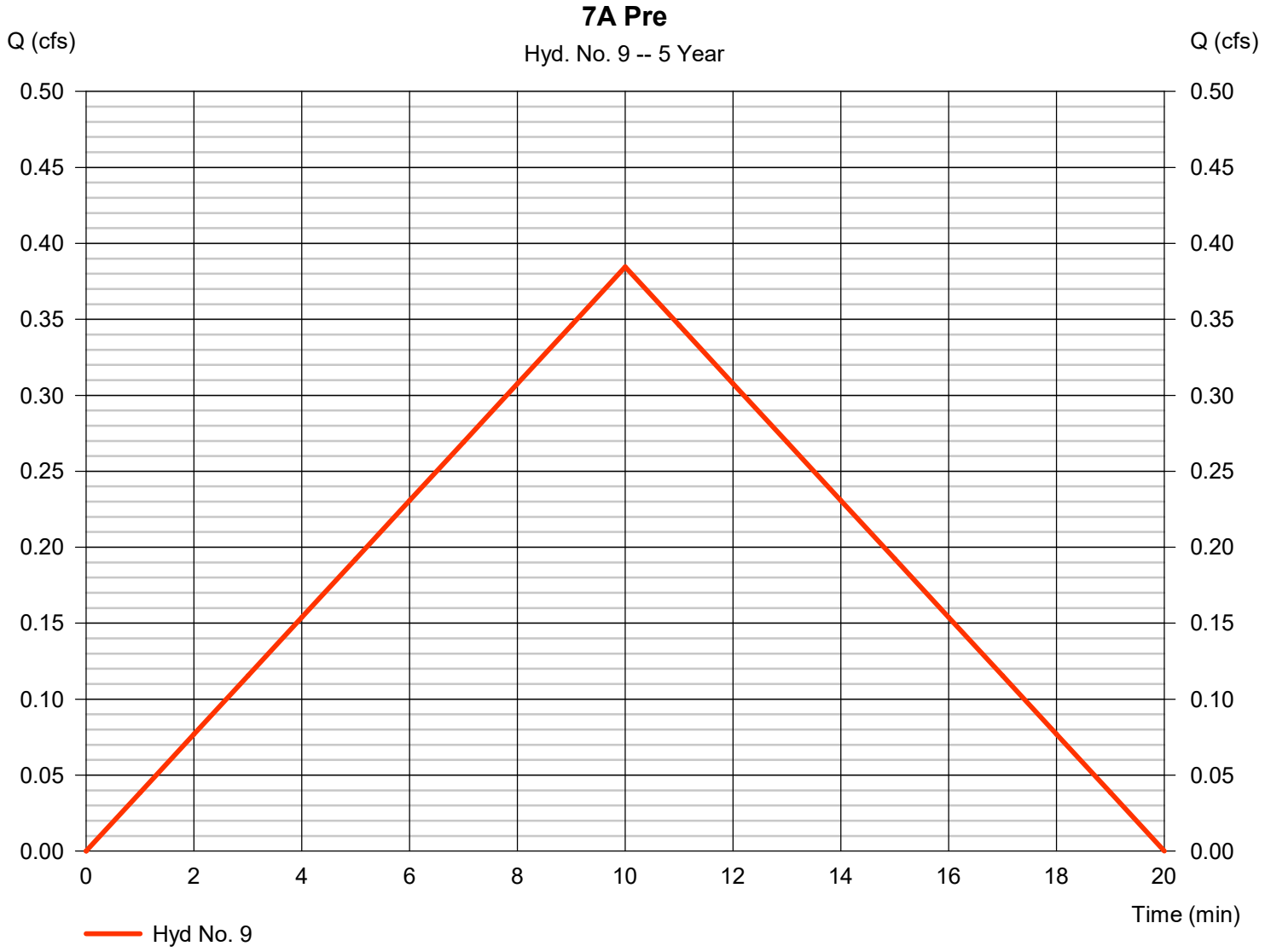


Hydrograph Report

Hyd. No. 9

7A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.385 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	231 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

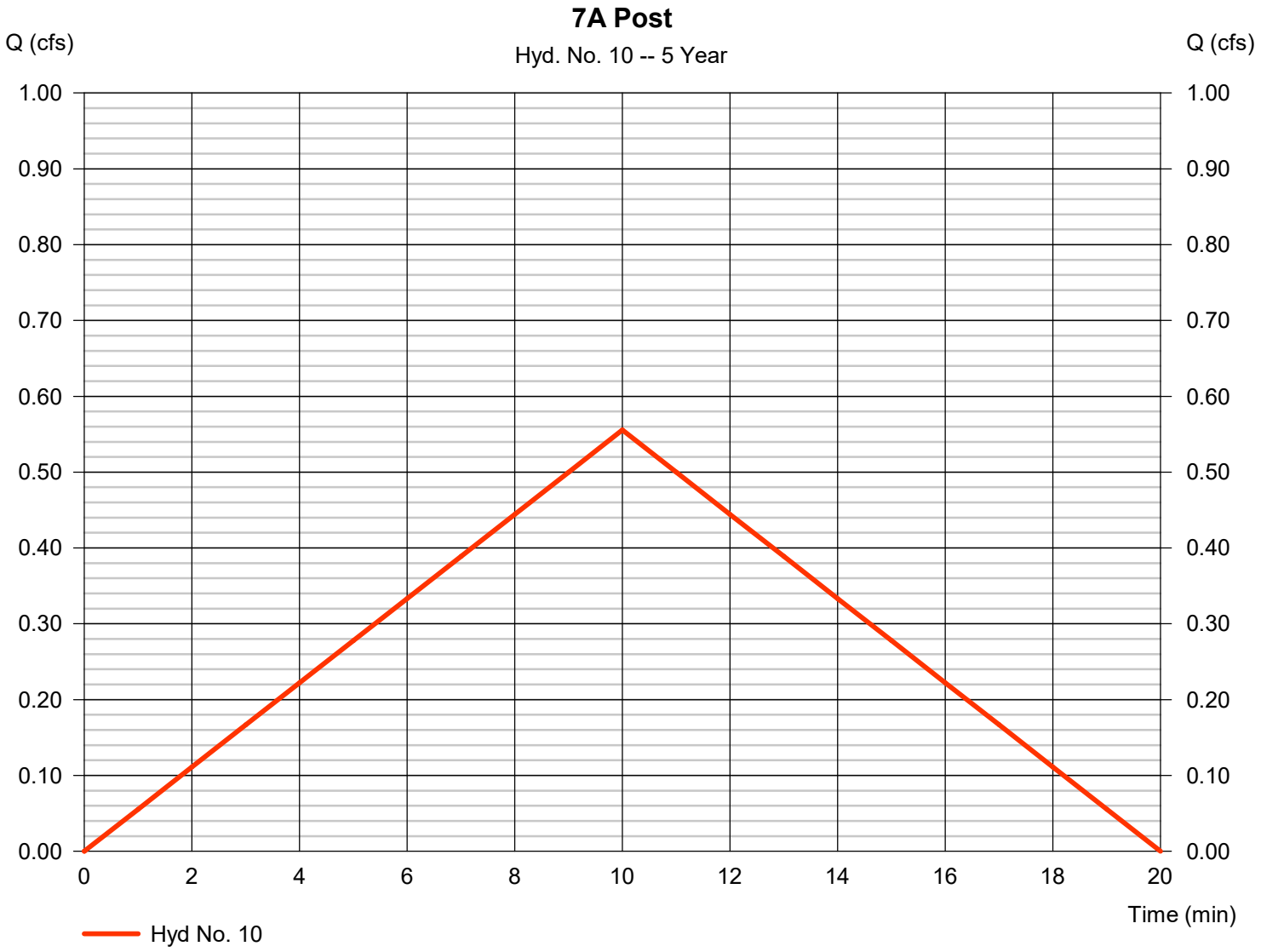


Hydrograph Report

Hyd. No. 10

7A Post

Hydrograph type	=	Rational	Peak discharge	=	0.555 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	333 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

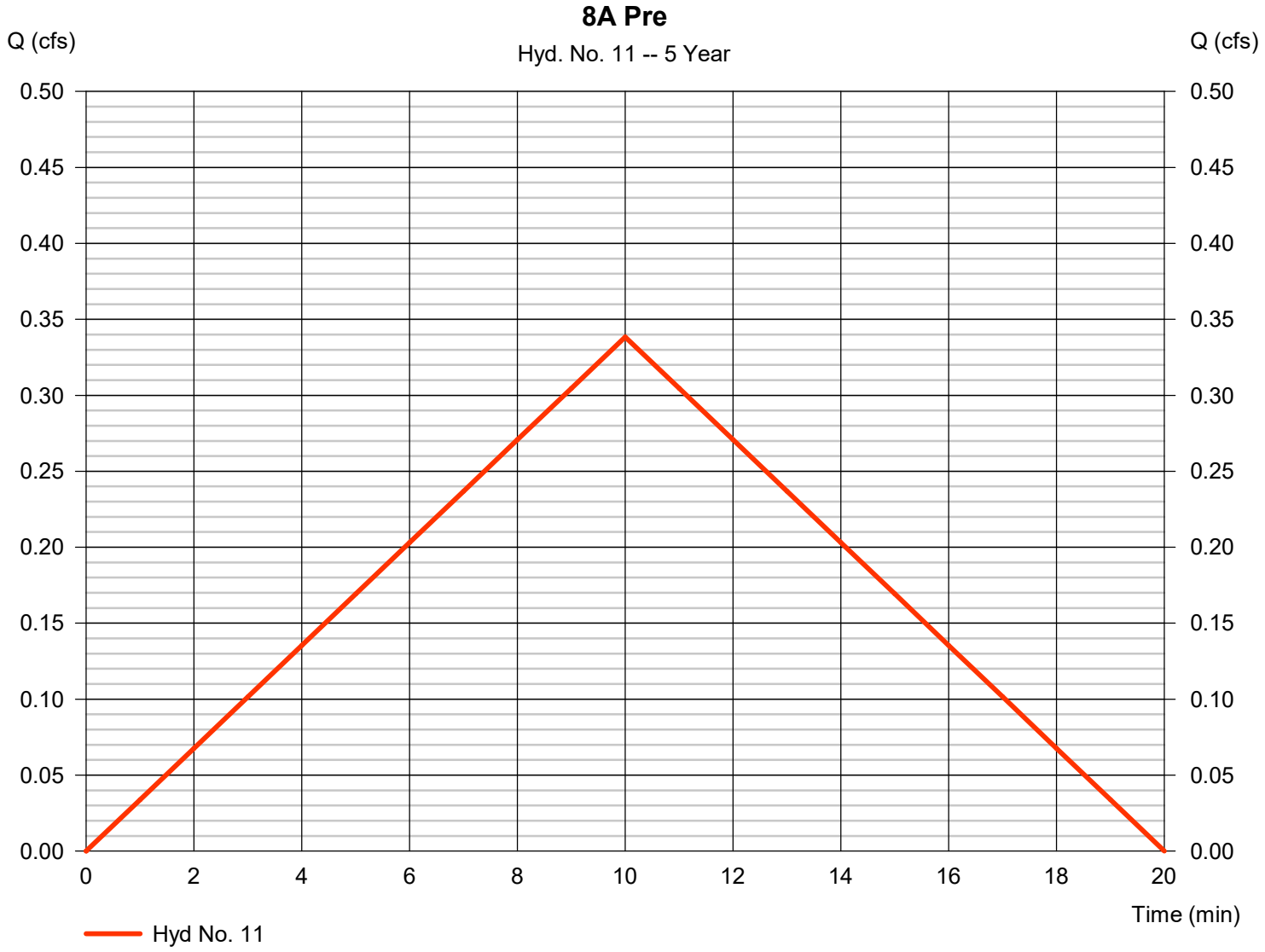


Hydrograph Report

Hyd. No. 11

8A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.338 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	203 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

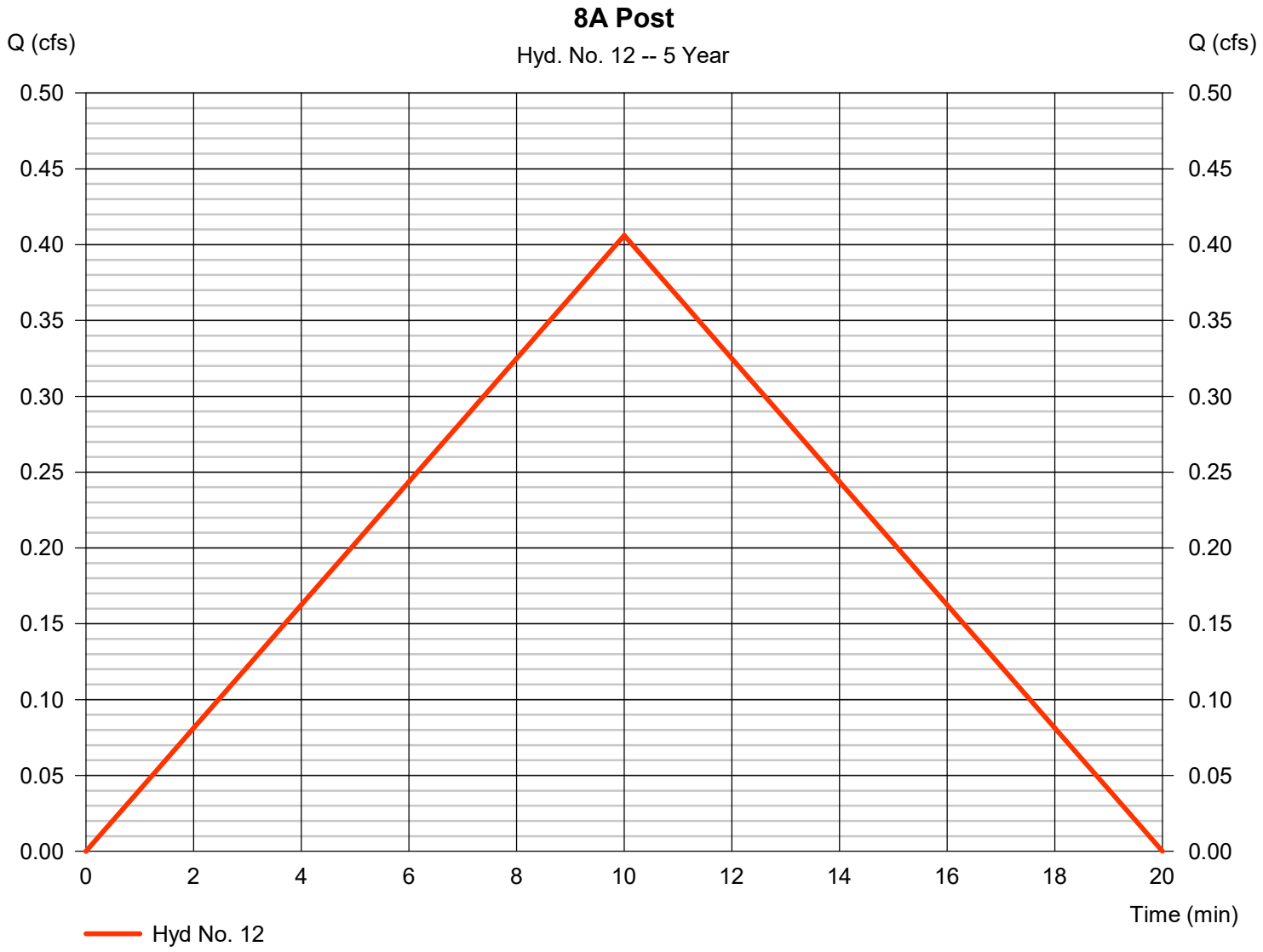


Hydrograph Report

Hyd. No. 12

8A Post

Hydrograph type	=	Rational	Peak discharge	=	0.406 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	244 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

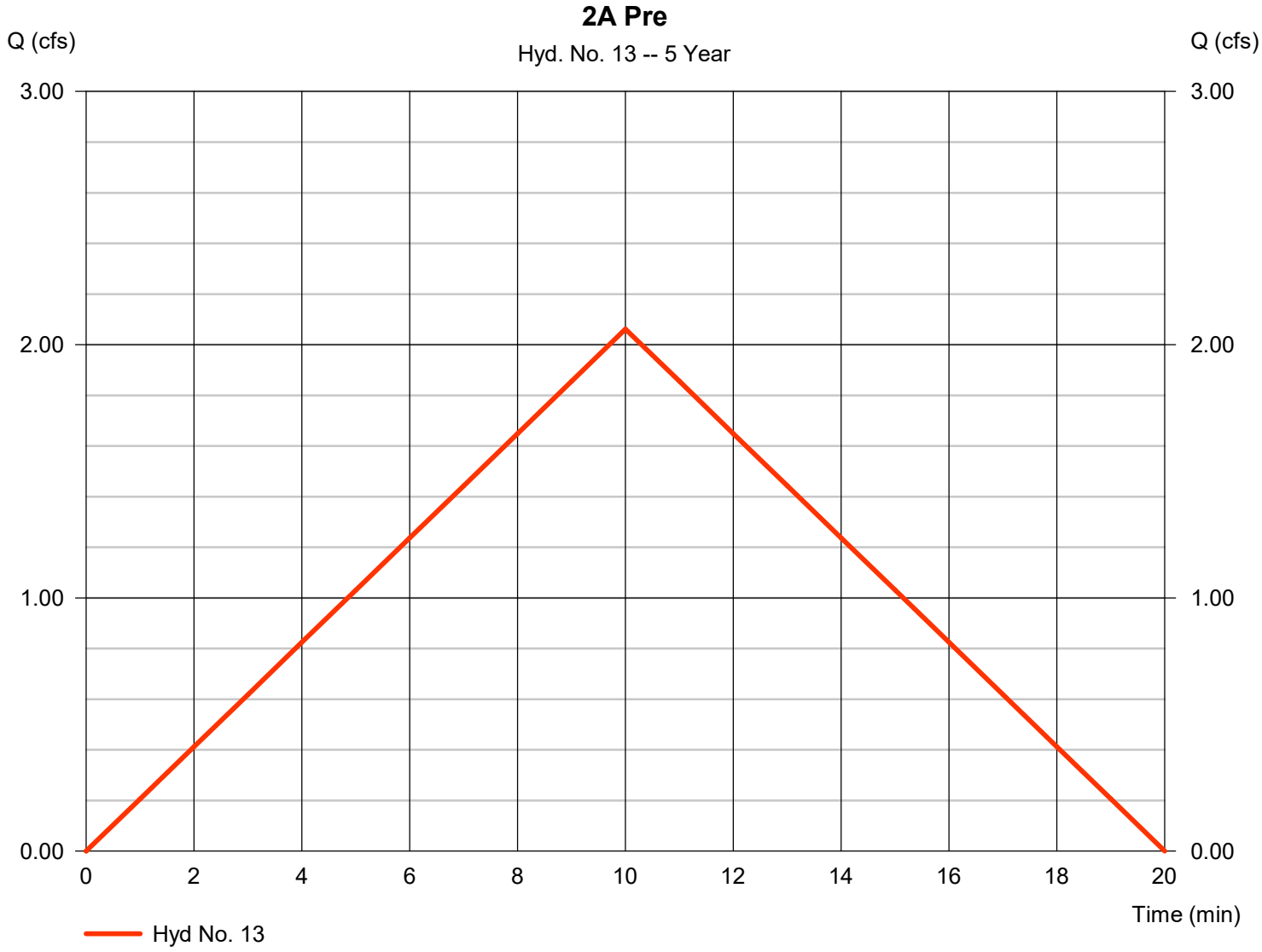


Hydrograph Report

Hyd. No. 13

2A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.061 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,237 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

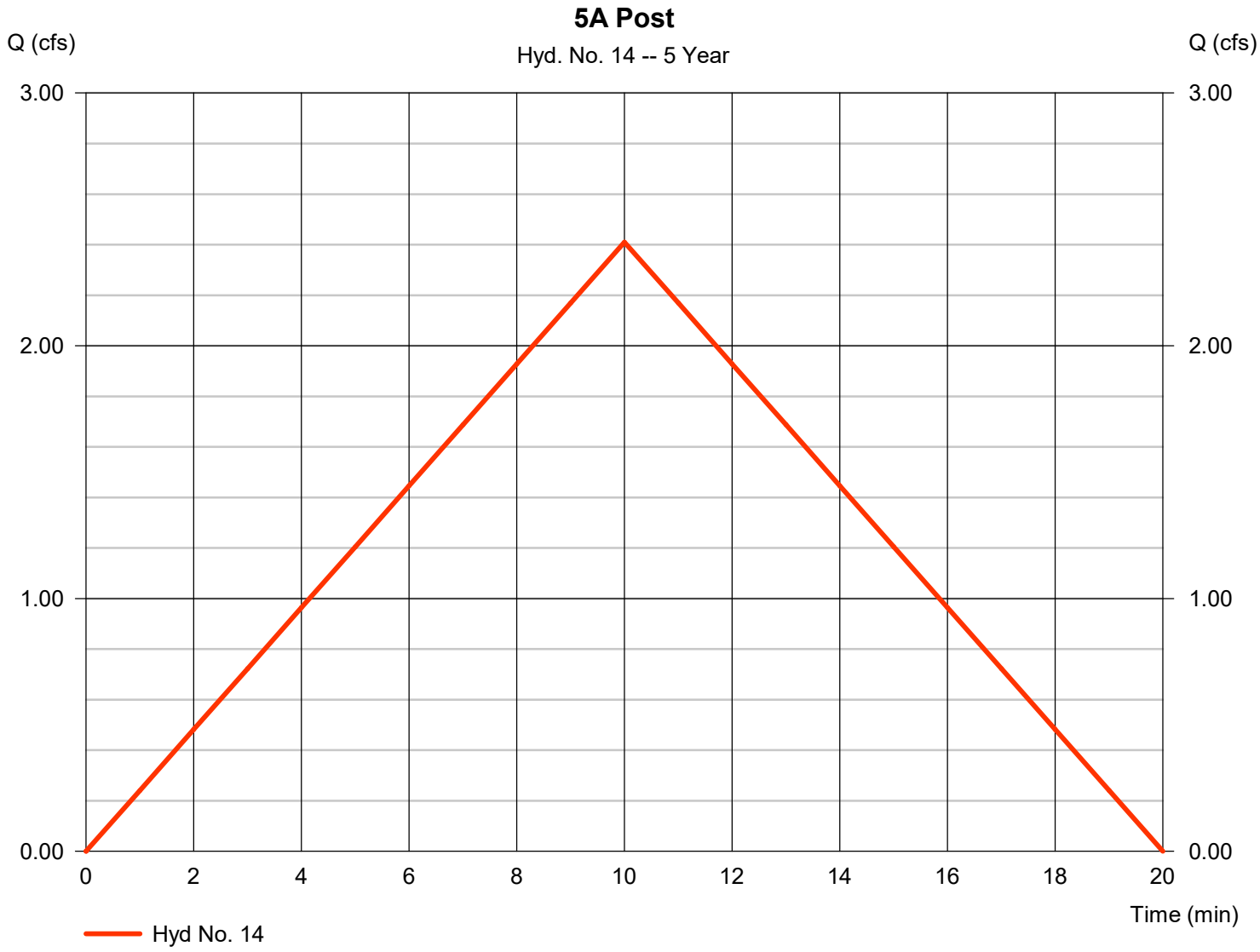


Hydrograph Report

Hyd. No. 14

5A Post

Hydrograph type	=	Rational	Peak discharge	=	2.410 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,446 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

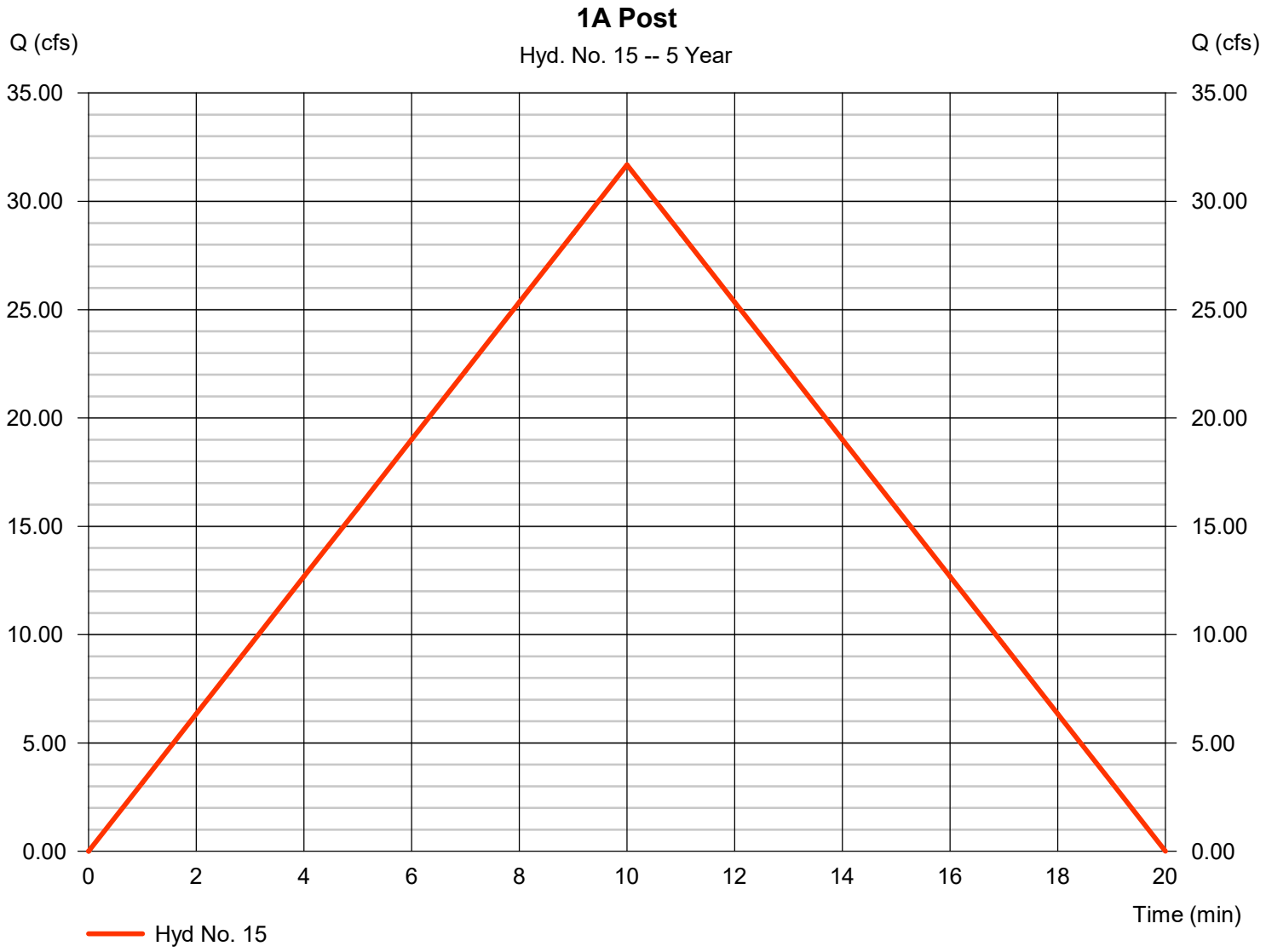


Hydrograph Report

Hyd. No. 15

1A Post

Hydrograph type	=	Rational	Peak discharge	=	31.69 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	19,013 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

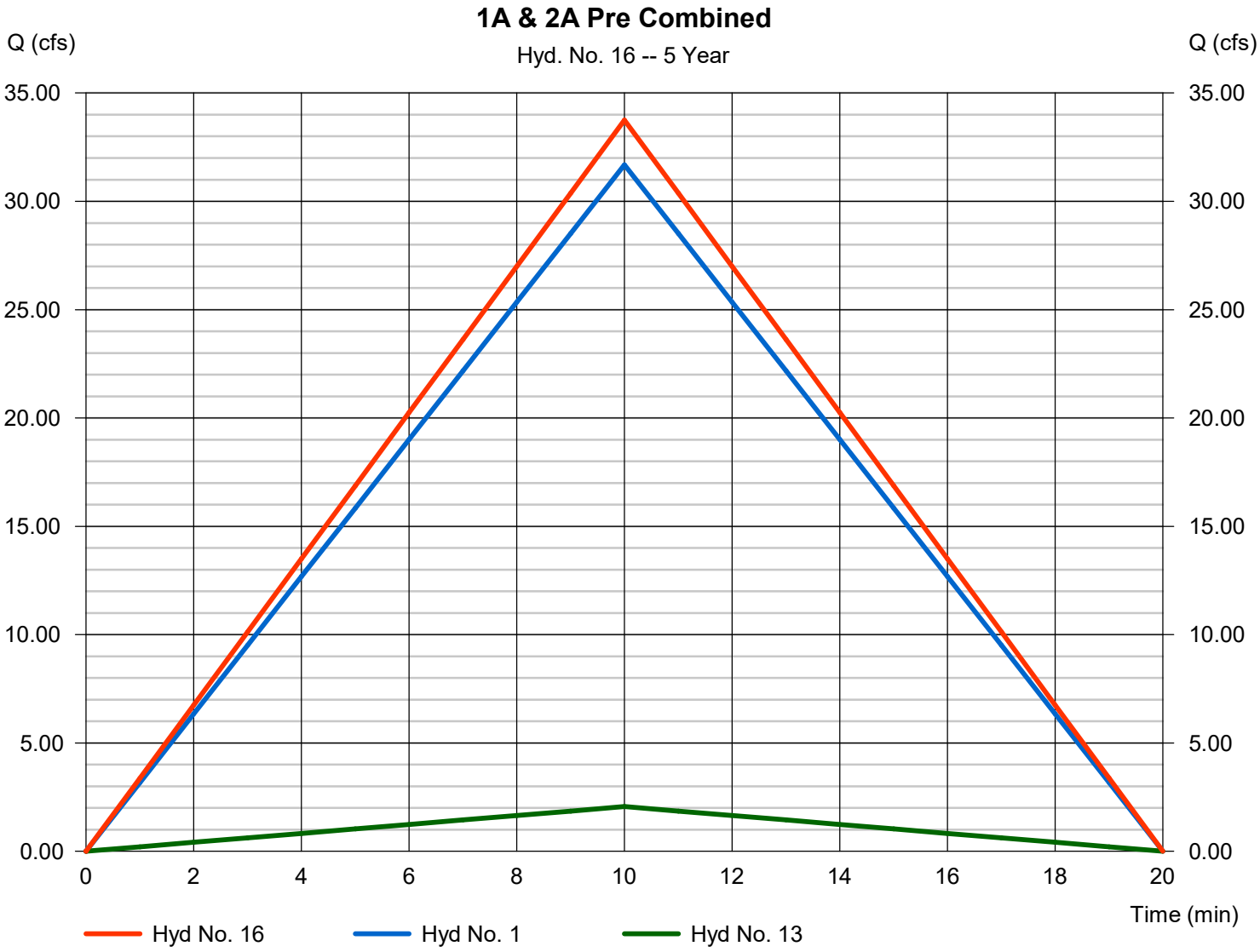


Hydrograph Report

Hyd. No. 16

1A & 2A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 33.75 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 20,249 cuft
Inflow hyds.	= 1, 13	Contrib. drain. area	= 21.940 ac

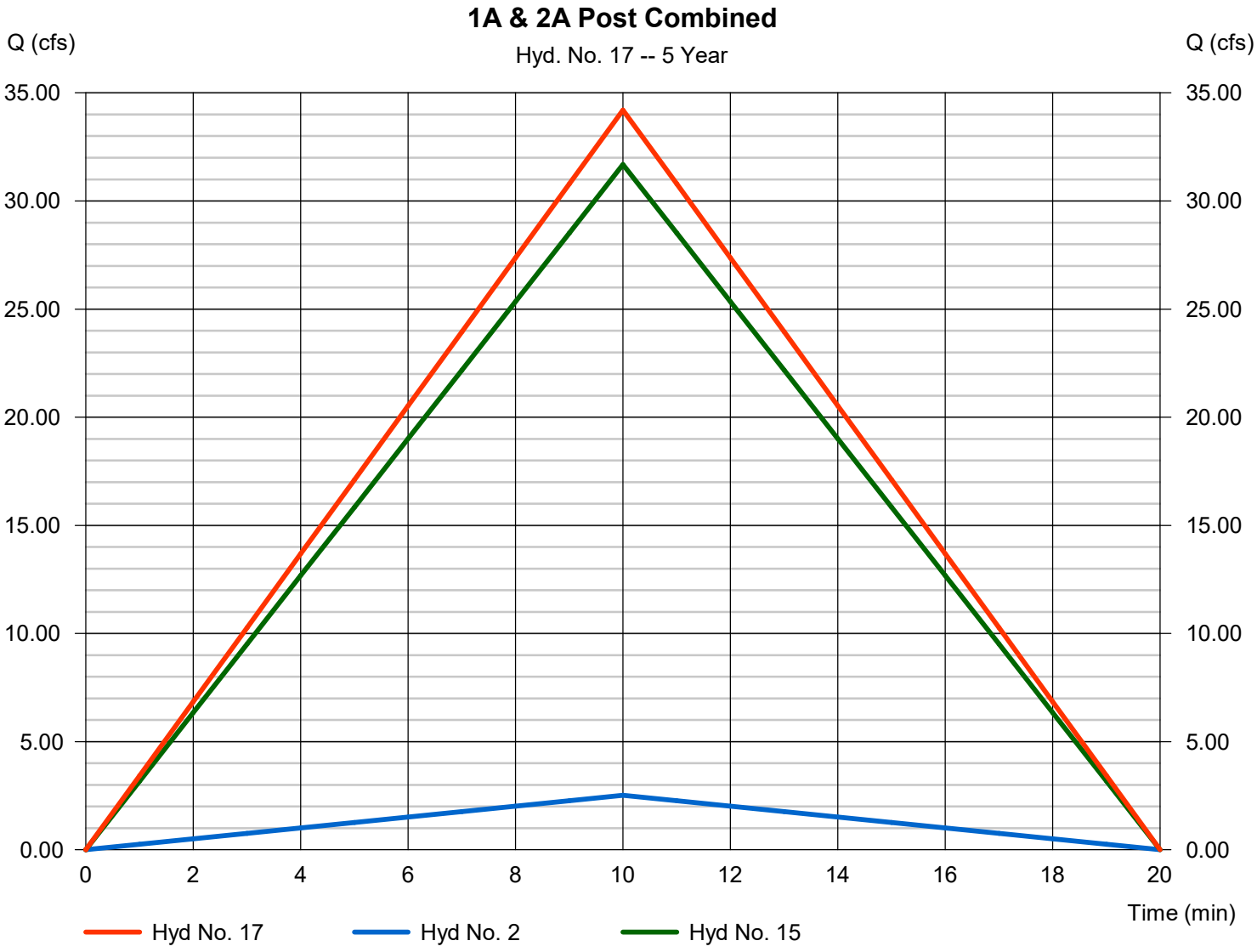


Hydrograph Report

Hyd. No. 17

1A & 2A Post Combined

Hydrograph type	= Combine	Peak discharge	= 34.21 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 20,524 cuft
Inflow hyds.	= 2, 15	Contrib. drain. area	= 21.940 ac

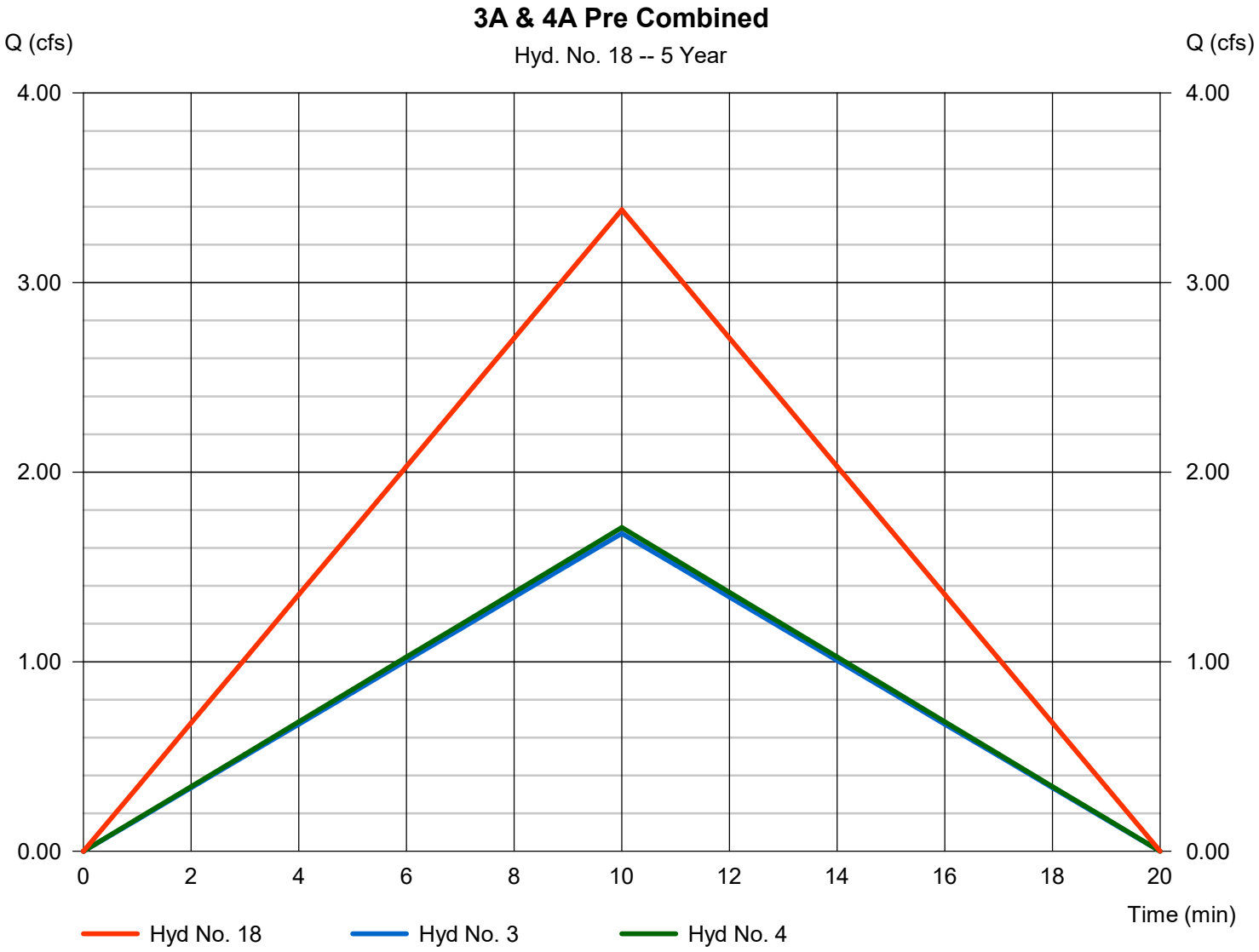


Hydrograph Report

Hyd. No. 18

3A & 4A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 3.384 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 2,030 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 2.200 ac

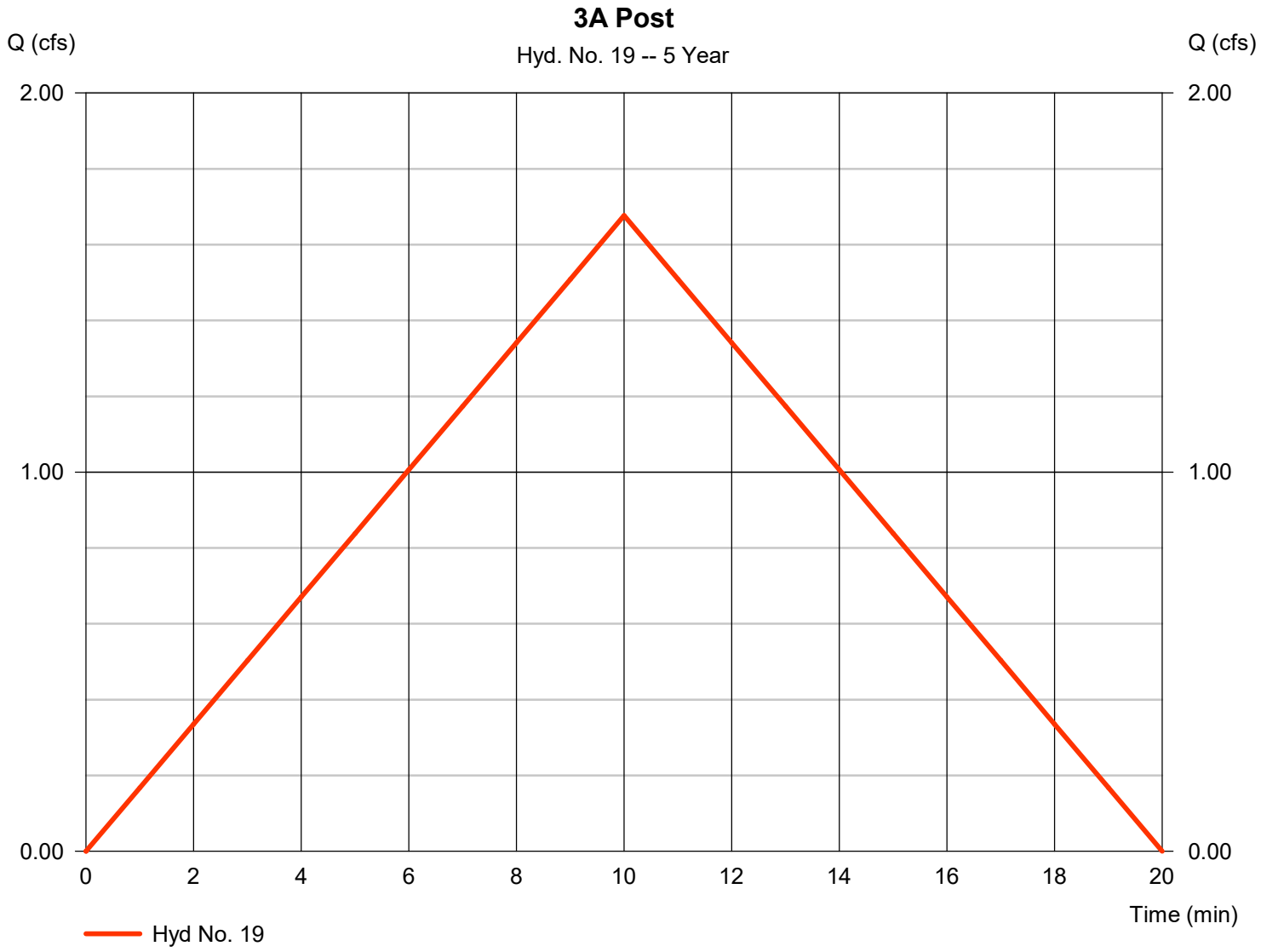


Hydrograph Report

Hyd. No. 19

3A Post

Hydrograph type	=	Rational	Peak discharge	=	1.677 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,006 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

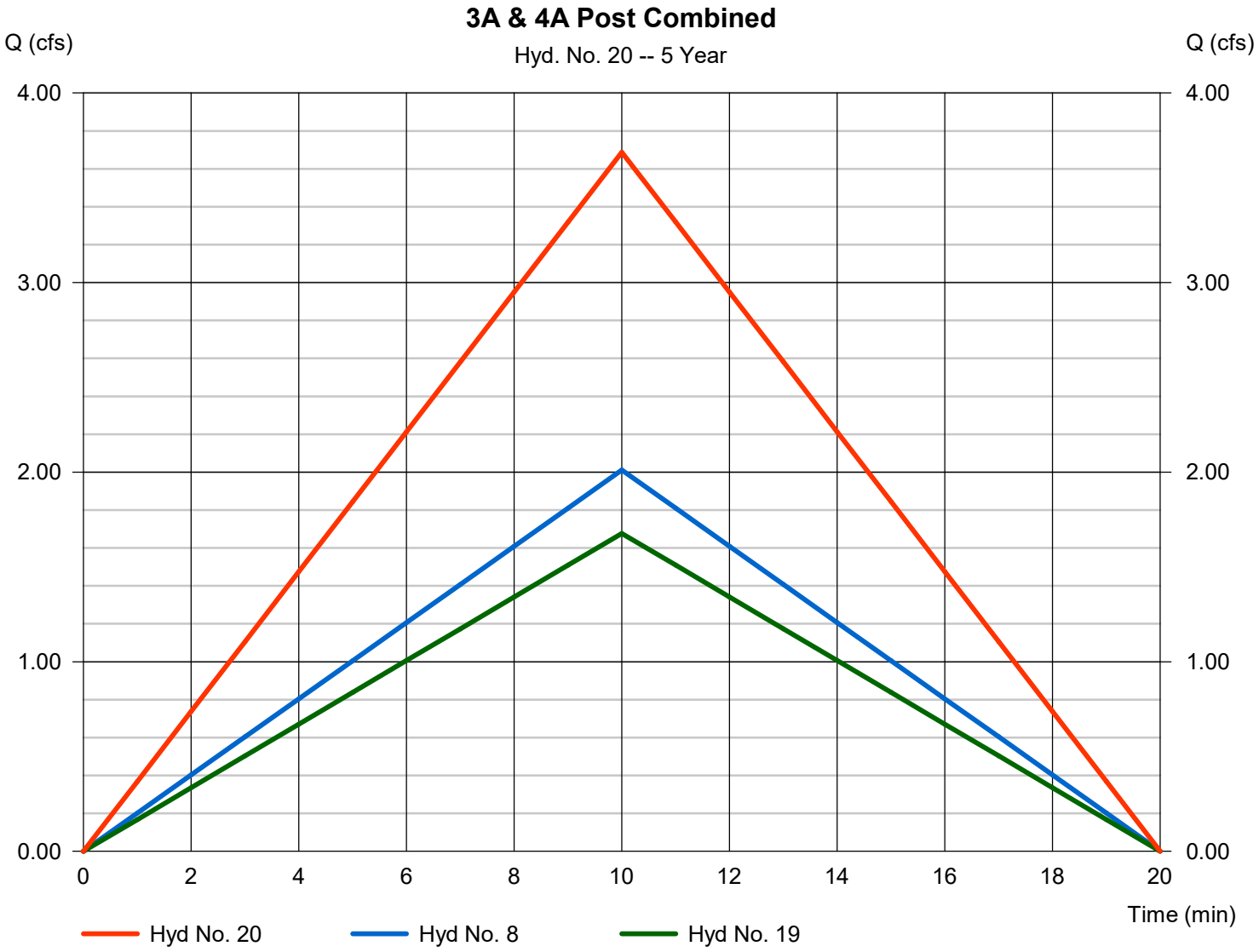


Hydrograph Report

Hyd. No. 20

3A & 4A Post Combined

Hydrograph type	= Combine	Peak discharge	= 3.688 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 2,213 cuft
Inflow hyds.	= 8, 19	Contrib. drain. area	= 2.200 ac

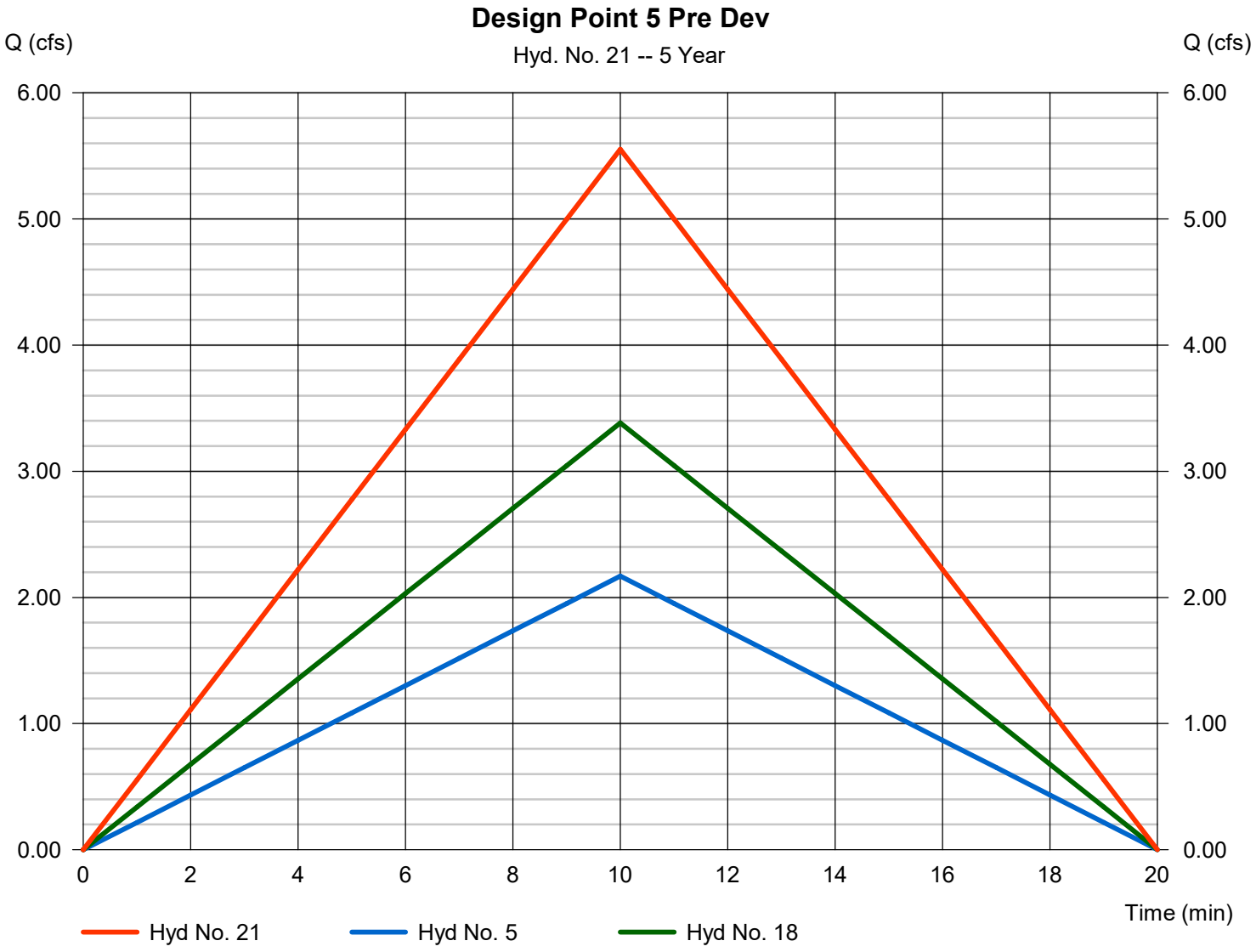


Hydrograph Report

Hyd. No. 21

Design Point 5 Pre Dev

Hydrograph type	= Combine	Peak discharge	= 5.553 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 3,332 cuft
Inflow hyds.	= 5, 18	Contrib. drain. area	= 1.410 ac

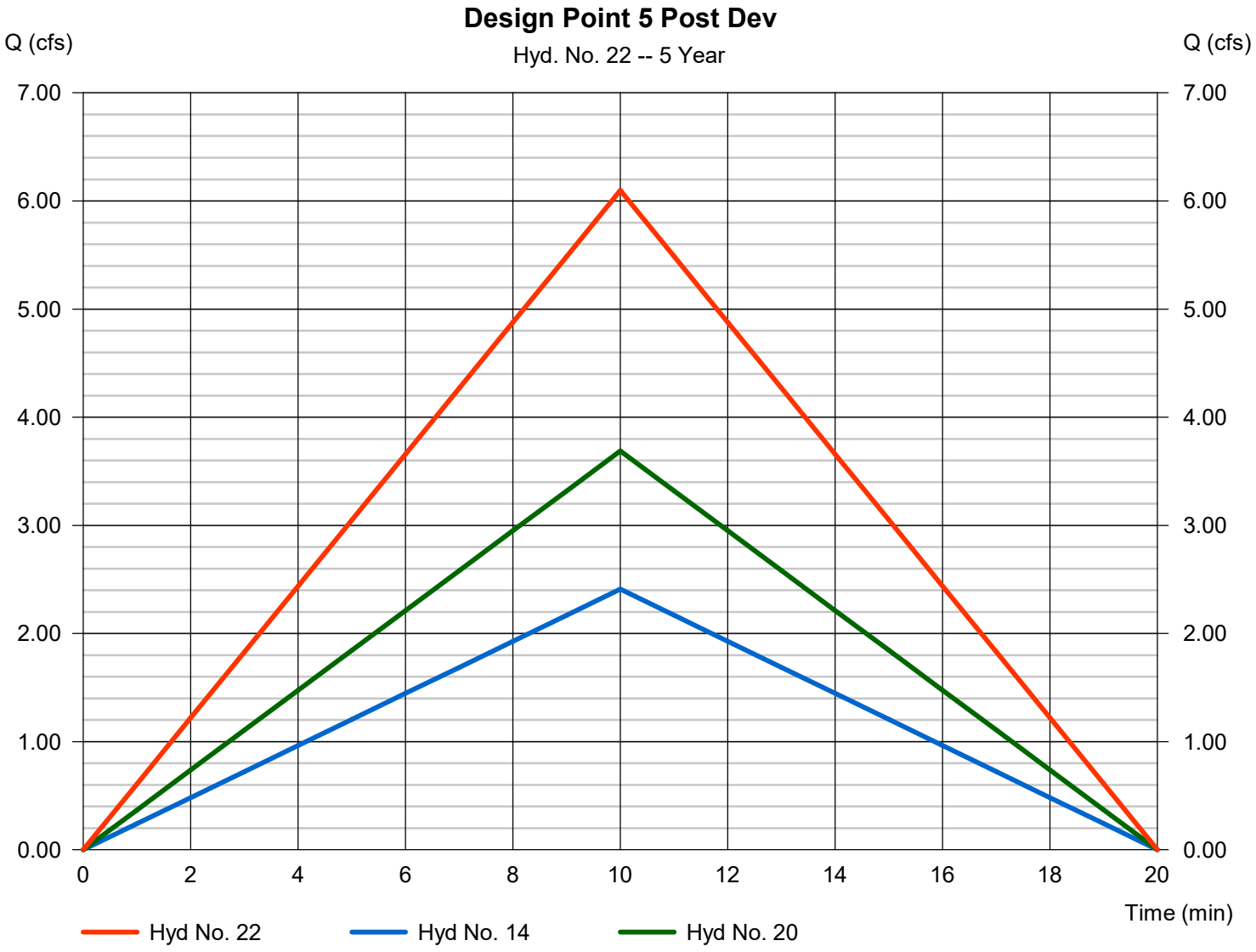


Hydrograph Report

Hyd. No. 22

Design Point 5 Post Dev

Hydrograph type	= Combine	Peak discharge	= 6.098 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 3,659 cuft
Inflow hyds.	= 14, 20	Contrib. drain. area	= 1.410 ac

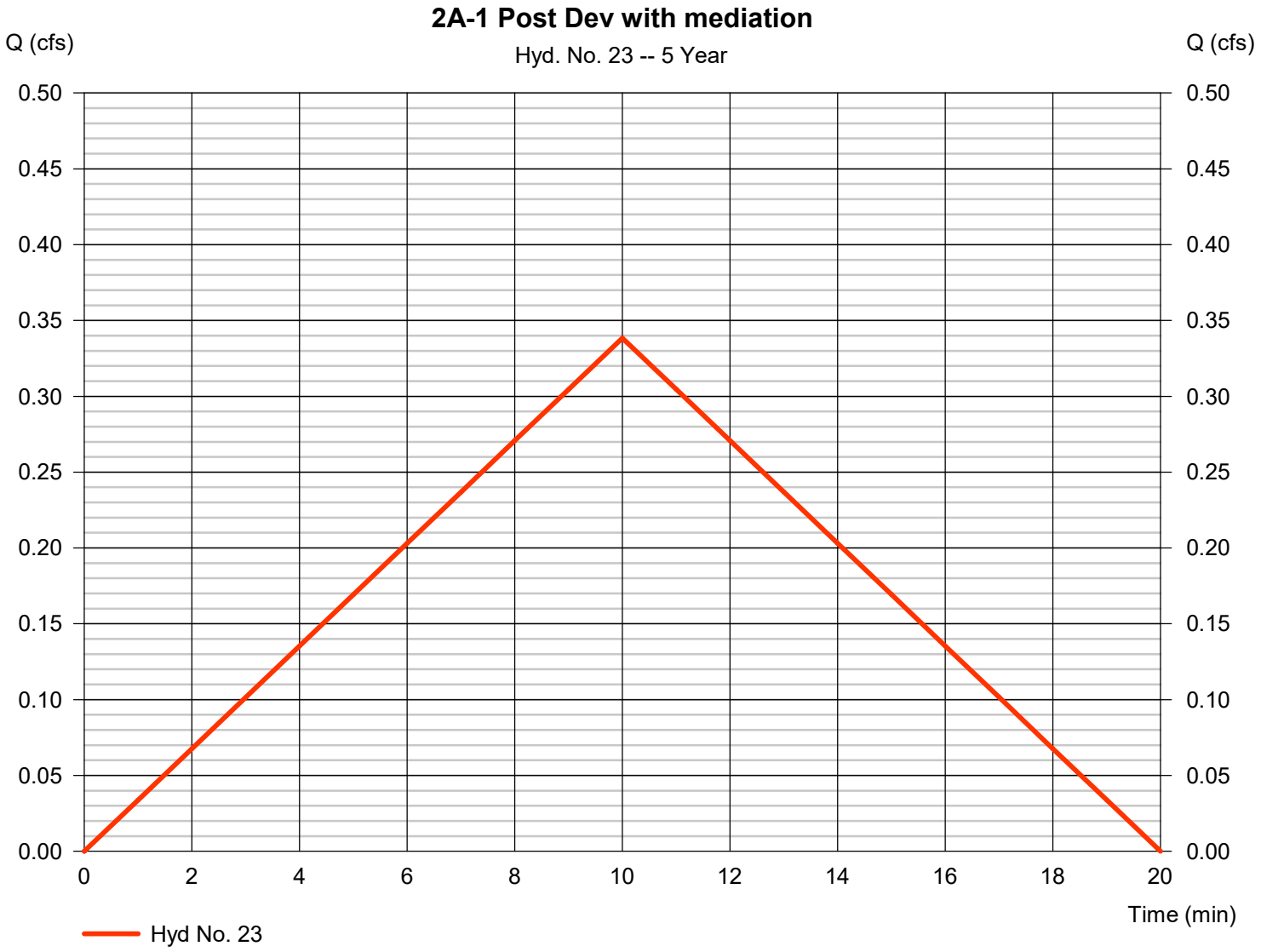


Hydrograph Report

Hyd. No. 23

2A-1 Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.338 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	203 cuft
Drainage area	=	0.180 ac	Runoff coeff.	=	0.55
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

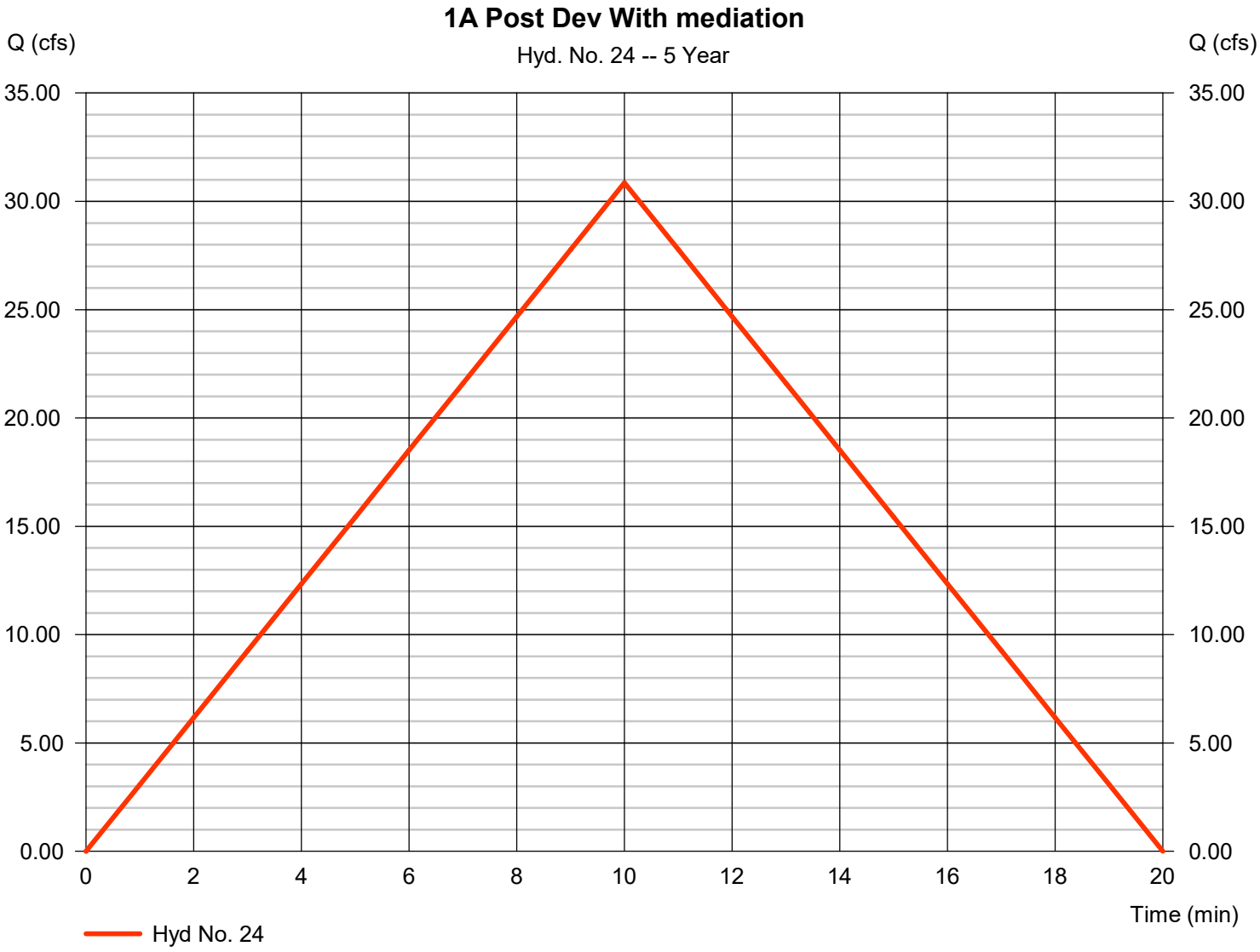


Hydrograph Report

Hyd. No. 24

1A Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	30.86 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	18,514 cuft
Drainage area	=	20.060 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

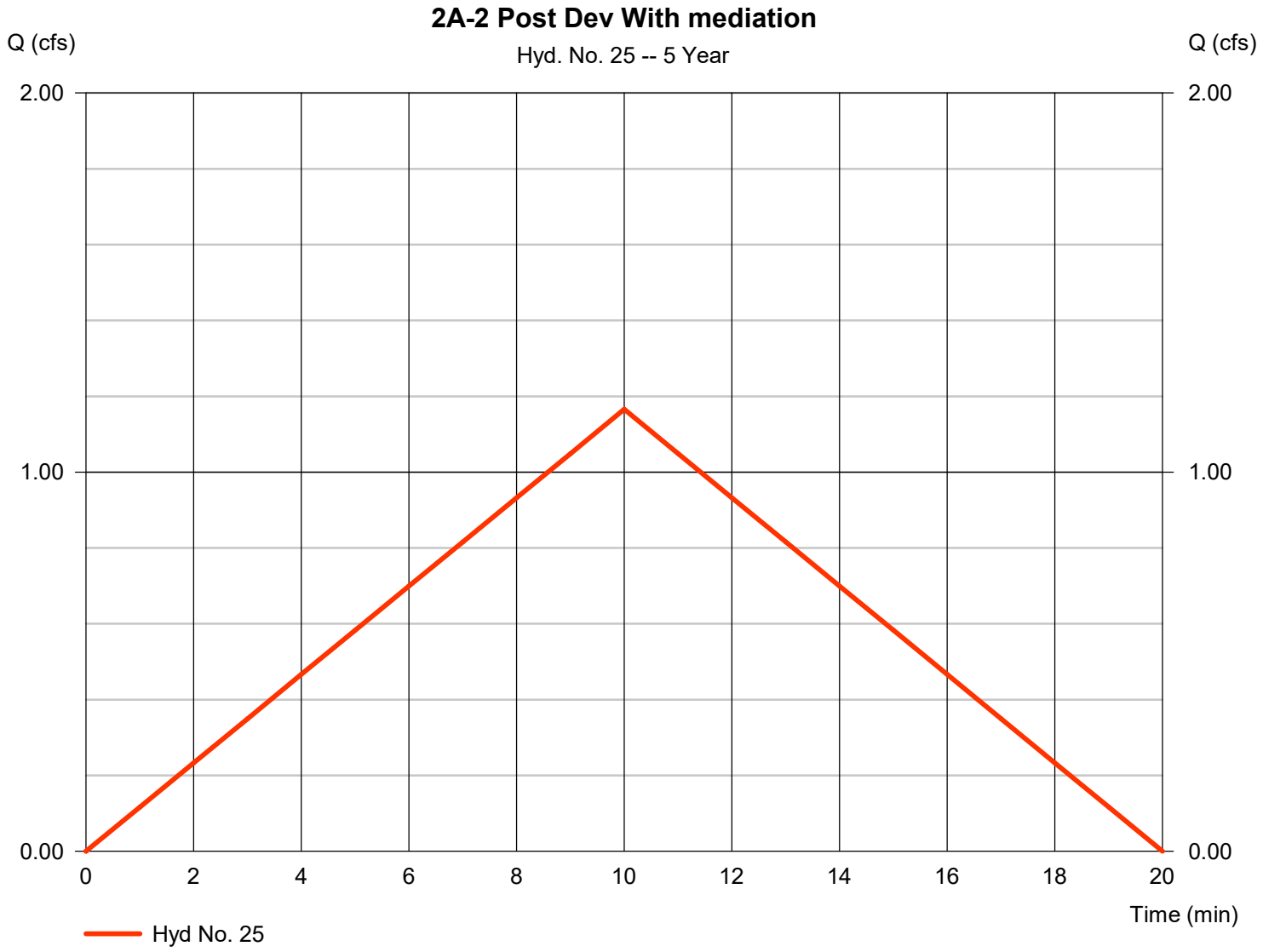


Hydrograph Report

Hyd. No. 25

2A-2 Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	1.166 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	699 cuft
Drainage area	=	0.620 ac	Runoff coeff.	=	0.55
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

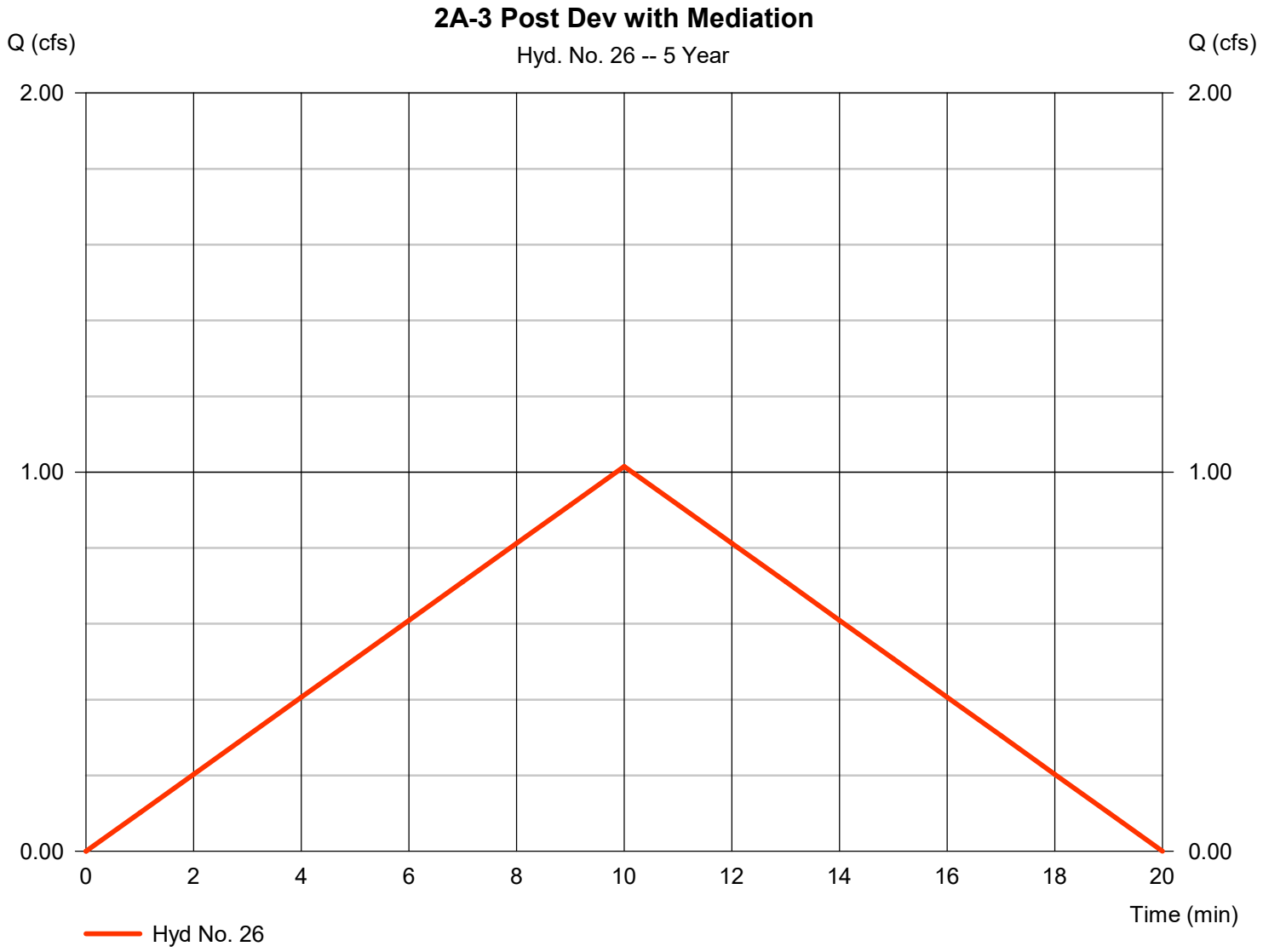


Hydrograph Report

Hyd. No. 26

2A-3 Post Dev with Mediation

Hydrograph type	=	Rational	Peak discharge	=	1.015 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	609 cuft
Drainage area	=	0.540 ac	Runoff coeff.	=	0.55
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



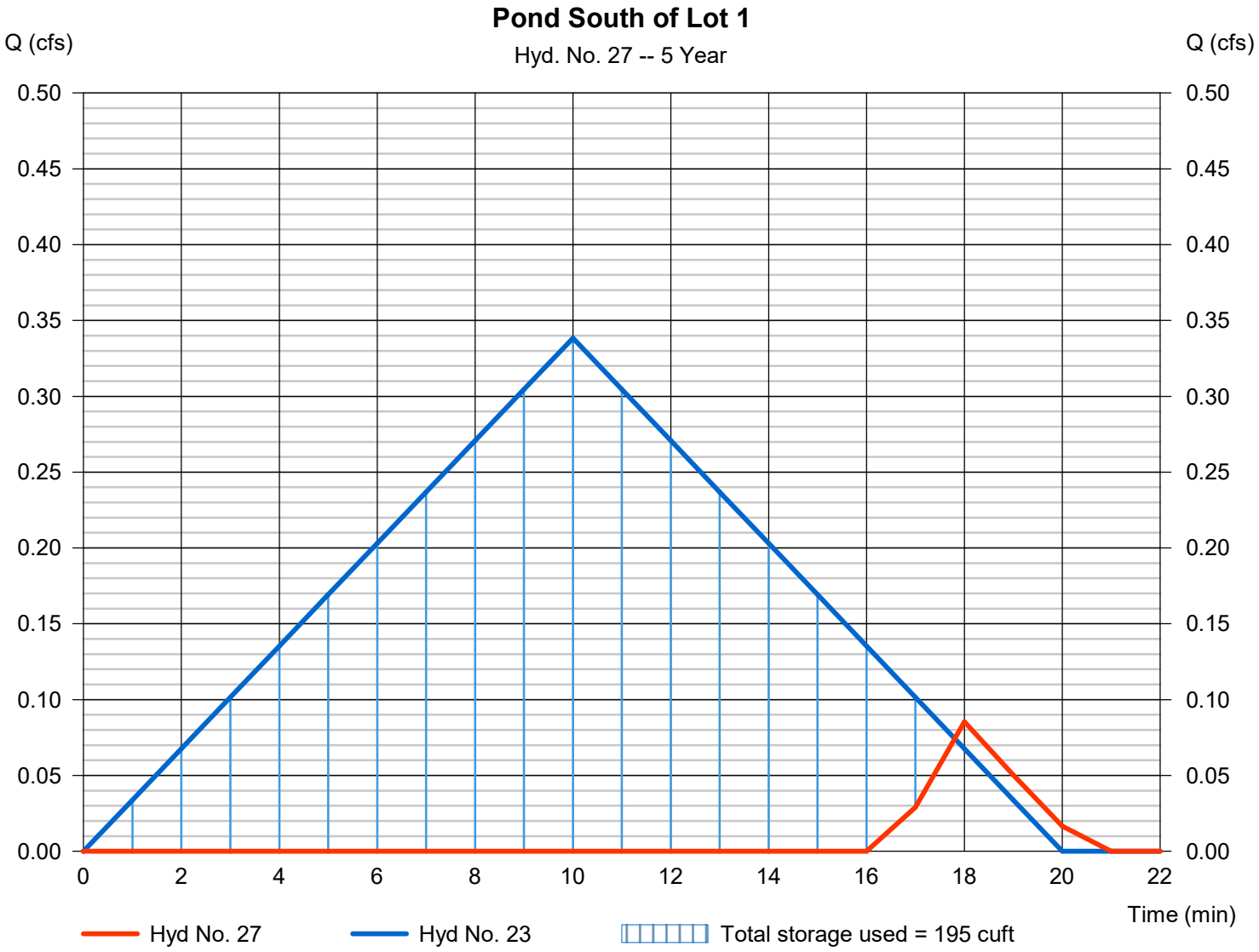
Hydrograph Report

Hyd. No. 27

Pond South of Lot 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.085 cfs
Storm frequency	=	5 yrs	Time to peak	=	18 min
Time interval	=	1 min	Hyd. volume	=	11 cuft
Inflow hyd. No.	=	23 - 2A-1 Post Dev with mediation	Max. Elevation	=	100.81 ft
Reservoir name	=	Pond on South of Lot 1	Max. Storage	=	195 cuft

Storage Indication method used.



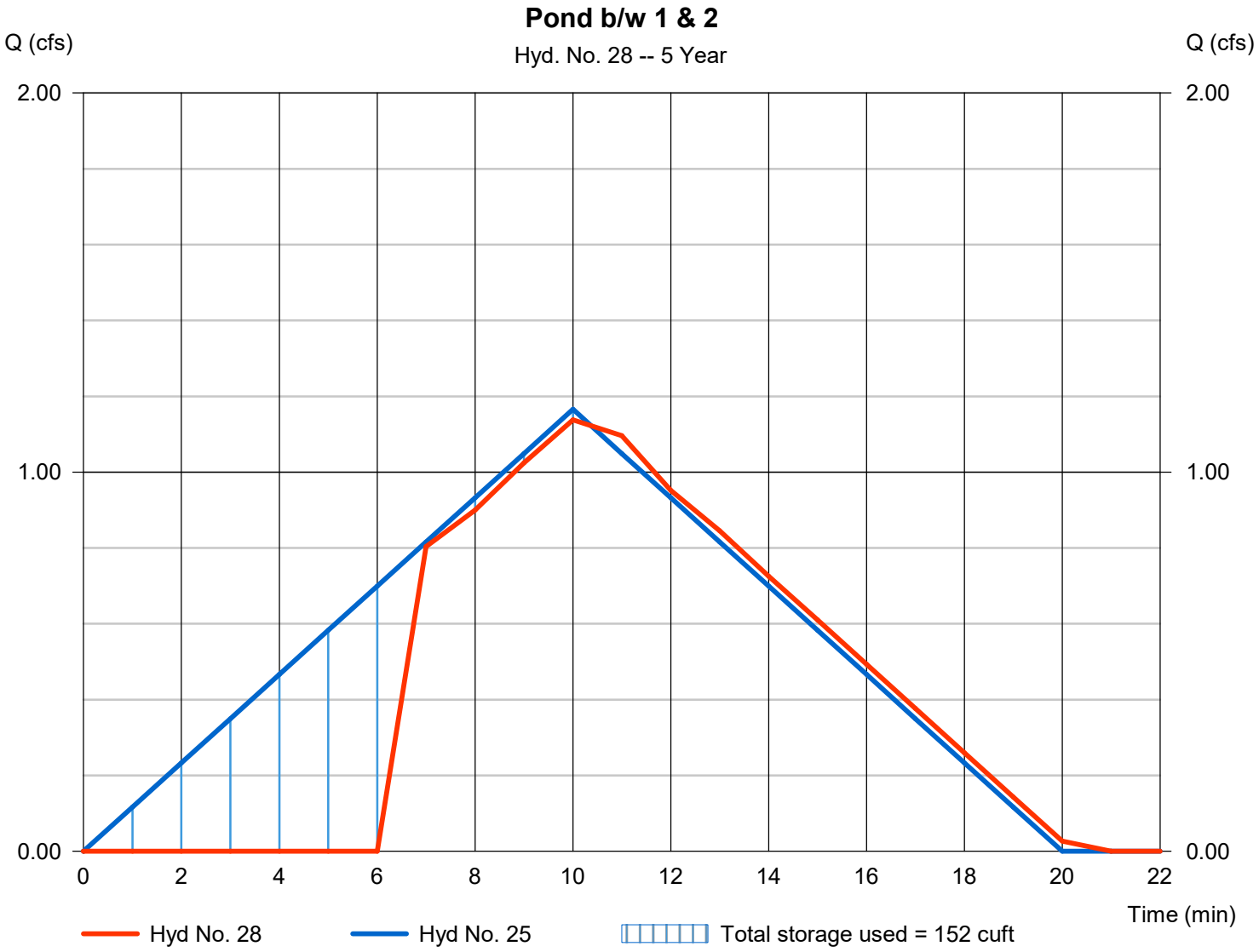
Hydrograph Report

Hyd. No. 28

Pond b/w 1 & 2

Hydrograph type	=	Reservoir	Peak discharge	=	1.138 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	564 cuft
Inflow hyd. No.	=	25 - 2A-2 Post Dev With median	Max. Elevation	=	100.89 ft
Reservoir name	=	Pond B/w 1&2	Max. Storage	=	152 cuft

Storage Indication method used.



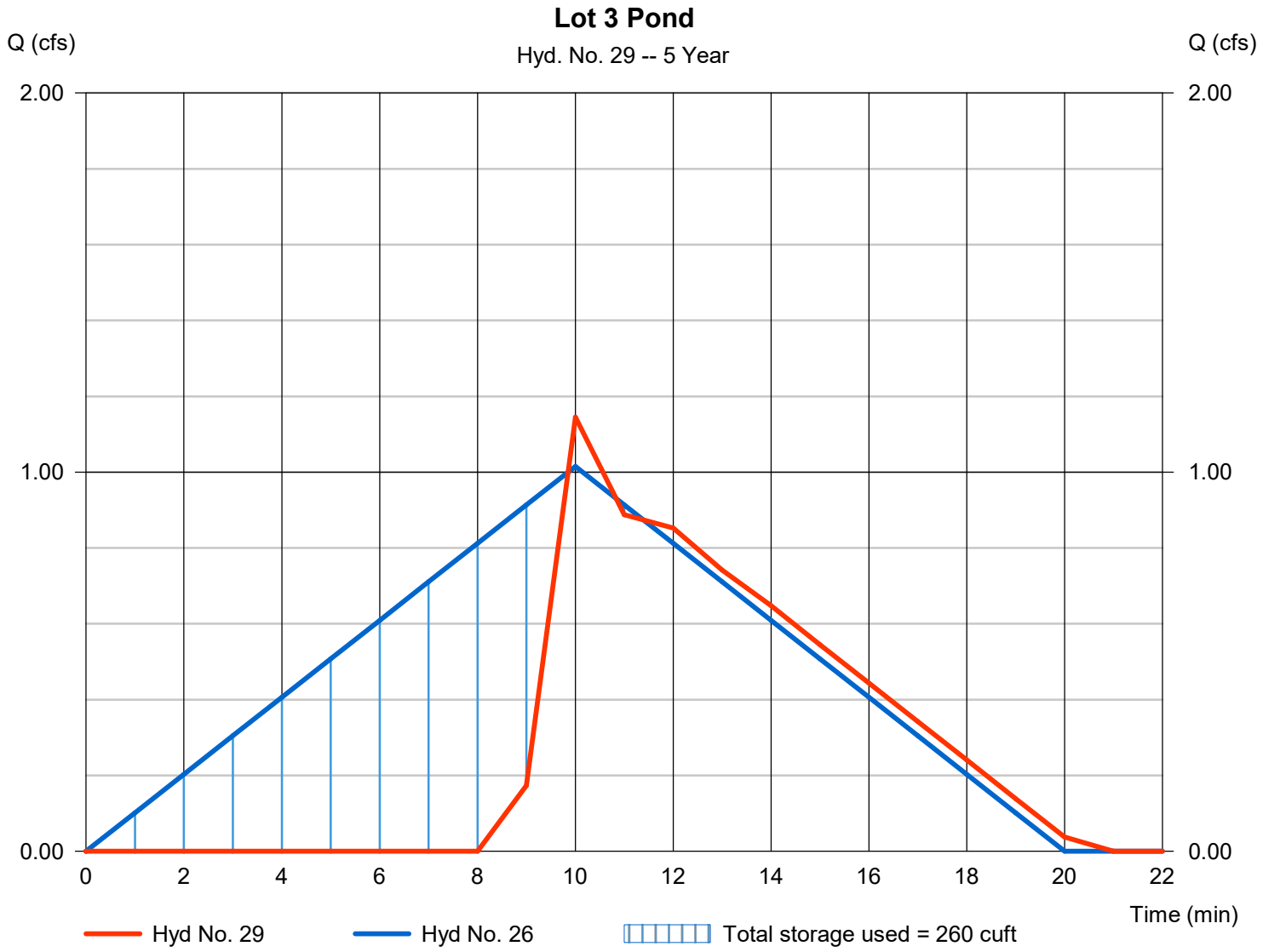
Hydrograph Report

Hyd. No. 29

Lot 3 Pond

Hydrograph type	=	Reservoir	Peak discharge	=	1.145 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	372 cuft
Inflow hyd. No.	=	26 - 2A-3 Post Dev with Mediation	Max. Elevation	=	101.92 ft
Reservoir name	=	Lot 3 Pond	Max. Storage	=	260 cuft

Storage Indication method used.

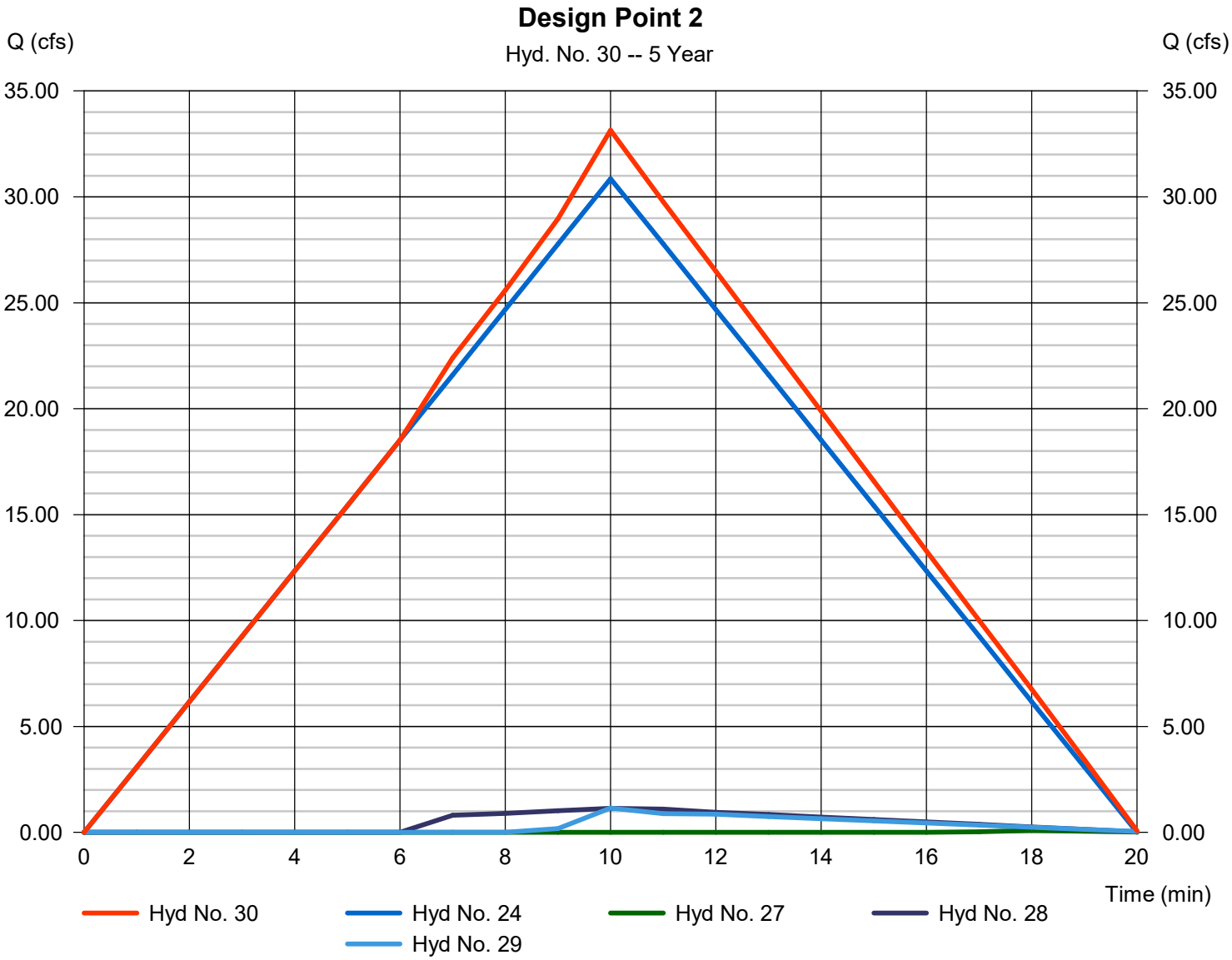


Hydrograph Report

Hyd. No. 30

Design Point 2

Hydrograph type	= Combine	Peak discharge	= 33.14 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 19,461 cuft
Inflow hyds.	= 24, 27, 28, 29	Contrib. drain. area	= 20.060 ac

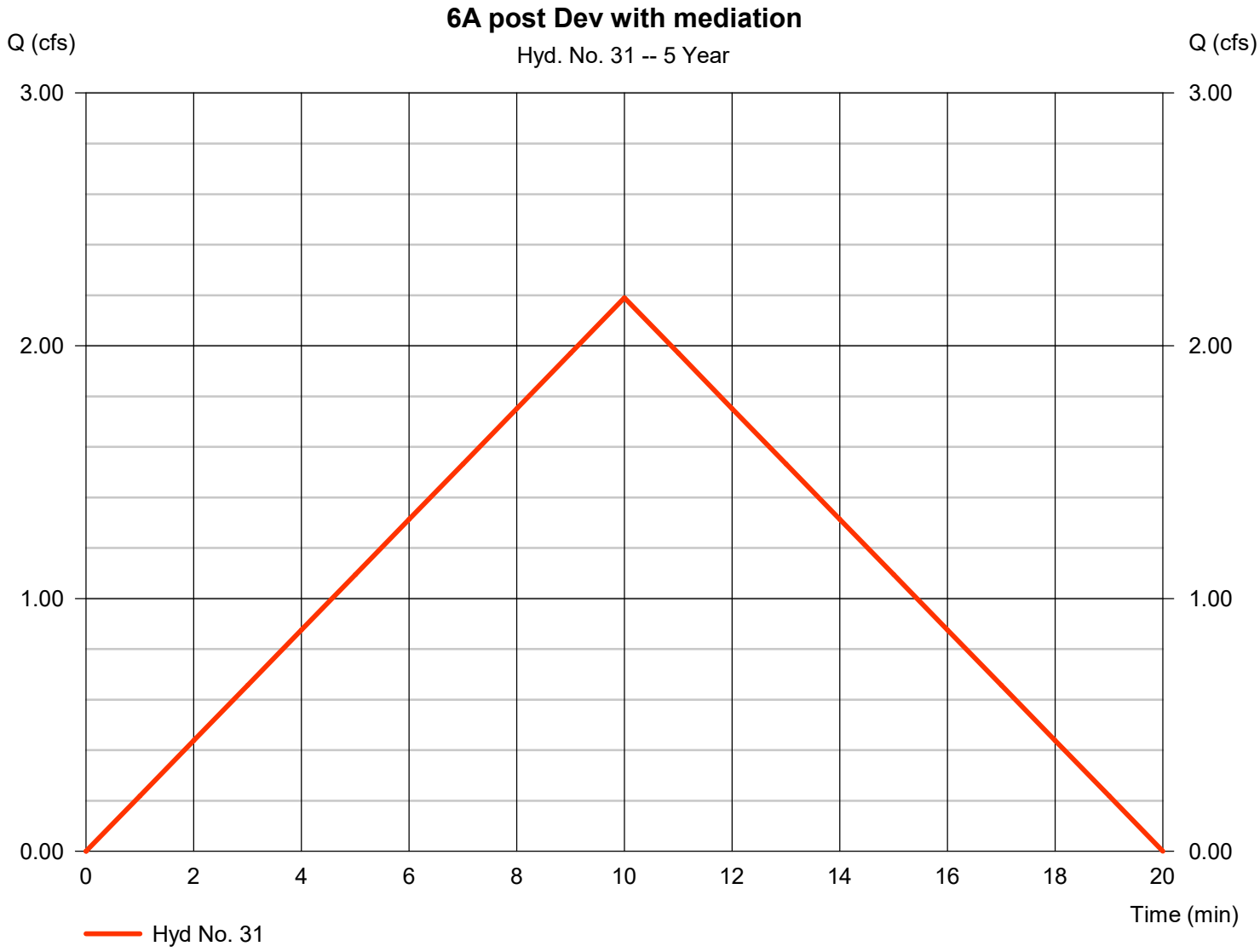


Hydrograph Report

Hyd. No. 31

6A post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	2.189 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,314 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

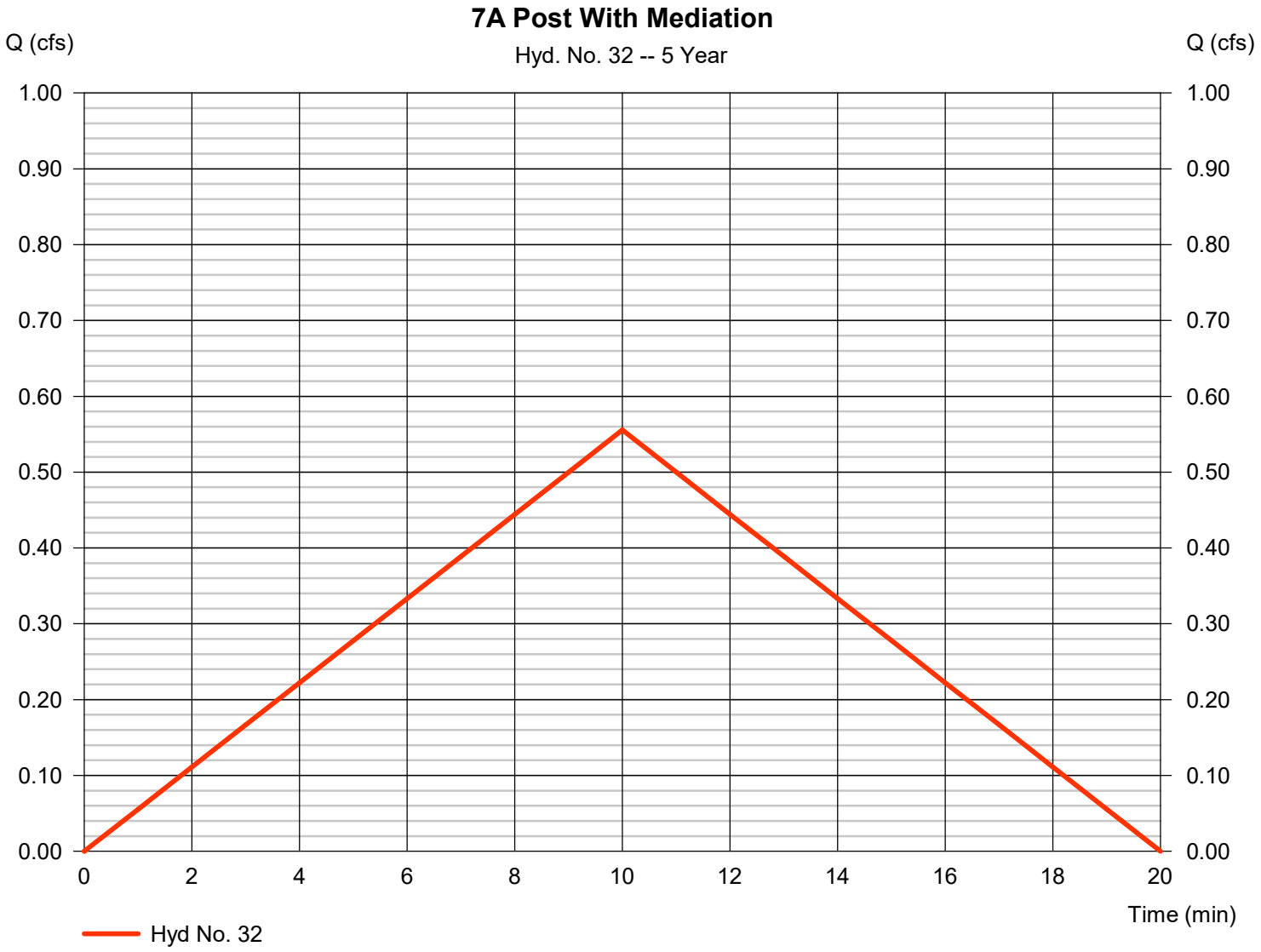


Hydrograph Report

Hyd. No. 32

7A Post With Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.555 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	333 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

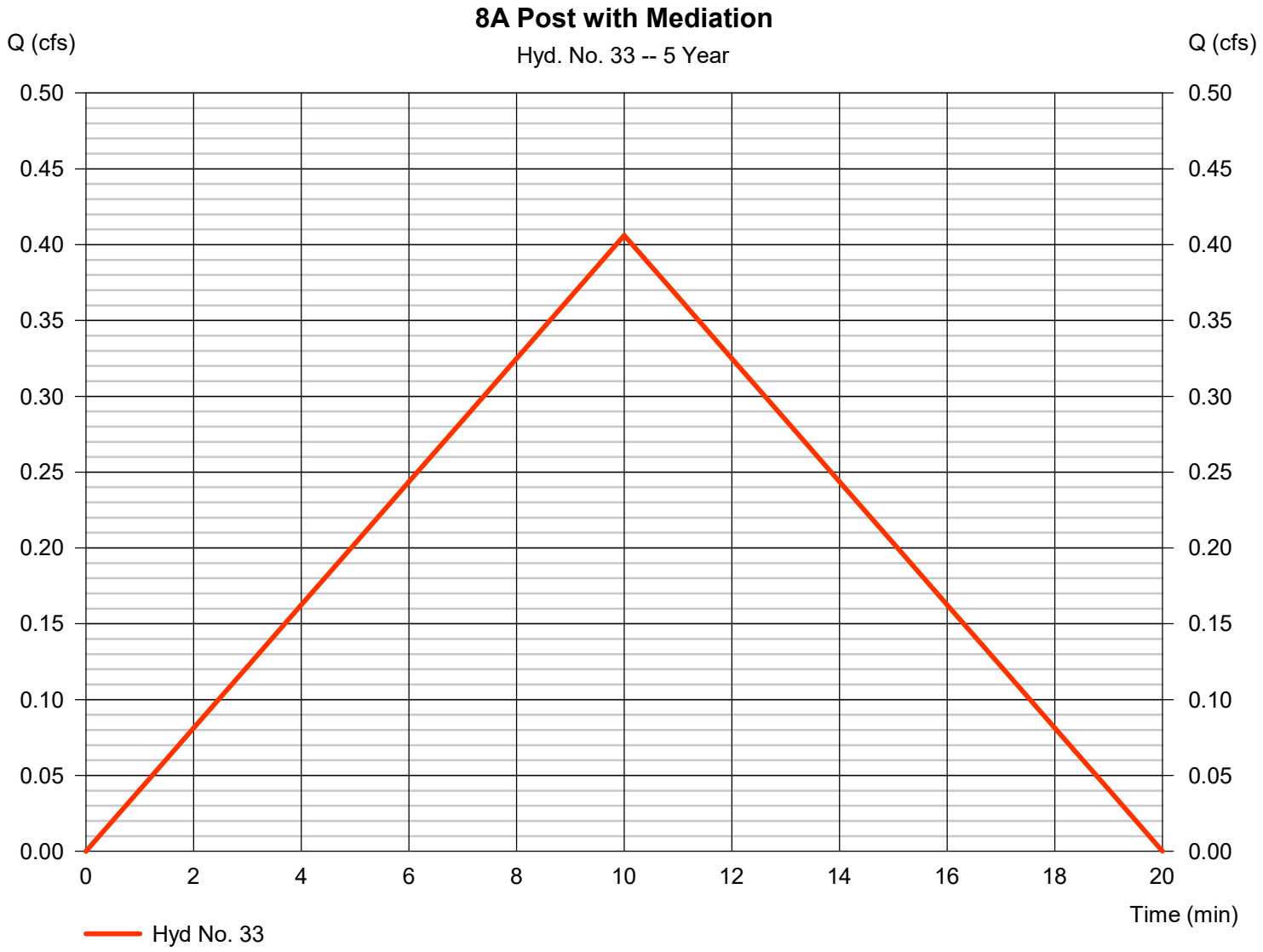


Hydrograph Report

Hyd. No. 33

8A Post with Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.406 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	244 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



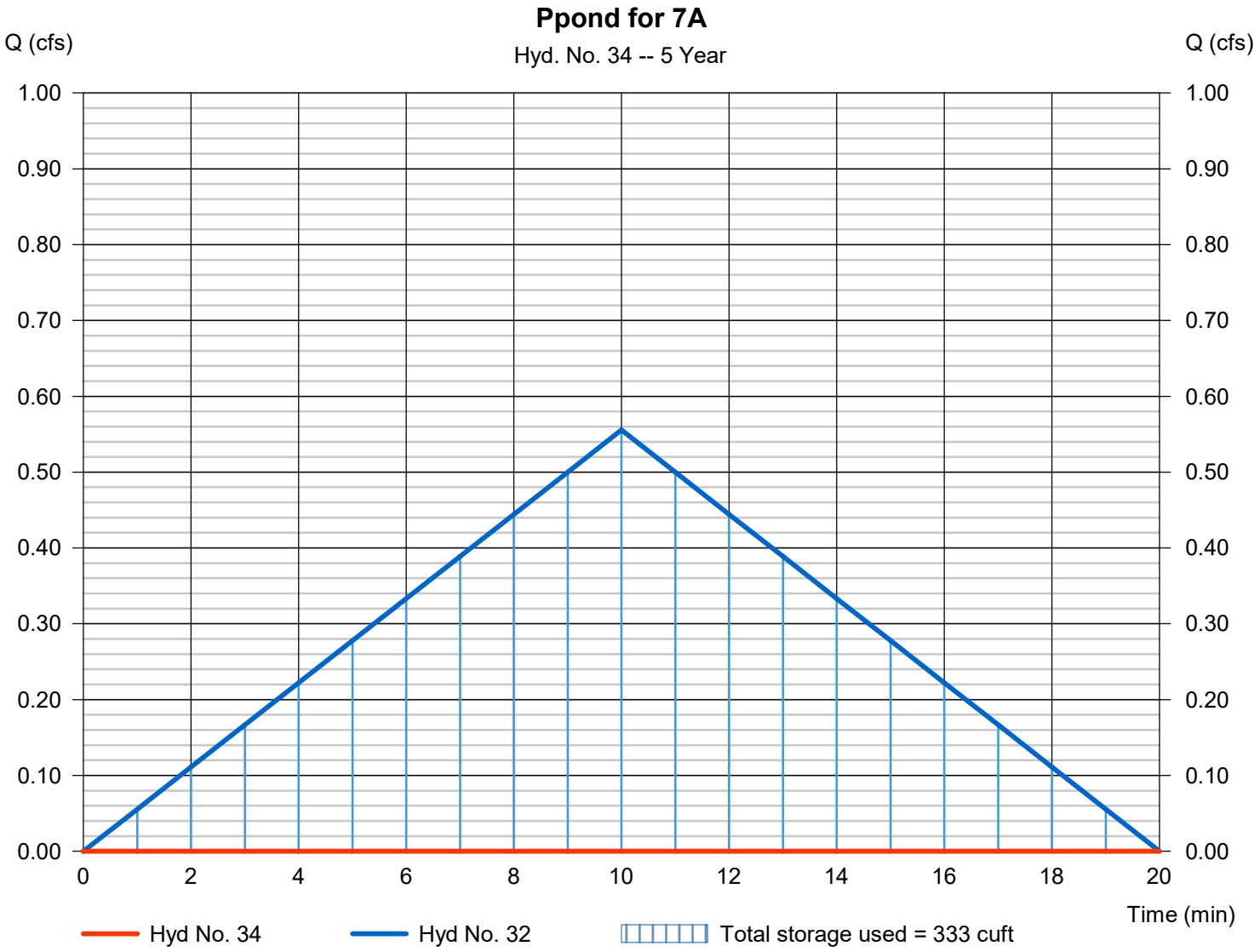
Hydrograph Report

Hyd. No. 34

Ppond for 7A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	5 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	32 - 7A Post With Mediation	Max. Elevation	=	100.97 ft
Reservoir name	=	Pond for 7A	Max. Storage	=	333 cuft

Storage Indication method used.



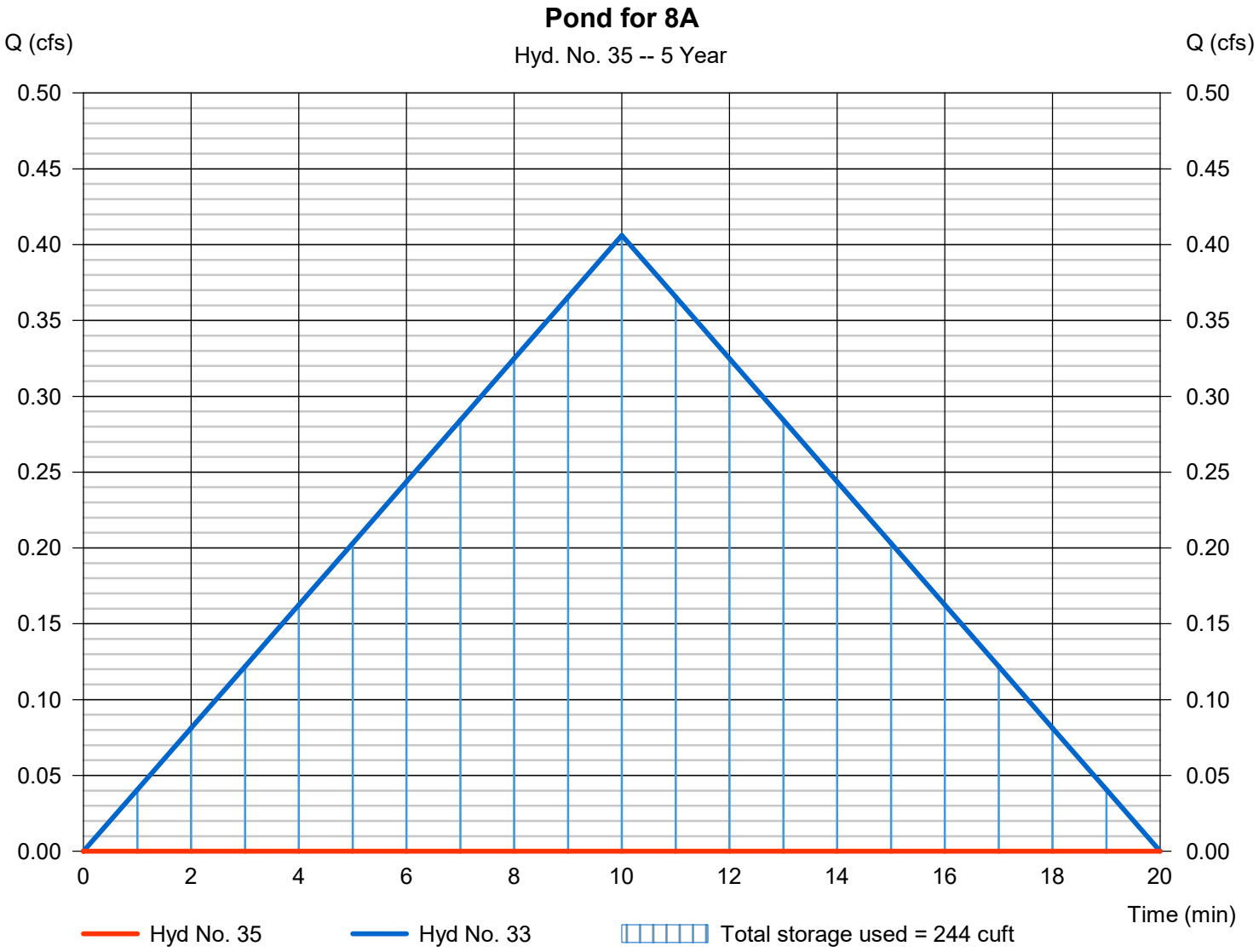
Hydrograph Report

Hyd. No. 35

Pond for 8A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	5 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	33 - 8A Post with Mediation	Max. Elevation	=	101.25 ft
Reservoir name	=	Pond for 8A	Max. Storage	=	244 cuft

Storage Indication method used.

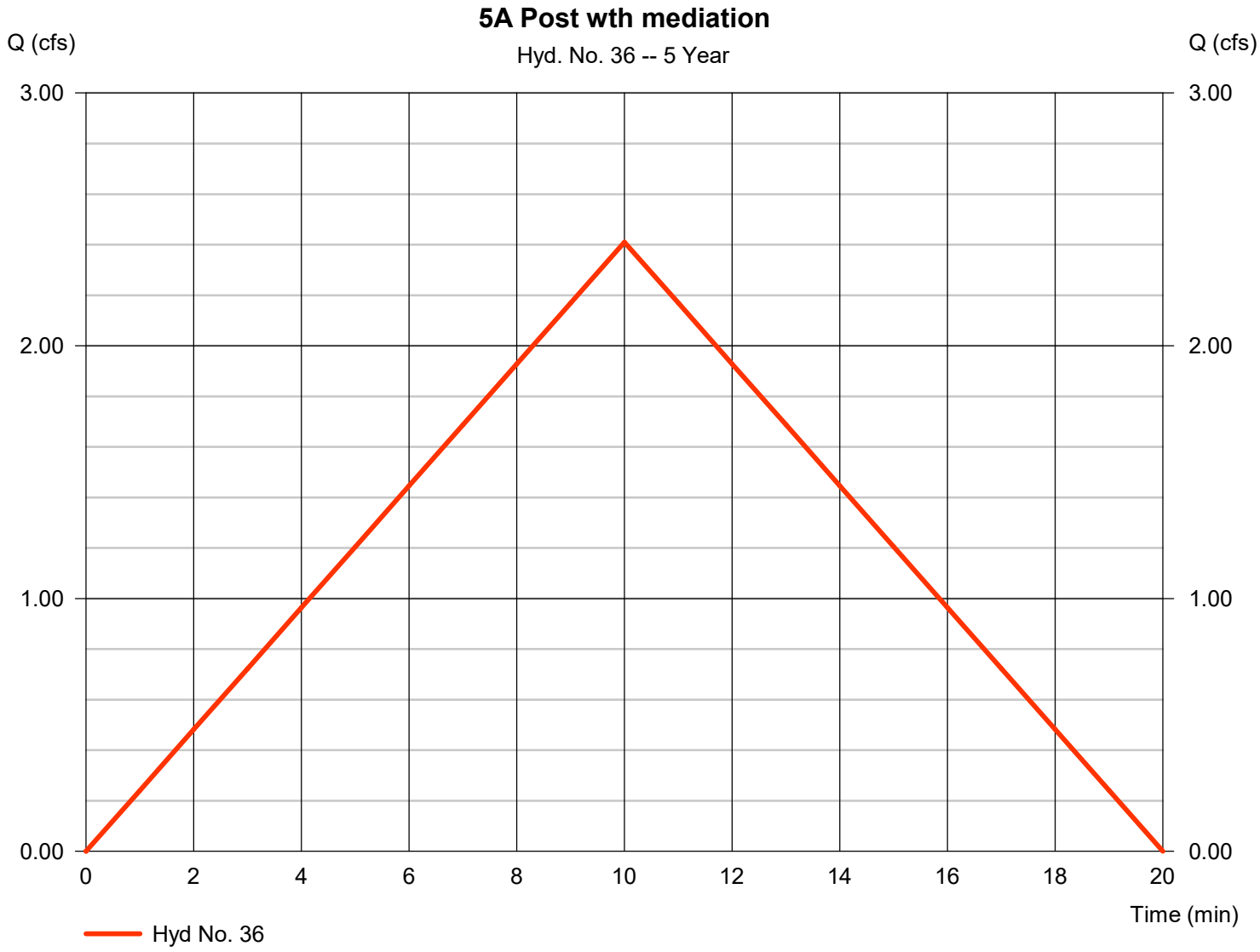


Hydrograph Report

Hyd. No. 36

5A Post wth mediation

Hydrograph type	=	Rational	Peak discharge	=	2.410 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,446 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



Hydrograph Report

Hyd. No. 37

3A Post Dev with mediation

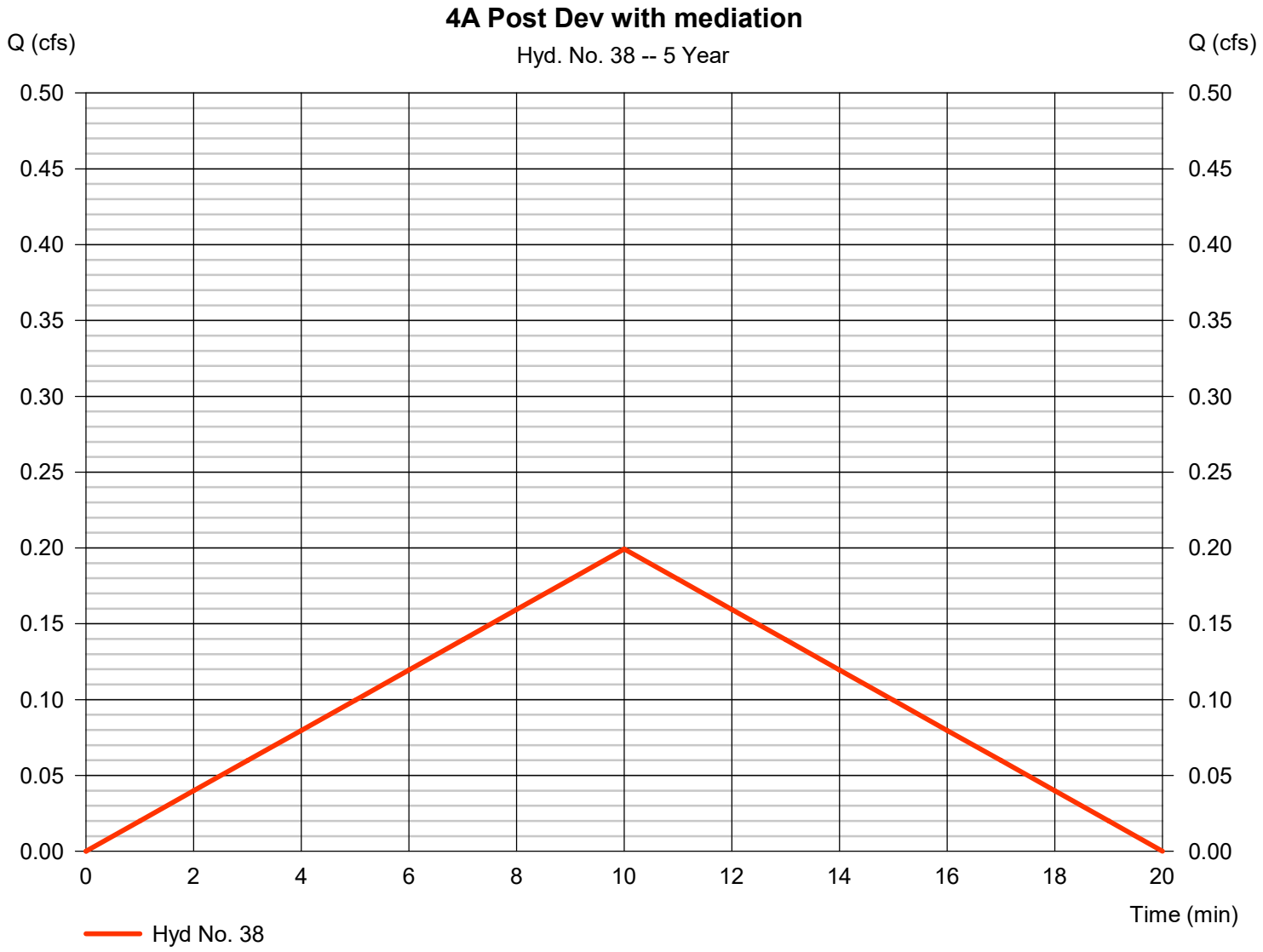
Hydrograph type	=	Rational	Peak discharge	=	1.677 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,006 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

Hydrograph Report

Hyd. No. 38

4A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.199 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	120 cuft
Drainage area	=	0.110 ac	Runoff coeff.	=	0.53
Intensity	=	3.418 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

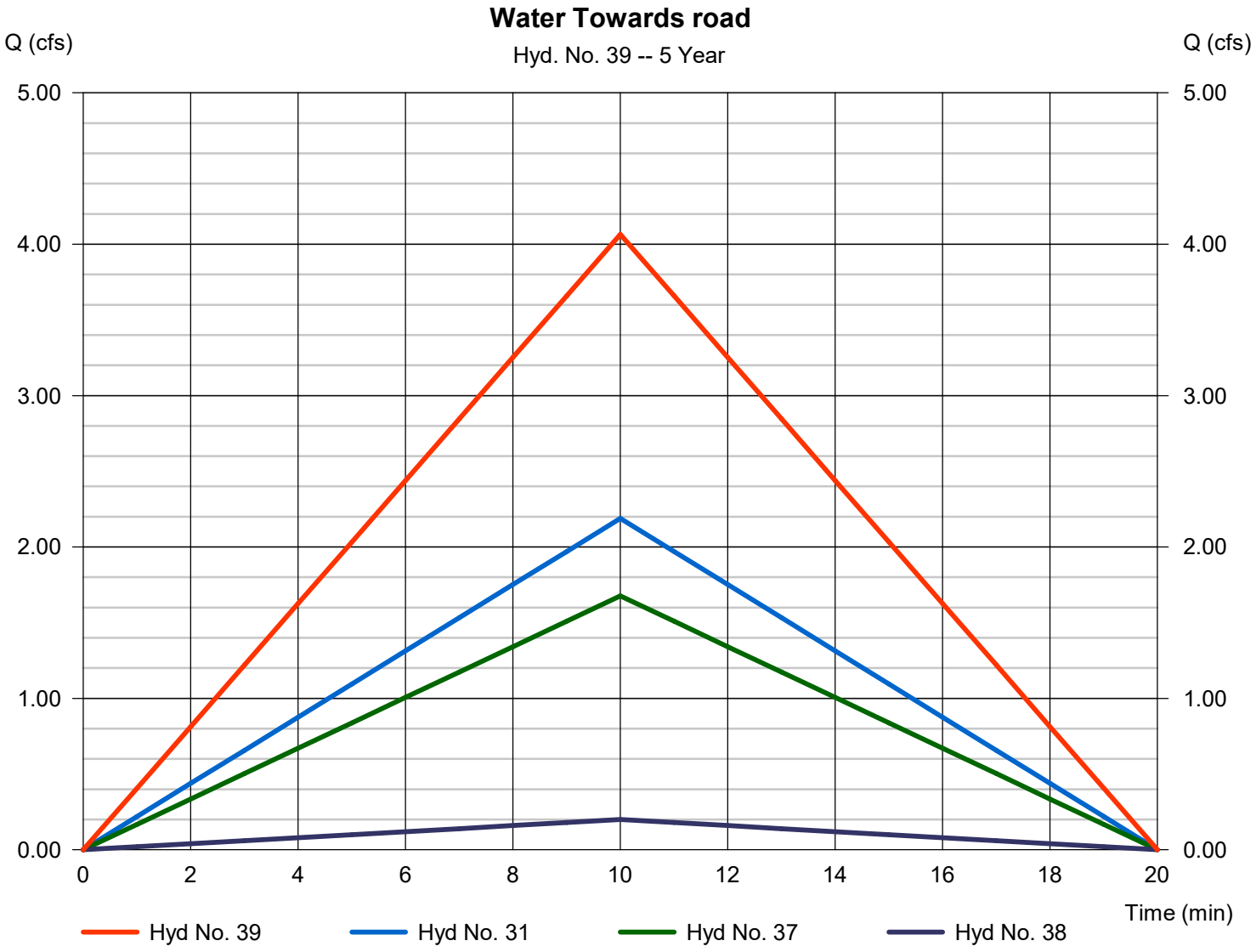


Hydrograph Report

Hyd. No. 39

Water Towards road

Hydrograph type	= Combine	Peak discharge	= 4.065 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 2,439 cuft
Inflow hyds.	= 31, 37, 38	Contrib. drain. area	= 2.250 ac



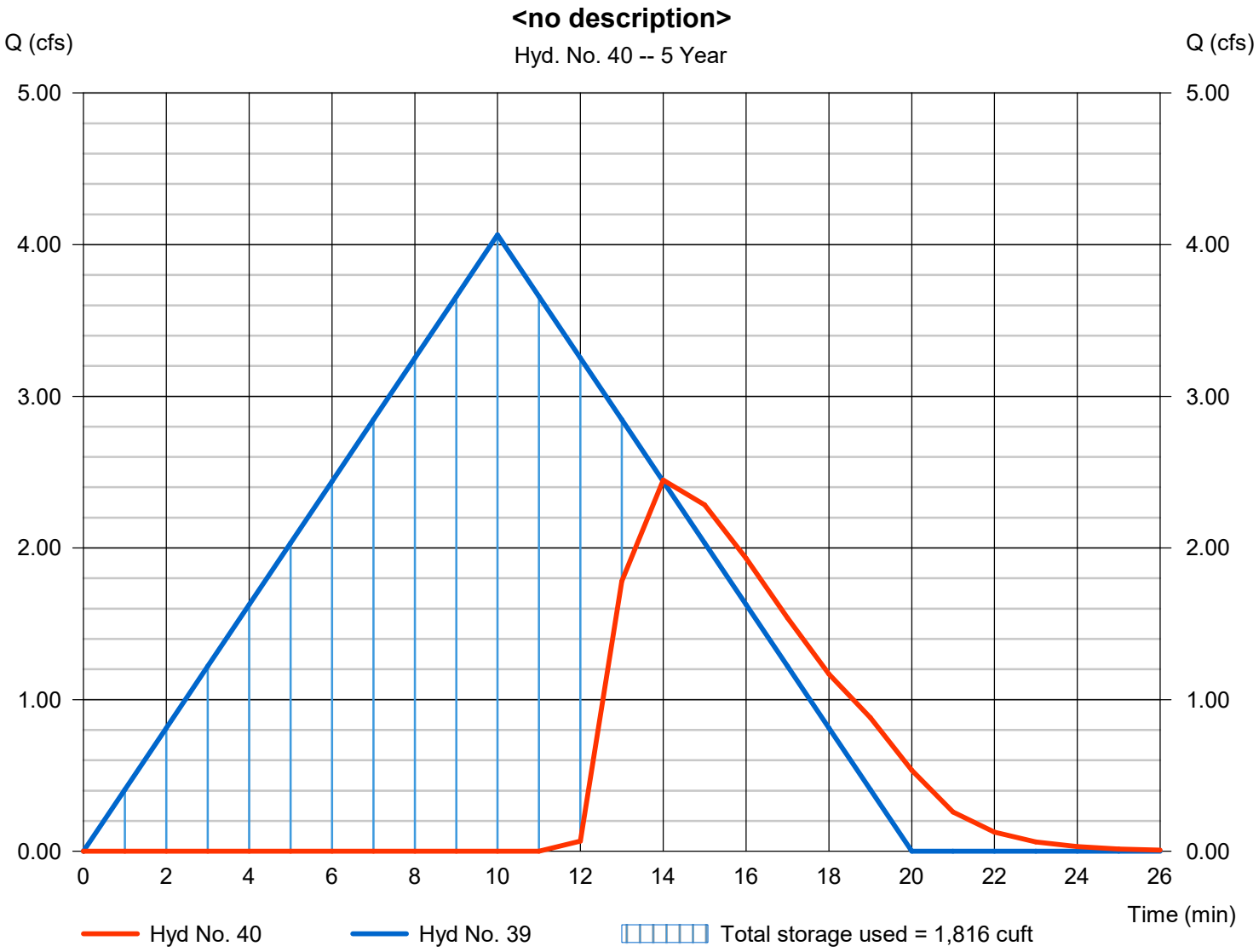
Hydrograph Report

Hyd. No. 40

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	2.448 cfs
Storm frequency	=	5 yrs	Time to peak	=	14 min
Time interval	=	1 min	Hyd. volume	=	788 cuft
Inflow hyd. No.	=	39 - Water Towards road	Max. Elevation	=	102.65 ft
Reservoir name	=	Lot 4 Pond	Max. Storage	=	1,816 cuft

Storage Indication method used.

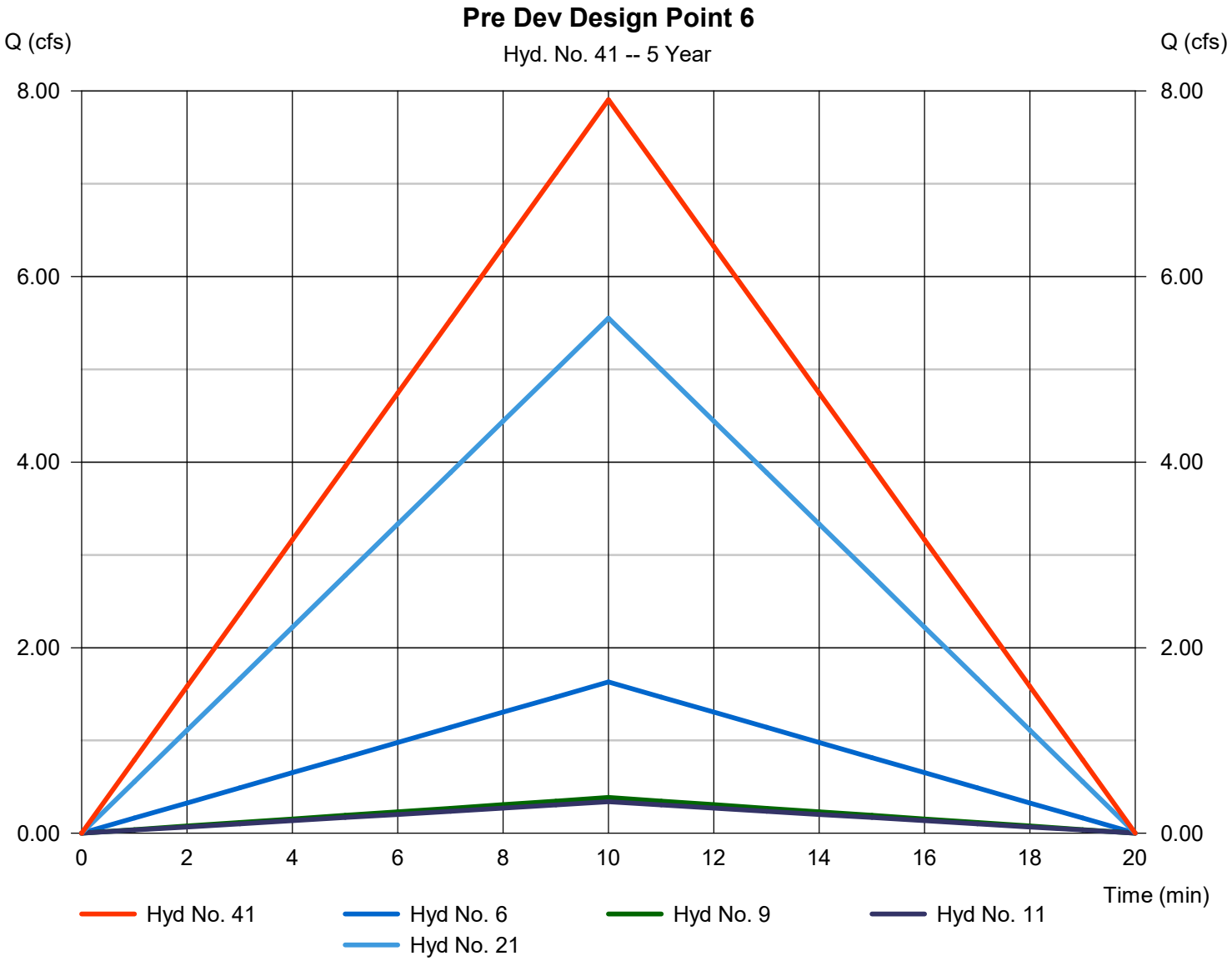


Hydrograph Report

Hyd. No. 41

Pre Dev Design Point 6

Hydrograph type	= Combine	Peak discharge	= 7.907 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 4,744 cuft
Inflow hyds.	= 6, 9, 11, 21	Contrib. drain. area	= 1.530 ac



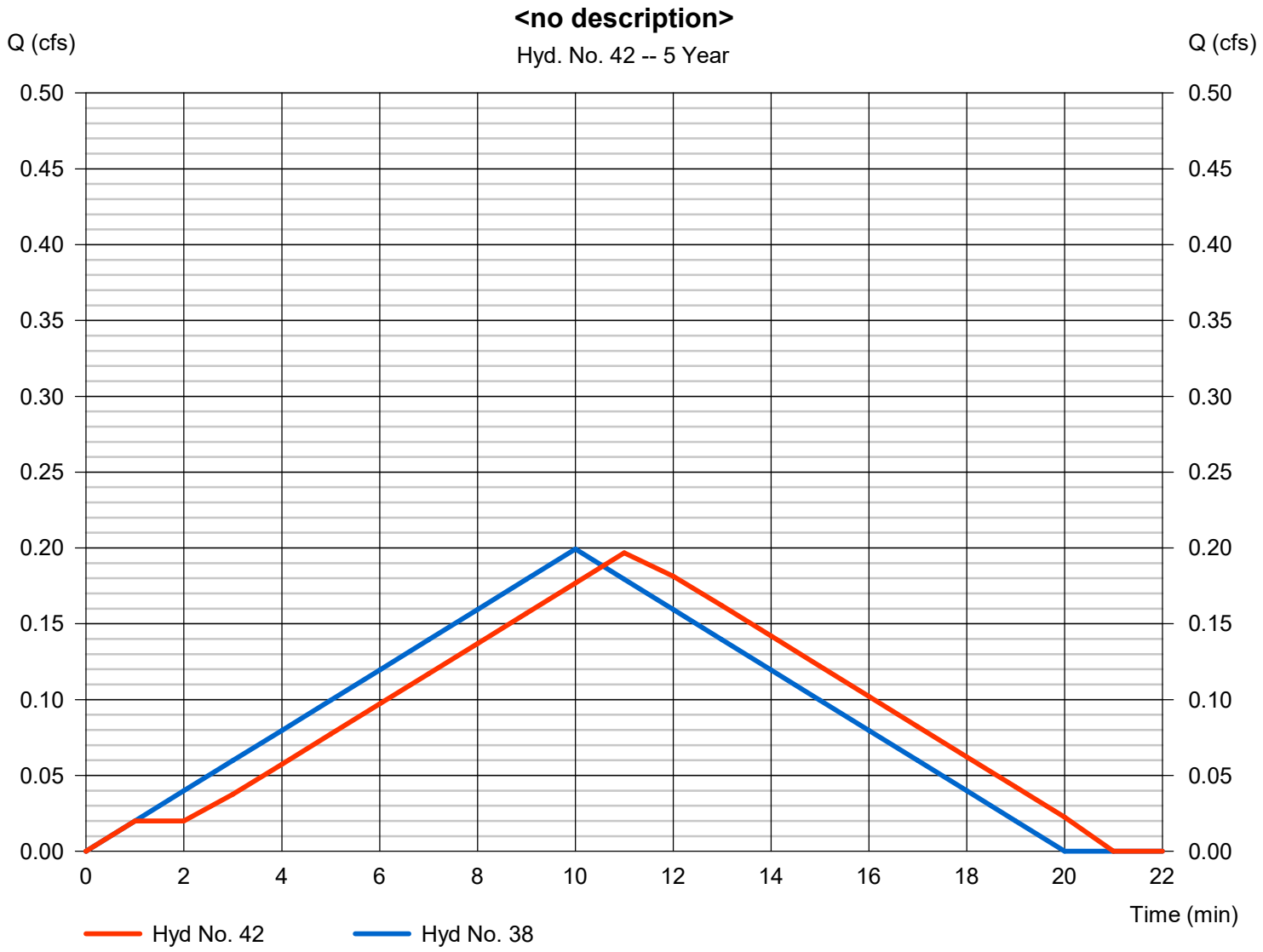
Hydrograph Report

Hyd. No. 42

<no description>

Hydrograph type	=	Reach	Peak discharge	=	0.197 cfs
Storm frequency	=	5 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	121 cuft
Inflow hyd. No.	=	38 - 4A Post Dev with mediation	Section type	=	Triangular
Reach length	=	140.0 ft	Channel slope	=	28.0 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	6.3:1	Max. depth	=	0.0 ft
Rating curve x	=	6.755	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.8888

Modified Att-Kin routing method used.

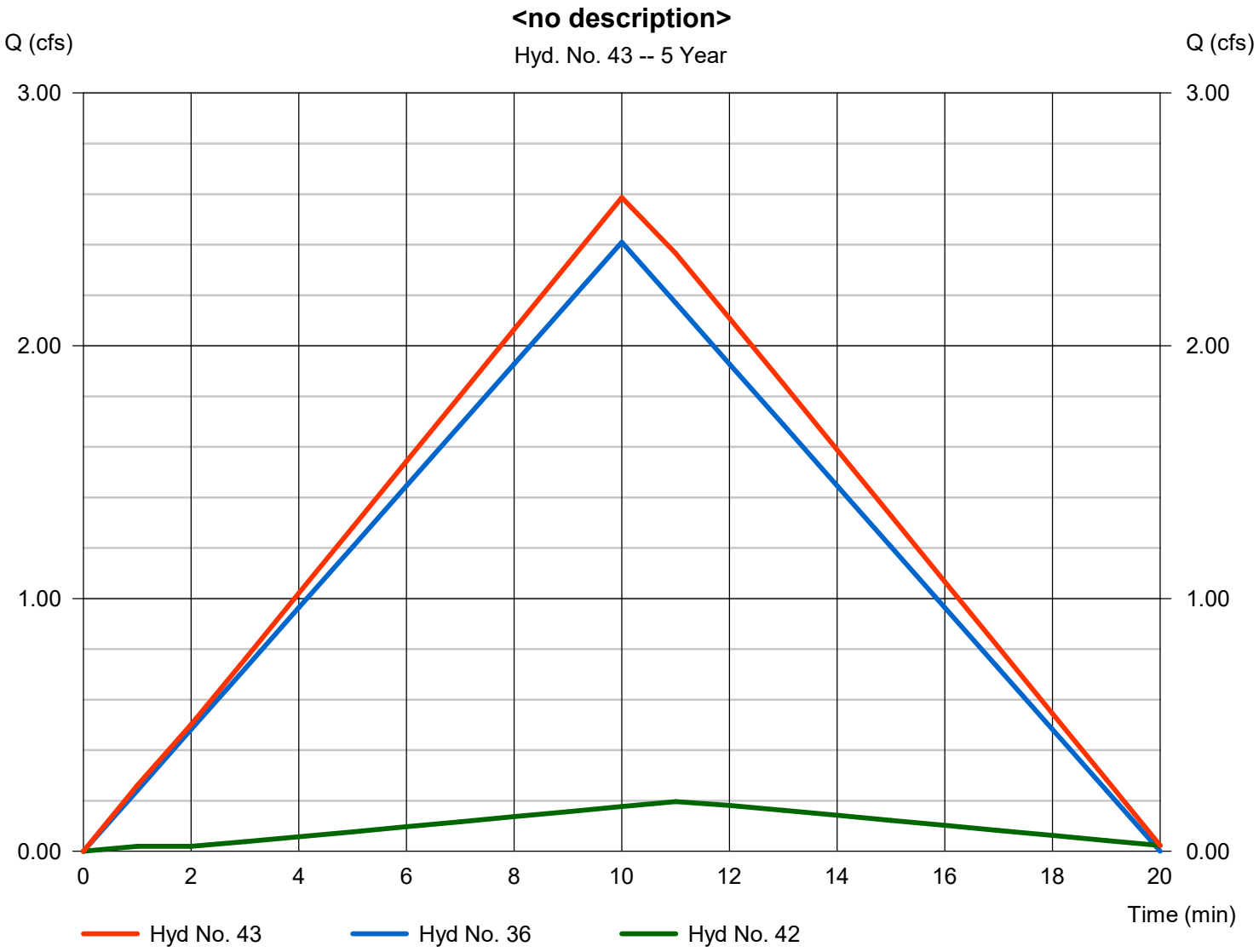


Hydrograph Report

Hyd. No. 43

<no description>

Hydrograph type	=	Combine	Peak discharge	=	2.587 cfs
Storm frequency	=	5 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,567 cuft
Inflow hyds.	=	36, 42	Contrib. drain. area	=	1.410 ac



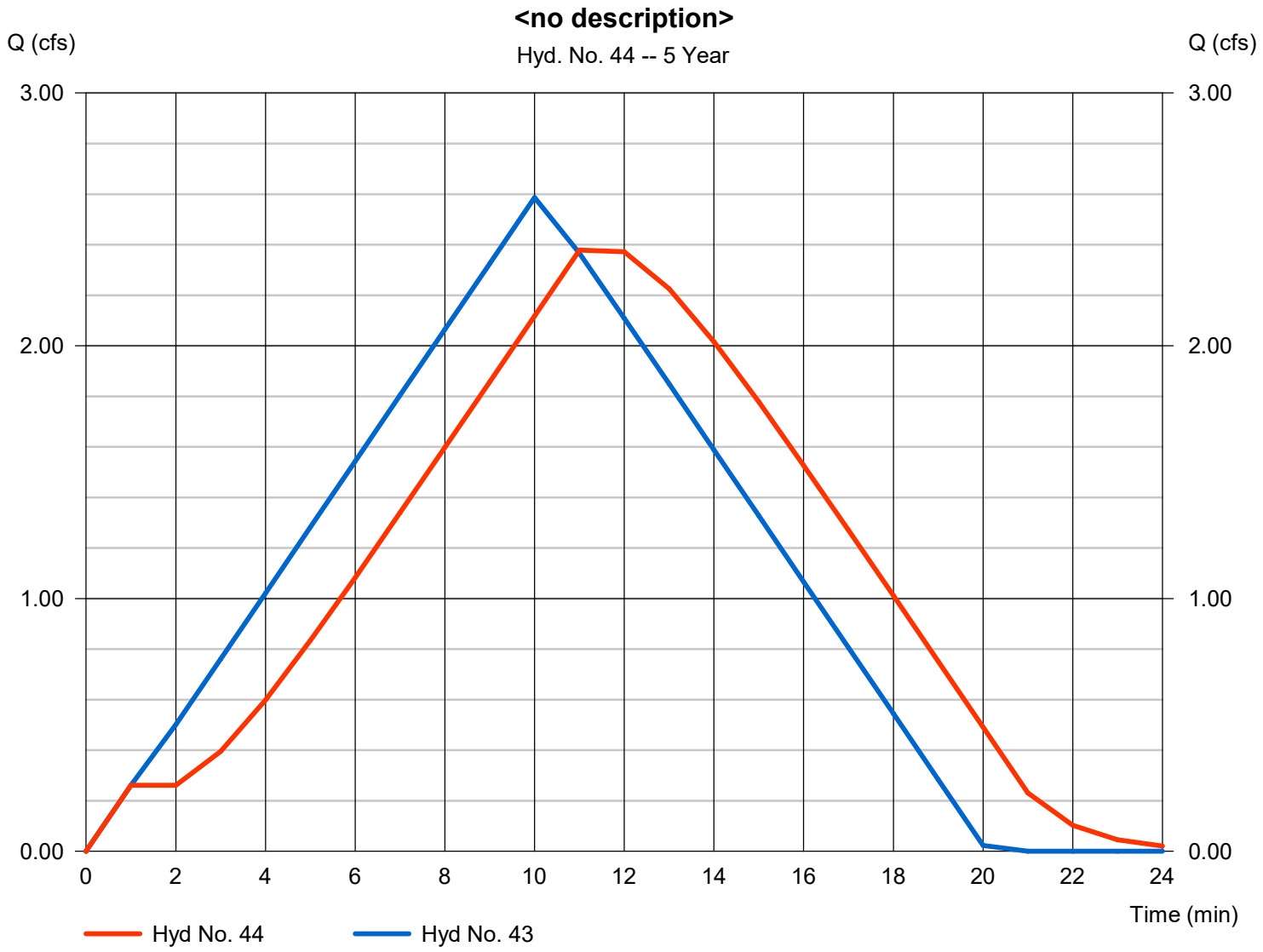
Hydrograph Report

Hyd. No. 44

<no description>

Hydrograph type	=	Reach	Peak discharge	=	2.379 cfs
Storm frequency	=	5 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	1,594 cuft
Inflow hyd. No.	=	43 - <no description>	Section type	=	Triangular
Reach length	=	307.0 ft	Channel slope	=	7.1 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	8.3:1	Max. depth	=	0.0 ft
Rating curve x	=	3.091	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.5562

Modified Att-Kin routing method used.

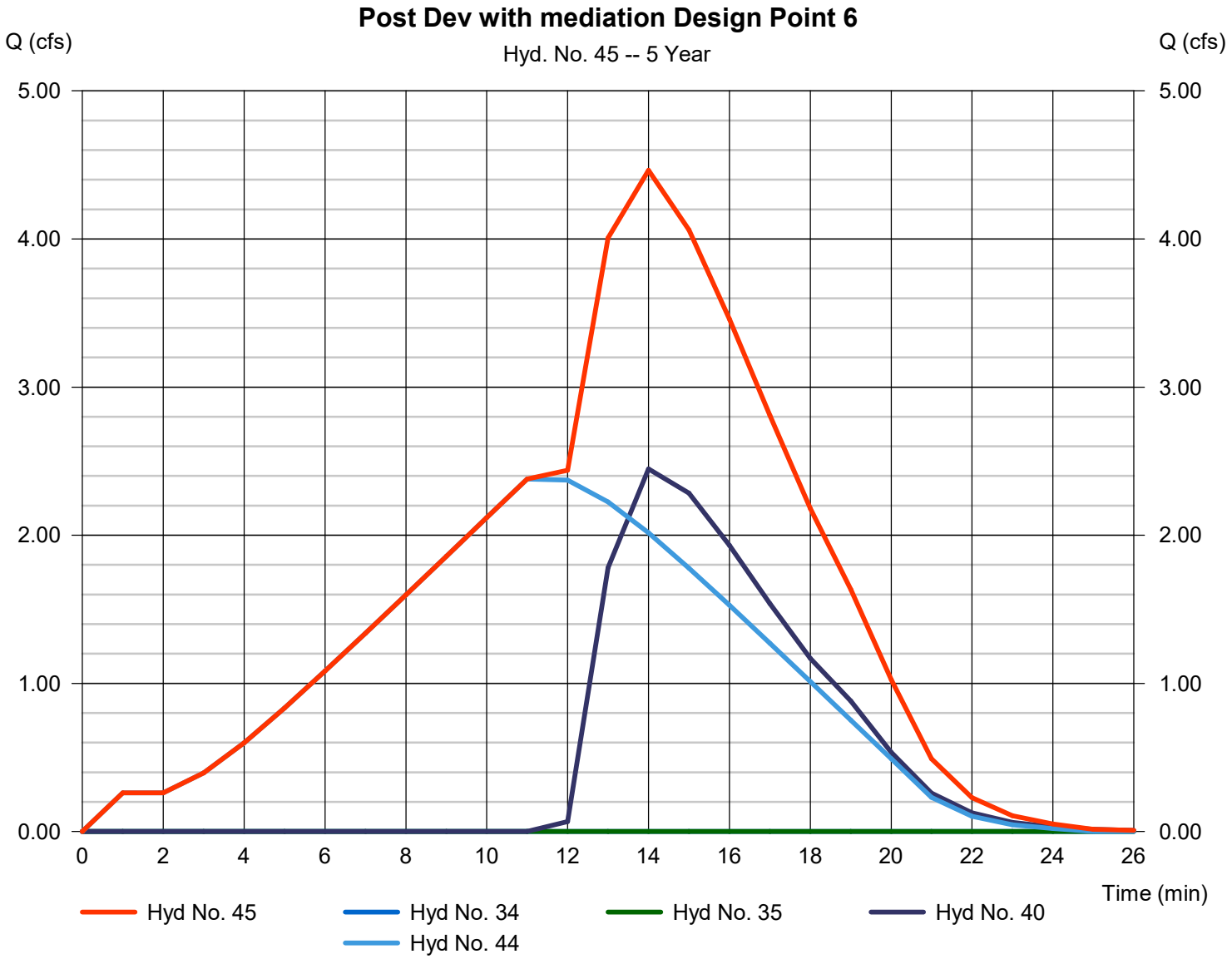


Hydrograph Report

Hyd. No. 45

Post Dev with mediation Design Point 6

Hydrograph type	= Combine	Peak discharge	= 4.464 cfs
Storm frequency	= 5 yrs	Time to peak	= 14 min
Time interval	= 1 min	Hyd. volume	= 2,382 cuft
Inflow hyds.	= 34, 35, 40, 44	Contrib. drain. area	= 0.000 ac

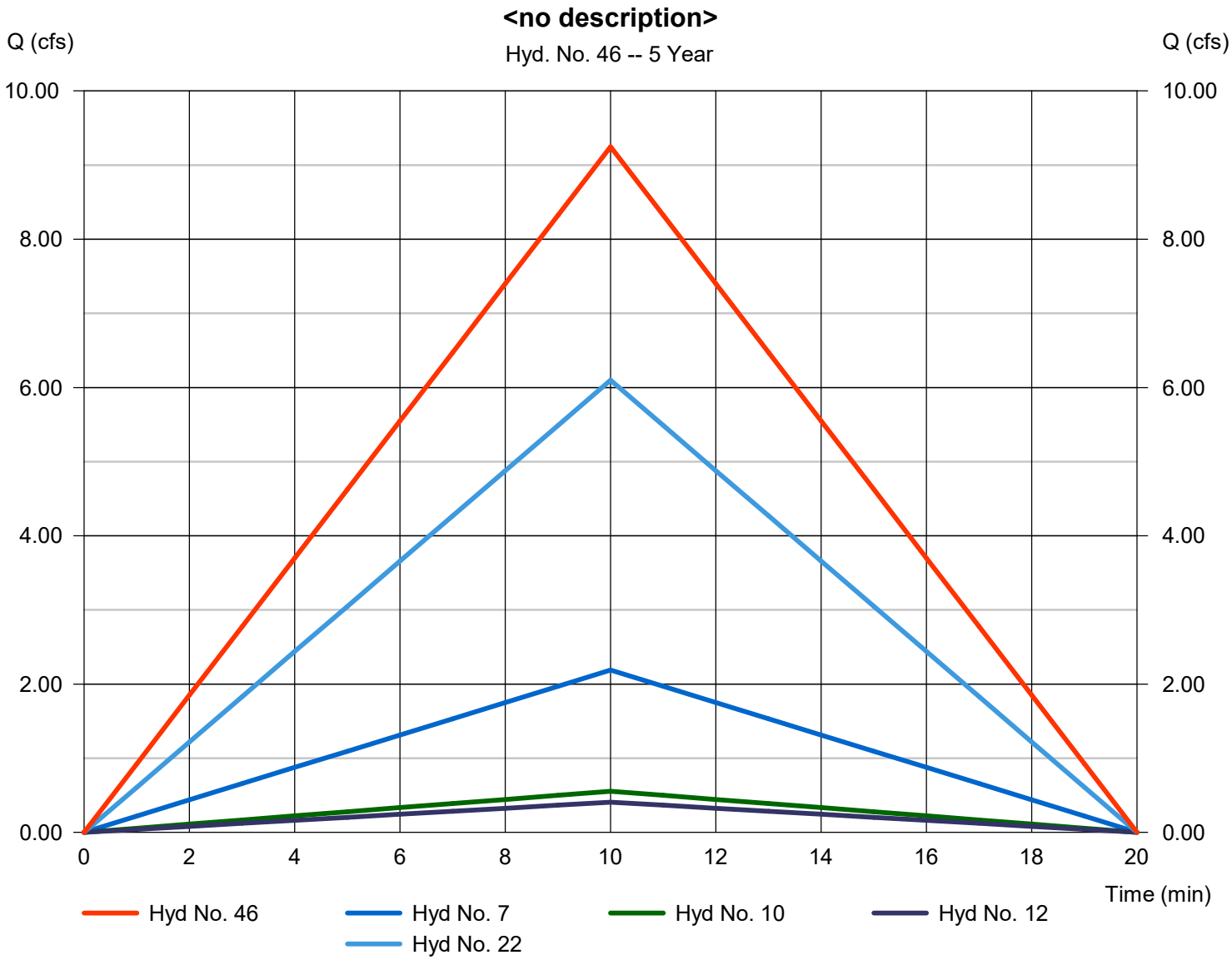


Hydrograph Report

Hyd. No. 46

<no description>

Hydrograph type	= Combine	Peak discharge	= 9.249 cfs
Storm frequency	= 5 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 5,549 cuft
Inflow hyds.	= 7, 10, 12, 22	Contrib. drain. area	= 1.520 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	Rational	38.61	1	10	23,165	------	------	------	1A Pre
2	Rational	3.069	1	10	1,842	------	------	------	2A Post
3	Rational	2.043	1	10	1,226	------	------	------	3A Pre
4	Rational	2.080	1	10	1,248	------	------	------	4A Pre
5	Rational	2.643	1	10	1,586	------	------	------	5A Pre
6	Rational	1.987	1	10	1,192	------	------	------	6A Pre
7	Rational	2.668	1	10	1,601	------	------	------	6A Post
8	Rational	2.450	1	10	1,470	------	------	------	4A Post
9	Rational	0.469	1	10	281	------	------	------	7A Pre
10	Rational	0.677	1	10	406	------	------	------	7A Post
11	Rational	0.412	1	10	247	------	------	------	8A Pre
12	Rational	0.495	1	10	297	------	------	------	8A Post
13	Rational	2.511	1	10	1,507	------	------	------	2A Pre
14	Rational	2.936	1	10	1,762	------	------	------	5A Post
15	Rational	38.61	1	10	23,165	------	------	------	1A Post
16	Combine	41.12	1	10	24,672	1, 13,	------	------	1A & 2A Pre Combined
17	Combine	41.68	1	10	25,007	2, 15,	------	------	1A & 2A Post Combined
18	Combine	4.123	1	10	2,474	3, 4,	------	------	3A & 4A Pre Combined
19	Rational	2.043	1	10	1,226	------	------	------	3A Post
20	Combine	4.493	1	10	2,696	8, 19	------	------	3A & 4A Post Combined
21	Combine	6.766	1	10	4,059	5, 18,	------	------	Design Point 5 Pre Dev
22	Combine	7.429	1	10	4,458	14, 20,	------	------	Design Point 5 Post Dev
23	Rational	0.412	1	10	247	------	------	------	2A-1 Post Dev with mediation
24	Rational	37.60	1	10	22,558	------	------	------	1A Post Dev With mediation
25	Rational	1.420	1	10	852	------	------	------	2A-2 Post Dev With mediation
26	Rational	1.237	1	10	742	------	------	------	2A-3 Post Dev with Mediation
27	Reservoir	0.227	1	15	55	23	100.83	199	Pond South of Lot 1
28	Reservoir	1.395	1	10	717	25	100.91	154	Pond b/w 1 & 2
29	Reservoir	1.297	1	9	505	26	101.93	262	Lot 3 Pond
30	Combine	40.11	1	10	23,834	24, 27, 28, 29	------	------	Design Point 2
31	Rational	2.668	1	10	1,601	------	------	------	6A post Dev with mediation
32	Rational	0.677	1	10	406	------	------	------	7A Post With Mediation
33	Rational	0.495	1	10	297	------	------	------	8A Post with Mediation
34	Reservoir	0.000	1	n/a	0	32	101.12	406	Ppond for 7A

Hydrograph Summary Report

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

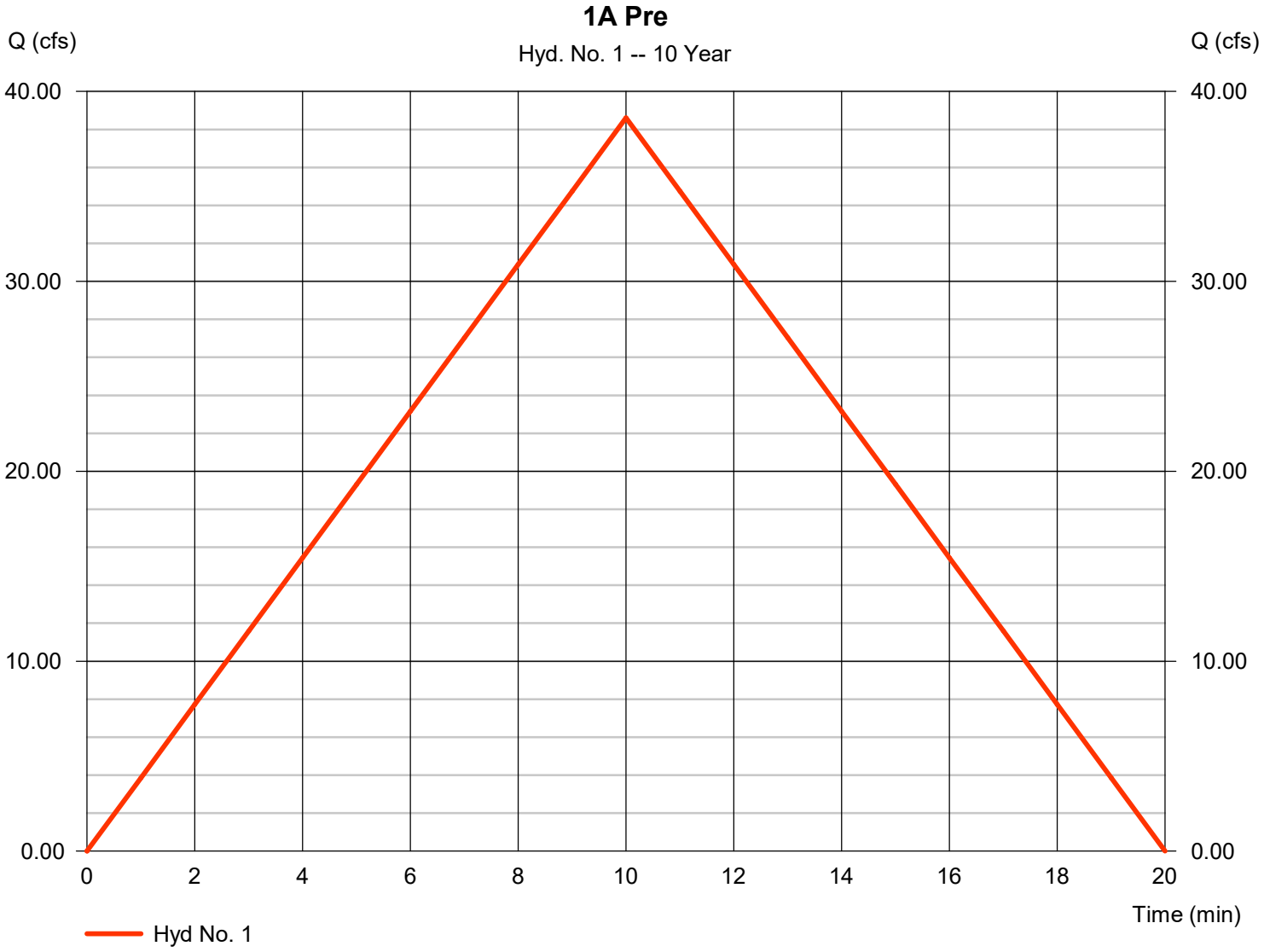
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	Reservoir	0.000	1	n/a	0	33	101.43	297	Pond for 8A
36	Rational	2.936	1	10	1,762	------	------	------	5A Post wth mediation
37	Rational	2.043	1	10	1,226	------	------	------	3A Post Dev with mediation
38	Rational	0.243	1	10	146	------	------	------	4A Post Dev with mediation
39	Combine	4.953	1	10	2,972	31, 37, 38	------	------	Water Towards road
40	Reservoir	3.661	1	13	1,321	39	102.71	1,872	<no description>
41	Combine	9.633	1	10	5,780	6, 9, 11, 21,	------	------	Pre Dev Design Point 6
42	Reach	0.241	1	11	147	38	------	------	<no description>
43	Combine	3.152	1	10	1,909	36, 42	------	------	<no description>
44	Reach	2.919	1	11	1,941	43	------	------	<no description>
45	Combine	6.369	1	13	3,262	34, 35, 40, 44	------	------	Post Dev with mediation Design Point
46	Combine	11.27	1	10	6,761	7, 10, 12, 22,	------	------	<no description>

Hydrograph Report

Hyd. No. 1

1A Pre

Hydrograph type	=	Rational	Peak discharge	=	38.61 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	23,165 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

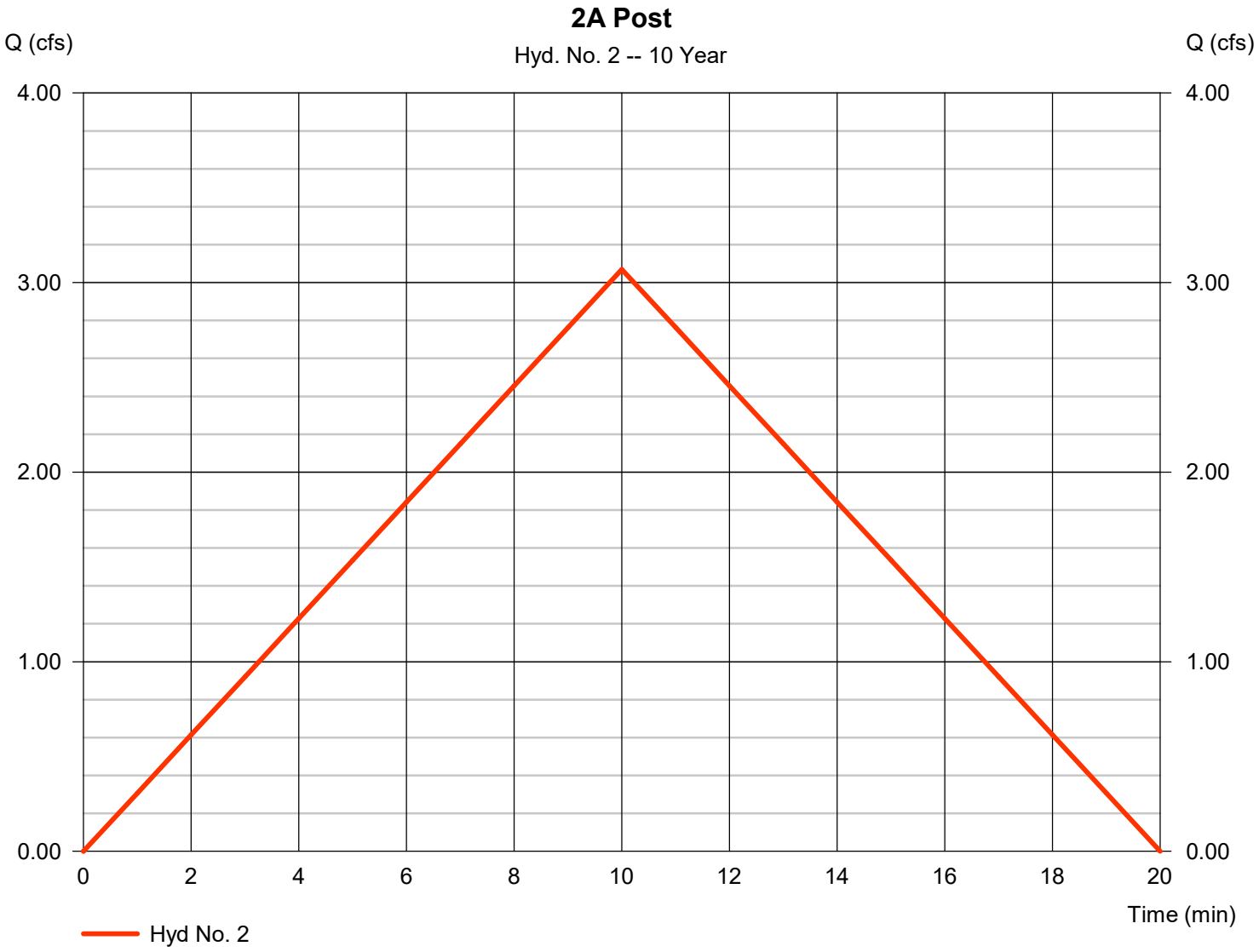


Hydrograph Report

Hyd. No. 2

2A Post

Hydrograph type	=	Rational	Peak discharge	=	3.069 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,842 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.55
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

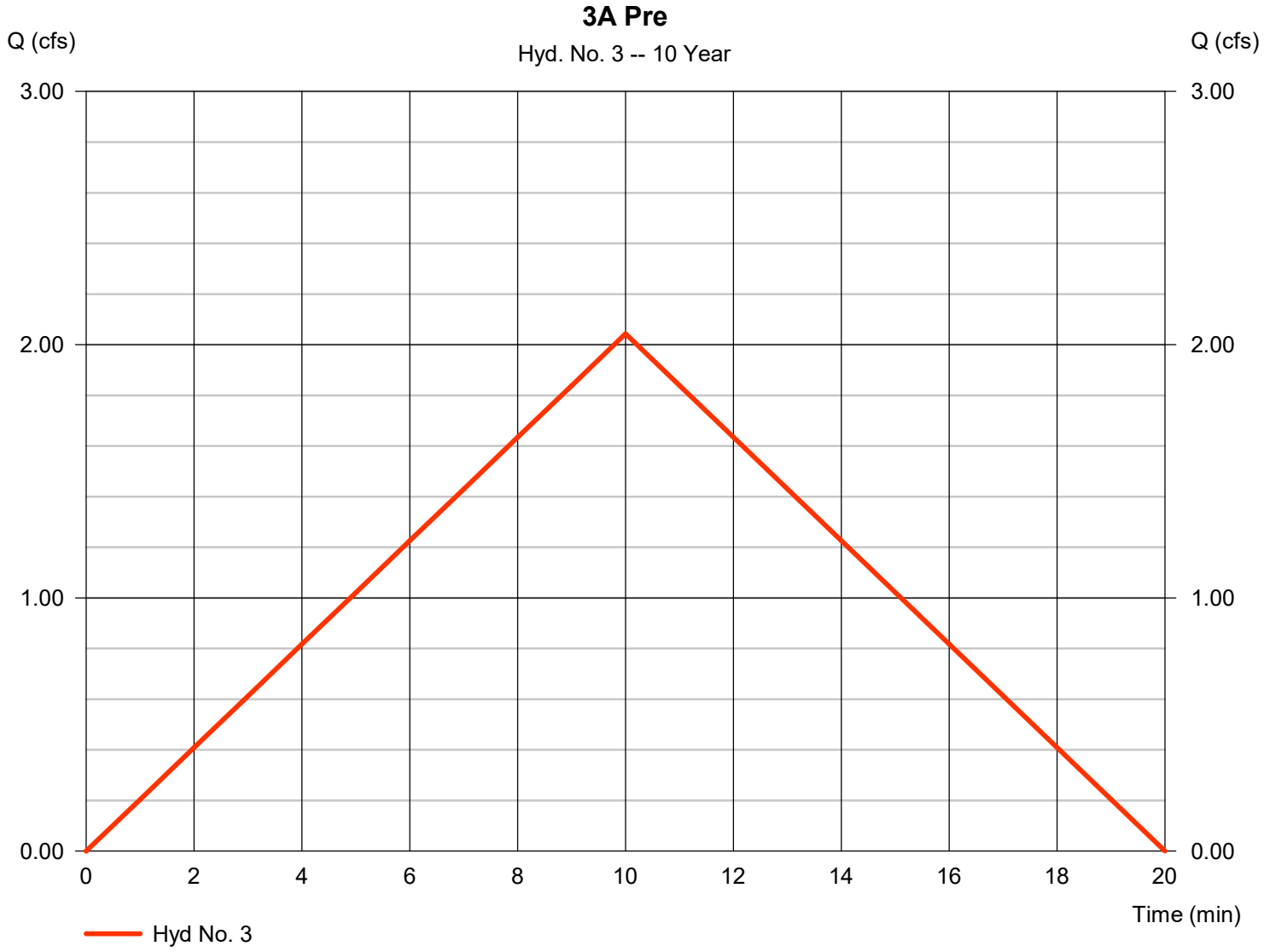


Hydrograph Report

Hyd. No. 3

3A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.043 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,226 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

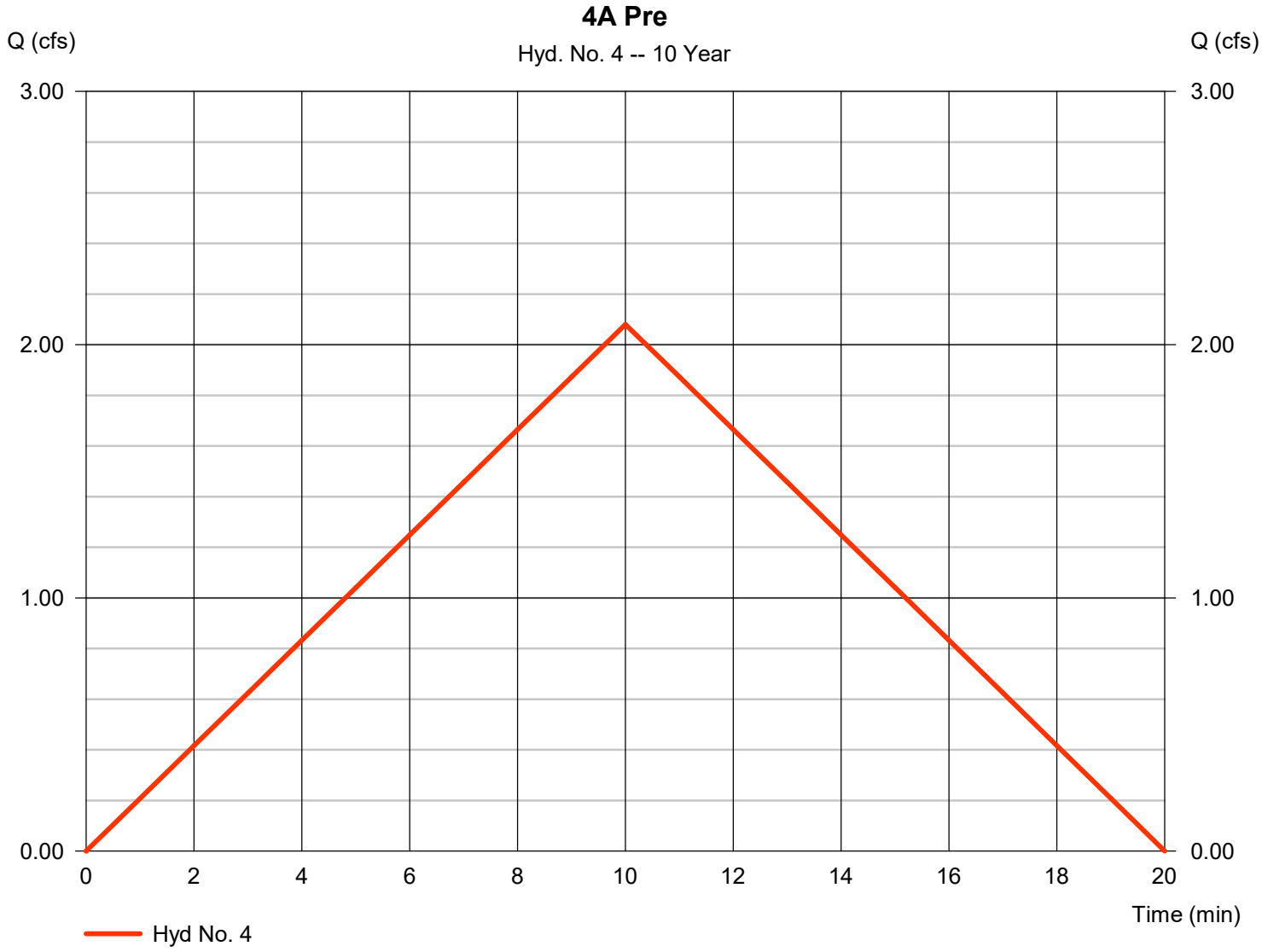


Hydrograph Report

Hyd. No. 4

4A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.080 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,248 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

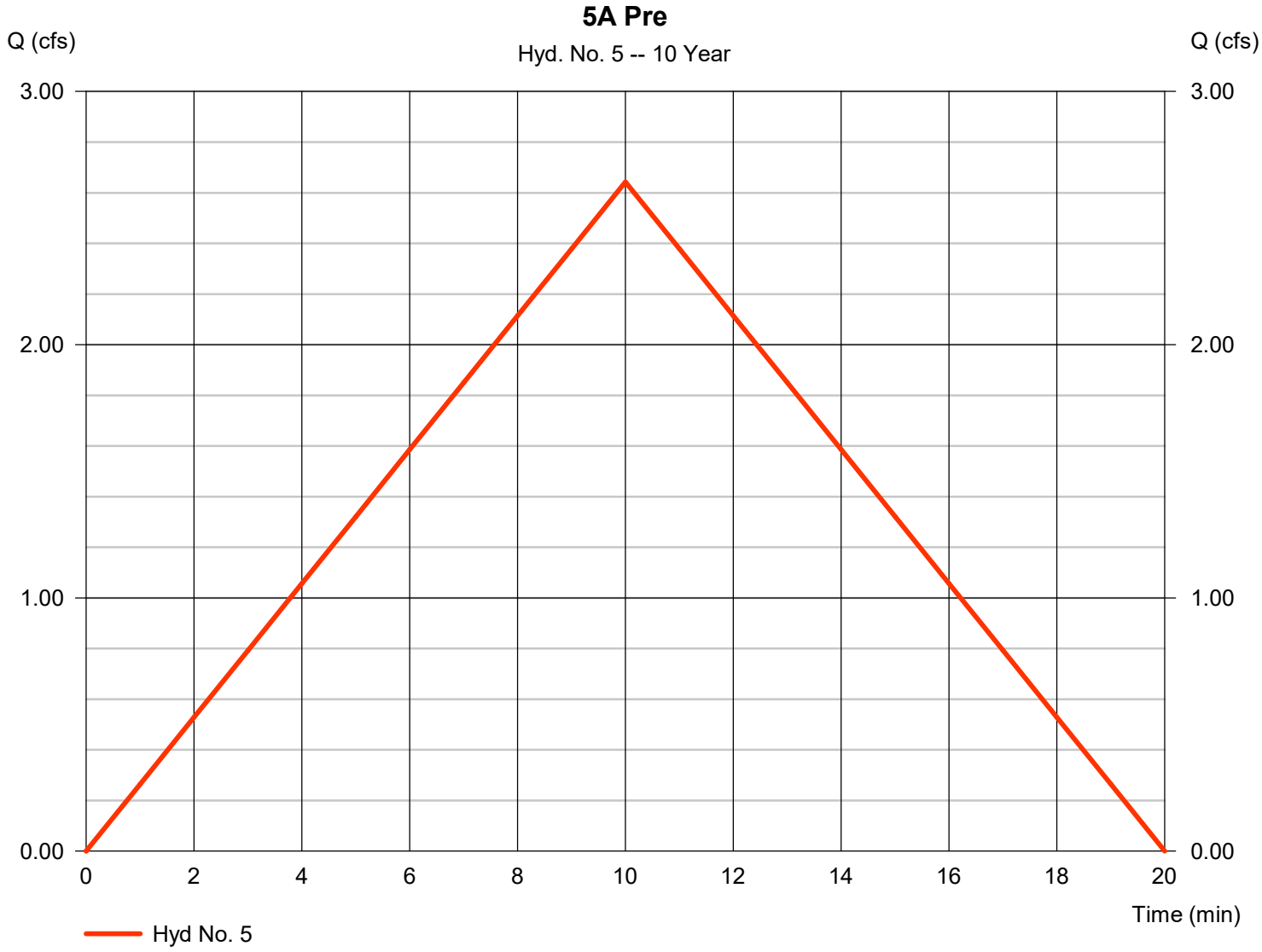


Hydrograph Report

Hyd. No. 5

5A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.643 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,586 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

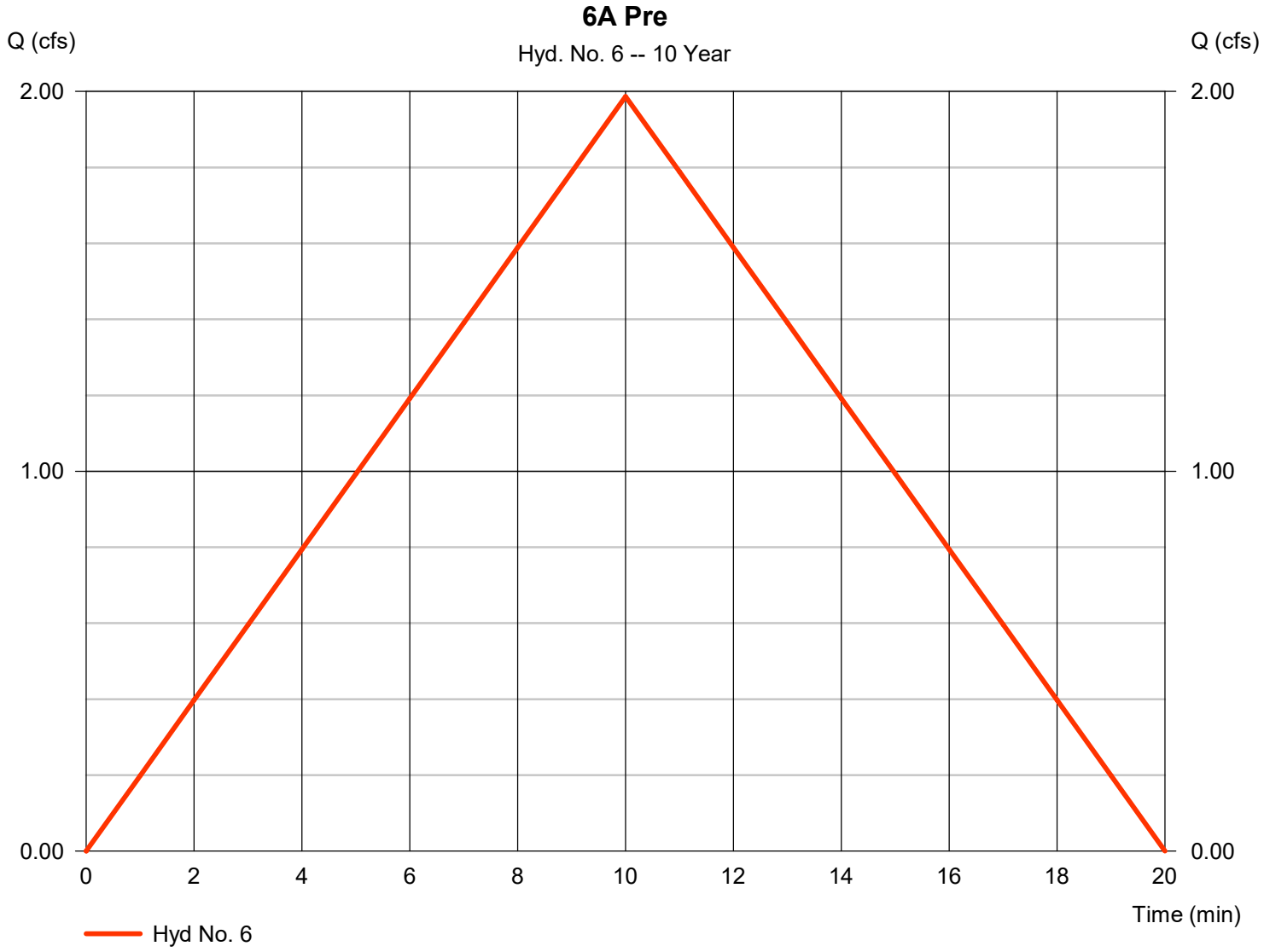


Hydrograph Report

Hyd. No. 6

6A Pre

Hydrograph type	=	Rational	Peak discharge	=	1.987 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,192 cuft
Drainage area	=	1.060 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

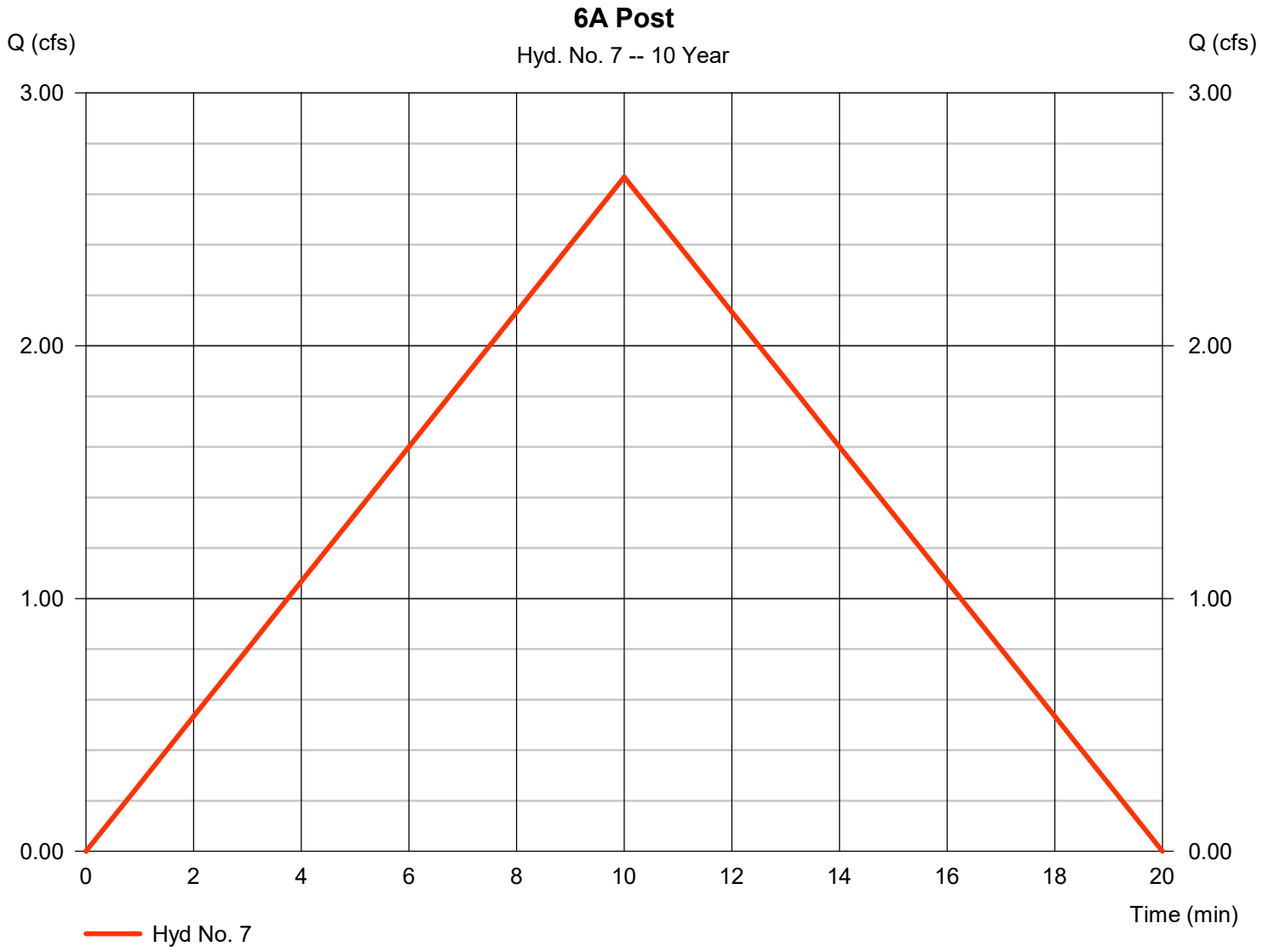


Hydrograph Report

Hyd. No. 7

6A Post

Hydrograph type	=	Rational	Peak discharge	=	2.668 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,601 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

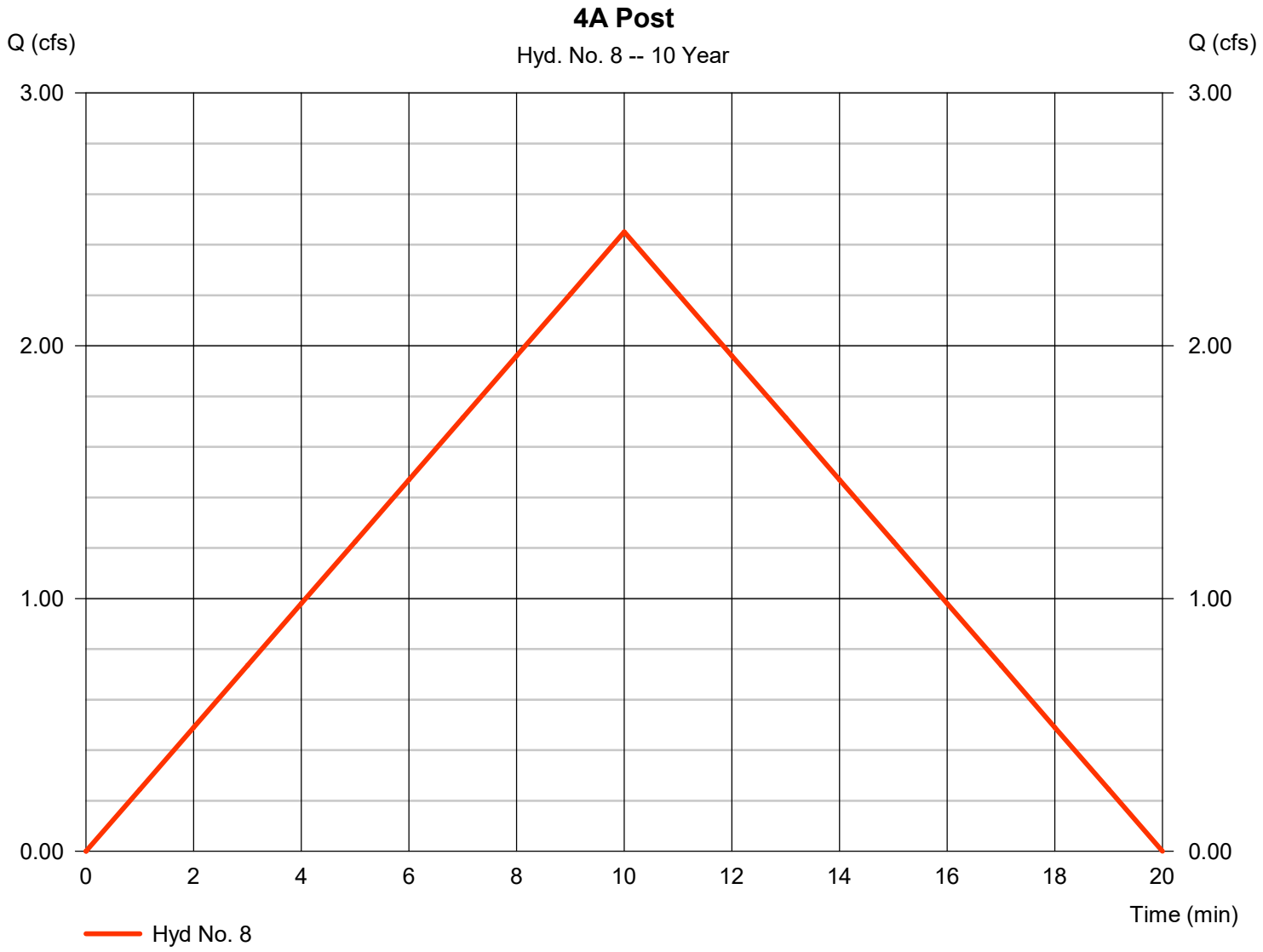


Hydrograph Report

Hyd. No. 8

4A Post

Hydrograph type	=	Rational	Peak discharge	=	2.450 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,470 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.53
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

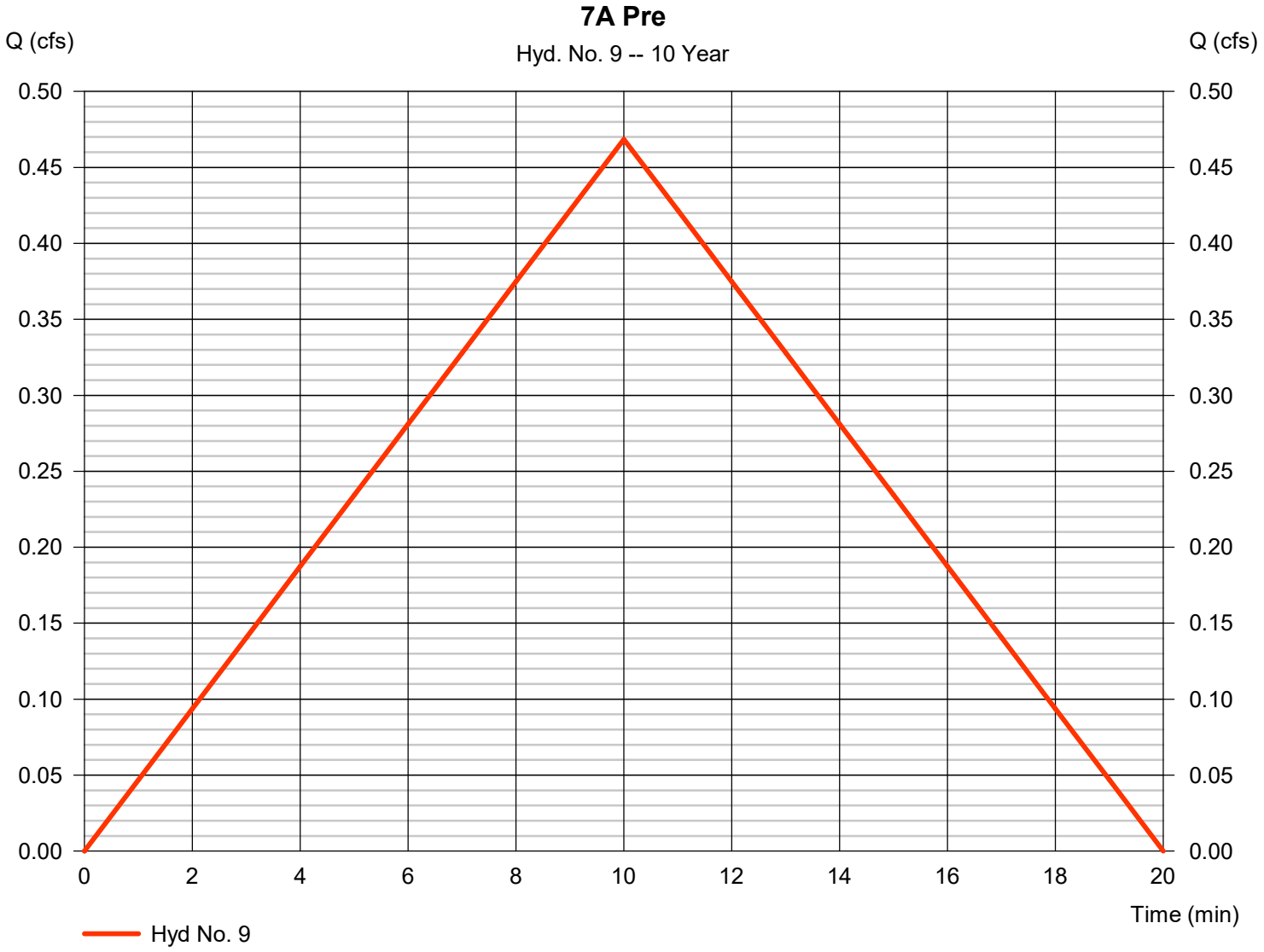


Hydrograph Report

Hyd. No. 9

7A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.469 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	281 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

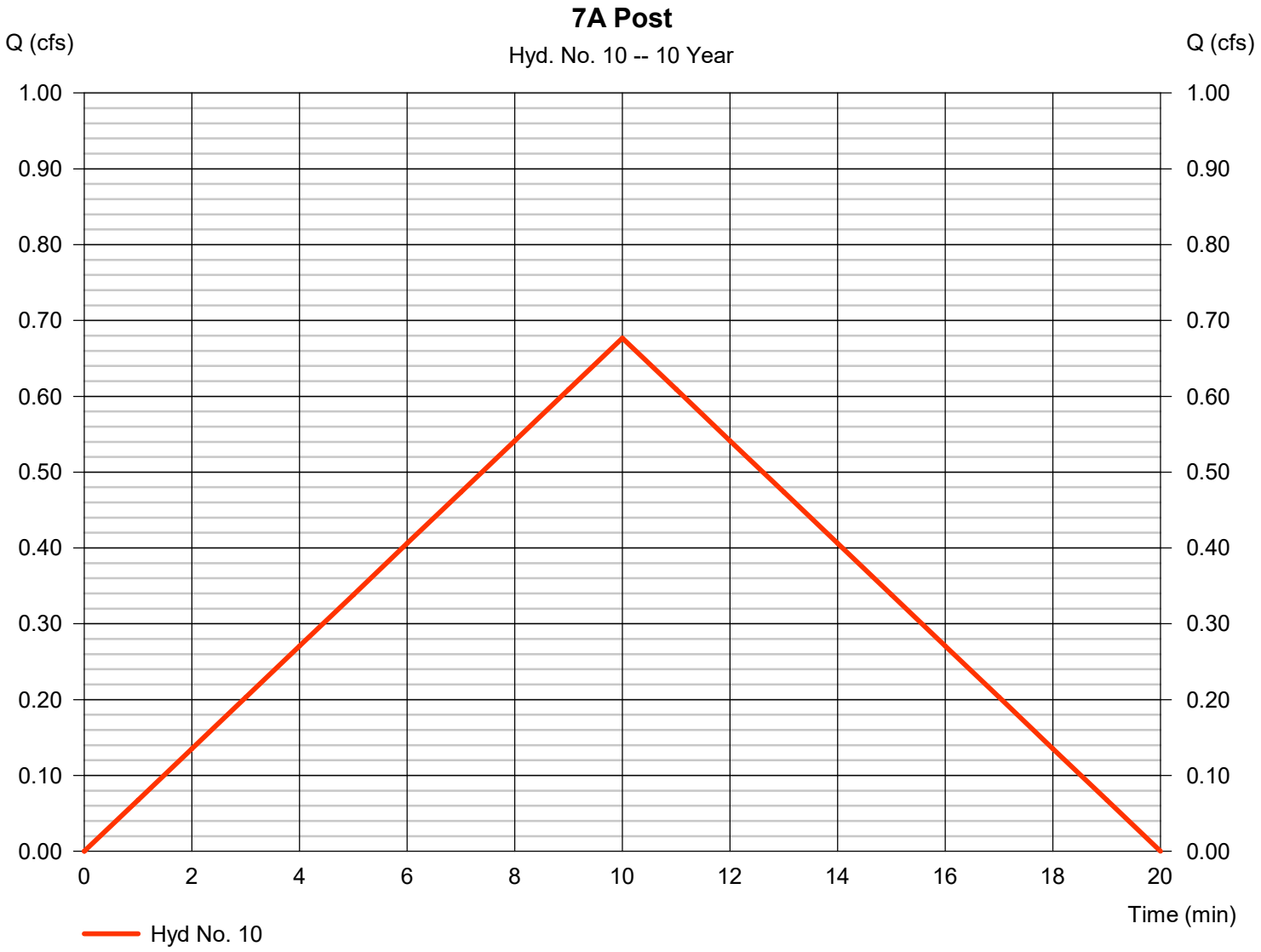


Hydrograph Report

Hyd. No. 10

7A Post

Hydrograph type	=	Rational	Peak discharge	=	0.677 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	406 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

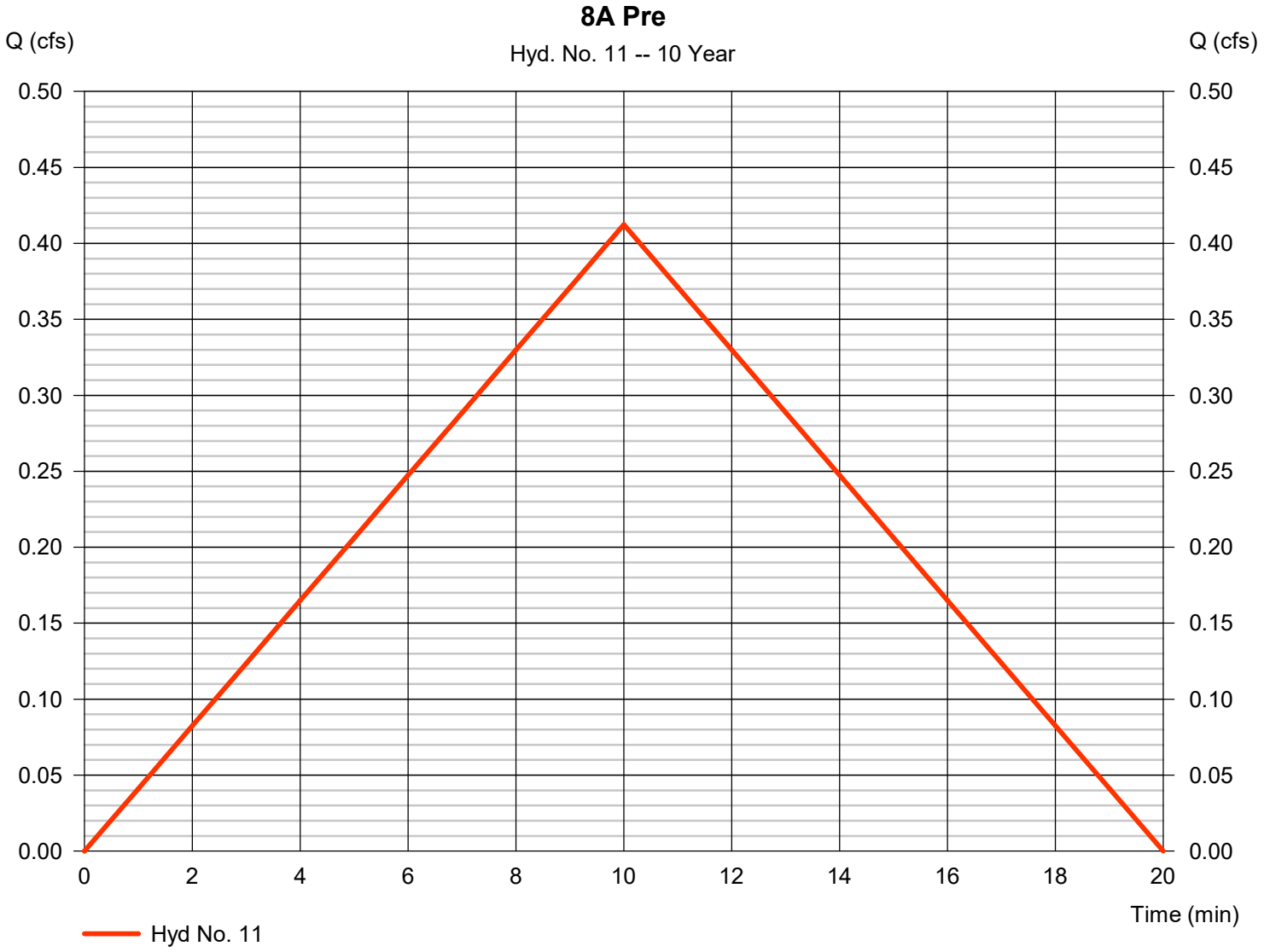


Hydrograph Report

Hyd. No. 11

8A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.412 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	247 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

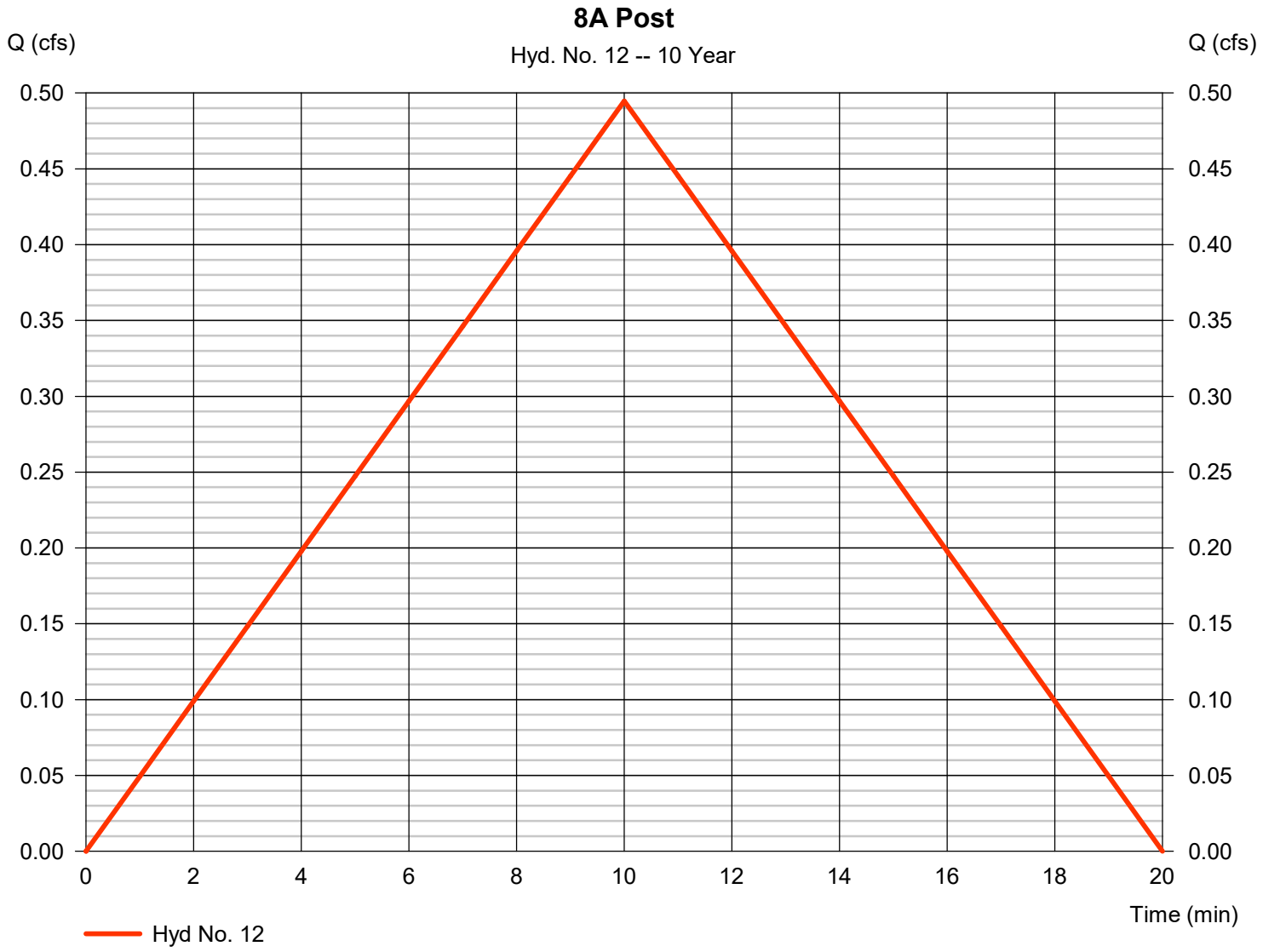


Hydrograph Report

Hyd. No. 12

8A Post

Hydrograph type	=	Rational	Peak discharge	=	0.495 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	297 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

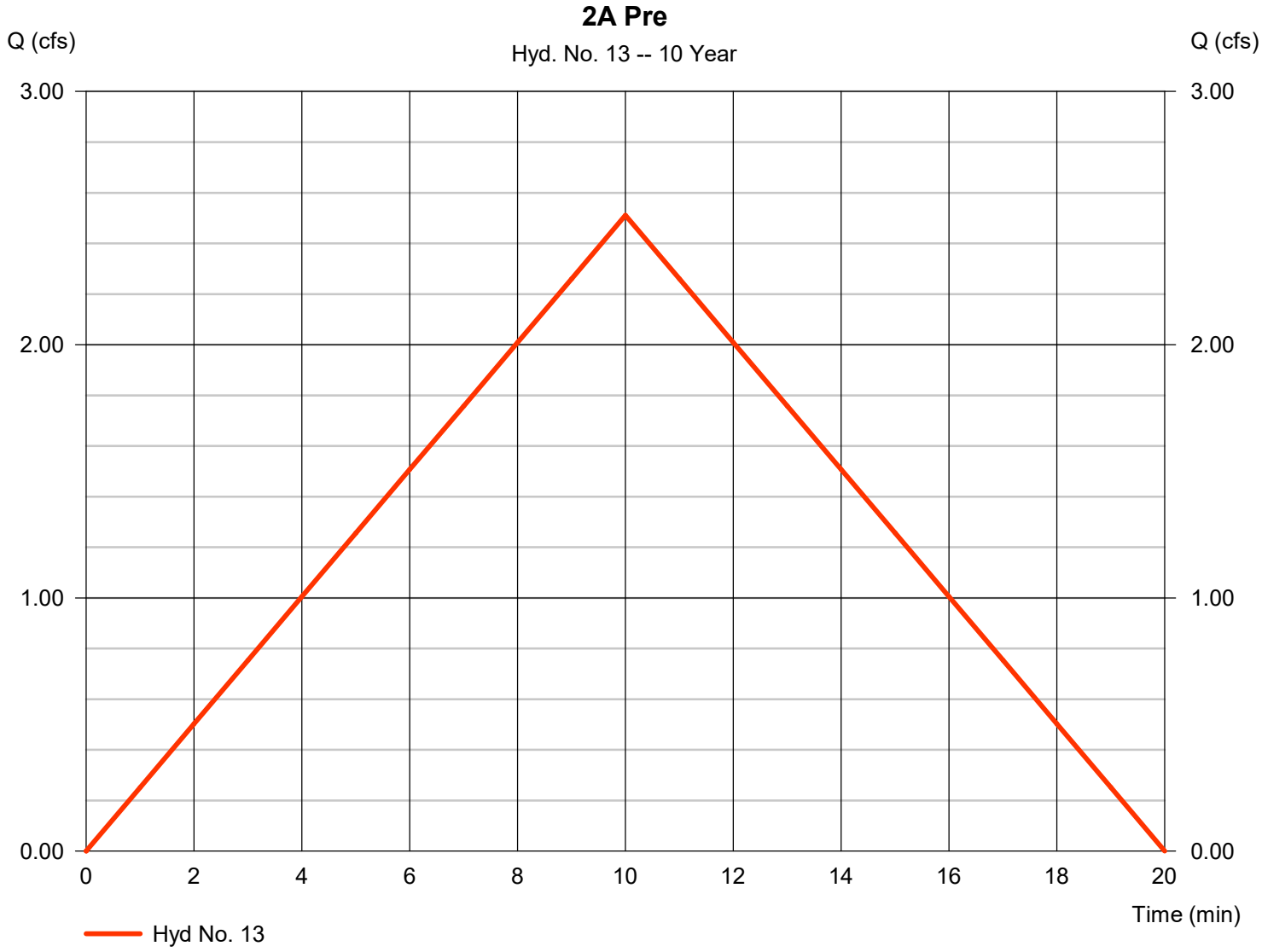


Hydrograph Report

Hyd. No. 13

2A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.511 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,507 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

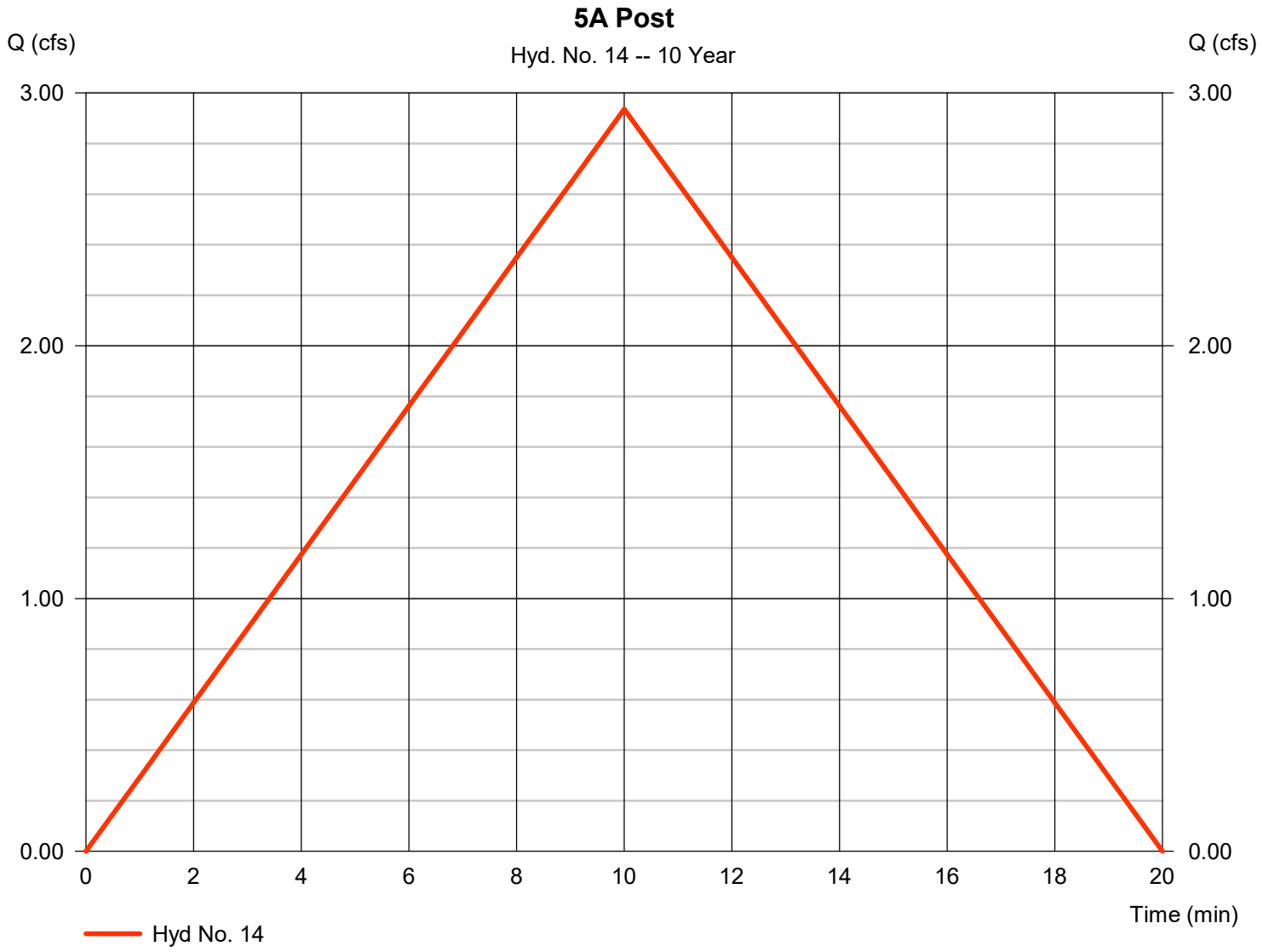


Hydrograph Report

Hyd. No. 14

5A Post

Hydrograph type	=	Rational	Peak discharge	=	2.936 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,762 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

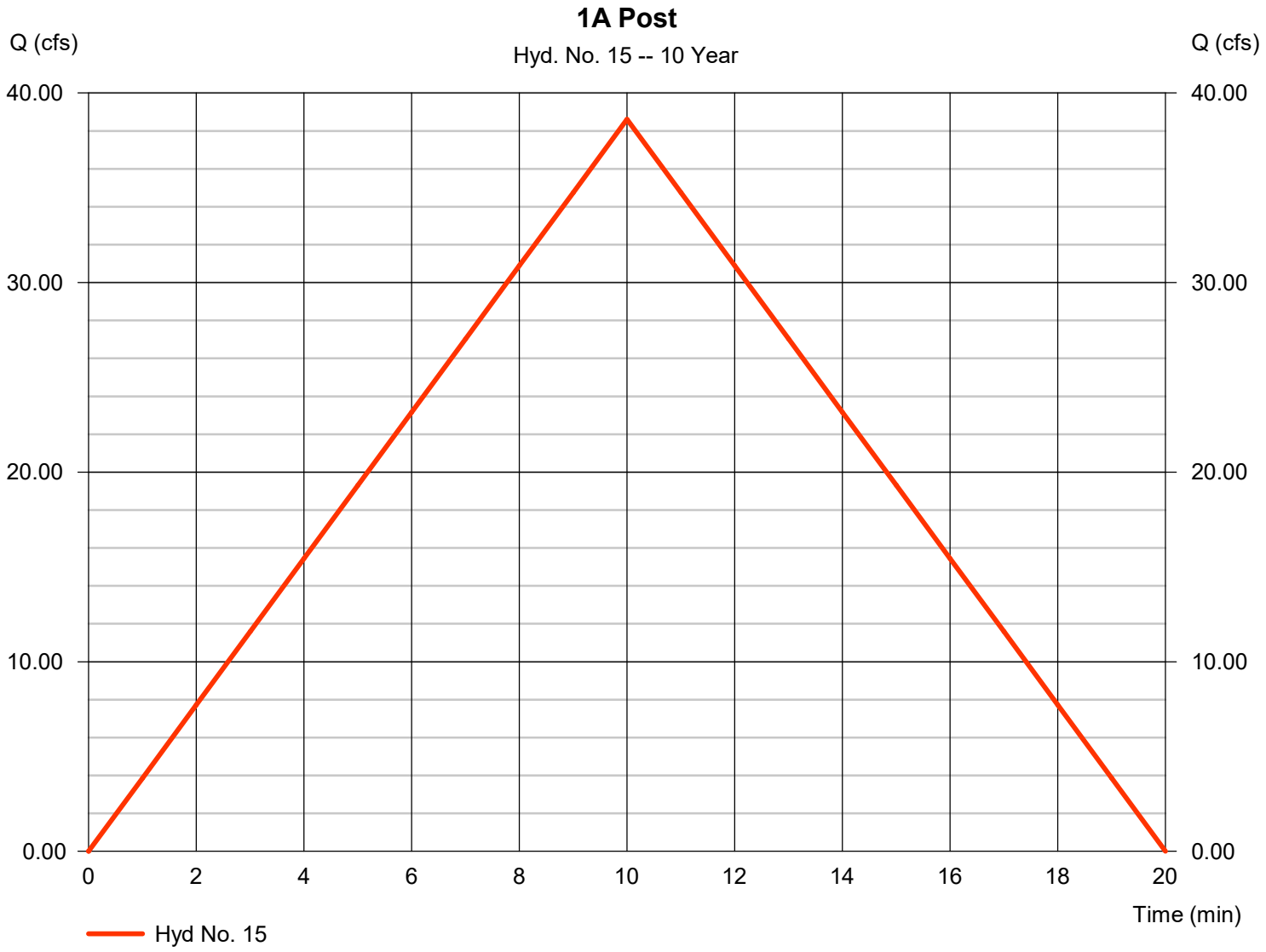


Hydrograph Report

Hyd. No. 15

1A Post

Hydrograph type	=	Rational	Peak discharge	=	38.61 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	23,165 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

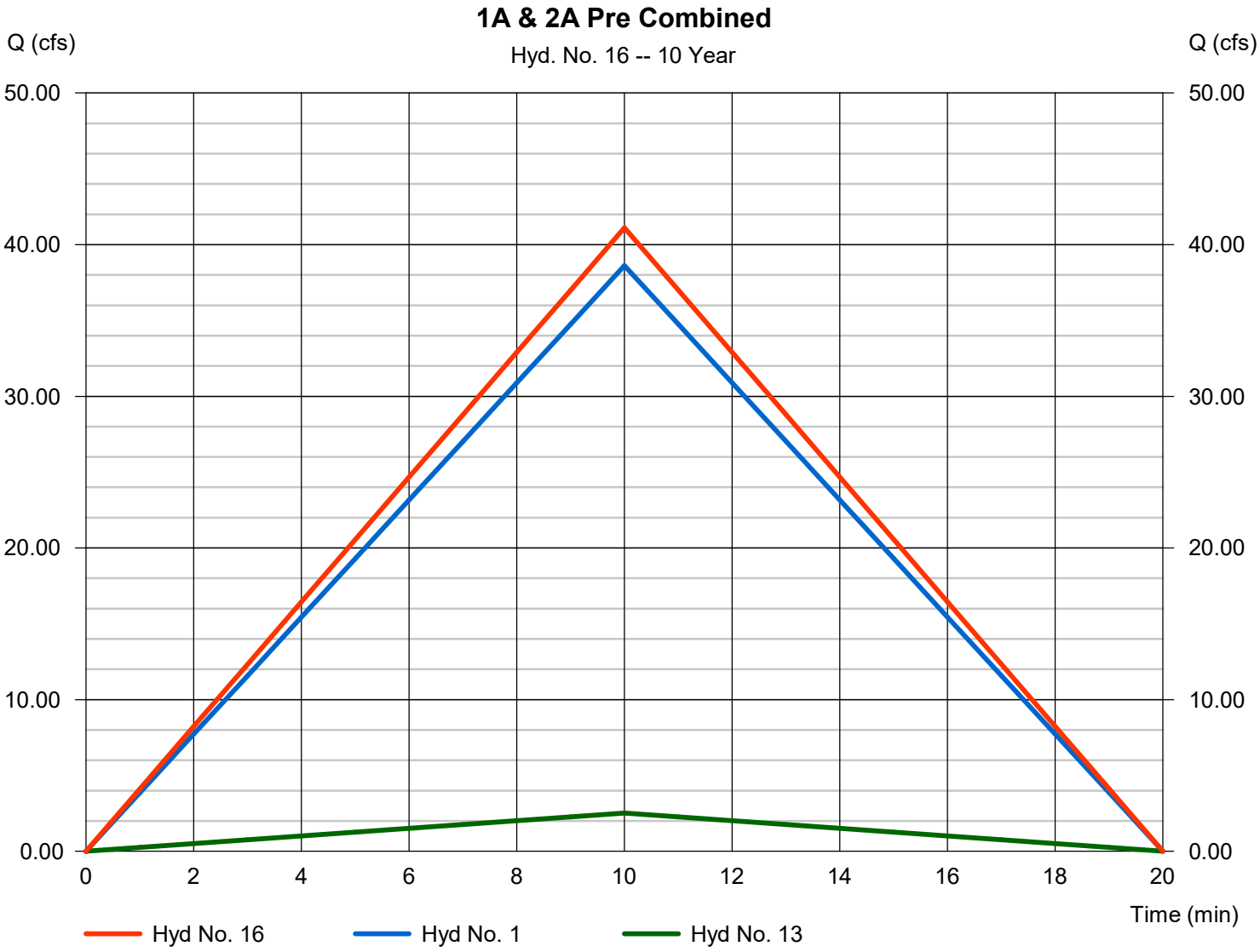


Hydrograph Report

Hyd. No. 16

1A & 2A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 41.12 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 24,672 cuft
Inflow hyds.	= 1, 13	Contrib. drain. area	= 21.940 ac

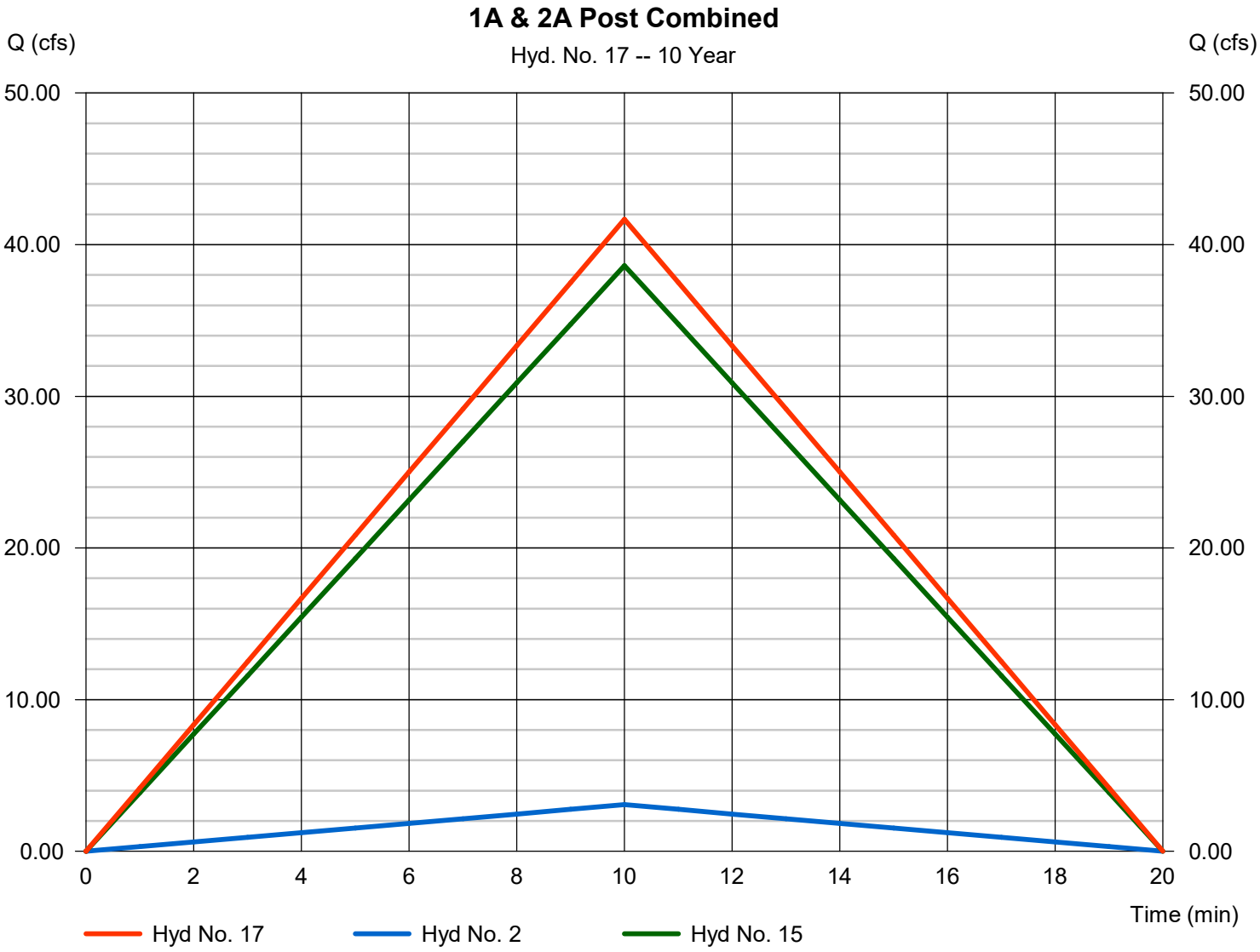


Hydrograph Report

Hyd. No. 17

1A & 2A Post Combined

Hydrograph type	= Combine	Peak discharge	= 41.68 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 25,007 cuft
Inflow hyds.	= 2, 15	Contrib. drain. area	= 21.940 ac

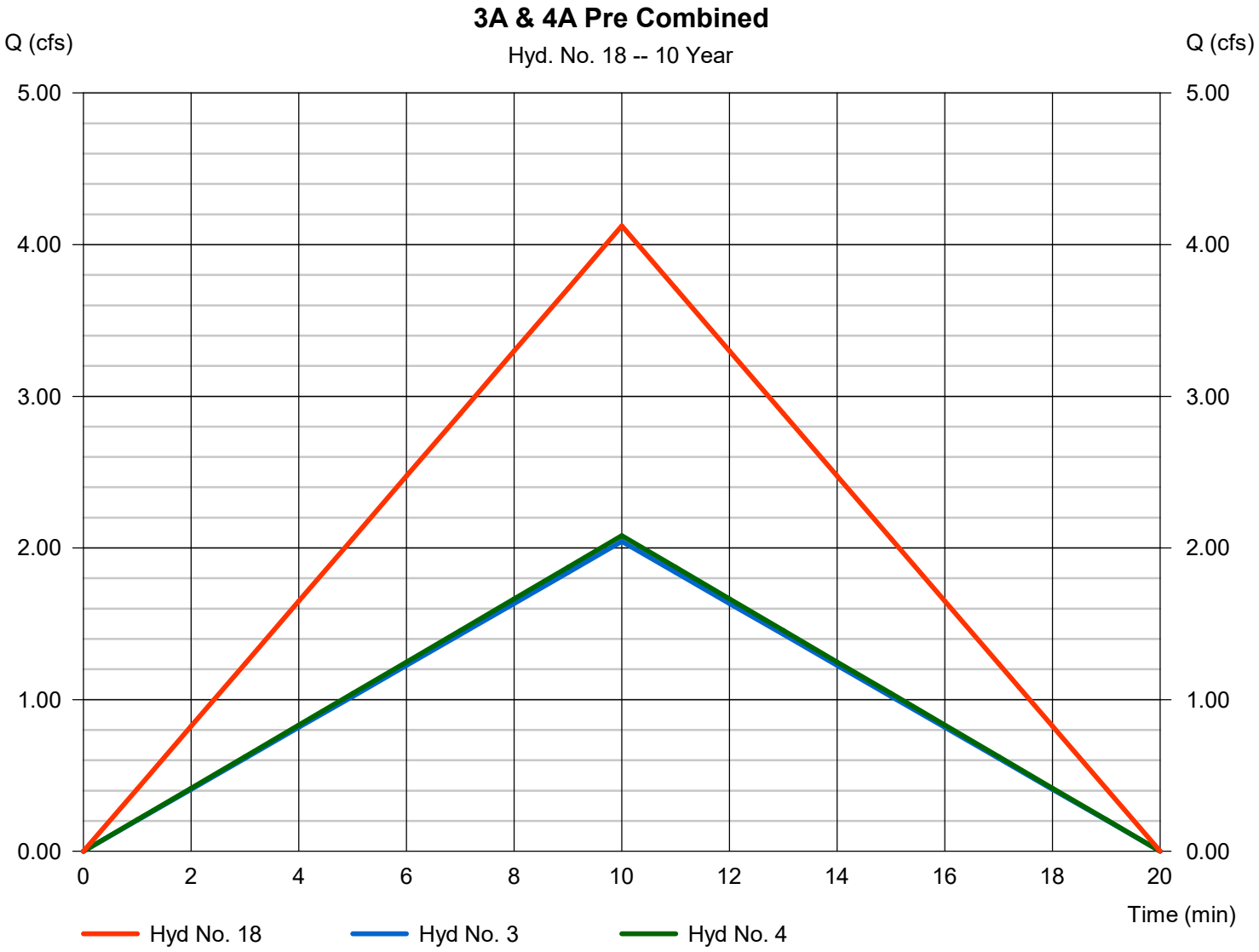


Hydrograph Report

Hyd. No. 18

3A & 4A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 4.123 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 2,474 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 2.200 ac

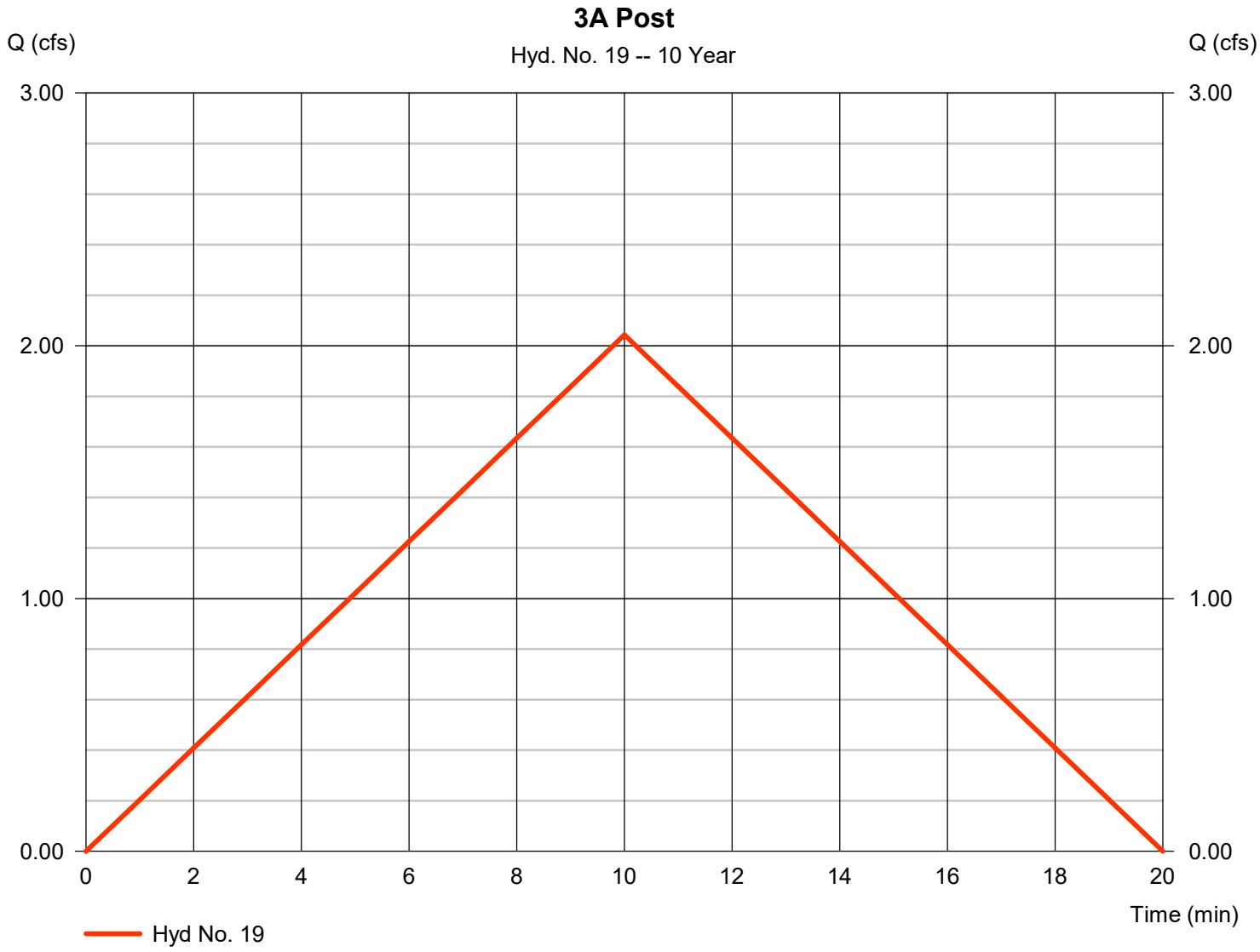


Hydrograph Report

Hyd. No. 19

3A Post

Hydrograph type	=	Rational	Peak discharge	=	2.043 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,226 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

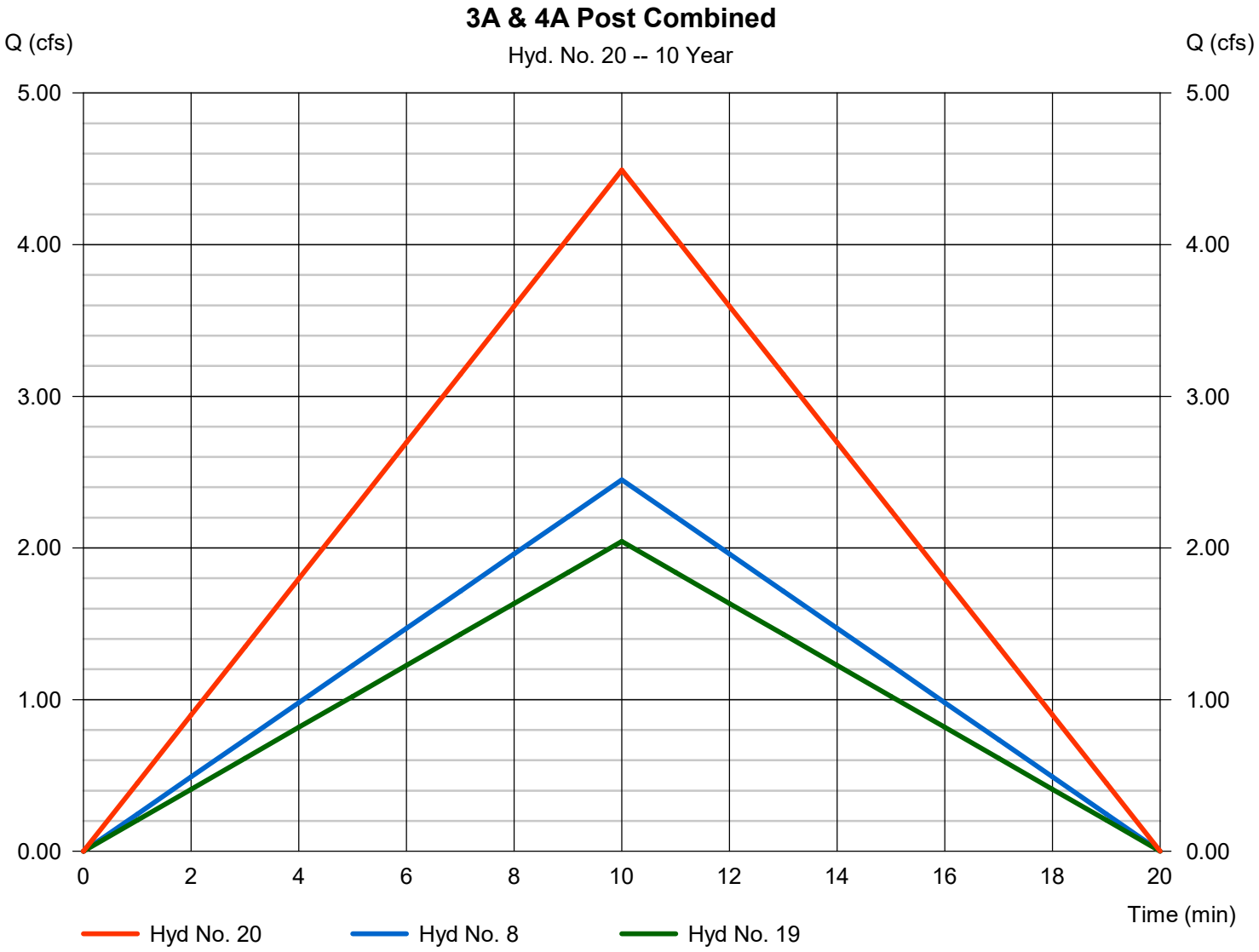


Hydrograph Report

Hyd. No. 20

3A & 4A Post Combined

Hydrograph type	= Combine	Peak discharge	= 4.493 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 2,696 cuft
Inflow hyds.	= 8, 19	Contrib. drain. area	= 2.200 ac

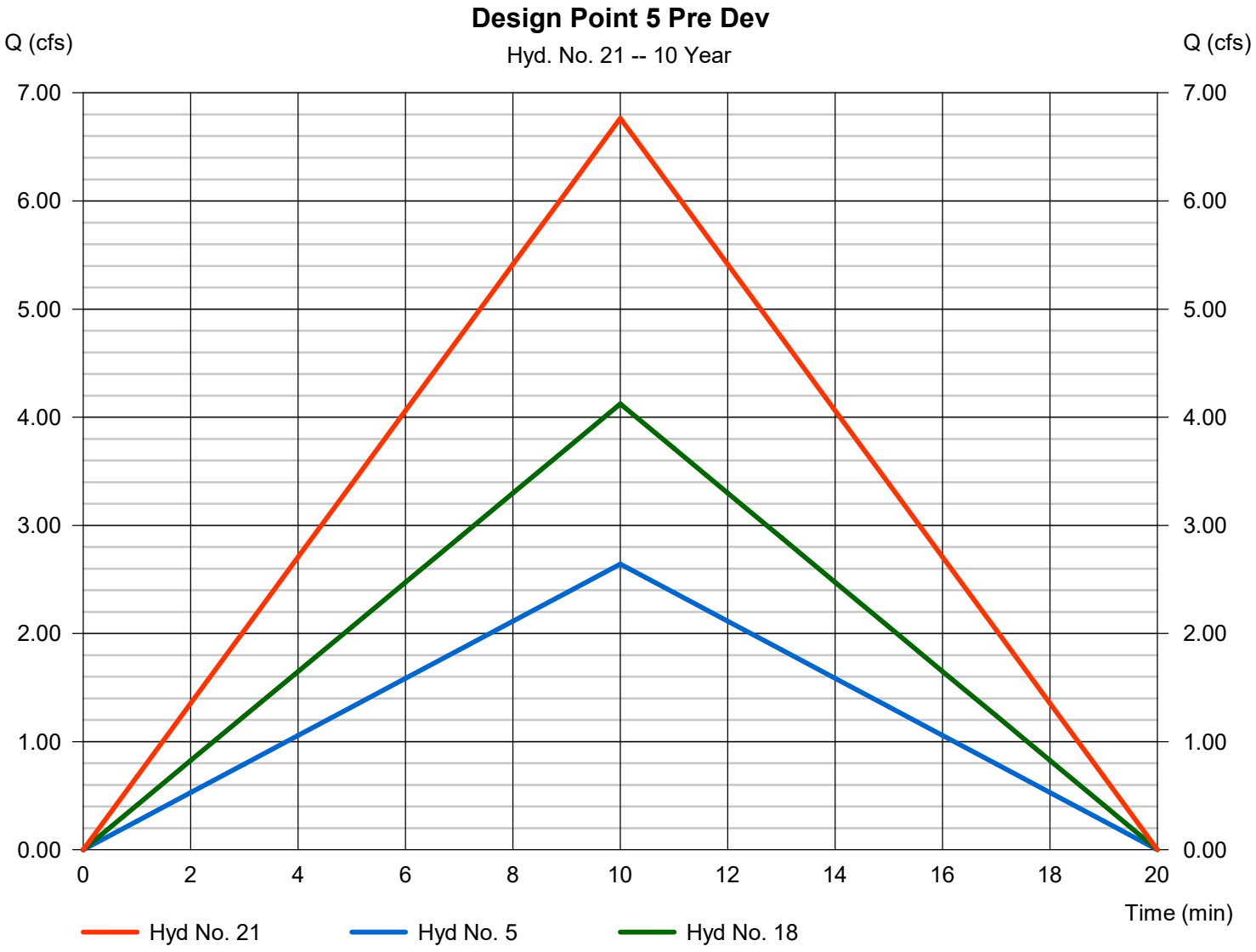


Hydrograph Report

Hyd. No. 21

Design Point 5 Pre Dev

Hydrograph type	= Combine	Peak discharge	= 6.766 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 4,059 cuft
Inflow hyds.	= 5, 18	Contrib. drain. area	= 1.410 ac

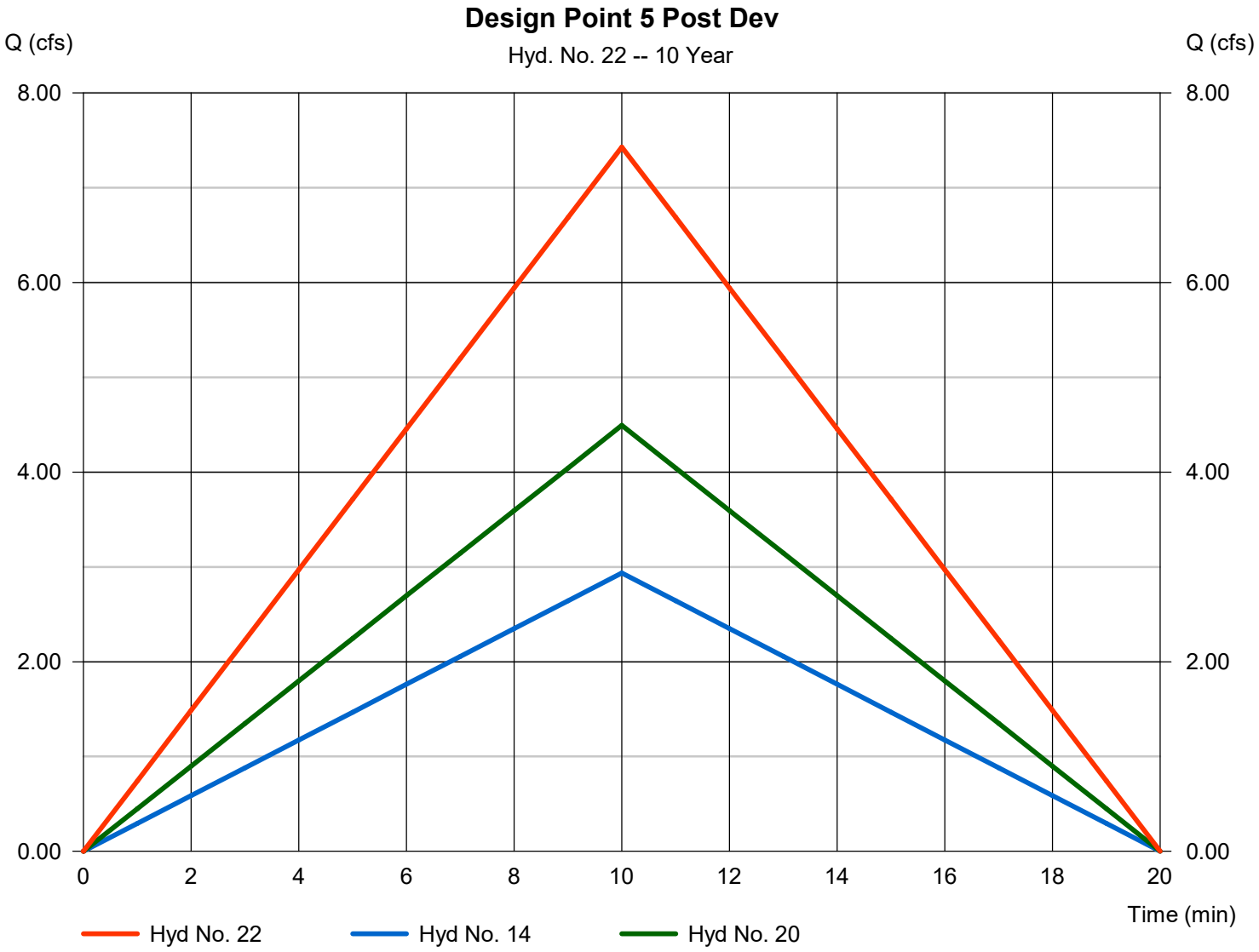


Hydrograph Report

Hyd. No. 22

Design Point 5 Post Dev

Hydrograph type	= Combine	Peak discharge	= 7.429 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 4,458 cuft
Inflow hyds.	= 14, 20	Contrib. drain. area	= 1.410 ac

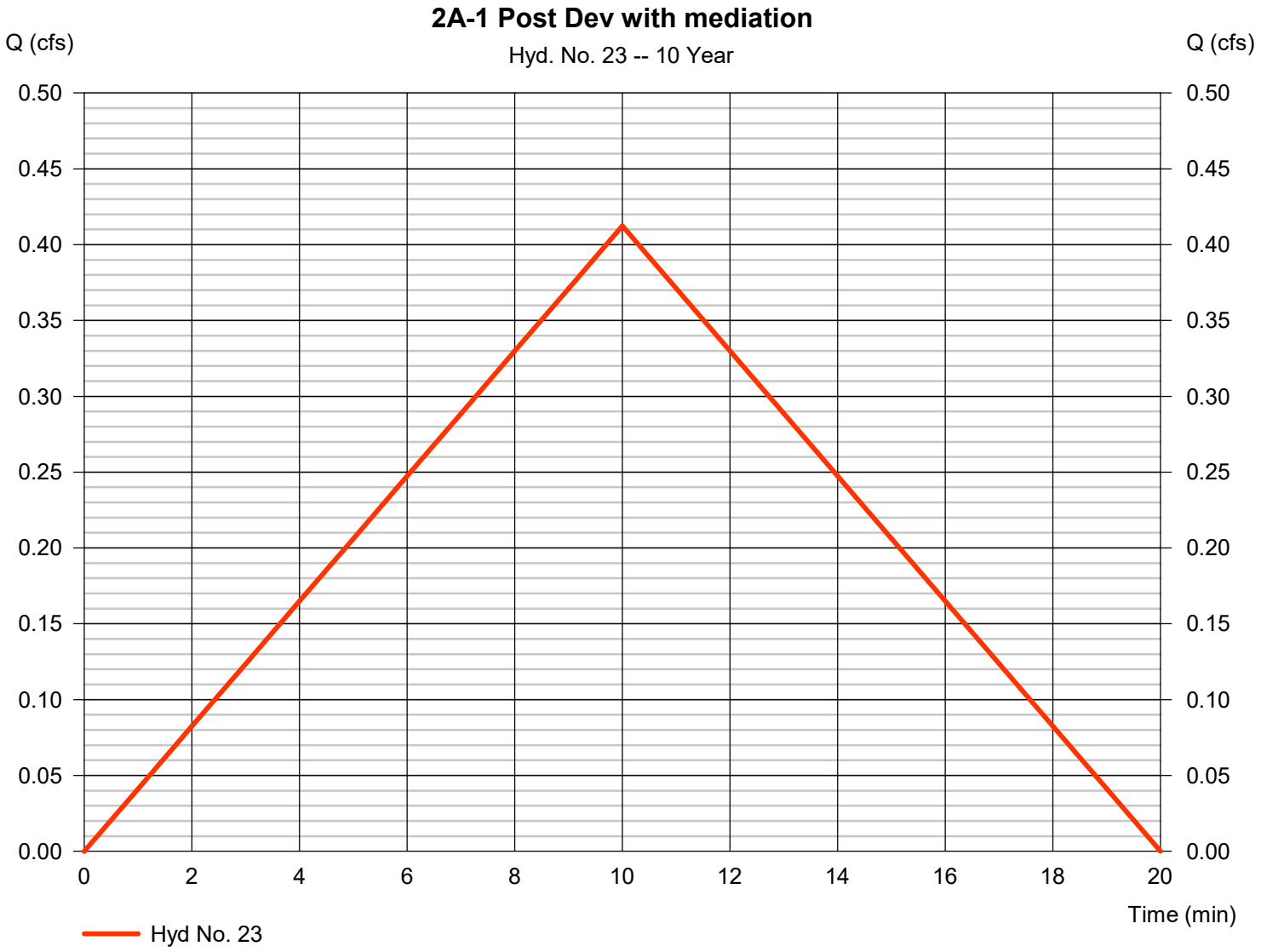


Hydrograph Report

Hyd. No. 23

2A-1 Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.412 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	247 cuft
Drainage area	=	0.180 ac	Runoff coeff.	=	0.55
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

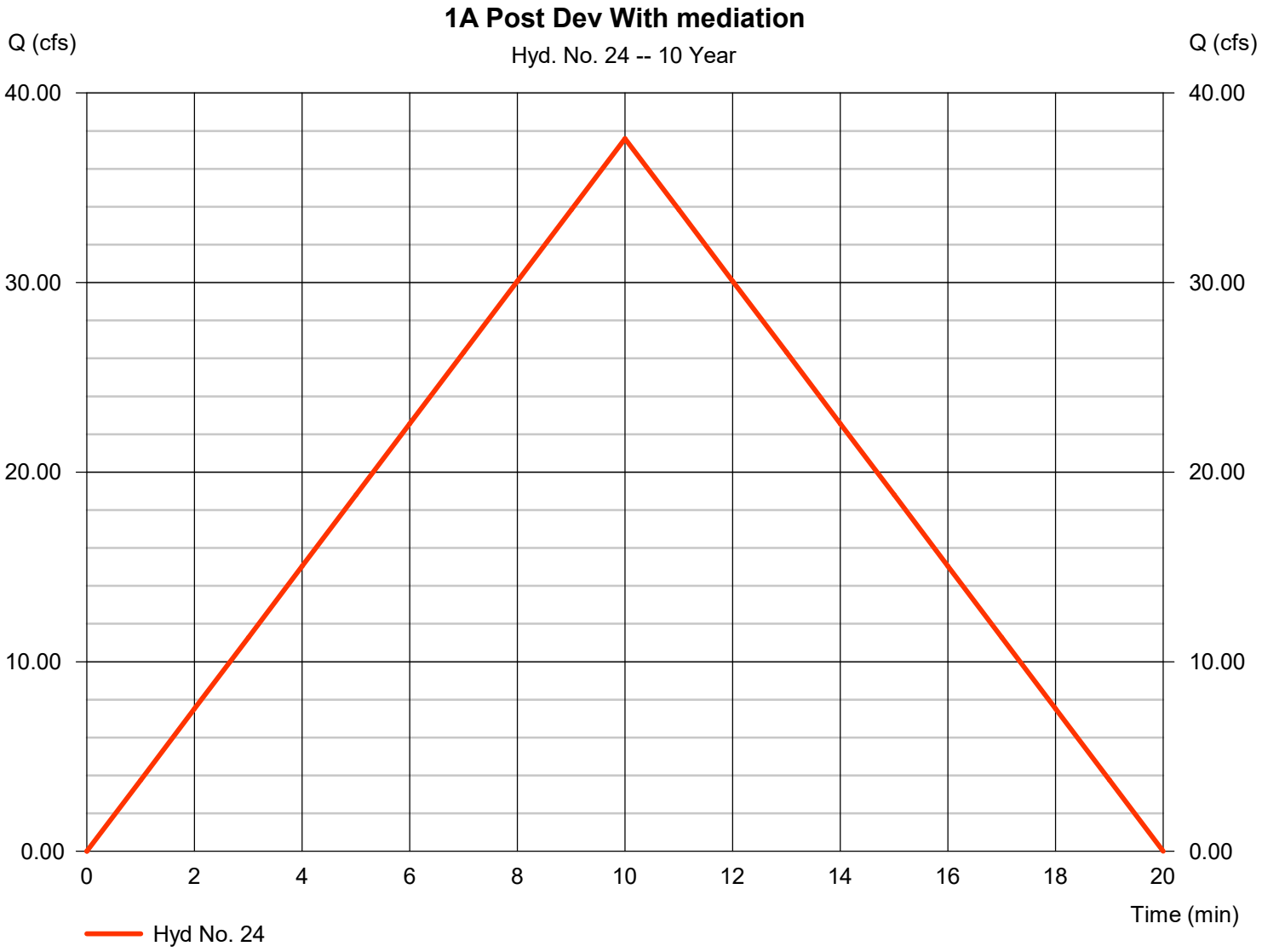


Hydrograph Report

Hyd. No. 24

1A Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	37.60 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	22,558 cuft
Drainage area	=	20.060 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

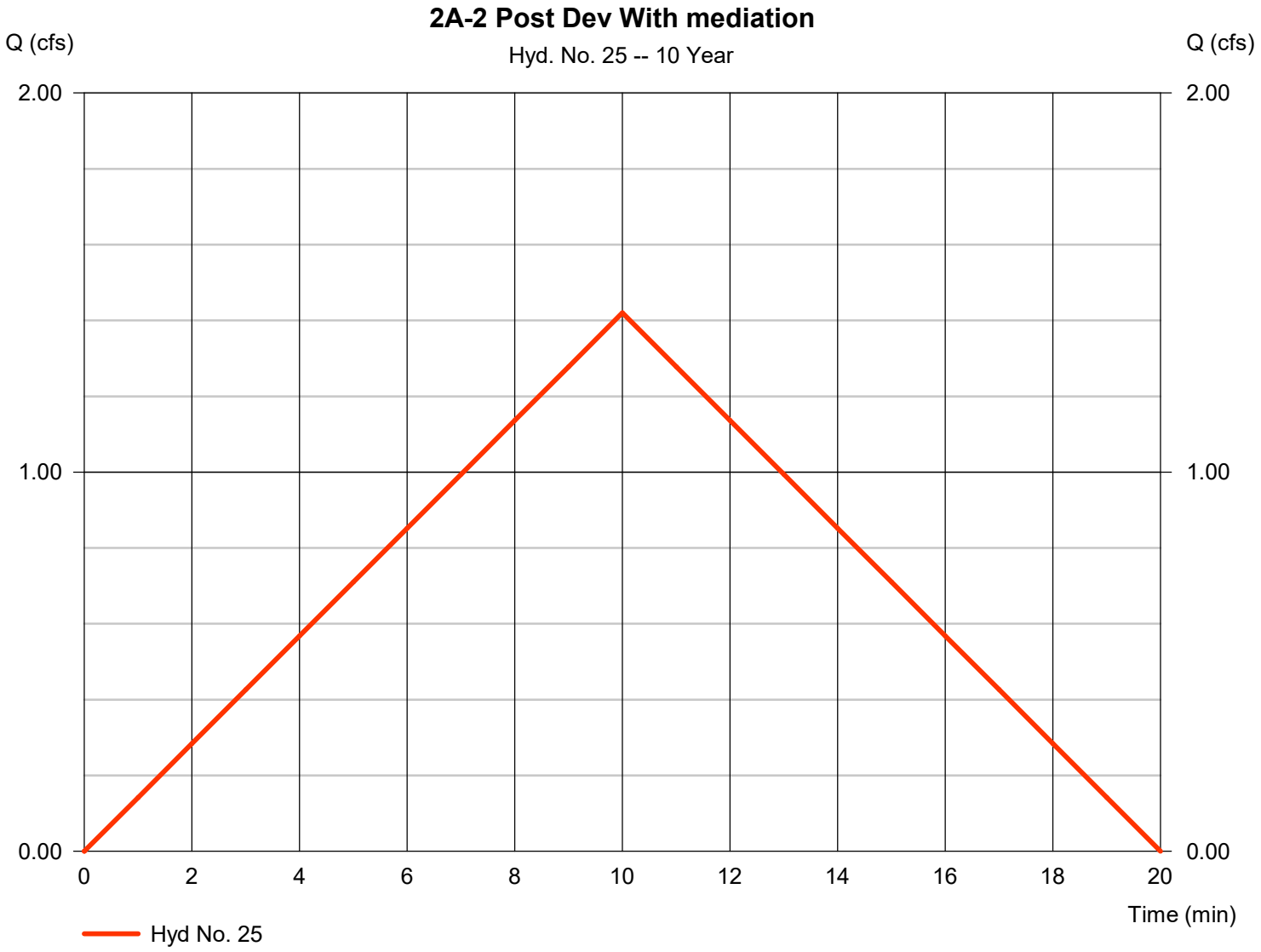


Hydrograph Report

Hyd. No. 25

2A-2 Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	1.420 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	852 cuft
Drainage area	=	0.620 ac	Runoff coeff.	=	0.55
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

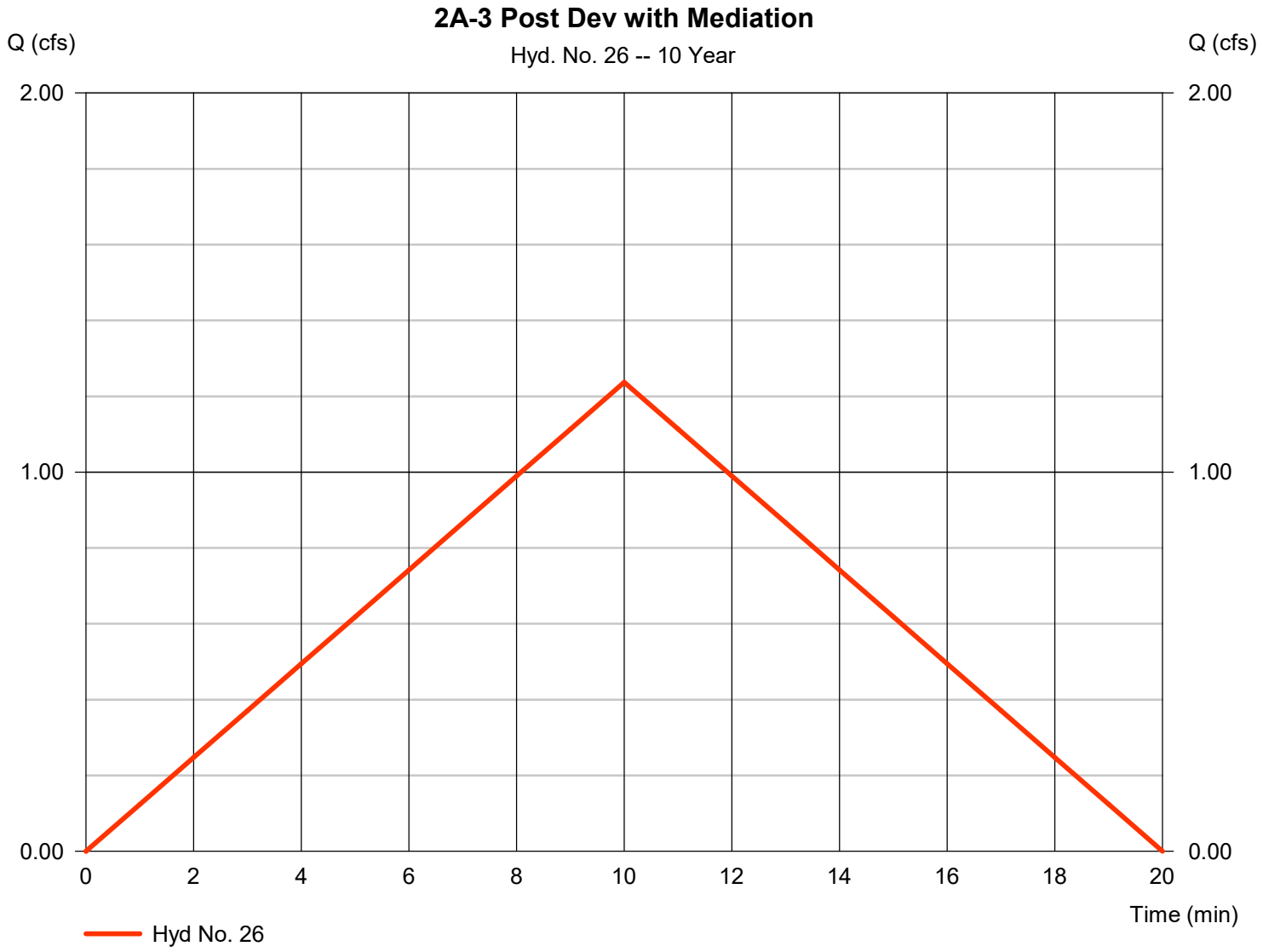


Hydrograph Report

Hyd. No. 26

2A-3 Post Dev with Mediation

Hydrograph type	=	Rational	Peak discharge	=	1.237 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	742 cuft
Drainage area	=	0.540 ac	Runoff coeff.	=	0.55
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



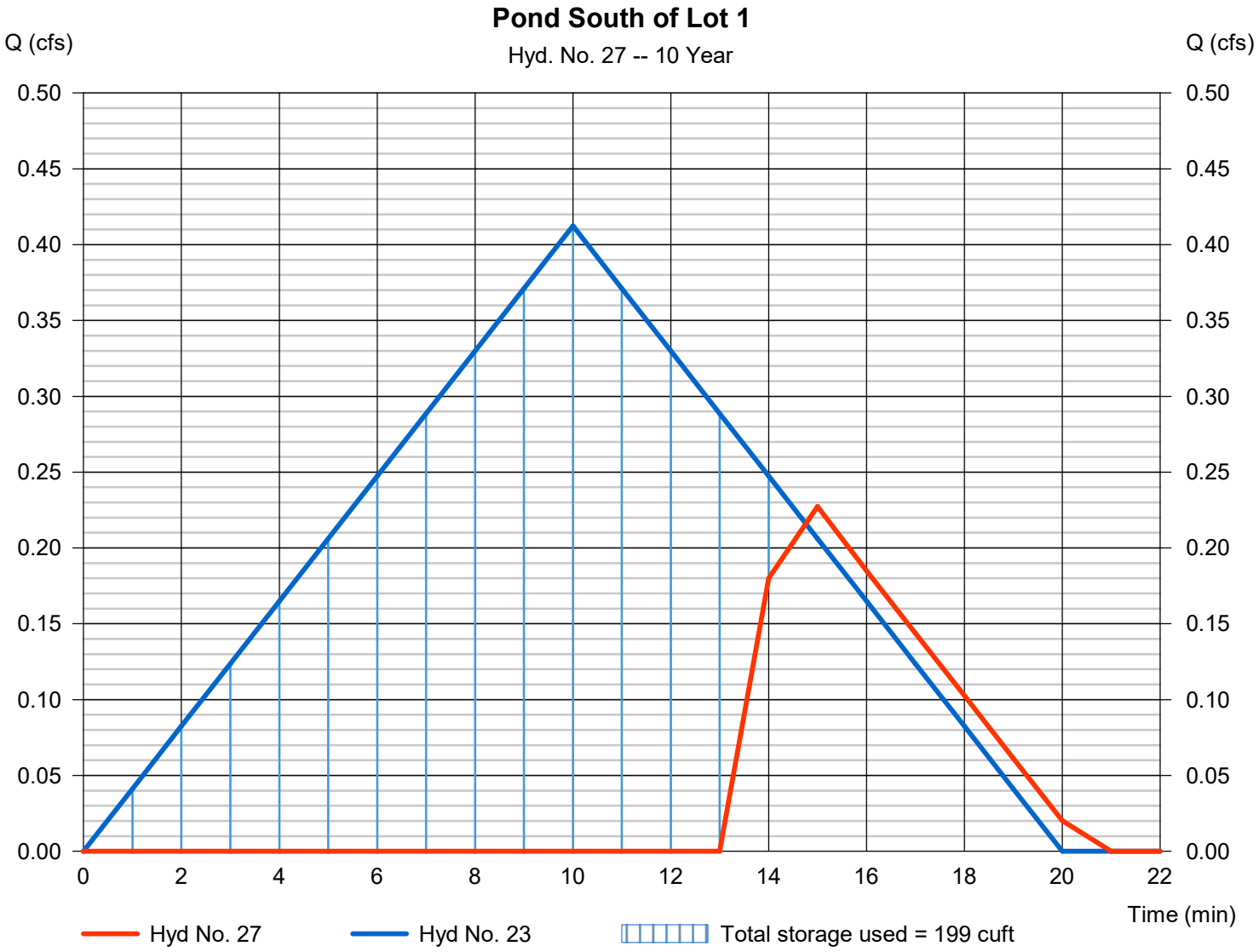
Hydrograph Report

Hyd. No. 27

Pond South of Lot 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.227 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	55 cuft
Inflow hyd. No.	=	23 - 2A-1 Post Dev with mediation	Max. Elevation	=	100.83 ft
Reservoir name	=	Pond on South of Lot 1	Max. Storage	=	199 cuft

Storage Indication method used.



Hydrograph Report

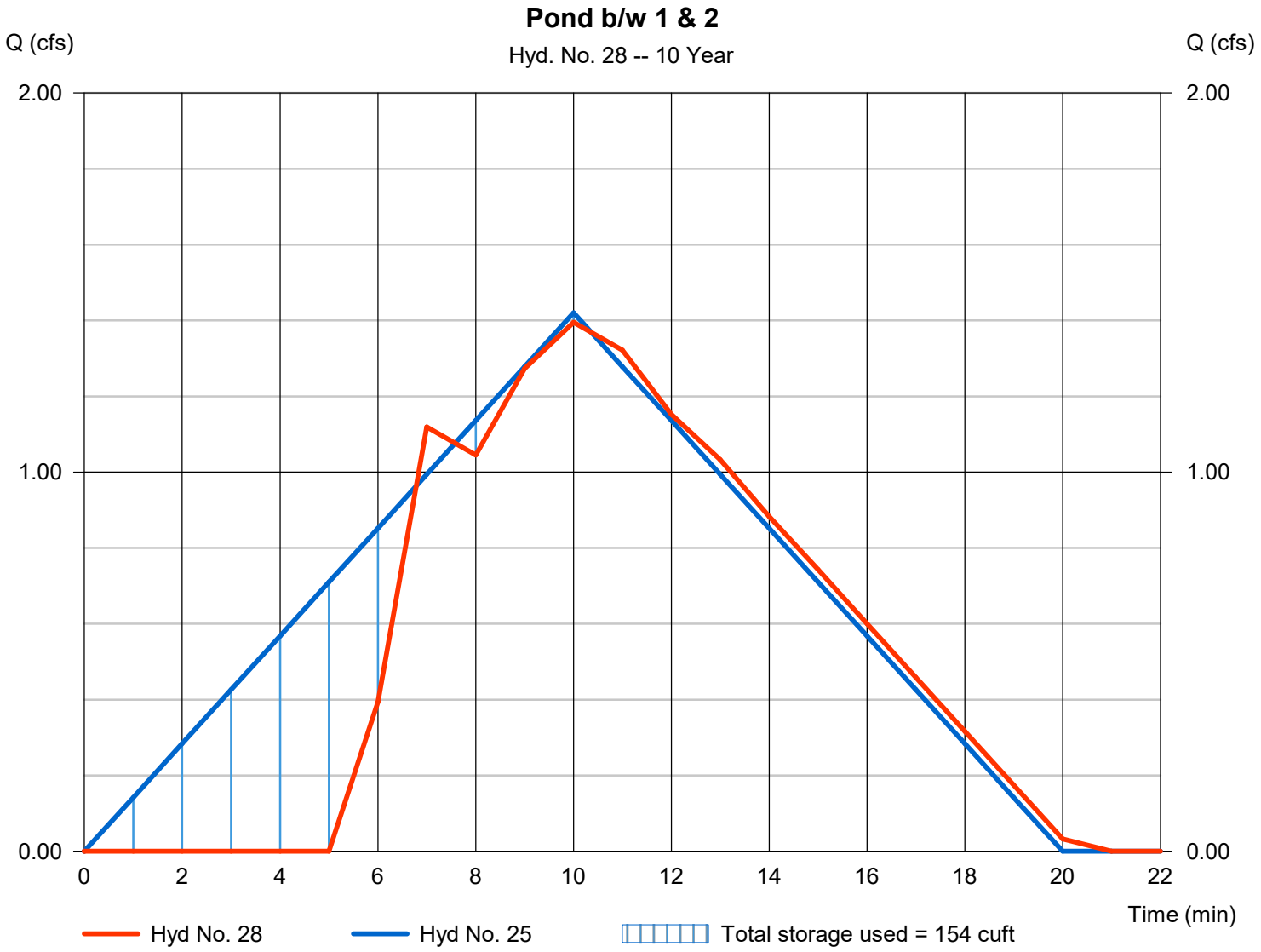
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 28

Pond b/w 1 & 2

Hydrograph type	=	Reservoir	Peak discharge	=	1.395 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	717 cuft
Inflow hyd. No.	=	25 - 2A-2 Post Dev With median	Max. Elevation	=	100.91 ft
Reservoir name	=	Pond B/w 1&2	Max. Storage	=	154 cuft

Storage Indication method used.



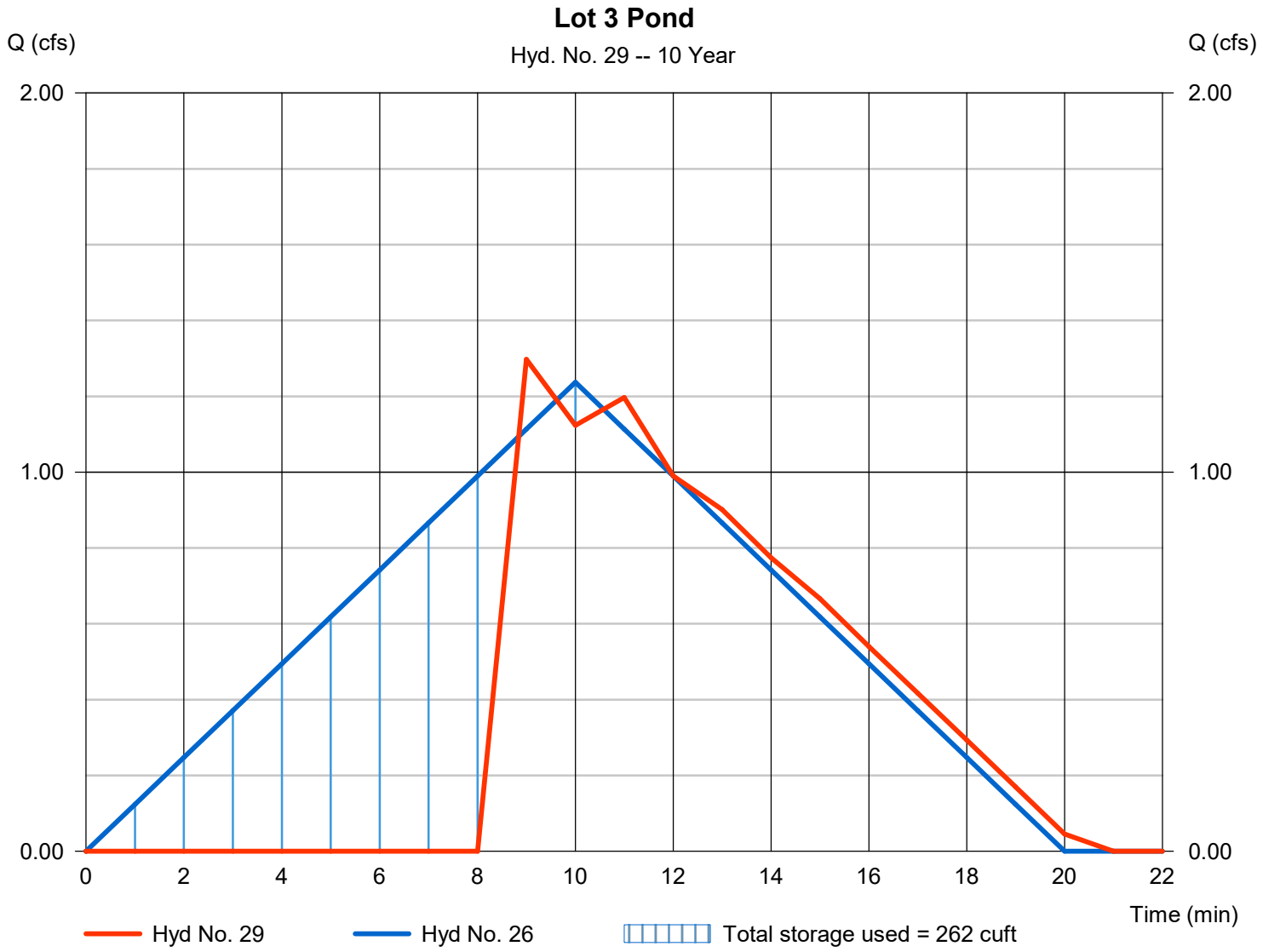
Hydrograph Report

Hyd. No. 29

Lot 3 Pond

Hydrograph type	=	Reservoir	Peak discharge	=	1.297 cfs
Storm frequency	=	10 yrs	Time to peak	=	9 min
Time interval	=	1 min	Hyd. volume	=	505 cuft
Inflow hyd. No.	=	26 - 2A-3 Post Dev with Mediation	Max. Elevation	=	101.93 ft
Reservoir name	=	Lot 3 Pond	Max. Storage	=	262 cuft

Storage Indication method used.

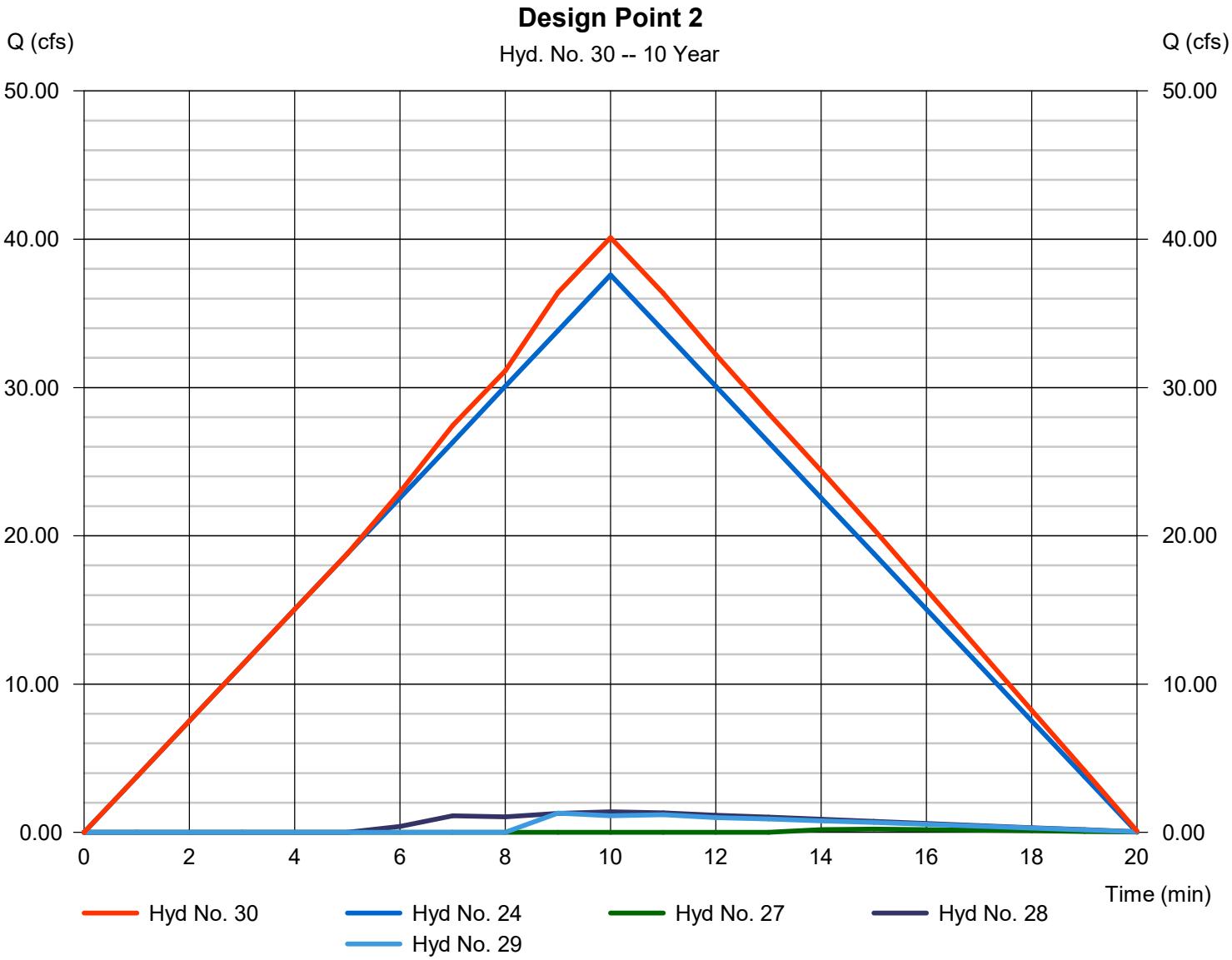


Hydrograph Report

Hyd. No. 30

Design Point 2

Hydrograph type	= Combine	Peak discharge	= 40.11 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 23,834 cuft
Inflow hyds.	= 24, 27, 28, 29	Contrib. drain. area	= 20.060 ac

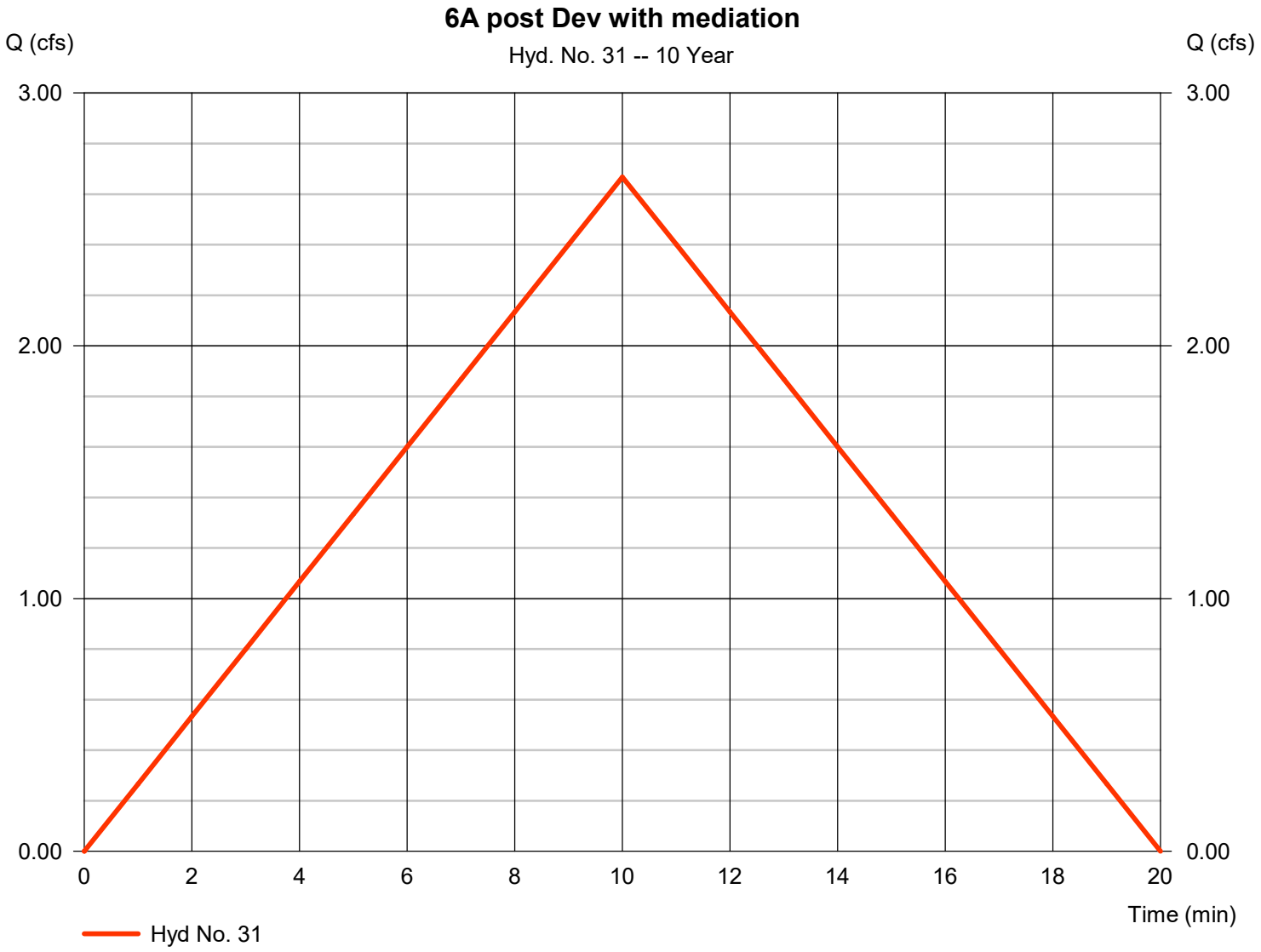


Hydrograph Report

Hyd. No. 31

6A post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	2.668 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,601 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

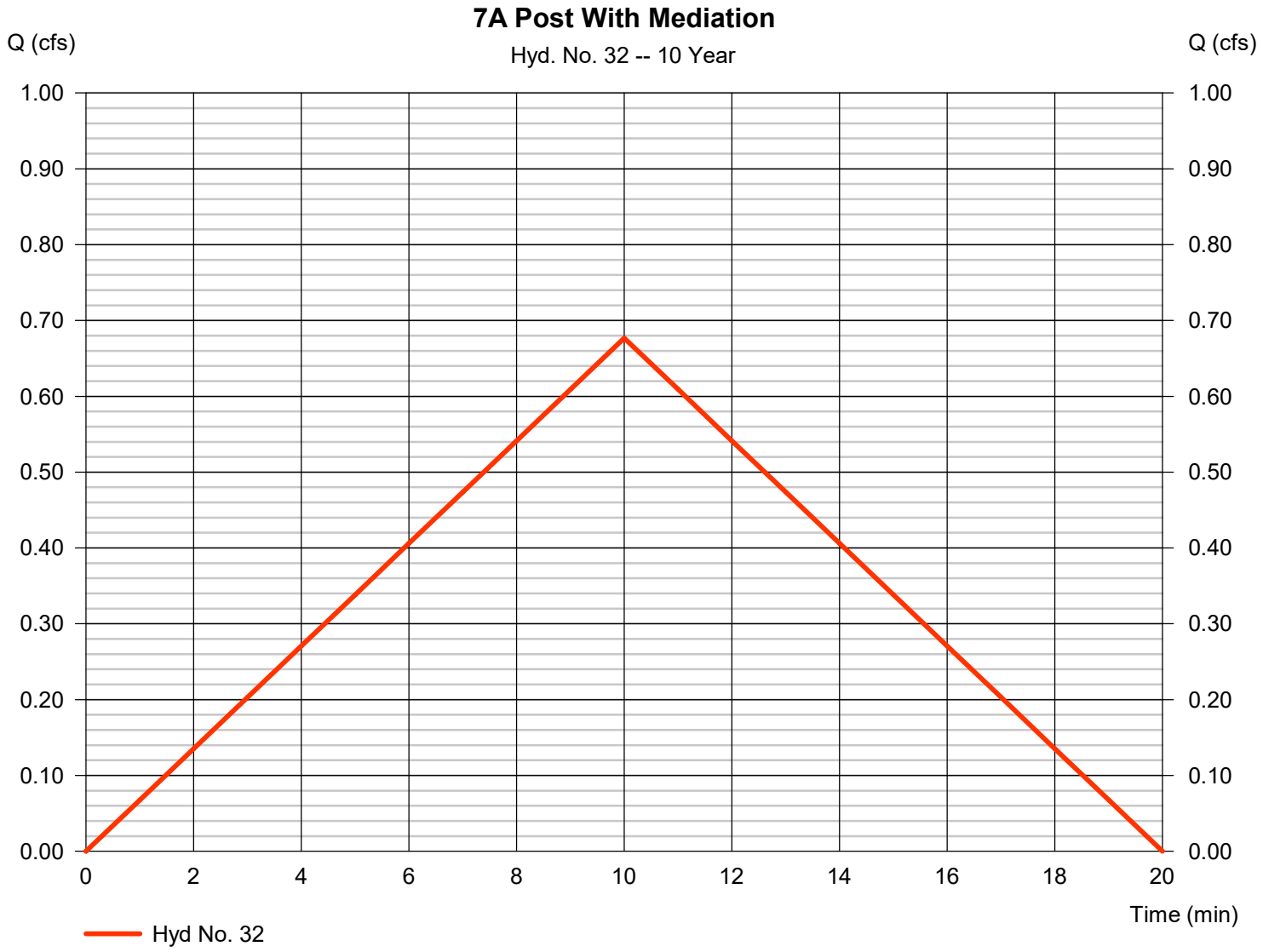


Hydrograph Report

Hyd. No. 32

7A Post With Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.677 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	406 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

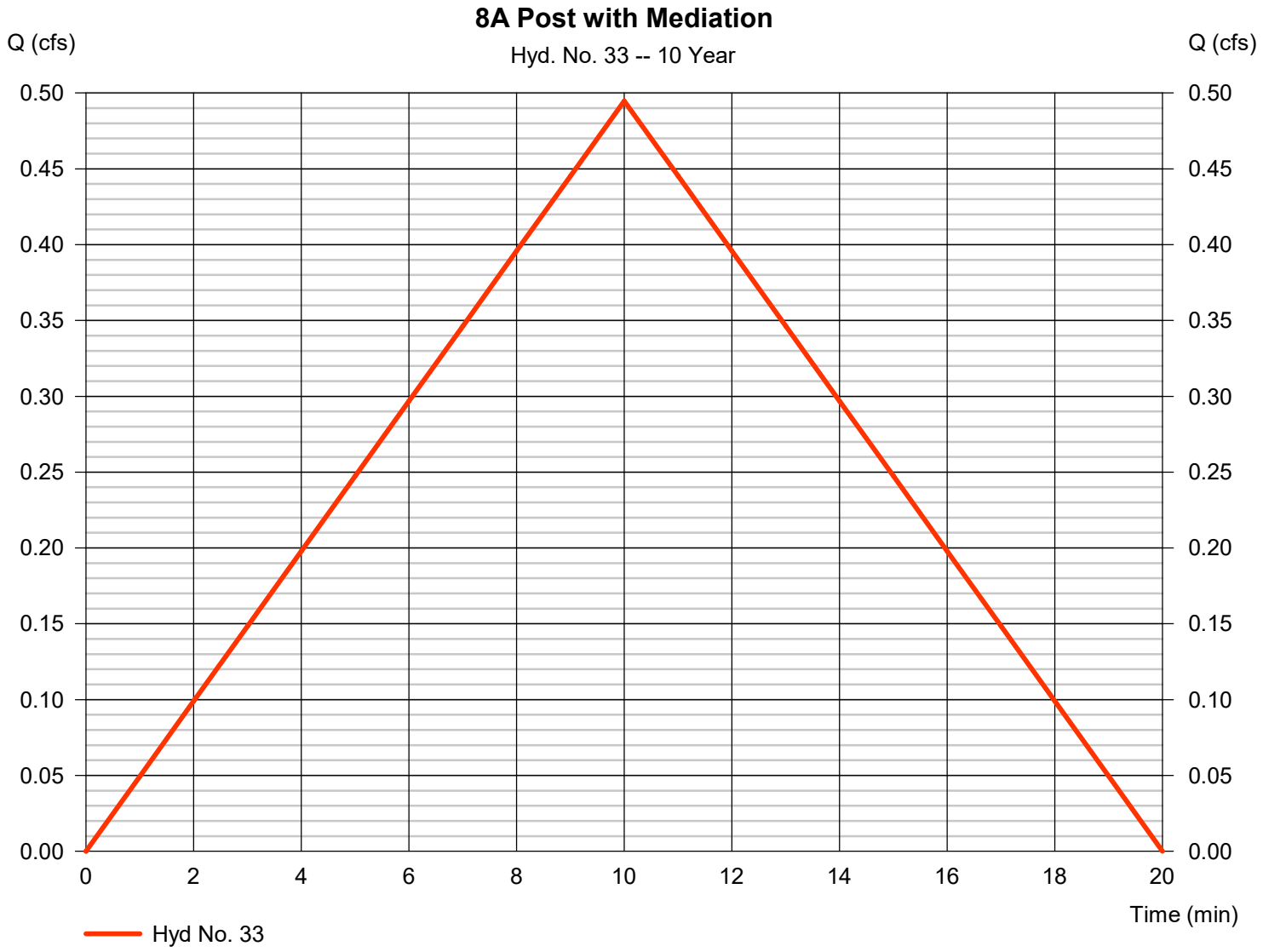


Hydrograph Report

Hyd. No. 33

8A Post with Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.495 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	297 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



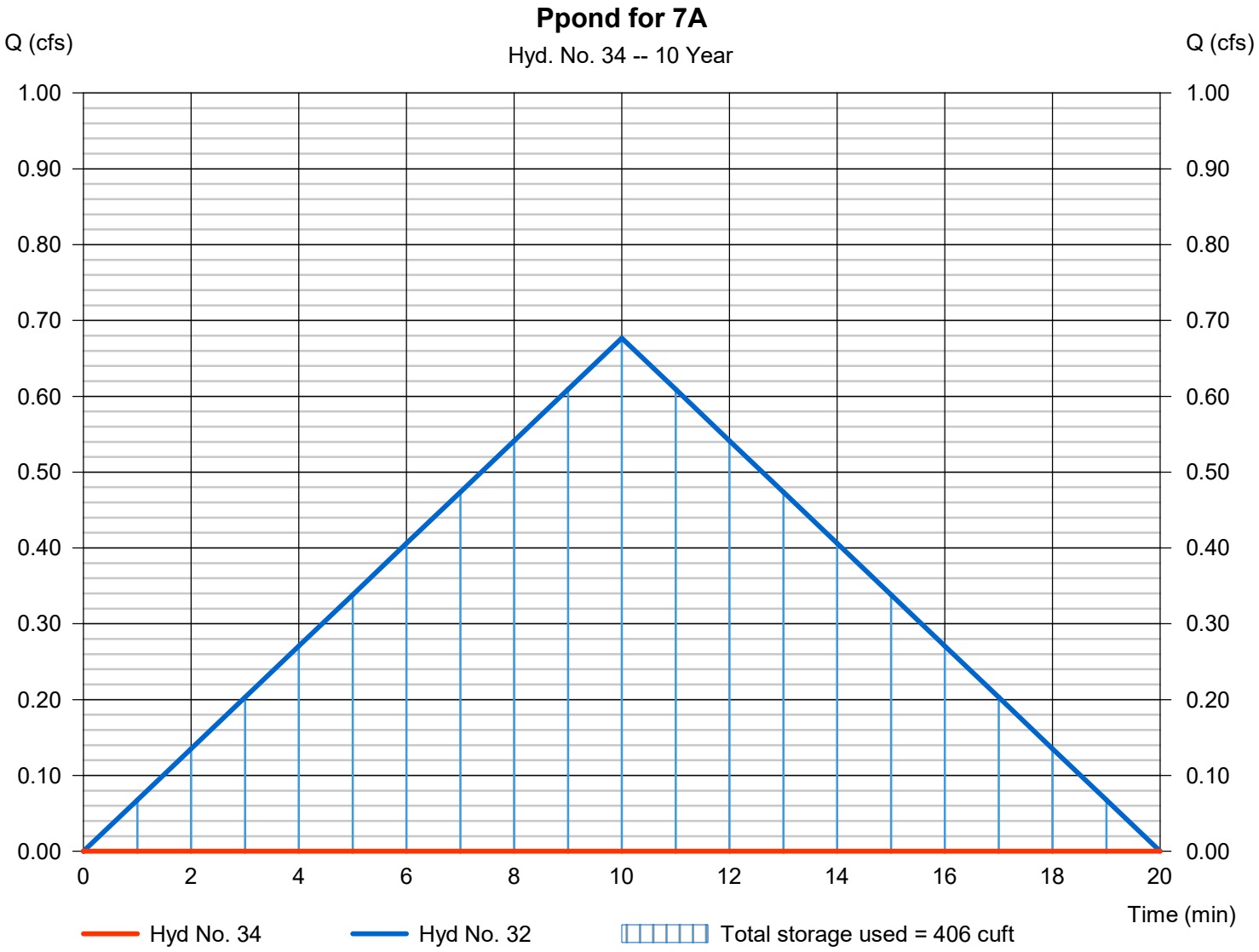
Hydrograph Report

Hyd. No. 34

Ppond for 7A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	32 - 7A Post With Mediation	Max. Elevation	=	101.12 ft
Reservoir name	=	Pond for 7A	Max. Storage	=	406 cuft

Storage Indication method used.



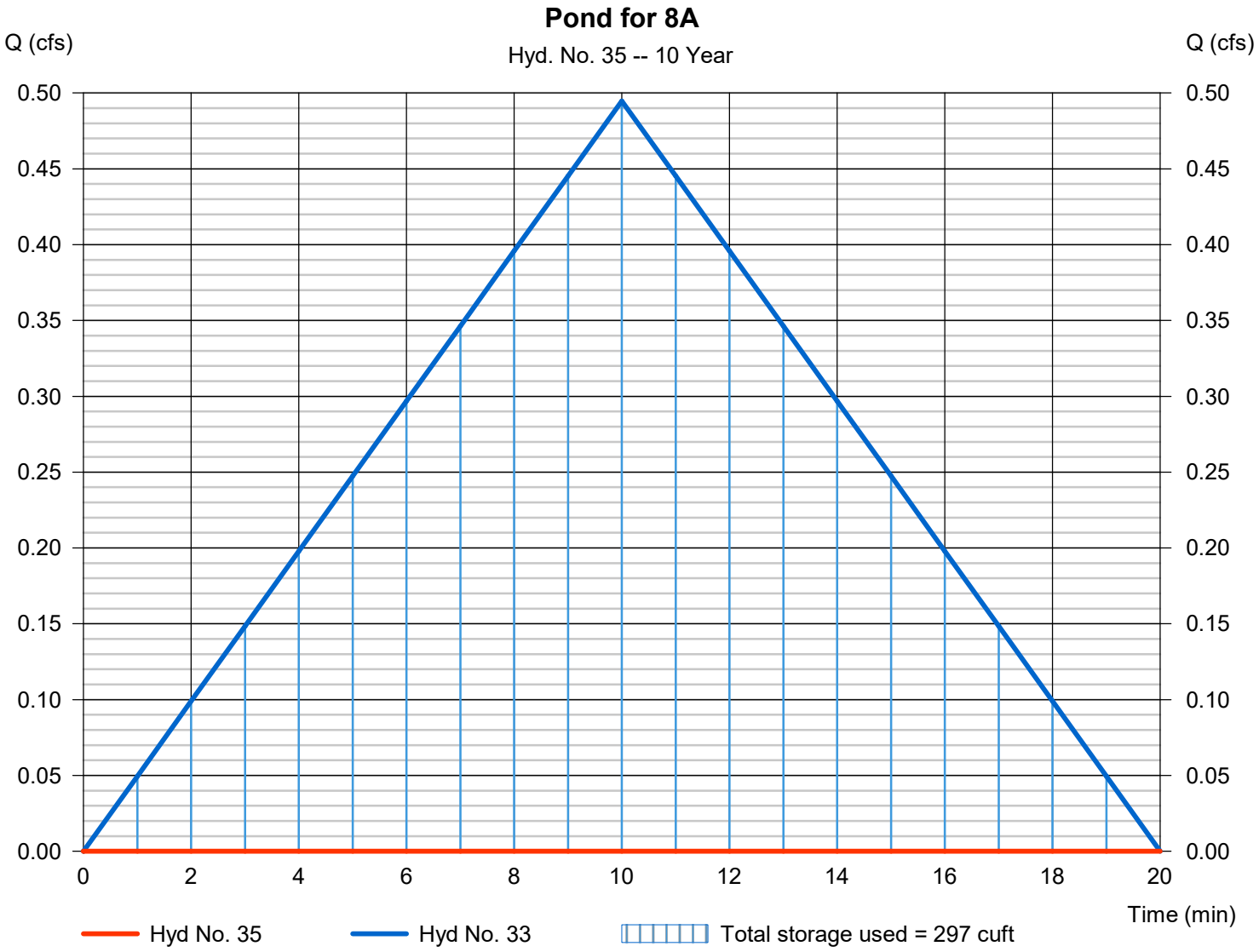
Hydrograph Report

Hyd. No. 35

Pond for 8A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	33 - 8A Post with Mediation	Max. Elevation	=	101.43 ft
Reservoir name	=	Pond for 8A	Max. Storage	=	297 cuft

Storage Indication method used.



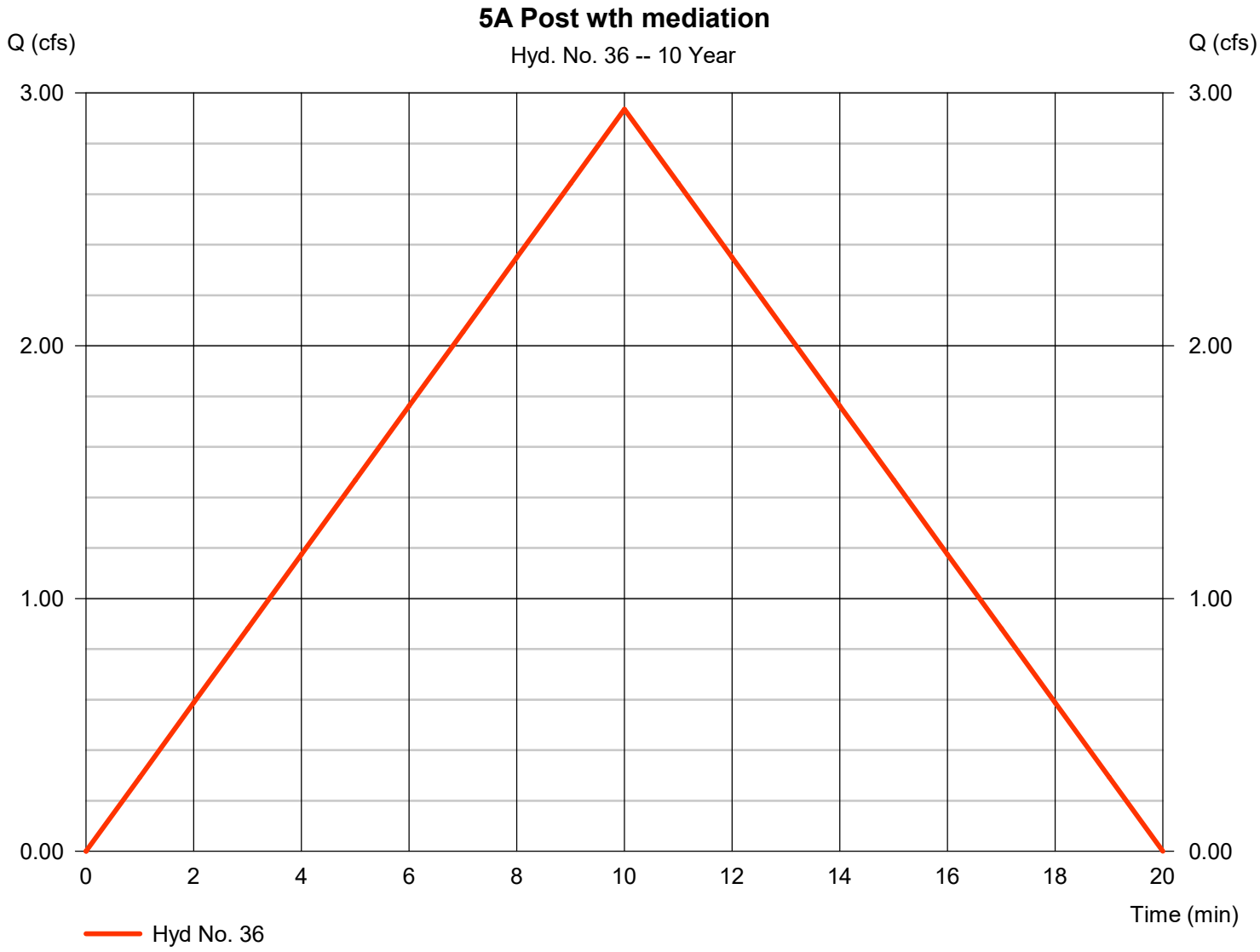
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 36

5A Post wth mediation

Hydrograph type	=	Rational	Peak discharge	=	2.936 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,762 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

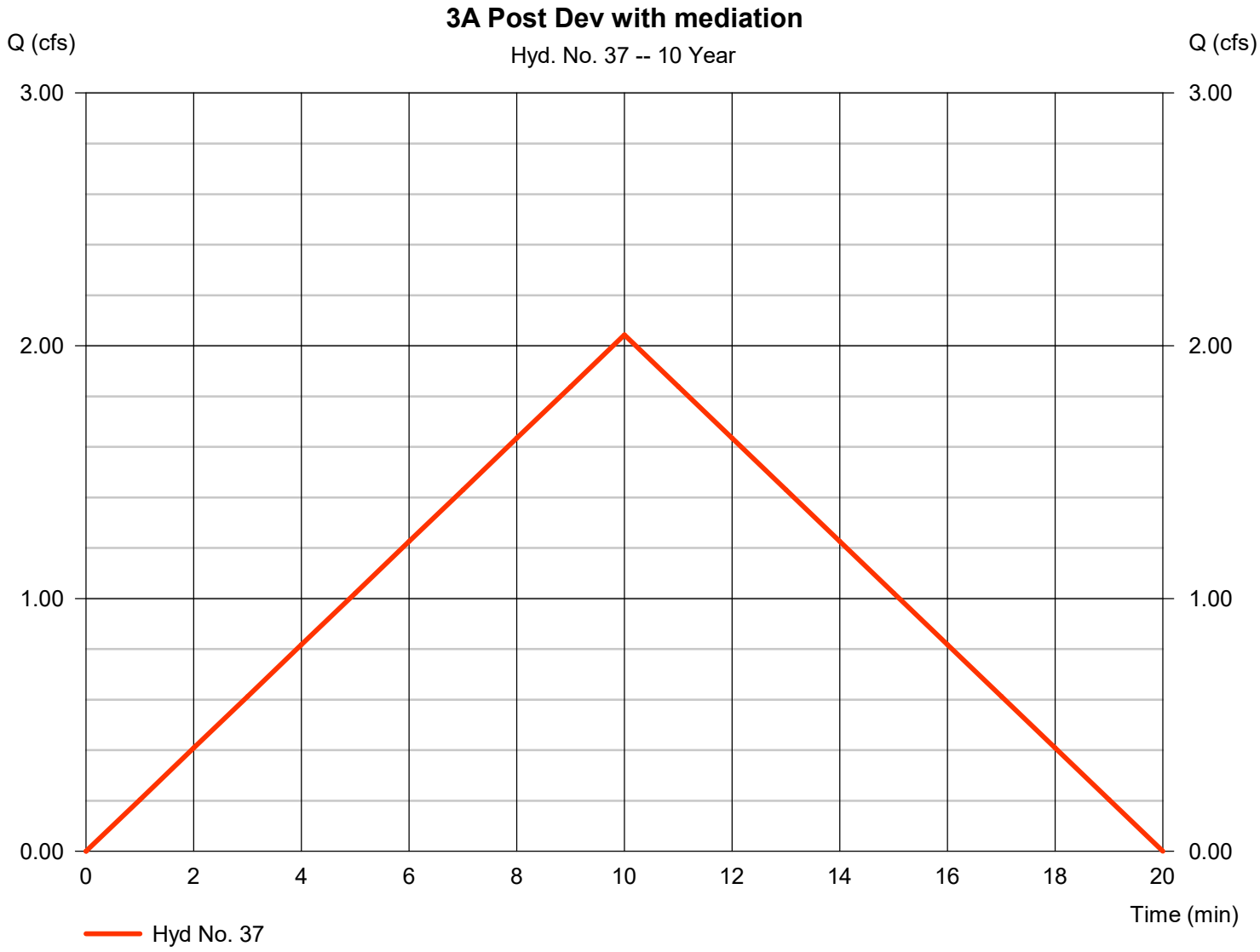


Hydrograph Report

Hyd. No. 37

3A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	2.043 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,226 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

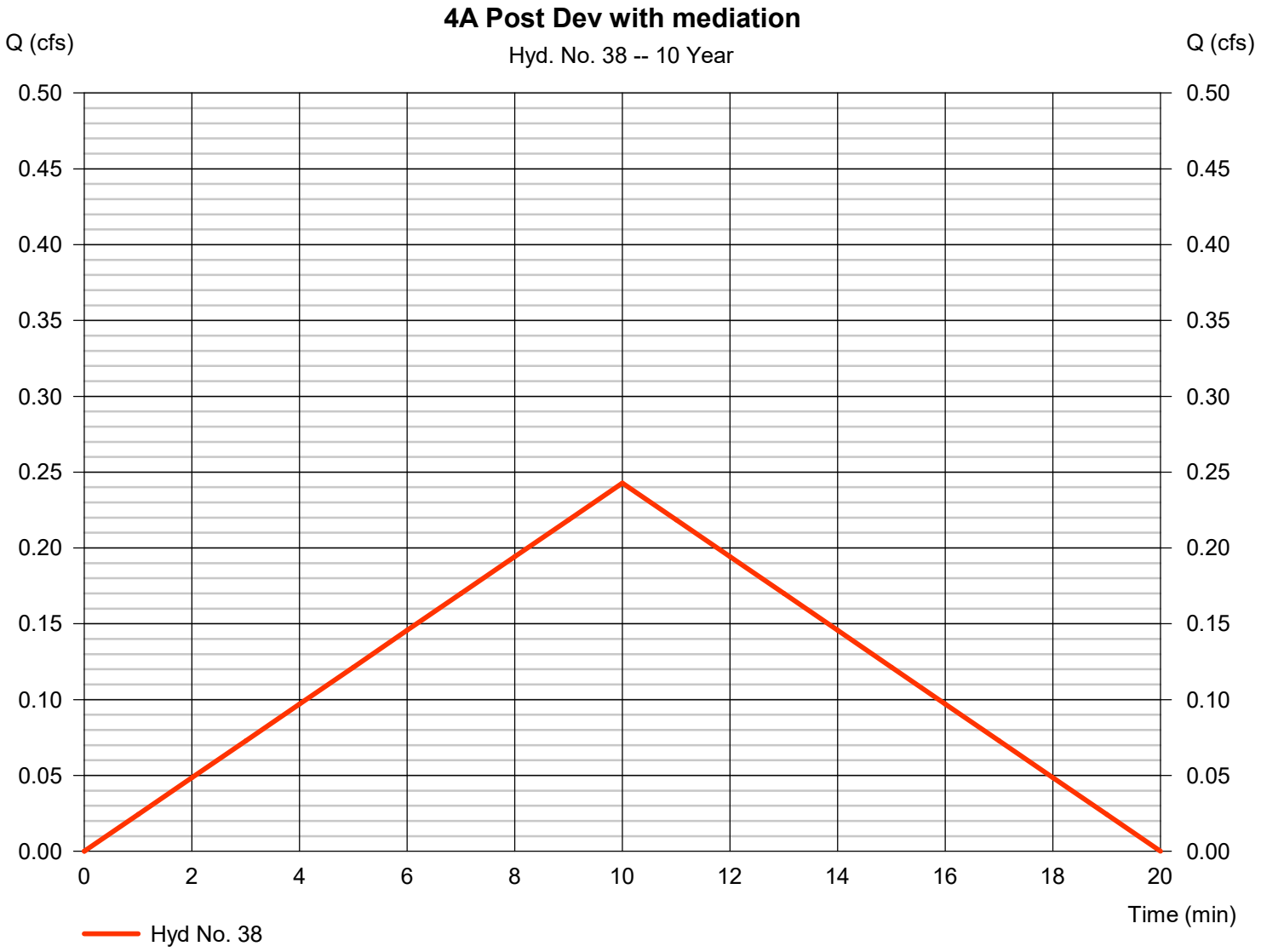


Hydrograph Report

Hyd. No. 38

4A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.243 cfs
Storm frequency	=	10 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	146 cuft
Drainage area	=	0.110 ac	Runoff coeff.	=	0.53
Intensity	=	4.165 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

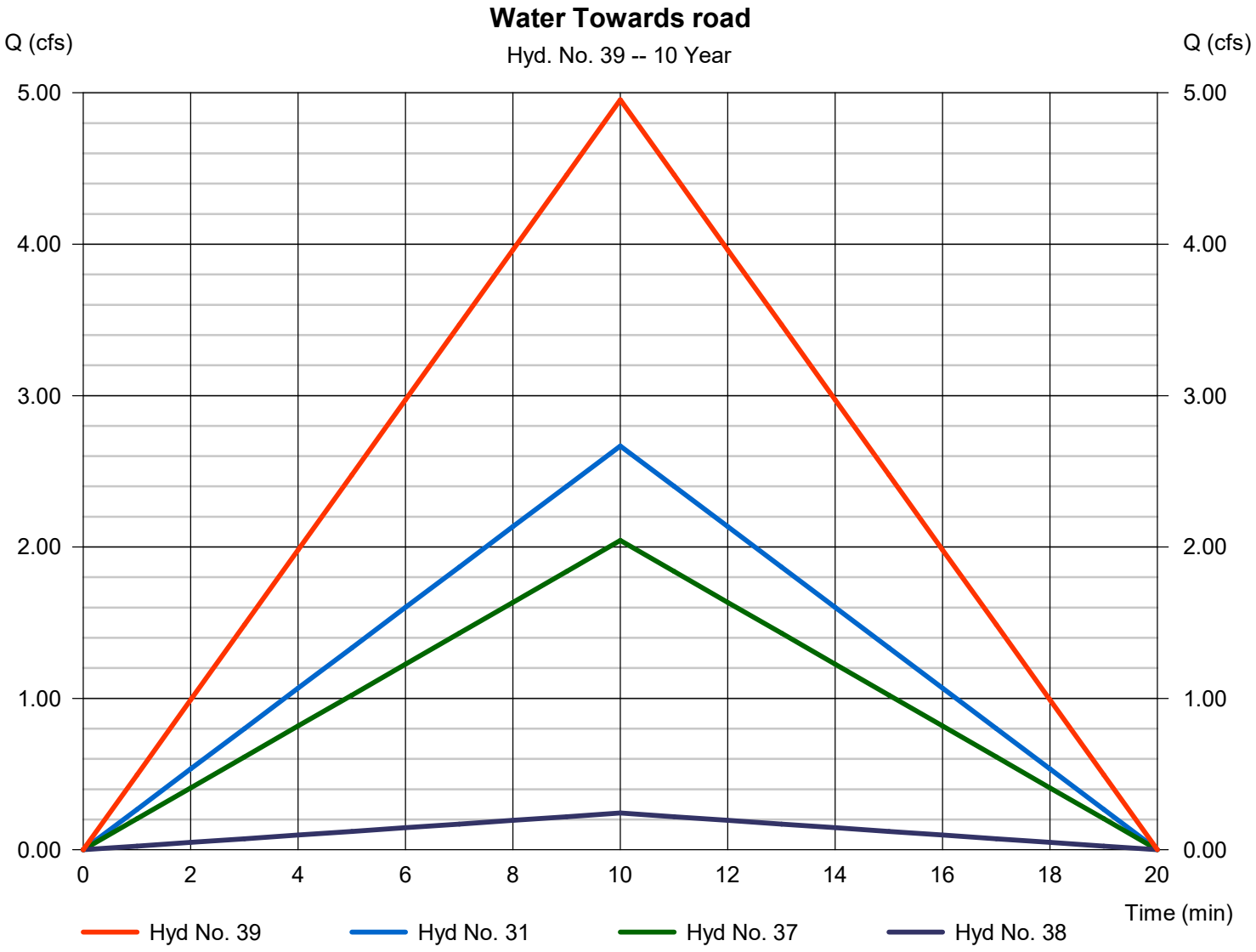


Hydrograph Report

Hyd. No. 39

Water Towards road

Hydrograph type	= Combine	Peak discharge	= 4.953 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 2,972 cuft
Inflow hyds.	= 31, 37, 38	Contrib. drain. area	= 2.250 ac



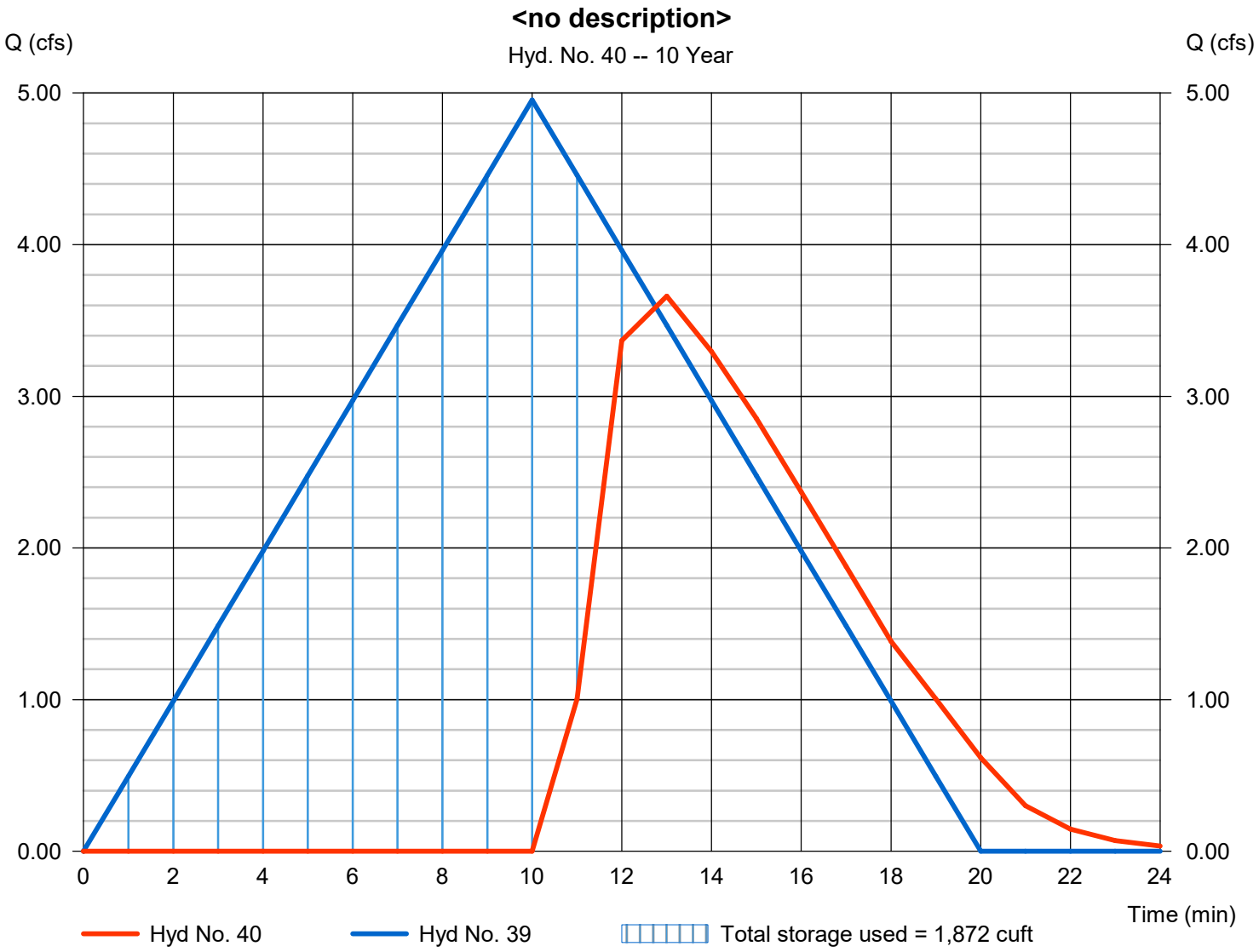
Hydrograph Report

Hyd. No. 40

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	3.661 cfs
Storm frequency	=	10 yrs	Time to peak	=	13 min
Time interval	=	1 min	Hyd. volume	=	1,321 cuft
Inflow hyd. No.	=	39 - Water Towards road	Max. Elevation	=	102.71 ft
Reservoir name	=	Lot 4 Pond	Max. Storage	=	1,872 cuft

Storage Indication method used.

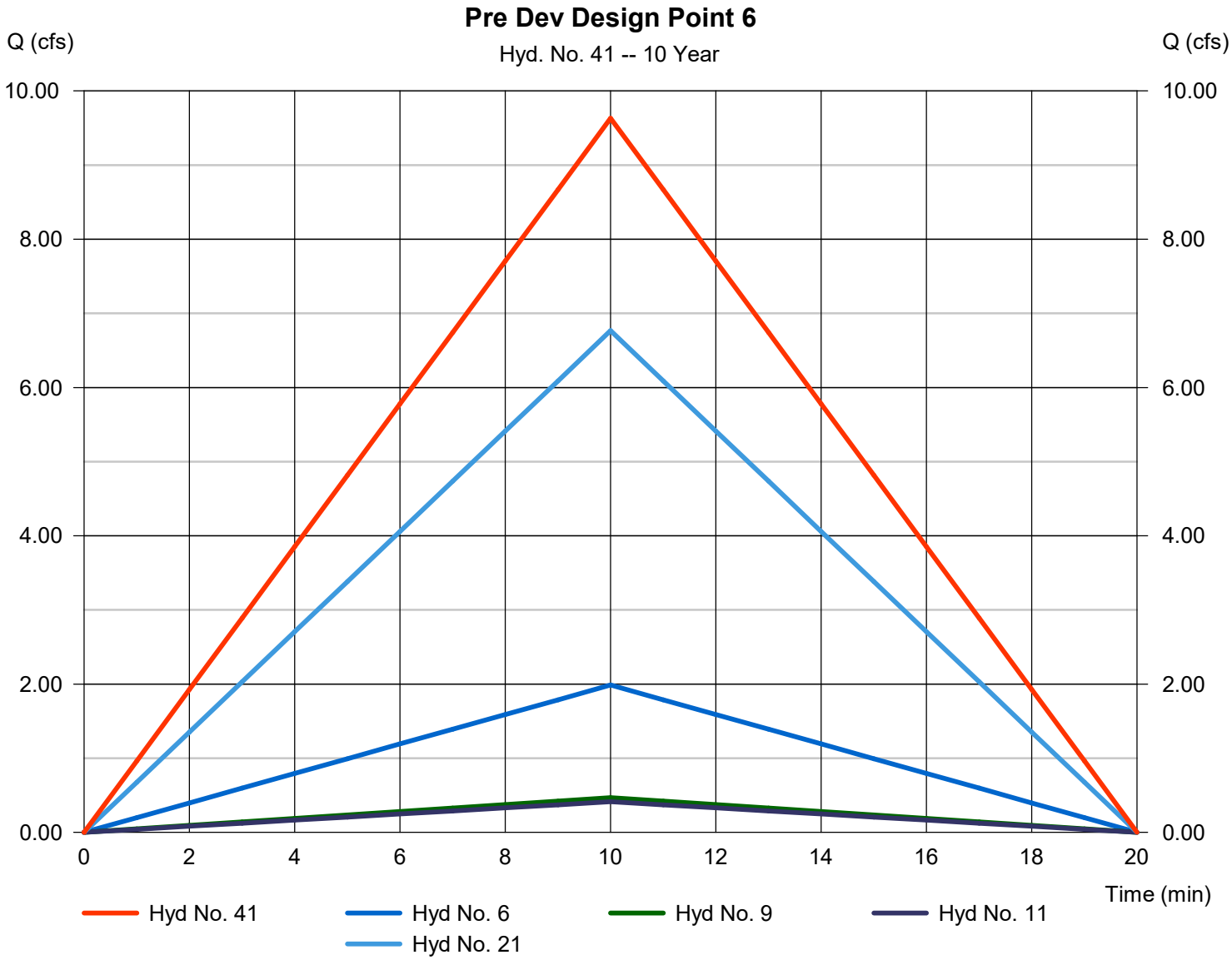


Hydrograph Report

Hyd. No. 41

Pre Dev Design Point 6

Hydrograph type	= Combine	Peak discharge	= 9.633 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 5,780 cuft
Inflow hyds.	= 6, 9, 11, 21	Contrib. drain. area	= 1.530 ac



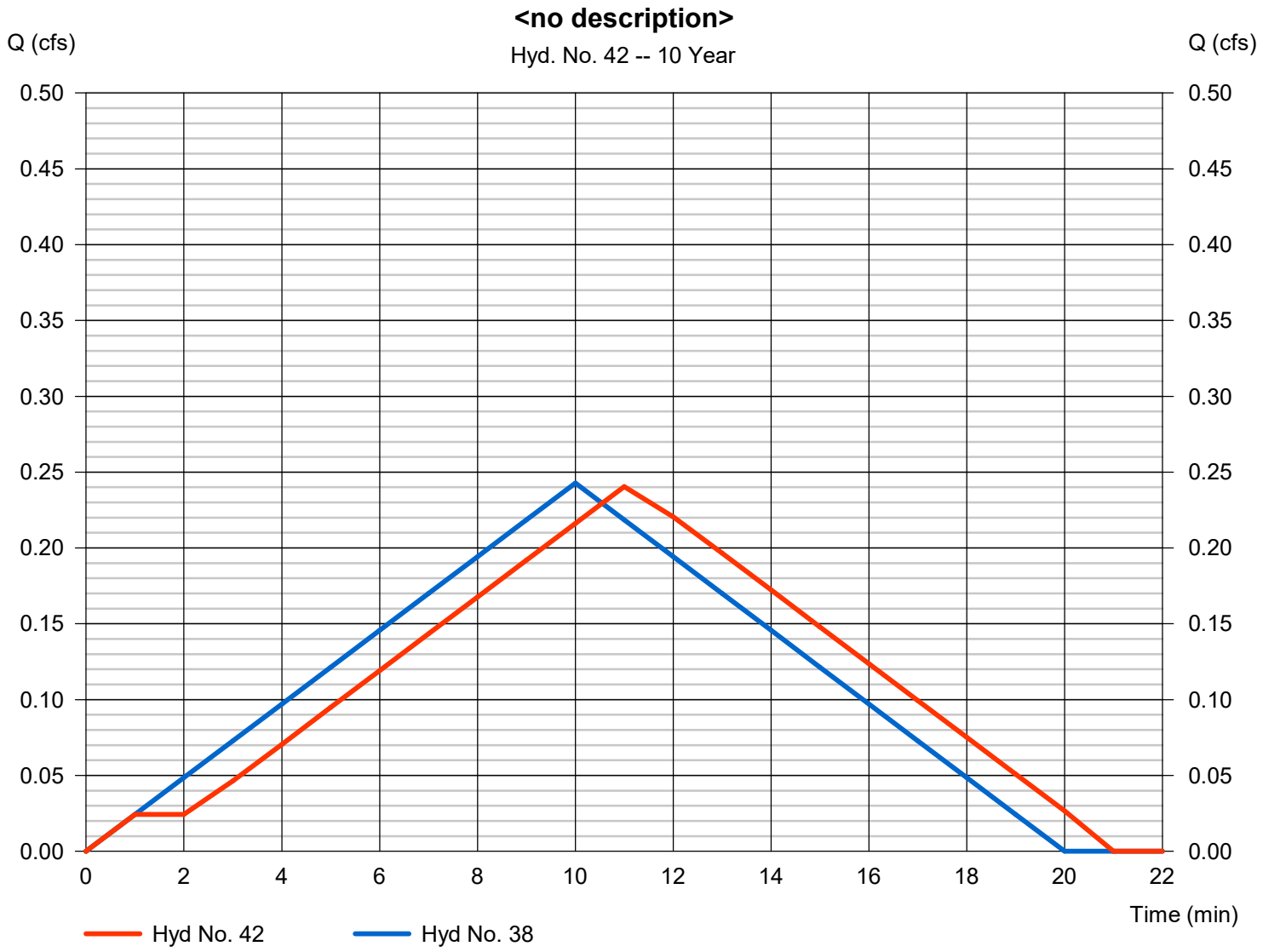
Hydrograph Report

Hyd. No. 42

<no description>

Hydrograph type	=	Reach	Peak discharge	=	0.241 cfs
Storm frequency	=	10 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	147 cuft
Inflow hyd. No.	=	38 - 4A Post Dev with mediation	Section type	=	Triangular
Reach length	=	140.0 ft	Channel slope	=	28.0 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	6.3:1	Max. depth	=	0.0 ft
Rating curve x	=	6.755	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.9133

Modified Att-Kin routing method used.

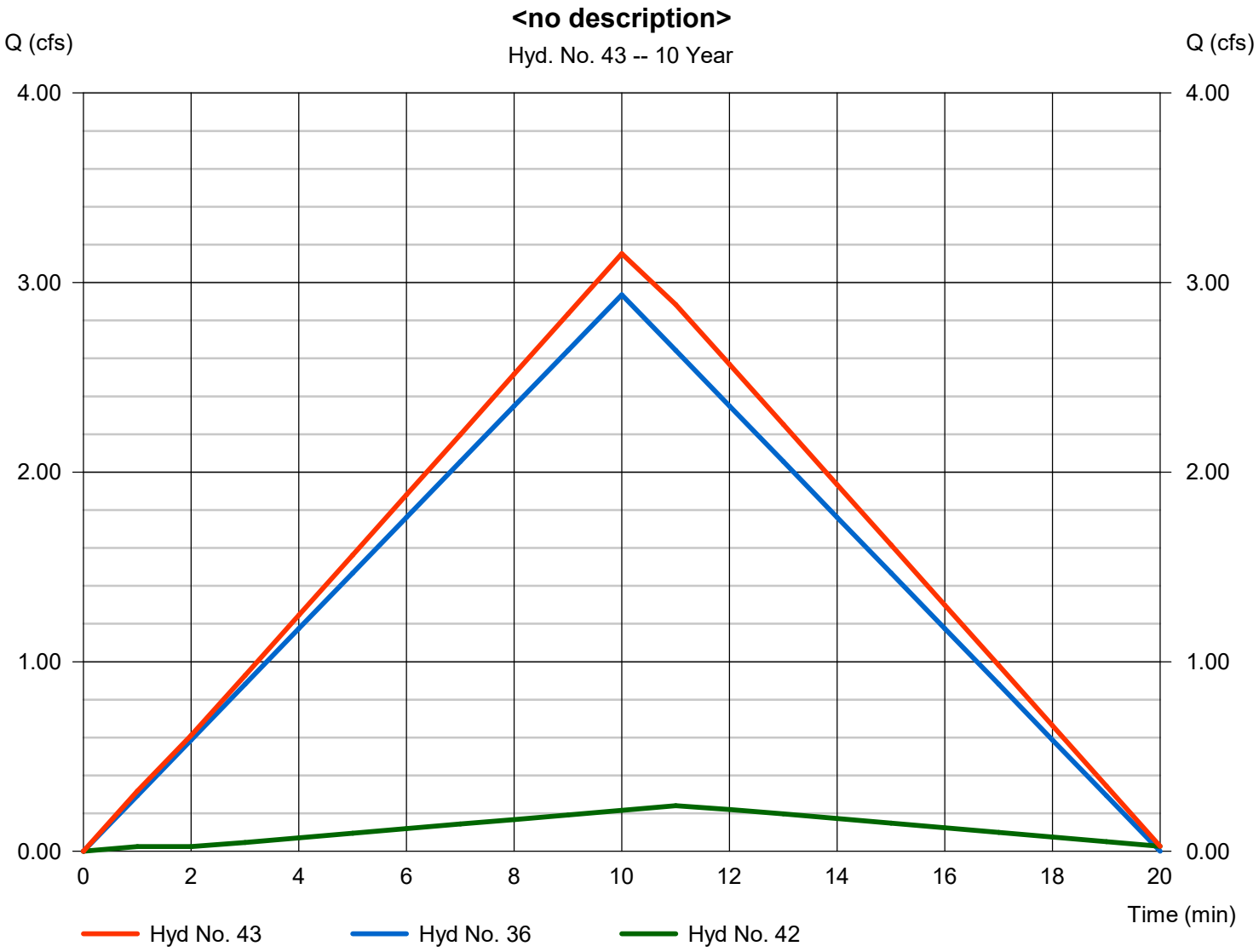


Hydrograph Report

Hyd. No. 43

<no description>

Hydrograph type	= Combine	Peak discharge	= 3.152 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 1,909 cuft
Inflow hyds.	= 36, 42	Contrib. drain. area	= 1.410 ac



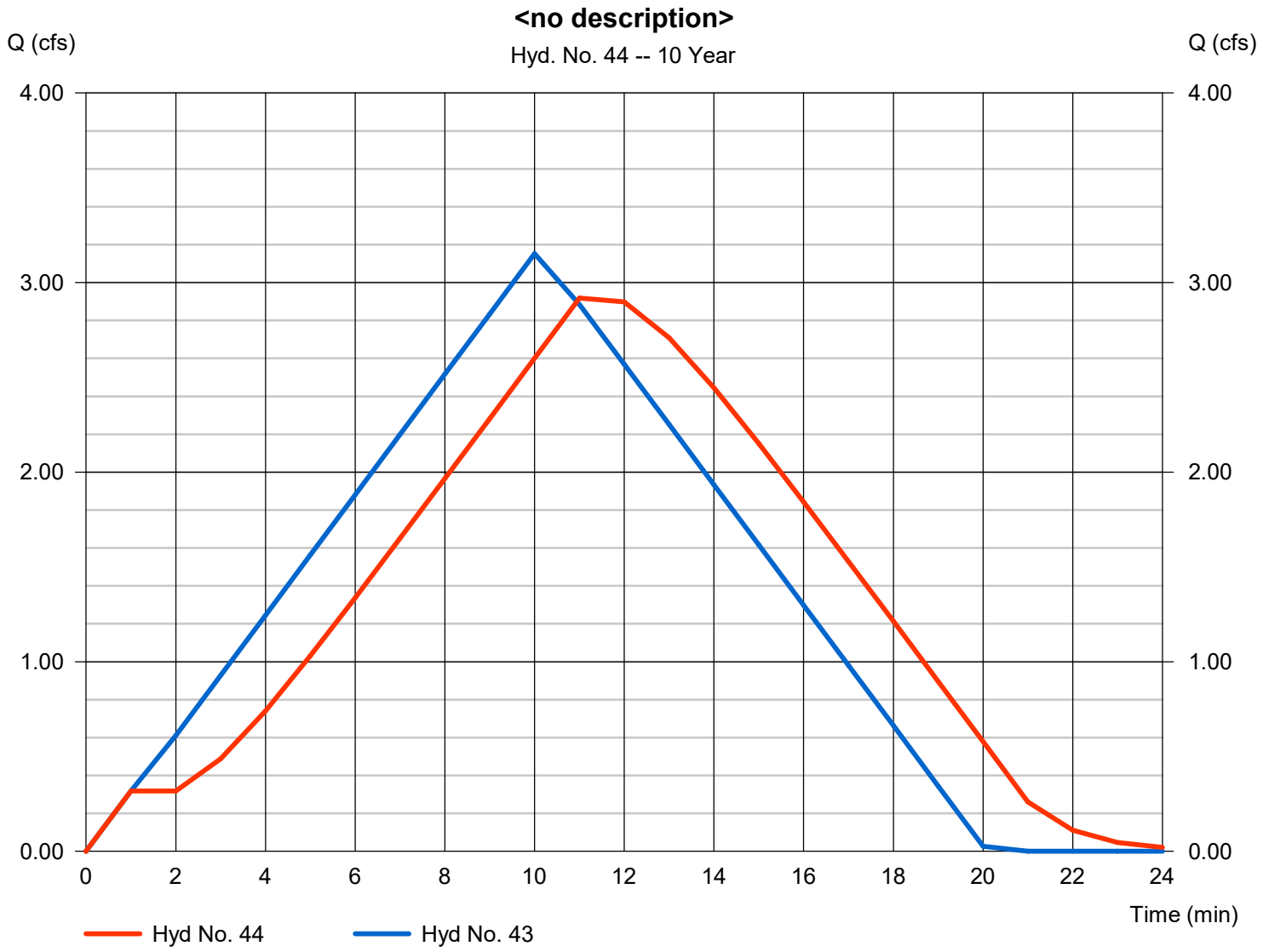
Hydrograph Report

Hyd. No. 44

<no description>

Hydrograph type	=	Reach	Peak discharge	=	2.919 cfs
Storm frequency	=	10 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	1,941 cuft
Inflow hyd. No.	=	43 - <no description>	Section type	=	Triangular
Reach length	=	307.0 ft	Channel slope	=	7.1 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	8.3:1	Max. depth	=	0.0 ft
Rating curve x	=	3.091	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.5762

Modified Att-Kin routing method used.

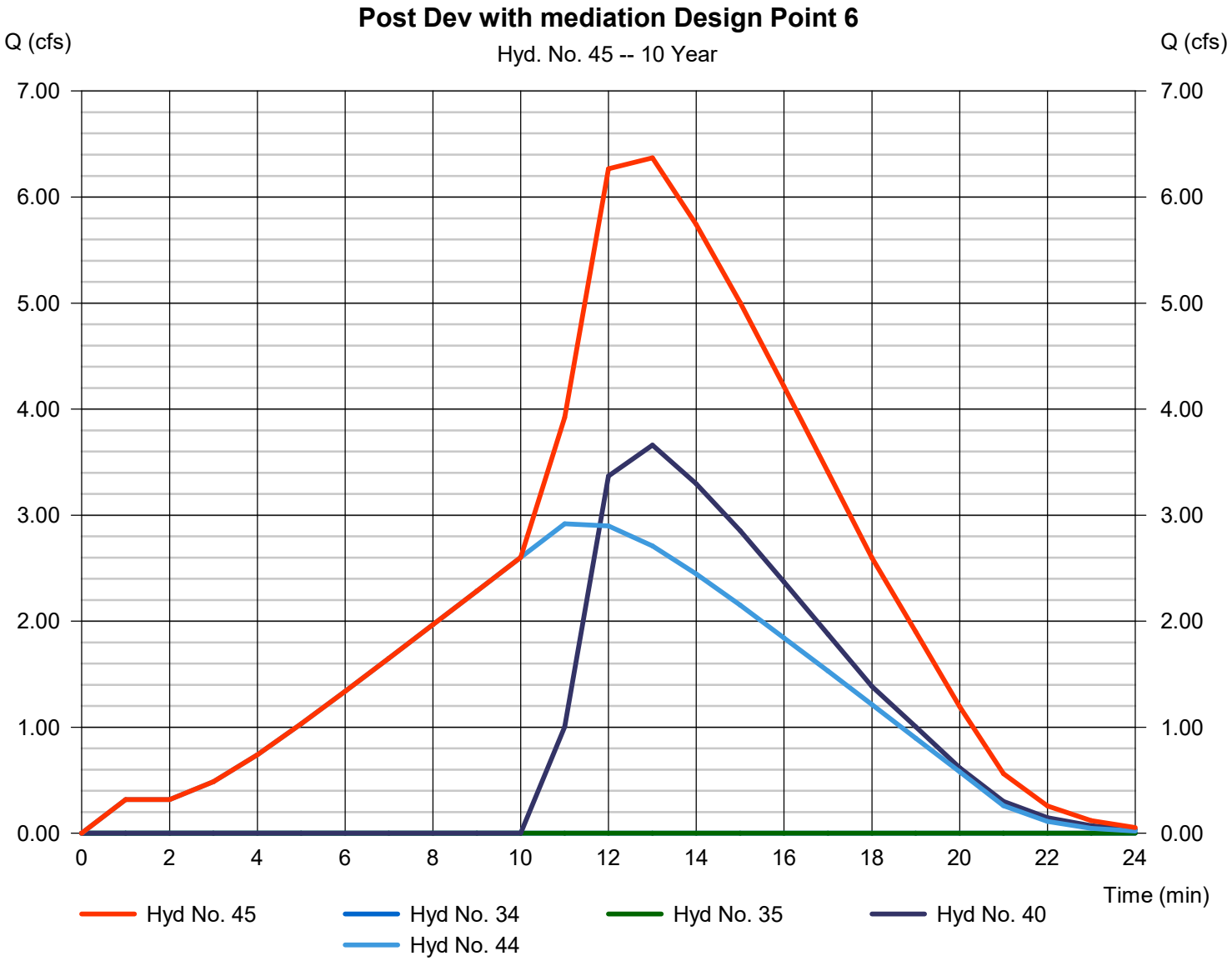


Hydrograph Report

Hyd. No. 45

Post Dev with mediation Design Point 6

Hydrograph type	= Combine	Peak discharge	= 6.369 cfs
Storm frequency	= 10 yrs	Time to peak	= 13 min
Time interval	= 1 min	Hyd. volume	= 3,262 cuft
Inflow hyds.	= 34, 35, 40, 44	Contrib. drain. area	= 0.000 ac

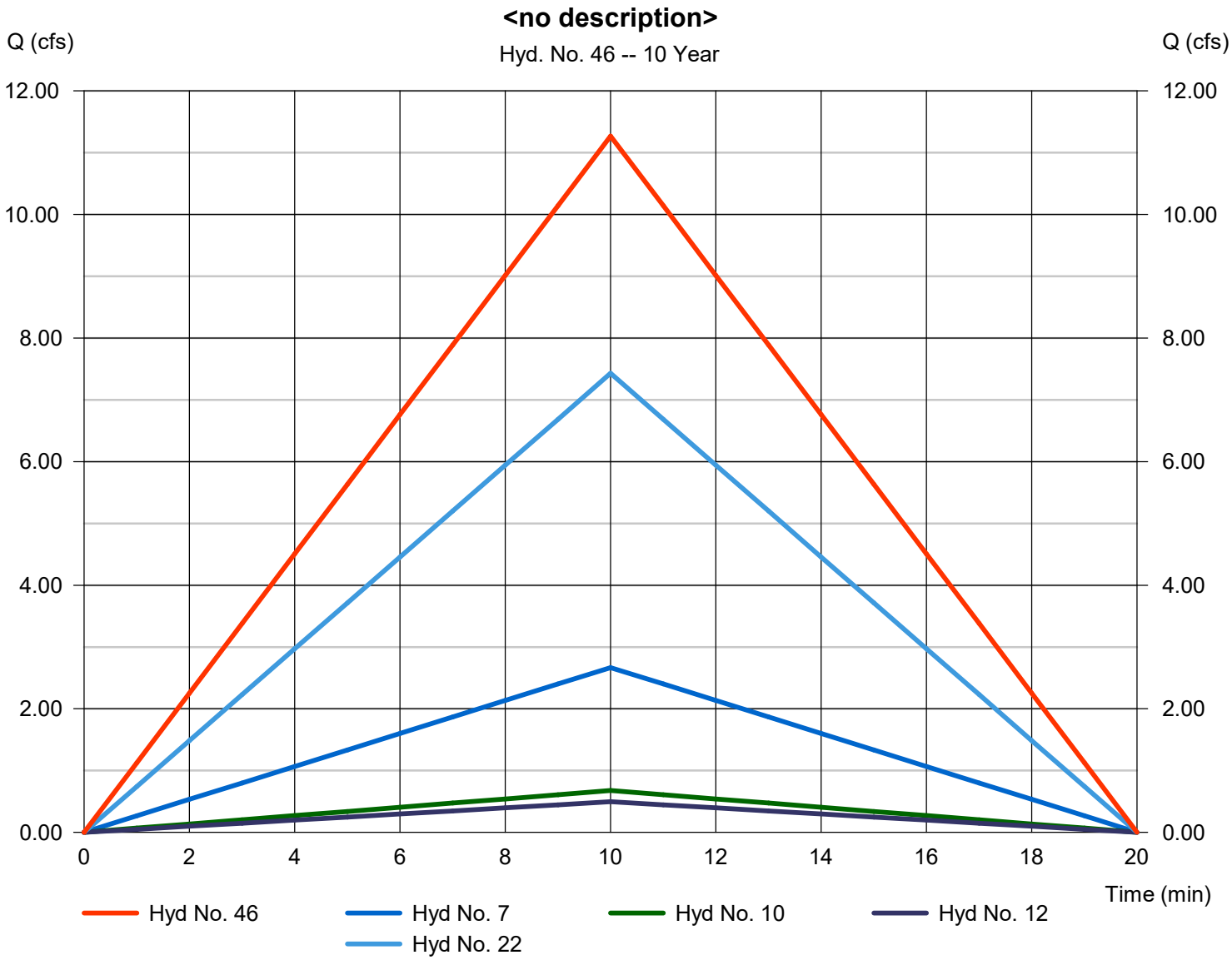


Hydrograph Report

Hyd. No. 46

<no description>

Hydrograph type	= Combine	Peak discharge	= 11.27 cfs
Storm frequency	= 10 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 6,761 cuft
Inflow hyds.	= 7, 10, 12, 22	Contrib. drain. area	= 1.520 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	Rational	48.17	1	10	28,903	------	------	------	1A Pre
2	Rational	3.830	1	10	2,298	------	------	------	2A Post
3	Rational	2.549	1	10	1,529	------	------	------	3A Pre
4	Rational	2.596	1	10	1,557	------	------	------	4A Pre
5	Rational	3.297	1	10	1,978	------	------	------	5A Pre
6	Rational	2.479	1	10	1,487	------	------	------	6A Pre
7	Rational	3.328	1	10	1,997	------	------	------	6A Post
8	Rational	3.057	1	10	1,834	------	------	------	4A Post
9	Rational	0.585	1	10	351	------	------	------	7A Pre
10	Rational	0.844	1	10	507	------	------	------	7A Post
11	Rational	0.514	1	10	309	------	------	------	8A Pre
12	Rational	0.617	1	10	370	------	------	------	8A Post
13	Rational	3.134	1	10	1,880	------	------	------	2A Pre
14	Rational	3.664	1	10	2,198	------	------	------	5A Post
15	Rational	48.17	1	10	28,903	------	------	------	1A Post
16	Combine	51.31	1	10	30,783	1, 13,	------	------	1A & 2A Pre Combined
17	Combine	52.00	1	10	31,201	2, 15,	------	------	1A & 2A Post Combined
18	Combine	5.145	1	10	3,087	3, 4,	------	------	3A & 4A Pre Combined
19	Rational	2.549	1	10	1,529	------	------	------	3A Post
20	Combine	5.606	1	10	3,364	8, 19	------	------	3A & 4A Post Combined
21	Combine	8.442	1	10	5,065	5, 18,	------	------	Design Point 5 Pre Dev
22	Combine	9.270	1	10	5,562	14, 20,	------	------	Design Point 5 Post Dev
23	Rational	0.514	1	10	309	------	------	------	2A-1 Post Dev with mediation
24	Rational	46.91	1	10	28,145	------	------	------	1A Post Dev With mediation
25	Rational	1.772	1	10	1,063	------	------	------	2A-2 Post Dev With mediation
26	Rational	1.543	1	10	926	------	------	------	2A-3 Post Dev with Mediation
27	Reservoir	0.387	1	13	116	23	100.85	204	Pond South of Lot 1
28	Reservoir	1.766	1	10	928	25	100.92	157	Pond b/w 1 & 2
29	Reservoir	1.511	1	10	689	26	101.95	264	Lot 3 Pond
30	Combine	50.19	1	10	29,878	24, 27, 28, 29	------	------	Design Point 2
31	Rational	3.328	1	10	1,997	------	------	------	6A post Dev with mediation
32	Rational	0.844	1	10	507	------	------	------	7A Post With Mediation
33	Rational	0.617	1	10	370	------	------	------	8A Post with Mediation
34	Reservoir	0.000	1	n/a	0	32	101.31	507	Ppond for 7A

Hydrograph Summary Report

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

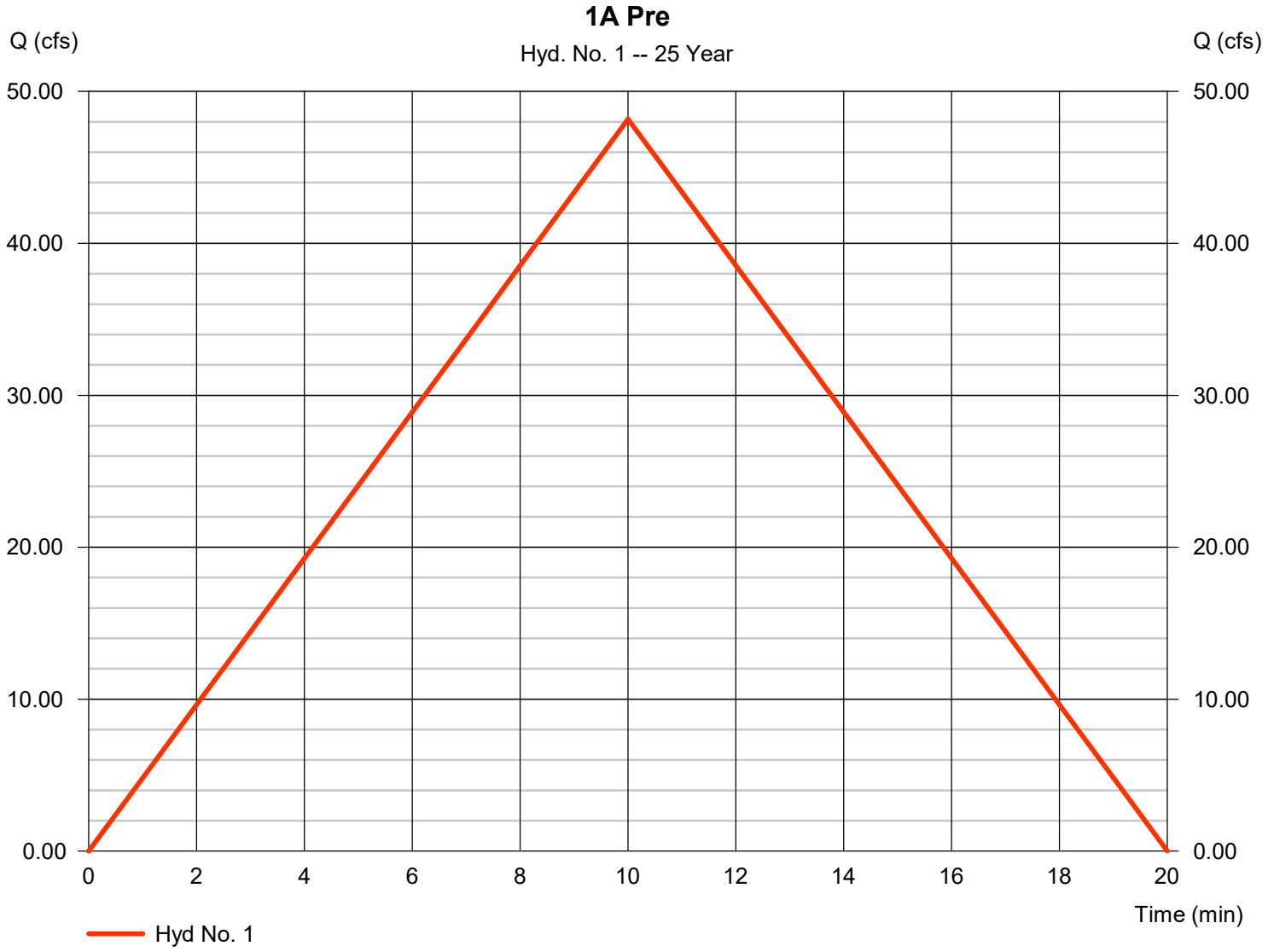
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	Reservoir	0.000	1	n/a	0	33	101.67	370	Pond for 8A
36	Rational	3.664	1	10	2,198	------	------	------	5A Post wth mediation
37	Rational	2.549	1	10	1,529	------	------	------	3A Post Dev with mediation
38	Rational	0.303	1	10	182	------	------	------	4A Post Dev with mediation
39	Combine	6.180	1	10	3,708	31, 37, 38	------	------	Water Towards road
40	Reservoir	5.252	1	12	2,057	39	102.76	1,930	<no description>
41	Combine	12.02	1	10	7,212	6, 9, 11, 21,	------	------	Pre Dev Design Point 6
42	Reach	0.301	1	11	184	38	------	------	<no description>
43	Combine	3.934	1	10	2,382	36, 42	------	------	<no description>
44	Reach	3.669	1	11	2,421	43	------	------	<no description>
45	Combine	8.907	1	11	4,478	34, 35, 40, 44	------	------	Post Dev with mediation Design Point
46	Combine	14.06	1	10	8,436	7, 10, 12, 22,	------	------	<no description>

Hydrograph Report

Hyd. No. 1

1A Pre

Hydrograph type	=	Rational	Peak discharge	=	48.17 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	28,903 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

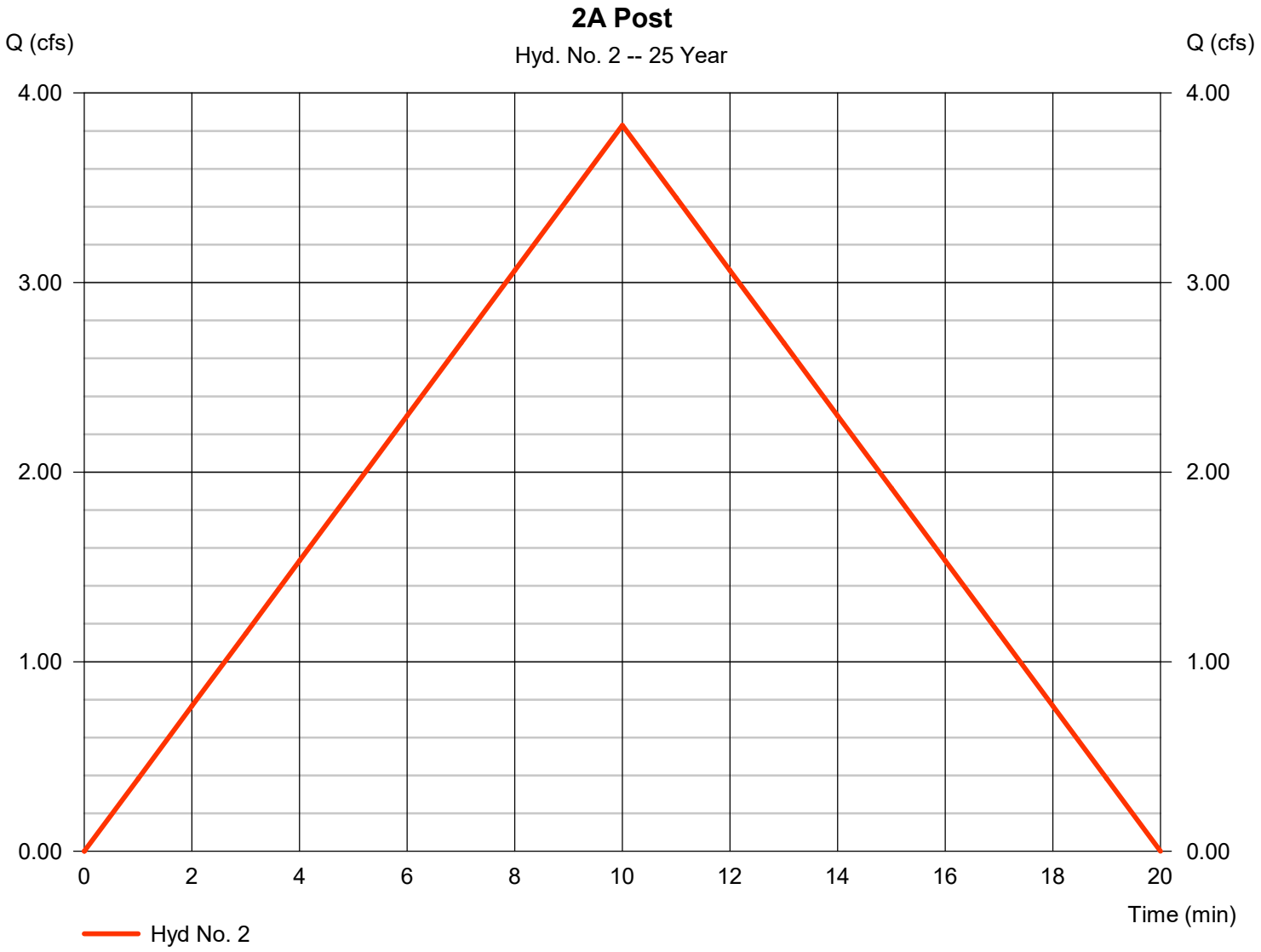


Hydrograph Report

Hyd. No. 2

2A Post

Hydrograph type	=	Rational	Peak discharge	=	3.830 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,298 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.55
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

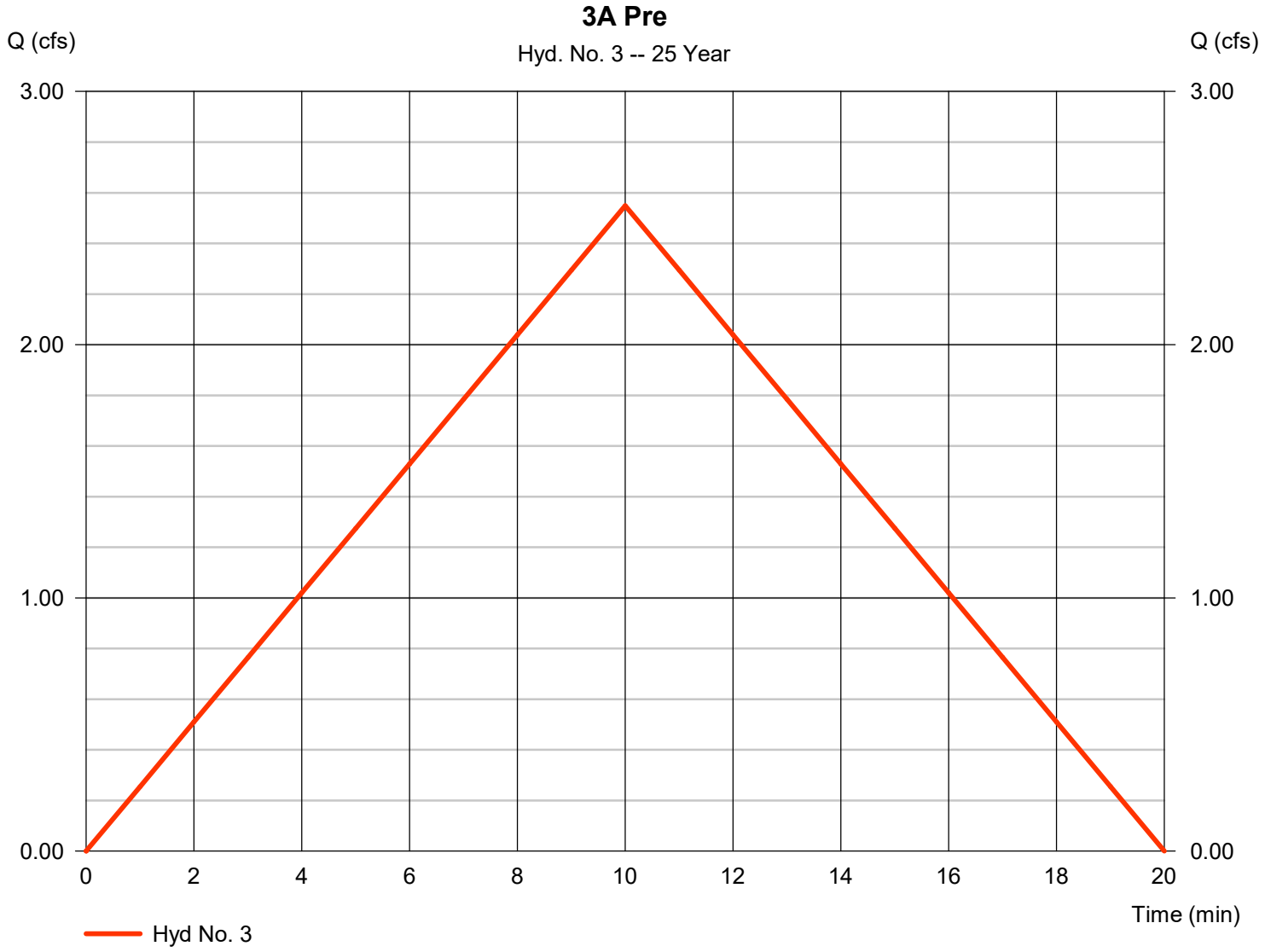


Hydrograph Report

Hyd. No. 3

3A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.549 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,529 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

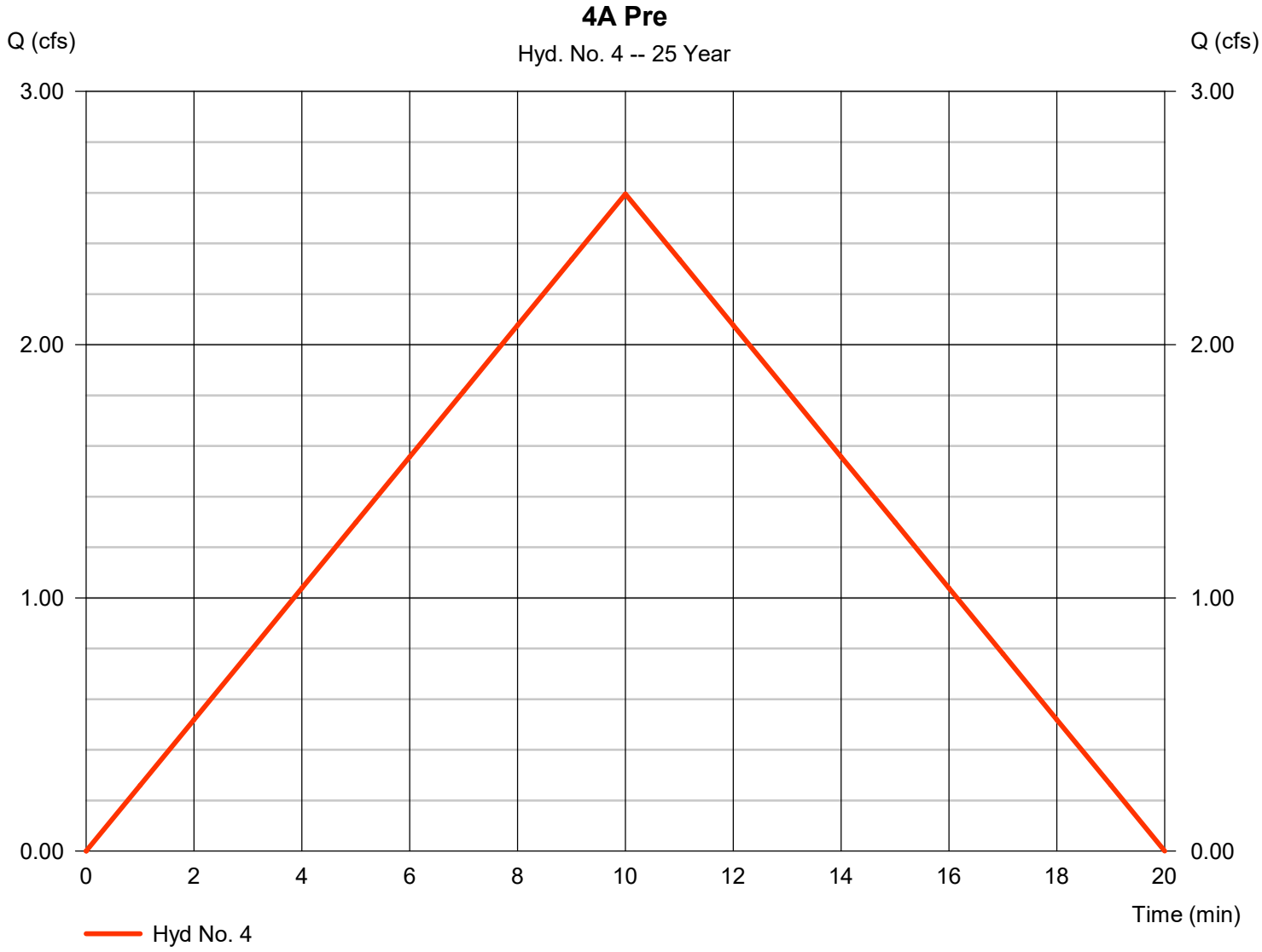


Hydrograph Report

Hyd. No. 4

4A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.596 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,557 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

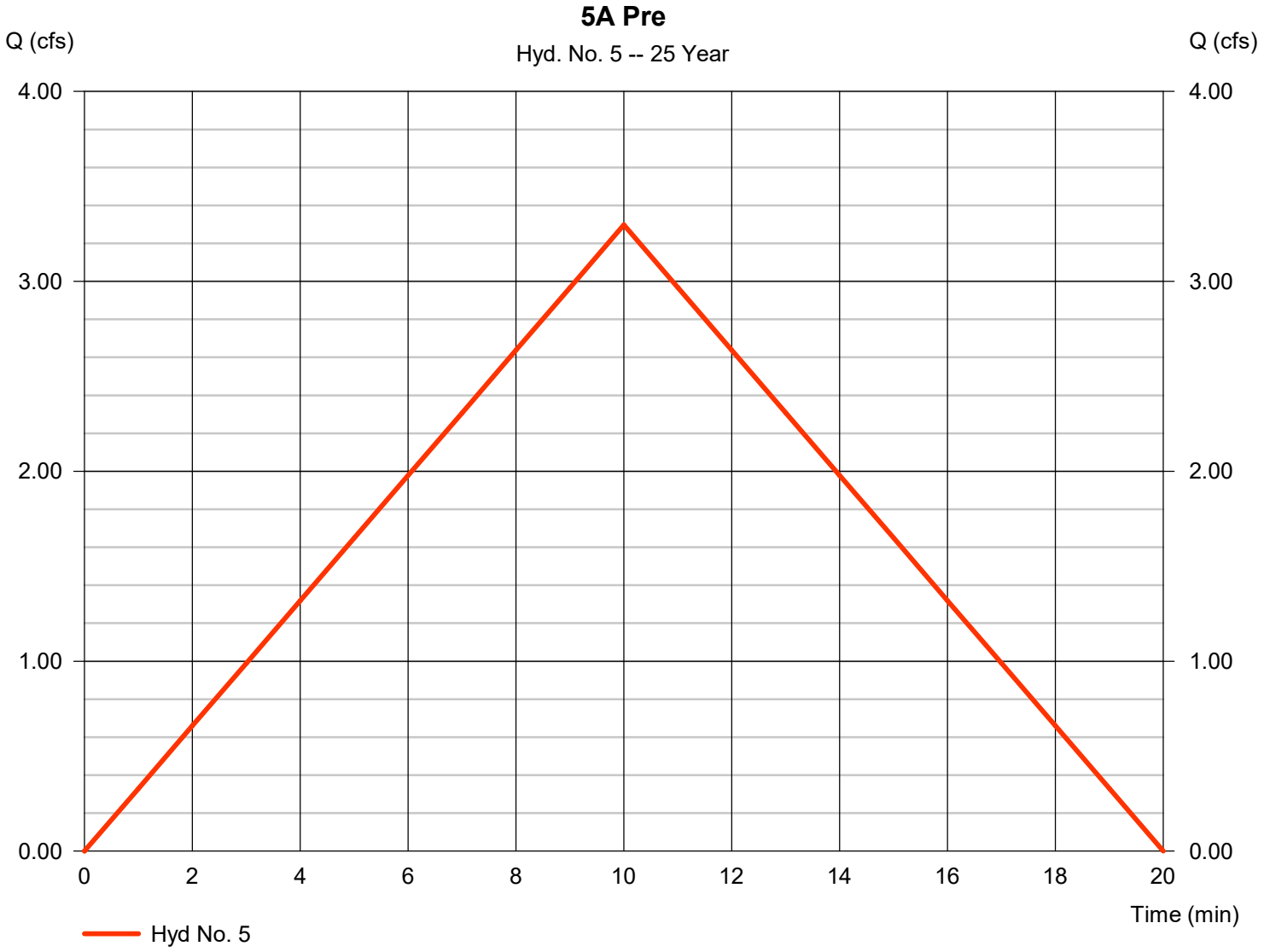


Hydrograph Report

Hyd. No. 5

5A Pre

Hydrograph type	=	Rational	Peak discharge	=	3.297 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,978 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

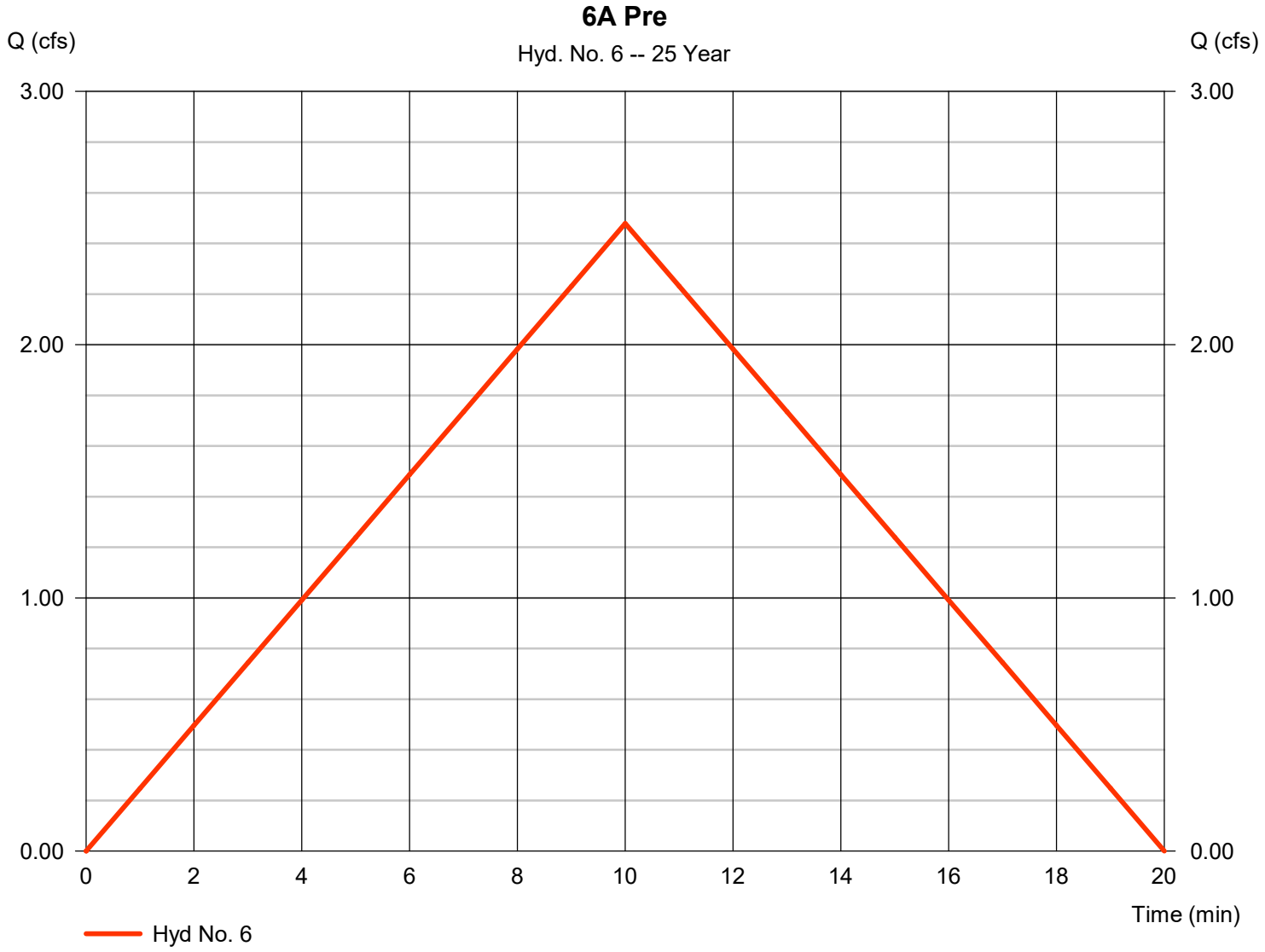


Hydrograph Report

Hyd. No. 6

6A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.479 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,487 cuft
Drainage area	=	1.060 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

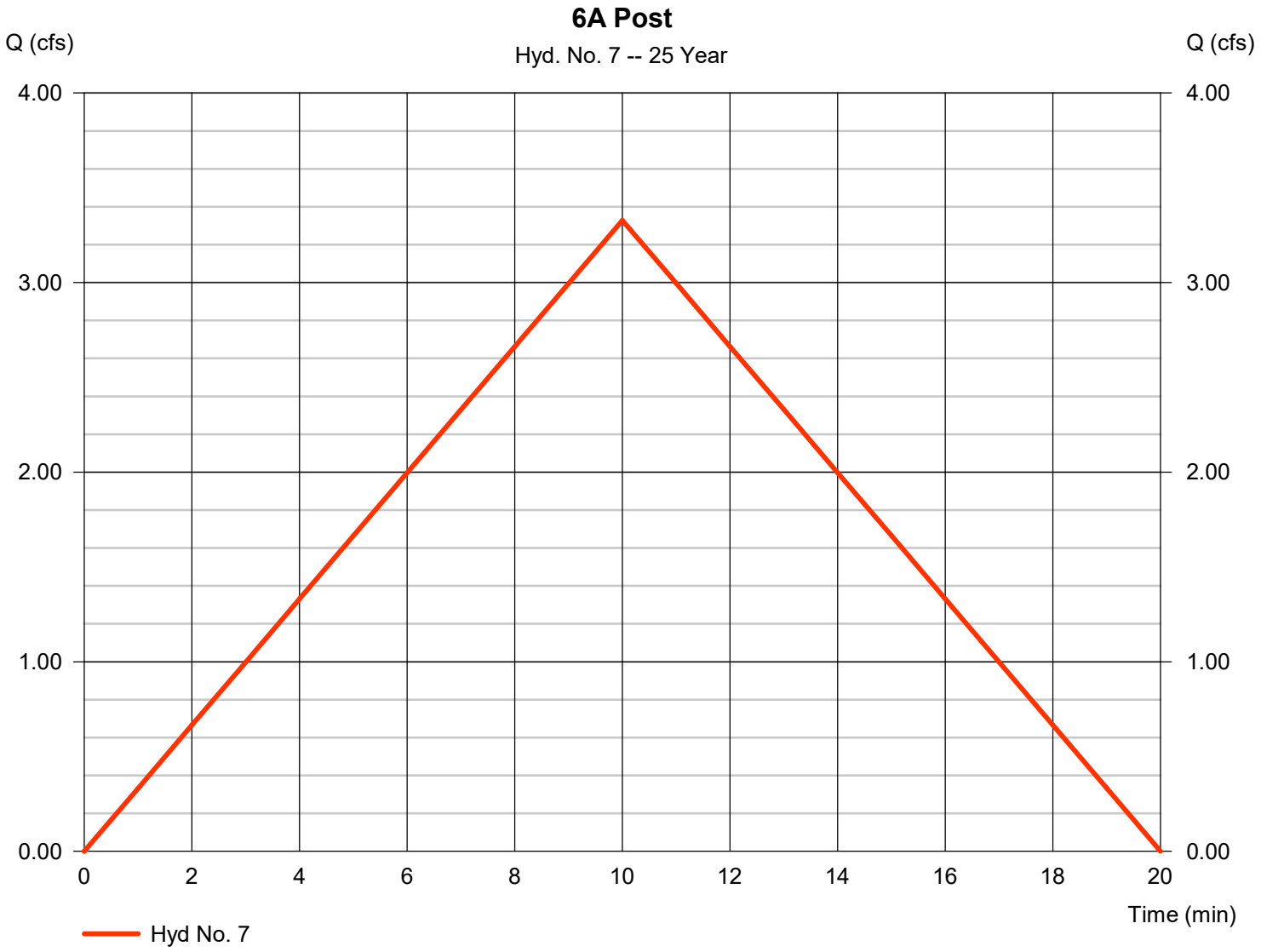


Hydrograph Report

Hyd. No. 7

6A Post

Hydrograph type	=	Rational	Peak discharge	=	3.328 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,997 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

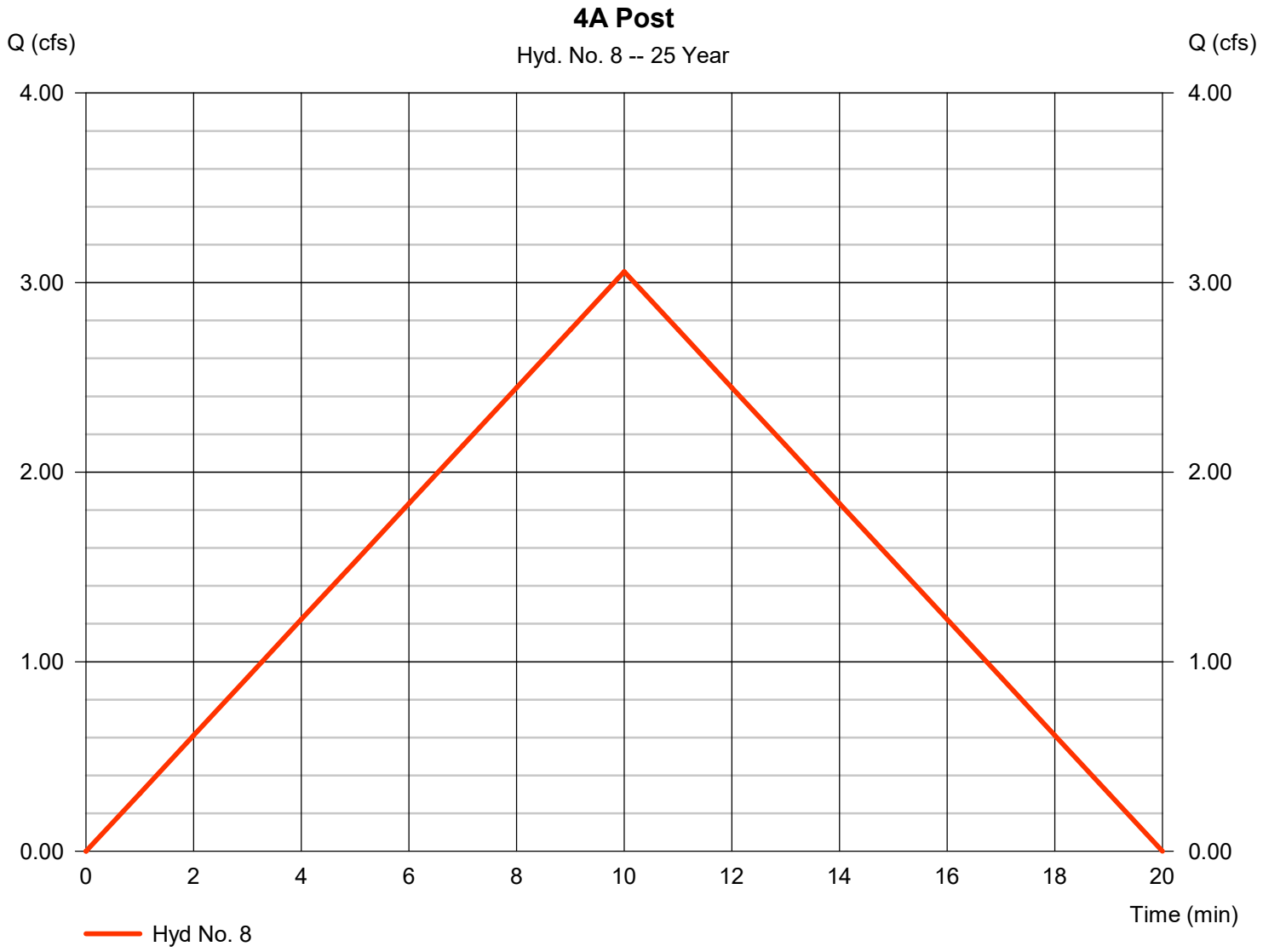


Hydrograph Report

Hyd. No. 8

4A Post

Hydrograph type	=	Rational	Peak discharge	=	3.057 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,834 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.53
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

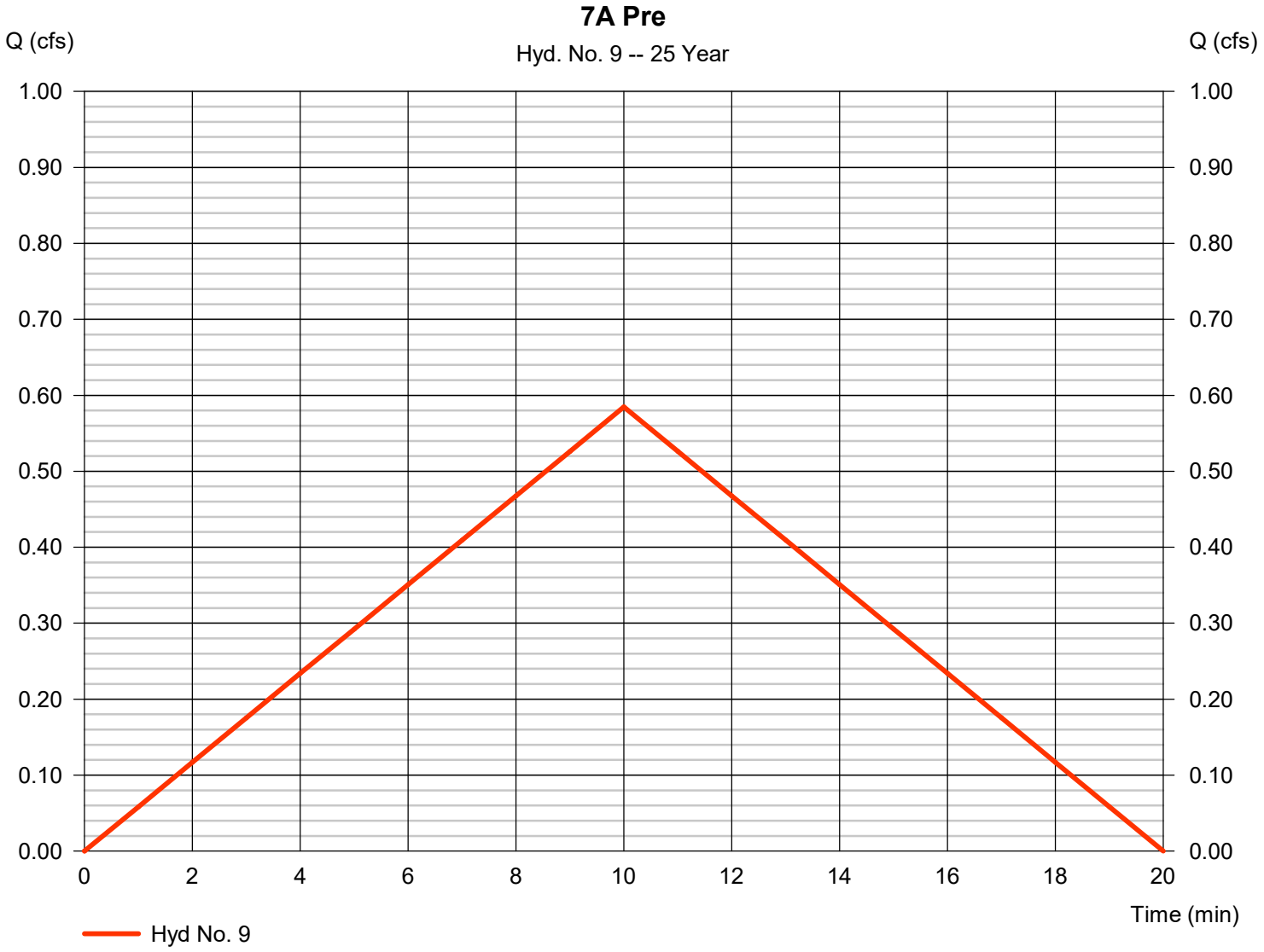


Hydrograph Report

Hyd. No. 9

7A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.585 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	351 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

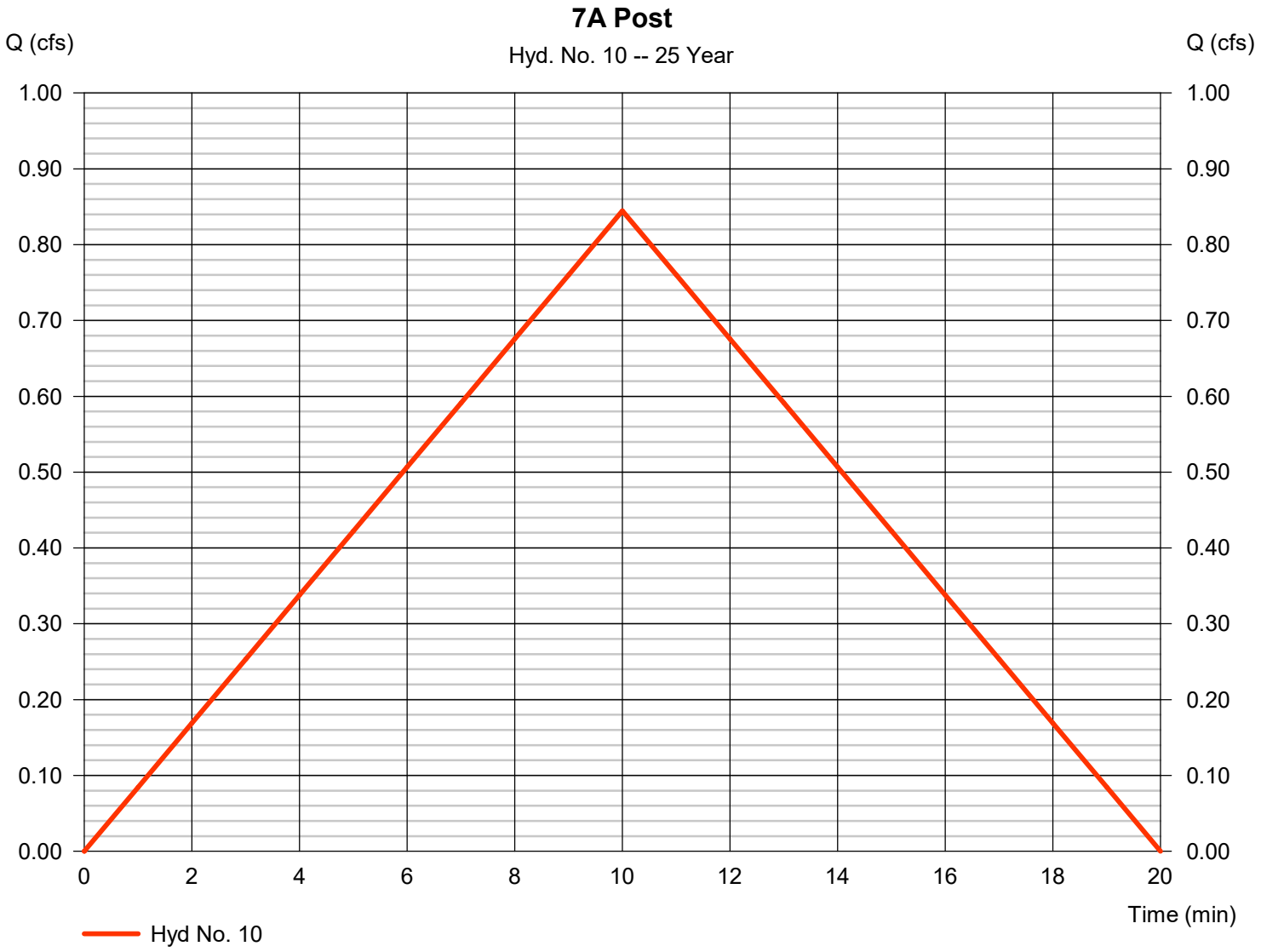


Hydrograph Report

Hyd. No. 10

7A Post

Hydrograph type	=	Rational	Peak discharge	=	0.844 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	507 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



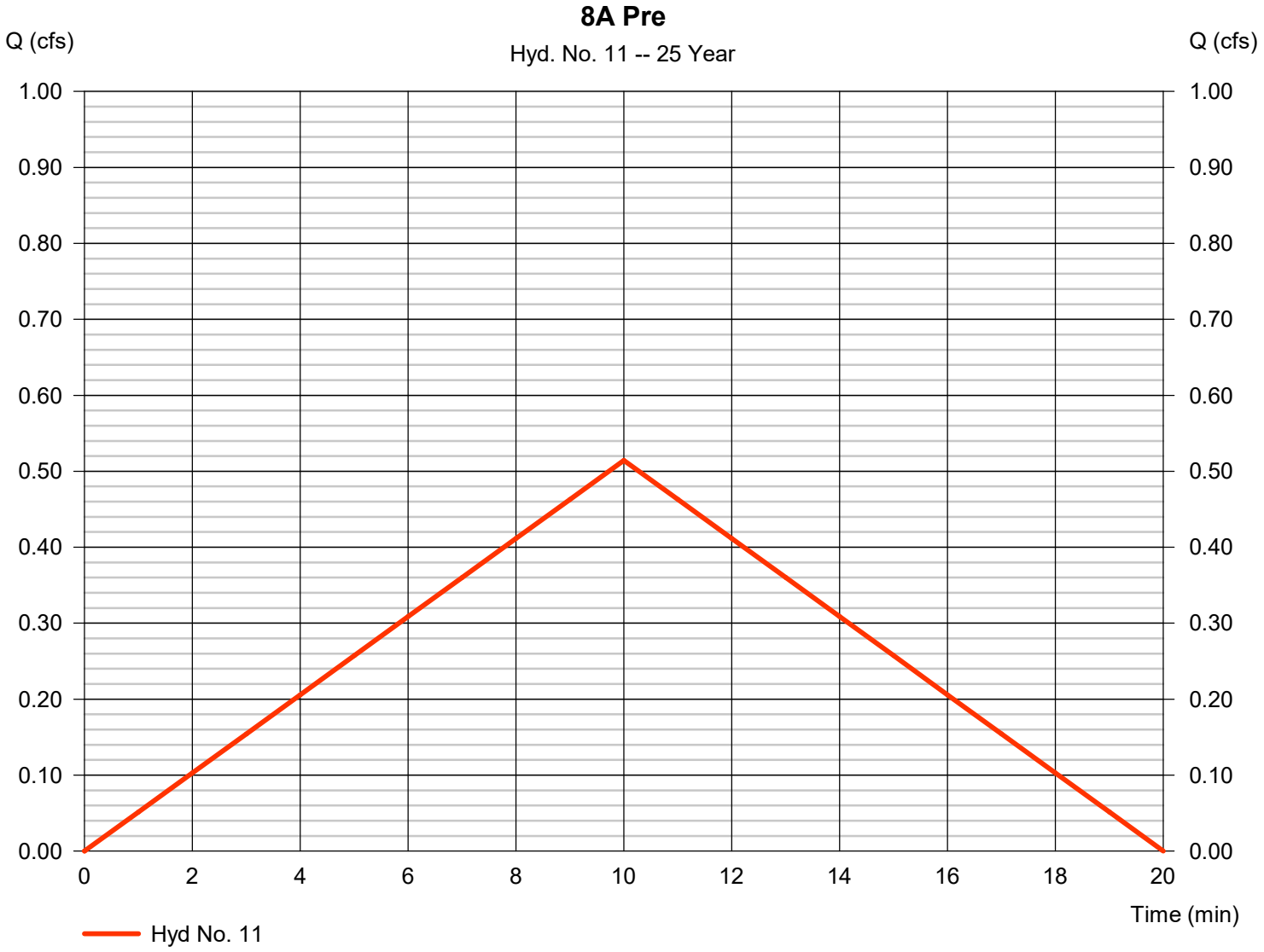
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 11

8A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.514 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	309 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

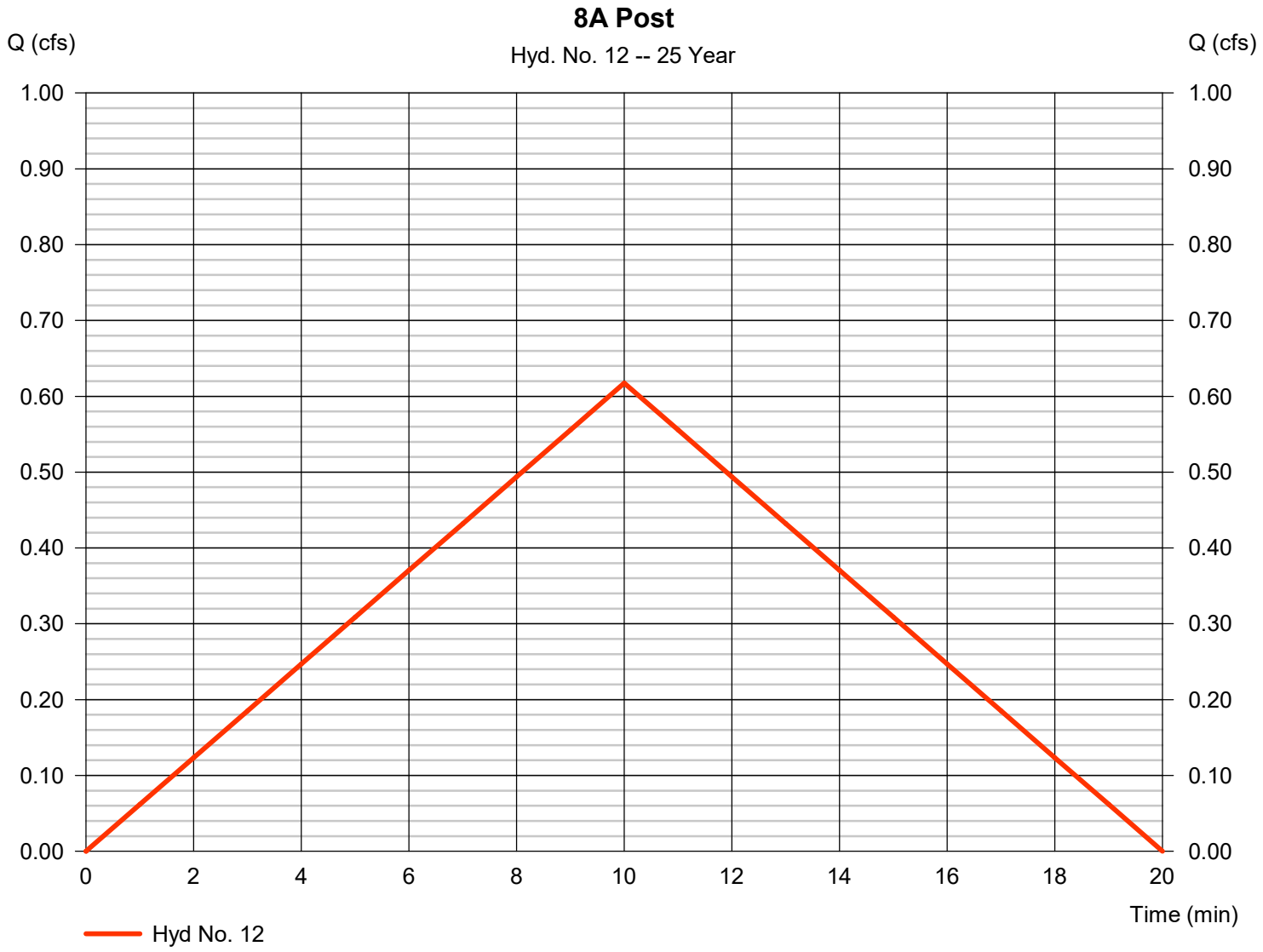


Hydrograph Report

Hyd. No. 12

8A Post

Hydrograph type	=	Rational	Peak discharge	=	0.617 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	370 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

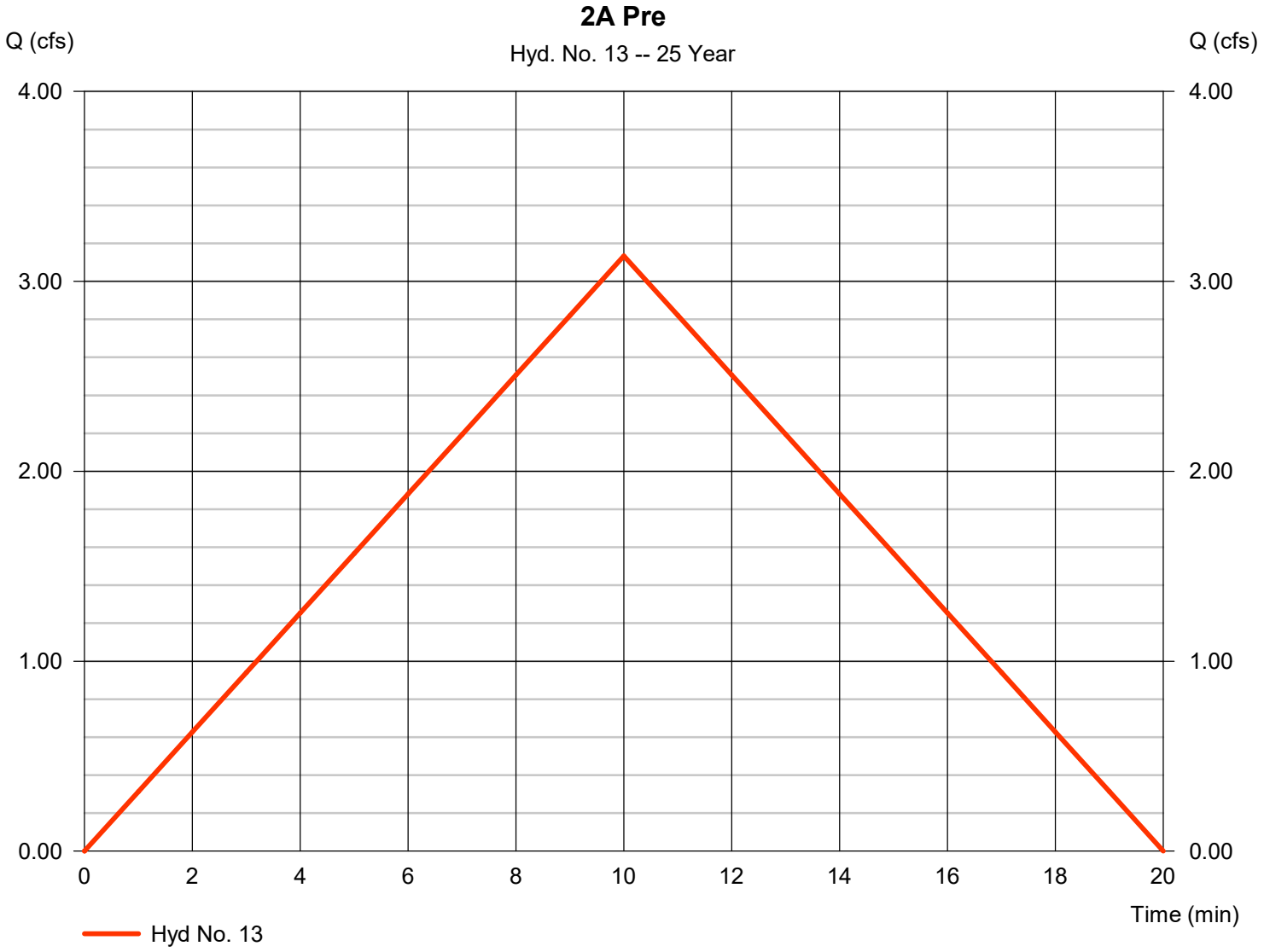


Hydrograph Report

Hyd. No. 13

2A Pre

Hydrograph type	=	Rational	Peak discharge	=	3.134 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,880 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

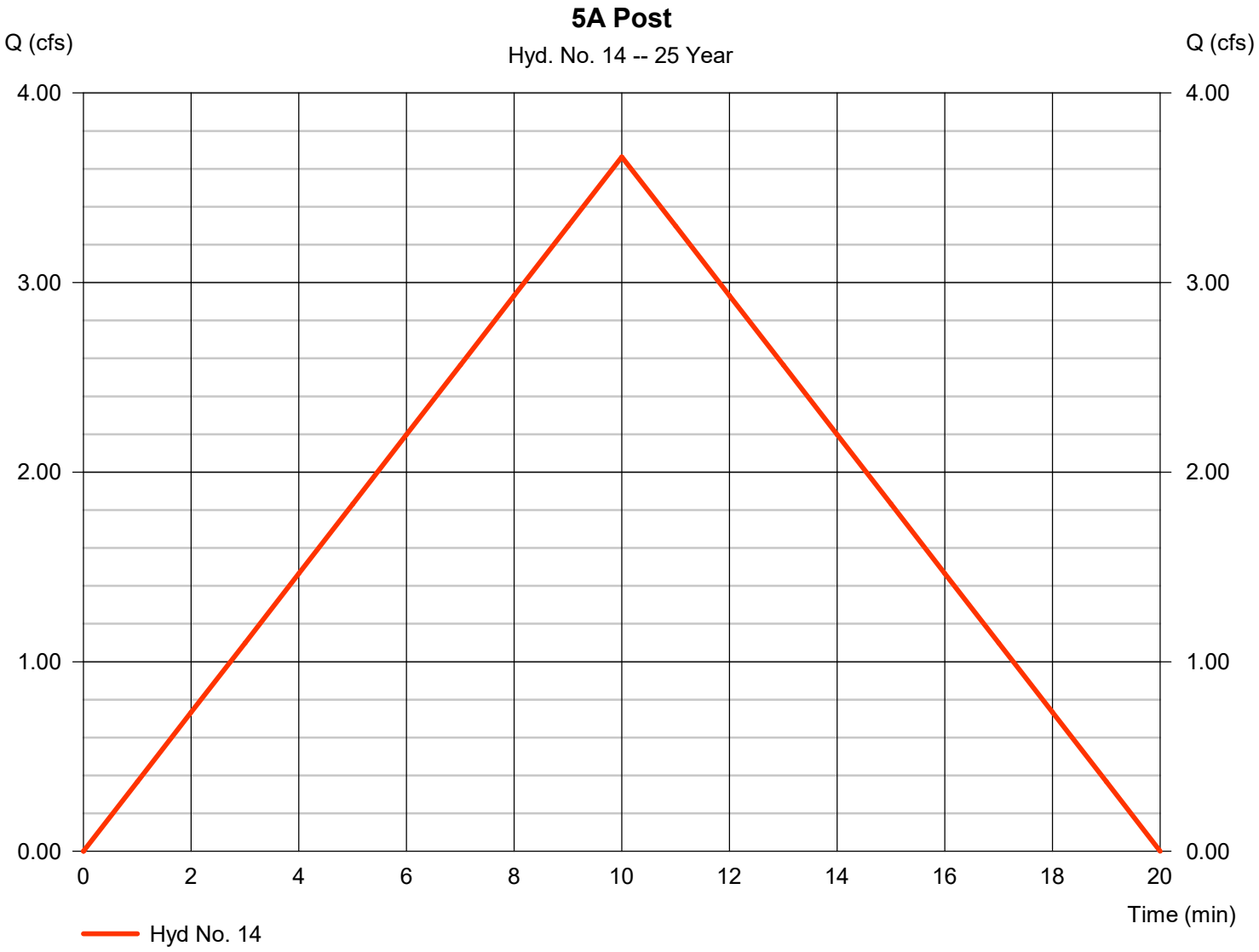


Hydrograph Report

Hyd. No. 14

5A Post

Hydrograph type	=	Rational	Peak discharge	=	3.664 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,198 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

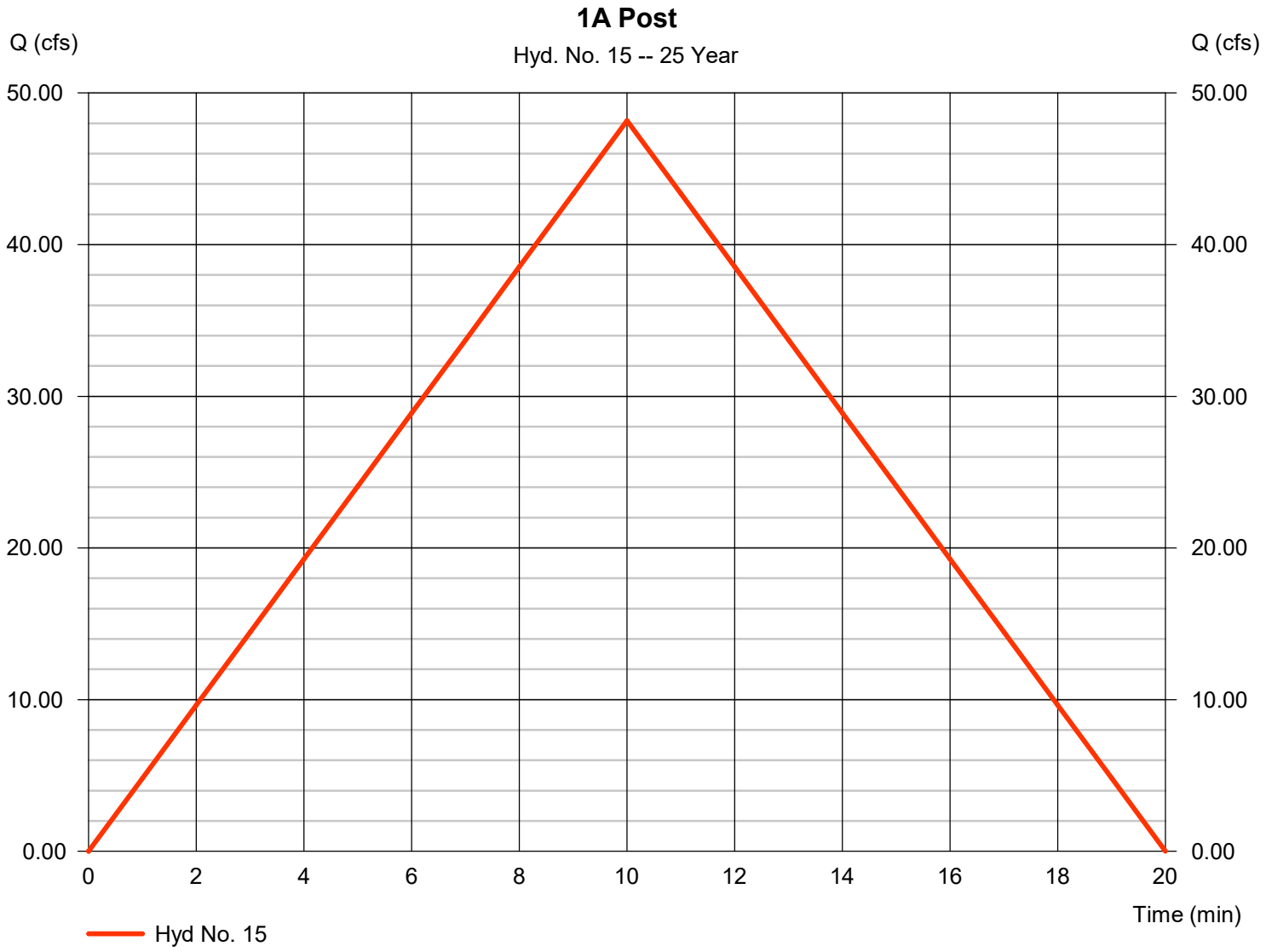


Hydrograph Report

Hyd. No. 15

1A Post

Hydrograph type	=	Rational	Peak discharge	=	48.17 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	28,903 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

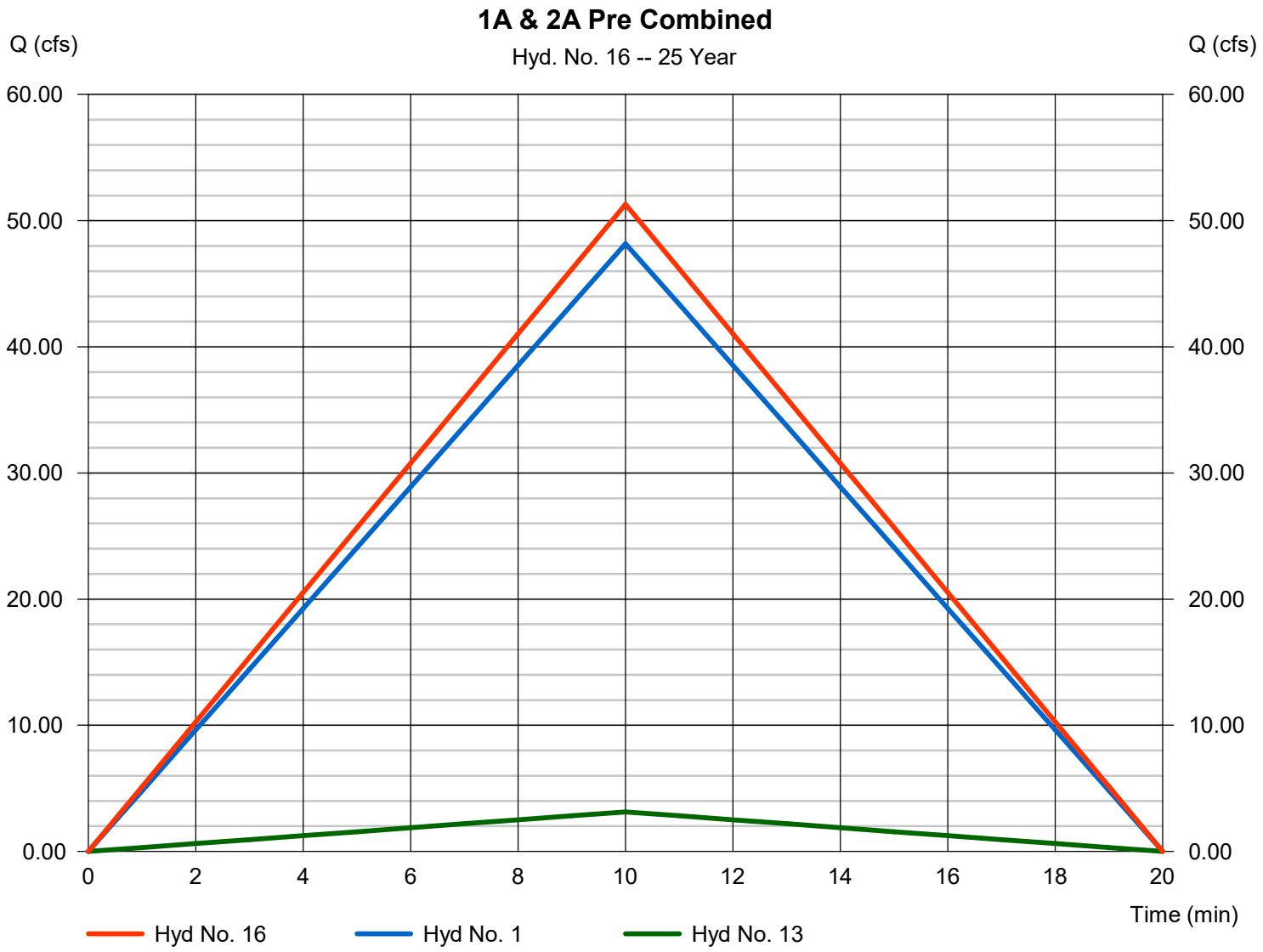


Hydrograph Report

Hyd. No. 16

1A & 2A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 51.31 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 30,783 cuft
Inflow hyds.	= 1, 13	Contrib. drain. area	= 21.940 ac

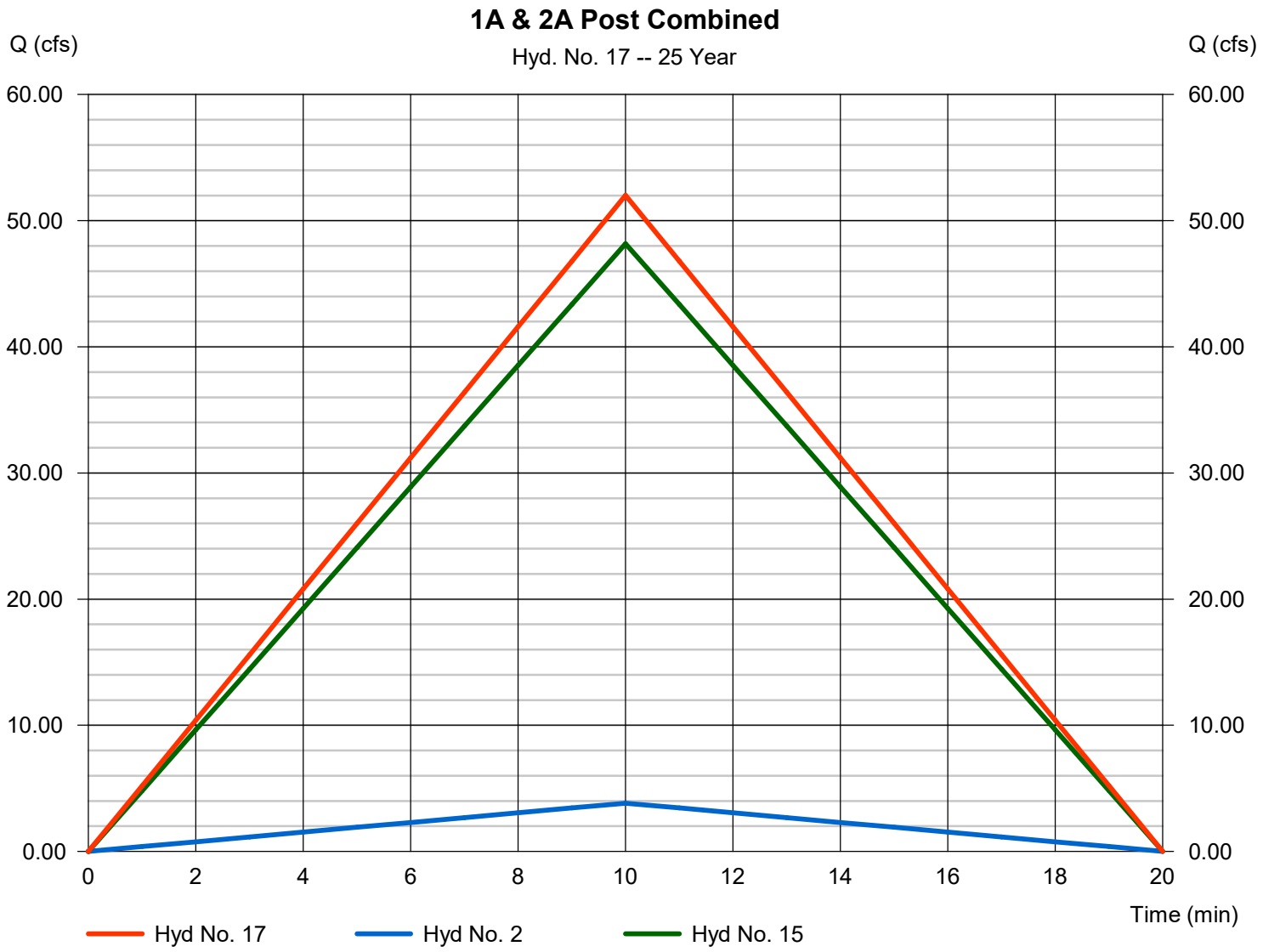


Hydrograph Report

Hyd. No. 17

1A & 2A Post Combined

Hydrograph type	= Combine	Peak discharge	= 52.00 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 31,201 cuft
Inflow hyds.	= 2, 15	Contrib. drain. area	= 21.940 ac

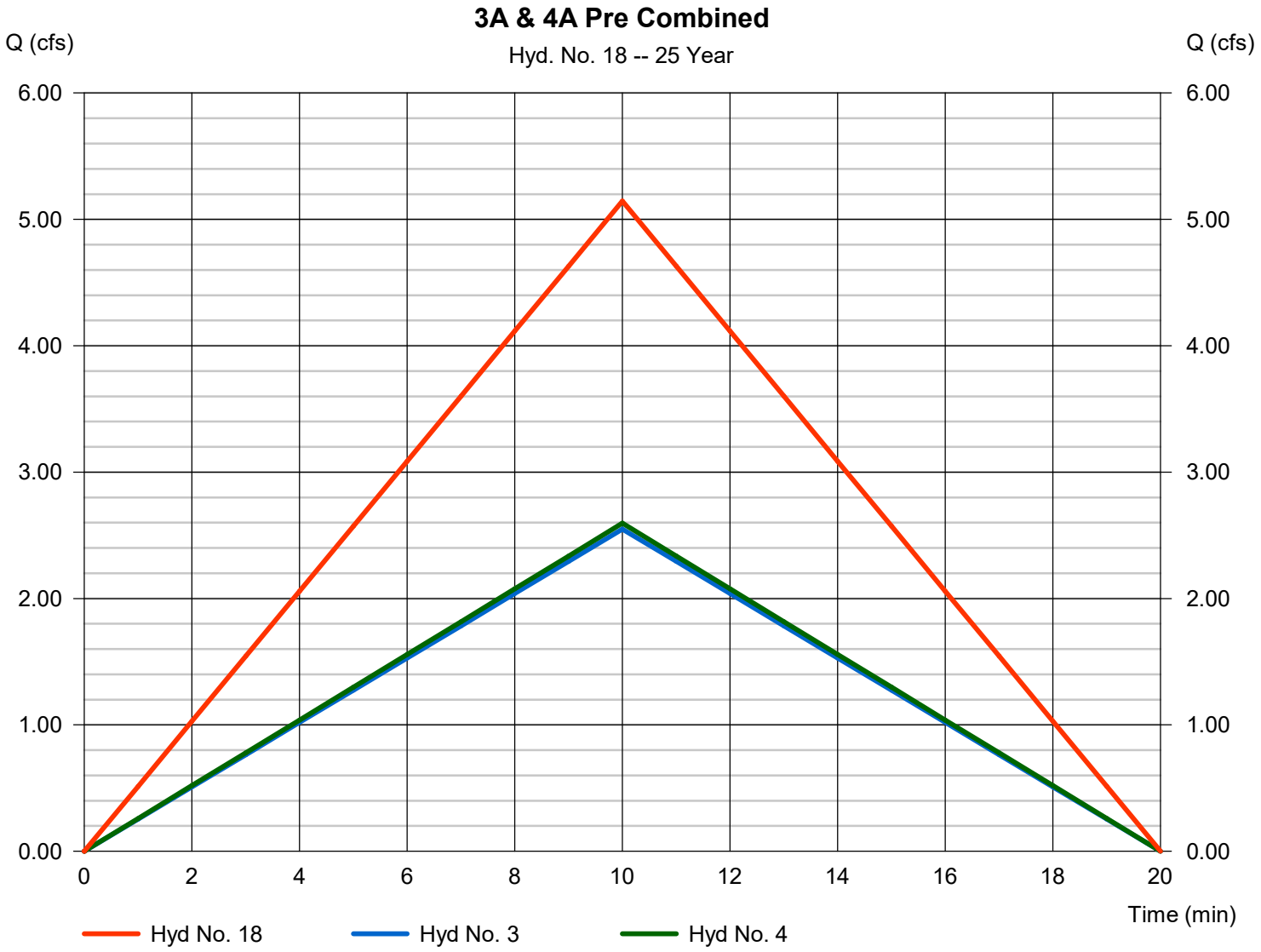


Hydrograph Report

Hyd. No. 18

3A & 4A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 5.145 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 3,087 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 2.200 ac

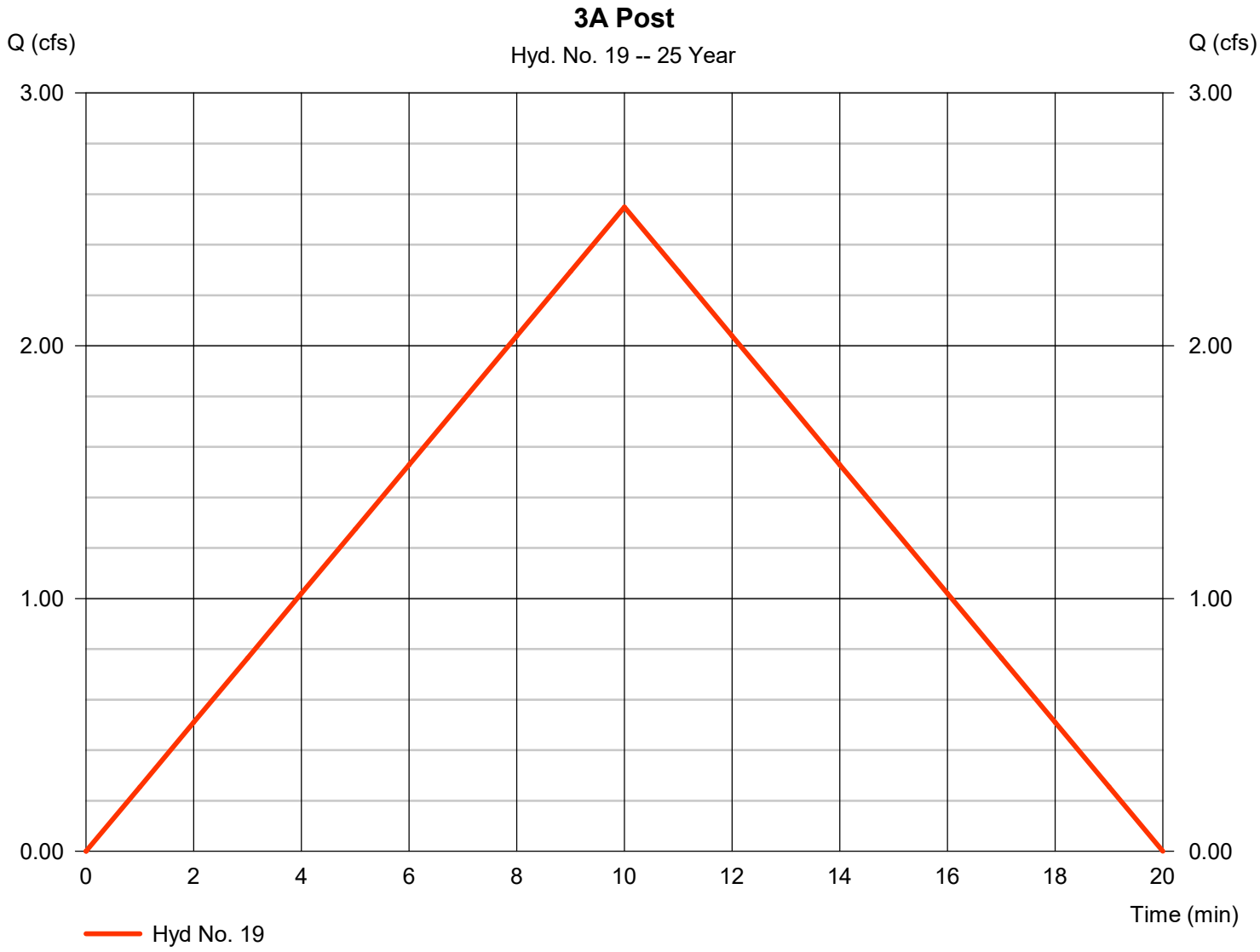


Hydrograph Report

Hyd. No. 19

3A Post

Hydrograph type	=	Rational	Peak discharge	=	2.549 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,529 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

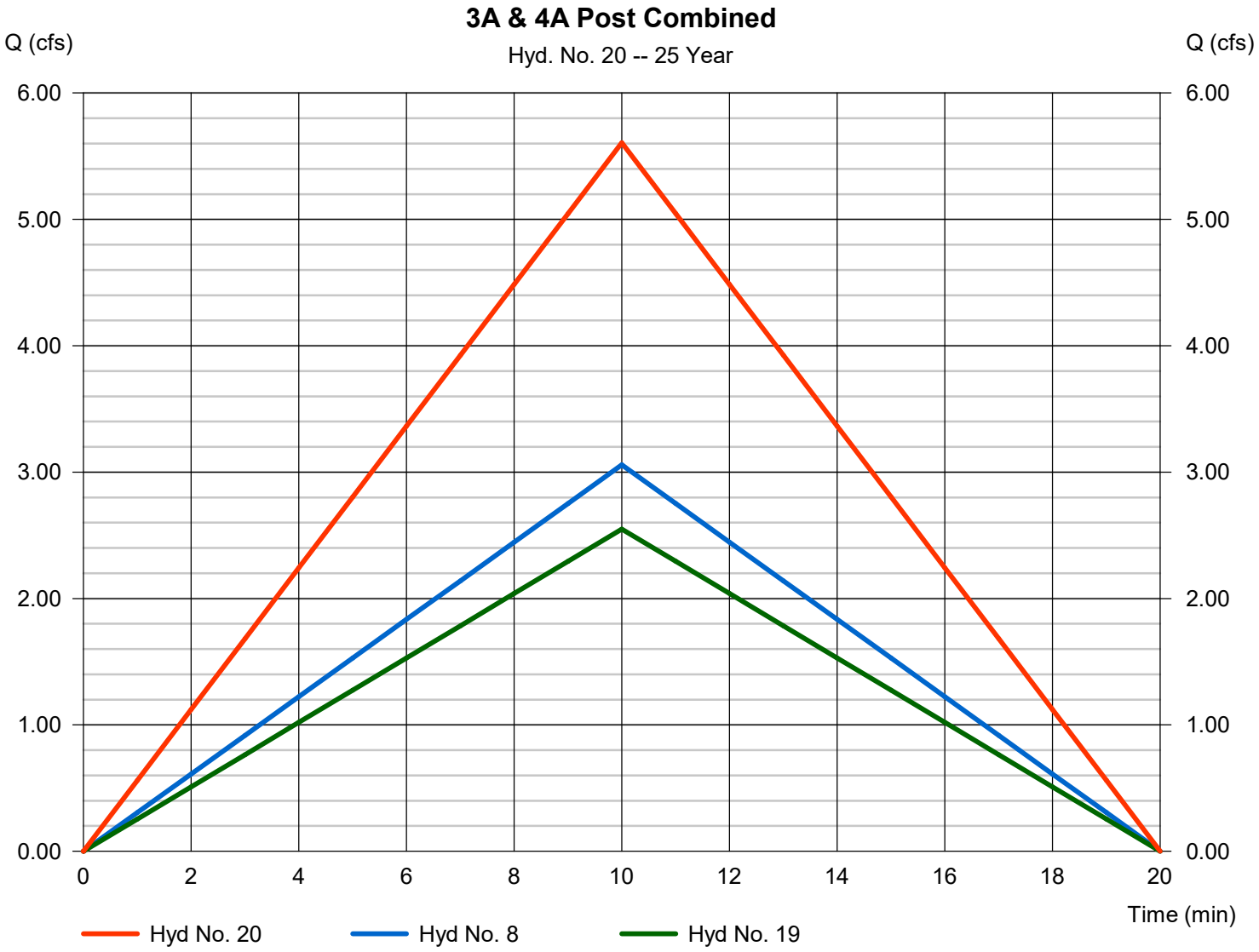


Hydrograph Report

Hyd. No. 20

3A & 4A Post Combined

Hydrograph type	= Combine	Peak discharge	= 5.606 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 3,364 cuft
Inflow hyds.	= 8, 19	Contrib. drain. area	= 2.200 ac

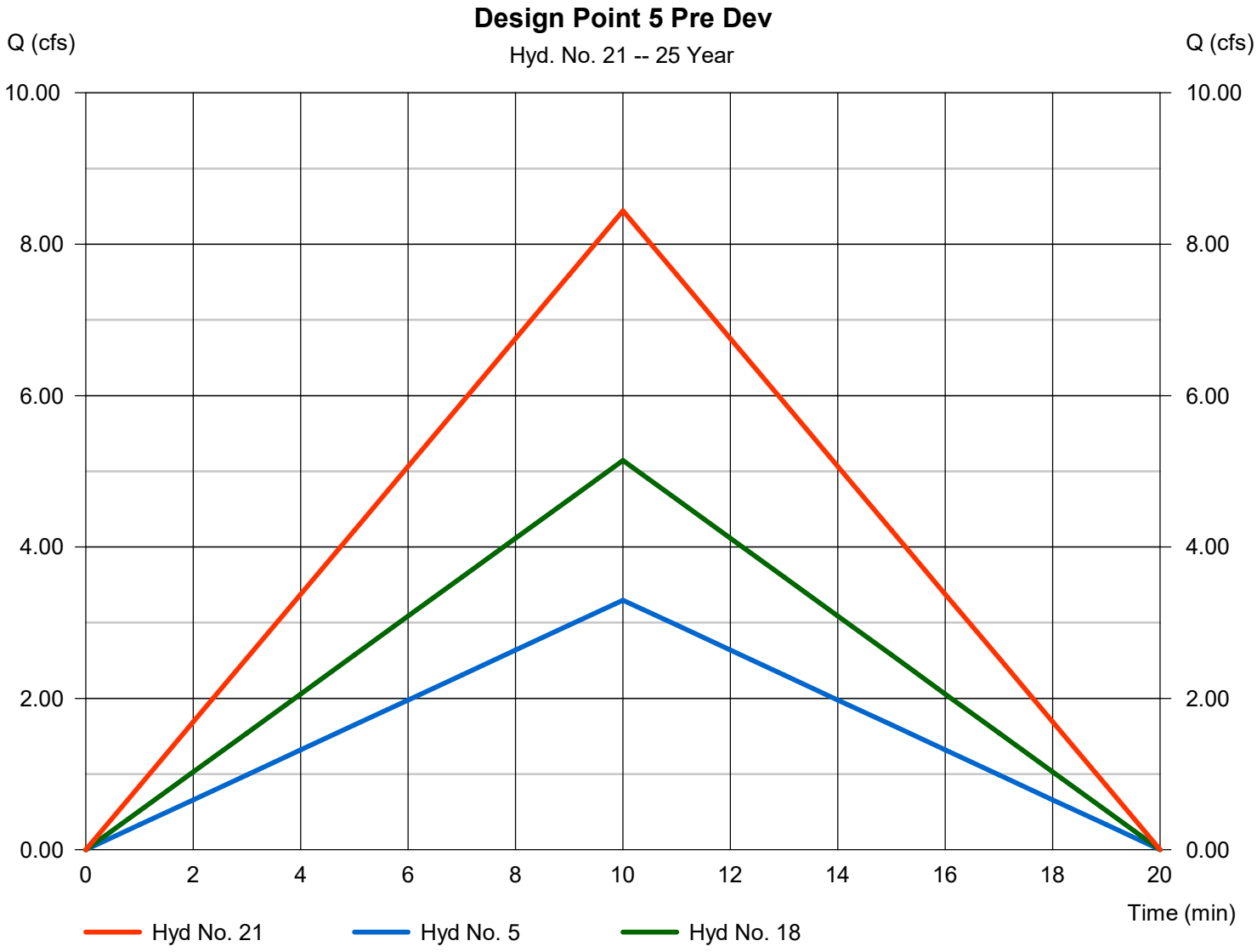


Hydrograph Report

Hyd. No. 21

Design Point 5 Pre Dev

Hydrograph type	= Combine	Peak discharge	= 8.442 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 5,065 cuft
Inflow hyds.	= 5, 18	Contrib. drain. area	= 1.410 ac

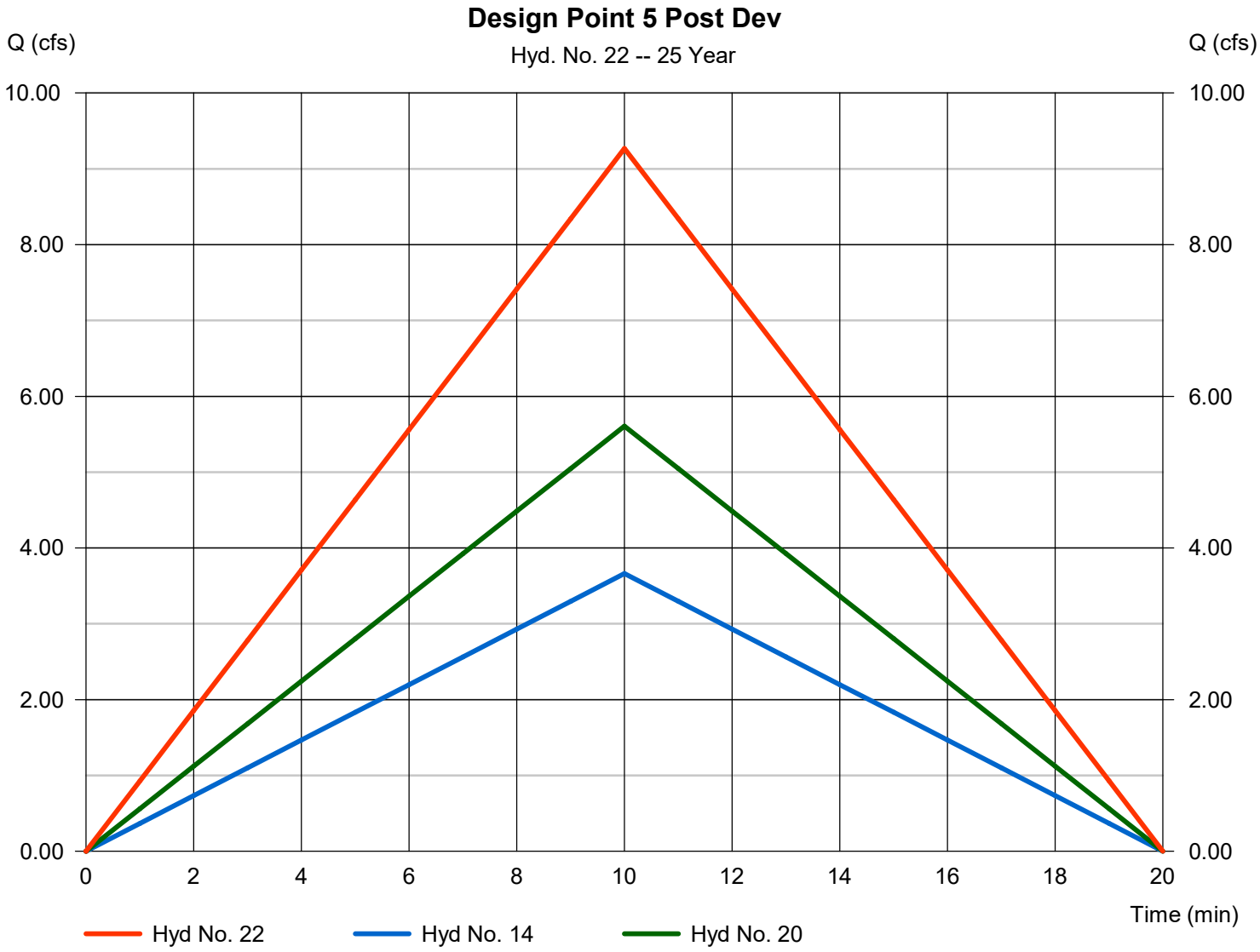


Hydrograph Report

Hyd. No. 22

Design Point 5 Post Dev

Hydrograph type	=	Combine	Peak discharge	=	9.270 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	5,562 cuft
Inflow hyds.	=	14, 20	Contrib. drain. area	=	1.410 ac

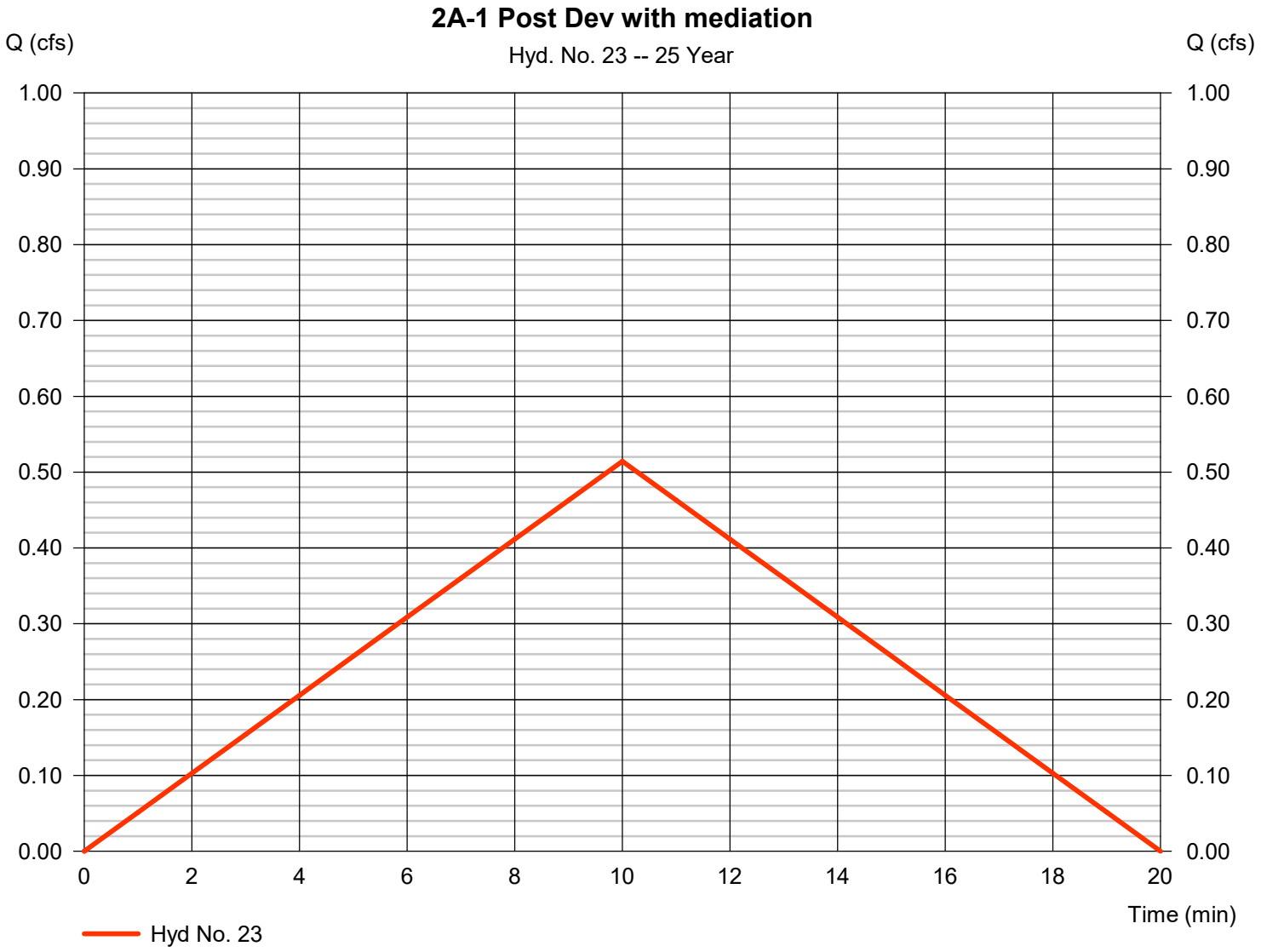


Hydrograph Report

Hyd. No. 23

2A-1 Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.514 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	309 cuft
Drainage area	=	0.180 ac	Runoff coeff.	=	0.55
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

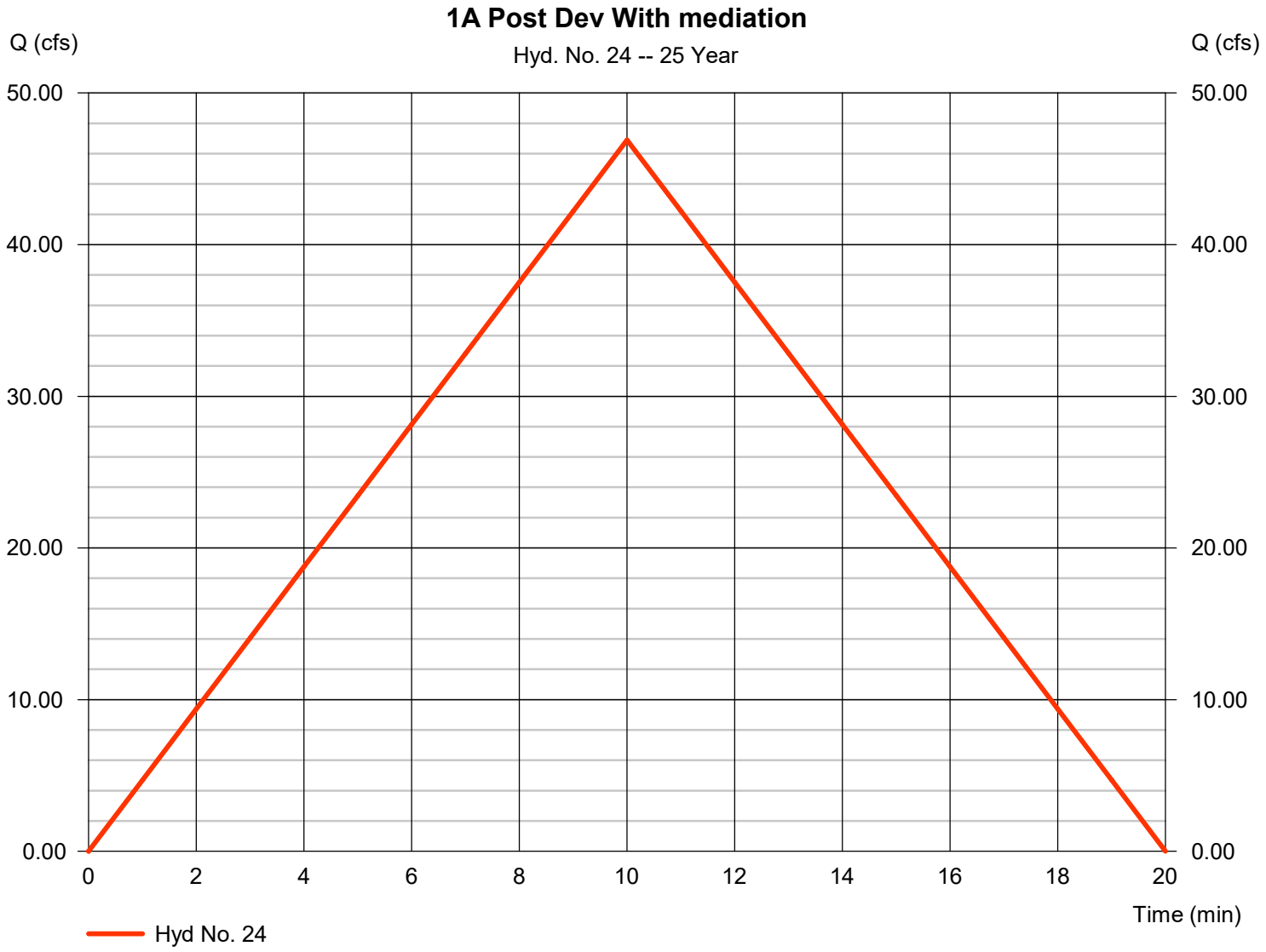


Hydrograph Report

Hyd. No. 24

1A Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	46.91 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	28,145 cuft
Drainage area	=	20.060 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

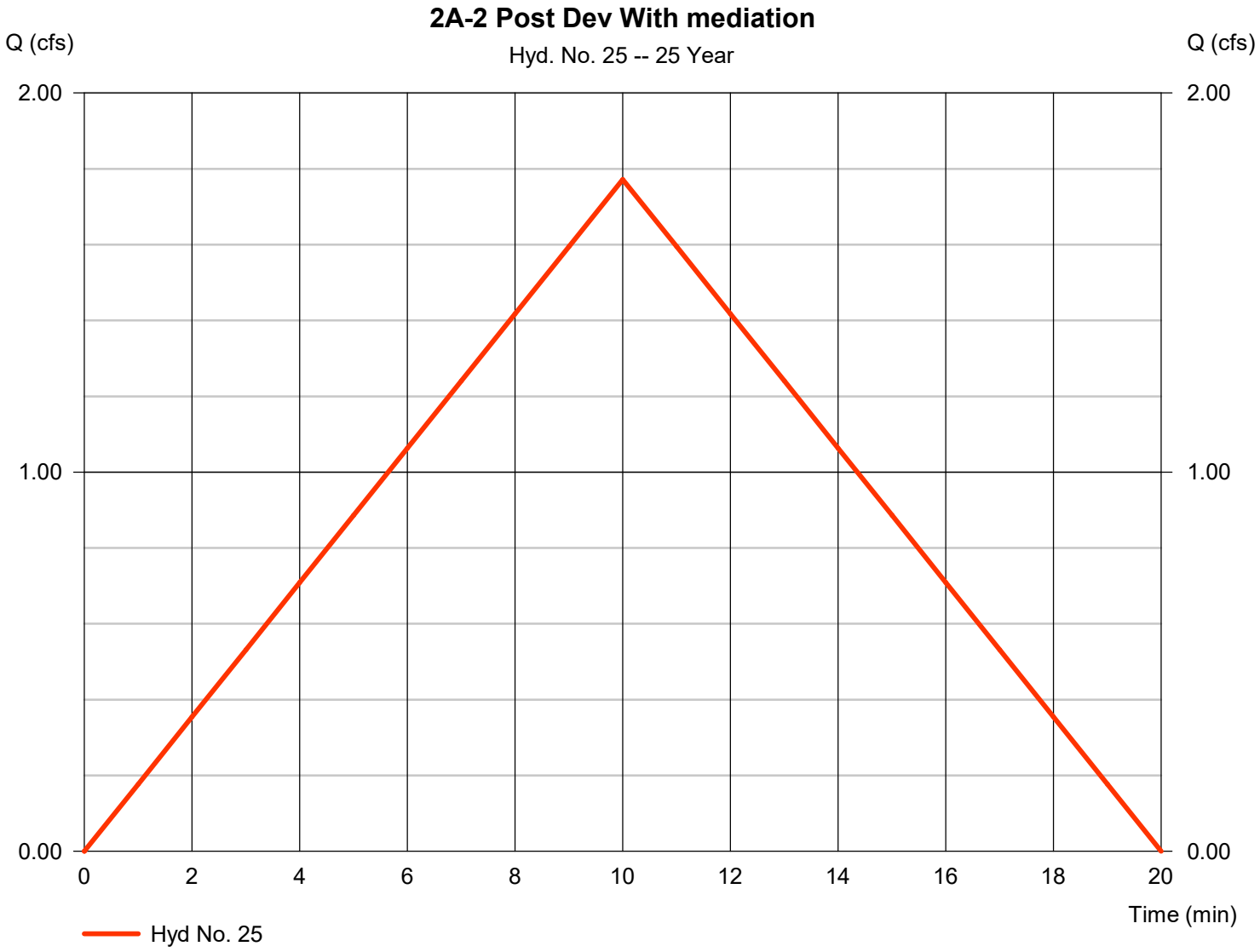


Hydrograph Report

Hyd. No. 25

2A-2 Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	1.772 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,063 cuft
Drainage area	=	0.620 ac	Runoff coeff.	=	0.55
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



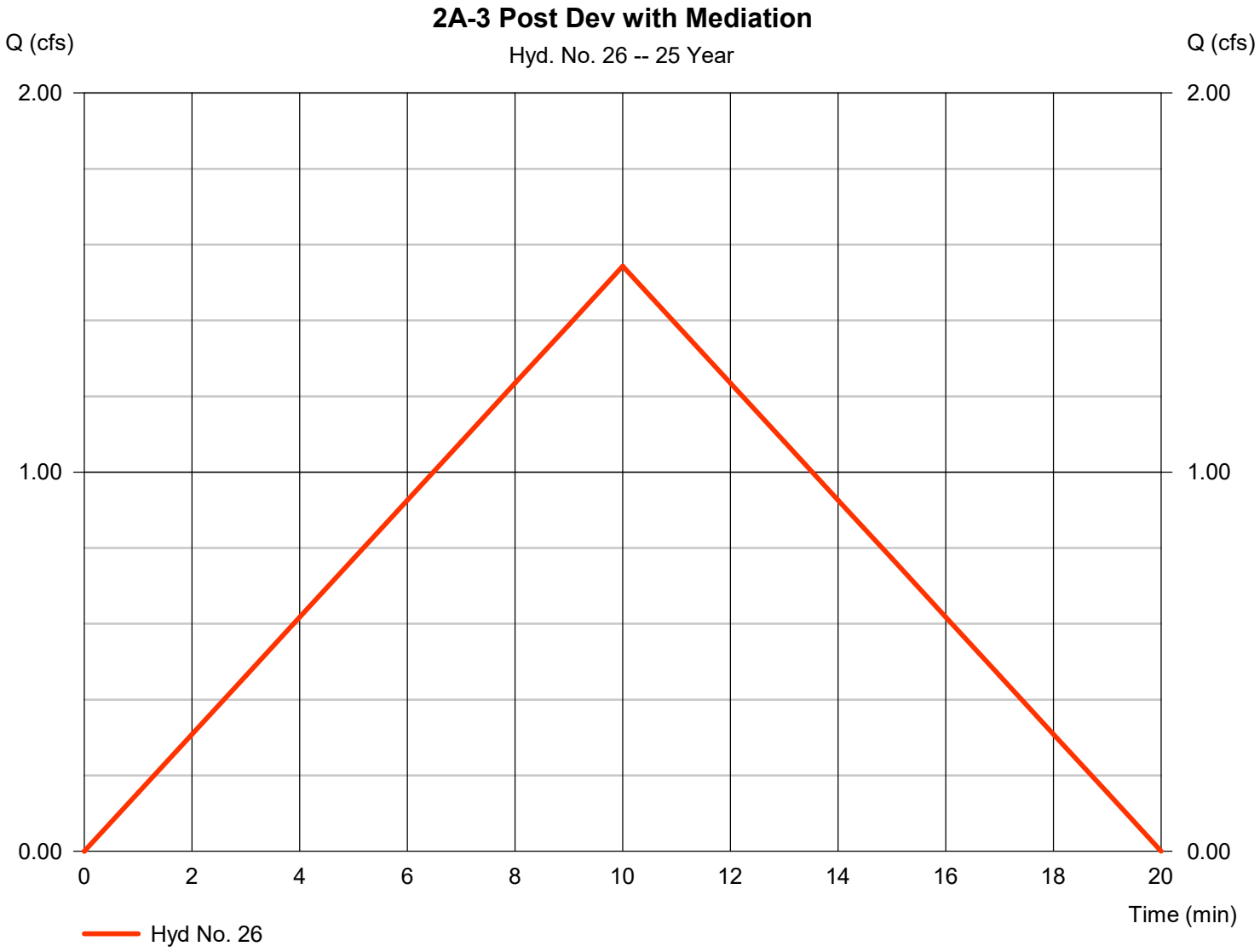
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 26

2A-3 Post Dev with Mediation

Hydrograph type	=	Rational	Peak discharge	=	1.543 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	926 cuft
Drainage area	=	0.540 ac	Runoff coeff.	=	0.55
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



Hydrograph Report

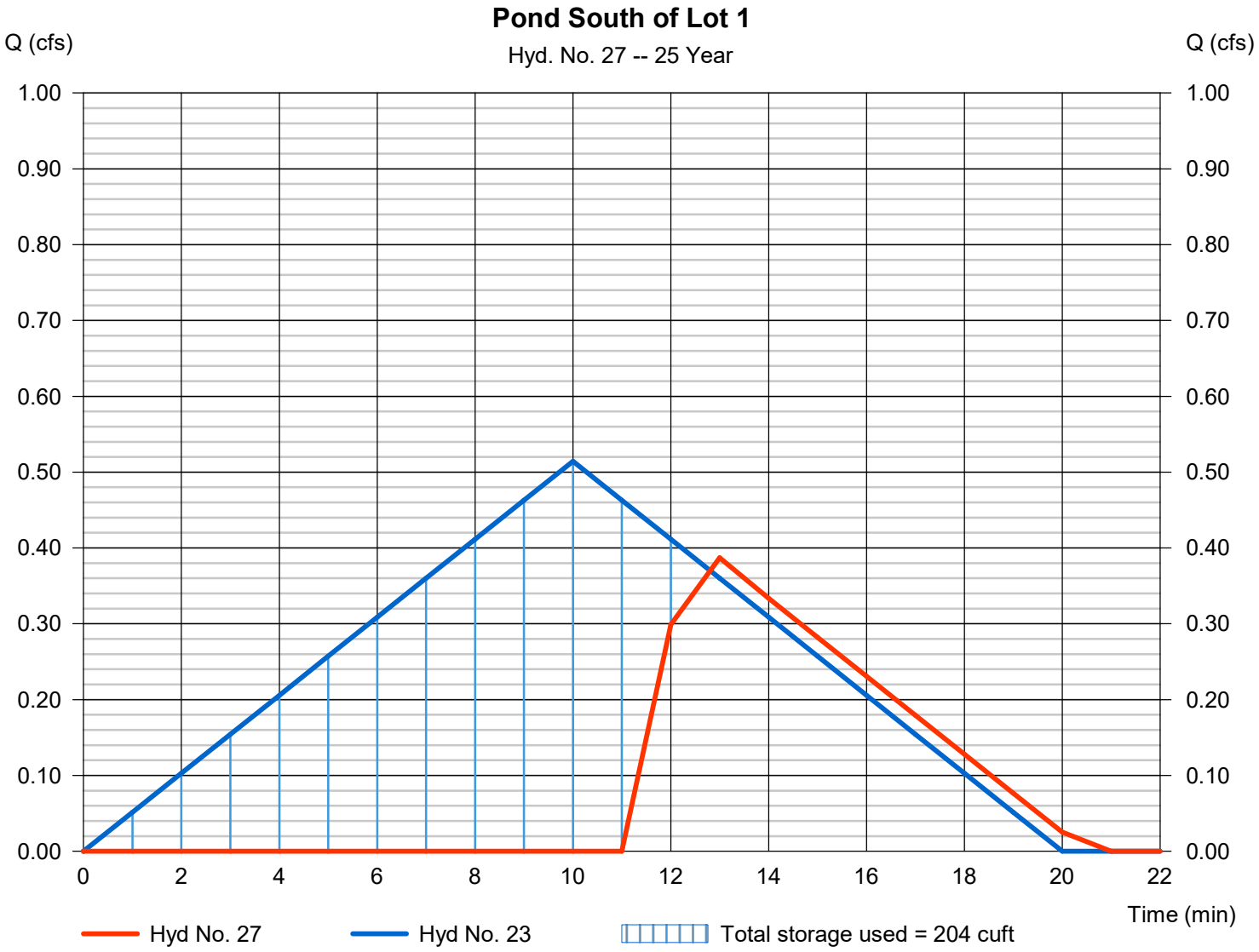
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 27

Pond South of Lot 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.387 cfs
Storm frequency	=	25 yrs	Time to peak	=	13 min
Time interval	=	1 min	Hyd. volume	=	116 cuft
Inflow hyd. No.	=	23 - 2A-1 Post Dev with mediation	Max. Elevation	=	100.85 ft
Reservoir name	=	Pond on South of Lot 1	Max. Storage	=	204 cuft

Storage Indication method used.



Hydrograph Report

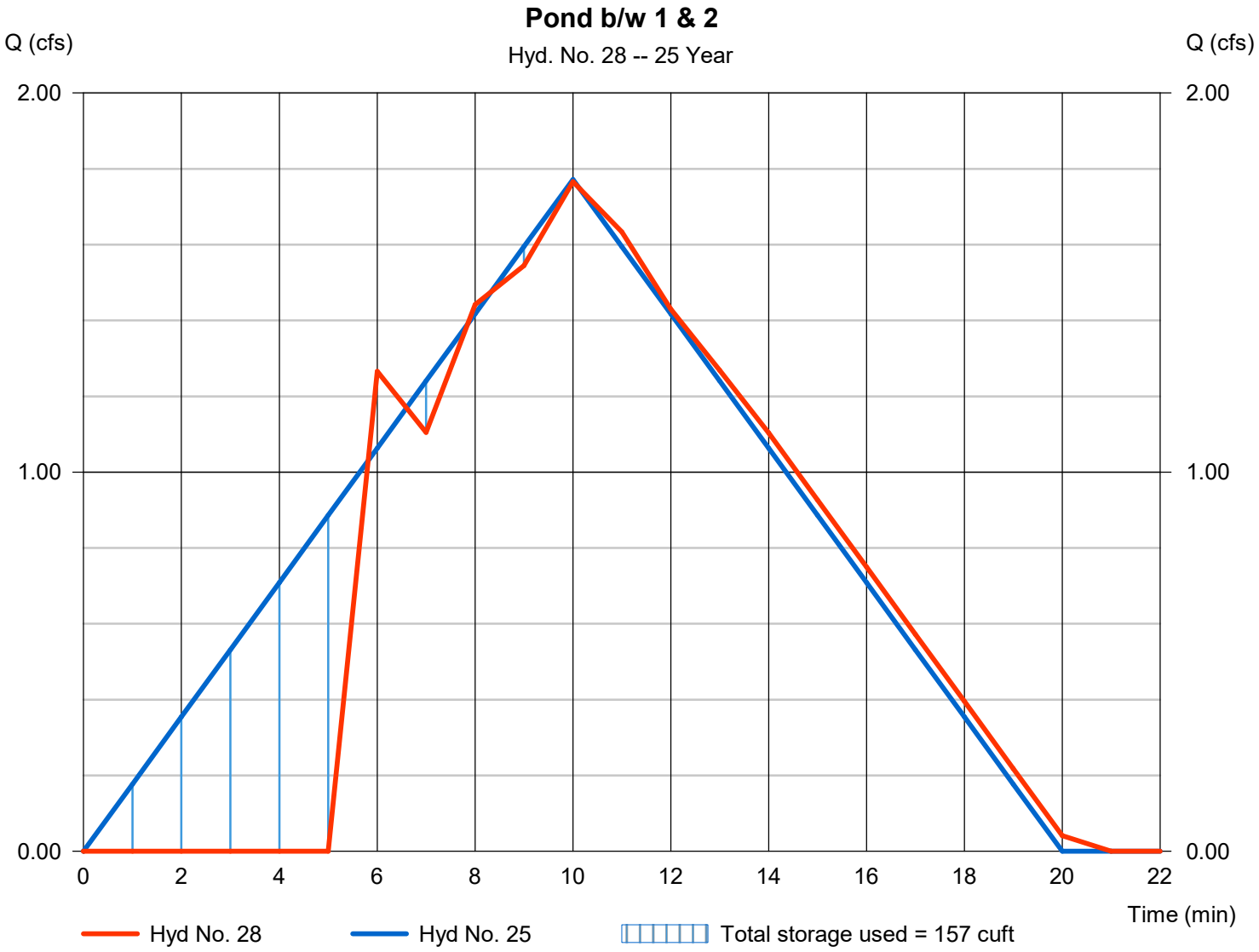
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 28

Pond b/w 1 & 2

Hydrograph type	=	Reservoir	Peak discharge	=	1.766 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	928 cuft
Inflow hyd. No.	=	25 - 2A-2 Post Dev With median	Max. Elevation	=	100.92 ft
Reservoir name	=	Pond B/w 1&2	Max. Storage	=	157 cuft

Storage Indication method used.



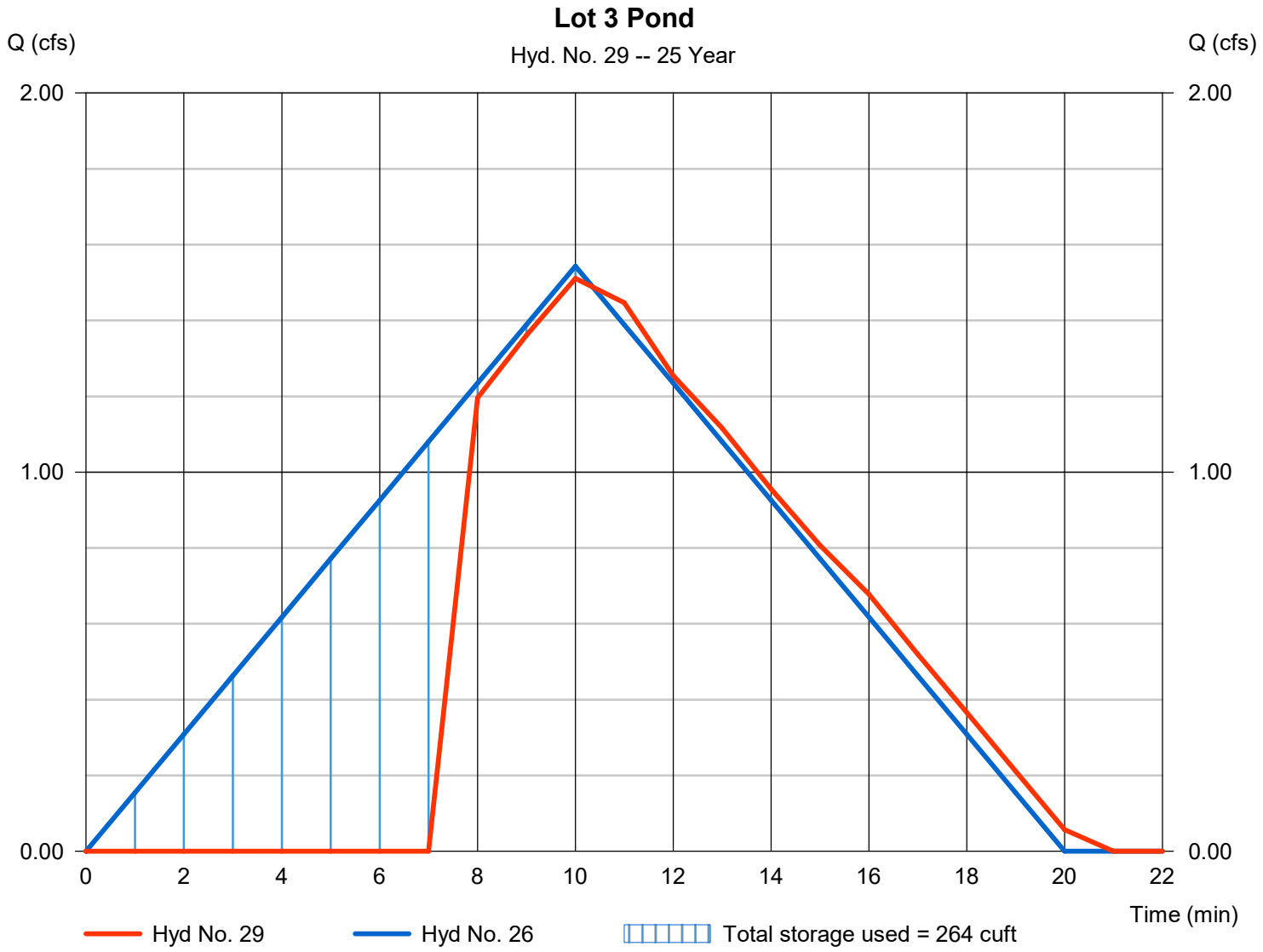
Hydrograph Report

Hyd. No. 29

Lot 3 Pond

Hydrograph type	=	Reservoir	Peak discharge	=	1.511 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	689 cuft
Inflow hyd. No.	=	26 - 2A-3 Post Dev with Mediation	Max. Elevation	=	101.95 ft
Reservoir name	=	Lot 3 Pond	Max. Storage	=	264 cuft

Storage Indication method used.

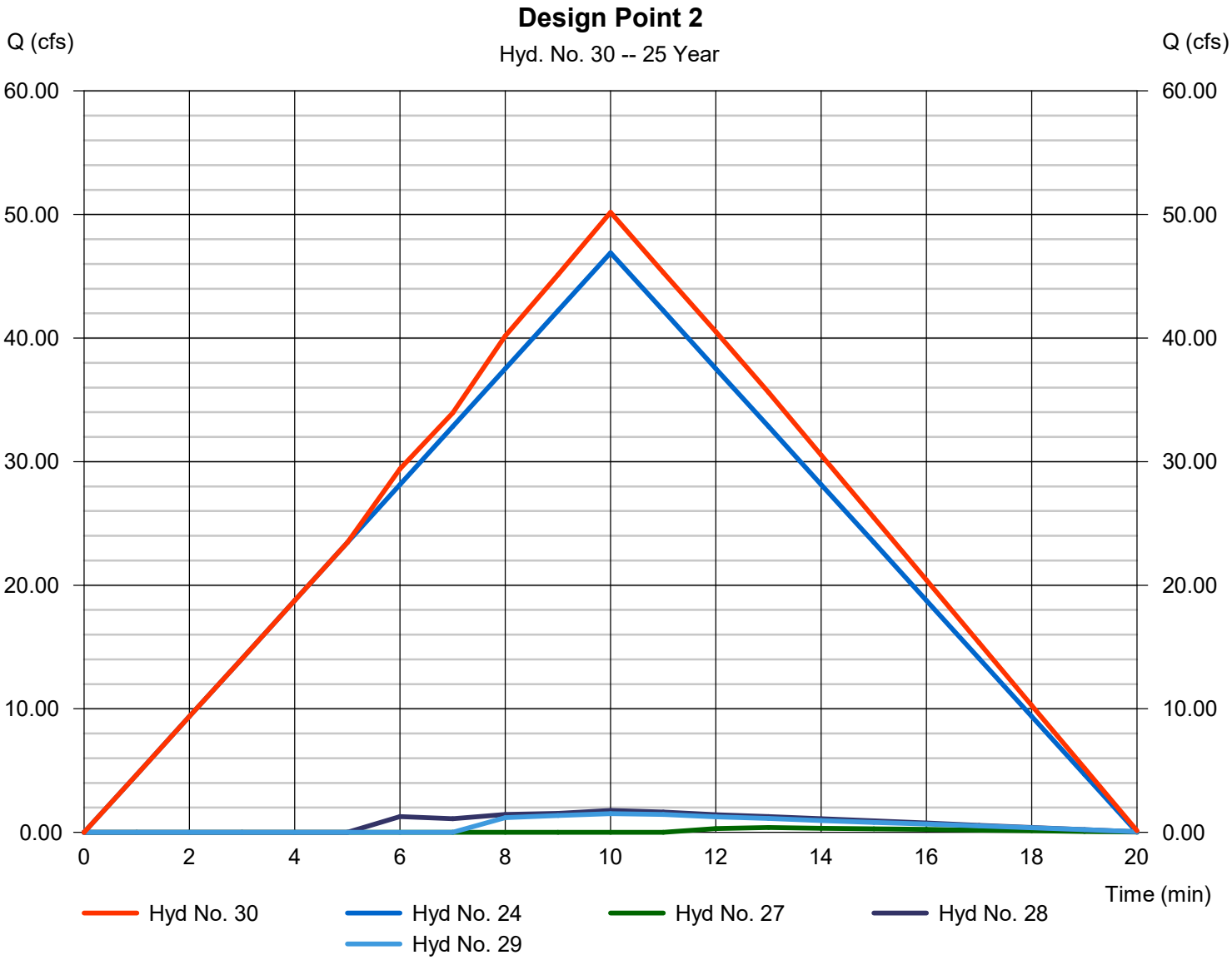


Hydrograph Report

Hyd. No. 30

Design Point 2

Hydrograph type	= Combine	Peak discharge	= 50.19 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 29,878 cuft
Inflow hyds.	= 24, 27, 28, 29	Contrib. drain. area	= 20.060 ac

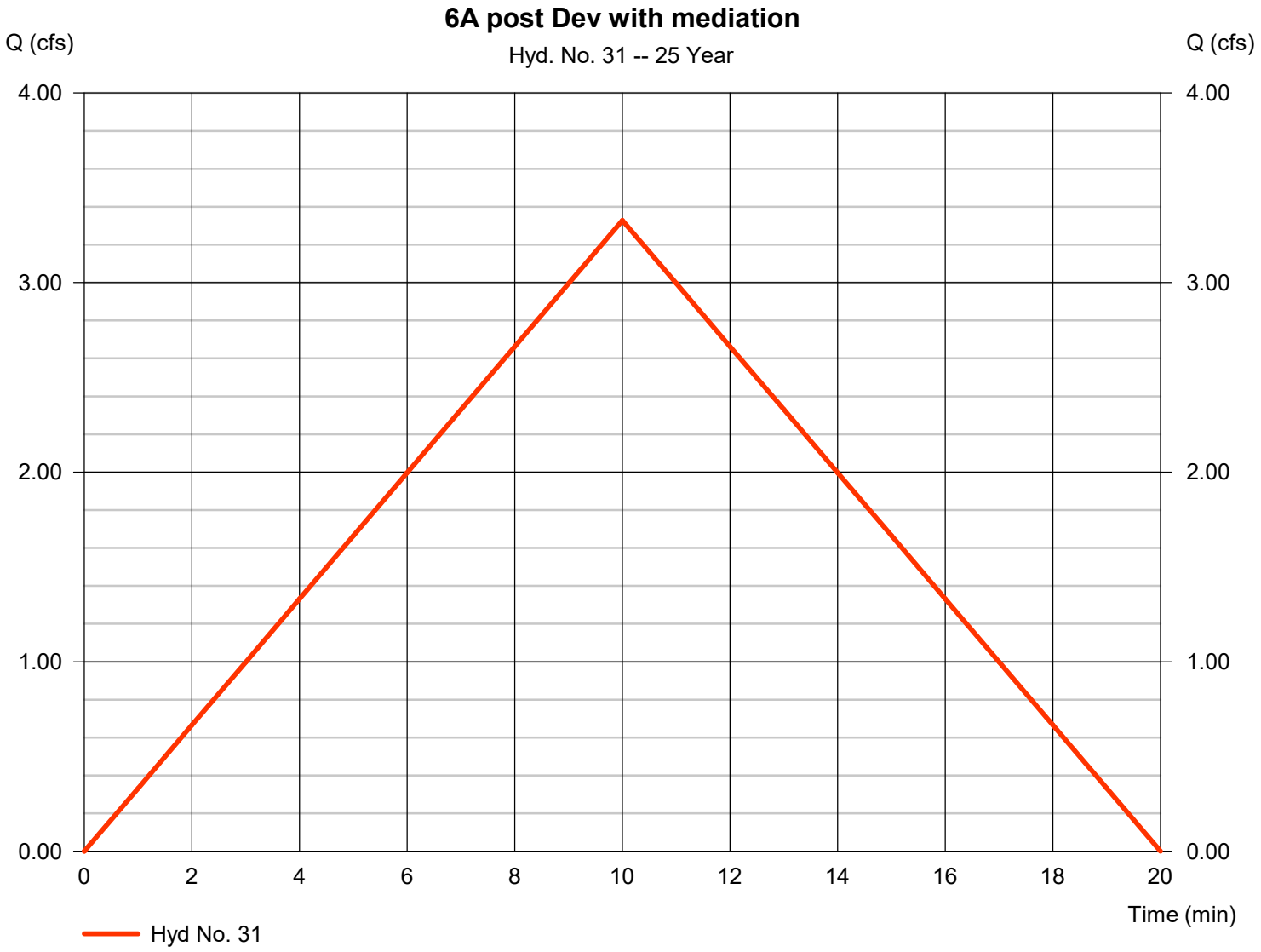


Hydrograph Report

Hyd. No. 31

6A post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	3.328 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,997 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



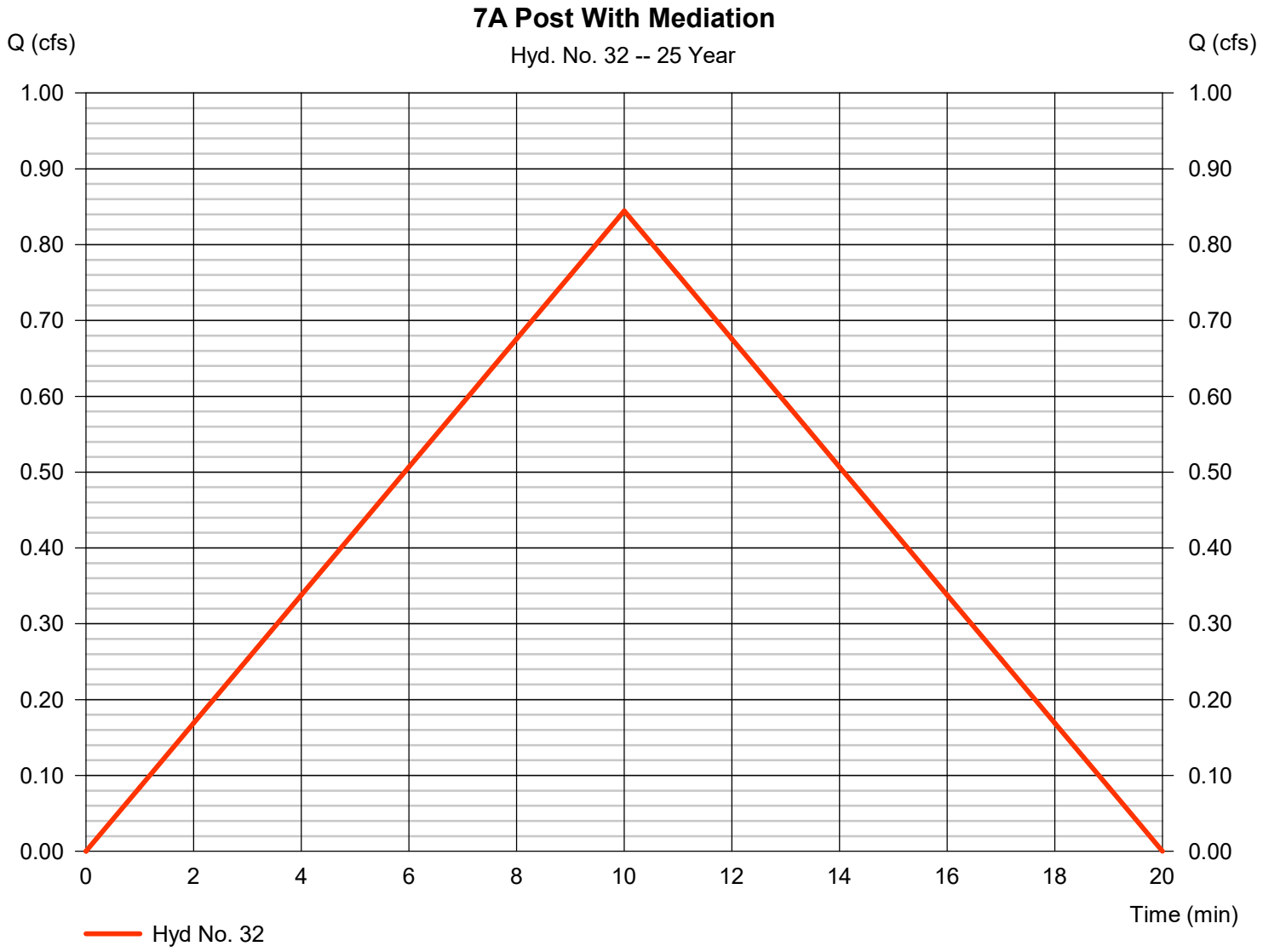
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 32

7A Post With Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.844 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	507 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



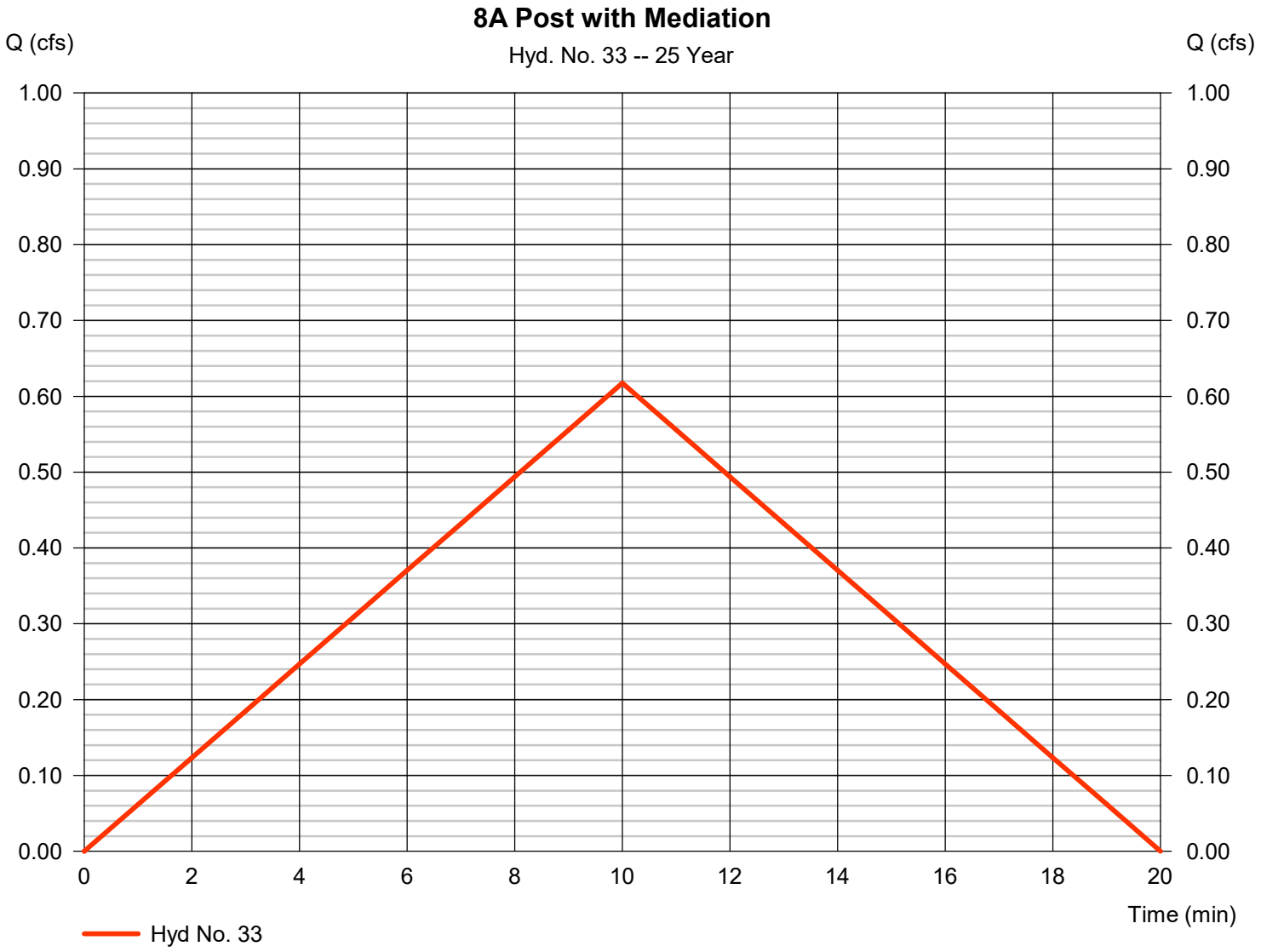
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 33

8A Post with Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.617 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	370 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



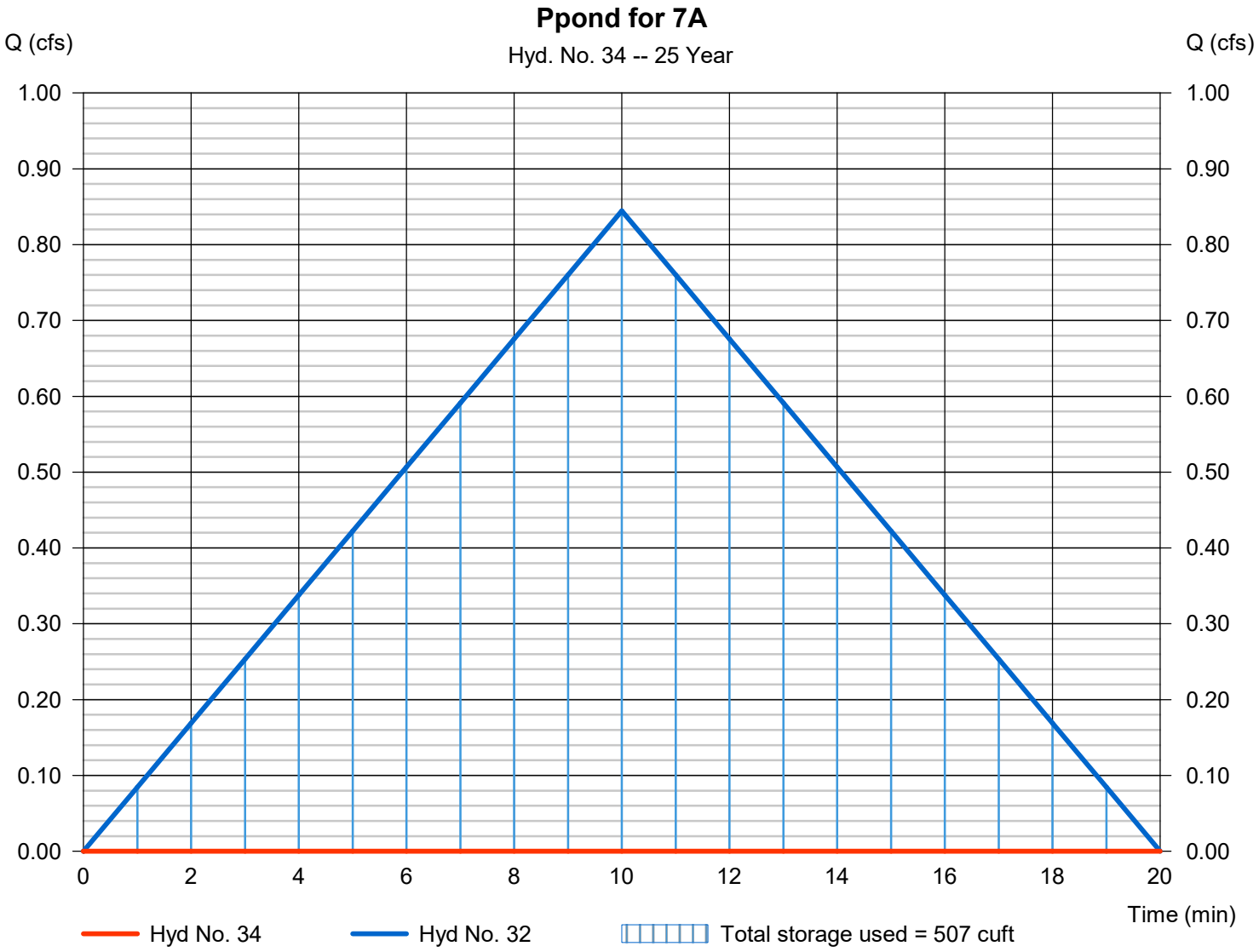
Hydrograph Report

Hyd. No. 34

Ppond for 7A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	25 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	32 - 7A Post With Mediation	Max. Elevation	=	101.31 ft
Reservoir name	=	Pond for 7A	Max. Storage	=	507 cuft

Storage Indication method used.



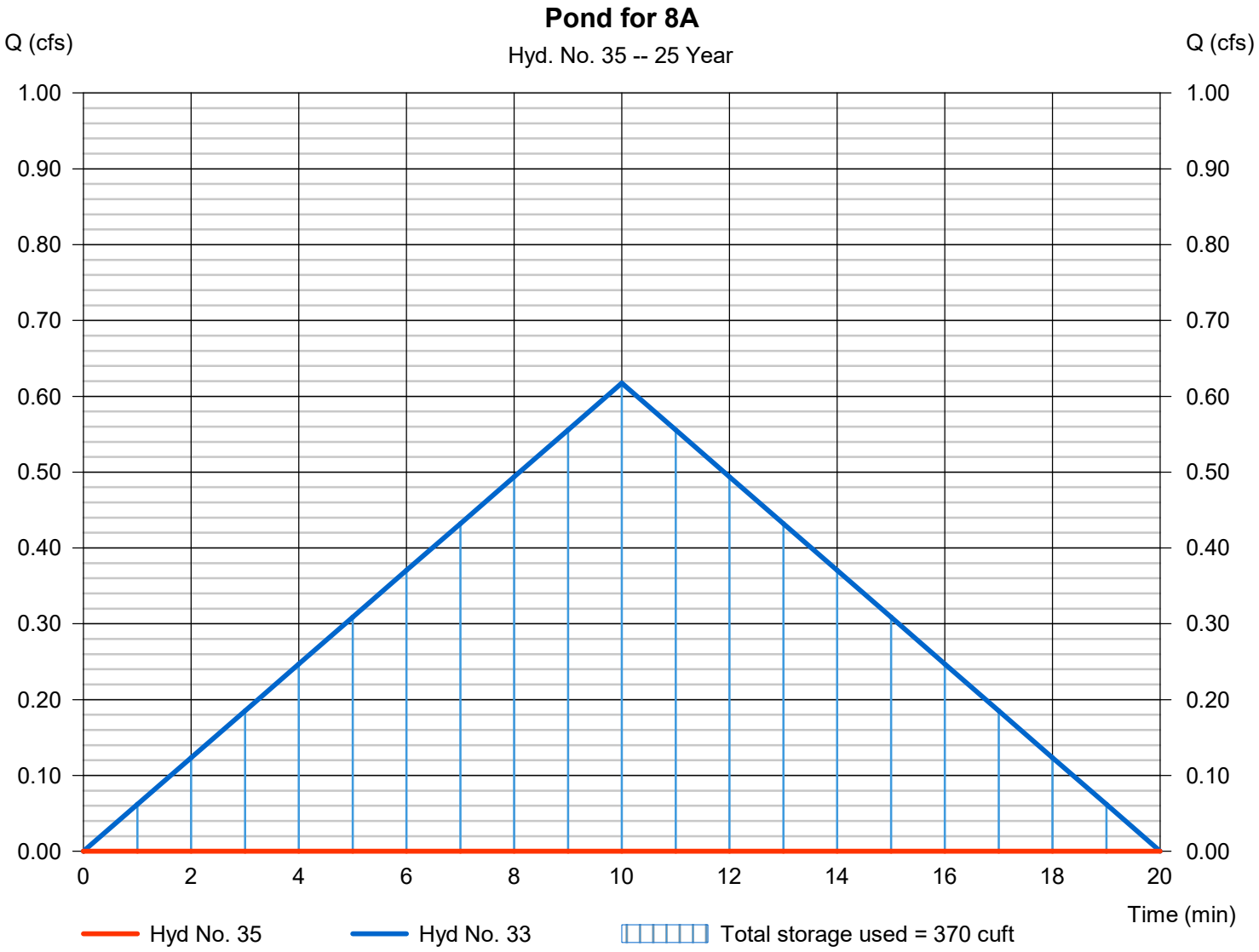
Hydrograph Report

Hyd. No. 35

Pond for 8A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	25 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	33 - 8A Post with Mediation	Max. Elevation	=	101.67 ft
Reservoir name	=	Pond for 8A	Max. Storage	=	370 cuft

Storage Indication method used.

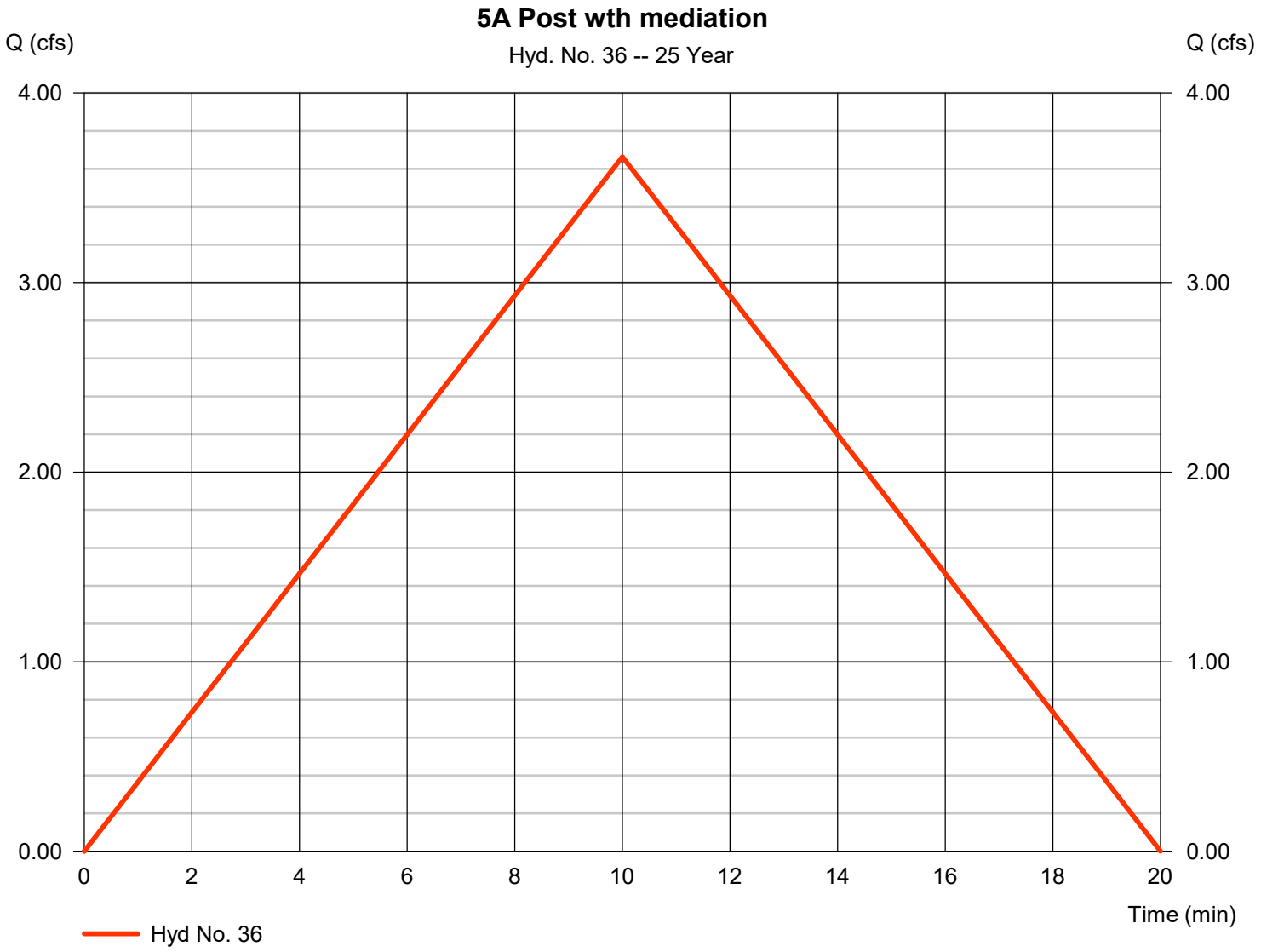


Hydrograph Report

Hyd. No. 36

5A Post wth mediation

Hydrograph type	=	Rational	Peak discharge	=	3.664 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,198 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

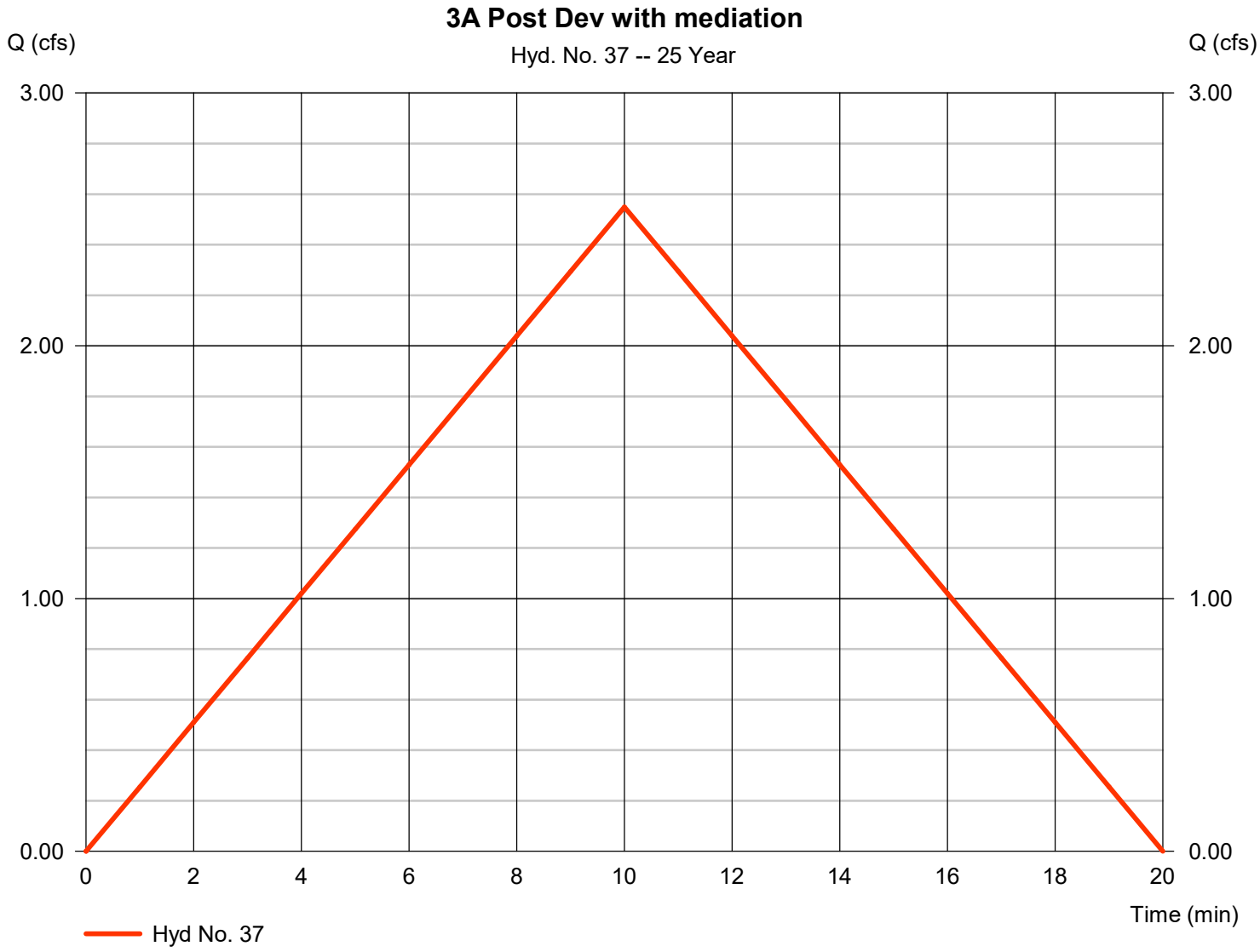


Hydrograph Report

Hyd. No. 37

3A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	2.549 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,529 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

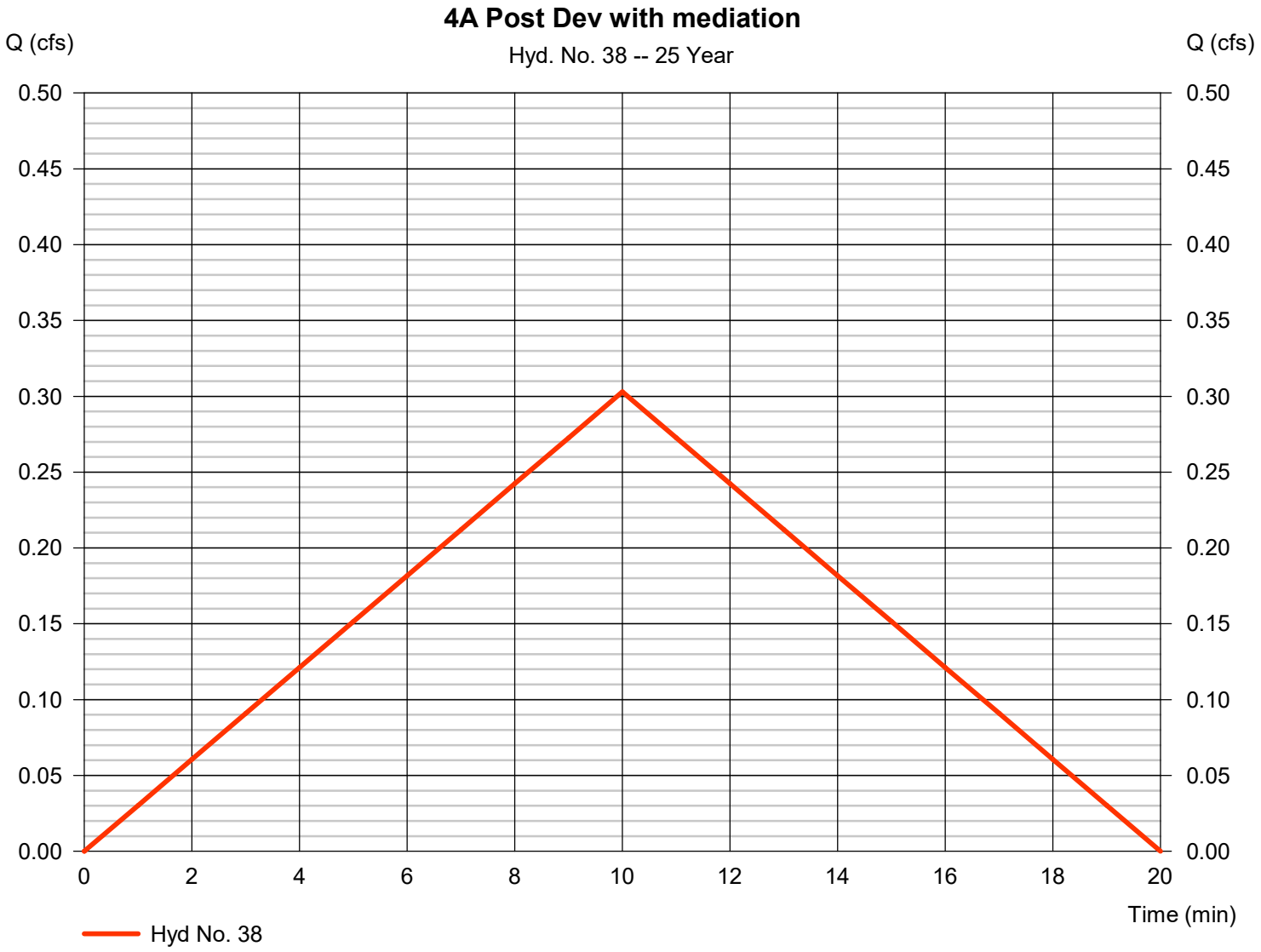


Hydrograph Report

Hyd. No. 38

4A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.303 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	182 cuft
Drainage area	=	0.110 ac	Runoff coeff.	=	0.53
Intensity	=	5.197 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

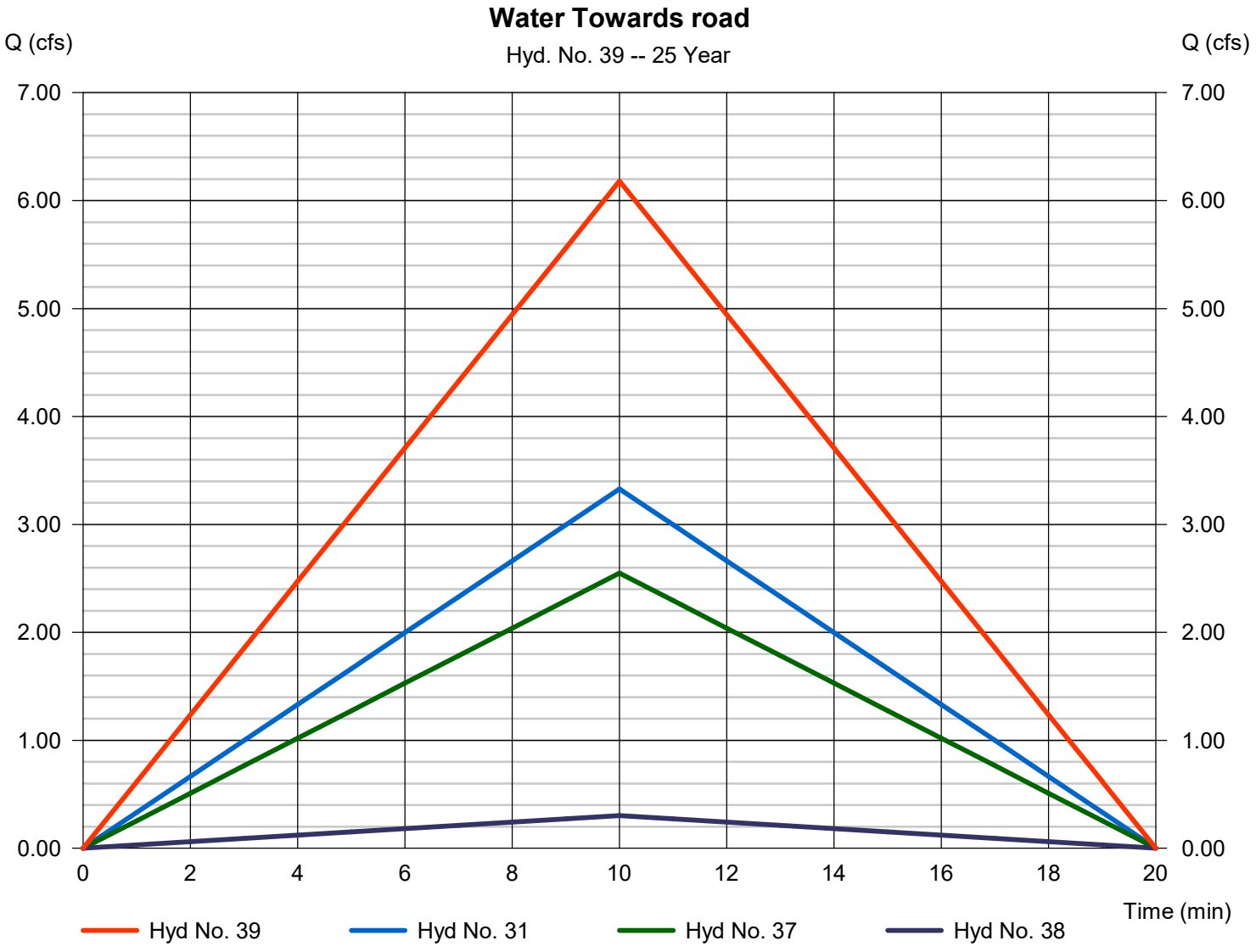


Hydrograph Report

Hyd. No. 39

Water Towards road

Hydrograph type	= Combine	Peak discharge	= 6.180 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 3,708 cuft
Inflow hyds.	= 31, 37, 38	Contrib. drain. area	= 2.250 ac



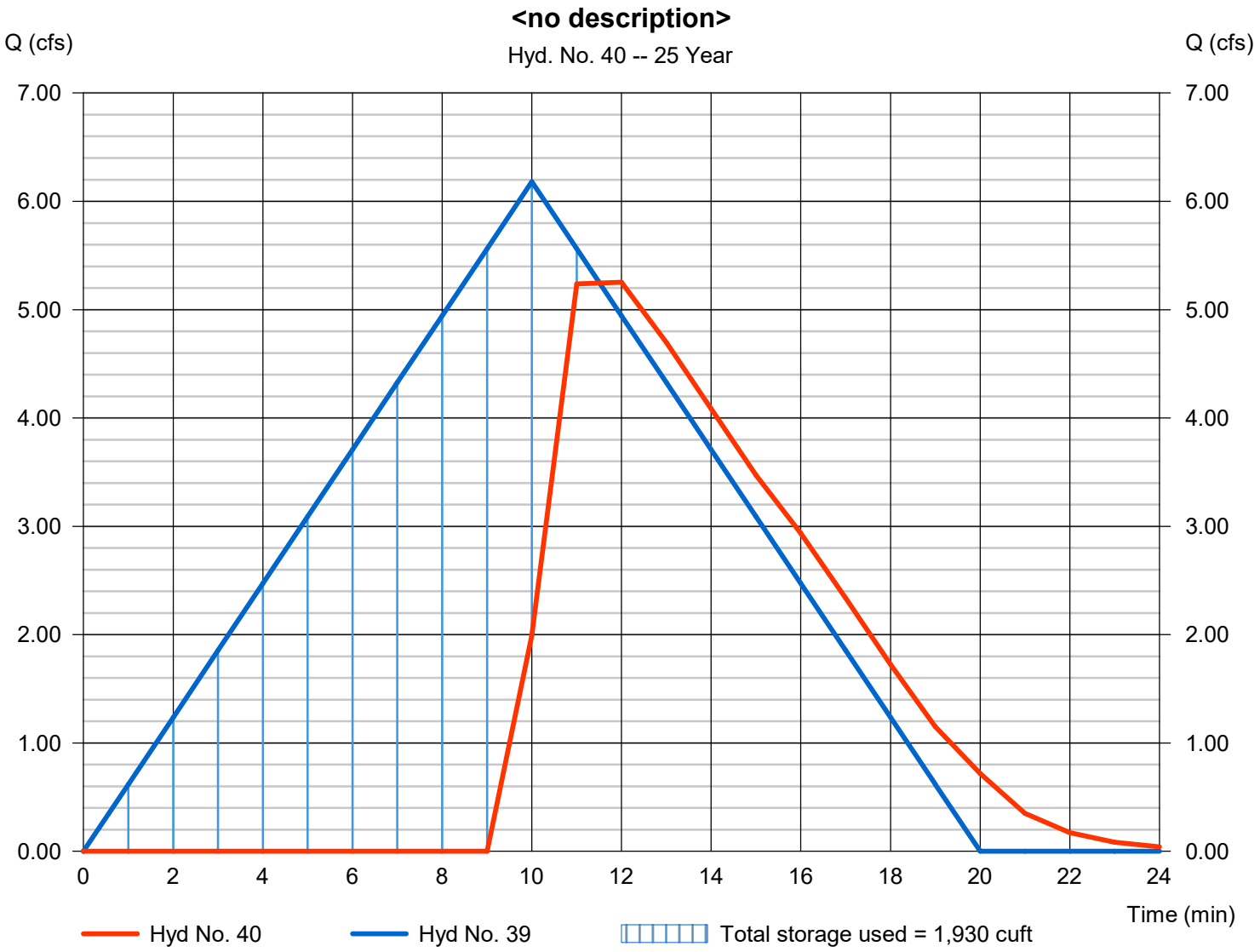
Hydrograph Report

Hyd. No. 40

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	5.252 cfs
Storm frequency	=	25 yrs	Time to peak	=	12 min
Time interval	=	1 min	Hyd. volume	=	2,057 cuft
Inflow hyd. No.	=	39 - Water Towards road	Max. Elevation	=	102.76 ft
Reservoir name	=	Lot 4 Pond	Max. Storage	=	1,930 cuft

Storage Indication method used.

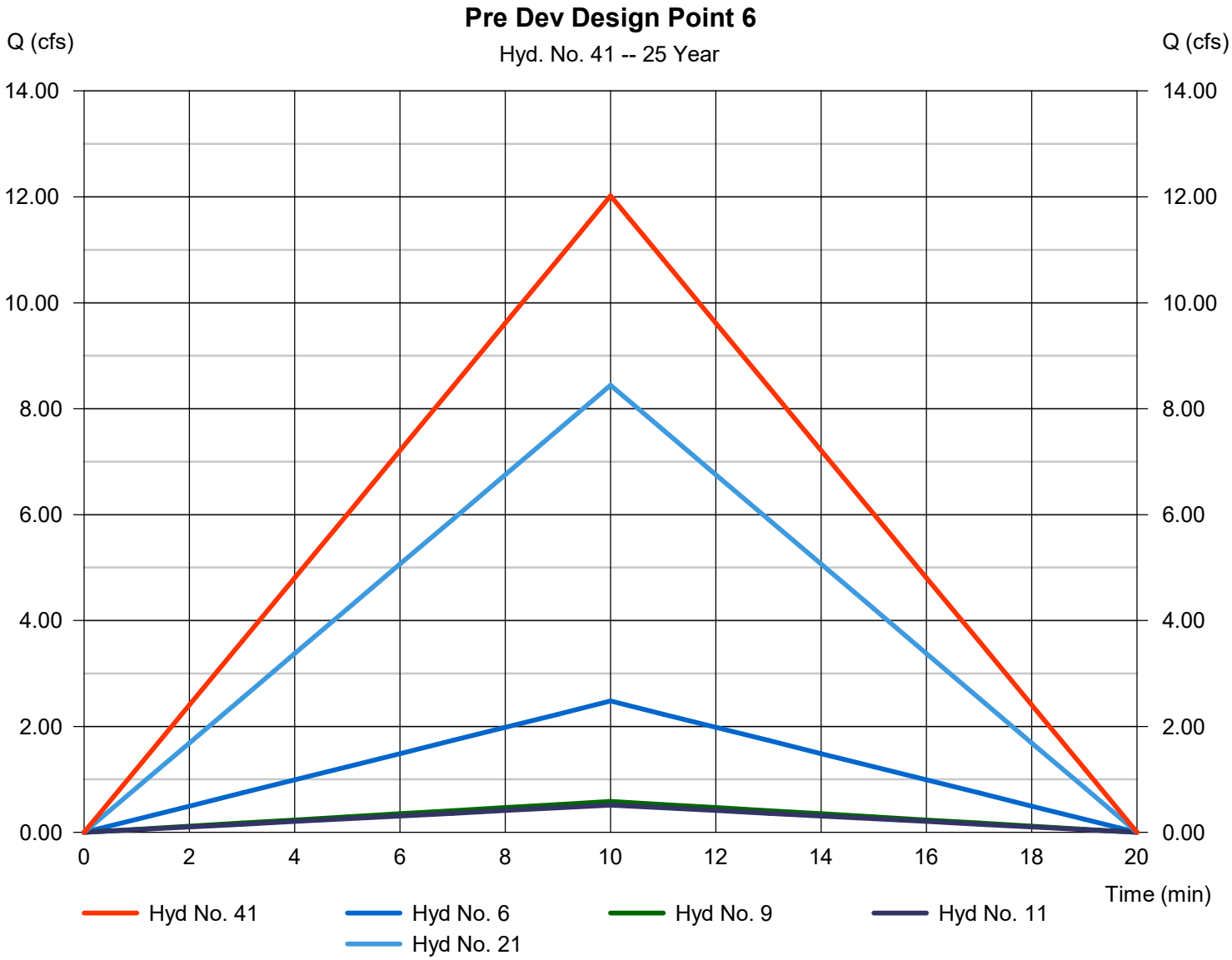


Hydrograph Report

Hyd. No. 41

Pre Dev Design Point 6

Hydrograph type	= Combine	Peak discharge	= 12.02 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 7,212 cuft
Inflow hyds.	= 6, 9, 11, 21	Contrib. drain. area	= 1.530 ac



Hydrograph Report

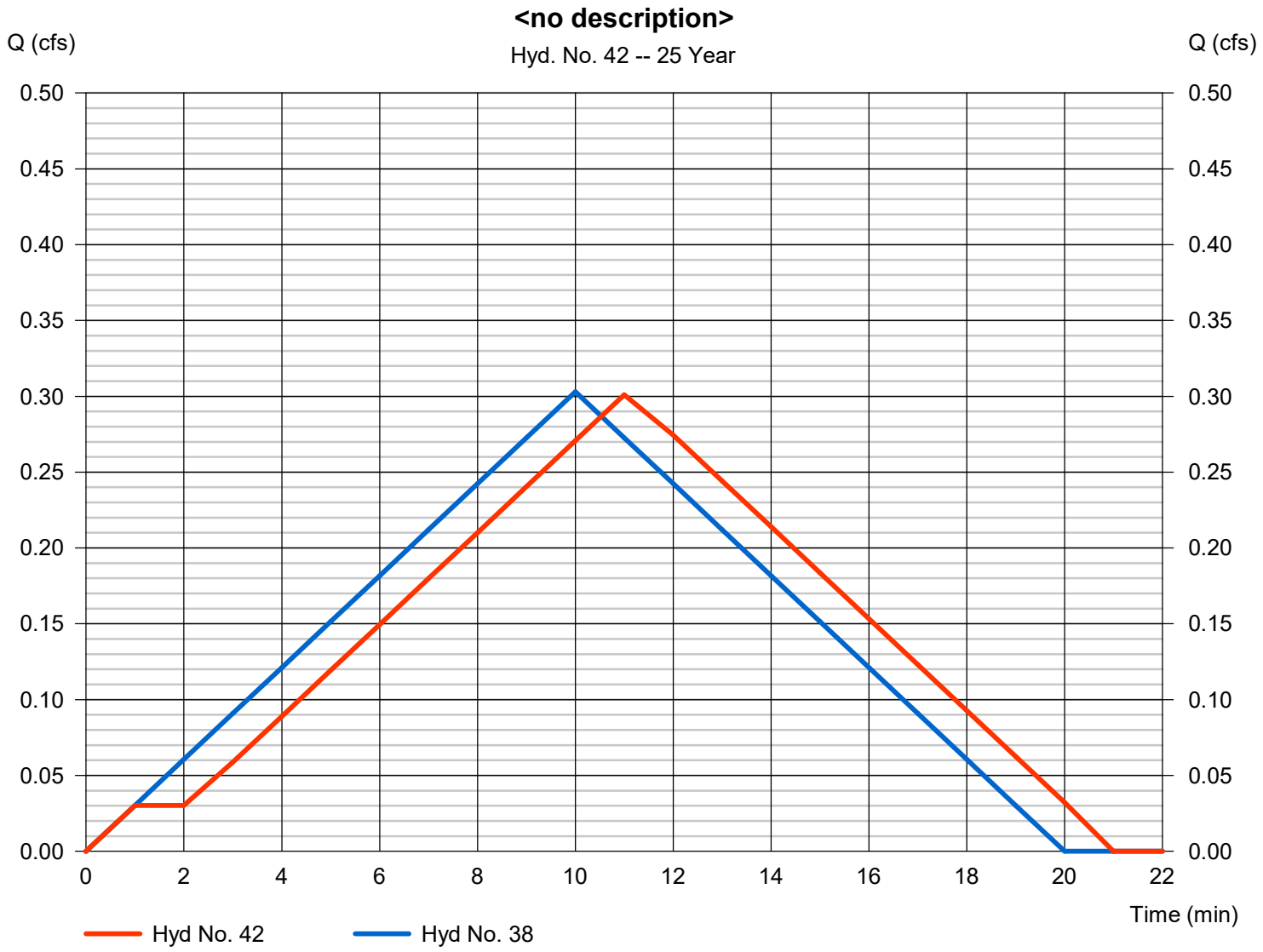
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 42

<no description>

Hydrograph type	=	Reach	Peak discharge	=	0.301 cfs
Storm frequency	=	25 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	184 cuft
Inflow hyd. No.	=	38 - 4A Post Dev with mediation	Section type	=	Triangular
Reach length	=	140.0 ft	Channel slope	=	28.0 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	6.3:1	Max. depth	=	0.0 ft
Rating curve x	=	6.755	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.9408

Modified Att-Kin routing method used.

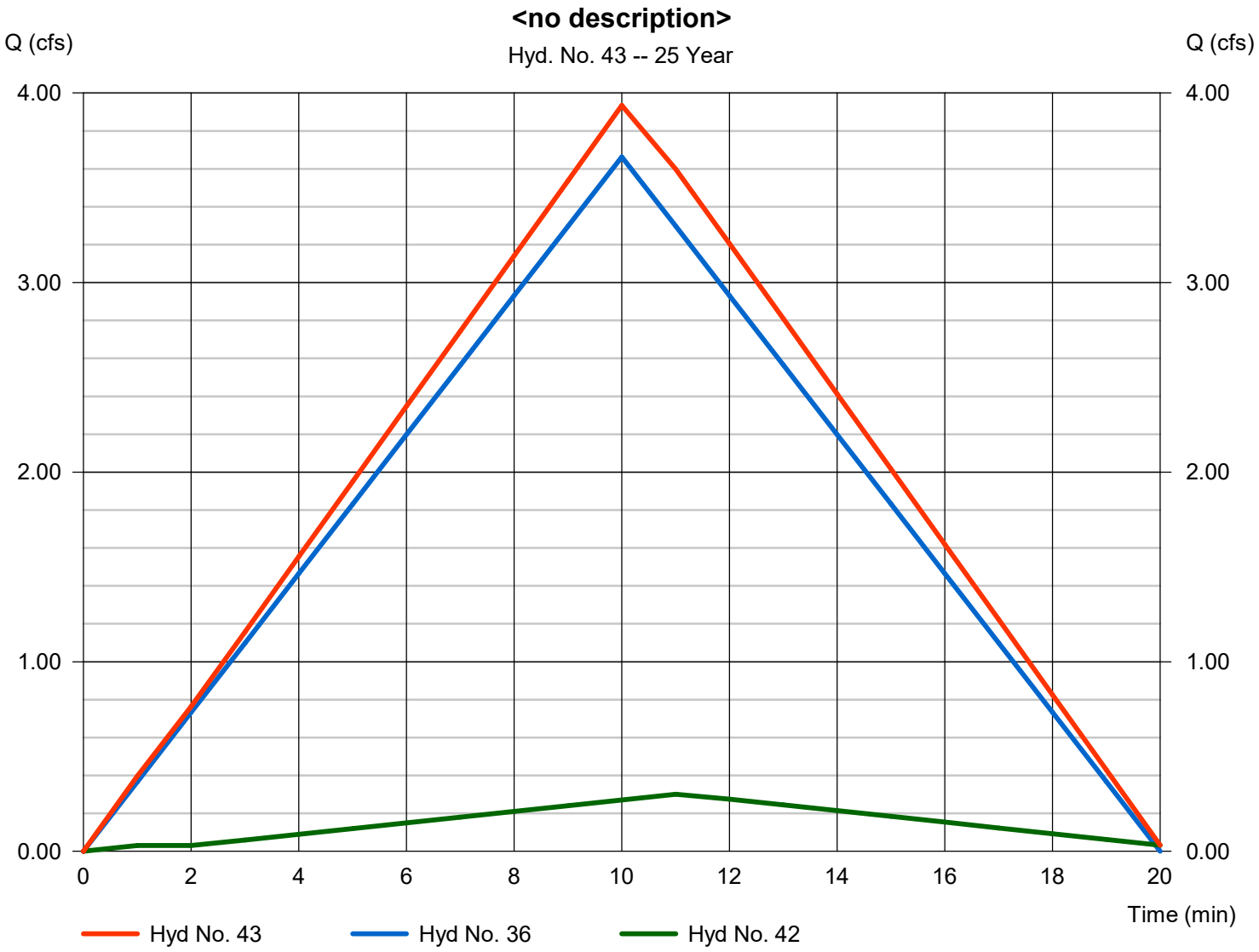


Hydrograph Report

Hyd. No. 43

<no description>

Hydrograph type	=	Combine	Peak discharge	=	3.934 cfs
Storm frequency	=	25 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,382 cuft
Inflow hyds.	=	36, 42	Contrib. drain. area	=	1.410 ac



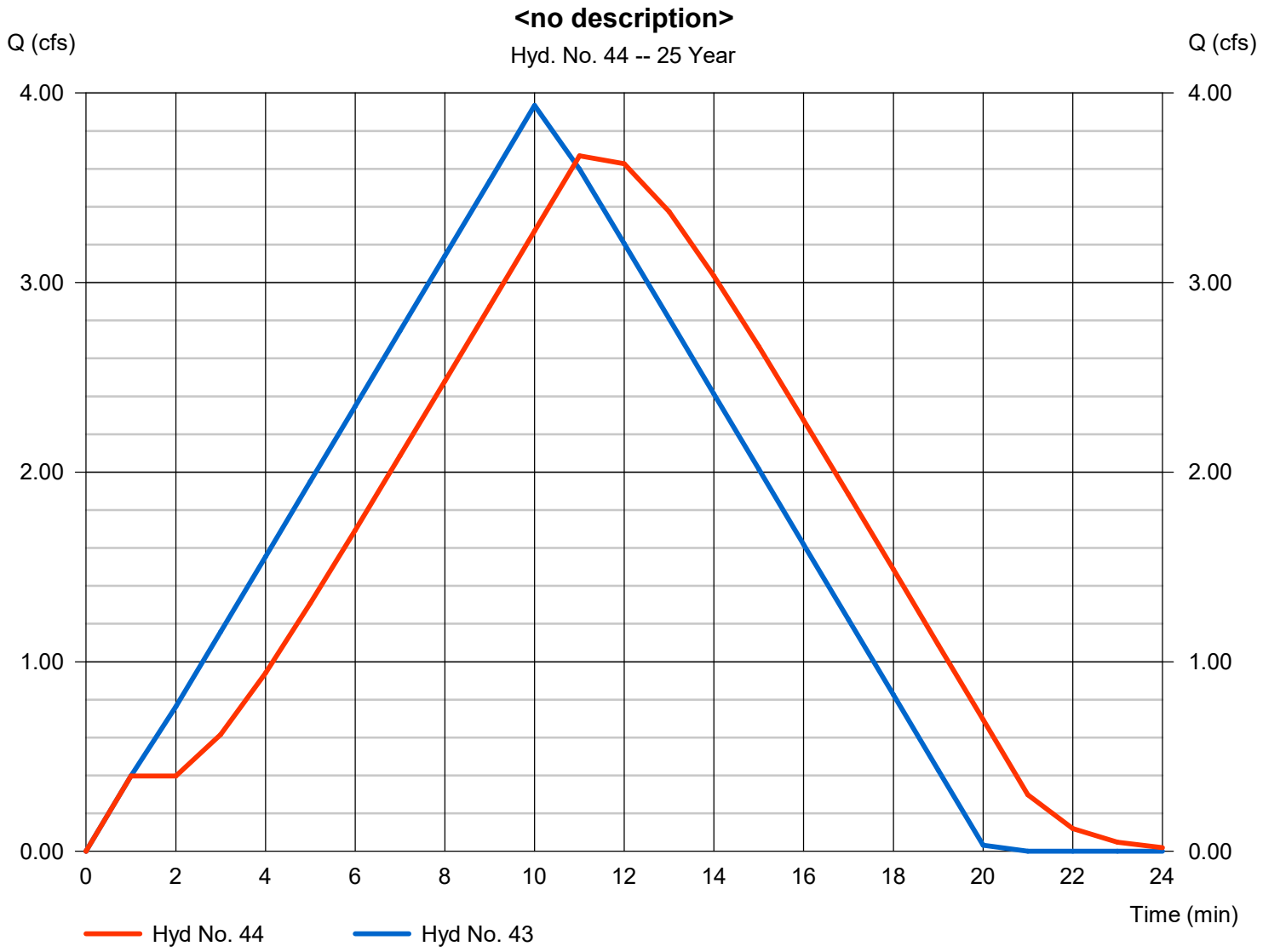
Hydrograph Report

Hyd. No. 44

<no description>

Hydrograph type	=	Reach	Peak discharge	=	3.669 cfs
Storm frequency	=	25 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	2,421 cuft
Inflow hyd. No.	=	43 - <no description>	Section type	=	Triangular
Reach length	=	307.0 ft	Channel slope	=	7.1 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	8.3:1	Max. depth	=	0.0 ft
Rating curve x	=	3.091	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.5992

Modified Att-Kin routing method used.

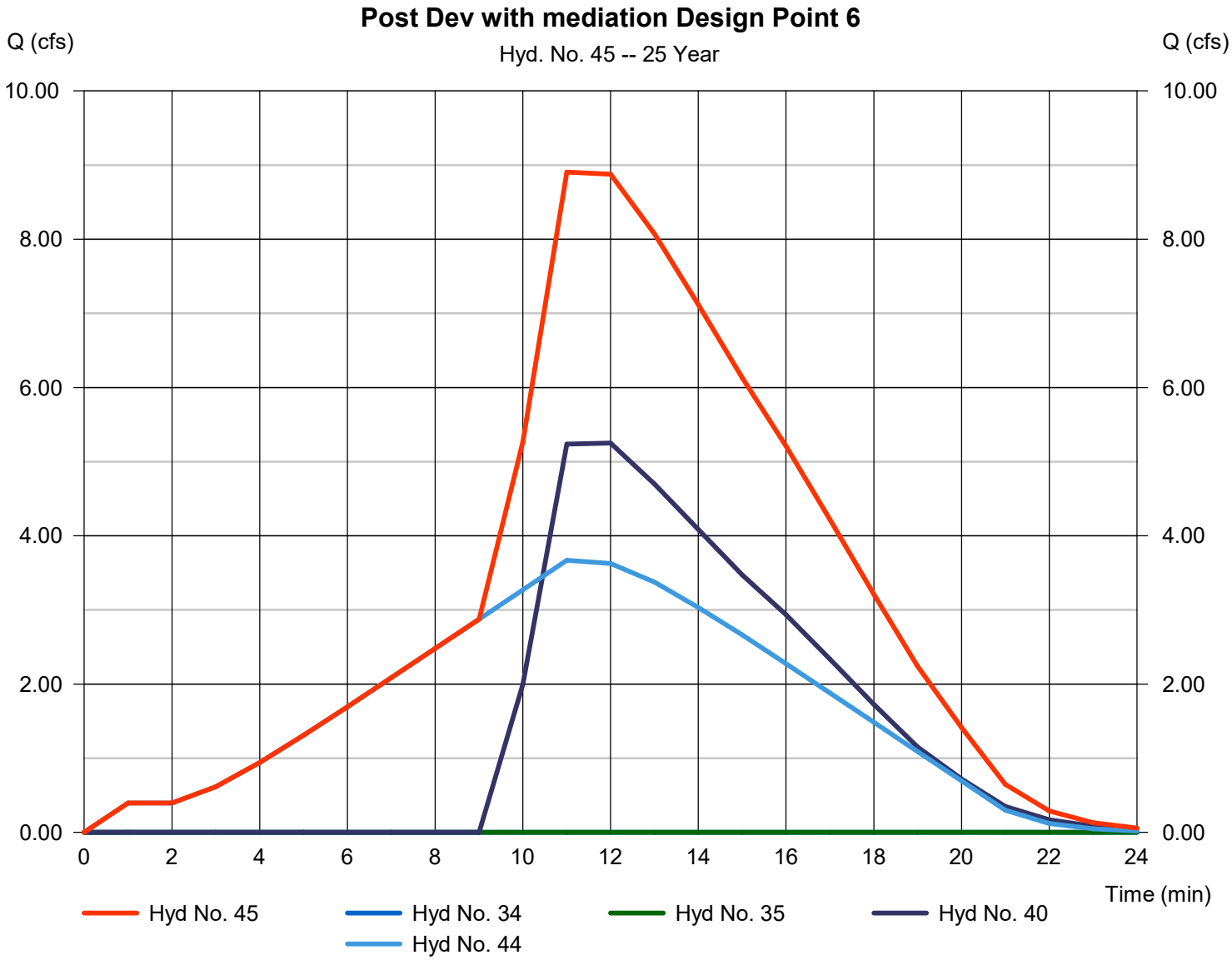


Hydrograph Report

Hyd. No. 45

Post Dev with mediation Design Point 6

Hydrograph type	=	Combine	Peak discharge	=	8.907 cfs
Storm frequency	=	25 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	4,478 cuft
Inflow hyds.	=	34, 35, 40, 44	Contrib. drain. area	=	0.000 ac

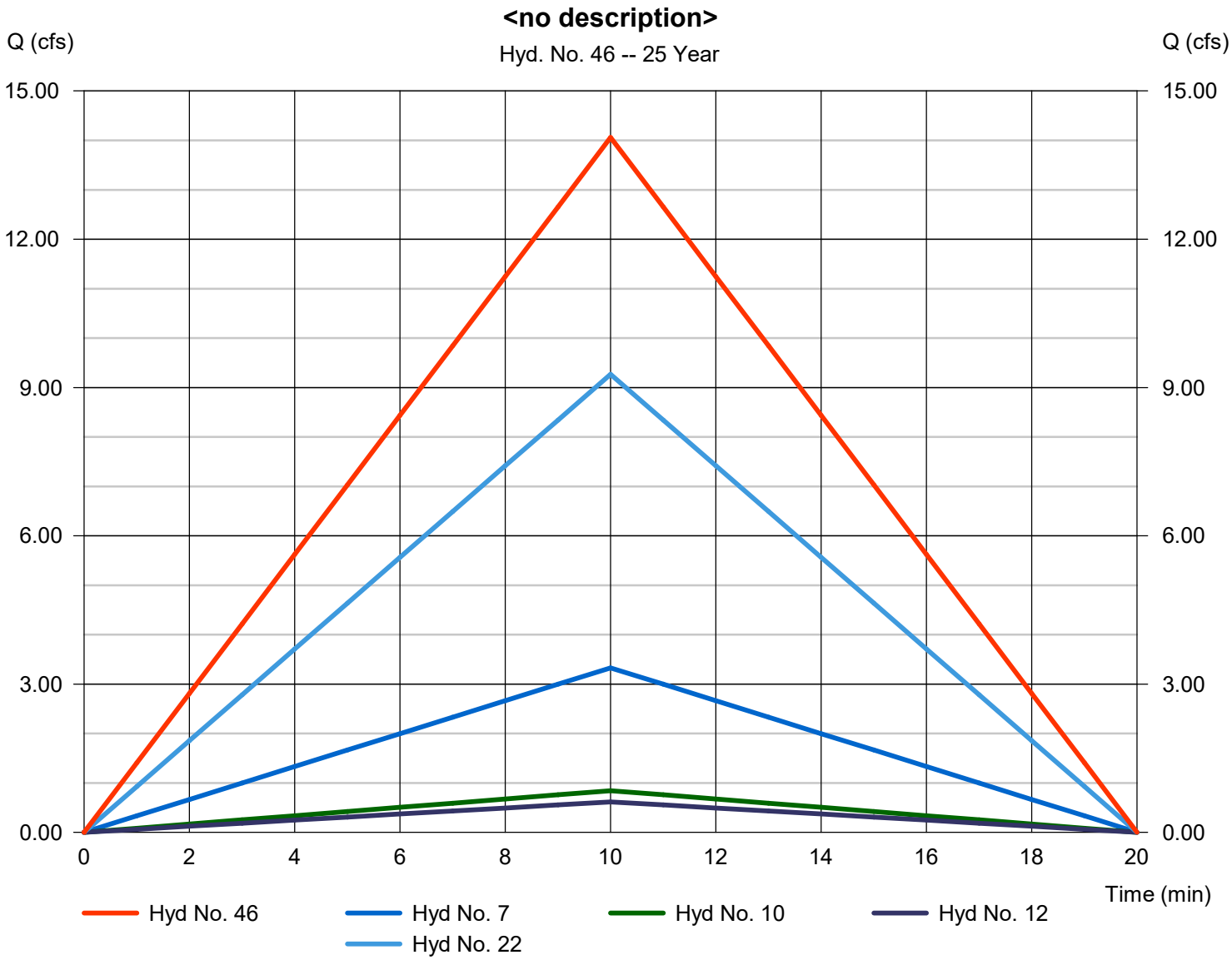


Hydrograph Report

Hyd. No. 46

<no description>

Hydrograph type	= Combine	Peak discharge	= 14.06 cfs
Storm frequency	= 25 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 8,436 cuft
Inflow hyds.	= 7, 10, 12, 22	Contrib. drain. area	= 1.520 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	Rational	56.29	1	10	33,773	------	------	------	1A Pre
2	Rational	4.475	1	10	2,685	------	------	------	2A Post
3	Rational	2.978	1	10	1,787	------	------	------	3A Pre
4	Rational	3.033	1	10	1,820	------	------	------	4A Pre
5	Rational	3.853	1	10	2,312	------	------	------	5A Pre
6	Rational	2.896	1	10	1,738	------	------	------	6A Pre
7	Rational	3.889	1	10	2,333	------	------	------	6A Post
8	Rational	3.572	1	10	2,143	------	------	------	4A Post
9	Rational	0.683	1	10	410	------	------	------	7A Pre
10	Rational	0.987	1	10	592	------	------	------	7A Post
11	Rational	0.601	1	10	361	------	------	------	8A Pre
12	Rational	0.721	1	10	433	------	------	------	8A Post
13	Rational	3.661	1	10	2,197	------	------	------	2A Pre
14	Rational	4.281	1	10	2,568	------	------	------	5A Post
15	Rational	56.29	1	10	33,773	------	------	------	1A Post
16	Combine	59.95	1	10	35,969	1, 13,	------	------	1A & 2A Pre Combined
17	Combine	60.76	1	10	36,458	2, 15,	------	------	1A & 2A Post Combined
18	Combine	6.011	1	10	3,607	3, 4,	------	------	3A & 4A Pre Combined
19	Rational	2.978	1	10	1,787	------	------	------	3A Post
20	Combine	6.550	1	10	3,930	8, 19	------	------	3A & 4A Post Combined
21	Combine	9.864	1	10	5,918	5, 18,	------	------	Design Point 5 Pre Dev
22	Combine	10.83	1	10	6,499	14, 20,	------	------	Design Point 5 Post Dev
23	Rational	0.601	1	10	361	------	------	------	2A-1 Post Dev with mediation
24	Rational	54.81	1	10	32,887	------	------	------	1A Post Dev With mediation
25	Rational	2.071	1	10	1,242	------	------	------	2A-2 Post Dev With mediation
26	Rational	1.803	1	10	1,082	------	------	------	2A-3 Post Dev with Mediation
27	Reservoir	0.513	1	12	169	23	100.86	207	Pond South of Lot 1
28	Reservoir	2.071	1	10	1,107	25	100.94	159	Pond b/w 1 & 2
29	Reservoir	1.808	1	10	845	26	101.97	268	Lot 3 Pond
30	Combine	58.69	1	10	35,008	24, 27, 28, 29	------	------	Design Point 2
31	Rational	3.889	1	10	2,333	------	------	------	6A post Dev with mediation
32	Rational	0.987	1	10	592	------	------	------	7A Post With Mediation
33	Rational	0.721	1	10	433	------	------	------	8A Post with Mediation
34	Reservoir	0.000	1	n/a	0	32	101.47	592	Ppond for 7A

Hydrograph Summary Report

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

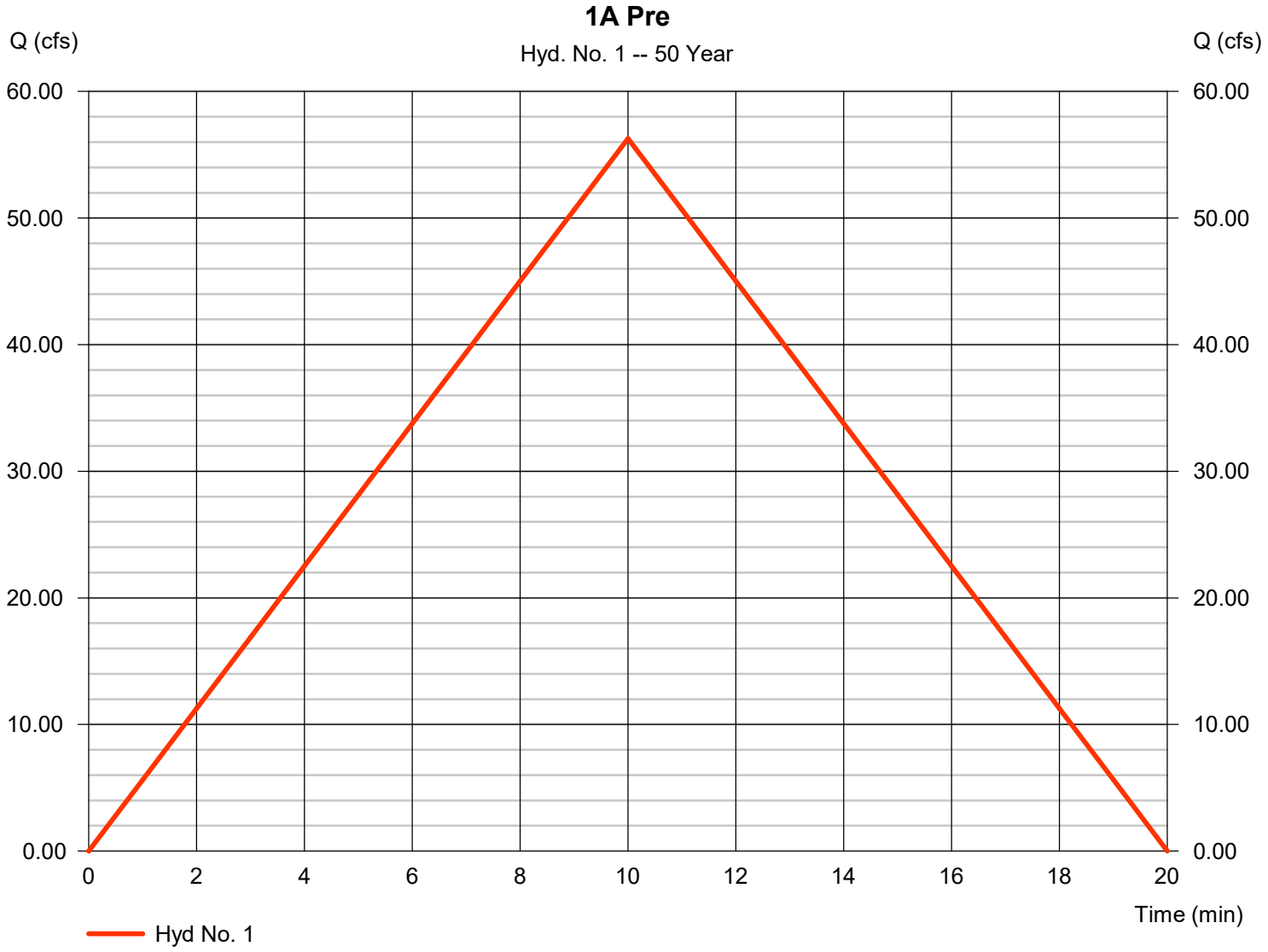
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	Reservoir	0.170	1	18	24	33	101.82	415	Pond for 8A
36	Rational	4.281	1	10	2,568	------	------	------	5A Post wth mediation
37	Rational	2.978	1	10	1,787	------	------	------	3A Post Dev with mediation
38	Rational	0.354	1	10	212	------	------	------	4A Post Dev with mediation
39	Combine	7.221	1	10	4,333	31, 37, 38	------	------	Water Towards road
40	Reservoir	6.768	1	11	2,682	39	102.81	1,984	<no description>
41	Combine	14.04	1	10	8,427	6, 9, 11, 21,	------	------	Pre Dev Design Point 6
42	Reach	0.353	1	11	215	38	------	------	<no description>
43	Combine	4.598	1	10	2,783	36, 42	------	------	<no description>
44	Reach	4.309	1	11	2,827	43	------	------	<no description>
45	Combine	11.08	1	11	5,534	34, 35, 40, 44	------	------	Post Dev with mediation Design Point
46	Combine	16.43	1	10	9,857	7, 10, 12, 22,	------	------	<no description>

Hydrograph Report

Hyd. No. 1

1A Pre

Hydrograph type	=	Rational	Peak discharge	=	56.29 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	33,773 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

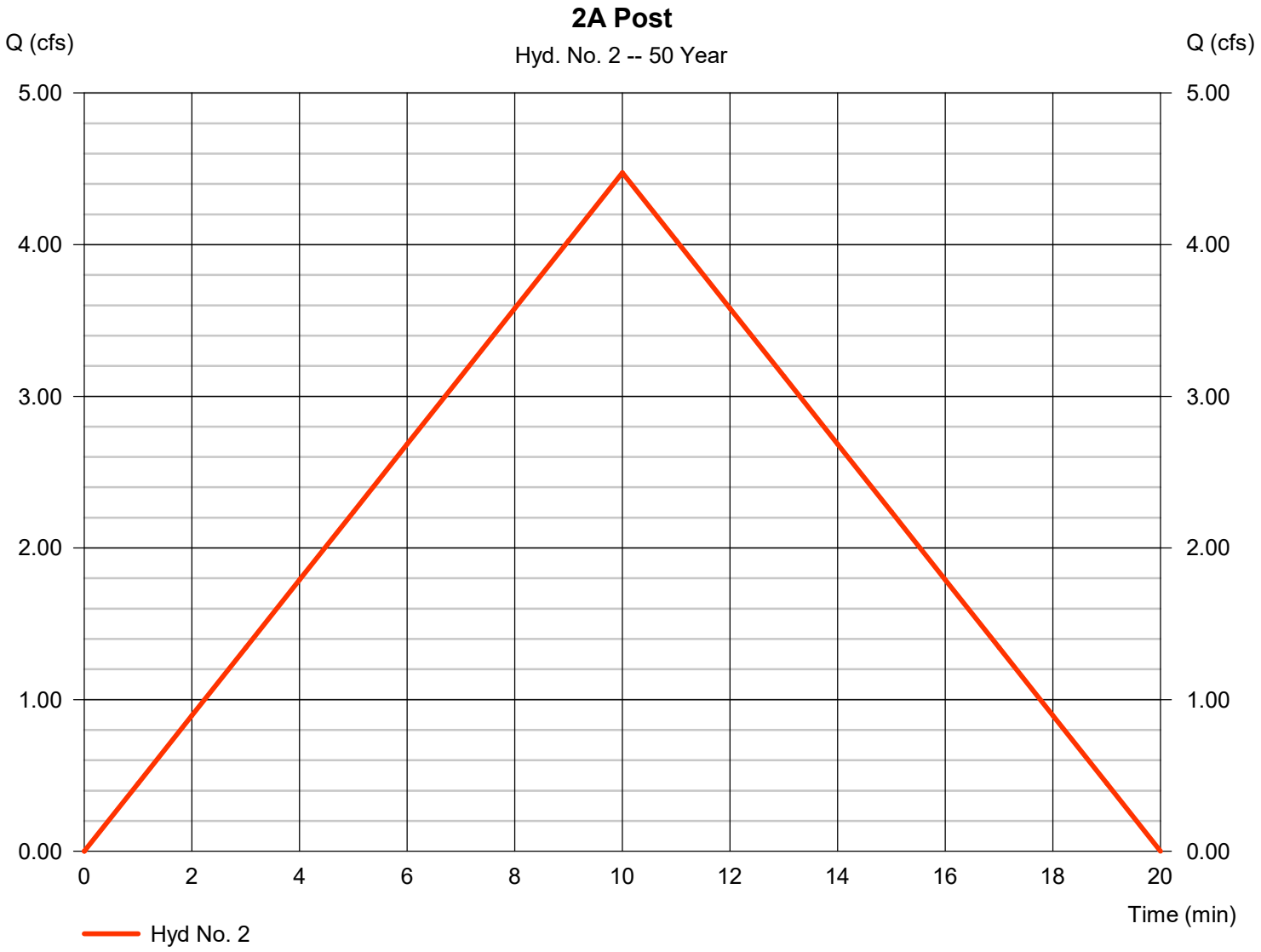


Hydrograph Report

Hyd. No. 2

2A Post

Hydrograph type	=	Rational	Peak discharge	=	4.475 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,685 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.55
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

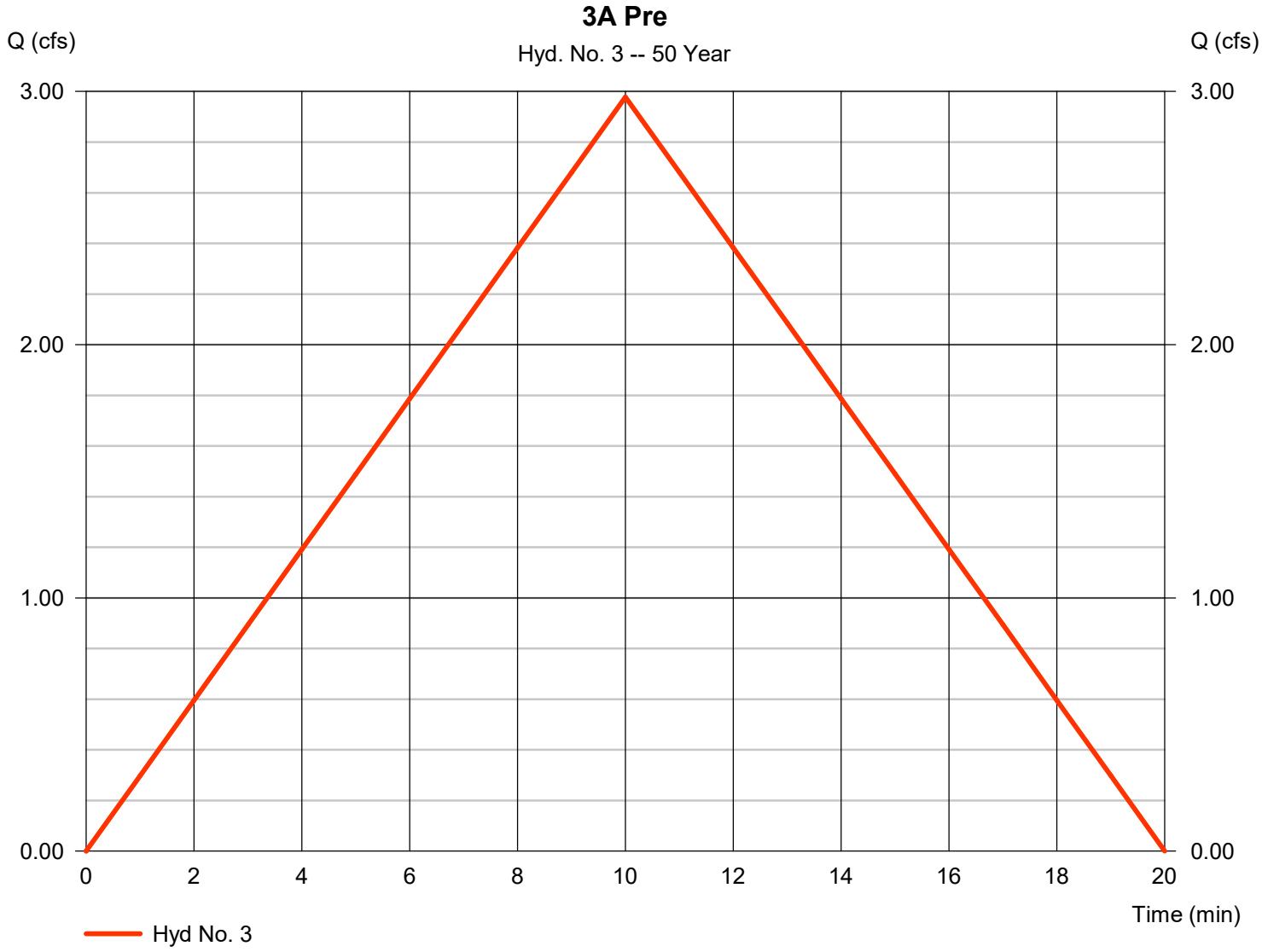


Hydrograph Report

Hyd. No. 3

3A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.978 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,787 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

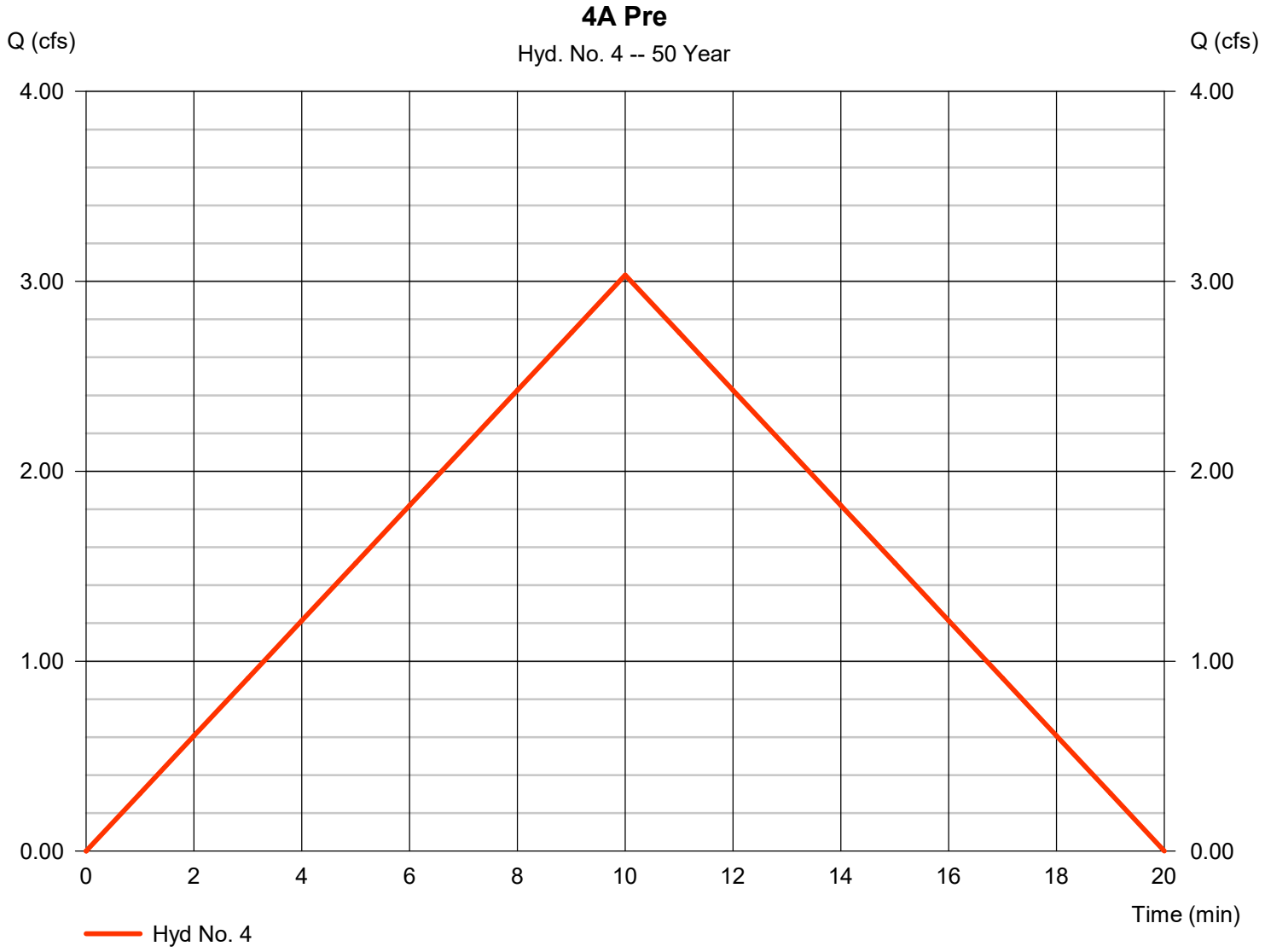


Hydrograph Report

Hyd. No. 4

4A Pre

Hydrograph type	=	Rational	Peak discharge	=	3.033 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,820 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

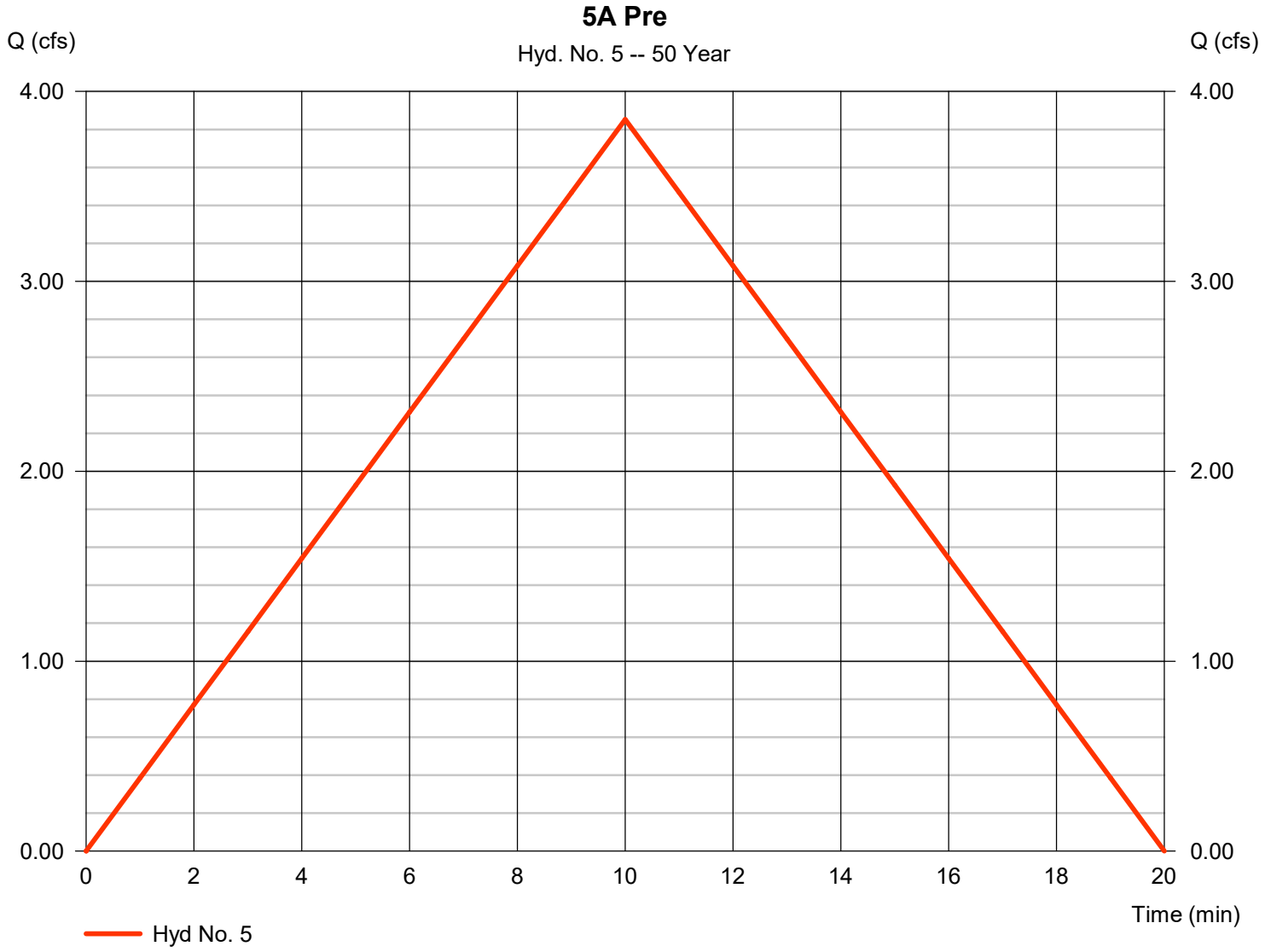


Hydrograph Report

Hyd. No. 5

5A Pre

Hydrograph type	=	Rational	Peak discharge	=	3.853 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,312 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

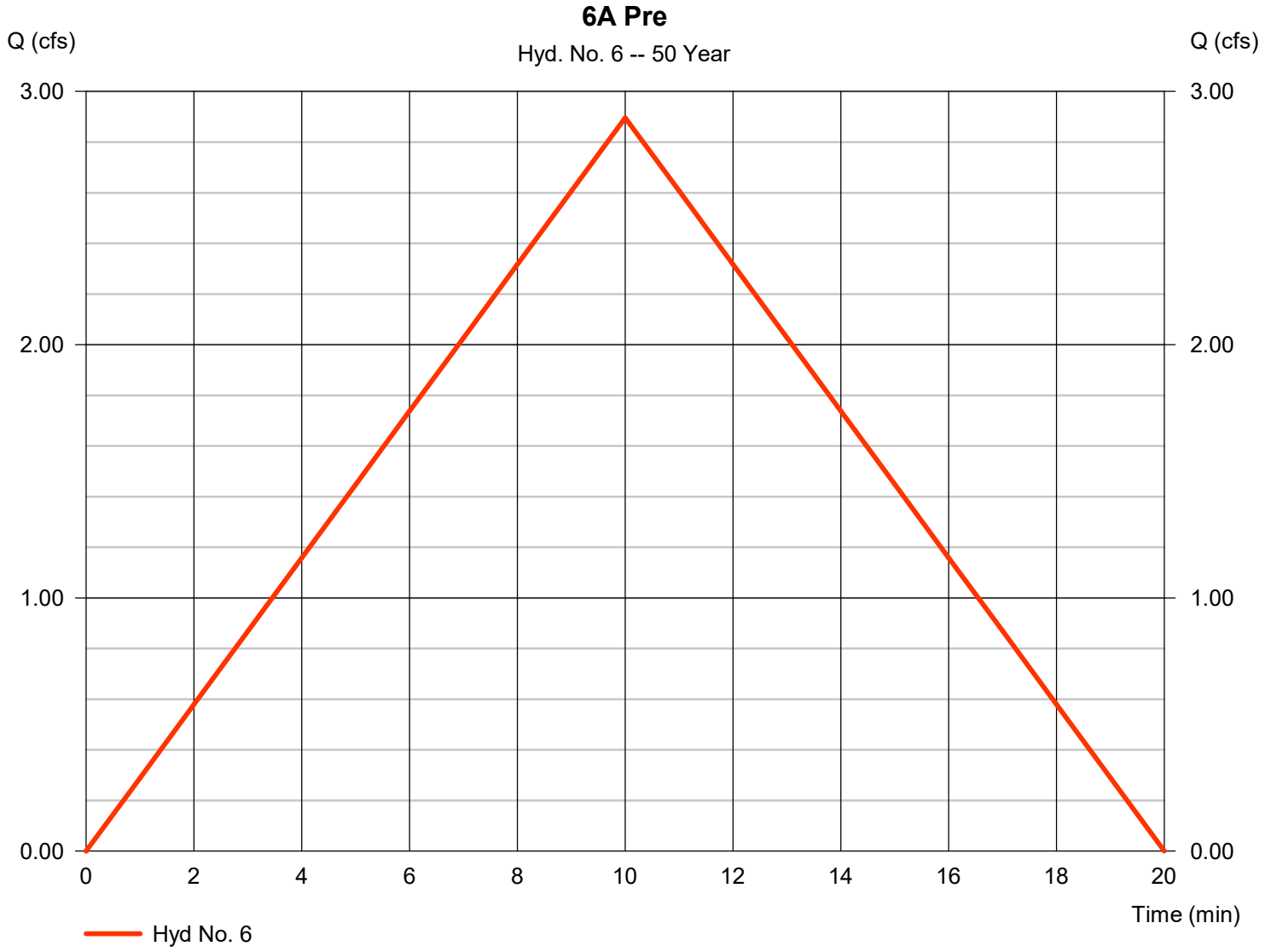


Hydrograph Report

Hyd. No. 6

6A Pre

Hydrograph type	=	Rational	Peak discharge	=	2.896 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,738 cuft
Drainage area	=	1.060 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

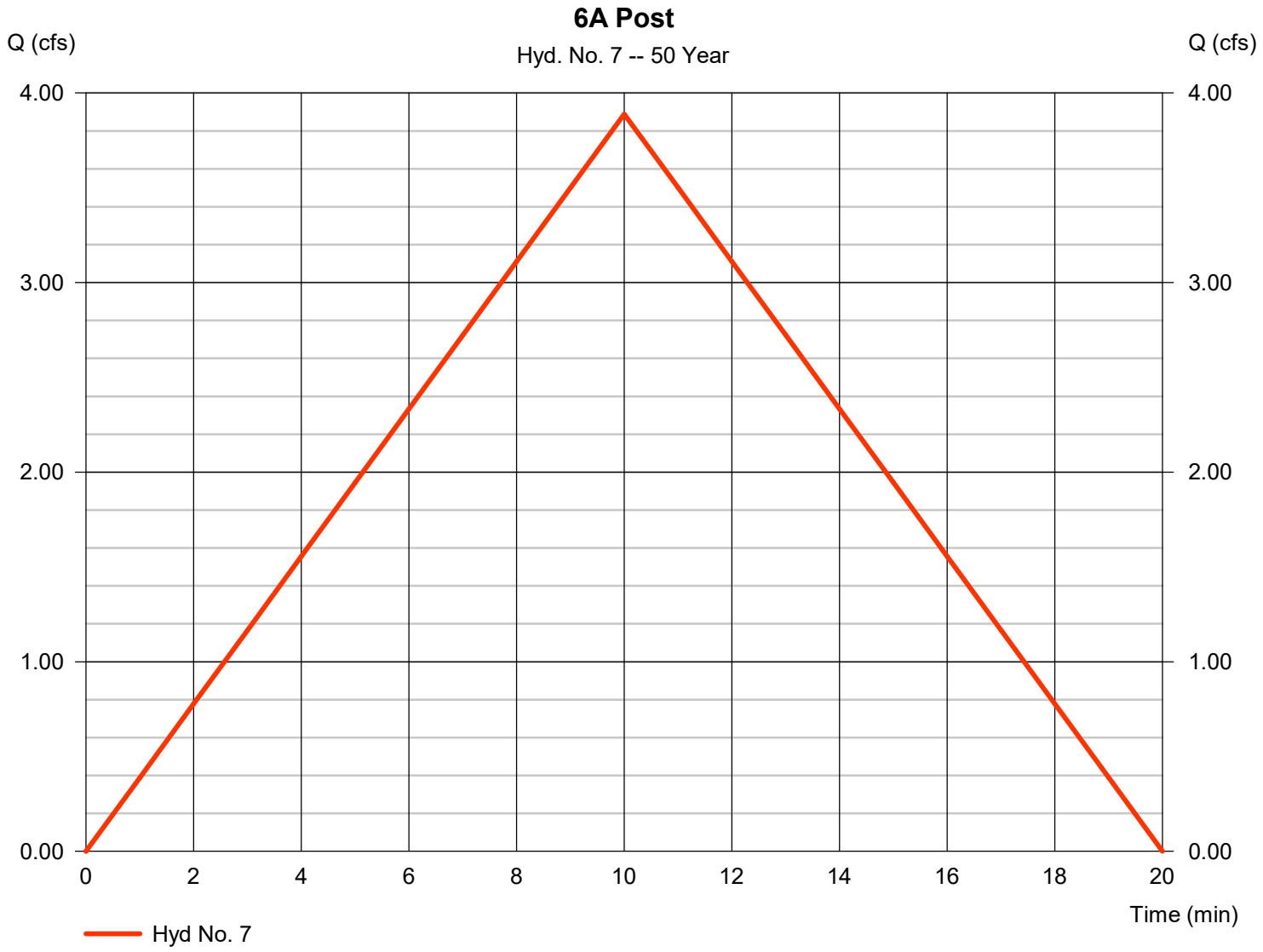


Hydrograph Report

Hyd. No. 7

6A Post

Hydrograph type	=	Rational	Peak discharge	=	3.889 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,333 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

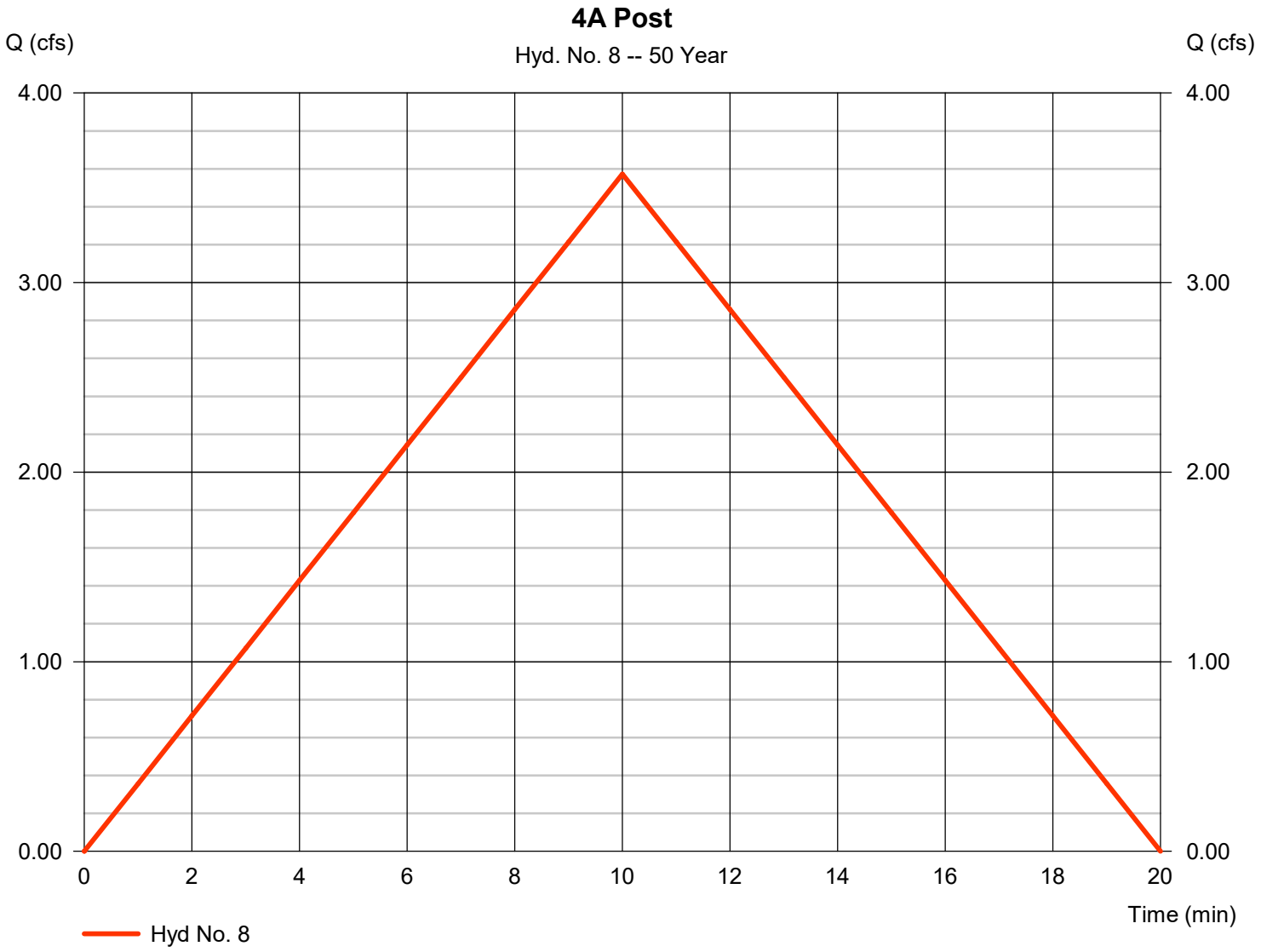


Hydrograph Report

Hyd. No. 8

4A Post

Hydrograph type	=	Rational	Peak discharge	=	3.572 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,143 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.53
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

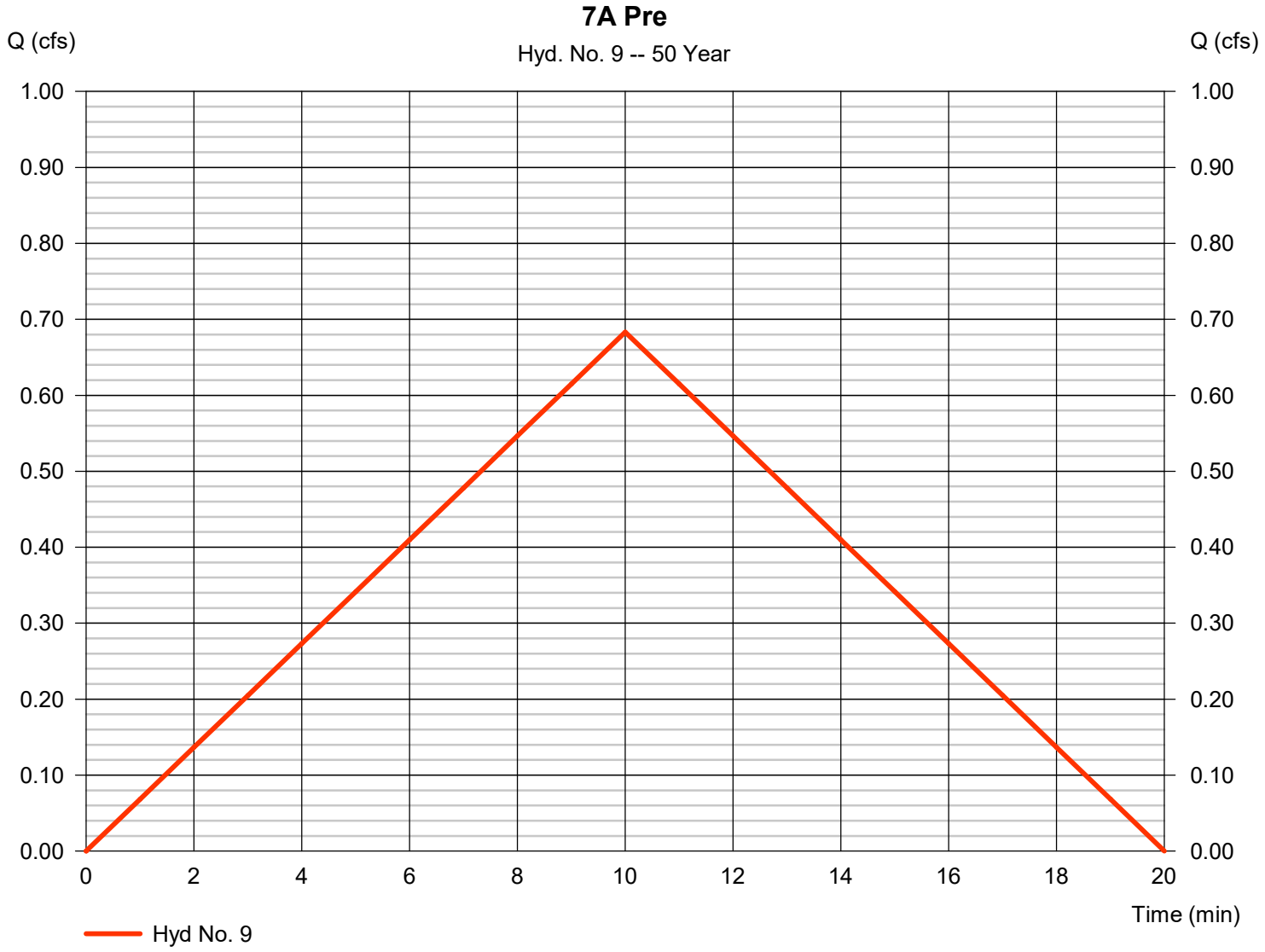


Hydrograph Report

Hyd. No. 9

7A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.683 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	410 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

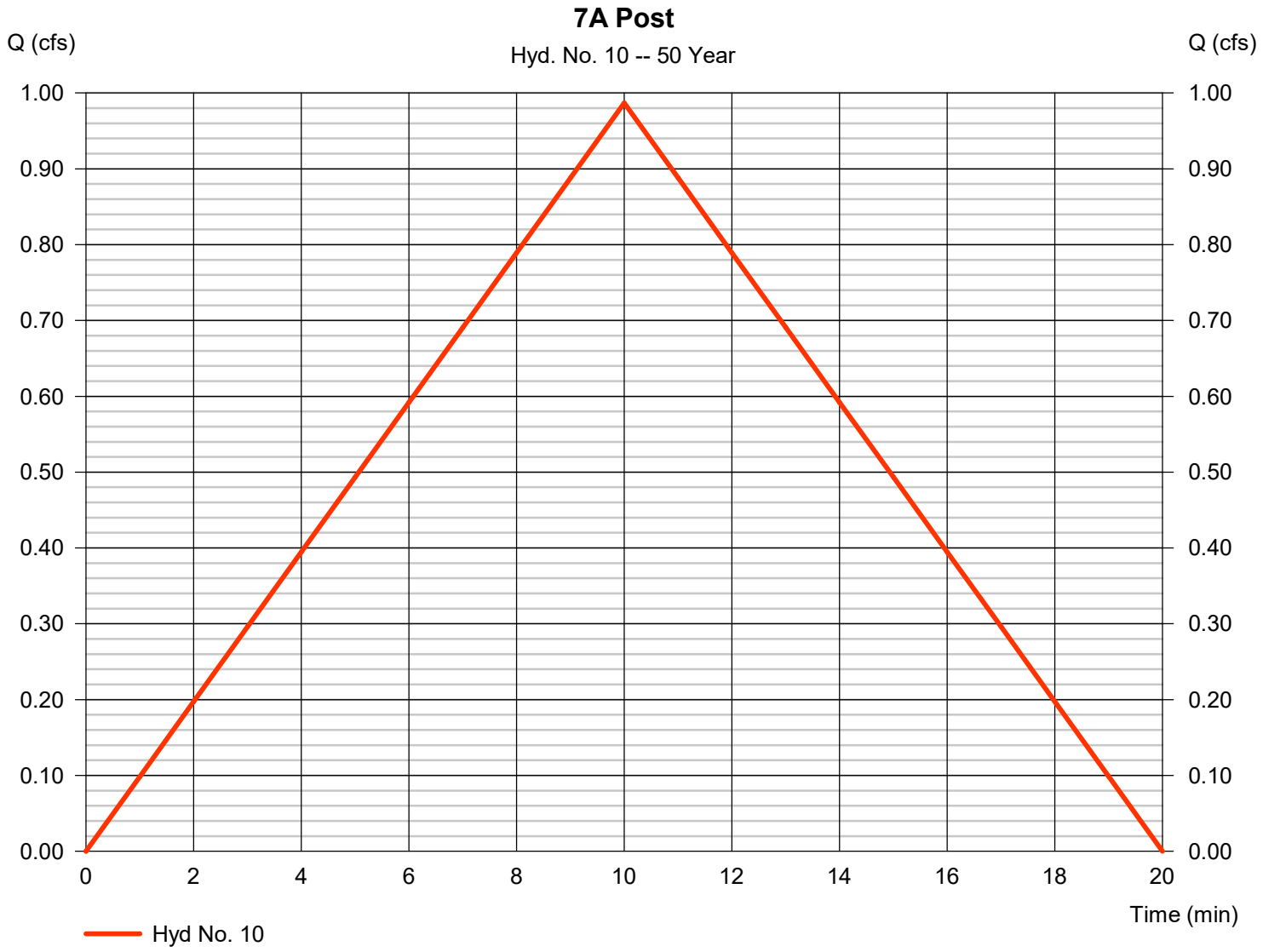


Hydrograph Report

Hyd. No. 10

7A Post

Hydrograph type	=	Rational	Peak discharge	=	0.987 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	592 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

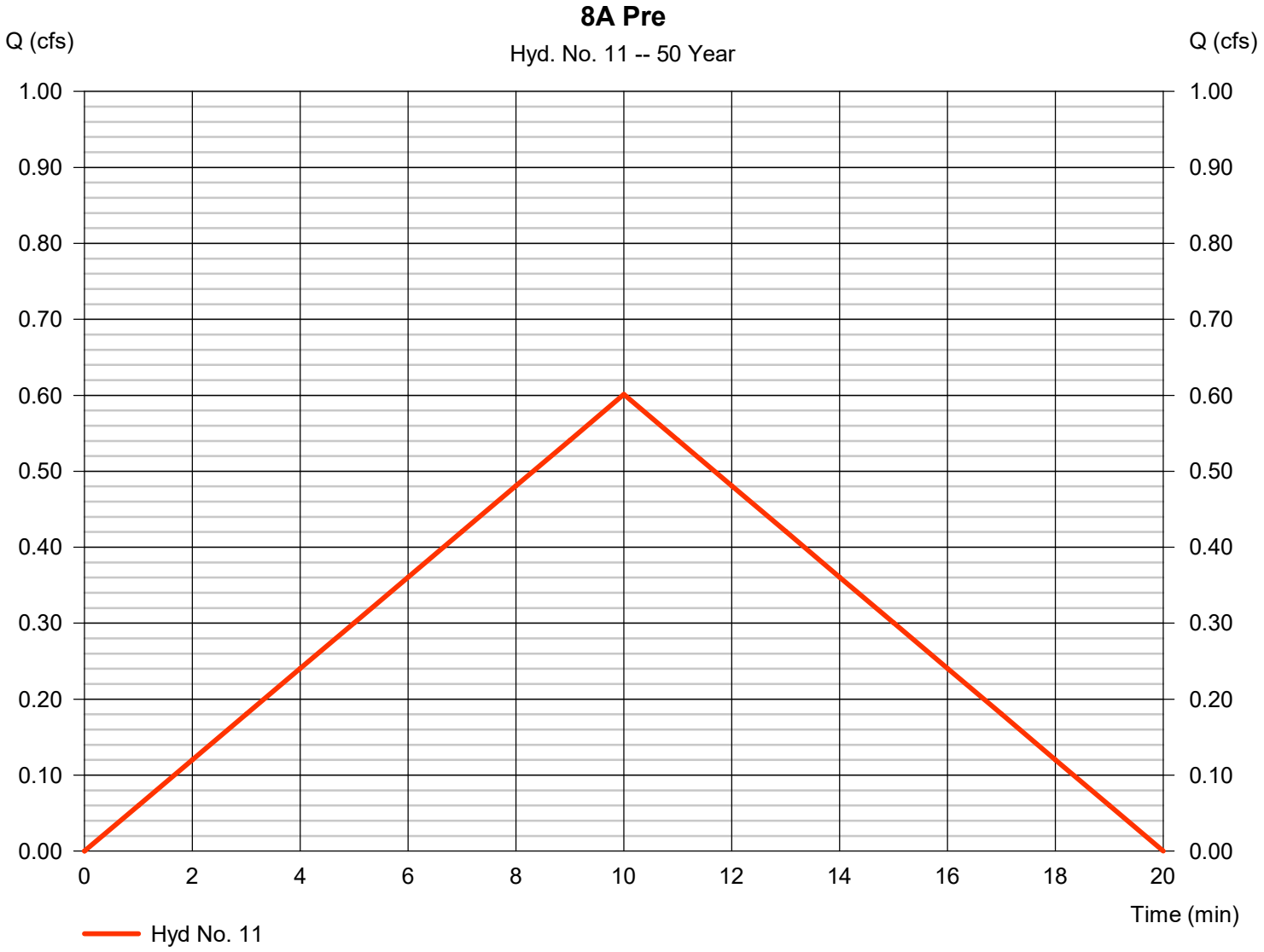


Hydrograph Report

Hyd. No. 11

8A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.601 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	361 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

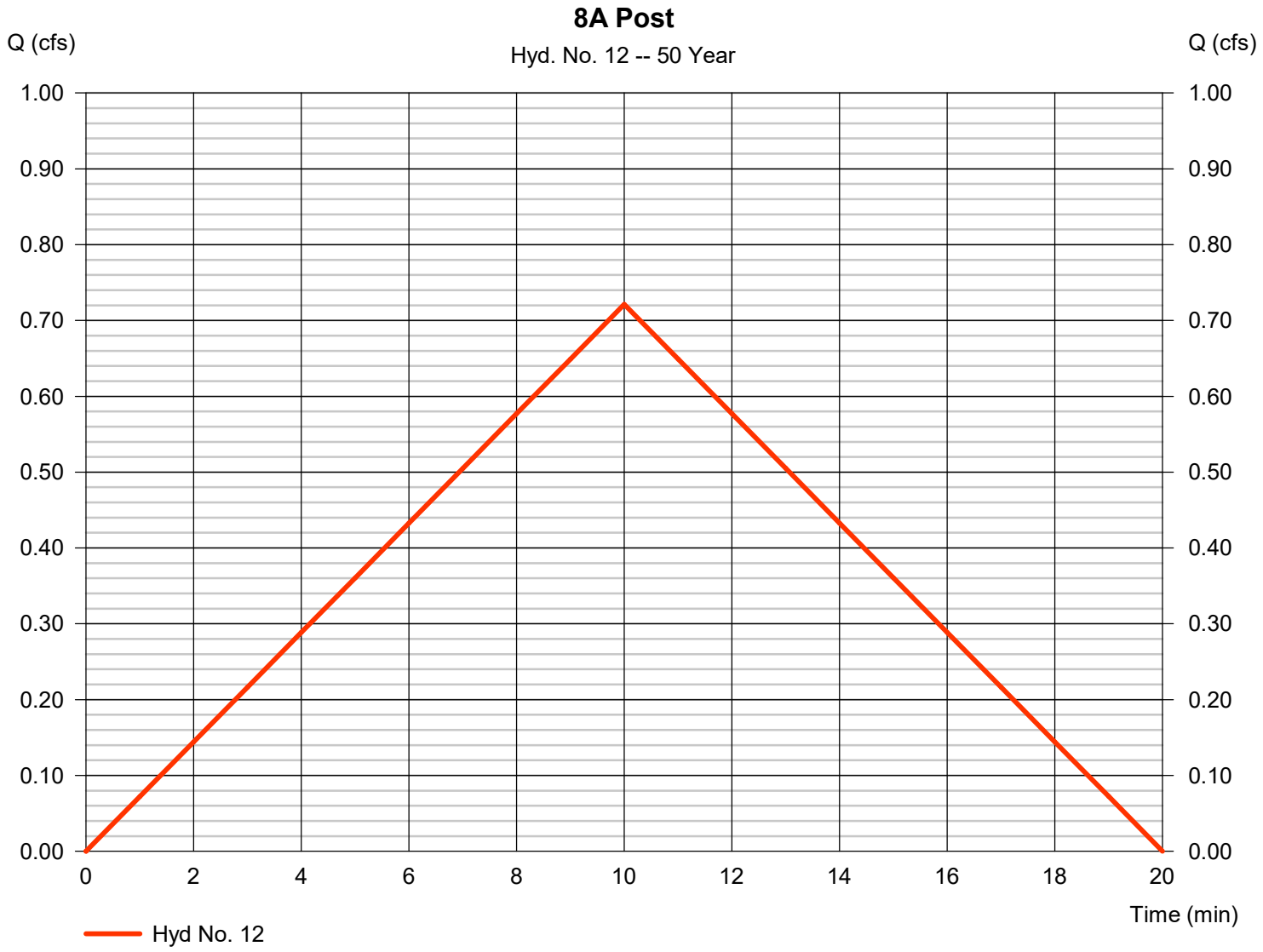


Hydrograph Report

Hyd. No. 12

8A Post

Hydrograph type	=	Rational	Peak discharge	=	0.721 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	433 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

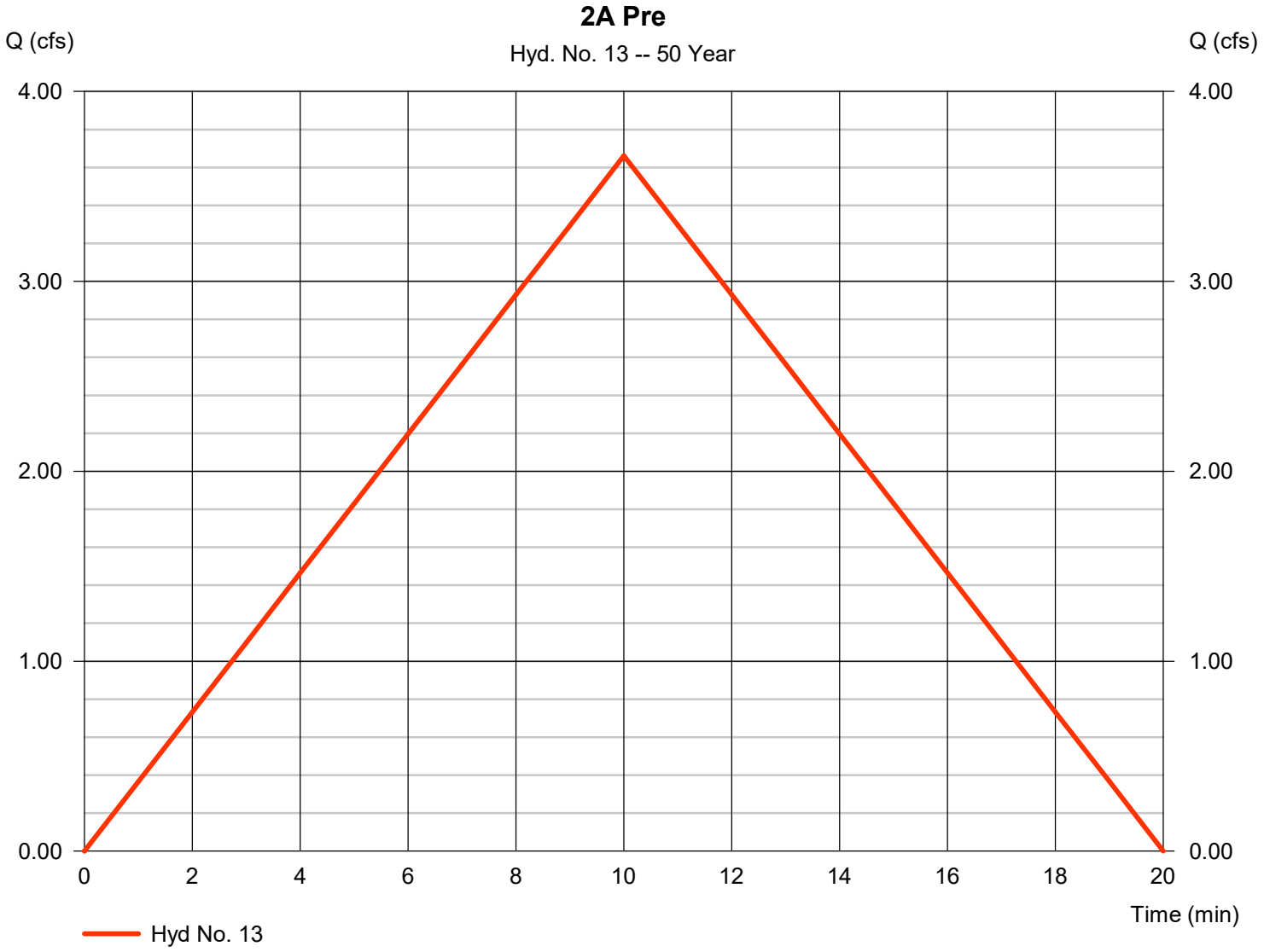


Hydrograph Report

Hyd. No. 13

2A Pre

Hydrograph type	=	Rational	Peak discharge	=	3.661 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,197 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

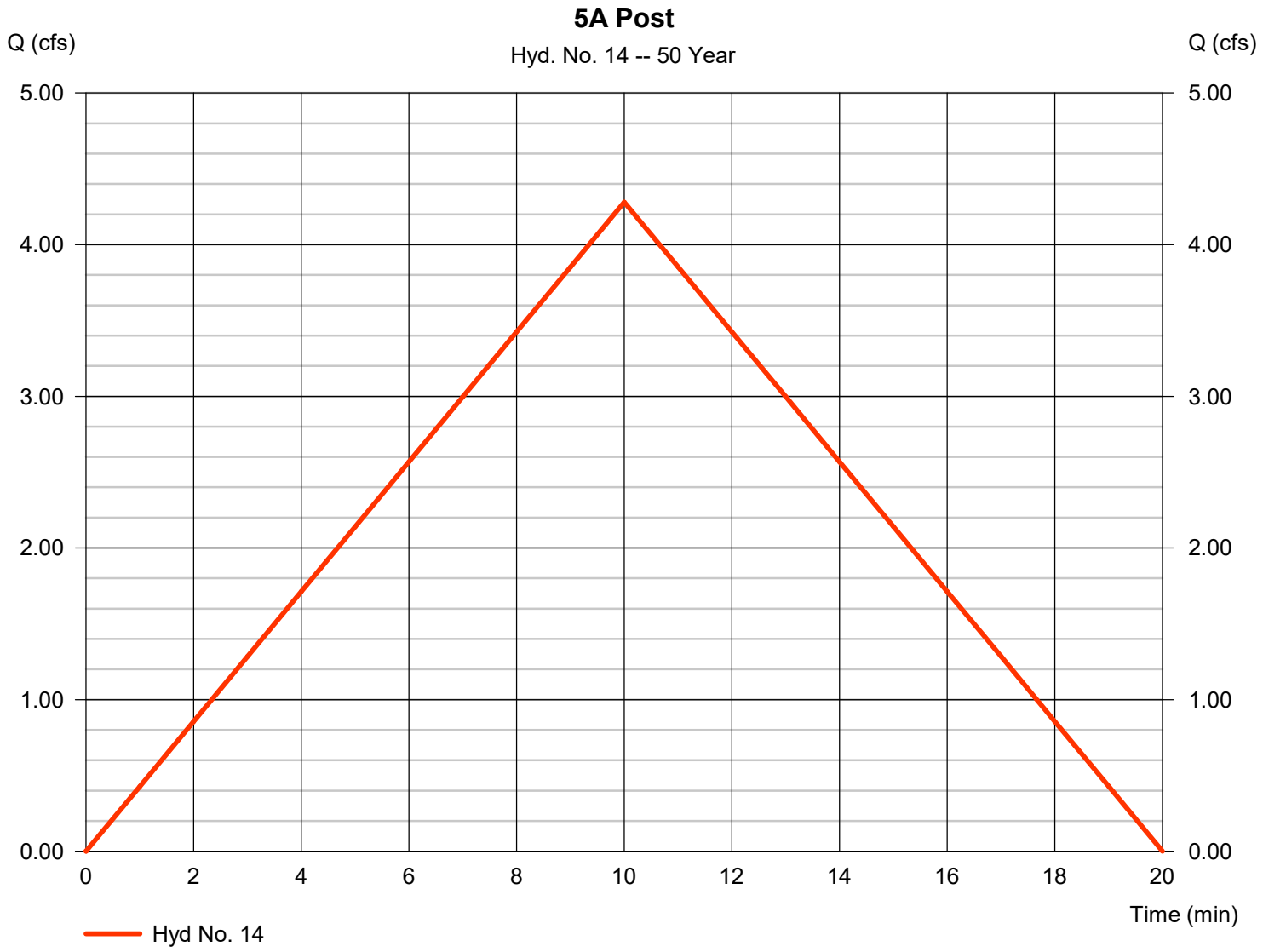


Hydrograph Report

Hyd. No. 14

5A Post

Hydrograph type	=	Rational	Peak discharge	=	4.281 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,568 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

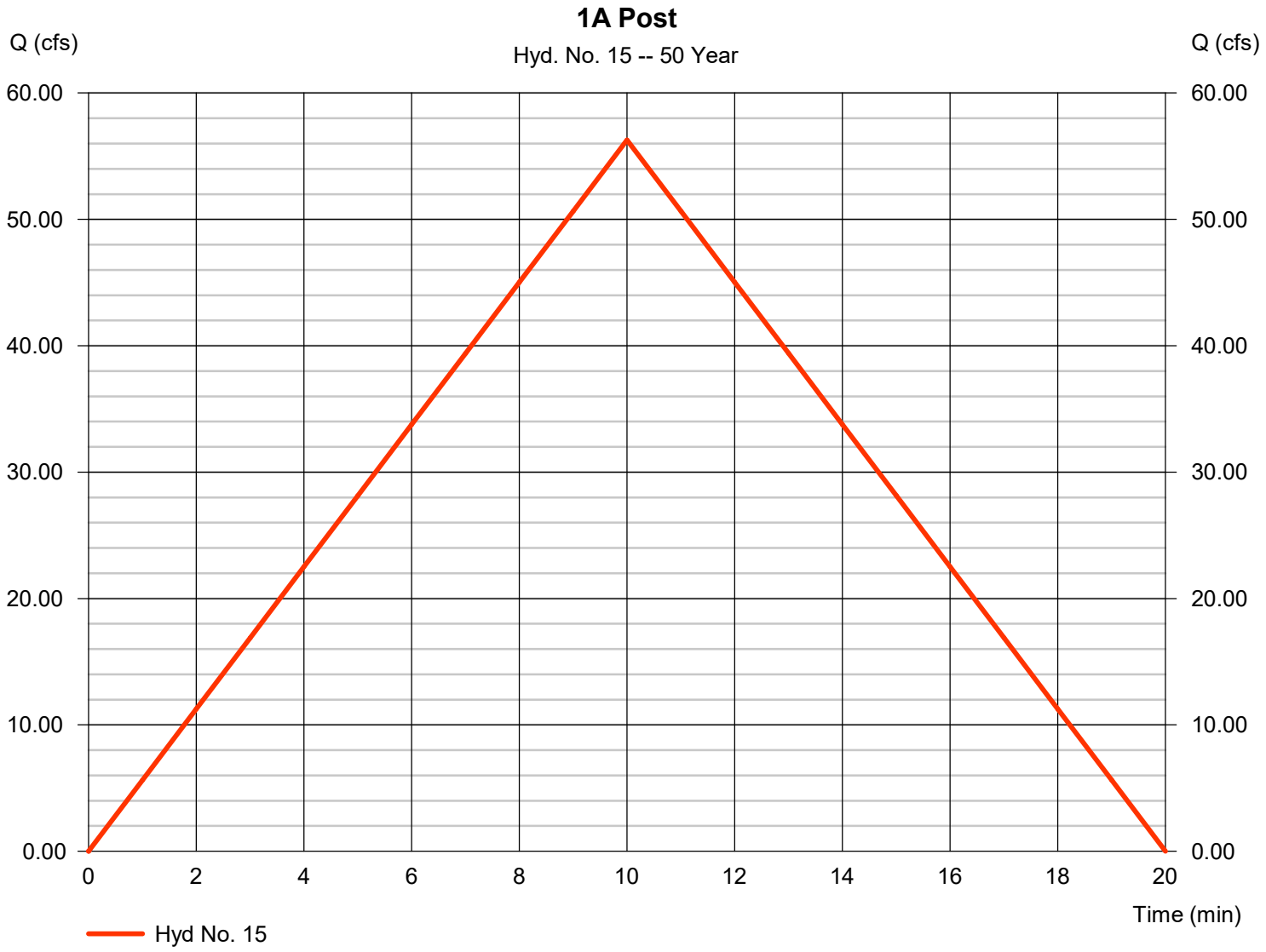


Hydrograph Report

Hyd. No. 15

1A Post

Hydrograph type	=	Rational	Peak discharge	=	56.29 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	33,773 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

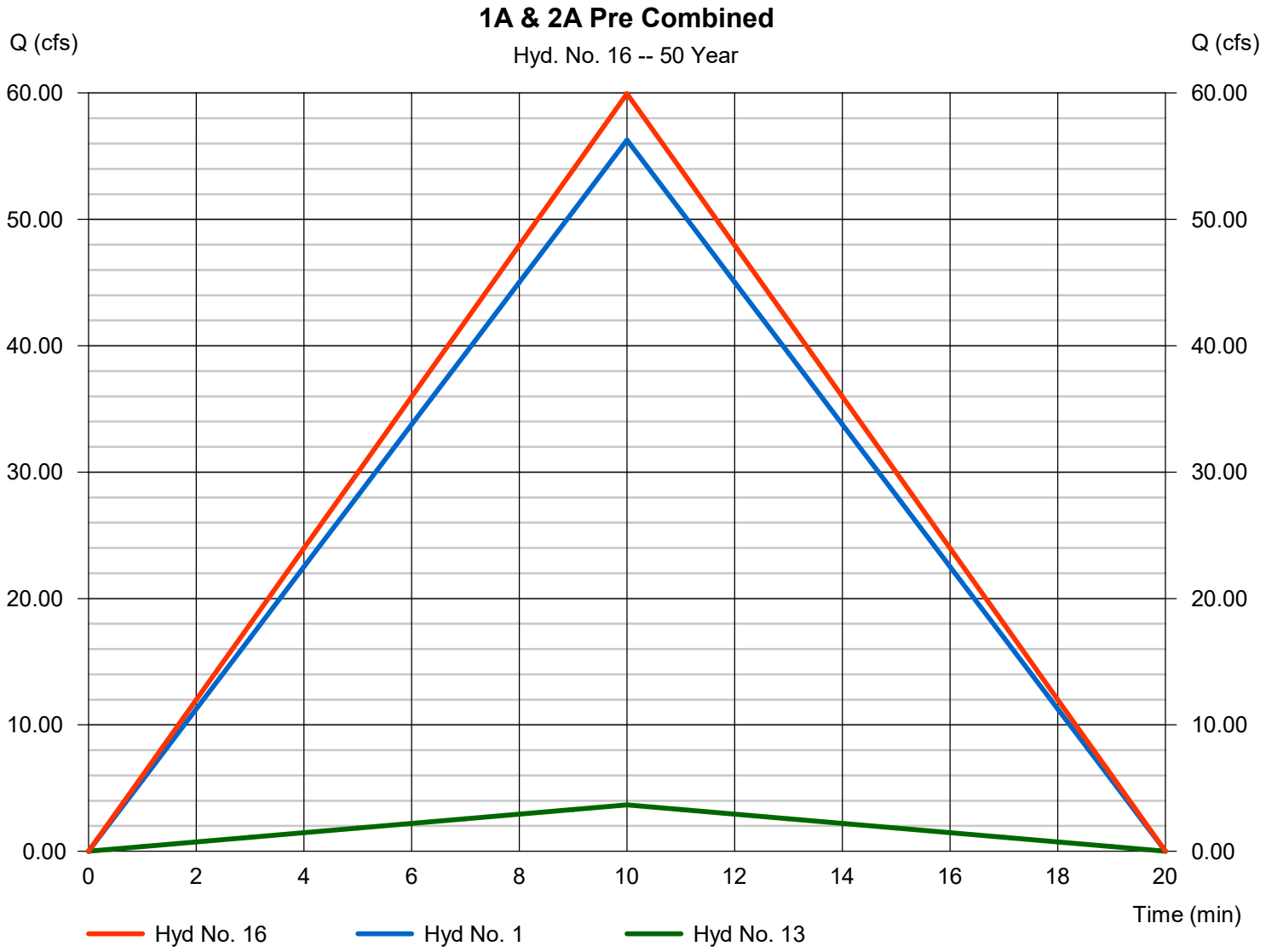


Hydrograph Report

Hyd. No. 16

1A & 2A Pre Combined

Hydrograph type	=	Combine	Peak discharge	=	59.95 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	35,969 cuft
Inflow hyds.	=	1, 13	Contrib. drain. area	=	21.940 ac

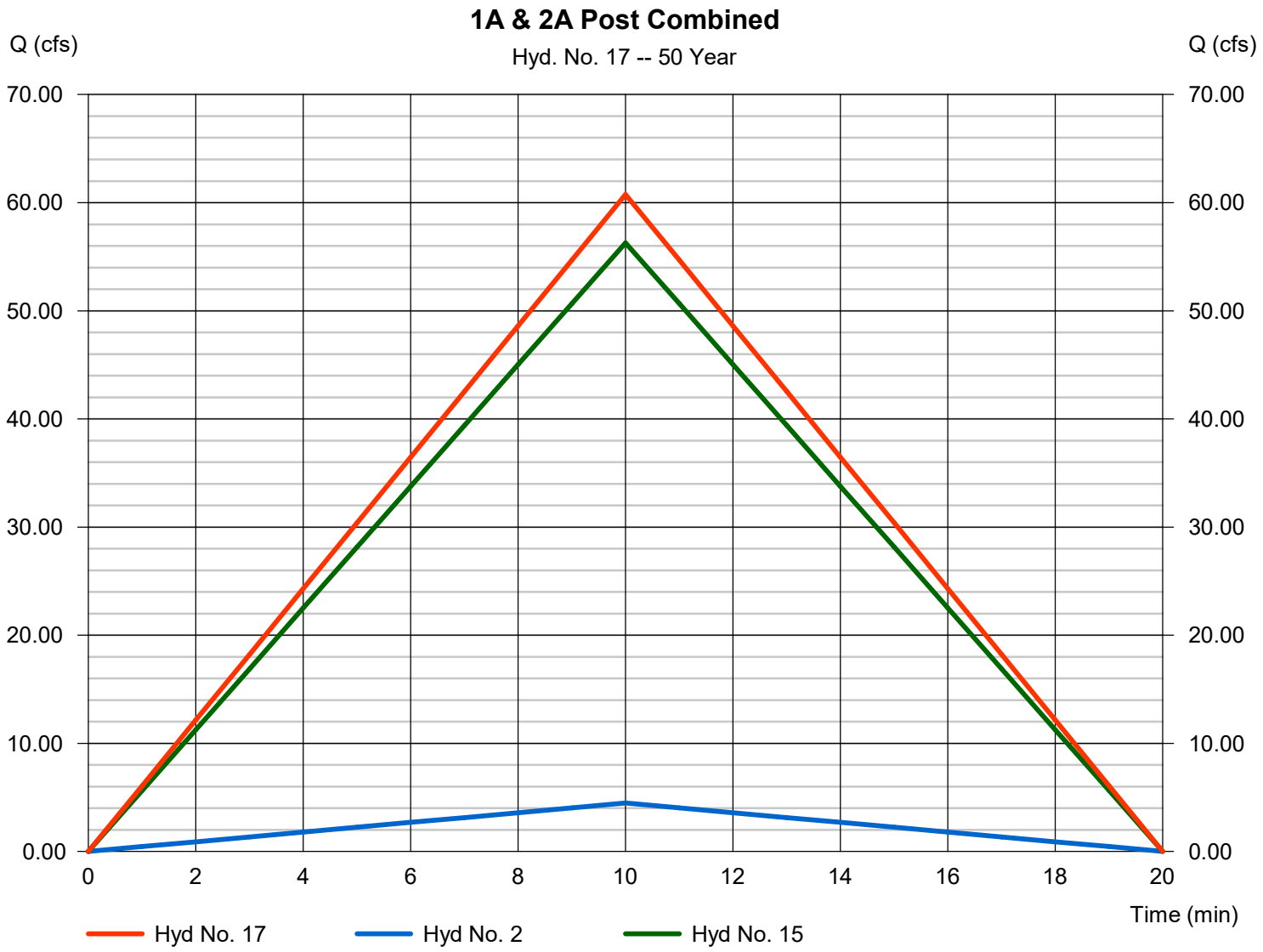


Hydrograph Report

Hyd. No. 17

1A & 2A Post Combined

Hydrograph type	= Combine	Peak discharge	= 60.76 cfs
Storm frequency	= 50 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 36,458 cuft
Inflow hyds.	= 2, 15	Contrib. drain. area	= 21.940 ac

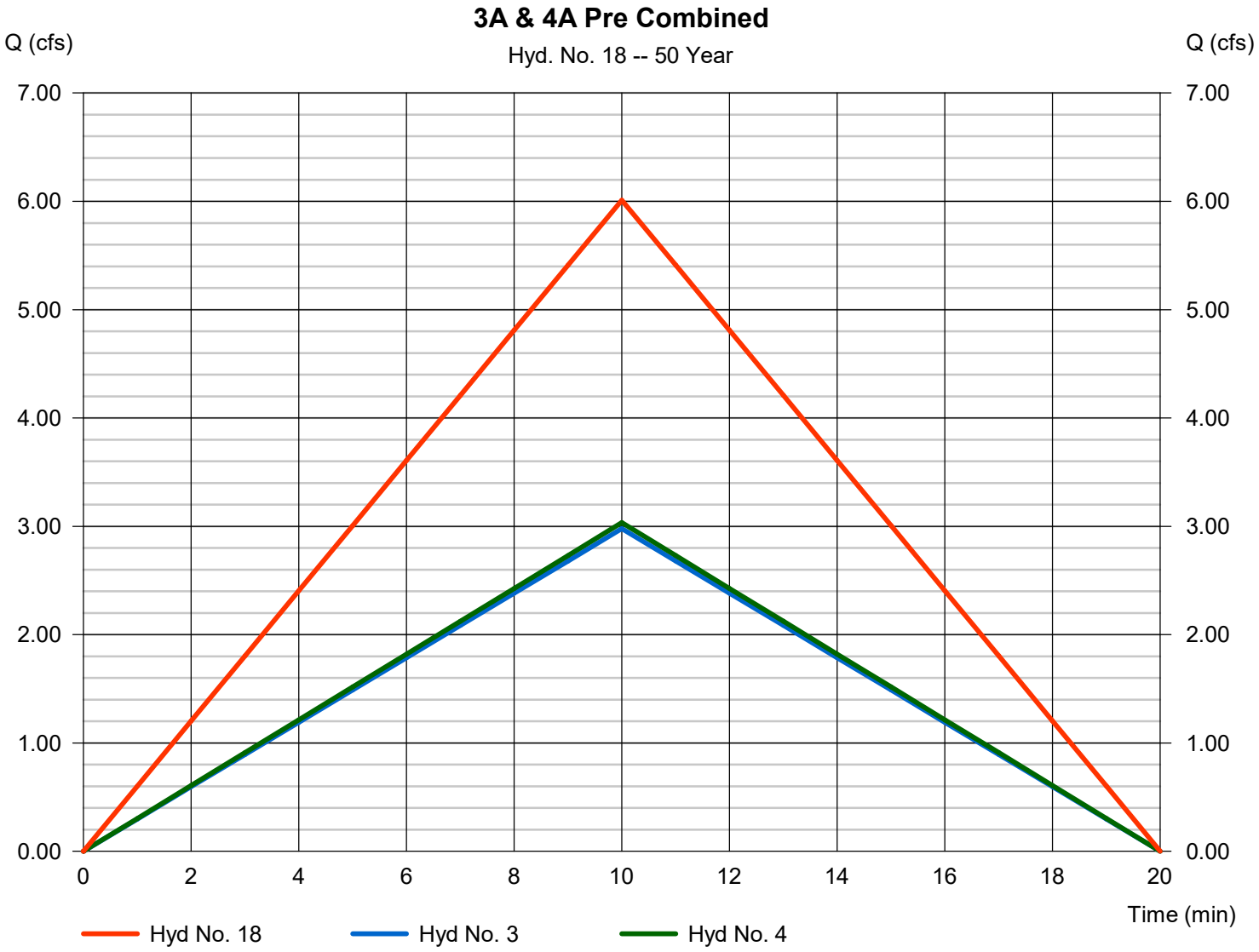


Hydrograph Report

Hyd. No. 18

3A & 4A Pre Combined

Hydrograph type	=	Combine	Peak discharge	=	6.011 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	3,607 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	2.200 ac

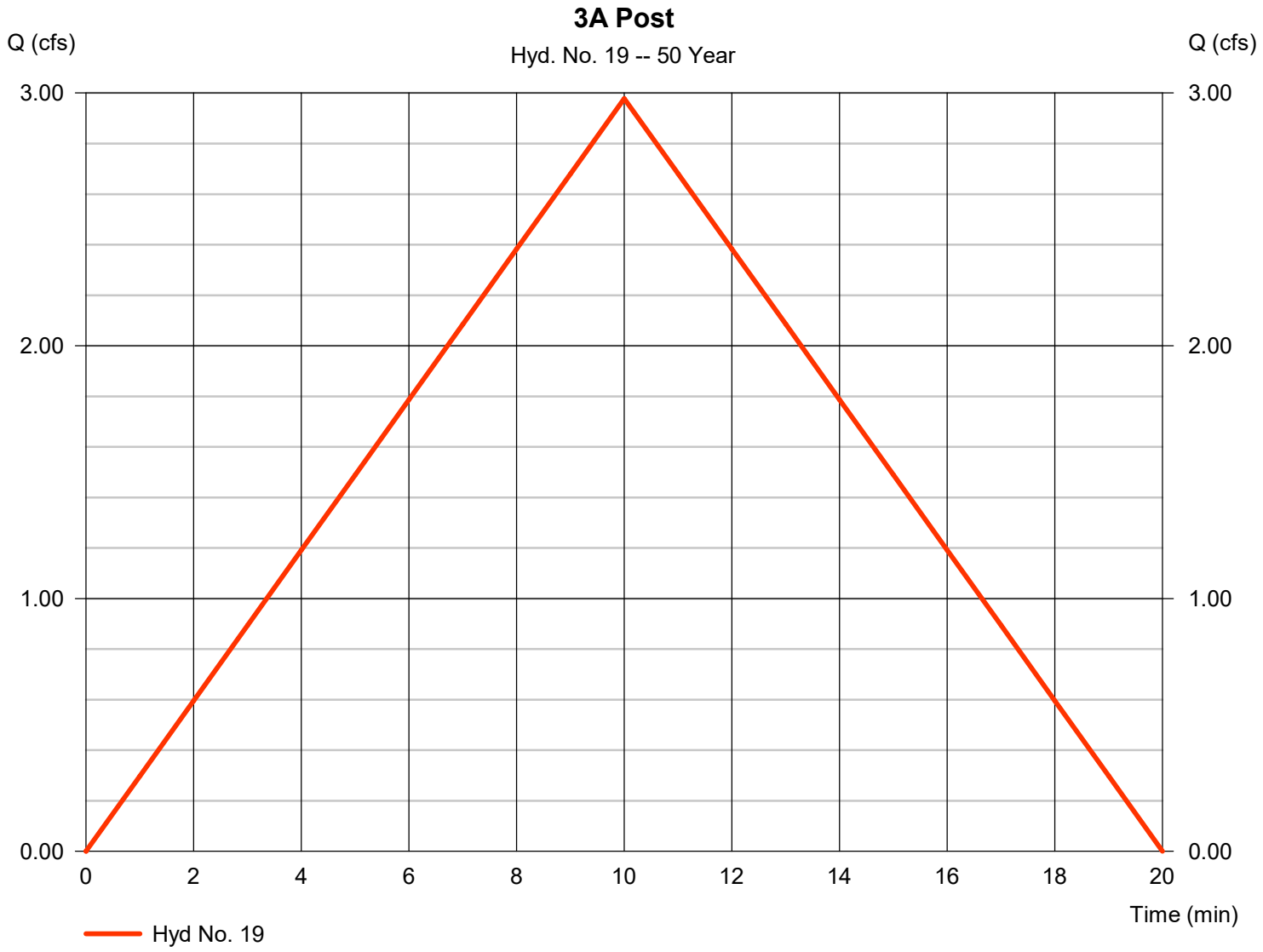


Hydrograph Report

Hyd. No. 19

3A Post

Hydrograph type	=	Rational	Peak discharge	=	2.978 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,787 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

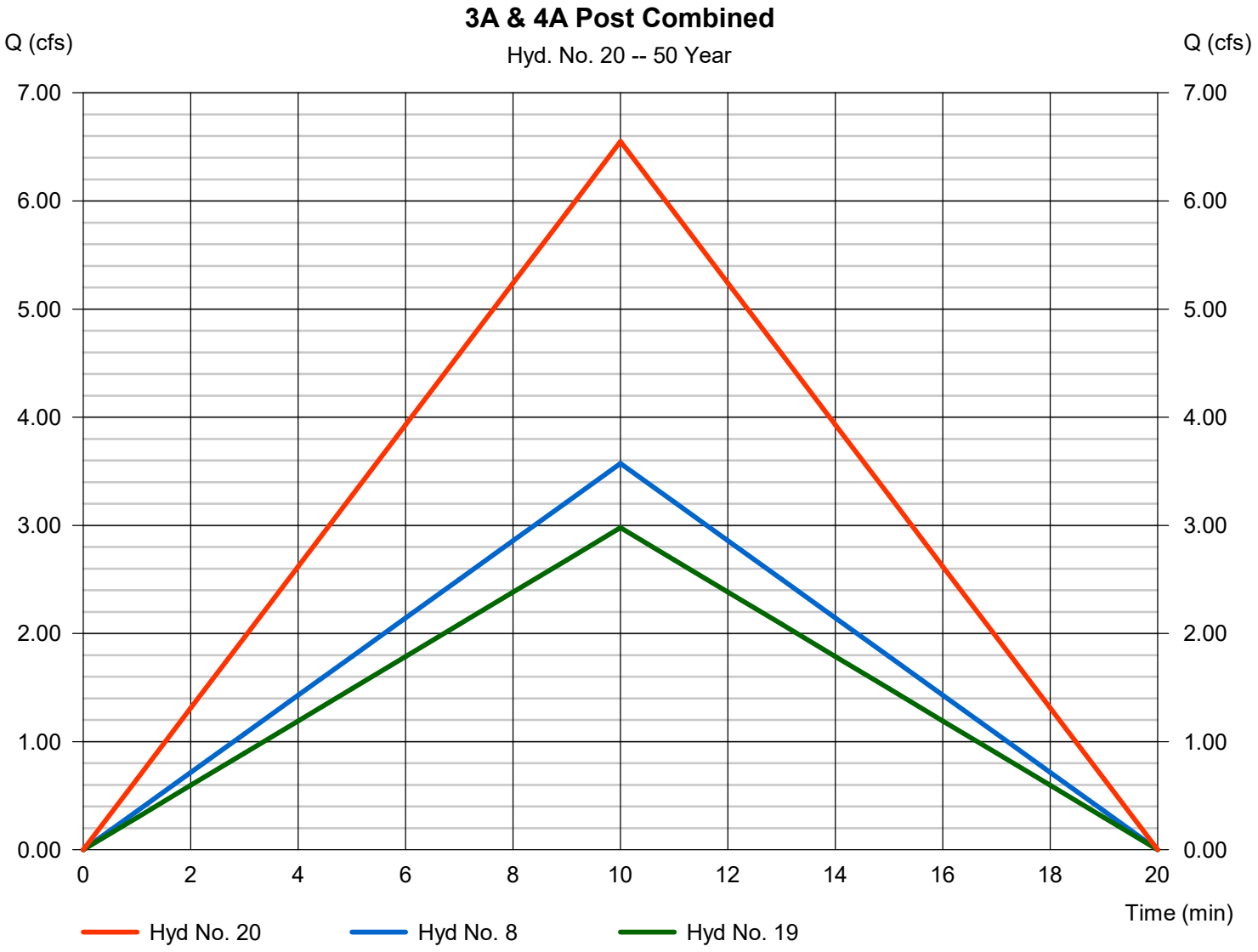


Hydrograph Report

Hyd. No. 20

3A & 4A Post Combined

Hydrograph type	=	Combine	Peak discharge	=	6.550 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	3,930 cuft
Inflow hyds.	=	8, 19	Contrib. drain. area	=	2.200 ac

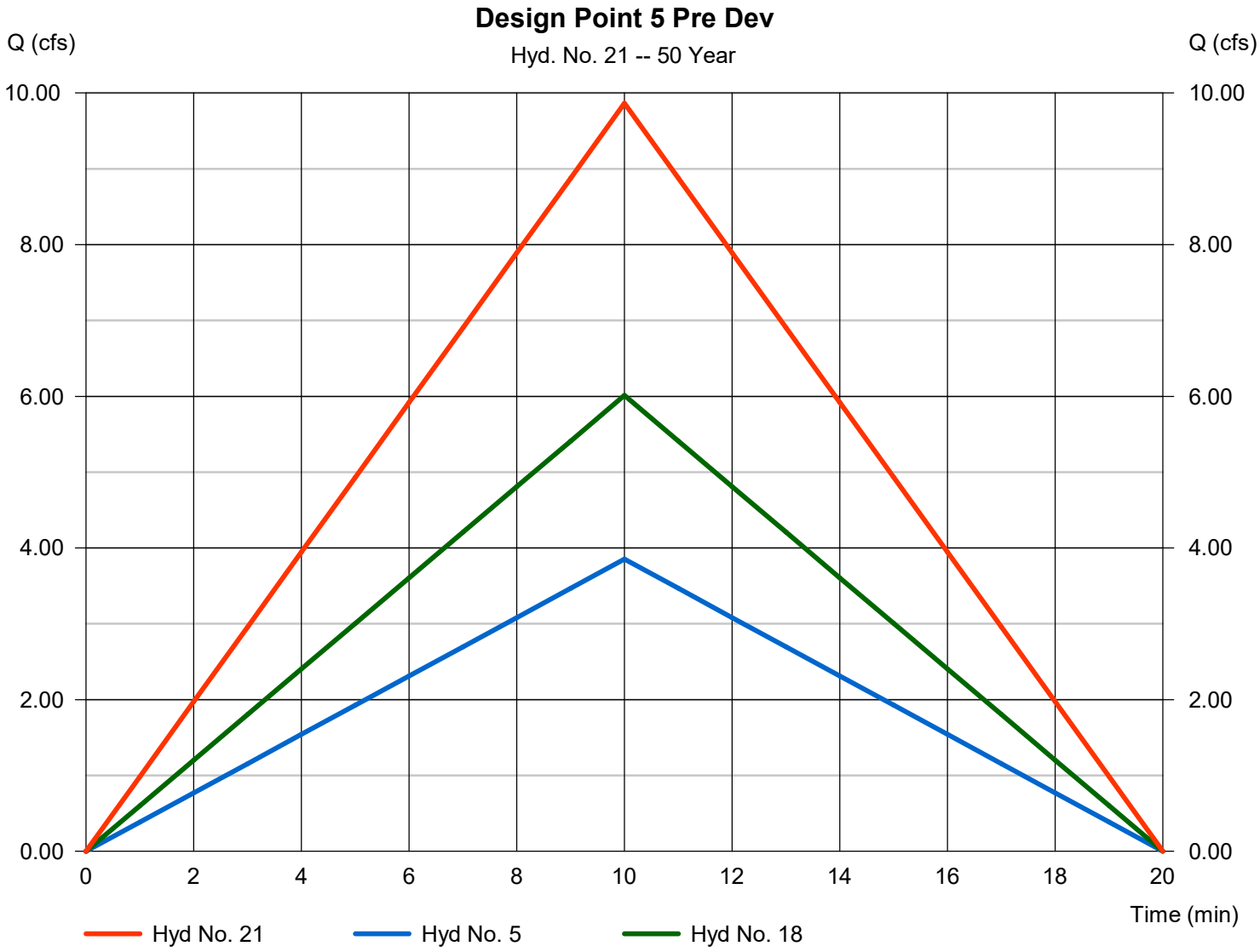


Hydrograph Report

Hyd. No. 21

Design Point 5 Pre Dev

Hydrograph type	= Combine	Peak discharge	= 9.864 cfs
Storm frequency	= 50 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 5,918 cuft
Inflow hyds.	= 5, 18	Contrib. drain. area	= 1.410 ac

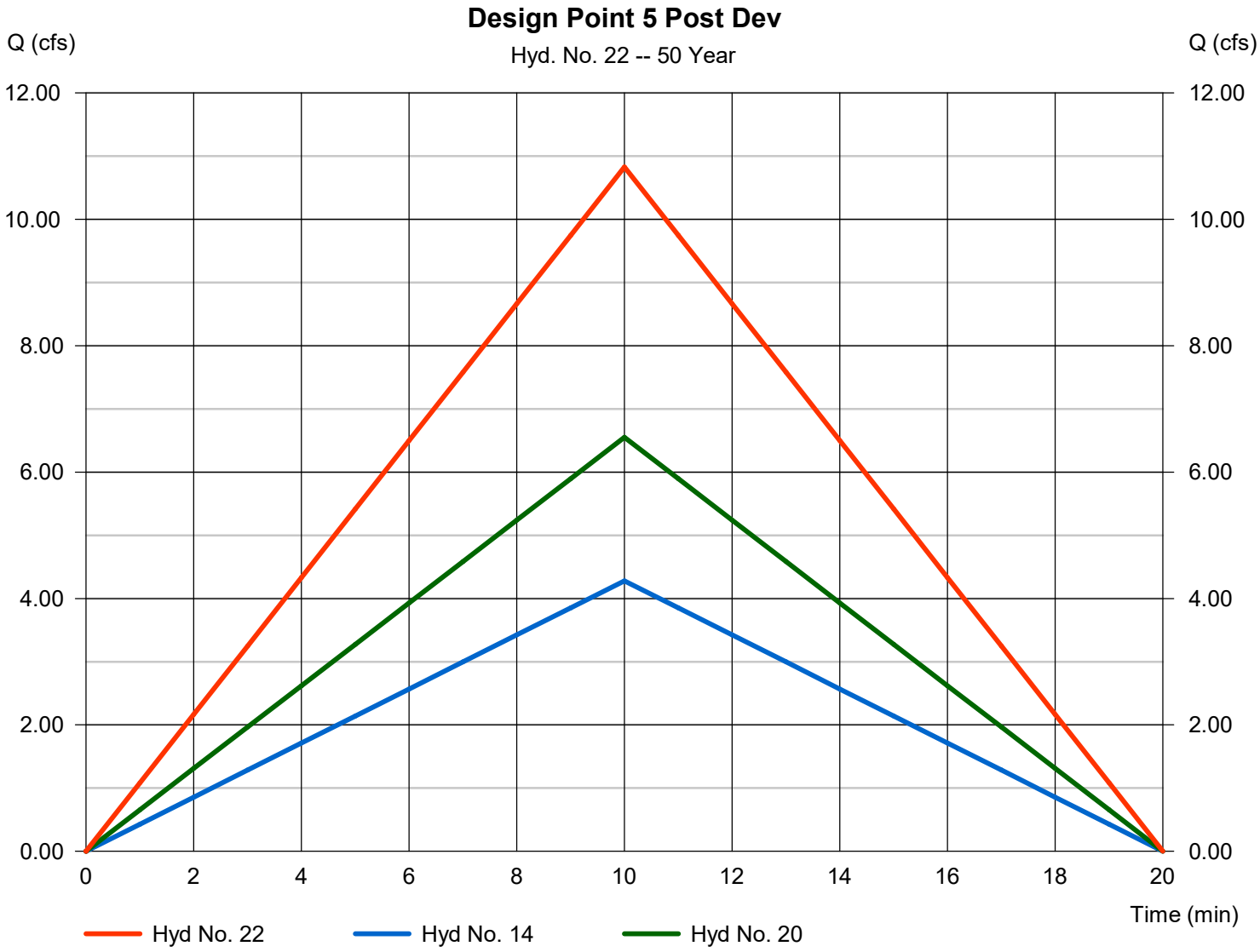


Hydrograph Report

Hyd. No. 22

Design Point 5 Post Dev

Hydrograph type	= Combine	Peak discharge	= 10.83 cfs
Storm frequency	= 50 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 6,499 cuft
Inflow hyds.	= 14, 20	Contrib. drain. area	= 1.410 ac

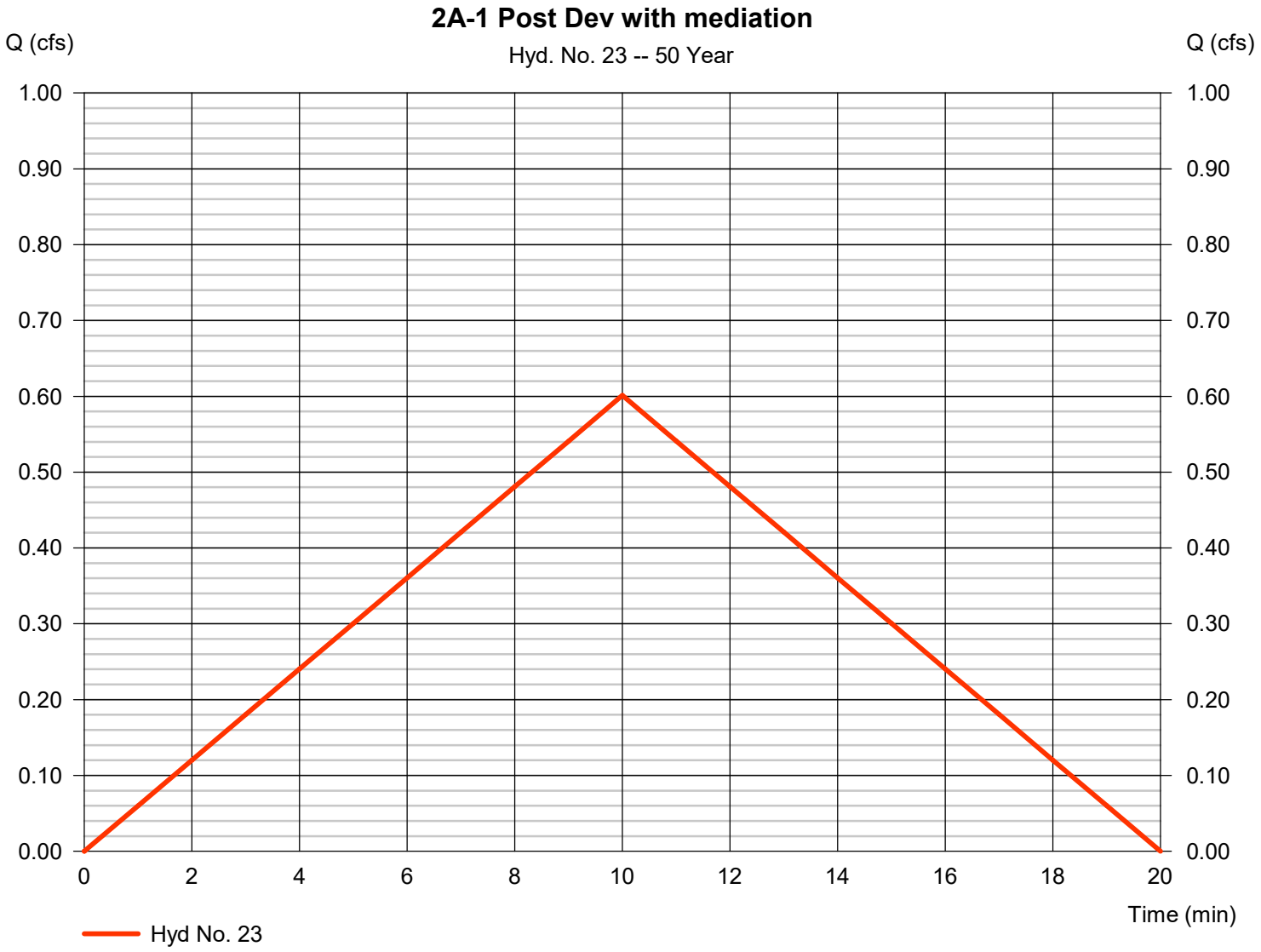


Hydrograph Report

Hyd. No. 23

2A-1 Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.601 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	361 cuft
Drainage area	=	0.180 ac	Runoff coeff.	=	0.55
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

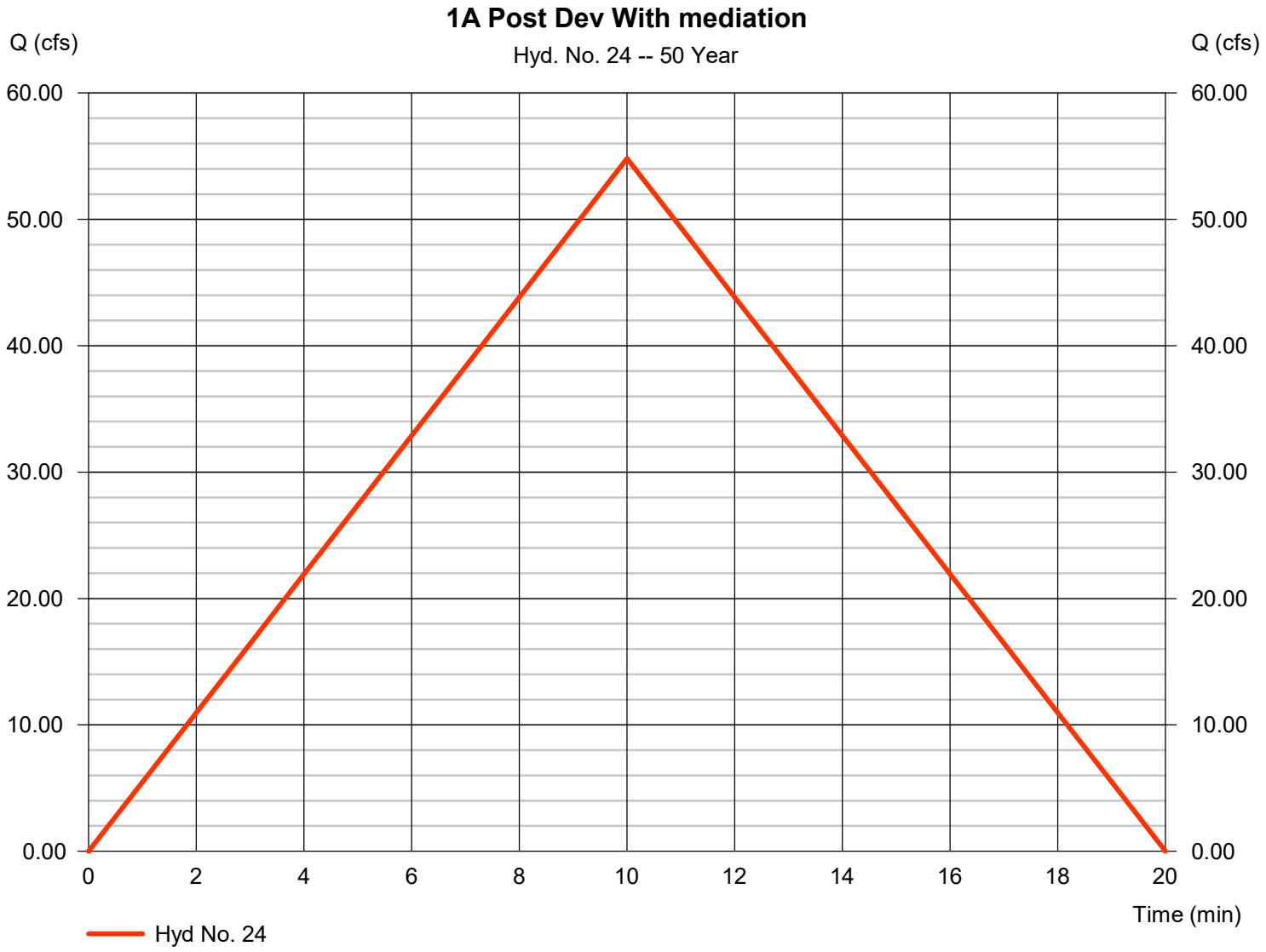


Hydrograph Report

Hyd. No. 24

1A Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	54.81 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	32,887 cuft
Drainage area	=	20.060 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

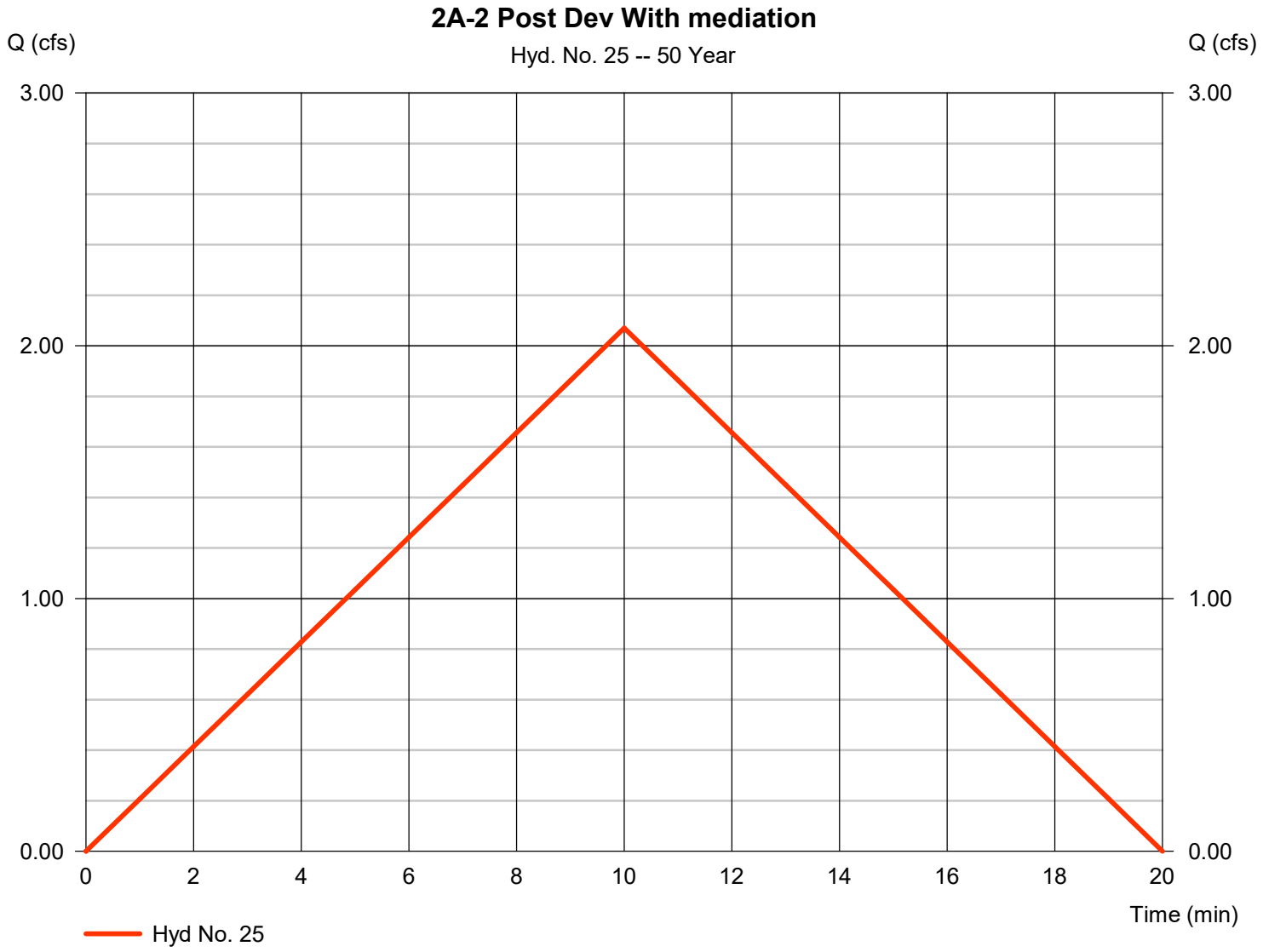


Hydrograph Report

Hyd. No. 25

2A-2 Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	2.071 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,242 cuft
Drainage area	=	0.620 ac	Runoff coeff.	=	0.55
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

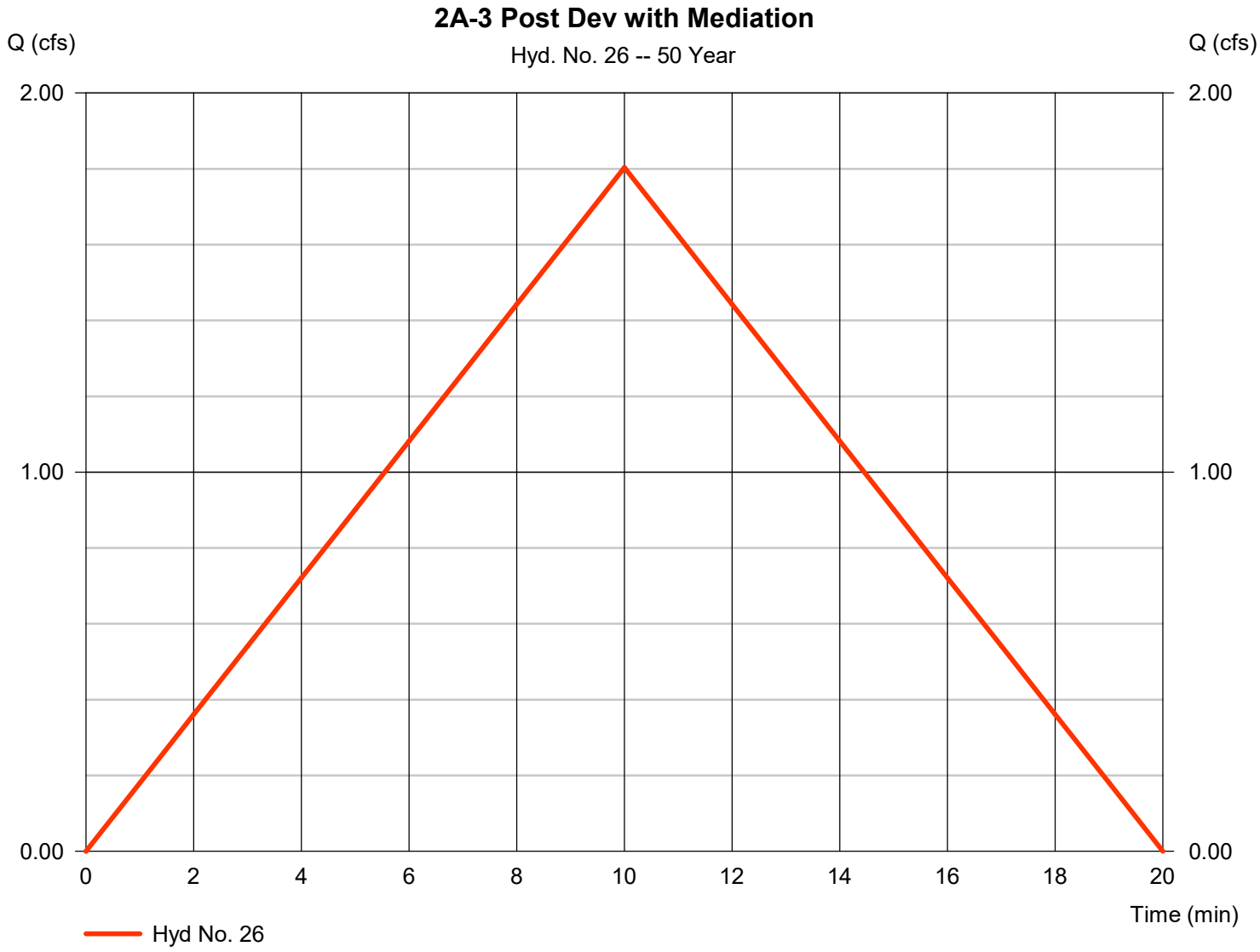


Hydrograph Report

Hyd. No. 26

2A-3 Post Dev with Mediation

Hydrograph type	=	Rational	Peak discharge	=	1.803 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,082 cuft
Drainage area	=	0.540 ac	Runoff coeff.	=	0.55
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



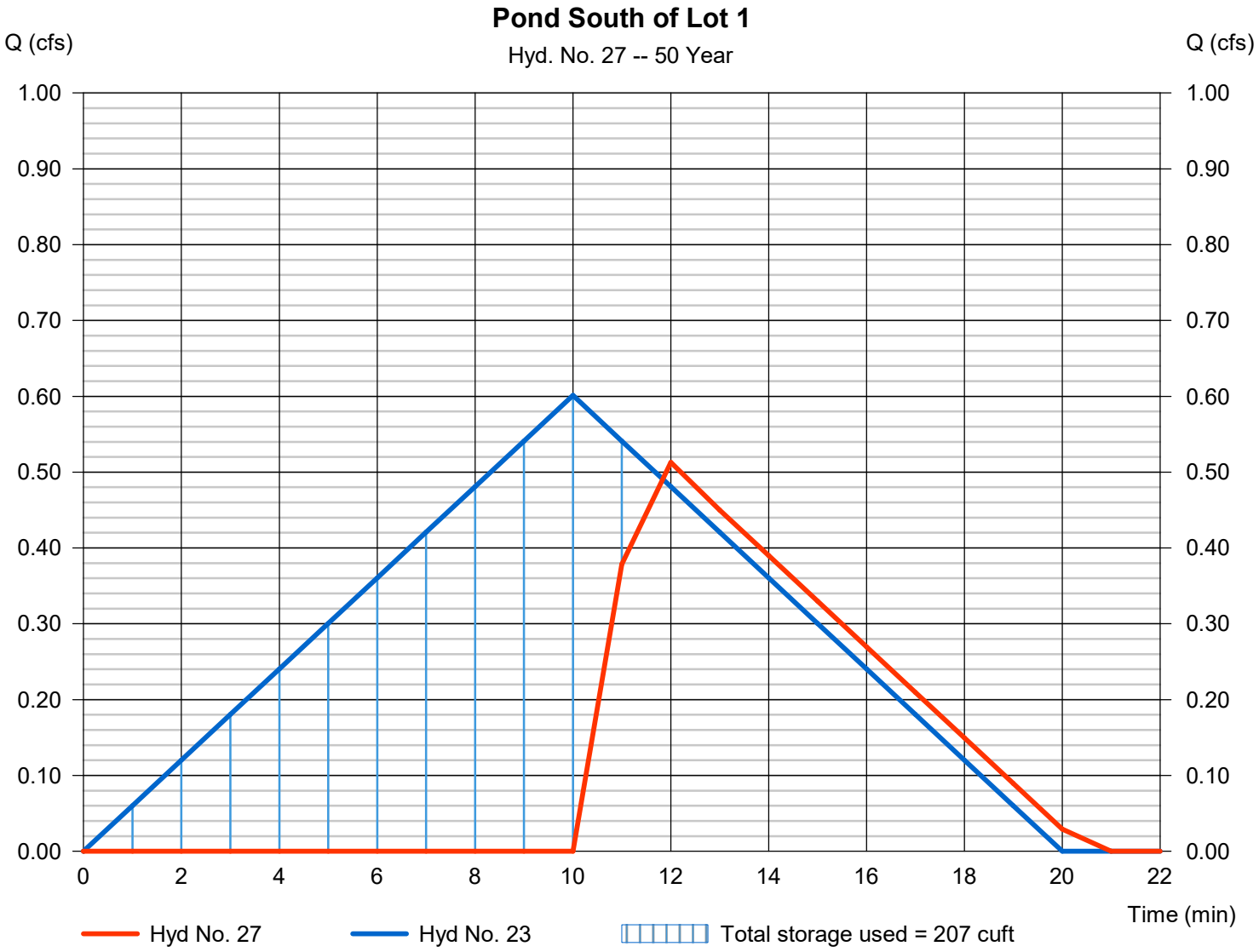
Hydrograph Report

Hyd. No. 27

Pond South of Lot 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.513 cfs
Storm frequency	=	50 yrs	Time to peak	=	12 min
Time interval	=	1 min	Hyd. volume	=	169 cuft
Inflow hyd. No.	=	23 - 2A-1 Post Dev with mediation	Max. Elevation	=	100.86 ft
Reservoir name	=	Pond on South of Lot 1	Max. Storage	=	207 cuft

Storage Indication method used.



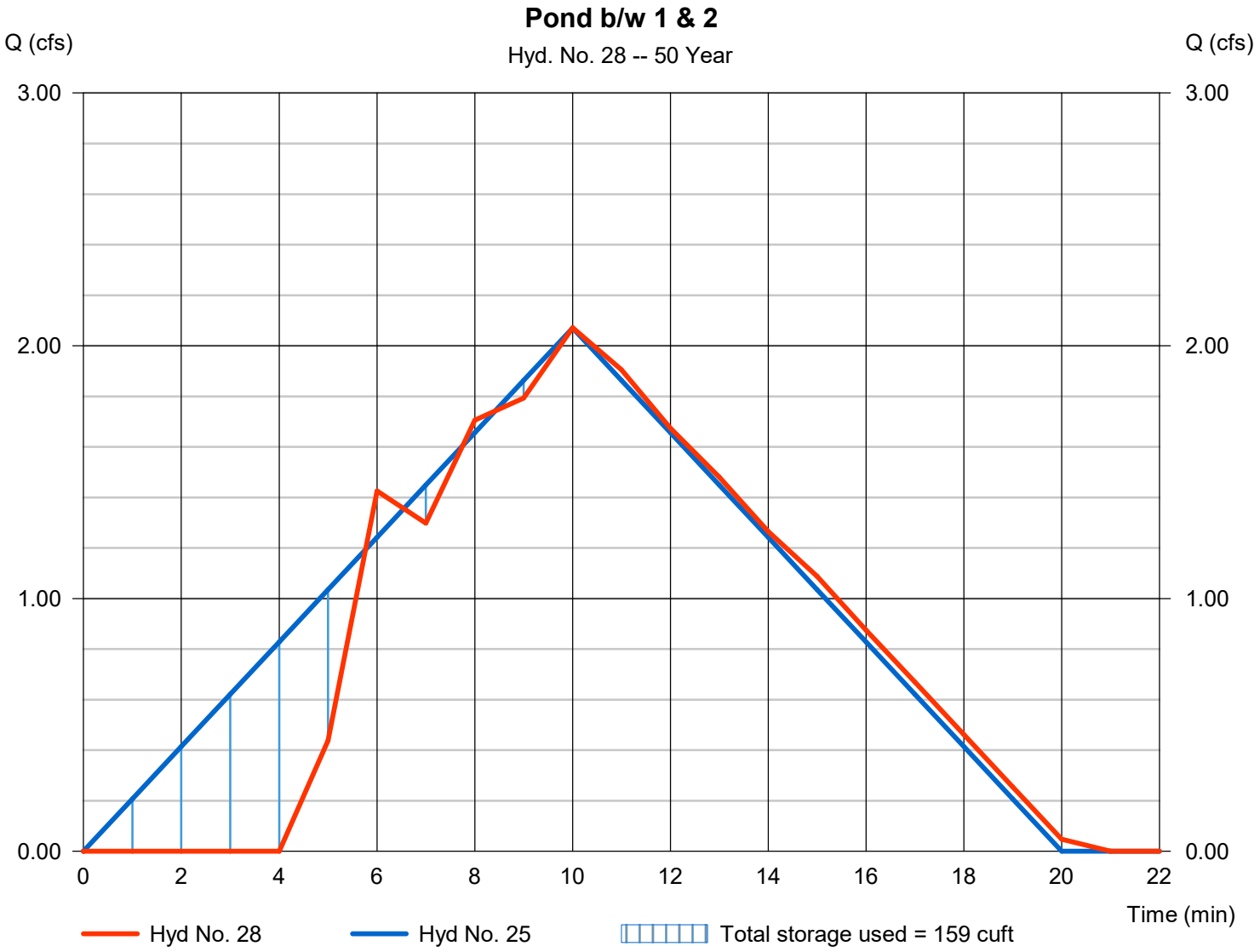
Hydrograph Report

Hyd. No. 28

Pond b/w 1 & 2

Hydrograph type	=	Reservoir	Peak discharge	=	2.071 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,107 cuft
Inflow hyd. No.	=	25 - 2A-2 Post Dev With median	Max. Elevation	=	100.94 ft
Reservoir name	=	Pond B/w 1&2	Max. Storage	=	159 cuft

Storage Indication method used.



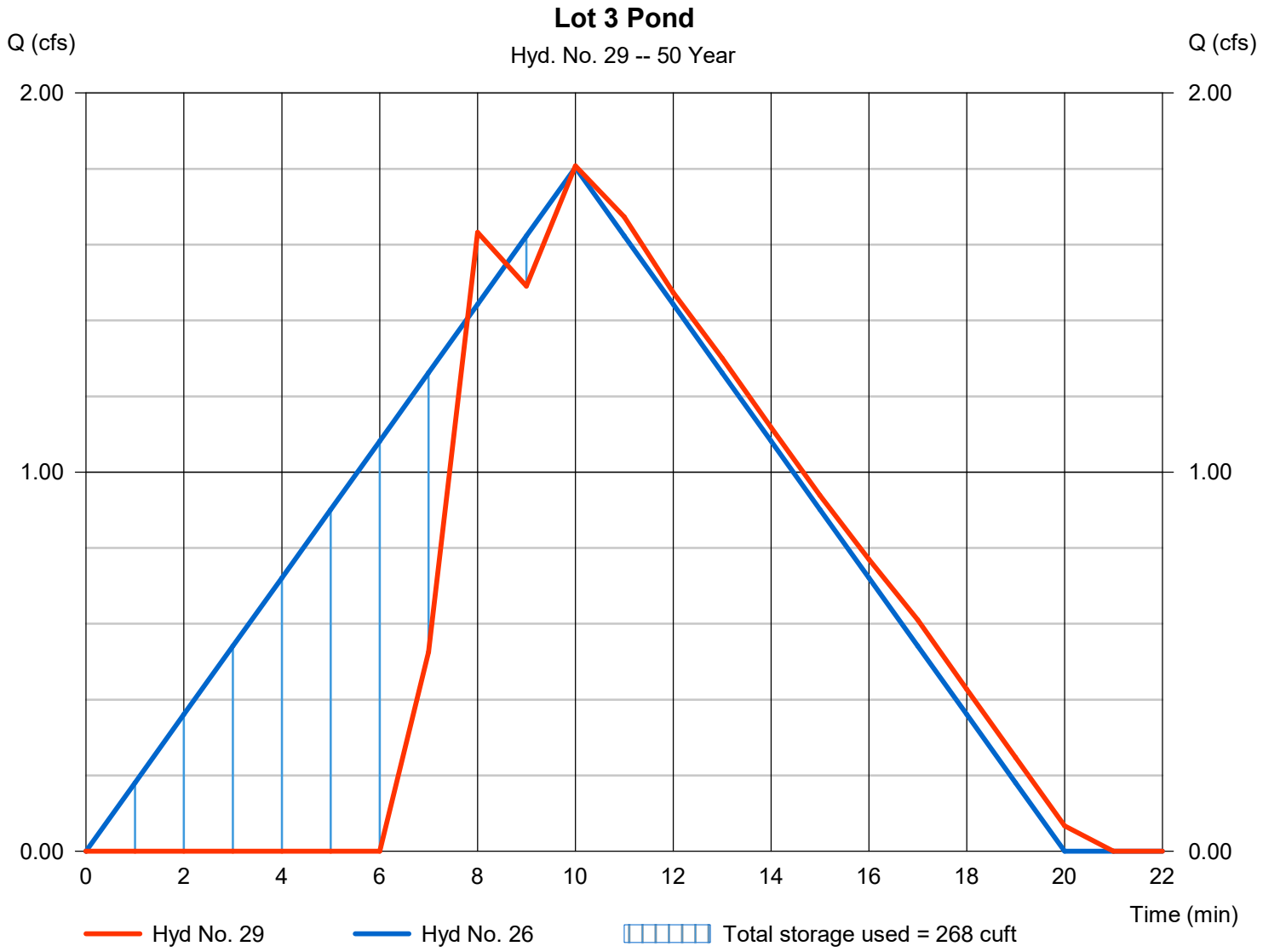
Hydrograph Report

Hyd. No. 29

Lot 3 Pond

Hydrograph type	=	Reservoir	Peak discharge	=	1.808 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	845 cuft
Inflow hyd. No.	=	26 - 2A-3 Post Dev with Mediation	Max. Elevation	=	101.97 ft
Reservoir name	=	Lot 3 Pond	Max. Storage	=	268 cuft

Storage Indication method used.

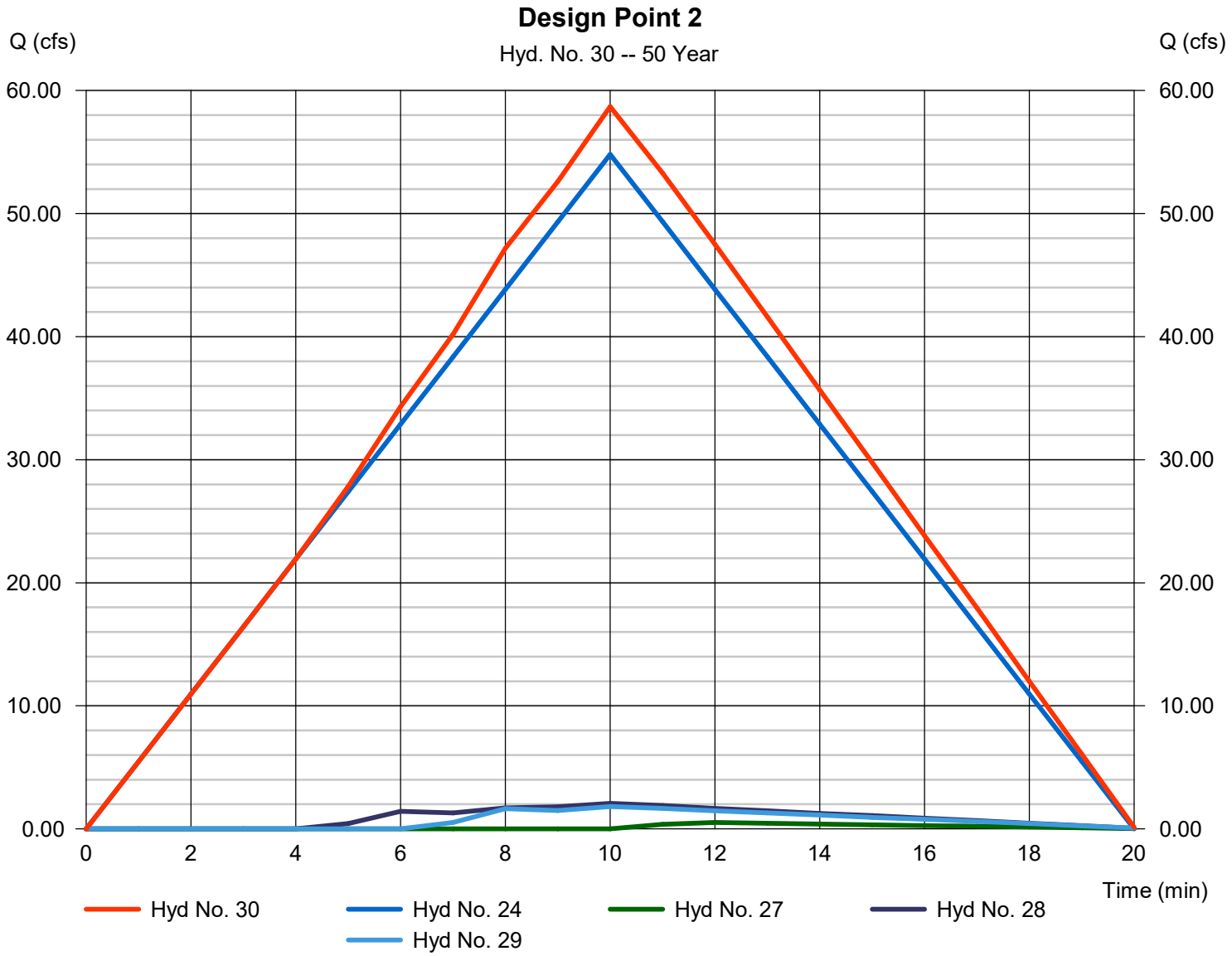


Hydrograph Report

Hyd. No. 30

Design Point 2

Hydrograph type	= Combine	Peak discharge	= 58.69 cfs
Storm frequency	= 50 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 35,008 cuft
Inflow hyds.	= 24, 27, 28, 29	Contrib. drain. area	= 20.060 ac

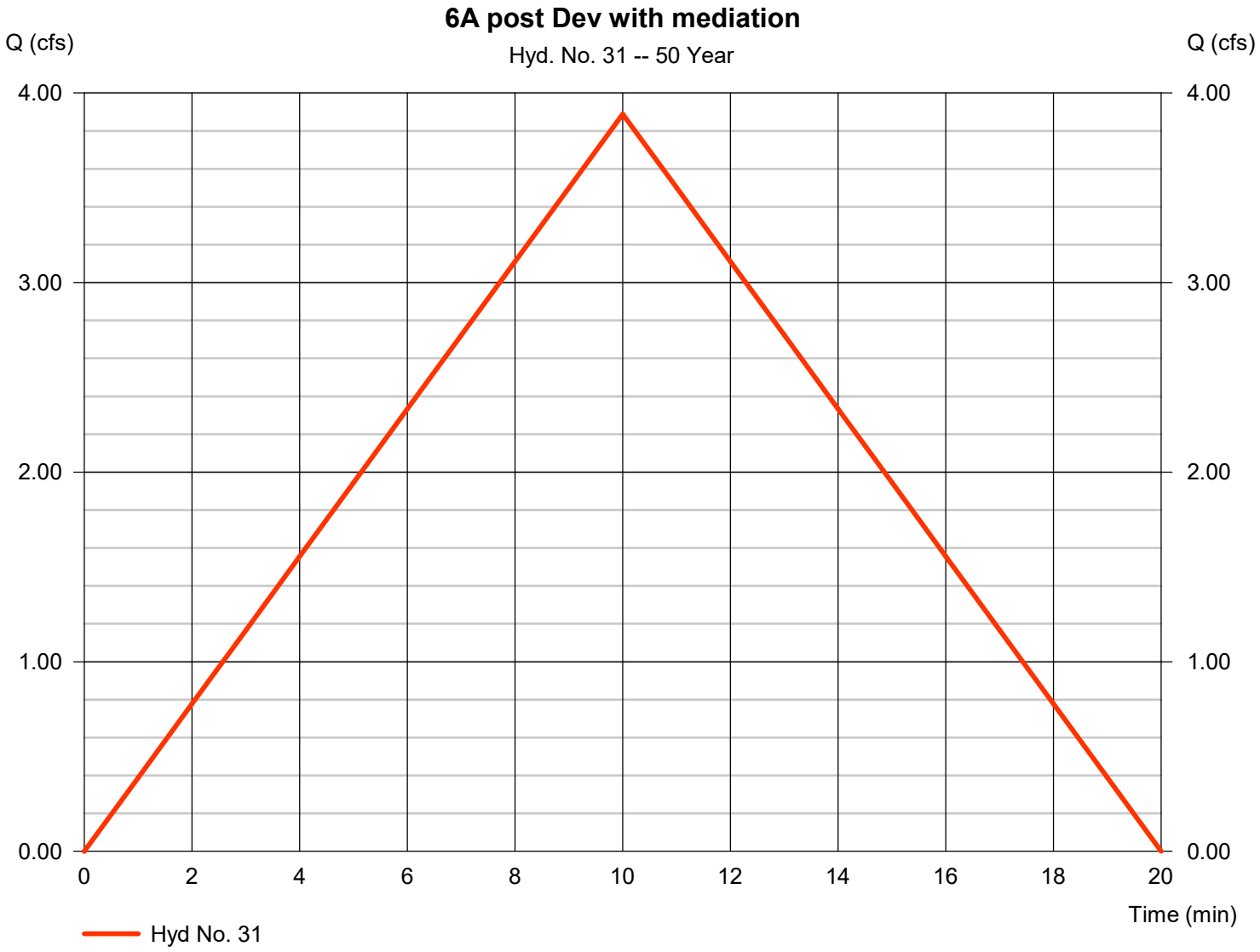


Hydrograph Report

Hyd. No. 31

6A post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	3.889 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,333 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

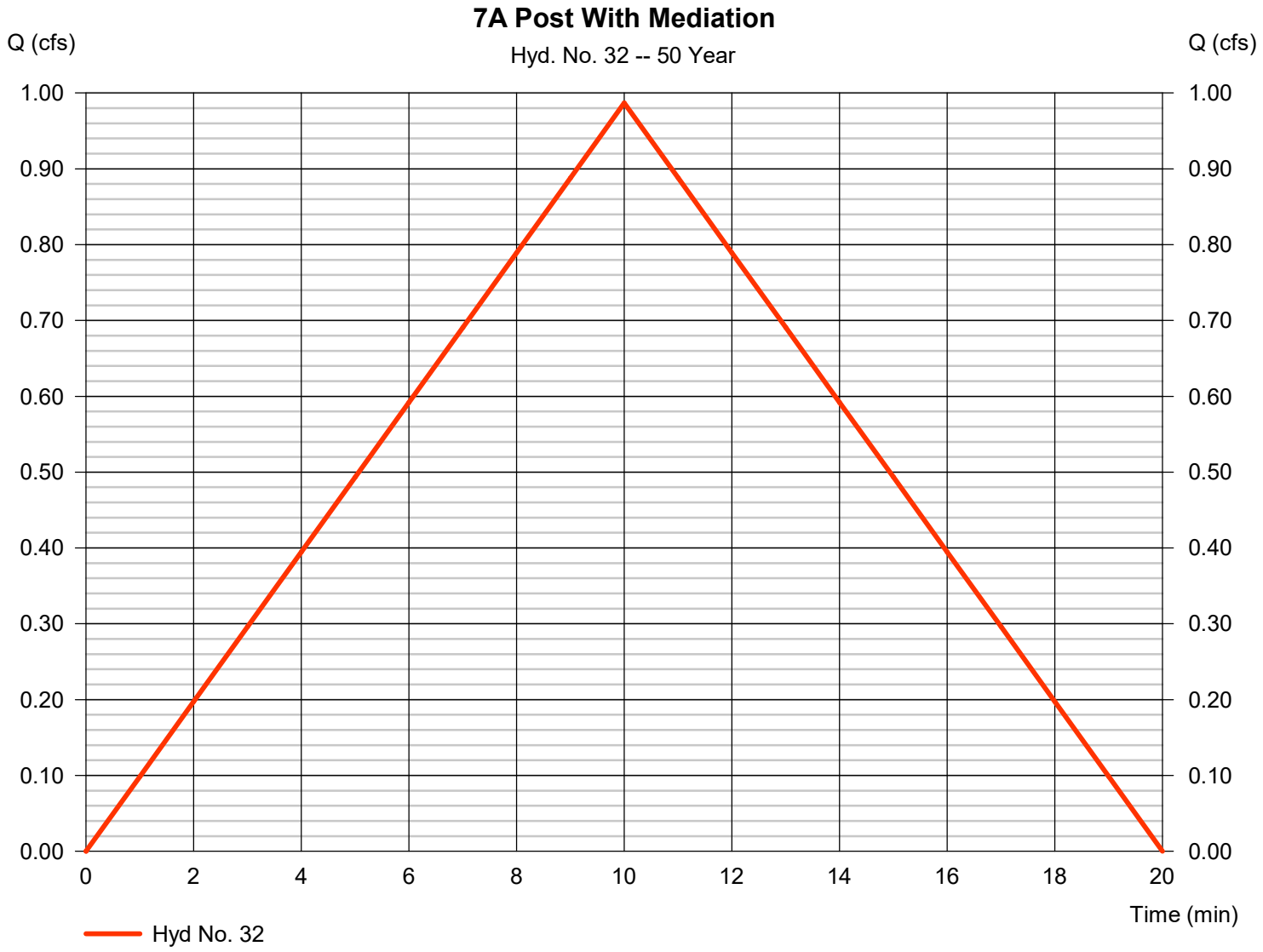


Hydrograph Report

Hyd. No. 32

7A Post With Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.987 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	592 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

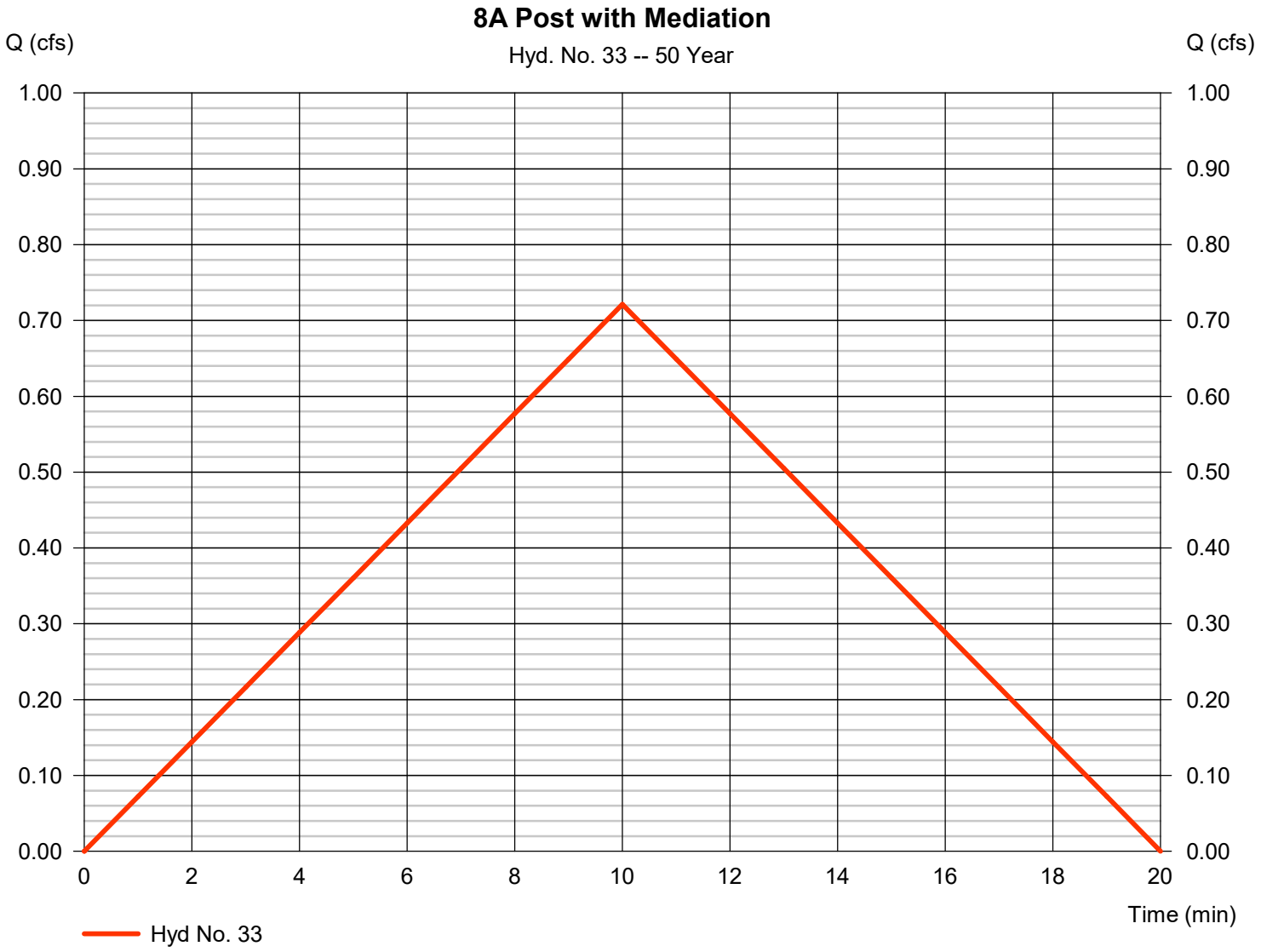


Hydrograph Report

Hyd. No. 33

8A Post with Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.721 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	433 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



Hydrograph Report

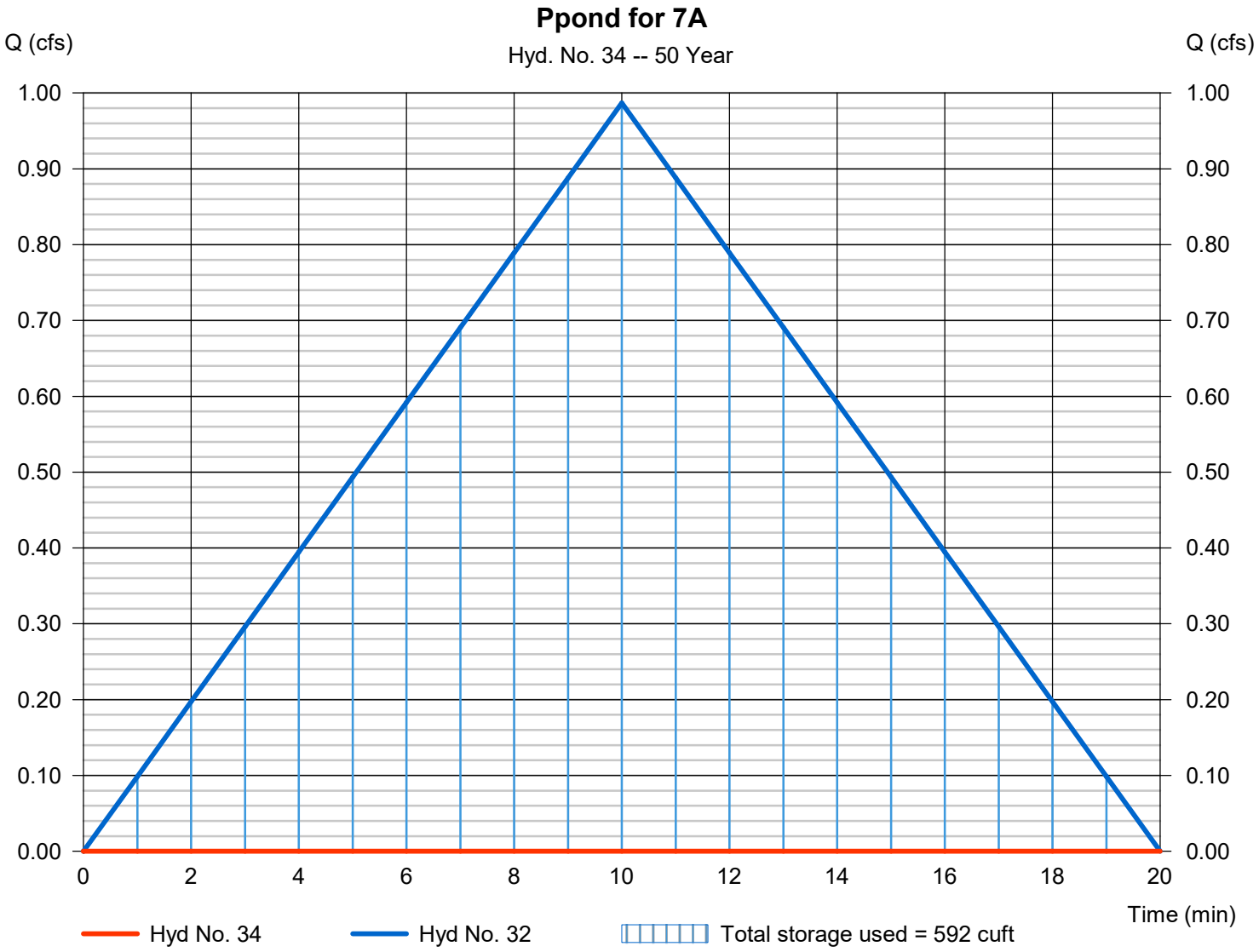
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 34

Ppond for 7A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	50 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	32 - 7A Post With Mediation	Max. Elevation	=	101.47 ft
Reservoir name	=	Pond for 7A	Max. Storage	=	592 cuft

Storage Indication method used.



Hydrograph Report

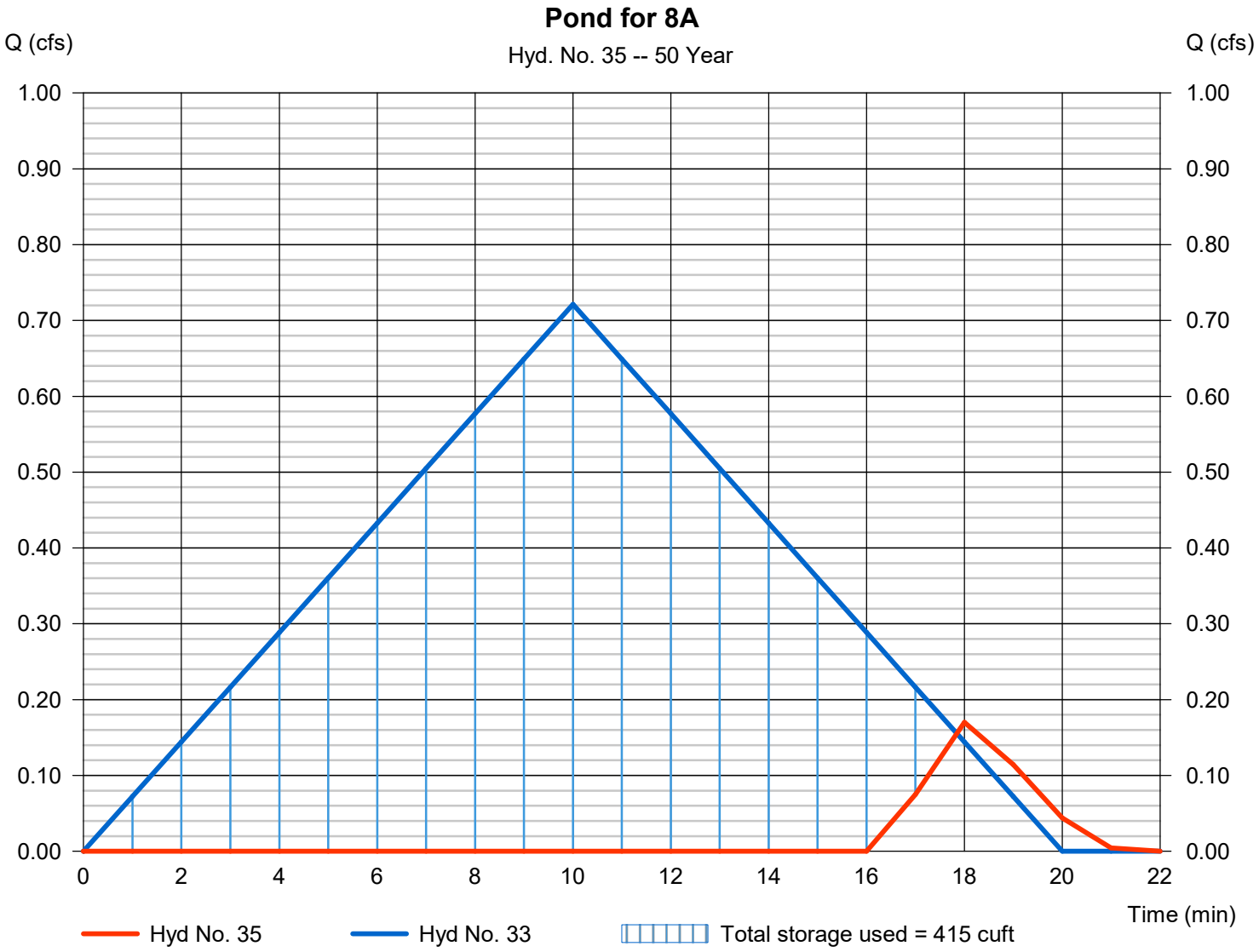
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 35

Pond for 8A

Hydrograph type	= Reservoir	Peak discharge	= 0.170 cfs
Storm frequency	= 50 yrs	Time to peak	= 18 min
Time interval	= 1 min	Hyd. volume	= 24 cuft
Inflow hyd. No.	= 33 - 8A Post with Mediation	Max. Elevation	= 101.82 ft
Reservoir name	= Pond for 8A	Max. Storage	= 415 cuft

Storage Indication method used.

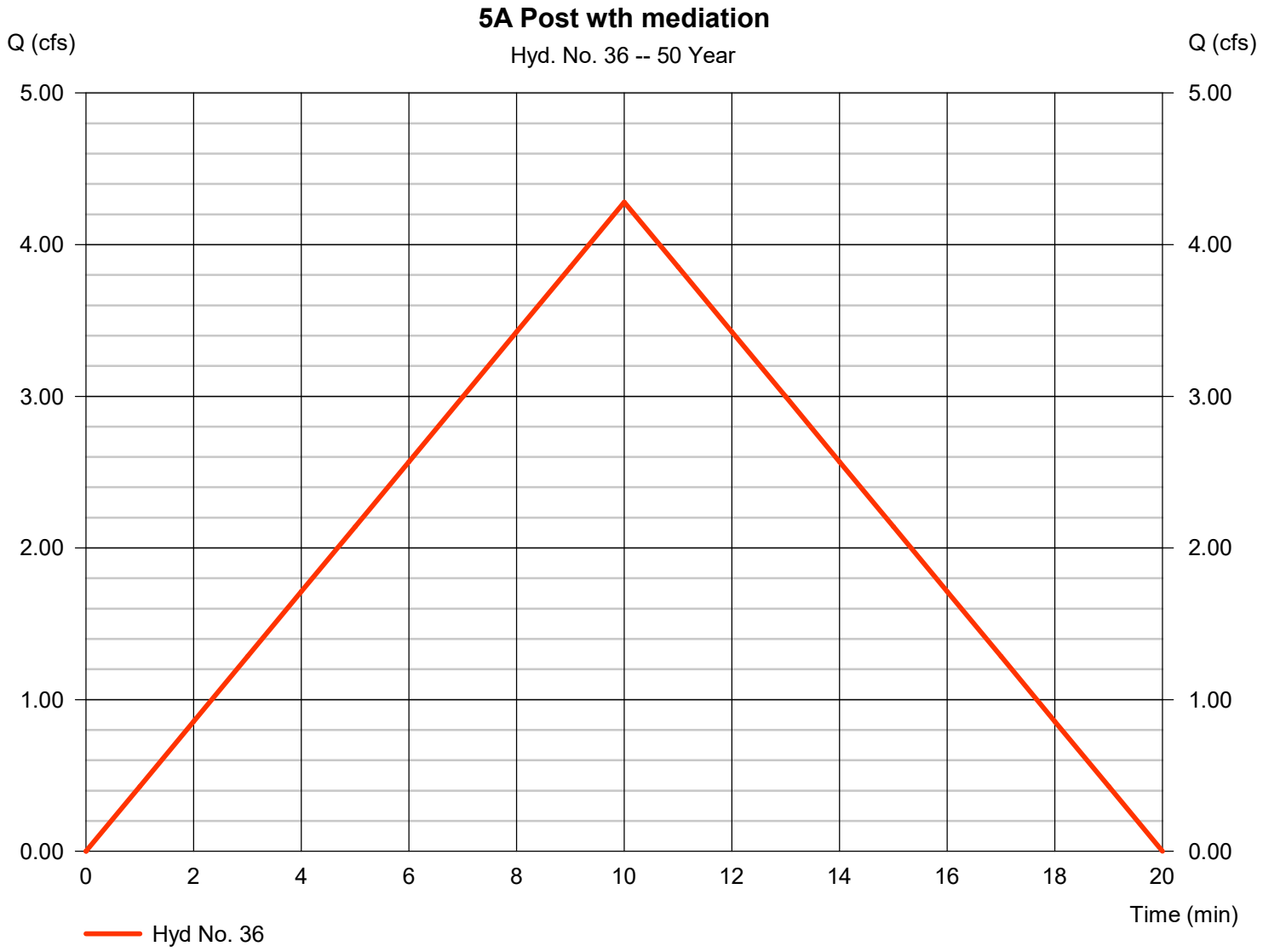


Hydrograph Report

Hyd. No. 36

5A Post wth mediation

Hydrograph type	=	Rational	Peak discharge	=	4.281 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,568 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

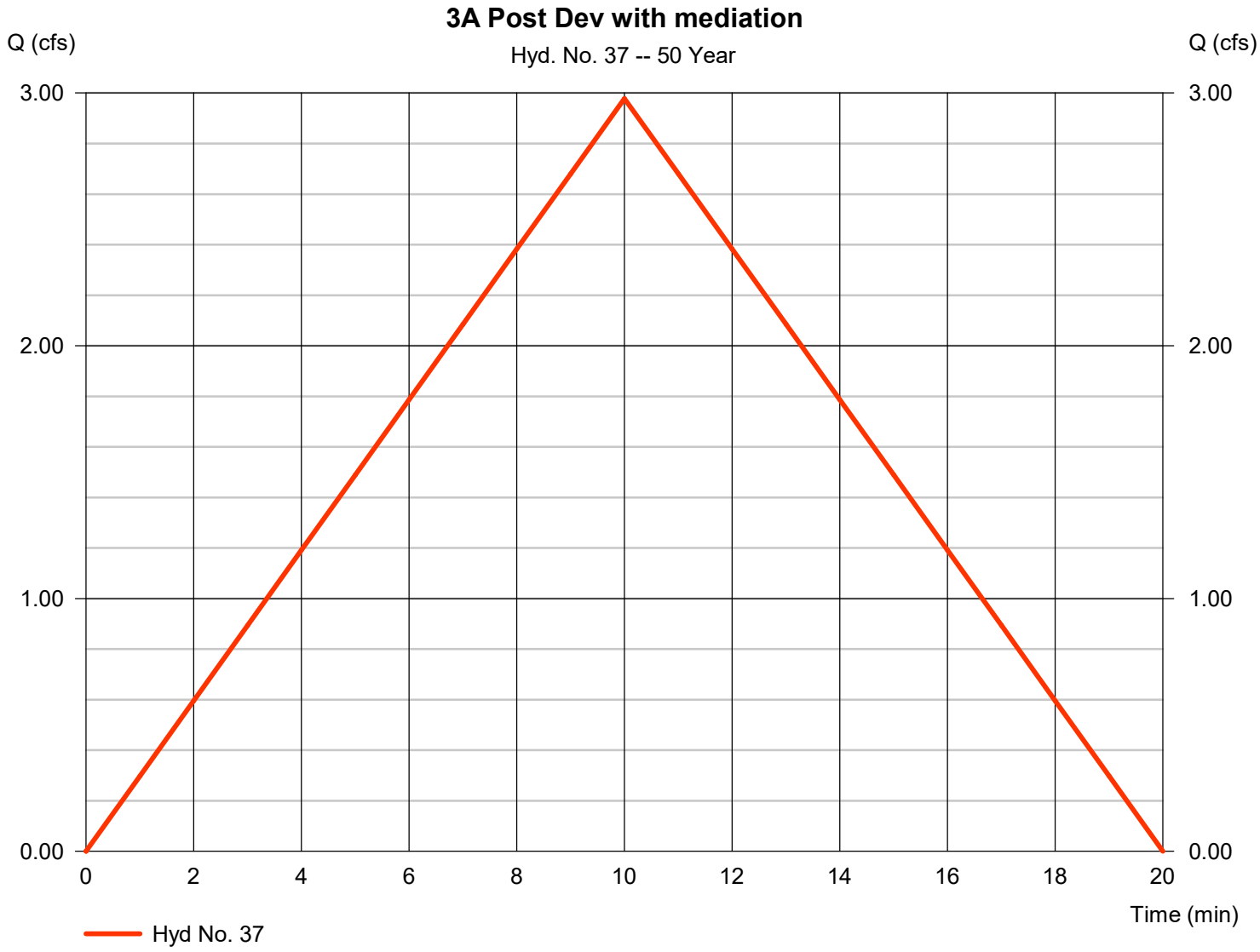


Hydrograph Report

Hyd. No. 37

3A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	2.978 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,787 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

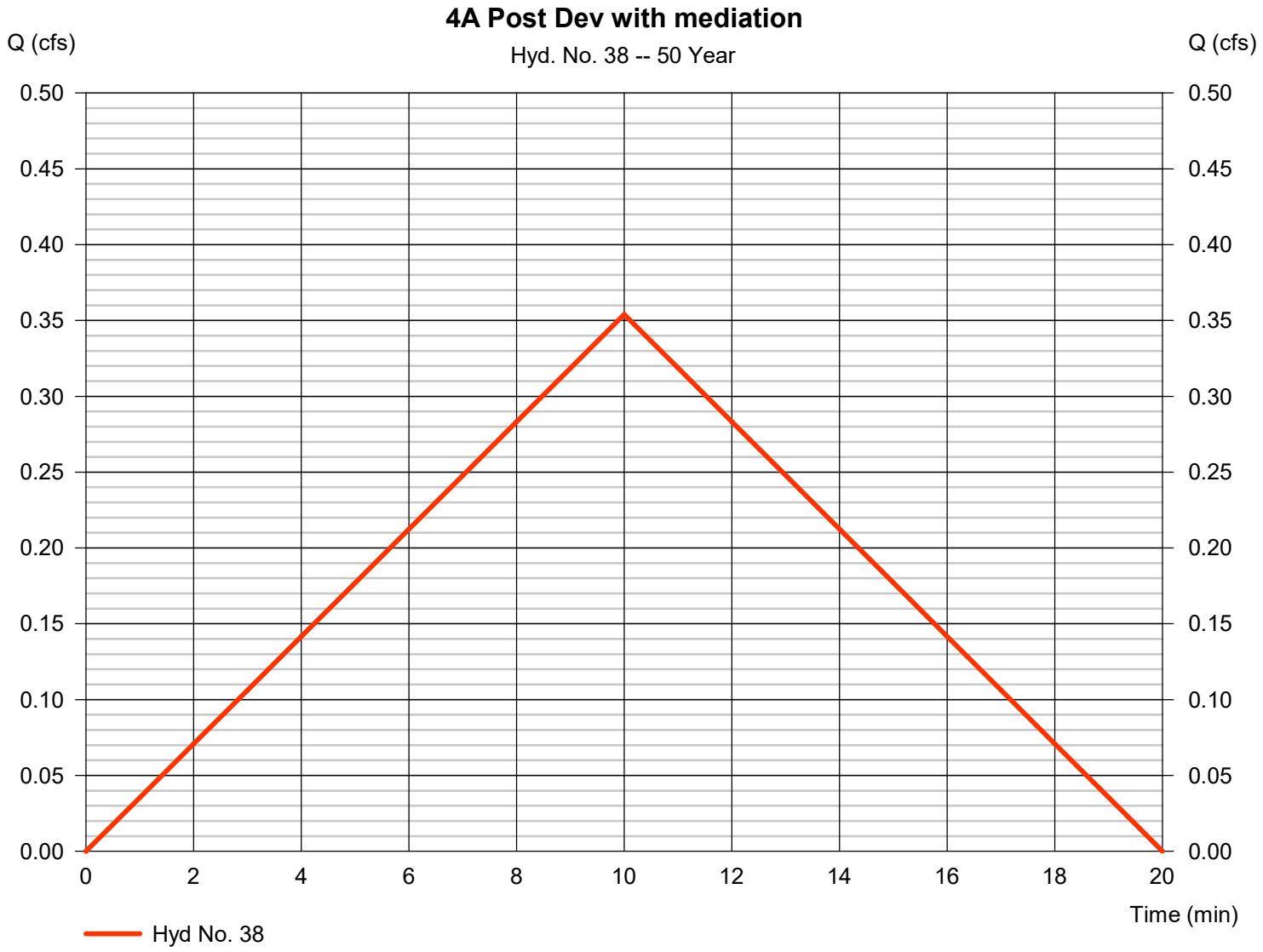


Hydrograph Report

Hyd. No. 38

4A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.354 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	212 cuft
Drainage area	=	0.110 ac	Runoff coeff.	=	0.53
Intensity	=	6.072 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

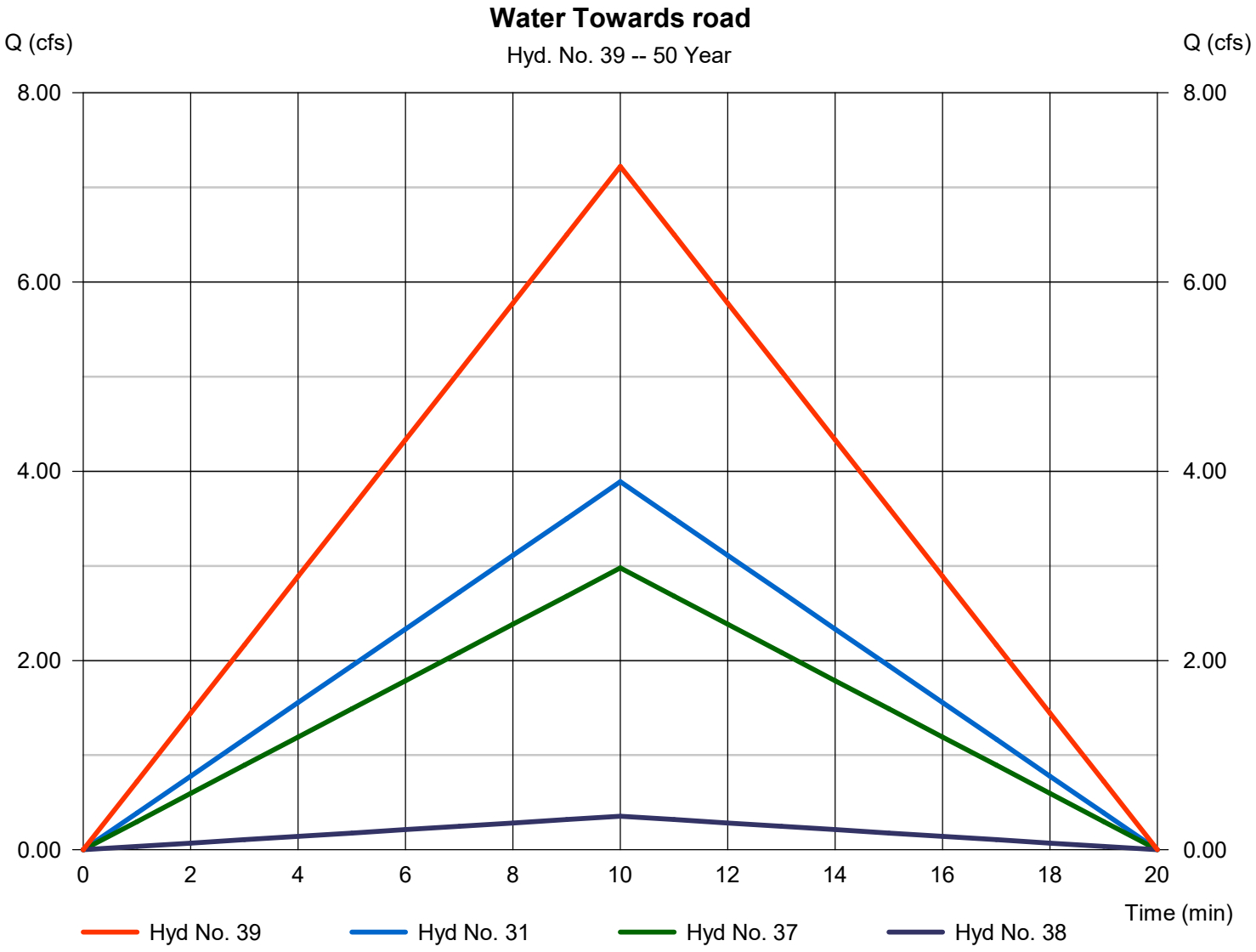


Hydrograph Report

Hyd. No. 39

Water Towards road

Hydrograph type	= Combine	Peak discharge	= 7.221 cfs
Storm frequency	= 50 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 4,333 cuft
Inflow hyds.	= 31, 37, 38	Contrib. drain. area	= 2.250 ac



Hydrograph Report

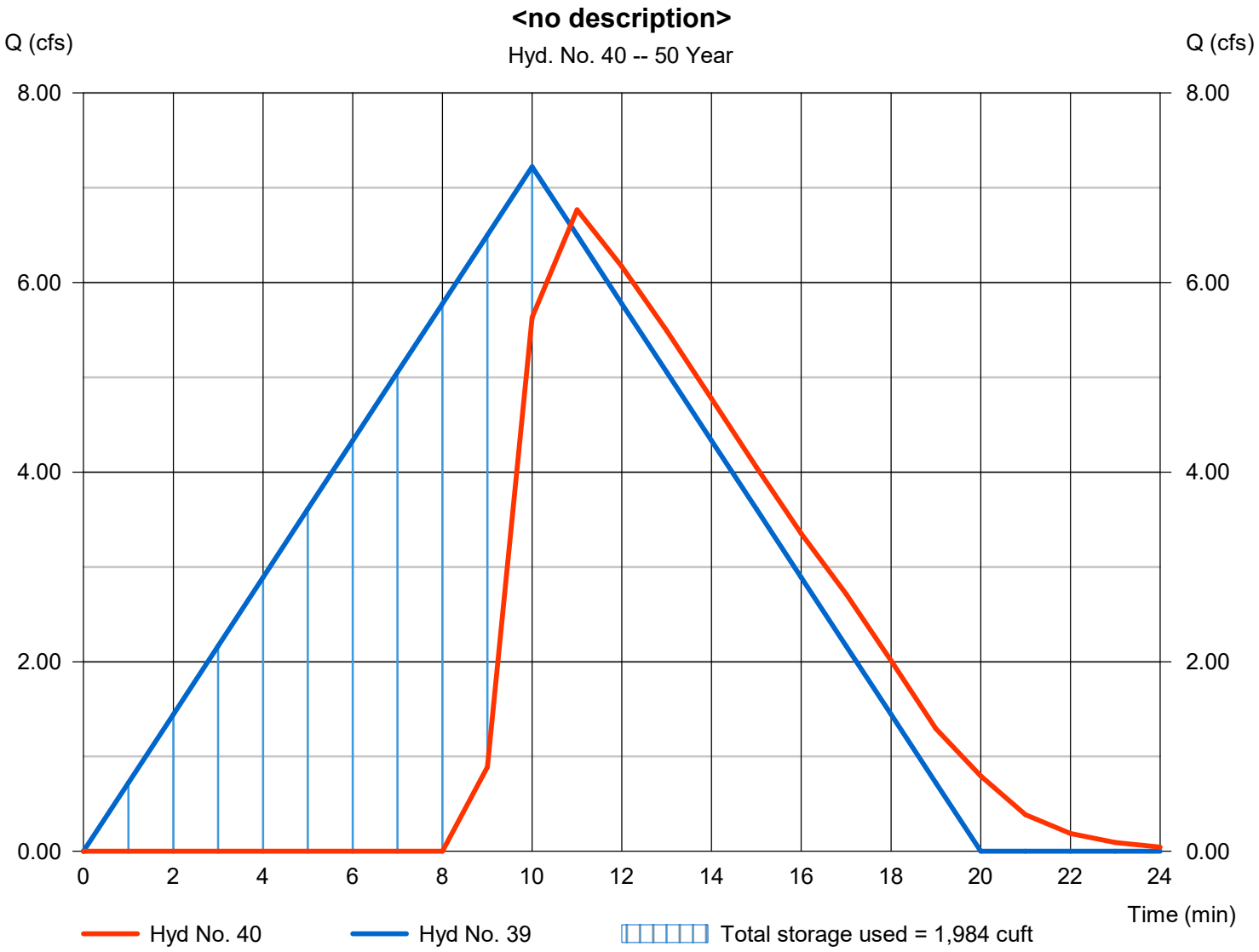
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 40

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	6.768 cfs
Storm frequency	=	50 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	2,682 cuft
Inflow hyd. No.	=	39 - Water Towards road	Max. Elevation	=	102.81 ft
Reservoir name	=	Lot 4 Pond	Max. Storage	=	1,984 cuft

Storage Indication method used.

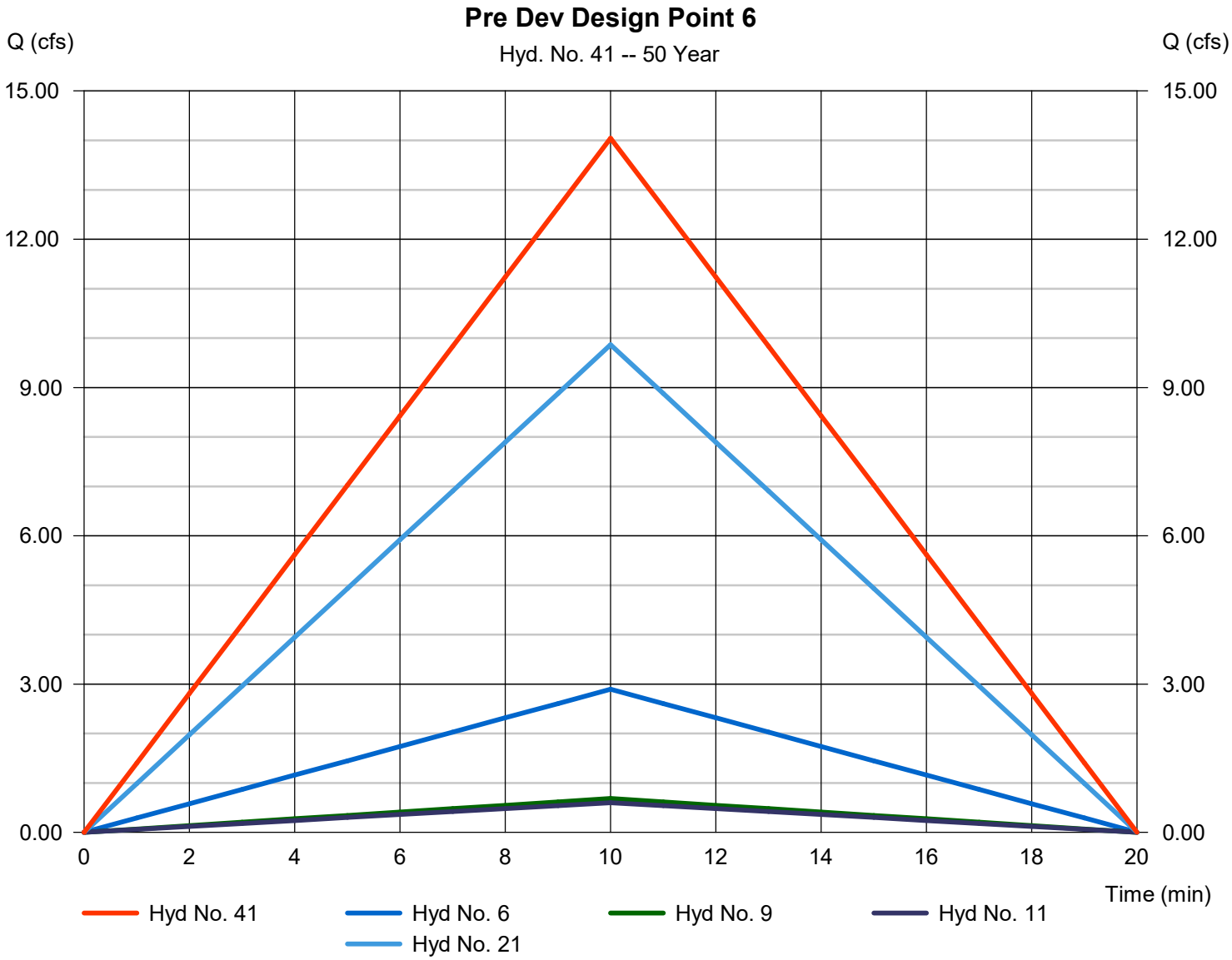


Hydrograph Report

Hyd. No. 41

Pre Dev Design Point 6

Hydrograph type	= Combine	Peak discharge	= 14.04 cfs
Storm frequency	= 50 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 8,427 cuft
Inflow hyds.	= 6, 9, 11, 21	Contrib. drain. area	= 1.530 ac



Hydrograph Report

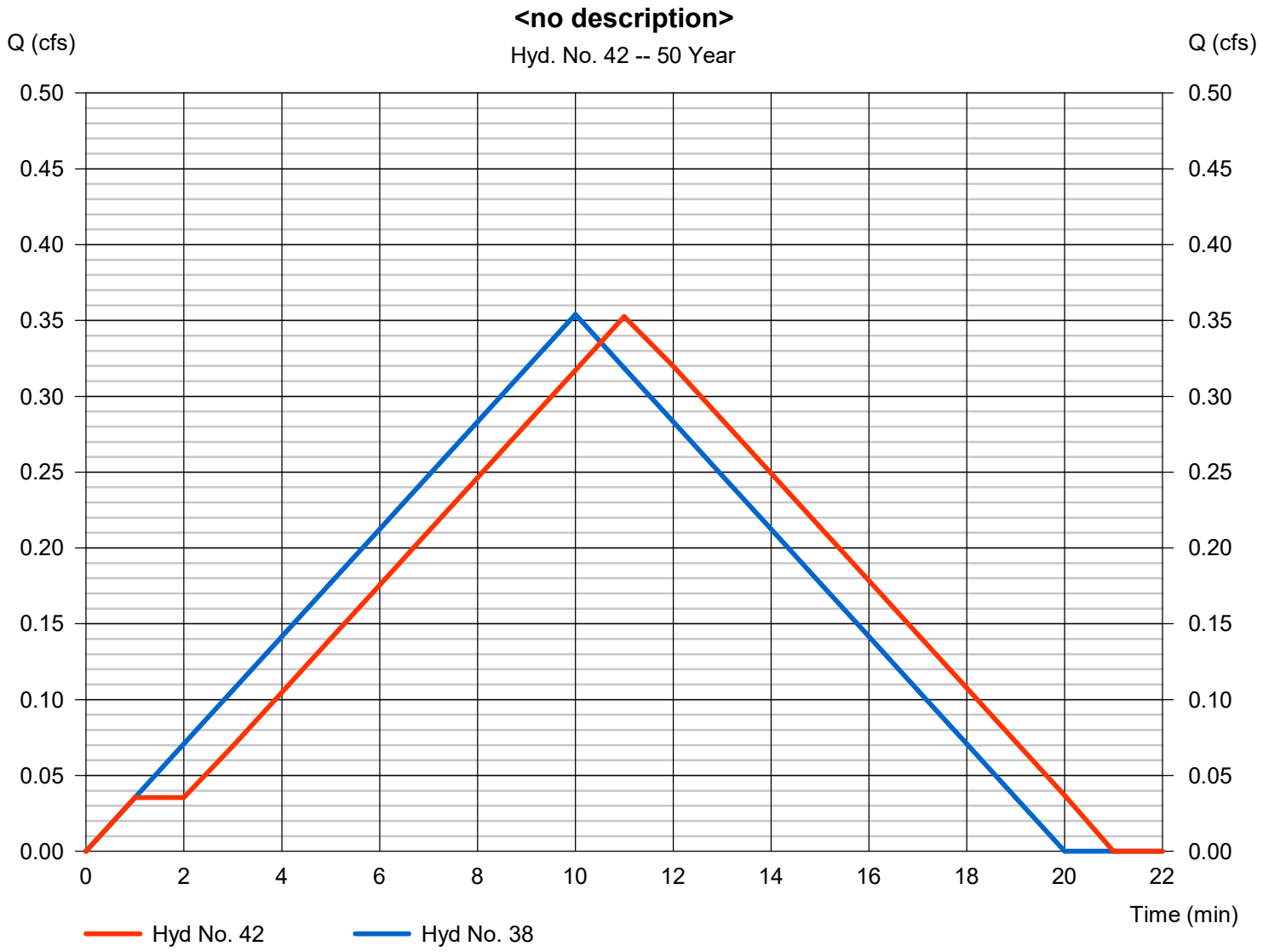
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 42

<no description>

Hydrograph type	=	Reach	Peak discharge	=	0.353 cfs
Storm frequency	=	50 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	215 cuft
Inflow hyd. No.	=	38 - 4A Post Dev with mediation	Section type	=	Triangular
Reach length	=	140.0 ft	Channel slope	=	28.0 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	6.3:1	Max. depth	=	0.0 ft
Rating curve x	=	6.755	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.9602

Modified Att-Kin routing method used.

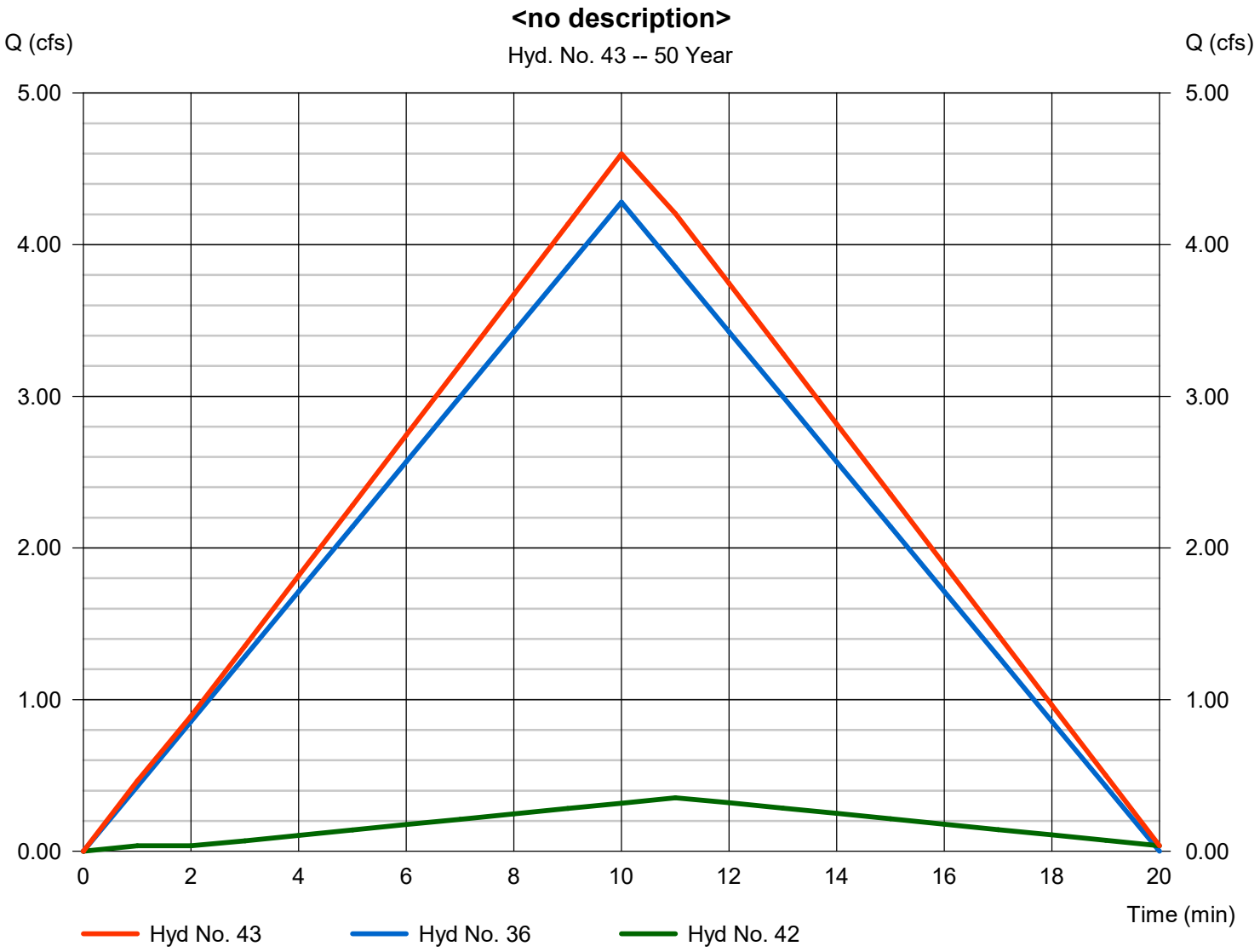


Hydrograph Report

Hyd. No. 43

<no description>

Hydrograph type	=	Combine	Peak discharge	=	4.598 cfs
Storm frequency	=	50 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,783 cuft
Inflow hyds.	=	36, 42	Contrib. drain. area	=	1.410 ac



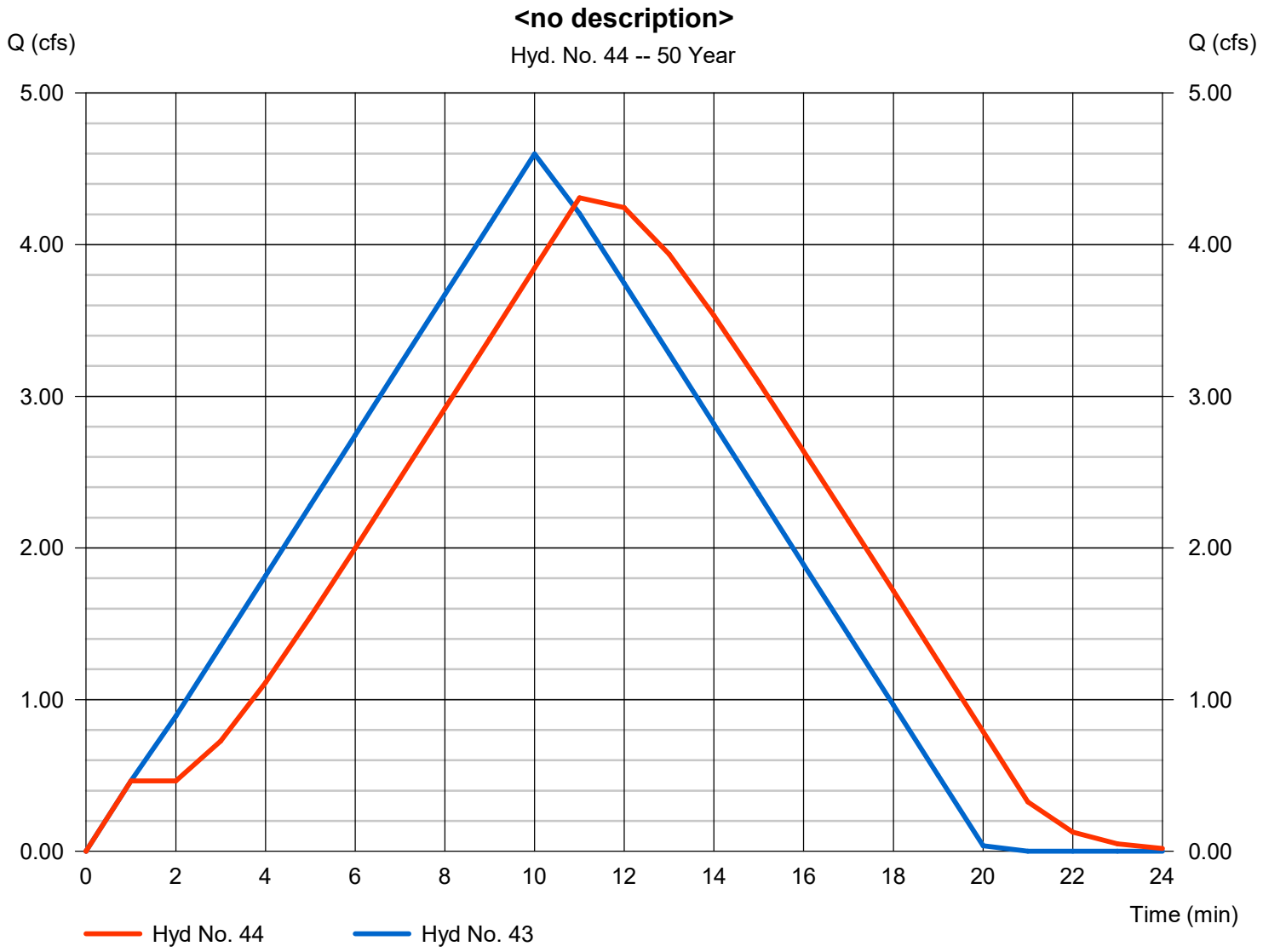
Hydrograph Report

Hyd. No. 44

<no description>

Hydrograph type	=	Reach	Peak discharge	=	4.309 cfs
Storm frequency	=	50 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	2,827 cuft
Inflow hyd. No.	=	43 - <no description>	Section type	=	Triangular
Reach length	=	307.0 ft	Channel slope	=	7.1 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	8.3:1	Max. depth	=	0.0 ft
Rating curve x	=	3.091	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.6157

Modified Att-Kin routing method used.

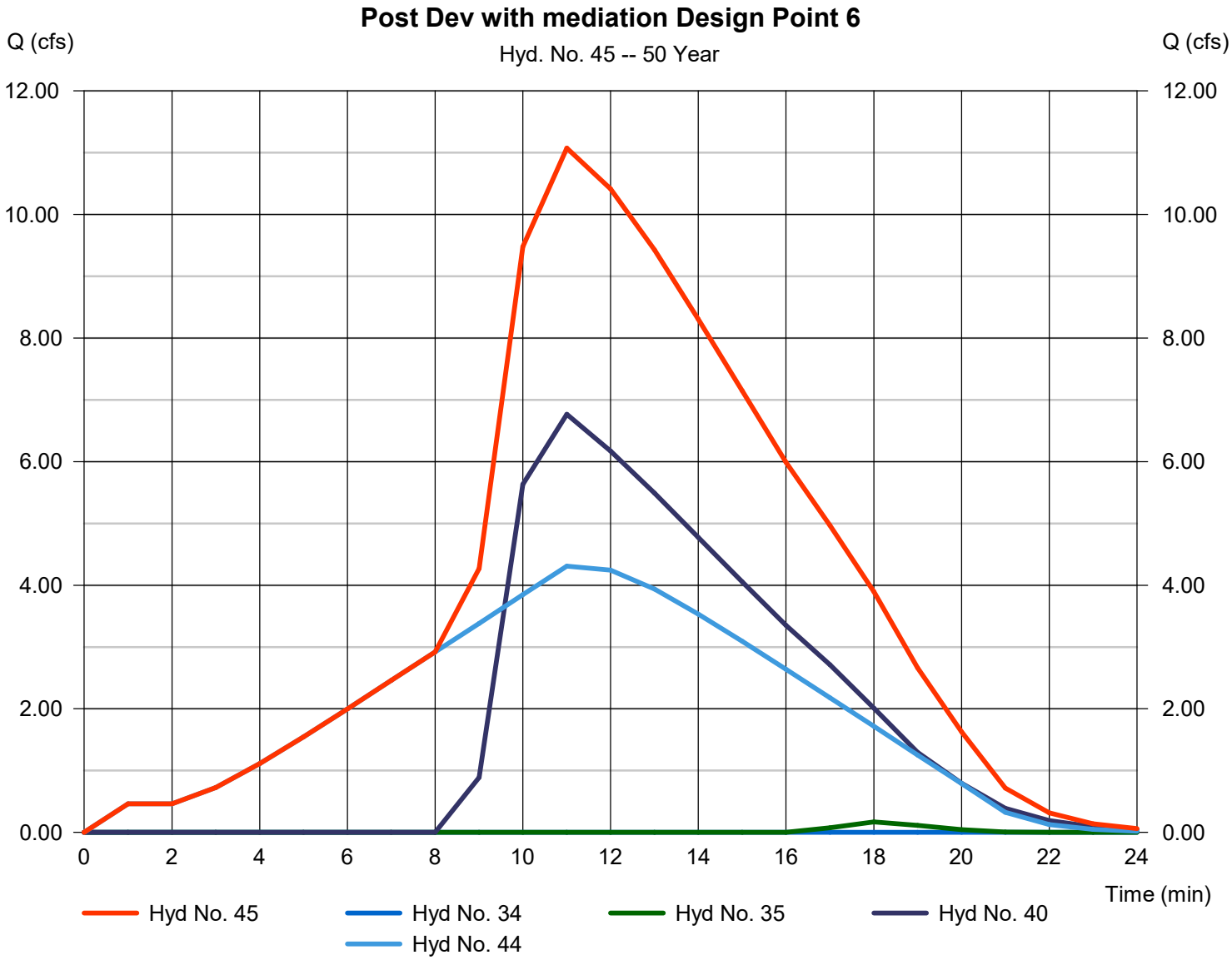


Hydrograph Report

Hyd. No. 45

Post Dev with mediation Design Point 6

Hydrograph type	= Combine	Peak discharge	= 11.08 cfs
Storm frequency	= 50 yrs	Time to peak	= 11 min
Time interval	= 1 min	Hyd. volume	= 5,534 cuft
Inflow hyds.	= 34, 35, 40, 44	Contrib. drain. area	= 0.000 ac

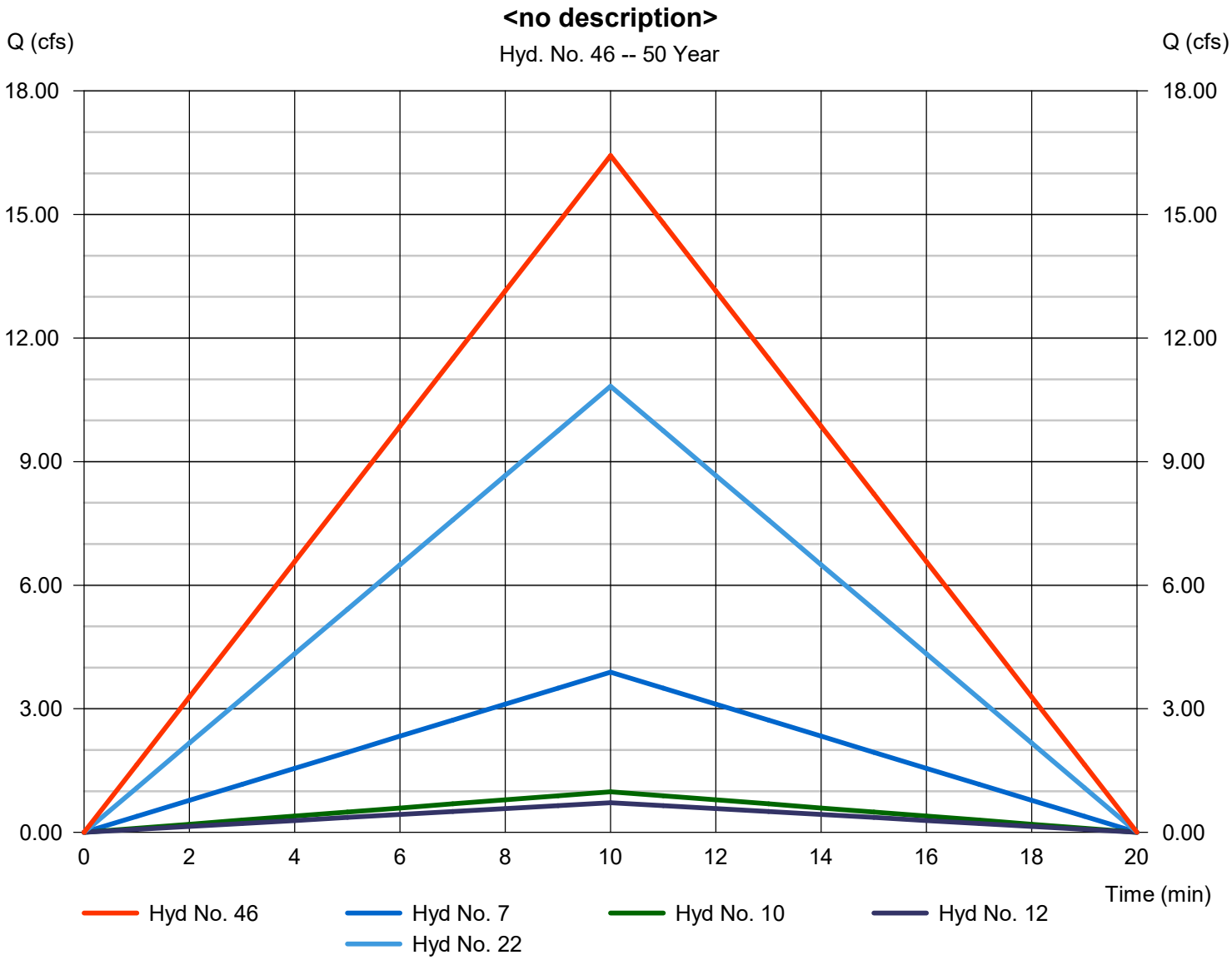


Hydrograph Report

Hyd. No. 46

<no description>

Hydrograph type	= Combine	Peak discharge	= 16.43 cfs
Storm frequency	= 50 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 9,857 cuft
Inflow hyds.	= 7, 10, 12, 22	Contrib. drain. area	= 1.520 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	Rational	65.05	1	10	39,032	------	------	------	1A Pre
2	Rational	5.172	1	10	3,103	------	------	------	2A Post
3	Rational	3.442	1	10	2,065	------	------	------	3A Pre
4	Rational	3.505	1	10	2,103	------	------	------	4A Pre
5	Rational	4.453	1	10	2,672	------	------	------	5A Pre
6	Rational	3.347	1	10	2,008	------	------	------	6A Pre
7	Rational	4.495	1	10	2,697	------	------	------	6A Post
8	Rational	4.128	1	10	2,477	------	------	------	4A Post
9	Rational	0.789	1	10	474	------	------	------	7A Pre
10	Rational	1.140	1	10	684	------	------	------	7A Post
11	Rational	0.695	1	10	417	------	------	------	8A Pre
12	Rational	0.834	1	10	500	------	------	------	8A Post
13	Rational	4.232	1	10	2,539	------	------	------	2A Pre
14	Rational	4.947	1	10	2,968	------	------	------	5A Post
15	Rational	65.05	1	10	39,032	------	------	------	1A Post
16	Combine	69.28	1	10	41,571	1, 13,	------	------	1A & 2A Pre Combined
17	Combine	70.22	1	10	42,135	2, 15,	------	------	1A & 2A Post Combined
18	Combine	6.947	1	10	4,168	3, 4,	------	------	3A & 4A Pre Combined
19	Rational	3.442	1	10	2,065	------	------	------	3A Post
20	Combine	7.571	1	10	4,542	8, 19	------	------	3A & 4A Post Combined
21	Combine	11.40	1	10	6,840	5, 18,	------	------	Design Point 5 Pre Dev
22	Combine	12.52	1	10	7,511	14, 20,	------	------	Design Point 5 Post Dev
23	Rational	0.695	1	10	417	------	------	------	2A-1 Post Dev with mediation
24	Rational	63.35	1	10	38,009	------	------	------	1A Post Dev With mediation
25	Rational	2.393	1	10	1,436	------	------	------	2A-2 Post Dev With mediation
26	Rational	2.084	1	10	1,251	------	------	------	2A-3 Post Dev with Mediation
27	Reservoir	0.665	1	11	225	23	100.88	212	Pond South of Lot 1
28	Reservoir	2.371	1	10	1,301	25	100.95	162	Pond b/w 1 & 2
29	Reservoir	2.041	1	10	1,013	26	101.98	271	Lot 3 Pond
30	Combine	68.03	1	10	40,547	24, 27, 28, 29	------	------	Design Point 2
31	Rational	4.495	1	10	2,697	------	------	------	6A post Dev with mediation
32	Rational	1.140	1	10	684	------	------	------	7A Post With Mediation
33	Rational	0.834	1	10	500	------	------	------	8A Post with Mediation
34	Reservoir	0.000	1	n/a	0	32	101.64	684	Ppond for 7A

Hydrograph Summary Report

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

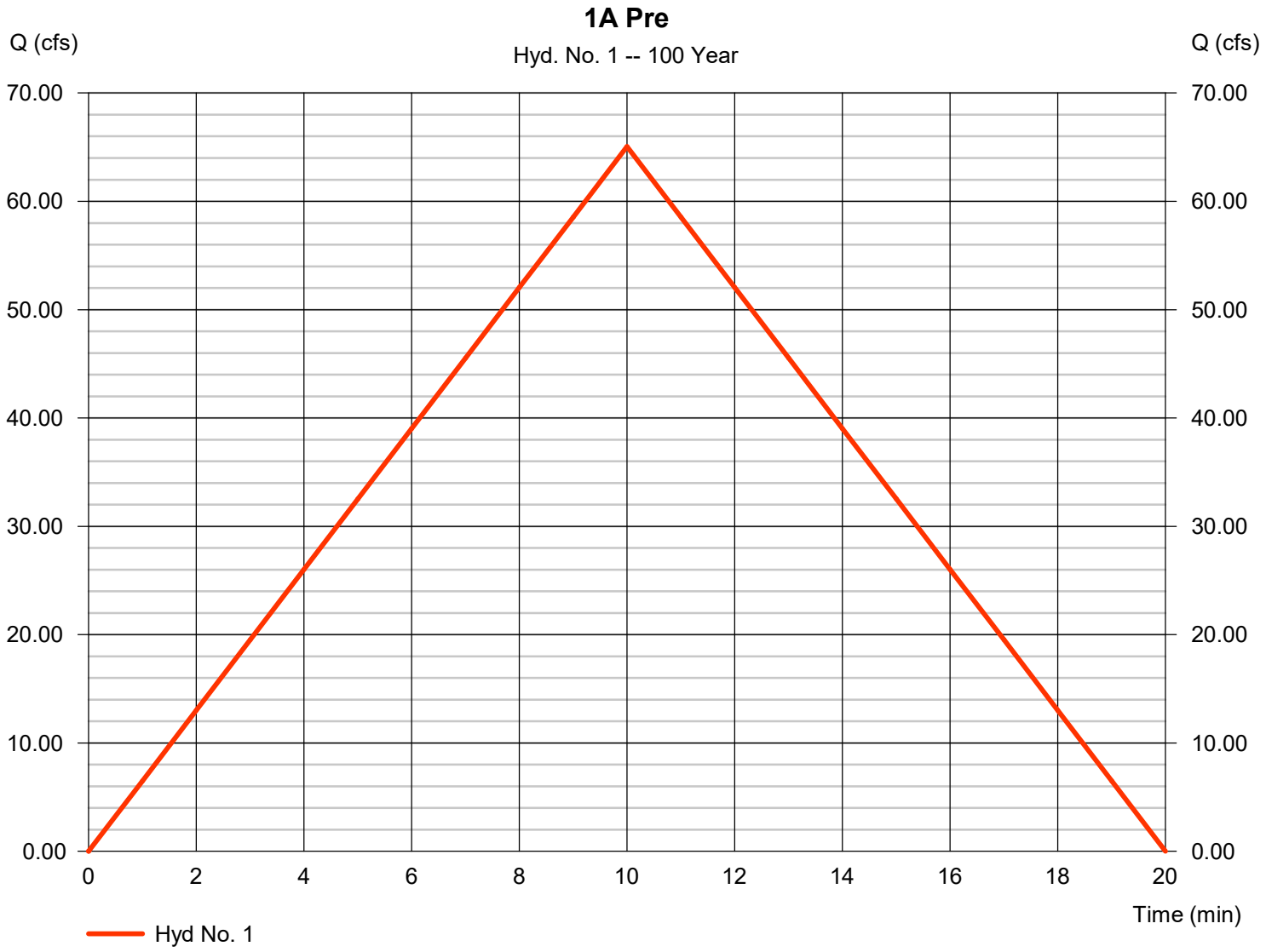
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	Reservoir	0.416	1	15	92	33	101.85	424	Pond for 8A
36	Rational	4.947	1	10	2,968	------	------	------	5A Post wth mediation
37	Rational	3.442	1	10	2,065	------	------	------	3A Post Dev with mediation
38	Rational	0.409	1	10	245	------	------	------	4A Post Dev with mediation
39	Combine	8.346	1	10	5,008	31, 37, 38	------	------	Water Towards road
40	Reservoir	7.925	1	11	3,357	39	102.84	2,020	<no description>
41	Combine	16.23	1	10	9,739	6, 9, 11, 21,	------	------	Pre Dev Design Point 6
42	Reach	0.408	1	11	248	38	------	------	<no description>
43	Combine	5.315	1	10	3,216	36, 42	------	------	<no description>
44	Reach	5.002	1	11	3,267	43	------	------	<no description>
45	Combine	12.93	1	11	6,715	34, 35, 40, 44	------	------	Post Dev with mediation Design Point
46	Combine	18.99	1	10	11,392	7, 10, 12, 22,	------	------	<no description>

Hydrograph Report

Hyd. No. 1

1A Pre

Hydrograph type	=	Rational	Peak discharge	=	65.05 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	39,032 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

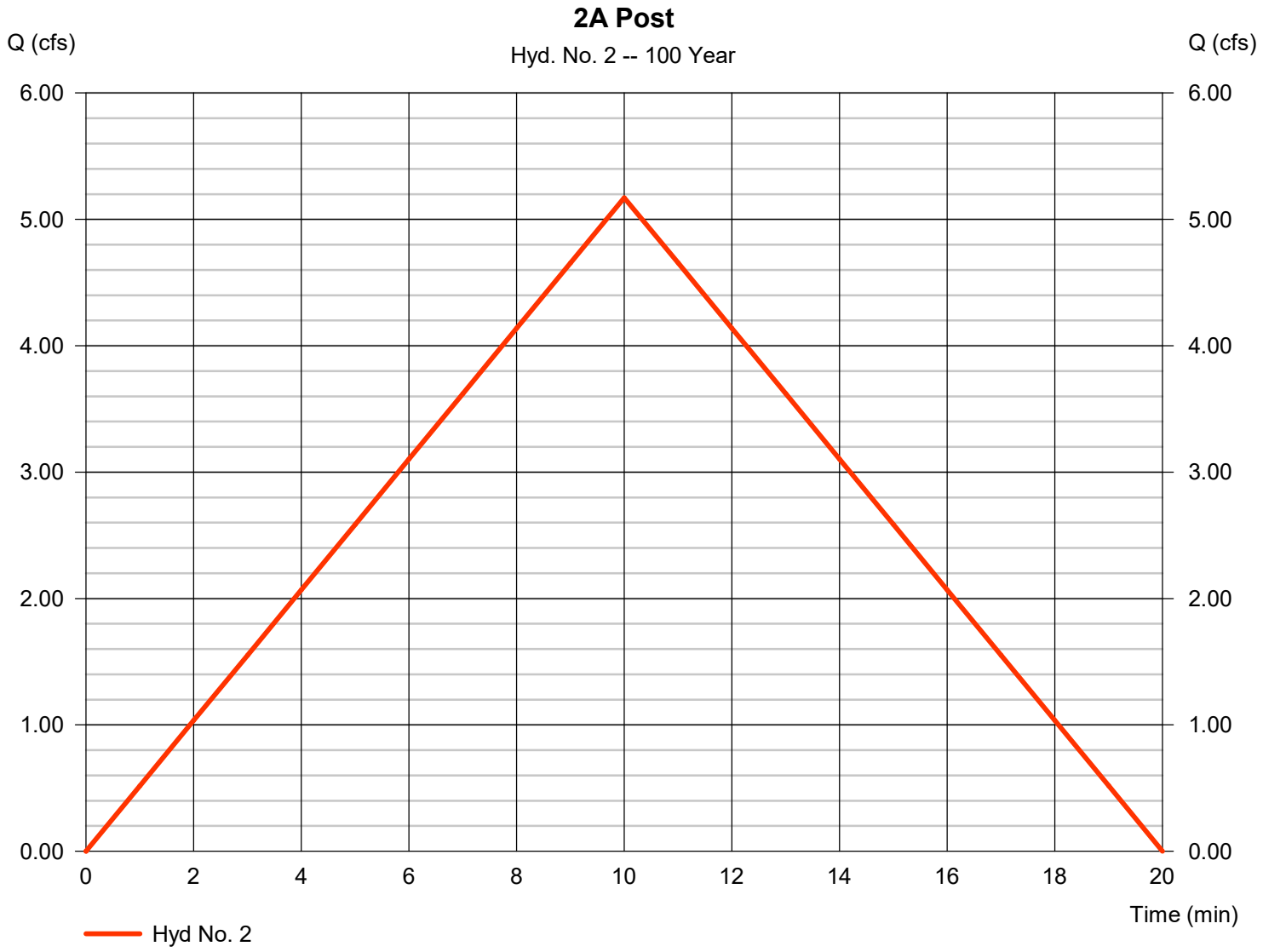


Hydrograph Report

Hyd. No. 2

2A Post

Hydrograph type	=	Rational	Peak discharge	=	5.172 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	3,103 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.55
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

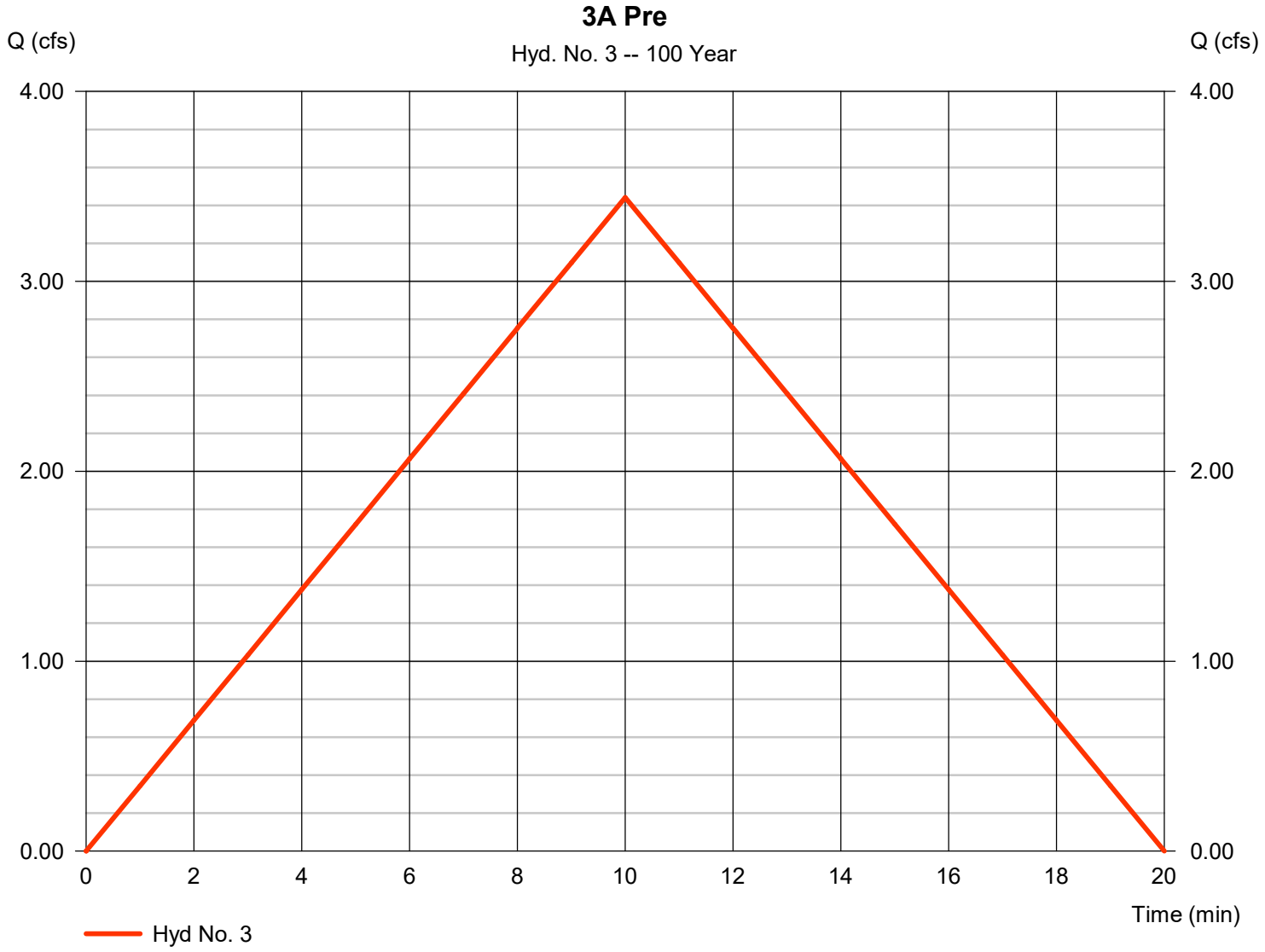


Hydrograph Report

Hyd. No. 3

3A Pre

Hydrograph type	=	Rational	Peak discharge	=	3.442 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,065 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

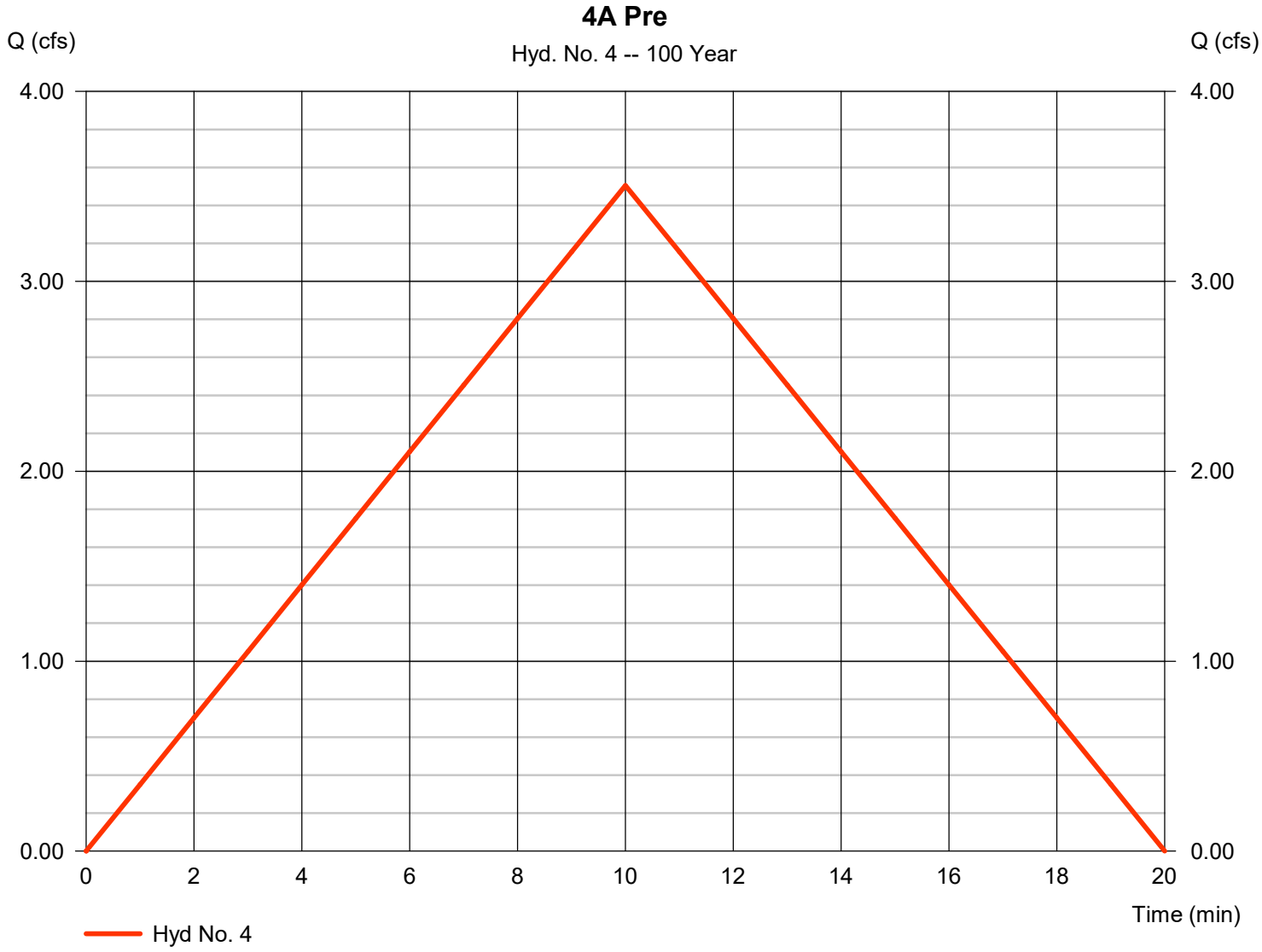


Hydrograph Report

Hyd. No. 4

4A Pre

Hydrograph type	=	Rational	Peak discharge	=	3.505 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,103 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

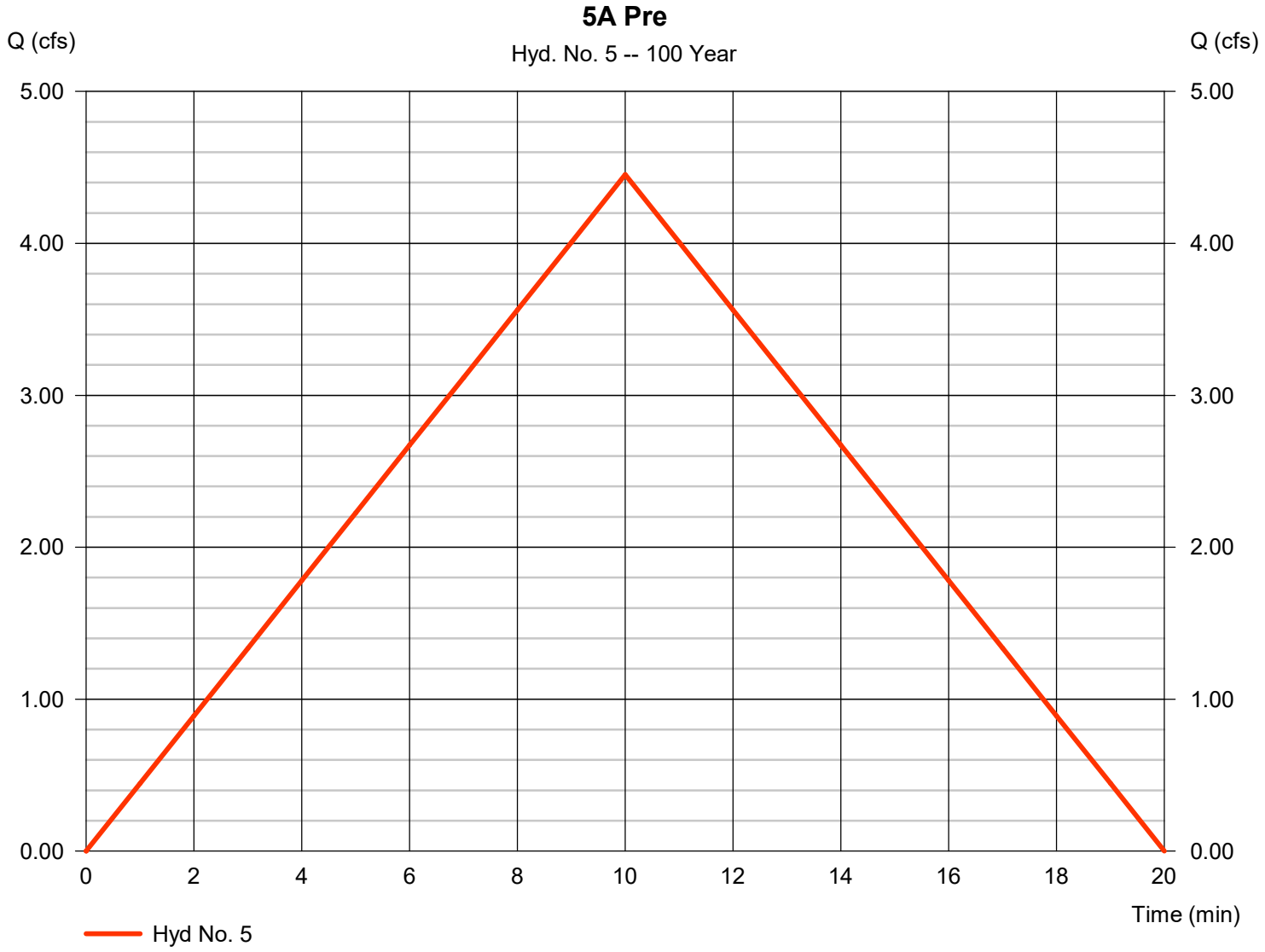


Hydrograph Report

Hyd. No. 5

5A Pre

Hydrograph type	=	Rational	Peak discharge	=	4.453 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,672 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



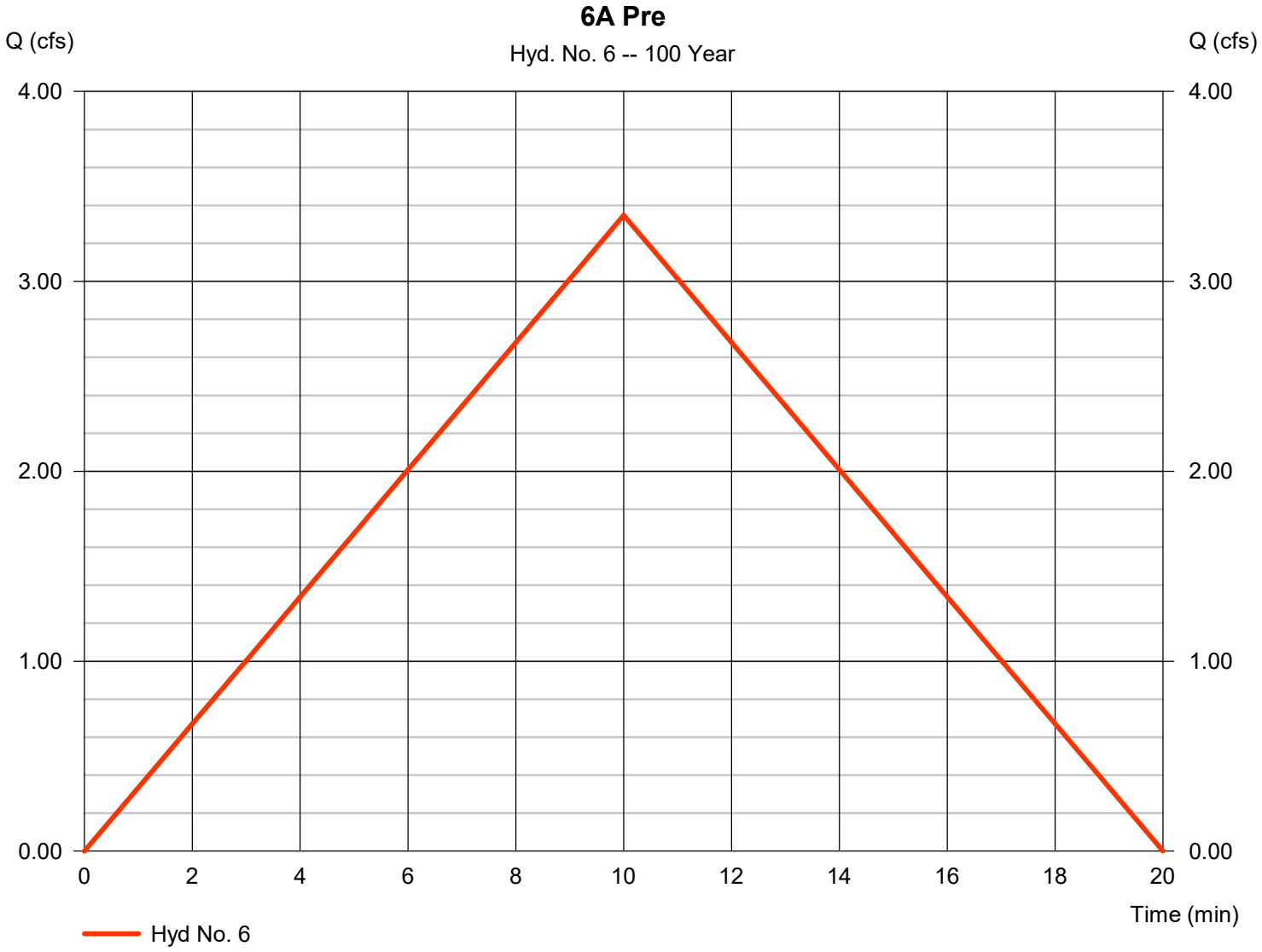
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 6

6A Pre

Hydrograph type	=	Rational	Peak discharge	=	3.347 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,008 cuft
Drainage area	=	1.060 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

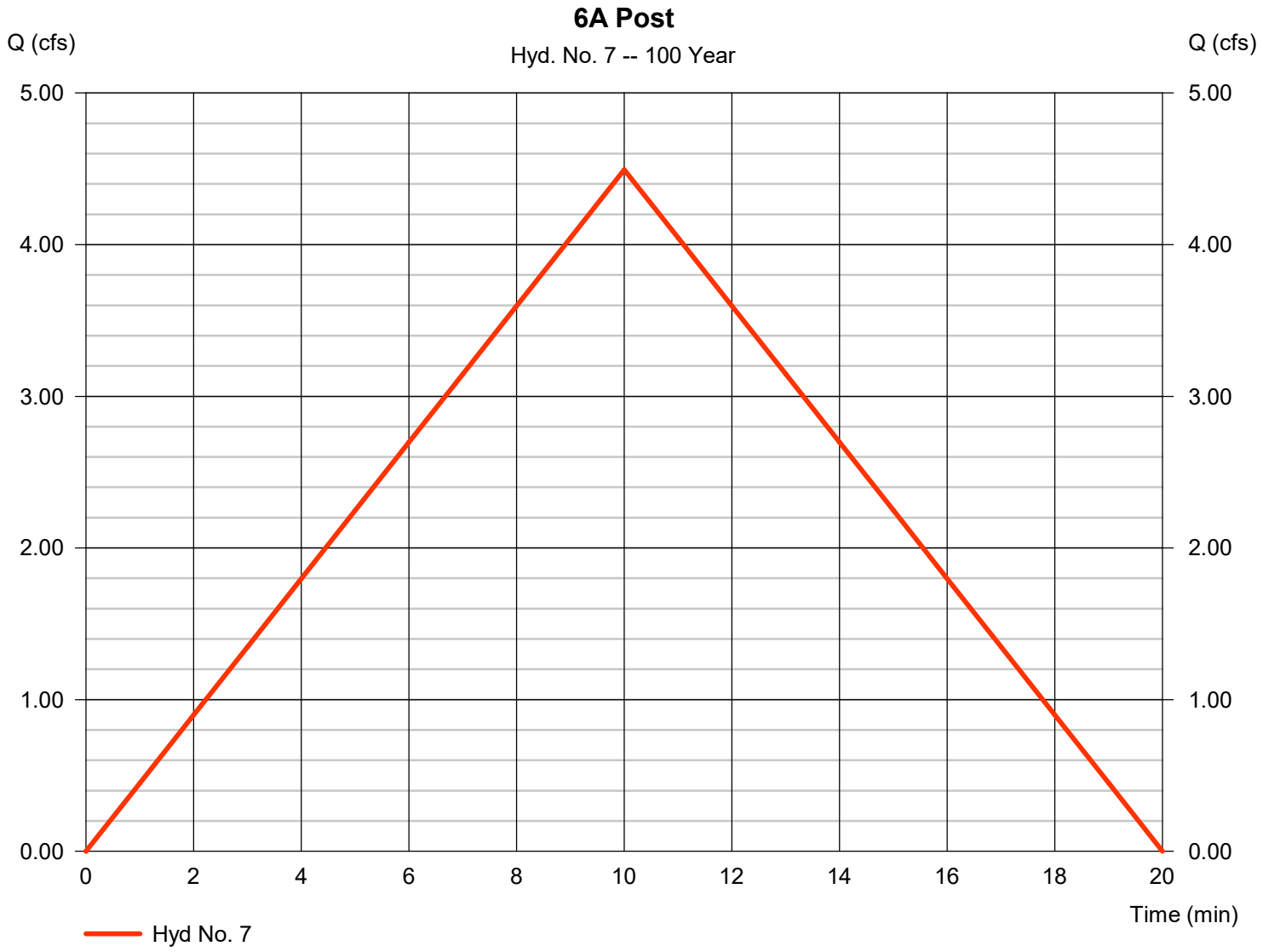


Hydrograph Report

Hyd. No. 7

6A Post

Hydrograph type	=	Rational	Peak discharge	=	4.495 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,697 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

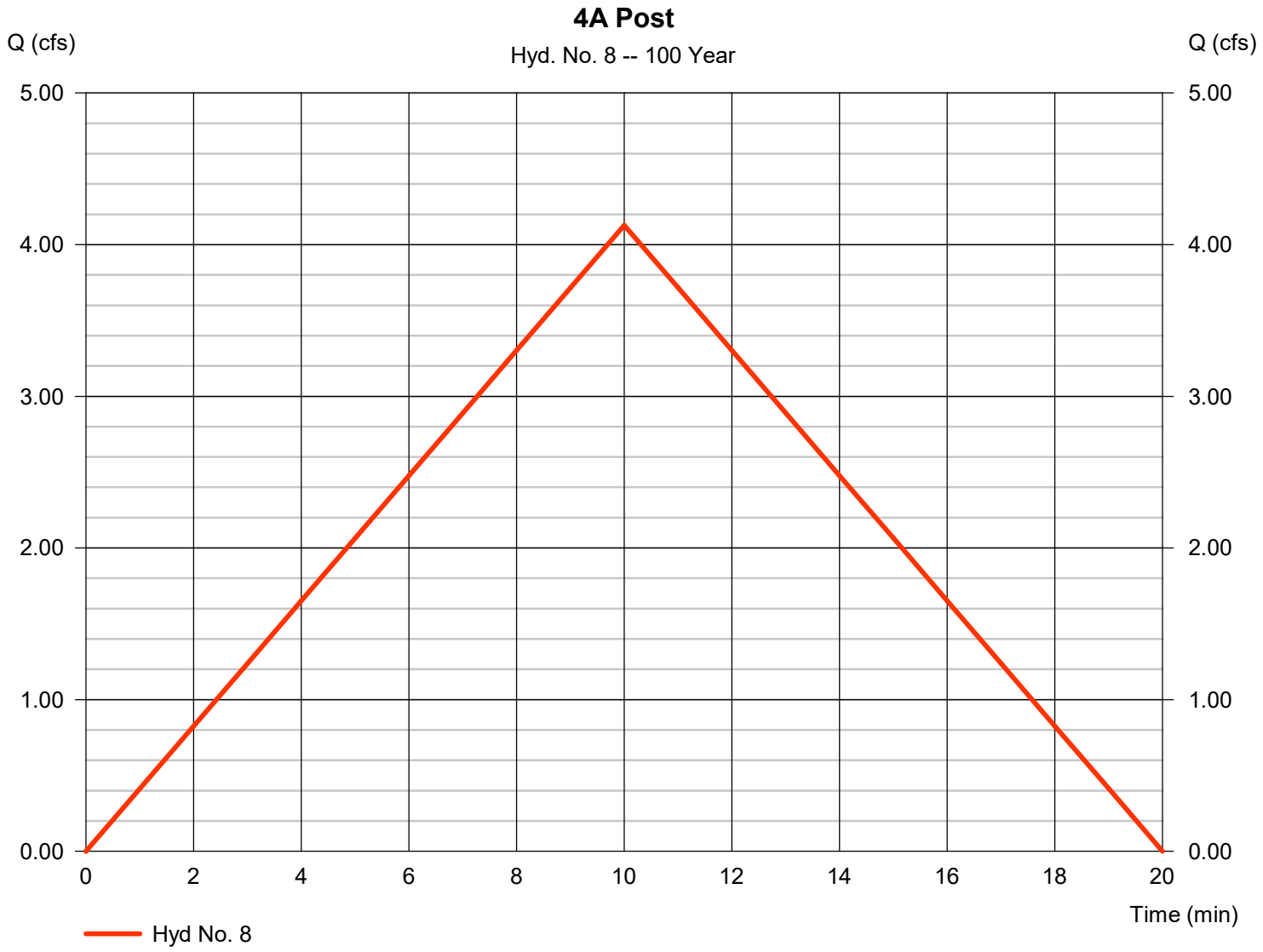


Hydrograph Report

Hyd. No. 8

4A Post

Hydrograph type	=	Rational	Peak discharge	=	4.128 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,477 cuft
Drainage area	=	1.110 ac	Runoff coeff.	=	0.53
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



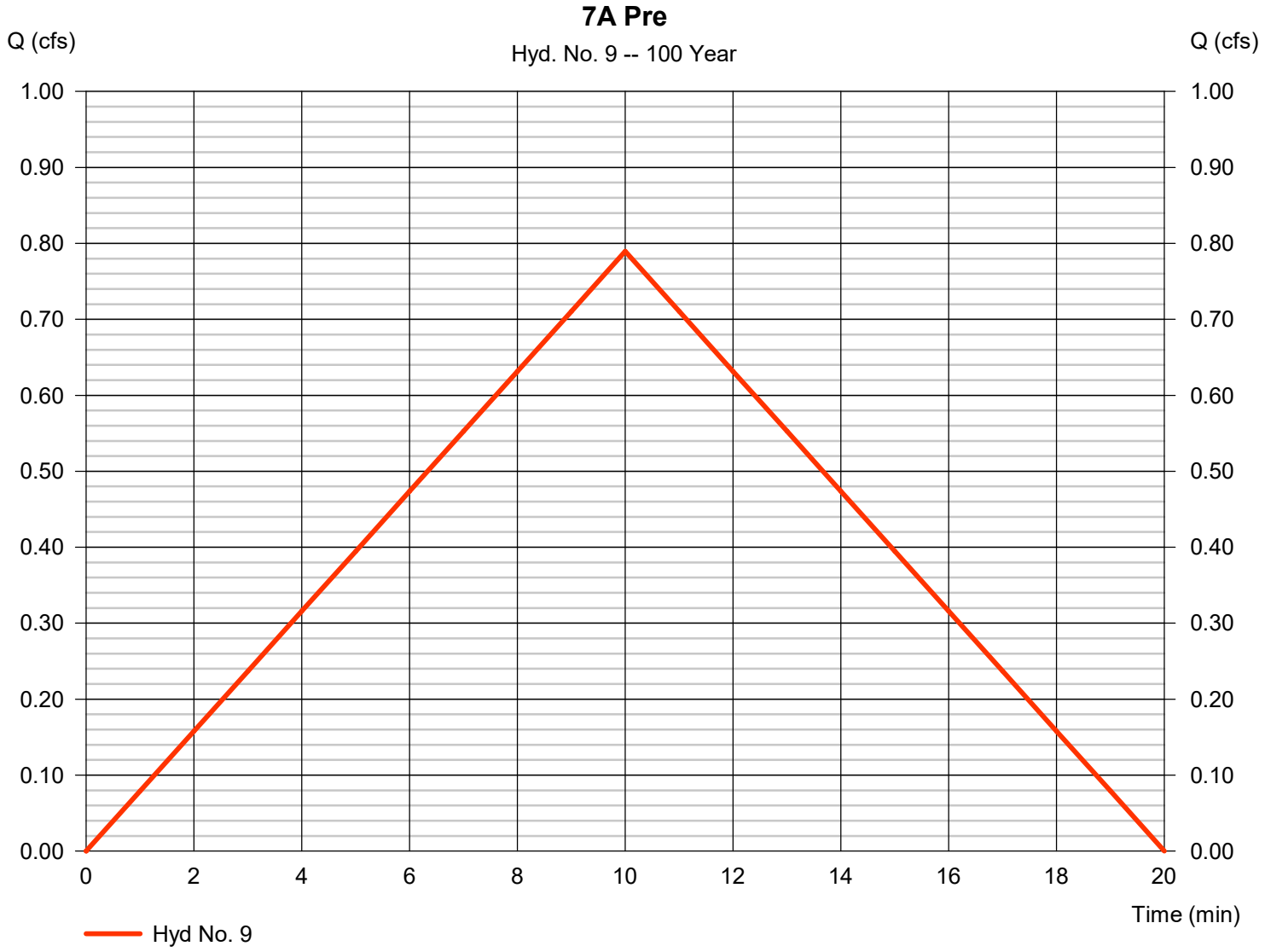
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 9

7A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.789 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	474 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

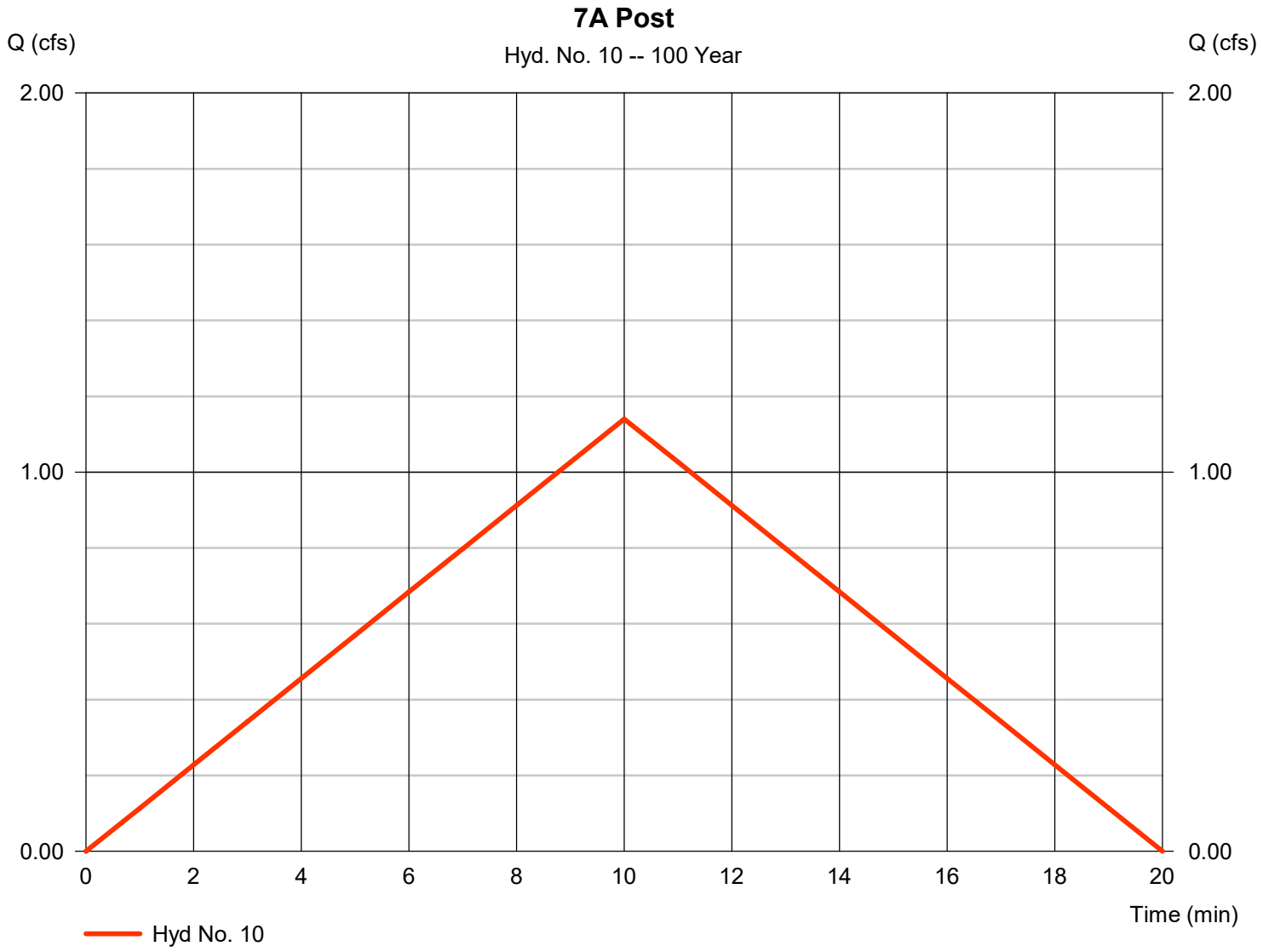


Hydrograph Report

Hyd. No. 10

7A Post

Hydrograph type	=	Rational	Peak discharge	=	1.140 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	684 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



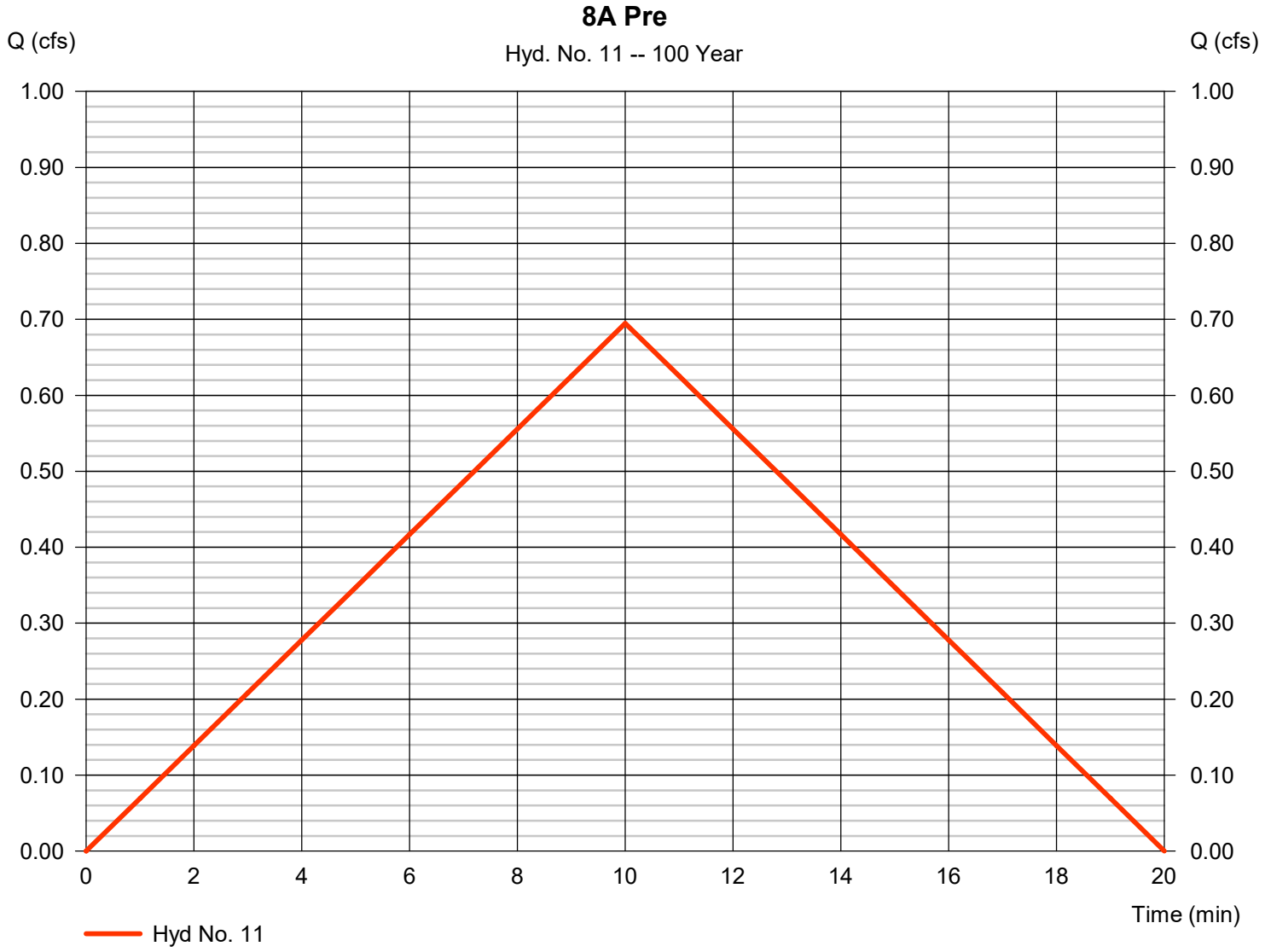
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 11

8A Pre

Hydrograph type	=	Rational	Peak discharge	=	0.695 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	417 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

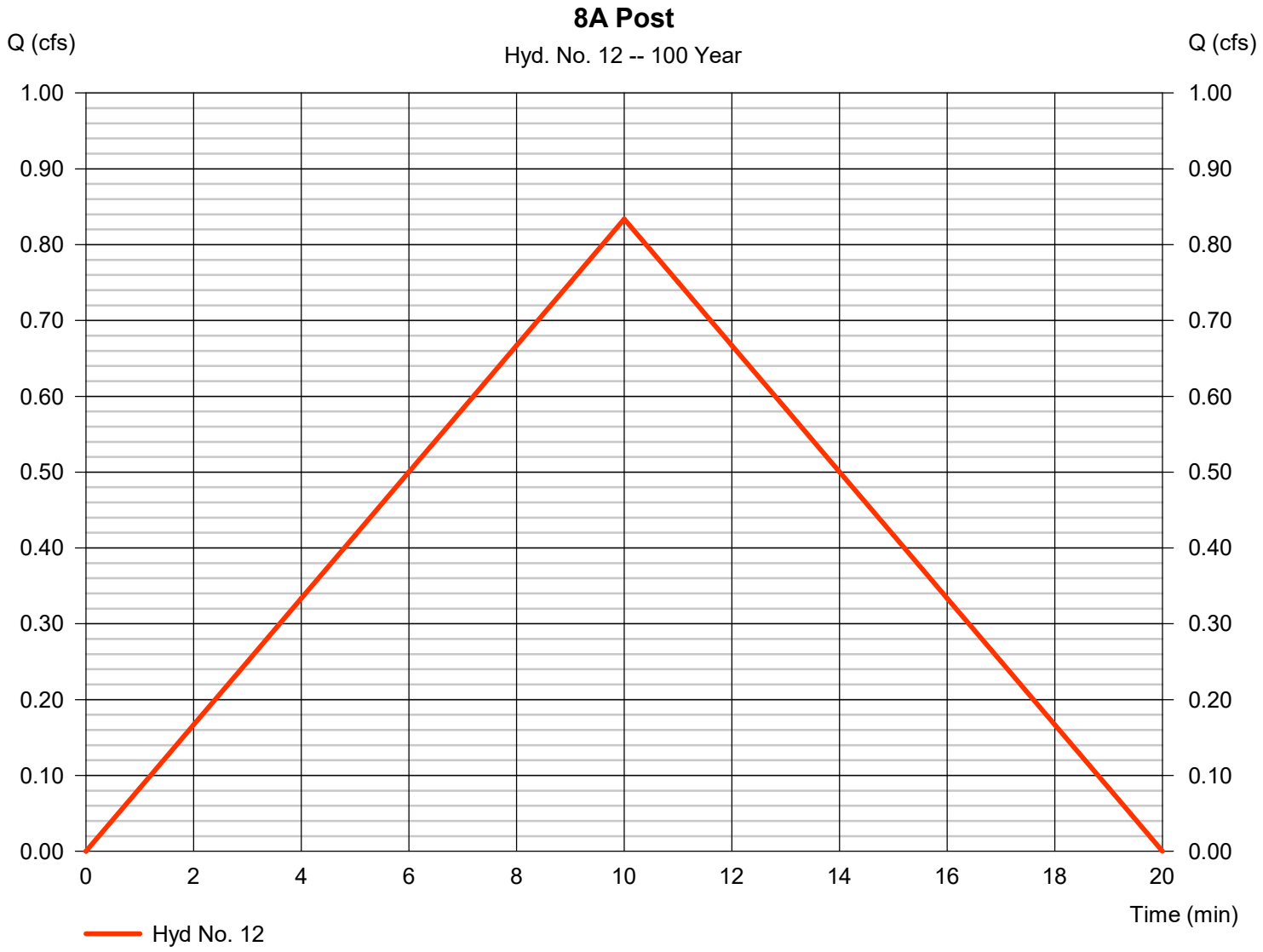


Hydrograph Report

Hyd. No. 12

8A Post

Hydrograph type	=	Rational	Peak discharge	=	0.834 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	500 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

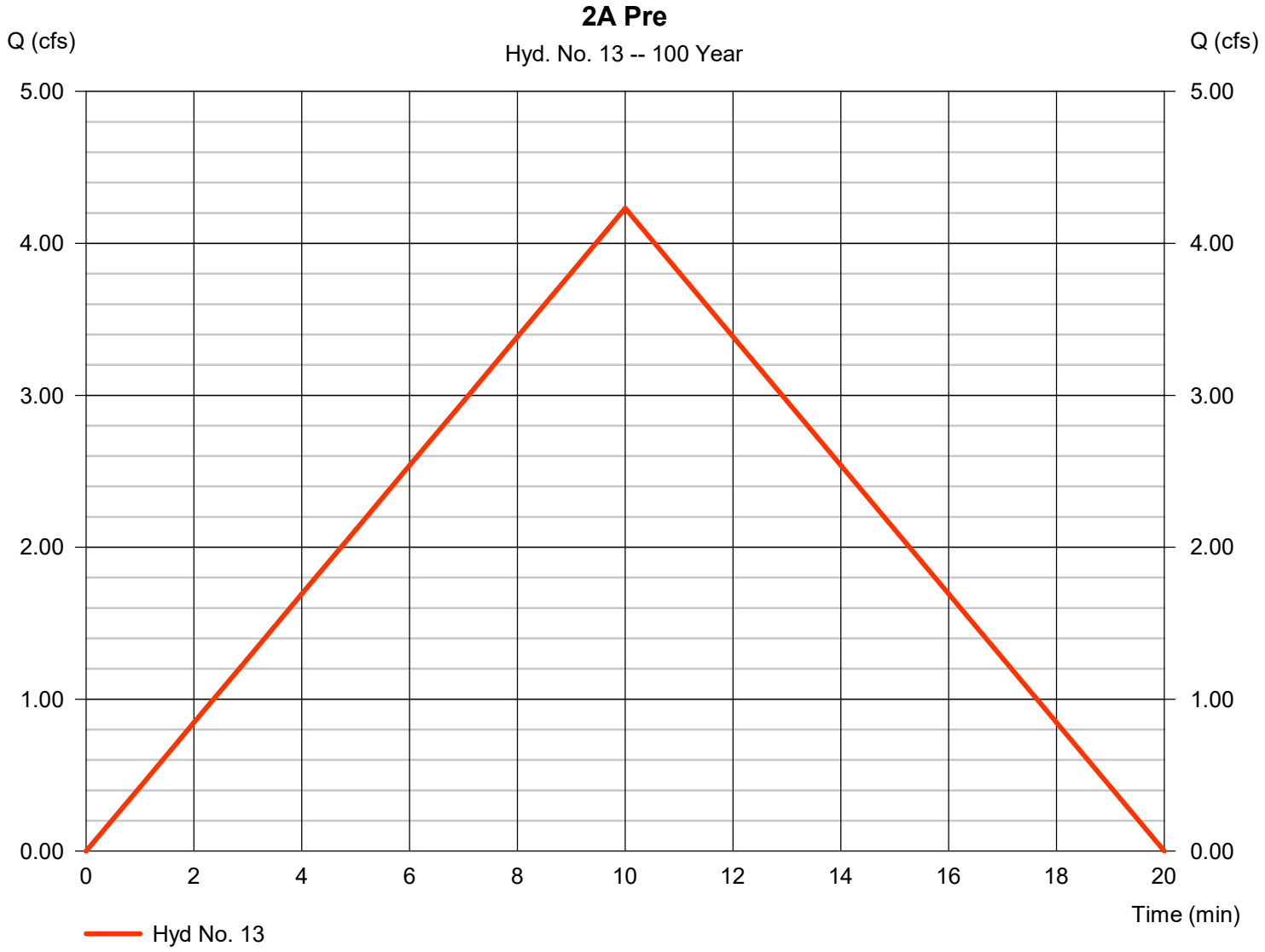


Hydrograph Report

Hyd. No. 13

2A Pre

Hydrograph type	=	Rational	Peak discharge	=	4.232 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,539 cuft
Drainage area	=	1.340 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

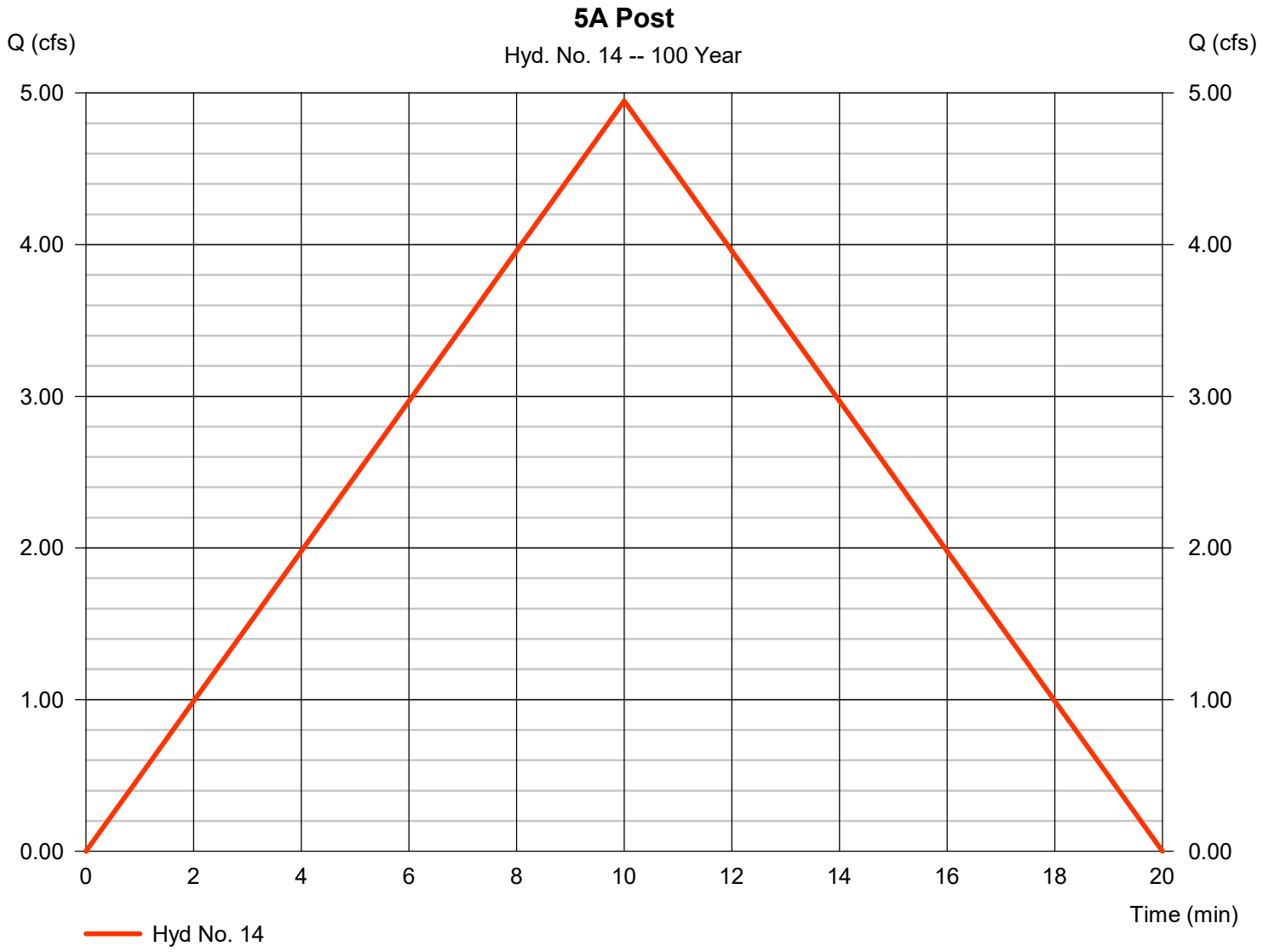


Hydrograph Report

Hyd. No. 14

5A Post

Hydrograph type	=	Rational	Peak discharge	=	4.947 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,968 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

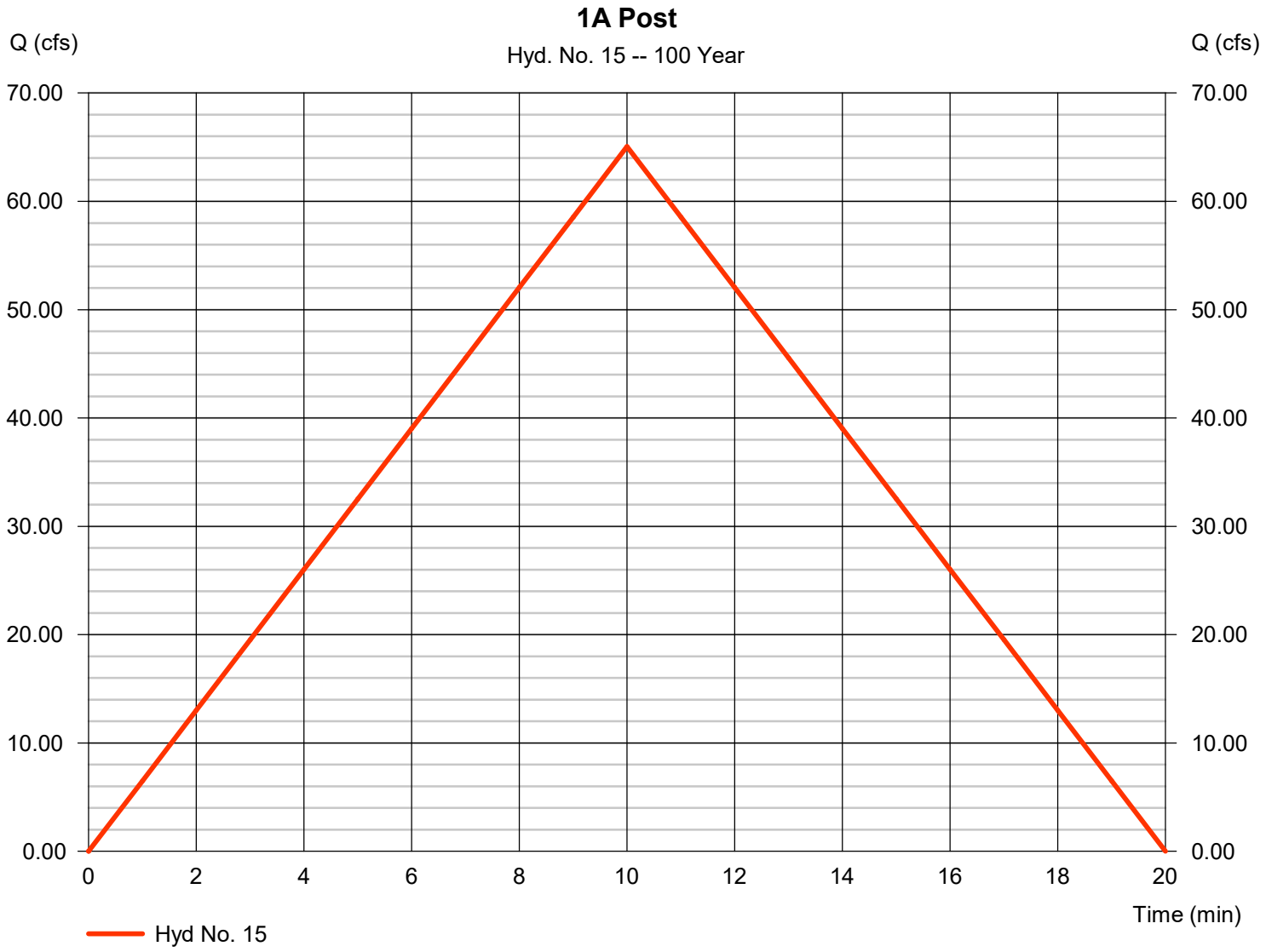


Hydrograph Report

Hyd. No. 15

1A Post

Hydrograph type	=	Rational	Peak discharge	=	65.05 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	39,032 cuft
Drainage area	=	20.600 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

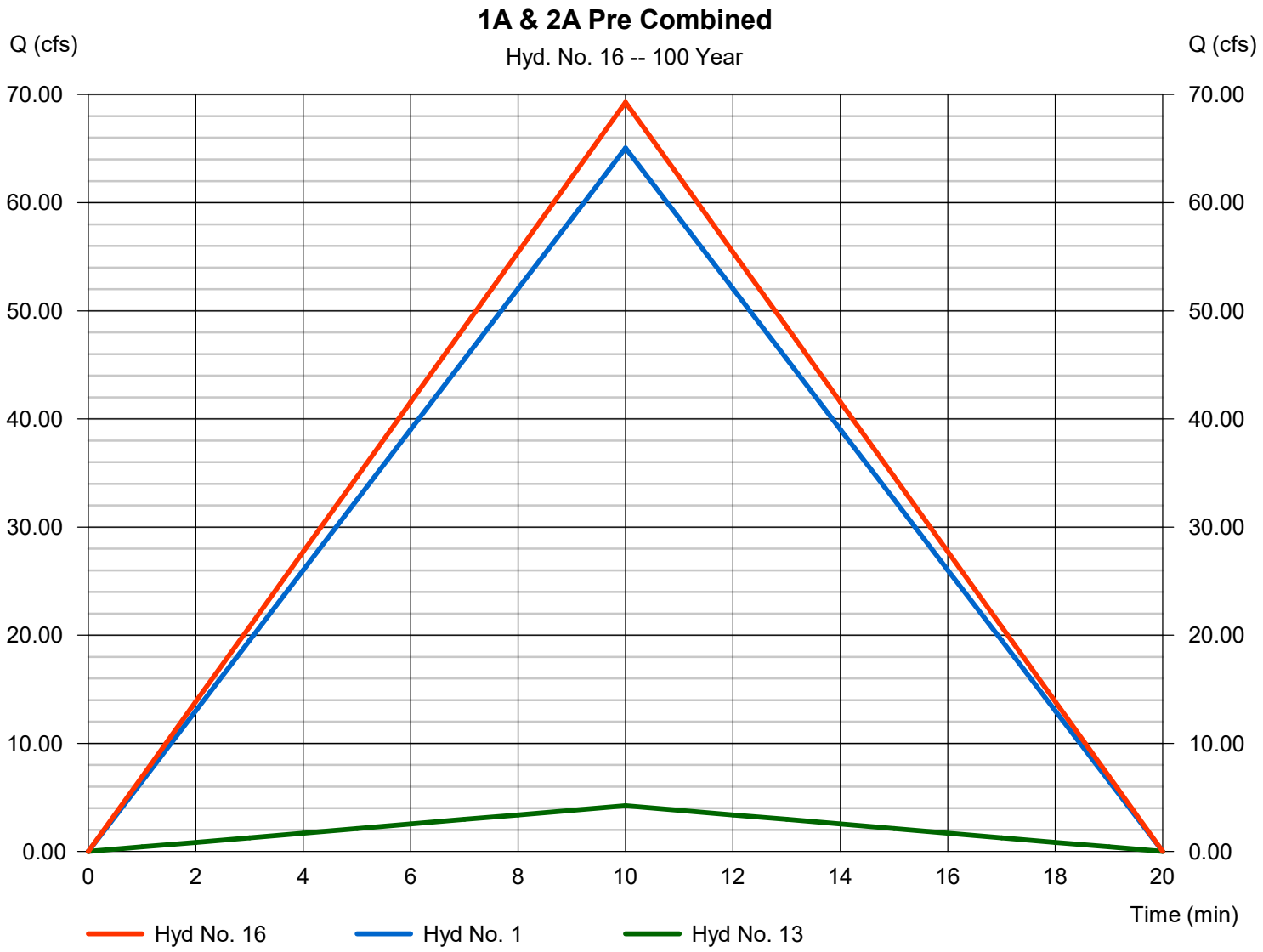


Hydrograph Report

Hyd. No. 16

1A & 2A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 69.28 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 41,571 cuft
Inflow hyds.	= 1, 13	Contrib. drain. area	= 21.940 ac

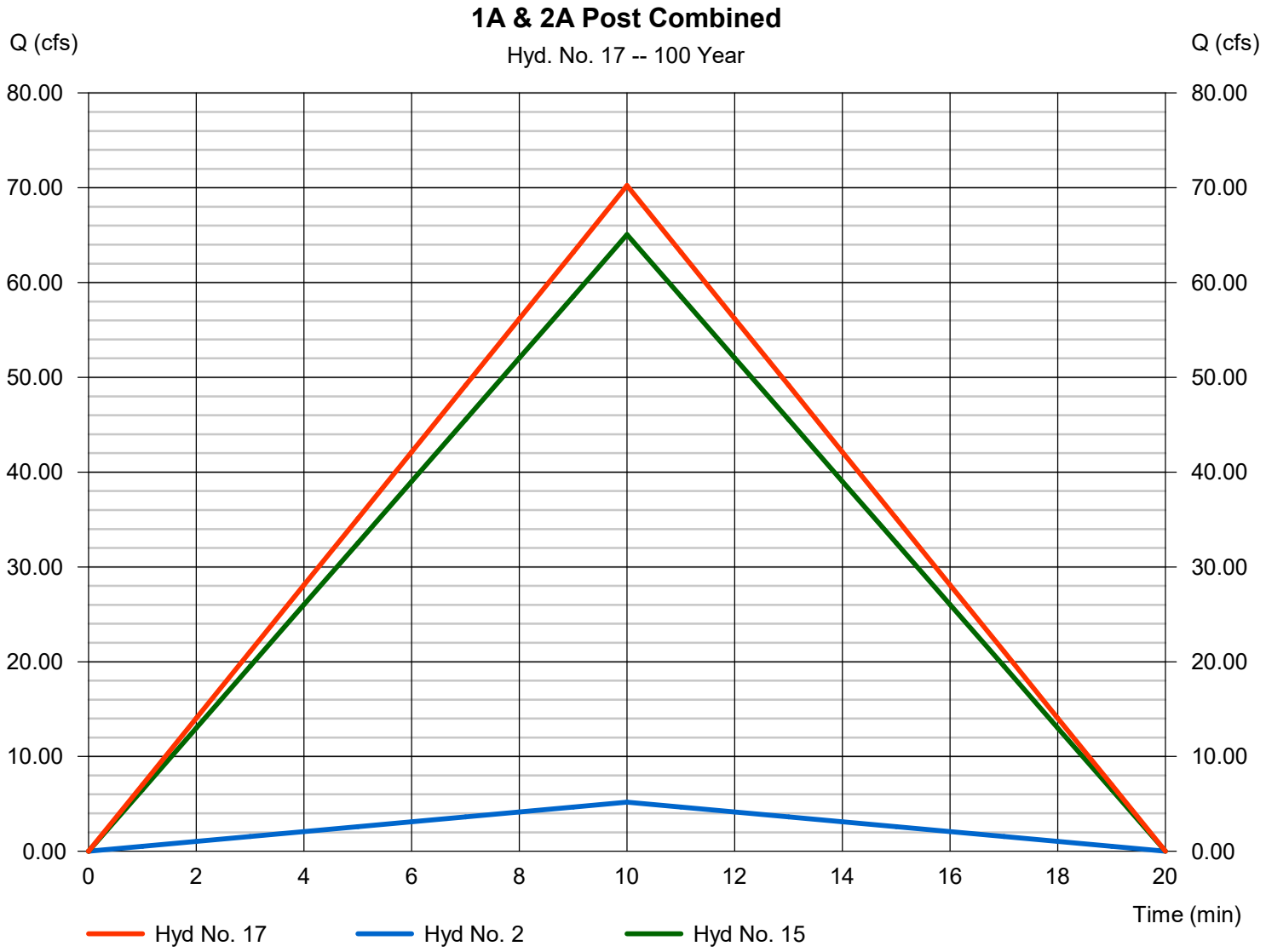


Hydrograph Report

Hyd. No. 17

1A & 2A Post Combined

Hydrograph type	= Combine	Peak discharge	= 70.22 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 42,135 cuft
Inflow hyds.	= 2, 15	Contrib. drain. area	= 21.940 ac

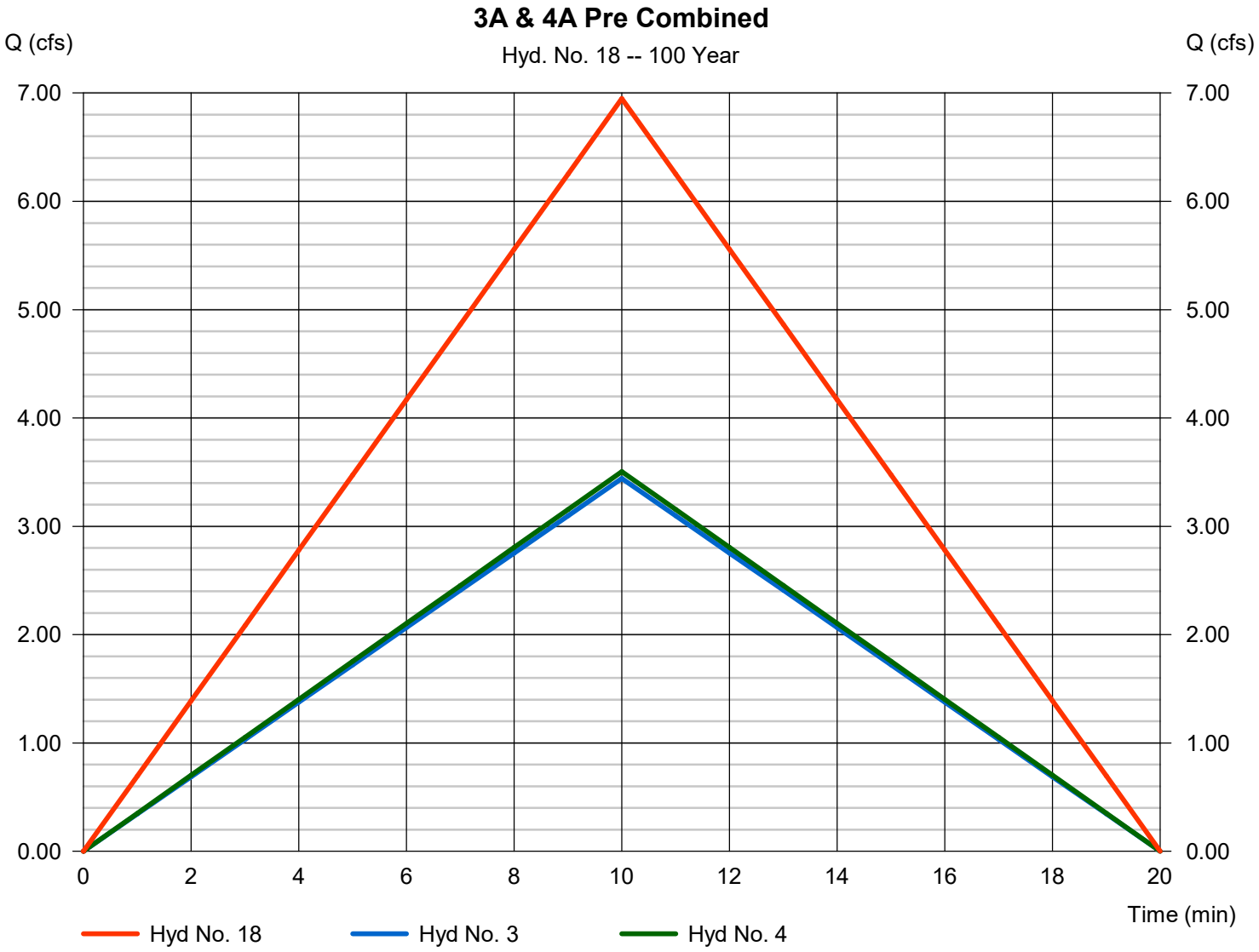


Hydrograph Report

Hyd. No. 18

3A & 4A Pre Combined

Hydrograph type	= Combine	Peak discharge	= 6.947 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 4,168 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 2.200 ac

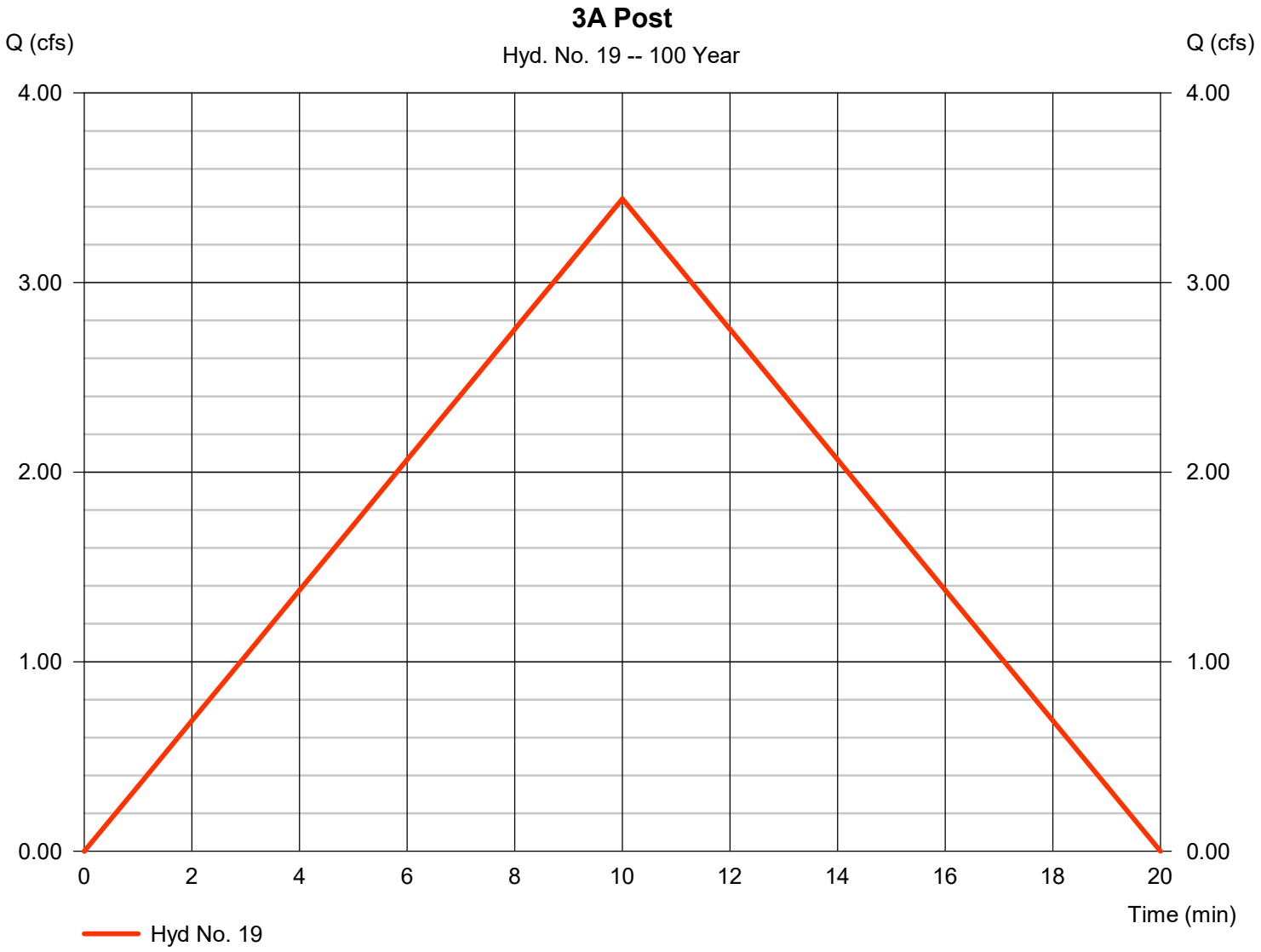


Hydrograph Report

Hyd. No. 19

3A Post

Hydrograph type	=	Rational	Peak discharge	=	3.442 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,065 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

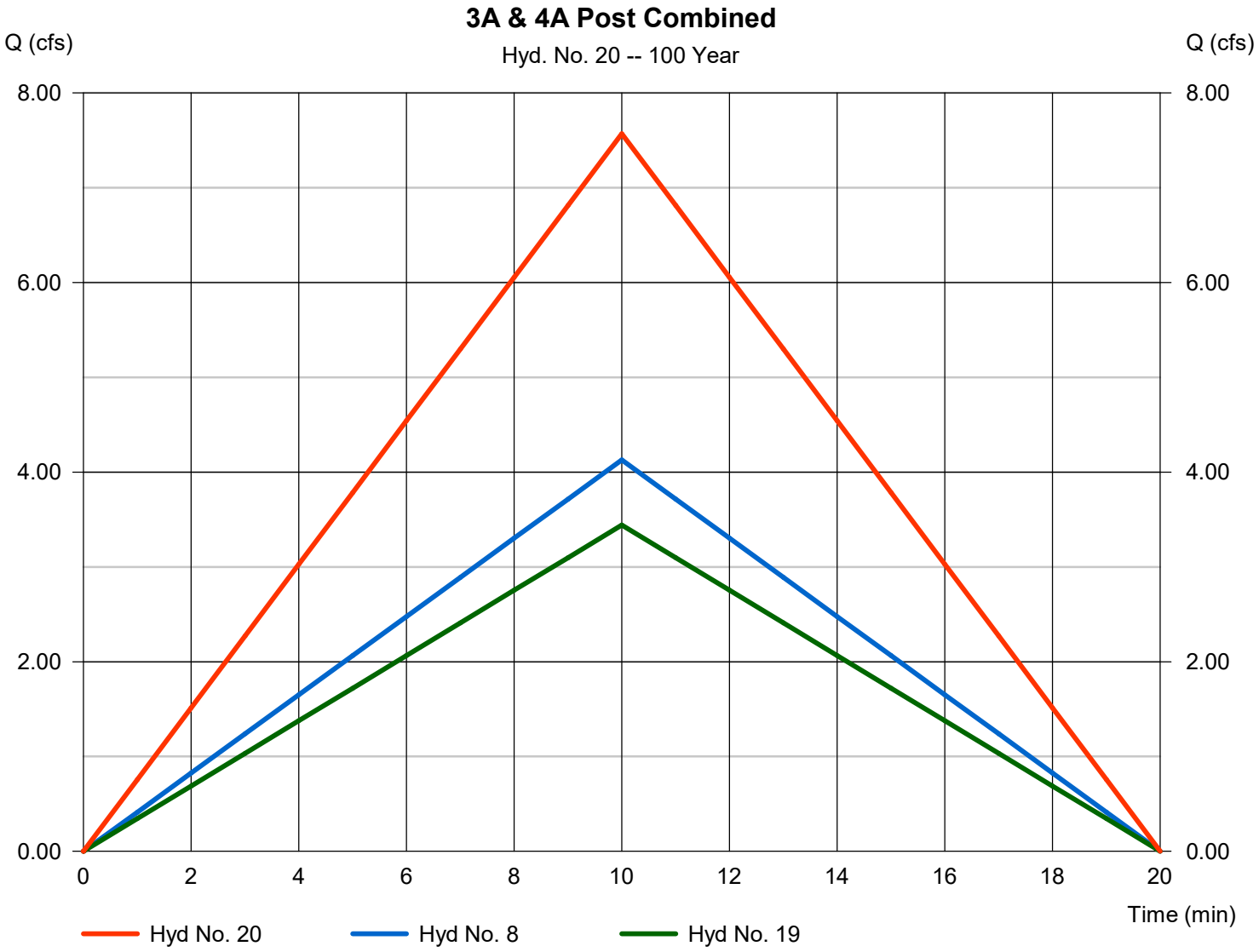


Hydrograph Report

Hyd. No. 20

3A & 4A Post Combined

Hydrograph type	= Combine	Peak discharge	= 7.571 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 4,542 cuft
Inflow hyds.	= 8, 19	Contrib. drain. area	= 2.200 ac

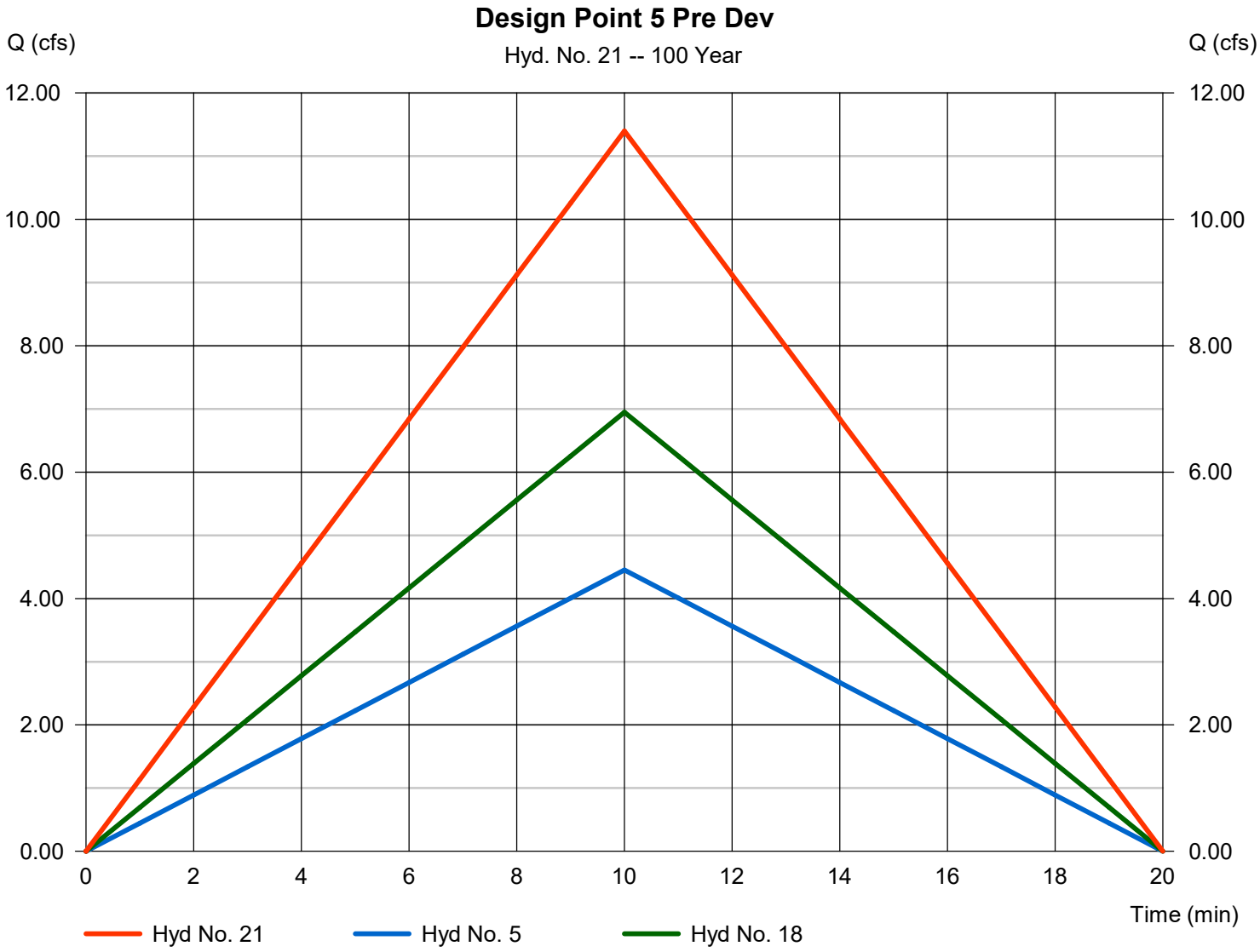


Hydrograph Report

Hyd. No. 21

Design Point 5 Pre Dev

Hydrograph type	= Combine	Peak discharge	= 11.40 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 6,840 cuft
Inflow hyds.	= 5, 18	Contrib. drain. area	= 1.410 ac



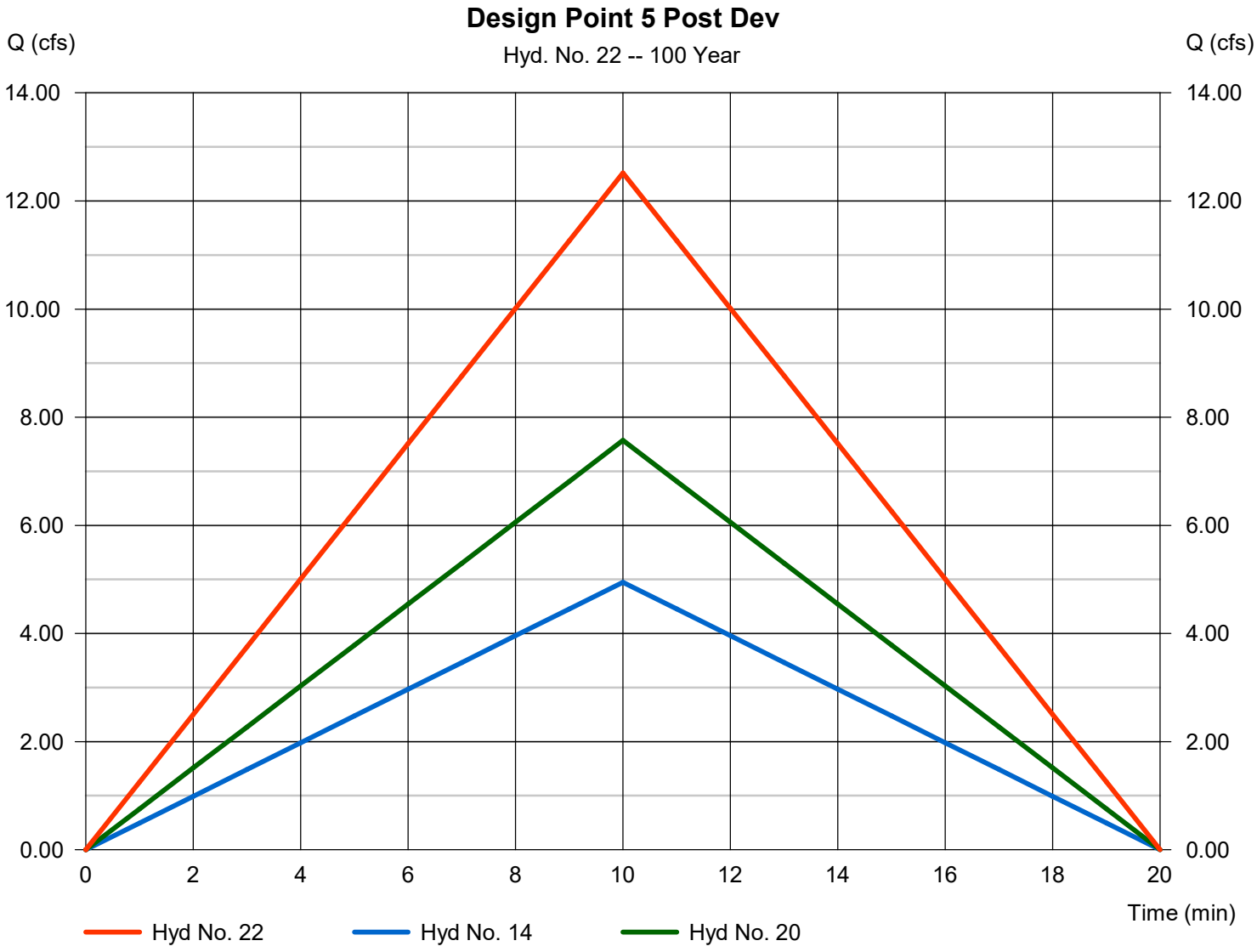
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 22

Design Point 5 Post Dev

Hydrograph type	= Combine	Peak discharge	= 12.52 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 7,511 cuft
Inflow hyds.	= 14, 20	Contrib. drain. area	= 1.410 ac

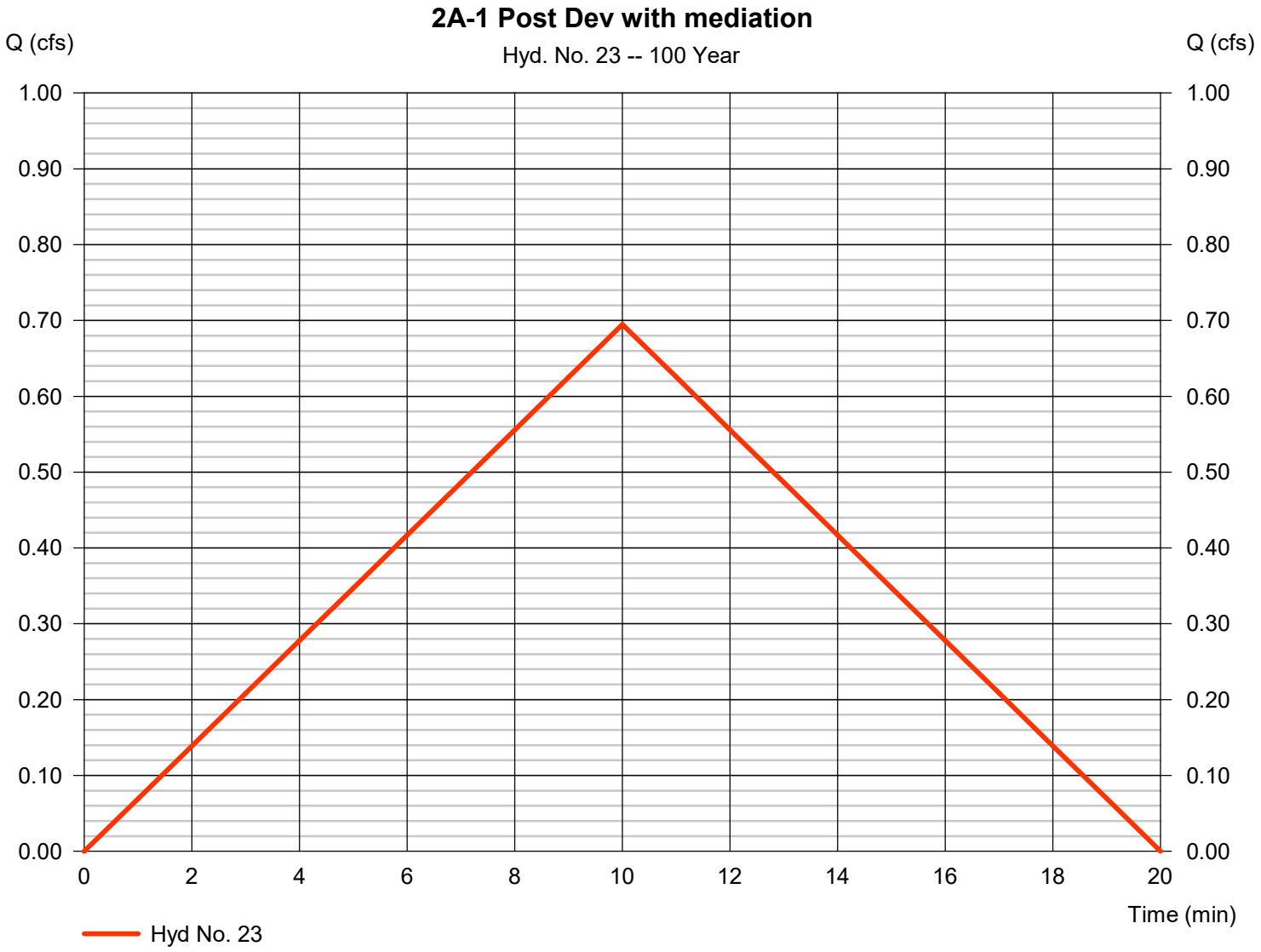


Hydrograph Report

Hyd. No. 23

2A-1 Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.695 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	417 cuft
Drainage area	=	0.180 ac	Runoff coeff.	=	0.55
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

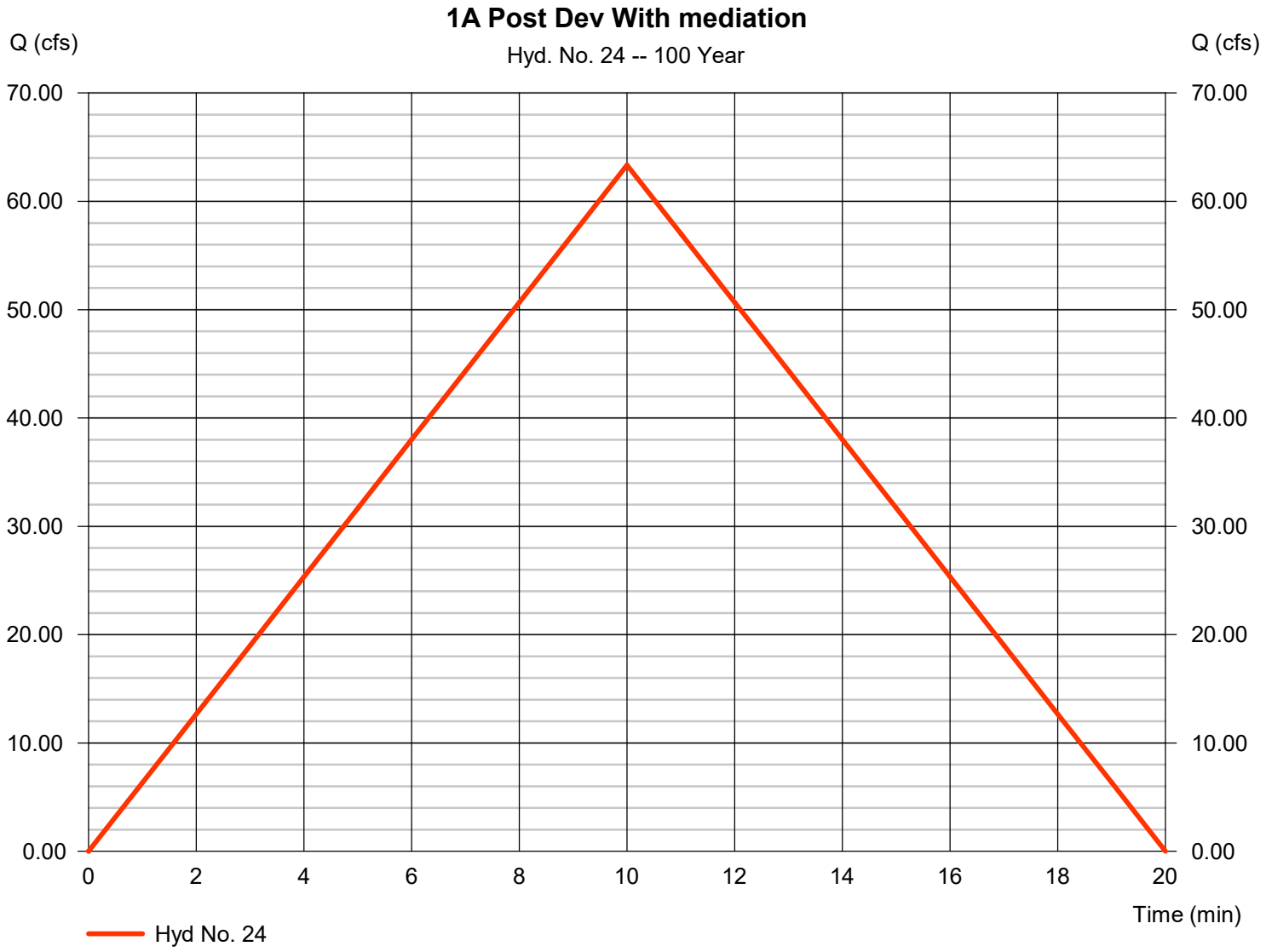


Hydrograph Report

Hyd. No. 24

1A Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	63.35 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	38,009 cuft
Drainage area	=	20.060 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

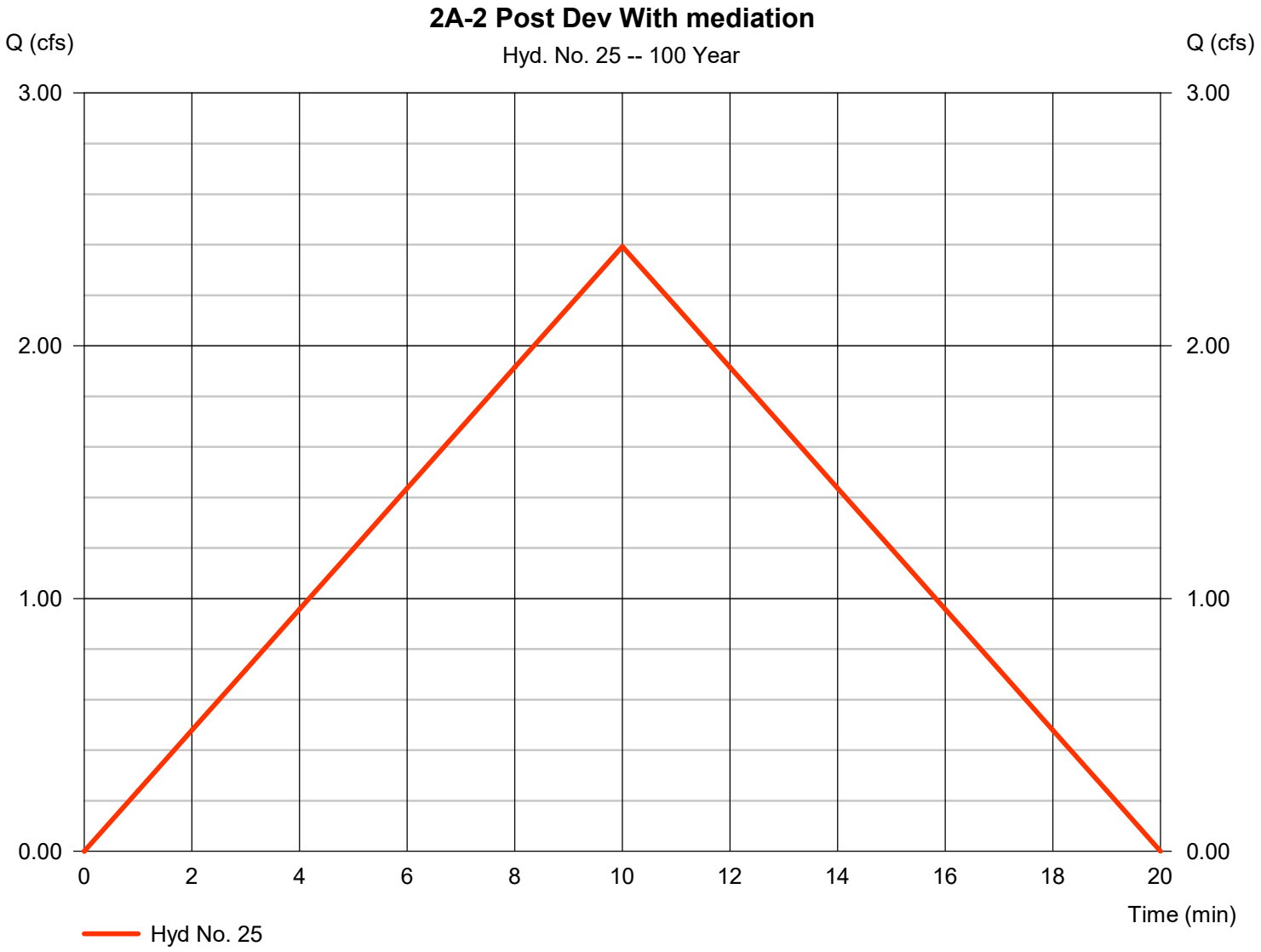


Hydrograph Report

Hyd. No. 25

2A-2 Post Dev With mediation

Hydrograph type	=	Rational	Peak discharge	=	2.393 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,436 cuft
Drainage area	=	0.620 ac	Runoff coeff.	=	0.55
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 26

2A-3 Post Dev with Mediation

Hydrograph type	=	Rational	Peak discharge	=	2.084 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,251 cuft
Drainage area	=	0.540 ac	Runoff coeff.	=	0.55
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

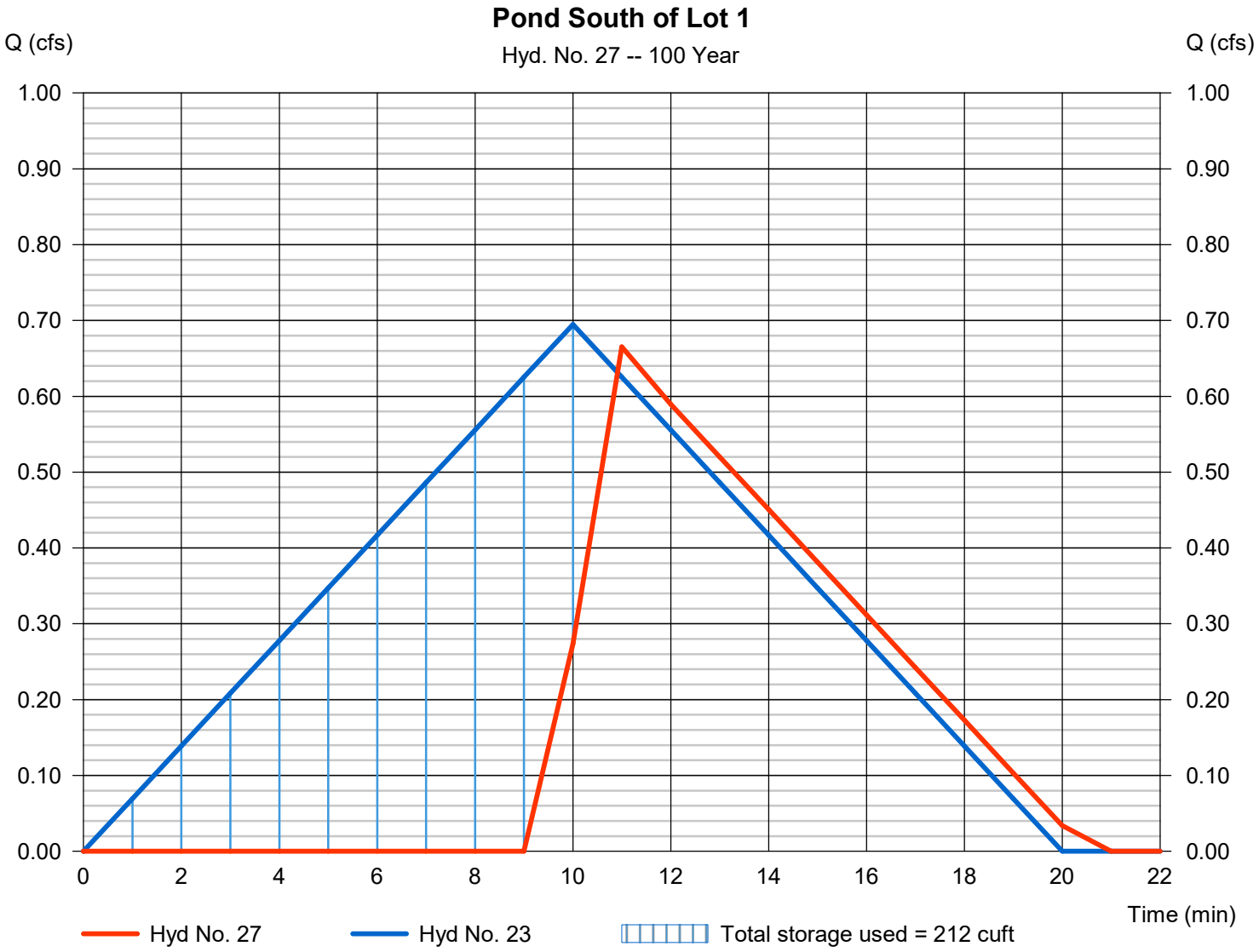
Hydrograph Report

Hyd. No. 27

Pond South of Lot 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.665 cfs
Storm frequency	=	100 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	225 cuft
Inflow hyd. No.	=	23 - 2A-1 Post Dev with mediation	Max. Elevation	=	100.88 ft
Reservoir name	=	Pond on South of Lot 1	Max. Storage	=	212 cuft

Storage Indication method used.



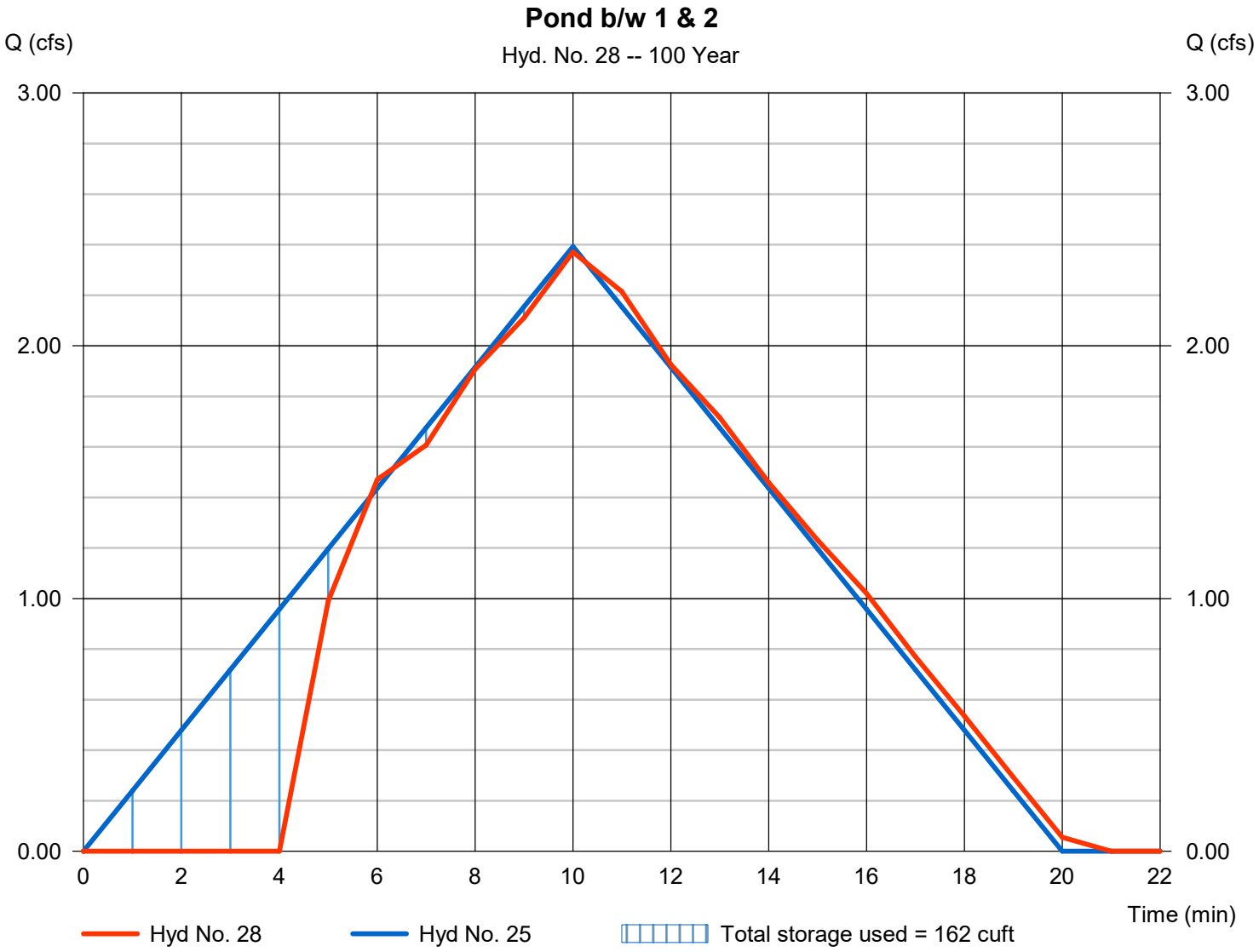
Hydrograph Report

Hyd. No. 28

Pond b/w 1 & 2

Hydrograph type	=	Reservoir	Peak discharge	=	2.371 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,301 cuft
Inflow hyd. No.	=	25 - 2A-2 Post Dev With median	Max. Elevation	=	100.95 ft
Reservoir name	=	Pond B/w 1&2	Max. Storage	=	162 cuft

Storage Indication method used.



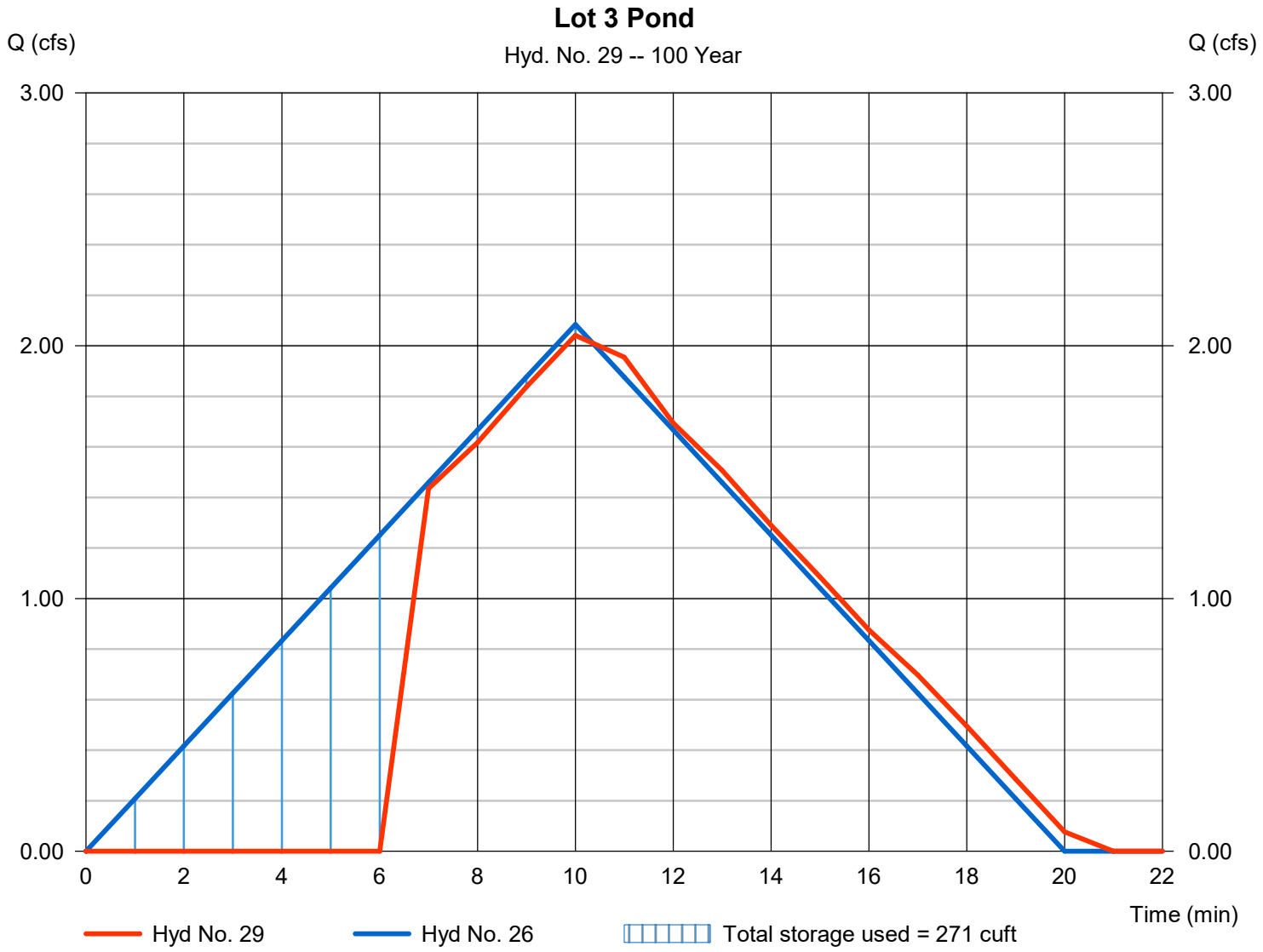
Hydrograph Report

Hyd. No. 29

Lot 3 Pond

Hydrograph type	=	Reservoir	Peak discharge	=	2.041 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	1,013 cuft
Inflow hyd. No.	=	26 - 2A-3 Post Dev with Mediation	Max. Elevation	=	101.98 ft
Reservoir name	=	Lot 3 Pond	Max. Storage	=	271 cuft

Storage Indication method used.

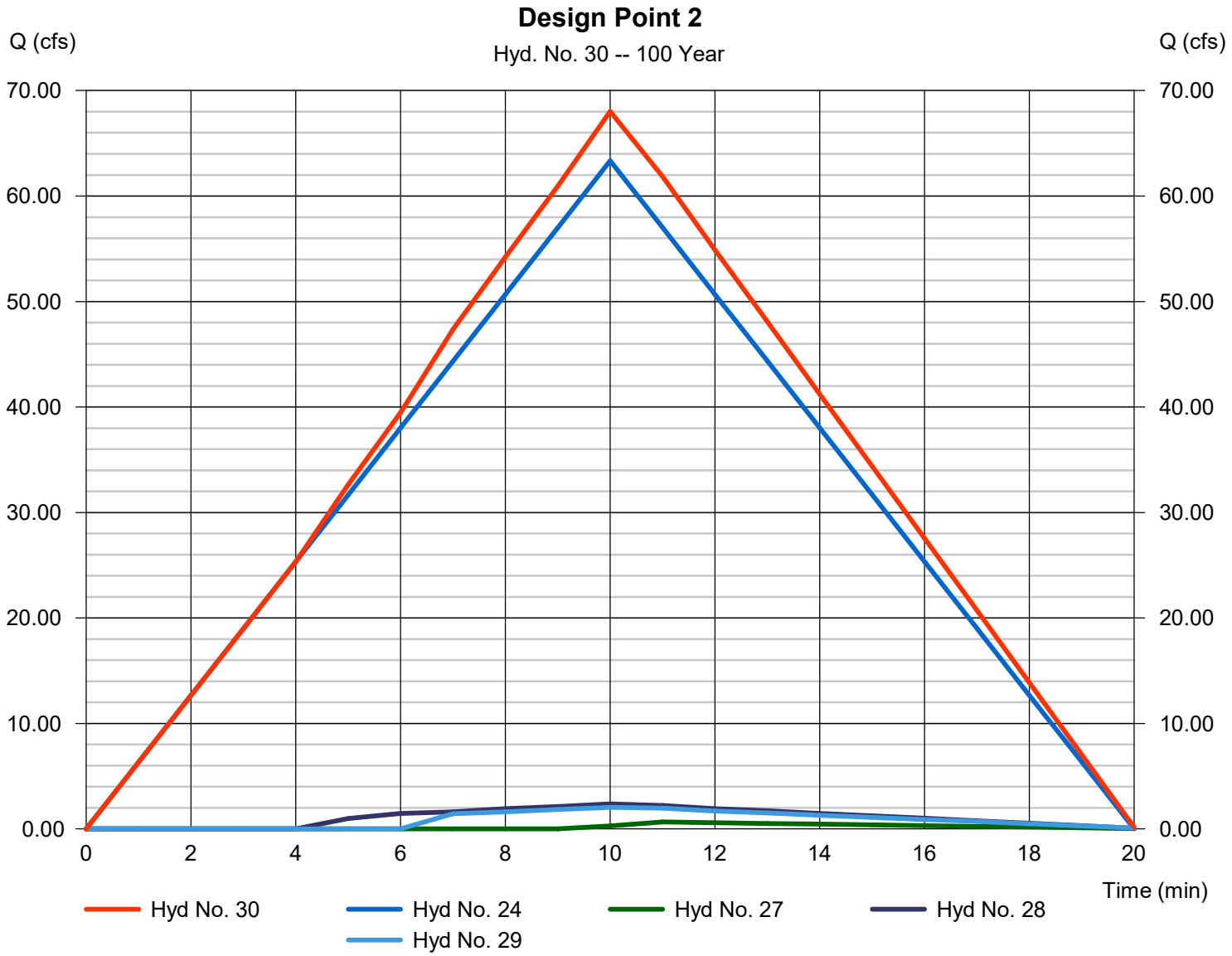


Hydrograph Report

Hyd. No. 30

Design Point 2

Hydrograph type	= Combine	Peak discharge	= 68.03 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 40,547 cuft
Inflow hyds.	= 24, 27, 28, 29	Contrib. drain. area	= 20.060 ac

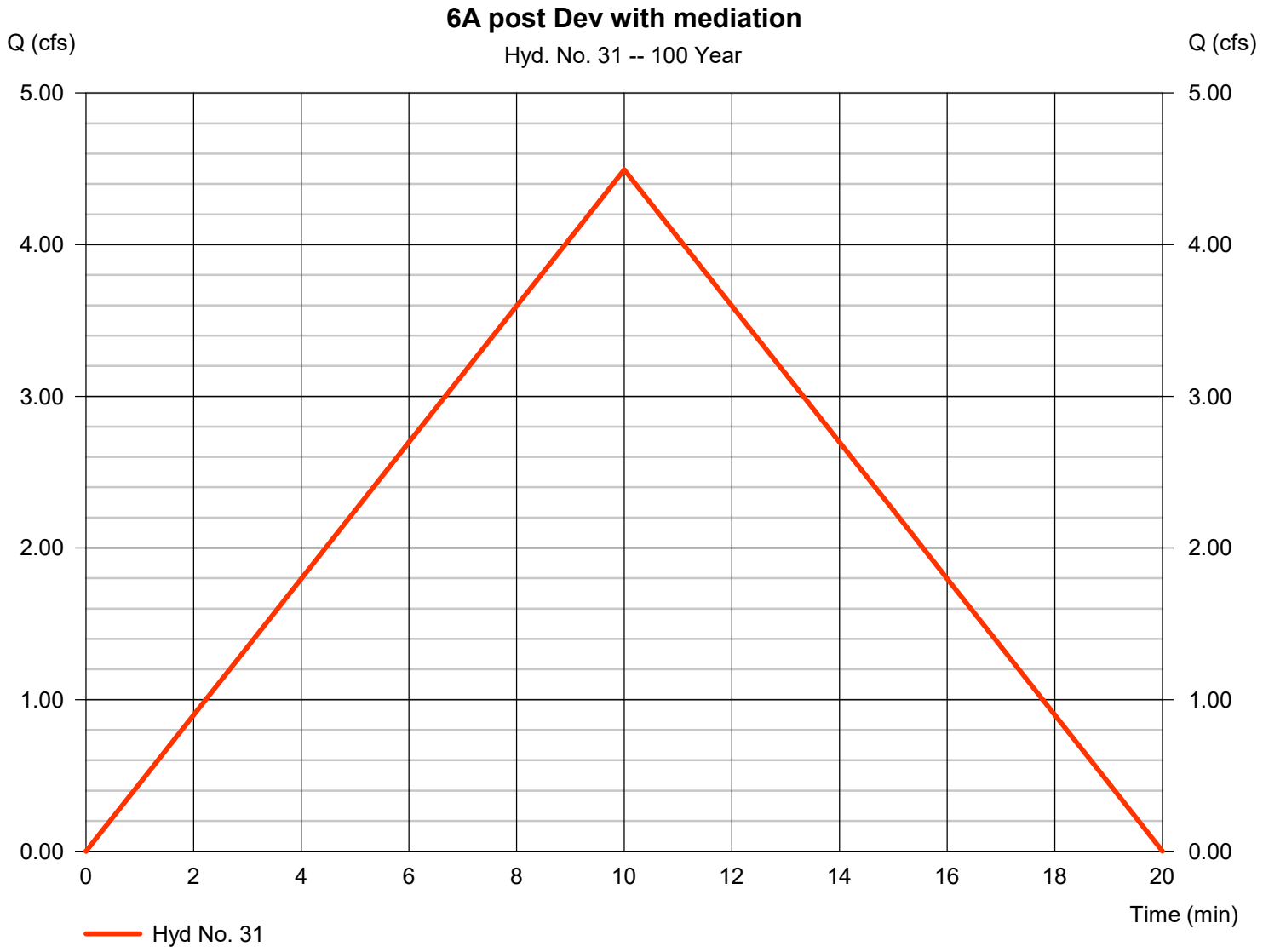


Hydrograph Report

Hyd. No. 31

6A post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	4.495 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,697 cuft
Drainage area	=	1.050 ac	Runoff coeff.	=	0.61
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



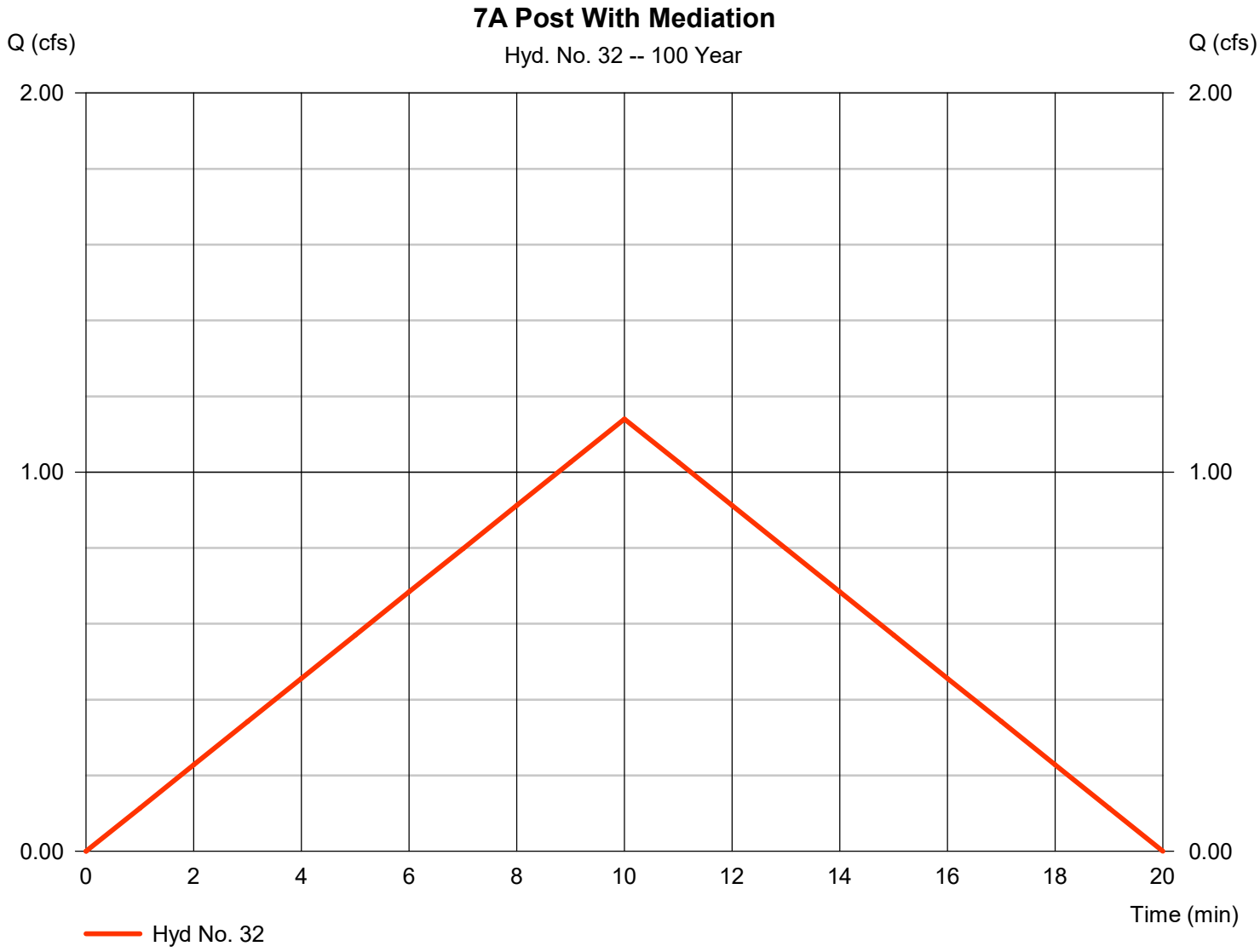
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 32

7A Post With Mediation

Hydrograph type	=	Rational	Peak discharge	=	1.140 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	684 cuft
Drainage area	=	0.250 ac	Runoff coeff.	=	0.65
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

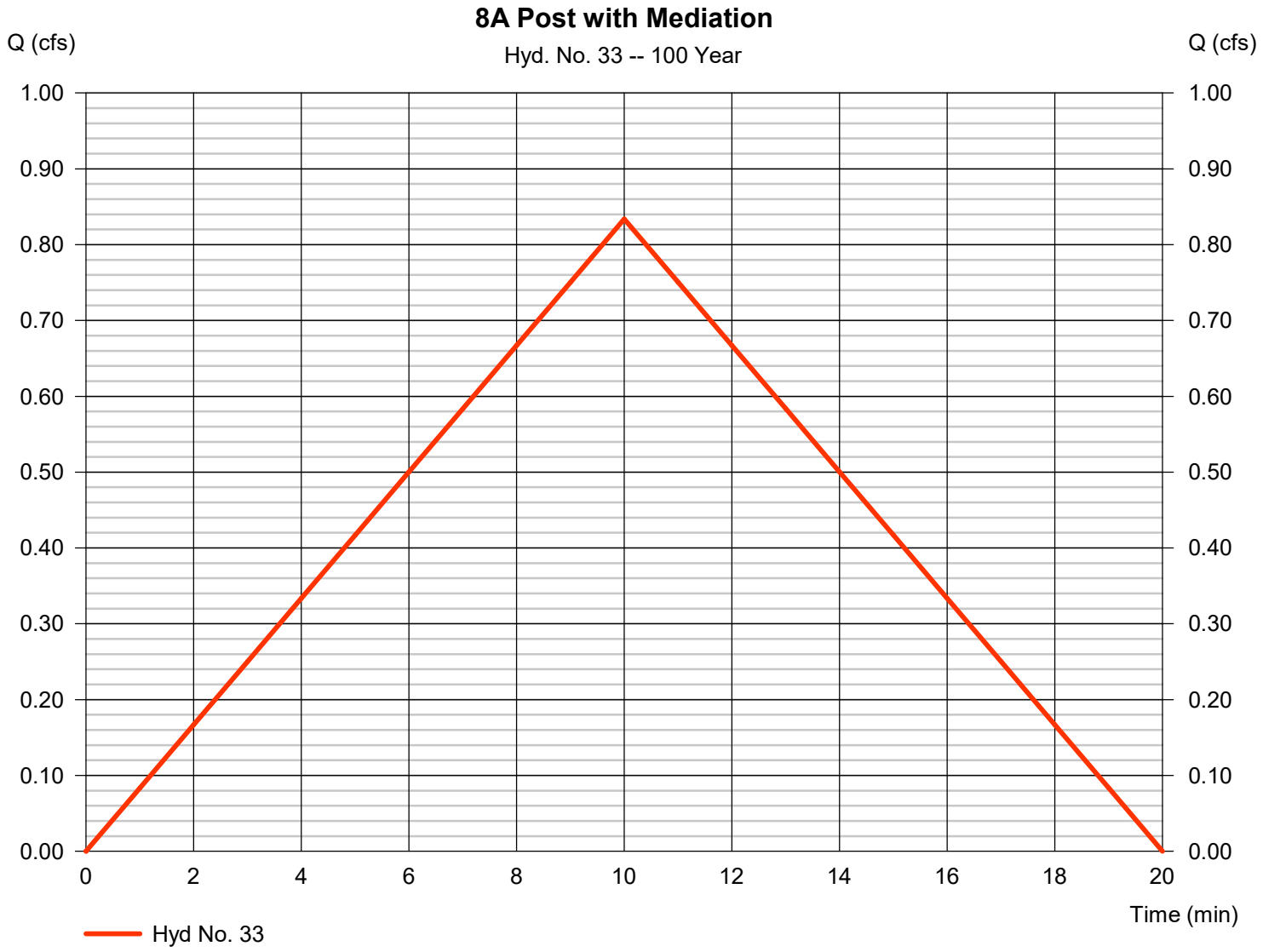


Hydrograph Report

Hyd. No. 33

8A Post with Mediation

Hydrograph type	=	Rational	Peak discharge	=	0.834 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	500 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.54
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1



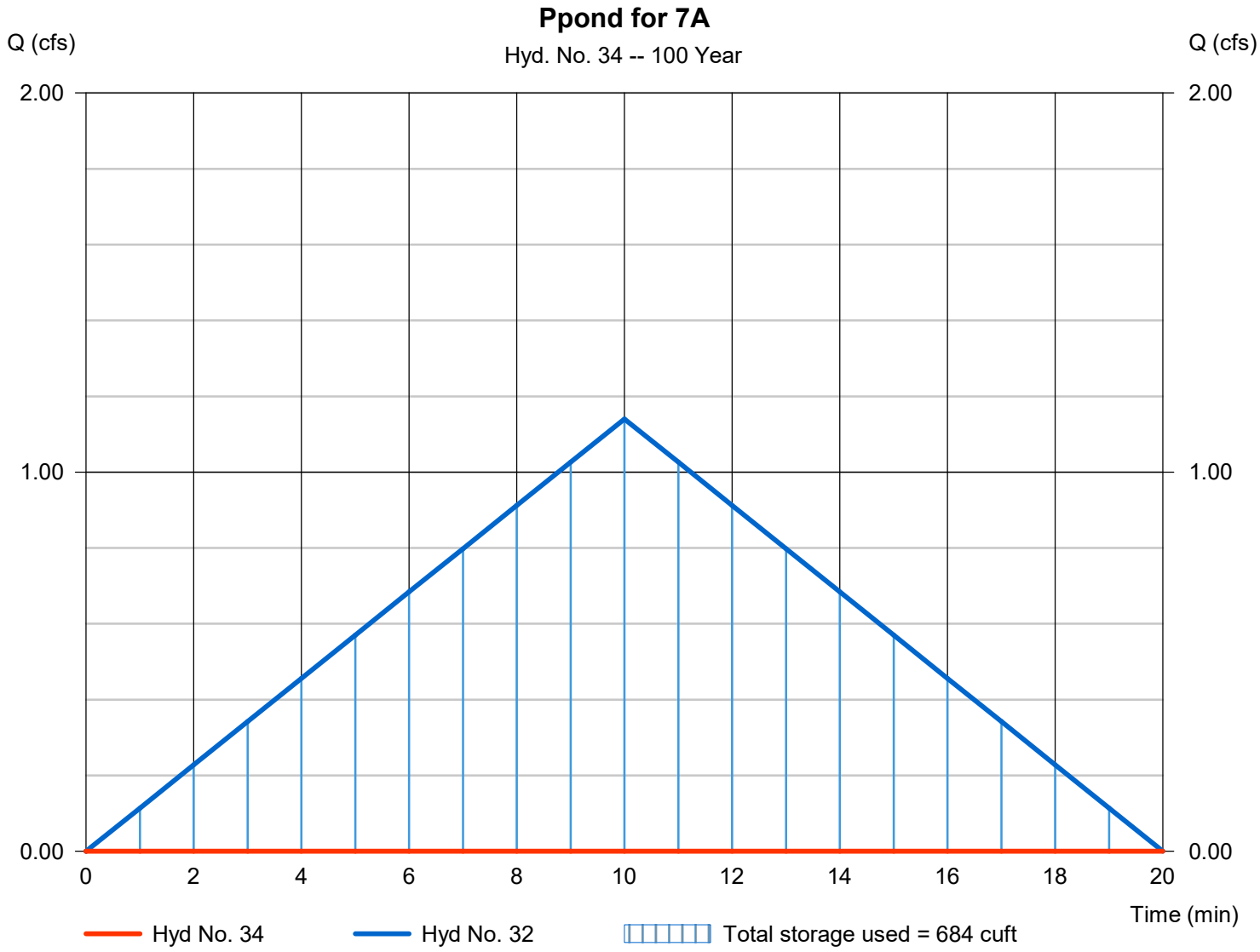
Hydrograph Report

Hyd. No. 34

Ppond for 7A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	100 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	32 - 7A Post With Mediation	Max. Elevation	=	101.64 ft
Reservoir name	=	Pond for 7A	Max. Storage	=	684 cuft

Storage Indication method used.



Hydrograph Report

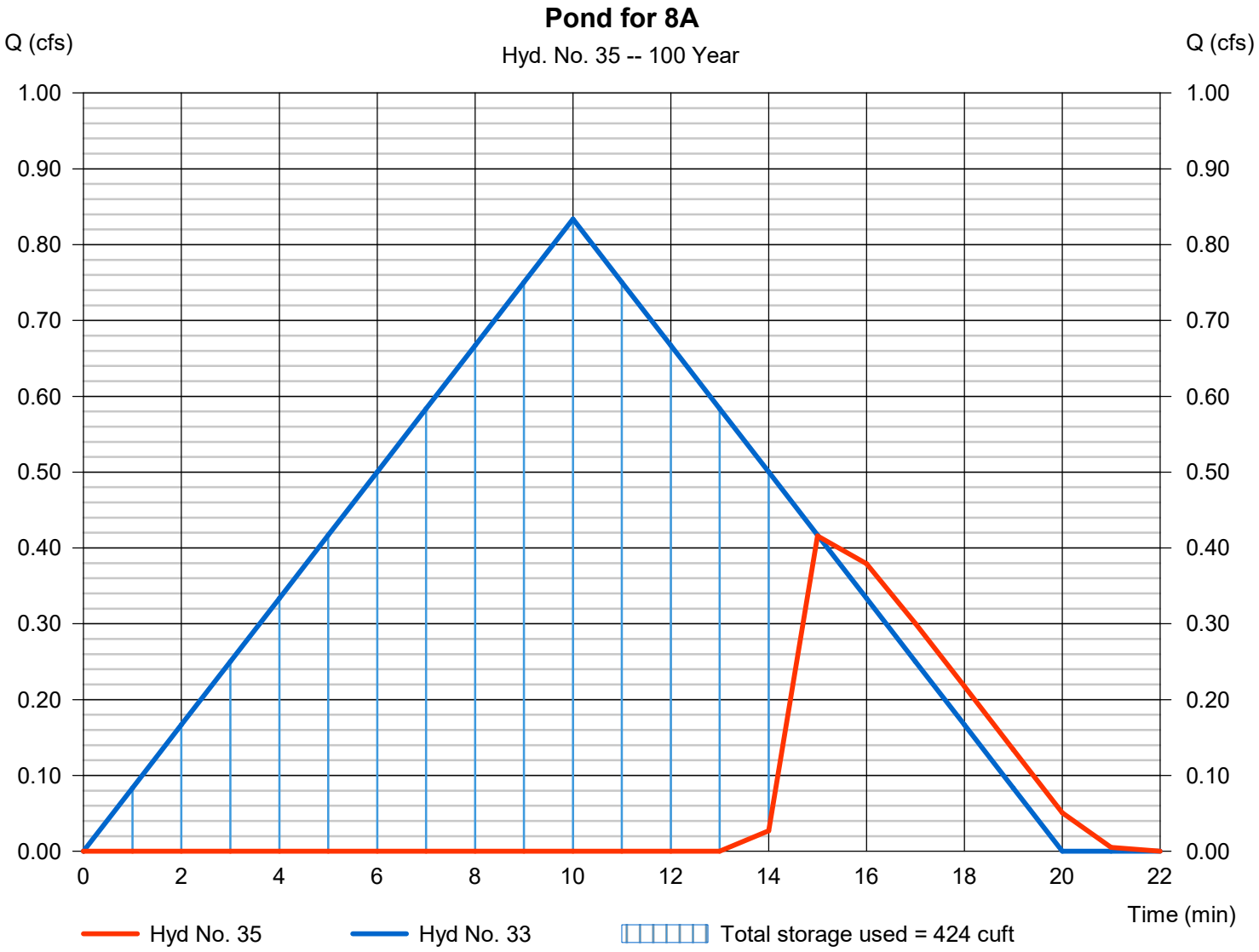
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 35

Pond for 8A

Hydrograph type	= Reservoir	Peak discharge	= 0.416 cfs
Storm frequency	= 100 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 92 cuft
Inflow hyd. No.	= 33 - 8A Post with Mediation	Max. Elevation	= 101.85 ft
Reservoir name	= Pond for 8A	Max. Storage	= 424 cuft

Storage Indication method used.

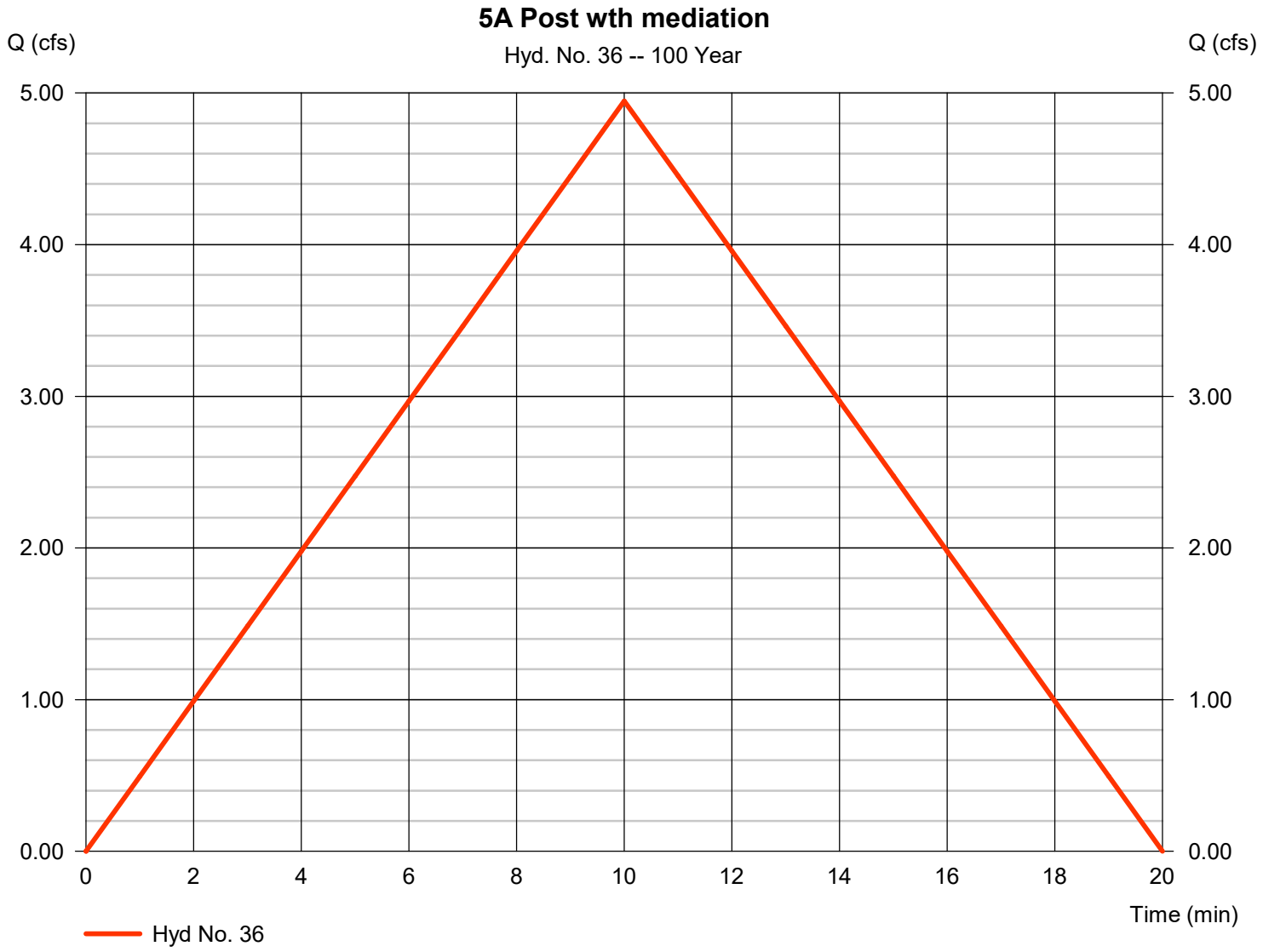


Hydrograph Report

Hyd. No. 36

5A Post wth mediation

Hydrograph type	=	Rational	Peak discharge	=	4.947 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,968 cuft
Drainage area	=	1.410 ac	Runoff coeff.	=	0.5
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

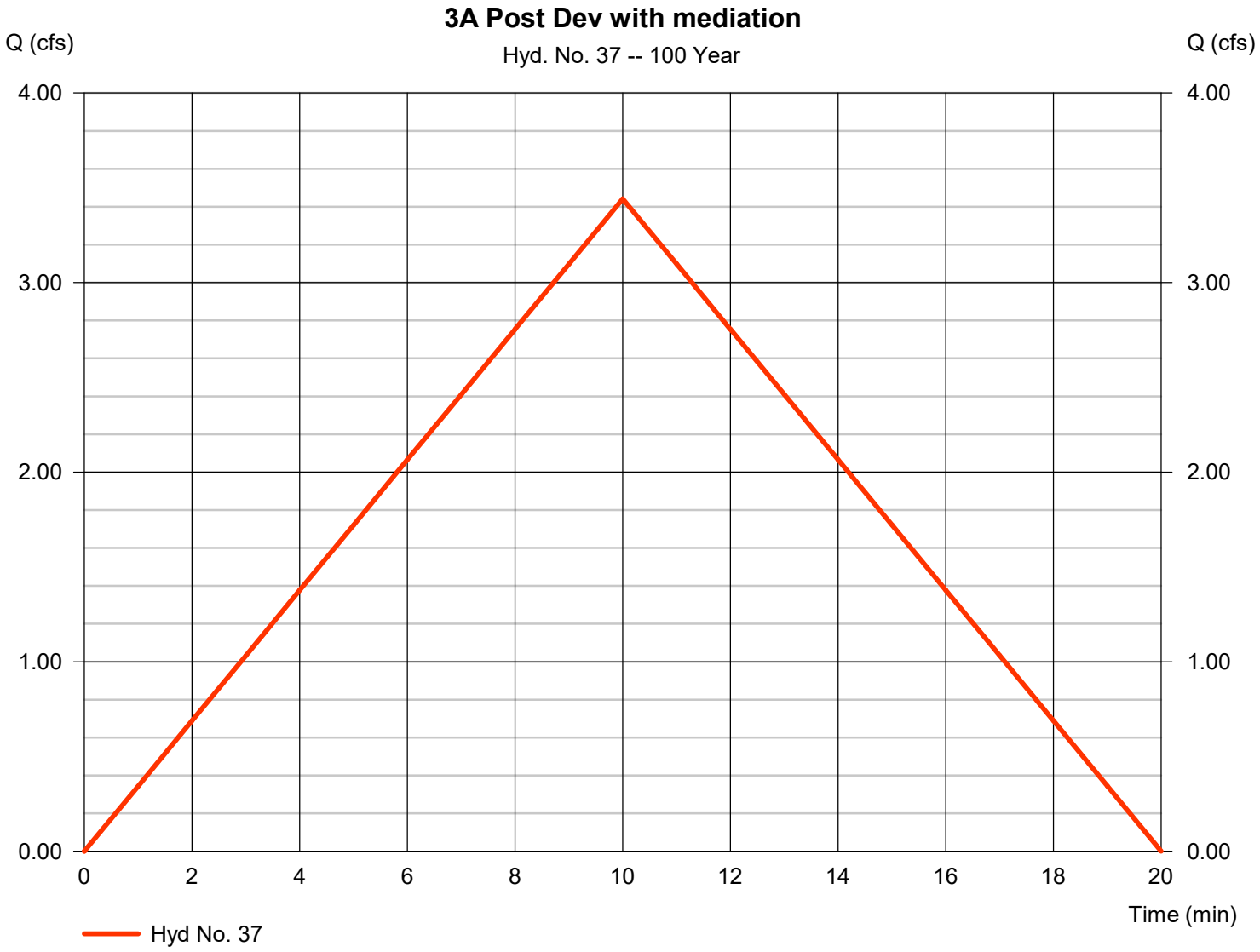


Hydrograph Report

Hyd. No. 37

3A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	3.442 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	2,065 cuft
Drainage area	=	1.090 ac	Runoff coeff.	=	0.45
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

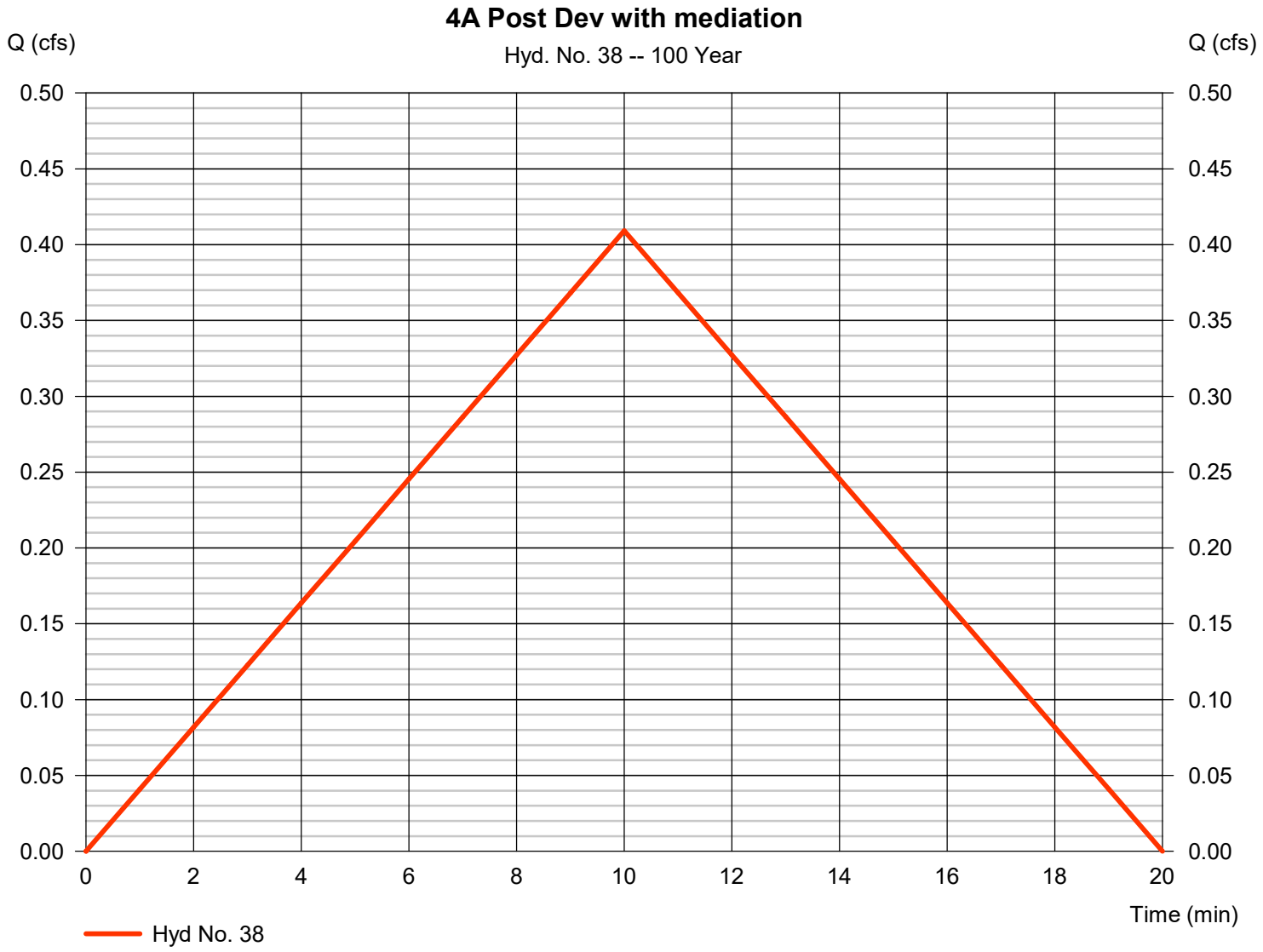


Hydrograph Report

Hyd. No. 38

4A Post Dev with mediation

Hydrograph type	=	Rational	Peak discharge	=	0.409 cfs
Storm frequency	=	100 yrs	Time to peak	=	10 min
Time interval	=	1 min	Hyd. volume	=	245 cuft
Drainage area	=	0.110 ac	Runoff coeff.	=	0.53
Intensity	=	7.018 in/hr	Tc by User	=	10.00 min
IDF Curve	=	CanyonVista.idf	Asc/Rec limb fact	=	1/1

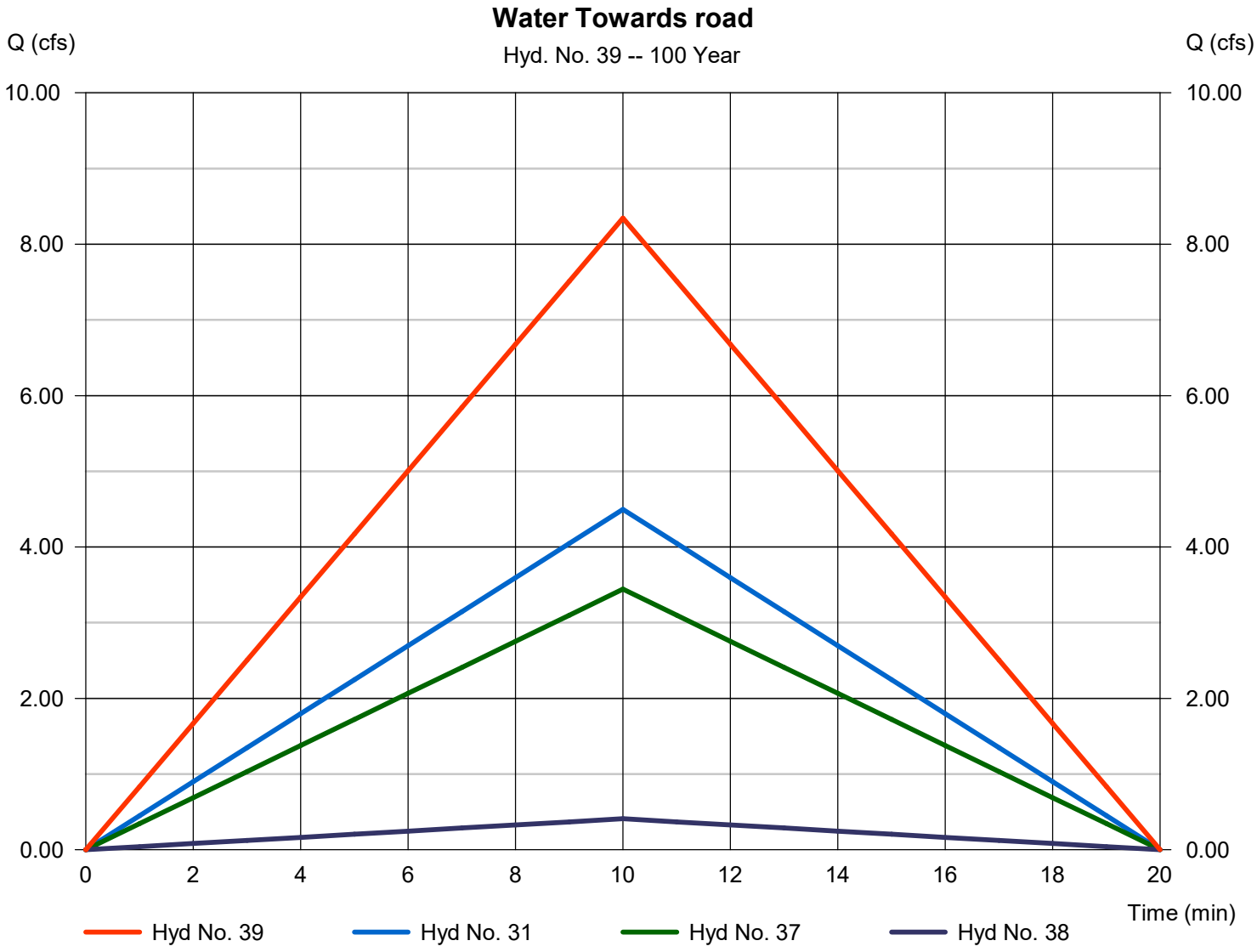


Hydrograph Report

Hyd. No. 39

Water Towards road

Hydrograph type	= Combine	Peak discharge	= 8.346 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 5,008 cuft
Inflow hyds.	= 31, 37, 38	Contrib. drain. area	= 2.250 ac



Hydrograph Report

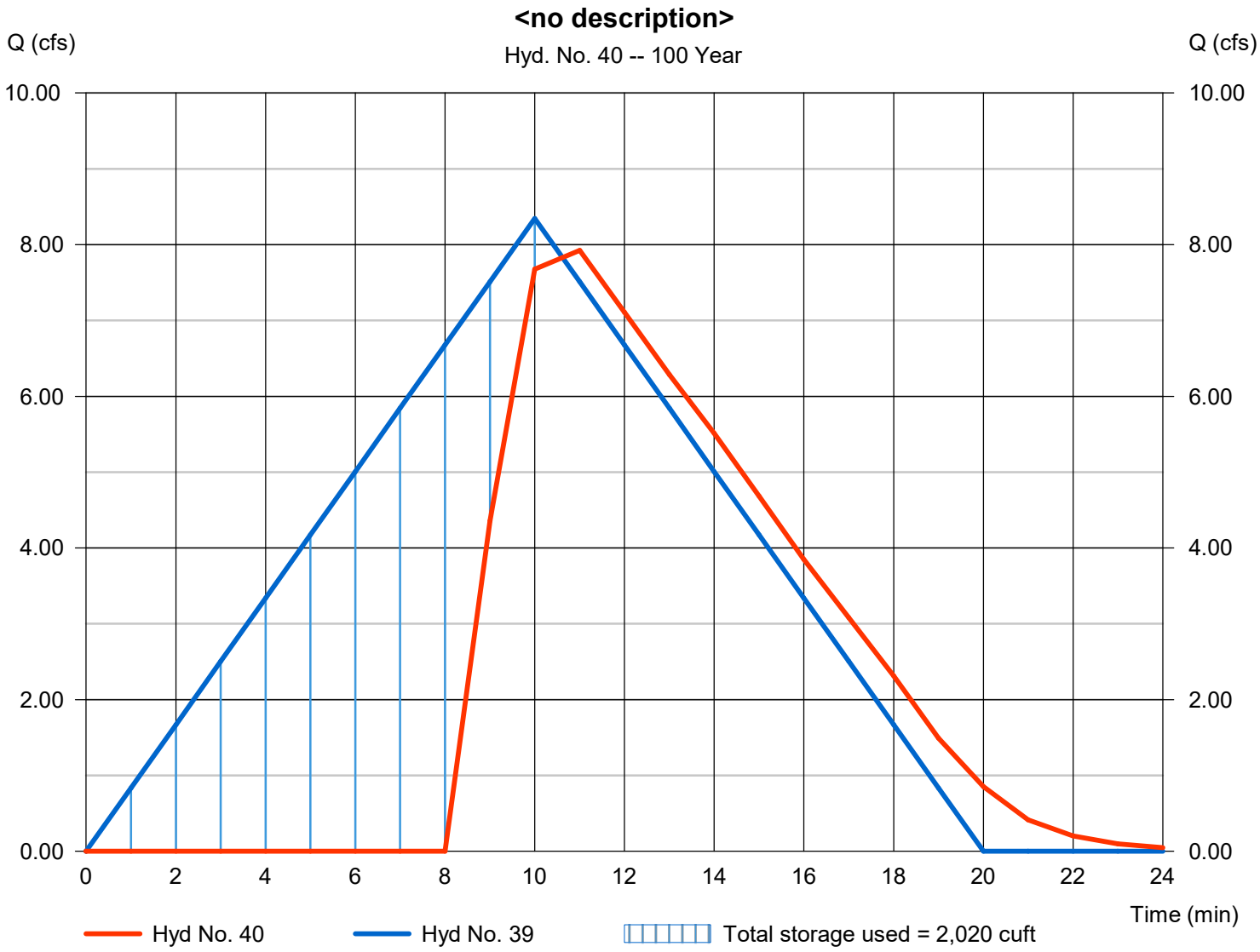
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 40

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	7.925 cfs
Storm frequency	=	100 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	3,357 cuft
Inflow hyd. No.	=	39 - Water Towards road	Max. Elevation	=	102.84 ft
Reservoir name	=	Lot 4 Pond	Max. Storage	=	2,020 cuft

Storage Indication method used.

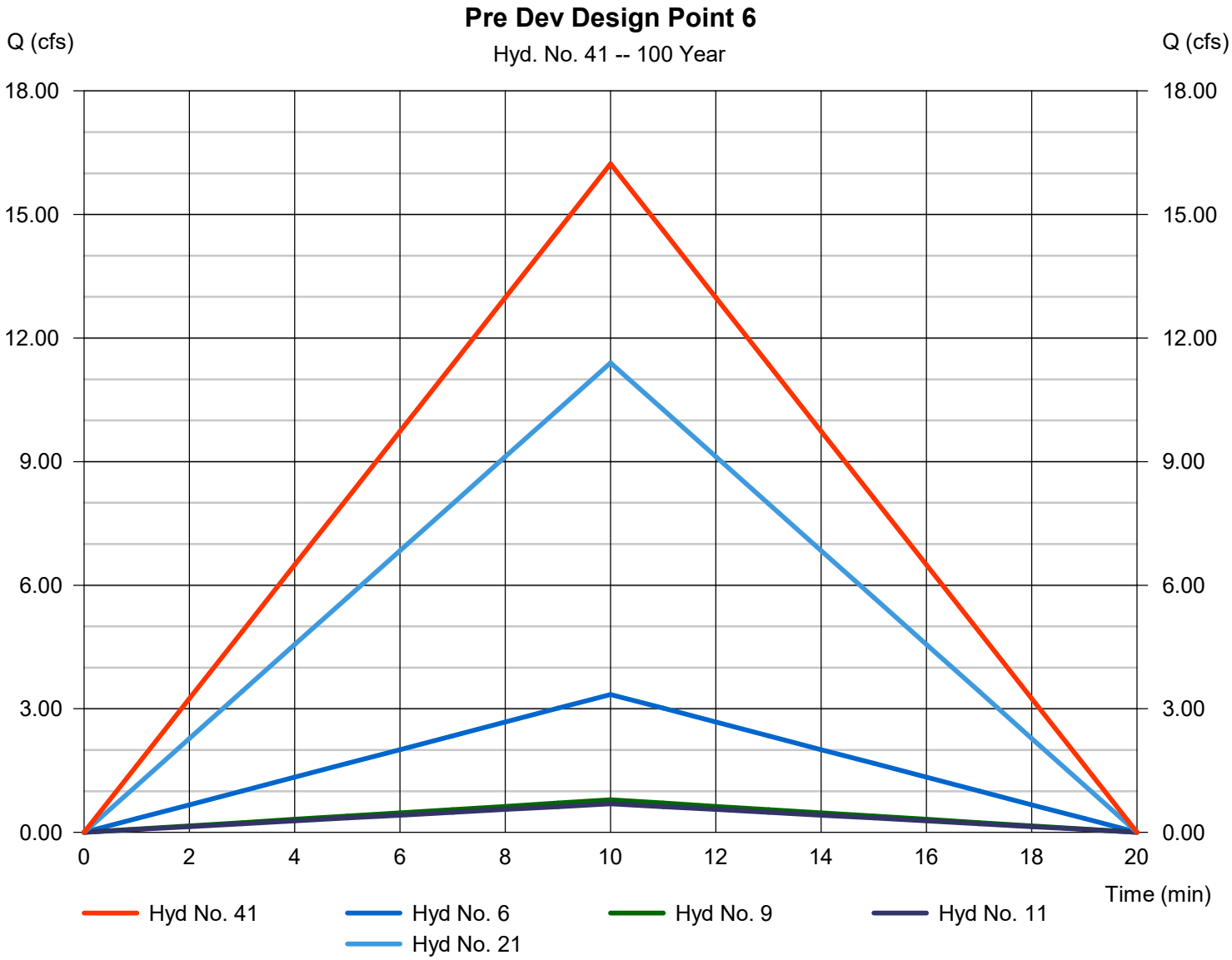


Hydrograph Report

Hyd. No. 41

Pre Dev Design Point 6

Hydrograph type	= Combine	Peak discharge	= 16.23 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 9,739 cuft
Inflow hyds.	= 6, 9, 11, 21	Contrib. drain. area	= 1.530 ac



Hydrograph Report

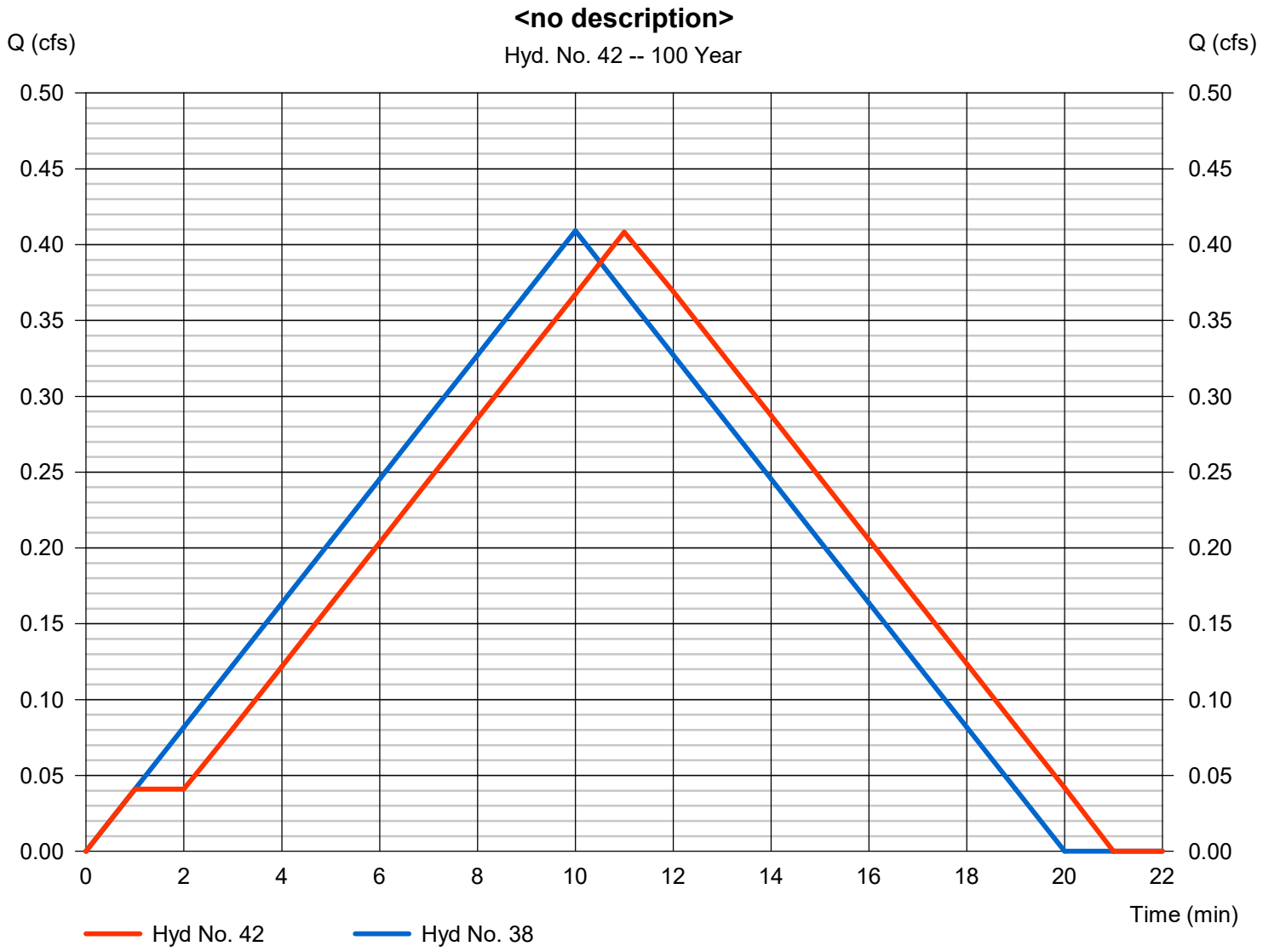
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 Saturday, 08 / 24 / 2024

Hyd. No. 42

<no description>

Hydrograph type	=	Reach	Peak discharge	=	0.408 cfs
Storm frequency	=	100 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	248 cuft
Inflow hyd. No.	=	38 - 4A Post Dev with mediation	Section type	=	Triangular
Reach length	=	140.0 ft	Channel slope	=	28.0 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	6.3:1	Max. depth	=	0.0 ft
Rating curve x	=	6.755	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.9783

Modified Att-Kin routing method used.

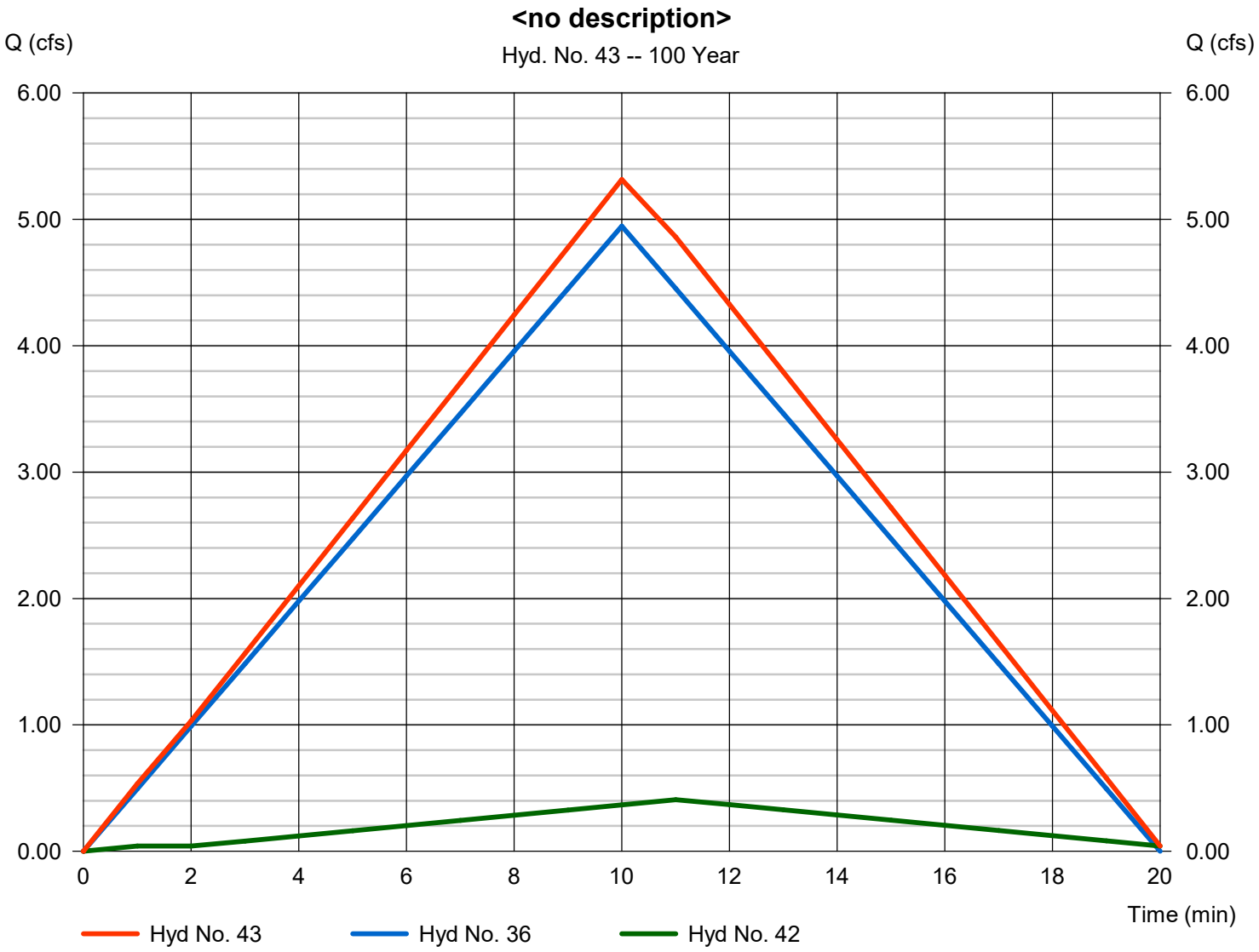


Hydrograph Report

Hyd. No. 43

<no description>

Hydrograph type	= Combine	Peak discharge	= 5.315 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 3,216 cuft
Inflow hyds.	= 36, 42	Contrib. drain. area	= 1.410 ac



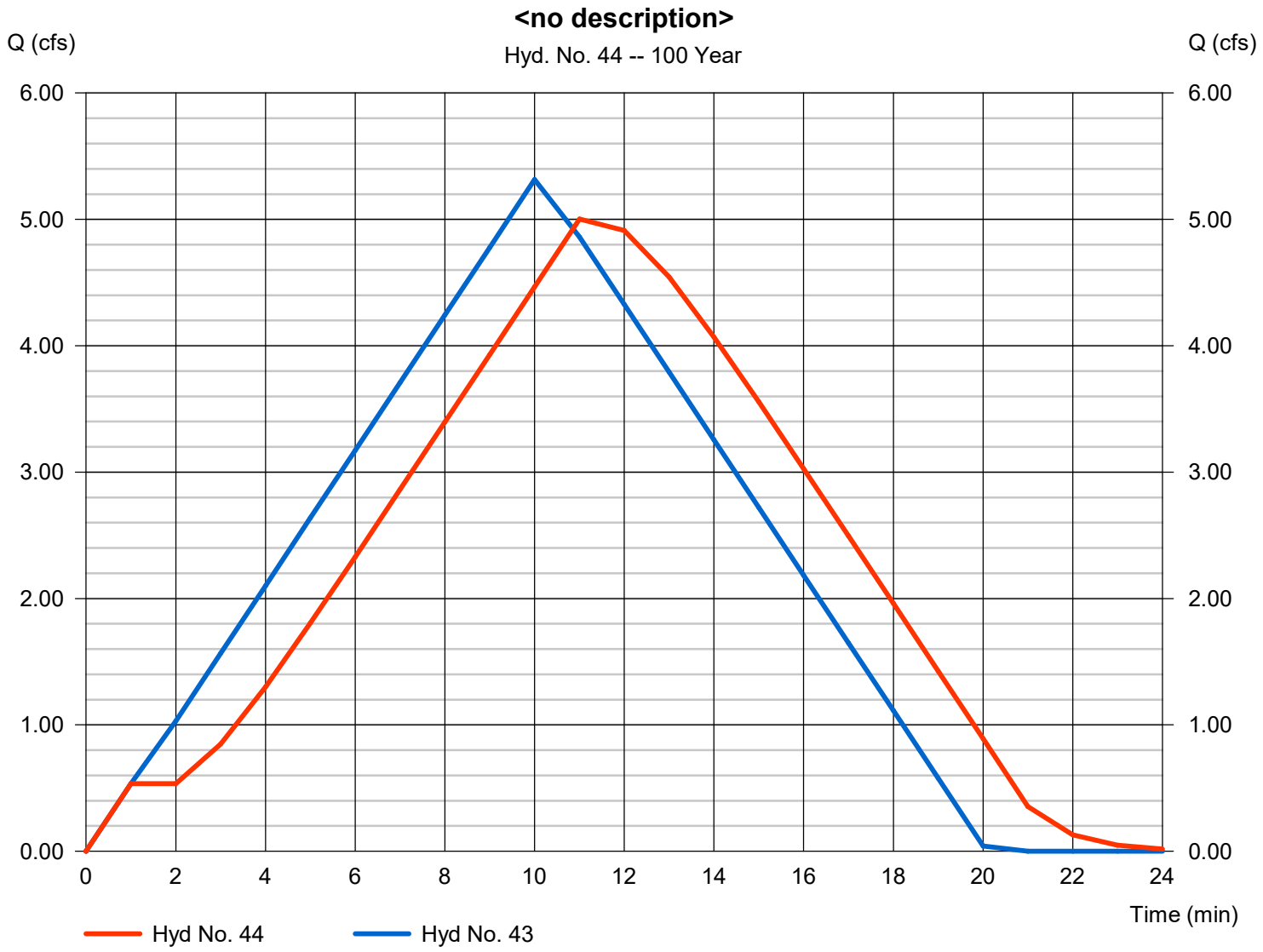
Hydrograph Report

Hyd. No. 44

<no description>

Hydrograph type	=	Reach	Peak discharge	=	5.002 cfs
Storm frequency	=	100 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	3,267 cuft
Inflow hyd. No.	=	43 - <no description>	Section type	=	Triangular
Reach length	=	307.0 ft	Channel slope	=	7.1 %
Manning's n	=	0.040	Bottom width	=	0.0 ft
Side slope	=	8.3:1	Max. depth	=	0.0 ft
Rating curve x	=	3.091	Rating curve m	=	1.333
Ave. velocity	=	0.00 ft/s	Routing coeff.	=	0.6313

Modified Att-Kin routing method used.

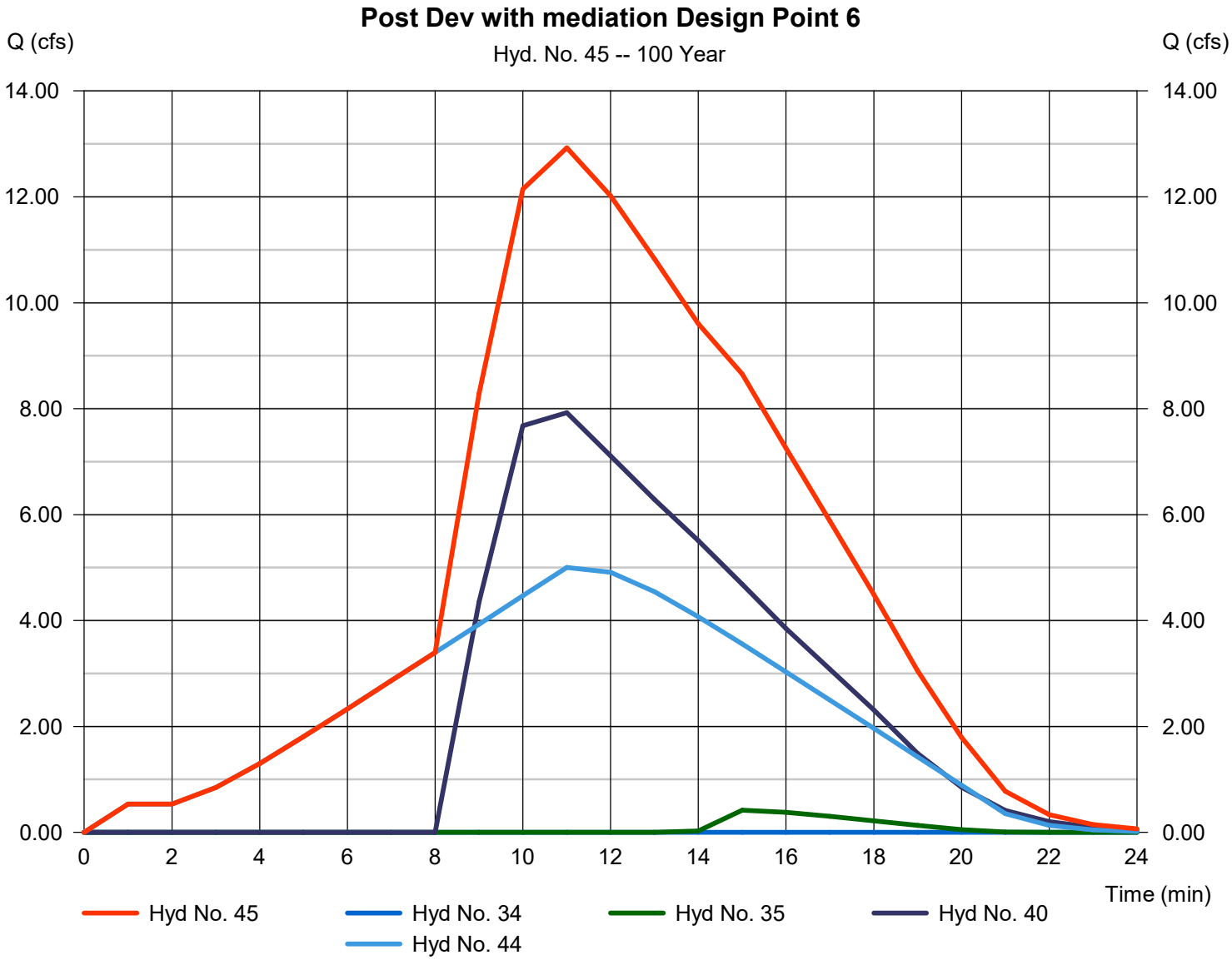


Hydrograph Report

Hyd. No. 45

Post Dev with mediation Design Point 6

Hydrograph type	=	Combine	Peak discharge	=	12.93 cfs
Storm frequency	=	100 yrs	Time to peak	=	11 min
Time interval	=	1 min	Hyd. volume	=	6,715 cuft
Inflow hyds.	=	34, 35, 40, 44	Contrib. drain. area	=	0.000 ac

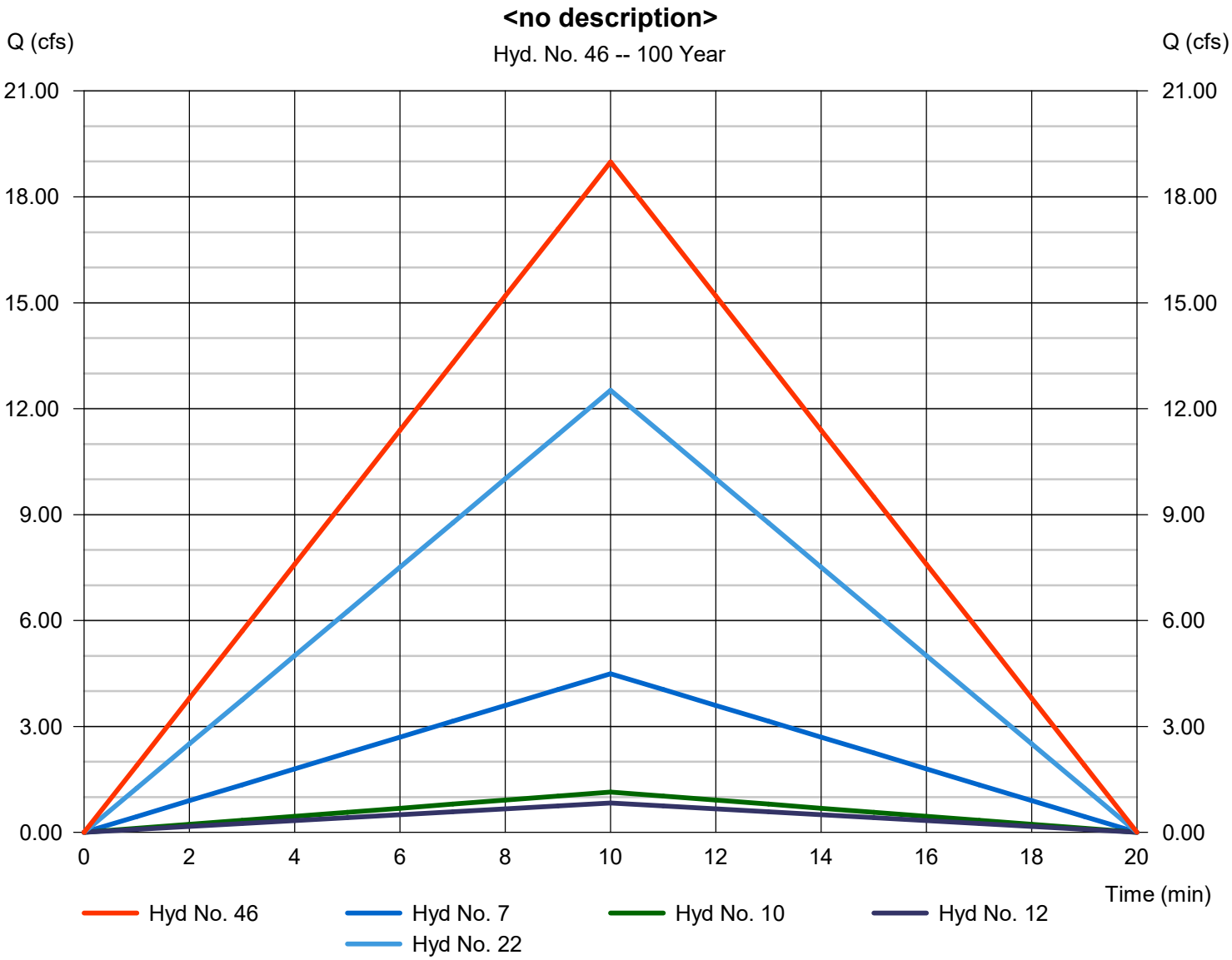


Hydrograph Report

Hyd. No. 46

<no description>

Hydrograph type	= Combine	Peak discharge	= 18.99 cfs
Storm frequency	= 100 yrs	Time to peak	= 10 min
Time interval	= 1 min	Hyd. volume	= 11,392 cuft
Inflow hyds.	= 7, 10, 12, 22	Contrib. drain. area	= 1.520 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	23.5806	9.1000	0.8411	--------
2	31.2891	9.3000	0.8474	--------
3	0.0000	0.0000	0.0000	--------
5	40.7824	9.1000	0.8405	--------
10	51.1455	9.3000	0.8473	--------
25	60.8320	8.9000	0.8370	--------
50	69.9835	8.8000	0.8332	--------
100	82.8619	9.0000	0.8384	--------

File name: CanyonVista.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	2.55	1.97	1.62	1.38	1.21	1.08	0.98	0.89	0.82	0.76	0.71	0.67
2	3.28	2.55	2.10	1.79	1.56	1.39	1.26	1.15	1.06	0.98	0.92	0.86
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	4.41	3.42	2.81	2.40	2.10	1.87	1.69	1.55	1.42	1.32	1.24	1.16
10	5.37	4.16	3.43	2.92	2.56	2.28	2.06	1.88	1.73	1.61	1.50	1.41
25	6.72	5.20	4.27	3.64	3.19	2.84	2.57	2.35	2.16	2.01	1.87	1.76
50	7.86	6.07	4.99	4.26	3.72	3.32	3.00	2.74	2.53	2.35	2.19	2.06
100	9.07	7.02	5.77	4.92	4.31	3.84	3.47	3.17	2.92	2.71	2.53	2.38

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

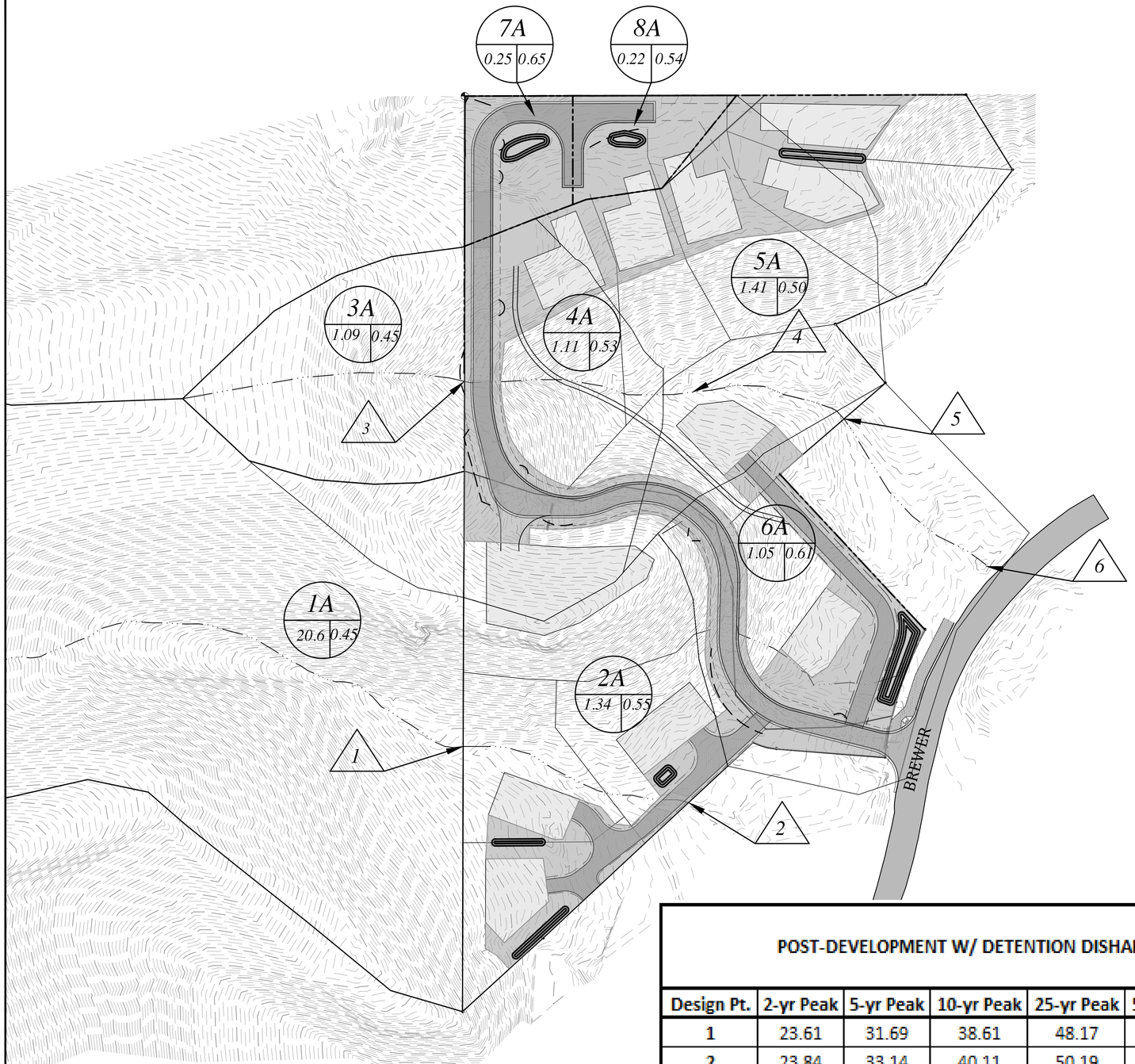
Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	2.20	0.00	3.30	4.25	5.77	6.80	7.95
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

XIII. APPENDIX H

POST DEVELOPMENT DRAINAGE MAP

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado



LEGEND

A = BASIN DESIGNATION
B = ARE IN ACRES
C = COMPOSITE RUNOFF COEFFICIENTS
D = DESIGN POINT DESIGNATION

POST-DEVELOPMENT W/ DETENTION DISHARGES (cfs)							WITHOUT DETENTION BASIN (cfs)	Difference
Design Pt.	2-yr Peak	5-yr Peak	10-yr Peak	25-yr Peak	50-yr Peak	100-yr Peak	100-yr Peak	100-yr Peak
1	23.61	31.69	38.61	48.17	56.29	65.05	65.05	0
2	23.84	33.14	40.11	50.19	58.69	68.03	70.22	-2.19
3	1.249	1.677	2.043	2.549	2.978	3.442	3.442	0
4	2.747	3.688	4.493	5.606	6.55	7.571	7.571	0
5	0	1.704	3.84	6.376	8.537	10.59	12.52	-1.93
6	1.757	4.464	6.369	8.907	11.08	12.93	18.99	-6.06
7A	0	0	0	0.313	0.525	0.726	1.14	-0.414
8A	0	0	0	0	0.17	0.416	0.834	-0.418

0 25' 50' 100'
HORIZONTAL SCALE IN FEET
1" = 50'

Registered Professional Engineer (Civil)
CERTIFICATION NO. 37322
LUKE A. SEFTON
DATE SIGNED 08-23-24
ARIZONA, U.S.A.

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning
40 STUTZ BEARCAT DR. #8
SEDONA, ARIZONA 86336
PH: (928) 202-3999 LS@SEFENGCO.COM

SHEET TITLE: POST-DEVELOPMENT DRAINAGE MAP

PROJECT TITLE:

CANYON VISTA SUBDIVISION

APN: 401-20-027G COCONINO COUNTY, SEDONA, ARIZONA

DRAWN BY: TBJ
SCALE: 1" = 50'
DATE: 08/23/2024
PROJECT NO: 140505
SHEET NO.

D-2

© 2021, Sefton Engineering Consultants LLC, All Rights Reserved. This document is protected under the United States Copyright Act. No part may be reproduced in any form or by any means or stored in a database or retrieval system, without the prior written permission of Sefton Engineering Consultants, LLC. These plans/documents have been prepared using technical knowledge that would be applied by other qualified registrants who practice the same profession in the same area and at the same time. Efforts have been made to be as accurate as possible. However, plans/documents could contain unintentional technical inaccuracies, typographical errors or omissions. Users of these plans/documents should understand that it is highly probable that errors and omissions will occur in any plan/document preparation process. The user shall notify the Registrant for clarification.

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

Aug 23, 2024

Sedona Community Development Department
102 Roadrunner Dr. Bldg. 104
Sedona, AZ 86336

Subject: Canyon Vista Subdivision Preliminary Plat – Traffic Impacts

Dear Sedona Community Development Department,

Sefton Engineering has prepared this Traffic Generation Assessment as required by the City of Sedona by the Community Development Design, Review, Engineering, and Administrative Manual for the proposed subdivision preliminary plat of the property located off Brewer Rd and identified as APN 401-20-027G in Coconino County, Arizona. More specifically, it is located in the NW ¼ of the NE ¼ of Section 18 of Township 17 North, Range 6 East of the Gila-Salt River Principal Meridian.

The proposed development includes 11 lots. The property is in an area zoned RS-10 while some surrounding areas that abut the parcel are zoned RS-18, PD, and NF. Brewer Rd must be accessed from W State Route 89A or Ranger Rd. Access for the proposed subdivision will be off Brewer Rd. approximately 0.1 miles north of Juniper Ln and 0.35 miles south of Ranger Rd. Brewer Rd is classified as a collector road and SR-89A is classified as a Major Arterial Road. The posted speed limit on Brewer Rd is 25 MPH and the posted speed limit on SR-179 is 35 MPH.

The Institute of Transportation Engineers (ITE) Trip Generation Rates 10th Edition was used to obtain the trip generation rates for the proposed development based on eleven single-family homes. These estimations were calculated for the Average Weekday, AM Peak Hour and PM Peak Hour using land use Variety Store (ITE Code 210). The results of the calculations are shown below:

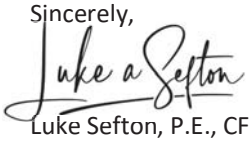
Land Use	ITE Code	Intensity	Average Weekday	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Trip Generation Rates									
Single-Family Detached Housing	210	1 du	9.44	25%	75%	0.75	63%	37%	99%
Trip Generation Summary									
Description		Size	Average Weekday	**AM Peak Hour**			**PM Peak Hour**		
				In	**Out**	**Total**	**In**	**Out**	**Total**
PROPOSED USE									
Single-Family Detached Housing		11	103.84	2.063	6.188	8.25	6.93	4.07	10.89
Proposed Project Trips			**103.84**	**2.063**	**6.188**	**8.25**	**6.93**	**4.07**	**10.89**

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

It is shown in the table above that this subdivision will generate approximately 11 traffic movements during the PM peak hour. It will have minimal impact on traffic counts.

Sincerely,



Luke Sefton, P.E., CFM

TEL: (928) 202-3999

Email: ls@sefengco.com

Prepared by: Shivaraj Shanmukh

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Sefton Engineering Consultants
Your Ideas to Completion
Surveying • Engineering • Land Planning

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

February 22, 2024

Sedona Community Development Department
102 Roadrunner Dr. Bldg. 104
Sedona, AZ 86336

Subject: Canyon Vista Subdivision Preliminary Plat – Sanitary Sewage and Water Supply

Project Overview & Location

The purpose of this report is to calculate demand for sanitary sewage and water supply for the proposed Canyon Vista subdivision on Brewer Road in Sedona. It is proposed that eleven lots be included in the subdivision. Identified as APN 401-20-027G in Coconino County, Arizona. More specifically located in the NW ¼ of the NE ¼ of Section 18 of Township 17 North, Range 6 East of the Gila-Salt River Principal Meridian.

The proposed subdivision is located near existing infrastructure. There is a sanitary line on Brewer Road maintained by the City of Sedona that services these properties. Water supply will be accessed from Brewer Road where an existing water line is maintained by the Arizona Water Company. This parcel contains approximately 5.74 Acres.

Water Demands

For this report total water demand for the development is based on the typical average water usage for each building. If each parcel is assumed to have a future single-family residence, then an average of 2.50 people per household is assumed. According to the *Arizona Department of Water Resources* on average, each Arizona resident uses about **120 gallons per day (gpd)**. This means that there will be approximately 300 gallons per day per household.

The City of Sedona does not publish any peaking factors therefore, the accepted values from Arizona Water Company were used to set Max-Day and Peak-Hour peaking factors. According to the company, the Max-Day Demands have a peaking factor of 2.0 times the Average-Daily Demand. Peak-Hour Demands have a peaking factor of 3.0 times the Average-Daily Demand. Water demands under full build-out conditions were calculated as shown in Table 1.

Table 1: Water Demand Calcs

Water Demand Calcs		
Given:		
Parcels =	11	Parcels
Residents =	2.5	People/parcel
Resident Demand =	120	Gal/day
Results:		
Household Demand =	300	Gal/day per hosue
Total Demand =	3300	Gal/day
	2.29	**GPM**

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

Luke Sefton, PE, CFM
Tim Huskett, PE, CFM
Robert Lane, Public Lands
Cheri Baker, Office Manager
Crockett Saline, PE
David Nicolella, Planner
Leonard Filner, Planner

Table 2 : Water Demand Design Flows

Building ID	Average Daily Water Demand (GPD)	Average Day Water Demand (GPM)	Max Day Peaking Factor	Max Day Water Demand (GPM)	Peak Hour Peaking Factor	Peak Hour Water Demand (GPM)
11 Single Family Residences	3300	2.29	2.00	4.58	3.000	6.88
Total	**3300**	**2.29**		**4.58**		**6.88**

Total estimated design demands for six future single-family residences are summarized below:

- Average Daily Demand: 3300 gallons per day (GPD) or 1.67 gallons per minute (GPM)
- Maximum-Day Demand: 4.58 gallons per minute (GPM)
- Peak-Hour Demand: 6.88 gallons per minute (GPM)

Sanitary Sewage

A sewer extension will be designed to provide service to the Canyon Vista subdivision. Assuming that each residence is on average four bedrooms with more than 28 fixtures then the design flow would be 750 GPD of sanitary sewage wastewater. If all lots are built out to this assumption, then there will be approximately 68,250 GPD of wastewater produced from this subdivision to contribute to the City of Sedona Wastewater system. This translates to an estimated **5.73 GPM** of wastewater disposal.

Fire Protection

The fire & life safety requirements for the City of Sedona Fire Department require that a fire hydrant be placed so that a structure does not exceed 600 feet. An existing fire hydrant has not been located near the proposed development. If any portion of a structure exceeds 600 ft then an intermediate fire hydrant will be required. The required fire flow for the building shall meet a minimum of 1,500 gallons per minute (GPM) or the available GPM in the water delivery system at 20 psi, whichever is less.

Conclusion

After due diligence of the existing infrastructure and some analysis of future development, there will be sufficient services to provide water supply and wastewater disposal on site. No critical issues were identified that would preclude the anticipated development presented in this report. As mentioned above, it is estimated that the subdivision will require a max of **6.88 GPM** of water and **5.73 GPM** of wastewater disposal.

Sincerely,

Luke Sefton, PE, CFM
TEL: (928) 202-3999, Cell: (928) 646-3494, Email: ls@SefEngCo.com
Prepared By: Shivaraj Shanmukh

40 Stutz Bearcat Dr., Sedona, Arizona 86336 ~Phone: (928) 202-3999
Email: info@sefengco.com ~ www.SeftonEngineeringCompany.com
In affiliation with:
Heritage Land Surveying & Mapping, Inc. with offices in Sedona, Camp Verde & Colorado

ENGINEERING & TESTING CONSULTANTS, INC.

May 14, 2007

Mr. William Heyer
Texona Investments
3205 Greenlee Drive
Austin, TX 78703-1622

SUBJECT: GEOTECHNICAL OBSERVATION FOR CANYON VISTA, SEDONA, AZ

Dear Mr. Heyer:

As requested, Engineering & Testing Consultants, Inc., (ETC) has completed the geotechnical observation for the subject project referenced above. The purpose of this exploration is to determine the general subgrade soil conditions for pavement thickness design, constructed slopes, and soil design factors.

This report discusses the general site conditions, laboratory test results, and provides pavement structure recommendations, recommended cut slope angles, and suggested construction procedures and design parameters. These services were provided following accepted soil mechanics and engineering practices. We make no other warranty, either implied or expressed. If soil conditions are encountered during construction that differ from those presented herein, this firm should be notified for evaluation.

PROJECT AND SITE CONDITIONS

The subject project is generally located on the west side of Brewer Road, between Juniper Lane and Procnow Road. ETC understands that the development will include 8 custom residential lots. A "hammer head" entrance road will be constructed, approximately 170 feet in length. One private drive will begin at the "hammer head" for access to interior lots. A second private drive will come off Brewer Road, just north of the main access road.

The proposed roadway alignments have been rough graded. We were informed that this occurred in the 1970's.

There is a significant cut slope exposed along the northeast side of Lot 3, up to approximately 10 feet in height. The cut exposes firm soils and highly weathered/fractured to decomposed rock material. The other existing cut slopes are much smaller, and exposed moderately fractured rock with relatively horizontal and vertical fracture planes.

The subgrade soils are generally comprised of low-plasticity, silty sand with gravel (Unified Soil Classification SM).

LABORATORY

Atterberg limits and gradation laboratory tests were performed for representative samples collected of the subgrade soils during the field operation. A summary of the laboratory test results are presented below in Table 1. Laboratory testing was performed in accordance with applicable ASTM standards.

TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

Location	Liquid Limit (%)	Plasticity Index	Fines Content (%)	Gravel Content (%)	Unified Soil Classification
Southern Subgrade Soils	23	3	35	34	SM
Northern Subgrade Soils	---	Non-plastic	32	24	SM

PAVEMENT DESIGN

Site grading for pavement areas should be as outlined herein, to provide subgrade support of flexible pavements. The native materials will provide good support for pavement structure. The pavement sections presented in Table 2 are recommended for the proposed development. Due to the potential steep roadway grades, Portland cement concrete should be considered for roadway pavement.

TABLE 2
PAVEMENT STRUCTURAL SECTION

Roadway	Alternative	Portland Cement Concrete* Thickness (inches)	Asphaltic Concrete Thickness (inches)	Aggregate Base Thickness (inches)	Prepared Subgrade Thickness (inches)
Canyon Vista Drive	1	---	3	6	8
Private Drives	1	---	2.5	6	8
	2	5	---	4	8

*Note: Air-entrained concrete with a minimum 28-day compressive strength of 3,500 psi.

The recommended pavement sections are expected to function with periodic maintenance or overlays when the subgrade, base, and pavement are constructed in accordance with YAG construction standards with City of Sedona modifications.

Efficient surface and subsurface drainage should be established prior to and maintained during and after construction to prevent water from ponding and/or saturating the soils within or adjacent to roadway areas.

In design and construction, adequate setback should be provided between the back of curb and/or sidewalk to ensure efficient drainage is maintained in areas adjacent to the toe of a rock cut slope.

EARTHWORK

The areas where fill is required must be stripped of all vegetation, debris, or unstable soils and such material should be removed. Depressions and sloped ground should be widened or benched as necessary to accommodate compaction equipment and provide a level base for placing fill.

Existing fill soils were encountered at various locations along the roadway alignment. The existing fill material in the area of culvert crossings shall be removed and replaced in compacted lifts. In addition, loose fill soils were observed along the existing fill slopes, which shall be removed and benched back into firm soils prior to placement of any additional fill. Loose or otherwise inadequate fill material, if encountered during construction, shall be removed and replaced in compacted lifts, as determined by the engineer.

Prior to fill placement, the exposed ground surface should be scarified; moisture conditioned, and compacted to a minimum depth of 8 inches, except on exposed rock. Special attention shall be given to insure adequate moisture is present throughout the entire 8-inch depth.

All subbase fill required to bring the structured areas up to subgrade elevation should be placed in horizontal lifts not exceeding 8 inches compacted thickness. Fill soils in roadway areas, and backfill in utility trenches shall be compacted to a minimum relative density of 95% of maximum dry density at –2% to +2% of optimum moisture content, ASTM D698.

Many cobbles and boulders will likely be generated during the earthwork phases of the construction. During fill placement "nesting" of large cobbles or boulders should be avoided. An adequate amount of finer material should be mixed in with the coarser material to create a dense fill without the creation of voids. Fill material with a large amount of rock pieces will still need to be adequately moisture conditioned to provide for long term stability and a dense fill section.

ETC recommends the observation of the site grading operation with sufficient tests to verify proper compaction.

CONSTRUCTED SLOPES

ETC recommends that fill slopes be constructed at a maximum slope angle of 2H:1V. If boulder revetment will be placed on the slope face, fill slopes may be constructed up to 1.5H:1V.

Cut slopes in the firm soil and highly weathered to decomposed rock material, as encountered in the northeast portion of Lot 3, shall be constructed at a maximum slope angle of 1.25H:1V up to 12 feet in height.

The relatively intact, moderately fractured rock encountered elsewhere may be cut at a maximum slope angle of 0.6H:1V, up to 10 feet in height. The rock strata may be excavated in stepped method along relatively horizontal and vertical fractures, provided the overall slope angle conforms to the maximum recommended slope angle.

Natural fractures within the rock mass may dictate that portions of some cut slopes be constructed along natural fracture planes, which may be at steeper angles. Steeper cut slopes shall be observed and approved by the engineer for adequate stability. Cut slopes should be constructed with careful rock excavation.

Zones of softer/decomposed/highly-fractured rock may not be apparent until a cut slope is exposed. Such strata, if encountered during construction, may require local slope angles to be adjusted.

Unstable cobbles, boulders, or loose material on the face of the slopes, and near the top of the slopes shall be removed, to help prevent future dislodgment due to weathering.

Soil in the top of cut slopes should be rounded back from the slope face to create a gradual transition to natural grade. Surface water runoff may erode slope faces, causing portions of a slope to become unstable, or dislodging larger rocks. Therefore, surface drainage should be prevented from flowing down slope faces without adequate revetment material.

LIMITATIONS

The recommendations in this report were prepared in accordance with accepted professional engineering principles and soil mechanics practices. We make no other warranty, either implied or expressed. If during subsequent planning and construction, conditions are different than as indicated, this firm should be notified for evaluation.

This report is not a bidding document. Any contractor reviewing this report must draw his own conclusions regarding site conditions and specific construction techniques to be used on this project.

For your use. If you have any questions, please contact us at (928) 778-9001.

Sincerely,

ENGINEERING & TESTING CONSULTANTS, INC.

Richard G. Kelley, P.E.
Project Manager

cc: Mr. Jim Sullivan, SEC, Inc.
Mr. Steven Garrett, ETC-Cottonwood
ETC File No. 6438