

Village of Mukwonago
Notice of Meeting and *Amended* Agenda

COMMITTEE OF THE WHOLE MEETING
Wednesday, April 1, 2020

Time: **5:30 pm**

Place: **Mukwonago Municipal Building/Board Room, 440 River Crest Ct. (Virtual Meeting log on details below)**

Virtual Meeting Log On Information

Join Zoom Meeting <https://us04web.zoom.us/j/520559279>

Meeting ID: 520 559 279

Dial by your location

+1 646 558 8656 US (New York)

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+1 346 248 7799 US (Houston)

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Meeting ID: 520 559 279

1. Call to Order

2. Roll Call

3. Approval of Minutes

- 3.1 Motion to approve minutes from March 4, 2020 Committee of the Whole meeting.
[2020-03-04 Draft COW minutes](#)

4. Finance Committee, Trustee Vermeulen

Discussion and possible action on the following items

4.1 Monthly Treasurer Report and Revenue/Expenditure Guideline Report For February

(For information purposes only, no action required)

[2020-02 February Treasury Report.pdf](#)

[2020 February Revenue & Expenditure Report.pdf](#)

- 4.2 Motion to recommend to the Village Board to approve Vouchers in the amount of \$447,056.21.

[2020-04-01 COW AP Report.pdf](#)

- 4.3 Motion to recommend approval to award a contract for Zoning Code and Sign Code Re Write to Civitek Consulting, Inc. for \$68,800.

[Contract](#)

[All Submittals Civi Tek Foth and VandeWalle](#)

5. Health and Recreation Committee, Trustee Decker

Discussion and possible action on the following items

- 5.1 Notification of the cancellation of the Annual Easter Egg Hunt sponsored by the Mukwonago Lions Foundation, located at Field Park April 4, 2020 (*this is for information only*)

6. Judicial Committee, Trustee Walsh

Discussion and possible action on the following items

- 6.1 Motion to recommend to the Village Board to approve an Ordinance amending Section 78-1 of the Village of Mukwonago Municipal Code regarding the composition, duties, and power of the Board of Review.

[Board of Review Pay Ordinance](#)

7. Personnel Committee, Trustee Johnson

Discussion and possible action on the following items

- 7.1 Motion to recommend to the Village Board to approve the request for educational pay incentive from Officer Taylor Zajichek

[Zajichek education pay request.pdf](#)

[Zajichek letter from Police Commission.pdf](#)

- 7.2 Motion to recommend to the Village Board to approve **Resolution 2020-17** a Resolution of the Village of Mukwonago Regarding Essential Governmental Functions/Employees, and general approval to utilize other village employees to supplement the Election Inspector shortage.

[Resolution 2020-17](#)

8. Public Works Committee, Trustee Wamser

Discussion and possible action on the following items

- 8.1 Motion to recommend to the Village Board to approve a Storm Water Maintenance Agreement with Bielinski Homes, Inc., for Chapman Farms Subdivision, a 64.51 acre development.

[Village Engr letter of approval 20200323](#)

[SWMA 20200306 Chapman Farms](#)

[SWMP 20200320](#)

- 8.2 Discussion, update, and possible recommendation to the Village Board to approve Well #3 repairs
- 8.3 Discussion and possible action to approve I-43 Elevated Tank Painting Final Payment Request
[Tank Painting Final - Combined.pdf](#)
- 8.4 Discussion and possible recommendation to approve Task Order 2020-04 for Mulcahy Shaw to install, collect data, maintain, and remove the flow meters and Ruekert & Mielke, Inc. to evaluate analyze, and recommend improvements associated with the Atkinson Pump Station Capacity.
[Atkinson Pump Station Capacity Task Order](#)

9. Adjournment

It is possible that a quorum of, members of other governmental bodies of the municipality may be in attendance at the above stated meeting to gather information. No action will be taken by any governmental body at the above stated meeting other than the governmental body specifically referred to above in this notice. Please note, upon reasonable notice, efforts will be made to accommodate the needs of individuals with disabilities through appropriate aids and services. For additional information or to request this service, contact the Municipal Clerk's Office, (262) 363-6420.

**VILLAGE OF MUKWONAGO
MINUTES OF THE COMMITTEE OF THE WHOLE MEETING
WEDNESDAY, MARCH 4, 2020**

Time: **5:30 pm**

Place: **Mukwonago Municipal Building/Board Room, 440 River Crest Court**

Call to Order

Meeting was called to order by President Winchowky at 5:30pm at Mukwonago Municipal Building/Board Room, 440 River Crest Court

Roll Call

Board Members Present:

Eric Brill
James Decker
Jason Wamser
Roger Walsh
Fred Winchowky

Also Present:

John Weidl, Village Administrator
Diana Dykstra, Clerk/Treasurer
Diana Doherty, Finance Director
Ron Bittner, DPW Director
Dave Brown, Utility Director
Kevin Schmidt, Police Chief
Mark Blum, Village Attorney
Peter Gesch, Village Engineer
Ben Kohout, Village Planner
Bob Harley, Building Inspector

Excused:

Darlene Johnson
Jay Vermeulen

Approval of Minutes

Committee of the Whole minutes of February 5, 2020.

Decker/Brill motion to approve. Unanimously carried.

Downtown Development Committee, Trustee Walsh

Downtown Development Committee Update

Trustee Walsh discussed the recent open house and the turn out. He acknowledged some confusion regarding concepts they were offering and the receipt of additional concepts. He noted they will be moving away from public comment portion and gearing up for the cost phasing. They have called a special meeting on Friday at the Library to discuss. In addition, they are looking at a presentation at the Farmers Market in March at the Library. They are updating the Downtown Yours Website as well. He noted that they would like to extend the deadline to May 20th to obtain better results and look further into the comments. There will be no additional cost. This would move the Board presentation from April to May.

Walsh/Wamser motion to extend the deadline of the proposal for final delivery date to May 20, 2020 for the Streetscaping and Wayfinding signage. Unanimously carried.

Finance Committee, Trustee Vermeulen

Monthly Treasurer Report and Revenue/Expenditure Guideline Report for January

Reports were placed on file.

Motion to recommend to the Village Board to approve Vouchers in the amount of \$2,382,879.31.

Decker/Brill motion to recommend to the Village Board to approve Vouchers in the amount of \$2,382,879.31. Unanimously carried.

Motion to recommend to the Village Board to approve Resolution 2020-05 Amending the 2019 Adopted Budgets for Wisconsin Development, TID 3, TID 4, TID 5, Debt Service, Village Designated, Capital Equipment, Library, Capital Improvement, Impact Fees, Water Utility, Sewer Utility, and Parkland Site Funds.

Finance Director Doherty noted a majority of these are increasing revenues that we weren't expecting and some funds rearranging. The Library was the only fund that expenses were slightly over. Trustee Walsh confirmed the CDBG program is closed and now that we don't have to return the money it is revenue to the Village.

Decker/Wamser motion to recommend to the Village Board to approve Resolution 2020-05 Amending the 2019 Adopted Budgets. Unanimously carried.

Motion to recommend approval to the Village Board of Resolution 2020 -08 to authorize payment and charge back for an Assessor Error in the amount of \$11,169.18 for Tax Key MUKV1962-996-008

Motion to recommend approval to the Village Board of Resolution 2020 -09 to authorize payment and charge back for an Assessor Error in the amount of \$13,848.37 for Tax Key MUKV1962-996-009

Motion to recommend approval to the Village Board of Resolution 2020-10 to authorize payment and charge back for an Assessor Error in the amount of \$1,718.73 for Tax Key MUKV2091-011-002

Motion to recommend approval to the Village Board of Resolution 2020 -11 to authorize payment and charge back for an Assessor Error in the amount of \$5,795.68 for Tax Key VM 00008

Decker/Brill motion to recommend approval of Resolutions 2020-08, 2020-09, 2020-10, and 2020-11. Unanimously carried.

Health and Recreation Committee, Trustee Decker

Discussion and possible recommendation on proposed park impact fee and Ordinance amendment, and to recommend Village Attorney finalize the Ordinance to include removal of the parkland site fee.

President Winchowky noted he felt it was high, but understands the need. Trustee Decker noted it can't be increased in the general fund and people didn't want higher user fees. Administrator Weidl noted this is mainly for multi-family units which were not contributing and this corrects that error. Public Works Director Bittner noted that the Park Impact Fee is still lower amount than the Library impact fee.

Unanimously carried.

Judicial Committee, Trustee Walsh

Discussion and possible recommendation to approve Resolution 2020-06 establishing a policy regarding the use of messaging on the Village's electronic reader board signs.

Decker/Wamser motion to recommend approval of Resolution 2020-06 establishing a policy regarding the use of messaging on the Village's electronic reader board signs with the amendment to remove reference to "Field Park" and make it refer to all electronic signs.

Roll Call: "Yes" Trustee Brill, Decker, Wamser, and Winchowky. "No" Trustee Walsh. Motion carried 4-1

Discussion and possible recommendation on Resolution 2020-07 a resolution adopting a policy for advertising on Village property and in Village communications.

Trustee Walsh questioned the locations of these signs. Trustee Wamser noted this is a blanket policy for advertising no matter what the medium is, it isn't just for the electronic signs. PW Director Bittner stated the Town has adopted a fence policy for signs.

It was noted our current scoreboard already has sponsorship that exists, so it would need to reflect that allowance. Attorney Blum commented he drafted this in anticipation of the reader boards but it may not be necessary to take action at this time if they are not ready to address the issue.

It was determined there no further action was necessary at this time.

Walsh/Brill motion to remove from the agenda. Unanimously carried.

Motion to recommend to the Village Board to approve the amendments to Section #34-46, 34-47 (a) and 34-49 (b) & (c) of the Village of Mukwonago Municipal Code regarding abandon or junked motor vehicles.

Walsh/Wamser motion to recommend approval of amendments to Section #34-46, 34-47 (a) and 34-49 (b) & (c) of the Village of Mukwonago Municipal Code regarding abandon or junked motor vehicles. Motion carried. Trustee Walsh opposed.

Motion to recommend to the Village Board to approve an Ordinance amending Section 78-1 of the Village of Mukwonago Municipal Code regarding the composition, duties, and power of the Board of Review.

Clerk Dykstra noted this Ordinance is brought forward to allow for the payment of the members who serve on the Board of Review.

President Winchowky noted he has always felt this is why elected officials receive a salary. Trustee Decker noted he remembers the fee being \$30. The Clerk will return with a comparable of other communities and past practice for the Village to the April 1 Committee of the Whole.

Request from Patti Muraczewski regarding the creation of an ordinance to prohibit the sale of dogs and cats by a retail establishment.

Resident Patti Muraczewski noted she is requesting a proactive ordinance and it would be the first in the State of Wisconsin. Currently Mukwonago does not have a pet store but this

would prohibit it for the future. She distributed copies of the Roseville, Minnesota ordinance.

Trustee Walsh recommend this be referred to the Planning and Zoning office for research and proposal examples. No motion was required.

Public Works Committee, Trustee Wamser

Motion to recommend to the Village Board to approve a Storm Water Maintenance Agreement with Castle Senior Living, At 210 McDivitt Lane for building addition and other work, contingent upon Attorney and Engineer approval.

Engineer Gesch noted the current status of the development doesn't meet the required standards. It reduces the run off but still doesn't meet the standard. He felt it was not a big concern for adjacent properties because the existing conditions were worse than the improved conditions.

Wamser/Brill motion to recommend approval of a Storm Water Maintenance Agreement with Castle Senior Living, at 210 McDivitt Lane for building addition and other work, contingent upon Attorney and Engineer approval, and waiver of the peak discharge ordinance. Unanimously carried.

Motion to recommend to the Village Board to award Wolf Paving, Inc. the River Park Estates Rehabilitation Phase 2 contract, and determine whether to award the 10-foot wide or 8-foot wide mandatory alternate for the additional paving of Miniwaukan Park Multi-Use Trail.

PW Director Bittner noted the (10) foot need was for WE Energies as required for State and Federal guidelines, and he was asked to bid both ways. The additional footage is only about \$6,000. Existing trails are (8) foot wide.

Wamser/Decker motion to award Wolf Paving, Inc. the River Park Estates Rehabilitation Phase 2 contract, and to award the 8-foot wide mandatory alternate for the additional paving of Miniwaukan Park Multi-Use Trail as the BC Alternate in the amount of \$1,341,541.65 with Alt. B at \$50,595.53. Unanimously carried.

Motion to recommend to the Village Board to approve Task Order No. 2020-02 from Ruekert Mielke, Inc. for construction related services of DeBack Drive Infrastructure.

Wamser/Brill motion to recommend approval of Task Order No. 2020-02 from Ruekert Mielke, Inc. for construction related services of DeBack Drive Infrastructure. Unanimously carried.

Discussion regarding the feasibility of constructing CTH ES Pedestrian Bridge at Fox River.

Administrator Weidl noted that this has been a long term decision to have this on our capital plan. It has been in the capital plan, and now the Board will need to decide the type of structure.

Engineer Gesch noted the (10) foot width is required for an ambulance. Trustee Decker felt the area was marsh and would require more funds to complete. Gesch noted there will be a need for additional fill to build up the shoulder and make it ADA compliant, which their costs include. Trustee Decker noted his opinion is that the County should be taking care of this. Trustee Brill explained the Village expanded on the other side of the bridge and now we have residents on the other side of the bridge with no pedestrian access. It was noted this will be back at a future date with more information. No action was taken.

Motion to recommend to the Village Board approval of TID #5 Public Improvements Close-out Change Order and Final Payment.

Decker/Brill motion to recommend approval of TID #5 Public Improvements Close-out Change Order and Final Payment. Unanimously carried.

Motion to recommend to the Village Board to approve WWTF Chemical Storage Building Bid Award to J.H. Hassinger, Inc. for the sum of \$614,766.00.

Engineer David Arnott was present and explained the Chemical Tank is underground and built in 1981. It is failing and each year insurance becomes more difficult which is the driver of this. This project brings the tank above ground in a building which provides greater control of chemical addition, general control, and SCADA of pumps. The exterior will match the architecture of other buildings, and they will be making minor changes to reduce costs. Utility Director Brown notes they will also serve future plant if you ever need to add on for growth.

Wamser/Decker motion to recommend approval of the WWTF Chemical Storage Building Bid Award to J.H. Hassinger, Inc. for the sum of \$614,766.00. Unanimously carried.

Discussion and possible action and update on Well #3 from Utility Director.

Utility Director Brown noted they are close to getting the tool free. They are drilling around it and they have it exposed and are about nine feet below. No action was required.

Motion to recommend to the Village Board to approve a Purchase Requisition for a valve exerciser and install with Northern Sewer Equipment in the amount of \$31,380.

Wamser/Brill motion to recommend approval of a Purchase Requisition for a valve exerciser and install with Northern Sewer Equipment in the amount of \$31,380.

Discussion regarding Village Electronic Recycling

DPW Director Bittner explained the last few years the Village has worked with the County. The County is no longer in the Electronic Recycling business. The vendor has a date on their calendar for June still and they noted the Village can keep this open if they wish to offer this to residents. The only cost to the Village would be the four hours of overtime for staffing. The recycling costs are paid for by the resident disposing.

Wamser/Decker motion to recommend signing a contract for Electronic Recycling pending approval as to form with Attorney. Unanimously carried.

Village Clerk

Review of February 18, 2020 Election Statistical Information for the Village of Mukwonago. Clerk Dykstra provided a review of the February Elections and the use of the electronic poll books.

Adjournment

Meeting was adjourned at 7:03pm.

Respectfully Submitted,

/s/ Diana Dykstra, CMC
Village Clerk/Treasurer

TREASURERS REPORT		Feb-20	TOTAL	Citizens	LGIP	Long Term Investments - Johnson Bank & ADM
GENERAL VILLAGE						
100-111xxx	General Fund	2,908,878.65	985,328.41	875,430.71	1,048,119.53	
100-111005/020/033	Checking/MRA/Accrued Sick	1,050,694.61	647,115.79	295,064.70	108,514.12	
150-111300	Fire Department	212,697.40	212,697.40			
200-110xxx	Lynch & Chapman Blvd	188,316.34	188,316.34			
210-111xxx	Wisc Development - RLF	209,360.62			209,360.62	
220-111xxx	TID#3-General	1,541,979.04	161,296.65	1,013,005.78	367,676.61	
240-111xxx	TID#4-General	7,317.47	7,317.47	-		
250-111xxx	TID#5-General	3,866,346.35	2,224.24	3,864,122.11		
300-111xxx	Debt Service	2,201,957.76	218,805.35	1,983,152.41		
320-111300	Fire Department Designated	256,738.44	132,526.57	124,211.87		
340-111xxx	Village Designated Funds	314,076.77	240,234.42	73,842.35		
410-111300	Recycling	307,124.21	268,245.02	38,879.19		
430-111300	Capital Equipment	87,560.85	30,224.14	57,336.71		
440-111xxx	Library	401,519.86	391,369.78	10,150.08		
480-111xxx	Capital Improvement Funds	2,210,590.78	296,201.79	1,661,976.30	252,412.69	
500-111300	Stormwater District #1	56,699.03	56,699.03			
600-111xxx	Impact Fees	259,989.86	8,244.74	251,745.12		
720-111xxx	Taxroll	345,512.23	154,539.74	190,972.49		
810-111xxx	Parkland Site	324,701.02	88,603.07	236,097.95		
TOTAL		16,752,061.29	4,089,989.95	10,675,987.77	1,986,083.57	
WATER UTILITY						
610-111300	Cash	68,617.65	68,617.65			
610-111200	Bonds & Unrestricted Cash	638,201.34		638,201.34		
610-111400	Long Term Debt	88,351.91			88,351.91	
610-111050	Current Year Debt Reserve	120,608.82	120,608.82	-		
610-111060	Required Debt Reserve	598,349.70	-	177,270.72	421,078.98	
610-111080	Impact Fee	12,492.65	8,998.96	3,493.69		
610-111033	Accrued Sick Pay	5,562.93			5,562.93	
TOTAL		1,532,185.00	198,225.43	818,965.75	514,993.82	
SEWER UTILITY						
620-111300	Cash	150,216.57	150,216.57			
620-111200	Bonds & Unrestricted Cash	517,330.83		517,330.83		
610-111400	Long Term Debt	21,106.97			21,106.97	
620-111030	Reserve Capacity Assessment	873,482.11	8,038.63	308,728.61	556,714.87	
620-111060	Required Debt Reserve	713,491.99	-	-	713,491.99	
620-111050	Current Year Debt Reserve	114,199.09	114,199.09	-		
620-111070	Equipment Replacement Fund	468,844.80	-	-	468,844.80	
620-111080	Impact Fee	638,115.87	3,421.84	634,694.03		
620-111033	Accrued Sick Pay	5,552.23		5,552.23	-	
TOTAL		3,502,340.46	275,876.13	1,466,305.70	1,760,158.63	
GRAND TOTAL		21,786,586.75	4,564,091.51	12,961,259.22	4,261,236.02	
Prepared by Diana Doherty				balance check	21,786,586.75	-

PERIOD ENDING 02/29/2020

GL NUMBER	DESCRIPTION	2020 AMENDED BUDGET	YTD BALANCE 02/29/2020	AVAILABLE BALANCE	% BDGT USED
Fund 100 - GENERAL FUND					
Revenues					
OTHERREV	OTHER REVENUES	22,000.00	6,940.09	15,059.91	31.55
PTAX	GENERAL PROPERTY TAX	2,671,895.00	2,035,407.54	636,487.46	76.18
TAXES	OTHER TAXES	392,000.00	683.82	391,316.18	0.17
IGOVTRV	INTERGOVERNMENTAL REVENUES	861,478.00	144,270.25	717,207.75	16.75
LICPER	LICENSES & PERMITS	337,597.00	60,665.25	276,931.75	17.97
LAWORD	FINES & FORFEITURES	165,000.00	36,073.12	128,926.88	21.86
PUBCHGS	PUBLIC CHARGES FOR SERVICES	38,817.00	5,495.66	33,321.34	14.16
LEISURE	LEISURE ACTIVITIES	98,000.00	0.00	98,000.00	0.00
IGOVTC	INTERGOVERNMENTAL CHARGES	209,200.00	10,494.81	198,705.19	5.02
INVTINC	INVESTMENT INCOME	86,500.00	24,624.98	61,875.02	28.47
TOTAL REVENUES		4,882,487.00	2,324,655.52	2,557,831.48	47.61
Expenditures					
5111	VILLAGE BOARD	54,829.00	13,719.11	41,109.89	25.02
5112	HISTORIC PRESERVATION	290.00	0.00	290.00	0.00
5120	MUNICIPAL COURT	44,630.00	11,589.25	33,040.75	25.97
5130	VILLAGE ATTORNEY	78,780.00	12,035.00	66,745.00	15.28
5141	VILLAGE ADMINISTRATION/FINANCE	233,369.00	16,521.00	216,848.00	7.08
5142	CLERK-TREASURER	224,096.00	28,736.28	195,359.72	12.82
5144	ELECTIONS	23,400.00	984.29	22,415.71	4.21
5151	INDEPENDENT AUDITING	13,000.00	1,431.87	11,568.13	11.01
5153	ASSESSMENT OF PROPERTY	19,850.00	2,959.94	16,890.06	14.91
5154	RISK & PROPERTY INSURANCE	132,800.00	24,786.13	108,013.87	18.66
5160	VILLAGE HALL	56,133.00	8,648.59	47,484.41	15.41
5191	UNCOLLECTED TAX	0.00	1,720.34	(1,720.34)	100.00
5211	POLICE ADMINISTRATION	1,177,535.00	165,322.16	1,012,212.84	14.04
5212	POLICE PATROL	976,998.00	146,498.27	830,499.73	14.99
5213	CRIME INVESTIGATION	241,298.00	33,134.69	208,163.31	13.73
5215	POLICE TRAINING	12,000.00	1,381.99	10,618.01	11.52
5220	FIRE STATION (VILLAGE)	8,198.00	542.79	7,655.21	6.62
5235	EMERGENCY GOVERNMENT	2,350.00	0.00	2,350.00	0.00
5241	BUILDING INSPECTOR	231,858.00	32,639.76	199,218.24	14.08
5247	BOARD OF APPEALS	1,000.00	0.19	999.81	0.02
5254	DAMS	7,652.00	762.99	6,889.01	9.97
5300	DPW GENERAL ADMINISTRATION	332,956.00	78,317.75	254,638.25	23.52
5323	GARAGE	49,502.00	8,815.37	40,686.63	17.81
5324	MACHINERY & EQUIPMENT	87,848.00	13,470.38	74,377.62	15.33
5335	ENGINEERING	50,000.00	3,343.59	46,656.41	6.69
5341	STREETS & ALLEYS	24,298.00	270.27	24,027.73	1.11
5342	STREET LIGHTING	172,500.00	34,052.97	138,447.03	19.74
5343	CURBS GUTTERS & SIDEWALKS	25,526.00	97.00	25,429.00	0.38
5344	STORM SEWER	16,208.00	1,827.20	14,380.80	11.27
5345	STREET CLEANING	11,438.00	0.00	11,438.00	0.00
5346	BRIDGES & CULVERTS	5,033.00	0.00	5,033.00	0.00
5347	SNOW & ICE CONTROL	126,777.00	16,372.10	110,404.90	12.91
5348	STREET SIGNS & MARKINGS	10,776.00	3,190.04	7,585.96	29.60
5362	GARBAGE COLLECTION	4,293.00	109.39	4,183.61	2.55
5431	ANIMAL POUND	2,750.00	2,420.00	330.00	88.00
5512	MUSEUM	11,000.00	1,015.28	9,984.72	9.23
5521	PARKS	173,872.00	3,587.35	170,284.65	2.06
5522	CELEBRATIONS	4,119.00	2,384.27	1,734.73	57.88
5611	FORESTRY	30,555.00	4,314.51	26,240.49	14.12
5613	WEED CONTROL	1,618.00	0.00	1,618.00	0.00
5632	PLANNING DEPARTMENT	123,658.00	17,063.60	106,594.40	13.80
5660	STORMWATER MASTER PLAN	12,000.00	240.00	11,760.00	2.00
5670	ECONOMIC DEVELOPMENT	65,694.00	17,066.97	48,627.03	25.98
TOTAL EXPENDITURES		4,882,487.00	711,372.68	4,171,114.32	14.57
Fund 100 - GENERAL FUND:					
TOTAL REVENUES		4,882,487.00	2,324,655.52	2,557,831.48	47.61
TOTAL EXPENDITURES		4,882,487.00	711,372.68	4,171,114.32	14.57
NET OF REVENUES & EXPENDITURES		0.00	1,613,282.84	(1,613,282.84)	100.00

PERIOD ENDING 02/29/2020

GL NUMBER	DESCRIPTION	2020 AMENDED BUDGET	YTD BALANCE 02/29/2020	AVAILABLE BALANCE	% BDGT USED
Fund 150 - FIRE/AMBULANCE FUND					
Revenues					
OTHERREV	OTHER REVENUES	0.00	250.00	(250.00)	100.00
PTAX	GENERAL PROPERTY TAX	222,854.00	37,142.34	185,711.66	16.67
EBIX	EBIX REVENUES	1,034,294.00	171,437.33	862,856.67	16.58
IGOVTRV	INTERGOVERNMENTAL REVENUES	6,000.00	0.00	6,000.00	0.00
PUBCHGS	PUBLIC CHARGES FOR SERVICES	1,500.00	0.00	1,500.00	0.00
IGOVTC	INTERGOVERNMENTAL CHARGES	222,854.00	37,142.34	185,711.66	16.67
INVTINC	INVESTMENT INCOME	1,000.00	190.58	809.42	19.06
TOTAL REVENUES		1,488,502.00	246,162.59	1,242,339.41	16.54
Expenditures					
5140	ADMINISTRATIVE & GENERAL	26,361.00	4,393.50	21,967.50	16.67
5221	FIRE ADMINISTRATION	939,371.00	142,709.13	796,661.87	15.19
5222	FIRE SUPPRESSION	62,798.00	5,199.08	57,598.92	8.28
5223	FIRE TRAINING	42,478.00	4,052.28	38,425.72	9.54
5231	AMBULANCE	328,347.00	53,555.66	274,791.34	16.31
5232	AMBULANCE TRAINING	22,601.00	2,489.12	20,111.88	11.01
5700	CAPITAL OUTLAY EXPENDITURES	34,000.00	3,314.00	30,686.00	9.75
5900	OTHER FINANCING USES	32,546.00	0.00	32,546.00	0.00
TOTAL EXPENDITURES		1,488,502.00	215,712.77	1,272,789.23	14.49
Fund 150 - FIRE/AMBULANCE FUND:					
TOTAL REVENUES		1,488,502.00	246,162.59	1,242,339.41	16.54
TOTAL EXPENDITURES		1,488,502.00	215,712.77	1,272,789.23	14.49
NET OF REVENUES & EXPENDITURES		0.00	30,449.82	(30,449.82)	100.00

PERIOD ENDING 02/29/2020

GL NUMBER	DESCRIPTION	2020 AMENDED BUDGET	YTD BALANCE 02/29/2020	AVAILABLE BALANCE	% BDGT USED
Fund 610 - WATER UTILITY FUND					
Revenues					
OTHERREV	OTHER REVENUES	100.00	0.00	100.00	0.00
UTILREV	UTILITY REVENUES	2,002,653.00	1,590.25	2,001,062.75	0.08
CONTRIB	CONTRIBUTED CAPITAL	100,000.00	8,663.00	91,337.00	8.66
MISCINC	MISC INCOME UTILITIES	137,000.00	54,366.96	82,633.04	39.68
IGOVTC	INTERGOVERNMENTAL CHARGES	1,500.00	8.36	1,491.64	0.56
INVTINC	INVESTMENT INCOME	52,100.00	6,048.27	46,051.73	11.61
TOTAL REVENUES		2,293,353.00	70,676.84	2,222,676.16	3.08
Expenditures					
5140	ADMINISTRATIVE & GENERAL	200.00	18.29	181.71	9.15
5900	OTHER FINANCING USES	267,896.00	0.00	267,896.00	0.00
6200	PUMPING OPERATIONS	112,320.00	20,058.48	92,261.52	17.86
6210	PUMPING MAINTENANCE	189,232.00	1,616.05	187,615.95	0.85
6300	WATER TREATMENT OPERATIONS	68,537.00	5,675.65	62,861.35	8.28
6310	WATER TREATMENT MAINTENANCE	13,838.00	1,729.69	12,108.31	12.50
6450	T&D-DISTR RSRVR/STNDP MAINT	21,740.00	393.08	21,346.92	1.81
6451	T&D-MAINS MAINTENANCE	54,847.00	1,205.33	53,641.67	2.20
6452	T&D-SERVICES MAINTENANCE	39,152.00	373.62	38,778.38	0.95
6453	T&D-METERS MAINTENANCE	20,166.00	(778.63)	20,944.63	(3.86)
6454	T&D-HYDRANTS MAINTENANCE	35,162.00	37.13	35,124.87	0.11
6901	METER READING LABOR	3,532.00	153.30	3,378.70	4.34
6902	ACCOUNTING & COLLECTING LABOR	73,400.00	12,233.34	61,166.66	16.67
6920	ADMINISTRATIVE & GENERAL EXP	995,777.00	45,961.64	949,815.36	4.62
6950	YEAR END ACCOUNTING ADJUSTMENT	397,554.00	0.00	397,554.00	0.00
TOTAL EXPENDITURES		2,293,353.00	88,676.97	2,204,676.03	3.87
Fund 610 - WATER UTILITY FUND:					
TOTAL REVENUES		2,293,353.00	70,676.84	2,222,676.16	3.08
TOTAL EXPENDITURES		2,293,353.00	88,676.97	2,204,676.03	3.87
NET OF REVENUES & EXPENDITURES		0.00	(18,000.13)	18,000.13	100.00

PERIOD ENDING 02/29/2020

GL NUMBER	DESCRIPTION	2020 AMENDED BUDGET	YTD BALANCE 02/29/2020	AVAILABLE BALANCE	% BDGT USED
Fund 620 - SEWER UTILITY FUND					
Revenues					
OTHERREV	OTHER REVENUES	1,500.00	0.00	1,500.00	0.00
UNCLASSIFIED	Unclassified	10,000.00	0.00	10,000.00	0.00
UTILREV	UTILITY REVENUES	1,590,640.00	4,315.31	1,586,324.69	0.27
LICPER	LICENSES & PERMITS	101,600.00	6,153.00	95,447.00	6.06
CONTRIB	CONTRIBUTED CAPITAL	80,000.00	3,201.00	76,799.00	4.00
MISCINC	MISC INCOME UTILITIES	250,000.00	57,083.11	192,916.89	22.83
INVSTINC	INVESTMENT INCOME	41,175.00	12,029.56	29,145.44	29.22
TOTAL REVENUES		2,074,915.00	82,781.98	1,992,133.02	3.99
Expenditures					
5140	ADMINISTRATIVE & GENERAL	120.00	6.76	113.24	5.63
5900	OTHER FINANCING USES	88,014.00	0.00	88,014.00	0.00
8010	WWTP-TREATMENT/DISPOSAL/GP	564,304.00	61,258.75	503,045.25	10.86
8020	LIFT STATIONS/PUMPING EQUIP	31,499.00	2,975.71	28,523.29	9.45
8030	WASTEWATER COLLECTION SYSTEM	105,867.00	357.96	105,509.04	0.34
8300	ACCOUNTING/COLLECTING	73,400.00	12,360.03	61,039.97	16.84
8400	ADMINISTRATIVE & GENERAL	576,232.00	45,084.83	531,147.17	7.82
8900	YEAR END ACCOUNTING ADJUSTMENT	635,479.00	0.00	635,479.00	0.00
TOTAL EXPENDITURES		2,074,915.00	122,044.04	1,952,870.96	5.88
Fund 620 - SEWER UTILITY FUND:					
TOTAL REVENUES		2,074,915.00	82,781.98	1,992,133.02	3.99
TOTAL EXPENDITURES		2,074,915.00	122,044.04	1,952,870.96	5.88
NET OF REVENUES & EXPENDITURES		0.00	(39,262.06)	39,262.06	100.00
TOTAL REVENUES - ALL FUNDS					
TOTAL REVENUES - ALL FUNDS		10,739,257.00	2,724,276.93	8,014,980.07	25.37
TOTAL EXPENDITURES - ALL FUNDS		10,739,257.00	1,137,806.46	9,601,450.54	10.59
NET OF REVENUES & EXPENDITURES		0.00	1,586,470.47	(1,586,470.47)	100.00

Accounts Payable Cover Sheet

Report:	Period or corresponding report date		
Village Accounts Payable	04-02-2020 check run	\$	207,714.96
Library Accounts Payable		\$	20,957.35
Spectrum (ach withdrawal)		\$	2,959.59
WE Energies (ach withdrawal)		\$	43,582.11
US Bank (ach withdrawal)		\$	14,067.22
Manual Checks or E-checks issued	March 2020	\$	156,874.08
Manual Checks or E-checks issued	March 2020	\$	900.90
Total for Approval:		\$	<u>447,056.21</u>

The preceding list of bills payable was approved for payment

Date: _____

Approved by: _____

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PENDING VILLAGE BOARD REVIEW FOR MUKWONAGO
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INVOICE NUMBER	DESCRIPTION	DISTRIBUTIONS\AMOUNTS	AMOUNT	APPROVAL DEPARTMENT
VENDOR NAME: AARON MENDEN				
05341	MENDEN REIMBURSEMENT	150-5222-531100 12.49	12.49	FIRE
TOTAL VENDOR AARON MENDEN			12.49	
VENDOR NAME: ABEDNEGO FIRE PROTECTION LLC				
150104	CASCADE AND SCUBA TANK HYDROTEST	150-5222-539500 821.66	821.66	FIRE
TOTAL VENDOR ABEDNEGO FIRE PROTECTION LLC			821.66	
VENDOR NAME: ALSCO				
IMIL1547787	MARCH 12 MAT CLEANING SERVICE	100-5211-539400 43.89	43.89	POLICE
IMIL1550252	VILLAGE HALL WALKOFF MATS	100-5160-521900 40.21	40.21	DPW
TOTAL VENDOR ALSCO			84.10	
VENDOR NAME: BATTERIES PLUS				
P25276542	BATTERIES	150-5222-531100 49.32	98.64	FIRE
		150-5231-531100 49.32		
TOTAL VENDOR BATTERIES PLUS			98.64	
VENDOR NAME: BEDROCK SEWER & WATER				
2042	WATER SERVICE REPLACEMENT MAIN TO LOT LI 610-0000-134600	10,495.41	10,495.41	UTILITIES
TOTAL VENDOR BEDROCK SEWER & WATER			10,495.41	
VENDOR NAME: C & M AUTO PARTS INC				
6079-313927	3462 REPAIR	150-5222-539500 68.96	68.96	FIRE
6079-314005	3462 REPAIR	150-5222-539500 84.49	84.49	FIRE
6079-314030	3462 REPAIR	150-5222-539500 7.98	7.98	FIRE
TOTAL VENDOR C & M AUTO PARTS INC			161.43	
VENDOR NAME: CENTRAL OFFICE SYSTEMS				
67327518	COPIER INVOICE	150-5221-531100 92.00	92.00	FIRE
67327123	LEASE PAYMENT APRIL 2020	100-5142-531200 23.10	165.00	ALLOCATE
		150-5221-531100 21.45		
		220-5140-531200 1.65		
		410-5363-531200 3.30		
		440-5511-531200 8.25		
		500-5344-531200 1.65		
		610-6920-693000 54.45		
		620-8400-856000 51.15		
TOTAL VENDOR CENTRAL OFFICE SYSTEMS			257.00	
VENDOR NAME: CHEMTRADE CHEMICALS US LLC				
92853678	CHEMICALS FOR PHOSPHORUS TREATMENT	620-8010-824000 9,716.10	9,716.10	UTILITIES
TOTAL VENDOR CHEMTRADE CHEMICALS US LLC			9,716.10	
VENDOR NAME: CINTAS				
4045275239	STAFF UNIFORMS	100-5323-531100 114.95	114.95	DPW

INVOICE NUMBER	DESCRIPTION	DISTRIBUTIONS\AMOUNTS		APPROVAL AMOUNT	DEPARTMENT
VENDOR NAME: CINTAS					
4045275223	UNIFORM SERVICE	610-6920-693000	36.50	73.00	UTILITIES
		620-8010-827000	36.50		
4045914153	UNIFORM SERVICE	610-6920-693000	73.00	73.00	UTILITIES
4045914135	STAFF UNIFORMS	100-5323-531100	114.95	114.95	DPW
TOTAL VENDOR CINTAS				375.90	
VENDOR NAME: CITIZENS BANK INS SERVICES					
159	BOND RENEWAL FOR MUNICIPAL JUDGE	100-5120-539900	100.00	100.00	FINANCE
TOTAL VENDOR CITIZENS BANK INS SERVICES				100.00	
VENDOR NAME: CITY OF MUSKEGO					
177427	911 5TH YEAR SUPPORT AND HOSTING ADMIN F	100-5211-521900	13,000.00	13,000.00	POLICE
TOTAL VENDOR CITY OF MUSKEGO				13,000.00	
VENDOR NAME: COMPASS MINERALS AMERICA					
612507	SODIUM CHLORIDE FOR ICE CONTROL	100-5347-531100	21,838.80	21,838.80	DPW
TOTAL VENDOR COMPASS MINERALS AMERICA				21,838.80	
VENDOR NAME: DIGGERS HOTLINE INC					
200238301	LOCATE FEES	610-6920-693000	35.00	69.65	UTILITIES
		620-8400-852000	34.65		
TOTAL VENDOR DIGGERS HOTLINE INC				69.65	
VENDOR NAME: DYNAMIC AWARDS					
17051	ELECTION SIGNS	100-5144-531200	60.00	60.00	CLERK
17055	PICKLE BALLL COURT SIGN	100-5521-531100	25.00	25.00	DPW
TOTAL VENDOR DYNAMIC AWARDS				85.00	
VENDOR NAME: EAGLE ENGRAVING					
2020-1765	EAGLE ENGRAVING INVOICE	150-5222-531100	80.40	80.40	FIRE
TOTAL VENDOR EAGLE ENGRAVING				80.40	
VENDOR NAME: EMERGENCY MEDICAL PRODUCTS					
2145374	EMS SUPPLIES	150-5231-531100	874.74	874.74	FIRE
TOTAL VENDOR EMERGENCY MEDICAL PRODUCTS				874.74	
VENDOR NAME: FOREMOST PROMOTIONS					
503836	FIRE PREVENTION SUPPLIES	150-5221-531300	365.20	365.20	FIRE
TOTAL VENDOR FOREMOST PROMOTIONS				365.20	
VENDOR NAME: FOTH INFRASTRUCTURE &					
66201	STREETSCAPE PLAN	480-5700-521900	13,800.00	13,800.00	FINANCE
TOTAL VENDOR FOTH INFRASTRUCTURE &				13,800.00	
VENDOR NAME: FREEDOM FIREARMS					
2020 PARK REFUND	2020 PARK RENTAL REFUND 5/14 - 5/16	100-4820-485000	525.00	525.00	CLERK

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VENDOR NAME: FREEDOM FIREARMS					
TOTAL VENDOR FREEDOM FIREARMS				525.00	
VENDOR NAME: GENESEE AGGREGATE CORP					
9669	PEA GRAVEL	610-0000-134500	153.03	153.03	UTILITIES
T9669	133 BARRON RD SERVICE REPLACEMENT	610-0000-134500	93.64	93.64	UTILITIES
TOTAL VENDOR GENESEE AGGREGATE CORP				246.67	
VENDOR NAME: HARLEY BOB					
2020 MARCH MILEAGE	2020 MILEAGE REIMBURSEMENT 3/5/2020	100-5241-533500	20.70	20.70	BUILDING
TOTAL VENDOR HARLEY BOB				20.70	
VENDOR NAME: HAWKINS WATER TREATMENT					
4674667	WWTF SLUDGE THICKENING CHEMICAL	620-8010-825000	1,014.30	1,014.30	UTILITIES
4674670	WATER CHEMICALS FOR TREATMENT	610-6300-663100	873.90	873.90	UTILITIES
4678533	WATER CHEMICALS FOR TREATMENT	610-6300-663100	255.30	255.30	UTILITIES
TOTAL VENDOR HAWKINS WATER TREATMENT				2,143.50	
VENDOR NAME: HIPPENMEYER, REILLY, BLUM,					
49287	PHANTOM LAKES RECORDED AGREEMENT	100-5130-521900	35.00	35.00	FINANCE
49285	MISC MATTERS	100-5130-521900	3,742.50	3,742.50	FINANCE
49286	UTILITIES	610-6920-692300	105.00	105.00	FINANCE
49288	PROSECUTIONS	100-5130-521900	1,177.50	1,177.50	FINANCE
TOTAL VENDOR HIPPENMEYER, REILLY, BLUM,				5,060.00	
VENDOR NAME: HOME DEPOT					
2020 MARCH	VH AND PARKS BUILDING MAINTENANCE SUPPLI	100-5160-539500	41.94	103.18	DPW
		100-5521-531100	61.24		
TOTAL VENDOR HOME DEPOT				103.18	
VENDOR NAME: I O SOLUTIONS INC					
C47438A	IO SOLUTIONS EXAMS	150-5221-521900	300.00	300.00	FIRE
TOTAL VENDOR I O SOLUTIONS INC				300.00	
VENDOR NAME: INTERSTATE PUMP & TANK					
11953	FUEL TANK REGULATION STICKERS	100-5324-535100	119.00	119.00	DPW
TOTAL VENDOR INTERSTATE PUMP & TANK				119.00	
VENDOR NAME: LANGE ENTERPRISES INC					
72000	PED CROSSING SIGNS	100-5348-531100	998.68	998.68	DPW
TOTAL VENDOR LANGE ENTERPRISES INC				998.68	
VENDOR NAME: MESSAGEUS.COM					
200600134	UTILITIES PHONE SERVICE	610-6920-692100	14.23	14.23	UTILITIES
TOTAL VENDOR MESSAGEUS.COM				14.23	
VENDOR NAME: MONTAGE ENTERPRISES, INC					
77262	TIGER MOWER PARTS	100-5324-539500	1,378.34	1,378.34	DPW
77451	TIGER MOWER PARTS	100-5324-539500	73.25	73.25	DPW

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INVOICE NUMBER	DESCRIPTION	DISTRIBUTIONS\AMOUNTS		APPROVAL AMOUNT DEPARTMENT
VENDOR NAME: MONTAGE ENTERPRISES, INC				
	TOTAL VENDOR MONTAGE ENTERPRISES, INC			1,451.59
VENDOR NAME: MORAIN PARK TECHNICAL COLLEGE				
S0075625	WATER CLASSES FOR LICENSING	610-6920-693000	913.80	913.80 UTILITIES
	TOTAL VENDOR MORAIN PARK TECHNICAL COLLEGE			913.80
VENDOR NAME: MUKWONAGO AREA CHAMBER OF COMM				
2020 FEB RM TX	2020 FEB AIR BNB RM TX	100-0000-244000	6.17	6.17 CLERK
	TOTAL VENDOR MUKWONAGO AREA CHAMBER OF COMM			6.17
VENDOR NAME: MUKWONAGO AUTO PARTS - GENERAL				
096634	F.D. FURNACE BELT	100-5220-539400	9.84	9.84 DPW
094527	WWTF BLOWER BELTS	620-8010-833000	217.74	217.74 UTILITIES
094207	EMRGENCY ROADSIDE KIT FOR TRUCK	620-8010-827000	42.99	42.99 UTILITIES
	TOTAL VENDOR MUKWONAGO AUTO PARTS - GENERAL			270.57
VENDOR NAME: OLSEN SAFETY EQUIPMENT				
0374751-IN	WWTF LATEX GLOVES FOR LAB	620-8010-826000	94.72	94.72 UTILITIES
	TOTAL VENDOR OLSEN SAFETY EQUIPMENT			94.72
VENDOR NAME: PATRICK PREUSS				
0000200216-01	PREUSS CLOTHING ALLOWANCE	150-5221-534600	151.32	151.32 FIRE
	TOTAL VENDOR PATRICK PREUSS			151.32
VENDOR NAME: PORT-A-JOHN, INC				
1310967-IN	PORTABLE RESTROOMS	100-5521-531100	88.00	88.00 DPW
	TOTAL VENDOR PORT-A-JOHN, INC			88.00
VENDOR NAME: QUILL LLC				
5490024 - PAPER	COPY PAPER - VILLAGE HALL	100-5142-531100	7.84	55.98 ALLOCATE
		150-5221-531100	7.28	
		220-5140-531100	0.56	
		410-5363-531100	1.12	
		440-5511-531100	2.80	
		500-5344-531100	0.56	
		610-6920-692100	18.47	
		620-8300-840000	17.35	
5514908	HDMI CABLE	100-5323-531100	7.29	7.29 DPW
5490024	VH AND PARK SUPPLIES	100-5160-531100	91.96	277.94 DPW
		100-5522-531100	185.98	
5511512	VH SOAP DISPENSERS	100-5160-539500	139.96	139.96 DPW
5469605	VH SUPPLIES TP	100-5160-531100	133.98	133.98 DPW
	TOTAL VENDOR QUILL LLC			615.15
VENDOR NAME: REINDERS, INC.				
259903-00	GRASS SEED	100-5521-531100	177.75	177.75 DPW
	TOTAL VENDOR REINDERS, INC.			177.75

INVOICE NUMBER	DESCRIPTION	DISTRIBUTIONS\AMOUNTS	APPROVAL AMOUNT DEPARTMENT
VENDOR NAME: RICOH USA, INC			
33227458	COPIER LEASE PAYMENT	100-5142-531200 23.88	170.61 FINANCE
		150-5221-531100 22.18	
		220-5140-531200 1.71	
		410-5363-531200 3.41	
		440-5511-531200 8.53	
		500-5344-531200 1.71	
		610-6920-693000 56.30	
		620-8400-856000 52.89	
TOTAL VENDOR RICOH USA, INC			170.61
VENDOR NAME: RUEKERT & MIELKE, INC.			
131165	12-00000.100 General Services	100-5335-521900 6,974.29	7,276.29 FINANCE
		100-5521-531100 302.00	
131166	12-00000.300 Water Utility Services	610-6920-692300 1,008.00	1,008.00 FINANCE
131167	12-00000.400 Sewer Utility Services	620-8400-852000 3,976.15	3,976.15 FINANCE
131168	12-10028.302 Front Street & Meacham Stre	480-5700-586100 1,386.00	1,386.00 FINANCE
131171	12-10061.300 Boat Launch Improvements /	480-5700-586400 630.00	630.00 FINANCE
131172	12-10063.210 2019 GIS Services - GIS Dat	610-6920-692300 619.50	1,239.00 FINANCE
		620-8400-852000 619.50	
131173	12-10068.310 TID #5 Phase 2 Construction	250-5335-521900 884.25	884.25 FINANCE
131174	12-10069.100 Chapman Farms Portion of Vi	100-0000-211400 386.50	386.50 FINANCE
131175	12-10071.300 Grand Avenue Water Main Rep	610-6920-692300 1,344.00	1,344.00 FINANCE
131176	12-10081.300 Well 5 Iron Filter / Constr	610-0000-000109 16,645.94	16,645.94 FINANCE
131177	12-10098.110 Mukwonago WWTF Phosphorus A	620-8400-852000 1,821.50	1,821.50 FINANCE
131178	12-10115.200 2019 Well & Well Pump Impro	610-6920-692300 49.00	49.00 FINANCE
131179	12-10015.300 2019 Well & Well Pump Impro	610-6920-692300 528.50	528.50 FINANCE
131181	12-10122.300 Village Hall Generator Addi	480-5700-539900 323.75	323.75 FINANCE
131183	12-10128.200 River Park Estates Rehabili	480-5700-586100 2,465.00	2,465.00 FINANCE
131184	12-10029.200 Miniwaukan Park Multi-Use T	480-5700-585000 4,809.00	4,809.00 FINANCE
131185	12-92041.486 2020 SCADA Service Work	610-6920-692300 865.33	1,730.66 FINANCE
		620-8400-852000 865.33	
131169	12-10044.300 BOX SELF STORAGE / CONSTRUC	100-0000-211425 38.50	38.50 FINANCE
131170	12-10057.100 EDGEWOOD APARTMENTS / REVIE	100-0000-211425 337.75	337.75 FINANCE
131180	12-10120.300 PHANTOM LAKES PRESERVE / CO	100-0000-211425 11,455.54	11,455.54 FINANCE
131182	12-10127.100 210 MCDIVITT LANE EXPANSION	100-0000-211425 859.50	859.50 FINANCE
131186	12-92191.103 PRO HEALTH EXPANSION / PROP	100-0000-211425 605.00	605.00 FINANCE
TOTAL VENDOR RUEKERT & MIELKE, INC.			59,799.83
VENDOR NAME: SERWE IMPLEMENT MUNICIPAL SALES			
6974	EQUIPMENT LABELS	100-5324-539500 32.35	32.35 DPW
TOTAL VENDOR SERWE IMPLEMENT MUNICIPAL SALES			32.35
VENDOR NAME: SHERWIN-WILLIAMS			
5228-3	PAINT FOR PUMPS AND PIPING	620-8010-833000 114.73	114.73 UTILITIES
1532-6	WWTF PIPING PAINT	620-8010-833000 114.73	114.73 UTILITIES
4848-9	WWTF PAINTING SUPPLIES	620-8010-827000 63.41	63.41 UTILITIES

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VENDOR NAME: SHERWIN-WILLIAMS			
TOTAL VENDOR SHERWIN-WILLIAMS			292.87
VENDOR NAME: SHRED-IT USA			
8129427873	VH SHREDDING SERVICE	100-5141-531100 31.62	63.23 FINANCE
		100-5142-531100 15.81	
		100-5632-531100 15.80	
TOTAL VENDOR SHRED-IT USA			63.23
VENDOR NAME: SOMAR ENTERPRISES			
101869	2020 UNIFORM ALLOWANCE - WILSON	100-5212-534600 24.40	24.40 POLICE
TOTAL VENDOR SOMAR ENTERPRISES			24.40
VENDOR NAME: STRYKER SALES CORP			
9200066226	EMS SUPPLIES	150-5231-531100 313.40	313.40 FIRE
TOTAL VENDOR STRYKER SALES CORP			313.40
VENDOR NAME: THE OSSEO CONSTRUCTION CO LLC			
12-10095.3 PMNT 7	FINAL PAYMENT I-43 TOWER PAINTING	610-0000-211150 32,487.00	32,487.00 FINANCE
TOTAL VENDOR THE OSSEO CONSTRUCTION CO LLC			32,487.00
VENDOR NAME: VERIZON WIRELESS			
9849706965	VERIZON INVOICE	150-5221-522500 100.20	100.20 FIRE
9850402986	MONTHLY BILL ACCT# 885503900-00002	150-5221-522500 20.66	275.32 MULTIPLE
		100-5323-522500 20.66	
		610-6920-692100 117.00	
		620-8400-851000 117.00	
9850402985	MONTHLY BILL ACCT# 885503900-00001	100-5141-522500 137.37	672.08 MULTIPLE
		100-5241-522500 93.45	
		150-5221-522500 4.62	
		100-5211-522500 2.42	
		100-5323-522500 135.10	
		610-6920-692100 149.56	
		620-8400-851000 149.56	
TOTAL VENDOR VERIZON WIRELESS			1,047.60
VENDOR NAME: VILLAGE OF ELM GROVE			
20-017	SCIT RESCUE VEHICLE	430-5700-571100 24,465.00	24,465.00 POLICE
TOTAL VENDOR VILLAGE OF ELM GROVE			24,465.00
VENDOR NAME: W C T C			
S0712603	WCTC TRAINING	150-5223-533500 80.00	736.75 FIRE
		150-5232-533500 656.75	
TOTAL VENDOR W C T C			736.75

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PENDING VILLAGE BOARD REVIEW FOR MUKWONAGO
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INVOICE NUMBER	DESCRIPTION	DISTRIBUTIONS\AMOUNTS		APPROVAL AMOUNT	DEPARTMENT
VENDOR NAME: WAUKESHA CTY TREASURER					
2019-00000075	HAZARDOUS WASTE COLLECTION	410-5363-521900	616.20	616.20	DPW
TOTAL VENDOR WAUKESHA CTY TREASURER				616.20	
VENDOR NAME: WE ENERGIES MAJOR PROJECTS					
4498398	FIXTURE RELATED TO DEBACK DR PER RB	200-5700-582100	973.48	973.48	FINANCE
TOTAL VENDOR WE ENERGIES MAJOR PROJECTS				973.48	
VENDOR NAME: WELDER SUPPLY CO.					
10129318	SHOP TOOLS WWTF	620-8010-827000	214.00	214.00	UTILITIES
TOTAL VENDOR WELDER SUPPLY CO.				214.00	
VENDOR NAME: WI RURAL WATER ASSOCIATION					
3944	PPE SAFETY TRAINING	100-5323-533500	144.51	144.51	DPW
TOTAL VENDOR WI RURAL WATER ASSOCIATION				144.51	
VENDOR NAME: WISCONSIN IMAGING SOLUTIONS LLC					
AR42697	COPIER FEES	610-6920-692100	52.82	52.82	UTILITIES
TOTAL VENDOR WISCONSIN IMAGING SOLUTIONS LLC				52.82	
VENDOR NAME: WOLF CONSTRUCTION					
8117	STREETS COLD PATCH	100-5341-539500	744.36	744.36	DPW
TOTAL VENDOR WOLF CONSTRUCTION				744.36	
GRAND TOTAL:				207,714.96	

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INVOICE REGISTER REPORT FOR MUKWONAGO
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Inv Num Inv Ref#	Vendor Description GL Distribution	Inv Date Entered By	Due Date	Inv Amt	Amt Due	Status	Jrnalized Post Date
2035121030 39657	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/18/2020 CKIM	03/13/2020	33.59 33.59	0.00	Paid	Y 03/13/2020
2035121031 39658	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/18/2020 CKIM	03/13/2020	25.18 25.18	0.00	Paid	Y 03/13/2020
2035121032 39659	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/18/2020 CKIM	03/13/2020	10.63 10.63	0.00	Paid	Y 03/13/2020
2035121033 39660	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/18/2020 CKIM	03/13/2020	58.75 58.75	0.00	Paid	Y 03/13/2020
2035121034 39661	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/18/2020 CKIM	03/13/2020	92.02 92.02	0.00	Paid	Y 03/13/2020
2035121035 39662	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/18/2020 CKIM	03/13/2020	14.33 14.33	0.00	Paid	Y 03/13/2020
2035109442 39780	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/12/2020 CKIM	03/13/2020	77.27 77.27	0.00	Paid	Y 03/12/2020
2035109443 39781	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/12/2020 CKIM	03/13/2020	10.07 10.07	0.00	Paid	Y 03/12/2020
2035109444 39782	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/12/2020 CKIM	03/13/2020	10.05 10.05	0.00	Paid	Y 03/12/2020
2035109445 39783	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/12/2020 CKIM	03/13/2020	292.42 292.42	0.00	Paid	Y 03/12/2020

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INVOICE REGISTER REPORT FOR MUKWONAGO
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Inv Num Inv Ref#	Vendor Description GL Distribution	Inv Date Entered By	Due Date	Inv Amt	Amt Due	Status	Jrnlized Post Date
2035145670 39784	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/28/2020 CKIM	03/13/2020	30.39 30.39	0.00	Paid	Y 03/12/2020
2035145671 39785	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/28/2020 CKIM	03/13/2020	14.10 14.10	0.00	Paid	Y 03/06/2020
2035145672 39786	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/28/2020 CKIM	03/13/2020	15.11 15.11	0.00	Paid	Y 03/06/2020
2035145673 39787	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/28/2020 CKIM	03/13/2020	109.54 109.54	0.00	Paid	Y 03/06/2020
2035145674 39788	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/28/2020 CKIM	03/13/2020	42.65 42.65	0.00	Paid	Y 03/06/2020
2035145675 39789	BAKER & TAYLOR INC. BOOKS 440-5700-532800	02/28/2020 CKIM	03/13/2020	3.14 3.14	0.00	Paid	Y 03/06/2020
2035158983 39854	BAKER & TAYLOR INC. BOOKS 440-5700-532800	03/06/2020 CKIM	03/13/2020	26.53 26.53	0.00	Paid	Y 03/10/2020
2035158984 39855	BAKER & TAYLOR INC. BOOKS 440-5700-532800	03/06/2020 CKIM	03/13/2020	328.02 328.02	0.00	Paid	Y 03/10/2020
2035158985 39858	BAKER & TAYLOR INC. BOOKS 440-5700-532800	03/06/2020 CKIM	03/13/2020	597.07 597.07	0.00	Paid	Y 03/10/2020
6769887 39666	DEMCO TECH SERVICES SUPPLIES 440-5511-531100	02/11/2020 CKIM	03/13/2020	271.35 271.35	0.00	Paid	Y 03/12/2020

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INVOICE REGISTER REPORT FOR MUKWONAGO
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Inv Num Inv Ref#	Vendor Description GL Distribution	Inv Date Entered By	Due Date	Inv Amt	Amt Due	Status	Jrnalized Post Date
6782174 39852	DEMCO LABELS 440-5511-531100	03/03/2020 CKIM	03/13/2020	134.20 134.20	0.00	Paid	Y 03/10/2020
	SUPPLIES						
70079069 39839	CENGAGE LEARNING BOOKS 440-5700-532800	03/04/2020 CKIM	03/13/2020	48.73 48.73	0.00	Paid	Y 03/12/2020
	BOOKS						
70065031 39859	CENGAGE LEARNING BOOKS 440-5700-532800	03/02/2020 CKIM	03/13/2020	26.39 26.39	0.00	Paid	Y 03/10/2020
	BOOKS						
70087032 39860	CENGAGE LEARNING BOOKS 440-5700-532800	03/02/2020 CKIM	03/13/2020	43.53 43.53	0.00	Paid	Y 03/10/2020
	BOOKS						
70094297 39871	CENGAGE LEARNING BOOKS 440-5700-532800	03/06/2020 CKIM	03/13/2020	20.14 20.14	0.00	Paid	Y 03/11/2020
	BOOKS						
4889628 39667	QUILL LLC PAPER & CLEANING SUPPLIES 440-5511-531100	02/19/2020 CKIM	03/13/2020	138.63 138.63	0.00	Paid	Y 03/12/2020
	SUPPLIES						
4891901 39668	QUILL LLC PAPER & CLEANING SUPPLIES 440-5511-531100	02/19/2020 CKIM	03/13/2020	495.00 495.00	0.00	Paid	Y 03/12/2020
	SUPPLIES						
593334 39838	UNIQUE MANAGEMENT PLACEMENTS 440-5511-531000	03/01/2020 CKIM	03/13/2020	35.80 35.80	0.00	Paid	Y 03/12/2020
	OUTSIDE SERVICES						
1018 39671	LAURA FRISCH PICK N SAVE/ USED PERSONAL CARD 440-5890-580600	02/15/2020 CKIM	03/13/2020	123.94 123.94	0.00	Paid	Y 03/12/2020
	DONATED FUND EXPENDITURES						
439165 39669	VERNON LIBRARY SUPPLIES TECH SERVICES SUPPLIES 440-5511-531100	02/12/2020 CKIM	03/13/2020	170.66 170.66	0.00	Paid	Y 03/12/2020
	SUPPLIES						

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Inv Num Inv Ref#	Vendor Description GL Distribution	Inv Date Entered By	Due Date	Inv Amt	Amt Due	Status	Jrnlized Post Date
AR106999 39672	OFFICE COPYING EQUIPMENT COPIES 1/12/20-2/11/20 440-5511-531000	02/13/2020 CKIM	03/13/2020	409.43	0.00	Paid	Y 03/12/2020
	OUTSIDE SERVICES			409.43			
B5867024 39663	BRODART BOOKS 440-5700-532800	02/12/2020 CKIM	03/13/2020	336.51	0.00	Paid	Y 03/12/2020
	BOOKS			336.51			
B5872341 39664	BRODART BOOKS 440-5700-532800	02/19/2020 CKIM	03/13/2020	93.57	0.00	Paid	Y 03/12/2020
	BOOKS			93.57			
IN-1200211963 39774	WUWM UNDERWRITING CULTURAL SHOWCASE ADVERTISING 440-5890-580600	02/23/2020 CKIM	03/13/2020	1,560.00	0.00	Paid	Y 03/12/2020
	DONATED FUND EXPENDITURES			1,560.00			
10362 39767	WAUKESHA ROOFING & SHEET METAL REPAIR ROOF 440-5511-539500	02/28/2020 CKIM	03/13/2020	630.56	0.00	Paid	Y 03/12/2020
	REPAIRS & MAINTENANCE			630.56			
FEB 39766	THE APPOINTED HOUSEWIFE RESTROOM CLEANING 440-5511-531000	02/29/2020 CKIM	03/13/2020	840.00	0.00	Paid	Y 03/12/2020
	OUTSIDE SERVICES			840.00			
INV00011349 39656	DEMCO SOFTWARE SIGN UP 4/1/20-3/31/21 440-5511-522000	02/15/2020 CKIM	03/13/2020	321.93	0.00	Paid	Y 03/13/2020
	CONTRACTUAL SERVICES			321.93			
FEBRUARY 39673	TERRY BUCHMANN DIY CLASS WEAVING 440-5511-533100	02/21/2020 CKIM	03/13/2020	199.44	0.00	Paid	Y 03/12/2020
	PROGRAMMING			199.44			
26361 39670	AMERICA AQUARIA FISH TANK MAINTENANCE 440-5511-531000	02/14/2020 CKIM	03/13/2020	85.00	0.00	Paid	Y 03/12/2020
	OUTSIDE SERVICES			85.00			
FEBRUARY 39772	MICHELLE MICHALIK OUTREACH 440-5511-533200	03/12/2020 CKIM	03/13/2020	31.75	0.00	Paid	Y 03/12/2020
	MILEAGE			31.75			

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INVOICE REGISTER REPORT FOR MUKWONAGO
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Inv Num Inv Ref#	Vendor Description GL Distribution	Inv Date Entered By	Due Date	Inv Amt	Amt Due	Status	Jrnlized Post Date
32020 39769	MUELLER AMY MARCH SHAKE RATTLE AND ROLL 440-5511-533100	03/12/2020 CKIM PROGRAMMING	03/13/2020	125.00 125.00	0.00	Paid	Y 03/12/2020
2020 39771	LIBRARY PETTY CASH PETTY CASH 440-5511-531500 440-5511-533100 440-5511-539500 440-5890-580600	03/12/2020 CKIM POSTAGE PROGRAMMING REPAIRS & MAINTENANCE DONATED FUND EXPENDITURES	03/13/2020	178.21 3.86 122.85 20.00 31.50	0.00	Paid	Y 03/12/2020
INV-US-46853 39765	ENVISIONWARE, INC RECEIPT PAPER 440-5511-531100	02/29/2020 CKIM SUPPLIES	03/13/2020	67.62 67.62	0.00	Paid	Y 03/12/2020
INV-US-46758 39773	ENVISIONWARE, INC MOBILE PRINT SERVICE 440-5511-522000	02/29/2020 CKIM CONTRACTUAL SERVICES	03/13/2020	725.00 725.00	0.00	Paid	Y 03/12/2020
1202 39770	GREAT EDUCATIONAL EXPERIENCES, LLC AFRICAN PYGMY HEDGHOG PROGRAM 440-5511-533100	02/06/2020 CKIM PROGRAMMING	03/13/2020	100.00 100.00	0.00	Paid	Y 03/12/2020
134659 39776	JANWAY COMPANY USA PLASTIC BAGS 440-5511-533300	02/27/2020 CKIM OUTREACH	03/13/2020	490.06 490.06	0.00	Paid	Y 03/12/2020
19300800-06 39665	ENGBERG ANDERSON INC SPACE STUDY 440-5890-580600	01/31/2020 CKIM DONATED FUND EXPENDITURES	03/13/2020	2,995.50 2,995.50	0.00	Paid	Y 03/12/2020
19300800-07 39861	ENGBERG ANDERSON INC SPACE STUDY 440-5890-580600	02/29/2020 CKIM DONATED FUND EXPENDITURES	03/13/2020	8,009.00 8,009.00	0.00	Paid	Y 03/10/2020
IMIL154386 39768	ALSCO MATS & DUSTERS 440-5511-531100	03/05/2020 CKIM SUPPLIES	03/13/2020	69.79 69.79	0.00	Paid	Y 03/12/2020

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INVOICE REGISTER REPORT FOR MUKWONAGO
EXP CHECK RUN DATES 03/13/2020 - 03/13/2020

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Inv Num Inv Ref#	Vendor Description GL Distribution	Inv Date Entered By	Due Date	Inv Amt	Amt Due	Status	Jrnlized Post Date
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144231							
39862	FIRE DETECTION GROUP	03/05/2020	03/13/2020	389.75	0.00	Paid	Y
	FIRE ALARM REPAIR	CKIM					03/10/2020
	440-5511-539500	REPAIRS & MAINTENANCE		389.75			

# of Invoices:	50	# Due:	0	Totals:	20,957.35	0.00
# of Credit Memos:	0	# Due:	0	Totals:	0.00	0.00
Net of Invoices and Credit Memos:					20,957.35	0.00

--- TOTALS BY GL DISTRIBUTION ---

440-5511-522000	CONTRACTUAL SERVICES	1,046.93
440-5511-531000	OUTSIDE SERVICES	1,370.23
440-5511-531100	SUPPLIES	1,347.25
440-5511-531500	POSTAGE	3.86
440-5511-533100	PROGRAMMING	547.29
440-5511-533200	MILEAGE	31.75
440-5511-533300	OUTREACH	490.06
440-5511-539500	REPAIRS & MAINTENANCE	1,040.31
440-5700-532800	BOOKS	2,359.73
440-5890-580600	DONATED FUND EXPENDITURES	12,719.94

--- TOTALS BY FUND ---

440 - LIBRARY FUND	20,957.35	0.00
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--- TOTALS BY DEPT/ACTIVITY ---

5511 - LIBRARY SERVICES	5,877.68	0.00
5700 - CAPITAL OUTLAY EXPENDITURES	2,359.73	0.00
5890 - USE OF DESIGNATED FUNDS	12,719.94	0.00

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JOURNALS POSTING REPORT

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Bank Code: GEN Pay By: EFT Transfer Check Run Dates 03/25/2020 - 03/25/2020

Post Date GL Number	Journal	Summ/Det	Ref # Description	DR Amount	CR Amount
03/25/2020	AP	D	70225 3252020	MONTHLY BILL 2/28-3/27/2020	
100-5120-522500			TELEPHONE	79.08	
100-5141-522500			TELEPHONE	87.03	
100-5142-522500			TELEPHONE	157.04	
100-5144-521900			PROFESSIONAL SERVICES	26.49	
100-5211-522500			TELEPHONE	838.64	
100-5241-522500			TELEPHONE	44.30	
100-5323-522500			TELEPHONE	79.79	
100-5512-522500			TELEPHONE	166.96	
150-5221-522500			TELEPHONE	797.40	
220-5140-522500			TELEPHONE	2.53	
410-5363-522500			Telephone	5.07	
440-5511-522500			TELEPHONE	586.61	
500-5344-522500			Telephone	2.53	
610-6920-692100			OFFICE SUPPLIES & EXPENSES	43.06	
620-8400-851000			OFFICE SUPPLIES & EXPENSES	43.06	
100-0000-211000			VOUCHERS PAYABLE		1,479.33
150-0000-211000			VOUCHERS PAYABLE		797.40
220-0000-211000			VOUCHERS PAYABLE		2.53
410-0000-211000			VOUCHERS PAYABLE		5.07
440-0000-211000			VOUCHERS PAYABLE		586.61
500-0000-211000			VOUCHERS PAYABLE		2.53
610-0000-211000			VOUCHERS PAYABLE		43.06
620-0000-211000			VOUCHERS PAYABLE		43.06
				<u>2,959.59</u>	<u>2,959.59</u>
				<u><u>2,959.59</u></u>	<u><u>2,959.59</u></u>

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INVOICE REGISTER REPORT FOR MUKWONAGO

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POST DATES 03/18/2020 - 03/18/2020

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Inv Num Inv Ref#	Vendor Description GL Distribution	Inv Date Entered By	Due Date	Inv Amt	Amt Due	Status	Jrnlized Post Date
20200305 40098	WE ENERGIES 6819-119-729 Hall 100-5160-522200	03/05/2020 rgallo 6819-119-729 Hall	04/03/2020	1,060.37 1,060.37	0.00	Paid	Y 03/18/2020
20200305 40099	WE ENERGIES 6819-119-729 Hall Gas 100-5160-522400	03/05/2020 rgallo 6819-119-729 Hall Gas	04/03/2020	307.32 307.32	0.00	Paid	Y 03/18/2020
20200305 40100	WE ENERGIES 0437-358-622 Flashers 100-5211-522200	03/05/2020 rgallo 0437-358-622 Flashers	04/03/2020	9.64 9.64	0.00	Paid	Y 03/18/2020
20200305 40101	WE ENERGIES 5000-725-767 PD Tower meter #05662 100-5211-522200	03/05/2020 rgallo 5000-725-767 PD Tower meter #05662	04/03/2020	47.44 47.44	0.00	Paid	Y 03/18/2020
20200305 40102	WE ENERGIES 8818-483-919 Tower Radio Bldg 100-5211-522200	03/05/2020 rgallo 8818-483-919 Tower Radio Bldg	04/03/2020	20.78 20.78	0.00	Paid	Y 03/18/2020
20200305 40103	WE ENERGIES 7410-051-890 Police 100-5211-522200	03/05/2020 rgallo 7410-051-890 Police	04/03/2020	1,586.11 1,586.11	0.00	Paid	Y 03/18/2020
20200305 40104	WE ENERGIES 8011-380-768 Police Garage 100-5211-522200	03/05/2020 rgallo 8011-380-768 Police Garage	04/03/2020	129.29 129.29	0.00	Paid	Y 03/18/2020
20200305 40105	WE ENERGIES 7879-450-073 Mukw Dam 100-5254-522200	03/05/2020 rgallo 7879-450-073 Mukw Dam	04/03/2020	22.47 22.47	0.00	Paid	Y 03/18/2020
20200305 40106	WE ENERGIES 3893-949-966 DPW Elec 100-5323-522200	03/05/2020 rgallo 3893-949-966 DPW Elec	04/03/2020	443.23 443.23	0.00	Paid	Y 03/18/2020
20200305 40107	WE ENERGIES 3608-115-165 DPW Gas 100-5323-522400	03/05/2020 rgallo 3608-115-165 DPW Gas	04/03/2020	733.89 733.89	0.00	Paid	Y 03/18/2020

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Inv Num Inv Ref#	Vendor Description GL Distribution	Inv Date Entered By	Due Date	Inv Amt	Amt Due	Status	Jrnlized Post Date
20200305 40108	WE ENERGIES 5001-021-384 Street Lights 100-5342-522200	03/05/2020 rgallo	04/03/2020	10,851.40 10,851.40	0.00	Paid	Y 03/18/2020
20200305 40109	WE ENERGIES 8808-380-714 Street Lights 100-5342-522200	03/05/2020 rgallo	04/03/2020	2,296.07 2,296.07	0.00	Paid	Y 03/18/2020
20200305 40110	WE ENERGIES 1438-746-449 Street Lights 100-5342-522200	03/05/2020 rgallo	04/03/2020	62.93 62.93	0.00	Paid	Y 03/18/2020
20200305 40111	WE ENERGIES 0647-211-550 School Crossing Lights 100-5342-522200	03/05/2020 rgallo	04/03/2020	15.97 15.97	0.00	Paid	Y 03/18/2020
20200305 40112	WE ENERGIES 0659-874-941 Museum 100-5512-522200	03/05/2020 rgallo	04/03/2020	260.89 260.89	0.00	Paid	Y 03/18/2020
20200305 40113	WE ENERGIES 2405-680-633 Andrews St. 100-5521-522200	03/05/2020 rgallo	04/03/2020	102.94 102.94	0.00	Paid	Y 03/18/2020
20200305 40114	WE ENERGIES 8046-699-403 Field Park 100-5521-522200	03/05/2020 rgallo	04/03/2020	118.51 118.51	0.00	Paid	Y 03/18/2020
20200305 40115	WE ENERGIES 8658-233-953 Fld Prk Baseball Lights 100-5521-522200	03/05/2020 rgallo	04/03/2020	22.11 22.11	0.00	Paid	Y 03/18/2020
20200305 40116	WE ENERGIES 6837-391-587 Parks 100-5521-522200	03/05/2020 rgallo	04/03/2020	23.54 23.54	0.00	Paid	Y 03/18/2020
20200305 40117	WE ENERGIES 5864-823-491 Concession Building 100-5521-522200	03/05/2020 rgallo	04/03/2020	75.04 75.04	0.00	Paid	Y 03/18/2020

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Inv Num Inv Ref#	Vendor Description GL Distribution	Inv Date Entered By	Due Date	Inv Amt	Amt Due	Status	Jrnlized Post Date
20200305 40118	WE ENERGIES 2054-702-968 Parks 100-5521-522200	03/05/2020 rgallo	04/03/2020	0.00 0.00	0.00	Paid	Y 03/18/2020
20200305 40119	WE ENERGIES 3277-621-318 F. Park Sump Pump 100-5521-522200	03/05/2020 rgallo	04/03/2020	20.64 20.64	0.00	Paid	Y 03/18/2020
20200305 40120	WE ENERGIES 1610-585-380 Parks 100-5521-522200	03/05/2020 rgallo	04/03/2020	16.24 16.24	0.00	Paid	Y 03/18/2020
20200305 40121	WE ENERGIES 3051-426-864 Miniwaukan Pavilion 100-5521-522200	03/05/2020 rgallo	04/03/2020	22.21 22.21	0.00	Paid	Y 03/18/2020
20200305 40122	WE ENERGIES 6881-040-700 Miniwauken Park 100-5521-522200	03/05/2020 rgallo	04/03/2020	20.34 20.34	0.00	Paid	Y 03/18/2020
20200305 40123	WE ENERGIES 7698-426-664 Fire 150-5221-522200	03/05/2020 rgallo	04/03/2020	1,927.98 1,927.98	0.00	Paid	Y 03/18/2020
20200305 40124	WE ENERGIES 9248-740-506 Library Elec 440-5511-522200	03/05/2020 rgallo	04/03/2020	1,947.26 1,947.26	0.00	Paid	Y 03/18/2020
20200305 40125	WE ENERGIES 4843-559-306 Library Gas 440-5511-522400	03/05/2020 rgallo	04/03/2020	895.18 895.18	0.00	Paid	Y 03/18/2020
20200305 40126	WE ENERGIES 9069-575-087 Well #3 Elec 610-6200-662200	03/05/2020 rgallo	04/03/2020	668.84 668.84	0.00	Paid	Y 03/18/2020
20200305 40127	WE ENERGIES 4400-457-029 Well #3 Gas 610-6200-662200	03/05/2020 rgallo	04/03/2020	39.36 39.36	0.00	Paid	Y 03/18/2020

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20200305 40128	WE ENERGIES 2409-366-321 Well #4 Elec 610-6200-662200	03/05/2020 rgallo	04/03/2020	1,342.22	0.00	Paid	Y 03/18/2020
	2409-366-321 Well #4 Elec			1,342.22			
20200305 40129	WE ENERGIES 0465-443-270 Well #4 Gas 610-6200-662200	03/05/2020 rgallo	04/03/2020	164.65	0.00	Paid	Y 03/18/2020
	0465-443-270 Well #4 Gas			164.65			
20200305 40130	WE ENERGIES 0801-988-732 Well #5 610-6200-662200	03/05/2020 rgallo	04/03/2020	2,843.72	0.00	Paid	Y 03/18/2020
	0801-988-732 Well #5			2,843.72			
20200305 40131	WE ENERGIES 4607-813-092 Well #6 610-6200-662200	03/05/2020 rgallo	04/03/2020	1,271.84	0.00	Paid	Y 03/18/2020
	4607-813-092 Well #6			1,271.84			
20200305 40132	WE ENERGIES 3234-559-591 Well #7 610-6200-662200	03/05/2020 rgallo	04/03/2020	1,736.49	0.00	Paid	Y 03/18/2020
	3234-559-591 Well #7			1,736.49			
20200305 40133	WE ENERGIES 9291-834-028 Greenwald 610-6200-662200	03/05/2020 rgallo	04/03/2020	341.10	0.00	Paid	Y 03/18/2020
	9291-834-028 Greenwald			341.10			
20200305 40134	WE ENERGIES 8016-691-668 Booster Station 610-6200-662200	03/05/2020 rgallo	04/03/2020	859.45	0.00	Paid	Y 03/18/2020
	8016-691-668 Booster Station			859.45			
20200305 40135	WE ENERGIES 3068-463-180 Tower 610-6200-662200	03/05/2020 rgallo	04/03/2020	32.04	0.00	Paid	Y 03/18/2020
	3068-463-180 Tower			32.04			
20200305 40136	WE ENERGIES 7843-678-578 Atkinson Pump 620-8020-821000	03/05/2020 rgallo	04/03/2020	543.59	0.00	Paid	Y 03/18/2020
	7843-678-578 Atkinson Pump			543.59			
20200305 40137	WE ENERGIES 8238-765-652 Fox River View 620-8020-821000	03/05/2020 rgallo	04/03/2020	197.68	0.00	Paid	Y 03/18/2020
	8238-765-652 Fox River View			197.68			

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20200305 40138	WE ENERGIES 6478-966-911 1224 Riverton 620-8020-821000	03/05/2020 rgallo	04/03/2020	129.81 129.81	0.00	Paid	Y 03/18/2020
20200305 40139	WE ENERGIES 8051-462-203 1240 N. Rochester 620-8020-821000	03/05/2020 rgallo	04/03/2020	135.88 135.88	0.00	Paid	Y 03/18/2020
20200305 40140	WE ENERGIES 7282-806-809 Holz Elec 620-8010-821100	03/05/2020 rgallo	04/03/2020	8,184.43 8,184.43	0.00	Paid	Y 03/18/2020
20200305 40141	WE ENERGIES 2404-776-809 Holz Gas 620-8010-821200	03/05/2020 rgallo	04/03/2020	331.52 331.52	0.00	Paid	Y 03/18/2020
20200305 40142	WE ENERGIES 9276-498-259 Digester Gas 620-8010-821200	03/05/2020 rgallo	04/03/2020	1,632.20 1,632.20	0.00	Paid	Y 03/18/2020
20200305 40143	WE ENERGIES 2008-500-143 Parks-200 S Rochester 100-5342-522200	03/05/2020 rgallo	04/03/2020	23.27 23.27	0.00	Paid	Y 03/18/2020
20200305 40144	WE ENERGIES 6482-485-554 police-CTH E N of 100-5211-522200	03/05/2020 rgallo	04/03/2020	64.23 64.23	0.00	Paid	Y 03/18/2020

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Inv Ref#	Description	Entered By					Post Date
	GL Distribution						
# of Invoices:	47	# Due:	0	Totals:	43,582.11	0.00	
# of Credit Memos:	0	# Due:	0	Totals:	0.00	0.00	
Net of Invoices and Credit Memos:					43,582.11	0.00	

--- TOTALS BY GL DISTRIBUTION ---

100-5160-522200	6819-119-729 Hall	1,060.37
100-5160-522400	6819-119-729 Hall Gas	307.32
100-5211-522200	0437-358-622 Flashers	1,857.49
100-5254-522200	7879-450-073 Mukw Dam	22.47
100-5323-522200	3893-949-966 DPW Elec	443.23
100-5323-522400	3608-115-165 DPW Gas	733.89
100-5342-522200	5001-021-384 Street Lights	13,249.64
100-5512-522200	0659-874-941 Museum	260.89
100-5521-522200	2405-680-633 Andrews St.	421.57
150-5221-522200	7698-426-664 Fire	1,927.98
440-5511-522200	9248-740-506 Library Elec	1,947.26
440-5511-522400	4843-559-306 Library Gas	895.18
610-6200-662200	9069-575-087 Well #3 Elec	9,299.71
620-8010-821100	7282-806-809 Holz Elec	8,184.43
620-8010-821200	2404-776-809 Holz Gas	1,963.72
620-8020-821000	7843-678-578 Atkinson Pump	1,006.96

--- TOTALS BY FUND ---

100 - GENERAL FUND	18,356.87	0.00
150 - FIRE/AMBULANCE FUND	1,927.98	0.00
440 - LIBRARY FUND	2,842.44	0.00
610 - WATER UTILITY FUND	9,299.71	0.00
620 - SEWER UTILITY FUND	11,155.11	0.00

--- TOTALS BY DEPT/ACTIVITY ---

5160 - VILLAGE HALL	1,367.69	0.00
5211 - POLICE ADMINISTRATION	1,857.49	0.00
5221 - FIRE ADMINISTRATION	1,927.98	0.00
5254 - DAMS	22.47	0.00
5323 - GARAGE	1,177.12	0.00
5342 - STREET LIGHTING	13,249.64	0.00
5511 - LIBRARY SERVICES	2,842.44	0.00
5512 - MUSEUM	260.89	0.00
5521 - PARKS	421.57	0.00
6200 - PUMPING OPERATIONS	9,299.71	0.00
8010 - WWTP-TREATMENT/DISPOSAL/GP	10,148.15	0.00
8020 - LIFT STATIONS/PUMPING EQUIP	1,006.96	0.00

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BITTNER RONALD							
39910	ALLPARTITIONS	02/19/2020	03/26/2020	2,655.00	0.00	Paid	Y
	BATHROOM PARTITION WALLS	rgallo					03/16/2020
	100-5521-531100	SUPPLIES		2,655.00			
BITTNER RONALD							
39911	WHOVA, INC.	02/20/2020	03/26/2020	300.00	0.00	Paid	Y
	RON APWA SPRING CONFRENCE	rgallo					03/16/2020
	410-5363-533500	Training & Travel		50.00			
	100-5323-533500	TRAINING & TRAVEL		150.00			
	500-5344-533500	Training & Travel		100.00			
BITTNER RONALD							
39912	HEIN ELECTRIC SUPPLY CO	03/04/2020	03/26/2020	730.51	0.00	Paid	Y
	VILLAGE HALL LED CONVERSION	rgallo					03/16/2020
	100-5160-539500	REPAIRS & MAINTENANCE		730.51			
BITTNER RONALD							
39913	ZORO TOOLS INC	03/05/2020	03/26/2020	1,168.18	0.00	Paid	Y
	VH AND PARK BUILDING SUPPLIES	rgallo					03/16/2020
	100-5160-539500	REPAIRS & MAINTENANCE		273.32			
	100-5521-531100	SUPPLIES		894.86			
BROWN DAVID							
39914	DMA EPAY SERVICE FEE	02/17/2020	03/26/2020	5.13	0.00	Paid	Y
	WWTF FERROUS TANK REGISTRATION	rgallo					03/16/2020
	620-8010-824000	PHOSPHOROUS REMOVAL CHEMICALS		5.13			
BROWN DAVID							
39915	DMA EPAY EPCRA FEES	02/17/2020	03/26/2020	205.00	0.00	Paid	Y
	WWTF FERROUS TANK REGISTRATION FEE	rgallo					03/16/2020
	620-8010-824000	PHOSPHOROUS REMOVAL CHEMICALS		205.00			
BROWN DAVID							
39916	MACHINE SHED PEWAUKEE	03/10/2020	03/26/2020	51.46	0.00	Paid	Y
	WWTF LUNCH FOR ADAPTIVE MANAGEMENT	rgallo					03/16/2020
	620-8010-824000	PHOSPHOROUS REMOVAL CHEMICALS		51.46			
CASTLE WAYNE A							
39917	OPC*WI RURAL WTR CONF	02/17/2020	03/26/2020	250.00	0.00	Paid	Y
	WATER WRWA ANNUAL CONFERENCE CODY	rgallo					03/16/2020
	610-6920-693000	MISC GENERAL EXPENSES		250.00			
CASTLE WAYNE A							
39918	OPC*WI RURAL WTR CONF	02/17/2020	03/26/2020	250.00	0.00	Paid	Y
	WATER WRWA ANNUAL CONFERENCE WAYNE	rgallo					03/16/2020
	610-6920-693000	MISC GENERAL EXPENSES		250.00			

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CASTLE WAYNE A 39919	OPC MSC*SERVICE FEE 024 WATER WRA ANNUAL CONFERENCE CODY 610-6920-693000	02/17/2020 rgallo	03/26/2020	6.38 6.38	0.00	Paid	Y 03/16/2020
CASTLE WAYNE A 39920	OPC MSC*SERVICE FEE 024 WRWA ANNUAL CONFERENCE WAYNE 610-6920-693000	02/17/2020 rgallo	03/26/2020	6.38 6.38	0.00	Paid	Y 03/16/2020
CASTLE WAYNE A 39921	WWOA WWOA CONFERENCE WAYNE 620-8400-854100	02/27/2020 rgallo	03/26/2020	25.88 25.88	0.00	Paid	Y 03/16/2020
CASTLE WAYNE A 39922	MICROSOFT*OFFICE 365 HOME UTILTIY SOFTWARE MAINT. 620-8400-851000	03/13/2020 rgallo	03/26/2020	105.09 105.09	0.00	Paid	Y 03/16/2020
DELIKAT CODY 39923	AMZN MKTP US*OK34H9UP3 WATER PLAN MAP RACK 610-6920-692100	03/03/2020 rgallo	03/26/2020	171.60 171.60	0.00	Paid	Y 03/16/2020
DELIKAT CODY 39924	THE HOME DEPOT 4921 WATER SERVICE BREAKS 610-6452-665200	03/12/2020 rgallo	03/26/2020	89.98 89.98	0.00	Paid	Y 03/16/2020
DOHERTY DIANA 39925	WISCONSIN MUNICIPAL CLER WCMA ANNUAL RENEWAL 100-5141-532400	02/26/2020 rgallo	03/26/2020	65.00 65.00	0.00	Paid	Y 03/16/2020
DOHERTY DIANA 39926	MICROSOFT*OFFICE 365 HOME ANNUAL SUBSCRIPTION 100-5141-531100	03/07/2020 rgallo	03/26/2020	105.09 105.09	0.00	Paid	Y 03/16/2020
DYKSTRA DIANA 39927	WISCONSIN MUNICIPAL CLER WMCA MEMBERSHIP 100-5142-532400	02/24/2020 rgallo	03/26/2020	65.00 65.00	0.00	Paid	Y 03/16/2020
DYKSTRA DIANA 39928	AMZN MKTP US*393DP9OI3 AM STYLUS PENS BADGER BOOKS 100-5144-531100	03/10/2020 rgallo	03/26/2020	13.98 13.98	0.00	Paid	Y 03/16/2020

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DYKSTRA DIANA 39929	AMAZON.COM*6D0WE1FS3 AMZN FELT BALLOT MARKING PENS 100-5144-531100	03/13/2020 rgallo	03/26/2020	44.84 44.84	0.00	Paid	Y 03/16/2020
FRISCH LAURA L 39930	FACEBK *Y3NUJP6Y82 SPECIAL EVENT AD 440-5890-580600	02/19/2020 rgallo	03/26/2020	213.24 213.24	0.00	Paid	Y 03/16/2020
FRISCH LAURA L 39931	STAPLS0181651791000001 INK 440-5511-531100	02/20/2020 rgallo	03/26/2020	29.98 29.98	0.00	Paid	Y 03/16/2020
FRISCH LAURA L 39932	WAL-MART #1571 PROGRAM SUPPLIES 440-5511-533100	03/04/2020 rgallo	03/26/2020	191.90 191.90	0.00	Paid	Y 03/16/2020
FRISCH LAURA L 39933	STAPLS0182092489000001 COPY PAPER 440-5511-531100	03/05/2020 rgallo	03/26/2020	38.18 38.18	0.00	Paid	Y 03/16/2020
FRISCH LAURA L 39934	AMZN MKTP US*YU0AI5WL3 PROGRAM SUPPLIES 440-5511-533100	03/08/2020 rgallo	03/26/2020	39.98 39.98	0.00	Paid	Y 03/16/2020
FRISCH LAURA L 39935	AMAZON.COM*XR8CN8753 BABY STATION LINERS 440-5511-531100	03/08/2020 rgallo	03/26/2020	34.42 34.42	0.00	Paid	Y 03/16/2020
FRISCH LAURA L 39936	AMZN MKTP US*3V1Y54EX3 CABLES 440-5511-531100	03/08/2020 rgallo	03/26/2020	28.07 28.07	0.00	Paid	Y 03/16/2020
FRISCH LAURA L 39937	MAILCHIMP *MONTHLY MONTHLY NEWSLETTER 440-5511-534000	03/08/2020 rgallo	03/26/2020	59.99 59.99	0.00	Paid	Y 03/16/2020
FRISCH LAURA L 39938	PICK N SAVE #384 PROGRAM SUPPLIES 440-5511-531400	03/10/2020 rgallo	03/26/2020	5.98 5.98	0.00	Paid	Y 03/16/2020

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FRISCH LAURA L 39939	GARDEN PARTY FLORIST FLOWERS FOR PROGRAM 440-5511-531400	03/10/2020 rgallo	03/26/2020	29.00	0.00	Paid	Y 03/16/2020
	META SPACE EQUIPMENT & SUPPLIE			29.00			
GOURDOUX LINDA 39940	KWIK TRIP 28200002824 COFFEE @ ELECTIONS 100-5144-531100	02/18/2020 rgallo	03/26/2020	5.99	0.00	Paid	Y 03/16/2020
	COFFEE @ELECTIONS			5.99			
ISELY MARY JO 39941	WALMART.COM 8009666546 DVD 440-5700-532900	02/18/2020 rgallo	03/26/2020	59.00	0.00	Paid	Y 03/16/2020
	AV MATERIAL			59.00			
ISELY MARY JO 39942	AMAZON.COM*K99U84UZ3 DVD 440-5700-532900	02/18/2020 rgallo	03/26/2020	29.98	0.00	Paid	Y 03/16/2020
	AV MATERIAL			29.98			
ISELY MARY JO 39943	AMAZON.COM*9E2AY2C63 AMZN DVD 440-5700-532900	02/19/2020 rgallo	03/26/2020	205.81	0.00	Paid	Y 03/16/2020
	AV MATERIAL			205.81			
ISELY MARY JO 39944	WM SUPERCENTER #1571 DVD 440-5700-532900	02/20/2020 rgallo	03/26/2020	197.56	0.00	Paid	Y 03/16/2020
	AV MATERIAL			197.56			
ISELY MARY JO 39945	AMZN MKTP US*SP2ET3P43 HOTSPOT BATTERY 440-5511-533000	02/24/2020 rgallo	03/26/2020	65.94	0.00	Paid	Y 03/16/2020
	THINGERY PURCHASES			65.94			
ISELY MARY JO 39946	WAL-MART #1571 GENERAL SUPPLIES 440-5511-531100	02/25/2020 rgallo	03/26/2020	30.21	0.00	Paid	Y 03/16/2020
	SUPPLIES			30.21			
ISELY MARY JO 39947	WAL-MART #1571 PROGRAM SUPPLIES 440-5511-533100	02/25/2020 rgallo	03/26/2020	34.16	0.00	Paid	Y 03/16/2020
	PROGRAMMING			34.16			
ISELY MARY JO 39948	WAL-MART #1571 DVD 440-5700-532900	02/25/2020 rgallo	03/26/2020	89.80	0.00	Paid	Y 03/16/2020
	AV MATERIAL			89.80			

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ISELY MARY JO 39949	PICK N SAVE #384 PROGRAM SUPPLIES 440-5511-533100	02/26/2020 rgallo	03/26/2020	107.77 107.77	0.00	Paid	Y 03/16/2020
ISELY MARY JO 39950	AMAZON.COM*1G6QI3CZ3 AMZN DVD 440-5700-532900	02/27/2020 rgallo	03/26/2020	9.82 9.82	0.00	Paid	Y 03/16/2020
ISELY MARY JO 39951	NETFLIX.COM STREAMING SERVICE MARCH 440-5511-534000	03/01/2020 rgallo	03/26/2020	15.99 15.99	0.00	Paid	Y 03/16/2020
ISELY MARY JO 39952	AMZN MKTP US*QO1AQ30J3 BOOKS 440-5700-532800	03/06/2020 rgallo	03/26/2020	21.13 21.13	0.00	Paid	Y 03/16/2020
ISELY MARY JO 39954	ACORN TV MONTHLY MONTHLY CHARGE 440-5511-534000	03/08/2020 rgallo	03/26/2020	6.29 6.29	0.00	Paid	Y 03/16/2020
ISELY MARY JO 39955	AMZN MKTP US*316LW6L93 DVD 440-5700-532900	03/08/2020 rgallo	03/26/2020	270.67 270.67	0.00	Paid	Y 03/16/2020
ISELY MARY JO 39956	DISNEYPLUS SUBSCRIPTION 440-5511-533000	03/10/2020 rgallo	03/26/2020	73.84 73.84	0.00	Paid	Y 03/16/2020
ISELY MARY JO 39957	AMAZON.COM*UO03D48G3 AMZN BOOK 440-5700-532800	03/11/2020 rgallo	03/26/2020	28.95 28.95	0.00	Paid	Y 03/16/2020
ISELY MARY JO 39958	ROKU FOR DISNEY ELECTRONI DISNEY PLUS 440-5511-533000	03/11/2020 rgallo	03/26/2020	73.56 73.56	0.00	Paid	Y 03/16/2020
KINDER MATTHEW 39959	WM SUPERCENTER #1571 WATER OFFICE SUPPLIES 610-6920-692100	02/19/2020 rgallo	03/26/2020	12.90 12.90	0.00	Paid	Y 03/16/2020

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KOHOUT BENJAMIN							
39960	KWIK TRIP 28200002824	02/27/2020	03/26/2020	7.96	0.00	Paid	Y
	ICE FOR DDC OPEN HOUSE	rgallo					03/16/2020
	100-5670-521500	DSPSC EXPENSES		7.96			
KOHOUT BENJAMIN							
39961	WAL-MART #1571	03/11/2020	03/26/2020	63.40	0.00	Paid	Y
	OFFICE SUPPLIES	rgallo					03/16/2020
	100-5632-531100	SUPPLIES		63.40			
MILLER KENNETH							
39962	SAFELITE AUTOGLASS	02/21/2020	03/26/2020	105.06	0.00	Paid	Y
	WINDSHIELD REPAIR 2019 SERVICE TRUCK	rgallo					03/16/2020
	620-8030-828000	TRANSPORTATION EXPENSE		105.06			
MILLER KENNETH							
39963	HIGHLAND TANK & MANUF	02/24/2020	03/26/2020	351.00	0.00	Paid	Y
	WWTF GENERATOR TANK MEASURE STICK	rgallo					03/16/2020
	620-8010-821300	EMERGENCY GENERATOR-FUEL/MAINT		351.00			
MILLER KENNETH							
39964	SAFELITE AUTOGLASS	02/26/2020	03/26/2020	640.49	0.00	Paid	Y
	WWTF WINDSHIELDREPLACEMENT 2020	rgallo					03/16/2020
	620-8030-828000	TRANSPORTATION EXPENSE		640.49			
MILLER KENNETH							
39965	ROGANS SHOES INC MILWAUKE	03/03/2020	03/26/2020	137.28	0.00	Paid	Y
	WELL 5 SHOES FOR WORKING ON METAL	rgallo					03/16/2020
	610-6920-693000	MISC GENERAL EXPENSES		137.28			
PETERSON RANDY							
39966	GETZ FIRE EQUIPMENT CO	03/06/2020	03/26/2020	281.35	0.00	Paid	Y
	DPW FIRST AID KITS	rgallo					03/16/2020
	100-5323-534800	SAFETY SUPPLIES		281.35			
PETERSON RANDY							
39967	ACOUSTECH SUPPLY	03/09/2020	03/26/2020	320.98	0.00	Paid	Y
	PACKS OF CEILING TILES TO REPLACE	rgallo					03/16/2020
	100-5211-539400	BLDG REPAIRS & MAINTENANCE		320.98			
PETERSON RANDY							
39968	HEIN ELECTRIC SUPPLY CO	03/11/2020	03/26/2020	141.43	0.00	Paid	Y
	LED LIGHT FOR OUTSIDE SOUTH GARAGE	rgallo					03/16/2020
	100-5211-539400	BLDG REPAIRS & MAINTENANCE		141.43			
PETERSON RANDY							
39969	HEIN ELECTRIC SUPPLY CO	03/11/2020	03/26/2020	84.46	0.00	Paid	Y
	VH LED CONVERSION	rgallo					03/16/2020
	100-5160-539500	REPAIRS & MAINTENANCE		84.46			

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PETERSON RANDY 39970	P A T DEPT OF AGRONOMY DUSTIN, PESTICIDE APPLICATORS 100-5323-533500	03/12/2020 rgallo	03/26/2020	49.58 49.58	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL						
SCHMIDT KEVIN B 39971	AMZN MKTP US*8W9L69QB3 SUPPLIES 100-5211-531100	02/17/2020 rgallo	03/26/2020	34.46 34.46	0.00	Paid	Y 03/16/2020
	SUPPLIES						
SCHMIDT KEVIN B 39972	STAPLS0181614867000001 RECEIPT BOOKS 100-5211-531100	02/18/2020 rgallo	03/26/2020	39.30 39.30	0.00	Paid	Y 03/16/2020
	SUPPLIES						
SCHMIDT KEVIN B 39973	STAPLS0181882384000001 TONER 100-5120-531100	02/27/2020 rgallo	03/26/2020	114.89 114.89	0.00	Paid	Y 03/16/2020
	SUPPLIES						
SCHMIDT KEVIN B 39974	STAPLS0182357556000001 HAND PAPER TOWELS AND KLEENEX 100-5211-531100	03/12/2020 rgallo	03/26/2020	120.57 120.57	0.00	Paid	Y 03/16/2020
	SUPPLIES						
SCHMIDT KEVIN B 39975	STAPLS0182369329000001 HEAVY DUTY BINDER FOR TIME CARDS 100-5211-531100	03/12/2020 rgallo	03/26/2020	20.41 20.41	0.00	Paid	Y 03/16/2020
	SUPPLIES						
SCHMIDT KEVIN B 39976	STAPLS0182369329000002 HEAVY DUTY BINDERS FOR TIME CARDS 100-5211-531100	03/12/2020 rgallo	03/26/2020	33.38 33.38	0.00	Paid	Y 03/16/2020
	SUPPLIES						
SCHMIDT KEVIN B 39977	UNIFI EQUIPMENT FINANCE BUY OFF OF COPY MACHINE LEASE WITH 100-5211-539500	03/12/2020 rgallo	03/26/2020	258.74 258.74	0.00	Paid	Y 03/16/2020
	REPAIRS & MAINTENANCE						
STIEN JEFFREY R 39979	HAIX PREUSS CLOTHING ALLOWANCE 150-5221-534600	02/18/2020 rgallo	03/26/2020	314.95 314.95	0.00	Paid	Y 03/16/2020
	CLOTHING ALLOWANCE						
STIEN JEFFREY R 39980	WM SUPERCENTER #1571 EMS CLEANING SUPPLIES 150-5231-531100	03/05/2020 rgallo	03/26/2020	16.62 16.62	0.00	Paid	Y 03/16/2020
	SUPPLIES						

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STIEN JEFFREY R 39981	WM SUPERCENTER #1571 STAFF PICS AND FIRE SUPPLIES 150-5222-531100 SUPPLIES	03/12/2020 rgallo	03/26/2020	19.28 19.28	0.00	Paid	Y 03/16/2020
SURA MATTHEW J 39982	AMAZON.COM*Z759D47G3 AMZN GARMIN REPLACEMENT FOR 3488 150-5231-531100 SUPPLIES	02/21/2020 rgallo	03/26/2020	99.50 99.50	0.00	Paid	Y 03/16/2020
SURA MATTHEW J 39983	SHERWIN WILLIAMS 703278 PAINT FOR STATION 150-5221-539500 REPAIRS & MAINTENANCE	03/03/2020 rgallo	03/26/2020	150.09 150.09	0.00	Paid	Y 03/16/2020
SURA MATTHEW J 39984	THE HOME DEPOT #4921 FIRE SUPPLIES 150-5222-531100 SUPPLIES	03/03/2020 rgallo	03/26/2020	102.86 102.86	0.00	Paid	Y 03/16/2020
WEGNER ANDREW P 39985	TRACTOR SUPPLY #339 OIL DRY 150-5222-531100 SUPPLIES	02/29/2020 rgallo	03/26/2020	65.88 65.88	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 39995	EAST TROY BREWERY POTENTIAL BAKERY MEETING 100-5670-533500 TRAINING & TRAVEL	02/17/2020 rgallo	03/26/2020	22.99 22.99	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 39996	TAYLOR S PEOPLES PARK MTG WITH BLUM AND WINCHOWKY 100-5141-533500 TRAINING & TRAVEL	02/17/2020 rgallo	03/26/2020	69.03 69.03	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 39997	EAST TROY HOUSE MEETING WITH DEREK - WALWORTH COUNTY 100-5670-533500 TRAINING & TRAVEL	02/18/2020 rgallo	03/26/2020	22.00 22.00	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 39998	KWIK TRIP 28200002824 WATER FOR CONSULTANT TOUR OF VILLAGE 100-5670-533500 TRAINING & TRAVEL	02/19/2020 rgallo	03/26/2020	2.38 2.38	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 39999	SQ *ESPRESSO LOVE COFFEE JOHN MCGIVERN SHOW 100-5141-533500 TRAINING & TRAVEL	02/20/2020 rgallo	03/26/2020	5.50 5.50	0.00	Paid	Y 03/16/2020

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WEIDL JOHN S 40000	NEXT DOOR PUB WISCONSIN AUTOMATION MEETING 100-5670-533500	02/20/2020 rgallo	03/26/2020	45.58 45.58	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 40001	CERTIF A GIFT RETIREMENT GIFT 100-5141-539800	02/21/2020 rgallo	03/26/2020	683.81 683.81	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 40002	IEDC ONLINE DOWNTOWN WEBINAR 100-5670-533500	02/26/2020 rgallo	03/26/2020	99.00 99.00	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 40003	WAUKESHA COUNTY BUSINESS WAUKESHA COUNTY BUSINESS ALLIANCE 100-5670-533500	03/02/2020 rgallo	03/26/2020	100.00 100.00	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 40004	WM SUPERCENTER #1571 WATER AND SNACKS FOR TRANING 100-5141-533500	03/05/2020 rgallo	03/26/2020	51.29 51.29	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 40005	CROSSROADS PIZZA AND STRATEGIC PLANNING FOOD 100-5141-533500	03/05/2020 rgallo	03/26/2020	117.18 117.18	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 40006	DAVID ALAN ALAN S SMOKEHO STRATEGIC PLANNING FOOD 100-5141-533500	03/10/2020 rgallo	03/26/2020	273.62 273.62	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 40007	EAST TROY BREWERY WALWORTH COUNTY ADMINS - COVID 19 100-5141-533500	03/13/2020 rgallo	03/26/2020	50.09 50.09	0.00	Paid	Y 03/16/2020
WEIDL JOHN S 40008	DNH*GODADDY.COM WEBSITE RENEWALS 100-5670-531100	03/14/2020 rgallo	03/26/2020	118.02 118.02	0.00	Paid	Y 03/16/2020
ZIMMERMANN ANGE 40009	AMZN MKTP US*ME8F81IO1 AM PROGRAM SUPPLIES 440-5511-531400	02/23/2020 rgallo	03/26/2020	36.92 36.92	0.00	Paid	Y 03/16/2020

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ZIMMERMANN ANGE							
40010	AMZN MKTP US*KDOCP8HD3 KNIFE SET 440-5511-531400	02/25/2020 rgallo	03/26/2020	18.97	0.00	Paid	Y 03/16/2020
	META SPACE EQUIPMENT & SUPPLIE			18.97			
ZIMMERMANN ANGE							
40011	SOUTHWES 5262176089188 FLIGHT TO PLA CONFERENCE 440-5511-533500	02/26/2020 rgallo	03/26/2020	136.00	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			136.00			
ZIMMERMANN ANGE							
40012	RENAISSANCE NASHVILLE F PLA CONFERENCE MEAL 440-5511-533500	02/26/2020 rgallo	03/26/2020	15.14	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			15.14			
ZIMMERMANN ANGE							
40013	TST* NASHHOUSE PLA CONFERENCE MEAL 440-5511-533500	02/28/2020 rgallo	03/26/2020	21.88	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			21.88			
ZIMMERMANN ANGE							
40014	TST* PANCHE AND LEFTY S C PLA CONFERENCE MEAL 440-5511-533500	02/28/2020 rgallo	03/26/2020	15.06	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			15.06			
ZIMMERMANN ANGE							
40015	ROCK BOTTOM NASHVILLE PLA CONFERENCE MEAL 440-5511-533500	02/28/2020 rgallo	03/26/2020	30.35	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			30.35			
ZIMMERMANN ANGE							
40016	RENAISSANCE NASHVILLE F PLA CONFERENCE MEAL 440-5511-533500	02/28/2020 rgallo	03/26/2020	15.14	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			15.14			
ZIMMERMANN ANGE							
40017	SQ *KOFI KUTTEN TRANSPORT CONFERENCE TRANSPORTATION 440-5511-533500	02/29/2020 rgallo	03/26/2020	25.00	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			25.00			
ZIMMERMANN ANGE							
40018	RENAISSANCE HOTELS NAS HOTEL PLA CONFERENCE 440-5511-533500	03/01/2020 rgallo	03/26/2020	1,411.65	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			1,411.65			
ZIMMERMANN ANGE							
40019	ADOBE IL CREATIVE CLD ILLUSTRATOR 440-5511-534000	03/09/2020 rgallo	03/26/2020	22.06	0.00	Paid	Y 03/16/2020
	DIGITAL MATERIALS			22.06			

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ZIMMERMANN ANGE							
40020	ADOBE CREATIVE CLOUD CREATIVE CLOUD 3/10-4/9 440-5511-534000	03/11/2020 rgallo	03/26/2020	84.07	0.00	Paid	Y 03/16/2020
	DIGITAL MATERIALS			84.07			
ZIMMERMANN ANGE							
40021	WISCONSIN LIBRARY ASSOCIA WAPL CONFERENCE 440-5511-533500	03/11/2020 rgallo	03/26/2020	130.00	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			130.00			
ZIMMERMANN ANGE							
40022	MOBILE BEACON HOTSPOT RENEWAL 440-5511-534000	03/12/2020 rgallo	03/26/2020	120.00	0.00	Paid	Y 03/16/2020
	DIGITAL MATERIALS			120.00			
ZIMMERMANN ANGE							
40023	AMZN MKTP US*IQ6UY1NU3 HUMMINGBIRD KIT 440-5511-531400	03/13/2020 rgallo	03/26/2020	227.12	0.00	Paid	Y 03/16/2020
	META SPACE EQUIPMENT & SUPPLIE			227.12			
ISELY MARY JO							
40095	AMZN MKTP US REFUND FOR AMAZON BOOK ORDER 440-5700-532900	03/08/2020 rgallo	03/26/2020	(0.10)	0.00	Paid	Y 03/16/2020
	AV MATERIAL			(0.10)			
STIEN JEFFREY R							
40096	AMZN MKTP US REFUND CLOTHING AMAZON 150-5221-534600	02/17/2020 rgallo	03/26/2020	(6.06)	0.00	Paid	Y 03/16/2020
	CLOTHING ALLOWANCE			(6.06)			
WEGNER LEE							
40097	UWEX REGISTRATION REFUND UWEX REGISTRATION 100-5323-533500	02/17/2020 rgallo	03/26/2020	(1,795.00)	0.00	Paid	Y 03/16/2020
	TRAINING & TRAVEL			(1,795.00)			

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Inv Num	Vendor	Inv Date	Due Date	Inv Amt	Amt Due	Status	Jrnlized
Inv Ref#	Description	Entered By					Post Date
	GL Distribution						

# of Invoices:	103	# Due:	0	Totals:	15,868.38	0.00
# of Credit Memos:	3	# Due:	0	Totals:	(1,801.16)	0.00
Net of Invoices and Credit Memos:					14,067.22	0.00

--- TOTALS BY GL DISTRIBUTION ---

100-5120-531100	SUPPLIES	114.89
100-5141-531100	SUPPLIES	105.09
100-5141-532400	MEMBERSHIP DUES	65.00
100-5141-533500	TRAINING & TRAVEL	566.71
100-5141-539800	EMPLOYEE RECOGNITION	683.81
100-5142-532400	WMCA MEMBERSHIP	65.00
100-5144-531100	STYLUS PENS BADGER BOOKS	64.81
100-5160-539500	REPAIRS & MAINTENANCE	1,088.29
100-5211-531100	SUPPLIES	248.12
100-5211-539400	BLDG REPAIRS & MAINTENANCE	462.41
100-5211-539500	REPAIRS & MAINTENANCE	258.74
100-5323-533500	TRAINING & TRAVEL	(1,595.42)
100-5323-534800	SAFETY SUPPLIES	281.35
100-5521-531100	SUPPLIES	3,549.86
100-5632-531100	SUPPLIES	63.40
100-5670-521500	DSPSC EXPENSES	7.96
100-5670-531100	SUPPLIES	118.02
100-5670-533500	TRAINING & TRAVEL	291.95
150-5221-534600	CLOTHING ALLOWANCE	308.89
150-5221-539500	REPAIRS & MAINTENANCE	150.09
150-5222-531100	SUPPLIES	188.02
150-5231-531100	SUPPLIES	116.12
410-5363-533500	Training & Travel	50.00
440-5511-531100	SUPPLIES	160.86
440-5511-531400	META SPACE EQUIPMENT & SUPPLIE	317.99
440-5511-533000	THINGERY PURCHASES	213.34
440-5511-533100	PROGRAMMING	373.81
440-5511-533500	TRAINING & TRAVEL	1,800.22
440-5511-534000	DIGITAL MATERIALS	308.40
440-5700-532800	BOOKS	50.08
440-5700-532900	AV MATERIAL	862.54
440-5890-580600	DONATED FUND EXPENDITURES	213.24
500-5344-533500	Training & Travel	100.00
610-6452-665200	MAINTENANCE-SERVICES	89.98
610-6920-692100	OFFICE SUPPLIES & EXPENSES	184.50
610-6920-693000	MISC GENERAL EXPENSES	650.04
620-8010-821300	EMERGENCY GENERATOR-FUEL/MAINT	351.00
620-8010-824000	PHOSPHOROUS REMOVAL CHEMICALS	261.59
620-8030-828000	TRANSPORTATION EXPENSE	745.55
620-8400-851000	OFFICE SUPPLIES & EXPENSES	105.09
620-8400-854100	EDUCATIONAL/TRAINING EXPENSES	25.88

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--- TOTALS BY FUND ---							
	100 - GENERAL FUND			6,439.99	0.00		
	150 - FIRE/AMBULANCE FUND			763.12	0.00		
	410 - RECYCLING FUND			50.00	0.00		
	440 - LIBRARY FUND			4,300.48	0.00		
	500 - STORM WATER UTILITY			100.00	0.00		
	610 - WATER UTILITY FUND			924.52	0.00		
	620 - SEWER UTILITY FUND			1,489.11	0.00		
--- TOTALS BY DEPT/ACTIVITY ---							
	5120 - MUNICIPAL COURT			114.89	0.00		
	5141 - VILLAGE ADMINISTRATION/FINA			1,420.61	0.00		
	5142 - CLERK-TREASURER			65.00	0.00		
	5144 - ELECTIONS			64.81	0.00		
	5160 - VILLAGE HALL			1,088.29	0.00		
	5211 - POLICE ADMINISTRATION			969.27	0.00		
	5221 - FIRE ADMINISTRATION			458.98	0.00		
	5222 - FIRE SUPPRESSION			188.02	0.00		
	5231 - AMBULANCE			116.12	0.00		
	5323 - GARAGE			(1,314.07)	0.00		
	5344 - STORM SEWER			100.00	0.00		
	5363 - RECYCLING			50.00	0.00		
	5511 - LIBRARY SERVICES			3,174.62	0.00		
	5521 - PARKS			3,549.86	0.00		
	5632 - PLANNING DEPARTMENT			63.40	0.00		
	5670 - ECONOMIC DEVELOPMENT			417.93	0.00		
	5700 - CAPITAL OUTLAY EXPENDITURES			912.62	0.00		
	5890 - USE OF DESIGNATED FUNDS			213.24	0.00		
	6452 - T&D-SERVICES MAINTENANCE			89.98	0.00		
	6920 - ADMINISTRATIVE & GENERAL EX			834.54	0.00		
	8010 - WWTP-TREATMENT/DISPOSAL/GP			612.59	0.00		
	8030 - WASTEWATER COLLECTION SYSTE			745.55	0.00		
	8400 - ADMINISTRATIVE & GENERAL			130.97	0.00		
--- TOTALS BY PAYMENT CARD ACCOUNT ---							
	0366			170.09			
	0960			2,309.36			
	1051			12.90			
	1275			261.59			
	2365			1,320.38			
	2380			1,660.49			
	2544			123.82			
	3167			65.88			

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Inv Ref#	Description	Entered By					Post Date
GL Distribution							
--- TOTALS BY PAYMENT CARD ACCOUNT ---							
4325				(1,795.00)			
4366				261.58			
4746				352.45			
6347				5.99			
6370				344.79			
6639				643.73			
7940				670.74			
8371				71.36			
8378				621.75			
8389				1,233.83			
9625				877.80			
9708				4,853.69			

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CHECK DISBURSEMENT REPORT FOR MUKWONAGO
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Check Date	Bank	Check #	Payee	Description	GL #	Amount
03/05/2020	GEN	127 (E)	INVOICE CLOUD	INVOICE CLOUD CC FEES INV # 1743-	100-5142-539900	27.59
		127 (E)		INVOICE CLOUD CC FEES INV # 1743-	100-5241-539900	24.14
		127 (E)		INVOICE CLOUD CC FEES INV # 1743-	410-5363-539900	33.59
		127 (E)		INVOICE CLOUD CC FEES INV # 1743-	610-6920-692100	33.59
		127 (E)		INVOICE CLOUD CC FEES INV # 1743-	620-8300-840000	33.59
						152.50
03/05/2020	GEN	128 (E)	WI DEPT OF REVENUE	ADMIN CERTIFICATE FEE	220-5140-539900	150.00
		128 (E)		ADMIN CERTIFICATE FEE	240-5140-539900	150.00
		128 (E)		ADMIN CERTIFICATE FEE	250-5140-539900	150.00
						450.00
03/05/2020	GEN	129 (E)	PAYROLLDATA.COM	OTHER PAYROLL FEES PR 03-06-20	100-5111-539900	32.25
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	100-5120-539900	9.21
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	100-5141-539900	63.85
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	100-5142-539900	29.68
		129 (E)		PROFESSIONAL SVC PAYROLL FEE PR 03-	100-5144-521900	28.75
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	100-5211-539900	107.45
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	100-5212-539900	126.67
		129 (E)		PROFESSIONAL SVC PAYROLL FEE PR 03-	100-5213-521900	22.85
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	100-5241-539900	22.85
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	100-5300-539900	96.03
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	100-5632-539900	25.07
		129 (E)		PROFESSIONAL SVC PAYROLL FEE PR 03-	100-5670-521900	4.61
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	150-5221-539900	254.40
		129 (E)		OTHER PAYROLL FEES PR 03-06-20	440-5511-539900	164.94
		129 (E)		MISC GENERAL EXP PAYROLL FEE PR 03-	610-6920-693000	37.64
		129 (E)		MISC GENERAL EXP PAYROLL FEE PR 03-	620-8400-856000	44.46
						1,070.71
03/05/2020	GEN	130 (E)	GREAT WEST RETIREMENT SERVICES	DEFERRED COMPENSATION PR 03-06-20	100-0000-215250	500.00
		130 (E)		DEFERRED COMPENSATION PR 03-06-20	150-0000-215250	74.00
		130 (E)		DEFERRED COMPENSATION PR 03-06-20	610-0000-215250	100.00
		130 (E)		DEFERRED COMPENSATION PR 03-06-20	620-0000-215250	100.00
						774.00
03/05/2020	GEN	29422	VANTAGEPOINT TRANSFER AGENTS	DEFERRED COMPENSATION PR 03-06-20	100-0000-215250	2,987.12
		29422		DEFERRED COMPENSATION PR 03-06-20	150-0000-215250	2.19

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Check Date	Bank	Check #	Payee	Description	GL #	Amount
		29422		DEFERRED COMPENSATION PR 03-06-20	440-0000-215250	470.40
		29422		DEFERRED COMPENSATION PR 03-06-20	610-0000-215250	209.21
		29422		DEFERRED COMPENSATION PR 03-06-20	620-0000-215250	217.36
						3,886.28
03/10/2020	GEN	29423	TREASURER STATE OF WI	COURT FEES DUE TO STATE-FEBRUARY JAIL FI	100-0000-242400	7,963.32
03/10/2020	GEN	29424	TREASURER WAUKESHA COUNTY	WAUKESHA COUNTY COURT FEES-JAIL FINES	100-0000-243240	2,478.69
03/10/2020	GEN	29425	WALWORTH CTY TREASURER	WALW COUNTY COURT-FEBRUARY JAIL FINES	100-0000-243250	30.00
03/13/2020	GEN	132 (E)	HASLER MAILING SOLUTIONS	POSTAGE	100-5142-531500	2,500.00
03/19/2020	GEN	135 (E)	GREAT WEST RETIREMENT SERVICES	DEFERRED COMPENSATION PR 03/20/20	100-0000-215250	500.00
		135 (E)		DEFERRED COMPENSATION PR 03/20/20	150-0000-215250	74.00
		135 (E)		DEFERRED COMPENSATION PR 03/20/20	610-0000-215250	100.00
		135 (E)		DEFERRED COMPENSATION PR 03/20/20	620-0000-215250	100.00
						774.00
03/19/2020	GEN	29541	VANTAGEPOINT TRANSFER AGENTS	DEFERRED COMPENSATION PR 03/20/20	100-0000-215250	2,935.97
		29541		DEFERRED COMPENSATION PR 03/20/20	150-0000-215250	10.24
		29541		DEFERRED COMPENSATION PR 03/20/20	440-0000-215250	465.59
		29541		DEFERRED COMPENSATION PR 03/20/20	500-0000-215250	11.34
		29541		DEFERRED COMPENSATION PR 03/20/20	610-0000-215250	228.26
		29541		DEFERRED COMPENSATION PR 03/20/20	620-0000-215250	212.80
						3,864.20
03/19/2020	GEN	29542	MINNESOTA LIFE INSURANCE	LIFE INSURANCE PAYABLE APRIL PREMS	100-0000-215301	1,121.87
		29542		LIFE INSURANCE PAYABLE APRIL PREMS	150-0000-215301	117.31
		29542		LIFE INSURANCE PAYABLE APRIL PREMS	440-0000-215301	182.14
		29542		LIFE INSURANCE PAYABLE APRIL PREMS	610-0000-215301	74.4 ^A
		29542		LIFE INSURANCE PAYABLE APRIL PREMS	620-0000-215301	66.0
						1,561.83
03/20/2020	GEN	134 (E)	PAYROLldata.COM	OTHER PAYROLL FEES PR 03/20/20	100-5111-539900	22.32

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Check Date	Bank	Check #	Payee	Description	GL #	Amount
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	100-5120-539900	6.38
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	100-5141-539900	19.13
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	100-5142-539900	6.38
		134 (E)		PROFESSIONAL SVC PAYROLL FEE PR	100-5144-521900	51.01
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	100-5211-539900	31.88
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	100-5212-539900	41.45
		134 (E)		PROFESSIONAL SVC PAYROLL FEE PR	100-5213-521900	6.38
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	100-5241-539900	6.38
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	100-5300-539900	28.69
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	100-5632-539900	3.19
		134 (E)		PROFESSIONAL SVC PAYROLL FEE PR	100-5670-521900	3.19
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	150-5221-539900	140.27
		134 (E)		OTHER PAYROLL FEES PR 03/20/20	440-5511-539900	66.95
		134 (E)		MISC GENERAL EXP PAYROLL FEE PR	610-6920-693000	12.75
		134 (E)		MISC GENERAL EXP PAYROLL FEE PR	620-8400-856000	12.75
						459.10
03/23/2020	GEN	133 (E)	EMPLOYEE TRUST FUNDS	HEALTH INSURANCE PAYABLE APRIL PREM	100-0000-215300	49,435.10
		133 (E)		HEALTH INSURANCE PAYABLE APRIL PREM	150-0000-215300	9,310.51
		133 (E)		HEALTH INSURANCE PAYABLE APRIL PREM	440-0000-215300	7,453.42
		133 (E)		HEALTH INSURANCE PAYABLE APRIL PREM	500-0000-215300	98.95
		133 (E)		HEALTH INSURANCE PAYABLE APRIL PREM	610-0000-215300	3,272.89
		133 (E)		HEALTH INSURANCE PAYABLE APRIL PREM	620-0000-215300	4,050.67
						73,621.54
03/23/2020	GEN	29543	VILLAGE OF SUMMIT POLICE DEPT	WARRANT COLLEEN MANNA DOB 8/19/87	100-0000-233000	540.00
03/26/2020	GEN	139 (E)	HASLER MAILING SOLUTIONS	POSTAGE	100-5142-531500	2,500.00
03/26/2020	GEN	140 (E)	DELTA DENTAL OF WISCONSIN	DENTAL - SUPPLEMENTAL INSURANCE	100-0000-215304	375.40
03/26/2020	GEN	141 (E)	WI RETIREMENT SYSTEM	RETIREMENT FEB 2020	100-0000-215200	30,488.89
		141 (E)		RETIREMENT FEB 2020	150-0000-215200	8,518.1
		141 (E)		RETIREMENT FEB 2020	440-0000-215200	5,386.41
		141 (E)		RETIREMENT FEB 2020	610-0000-215200	1,853.90
		141 (E)		RETIREMENT FEB 2020	620-0000-215200	1,893.77

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Check Date	Bank	Check #	Payee	Description	GL #	Amount
						48,141.14
03/26/2020	GEN	142 (E)	TASC	OTHER	100-5142-539900	162.54
		142 (E)		OTHER	100-5211-539900	180.60
		142 (E)		OTHER	100-5212-539900	216.72
		142 (E)		OTHER	100-5241-539900	36.12
		142 (E)		SUPPLIES	100-5323-531100	180.60
		142 (E)		OTHER	100-5632-539900	18.06
		142 (E)		OTHER	150-5221-539900	144.48
		142 (E)		OTHER	440-5511-539900	108.36
		142 (E)		MISC GENERAL EXPENSES	610-6920-693000	54.18
		142 (E)		MISC GENERAL EXPENSE	620-8400-856000	72.24
						1,173.90
03/26/2020	GEN	143 (E)	TASC	HRA 04/01/20 - 06/30/20	100-5142-539900	58.68
		143 (E)		HRA 04/01/20 - 06/30/20	100-5211-539900	88.02
		143 (E)		HRA 04/01/20 - 06/30/20	100-5212-539900	117.36
		143 (E)		HRA 04/01/20 - 06/30/20	100-5241-539900	14.67
		143 (E)		HRA 04/01/20 - 06/30/20	100-5323-531100	29.34
		143 (E)		HRA 04/01/20 - 06/30/20	150-5221-539900	44.01
		143 (E)		HRA 04/01/20 - 06/30/20	440-5511-539900	44.01
		143 (E)		HRA 04/01/20 - 06/30/20	610-6920-693000	29.34
		143 (E)		HRA 04/01/20 - 06/30/20	620-8400-856000	14.67
						440.10
03/26/2020	GEN	29544	AFLAC	SUPPLEMENTAL INSURANCE PAYABLE	100-0000-215302	299.57
		29544		SUPPLEMENTAL INSURANCE PAYABLE	150-0000-215302	260.81
		29544		SUPPLEMENTAL INSURANCE PAYABLE	440-0000-215302	0.88
		29544		SUPPLEMENTAL INSURANCE PAYABLE	500-0000-215302	0.79
		29544		SUPPLEMENTAL INSURANCE PAYABLE	610-0000-215302	50.76
		29544		SUPPLEMENTAL INSURANCE PAYABLE	620-0000-215302	50.74
						663.55
03/26/2020	GEN	29545	MUKWONAGO PROFESSIONAL POLICE	UNION DUES PAYABLE	100-0000-215500	600.00
03/26/2020	GEN	29546	MUKWONAGO PROFESSIONAL	UNION DUES PAYABLE	150-0000-215500	270.00
03/26/2020	GEN	29547	VILLAGE OF MUKWONAGO MRA	FLEXIBLE SPENDING CONTRIBUTION	100-0000-215350	2,133.90

Check Date	Bank	Check #	Payee	Description	GL #	Amount
		29547		FLEXIBLE SPENDING CONTRIBUTION	150-0000-215350	425.38
		29547		FLEXIBLE SPENDING CONTRIBUTION	440-0000-215350	24.54
						2,583.82
TOTAL - ALL FUNDS				TOTAL OF 24 CHECKS		156,874.08

Check Date	Bank	Check #	Payee	Description	GL #	Amount
03/05/2020	GEN	131 (E)	VILLAGE OF MUKWONAGO	B19-0005 CHAPMAN FARMS VILLAS	100-0000-211425	900.90
			TOTAL - ALL FUNDS	TOTAL OF 1 CHECKS		900.90

AGENDA ITEM REQUEST FORM

Committee/Board:	Committee of the Whole
Topic:	Motion to recommend approval to award a contract for Zoning Code and Sign Code Re Write to Civitek Consulting, Inc. for \$68,800.
From:	Ben Kohout
Department:	Planning & Zoning
Presenter:	Village Planner
Date of Committee Action (if required)	April 1, 2020
Date of Village Board Action (if required)	April 15, 2020

Information

Subject:

Motion to recommend approval to award a contract for Zoning Code and Sign Code Re Write to Civitek Consulting, Inc. for \$68,800.

Background Information/Rationale:

The Village has budgeted money for a Zoning Code and Sign Code Section rewrite. The Village sent out request for proposals and received three (3) replies. The three companies that responded (in no particular order) were Civi Tek Consulting, LLC (\$68,800), Foth Infrastructure and Environment, LLC (\$64,900), and VandeWalle and Associates, LLC (\$74,910).

Submittals by the three companies were reviewed by the Village Planner, Clerk and Building Inspector Supervisor. Following grading based on qualifications and experience, proposed plan, responsiveness to needs in request, familiarity with the Village of Mukwonago, meeting all desired outcomes, proposed schedule deliverables and pricing, staff cumulatively graded Civi Tek Consulting the highest. Therefore, staff is recommending Civi Tek Consulting, LLC to the Committee of the Whole as the best candidate to pursue this project.

The project will entail evaluating the zoning code and sign codes, gathering opinions from the public, stakeholders, staff and elected officials on how the current codes work and where there are areas for improvement. This will entail conducting forums to gather public sentiment, that will give direction to the code language. The contract entails the consultant conducting said opportunities and integrating comments into a revised zoning code and sign code that reflects the Village wants and needs to achieve the goals set forth in the Comprehensive Plan. The Request for Proposals (RFP) outlined this information and is attached for review.

The timeline calls for Civi Tek to complete this task within 16 months, or possibly sooner, depending on if the process would warrant this.

Key Issues for Consideration:

Fiscal Impact (if any):

\$68,800 from budgeted funds for this item. Budgeted \$75,000 for this item.

Requested Action by Committee/Board:

Attachments

Contract

All Submittals Civi Tek Foth and VandeWalle

AGREEMENT BETWEEN VILLAGE OF MUKWONAGO AND CIVI TEK CONSULTING, LLC

This agreement is between the Village of Mukwonago (Client) and Civi Tek Consulting LLC (Consultant) of 610 S Ferry Drive; Lake Mills, Wisconsin; 53551.

Article 1 Description of Services

- A. **Services provided as part of this agreement.** The Consultant will perform the services and submit the deliverables described in Attachment A, attached hereto.
- B. **Additional services.** The scope of services in this agreement is intended to cover services normally required for this type of project. However, occasionally events occur beyond the control of the Consultant or the Client that create a need for additional services. The Consultant and/or Client shall promptly and in a timely manner bring to the attention of the other the potential need to change the scope of services as set forth above. Such a change shall be approved by both parties. Charges for additional services shall be based on the Consultant's wage and expense schedules in effect at the time those services are requested.
- C. **Excluded services.** The following are specifically not included:
1. detailed studies or investigations not specifically provided for in part A of this article
 2. verification or authentication of work supplied to the Consultant by others
 3. collection of additional information at the Client's instruction
- D. **Standard of service.** Consultant agrees to provide those professional services covered by this agreement in accordance with generally accepted standards of its profession.

Article 2 Client's Responsibilities

- A. Client shall perform the following tasks with regard to this project:
- Provide background information and documents as may be required
 - Offer continuous feedback to the project team
 - Review and submit comments on various drafts
 - Participate in working sessions with the project team
 - Provide notices and secure venues for public meetings
 - Give the consultant team a tour of the Village
 - Serve as a liaison between the public and consultant
- B. Client agrees to provide Consultant with all information, surveys, reports, and professional recommendations and any other related items requested by Consultant in order to provide its professional services. Consultant may rely on the accuracy and completeness of these items. Client agrees to provide this information in a timely manner so as not to delay the orderly and sequential progress of Consultant's services.
- C. Client agrees to promptly advise Consultant of any issue that could affect the performance of the Consultant in completing the scope of services.
- D. Client agrees to render decisions in a timely manner so as not to delay the orderly and sequential progress of Consultant's services.

AGREEMENT BETWEEN VILLAGE OF MUKWONAGO AND CIVI TEK CONSULTING, LLC

Article 3 Schedule

Consultant will immediately commence work on this project and shall continue to work on the project consistent with the timeline set forth below. While the Consultant will perform all work accordingly, the Client understands that there may be unforeseen events which may impact the project's timeline. In all circumstances, the Consultant and Client will remain in close communication.

Key Tasks	Month											
	1	2	3	4	5	6	7	8	9-10	11-12	13-14	15-16
1. Public Participation Plan	■											
2. Project Orientation and Kick-off Meeting	■											
3. Continuing Coordination	■	■	■	■	■	■	■	■	■	■	■	■
4. Issue Identification (Project Scoping)	■	■	■									
5. Background Analysis/Evaluation	■	■	■									
6. Annotated Outline			■	■								
7. Preliminary Discussion Draft (Draft 1)				■	■	■	■					
8. Final Discussion Draft (Draft 2)								■	■			
9. Open house									■			
10. Public Hearing Draft (Draft 3)										■		
11. Public Hearing											■	■
12. Code Adoption												■
13. Training												■

To avoid any confusion on the part of residents and property owners, the Consultant will ensure that all documents and materials created over the course of the project are clearly marked as "Draft" or "Proposed." The intent of this is to ensure the public understands that discussed changes to the zoning code will not be adopted until final action is taken by the Village Board.

Article 4 Compensation and Payments

A. Consultant will complete the project as described herein for a fixed-fee amount of \$68,800.

B. Consultant shall bill Client once a month for services rendered during that period. Unless otherwise notified, payments will be made payable to Civi Tek Consulting (EIN #20-4424424) and mailed to 610 S. Ferry Drive; Lake Mills, Wisconsin 53551.

C. All payments are due Consultant upon receipt of invoice. If payments are not made within 45 days from the date of the invoice, Consultant has the right to (1) withhold all work products, (2) stop work on the project until payment is received, (3) modify any agreed upon schedule by extending such deadlines by an amount of time equal to the number of days payment has been delayed past the due date, and (4) charge an additional amount (i.e., above and beyond any agreed upon not-to-exceed limits or other contract amounts) required to prepare additional notices, letters, and related accounting documents. Invoices not paid within 60 days will be subject to an additional late fee of 1 percent per month of the unpaid balance.

AGREEMENT BETWEEN VILLAGE OF MUKWONAGO AND CIVI TEK CONSULTING, LLC

Article 5 Termination

In the event of termination by Client for other than breach by Consultant, Consultant shall be entitled to payment for all services rendered and expenses incurred prior to the date of termination.

Article 6 Dispute Resolution

Client and Consultant agree to mediate claims or disputes arising out of or relating to this agreement before initiating litigation. The mediation shall be conducted by a mediation service acceptable to both parties pursuant to such rules and terms agreeable to both parties. A party shall make a demand for mediation within a reasonable time after a claim or dispute arises, and the parties agree to mediate in good faith. In no event shall any demand for mediation be made after such claim or dispute would be barred by applicable law. Mediation fees shall be shared equally.

Article 7 Use and Ownership of Consultant's Documents

Upon completion of this project or termination, and upon payment due Consultant, all work products shall become the property of the Client, with the exception of any web services used for hosting the zoning code and/or sign code.

Article 8 Miscellaneous Provisions

- A. This agreement is governed by the law of the state in which the project is located.
- B. This agreement is the entire and integrated agreement between Client and Consultant and supersedes all prior negotiations, statements or agreements, either written or oral. The parties may amend this agreement only by a written instrument signed by both Client and Consultant.
- C. In the event that any term or provision of this agreement is found to be unenforceable or invalid for any reason, the remainder of this agreement shall continue in full force and effect, and the parties agree that any unenforceable or invalid term or provision shall be amended to the minimum extent required to make such term or provision enforceable and valid.
- D. Neither Client nor Consultant shall assign this agreement without the written consent of the other.
- E. Client and Consultant waive consequential damages for any claims, disputes or other matters in question arising out of or relating to this agreement. Consultant's waiver of consequential damages, however, is contingent upon the Client requiring contractor and its subcontractors to waive all consequential damages against Consultant for claims, disputes or other matters in question arising out of or relating to the project.
- F. Nothing in this agreement shall create a contractual relationship for the benefit of any third party.
- G. With the approval of the Client, Consultant may include descriptions, including graphics, of the project in its promotional and professional materials, including professional resumes and proposals to other municipalities.
- H. Client understands that the Consultant may use subconsultants to perform various parts of the work. Consultant is responsible for all work prepared by the subconsultant. The subconsultants include the following:
 - 1. Attorney John Macy (Arenz, Molter, Macy, Riffle, & Larson, S.C.) for legal review

AGREEMENT BETWEEN VILLAGE OF MUKWONAGO AND CIVI TEK CONSULTING, LLC

2. Nicholas Zukauskas for illustrations and related graphics
3. Geographic Marketing Advantage (Todd Niedermeyer) for GIS and related mapping

In the event, Consultant wishes to work with any other subconsultants (not listed above), Consultant shall obtain the approval of the Client.

- I. Notwithstanding any other clause written herein, Consultant understands and agrees that the Village is a municipal entity and therefore, is subject to the Wisconsin Public Records Law. Wisconsin Statute Sec. 19.36(3) requires governmental entities to make available for inspection and copying any records produced or collected under a contract entered into by the municipal entity to the same extent as if the record were maintained by the municipality. Therefore, in the event there is a request for any of the documentation pertaining to this agreement, the Consultant shall provide the information as requested and charge no more than the cost to copy said information.
- J. Consultant agrees to indemnify and hold harmless the Client as and against any and all claims, demands, actions or causes of action, including actual attorney fees, which may arise from the Consultant's performance of the terms and conditions of this agreement.
- K. In the event the Consultant misappropriates a trademark and/or copyright as part of this project, the Consultant hereby indemnifies the Client of any resulting claims.
- L. As set forth in the attached scope of services, the Consultant will update the Village's existing ZoningHub site with the applicable parts of the adopted zoning/sign code. The Client is responsible for the annual subscription cost, and has the ability to not renew such subscription at its discretion.

Article 9 Authorization and Date of Agreement

This agreement will become effective when signed by both parties on the date of the last signature.

Consultant

Civi Tek Consulting, LLC



Tim Schwecke, AICP

03-20-2020

Date

Client

Village of Mukwonago

Name and Title

Date

Attachment A. Scope of Services and Deliverables

Scope of Services

Task 1 – Public Participation Plan

We will develop a public participation plan that describes the ways in which the public and others will be involved in the preparation, review, and adoption of the zoning ordinance. This plan needs to be realistic and solicit public input in cost-effective and meaningful ways.

Deliverables: Public participation plan for Village review and approval.

Task 2 – Project Orientation and Kick-off Meeting

At the onset of the project we will conduct an orientation and kick-off meeting with Village staff, the Plan Commission, and others. Our intent is to confirm the goals of the project, review the timeline for the project, and to identify specific issues the project will need to address.

Deliverables: All required meeting materials, visual presentations, or any other resources or materials.

Meetings: One meeting

Task 3 – Continuing Coordination. We will maintain constant contact with Village staff and others throughout the process to ensure the project is moving forward consistent with the adopted timeline and resolve any issues that arise during the project. We will provide regular updates and maintain regular contact.

Task 4 – Issue Identification (Project Scoping)

In this task, we will actively solicit input from a wide variety of people and groups regarding current zoning code requirements, administration procedures, zoning code deficiencies, suggested changes and implementation procedures.

4.1 – Stakeholder Listening Sessions. We will conduct confidential listening sessions with key stakeholders, which could include elected and appointed officials, department staff, and representatives of civic organizations, the local chamber of commerce, business groups, neighborhood groups, and the like. We will work with you to identify a list of potential participants.

4.2 – Scoping Session with Village Staff. In this subtask, we will meet with Village staff to identify issues and concerns they may have regarding the code rewrite.

4.3 – General Scoping Session. The consultant team will conduct a workshop for the Plan Commission, and other invited participants to identify issues the new zoning code should address in new or different ways. After that initial exercise, we will work with the workshop participants to identify and evaluate alternative solutions to the key issues. The purpose of this exercise is to develop consensus on what needs to be addressed in the rewrite and sufficient direction to begin drafting the zoning ordinance.

Deliverables: (1) All required meeting materials; (2) one original and 25 copies of a draft and final memorandum summarizing input received during this task; and (3) electronic files (Microsoft Word and PDF) of the draft and final memorandum.

Meetings: Eight stakeholder listening sessions, one work session with Village staff, and one meeting for the general scoping session.

Task 5 – Background Analysis/Evaluation

5.1 – Review of Comprehensive Plan and other Plans. We will review the Village's adopted comprehensive plan to determine the extent to which the current zoning code conforms to the Village's plan and analyze and document where it does not conform. For those areas of conflict or potential conflict, recommended alternative solutions are sought. Part of this analysis will include the review of the Village's current zoning map to identify areas where there is an inconsistency between the zoning district designation and the desired future land use as recommended in the plans. Part of the following tasks will include proposed "up zonings" and "down zonings" to better conform. Finally, the project team will review the Village's comprehensive plan to determine whether there are regulatory frameworks that would help implement those plans.

5.2 – Review of other Municipal Ordinances. We review other Village regulations (e.g., subdivision and platting, historic preservation, building, utilities and others) to identify potential inconsistencies and gaps. There is a large interest in reviewing other Village regulations pertaining to Planned Unit Developments and finding models which may streamline, as much as possible, the review procedures and timeline to find a process which simplifies the process. The overall intent is to ensure consistency and integration. Recommendations will be provided to address any deficiencies identified in this step.

5.3 – Field Study. The consultant team will complete an on-the-ground visual assessment of the Village to fully understand current land uses and development patterns. It is anticipated that Village staff or another person will take the consultant team on a tour to assist with this task.

5.4 – Review Land Use Decisions Made Under the Existing Code. We will work with Village staff to review a number of recent development projects that were relatively controversial, did not proceed efficiently through the development review process, faced a legal challenge or threats of a legal challenge, or resulted in an undesirable end product. The intent of this task is to identify areas where the current zoning code functions well and where the new code needs to do things differently.

Deliverables: (1) one original and 25 copies of the report and (2) electronic (PDF) file of report.

Meetings: One meeting with the Plan Commission is anticipated to review the written report.

Task 7 – Annotated Outline

We will identify and evaluate new zoning concepts and approaches for potential inclusion in the draft zoning code, with special attention given to addressing the project objectives and the results of the issue identification and zoning code analysis tasks previously described. Based on this information, we will prepare an annotated outline that includes a chapter-by-chapter description of the proposed new zoning code, an overview of the proposed structure and substance of the new zoning code, a discussion of zoning options, and a commentary explaining the rationale for the recommended approach to drafting the zoning code. The annotated outline will include examples of how the new zoning code would be used to implement the recommendations of the comprehensive plan, overlay districts, and neighborhood plans, if any.

The proposed annotated outline will be submitted to Village staff, the Plan Commission, and other Village boards and commissions as deemed appropriate by the Village and others for review and comment. After obtaining general agreement on the contents of the initial draft of the annotated outline, we will prepare a final annotated outline, based on the comments received.

Deliverables: (1) All required meeting materials; (2) one original and 25 copies of the annotated outline; and (3) electronic (PDF) files of all documents.

Meetings: One meeting with the Plan Commission is anticipated to review the annotated outline and solicit feedback.

Task 7 – Preliminary Discussion Draft of Zoning Code (Draft 1)

We will prepare a discussion draft of the zoning code based on the final annotated outline. The new zoning code will be organized into logical topics, which will help create a user-friendly code. The code will include extensive use of graphics, tables, flow charts, matrices, and other methods for facilitating easy use and understanding of the zoning code.

The discussion draft will be presented in distinct modules that will permit easy review. As part of this task, we will evaluate, test, and revise the discussion draft.

Deliverables: (1) All required meeting materials; (2) one original and 20 copies of the preliminary discussion draft of the zoning code; (3) an electronic (PDF) file of the preliminary discussion draft of the zoning code; and (4) an electronic file (ArcGIS) of the zoning map.

Meetings: Five meetings with the Plan Commission are anticipated to review the preliminary discussion draft.

Task 8 – Final Discussion Draft of Zoning Code (Draft 2)

Based on input received from Village staff and Plan Commission, a final draft of the zoning code will be prepared. This draft will be widely distributed to the public for review and comment. Various public meetings will be held to solicit input from the general public, stakeholders, and others.

Deliverables: (1) All required meeting materials; (2) one original and 20 copies of the final discussion draft zoning code text; (3) an electronic (PDF) file of the final discussion draft zoning code text; and (4) and electronic file of zoning map.

Meetings: One meeting is anticipated

Task 9 – Open House

An open house will be held to create an informal setting for residents and others to learn more about the zoning code and to offer their suggestions and comments. Poster sessions will be used to describe the code and what it is intended to accomplish. A formal presentation may be given to highlight the key aspects of the proposed code. Comments collected from this session will be organized and submitted to the Plan Commission for review and consideration. At this point, we would suggest that the open house be held on a weekday from late afternoon into the evening hours to fit the schedule of more residents. Residents tend to like this format because they are able to focus in on those areas that interest them and have their questions answered quickly and efficiently.

Deliverables: All required meeting materials, visual presentations, or any other resources or materials.

Meetings: Open house

Task 10 – Public Hearing Draft Zoning Code (Draft 3)

In this step, we will prepare a public hearing draft zoning code and map based on input from the previous steps. In addition, we will prepare an executive summary explaining the public hearing draft and map and changes from the discussion draft and map. The executive summary will be distributed to the general public and the media prior to the public hearing.

Deliverables: (1) One original and 20 copies of the public hearing draft of the zoning code; (2) one original and 20 copies of the public hearing draft zoning code executive summary; (3) electronic (PDF) file of the public hearing draft zoning code and executive summary; and (4) electronic file of the public hearing draft zoning code map.

Meetings: One work session with the Plan Commission

Task 11 – Public Hearing

The consultant team will attend the public hearing at which time the public hearing draft of the proposed zoning code and map will be presented and public input accepted. We will give a presentation regarding the project, explain the proposal, and respond to questions.

Deliverables: None anticipated

Meetings: One public meeting is anticipated

Task 12 – Code Adoption

Civi Tek will attend a Village Board meeting to present the consensus zoning code and map, as recommended by the Plan Commission.

Deliverables: (1) One reproducible copy of the adopted zoning code; (2) an electronic file of the adopted zoning code; and (3) electronic file of the adopted zoning code map in a format acceptable to the Village.

Meetings: One meeting is anticipated.

Task 13 – Training

We will conduct a training session for the staff (up to 15 hours) and also the Plan Commission (up to 10 hours) with the goal of giving staff and commissioners a working knowledge of the code and administrative requirements. The actual number of hours allocated to each will be determined by the Plan Commission in consultation with staff.

Meetings: Up to two work sessions with staff and up to two meetings with the Plan Commission, depending on absences or need to accommodate schedules.

Deliverables

1 – Application Forms. For each of the various types of development review, we will prepare an application form that asks for the type of information required by the zoning code. These will include examples such as for wetland setback variance application forms, tree removal permit application forms and all associated forms to accomplish the mandated Zoning code inclusions. To complete this task, we will work with the Village's current online application provider, BSA Software, to ensure the proposed applications mirror the online applications and changes are completed to reflect the applications created by the consultant.

2 – Sample Documents. Zoning codes often refer to various documents that may be used or that are required. We will provide samples of each. These may include cross-access agreement, shared parking agreement, letter of credit, flooding easement, and more resulting from the outcome of the Scope of Services and resultant code provisions.

3 – Style Guide. One of the reasons many zoning codes read differently over time is that drafting rules (e.g., word usage and capitalization, etc.) are not followed when amendments are made. To help minimize this tendency, we will provide you with a style guide that we used in writing the code. Ideally, this style guide would be referred to when amendatory ordinances are drafted in the future.

4 – Inventory of Nonconformities. Although one of the goals of drafting a new zoning code is to avoid creating nonconformities, it is inevitable that some nonconforming situations may arise. It is important to document known nonconformities as soon as they are discovered. For this task, we will create a database of nonconformities. Data will be derived from existing sources of information, GIS analysis, and information discovered during the public participation process. Once this task is complete, Village staff will then be able to add new records to the database and revise existing records.

5 – Permanent Zoning Code Website

Once the Village Board adopts the zoning code, we will create a permanent ZoningHub website.

6 – Interactive Sign Code

As an additional feature, the essential elements of the Village's new sign code (i.e., what's allowed where) will be integrated into the Village's ZoningHub website. It will be map-based and fully interactive. That means a person will be able to get zoning details **AND** sign code requirements in the same easy-to-use interface.

7 – Digital File

Upon adoption of the final zoning/sign code, the Consultant will provide a digital file of the entire code to the Client, which can be sent to Municode for codification.

*Proposal for Planning Services
Zoning Code & Sign Code Rewrite
Village of Mukwonago*



Prepared For:

Ben Kohout, Planner/Zoning Administrator
Village of Mukwonago
440 River Crest Court
Mukwonago, WI 53149

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February 13, 2020

Ben Kohout, Planner/Zoning Administrator
Village of Mukwonago
440 River Crest Court
Mukwonago, WI 53149

Dear Mr. Kohout:

We are pleased to submit our proposal to rewrite the Village's zoning code and sign code. As you review our proposal, please consider the following:

- **Team Approach** Our team includes professional planners, a land-use attorney, and a graphic designer.
- **Proven Track Record** Please talk to any of the client contacts. They can speak the best for our services and abilities.
- **Perspective** I have had the fortunate opportunity to have worked in both the public sector and the private sector. I have extensive experience with the day-to-day administration of local land development regulations, and also writing regulations from scratch and amendments.
- **Urban Design** Our team has a history of delivering insightful and detailed graphics and maps that give form, shape, and character to neighborhoods and cities.
- **Value** Given our competitive fee structure, you'll receive more effort and value when compared to a comparable budget proposal.
- **Start strong and finish strong** We are committed to seeing this project through to successful completion. We will not become enchanted with another project and allow yours to languish or give less effort than what your project deserves. We understand that this project is very important to the Village's future and will therefore give it our very best effort from the first day of the project to the last day.
- **Custom-tailored products** You will receive products that meet your needs.
- **Familiarity with the Village's codes** I am familiar with the Village's zoning/sign code, so we will be able to hit the ground running.
- **Interactive Sign Code** As part of our services, you will receive an interactive sign code that mirrors the map-based platform in ZoningHub. People will be able to click on their property to see what signage is allowed.

If you should have any questions or need more details, feel free to contact me at your convenience.

I look forward to hearing from you.

Sincerely,



Tim Schwecke, AICP

2. Project Team

To meet the unique needs of this project, Civi Tek Consulting will be teaming with:

- Nicholas Zukauskas, for illustrations and other graphic designs;
- Arenz, Molter, Macy, Riffle, & Larson, for legal review; and
- James Carpentier, International Sign Association (in an advisory role).

Civi Tek Consulting

Civi Tek Consulting helps communities master the challenges and opportunities they face by offering a full suite of municipal planning services, including:

- | | |
|---|--------------------------------|
| • Unified land development codes | • Tax increment financing |
| • Zoning codes | • Comprehensive plans |
| • Subdivision regulations | • Neighborhood plans |
| • Sign codes | • Recreation and park plans |
| • Landscaping regulations | • Community surveys |
| • Conservation subdivision design regulations | • Environmental reviews |
| • Hazard mitigation plans | • Zoning code administration |
| | • General municipal consulting |

Tim Schwecke, AICP, formed Civi Tek Consulting in 2003 after having worked for local government and for consulting firms in Wisconsin and Florida. As a consultant, Tim has worked with large and mid-sized communities and rural towns on a wide variety of projects.

In addition, Tim is the founder of Civic Webware, a technology firm that works at the intersection of innovative technology and community planning to help communities become Smart + Connected. Civic Webware's flagship product, ZoningHub, is an online service that municipalities can use to post their land development codes and related materials online in a new, user-friendly format.

Charlie Handy joined Civi Tek in 2010 and works on a part-time basis. He served as the project manager for Winnebago County's farmland preservation plan for Winnebago County, Wisconsin and assisted with the zoning code rewrite project for Wisconsin Rapids and Winnebago County. Currently, he is the county planner for La Crosse County, Wisconsin, and is responsible for a wide range of duties including long-range planning and economic development, and special projects including a farmland preservation plan and a complete rewrite of the county's zoning code. Charlie is certified by the National Charrette Institute as a charrette leader.

Nicholas Zukauskas

Nicholas Zukauskas works for Fergus Garber Young Architects, a full-service architectural firm based in Palo Alto, California, and will produce the illustrations and other graphics that will be included in the zoning/sign codes.

Arenz, Molter, Macy, Riffle, & Larson, S.C.

Arenz, Molter, Macy, Riffle, & Larson will provide a legal review of both codes.

The firm provides on-going legal counsel to more than 100 municipalities and other governmental bodies throughout Wisconsin. The firm currently has nine attorneys licensed to practice law in Wisconsin and in other states.

Aside from the obvious benefit of working directly with municipal attorneys while drafting the new code, our team will be complying with a ruling of the Wisconsin Supreme Court relating to work qualifying as the “practice of law.” A zoning code rewrite falls under this ruling when undertaken by planning consultants.

Attorney John Macy, the lead attorney working on this project, has more than 30 years of experience in municipal law and is an expert in Wisconsin’s land-use law. Attorney Macy will be involved in the preparation of the zoning/sign codes to ensure compliance with state and federal laws and court cases.

International Sign Association (ISA)

Although the International Sign Association is not part of the project team per se, James Carpentier, Director of State & Local Affairs, will be serving in an advisory capacity. He will be working with our team to ensure the Village’s sign code complies with legal precedent. He will provide resources that we could potentially use and critique our drafts.

In addition, Mr. Carpentier has agreed to collaborate with ZoningHub on how to best share sign regulations in an interactive platform that is easily understood by business owners and sign designers/installers. As noted elsewhere, the Village’s sign regulations can be shared via that platform at no additional cost.

In his early planning career, Mr. Carpentier worked as a consultant in southeast Wisconsin.

Professional Resume

TIMOTHY SCHWECKE, AICP

PROFESSIONAL EXPERIENCE

CiviTek Consulting
Lake Mills, Wisconsin

ZoningHub
Lake Mills, Wisconsin

Vierbicher Associates, Inc.
Madison, Wisconsin
Senior Planner (2002-2003)

Mid-America Planning Services
Madison, Wisconsin
Project Planner (2000-2002)

Ravalli County, Montana
Hamilton, Montana
Director of Planning (1991-2000)

Prosser, Hallock & Kristoff
Jacksonville, Florida
Project Planner (1989-1991)

EDUCATION

University of Wisconsin-Madison
M.S., Urban and Regional Planning (1989)

University of Montana
B.S., Recreation Resources Management (1986)

CERTIFICATION

American Institute of Certified Planners (AICP)
#016446

CONTINUING EDUCATION

- ◆ Effective Zoning Techniques – June 2007; American Planning Association
- ◆ New Urbanism Codes – July 2005; American Planning Association
- ◆ Comprehensive Approach to Land Use Planning – December 2003
- ◆ All Hazards Mitigation Planning Workshop – December 2002; Wisconsin Emergency Management
- ◆ Municipal Engineering Fundamentals for Non-engineers, 2002; University of Wisconsin-Madison, College of Engineering
- ◆ Wisconsin Planning and Zoning Law - May, 2001
- ◆ Public Road and Federal Access Law - May, 1996; Montana Board of Continuing Legal Education
- ◆ Road Corridor Preservation - November, 1993; Federal Highway Administration

PROFESSIONAL AFFILIATIONS

- ◆ American Planning Association
- ◆ Wisconsin Chapter of the American Planning Association

RECENT PROJECT EXPERIENCE

Wisconsin Rapids Sign Code Rewrite
Working to create a new sign code that meets all of the City's objectives, while complying with state and federal law. Adoption is anticipated in 2019.

Wisconsin Rapids Zoning Code Rewrite
Worked in concert with the Planning Commission, Mayor, Common Council, city staff, and the public to create a new zoning code. Activities included meeting facilitation, public participation, project website, ZoningHub site, and drafting of the zoning code. The Council adopted the new code in 2018 by unanimous approval.

Washburn Zoning Code Rewrite Project
Prepared a new zoning code for the city that included new regulations including outdoor lighting, landscaping, and design review.

Municipal Planning Services, Town of Mukwonago (Waukesha County), Wisconsin
Administered the town's land development regulations, including zoning and land division; implemented its smart growth comprehensive plan; met with developers and citizens regarding the land development regulations; prepared staff reports for proposed projects; and authored numerous ordinances, including various amendments to the town's land development regulations.

Municipal Planning Services, Town of Eagle (Waukesha County), Wisconsin
Provided on-going planning support related to development review, enforcement of land development ordinances, and implementing the Town's comprehensive plan. Worked with the Plan Commission, Board of Appeals, and Town Board on a wide range of projects and development-related applications.

Municipal Planning Services, Village of Richfield
Served as the village planner for a community with more than 11,500 residents and a land area exceeding 23,000 acres. Responsibilities include the following (1) meet with developers and citizens regarding the Village's development regulations including design standards and zoning, subdivision, and sign regulations, (2) prepare staff reports on proposed projects, (3) author ordinances for zoning map amendments and to amend the village's development regulations, and (4) undertake special projects as assigned.

Municipal Planning Services, Village of East Troy
Served as the zoning administrator, which involved development review, meeting with applicants, preparing staff reports and decision documents, and Plan Commission meetings. Prepared numerous ordinances to amend the Village's zoning regulations.

Zoning Code Rewrite Project, Winnebago County, Wisconsin
Prepared a new town/county zoning code and new floodplain regulations and shoreland regulations; implemented a public participation plan to involve county residents and other stakeholders in the rewrite project; and worked with an advisory committee and the Winnebago County Planning and Zoning Committee. The Board of County Supervisors adopted the various ordinances including the zoning code March, 2012.

Experience continued on next page

Professional Resume

TIMOTHY SCHWECKE, AICP

RECENT PROJECT EXPERIENCE - CONTINUED

Zoning Code Update Project, Village of Sturtevant, Wisconsin

Worked in collaboration with the Village Attorney and Village Engineer to update the village's zoning code. This is an on-going project and adoption is anticipated in the first quarter of 2013

Unified Land Development Code, Great Falls, Montana

Rewrote the city's development regulations from top to bottom. The unified code covered all aspects of development from land use to design review to stormwater management.

Zoning Code Rewrite, Wisconsin Dells, Wisconsin

Worked with a task force to update the city's zoning code to help implement its recently adopted comprehensive plan. Given the unique character of this tourism center, innovative approaches were crafted to meet the needs of the community.

Farmland Preservation Plan, Winnebago County

Prepared a new farmland preservation plan based on extensive involvement of the towns and property owners. Worked with an advisory committee over a 12-month process in the preparation, review, and adoption of the plan.

Lake View Farm Transportation/Land Use Plan, La Crosse County, Wisconsin

Developed two different concept plans for a county-owned parcel adjacent to the village of West Salem. One concept for the 200-acre parcel followed a conventional approach to residential development, while the other plan followed a traditional neighborhood development (TND) scheme. The TND plan incorporated a number of key features: mix of housing types, roundabouts, a hierarchy of street types including alleys and boulevards, a village green, and an extensive system of pedestrian paths. This project was completed within seven weeks to meet a deadline for a County Board meeting.

Ashland County Multi-Jurisdictional Comprehensive Plans, Wisconsin

Prepared comprehensive plans for the County and also for each of the 15 towns.

Smart Growth Comprehensive Plan, Prairie du Chien, Wisconsin

Prepared a comprehensive plan to meet Wisconsin's new "Smart Growth" legislation. Varied opportunities for public participation were used throughout the project and included a community-wide survey, public meetings, and an open house. Environmental constraints and intergovernmental coordination were important considerations in developing the future land use plan.

Natural Hazard Mitigation Plans

Completed a number of natural hazards mitigation plans and plan updates consistent with the requirements of the Disaster Mitigation Act of 2000, including Fond du Lac, Jefferson, Sauk, Walworth, and Winnebago counties; village of North Fond du Lac; and the city of Darlington.

Professional Resume

CHARLES R. HANDY

EDUCATION

University of Wisconsin-Madison
B.S., Landscape Architecture, Urban and Regional
Planning (1991)

PREVIOUS PROFESSIONAL EXPERIENCE

La Crosse County, Wisconsin
Planner (2002-Present)

Pierce County, Wisconsin
Land Conservation Director (1999-2002)

La Crosse County, Wisconsin
Senior Conservation Specialist (1995-1999)

City of Onalaska, Wisconsin
Deputy Planner (1993-1995)

CONTINUING EDUCATION

- ◆ Charrette System Certification Training – June 2010; National Charrette Institute (NCI)
- ◆ The Change Agents Guide to Radical Improvement – August 2008; Ken Miller
- ◆ Natural Step for Sustainable Communities – March 2009
- ◆ PromiseNET 2009 - Conference on Universal Place Based Scholarship Programs, Denver Colorado – June 2009
- ◆ Facilitation and Process Improvement Certification for Public Operations – December 2009
- ◆ Conservation Development Design - October 2008
- ◆ Conservation Subdivision Design – August 2008; Wisconsin Builders Association
- ◆ Planning Manager Certification – October 2008; Zucker Systems
- ◆ Growing Wisconsin Working Lands Initiative – February 2007; UW Extension and DATCP
- ◆ Our Town, Rural Communities Visioning Session - Taliesin, Spring Green – April 2007
- ◆ The ABZ-s of Planning Management – Spring 2007; Zucker Systems
- ◆ Your Town Charrette – September 2005; National Trust for Historic Preservation
- ◆ Certification in Zoning and Planning – June 2003; Waukesha County and University of Wisconsin Extension
- ◆ Team Building NRCS – October 2001; NEDC Leadership Training

PROFESSIONAL AFFILIATIONS

- ◆ American Planning Association
Wisconsin Chapter of the American Planning Association

RECENT PROJECT EXPERIENCE

Washburn Zoning Code Rewrite Project

Ongoing work with the Plan Commission, Mayor, Common Council, city staff, and the public in preparing a new zoning code. Current activities include meeting facilitation, public participation, and drafting of the zoning code. Adoption is anticipated in 2014.

Farmland Preservation Plan, Winnebago County

Prepared a new farmland preservation plan based on extensive involvement of the towns and property owners. Worked with an advisory committee over a 12-month process in the preparation, review, and adoption of the plan.

Zoning Code Rewrite Project, La Crosse County, Wisconsin

Prepared a new town/county zoning code and new floodplain regulations and shoreland regulations; implemented a public participation plan to involve county residents and other stakeholders in the rewrite project; and worked with an advisory committee and the County Planning and Zoning Committee. Ensure compliance with State farmland preservation requirements. The code is being drafted to retain all 12 towns currently in countywide zoning. The Board of County Supervisors adopted the code in 2012.

Park Plaza Redevelopment

Lead staff member responsible for the redevelopment of a 15-acre waterfront property for mixed uses.

County Development Agency/Authority for La Crosse County

Lead staff member involved in creation of a county development agency or authority for the county.

La Crosse County Affordable Housing Land Trust

Lead staff member involved in the creation of an affordable housing land trust.

La Crosse Housing Promise Program

Assisted in the establishment of a public private partnership to encourage housing infill in designated neighborhoods to support the La Crosse Promise, which is a collaborative effort by the school district, county, and city of La Crosse to develop a universal placed-based scholarship program modeled after the Kalamazoo Promise.

La Crosse County Farmland Preservation Plan

Lead staff responsible for updating the county farmland preservation plan. Received a grant from DATCP and completed initial GIS work. Scheduling and scope of work has been completed. Involved in all phases including drafting of the plan, public participation activities, and completing statutory ordinance and resolution approvals.

La Crosse County PACE Program

Established criteria for analyzing applications for PACE (Purchase of Agricultural Conservation Easements), developed a County Farmland Preservation ordinance, solicited interested landowners to serve on the Farmland Preservation Committee, established application materials and an education program, and administered conservation easements.

Experience continued on next page

Professional Resume

CHARLES R. HANDY

MEMBER ORGANIZATIONS

- ◆ Empire Builder High Speed Rail Coalition
- ◆ La Crosse County Housing Commission
La Crosse Area Planning Committee

RECENT PROJECT EXPERIENCE - CONTINUED

La Crosse County LESA Model

Developed a Land Evaluation and Site Assessment (LESA) model to rank PACE applicants.

Promotion of High Speed Rail through La Crosse

Founding member of the Empire Builder High Speed Rail Coalition.

La Crosse County Comprehensive Plan – 2008

Lead staff member directing the adoption of the county comprehensive plan, including drafting, public participation, and adoption of the plan.

County Farm Development Project

Lead staff member and project manager for the development of the County Farm property adjacent to the village of West Salem. Developed the first county/village municipal revenue sharing tax increment district in the state of Wisconsin. The agreement between the village and La Crosse County involved a 160-acre industrial park. Developing the vacant La Crosse County Farm property (325 acres) into a master planned community with expansion in West Salem.

Supplemental Plans and Ordinances for La Crosse County

Assisted in drafting and the public review and approval of the following plans and ordinances: County driveway ordinance, subdivision ordinance update, shoreland zoning ordinance update, stormwater management ordinance, County Land and Water Resource Management Plan, Land Records Modernization Plan, and City and County Sustainability Plan.

Special Projects for La Crosse County

- ◆ Lead staff member responsible for purchasing 12" resolution orthophotos, oblique aerial photos, and LiDAR in 2007 and 2010. In 2010 working with the Wisconsin Rural Orthophoto Consortium (WROC).
 - ◆ Responsible for the establishment of the Extra-territorial Technical Advisory Committee in La Crosse County.
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LAW OFFICES OF
ARENZ, MOLTER, MACY & RIFFLE, S.C.

720 N. EAST AVENUE
P.O. BOX 1348 (53187-1348)
WAUKESHA, WI 53186
Telephone: (262) 548-1340
Facsimile: (262) 548-9211

DALE W. ARENZ
DONALD S. MOLTER, JR.
JOHN P. MACY
COURT COMMISSIONER
H. STANLEY RIFFLE
COURT COMMISSIONER
ERIC J. LARSON

RICK D. TRINDL
PAUL E. ALEXY
JULIE A. AQUAVIA
R. VALJON ANDERSON

JOHN P. MACY

Born in Menomonee Falls, Wisconsin, June 26, 1955; admitted to Bar, 1980, Wisconsin and U.S. District Courts, Eastern and Western Districts of Wisconsin, the United States Court of Appeals for the Armed Forces and United States Supreme Court.

EDUCATION

Carroll College (B.A., cum laude, 1977); Marquette University (J.D., 1980).

MEMBERSHIPS

American Bar Association: Member 1980 to present; House of Delegates: 1996 to 2002, 2006 to present; Section of General Practice Solo and Small Firm Lawyers: Revenue Development Director 2008-present; Immediate Past Chair 2007-2008; Chair 2006-2007; Chair-Elect 2005-2006; Vice Chair 2004-2005; Secretary 2003-2004; Secretary- Elect 2002-2003, Executive Committee: 2003-present; Finance Committee 2008-present, Board Member 1999 to present, Director 2002-2003, 2008-2009; Past Chairs Advisory Committee: 2007- present; Chair 2007-2008; Corporate Sponsor Committee: Chair 2007-2008; Special Advisor 2011; Revenue Development Committee: Vice Chair 2007-2008; Coordination Committee: Member 2007-2008; GPSolo Editorial Board: 1993 to 2008; Bylaws Committee: 2011; Programs Committee: 2000 to 2003, Chair: 2000 to 2003; Long-Range Planning Committee: 1999 to 2008, Chair 2004-2005 ; Long-Range Planning Task Force: 2000 to 2002, Chair: 2000 to 2002; Chair-Elect Planning Committee: 1999 to 2002; Chair of Administrative and Government Law Committee: 1989-1991; Chair of Urban, State and Local Government Law Committee: 1991-1994; Government & Public Sector Lawyers Division; Gavel Committee: 1989 to 1998, 1999 to 2001, 2002 to present; Standing Committee on Publishing Oversight: 2010 to present; West Legal Advisory Board: 2002-present.

THE FELLOWS of the American Bar Foundation: Nomination accepted 2005.

State Bar of Wisconsin: Member 1980 to present; Board of Governors: 1992-1996 and 2003-2008, Chair: 1995-1996, Executive Committee: 1994-1996, 2007-2008; Section of Administrative and Local Government Law, Board Member: 1994 to 2000, Chair: 1997 to 1998, Secretary: 1996 to 1997; Government Lawyer Division; Video-Tape Committee, Member: 1989 to 2000, Chair: 1996 to 1998; Staff-Client Education Committee: 2000-2008; Programs Committee: 1994 to 1998, Chair: 1996 to 1998; Personnel Study Committee: 1994 to 1998; Government Lawyers Task Force, Chair: 1994 to 1998; Convention and Entertainment Committee: 1996-2008; CLE Committee: 1995-1996, 2000 to 2001, Chair: 2000 to 2001; Commission on Judiciary as a Co-Equal Branch of Government: 1995 to 1998; Public Affairs Advisory Committee: 1996 to 1998; Local Bar Relations Committee: 1997 to 1998, Chair: 1997 to 1998; Finance Committee: 1996 to 2001, Chair: 1997 to 2000; Strategic Planning Committee: 1999 to 2001; Legislative Oversight Committee: 2008 to Present; American Bar Association Delegate: 1996 to 2002, 2006 to Present; Gender Equity Committee: 2002-2006; High School Mock Trial Tournament Judge; We the People Program Judge; National Moot Court Judge; Gavel Awards Judge.

THE FELLOWS of the Wisconsin Law Foundation: Nomination accepted 2001.

Waukesha County Bar Association: Member 1980 to present; President: 1987-88; Entertainment Chair: 1981-1994; Membership Chair: 1988 to 1998; Municipal Law Section: 1995 to present; Chair: 2002 to 2007.

Court Commissioner: Waukesha County.

League of Wisconsin Municipalities: Attorneys Section: 1980 to present, President 2004-2005, Secretary 2003-2004.

Wisconsin Towns Association

Wisconsin Association of Assessing Officers

Wisconsin Municipal Clerks Association

Town of Summit Member of Planning Commission: 1989-91.

Citizen Bank of Mukwonago: Board of Directors: 2006 to present.

Waukesha County Community Foundation: 2004 to present, Grant Committee: 2003 to present; Chair: 2004 to present.

Sussex Teen Center Improvement Corporation: Chair: 1985-87, 1988-90; Secretary: 1991; Board of Directors: 1981-91.

Waukesha County Tavern League: Legal Counsel; Executive Director of Stop Underage Drinkers Program.

Mediation Center of Waukesha County: Board Member: 1993 to 2000, 2002-2009, Chair: 1994-1996, 2005-2009.

Republican Party: Member, First Vice-Chair: 2000 to present; Second Vice-Chair: 1995 to 2000, Executive Committee: 1991 to present; Western Branch Club, Chair: 1991 to 1996; Treasurer, Bucher for Attorney General Committee.

Carroll College: Alumni Council: 1991 to 2002.

Delta Rho Upsilon Alumni Association: President, Vice-President, Past President, Board of Directors: 1979-90 and 1998 to present.

Law Explorer Post Committee: Chair: 1994 to 1999.

Waukesha County Historical Society and Museum

Frank Lloyd Wright Preservation Trust

Frank Lloyd Wright Wisconsin

Ten Chimneys Foundation

Waukesha Civic Theater

Waukesha Symphony Orchestra

Waukesha Land Conservancy

Milwaukee Art Museum

Friends of the Mukwonago River

Wisconsin Association of Lakes

Sunset Homes Condominium Association: President, Board Member.

Silver Lake Yacht Club: Member, Treasurer: 1986-88.

Silver Lake Environmental Association Member: Treasurer: 1988-89.

56th Annual National Moot Court Competition Judge: 2005.

AWARDS

Who's Who in American Law, 6th Edition; 7th Edition; 8th Edition; 9th Edition; 10th Edition; 11th Edition; 12th Edition; 13th Edition; 14th Edition; 15th Edition; 30th Anniversary Edition, 16th Edition and 17th Edition. ***Who's Who Among Rising Young Americans***, 1992; ***Who's Who of Emerging Leaders in America***, 4th Edition; ***Oxford Who's Who***, ***Who's Who Among Outstanding Americans***; ***Sterling Who's Who Directory***; ***International Who's Who***; ***International Who's Who of Professionals***, Millennium Edition; 2005-2006 Edition; ***Marquis Who's Who in America***, 50th Edition; 51st Edition; 52nd Edition; 53rd Edition; 54th Edition; and 55th Edition; 56th Edition; 57th Edition; 58th Edition; 60th Anniversary Edition, 61st Edition; ***Continental Who's Who***, 2009; ***Continental Who's Who Registry of National Business Leaders***; ***Continental Who's Who V.I.P. Program***, 2005 Edition; ***Strathmore's Who's Who Registry of Business Leaders***; ***Nationwide Register's Who's Who in Executives and Businesses***, Millennium Edition; and 2001 Edition; ***Presidential Who's Who***, 2011 Edition, 2010 Edition; ***Who's Who in the Midwest***, Millennium Edition; 28th Edition; 29th Edition; 30th Edition; 31st Edition; 32nd Edition; 33rd Edition; ***Who's Who Historical Society***; ***Honored Member of the American Registry of Outstanding Professionals***, Edition 2001-2002; ***Who's Who in Executives and Professionals***, 2001-2002 Edition, 2005-2006 Edition; 2007-2008 Honors Edition; 2009-2010 Edition; 2010-20100 Edition. ***America's Register of Outstanding Professionals***, 2005-2006 Edition, 2002-2003 Edition; ***Strathmore's Who's Who***, 2002-2003 Edition, 2003-2004 Edition; 2005-2006 Edition, 2009-2010 Edition; ***Who's Who in the World***, 21st Edition; 22nd Edition; 23rd Edition; 24th Edition; 25th Silver Anniversary Edition; ***Outstanding***

Lawyers of America (2004); **Contemporary Who's Who**, 2003-2004 Edition; 2004-2005 Edition; **Who's Who Among Executives, Professionals and Entrepreneurs**, 2010, 2009, 2008, 2007; **Who's Who Among American Law Professionals**, 2010; American **Biographical Institute**, Gold Medal for the United States (2007), **American Biographical Institute**, Great Minds of the 21st Century, Man of the Year, (2004), (2005), Men of the Year- A Celebrated Collection of Biographies; International Profiles of Accomplished Leaders, Inaugural Edition; **International Legal Professional of the Year**, **International Biographical Institute 21st Century Award for Achievement**, (2004); **International Biographical Institute**, International Directory of Experts and Expertise (2005), (2006) (2007) (2008) (2009), **Best Lawyers in America**, Milwaukee Area, Municipal Law (2008) (2009) (2010) (2011), **Top Attorneys in Wisconsin**, 2009.

Waukesha County Technical Institute Employer Service Award 1981

Wisconsin Correctional Service Waukesha County Mediation Program Award 1985

Wisconsin Association of Assessing Officers Certificate of Appreciation 1988

Alcohol Drug Awareness and Prevention Program Waukesha County Certificate of Appreciation 1989

Republican Party of Wisconsin William J. Campbell Award 1991

Sussex Teen Center Service Award 1991

Waukesha County Bar Association Award for Dedicated Service 1991

Carroll College Outstanding Service and Volunteer Efforts 1991-1992

Wisconsin Municipal Clerks Association Special Recognition Award 1995

Wisconsin Municipal Clerks Association Certificate of Appreciation 2004.

State Bar of Wisconsin Outstanding Leadership Award 1995-1996

State Bar of Wisconsin President's Award of Excellence 1998

State Bar of Wisconsin President's Award of Excellence 1999

State Bar of Wisconsin Special Presidential Recognition 2000

State Bar of Wisconsin President's Award of Excellence 2004

State Bar of Wisconsin President's Award of Excellence 2010.

Wisconsin Association of Assessing Officers Distinguished Research and Development Award 2002

Wisconsin Law Journal Leader in the Law Award 2009

Wisconsin Super Lawyers Award 2007, 2008, 2009

REPRESENTATION

MUNICIPAL ATTORNEYS FOR THE FOLLOWING ENTITIES:

City of Muskego	Town of Ottawa
City of Pewaukee	Town of Raymond
Village of Butler	Town of Troy
Village of Dousman	Town of Vernon
Village of Fox Point	Allenton Sanitary District No. 1
Village of Nashotah	Delavan Lake Sanitary District
Village of North Prairie	Dousman Fire District
Village of Oconomowoc Lake	Eagle Spring Lake Management District
Village of Palmyra	Hilldale Sanitary District
Village of Richfield	North Lake Management District
Village of Slinger	Pike Lake Utility District
Village of Summit	Silver Lake Sanitary District
Village of Sussex	Silver Lake Utility District (Summit)
Village of West Milwaukee	Summit Fire District
Town of Addison	Summit Utility District No. 2
Town of Ashippun	Summit Utility District No. 3
Town of Delafield	Town of Ixonia Sanitary District No. 1
Town of Eagle	Town of Ixonia Sanitary District No. 2
Town of Genesee	
Town of Hartford	
Town of Ixonia	
Town of Jackson	
Town of LaGrange	
Town of Mukwonago	

CONSULTANTS TO THE FOLLOWING ENTITIES:

City of Altoona	Town of Farmington
City of Brookfield	Town of Harmony
City of Manitowoc	Town of Harrison
City of Manitowoc Police and Fire Commission	Town of Kewaskum
City of Mequon	Town of Merton
City of Mequon Zoning Board of Appeals	Town of Mukwa
City of Milwaukee Zoning Board of Appeals	Town of Pleasant Springs
City of Oconomowoc	Town of Port Washington
City of Oconomowoc Zoning Board of Appeals	Town of Randall
City of Waukesha	Town of Theresa
Village of Adell	Town of Wautoma
Village of Brown Deer	Town of Wayne
Village of Campbellsport	Town of West Bend
Village of Hortonville	Town of Westport
Village of Jackson	Waukesha County Technical College
Village of Kewaskum	Arrowhead High School District Area Schools
Village of Kingston	Delafield-Hartland Water Pollution Control Commission
Village of Menomonee Falls	Merton School Joint District No. 9
Village of Newburg	Milwaukee County Ethics Commission
Village of North Fond du Lac	City of Milwaukee Tax Commission (Board of Review)
Village of Sturtevant	Oconomowoc School District
Town of Barton	Racine Water Utility
Town of Beloit	
Town of Caledonia	
Town of Cedarburg	

SAMPLE OF LECTURES AND SEMINARS

Frequent instructor for municipal law seminars sponsored by the Wisconsin Bar Association, Wisconsin Municipal Clerks Association, League of Wisconsin Municipalities, Wisconsin Towns Association, Wisconsin Association of Assessing Officers, National Business Institute, Inc., and Lorman Education Services.

3. Project Understanding

The Village of Mukwonago is looking to undertake a complete overhaul of the zoning and sign codes, Chapters 62 and 64, respectively.

Zoning Code

The original zoning code was written decades ago and has been amended numerous times. The code is now outdated and does not always reflect best zoning and planning practices. Further, the code does not fully implement the goals and objectives in the Village's Comprehensive Plan.

Some parts of the existing zoning code will be carried forward into the new code, while other parts will be substantially revised. Entirely new sections will be added as well.

When completed, the new zoning code will look and feel different. It will be more user-friendly. It will be integrated into other land-use regulations and be internally consistent, with no overlapping or contradictory provisions.

The new code will be readable and understandable. Graphics and drawings will be used to increase reader comprehension.

The final product may contain past Euclidean provisions, but where possible allows for the creation of form-based code, hybrid, or other innovative approaches not mentioned here. The result will reflect a more user-friendly document for staff and the general public.

Our overall approach is intended to create a zoning code and sign code that enjoy broad public support.

As an initial starting point, the following improvement themes have been identified.

1. Restructure and reformat the code and include recent adoptions which are not yet codified in the online "MuniCode" version.
2. Review and integrate the Village's adopted comprehensive plan into the Zoning Standards to ensure the code is consistent.
3. Evaluate and clarify the purpose for each of the zoning districts and associated land uses and development standards.
4. Eliminate inconsistencies, such as zoning terms and definitions referenced throughout the entire code.
5. Evaluate conditional uses and determine, following meetings with the Plan Commission and Village Board, which ones they wish to see and what conditions, if any, would apply to the respective conditional uses.
6. Evaluate the village's zoning map
7. Address zoning requirements in the downtown core to promote common construction elements for a unified look to complement anticipated streetscape treatments, taller appropriate infill structures and integrate the Downtown Strategic Plan (2018) initiatives into the requirements.
8. Update, streamline, and clarify development review procedures.

Sign Code

The Village's sign regulations currently do not comply with the Supreme Court's ruling in Reed v. Town of Gilbert issued in 2015. The court determined that sign regulations must be content-neutral (they invalidated the Town's entire sign code as a result). In brief, you'll need to remove regulations that apply to realtor signs, event signs, rummage sale signs and others. And then you'll need to figure out how to accommodate them without call them by name.

In addition, the sign variance procedures are somewhat limited and leave elements such as large industrial lots with directional signage needs with a lack of an amenable process by which to seek relief of sign ordinance regulations. These issues are sought to be remedied through a proposed rewrite.

Following the Reed decision, there have been other lawsuits regarding open-ended questions raised by the Supreme Court's decision. The most recent, Thomas v. Bright, was decided by the 6th U.S. circuit court of appeals. It concluded the on/off premise distinction (included in most sign regulations) is in fact content-based and is therefore subject to a "strict scrutiny" level of review. An appeal is anticipated, and if upheld this ruling will significantly change the way signs are regulated across the country.

4. Proposed Approach

Drafting Principles

While drafting land-use regulations seems fairly straightforward, the result can be less than satisfying if not done well. We will use the following principles in drafting the zoning code:

- Divide the code into logical parts
- Include legislative findings – also called findings of fact
- Include purpose statements to define what the code is intended to accomplish
- Devise a simple scheme for numbering sections
- Use descriptive section headings
- Keep each of the sections short by covering only one topic
- Write simply and clearly
- Use tables and charts
- Incorporate pictures and graphics
- Eliminate inconsistencies and duplicative language
- Develop clear definitions
- Craft the code so subsequent amendments can be easily incorporated
- Eliminate legalese and vague language
- Focus on details in the context of the larger picture
- Differentiate between legislative, quasi-judicial, and administrative decisions
- Establish step-by-step procedures for each of the development review processes
- Include examples where a formula is used
- Keep the code simple – but effective

Our overall approach is intended to create land-use regulations that enjoy broad public support.

Public Participation

Although the importance of public participation is generally understood, it takes experience and sensitivity to local conditions to really do it well and in a cost-effective manner. A successful public participation effort is necessary to garner public support for a project, especially land-use regulations.

Public participation is about connecting with people.

Near the end of this project, the Village Board will need to decide whether or not the proposed zoning code and sign code are in the public interest. We want to make it as easy as possible to cast

an affirmative vote in favor of adoption. For that to happen, they need to feel confident that all the voices have been heard and considered, and that the regulations strike an appropriate balance between potentially competing interests.

As discussed in the scope of services in more detail, a number of tools will be used to first of all gather input and then secondly to share information with Village residents. They include the following:

- Stakeholder listening sessions
- Scoping workshop
- Community open house

Village Staff Involvement

Village staff will play an important role in the successful completion of this project. Although the final list of responsibilities will be negotiated through the contract process, staff could assist with the following tasks:

- Provide background information and documents as may be required
- Offer continuous feedback to the project team
- Review and submit comments on various drafts
- Participate in working sessions with the project team
- Provide notices and secure venues for public meetings
- Give the consultant team a tour of the Village
- Serve as a liaison between the public and consultant

The unique characteristics created by the Village's long history and the resulting wide range of land uses as well as current land demand will be important to consider in the creation of an effective zoning code.

Communication between the project team and Village staff will be critical. During the course of the project, we will be in constant contact to document our progress and accomplishments and to discuss unresolved issues, upcoming milestones, and logistics for completing the project on time.

5. Scope of Services and Deliverables

We have developed a proposed scope of services as outlined below for your consideration and would welcome the opportunity to meet with you and further refine it to meet your needs.

Task 1 – Public Participation Plan

We will develop a public participation plan that describes the ways in which the public and others will be involved in the preparation, review, and adoption of the zoning ordinance. This plan needs to be realistic and solicit public input in cost-effective and meaningful ways.

Deliverables: Public participation plan for Village review and approval.

Task 2 – Project Orientation and Kick-off Meeting

At the onset of the project we will conduct an orientation and kick-off meeting with Village staff, the Plan Commission, and others. Our intent is to confirm the goals of the project, review the timeline for the project, and to identify specific issues the project will need to address.

Deliverables: All required meeting materials, visual presentations, or any other resources or materials.

Meetings: One meeting

Our approach fosters a positive environment for:

- sharing,
- learning,
- creating,
- problem solving, and
- decision-making.

Task 3 – Continuing Coordination. We will maintain constant contact with Village staff and others throughout the process to ensure the project is moving forward consistent with the adopted timeline and resolve any issues that arise during the project. We will provide regular updates and maintain regular contact.

Task 4 – Issue Identification (Project Scoping)

In this task, we will actively solicit input from a wide variety of people and groups regarding current zoning code requirements, administration procedures, zoning code deficiencies, suggested changes and implementation procedures.



4.1 – Stakeholder Listening Sessions. We will conduct confidential listening sessions with key stakeholders, which could include elected and appointed officials, department staff, and representatives of civic organizations, the local chamber of commerce, business groups, neighborhood groups, and the like. We will work with you to identify a list of potential participants.

4.2 – Scoping Session with Village Staff. In this subtask, we will meet with Village staff to identify issues and concerns they may have regarding the code rewrite.

4.3 – General Scoping Session. The consultant team will conduct a workshop for the Plan Commission, and other invited participants to identify issues the new zoning code should address in new or different ways. After that initial exercise, we will work with the workshop participants to identify and evaluate alternative solutions to the key issues. The purpose of this exercise is to develop consensus on what needs to be addressed in the rewrite and sufficient direction to begin drafting the zoning ordinance.

Deliverables: (1) All required meeting materials; (2) one original and 25 copies of a draft and final memorandum summarizing input received during this task; and (3) electronic files (Microsoft Word and PDF) of the draft and final memorandum.

Meetings: Eight stakeholder listening sessions, one work session with Village staff, and one meeting for the general scoping session.

We will ensure that the zoning code fosters development appropriate for the Village.

Task 5 – Background Analysis/Evaluation

5.1 – Review of Comprehensive Plan and other Plans. We will review the Village's adopted comprehensive plan to determine the extent to which the current zoning code conforms to the Village's plan and analyze and document where it does not conform. For those areas of conflict or potential conflict, recommended alternative solutions are sought. Part of this analysis will include the review of the Village's current zoning map to identify areas where there is an inconsistency between the zoning district designation and the desired future land use as recommended in the plans. Part of the following tasks will include proposed "up zonings" and "down zonings" to better conform. Finally, the project team will review the Village's comprehensive plan to determine whether there are regulatory frameworks that would help implement those plans.

5.2 – Review of other Municipal Ordinances. We review other Village regulations (e.g., subdivision and platting, historic preservation, building, utilities and others) to identify potential inconsistencies and gaps. There is a large interest in reviewing other Village regulations pertaining to Planned Unit Developments and finding models which may streamline, as much as possible, the review procedures and timeline to find a process which simplifies the process. The overall intent is to ensure consistency and integration. Recommendations will be provided to address any deficiencies identified in this step.

5.3 – Field Study. The consultant team will complete an on-the-ground visual assessment of the Village to fully understand current land uses and development patterns. It is anticipated that Village staff or another person will take the consultant team on a tour to assist with this task.

5.4 – Review Land Use Decisions Made Under the Existing Code. We will work with Village staff to review a number of recent development projects that were relatively controversial, did not proceed efficiently through the development review process, faced a legal challenge or threats of a legal challenge, or resulted in an undesirable end product. The intent of this task is to identify areas where the current zoning code functions well and where the new code needs to do things differently.

Deliverables: (1) one original and 25 copies of the report and (2) electronic (PDF) file of report.

Meetings: One meeting with the Plan Commission is anticipated to review the written report.

Task 7 – Annotated Outline

We will identify and evaluate new zoning concepts and approaches for potential inclusion in the draft zoning code, with special attention given to addressing the project objectives and the results of the issue identification and zoning code analysis tasks previously described. Based on this information, we will prepare an annotated outline that includes a chapter-by-chapter description of the proposed new zoning code, an overview of the proposed structure and substance of the new zoning code, a discussion of zoning options, and a commentary explaining the rationale for the recommended approach to drafting the zoning code. The annotated outline will include examples of how the new zoning code would be used to implement the recommendations of the comprehensive plan, overlay districts, and neighborhood plans, if any.

The proposed annotated outline will be submitted to Village staff, the Plan Commission, and other Village boards and commissions as deemed appropriate by the Village and others for review and comment. After obtaining general agreement on the contents of the initial draft of the annotated outline, we will prepare a final annotated outline, based on the comments received.

Deliverables: (1) All required meeting materials; (2) one original and 25 copies of the annotated outline; and (3) electronic (PDF) files of all documents.

Meetings: One meeting with the Plan Commission is anticipated to review the annotated outline and solicit feedback.

Task 7 – Preliminary Discussion Draft of Zoning Code (Draft 1)

We will prepare a discussion draft of the zoning code based on the final annotated outline. The new zoning code will be organized into logical topics, which will help create a user-friendly code. The code will include extensive use of graphics, tables, flow charts, matrices, and other methods for facilitating easy use and understanding of the zoning code.



The discussion draft will be presented in distinct modules that will permit easy review. As part of this task, we will evaluate, test, and revise the discussion draft.

Deliverables: (1) All required meeting materials; (2) one original and 20 copies of the preliminary discussion draft of the zoning code; (3) an electronic (PDF) file of the preliminary discussion draft of the zoning code; and (4) an electronic file (ArcGIS) of the zoning map.

Meetings: Five meetings with the Plan Commission are anticipated to review the preliminary discussion draft.

Task 8 – Final Discussion Draft of Zoning Code (Draft 2)

Based on input received from Village staff and Plan Commission, a final draft of the zoning code will be prepared. This draft will be widely distributed to the public for review and comment. Various public meetings will be held to solicit input from the general public, stakeholders, and others.

Deliverables: (1) All required meeting materials; (2) one original and 20 copies of the final discussion draft zoning code text; (3) an electronic (PDF) file of the final discussion draft zoning code text; and (4) an electronic file of zoning map.

Meetings: One meeting is anticipated

Task 9 – Open House

An open house will be held to create an informal setting for residents and others to learn more about the zoning code and to offer their suggestions and comments. Poster sessions will be used to describe the code and what it is intended to accomplish. A formal presentation may be given to highlight the key aspects of the proposed code. Comments collected from this session will be organized and submitted to the Plan Commission for review and consideration. At this point, we would suggest that the open house be held on a weekday from late afternoon into the evening hours to fit the schedule of more residents. Residents tend to like this format because they are able to focus in on those areas that interest them and have their questions answered quickly and efficiently.



Deliverables: All required meeting materials, visual presentations, or any other resources or materials.

Meetings: Open house

Task 10 – Public Hearing Draft Zoning Code (Draft 3)

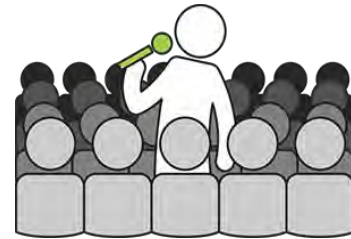
In this step, we will prepare a public hearing draft zoning code and map based on input from the previous steps. In addition, we will prepare an executive summary explaining the public hearing draft and map and changes from the discussion draft and map. The executive summary will be distributed to the general public and the media prior to the public hearing.

Deliverables: (1) One original and 20 copies of the public hearing draft of the zoning code; (2) one original and 20 copies of the public hearing draft zoning code executive summary; (3) electronic (PDF) file of the public hearing draft zoning code and executive summary; and (4) electronic file of the public hearing draft zoning code map.

Meetings: One work session with the Plan Commission

Task 11 – Public Hearing

The consultant team will attend the public hearing at which time the public hearing draft of the proposed zoning code and map will be presented and public input accepted. We will give a presentation regarding the project, explain the proposal, and respond to questions.



Deliverables: None anticipated

Meetings: One public meeting is anticipated

Task 12 – Code Adoption

Civi Tek will attend a Village Board meeting to present the consensus zoning code and map, as recommended by the Plan Commission.

Deliverables: (1) One reproducible copy of the adopted zoning code; (2) an electronic file of the adopted zoning code; and (3) electronic file of the adopted zoning code map in a format acceptable to the Village.

Meetings: One meeting is anticipated.

Task 13 – Training

We will conduct a training session for the staff (up to 15 hours) and also the Plan Commission (up to 10 hours) with the goal of giving staff and commissioners a working knowledge of the code and administrative requirements. The actual number of hours allocated to each will be determined by the Plan Commission in consultation with staff.

Meetings: Up to two work sessions with staff and up to two meetings with the Plan Commission, depending on absences or need to accommodate schedules.

Additional Deliverables

1 – Application Forms. For each of the various types of development review, we will prepare an application form that asks for the type of information required by the zoning code. These will include examples such as for wetland setback variance application forms, tree removal permit application forms and all associated forms to accomplish the mandated Zoning code inclusions. To complete this task, we will work with the Village's current online application provider, BSA Software, to ensure the proposed applications mirror the online applications and changes are completed to reflect the applications created by the consultant.

2 – Sample Documents. Zoning codes often refer to various documents that may be used or that are required. We will provide samples of each. These may include cross-access agreement, shared parking agreement, letter of credit, flooding easement, and more resulting from the outcome of the Scope of Services and resultant code provisions.

3 – Style Guide. One of the reasons many zoning codes read differently over time is that drafting rules (e.g., word usage and capitalization, etc.) are not followed when amendments are made. To help minimize this tendency, we will provide you with a style guide that we used in writing the code. Ideally, this style guide would be referred to when amendatory ordinances are drafted in the future.

4 – Inventory of Nonconformities. Although one of the goals of drafting a new zoning code is to avoid creating nonconformities, it is inevitable that some nonconforming situations may arise. It is important to document known nonconformities as soon as they are discovered. For this task, we will create a database of nonconformities. Data will be derived from existing sources of information, GIS analysis, and information discovered during the public participation process. Once this task is complete, Village staff will then be able to add new records to the database and revise existing records.

5 – Permanent Zoning Code Website

Once the Village Board adopts the zoning code, we will create a permanent ZoningHub website.



6 – Interactive Sign Code

As an additional feature, the essential elements of the Village's new sign code (i.e., what's allowed where) will be integrated into the Village's ZoningHub website. It will be map-based and fully interactive. That means a person will be able to get zoning details AND sign code requirements in the same easy-to-use interface.

6. Proposed Timeline

Before taking on additional work, we evaluate our current workload to ensure that we are able to provide the highest quality service to our current clients and meet the demands of a new project.

Given our current workload and staffing levels, we will be able to complete the project in 16 months, and potentially sooner.

	Month												
Key Tasks	1	2	3	4	5	6	7	8	9-10	11-12	13-14	15-16	
1. Public Participation Plan	■												
2. Project Orientation and Kick-off Meeting	■												
3. Continuing Coordination	■	■	■	■	■	■	■	■	■	■	■	■	
4. Issue Identification (Project Scoping)	■	■	■										
5. Background Analysis/Evaluation	■	■	■										
6. Annotated Outline			■	■									
7. Preliminary Discussion Draft (Draft 1)				■	■	■	■						
8. Final Discussion Draft (Draft 2)								■	■				
9. Open house									■				
10. Public Hearing Draft (Draft 3)										■			
11. Public Hearing											■	■	
12. Code Adoption												■	
13. Training												■	

7. Similar Projects

Wisconsin Rapids Zoning Code Rewrite

Wisconsin Rapids, like many cities, was using an outdated zoning code that worked, but not really. There were internal inconsistencies, contradictory provisions, and missing details. Their code did not include enough guidance for landscaping, making it difficult for developers and staff. For those reasons, and many more, the City decided it was time to undertake the important work of rewriting their zoning regulations.

One of the first tasks, and arguably one of the most important, was to identify the scope of changes and revisions. Scoping efforts included a public meeting with a visual preference survey, informal interviews with key stakeholders, and a diagnostic review of the current code and the city's comprehensive plan.

Understanding the importance of the new code, the City's Planning Commission was very involved in the review of the new code. Monthly work sessions were held to review broad policy issues and nuanced details.

New regulations were incorporated into the overall zoning structure including landscaping and outdoor lighting. In an effort to provide affordable housing options, cottage housing standards and guidelines were prepared.

A project website was developed to help people understand the project objectives and to track the progress from the first day to the last.

Staff Contact: Adam Tegen, Director of Community Development

Adam is now the Community Development Director for the City of Manitowoc.

ategen@manitowoc.org

Project Highlights for Wisconsin Rapids

- Development standards were written to support the City's SolSmart (solar energy) designation
 - Development standards were written to be consistent with the Wisconsin Green Tier Legacy program
 - Development standards were designed to encourage sustainable development
 - Cottage Housing was added as an alternative development option
 - Design standards for commercial and industrial buildings and special standards in the downtown area
 - Implemented the Green Infrastructure Audit Tool to promote and advance green infrastructure implementation
 - Custom graphics
 - Reduced the number of zoning districts
 - Project website
 - Conducted more than 18 working-style meetings with the Planning Commission
 - Used the ZoningHub platform during public participation phase and as permanent front door to the city's zoning regulations
-

Village of Richfield Code Rewrite - Ongoing project

Civi Tek is currently working with a steering committee to revamp the village's zoning regulations. The main objective is to simplify the zoning regulations while maintaining an effective set of regulations. Most notably, we are working to reduce the number of zoning and to reduce/consolidate land uses by 30 percent. In addition, we will be converting three environmental districts to overlay districts to better reflect desired outcomes. Anticipated adoption is in 2019.

Jim Healy, Village Administrator
Village of Richfield
4128 Hubertus Road
Hubertus, WI 53033
262.628.2260
administrator@richfieldwi.gov

Washburn Zoning Code Rewrite Project

Civi Tek worked with the Plan Commission, Mayor, Common Council, City staff, and the public to prepare a new zoning code. Activities include meeting facilitation, public participation, and drafting of the zoning code. The code was adopted by unanimous vote in 2016.

Scott Kluver, City Administrator
City of Washburn
119 Washington Avenue
Washburn, Wisconsin 54891
715.373.6160
washburnadmin@cityofwashburn.org

Winnebago County Zoning Code Rewrite Project

Civi Tek completed a three-year project to rewrite Winnebago County's zoning code, floodplain regulations, shoreland-wetland regulations, and airport overlay zoning regulations. The project team implemented a public participation plan to involve county residents and other stakeholders in the rewrite project and worked with an advisory committee and the Winnebago County Planning and Zoning Committee throughout the entire process.

Jerry Bougie, Planning Director
Brian O'Rourke, Principal Planner
Winnebago County Planning Department
112 Otter Avenue
Oshkosh, WI 54901
920.232.3340
jbougie@co.winnebago.wi.us
borourke@co.winnebago.wi.us

Town of Eagle (Waukesha County) Zoning Code Rewrite Project

Town of Eagle officials worked with Civi Tek to rewrite the Town's zoning code. The goal of this project was to remove internal inconsistencies, update regulations that are now inconsistent with state law and court rulings, improve the code's overall organization, utilize tables and charts, and update definitions. The entire code was rewritten to improve the code's organization and make it more user-friendly. The code was adopted unanimously in 2017.

Don Malek, Town Chair
Town of Eagle
820 E. Main Street

Eagle, WI 53119
262.594.5800
eagletc@townofeaglewi.us

Town of Mukwonago (Waukesha County) Zoning Code Update Project

In addition to the ongoing services Civi Tek provides to the Town of Mukwonago, we are nearing completion of a two-year zoning code update.

Kathy Karalewitz, Town Administrator
Town of Mukwonago
W320 S8315 Beulah Road
Mukwonago, WI 53149
262.363.4555
kkaralewitz@townofmukwonago.us

Wisconsin Dells Zoning Code

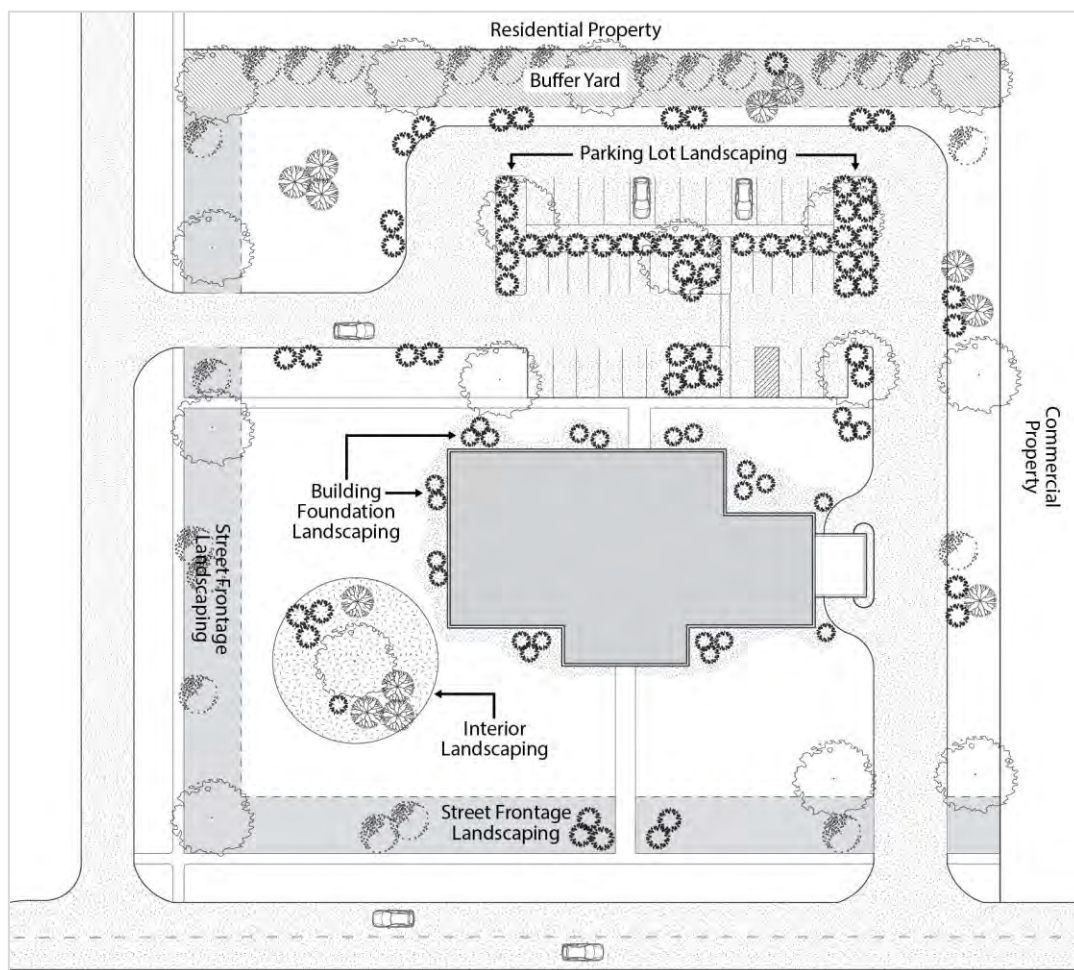
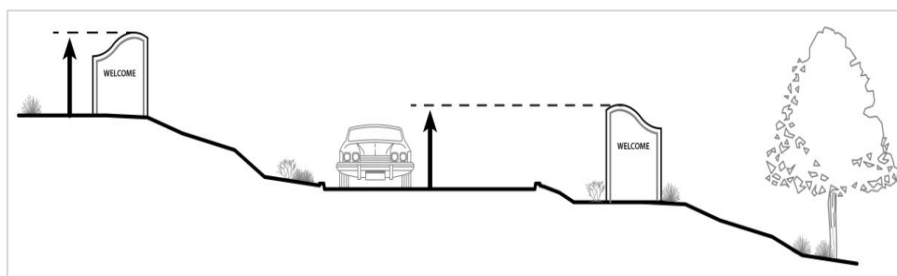
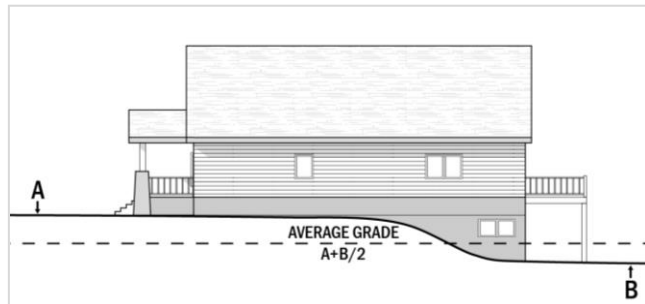
Following adoption of the City's smart growth comprehensive plan, work ensued to update the zoning ordinance to help implement the plan. Given the unique character of this tourism center for the Midwest, innovative approaches were crafted to meet the diverse needs of the community. The City Council adopted the code by unanimous vote in 2007.

Conservation Subdivision Ordinance, Village of North Fond du Lac

This project entailed drafting a set of regulations that would allow conservation subdivision designs on the periphery of the Village. The Village Board unanimously adopted the ordinance in 2002.

8. Sample Code Graphics

In addition to using stock illustrations in our image library, we will create custom graphics for the zoning/sign codes. Below are some samples.

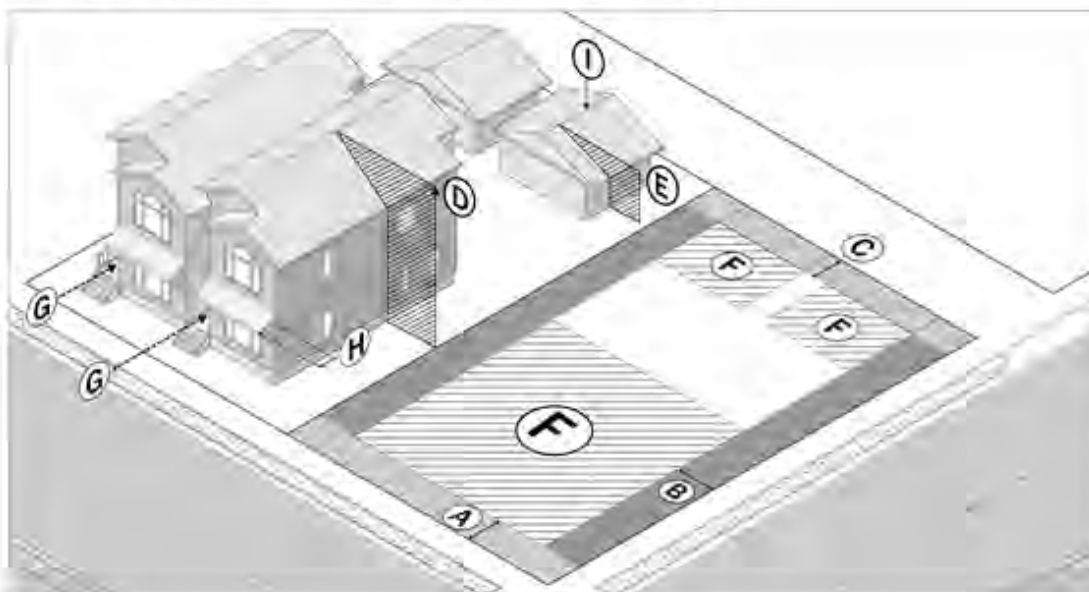


The graphic below is an example of a building type diagram we have used in our zoning codes. As a general rule, there are usually 8 to 10 types, although this number can grow to account for special circumstances. Again, these are samples only.

Two-Family Dwelling		
Building Setbacks	Illustration Symbol	
Front yard setback	A	Minimum distance set by zoning district in Appendix C
Side yard setback	B	Minimum distance set by zoning district in Appendix C
Rear yard setback	C	Minimum distance set by zoning district in Appendix C
Building Height		
Principal building	D	Maximum height set by zoning district in Appendix C
Accessory building	E	Maximum height set by zoning district in Appendix C
Coverage		
Building coverage, principal	F	Maximum amount set by zoning district in Appendix C
Building coverage, accessory	F	Maximum amount set by zoning district in Appendix C
Building Elements		
Entrance to dwelling unit	G	The front entrance to the building must face the street. If the building consists of two or more floors, the entrance to the second floor must be integral to the building's design. An exterior staircase is not acceptable.
Allowable projections in a required setback area	H	Various building features may extend into required setback areas as set forth in s. 11.06.106.
Garage	I	A two-car garage containing at least 400 square feet must be built for each unit at the same time the dwelling units are being constructed. Such garage may be attached or detached.
Roof	-	The roof must have a minimum pitch of 4 to 12, except when a flat roof is integral to the architectural style of the dwelling. An overhang must extend at least 12 inches beyond the face of the exterior wall, except when integral to the architectural style of the dwelling (e.g., saltbox).
Materials	-	The roof must be covered with slate, concrete, clay, or ceramic tiles; wood shingles or shakes; or metal, fiberglass, or asphalt shingles; or standing seam panels. Exterior wall surfaces must be covered with stucco, wood siding, cement-fiber siding, vinyl siding, metal horizontal lap siding, wood shingles, or a masonry veneer. The Planning Commission may approve a special exception authorizing the use of an exterior material not specifically allowed.
Foundation	-	The building must be set on and anchored to a continuous permanent foundation that extends around its perimeter.
Driveways and Parking		
Distance between driveway and adjoining property boundary line	-	Minimum distance set by zoning district in Appendix C
Distance between parking lot and adjoining property boundary line	-	Minimum distance set by zoning district in Appendix C

Notes:

1. Also see Appendix B for any supplemental requirements related to this specific building type.





Proposal

Zoning Chapter & Sign Ordinance Rewrite

Mukwonago, Wisconsin

February 2020



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◆ SECTION 2	Project Team 2-1
◆ SECTION 3	Scope of Services 3-1
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2514 S 102nd Street
West Allis, WI 53227
(414) 336-7900
www.foth.com

February 2020

Ben Kohout
Village of Mukwonago
440 River Crest Ct.
Mukwonago, WI 53149

Dear Mr. Kohout:

RE: Village of Mukwonago Zoning Chapter and Sign Ordinance Rewrite Services

Foth is pleased to respond to the Village of Mukwonago's Request for Proposal for a comprehensive rewrite of the Village's Zoning and Sign Ordinances. We are confident that our breadth of local zoning and sign ordinance projects, strong public participation facilitation skills, and experienced professional planning staff will enable us to work efficiently and effectively in reviewing and updating the Village's Zoning and Sign Ordinances.

Foth is happy to offer a team of members working out of our Milwaukee office to assist with this effort. Mr. Sumwalt will be the Project Manager and main point of contact for the Village. Mr. Sumwalt is a professional planner certified by the American Institute of Certified Planners (AICP), and a dedicated team leader. Over the past twelve years, Mr. Sumwalt has had the opportunity to manage projects in both the public and private sectors. Mr. Sumwalt currently serves as Village Planner for the Village of Salem Lakes, WI where he has prepared Housing Affordability and New Housing Fee Reports in compliance with Act 243, updated all Village zoning and land division applications, reviews development proposals for compliance with Village plans, policies, and codes, and provides staff support and assistance to boards and commissions. Mr. Sumwalt is also currently managing Mukwonago's Downtown Streetscaping Enhancement Plan with Wayfinding Signage. Mr. Sumwalt has an enthusiastic personality suited for your project's success and a proven record of achieving results when working with multiple stakeholders including community businesses, the general public, and elected officials.

Foth is excited about the opportunity to further our work with the Village of Mukwonago. We believe you will find Mr. Sumwalt and his supporting team's work to be personalized and client-centered. Foth will be fully invested in Mukwonago during this process to assure a successful and distinctive outcome that is sure to gain results unlike any other firm.

Should you have any questions or need any additional information to assist you in making your decision please do not hesitate to contact me by phone at (414) 336-7915.

Sincerely,
Foth Infrastructure & Environment, LLC

Orrin Sumwalt, AICP
Project Manager
Orrin.Sumwalt@foth.com

1 | Project Understanding



Foth understands the Village of Mukwonago desires a qualified consultant to conduct a public process to develop a new Zoning and Sign Ordinance. Through this effort the Village is looking for a consultant to deliver final documents that reflect the desired expectations of the community as determined by citizens, appointed/elected officials, landowners, business leaders, developers, and other stakeholders. Inclusive and engaging public participation will be paramount to the success of the Ordinance updates.

Foth has had the great opportunity of working with staff, volunteer committee members and elected officials on the Village's Downtown Streetscaping Enhancement Plan and Wayfinding Signage project. We've demonstrated innovative and effective public participation facilitation through a well-attended and engaging downtown design charrette. Our firsthand knowledge of the challenges and opportunities facing Mukwonago's downtown, coupled with our experience engaging with Mukwonago stakeholders will help us facilitate community involvement in the Village's Zoning and Sign Ordinance updates.

Services Foth anticipates providing as part of the Zoning and Sign Ordinance update include, but are not limited to, the following:

- ▶ Graphics and drawings to increase reader comprehension
- ▶ Reviewing existing codes and providing updates as well as full revisions where required
- ▶ Complete public meetings and workshops to engage stakeholders of the codes
- ▶ Incorporate Zoninghub updates
- ▶ Incorporate needs of Downtown Development Committee and the Downtown Strategic Plan
- ▶ Incorporate the Comprehensive Land Use Plan
- ▶ Review the downtown area for possible increased heights of structures and other unifying design standards
- ▶ Work with Village Staff in implementation
- ▶ Utilize members from the Village's Plan Commission, Village Board and associated Village Committees
- ▶ Restructure and reformat the code in cooperation with the present MuniCode
- ▶ Eliminate inconsistencies, such as zoning terms and definitions referenced throughout the entire code
- ▶ Evaluate the village's zoning map
- ▶ Create compliance with the Supreme Court's ruling in Reed v. Town of Gilbert issued in 2015.
- ▶ Include legislative findings – also called findings of fact
- ▶ Use tables, charts, pictures, graphics for clarity of concepts
- ▶ Craft so subsequent amendments can be easily incorporated
- ▶ Keep the code simple – but effective

2 | Project Team

Foth employs a team that has decades of experience in community planning and economic development. The professionals employed for this zoning code rewrite project for the Village have led numerous efforts that will translate into producing exceptional outcomes for the community.

The Foth Team consists of creative individuals who are ready to lead Mukwonago with new and innovative ideas to meet the desired goals. Our staff is well versed on the environs of the Village and are currently assisting the community in STH 83 area streetscaping services.



Village of Mukwonago

Ben Kohout
Planner / Zoning Administrator

Project Manager

Orrin Sumwalt, AICP
Point of Contact, Code Author, & Engagement

Associate Planners

Jeff Muenkel, AICP CECd EDFP
Code Author & Engagement

Shaun Mularkey
Graphics Production, GIS, & Engagement



Project Team Cont.

At Foth, every solution starts with you.

Founded in 1938 in Green Bay, Wisconsin, Foth offers a tradition of personalized, client-centered service and smart solutions to a variety of government, industrial and commercial clients. The Foth members as part of the project team for Mukwonago include certifications as Economic Developers (CEcD), EcDev Finance Professionals (EDFP), and Planners (AICP).



Project Manager
(Point of Contact, Code Author, & Engagement)

Orrin Sumwalt, AICP

Mr. Sumwalt has 12 years of experience serving municipal governments as a planner in both the public and private realms. Orrin has overseen the many facets of a planning department's daily operations and executed long range planning efforts over his career delivering updated ordinances and new zoning codes in order to guide local community development visions. Mr. Sumwalt is skilled in outdoor recreation planning, zoning administration, development review, comprehensive plan development, and public engagement. Representative projects include Mukwonago Streetscaping, City of South Milwaukee Zoning Code Rewrite, Village of Caledonia Zoning Code Rewrite, and Ongoing Planning Services for the Village of Salem Lakes, WI.

B.A. Land Use Planning, University of Wisconsin-Stevens Point, WI



Planner
(Code Author, & Engagement)

Jeff Muenkel, CEcD AICP EDFP

Mr. Muenkel has 19 years of experience in a wide range of community planning initiatives in the public and private sectors. A specialty of Mr. Muenkel is in economic development initiatives including collaborative public engagement techniques. He is a Certified Economic Developer (CEcD) and has also earned certifications as a Professional Planner (AICP) and Economic Development Finance Professional (EDFP). Representative projects include Alliant Energy Business Park/Site Certification Creation, Village of Caledonia Zoning Code Rewrite, City of South Milwaukee Zoning Code Rewrite, and numerous economic development plan creations.

B.A., Urban Studies, University of Wisconsin-Green Bay, 1999



Planner
(Graphics, GIS, & Engagement)

Shaun Mularkey

Mr. Mularkey has 19 years community planning experience including ordinance revision, design guidelines and codes, comprehensive plans, neighborhood revitalization and district plans, urban design and streetscaping, site development plans, public participation, and development review. Mr. Mularkey's also has specialties in GIS mapping and analysis as well as being proficient in graphic design. He will be instrumental in supplying GIS and graphic needs for the Mukwonago zoning code rewrite as well as aid in public facilitation. Representative projects include the Village of Caledonia Zoning Code Rewrite, City of South Milwaukee Zoning Code Rewrite, and Ongoing Planning Services for the Towns in SE Wisconsin.

B.A. Architectural Studies, University of Wisconsin-Milwaukee, WI
Master of Urban Planning, University of Wisconsin-Milwaukee, WI

3 | Scope of Services

Please find below the proposed scope of services to complete the Zoning and Sign Ordinance Rewrite for the Village of Mukwonago. You will find that Foth has outlined a process they believe can be completed in one (1) year. Further, a variety of services are outlined in slight alteration to the Village's proposed scope in the RFP that the Foth Team believes will give added quality to the outcomes.

A.1 Project Orientation and Kickoff

Kickoff meeting with the plan commission, village staff, and village board members (Mtg#1)

- ▶ Discuss and refine timeline & community engagement plan
- ▶ Layout project expectations
- ▶ Identify Issues and Opportunities

A.2 Community Engagement Plan & Approach

- ▶ Plan Commission Review and Recommendation of Public Engagement Plan (Mtg #2)
- ▶ Village Board Consideration and Adoption of Public Engagement Plan (Mtg #3)

Deliverables:

- Community Engagement Plan (hard copy and electronic)

A.3 Background Analysis/Evaluation

- ▶ Review adopted Village plans & municipal ordinances
- ▶ Comparison with comparable community's codes
- ▶ Field Study
- ▶ Stakeholder Interviews (Mtg #4)
- ▶ Scoping Session with Village Staff (Mtg #5)
 - Review land use decisions made under existing code with Village staff
- ▶ General Scoping Session with Plan Commission (Mtg #6)
- ▶ Present Analysis Memo and Annotated Outline to Plan Commission

Deliverables:

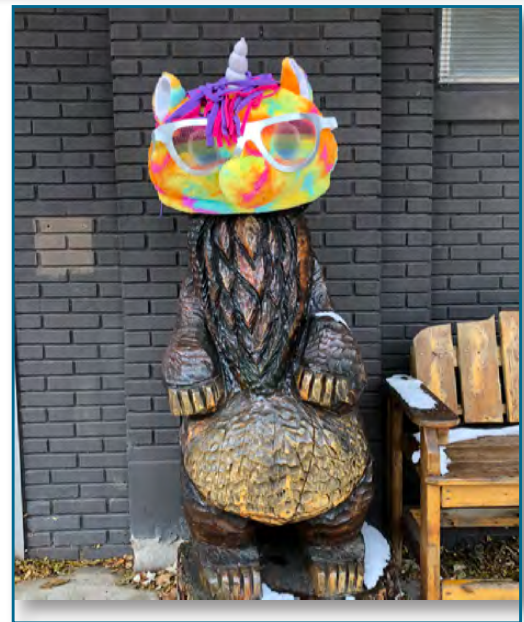
- Analysis Memo (hard copy and electronic)
- Annotated Outline (hard copy and electronic)

A.4 Preliminary "Discussion" Draft

- ▶ Work Session with Plan Commission (Mtg #8)

Deliverables:

- Draft 1 zoning code (hard copy and digital)
- Draft 1 zoning map (hard copy, digital, and electronic file "GIS")



Scope of Services Cont.

A.5 Final “Discussion Draft”

- ▶ Public Open House

Deliverables:

- Notes from public open house
- Draft 2 zoning code (hard copy and digital)
- Draft 2 zoning map (hard copy, digital, and electronic file “GIS”)

A.6 Public Hearing Draft Zoning Code

- ▶ Work session with Plan Commission (Mtg #10)

Deliverables:

- Executive Summary (hard copy and digital)
- Draft 3 zoning code (hard copy and digital)
- Draft 3 zoning map (hard copy, digital, and electronic file “GIS”)

A.7 Public Hearing

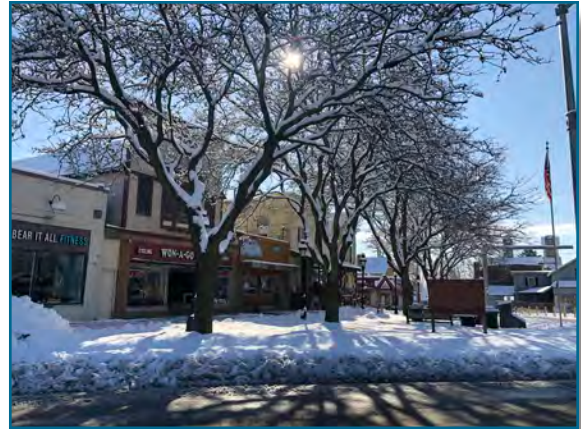
- ▶ Public Hearing for draft zoning code at Plan Commission (Mtg #11)

A.8 Final Preparation & Presentation

- ▶ Present final zoning code and map to the Village Board (Mtg #12)
- ▶ Update “Zoning Hub”
- ▶ Staff training session (Mtg # 13)
- ▶ Plan Commission Training Session (Mtg #14)

Deliverables:

- Adopted Zoning Code (hard copy and digital)
- Adopted Zoning Map (electronic file “GIS”)
- “Zoning Hub” website updated accordingly



4 | Timeline

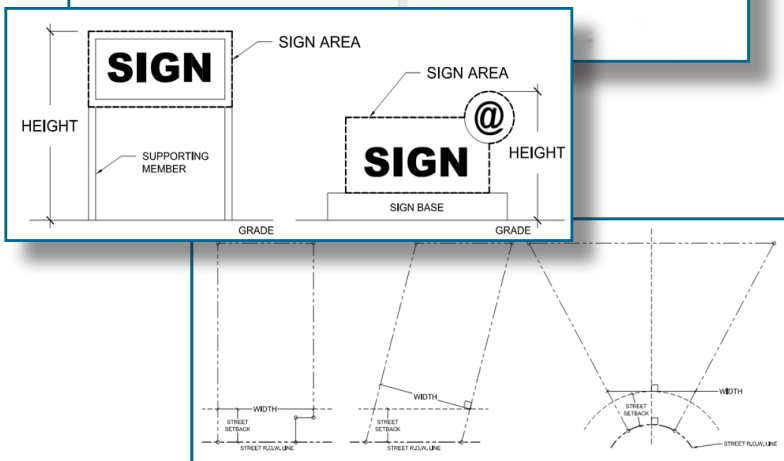
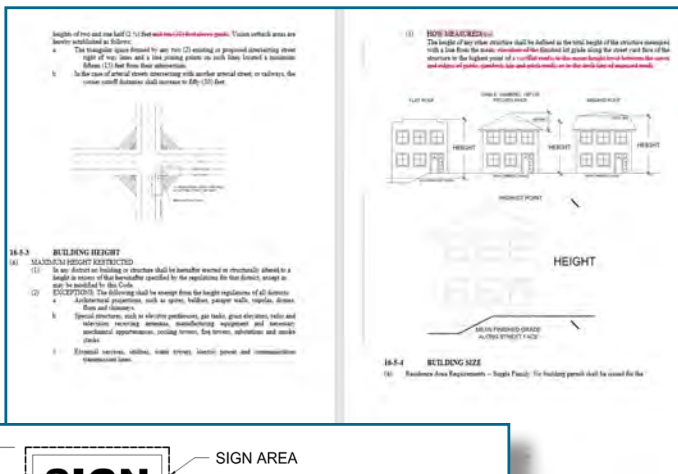
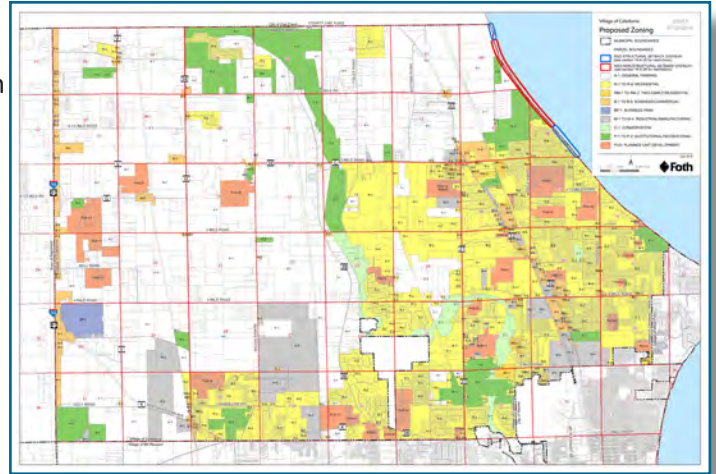
Given our current workload we propose the project to be successfully completed within a twelve (12) month time-frame as outlined below. The Project Team can begin work on March 19, 2020 with an anticipated completion date of March 2020.



5 | Project References

Village of Caledonia, WI Zoning Code Rewrite

The Village of Caledonia, WI has been under a version of Racine County zoning since the Village's incorporation from being a Town in the early 2000s. Foth provided a comprehensive assessment of the existing code and created a brand new zoning code applicable to the Village's development direction of today. GIS was heavily used in determining unneeded and unused zoning districts. New sets of allowed land uses in each district were found. The code was produced with new graphical representations allowing clearer direction to the users of the code. Sign codes were reproduced meeting "Reed vs. The Town of Gilbert" case and the zoning directly applies to the goals for development found in the Village's adopted Comprehensive Land Use Plan. Foth implemented a new set of design standards in coordination with the code that sets forth design development standards for all uses in the Village. Lastly, Foth created a ZoningHub website for the new code. The Caledonia code is currently under final review for adoption in the community.



Project References Cont.

City of South Milwaukee Zoning Code Rewrite

Foth is currently engaged in developing a new zoning and sign code for the City of South Milwaukee, WI. A variety of goals are being met during this process including:

- Provide statutory updates throughout including conditional uses, telecommunication towers, variances, signage, and nonconforming uses;
- Meeting Comprehensive Plan objectives;
- Update commercial and industrial land use definitions;
- Establish (re)development standards for existing sites that recognize the difference between green development and site reuse; and
- General modernization of the code in the context of the existing zoning district framework.

The new code includes use of graphic representations to tell code stories as well as aid in GIS mapping updates and assessments as needed. A set of zoning matrices are also created to easily show allowances of land uses in each proposed zoning district. The City of South Milwaukee zoning code is currently under review for future adoption.



Section ____: Commercial Land Use Types

- 1) **Medical Office and Clinics:** Land uses which provide diagnosis and treatment for medical, dental, or psychiatric outpatient care. Examples of such land uses include, but are not limited to doctor's offices and clinics, dentist's offices and clinics, urgent care clinics, drug treatment clinics, plasma donation centers, blood donation centers, dialysis centers, veterinary clinics, and related land uses.

Conditional use regulations (SO):

- 1.
- 2) **Neighborhood Personal or Professional Service:** Land uses whose primary function is the provision of services directly to an individual on a walk-in or on-appointment basis, entirely within an enclosed building with a footprint smaller than 1,800 square feet. Examples of such land uses include, but are not limited to, professional services, insurance services, realty offices, financial services, barber shops, beauty shops, and related land uses. (These uses do not include "tattoo or body piercing establishments", or "other personal sales and service", pawnshops or convenient cash and similar businesses.
- 3) **Personal or Professional Service:** Land uses whose primary function is the provision of services directly to an individual on a walk-in or on-appointment basis, entirely within an enclosed building with a footprint of 1,800 square feet or greater. Examples of such land uses include, but are not limited to, professional services, insurance services, realty offices, financial services, catering services, barber shops, beauty shops, and related land uses. (These uses do not include "tattoo or body piercing establishments", or "other personal sales and service", pawnshops or convenient cash and similar businesses.
- 4) **Neighborhood Indoor Sales and Service:** Land uses which conduct or display sales or rental merchandise or equipment, or non-personal or non-professional services, entirely within an enclosed building with a footprint smaller than 1,800 square feet. This includes general merchandise stores, grocery stores, bait shops, sporting goods stores, antique stores, gift shops, laundromats, art and artist studios, bakeries, and the like. Artisan craft production such as consumer ceramics, custom woodwork, or related sales are regulated as "personal sales and service." (These uses do not include pawnshops or convenient cash and similar businesses.)

- 5) **Indoor Sales and Service:** Land uses which conduct or display sales or rental merchandise or equipment, or non-personal or non-professional services, entirely within an enclosed building with a footprint of 1,800 square feet or greater. This includes general merchandise stores, grocery stores, bait shops, sporting goods stores, antique stores, gift shops, laundromats, art and artist studios, bakeries, and the like. Artisan craft production such as consumer ceramics, custom woodwork, or related sales are regulated as "personal sales and service." (These uses do not include pawnshops or convenient cash and similar businesses.)

Land Use	Neighborhood Personal or Professional Service	Personal or Professional Service	Neighborhood Indoor Sales and Service	Indoor Sales and Service
Medical Office and Clinics				
Neighborhood Personal or Professional Service				
Personal or Professional Service				
Neighborhood Indoor Sales and Service				
Indoor Sales and Service				
Other Personal Sales and Service				
Long Term Outdoor Display and Sale				
Indoor Maintenance Service				
Outdoor Maintenance Service				
In-Vehicle Sales and Service				
Indoor Commercial Entertainment and Service				
Commercial Indoor Lodging Facility				
Group Day Care Center (9+ Children)				
Commercial Animal Boarding Facility and Dog Daycare				

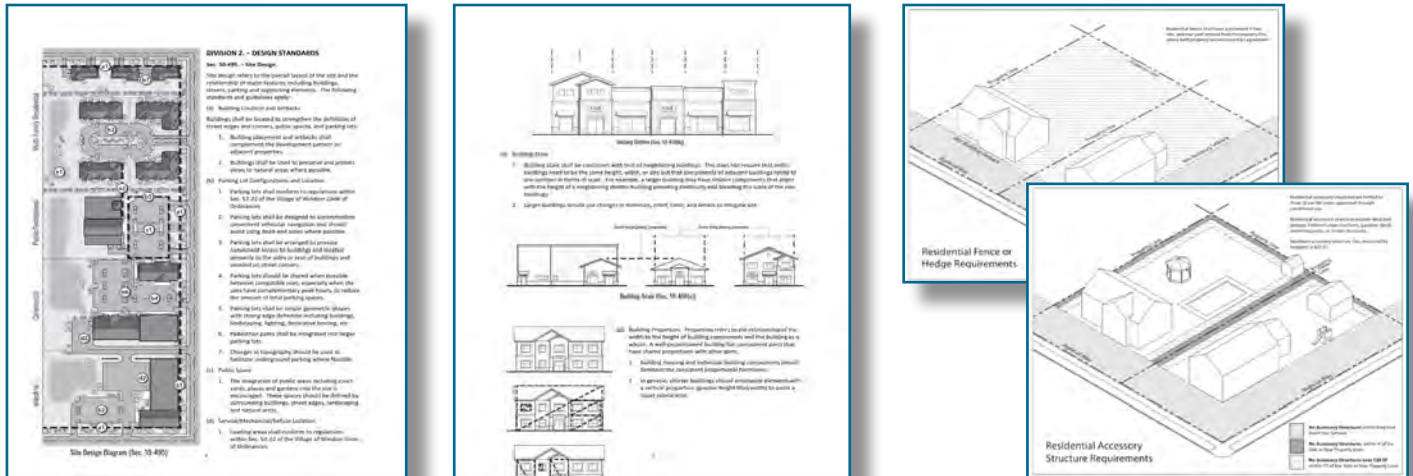
South Milwaukee Zoning Matrix

Existing Districts	R-A Residential District	R-B Residential District	R-C Residential District	C-1 Neighborhood Commercial District	C-2 General Commercial District	C-3 Central Commercial District	LI Limited Industrial District	GI General Industrial District	I Institutional District	P Park District
Land Uses										
COMMERCIAL LAND USES										
Medical Offices and Clinics					P					
Neighborhood Personal or Professional Service				P	P	P				
Personal or Professional Service					P	P				
Neighborhood Indoor Sales and Service				P	P	P				
Indoor Sales and Service				P	P	P				
Other Personal Sales and Service					C					
Long Term Outdoor Display and Sale					C					
Indoor Maintenance Service				P	P	P				
Outdoor Maintenance Service								C		
In-Vehicle Sales and Service				C	C	C				
Indoor Commercial Entertainment and Service				C	C	C				
Commercial Indoor Lodging Facility					C	C				
Group Day Care Center (9+ Children)				C	C	C				
Commercial Animal Boarding Facility and Dog Daycare					C		C			
P = Permitted Use										
C = Conditional Use										
Empty Cell = Prohibited Use										

Project References Cont.

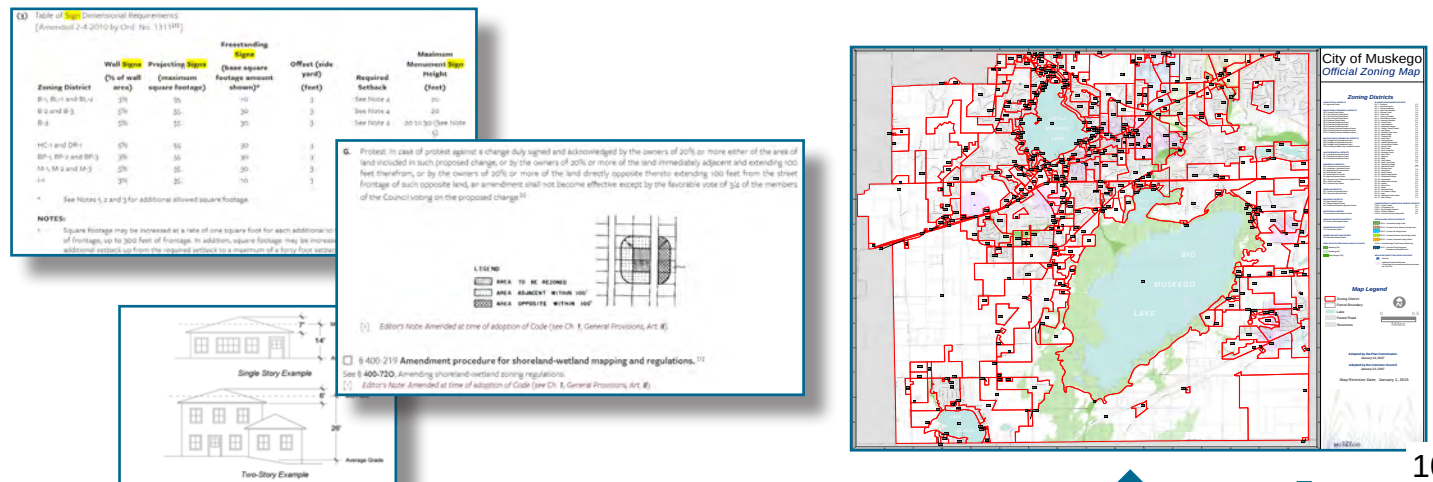
Village of Windsor Zoning Code Rewrite

The Village of Windsor, WI was previously under Dane County zoning and the City of Sun Prairie Extraterritorial Zoning. Foth brought together the best from both ordinances while minimizing nonconforming uses along the way. Preparation of the Village's Shoreland/Floodplain zoning ordinance also took place during this project. The new code is fully implemented today and includes multiple graphical representations to guide residents and developers on appropriate positioning and design. Zoning for both rural and urban areas were required along with opportunities for downtown development encouragement such as planned unit developments.



City of Muskego Zoning & Sign Code Rewrite

Mr. Jeff Muenkel personally authored a new zoning code for the City of Muskego that included a sign ordinance update meeting the content requirements set forth in the "Reed vs. the Town of Gilbert" case. Past zoning districts were removed and new opportunity districts were created (planned developments, conditional overlay districts, etc.). New graphical layouts portraying codes in an easier to understand format were laid out and a cleaner zoning map was produced. The code was coordinated with the City's adopted Comprehensive Plan land uses allowing developers a precise guide for direction on future development patterns desired throughout the community in both urban and rural areas.



6 | Why The Foth Team?

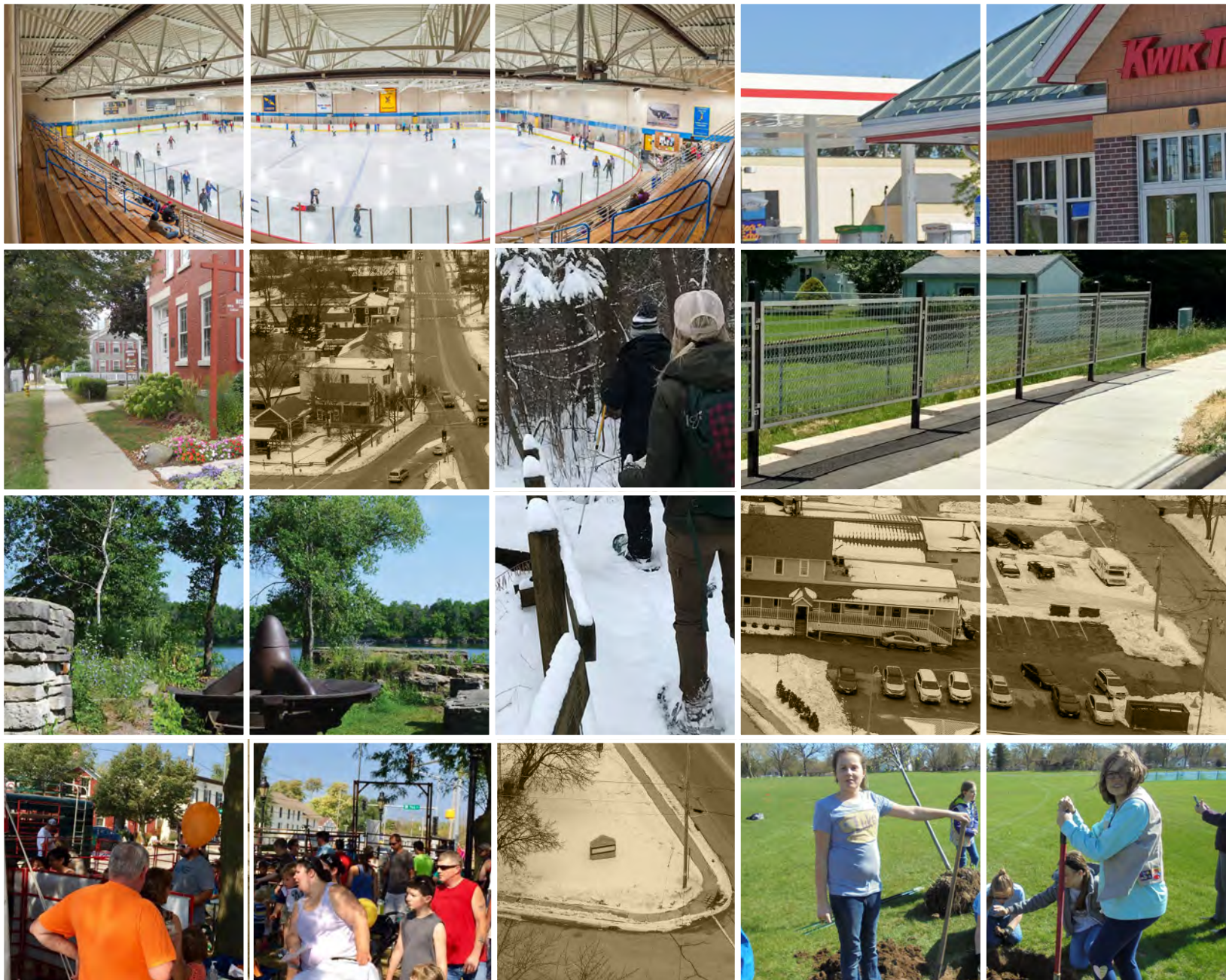
- **RECOGNIZED EXPERIENCE** – Team of professional certified planners and economic developers (AICP CEcD).
- **RELATIONSHIPS** – Decades of projects over state leads to many relationships with residents, governments, and commissions including existing relationships in Mukwonago today!
- **PLANNING UNDERSTANDING** – We’re planners authoring and administering zoning codes already - we understand the goals for Mukwonago.
- **INNOVATIVE THINKING** – We can adapt to the existing needs of the community whether it is employing unique quality audience engagement, creating design standards, or implementing zoning hub.
- **RECOGNIZED COMMITMENT**– Central point of contact ready to serve your community.
- **INGENUITY** – On forefront of technology techniques and able to deliver your GIS and graphic needs.
- **VALUE** – We believe we can get you more value with our team knowledge compared to a comparable consultant.
- **PUBLIC SECTOR PERSPECTIVE** – Team from the public sector and understands balance of government!
- **PROVEN TRACK RECORD** – Our projects get implemented by our clients leading to their new investments.



Budget

Foth proposes a total fixed fee amount of **\$64,900** to complete the tasks identified in the Scope of Services presented herein. This cost includes all reimbursable expenses.





Response to Request for Proposals VILLAGE OF MUKWONAGO ZONING AND SIGN ORDINANCE REWRITE

February 14, 2020



VANDEWALLE & ASSOCIATES, INC.

Madison Office: 120 East Lakeside Street / Madison, WI 53715
 Milwaukee Office: 247 Freshwater Way, Suite 530 / Milwaukee, WI 53204
 Primary Contact: Mike Slavney / (608) 255-3988 / mslavney@vandewalle.com



CONTACT INFORMATION

Principal-In-Charge

Mike Slavney, FAICP / mslavney@vandewalle.com

Madison Office:

120 E. Lakeside Street
Madison, WI 53715
(608) 255-3988 Phone
(608) 255-0814 Fax

Project Manager

Ben Rohr, AICP / brohr@vandewalle.com

Milwaukee Office:

247 W Freshwater Way, Suite 530
Milwaukee, WI 53204
(414) 988-8654 Phone

STATEMENT OF INTEREST

Benjamin Kohout, Village Planner
Village of Mukwonago
440 River Crest Court / Mukwonago, WI 53149

RE: RFP for Village of Mukwonago Zoning Chapter and Sign Ordinance Rewrite

Dear Mr. Kohout:

On behalf of the Vandewalle & Associates' team, I am pleased to present our attached proposal for the Village's Zoning Code Update. We have thoroughly reviewed the RFP and have prepared a detailed proposal to address all of the Village's requirements on time and on budget. While our proposed organization, approach, and project timeline are specific to Mukwonago, they are based on a highly successful approach that we have used in crafting hybrid use-based/form-based development codes for more than twenty communities throughout Wisconsin. We will utilize a process that provides for meaningful input by staff, elected officials, businesses, neighborhoods, and interested citizens. The result will be a new Zoning Code that is thoroughly customized to forward the Village's plans and facilitate the type of development desired.

The award-winning staff on our Project Team offers an unmatched wealth of experience, including:

- A deep understanding of the connection between planning, zoning, land division, economic development, and redevelopment. We will leverage Vandewalle & Associates' focus on revitalizing central urban cores, older neighborhoods, and aging commercial corridors in crafting zoning provisions that respond to market conditions and stimulate reinvestment.
- The ability to craft zoning standards and procedures that not only serve to protect and enhance community character and neighborhoods, but also provide flexibility and encourage significant new development, infill development, and redevelopment in appropriate locations. Our more than 40 years of experience in communities throughout Wisconsin plays an essential role in this knowledge base.
- Dynamic public participation processes that are a hallmark of Vandewalle & Associates.
- A team of planning and legal professionals with a long history of working together to successfully address the practicalities of developing and administering zoning regulations, with expertise in the unique statutes and case law governing land use controls in the state of Wisconsin. This includes:
 - Recently-enacted Wisconsin Act 67 regarding conditional use standards, nonconforming structures, and required lot combination;
 - Recently-enacted Chapter ACTP 72 which requires Tourist Rooming Houses to be permitted by right in all single-family residential dwellings throughout the state;
 - Wisconsin Act 391 which includes provisions regarding zoning interpretations, zoning amendment notification, building permits in shoreland areas, and the requirement for 2/3 majority vote for adopting code or map revisions that result in a downzoning; and,
 - Wisconsin's unique "consistency requirement" in relation to all zoning code and map amendments, including comprehensive code rewrites.
- A principal planner with 37 years of experience in preparing a full range of land development ordinances and serving as local planning and zoning staff on the front lines of development review and zoning administration.

We appreciate your interest in working with our firm. If you have any questions or need more information, please do not hesitate to contact me at 608-255-3988 or at mslavney@vandewalle.com.

Sincerely,



Mike Slavney, FAICP, Principal Planner
Vandewalle & Associates, Inc.

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SUMMARY OF THE PROPOSAL

About Vandewalle & Associates: Since our founding in 1976, Vandewalle & Associates consistently has been a leader in providing zoning codes that are designed to implement local plans by carefully responding to local economies, local resources, and local leadership. We have prepared over 40 Zoning Code Updates, primarily in Wisconsin. Selected project examples and references include the City of Wausau, Village of Oregon, City of Fort Atkinson, and the City of Delavan.

Project Team: Mike Slavney, FAICP, Principal-in-Charge; Ben Rohr, AICP, Project Manager, Assistant Planner; Meredith Perks, Assistant Planner; Elona Bartnick, Associate Urban Designer; and Dan Eckberg, AICP, GIS Planner.

Project Understanding: Based on the Village's Request for Proposals, our experience in numerous Wisconsin communities, and our preliminary review of Mukwonago's existing Zoning Ordinance and Map, we recommend a Zoning Code Update that:

- Helps implement the vision, goals, and objectives of adopted community plans such as the Downtown Strategic Plan and Comprehensive Land Use Plan
- Is readily transferrable to Zoning Hub
- Reorganizes the ordinance to match the typical development process and combines similar Articles and Sections to improve user-friendliness
- Includes zoning districts tailored to Mukwonago's unique areas, neighborhoods, and districts, such as the development along the lake, Interstate interchange, and Village Center
- Builds on the existing and integrates more building design standards to ensure high-quality development, while still allowing for and promoting flexibility and creativity for business and property owners
- Increases the number of user-friendly graphics and tables that clearly explain zoning regulations
- Provides internal consistency and clarifies regulations for permitted uses, special uses, conditional uses, and temporary uses
- Incorporates best practices from around the state, including urban design standards, form-based components, landscaping point system, and provisions for bicycle and pedestrian facilities
- Updates signage regulations to comply with *Reed v. Gilbert* and incorporates the latest state and federal regulations and case law that impact land use regulation by local governments

The V&A Approach:

- User-friendly zoning ordinance tailored to each community
- Time-tested strategies to ensure a smooth adoption process
- Proven approach for public outreach and review
- Quality control procedures and professional project management techniques
- Summary and technical memos to guide decision-making
- Multiple layers of product review
- A history of firm and staff continuity
- A commitment to meet budgets and deadlines
- Expert facilitation at all public meetings
- On-going support
- Strong staff and Plan Commission engagement

Timeline: Vandewalle & Associates is prepared to deliver a Zoning Ordinance Rewrite and Map that will be ready to be adopted by the Village Board in July 2021.



VANDEWALLE & ASSOCIATES

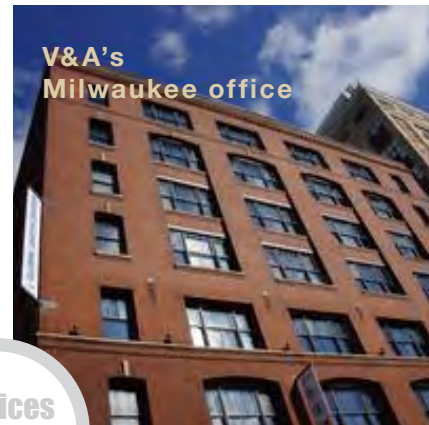
WHO WE ARE

Top-level teams turning assets into economic opportunities, transformational projects, and impactful solutions

Vandewalle & Associates is a collection of passionate professionals with expertise in disciplines that converge to best impact change and make places work better for people:

- **Community planning and zoning**
- **Sign regulations**
- **Comprehensive planning**
- **Intergovernmental relations**
- **Development review**
- **Multi-layered asset analysis**
- **Economic strategy**
- **Market analysis**
- **Redevelopment**
- **Design and Architecture**
- **Marketing**
- **Real estate**
- **Public-private partnerships**

Established in 1976, V&A has been a Midwest leader in community planning, zoning, public participation, place-based analysis, economic strategies, visioning, planning, and implementation for more than 40 years. We work in partnership with our clients to identify core, place-based opportunities and translate them into strategic plans, innovative projects, and custom regulations.



2 offices
40+ years



FIRM QUALIFICATIONS

Vandewalle & Associates is headquartered in Madison, Wisconsin with a second office located within the Global Water Center in downtown Milwaukee, Wisconsin. Our firm is comprised of over 25 talented professionals, including land use, economic development, and real estate specialists, community and regional planners, urban designers, and redevelopment experts. Together, this multi-disciplinary team provides a comprehensive range of creative solutions and services that foster economically, socially, and environmentally sustainable growth patterns to preserve and enhance quality of life.

Vandewalle & Associates has developed unparalleled experience in municipal planning and plan implementation, working with cities and villages throughout the state. **This experience has led to expertise in designing and custom tailoring regulations, plans, and public participation strategies to best fit the unique needs of each community.** Over the last 40+ years V&A has honed a talented team that is well versed in engaging diverse sets of stakeholders, uncovering opportunities, analyzing solutions, and outlining strategic directions and plans that positively impact the community.

Since Vandewalle & Associates' founding in 1976, we have consistently been leaders in providing codes that are designed to implement local plans through careful response to local economies, local resources, and local leadership. We have led the Midwest in the following:

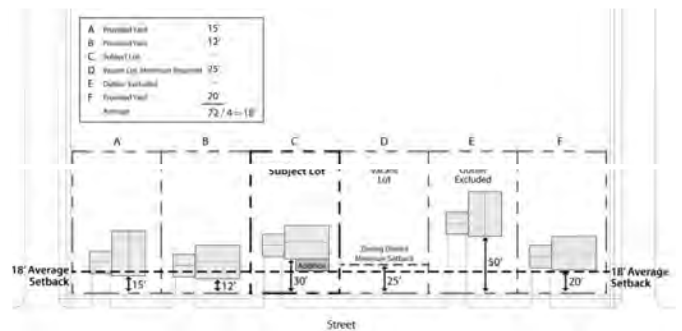
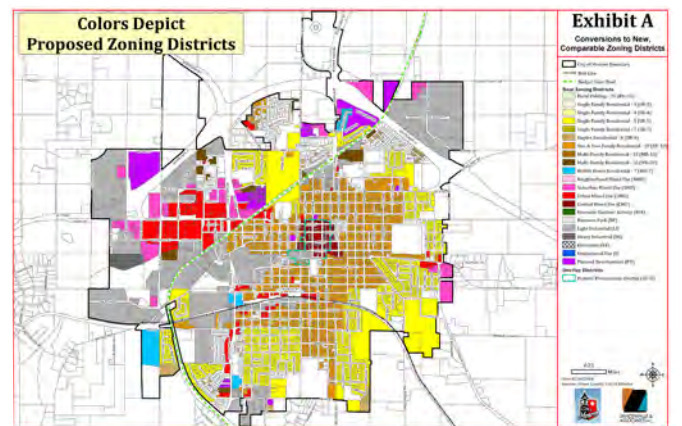
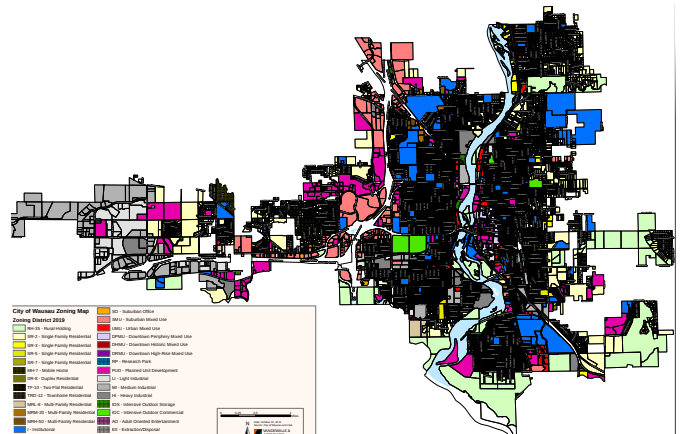
- **Creating ordinances that are easy to administer** in communities with busy planning staff
- **Forwarding building, site, neighborhood, and community design, and character objectives** through standards, graphics, and procedures customized for each municipality
- **Furthering economic development goals** by incorporating clear procedures and flexible land use regulations to provide market-responsive development opportunities
- **Establishing point-based landscaping programs** that emphasize street frontage, parking lots, and building foundation plantings, as well as zoning district bufferyards
- **Developing award-winning sign regulations** that fully respond to the landmark *Reed v. Gilbert* U.S. Supreme Court decision



ZONING EXPERIENCE

Vandewalle & Associates' staff takes great pride in its ability to implement our client communities' goals and objectives through ordinance preparation. Our team includes nationally recognized experts in zoning and subdivision regulations. Our expertise and knowledge in both time-tested and cutting edge regulatory techniques enable us to craft ordinances that are easy to administer and match changing development trends. Since Vandewalle & Associates' founding more than 40 years ago, we have consistently been leaders in providing codes that are designed to implement local plans by carefully responding to local economies, local resources, and local leadership. Led by Mike Slavney, Vandewalle & Associates typically works on one or two of these major projects each year. Mike has been specializing in this work since the 1984 Unified Development Ordinance for the City of High Point, North Carolina (population 85,000). Mike has also served as the Citizen Chair on the City of Madison's Zoning Code Rewrite Committee - This effort focused extensively on exploring the latest national best practices in form-based codes and sustainability, contending with Wisconsin's "consistency requirement," and accommodating the often-extensive involvement of neighborhood associations in zoning-related actions.

The table below shows a sampling of the ordinances that we have completed.



Zoning Ordinances

Village of Cross Plains, WI

Village of Darien, WI

City of Darlington, WI

City of Delavan, WI

Village of East Troy, WI

City of Edgerton, WI

City of Evansville, WI

Village of Fontana, WI

City of Fort Atkinson, WI

Town of Germantown, WI

City of Janesville, WI

City of Jefferson, WI

Village of Johnson Creek, WI

Village of Kohler, WI

City of Lake Geneva, WI

Lincoln County, WI

Village of Maple Bluff, WI

City of Marshfield, WI

City of Milton, WI

City of Monroe, WI

Village of Mount Horeb, WI

City of Oconomowoc, WI

Village of Oregon, WI

City of Oshkosh, WI

City of Portage, WI

City of Prairie du Chien, WI

Town of Rib Mountain, WI

City of Shawano, WI

City of Sheboygan, WI

Village of Spring Green, WI

City of Stoughton, WI

City of Sun Prairie, WI

City of Verona, WI

Village of Walworth, WI

City of Watertown, WI

City of Wausau, WI

Town of West Bend, WI

City of Whitewater, WI

Village of Williams Bay, WI

City of Belvidere, IL

Lee County, IL

City of Moline, IL

Village of Rockton, IL



PROJECT EXPERIENCE AND REFERENCES

PROJECT EXPERIENCE

CITY OF WAUSAU ZONING CODE AND MAP

Team Members: Mike Slavney, Jackie Mich, Ben Rohr, Elona Bartrick, Dan Eckberg

Dates: 2018-2019

The City of Wausau, a community of 40,000, is limited in its ability to physically grow. Boxed-in due to town incorporation over the past 20 years, the City of Wausau worked with Vandewalle & Associates to capitalize on the Zoning Code as a tool for growing tax base without substantial annexation. The City of Wausau's hybrid zoning ordinance – adopted in 2019 – incorporates zoning districts tailored to Wausau's unique neighborhoods and corridors. The highly customized ordinance includes multiple “missing middle” districts designed for small-scale multi-family and townhomes. These districts blend well with both single-family neighborhoods and higher-density residential areas. The ordinance promotes new infill housing by enabling varied unit types and tenure in existing neighborhoods, while protecting neighborhood character. The ordinance also introduces three distinct downtown districts tailored to specific development forms, character, and uses, including a high-rise development district, a historic Main Street district, and a downtown-fringe district.

Once the new zoning districts were drafted, V&A led multiple work sessions with City staff to “test drive” the new districts. This helped the project team confirm the correct mix of districts on the ground, identify opportunities to combine, refine, or add new districts, and allowed a draft zoning map to be presented to the public early in the process. This approach helped City staff, public officials, and the public recognize the significance of the new zoning map changes early on, which led to better input all around.

Further, the Wausau ordinance complies with new state and federal requirements that impact local zoning: 2017 Wisconsin Act 67 and 59, recent changes to vested rights analysis resulting from recent case-law and legislative proposals, *Reed v. Gilbert*, and limitations on local regulation of mobile service support structures (Wis. Stat. 66.0404). It also includes many provisions not included in the current ordinance:

- Big box development standards and grayfield provisions for vacant buildings
- Point-based landscaping requirements
- Large lot and small lot single family districts, multiple mixed-use districts, and an institutional district
- Provisions to make legal non-conforming lots, structures, and sites fully legal
- Exterior building design and performance standards
- Extensive use of tables, graphics, and illustrations to communicate regulations



VILLAGE OF OREGON ZONING ORDINANCE AND MAP

Team Members: Mike Slavney, Jackie Mich, Ben Rohr, Elona Bartrick, Dan Eckberg

Dates: 2018-2019

Vandewalle & Associates and Mike Slavney have served as the consulting planner to Village of Oregon since 2000. Located ten miles south of Madison, Oregon was experiencing fluctuating waves of growth and stagnation. Mr. Slavney worked with Village Staff and the Plan Commission in 2005-2006 to rewrite the Village's Zoning Ordinance and redraw the Zoning Map, which were last updated in the early 1960s. Since its adoption, Mr. Slavney has been applying the code through the development review process.

The new Ordinance was designed to implement many of the most important recommendations of the Village's Comprehensive Plan. This effort resulted in a full set of new zoning districts specifically designed to implement the Plan's call for higher-quality development for all multifamily and non-residential land uses, and to promote mixed used development comprised of businesses on the ground floor with residential uses above in all office and commercial zoning districts. The new code is carefully-linked to the Comprehensive Plan to provide a high-degree of development predictability, including control over the timing of development, the dispersion (rather than concentration) of multi-family projects, and the reservation of key sites for mid-range or long-range office, commercial, or industrial development instead of being used for residential development in the short-term.



PROJECT EXPERIENCE

To address the desire for tax base rich mixed-use development in what has been a bedroom suburb since the 1960s, the new code created a land use type called “commercial apartment” which is permitted above the ground floor in the Central Business, Neighborhood Business, Planned Office, and Planned Business zoning districts. Each of these districts has form-based requirements for building form and placement, high-quality exterior building materials, setbacks, signage, and landscaping. The code reduced parking requirements by 25%, identifies maximum parking ratios, requires bicycle parking, and allows for the sharing of parking spaces for complementary land uses, including residential and business.

The new code created a wider range of single-family residential districts to help capture very high-end homes now being lost to rural development, and affordable small lot districts to allow both street- or alley-loaded single-family homes.

In 2015-2016, Mr. Slavney worked with Jackie Mich to develop the first Sign Code in Wisconsin based on the *Reed v Gilbert* U.S. Supreme Court decision prohibiting content-based sign regulations. This project was featured at the Wisconsin APA conferences in 2015 and 2016 and was awarded as the “Project of the Year” by Wisconsin APA in 2017.



CITY OF FORT ATKINSON ZONING CODE AND MAP

Team Members: Mike Slavney, Dan Johns, Ben Rohr, Elona Bartnick, Dan Eckberg

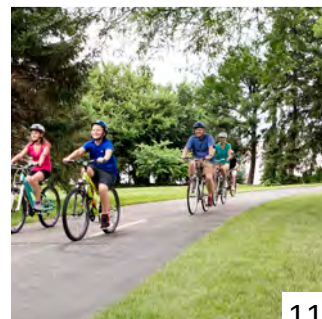
Dates: 2018-current

Since the Great Recession, Fort Atkinson has struggled to attract any kind of new construction, however the community has seen recent signs of recovery over the past few years. The City is only a 40-minute commute to the fastest growing metro area in state, Dane County. As the cost of living continues to increase in Dane County, communities like Fort Atkinson have significant growth potential as the cost of living is much lower.

Building on the recommendations of the 2019 Comprehensive Plan and 2018 TID Feasibility Study, Vandewalle & Associates began the full rewrite of the Zoning Code in late 2018. The rewrite addresses several key community priorities and issues identified through these two planning processes, including generating new commercial and industrial development, redeveloping key corridors, increasing residential opportunities, and retaining community character, especially in and around downtown. The new Zoning Code directly addresses these issues by:

- Codifying the community's historic downtown Main Street corridor design standards
- Offering increased opportunities for mixed-use development throughout the City
- Establishing density-based tiers of single-family, two-family, and multi-family zoning districts to provide options for a wide-variety of building types and price points
- Facilitating high-quality new development at the STH 26 Bypass interchange through new building design guidelines for commercial, industrial, and institutional development
- Providing flexibility for infill and redevelopment through new form-based regulations

Since late 2018, Vandewalle & Associates have been working with City Staff and the project working group to complete a new draft Zoning Code and Map. Over the past few months, Vandewalle & Associates has been facilitating a series of public participation events to gather community input and foster resident, Plan Commission, and elected official buy-in prior to the public hearings. This process is expected to be completed with adoption of the new Zoning Code and Map in the Spring of 2020.



PROJECT EXPERIENCE

CITY OF DELAVAN ZONING ORDINANCE AND MAP

Team Member: Mike Slavney, Jackie Mich, Ben Rohr, Dan Eckberg

Dates: 2018-2019

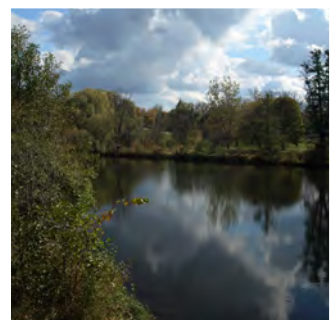
Vandewalle & Associates and Mike Slavney have served as the consulting planner to the City of Delavan since 1989. Mr. Slavney worked with City Staff in 1997 and 1998 to rewrite the City's Zoning Ordinance and redraw the Zoning Map, which were last updated in the 1950s. The new Ordinance was designed to implement many of the most important recommendations of the City's Comprehensive Plan. Since its adoption, Mr. Slavney has been applying the code through the development review process. The large area of regional commercial development at the interchange of I-43 and Wis Hwy 50 was developed under the code, with a new Fleet Farm approved in 2019 and a new Maier's planned in 2020. In 2020, the code provided a clear path for approval of a new planned development for the eastern two-thirds of the Lake Lawn Resort property. This will be a mixed-use project including single-family and twin home residential, a new conference center, and new marina and boat launch facilities.

The procedures portion of the code was thoroughly rewritten to provide very clear steps in the process and submittal requirements. These sections were supplemented with detailed applications forms with complete submittal checklists for each step in the process. To protect Delavan Lake, Lake Comus, Swan Creek, and Turtle Creek, the new code established overlay zoning districts to provide strong protections for each of the components of SEWRPC's primary and secondary environmental corridors, including floodplains, wetlands, lakeshores, drainageways, steep slopes, and mature woodlands.

To foster higher-quality commercial and multifamily development, the new code provided zoning districts with distinct community characters to distinguish downtown, neighborhood, community, and regional commercial development; and to distinguish large- and small-scale multifamily development. The downtown area was further protected with a new form-based overlay zoning district that requires all new development and building and site modifications to enhance the area's distinct downtown architecture and brick street vibe. The new code also adopted a point-based landscaping system that requires any new multifamily or nonresidential development to provide landscaping in front yards, along building foundations, in parking lots, and in open space areas. Finally, the new Zoning Map downzoned 14 blocks of historic homes from the multifamily zoning district to either the single-family or two-flat zoning district, based on the preponderance of actual residential use.

In 2018, the Vandewalle & Associates team of Mike Slavney and Jackie Mich worked with a private/public committee to rewrite the City's Sign Ordinance to comply with the Reed v Gilbert U.S. Supreme Court decision prohibiting content-based sign regulations. Based on the award-winning Village of Oregon Sign Code, these provisions provide area bonuses for sculptural signs in the downtown and require all internally illuminated cabinet signs to have an opaque background.

In 2020, Mike Slavney is working with Ben Rohr to update the Zoning Ordinance to respond to the flurry of amendments to Wisconsin Statutes between 2016-2018. This will include the creation of several new zoning districts to consider accommodating new extraction and disposal land uses, intensive outdoor storage land uses, and intensive outdoor commercial land uses through the rezoning process.



REFERENCES

City of Wausau, Wisconsin

Brad Lenz, City Planner

407 Grant Street / Wausau, WI 54403

Phone: (715) 261-6760 / Email: brad.lenz@ci.wausau.wi.us



Village of Oregon, Wisconsin

Mike Gracz, Village Administrator

117 Spring Street / Oregon, WI 53575

Phone: 608.835.6290 / Email: mgracz@vil.oregon.wi.us



City of Fort Atkinson, Wisconsin

Matt Trebatoski, City Manager

101 N. Main Street / Fort Atkinson, WI 53538

Phone: 920.563.7760 / Email: mtrebatoski@fortatkinsonwi.net

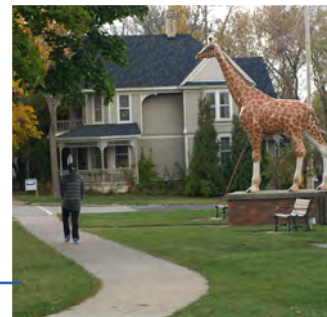


City of Delavan, Wisconsin

Denise Pieroni, City Administrator

123 South Second Street / Delavan, WI 53115

Phone: 262.728.5585 / Email: cityadmin@ci.delavan.wi.us







PROJECT TEAM

MULTI-DISCIPLINARY TEAM

Decades of experience. From a team of more than 20 in-house experts, V&A has assembled an experienced project team that routinely works together. Together the project team brings a full understanding of comprehensive planning, zoning ordinance preparation, urban and strategic planning, market opportunities, TIF and financial analysis, real estate market dynamics, community and committee engagement, and unmatched experience in working with various stakeholders. When engaged in a contract with Vandewalle & Associates, the client has access to all our expertise, and we can quickly engage other in-house specialists if an issue arises.



MIKE SLAVNEY, FAICP, PRINCIPAL: Mike will be the Principal-in-Charge on this project. Mike has been with the company for 30 years and has completed 35 zoning code rewrites in his 37-year career. As Principal-in-Charge, Mike will be the “face” of the Zoning Code rewrite. He will provide planning and implementation expertise, guide solutions to specific zoning issues, and ultimately be responsible for the quality and content of all work products.



BEN ROHR, AICP, ASSISTANT: Ben will serve as the Project Manager on this project and will manage quality assurance and quality control task delivery, which include all aspects of research, community outreach, meeting preparation, and document creation. He has been involved with several zoning code rewrites, including the City of Wausau, the City of Fort Atkinson, the City of Jefferson, the City of Monona, and several other ordinance amendments for communities throughout southern Wisconsin. With Mike Slavney, he has worked extensively on new sign ordinances that comply with *Reed v. Gilbert* (2015) and new Conditional Use process ordinances that comply with Wisconsin Act 67.



MEREDITH PERKS
Assistant Planner

ROLE: Project Assistant,
Research, Meeting Preparation



ELONA BARTNICK
Associate Urban Designer

ROLE: Design Lead,
Graphic Management



DAN ECKBERG, AICP
GIS Planner

ROLE: GIS Mapping,
Graphics, Drone Footage

MIKE SLAVNEY, FAICP

Principal Planner

Mike Slavney is the Director of Planning Services for Vandewalle & Associates. In this role he coordinates the firm's activities in providing planning services to municipalities, state agencies, and organizations. He is a nationally recognized leader in zoning, growth management, development review and negotiation, farmland and open space preservation, inter-municipal planning, participatory techniques, and plan implementation.

Mike's planning practice includes comprehensive, transportation, neighborhood, and park and recreation planning; development regulation (zoning, subdivision, and related ordinances); intergovernmental relations and agreements; public participation; and municipal planning services. Mike also provides strong expert testimony services on a broad range of planning and development topics.

Mike has been certified by the American Institute of Certified Planners since 1985 and has been a practicing consulting planner since 1981. In 2004, Mike became the second Wisconsin planner to become a member of the College of Fellows of the American Institute of Certified Planners (FAICP). This honor was primarily based on Mike's contribution to the national practice of planning by crafting zoning regulations and maps to most effectively implement the unique objectives of each community and its comprehensive plan.

Prior to joining Vandewalle & Associates, Mike served as the Director of Planning and Development for the City of Sun Prairie, Wisconsin; as the Senior Associate Planner for Lane Kendig, Inc.; and as the Principal Long-Range Planner for the City of High Point, North Carolina. His clients include over 100 municipalities and counties, numerous state agencies, school districts, and organizations.

Mike's practice has continuously focused on the efficient implementation of achievable plans—particularly those that forward the mutual accomplishment of economic, environmental, and community character objectives. Mike knows how to make creative plans a reality one step at a time.



Madison office:
120 East Lakeside Street
Madison, WI 53715
Phone: 608.255.3988
mslavney@vandewalle.com

EDUCATION

- M.S. City and Regional Planning, concentrations in Land Use and Transportation
University of North Carolina - Chapel Hill
- B.S. Economic Geography and Urban Sociology
University of Wisconsin - Madison, Wisconsin

PROFESSIONAL LICENSES & MEMBERSHIPS

- Fellow, American Institute of Certified Planners (FAICP)
- Member, American Planning Association (APA) & Wisconsin Chapter (WAPA)
- Past President, Natural Heritage Land Trust
- Award Winner: 2017 APA-WI Excellence in Planning Award, "Village of Oregon Sign Code"
- Award Winner: 2017 APA-WI Excellence in Planning Award, "Madison Metropolitan School District Enrollment Projections: 2017-2037"
- Award Winner: 2004 APA-WI Recognition for Outstanding Contributions to the Planning Profession
- Award Winner: 2004 APA-WI Project of the Year, North Mendota Parkway Study
- Award Winner: 2002 WAPA Project of the Year, City of Muskego Conservation Plan

BEN ROHR, AICP

Assistant Planner

Benjamin Rohr is an Assistant Planner at Vandewalle & Associates and works on a variety of Growth Management projects. It is the perfect fit for Ben, as it is his personal goal to help communities better plan and understand systems. "I want to push for a more sustainable future," Ben explains, "to help communities see that planning for infrastructure, for health, for environment, and for economy are not separate ideas; these can, and should all happen together."

Since joining V&A, Ben has worked on or been the project manager for three full zoning ordinance rewrites, several minor zoning ordinance updates for our municipal planning clients, over ten Comprehensive Plan updates, two Park and Open Space Plan updates, four Housing Affordability Reports, and an Urban Service Area Amendment, among others.

Prior to joining V&A, Ben worked as a Land Use Planner for Region 1 Planning Council in Rockford, IL where he focused on both short- and long-range land use planning projects including a full rewrite of the Boone County Comprehensive Plan, the City of Loves Park Comprehensive Plan, and the Rockford Regional Bicycle and Pedestrian Study. Ben also worked as a Planner/GIS Specialist for Southwestern Wisconsin Regional Planning Commission in Platteville, WI, and held multiple planning internships during undergraduate and graduate school at the City of West Allis, Southwestern Wisconsin Regional Planning Commission, and the City of Janesville.

In all of these roles, Ben has worked to actively foster public engagement, more efficiently integrate government systems, and establish links between planning, public health, sustainability, and equity. He is passionate about utilizing planning to make smarter decisions, effectively leverage available assets, and better the community as a whole.



Madison office:
120 East Lakeside Street
Madison, WI 53715
Phone: 608.255.3988
brohr@vandewalle.com

EDUCATION

- M.U.P. Urban Planning
University of Wisconsin - Milwaukee
Milwaukee, Wisconsin
- B.S. Geography
Minor in Urban and Area Development
University of Wisconsin - Whitewater
Whitewater, Wisconsin

PROFESSIONAL LICENSES & MEMBERSHIPS

- Member, American Planning Association,
State and National Chapters

MEREDITH PERKS

Assistant Planner

Meredith Perks is an Assistant Planner at Vandewalle & Associates, Inc. She brings to the team a unique combination of professional experience along with an avid interest in planning, public service, local community and economic development, downtown redevelopment, and active transportation plans, and a deep love of her city.

Having worked in the past as Regional Director for Senator Joe Donnelly, Meredith traveled to communities across Indiana and learned about their unique assets and character as well as the innovative approaches they were taking to face their challenges. These interactions provided valuable perspective on the constraints that cities of all sizes experience. At Vandewalle & Associates Meredith aims to assist Midwest communities like these in overcoming such barriers. Meredith is excited by the opportunities Midwest communities have to grow and reinvent themselves using the tools of effective planning that can prepare their economies, residents, and institutions for the future. Active transportation plans are a particular passion for Meredith; she has worked on Complete Streets projects in Chicago and with the Chicago Department of Transportation Bike Program.

Applying her experience with community outreach and public speaking, Meredith is skilled at effectively facilitating an inclusive planning process that is meaningful to a wide range of stakeholders and clients, including elected officials, non-profit advocacy groups, and community residents. She has proven herself to be an active and engaged listener who can consider diverse viewpoints while developing targeted alternatives to address interrelated economic development, land use, and transportation priorities.

Since joining Vandewalle and Associates, Meredith has been working with the Village of Cross Plains Comprehensive Plan and Park and Open Space Master Plans as well as the implementation of the City of Jefferson's Downtown and Economic Recovery Plans. Meredith is also actively engaged, on behalf of Vandewalle and Associates, with emerging planning trends and grant and financing resources, in order to better serve clients and connect them with new opportunities.



Milwaukee office:
247 Freshwater Way, Suite 530
Milwaukee, WI 53204
Phone: 414.988.8631
mperks@vandewalle.com

EDUCATION

- M.U.P. Urban Planning and Policy
University of Illinois at Chicago - Chicago, Illinois
- B.A. Political Science
The Hesburgh Program of Public Service
University of Notre Dame - Notre Dame, Indiana

PROFESSIONAL LICENSES & MEMBERSHIPS

- Member, American Planning Association, National, Wisconsin, and Chicago Chapters
- Member of Women in Planning and Development – Chicago
- Phi Kappa Phi Honor Society
- Leadership South Bend Mishawaka Emerging Leaders Program
- Neighborhood Resource Corporation
Neighborhood Leadership Academy

ELONA BARTNICK

Associate Urban Designer

Elona Bartnick is an Associate Urban Designer involved in a broad range of projects at Vandewalle & Associates. She is skilled in the areas of site analysis, site planning and design, neighborhood design, landscape architecture, and graphic communication. These skills are utilized and communicated through computer graphics, CAD design, SketchUp modeling, GIS analysis, and hand illustration.

In her time at Vandewalle & Associates, Elona has contributed to a diverse range of projects, including assisting in land and development plans for mixed-use and traditional neighborhood projects. She has worked on a number of redevelopment and downtown master plans identifying areas that would benefit from reinvestment and revitalization and developing guidelines and site design for future redevelopment. Her involvement in comprehensive plan development includes creating regional and local asset and opportunity analysis, future growth or redevelopment scenarios and site designs, and additional graphics specific to each plan. Elona's landscape architecture experience focuses on design and construction documents for hardscape and planting plans for parks, streetscapes, naturalized areas, roadway planting schemes, riverfronts, and urban design elements.

Projects that Elona has been and continues to be involved in include:

Grandview Commons Neighborhood in Madison, Wisconsin; Fitchburg Technology Campus in Fitchburg, Wisconsin; Brookfield, Wisconsin and Lake Geneva, Wisconsin Comprehensive Plans; Marshfield Zoning Ordinance; Harwood Heights, Illinois Streetscape; Ripon, Wisconsin Downtown Master Plan; Thrive-Madison Region and Quad Cities Region Assets and Opportunities Analysis; and Middleton, Racine, and Sturgeon Bay, Wisconsin; and Waterloo, Iowa Redevelopment and Implementation.



Madison office:
120 East Lakeside Street
Madison, WI 53715
Phone: 608.255.3988
ebartnick@vandewalle.com

EDUCATION

- B.S. Landscape Architecture
University of Wisconsin - Madison, Wisconsin

PROFESSIONAL LICENSES & MEMBERSHIPS

- Associate, American Society of Landscape Architects National and State Chapters

DAN ECKBERG, AICP

GIS Planner

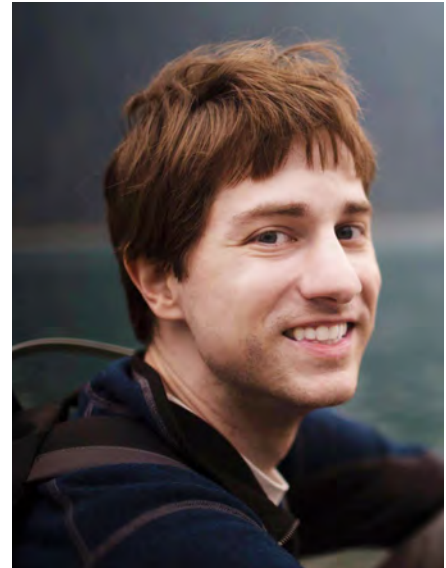
Dan Eckberg is a GIS Planner whose primary responsibilities include map creation and spatial data acquisition, organization, manipulation, and analysis.

Dan utilizes extensive experience with ESRI's ArcDesktop GIS software, including Python scripting, to apply cartographic techniques to a range of planning projects. These include conducting and writing a formal analysis of potential Fire Station sites for the City of Watertown, mapping Environmental Justice populations and developing novel approaches for ensuring NEPA compliance for WisDOT highway studies, evaluating bike trail routes for the Village of Oregon, analyzing demographics of food deserts in Freeport, IL, geo-coding survey results for city development projects, designing and creating a database of possible Brownfield sites for the City of Janesville, managing Urban Service Area applications, producing numerous Comprehensive Plan maps, and preparing Official Zoning Maps for nearly a dozen Wisconsin communities.

Dan also works extensively with school districts on long range growth reports. This entails meeting with representatives of district municipalities, studying adopted Future Land Use Plans and population trends, and with the aid of GIS, projecting and mapping anticipated quantities and locations of student growth. In a study for the Madison Metropolitan School District, Dan was a key part of the Vandewalle team that developed an award-winning new student projection methodology. This scalable method uses GIS to identify enrollment ratios customized to a given district based upon 26 detailed housing types, differentiated by density and greenfield or infill sites.

Dan is a licensed commercial Unmanned Aircraft System (drone) pilot registered with the FAA and is able to provide clients with high quality aerial video footage.

Previously, Dan worked as a GIS research assistant at the Minnesota Population Center helping to update the National Historic Geographic Information System (NHGIS). Before that, Dan worked at East View Geospatial and held an internship with U-PLAN, a community planning group for the Frogtown/Rondo neighborhood of St. Paul, MN. In the latter position, Dan helped design a traffic impact analysis for the neighborhood using the CommunityViz extension of ArcGIS.



Madison office:
120 East Lakeside Street
Madison, WI 53715
Phone: 608.255.3988
deckberg@vandewalle.com

EDUCATION

- B.A. Geography (City Systems)
Minor - Geographic Information Systems
University of Minnesota - Minneapolis, Minnesota

AWARDS & MEMBERSHIPS

- Member, American Institute of Certified Planners
- Excellence in Planning Award, "Madison Metropolitan School District Enrollment Projections: 2017-2037 - APA-WI Chapter, 2017
- Guest Lecturer (Applications of GIS in Planning) – University of Wisconsin-Madison, 2012





METHODOLOGY AND APPROACH, SCOPE OF SERVICES, AND TIMELINE

METHODOLOGY AND APPROACH

Consistent with the Village's RFP, our objective is to provide Mukwonago with a Zoning Code update process that is efficient, cost-effective, politically astute, and based on creative and proven strategies for addressing the full range of zoning issues.

Having developed Zoning Codes for communities nationwide and with unparalleled experience in Wisconsin, members of our Project Team appreciate that Village officials must place a high level of trust in their consultants when undertaking a consultant-led Zoning Code update process. In our collective experience, projects of this nature require a sound, multi-phase strategy that allows the community to clearly distinguish between the Zoning Code update process and other Village initiatives that may be easily confused with zoning (such as other recent planning efforts and specific development proposals).

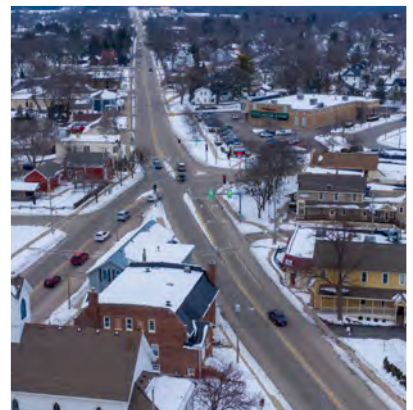
A strategically crafted process also allows the Village to work through more controversial aspects of the Code update process without bogging down or reversing progress on other, less controversial aspects of the Code. (For instance, we recommend adopting the Zoning Code prior to adopting the Zoning Map. This separates Zoning Code matters from Zoning Map matters and ensures a smooth adoption process.)

We have used this approach in many Wisconsin communities and have created a transparent process where predictability and consistency were clearly demonstrated. Our approach has consistently led to a positive public response to the project objectives, the overall process, and the final product. Further, we have found that our approach results in calming the public and building confidence in the municipal staff, Plan Commissioners, and Board members who ultimately approve and apply the new Zoning Code and Map.

Recently, we have refined our approach to reflect Wisconsin Act 391, which now requires a two-thirds majority vote by the elected body to adopt the Zoning Code and Map. In order to marshal public support for Mukwonago's update, we will hold a public open house to review the draft Zoning Code and Map prior to the public hearings. The open house provides a venue for the consultant and staff to provide answers and clarifications to individuals who have concerns about the update. The result is that many of the public's issues, questions, and concerns are resolved well before the public hearings take place. This makes the Plan Commission and Village Board members in our client communities much more comfortable with the two-thirds majority requirement. We have led three rewrite processes that have been subject to this legislation.

Our Project Team maintains a high degree of respect for the knowledge of Village staff, the Plan Commission, and Board members. Ultimately, there is simply no substitute for their combination of site-by-site familiarity within the community, historical perspective on past regulatory efforts and strategies, knowledge of the potential interrelationship between ongoing planning and economic development efforts and land regulation, and up-to-date perspective on the political realities within the community.

We appreciate the time and effort that went into preparing the Village's RFP. As such, our proposed scope of work simply elaborates on the basic framework. All tasks and corresponding deliverables requested in the RFP are laid out in the draft budget of this proposal, included under separate cover. Our goal is to efficiently and effectively work through all the tasks in the Scope of Services while allocating the most effort to meticulously address the key issues and products. This approach takes full advantage of our understanding of the Village, its people, and its culture.



METHODOLOGY AND APPROACH

Highly Effective Zoning Code and Map Tailored to Mukwonago

Although the Village's current Zoning Code has not been completely updated in recent years, we imagine that some elements are currently working well. With direction from staff, we encourage the Village to retain these effective components of the code. Based on the Request for Proposals, our experience in numerous Wisconsin communities, and our preliminary review of Village's existing Zoning Code and Map, we recommend a revised Chapter 100 and Chapter 64 that:

- Implements the goals and objectives of the **Downtown Strategic Plan, Comprehensive Land Use Plan** and the **Future Land Use Map** through enforceable regulations.
- Includes a variety of **mixed use districts** that accommodate a complementary mix of neighborhood-scale retail, office, service, multi-family residential, institutional, and open space uses.
- Utilizes general land use categories that **easily adapt to changing times and emerging trends**.
- Includes zoning districts **tailored to Mukwonago's unique areas, neighborhoods, and districts** such as the development along the lake, Interstate interchange, and Village Center.
- Assists and promotes **new business development** at many different scales.
- Builds on the existing and integrates more building design standards into the Zoning Code to ensure **high-quality development** while still allowing for and promoting **flexibility and creativity** for business and property owners.
- Strategically promotes **new infill housing development** with varied unit types and tenure in existing neighborhoods, while **protecting neighborhood character**.
- Increases the number of **user-friendly graphics and tables** that clearly explain zoning regulations.
- Provides internal consistency and clarifies regulations for permitted uses, special uses, conditional uses, and temporary uses.
- Reduces the need to navigate between many Articles as required by the current ordinance's organizational scheme.
- Incorporates **best practices** from around the state, including for urban design standards, form-based components, landscaping point systems, and provisions for bicycle and pedestrian facilities.
- Updates signage regulations to comply with **Reed v. Gilbert** and incorporates the **latest state and federal regulations** and case law that impact land use regulation by local governments.

Strategy for Public Outreach and Review

We consider widespread public outreach, education, and input a vital component of any Zoning Code update, amendment, or rewrite process. Preparing zoning and land division regulations is complicated, controversial, and sometimes arcane. At the same time, these regulations are among the most fundamental tools a community has for achieving its land use and economic development goals, influencing property values, and providing a foundation for equitable and transparent decision-making regarding community development proposals. For these reasons, and because zoning controls affect all property owners in a community, public outreach must have a calming effect.

As the first step in the project, we will prepare a Public Participation Plan that integrates a formal, multi-faceted, well-organized, and meaningful public outreach program into the Zoning Code update process. Our approach is described below. Additional or alternative strategies may be negotiated between the Village and our Project Team.

- **Plan Commission:** Our team holds the knowledge of staff, elected officials, and appointed officials in high regard. We recommend that the Plan Commission be the primary body responsible for providing policy guidance throughout the Zoning Code update process. Plan Commission meetings will be open to the public and will provide frequent opportunities for Commissioners and other stakeholders to remain engaged in the process. The proposed scope of services includes six working meetings with the Plan Commission throughout the process, in addition to the required public hearing. Additional work sessions can be added if necessary.

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- **Focus Groups and Stakeholder Interviews:** In a Zoning Code update process, important stakeholders usually include a mix of residents, property owners, landlords, interest groups, real estate professionals, business owners, and members of other community boards, commissions, and committees. We will work with staff to identify stakeholders and arrange focus groups and individual interviews. Engaging with these stakeholders in this manner provides a formal, organized opportunity to gather input from knowledgeable individuals early in the process, which will inform the development of the Draft Zoning Code and subsequent revisions. Additionally, utilizing stakeholder listening sessions throughout the process allows for input directly from future code users which helps identify potential issues prior to formal Public Hearings and Adoption meetings.
- **Issues Identification Workshop:** Our team will facilitate a workshop geared toward residents and property owners to identify issues and gain feedback on how to address special issues such as form-based regulations, building materials, outdoor storage, landscaping, and wind/solar energy uses using photo examples and illustrations.
- **Draft Code Text and Zoning Map Open House:** Open house events are intended to be “sharing sessions” that provide opportunities to educate property owners about the draft Zoning Code and Map and to gather feedback on complete draft versions of each before beginning their respective adoption processes.
- **Public Hearings and Adoption:** We recommend holding separate public hearings for the Plan Commission and Village Board to recommend and adopt the new Zoning Code and Zoning Map. This allows the public multiple opportunities to provide comment and feedback on the Final Draft versions of both the code and map. It also allows the Village Board to feel more comfortable in adopting the new Zoning Code and Zoning Map because of the thorough involvement of the Plan Commission and public throughout the process.
- **Project Webpage:** Mukwonago's website is a cost-effective and essential means of disseminating information and soliciting input. We suggest that the Public Participation Plan incorporates a simple webpage specific to this project, e.g., background information, draft Zoning Code documents, responses to frequently asked questions, timeline and process information, Plan Commission presentations and meeting materials, and a means for submitting input and comments to staff and our Project Team. We can develop and maintain the webpage on behalf of the Village or simply provide the content to staff to upload.

Wherever possible, we support combining meetings. This will be cost effective, help maintain focus, keep the project on schedule, and avoid participant burnout. It will also allow us to preserve all required deliverables and provide the same quality of product for the same budget.

User-Friendly Zoning Ordinance

Our team includes skilled graphic communicators of complex ideas. We will provide a mix of high-quality tables, photo examples, graphics, and illustrations to communicate zoning concepts, bulk/intensity regulations, and building design standards. As seen in our project examples, these graphics come standard in our Zoning Ordinances.



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We also provide an Annotated Outline (Task 5.2) near the outset of the project and an Executive Summary of the Zoning Code (Task 8.3) approaching the end of the project to offer staff, the public, and policy makers an overview of how the new Zoning Code is organized.

Ordinance Tailored to the Community

Every planning process starts with identifying issues, then determining solutions. As part of Task 2, 3, and 4, we focus on identifying issues. Then, as part of Task 6, we will determine the right balance of regulatory approaches that will accommodate existing development, guide the character and type of future development, and be acceptable to stakeholders and policy makers. Rather than using standards copied from other communities or model codes, zoning provisions recommended for consideration by Vandewalle & Associates, including form-based requirements, will be unique to the Village, its economic potential, and the desired character of development for every site in the community. It is our experience that the basic land use and dimensional development standards for about 80% of the community are working well and do not need substantial revisions. Accordingly, our process will focus on the remaining 20%, as well as the tools the Village needs to ensure that changes in these areas reflect the community's vision and goals and can be effectively and fairly implemented.

Quality Control Procedures

Vandewalle & Associates is committed to delivering only high-quality services and projects. Quality control is particularly important when developing new zoning regulations and maps because of their direct relation to the use and value of property, neighborhoods, and the community as a whole. With more than 44 years of experience in zoning projects, we have learned many lessons related to implementing high-quality Zoning Codes that extend beyond proofreading texts and maps. Most importantly, we are committed to listening, understanding, and considering the perspectives of everyone involved in the project.

Professional Project Management Techniques

Vandewalle & Associates is staffed by highly-experienced project management talent. Project management techniques that we will deploy include:

- Preparation and regular updates of a detailed project schedule and public outreach schedule.
- Monthly progress reports and frequent communication to ensure project coordination and clear understanding of expectations and assignments.
- Active internal budget management to monitor progress towards successful project completion against the available budget.

Preparation of Summary and Technical Memos

We will prepare memos throughout the process to provide for an organized review of public input, concerns with the current ordinance, and Vandewalle & Associates' preliminary recommendations for the updated Zoning Code and Map. Specifically:

- The Issues Identification Memo (Task 3.4) will summarize what we heard from stakeholders in Tasks 2 and 3, including the Project Kick-off and Orientation Meetings, Issues Identification Workshop, Stakeholder Listening Sessions, and online input.
- The Zoning Code Analysis and Evaluation Report (Task 4.1) is a tool to capture and summarize our insights into the existing Zoning Code and Map. It will examine the existing code's strengths and weaknesses in terms of its regulations, structure, clarity, ease of use, existing zoning districts and district standards, definitions, review procedures, and other topics. It will additionally provide recommend solutions to specific areas of the existing Code to be incorporated in the update. This memo will be reviewed in detail with staff and the Plan Commission and help provide policy direction to the consultant and staff in compiling the draft Zoning Code and Map.

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- The Policy Question Decision Guide (Task 5.1) aims at identifying significant policy decisions that must be made through the update of the Zoning Code and Map prior to drafting the ordinance. This allows the consultant and staff to gain valuable insight from the Plan Commission on these key areas.
- The Annotated Outline (Task 5.2) will include a chapter-by-chapter description of the new Zoning Code, an overview of its proposed contents, and a discussion of zoning options.

Multiple Layers of Product Review

Before the release of any public product, Vandewalle & Associates will subject all plan products to at least two sets of professional eyes from members of the Project Team. Based on years of professional product creation, our team uses many techniques to assure high-quality products. All planning products will be reviewed by the Principal-in-Charge of the project, Mike Slavney, before being released to the Village.

A History of Firm and Staff Continuity

Continuity is a key aspect of quality control. Our consultant team has deep experience in zoning projects. The Principal-in-Charge, Mike Slavney, has been with Vandewalle & Associates for 30 years. The firm also has a progressive approach to professional staff advancement, designed to assist in retention of “the best and the brightest.”

A Commitment to Meet Budget and Deadlines

Vandewalle & Associates is committed to following the proposed timeline and proposed budget as included in this proposal.

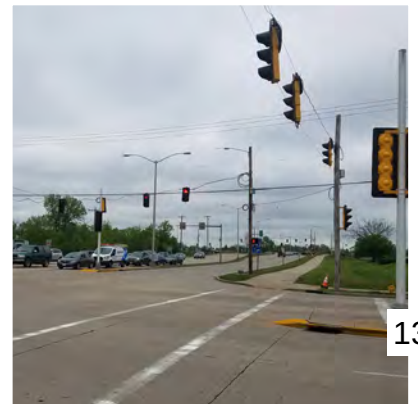
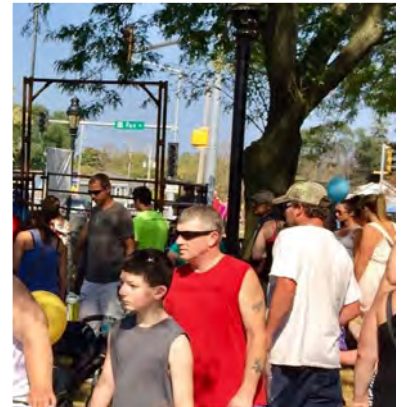
Expert Facilitation at all Public Meetings

Vandewalle & Associates commits to having upper-level staff facilitate all public, stakeholder, and Plan Commission meetings on this project. Our staff includes excellent facilitators skilled at addressing unforeseen issues that may emerge during the meeting and establishing and reinforcing confidence among all project participants.

Ongoing Zoning Ordinance Support

Finally, Ben Rohr will remain on-call to Village staff for five years after the adoption of the new ordinance to address issues specific to this project. Where issues arise related to the need for interpretation, clarification, or correction to the adopted Zoning Code or Map, he will respond to all concerns promptly and thoroughly. These services will be provided at no charge. Ben also will remain available to the Village to assist with future amendments to the Zoning Code and Map that respond to changes in community objectives, policies, and procedures at his hourly rate for ongoing municipal clients.

Zoning Code rewrites are among the most challenging projects that any municipality can undertake. We are fully committed to responding to these challenges and to fulfilling the trust that Mukwonago places in our hands.



METHODOLOGY AND APPROACH

Role of the Village

In an effort to maximize efficiency and control costs, we suggest Village staff maintain the following responsibilities throughout the project:

- Provide detailed insights about the community, key issues, and property owners, not readily available or apparent to the consultant.
- Provide Vandewalle & Associates with copies of all existing plans and ordinances, research, inventory information, and digital mapping data relevant to this Code update process, as needed.
- Review and provide Vandewalle & Associates with professional feedback on all draft documents.
- Print/copy and distribute all documents and meeting materials.
- Identify and reserve adequate meeting facilities, finalize meeting dates and times, and provide all accommodations for disabled participants as may be required by law.
- Provide a parcel-based ArcView shapefile including existing zoning, existing land use, planned land use, property ownership, and addresses for each parcel.

Regular Staff-Consultant Interaction

Building a successful relationship between consultant and Village staff is crucial to the success of all our planning projects. While we are willing to mold our approaches to the needs and practices of Village staff, we recommend the following approaches.

- **Specifying a clear division of labor** between Village staff and consultant staff in final contract negotiations and through the contract itself.
- **Establishing clear lines of authority and communication** among Village and consultant staff to eliminate any confusion and assure that project elements can move forward in the event of illnesses, vacations, and other unavoidable commitments.
- **Utilizing regular progress reports and discussions on project status.** Staff/consultant meetings will generally be organized around regular Plan Commission meeting dates and as needed. Overall, our philosophy is that face-to-face meetings are usually better than phone calls, which in turn are usually better than emails—although all three have their place in good project communication.
- **Maintaining regular communication** to discuss the Draft Zoning Code and revisions via conference call and/or in-person meetings.
- **Committing to talk frankly** in the event that certain project components do not meet initial expectations or unexpected issues emerge. Our experience and common sense suggests that dodging or delaying tough issues does not lead to successful project completion.
- **Conducting a training session** for all interested Village staff. The session will provide an overview of the entire new Code, focusing on key differences between the Village's former Code and newly adopted Code; regulations associated with nonconformities; and procedures and administration.

SCOPE OF SERVICES

Vandewalle & Associates will undertake the following tasks in conducting the Zoning Ordinance Rewrite for the Village of Mukwonago. The scope of this project includes:

Work Element 1: Public Participation Plan

Task 1.1: Public Participation Plan

Prepare a public participation plan that includes a detailed strategy and timeline for engaging the public and other stakeholders in the Zoning Code Rewrite process.

Task 1.2: Provide Content and Project Updates for Project Website

Provide on-going information for the Village's website or host a web page devoted to the Village's Zoning Code Rewrite process that includes meeting materials, draft documents, and an opportunity to provide comments.

Work Element 2: Project Orientation

Task 2.1: Review Relevant Village Plans, Ordinances, and Documents

Review existing plans and ordinances to identify issues and inconsistencies, in addition to understanding areas where recommended changes are needed in the new Zoning Ordinance.

Task 2.2: Project Kick-off Meeting with Village Staff (1, 2-hour meeting)

Meet with Village Staff to discuss project goals and timelines, specific issues that need to be addressed, and opportunities related to growth and development in the Village. Provide all meeting materials.

Task 2.3: Project Orientation and Kick-off Meeting with the Plan Commission (1, 2-hour meeting)

Facilitate one meeting with the Plan Commission to review feedback from Task 2.2, discuss project goals and timelines, specific issues that need to be addressed, and opportunities related to growth and development in the Village. Provide all meeting materials.

Work Element 3: Issues Identification

Task 3.1: Village Tour with Village Staff

Conduct a tour of Mukwonago with Village Staff to gain an understanding of unique land use issues and current zoning challenges. Provide all meeting materials.

Task 3.2: Stakeholder Listening Sessions (2, 1-hour sessions)

Work with the Village to identify participants, provide a draft invitation to the sessions, prepare and provide all meeting materials, and facilitate up to 2 hours of meetings with key stakeholders and interest groups in the community.

Task 3.3: Public Workshop on Issues Identification (1, 2-hour meeting)

Work with the Village to select an appropriate location, provide a draft invitation, prepare and provide all meeting materials, and facilitate one public workshop to identify Zoning Code issues and opportunities.

Task 3.4: Issues Identification Memorandum

Prepare and provide a memorandum to the Village summarizing all input from Work Elements 2 and 3 (hard copy and digital copy).

Work Element 4: Zoning Code Analysis/Evaluation

Task 4.1: Zoning Code Analysis and Evaluation Report

Based on the review in Task 2.1 and the issues identified in Task 3.4, prepare a memo summarizing how well the existing ordinance meets the Village's objectives, in addition to recommended zoning solutions to be incorporated into the new Draft Zoning Ordinance (hard copy and digital copy).

Task 4.2: Plan Commission Meeting to Present Report (1, 2-hour meeting)

Attend a meeting of the Plan Commission to present the memos prepared in Tasks 3.4 and 4.1. Provide all meeting materials.

SCOPE OF SERVICES

Work Element 5: Annotated Outline

Task 5.1: Policy Questions Decision Guide

Identify key policy decisions for the Village Staff and Plan Commission to consider. Summarize the decisions in a Policy Questions Decision Guide.

Task 5.2: Draft Annotated Outline of Zoning Code

Prepare a detailed outline of the new Draft Zoning Code that identifies the proposed content and organization of the ordinance.

Task 5.3: Staff Conference Call to Review Draft Annotated Outline and Policy Questions Decision Guide (1, 1-hour meeting)

Hold one conference call with Village Staff to review and discuss potential changes to the Annotated Outline and Policy Questions Decision Guide. Materials developed in Task 5.1 and 5.2 will be provided digitally.

Task 5.4: Plan Commission Meeting to Present the Annotated Outline and Policy Questions Decision Guide (1, 2-hour meeting)

Review, discuss, and evaluate the Draft Annotated Outline and Policy Questions Decision Guide with the Plan Commission. Provide all meeting materials.

Task 5.5: Final Annotated Outline of the Zoning Code

Make all changes and edits based on feedback from the Plan Commission and Village Staff to produce the final version of the Annotated Outline that will guide the writing of the new Zoning Ordinance. Provide the documents to Village Staff digitally.

Work Element 6: Discussion Draft Zoning Code

Task 6.1: Part 1 of Draft Zoning Code (Draft #1)

Prepare the Draft Zoning Code text for the sections of the code relating to the proposed new zoning districts, bulk regulations, and land uses:

- Introduction and definitions
- Description, purpose, and intent of the district
- List of permitted and conditional land uses
- Density and intensity regulations
- Other miscellaneous regulations specific to the zoning district
- Bulk regulations
- Land use regulations
- Figures and graphics that help make the regulations for each district easier to understand and interpret

Following the initial draft of these sections, the new draft Zoning Ordinance will be sent (digitally) to Village Staff for review with marked comments and questions.

Task 6.2: Part 2 of Draft Zoning Code (Draft #1)

Prepare the Draft Zoning Code text for the sections of the code relating to:

- Nonconforming provisions (uses, lots, structures, etc.)
- Points-based landscaping and bufferyard regulations (requirements for lots, buildings, parking, etc.)
- Performance standards (visibility, parking, parking lots, noise, lighting, etc.)
- Signage (types, locations, area, etc.)
- Procedures and administration

Following the initial draft of these sections, the new draft Zoning Ordinance will be sent (digitally) to Village Staff for review with marked comments and questions.

Task 6.3: Staff Conference Calls to Review Draft of Zoning Code (4, 1-hour meetings)

During the Village Staff's review of Part 1 and Part 2 of the Draft Zoning Code in Tasks 6.1 and 6.2, a series of conference calls will be held to gather feedback, answer questions, and discuss potential changes. All meeting materials will be provided digitally.

SCOPE OF SERVICES

Task 6.4: Plan Commission Meetings to Review Draft Zoning Code (2, 2-hour meetings)

Following the completed Village Staff review of Part 1, a Plan Commission meeting will be held to review and discuss Part 1 of the Draft Zoning Code. Additionally, following the completed Village Staff review of Part 2, a Plan Commission meeting will be held to review and discuss Part 2 of the Draft Zoning Code. Provide all meeting materials.

Task 6.5: Revised Draft of Zoning Code (Draft #2)

Based on the discussions and suggested edits in Task 6.4, a revised Draft Zoning Code will be created and sent (digitally) to the Village for Staff review and input.

Task 6.6: Stakeholder Listening Session to Review Draft Zoning Code (Draft #2) and Zoning Map (Draft #2)

Following the completion of Tasks 6.1-6.5 and Tasks 7.1-7.3, a stakeholder listening session will be held to review the process and gather feedback on the new Draft Zoning Code and Map. Provide all meeting materials.

Task 6.7: Revised Draft of Zoning Code (Draft #3)

Based on Village Staff input, revisions to the Draft Zoning Code (Draft #3) following Task 6.6 will be made, sent to the Village (digitally), and released to the public via the Village's website. Draft #3 will be displayed and reviewed during Task 6.8.

Task 6.8: Public Open House (1, 2-hour meeting) on Zoning Code Draft #3 and Zoning Map Draft #2

A public open house-style event will be held to provide an opportunity for the general public to learn about, review, and provide comments on Zoning Code Draft #3 and Zoning Map Draft #2 prior to the public hearing. Provide all meeting materials.

Work Element 7: Discussion Draft Village-wide Zoning Map

Task 7.1: Half-Day Mapping Workshop with Village Staff (1, 4-hour meeting)

Meet with Village staff to review the existing Zoning Map and discuss revisions based on the proposed zoning districts; provide materials necessary to facilitate the worksession.

Task 7.2: Draft Zoning Map (Map Draft #1)

Prepare one complete, parcel-based draft of the Zoning Map (Draft #1) based on the worksession in Task 7.1.

Task 7.3: Plan Commission Meeting to Review Draft Zoning Map (1, 2-hour meeting)

Attend one meeting of the Plan Commission to review the Draft Zoning Map (Draft #1) and identify revisions; provide materials necessary to facilitate the meeting.

Task 7.4: Revised Draft Zoning Map (Draft #2 for Open House)

Based on Village Staff input, revisions to the Draft Zoning Map (Draft #1) following Task 6.6 and 7.3 will be made and released to the public via the Village's website. Draft #2 will be displayed and reviewed during Task 6.8.

Work Element 8: Public Hearing Draft of Zoning Code and Zoning Map

Task 8.1: Public Hearing Draft of Zoning Code (Draft #4)

Based on direction from Village Staff and feedback gathered during the public open house (Task 6.8), prepare a revised draft Zoning Code (Draft #4) to be used in the public hearing. The draft will be posted on the Village website in advance of the public hearing.

Task 8.2: Public Hearing Draft of Zoning Map (Draft #3)

Based on direction from Village Staff and feedback gathered during the public open house (Task 6.8), prepare a revised draft Zoning Map (Draft #3) to be used in the public hearing. The draft will be posted on the Village website in advance of the public hearing.

Task 8.3: Executive Summary

Prepare one Executive Summary describing the primary changes in Tasks 8.1 and 8.2 and the rationale for said changes. This document will accompany the Public Hearing Draft Zoning Code and Map in Tasks 9.1-9.3).

Task 8.4: Recommended Comprehensive Plan and Other Code Changes Memorandum

Prepare one memorandum summarizing suggested changes to the Village's Comprehensive Plan, municipal code, and other policies based on the outcomes of the Zoning Code Rewrite project. The document will be provided to Village following Adoption (Task 9.3).

SCOPE OF SERVICES

Work Element 9: Public Hearings, Revisions, and Final Adoption

Task 9.1: Plan Commission Public Hearing on Zoning Code (1, 2-hour meeting)

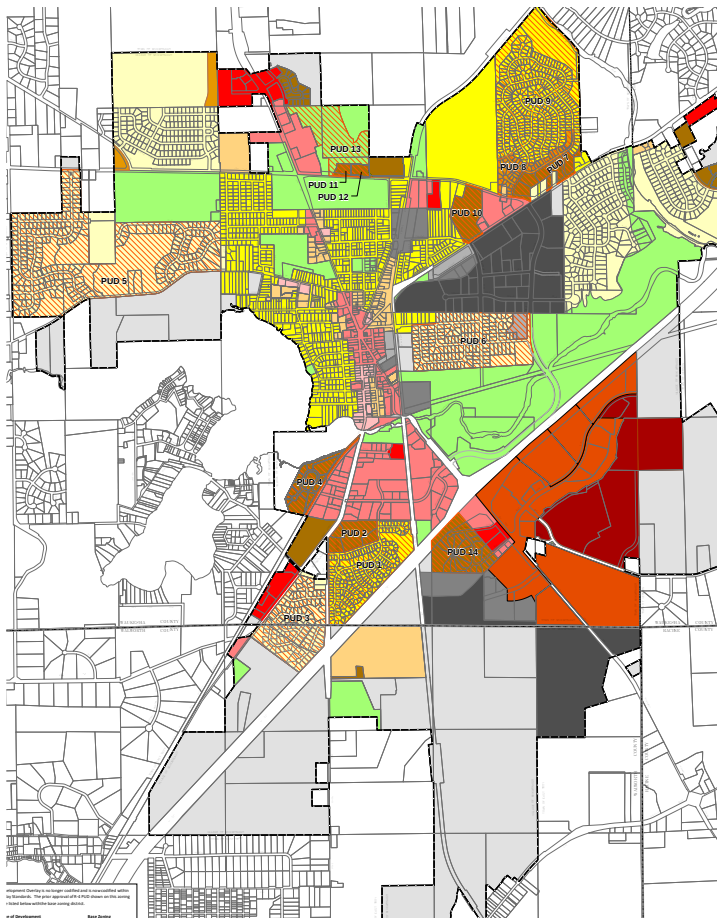
Present the public hearing draft of the Zoning Code and Zoning Map at a public hearing of the Plan Commission.

Task 9.2: Revised Zoning Code (Post Public Hearing)

Integrate any changes into the Zoning Code or Zoning Map that were advised at the public hearing and recommended by the Plan Commission. Provide the revised Zoning Code and Map to the Village for Task 9.3.

Task 9.3: Village Board Meeting to Adopt Zoning Code and Zoning Map (1, 2-hour meeting)

Present the revised Zoning Code and Zoning Map described in Task 9.2 at a meeting of the Village Board. The Village Board will take action to adopt the Zoning Code and Zoning Map.



Existing Village of Mukwonago Zoning Map, 2018

Work Element 10: Zoning Code Implementation

Task 10.1: Final Zoning Code, Zoning Map, and Other Relevant Documents

Integrate any final changes into the Zoning Code and Zoning Map that were advised and adopted by the Village Board (Task 9.3). Provide an electronic file (PDF and MS Word) of the final, adopted Zoning Code and Zoning Map. Additionally, provide the Village with updated application forms, other sample documents, style guides, and an inventory of nonconformities. All of these materials provided in this Task can be directly used to update the Village's online tools such as Muni-code and Zoning Hub. Due to familiarity and software-specific technical training at the Village Staff and software proprietor level, edits and full updates to these tools are not included in this scope.

Task 10.2: Staff Training Seminar and User Guide (as needed)

Conduct training via web conference (up to 15 hours) for interested Village Staff and Plan Commission members. Additionally, provide the Village with a User Guide that helps users navigate the new Zoning Code and Map.

Task 10.3: Ongoing Administrative Support

Via email or telephone, provide assistance with answering questions about Code administration and interpretation and advice regarding minor regulatory amendments; to be provided at no charge through term of contract.

Village of Mukwonago Zoning and Sign Code Rewrite Proposed Timeline

Village of Mukwonago Zoning and Sign Code Rewrite Proposed Timeline		2020											2021	
		March	April	May	June	July	August	September	October	November	December	January	February	
1. Public Participation Plan														
Task 1.1 Public Participation Plan														
Task 1.2. Provide Content and Project Updates for Project Website														
2. Project Orientation														
Task 2.1 Review Relevant Village Plans, Ordinance, and Documents														
Task 2.2 Project Kick-off Meeting with Village Staff (1 2-hour meeting)			●											
Task 2.2 Project Orientation and Kick-off Meeting the Plan Commission (1 2-hour meeting)			●											
3. Issues Identification														
Task 3.1 Village Tour with Village Staff		●												
Task 3.2 Stakeholder Listening Sessions (2 1-hour meetings)			●											
Task 3.3 Public Workshop on Issues Identification (1 2-hour meeting)														
Task 3.4 Issues Identification Memorandum														
4. Zoning Code Analysis/Evaluation														
Task 4.1 Draft Zoning Code Analysis and Evaluation Report														
Task 4.2 Plan Commission Meeting to Present Report (PC Meeting 1)					●									
5. Annotated Outline														
Task 5.1 Policy Questions Decision Guide														
Task 5.2 Draft Annotated Outline of the Zoning Code														
Task 5.3 Staff Conference Call to Review the Annotated Outline and Policy Questions Decision Guide (1 1-hour meeting)														
Task 5.4 Plan Commission Meeting to Present the Annotated Outline and Policy Questions Decision Guide (PC Meeting 2)					●									
Task 5.5 Final Annotated Outline of the Zoning Code														
6. Discussion Draft Zoning Code														
Task 6.1 Part 1 of Draft Zoning Code (Draft #1: Districts, Bulk Regulations, Land Uses)														
Task 6.2 Part 2 of Draft Zoning Code (Draft #1: All Remaining Chapters)														
Task 6.3 Staff Conference Calls to Review Draft Zoning Code (4 1-hour meetings throughout Task F 1-6)														
Task 6.4 Plan Commission Meetings to Review Draft Zoning Code (PC Meetings 3 and 4)						●	●							
Task 6.5 Revised Draft Zoning Code (Draft #2)														
Task 6.6 Stakeholder Listening Session to Review Draft Zoning Code (Draft #2) and Zoning Map (Draft #1)							●							
Task 6.7 Revised Draft Zoning Code (Draft #3)														
Task 6.8 Public Open House (1 2-hour meeting) on Zoning Code (Draft #3) and Zoning Map (Draft #2) (see Task 7.5)							●							
7. Discussion Draft Villagewide Zoning Map														
Task 7.1 Half-Day Mapping Workshop with Village Staff (1 4-hour meeting)							●							
Task 7.2 Draft Zoning Map (Map Draft #1)														
Task 7.3 Plan Commission Meeting to Review Draft Zoning Map (PC Meeting 5)								●						
Task 7.4 Revised Draft Zoning Map (Map Draft #2 for Open House)														
8. Public Hearing Draft Zoning Code and Villagewide Map														
Task 8.1 Public Hearing Draft Zoning Code (Draft #4)														
Task 8.2 Public Hearing Draft Zoning Map (Draft #3)														
Task 8.3 Executive Summary														
Task 8.4 Recommended Comprehensive Plan and Other Code Changes Memorandum														
9. Public Hearings, Revisions, & Final Adoption														
Task 9.1 Plan Commission Public Hearing on Zoning Code and Zoning Map (PC Meeting 6)*												●		
Task 9.2 Revised Zoning Code and Zoning Map (Post Public Hearing)														
Task 9.3 Village Board Meeting to Adopt Zoning Code and Zoning Map*													●	
10. Zoning Code Implementation														
Task 10.1 Final Zoning Code, Zoning Map, and Other Relevant Documents														
Task 10.2 Staff and Plan Commission Training Seminar and User Guide (as needed)														
Task 10.3 Ongoing Administrative Support														

141



Cost Proposal for

VILLAGE OF MUKWONAGO

ZONING AND SIGN ORDINANCE REWRITE

February 14, 2020



VANDEWALLE & ASSOCIATES, INC.

Madison Office: 120 East Lakeside Street / Madison, WI 53715
Milwaukee Office: 247 Freshwater Way, Suite 530 / Milwaukee, WI 53204
Primary Contact: Mike Slavney / (608) 255-3988 / mslavney@vandewalle.com

PROJECT FEES

Vandewalle & Associates is Unique in its Integrated Ability to Lead Projects and Communities through Complex Analysis, Planning, and Implementation

Vandewalle & Associates is focused on providing the Village of Mukwonago with a project that provides excellent value and clear direction.

This will be accomplished through expert project management and reliance on Village staff to complete certain tasks as described in the Village's Request for Proposals.

The table below provides a breakdown of billing rates by position and charges for other items. A full cost breakdown by task follows on the next page. While the actual cost of individual tasks may ultimately be more or less than the amounts presented in this estimated budget. All work associated with Work Elements 1-8 will be conducted on a cost not to exceed \$68,120. All work associated with Work Elements 1-10 will be conducted on a cost not to exceed \$74,910.

Tasks beyond those identified in the final contract will be completed through a Work Order and billed on a time and materials basis.

FEE SCHEDULE

2020 Billing Rates			
Principal	\$175 to \$220	Other Charges: Invoice charges to the client consist of (1) Professional fees rendered at current billing rates, (2) Reimbursable expenses billed at cost multiplied by 1.1, excepting some in-house charges and travel, and. (3) Technology/Software expenses billed at \$50/month.	
Associate	\$105 to \$125		
Assistant	\$80 to \$95		
GIS Technician/Specialist	\$85 to \$95	Expense	Cost
Communications Specialist	\$65 to \$125	Mileage	IRS Rate
Project Assistant	\$50 to \$70	Printing and Postage	Cost plus 10%

Zoning and Sign Code Rewrite

Project Cost Estimate

Expenses

Total

1. Public Participation Plan

Task 1.1	Public Participation Plan		\$360
Task 1.2.	Provide Content and Project Updates for Project Website		\$1,020

2. Project Orientation

Task 2.1	Review Relevant Village Plans, Ordinance, and Documents		\$890
Task 2.2	Project Kick-off Meeting with Village Staff (1 2-hour meeting)		\$1,270
Task 2.2	Project Orientation and Kick-off Meeting the Plan Commission (1 2-hour meeting)	\$ 100	\$1,510

3. Issues Identification

Task 3.1	Village Tour with Village Staff	\$ 100	\$990
Task 3.2	Stakeholder Listening Sessions (2 1-hour meetings)	\$ 50	\$1,460
Task 3.3	Public Workshop on Issues Identification (1 2-hour meeting)	\$ 150	\$2,070
Task 3.4	Issues Identification Memorandum		\$1,400

4. Zoning Code Analysis/Evaluation

Task 4.1	Draft Zoning Code Analysis and Evaluation Report		\$1,780
Task 4.2	Plan Commission Meeting to Present Report (PC Meeting 1)	\$ 100	\$1,370

5. Annotated Outline

Task 5.1	Policy Questions Decision Guide		\$1,610
Task 5.2	Draft Annotated Outline of the Zoning Code		\$530
Task 5.3	Staff Conference Call to Review the Annotated Outline and Policy Questions Decision Guide (1 1-hour meeting)		\$550
Task 5.4	Plan Commission Meeting to Present the Annotated Outline and Policy Questions Decision Guide (PC Meeting 2)	\$ 100	\$1,370
Task 5.5	Final Annotated Outline of the Zoning Code		\$170

6. Discussion Draft Zoning Code

Task 6.1	Part 1 of Draft Zoning Code (Draft #1: Districts, Bulk Regulations, Land Uses)	\$ 100	\$11,180
Task 6.2	Part 2 of Draft Zoning Code (Draft #1: All Remaining Chapters)	\$ 100	\$10,100
Task 6.3	Staff Conference Calls to Review Draft Zoning Code (4 1-hour meetings throughout Task F 1-6)	\$ 100	\$1,880
Task 6.4	Plan Commission Meetings to Review Draft Zoning Code (PC Meetings 3 and 4)	\$ 200	\$3,050
Task 6.5	Revised Draft Zoning Code (Draft #2)	\$ 100	\$4,200
Task 6.6	Stakeholder Listening Session to Review Draft Zoning Code (Draft #2) and Zoning Map (Draft #1)	\$ 100	\$1,850
Task 6.7	Revised Draft Zoning Code (Draft #3)	\$ 100	\$1,550
Task 6.8	Public Open House (1 2-hour meeting) on Zoning Code (Draft #3) and Zoning Map (Draft #2) (see Task 7.5)	\$ 200	\$2,330

7. Discussion Draft Villagewide Zoning Map

Task 7.1	Half-Day Mapping Workshop with Village Staff (1 4-hour meeting)	\$ 150	\$2,490
Task 7.2	Draft Zoning Map (Map Draft #1)	\$ 100	\$4,380
Task 7.3	Plan Commission Meeting to Review Draft Zoning Map (PC Meeting 5)	\$ 150	\$1,570
Task 7.4	Revised Draft Zoning Map (Map Draft #2 for Open House)		\$1,250

8. Public Hearing Draft Zoning Code and Villagewide Map

Task 8.1	Public Hearing Draft Zoning Code (Draft #4)	\$ 100	\$1,580
Task 8.2	Public Hearing Draft Zoning Map (Draft #3)	\$ 50	\$580
Task 8.3	Executive Summary		\$890
Task 8.4	Recommended Comprehensive Plan and Other Code Changes Memorandum		\$890

9. Public Hearings, Revisions, & Final Adoption

Task 9.1	Plan Commission Public Hearing on Zoning Code and Zoning Map (PC Meeting 6)*	\$ 100	\$1,540
Task 9.2	Revised Zoning Code and Zoning Map (Post Public Hearing)	\$ 100	\$990
Task 9.3	Village Board Meeting to Adopt Zoning Code and Zoning Map*	\$ 100	\$1,610

10. Zoning Code Implementation

Task 10.1	Final Zoning Code, Zoning Map, and Other Relevant Documents	\$ 100	\$1,930
Task 10.2	Staff and Plan Commission Training Seminar and User Guide (as needed)	\$ 100	\$2,260
Task 10.3	Ongoing Administrative Support		\$0

Total Estimated Project Cost -- Only the Full Public Hearing Draft Code and Map (excluding Task 9 and 10)*** \$2,150 \$68,144

Total Estimated Project Cost -- With All Tasks \$2,650 \$74,910

AGENDA ITEM REQUEST FORM

Committee/Board:	Committee of the Whole
Topic:	Motion to recommend to the Village Board to approve an Ordinance amending <u>Section 78-1</u> of the Village of Mukwonago Municipal Code regarding the composition, duties, and power of the Board of Review.
From:	Diana Dykstra
Department:	Administration
Presenter:	Diana Dykstra
Date of Committee Action (if required)	03/04/20 & 4/1/20
Date of Village Board Action (if required)	04/15/20

Information

Subject:

Motion to recommend to the Village Board to approve an Ordinance amending Section 78-1 of the Village of Mukwonago Municipal Code regarding the composition, duties, and power of the Board of Review.

Background Information/Rationale:

Each year the Village is required to conduct a Board of Review. There are three Trustees and the Village President who make up the Elected officials who serve on this Board, which are appointed by the Village President and confirmed by the Village Board annually.

It was brought to my attention that due to the length of that meeting commitment, members have always been paid a small stipend of \$50.

In reviewing our local ordinance, we found it necessary to amend in order to provide for that payment.

At the last Committee Meeting, it was requested that I review the rate of pay for discrepancy. After review, it is noted In 2018 the following was paid:

Darlene Johnson \$50
 Jason Vermeulen \$50
 Jim Decker \$50
 Fred Winchowky \$50

I was unable to find any record in 2017 of payment.

In 2016 the following was paid:

Darlene Johnson \$30
 Jason Vermeulen \$30

Ken Werner \$30
Fred Winchowky \$30

Key Issues for Consideration:

I requested the addition of language to allow us to grant payment for the 2019 Board of Review.

Fiscal Impact (if any):

In 2019 There are (4) elected officials who would be eligible for this payment. The membership may rotate based on appointments from the Village President. The Village Clerk is a member, however is a salaried employee, and therefore not eligible for payment. The fiscal impact of payments to (4) elected officials who serve would be \$200.

Attachments

Ord Amend Board of Review

**VILLAGE OF MUKWONAGO
WAUKESHA AND WALWORTH COUNTIES**

ORDINANCE NO. ____

**ORDINANCE TO AMEND SECTION 78-1
OF THE VILLAGE OF MUKWONAGO MUNICIPAL CODE
REGARDING THE COMPOSITION, DUTIES AND POWER OF
THE BOARD OF REVIEW**

The Village Board of the Village of Mukwonago do ordain as follows:

SECTION I

Section 78-1(a) of the Municipal Code of the Village of Mukwonago is hereby amended to read as follows:

- (a) The Board of Review of the Village shall be composed of five (5) members, including the Village President, Village Clerk and three (3) members of Village Board of Trustees, who will be appointed by the Village President subject to confirmation by the Village Board. The Board of Review shall have the duties and powers prescribed in Wisconsin Statute §70.46 and §70.47.

SECTION II

Section 78-1(c) of the Municipal Code of the Village of Mukwonago is hereby created to read as follows:

- (c) Members of the Village Board who are appointed members of the Board of Review shall be compensated as established by Resolution, from time to time, by the Village Board.

SECTION III

Section 78-1(d) of the Municipal Code of the Village of Mukwonago is hereby created to read as follows:

- (d) The Village Board hereby authorizes compensation to be paid to the members of the Village Board appointed to the Board of Review as a stipend for the services they are providing to the Village by participating on the Board of Review of the 2019 Board of Review sessions, even though that service pre-dates the enactment of Section 78-1(c) of the Village Code as provided for hereunder.

SECTION IV

All Ordinances or parts of Ordinances contravening the terms and conditions of this Ordinance are hereby to that extent repealed.

SECTION V

The several sections of this Ordinance shall be considered severable. If any section shall be considered by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the other portions of the Ordinance.

SECTION VI

This Ordinance shall take effect upon passage and publication as approved by law, and the Village Clerk shall so amend the Code of Ordinances of the Village of Mukwonago, and shall indicate the date and number of this amending ordinance therein.

PASSED AND ADOPTED by the Village Board this _____ day of _____, 2020.

APPROVED:

Fred Winchowky, Village President

Countersigned:

Diana Dykstra, Village Clerk/Treasurer

AGENDA ITEM REQUEST FORM

Committee/Board:	Committee of the Whole
Topic:	Motion to recommend to the Village Board to approve the request for educational pay incentive from Officer Taylor Zajichek
From:	Kevin Schmidt
Department:	Police
Presenter:	Police Chief Kevin Schmidt
Date of Committee Action (if required)	April 1, 2020
Date of Village Board Action (if required)	April 15, 2020

Information

Subject:

Motion to recommend to the Village Board to approve the request for educational pay incentive from Officer Taylor Zajichek

Background Information/Rationale:

Article 6 of the Mukwonago Professional Police Association contract states as follows:

“For employees hired after 3/1/95, credits earned and approved in the foregoing program will be compensated per annum, in the following manner:

Associates +	Associates +	Associates +	Bachelors
15 credits	30 credits	45 credits	Degree
\$ 700	\$ 800	\$ 900	\$ 1,500

Officer Zajichek was hired by the Department in December of 2018. He earned his Associates Degree in Police Science (60 credits) from Waukesha County Technical College in May, 2017. He has earned an additional thirty-two (32) credits in a criminal justice area of study through WCTC, and is currently enrolled at Columbia Southern University to earn his Bachelor of Science Degree in Criminal Justice. His total credits earned are currently at ninety-two (92).

Key Issues for Consideration:

The Police Commission has reviewed his transcripts and requests approval of Officer Zajicheck receiving an additional \$800 per year for education pay incentive, as per the contract, pending the repayment of any advanced tuition paid by the Village of Mukwonago.

Fiscal Impact (if any):

Officer Taylor Zajicheck should receive \$800 per year, divided by 26 pay periods.

However, he should not receive the payment until monies advanced to him are paid back to the Village.

Per the current contract ***"The officer will not be eligible to receive an incentive payment while advanced monies are owed by an officer. Instead, the Village shall apply what would otherwise be paid to the officer against their balance for advanced tuition, until such amount is paid back in full."***

Requested Action by Committee/Board:

Attachments

[Zajicheck education pay request.pdf](#)

[Zajicheck letter from Police Commission.pdf](#)

Taylor Zajichek
627 s Rochester St
Mukwonago WI, 53149

Chief,

According to Article 6 of our contract the "Pay Incentive Plan" once I have my Associates Degree plus 30 credits I am eligible for another \$800 per year. I will attach my unofficial transcript from Waukesha County Technical College, which says I have a total of 92 credits currently. The Associates Degree through Waukesha County Technical College is 60 credits.

Taylor Zajichek

WAUKESHA COUNTY TECHNICAL COLLEGE

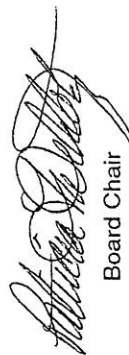
*On recommendation of the Faculty and by virtue of the
authority vested in them, the Board of Waukesha County
Area Technical College District have conferred upon*

Taylor C. Zajichek

Criminal Justice Studies

Associate of Applied Science

Given at Pewaukee, in the State of Wisconsin
May 19, 2017


Board Chair




President

Official Academic Transcript from:
WAUKESHA COUNTY TECHNICAL COLLEGE
REGISTRATION & RECORDS OFFICE
800 MAIN ST.
PEWAUKEE, WI 53072-4696



TELEPHONE: 262-691-5578

Official Academic Transcript of:
TAYLOR C ZAJICHEK
Transcript Created: 4-Feb-2020

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Intended Recipient:
TAYLOR ZAJICHEK
1081 REGENT RD APT 804
OCONOMOWOC, WI 53066-4641

E-Mail: tzajichkek@mkpd.org

Requested by:
TAYLOR C ZAJICHEK
1081 REGENT RD APT 804
OCONOMOWOC, WI 53066-4641

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WAUKESHA COUNTY TECHNICAL COLLEGE

800 Main Street Pewaukee, WI 53072

OFFICE OF RECORDS TRANSCRIPT OF ACADEMIC RECORD

Student No: 000447076

Date of Birth: 25-JUL-1994

Date Issued: 04-FEB-2020
OFF

Record of: Taylor C Zajichek
Issued To: TAYLOR ZAJICHEK
1081 REGENT RD APT 804
OCONOMOWOC, WI 53066-4641

Page: 1

Course Level: Degree Seeking/Credit Course

Current Program

Program : Crim Justice-Law EnF 720 Acad

Degrees Awarded Associate-Applied Science 19-MAY-2017
Program : Criminal Justice Studies

Degrees Awarded Technical Diploma 18-DEC-2018
Program : Crim Justice-Law EnF 720 Acad

SUBJ NO.	COURSE TITLE	CRED GRD	PTS R
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INSTITUTION CREDIT:

Spring 2013-14

504 104	Introduction to Security	3.00 C	6.00
504 122	Patrol & Traffic Procedures	3.00 B	9.00
504 900	Intro to Criminal Justice	3.00 A	12.00
801 196	Oral/Interpersonal Comm	3.00 W	0.00 E
809 199	Psychology of Human Relations	3.00 F	0.00 E
Ehrs: 9.00 GPA-Hrs: 9.00 QPts: 27.00 GPA: 3.00			

Fall 2014-2015

801 136	English Composition 1	3.00 W	0.00 E
804 107	College Mathematics	3.00 B	9.00
809 199	Psychology of Human Relations	3.00 W	0.00 E
Ehrs: 3.00 GPA-Hrs: 3.00 QPts: 9.00 GPA: 3.00			

Spring 2014-2015

504 102	Police Organization and Admin	3.00 F	0.00 E
504 124	Forensic Investigation I	3.00 B+	9.99
504 160	Intro to Homeland Security	3.00 B	9.00
504 902	Criminal Law	3.00 C	6.00
Ehrs: 9.00 GPA-Hrs: 9.00 QPts: 24.99 GPA: 2.77			

Fall 2015-2016

504 108	Introduction to Terrorism	3.00 B	9.00
504 115	Criminal Evidence	3.00 C	6.00
504 125	Forensics Investigation II	3.00 B+	9.99
504 140	Criminology	3.00 A-	11.01
801 196	Oral/Interpersonal Comm	3.00 D	3.00 I
Ehrs: 15.00 GPA-Hrs: 15.00 QPts: 39.00 GPA: 2.60			

Spring 2015-2016

504 102	Police Organization and Admin	3.00 B+	9.99 I
504 904	Juvenile Law	3.00 C-	5.01
504 905	Report Writing	3.00 C	6.00
504 906	Criminal Investigation Theory	3.00 A-	11.01
801 198	Speech	3.00 W	0.00 E
Ehrs: 12.00 GPA-Hrs: 12.00 QPts: 32.01 GPA: 2.66			

***** CONTINUED ON NEXT COLUMN *****

SUBJ NO.	COURSE TITLE	CRED GRD	PTS R
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Institution Information continued:

Summer 2016-2017

801 136	English Composition 1	3.00 B	9.00 I
809 166	Intro to Ethics: Theory & App	3.00 C-	5.01
Ehrs: 6.00 GPA-Hrs: 6.00 QPts: 14.01 GPA: 2.33			

Fall 2016-2017

504 901	Constitutional Law	3.00 A-	11.01
809 197	Contemporary Amer Society	3.00 C+	6.99
809 199	Psychology of Human Relations	3.00 B	9.00 I
Ehrs: 9.00 GPA-Hrs: 9.00 QPts: 27.00 GPA: 3.00			

Spring 2016-2017

504 162	Employment Strategies	1.00 B	3.00
504 903	Professional Communications	3.00 A	12.00
801 198	Speech	3.00 C	6.00 I
Ehrs: 7.00 GPA-Hrs: 7.00 QPts: 21.00 GPA: 3.00			

Fall 2018-2019

504 700	Overview of Criminal Justice	1.00 B+	3.33
504 701	Overview of Patrol Response	2.00 B+	6.66
504 702	Overview of Tactics	1.00 B+	3.33
504 703	Overview of Investigations	2.00 B+	6.66
504 704	Principles Patrol Response	2.00 B+	6.66
504 705	Principles of Tactics	3.00 B+	9.99
504 706	Princ Emer Veh Response	2.00 B+	6.66
504 707	Principles of Investigations	2.00 B+	6.66
504 708	Health and Fitness	1.00 B+	3.33
504 709	Application Traffic Response	2.00 B+	6.66
504 711	Scenario Assessment	1.00 B+	3.33
504 712	Application of Investigation	3.00 B+	9.99
Ehrs: 22.00 GPA-Hrs: 22.00 QPts: 73.26 GPA: 3.33			

***** TRANSCRIPT TOTALS *****

	Earned Hrs	GPA Hrs	Points	GPA
TOTAL INSTITUTION	92.00	92.00	267.27	2.90

TOTAL TRANSFER	0.00	0.00	0.00	0.00
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OVERALL	92.00	92.00	267.27	2.90
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Rachel Burling
Registrar

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WAUKESHA
COUNTY TECHNICAL
COLLEGE

WCTC Transcript Key

Grades	Percent value	Point value
A	95-100	4.00
A-	93-94	3.67
B+	91-92	3.33
B	87-90	3.00
B-	85-86	2.67
C+	83-84	2.33
C	79-82	2.00
C-	77-78	1.67
D+	75-76	1.33
D	72-74	1.00
D-	70-71	0.67
F	69 or below	0.00
WF	Withdrawn Failing (not currently in course)	

The grade point average (GPA) at the end of the any semester is the total number of grade points divided by the total number of credits attempted.

Grades which do not have associated grade point average

S	Satisfactory (ADN, recruit school and non-credit students receiving CEU)
NG	No grade (non-credit)
U	Unsatisfactory (did not meet course requirements)
I	Incomplete (must be completed within one semester to complete course requirements)
WP	Withdrawn Passing (not currently in use)
AU	Audit
W	Student initiated withdrawal
AW	Administrative Withdrawal

Course numbering system

Courses have a 10-digit course number

1st three digits - area of instruction
4th digits - program level
5th and 6th digits - course
Remaining digits - section

Credit courses - 4th digit

0 or 1	Associate Degree
3	Technical Diploma
5	Apprenticeship
7	Technical Diploma (Fire Training)
9	Associate Degree (Law Enforcement/Paramedic)

Non-credit courses - 4th digit

4	Continuing education
6	Community service
7	Adult high school
7	Fire Training continuing education

Repeat courses (R-column)

I	Inclusion in GPA
E	Exclusion in GPA
A	Excluded from earned hours but averaged into GPA

Name change

Prior to 7-28-87, Waukesha County Technical College was referred to as Waukesha County Technical Institute.

Advanced standing credit

AP	College Board Advanced Placement Examination
CL	College Level Examination (CLEP)
DT	DSST (formerly DANTES subject Standardized Tests)
OT	Other college credit earned in high school
PD	Prior degree (Wisconsin Technical College System Credit for Prior Learning Policy, November 20, 2002)
PR	Credit by exam
TR	Transfer from other institutions
WX	Work experience, life experience

Waukesha County Technical College

Records Department
800 Main Street
Pewaukee, WI 53072

262.691.5280

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WAUKESHA
COUNTY TECHNICAL
COLLEGE

To: Village of Mukwonago Personnel Committee
From: Village of Mukwonago Police Commission
Date: February 11, 2020
Re: Request for educational pay incentive for Officer Taylor Zajichuk

A request for educational pay incentive for Officer Taylor Zajichuk was brought forth by Chief Kevin Schmidt via email, since there were no regular scheduled Police Commission meetings for the month of February 2020.

As Chair for the Police Commission, I reviewed Officer Zajichuk's application and associated documents for "Pay Incentive Plan," as outlined in Article 6 of the contract between the Village of Mukwonago and the Police Association. I concur with Chief Schmidt's recommendation that Officer Zajichuk receives the pay incentive for Associates + 30 credits, or \$800.00, as set forth in the current police contract.

I, therefore, request the approval of this matter, by the Personnel Committee, at its earliest convenience.

Thank you for your consideration.

Respectfully Submitted,

Kenneth Johnson

Kenneth Johnson
Police Commission / Chairperson

CC: Chief of Police, Kevin Schmidt
Officer Taylor Zajichuk
Village of Mukwonago Police Commission

**VILLAGE OF MUKWONAGO
WAUKESHA/WALWORTH COUNTIES**

RESOLUTION NO. 2020-17

**RESOLUTION OF THE VILLAGE BOARD OF THE VILLAGE OF MUKWONAGO
REGARDING ESSENTIAL GOVERNMENTAL FUNCTIONS/EMPLOYEES**

WHEREAS, the State of Wisconsin Department of Health Services has issued Emergency Order No. 12 dated March 24, 2020, which provides, in part, that all individuals present within the State of Wisconsin are ordered to stay home or at their place of residence with exceptions that are outlined in the Order; and

WHEREAS, one of the exceptions to the restriction to stay at home is found in Paragraph 12 of the Order and indicates that essential governmental functions are determined to be exempt from the Order; and

WHEREAS, the Order provides, in pertinent part, that “each government body shall determine its essential governmental function, if any, and identify employees and contractors necessary to the performance of those functions”; and

WHEREAS, the Village Board has reviewed the functions of the Village of Mukwonago governmental structure and as a consequence, is desirous of adopting this Resolution identifying those essential governmental functions, as well as those employees and contractors necessary to the performance of those functions.

NOW, THEREFORE, BE IT RESOLVED by the Village Board of the Village of Mukwonago, that the essential function of the Village of Mukwonago are those identified in the Wisconsin Constitution, as well as Chapters 61 and 66 of the Wisconsin Statutes; more specifically, the Board determines that the essential function of Village Government is to protect the public health, safety and welfare.

BE IT FURTHER RESOLVED that the Village Board finds that each of the Village Departments is essential to the functioning of the Village as a whole and therefore, the list of positions as set forth in the attached list (Exhibit A) are essential to the functions of the Village of Mukwonago, in part, for the reasons set forth by each Department Head in the memos attached collectively as Exhibit B.

BE IT FURTHER RESOLVED that the Village appoints various contractors that also provide essential services to the Village of Mukwonago in discharging its essential function, which list of contractors is attached hereto as Exhibit C.

BE IT FURTHER RESOLVED that Village Staff is hereby directed to take such steps are necessary to effectuate the intention of this Resolution.

Adopted this _____ day of _____, 2020.

APPROVED:

Attestation:

Fred Winchowky, Village President

Diana Dykstra, Village Clerk

RESOLUTION 2019-059

**A RESOLUTION RELATING TO SALARY AND WAGE SCHEDULES FOR
NON-REPRESENTED FULL-TIME AND PART-TIME EMPLOYEES**

WHEREAS, the Village Board adopted the 2020 Village Budget on November 12, 2019; and,

WHEREAS, the Budget included the following salary and hourly ranges for non-represented full-time and part-time employees for the calendar year 2020; and:

1. Full-time Positions

A. Salaried

Administrator	\$86,993	-	\$117,440
Fire Chief	\$79,454	-	\$107,262
Police Chief	\$79,454	-	\$107,262
Assistant Police Chief	\$79,454	-	\$107,262
Finance Director	\$72,230	-	\$97,511
Police Lieutenant	\$72,230	-	\$97,511
Public Works Director	\$72,230	-	\$97,511
Utilities Director	\$72,230	-	\$97,511
Community Planner	\$72,230	-	\$97,511
Assistant Utilities Director	\$61,882	-	\$83,539
Clerk-Treasurer	\$61,882	-	\$83,539
Supervisor of Inspections	\$56,255	-	\$75,945
Building Code Official	\$51,141	-	\$69,041

B. Hourly

Lead Police Dispatcher/Clerk	\$27.05	-	\$36.51
Lead Utilities Operator	\$27.05	-	\$36.51
Public Works Crew Supervisor	\$27.05	-	\$36.51
Accountant	\$24.59	-	\$33.19
Public Works Crew Mechanic	\$24.59	-	\$33.19
Utilities Operator	\$24.59	-	\$33.19
Deputy Clerk/Treasurer	\$20.50	-	\$27.68
Police Dispatcher/Clerk	\$20.50	-	\$27.68
Public Works Crewperson	\$20.50	-	\$27.68
Administrative Clerk/HR Specialist	\$19.07	-	\$25.75
Administrative Clerk/Building Support Specialist	\$19.07	-	\$25.75

2. Part-time Positions

A. Salaried

Municipal Judge	\$14,795
Village President	\$7,200
Village Trustee	\$4,200



Village of Mukwonago, Walworth and Waukesha Counties, State of Wisconsin

B. Hourly

Accountant I	\$24.59	-	\$33.19
Court Clerk - I	\$19.07	-	\$25.75
Administrative Clerk	\$17.74	-	\$23.95
Economic Development Intern	\$10.62	-	\$15.94
Building Codes Official	\$24.59	-	\$33.19
Firefighter/EMT Incident and Training POP	\$13.26	-	\$18.36
Firefighter/EMT Incident and Training POC	\$10.71	-	\$25.50
Firefighter Cadet		-	\$7.65
Office Assistant	\$10.62	-	\$15.94
Relief Snowplow Operator		-	\$21.25
Public Works Crewperson	\$14.87	-	\$21.25
Public Works Seasonal Help	\$9.18	-	\$15.30
Utilities Summer Help	\$9.18	-	\$15.30
Crossing Guard	\$11.61	-	\$13.26
Police Reserves		-	\$13.26
Chief Election Inspector		-	\$11.16
Assistant Election Inspector		-	\$10.38
Election Inspector		-	\$9.34

WHEREAS, the Personnel Committee reviewed this resolution on December 4, 2019 and recommended adoption.

THEREFORE, BE IT RESOLVED, this Resolution shall supersede and repeal any and all resolutions relating to the same subject matter previously adopted, and,

BE IT FURTHER RESOLVED, the terms of this Resolution shall take effect on the 1st day of January 2020 for the 2020 Fiscal Year.

ADOPTED this 18th day of December 2019.


Fred Winchowky, Village President

Attest:


Diana Dykstra, Clerk-Treasurer

ADDITIONS TO EXHIBIT A

Sworn Officers and Police Department Employees
Library Director and all Library Employees
Municipal Judge and Municipal Court Staff

Mark G. Blum

From: Diana Doherty <ddoherty@villageofmukwonago.com>
Sent: Wednesday, March 25, 2020 9:51 AM
To: Mark G. Blum
Cc: John Weidl
Subject: Finance/Admin Essential Functions

Hi Mark

My list of essential functions by positions that report to me are:

Accountant: Payroll, Utility Billing & Cash Transfer coordination

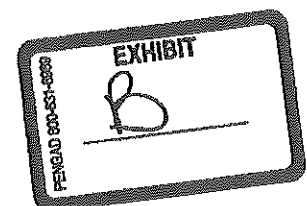
Admin/HR: HR processing of employee paperwork; Accounts Payable

Admin/Building: Inspection paperwork & payment processing; distribution of incoming mail; processing of tax and utility bill receipts (April is a big month for both); and some AP

If you need anything else, please let me know.

Thanks

Diana Doherty
Finance Director
Village of Mukwonago
440 River Crest Ct
Mukwonago, WI 53149
262-363-6421 ext 2101



Mark G. Blum

From: David Brown <dbrown@villageofmukwonago.com>
Sent: Tuesday, March 24, 2020 3:55 PM
To: Mark G. Blum
Cc: John Weidl; Wayne Castle
Subject: Village of Mukwonago Utility Essential Employees and Contractors/Suppliers

Good afternoon Mark,

The Mukwonago Water and Sewer Utilities is a essential part of the Village of Mukwonago by Supplying a safe supply of potable drinking water and treating it's wastewater for the health and welfare of the community. The Utilities consists of the Utility Director, Assistant Utility Director, Lead Operator and Four Operator.

Essential contractors and suppliers to the Villages Utilities are as follow and others may be deemed necessary.

Ace Hardware
Bedrock Sewer and Water
Century Springs
Core and Main
DF Tomasini
Expeditors, Inc
Home Depot
Horn Oil
Ruekert & Mielke
Sabel Mechanical
Suez/Water Well Solutions
Wanasek Corporation

Regards,
Dave Brown

Mark G. Blum

From: Diana Dykstra <ddykstra@villageofmukwonago.com>
Sent: Wednesday, March 25, 2020 11:48 AM
To: John Weidl; Mark G. Blum
Subject: Essential Staff - Clerk-Treasurer Office

I was asked to provide you who is essential in my department.

The entire Clerk-Treasurer Office (Clerk & Deputy) are considered essential staff.

Diana Dykstra, CMC
Clerk-Treasurer
Village of Mukwonago
440 River Crest Court
Mukwonago, WI 53149
262.363.6420
Population 8,057
The Village of



UPCOMING ELECTIONS FOR 2020:

Spring Election & Presidential Preference Primary – Tuesday, April 7, 2020

Partisan Primary – Tuesday, August 11, 2020

General Election – Tuesday, November 3, 2020

Check your Voter Status, Change your address, or Request an Absentee Ballot at www.mvotewi.gov

Please do not respond to this email unless specifically requested. Elected Officials and Members of Official Committees: In order to comply with the Wisconsin Open Meetings Law, please limit only response to the SENDER ONLY of this electronic communication.

Mark G. Blum

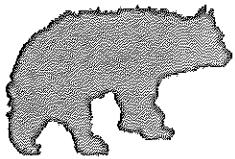
From: Ron Bittner <rbittner@villageofmukwonago.com>
Sent: Wednesday, March 25, 2020 11:46 AM
To: John Weidl; David Brown; Mark G. Blum
Subject: Essential Staff

In 2003, George W. Bush, through a Homeland Security Presidential Directive (HSPD-8), declared that:

<https://fas.org/irp/offdocs/nspd/hspd-8.html>

2c in the above presidential directive list public works as first responders

Ron Bittner
Public Works Director
Village of Mukwonago
262-363-6447



Village of Mukwonago Office of the Village Public Works Dept.

440 River Crest Ct. Mukwonago, Wisconsin 53149
262) 363-6447 Fax: (262) 363-7197

www.villageofmukwonago.com

ESSENTIAL DUTIES AND RESPONSIBILITIES, GENERAL DUTIES; The Public Works staff is responsible for maintenance of all municipally owned buildings, storm sewer system, streets, parking lots, snow and ice removal,

1. Maintain the Village Hall, Police, DPW Garage and Fire Station buildings
2. Maintain on a daily basis the dam of the Mukwonago River to control regional flooding.
3. Assist the Village Mechanic in the maintenance and repair of Fire, Police and Village equipment as needed,
4. Maintain streets in the Village of Mukwonago by patching, and grading road edges.
5. Maintain the Village storm sewer system including, catch basin cleaning and repair, and cleaning of storm sewer grates to prevent localized flooding
6. Perform snow and ice removal control including plowing the snow, sanding the ice, and removing the snow from the streets, public parking lots and Village maintained sidewalks.
7. Maintain street and park trees that are deemed a hazard to the public.
8. Maintain Village parks involving garbage collection, maintenance and inspection of park equipment, play structures.
9. Maintain the village street signs including GIS data entry, repair, replacement and installation of new signs.
10. Assist other departments as conditions warrant.

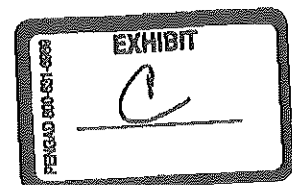
Regards,
Village of Mukwonago

Ron Bittner
Public Works Director/Weed Commissioner

EXHIBIT C

Essential contractors for the Village of Mukwonago

1. Village Engineers – Ruekert & Mielke
2. Village Attorneys – Hippenmeyer, Reilly, Blum, Schmitzer, Fabian & English, SC
3. Village Auditors – Baker Tilly
4. Village Financial Advisors – Hutchinson, Schockey & Erley Co.
5. Village Assessor – Associated Appraisals
6. 2020 Pending Village Infrastructure Contract:
 - a. Musson Brothers, Inc.
 - b. Wolf Paving, Inc.
 - c. Mud-Tek LLC
7. Village Streetscape Project
 - a. Foth Engineering
8. DeBack Drive Infrastructure Project
 - a. Musson Brothers, Inc.
 - b. T&T Tree
 - c. Stark Pavement
 - d. Northway Fence
 - e. M-Tec Environmental
 - f. Century Fence
 - g. Globe Contractors
 - h. Barricade Flasher Service
 - i. SX Blasting
 - j. County Materials
 - k. Super Aggregates
 - l. Johnson Sand & Gravel
 - m. Core and Main
9. River Park Estates Rehabilitation Phase 2
 - a. Wolf Paving, Inc.
 - b. Pavement Maintenance, Inc.
 - c. D.C. Burbach, Inc.
10. Pick N' Save Pond Retrofit
 - a. Mudtech, LLC



11. Village Zoning Code & Sign Code Updates

- a. Civi Tek Consulting, LLC

12. Utility Contractors

- a. Ace Hardware
- b. Bedrock Sewer and Water
- c. Century Springs
- d. Core and Main
- e. DF Tomasini
- f. Expeditors Inc.
- g. Home Depot
- h. Horn II
- i. Sabel Mechanical
- j. Suez/Water Well Solutions
- k. Wanasek Corporation

AGENDA ITEM REQUEST FORM

Committee/Board:	Committee of the Whole
Topic:	Motion to recommend to the Village Board to approve a Storm Water Maintenance Agreement with Bielinski Homes, Inc., for Chapman Farms Subdivision, a 64.51 acre development.
From:	Ben Kohout
Department:	Planning & Zoning
Presenter:	Village Planner
Date of Committee Action (if required)	April 1, 2020
Date of Village Board Action (if required)	April 15, 2020

Information

Subject:

Motion to recommend to the Village Board to approve a Storm Water Maintenance Agreement with Bielinski Homes, Inc., for Chapman Farms Subdivision, a 64.51 acre development.

Background Information/Rationale:

As part of a Development Project that includes a storm water management plan, a storm water maintenance agreement is required to be established which governs the general maintenance and upkeep. The document specifies whom is responsible and for which aspects each party is responsible for. This Stormwater Maintenance Agreement (SWMA) has been reviewed and recommended approval by the Village Engineer.

Key Issues for Consideration:
Fiscal Impact (if any):

n/a

Requested Action by Committee/Board:

Attachments

SWMA 20200306 Chapman Farms

SWMP 20200320

March 23, 2020

Mr. Fred Winchowky
Village President
Village of Mukwonago
440 River Crest Court
Mukwonago, WI 53149

Re: Chapman Farms – Villas
REVISED - Recommendation of Approval of Development Documents

Dear President Winchowky:

Our office has received a revised submittal of the storm water documents for the Chapman Farms Subdivision Development – specifically, phase 1 of the subdivision or “The Villas”. The revised submittal was received in our office on March 10, 2020 and included an updated Storm Water Management Plan (SWMP), Storm Water Maintenance Agreement (SWMA), and various approved permits for the development. Through review of the updated SWMP which was dated February 27, 2020, we found that it was lacking pertinent details pertaining to how the development will function when Phase 2 is ultimately built. Through conversations with Trio Engineering, an updated SWMP was submitted on and is dated March 20, 2020.

Our office had previously recommended approval of earlier versions of the documents, on September 23, 2019. Since that time, the developer has considered revising the future Phase 2 portion of the subdivision to include a few areas of higher density. Higher density directly equates to an increase in impervious area. Due to this increase in impervious area, we required that the storm water documents be revised to reflect the potential for the increased density. This revision ensures that when Phase 1 or “The Villas” is constructed, the storm water facilities that are built as part of Phase 1 will be built to handle the higher density of the Phase 2 tributary areas.

When the Phase 2 plans are finalized the SWMP for the subdivision will need to be revised to reflect how all the storm water facilities function. Since the Phase 1 SWMP was revised to reflect the anticipated results of the Phase 2 development, we are confident that the storm water facilities that will be constructed as part of Phase 1, will function as intended when Phase 2 is ultimately constructed.

We believe that the revised SWMP meets all requirements of the Village of Mukwonago Storm Water Ordinance and are satisfied with the results that are presented within. We, therefore, recommend the following actions of the documents to you and the Village Board:

1. Approval of the Storm Water Management Plan subject to the following conditions:
 - a. Submittal of the Storm Water Management Plan stamped by a professional engineer.
2. Approval and execution of the Storm Water Maintenance Agreement.
 - a. The Storm Water Maintenance Agreement was sent directly to Village staff in a previous submittal.

We recommend the above actions also be made subject to the following conditions:

1. Establish a Letter of Credit for the Public Improvements in the amount previously recommended by the Village Engineer on February 27, 2020.
2. Prior to any land disturbing activity, hold a preconstruction conference with representatives of the design team, the construction team, Village and Utility Staff and Ruekert & Mielke to ensure all members of the design and construction team understand the installation of utilities and the storm water management and erosion control plan requirements.
3. During construction, the following conditions shall be followed:
 - b. Owner shall maintain approved plans on-site and readily available to the Village Erosion Control Inspector.
 - c. On-site approved plans must reflect current construction conditions and compliance with the Village ordinance.
 - d. On-site plans must reflect the current sequence of construction and all erosion and sediment control measures shall meet the Wisconsin Department of Natural Resources Technical Standards.
 - e. Village ordinance requires inspection of the erosion control measures once every 7 days and within 24 hours of a rainfall of 0.5 inches or greater. All inspection reports must be available on-site and available to the Village at any time of day. Reports must contain the information required by the WDNR.
 - f. Any construction within the public right-of-way, will conform to the Village Standard Specifications and Village standard details.
 - g. Owner will provide erosion control measures and restore any private utility company land disturbance resulting from providing utilities to this site regardless of location.

Our review did not include a detailed check of all engineering and survey data indicated on the drawings. The accuracy of this data is the responsibility of Trio Engineering.

If you or any staff or board member should have any questions regarding this, please feel free to contact me at (262) 542-5733.

Respectfully,

RUEKERT & MIELKE, INC.



Peter W. Gesch
Project Engineer
pgesch@ruekertmielke.com

Mr. Fred Winchowky
Chapman Villas – Revised Approval of Documents
March 23, 2020
Page 3

PWG:pwg

cc: Diana Dykstra, Village of Mukwonago
John Weidl, Village of Mukwonago
Bob Harley, Village of Mukwonago
Mark G. Blum, Village of Mukwonago
Dave Brown, Village of Mukwonago
Ron Bittner, Village of Mukwonago
Ben Kohout, Village of Mukwonago
John Donovan, Bielinski Homes
Matthew Bailey, P.E., Trio Engineering
Jerad J. Wegner, P.E., Ruekert & Mielke, Inc.

Bielinski Homes, Inc., as "Owner" of the property described in Exhibit A, in accordance with Chapter 34 of the Village of Mukwonago Municipal Code, agrees to install and maintain storm water management practices on the subject property in accordance with approved plans and Storm Water Permit conditions. The Owner further agrees to the terms stated in this document to ensure that the storm water management practices continue serving the intended functions in perpetuity. This Agreement includes the following exhibits:

Exhibit A: Legal Description of the real estate for which this Agreement applies ("Property").

Exhibit B: Location Map - shows an accurate location of each storm water management practice affected by this Agreement.

Exhibit C: Maintenance Plan - prescribes those activities that must be carried out to maintain compliance with this Agreement.

Exhibit D: Design Summary - contains a summary of key Engineering calculations and other data used to design the storm water management practices.

Exhibit E: As-built survey (to be recorded as an addendum) - shows a detailed "as-built" cross section and plan view of the storm water management practices.

Exhibit F: Engineering/Construction Verification (to be recorded as an addendum) - provides verification from the project engineer that the design and construction of the storm water management practices complies with all applicable technical standards and the Village's requirements.

NOTE: After construction verification has been accepted by the Village of Mukwonago, for all planned storm water management practices, an addendum(s) to this agreement shall be recorded by the Owner showing construction details and construction verification. The addendum(s) may contain several additional exhibits, as described below.

Through this Agreement, the Owner hereby subjects the Property to the following covenants, conditions and restrictions:

1. Upon execution of this Agreement, the Village shall record the Agreement at the Waukesha County or Walworth County Register of Deeds, as applicable. The recording of this Agreement shall be a condition for the issuance of a Storm Water Permit. An addendum to this Agreement shall be recorded upon project completion which shall include submittal of Exhibit E and Exhibit F in an acceptable form to the Village. The recording of Amendment #1 including Exhibit E and Exhibit F shall be a condition for the issuance of an occupancy permit.
2. The current titleholder and/or Owner's Association shall construct, maintain and if necessary reconstruct the storm water management practices so as to maintain their compliance with applicable governmental, statutes, ordinances or rules. The current titleholder and/or Owner's Association shall be responsible for the routine and extraordinary maintenance and repair of the storm water management practices identified in Exhibit B in accordance with the maintenance plan contained in Exhibit C.

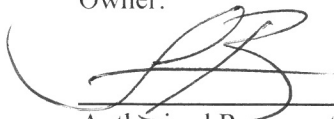
3. The current titleholder and/or Owner's Association shall, at their own cost, inspect the storm water best management practices on an annual basis and maintain records of annual inspections and maintenance performed. Records shall be made available to the Village upon request within 30 days of written notice. Annual inspections shall be performed as detailed in Exhibit C Maintenance Plan of the storm water maintenance agreement and shall be performed to determine if the facility is functioning within the design parameters. Commencing five years after completion and approval of the storm water management facility As-built Plans, and every five years thereafter, the current titleholder and/or Owner's Association shall, at their own cost, have a certification inspection of the storm water management practices conducted by a professional engineer, who shall then file a report with the Village of Mukwonago no later than December 31st of the same year. Upon written notification by Village of Mukwonago or its designee the current titleholder and/or Owner's Association shall, at their own cost and within a reasonable time period determined by the Village of Mukwonago, have an inspection of the storm water management practices conducted by a professional engineer, who shall then file a report with the Village of Mukwonago. The current titleholder and/or Owner's Association shall thereafter timely complete any maintenance or repair work recommended in any of the above reports. The current titleholder and/or Owner's Association shall be liable for the failure to undertake any maintenance or repairs.
4. In addition, and independent of the requirements under paragraph 2 above, the Village of Mukwonago, or its designee, is authorized but not required to access the property as necessary to conduct inspections of the storm water management BMP's to ascertain compliance with the terms and intent of this Agreement and the activities prescribed in Exhibit C. The Village of Mukwonago may require work to be done which differs from the report(s) described in paragraph 3 above, if the Village of Mukwonago reasonably concludes that such work is necessary and consistent with the intent of this agreement and /or with Chapter 34 of the Village Code of Ordinances. Upon notification by the Village of Mukwonago of required maintenance or repairs, the current titleholder and/or Owner's Association shall complete the specified maintenance or repairs within a reasonable time frame, as determined by the Village of Mukwonago.
5. If the current titleholder and/or Owner's Association does not complete an inspection under 3 above or complete the required maintenance or repairs under 2 above within the specified time period, the Village of Mukwonago is authorized, but not required, to perform the specified inspections, maintenance or repairs. In the case of an emergency situation, as determined by the Village of Mukwonago, no notice shall be required prior to the Village of Mukwonago performing emergency maintenance or repairs.

The cost of inspections or measures undertaken by the Village pursuant to this agreement shall be first paid from the proceeds of any surety maintained to secure the performance by the Owner/Developer of its obligations under this agreement and the conditions of the use, site and architectural approval. In the event that the costs of said measures shall exceed the value of the surety or the surety has expired or been terminated, then in that event the cost of said measures shall be assessed as a special charge for current services pursuant to Wis Stat Sec. 66.0627. Any such assessment which is not paid within 60 days after billing shall be deemed a delinquent special charge and shall become a lien upon the parcel against which such charge has been assessed. Such delinquent charges shall be extended upon the current or next tax roll as a delinquent tax against the parcels for which payment has not been received by the Village and all proceedings in relation to the collection, return and sale of property for delinquent real estate taxes shall apply to such special charges. The Developer hereby consents to the levy of such charge and waives notice and the right to hearing.

6. This Agreement shall run with the property and be binding upon all heirs, successors and assigns. Any modifications shall conform to the minimum requirements of Chapter 34 (or its successor) and be written so as to ensure the long-term maintenance of the storm water BMP's.
7. The Owner/Developer agrees to pledge a surety in a form acceptable to the Village of Mukwonago to secure performance of the obligations arising from the construction and maintenance of the storm water BMPs provided for under this Agreement in the amount of 120% of the actual cost of the storm water BMPs. Said surety shall remain in effect for a period of three (3) years from the date of the execution of this Agreement or until drawn upon in full by the Village or one year (1) from the date of the certification of the storm water improvements whichever occurs first. Release of the surety prior to the deadlines stated herein shall be governed by Mukwonago Village code section 34-108(c) as amended
8. This Agreement shall be governed and construed in accordance with the laws of the State of Wisconsin.

Dated this 6th day of March, 2020

Owner:



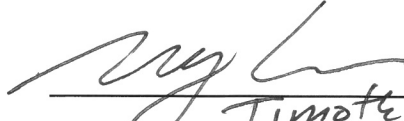
Authorized Representative of Bielinski Homes, Inc.

Frank Bielinski, President

(Printed Name of Authorized Representative)

State of Wisconsin:
County of Waukesha

Personally came before me this 6th day of March, 2020, the above named to me known to be the person who executed the foregoing instrument and acknowledged the same.


Notary Public, State of WI County, WI
My commission expires: is permanent

Accepted by the Village of Mukwonago this ____ day of _____, 202 ____

Fred Winchowky, Village President

Diana Dykstra, Village Clerk

This document was drafted by:
Trio Engineering, LLC
4100 N. Calhoun Road, Ste 300
Brookfield, WI 53005
Telephone: (262) 790-1480
Email: mbailey@trioeng.com

Exhibit A – Legal Description

The following description and reduced copy map identify the land parcel(s) affected by this Agreement. For a larger scale view of the referenced document, contact the Waukesha County Register of Deeds office.

Legal Description:

All that part of the Northwest 1/4, Northeast 1/4, Southwest 1/4 and Southeast 1/4 of the Northeast 1/4 of Section 22, Town 5 North, Range 18 East, in the Village of Mukwonago, Waukesha County, Wisconsin, now being more particularly bounded and described as follows:

Commencing at the East 1/4 Corner of said Section 22; said point being the place of beginning of lands hereinafter described;

Thence North 01°20'25" West and along the East line of the said Northeast 1/4 Section, 1405.03 feet to a point; Thence South 89°26'00" West and along the South line of Unplatted Lands and the Corporate Limits line, 1985.16 feet to a point; Thence South 00°30'47" East, 1411.78 feet to a point on the South line of the said Northeast 1/4 Section; Thence North 89°14'12" East and along the said South line, 2005.46 feet to the point of beginning of this description.

Said Parcel contains 2,810,100 Square Feet (or 64.5110 Acres) of land, more or less.

Exhibit A – Continued

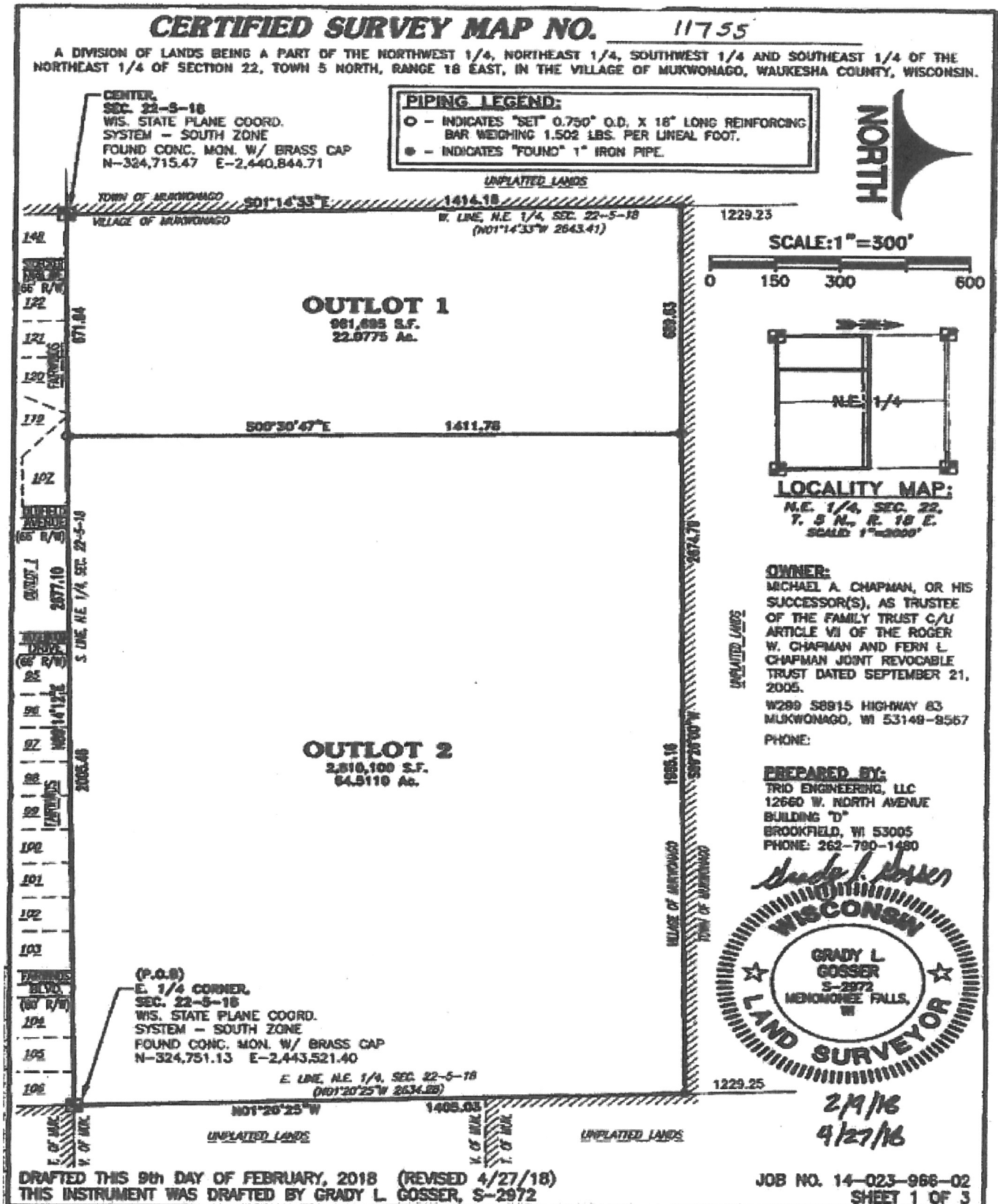


Exhibit B - Location Map
Storm Water Management Practices Covered by this Agreement



Exhibit C

Minimum Storm Water Practice Maintenance Requirements

This exhibit explains the basic function of each of the storm water practices listed in Exhibit B and prescribes the minimum maintenance requirements to remain compliant with this Plan. The maintenance activities listed below are aimed to ensure these practices continue serving their intended functions in perpetuity. The list of activities is not all-inclusive, but rather indicates the minimum type of maintenance that can be expected for this particular site.

WET DETENTION BASIN, INFILTRATION BASIN & RAIN GARDEN

System Description:

The wet detention basin and rain gardens are designed to remove at least 80% of the Total Suspended Solids (TSS) from the site runoff and to reduce the post-development downstream peak flows to meet the Village of Mukwonago Stormwater Ordinance. Swales and storm sewer function to convey runoff to the basins, as well as filter pollutants, especially from smaller storms. To function correctly, the pond size, water level, vegetation and outlet structures must be maintained as specified in this Plan.

Minimum Maintenance Requirements:

To ensure the proper long-term function of the storm water management practices described above, the following activities must be completed:

General Maintenance requirements and restrictions:

1. Grass swales shall be preserved to allow free flow of surface runoff in accordance with approved grading plans.
2. No buildings or other structures are allowed in grass swale areas.
3. No grading or filling is allowed that may interrupt flows in any way.
4. Grass swales, inlets and outlets should be checked after heavy rains (minimum of annually) for signs of erosion. Any eroding areas must be repaired immediately to prevent premature sediment build-up in the downstream forebays or basin. Erosion matting is recommended for repairing grassed areas.
5. NO trees are to be planted or allowed to grow in bottom of grass swales.
6. Periodic mowing of the grass swales for the first two years following construction will encourage vigorous grass cover and allow better inspections for erosion. Waiting until after August 1 will avoid disturbing nesting wildlife.
7. Invasive plant and animal species shall be managed in compliance with Wisconsin Administrative Code Chapter NR 40. This may require eradication of invasive species in some cases.
8. Any other repair or maintenance needed to ensure the continued function of the storm water practices or as ordered under the provisions listed on page 1 of this Agreement.

Wet Pond/Forebay Maintenance

1. The basin and all components (grass swales, forebay, inlets, outlets, etc.) should be inspected after each heavy rain, and periodically throughout the year, but at a minimum of once per year to ensure there is no blockage from floating debris or ice, especially at the low flow orifice and the trash rack on the riser in the main wet basin. Any blockage must be removed immediately.
2. If the permanent pool water level falls below the safety shelf, a review shall be performed to determine whether the cause is liner leakage or an insufficient water recharge. If the cause is leakage, the liner shall be repaired. Leakage due to muskrat burrows may require removal of the animals, repair of the liner with clay, and embedding wire mesh in the liner to deter further burrowing. If the permanent pool cannot be sustained at the design elevation, benching of the safety shelf may be necessary.
3. Nuisance (decay odors, etc.) floating algae or weed growth should be removed from the basin or the forebay and deposited where it cannot drain back into the basin. Removal of the vegetation from

Exhibit C – Continued

the water reduces regrowth the following season (by harvesting the nutrients). Wetland vegetation must be maintained along the waters edge for safety and pollutant removal purposes.

4. If mosquitoes become a nuisance, the use of mosquito larvicide containing naturally-occurring Bti soil bacteria is recommended.
5. When sediment in the forebays or the basin has accumulated to an elevation of three feet below the outlet elevation, it must be removed (see Exhibit D). All removed sediment must be placed in an appropriate upland disposal site and stabilized (grass cover) to prevent sediment from washing back into the basin. Failure to remove sediment from the wet basins will cause resuspension of previously trapped sediments and increase downstream deposition.
6. No grading or filling of the basin or berm other than for sediment removal is allowed, unless otherwise approved by the Village of Mukwonago.
7. Mowing around the basins may attract nuisance populations of geese to the property and is not necessary or recommended.
8. Aerators/Fountains – If an aerator or fountain is desired for visual and other aesthetic effects (aerators designed to mix the contents of the pond are prohibited) they must meet all of the items below:
 - Use an aerator/fountain that does not have a depth of influence that extends into the sediment storage depth (i.e. more than three feet below the normal water surface).
 - If the water surface drops due to drought or leakage, the aerator / fountain may not be operated until the water rises enough for the depth of influence to be above the sediment storage layer. Therefore, if the depth of influence of the aerator / fountain is two feet, the water surface must be within one foot or less of the lowest pond outlet.
 - Provide an automatic shut-off of the aerator/fountain as the pond starts to rise during a storm event. The aerator/fountain must remain off while the pond depth returns to the permanent pool elevation and, further, shall remain off for an additional 48 hours, as required for the design micron particle size to settle to below the draw depth of the pump.
 - Configure the pump intake to draw water primarily from a horizontal plane so as to minimize the creation of a circulatory pattern from bottom to top throughout the pond.

Infiltration Basin Maintenance

1. A minimum of 25% of the bottom of the infiltration basins consist of native plantings in irregularly shaped beds. The native plantings in (top)soil areas and granular open spaces must be maintained on the basin bottom to ensure infiltration rates. Note that infiltration rates within this development are high, in the range of 46 in/hr to >184 in/hr based on field testing, which supports and promotes the development goal of 100% stormwater infiltration. Periodic burning or mowing is recommended to enhance establishment of the prairie grasses (which may take 2-3 years) and maintain the minimum native cover. To reduce competition from cool season grasses (bluegrass, fescues, quack, etc.) and other weeds:
 - i. For the first year, cut to a 6" height three times – once each in June, July and early August. To prevent damage to the native grasses, do not mow below a 6" height. Remove excessive accumulation of clippings to avoid smothering next year's seedlings.
 - ii. After the first year, mowing may only be needed in early June each year to help control the spread of cool season plants. The mowing should also be raised to 10-12" to avoid damage to the warm season plants.
 - iii. Burning may also be used to manage weeds in 2-5 years intervals. Late spring burns (mid-late May) provide maximum stimulus to warm season grasses and work well to control cool season grasses. Burn when the cool season grasses are growing and the warm season plants are just barely starting to grow to get maximum control of cool season species.

Exhibit C – Continued

- iv. Any major bare areas or areas taken over by nonnative species must be reseeded. To clear area of weeds and cool season grasses, treat with an herbicide that contains glyphosphate in accordance with manufacturer's instructions. Ensure a firm seedbed is prepared to a depth of 3 inches (a roller is recommended). Seeding should occur in early-mid June. Seed with Big Bluestem, Indian Grass, Little Blue Stem or Switchgrass (preferably an equal mix of all four types). A companion crop of oats is recommended. Seed must be placed at a depth of 1/4 – 1/2" and a minimum rate of 1/4 pound per 100 square feet. If broadcast seeding by hand, drag leaf rake over soil surface after seeding. Then roll it again and cover with a light layer of mulch and staked erosion control netting to hold it in place until germination. For other planting details, see NRCS standard 342 (Critical Area Planting).
2. The basin and all components (grass swales, wet forebay, inlets, outlets, etc.) should be inspected after each heavy rain, but at a minimum of once per year. If the basin is not draining properly (within 72 hours), further inspection may be required by persons with expertise in storm water management and/or soils.
 - i. If soil testing shows that the soil surface has become crusted, sealed or compacted, some deep tillage should be performed. Deep tillage will cut through the underlying soils at a 2-3 foot depth, loosening the soil and improving infiltration rates, with minimal disturbance of the surface vegetation. Types of tillage equipment that can be used include a subsoiler or straight, narrow-shanked chisel plow.
 - ii. If sedimentation is determined to be causing the failure, the accumulated sediment must be removed and the area reseeded in accordance with the notes above and addendum details.
3. All emergency overflow spillways and other flow control devices must be kept free of debris. Any blockage must be removed immediately.
4. Any eroding areas must be repaired immediately to prevent premature sediment build-up in the system. Erosion matting is recommended for repairing grassed areas.
5. Heavy equipment and vehicles must be kept off of the bottom and side slopes of infiltration basins to prevent soil compaction. Soil compaction will reduce infiltration rates and may cause failure of the basin, resulting in ponding and possible growth of wetland plants.
6. No trees are to be planted or allowed to grow on the bottom of the basin unless specified on the landscape plan. On the basin bottom, trees may shade out the native grasses. The basin must be inspected annually and any woody vegetation removed.

RAIN GARDEN OPERATIONS AND MAINTENANCE

I. ROUTINE MAINTENANCE

A. Inspection

1. Performance of the rain garden should be inspected monthly and after every major storm event, following the initial construction to evaluate if the basin is draining within the design time limits.
 - a. Water plants should be watered as necessary the first year to establish plants.
2. If performance does not meet the design goals, complete repairs to the facility to meet the design requirements.
3. Following the initial growing season of monthly inspections, quarterly inspections of the facility should be made. Inspect the facility for:
 - a. Differential settlement
 - b. Cracking

Exhibit C – Continued

- c. Erosion
 - d. Leakage
 - e. Tree and woody plant growth on the embankments and plant health
 - f. Condition of the inlets and outlets
 - g. Sediment accumulation
 - h. Vigor and density of vegetation on the floor of the basin and buffer strips
 - i. pH testing of the soil (if plants growth issues exist)
 - j. Observation wells and/or under drains
 - B. Mowing – Native Vegetation
 - 1. During establishment of vegetation, the first mowing shall occur once it reaches a height of 10 to 12 inches.
 - 2. Control woody plant invasion by mowing once a year. The vegetation height shall be 5 to 6 inches after mowing.
 - 3. Mow once per year in the fall after November 1st.
 - 4. Remove trash and debris at the time of mowing.
 - C. Erosion Control
 - 1. Inspect seasonally for erosion. Inspection after major storm events for erosion problems is also recommended if practical.
 - 2. Repair all eroded areas immediately. Temporary erosion controls may be necessary to facilitate repairs.
 - D. Tilling
 - 1. If the basin is located on marginally permeable soils, annual or semi- annual tilling may be needed to maintain infiltration capacity.
 - 2. Tilled areas should be immediately re-vegetated to prevent erosion.
- II. NON-ROUTINE MAINTENANCE
- A. Structural Maintenance
 - 1. Inspect pipe systems quarterly.
 - 2. Remove and replace pipe systems that have eroded or rusted.
 - 3. Earthen structures should be inspected annually. Erosion should be repaired immediately upon discovery.
 - B. Restoration of Infiltration Capacity
 - 1. Over time the original infiltration capacity of the basin will be diminished. Diminished infiltration capacity will require maintenance once the rain garden practice fails to infiltrate a rain event within 72 hours.
 - 2. Deep tilling can be done to restore the infiltration capacity of the basin. The basin will be drained and the soils dried to a depth of 8 inches.
 - 3. The top 2 to 3 inches of topsoil, chisel plowing, and adding topsoil and compost can be done.
 - 4. The basin must be restored with native plantings.
 - C. Watering
 - 1. Water plants need to be watered as necessary during the first growing season.
 - 2. After the first growing season, water as necessary during dry periods.

STORM SEWER SYSTEM OPERATIONS AND MAINTENANCE

I. INSPECTION

A. Frequency

- a. Inspect catch basins, inlets and manholes at least once per year.
- b. Inspect storm sewer end sections at least twice per year and after major rainfall events.

B. Inspection

a. Catch Basins, Inlets and Manholes

- i. Inspect for sediment deposition in the bottom of structures.
- ii. Check frames and lids for cracks and wear such as rocking lids or lids moved by traffic and for shifted frames.
- iii. Check chimneys for cracked mortar, cracked lift rings and spalling.
- iv. Check for leaks at joints.
- v. Check surrounding areas for pollutants such as leaks from dumpsters, minor spills and oil dumping.

b. Storm Sewer End sections

- i. Observe for obstructions, accumulation of sediment and trash, undermining and joint separation.
- ii. Inspect end treatment for settlement, scour and displaced armoring.

II. STANDARD MAINTENANCE

A. Catch Basins, Inlets and Manholes

- a. Repair any deterioration threatening structural integrity immediately.
- b. Replace worn or cracked frames and lids. Frames that have shifted should be re-centered and re-set on the structure.
- c. Repair any spalled or cracked mortar. Cracked rings should be repaired or replaced.
- d. Repair leaking joints.
- e. Clean manhole and storm inlet inverts of deposited material. Catch basins should be cleaned before the sump is 40 percent full.
- f. Remove potential sources of contamination away from catch basins, inlets and manholes.

B. Storm Sewer End sections

- a. End sections should be free flowing; trash, debris and obstructions should be removed to prevent backups.
- b. End sections which have separated from the storm sewer pipe shall be reset on firm bedding and reconnected to the existing storm sewer pipe. Restrain joints if necessary.
- c. Scour areas shall be repaired immediately. Replace missing soil with clean fill and replace/install end treatment. Missing armoring will require additional stone, typically one class larger.
- d. Excessive material deposited at the storm sewer outfall is indicative of: a disturbed area upstream draining to the system or a potential failure of a system component. Disturbed areas draining to the system should be stabilized immediately or diverted to drain to a BMP. Potential system failures require non-standard maintenance.

III. NON-STANDARD MAINTENANCE

- A. Non-standard maintenance includes inspection, repair or replacement of buried structures.
 - a. Televising of buried structures (pipes) should occur when excessive material is found within the system or at an outfall with no apparent source area visible at the surface, or the system experiences frequent backups.
 - b. Follow the recommendations for the repair and/or replacement of system components televised by a firm specializing in this work.

Exhibit D

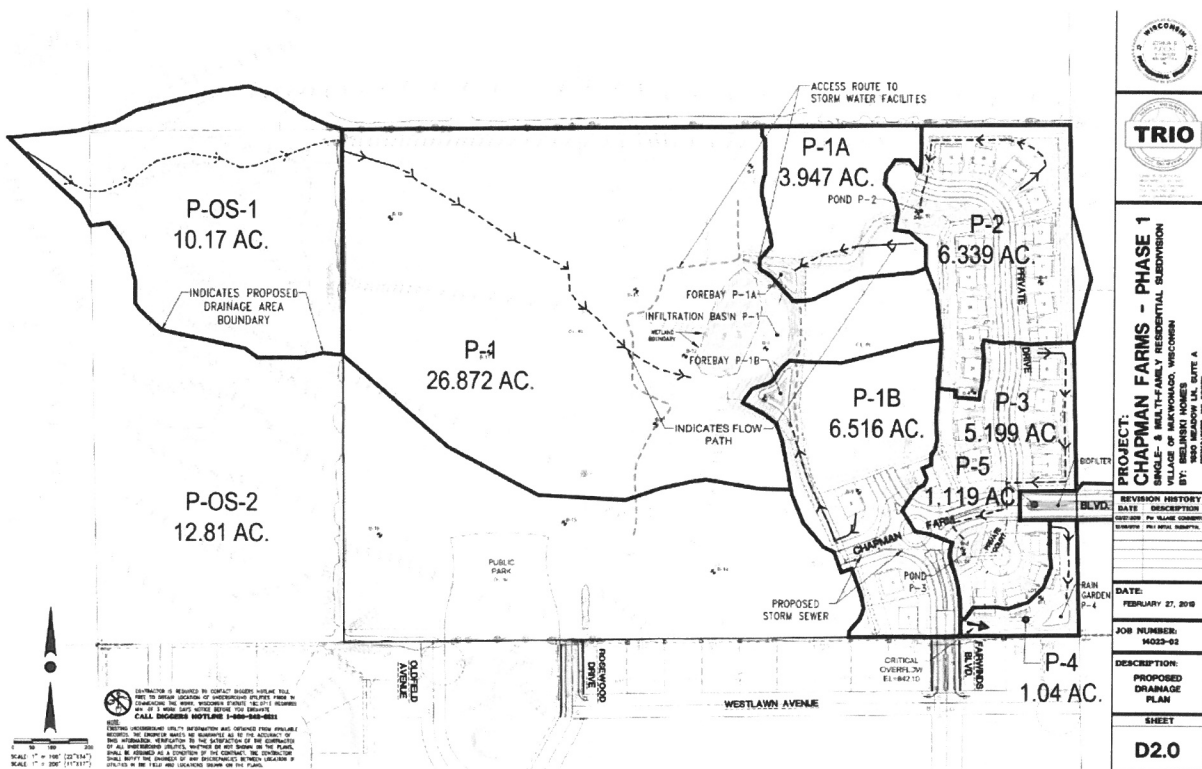
Design Summary

The proposed development will include twenty-four (24) buildings containing two (2) units each, four (4) single family lots, public road construction, sidewalk for pedestrians, and storm water management facilities.

The proposed development has been intentionally designed with sensitivity to storm water drainage, recognizing that existing drainage patterns should be maintained while measures should be taken to improve drainage and alleviate or maintain proposed discharges to pre-development levels as described by chapter 34 of the Village of Mukwonago Municipal Code. Water quality has also been addressed to meet or exceed the Village of Mukwonago requirements for Total Suspended Solid (TSS) removal.

Proposed Drainage Areas

Phase 1 of the proposed project is divided in to seven (7) drainage areas, which include detained and offsite drainage areas. The following is a description of the proposed drainage areas; please refer to the drainage map for additional information:



Drainage Summary

The following describes the peak flows associated with the proposed drainage areas.

Summary Data Elements	Subwatershed P-1		Subwatershed P-1A	
	Pre-develop	Post-develop	Pre-develop	Post-develop
Watershed areas <i>(in acres)</i> <i>(see attached map)</i>	26.872 acres	26.872 acres	3.947 acres	3.947 acres
Average Watershed Slopes (%)	2-20%	2-25%	1-2%	2-25%
Land Uses (% of each) <i>(see attached map)</i>	100% Crop Land	90% Crop Land 10% Open Space	100% Crop Land	100% Open Space
Runoff Curve Numbers	RCN = 71	RCN = 74	RCN = 70	RCN = 74
Conveyance Systems Types	Grass waterway	Grass waterway	Grass waterway	100% grass swale
Summary of Average Conveyance System Data	11% Grade	13% Grade	1.5% Grade	6' deep grass swale @ 0.75% grade
Time of Concentration (Tc) <i>(see attached map & worksheets)</i>	0.19 hrs.	0.19 hrs.	0.17 hrs.	0.50 hrs.
25% of 2-yr/24-hr post dev runoff volume	N/A	0.418 ac. ft.	N/A	0.060 ac. ft.
1-year/24 hour Runoff Volume	14,414 cfs	19.64 cfs.	2,117 cfs	1,778 cfs
2-yr./24 hour Peak Flow <i>(see attached hydrographs)</i>	20,741 cfs	26.68 cfs	3,050 cfs	2,445 cfs
10-yr./24 hour Peak Flow	48,119 cfs	56.30 cfs	7,090 cfs	5,305 cfs
100-yr./24 hour Peak Flow	118,686 cfs	130.52 cfs	17,527 cfs	12,430 cfs

Drainage Summary (Cont.)

The following describes the peak flows associated with the proposed drainage areas.

Summary Data Elements	Subwatershed P-1B		Subwatershed P-2	
	Pre-develop	Post-develop	Pre-develop	Post-develop
Watershed areas <i>(in acres)</i> <i>(see attached map)</i>	6.516 acres	6.516 acres	6.339 acres	6.339 acres
Average Watershed Slopes (%)	2-16%	4-25%	1-2%	4-25%
Land Uses (% of each) <i>(see attached map)</i>	100% Crop Land	33% Residential 67% Open Space	100% Crop Land	100% Residential
Runoff Curve Numbers	RCN = 69	RCN = 78	RCN = 69	RCN = 85
Conveyance Systems Types	Grass waterway	100% Storm Sewer	Grass waterway	100% Storm Sewer
Summary of Average Conveyance System Data	9% Grade	15" Storm Sewer @ 0.74%	1.5% Grade	12" Storm Sewer @ 0.75%
Time of Concentration (T_c) <i>(see attached map & worksheets)</i>	0.30 hrs.	0.36 hrs.	0.17 hrs.	0.37 hrs.
25% of 2-yr/24-hr post dev runoff volume	N/A	0.127 ac. ft.	N/A	0.180 ac. ft.
1-year/24 hour Runoff Volume	2.515 cfs	4.87 cfs	2.950 cfs	7.587 cfs
2-yr./24 hour Peak Flow <i>(see attached hydrographs)</i>	3.730 cfs	6.334 cfs	4.338 cfs	9.272 cfs
10-yr./24 hour Peak Flow	9.224 cfs	12.32 cfs	10.450 cfs	15.81 cfs
100-yr./24 hour Peak Flow	23.591 cfs	26.54 cfs	26.533 cfs	30.40 cfs

Drainage Summary (Cont.)

The following describes the peak flows associated with the proposed drainage areas.

Summary Data Elements	Subwatershed P-3		Subwatershed P-4	
	Pre-develop	Post-develop	Pre-develop	Post-develop
Watershed areas <i>(in acres)</i> <i>(see attached map)</i>	5.199 acres	5.199 acres	1.043 acres	1.043 acres
Average Watershed Slopes (%)	1-6%	4-25%	1-2%	1-25%
Land Uses (% of each) <i>(see attached map)</i>	100% Crop Land	100% Residential	100% Crop Land	33% Residential 67% Open Space
Runoff Curve Numbers	RCN = 69	RCN = 85	RCN = 69	RCN = 87
Conveyance Systems Types	Grass waterway	100% Storm Sewer	Grass waterway	Grass Channel
Summary of Average Conveyance System Data	3.5% Grade	12" & 15" Storm Sewer @ 0.5%	1.5% Grade	1' Deep Grass Channel @ 1% Grade
Time of Concentration (T_c) <i>(see attached map & worksheets)</i>	0.25 hrs.	0.39 hrs.	0.21 hrs.	0.39 hrs.
25% of 2-yr24-hr post dev runoff volume	N/A	0.148 ac. ft.	N/A	0.033 ac. ft.
1-year/24 hour Runoff Volume	1.832 cfs	6.222 cfs	0.436 cfs	1.395 cfs
2-yr./24 hour Peak Flow <i>(see attached hydrographs)</i>	2.780 cfs	7.605 cfs	0.664 cfs	1.681 cfs
10-yr./24 hour Peak Flow	7.094 cfs	12.97 cfs	1.669 cfs	2.782 cfs
100-yr./24 hour Peak Flow	18.457 cfs	24.93 cfs	4.312 cfs	5.183 cfs

Drainage Summary (Cont.)

The following describes the peak flows associated with the proposed drainage areas.

Summary Data Elements	Subwatershed P-OS-1	
	Pre-develop	Post-develop
Watershed areas <i>(in acres)</i> <i>(see attached map)</i>	10.166 acres	10.166 acres
Average Watershed Slopes (%)	5-22%	5-22%
Land Uses (% of each) <i>(see attached map)</i>	100% Crop Land	100% Crop Land
Runoff Curve Numbers	RCN = 62	RCN = 62
Conveyance Systems Types	Grass waterway	Grass waterway
Summary of Average Conveyance System Data	13.5% Grade	13.5% Grade
Time of Concentration (T_c) <i>(see attached map & worksheets)</i>	0.38 hrs.	0.38 hrs.
25% of 2-yr/24-hr post dev runoff volume	N/A	0.062 ac. ft.
1-year/24 hour Runoff Volume	0.1034 cfs	1.034 cfs
2-yr./24 hour Peak Flow <i>(see attached hydrographs)</i>	1.888 cfs	1.888 cfs
10-yr./24 hour Peak Flow	7.052 cfs	7.052 cfs
100-yr./24 hour Peak Flow	23.96 cfs	23.96 cfs

Descriptions & Summaries of Storm Water Practices

The infiltration basins are designed in accordance with WDNR NR 151 and Technical Standards. Two infiltration tests will be provided for the infiltration basin and are expected to demonstrate minimum infiltration rate of 0.5 in/hr within the infiltration basin P-1 foot print and 1.63 in/hr within the raingarden P-4 foot print, based on the given soil types. The development utilizes swales, storm sewer and controlled overflow routes to convey runoff from the site to the stormwater management facilities. Wet ponds with 2' clay liners or synthetic liners (or other as recommended by geotechnical consultant, subject to verification and installation testing) are located prior to infiltration basin to provide 60% - 80% TSS removal pretreatment prior to discharging to the associated infiltration area. All stormwater facilities are located within Outlots, that will be fractionally owned by all lots within the development. The one exception is for Raingarden P-4, which will be located within an easement. Access to all facilities is accommodated and provided via public street, trail and/or accessible routes.

Infiltration Basin P-1

This basin is located at the center of the property collects runoff directly from drainage areas P-1 and Wet Fore Bays P-1A & P-1B. Characteristics of this basin are as follows:

Infiltration Basin P-1	Design Data
Site assessment data: (see attached maps)	
Contributing drainage area to basin (P-1, P-1A, P-1B, P-2, P-3, P-OS-1.)	59.043 acres
Distance to nearest private well (including off-site wells)	>100feet
Distance to municipal well (including off-site wells)	>1200 feet
Wellhead protection area involved?	No
Ground slope at site of proposed basin	average 4%
Any buried or overhead utilities in the area?	No
Proposed outfall conveyance system/discharge (w/ distances)	N/A
Any downstream roads or other structures? (describe)	N/A
Floodplain, shoreland or wetlands?	Yes, adjacent wetlands to the west
Soil investigation data (see attached map & soil logs):	
Number of soil investigations completed	1 (in basin area)
Do elevations of test holes extend 3ft. below proposed bottom?	Yes (see SWMP)
Average soil texture at pond bottom elevation (USDA)	Silty Sand
Distance from pond bottom to bedrock	>8 feet
Distance from pond bottom to seasonal water table	No Water Found in soil boring B-9
General basin design data (see attached detailed drawings):	
Permanent pool surface area	N/A
Design permanent pool water surface elevation	N/A
Top of berm elevation (after settling) and width	N/A
Length/width (dimension/ratio) (Phase 1)	350 ft. (L)x 90 ft. (W.) = 4:1
Safety shelf design (length, grade, max. depth)	N/A
Ave. water depth (minus safety shelf/sediment)	0 ft. in center
Sediment forebay size & depth	See Wet Forebay P-1A & P-1B
Sediment storage depth & design maintenance	yearly maintenance schedule

Infiltration Basin P-1 Inflow, Outflow & Storage Data (see attached hydrographs and detail drawings)				
Inflow Peak/Volume	Maximum Outflow Rate	Max. Water Elevation	Storage Volume at Max. Elev. (above perm. pool)	Outflow Control Structures *
19.99 1-yr/24hr. (volume)	0.0 cfs	831.75 ft.	2.24 acre-feet	#1
27.59 cfs (Post 2-yr./24 hr. peak)	0.0 cfs	832.27 ft.	3.00 acre-feet	#1
61.39 cfs (Post 10-yr./24 hr. peak)	0.0 cfs	834.04 ft.	6.31 acre-feet	#1
149.04 cfs (Post 100-yr/24 hr. peak)	0.0 cfs	837.19 ft.	15.10 acre-feet	#1

*
#1 = infiltration, 0.5 in./hr.
#2 = Overflow route @ 842.10.

Wet Forebay P-1A

This basin is located at the center of the property, just north of Infiltration Basin P-1, and collects runoff directly from drainage areas P-1A and discharge from Wet Pond P-2. Characteristics of this basin are as follows:

Wet Forebay P-1A		Design Data
Site assessment data: (see attached maps)		
Contributing drainage area to basin (P-1)		10.286 acres
Distance to nearest private well (including off-site wells)		>100feet
Distance to municipal well (including off-site wells)		>1200 feet
Wellhead protection area involved?		No
Ground slope at site of proposed basin		average 3%
Any buried or overhead utilities in the area?		No
Proposed outfall conveyance system/discharge (w/ distances)		43 ft. to proposed Infiltration Basin P-1
Any downstream roads or other structures? (describe)		No
Floodplain, shoreland or wetlands?		No
Soil investigation data (see attached map & soil logs):		
Number of soil investigations completed		1 (in Southwest Berm)
Do elevations of test holes extend 3ft. below proposed bottom?		Yes (see SWMP)
Average soil texture at pond bottom elevation (USDA)		Fine Sandy Clay
Distance from pond bottom to bedrock		>8 feet
Distance from pond bottom to seasonal water table		6.5 foot below pond bottom
General basin design data (see attached detailed drawings):		
Permanent pool surface area		0.07 acres
Design permanent pool water surface elevation		elev. 834.00
Top of berm elevation (after settling) and width		elev. 836.50/8 feet wide
Length/width (dimension/ratio)		115 ft. (L)x 45 ft. (W.) = 5:2
Safety shelf design (length, grade, max. depth)		10 ft. @ 10% slope/1.0' deepest
Ave. water depth (minus safety shelf/sediment)		5 ft. in center
Sediment forebay size & depth		0.006 acres (8% pool size)/2 feet
Sediment storage depth & design maintenance		2 feet/yearly maintenance schedule

Wet Forebay P-1A Inflow, Outflow & Storage Data (see attached hydrographs and detail drawings)				
Inflow Peak/Volume	Maximum Outflow Rate	Max. Water Elevation	Storage Volume at Max. Elev. (above perm. pool)	Outflow Control Structures *
2.827 1-yr/24hr. (volume)	2.784 cfs	834.93 ft.	0.075 acre-feet	#1 & #2
6.620 cfs (Post 2-yr./24 hr. peak)	6.429 cfs	835.04 ft.	0.084 acre-feet	#1 & #2
19.07 cfs (Post 10-yr./24 hr. peak)	18.87 cfs	835.30 ft.	0.112 acre-feet	#1 & #2
38.52 cfs (Post 100-yr/24 hr. peak)	N/A	837.19 ft.	15.10 acre-feet	#1, #2, & #3

- * #1 = 4-inch orifice in proposed outlet structure - flow line elev. @ 834.00
#2 = 5' outlet control structure - rim elev. @ 834.80
#3 = 10' earthen spillway - elev. @835.50
Note: In the 100-yr storm event the forebay combines with the area of Pond P-1 elev. @ 835.50

Wet Forebay P-1B

This basin is located at the center of the property, just south of Infiltration Basin P-1, and collects runoff directly from drainage areas P-1B and discharge from Wet Pond P-3. Characteristics of this basin are as follows:

Wet Forebay P-1B	Design Data
Site assessment data: (see attached maps)	
Contributing drainage area to basin (P-1B & P-3)	11.715 acres
Distance to nearest private well (including off-site wells)	>100feet
Distance to municipal well (including off-site wells)	>1200 feet
Wellhead protection area involved?	No
Ground slope at site of proposed basin	average 6%
Any buried or overhead utilities in the area?	No
Proposed outfall conveyance system/discharge (w/ distances)	38 ft. to proposed Infiltration Basin P-1
Any downstream roads or other structures? (describe)	No
Floodplain, shoreland or wetlands?	No
Soil investigation data (see attached map & soil logs):	
Number of soil investigations completed	1 (in basin area)
Do elevations of test holes extend 3ft. below proposed bottom?	Yes (see SWMP)
Average soil texture at pond bottom elevation (USDA)	Fine to Coarse Sand & Gravel
Distance from pond bottom to bedrock	>6 feet
Distance from pond bottom to seasonal water table	No Water Found in soil boring B-10
General basin design data (see attached detailed drawings):	
Permanent pool surface area	0.142 acres
Design permanent pool water surface elevation	elev. 833.50
Top of berm elevation (after settling) and width	elev. 840.00/8 feet wide
Length/width (dimension/ratio)	115 ft. (L)x 65 ft. (W.) = 2:1
Safety shelf design (length, grade, max. depth)	10 ft. @ 10% slope/1.0' deepest
Ave. water depth (minus safety shelf/sediment)	5 ft. in center
Sediment forebay size & depth	0.021 acres (15% pool size)/2 feet
Sediment storage depth & design maintenance	2 feet/yearly maintenance schedule

Wet Forebay P-1B Inflow, Outflow & Storage Data (see attached hydrographs and detail drawings)				
Inflow Peak/Volume	Maximum Outflow Rate	Max. Water Elevation	Storage Volume at Max. Elev. (above perm. pool)	Outflow Control Structures *
9.595 1-yr/24hr. (volume)	6.935 cfs	834.95 ft.	0.218 acre-feet	#1 & #2
12.97 cfs (Post 2-yr./24 hr. peak)	10.85 cfs	835.04 ft.	0.234 acre-feet	#1 & #2
25.12 cfs (Post 10-yr./24 hr. peak)	24.08 cfs	835.29 ft.	0.284 acre-feet	#1 & #2
47.97 cfs (Post 100-yr/24 hr. peak)	N/A	837.19 ft.	15.10 acre-feet	#1, #2, & #3

- * #1 = 4-inch orifice in proposed outlet structure - flow line elev. @ 833.50
#2 = 5' outlet control structure - rim elev. @ 834.70
#3 = 25' earthen spillway – elev. @835.50
Note: In the 100-yr storm event the forebay combines with the area of Pond P-1 elev. @ 835.50

Wet Pond P-2

This basin is located at the north east corner of the property and collects runoff directly from drainage areas P-2. Characteristics of this basin are as follows:

Wet Pond P-2	Design Data
Site assessment data: (see attached maps)	
Contributing drainage area to basin (P-1)	6.339 acres
Distance to nearest private well (including off-site wells)	>100feet
Distance to municipal well (including off-site wells)	>1200 feet
Wellhead protection area involved?	No
Ground slope at site of proposed basin	average 11%
Any buried or overhead utilities in the area?	No
Proposed outfall conveyance system/discharge (w/ distances)	370 ft. to proposed wet forebay P-1A
Any downstream roads or other structures? (describe)	No
Floodplain, shoreland or wetlands?	No
Soil investigation data (see attached map & soil logs):	
Number of soil investigations completed	1 (in basin area)
Do elevations of test holes extend 3ft. below proposed bottom?	Yes (see SWMP)
Average soil texture at pond bottom elevation (USDA)	Fine to Coarse Sand & Gravel
Distance from pond bottom to bedrock	>8 feet
Distance from pond bottom to seasonal water table	No Water Found in soil boring B-6
General basin design data (see attached detailed drawings):	
Permanent pool surface area	0.08 acres
Design permanent pool water surface elevation	elev. 837.00
Top of berm elevation (after settling) and width	elev. 842.00/10 feet wide
Length/width (dimension/ratio)	70 ft. (L)x 45 ft. (W.) = 3:2
Safety shelf design (length, grade, max. depth)	10 ft. @ 10% slope/1.0' deepest
Ave. water depth (minus safety shelf/sediment)	5 ft. in center
Sediment forebay size & depth	0.0002 acres (0.3% pool size)/2 feet
Sediment storage depth & design maintenance	2 feet/yearly maintenance schedule

Wet Pond P-2 Inflow, Outflow & Storage Data (see attached hydrographs and detail drawings)				
Inflow Peak/Volume	Maximum Outflow Rate	Max. Water Elevation	Storage Volume at Max. Elev. (above perm. pool)	Outflow Control Structures *
7.587 1-yr/24hr. (volume)	1.821 cfs	839.34 ft.	0.303 acre-feet	#1 & #2
9.272 cfs (Post 2-yr./24 hr. peak)	4.544 cfs	839.46 ft.	0.323 acre-feet	#1 & #2
15.810 cfs (Post 10-yr./24 hr. peak)	13.82 cfs	839.72 ft.	0.371 acre-feet	#1 & #2
30.400 cfs (Post 100-yr/24 hr. peak)	26.10 cfs	840.30 ft.	0.484 acre-feet	#1 & #2

- * #1 = 4-inch orifice in proposed outlet structure - flow line elev. @ 837.00
#2 = 48" outlet control structure - rim elev. @ 839.25
#3 = 20' earthen spillway - elev. @841.90

Wet Pond P-3

This basin is located at the southeast corner of the property, on the southeast corner of the proposed cul-de-sac, and collects runoff directly from drainage areas P-3. Characteristics of this basin are as follows:

Wet Pond P-3	Design Data
Site assessment data: (see attached maps)	
Contributing drainage area to basin (P-1)	5.199 acres
Distance to nearest private well (including off-site wells)	>100feet
Distance to municipal well (including off-site wells)	>1200 feet
Wellhead protection area involved?	No
Ground slope at site of proposed basin	average 1.5%
Any buried or overhead utilities in the area?	No
Proposed outfall conveyance system/discharge (w/ distances)	725 ft. to proposed Wet Forebay P-1B
Any downstream roads or other structures? (describe)	Yes-intersection of Chapman Farm Blvd & Fairwinds Blvd.
Floodplain, shoreland or wetlands?	No
Soil investigation data (see attached map & soil logs):	
Number of soil investigations completed	1 (in basin area)
Do elevations of test holes extend 3ft. below proposed bottom?	Yes (see SWMP)
Average soil texture at pond bottom elevation (USDA)	Clay
Distance from pond bottom to bedrock	>13 feet
Distance from pond bottom to seasonal water table	No Water Found in soil boring B-2
General basin design data (see attached detailed drawings):	
Permanent pool surface area	0.06 acres
Design permanent pool water surface elevation	elev. 838.00
Top of berm elevation (after settling) and width	elev. 842.00/10 feet wide
Length/width (dimension/ratio)	105 ft. (L)x 35 ft. (W.) = 3:1
Safety shelf design (length, grade, max. depth)	10 ft. @ 10% slope/1.0' deepest
Ave. water depth (minus safety shelf/sediment)	4 ft. in center
Sediment forebay size & depth	0.006 acres (10% pool size)/2 feet
Sediment storage depth & design maintenance	2 feet/yearly maintenance schedule

Wet Pond P-3 Inflow, Outflow & Storage Data (see attached hydrographs and detail drawings)				
Inflow Peak/Volume	Maximum Outflow Rate	Max. Water Elevation	Storage Volume at Max. Elev. (above perm. pool)	Outflow Control Structures *
6.222 1-yr/24hr. (volume)	5.205 cfs	839.73 ft.	0.145 acre-feet	#1 & #2
7.605 cfs (Post 2-yr./24 hr. peak)	7.010 cfs	839.79 ft.	0.151 acre-feet	#1 & #2
12.970 cfs (Post 10-yr./24 hr. peak)	12.800 cfs	839.95 ft.	0.166 acre-feet	#1 & #2
24.930 cfs (Post 100-yr/24 hr. peak)	22.09 cfs	840.52 ft.	0.237 acre-feet	#1 & #2

- *
 #1 = 4-inch orifice in proposed outlet structure - flow line elev. @ 838.00
 #2 = 48" outlet control structure - rim elev. @ 839.50
 #3 = 5' earthen spillway – elev. @841.70

Rain Garden P-4

This basin is located at the north east corner of the property and collects runoff directly from drainage areas P-4. Characteristics of this basin are as follows:

Rain Garden P-4	Design Data
Site assessment data: (see attached maps)	
Contributing drainage area to basin (P-4)	1.04 acres
Distance to nearest private well (including off-site wells)	>100feet
Distance to municipal well (including off-site wells)	>1200 feet
Wellhead protection area involved?	No
Ground slope at site of proposed basin	average 5%
Any buried or overhead utilities in the area?	No
Proposed outfall conveyance system/discharge (w/ distances)	20 ft. to emergency spillway
Any downstream roads or other structures? (describe)	No
Floodplain, shoreland or wetlands?	No
Soil investigation data (see attached map & soil logs):	
Number of soil investigations completed	1 (Northwest of proposed basin)
Do elevations of test holes extend 3ft. below proposed bottom?	Yes (see SWMP)
Average soil texture at pond bottom elevation (USDA)	Clay
Distance from pond bottom to bedrock	>13 feet
Distance from pond bottom to seasonal water table	No Water Found in soil boring B-1
General basin design data (see attached detailed drawings):	
Permanent pool surface area	N/A
Design permanent pool water surface elevation	N/A
Top of berm elevation (after settling) and width	elev. 841.70/12 feet wide
Length/width (dimension/ratio)	90 ft. (L)x 50 ft. (W.) = 2:1
Safety shelf design (length, grade, max. depth)	N/A
Ave. water depth (minus safety shelf/sediment)	0 ft. in center
Sediment forebay size & depth	N/A
Sediment storage depth & design maintenance	yearly maintenance schedule

Rain Garden P-4 Inflow, Outflow & Storage Data (see attached hydrographs and detail drawings)				
Inflow Peak/Volume	Maximum Outflow Rate	Max. Water Elevation	Storage Volume at Max. Elev. (above perm. pool)	Outflow Control Structures *
1.395 1-yr/24hr. (volume)	0.0 cfs	839.81 ft.	0.065 acre-feet	N/A
1.681 cfs (Post 2-yr./24 hr. peak)	0.0 cfs	839.99 ft.	0.079 acre-feet	N/A
2.782 cfs (Post 10-yr./24 hr. peak)	0.0 cfs	840.47 ft.	0.140 acre-feet	N/A
5.183 cfs (Post 100-yr/24 hr. peak)	3.364 cfs	840.86 ft.	0.189 acre-feet	#1

* #1 = 20' earthen spill way – elev. @ 840.70

Total Site Release Rates

The table below summarizes the storm water release rates associated with the overall development. Per the Village of Mukwonago Storm Water Ordinance, the Allowable Release Rate is defined as;

Peak Discharge.

- A. Minimum requirement. To minimize downstream bank erosion and the failure of downstream conveyance systems, the calculated post-development peak storm water discharge rates shall be reduced as depicted in the table below. Modeling requirements for this provision are further described in sec. 34-111 below.

Recurrence interval storm	Post Development Peak Discharge =	Pre-Development Peak Discharge
	100	10
	10	2
	2	2
	1	1

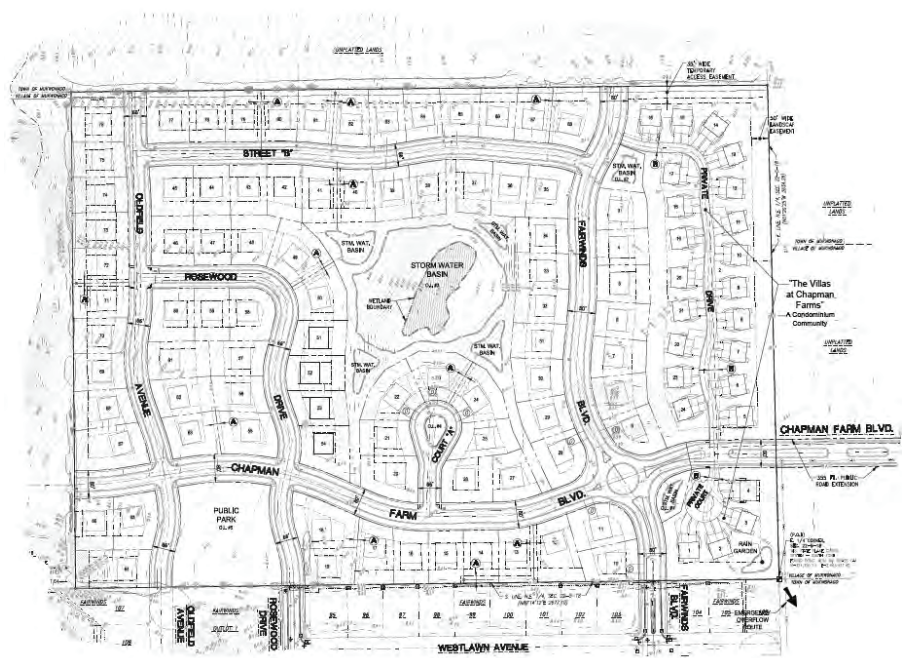
TOTAL SITE DISCHARGE			
STORM EVENT	EXISTING	PROPOSED	ALLOWABLE
1-YR	2.060 CFS	0.000 CFS	2.060 CFS
2-YR	3.110 CFS	0.000 CFS	3.110 CFS
10-YR	7.912 CFS	0.000 CFS	3.110 CFS
100-YR	20.52 CFS	3.364 CFS	7.912 CFS

Site Water Quality Summary

Pollutant (1)	Concen- tration - No Controls	Concen- tration - With Controls	Concen- tration Units	Pollutant Yield - No Controls	Pollutant Yield - With Controls	Pollutant Yield Units	Percent Yield Reduction
Particulate Solids	152.9	0 mg/L		3543	0 lbs		100.00 %
Total Phosphorus	0.7370	0 mg/L		17.08	0 lbs		100.00 %

Chapman Farms – Phase 1 Residential Community

Village of Mukwonago
Waukesha County, WI



Storm Water Management Plan

Prepared By:



4100 N. CALHOUN ROAD, BROOKFIELD, WI 53005

t: 262.790.1480 f: 262.790.1481

email: JPUEDELKO@TRIOENG.COM

Submittal Date:
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Introduction

CHAPMAN FARMS is a proposed single-family subdivision and condominium community, with 100 new homesites and 24 condominium buildings (48 total units) on 64.51 acres of land. The subdivision portion of the development will be zoned R-3 single family small lot residential with lots sizes a minimum of 10,000 s.f. The condominium portion of the development will be zoned R-5 low density multi-family residential with private road access. The public roads will include asphalt pavement, concrete curb & gutter, concrete sidewalk and public storm sewer. All single-family lots and condominium buildings will be serviced by public sanitary sewer and water main.

The proposed home elevations will typically be 2 feet higher than the proposed roads, with all homes set at least 2' above the frozen ground condition 100-year storm event, per Waukesha County requirements. Storm water management design for this development conforms to Village of Mukwonago and Waukesha County Stormwater Management and Erosion Control Ordinance requirements and/or objectives. The storm water management approach provides localized wet ponds to pretreat runoff prior to discharge into the central detention/infiltration basin which will infiltrate a majority of runoff from the development. The Chapman Farms development will be constructed in multiple phases, with phase 1 including the construction of the multi-family development area, as well as, the four single family lots surrounding the proposed cul-de-sac at the southeast corner of the development.

The storm water facilities have been designed to meet multiple design goals. The goals include designing for both normal and frozen ground conditions to demonstrate how the site accommodates runoff. There are existing kettles throughout the site. Due to this, another goal was to utilize these existing kettles by expanding the existing kettle and providing forebays to provide pre-treatment. Phase 1 proposes leaving the existing kettle as natural as possible, while providing two forebays to provide pretreatment for the developed areas. These would function in both the phase 1 and final development condition without the need to for modification. The large central kettle will be expanded in the final development condition and remain as the final storm water detention area for the majority of the development; the small existing wetland area within it will remain undisturbed. **Through the proposed development storm water management will be improved. The proposed central storm water basin will retain and infiltrate all tributary runoff, including offsite areas, and has been designed to contain runoff associated with the 100-yr frozen ground condition.**

Owner

The owner and responsible entity for installation of the storm water management practices is:
Bielinski Homes
1830 Meadow Lane, Suite A
Pewaukee, WI 53072
Contact: Mr. John Donovan

Design Requirements

The following design standards have been and will be used to develop the storm water management plan for the Chapman Farms development:

- Village of Mukwonago Stormwater Management and Erosion Control Ordinance
- Waukesha County Stormwater Management and Erosion Control Ordinance, including reference to Basement Wetness and Flood Prevention Standards

- Wisconsin Administrative Code Sections NR 151 and NR 216.

Analysis Overview

This Storm Water Management Plan has been developed to demonstrate that the proposed practices are appropriate and that the proposed subdivision will conform to Village, County and WDNR requirements. Documentation and figures provided within this plan will show that the development meets the design requirements for the phase 1 condition and provides an overview for the final condition to illustrate that the phase 1 condition will be compatible in the final condition. This plan will be revised for the final condition as the next phases are finalized.

As stated in the introduction, the proposed development will improve how storm water is managed on, across and adjacent to this site. The proposed storm water practices are designed as if the entire site is internally drained, with wet ponds discharging to the central storm water/infiltration basin with 11'+ of active storage.

This analysis began with and focused on the 100-year frozen ground condition, recognizing that if the proposed condition was an improvement over the existing condition (which it is), and if the proposed condition met Village of Mukwonago standards, that typically the 1-, 2-, 10- and 100-yr peak flow control, water quality and infiltration requirements would all be met. The analysis produced the resultant summary tables in the proceeding sections. The standard, non-frozen ground condition analysis was also completed and is included in this analysis.

Post development stormwater runoff conditions for the development are analyzed for: runoff volume, peak volume, discharge, pond storage capacity required, outlet structures and storm sewer system requirements. The software package used for modeling and analysis is Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018. Hydraflow uses NRCS methods to generate runoff and pond routing hydrographs. Hydraflow's capabilities include: modeling simple or complex drainage basins, combining hydrographs to determine runoff and storage requirements, analyzing interconnected detention basins and detention basin and outlet structure sizing.

The computer model analyzed the one, two, ten, one hundred-year storm events. MSE 3 rainfall distribution is used. The necessary hydrographs were generated to determine the stormwater runoff rates, depths and volumes for post development conditions. This information is used to calculate detention basin size & outlet requirements.

NOAA Atlas 14 is used for rainfall data. The rainfall depths for the 24-hour duration storm are (per Village of Mukwonago Stormwater Management Ordinance and exceed the NOAA Atlas 14 data):

<u>1-year</u>	<u>2-year</u>	<u>10-year</u>	<u>100-year</u>
2.40 inches	2.7 inches	3.81 inches	6.18 inches

Run-off curve numbers for the drainage areas were determined using the requirements outlined in the NRCS TR-55 Manual and WDNR standards. The existing soils on the site are hydrologic soil groups B and C. Soil groups B WeA-Warsaw loam; CeC2, CeD2-Casco loam; CrD-Casco-Rodman; MxD2, MxC2-Miami loam are representative of most drainage basins within the development. Type C FoA-Fox Loam and PrA-Pistakee silt loam may be present along the western side of the site and around the wetland area and have been included in the modeling. Likewise, the offsite areas in this analysis have curve numbers assigned based on the underlying hydrologic soil group.

The following describes the curve numbers that will be assigned to the proposed development Land uses:

<u>Land Use</u>	<u>RCN</u>	<u>Land Use</u>	<u>RCN</u>
Existing Offsite Woods	55 (Type B)	Open Space (B)	61 (Type B)
Existing Offsite Farrow	69 (Type B)	Open Space	74 (Type B)

Road/Impervious 98 FROZEN CONDITION 98

Soil Summary

A geotechnical analysis has been completed by CGC, Inc. Per soil borings performed in the vicinity of the proposed storm water management areas the soils will have very high infiltration rates. The well-drained nature of the site is seen today through the existing kettles and shallow farm field depressions having no evidence of perpetual ponding.

Although in-situ testing is expected to show much higher, an infiltration rate of 0.5 in/hr was used for the storm water infiltration basin, while 1.63in/hr was used for the rain garden in the calculations. See Appendix 3 for detailed soils information, as presented by soil maps and CGC, Inc. soil investigation data.

Existing Site Description

Description

The existing site is primarily farm field with an existing wooded area on the western offsite drainage basins. A majority of the farm field area has a bowled topography, primarily sloping into the middle of the site, with the central kettle being approximately 12' lower than the north and south areas. The existing condition analysis models the 3 kettle areas to produce a conservative peak discharge rate in the existing condition.

The Existing Drainage Map identifies the locations of all existing kettles adjacent to this property and the shallow farm kettles that are on the site. The existing condition was modeled to determine current peak water surface elevations and site release rates. The tables below summarize the existing site discharge rates and the peak water surface elevations and spillway elevation of each kettle area:

EXISTING KETTLES				
KETTLE	2-YR STORM ELEV.	10-YR STORM ELEV.	100-YR STORM ELEV.	SPILLWAY ELEVATION
E-1	832.26	833.59	836.17	842.30
E-2	841.14	841.46	842.19	842.01
E-3	834.98	836.47	839.13	841.60

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	0.298	0.731	-----	-----	4.180	-----	-----	18.56	E-OS-1
2	SCS Runoff	-----	2.204	3.659	-----	-----	11.46	-----	-----	34.30	E-OS-2
3	SCS Runoff	-----	18.34	26.38	-----	-----	61.15	-----	-----	150.75	E-1
4	SCS Runoff	-----	9.115	12.83	-----	-----	28.74	-----	-----	69.35	E-2
5	SCS Runoff	-----	3.540	5.363	-----	-----	13.79	-----	-----	36.00	E-3
6	SCS Runoff	-----	1.144	1.741	-----	-----	4.374	-----	-----	11.30	E-4
7	SCS Runoff	-----	0.628	0.939	-----	-----	2.300	-----	-----	5.985	E-5
8	SCS Runoff	-----	0.365	0.546	-----	-----	1.337	-----	-----	3.480	E-6
10	Combine	1, 3,	18.35	26.54	-----	-----	63.67	-----	-----	164.63	E-OS-1 + E-1
12	Combine	2, 4,	10.19	15.01	-----	-----	37.49	-----	-----	97.86	E-OS-2 + E-2
14	Reservoir	10	0.000	0.000	-----	-----	0.000	-----	-----	0.000	KETTLE E-1
16	Reservoir	12	0.539	1.313	-----	-----	7.997	-----	-----	33.16	KETTLE E-2
18	Reservoir	5	0.000	0.000	-----	-----	0.000	-----	-----	0.000	KETTLE E-3
20	Combine	6, 7, 8, 14, 18,	2.060	3.110	-----	-----	7.912	-----	-----	20.52	TOTAL PHASE 1
22	Combine	6, 7, 8, 14, 16, 18,	2.060	3.110	-----	-----	9.231	-----	-----	39.94	TOTAL FUTURE PHASE

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	
9	SCS Runoff	----	0.213	0.263	-----	-----	0.459	-----	-----	0.896	R&M EX. P-1
10	SCS Runoff	----	0.445	0.531	-----	-----	0.856	-----	-----	1.550	R&M EX. P-2
11	SCS Runoff	----	0.178	0.219	-----	-----	0.383	-----	-----	0.747	R&M EX. P-3
12	SCS Runoff	----	0.219	0.267	-----	-----	0.451	-----	-----	0.854	R&M EX. P-4
13	SCS Runoff	----	0.279	0.340	-----	-----	0.574	-----	-----	1.086	R&M EX. P-5
14	SCS Runoff	----	0.445	0.535	-----	-----	0.874	-----	-----	1.606	R&M EX. P-6
15	SCS Runoff	----	0.541	0.634	-----	-----	0.977	-----	-----	1.701	R&M EX. P-7
16	SCS Runoff	----	0.380	0.459	-----	-----	0.762	-----	-----	1.422	R&M EX. P-8
17	SCS Runoff	----	0.349	0.399	-----	-----	0.585	-----	-----	0.975	R&M EX. P-9
18	Reservoir	9	0.010	0.011	-----	-----	0.015	-----	-----	0.201	R&M EX. BIOSWALE P-1
19	Combine	10, 18	0.452	0.539	-----	-----	0.866	-----	-----	1.566	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	19	0.000	0.000	-----	-----	0.092	-----	-----	1.007	R&M EX. BIOSWALE P-2
21	Combine	11, 20	0.178	0.219	-----	-----	0.383	-----	-----	1.584	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	21	0.000	0.000	-----	-----	0.000	-----	-----	0.529	R&M EX. BIOSWALE P-3
23	Combine	12, 22	0.219	0.267	-----	-----	0.451	-----	-----	0.854	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	23	0.000	0.000	-----	-----	0.000	-----	-----	0.343	R&M EX. BIOSWALE P-4
25	Combine	13, 24	0.279	0.340	-----	-----	0.574	-----	-----	1.086	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	25	0.000	0.000	-----	-----	0.000	-----	-----	0.362	R&M EX. BIOSWALE P-5
27	Combine	14, 26	0.445	0.535	-----	-----	0.874	-----	-----	1.606	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	27	0.000	0.000	-----	-----	0.000	-----	-----	0.400	R&M EX. BIOSWALE P-6
29	Combine	15, 28	0.541	0.634	-----	-----	0.977	-----	-----	1.701	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	29	0.000	0.000	-----	-----	0.024	-----	-----	0.728	R&M EX. BIOSWALE P-7
31	Combine	16, 30	0.380	0.459	-----	-----	0.762	-----	-----	1.788	R&M EX. BIOSWALE P-8
32	Reservoir	31	0.000	0.000	-----	-----	0.000	-----	-----	0.456	R&M EX. BIOSWALE P-8

Post-Development Site

Description

The storm water management approach provides localized wet ponds to pretreat runoff prior to discharge into the central detention/infiltration basin which will infiltrate a majority of runoff from the development.

The storm water facilities were designed under both normal and frozen ground conditions to demonstrate how the site accommodates runoff. The large central kettle area will be expanded and remain as the final storm water detention area for the majority of the development. The proposed development will improve storm water drainage in this area by: 1) promoting perpetual infiltration of all tributary runoff to the large central storm water basin area; and 2) through the reduction of peak flows to the northeast and southeast corners of the site (as compared to existing conditions). The central storm water basin area has been designed to safely retain the 100-yr frozen ground condition, with all homes set at least 2' above this elevation and the emergency overflow route. Curb and gutter with storm sewer are proposed in the public and private roadways to convey runoff to the detention basins.

The central detention/infiltration basin is the ultimate downstream detention facility for all drainage basins except P-4, P-5 and P-UD-1. Drainage basin P-4 will be treated & discharged through a rain garden at the southeast corner of the site. Drainage basin P-5 will be treated and 100% infiltrated through the biofilter in the Chapman Blvd. median island. Drainage basin P-UD-1 is tributary to the existing storm water facility in the Fairwinds subdivision to the south.

Drainage Area Summary

The following tables summarizes the proposed peak flows for the proposed phase 1 development. Please refer to the attached Hydraflow calculations for additional information and the proceeding sections for background on the emergency overflow evaluation.

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	1.034	1.888	-----	-----	7.052	-----	-----	23.96	P-OS-1-PH 1
2	SCS Runoff	-----	19.64	26.68	-----	-----	56.30	-----	-----	130.52	P-1-PH 1
3	SCS Runoff	-----	1.778	2.445	-----	-----	5.305	-----	-----	12.43	P-1A-PH1
4	SCS Runoff	-----	4.870	6.334	-----	-----	12.32	-----	-----	26.54	P-1B-PH1
5	SCS Runoff	-----	7.587	9.272	-----	-----	15.81	-----	-----	30.40	P-2
6	SCS Runoff	-----	6.222	7.605	-----	-----	12.97	-----	-----	24.93	P-3
7	SCS Runoff	-----	1.395	1.681	-----	-----	2.782	-----	-----	5.183	P-4
9	SCS Runoff	-----	0.213	0.263	-----	-----	0.459	-----	-----	0.896	R&M EX. P-1
10	SCS Runoff	-----	0.445	0.531	-----	-----	0.856	-----	-----	1.550	R&M EX. P-2
11	SCS Runoff	-----	0.178	0.219	-----	-----	0.383	-----	-----	0.747	R&M EX. P-3
12	SCS Runoff	-----	0.219	0.267	-----	-----	0.451	-----	-----	0.854	R&M EX. P-4
13	SCS Runoff	-----	0.279	0.340	-----	-----	0.574	-----	-----	1.086	R&M EX. P-5
14	SCS Runoff	-----	0.445	0.535	-----	-----	0.874	-----	-----	1.606	R&M EX. P-6
15	SCS Runoff	-----	0.541	0.634	-----	-----	0.977	-----	-----	1.701	R&M EX. P-7
16	SCS Runoff	-----	0.380	0.459	-----	-----	0.762	-----	-----	1.422	R&M EX. P-8
17	SCS Runoff	-----	0.349	0.399	-----	-----	0.585	-----	-----	0.975	R&M EX. P-9
18	Reservoir	9	0.010	0.011	-----	-----	0.015	-----	-----	0.201	R&M EX. BIOSWALE P-1
19	Combine	10, 18	0.452	0.539	-----	-----	0.866	-----	-----	1.566	INFLOW R&M EX. BIOSWALE P-2

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	
20	Reservoir	19	0.000	0.000	-----	-----	0.092	-----	-----	1.007	R&M EX. BIOSWALE P-2
21	Combine	11, 20	0.178	0.219	-----	-----	0.383	-----	-----	1.584	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	21	0.000	0.000	-----	-----	0.000	-----	-----	0.529	R&M EX. BIOSWALE P-3
23	Combine	12, 22	0.219	0.267	-----	-----	0.451	-----	-----	0.854	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	23	0.000	0.000	-----	-----	0.000	-----	-----	0.343	R&M EX. BIOSWALE P-4
25	Combine	13, 24	0.279	0.340	-----	-----	0.574	-----	-----	1.086	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	25	0.000	0.000	-----	-----	0.000	-----	-----	0.362	R&M EX. BIOSWALE P-5
27	Combine	14, 26	0.445	0.535	-----	-----	0.874	-----	-----	1.606	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	27	0.000	0.000	-----	-----	0.000	-----	-----	0.400	R&M EX. BIOSWALE P-6
29	Combine	15, 28	0.541	0.634	-----	-----	0.977	-----	-----	1.701	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	29	0.000	0.000	-----	-----	0.024	-----	-----	0.728	R&M EX. BIOSWALE P-7
31	Combine	16, 30	0.380	0.459	-----	-----	0.762	-----	-----	1.788	R&M EX. BIOSWALE P-8
32	Reservoir	31	0.000	0.000	-----	-----	0.000	-----	-----	0.456	R&M EX. BIOSWALE P-8
33	SCS Runoff	-----	2.803	3.263	-----	-----	4.962	-----	-----	8.540	PROPOSED P-5
34	Combine	32, 33	2.803	3.263	-----	-----	4.962	-----	-----	8.540	INFLOW TO PR. P-5
35	Reservoir	34	0.000	0.000	-----	-----	0.000	-----	-----	0.000	PR. BLVD BIOFILTER P-5
37	Reservoir	5	1.821	4.544	-----	-----	13.82	-----	-----	26.10	POND P-2
38	Reservoir	6	5.205	7.010	-----	-----	12.80	-----	-----	22.09	POND P-3
39	Reservoir	7	0.000	0.000	-----	-----	0.000	-----	-----	3.364	RAIN GARDEN P-4
41	Combine	1, 2,	19.99	27.59	-----	-----	61.39	-----	-----	149.04	PHASE 1 OS-1 + P-1
42	Combine	3, 37,	2.827	6.620	-----	-----	19.07	-----	-----	38.52	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	42	2.784	6.429	-----	-----	18.87	-----	-----	38.36	PH 1 FOREBAY 1A
44	Combine	4, 38,	9.595	12.97	-----	-----	25.12	-----	-----	47.97	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	44	6.935	10.85	-----	-----	24.08	-----	-----	47.32	PH 1 FOREBAY 1B
46	Combine	41, 43, 45	20.27	28.01	-----	-----	82.17	-----	-----	215.64	PH 1 INFLOW - POND P-1
47	Reservoir	46	0.000	0.000	-----	-----	0.000	-----	-----	0.000	INFILTRATION BASIN P-1
49	Combine	39, 47,	0.000	0.000	-----	-----	0.000	-----	-----	3.364	PHASE 1 P-TOTAL

*A design infiltration rate of 0.5 inches/hour for the Infiltration Basin and 1.63 inches/hour for the Rain Garden were used for the enclosed calculations.

**See Hydraflow calculations in attached appendix for information for the approximate final development maximum flow rates associated with the design storms. The future design is subject to change upon phase design. This SWMP will be updated as future project phases move forward.

Pond and Infiltration Basin Design Summary

The infiltration basins are designed in accordance with WDNR NR 151 and Technical Standards. Two infiltration tests will be provided for the infiltration basin and are expected to demonstrate minimum infiltration rate of 0.5 in/hr within the infiltration basin P-1 foot print and 1.63 in/hr within the raingarden P-4 foot print, based on the given soil types. The development utilizes swales, storm sewer and controlled overflow routes to convey runoff from the site to the stormwater management facilities. Wet ponds with 2' clay liners or synthetic liners (or other as recommended by geotechnical consultant, subject to verification and installation testing) are located prior to infiltration basin to provide 60% - 80% TSS removal pretreatment prior to discharging to the associated infiltration area. All stormwater facilities are located within Outlots, that will be fractionally owned by all lots within the development. The one exception is for Raingarden P-4, which will be located within an easement. Access to all facilities is accommodated and provided via public street, trail and/or accessible routes.

Post-Development Site – NO INFILTRATION & 100-YEAR FROZEN GROUND EVENT

Description

The storm water management plan was modeled under the frozen ground condition in a 100-year storm event, which assumes no infiltration and every drainage area having a curve number of 98 (equivalent to impervious). The proceeding tables identify the maximum water surface elevations during a frozen ground condition 100-year event. This information is utilized to establish minimum exposed home/structure yard grades in certain areas, minimizing the potential for flooding during a catastrophic storm event. All home grades are set at least 2' above the critical site emergency overflow spillway elevation of 842.10. The minimum home yard/garage floor elevation proposed throughout the development is therefore 844.10, which is 2.94' higher than the calculated Frozen Ground 100-year elevation.

PROPOSED 100-YR STORM (FROZEN GROUND CONDITIONS)				
POND	2-YR STORM ELEV.	10-YR STORM ELEV.	100-YR STORM ELEV.	FROZEN GROUND 100-YR ELEV.
BASIN P-1	832.27	834.04	837.19	840.73
RAIN GARDEN P-4	839.99	840.47	840.86	840.93
NOTE: Ponds P-2 and P-3 discharge & ultimately overflow to Central Pond P-1. Critical offsite emergency spillway elevation for Central Pond P-1 is 842.10.				

*For the 1, 2, & 10-year storm events, the high-water elevations associated with Forebays 1A & 1B correspond to the value indicated in their respective rows. The 100-yr & 100-yr frozen conditions high water elevation for these same forebays is assumed to be equivalent to the elevation depicted in the infiltration Basin P-1 row, as there will be free flow between the forebays and infiltration basin.

Emergency Overflow Routing

Proposed Emergency Overflow Routing

All roads within the development are proposed to have positive slope to a stormwater management area. This ensures that low points in roads will overtop to a storm water management area and minimize the potential for road ponding. As identified in the preceding table, the standard 100-year storm event is managed and contained within each pond with freeboard from the overflow spillway; no roads are overtopped by ponds. During the catastrophic frozen ground 100-year storm event, the central basin will fill up to elevation 840.90, and over 2 ft. of freeboard will be provided to the critical site overflow spillway elevation of 842.10. In this case there will be ponding on adjacent lots. However, a minimum separation between exposures/finished floors and the catastrophic frozen ground 100-year water level will be 3.2 feet.

Water Quality & Infiltration

Description

The dead-storage design of the central infiltration basin will ensure that the site achieves nearly 100% TSS removal for water quality and that the development will exceed infiltrating at least 90% of the existing infiltration volume for a 2-year storm event. Therefore, the proposed development meets Water Quality and Infiltration requirements.

SLAMM Results – Chapman Farms Development June 28, 2019				
Rain file: Milwaukee WI 1969.RAN		Runoff Volume (cu ft)	Particulate Solids Concentration (mg/L)	Particulate Solids yield (lbs)
Model Run Start Date: 03/28/69	Model Run End Date: 12/06/69			
Total Without Controls:				
Total Without Controls		371,126	152.9	3543.0
Total After Outlet Controls		0.0	0.0	0.0
Percent Reduction:		N/A	N/A	100.0%

*Total After Outlet Controls outputs are based on the values generated by Winslamm for the RG-4 output in addition to the outflows from basin P-1. Pond P-1 & Raingarden RG-1 do not produce discharge in the 1-yr storm event, which results in a 100% reduction on T.S.S. and Volume.

To ensure proper Total Suspended Solids (T.S.S.) pretreatment for flows entering the proposed kettle (Infiltration Basin) of at least 60% the following Winslamm summary table has been provided:

SLAMM Results – Chapman Farms Development – Forebays 1A & 1B June 28, 2019				
Rain file: Milwaukee WI 1969.RAN		Runoff Volume (cu ft)	Particulate Solids Concentration (mg/L)	Particulate Solids yield (lbs)
Model Run Start Date: 03/28/69	Model Run End Date: 12/06/69			
Total Without Controls:				
Discharge from Forebay 1A* Total Without Controls		N/A	N/A	1400.1
Discharge from Forebay 1A Total After Outlet Controls		N/A	N/A	381.7
Pond P-2 & Forebay 1A Percent Reduction:		N/A	N/A	72.7%
Discharge from Forebay 1B* Total Without Controls		N/A	N/A	2090.4
Discharge from Forebay 1B Total After Outlet Controls		N/A	N/A	538.7
Pond P-3 & Forebay 1B Percent Reduction:		N/A	N/A	74.2%

Total Site Release Rates

The table below summarizes the storm water release rates associated with the overall development. Per the Village of Mukwonago Storm Water Ordinance, the Allowable Release Rate is defined as;

Peak Discharge.

- A. Minimum requirement. To minimize downstream bank erosion and the failure of downstream conveyance systems, the calculated post-development peak storm water discharge rates shall be reduced as depicted in the table below. Modeling requirements for this provision are further described in sec. 34-111 below.

	Post Development Peak Discharge =	Pre-Development Peak Discharge
Recurrence	100	10
interval storm	10	2
	2	2
	1	1

TOTAL SITE DISCHARGE			
STORM EVENT	EXISTING	PROPOSED	ALLOWABLE
1-YR	2.060 CFS	0.000 CFS	2.060 CFS
2-YR	3.110 CFS	0.000 CFS	3.110 CFS
10-YR	7.912 CFS	0.000 CFS	3.110 CFS
100-YR	20.52 CFS	3.364 CFS	7.912 CFS

Phase 2 Summary

To ensure that the Phase 1 design elements, detailed within this stormwater management plan, will meet the Village and WDNR requirements when Phase 2 is eventually developed, the following summaries have been provided. The below figures have been established assuming an R-3 zoning density and equates to one hundred (100) signal family lots, of which four (4) will be included in the development of phase 1. The below tables have been provided to illustrate the expected release rates, ponding elevations, and water quality that can be expected in Phase 2. Ultimately this plan will need to be updated to establish exact figures for the Phase 2 improvements.

Phase 2 Peak Discharge Summary:

TOTAL SITE DISCHARGE			
STORM EVENT	EXISTING	PROPOSED	ALLOWABLE
1-YR	2.060 CFS	1.337 CFS	2.060 CFS
2-YR	3.110 CFS	1.628 CFS	3.110 CFS
10-YR	9.231 CFS	2.747 CFS	3.110 CFS
100-YR	39.940 CFS	5.199 CFS	9.231 CFS

Stormwater Management Facility Summary:

Infiltration Basin P-1:

1-yr = 831.57; 2-yr = 832.14; 10-yr = 834.25; 100-yr = 838.11

Forebay 1A:

1-yr = 835.08; 2-yr = 835.16; 10-yr = 835.50; 100-yr = 838.11

Forebay 1B:

1-yr = 835.08; 2-yr = 835.17; 10-yr = 835.43; 100-yr = 838.11

Pond P-2:

1-yr = 839.39; 2-yr = 839.50; 10-yr = 839.78; 100-yr = 840.53

Pond P-3:

1-yr = 839.75; 2-yr = 839.81; 10-yr = 839.97; 100-yr = 840.68

RG-4:

1-yr = 839.81; 2-yr = 839.99; 10-yr = 840.47; 100-yr = 840.86

Phase 2 Water Quality (TSS) Summary:

Overall Analysis:

SLAMM Results – Chapman Farms Development February 27, 2020				
Rain file: Milwaukee WI 1969.RAN		Runoff Volume (cu ft)	Particulate Solids Concentration (mg/L)	Particulate Solids yield (lbs)
Model	Run Start Date: 03/28/69			
Model	Run End Date: 12/06/69			
Total Without Controls:				
Total Without Controls		570,797	149.9	5343.0
Total After Outlet Controls		0.0	0.0	0.0
Percent Reduction:		N/A	N/A	100.0%

Individual Facility Analysis:

Col. #:	2	3	4	5	6	7	8	9	10	11	12
Control Practice No.	Control Practice Type	Control Practice Name or Location	Total Inflow Volume (cf)	Total Outflow Volume (cf)	Percent Volume Reduction	Total Influent Load (lbs)	Total Effluent Load (lbs)	Percent Load Reduction	Flow Weighted Influent Conc (mg/L)	Flow Weighted Effluent Conc (mg/L)	Percent Conc. Reduction
1	Wet Detention Pond	POND P-3	122661	122962	-0.245	1092	340.7	68.80	142.6	44.38	68.883
2	Wet Detention Pond	POND P-2	125893	126189	-0.235	1114	294.9	73.53	141.8	37.44	73.591
3	Wet Detention Pond	FOREBAY 1B	264338	264623	-0.108	1860	732.3	60.63	112.7	44.33	60.665
4	Wet Detention Pond	FOREBAY 1A	300509	300918	-0.136	1861	890.2	52.17	99.19	47.39	52.224
5	Biofilter	RG-4	6547	0	100.0	51.92	0	100.0	127.0	0	100.000
6	Biofilter	Infiltratio P-1	565541	0	100.0	1623	0	100.0	45.96	0	100.000

Conclusion

This preliminary stormwater management plan provides calculations and supporting documentation that demonstrate the design complies with Village, County and WDNR requirements and will improve drainage conditions in the immediate area. This analysis provides initial pond and basin sizing and outfall structure design, establishes overflow routes and maximum water surface elevations, and identifies the effects of extreme or catastrophic events to ensure that the development and proposed structures are properly designed.

The final landscaping and/or construction plans will provide planting details and specifications in and around the pond and infiltration basin areas.

A Storm Water Management Practice Maintenance Agreement will be prepared and recorded for this development, ensuring that the storm water practices are properly maintained by the HOA and lot owners in perpetuity.

APPENDIX 1

Existing & Proposed Drainage Area Maps

D1.0 – Existing Drainage Map

D2.0 – Phase 1 Drainage Map

D2.1 – Overall Drainage Map



THOMAS W. MCNEITH APT.
BROOKFIELD, WI 53005
PHONE: (262) 790-1400
FAX: (262) 790-1400
EMAIL: tom@mcneith.com

D1.0





TOMAS W. NORTH APT.
 BRIDGEMONT, PA 19009
 PHONE: (215) 780-1400
 FAX: (215) 780-1400
 EMAIL: twnorth@comcast.com

REVISION HISTORY	
DATE	DESCRIPTION
08/27/2010	Per R-3 ZONING
08/27/2010	Per VILLAGE COMMENTS
08/07/2010	Per VILLAGE COMMENTS
08/27/2010	Per VILLAGE COMMENTS
10/02/2010	PH1 INITIAL SUBMITTAL

JOB NUMBER:
14023-02

DESCRIPTION:

PLAN

D2.0



APPENDIX 2

Development Plans (Grading & Pond Plans)



12650 W. NORTH AVE.
BIRMINGHAM, AL 35205
PHONE: (205) 790-1400
FAX: (205) 790-1401
MAIL: info@harsco.com

C1.0

LEGEND:

- - - 86.0
- 88.0
- × 89.5
- PROPOSED FLOW ARROW
- PROPOSED YARD GRADE
- PROPOSED EXPOSURE GRADE
- SOIL BORING LOCATION

FG 890.0

EXP 843.0



TRIO

PROJECT:
CHAPMAN FARMS - PHASE 1
SINGLE- & MULTI-FAMILY RESIDENTIAL SUBDIVISION
VILLAGE OF MUKWONG, WISCONSIN
BY: BELINSKI HOMES
1830 MEADOW LN, SUITE A
PEWaukee, WI 53072

REVISION HISTORY	DATE	DESCRIPTION
	12/28/2019	Per SWAP COMMENTS
	05/07/2019	Per VILLAGE COMMENTS
	12/27/2019	Per VILLAGE COMMENTS
	03/05/2019	PH1 INITIAL SUBMITTAL

DATE: JUNE 28, 2019

JOB NUMBER:
14023-02

DESCRIPTION:
**GRADING &
DRAINAGE PLAN**

SHEET

C1.1



CONTRACTOR IS REQUIRED TO CONTACT DIGGERS HOTLINE TOLL FREE TO OBTAIN LOCATION OF UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND NOTICES. A MINIMUM OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE. **CALL DIGGERS HOTLINE 1-800-245-4811**

EXISTING UNDERGROUND UTILITY INFORMATION WAS OBTAINED FROM AVAILABLE RECORDS. THE ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF RECORDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL UNDERGROUND UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF UTILITIES IN THE FIELD AND LOCATIONS SHOWN ON THE PLANS.



PROJECT:
CHAPMAN FARMS - PHASE 1
 SINGLE- & MULTI-FAMILY RESIDENTIAL SUBDIVISION
 BY: BELINSKI HOMES
 1630 MEADOW LN, SUITE A
 PEWAUKEE, WI 53072

REVISION HISTORY	DATE	DESCRIPTION
01/06/2019	PG SHIP COMMENTS	
03/07/2019	PG VILLAGE COMMENTS	
05/09/2019	PG FINAL SUBMITTAL	

DATE:
 JUNE 28, 2019

JOB NUMBER:
 14023-02

DESCRIPTION:
 PHASE 2
 GRADING &
 DRAINAGE PLAN

SHEET

C1.3



PROJECT:
CHAPMAN FARMS - PHASE 1
CONSOLE & MULTI-FAMILY RESIDENTIAL SUBDIVISION
BY: BELINSKI HOMES
1830 MEADOW LN, SUITE A
PEWaukee, WI 53072

REVISION HISTORY	
DATE	DESCRIPTION
08/28/2019	Per SWAP COMMENTS
08/07/2019	Per VILLAGE COMMENTS
05/02/2019	Per VILLAGE COMMENTS
12/06/2018	PH1 INITIAL SUBMITTAL

DATE: JUNE 28, 2019

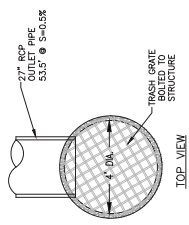
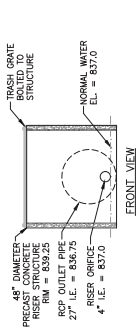
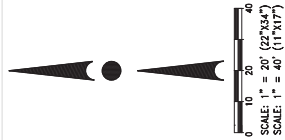
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14023-02

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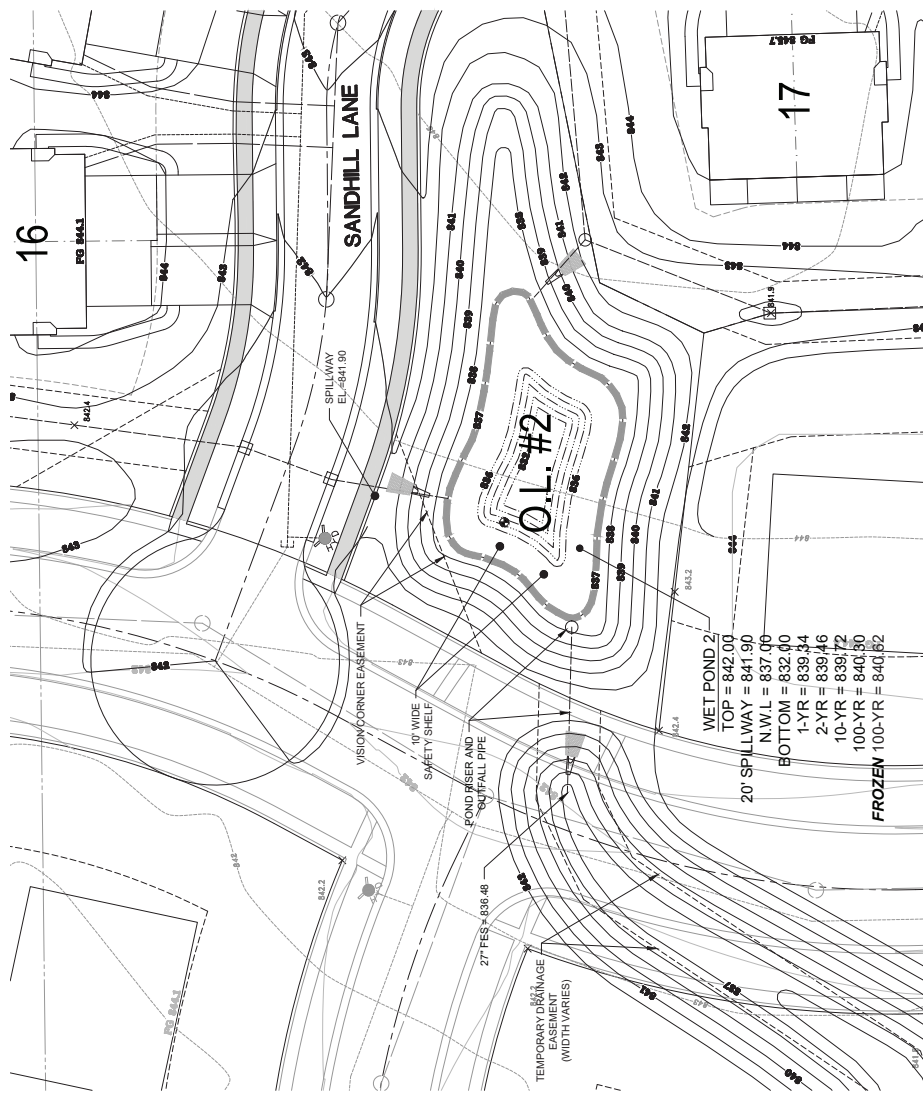
POND

PLAN & DETAILS

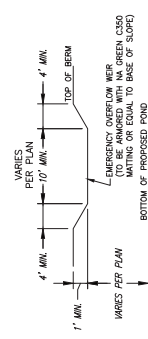
SHEET
C1.4



**WET POND 2
OUTLET STRUCTURE
DETAIL**
NO SCALE



CLAY LINER NOTE:
2" THICK CLAY LINER IN ACCORDANCE WITH MDOT TECH. STD. 1001 TYPE B, AND SALS REPORT.
CLAY LINER SHALL BE COMPACTED TO A MINIMUM OF 90% TO 92% DRY DENSITY AS DETERMINED BY MODIFIED PROCTOR (ASTM D1557)
IF PREDOMINANTLY GRANULAR TEXTURE SOILS AND/OR GROUNDWATER ARE PLACED, A "SUFFICIENT" LIFT OF CLAYT LIFT MAY BE REQUIRED TO BE PLAZED ALONG THE SIDEWALLS AND BASE PRIOR TO COMMENCING WITH ACTUAL LINER PLACEMENT/CONSTRUCTION. TO AID IN ATTAINING A "SUFFICIENT" LAYER IS PARTICULARLY BENEFICIAL IN CREATING A STABLE SUBBASE IN THE EXIST SLOTTED GROUNDWATER SEEPAGE OCCURS. THE CLAY LAYER SHALL BE PLACED TO THE FULL DEPTH OF THE CLAY LAYER INTENDAL TO CONFIRM THAT SPECIFICATIONS ARE MET.



TYPICAL EMERGENCY OVERFLOW WEIR DETAIL
NOT TO SCALE
NOTE: GRADES FOR TOP OF BERM, OVERFLOW SPILLWAY, AND BOTTOM OF POND SHALL BE PER PLAN.

CONTRACTOR IS REQUIRED TO CONTACT DIGESTERS HOTLINE TOLL FREE TO OBTAIN THE NEAREST AVAILABLE DIGESTER. IN ORDER TO COME TO THE WORK, WISCONSIN STATUTE 182.07(3) REQUIRES THE USE OF 3 WORK DAYS NOTICE BEFORE YOU DIG. **CALL DIGESTERS HOTLINE 1-800-249-4811**

BACKGROUND UTILITY INFORMATION WAS OBTAINED FROM AVAILABLE SOURCES. THE ENGINEERS MAKE NO GUARANTEE AS TO THE ACCURACY OF THE INFORMATION. VERIFICATION TO THE SATISFACTION OF THE CONTRACTOR IS REQUIRED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PERMISSING UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY PERMITS ASSUMED AS A CONDITION OF THE CONTRACT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING ANY DISCREPANCIES BETWEEN LOCATION OF THE FIELD AND LOCATIONS SHOWN ON THE PLANS.



Project:
CHAPMAN FARMS - PHASE 1
SINGLE- & MULTI-FAMILY RESIDENTIAL SUBDIVISION
BY: BELINSKI HOMES
VILLAGE OF MUKWONGO, WISCONSIN
1630 MEADOW LN, SUITE A
PEWaukee, WI 53072

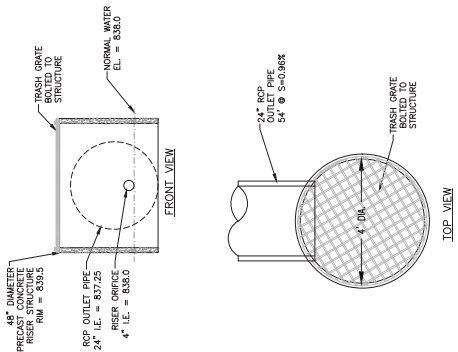
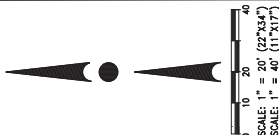
REVISION HISTORY	
DATE	DESCRIPTION
9/26/2018	Per SWAP COMMENTS
9/26/2018	Per VILLAGE COMMENTS
9/26/2018	Per VILLAGE COMMENTS
9/26/2018	PH1 INITIAL SUBMITTAL

DATE: JUNE 28, 2019

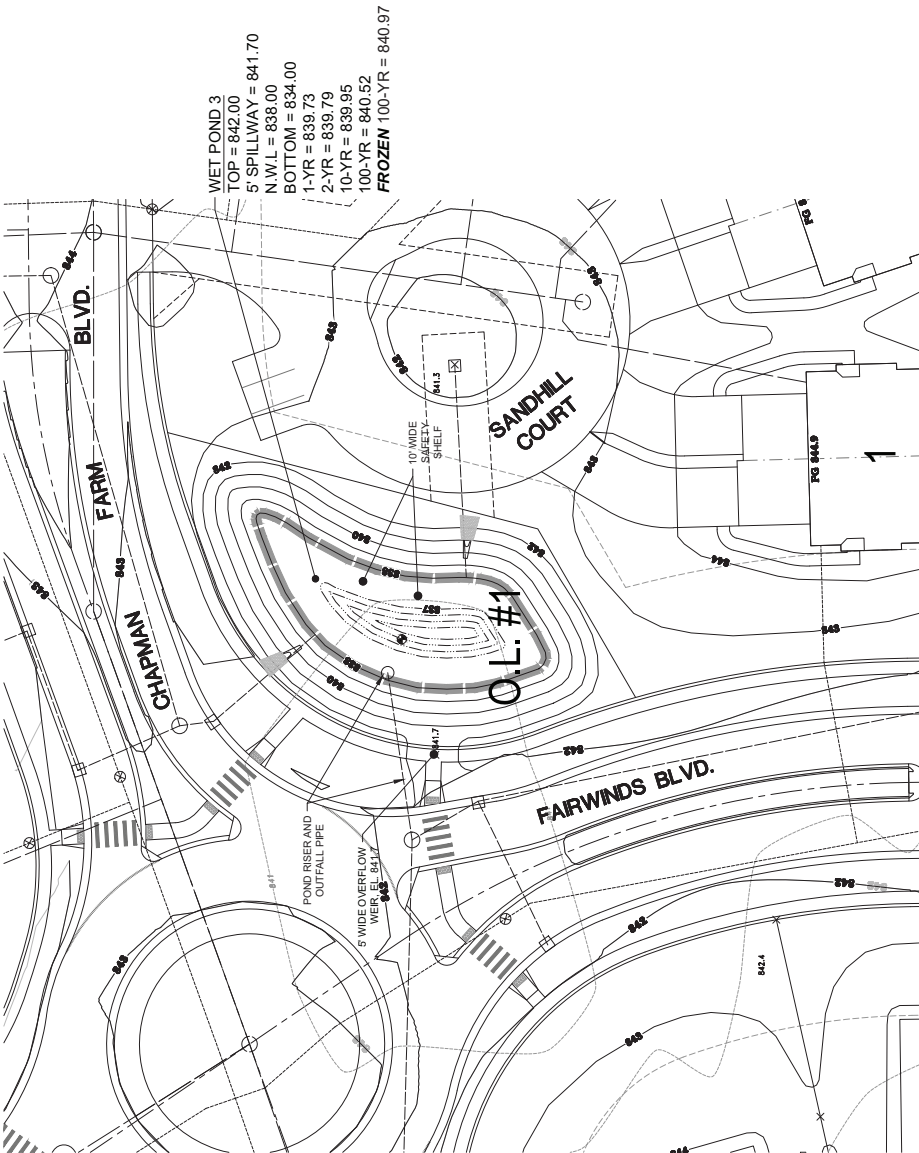
JOB NUMBER:
14023-02

DESCRIPTION:
POND
PLAN & DETAILS

SHEET
C1.5



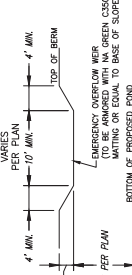
WET POND 3
OUTLET STRUCTURE
DETAIL
NO. SCALE



CLAY LINER. CLAY LINER IN ACCORDANCE WITH MONSIEUX, STD. 1001 TYPE B, AND SOILS REPORT, SHOULD BE COMPOSED OF A MINIMUM OF 90 PERCENT CLAY. CLAY CONTENT SHOULD BE DETERMINED BY AGRICULTURAL MEANS TO 90% DRY DENSITY AS DETERMINED BY AGRIQUEST PROCTOR (ASTM D1557).

IF PREDOMINANTLY GRANULAR (PURE SOILS AND/OR GRANULOMETER #100) MATERIAL IS USED, THE CLAY CONTENT OF THE SOILS SHOULD BE PLACED ABOVE THE SIGNALS AND BASE PLY MAY BE REQUIRED TO BE PLACED ABOVE THE SIGNALS AND BASE PLY MAY BE REQUIRED TO BE SATISFACTORILY COMPACTED UNDER SECTION. THE PLACEMENT OF A "SATISFACTORIAL" LAYER IS PARTICULAR BENEFICIAL IN CREATING A STABLE SUBSTRATE FOR THE LAYER OF GEOTEXTILE. THE LAYER OF GEOTEXTILE. GEOTECHNICAL TESTING SHALL BE PERFORMED ON POTENTIAL CLAY LINER MATERIAL TO CONFIRM THAT SPECIFICATIONS ARE MET.

RIP-RAP NOTE:
RIP-RAP IS TO EXTEND FROM ALL STORM
SEWER OUTFALLS TO THE DOWNSLOPE
EDGE OF THE WET POND SAFETY SHELL.



TYPICAL EMERGENCY OVERFLOW WEIR DETAIL

NOT TO SCALE
NOTE: GRADES FOR TOP OF BERM, OVERFLOW SPILLWAY, AND
BOTTOM OF POND SHALL BE PER PLAN.

 CONTRACTOR IS REQUIRED TO CONTACT DIGGERS HOTLINE TO
FREE TO OBTAIN LOCATION OF UNDERGROUND UTILITIES PRIOR TO
COMMENCING THE WORK. WISCONSIN STATUTE 182.0715 REQUIRES
MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.

CALL DIGGERS HOTLINE 1-800-948-4811

EXISTING UNDERGROUND UTILITY INFORMATION WAS OBTAINED FROM AVAILABLE
RECORDS. THE ENGINEER MAKES NO WARRANTY AS TO THE ACCURACY OF
ALL UNDERGROUND UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS.
SHALL BE ASSUMED AS A CONDITION OF THE CONTRACT. THE CONTRACTOR
SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN LOCATION OF



PROJECT:
CHAPMAN FARMS - PHASE 1
SINGLE- & MULT-FAMILY RESIDENTIAL SUBDIVISION
BY: BELINSKI HOMES
VILLAGE OF MUKWAGO, WISCONSIN
1830 MEADOW LN, SUITE A
PEWaukee, WI 53072

REVISION HISTORY	
DATE	DESCRIPTION
2/28/2019	Per SWAP COMMENTS
3/10/2019	Per VILLAGE COMMENTS
3/27/2019	Per VILLAGE COMMENTS
4/09/2019	PH1 INITIAL SUBMITTAL

DATE: **JUNE 28, 2019**

JOB NUMBER:
14023-02

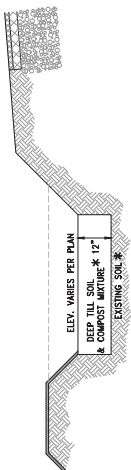
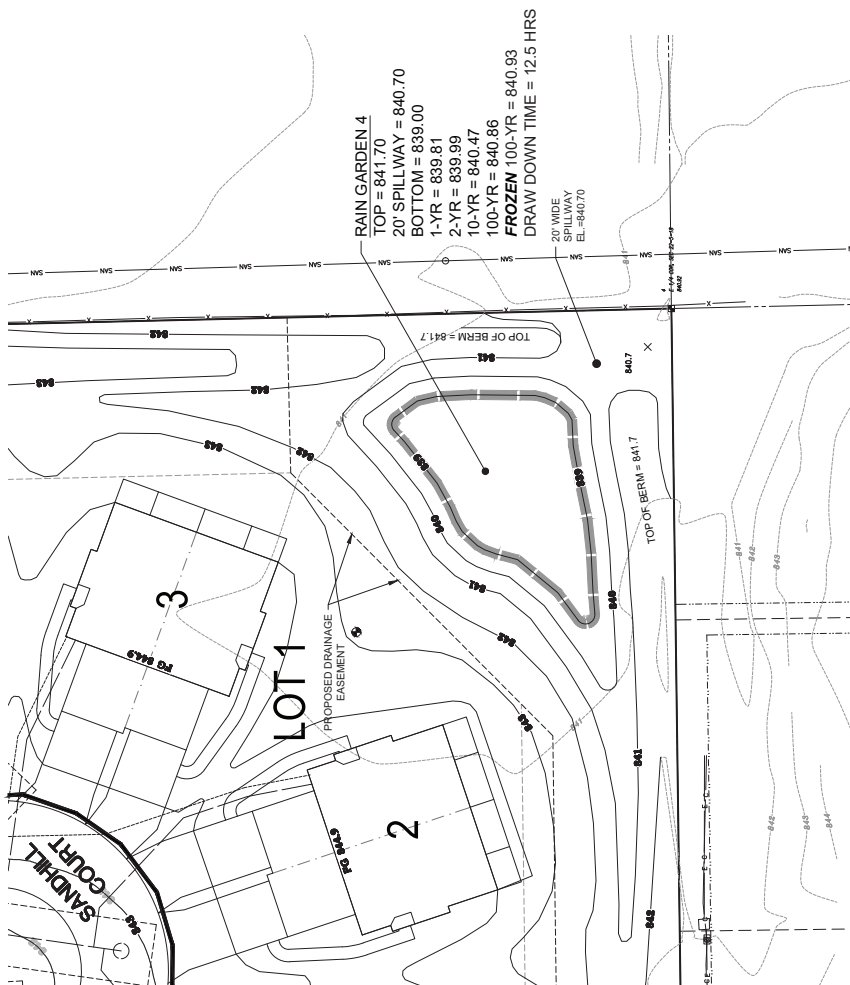
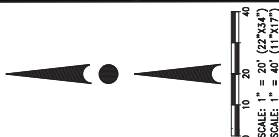
DESCRIPTION:

POND

PLAN & DETAILS

SHEET

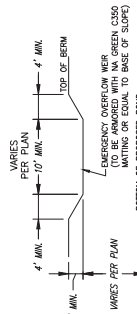
C1.6



BRAIN GARDEN TYPICAL SECTION

* EXCAVATE BOTTOM OF RAINGARDENS TO NATIVE SAND/GRAVEL LAYERS. SOILS LAYER VARIES PER GEOTECHNICAL REPORT, OVEREXCAVATION MAY BE BACKFILLED WITH OTHER ONSITE SAND OR GRAVEL MATCHING NATIVE UNDERLYING SOILS (AS DIRECTED BY GEOTECHNICAL ENGINEER).

- TRACTED EQUIPMENT AND LOW WEIGHT VEHICLES SHALL BE USED TO CONSTRUCT RAIN GARDENS. RAIN GARDENS SHALL BE CONSTRUCTED TO MEET THE FOLLOWING REQUIREMENTS:
- THE COMPOSE COMPONENT SHALL MEET THE REQUIREMENTS OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES SPECIFICATIONS 3100 - COMPOST.
 - ALL RAIN GARDEN SLOPES 4:1 OR GREATER SHALL BE PROVIDED WITH CLAS 1, TYPE 1 EROSION MATING.
 - SOIL TESTS SHOULD BE COMPLETED PRIOR TO RAIN GARDEN CONSTRUCTION TO VERIFY THE DEPTH TO APPROPRIATE SOILS. A QUALIFIED SOILS PROFESSIONAL SHOULD BE ON-SITE TO VERIFY THAT APPROPRIATE DEPTHS ARE REACHED TO HELP ENSURE THE RAIN GARDEN FUNCTIONS PROPERLY.



TYPICAL EMERGENCY OVERFLOW WEIR DETAIL

NOT TO SCALE
NOTE: GRADES FOR TOP OF BERM, OVERFLOW SPILLWAY, AND
BOTTOM OF POND SHALL BE PER PLAN.

INFILTRATION BASIN CONSTRUCTION NOTES

1. IT IS RECOMMENDED THAT THE RAIN GARDEN AREA BE PROTECTED FROM THE RAIN GARDEN DRAINAGE SYSTEM. THE CONTRACTOR SHALL PROVIDE THE RAIN GARDEN WITH A PERMANENT OR TEMPORARY BERMING UPSLOPE OF THE RAIN GARDEN DRAINAGE SYSTEM. THE CONTRACTOR SHALL PROVIDE THE RAIN GARDEN WITH A PERMANENT OR TEMPORARY BERMING UPSLOPE OF THE RAIN GARDEN DRAINAGE SYSTEM. THE CONTRACTOR SHALL PROVIDE THE RAIN GARDEN WITH A PERMANENT OR TEMPORARY BERMING UPSLOPE OF THE RAIN GARDEN DRAINAGE SYSTEM. THE CONTRACTOR SHALL PROVIDE THE RAIN GARDEN WITH A PERMANENT OR TEMPORARY BERMING UPSLOPE OF THE RAIN GARDEN DRAINAGE SYSTEM.
2. ONCE CONSTRUCTION OF A RAIN GARDEN BEGINS, THE CONTRACTOR SHALL PROVIDE TRACKING HEAVY EQUIPMENT OVER THE RAIN GARDEN BOTTOM AREA.
3. VEGETATION WITHIN THE BOTTOM OF THE RAIN GARDEN SHALL BE ESTABLISHED USING (NUMBER) SPECIES (NUMBER) SEEDING IN ACCORDANCE WITH YOUR TECHNICAL STANDARD 1003.

RAIN GARDEN BOTTOM RESTORATION NOTES

- THE BOTTOM OF THE RAIN GARDEN SHALL BE STRIPPED OF TOPSOIL AND ANY SURFICIAL CLAY LAYER(S).
- THE UNDERLYING SANDY SOILS SHALL BE DEEP TILLED A THIN LAYER OF COMPOST OR PURPLE COW ORGANICS BIOFILTRATION MEDIA SPREAD ON THE BOTTOM OF THE RAIN GARDEN AREA.
- SEED WITH PRAMBE MOON NURSERY INFILTRATION BASIN MIX OR FUNCTIONAL PRAMBE SEEDING EQUIVALENT. FOLLOW SEEDING RATES PROVIDED BY THE SUPPLIER.
- INSTALL STEERING MATTING IF/AS APPROPRIATE WITHIN RAIN GARDEN.

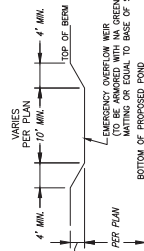
GENERAL RESTORATION REQUIREMENTS

- TRACKED EQUIPMENT AND LOW WEIGHT VEHICLES SHALL BE USED TO CONSTRUCT RAIN GARDENS.
- RAIN GARDENS SHALL BE CONSTRUCTED IN A MANNER THAT MINIMIZES SOIL COMPACTION. IF A COMPOST COMPONENT IS USED, IT SHALL MEET THE REQUIREMENTS OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES SPECIFICATIONS S100 - COMPOST.
- ALL SLOPES 4:1 OR GREATER SHALL BE MATING WITH CLASS 1, TYPE A, EROSION MATTING.

CALL DIGGERS HOTLINE 1-800-248-4811



NOTE: THE FOLLOWING UNDERGROUND UTILITY INFORMATION WAS OBTAINED FROM AVAILABLE RECORDS. THE ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF THIS INFORMATION. VERIFICATION TO THE SATISFACTION OF THE CONTRACTOR OF ALL UNDERGROUND UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE ASSUMED AS A CONDITION OF THE CONTRACT. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN LOCATION OF UTILITIES IN THE FIELD AND LOCATIONS SHOWN ON THE PLANS.



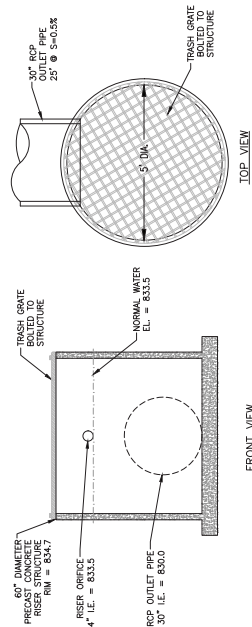
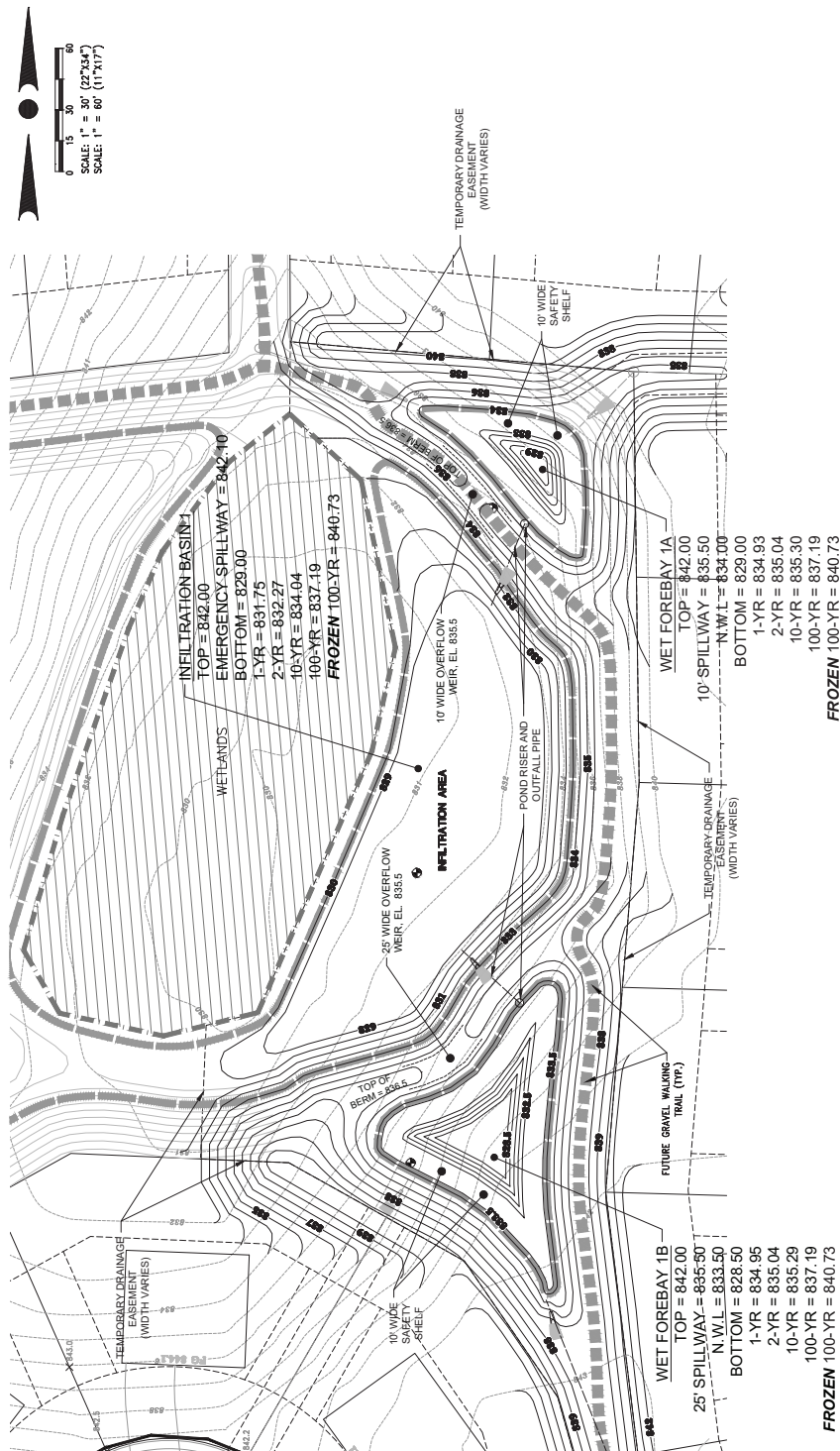
TYPICAL EMERGENCY OVERFLOW WEIR DETAIL

NOT TO SCALE
NOTE: GRADES FOR TOP OF BERM, OVERFLOW SPILLWAY, AND
BOTTOM OF POND SHALL BE PER PLAN.

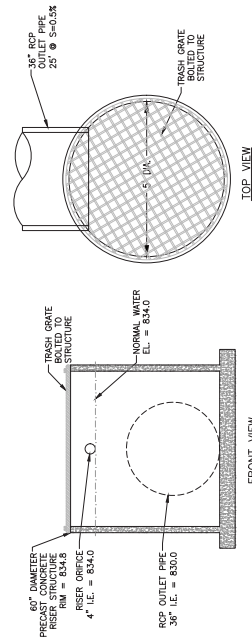
CLAY LINER MATS:
 1. 2" THICK LINER IN ACCORDANCE WITH MNR TECH. STD. 1001 TYPE B, AND SOILS REPORT.
 2. CLAY LINER MATERIALS SHOULD BE COMPACTED TO A MINIMUM OF 90% OF THEORETICAL DENSITY BY MODIFIED PROCTOR (ASTM D1557).
 3. PREDESIGNATED GRANULAR FILL SOILS AND/OR GROUNDWATER INFILTRATION IS ENCOUNTERED AT OR BELOW THE BOTTOM ELEVATION OF THE CLAY LINER, THE CLAY LINER SHALL BE REPAIRED BY REMOVING THE DEFECTIVE PLACED AGAINST THE SIDEWALLS AND BASE PRIOR TO COMINGLING WITH AN ACTUAL PLACEMENT/CONSTRUCTION TO JOINT IN ATTAINING A MINIMUM OF 90% OF THEORETICAL DENSITY.
 4. A SUPERFICIAL LAYER IS PARTICULARLY BENEFICIAL IN CREATING A STABLE SUBBASE IN THE EVENT SUCH GROUNDWATER SEEPAGE OCCURS.
 5. THE CLAY LINER MATERIAL SHALL BE SPECIFICALLY DESIGNED TO COMBINE WITH THE SUBBASE TO PROVIDE AN ADDITIONAL CLAY

INfiltration BASin CONSTRUCTION NOTES

- [illegible]



WET FOREBAY 1B
OUTLET STRUCTURE
DETAIL
NO SCALE



WET FOREBAY 1A
OUTLET STRUCTURE
DETAIL
NO. SCALE

REVISION HISTORY
DATE DESCRIPTION
Per SWAP COMMENTS
Per VILLAGE COMMENTS
Per VILLAGE COMMENTS
PH1 INITIAL SUBMITTAL

DATE: JUNE 28, 2019

JOB NUMBER:
'14023-02

DESCRIPTION:
POND
PLAN & DETAILS

SHEET

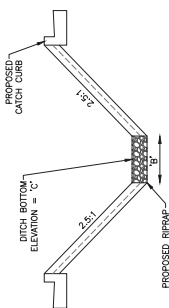
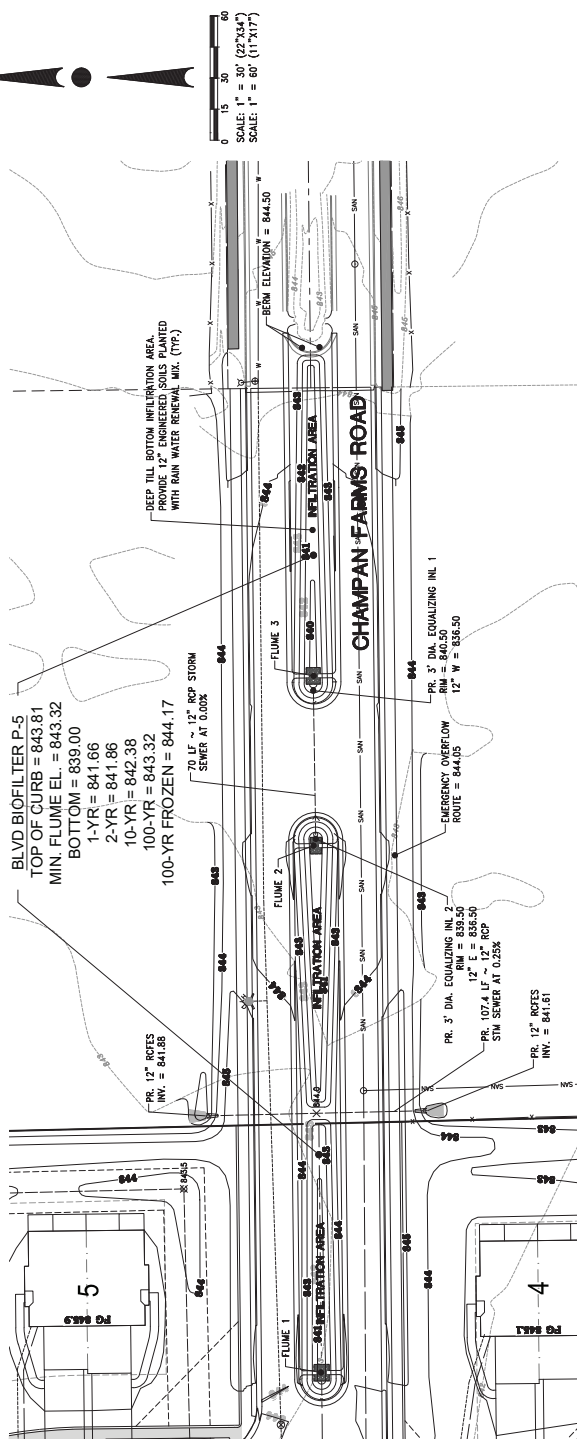
C1.7



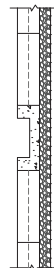
NOTE: EXISTING UNDERGROUND UTILITY INFORMATION WAS OBTAINED FROM AVAILABLE RECORDS. THE ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF THIS INFORMATION. VERIFICATION TO THE SATISFACTION OF THE CONTRACTOR OF ALL UNDERGROUND UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE ASSUMED AS A CONDITION OF THE CONTRACT. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN LOCATION OF UTILITIES IN THE FIELD AND LOCATIONS SHOWN ON THE PLANS.

BIOFILTER CONSTRUCTION NOTES

- [illegible]

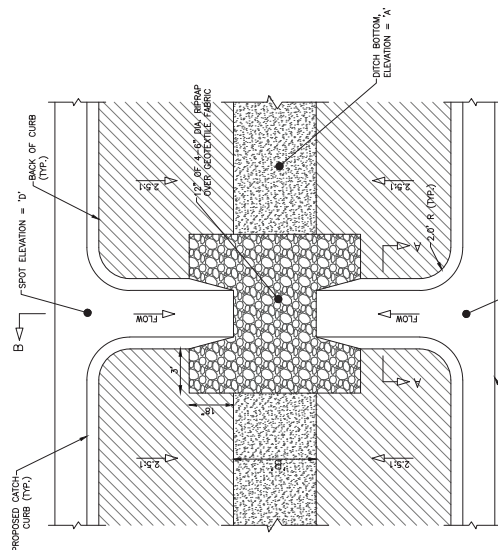


CONCRETE FLUME
SECTION 'B'



CONCRETE FLUME
SECTION 'A'

CONCRETE FLUME DATA TABLE				
CONCRETE FLUME NUMBER	A' (ELEVATION)	B' (DITCH WIDTH) (FT)	C' (TOP OF RIPRAP)	D' (ELEVATION)
1	841.00	4.00	841.00	843.95
2	839.00	2.00	843.32	
3	840.00	3.75	840.00	843.50



CONCRETE FLUME DETAIL

NTS



12800 W. NORTH AVE.
BROOKFIELD, WI 53005
PHONE: (262) 790-1489
FAX: (262) 790-1491
EMAIL: info@pulsar.org

Project:
CHAPMAN FARMS - PHASE 1
SINGLE- & MULTI-FAMILY RESIDENTIAL SUBDIVISION
BY: BELINSKI HOMES
VILLAGE OF MUKWONGO, WISCONSIN
1630 MEADOW LN, SUITE A
PEWaukee, WI 53072

PEWALKEE, WI 53072

REVISION HISTORY	DATE	DESCRIPTION
	12/28/2019	Per SWAP COMMENTS
	05/07/2019	Per VILLAGE COMMENTS
	12/22/2019	Per VILLAGE COMMENTS
	03/05/2019	PH1 INITIAL SUBMITTAL

DATE: JUNE 28 2019

JOB NUMBER:
14023-02

DESCRIPTION:
POND
PLAN & DETAILS

SHEET

C1.8

APPENDIX 3

Soils Map, Soil Boring Map & Soil and Site Evaluation Forms

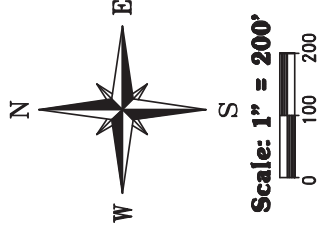
SOIL TESTING EXHIBIT

"CHAPMAN FARMS"
VILLAGE OF MUKWONAGO, WI

LEGEND	
	- Geotechnical test location
	Ex Elev=842
	- Ground elevation

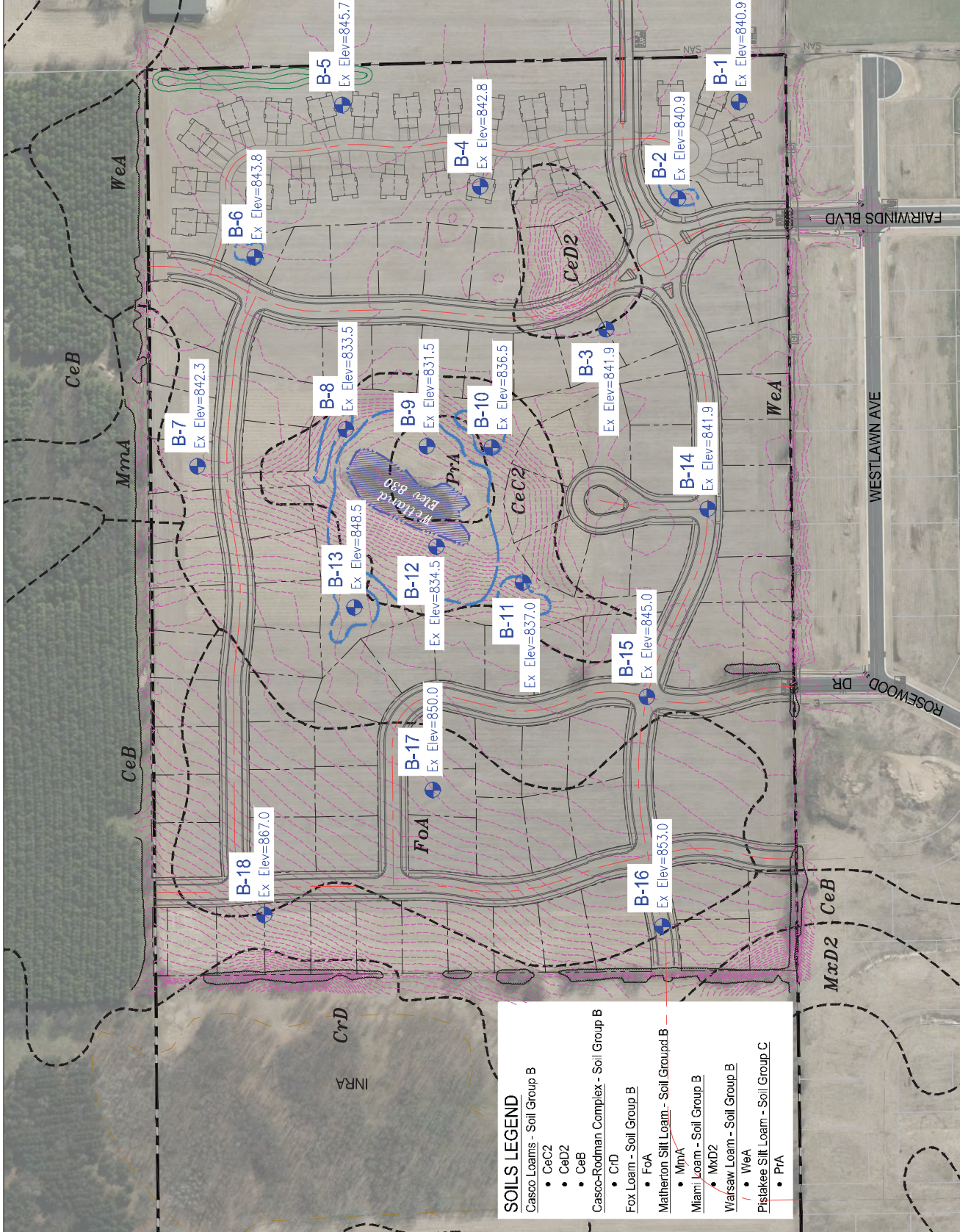
NOTES

- Stormwater Basin test locations: B-2, B-6 and B-8 - B-13
- Infiltration evaluation per WDR Standard 1002 and SFS 362, 365 for locations: B-1 - B-13.
- Soil testing shall extend a minimum 15' below existing grade or as noted herein: 20' depth for B-2, B-3 and B-6; 18' depth for B-4; to elevation 822 for B-8 - B-12.



12660 W. NORTH AVE., BLDG D
BROOKFIELD, WI 53005
PHONE: (262) 790-1480
FAX: (262) 790-1481
EMAIL: jputelko@trioeng.com

DATE: 01-25-2018

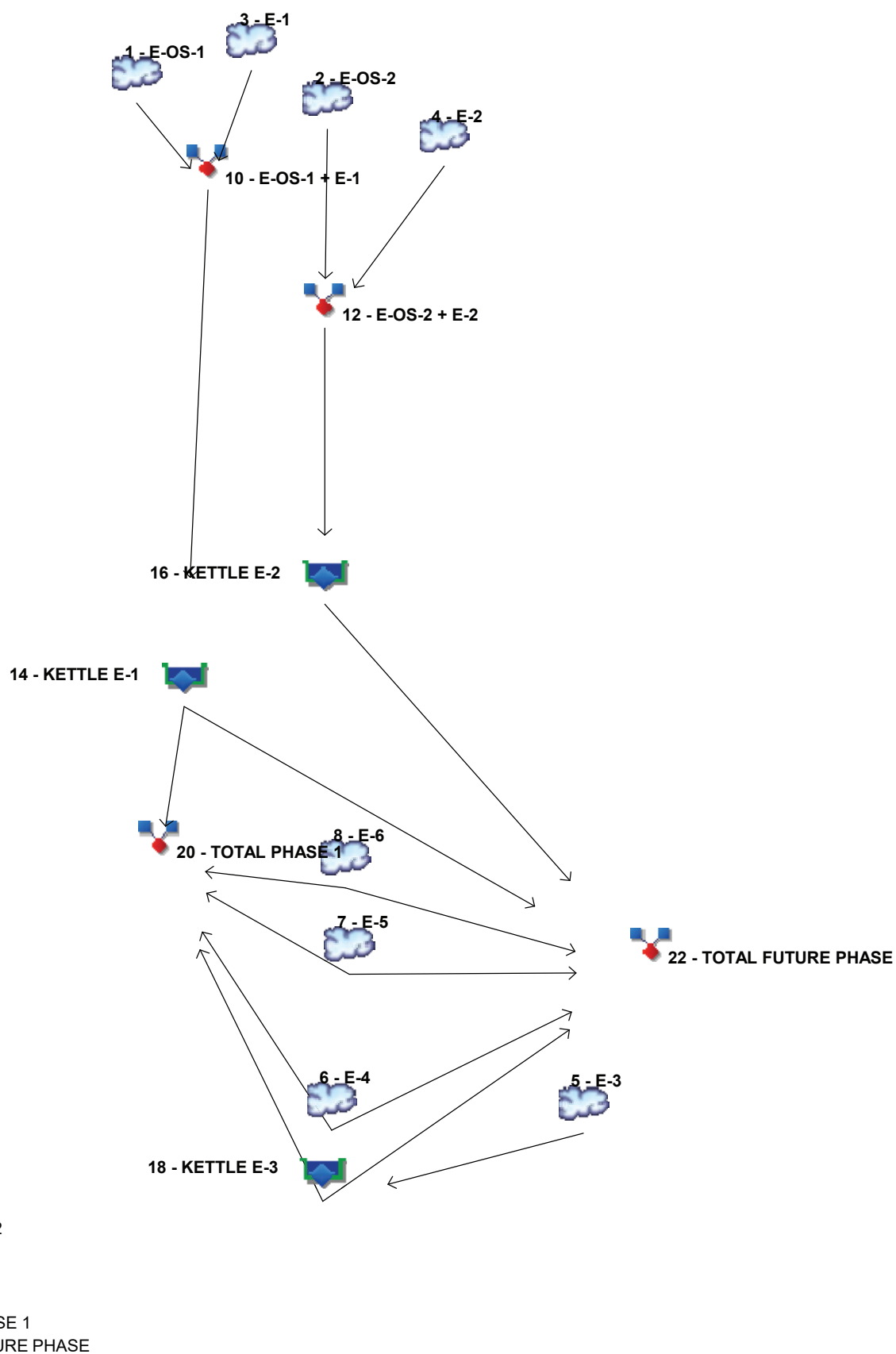


APPENDIX 4

EXISTING Hydraflow Calculations – Normal Conditions

Watershed Model Schematic

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



Hydrograph Return Period Recap

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

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	0.298	0.731	-----	-----	4.180	-----	-----	18.56	E-OS-1
2	SCS Runoff	-----	2.204	3.659	-----	-----	11.46	-----	-----	34.30	E-OS-2
3	SCS Runoff	-----	18.34	26.38	-----	-----	61.15	-----	-----	150.75	E-1
4	SCS Runoff	-----	9.115	12.83	-----	-----	28.74	-----	-----	69.35	E-2
5	SCS Runoff	-----	3.540	5.363	-----	-----	13.79	-----	-----	36.00	E-3
6	SCS Runoff	-----	1.144	1.741	-----	-----	4.374	-----	-----	11.30	E-4
7	SCS Runoff	-----	0.628	0.939	-----	-----	2.300	-----	-----	5.985	E-5
8	SCS Runoff	-----	0.365	0.546	-----	-----	1.337	-----	-----	3.480	E-6
10	Combine	1, 3,	18.35	26.54	-----	-----	63.67	-----	-----	164.63	E-OS-1 + E-1
12	Combine	2, 4,	10.19	15.01	-----	-----	37.49	-----	-----	97.86	E-OS-2 + E-2
14	Reservoir	10	0.000	0.000	-----	-----	0.000	-----	-----	0.000	KETTLE E-1
16	Reservoir	12	0.539	1.313	-----	-----	7.997	-----	-----	33.16	KETTLE E-2
18	Reservoir	5	0.000	0.000	-----	-----	0.000	-----	-----	0.000	KETTLE E-3
20	Combine	6, 7, 8, 14, 18,	2.060	3.110	-----	-----	7.912	-----	-----	20.52	TOTAL PHASE 1
22	Combine	6, 7, 8, 14, 16, 18,	2.060	3.110	-----	-----	9.231	-----	-----	39.94	TOTAL FUTURE PHASE

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	0.298	2	760	0.081	-----	-----	-----	E-OS-1
2	SCS Runoff	2.204	2	746	0.283	-----	-----	-----	E-OS-2
3	SCS Runoff	18.34	2	732	1.294	-----	-----	-----	E-1
4	SCS Runoff	9.115	2	732	0.623	-----	-----	-----	E-2
5	SCS Runoff	3.540	2	738	0.338	-----	-----	-----	E-3
6	SCS Runoff	1.144	2	732	0.088	-----	-----	-----	E-4
7	SCS Runoff	0.628	2	730	0.040	-----	-----	-----	E-5
8	SCS Runoff	0.365	2	730	0.024	-----	-----	-----	E-6
10	Combine	18.35	2	732	1.375	1, 3,	-----	-----	E-OS-1 + E-1
12	Combine	10.19	2	732	0.906	2, 4,	-----	-----	E-OS-2 + E-2
14	Reservoir	0.000	2	n/a	0.000	10	831.89	1.38	KETTLE E-1
16	Reservoir	0.539	2	930	0.421	12	841.08	0.606	KETTLE E-2
18	Reservoir	0.000	2	n/a	0.000	5	834.49	0.338	KETTLE E-3
20	Combine	2.060	2	732	0.152	6, 7, 8, 14, 18,	-----	-----	TOTAL PHASE 1
22	Combine	2.060	2	732	0.573	6, 7, 8, 14, 16, 18,	-----	-----	TOTAL FUTURE PHASE
2019-02-19_CHAPMAN FARMS_EXISTING.gpr					Return Period: 1 Year			Tuesday, 05 / 7 / 2019	

Hydrograph Report

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

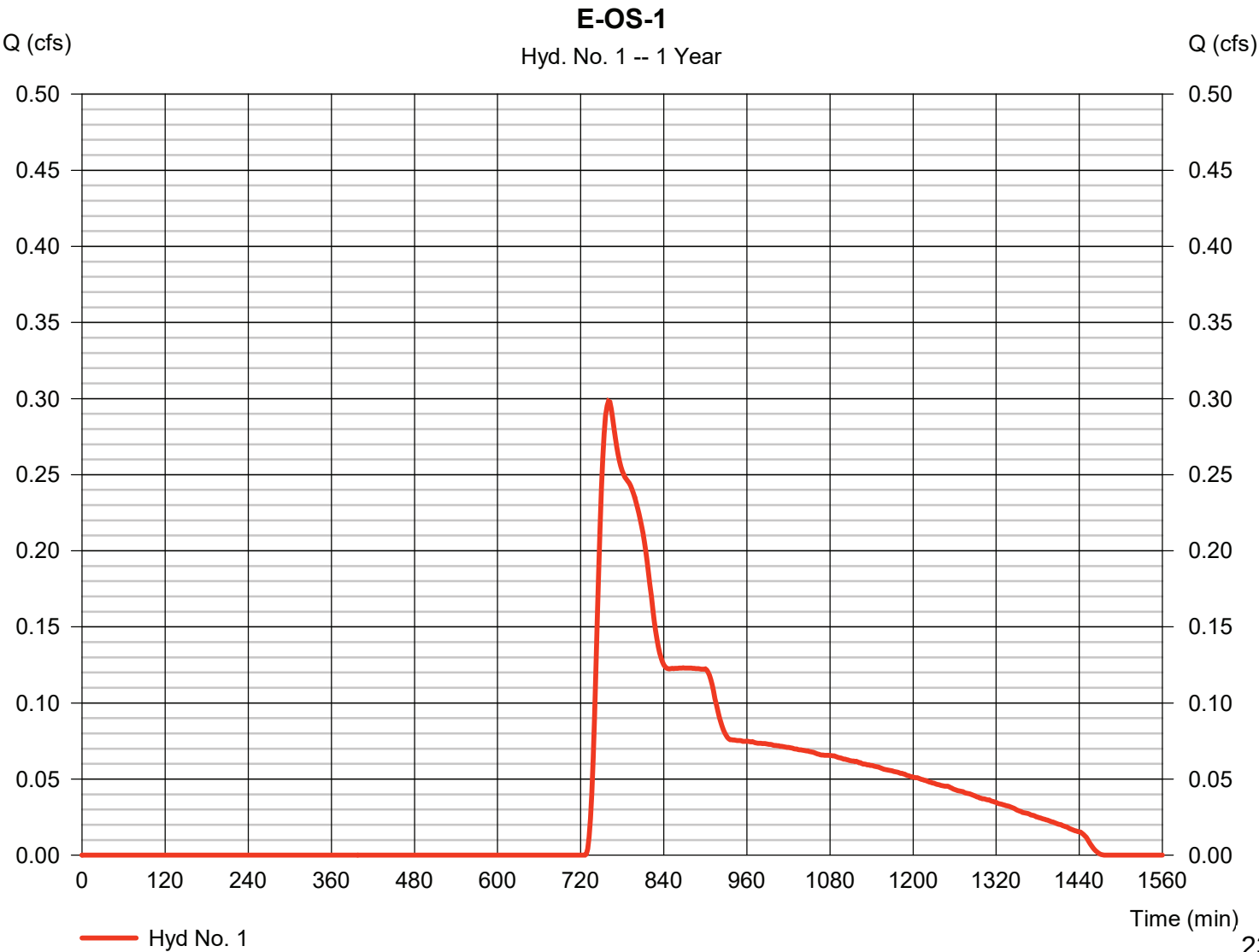
Tuesday, 05 / 7 / 2019

Hyd. No. 1

E-OS-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.298 cfs
Storm frequency	=	1 yrs	Time to peak	=	760 min
Time interval	=	2 min	Hyd. volume	=	0.081 acft
Drainage area	=	10.160 ac	Curve number	=	57*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	22.50 min
Total precip.	=	2.40 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrographs\16034-01\284481 Storm Water Management			

* Composite (Area/CN) = [(1.300 x 69) + (8.860 x 55)] / 10.160



TR55 Tc Worksheet

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

Hyd. No. 1

E-OS-1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 5.30	0.00	0.00	
Travel Time (min)	= 14.55	+	0.00	+
			0.00	= 14.55
Shallow Concentrated Flow				
Flow length (ft)	= 790.00	1100.00	0.00	
Watercourse slope (%)	= 8.10	3.10	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=4.59	3.58	0.00	
Travel Time (min)	= 2.87	+	5.12	+
			0.00	= 7.99
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				22.50 min

Precipitation Report

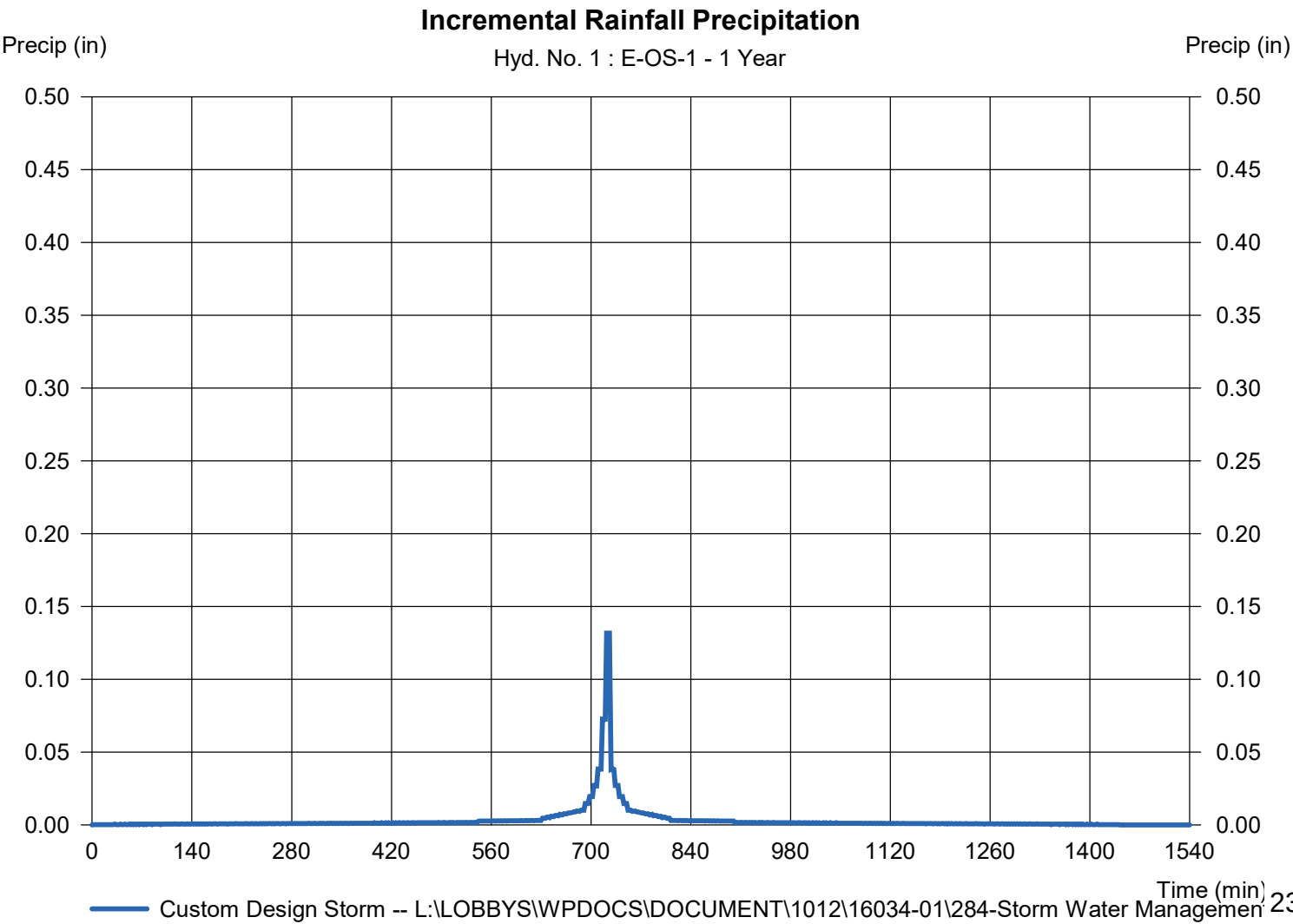
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 1

E-OS-1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

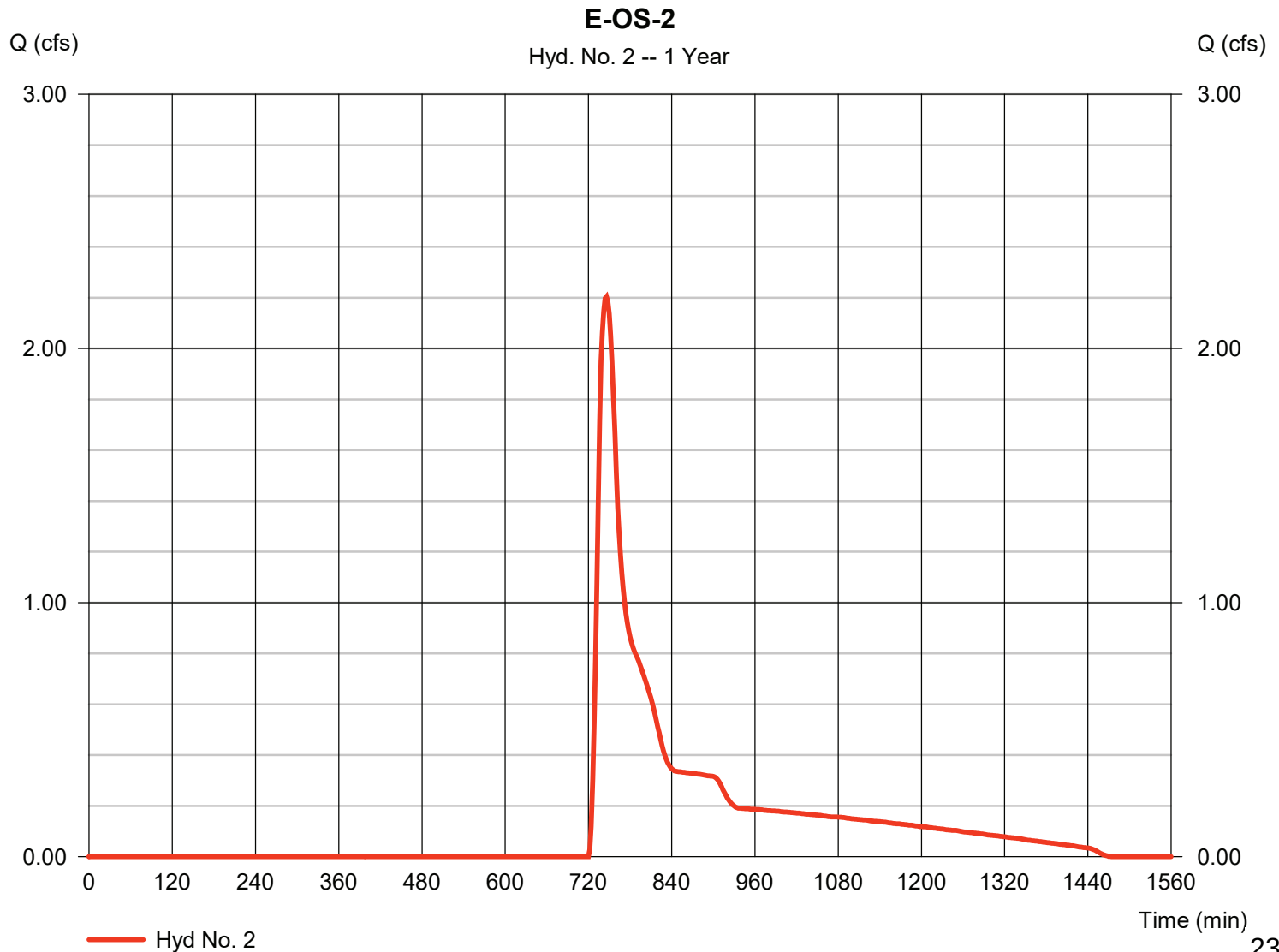
Tuesday, 05 / 7 / 2019

Hyd. No. 2

E-OS-2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.204 cfs
Storm frequency	= 1 yrs	Time to peak	= 746 min
Time interval	= 2 min	Hyd. volume	= 0.283 acft
Drainage area	= 12.810 ac	Curve number	= 65*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.80 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management		

* Composite (Area/CN) = $[(9.150 \times 69) + (3.660 \times 55)] / 12.810$



TR55 Tc Worksheet

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

Hyd. No. 2

E-OS-2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 9.30	0.00	0.00	
Travel Time (min)	= 11.62	+	0.00	+
			0.00	= 11.62
Shallow Concentrated Flow				
Flow length (ft)	= 780.00	900.00	0.00	
Watercourse slope (%)	= 8.70	2.10	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=4.76	2.34	0.00	
Travel Time (min)	= 2.73	+	6.42	+
			0.00	= 9.15
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				20.80 min

Precipitation Report

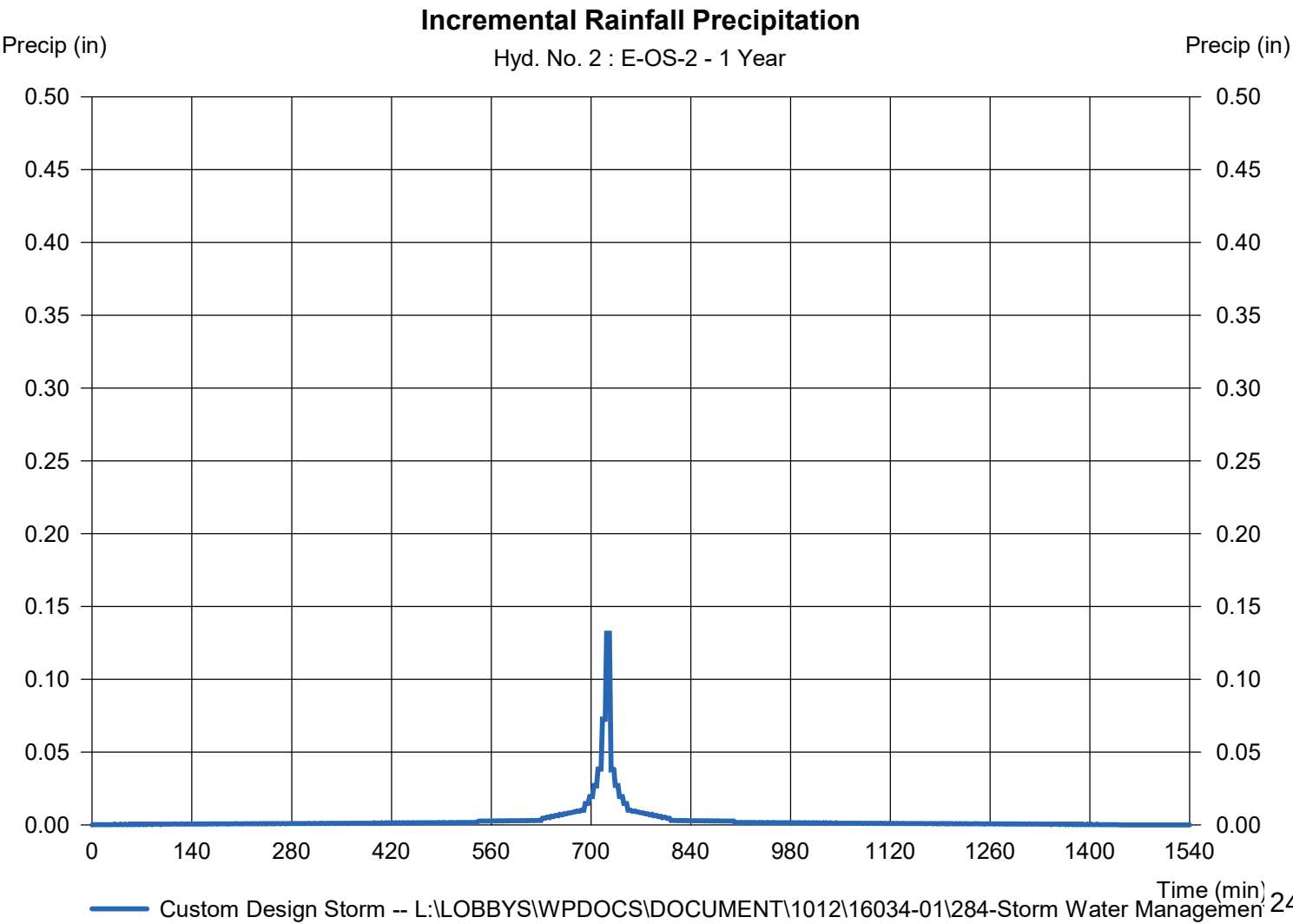
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 2

E-OS-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

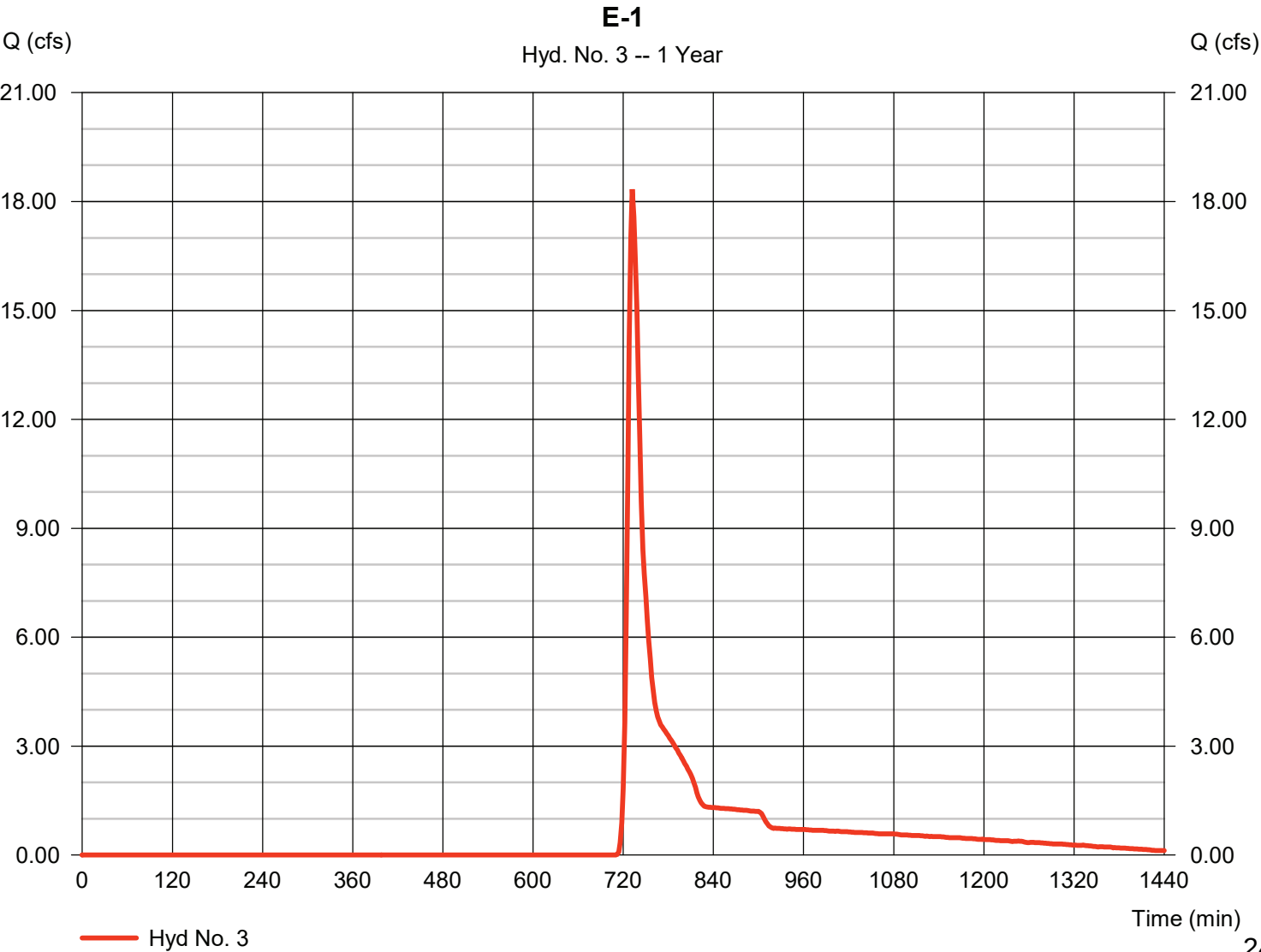
Tuesday, 05 / 7 / 2019

Hyd. No. 3

E-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.34 cfs
Storm frequency	=	1 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	1.294 acft
Drainage area	=	34.050 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.20 min
Total precip.	=	2.40 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management			

* Composite (Area/CN) = [(8.640 x 78) + (25.410 x 69)] / 34.050



TR55 Tc Worksheet

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

Hyd. No. 3

E-1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.050	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 4.66	0.00	0.00	
Travel Time (min)	= 4.37	+	0.00	+
			0.00	= 4.37
Shallow Concentrated Flow				
Flow length (ft)	= 1225.00	0.00	0.00	
Watercourse slope (%)	= 3.40	0.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=2.98	0.00	0.00	
Travel Time (min)	= 6.86	+	0.00	+
			0.00	= 6.86
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				11.20 min

Precipitation Report

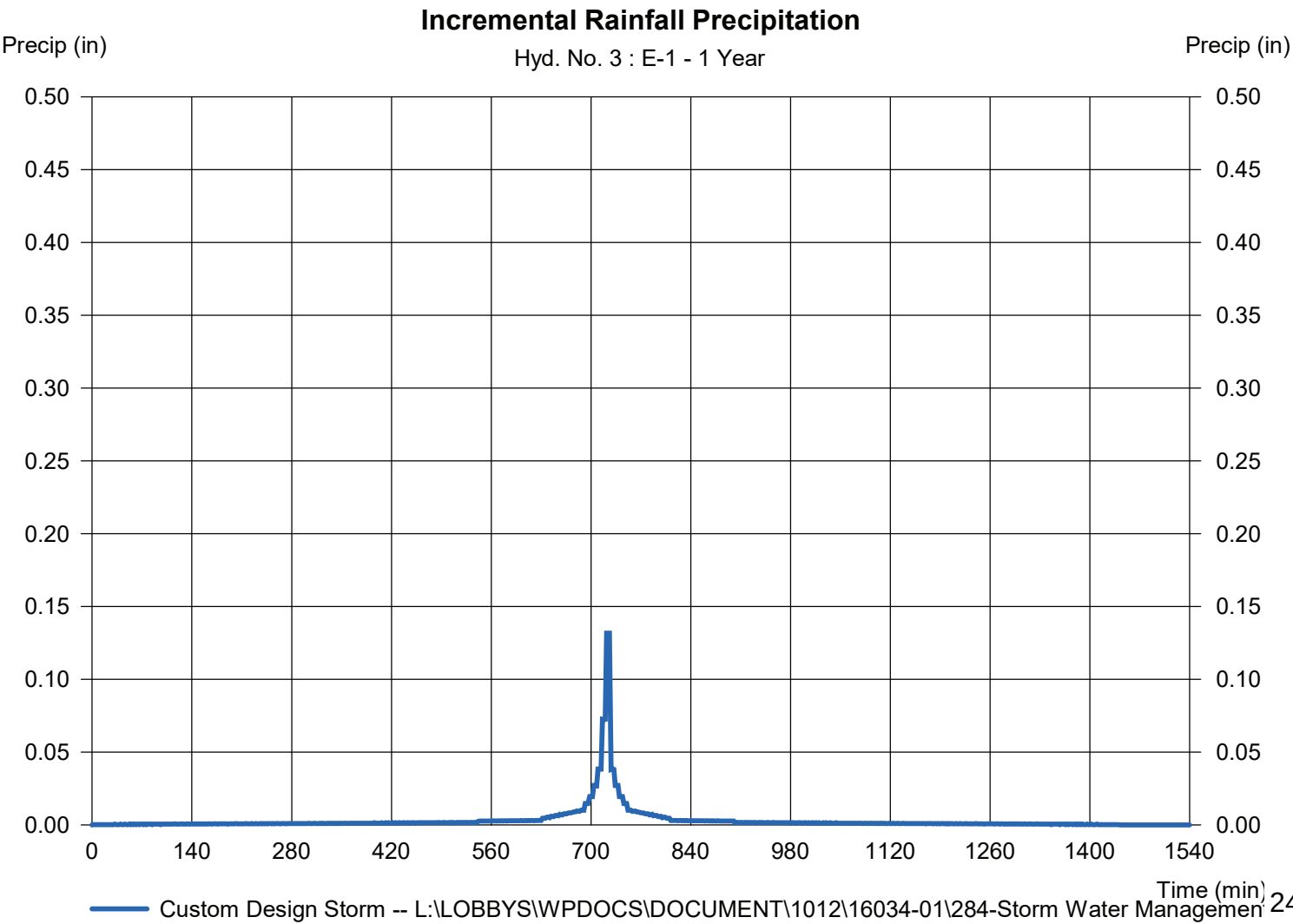
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 3

E-1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

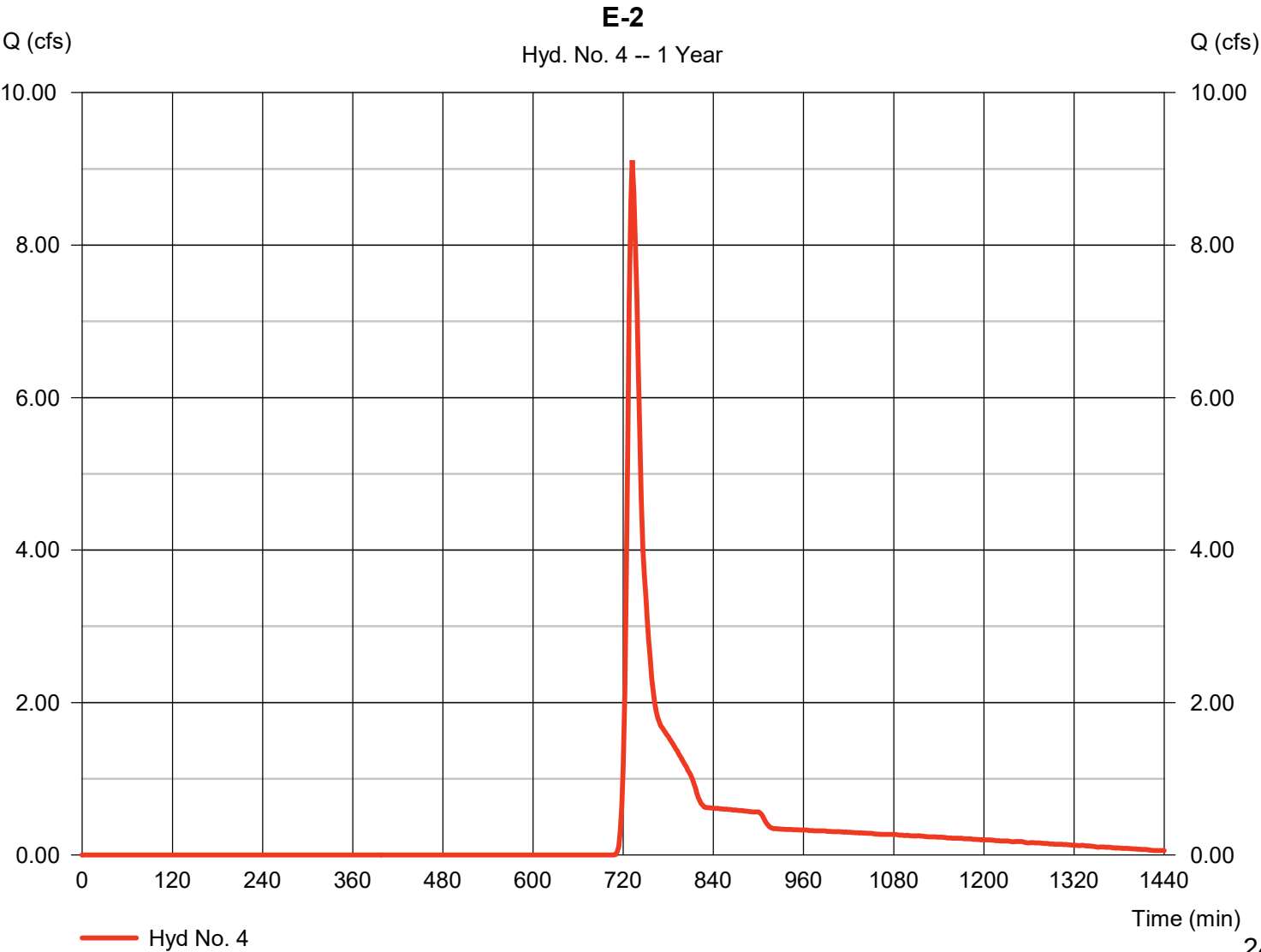
Tuesday, 05 / 7 / 2019

Hyd. No. 4

E-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.115 cfs
Storm frequency	=	1 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	0.623 acft
Drainage area	=	15.170 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.30 min
Total precip.	=	2.40 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management			

* Composite (Area/CN) = [(4.970 x 78) + (10.200 x 69)] / 15.170



TR55 Tc Worksheet

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

Hyd. No. 4

E-2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.050	0.011	0.011				
Flow length (ft)	= 150.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00				
Land slope (%)	= 5.33	0.00	0.00				
Travel Time (min)	= 4.14	+	0.00	+	0.00	=	4.14
Shallow Concentrated Flow							
Flow length (ft)	= 1000.00	0.00	0.00				
Watercourse slope (%)	= 2.10	0.00	0.00				
Surface description	= Unpaved	Unpaved	Paved				
Average velocity (ft/s)	=2.34	0.00	0.00				
Travel Time (min)	= 7.13	+	0.00	+	0.00	=	7.13
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.013	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				11.30 min			

Precipitation Report

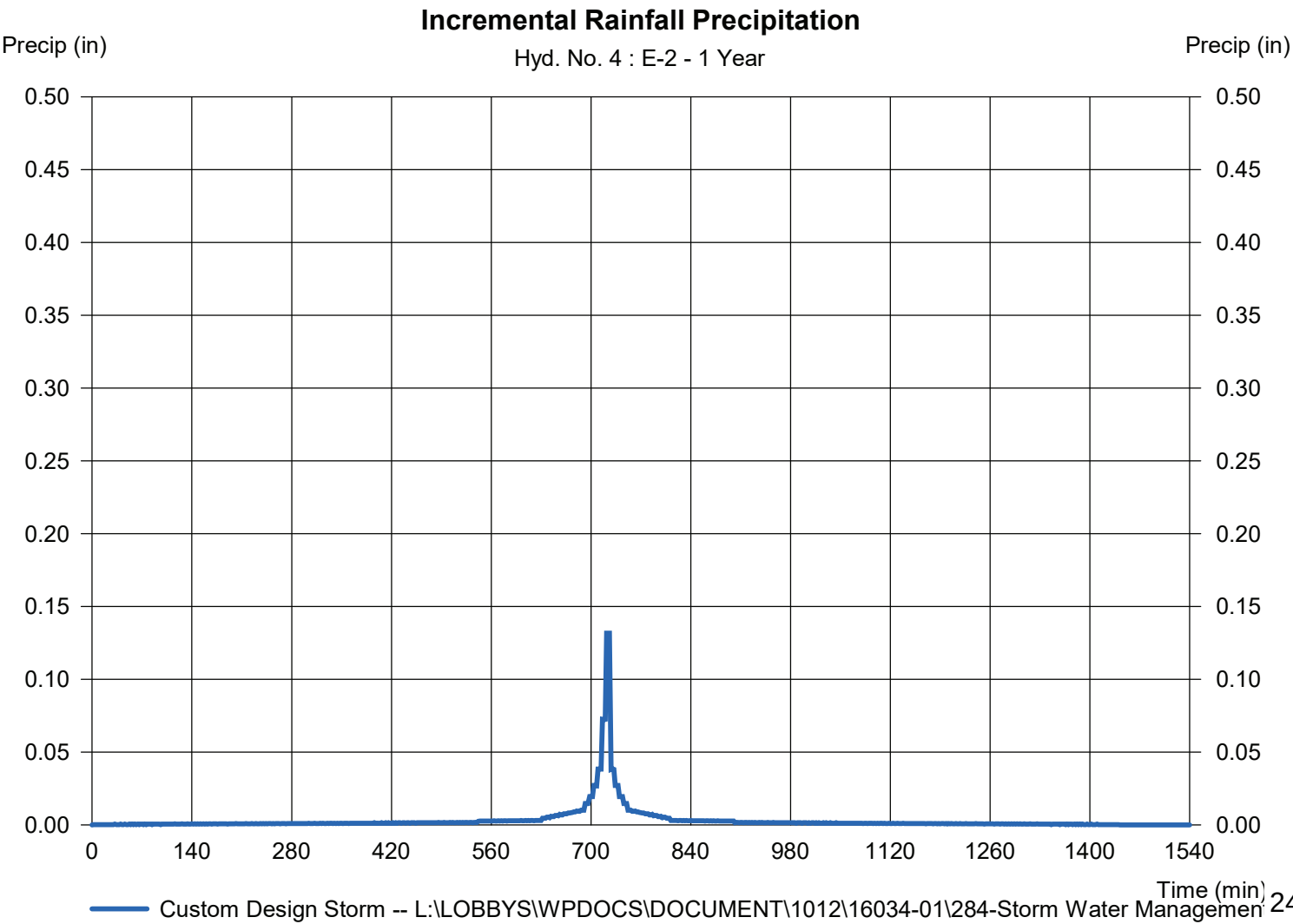
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 4

E-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

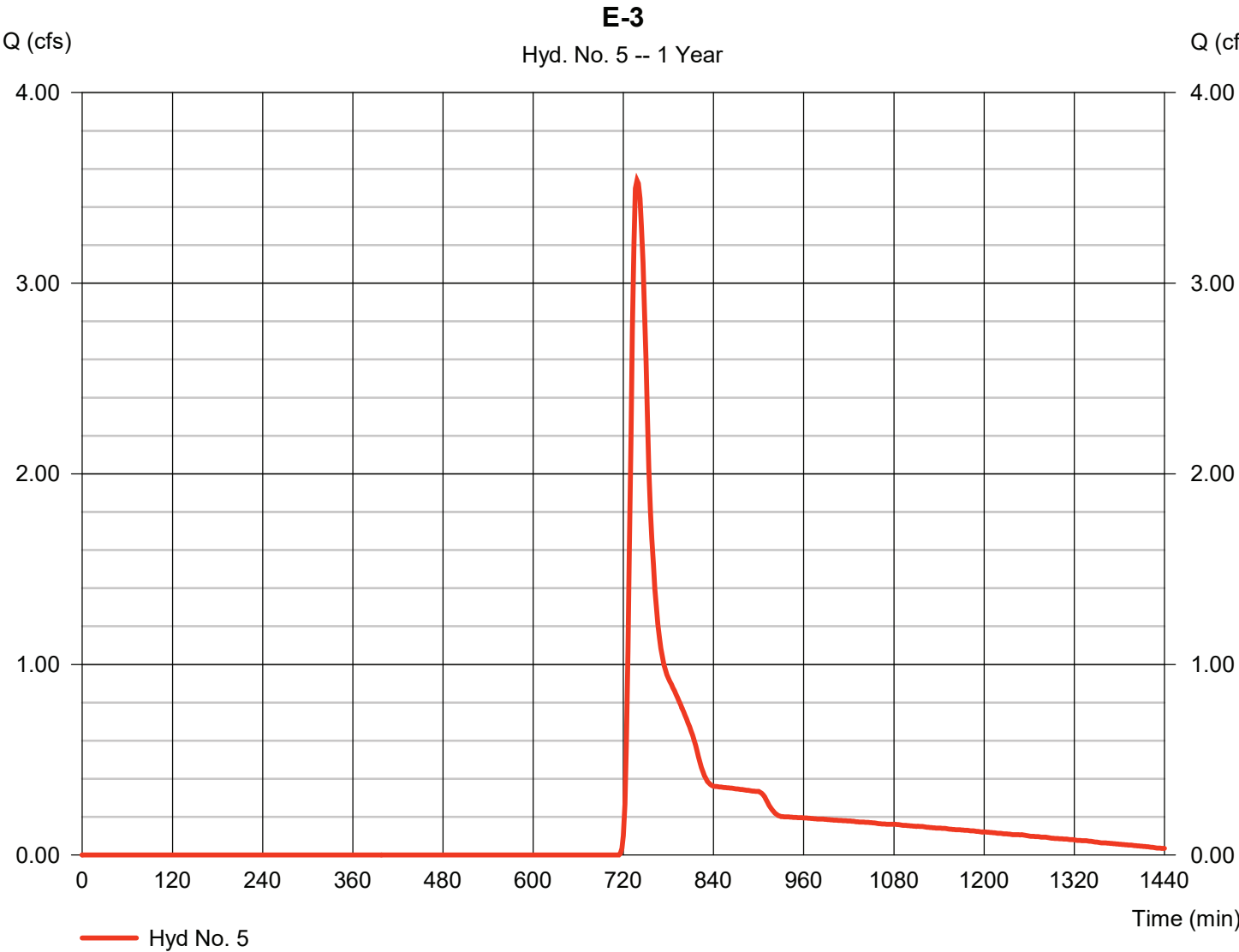
Tuesday, 05 / 7 / 2019

Hyd. No. 5

E-3

Hydrograph type	= SCS Runoff	Peak discharge	= 3.540 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.338 acft
Drainage area	= 10.776 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management		

* Composite (Area/CN) = [(11.490 x 69)] / 10.776



TR55 Tc Worksheet

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

Hyd. No. 5

E-3

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.050	0.011	0.011				
Flow length (ft)	= 150.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00				
Land slope (%)	= 0.33	0.00	0.00				
Travel Time (min)	= 12.60	+	0.00	+	0.00	=	12.60
Shallow Concentrated Flow							
Flow length (ft)	= 987.00	0.00	0.00				
Watercourse slope (%)	= 2.30	0.00	0.00				
Surface description	= Unpaved	Unpaved	Paved				
Average velocity (ft/s)	=2.45	0.00	0.00				
Travel Time (min)	= 6.72	+	0.00	+	0.00	=	6.72
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.013	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				19.30 min			

Precipitation Report

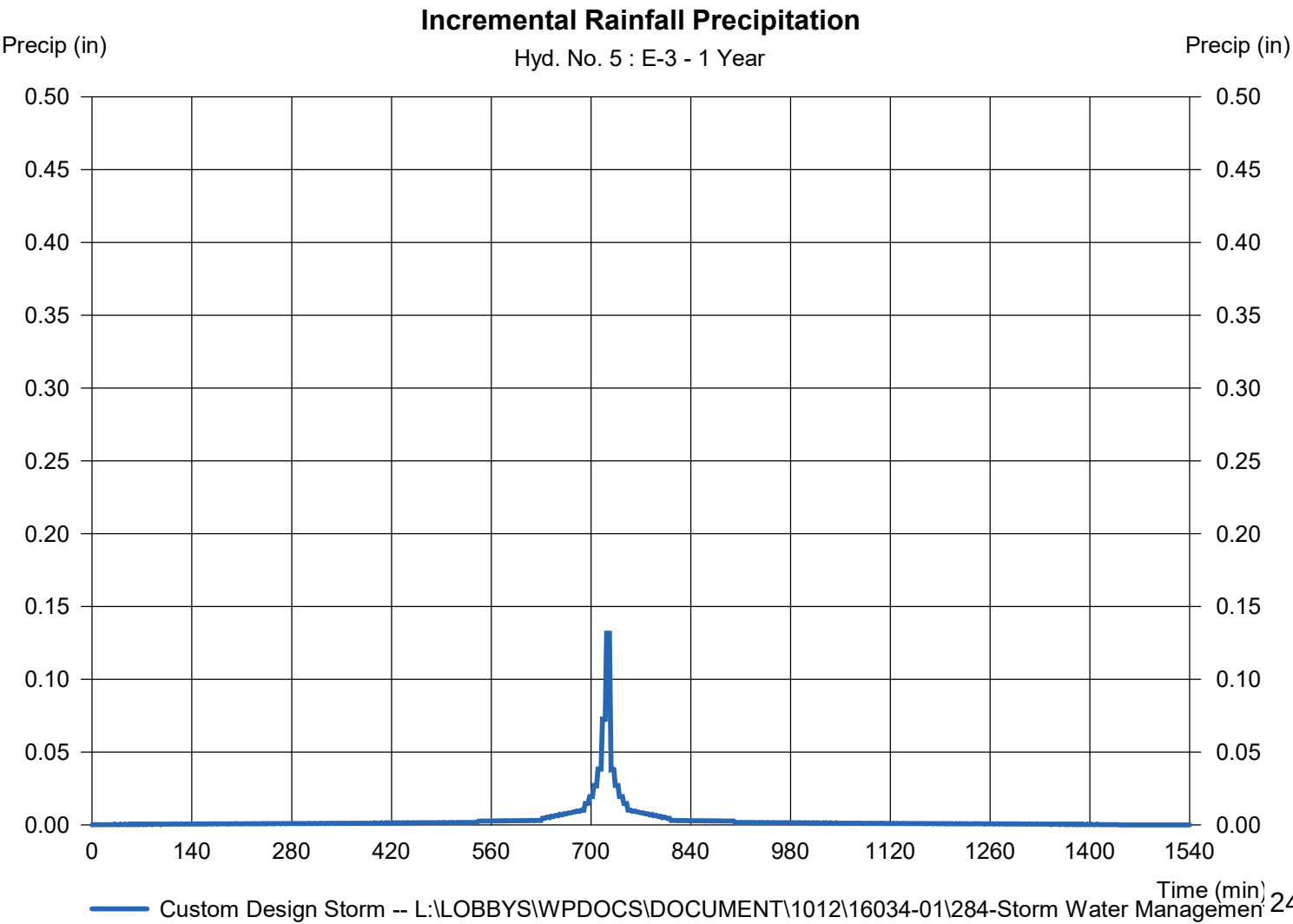
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 5

E-3

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

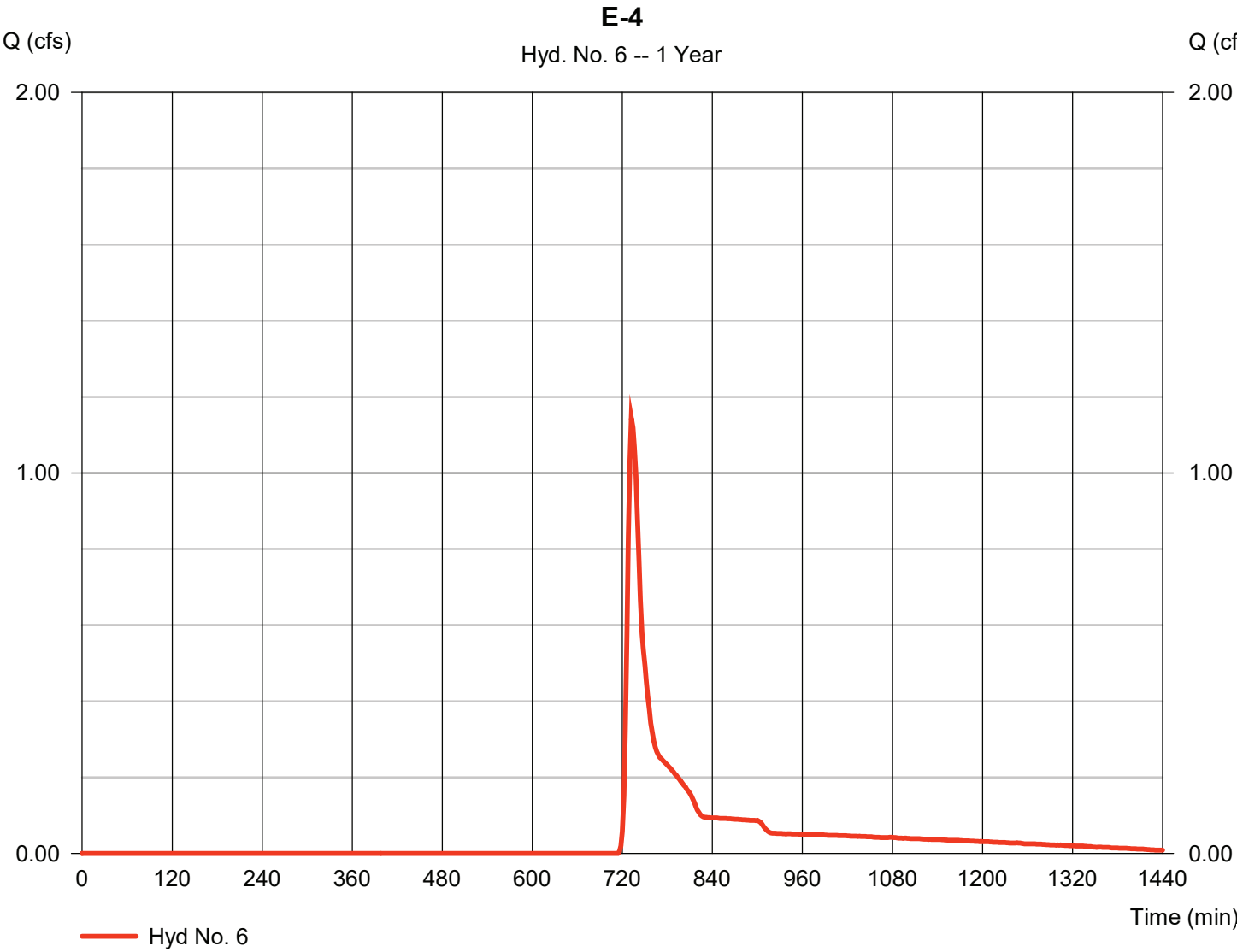
Tuesday, 05 / 7 / 2019

Hyd. No. 6

E-4

Hydrograph type	= SCS Runoff	Peak discharge	= 1.144 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 0.088 acft
Drainage area	= 2.729 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.40 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management		

* Composite (Area/CN) = [(2.010 x 69)] / 2.729



TR55 Tc Worksheet

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

Hyd. No. 6

E-4

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.050	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
Travel Time (min)	= 8.08	+	0.00	+
			0.00	= 8.08
Shallow Concentrated Flow				
Flow length (ft)	= 350.00	0.00	0.00	
Watercourse slope (%)	= 0.70	0.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=1.35	0.00	0.00	
Travel Time (min)	= 4.32	+	0.00	+
			0.00	= 4.32
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				12.40 min

Precipitation Report

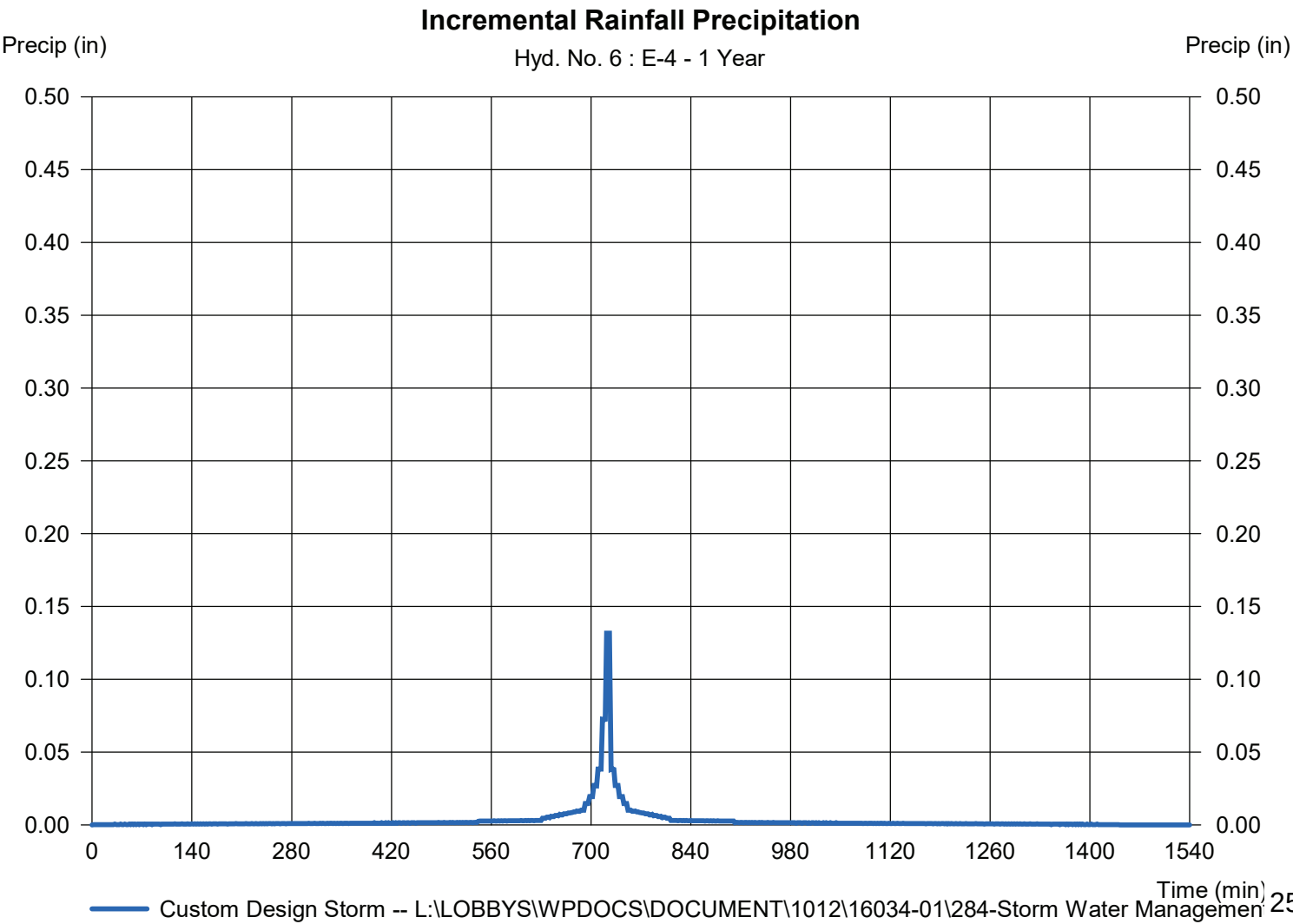
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 6

E-4

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

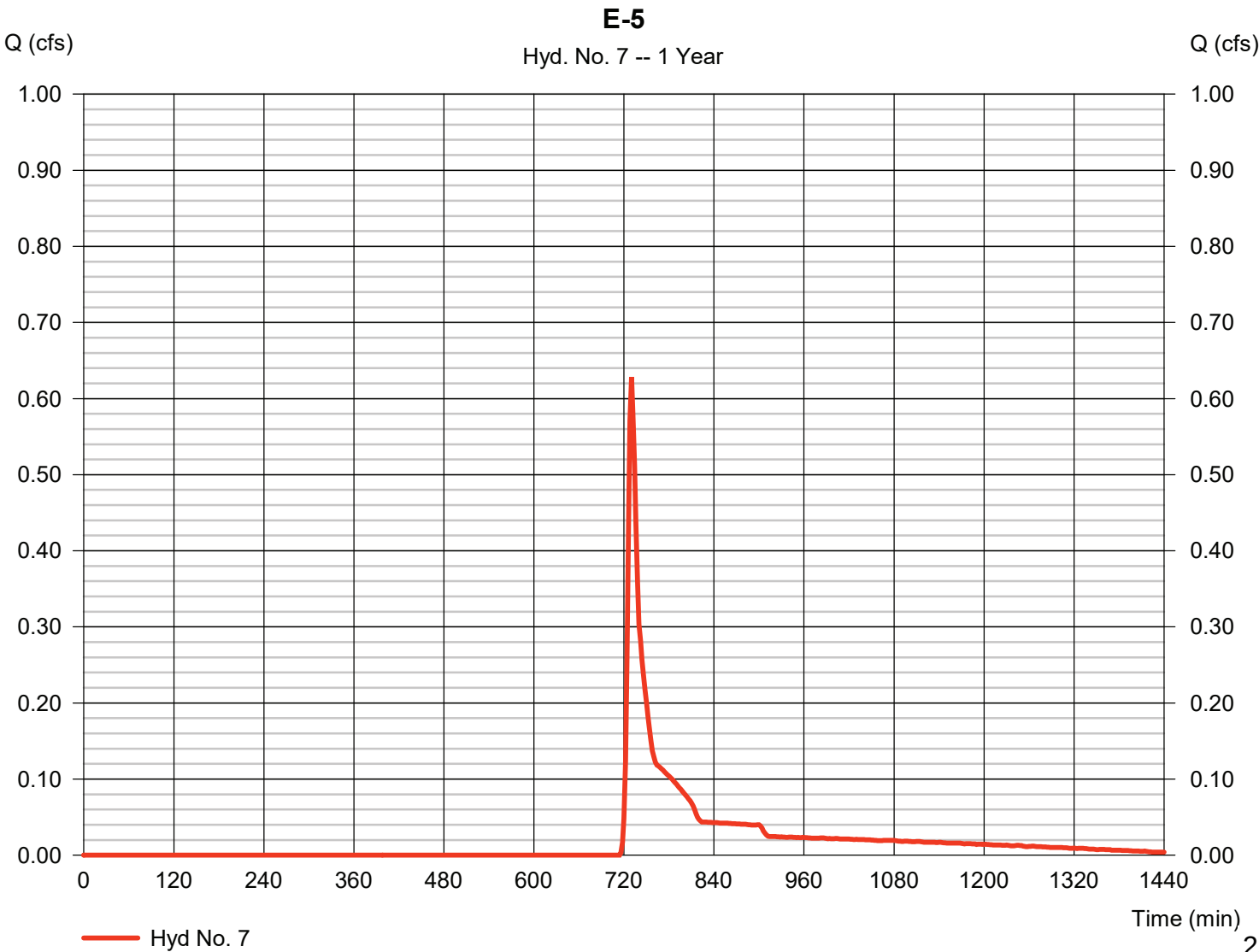
Tuesday, 05 / 7 / 2019

Hyd. No. 7

E-5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.628 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 0.040 acft
Drainage area	= 1.290 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.50 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\284481 Storm Water Management		

* Composite (Area/CN) = [(1.290 x 69)] / 1.290



TR55 Tc Worksheet

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

Hyd. No. 7

E-5

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.050	0.011	0.011				
Flow length (ft)	= 150.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00				
Land slope (%)	= 1.00	0.00	0.00				
Travel Time (min)	= 8.08	+	0.00	+	0.00	=	8.08
Shallow Concentrated Flow							
Flow length (ft)	= 178.00	0.00	0.00				
Watercourse slope (%)	= 1.60	0.00	0.00				
Surface description	= Unpaved	Unpaved	Paved				
Average velocity (ft/s)	=2.04	0.00	0.00				
Travel Time (min)	= 1.45	+	0.00	+	0.00	=	1.45
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.013	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	((0})0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				9.50 min			

Precipitation Report

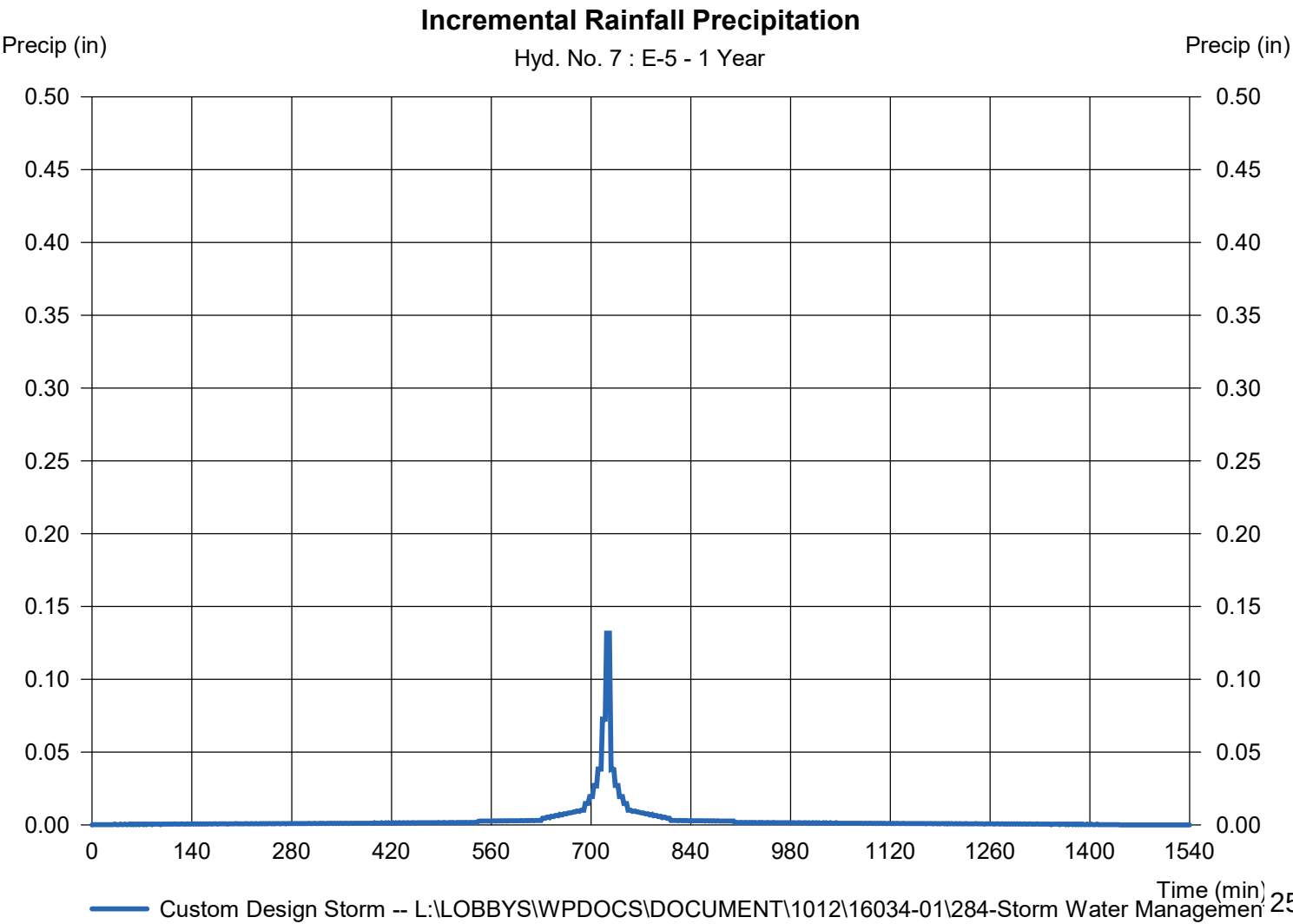
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 7

E-5

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

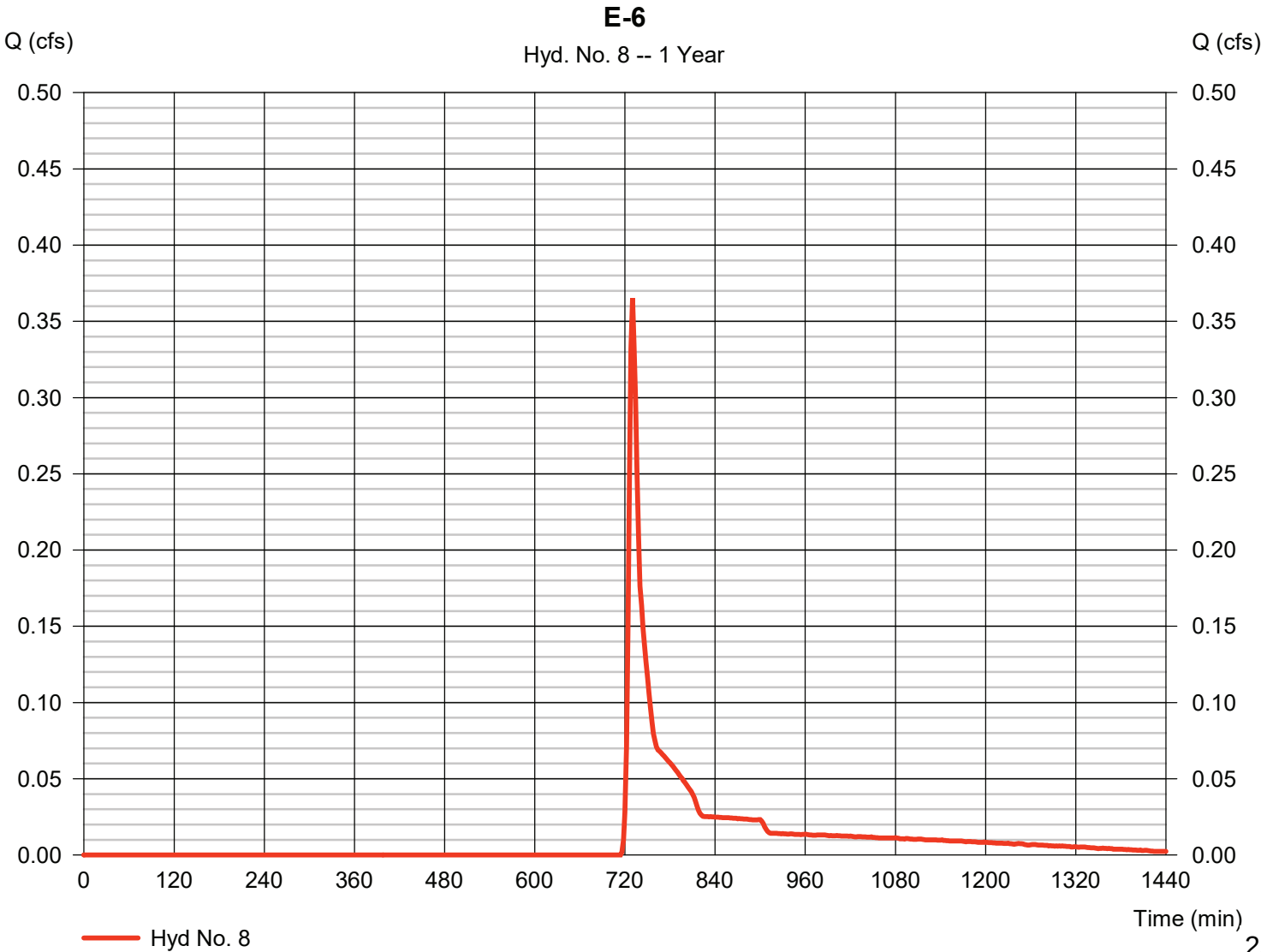
Tuesday, 05 / 7 / 2019

Hyd. No. 8

E-6

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.365 cfs
Storm frequency	=	1 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	0.024 acft
Drainage area	=	0.750 ac	Curve number	=	69*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.50 min
Total precip.	=	2.40 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\HNTB\16034-01\284481 Storm Water Management			

* Composite (Area/CN) = [(0.760 x 69)] / 0.750



TR55 Tc Worksheet

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

Hyd. No. 8

E-6

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.050	0.011	0.011				
Flow length (ft)	= 150.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00				
Land slope (%)	= 1.00	0.00	0.00				
Travel Time (min)	= 8.08	+	0.00	+	0.00	=	8.08
Shallow Concentrated Flow							
Flow length (ft)	= 160.00	0.00	0.00				
Watercourse slope (%)	= 1.30	0.00	0.00				
Surface description	= Unpaved	Unpaved	Paved				
Average velocity (ft/s)	=1.84	0.00	0.00				
Travel Time (min)	= 1.45	+	0.00	+	0.00	=	1.45
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.013	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	((0})0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				9.50 min			

Precipitation Report

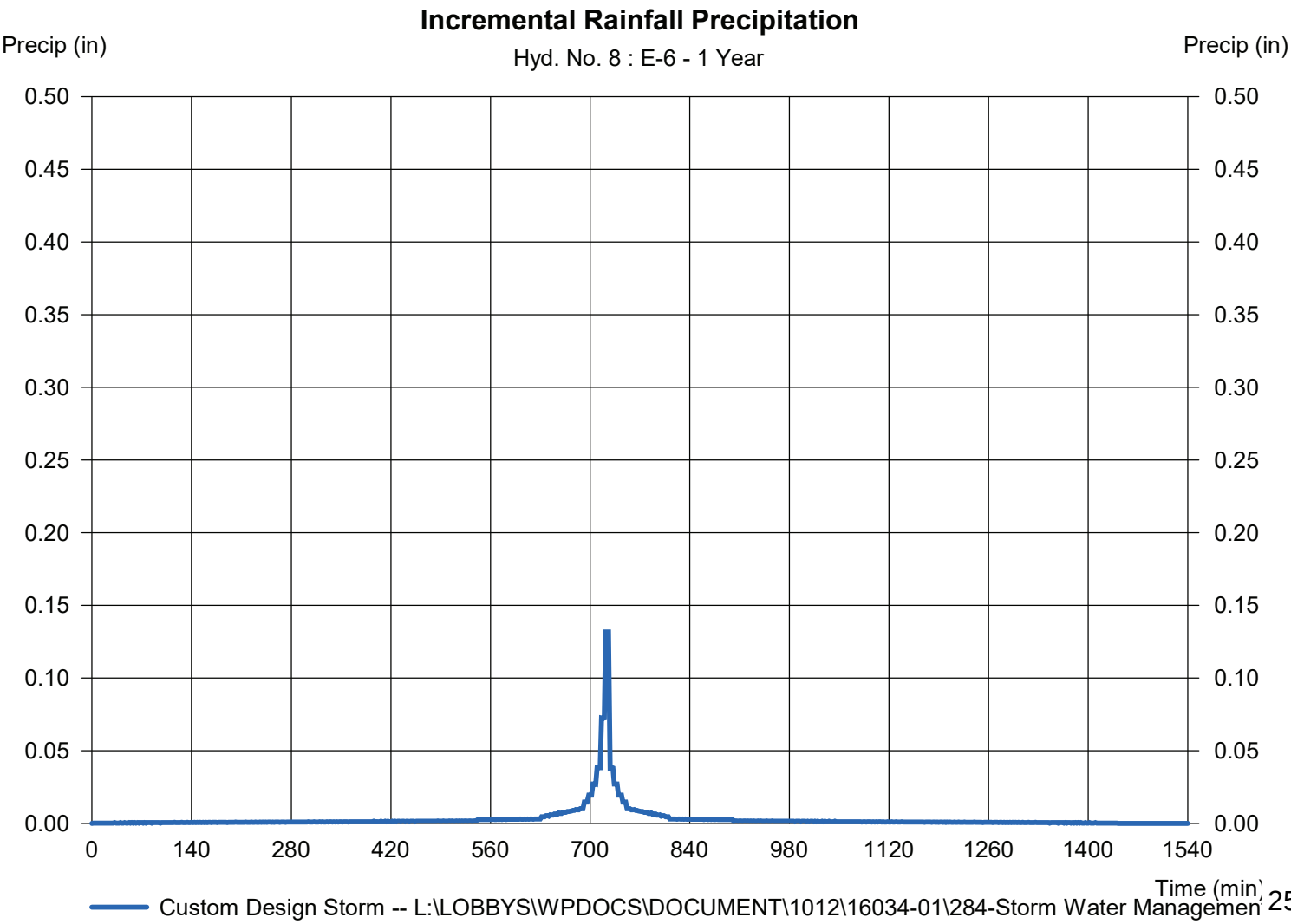
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 8

E-6

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

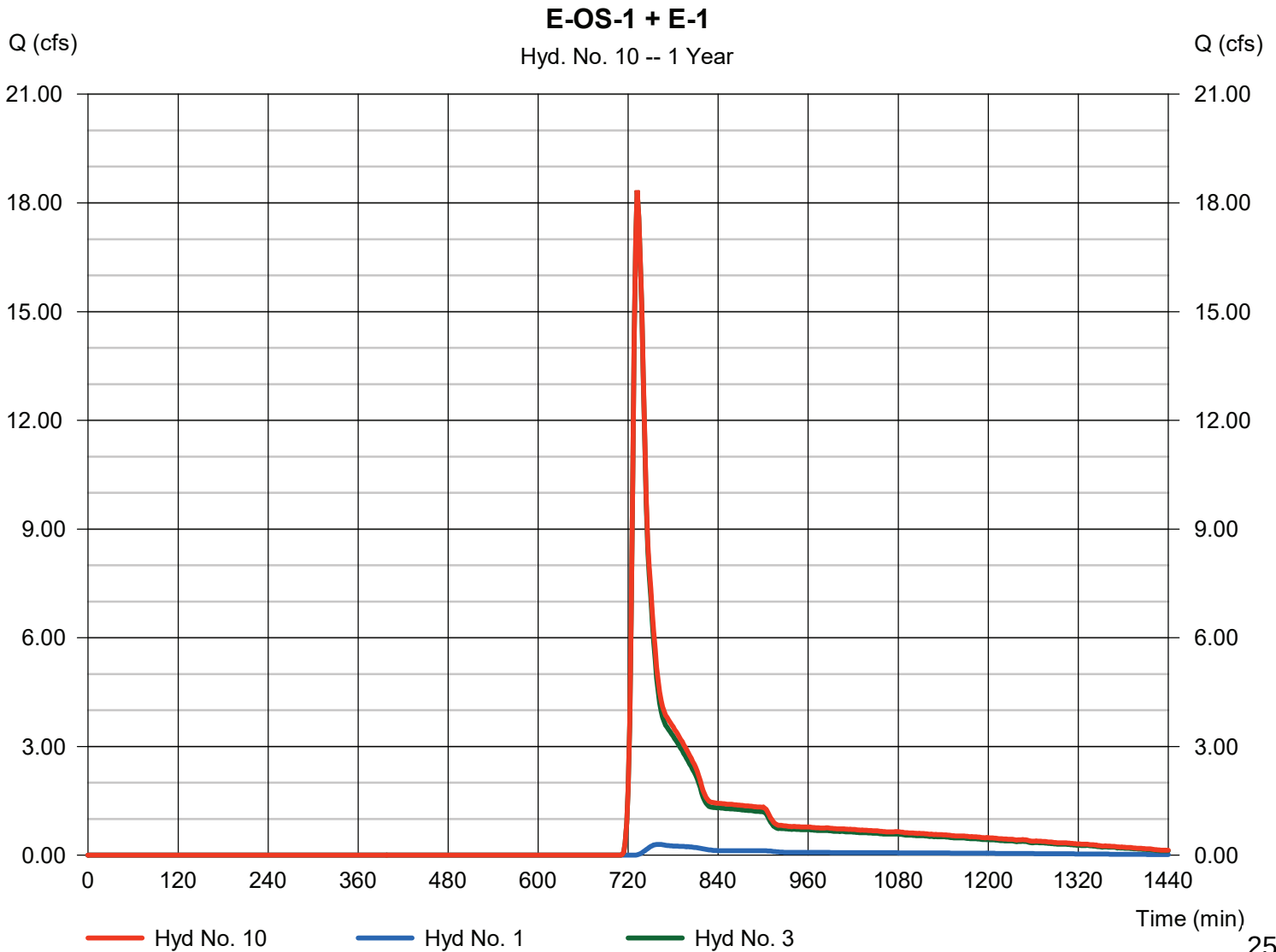
Tuesday, 05 / 7 / 2019

Hyd. No. 10

E-OS-1 + E-1

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 3

Peak discharge = 18.35 cfs
 Time to peak = 732 min
 Hyd. volume = 1.375 acft
 Contrib. drain. area = 44.210 ac



Hydrograph Report

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

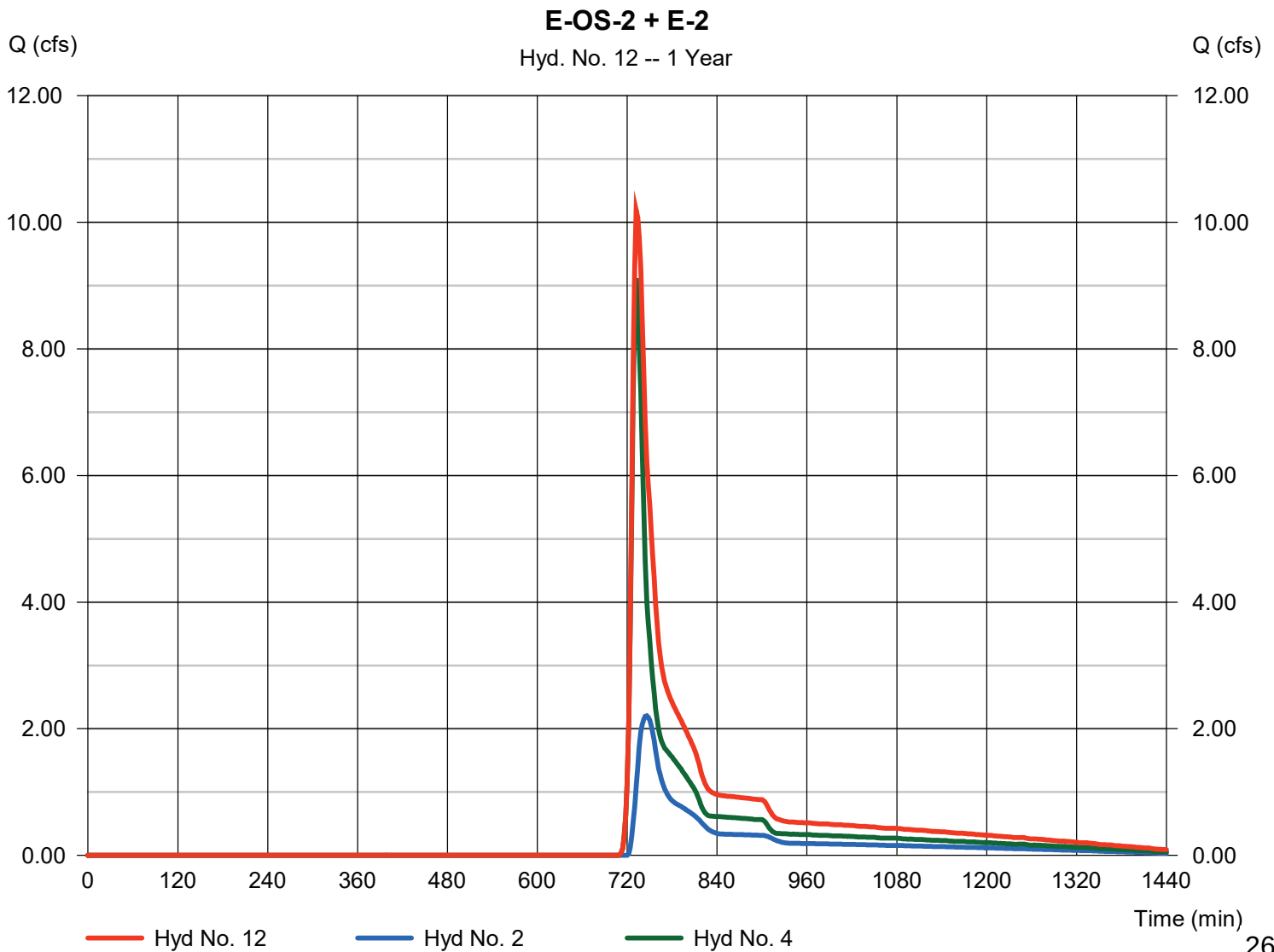
Tuesday, 05 / 7 / 2019

Hyd. No. 12

E-OS-2 + E-2

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 2, 4

Peak discharge = 10.19 cfs
 Time to peak = 732 min
 Hyd. volume = 0.906 acft
 Contrib. drain. area = 27.980 ac



Hydrograph Report

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

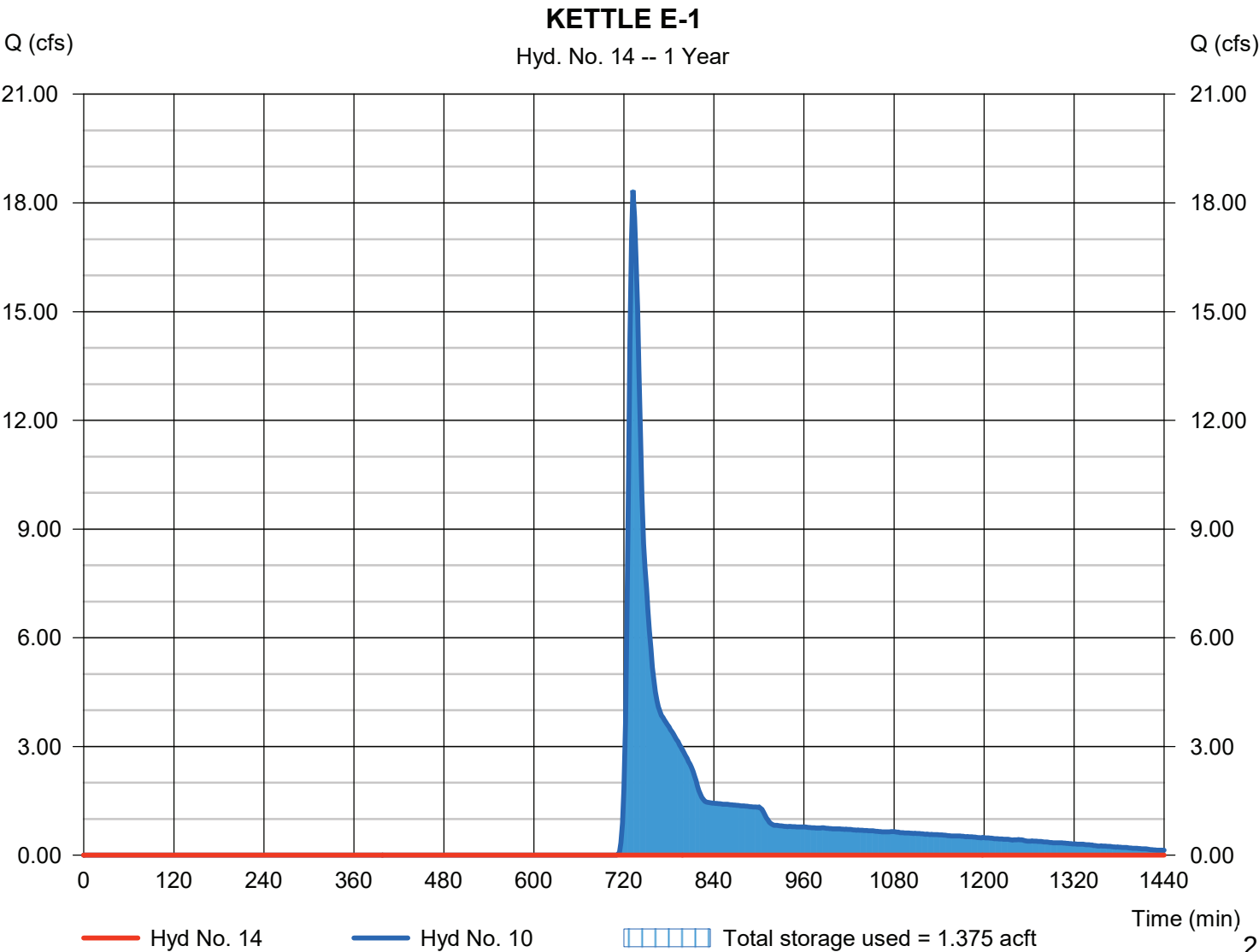
Tuesday, 05 / 7 / 2019

Hyd. No. 14

KETTLE E-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 10 - E-OS-1 + E-1	Max. Elevation	= 831.89 ft
Reservoir name	= KETTLE-E-1	Max. Storage	= 1.375 acft

Storage Indication method used.



Pond Report

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

Tuesday, 05 / 7 / 2019

Pond No. 1 - KETTLE-E-1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 829.75 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	829.75	1,000	0.000	0.000
0.25	830.00	7,397	0.021	0.021
1.25	831.00	33,912	0.437	0.459
2.25	832.00	56,711	1.029	1.487
3.25	833.00	77,449	1.534	3.021
4.25	834.00	93,456	1.959	4.980
5.25	835.00	107,926	2.309	7.289
6.25	836.00	122,352	2.641	9.930
7.25	837.00	136,825	2.973	12.903
8.25	838.00	152,466	3.319	16.222
9.25	839.00	169,939	3.699	19.921
10.25	840.00	190,048	4.130	24.050
11.25	841.00	217,814	4.678	28.728
12.25	842.00	308,651	6.012	34.740

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 842.30	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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	829.75	---	---	---	---	0.00	---	---	---	---	---	0.000
0.03	0.002	829.78	---	---	---	---	0.00	---	---	---	---	---	0.000
0.05	0.004	829.80	---	---	---	---	0.00	---	---	---	---	---	0.000
0.08	0.006	829.83	---	---	---	---	0.00	---	---	---	---	---	0.000
0.10	0.009	829.85	---	---	---	---	0.00	---	---	---	---	---	0.000
0.13	0.011	829.88	---	---	---	---	0.00	---	---	---	---	---	0.000
0.15	0.013	829.90	---	---	---	---	0.00	---	---	---	---	---	0.000
0.17	0.015	829.93	---	---	---	---	0.00	---	---	---	---	---	0.000
0.20	0.017	829.95	---	---	---	---	0.00	---	---	---	---	---	0.000
0.22	0.019	829.98	---	---	---	---	0.00	---	---	---	---	---	0.000
0.25	0.021	830.00	---	---	---	---	0.00	---	---	---	---	---	0.000
0.35	0.065	830.10	---	---	---	---	0.00	---	---	---	---	---	0.000
0.45	0.109	830.20	---	---	---	---	0.00	---	---	---	---	---	0.000
0.55	0.152	830.30	---	---	---	---	0.00	---	---	---	---	---	0.000
0.65	0.196	830.40	---	---	---	---	0.00	---	---	---	---	---	0.000
0.75	0.240	830.50	---	---	---	---	0.00	---	---	---	---	---	0.000
0.85	0.284	830.60	---	---	---	---	0.00	---	---	---	---	---	0.000
0.95	0.327	830.70	---	---	---	---	0.00	---	---	---	---	---	0.000
1.05	0.371	830.80	---	---	---	---	0.00	---	---	---	---	---	0.000
1.15	0.415	830.90	---	---	---	---	0.00	---	---	---	---	---	0.000
1.25	0.459	831.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.35	0.561	831.10	---	---	---	---	0.00	---	---	---	---	---	0.000
1.45	0.664	831.20	---	---	---	---	0.00	---	---	---	---	---	0.000
1.55	0.767	831.30	---	---	---	---	0.00	---	---	---	---	---	0.000
1.65	0.870	831.40	---	---	---	---	0.00	---	---	---	---	---	0.000
1.75	0.973	831.50	---	---	---	---	0.00	---	---	---	---	---	0.000
1.85	1.076	831.60	---	---	---	---	0.00	---	---	---	---	---	0.000
1.95	1.179	831.70	---	---	---	---	0.00	---	---	---	---	---	0.000
2.05	1.282	831.80	---	---	---	---	0.00	---	---	---	---	---	0.000

Continues on next page...

KETTLE-E-1

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.15	1.385	831.90	---	---	---	---	0.00	---	---	---	---	---	0.000
2.25	1.487	832.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.35	1.641	832.10	---	---	---	---	0.00	---	---	---	---	---	0.000
2.45	1.794	832.20	---	---	---	---	0.00	---	---	---	---	---	0.000
2.55	1.948	832.30	---	---	---	---	0.00	---	---	---	---	---	0.000
2.65	2.101	832.40	---	---	---	---	0.00	---	---	---	---	---	0.000
2.75	2.254	832.50	---	---	---	---	0.00	---	---	---	---	---	0.000
2.85	2.408	832.60	---	---	---	---	0.00	---	---	---	---	---	0.000
2.95	2.561	832.70	---	---	---	---	0.00	---	---	---	---	---	0.000
3.05	2.714	832.80	---	---	---	---	0.00	---	---	---	---	---	0.000
3.15	2.868	832.90	---	---	---	---	0.00	---	---	---	---	---	0.000
3.25	3.021	833.00	---	---	---	---	0.00	---	---	---	---	---	0.000
3.35	3.217	833.10	---	---	---	---	0.00	---	---	---	---	---	0.000
3.45	3.413	833.20	---	---	---	---	0.00	---	---	---	---	---	0.000
3.55	3.609	833.30	---	---	---	---	0.00	---	---	---	---	---	0.000
3.65	3.805	833.40	---	---	---	---	0.00	---	---	---	---	---	0.000
3.75	4.000	833.50	---	---	---	---	0.00	---	---	---	---	---	0.000
3.85	4.196	833.60	---	---	---	---	0.00	---	---	---	---	---	0.000
3.95	4.392	833.70	---	---	---	---	0.00	---	---	---	---	---	0.000
4.05	4.588	833.80	---	---	---	---	0.00	---	---	---	---	---	0.000
4.15	4.784	833.90	---	---	---	---	0.00	---	---	---	---	---	0.000
4.25	4.980	834.00	---	---	---	---	0.00	---	---	---	---	---	0.000
4.35	5.211	834.10	---	---	---	---	0.00	---	---	---	---	---	0.000
4.45	5.442	834.20	---	---	---	---	0.00	---	---	---	---	---	0.000
4.55	5.673	834.30	---	---	---	---	0.00	---	---	---	---	---	0.000
4.65	5.903	834.40	---	---	---	---	0.00	---	---	---	---	---	0.000
4.75	6.134	834.50	---	---	---	---	0.00	---	---	---	---	---	0.000
4.85	6.365	834.60	---	---	---	---	0.00	---	---	---	---	---	0.000
4.95	6.596	834.70	---	---	---	---	0.00	---	---	---	---	---	0.000
5.05	6.827	834.80	---	---	---	---	0.00	---	---	---	---	---	0.000
5.15	7.058	834.90	---	---	---	---	0.00	---	---	---	---	---	0.000
5.25	7.289	835.00	---	---	---	---	0.00	---	---	---	---	---	0.000
5.35	7.553	835.10	---	---	---	---	0.00	---	---	---	---	---	0.000
5.45	7.817	835.20	---	---	---	---	0.00	---	---	---	---	---	0.000
5.55	8.081	835.30	---	---	---	---	0.00	---	---	---	---	---	0.000
5.65	8.346	835.40	---	---	---	---	0.00	---	---	---	---	---	0.000
5.75	8.610	835.50	---	---	---	---	0.00	---	---	---	---	---	0.000
5.85	8.874	835.60	---	---	---	---	0.00	---	---	---	---	---	0.000
5.95	9.138	835.70	---	---	---	---	0.00	---	---	---	---	---	0.000
6.05	9.402	835.80	---	---	---	---	0.00	---	---	---	---	---	0.000
6.15	9.666	835.90	---	---	---	---	0.00	---	---	---	---	---	0.000
6.25	9.930	836.00	---	---	---	---	0.00	---	---	---	---	---	0.000
6.35	10.228	836.10	---	---	---	---	0.00	---	---	---	---	---	0.000
6.45	10.525	836.20	---	---	---	---	0.00	---	---	---	---	---	0.000
6.55	10.822	836.30	---	---	---	---	0.00	---	---	---	---	---	0.000
6.65	11.120	836.40	---	---	---	---	0.00	---	---	---	---	---	0.000
6.75	11.417	836.50	---	---	---	---	0.00	---	---	---	---	---	0.000
6.85	11.714	836.60	---	---	---	---	0.00	---	---	---	---	---	0.000
6.95	12.011	836.70	---	---	---	---	0.00	---	---	---	---	---	0.000
7.05	12.309	836.80	---	---	---	---	0.00	---	---	---	---	---	0.000
7.15	12.606	836.90	---	---	---	---	0.00	---	---	---	---	---	0.000
7.25	12.903	837.00	---	---	---	---	0.00	---	---	---	---	---	0.000
7.35	13.235	837.10	---	---	---	---	0.00	---	---	---	---	---	0.000
7.45	13.567	837.20	---	---	---	---	0.00	---	---	---	---	---	0.000
7.55	13.899	837.30	---	---	---	---	0.00	---	---	---	---	---	0.000
7.65	14.231	837.40	---	---	---	---	0.00	---	---	---	---	---	0.000
7.75	14.563	837.50	---	---	---	---	0.00	---	---	---	---	---	0.000
7.85	14.895	837.60	---	---	---	---	0.00	---	---	---	---	---	0.000
7.95	15.226	837.70	---	---	---	---	0.00	---	---	---	---	---	0.000
8.05	15.558	837.80	---	---	---	---	0.00	---	---	---	---	---	0.000
8.15	15.890	837.90	---	---	---	---	0.00	---	---	---	---	---	0.000
8.25	16.222	838.00	---	---	---	---	0.00	---	---	---	---	---	0.000
8.35	16.592	838.10	---	---	---	---	0.00	---	---	---	---	---	0.000
8.45	16.962	838.20	---	---	---	---	0.00	---	---	---	---	---	0.000
8.55	17.332	838.30	---	---	---	---	0.00	---	---	---	---	---	0.000
8.65	17.701	838.40	---	---	---	---	0.00	---	---	---	---	---	0.000
8.75	18.071	838.50	---	---	---	---	0.00	---	---	---	---	---	0.000
8.85	18.441	838.60	---	---	---	---	0.00	---	---	---	---	---	0.000
8.95	18.811	838.70	---	---	---	---	0.00	---	---	---	---	---	0.000
9.05	19.181	838.80	---	---	---	---	0.00	---	---	---	---	---	0.000
9.15	19.551	838.90	---	---	---	---	0.00	---	---	---	---	---	0.000
9.25	19.921	839.00	---	---	---	---	0.00	---	---	---	---	---	0.000

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KETTLE-E-1

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
9.35	20.334	839.10	---	---	---	---	0.00	---	---	---	---	---	0.000
9.45	20.746	839.20	---	---	---	---	0.00	---	---	---	---	---	0.000
9.55	21.159	839.30	---	---	---	---	0.00	---	---	---	---	---	0.000
9.65	21.572	839.40	---	---	---	---	0.00	---	---	---	---	---	0.000
9.75	21.985	839.50	---	---	---	---	0.00	---	---	---	---	---	0.000
9.85	22.398	839.60	---	---	---	---	0.00	---	---	---	---	---	0.000
9.95	22.811	839.70	---	---	---	---	0.00	---	---	---	---	---	0.000
10.05	23.224	839.80	---	---	---	---	0.00	---	---	---	---	---	0.000
10.15	23.637	839.90	---	---	---	---	0.00	---	---	---	---	---	0.000
10.25	24.050	840.00	---	---	---	---	0.00	---	---	---	---	---	0.000
10.35	24.518	840.10	---	---	---	---	0.00	---	---	---	---	---	0.000
10.45	24.986	840.20	---	---	---	---	0.00	---	---	---	---	---	0.000
10.55	25.453	840.30	---	---	---	---	0.00	---	---	---	---	---	0.000
10.65	25.921	840.40	---	---	---	---	0.00	---	---	---	---	---	0.000
10.75	26.389	840.50	---	---	---	---	0.00	---	---	---	---	---	0.000
10.85	26.857	840.60	---	---	---	---	0.00	---	---	---	---	---	0.000
10.95	27.324	840.70	---	---	---	---	0.00	---	---	---	---	---	0.000
11.05	27.792	840.80	---	---	---	---	0.00	---	---	---	---	---	0.000
11.15	28.260	840.90	---	---	---	---	0.00	---	---	---	---	---	0.000
11.25	28.728	841.00	---	---	---	---	0.00	---	---	---	---	---	0.000
11.35	29.329	841.10	---	---	---	---	0.00	---	---	---	---	---	0.000
11.45	29.930	841.20	---	---	---	---	0.00	---	---	---	---	---	0.000
11.55	30.531	841.30	---	---	---	---	0.00	---	---	---	---	---	0.000
11.65	31.132	841.40	---	---	---	---	0.00	---	---	---	---	---	0.000
11.75	31.734	841.50	---	---	---	---	0.00	---	---	---	---	---	0.000
11.85	32.335	841.60	---	---	---	---	0.00	---	---	---	---	---	0.000
11.95	32.936	841.70	---	---	---	---	0.00	---	---	---	---	---	0.000
12.05	33.537	841.80	---	---	---	---	0.00	---	---	---	---	---	0.000
12.15	34.139	841.90	---	---	---	---	0.00	---	---	---	---	---	0.000
12.25	34.740	842.00	---	---	---	---	0.00	---	---	---	---	---	0.000

...End

Hydrograph Report

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

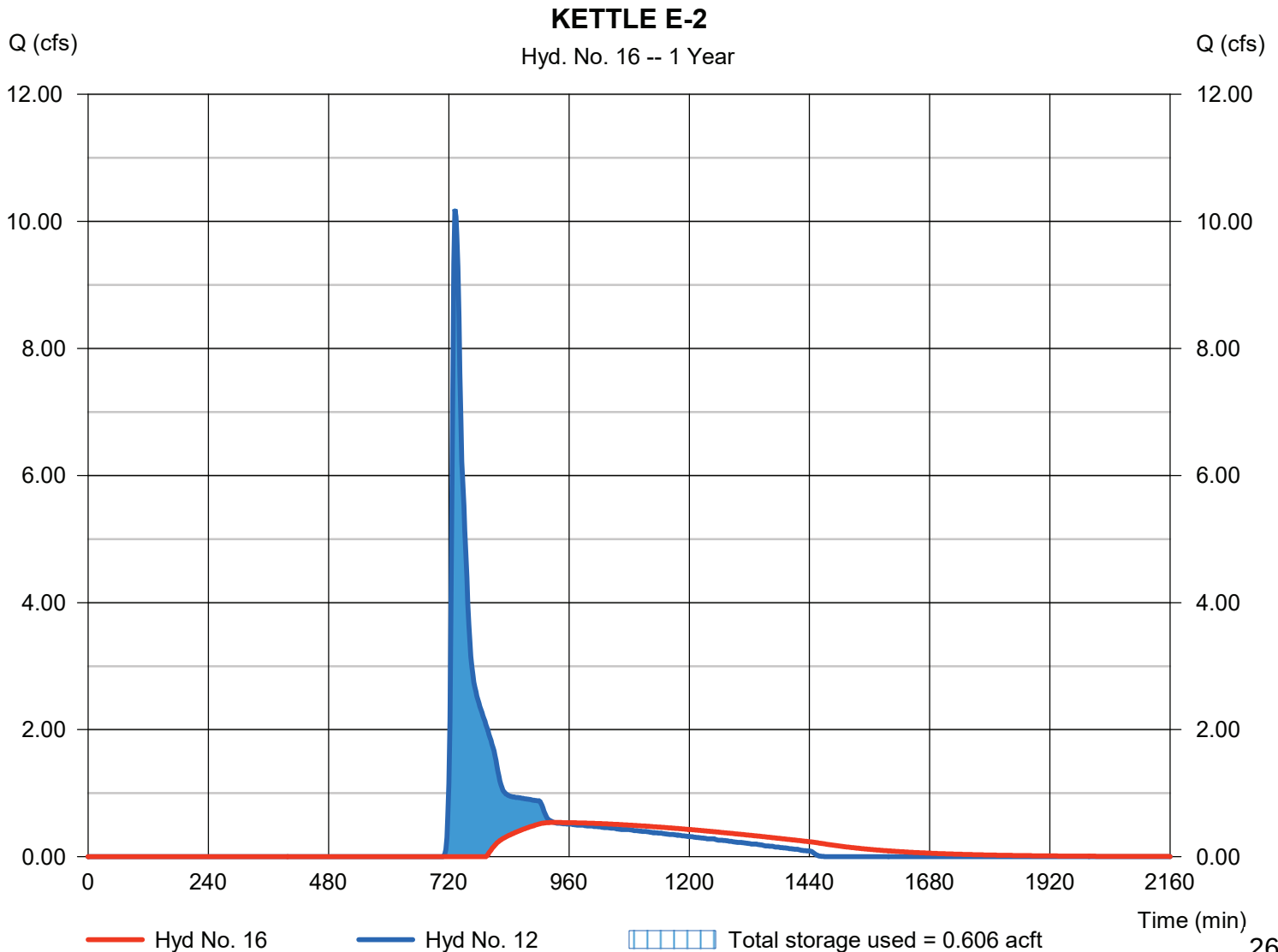
Tuesday, 05 / 7 / 2019

Hyd. No. 16

KETTLE E-2

Hydrograph type	= Reservoir	Peak discharge	= 0.539 cfs
Storm frequency	= 1 yrs	Time to peak	= 930 min
Time interval	= 2 min	Hyd. volume	= 0.421 acft
Inflow hyd. No.	= 12 - E-OS-2 + E-2	Max. Elevation	= 841.08 ft
Reservoir name	= KETTLE-E-2	Max. Storage	= 0.606 acft

Storage Indication method used.



Pond Report

35

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

Tuesday, 05 / 7 / 2019

Pond No. 2 - KETTLE-E-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 838.75 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	838.75	1,152	0.000	0.000
0.25	839.00	1,152	0.007	0.007
1.25	840.00	7,289	0.087	0.093
2.25	841.00	29,279	0.392	0.485
3.25	842.00	117,750	1.574	2.059
4.25	843.00	200,000	3.605	5.665

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 841.01	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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	838.75	---	---	---	---	0.00	---	---	---	---	---	0.000
0.03	0.001	838.78	---	---	---	---	0.00	---	---	---	---	---	0.000
0.05	0.001	838.80	---	---	---	---	0.00	---	---	---	---	---	0.000
0.08	0.002	838.83	---	---	---	---	0.00	---	---	---	---	---	0.000
0.10	0.003	838.85	---	---	---	---	0.00	---	---	---	---	---	0.000
0.13	0.003	838.88	---	---	---	---	0.00	---	---	---	---	---	0.000
0.15	0.004	838.90	---	---	---	---	0.00	---	---	---	---	---	0.000
0.17	0.005	838.93	---	---	---	---	0.00	---	---	---	---	---	0.000
0.20	0.005	838.95	---	---	---	---	0.00	---	---	---	---	---	0.000
0.22	0.006	838.98	---	---	---	---	0.00	---	---	---	---	---	0.000
0.25	0.007	839.00	---	---	---	---	0.00	---	---	---	---	---	0.000
0.35	0.015	839.10	---	---	---	---	0.00	---	---	---	---	---	0.000
0.45	0.024	839.20	---	---	---	---	0.00	---	---	---	---	---	0.000
0.55	0.033	839.30	---	---	---	---	0.00	---	---	---	---	---	0.000
0.65	0.041	839.40	---	---	---	---	0.00	---	---	---	---	---	0.000
0.75	0.050	839.50	---	---	---	---	0.00	---	---	---	---	---	0.000
0.85	0.059	839.60	---	---	---	---	0.00	---	---	---	---	---	0.000
0.95	0.067	839.70	---	---	---	---	0.00	---	---	---	---	---	0.000
1.05	0.076	839.80	---	---	---	---	0.00	---	---	---	---	---	0.000
1.15	0.085	839.90	---	---	---	---	0.00	---	---	---	---	---	0.000
1.25	0.093	840.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.35	0.133	840.10	---	---	---	---	0.00	---	---	---	---	---	0.000
1.45	0.172	840.20	---	---	---	---	0.00	---	---	---	---	---	0.000
1.55	0.211	840.30	---	---	---	---	0.00	---	---	---	---	---	0.000
1.65	0.250	840.40	---	---	---	---	0.00	---	---	---	---	---	0.000
1.75	0.289	840.50	---	---	---	---	0.00	---	---	---	---	---	0.000
1.85	0.328	840.60	---	---	---	---	0.00	---	---	---	---	---	0.000
1.95	0.367	840.70	---	---	---	---	0.00	---	---	---	---	---	0.000
2.05	0.407	840.80	---	---	---	---	0.00	---	---	---	---	---	0.000
2.15	0.446	840.90	---	---	---	---	0.00	---	---	---	---	---	0.000
2.25	0.485	841.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.35	0.642	841.10	---	---	---	---	0.70	---	---	---	---	---	0.702
2.45	0.800	841.20	---	---	---	---	2.15	---	---	---	---	---	2.153
2.55	0.957	841.30	---	---	---	---	4.06	---	---	---	---	---	4.059
2.65	1.115	841.40	---	---	---	---	6.33	---	---	---	---	---	6.330
2.75	1.272	841.50	---	---	---	---	8.91	---	---	---	---	---	8.914
2.85	1.430	841.60	---	---	---	---	11.78	---	---	---	---	---	11.78

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Continues on next page...

KETTLE-E-2

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.95	1.587	841.70	---	---	---	---	14.90	---	---	---	---	---	14.90
3.05	1.744	841.80	---	---	---	---	18.25	---	---	---	---	---	18.25
3.15	1.902	841.90	---	---	---	---	21.82	---	---	---	---	---	21.82
3.25	2.059	842.00	---	---	---	---	25.61	---	---	---	---	---	25.61
3.35	2.420	842.10	---	---	---	---	29.59	---	---	---	---	---	29.59
3.45	2.780	842.20	---	---	---	---	33.75	---	---	---	---	---	33.75
3.55	3.141	842.30	---	---	---	---	38.09	---	---	---	---	---	38.09
3.65	3.501	842.40	---	---	---	---	42.60	---	---	---	---	---	42.60
3.75	3.862	842.50	---	---	---	---	47.28	---	---	---	---	---	47.28
3.85	4.222	842.60	---	---	---	---	52.12	---	---	---	---	---	52.12
3.95	4.583	842.70	---	---	---	---	57.11	---	---	---	---	---	57.11
4.05	4.944	842.80	---	---	---	---	62.26	---	---	---	---	---	62.26
4.15	5.304	842.90	---	---	---	---	67.54	---	---	---	---	---	67.54
4.25	5.665	843.00	---	---	---	---	72.99	---	---	---	---	---	72.99

...End

Hydrograph Report

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

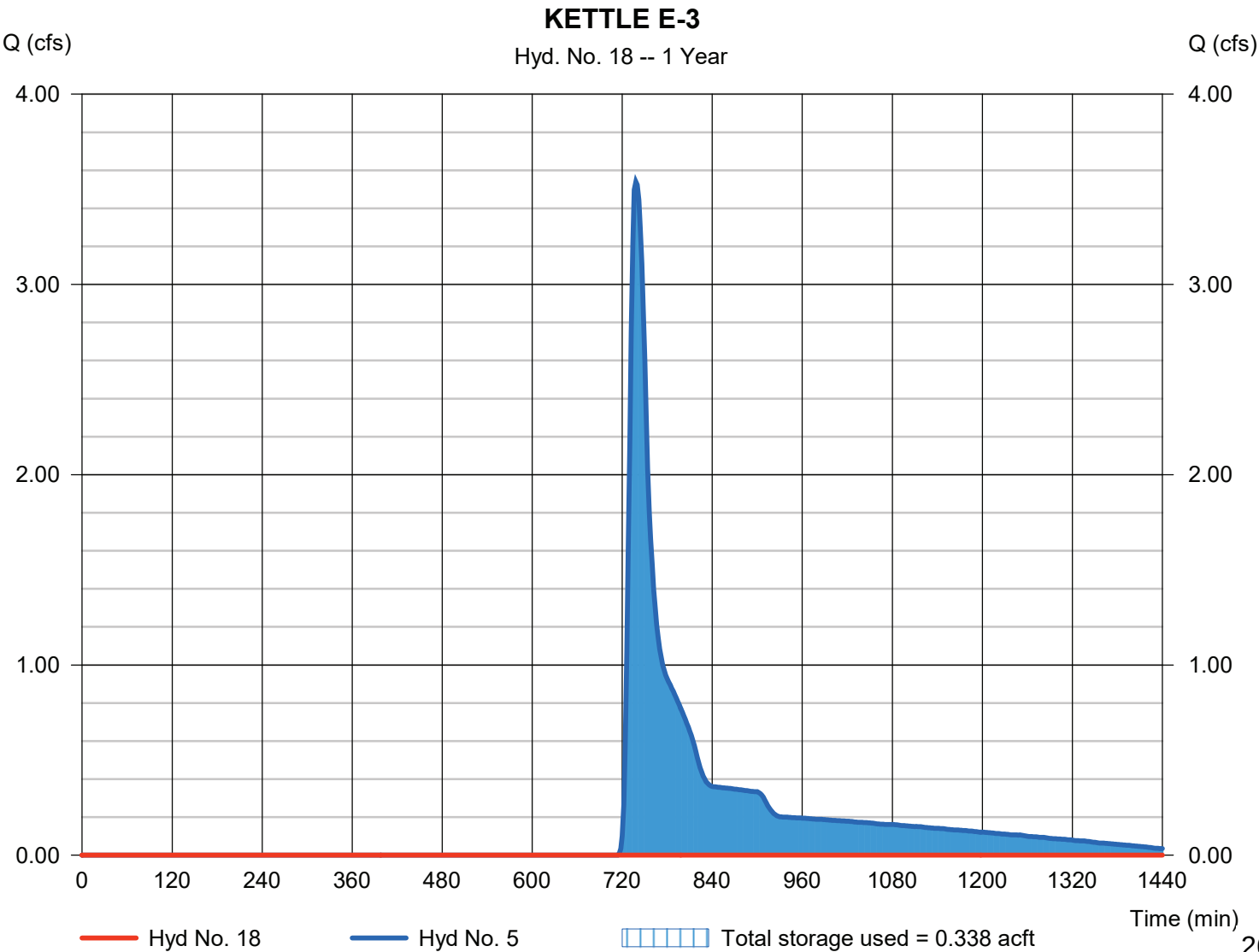
Tuesday, 05 / 7 / 2019

Hyd. No. 18

KETTLE E-3

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 5 - E-3	Max. Elevation	= 834.49 ft
Reservoir name	= KETTLE-E-3	Max. Storage	= 0.338 acft

Storage Indication method used.



Pond No. 3 - KETTLE-E-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 832.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	832.00	734	0.000	0.000
1.00	833.00	4,615	0.055	0.055
2.00	834.00	9,182	0.155	0.210
3.00	835.00	13,412	0.258	0.468
4.00	836.00	17,202	0.350	0.819
5.00	837.00	21,451	0.443	1.261
6.00	838.00	25,934	0.543	1.804
7.00	839.00	31,188	0.655	2.459
8.00	840.00	37,976	0.793	3.252
9.00	841.00	47,989	0.984	4.236

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 841.60	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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	832.00	---	---	---	---	0.00	---	---	---	---	---	0.000
0.10	0.006	832.10	---	---	---	---	0.00	---	---	---	---	---	0.000
0.20	0.011	832.20	---	---	---	---	0.00	---	---	---	---	---	0.000
0.30	0.017	832.30	---	---	---	---	0.00	---	---	---	---	---	0.000
0.40	0.022	832.40	---	---	---	---	0.00	---	---	---	---	---	0.000
0.50	0.028	832.50	---	---	---	---	0.00	---	---	---	---	---	0.000
0.60	0.033	832.60	---	---	---	---	0.00	---	---	---	---	---	0.000
0.70	0.039	832.70	---	---	---	---	0.00	---	---	---	---	---	0.000
0.80	0.044	832.80	---	---	---	---	0.00	---	---	---	---	---	0.000
0.90	0.050	832.90	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	0.055	833.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.10	0.071	833.10	---	---	---	---	0.00	---	---	---	---	---	0.000
1.20	0.086	833.20	---	---	---	---	0.00	---	---	---	---	---	0.000
1.30	0.102	833.30	---	---	---	---	0.00	---	---	---	---	---	0.000
1.40	0.117	833.40	---	---	---	---	0.00	---	---	---	---	---	0.000
1.50	0.133	833.50	---	---	---	---	0.00	---	---	---	---	---	0.000
1.60	0.148	833.60	---	---	---	---	0.00	---	---	---	---	---	0.000
1.70	0.164	833.70	---	---	---	---	0.00	---	---	---	---	---	0.000
1.80	0.179	833.80	---	---	---	---	0.00	---	---	---	---	---	0.000
1.90	0.195	833.90	---	---	---	---	0.00	---	---	---	---	---	0.000
2.00	0.210	834.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.10	0.236	834.10	---	---	---	---	0.00	---	---	---	---	---	0.000
2.20	0.262	834.20	---	---	---	---	0.00	---	---	---	---	---	0.000
2.30	0.288	834.30	---	---	---	---	0.00	---	---	---	---	---	0.000
2.40	0.314	834.40	---	---	---	---	0.00	---	---	---	---	---	0.000
2.50	0.339	834.50	---	---	---	---	0.00	---	---	---	---	---	0.000
2.60	0.365	834.60	---	---	---	---	0.00	---	---	---	---	---	0.000
2.70	0.391	834.70	---	---	---	---	0.00	---	---	---	---	---	0.000
2.80	0.417	834.80	---	---	---	---	0.00	---	---	---	---	---	0.000
2.90	0.442	834.90	---	---	---	---	0.00	---	---	---	---	---	0.000
3.00	0.468	835.00	---	---	---	---	0.00	---	---	---	---	---	0.000
3.10	0.503	835.10	---	---	---	---	0.00	---	---	---	---	---	0.000
3.20	0.538	835.20	---	---	---	---	0.00	---	---	---	---	---	0.000

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KETTLE-E-3

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.30	0.573	835.30	---	---	---	---	0.00	---	---	---	---	---	0.000
3.40	0.608	835.40	---	---	---	---	0.00	---	---	---	---	---	0.000
3.50	0.643	835.50	---	---	---	---	0.00	---	---	---	---	---	0.000
3.60	0.678	835.60	---	---	---	---	0.00	---	---	---	---	---	0.000
3.70	0.714	835.70	---	---	---	---	0.00	---	---	---	---	---	0.000
3.80	0.749	835.80	---	---	---	---	0.00	---	---	---	---	---	0.000
3.90	0.784	835.90	---	---	---	---	0.00	---	---	---	---	---	0.000
4.00	0.819	836.00	---	---	---	---	0.00	---	---	---	---	---	0.000
4.10	0.863	836.10	---	---	---	---	0.00	---	---	---	---	---	0.000
4.20	0.907	836.20	---	---	---	---	0.00	---	---	---	---	---	0.000
4.30	0.951	836.30	---	---	---	---	0.00	---	---	---	---	---	0.000
4.40	0.996	836.40	---	---	---	---	0.00	---	---	---	---	---	0.000
4.50	1.040	836.50	---	---	---	---	0.00	---	---	---	---	---	0.000
4.60	1.084	836.60	---	---	---	---	0.00	---	---	---	---	---	0.000
4.70	1.129	836.70	---	---	---	---	0.00	---	---	---	---	---	0.000
4.80	1.173	836.80	---	---	---	---	0.00	---	---	---	---	---	0.000
4.90	1.217	836.90	---	---	---	---	0.00	---	---	---	---	---	0.000
5.00	1.261	837.00	---	---	---	---	0.00	---	---	---	---	---	0.000
5.10	1.316	837.10	---	---	---	---	0.00	---	---	---	---	---	0.000
5.20	1.370	837.20	---	---	---	---	0.00	---	---	---	---	---	0.000
5.30	1.424	837.30	---	---	---	---	0.00	---	---	---	---	---	0.000
5.40	1.479	837.40	---	---	---	---	0.00	---	---	---	---	---	0.000
5.50	1.533	837.50	---	---	---	---	0.00	---	---	---	---	---	0.000
5.60	1.587	837.60	---	---	---	---	0.00	---	---	---	---	---	0.000
5.70	1.642	837.70	---	---	---	---	0.00	---	---	---	---	---	0.000
5.80	1.696	837.80	---	---	---	---	0.00	---	---	---	---	---	0.000
5.90	1.750	837.90	---	---	---	---	0.00	---	---	---	---	---	0.000
6.00	1.804	838.00	---	---	---	---	0.00	---	---	---	---	---	0.000
6.10	1.870	838.10	---	---	---	---	0.00	---	---	---	---	---	0.000
6.20	1.935	838.20	---	---	---	---	0.00	---	---	---	---	---	0.000
6.30	2.001	838.30	---	---	---	---	0.00	---	---	---	---	---	0.000
6.40	2.066	838.40	---	---	---	---	0.00	---	---	---	---	---	0.000
6.50	2.132	838.50	---	---	---	---	0.00	---	---	---	---	---	0.000
6.60	2.197	838.60	---	---	---	---	0.00	---	---	---	---	---	0.000
6.70	2.263	838.70	---	---	---	---	0.00	---	---	---	---	---	0.000
6.80	2.328	838.80	---	---	---	---	0.00	---	---	---	---	---	0.000
6.90	2.394	838.90	---	---	---	---	0.00	---	---	---	---	---	0.000
7.00	2.459	839.00	---	---	---	---	0.00	---	---	---	---	---	0.000
7.10	2.538	839.10	---	---	---	---	0.00	---	---	---	---	---	0.000
7.20	2.618	839.20	---	---	---	---	0.00	---	---	---	---	---	0.000
7.30	2.697	839.30	---	---	---	---	0.00	---	---	---	---	---	0.000
7.40	2.776	839.40	---	---	---	---	0.00	---	---	---	---	---	0.000
7.50	2.855	839.50	---	---	---	---	0.00	---	---	---	---	---	0.000
7.60	2.935	839.60	---	---	---	---	0.00	---	---	---	---	---	0.000
7.70	3.014	839.70	---	---	---	---	0.00	---	---	---	---	---	0.000
7.80	3.093	839.80	---	---	---	---	0.00	---	---	---	---	---	0.000
7.90	3.172	839.90	---	---	---	---	0.00	---	---	---	---	---	0.000
8.00	3.252	840.00	---	---	---	---	0.00	---	---	---	---	---	0.000
8.10	3.350	840.10	---	---	---	---	0.00	---	---	---	---	---	0.000
8.20	3.449	840.20	---	---	---	---	0.00	---	---	---	---	---	0.000
8.30	3.547	840.30	---	---	---	---	0.00	---	---	---	---	---	0.000
8.40	3.645	840.40	---	---	---	---	0.00	---	---	---	---	---	0.000
8.50	3.744	840.50	---	---	---	---	0.00	---	---	---	---	---	0.000
8.60	3.842	840.60	---	---	---	---	0.00	---	---	---	---	---	0.000
8.70	3.941	840.70	---	---	---	---	0.00	---	---	---	---	---	0.000
8.80	4.039	840.80	---	---	---	---	0.00	---	---	---	---	---	0.000
8.90	4.138	840.90	---	---	---	---	0.00	---	---	---	---	---	0.000
9.00	4.236	841.00	---	---	---	---	0.00	---	---	---	---	---	0.000

...End

Hydrograph Report

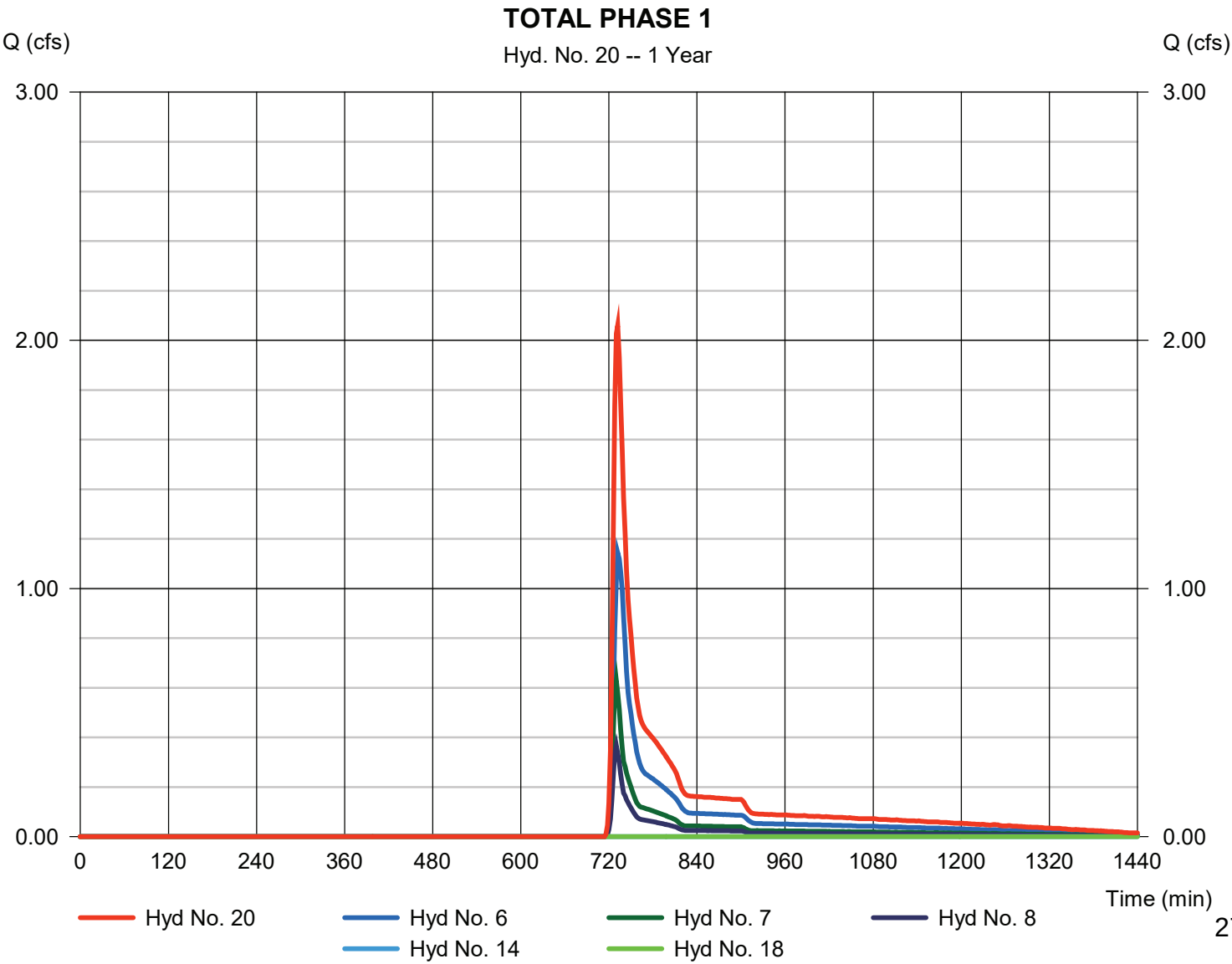
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 20

TOTAL PHASE 1

Hydrograph type	= Combine	Peak discharge	= 2.060 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 0.152 acft
Inflow hyds.	= 6, 7, 8, 14, 18	Contrib. drain. area	= 4.769 ac



Hydrograph Report

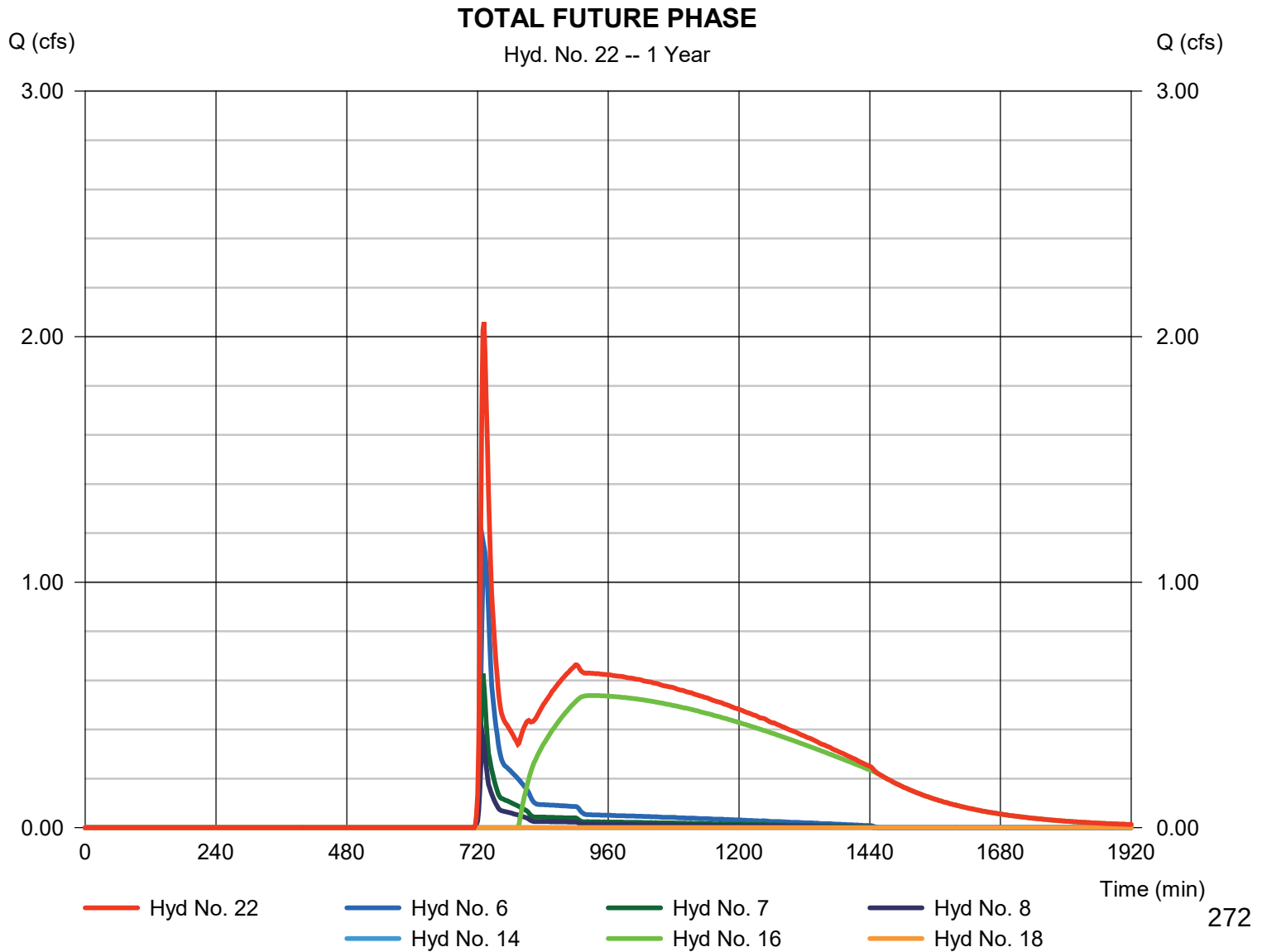
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 22

TOTAL FUTURE PHASE

Hydrograph type	= Combine	Peak discharge	= 2.060 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 0.573 acft
Inflow hyds.	= 6, 7, 8, 14, 16, 18	Contrib. drain. area	= 4.769 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	0.731	2	754	0.140	-----	-----	-----	E-OS-1
2	SCS Runoff	3.659	2	744	0.408	-----	-----	-----	E-OS-2
3	SCS Runoff	26.38	2	732	1.739	-----	-----	-----	E-1
4	SCS Runoff	12.83	2	732	0.829	-----	-----	-----	E-2
5	SCS Runoff	5.363	2	736	0.463	-----	-----	-----	E-3
6	SCS Runoff	1.741	2	732	0.121	-----	-----	-----	E-4
7	SCS Runoff	0.939	2	730	0.055	-----	-----	-----	E-5
8	SCS Runoff	0.546	2	730	0.032	-----	-----	-----	E-6
10	Combine	26.54	2	732	1.879	1, 3,	-----	-----	E-OS-1 + E-1
12	Combine	15.01	2	732	1.237	2, 4,	-----	-----	E-OS-2 + E-2
14	Reservoir	0.000	2	n/a	0.000	10	832.26	1.88	KETTLE E-1
16	Reservoir	1.313	2	832	0.752	12	841.14	0.709	KETTLE E-2
18	Reservoir	0.000	2	n/a	0.000	5	834.98	0.463	KETTLE E-3
20	Combine	3.110	2	730	0.209	6, 7, 8, 14, 18,	-----	-----	TOTAL PHASE 1
22	Combine	3.110	2	730	0.961	6, 7, 8, 14, 16, 18,	-----	-----	TOTAL FUTURE PHASE
2019-02-19_CHAPMAN FARMS_EXISTING.dwg					Return Period: 2 Year			Tuesday, 05 / 7 / 2019	

Hydrograph Report

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

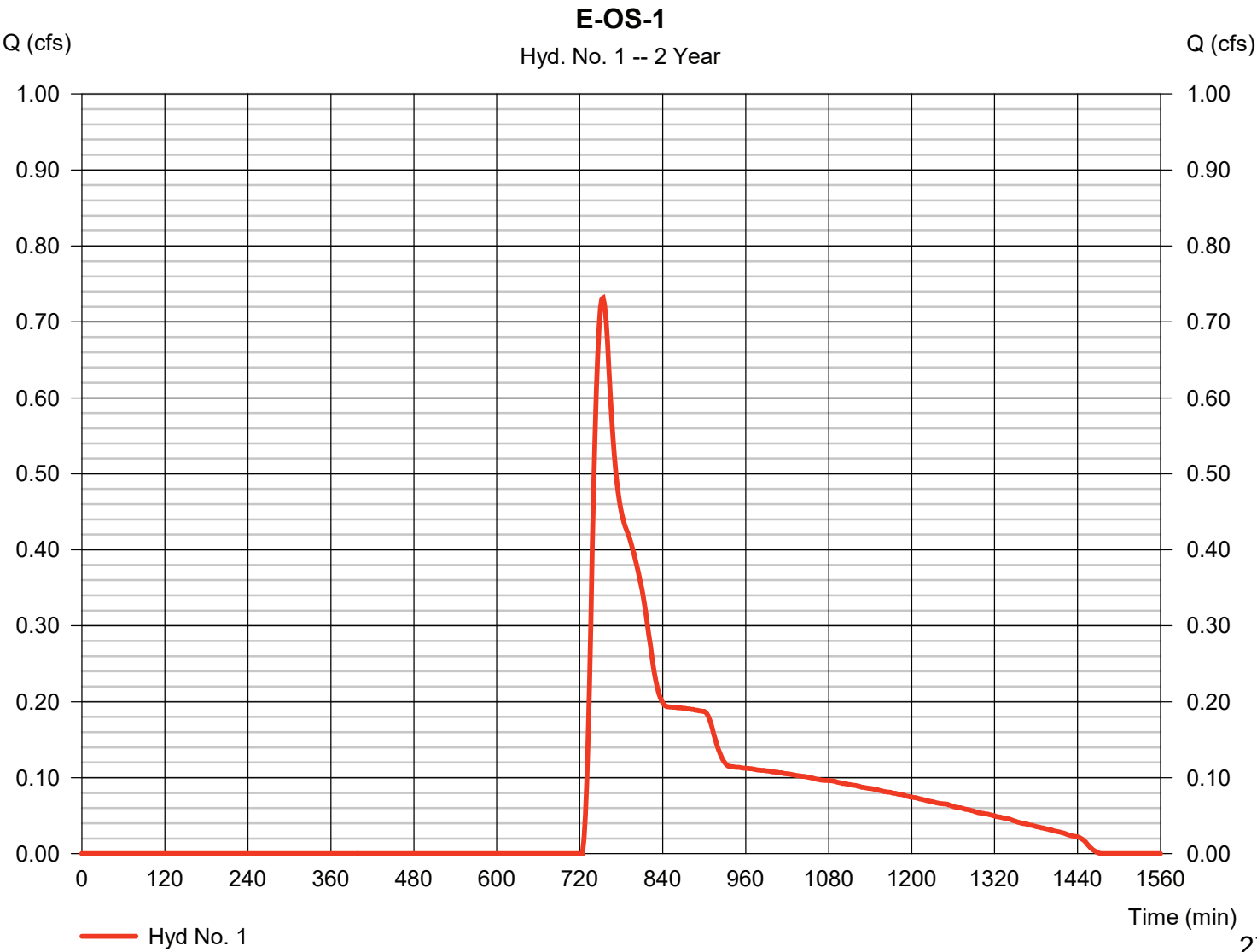
Tuesday, 05 / 7 / 2019

Hyd. No. 1

E-OS-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.731 cfs
Storm frequency	=	2 yrs	Time to peak	=	754 min
Time interval	=	2 min	Hyd. volume	=	0.140 acft
Drainage area	=	10.160 ac	Curve number	=	57*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	22.50 min
Total precip.	=	2.70 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrographs\16034-01\284481 Storm Water Management			

* Composite (Area/CN) = [(1.300 x 69) + (8.860 x 55)] / 10.160



Precipitation Report

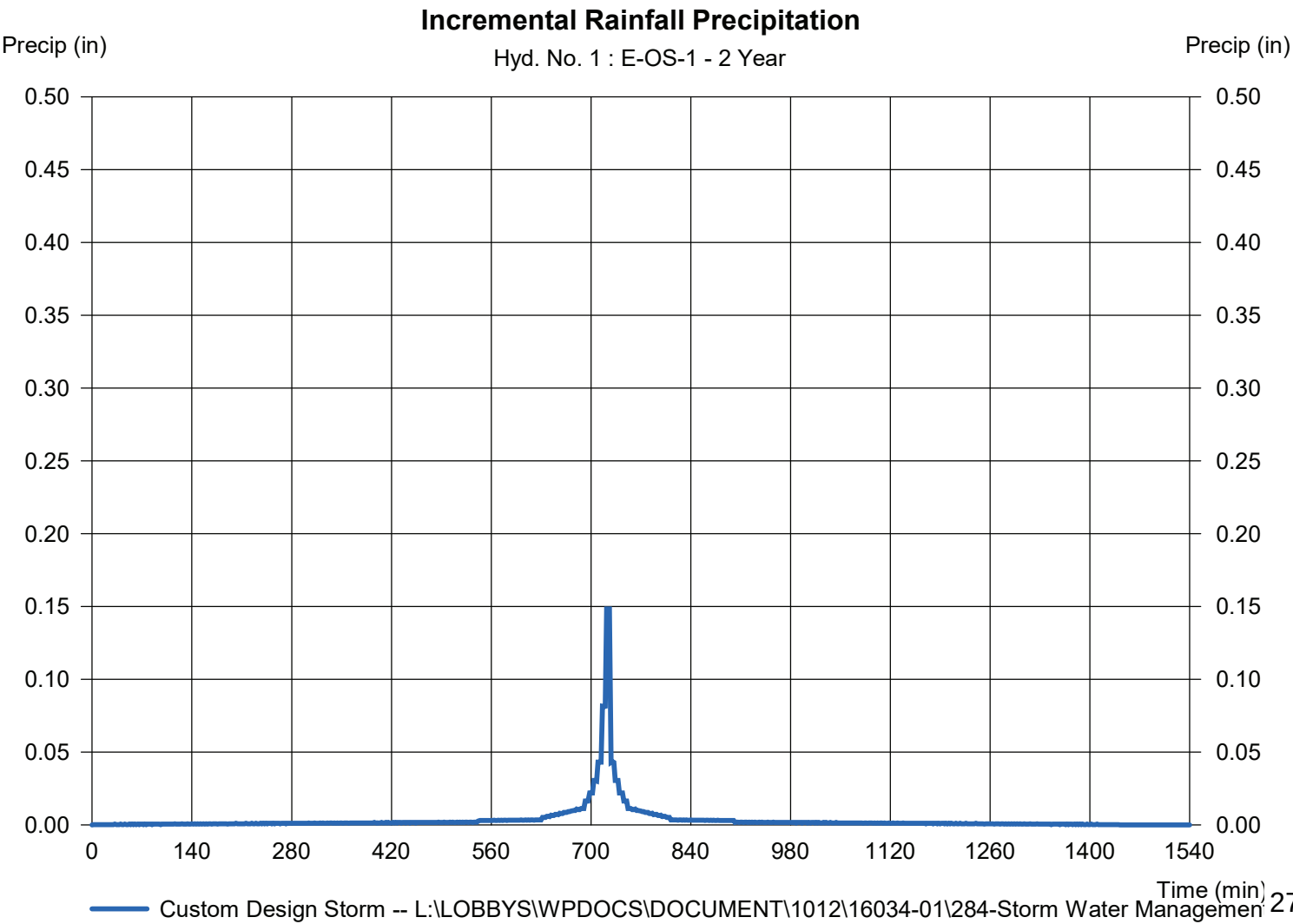
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 1

E-OS-1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

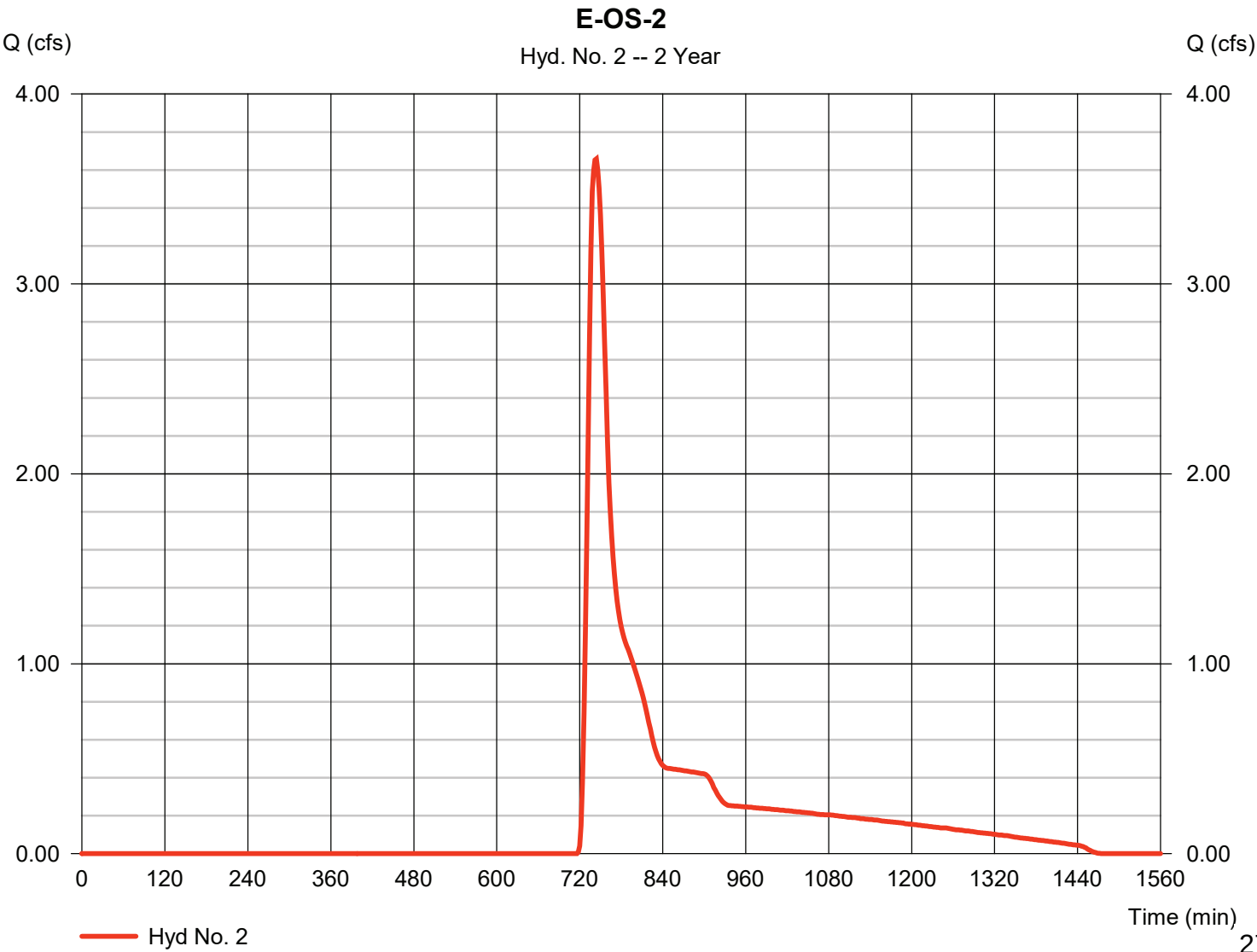
Tuesday, 05 / 7 / 2019

Hyd. No. 2

E-OS-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.659 cfs
Storm frequency	=	2 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	0.408 acft
Drainage area	=	12.810 ac	Curve number	=	65*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	20.80 min
Total precip.	=	2.70 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrographs\16034-01\284481 Storm Water Management			

* Composite (Area/CN) = [(9.150 x 69) + (3.660 x 55)] / 12.810



Precipitation Report

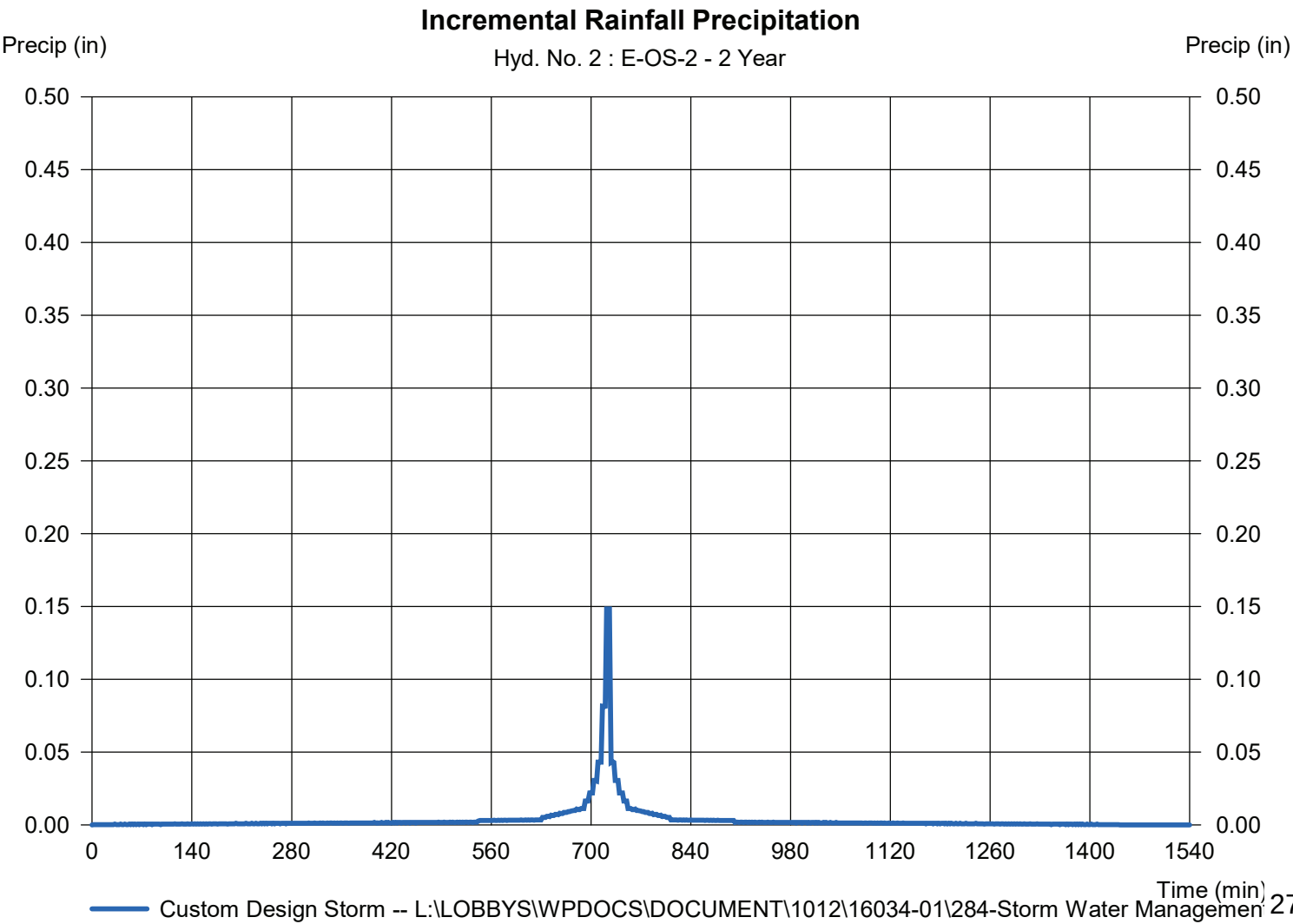
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 2

E-OS-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

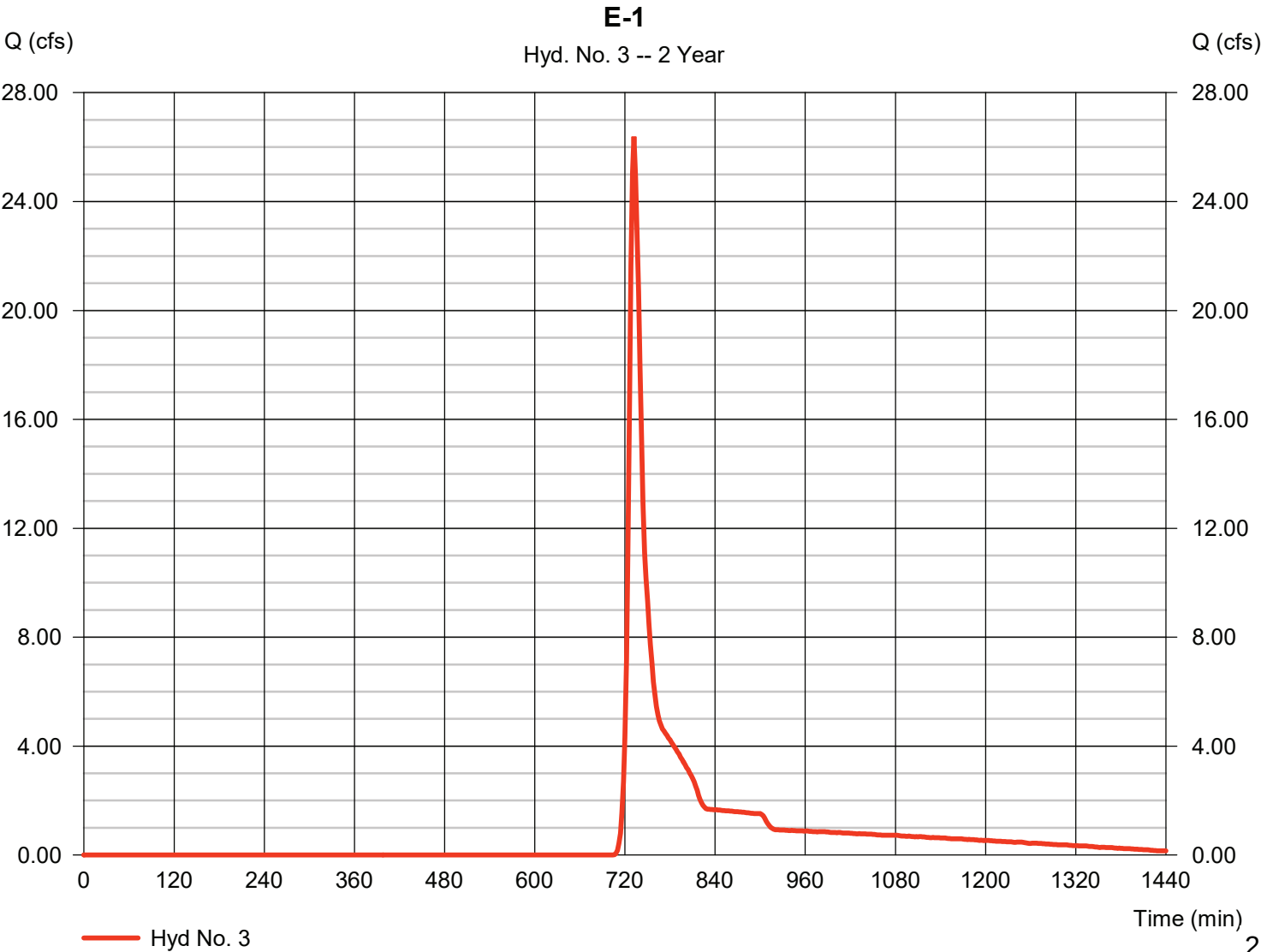
Tuesday, 05 / 7 / 2019

Hyd. No. 3

E-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.38 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	1.739 acft
Drainage area	=	34.050 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.20 min
Total precip.	=	2.70 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrographs\16034-01\28484 Storm Water Management			

* Composite (Area/CN) = [(8.640 x 78) + (25.410 x 69)] / 34.050



Precipitation Report

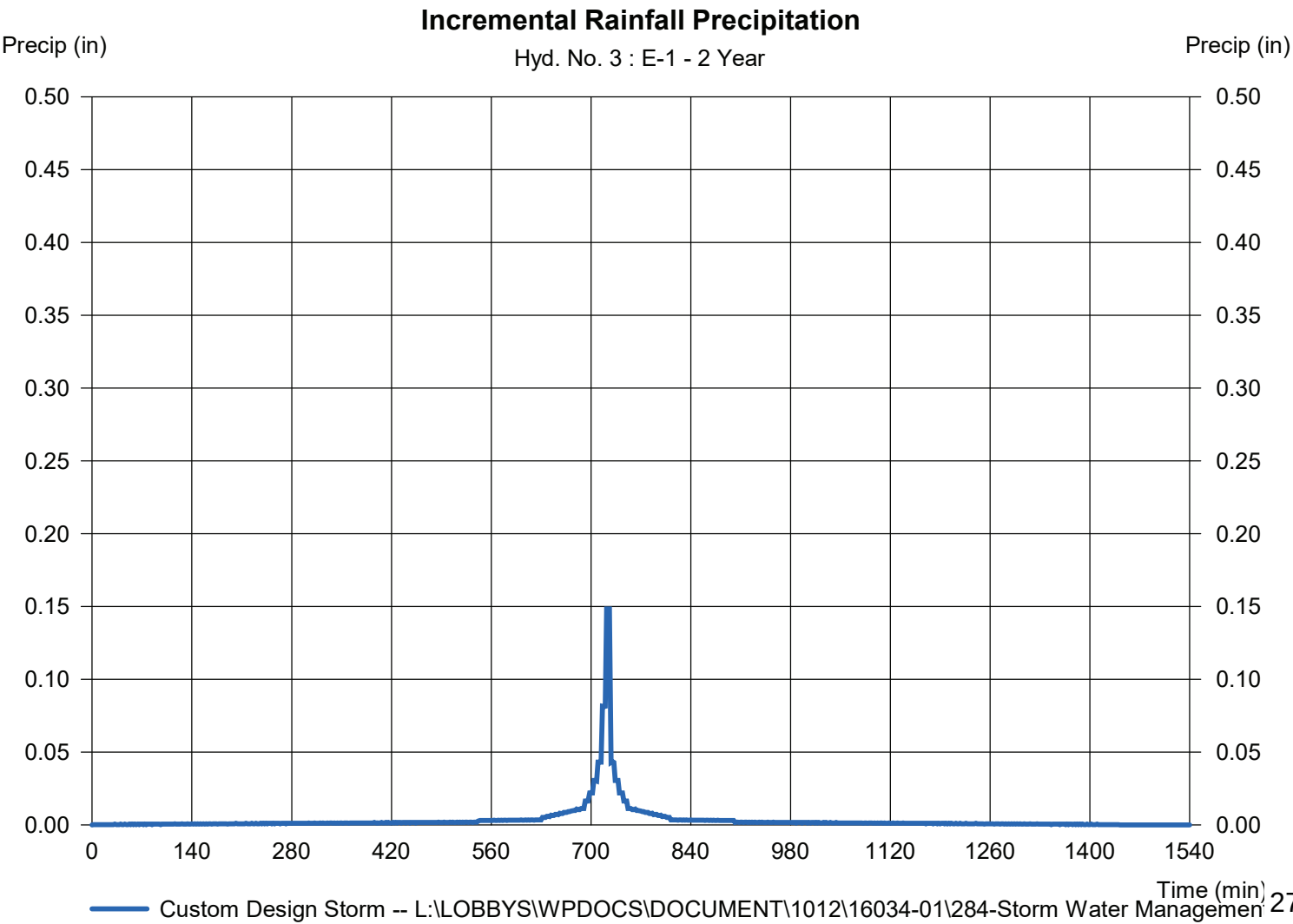
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 3

E-1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

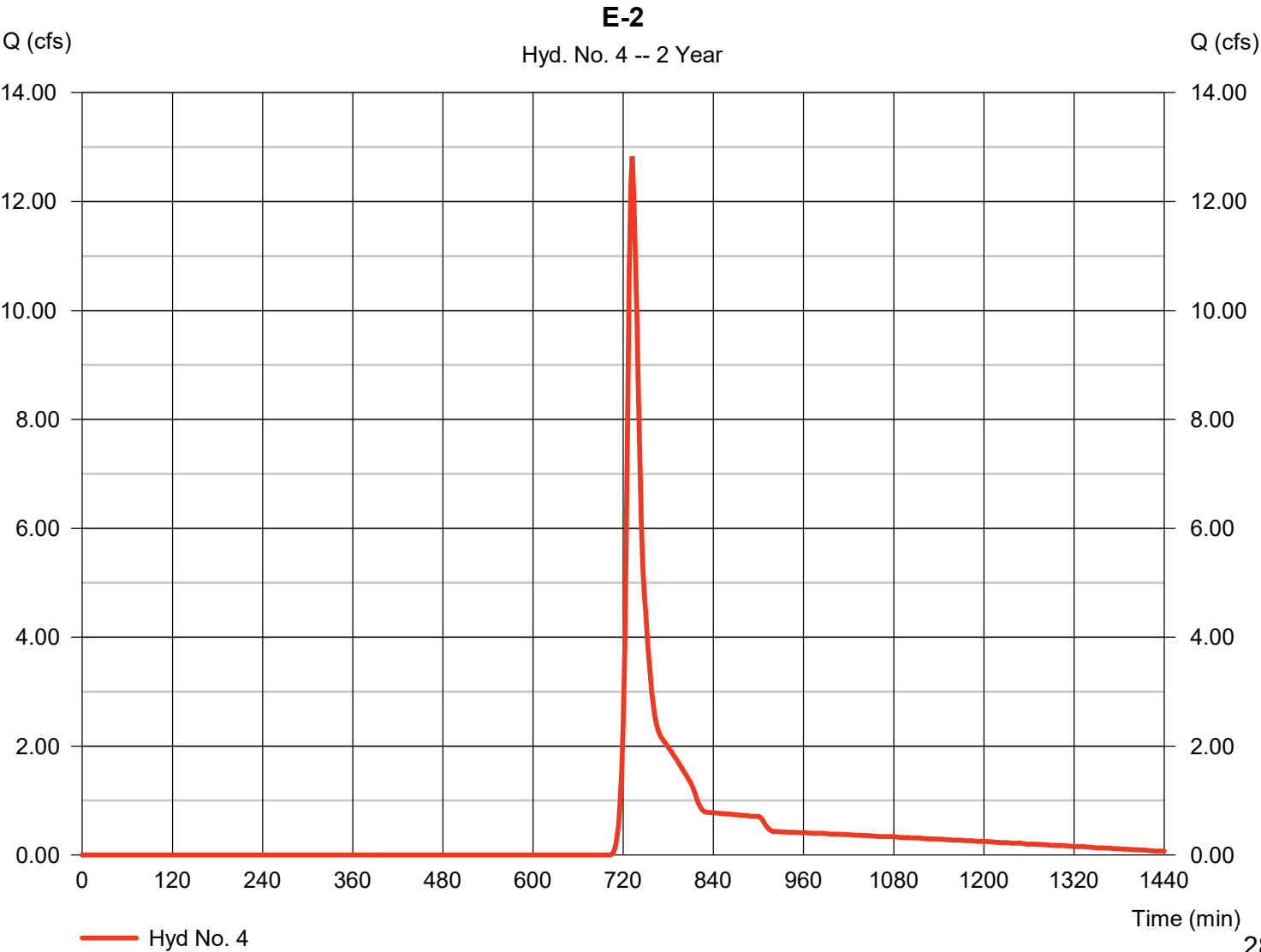
Tuesday, 05 / 7 / 2019

Hyd. No. 4

E-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.83 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	0.829 acft
Drainage area	=	15.170 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.30 min
Total precip.	=	2.70 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28484 Storm Water Management			

* Composite (Area/CN) = [(4.970 x 78) + (10.200 x 69)] / 15.170



Precipitation Report

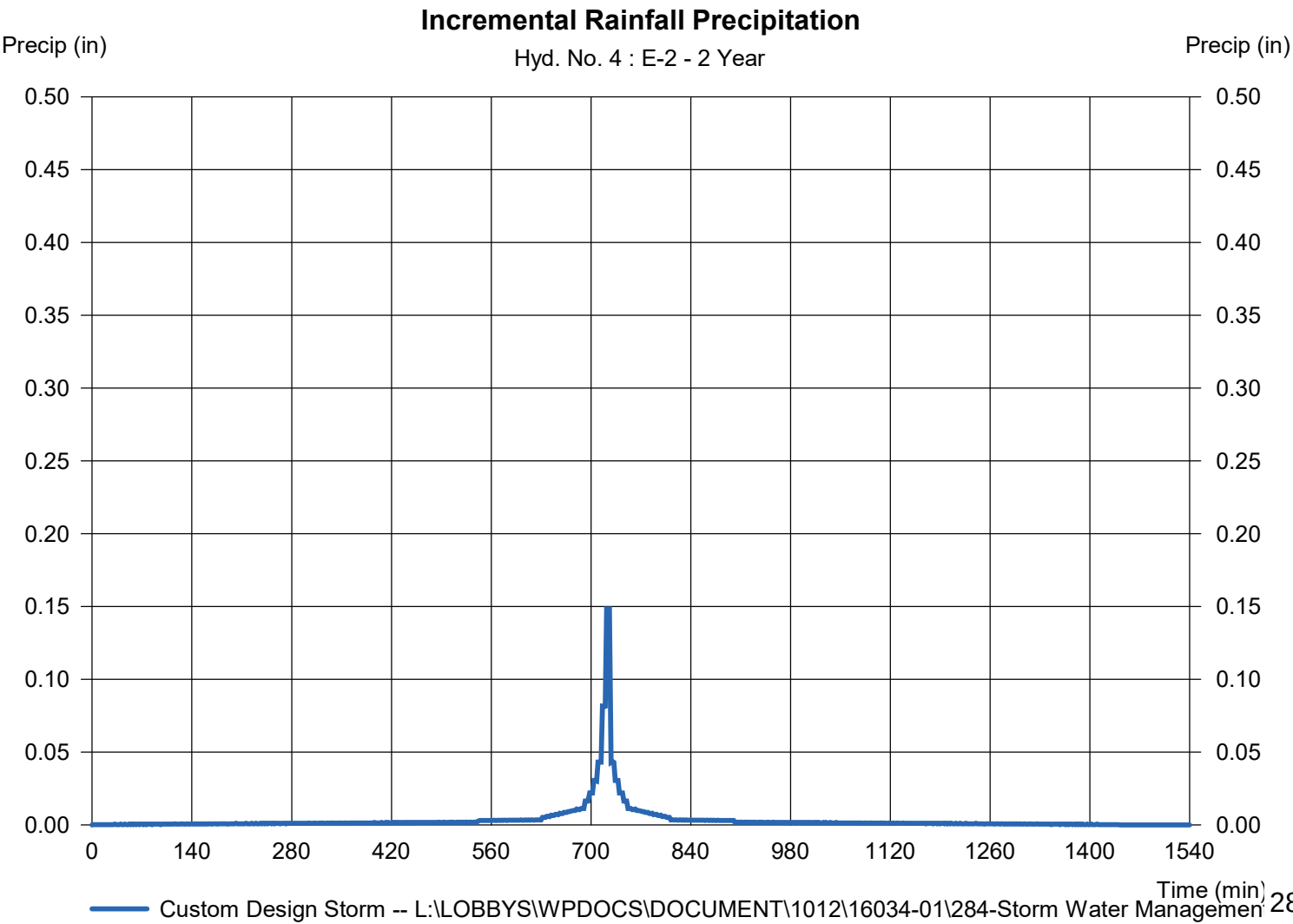
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 4

E-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

Tuesday, 05 / 7 / 2019

Hyd. No. 5

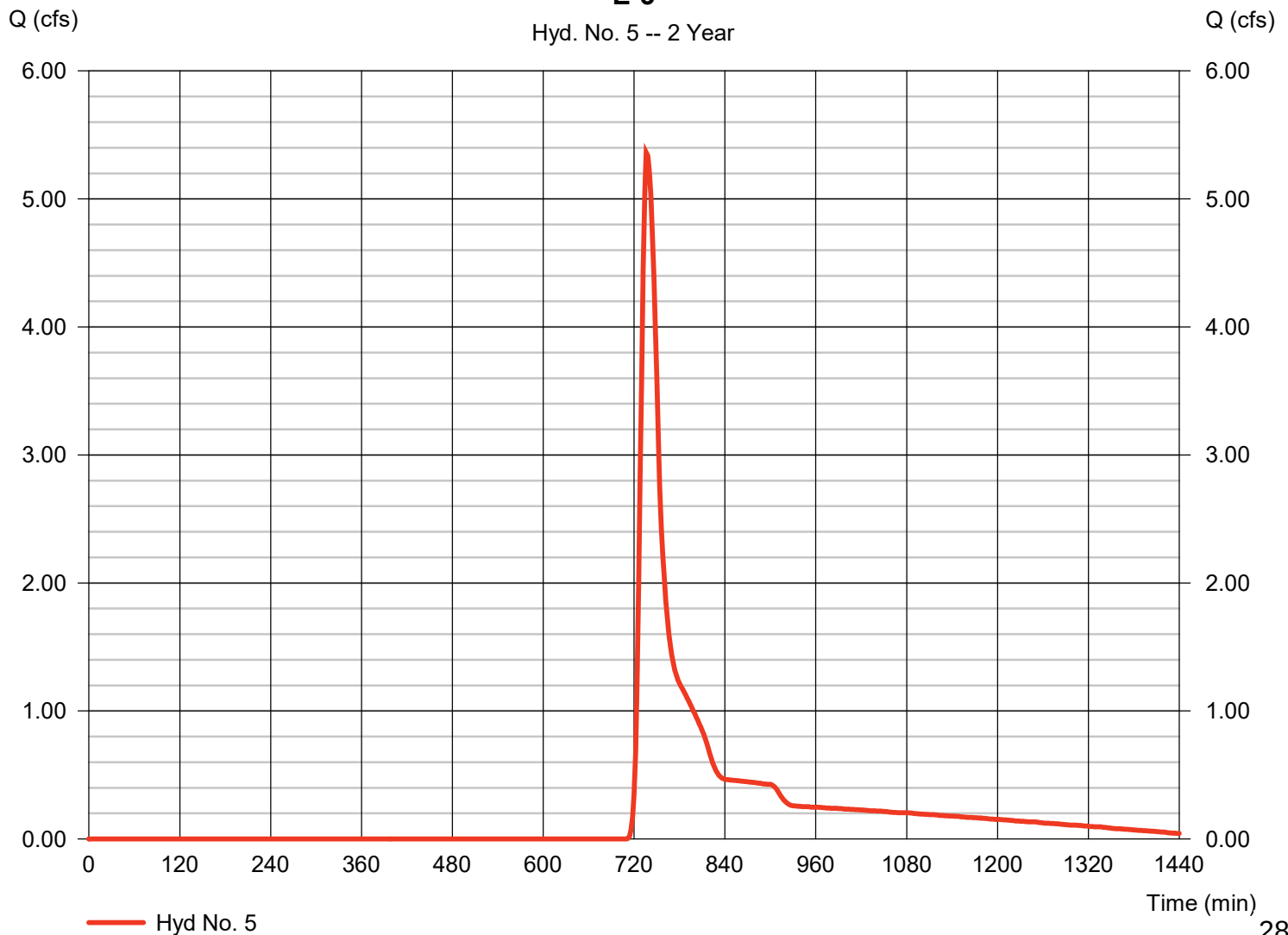
E-3

Hydrograph type	= SCS Runoff	Peak discharge	= 5.363 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 0.463 acft
Drainage area	= 10.776 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management		

* Composite (Area/CN) = [(11.490 x 69)] / 10.776

E-3

Hyd. No. 5 -- 2 Year



Precipitation Report

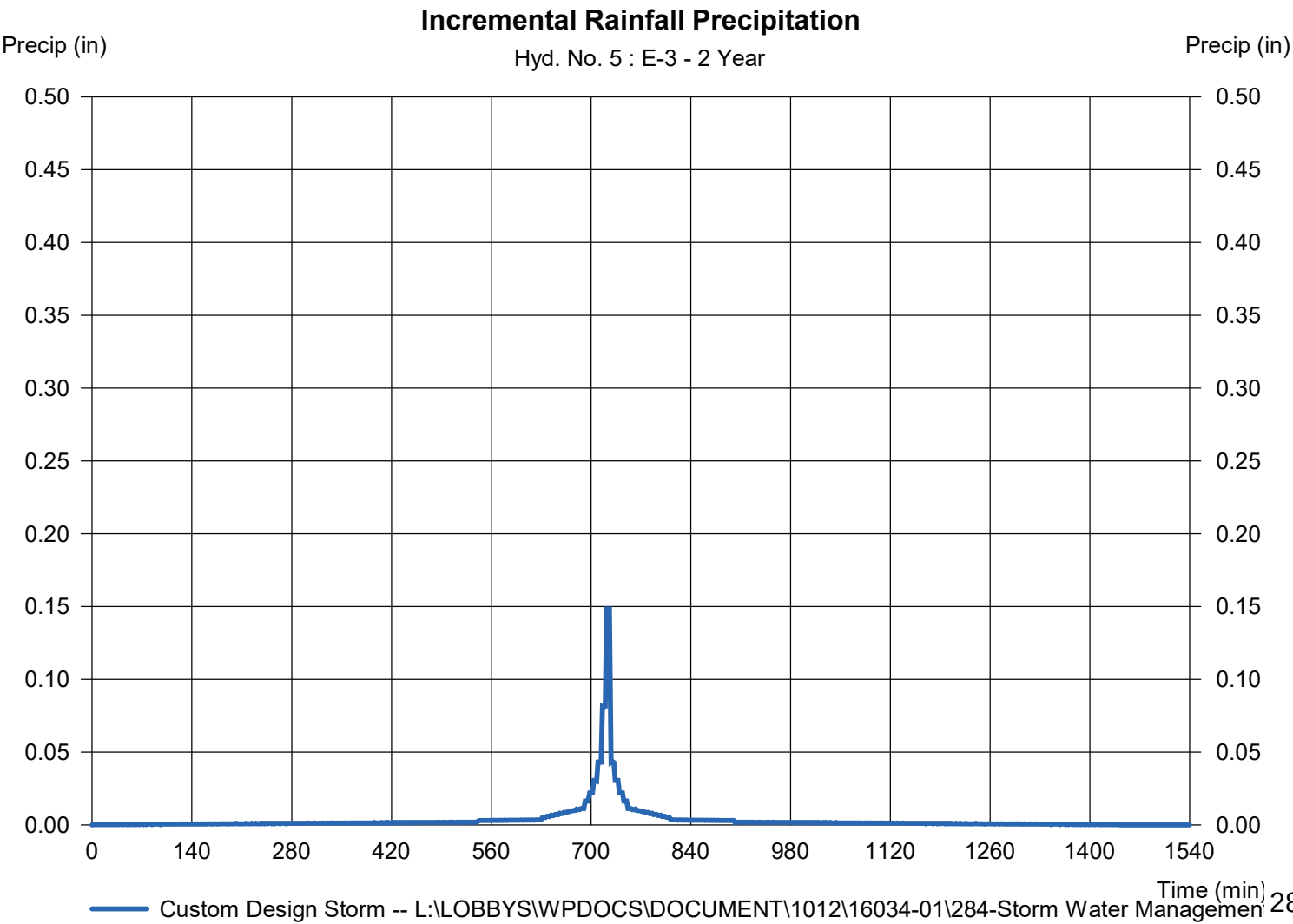
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 5

E-3

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

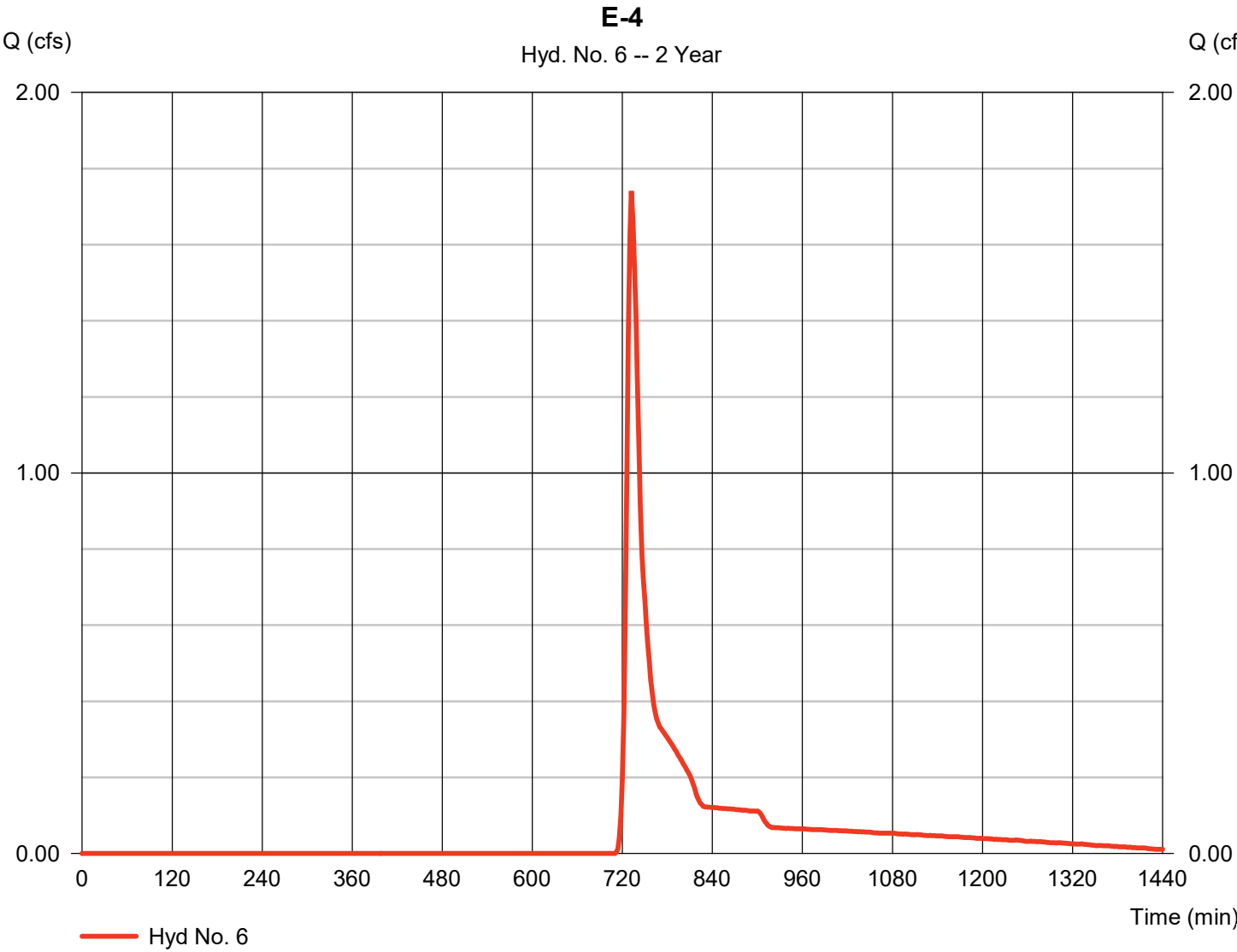
Tuesday, 05 / 7 / 2019

Hyd. No. 6

E-4

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.741 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	0.121 acft
Drainage area	=	2.729 ac	Curve number	=	69*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.40 min
Total precip.	=	2.70 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28484 Storm Water Management			

* Composite (Area/CN) = [(2.010 x 69)] / 2.729



Precipitation Report

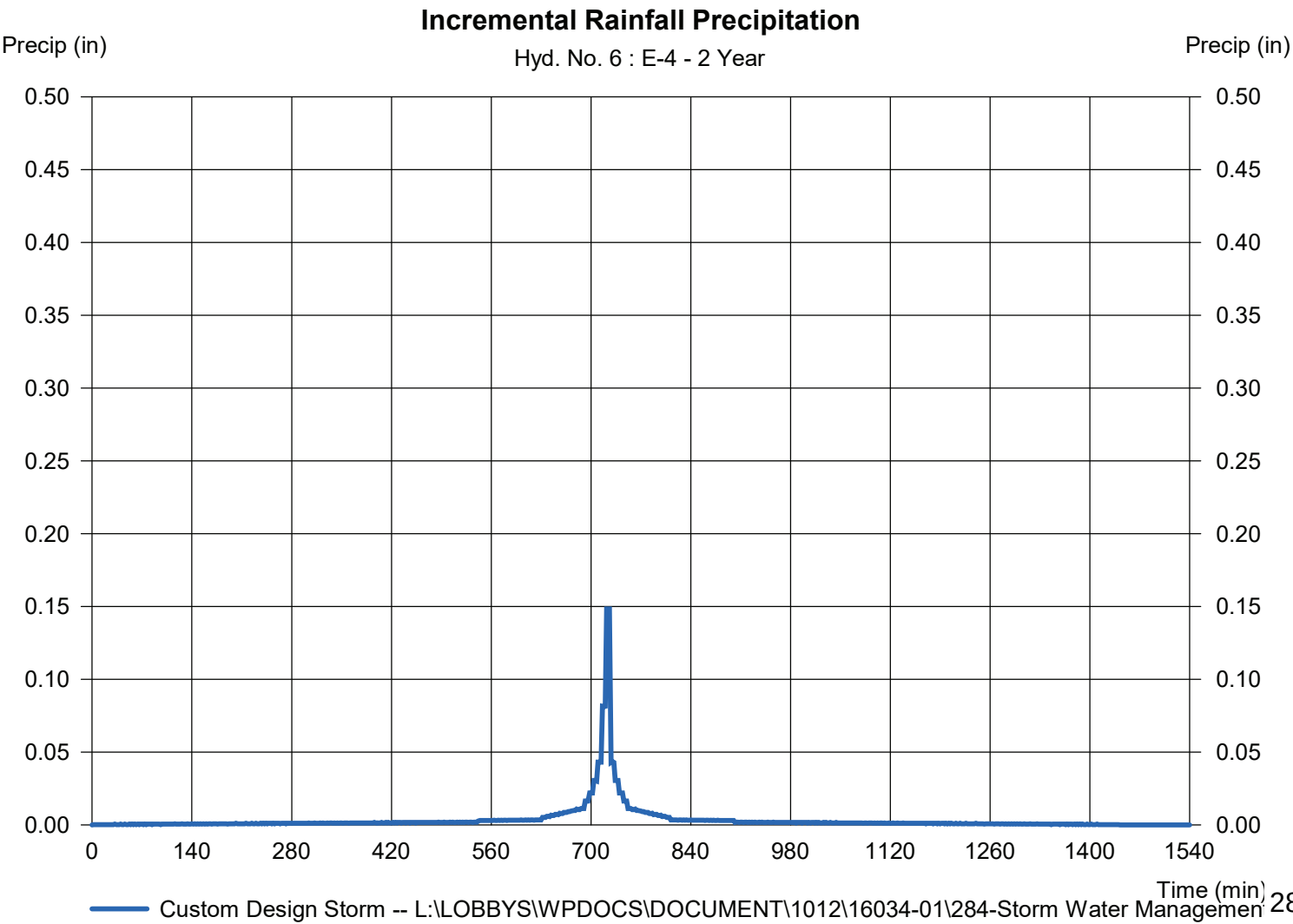
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 6

E-4

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

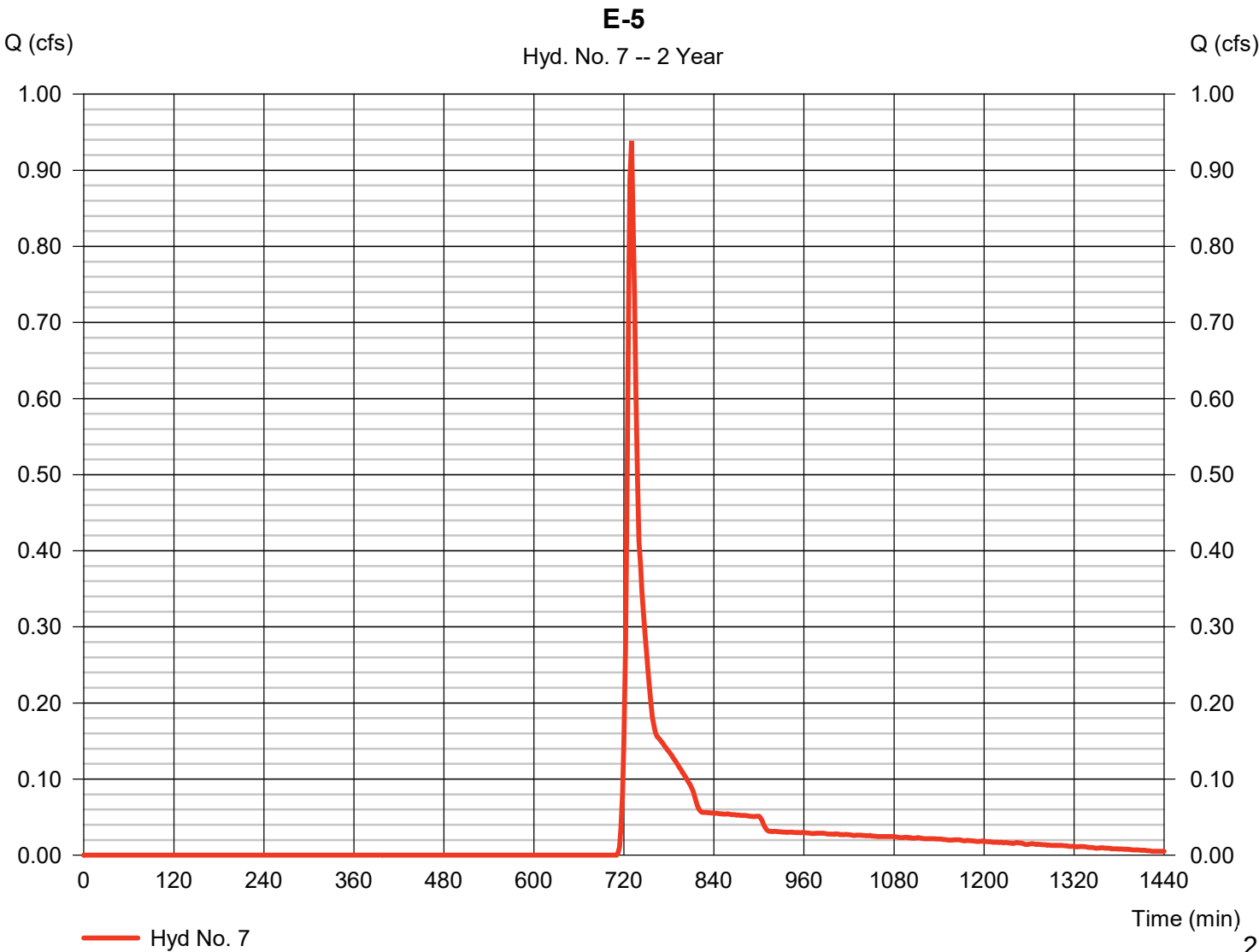
Tuesday, 05 / 7 / 2019

Hyd. No. 7

E-5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.939 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 0.055 acft
Drainage area	= 1.290 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.50 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28484 Storm Water Management		

* Composite (Area/CN) = [(1.290 x 69)] / 1.290



Precipitation Report

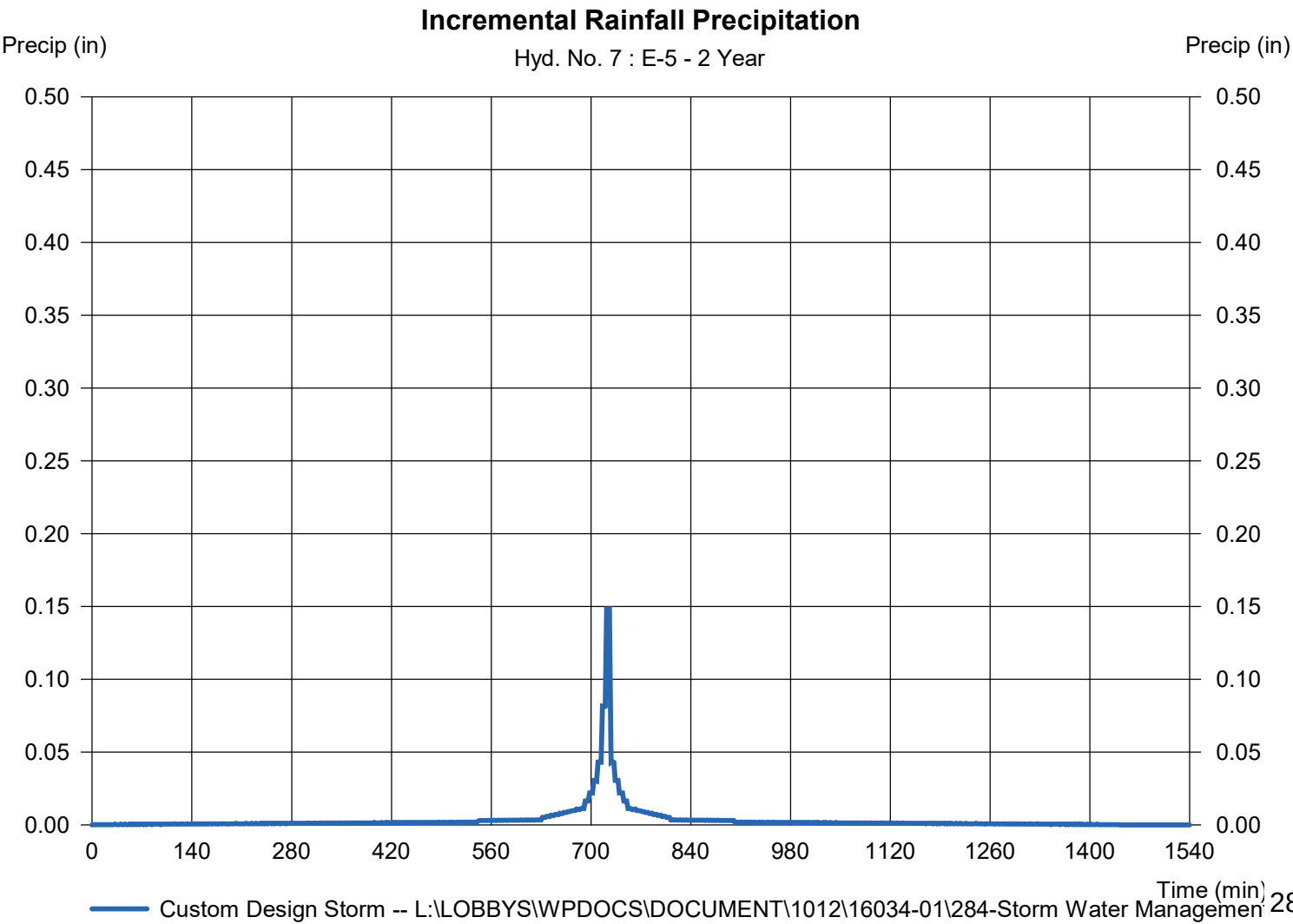
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 7

E-5

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

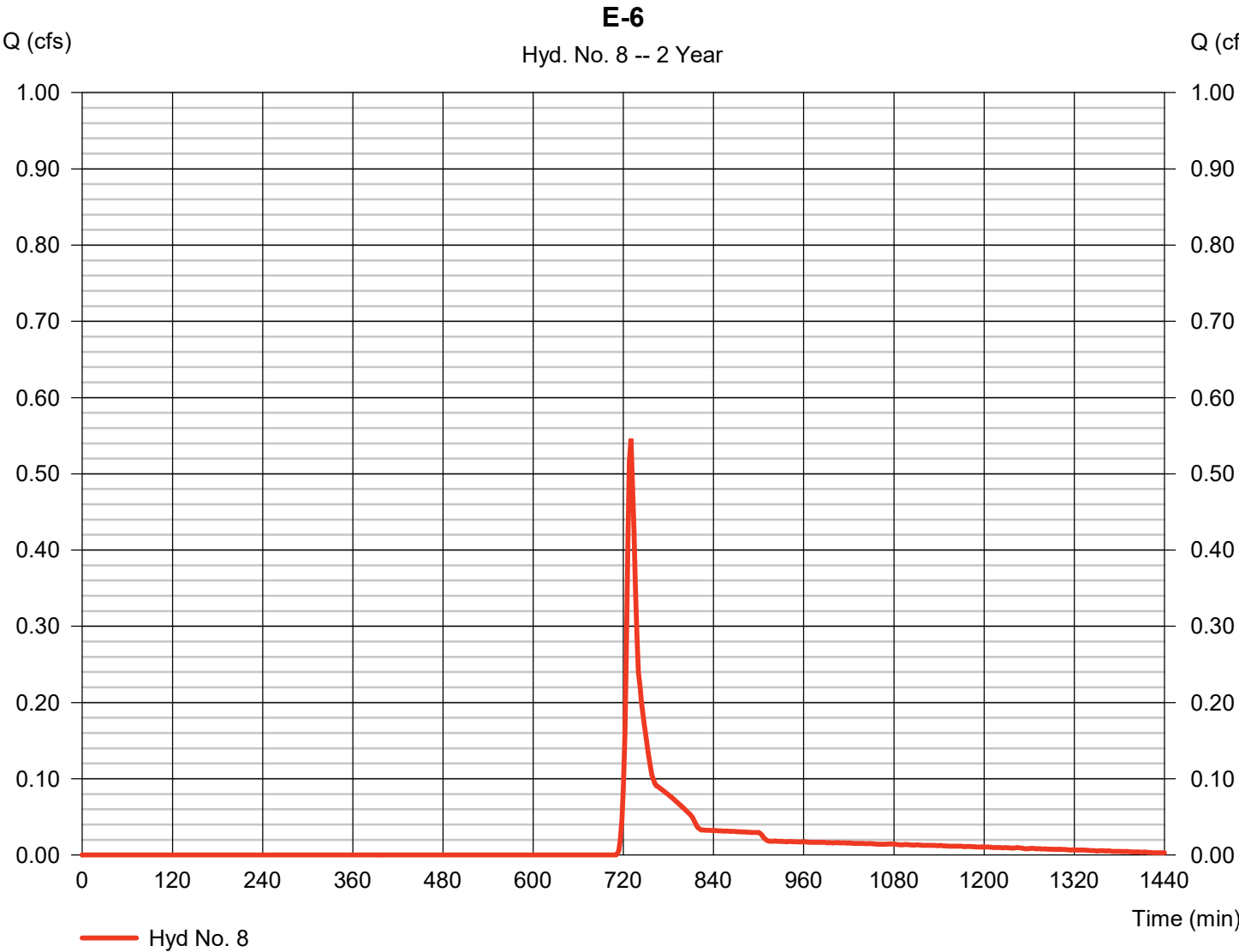
Tuesday, 05 / 7 / 2019

Hyd. No. 8

E-6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.546 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 0.032 acft
Drainage area	= 0.750 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.50 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management		

* Composite (Area/CN) = [(0.760 x 69)] / 0.750



Precipitation Report

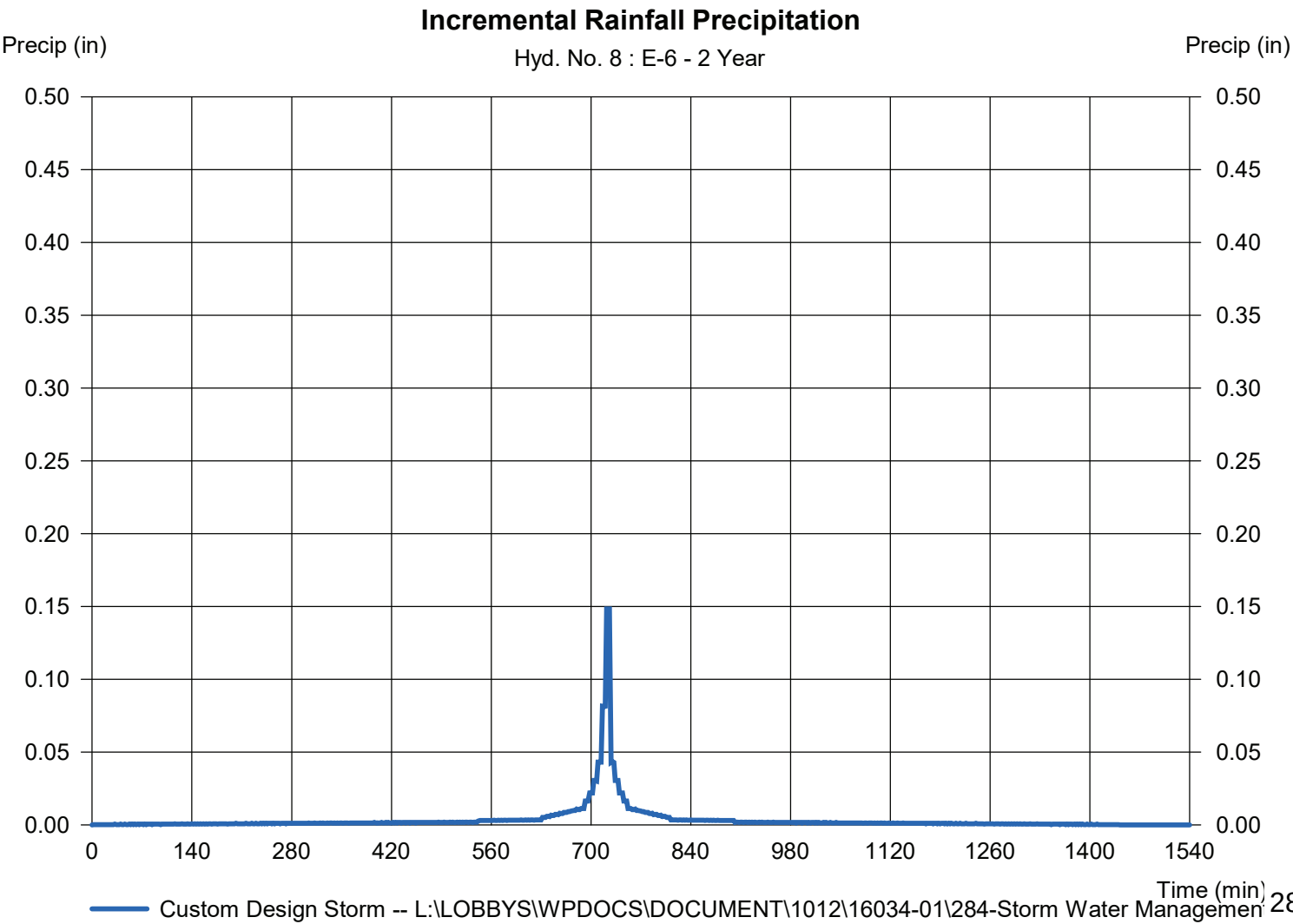
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 8

E-6

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

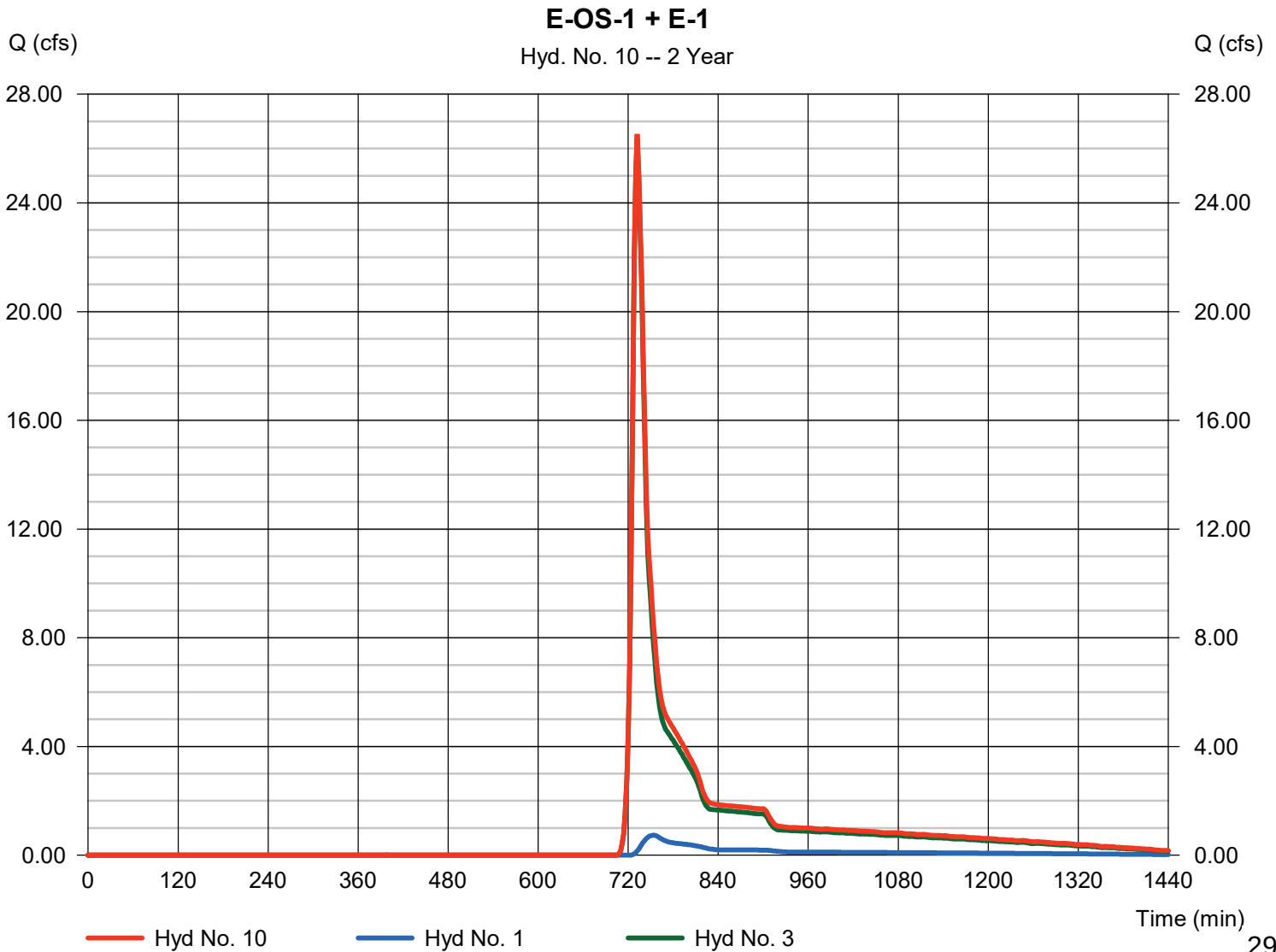
Tuesday, 05 / 7 / 2019

Hyd. No. 10

E-OS-1 + E-1

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 1, 3

Peak discharge = 26.54 cfs
Time to peak = 732 min
Hyd. volume = 1.879 acft
Contrib. drain. area = 44.210 ac



Hydrograph Report

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

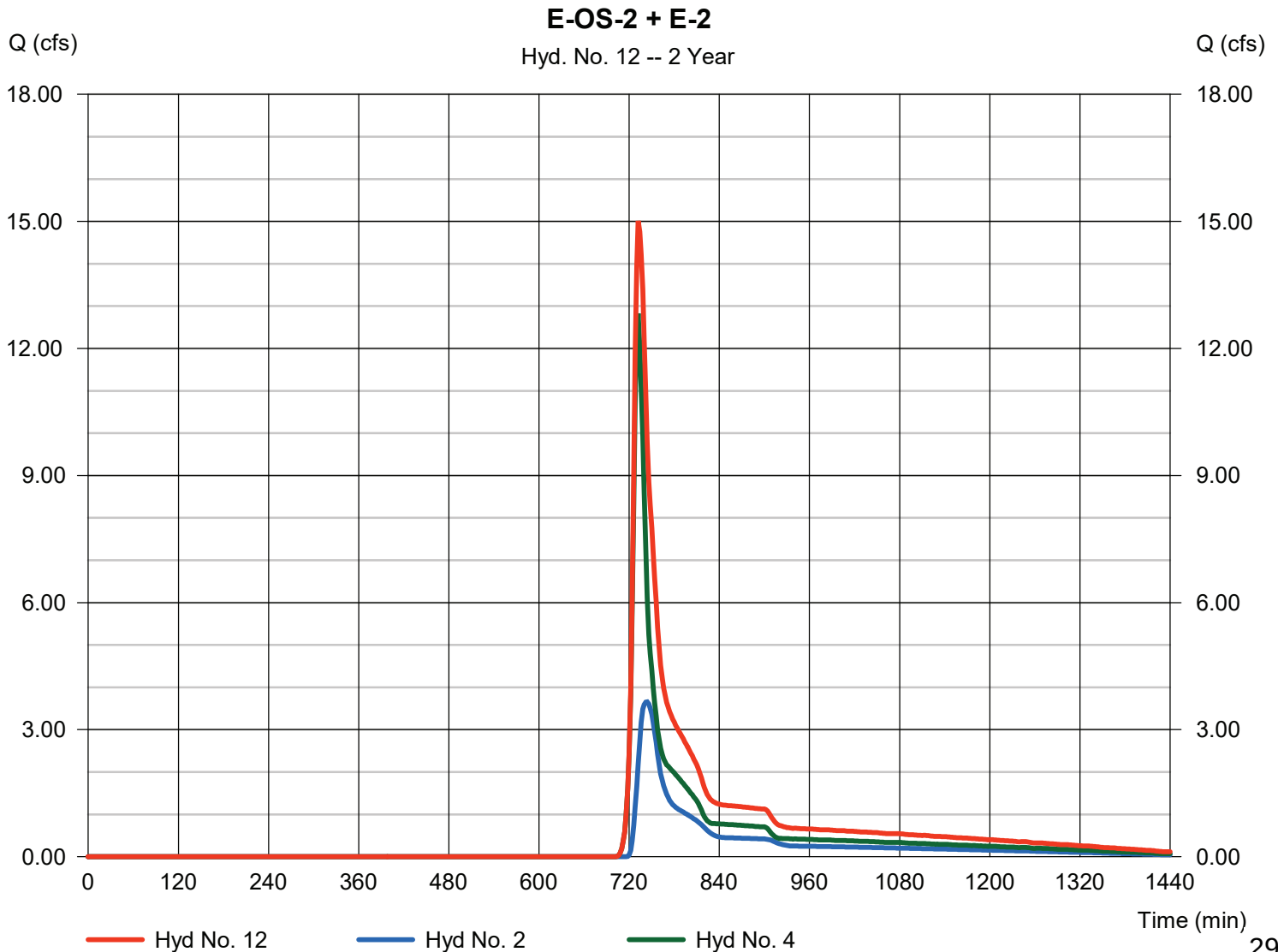
Tuesday, 05 / 7 / 2019

Hyd. No. 12

E-OS-2 + E-2

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

Peak discharge = 15.01 cfs
 Time to peak = 732 min
 Hyd. volume = 1.237 acft
 Contrib. drain. area = 27.980 ac



Hydrograph Report

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

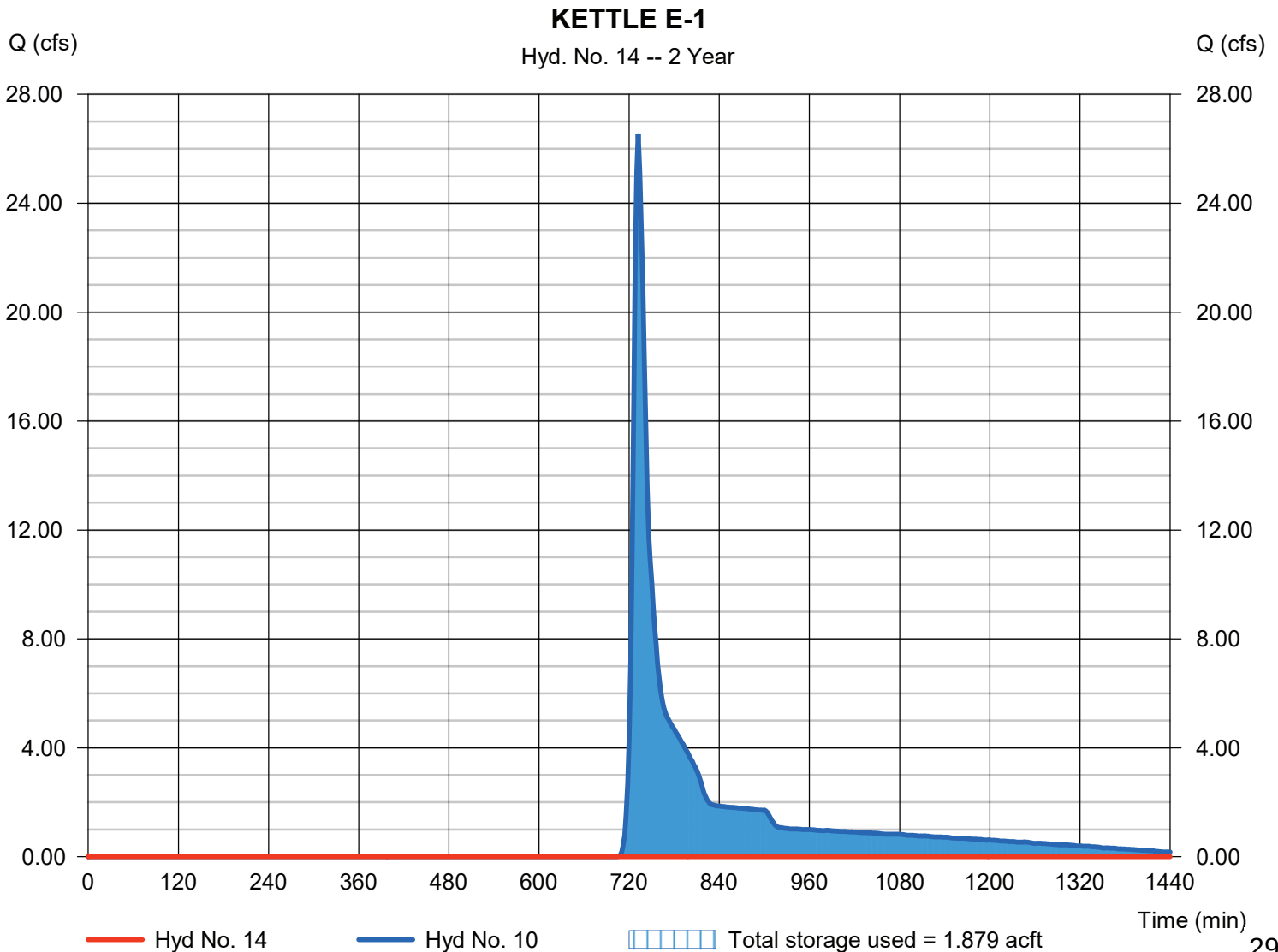
Tuesday, 05 / 7 / 2019

Hyd. No. 14

KETTLE E-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 10 - E-OS-1 + E-1	Max. Elevation	= 832.26 ft
Reservoir name	= KETTLE-E-1	Max. Storage	= 1.879 acft

Storage Indication method used.



Hydrograph Report

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

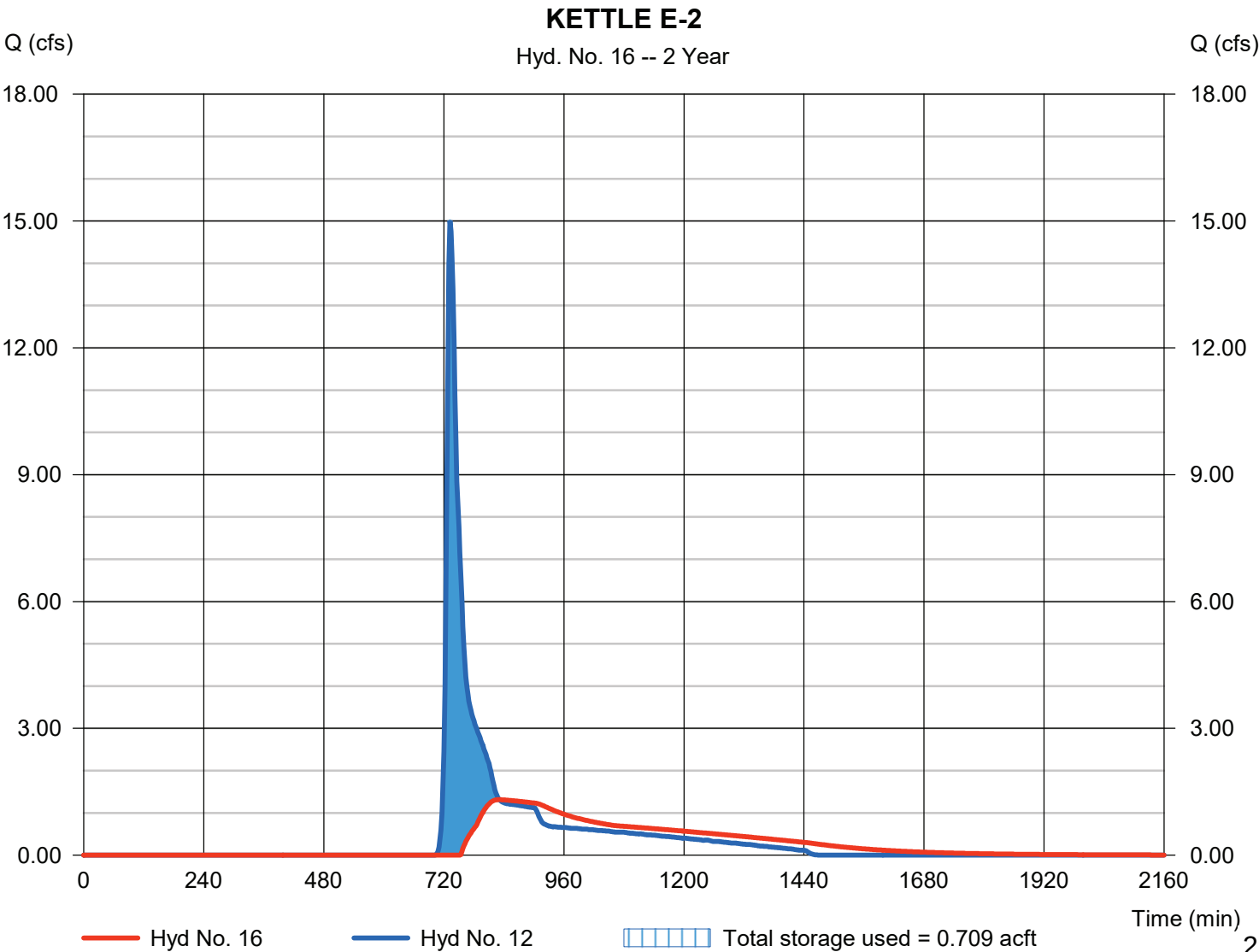
Tuesday, 05 / 7 / 2019

Hyd. No. 16

KETTLE E-2

Hydrograph type	= Reservoir	Peak discharge	= 1.313 cfs
Storm frequency	= 2 yrs	Time to peak	= 832 min
Time interval	= 2 min	Hyd. volume	= 0.752 acft
Inflow hyd. No.	= 12 - E-OS-2 + E-2	Max. Elevation	= 841.14 ft
Reservoir name	= KETTLE-E-2	Max. Storage	= 0.709 acft

Storage Indication method used.



Hydrograph Report

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

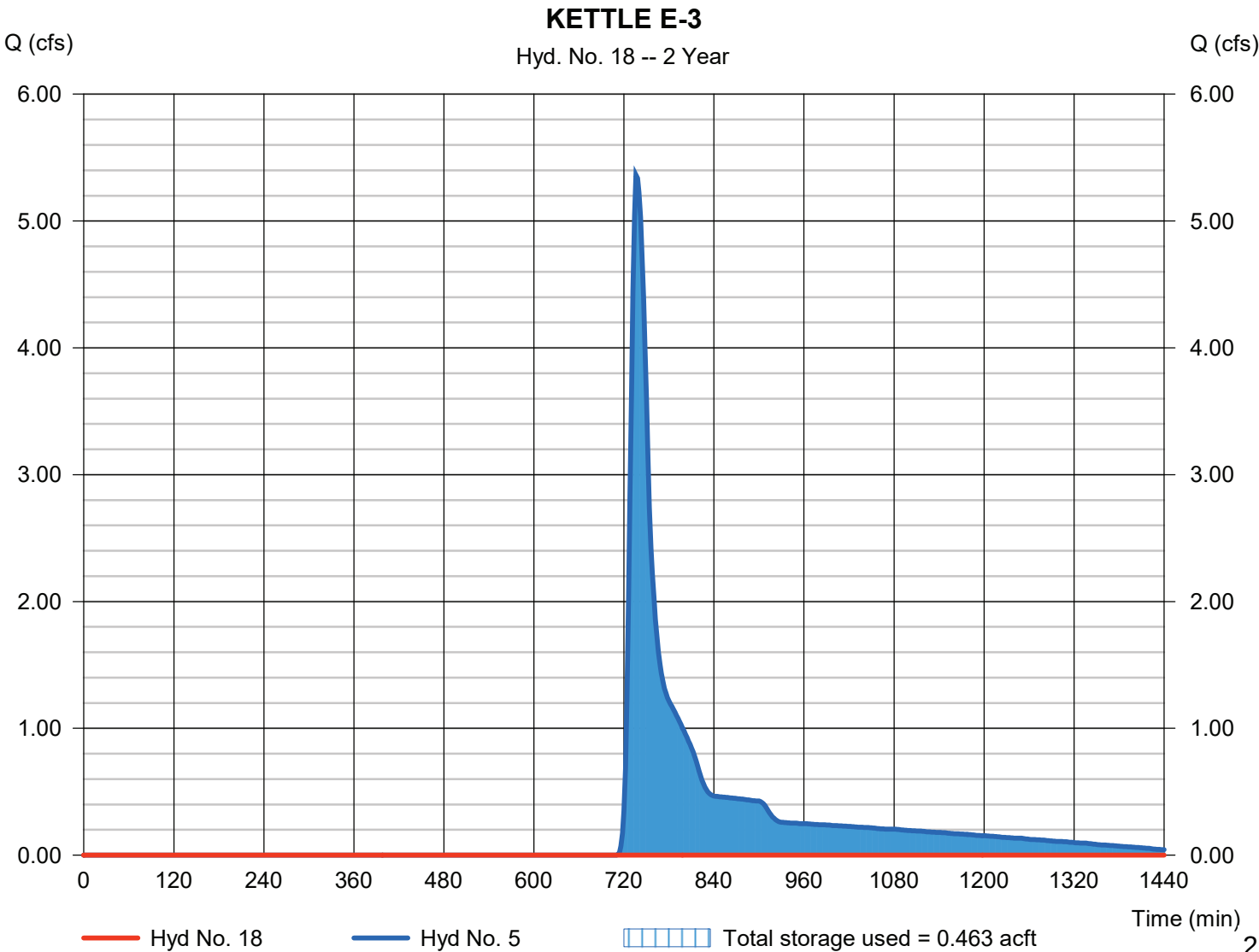
Tuesday, 05 / 7 / 2019

Hyd. No. 18

KETTLE E-3

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 5 - E-3	Max. Elevation	= 834.98 ft
Reservoir name	= KETTLE-E-3	Max. Storage	= 0.463 acft

Storage Indication method used.



Hydrograph Report

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

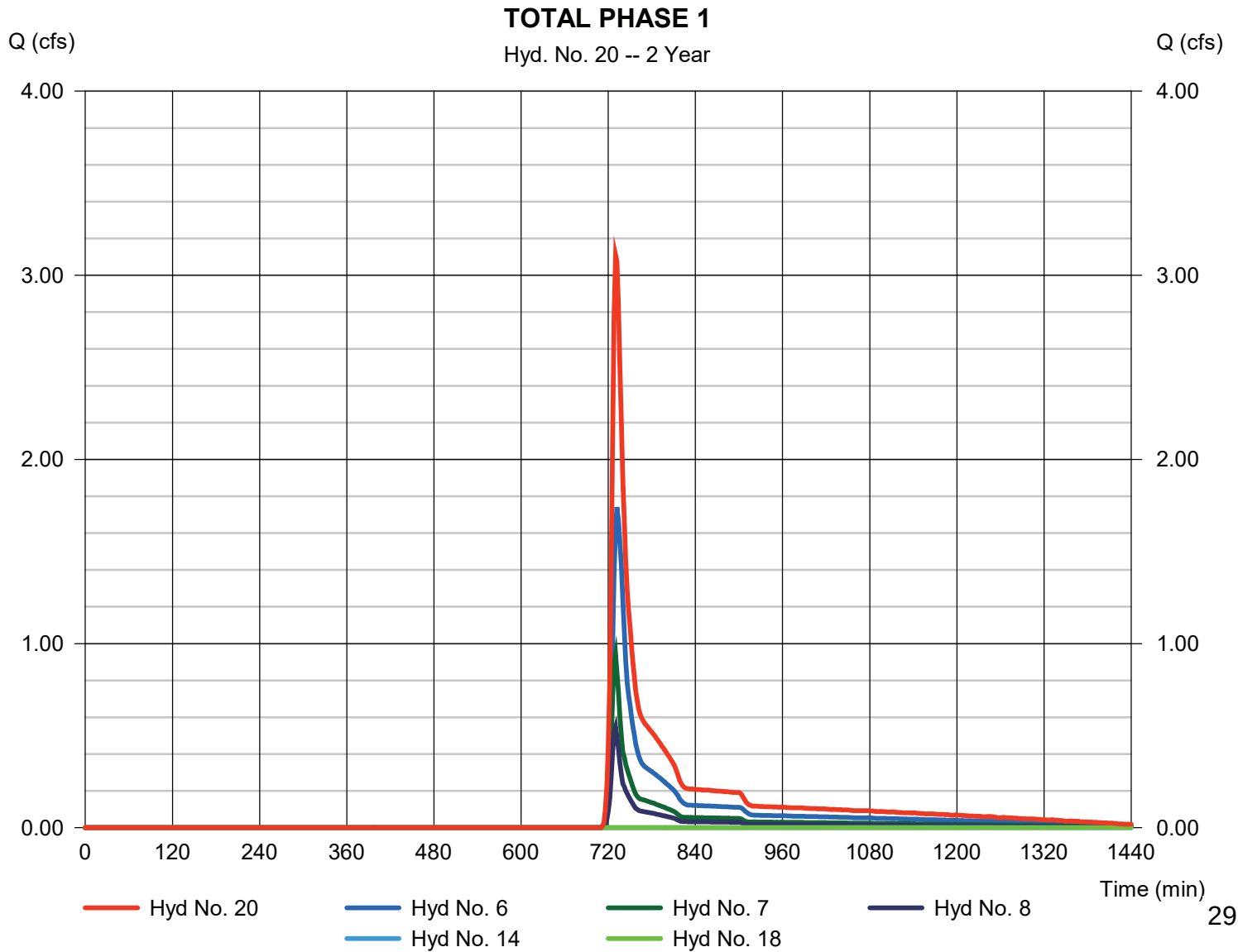
Tuesday, 05 / 7 / 2019

Hyd. No. 20

TOTAL PHASE 1

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 6, 7, 8, 14, 18

Peak discharge = 3.110 cfs
 Time to peak = 730 min
 Hyd. volume = 0.209 acft
 Contrib. drain. area = 4.769 ac



Hydrograph Report

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

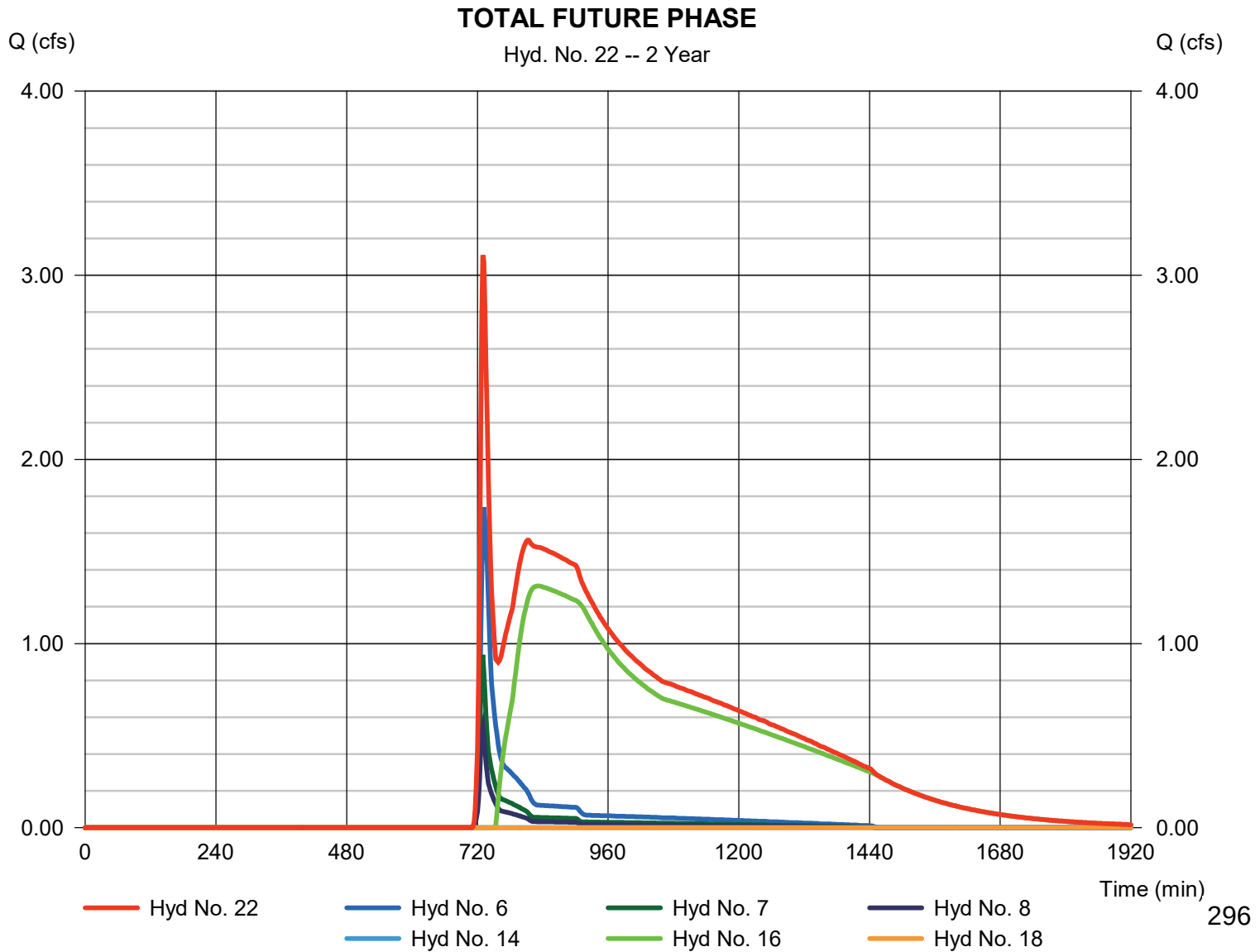
Tuesday, 05 / 7 / 2019

Hyd. No. 22

TOTAL FUTURE PHASE

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 6, 7, 8, 14, 16, 18

Peak discharge = 3.110 cfs
 Time to peak = 730 min
 Hyd. volume = 0.961 acft
 Contrib. drain. area = 4.769 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	4.180	2	744	0.463	-----	-----	-----	E-OS-1
2	SCS Runoff	11.46	2	738	1.000	-----	-----	-----	E-OS-2
3	SCS Runoff	61.15	2	732	3.704	-----	-----	-----	E-1
4	SCS Runoff	28.74	2	732	1.732	-----	-----	-----	E-2
5	SCS Runoff	13.79	2	736	1.028	-----	-----	-----	E-3
6	SCS Runoff	4.374	2	732	0.268	-----	-----	-----	E-4
7	SCS Runoff	2.300	2	730	0.123	-----	-----	-----	E-5
8	SCS Runoff	1.337	2	730	0.072	-----	-----	-----	E-6
10	Combine	63.67	2	732	4.167	1, 3,	-----	-----	E-OS-1 + E-1
12	Combine	37.49	2	732	2.732	2, 4,	-----	-----	E-OS-2 + E-2
14	Reservoir	0.000	2	n/a	0.000	10	833.59	4.17	KETTLE E-1
16	Reservoir	7.997	2	766	2.247	12	841.46	1.22	KETTLE E-2
18	Reservoir	0.000	2	n/a	0.000	5	836.47	1.03	KETTLE E-3
20	Combine	7.912	2	730	0.463	6, 7, 8, 14, 18,	-----	-----	TOTAL PHASE 1
22	Combine	9.231	2	760	2.710	6, 7, 8, 14, 16, 18,	-----	-----	TOTAL FUTURE PHASE
2019-02-19_CHAPMAN FARMS_EXISTING.dwg					Return Period: 10 Year			Tuesday, 05 / 7 / 2019	

Hydrograph Report

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

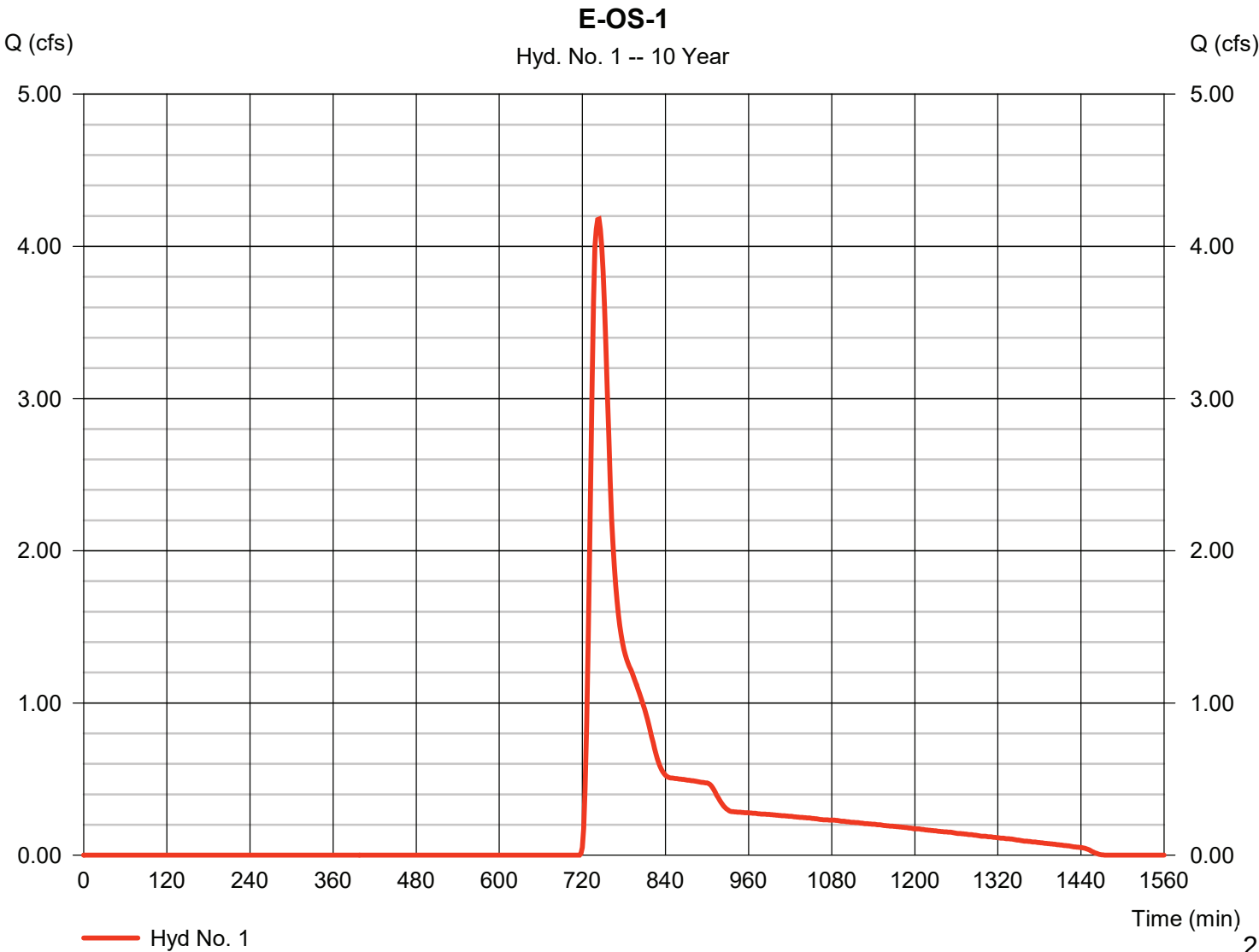
Tuesday, 05 / 7 / 2019

Hyd. No. 1

E-OS-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.180 cfs
Storm frequency	=	10 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	0.463 acft
Drainage area	=	10.160 ac	Curve number	=	57*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	22.50 min
Total precip.	=	3.81 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management			

* Composite (Area/CN) = [(1.300 x 69) + (8.860 x 55)] / 10.160



Precipitation Report

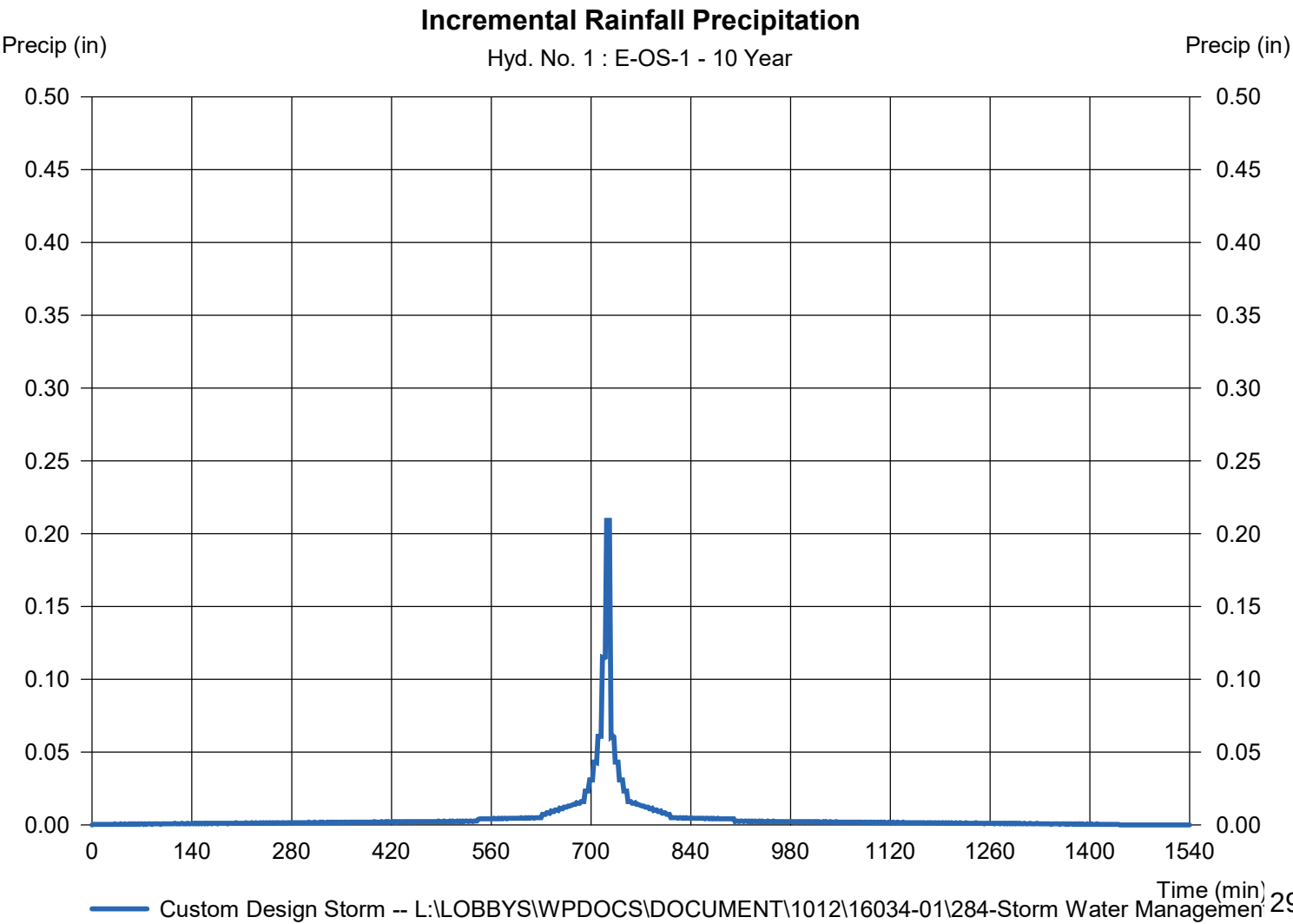
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 1

E-OS-1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

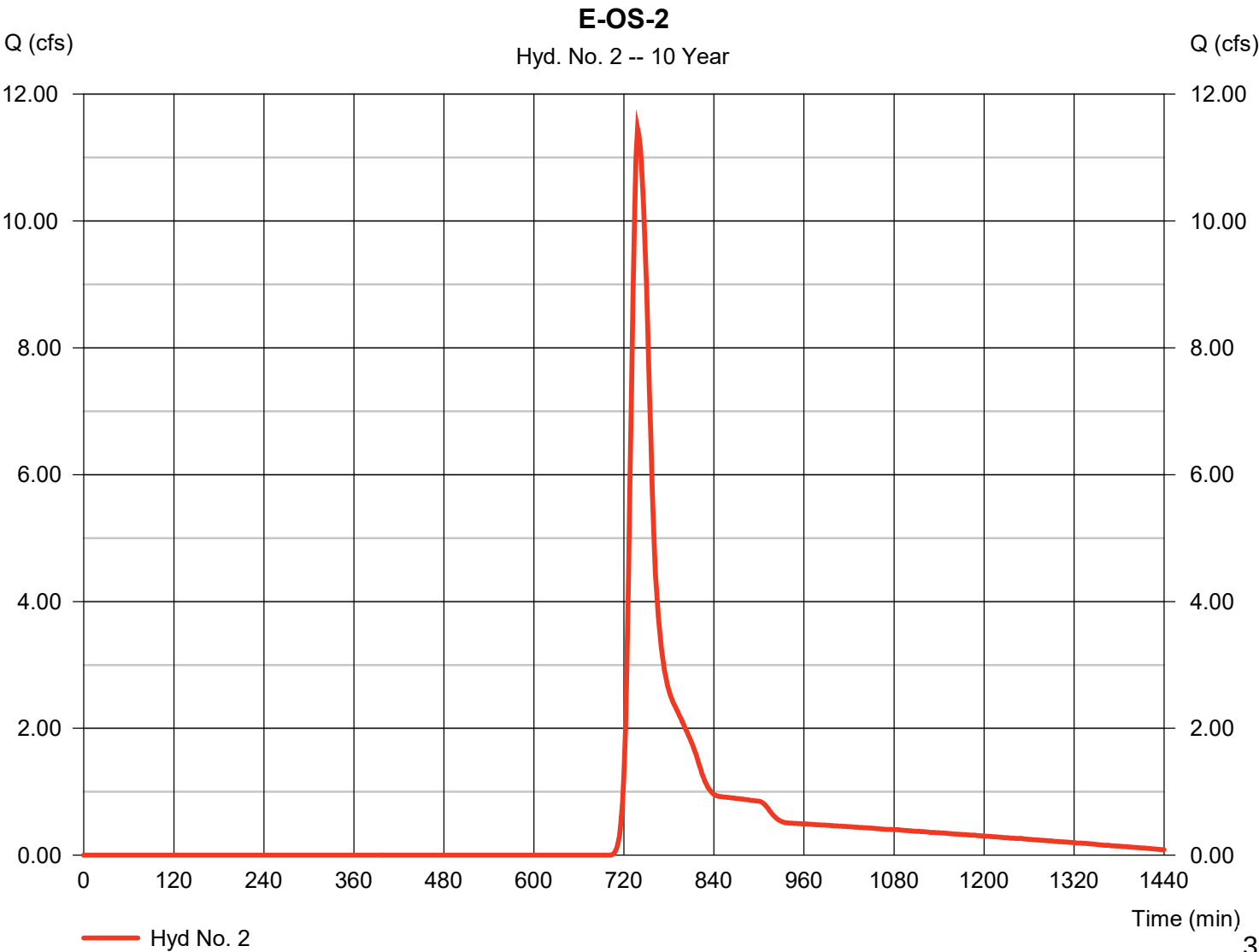
Tuesday, 05 / 7 / 2019

Hyd. No. 2

E-OS-2

Hydrograph type	= SCS Runoff	Peak discharge	= 11.46 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 1.000 acft
Drainage area	= 12.810 ac	Curve number	= 65*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.80 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\Hydro\101216034-01\28481 Storm Water Management		

* Composite (Area/CN) = [(9.150 x 69) + (3.660 x 55)] / 12.810



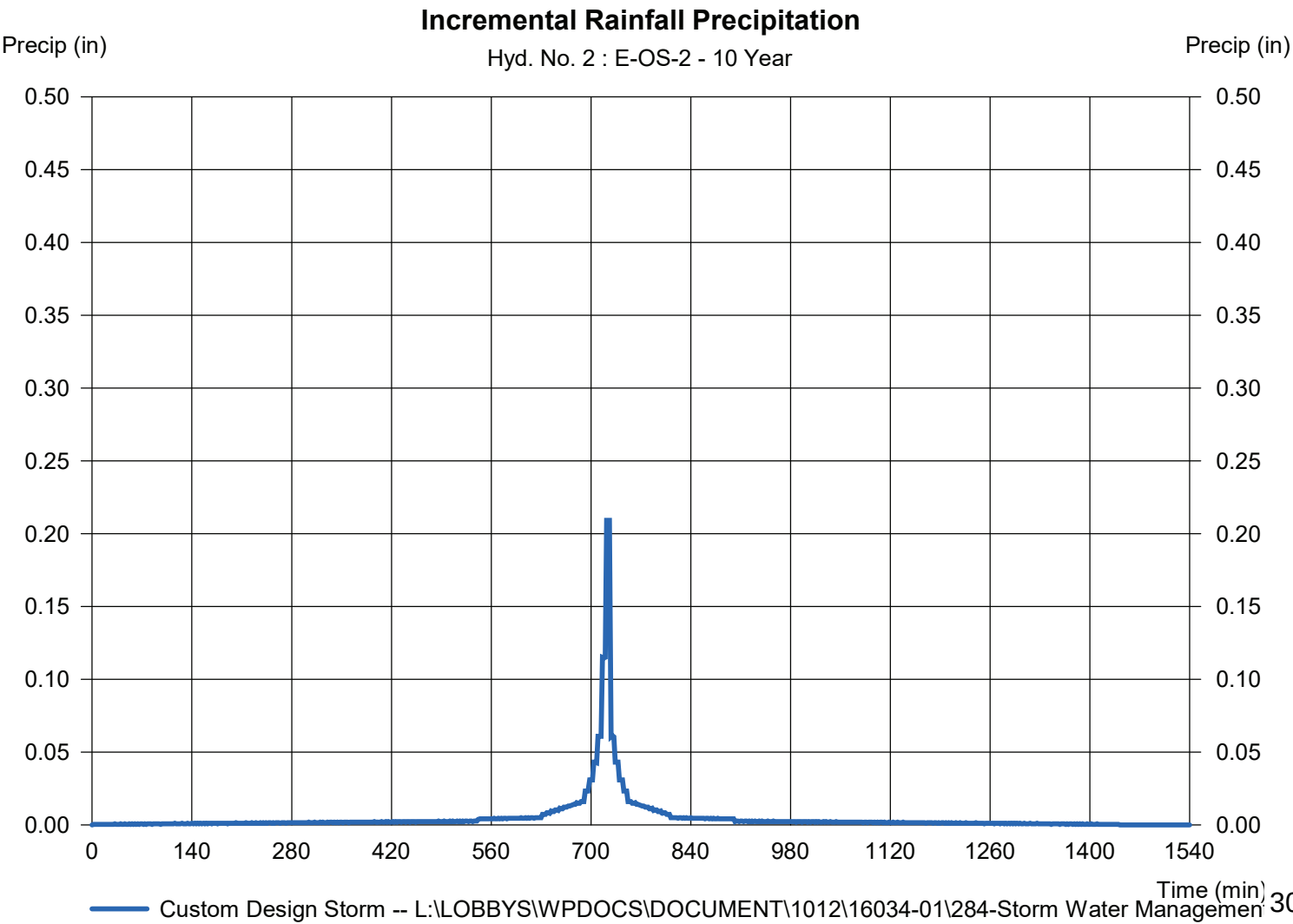
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Tuesday, 05 / 7 / 2019

Hyd. No. 2

E-OS-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

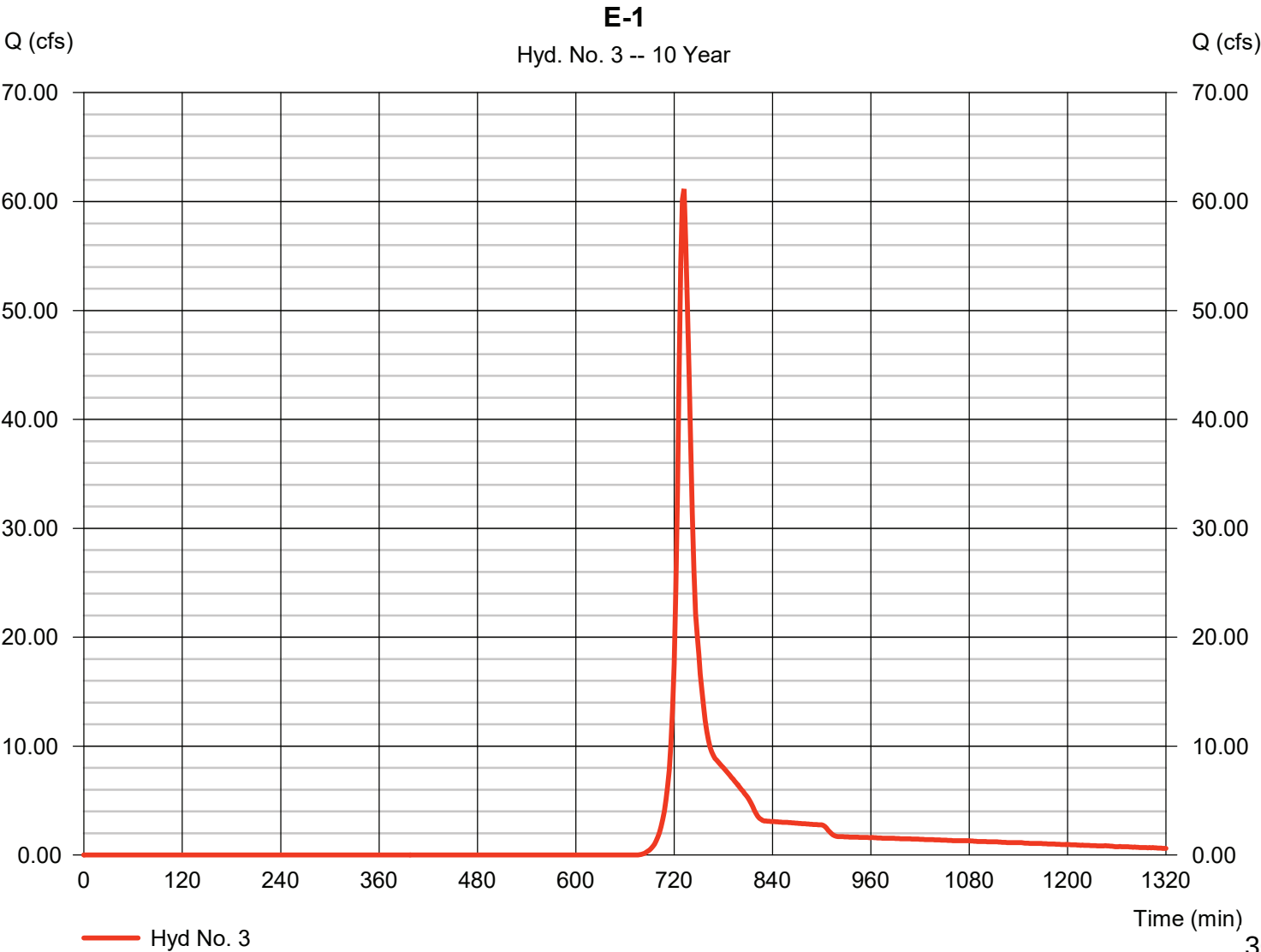
Tuesday, 05 / 7 / 2019

Hyd. No. 3

E-1

Hydrograph type	= SCS Runoff	Peak discharge	= 61.15 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 3.704 acft
Drainage area	= 34.050 ac	Curve number	= 71*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\284481 Storm Water Management		

* Composite (Area/CN) = [(8.640 x 78) + (25.410 x 69)] / 34.050



Precipitation Report

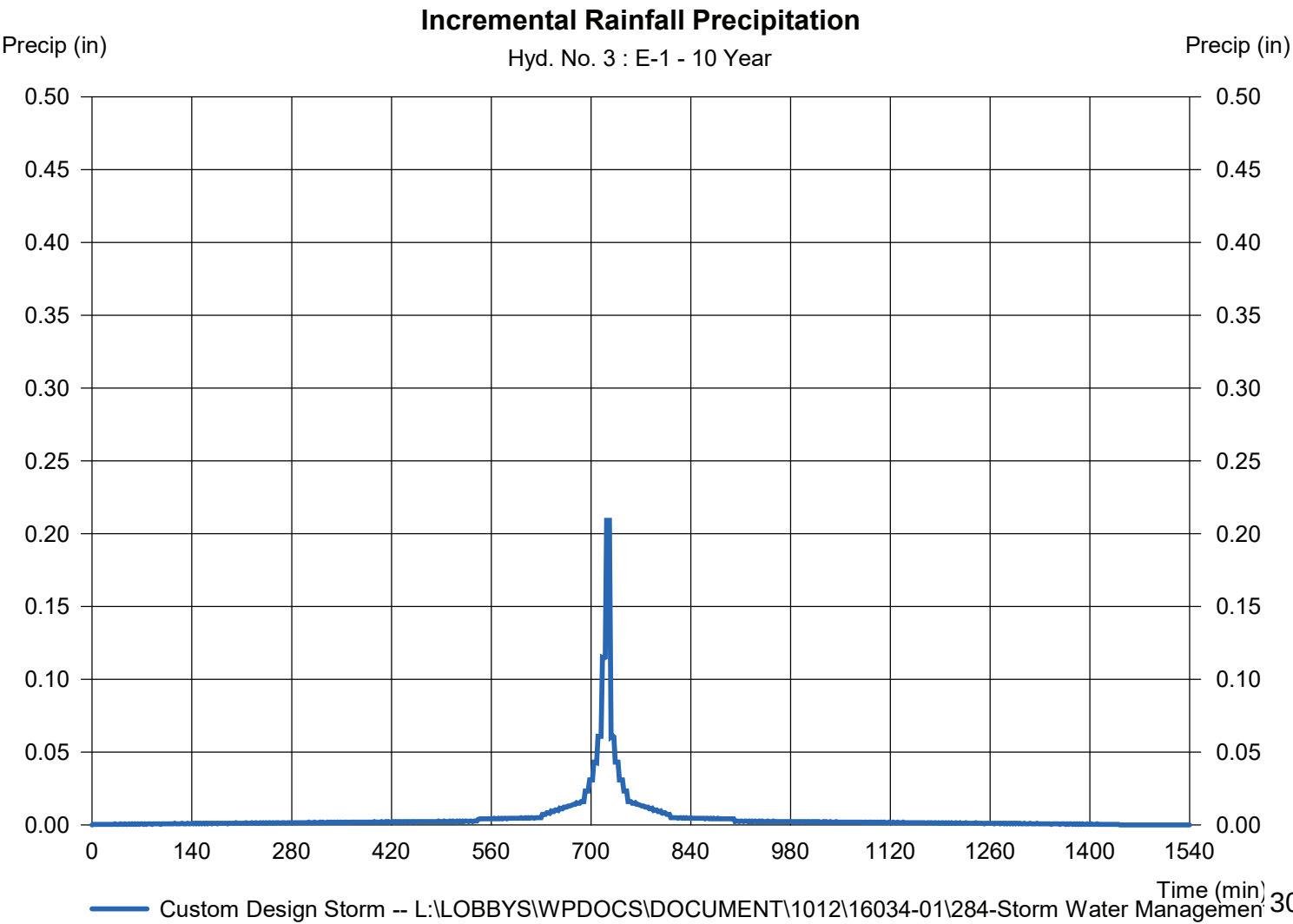
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 3

E-1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

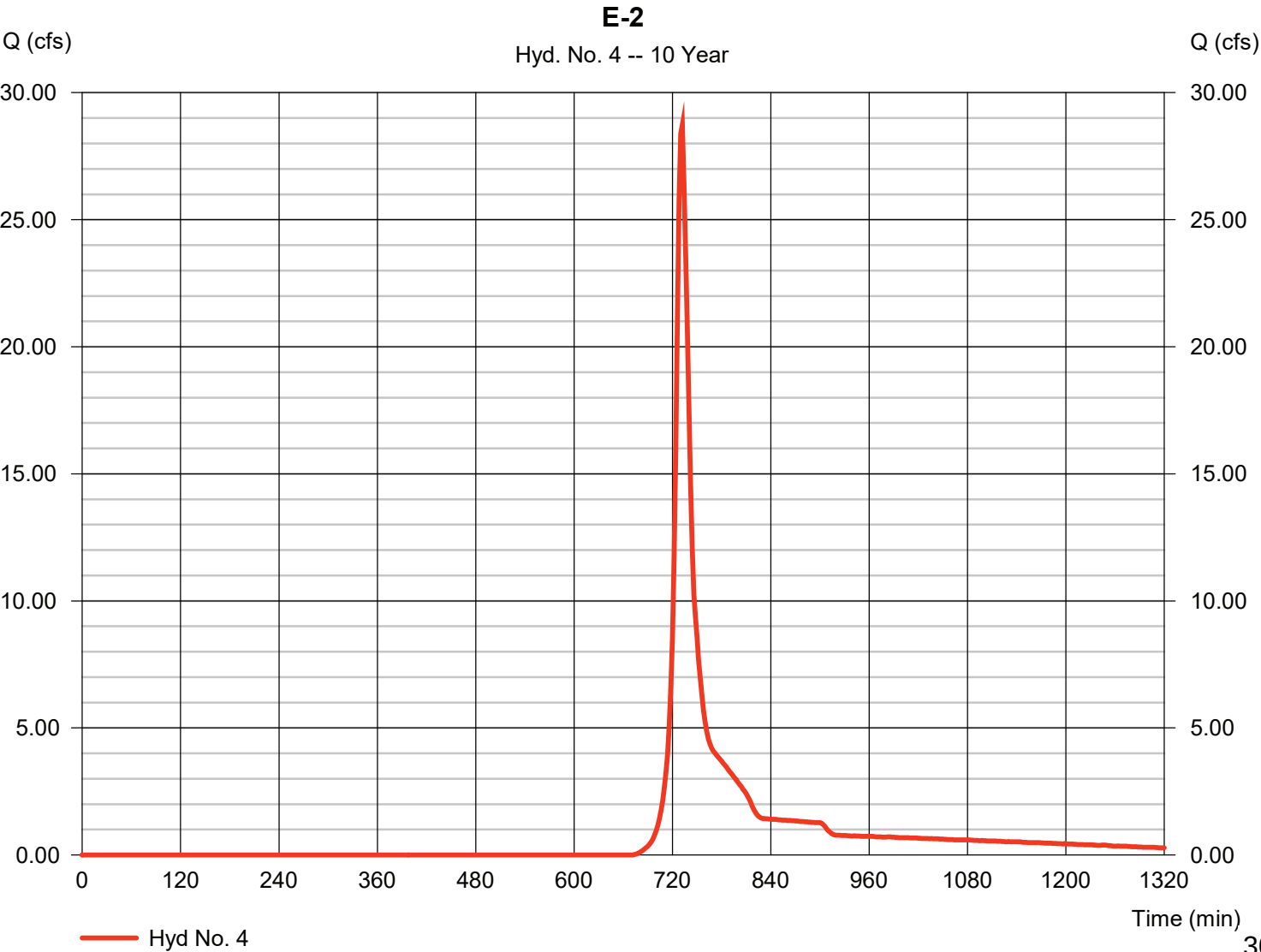
Tuesday, 05 / 7 / 2019

Hyd. No. 4

E-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	28.74 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	1.732 acft
Drainage area	=	15.170 ac	Curve number	=	72*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.30 min
Total precip.	=	3.81 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrographs\16034-01\284481 Storm Water Management			

* Composite (Area/CN) = [(4.970 x 78) + (10.200 x 69)] / 15.170



Precipitation Report

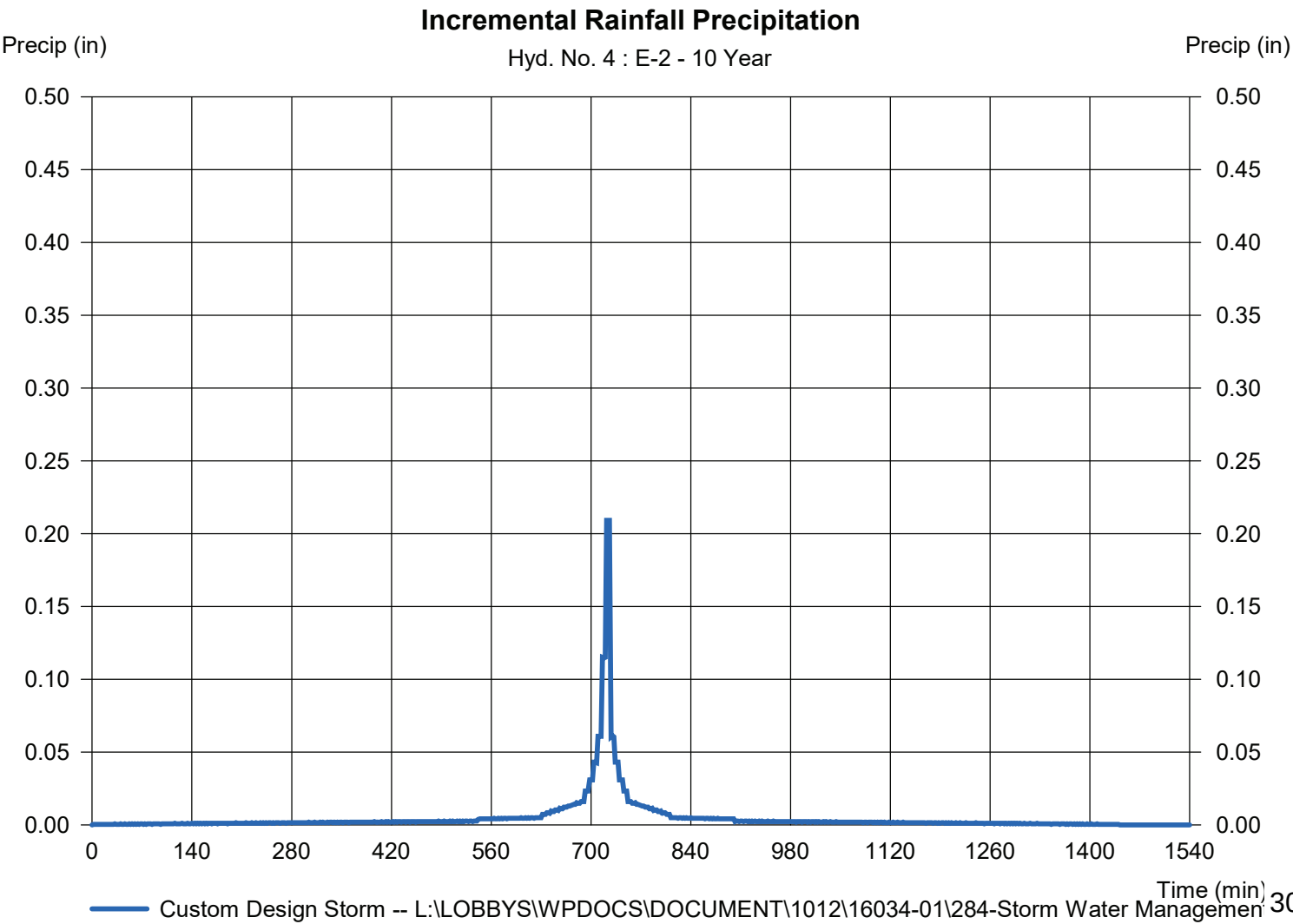
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 4

E-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

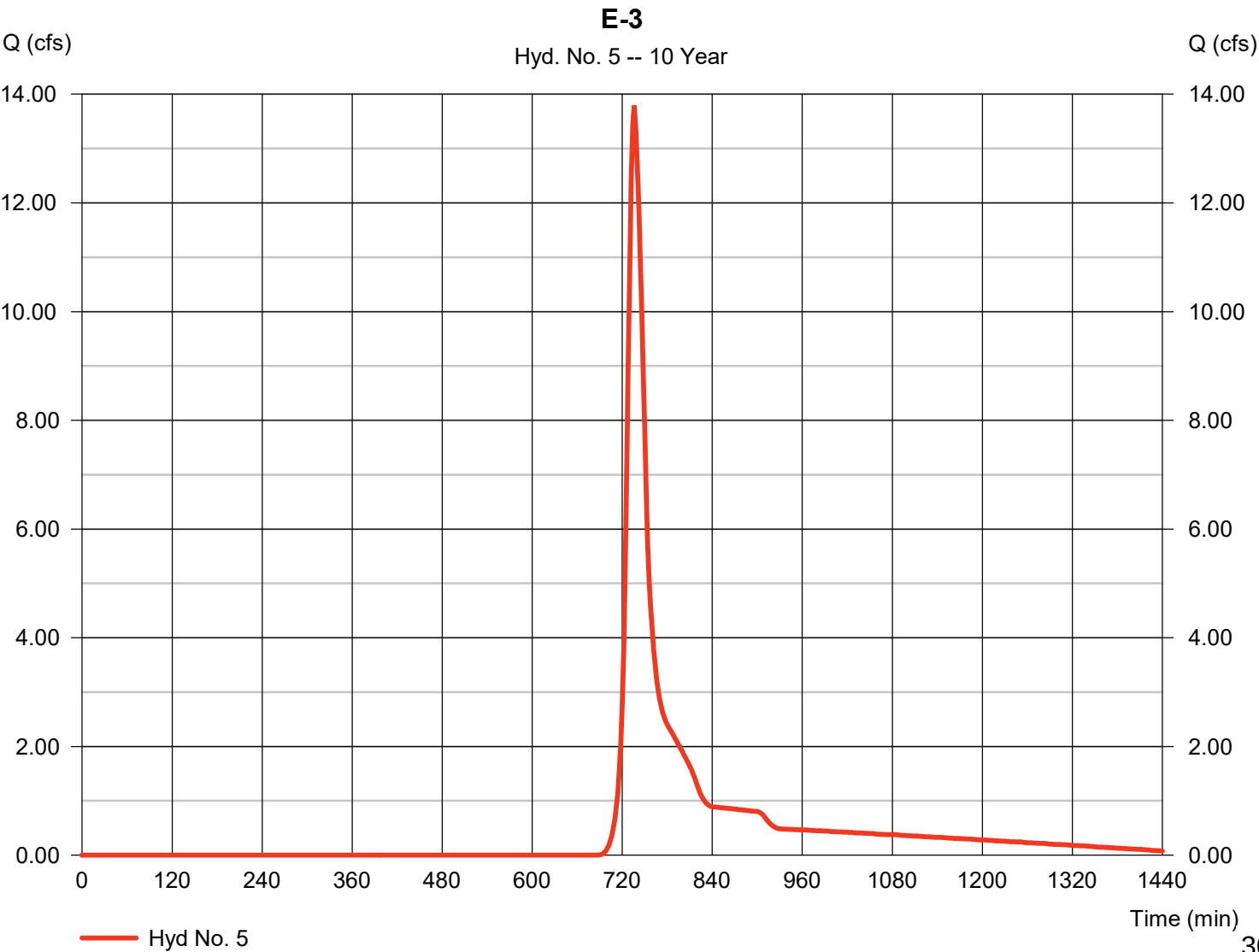
Tuesday, 05 / 7 / 2019

Hyd. No. 5

E-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.79 cfs
Storm frequency	=	10 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	1.028 acft
Drainage area	=	10.776 ac	Curve number	=	69*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.30 min
Total precip.	=	3.81 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrographs\16034-01\28481 Storm Water Management			

* Composite (Area/CN) = [(11.490 x 69)] / 10.776



Precipitation Report

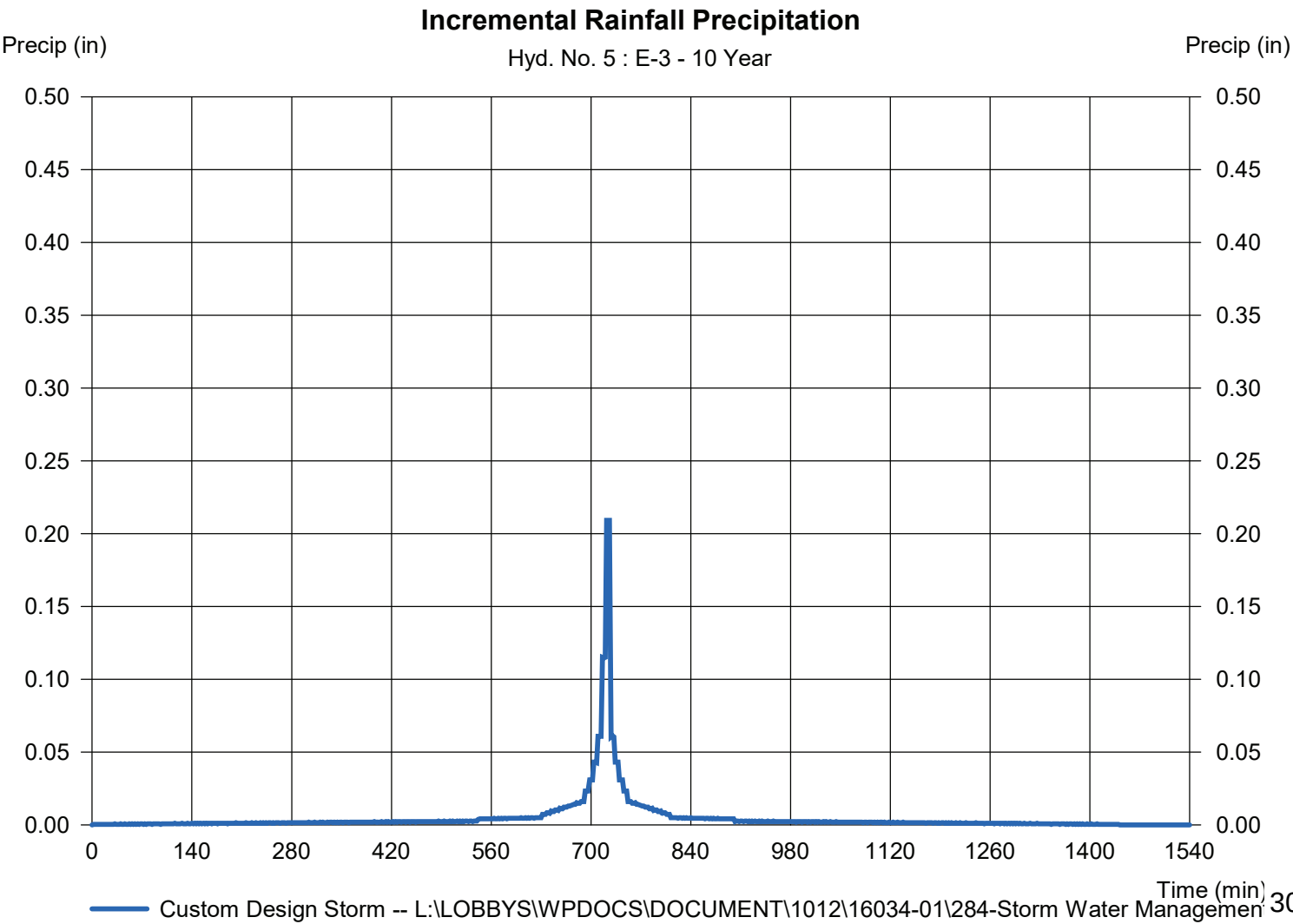
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 5

E-3

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

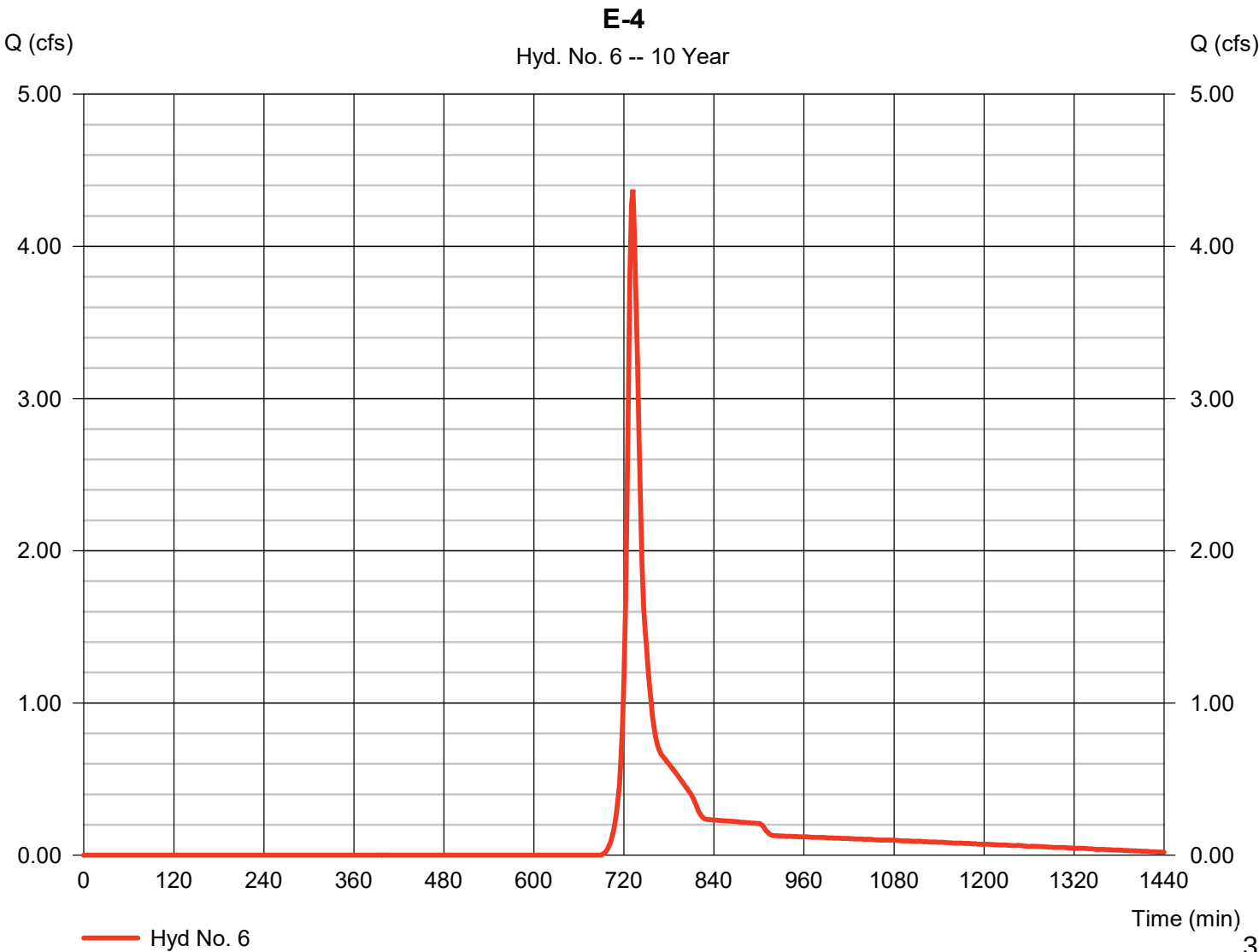
Tuesday, 05 / 7 / 2019

Hyd. No. 6

E-4

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.374 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	0.268 acft
Drainage area	=	2.729 ac	Curve number	=	69*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.40 min
Total precip.	=	3.81 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management			

* Composite (Area/CN) = [(2.010 x 69)] / 2.729



Precipitation Report

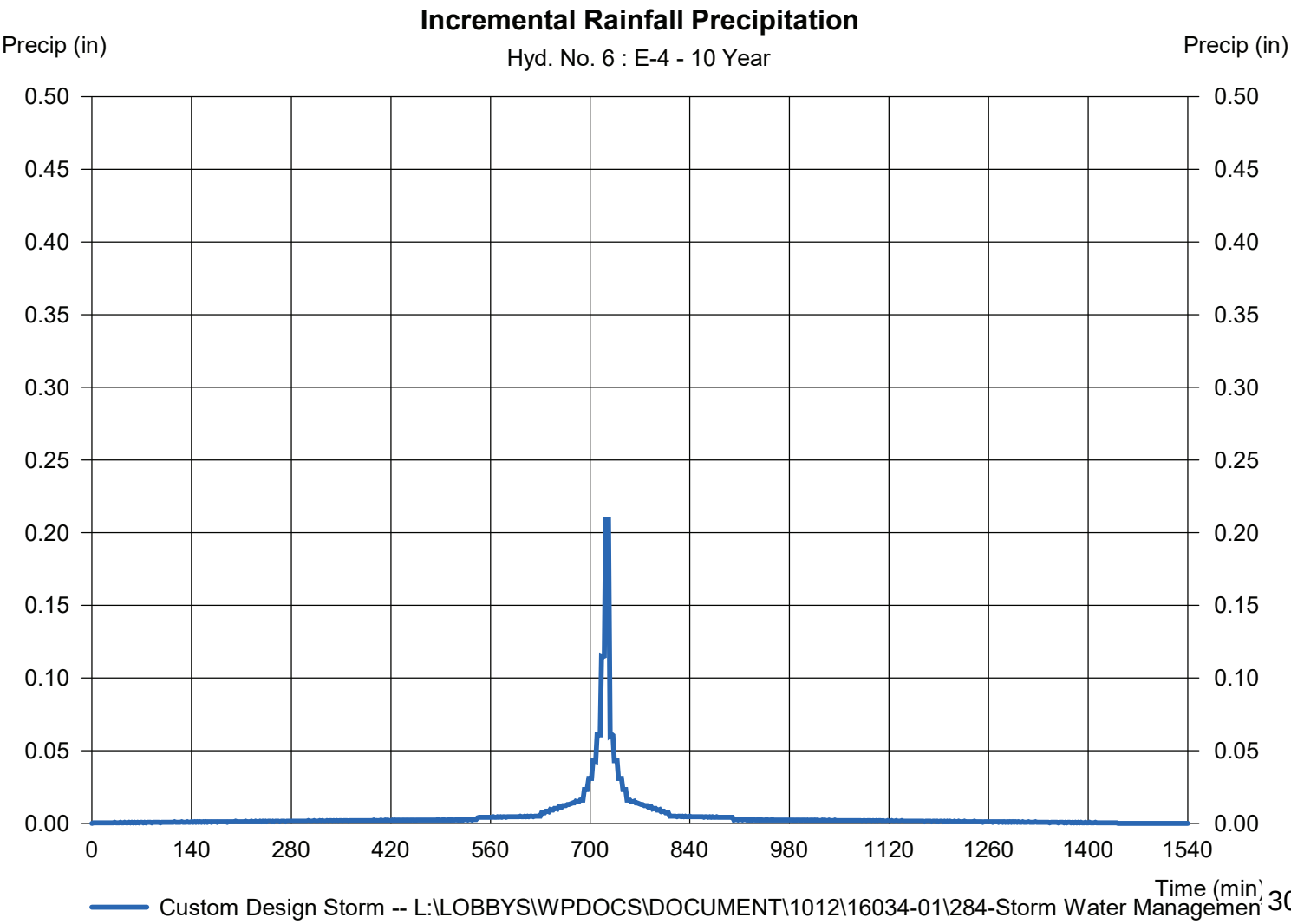
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 6

E-4

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

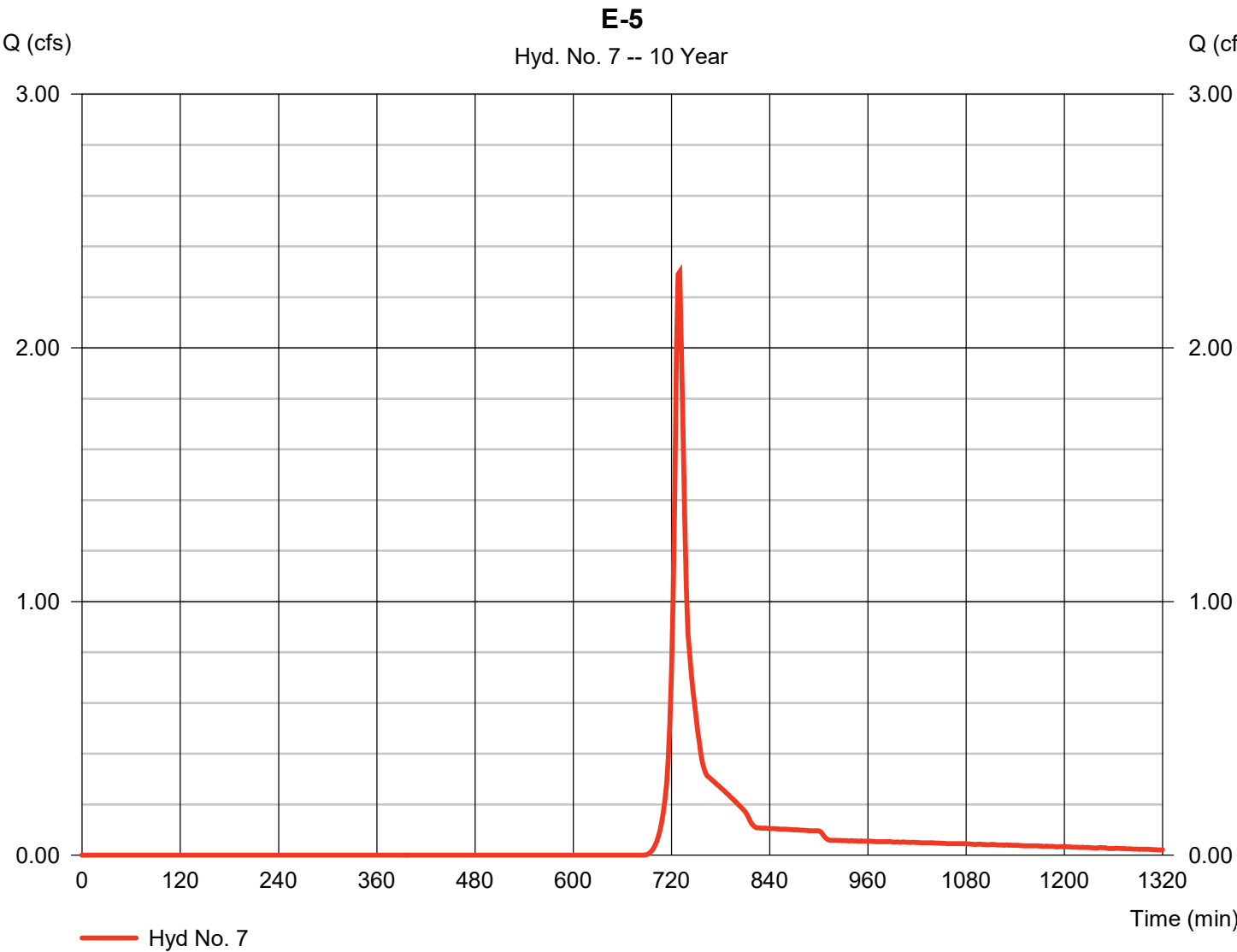
Tuesday, 05 / 7 / 2019

Hyd. No. 7

E-5

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.300 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	0.123 acft
Drainage area	=	1.290 ac	Curve number	=	69*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.50 min
Total precip.	=	3.81 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrographs\16034-01\28484 Storm Water Management			

* Composite (Area/CN) = [(1.290 x 69)] / 1.290



Precipitation Report

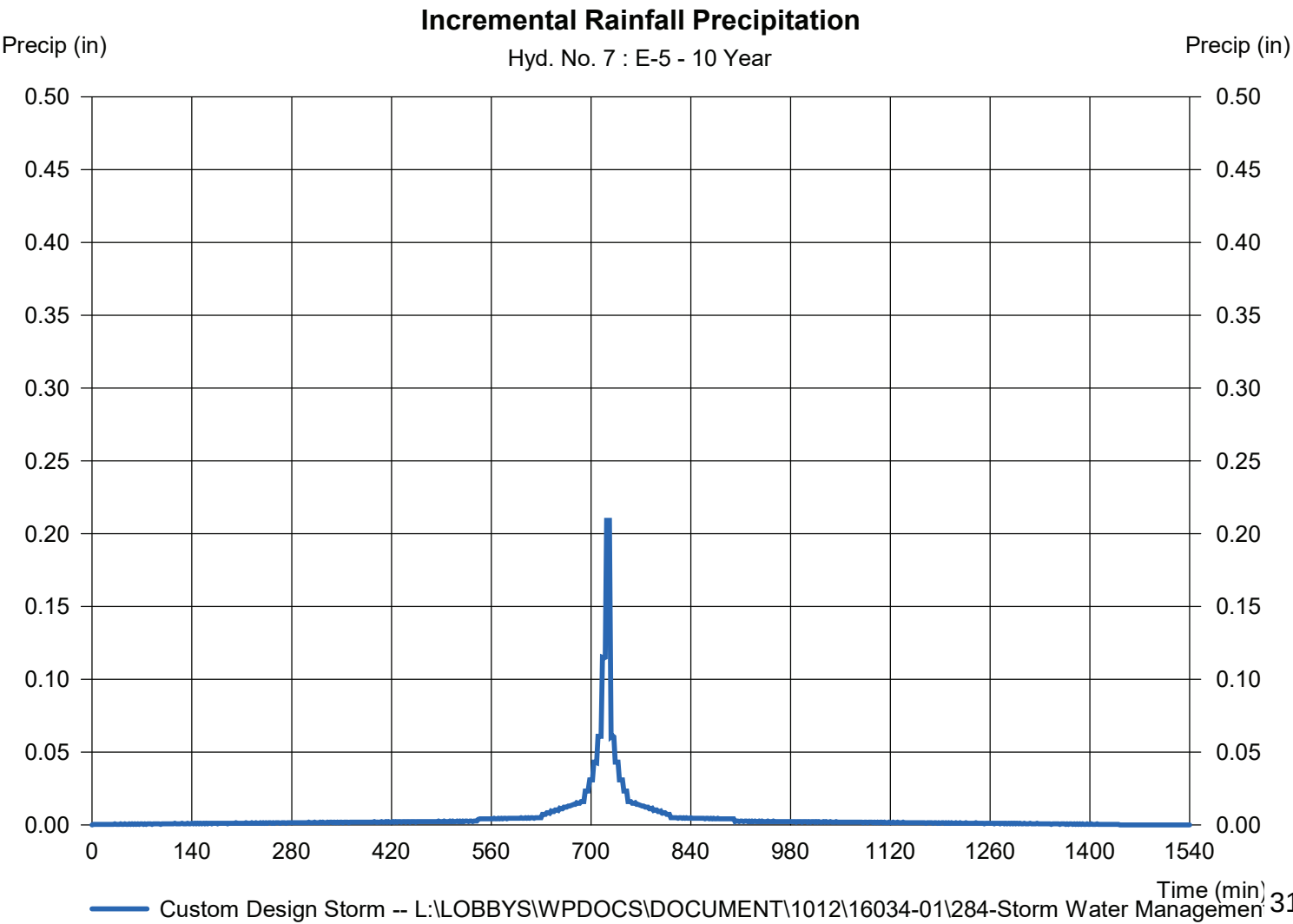
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 7

E-5

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

Tuesday, 05 / 7 / 2019

Hyd. No. 8

E-6

Hydrograph type	= SCS Runoff	Peak discharge	= 1.337 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 0.072 acft
Drainage area	= 0.750 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.50 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrographs\16034-01\284481 Storm Water Management		

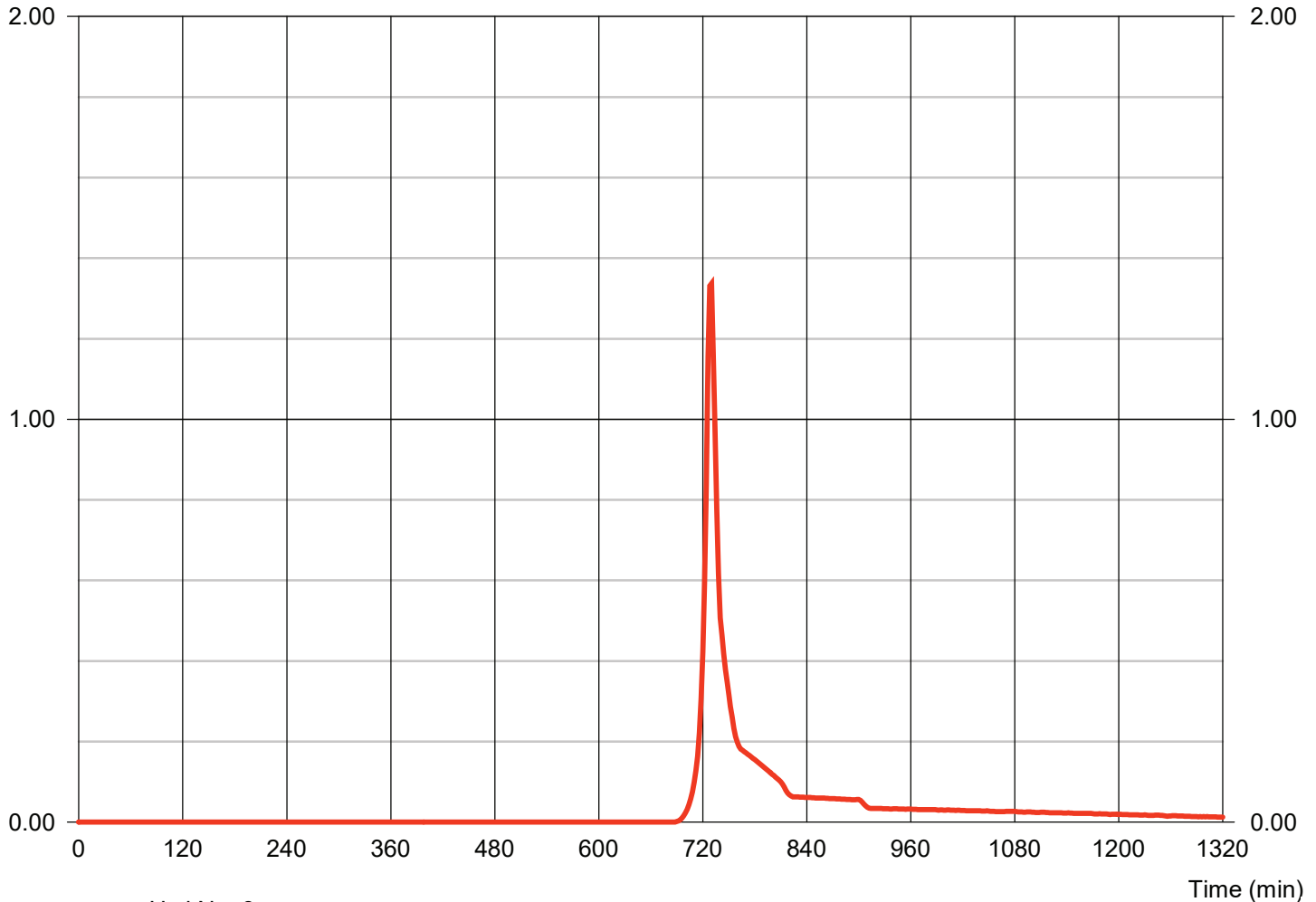
* Composite (Area/CN) = $[(0.760 \times 69)] / 0.750$

E-6

Q (cfs)

Hyd. No. 8 -- 10 Year

Q (cfs)



— Hyd No. 8

312

Precipitation Report

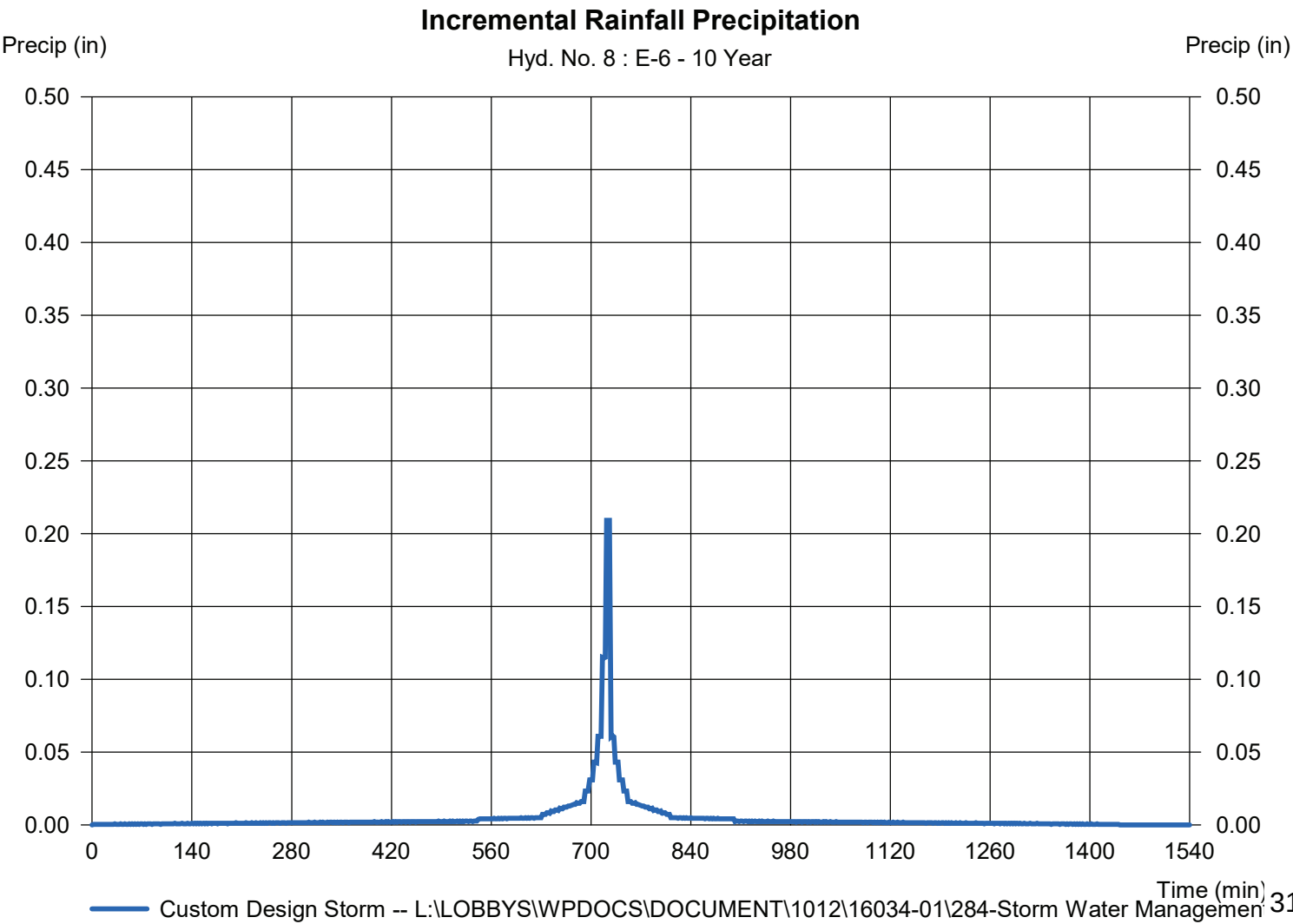
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 8

E-6

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

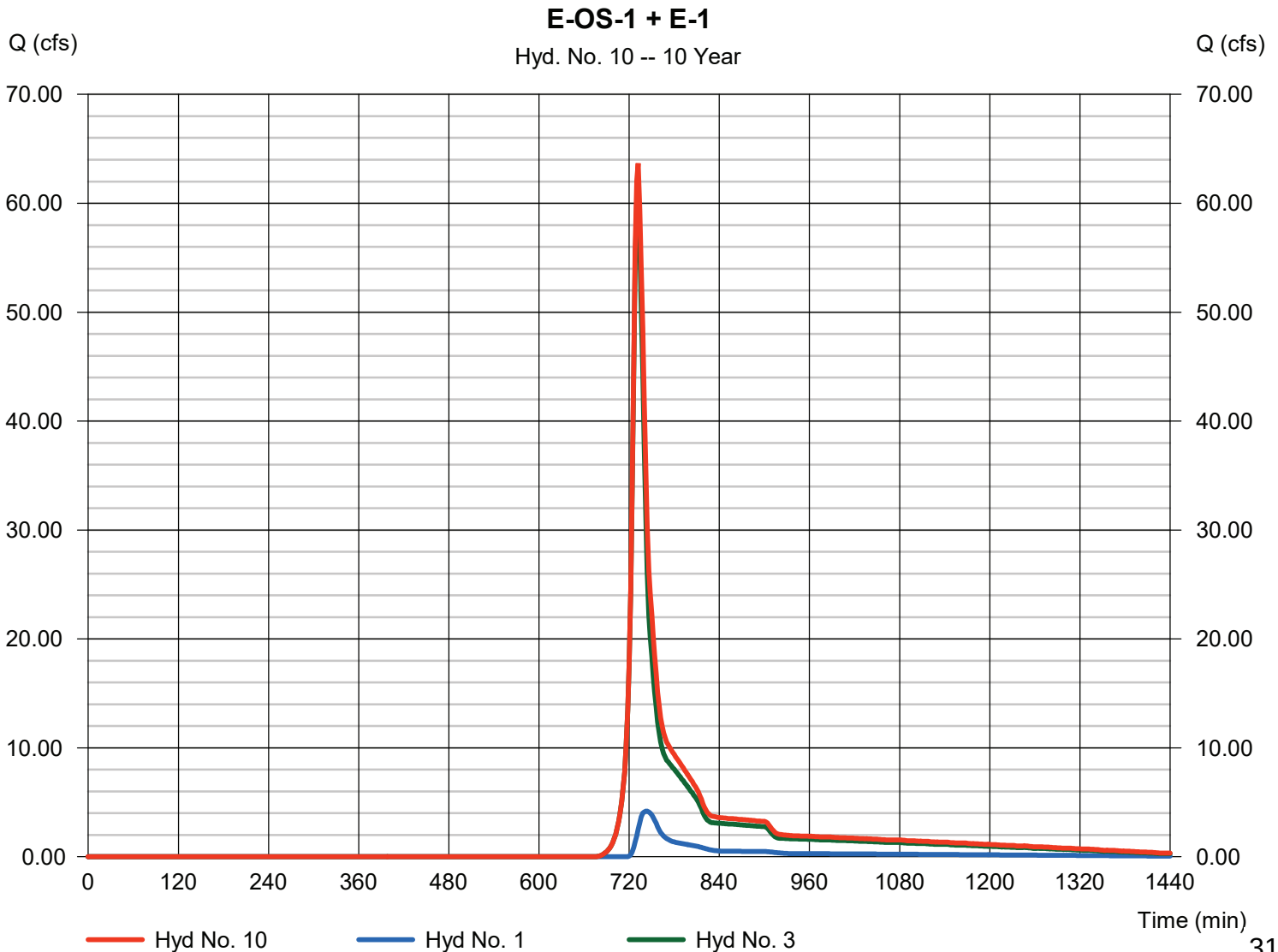
Tuesday, 05 / 7 / 2019

Hyd. No. 10

E-OS-1 + E-1

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 3

Peak discharge = 63.67 cfs
 Time to peak = 732 min
 Hyd. volume = 4.167 acft
 Contrib. drain. area = 44.210 ac



Hydrograph Report

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

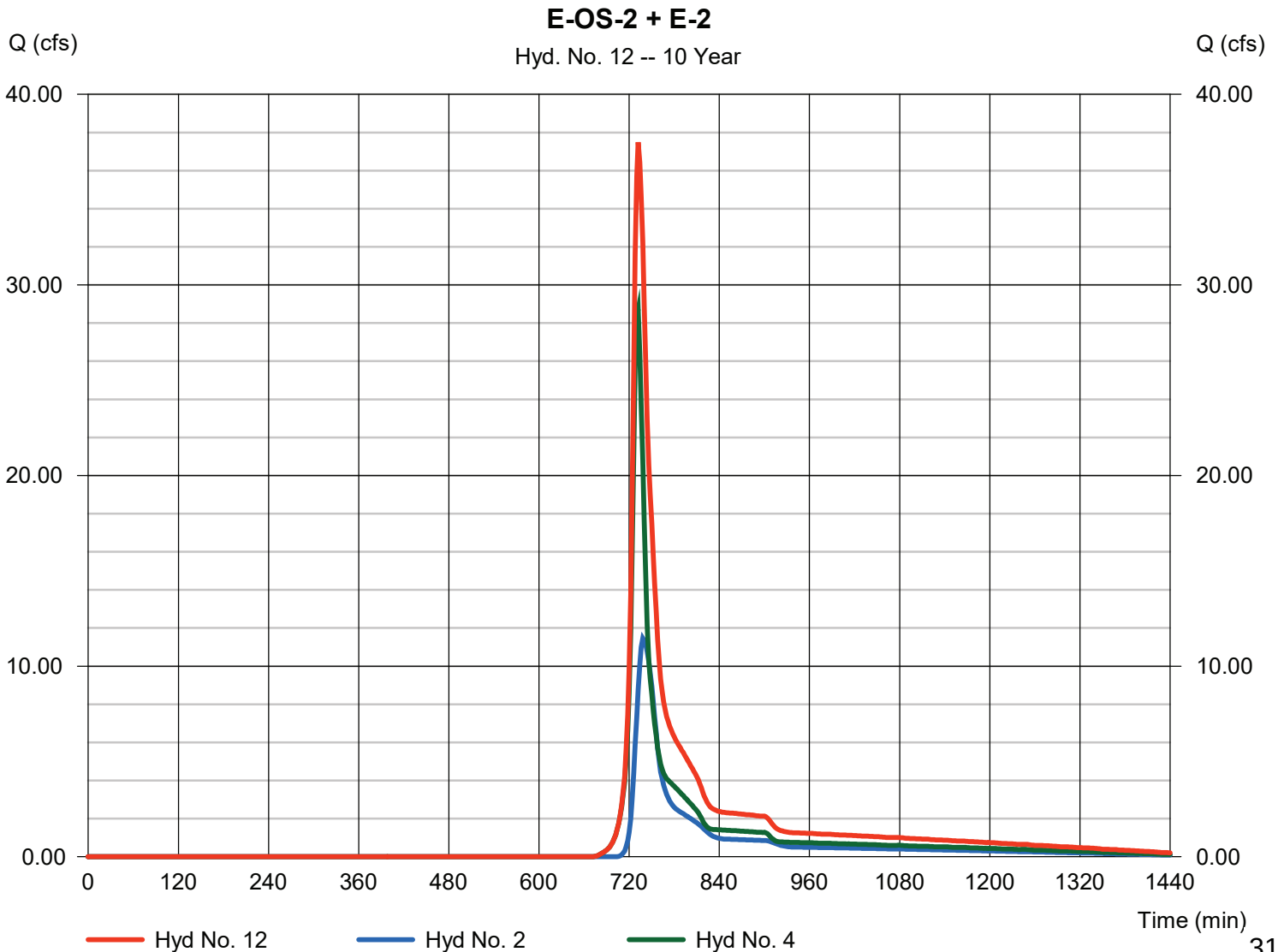
Tuesday, 05 / 7 / 2019

Hyd. No. 12

E-OS-2 + E-2

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 2, 4

Peak discharge = 37.49 cfs
 Time to peak = 732 min
 Hyd. volume = 2.732 acft
 Contrib. drain. area = 27.980 ac



Hydrograph Report

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

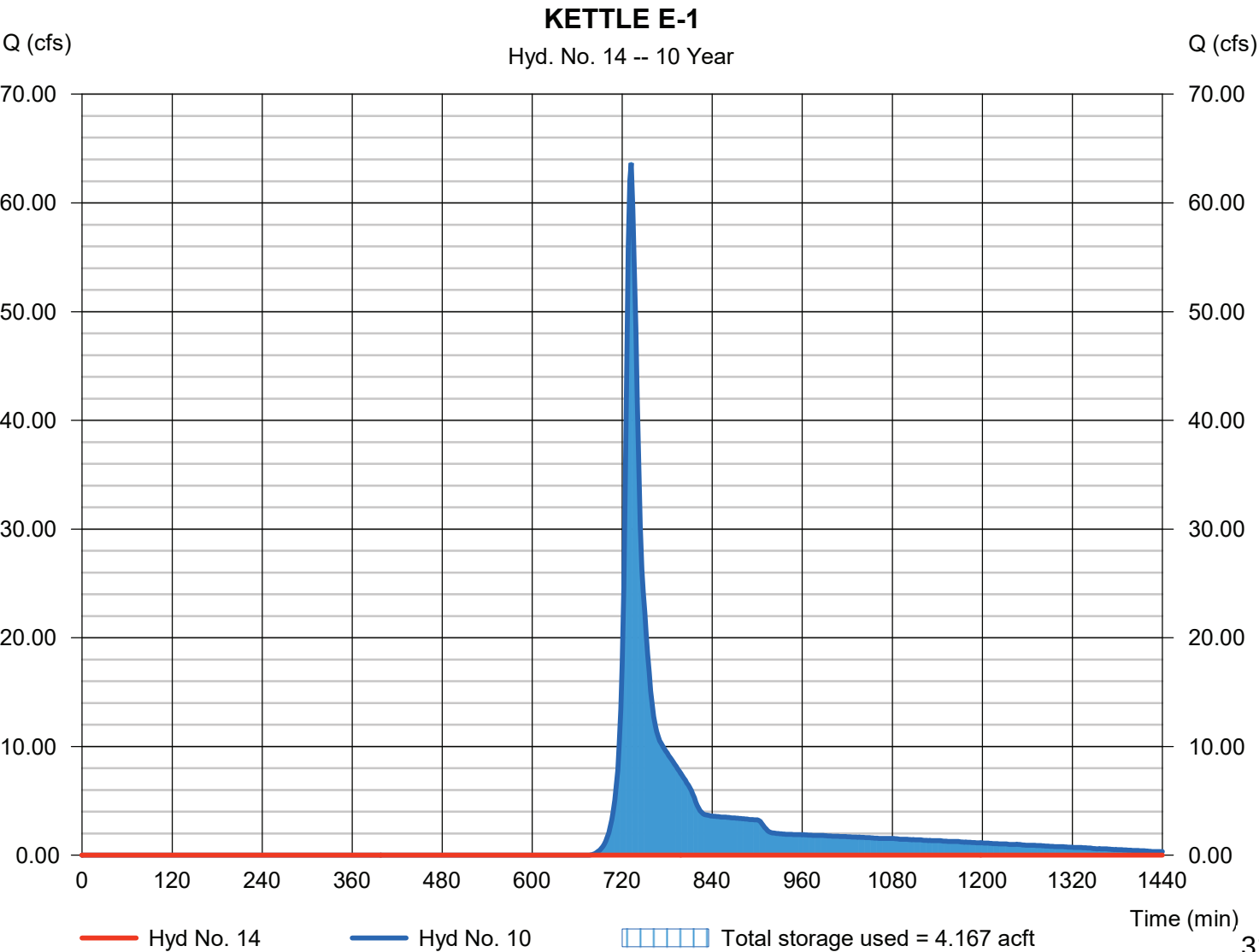
Tuesday, 05 / 7 / 2019

Hyd. No. 14

KETTLE E-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 10 - E-OS-1 + E-1	Max. Elevation	= 833.59 ft
Reservoir name	= KETTLE-E-1	Max. Storage	= 4.167 acft

Storage Indication method used.



Hydrograph Report

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

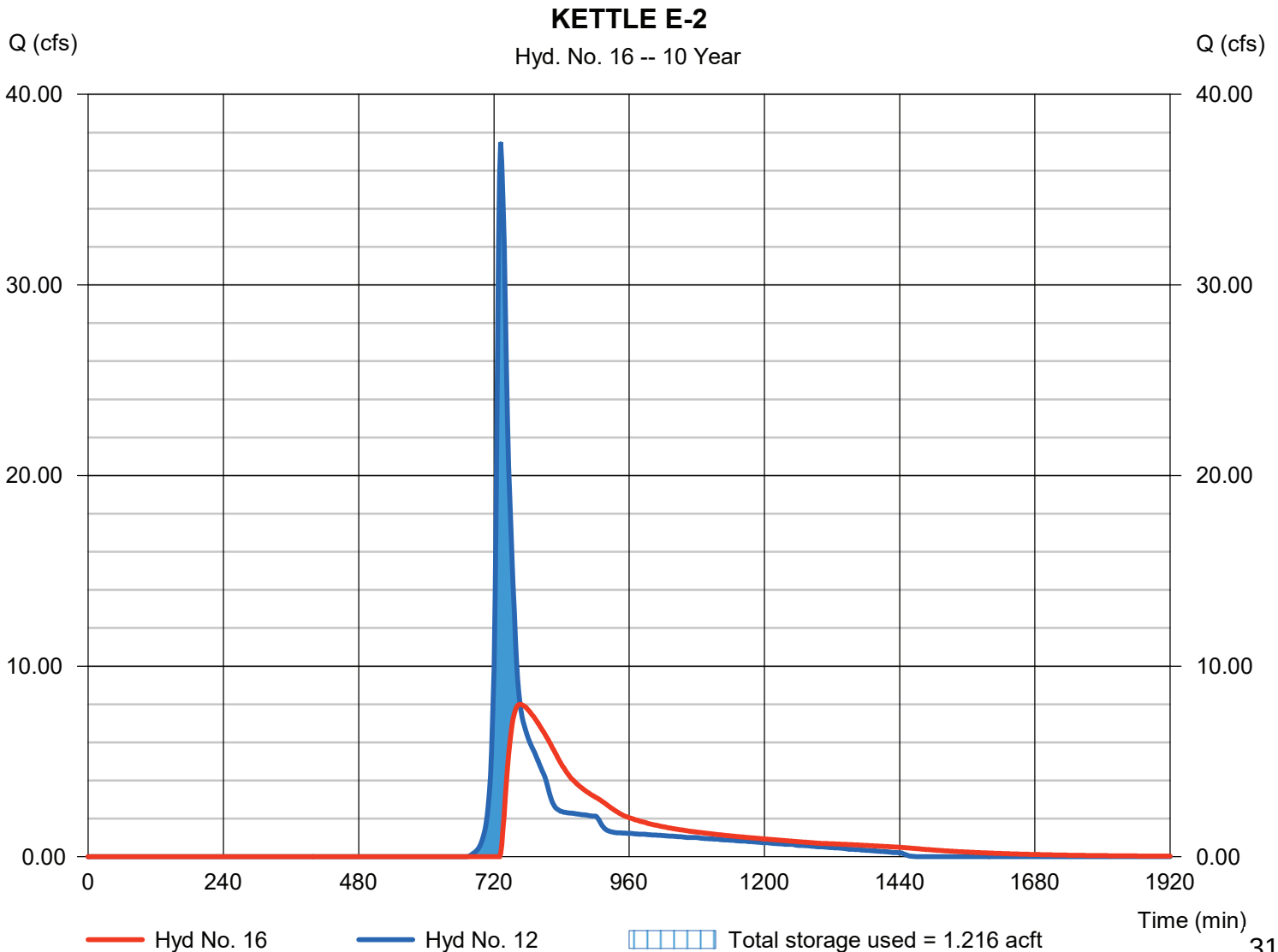
Tuesday, 05 / 7 / 2019

Hyd. No. 16

KETTLE E-2

Hydrograph type	= Reservoir	Peak discharge	= 7.997 cfs
Storm frequency	= 10 yrs	Time to peak	= 766 min
Time interval	= 2 min	Hyd. volume	= 2.247 acft
Inflow hyd. No.	= 12 - E-OS-2 + E-2	Max. Elevation	= 841.46 ft
Reservoir name	= KETTLE-E-2	Max. Storage	= 1.216 acft

Storage Indication method used.



Hydrograph Report

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

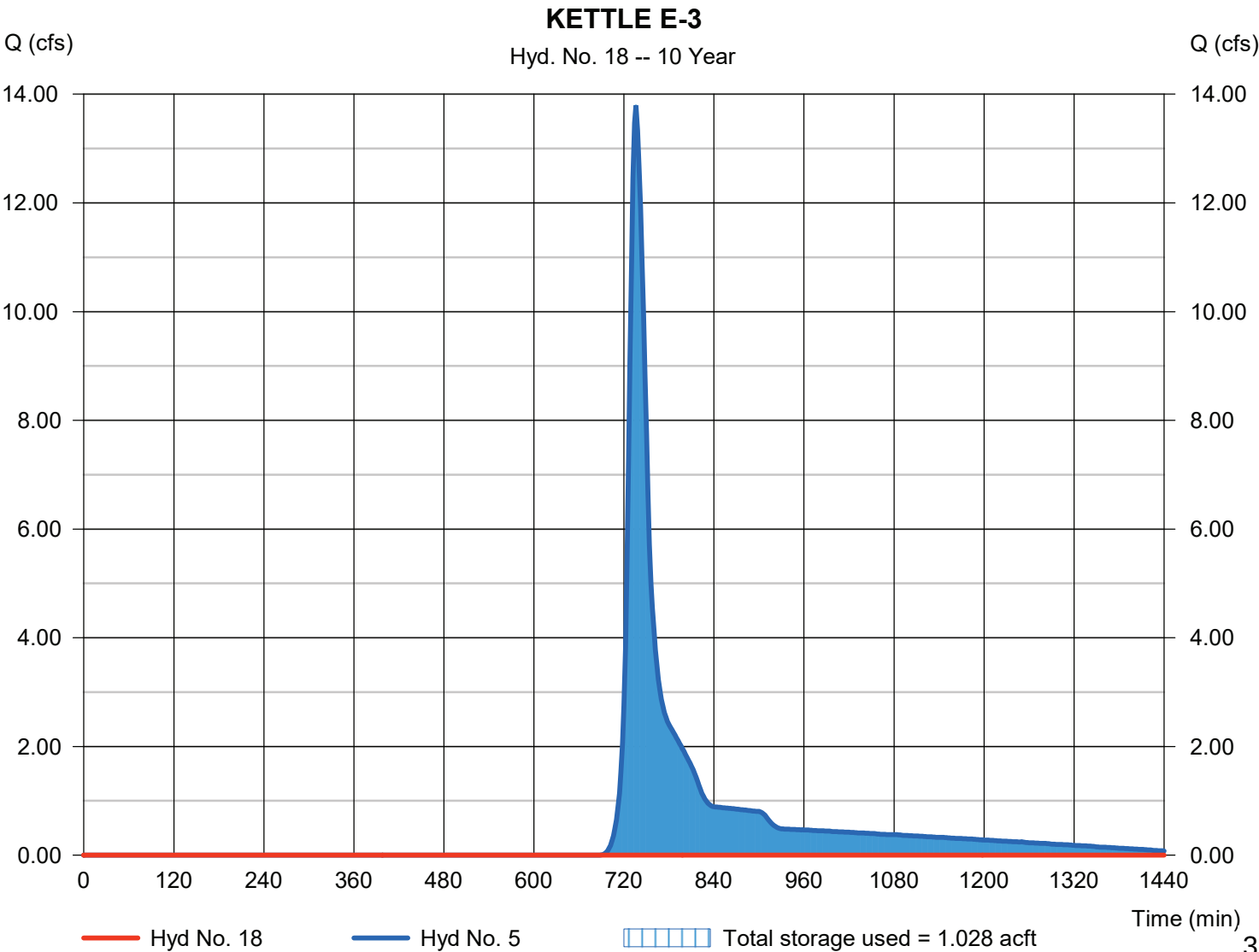
Tuesday, 05 / 7 / 2019

Hyd. No. 18

KETTLE E-3

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 5 - E-3	Max. Elevation	= 836.47 ft
Reservoir name	= KETTLE-E-3	Max. Storage	= 1.028 acft

Storage Indication method used.



Hydrograph Report

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

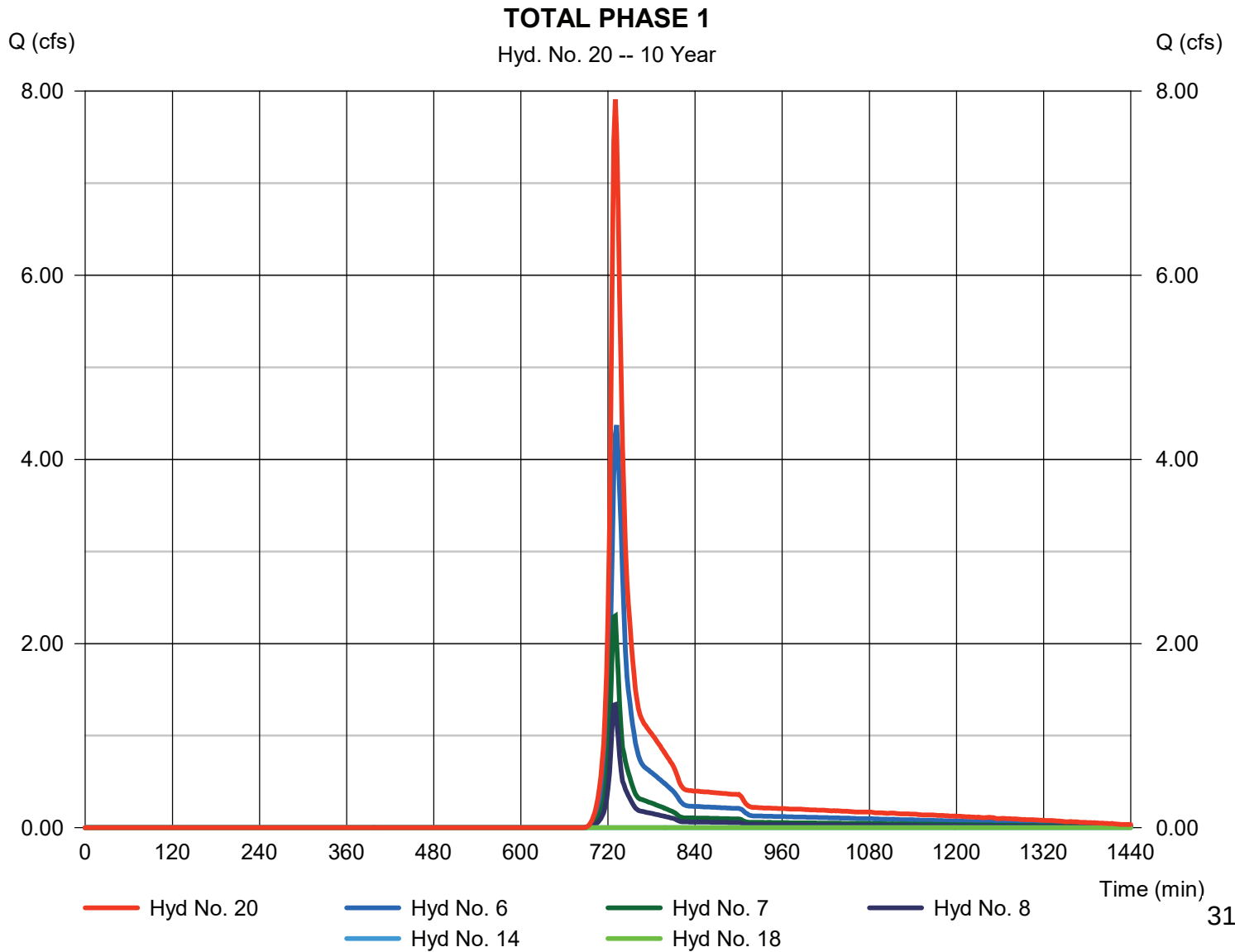
Tuesday, 05 / 7 / 2019

Hyd. No. 20

TOTAL PHASE 1

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 6, 7, 8, 14, 18

Peak discharge = 7.912 cfs
 Time to peak = 730 min
 Hyd. volume = 0.463 acft
 Contrib. drain. area = 4.769 ac



Hydrograph Report

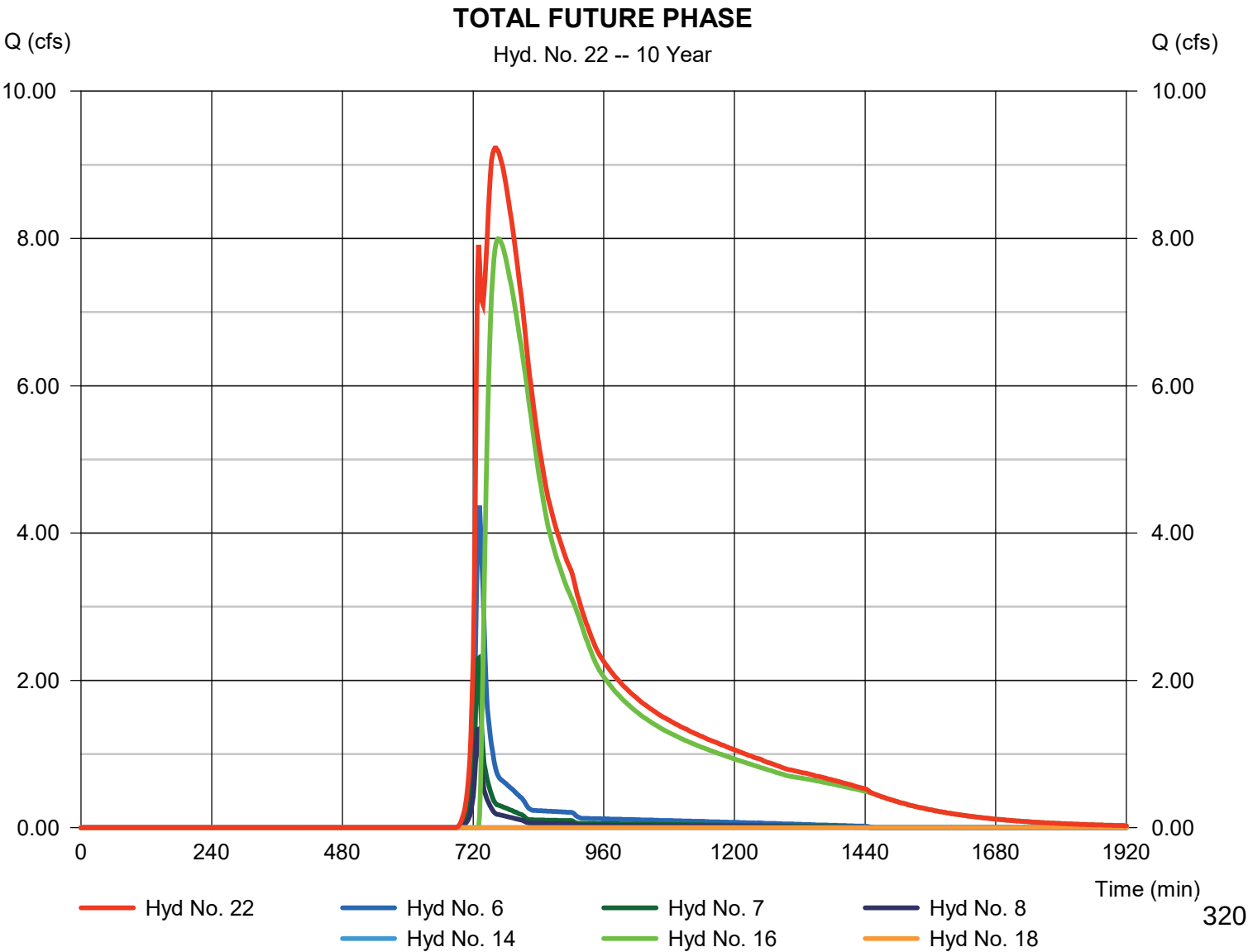
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 22

TOTAL FUTURE PHASE

Hydrograph type	= Combine	Peak discharge	= 9.231 cfs
Storm frequency	= 10 yrs	Time to peak	= 760 min
Time interval	= 2 min	Hyd. volume	= 2.710 acft
Inflow hyds.	= 6, 7, 8, 14, 16, 18	Contrib. drain. area	= 4.769 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	18.56	2	738	1.539	-----	-----	-----	E-OS-1
2	SCS Runoff	34.30	2	738	2.698	-----	-----	-----	E-OS-2
3	SCS Runoff	150.75	2	730	8.909	-----	-----	-----	E-1
4	SCS Runoff	69.35	2	730	4.095	-----	-----	-----	E-2
5	SCS Runoff	36.00	2	736	2.563	-----	-----	-----	E-3
6	SCS Runoff	11.30	2	730	0.669	-----	-----	-----	E-4
7	SCS Runoff	5.985	2	728	0.307	-----	-----	-----	E-5
8	SCS Runoff	3.480	2	728	0.178	-----	-----	-----	E-6
10	Combine	164.63	2	732	10.448	1, 3,	-----	-----	E-OS-1 + E-1
12	Combine	97.86	2	732	6.793	2, 4,	-----	-----	E-OS-2 + E-2
14	Reservoir	0.000	2	n/a	0.000	10	836.17	10.4	KETTLE E-1
16	Reservoir	33.16	2	754	6.308	12	842.19	2.73	KETTLE E-2
18	Reservoir	0.000	2	n/a	0.000	5	839.13	2.56	KETTLE E-3
20	Combine	20.52	2	730	1.154	6, 7, 8, 14, 18,	-----	-----	TOTAL PHASE 1
22	Combine	39.94	2	736	7.462	6, 7, 8, 14, 16, 18,	-----	-----	TOTAL FUTURE PHASE
2019-02-19_CHAPMAN FARMS_EXISTING.dwg					Return Period: 100 Year			Tuesday, 05 / 7 / 2019	

Hydrograph Report

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

Tuesday, 05 / 7 / 2019

Hyd. No. 1

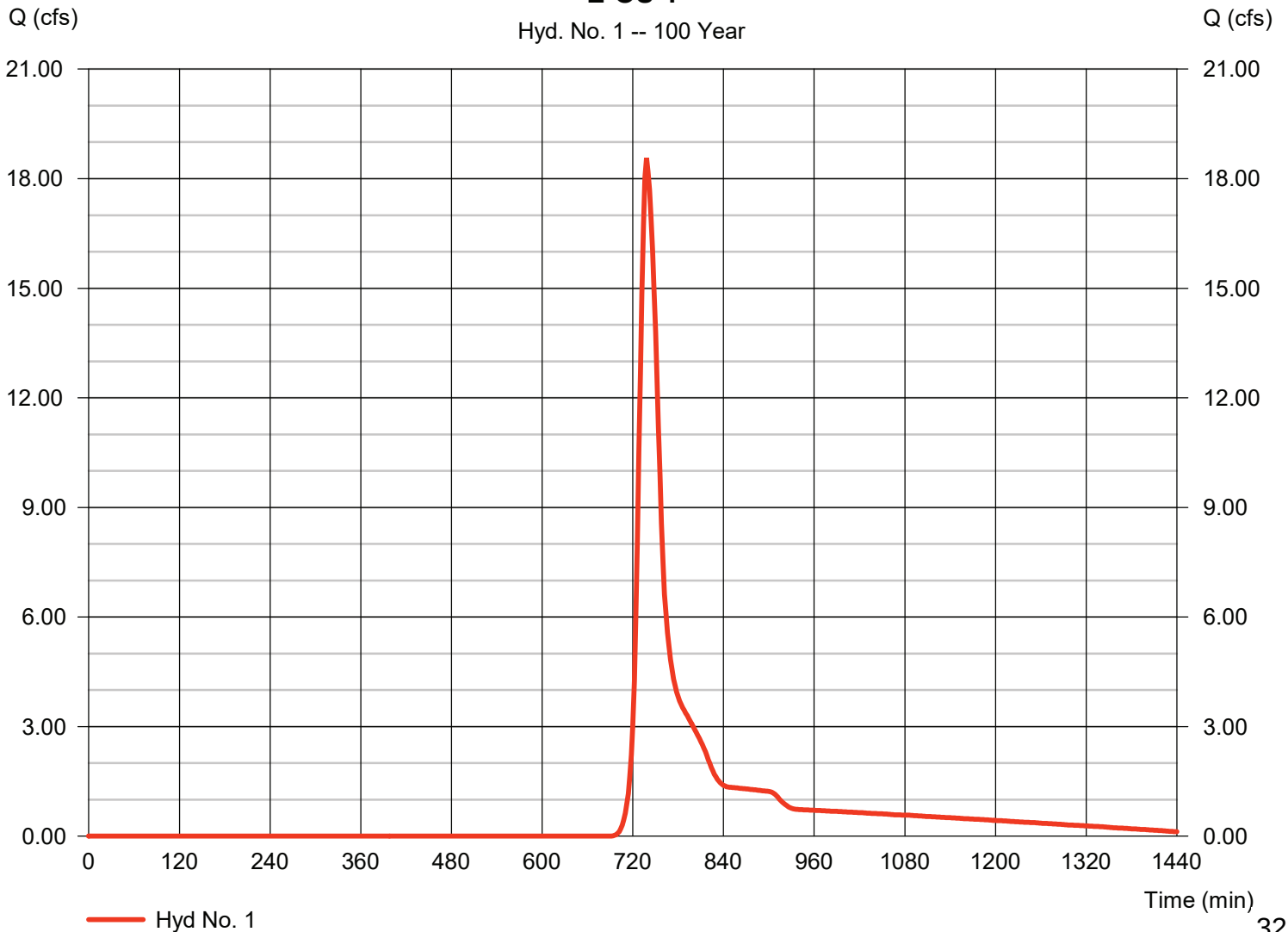
E-OS-1

Hydrograph type	= SCS Runoff	Peak discharge	= 18.56 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 1.539 acft
Drainage area	= 10.160 ac	Curve number	= 57*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.50 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management		

* Composite (Area/CN) = $[(1.300 \times 69) + (8.860 \times 55)] / 10.160$

E-OS-1

Hyd. No. 1 -- 100 Year



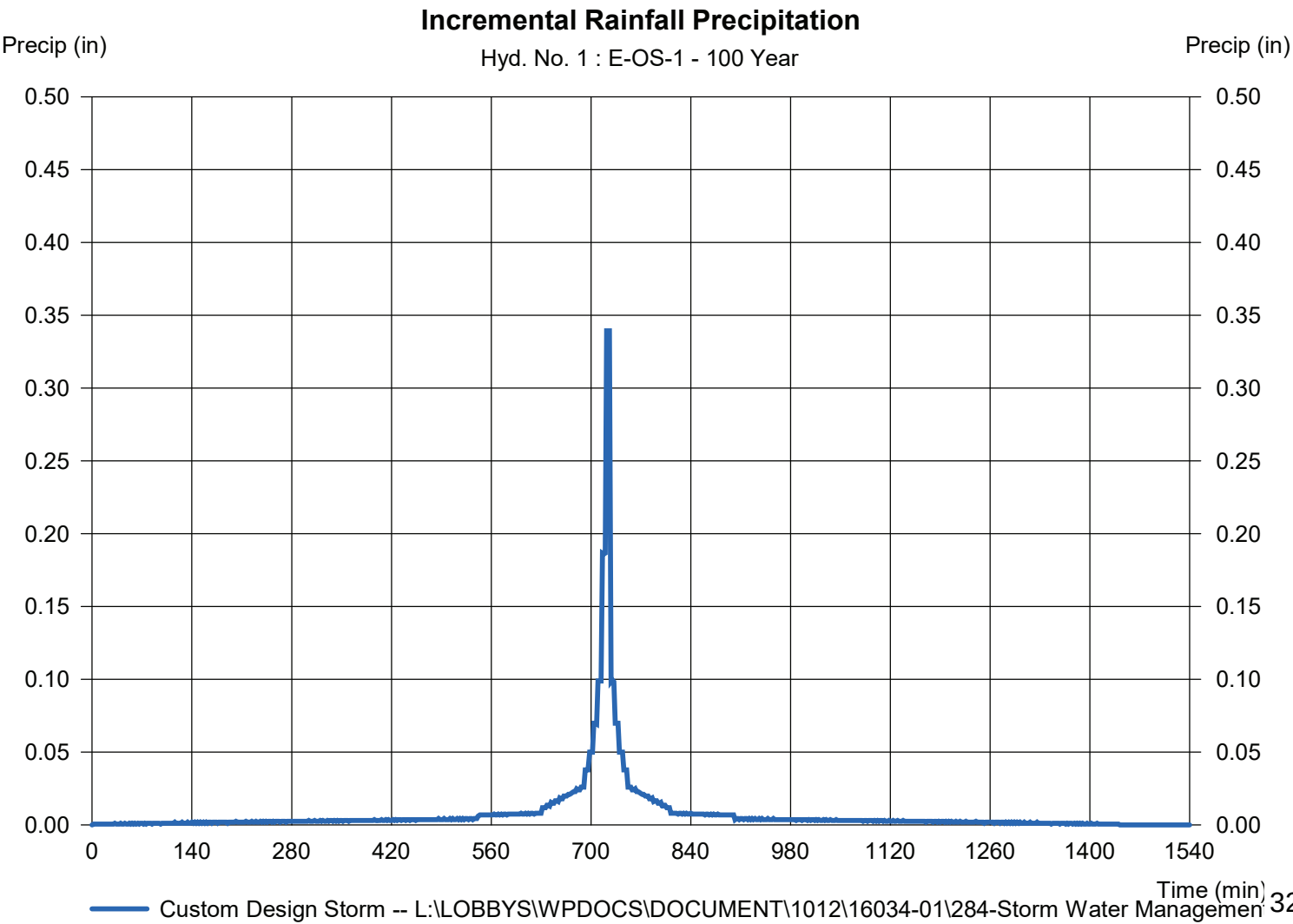
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Tuesday, 05 / 7 / 2019

Hyd. No. 1

E-OS-1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

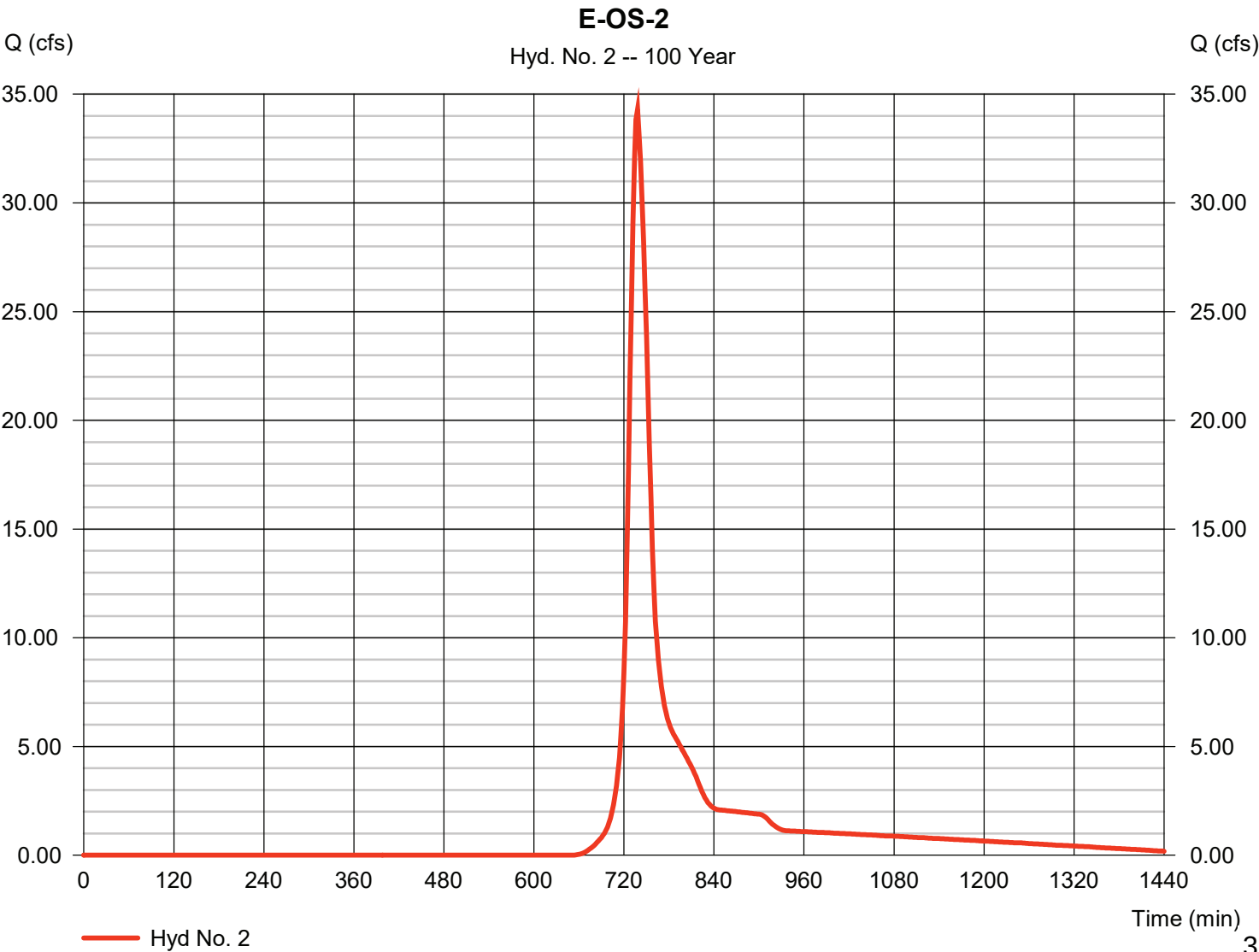
Tuesday, 05 / 7 / 2019

Hyd. No. 2

E-OS-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	34.30 cfs
Storm frequency	=	100 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	2.698 acft
Drainage area	=	12.810 ac	Curve number	=	65*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	20.80 min
Total precip.	=	6.18 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrographs\16034-01\284481 Storm Water Management			

* Composite (Area/CN) = [(9.150 x 69) + (3.660 x 55)] / 12.810



Precipitation Report

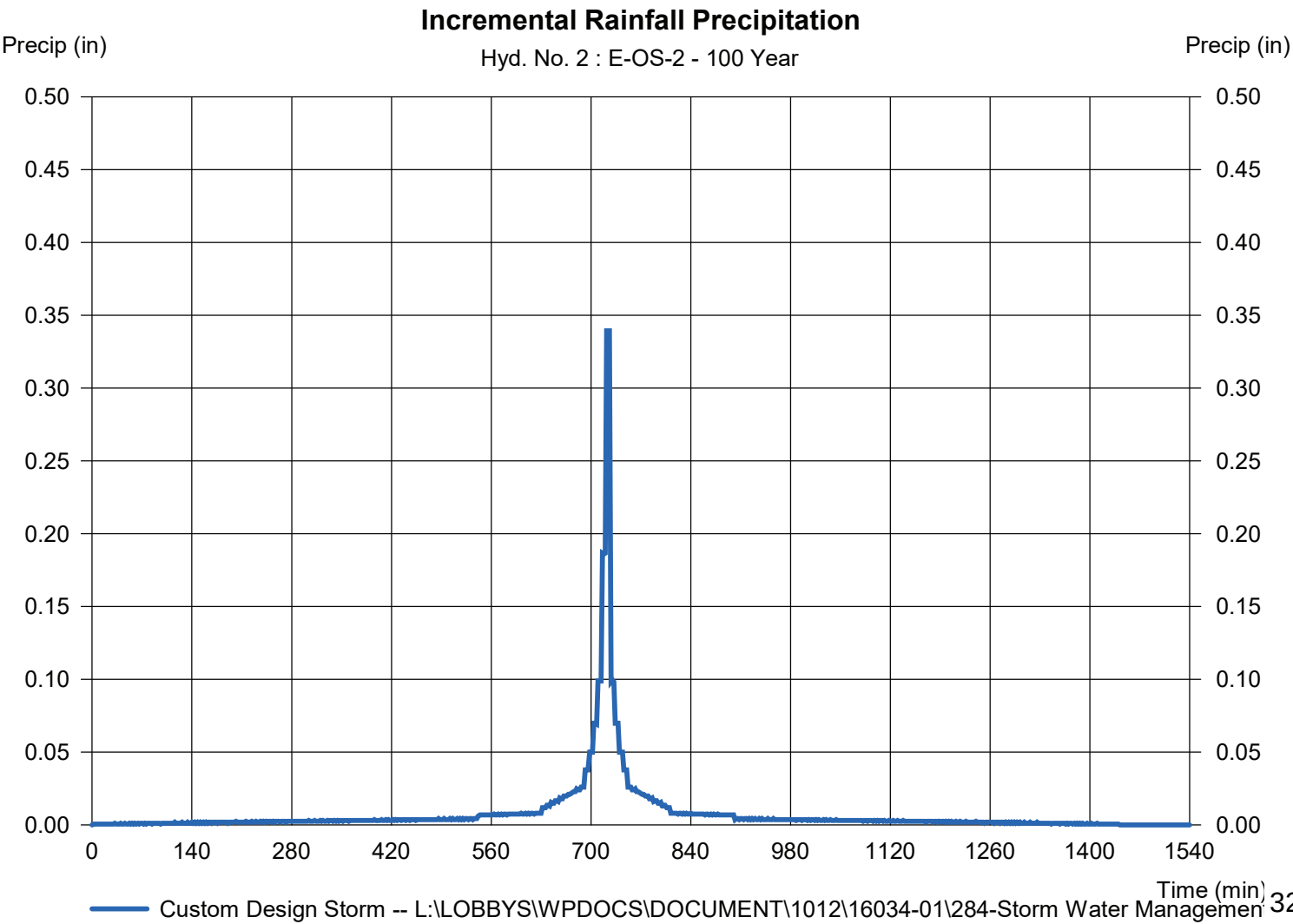
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 2

E-OS-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

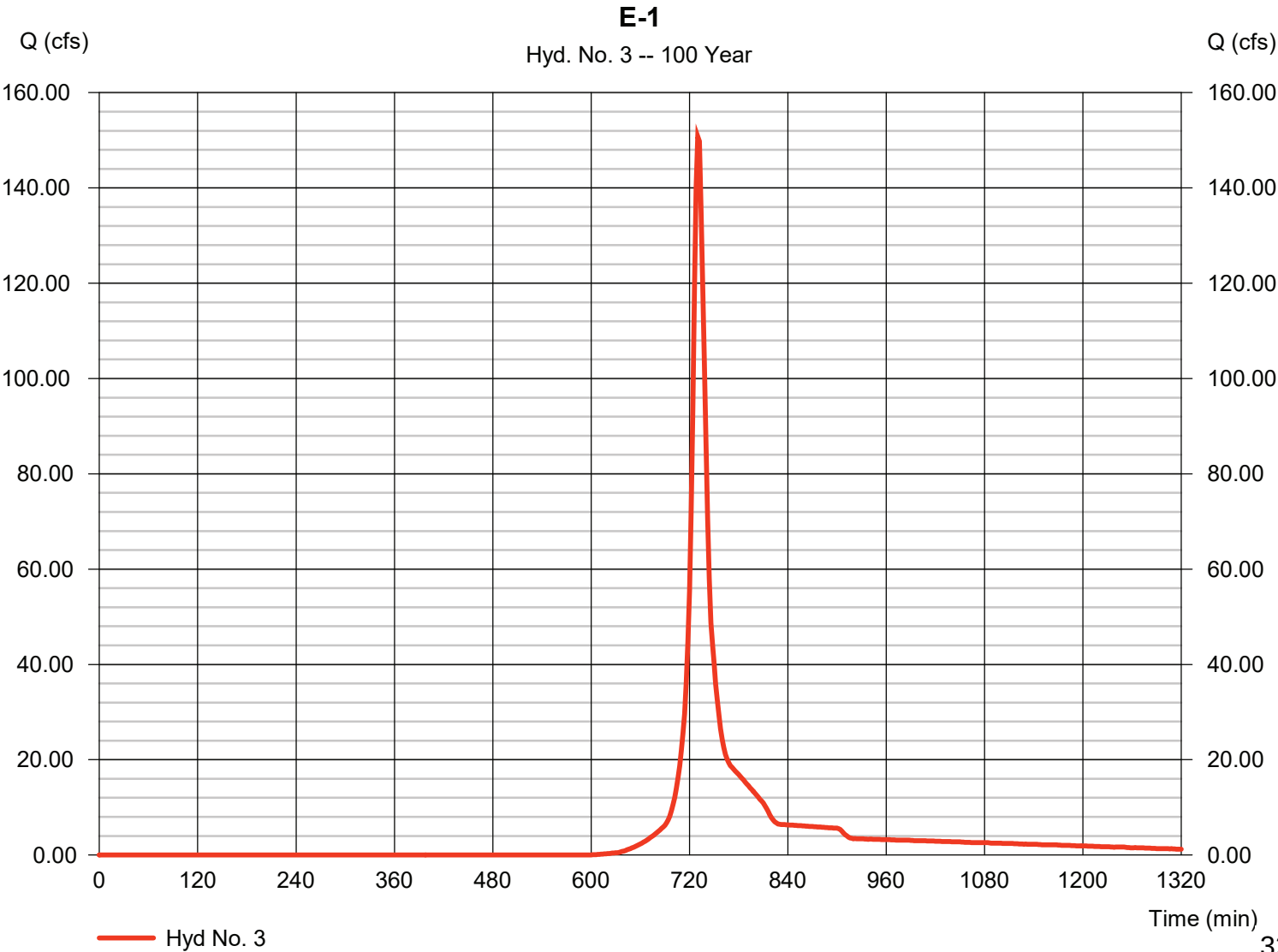
Tuesday, 05 / 7 / 2019

Hyd. No. 3

E-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	150.75 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	8.909 acft
Drainage area	=	34.050 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.20 min
Total precip.	=	6.18 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\284481 Storm Water Management			

* Composite (Area/CN) = [(8.640 x 78) + (25.410 x 69)] / 34.050



Precipitation Report

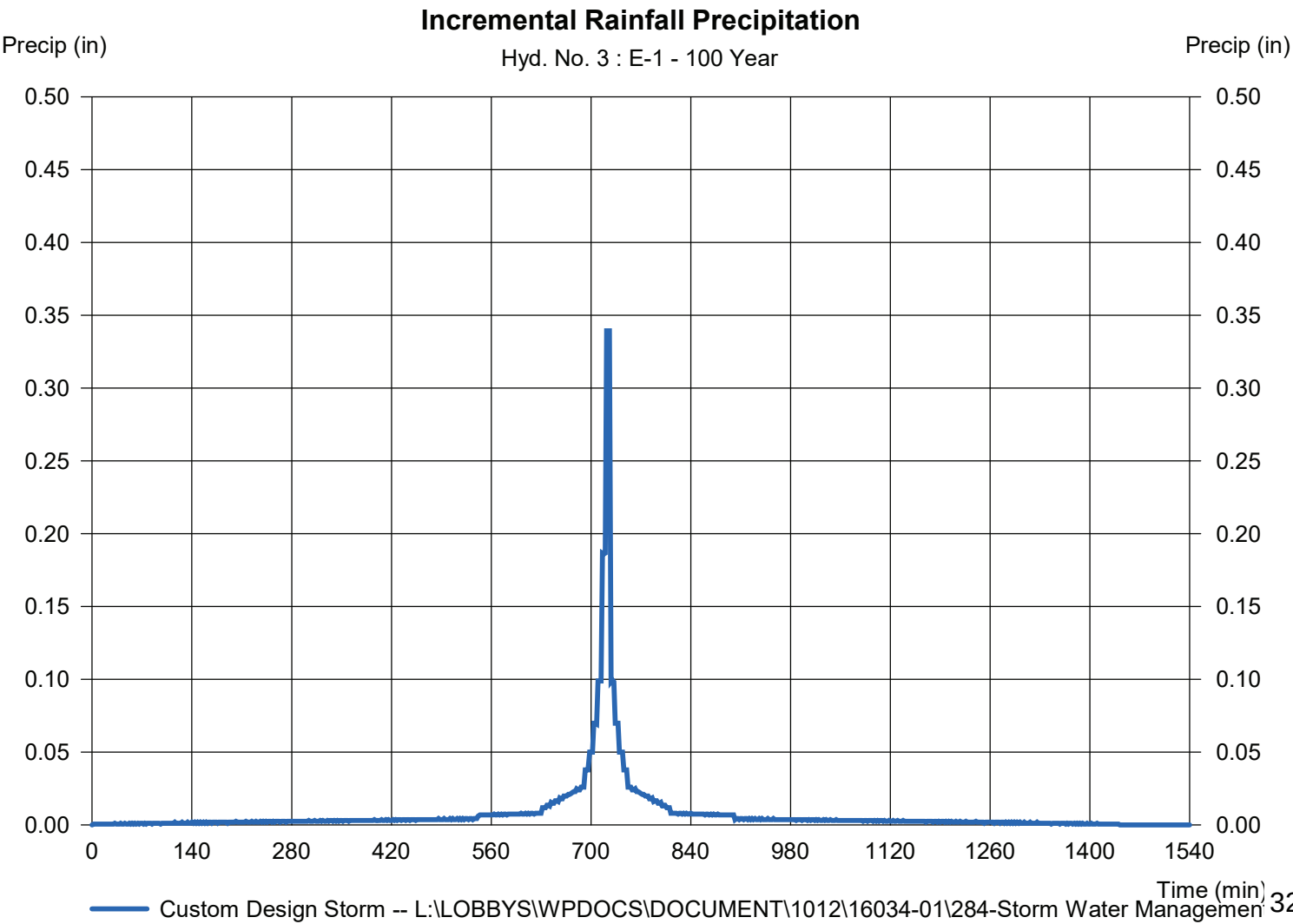
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 3

E-1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

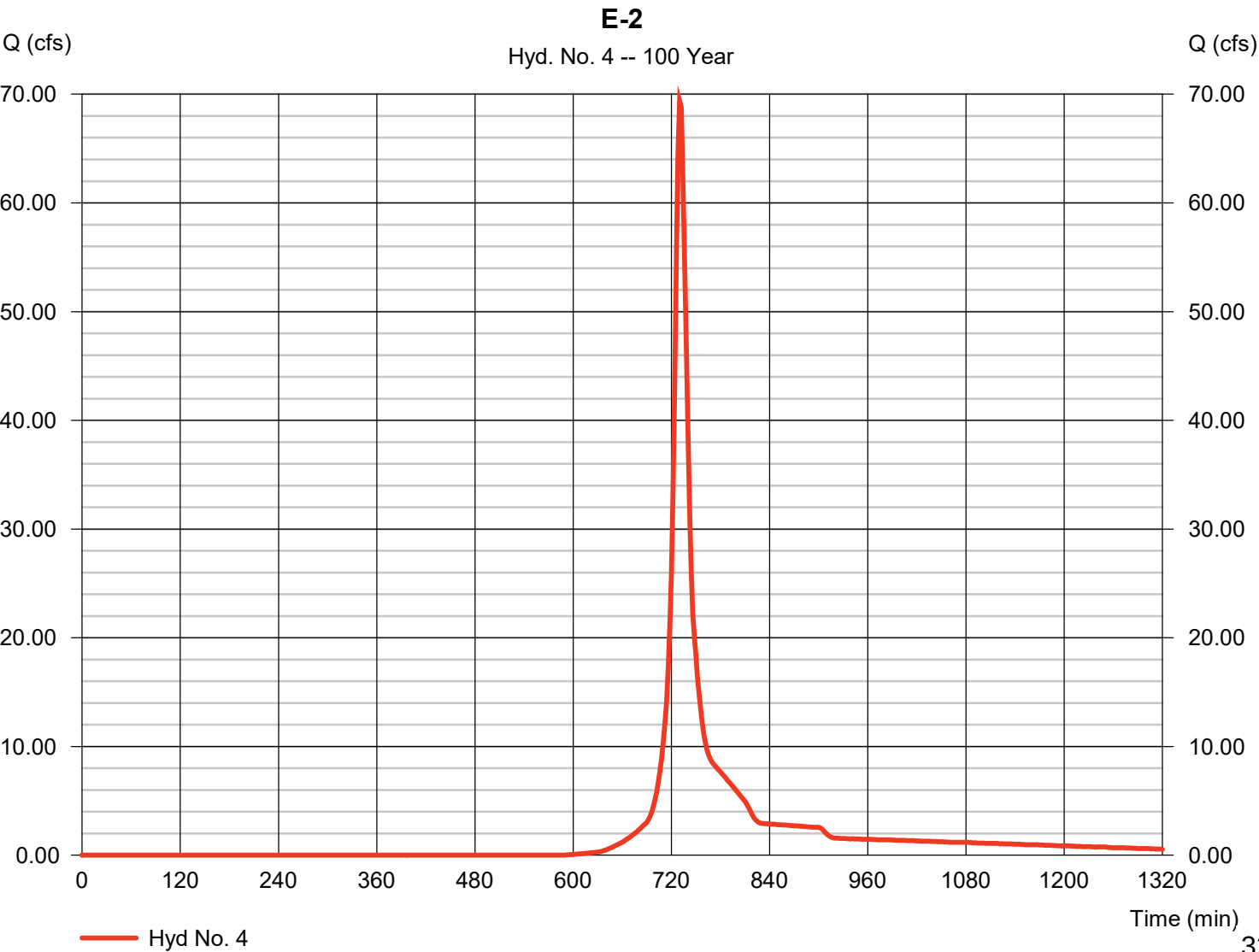
Tuesday, 05 / 7 / 2019

Hyd. No. 4

E-2

Hydrograph type	= SCS Runoff	Peak discharge	= 69.35 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 4.095 acft
Drainage area	= 15.170 ac	Curve number	= 72*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.30 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\284481 Storm Water Management		

* Composite (Area/CN) = [(4.970 x 78) + (10.200 x 69)] / 15.170



Precipitation Report

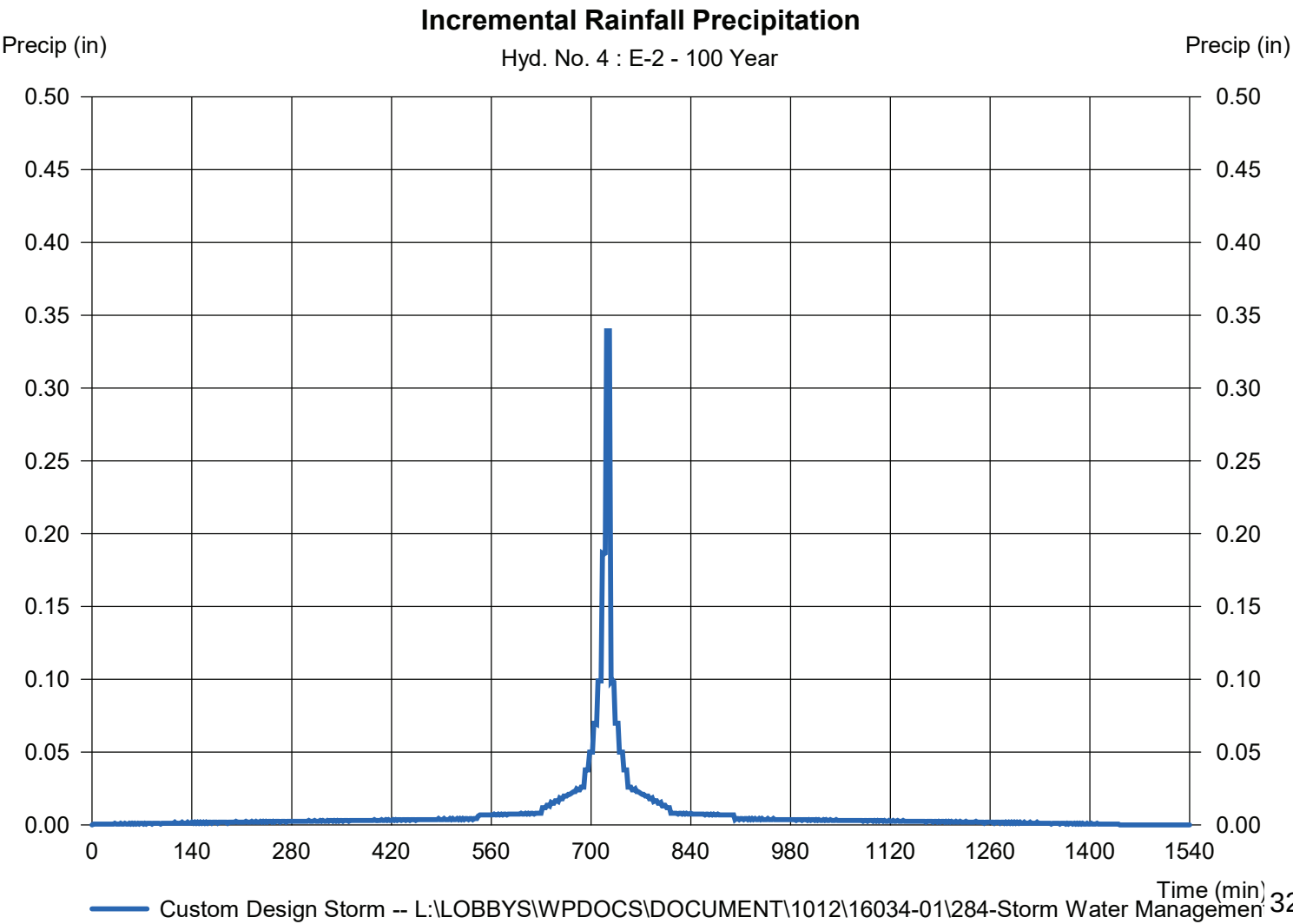
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 4

E-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

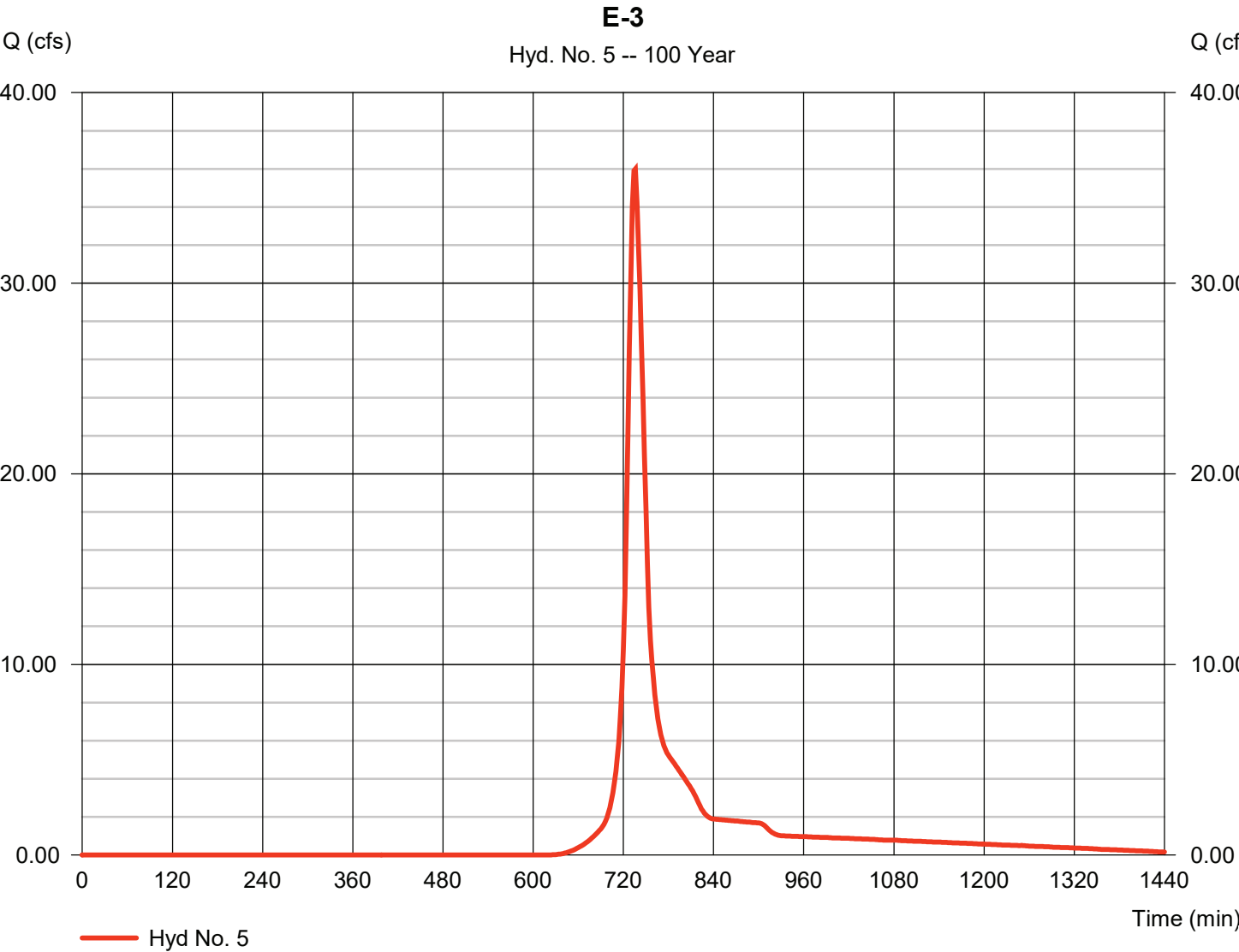
Tuesday, 05 / 7 / 2019

Hyd. No. 5

E-3

Hydrograph type	= SCS Runoff	Peak discharge	= 36.00 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 2.563 acft
Drainage area	= 10.776 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 19.30 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\28481 Storm Water Management		

* Composite (Area/CN) = [(11.490 x 69)] / 10.776

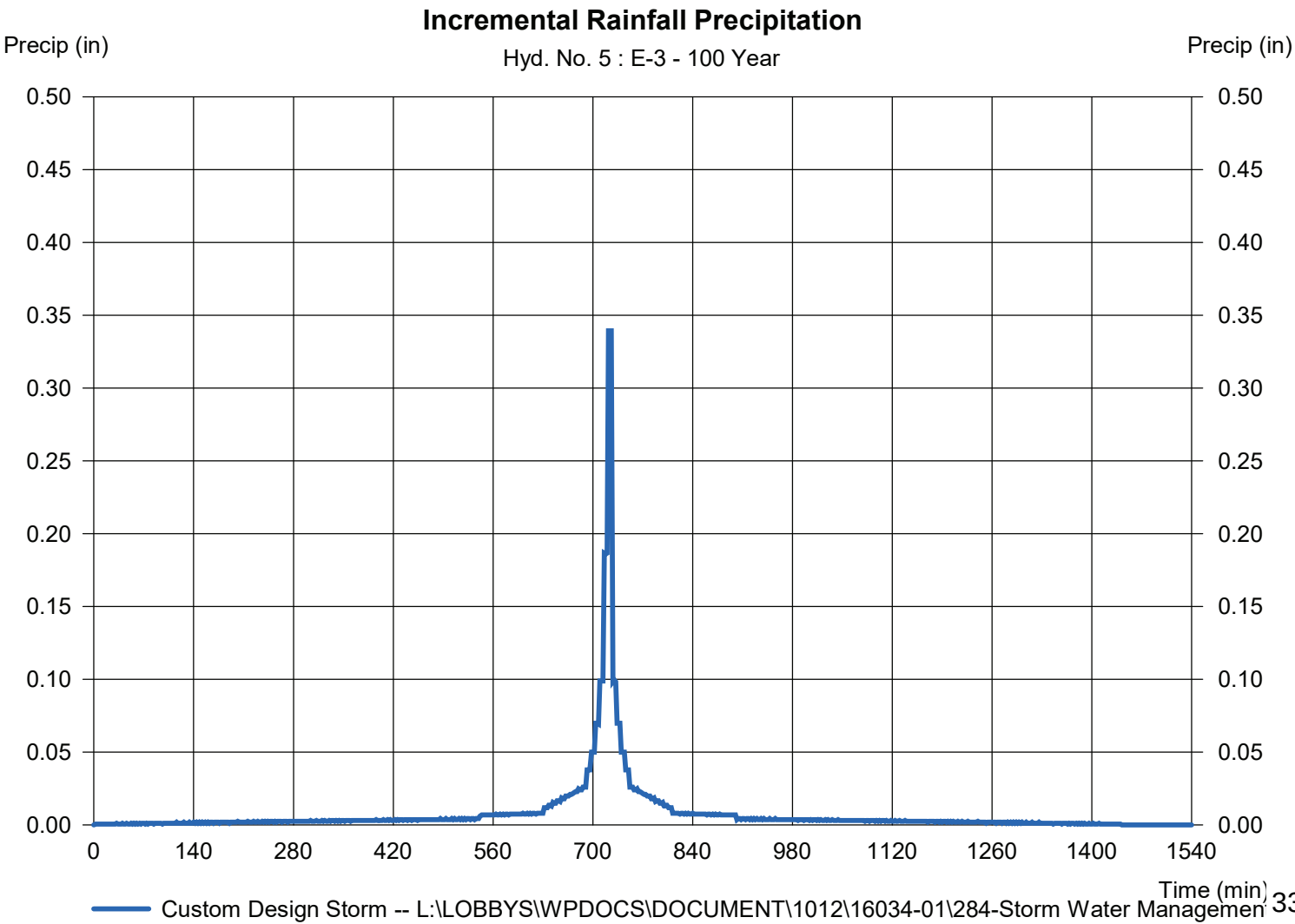


Precipitation Report

Hyd. No. 5

E-3

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

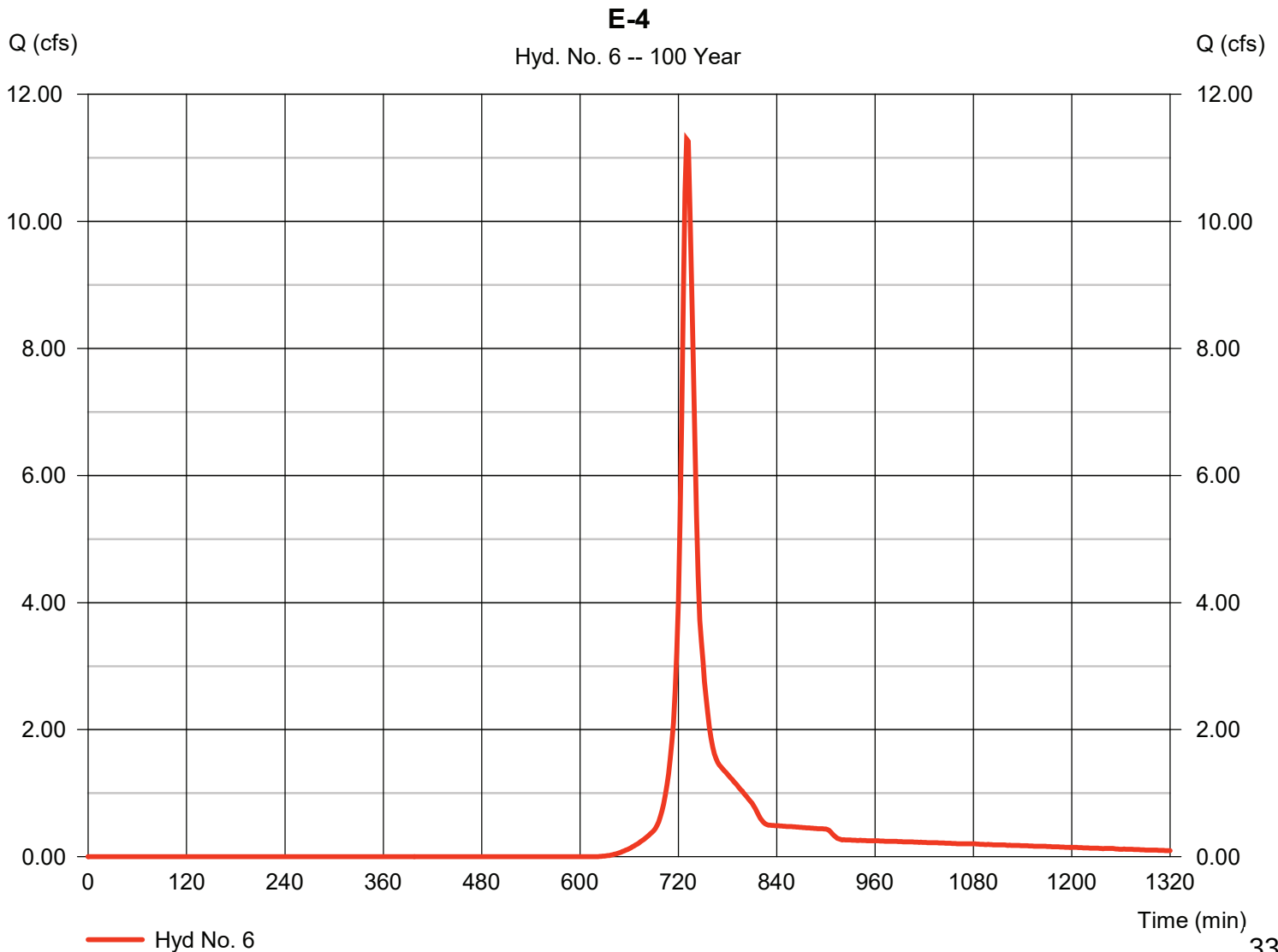
Tuesday, 05 / 7 / 2019

Hyd. No. 6

E-4

Hydrograph type	= SCS Runoff	Peak discharge	= 11.30 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 0.669 acft
Drainage area	= 2.729 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.40 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\Hydrograph\16034-01\28481 Storm Water Management		

* Composite (Area/CN) = $[(2.010 \times 69)] / 2.729$



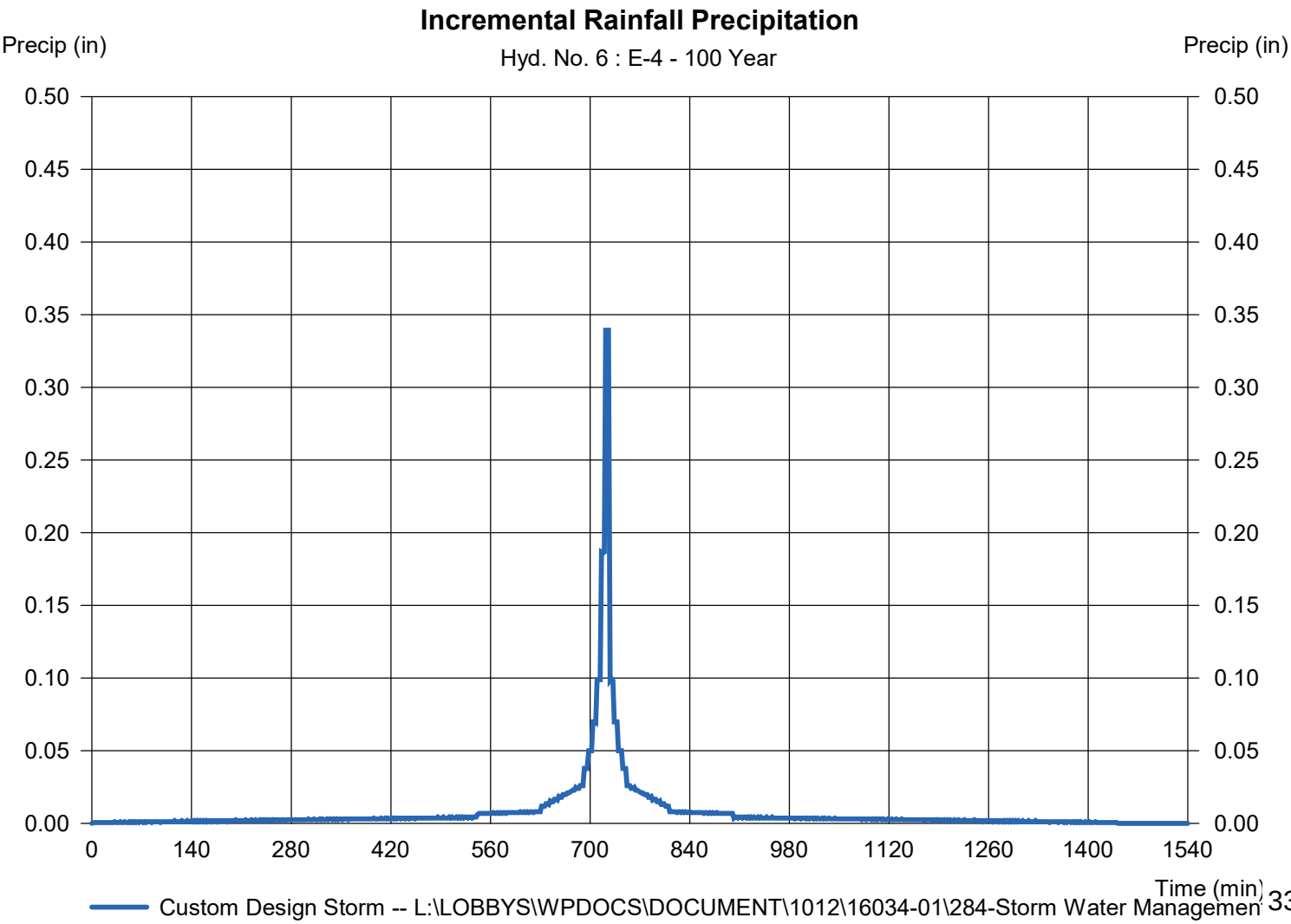
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Tuesday, 05 / 7 / 2019

Hyd. No. 6

E-4

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

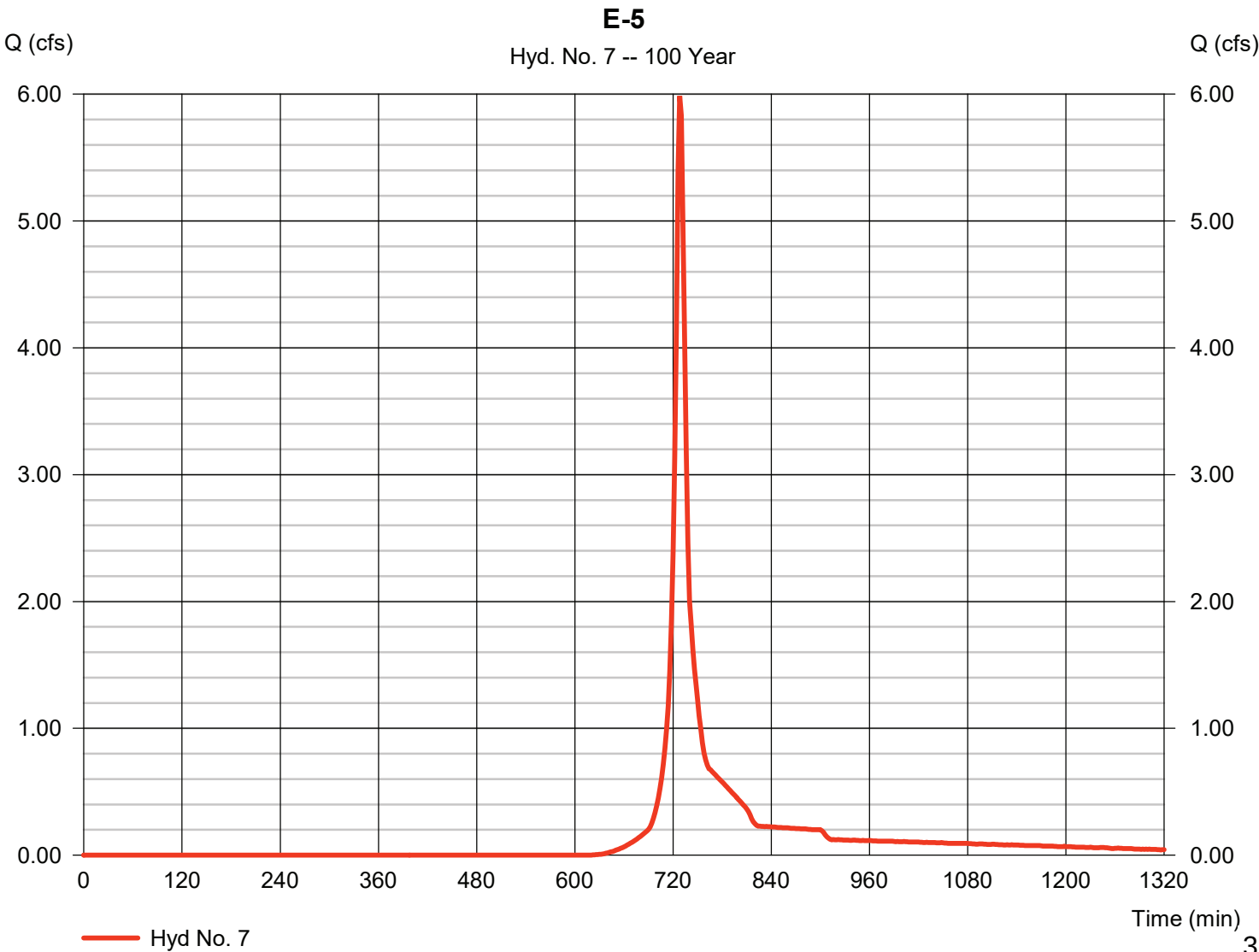
Tuesday, 05 / 7 / 2019

Hyd. No. 7

E-5

Hydrograph type	= SCS Runoff	Peak discharge	= 5.985 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 0.307 acft
Drainage area	= 1.290 ac	Curve number	= 69*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.50 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\284481 Storm Water Management		

* Composite (Area/CN) = [(1.290 x 69)] / 1.290



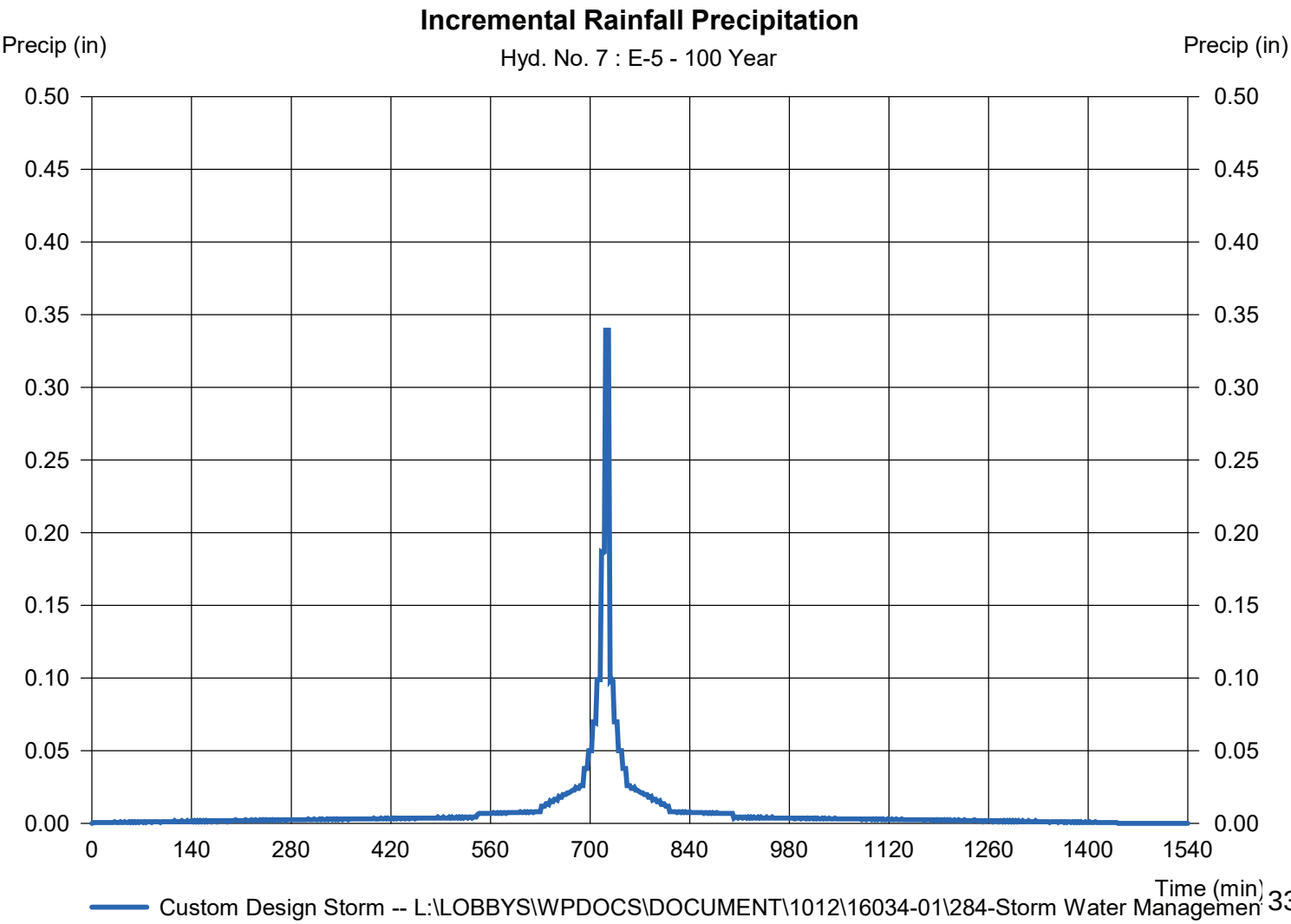
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Tuesday, 05 / 7 / 2019

Hyd. No. 7

E-5

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

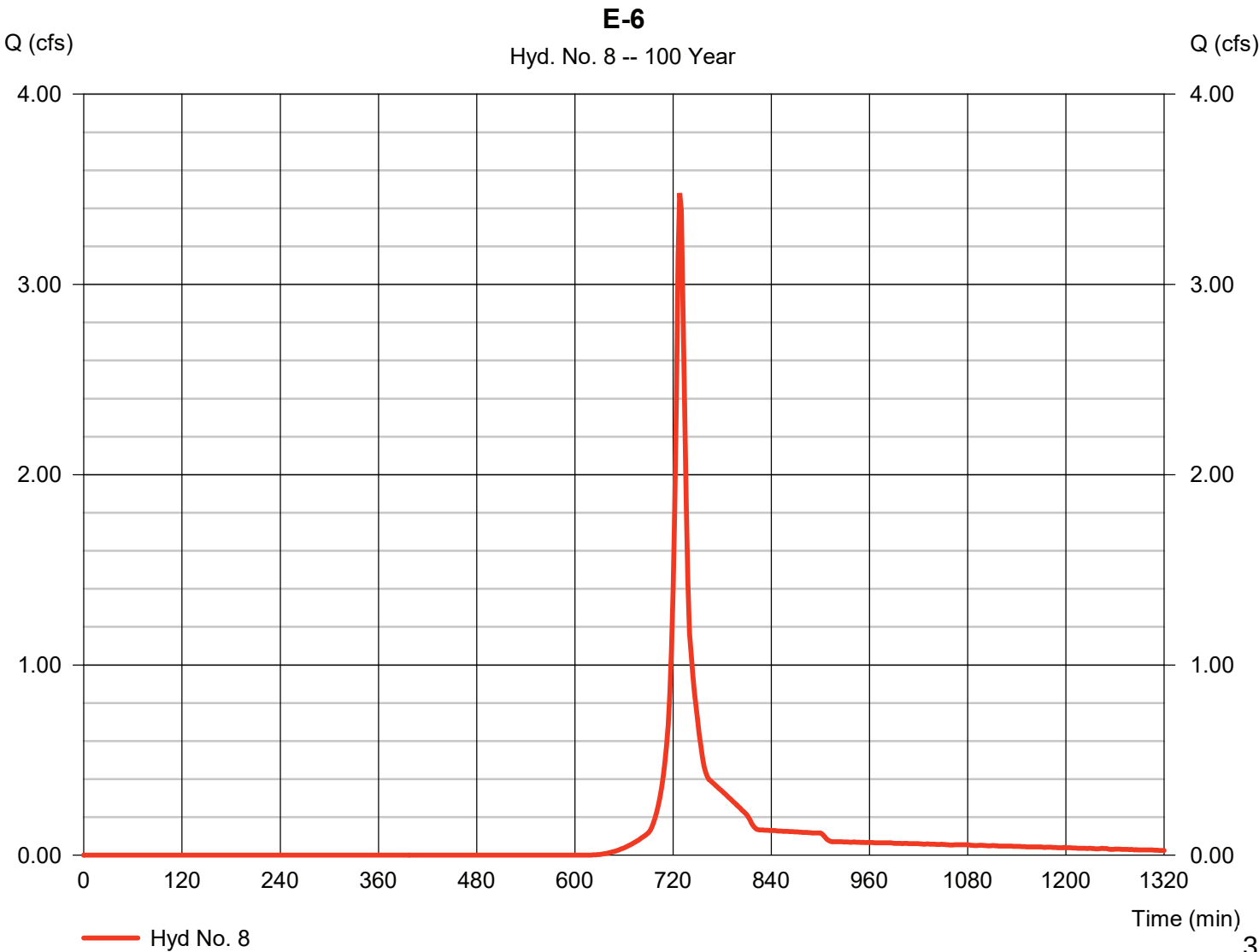
Tuesday, 05 / 7 / 2019

Hyd. No. 8

E-6

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.480 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	0.178 acft
Drainage area	=	0.750 ac	Curve number	=	69*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.50 min
Total precip.	=	6.18 in	Distribution	=	Custom
Storm duration	=	L:\LOBBYS\WPDOCS\DOCUMENTS\16034-01\284481 Storm Water Management			

* Composite (Area/CN) = [(0.760 x 69)] / 0.750



Precipitation Report

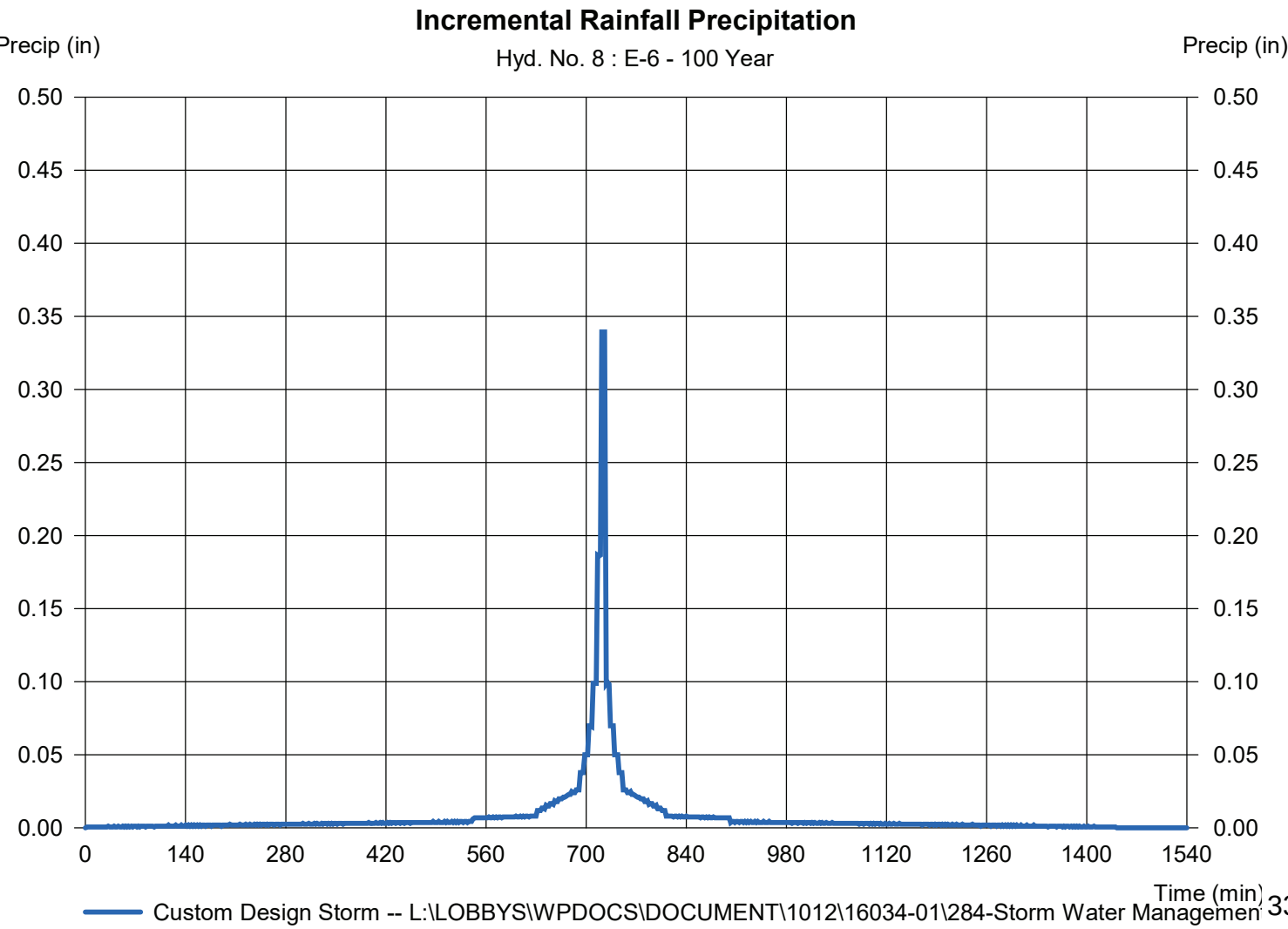
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Tuesday, 05 / 7 / 2019

Hyd. No. 8

E-6

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= L:\LOBBYS\WPDOCS\DOCUMENT\1012\16034-01\284-Storm Water Managemen		



Hydrograph Report

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

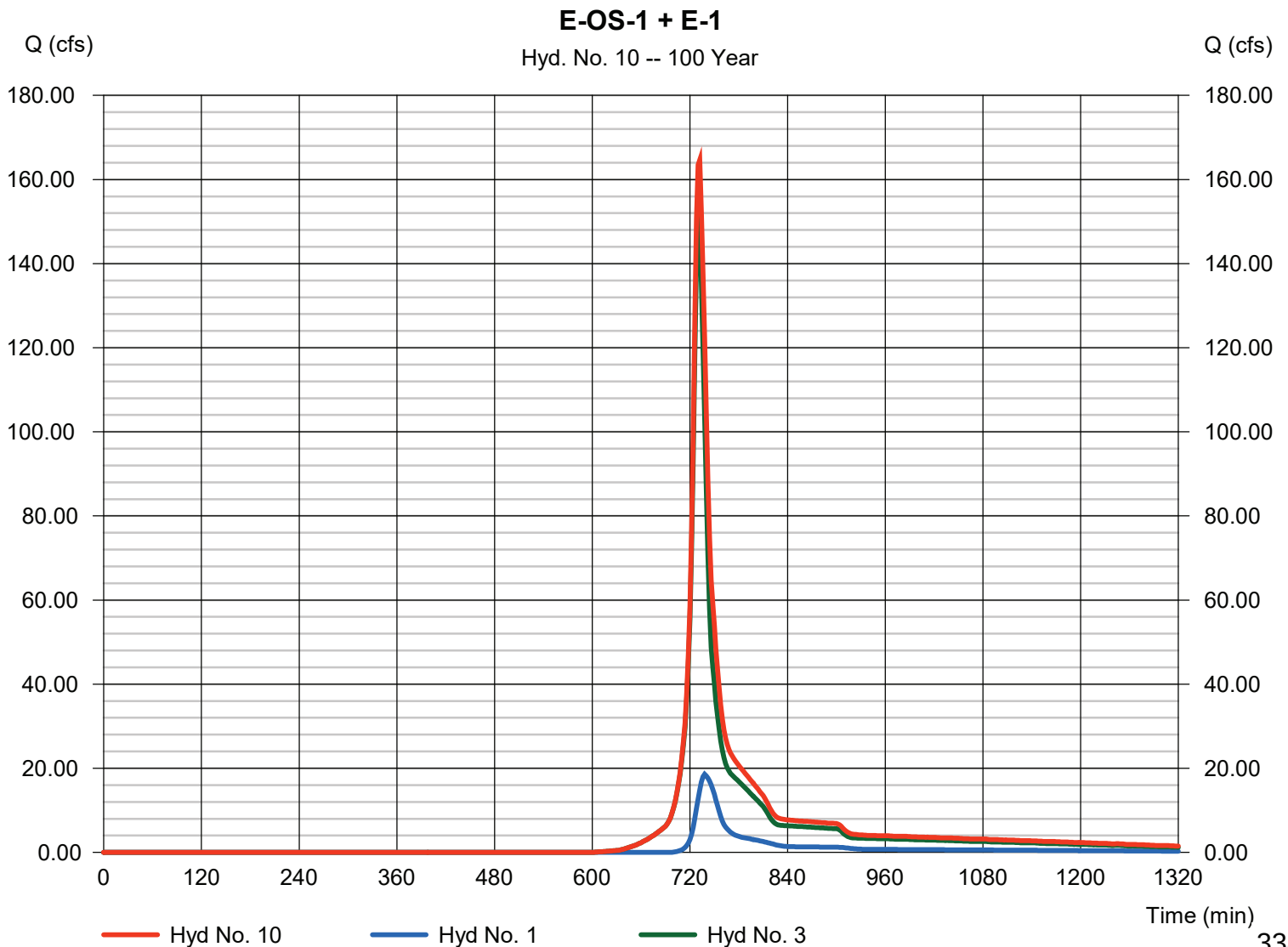
Tuesday, 05 / 7 / 2019

Hyd. No. 10

E-OS-1 + E-1

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 3

Peak discharge = 164.63 cfs
 Time to peak = 732 min
 Hyd. volume = 10.448 acft
 Contrib. drain. area = 44.210 ac



Hydrograph Report

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

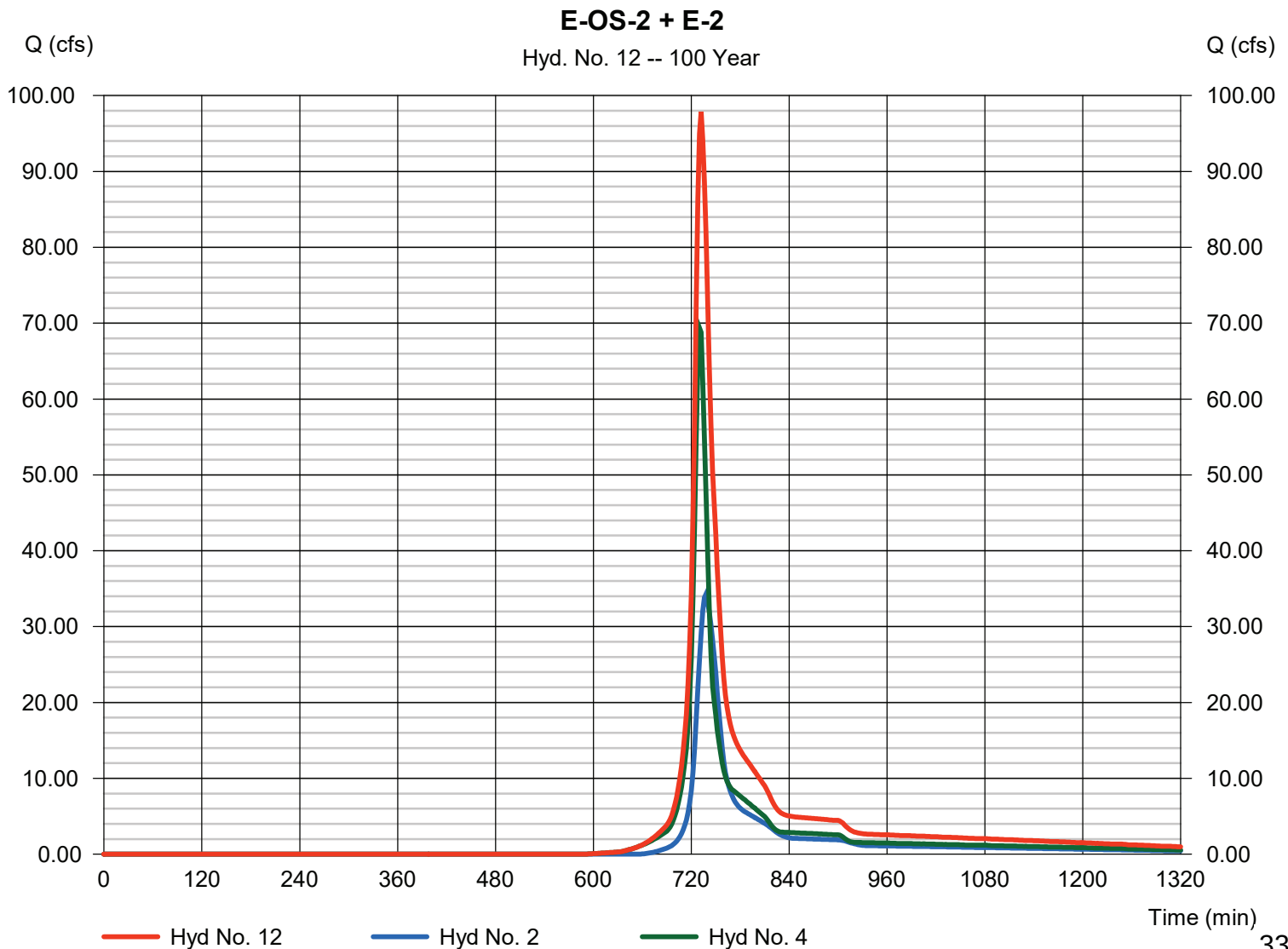
Tuesday, 05 / 7 / 2019

Hyd. No. 12

E-OS-2 + E-2

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

Peak discharge = 97.86 cfs
Time to peak = 732 min
Hyd. volume = 6.793 acft
Contrib. drain. area = 27.980 ac



Hydrograph Report

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

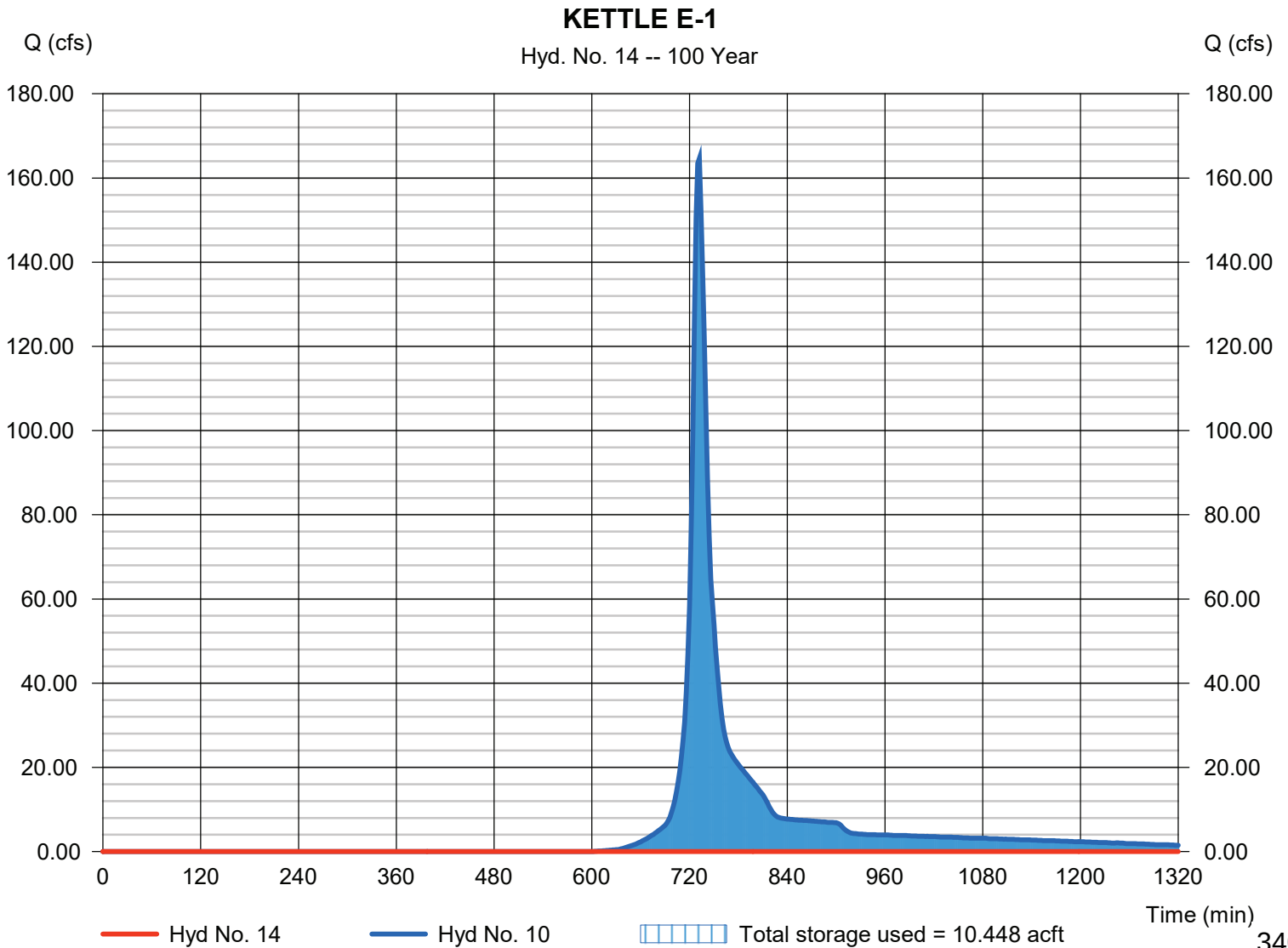
Tuesday, 05 / 7 / 2019

Hyd. No. 14

KETTLE E-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 10 - E-OS-1 + E-1	Max. Elevation	= 836.17 ft
Reservoir name	= KETTLE-E-1	Max. Storage	= 10.448 acft

Storage Indication method used.



Hydrograph Report

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

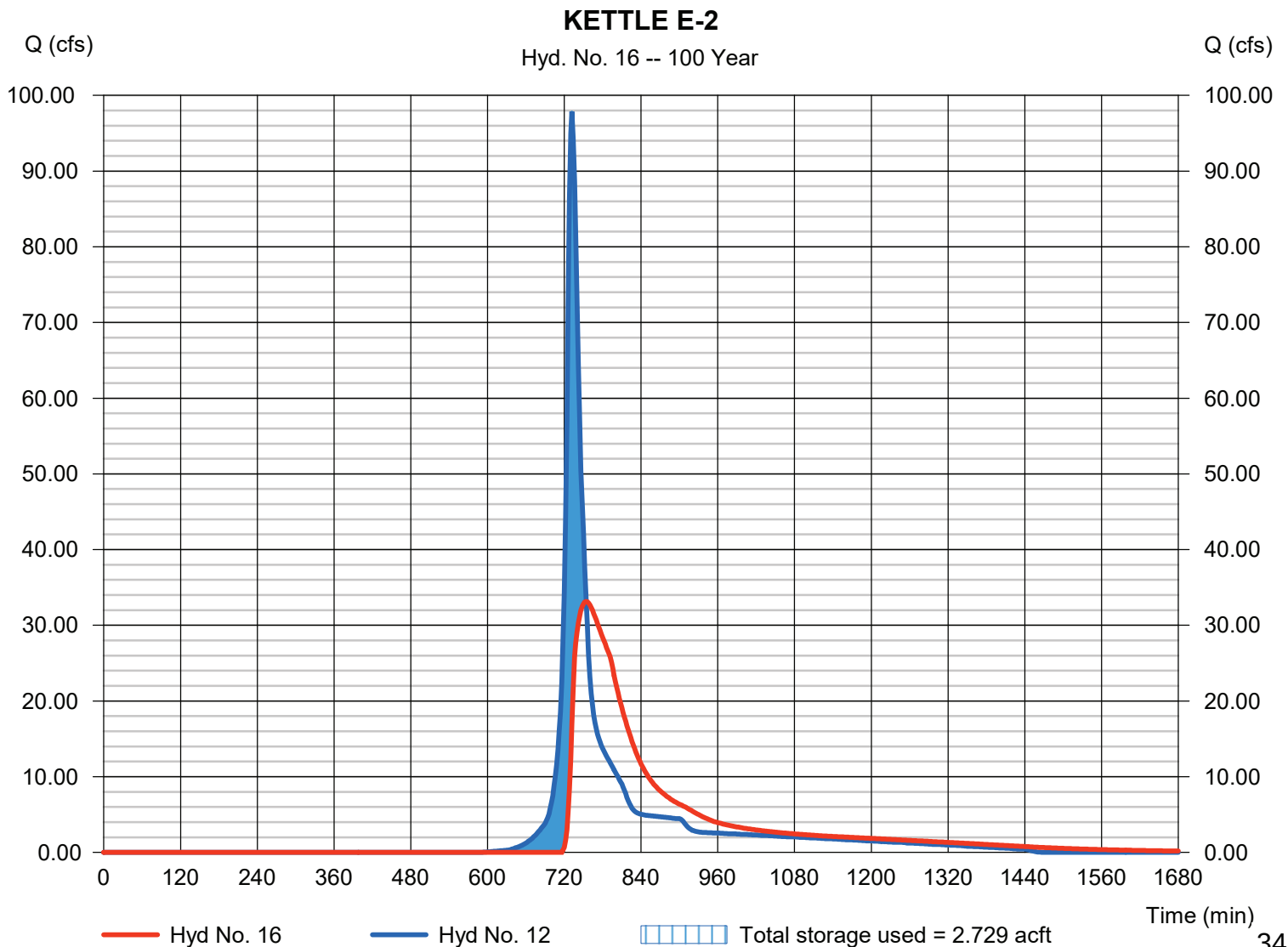
Tuesday, 05 / 7 / 2019

Hyd. No. 16

KETTLE E-2

Hydrograph type	= Reservoir	Peak discharge	= 33.16 cfs
Storm frequency	= 100 yrs	Time to peak	= 754 min
Time interval	= 2 min	Hyd. volume	= 6.308 acft
Inflow hyd. No.	= 12 - E-OS-2 + E-2	Max. Elevation	= 842.19 ft
Reservoir name	= KETTLE-E-2	Max. Storage	= 2.729 acft

Storage Indication method used.



Hydrograph Report

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

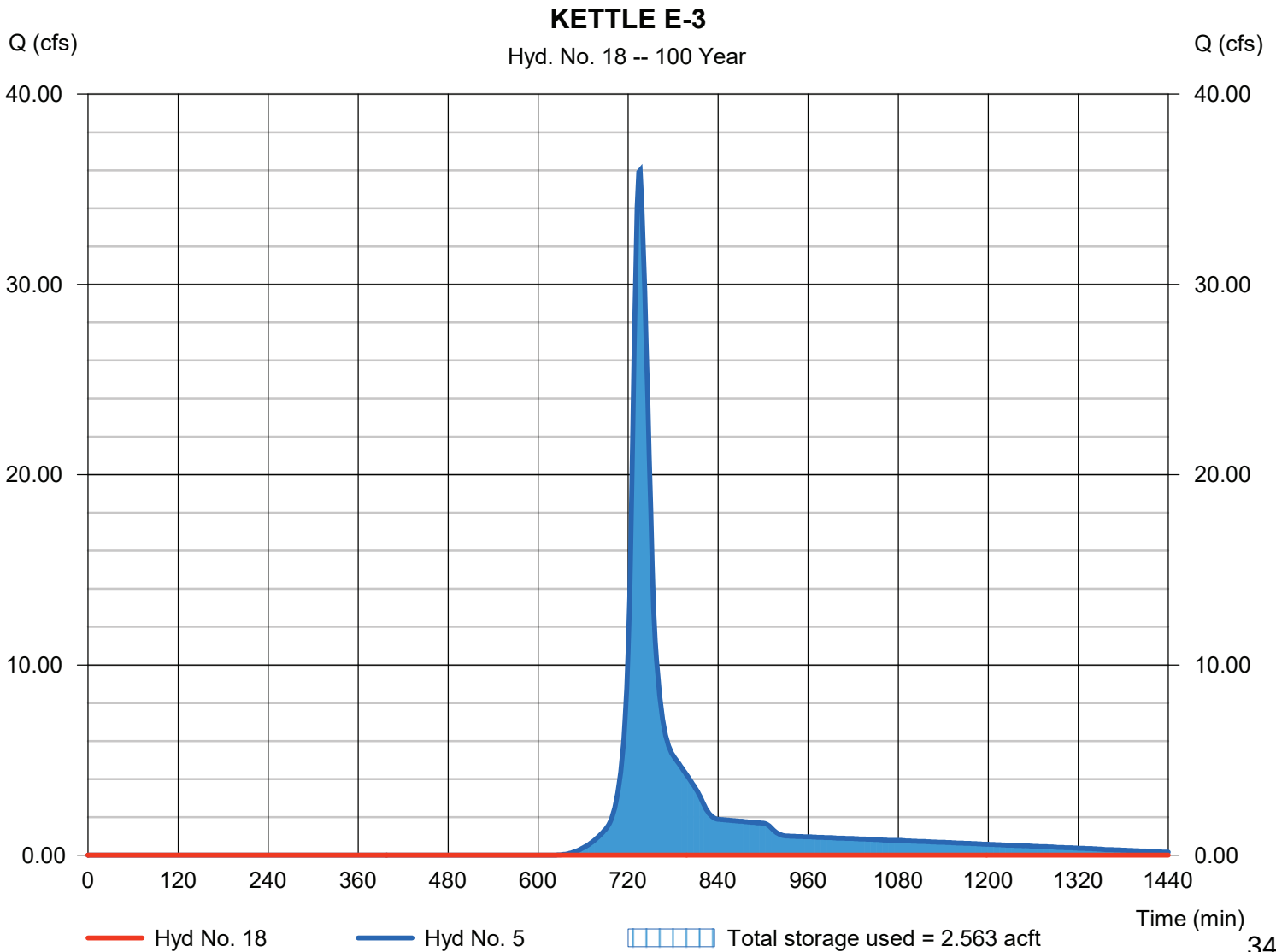
Tuesday, 05 / 7 / 2019

Hyd. No. 18

KETTLE E-3

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 5 - E-3	Max. Elevation	= 839.13 ft
Reservoir name	= KETTLE-E-3	Max. Storage	= 2.563 acft

Storage Indication method used.



Hydrograph Report

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

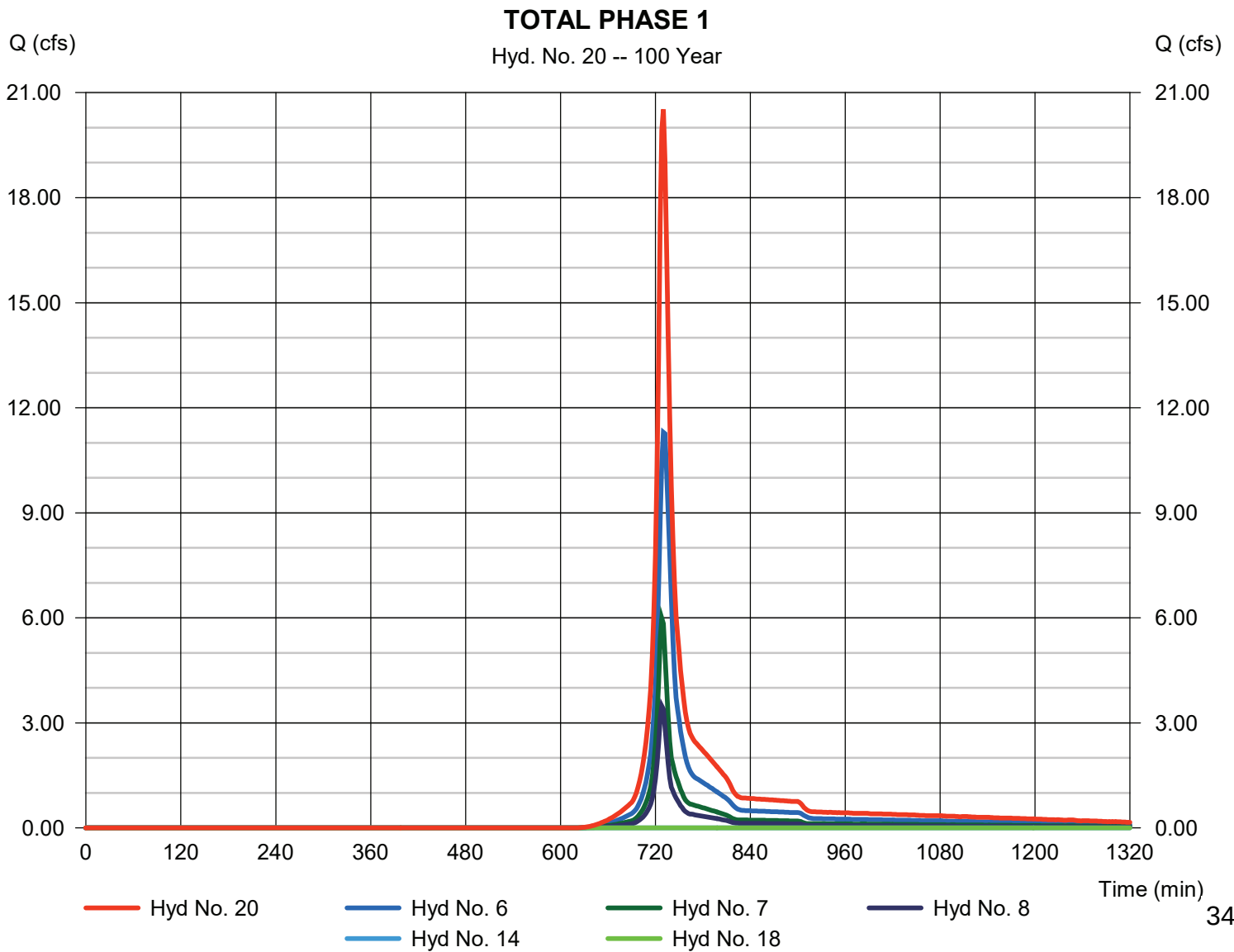
Tuesday, 05 / 7 / 2019

Hyd. No. 20

TOTAL PHASE 1

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 6, 7, 8, 14, 18

Peak discharge = 20.52 cfs
 Time to peak = 730 min
 Hyd. volume = 1.154 acft
 Contrib. drain. area = 4.769 ac



Hydrograph Report

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

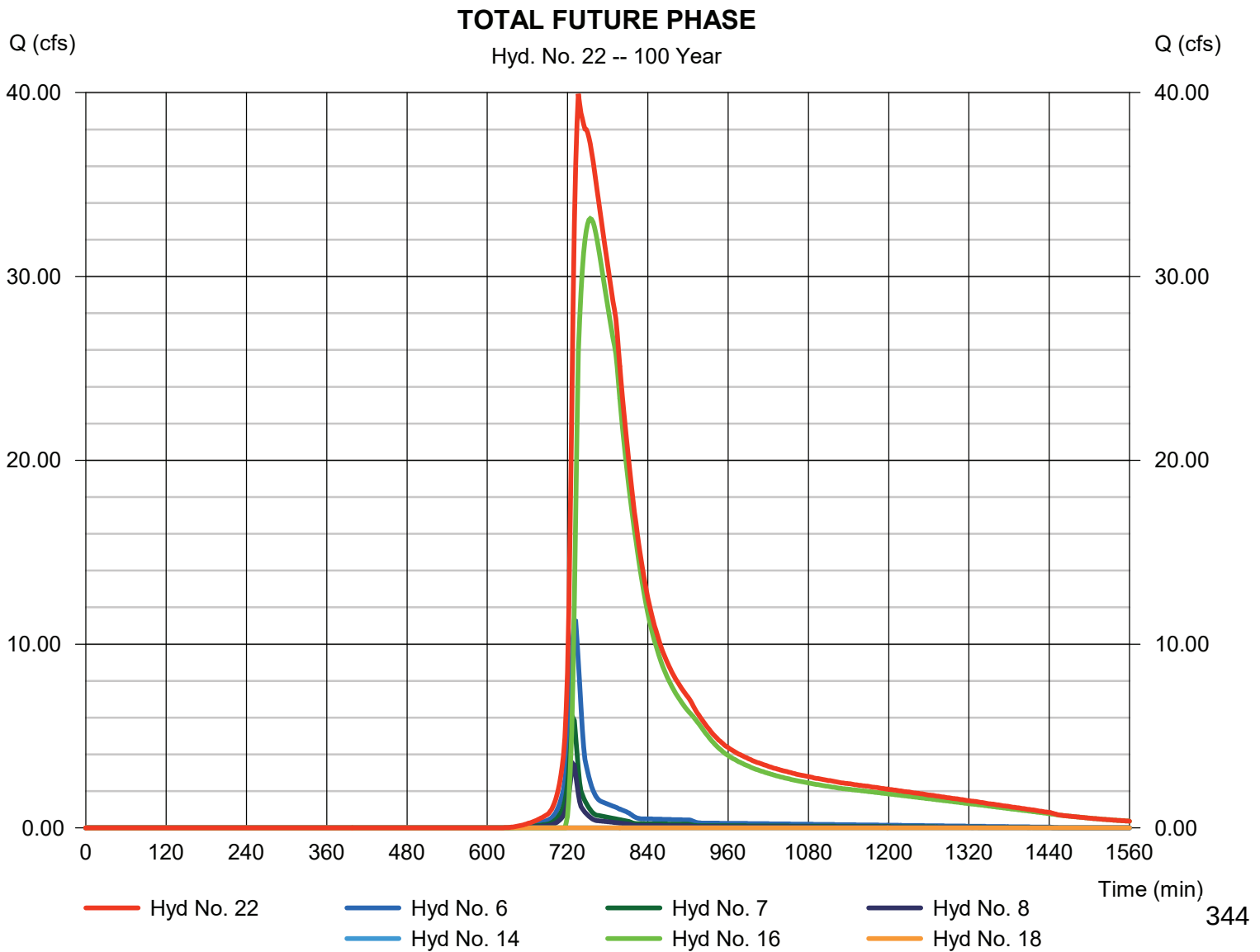
Tuesday, 05 / 7 / 2019

Hyd. No. 22

TOTAL FUTURE PHASE

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 6, 7, 8, 14, 16, 18

Peak discharge = 39.94 cfs
 Time to peak = 736 min
 Hyd. volume = 7.462 acft
 Contrib. drain. area = 4.769 ac



Hydraflow Rainfall Report

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

Tuesday, 05 / 7 / 2019

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	22.8367	5.6000	0.7338	-----
2	25.4674	5.2000	0.7159	-----
3	0.0000	0.0000	0.0000	-----
5	30.5439	4.9000	0.7023	-----
10	33.5363	4.6000	0.6850	-----
25	36.2566	4.0000	0.6589	-----
50	35.2584	3.1000	0.6226	-----
100	34.0002	2.2000	0.5870	-----

File name: WAUKESHA ATLAS 14 IDF.IDF

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.04	3.04	2.48	2.11	1.85	1.66	1.51	1.38	1.28	1.20	1.12	1.06
2	4.83	3.63	2.96	2.53	2.22	1.99	1.81	1.66	1.54	1.44	1.36	1.28
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	6.11	4.58	3.74	3.19	2.81	2.52	2.29	2.11	1.96	1.83	1.72	1.63
10	7.12	5.35	4.37	3.74	3.29	2.96	2.70	2.49	2.31	2.17	2.04	1.93
25	8.52	6.37	5.21	4.47	3.94	3.55	3.24	3.00	2.79	2.62	2.47	2.34
50	9.59	7.11	5.81	4.99	4.42	3.99	3.66	3.39	3.16	2.97	2.81	2.67
100	10.67	7.83	6.40	5.51	4.89	4.43	4.07	3.78	3.54	3.34	3.16	3.01

T_c = time in minutes. Values may exceed 60.

gn Standards\Hydrology\Hydraflow UPDATED ATLAS 14\STATIONS\WAUKESHA\WAUKESHA ATLAS 14 Precip.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	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	2.40	2.70	0.00	0.00	3.81	4.65	0.00	6.18

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APPENDIX 5

PROPOSED Hydraflow Calculations – Normal Conditions

Watershed Model Schematic

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

97 - R&M EX. P-5

38 - POND FOREBAY 1A

29 - INFLOW R&M EX. BIOSWALE P-5

1 - P-OS-1-PH 1

2 - P-1-PH 1

3 - P-1A-PH1

5 - P-2

4 - P-1B-PH1

6 - P-3

7 - P-4

13 - R&M EX. P-5

10 - R&M EX. P-2

11 - R&M EX. P-3

12 - R&M EX. P-4

14 - R&M EX. P-6

15 - R&M EX. P-7

16 - R&M EX. P-8

Legend

Hyd.	Origin	Description
1	SCS Runoff	P-OS-1-PH 1
2	SCS Runoff	P-1-PH 1
3	SCS Runoff	P-1A-PH1
4	SCS Runoff	P-1B-PH1
5	SCS Runoff	P-2
6	SCS Runoff	P-3
7	SCS Runoff	P-4
9	SCS Runoff	R&M EX. P-1
10	SCS Runoff	R&M EX. P-2
11	SCS Runoff	R&M EX. P-3
12	SCS Runoff	R&M EX. P-4
13	SCS Runoff	R&M EX. P-5
14	SCS Runoff	R&M EX. P-6
15	SCS Runoff	R&M EX. P-7
16	SCS Runoff	R&M EX. P-8
17	SCS Runoff	R&M EX. P-9
18	Reservoir	R&M EX. BIOSWALE P-1
19	Combine	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	R&M EX. BIOSWALE P-2
21	Combine	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	R&M EX. BIOSWALE P-3
23	Combine	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	R&M EX. BIOSWALE P-4
25	Combine	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	R&M EX. BIOSWALE P-5
27	Combine	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	R&M EX. BIOSWALE P-6
29	Combine	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	R&M EX. BIOSWALE P-7
31	Combine	R&M EX. BIOSWALE P-8
32	Reservoir	R&M EX. BIOSWALE P-8
33	SCS Runoff	PROPOSED P-5
34	Combine	INFLOW TO PR. P-5
35	Reservoir	PR. BLVD BIOFILTER P-5
37	Reservoir	POND P-2
38	Reservoir	POND P-3
39	Reservoir	RAIN GARDEN P-4
41	Combine	PHASE 1 OS-1 + P-1
42	Combine	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	PH 1 FOREBAY 1A
44	Combine	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	PH 1 FOREBAY 1B
46	Combine	PH 1 INFLOW - POND P-1
47	Reservoir	INFILTRATION BASIN P-1
49	Combine	PHASE 1 P-TOTAL

Hydrograph Return Period Recap

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

Hvd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	1.034	1.888	-----	-----	7.052	-----	-----	23.96	P-OS-1-PH 1
2	SCS Runoff	-----	19.64	26.68	-----	-----	56.30	-----	-----	130.52	P-1-PH 1
3	SCS Runoff	-----	1.778	2.445	-----	-----	5.305	-----	-----	12.43	P-1A-PH1
4	SCS Runoff	-----	4.870	6.334	-----	-----	12.32	-----	-----	26.54	P-1B-PH1
5	SCS Runoff	-----	7.587	9.272	-----	-----	15.81	-----	-----	30.40	P-2
6	SCS Runoff	-----	6.222	7.605	-----	-----	12.97	-----	-----	24.93	P-3
7	SCS Runoff	-----	1.395	1.681	-----	-----	2.782	-----	-----	5.183	P-4
9	SCS Runoff	-----	0.213	0.263	-----	-----	0.459	-----	-----	0.896	R&M EX. P-1
10	SCS Runoff	-----	0.445	0.531	-----	-----	0.856	-----	-----	1.550	R&M EX. P-2
11	SCS Runoff	-----	0.178	0.219	-----	-----	0.383	-----	-----	0.747	R&M EX. P-3
12	SCS Runoff	-----	0.219	0.267	-----	-----	0.451	-----	-----	0.854	R&M EX. P-4
13	SCS Runoff	-----	0.279	0.340	-----	-----	0.574	-----	-----	1.086	R&M EX. P-5
14	SCS Runoff	-----	0.445	0.535	-----	-----	0.874	-----	-----	1.606	R&M EX. P-6
15	SCS Runoff	-----	0.541	0.634	-----	-----	0.977	-----	-----	1.701	R&M EX. P-7
16	SCS Runoff	-----	0.380	0.459	-----	-----	0.762	-----	-----	1.422	R&M EX. P-8
17	SCS Runoff	-----	0.349	0.399	-----	-----	0.585	-----	-----	0.975	R&M EX. P-9
18	Reservoir	9	0.010	0.011	-----	-----	0.015	-----	-----	0.201	R&M EX. BIOSWALE P-1
19	Combine	10, 18	0.452	0.539	-----	-----	0.866	-----	-----	1.566	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	19	0.000	0.000	-----	-----	0.092	-----	-----	1.007	R&M EX. BIOSWALE P-2
21	Combine	11, 20	0.178	0.219	-----	-----	0.383	-----	-----	1.584	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	21	0.000	0.000	-----	-----	0.000	-----	-----	0.529	R&M EX. BIOSWALE P-3
23	Combine	12, 22	0.219	0.267	-----	-----	0.451	-----	-----	0.854	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	23	0.000	0.000	-----	-----	0.000	-----	-----	0.343	R&M EX. BIOSWALE P-4
25	Combine	13, 24	0.279	0.340	-----	-----	0.574	-----	-----	1.086	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	25	0.000	0.000	-----	-----	0.000	-----	-----	0.362	R&M EX. BIOSWALE P-5
27	Combine	14, 26	0.445	0.535	-----	-----	0.874	-----	-----	1.606	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	27	0.000	0.000	-----	-----	0.000	-----	-----	0.400	R&M EX. BIOSWALE P-6
29	Combine	15, 28	0.541	0.634	-----	-----	0.977	-----	-----	1.701	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	29	0.000	0.000	-----	-----	0.024	-----	-----	0.728	R&M EX. BIOSWALE P-7
31	Combine	16, 30	0.380	0.459	-----	-----	0.762	-----	-----	1.788	R&M EX. BIOSWALE P-8
32	Reservoir	31	0.000	0.000	-----	-----	0.000	-----	-----	0.456	R&M EX. BIOSWALE P-8
33	SCS Runoff	-----	2.803	3.263	-----	-----	4.962	-----	-----	8.540	PROPOSED P-5
34	Combine	32, 33	2.803	3.263	-----	-----	4.962	-----	-----	8.540	INFLOW TO PR. P-5
Proj. file: 2019-06-27_CHAPMAN FARMS_PHASE I.gpw										Friday, 06 / 28 / 2019	

Hydrograph Return Period Recap

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

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	34	0.000	0.000	-----	-----	0.000	-----	-----	0.000	PR. BLVD BIOFILTER P-5
37	Reservoir	5	1.821	4.544	-----	-----	13.82	-----	-----	26.10	POND P-2
38	Reservoir	6	5.205	7.010	-----	-----	12.80	-----	-----	22.09	POND P-3
39	Reservoir	7	0.000	0.000	-----	-----	0.000	-----	-----	3.364	RAIN GARDEN P-4
41	Combine	1, 2,	19.99	27.59	-----	-----	61.39	-----	-----	149.04	PHASE 1 OS-1 + P-1
42	Combine	3, 37,	2.827	6.620	-----	-----	19.07	-----	-----	38.52	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	42	2.784	6.429	-----	-----	18.87	-----	-----	38.36	PH 1 FOREBAY 1A
44	Combine	4, 38,	9.595	12.97	-----	-----	25.12	-----	-----	47.97	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	44	6.935	10.85	-----	-----	24.08	-----	-----	47.32	PH 1 FOREBAY 1B
46	Combine	41, 43, 45	20.27	28.01	-----	-----	82.17	-----	-----	215.64	PH 1 INFLOW - POND P-1
47	Reservoir	46	0.000	0.000	-----	-----	0.000	-----	-----	0.000	INFILTRATION BASIN P-1
49	Combine	39, 47,	0.000	0.000	-----	-----	0.000	-----	-----	3.364	PHASE 1 P-TOTAL
Proj. file: 2019-06-27_CHAPMAN FARMS_PHASE I.gpw Friday, 06 / 28 / 2019											

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	1.034	2	750	0.163	-----	-----	-----	P-OS-1-PH 1
2	SCS Runoff	19.64	2	732	1.277	-----	-----	-----	P-1-PH 1
3	SCS Runoff	1.778	2	744	0.182	-----	-----	-----	P-1A-PH1
4	SCS Runoff	4.870	2	738	0.400	-----	-----	-----	P-1B-PH1
5	SCS Runoff	7.587	2	738	0.591	-----	-----	-----	P-2
6	SCS Runoff	6.222	2	738	0.485	-----	-----	-----	P-3
7	SCS Runoff	1.395	2	738	0.108	-----	-----	-----	P-4
9	SCS Runoff	0.213	2	726	0.009	-----	-----	-----	R&M EX. P-1
10	SCS Runoff	0.445	2	726	0.019	-----	-----	-----	R&M EX. P-2
11	SCS Runoff	0.178	2	726	0.008	-----	-----	-----	R&M EX. P-3
12	SCS Runoff	0.219	2	726	0.009	-----	-----	-----	R&M EX. P-4
13	SCS Runoff	0.279	2	726	0.012	-----	-----	-----	R&M EX. P-5
14	SCS Runoff	0.445	2	726	0.019	-----	-----	-----	R&M EX. P-6
15	SCS Runoff	0.541	2	726	0.024	-----	-----	-----	R&M EX. P-7
16	SCS Runoff	0.380	2	726	0.016	-----	-----	-----	R&M EX. P-8
17	SCS Runoff	0.349	2	726	0.016	-----	-----	-----	R&M EX. P-9
18	Reservoir	0.010	2	812	0.009	9	850.96	0.005	R&M EX. BIOSWALE P-1
19	Combine	0.452	2	726	0.028	10, 18	-----	-----	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	0.000	2	2398	0.000	19	850.97	0.016	R&M EX. BIOSWALE P-2
21	Combine	0.178	2	726	0.008	11, 20	-----	-----	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	0.000	2	720	0.000	21	849.63	0.004	R&M EX. BIOSWALE P-3
23	Combine	0.219	2	726	0.009	12, 22	-----	-----	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	0.000	2	938	0.000	23	848.91	0.006	R&M EX. BIOSWALE P-4
25	Combine	0.279	2	726	0.012	13, 24	-----	-----	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	0.000	2	1240	0.000	25	847.60	0.007	R&M EX. BIOSWALE P-5
27	Combine	0.445	2	726	0.019	14, 26	-----	-----	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	0.000	2	1570	0.000	27	846.33	0.013	R&M EX. BIOSWALE P-6
29	Combine	0.541	2	726	0.024	15, 28	-----	-----	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	0.000	2	1866	0.000	29	844.67	0.016	R&M EX. BIOSWALE P-7
31	Combine	0.380	2	726	0.016	16, 30	-----	-----	R&M EX. BIOSWALE P-8
32	Reservoir	0.000	2	1326	0.000	31	843.28	0.010	R&M EX. BIOSWALE P-8
33	SCS Runoff	2.803	2	726	0.124	-----	-----	-----	PROPOSED P-5
34	Combine	2.803	2	726	0.124	32, 33	-----	-----	INFLOW TO PR. P-5
2019-06-27_CHAPMAN FARMS_PHASE I.gpw						Return Period: 1 Year		Friday, 06 / 28 / 2019	

Hydrograph Summary Report

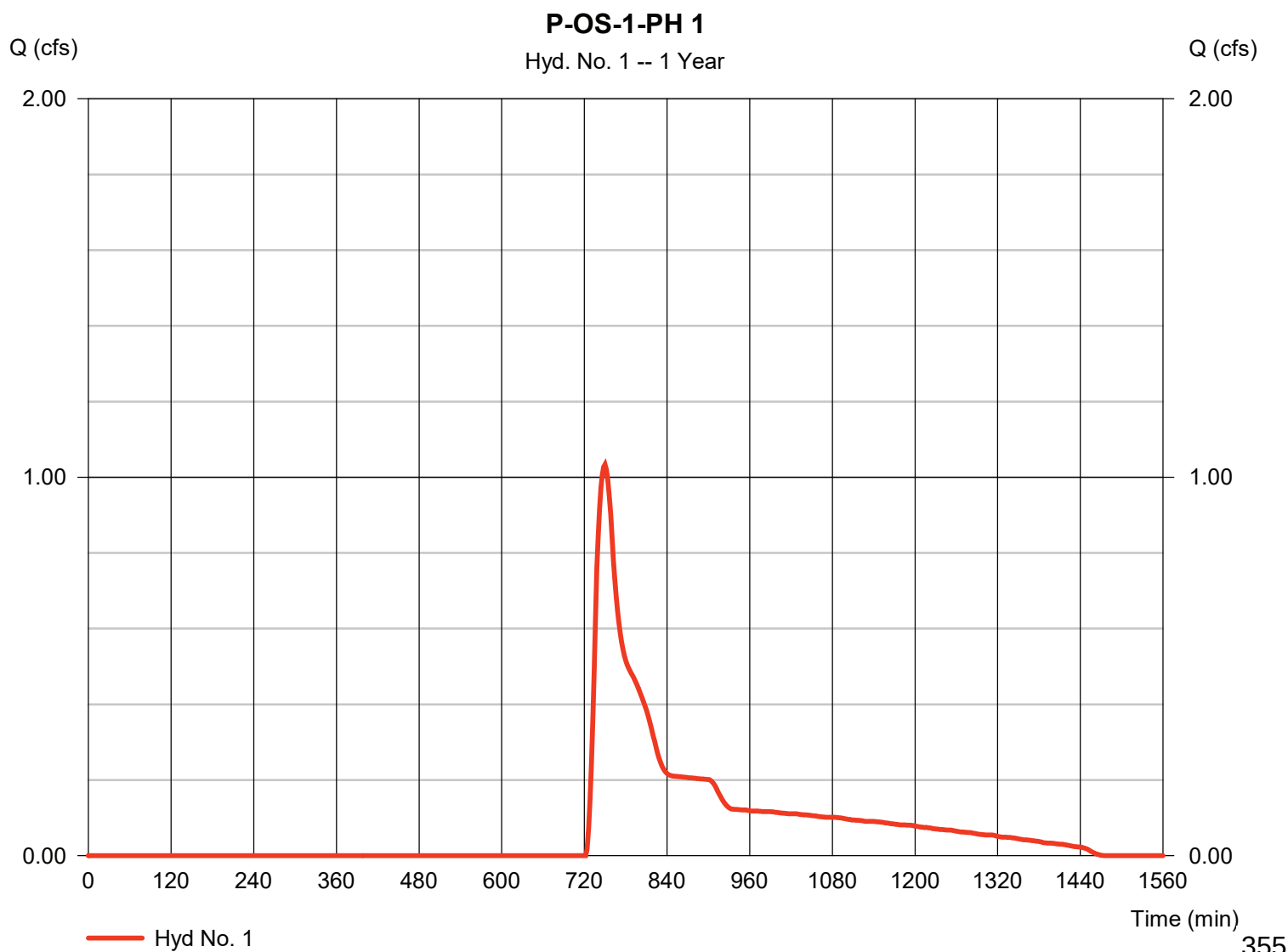
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
35	Reservoir	0.000	2	746	0.000	34	841.66	0.078	PR. BLVD BIOFILTER P-5
37	Reservoir	1.821	2	768	0.591	5	839.34	0.303	POND P-2
38	Reservoir	5.205	2	746	0.484	6	839.73	0.145	POND P-3
39	Reservoir	0.000	2	746	0.000	7	839.81	0.065	RAIN GARDEN P-4
41	Combine	19.99	2	732	1.440	1, 2,	-----	-----	PHASE 1 OS-1 + P-1
42	Combine	2.827	2	764	0.773	3, 37,	-----	-----	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	2.784	2	766	0.772	42	834.93	0.075	PH 1 FOREBAY 1A
44	Combine	9.595	2	744	0.885	4, 38,	-----	-----	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	6.935	2	754	0.884	44	834.95	0.218	PH 1 FOREBAY 1B
46	Combine	20.27	2	732	3.095	41, 43, 45	-----	-----	PH 1 INFLOW - POND P-1
47	Reservoir	0.000	2	3256	0.000	46	831.75	2.24	INFILTRATION BASIN P-1
49	Combine	0.000	2	3256	0.000	39, 47,	-----	-----	PHASE 1 P-TOTAL
2019-06-27_CHAPMAN FARMS_PHASE 1.gpw					Return Period: 1 Year			Friday, 06 / 28 / 2019	

Hyd. No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.034 cfs
Storm frequency	= 1 yrs	Time to peak	= 750 min
Time interval	= 2 min	Hyd. volume	= 0.163 acft
Drainage area	= 10.170 ac	Curve number	= 62*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.50 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE	Shyde factor	= 1.0

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

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

Friday, 06 / 28 / 2019

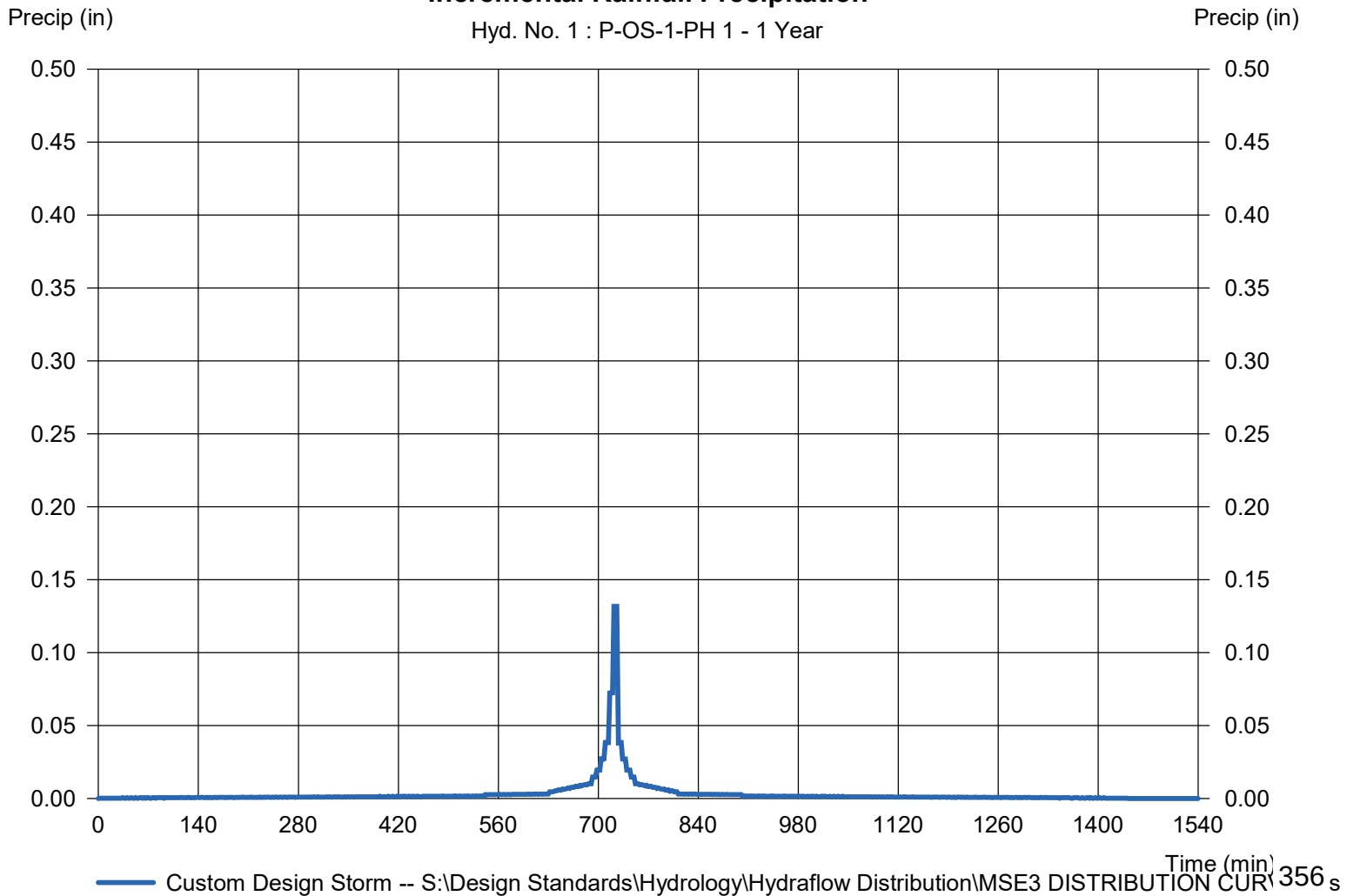
Hyd. No. 1

P-OS-1-PH 1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 1 : P-OS-1-PH 1 - 1 Year



Hydrograph Report

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

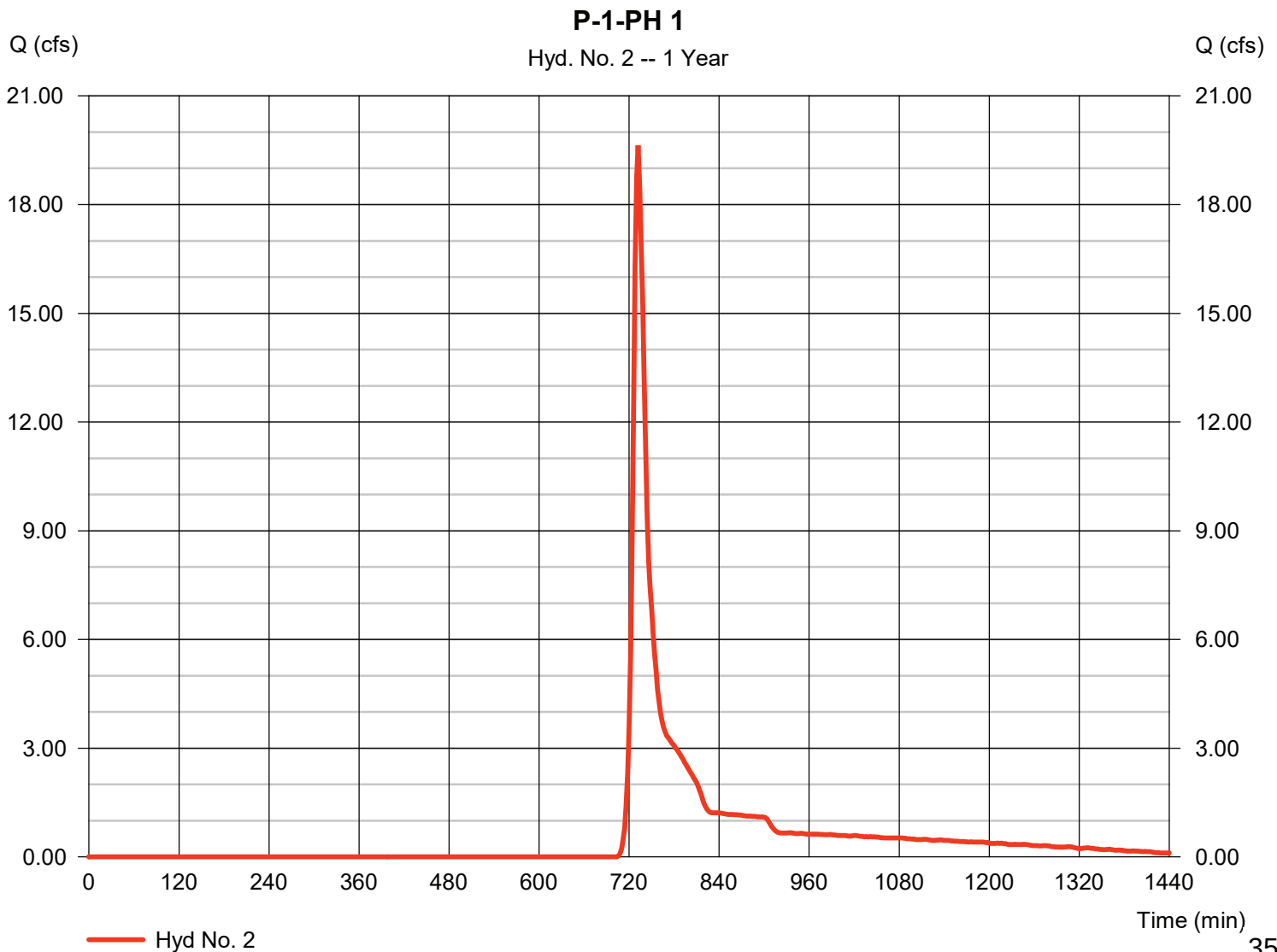
Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 19.64 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 1.277 acft
Drainage area	= 26.872 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 26.872



TR55 Tc Worksheet

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

Hyd. No. 2

P-1-PH 1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 70.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 4.00	0.00	0.00	
Travel Time (min)	= 8.85	+	0.00	+
			0.00	= 8.85
Shallow Concentrated Flow				
Flow length (ft)	= 360.00	0.00	0.00	
Watercourse slope (%)	= 2.50	0.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=2.55	0.00	0.00	
Travel Time (min)	= 2.35	+	0.00	+
			0.00	= 2.35
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				11.20 min

Precipitation Report

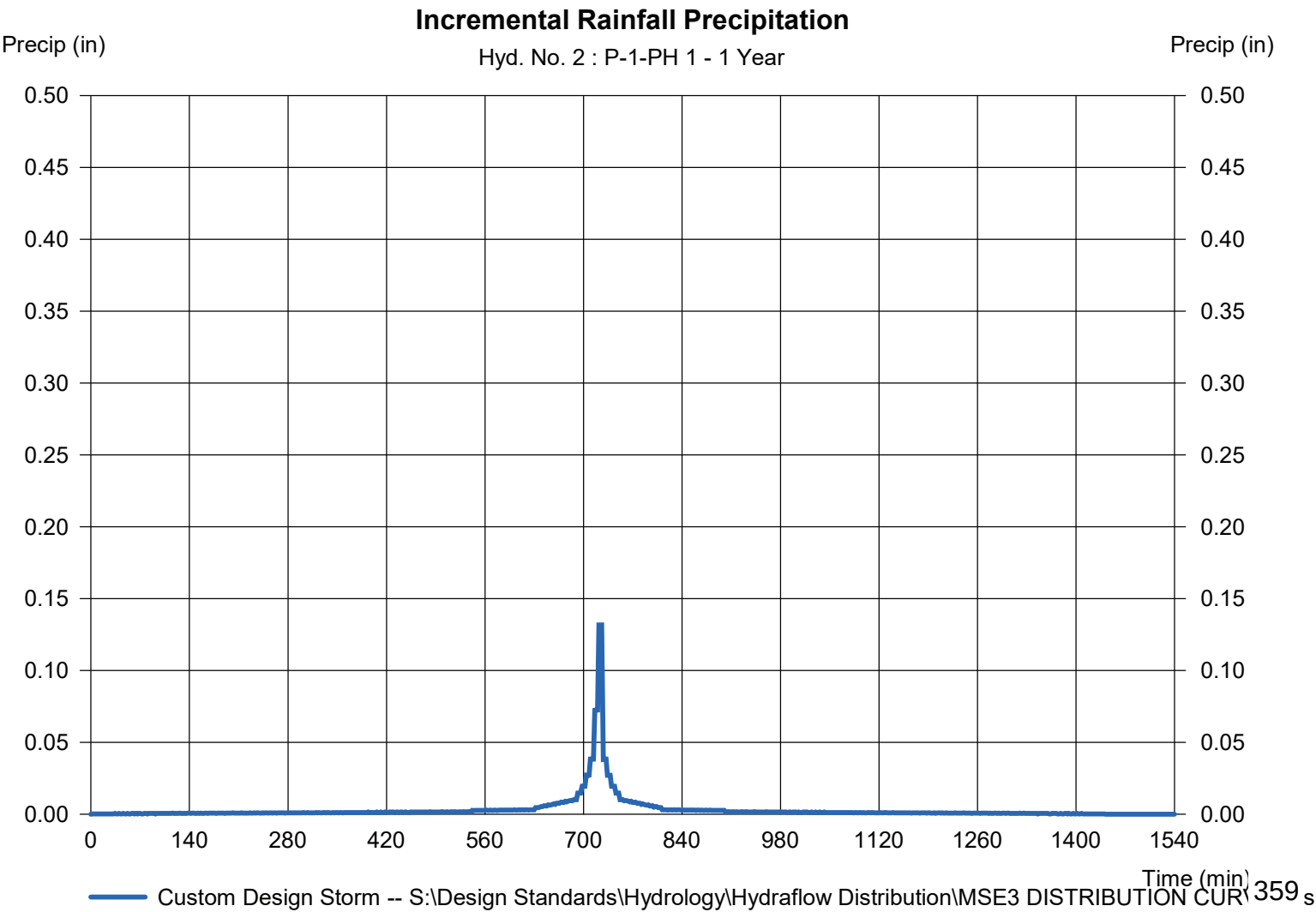
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

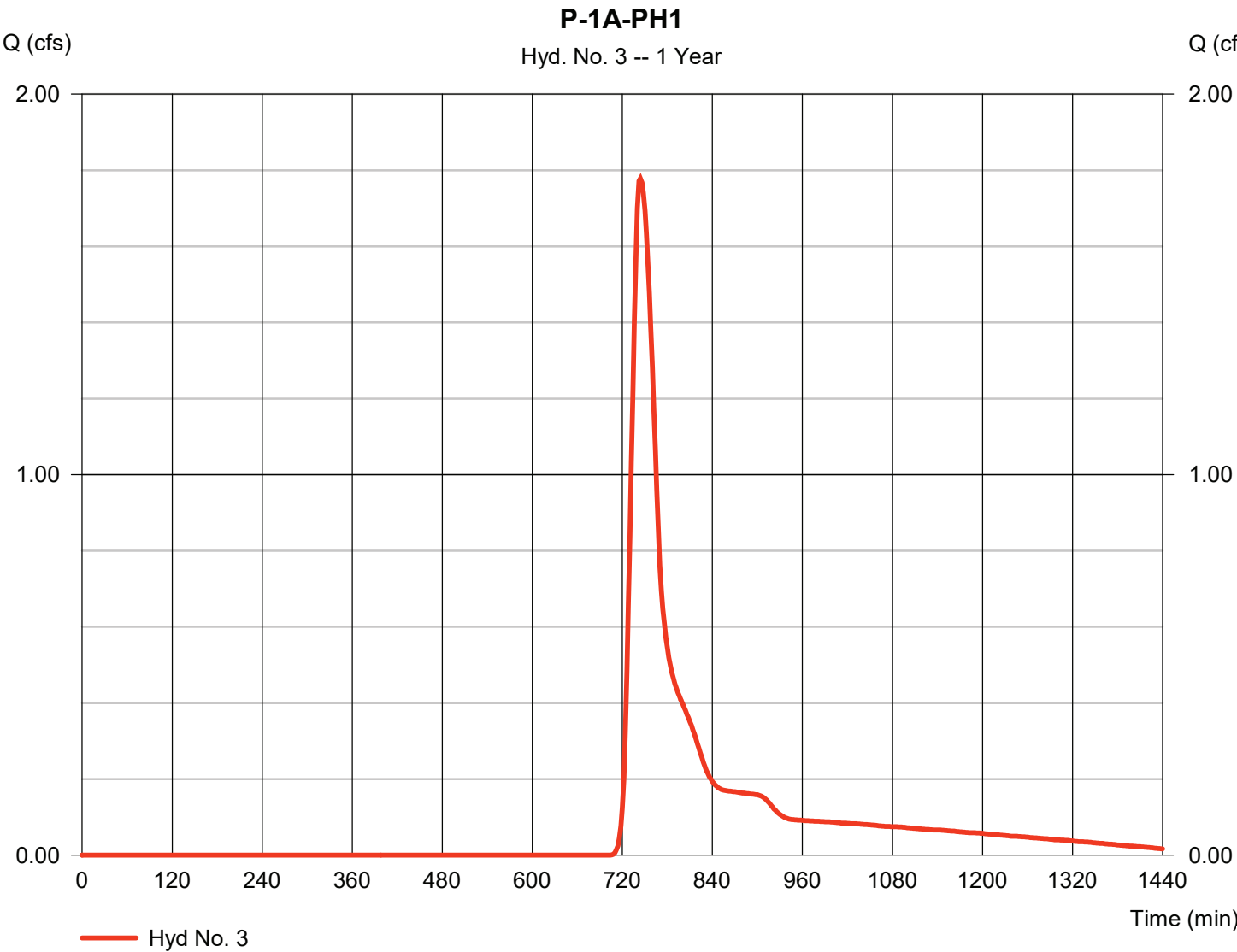
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.778 cfs
Storm frequency	= 1 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 0.182 acft
Drainage area	= 3.947 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 29.90 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		



TR55 Tc Worksheet

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

Hyd. No. 3

P-1A-PH1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
Travel Time (min)	= 28.35	+	0.00	+
			0.00	= 28.35
Shallow Concentrated Flow				
Flow length (ft)	= 165.00	25.00	0.00	
Watercourse slope (%)	= 1.25	25.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=1.80	8.07	0.00	
Travel Time (min)	= 1.52	+	0.05	+
			0.00	= 1.58
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				29.90 min

Precipitation Report

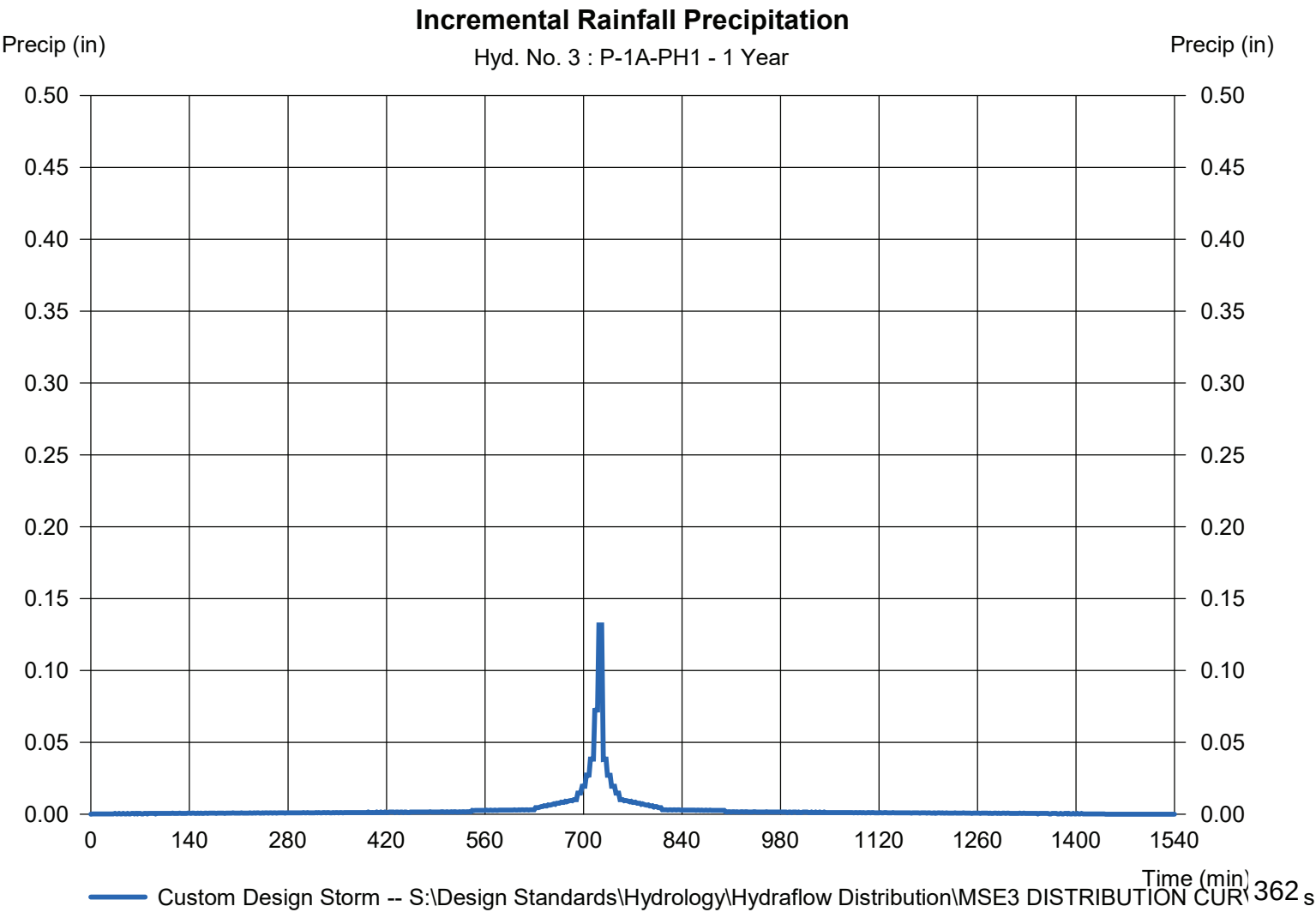
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

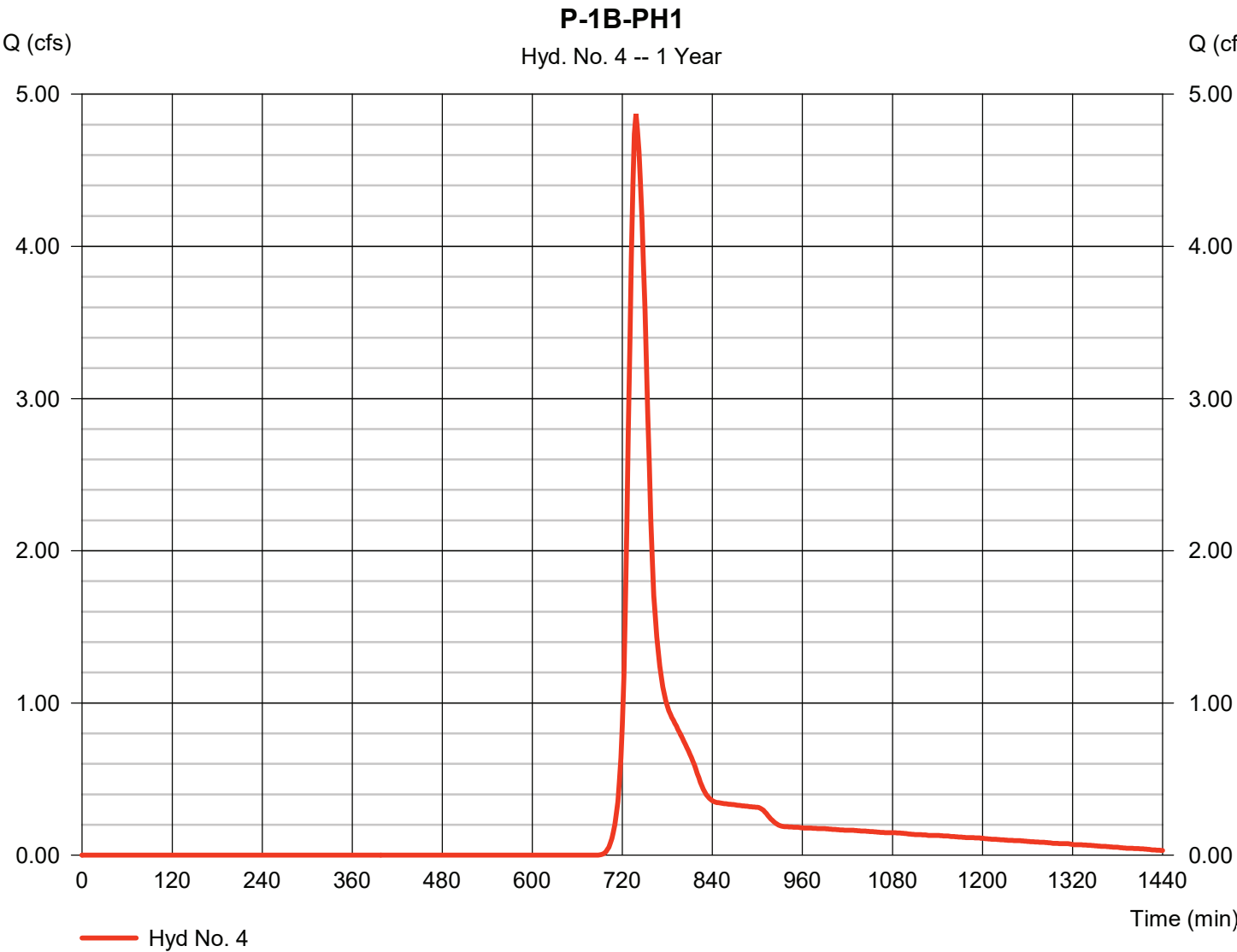
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 4.870 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.400 acft
Drainage area	= 6.516 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.60 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		



TR55 Tc Worksheet

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

Hyd. No. 4

P-1B-PH1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 150.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00				
Land slope (%)	= 2.83	0.00	0.00				
Travel Time (min)	= 18.70	+	0.00	+	0.00	=	18.70
Shallow Concentrated Flow							
Flow length (ft)	= 275.00	33.00	0.00				
Watercourse slope (%)	= 1.00	20.00	0.00				
Surface description	= Unpaved	Unpaved	Paved				
Average velocity (ft/s)	=1.61	7.22	0.00				
Travel Time (min)	= 2.84	+	0.08	+	0.00	=	2.92
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				21.60 min			

Precipitation Report

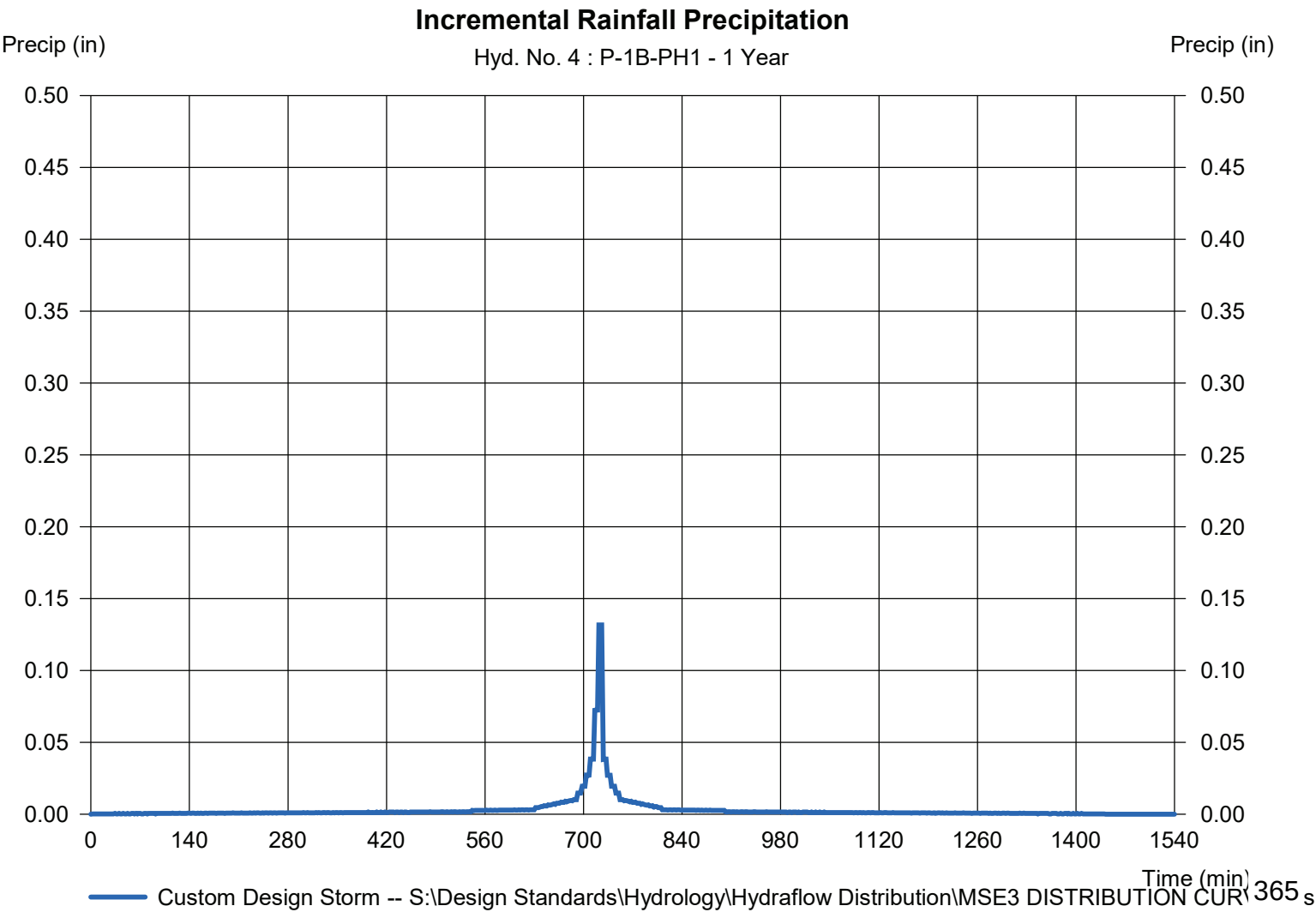
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

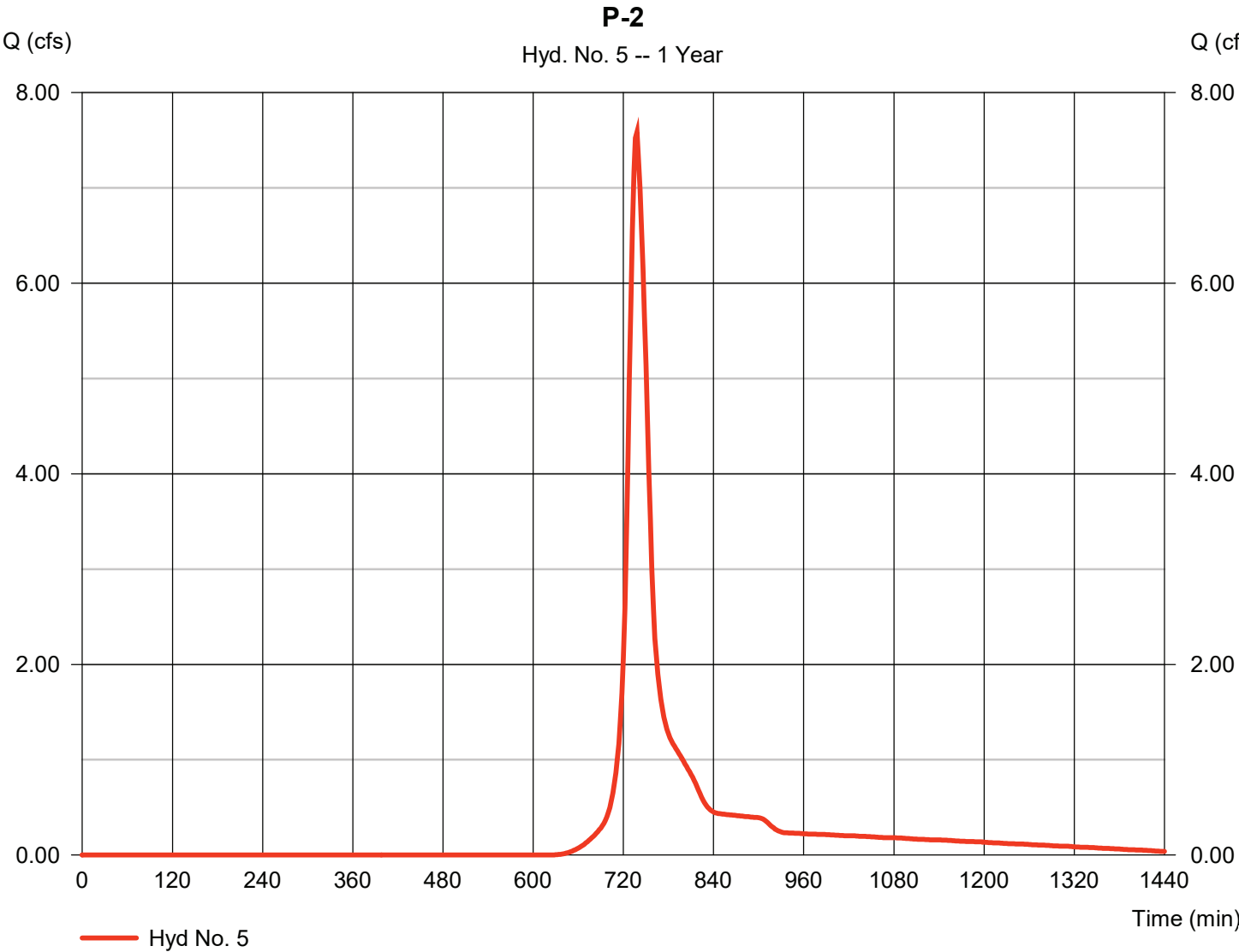
Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 7.587 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.591 acft
Drainage area	= 6.339 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.710 x 75)] / 6.339



TR55 Tc Worksheet

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

Hyd. No. 5

P-2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 97.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
Travel Time (min)	= 20.01	+	0.00	+
			0.00	= 20.01
Shallow Concentrated Flow				
Flow length (ft)	= 132.00	0.00	0.00	
Watercourse slope (%)	= 1.50	0.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=1.98	0.00	0.00	
Travel Time (min)	= 1.11	+	0.00	+
			0.00	= 1.11
Channel Flow				
X sectional flow area (sqft)	= 1.23	0.00	0.00	
Wetted perimeter (ft)	= 3.93	0.00	0.00	
Channel slope (%)	= 0.50	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=3.72	0.00	0.00	
Flow length (ft)	(0)189.0	0.0	0.0	
Travel Time (min)	= 0.85	+	0.00	+
			0.00	= 0.85
Total Travel Time, Tc				22.00 min

Precipitation Report

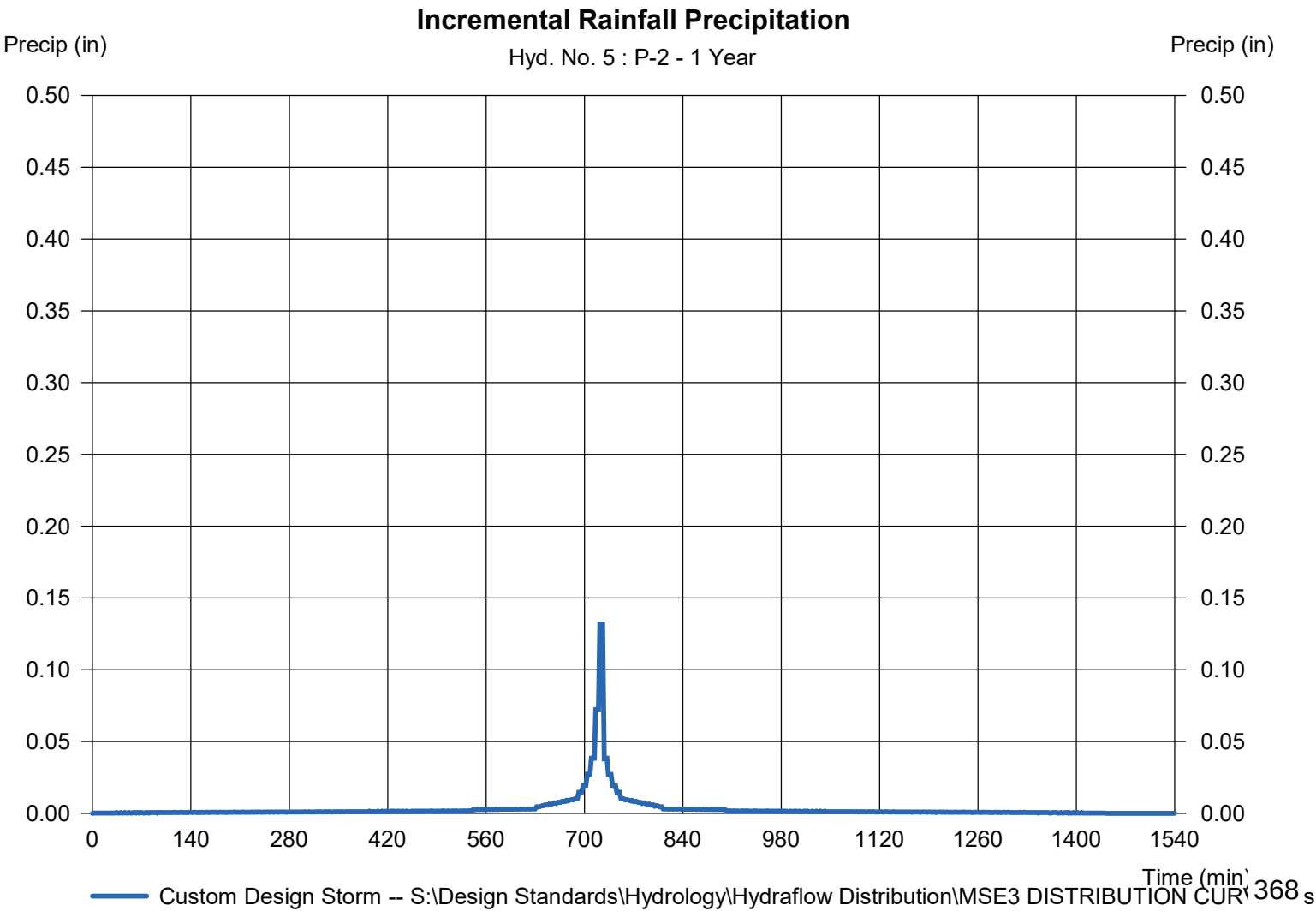
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

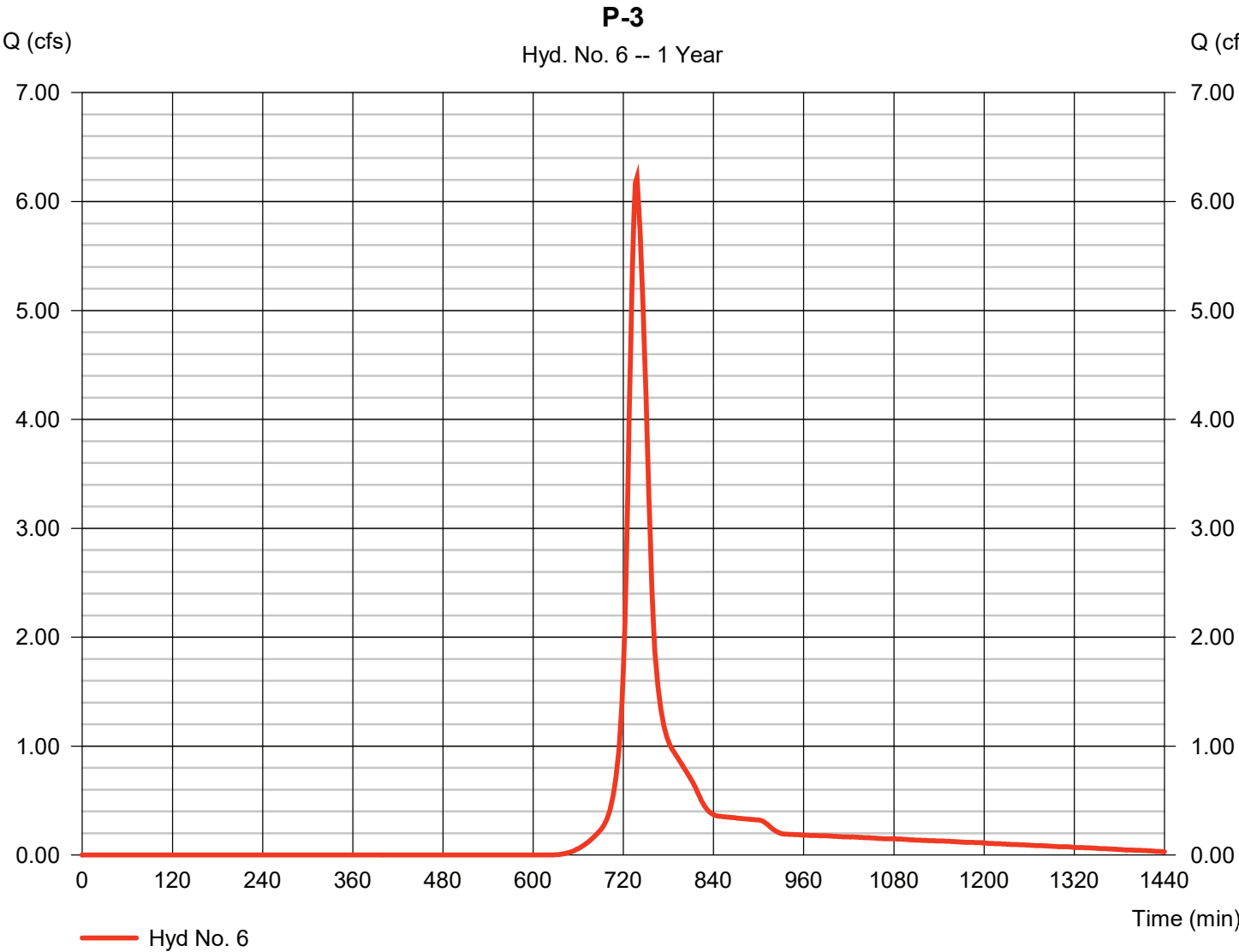
Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 6.222 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.485 acft
Drainage area	= 5.199 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.199



TR55 Tc Worksheet

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

Hyd. No. 6

P-3

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 92.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
Travel Time (min)	= 19.18	+	0.00	+
			0.00	= 19.18
Shallow Concentrated Flow				
Flow length (ft)	= 156.00	0.00	0.00	
Watercourse slope (%)	= 1.00	0.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=1.61	0.00	0.00	
Travel Time (min)	= 1.61	+	0.00	+
			0.00	= 1.61
Channel Flow				
X sectional flow area (sqft)	= 1.77	0.00	0.00	
Wetted perimeter (ft)	= 4.71	0.00	0.00	
Channel slope (%)	= 0.50	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=4.21	0.00	0.00	
Flow length (ft)	(0)614.0	0.0	0.0	
Travel Time (min)	= 2.43	+	0.00	+
			0.00	= 2.43
Total Travel Time, Tc				23.20 min

Precipitation Report

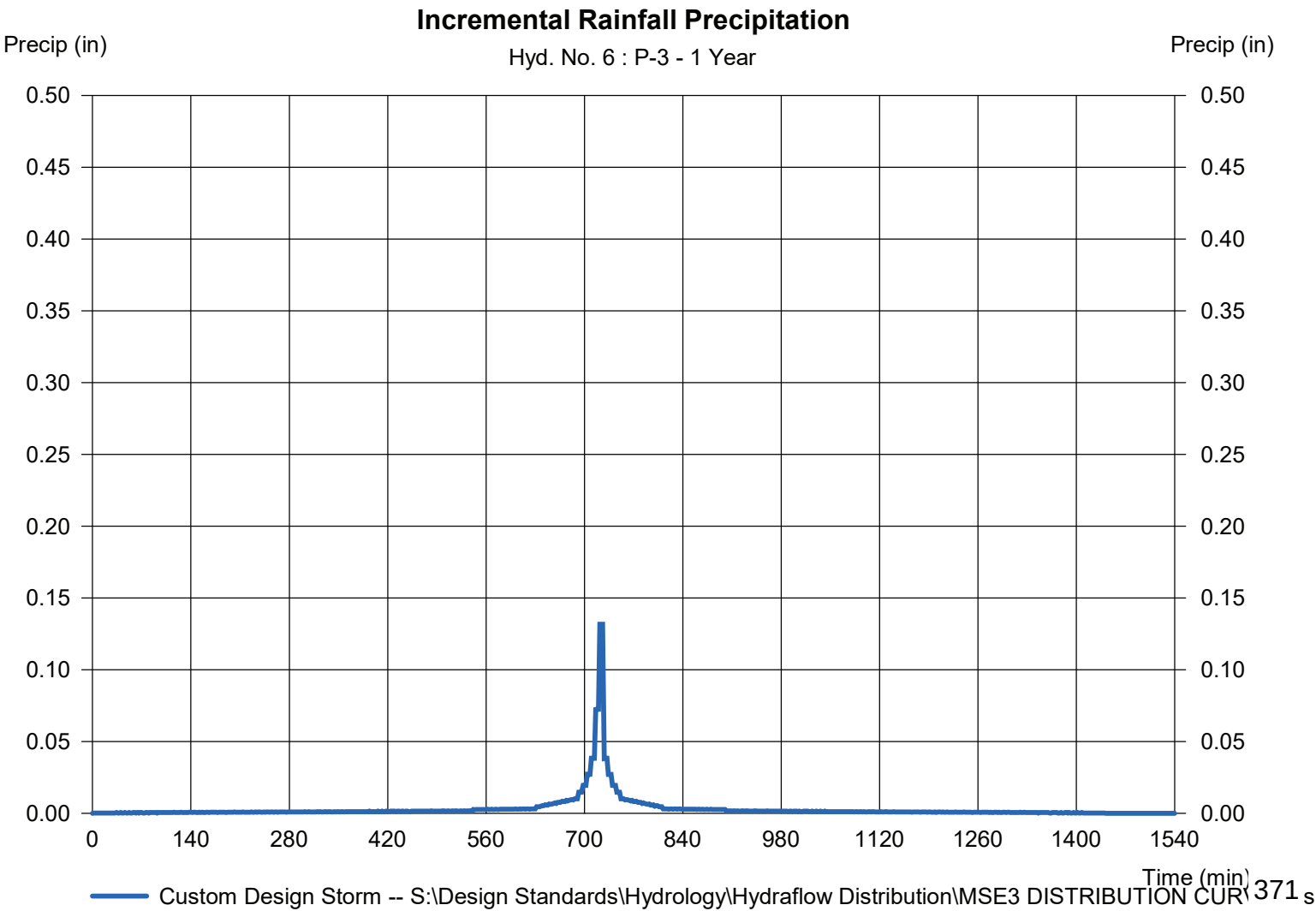
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

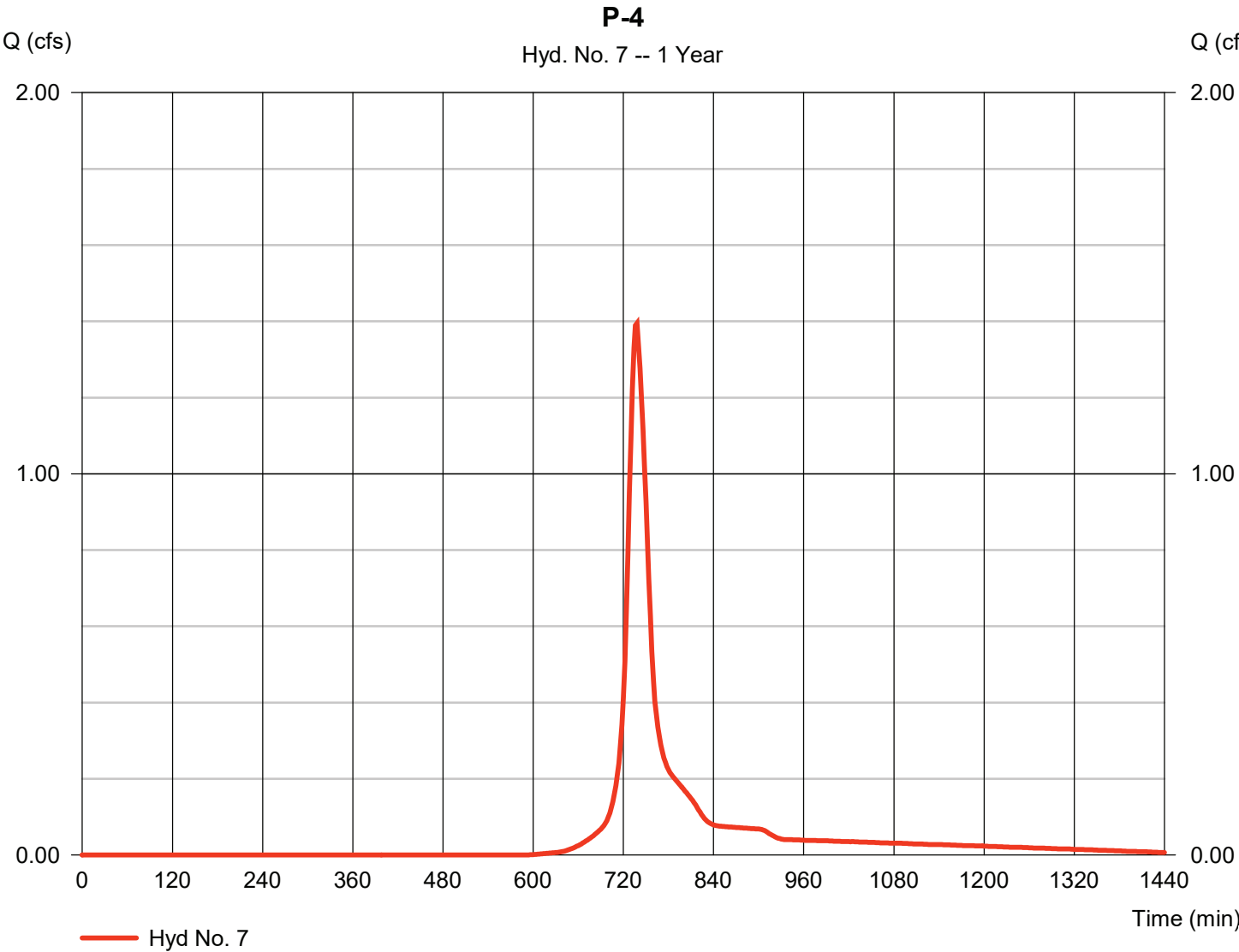
Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.395 cfs
Storm frequency	=	1 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	0.108 acft
Drainage area	=	1.040 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.10 min
Total precip.	=	2.40 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE			

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



TR55 Tc Worksheet

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

Hyd. No. 7

P-4

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00				
Land slope (%)	= 1.00	0.00	0.00				
Travel Time (min)	= 20.50	+	0.00	+	0.00	=	20.50
Shallow Concentrated Flow							
Flow length (ft)	= 270.00	0.00	0.00				
Watercourse slope (%)	= 1.11	0.00	0.00				
Surface description	= Unpaved	Unpaved	Paved				
Average velocity (ft/s)	=1.70	0.00	0.00				
Travel Time (min)	= 2.65	+	0.00	+	0.00	=	2.65
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.013	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				23.10 min			

Precipitation Report

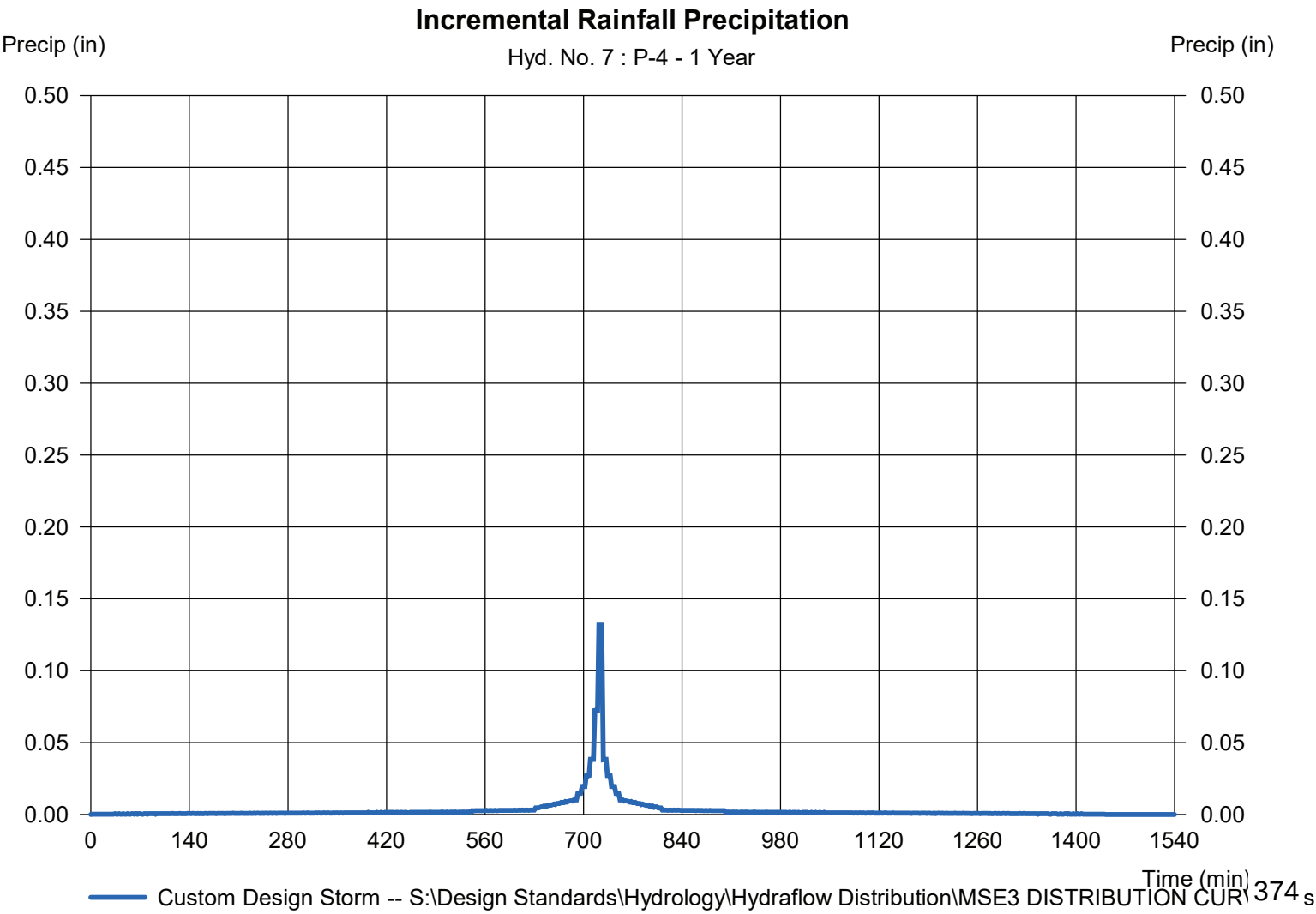
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

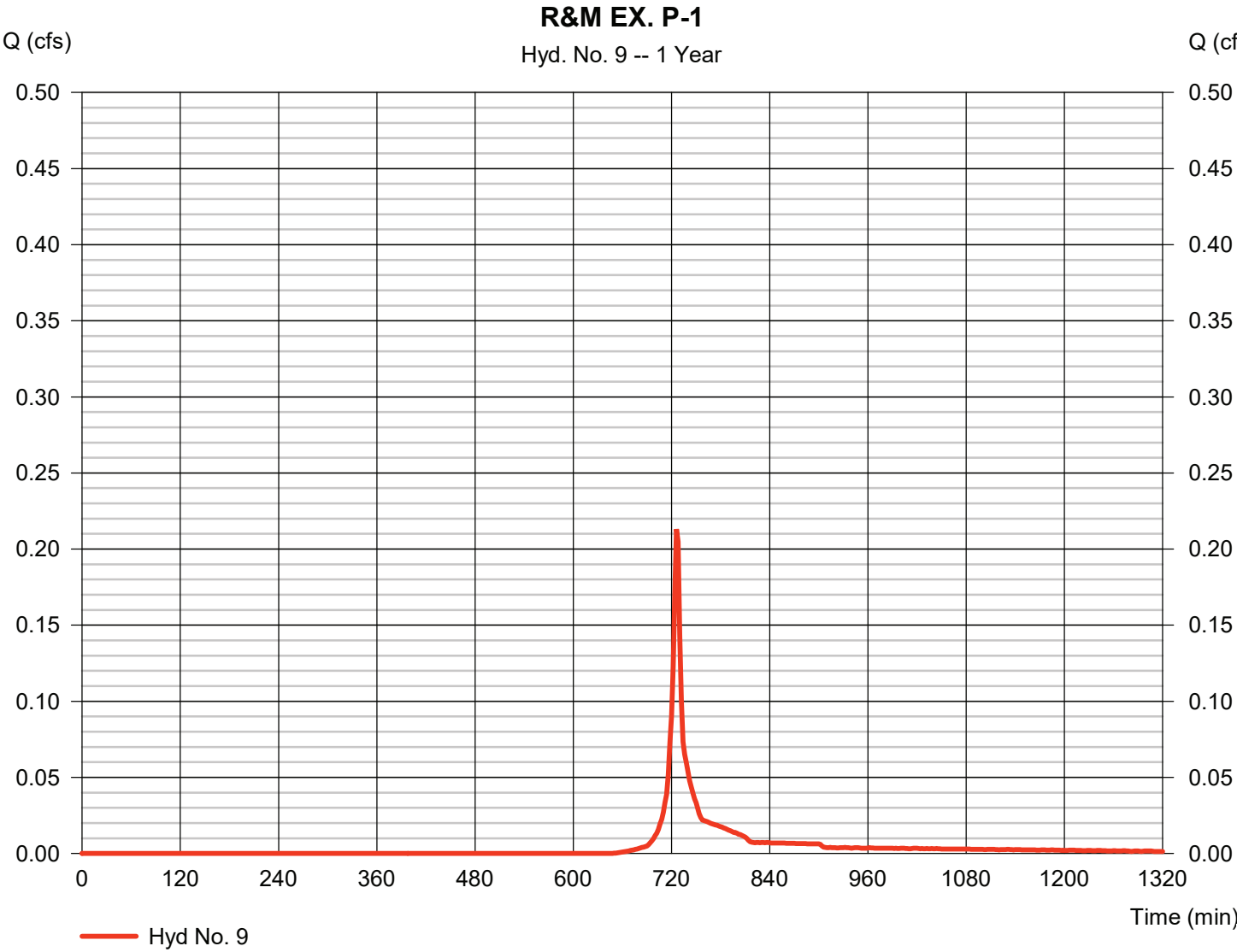
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.213 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.009 acft
Drainage area	= 0.120 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD3 DISTRIBUTION CU		



Precipitation Report

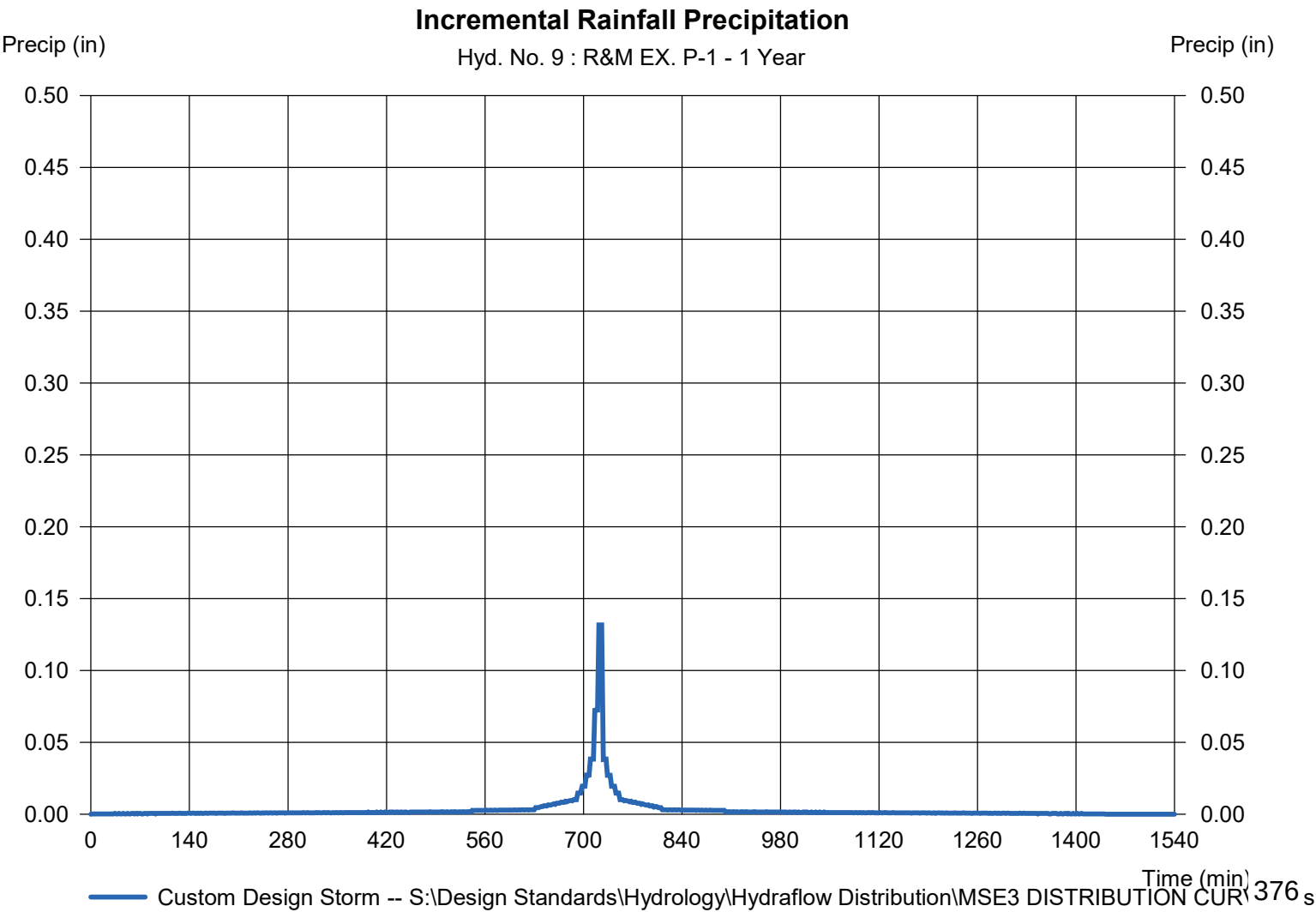
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

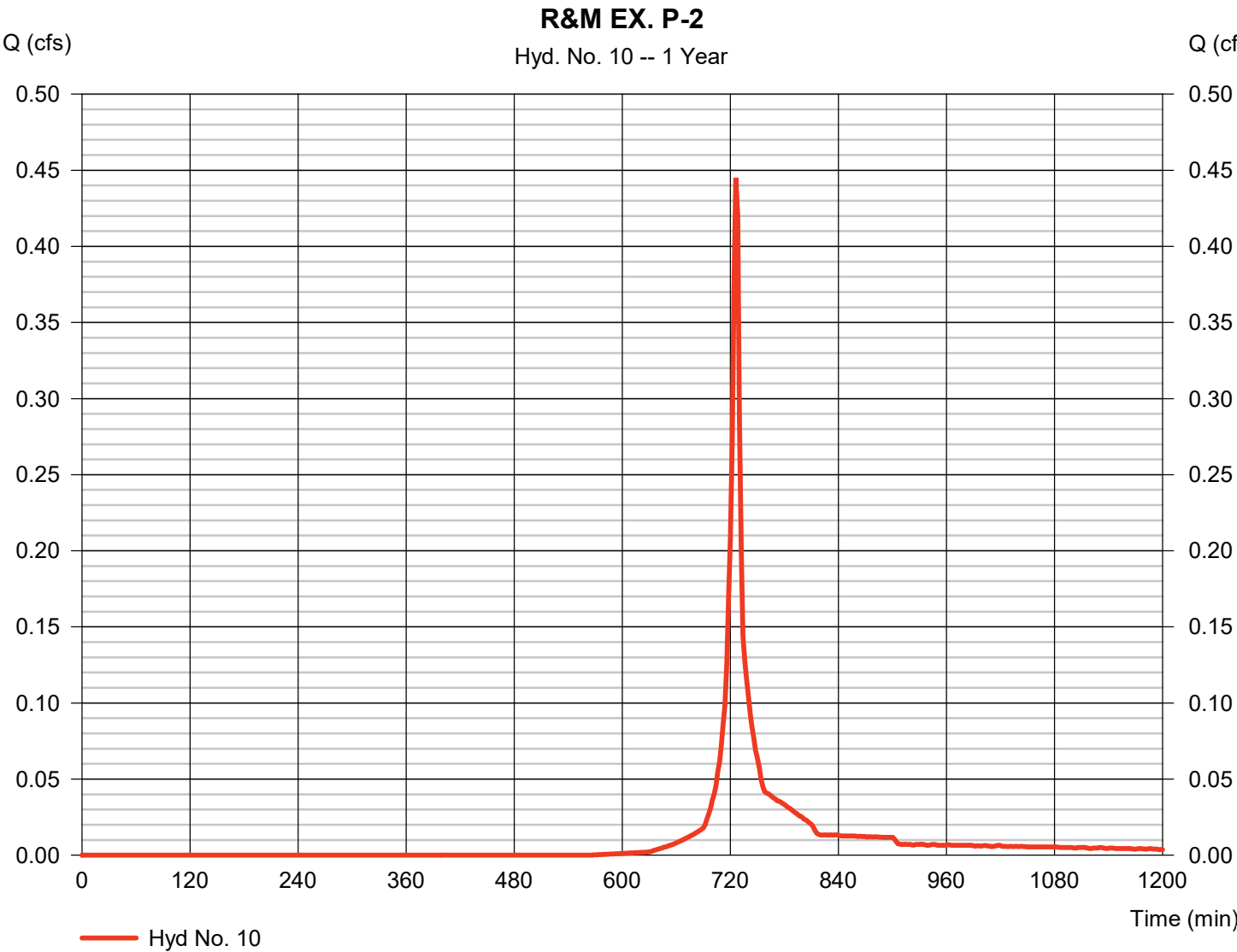
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.445 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.019 acft
Drainage area	= 0.190 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

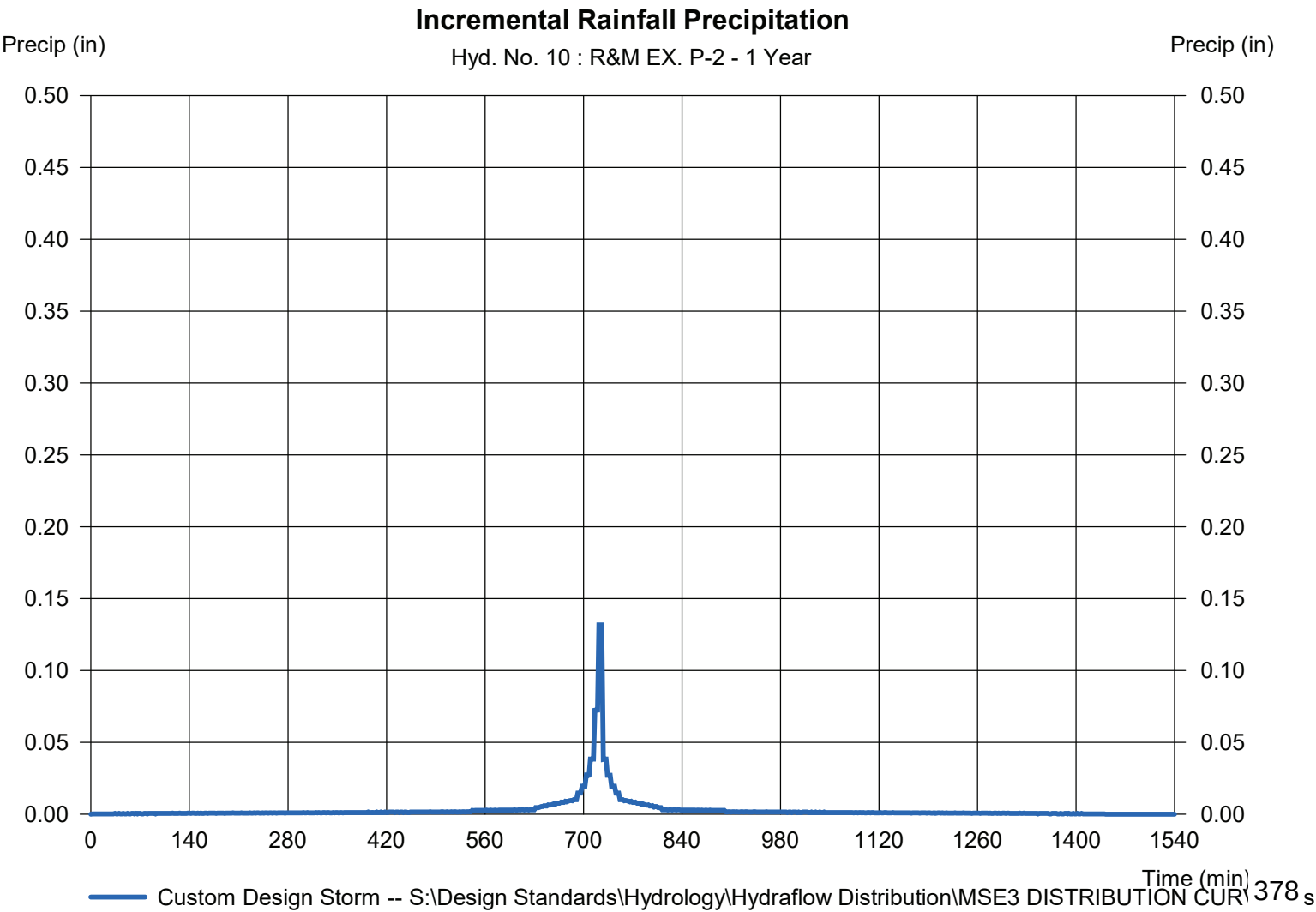
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

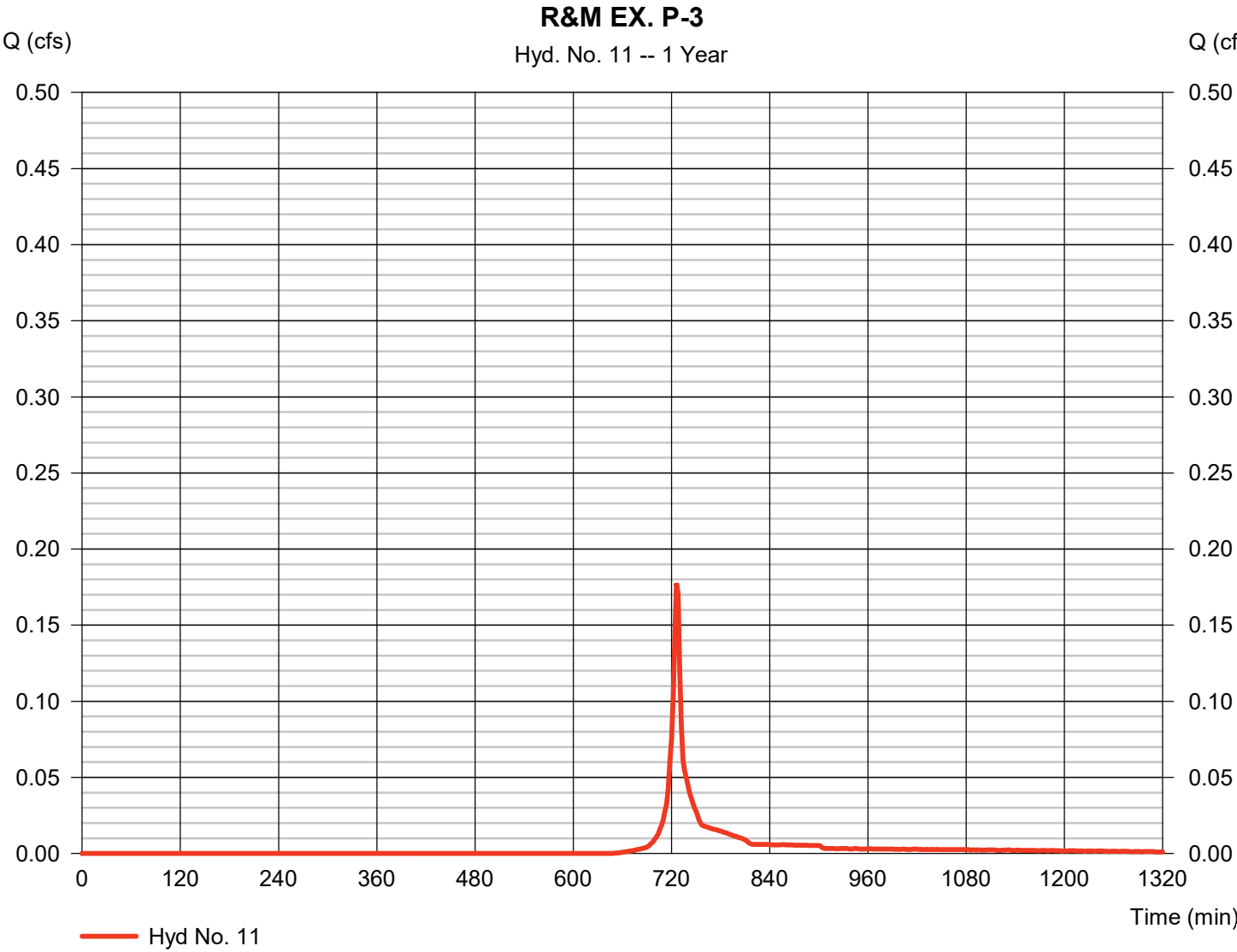
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.178 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.008 acft
Drainage area	= 0.100 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD\MSD3 DISTRIBUTION CU		



Precipitation Report

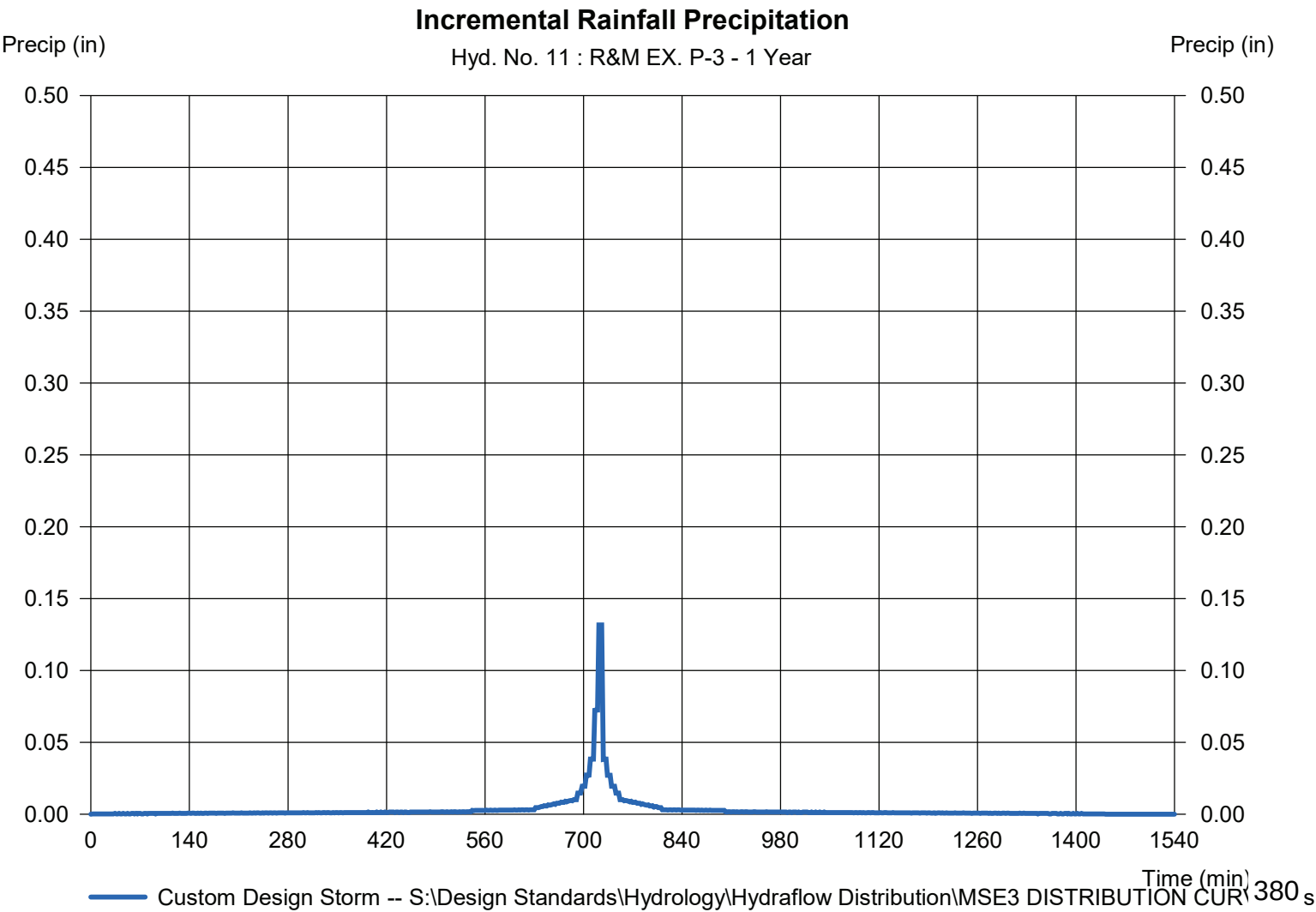
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION CUR		



Hydrograph Report

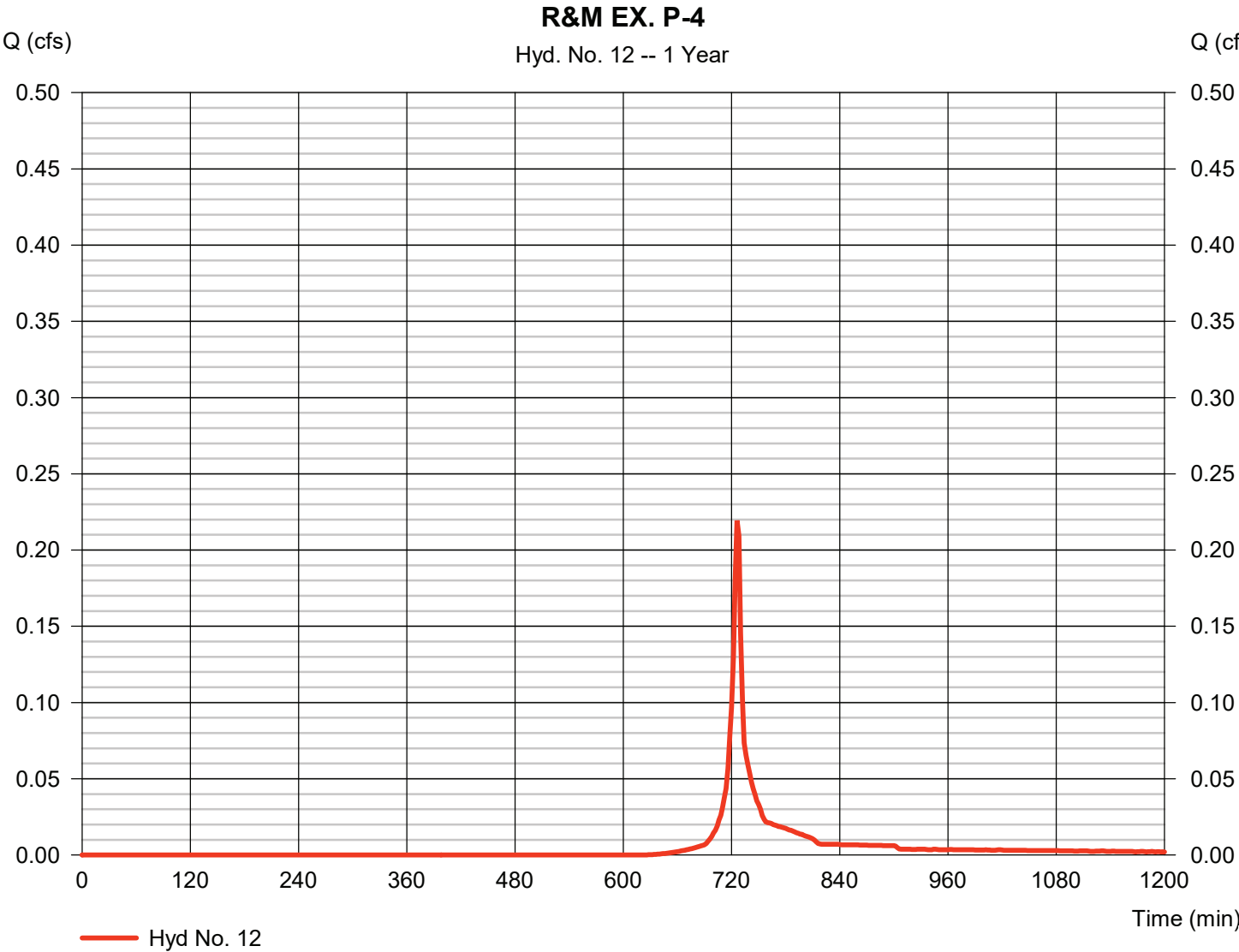
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.219 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.009 acft
Drainage area	= 0.110 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

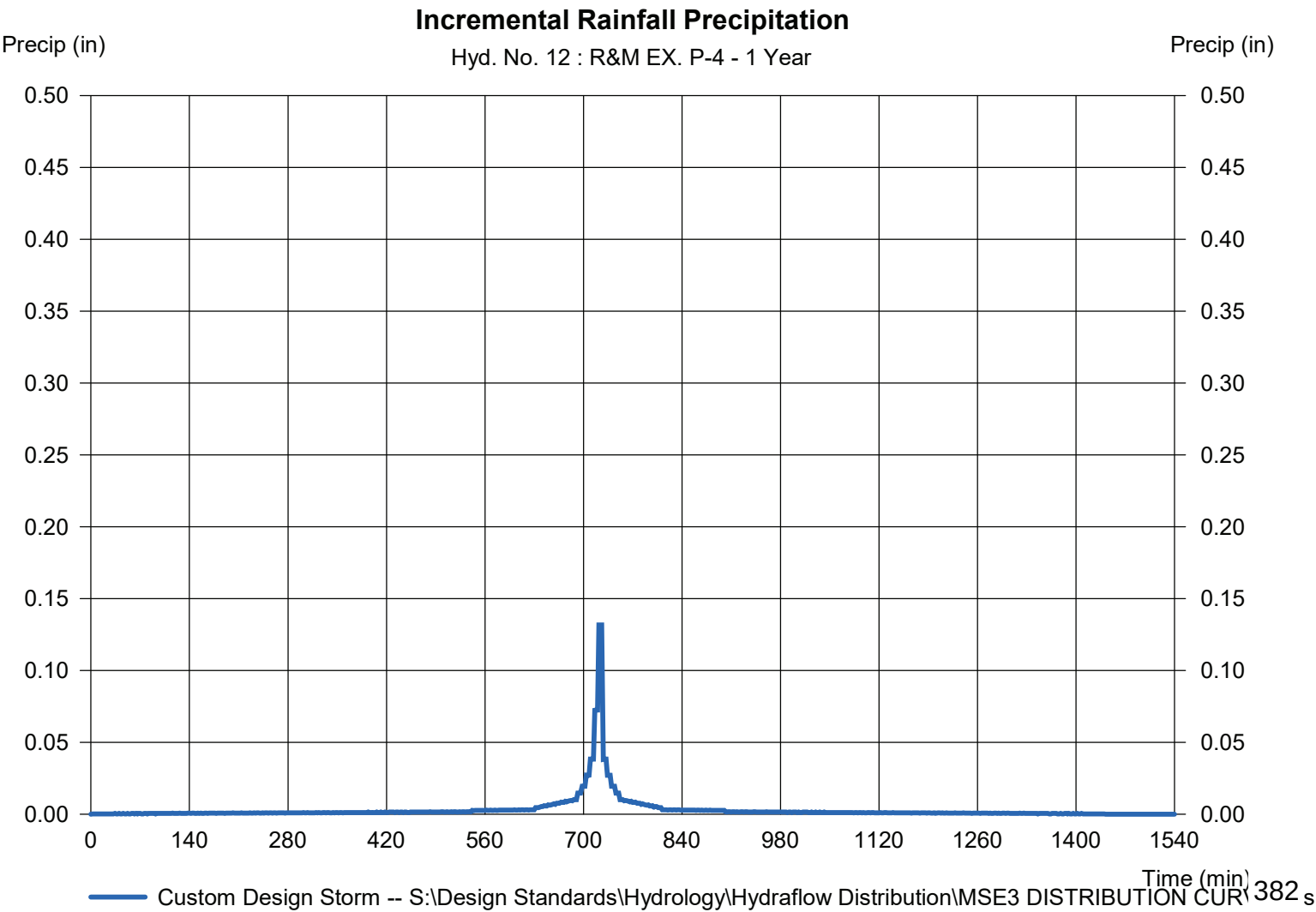
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

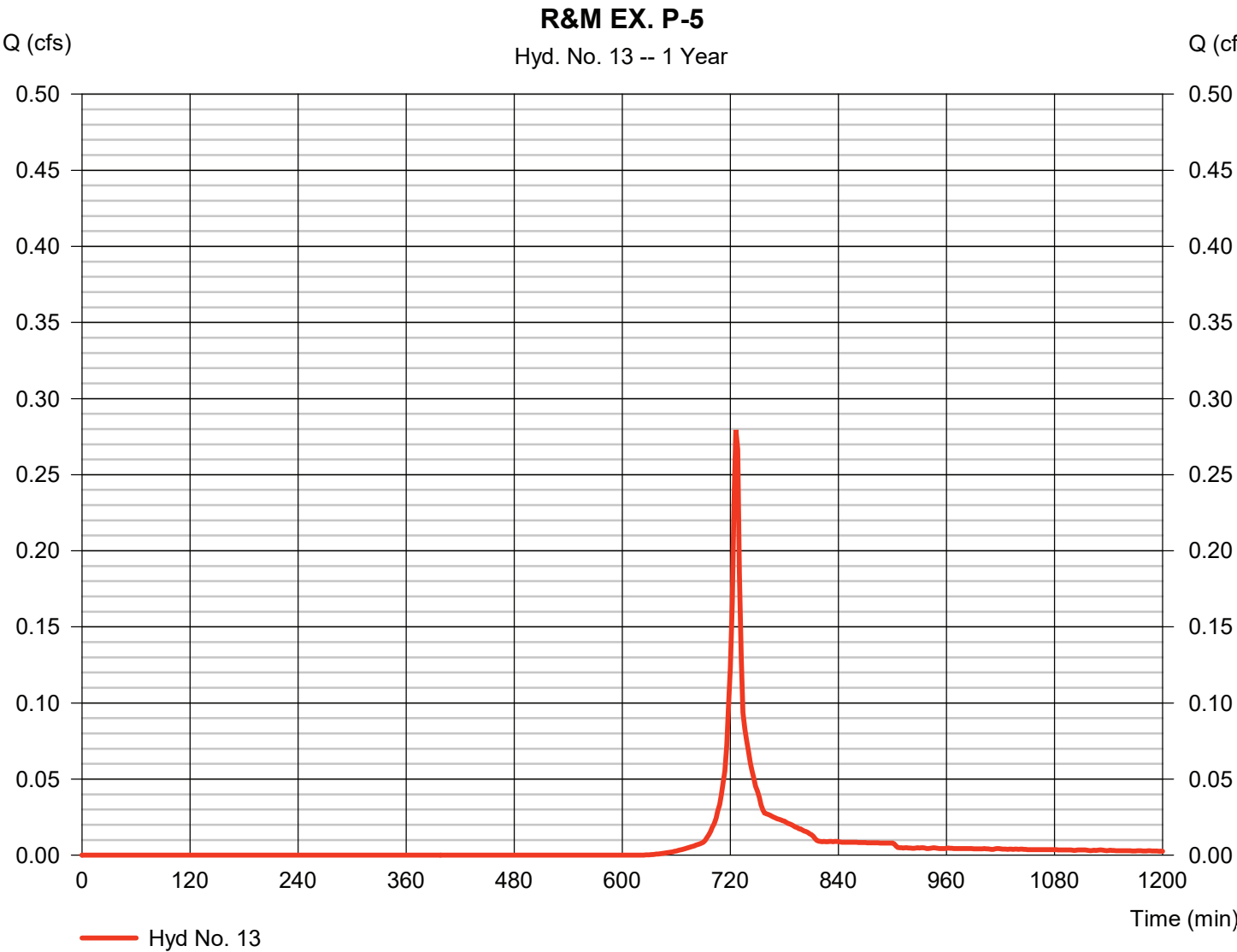
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.279 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.012 acft
Drainage area	= 0.140 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

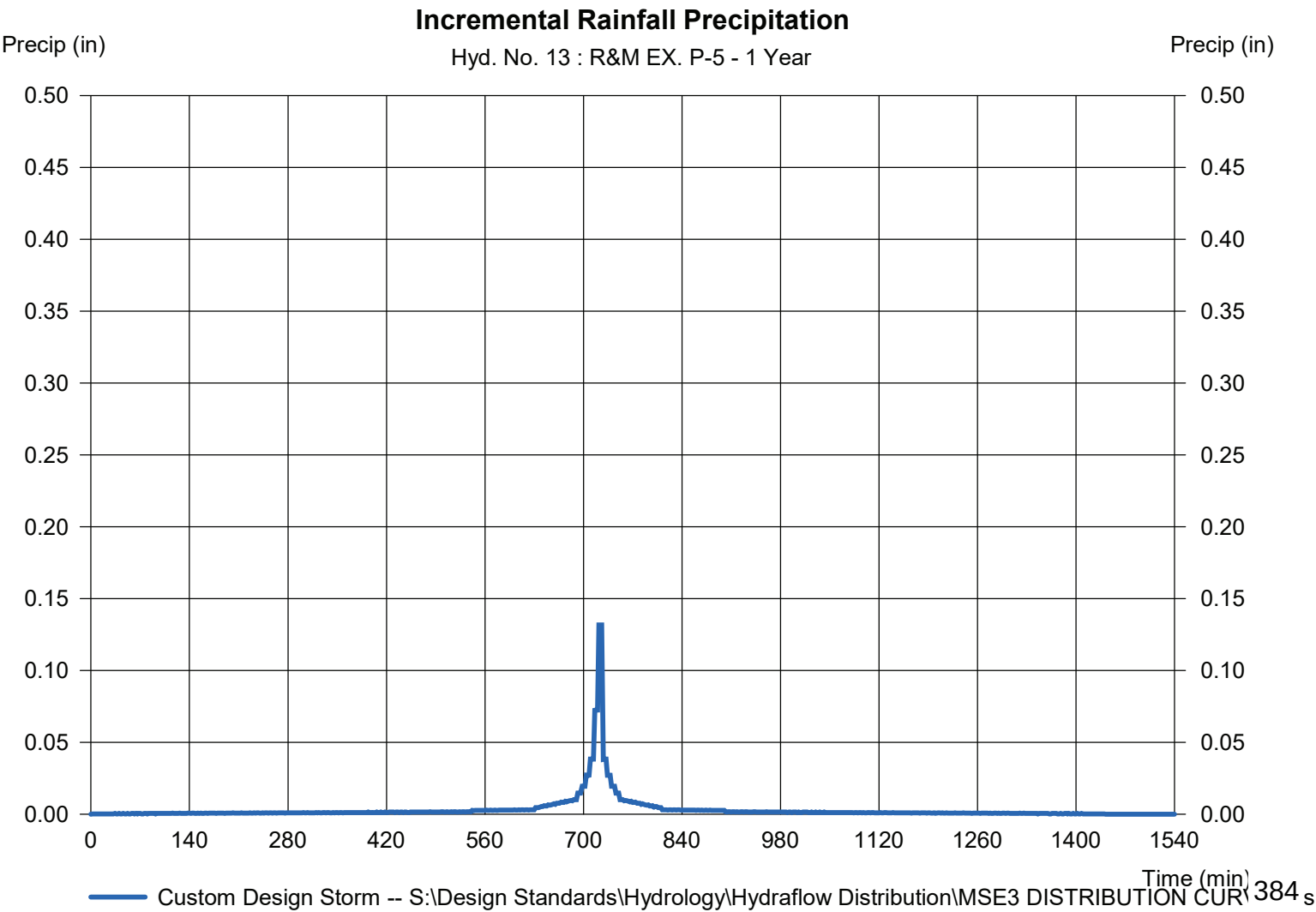
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

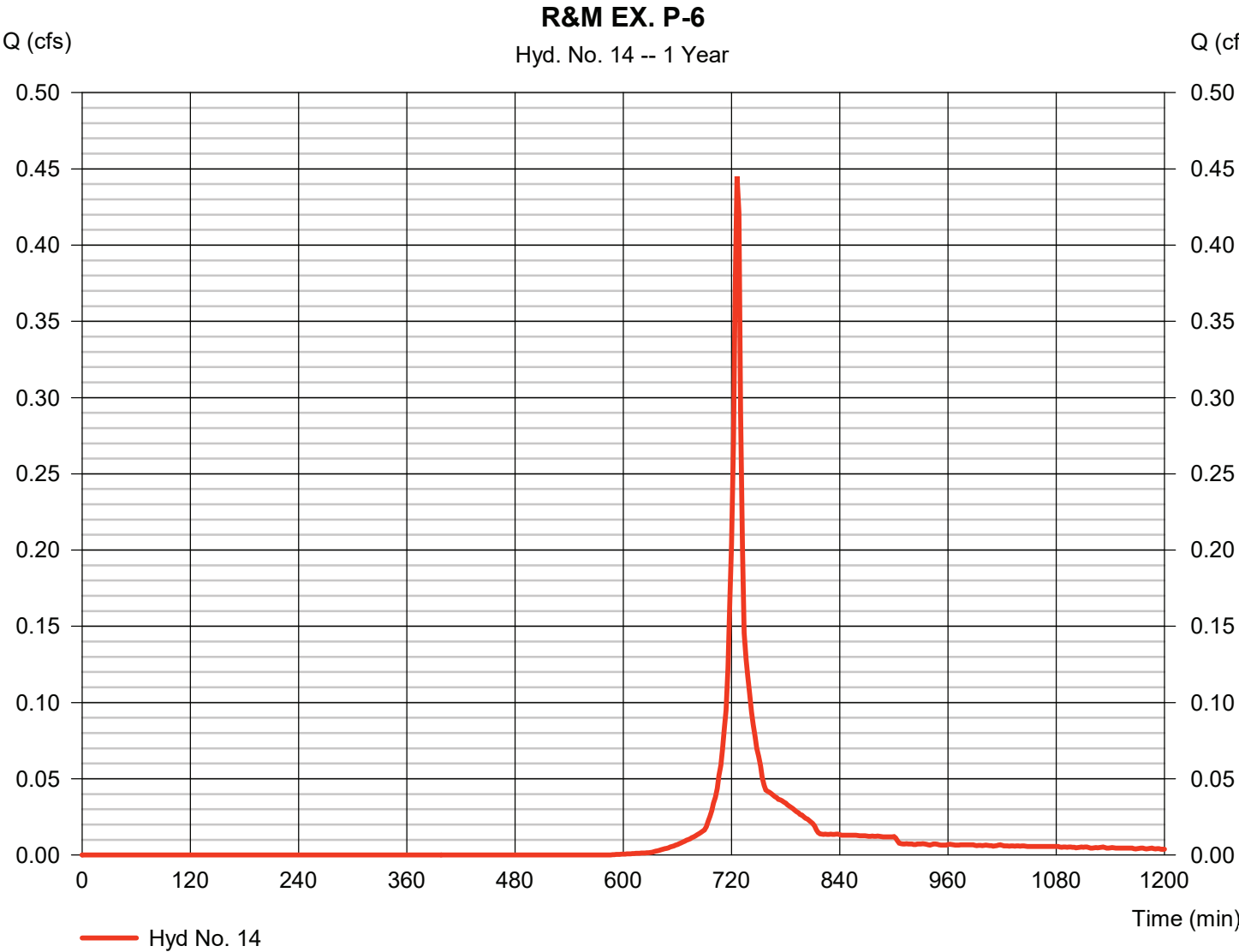
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.445 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.019 acft
Drainage area	= 0.200 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

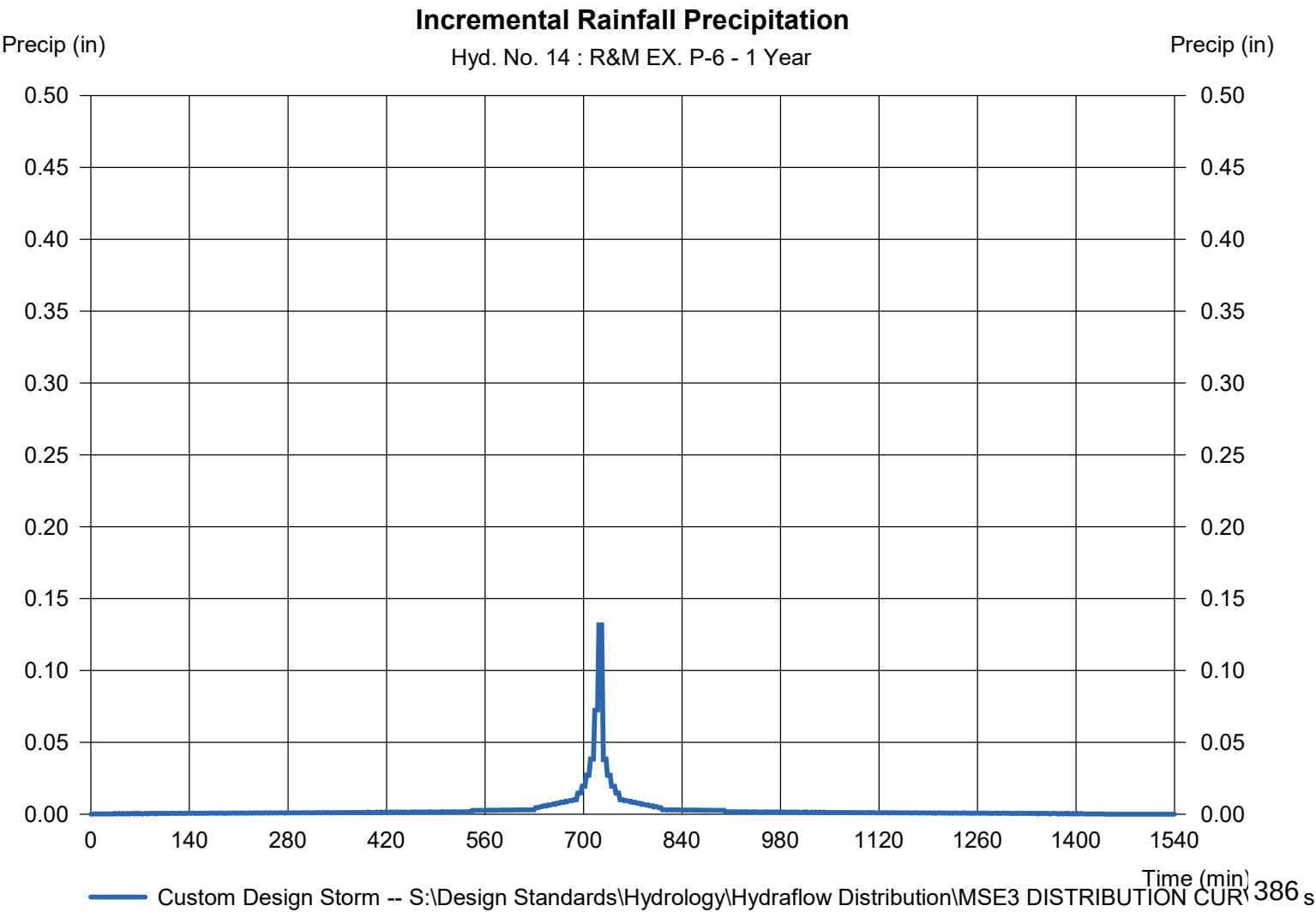
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

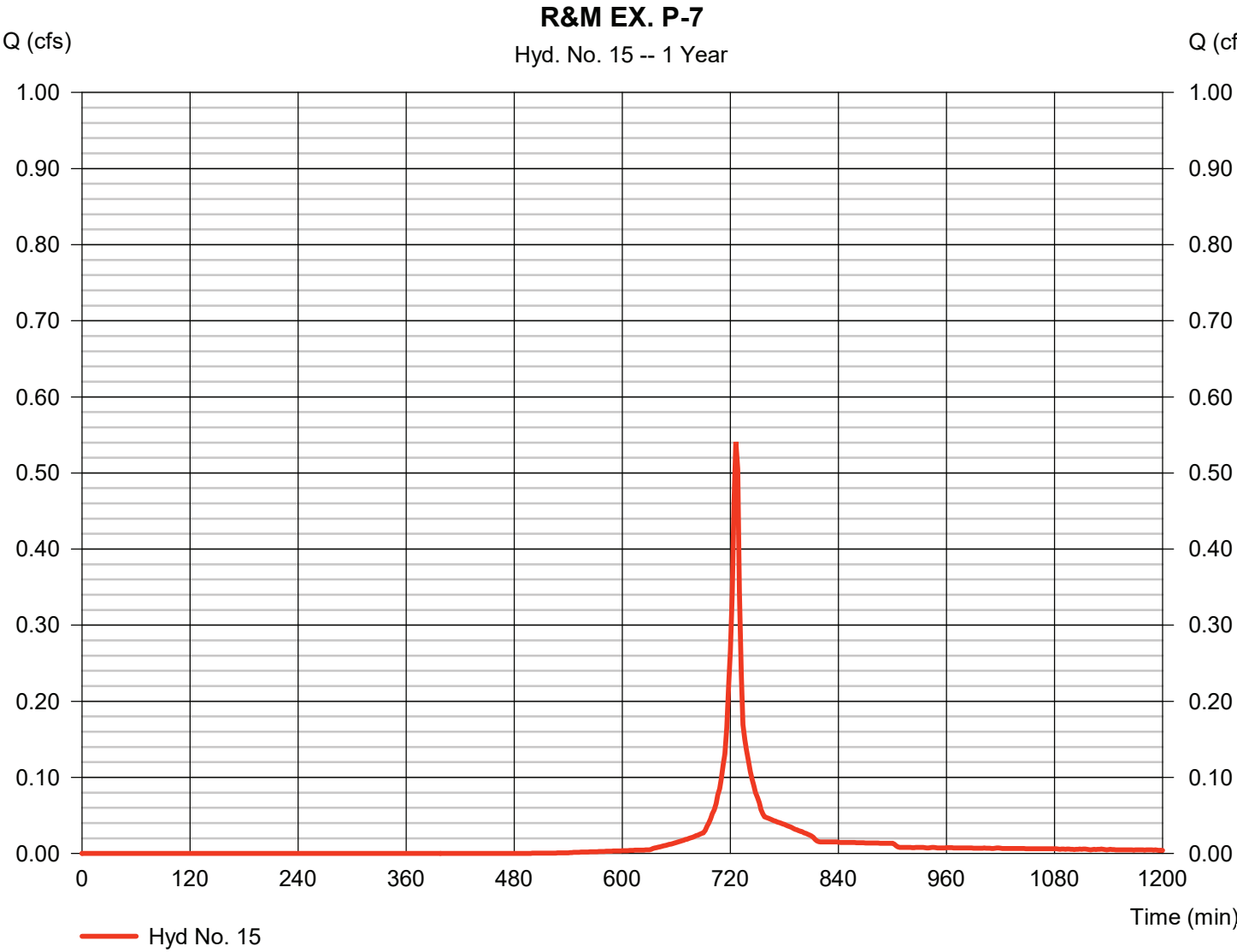
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.541 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.024 acft
Drainage area	= 0.200 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

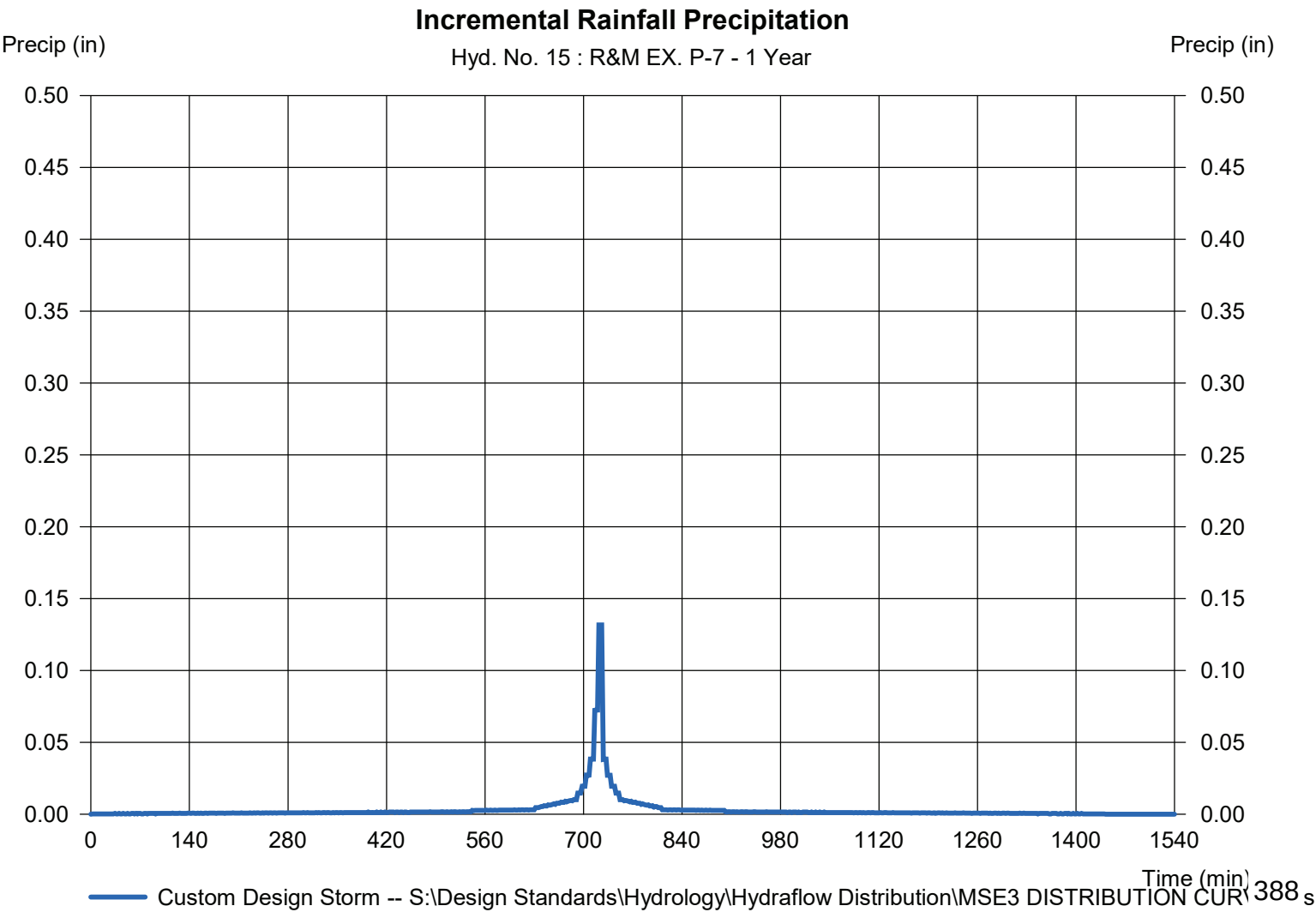
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

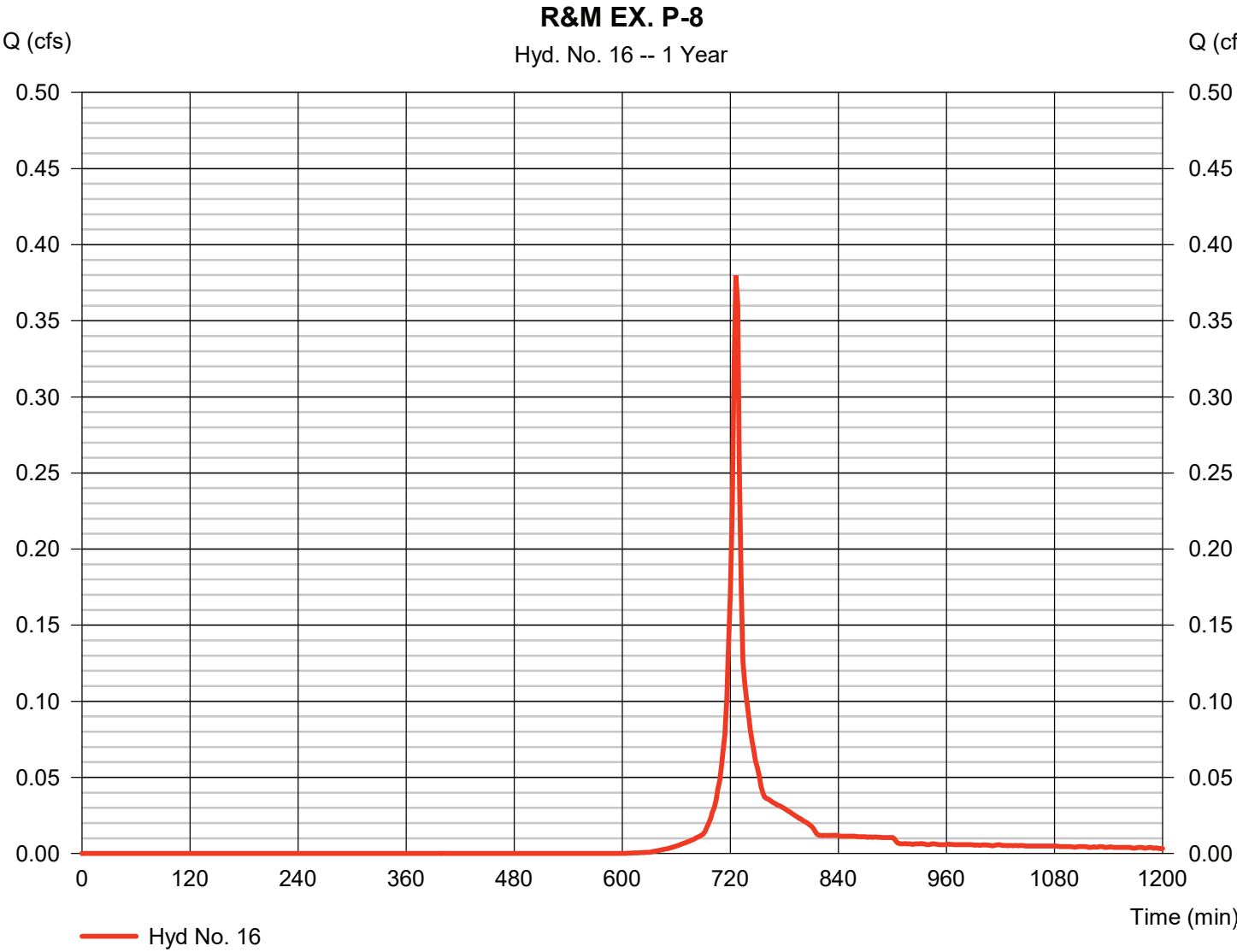
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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Hyd. No. 16

R&M EX. P-8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.380 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.016 acft
Drainage area	= 0.180 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD3 DISTRIBUTION CU		



Precipitation Report

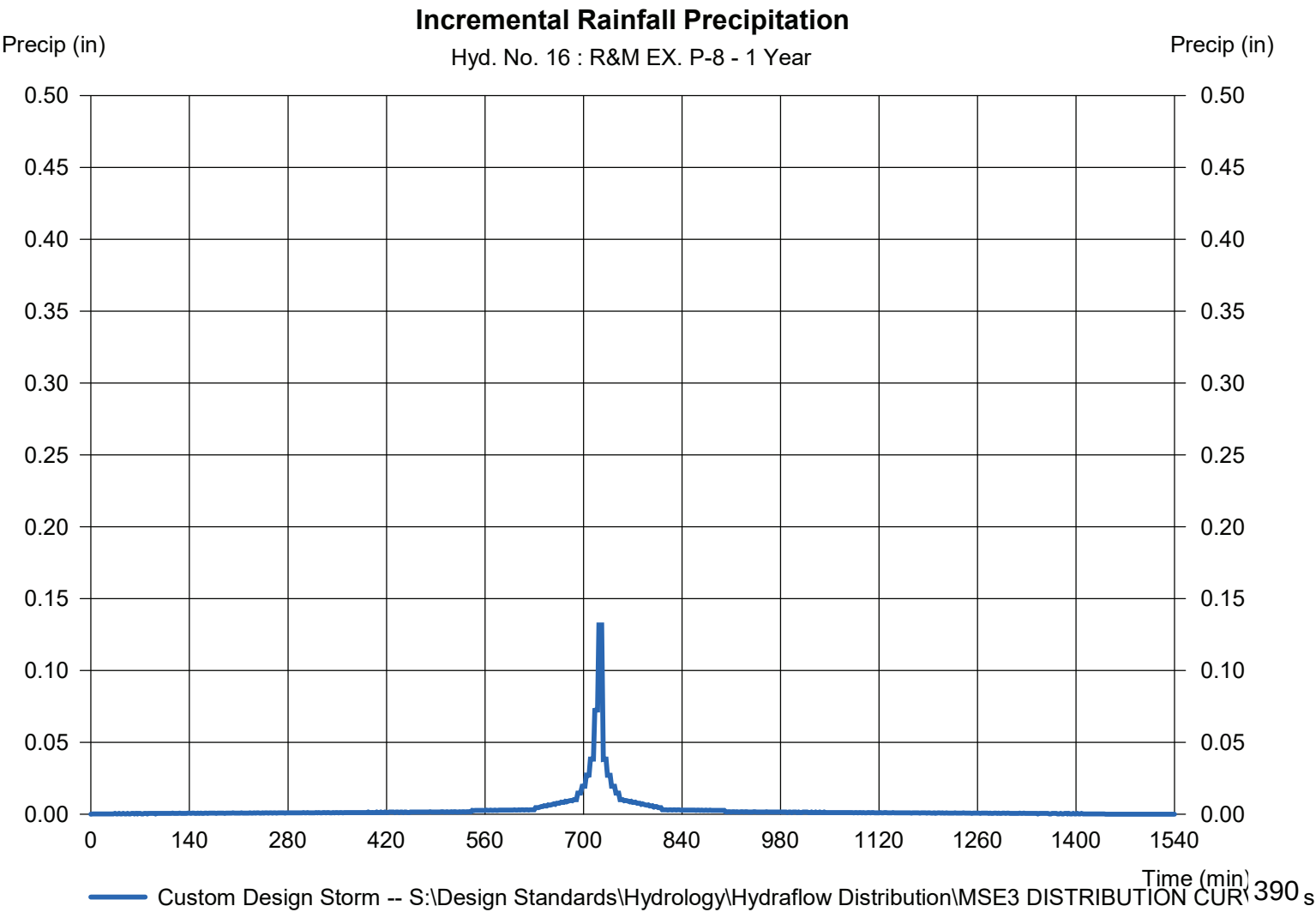
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

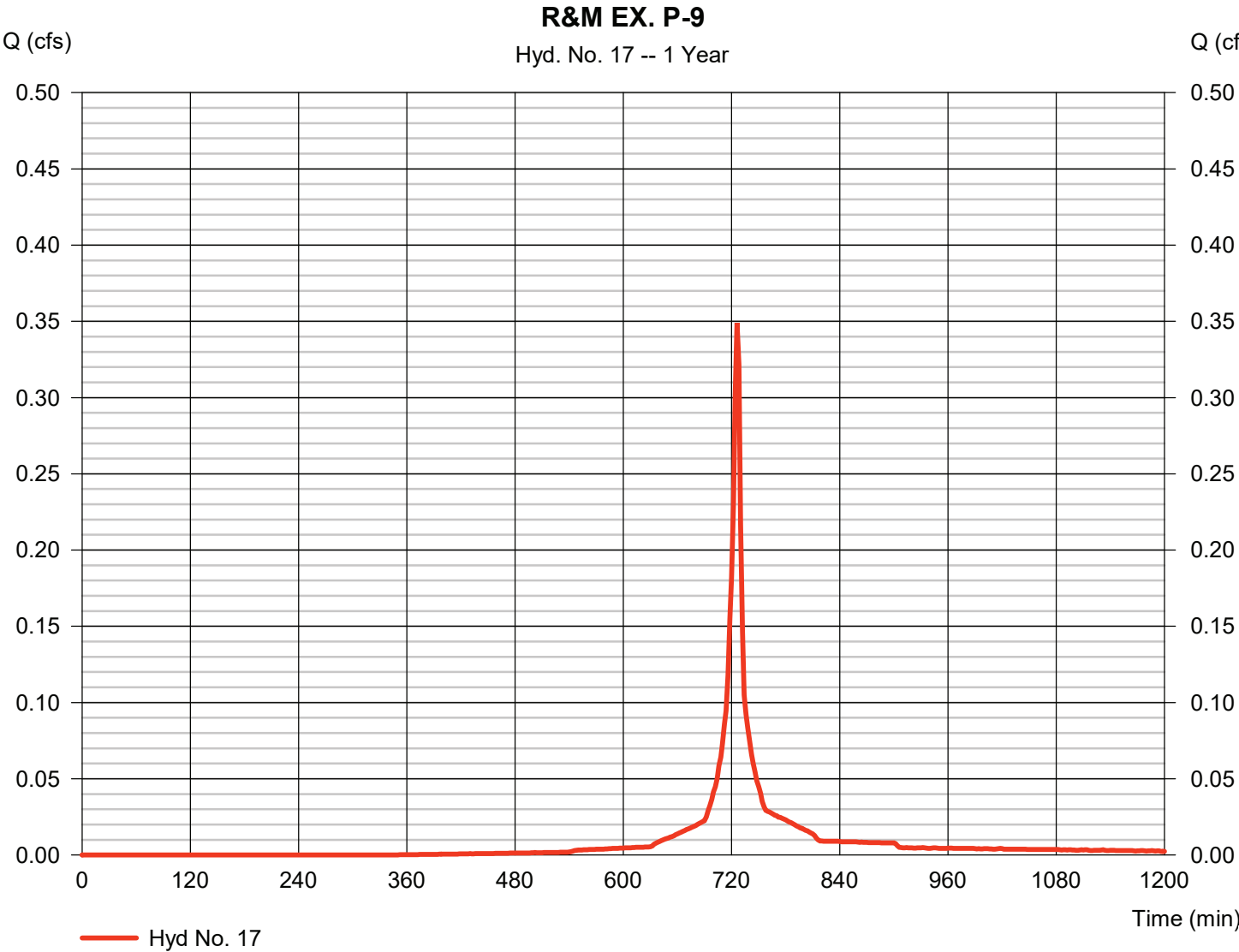
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.349 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.016 acft
Drainage area	= 0.110 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

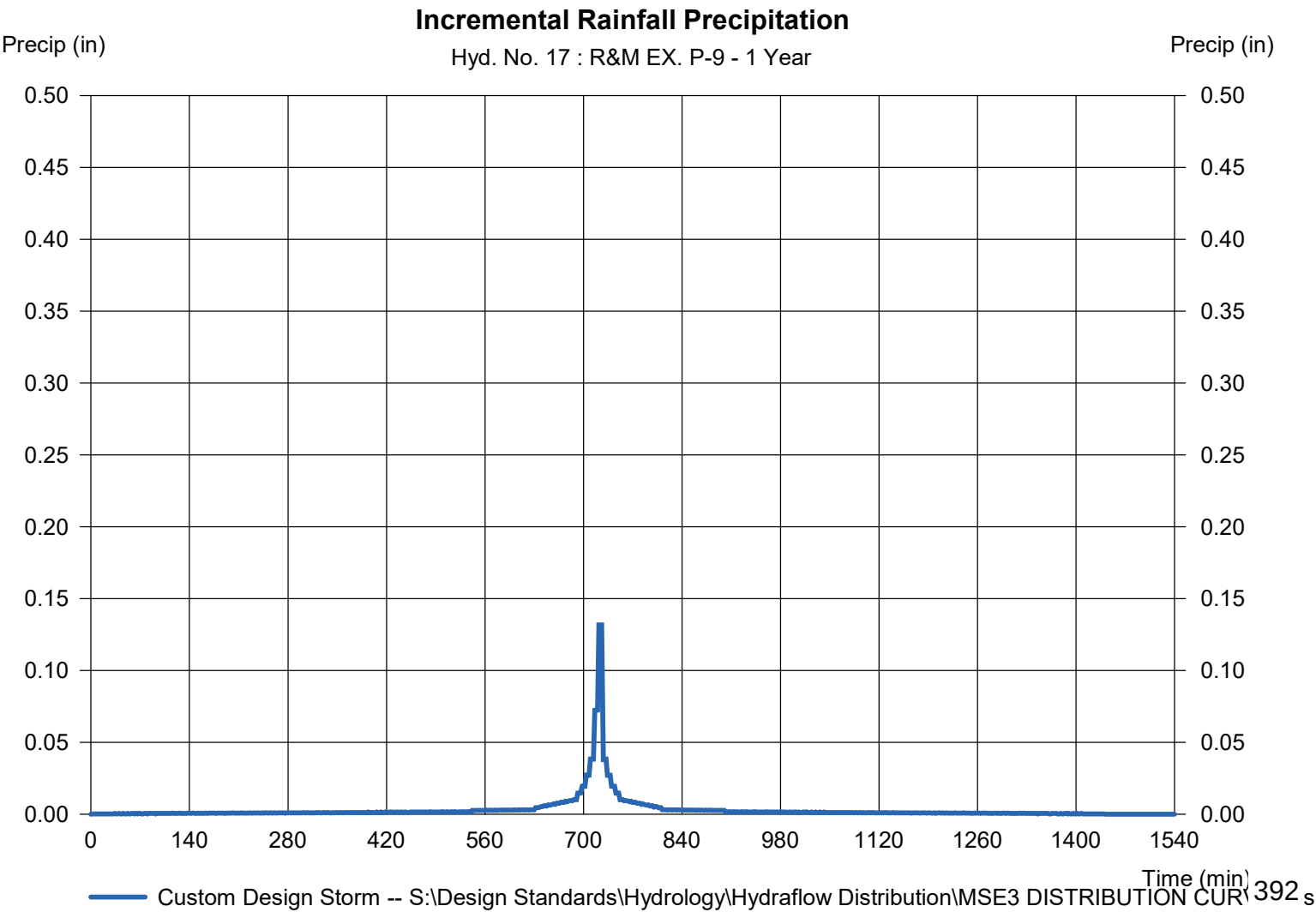
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

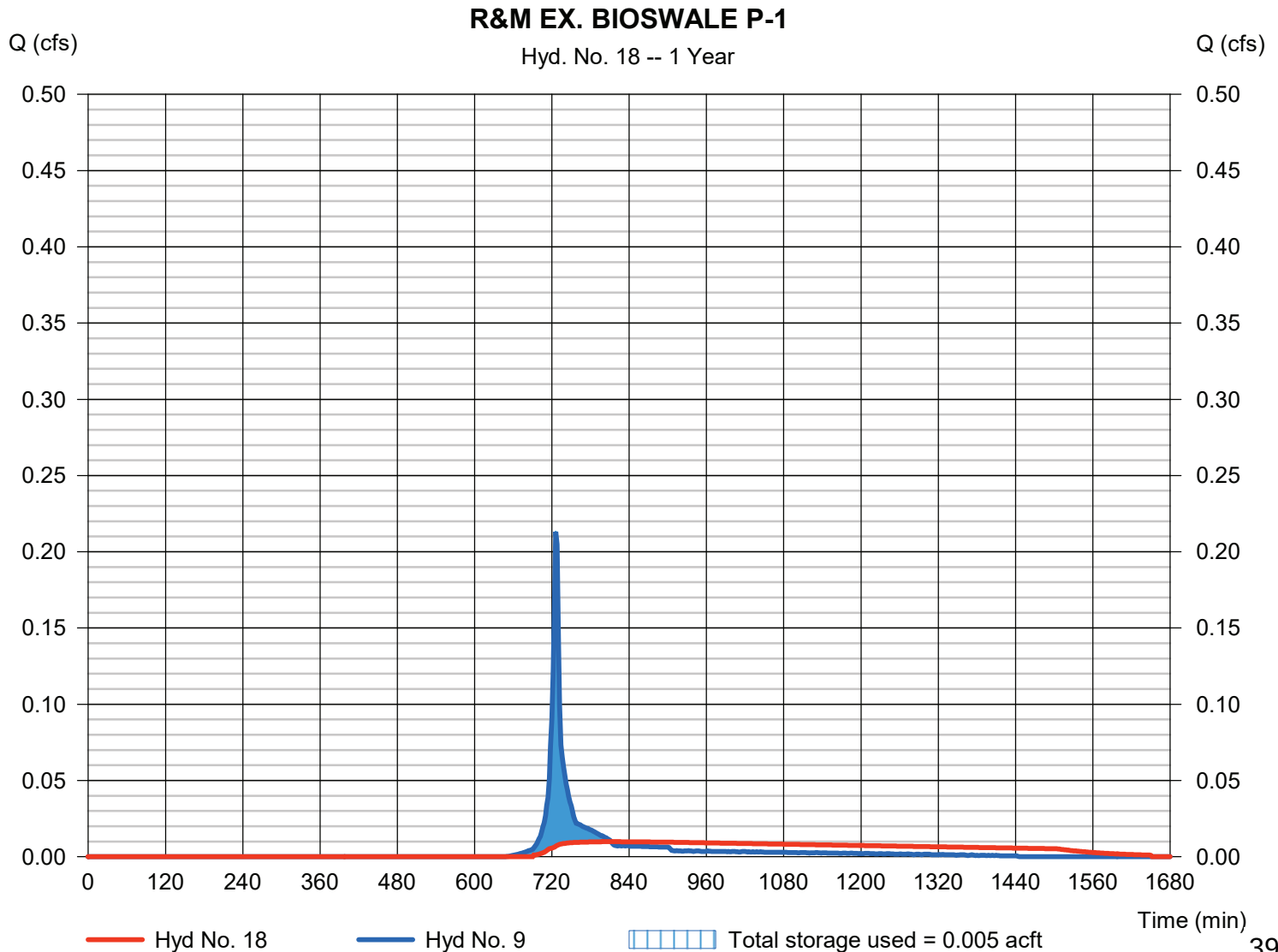
Friday, 06 / 28 / 2019

Hyd. No. 18

R&M EX. BIOSWALE P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.010 cfs
Storm frequency	= 1 yrs	Time to peak	= 812 min
Time interval	= 2 min	Hyd. volume	= 0.009 acft
Inflow hyd. No.	= 9 - R&M EX. P-1	Max. Elevation	= 850.96 ft
Reservoir name	= Ex. Bioswale P-1	Max. Storage	= 0.005 acft

Storage Indication method used. Outflow includes exfiltration.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 10 - Ex. Bioswale P-1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 850.40 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	850.40	247	0.000	0.000
0.10	850.50	307	0.001	0.001
0.60	851.00	608	0.005	0.006
1.10	851.50	914	0.009	0.014
1.60	852.00	1,225	0.012	0.027
1.69	852.09	1,284	0.003	0.029

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 851.59	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.730 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	850.40	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.01	0.000	850.41	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.02	0.000	850.42	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.03	0.000	850.43	---	---	---	---	0.00	---	---	---	0.002	---	0.002
0.04	0.000	850.44	---	---	---	---	0.00	---	---	---	0.002	---	0.002
0.05	0.000	850.45	---	---	---	---	0.00	---	---	---	0.003	---	0.003
0.06	0.000	850.46	---	---	---	---	0.00	---	---	---	0.003	---	0.003
0.07	0.000	850.47	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.08	0.001	850.48	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.09	0.001	850.49	---	---	---	---	0.00	---	---	---	0.005	---	0.005
0.10	0.001	850.50	---	---	---	---	0.00	---	---	---	0.005	---	0.005
0.15	0.001	850.55	---	---	---	---	0.00	---	---	---	0.006	---	0.006
0.20	0.002	850.60	---	---	---	---	0.00	---	---	---	0.006	---	0.006
0.25	0.002	850.65	---	---	---	---	0.00	---	---	---	0.007	---	0.007
0.30	0.003	850.70	---	---	---	---	0.00	---	---	---	0.007	---	0.007
0.35	0.003	850.75	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.40	0.004	850.80	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.45	0.004	850.85	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.50	0.005	850.90	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.55	0.005	850.95	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.60	0.006	851.00	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.65	0.007	851.05	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.70	0.008	851.10	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.75	0.008	851.15	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.80	0.009	851.20	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.85	0.010	851.25	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.90	0.011	851.30	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.95	0.012	851.35	---	---	---	---	0.00	---	---	---	0.014	---	0.014
1.00	0.013	851.40	---	---	---	---	0.00	---	---	---	0.014	---	0.014
1.05	0.014	851.45	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.10	0.014	851.50	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.15	0.016	851.55	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.20	0.017	851.60	---	---	---	---	0.00	---	---	---	0.016	---	0.020
1.25	0.018	851.65	---	---	---	---	0.05	---	---	---	0.017	---	0.066
1.30	0.019	851.70	---	---	---	---	0.12	---	---	---	0.018	---	0.139
1.35	0.021	851.75	---	---	---	---	0.21	---	---	---	0.018	---	0.231
1.40	0.022	851.80	---	---	---	---	0.32	---	---	---	0.019	---	0.339

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Continues on next page...

Ex. Bioswale P-1

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.45	0.023	851.85	---	---	---	---	0.44	---	---	---	0.019	---	0.460
1.50	0.024	851.90	---	---	---	---	0.57	---	---	---	0.020	---	0.594
1.55	0.025	851.95	---	---	---	---	0.72	---	---	---	0.020	---	0.739
1.60	0.027	852.00	---	---	---	---	0.87	---	---	---	0.021	---	0.895
1.61	0.027	852.01	---	---	---	---	0.90	---	---	---	0.021	---	0.924
1.62	0.027	852.02	---	---	---	---	0.93	---	---	---	0.021	---	0.953
1.63	0.027	852.03	---	---	---	---	0.96	---	---	---	0.021	---	0.983
1.64	0.028	852.04	---	---	---	---	0.99	---	---	---	0.021	---	1.012
1.64	0.028	852.04	---	---	---	---	1.02	---	---	---	0.021	---	1.043
1.65	0.028	852.05	---	---	---	---	1.05	---	---	---	0.021	---	1.073
1.66	0.029	852.06	---	---	---	---	1.08	---	---	---	0.021	---	1.104
1.67	0.029	852.07	---	---	---	---	1.11	---	---	---	0.021	---	1.135
1.68	0.029	852.08	---	---	---	---	1.14	---	---	---	0.022	---	1.166
1.69	0.029	852.09	---	---	---	---	1.18	---	---	---	0.022	---	1.199

...End

Hydrograph Report

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

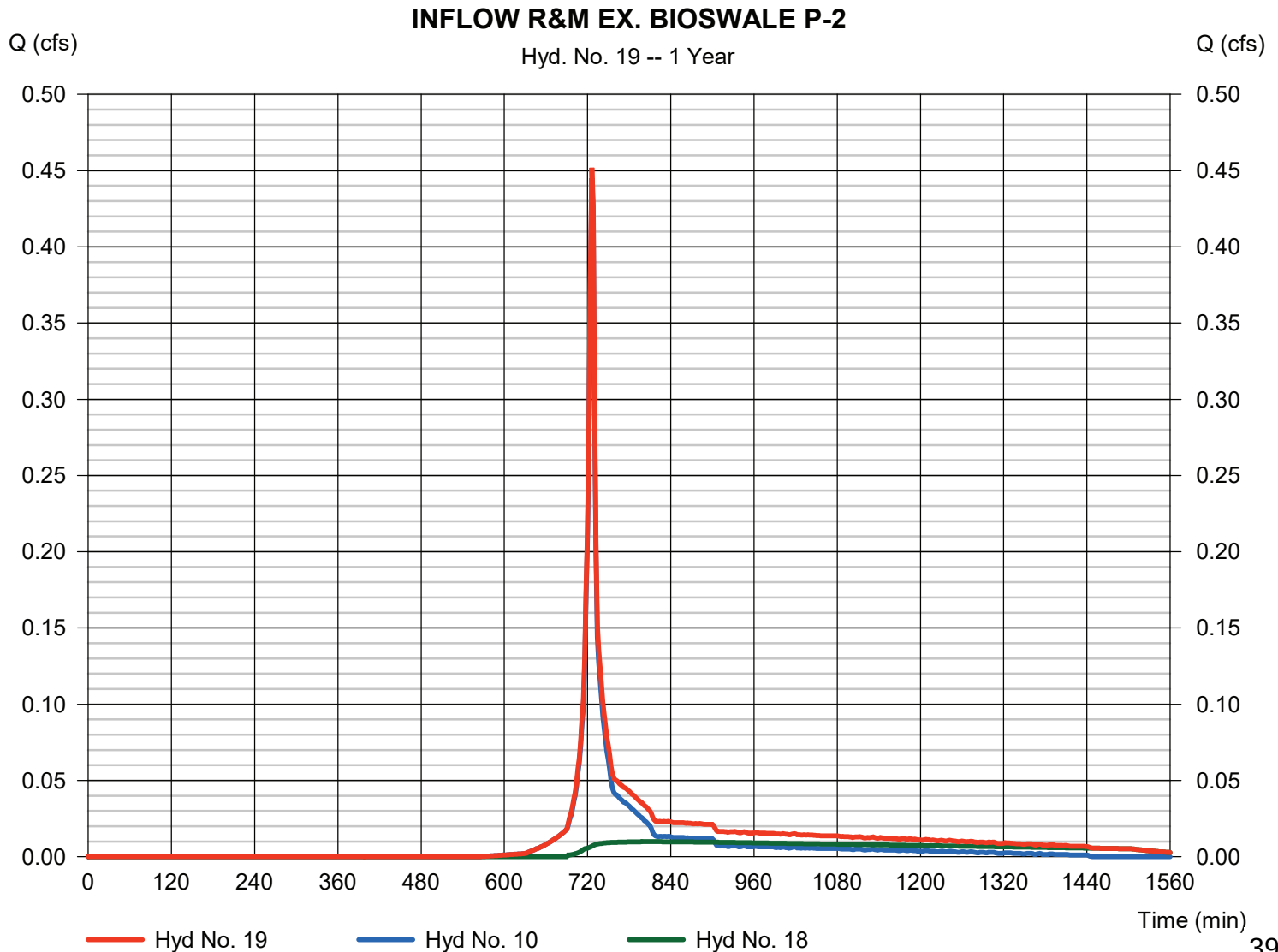
Friday, 06 / 28 / 2019

Hyd. No. 19

INFLOW R&M EX. BIOSWALE P-2

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 10, 18

Peak discharge = 0.452 cfs
 Time to peak = 726 min
 Hyd. volume = 0.028 acft
 Contrib. drain. area = 0.190 ac



Hydrograph Report

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

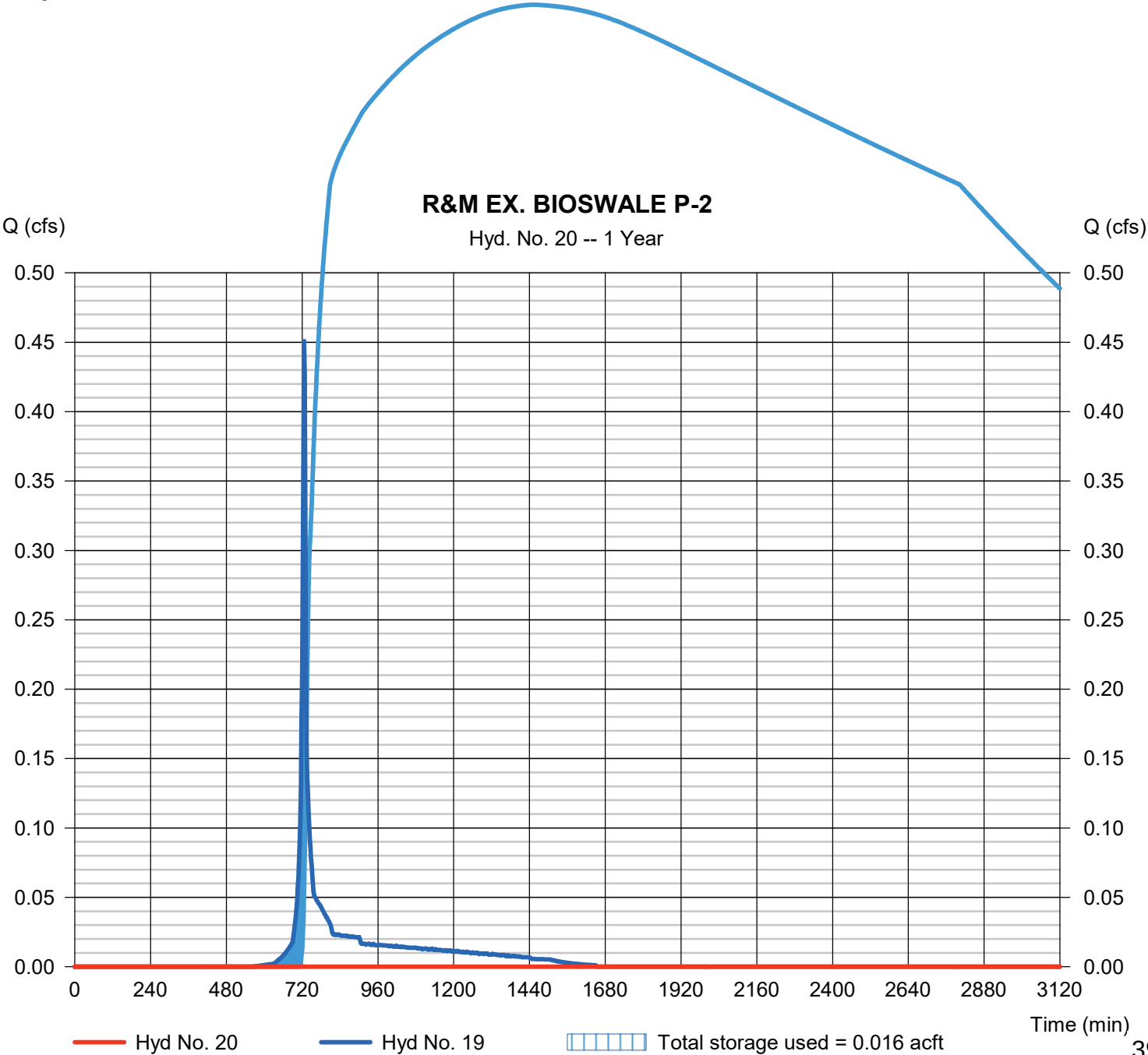
Friday, 06 / 28 / 2019

Hyd. No. 20

R&M EX. BIOSWALE P-2

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 2398 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 19 - INFLOW R&M EX. BIOSWALE P-2	Max. Elevation	= 850.97 ft
Reservoir name	= Ex. Bioswale P-2	Max. Storage	= 0.016 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

49

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

Friday, 06 / 28 / 2019

Pond No. 11 - Ex. Bioswale P-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 849.67 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	849.67	338	0.000	0.000
0.33	850.00	441	0.003	0.003
0.83	850.50	598	0.006	0.009
1.33	851.00	756	0.008	0.017
1.83	851.50	913	0.010	0.026
2.10	851.77	997	0.006	0.032

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 851.27	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.730 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	849.67	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.03	0.000	849.70	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.07	0.001	849.74	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.10	0.001	849.77	---	---	---	---	0.00	---	---	---	0.002	---	0.002
0.13	0.001	849.80	---	---	---	---	0.00	---	---	---	0.003	---	0.003
0.17	0.001	849.84	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.20	0.002	849.87	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.23	0.002	849.90	---	---	---	---	0.00	---	---	---	0.005	---	0.005
0.26	0.002	849.93	---	---	---	---	0.00	---	---	---	0.006	---	0.006
0.30	0.003	849.97	---	---	---	---	0.00	---	---	---	0.007	---	0.007
0.33	0.003	850.00	---	---	---	---	0.00	---	---	---	0.007	---	0.007
0.38	0.004	850.05	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.43	0.004	850.10	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.48	0.005	850.15	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.53	0.005	850.20	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.58	0.006	850.25	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.63	0.007	850.30	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.68	0.007	850.35	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.73	0.008	850.40	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.78	0.008	850.45	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.83	0.009	850.50	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.88	0.010	850.55	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.93	0.010	850.60	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.98	0.011	850.65	---	---	---	---	0.00	---	---	---	0.011	---	0.011
1.03	0.012	850.70	---	---	---	---	0.00	---	---	---	0.011	---	0.011
1.08	0.013	850.75	---	---	---	---	0.00	---	---	---	0.011	---	0.011
1.13	0.014	850.80	---	---	---	---	0.00	---	---	---	0.012	---	0.012
1.18	0.014	850.85	---	---	---	---	0.00	---	---	---	0.012	---	0.012
1.23	0.015	850.90	---	---	---	---	0.00	---	---	---	0.012	---	0.012
1.28	0.016	850.95	---	---	---	---	0.00	---	---	---	0.013	---	0.013
1.33	0.017	851.00	---	---	---	---	0.00	---	---	---	0.013	---	0.013
1.38	0.018	851.05	---	---	---	---	0.00	---	---	---	0.013	---	0.013
1.43	0.019	851.10	---	---	---	---	0.00	---	---	---	0.013	---	0.013
1.48	0.020	851.15	---	---	---	---	0.00	---	---	---	0.014	---	0.014
1.53	0.020	851.20	---	---	---	---	0.00	---	---	---	0.014	---	0.014
1.58	0.021	851.25	---	---	---	---	0.00	---	---	---	0.014	---	0.014
1.63	0.022	851.30	---	---	---	---	0.02	---	---	---	0.014	---	0.032

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Ex. Bioswale P-2

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.68	0.023	851.35	---	---	---	---	0.08	---	---	---	0.015	---	0.090
1.73	0.024	851.40	---	---	---	---	0.16	---	---	---	0.015	---	0.171
1.78	0.025	851.45	---	---	---	---	0.25	---	---	---	0.015	---	0.269
1.83	0.026	851.50	---	---	---	---	0.37	---	---	---	0.015	---	0.383
1.86	0.027	851.53	---	---	---	---	0.43	---	---	---	0.016	---	0.449
1.88	0.027	851.55	---	---	---	---	0.50	---	---	---	0.016	---	0.520
1.91	0.028	851.58	---	---	---	---	0.58	---	---	---	0.016	---	0.593
1.94	0.029	851.61	---	---	---	---	0.65	---	---	---	0.016	---	0.670
1.97	0.029	851.63	---	---	---	---	0.73	---	---	---	0.016	---	0.750
1.99	0.030	851.66	---	---	---	---	0.82	---	---	---	0.016	---	0.833
2.02	0.030	851.69	---	---	---	---	0.90	---	---	---	0.016	---	0.919
2.05	0.031	851.72	---	---	---	---	0.99	---	---	---	0.017	---	1.008
2.07	0.032	851.74	---	---	---	---	1.08	---	---	---	0.017	---	1.099
2.10	0.032	851.77	---	---	---	---	1.18	---	---	---	0.017	---	1.194

...End

Hydrograph Report

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

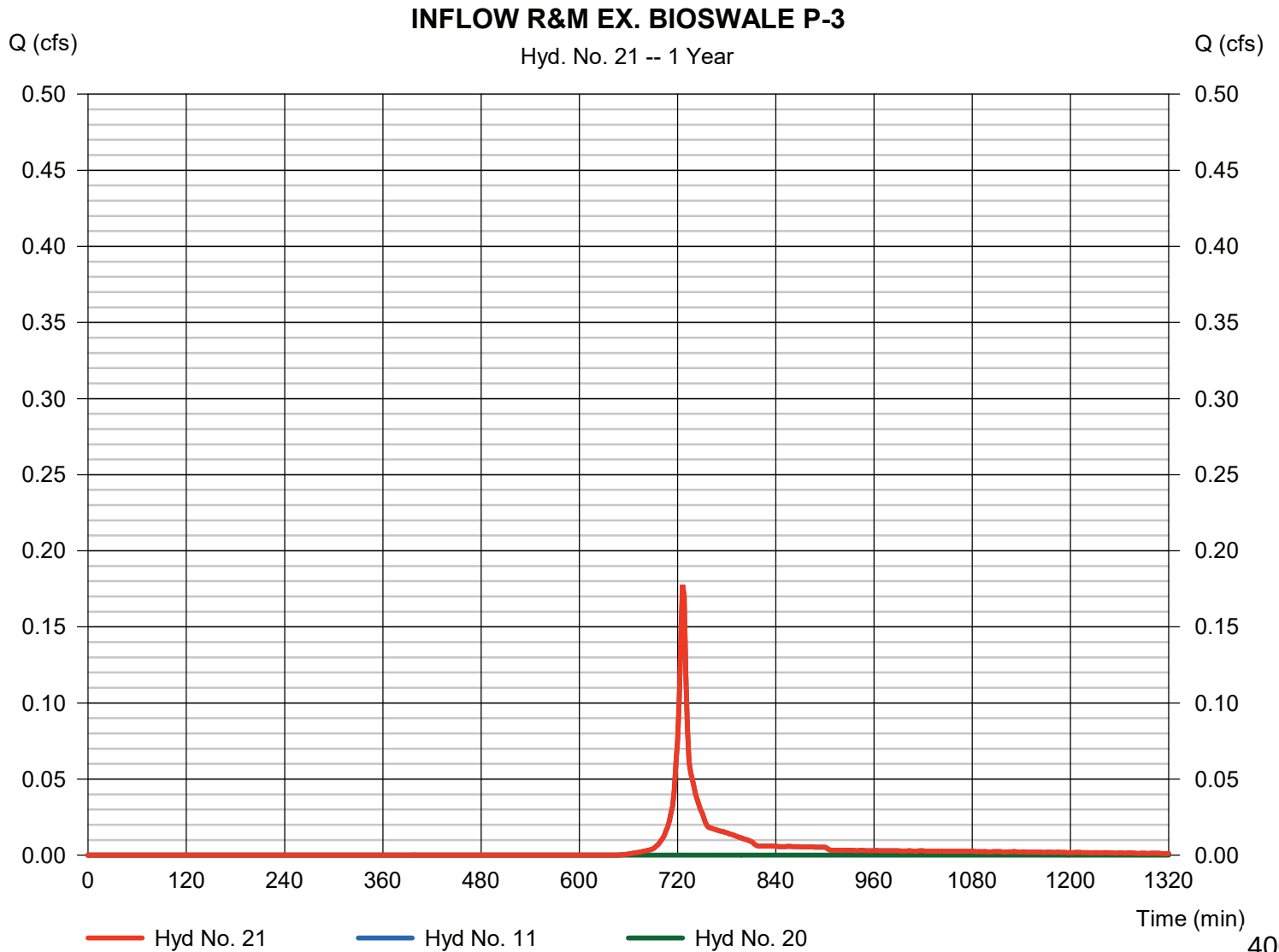
Friday, 06 / 28 / 2019

Hyd. No. 21

INFLOW R&M EX. BIOSWALE P-3

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 11, 20

Peak discharge = 0.178 cfs
Time to peak = 726 min
Hyd. volume = 0.008 acft
Contrib. drain. area = 0.100 ac



Hydrograph Report

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

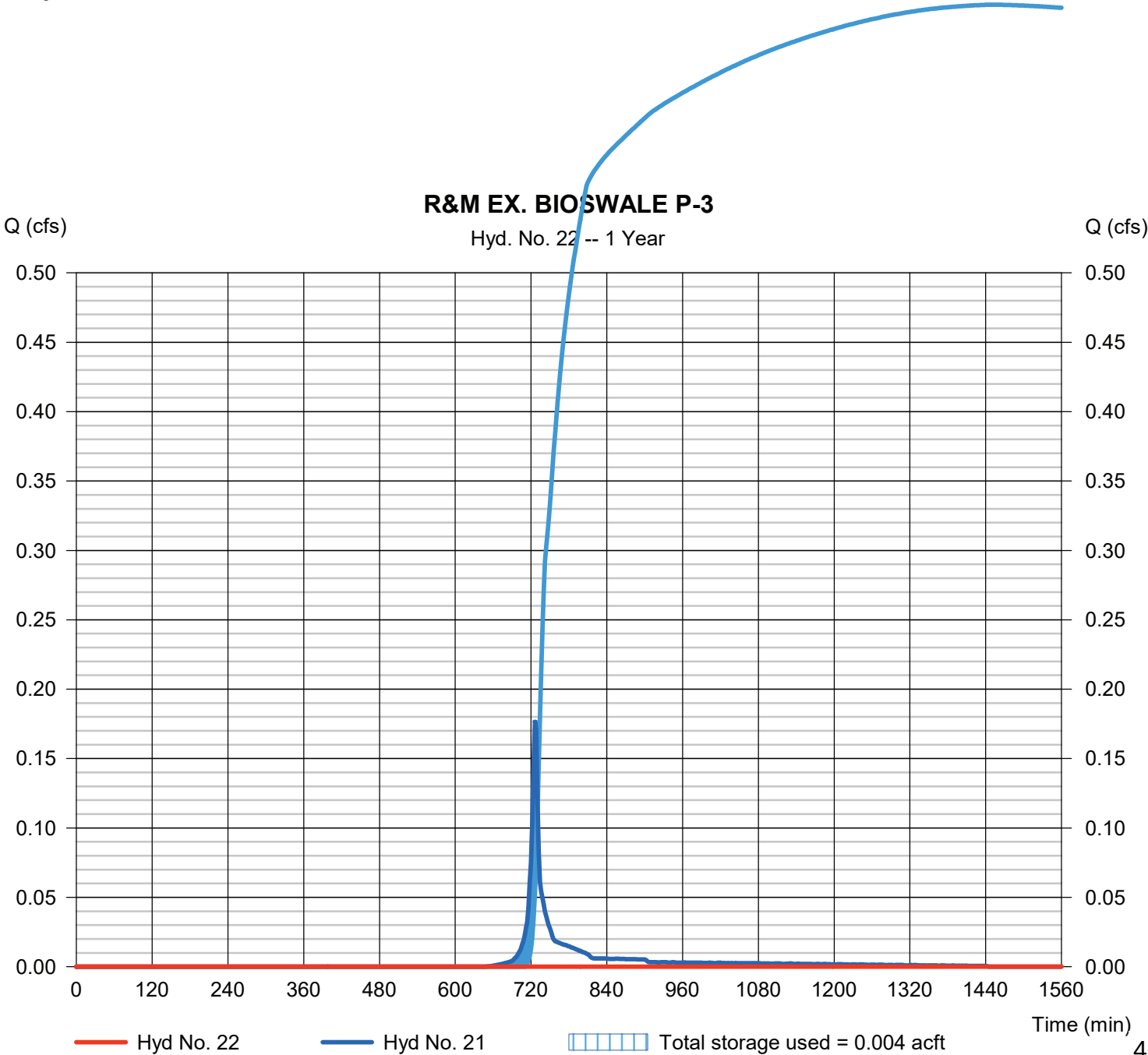
Friday, 06 / 28 / 2019

Hyd. No. 22

R&M EX. BIOSWALE P-3

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 21 - INFLOW R&M EX. BIOSWALE P-3	Max. Elevation	= 849.63 ft
Reservoir name	= Ex. Bioswale P-3	Max. Storage	= 0.004 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

53

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

Friday, 06 / 28 / 2019

Pond No. 12 - Ex. Bioswale P-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 849.36 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	849.36	593	0.000	0.000
0.14	849.50	635	0.002	0.002
0.64	850.00	788	0.008	0.010
1.14	850.50	941	0.010	0.020
1.64	851.00	1,093	0.012	0.032
2.10	851.46	1,234	0.012	0.044
2.64	852.00	1,234	0.015	0.059

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 850.96	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.730 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	849.36	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.01	0.000	849.37	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.03	0.000	849.39	---	---	---	---	0.00	---	---	---	0.002	---	0.002
0.04	0.001	849.40	---	---	---	---	0.00	---	---	---	0.003	---	0.003
0.06	0.001	849.42	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.07	0.001	849.43	---	---	---	---	0.00	---	---	---	0.005	---	0.005
0.08	0.001	849.44	---	---	---	---	0.00	---	---	---	0.006	---	0.006
0.10	0.001	849.46	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.11	0.002	849.47	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.13	0.002	849.49	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.14	0.002	849.50	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.19	0.003	849.55	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.24	0.004	849.60	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.29	0.004	849.65	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.34	0.005	849.70	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.39	0.006	849.75	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.44	0.007	849.80	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.49	0.008	849.85	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.54	0.008	849.90	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.59	0.009	849.95	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.64	0.010	850.00	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.69	0.011	850.05	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.74	0.012	850.10	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.79	0.013	850.15	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.84	0.014	850.20	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.89	0.015	850.25	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.94	0.016	850.30	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.99	0.017	850.35	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.04	0.018	850.40	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.09	0.019	850.45	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.14	0.020	850.50	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.19	0.021	850.55	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.24	0.022	850.60	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.29	0.024	850.65	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.34	0.025	850.70	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.39	0.026	850.75	---	---	---	---	0.00	---	---	---	0.017	---	0.017

Continues on next page...

Ex. Bioswale P-3

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.44	0.027	850.80	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.49	0.028	850.85	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.54	0.029	850.90	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.59	0.031	850.95	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.64	0.032	851.00	---	---	---	---	0.03	---	---	---	0.018	---	0.045
1.69	0.033	851.05	---	---	---	---	0.08	---	---	---	0.019	---	0.103
1.73	0.034	851.09	---	---	---	---	0.16	---	---	---	0.019	---	0.179
1.78	0.035	851.14	---	---	---	---	0.25	---	---	---	0.019	---	0.269
1.82	0.037	851.18	---	---	---	---	0.35	---	---	---	0.019	---	0.373
1.87	0.038	851.23	---	---	---	---	0.47	---	---	---	0.020	---	0.487
1.92	0.039	851.28	---	---	---	---	0.59	---	---	---	0.020	---	0.612
1.96	0.040	851.32	---	---	---	---	0.73	---	---	---	0.020	---	0.746
2.01	0.042	851.37	---	---	---	---	0.87	---	---	---	0.020	---	0.889
2.05	0.043	851.41	---	---	---	---	1.02	---	---	---	0.021	---	1.040
2.10	0.044	851.46	---	---	---	---	1.18	---	---	---	0.021	---	1.198
2.15	0.046	851.51	---	---	---	---	1.37	---	---	---	0.021	---	1.394
2.21	0.047	851.57	---	---	---	---	1.58	---	---	---	0.021	---	1.599
2.26	0.049	851.62	---	---	---	---	1.79	---	---	---	0.021	---	1.814
2.32	0.050	851.68	---	---	---	---	2.02	---	---	---	0.021	---	2.038
2.37	0.052	851.73	---	---	---	---	2.25	---	---	---	0.021	---	2.271
2.42	0.053	851.78	---	---	---	---	2.49	---	---	---	0.021	---	2.512
2.48	0.055	851.84	---	---	---	---	2.74	---	---	---	0.021	---	2.761
2.53	0.056	851.89	---	---	---	---	3.00	---	---	---	0.021	---	3.017
2.59	0.058	851.95	---	---	---	---	3.26	---	---	---	0.021	---	3.282
2.64	0.059	852.00	---	---	---	---	3.53	---	---	---	0.021	---	3.553

...End

Hydrograph Report

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

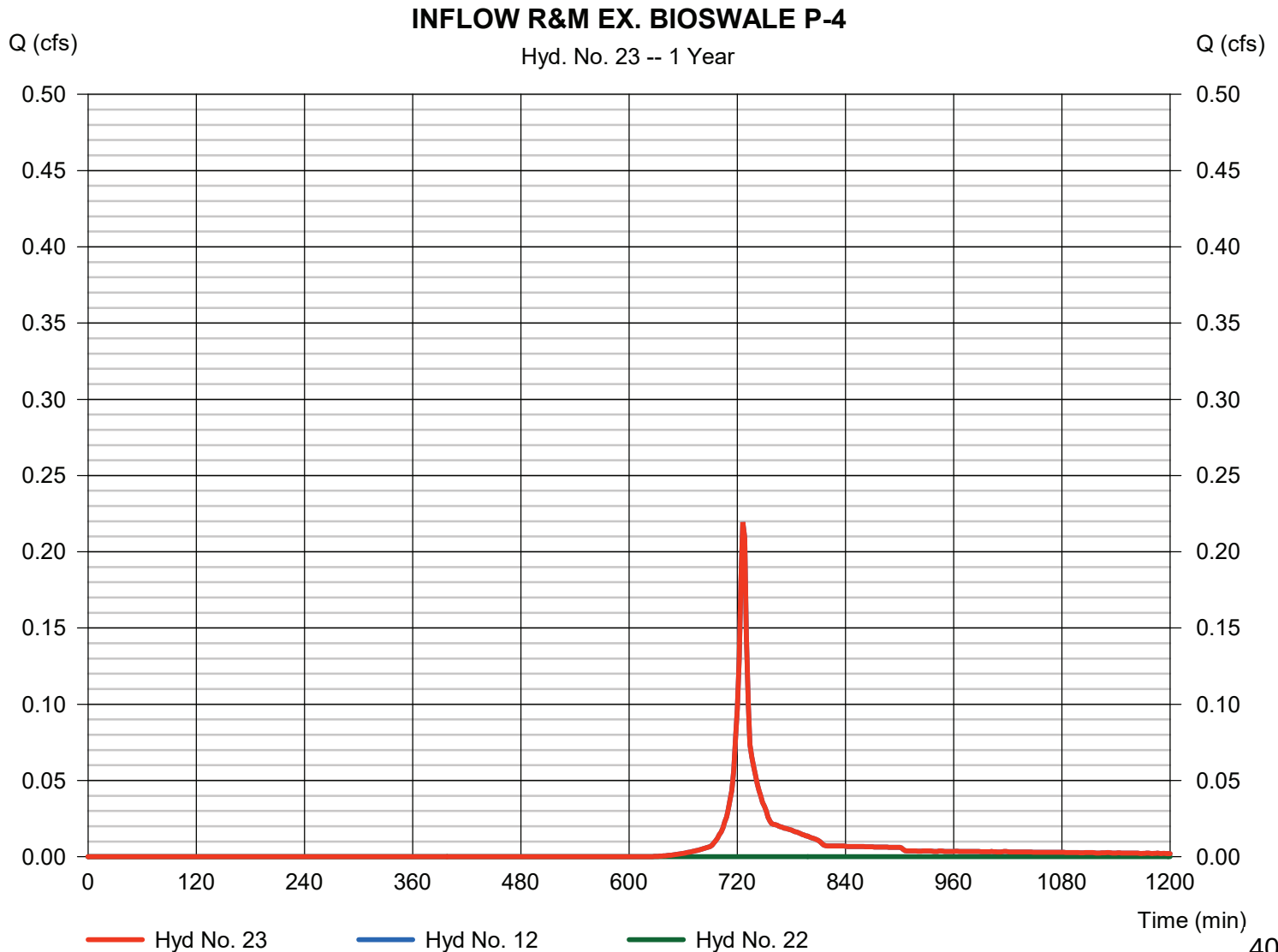
Friday, 06 / 28 / 2019

Hyd. No. 23

INFLOW R&M EX. BIOSWALE P-4

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 12, 22

Peak discharge = 0.219 cfs
 Time to peak = 726 min
 Hyd. volume = 0.009 acft
 Contrib. drain. area = 0.110 ac



Hydrograph Report

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

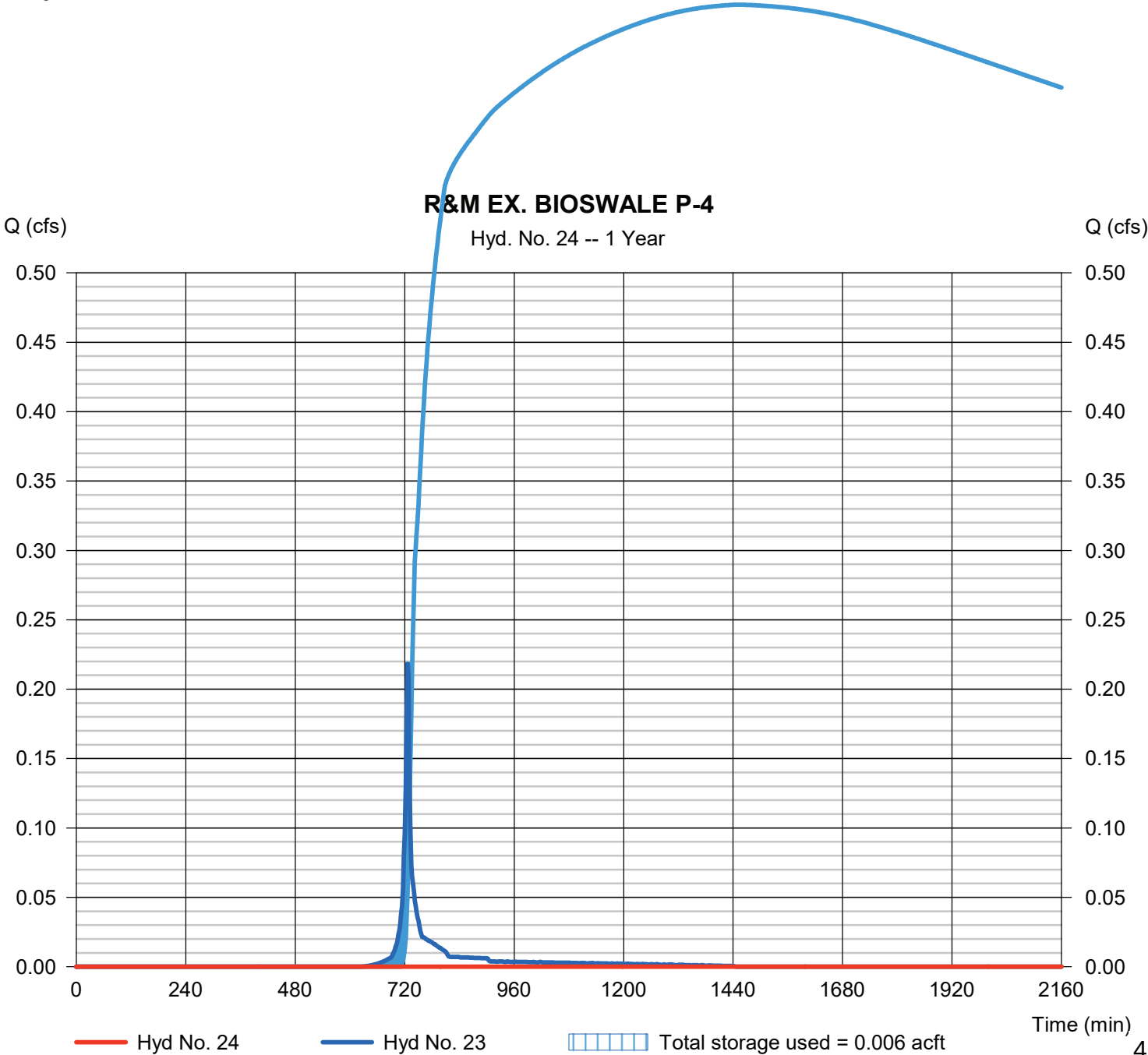
Friday, 06 / 28 / 2019

Hyd. No. 24

R&M EX. BIOSWALE P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 938 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 23 - INFLOW R&M EX. BIOSWALE P-4	Max. Elevation	= 848.91 ft
Reservoir name	= Ex. Bioswale P-4	Max. Storage	= 0.006 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

57

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

Friday, 06 / 28 / 2019

Pond No. 13 - Ex. Bioswale P-4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 848.55 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	848.55	625	0.000	0.000
0.45	849.00	791	0.007	0.007
0.95	849.50	976	0.010	0.017
1.45	850.00	1,161	0.012	0.030
1.95	850.50	1,346	0.014	0.044
2.10	850.65	1,404	0.005	0.049

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 850.15	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.730 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	848.55	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.05	0.001	848.59	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.09	0.001	848.64	---	---	---	---	0.00	---	---	---	0.003	---	0.003
0.14	0.002	848.68	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.18	0.003	848.73	---	---	---	---	0.00	---	---	---	0.005	---	0.005
0.22	0.004	848.77	---	---	---	---	0.00	---	---	---	0.007	---	0.007
0.27	0.004	848.82	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.31	0.005	848.86	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.36	0.006	848.91	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.40	0.007	848.95	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.45	0.007	849.00	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.50	0.008	849.05	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.55	0.009	849.10	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.60	0.010	849.15	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.65	0.011	849.20	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.70	0.012	849.25	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.75	0.013	849.30	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.80	0.014	849.35	---	---	---	---	0.00	---	---	---	0.016	---	0.016
0.85	0.015	849.40	---	---	---	---	0.00	---	---	---	0.016	---	0.016
0.90	0.016	849.45	---	---	---	---	0.00	---	---	---	0.016	---	0.016
0.95	0.017	849.50	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.00	0.019	849.55	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.05	0.020	849.60	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.10	0.021	849.65	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.15	0.022	849.70	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.20	0.024	849.75	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.25	0.025	849.80	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.30	0.026	849.85	---	---	---	---	0.00	---	---	---	0.019	---	0.019
1.35	0.027	849.90	---	---	---	---	0.00	---	---	---	0.019	---	0.019
1.40	0.028	849.95	---	---	---	---	0.00	---	---	---	0.019	---	0.019
1.45	0.030	850.00	---	---	---	---	0.00	---	---	---	0.020	---	0.020
1.50	0.031	850.05	---	---	---	---	0.00	---	---	---	0.020	---	0.020
1.55	0.033	850.10	---	---	---	---	0.00	---	---	---	0.020	---	0.020
1.60	0.034	850.15	---	---	---	---	0.00	---	---	---	0.021	---	0.021
1.65	0.035	850.20	---	---	---	---	0.04	---	---	---	0.021	---	0.058
1.70	0.037	850.25	---	---	---	---	0.11	---	---	---	0.021	---	0.126
1.75	0.038	850.30	---	---	---	---	0.19	---	---	---	0.021	---	0.215

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Ex. Bioswale P-4

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.80	0.040	850.35	---	---	---	---	0.30	---	---	---	0.022	---	0.319
1.85	0.041	850.40	---	---	---	---	0.42	---	---	---	0.022	---	0.438
1.90	0.043	850.45	---	---	---	---	0.55	---	---	---	0.022	---	0.569
1.95	0.044	850.50	---	---	---	---	0.69	---	---	---	0.023	---	0.712
1.97	0.045	850.52	---	---	---	---	0.73	---	---	---	0.023	---	0.757
1.98	0.045	850.53	---	---	---	---	0.78	---	---	---	0.023	---	0.803
2.00	0.045	850.54	---	---	---	---	0.83	---	---	---	0.023	---	0.850
2.01	0.046	850.56	---	---	---	---	0.87	---	---	---	0.023	---	0.897
2.03	0.046	850.58	---	---	---	---	0.92	---	---	---	0.023	---	0.946
2.04	0.047	850.59	---	---	---	---	0.97	---	---	---	0.023	---	0.995
2.06	0.047	850.61	---	---	---	---	1.02	---	---	---	0.023	---	1.046
2.07	0.048	850.62	---	---	---	---	1.07	---	---	---	0.024	---	1.097
2.09	0.048	850.64	---	---	---	---	1.13	---	---	---	0.024	---	1.149
2.10	0.049	850.65	---	---	---	---	1.18	---	---	---	0.024	---	1.201

...End

Hydrograph Report

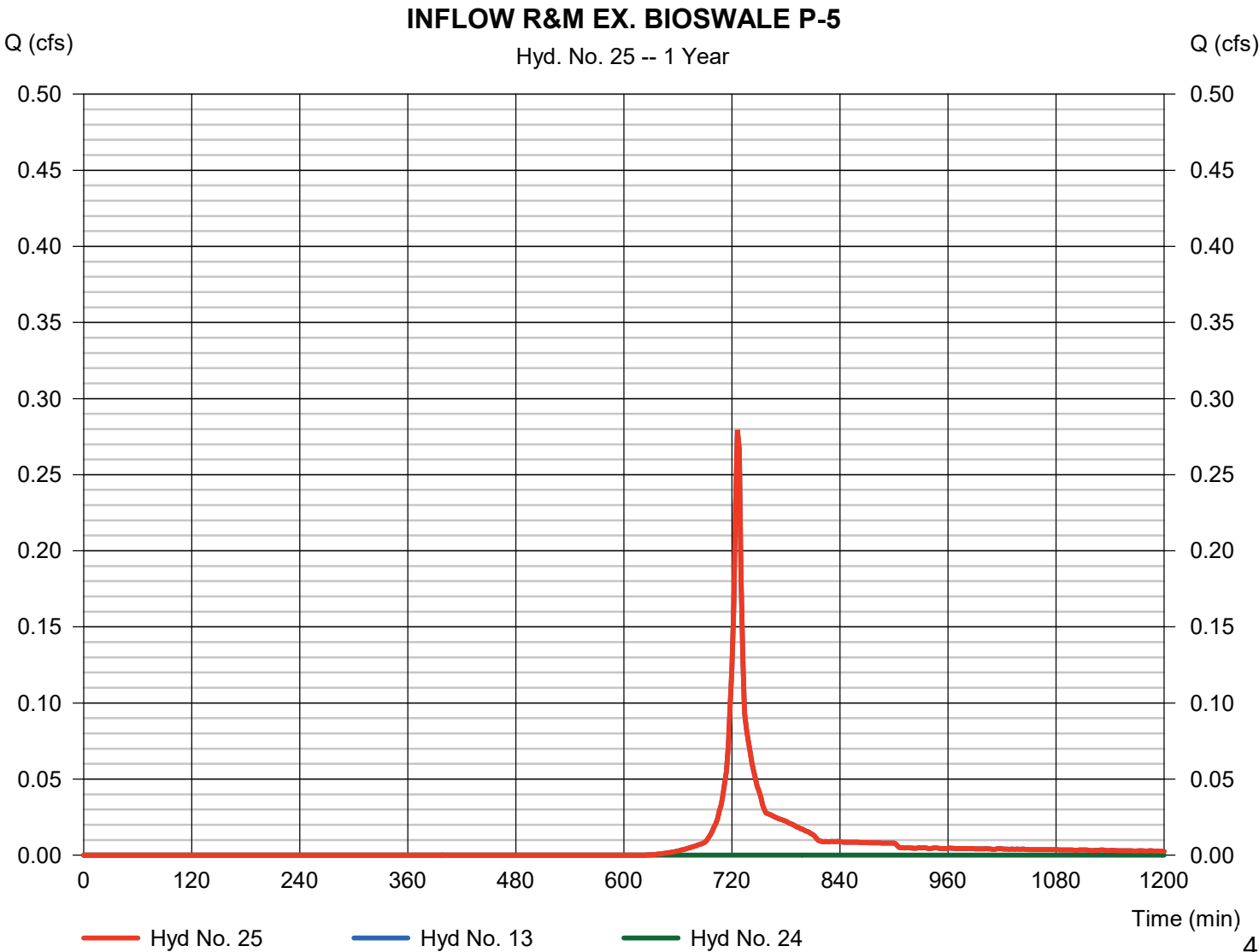
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 25

INFLOW R&M EX. BIOSWALE P-5

Hydrograph type	= Combine	Peak discharge	= 0.279 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.012 acft
Inflow hyds.	= 13, 24	Contrib. drain. area	= 0.140 ac



Hydrograph Report

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

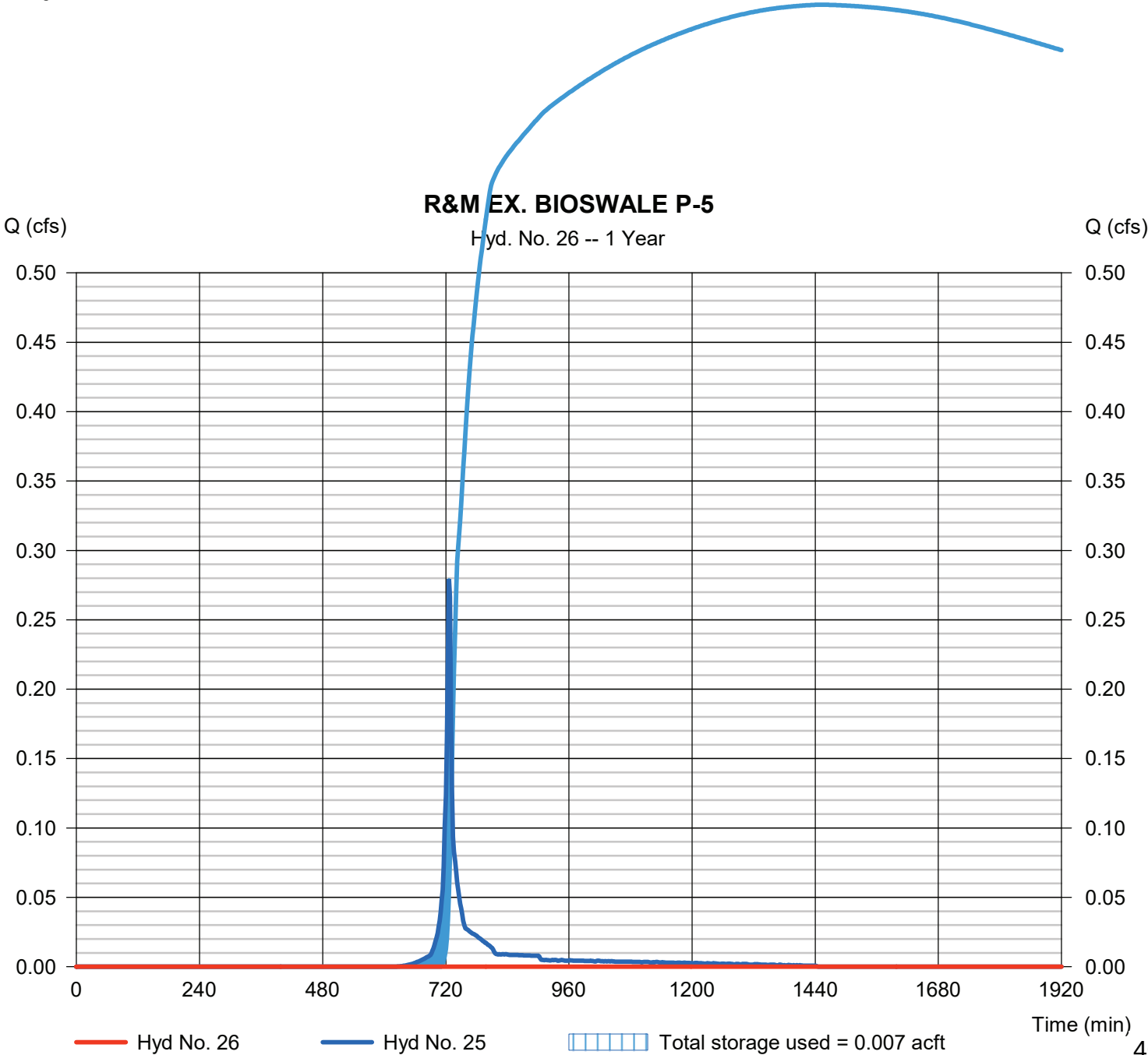
Friday, 06 / 28 / 2019

Hyd. No. 26

R&M EX. BIOSWALE P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 1240 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 25 - INFLOW R&M EX. BIOSWALE P-5	Max. Elevation	= 847.60 ft
Reservoir name	= Ex. Bioswale P-5	Max. Storage	= 0.007 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 14 - Ex. Bioswale P-5

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 847.07 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	847.07	503	0.000	0.000
0.43	847.50	662	0.006	0.006
0.93	848.00	847	0.009	0.014
1.43	848.50	1,032	0.011	0.025
1.93	849.00	1,218	0.013	0.038
2.10	849.17	1,281	0.005	0.043

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 848.67	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.730 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	847.07	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.04	0.001	847.11	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.09	0.001	847.16	---	---	---	---	0.00	---	---	---	0.002	---	0.002
0.13	0.002	847.20	---	---	---	---	0.00	---	---	---	0.003	---	0.003
0.17	0.002	847.24	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.22	0.003	847.29	---	---	---	---	0.00	---	---	---	0.006	---	0.006
0.26	0.003	847.33	---	---	---	---	0.00	---	---	---	0.007	---	0.007
0.30	0.004	847.37	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.34	0.005	847.41	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.39	0.005	847.46	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.43	0.006	847.50	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.48	0.007	847.55	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.53	0.007	847.60	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.58	0.008	847.65	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.63	0.009	847.70	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.68	0.010	847.75	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.73	0.011	847.80	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.78	0.012	847.85	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.83	0.013	847.90	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.88	0.014	847.95	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.93	0.014	848.00	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.98	0.015	848.05	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.03	0.017	848.10	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.08	0.018	848.15	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.13	0.019	848.20	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.18	0.020	848.25	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.23	0.021	848.30	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.28	0.022	848.35	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.33	0.023	848.40	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.38	0.024	848.45	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.43	0.025	848.50	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.48	0.026	848.55	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.53	0.028	848.60	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.58	0.029	848.65	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.63	0.030	848.70	---	---	---	---	0.02	---	---	---	0.019	---	0.036
1.68	0.032	848.75	---	---	---	---	0.08	---	---	---	0.019	---	0.094
1.73	0.033	848.80	---	---	---	---	0.16	---	---	---	0.019	---	0.175

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Ex. Bioswale P-5

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.78	0.034	848.85	---	---	---	---	0.25	---	---	---	0.020	---	0.274
1.83	0.035	848.90	---	---	---	---	0.37	---	---	---	0.020	---	0.387
1.88	0.037	848.95	---	---	---	---	0.49	---	---	---	0.020	---	0.513
1.93	0.038	849.00	---	---	---	---	0.63	---	---	---	0.021	---	0.652
1.95	0.039	849.02	---	---	---	---	0.68	---	---	---	0.021	---	0.701
1.96	0.039	849.03	---	---	---	---	0.73	---	---	---	0.021	---	0.752
1.98	0.039	849.05	---	---	---	---	0.78	---	---	---	0.021	---	0.804
2.00	0.040	849.07	---	---	---	---	0.84	---	---	---	0.021	---	0.858
2.02	0.040	849.09	---	---	---	---	0.89	---	---	---	0.021	---	0.912
2.03	0.041	849.10	---	---	---	---	0.95	---	---	---	0.021	---	0.967
2.05	0.041	849.12	---	---	---	---	1.00	---	---	---	0.021	---	1.024
2.07	0.042	849.14	---	---	---	---	1.06	---	---	---	0.021	---	1.082
2.08	0.042	849.15	---	---	---	---	1.12	---	---	---	0.022	---	1.140
2.10	0.043	849.17	---	---	---	---	1.18	---	---	---	0.022	---	1.199

...End

Hydrograph Report

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

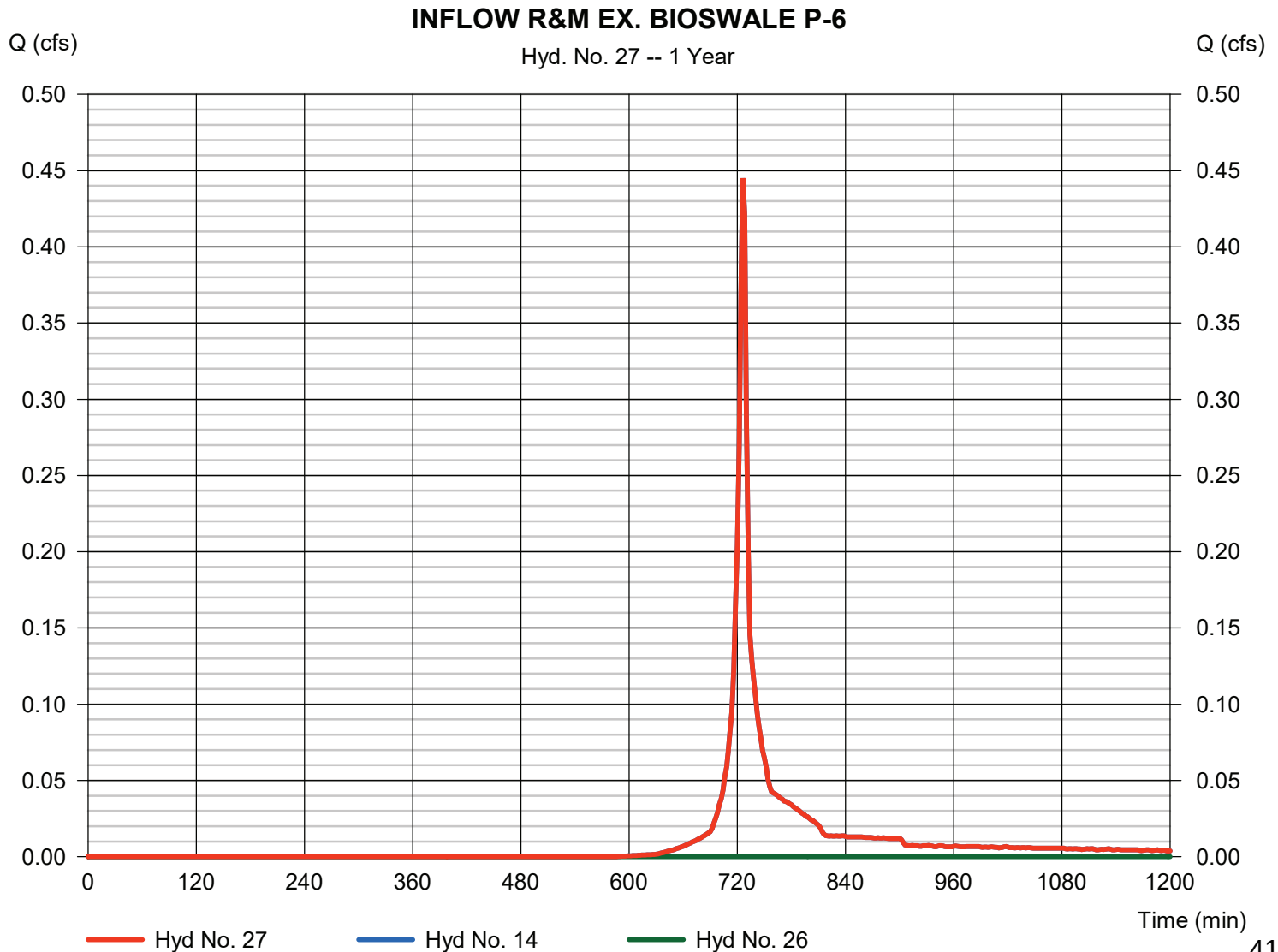
Friday, 06 / 28 / 2019

Hyd. No. 27

INFLOW R&M EX. BIOSWALE P-6

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 14, 26

Peak discharge = 0.445 cfs
 Time to peak = 726 min
 Hyd. volume = 0.019 acft
 Contrib. drain. area = 0.200 ac



Hydrograph Report

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

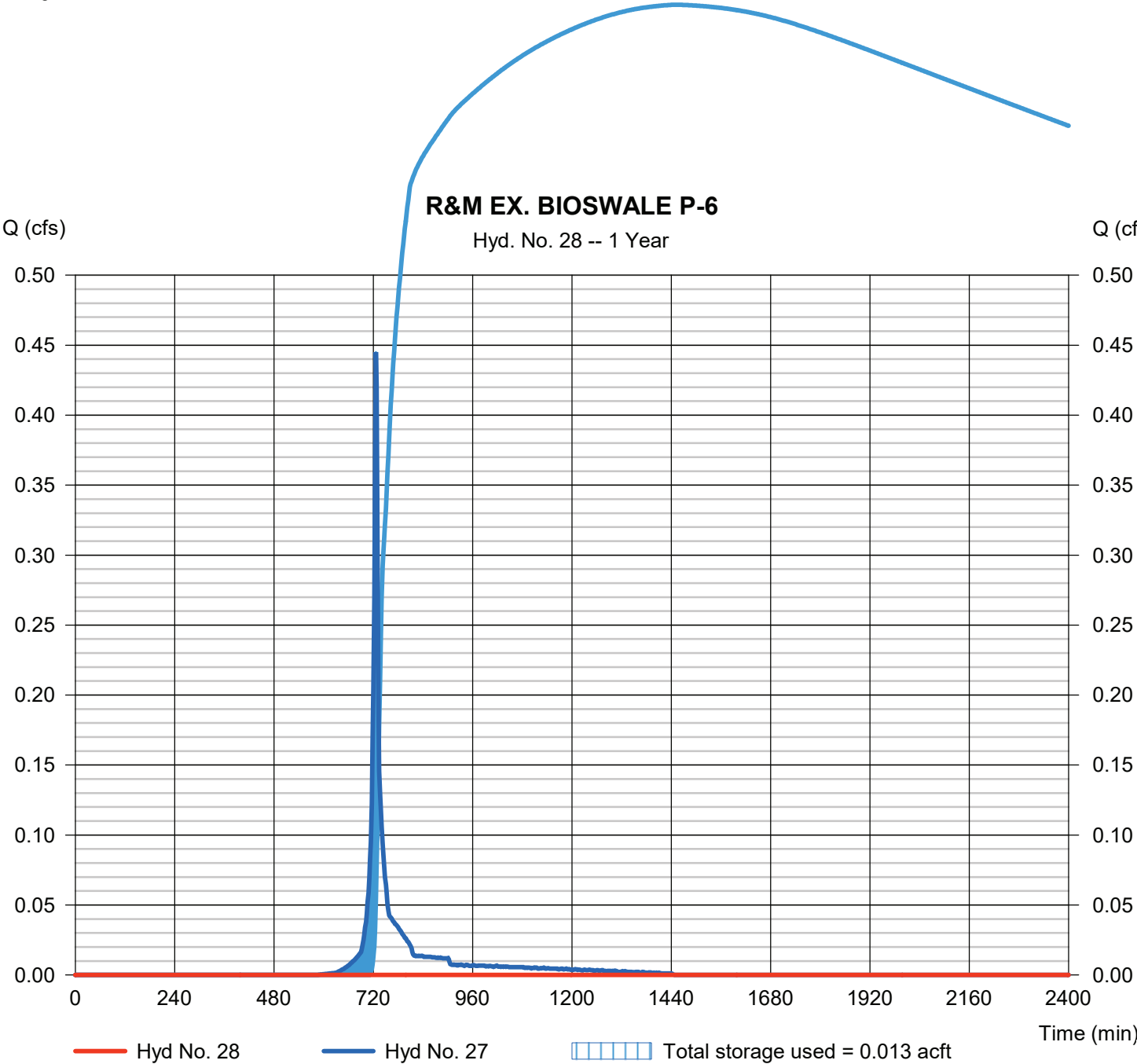
Friday, 06 / 28 / 2019

Hyd. No. 28

R&M EX. BIOSWALE P-6

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 1570 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 27 - INFLOW R&M EX. BIOSWALE P-6	Max. Elevation	= 846.33 ft
Reservoir name	= Ex. Bioswale P-6	Max. Storage	= 0.013 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

65

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

Friday, 06 / 28 / 2019

Pond No. 15 - Ex. Bioswale P-6

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 845.56 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	845.56	537	0.000	0.000
0.44	846.00	719	0.006	0.006
0.94	846.50	930	0.009	0.016
1.44	847.00	1,146	0.012	0.028
1.94	847.50	1,366	0.014	0.042
2.10	847.66	1,440	0.005	0.047
2.44	848.00	1,440	0.011	0.058

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 847.60	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.730 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	845.56	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.04	0.001	845.60	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.09	0.001	845.65	---	---	---	---	0.00	---	---	---	0.002	---	0.002
0.13	0.002	845.69	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.18	0.003	845.74	---	---	---	---	0.00	---	---	---	0.005	---	0.005
0.22	0.003	845.78	---	---	---	---	0.00	---	---	---	0.006	---	0.006
0.26	0.004	845.82	---	---	---	---	0.00	---	---	---	0.007	---	0.007
0.31	0.004	845.87	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.35	0.005	845.91	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.40	0.006	845.96	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.44	0.006	846.00	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.49	0.007	846.05	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.54	0.008	846.10	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.59	0.009	846.15	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.64	0.010	846.20	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.69	0.011	846.25	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.74	0.012	846.30	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.79	0.013	846.35	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.84	0.014	846.40	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.89	0.015	846.45	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.94	0.016	846.50	---	---	---	---	0.00	---	---	---	0.016	---	0.016
0.99	0.017	846.55	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.04	0.018	846.60	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.09	0.019	846.65	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.14	0.021	846.70	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.19	0.022	846.75	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.24	0.023	846.80	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.29	0.024	846.85	---	---	---	---	0.00	---	---	---	0.018	---	0.018
1.34	0.025	846.90	---	---	---	---	0.00	---	---	---	0.019	---	0.019
1.39	0.026	846.95	---	---	---	---	0.00	---	---	---	0.019	---	0.019
1.44	0.028	847.00	---	---	---	---	0.00	---	---	---	0.019	---	0.019
1.49	0.029	847.05	---	---	---	---	0.00	---	---	---	0.020	---	0.020
1.54	0.031	847.10	---	---	---	---	0.00	---	---	---	0.020	---	0.020
1.59	0.032	847.15	---	---	---	---	0.00	---	---	---	0.020	---	0.020
1.64	0.033	847.20	---	---	---	---	0.00	---	---	---	0.021	---	0.021
1.69	0.035	847.25	---	---	---	---	0.00	---	---	---	0.021	---	0.021

Continues on next page...

Ex. Bioswale P-6

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.74	0.036	847.30	---	---	---	---	0.00	---	---	---	0.022	---	0.022
1.79	0.038	847.35	---	---	---	---	0.00	---	---	---	0.022	---	0.022
1.84	0.039	847.40	---	---	---	---	0.00	---	---	---	0.022	---	0.022
1.89	0.041	847.45	---	---	---	---	0.00	---	---	---	0.023	---	0.023
1.94	0.042	847.50	---	---	---	---	0.00	---	---	---	0.023	---	0.023
1.96	0.043	847.52	---	---	---	---	0.00	---	---	---	0.023	---	0.023
1.97	0.043	847.53	---	---	---	---	0.00	---	---	---	0.023	---	0.023
1.99	0.044	847.55	---	---	---	---	0.00	---	---	---	0.023	---	0.023
2.00	0.044	847.56	---	---	---	---	0.00	---	---	---	0.024	---	0.024
2.02	0.045	847.58	---	---	---	---	0.00	---	---	---	0.024	---	0.024
2.04	0.045	847.60	---	---	---	---	0.00	---	---	---	0.024	---	0.024
2.05	0.046	847.61	---	---	---	---	0.00	---	---	---	0.024	---	0.028
2.07	0.046	847.63	---	---	---	---	0.02	---	---	---	0.024	---	0.040
2.08	0.047	847.64	---	---	---	---	0.03	---	---	---	0.024	---	0.055
2.10	0.047	847.66	---	---	---	---	0.05	---	---	---	0.024	---	0.073
2.13	0.048	847.69	---	---	---	---	0.10	---	---	---	0.024	---	0.120
2.17	0.049	847.73	---	---	---	---	0.15	---	---	---	0.024	---	0.177
2.20	0.051	847.76	---	---	---	---	0.22	---	---	---	0.024	---	0.241
2.24	0.052	847.80	---	---	---	---	0.29	---	---	---	0.024	---	0.313
2.27	0.053	847.83	---	---	---	---	0.37	---	---	---	0.024	---	0.392
2.30	0.054	847.86	---	---	---	---	0.45	---	---	---	0.024	---	0.476
2.34	0.055	847.90	---	---	---	---	0.54	---	---	---	0.024	---	0.566
2.37	0.056	847.93	---	---	---	---	0.64	---	---	---	0.024	---	0.661
2.41	0.057	847.97	---	---	---	---	0.74	---	---	---	0.024	---	0.762
2.44	0.058	848.00	---	---	---	---	0.84	---	---	---	0.024	---	0.867

...End

Hydrograph Report

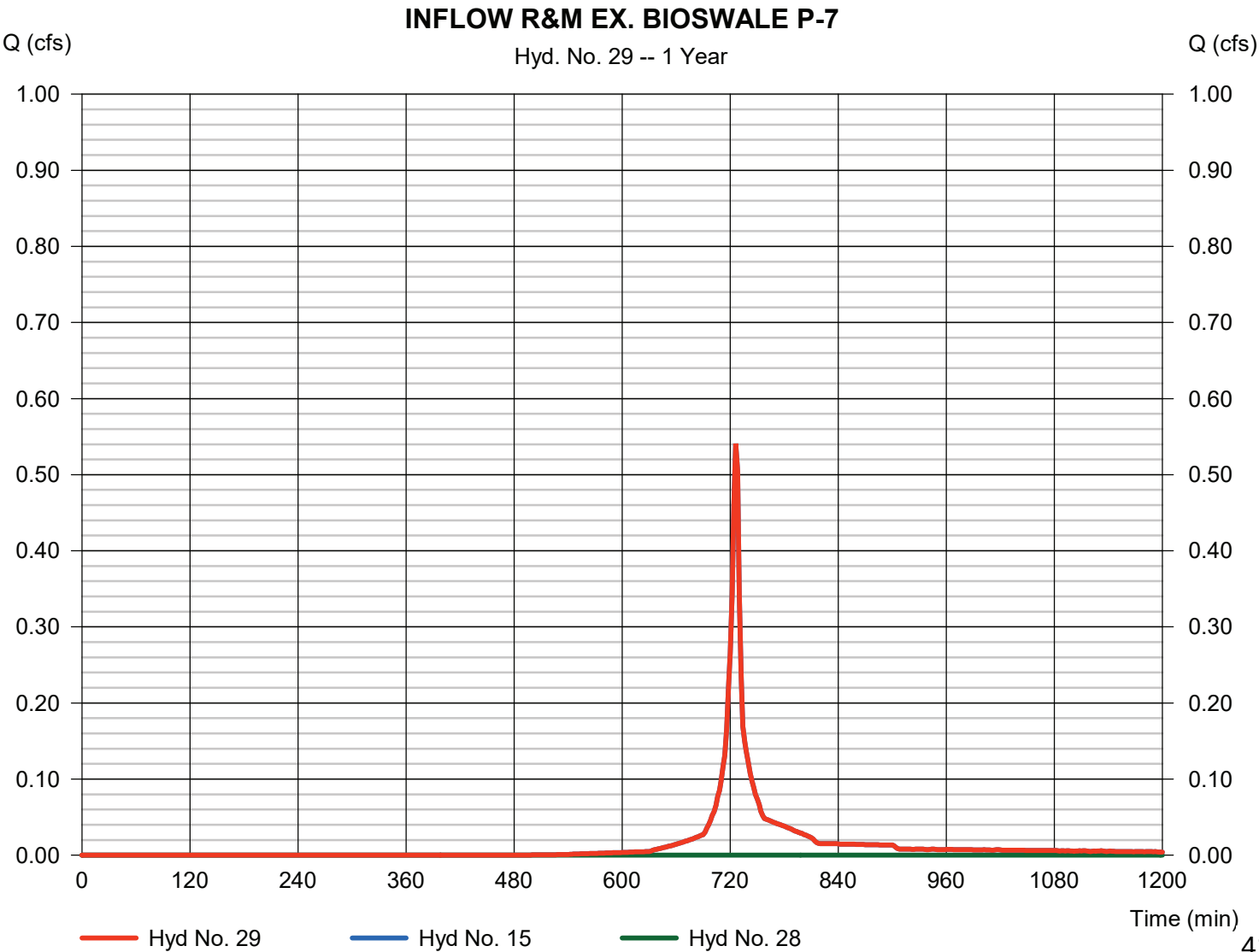
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 29

INFLOW R&M EX. BIOSWALE P-7

Hydrograph type	= Combine	Peak discharge	= 0.541 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.024 acft
Inflow hyds.	= 15, 28	Contrib. drain. area	= 0.200 ac



Hydrograph Report

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

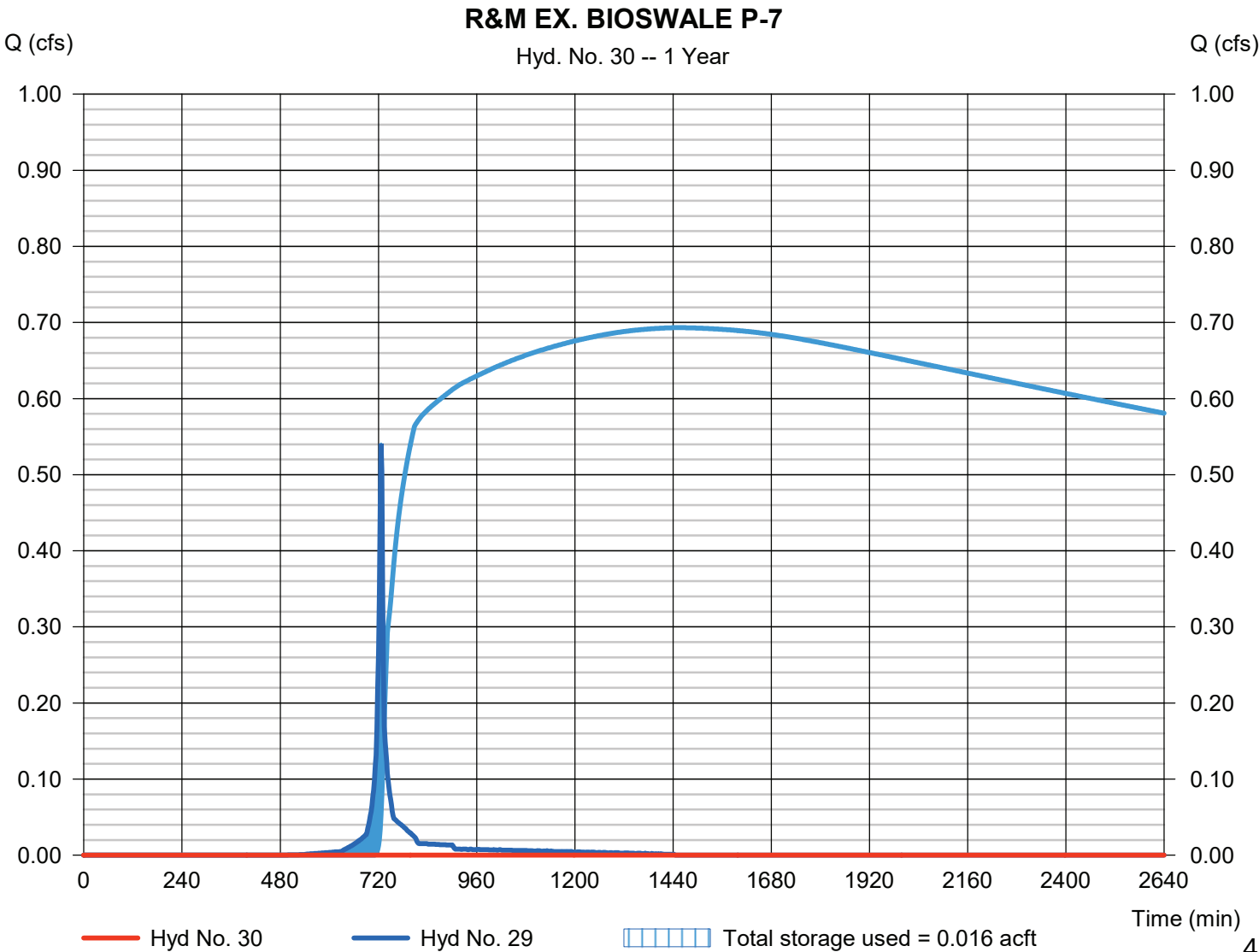
Friday, 06 / 28 / 2019

Hyd. No. 30

R&M EX. BIOSWALE P-7

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 1866 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 29 - INFLOW R&M EX. BIOSWALE P-7	Max. Elevation	= 844.67 ft
Reservoir name	= Ex. Bioswale P-7	Max. Storage	= 0.016 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 16 - Ex. Bioswale P-7

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 843.59 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	843.59	484	0.000	0.000
0.41	844.00	615	0.005	0.005
0.91	844.50	778	0.008	0.013
1.41	845.00	946	0.010	0.023
1.91	845.50	1,120	0.012	0.035
2.09	845.68	1,185	0.005	0.040

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 845.31	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.730 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	843.59	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.04	0.001	843.63	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.08	0.001	843.67	---	---	---	---	0.00	---	---	---	0.002	---	0.002
0.12	0.002	843.71	---	---	---	---	0.00	---	---	---	0.003	---	0.003
0.16	0.002	843.75	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.20	0.003	843.80	---	---	---	---	0.00	---	---	---	0.005	---	0.005
0.25	0.003	843.84	---	---	---	---	0.00	---	---	---	0.006	---	0.006
0.29	0.004	843.88	---	---	---	---	0.00	---	---	---	0.007	---	0.007
0.33	0.004	843.92	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.37	0.005	843.96	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.41	0.005	844.00	---	---	---	---	0.00	---	---	---	0.010	---	0.010
0.46	0.006	844.05	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.51	0.007	844.10	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.56	0.008	844.15	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.61	0.008	844.20	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.66	0.009	844.25	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.71	0.010	844.30	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.76	0.011	844.35	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.81	0.012	844.40	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.86	0.012	844.45	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.91	0.013	844.50	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.96	0.014	844.55	---	---	---	---	0.00	---	---	---	0.013	---	0.013
1.01	0.015	844.60	---	---	---	---	0.00	---	---	---	0.014	---	0.014
1.06	0.016	844.65	---	---	---	---	0.00	---	---	---	0.014	---	0.014
1.11	0.017	844.70	---	---	---	---	0.00	---	---	---	0.014	---	0.014
1.16	0.018	844.75	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.21	0.019	844.80	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.26	0.020	844.85	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.31	0.021	844.90	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.36	0.022	844.95	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.41	0.023	845.00	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.46	0.024	845.05	---	---	---	---	0.00	---	---	---	0.016	---	0.016
1.51	0.025	845.10	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.56	0.027	845.15	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.61	0.028	845.20	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.66	0.029	845.25	---	---	---	---	0.00	---	---	---	0.017	---	0.017
1.71	0.030	845.30	---	---	---	---	0.00	---	---	---	0.018	---	0.018

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Ex. Bioswale P-7

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.76	0.031	845.35	---	---	---	---	0.03	---	---	---	0.018	---	0.045
1.81	0.032	845.40	---	---	---	---	0.09	---	---	---	0.018	---	0.108
1.86	0.034	845.45	---	---	---	---	0.17	---	---	---	0.019	---	0.193
1.91	0.035	845.50	---	---	---	---	0.28	---	---	---	0.019	---	0.295
1.93	0.035	845.52	---	---	---	---	0.32	---	---	---	0.019	---	0.335
1.95	0.036	845.54	---	---	---	---	0.36	---	---	---	0.019	---	0.377
1.96	0.036	845.55	---	---	---	---	0.40	---	---	---	0.019	---	0.421
1.98	0.037	845.57	---	---	---	---	0.45	---	---	---	0.019	---	0.466
2.00	0.037	845.59	---	---	---	---	0.49	---	---	---	0.019	---	0.513
2.02	0.038	845.61	---	---	---	---	0.54	---	---	---	0.020	---	0.561
2.04	0.038	845.63	---	---	---	---	0.59	---	---	---	0.020	---	0.611
2.05	0.039	845.64	---	---	---	---	0.64	---	---	---	0.020	---	0.663
2.07	0.039	845.66	---	---	---	---	0.70	---	---	---	0.020	---	0.716
2.09	0.040	845.68	---	---	---	---	0.75	---	---	---	0.020	---	0.770

...End

Hydrograph Report

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

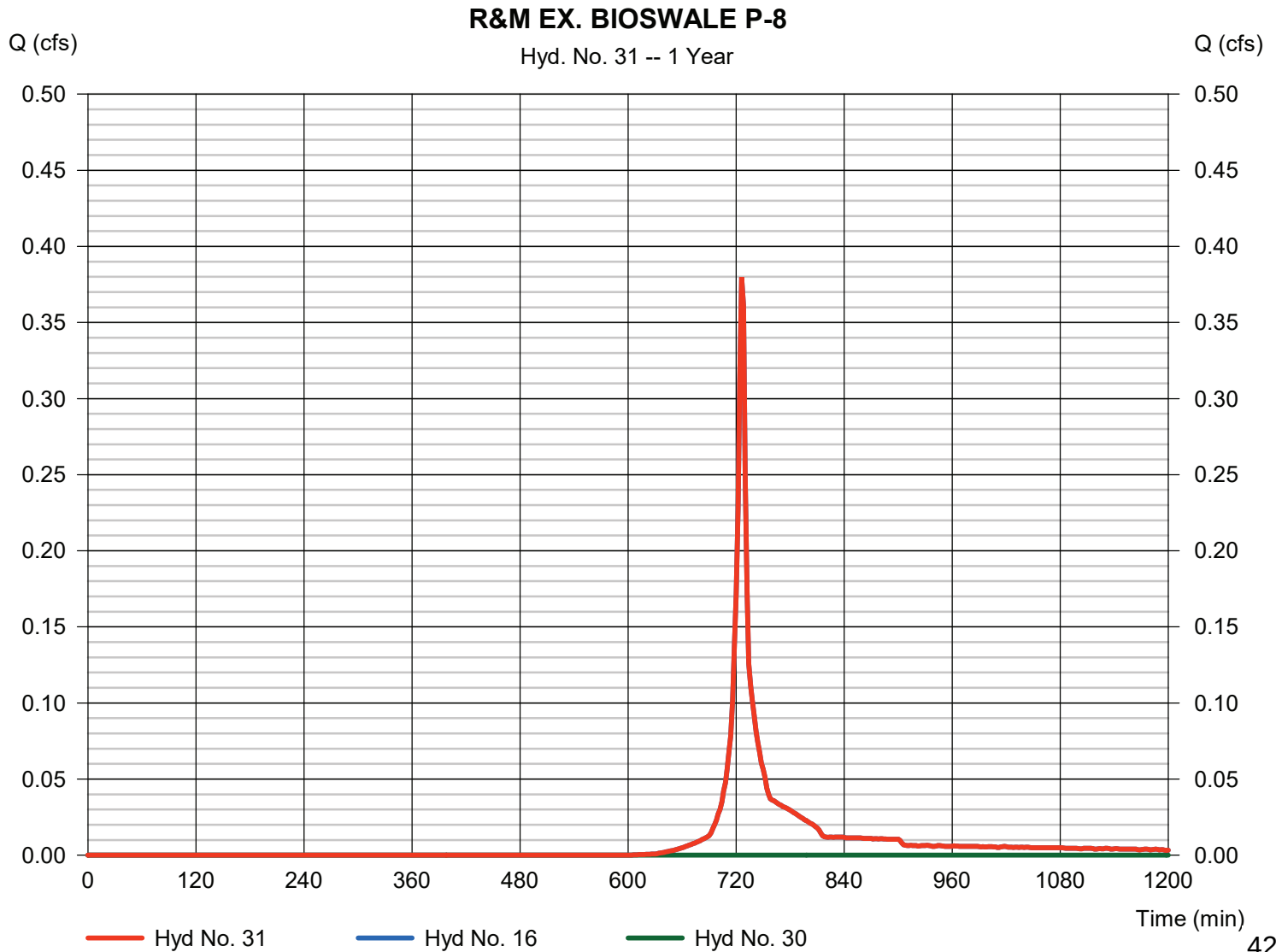
Friday, 06 / 28 / 2019

Hyd. No. 31

R&M EX. BIOSWALE P-8

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 16, 30

Peak discharge = 0.380 cfs
 Time to peak = 726 min
 Hyd. volume = 0.016 acft
 Contrib. drain. area = 0.180 ac



Hydrograph Report

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

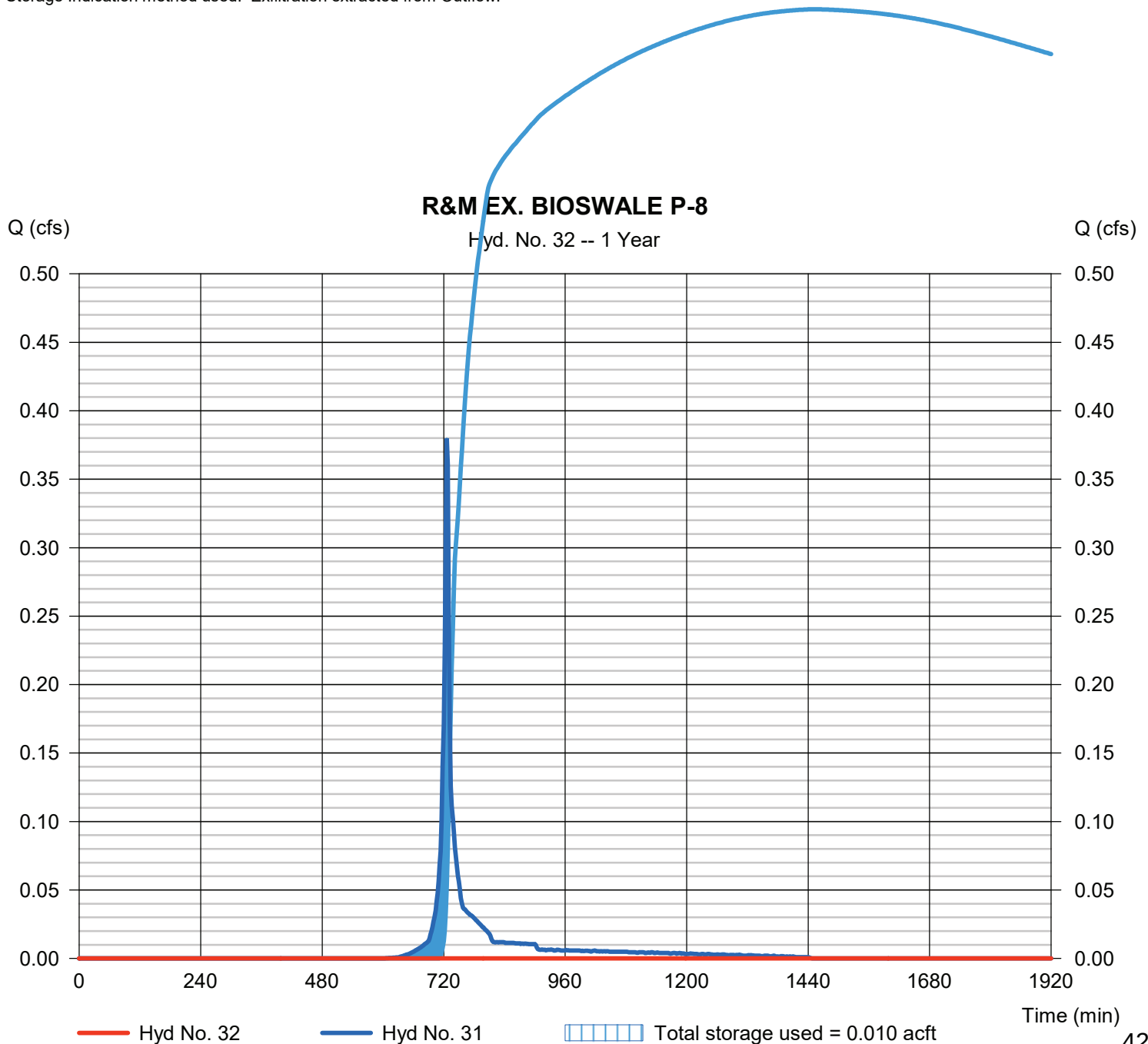
Friday, 06 / 28 / 2019

Hyd. No. 32

R&M EX. BIOSWALE P-8

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 1326 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 31 - R&M EX. BIOSWALE P-8	Max. Elevation	= 843.28 ft
Reservoir name	= Ex. Bioswale P-8	Max. Storage	= 0.010 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 17 - Ex. Bioswale P-8

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 842.75 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	842.75	687	0.000	0.000
0.25	843.00	797	0.004	0.004
0.75	843.50	1,022	0.010	0.015
1.25	844.00	1,251	0.013	0.028
1.75	844.50	1,485	0.016	0.043
2.11	844.86	1,658	0.013	0.056
2.25	845.00	1,658	0.005	0.062
2.39	845.14	2,500	0.007	0.068

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 844.80	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.730 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	842.75	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.03	0.000	842.78	---	---	---	---	0.00	---	---	---	0.001	---	0.001
0.05	0.001	842.80	---	---	---	---	0.00	---	---	---	0.003	---	0.003
0.08	0.001	842.83	---	---	---	---	0.00	---	---	---	0.004	---	0.004
0.10	0.002	842.85	---	---	---	---	0.00	---	---	---	0.005	---	0.005
0.13	0.002	842.88	---	---	---	---	0.00	---	---	---	0.007	---	0.007
0.15	0.003	842.90	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.17	0.003	842.93	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.20	0.003	842.95	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.22	0.004	842.98	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.25	0.004	843.00	---	---	---	---	0.00	---	---	---	0.013	---	0.013
0.30	0.005	843.05	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.35	0.006	843.10	---	---	---	---	0.00	---	---	---	0.014	---	0.014
0.40	0.007	843.15	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.45	0.008	843.20	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.50	0.009	843.25	---	---	---	---	0.00	---	---	---	0.015	---	0.015
0.55	0.011	843.30	---	---	---	---	0.00	---	---	---	0.016	---	0.016
0.60	0.012	843.35	---	---	---	---	0.00	---	---	---	0.016	---	0.016
0.65	0.013	843.40	---	---	---	---	0.00	---	---	---	0.017	---	0.017
0.70	0.014	843.45	---	---	---	---	0.00	---	---	---	0.017	---	0.017
0.75	0.015	843.50	---	---	---	---	0.00	---	---	---	0.017	---	0.017
0.80	0.016	843.55	---	---	---	---	0.00	---	---	---	0.018	---	0.018
0.85	0.017	843.60	---	---	---	---	0.00	---	---	---	0.018	---	0.018
0.90	0.019	843.65	---	---	---	---	0.00	---	---	---	0.018	---	0.018
0.95	0.020	843.70	---	---	---	---	0.00	---	---	---	0.019	---	0.019
1.00	0.021	843.75	---	---	---	---	0.00	---	---	---	0.019	---	0.019
1.05	0.022	843.80	---	---	---	---	0.00	---	---	---	0.020	---	0.020
1.10	0.024	843.85	---	---	---	---	0.00	---	---	---	0.020	---	0.020
1.15	0.025	843.90	---	---	---	---	0.00	---	---	---	0.020	---	0.020
1.20	0.026	843.95	---	---	---	---	0.00	---	---	---	0.021	---	0.021
1.25	0.028	844.00	---	---	---	---	0.00	---	---	---	0.021	---	0.021
1.30	0.029	844.05	---	---	---	---	0.00	---	---	---	0.022	---	0.022
1.35	0.031	844.10	---	---	---	---	0.00	---	---	---	0.022	---	0.022
1.40	0.032	844.15	---	---	---	---	0.00	---	---	---	0.022	---	0.022
1.45	0.034	844.20	---	---	---	---	0.00	---	---	---	0.023	---	0.023

Continues on next page...

Ex. Bioswale P-8

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.50	0.036	844.25	---	---	---	---	0.00	---	---	---	0.023	---	0.023
1.55	0.037	844.30	---	---	---	---	0.00	---	---	---	0.024	---	0.024
1.60	0.039	844.35	---	---	---	---	0.00	---	---	---	0.024	---	0.024
1.65	0.040	844.40	---	---	---	---	0.00	---	---	---	0.024	---	0.024
1.70	0.042	844.45	---	---	---	---	0.00	---	---	---	0.025	---	0.025
1.75	0.043	844.50	---	---	---	---	0.00	---	---	---	0.025	---	0.025
1.79	0.045	844.54	---	---	---	---	0.00	---	---	---	0.025	---	0.025
1.82	0.046	844.57	---	---	---	---	0.00	---	---	---	0.026	---	0.026
1.86	0.047	844.61	---	---	---	---	0.00	---	---	---	0.026	---	0.026
1.89	0.049	844.64	---	---	---	---	0.00	---	---	---	0.026	---	0.026
1.93	0.050	844.68	---	---	---	---	0.00	---	---	---	0.027	---	0.027
1.97	0.051	844.72	---	---	---	---	0.00	---	---	---	0.027	---	0.027
2.00	0.052	844.75	---	---	---	---	0.00	---	---	---	0.027	---	0.027
2.04	0.054	844.79	---	---	---	---	0.00	---	---	---	0.027	---	0.027
2.07	0.055	844.82	---	---	---	---	0.01	---	---	---	0.028	---	0.040
2.11	0.056	844.86	---	---	---	---	0.05	---	---	---	0.028	---	0.077
2.12	0.057	844.87	---	---	---	---	0.07	---	---	---	0.028	---	0.095
2.14	0.057	844.89	---	---	---	---	0.09	---	---	---	0.028	---	0.115
2.15	0.058	844.90	---	---	---	---	0.11	---	---	---	0.028	---	0.136
2.17	0.058	844.92	---	---	---	---	0.13	---	---	---	0.028	---	0.159
2.18	0.059	844.93	---	---	---	---	0.16	---	---	---	0.028	---	0.184
2.19	0.060	844.94	---	---	---	---	0.18	---	---	---	0.028	---	0.210
2.21	0.060	844.96	---	---	---	---	0.21	---	---	---	0.028	---	0.237
2.22	0.061	844.97	---	---	---	---	0.24	---	---	---	0.028	---	0.265
2.24	0.061	844.99	---	---	---	---	0.27	---	---	---	0.028	---	0.295
2.25	0.062	845.00	---	---	---	---	0.30	---	---	---	0.028	---	0.326
2.26	0.062	845.01	---	---	---	---	0.33	---	---	---	0.029	---	0.359
2.28	0.063	845.03	---	---	---	---	0.36	---	---	---	0.031	---	0.393
2.29	0.064	845.04	---	---	---	---	0.40	---	---	---	0.032	---	0.429
2.31	0.064	845.06	---	---	---	---	0.43	---	---	---	0.034	---	0.465
2.32	0.065	845.07	---	---	---	---	0.47	---	---	---	0.035	---	0.502
2.33	0.066	845.08	---	---	---	---	0.50	---	---	---	0.037	---	0.540
2.35	0.066	845.10	---	---	---	---	0.54	---	---	---	0.038	---	0.579
2.36	0.067	845.11	---	---	---	---	0.58	---	---	---	0.039	---	0.619
2.38	0.068	845.13	---	---	---	---	0.62	---	---	---	0.041	---	0.660
2.39	0.068	845.14	---	---	---	---	0.66	---	---	---	0.042	---	0.703

...End

Hydrograph Report

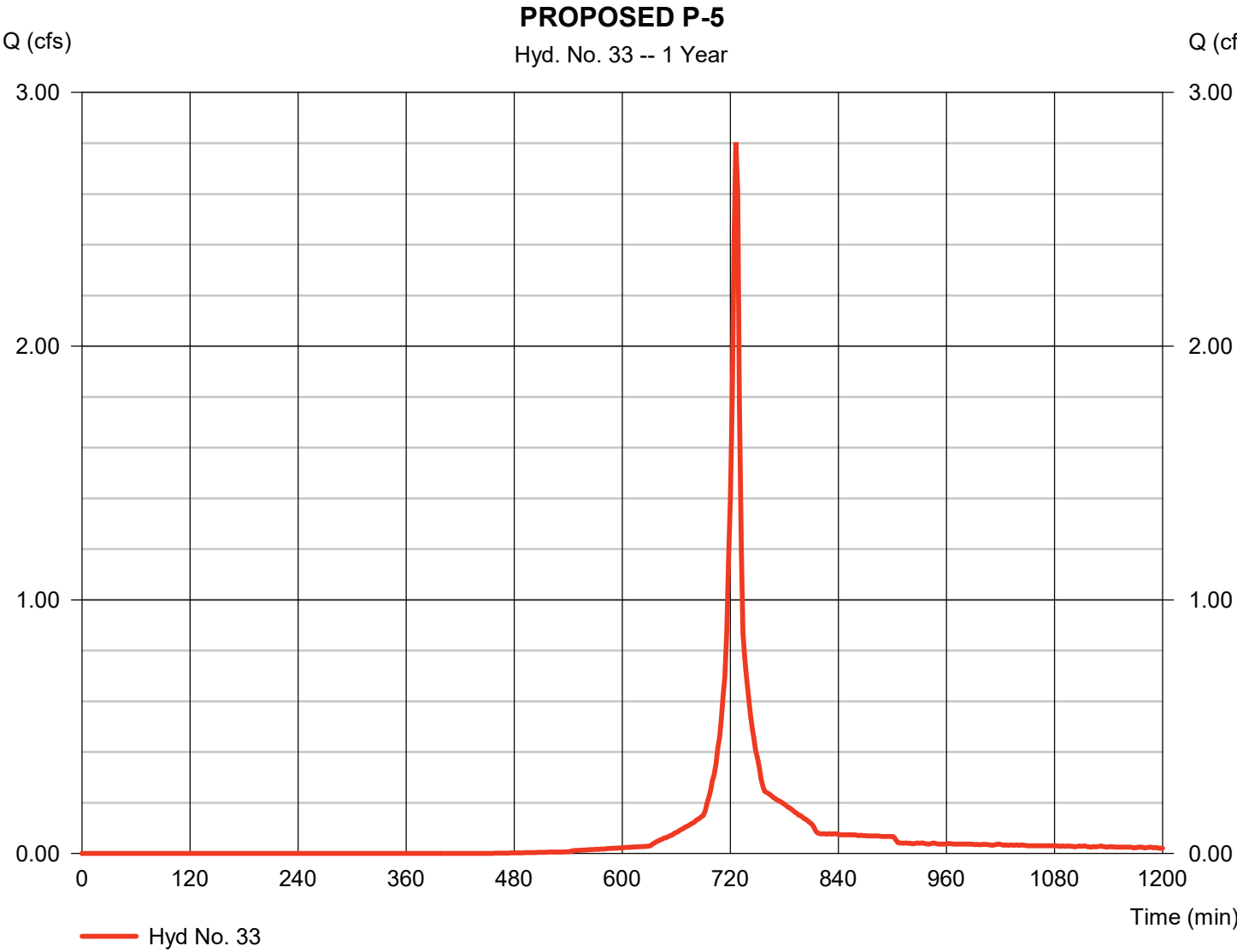
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 2.803 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.124 acft
Drainage area	= 0.992 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

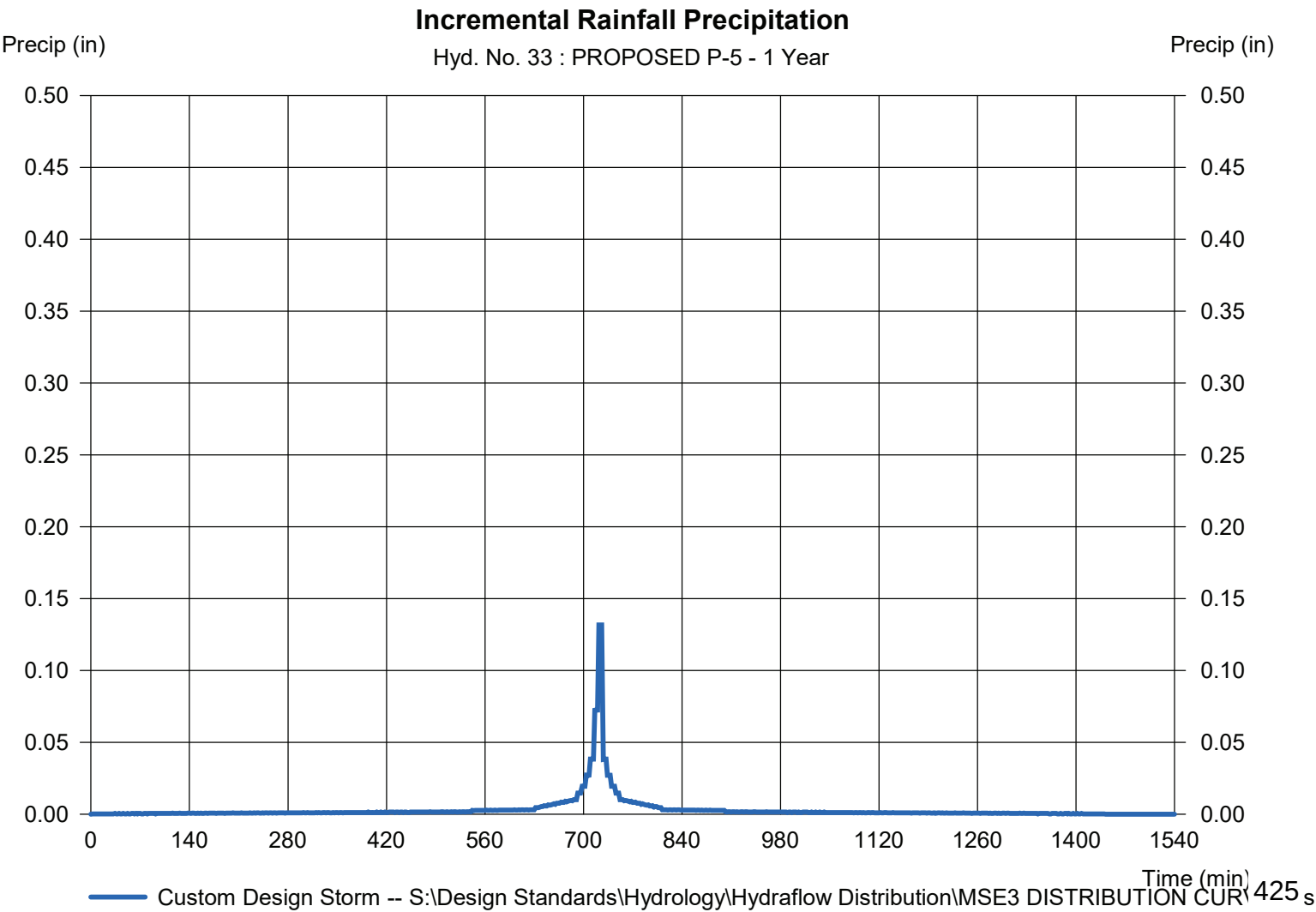
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



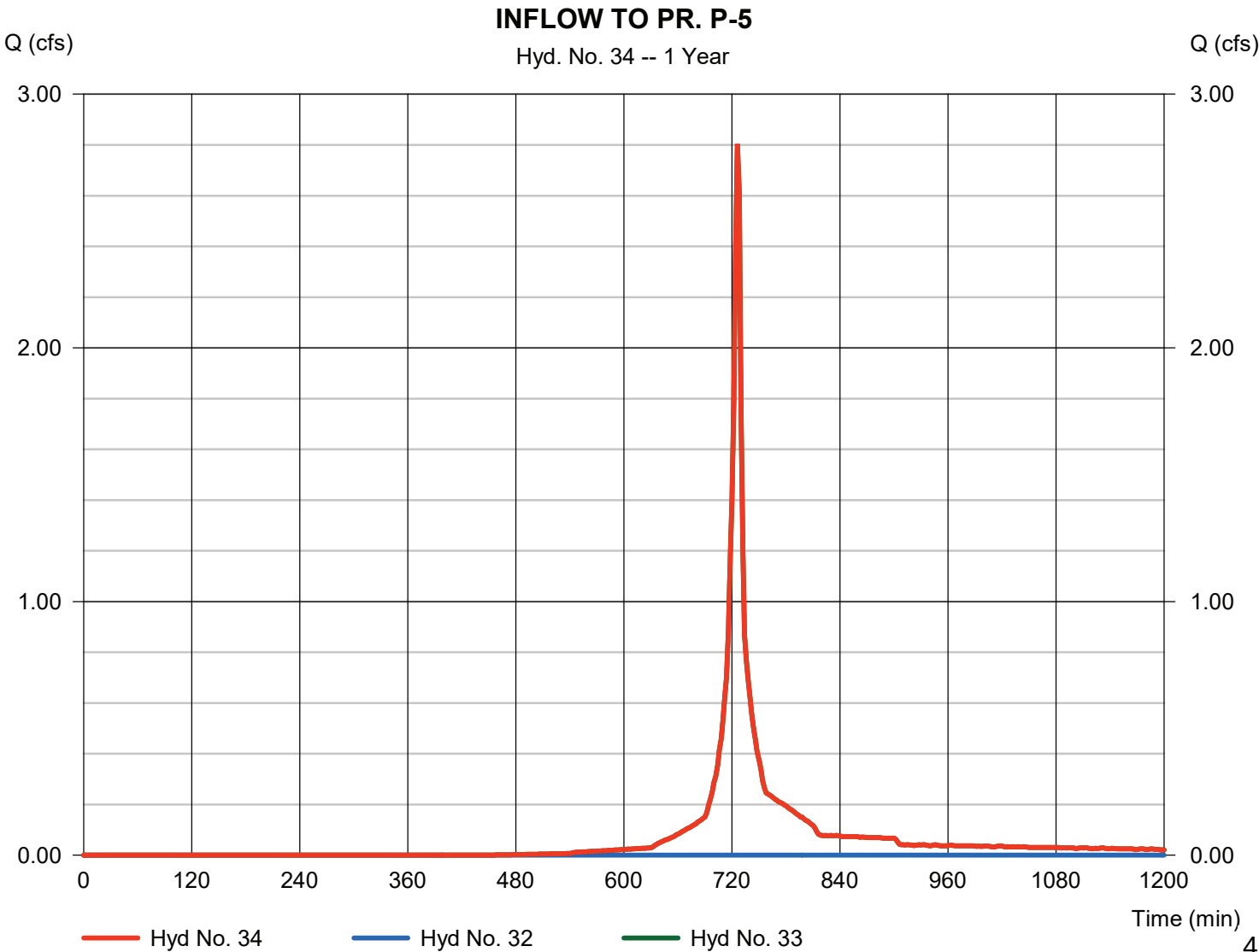
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020
Friday, 06 / 28 / 2019

Hyd. No. 34

INFLOW TO PR. P-5

Hydrograph type	= Combine	Peak discharge	= 2.803 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.124 acft
Inflow hyds.	= 32, 33	Contrib. drain. area	= 0.992 ac



Hydrograph Report

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

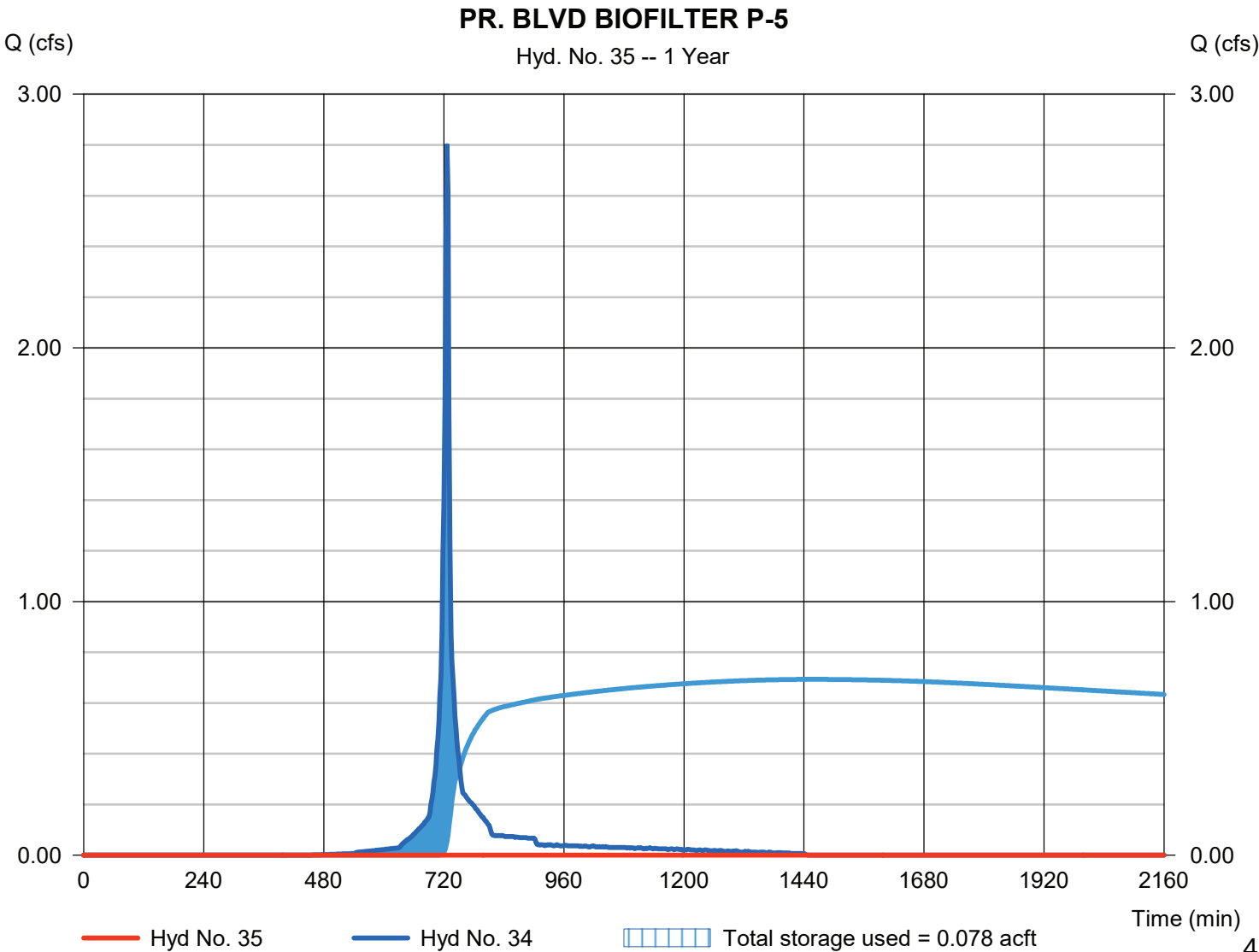
Friday, 06 / 28 / 2019

Hyd. No. 35

PR. BLVD BIOFILTER P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 746 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 34 - INFLOW TO PR. P-5	Max. Elevation	= 841.66 ft
Reservoir name	= BLVD BIOFILTER P-5	Max. Storage	= 0.078 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 8 - BLVD BIOFILTER P-5

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 839.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	839.00	17	0.000	0.000
1.00	840.00	410	0.004	0.004
2.00	841.00	2,115	0.026	0.030
3.00	842.00	4,331	0.072	0.103
4.00	843.00	6,634	0.125	0.228
5.00	844.00	18,061	0.273	0.500
5.50	844.50	20,000	0.218	0.719

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 5.00	0.00	0.00	0.00
Crest El. (ft)	= 844.05	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)	= 1.630 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	839.00	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.10	0.000	839.10	---	---	---	---	0.00	---	---	---	0.002	---	0.002
0.20	0.001	839.20	---	---	---	---	0.00	---	---	---	0.003	---	0.003
0.30	0.001	839.30	---	---	---	---	0.00	---	---	---	0.005	---	0.005
0.40	0.002	839.40	---	---	---	---	0.00	---	---	---	0.006	---	0.006
0.50	0.002	839.50	---	---	---	---	0.00	---	---	---	0.008	---	0.008
0.60	0.002	839.60	---	---	---	---	0.00	---	---	---	0.009	---	0.009
0.70	0.003	839.70	---	---	---	---	0.00	---	---	---	0.011	---	0.011
0.80	0.003	839.80	---	---	---	---	0.00	---	---	---	0.012	---	0.012
0.90	0.004	839.90	---	---	---	---	0.00	---	---	---	0.014	---	0.014
1.00	0.004	840.00	---	---	---	---	0.00	---	---	---	0.015	---	0.015
1.10	0.007	840.10	---	---	---	---	0.00	---	---	---	0.022	---	0.022
1.20	0.009	840.20	---	---	---	---	0.00	---	---	---	0.028	---	0.028
1.30	0.012	840.30	---	---	---	---	0.00	---	---	---	0.035	---	0.035
1.40	0.014	840.40	---	---	---	---	0.00	---	---	---	0.041	---	0.041
1.50	0.017	840.50	---	---	---	---	0.00	---	---	---	0.048	---	0.048
1.60	0.020	840.60	---	---	---	---	0.00	---	---	---	0.054	---	0.054
1.70	0.022	840.70	---	---	---	---	0.00	---	---	---	0.061	---	0.061
1.80	0.025	840.80	---	---	---	---	0.00	---	---	---	0.067	---	0.067
1.90	0.028	840.90	---	---	---	---	0.00	---	---	---	0.073	---	0.073
2.00	0.030	841.00	---	---	---	---	0.00	---	---	---	0.080	---	0.080
2.10	0.038	841.10	---	---	---	---	0.00	---	---	---	0.088	---	0.088
2.20	0.045	841.20	---	---	---	---	0.00	---	---	---	0.097	---	0.097
2.30	0.052	841.30	---	---	---	---	0.00	---	---	---	0.105	---	0.105
2.40	0.059	841.40	---	---	---	---	0.00	---	---	---	0.113	---	0.113
2.50	0.067	841.50	---	---	---	---	0.00	---	---	---	0.122	---	0.122
2.60	0.074	841.60	---	---	---	---	0.00	---	---	---	0.130	---	0.130
2.70	0.081	841.70	---	---	---	---	0.00	---	---	---	0.138	---	0.138
2.80	0.088	841.80	---	---	---	---	0.00	---	---	---	0.147	---	0.147
2.90	0.096	841.90	---	---	---	---	0.00	---	---	---	0.155	---	0.155
3.00	0.103	842.00	---	---	---	---	0.00	---	---	---	0.163	---	0.163
3.10	0.115	842.10	---	---	---	---	0.00	---	---	---	0.172	---	0.172
3.20	0.128	842.20	---	---	---	---	0.00	---	---	---	0.181	---	0.181
3.30	0.140	842.30	---	---	---	---	0.00	---	---	---	0.189	---	0.189
3.40	0.153	842.40	---	---	---	---	0.00	---	---	---	0.198	---	0.198
3.50	0.165	842.50	---	---	---	---	0.00	---	---	---	0.207	---	0.207

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BLVD BIOFILTER P-5

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	0.178	842.60	---	---	---	---	0.00	---	---	---	0.216	---	0.216
3.70	0.190	842.70	---	---	---	---	0.00	---	---	---	0.224	---	0.224
3.80	0.203	842.80	---	---	---	---	0.00	---	---	---	0.233	---	0.233
3.90	0.215	842.90	---	---	---	---	0.00	---	---	---	0.242	---	0.242
4.00	0.228	843.00	---	---	---	---	0.00	---	---	---	0.250	---	0.250
4.10	0.255	843.10	---	---	---	---	0.00	---	---	---	0.293	---	0.293
4.20	0.282	843.20	---	---	---	---	0.00	---	---	---	0.337	---	0.337
4.30	0.310	843.30	---	---	---	---	0.00	---	---	---	0.380	---	0.380
4.40	0.337	843.40	---	---	---	---	0.00	---	---	---	0.423	---	0.423
4.50	0.364	843.50	---	---	---	---	0.00	---	---	---	0.466	---	0.466
4.60	0.391	843.60	---	---	---	---	0.00	---	---	---	0.509	---	0.509
4.70	0.419	843.70	---	---	---	---	0.00	---	---	---	0.552	---	0.552
4.80	0.446	843.80	---	---	---	---	0.00	---	---	---	0.595	---	0.595
4.90	0.473	843.90	---	---	---	---	0.00	---	---	---	0.638	---	0.638
5.00	0.500	844.00	---	---	---	---	0.00	---	---	---	0.681	---	0.681
5.05	0.522	844.05	---	---	---	---	0.00	---	---	---	0.689	---	0.689
5.10	0.544	844.10	---	---	---	---	0.15	---	---	---	0.696	---	0.841
5.15	0.566	844.15	---	---	---	---	0.41	---	---	---	0.703	---	1.114
5.20	0.588	844.20	---	---	---	---	0.75	---	---	---	0.711	---	1.466
5.25	0.610	844.25	---	---	---	---	1.16	---	---	---	0.718	---	1.880
5.30	0.631	844.30	---	---	---	---	1.62	---	---	---	0.725	---	2.350
5.35	0.653	844.35	---	---	---	---	2.14	---	---	---	0.733	---	2.868
5.40	0.675	844.40	---	---	---	---	2.69	---	---	---	0.740	---	3.431
5.45	0.697	844.45	---	---	---	---	3.29	---	---	---	0.747	---	4.035
5.50	0.719	844.50	---	---	---	---	3.92	---	---	---	0.755	---	4.679

...End

Hydrograph Report

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

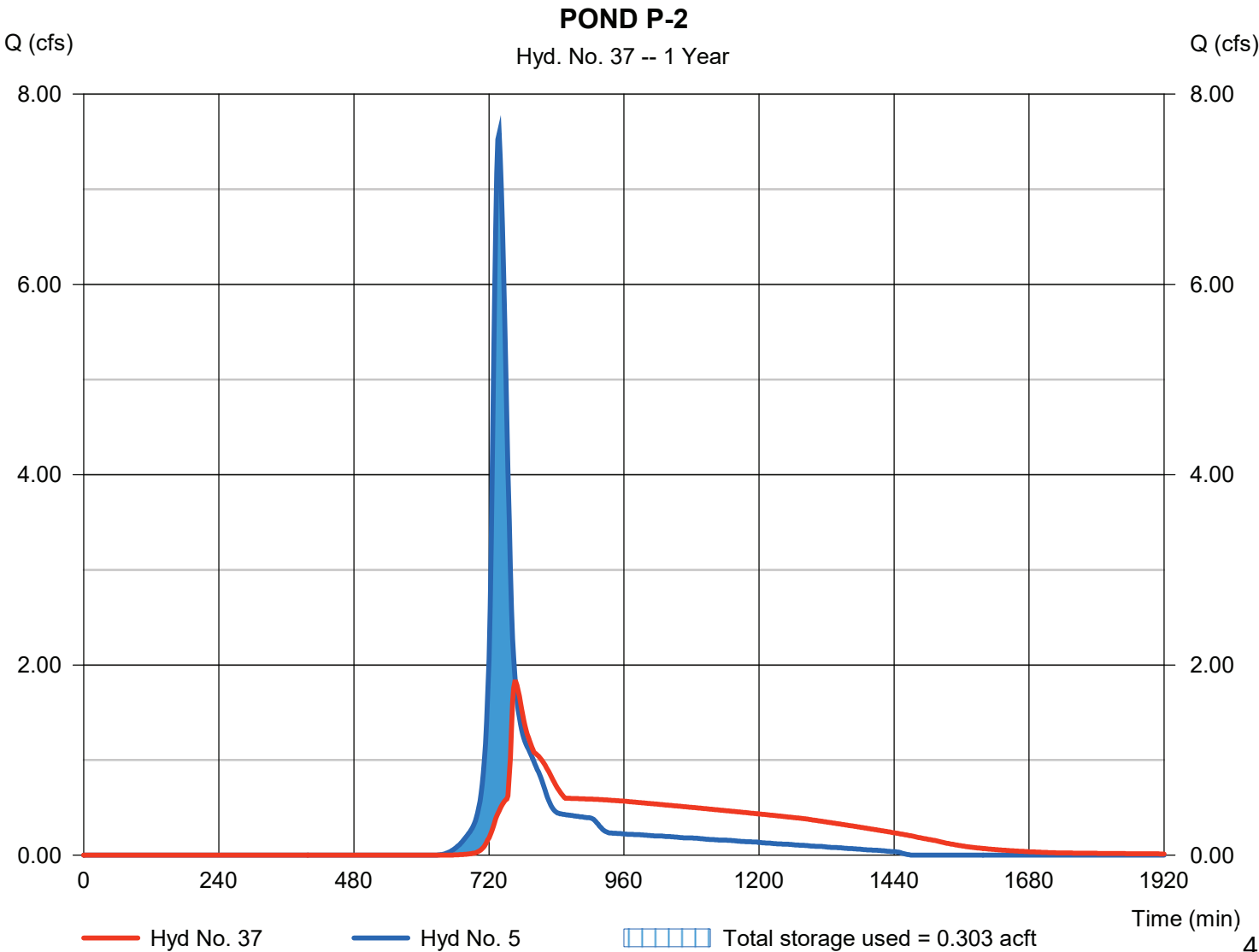
Friday, 06 / 28 / 2019

Hyd. No. 37

POND P-2

Hydrograph type	= Reservoir	Peak discharge	= 1.821 cfs
Storm frequency	= 1 yrs	Time to peak	= 768 min
Time interval	= 2 min	Hyd. volume	= 0.591 acft
Inflow hyd. No.	= 5 - P-2	Max. Elevation	= 839.34 ft
Reservoir name	= POND P-2	Max. Storage	= 0.303 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 2 - POND P-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 837.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	837.00	3,641	0.000	0.000
1.00	838.00	5,315	0.102	0.102
2.00	839.00	6,928	0.140	0.242
3.00	840.00	8,626	0.178	0.420
4.00	841.00	10,425	0.218	0.639
5.00	842.00	14,394	0.284	0.922
6.00	843.00	20,000	0.393	1.315

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 27.00	4.00	0.00	0.00
Span (in)	= 27.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 836.75	837.00	0.00	0.00
Length (ft)	= 53.50	1.00	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	20.00	0.00	0.00
Crest El. (ft)	= 839.25	841.90	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	837.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.010	837.10	0.43 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	0.020	837.20	0.43 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	0.031	837.30	0.43 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	0.041	837.40	0.43 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	0.051	837.50	0.43 ic	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	0.061	837.60	0.43 ic	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	0.072	837.70	0.43 ic	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	0.082	837.80	0.43 ic	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	0.092	837.90	0.43 ic	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	0.102	838.00	0.43 ic	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.384
1.10	0.116	838.10	0.43 ic	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	0.130	838.20	0.43 ic	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	0.144	838.30	0.47 ic	0.45 ic	---	---	0.00	0.00	---	---	---	---	0.447
1.40	0.158	838.40	0.47 ic	0.47 ic	---	---	0.00	0.00	---	---	---	---	0.467
1.50	0.172	838.50	0.51 ic	0.49 ic	---	---	0.00	0.00	---	---	---	---	0.485
1.60	0.186	838.60	0.51 ic	0.50 ic	---	---	0.00	0.00	---	---	---	---	0.503
1.70	0.200	838.70	0.55 ic	0.52 ic	---	---	0.00	0.00	---	---	---	---	0.520
1.80	0.214	838.80	0.55 ic	0.54 ic	---	---	0.00	0.00	---	---	---	---	0.537
1.90	0.228	838.90	0.55 ic	0.55 ic	---	---	0.00	0.00	---	---	---	---	0.553
2.00	0.242	839.00	0.59 ic	0.57 ic	---	---	0.00	0.00	---	---	---	---	0.569
2.10	0.260	839.10	0.59 ic	0.58 ic	---	---	0.00	0.00	---	---	---	---	0.584
2.20	0.278	839.20	0.60 ic	0.60 ic	---	---	0.00	0.00	---	---	---	---	0.599
2.30	0.296	839.30	1.12 ic	0.61 ic	---	---	0.47	0.00	---	---	---	---	1.081
2.40	0.314	839.40	3.11 oc	0.58 ic	---	---	2.43	0.00	---	---	---	---	3.012
2.50	0.331	839.50	5.87 oc	0.54 ic	---	---	5.23	0.00	---	---	---	---	5.764
2.60	0.349	839.60	9.22 oc	0.47 ic	---	---	8.66	0.00	---	---	---	---	9.130
2.70	0.367	839.70	12.96 oc	0.33 ic	---	---	12.63	0.00	---	---	---	---	12.96
2.80	0.385	839.80	17.04 oc	0.29 ic	---	---	16.75 s	0.00	---	---	---	---	17.04
2.90	0.403	839.90	19.71 oc	0.26 ic	---	---	19.45 s	0.00	---	---	---	---	19.71
3.00	0.420	840.00	21.77 oc	0.23 ic	---	---	21.53 s	0.00	---	---	---	---	21.77
3.10	0.442	840.10	23.46 oc	0.21 ic	---	---	23.25 s	0.00	---	---	---	---	23.46
3.20	0.464	840.20	24.92 oc	0.19 ic	---	---	24.72 s	0.00	---	---	---	---	24.91
3.30	0.486	840.30	26.20 oc	0.18 ic	---	---	26.02 s	0.00	---	---	---	---	26.19
3.40	0.508	840.40	27.36 oc	0.16 ic	---	---	27.19 s	0.00	---	---	---	---	27.36
3.50	0.530	840.50	28.42 oc	0.15 ic	---	---	28.26 s	0.00	---	---	---	---	28.42

Continues on next page...

POND P-2

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	0.551	840.60	29.42 oc	0.14 ic	---	---	29.28 s	0.00	---	---	---	---	29.42
3.70	0.573	840.70	30.35 oc	0.13 ic	---	---	30.21 s	0.00	---	---	---	---	30.34
3.80	0.595	840.80	31.24 oc	0.12 ic	---	---	31.11 s	0.00	---	---	---	---	31.24
3.90	0.617	840.90	32.10 oc	0.12 ic	---	---	31.97 s	0.00	---	---	---	---	32.09
4.00	0.639	841.00	32.92 oc	0.11 ic	---	---	32.79 s	0.00	---	---	---	---	32.90
4.10	0.667	841.10	33.71 oc	0.11 ic	---	---	33.59 s	0.00	---	---	---	---	33.69
4.20	0.696	841.20	34.47 oc	0.10 ic	---	---	34.37 s	0.00	---	---	---	---	34.47
4.30	0.724	841.30	35.15 ic	0.10 ic	---	---	35.05 s	0.00	---	---	---	---	35.15
4.40	0.752	841.40	35.69 ic	0.09 ic	---	---	35.59 s	0.00	---	---	---	---	35.68
4.50	0.781	841.50	36.23 ic	0.09 ic	---	---	36.11 s	0.00	---	---	---	---	36.20
4.60	0.809	841.60	36.75 ic	0.08 ic	---	---	36.65 s	0.00	---	---	---	---	36.74
4.70	0.837	841.70	37.26 ic	0.08 ic	---	---	37.17 s	0.00	---	---	---	---	37.25
4.80	0.866	841.80	37.76 ic	0.08 ic	---	---	37.66 s	0.00	---	---	---	---	37.74
4.90	0.894	841.90	38.25 ic	0.07 ic	---	---	38.16 s	0.00	---	---	---	---	38.24
5.00	0.922	842.00	38.74 ic	0.07 ic	---	---	38.66 s	1.64	---	---	---	---	40.37
5.10	0.962	842.10	39.22 ic	0.07 ic	---	---	39.13 s	4.65	---	---	---	---	43.85
5.20	1.001	842.20	39.69 ic	0.07 ic	---	---	39.57 s	8.54	---	---	---	---	48.18
5.30	1.040	842.30	40.16 ic	0.06 ic	---	---	40.09 s	13.15	---	---	---	---	53.30
5.40	1.080	842.40	40.62 ic	0.06 ic	---	---	40.51 s	18.38	---	---	---	---	58.95
5.50	1.119	842.50	41.07 ic	0.06 ic	---	---	41.00 s	24.16	---	---	---	---	65.22
5.60	1.158	842.60	41.52 ic	0.06 ic	---	---	41.44 s	30.45	---	---	---	---	71.95
5.70	1.198	842.70	41.97 ic	0.06 ic	---	---	41.85 s	37.19	---	---	---	---	79.11
5.80	1.237	842.80	42.40 ic	0.06 ic	---	---	42.32 s	44.38	---	---	---	---	86.75
5.90	1.276	842.90	42.84 ic	0.05 ic	---	---	42.70 s	51.98	---	---	---	---	94.73
6.00	1.315	843.00	43.27 ic	0.05 ic	---	---	43.14 s	59.99	---	---	---	---	103.18

...End

Hydrograph Report

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

Friday, 06 / 28 / 2019

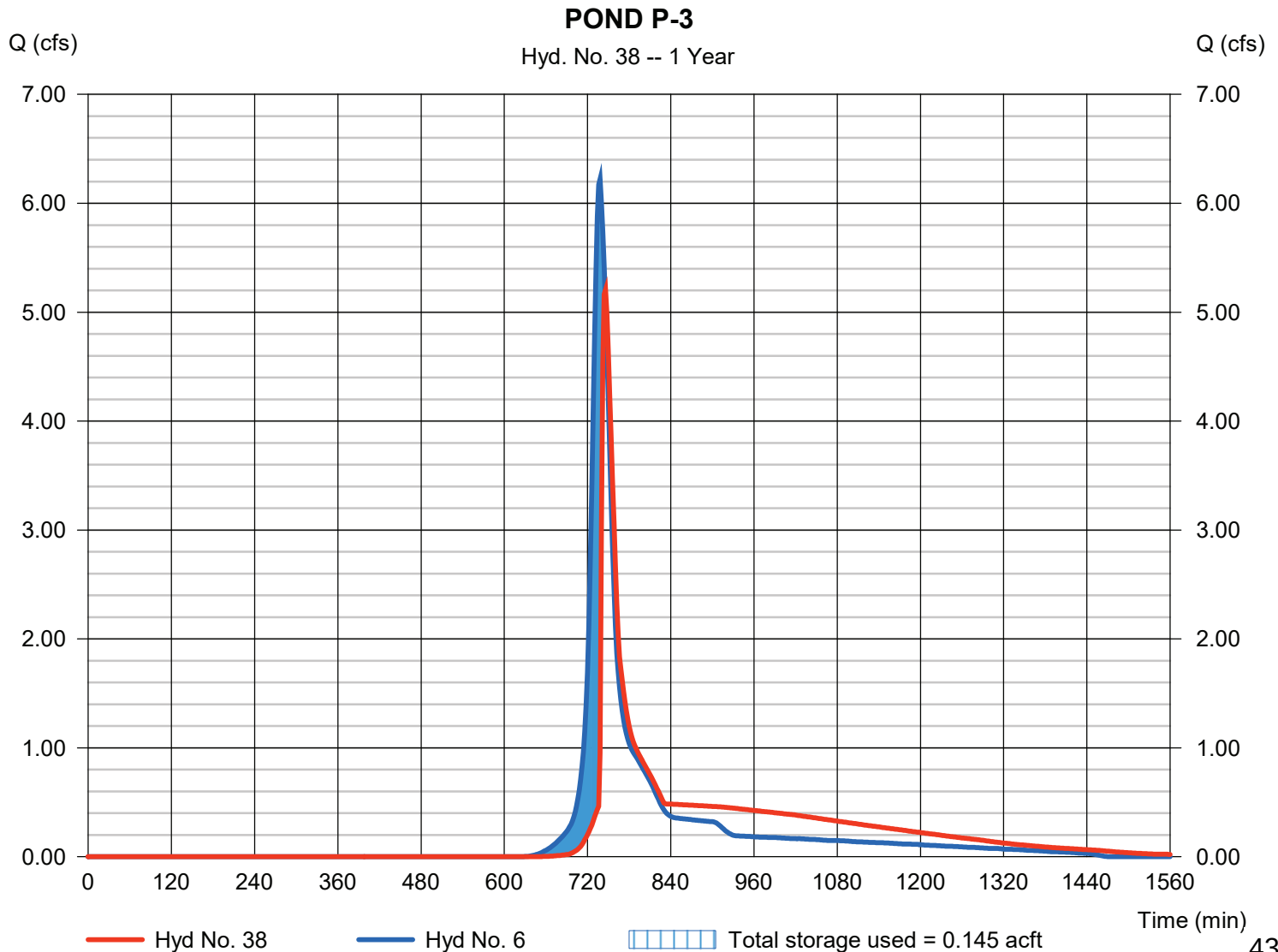
Hyd. No. 38

POND P-3

Hydrograph type = Reservoir
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-3
 Reservoir name = POND P-3

Peak discharge = 5.205 cfs
 Time to peak = 746 min
 Hyd. volume = 0.484 acft
 Max. Elevation = 839.73 ft
 Max. Storage = 0.145 acft

Storage Indication method used.



Pond Report

85

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

Friday, 06 / 28 / 2019

Pond No. 3 - POND P-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 838.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	838.00	2,707	0.000	0.000
1.00	839.00	3,721	0.073	0.073
2.00	840.00	4,846	0.098	0.172
3.00	841.00	6,075	0.125	0.297
4.00	842.00	7,400	0.154	0.451
5.00	843.00	20,000	0.303	0.754

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	4.00	0.00	0.00
Span (in)	= 24.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 837.25	838.00	0.00	0.00
Length (ft)	= 54.00	1.00	0.00	0.00
Slope (%)	= 0.96	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	5.00	0.00	0.00
Crest El. (ft)	= 839.50	841.70	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	838.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.007	838.10	3.18 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	0.015	838.20	3.18 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	0.022	838.30	3.18 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	0.029	838.40	3.18 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	0.037	838.50	3.18 ic	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	0.044	838.60	3.18 ic	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	0.051	838.70	3.18 ic	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	0.059	838.80	3.18 ic	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	0.066	838.90	3.18 ic	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	0.073	839.00	3.18 ic	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.384
1.10	0.083	839.10	3.18 ic	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	0.093	839.20	3.18 ic	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	0.103	839.30	3.18 ic	0.45 ic	---	---	0.00	0.00	---	---	---	---	0.447
1.40	0.113	839.40	3.18 ic	0.47 ic	---	---	0.00	0.00	---	---	---	---	0.467
1.50	0.122	839.50	3.18 ic	0.49 ic	---	---	0.00	0.00	---	---	---	---	0.485
1.60	0.132	839.60	3.18 ic	0.50 ic	---	---	1.32	0.00	---	---	---	---	1.825
1.70	0.142	839.70	4.30 ic	0.52 ic	---	---	3.74	0.00	---	---	---	---	4.259
1.80	0.152	839.80	7.36 ic	0.49 ic	---	---	6.87	0.00	---	---	---	---	7.359
1.90	0.162	839.90	11.06 oc	0.43 ic	---	---	10.58	0.00	---	---	---	---	11.01
2.00	0.172	840.00	15.08 oc	0.29 ic	---	---	14.79 s	0.00	---	---	---	---	15.08
2.10	0.184	840.10	17.36 oc	0.25 ic	---	---	17.11 s	0.00	---	---	---	---	17.36
2.20	0.197	840.20	18.87 oc	0.21 ic	---	---	18.66 s	0.00	---	---	---	---	18.87
2.30	0.209	840.30	20.06 oc	0.19 ic	---	---	19.87 s	0.00	---	---	---	---	20.06
2.40	0.222	840.40	21.07 oc	0.17 ic	---	---	20.90 s	0.00	---	---	---	---	21.06
2.50	0.234	840.50	21.95 oc	0.15 ic	---	---	21.80 s	0.00	---	---	---	---	21.95
2.60	0.247	840.60	22.67 ic	0.14 ic	---	---	22.53 s	0.00	---	---	---	---	22.66
2.70	0.259	840.70	23.25 ic	0.12 ic	---	---	23.13 s	0.00	---	---	---	---	23.25
2.80	0.272	840.80	23.81 ic	0.11 ic	---	---	23.69 s	0.00	---	---	---	---	23.80
2.90	0.284	840.90	24.33 ic	0.10 ic	---	---	24.23 s	0.00	---	---	---	---	24.33
3.00	0.297	841.00	24.84 ic	0.10 ic	---	---	24.72 s	0.00	---	---	---	---	24.82
3.10	0.312	841.10	25.33 ic	0.09 ic	---	---	25.23 s	0.00	---	---	---	---	25.32
3.20	0.327	841.20	25.80 ic	0.08 ic	---	---	25.70 s	0.00	---	---	---	---	25.78
3.30	0.343	841.30	26.26 ic	0.08 ic	---	---	26.16 s	0.00	---	---	---	---	26.24
3.40	0.358	841.40	26.71 ic	0.08 ic	---	---	26.62 s	0.00	---	---	---	---	26.69
3.50	0.374	841.50	27.14 ic	0.07 ic	---	---	27.04 s	0.00	---	---	---	---	27.12
3.60	0.389	841.60	27.57 ic	0.07 ic	---	---	27.49 s	0.00	---	---	---	---	27.56

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POND P-3

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.70	0.405	841.70	28.00 ic	0.06 ic	---	---	27.93 s	0.00	---	---	---	---	27.99
3.80	0.420	841.80	28.41 ic	0.06 ic	---	---	28.32 s	0.41	---	---	---	---	28.79
3.90	0.436	841.90	28.82 ic	0.06 ic	---	---	28.74 s	1.16	---	---	---	---	29.96
4.00	0.451	842.00	29.22 ic	0.06 ic	---	---	29.15 s	2.14	---	---	---	---	31.34
4.10	0.481	842.10	29.61 ic	0.05 ic	---	---	29.53 s	3.29	---	---	---	---	32.87
4.20	0.512	842.20	30.00 ic	0.05 ic	---	---	29.93 s	4.60	---	---	---	---	34.58
4.30	0.542	842.30	30.38 ic	0.05 ic	---	---	30.28 s	6.04	---	---	---	---	36.37
4.40	0.572	842.40	30.76 ic	0.05 ic	---	---	30.66 s	7.61	---	---	---	---	38.32
4.50	0.602	842.50	31.13 ic	0.05 ic	---	---	31.04 s	9.30	---	---	---	---	40.39
4.60	0.633	842.60	31.50 ic	0.05 ic	---	---	31.39 s	11.10	---	---	---	---	42.53
4.70	0.663	842.70	31.86 ic	0.04 ic	---	---	31.81 s	13.00	---	---	---	---	44.85
4.80	0.693	842.80	32.22 ic	0.04 ic	---	---	32.15 s	14.99	---	---	---	---	47.19
4.90	0.723	842.90	32.58 ic	0.04 ic	---	---	32.53 s	17.08	---	---	---	---	49.65
5.00	0.754	843.00	32.93 ic	0.04 ic	---	---	32.77 s	19.27	---	---	---	---	52.08

...End

Hydrograph Report

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

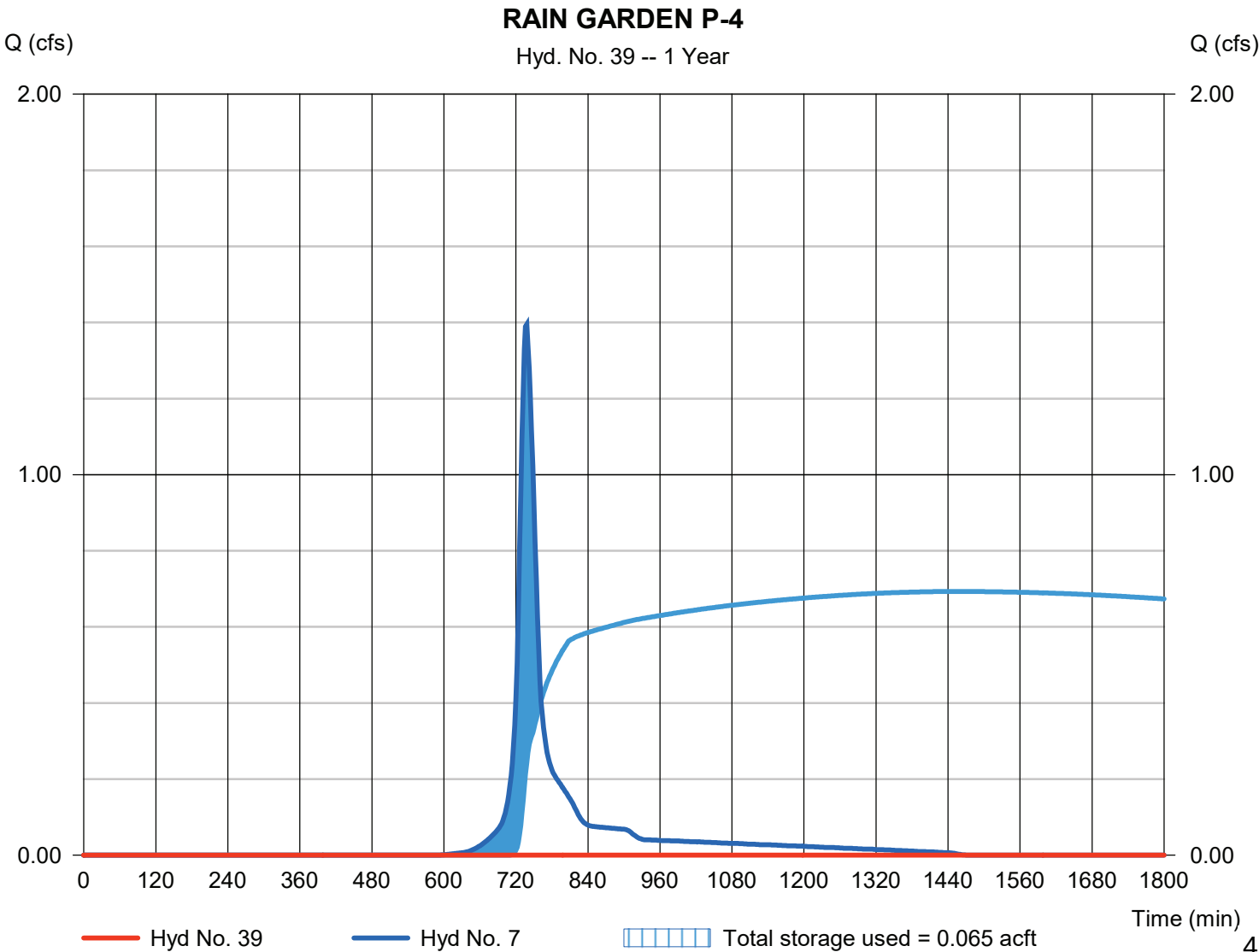
Friday, 06 / 28 / 2019

Hyd. No. 39

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 746 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 7 - P-4	Max. Elevation	= 839.81 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 0.065 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

88

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

Friday, 06 / 28 / 2019

Pond No. 4 - RAIN GARDEN P-4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 839.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	839.00	2,706	0.000	0.000
1.00	840.00	4,351	0.080	0.080
2.00	841.00	6,823	0.127	0.207
2.70	841.70	8,331	0.122	0.329

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 840.70	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)	= 1.630 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	839.00	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.10	0.008	839.10	---	---	---	---	0.00	---	---	---	0.016	---	0.016
0.20	0.016	839.20	---	---	---	---	0.00	---	---	---	0.033	---	0.033
0.30	0.024	839.30	---	---	---	---	0.00	---	---	---	0.049	---	0.049
0.40	0.032	839.40	---	---	---	---	0.00	---	---	---	0.066	---	0.066
0.50	0.040	839.50	---	---	---	---	0.00	---	---	---	0.082	---	0.082
0.60	0.048	839.60	---	---	---	---	0.00	---	---	---	0.099	---	0.099
0.70	0.056	839.70	---	---	---	---	0.00	---	---	---	0.115	---	0.115
0.80	0.064	839.80	---	---	---	---	0.00	---	---	---	0.131	---	0.131
0.90	0.072	839.90	---	---	---	---	0.00	---	---	---	0.148	---	0.148
1.00	0.080	840.00	---	---	---	---	0.00	---	---	---	0.164	---	0.164
1.10	0.093	840.10	---	---	---	---	0.00	---	---	---	0.173	---	0.173
1.20	0.106	840.20	---	---	---	---	0.00	---	---	---	0.183	---	0.183
1.30	0.118	840.30	---	---	---	---	0.00	---	---	---	0.192	---	0.192
1.40	0.131	840.40	---	---	---	---	0.00	---	---	---	0.201	---	0.201
1.50	0.144	840.50	---	---	---	---	0.00	---	---	---	0.211	---	0.211
1.60	0.157	840.60	---	---	---	---	0.00	---	---	---	0.220	---	0.220
1.70	0.169	840.70	---	---	---	---	0.00	---	---	---	0.229	---	0.229
1.80	0.182	840.80	---	---	---	---	1.64	---	---	---	0.239	---	1.878
1.90	0.195	840.90	---	---	---	---	4.64	---	---	---	0.248	---	4.891
2.00	0.207	841.00	---	---	---	---	8.54	---	---	---	0.257	---	8.801
2.07	0.220	841.07	---	---	---	---	11.70	---	---	---	0.263	---	11.97
2.14	0.232	841.14	---	---	---	---	15.18	---	---	---	0.269	---	15.45
2.21	0.244	841.21	---	---	---	---	18.94	---	---	---	0.275	---	19.21
2.28	0.256	841.28	---	---	---	---	22.97	---	---	---	0.280	---	23.25
2.35	0.268	841.35	---	---	---	---	27.25	---	---	---	0.286	---	27.54
2.42	0.280	841.42	---	---	---	---	31.77	---	---	---	0.292	---	32.06
2.49	0.293	841.49	---	---	---	---	36.52	---	---	---	0.297	---	36.81
2.56	0.305	841.56	---	---	---	---	41.47	---	---	---	0.303	---	41.78
2.63	0.317	841.63	---	---	---	---	46.64	---	---	---	0.309	---	46.95
2.70	0.329	841.70	---	---	---	---	52.00	---	---	---	0.314	---	52.31

Hydrograph Report

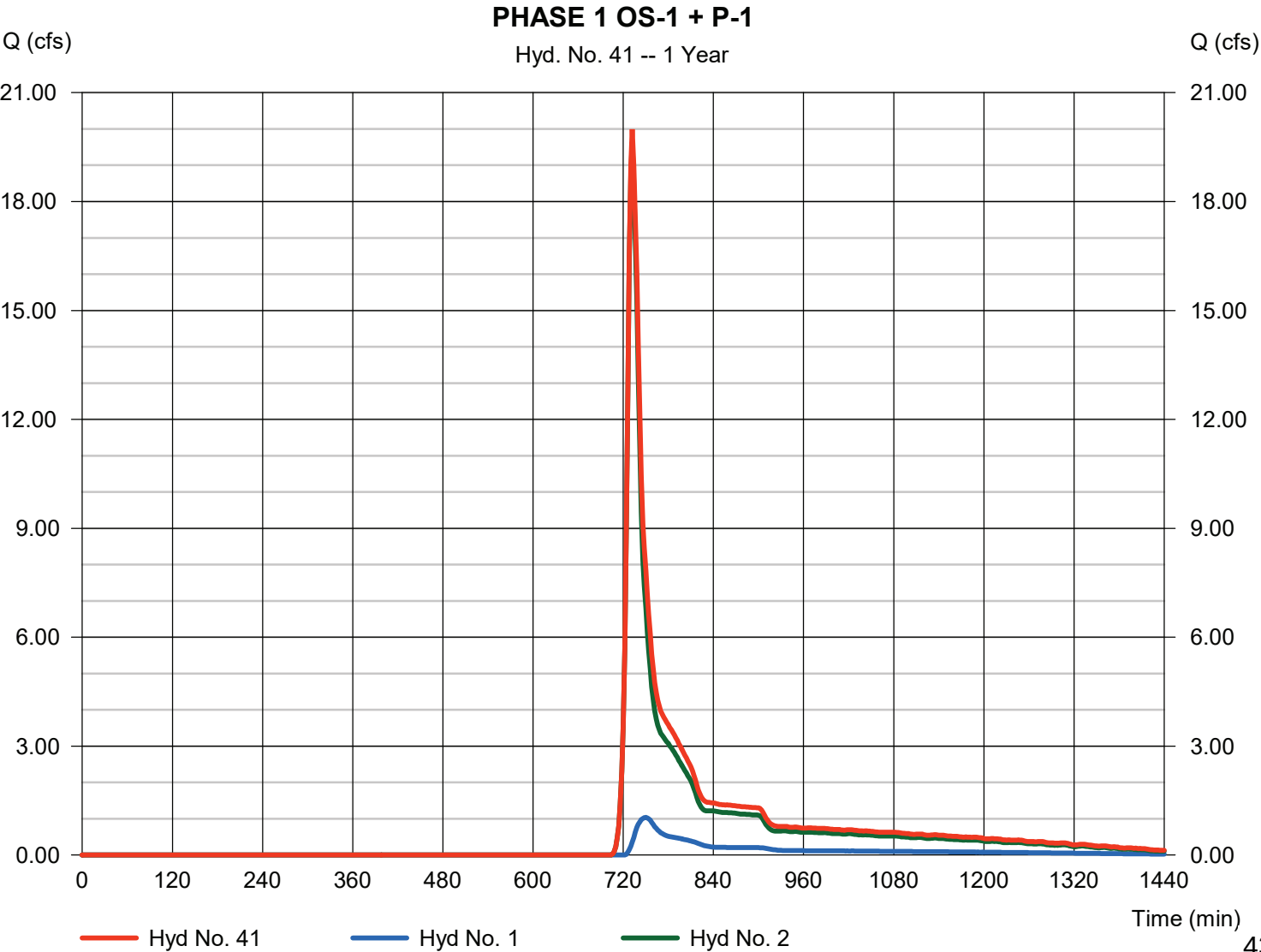
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 41

PHASE 1 OS-1 + P-1

Hydrograph type	= Combine	Peak discharge	= 19.99 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 1.440 acft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 37.042 ac



Hydrograph Report

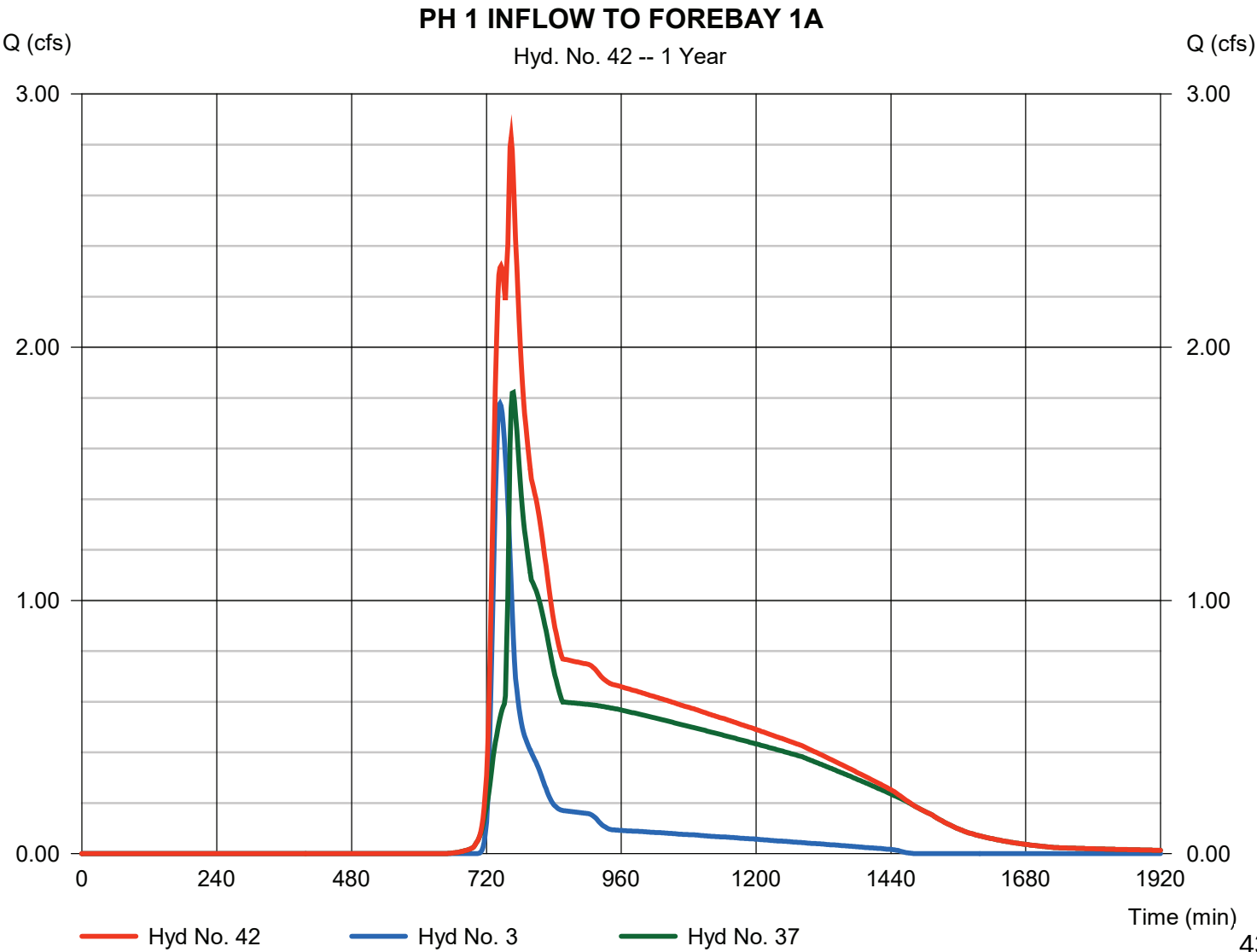
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 42

PH 1 INFLOW TO FOREBAY 1A

Hydrograph type	= Combine	Peak discharge	= 2.827 cfs
Storm frequency	= 1 yrs	Time to peak	= 764 min
Time interval	= 2 min	Hyd. volume	= 0.773 acft
Inflow hyds.	= 3, 37	Contrib. drain. area	= 3.947 ac



Hydrograph Report

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

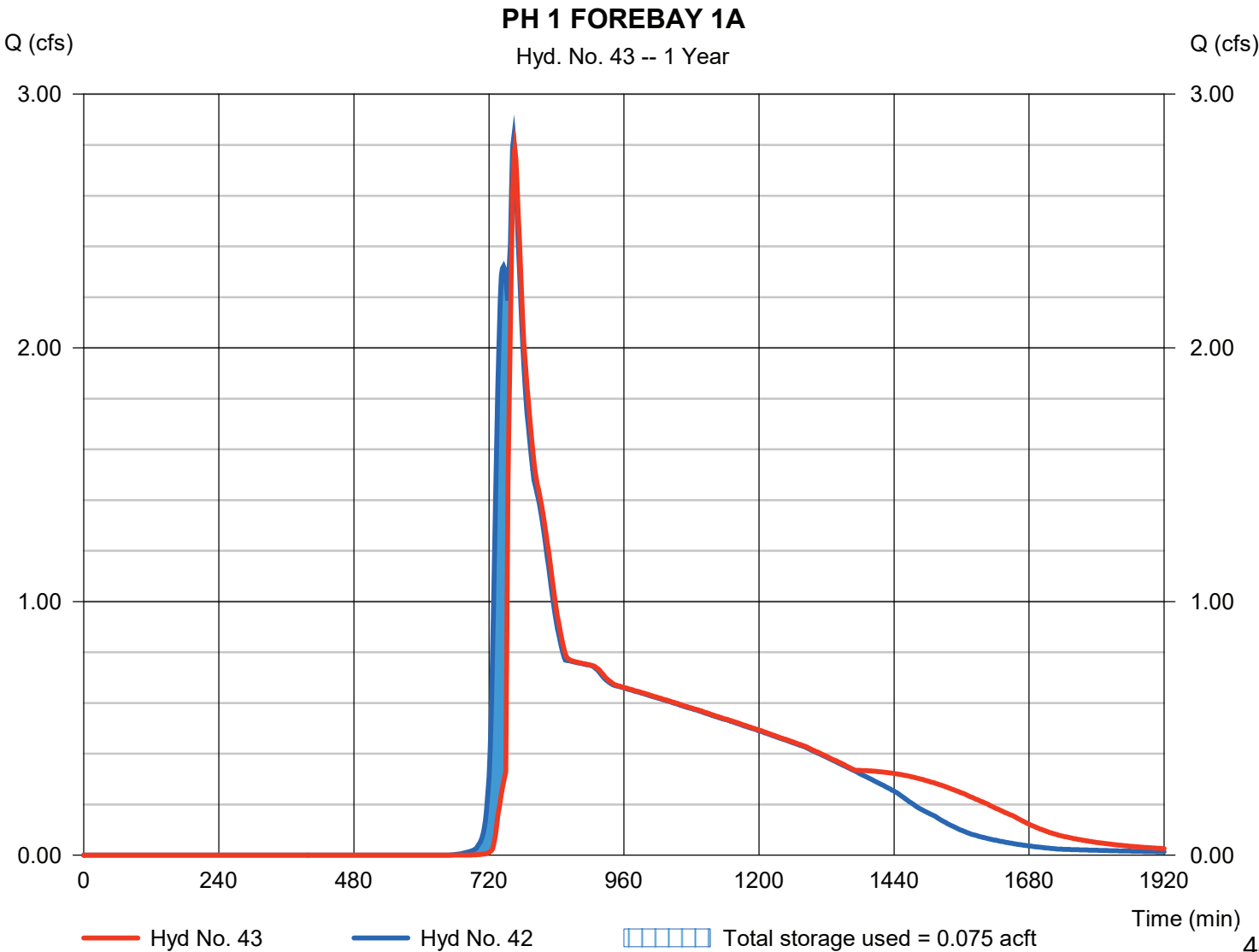
Friday, 06 / 28 / 2019

Hyd. No. 43

PH 1 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 2.784 cfs
Storm frequency	= 1 yrs	Time to peak	= 766 min
Time interval	= 2 min	Hyd. volume	= 0.772 acft
Inflow hyd. No.	= 42 - PH 1 INFLOW TO FOREBAY 1A	Max. Elevation	= 834.93 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 0.075 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 6 - FOREBAY 1A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 834.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	834.00	2,986	0.000	0.000
1.00	835.00	4,064	0.081	0.081
2.00	836.00	5,241	0.107	0.187
3.00	837.00	6,661	0.136	0.323
4.00	838.00	7,710	0.165	0.488
5.00	839.00	8,606	0.187	0.675
6.00	840.00	9,514	0.208	0.883

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	4.00	0.00	0.00
Span (in)	= 36.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 830.00	834.00	0.00	0.00
Length (ft)	= 43.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.71	10.00	0.00	0.00
Crest El. (ft)	= 834.80	835.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	834.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.008	834.10	46.48 oc	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	0.016	834.20	46.48 oc	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	0.024	834.30	46.48 oc	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	0.032	834.40	46.48 oc	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	0.040	834.50	46.48 oc	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	0.048	834.60	46.48 oc	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	0.056	834.70	46.48 oc	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	0.064	834.80	46.48 oc	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	0.073	834.90	46.48 oc	0.36 ic	---	---	1.65	0.00	---	---	---	---	2.009
1.00	0.081	835.00	46.48 oc	0.38 ic	---	---	4.68	0.00	---	---	---	---	5.063
1.10	0.091	835.10	46.48 oc	0.41 ic	---	---	8.60	0.00	---	---	---	---	9.001
1.20	0.102	835.20	46.48 oc	0.43 ic	---	---	13.24	0.00	---	---	---	---	13.66
1.30	0.113	835.30	46.48 oc	0.45 ic	---	---	18.49	0.00	---	---	---	---	18.94
1.40	0.123	835.40	46.48 oc	0.47 ic	---	---	24.31	0.00	---	---	---	---	24.77
1.50	0.134	835.50	46.48 oc	0.49 ic	---	---	30.63	0.00	---	---	---	---	31.12
1.60	0.145	835.60	46.48 oc	0.50 ic	---	---	37.43	0.82	---	---	---	---	38.75
1.70	0.155	835.70	46.48 oc	0.52 ic	---	---	44.65	2.32	---	---	---	---	47.50
1.80	0.166	835.80	52.81 oc	0.51 ic	---	---	52.30	4.27	---	---	---	---	57.07
1.90	0.176	835.90	60.56 oc	0.43 ic	---	---	60.13 s	6.57	---	---	---	---	67.13
2.00	0.187	836.00	64.82 oc	0.39 ic	---	---	64.43 s	9.19	---	---	---	---	74.01
2.10	0.201	836.10	67.26 ic	0.35 ic	---	---	66.90 s	12.08	---	---	---	---	79.34
2.20	0.214	836.20	69.11 ic	0.32 ic	---	---	68.79 s	15.23	---	---	---	---	84.33
2.30	0.228	836.30	70.67 ic	0.29 ic	---	---	70.37 s	18.60	---	---	---	---	89.27
2.40	0.242	836.40	72.05 ic	0.27 ic	---	---	71.77 s	22.20	---	---	---	---	94.24
2.50	0.255	836.50	73.29 ic	0.25 ic	---	---	73.04 s	26.00	---	---	---	---	99.29
2.60	0.269	836.60	74.44 ic	0.24 ic	---	---	74.20 s	29.99	---	---	---	---	104.43
2.70	0.283	836.70	75.50 ic	0.22 ic	---	---	75.27 s	34.17	---	---	---	---	109.66
2.80	0.296	836.80	76.50 ic	0.21 ic	---	---	76.29 s	38.53	---	---	---	---	115.02
2.90	0.310	836.90	77.45 ic	0.20 ic	---	---	77.25 s	43.06	---	---	---	---	120.50
3.00	0.323	837.00	78.36 ic	0.19 ic	---	---	78.16 s	47.77	---	---	---	---	126.12
3.10	0.340	837.10	79.24 ic	0.18 ic	---	---	79.06 s	52.62	---	---	---	---	131.86
3.20	0.356	837.20	80.09 ic	0.17 ic	---	---	79.91 s	57.63	---	---	---	---	137.71
3.30	0.373	837.30	80.91 ic	0.16 ic	---	---	80.74 s	62.78	---	---	---	---	143.69
3.40	0.389	837.40	81.71 ic	0.15 ic	---	---	81.55 s	68.09	---	---	---	---	149.79
3.50	0.406	837.50	82.50 ic	0.15 ic	---	---	82.33 s	73.53	---	---	---	---	156.01

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FOREBAY 1A

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	0.422	837.60	83.26 ic	0.14 ic	---	---	83.11 s	79.12	---	---	---	---	162.37
3.70	0.439	837.70	84.01 ic	0.14 ic	---	---	83.87 s	84.83	---	---	---	---	168.84
3.80	0.455	837.80	84.75 ic	0.13 ic	---	---	84.61 s	90.68	---	---	---	---	175.42
3.90	0.472	837.90	85.48 ic	0.13 ic	---	---	85.33 s	96.66	---	---	---	---	182.11
4.00	0.488	838.00	86.20 ic	0.12 ic	---	---	86.06 s	102.77	---	---	---	---	188.95
4.10	0.507	838.10	86.90 ic	0.12 ic	---	---	86.75 s	109.00	---	---	---	---	195.87
4.20	0.526	838.20	87.60 ic	0.11 ic	---	---	87.44 s	115.35	---	---	---	---	202.91
4.30	0.544	838.30	88.29 ic	0.11 ic	---	---	88.18 s	121.81	---	---	---	---	210.10
4.40	0.563	838.40	88.97 ic	0.11 ic	---	---	88.82 s	128.40	---	---	---	---	217.32
4.50	0.582	838.50	89.64 ic	0.10 ic	---	---	89.52 s	135.09	---	---	---	---	224.72
4.60	0.600	838.60	90.31 ic	0.10 ic	---	---	90.15 s	141.91	---	---	---	---	232.15
4.70	0.619	838.70	90.97 ic	0.10 ic	---	---	90.82 s	148.82	---	---	---	---	239.74
4.80	0.638	838.80	91.62 ic	0.10 ic	---	---	91.48 s	155.85	---	---	---	---	247.43
4.90	0.657	838.90	92.27 ic	0.09 ic	---	---	92.12 s	162.99	---	---	---	---	255.20
5.00	0.675	839.00	92.91 ic	0.09 ic	---	---	92.79 s	170.25	---	---	---	---	263.13
5.10	0.696	839.10	93.54 ic	0.09 ic	---	---	93.41 s	177.59	---	---	---	---	271.09
5.20	0.717	839.20	94.17 ic	0.09 ic	---	---	94.01 s	185.05	---	---	---	---	279.14
5.30	0.738	839.30	94.80 ic	0.08 ic	---	---	94.63 s	192.59	---	---	---	---	287.30
5.40	0.758	839.40	95.42 ic	0.08 ic	---	---	95.26 s	200.24	---	---	---	---	295.59
5.50	0.779	839.50	96.03 ic	0.08 ic	---	---	95.90 s	207.99	---	---	---	---	303.98
5.60	0.800	839.60	96.64 ic	0.08 ic	---	---	96.56 s	215.84	---	---	---	---	312.48
5.70	0.821	839.70	97.25 ic	0.08 ic	---	---	97.06 s	223.78	---	---	---	---	320.92
5.80	0.842	839.80	97.85 ic	0.08 ic	---	---	97.68 s	231.82	---	---	---	---	329.57
5.90	0.862	839.90	98.45 ic	0.07 ic	---	---	98.31 s	239.95	---	---	---	---	338.33
6.00	0.883	840.00	99.04 ic	0.07 ic	---	---	98.85 s	248.19	---	---	---	---	347.12

...End

Hydrograph Report

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

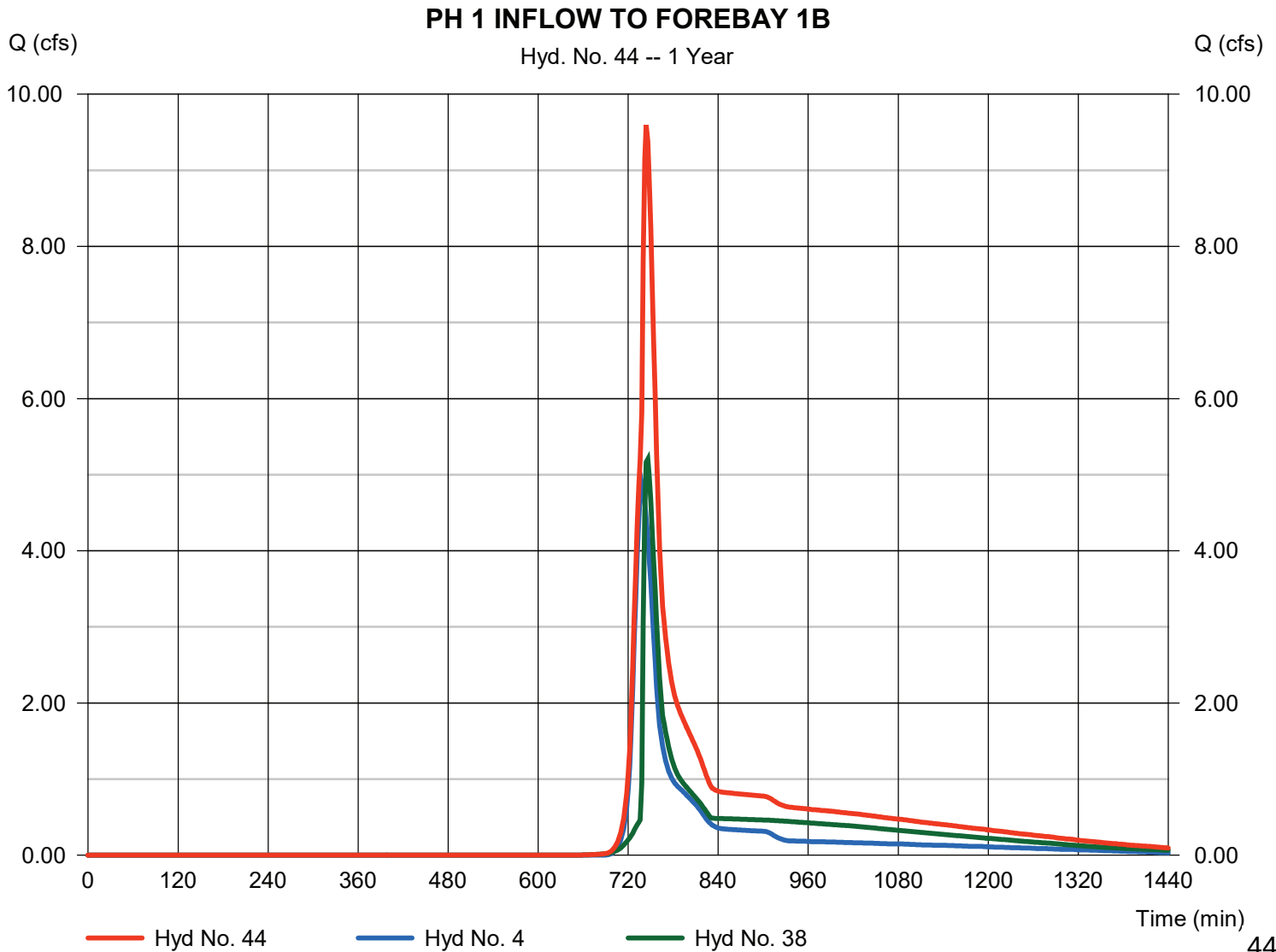
Friday, 06 / 28 / 2019

Hyd. No. 44

PH 1 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 4, 38

Peak discharge = 9.595 cfs
 Time to peak = 744 min
 Hyd. volume = 0.885 acft
 Contrib. drain. area = 6.516 ac



Hydrograph Report

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

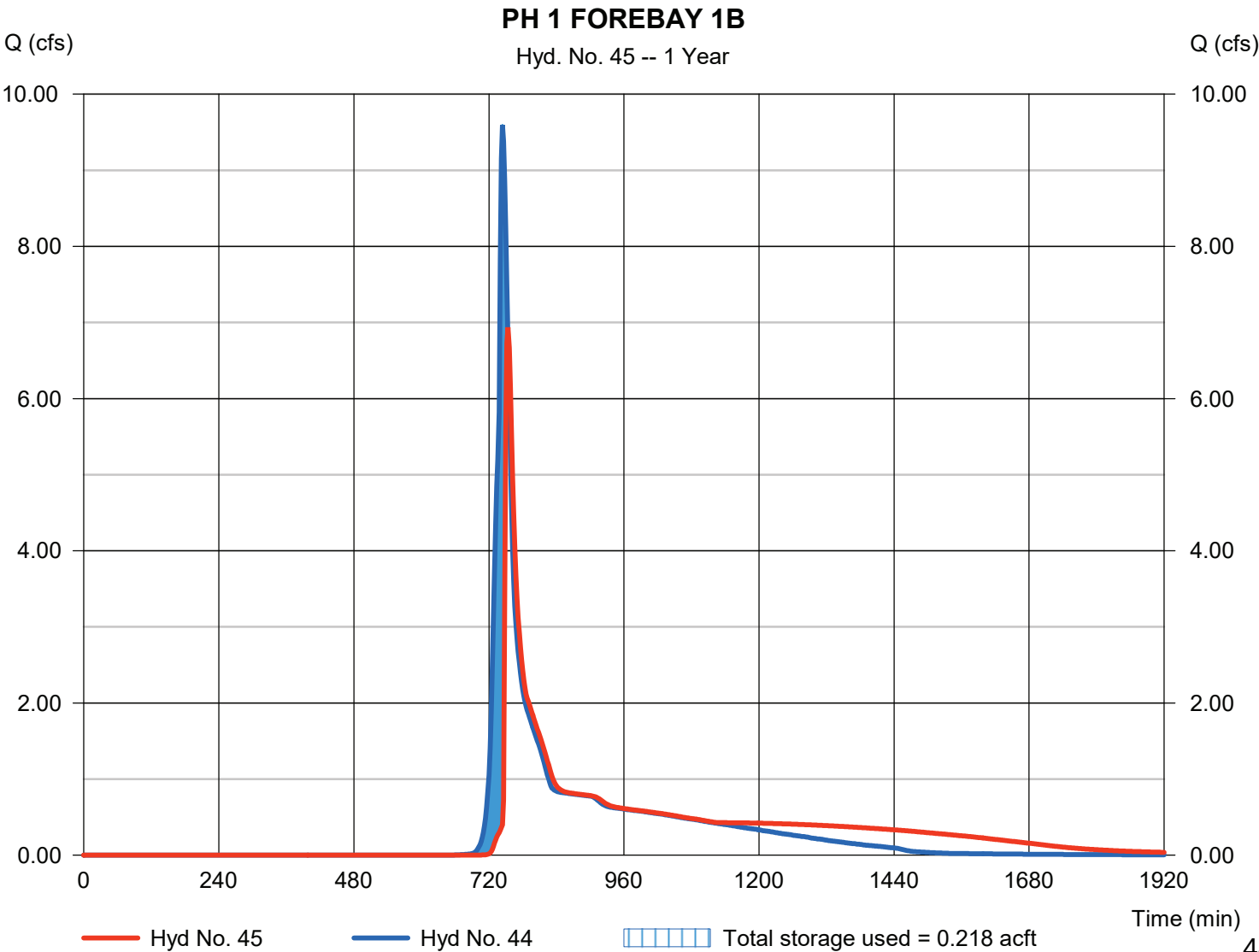
Friday, 06 / 28 / 2019

Hyd. No. 45

PH 1 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 6.935 cfs
Storm frequency	= 1 yrs	Time to peak	= 754 min
Time interval	= 2 min	Hyd. volume	= 0.884 acft
Inflow hyd. No.	= 44 - PH 1 INFLOW TO FOREBAY 1B	Max. Elevation	= 834.95 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 0.218 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 7 - FOREBAY 1B

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 833.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	833.50	5,407	0.000	0.000
0.50	834.00	6,186	0.066	0.066
1.50	835.00	7,811	0.160	0.227
2.50	836.00	9,529	0.199	0.425
3.50	837.00	11,534	0.241	0.667
4.50	838.00	15,922	0.314	0.981
5.50	839.00	20,293	0.415	1.395
6.50	840.00	26,384	0.534	1.929

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	4.00	0.00	0.00
Span (in)	= 30.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 830.00	833.50	0.00	0.00
Length (ft)	= 38.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.71	25.00	0.00	0.00
Crest El. (ft)	= 834.70	835.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	833.50	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.05	0.007	833.55	31.61 oc	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.006
0.10	0.013	833.60	31.61 oc	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.15	0.020	833.65	31.61 oc	0.05 ic	---	---	0.00	0.00	---	---	---	---	0.051
0.20	0.027	833.70	31.61 oc	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.25	0.033	833.75	31.61 oc	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.120
0.30	0.040	833.80	31.61 oc	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.35	0.047	833.85	31.61 oc	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.180
0.40	0.053	833.90	31.61 oc	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.45	0.060	833.95	31.61 oc	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.224
0.50	0.066	834.00	31.61 oc	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	0.083	834.10	31.61 oc	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	0.099	834.20	31.61 oc	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	0.115	834.30	31.61 oc	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	0.131	834.40	31.61 oc	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	0.147	834.50	31.61 oc	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.383
1.10	0.163	834.60	31.61 oc	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	0.179	834.70	31.61 oc	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	0.195	834.80	31.61 oc	0.45 ic	---	---	1.65	0.00	---	---	---	---	2.096
1.40	0.211	834.90	31.61 oc	0.47 ic	---	---	4.67	0.00	---	---	---	---	5.138
1.50	0.227	835.00	31.61 oc	0.49 ic	---	---	8.60	0.00	---	---	---	---	9.081
1.60	0.247	835.10	31.61 oc	0.50 ic	---	---	13.23	0.00	---	---	---	---	13.74
1.70	0.267	835.20	31.61 oc	0.52 ic	---	---	18.50	0.00	---	---	---	---	19.02
1.80	0.286	835.30	31.61 oc	0.54 ic	---	---	24.31	0.00	---	---	---	---	24.85
1.90	0.306	835.40	31.61 oc	0.55 ic	---	---	30.63	0.00	---	---	---	---	31.18
2.00	0.326	835.50	37.94 oc	0.51 ic	---	---	37.42	0.00	---	---	---	---	37.93
2.10	0.346	835.60	44.47 ic	0.38 ic	---	---	44.10 s	2.05	---	---	---	---	46.53
2.20	0.366	835.70	46.51 ic	0.32 ic	---	---	46.19 s	5.81	---	---	---	---	52.32
2.30	0.386	835.80	47.88 ic	0.28 ic	---	---	47.60 s	10.67	---	---	---	---	58.55
2.40	0.406	835.90	48.98 ic	0.25 ic	---	---	48.72 s	16.43	---	---	---	---	65.40
2.50	0.425	836.00	49.91 ic	0.23 ic	---	---	49.68 s	22.98	---	---	---	---	72.89
2.60	0.450	836.10	50.74 ic	0.21 ic	---	---	50.53 s	30.21	---	---	---	---	80.94
2.70	0.474	836.20	51.49 ic	0.19 ic	---	---	51.30 s	38.07	---	---	---	---	89.56
2.80	0.498	836.30	52.19 ic	0.17 ic	---	---	52.01 s	46.50	---	---	---	---	98.69
2.90	0.522	836.40	52.85 ic	0.16 ic	---	---	52.67 s	55.49	---	---	---	---	108.32

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FOREBAY 1B

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.00	0.546	836.50	53.47 ic	0.15 ic	---	---	53.31 s	64.99	---	---	---	---	118.45
3.10	0.570	836.60	54.08 ic	0.14 ic	---	---	53.93 s	74.98	---	---	---	---	129.05
3.20	0.594	836.70	54.66 ic	0.13 ic	---	---	54.50 s	85.43	---	---	---	---	140.06
3.30	0.619	836.80	55.22 ic	0.13 ic	---	---	55.09 s	96.32	---	---	---	---	151.54
3.40	0.643	836.90	55.77 ic	0.12 ic	---	---	55.64 s	107.65	---	---	---	---	163.41
3.50	0.667	837.00	56.31 ic	0.11 ic	---	---	56.18 s	119.41	---	---	---	---	175.71
3.60	0.698	837.10	56.84 ic	0.11 ic	---	---	56.70 s	131.55	---	---	---	---	188.36
3.70	0.730	837.20	57.36 ic	0.10 ic	---	---	57.24 s	144.08	---	---	---	---	201.42
3.80	0.761	837.30	57.87 ic	0.10 ic	---	---	57.76 s	156.96	---	---	---	---	214.82
3.90	0.792	837.40	58.37 ic	0.09 ic	---	---	58.25 s	170.22	---	---	---	---	228.56
4.00	0.824	837.50	58.86 ic	0.09 ic	---	---	58.73 s	183.83	---	---	---	---	242.65
4.10	0.855	837.60	59.35 ic	0.09 ic	---	---	59.23 s	197.80	---	---	---	---	257.11
4.20	0.886	837.70	59.84 ic	0.08 ic	---	---	59.71 s	212.08	---	---	---	---	271.88
4.30	0.918	837.80	60.31 ic	0.08 ic	---	---	60.21 s	226.70	---	---	---	---	286.99
4.40	0.949	837.90	60.79 ic	0.08 ic	---	---	60.70 s	241.64	---	---	---	---	302.42
4.50	0.981	838.00	61.26 ic	0.07 ic	---	---	61.18 s	256.94	---	---	---	---	318.19
4.60	1.022	838.10	61.72 ic	0.07 ic	---	---	61.59 s	272.50	---	---	---	---	334.16
4.70	1.064	838.20	62.18 ic	0.07 ic	---	---	62.05 s	288.38	---	---	---	---	350.50
4.80	1.105	838.30	62.63 ic	0.07 ic	---	---	62.51 s	304.53	---	---	---	---	367.11
4.90	1.146	838.40	63.08 ic	0.07 ic	---	---	63.01 s	320.99	---	---	---	---	384.07
5.00	1.188	838.50	63.53 ic	0.06 ic	---	---	63.45 s	337.73	---	---	---	---	401.24
5.10	1.229	838.60	63.97 ic	0.06 ic	---	---	63.86 s	354.76	---	---	---	---	418.68
5.20	1.271	838.70	64.41 ic	0.06 ic	---	---	64.34 s	372.05	---	---	---	---	436.46
5.30	1.312	838.80	64.85 ic	0.06 ic	---	---	64.79 s	389.62	---	---	---	---	454.47
5.40	1.354	838.90	65.28 ic	0.06 ic	---	---	65.12 s	407.46	---	---	---	---	472.64
5.50	1.395	839.00	65.72 ic	0.06 ic	---	---	65.63 s	425.61	---	---	---	---	491.30
5.60	1.449	839.10	66.14 ic	0.05 ic	---	---	65.99 s	443.98	---	---	---	---	510.02
5.70	1.502	839.20	66.57 ic	0.05 ic	---	---	66.37 s	462.61	---	---	---	---	529.04
5.80	1.555	839.30	66.99 ic	0.05 ic	---	---	66.78 s	481.48	---	---	---	---	548.31
5.90	1.609	839.40	67.41 ic	0.05 ic	---	---	67.21 s	500.60	---	---	---	---	567.87
6.00	1.662	839.50	67.82 ic	0.05 ic	---	---	67.70 s	519.98	---	---	---	---	587.72
6.10	1.716	839.60	68.23 ic	0.05 ic	---	---	68.07 s	539.60	---	---	---	---	607.73
6.20	1.769	839.70	68.64 ic	0.05 ic	---	---	68.52 s	559.45	---	---	---	---	628.02
6.30	1.823	839.80	69.05 ic	0.05 ic	---	---	68.98 s	579.54	---	---	---	---	648.57
6.40	1.876	839.90	69.46 ic	0.05 ic	---	---	69.19 s	599.87	---	---	---	---	669.11
6.50	1.929	840.00	69.86 ic	0.04 ic	---	---	69.60 s	620.49	---	---	---	---	690.13

...End

Hydrograph Report

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

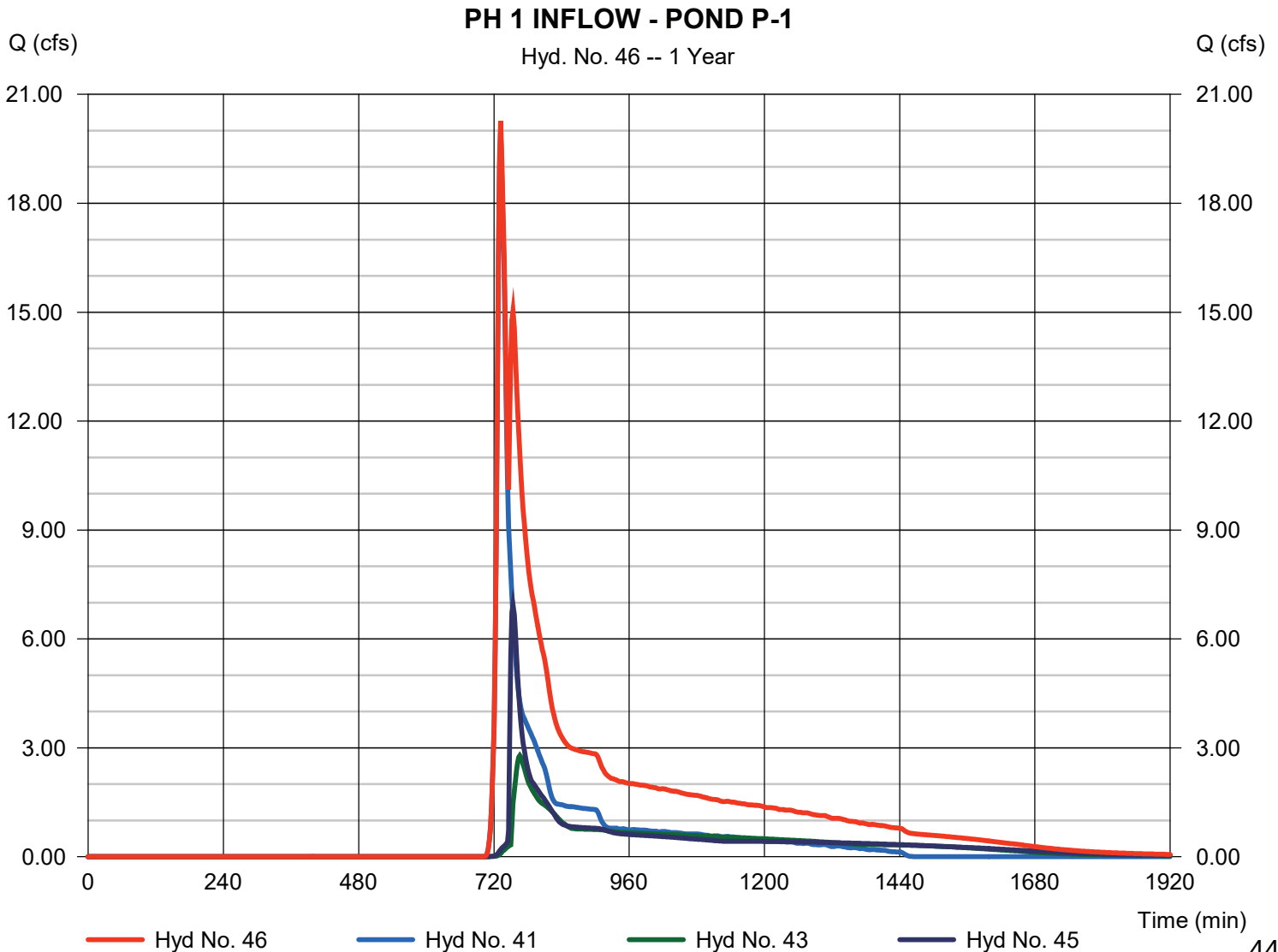
Friday, 06 / 28 / 2019

Hyd. No. 46

PH 1 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 41, 43, 45

Peak discharge = 20.27 cfs
 Time to peak = 732 min
 Hyd. volume = 3.095 acft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

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

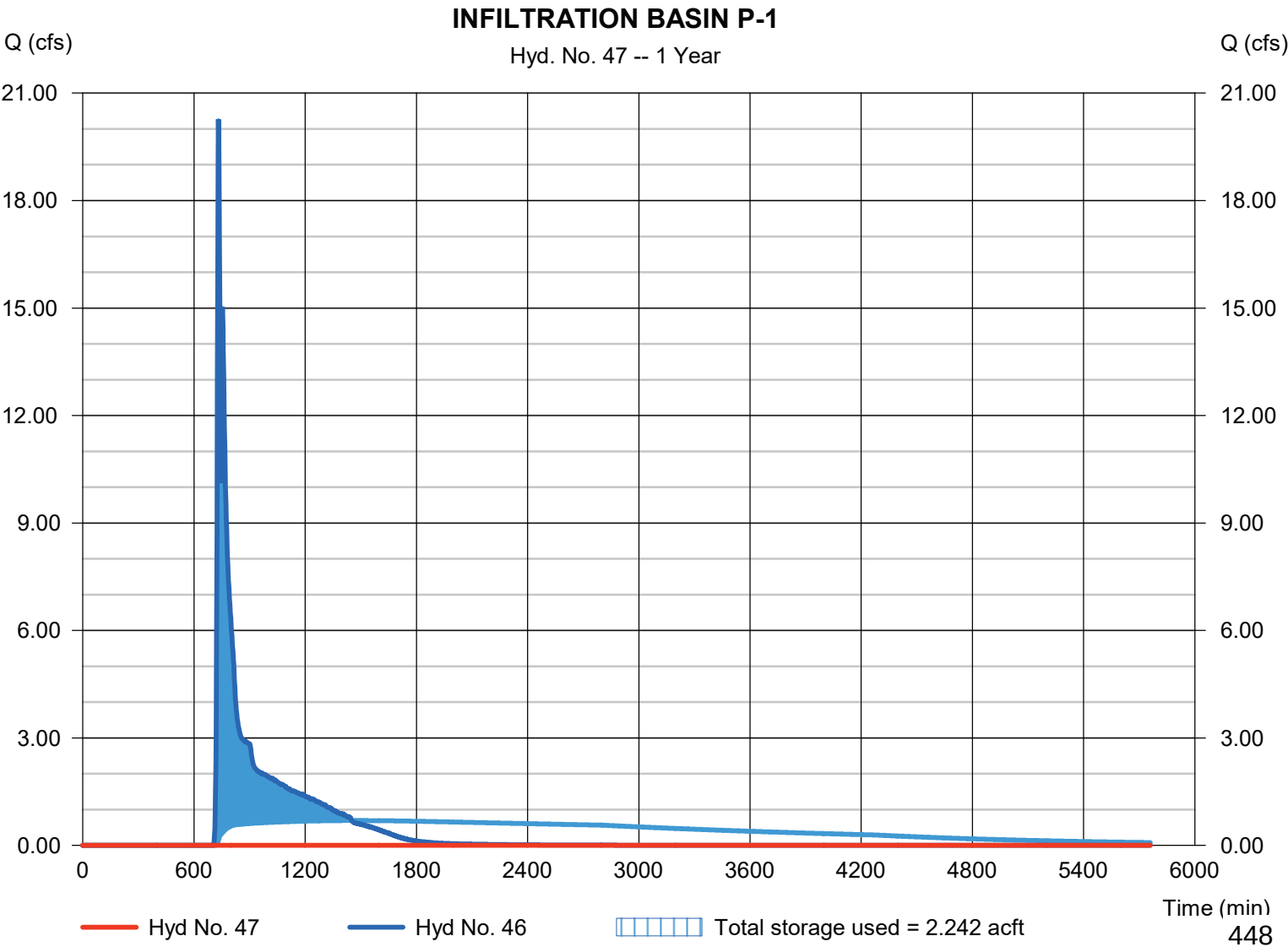
Friday, 06 / 28 / 2019

Hyd. No. 47

INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 3256 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 46 - PH 1 INFLOW - POND P-1	Max. Elevation	= 831.75 ft
Reservoir name	= INFILTRATION BASIN P-1-PH1	Max. Storage	= 2.242 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 5 - INFILTRATION BASIN P-1-PH1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 829.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	829.00	14,687	0.000	0.000
1.00	830.00	25,075	0.451	0.451
2.00	831.00	48,705	0.832	1.283
3.00	832.00	63,719	1.286	2.569
4.00	833.00	77,550	1.619	4.188
5.00	834.00	98,330	2.014	6.202
6.00	835.00	111,632	2.408	8.610
7.00	836.00	125,971	2.725	11.336
8.00	837.00	141,877	3.072	14.408
9.00	838.00	160,442	3.468	17.876
10.00	839.00	180,300	3.909	21.784
11.00	840.00	204,214	4.410	26.195
12.00	841.00	236,239	5.051	31.245
13.00	842.00	329,855	6.467	37.713

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.500 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	829.00	---	---	---	---	---	---	---	---	0.000	---	0.000
0.10	0.045	829.10	---	---	---	---	---	---	---	---	0.029	---	0.029
0.20	0.090	829.20	---	---	---	---	---	---	---	---	0.058	---	0.058
0.30	0.135	829.30	---	---	---	---	---	---	---	---	0.087	---	0.087
0.40	0.180	829.40	---	---	---	---	---	---	---	---	0.116	---	0.116
0.50	0.226	829.50	---	---	---	---	---	---	---	---	0.145	---	0.145
0.60	0.271	829.60	---	---	---	---	---	---	---	---	0.174	---	0.174
0.70	0.316	829.70	---	---	---	---	---	---	---	---	0.203	---	0.203
0.80	0.361	829.80	---	---	---	---	---	---	---	---	0.232	---	0.232
0.90	0.406	829.90	---	---	---	---	---	---	---	---	0.261	---	0.261
1.00	0.451	830.00	---	---	---	---	---	---	---	---	0.290	---	0.290
1.10	0.534	830.10	---	---	---	---	---	---	---	---	0.318	---	0.318
1.20	0.617	830.20	---	---	---	---	---	---	---	---	0.345	---	0.345
1.30	0.701	830.30	---	---	---	---	---	---	---	---	0.372	---	0.372
1.40	0.784	830.40	---	---	---	---	---	---	---	---	0.400	---	0.400
1.50	0.867	830.50	---	---	---	---	---	---	---	---	0.427	---	0.427
1.60	0.950	830.60	---	---	---	---	---	---	---	---	0.454	---	0.454
1.70	1.033	830.70	---	---	---	---	---	---	---	---	0.482	---	0.482
1.80	1.117	830.80	---	---	---	---	---	---	---	---	0.509	---	0.509
1.90	1.200	830.90	---	---	---	---	---	---	---	---	0.536	---	0.536
2.00	1.283	831.00	---	---	---	---	---	---	---	---	0.564	---	0.564
2.10	1.412	831.10	---	---	---	---	---	---	---	---	0.581	---	0.581
2.20	1.540	831.20	---	---	---	---	---	---	---	---	0.598	---	0.598
2.30	1.669	831.30	---	---	---	---	---	---	---	---	0.616	---	0.616
2.40	1.798	831.40	---	---	---	---	---	---	---	---	0.633	---	0.633
2.50	1.926	831.50	---	---	---	---	---	---	---	---	0.651	---	0.651
2.60	2.055	831.60	---	---	---	---	---	---	---	---	0.668	---	0.668
2.70	2.184	831.70	---	---	---	---	---	---	---	---	0.685	---	0.685
2.80	2.312	831.80	---	---	---	---	---	---	---	---	0.703	---	0.703

INFILTRATION BASIN P-1-PH1

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.90	2.441	831.90	---	---	---	---	---	---	---	---	0.720	---	0.720
3.00	2.569	832.00	---	---	---	---	---	---	---	---	0.737	---	0.737
3.10	2.731	832.10	---	---	---	---	---	---	---	---	0.753	---	0.753
3.20	2.893	832.20	---	---	---	---	---	---	---	---	0.769	---	0.769
3.30	3.055	832.30	---	---	---	---	---	---	---	---	0.786	---	0.786
3.40	3.217	832.40	---	---	---	---	---	---	---	---	0.802	---	0.802
3.50	3.379	832.50	---	---	---	---	---	---	---	---	0.818	---	0.818
3.60	3.541	832.60	---	---	---	---	---	---	---	---	0.834	---	0.834
3.70	3.703	832.70	---	---	---	---	---	---	---	---	0.850	---	0.850
3.80	3.864	832.80	---	---	---	---	---	---	---	---	0.866	---	0.866
3.90	4.026	832.90	---	---	---	---	---	---	---	---	0.882	---	0.882
4.00	4.188	833.00	---	---	---	---	---	---	---	---	0.898	---	0.898
4.10	4.390	833.10	---	---	---	---	---	---	---	---	0.922	---	0.922
4.20	4.591	833.20	---	---	---	---	---	---	---	---	0.946	---	0.946
4.30	4.792	833.30	---	---	---	---	---	---	---	---	0.970	---	0.970
4.40	4.994	833.40	---	---	---	---	---	---	---	---	0.994	---	0.994
4.50	5.195	833.50	---	---	---	---	---	---	---	---	1.018	---	1.018
4.60	5.397	833.60	---	---	---	---	---	---	---	---	1.042	---	1.042
4.70	5.598	833.70	---	---	---	---	---	---	---	---	1.066	---	1.066
4.80	5.799	833.80	---	---	---	---	---	---	---	---	1.090	---	1.090
4.90	6.001	833.90	---	---	---	---	---	---	---	---	1.114	---	1.114
5.00	6.202	834.00	---	---	---	---	---	---	---	---	1.138	---	1.138
5.10	6.443	834.10	---	---	---	---	---	---	---	---	1.153	---	1.153
5.20	6.684	834.20	---	---	---	---	---	---	---	---	1.169	---	1.169
5.30	6.925	834.30	---	---	---	---	---	---	---	---	1.184	---	1.184
5.40	7.165	834.40	---	---	---	---	---	---	---	---	1.200	---	1.200
5.50	7.406	834.50	---	---	---	---	---	---	---	---	1.215	---	1.215
5.60	7.647	834.60	---	---	---	---	---	---	---	---	1.230	---	1.230
5.70	7.888	834.70	---	---	---	---	---	---	---	---	1.246	---	1.246
5.80	8.129	834.80	---	---	---	---	---	---	---	---	1.261	---	1.261
5.90	8.370	834.90	---	---	---	---	---	---	---	---	1.277	---	1.277
6.00	8.610	835.00	---	---	---	---	---	---	---	---	1.292	---	1.292
6.10	8.883	835.10	---	---	---	---	---	---	---	---	1.309	---	1.309
6.20	9.155	835.20	---	---	---	---	---	---	---	---	1.325	---	1.325
6.30	9.428	835.30	---	---	---	---	---	---	---	---	1.342	---	1.342
6.40	9.700	835.40	---	---	---	---	---	---	---	---	1.358	---	1.358
6.50	9.973	835.50	---	---	---	---	---	---	---	---	1.375	---	1.375
6.60	10.246	835.60	---	---	---	---	---	---	---	---	1.392	---	1.392
6.70	10.518	835.70	---	---	---	---	---	---	---	---	1.408	---	1.408
6.80	10.791	835.80	---	---	---	---	---	---	---	---	1.425	---	1.425
6.90	11.063	835.90	---	---	---	---	---	---	---	---	1.441	---	1.441
7.00	11.336	836.00	---	---	---	---	---	---	---	---	1.458	---	1.458
7.10	11.643	836.10	---	---	---	---	---	---	---	---	1.476	---	1.476
7.20	11.950	836.20	---	---	---	---	---	---	---	---	1.495	---	1.495
7.30	12.257	836.30	---	---	---	---	---	---	---	---	1.513	---	1.513
7.40	12.565	836.40	---	---	---	---	---	---	---	---	1.532	---	1.532
7.50	12.872	836.50	---	---	---	---	---	---	---	---	1.550	---	1.550
7.60	13.179	836.60	---	---	---	---	---	---	---	---	1.568	---	1.568
7.70	13.486	836.70	---	---	---	---	---	---	---	---	1.587	---	1.587
7.80	13.794	836.80	---	---	---	---	---	---	---	---	1.605	---	1.605
7.90	14.101	836.90	---	---	---	---	---	---	---	---	1.624	---	1.624
8.00	14.408	837.00	---	---	---	---	---	---	---	---	1.642	---	1.642
8.10	14.755	837.10	---	---	---	---	---	---	---	---	1.664	---	1.664
8.20	15.102	837.20	---	---	---	---	---	---	---	---	1.685	---	1.685
8.30	15.448	837.30	---	---	---	---	---	---	---	---	1.707	---	1.707
8.40	15.795	837.40	---	---	---	---	---	---	---	---	1.728	---	1.728
8.50	16.142	837.50	---	---	---	---	---	---	---	---	1.750	---	1.750
8.60	16.489	837.60	---	---	---	---	---	---	---	---	1.771	---	1.771
8.70	16.835	837.70	---	---	---	---	---	---	---	---	1.792	---	1.792
8.80	17.182	837.80	---	---	---	---	---	---	---	---	1.814	---	1.814
8.90	17.529	837.90	---	---	---	---	---	---	---	---	1.835	---	1.835
9.00	17.876	838.00	---	---	---	---	---	---	---	---	1.857	---	1.857
9.10	18.267	838.10	---	---	---	---	---	---	---	---	1.880	---	1.880
9.20	18.657	838.20	---	---	---	---	---	---	---	---	1.903	---	1.903
9.30	19.048	838.30	---	---	---	---	---	---	---	---	1.926	---	1.926
9.40	19.439	838.40	---	---	---	---	---	---	---	---	1.949	---	1.949
9.50	19.830	838.50	---	---	---	---	---	---	---	---	1.972	---	1.972
9.60	20.221	838.60	---	---	---	---	---	---	---	---	1.995	---	1.995
9.70	20.612	838.70	---	---	---	---	---	---	---	---	2.018	---	2.018
9.80	21.003	838.80	---	---	---	---	---	---	---	---	2.041	---	2.041
9.90	21.393	838.90	---	---	---	---	---	---	---	---	2.064	---	2.064
10.00	21.784	839.00	---	---	---	---	---	---	---	---	2.087	---	2.087

INFILTRATION BASIN P-1-PH1

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
10.10	22.225	839.10	---	---	---	---	---	---	---	---	2.114	---	2.114
10.20	22.666	839.20	---	---	---	---	---	---	---	---	2.142	---	2.142
10.30	23.107	839.30	---	---	---	---	---	---	---	---	2.170	---	2.170
10.40	23.548	839.40	---	---	---	---	---	---	---	---	2.198	---	2.198
10.50	23.989	839.50	---	---	---	---	---	---	---	---	2.225	---	2.225
10.60	24.430	839.60	---	---	---	---	---	---	---	---	2.253	---	2.253
10.70	24.871	839.70	---	---	---	---	---	---	---	---	2.281	---	2.281
10.80	25.313	839.80	---	---	---	---	---	---	---	---	2.308	---	2.308
10.90	25.754	839.90	---	---	---	---	---	---	---	---	2.336	---	2.336
11.00	26.195	840.00	---	---	---	---	---	---	---	---	2.364	---	2.364
11.10	26.700	840.10	---	---	---	---	---	---	---	---	2.401	---	2.401
11.20	27.205	840.20	---	---	---	---	---	---	---	---	2.438	---	2.438
11.30	27.710	840.30	---	---	---	---	---	---	---	---	2.475	---	2.475
11.40	28.215	840.40	---	---	---	---	---	---	---	---	2.512	---	2.512
11.50	28.720	840.50	---	---	---	---	---	---	---	---	2.549	---	2.549
11.60	29.225	840.60	---	---	---	---	---	---	---	---	2.586	---	2.586
11.70	29.730	840.70	---	---	---	---	---	---	---	---	2.623	---	2.623
11.80	30.235	840.80	---	---	---	---	---	---	---	---	2.660	---	2.660
11.90	30.740	840.90	---	---	---	---	---	---	---	---	2.697	---	2.697
12.00	31.245	841.00	---	---	---	---	---	---	---	---	2.734	---	2.734
12.10	31.892	841.10	---	---	---	---	---	---	---	---	2.843	---	2.843
12.20	32.539	841.20	---	---	---	---	---	---	---	---	2.951	---	2.951
12.30	33.186	841.30	---	---	---	---	---	---	---	---	3.059	---	3.059
12.40	33.832	841.40	---	---	---	---	---	---	---	---	3.168	---	3.168
12.50	34.479	841.50	---	---	---	---	---	---	---	---	3.276	---	3.276
12.60	35.126	841.60	---	---	---	---	---	---	---	---	3.384	---	3.384
12.70	35.773	841.70	---	---	---	---	---	---	---	---	3.493	---	3.493
12.80	36.419	841.80	---	---	---	---	---	---	---	---	3.601	---	3.601
12.90	37.066	841.90	---	---	---	---	---	---	---	---	3.709	---	3.709
13.00	37.713	842.00	---	---	---	---	---	---	---	---	3.818	---	3.818

...End

Hydrograph Report

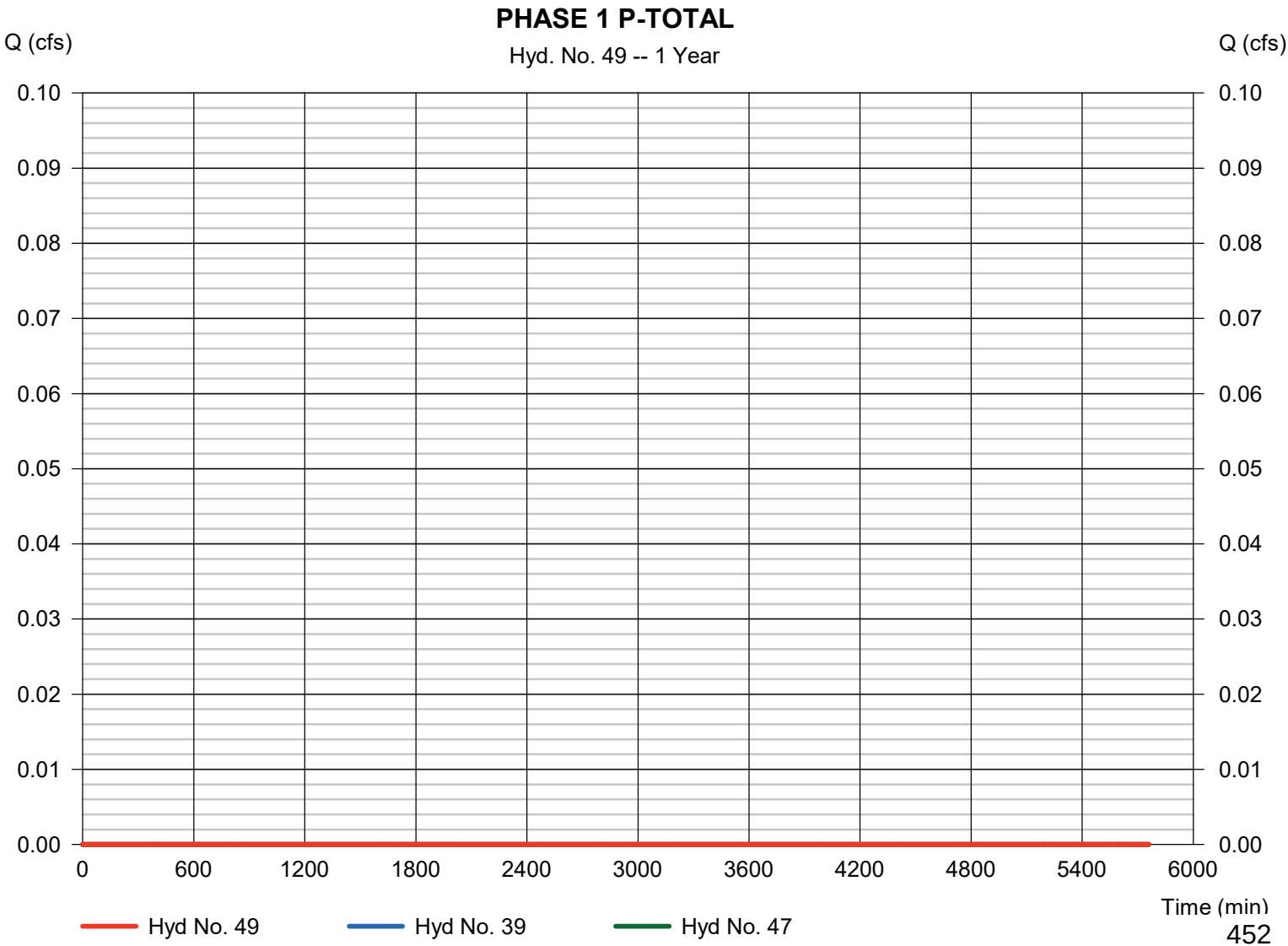
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 49

PHASE 1 P-TOTAL

Hydrograph type	= Combine	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 3256 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyds.	= 39, 47	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	1.888	2	746	0.246	-----	-----	-----	P-OS-1-PH 1
2	SCS Runoff	26.68	2	732	1.672	-----	-----	-----	P-1-PH 1
3	SCS Runoff	2.445	2	742	0.238	-----	-----	-----	P-1A-PH1
4	SCS Runoff	6.334	2	738	0.509	-----	-----	-----	P-1B-PH1
5	SCS Runoff	9.272	2	738	0.720	-----	-----	-----	P-2
6	SCS Runoff	7.605	2	738	0.591	-----	-----	-----	P-3
7	SCS Runoff	1.681	2	738	0.131	-----	-----	-----	P-4
9	SCS Runoff	0.263	2	726	0.011	-----	-----	-----	R&M EX. P-1
10	SCS Runoff	0.531	2	726	0.023	-----	-----	-----	R&M EX. P-2
11	SCS Runoff	0.219	2	726	0.009	-----	-----	-----	R&M EX. P-3
12	SCS Runoff	0.267	2	726	0.012	-----	-----	-----	R&M EX. P-4
13	SCS Runoff	0.340	2	726	0.015	-----	-----	-----	R&M EX. P-5
14	SCS Runoff	0.535	2	726	0.023	-----	-----	-----	R&M EX. P-6
15	SCS Runoff	0.634	2	726	0.028	-----	-----	-----	R&M EX. P-7
16	SCS Runoff	0.459	2	726	0.020	-----	-----	-----	R&M EX. P-8
17	SCS Runoff	0.399	2	726	0.019	-----	-----	-----	R&M EX. P-9
18	Reservoir	0.011	2	814	0.011	9	851.06	0.007	R&M EX. BIOSWALE P-1
19	Combine	0.539	2	726	0.034	10, 18	-----	-----	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	0.000	2	2682	0.000	19	851.17	0.020	R&M EX. BIOSWALE P-2
21	Combine	0.219	2	726	0.009	11, 20	-----	-----	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	0.000	2	724	0.000	21	849.71	0.005	R&M EX. BIOSWALE P-3
23	Combine	0.267	2	726	0.012	12, 22	-----	-----	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	0.000	2	798	0.000	23	848.99	0.007	R&M EX. BIOSWALE P-4
25	Combine	0.340	2	726	0.015	13, 24	-----	-----	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	0.000	2	724	0.000	25	847.71	0.009	R&M EX. BIOSWALE P-5
27	Combine	0.535	2	726	0.023	14, 26	-----	-----	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	0.000	2	1744	0.000	27	846.49	0.016	R&M EX. BIOSWALE P-6
29	Combine	0.634	2	726	0.028	15, 28	-----	-----	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	0.000	2	2048	0.000	29	844.84	0.020	R&M EX. BIOSWALE P-7
31	Combine	0.459	2	726	0.020	16, 30	-----	-----	R&M EX. BIOSWALE P-8
32	Reservoir	0.000	2	1564	0.000	31	843.40	0.013	R&M EX. BIOSWALE P-8
33	SCS Runoff	3.263	2	726	0.146	-----	-----	-----	PROPOSED P-5
34	Combine	3.263	2	726	0.146	32, 33	-----	-----	INFLOW TO PR. P-5
2019-06-27_CHAPMAN FARMS_PHASE I.gpw Return Period: 2 Year								Friday, 06 / 28 / 2019	

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
35	Reservoir	0.000	2	756	0.000	34	841.86	0.093	PR. BLVD BIOFILTER P-5
37	Reservoir	4.544	2	754	0.720	5	839.46	0.323	POND P-2
38	Reservoir	7.010	2	742	0.590	6	839.79	0.151	POND P-3
39	Reservoir	0.000	2	738	0.000	7	839.99	0.079	RAIN GARDEN P-4
41	Combine	27.59	2	732	1.918	1, 2,	-----	-----	PHASE 1 OS-1 + P-1
42	Combine	6.620	2	754	0.958	3, 37,	-----	-----	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	6.429	2	756	0.958	42	835.04	0.084	PH 1 FOREBAY 1A
44	Combine	12.97	2	740	1.099	4, 38,	-----	-----	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	10.85	2	748	1.098	44	835.04	0.234	PH 1 FOREBAY 1B
46	Combine	28.01	2	732	3.974	41, 43, 45	-----	-----	PH 1 INFLOW - POND P-1
47	Reservoir	0.000	2	746	0.000	46	832.27	3.00	INFILTRATION BASIN P-1
49	Combine	0.000	2	3882	0.000	39, 47,	-----	-----	PHASE 1 P-TOTAL
2019-06-27_CHAPMAN FARMS_PHASE 1.gpr					Return Period: 2 Year			Friday, 06 / 28 / 2019	

Hydrograph Report

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

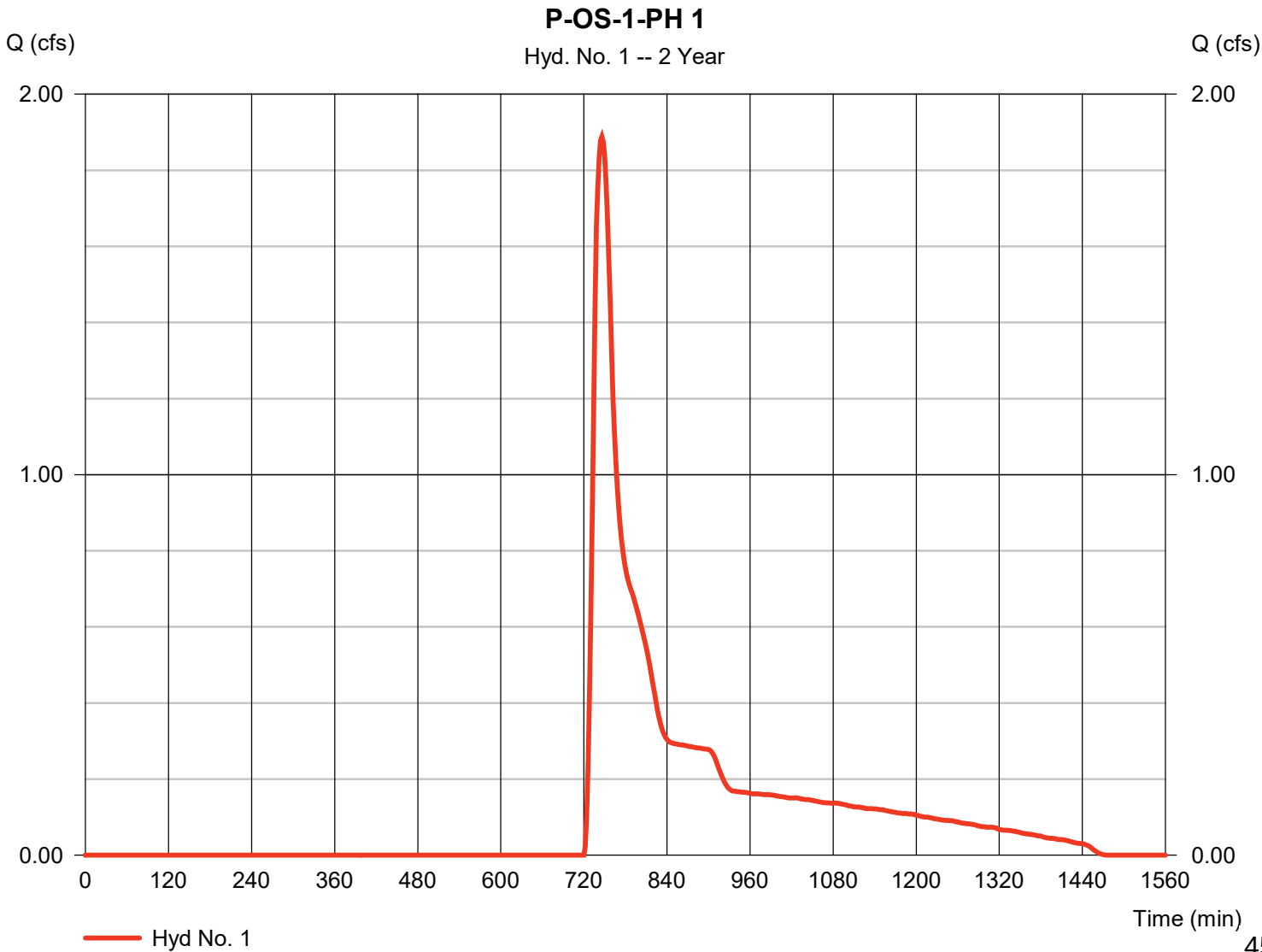
Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.888 cfs
Storm frequency	= 2 yrs	Time to peak	= 746 min
Time interval	= 2 min	Hyd. volume	= 0.246 acft
Drainage area	= 10.170 ac	Curve number	= 62*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.50 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

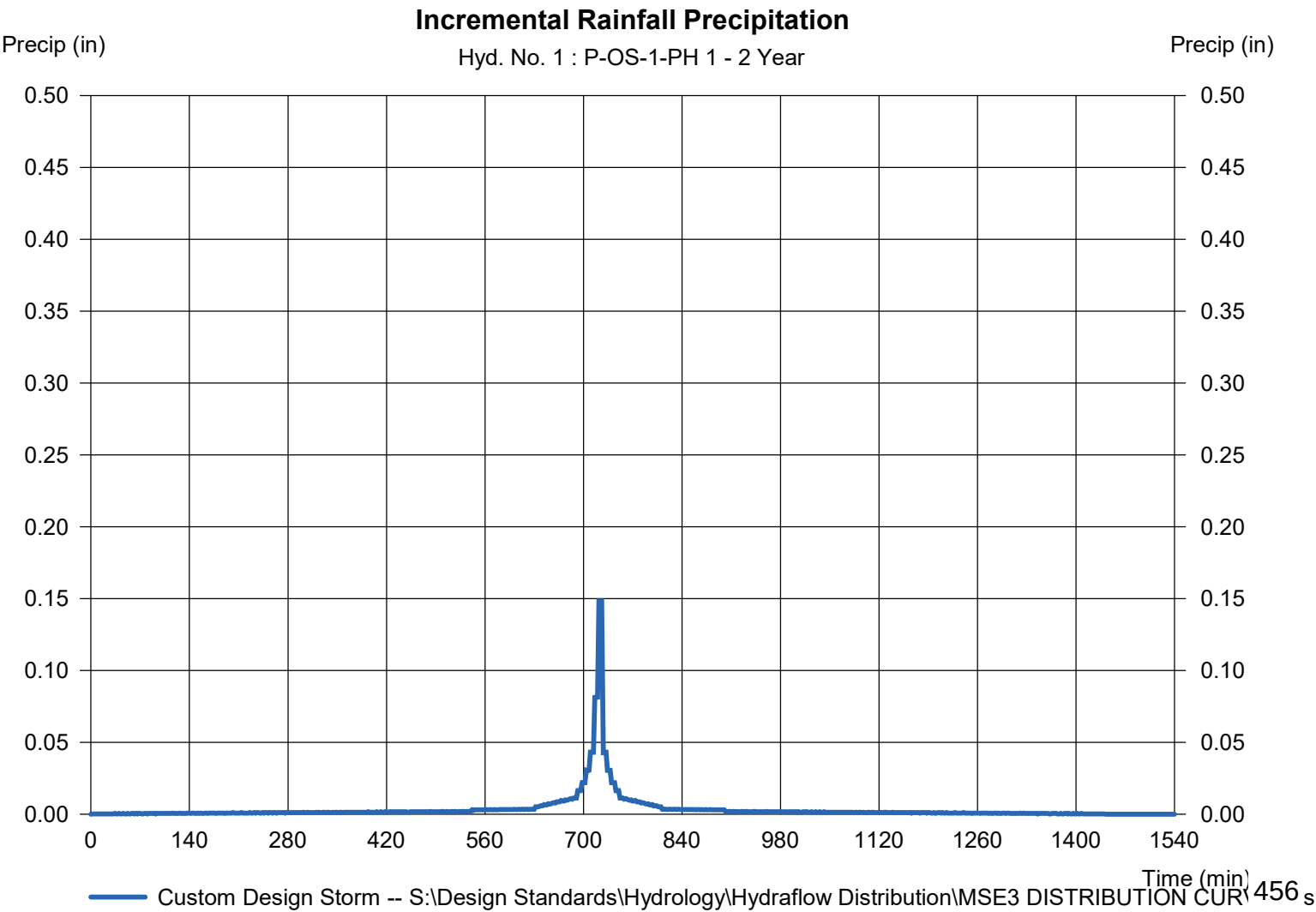
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

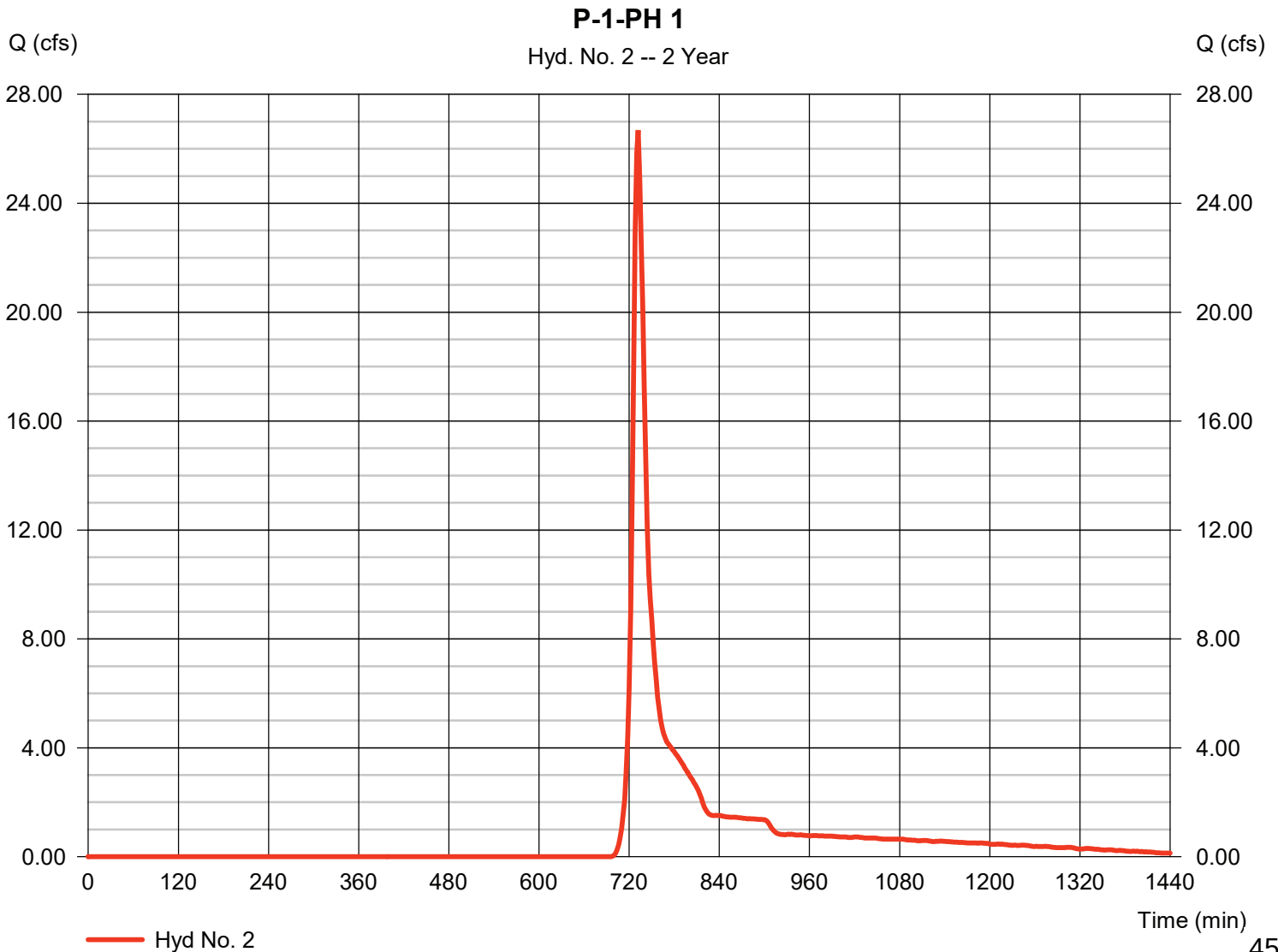
Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 26.68 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 1.672 acft
Drainage area	= 26.872 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSR3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 26.872



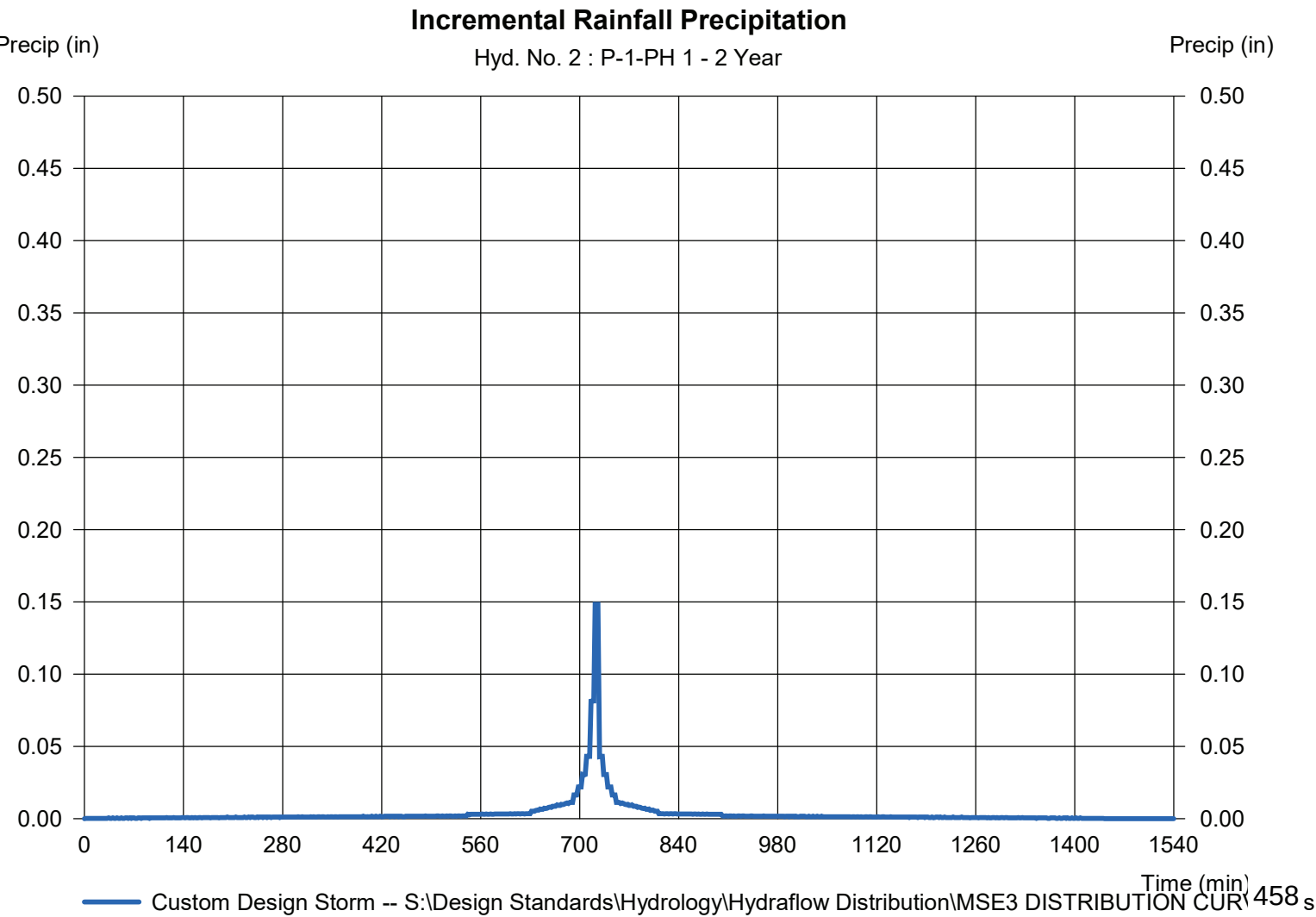
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Friday, 06 / 28 / 2019

Hyd. No. 2

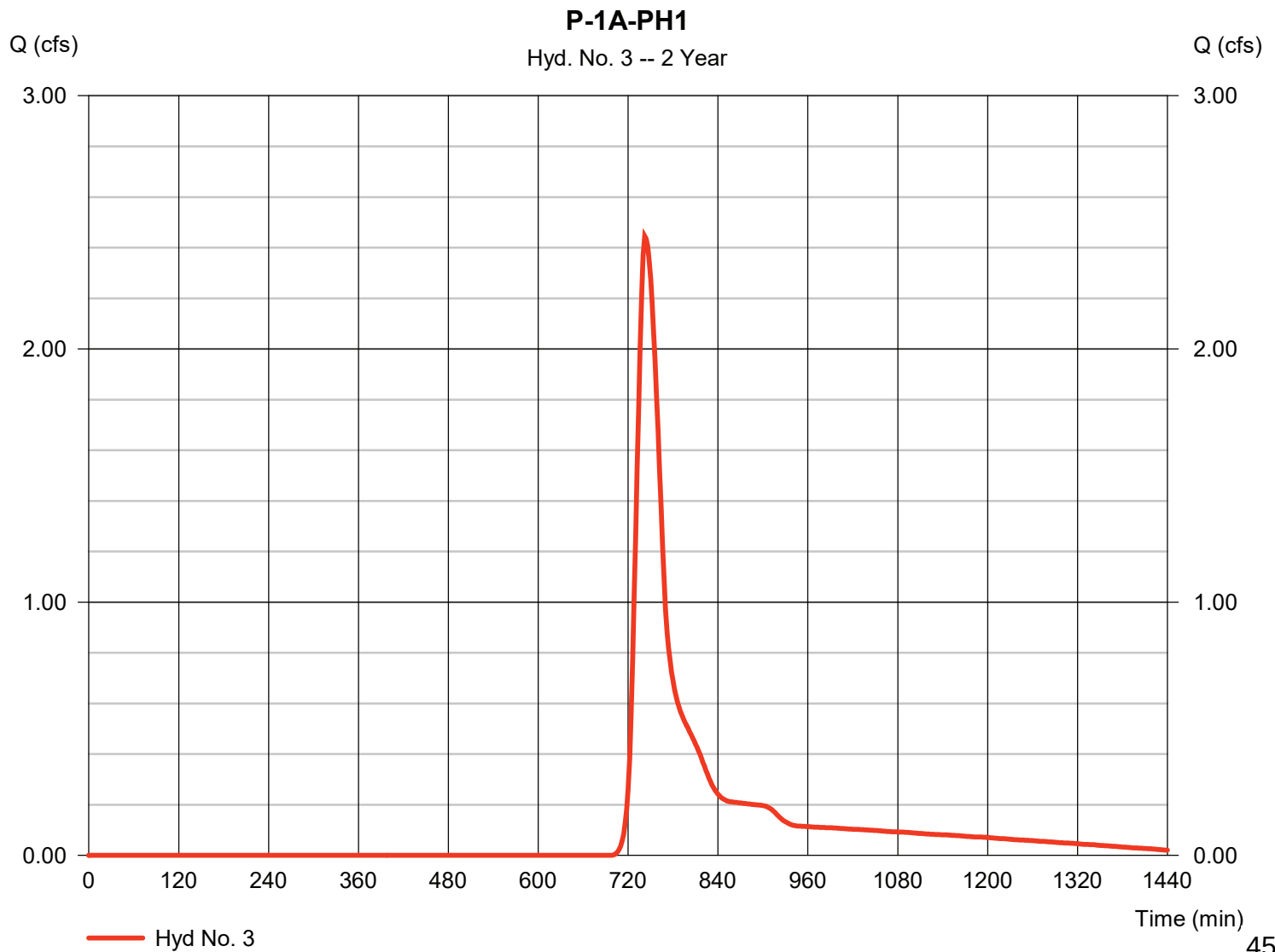
P-1-PH 1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



P-1A-PH1

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.445 cfs
Storm frequency	=	2 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	0.238 acft
Drainage area	=	3.947 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	29.90 min
Total precip.	=	2.70 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow\MSR3 DISTRIBUTION CURVE	Hydroflow Distribution	=	MSR3 DISTRIBUTION CURVE



Precipitation Report

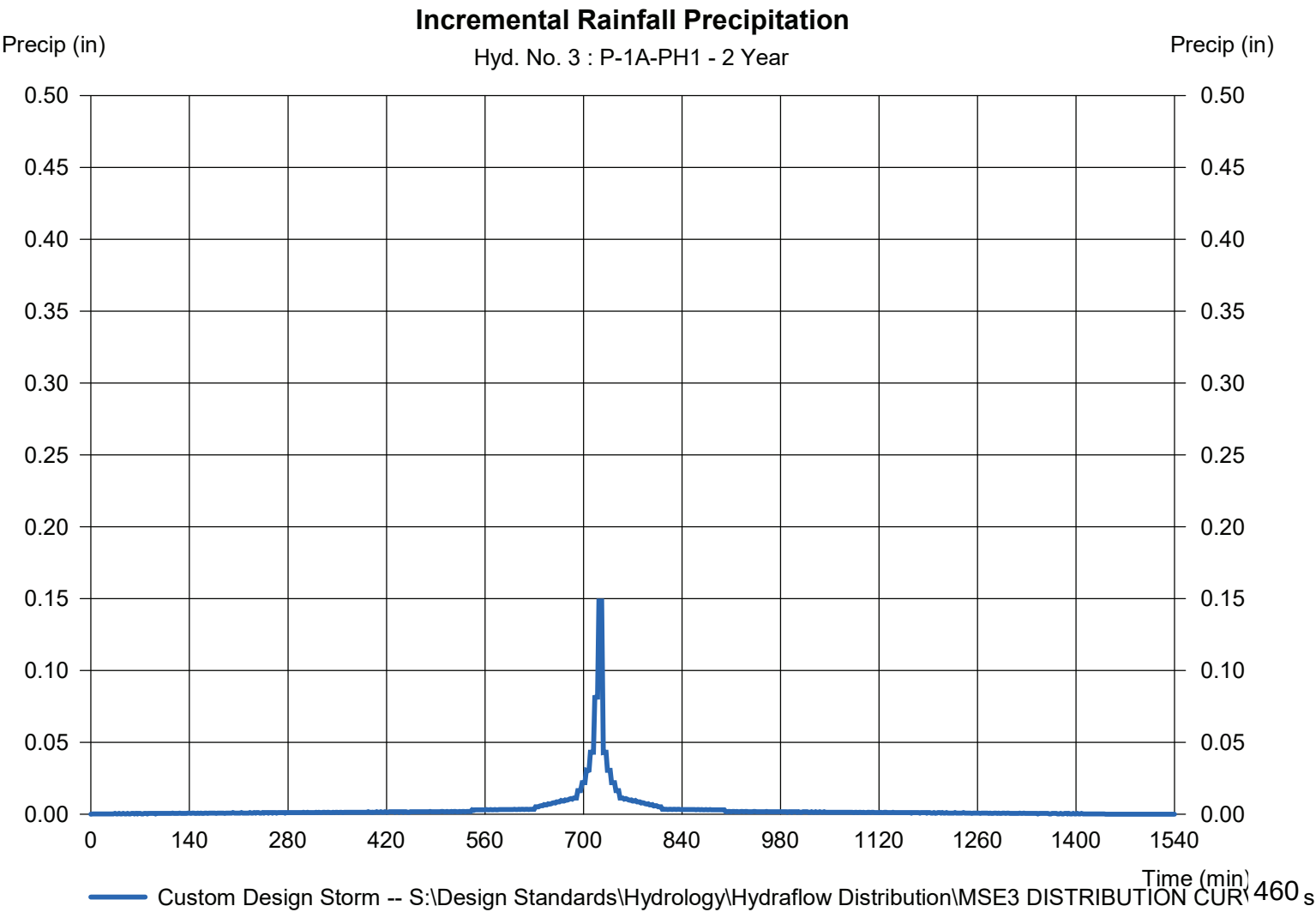
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

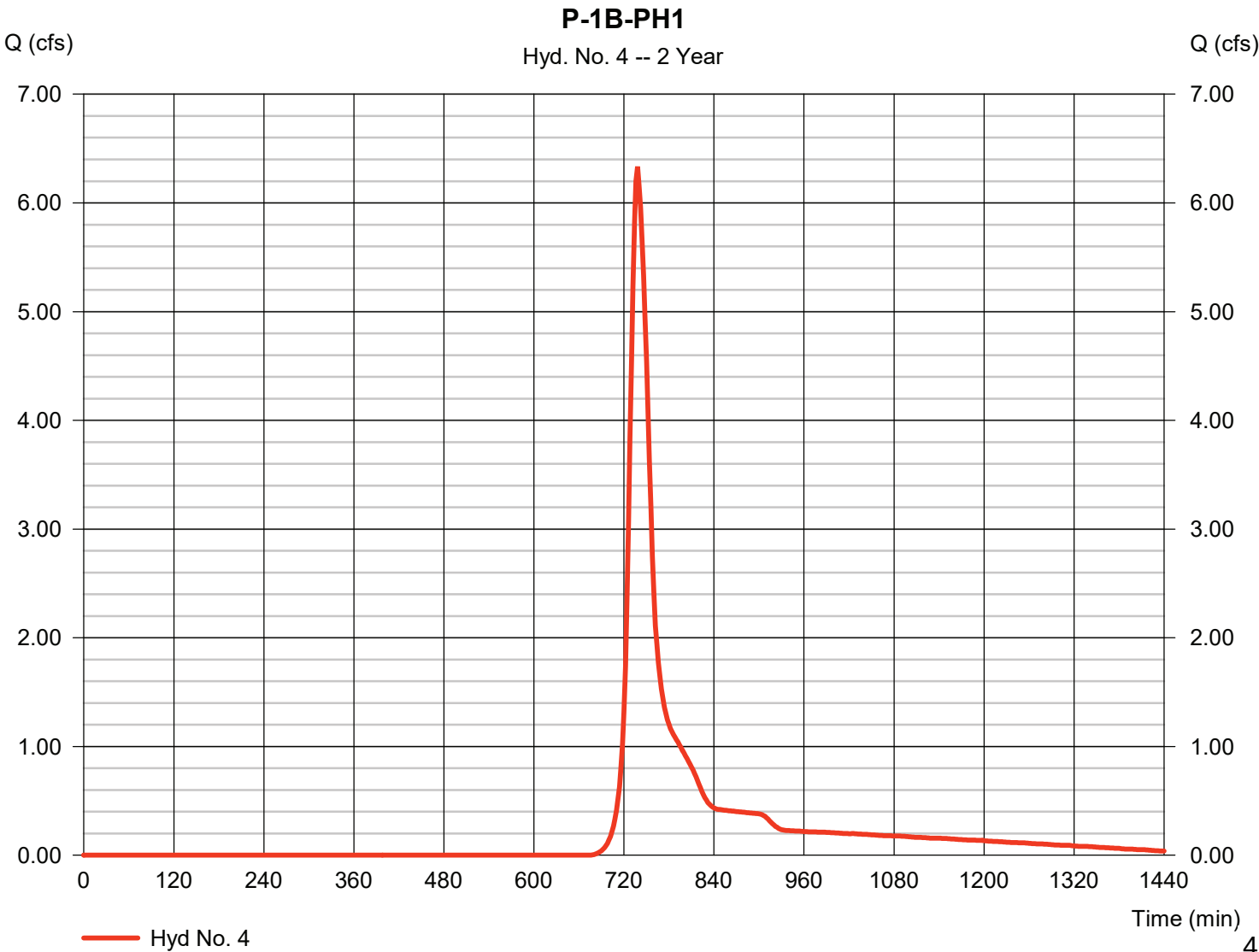
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 6.334 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.509 acft
Drainage area	= 6.516 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.60 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

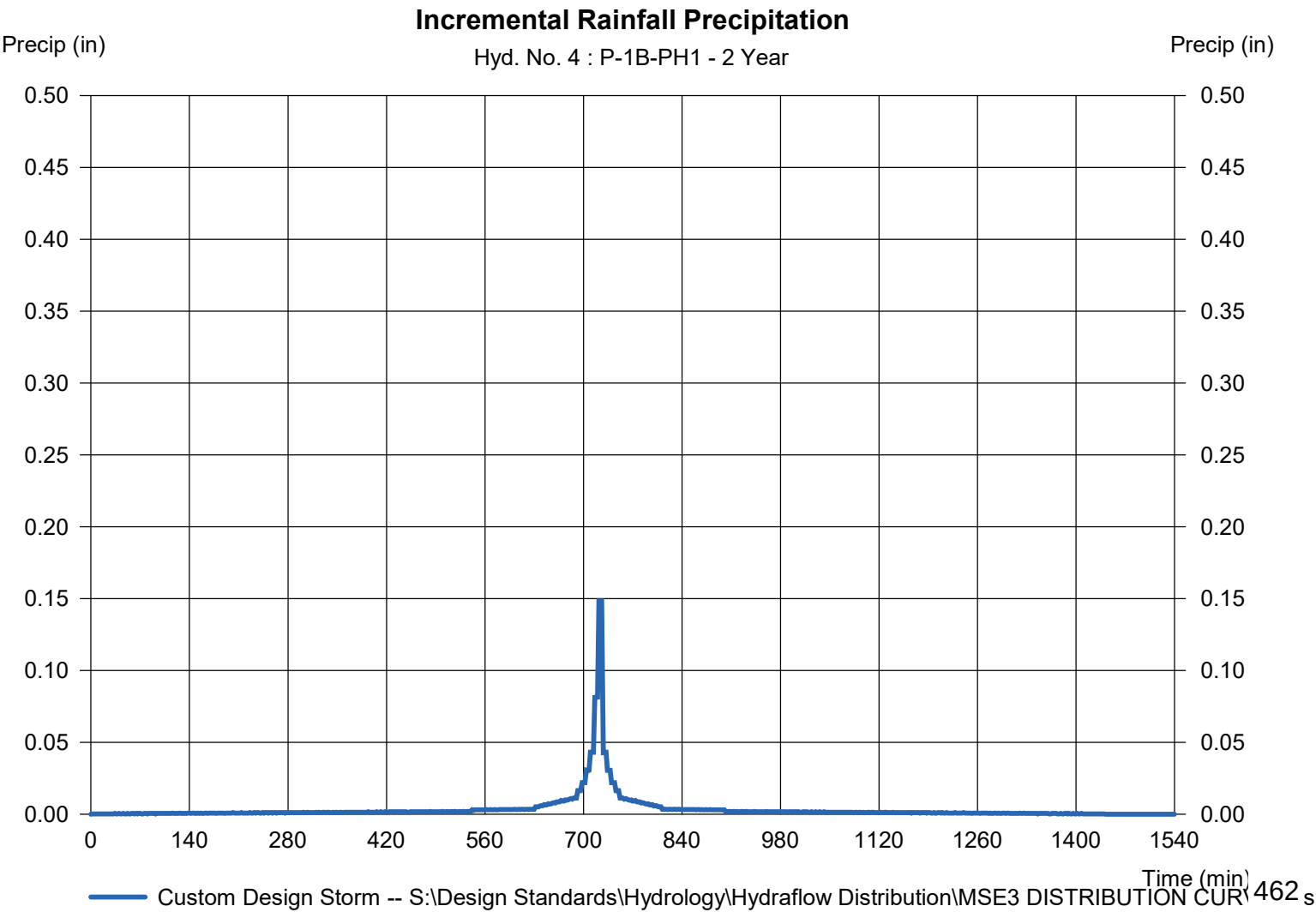
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

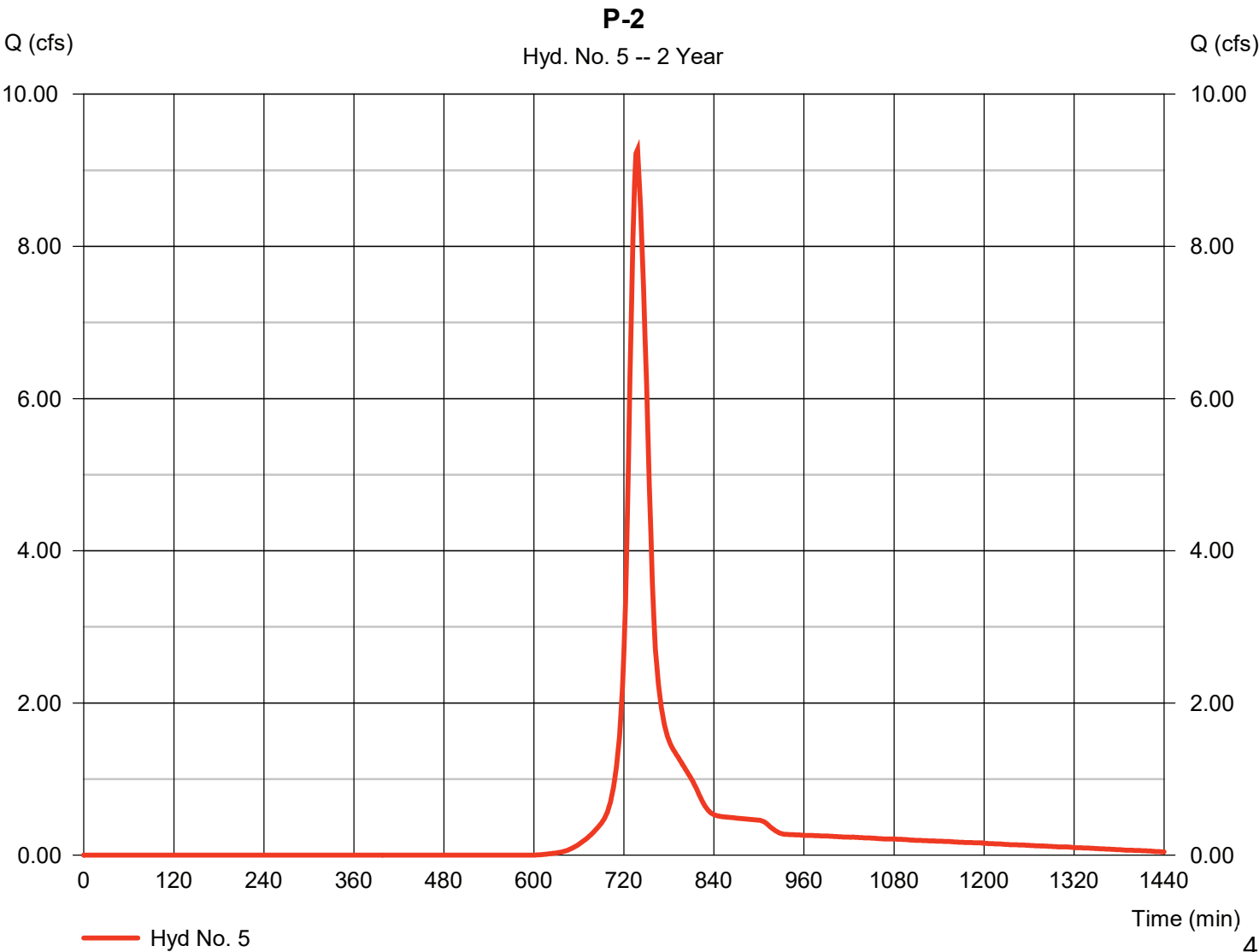
Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 9.272 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.720 acft
Drainage area	= 6.339 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.710 x 75)] / 6.339



Precipitation Report

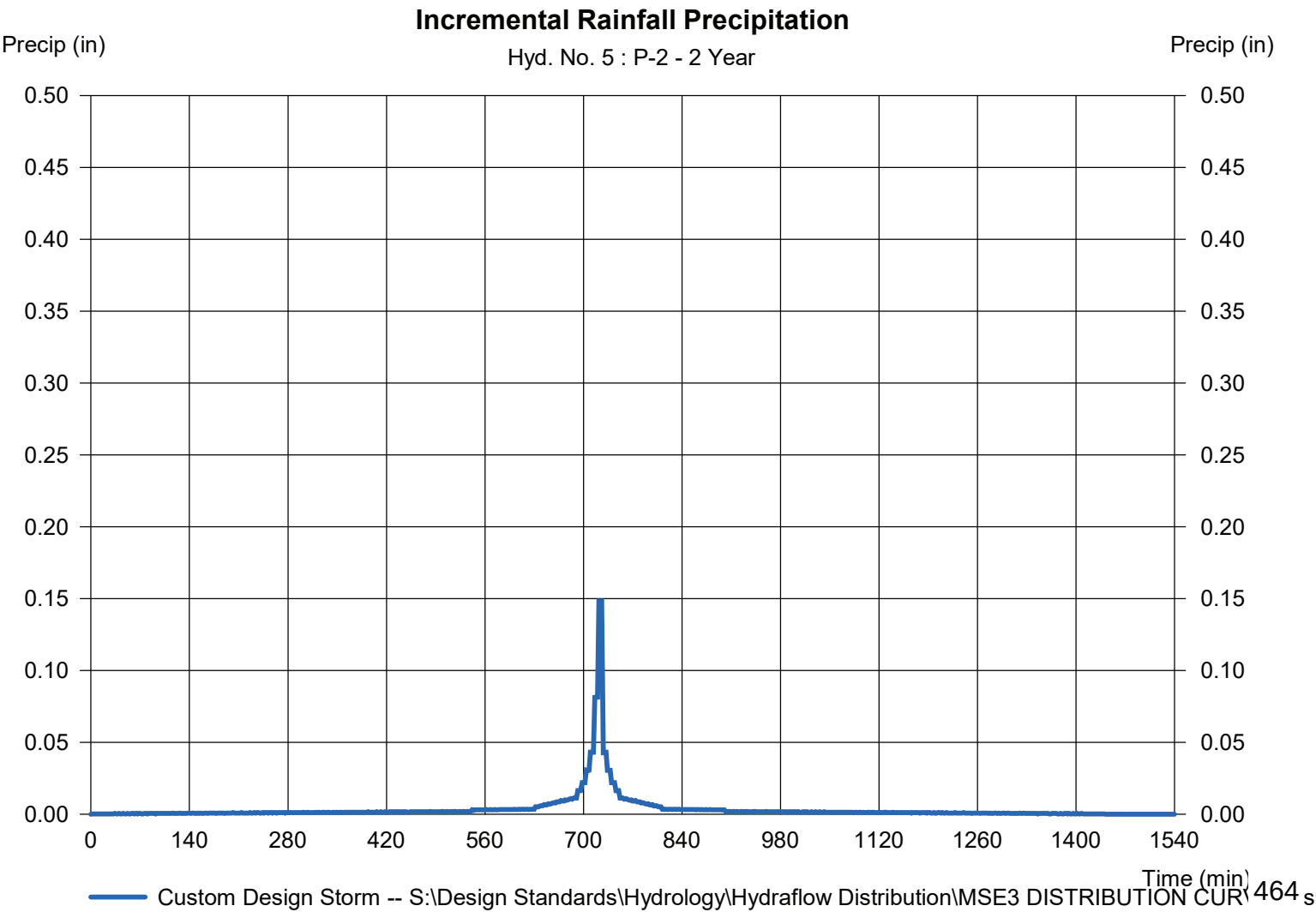
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

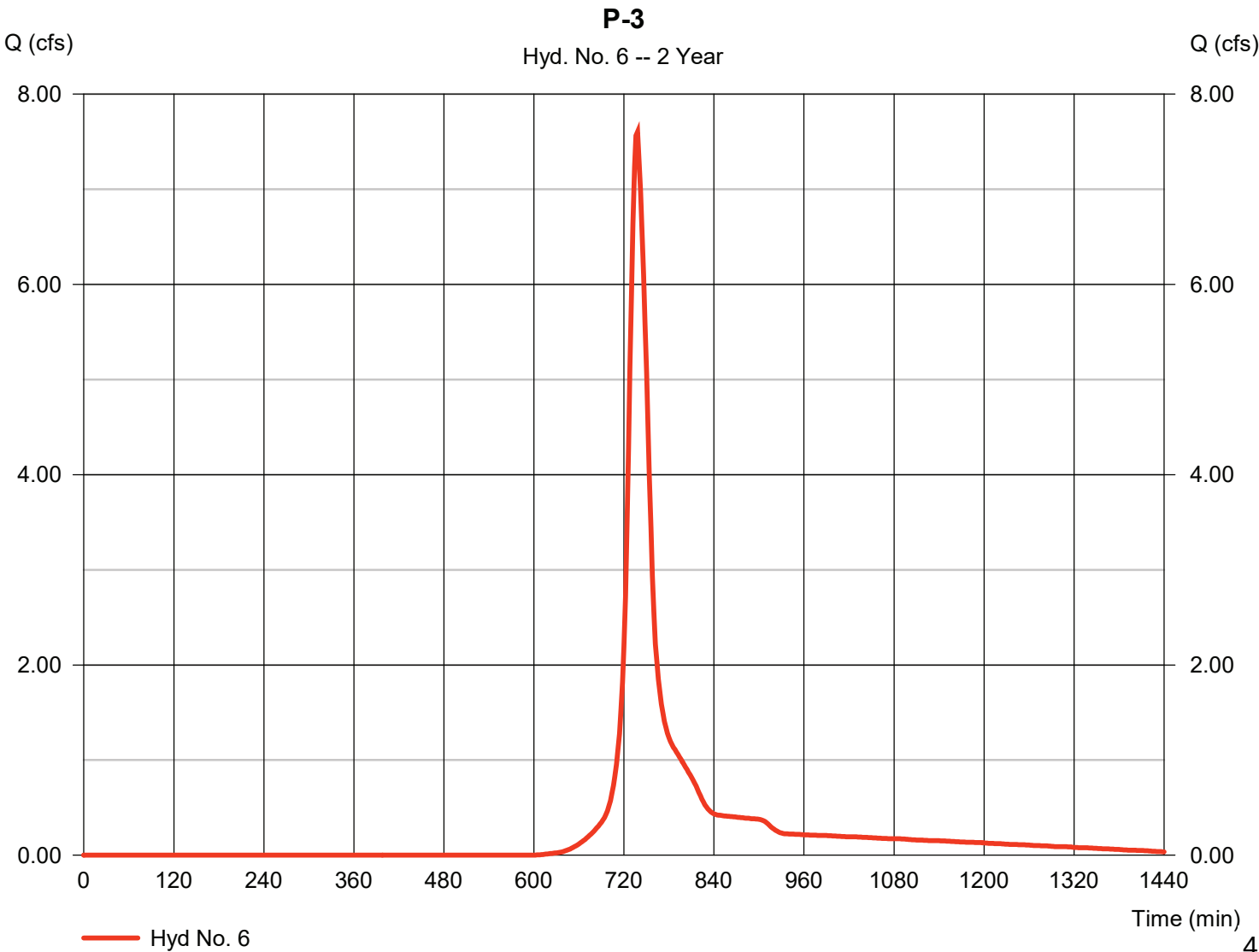
Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 7.605 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.591 acft
Drainage area	= 5.199 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSR3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.199



Precipitation Report

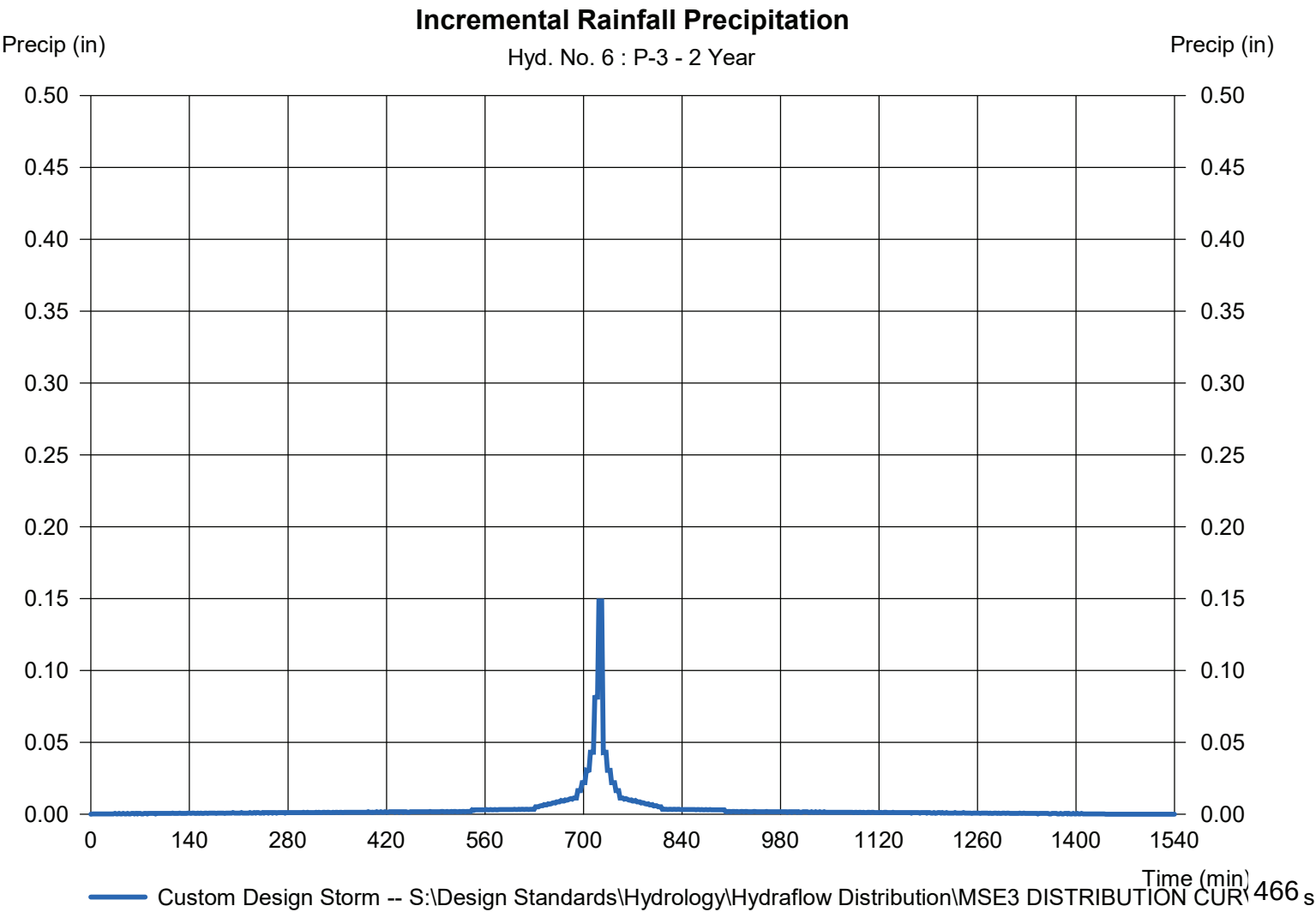
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

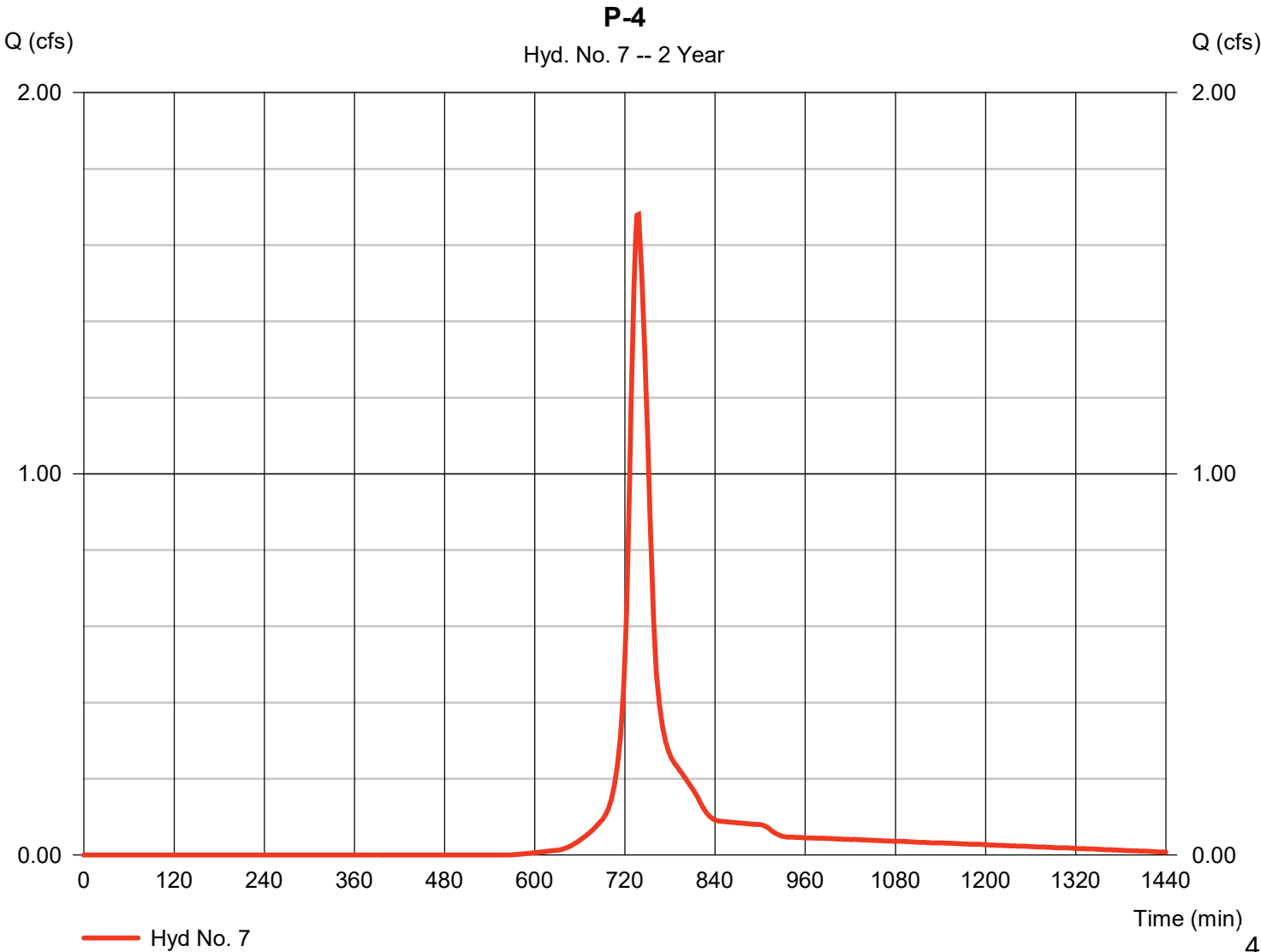
Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 1.681 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.131 acft
Drainage area	= 1.040 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.10 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

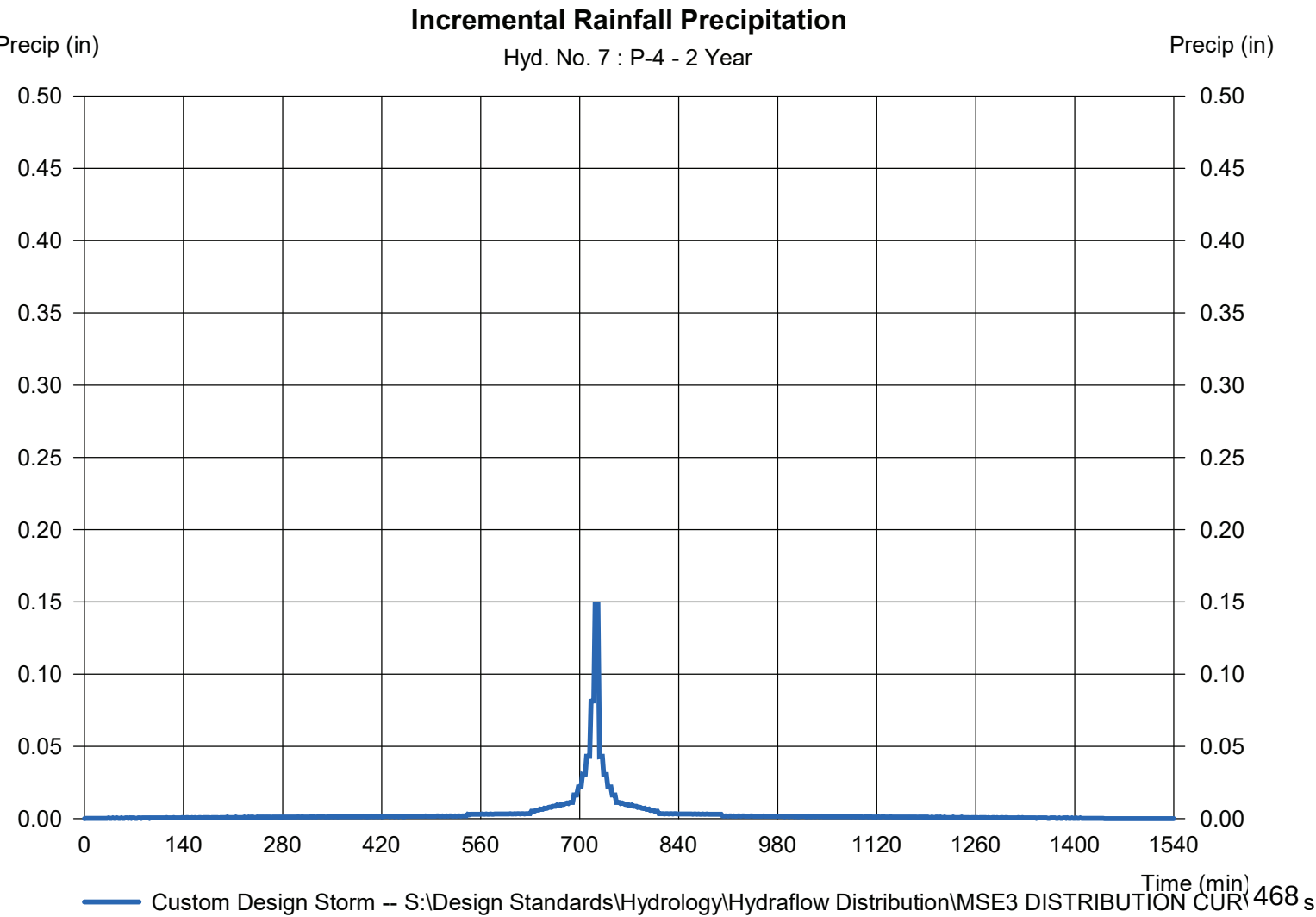
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

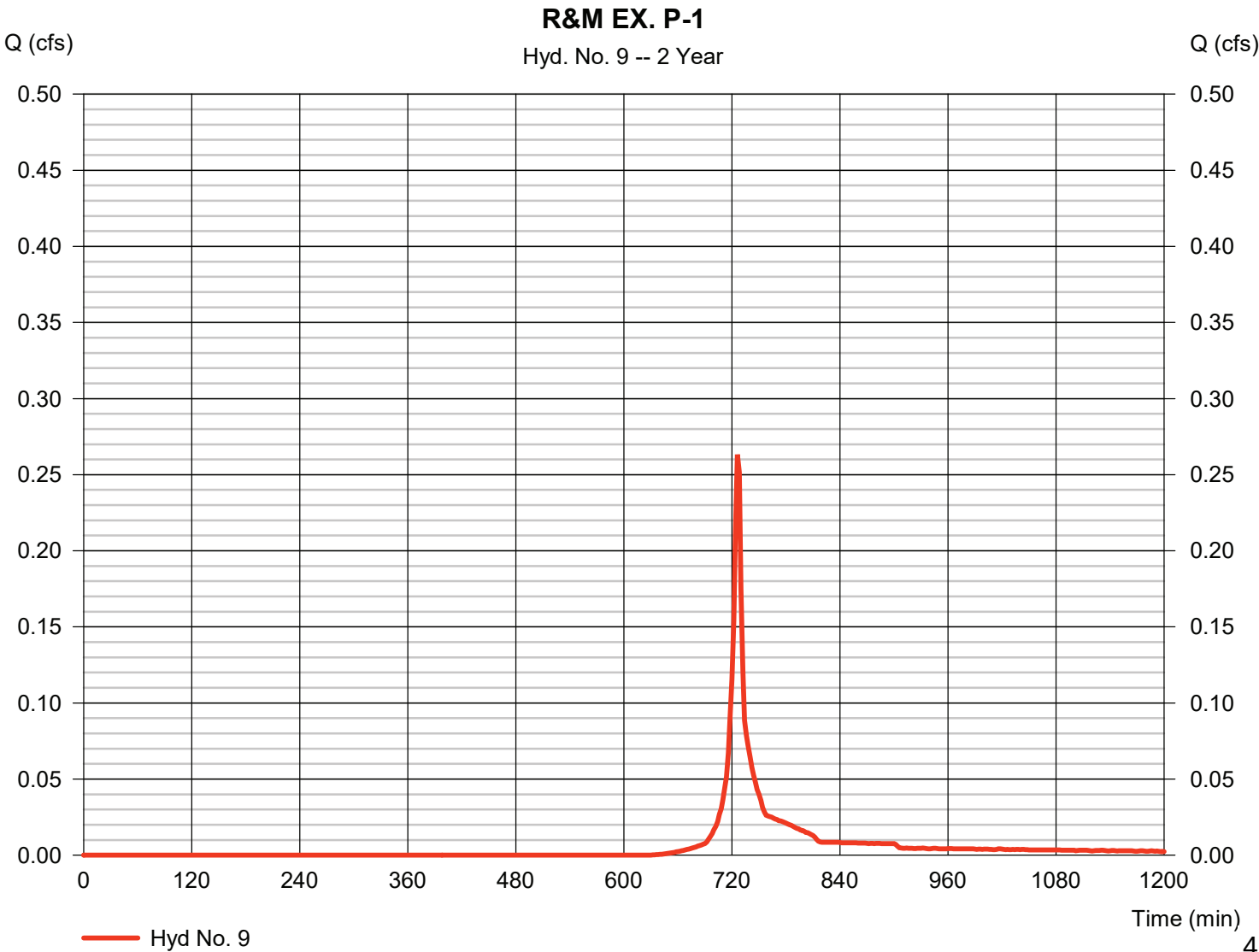
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.263 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.011 acft
Drainage area	= 0.120 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

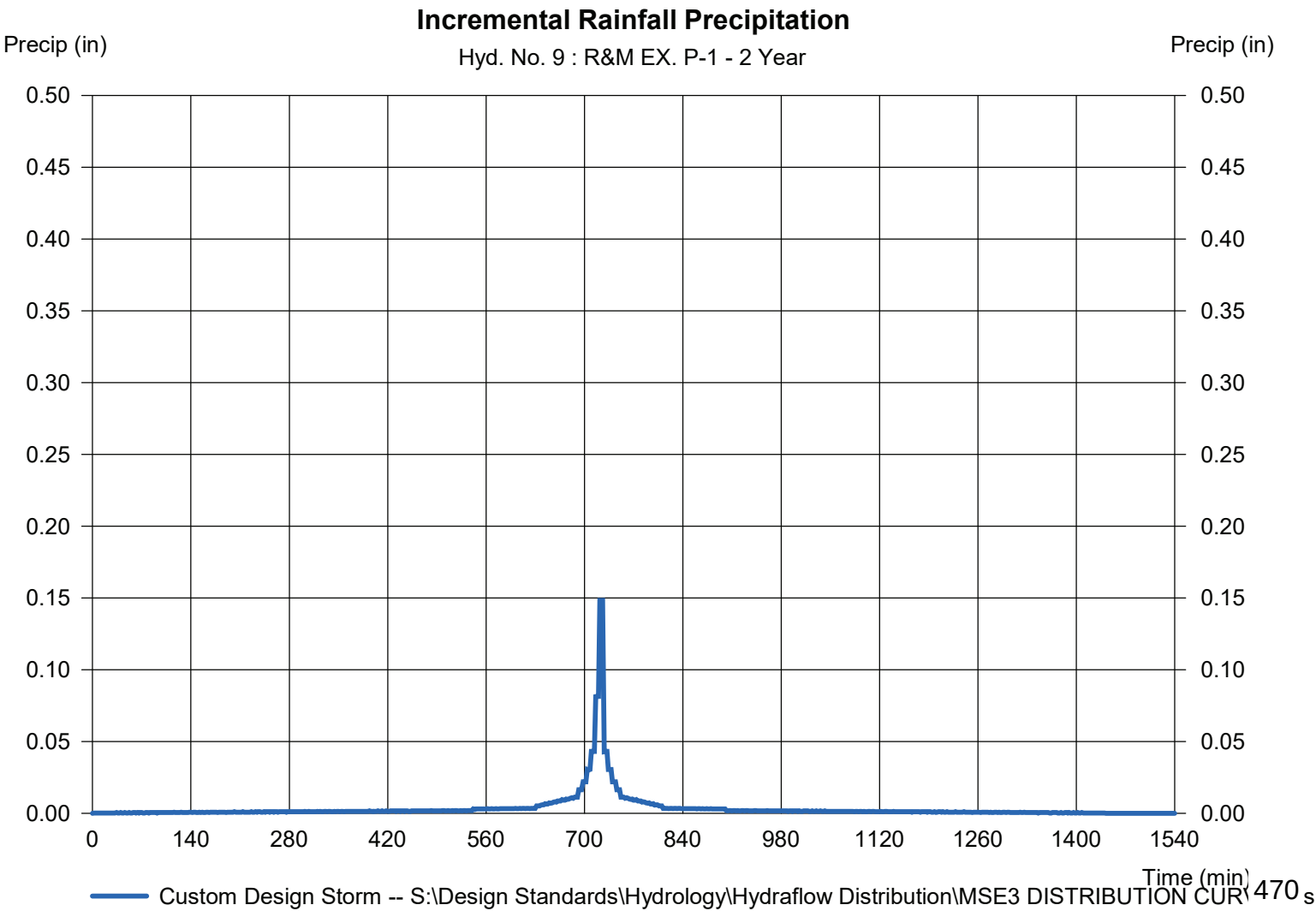


Precipitation Report

Hyd. No. 9

R&M EX. P-1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

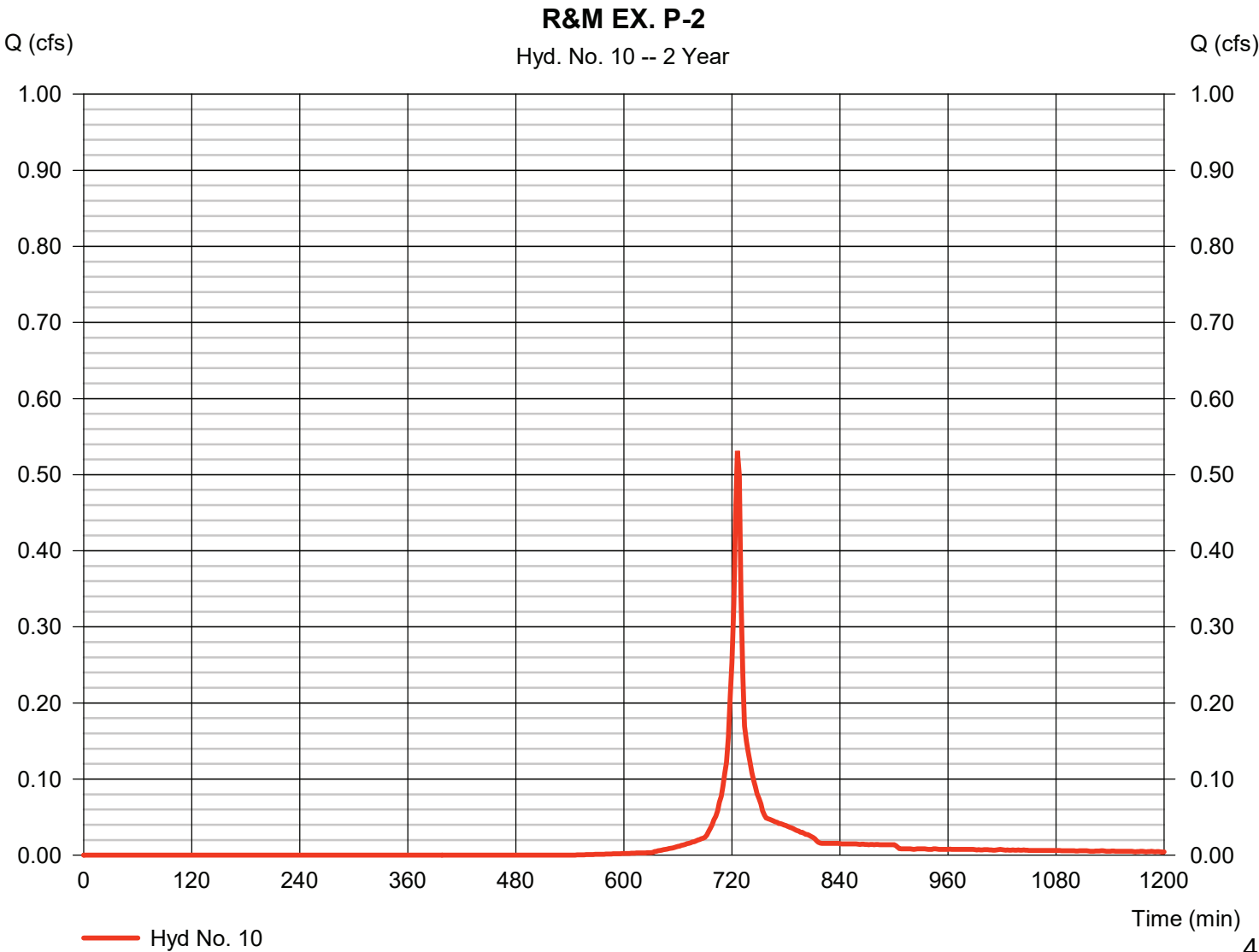
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.531 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.023 acft
Drainage area	= 0.190 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

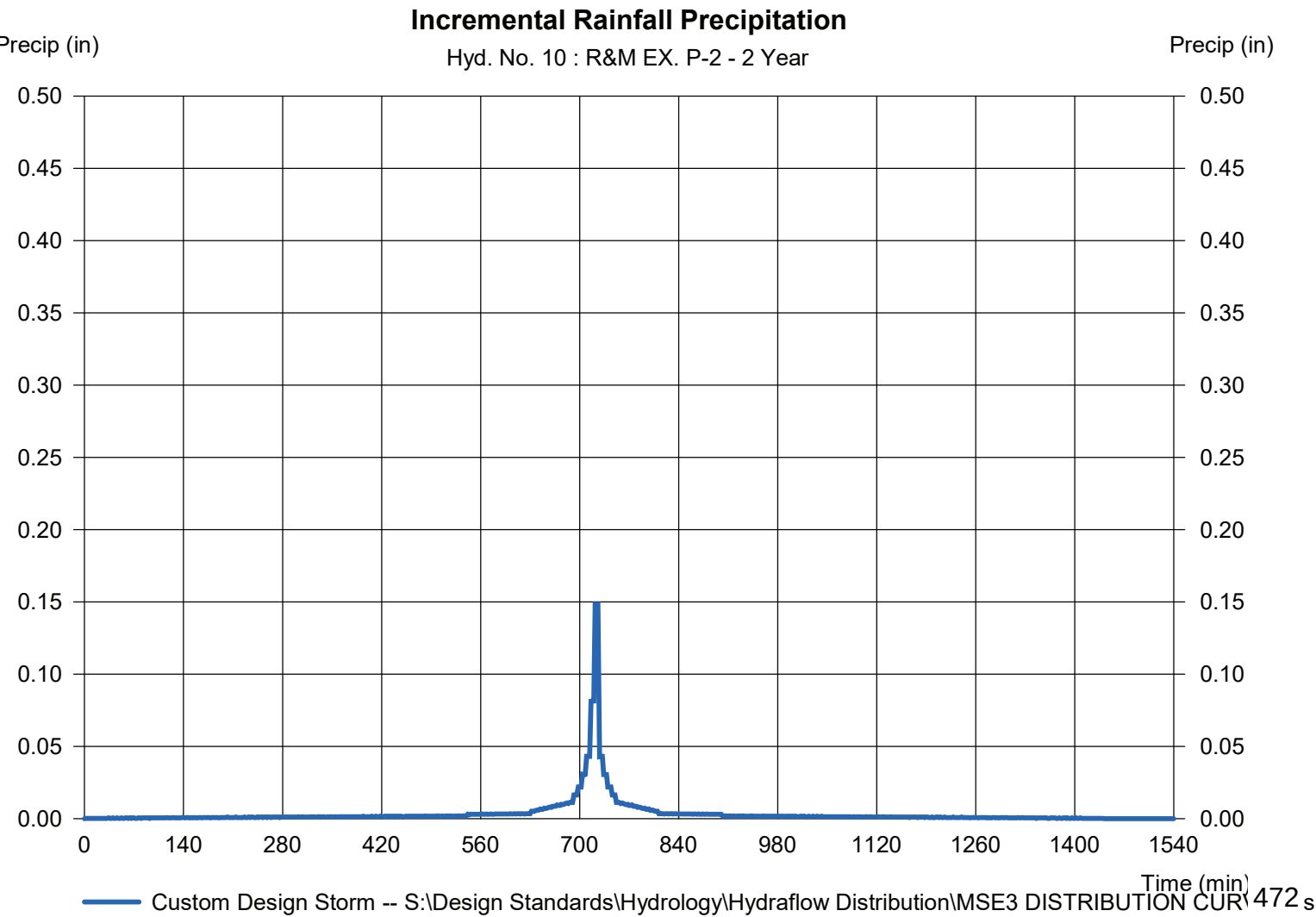
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

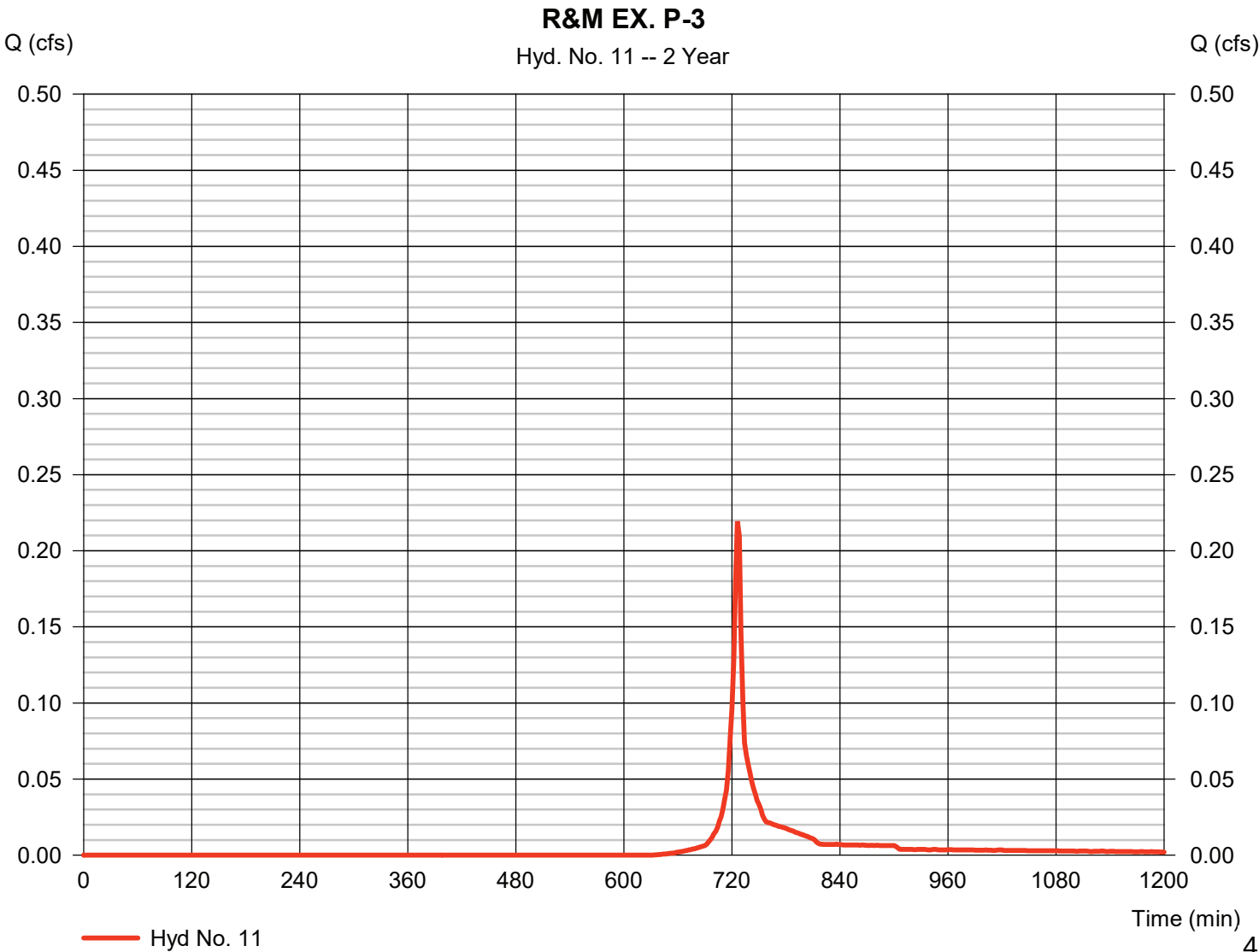
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.219 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.009 acft
Drainage area	= 0.100 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

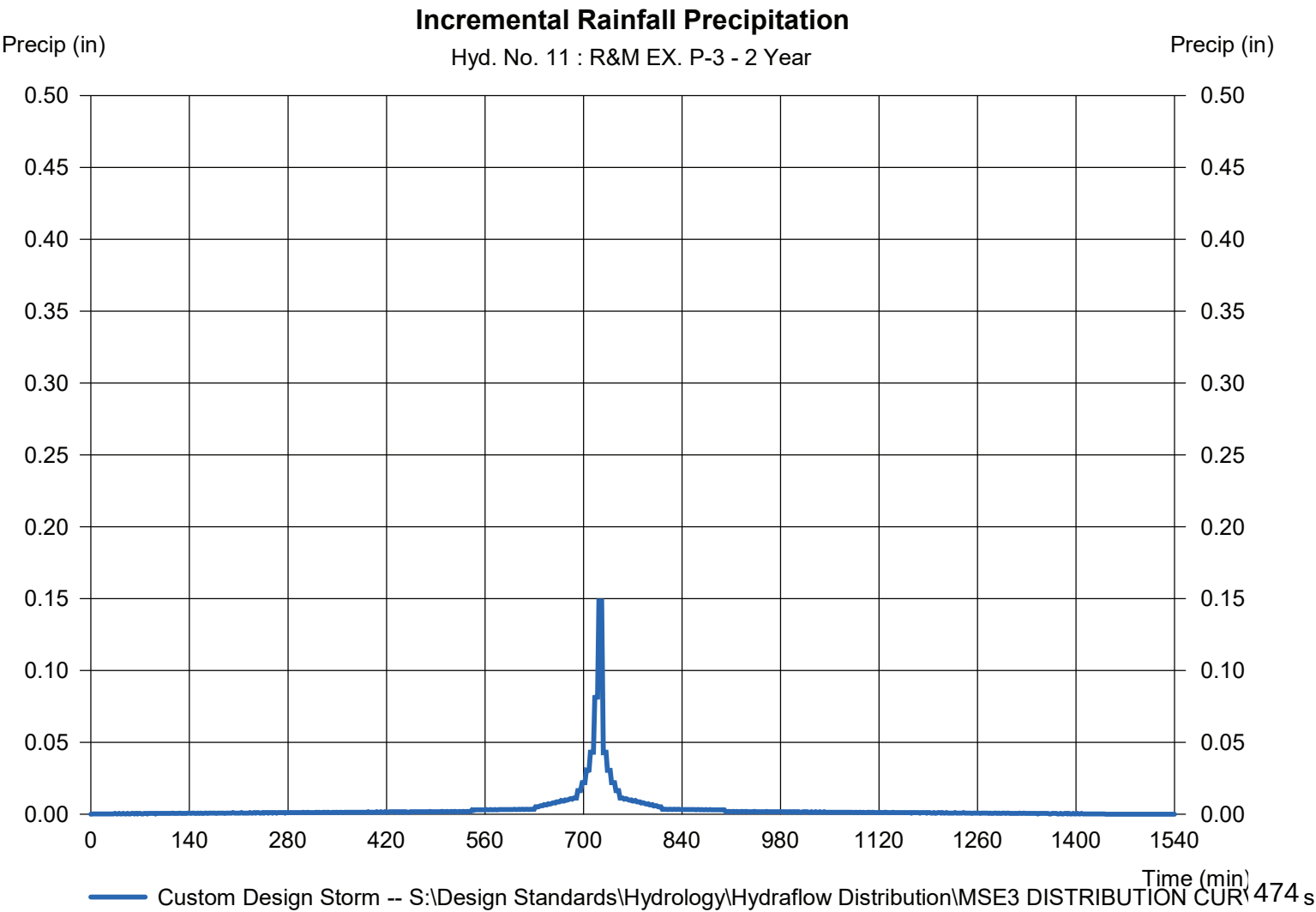
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

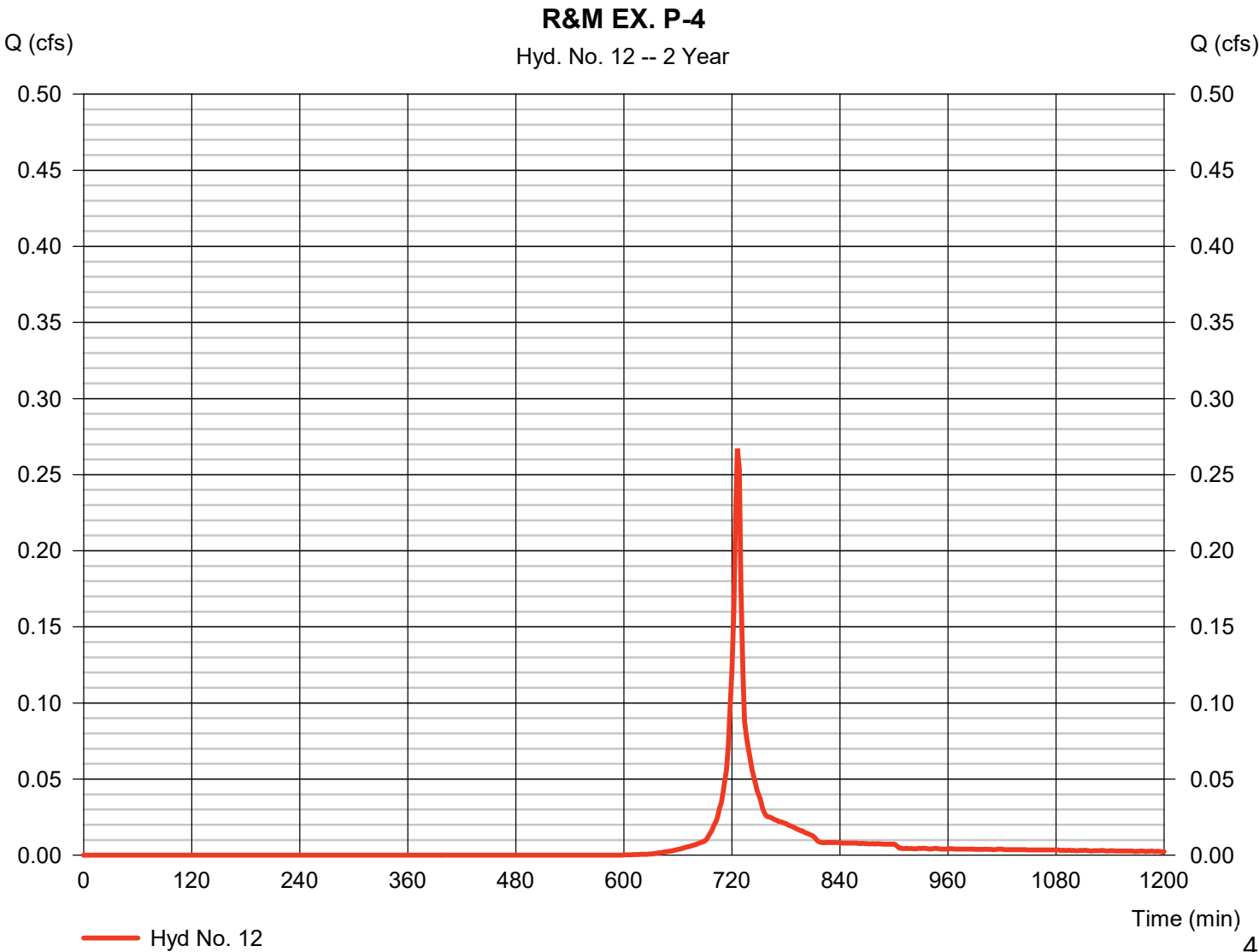
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.267 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.012 acft
Drainage area	= 0.110 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

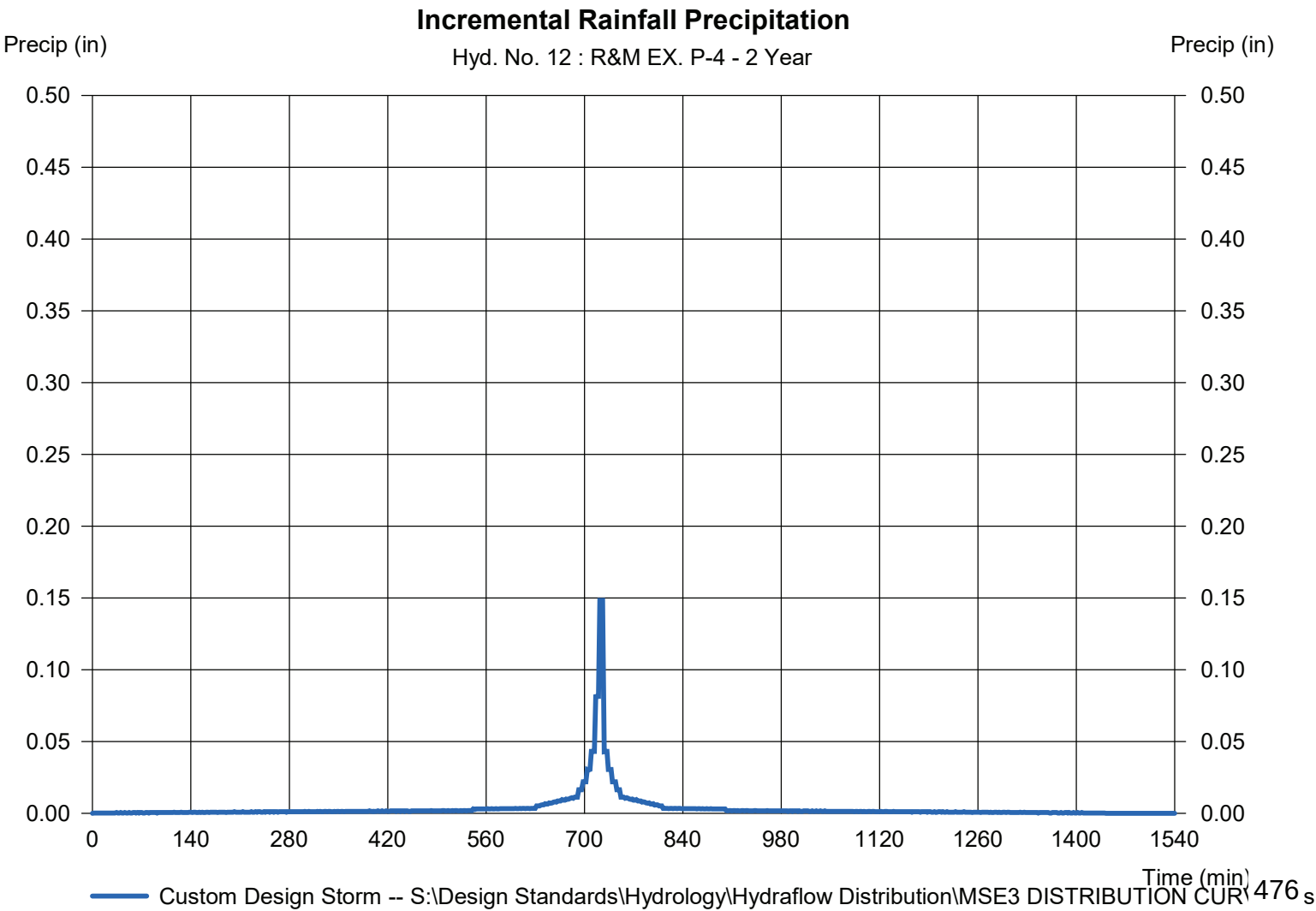
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

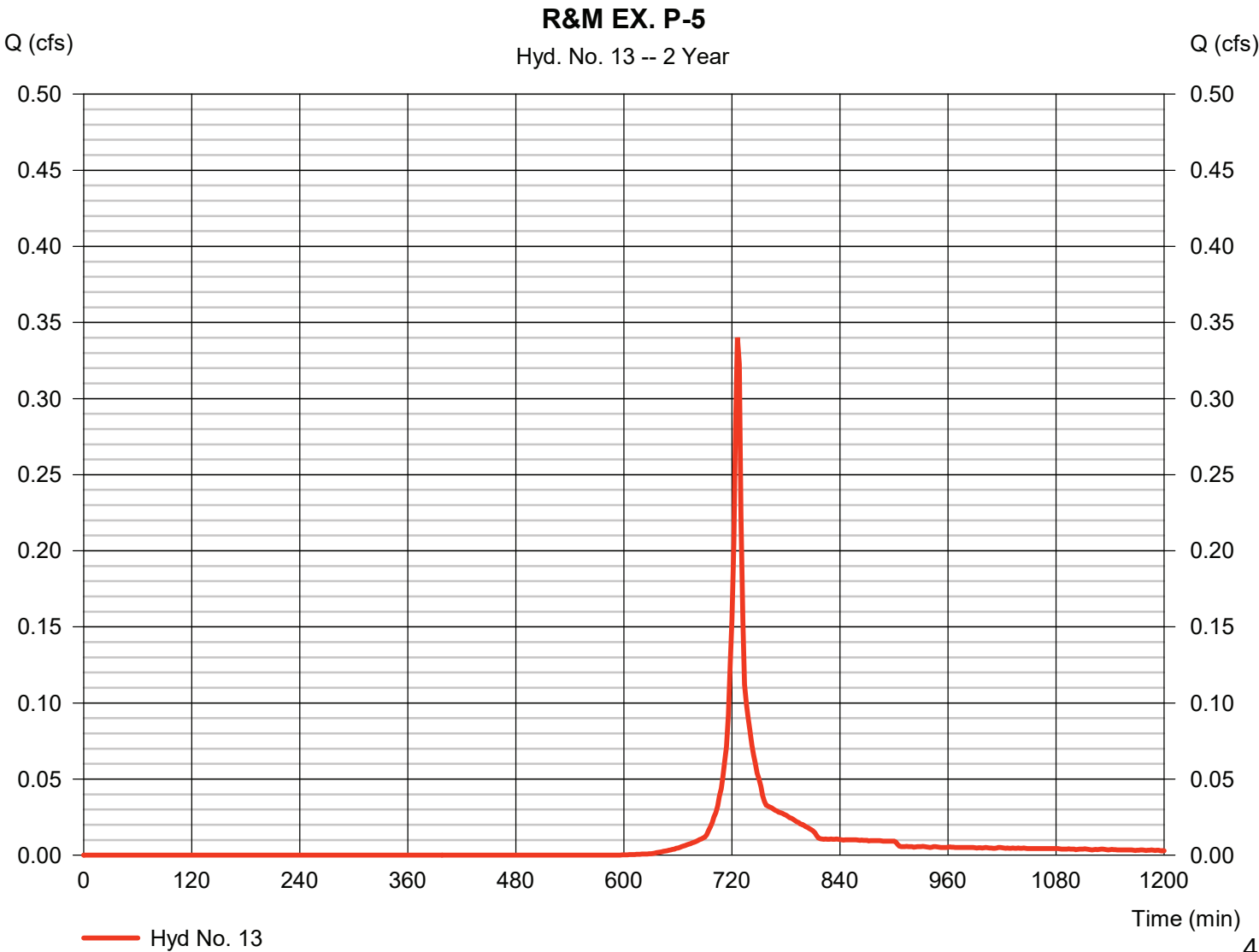
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.340 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.015 acft
Drainage area	= 0.140 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

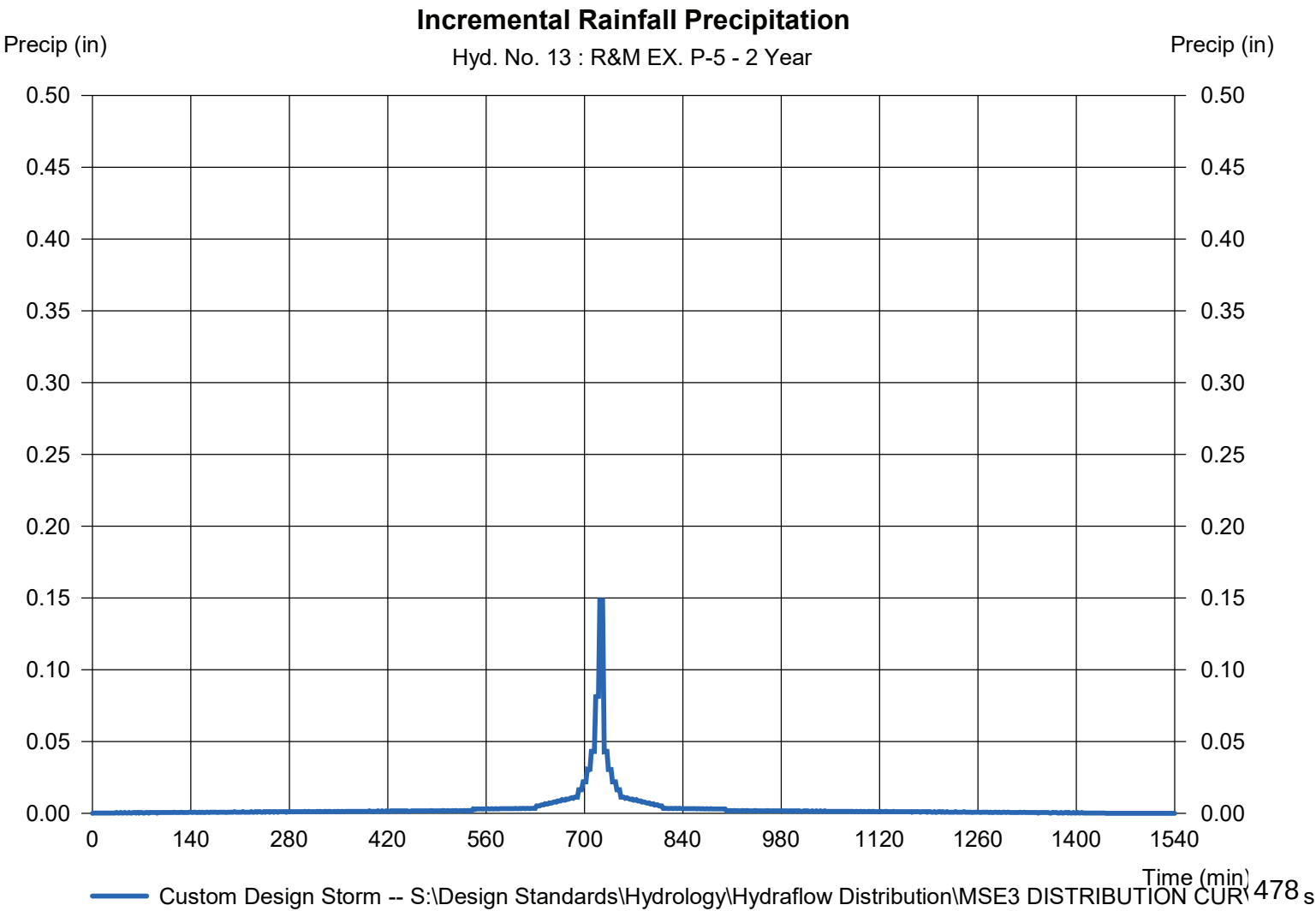
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

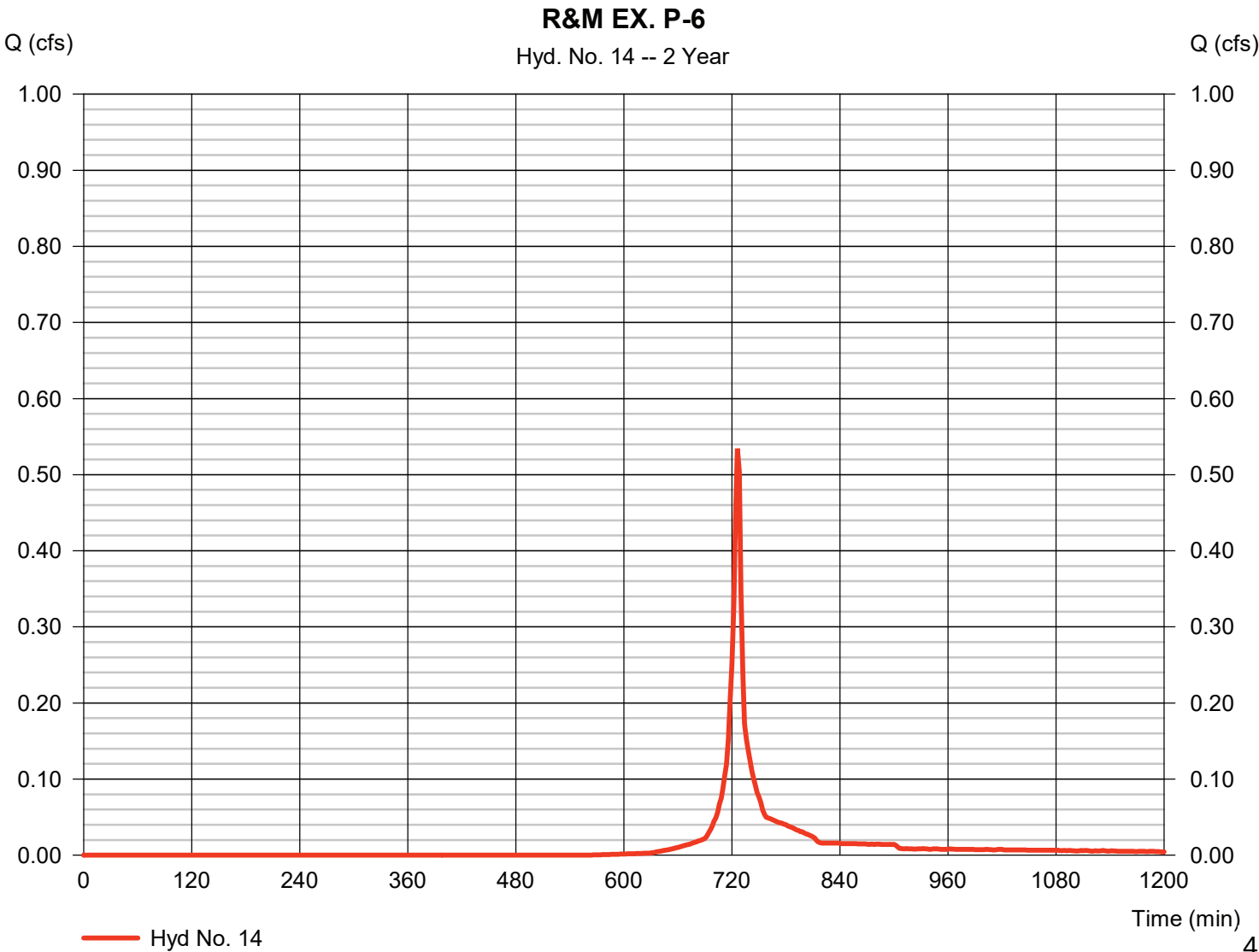
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.535 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.023 acft
Drainage area	= 0.200 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

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Friday, 06 / 28 / 2019

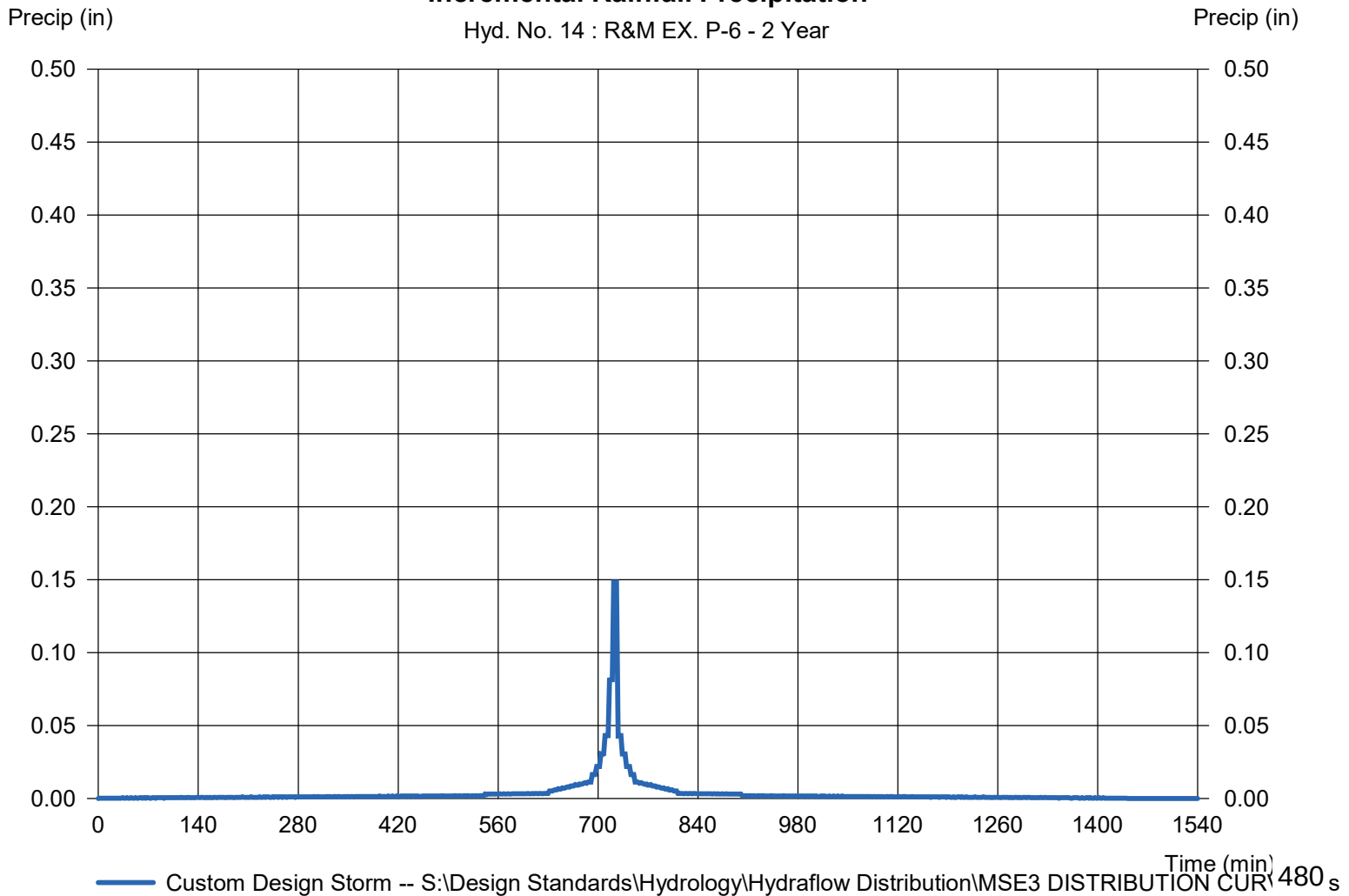
Hyd. No. 14

R&M EX. P-6

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 14 : R&M EX. P-6 - 2 Year



Hydrograph Report

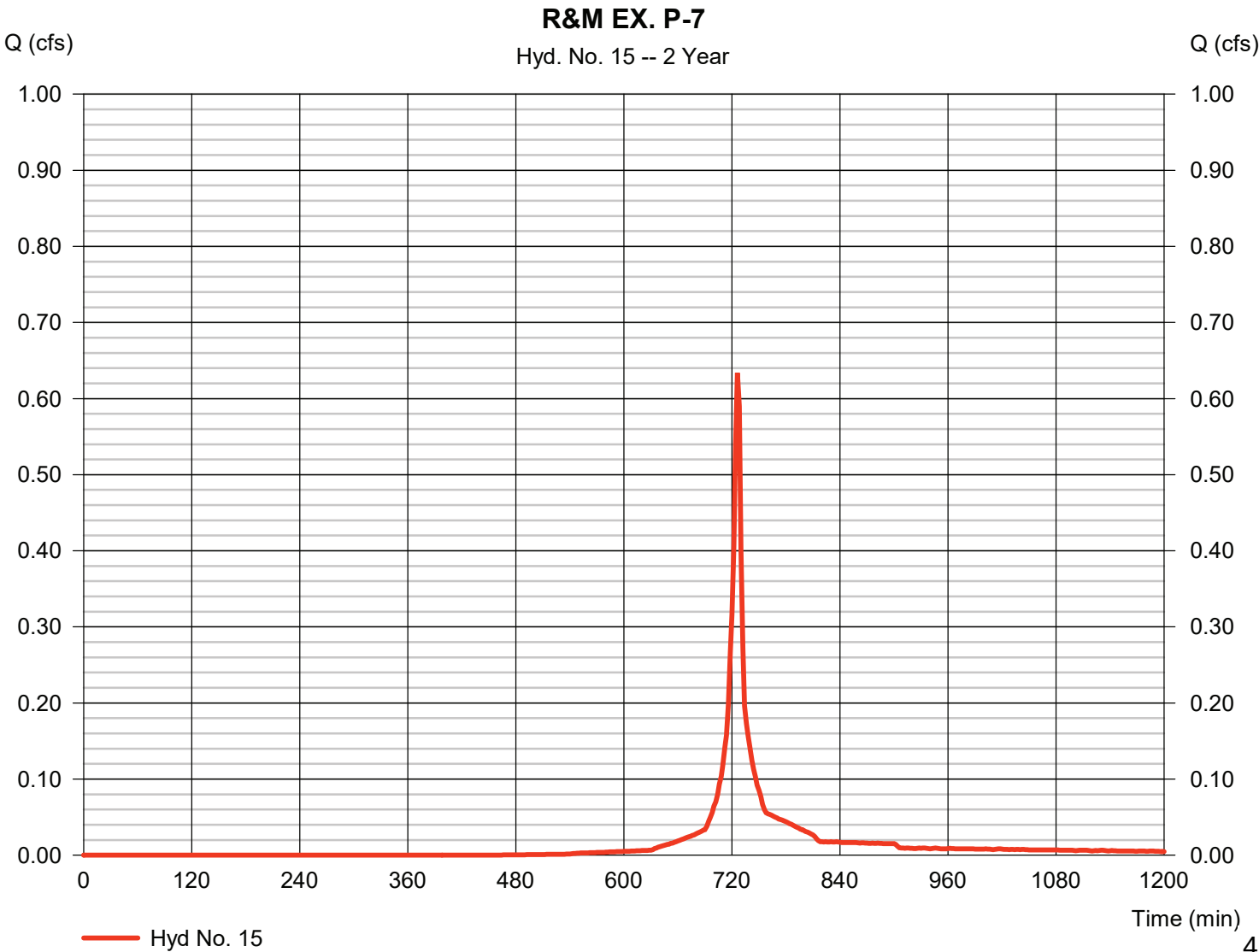
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.634 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.028 acft
Drainage area	= 0.200 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

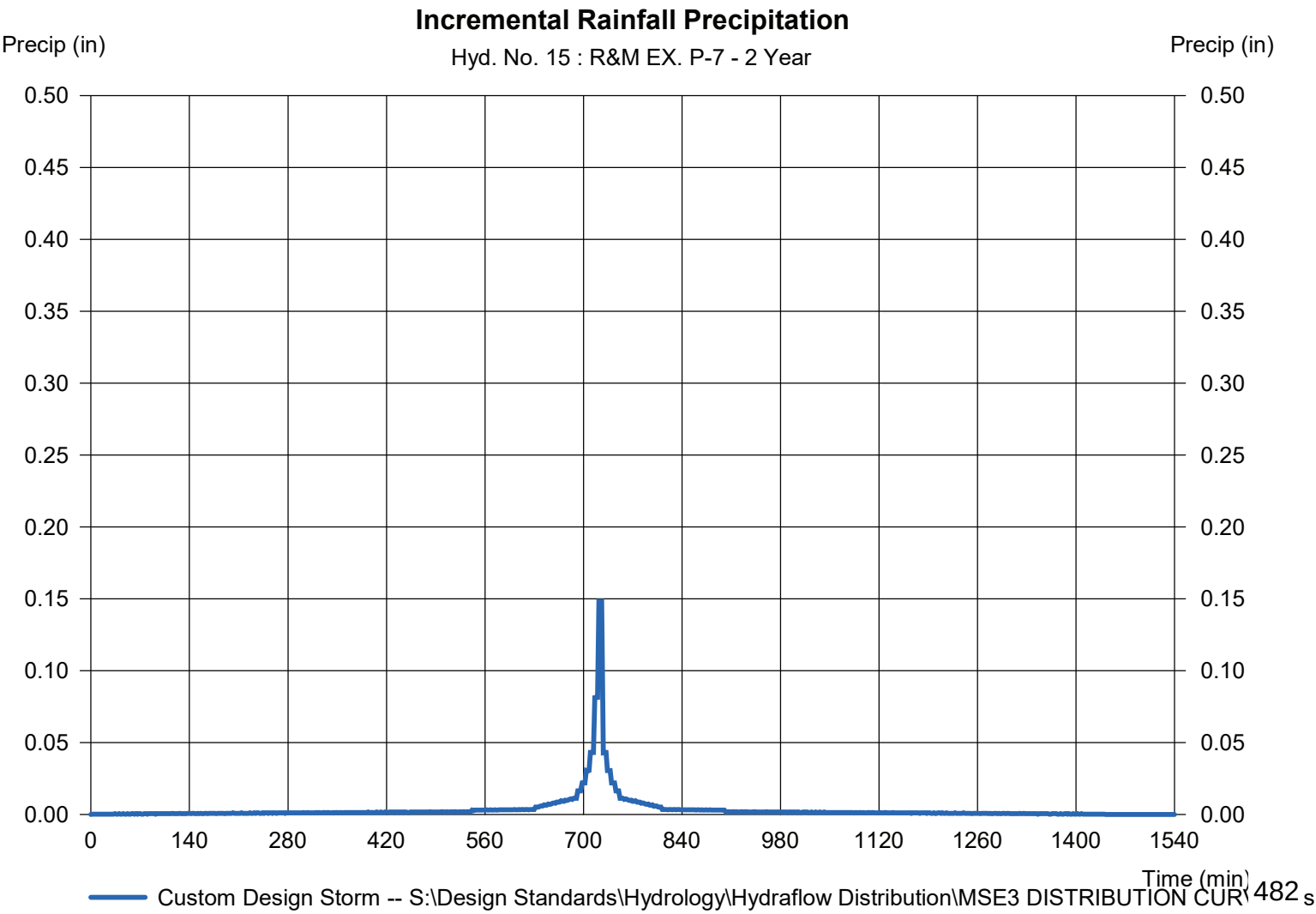
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

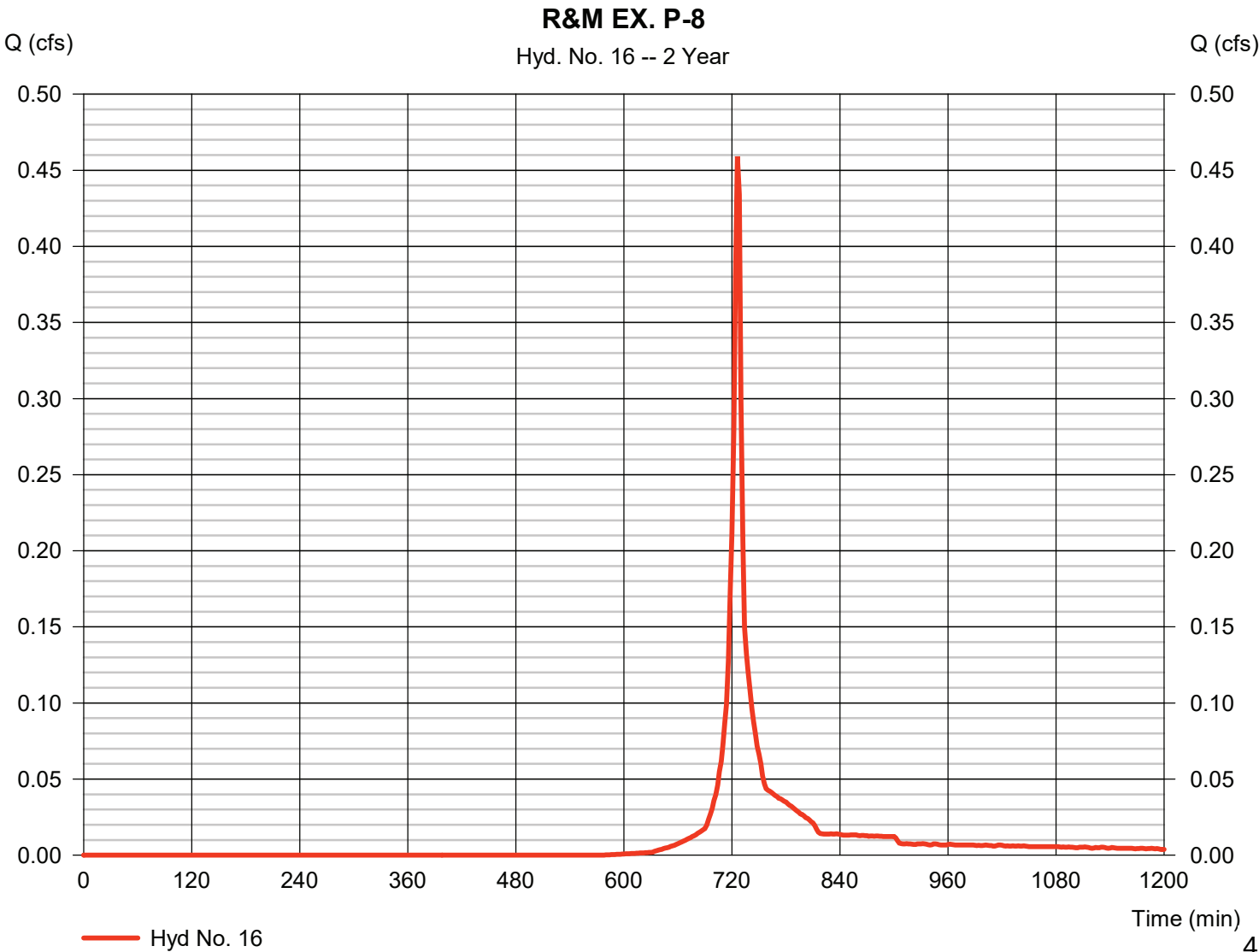
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.459 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.020 acft
Drainage area	= 0.180 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

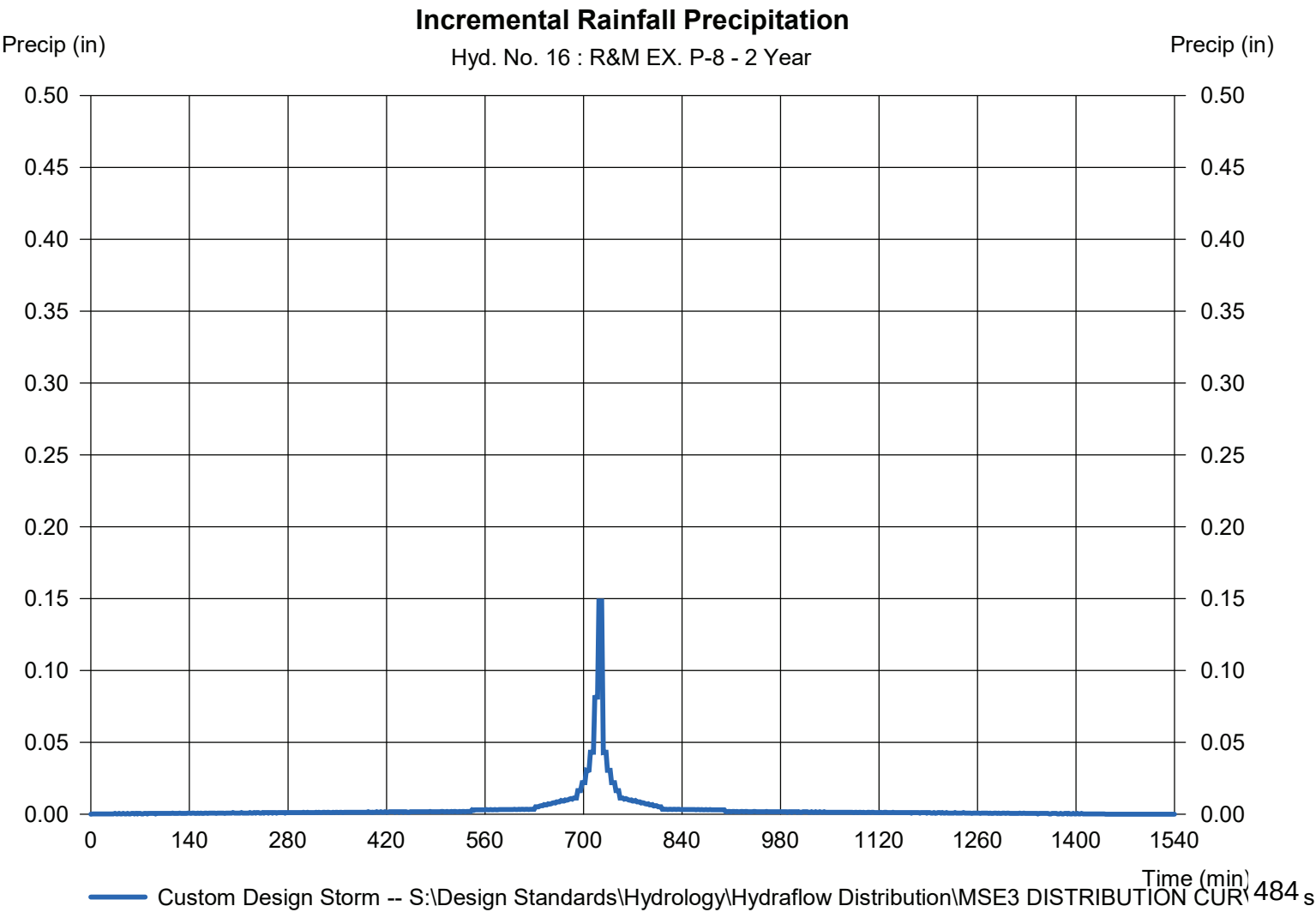
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

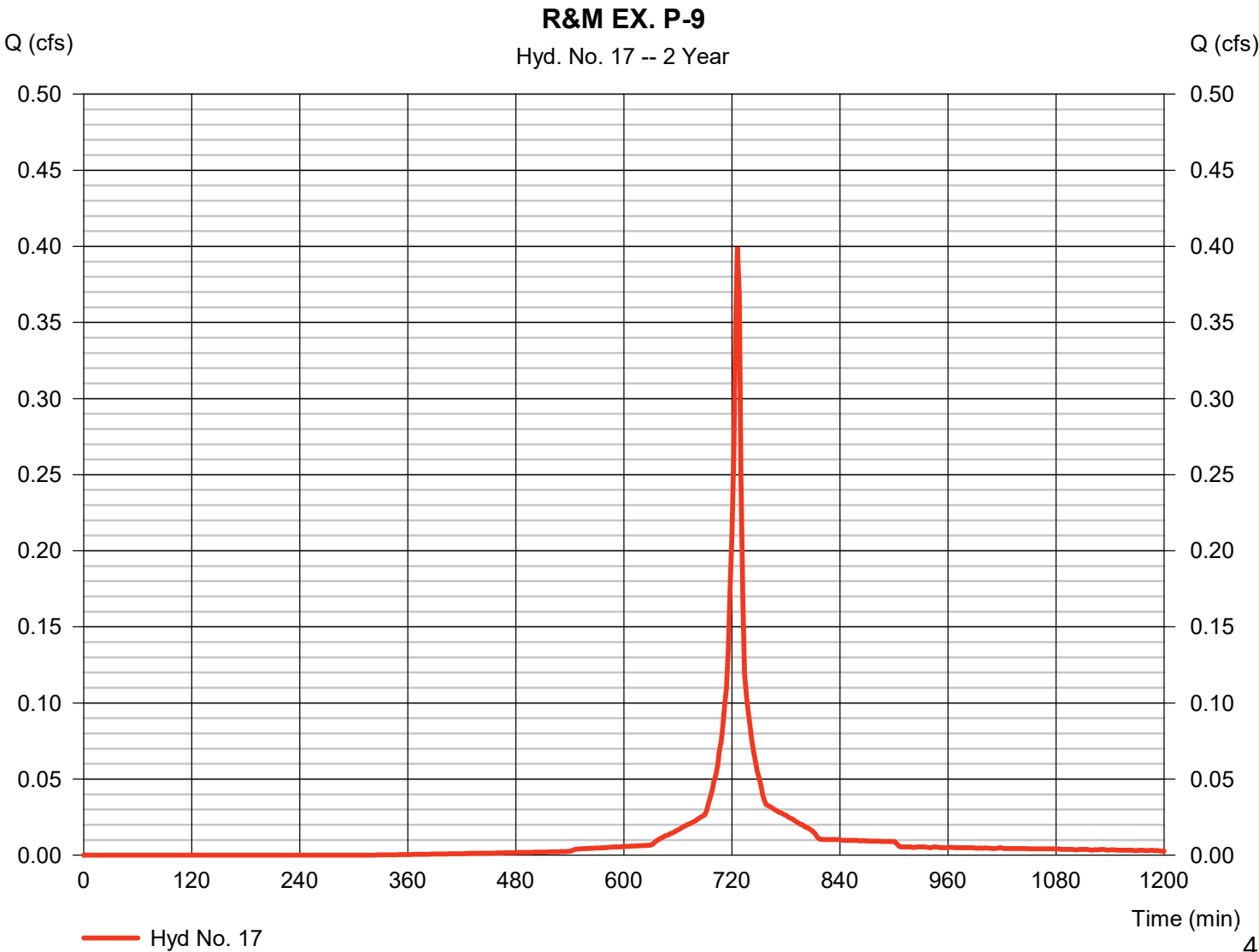
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.399 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.019 acft
Drainage area	= 0.110 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

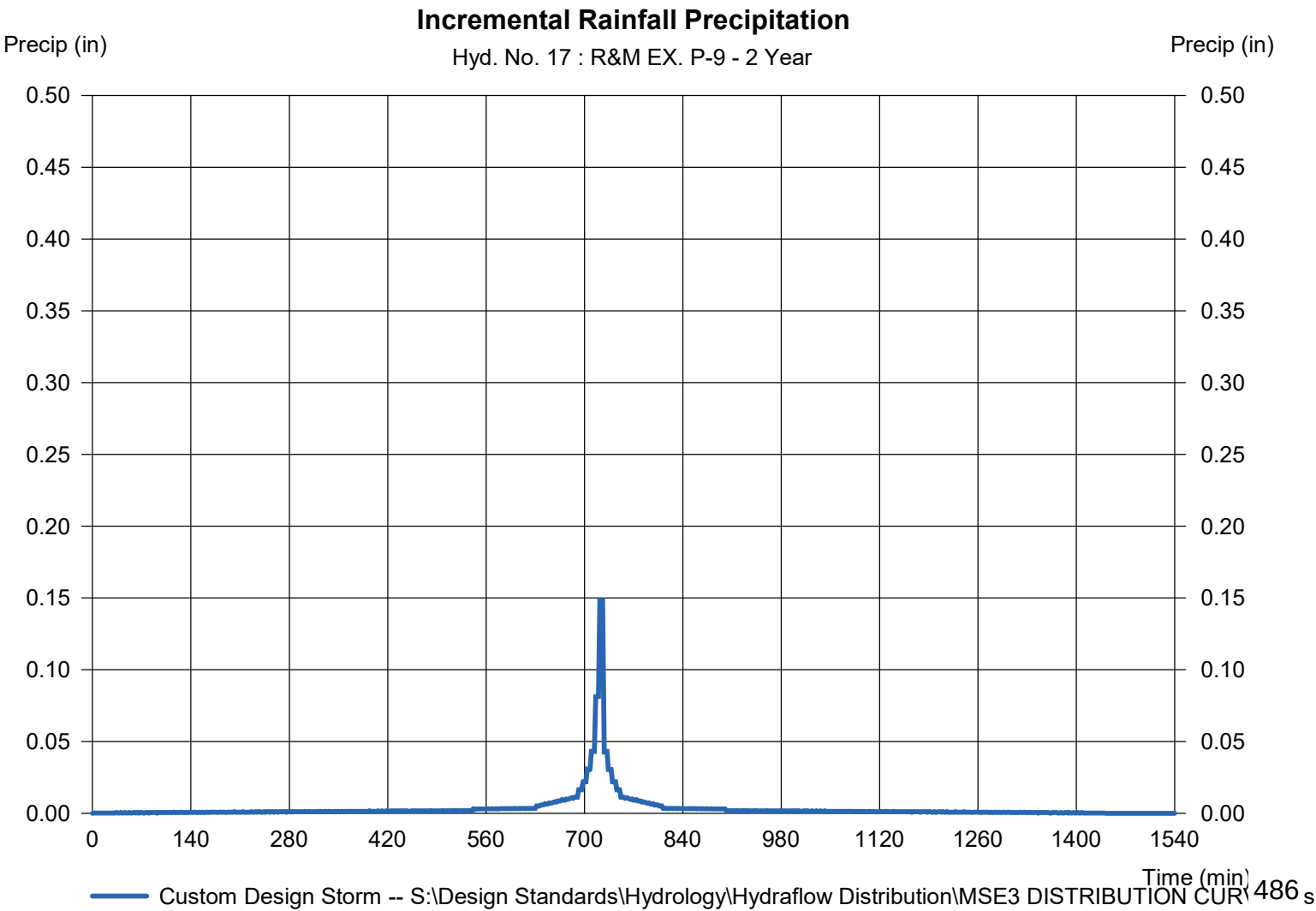
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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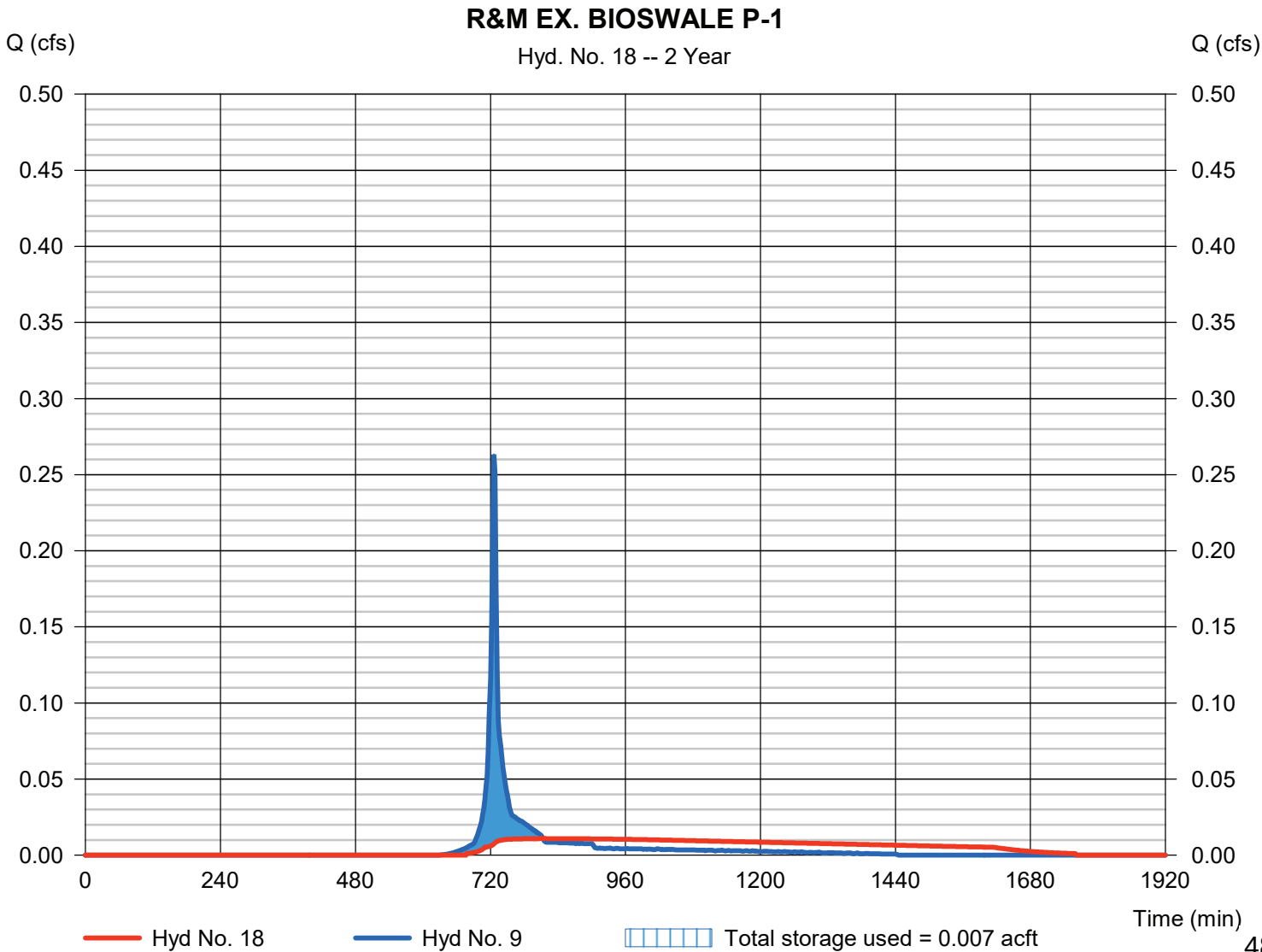
Friday, 06 / 28 / 2019

Hyd. No. 18

R&M EX. BIOSWALE P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.011 cfs
Storm frequency	= 2 yrs	Time to peak	= 814 min
Time interval	= 2 min	Hyd. volume	= 0.011 acft
Inflow hyd. No.	= 9 - R&M EX. P-1	Max. Elevation	= 851.06 ft
Reservoir name	= Ex. Bioswale P-1	Max. Storage	= 0.007 acft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

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

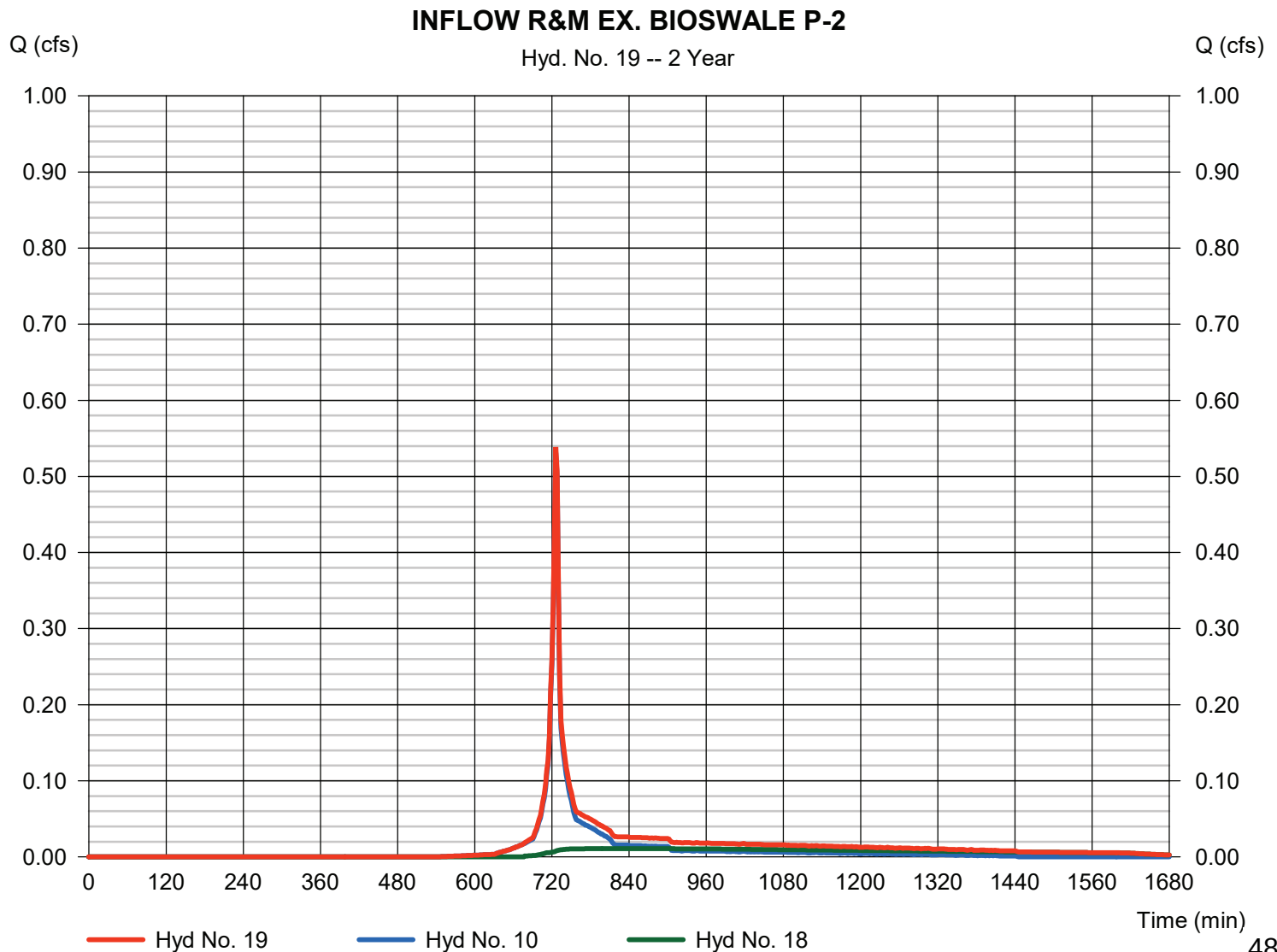
Friday, 06 / 28 / 2019

Hyd. No. 19

INFLOW R&M EX. BIOSWALE P-2

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 10, 18

Peak discharge = 0.539 cfs
Time to peak = 726 min
Hyd. volume = 0.034 acft
Contrib. drain. area = 0.190 ac



Hydrograph Report

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

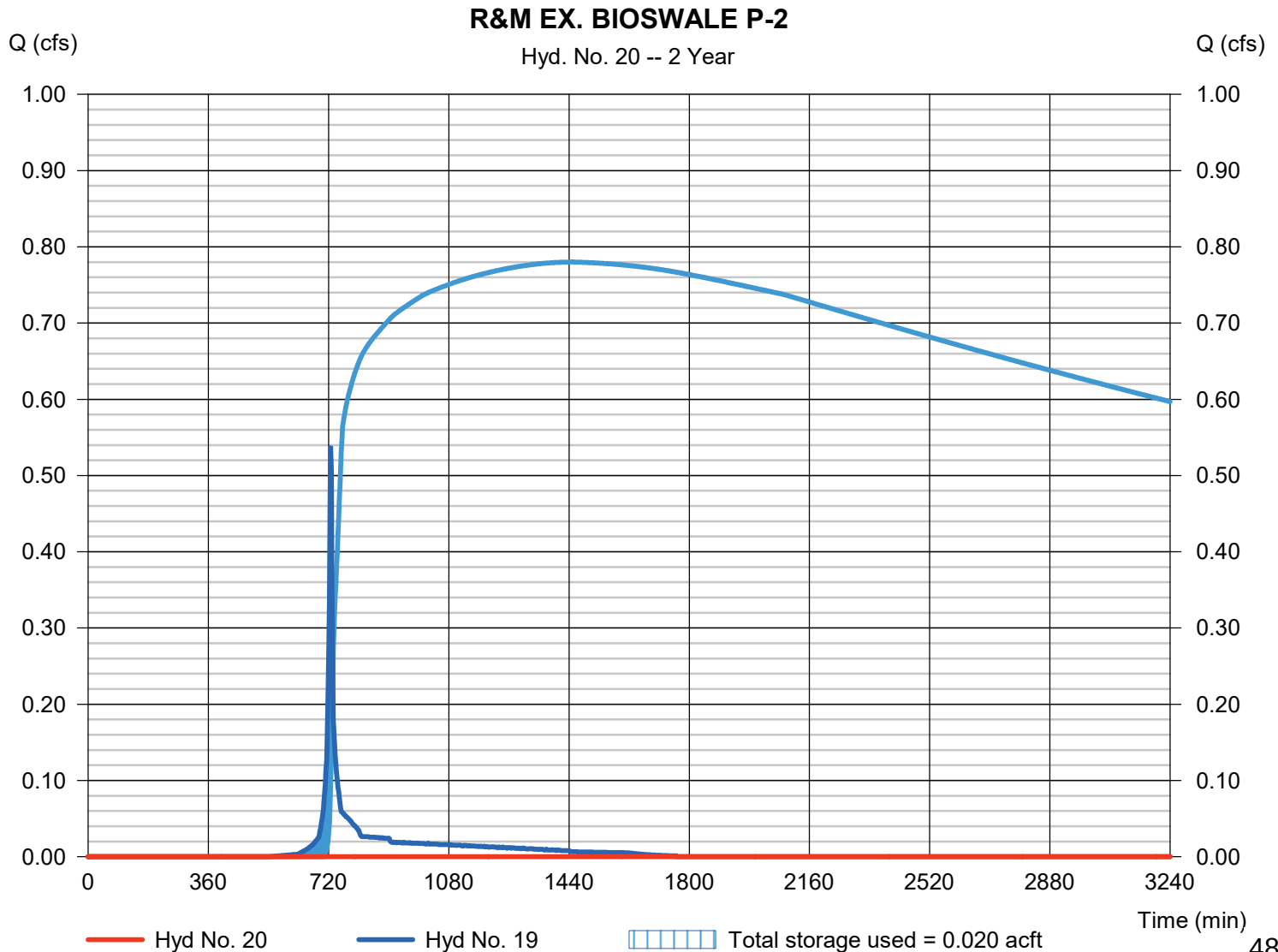
Friday, 06 / 28 / 2019

Hyd. No. 20

R&M EX. BIOSWALE P-2

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 2682 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 19 - INFLOW R&M EX. BIOSWALE P-2	Max. Elevation	= 851.17 ft
Reservoir name	= Ex. Bioswale P-2	Max. Storage	= 0.020 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

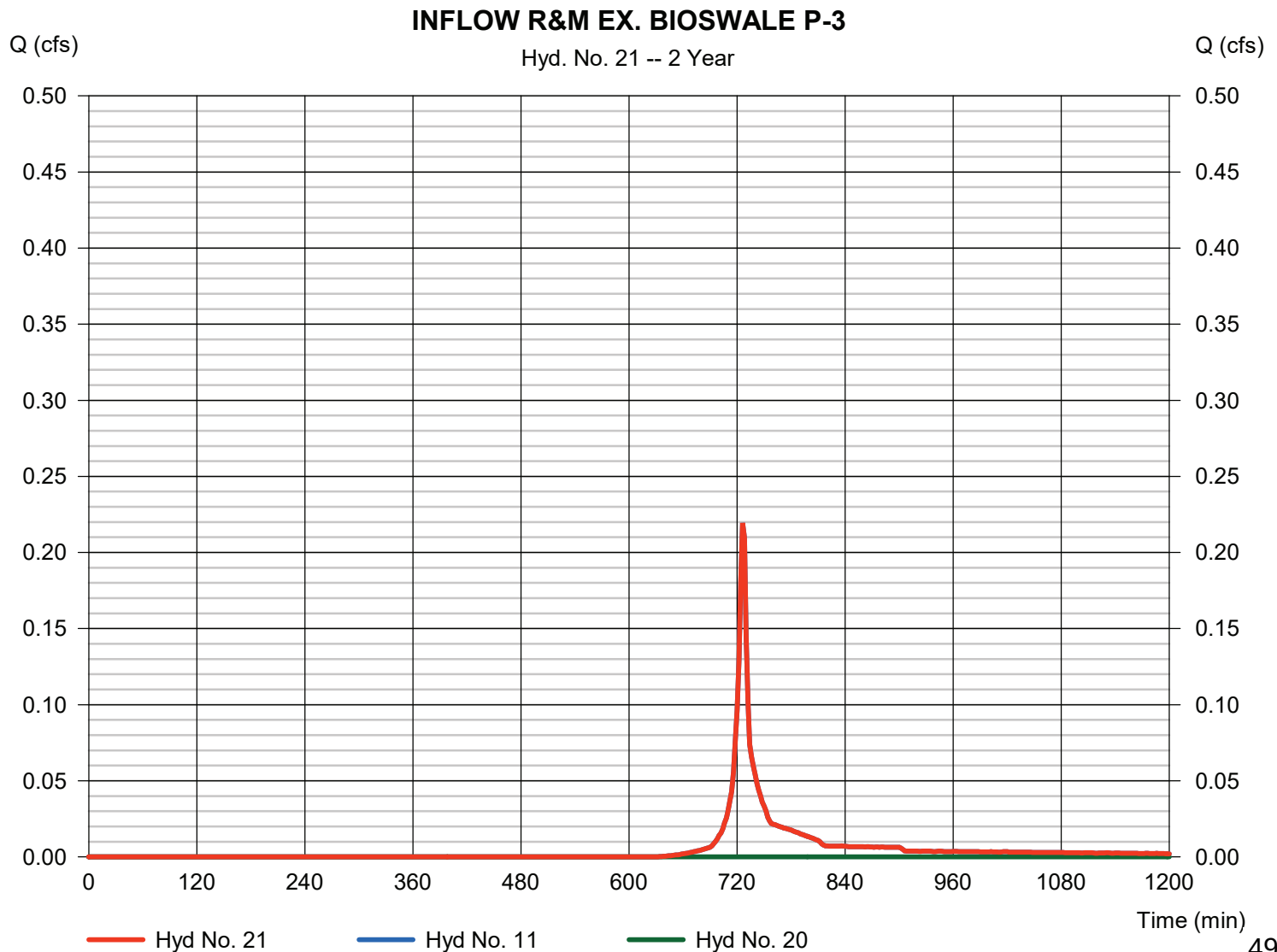
Friday, 06 / 28 / 2019

Hyd. No. 21

INFLOW R&M EX. BIOSWALE P-3

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 11, 20

Peak discharge = 0.219 cfs
Time to peak = 726 min
Hyd. volume = 0.009 acft
Contrib. drain. area = 0.100 ac



490

Hydrograph Report

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

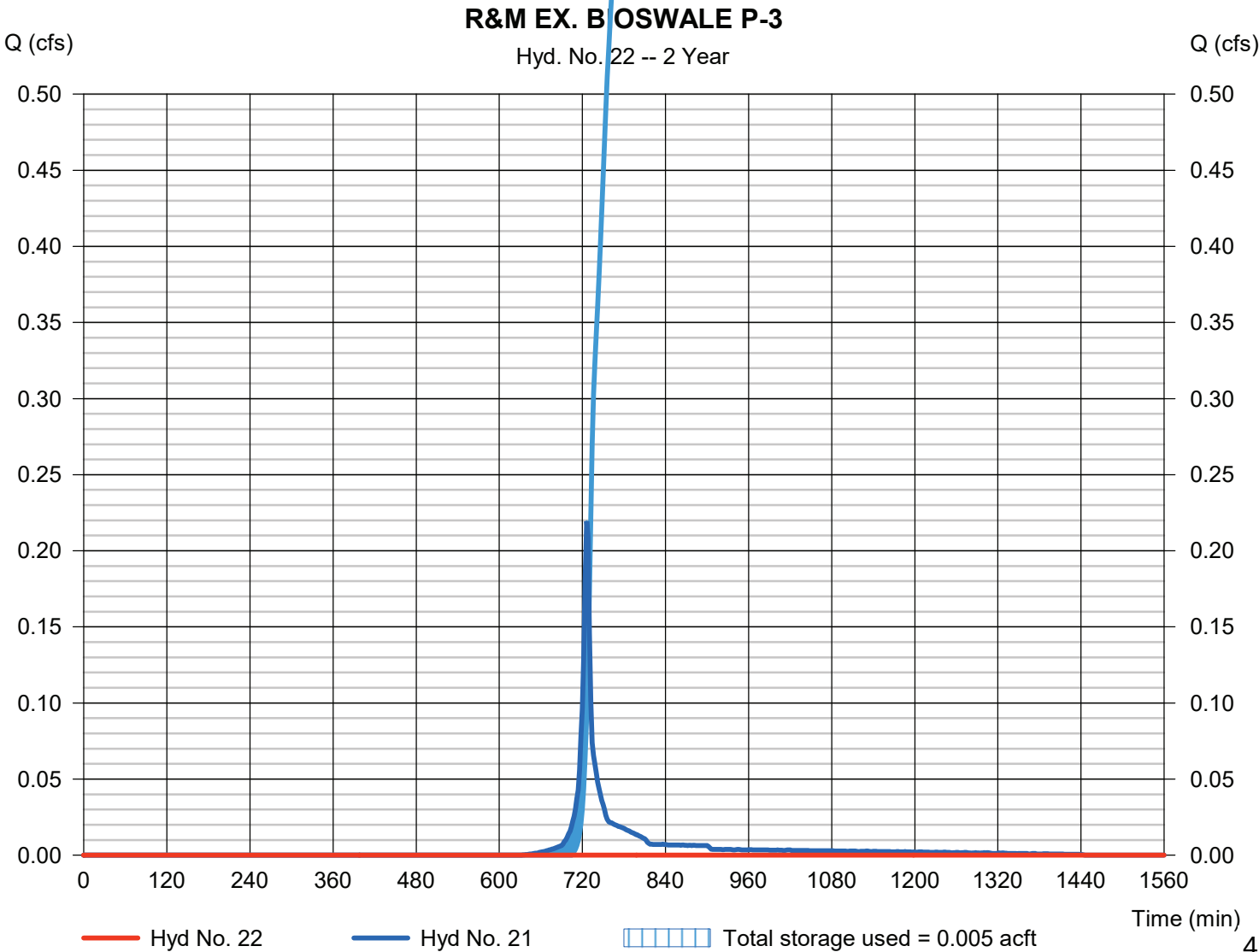
Friday, 06 / 28 / 2019

Hyd. No. 22

R&M EX. BIOSWALE P-3

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 21 - INFLOW R&M EX. BIOSWALE P-3	Max. Elevation	= 849.71 ft
Reservoir name	= Ex. Bioswale P-3	Max. Storage	= 0.005 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

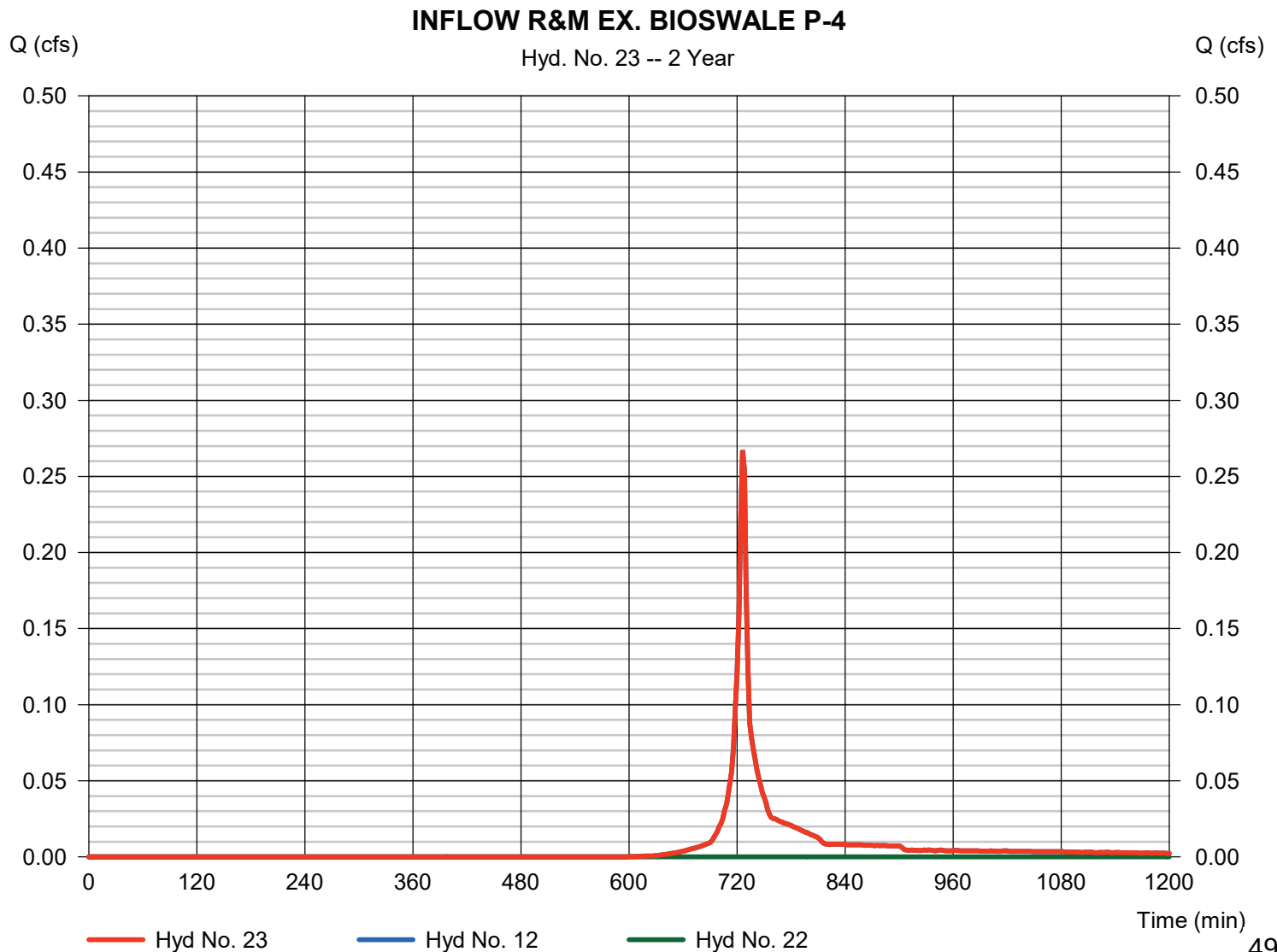
Friday, 06 / 28 / 2019

Hyd. No. 23

INFLOW R&M EX. BIOSWALE P-4

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 12, 22

Peak discharge = 0.267 cfs
Time to peak = 726 min
Hyd. volume = 0.012 acft
Contrib. drain. area = 0.110 ac



Hydrograph Report

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

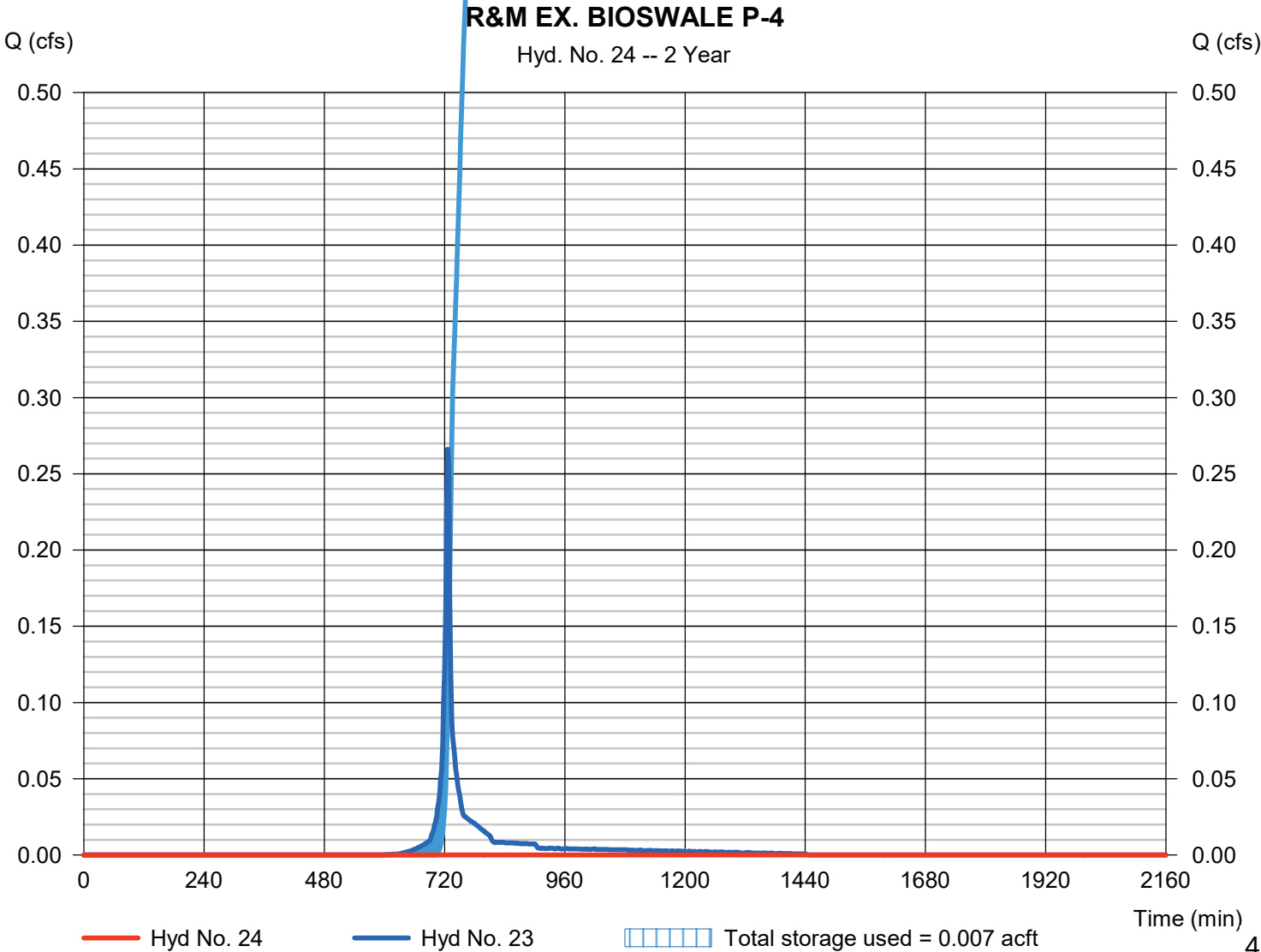
Friday, 06 / 28 / 2019

Hyd. No. 24

R&M EX. BIOSWALE P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 798 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 23 - INFLOW R&M EX. BIOSWALE P-4	Max. Elevation	= 848.99 ft
Reservoir name	= Ex. Bioswale P-4	Max. Storage	= 0.007 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

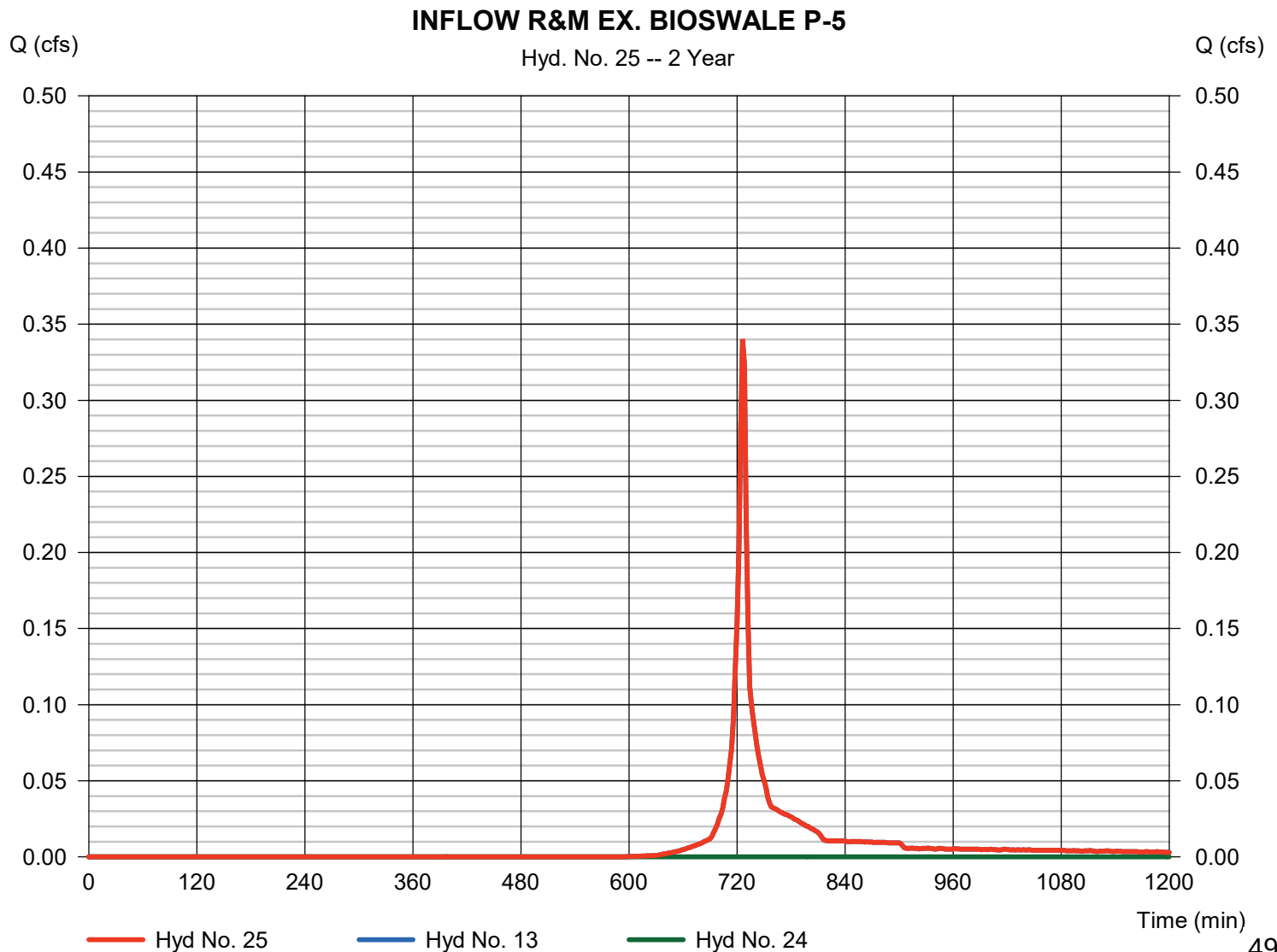
Friday, 06 / 28 / 2019

Hyd. No. 25

INFLOW R&M EX. BIOSWALE P-5

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 13, 24

Peak discharge = 0.340 cfs
Time to peak = 726 min
Hyd. volume = 0.015 acft
Contrib. drain. area = 0.140 ac



Hydrograph Report

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

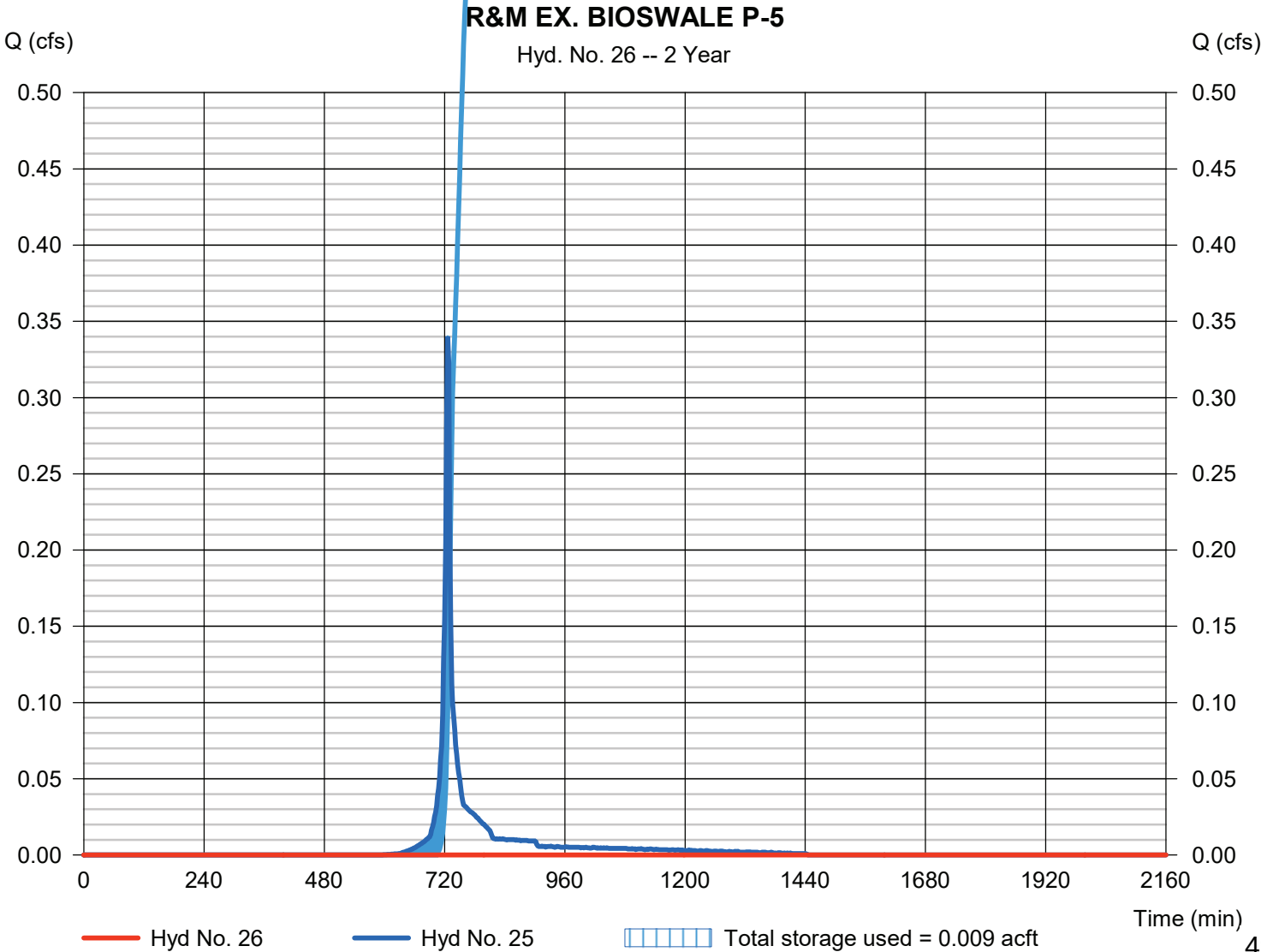
Friday, 06 / 28 / 2019

Hyd. No. 26

R&M EX. BIOSWALE P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 25 - INFLOW R&M EX. BIOSWALE P-5	Max. Elevation	= 847.71 ft
Reservoir name	= Ex. Bioswale P-5	Max. Storage	= 0.000 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

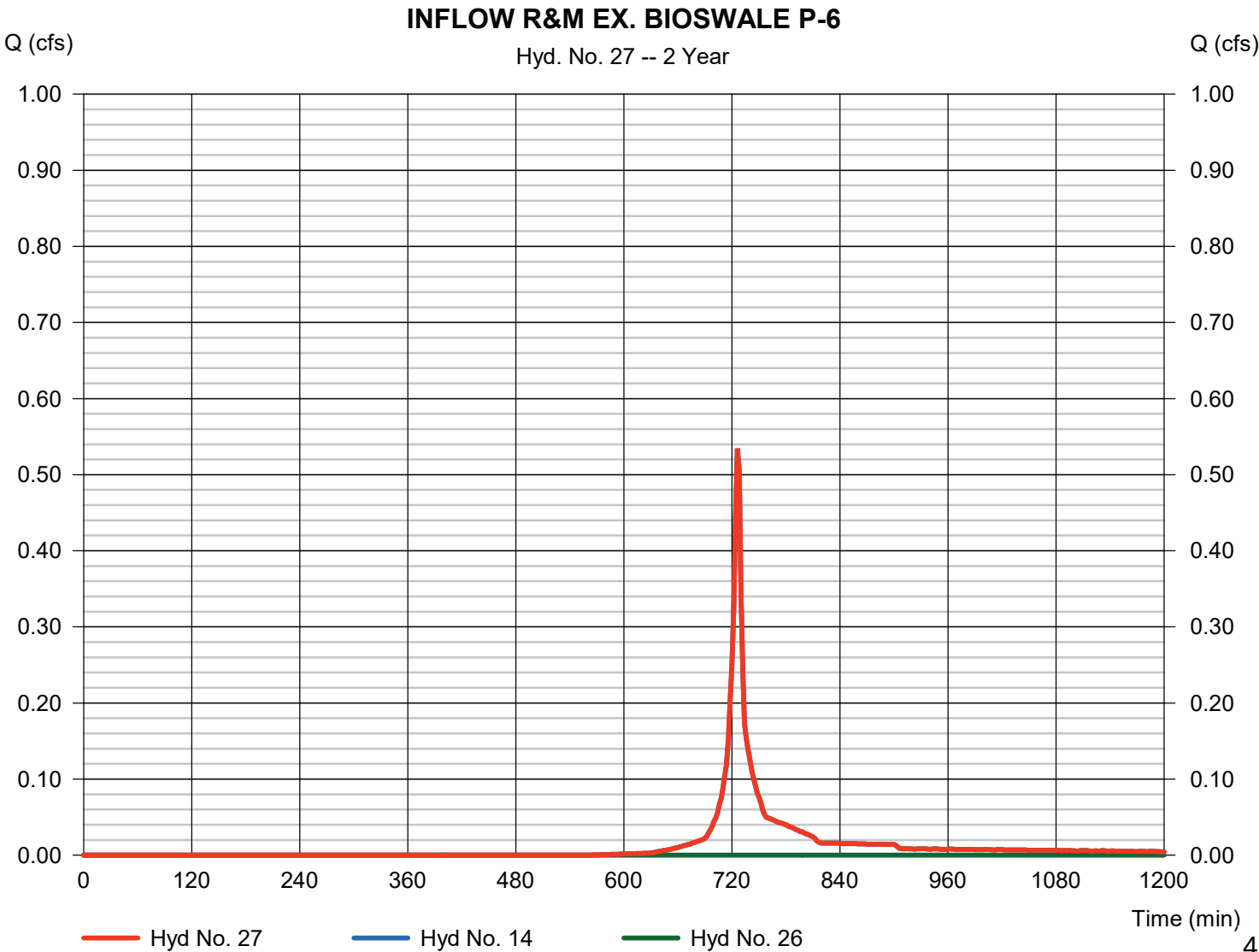
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Friday, 06 / 28 / 2019

Hyd. No. 27

INFLOW R&M EX. BIOSWALE P-6

Hydrograph type	= Combine	Peak discharge	= 0.535 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.023 acft
Inflow hyds.	= 14, 26	Contrib. drain. area	= 0.200 ac



Hydrograph Report

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

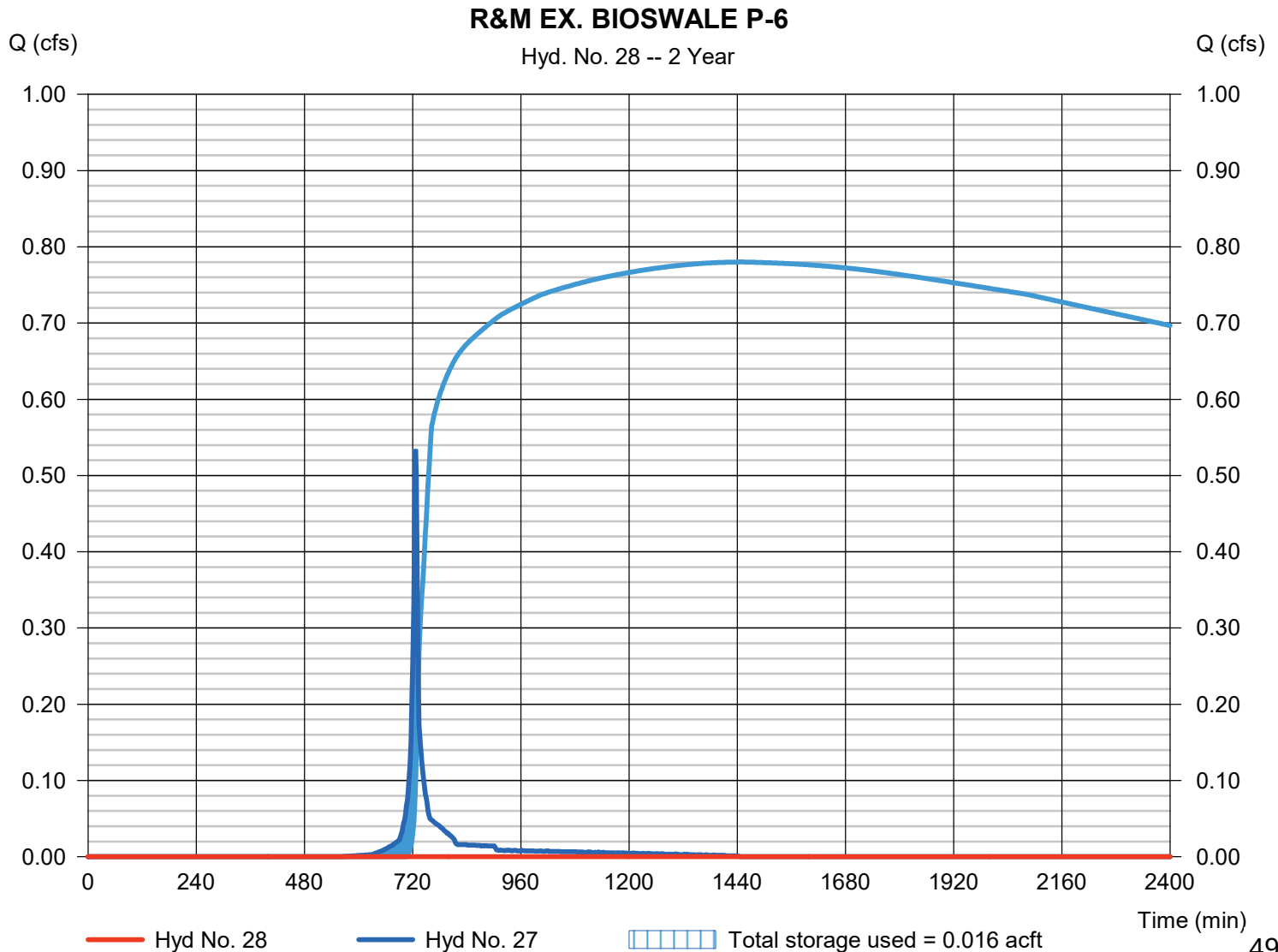
Friday, 06 / 28 / 2019

Hyd. No. 28

R&M EX. BIOSWALE P-6

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 1744 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 27 - INFLOW R&M EX. BIOSWALE P-6	Max. Elevation	= 846.49 ft
Reservoir name	= Ex. Bioswale P-6	Max. Storage	= 0.016 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

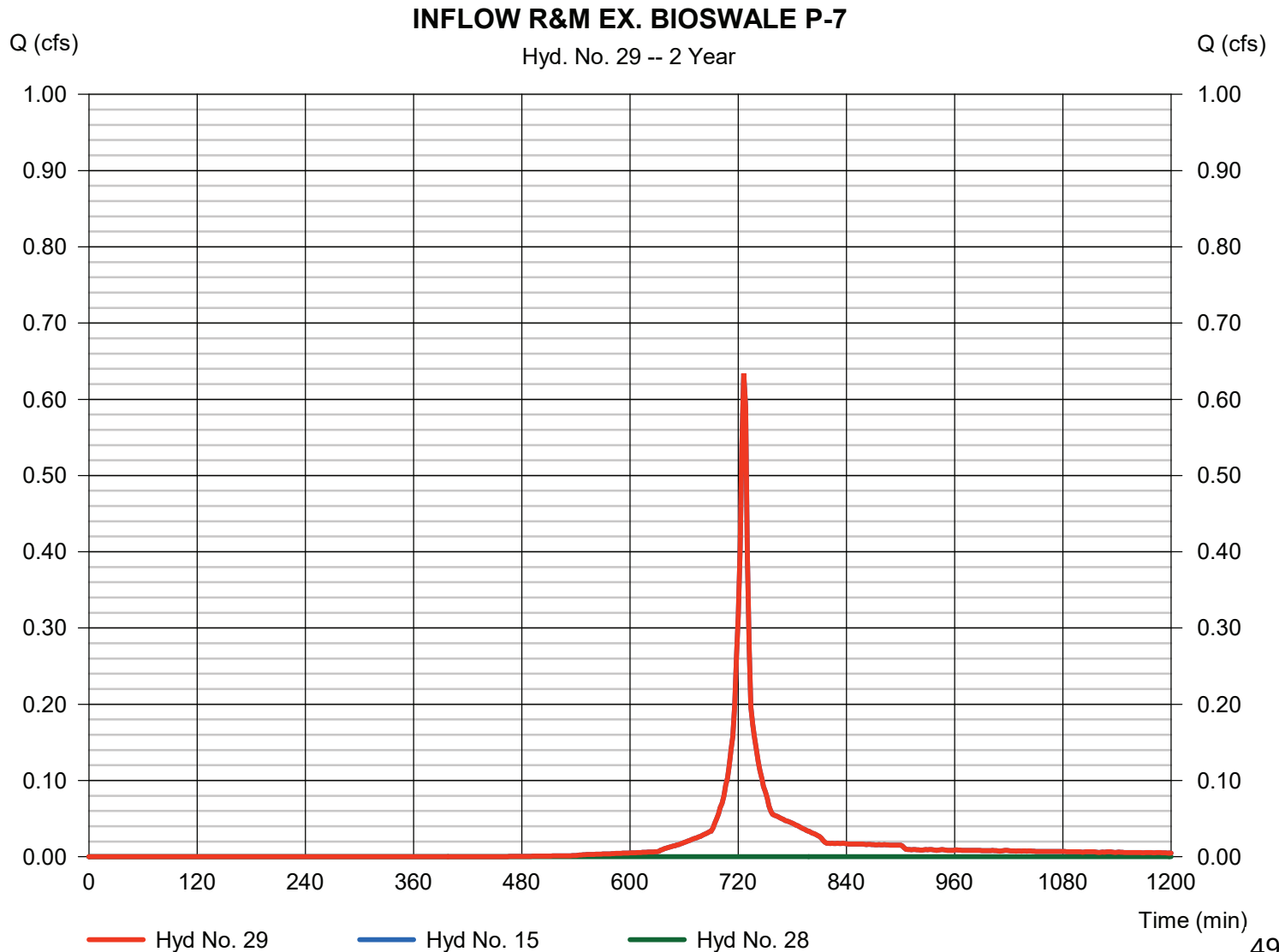
Friday, 06 / 28 / 2019

Hyd. No. 29

INFLOW R&M EX. BIOSWALE P-7

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 15, 28

Peak discharge = 0.634 cfs
Time to peak = 726 min
Hyd. volume = 0.028 acft
Contrib. drain. area = 0.200 ac



Hydrograph Report

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

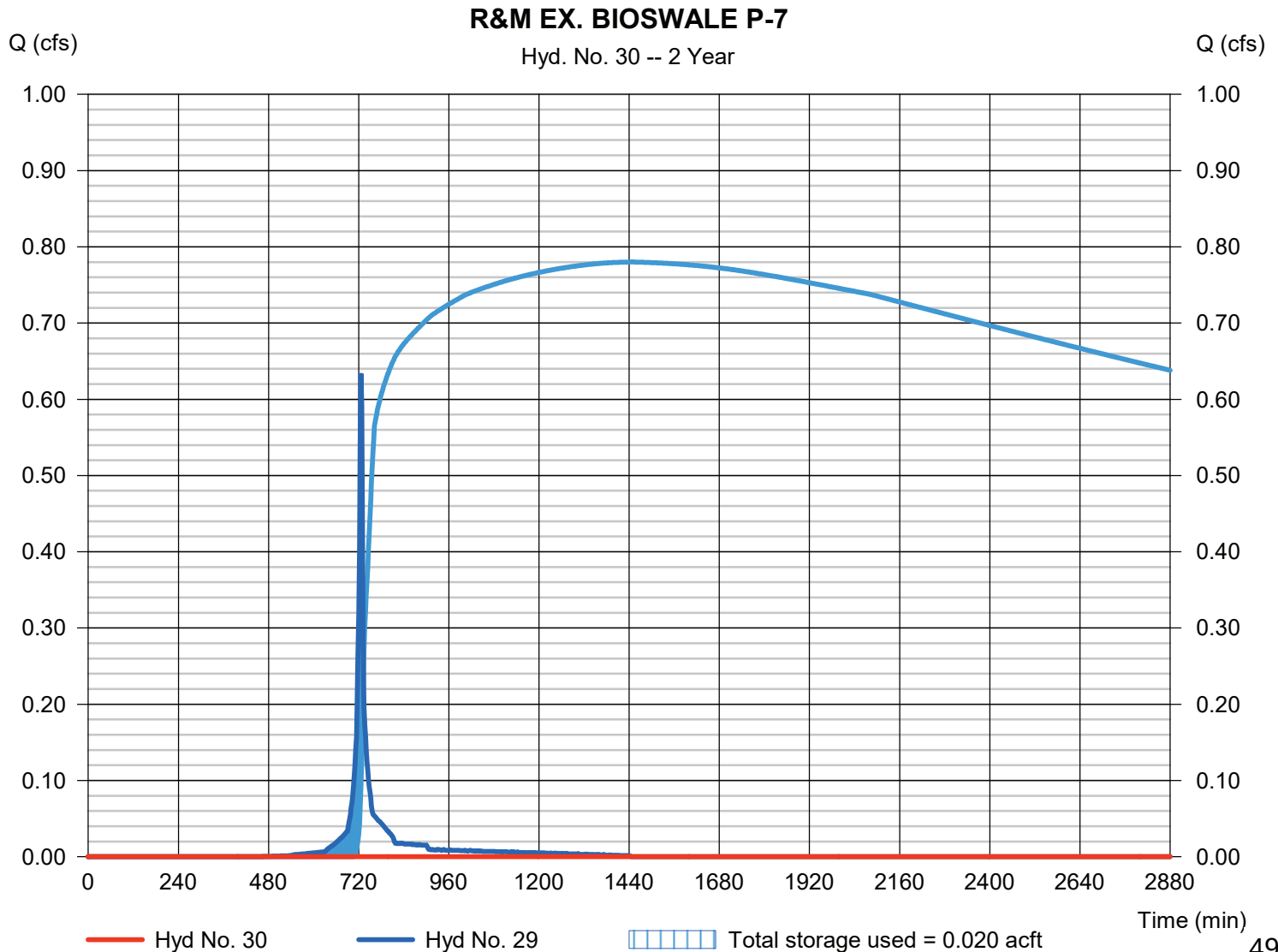
Friday, 06 / 28 / 2019

Hyd. No. 30

R&M EX. BIOSWALE P-7

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 2048 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 29 - INFLOW R&M EX. BIOSWALE P-7	Max. Elevation	= 844.84 ft
Reservoir name	= Ex. Bioswale P-7	Max. Storage	= 0.020 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

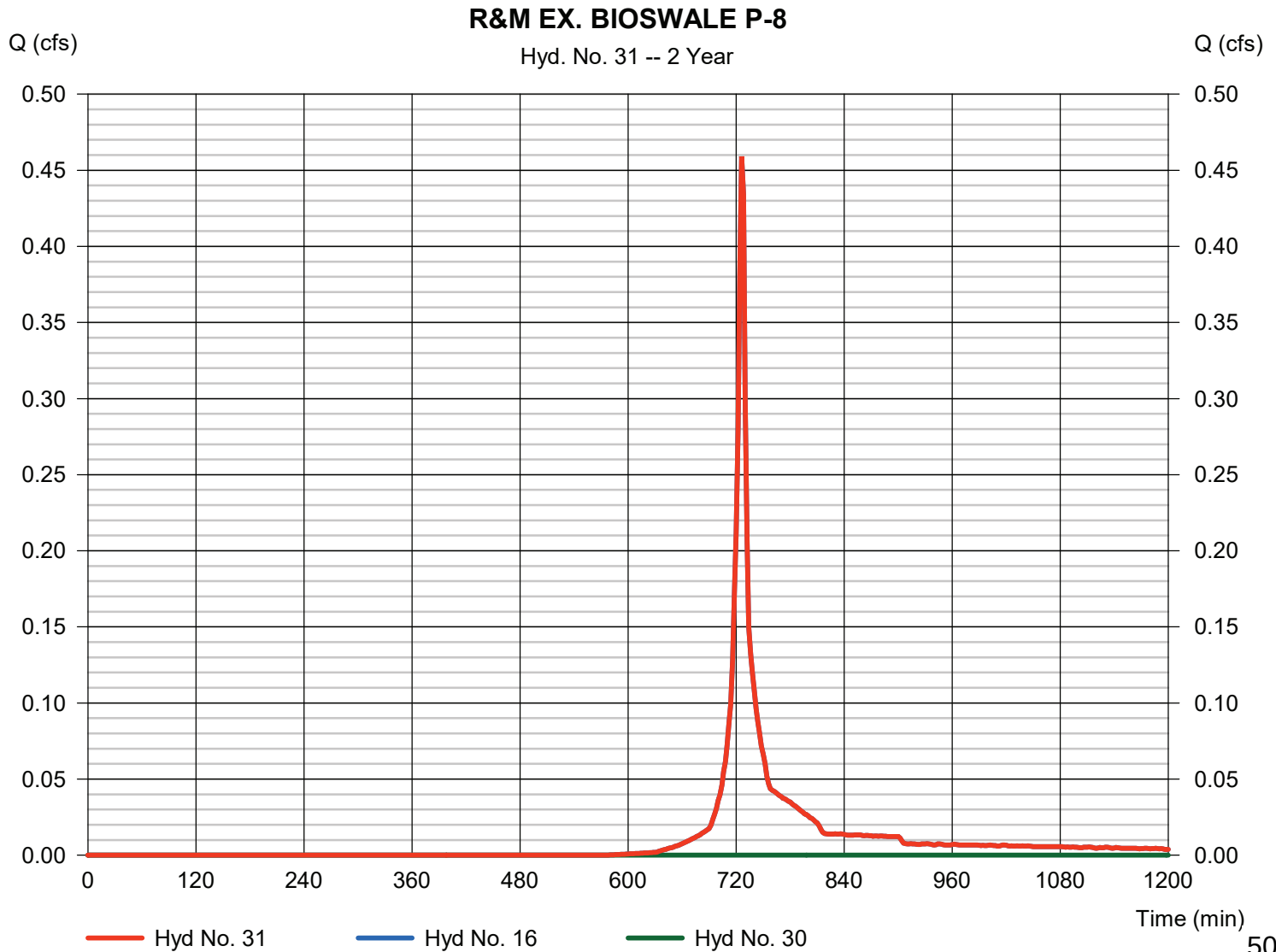
Friday, 06 / 28 / 2019

Hyd. No. 31

R&M EX. BIOSWALE P-8

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 16, 30

Peak discharge = 0.459 cfs
Time to peak = 726 min
Hyd. volume = 0.020 acft
Contrib. drain. area = 0.180 ac



Hydrograph Report

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

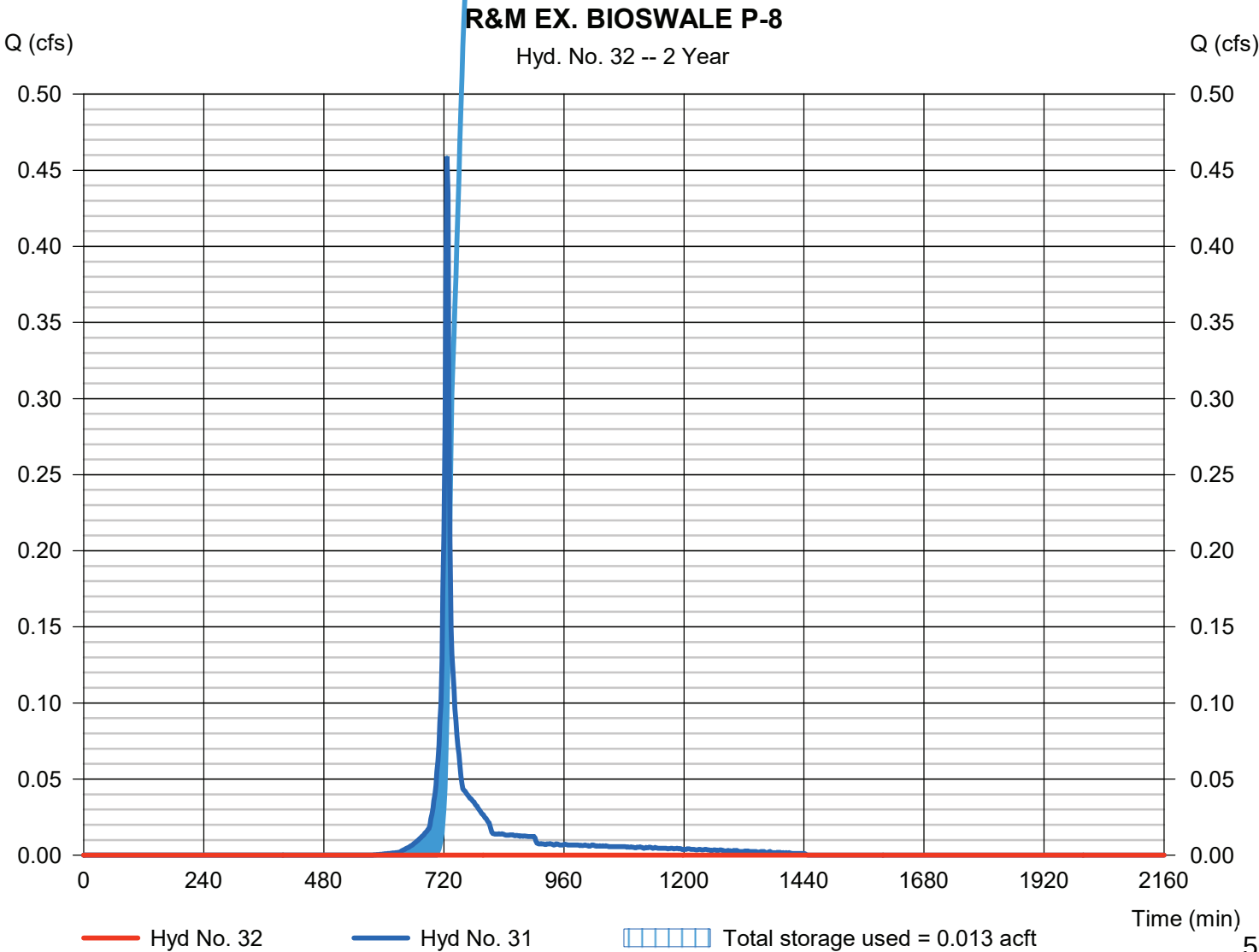
Friday, 06 / 28 / 2019

Hyd. No. 32

R&M EX. BIOSWALE P-8

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 1564 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 31 - R&M EX. BIOSWALE P-8	Max. Elevation	= 843.40 ft
Reservoir name	= Ex. Bioswale P-8	Max. Storage	= 0.013 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

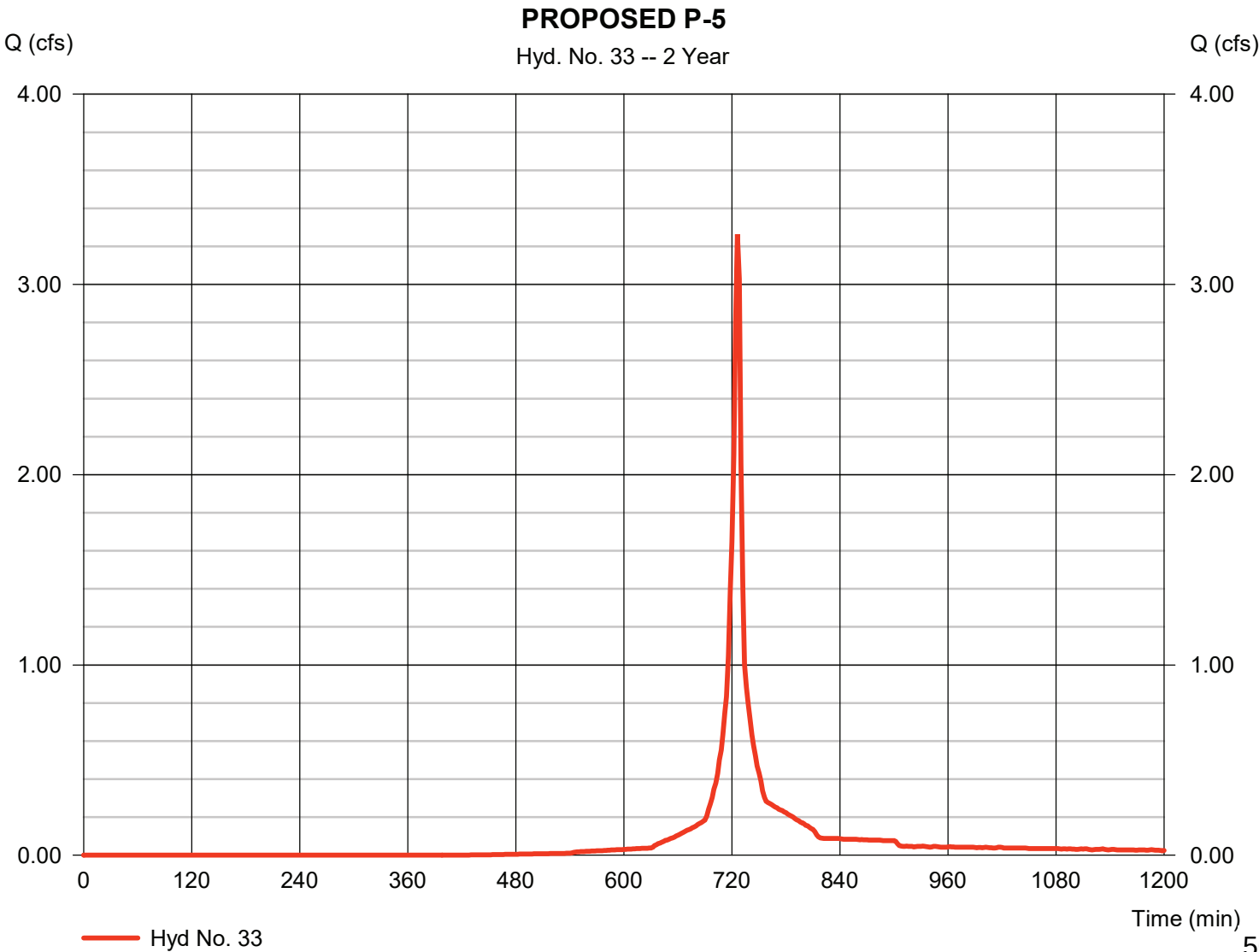
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 3.263 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.146 acft
Drainage area	= 0.992 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

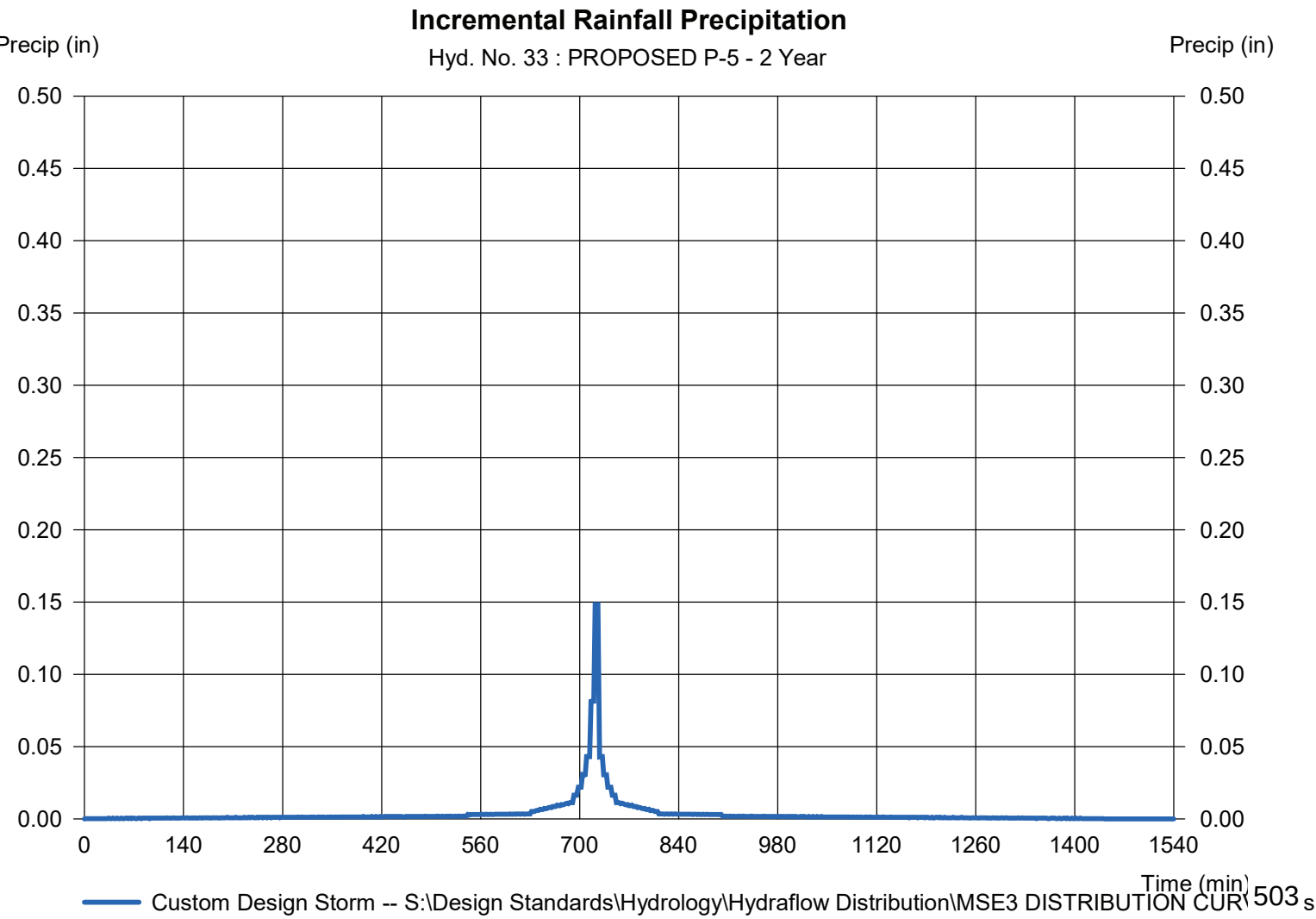
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

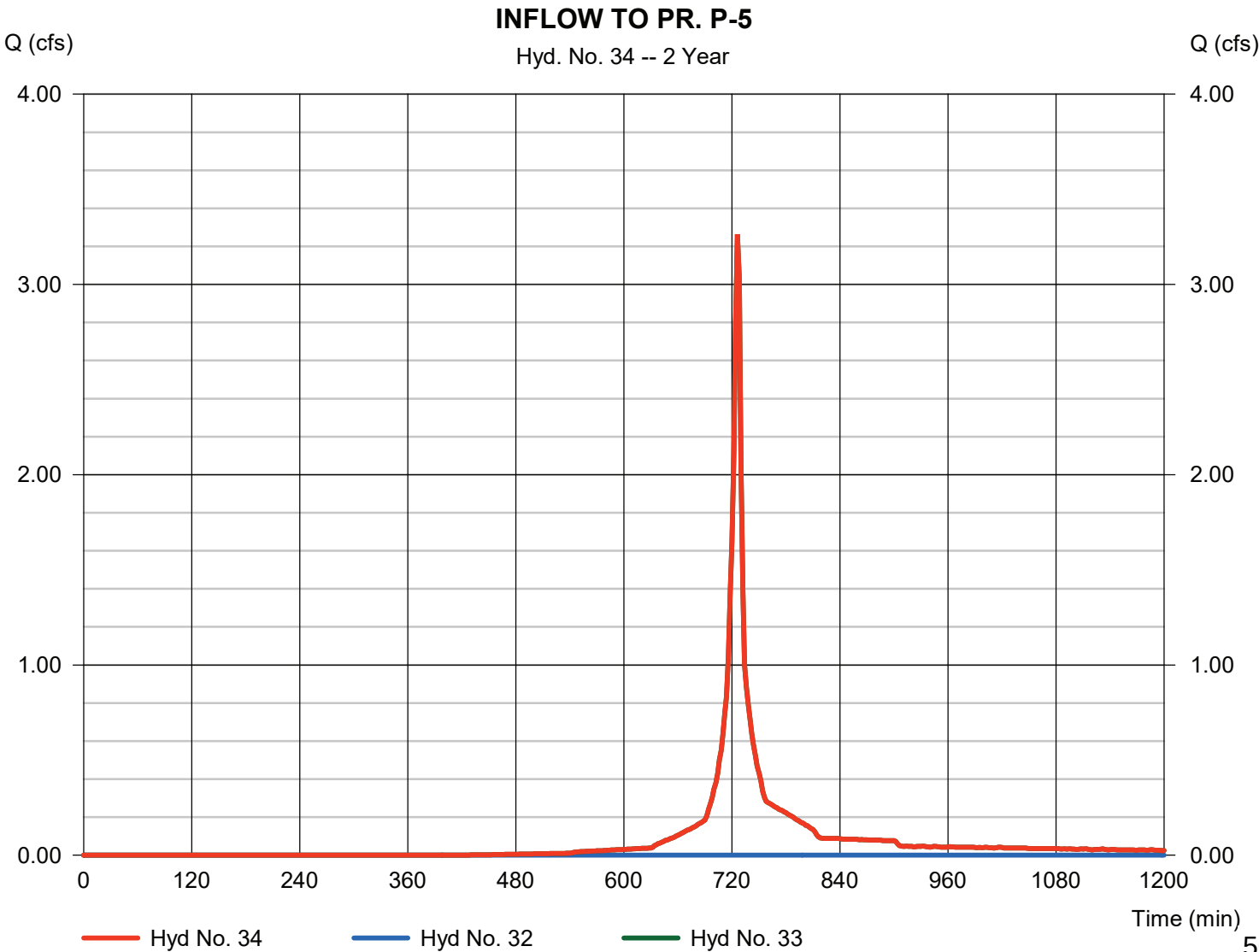
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 34

INFLOW TO PR. P-5

Hydrograph type	= Combine	Peak discharge	= 3.263 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.146 acft
Inflow hyds.	= 32, 33	Contrib. drain. area	= 0.992 ac



Hydrograph Report

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

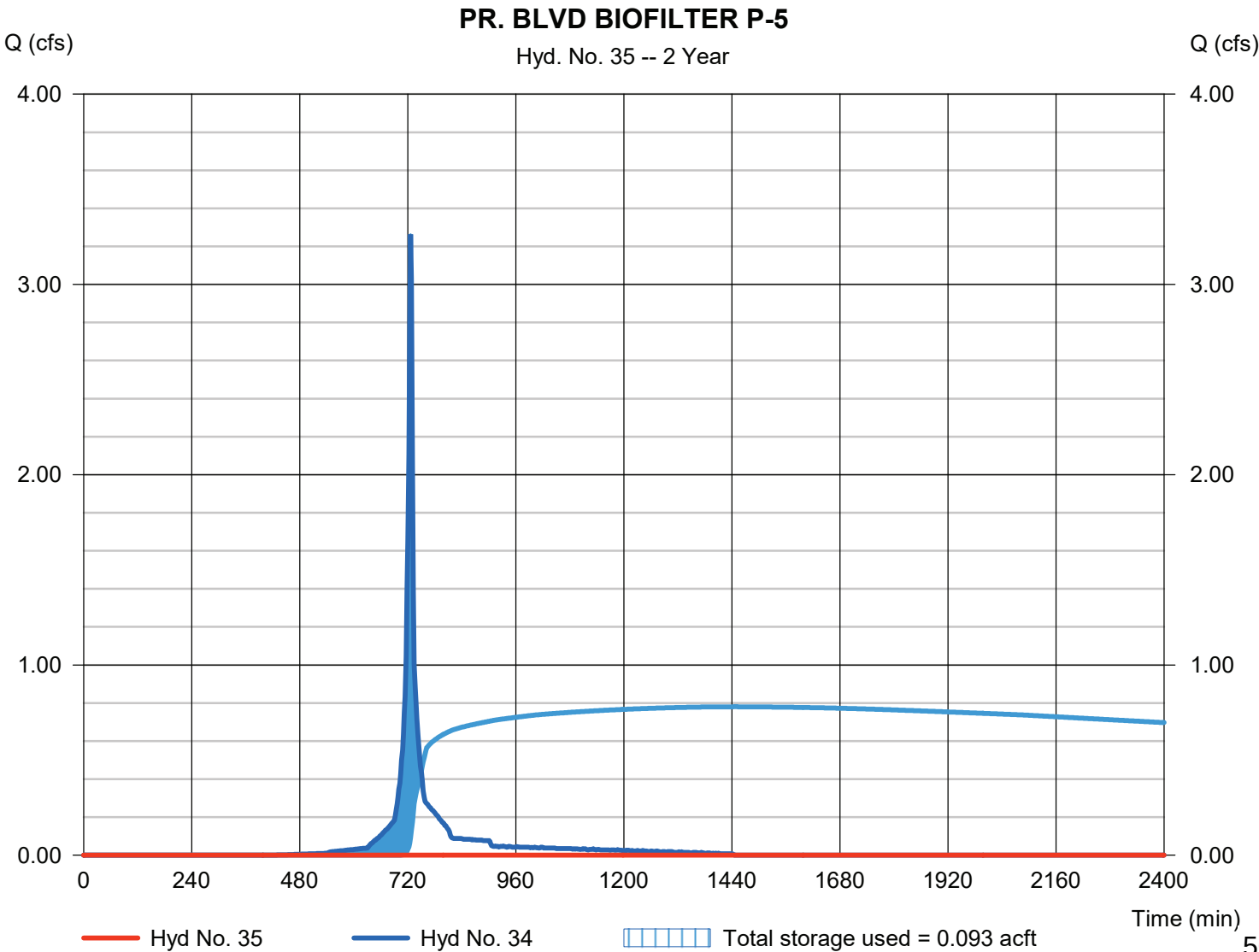
Friday, 06 / 28 / 2019

Hyd. No. 35

PR. BLVD BIOFILTER P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 756 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 34 - INFLOW TO PR. P-5	Max. Elevation	= 841.86 ft
Reservoir name	= BLVD BIOFILTER P-5	Max. Storage	= 0.093 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

Friday, 06 / 28 / 2019

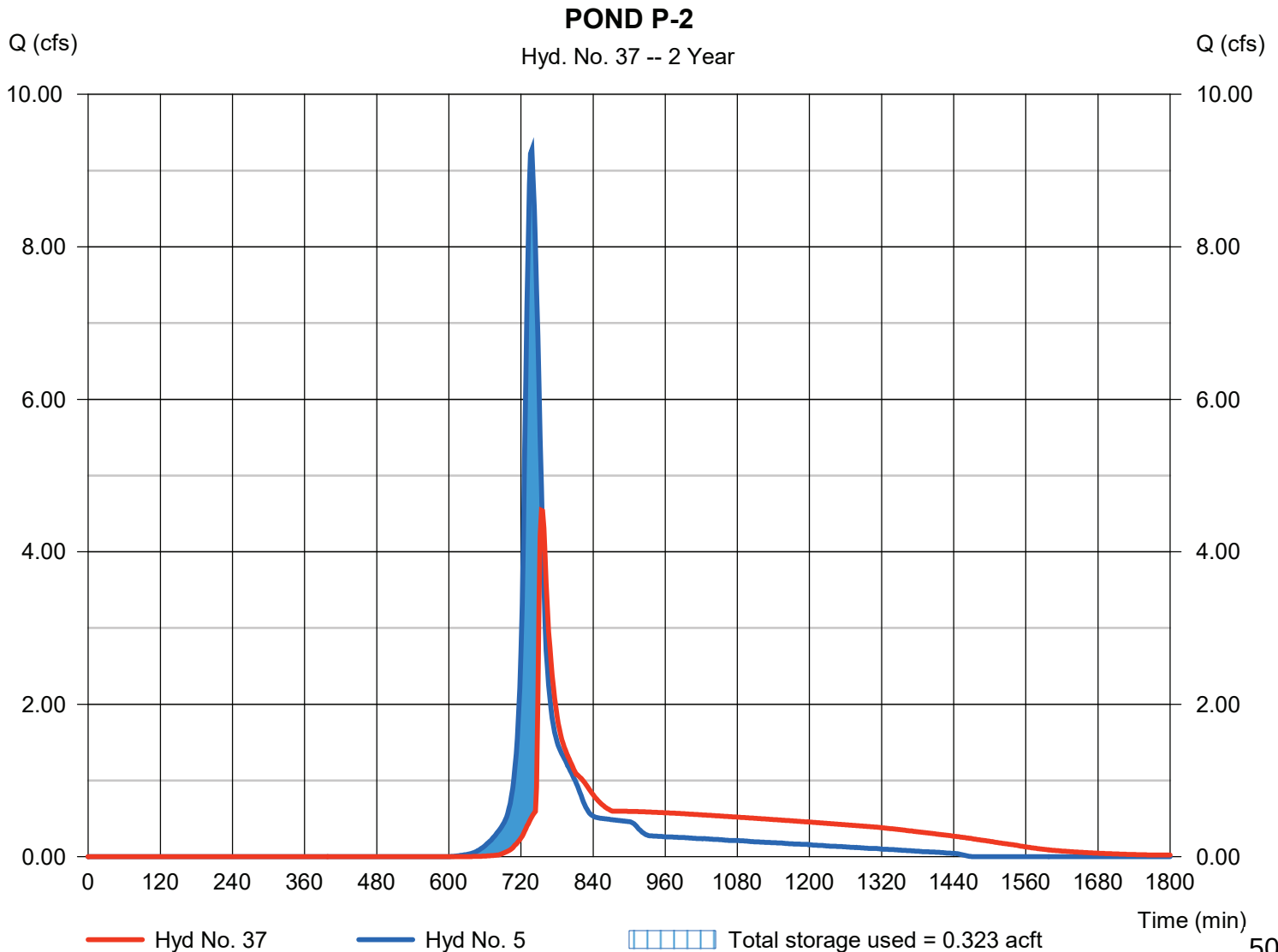
Hyd. No. 37

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyd. No. = 5 - P-2
 Reservoir name = POND P-2

Peak discharge = 4.544 cfs
 Time to peak = 754 min
 Hyd. volume = 0.720 acft
 Max. Elevation = 839.46 ft
 Max. Storage = 0.323 acft

Storage Indication method used.



Hydrograph Report

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

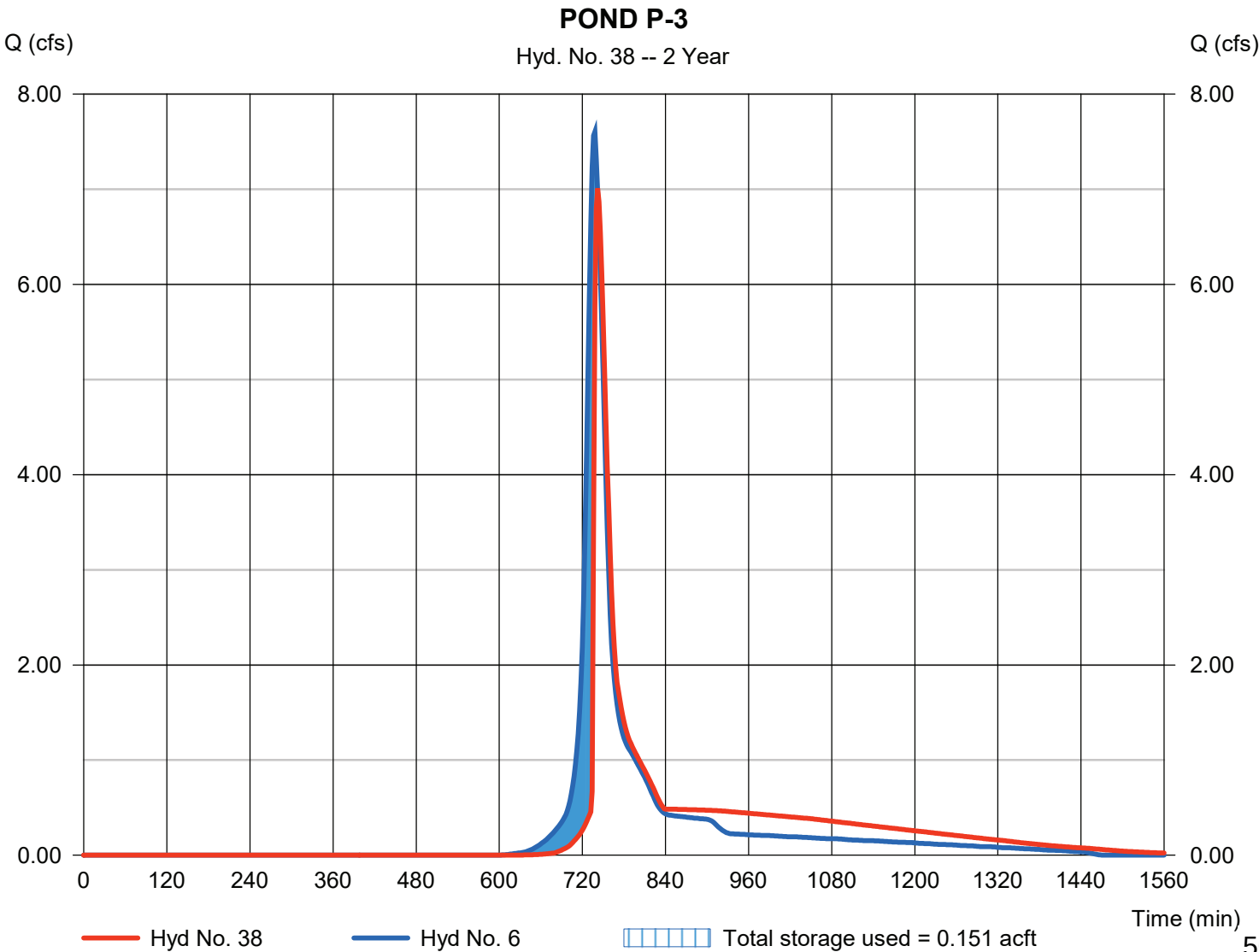
Friday, 06 / 28 / 2019

Hyd. No. 38

POND P-3

Hydrograph type	= Reservoir	Peak discharge	= 7.010 cfs
Storm frequency	= 2 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 0.590 acft
Inflow hyd. No.	= 6 - P-3	Max. Elevation	= 839.79 ft
Reservoir name	= POND P-3	Max. Storage	= 0.151 acft

Storage Indication method used.



Hydrograph Report

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

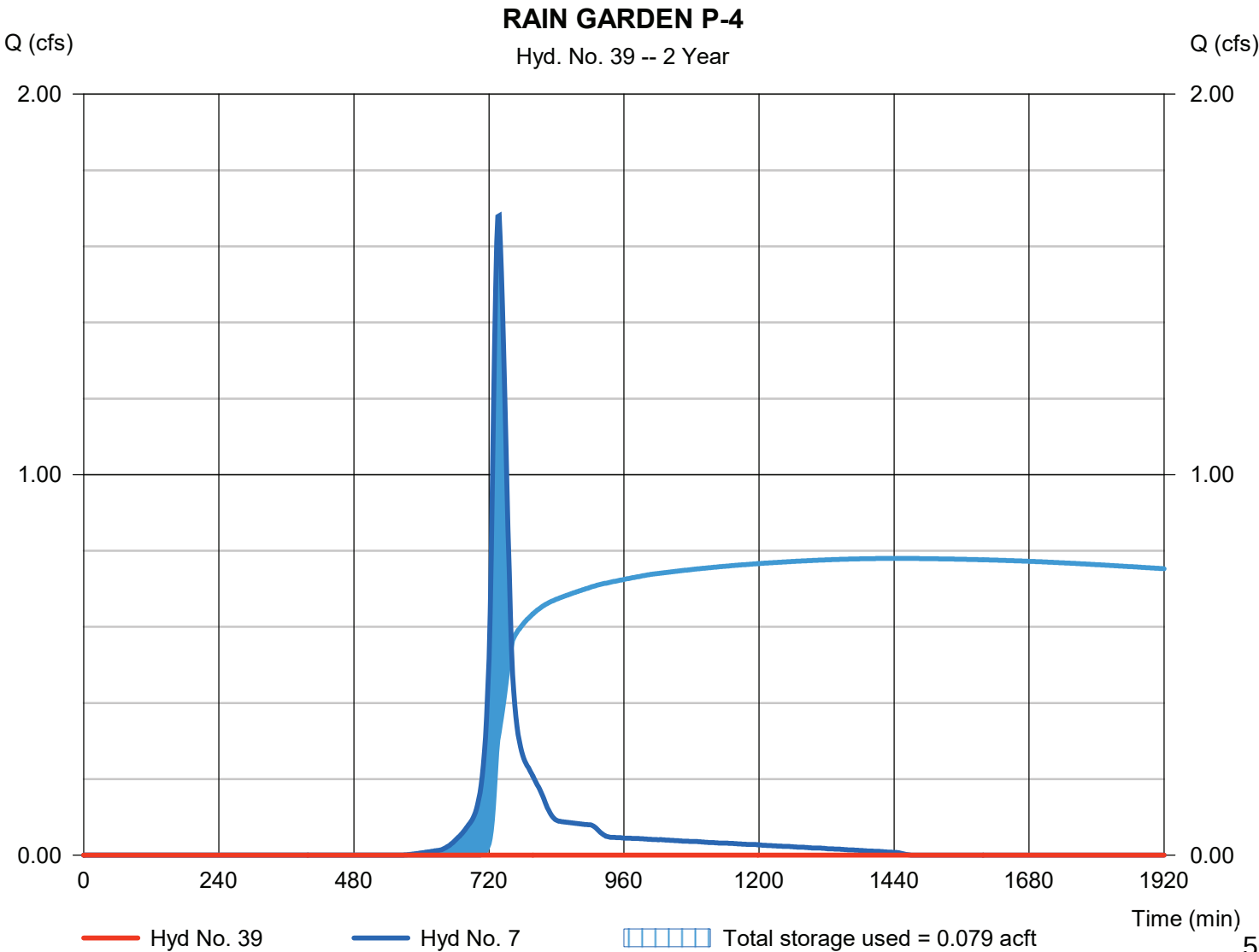
Friday, 06 / 28 / 2019

Hyd. No. 39

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 7 - P-4	Max. Elevation	= 839.99 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 0.079 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

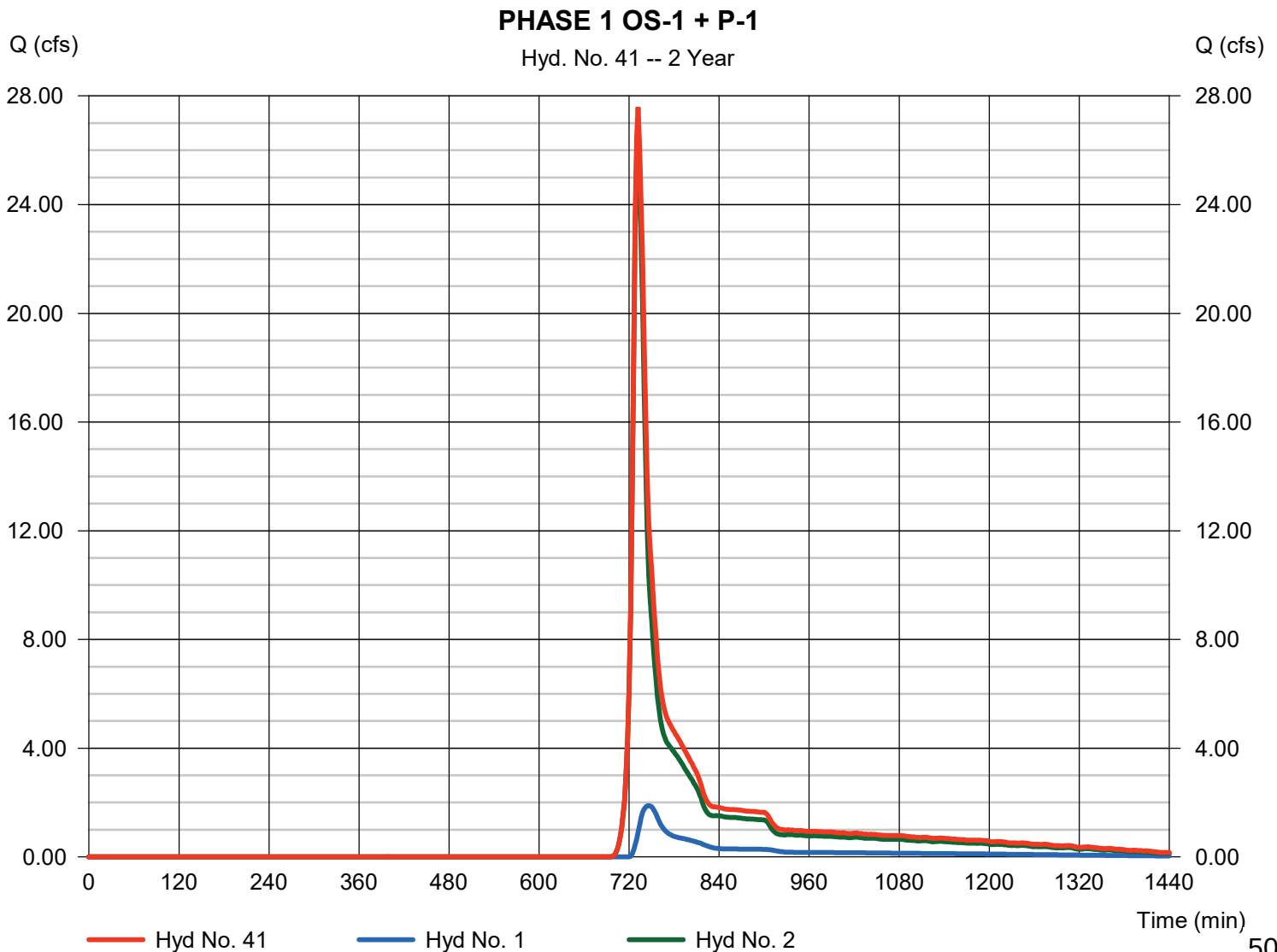
Friday, 06 / 28 / 2019

Hyd. No. 41

PHASE 1 OS-1 + P-1

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

Peak discharge = 27.59 cfs
Time to peak = 732 min
Hyd. volume = 1.918 acft
Contrib. drain. area = 37.042 ac



Hydrograph Report

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

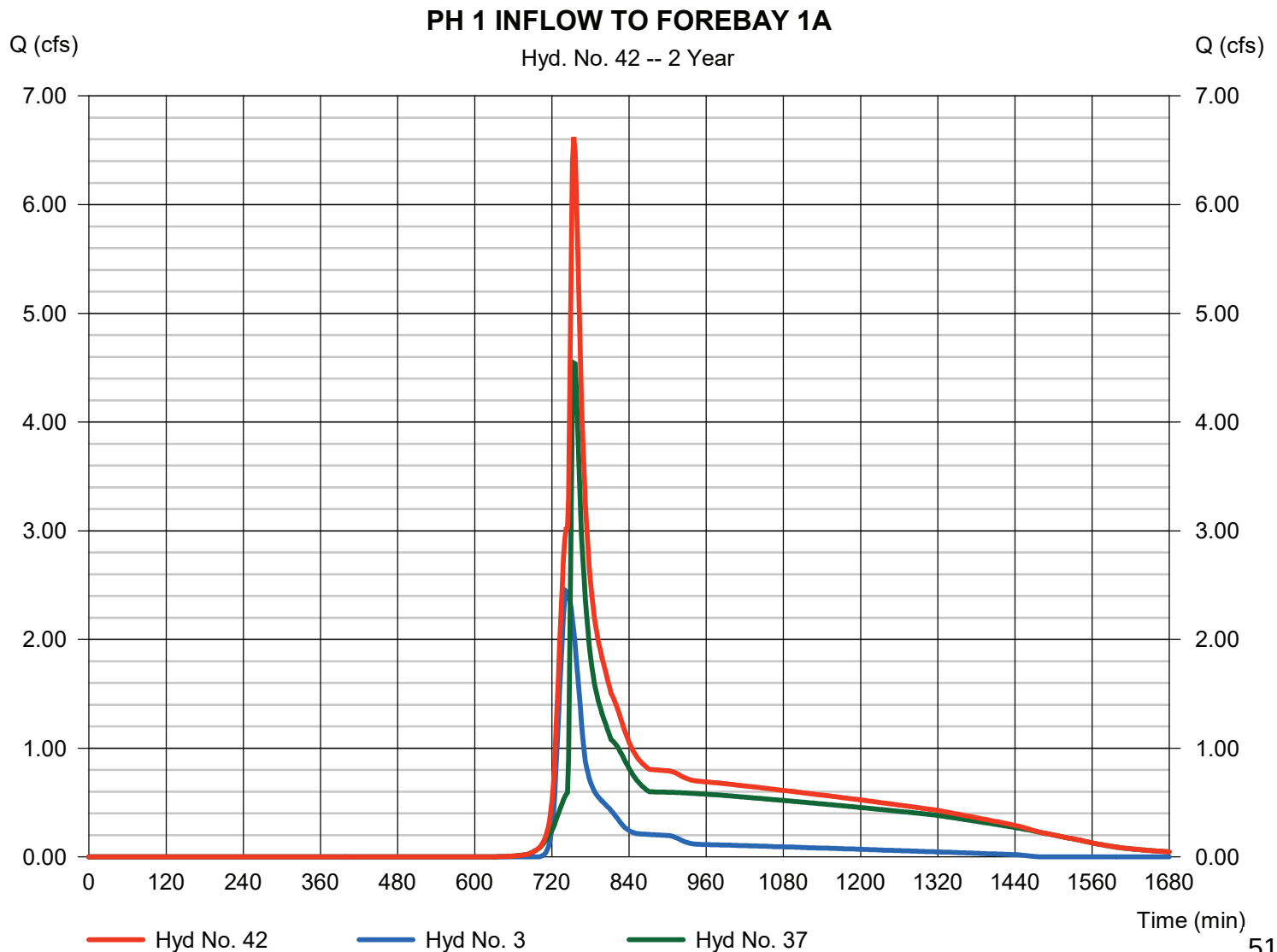
Friday, 06 / 28 / 2019

Hyd. No. 42

PH 1 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 3, 37

Peak discharge = 6.620 cfs
Time to peak = 754 min
Hyd. volume = 0.958 acft
Contrib. drain. area = 3.947 ac



Hydrograph Report

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

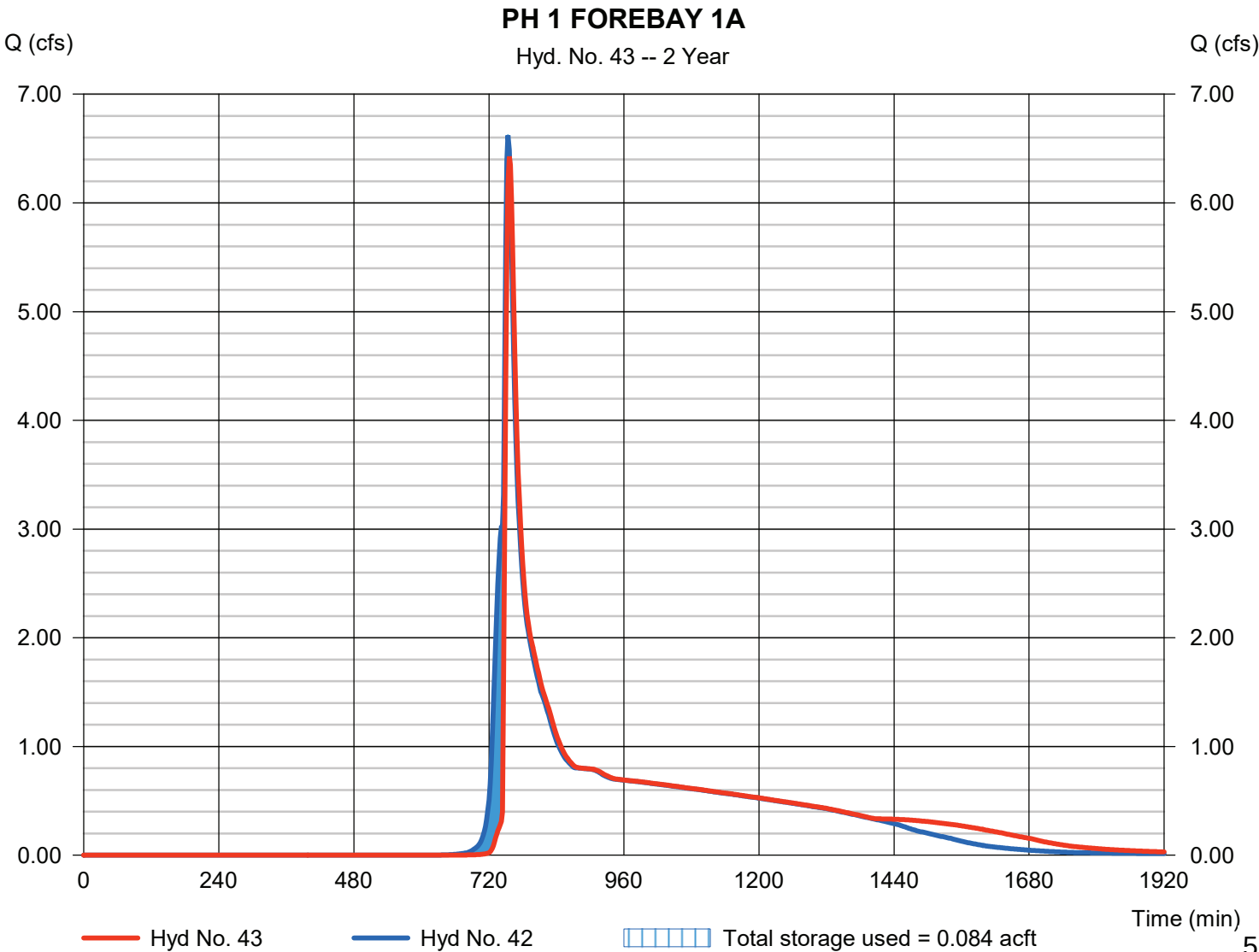
Friday, 06 / 28 / 2019

Hyd. No. 43

PH 1 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 6.429 cfs
Storm frequency	= 2 yrs	Time to peak	= 756 min
Time interval	= 2 min	Hyd. volume	= 0.958 acft
Inflow hyd. No.	= 42 - PH 1 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.04 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 0.084 acft

Storage Indication method used.



Hydrograph Report

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

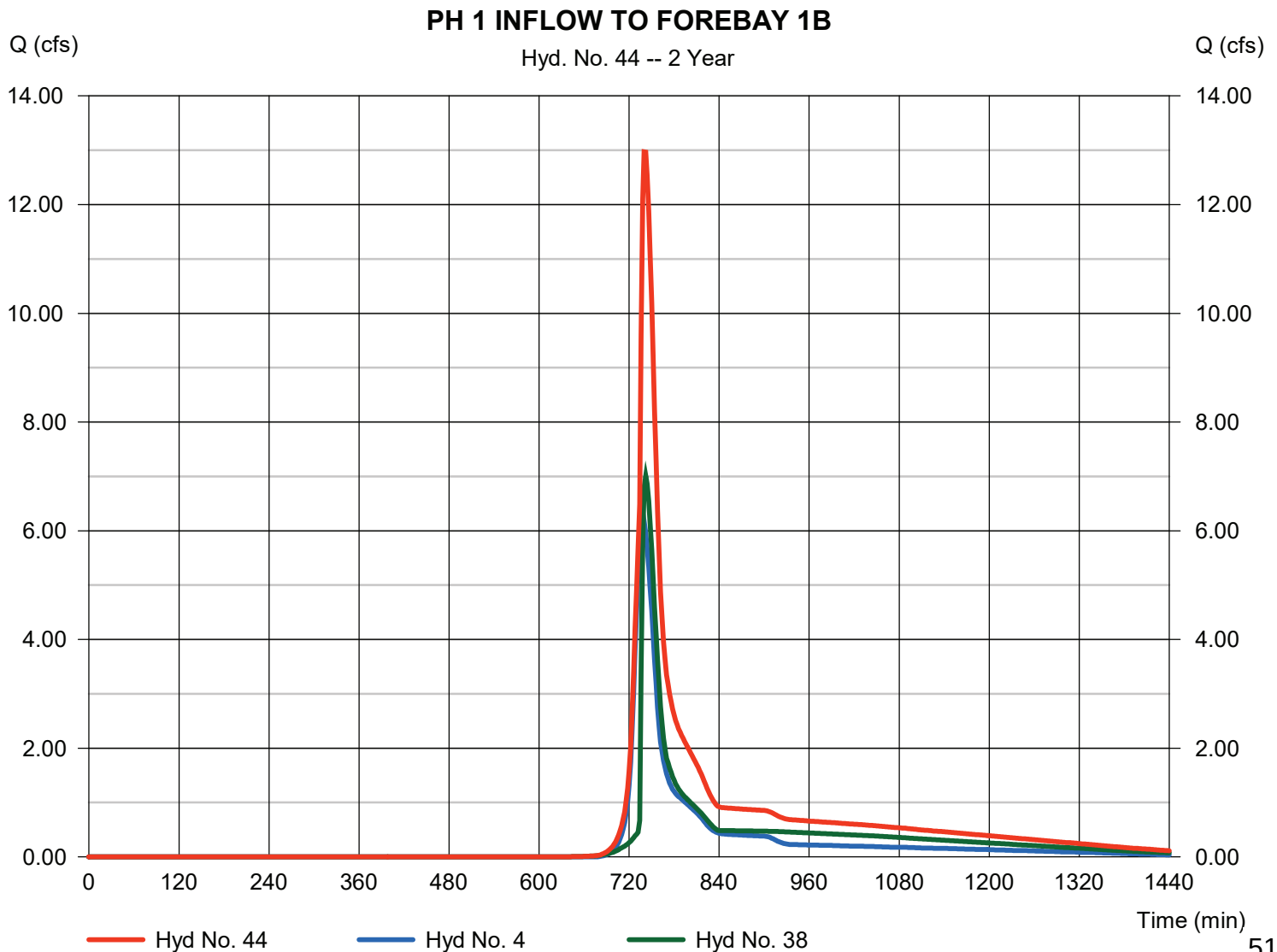
Friday, 06 / 28 / 2019

Hyd. No. 44

PH 1 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 4, 38

Peak discharge = 12.97 cfs
Time to peak = 740 min
Hyd. volume = 1.099 acft
Contrib. drain. area = 6.516 ac



Hydrograph Report

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

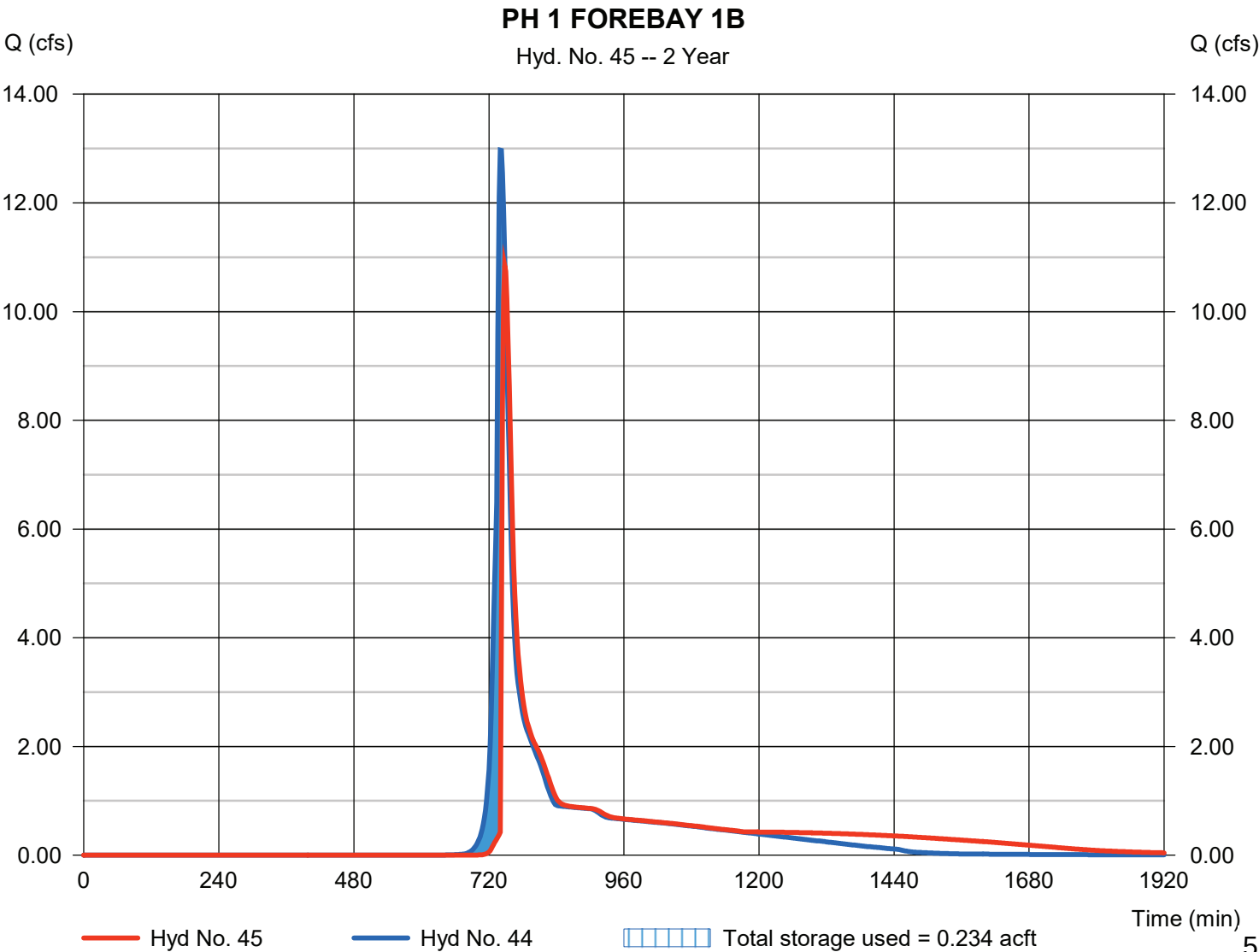
Friday, 06 / 28 / 2019

Hyd. No. 45

PH 1 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 10.85 cfs
Storm frequency	= 2 yrs	Time to peak	= 748 min
Time interval	= 2 min	Hyd. volume	= 1.098 acft
Inflow hyd. No.	= 44 - PH 1 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.04 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 0.234 acft

Storage Indication method used.



Hydrograph Report

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

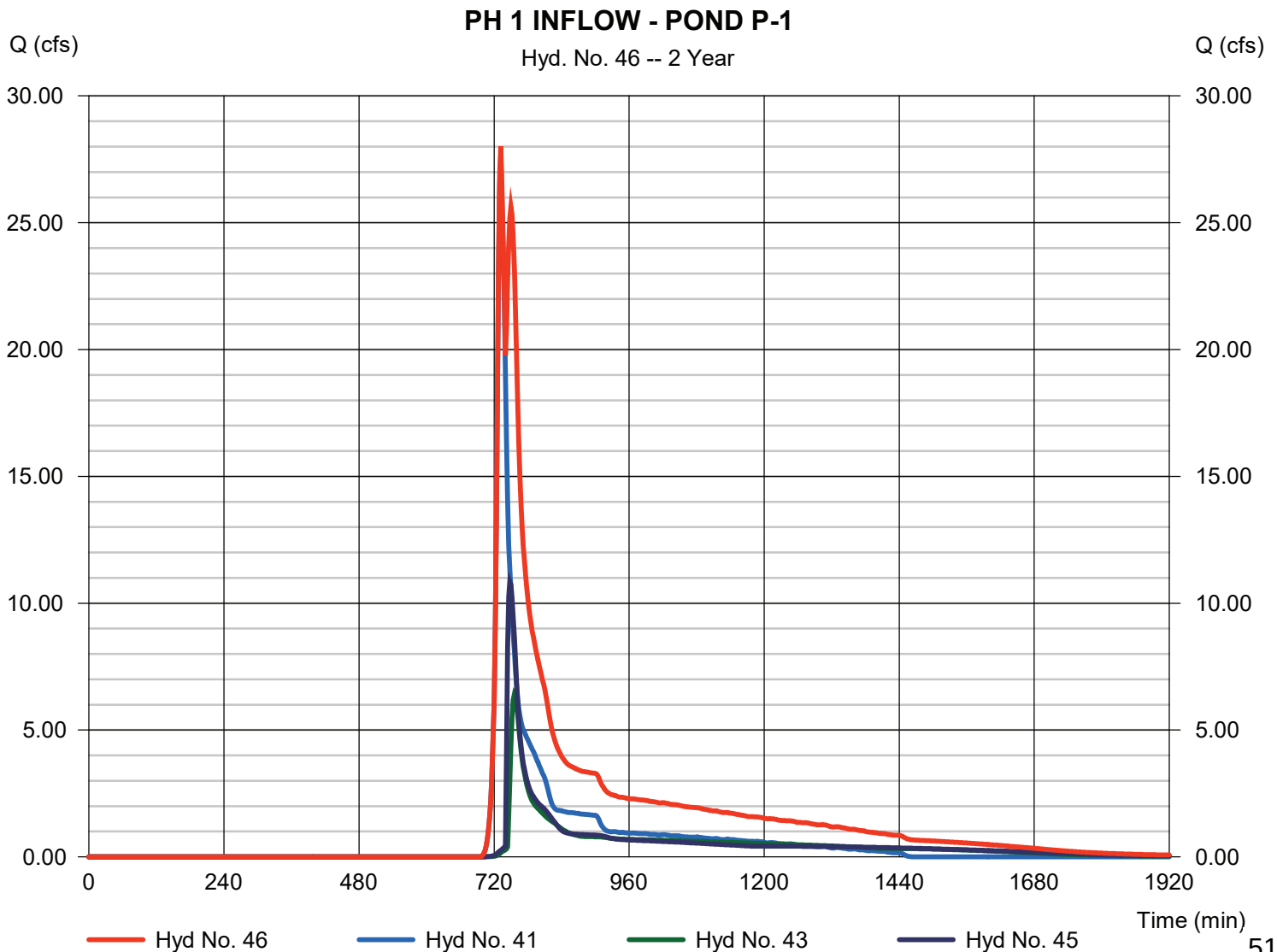
Friday, 06 / 28 / 2019

Hyd. No. 46

PH 1 INFLOW - POND P-1

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 41, 43, 45

Peak discharge = 28.01 cfs
Time to peak = 732 min
Hyd. volume = 3.974 acft
Contrib. drain. area = 0.000 ac



Hydrograph Report

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

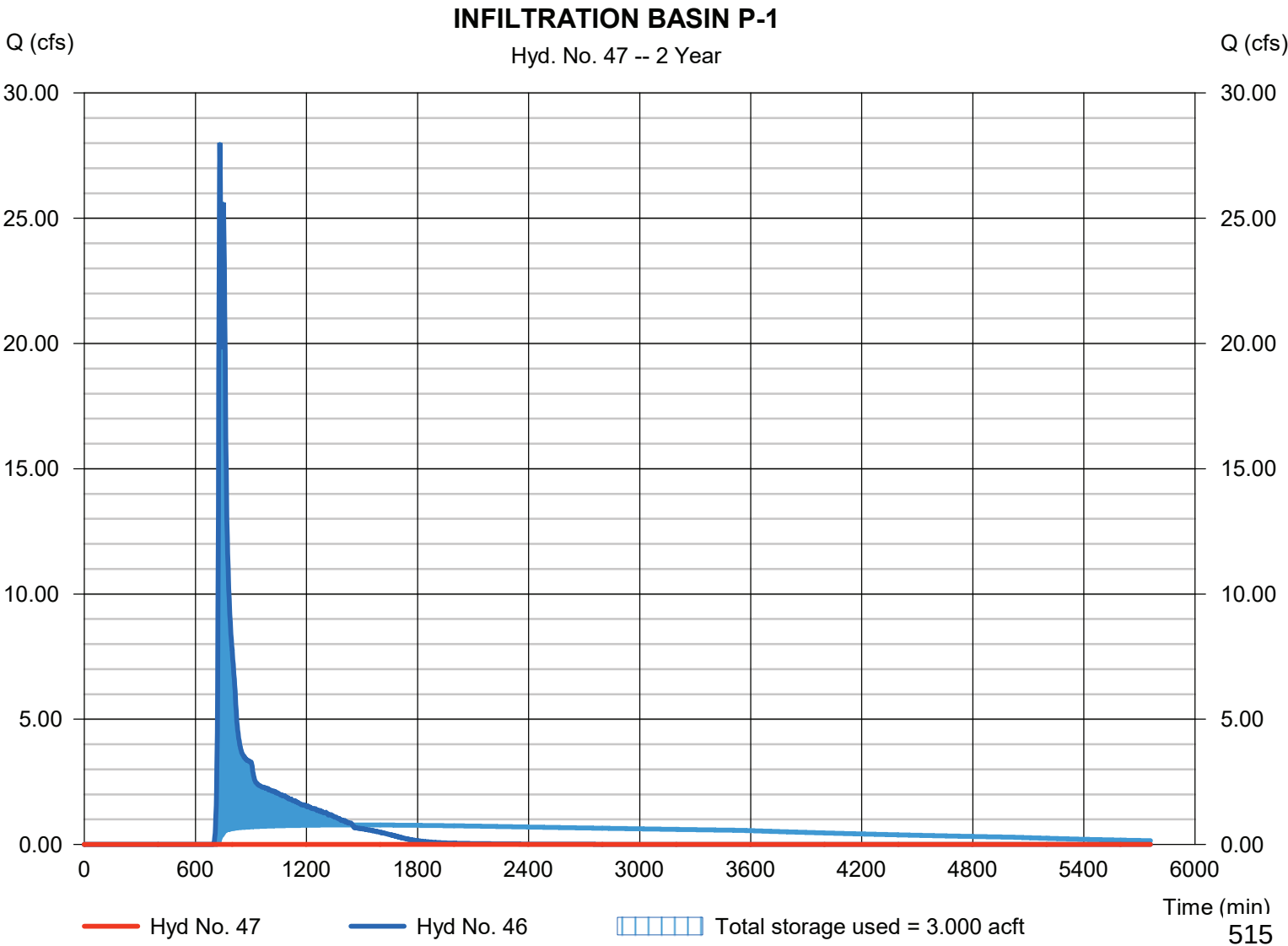
Friday, 06 / 28 / 2019

Hyd. No. 47

INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 746 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 46 - PH 1 INFLOW - POND P-1	Max. Elevation	= 832.27 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 1	Max. Storage	= 3.000 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

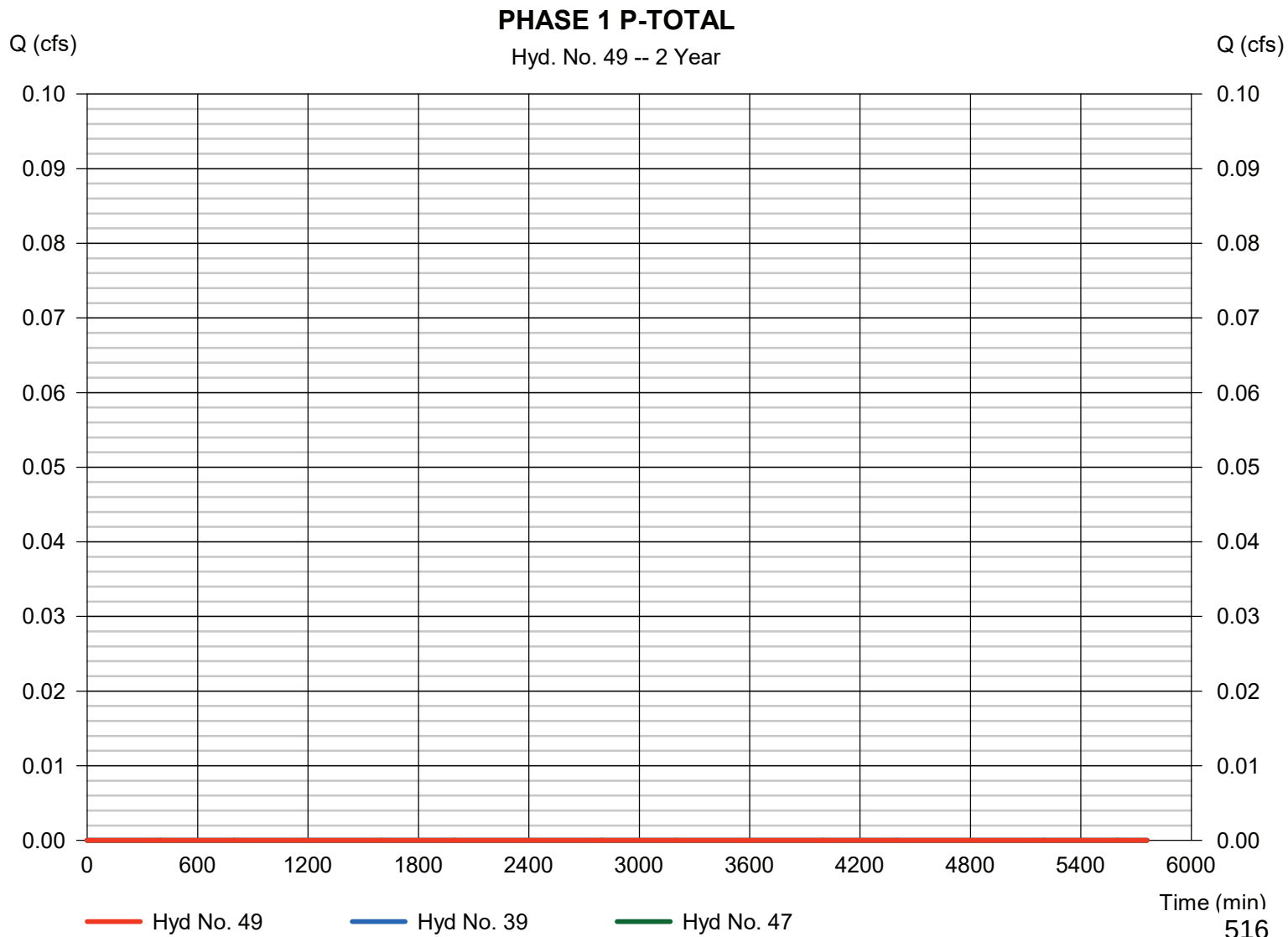
Friday, 06 / 28 / 2019

Hyd. No. 49

PHASE 1 P-TOTAL

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 39, 47

Peak discharge = 0.000 cfs
 Time to peak = 3882 min
 Hyd. volume = 0.000 acft
 Contrib. drain. area = 0.000 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	7.052	2	740	0.661	-----	-----	-----	P-OS-1-PH 1
2	SCS Runoff	56.30	2	732	3.368	-----	-----	-----	P-1-PH 1
3	SCS Runoff	5.305	2	742	0.480	-----	-----	-----	P-1A-PH1
4	SCS Runoff	12.32	2	738	0.960	-----	-----	-----	P-1B-PH1
5	SCS Runoff	15.81	2	736	1.231	-----	-----	-----	P-2
6	SCS Runoff	12.97	2	736	1.009	-----	-----	-----	P-3
7	SCS Runoff	2.782	2	736	0.217	-----	-----	-----	P-4
9	SCS Runoff	0.459	2	726	0.020	-----	-----	-----	R&M EX. P-1
10	SCS Runoff	0.856	2	726	0.038	-----	-----	-----	R&M EX. P-2
11	SCS Runoff	0.383	2	726	0.017	-----	-----	-----	R&M EX. P-3
12	SCS Runoff	0.451	2	726	0.020	-----	-----	-----	R&M EX. P-4
13	SCS Runoff	0.574	2	726	0.025	-----	-----	-----	R&M EX. P-5
14	SCS Runoff	0.874	2	726	0.038	-----	-----	-----	R&M EX. P-6
15	SCS Runoff	0.977	2	726	0.044	-----	-----	-----	R&M EX. P-7
16	SCS Runoff	0.762	2	726	0.033	-----	-----	-----	R&M EX. P-8
17	SCS Runoff	0.585	2	726	0.028	-----	-----	-----	R&M EX. P-9
18	Reservoir	0.015	2	816	0.020	9	851.41	0.013	R&M EX. BIOSWALE P-1
19	Combine	0.866	2	726	0.058	10, 18	-----	-----	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	0.092	2	754	0.015	19	851.36	0.024	R&M EX. BIOSWALE P-2
21	Combine	0.383	2	726	0.032	11, 20	-----	-----	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	0.000	2	2246	0.000	21	850.51	0.020	R&M EX. BIOSWALE P-3
23	Combine	0.451	2	726	0.020	12, 22	-----	-----	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	0.000	2	1330	0.000	23	849.29	0.013	R&M EX. BIOSWALE P-4
25	Combine	0.574	2	726	0.025	13, 24	-----	-----	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	0.000	2	1814	0.000	25	848.13	0.017	R&M EX. BIOSWALE P-5
27	Combine	0.874	2	726	0.038	14, 26	-----	-----	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	0.000	2	2292	0.000	27	847.00	0.028	R&M EX. BIOSWALE P-6
29	Combine	0.977	2	726	0.044	15, 28	-----	-----	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	0.024	2	806	0.003	29	845.35	0.031	R&M EX. BIOSWALE P-7
31	Combine	0.762	2	726	0.036	16, 30	-----	-----	R&M EX. BIOSWALE P-8
32	Reservoir	0.000	2	2050	0.000	31	843.91	0.025	R&M EX. BIOSWALE P-8
33	SCS Runoff	4.962	2	726	0.227	-----	-----	-----	PROPOSED P-5
34	Combine	4.962	2	726	0.227	32, 33	-----	-----	INFLOW TO PR. P-5
2019-06-27_CHAPMAN FARMS_PHASE I.gpw					Return Period: 10 Year			Friday, 06 / 28 / 2019	

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
35	Reservoir	0.000	2	746	0.000	34	842.38	0.150	PR. BLVD BIOFILTER P-5
37	Reservoir	13.82	2	744	1.230	5	839.72	0.371	POND P-2
38	Reservoir	12.80	2	738	1.009	6	839.95	0.166	POND P-3
39	Reservoir	0.000	2	1346	0.000	7	840.47	0.140	RAIN GARDEN P-4
41	Combine	61.39	2	732	4.029	1, 2,	-----	-----	PHASE 1 OS-1 + P-1
42	Combine	19.07	2	742	1.710	3, 37,	-----	-----	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	18.87	2	744	1.710	42	835.30	0.112	PH 1 FOREBAY 1A
44	Combine	25.12	2	738	1.969	4, 38,	-----	-----	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	24.08	2	742	1.968	44	835.29	0.284	PH 1 FOREBAY 1B
46	Combine	82.17	2	738	7.706	41, 43, 45	-----	-----	PH 1 INFLOW - POND P-1
47	Reservoir	0.000	2	788	0.000	46	834.04	6.31	INFILTRATION BASIN P-1
49	Combine	0.000	2	788	0.000	39, 47,	-----	-----	PHASE 1 P-TOTAL
2019-06-27_CHAPMAN FARMS_PHASE 1.gpw					Return Period: 10 Year			Friday, 06 / 28 / 2019	

Hydrograph Report

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

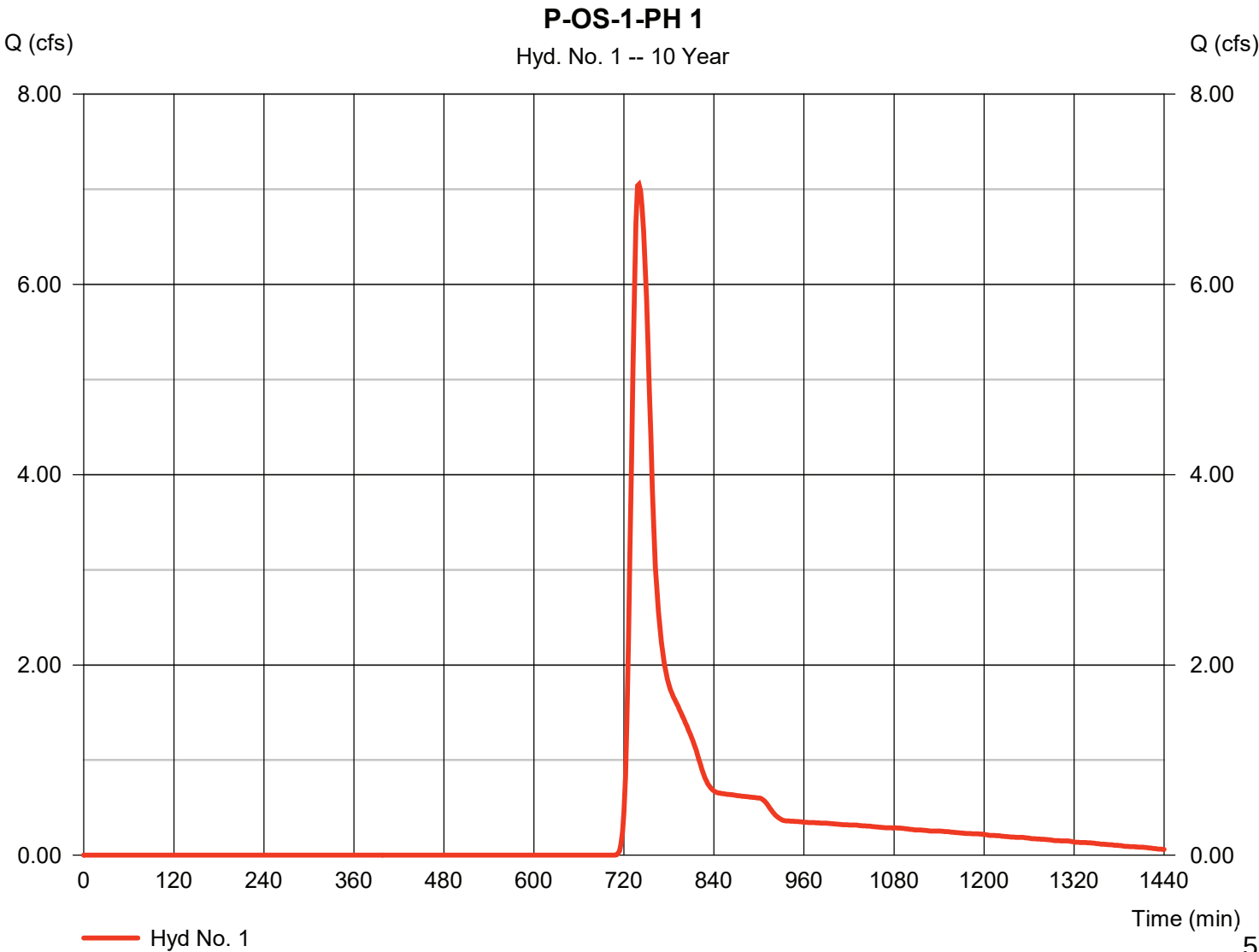
Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 7.052 cfs
Storm frequency	= 10 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 0.661 acft
Drainage area	= 10.170 ac	Curve number	= 62*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.50 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

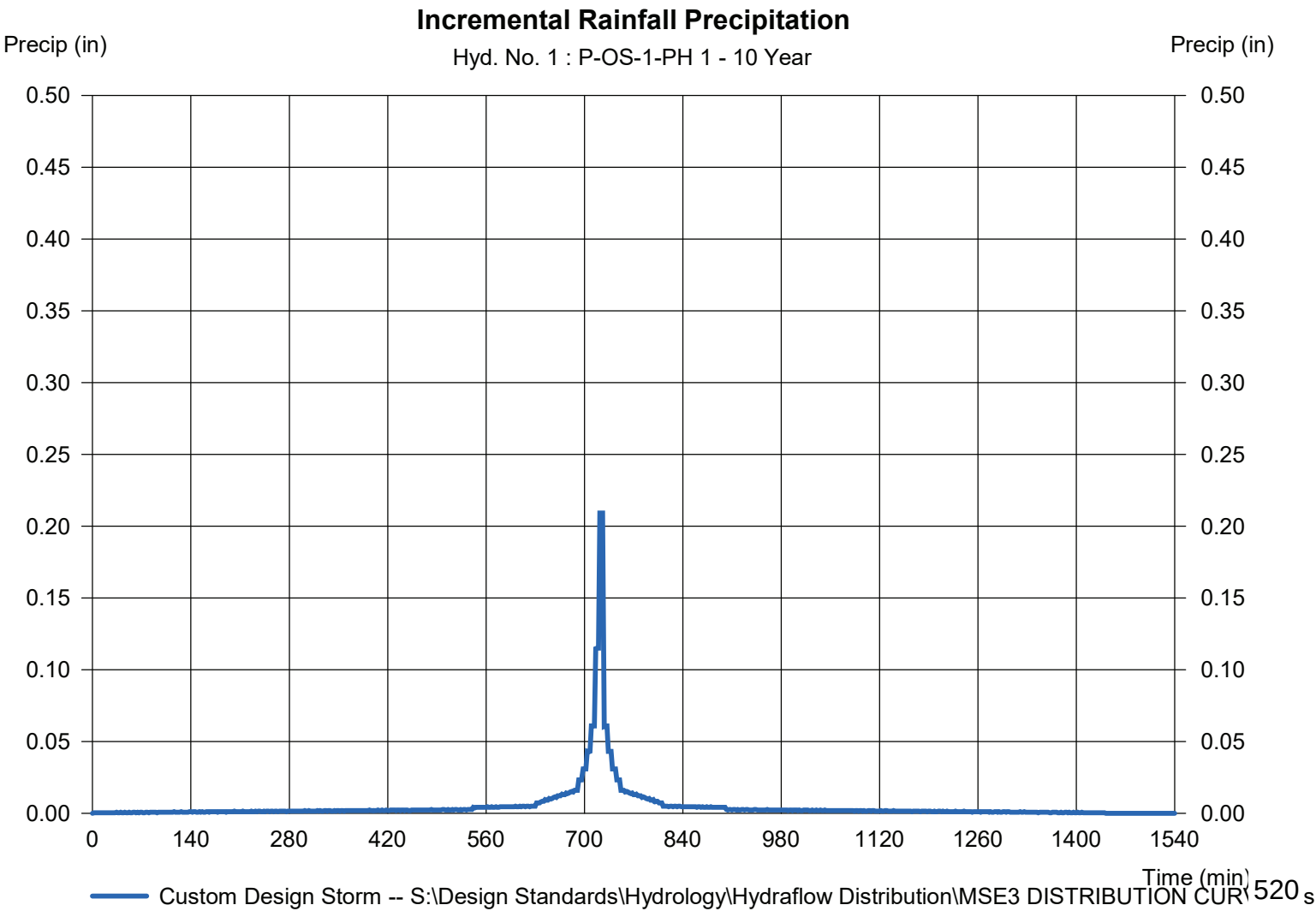
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

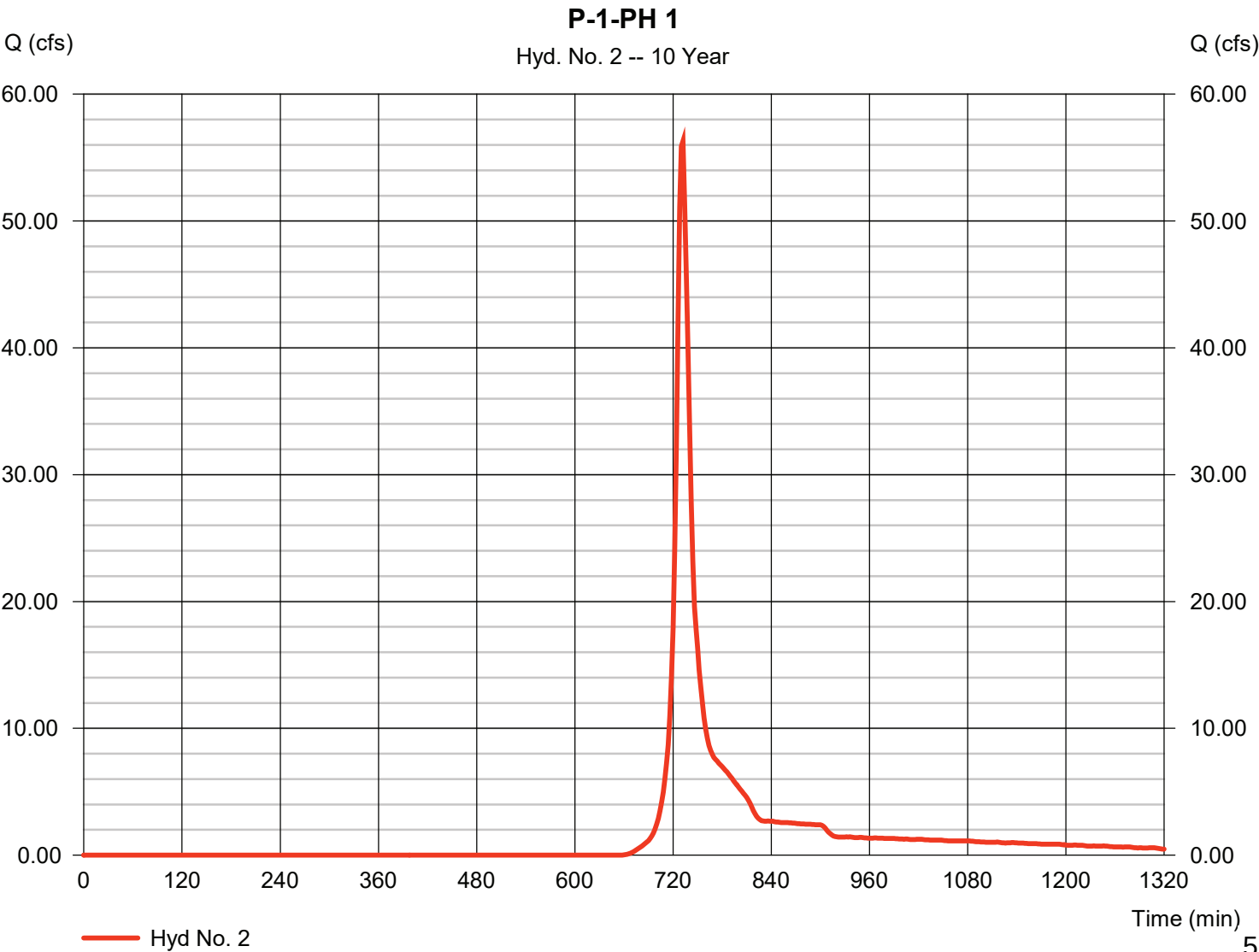
Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 56.30 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 3.368 acft
Drainage area	= 26.872 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 26.872



Precipitation Report

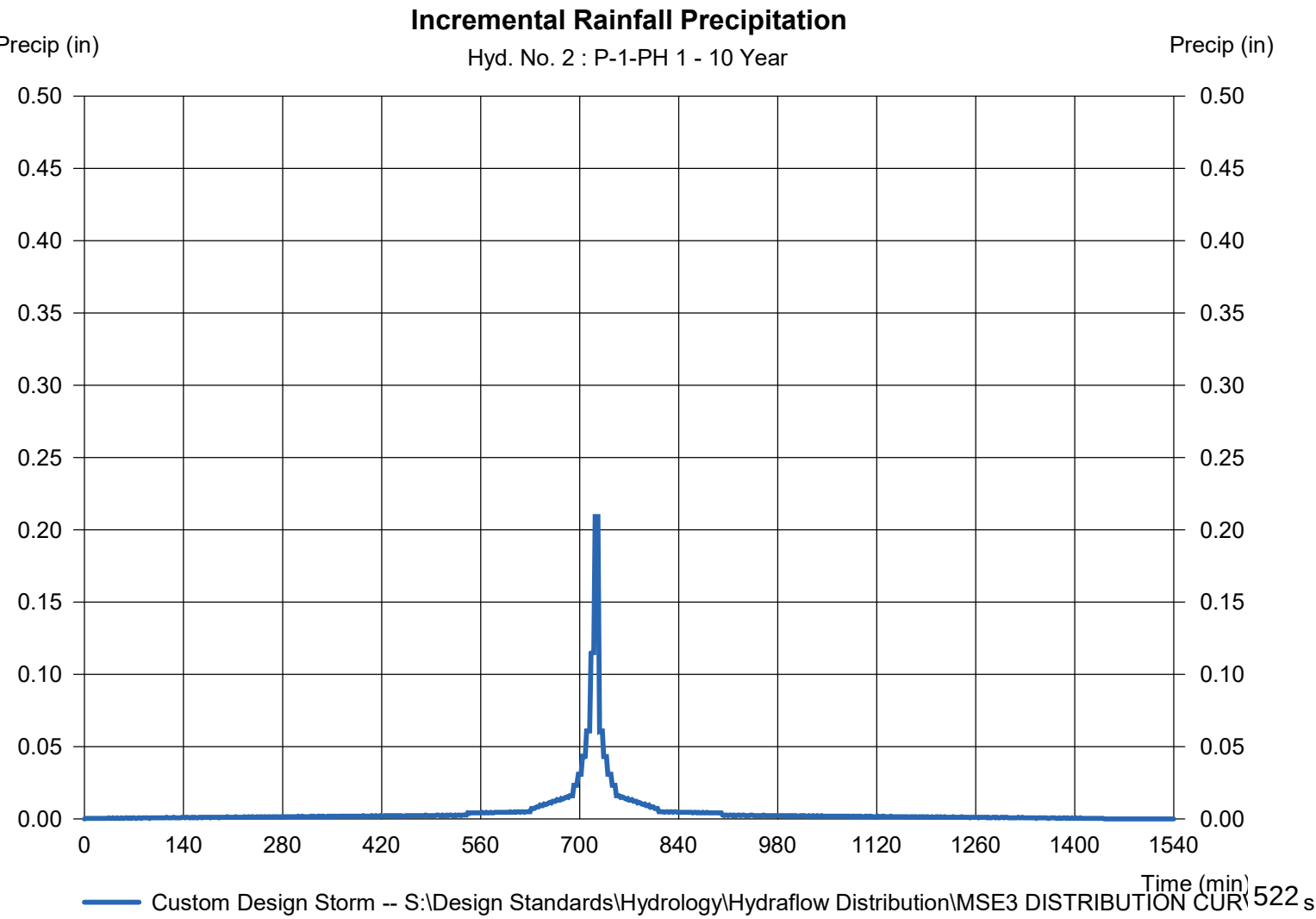
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

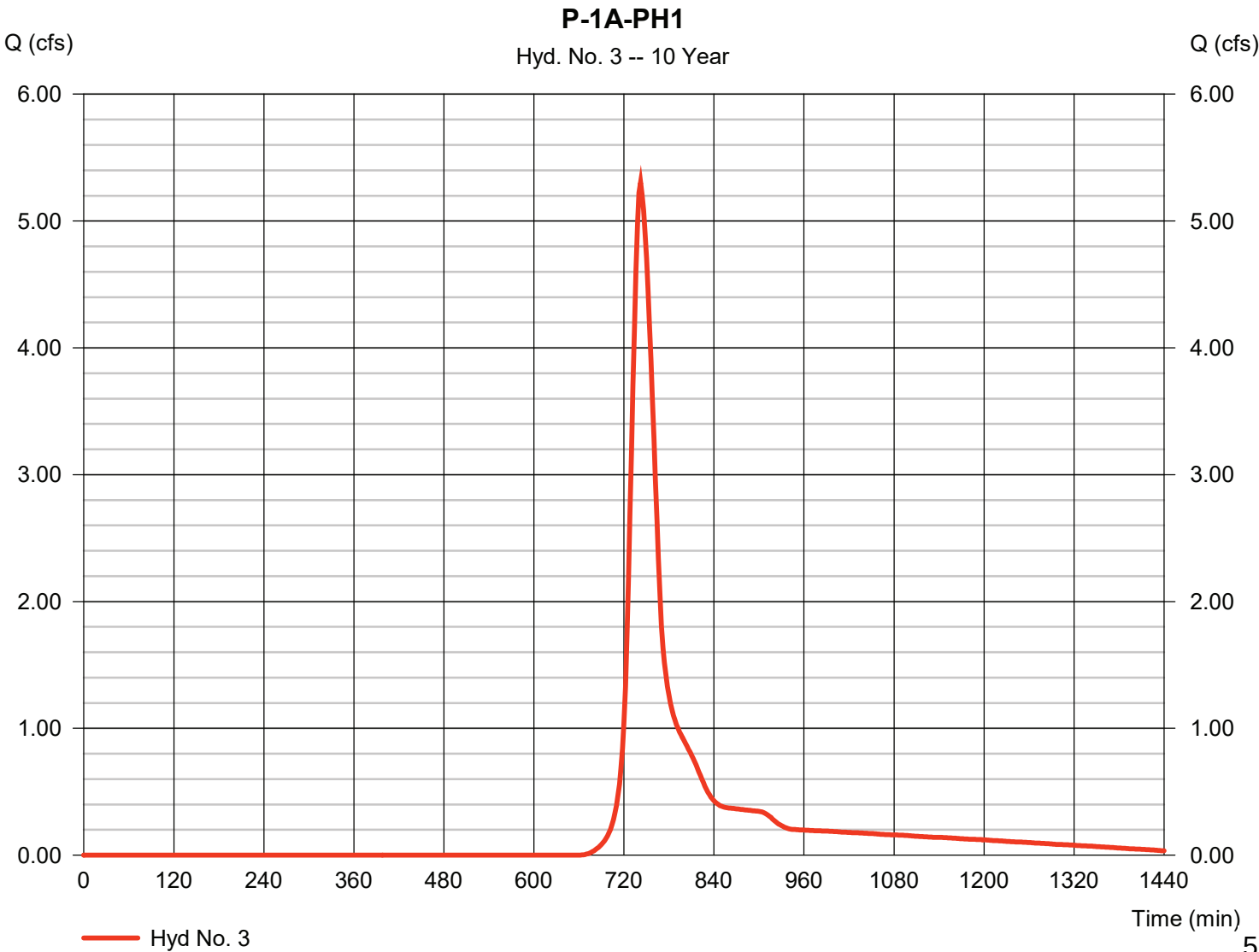
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 5.305 cfs
Storm frequency	= 10 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 0.480 acft
Drainage area	= 3.947 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 29.90 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD DISTRIBUTION CURVE		



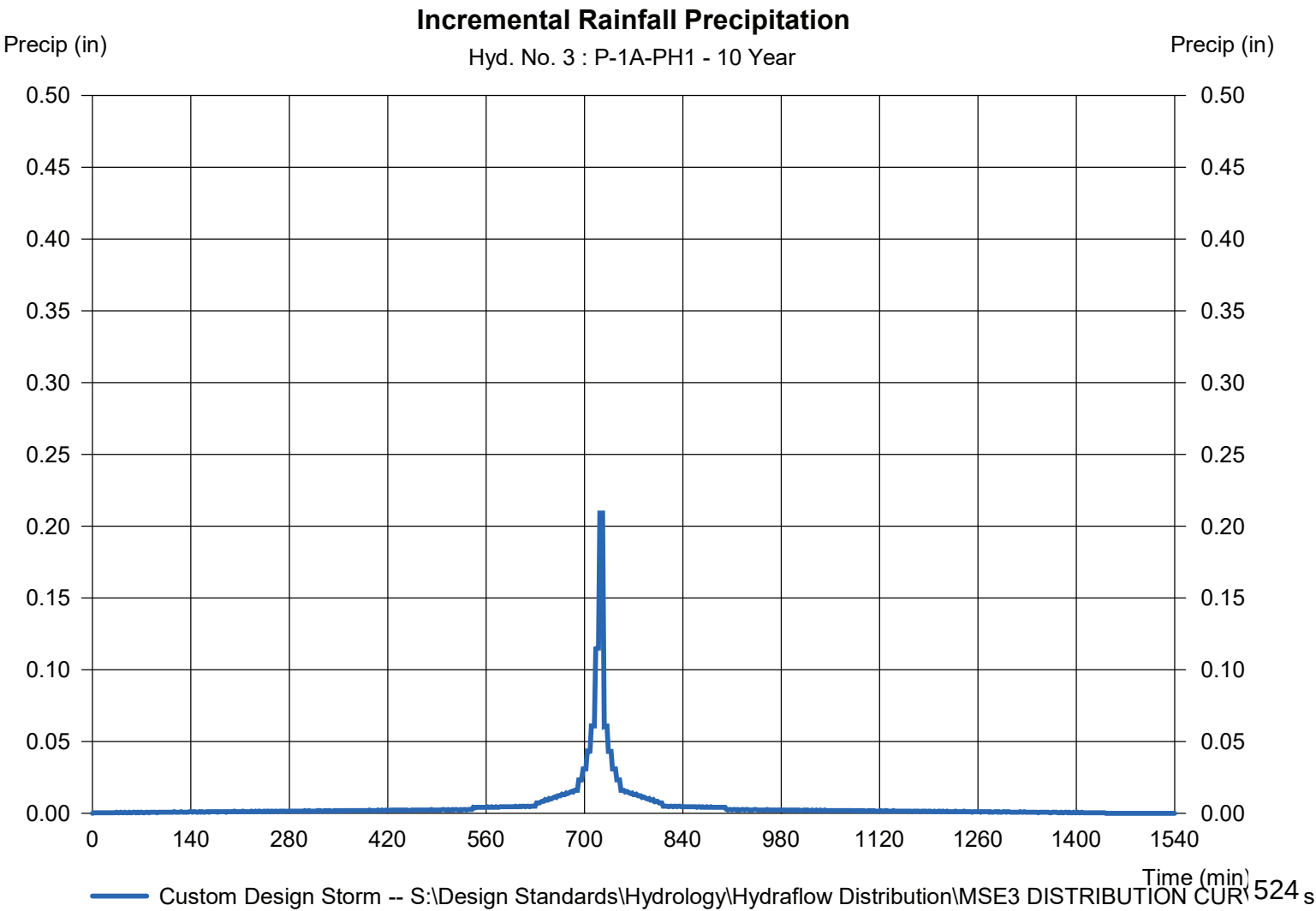
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

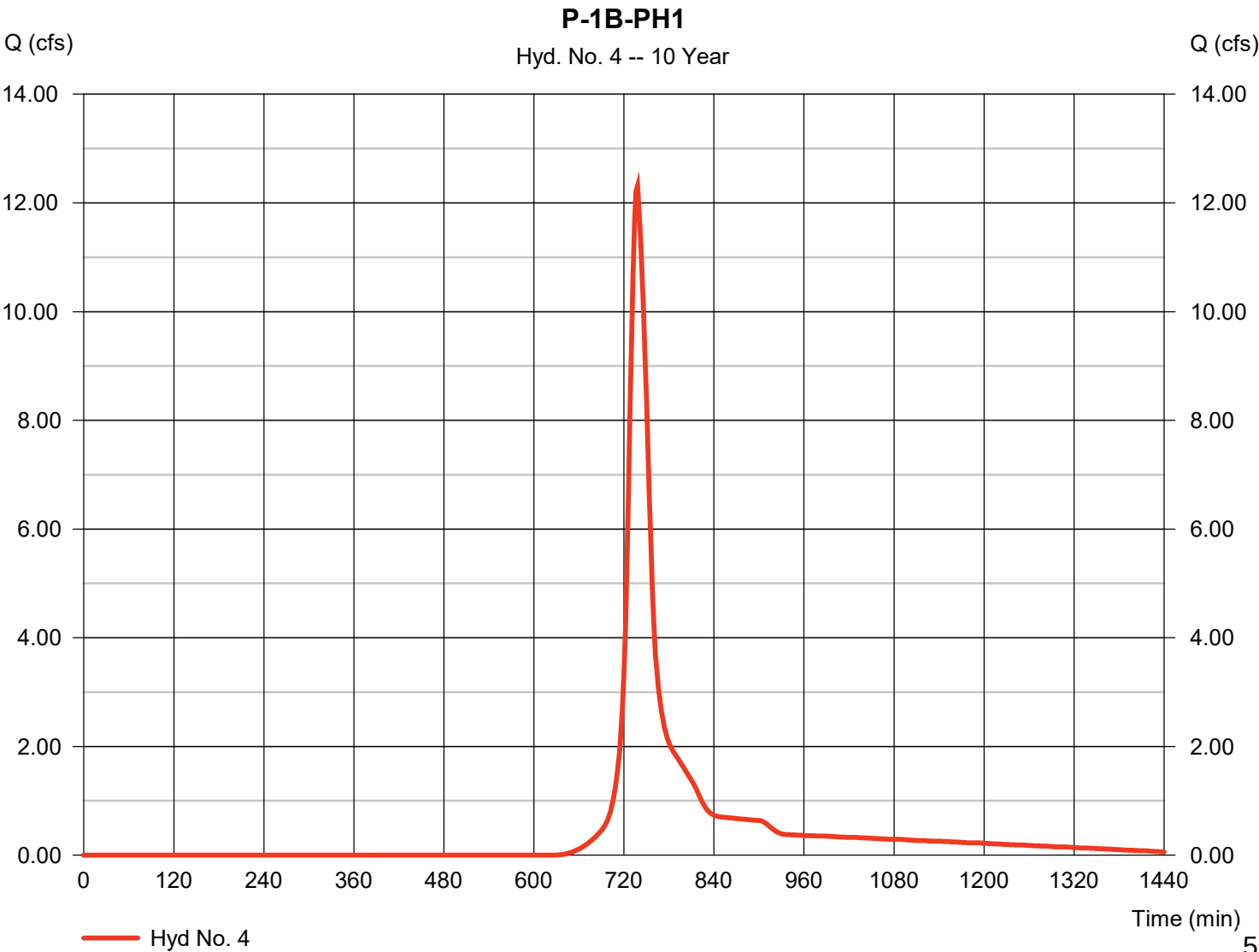
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 12.32 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.960 acft
Drainage area	= 6.516 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.60 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSR3 DISTRIBUTION CURVE		



Precipitation Report

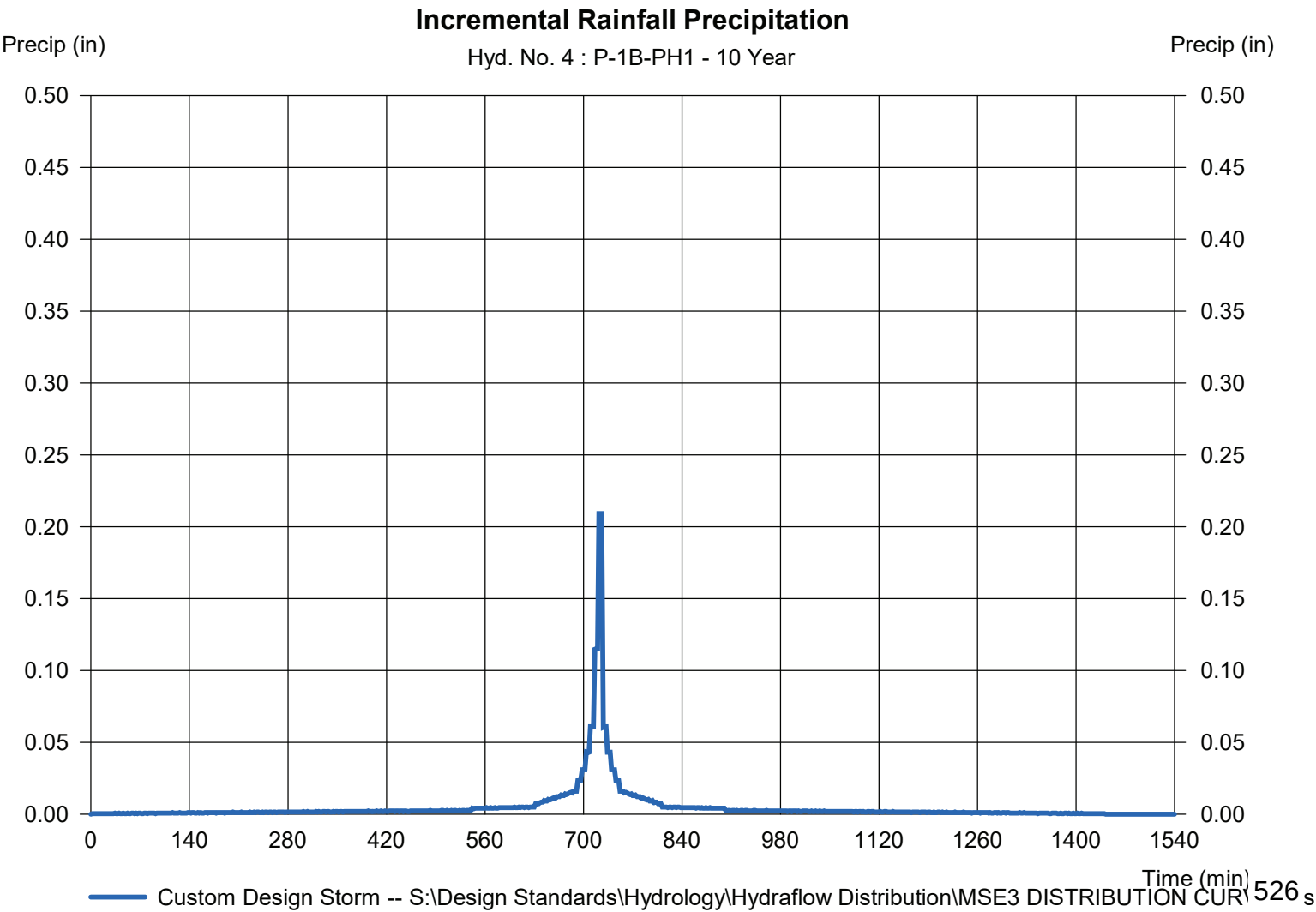
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

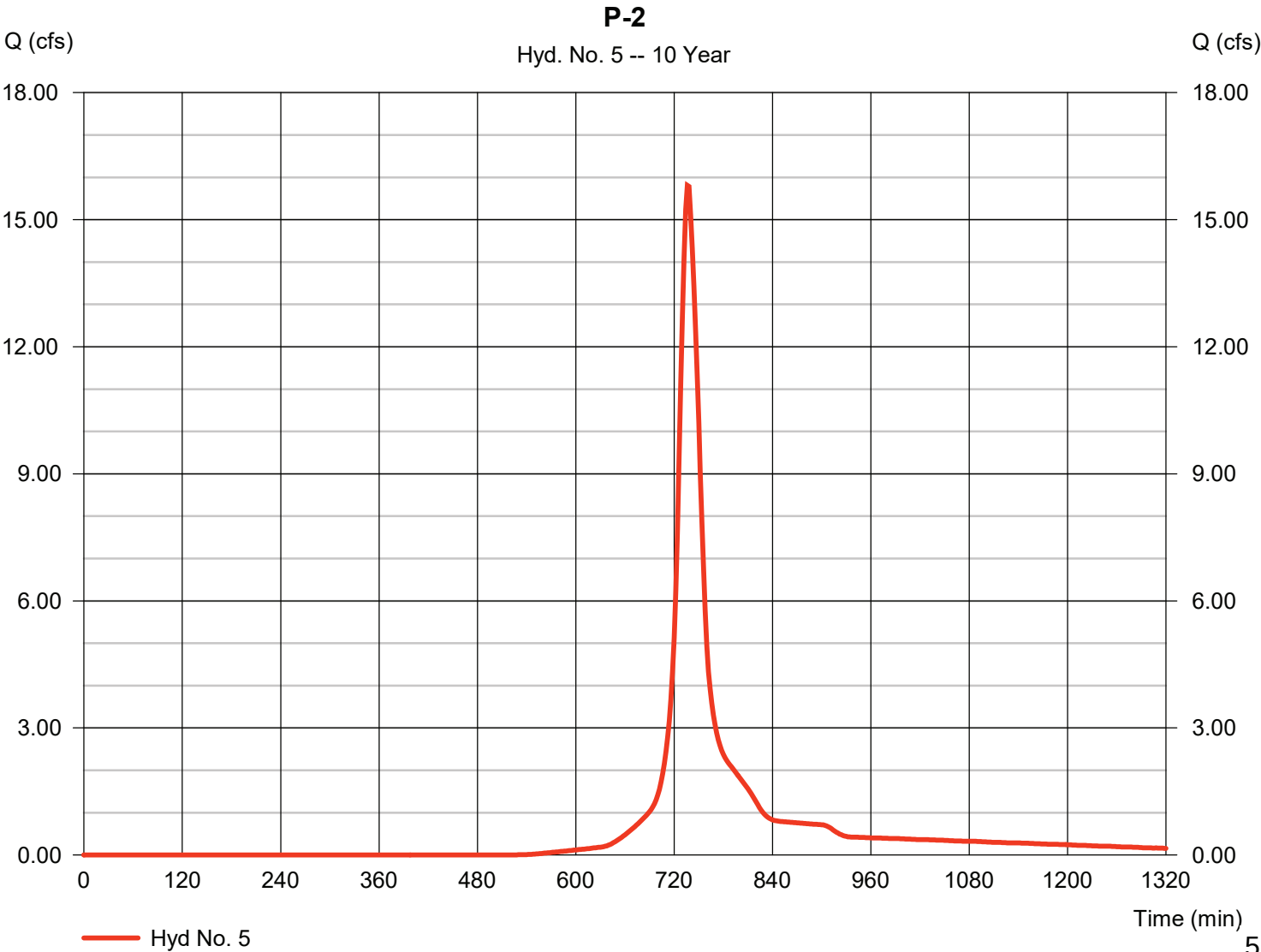
Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 15.81 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.231 acft
Drainage area	= 6.339 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.710 x 75)] / 6.339



Precipitation Report

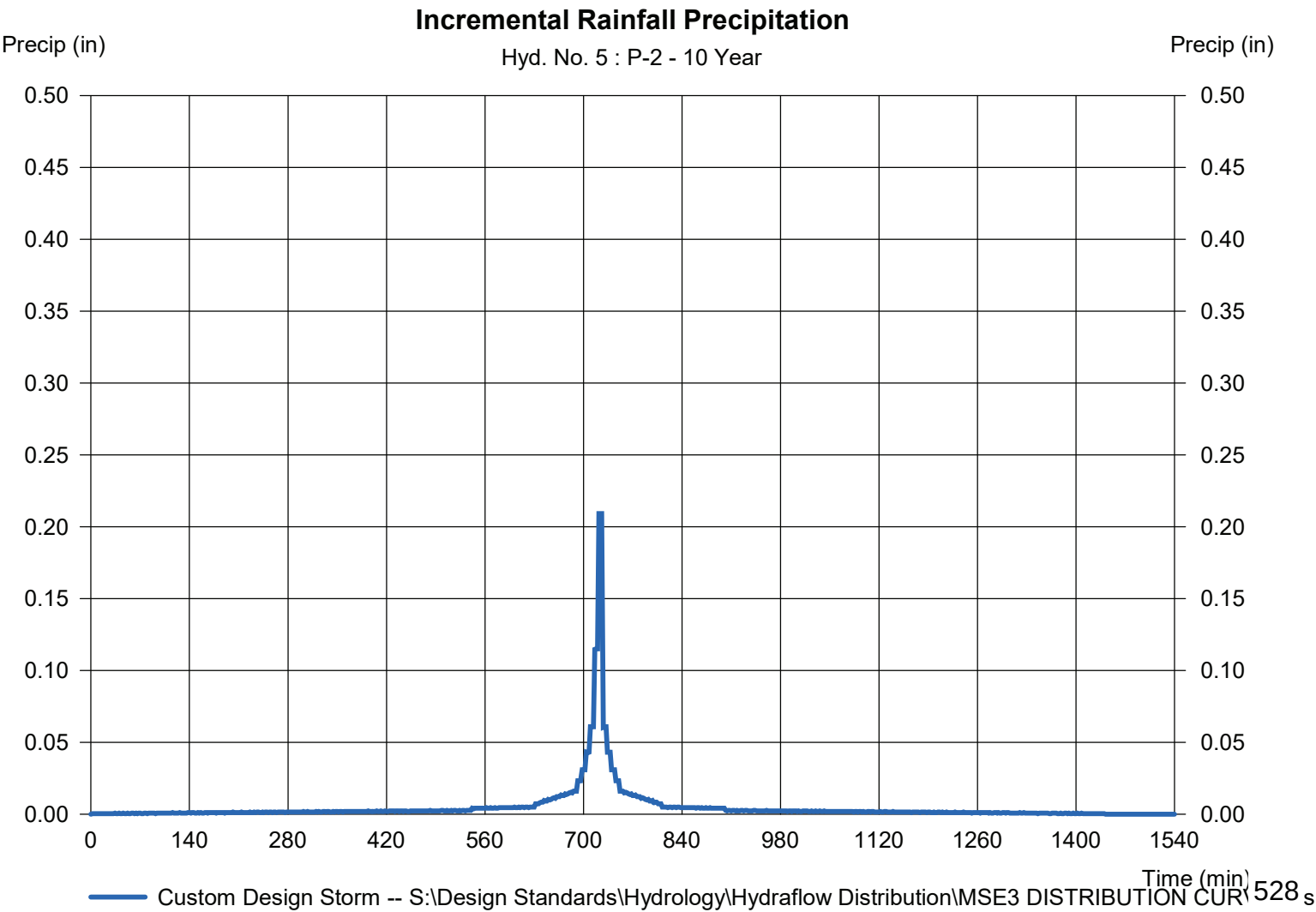
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

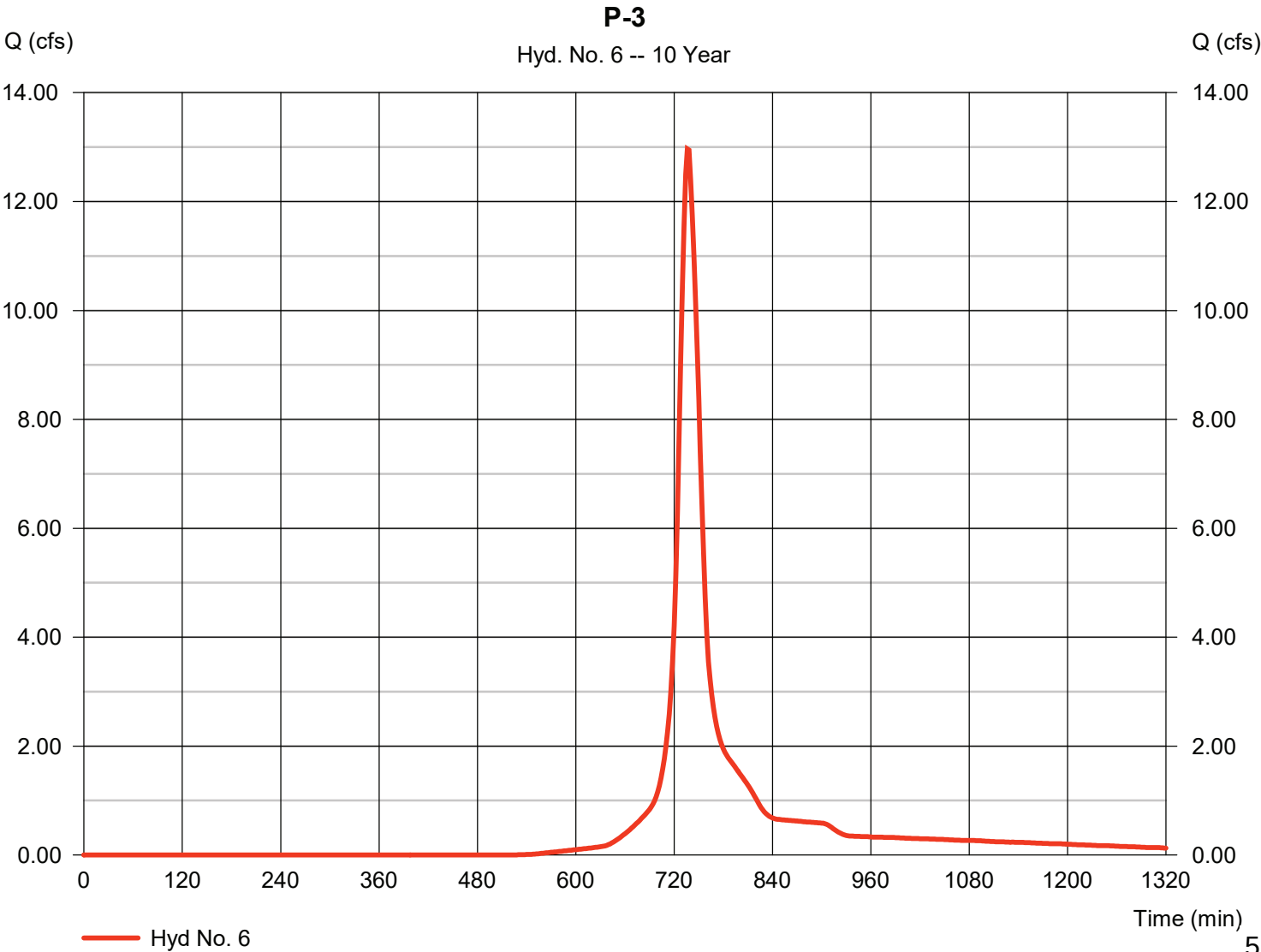
Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 12.97 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.009 acft
Drainage area	= 5.199 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.199



Precipitation Report

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

Friday, 06 / 28 / 2019

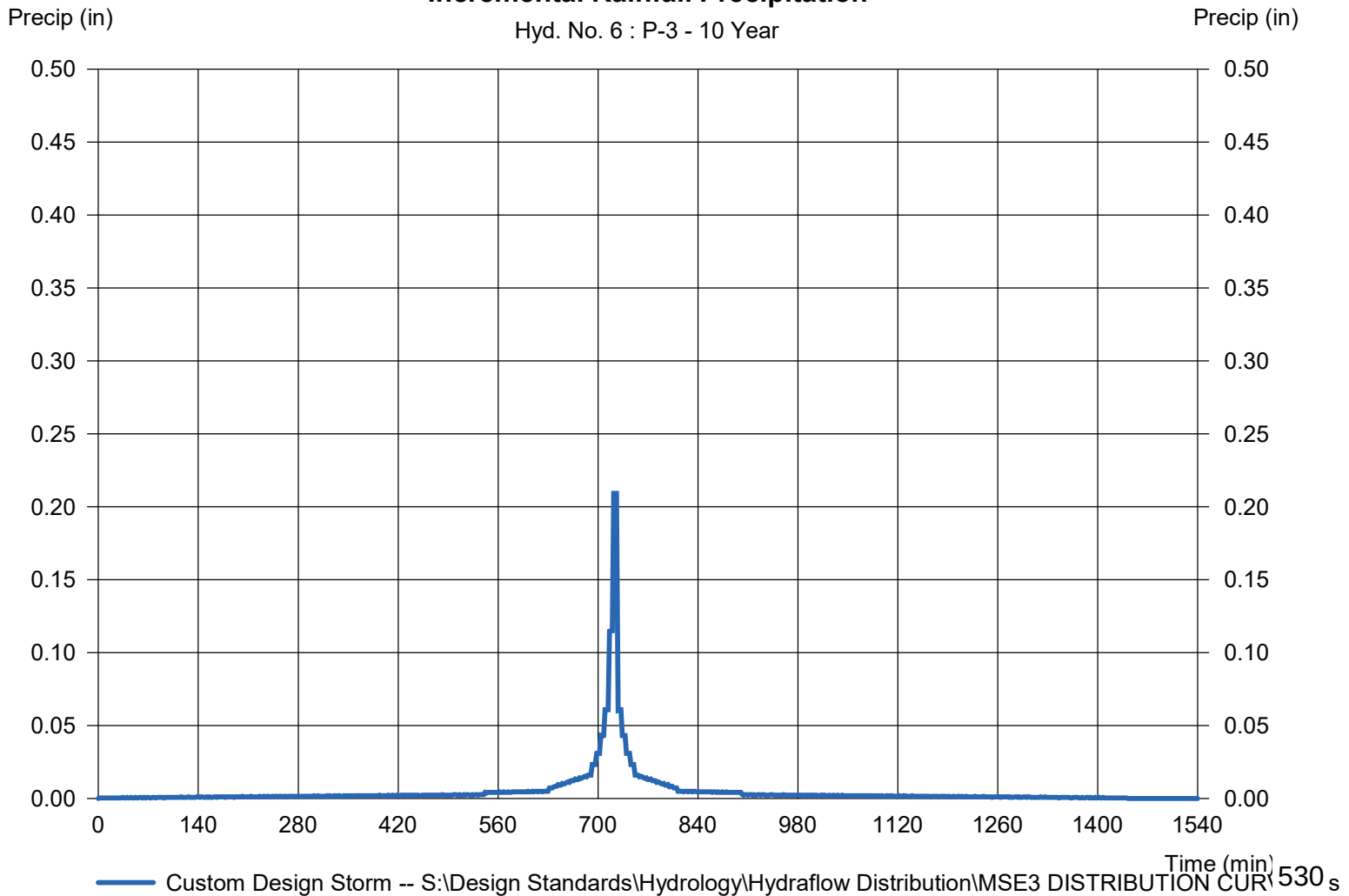
Hyd. No. 6

P-3

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 6 : P-3 - 10 Year



Hydrograph Report

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

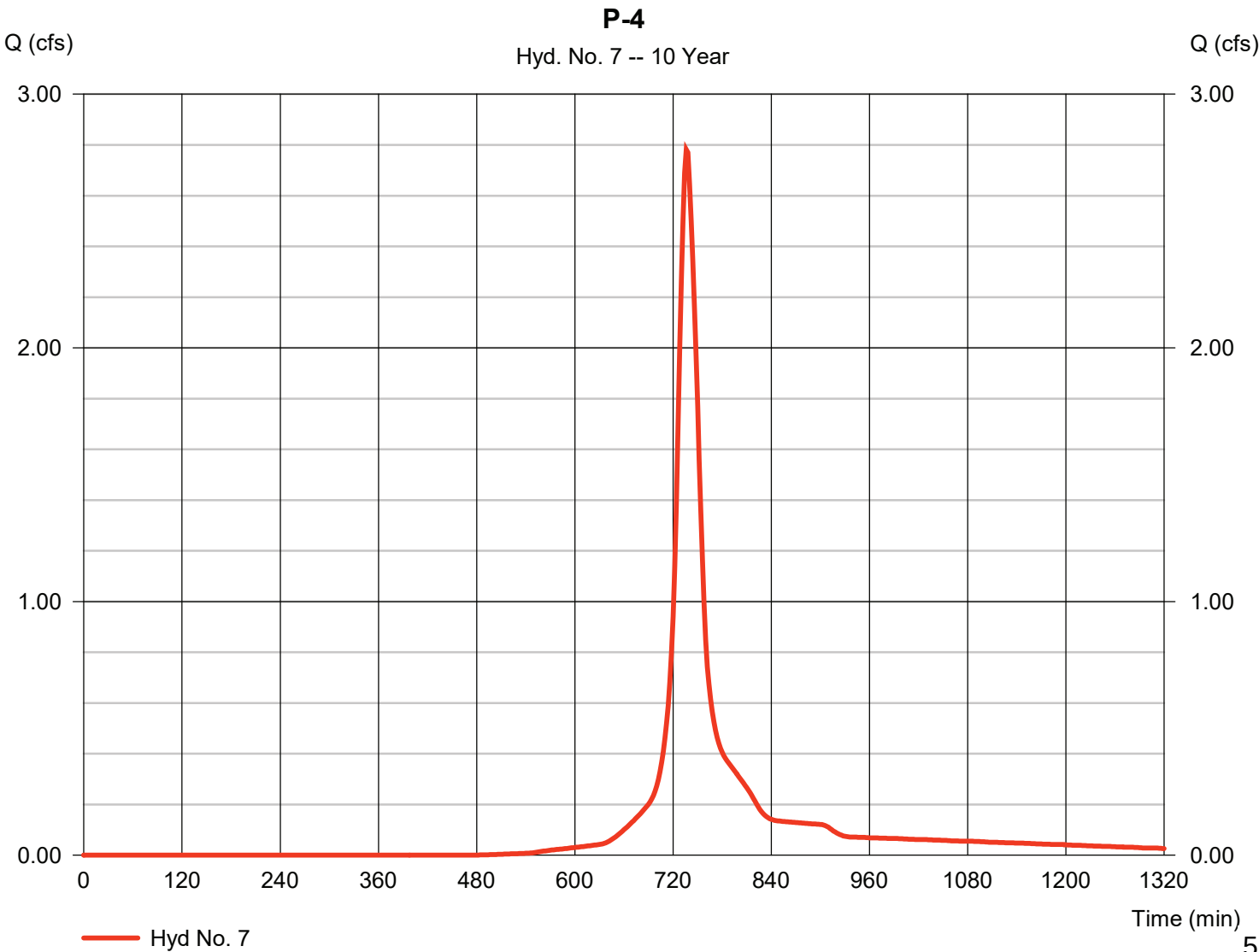
Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 2.782 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 0.217 acft
Drainage area	= 1.040 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.10 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

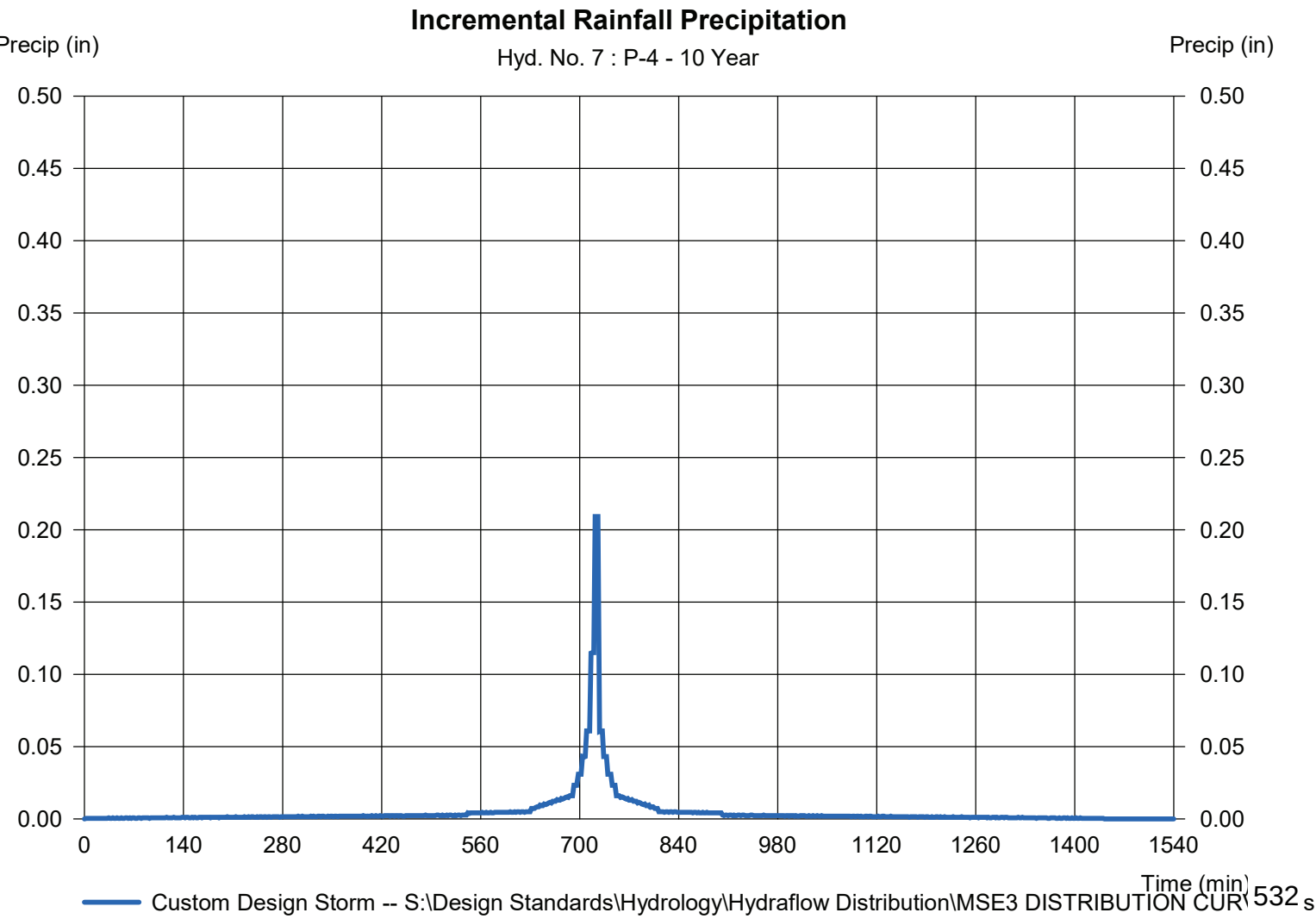
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

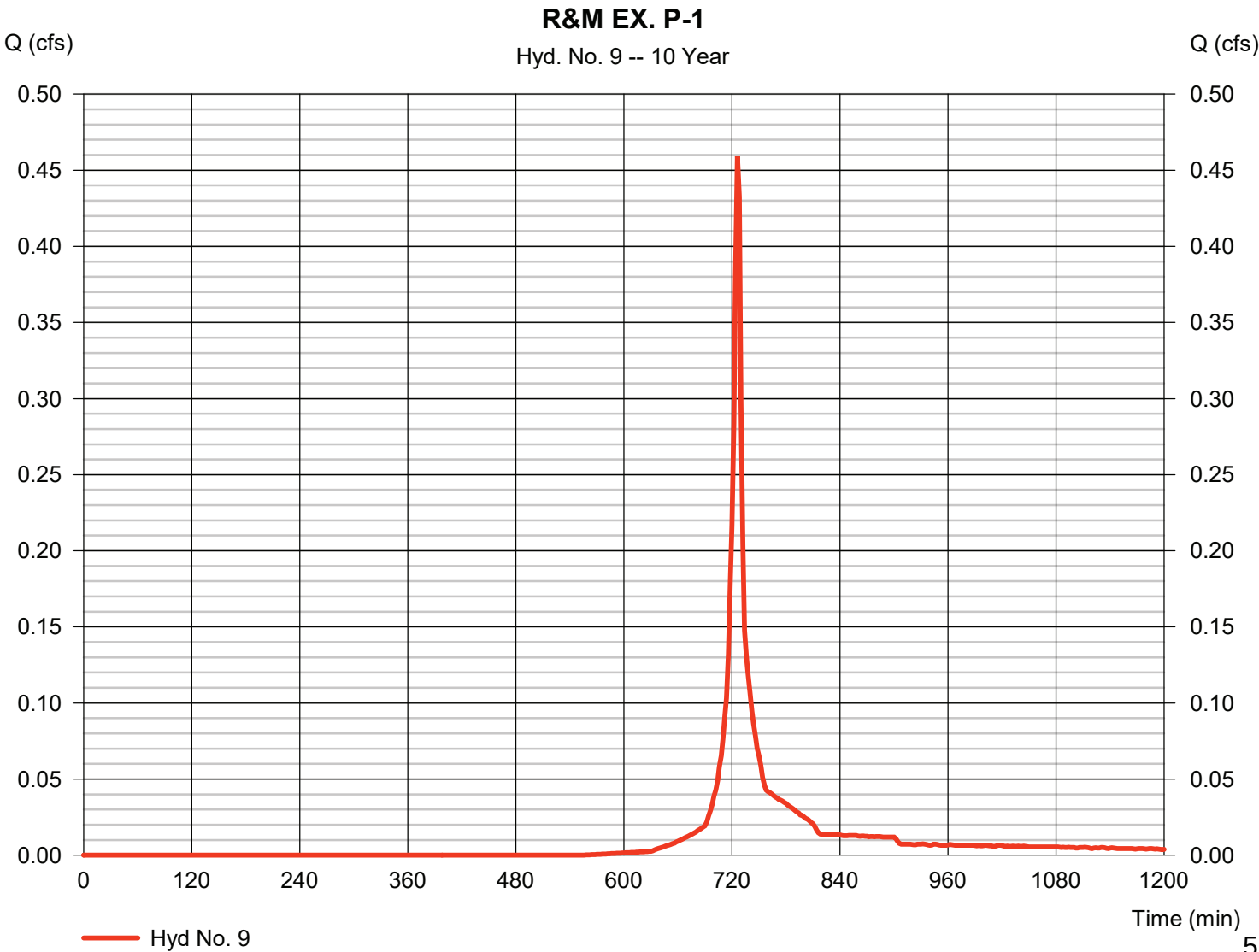
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.459 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.020 acft
Drainage area	= 0.120 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

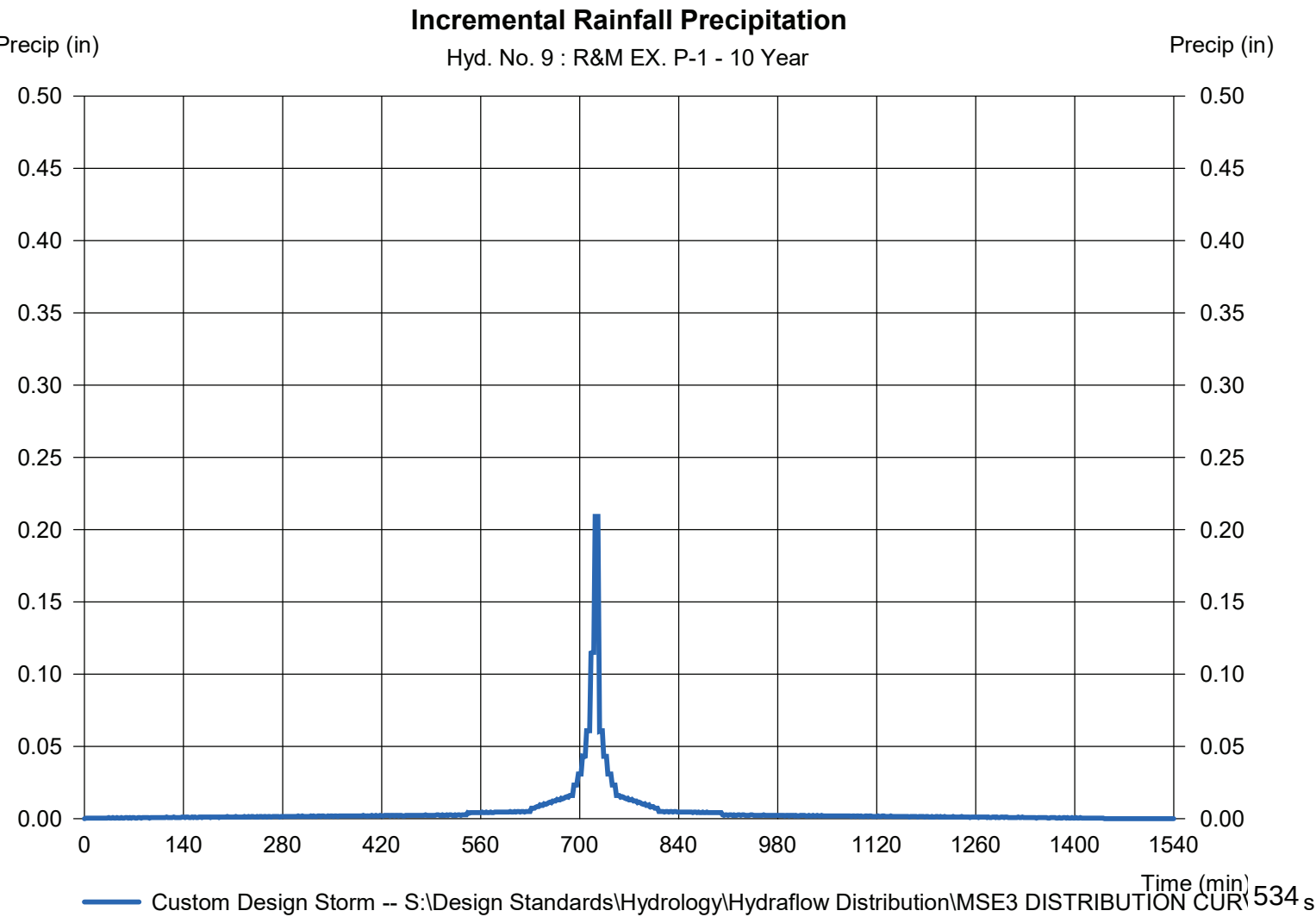
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

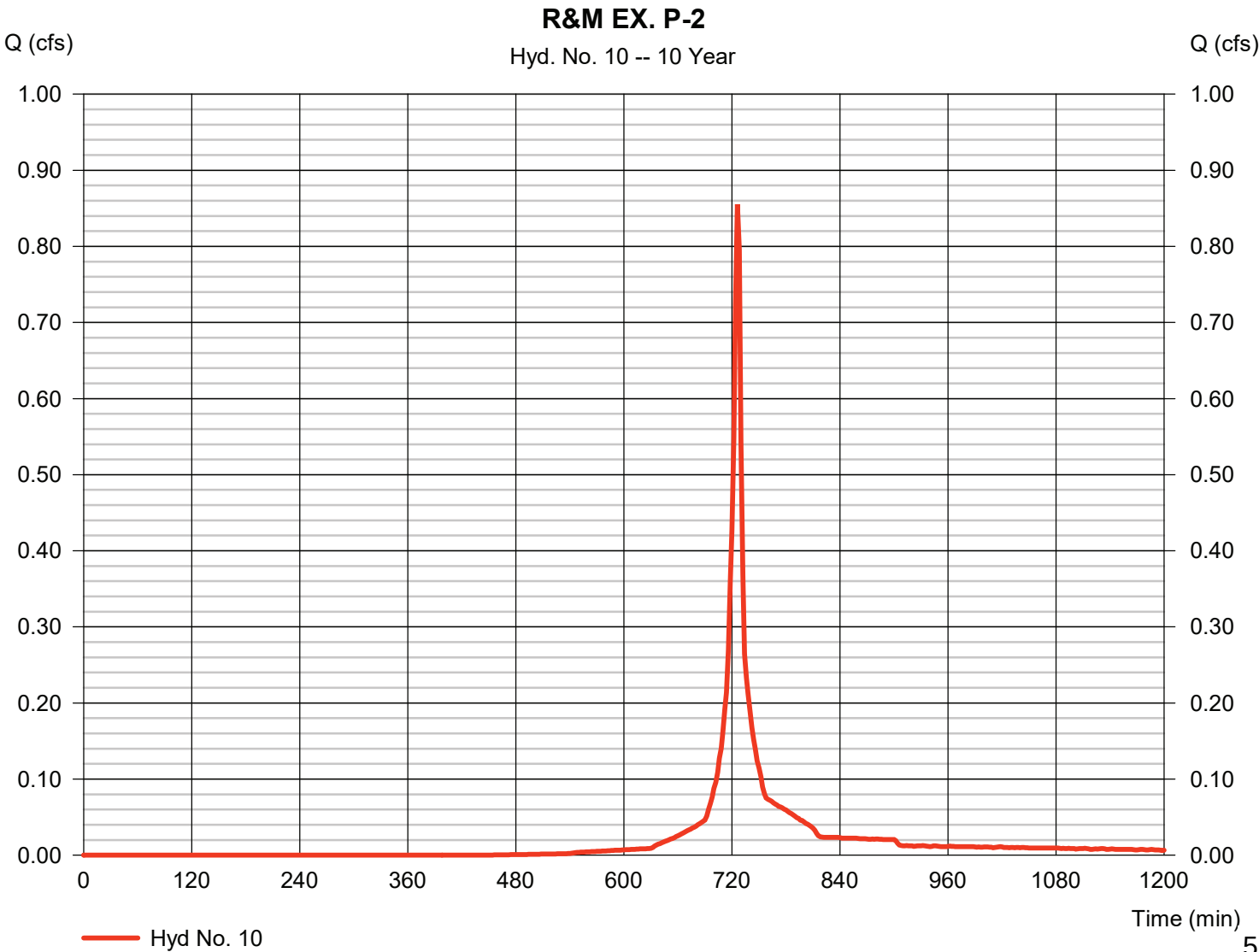
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.856 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.038 acft
Drainage area	= 0.190 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

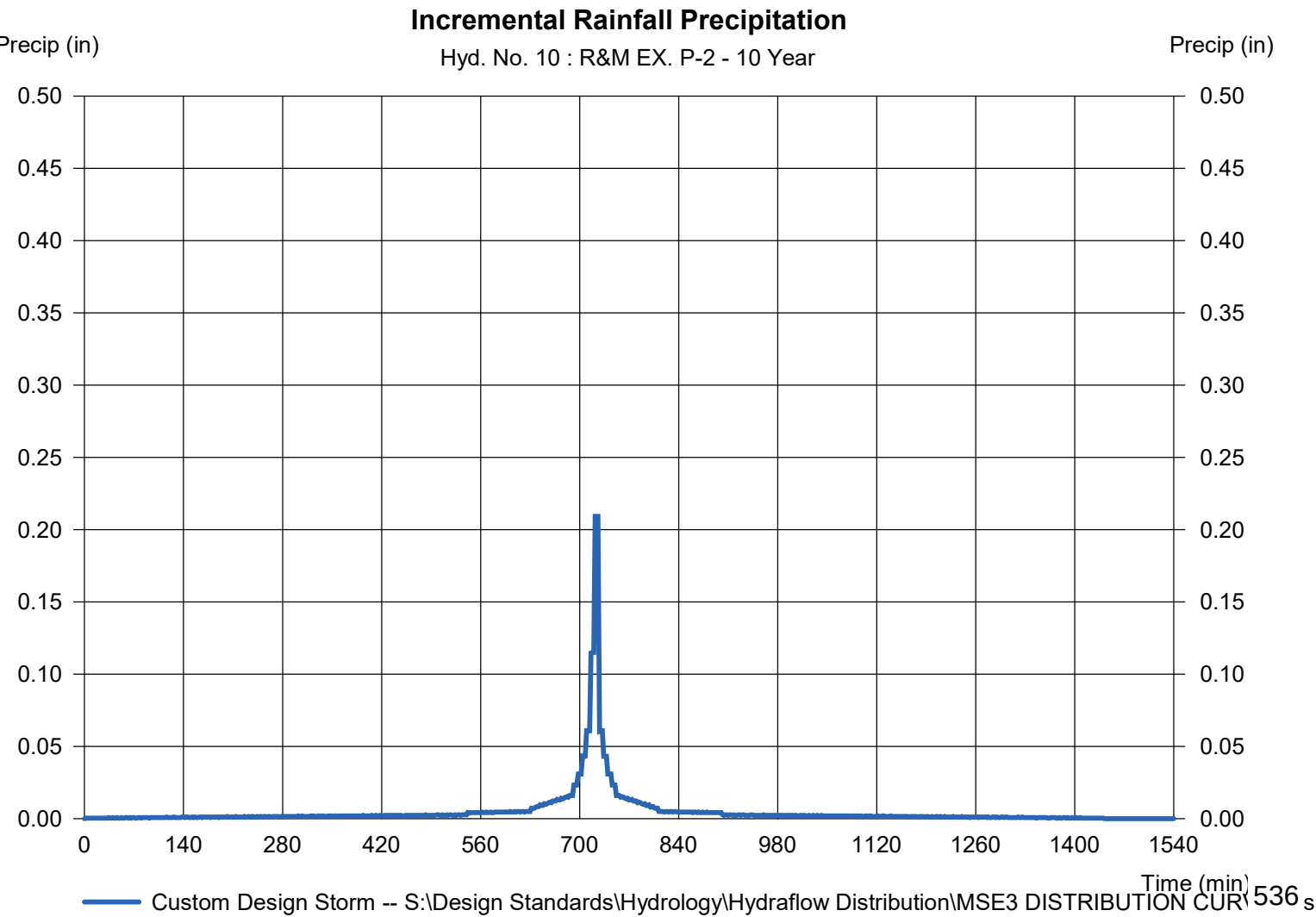
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

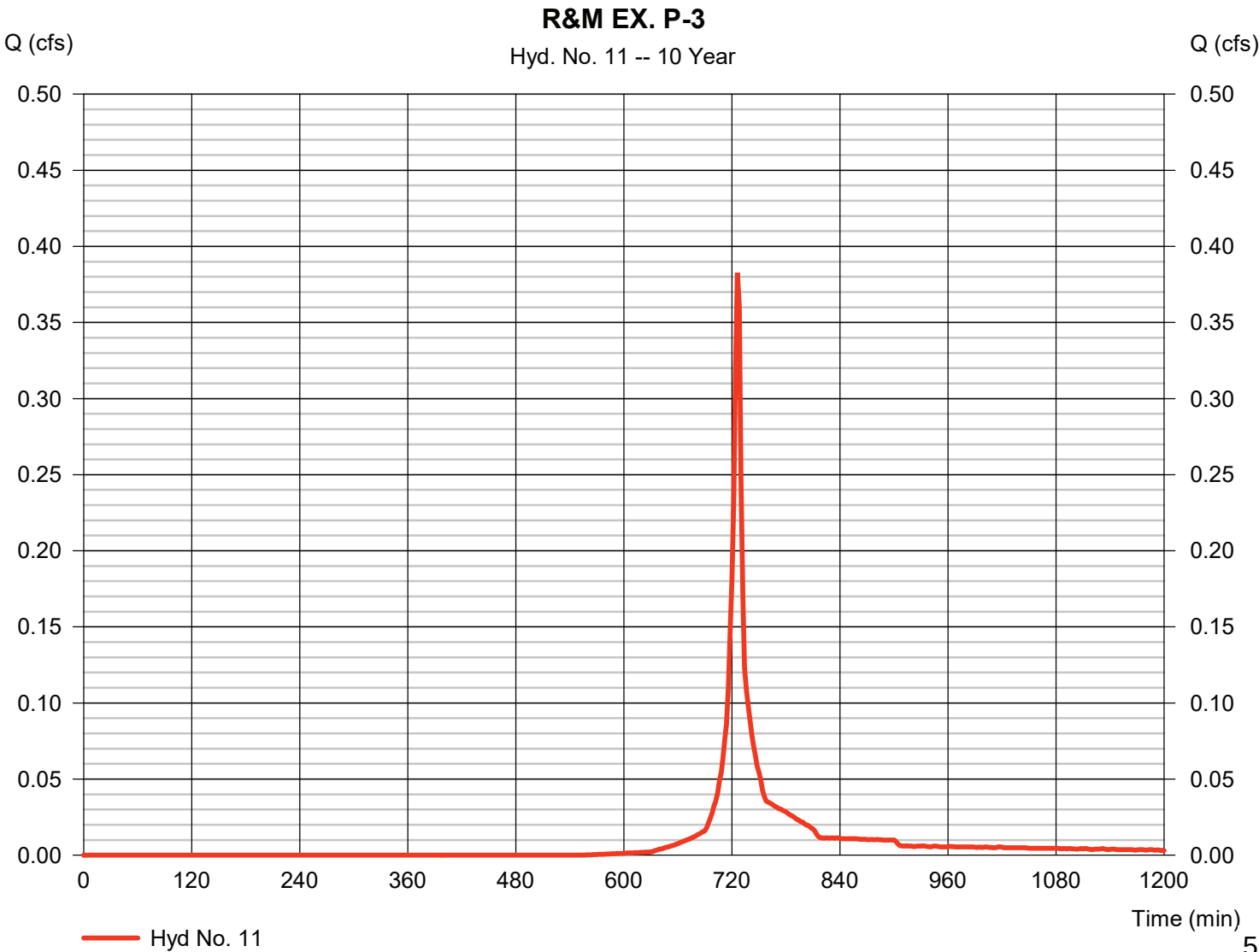
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.383 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.017 acft
Drainage area	= 0.100 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

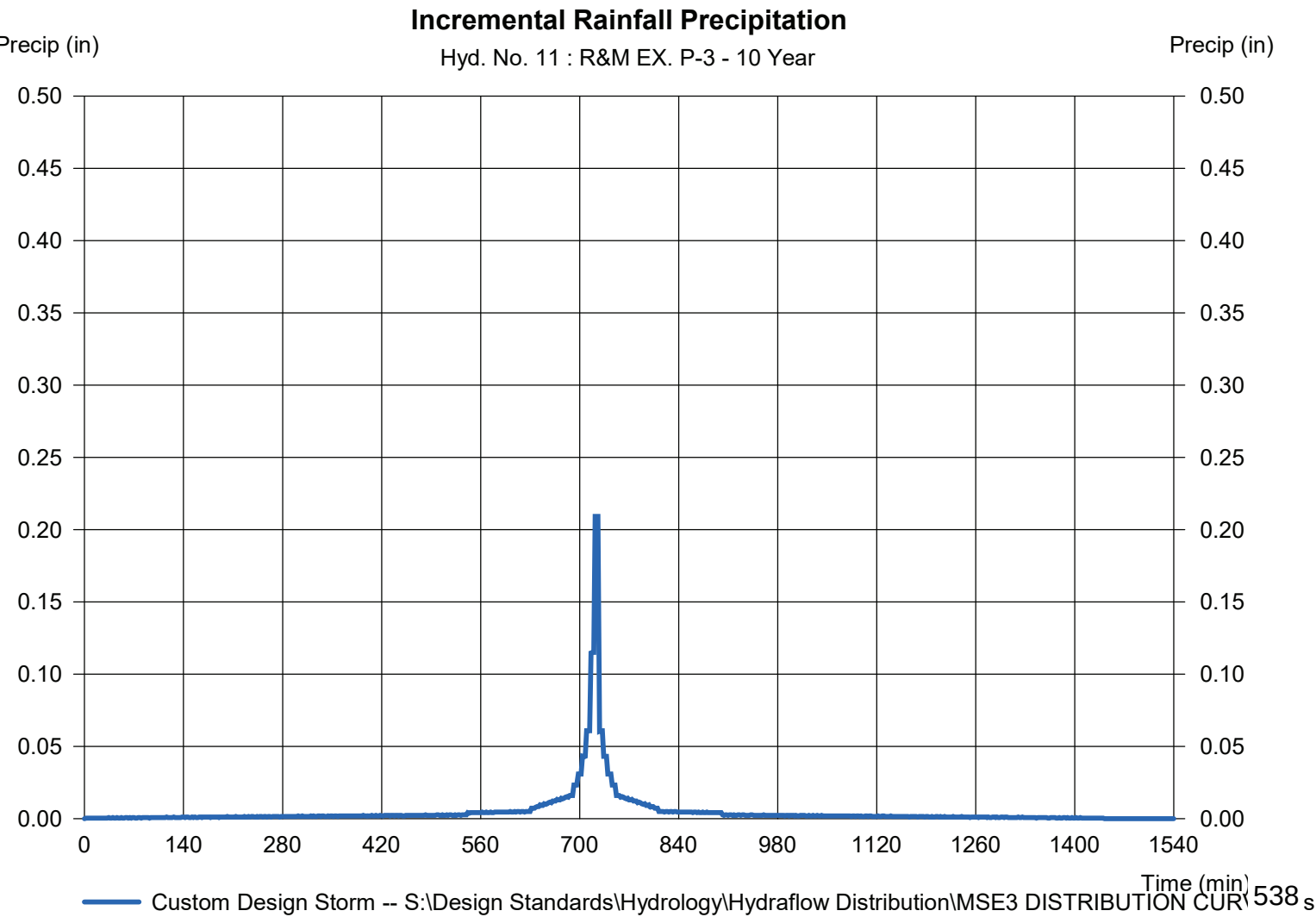
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

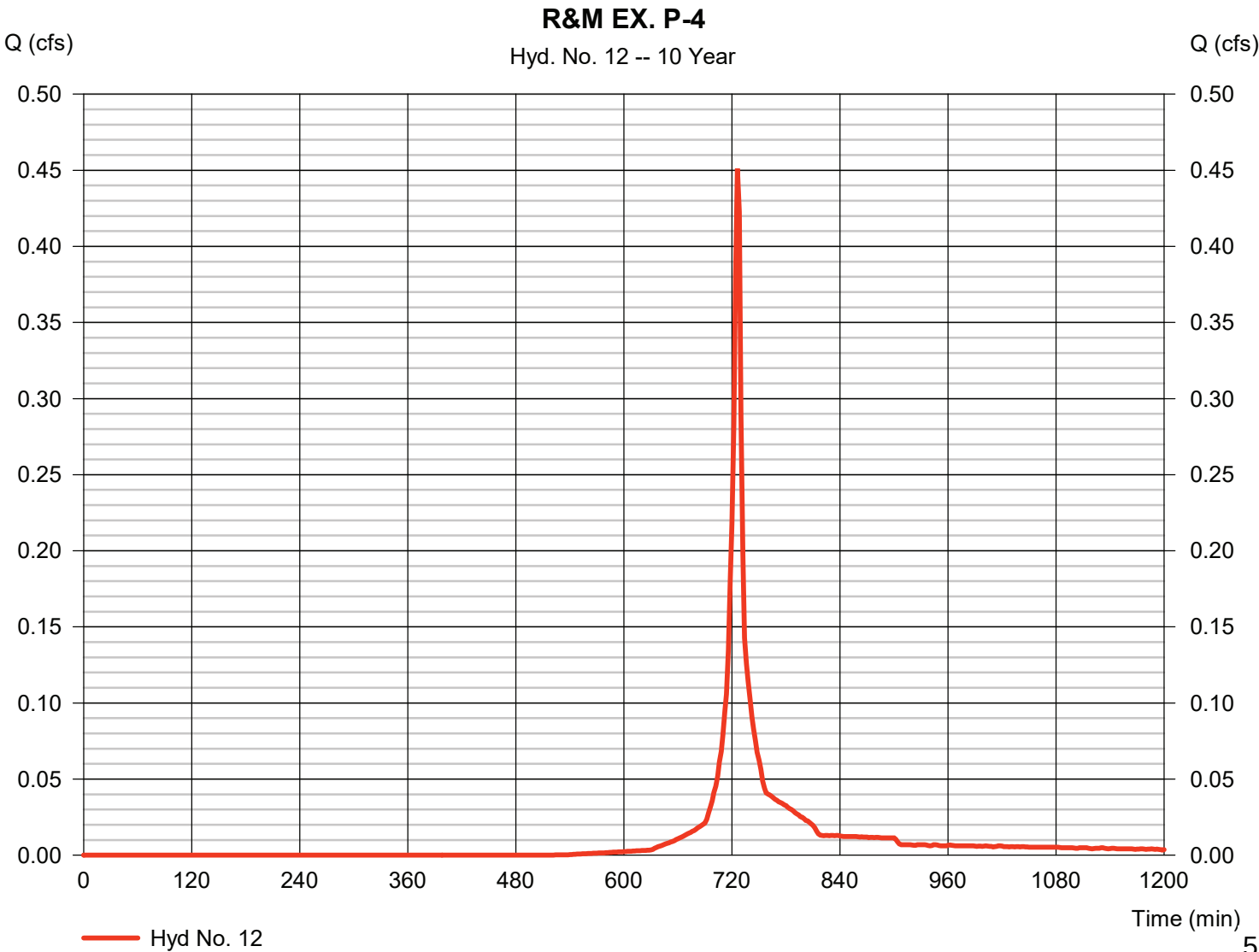
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.451 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.020 acft
Drainage area	= 0.110 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

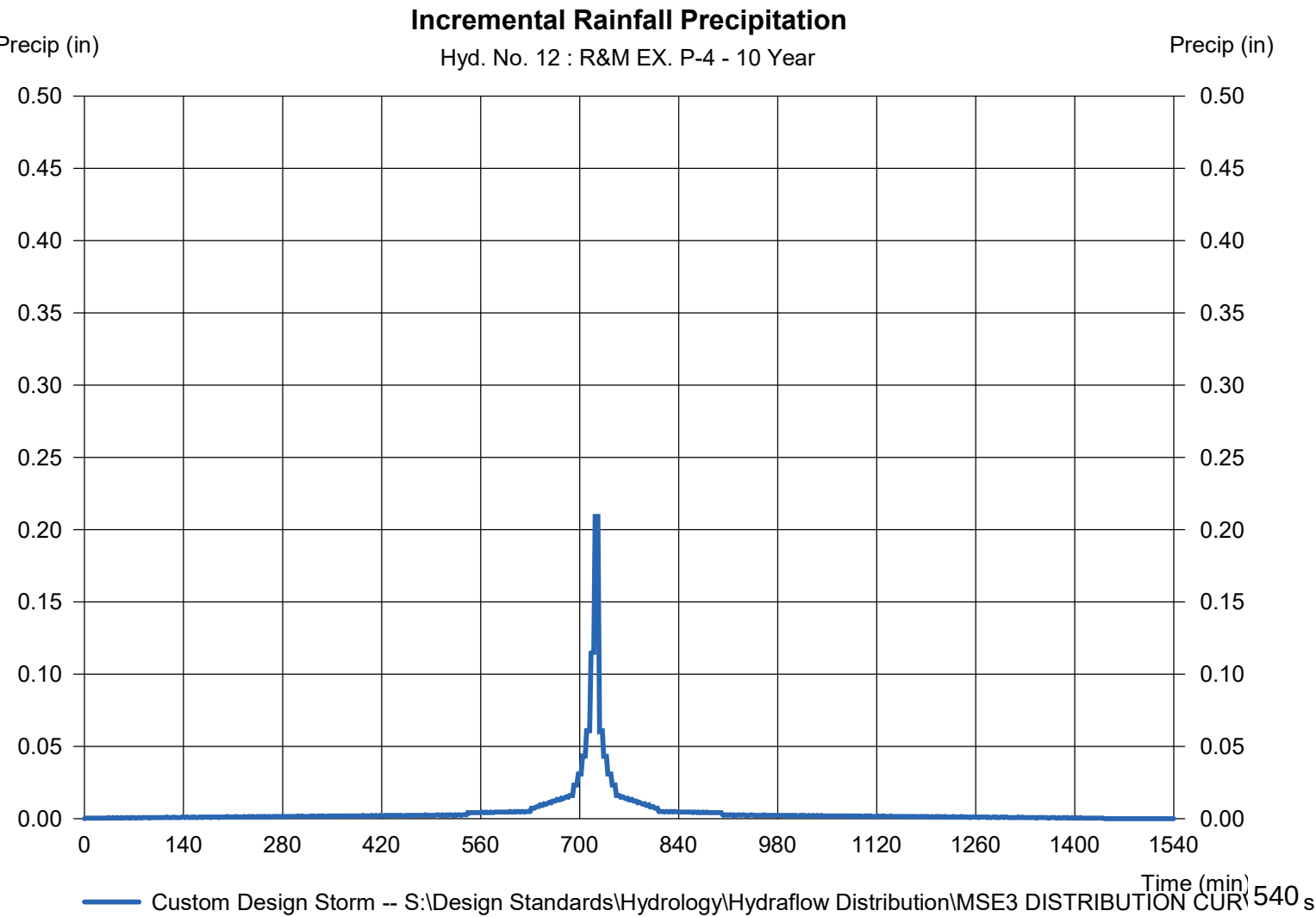
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

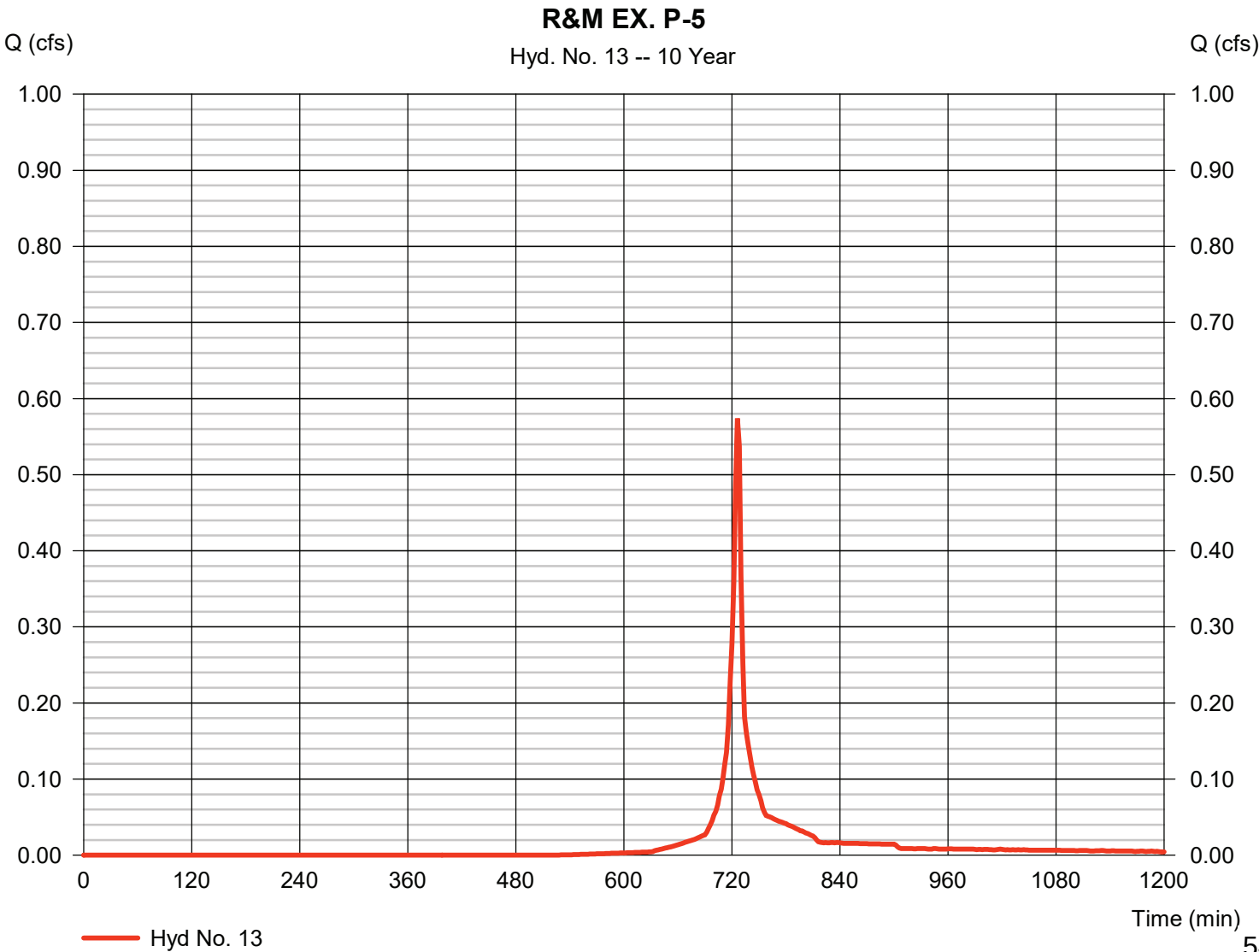
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.574 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.025 acft
Drainage area	= 0.140 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



R&M EX. P-5

Hyd. No. 13 -- 10 Year

— Hyd No. 13

Precipitation Report

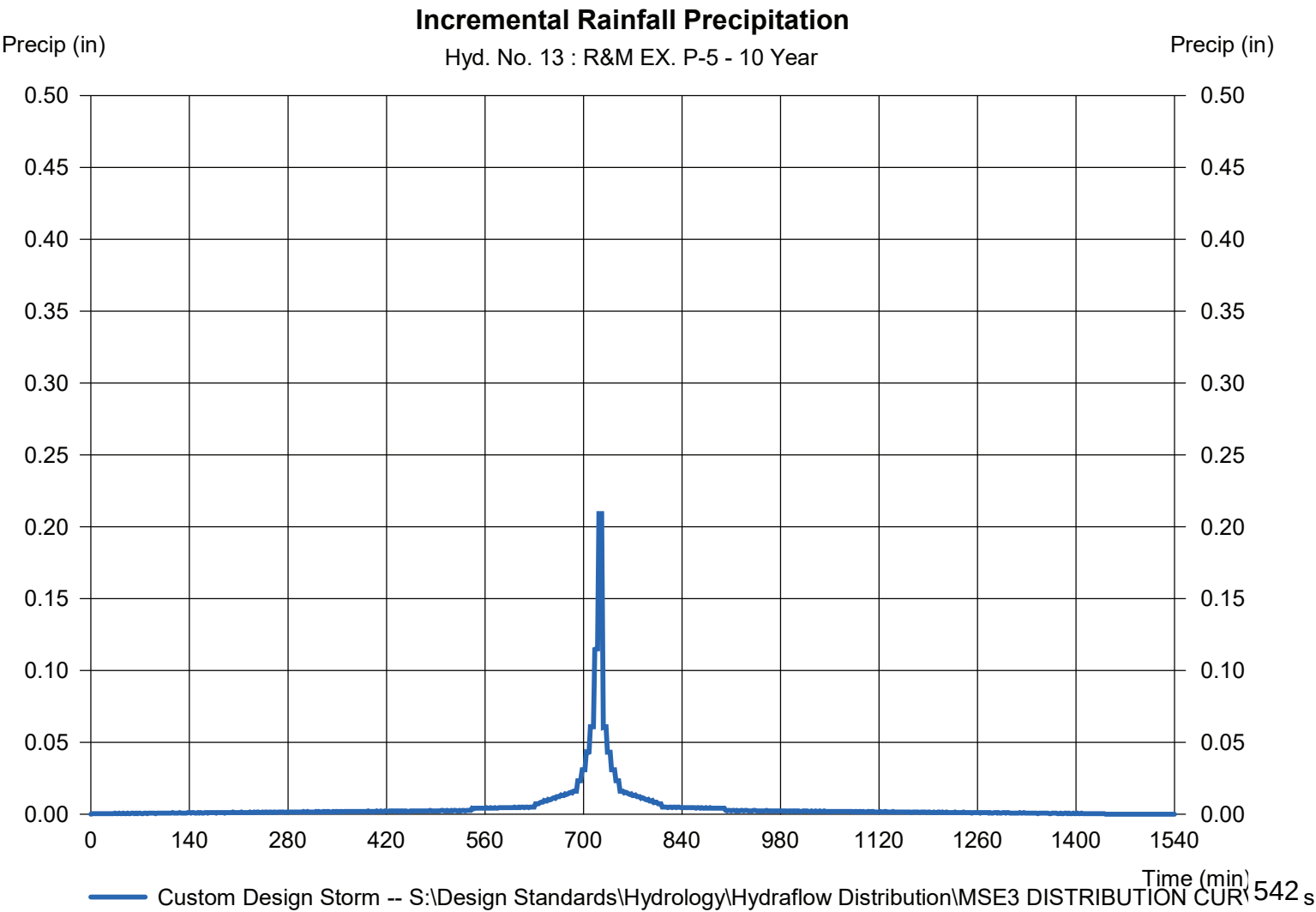
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

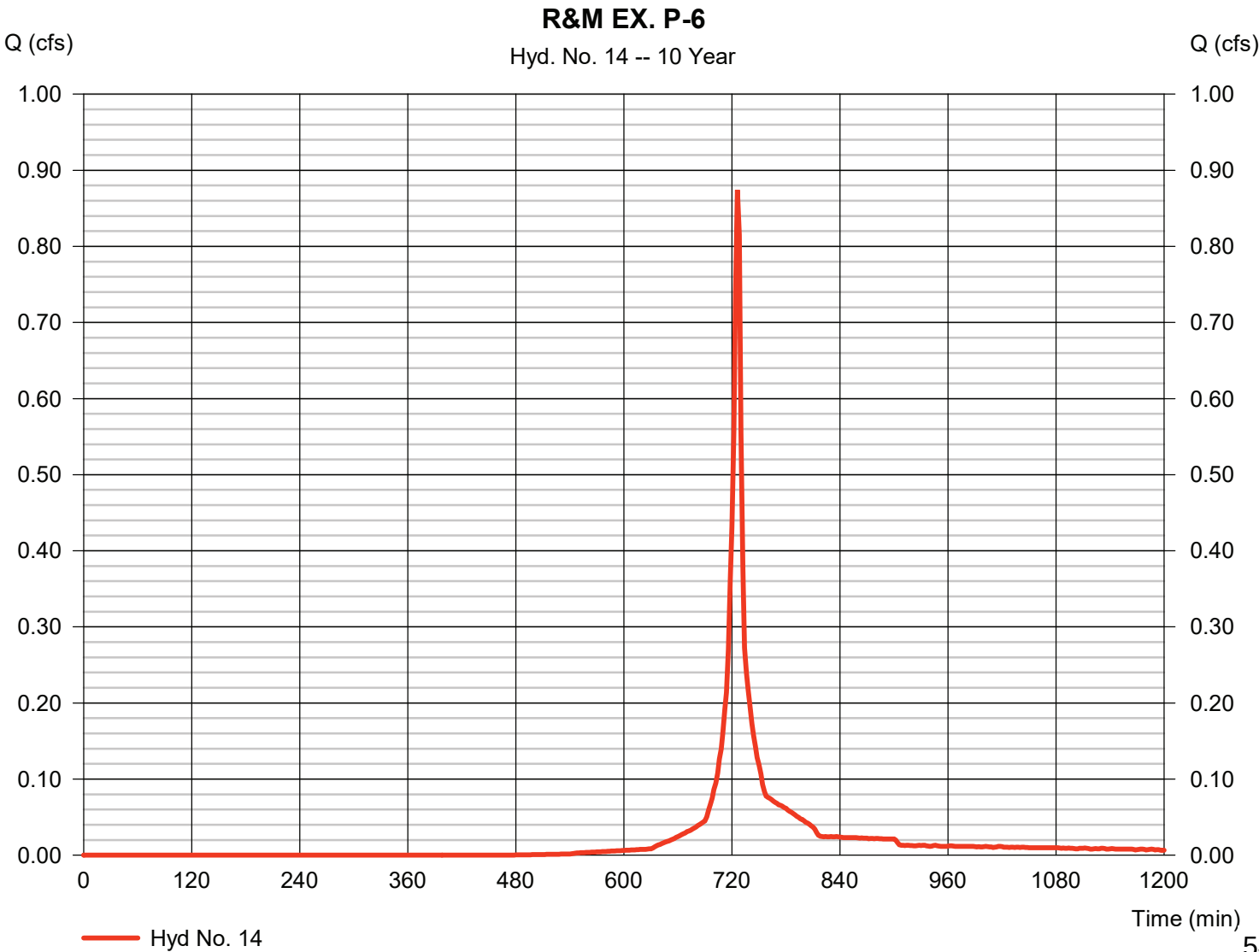
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.874 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.038 acft
Drainage area	= 0.200 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

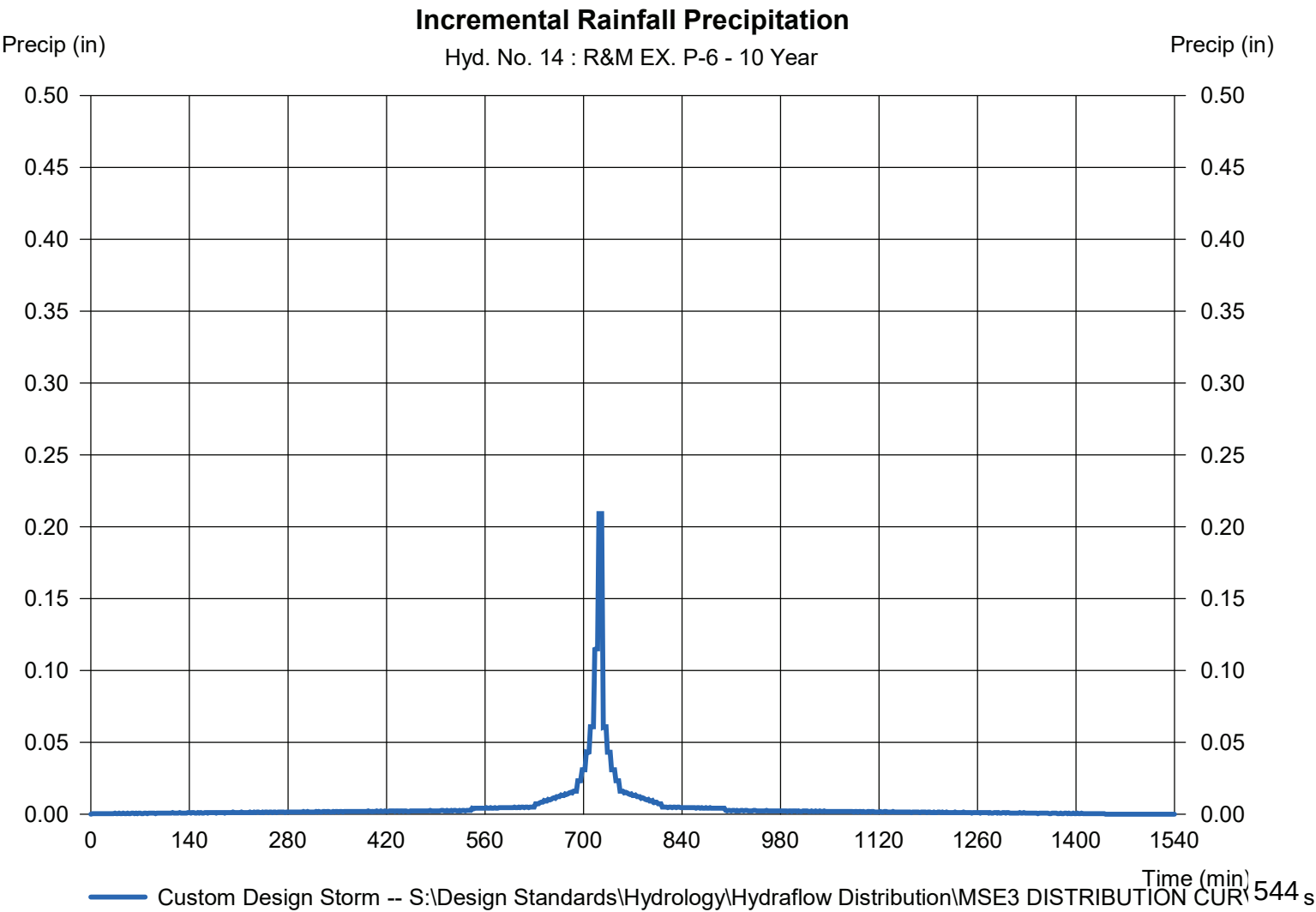
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

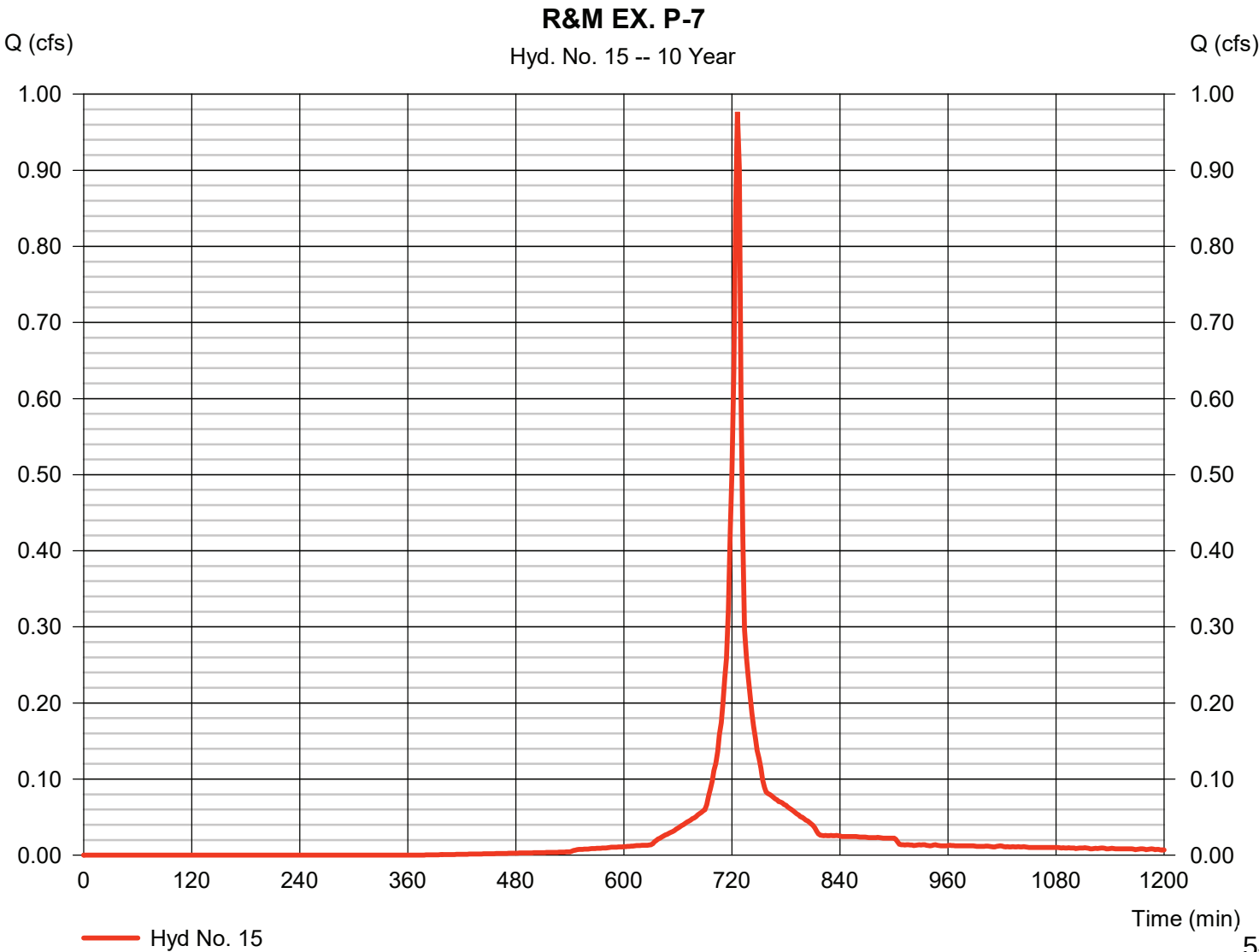
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.977 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.044 acft
Drainage area	= 0.200 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

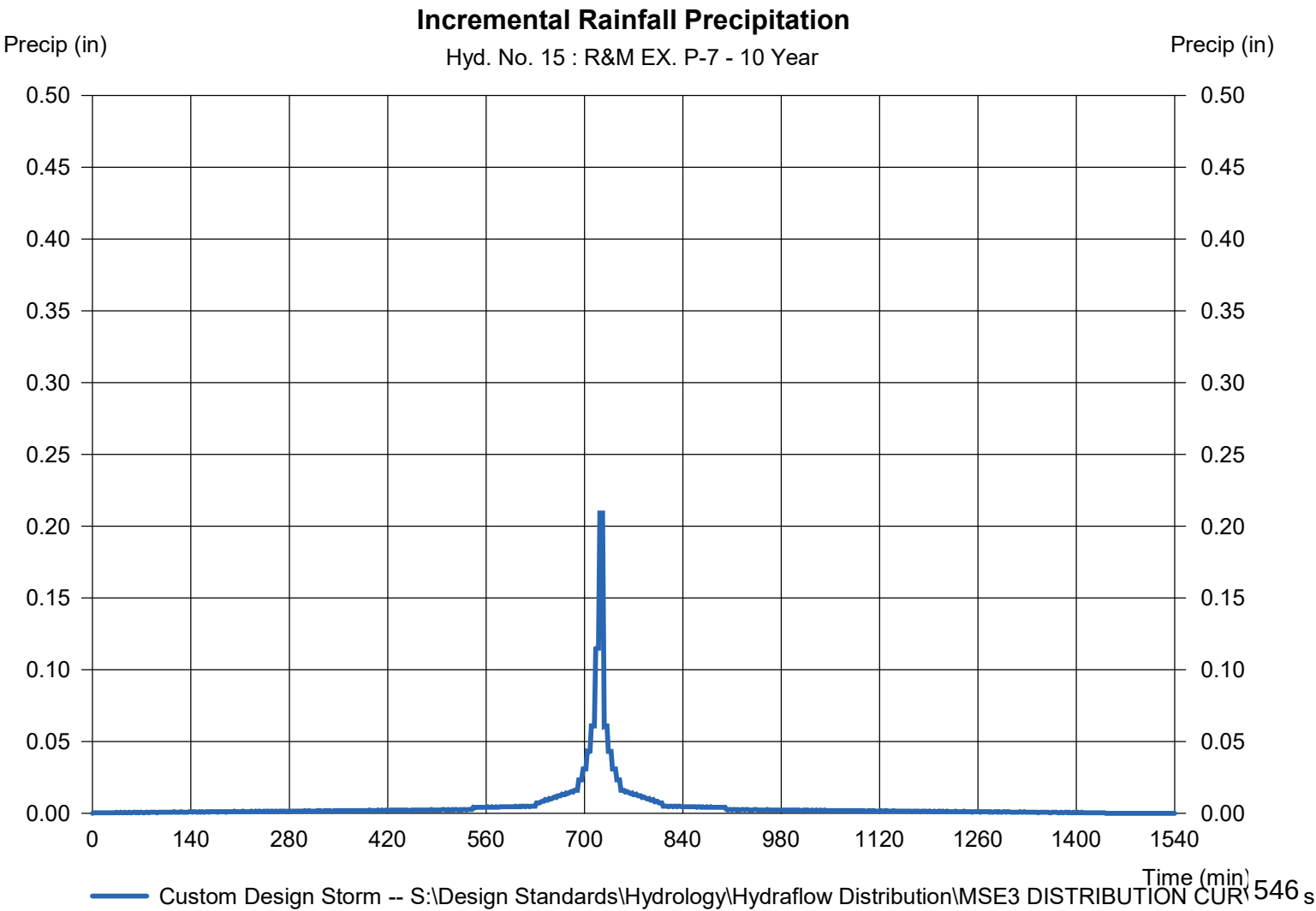
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

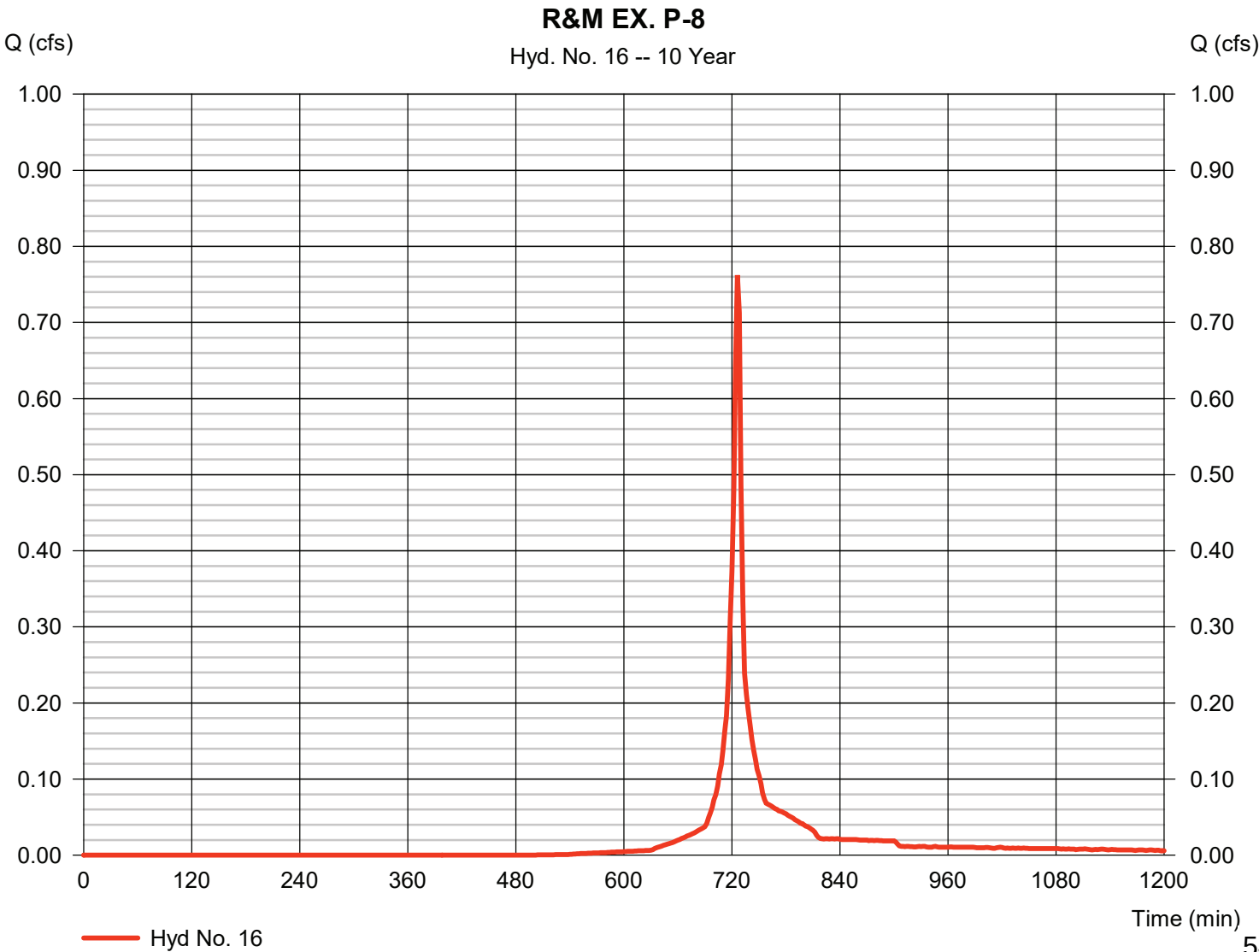
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.762 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.033 acft
Drainage area	= 0.180 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

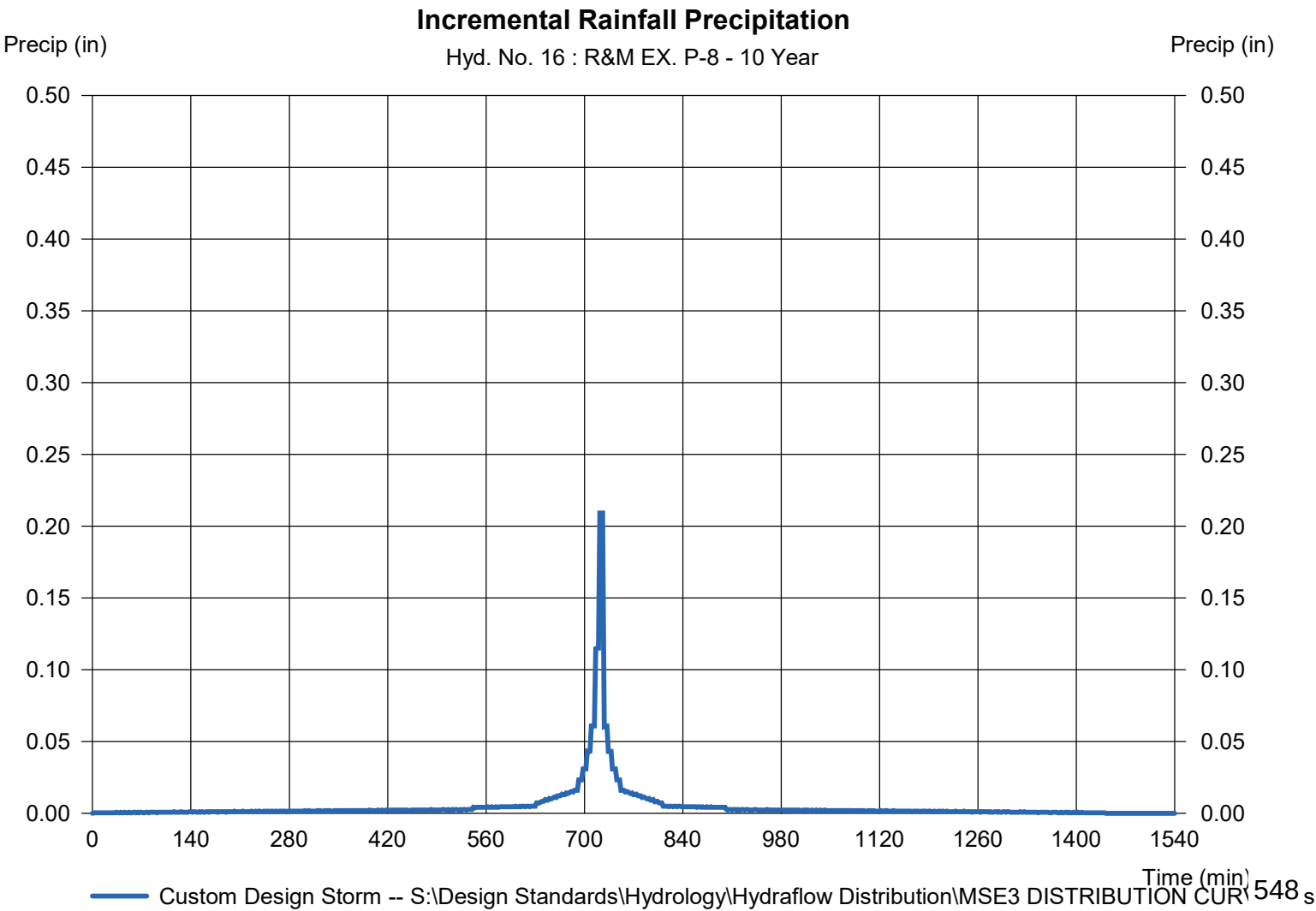
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

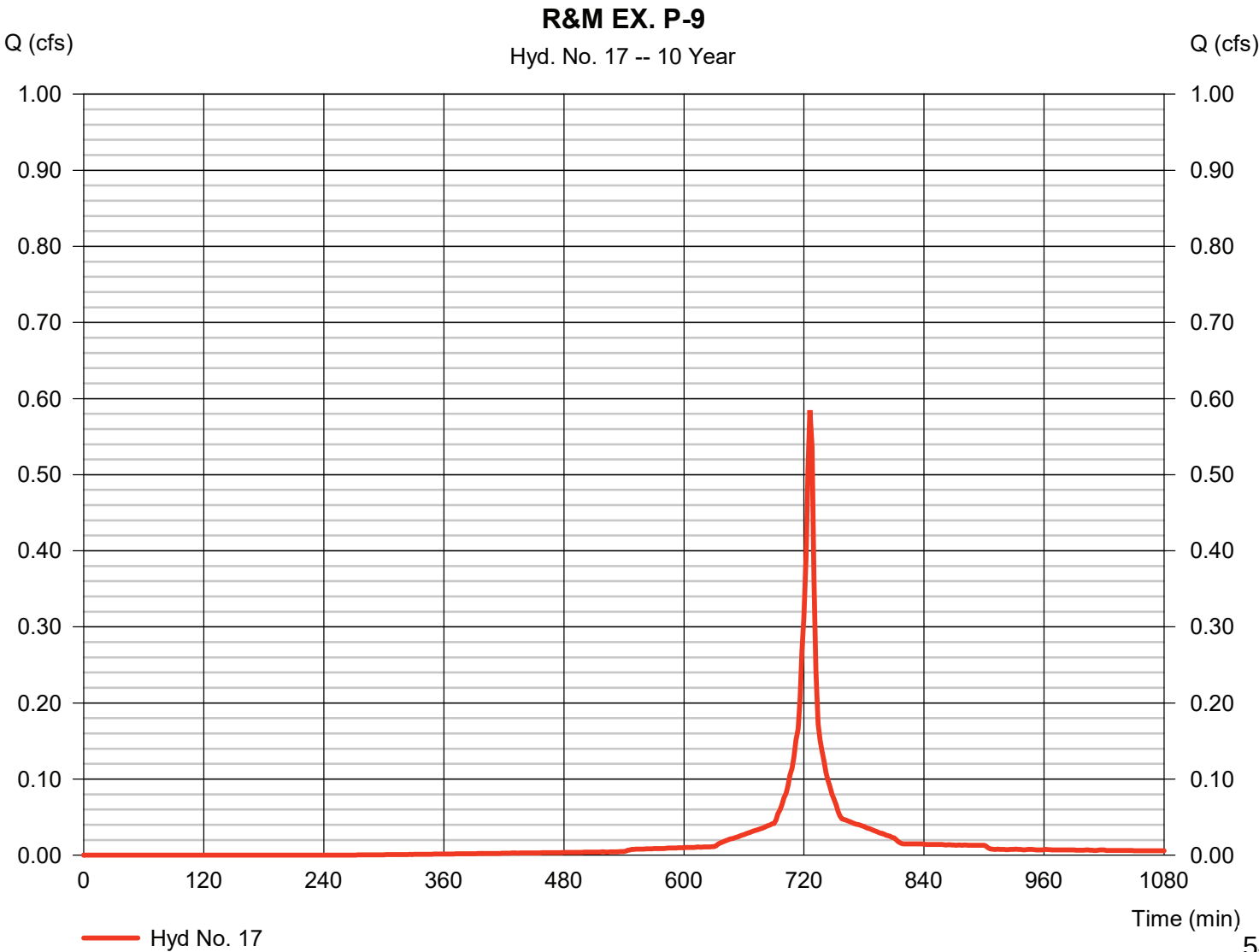
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.585 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.028 acft
Drainage area	= 0.110 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

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

Friday, 06 / 28 / 2019

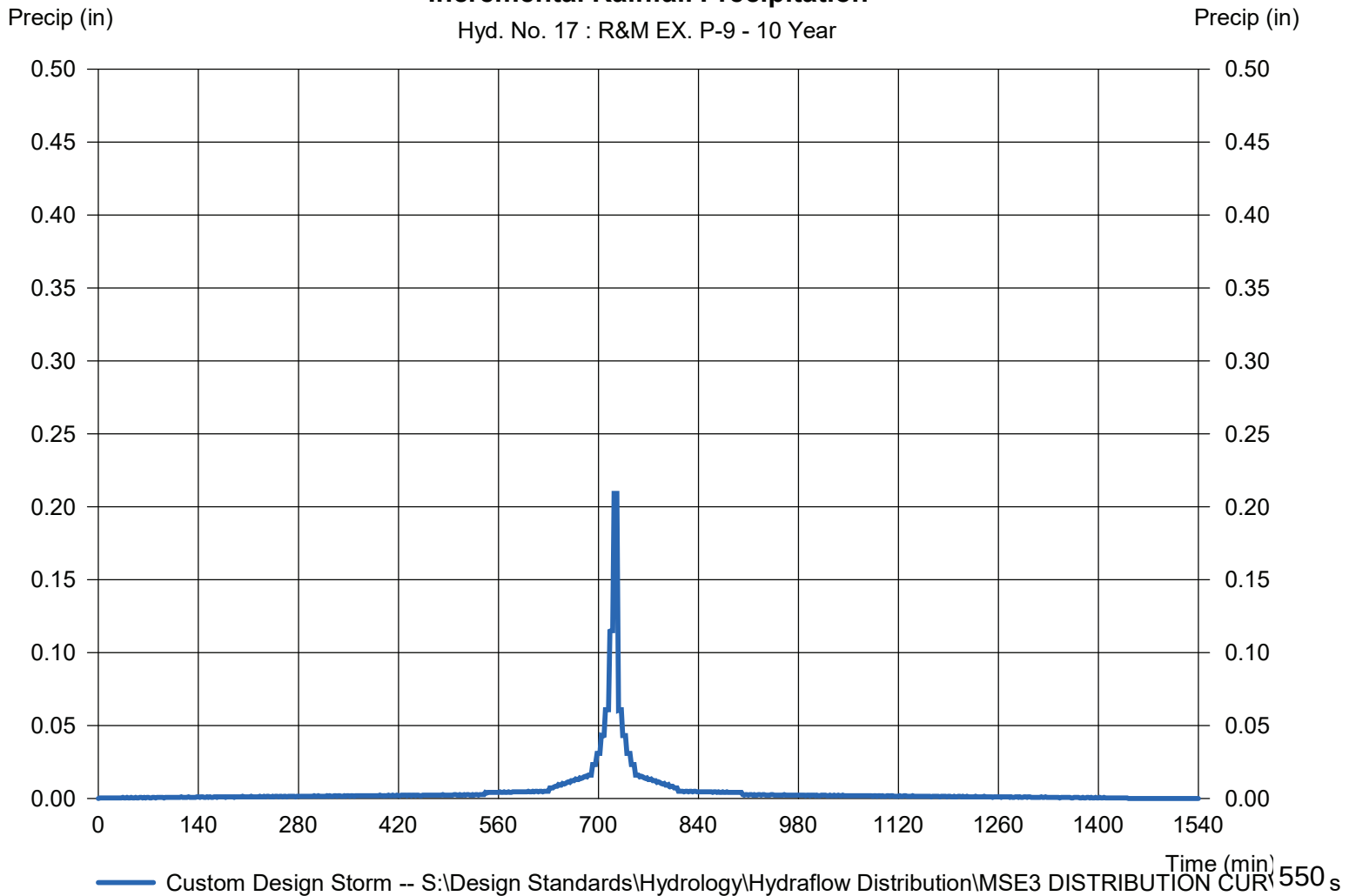
Hyd. No. 17

R&M EX. P-9

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 17 : R&M EX. P-9 - 10 Year



Hydrograph Report

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

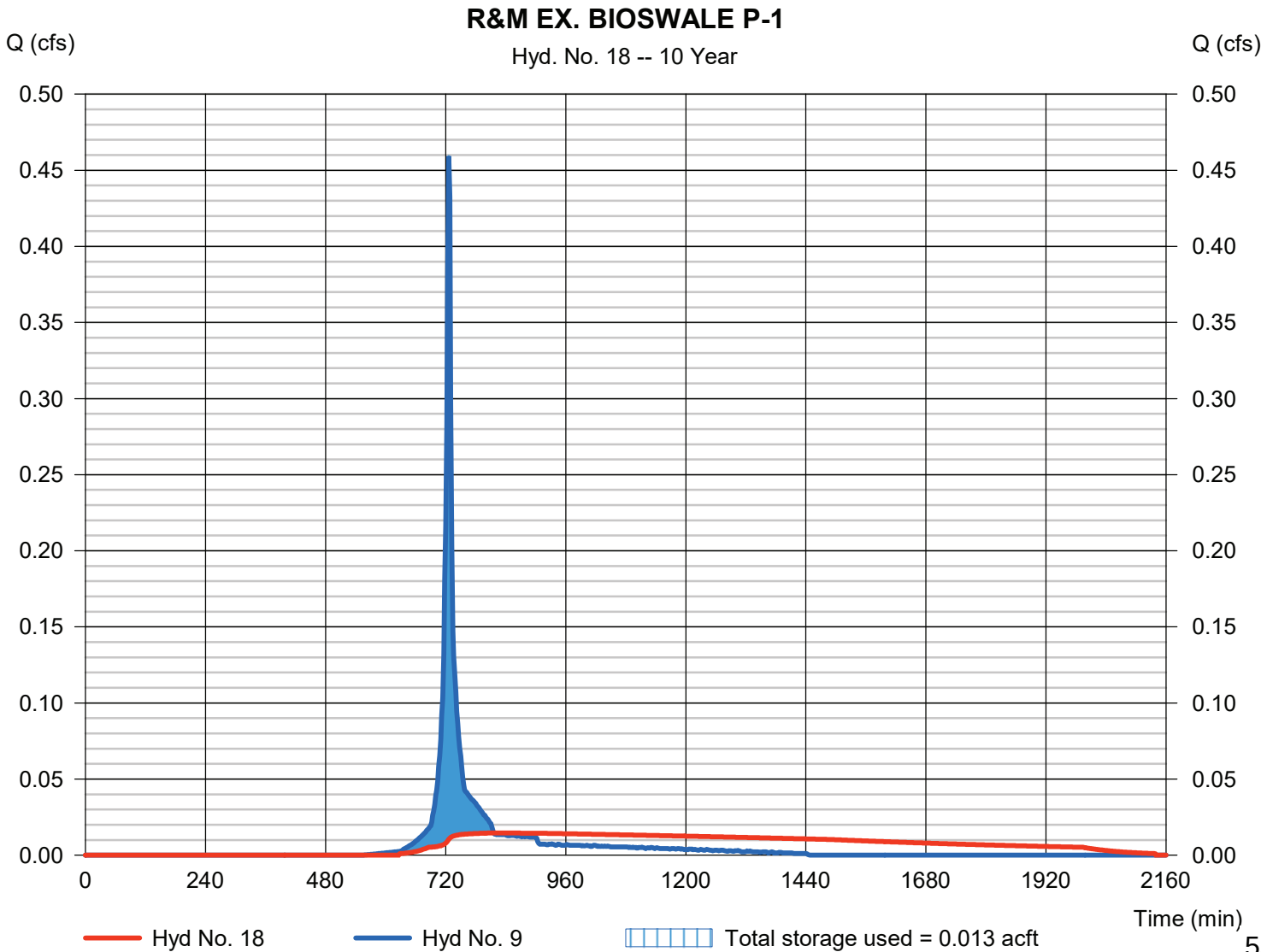
Friday, 06 / 28 / 2019

Hyd. No. 18

R&M EX. BIOSWALE P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.015 cfs
Storm frequency	= 10 yrs	Time to peak	= 816 min
Time interval	= 2 min	Hyd. volume	= 0.020 acft
Inflow hyd. No.	= 9 - R&M EX. P-1	Max. Elevation	= 851.41 ft
Reservoir name	= Ex. Bioswale P-1	Max. Storage	= 0.013 acft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

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

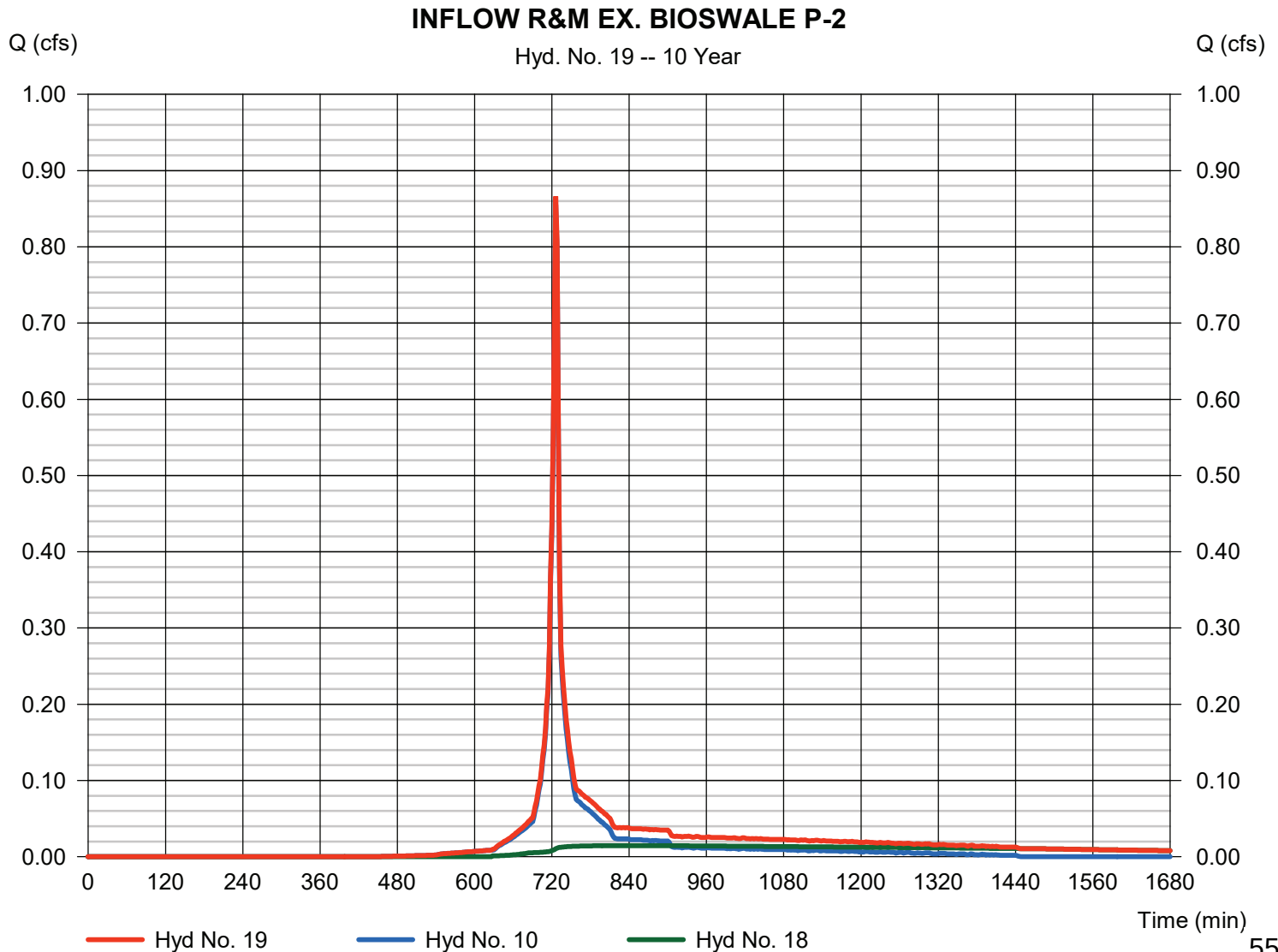
Friday, 06 / 28 / 2019

Hyd. No. 19

INFLOW R&M EX. BIOSWALE P-2

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 10, 18

Peak discharge = 0.866 cfs
Time to peak = 726 min
Hyd. volume = 0.058 acft
Contrib. drain. area = 0.190 ac



Hydrograph Report

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

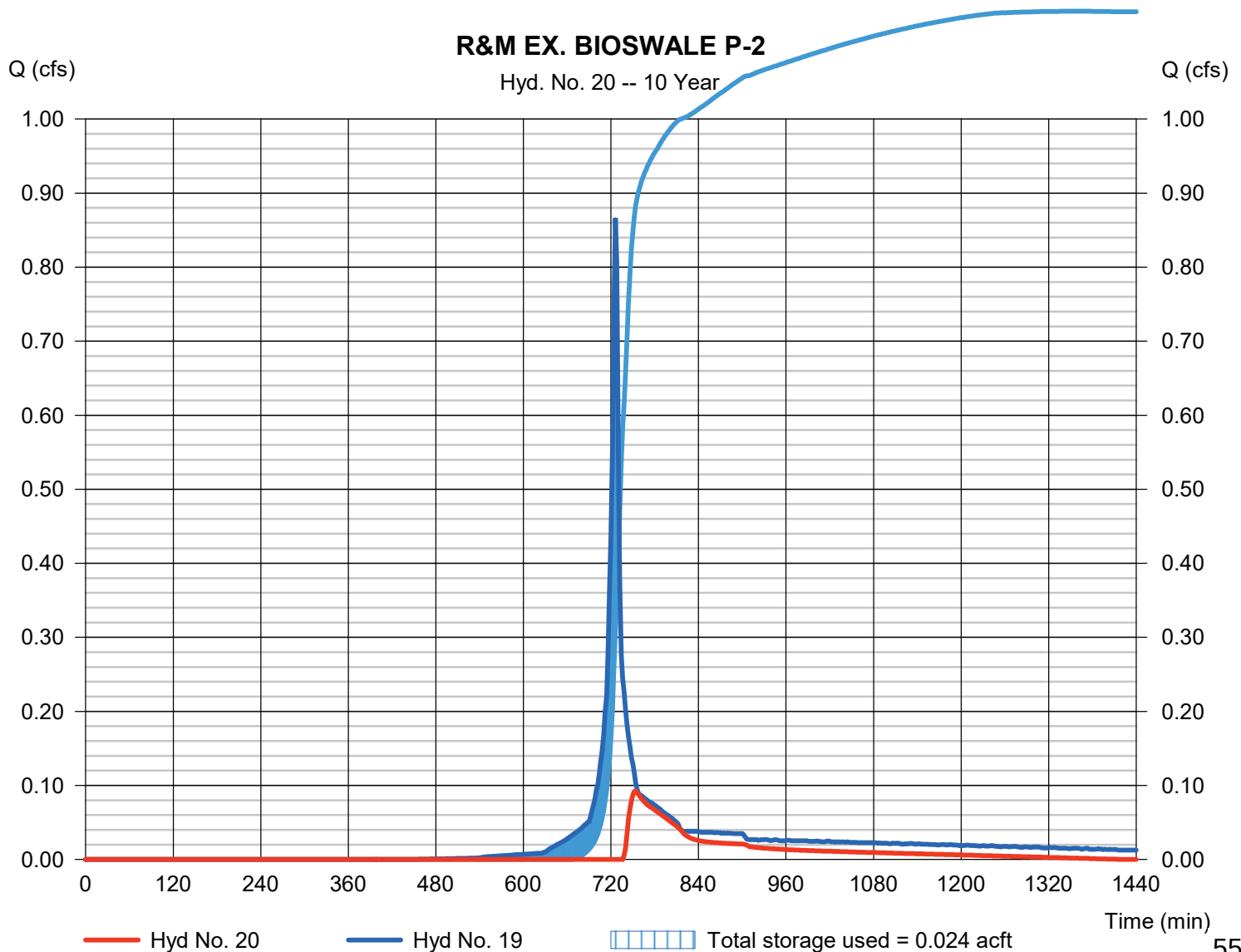
Friday, 06 / 28 / 2019

Hyd. No. 20

R&M EX. BIOSWALE P-2

Hydrograph type	= Reservoir	Peak discharge	= 0.092 cfs
Storm frequency	= 10 yrs	Time to peak	= 754 min
Time interval	= 2 min	Hyd. volume	= 0.015 acft
Inflow hyd. No.	= 19 - INFLOW R&M EX. BIOSWALE P-2	Max. Elevation	= 851.36 ft
Reservoir name	= Ex. Bioswale P-2	Max. Storage	= 0.024 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

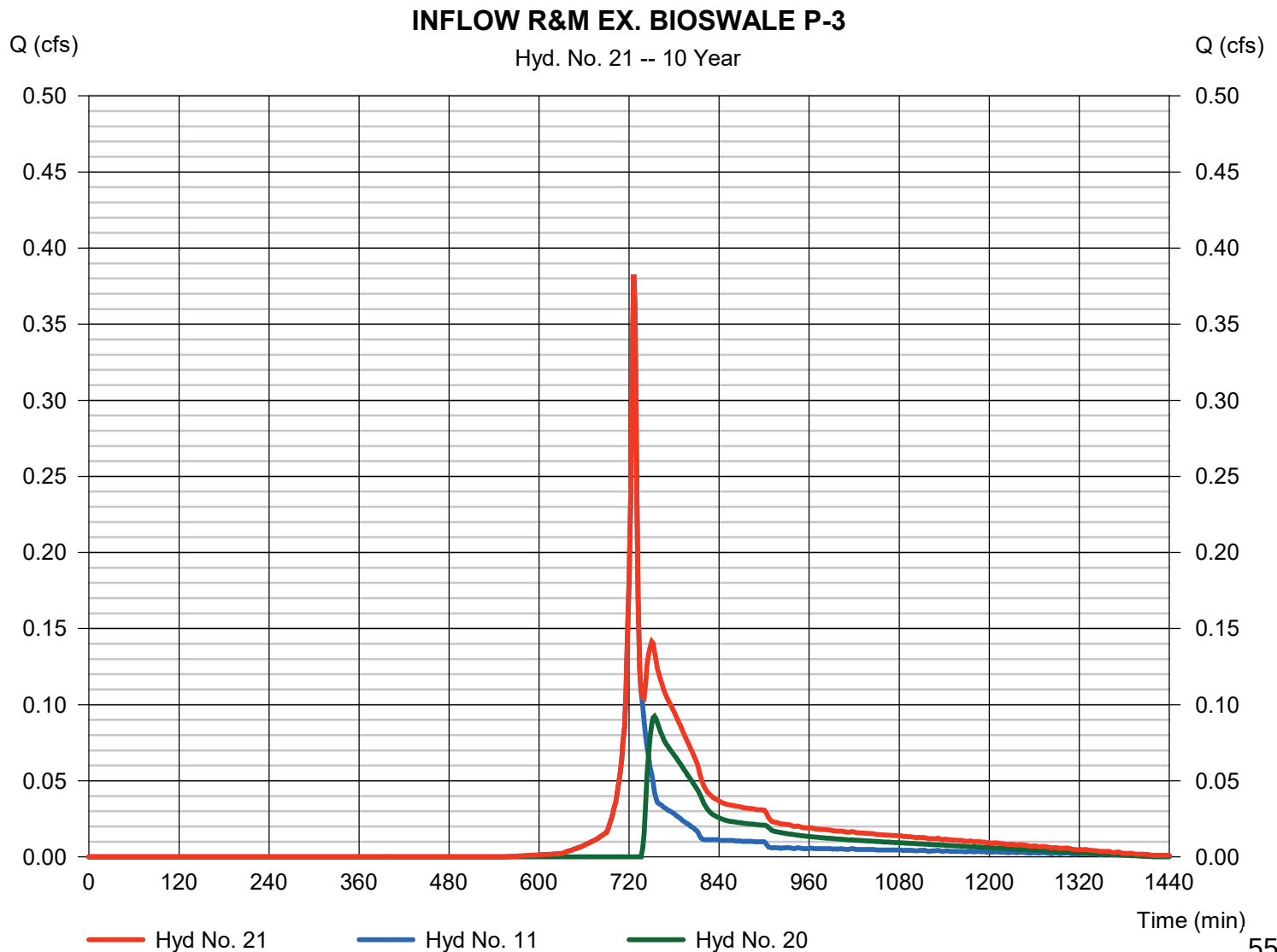
Friday, 06 / 28 / 2019

Hyd. No. 21

INFLOW R&M EX. BIOSWALE P-3

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 11, 20

Peak discharge = 0.383 cfs
Time to peak = 726 min
Hyd. volume = 0.032 acft
Contrib. drain. area = 0.100 ac



Hydrograph Report

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

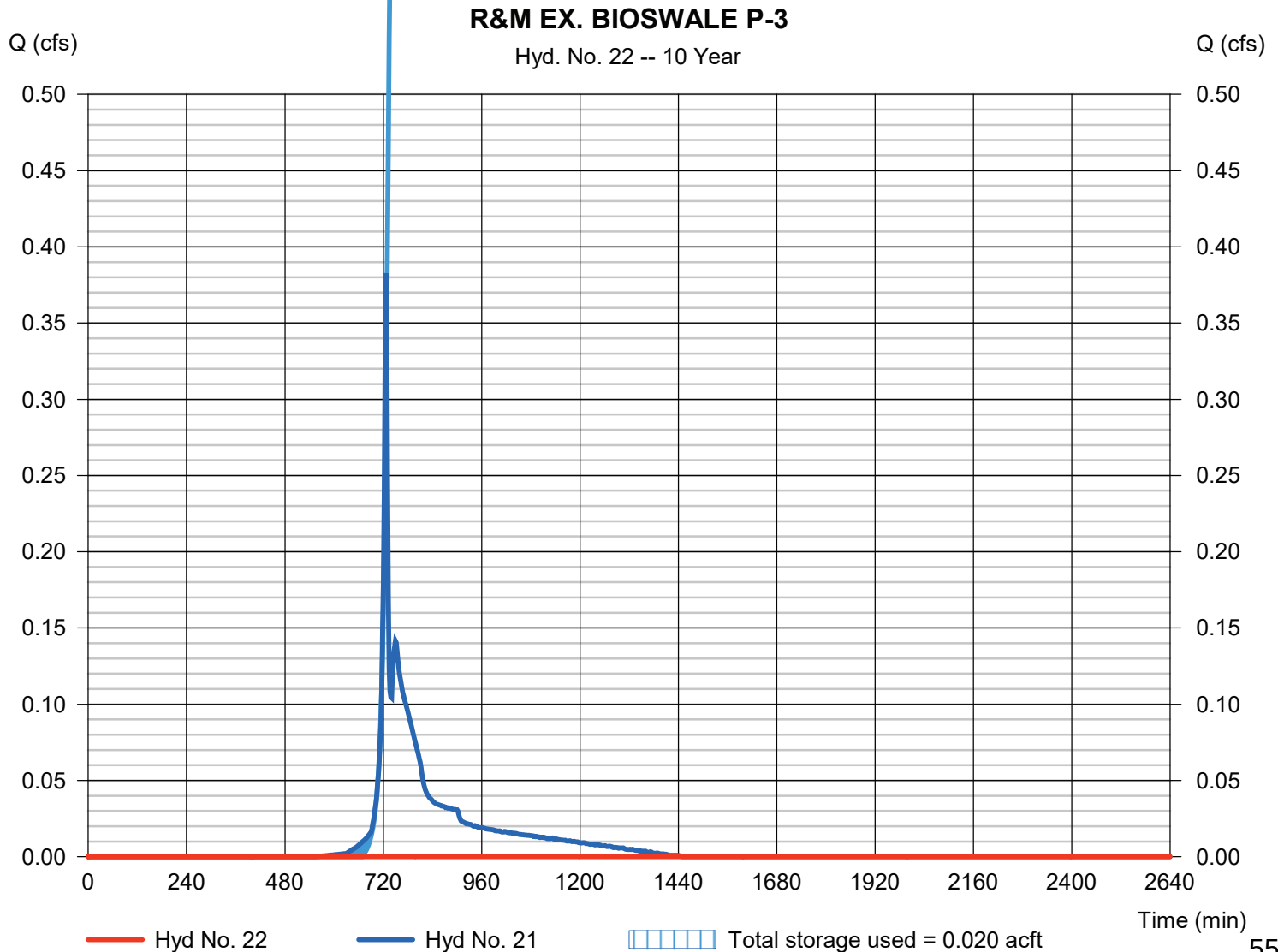
Friday, 06 / 28 / 2019

Hyd. No. 22

R&M EX. BIOSWALE P-3

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 2246 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 21 - INFLOW R&M EX. BIOSWALE P-3	Max. Elevation	= 850.51 ft
Reservoir name	= Ex. Bioswale P-3	Max. Storage	= 0.020 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

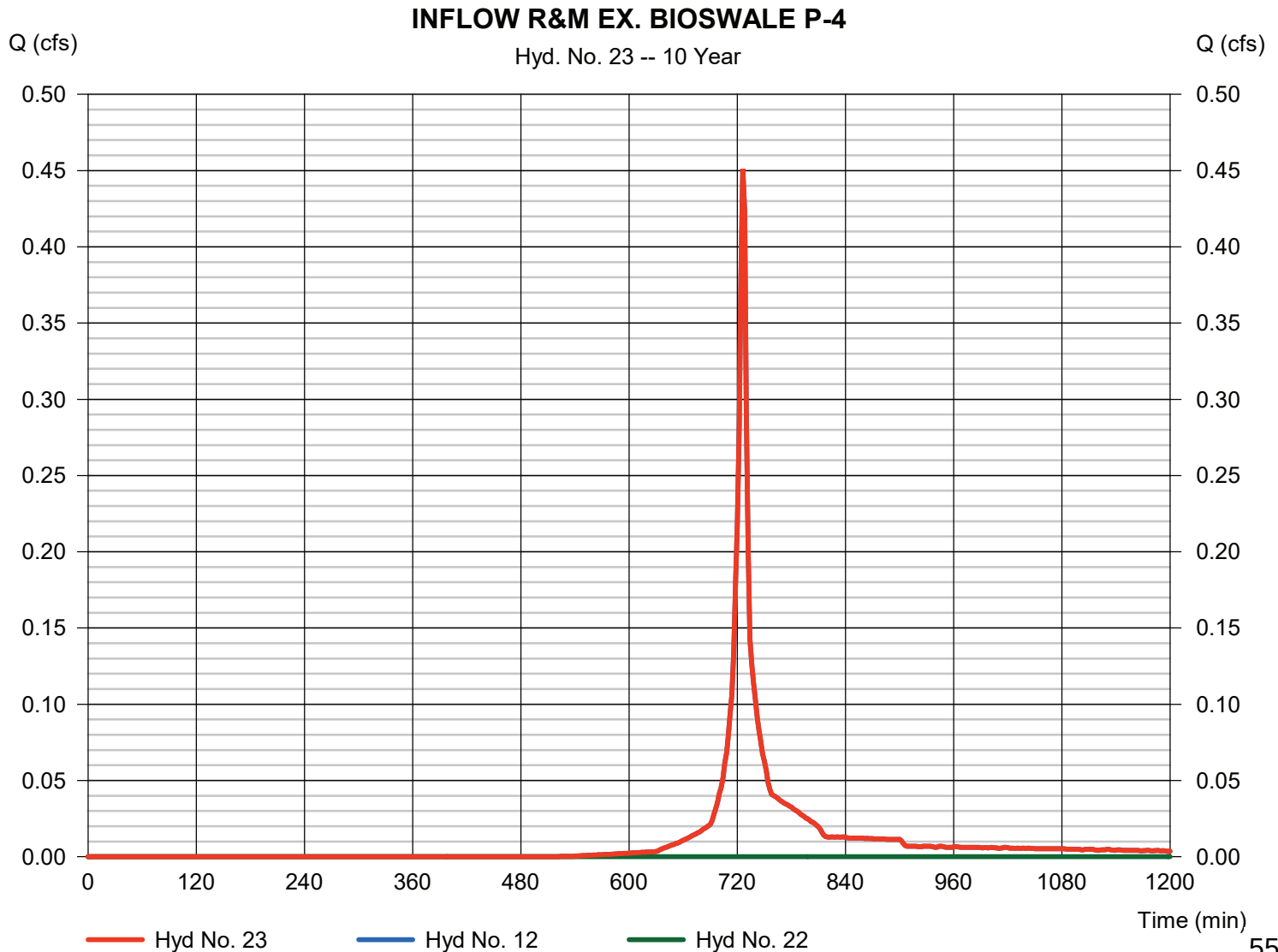
Friday, 06 / 28 / 2019

Hyd. No. 23

INFLOW R&M EX. BIOSWALE P-4

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 12, 22

Peak discharge = 0.451 cfs
Time to peak = 726 min
Hyd. volume = 0.020 acft
Contrib. drain. area = 0.110 ac



Hydrograph Report

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

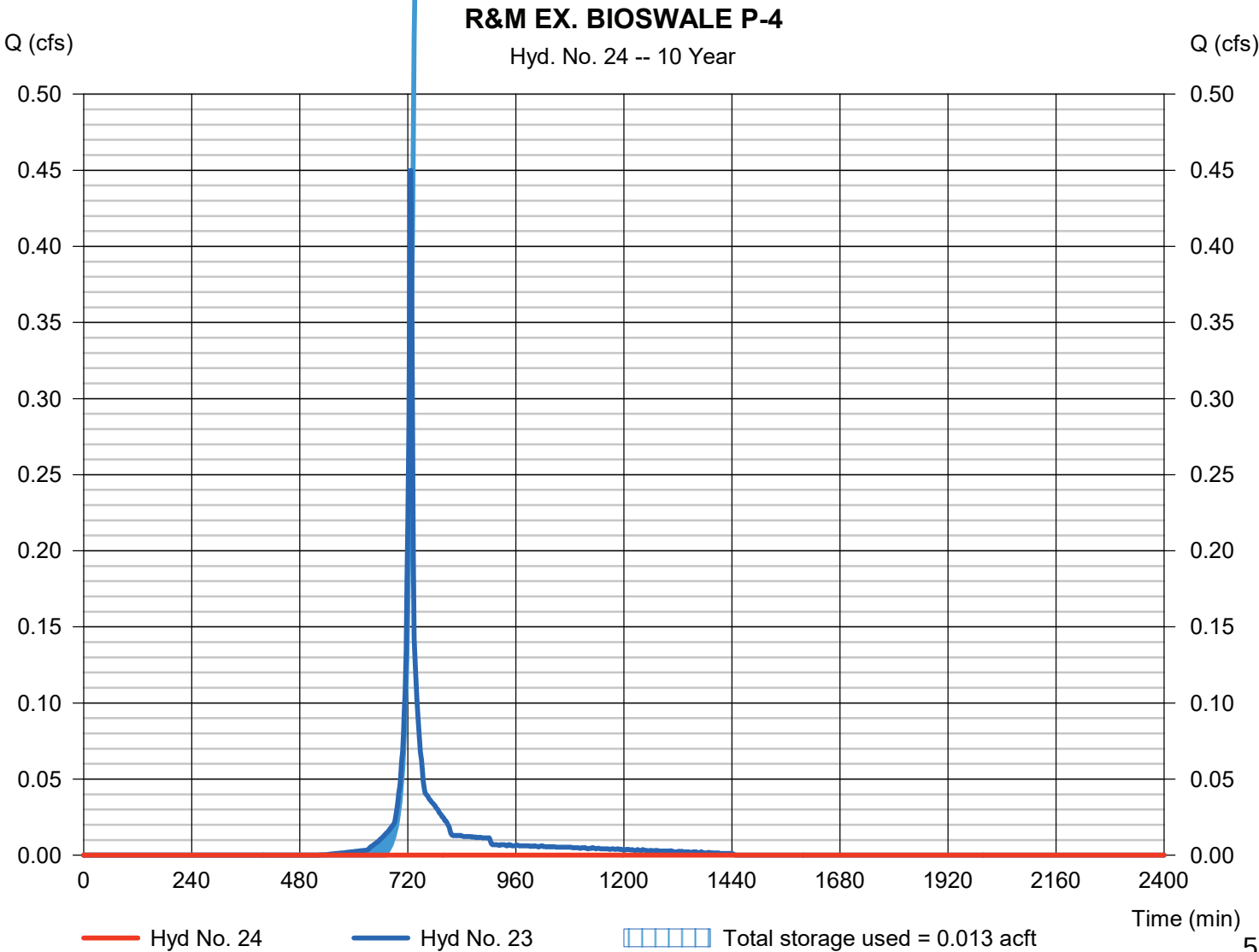
Friday, 06 / 28 / 2019

Hyd. No. 24

R&M EX. BIOSWALE P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 1330 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 23 - INFLOW R&M EX. BIOSWALE P-4	Max. Elevation	= 849.29 ft
Reservoir name	= Ex. Bioswale P-4	Max. Storage	= 0.013 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

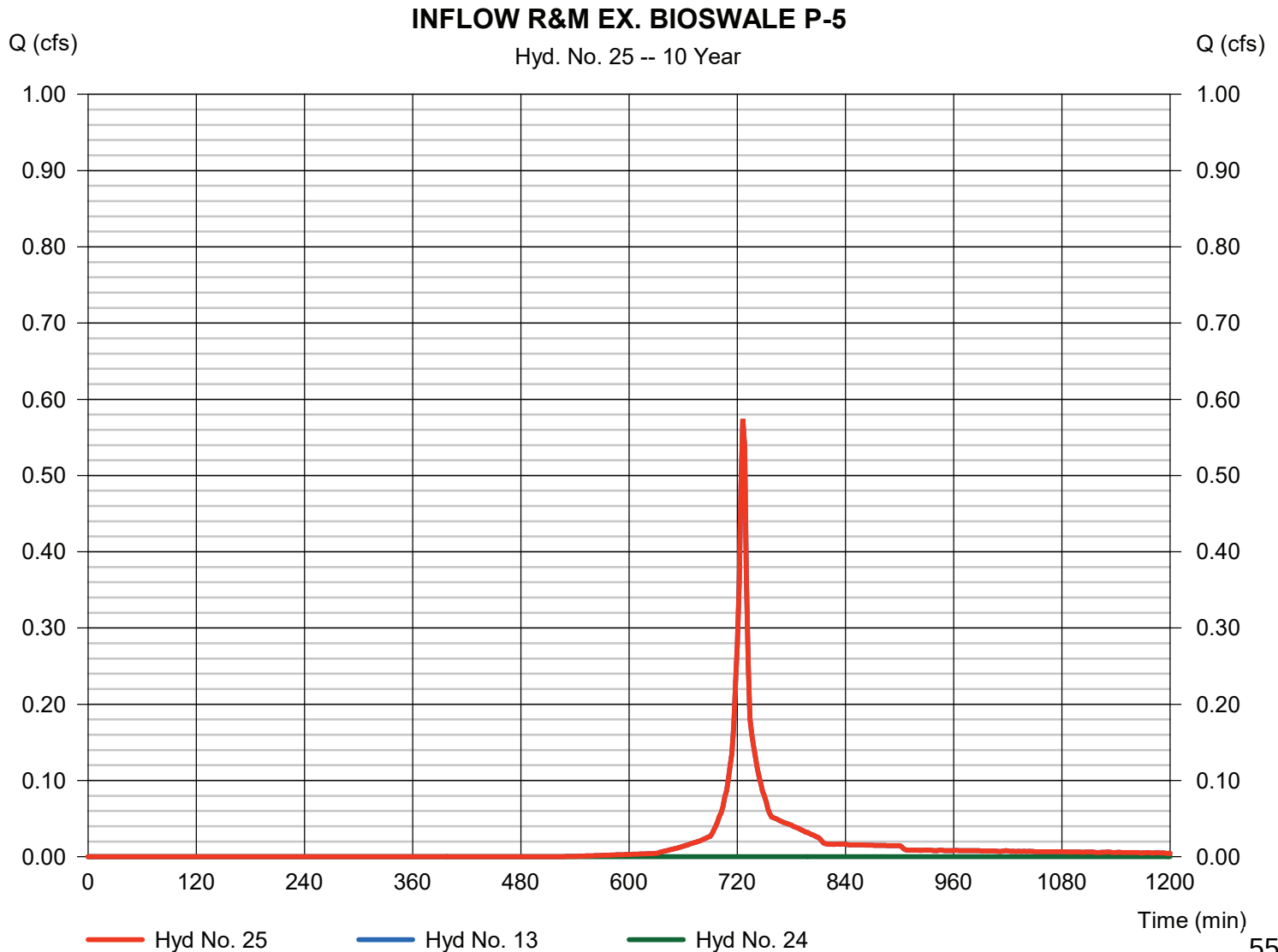
Friday, 06 / 28 / 2019

Hyd. No. 25

INFLOW R&M EX. BIOSWALE P-5

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 13, 24

Peak discharge = 0.574 cfs
Time to peak = 726 min
Hyd. volume = 0.025 acft
Contrib. drain. area = 0.140 ac



Hydrograph Report

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

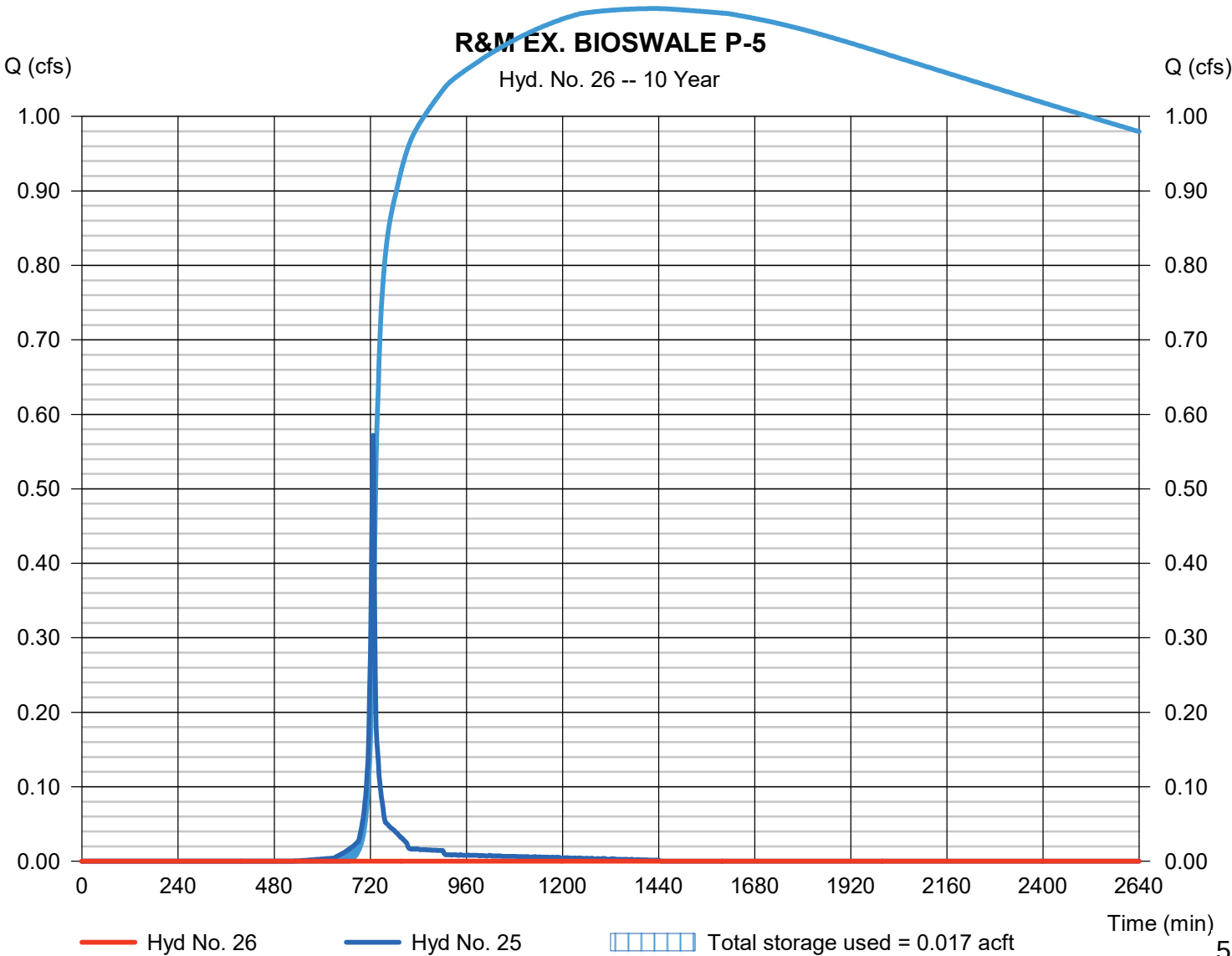
Friday, 06 / 28 / 2019

Hyd. No. 26

R&M EX. BIOSWALE P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 1814 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 25 - INFLOW R&M EX. BIOSWALE P-5	Max. Elevation	= 848.13 ft
Reservoir name	= Ex. Bioswale P-5	Max. Storage	= 0.017 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

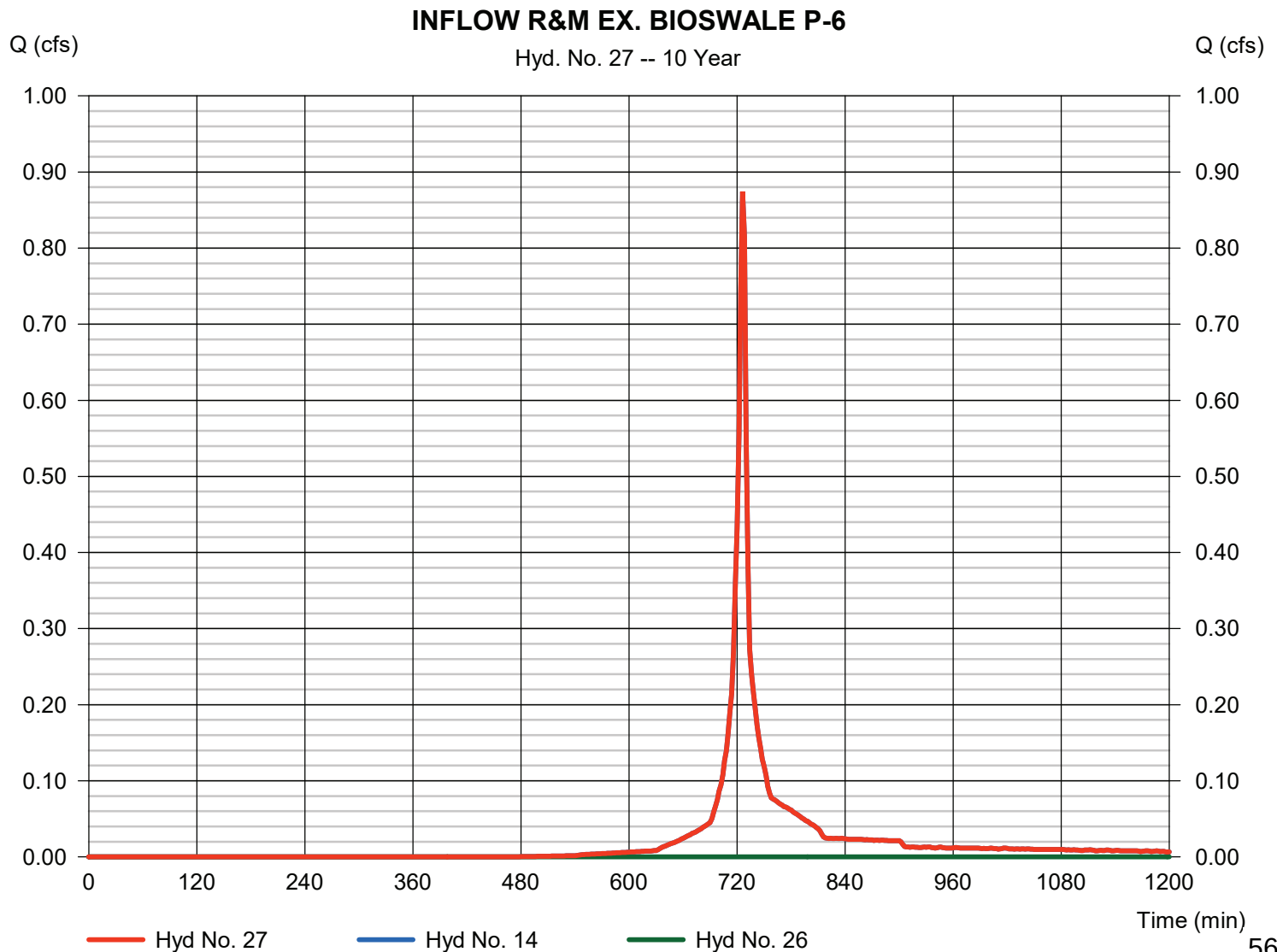
Friday, 06 / 28 / 2019

Hyd. No. 27

INFLOW R&M EX. BIOSWALE P-6

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 14, 26

Peak discharge = 0.874 cfs
Time to peak = 726 min
Hyd. volume = 0.038 acft
Contrib. drain. area = 0.200 ac



Hydrograph Report

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

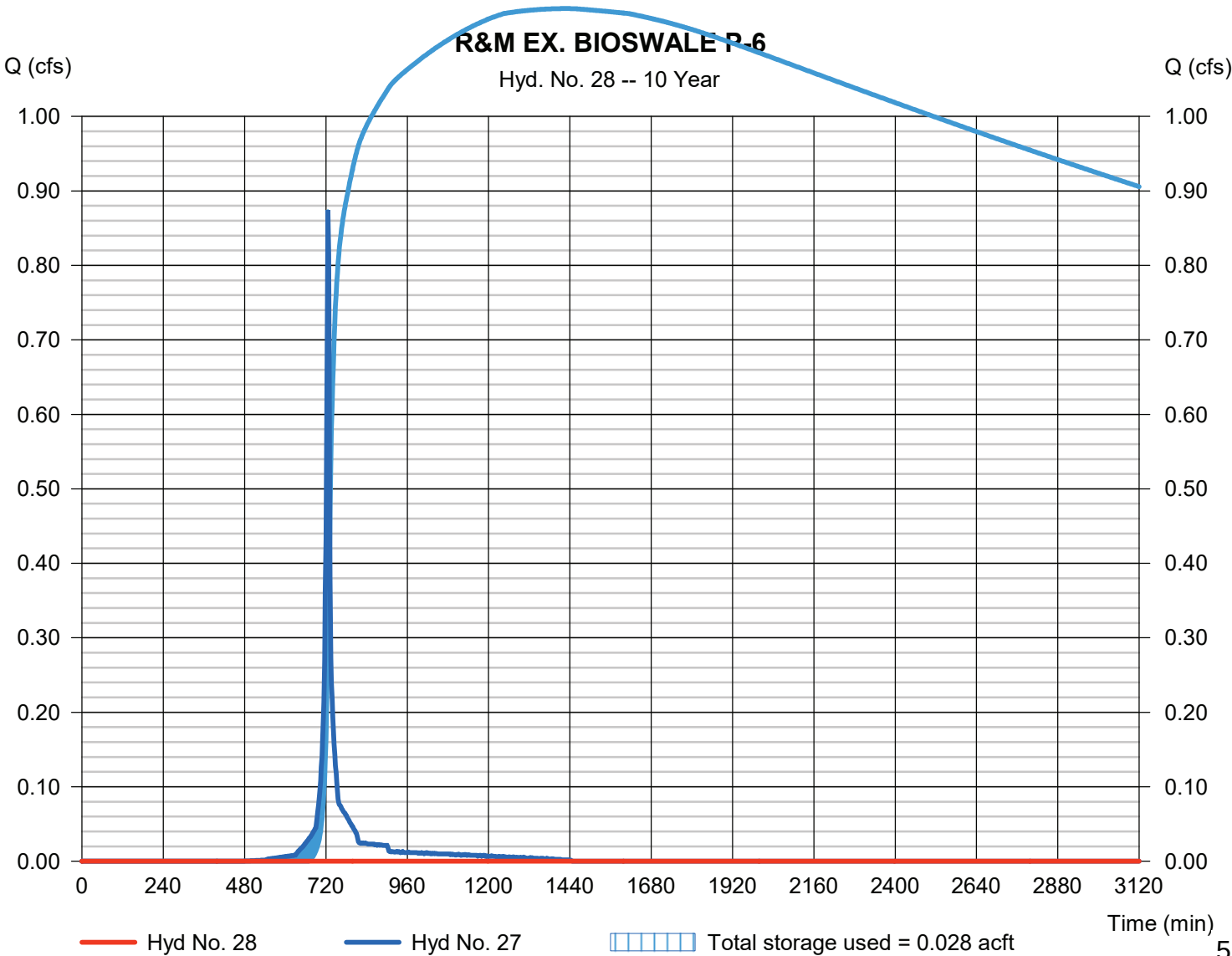
Friday, 06 / 28 / 2019

Hyd. No. 28

R&M EX. BIOSWALE P-6

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 2292 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 27 - INFLOW R&M EX. BIOSWALE P-6	Max. Elevation	= 847.00 ft
Reservoir name	= Ex. Bioswale P-6	Max. Storage	= 0.028 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

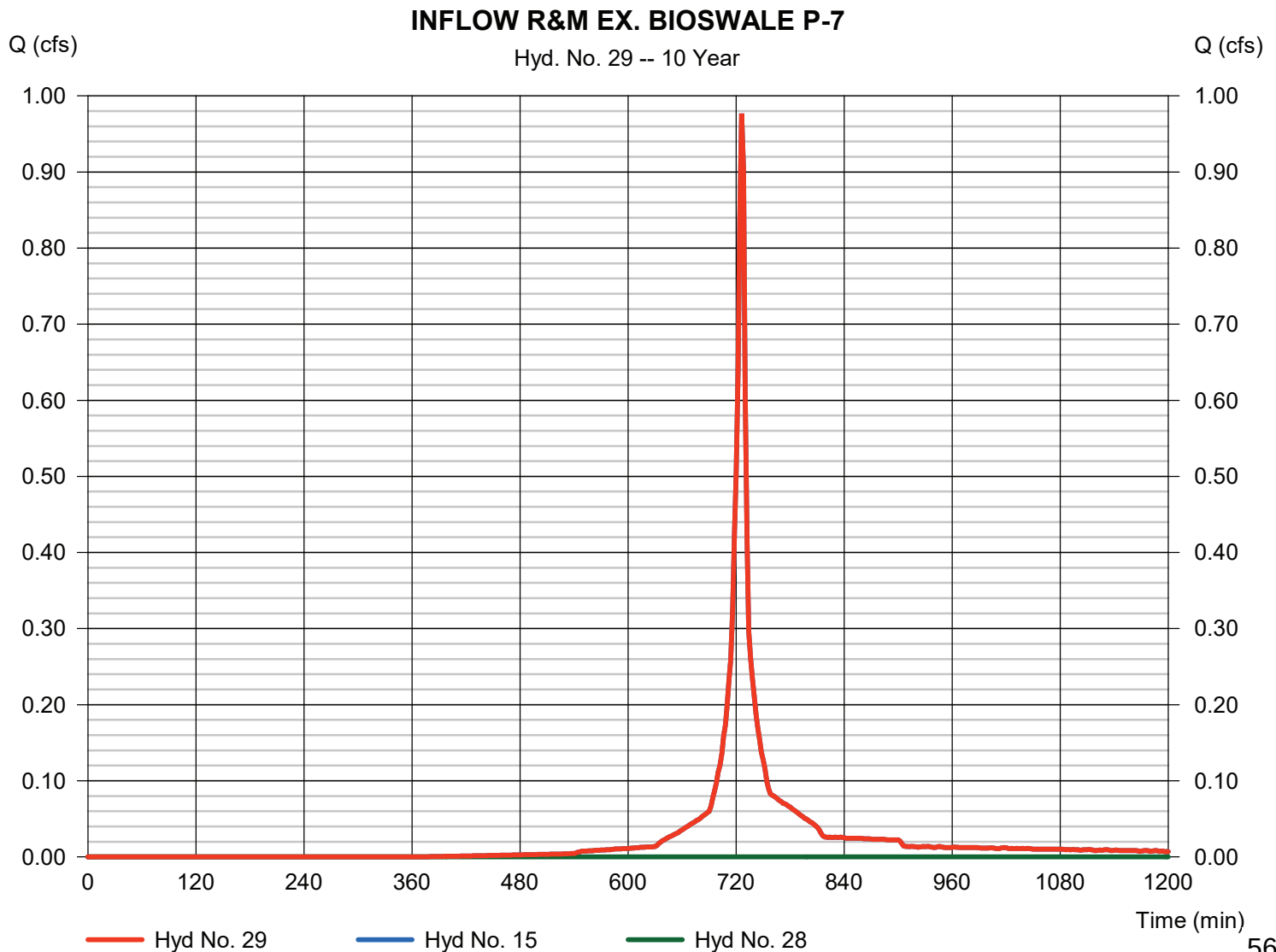
Friday, 06 / 28 / 2019

Hyd. No. 29

INFLOW R&M EX. BIOSWALE P-7

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 15, 28

Peak discharge = 0.977 cfs
 Time to peak = 726 min
 Hyd. volume = 0.044 acft
 Contrib. drain. area = 0.200 ac



Hydrograph Report

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

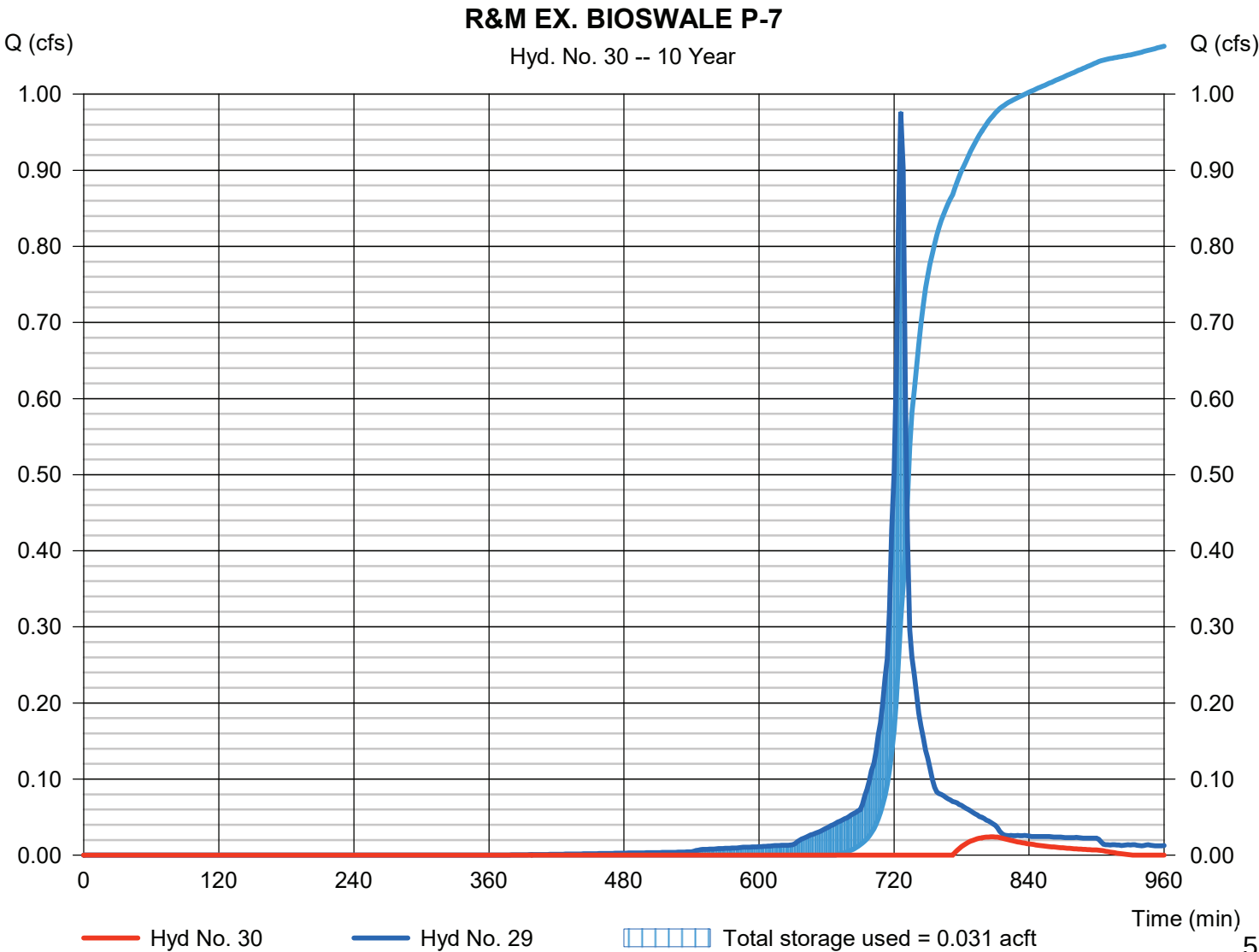
Friday, 06 / 28 / 2019

Hyd. No. 30

R&M EX. BIOSWALE P-7

Hydrograph type	= Reservoir	Peak discharge	= 0.024 cfs
Storm frequency	= 10 yrs	Time to peak	= 806 min
Time interval	= 2 min	Hyd. volume	= 0.003 acft
Inflow hyd. No.	= 29 - INFLOW R&M EX. BIOSWALE P-7	Max. Elevation	= 845.35 ft
Reservoir name	= Ex. Bioswale P-7	Max. Storage	= 0.031 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

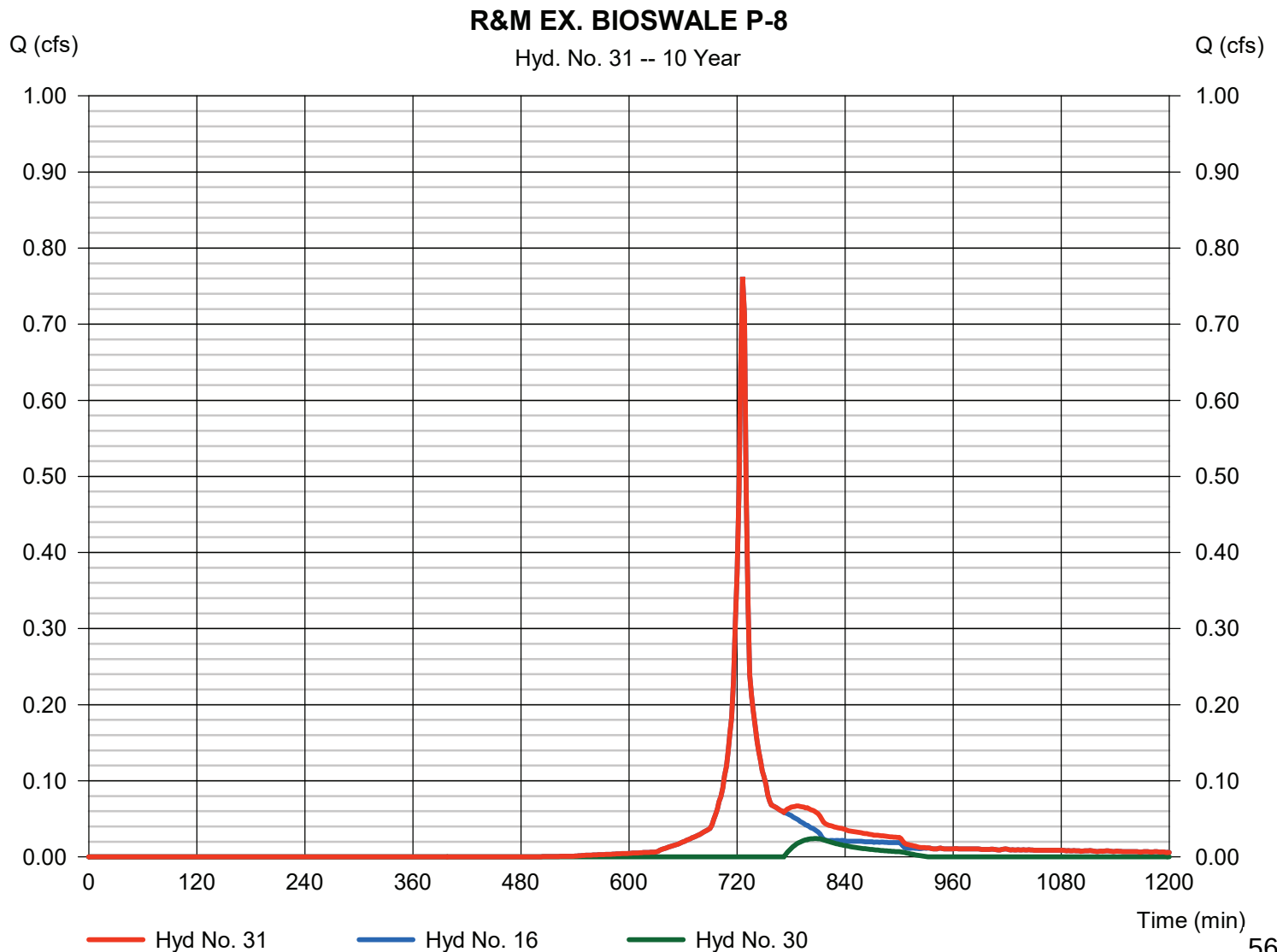
Friday, 06 / 28 / 2019

Hyd. No. 31

R&M EX. BIOSWALE P-8

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 16, 30

Peak discharge = 0.762 cfs
Time to peak = 726 min
Hyd. volume = 0.036 acft
Contrib. drain. area = 0.180 ac



Hydrograph Report

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

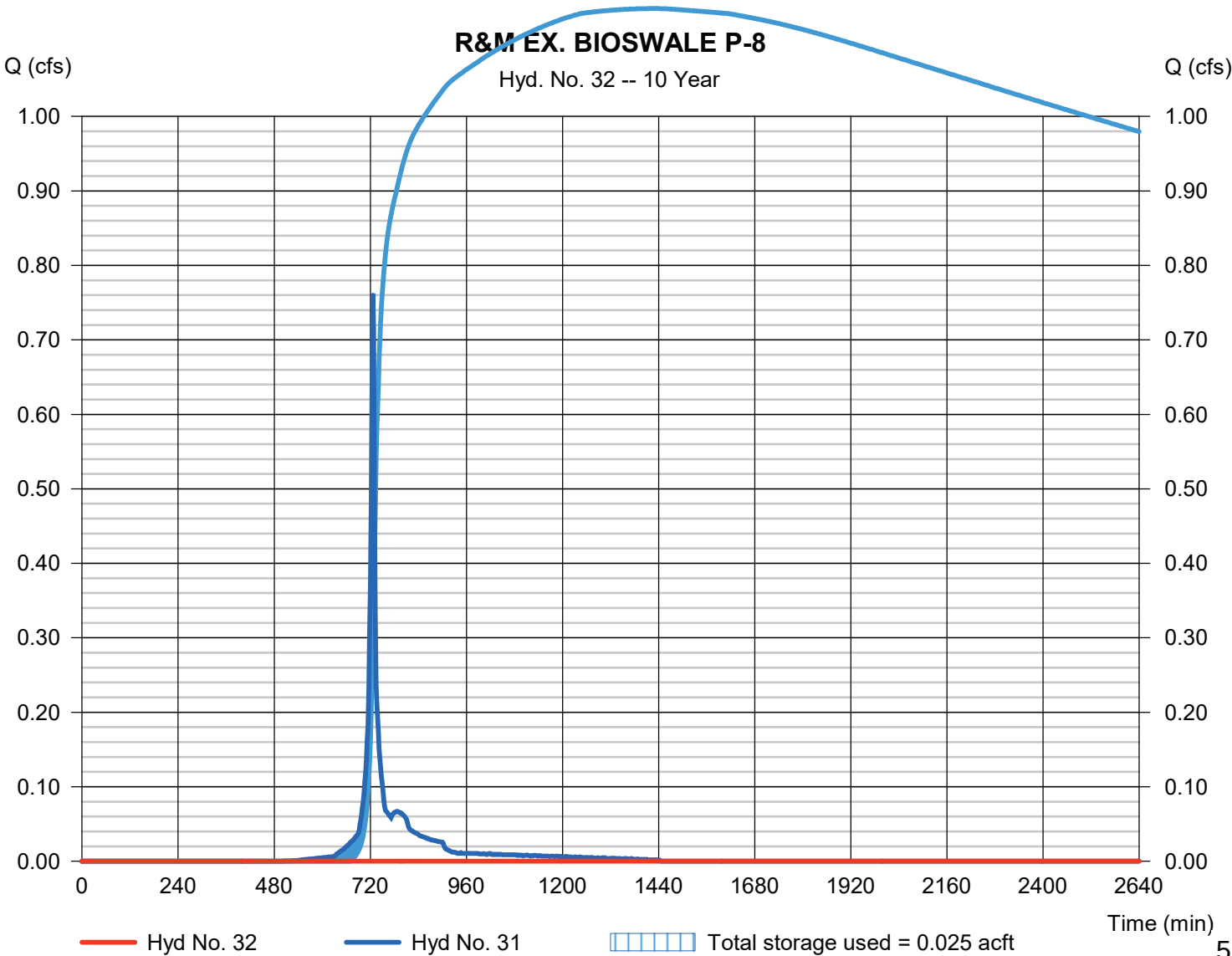
Friday, 06 / 28 / 2019

Hyd. No. 32

R&M EX. BIOSWALE P-8

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 2050 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 31 - R&M EX. BIOSWALE P-8	Max. Elevation	= 843.91 ft
Reservoir name	= Ex. Bioswale P-8	Max. Storage	= 0.025 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

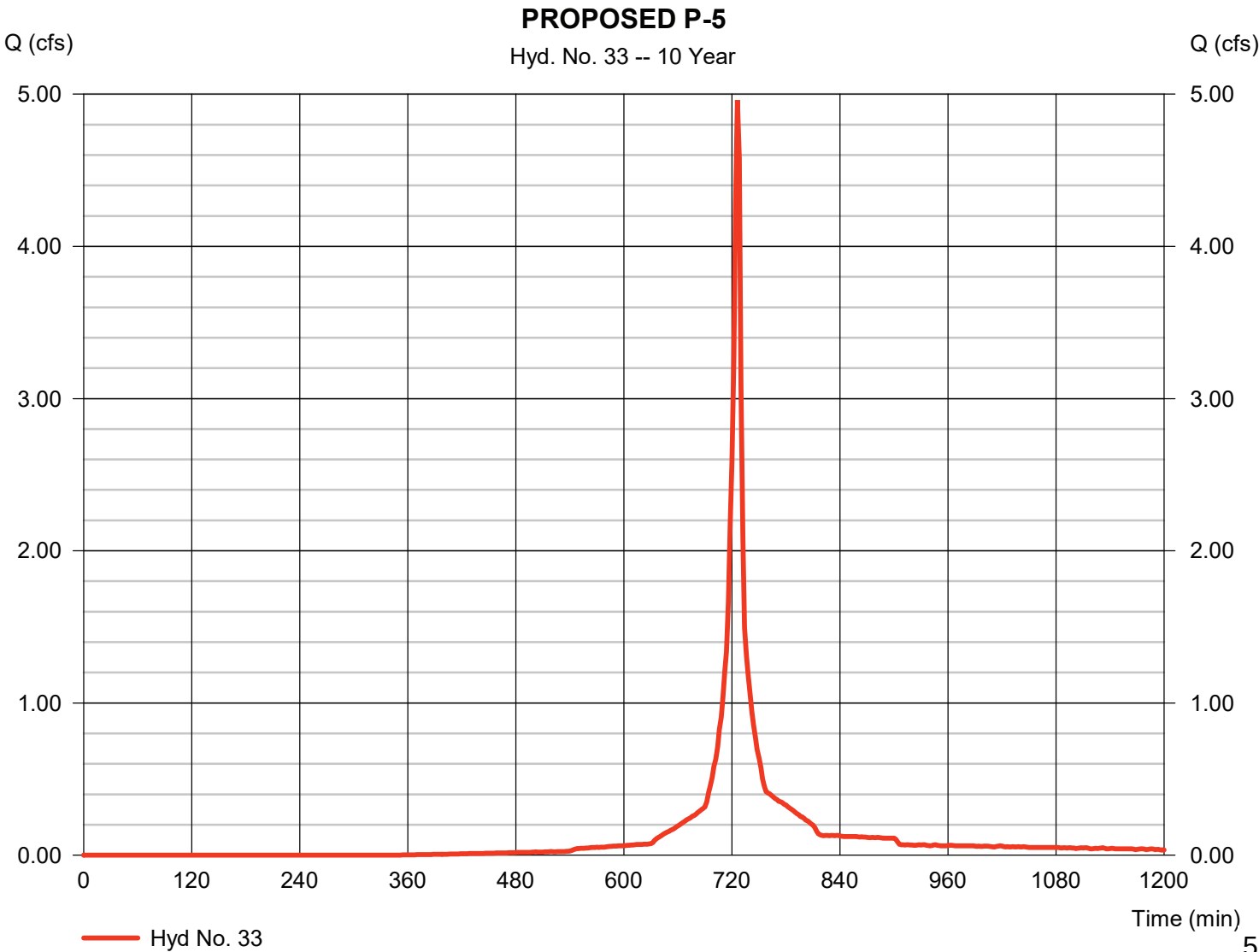
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 4.962 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.227 acft
Drainage area	= 0.992 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

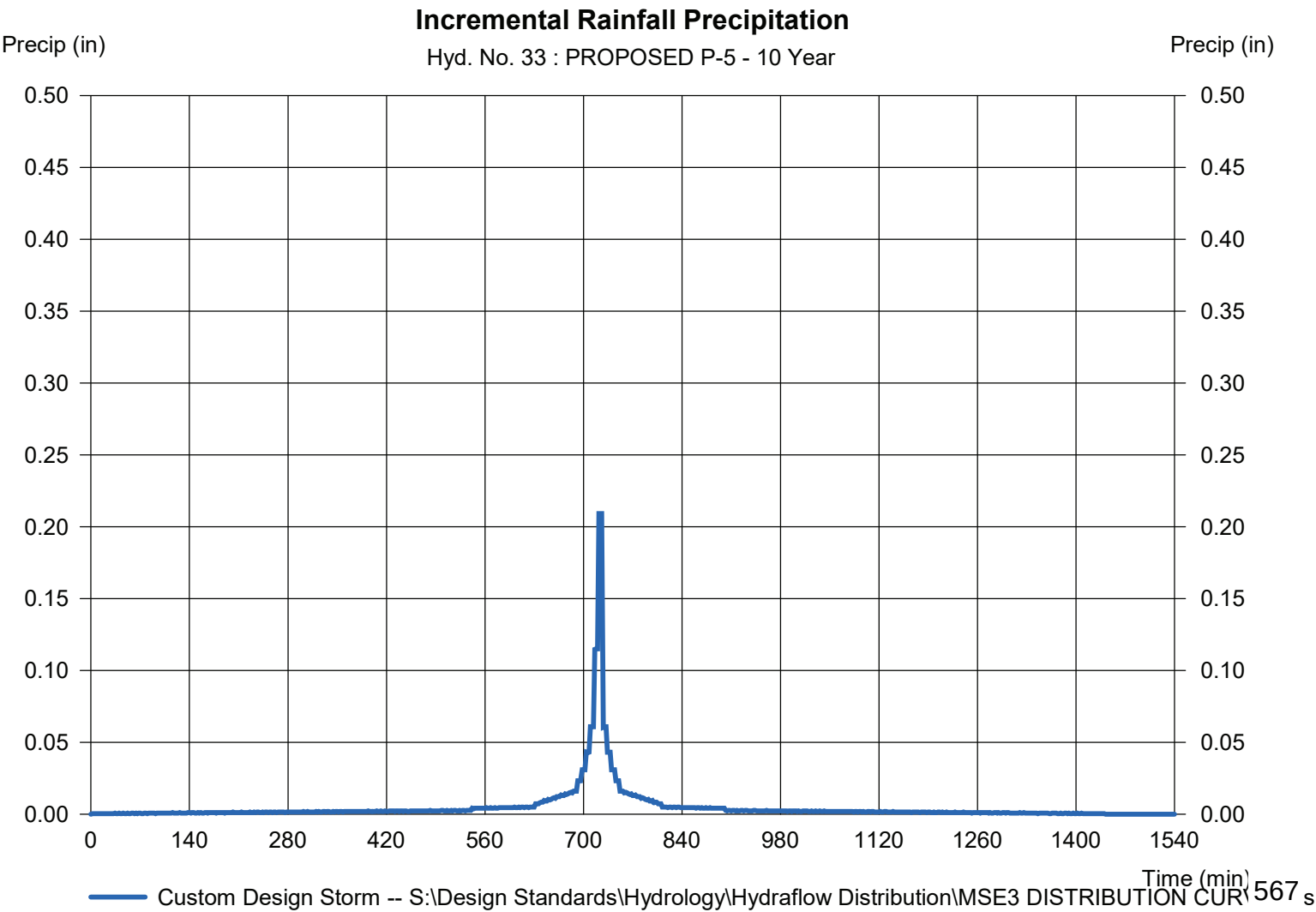
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

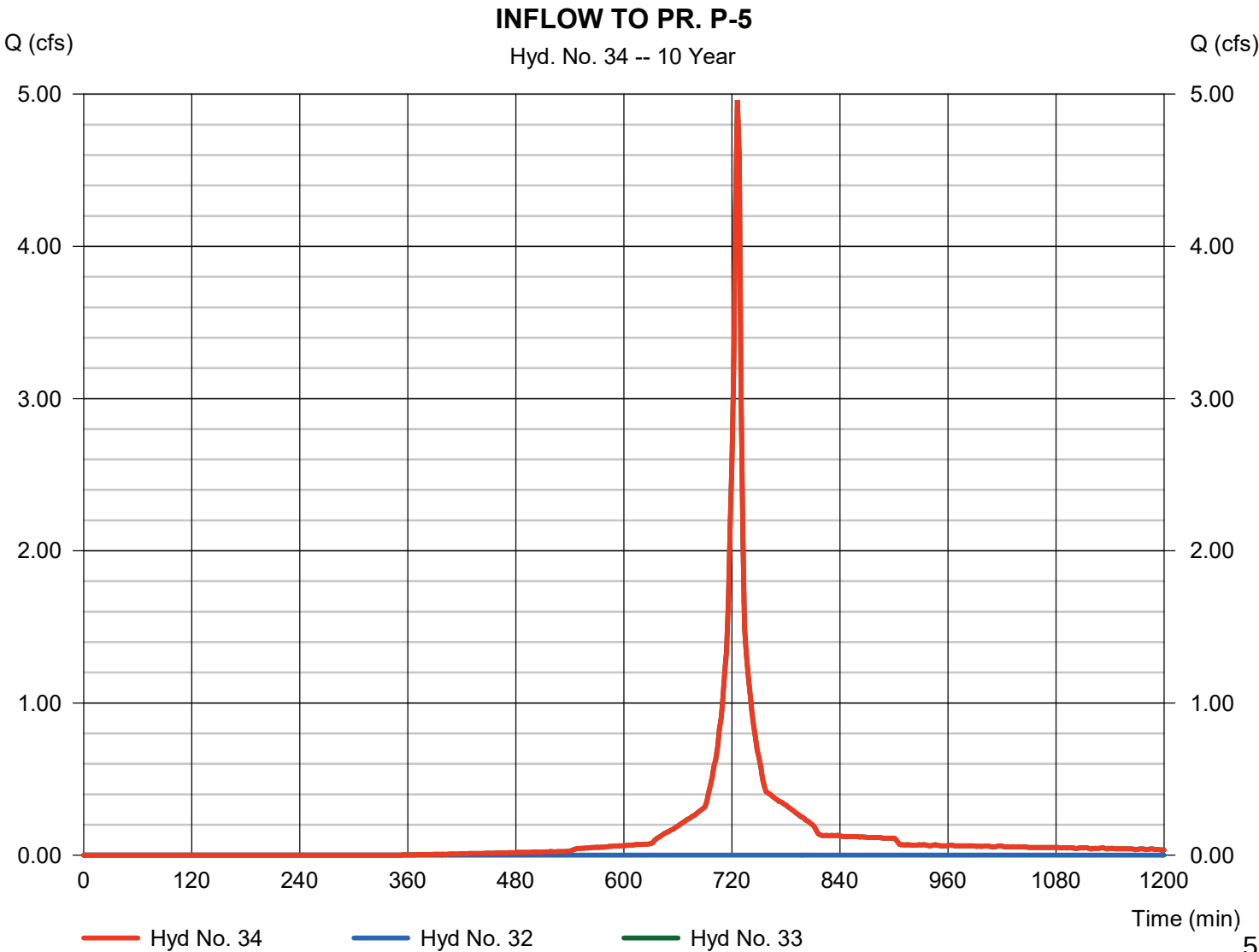
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 34

INFLOW TO PR. P-5

Hydrograph type	= Combine	Peak discharge	= 4.962 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.227 acft
Inflow hyds.	= 32, 33	Contrib. drain. area	= 0.992 ac



Hydrograph Report

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

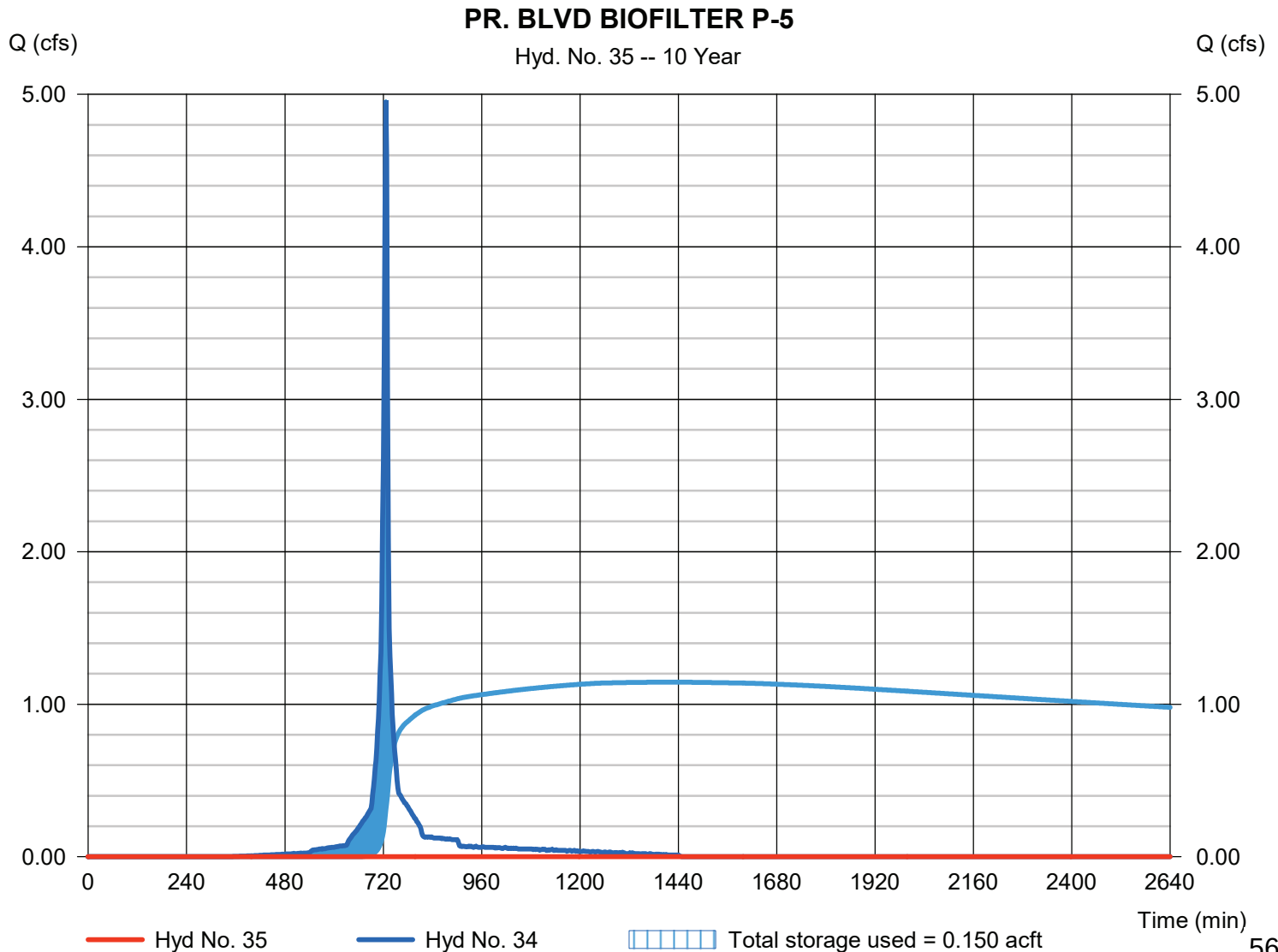
Friday, 06 / 28 / 2019

Hyd. No. 35

PR. BLVD BIOFILTER P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 746 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 34 - INFLOW TO PR. P-5	Max. Elevation	= 842.38 ft
Reservoir name	= BLVD BIOFILTER P-5	Max. Storage	= 0.150 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

Friday, 06 / 28 / 2019

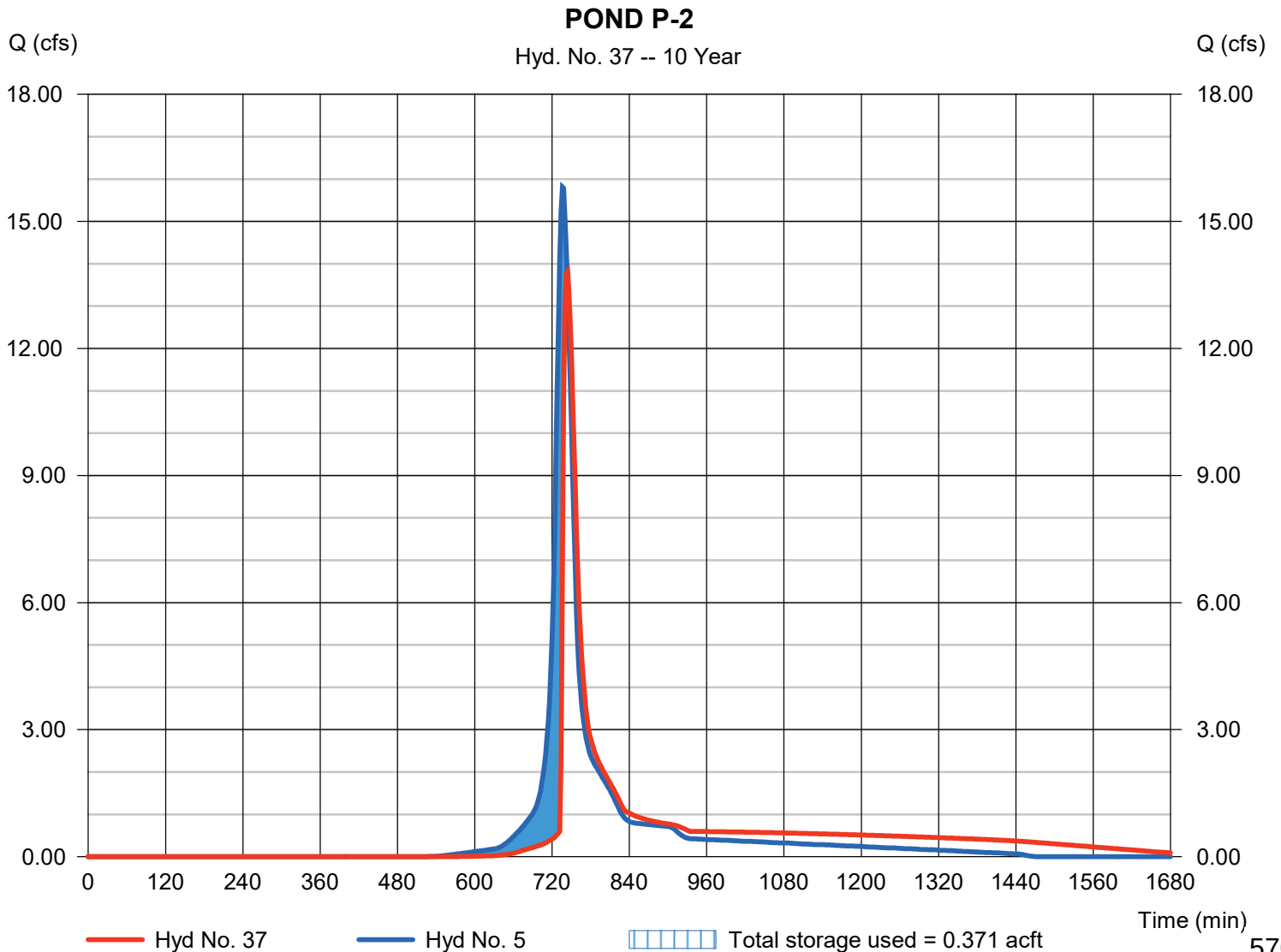
Hyd. No. 37

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 5 - P-2
 Reservoir name = POND P-2

Peak discharge = 13.82 cfs
 Time to peak = 744 min
 Hyd. volume = 1.230 acft
 Max. Elevation = 839.72 ft
 Max. Storage = 0.371 acft

Storage Indication method used.



Hydrograph Report

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

Friday, 06 / 28 / 2019

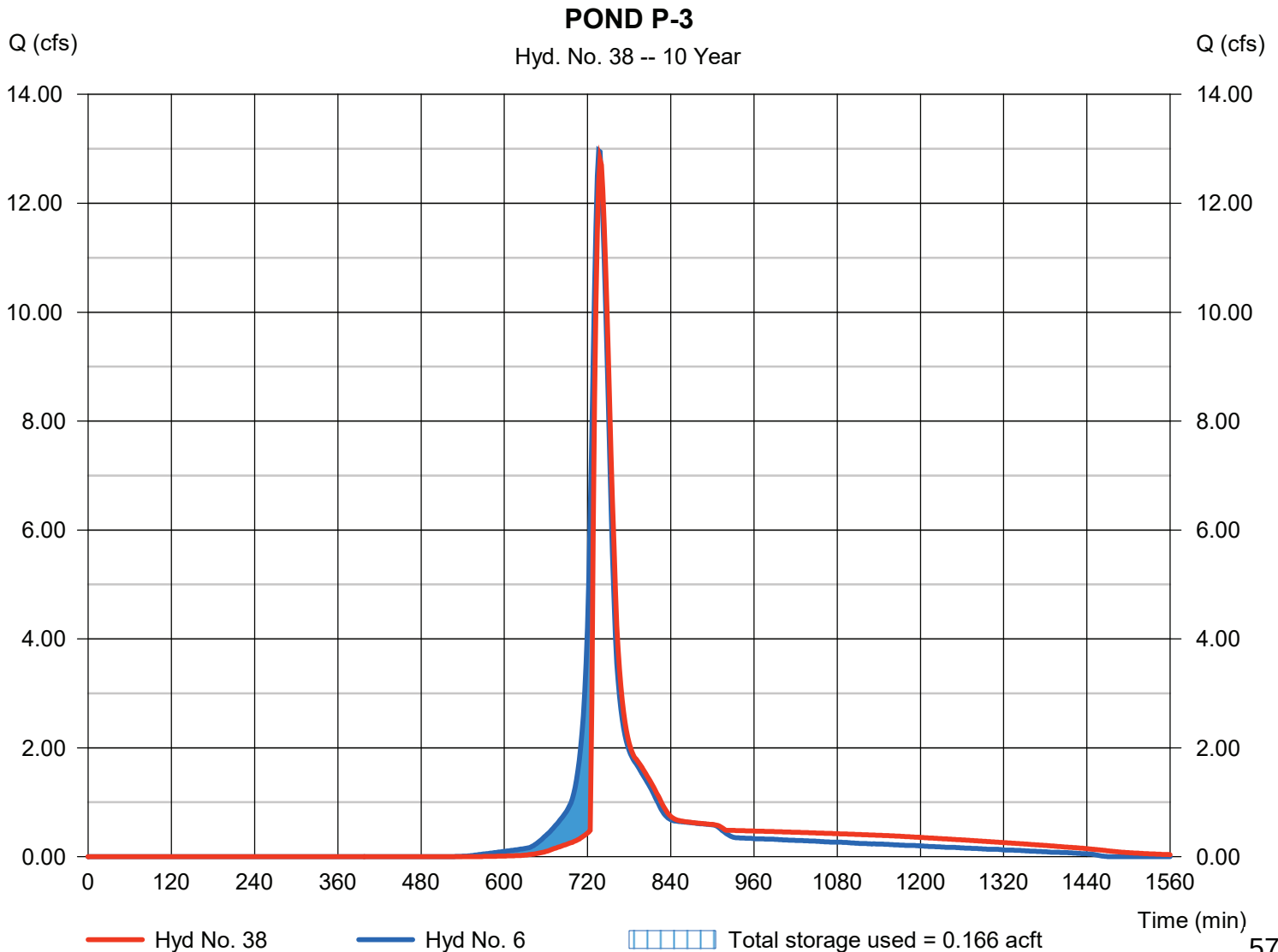
Hyd. No. 38

POND P-3

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-3
 Reservoir name = POND P-3

Peak discharge = 12.80 cfs
 Time to peak = 738 min
 Hyd. volume = 1.009 acft
 Max. Elevation = 839.95 ft
 Max. Storage = 0.166 acft

Storage Indication method used.



Hydrograph Report

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

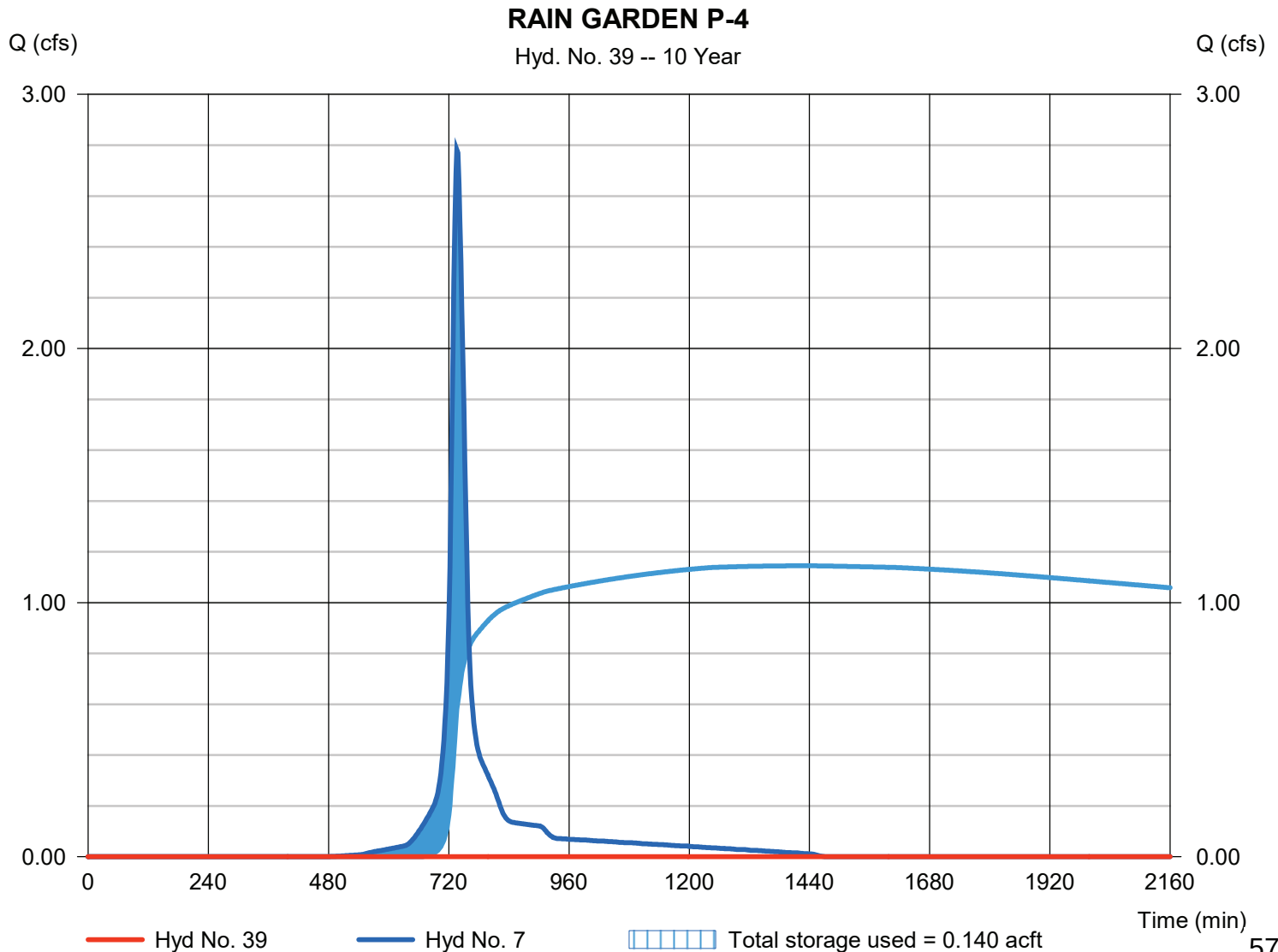
Friday, 06 / 28 / 2019

Hyd. No. 39

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 1346 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 7 - P-4	Max. Elevation	= 840.47 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 0.140 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

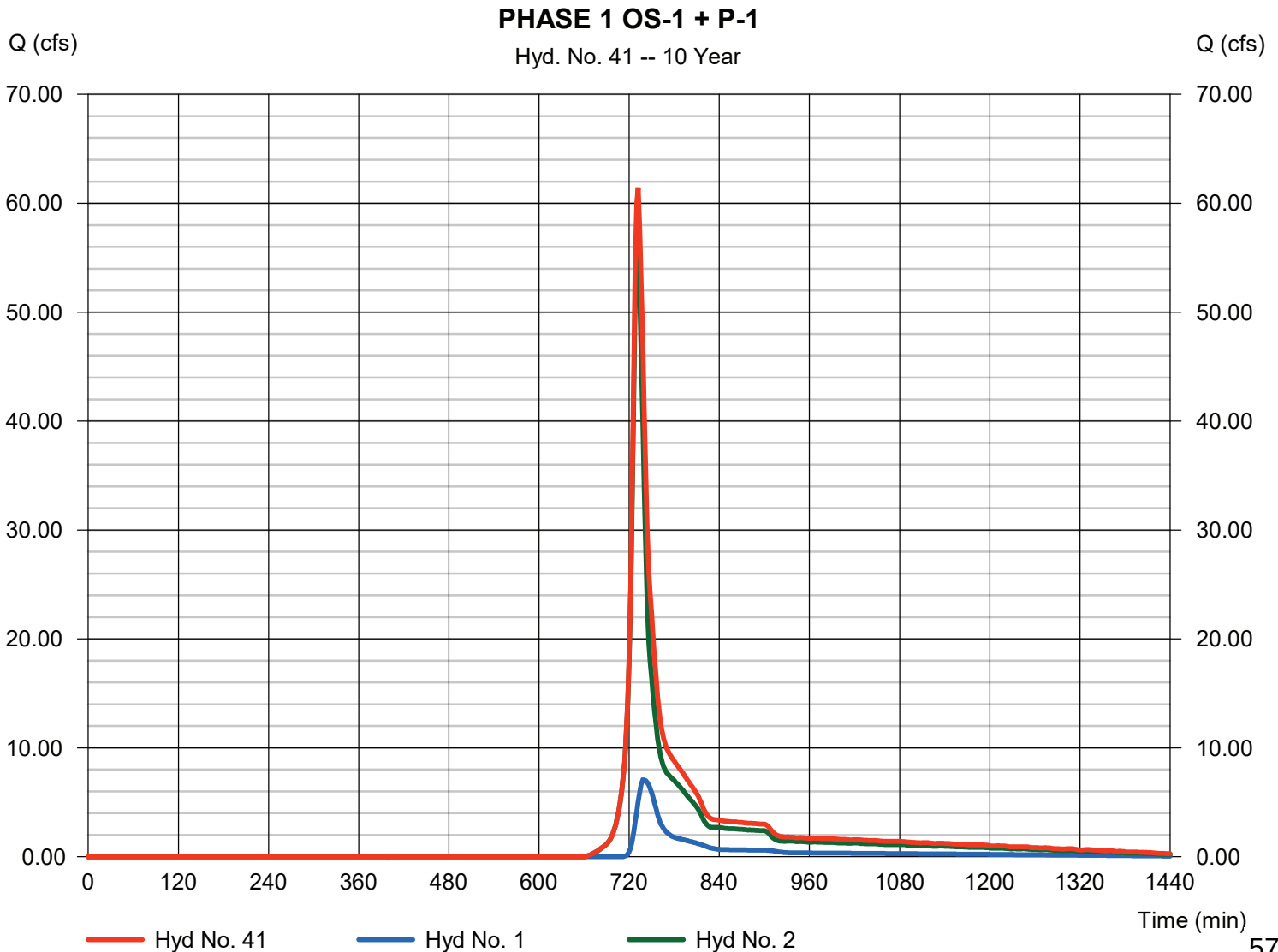
Friday, 06 / 28 / 2019

Hyd. No. 41

PHASE 1 OS-1 + P-1

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 1, 2

Peak discharge = 61.39 cfs
Time to peak = 732 min
Hyd. volume = 4.029 acft
Contrib. drain. area = 37.042 ac



Hydrograph Report

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

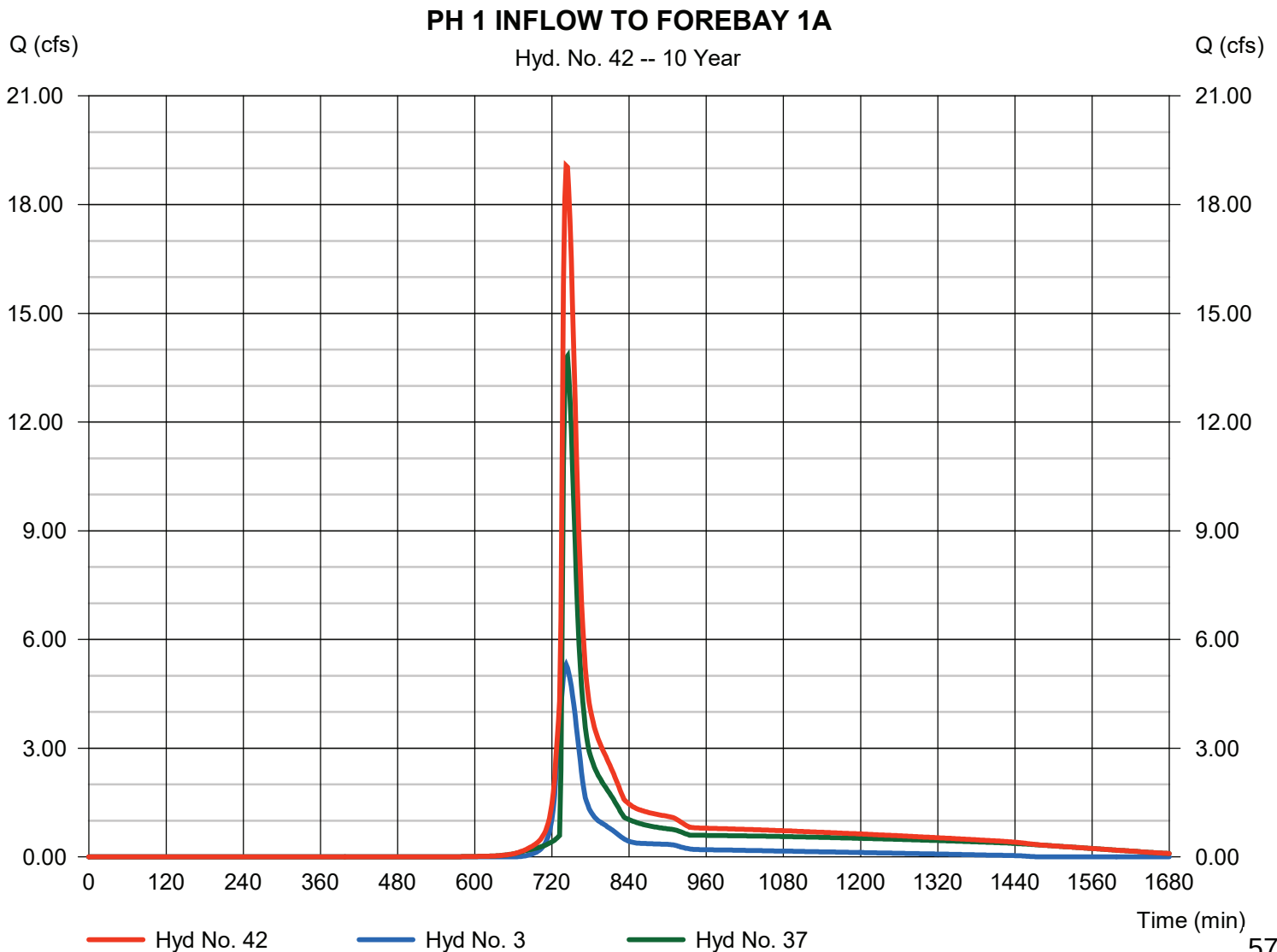
Friday, 06 / 28 / 2019

Hyd. No. 42

PH 1 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 3, 37

Peak discharge = 19.07 cfs
Time to peak = 742 min
Hyd. volume = 1.710 acft
Contrib. drain. area = 3.947 ac



Hydrograph Report

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

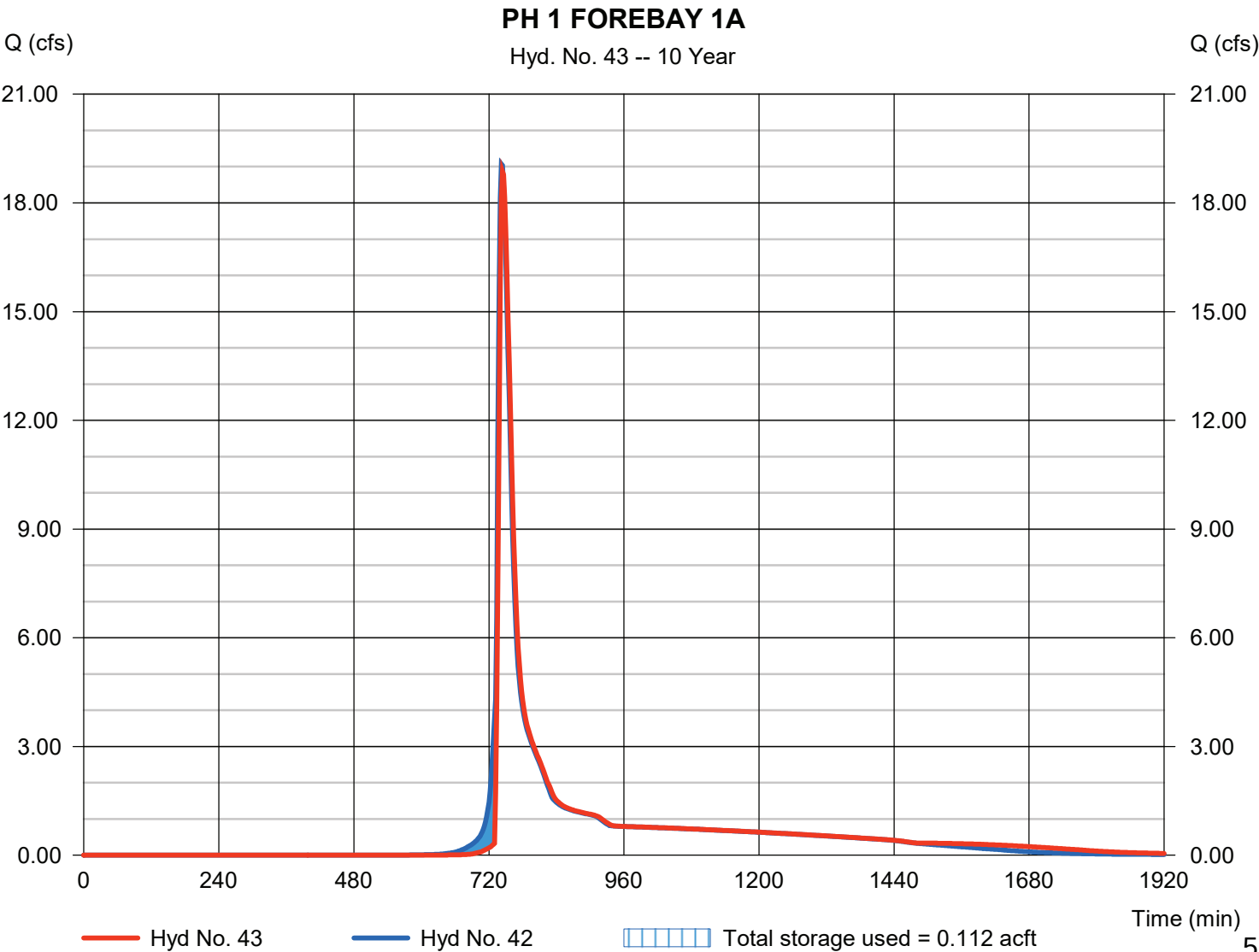
Friday, 06 / 28 / 2019

Hyd. No. 43

PH 1 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 18.87 cfs
Storm frequency	= 10 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 1.710 acft
Inflow hyd. No.	= 42 - PH 1 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.30 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 0.112 acft

Storage Indication method used.



Hydrograph Report

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

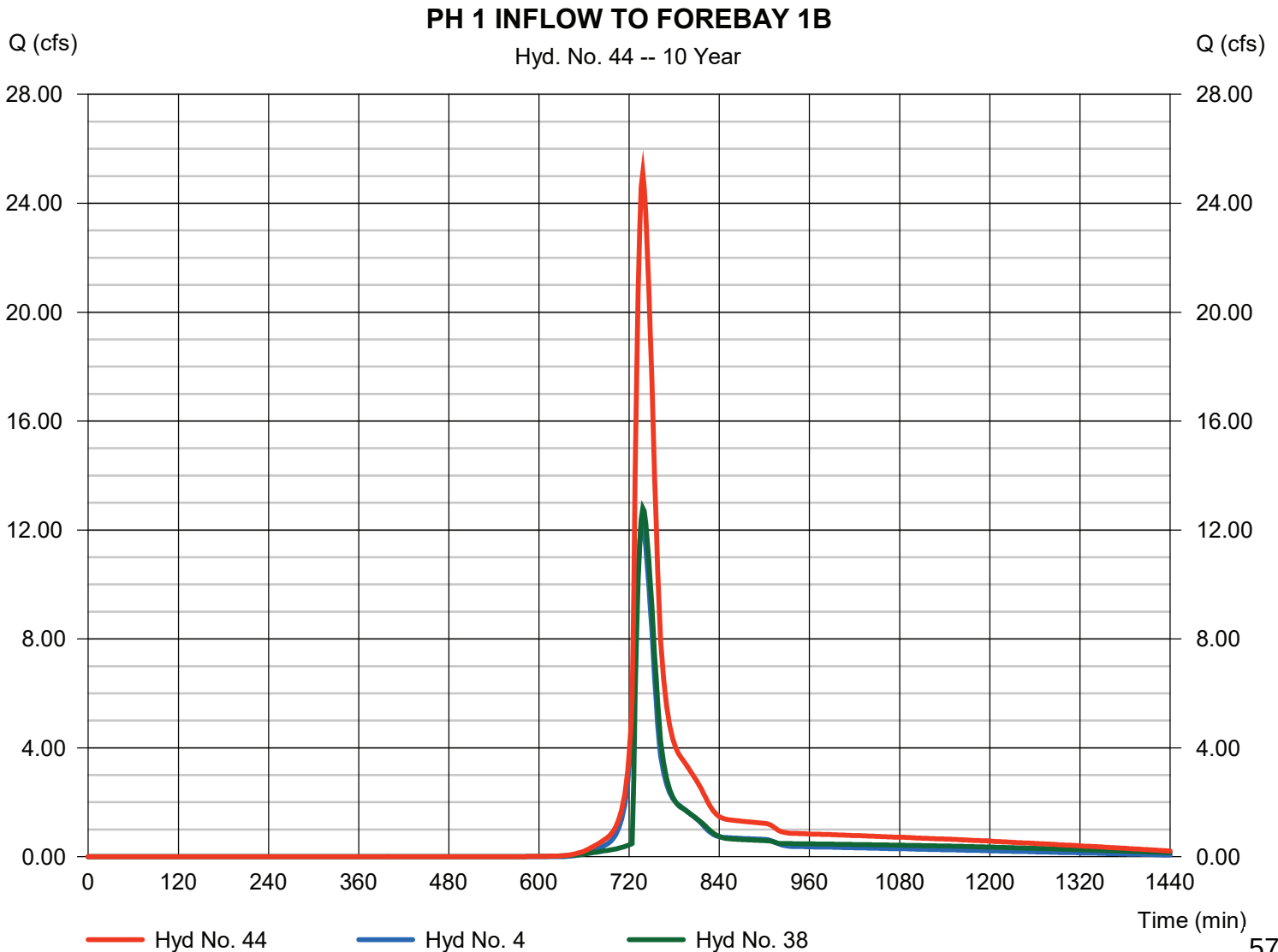
Friday, 06 / 28 / 2019

Hyd. No. 44

PH 1 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 4, 38

Peak discharge = 25.12 cfs
Time to peak = 738 min
Hyd. volume = 1.969 acft
Contrib. drain. area = 6.516 ac



Hydrograph Report

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

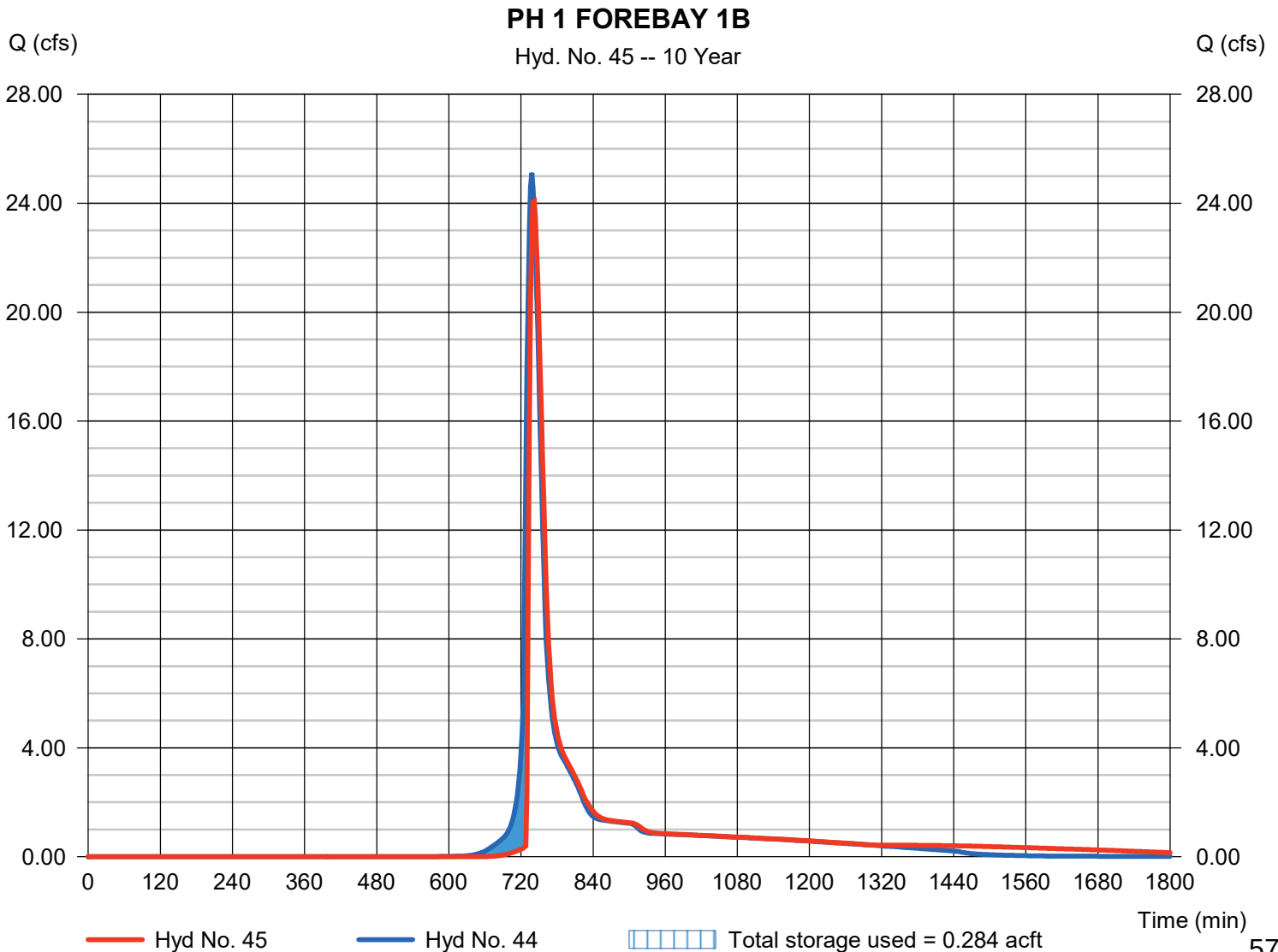
Friday, 06 / 28 / 2019

Hyd. No. 45

PH 1 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 24.08 cfs
Storm frequency	= 10 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 1.968 acft
Inflow hyd. No.	= 44 - PH 1 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.29 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 0.284 acft

Storage Indication method used.



Hydrograph Report

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

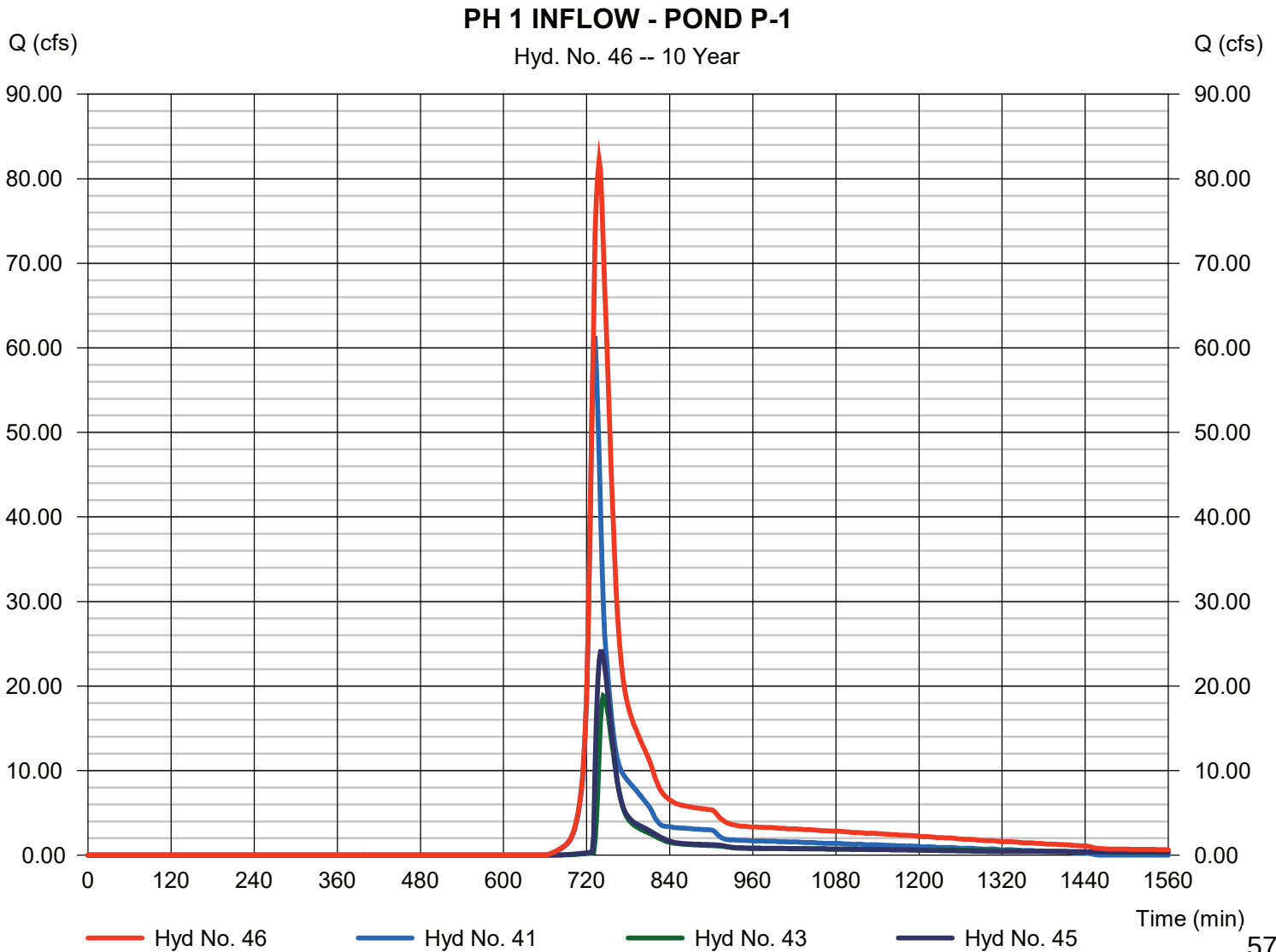
Friday, 06 / 28 / 2019

Hyd. No. 46

PH 1 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 41, 43, 45

Peak discharge = 82.17 cfs
 Time to peak = 738 min
 Hyd. volume = 7.706 acft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

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

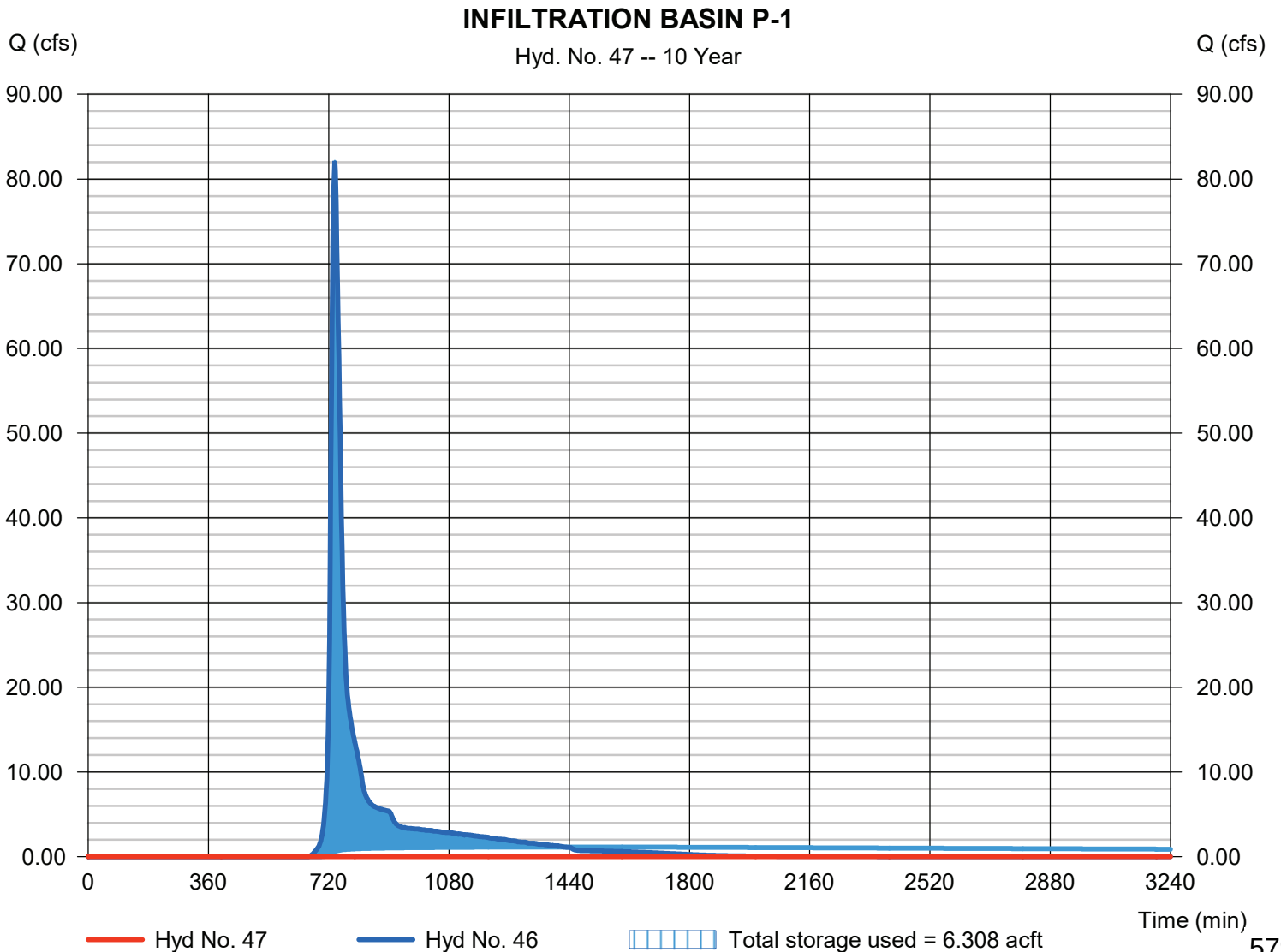
Friday, 06 / 28 / 2019

Hyd. No. 47

INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 788 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 46 - PH 1 INFLOW - POND P-1	Max. Elevation	= 834.04 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 1	Max. Storage	= 6.308 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

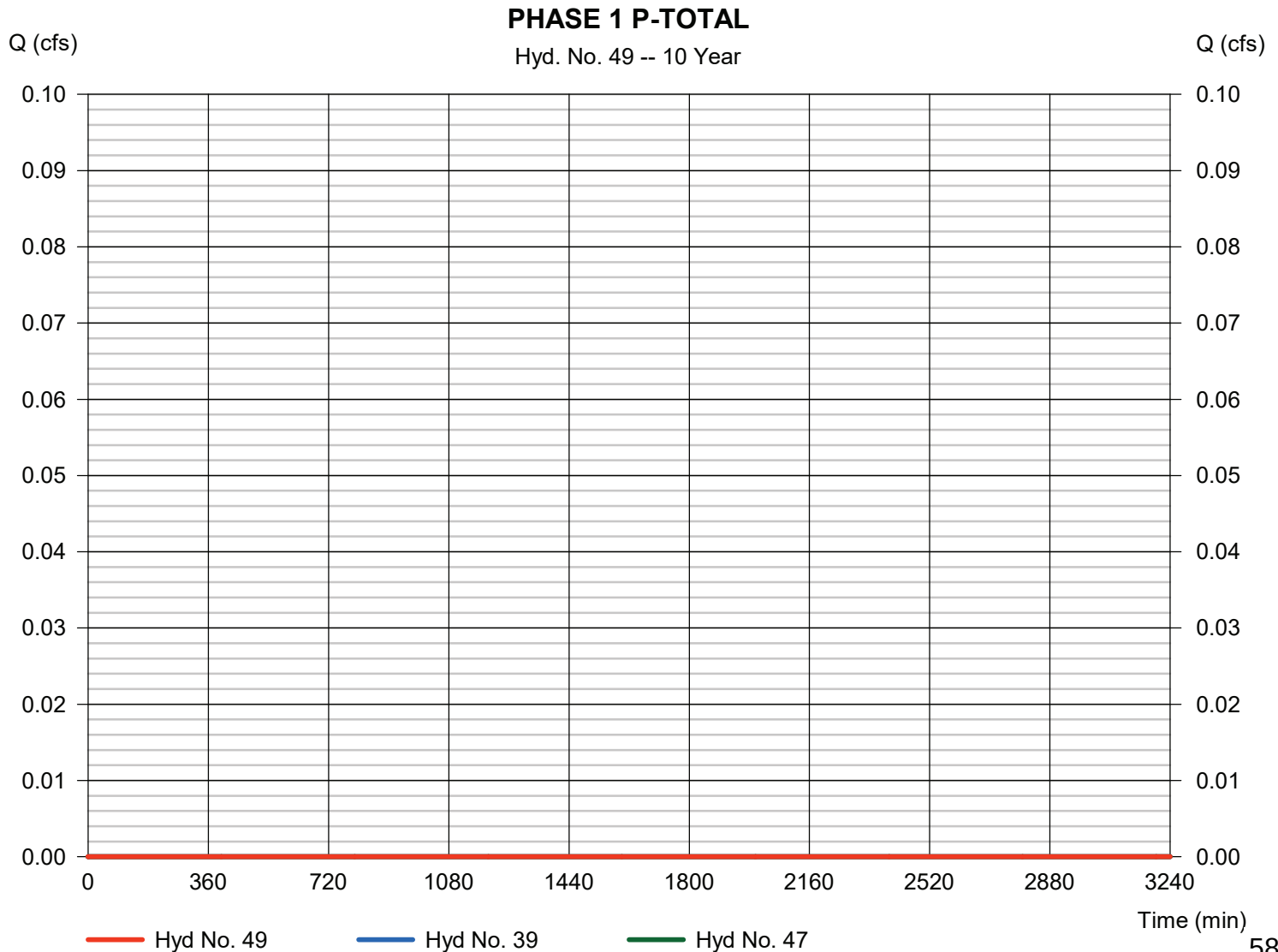
Friday, 06 / 28 / 2019

Hyd. No. 49

PHASE 1 P-TOTAL

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 39, 47

Peak discharge = 0.000 cfs
 Time to peak = 788 min
 Hyd. volume = 0.000 acft
 Contrib. drain. area = 0.000 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	23.96	2	738	1.910	-----	-----	-----	P-OS-1-PH 1
2	SCS Runoff	130.52	2	730	7.706	-----	-----	-----	P-1-PH 1
3	SCS Runoff	12.43	2	742	1.098	-----	-----	-----	P-1A-PH1
4	SCS Runoff	26.54	2	736	2.066	-----	-----	-----	P-1B-PH1
5	SCS Runoff	30.40	2	736	2.405	-----	-----	-----	P-2
6	SCS Runoff	24.93	2	736	1.972	-----	-----	-----	P-3
7	SCS Runoff	5.183	2	736	0.414	-----	-----	-----	P-4
9	SCS Runoff	0.896	2	726	0.040	-----	-----	-----	R&M EX. P-1
10	SCS Runoff	1.550	2	726	0.071	-----	-----	-----	R&M EX. P-2
11	SCS Runoff	0.747	2	726	0.033	-----	-----	-----	R&M EX. P-3
12	SCS Runoff	0.854	2	726	0.038	-----	-----	-----	R&M EX. P-4
13	SCS Runoff	1.086	2	726	0.049	-----	-----	-----	R&M EX. P-5
14	SCS Runoff	1.606	2	726	0.073	-----	-----	-----	R&M EX. P-6
15	SCS Runoff	1.701	2	726	0.080	-----	-----	-----	R&M EX. P-7
16	SCS Runoff	1.422	2	726	0.064	-----	-----	-----	R&M EX. P-8
17	SCS Runoff	0.975	2	726	0.048	-----	-----	-----	R&M EX. P-9
18	Reservoir	0.201	2	740	0.040	9	851.73	0.020	R&M EX. BIOSWALE P-1
19	Combine	1.566	2	726	0.111	10, 18	-----	-----	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	1.007	2	730	0.062	19	851.72	0.031	R&M EX. BIOSWALE P-2
21	Combine	1.584	2	728	0.096	11, 20	-----	-----	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	0.529	2	750	0.047	21	851.25	0.038	R&M EX. BIOSWALE P-3
23	Combine	0.854	2	726	0.086	12, 22	-----	-----	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	0.343	2	774	0.037	23	850.37	0.040	R&M EX. BIOSWALE P-4
25	Combine	1.086	2	726	0.086	13, 24	-----	-----	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	0.362	2	784	0.043	25	848.90	0.035	R&M EX. BIOSWALE P-5
27	Combine	1.606	2	726	0.117	14, 26	-----	-----	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	0.400	2	794	0.053	27	847.84	0.053	R&M EX. BIOSWALE P-6
29	Combine	1.701	2	726	0.133	15, 28	-----	-----	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	0.728	2	732	0.086	29	845.67	0.039	R&M EX. BIOSWALE P-7
31	Combine	1.788	2	728	0.151	16, 30	-----	-----	R&M EX. BIOSWALE P-8
32	Reservoir	0.456	2	810	0.076	31	845.07	0.065	R&M EX. BIOSWALE P-8
33	SCS Runoff	8.540	2	726	0.407	-----	-----	-----	PROPOSED P-5
34	Combine	8.540	2	726	0.482	32, 33	-----	-----	INFLOW TO PR. P-5
2019-06-27_CHAPMAN FARMS_PHASE I.gpw						Return Period: 100 Year		Friday, 06 / 28 / 2019	

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
35	Reservoir	0.000	2	742	0.000	34	843.32	0.316	PR. BLVD BIOFILTER P-5
37	Reservoir	26.10	2	744	2.404	5	840.30	0.484	POND P-2
38	Reservoir	22.09	2	742	1.972	6	840.52	0.237	POND P-3
39	Reservoir	3.364	2	748	0.121	7	840.86	0.189	RAIN GARDEN P-4
41	Combine	149.04	2	732	9.616	1, 2,	-----	-----	PHASE 1 OS-1 + P-1
42	Combine	38.52	2	742	3.502	3, 37,	-----	-----	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	38.36	2	744	3.502	42	835.60	0.144	PH 1 FOREBAY 1A
44	Combine	47.97	2	738	4.038	4, 38,	-----	-----	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	47.32	2	740	4.037	44	835.61	0.349	PH 1 FOREBAY 1B
46	Combine	215.64	2	732	17.155	41, 43, 45	-----	-----	PH 1 INFLOW - POND P-1
47	Reservoir	0.000	2	1102	0.000	46	837.19	15.1	INFILTRATION BASIN P-1
49	Combine	3.364	2	748	0.121	39, 47,	-----	-----	PHASE 1 P-TOTAL
									</

Hydrograph Report

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

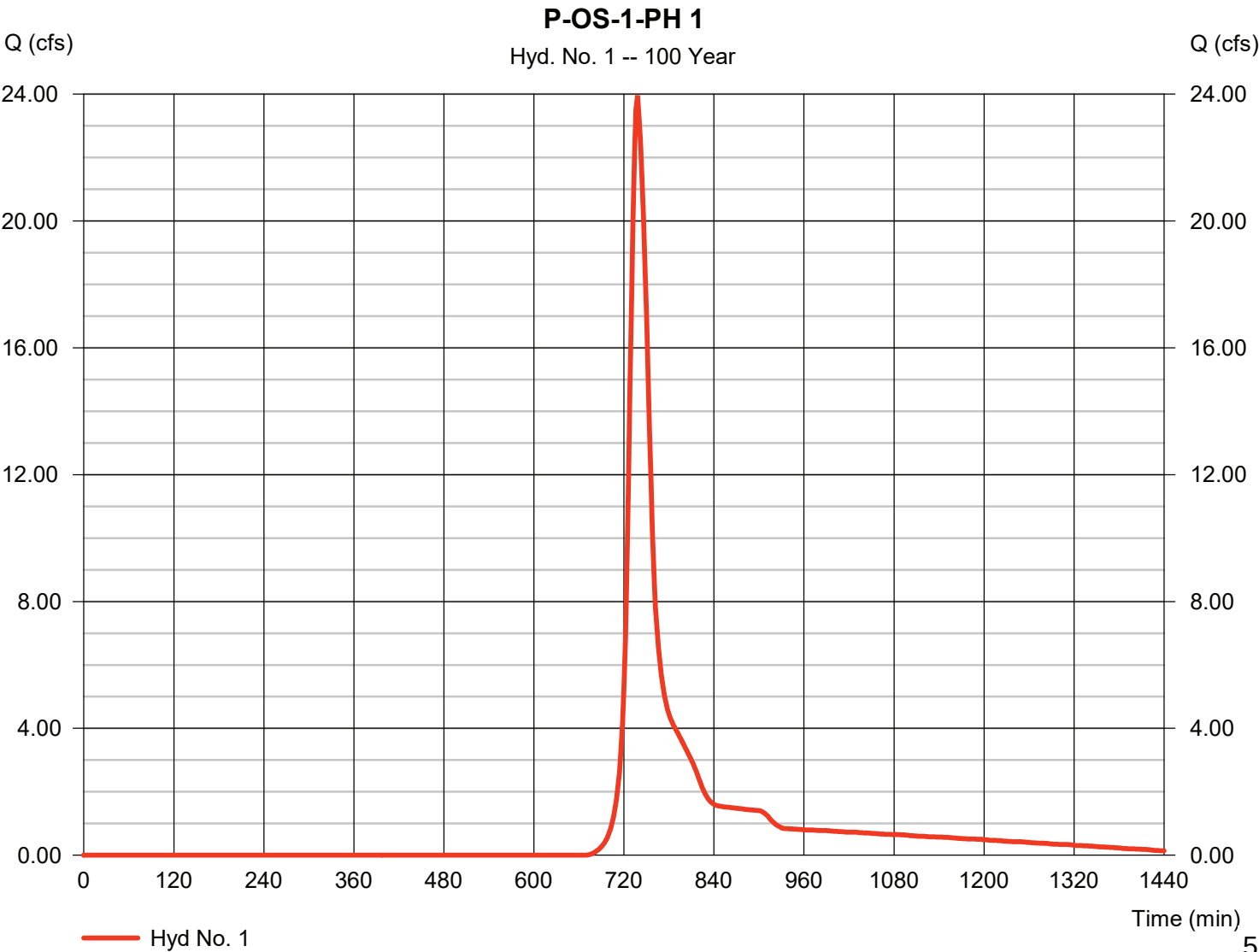
Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 23.96 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 1.910 acft
Drainage area	= 10.170 ac	Curve number	= 62*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.50 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



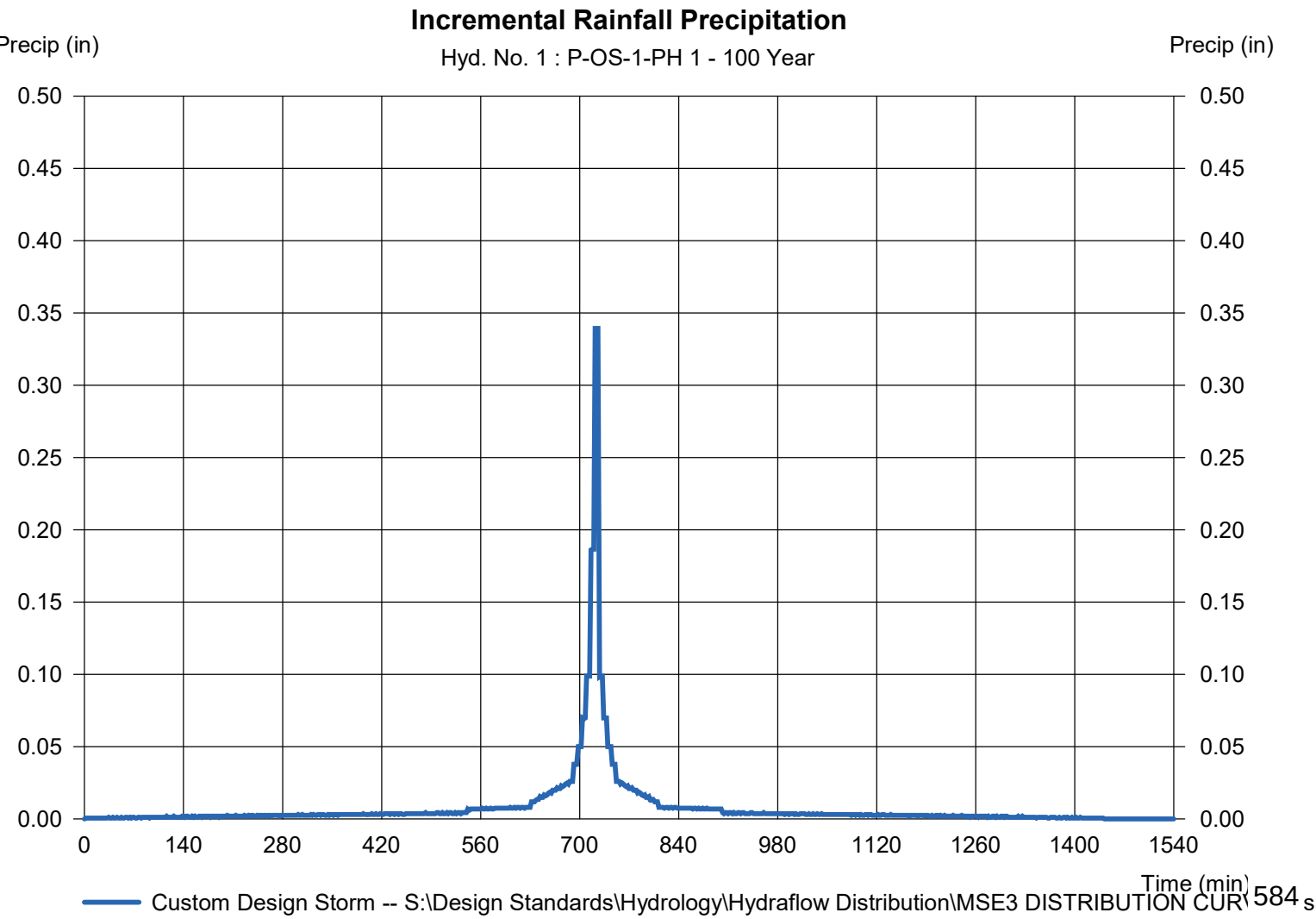
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

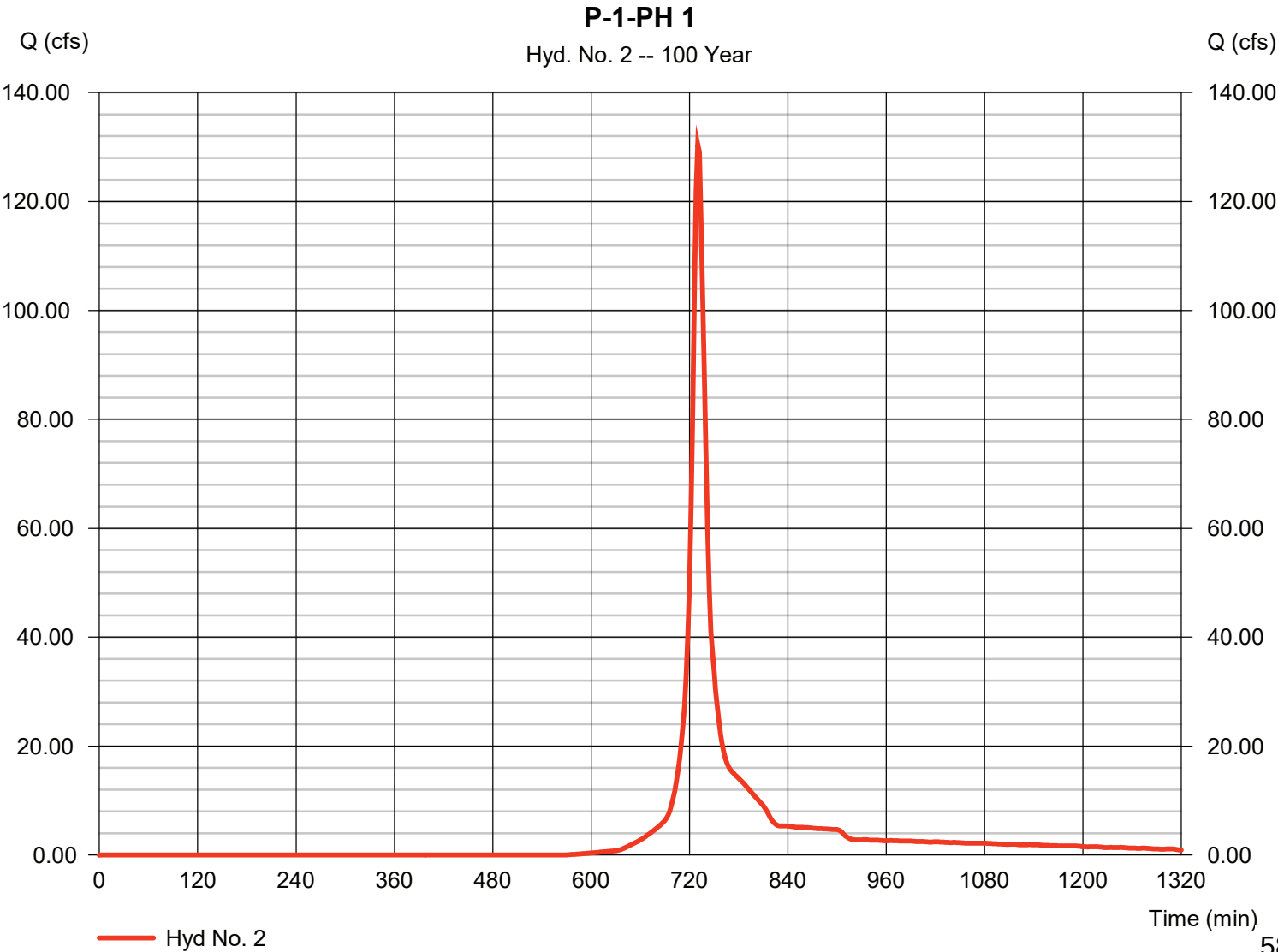
Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 130.52 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 7.706 acft
Drainage area	= 26.872 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 26.872



Precipitation Report

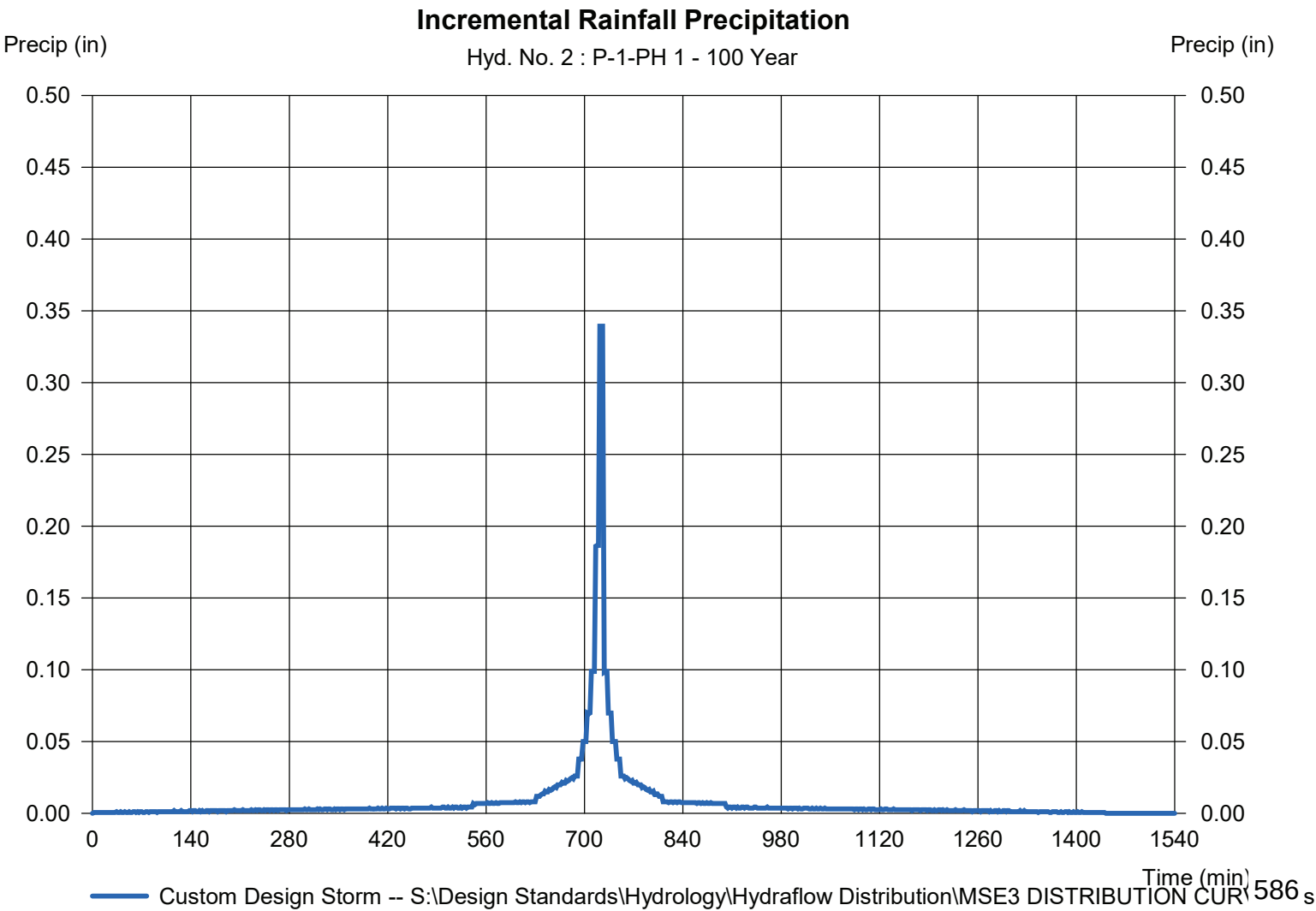
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

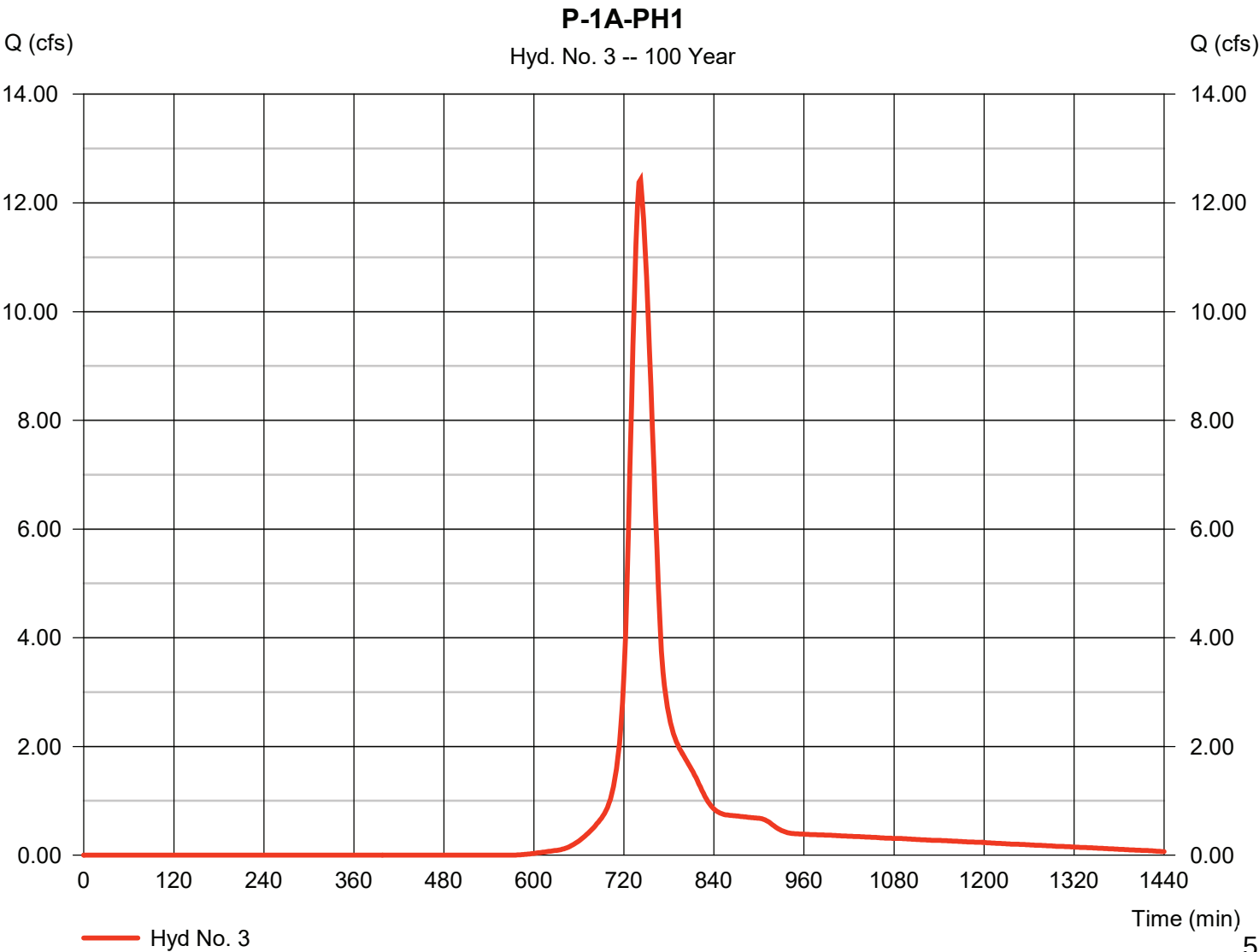
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 12.43 cfs
Storm frequency	= 100 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 1.098 acft
Drainage area	= 3.947 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 29.90 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSR3 DISTRIBUTION CURVE		



Precipitation Report

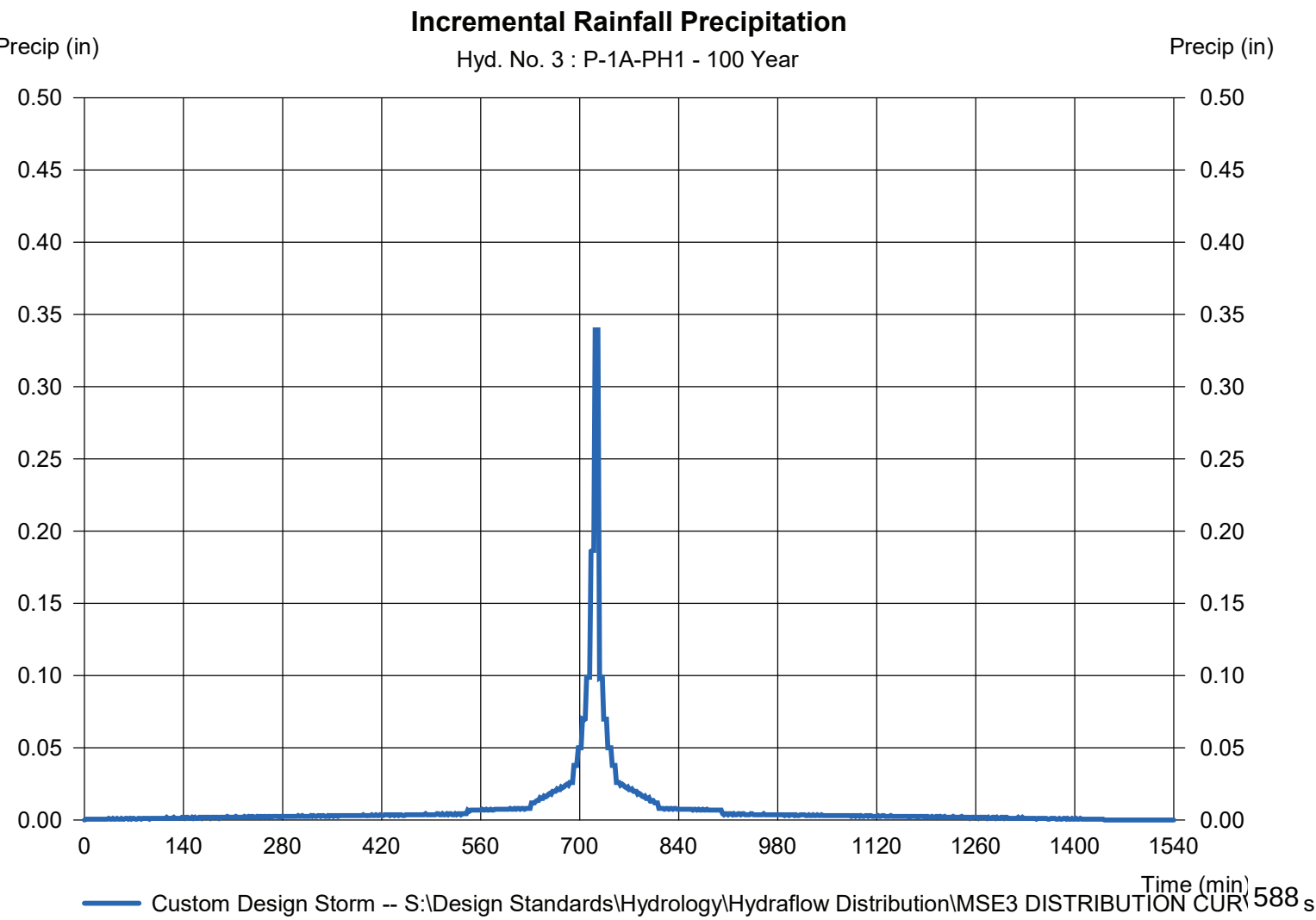
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

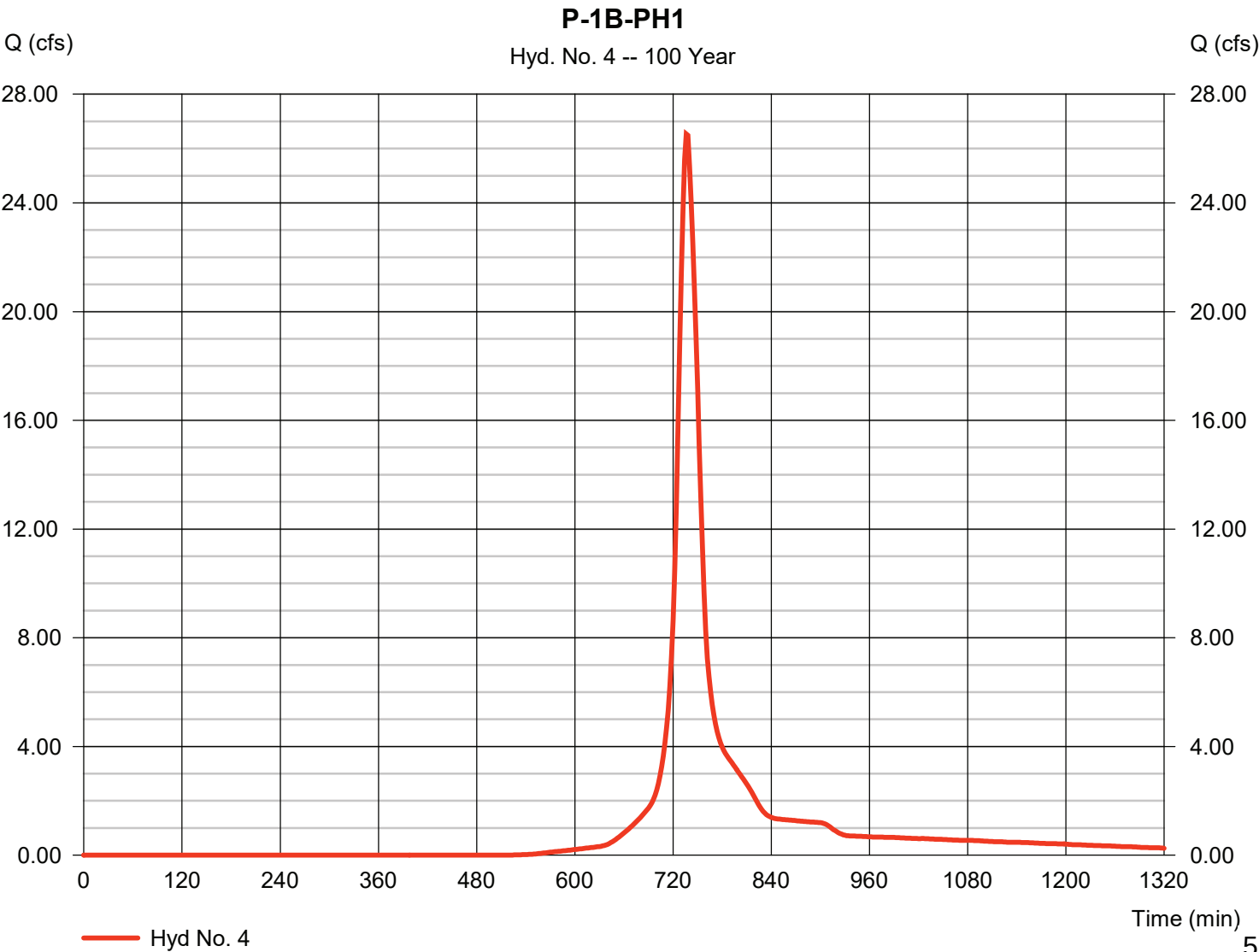
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 26.54 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 2.066 acft
Drainage area	= 6.516 ac	Curve number	= 78
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.60 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSR3 DISTRIBUTION CURVE		



Precipitation Report

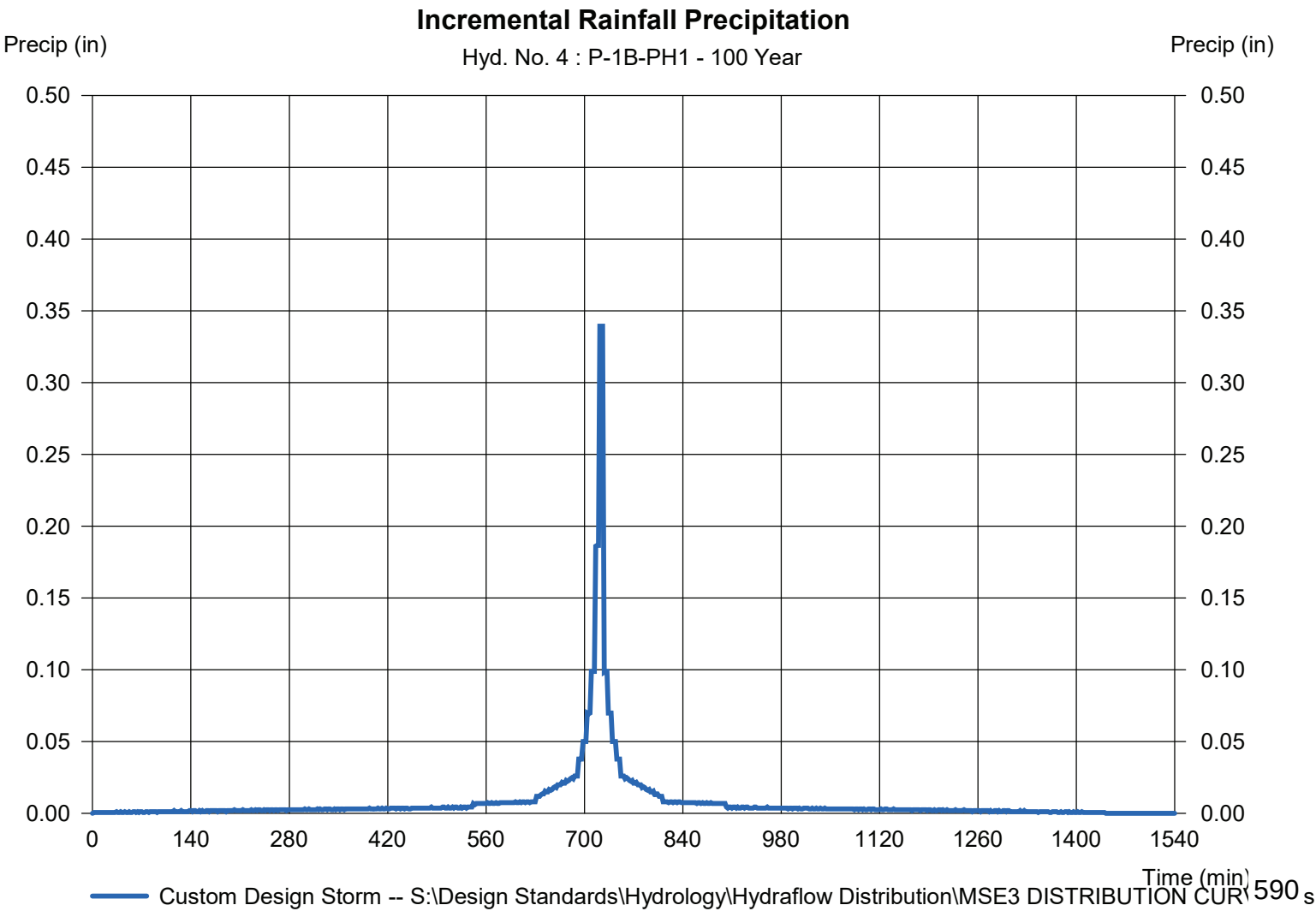
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

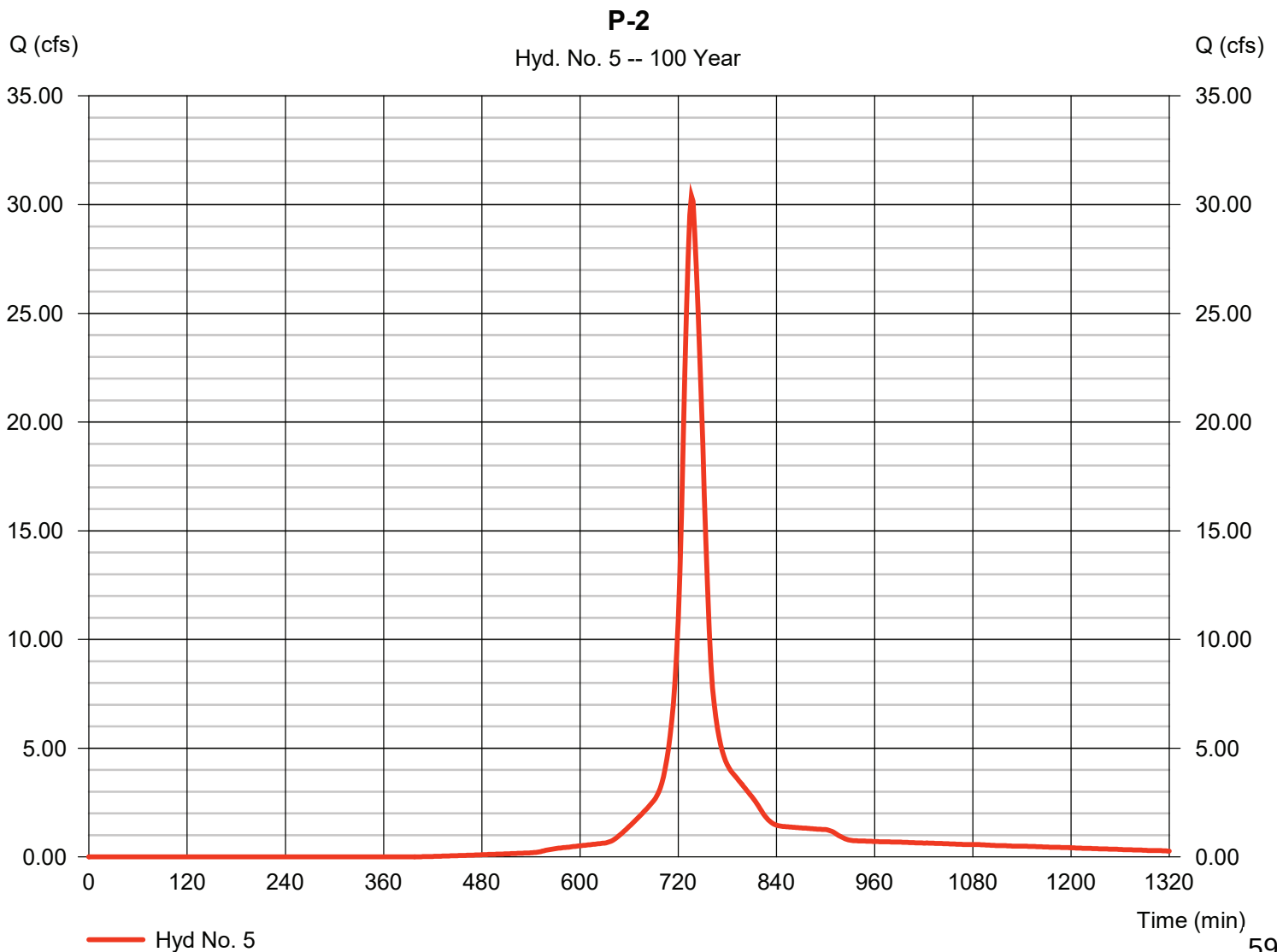
Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hyd. No. 5

Hydrograph type	=	SCS Runoff	Peak discharge	=	30.40 cfs
Storm frequency	=	100 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	2.405 acft
Drainage area	=	6.339 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	22.00 min
Total precip.	=	6.18 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow\MSR3 DISTRIBUTION CURVE			

* Composite (Area/CN) = [(6.710 x 75)] / 6.339



Precipitation Report

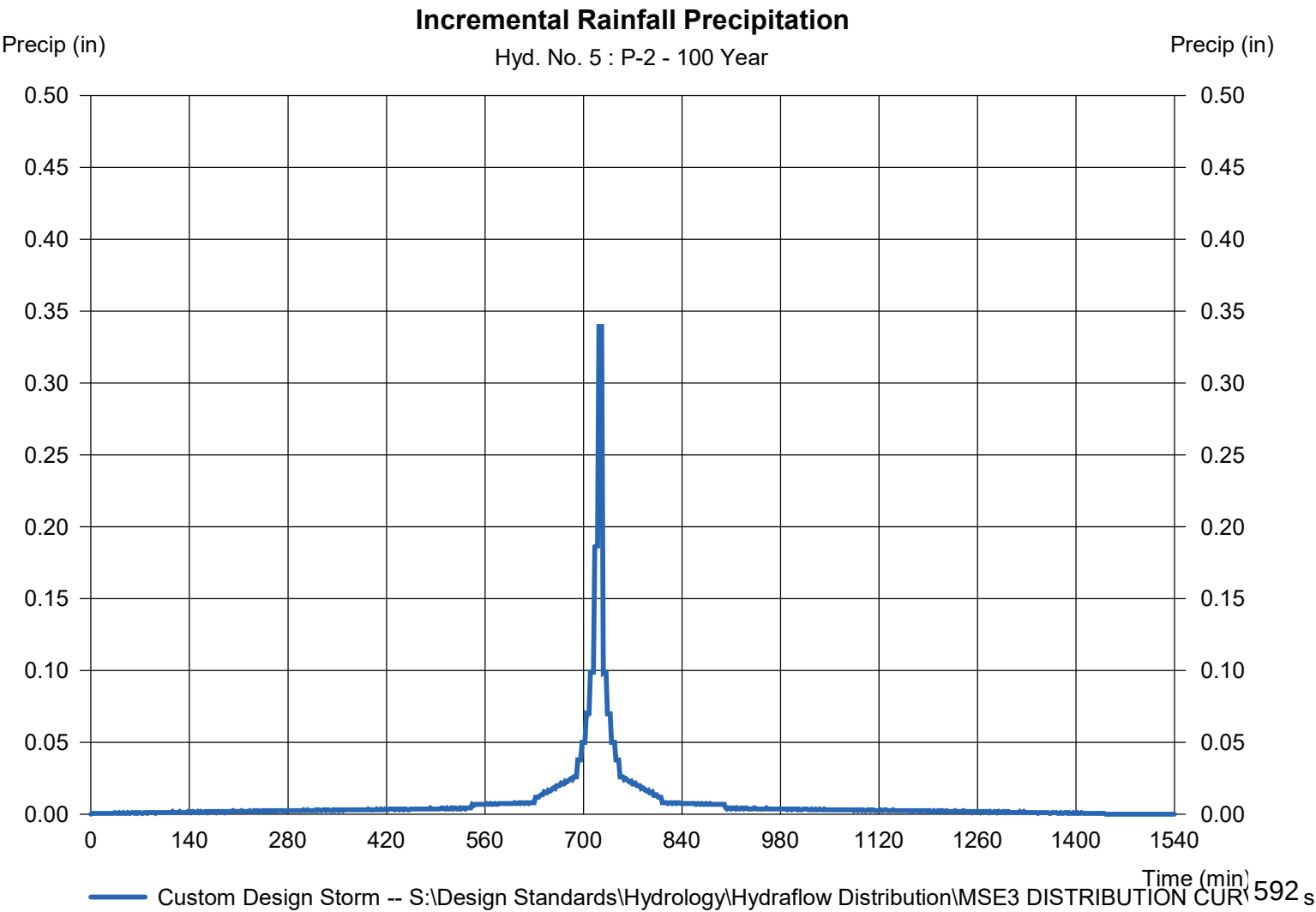
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

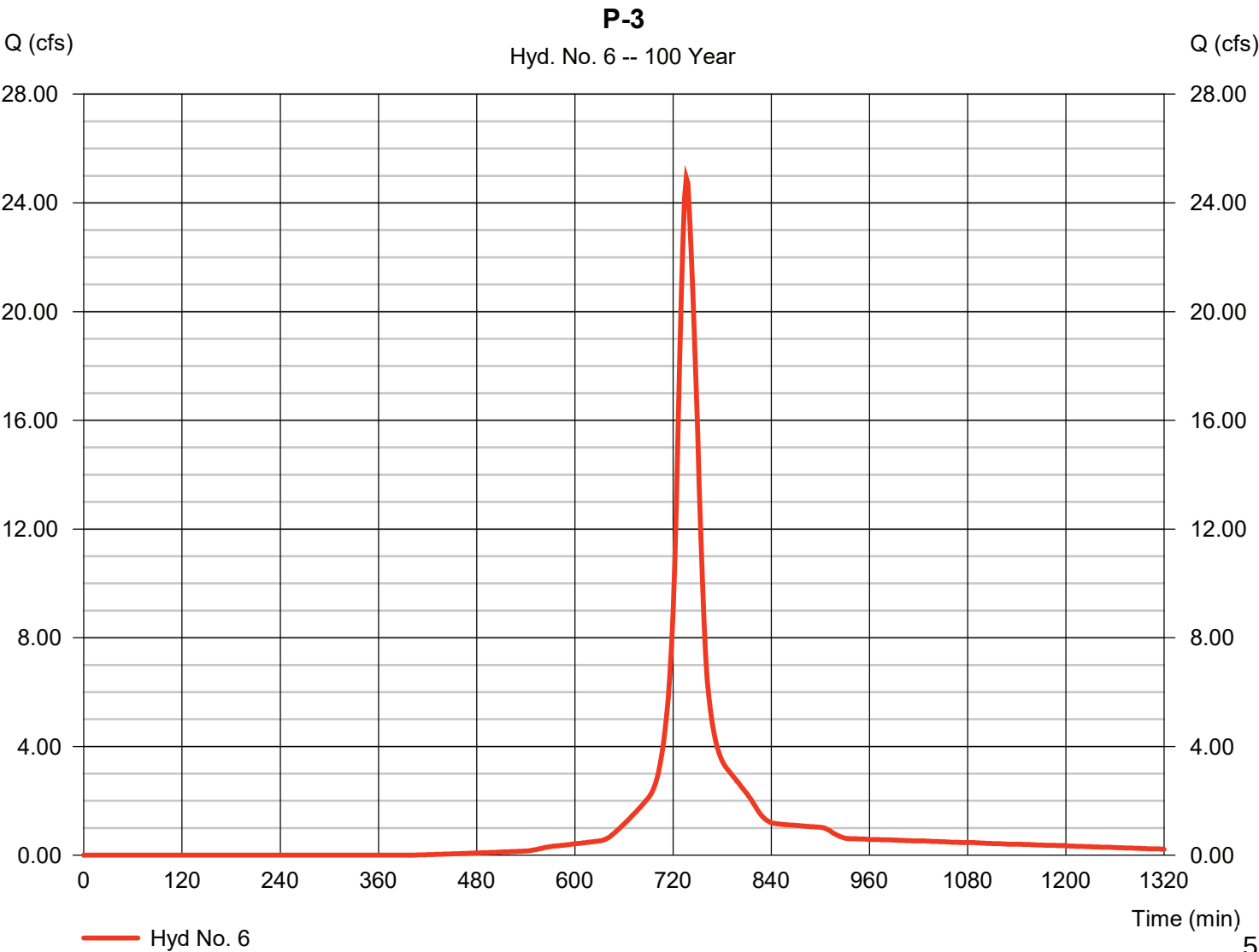
Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 24.93 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.972 acft
Drainage area	= 5.199 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.199



Precipitation Report

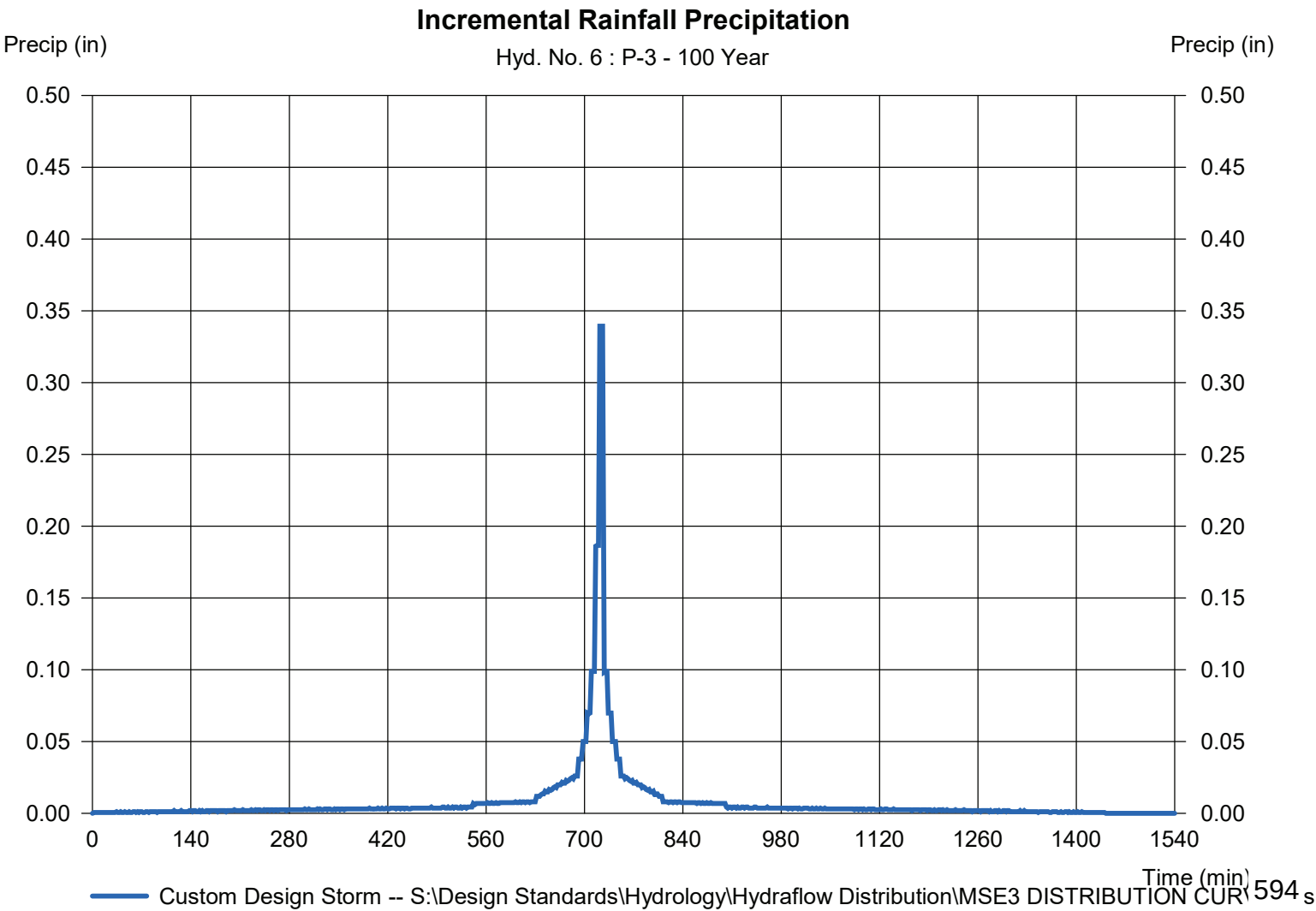
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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Hyd. No. 6

P-3

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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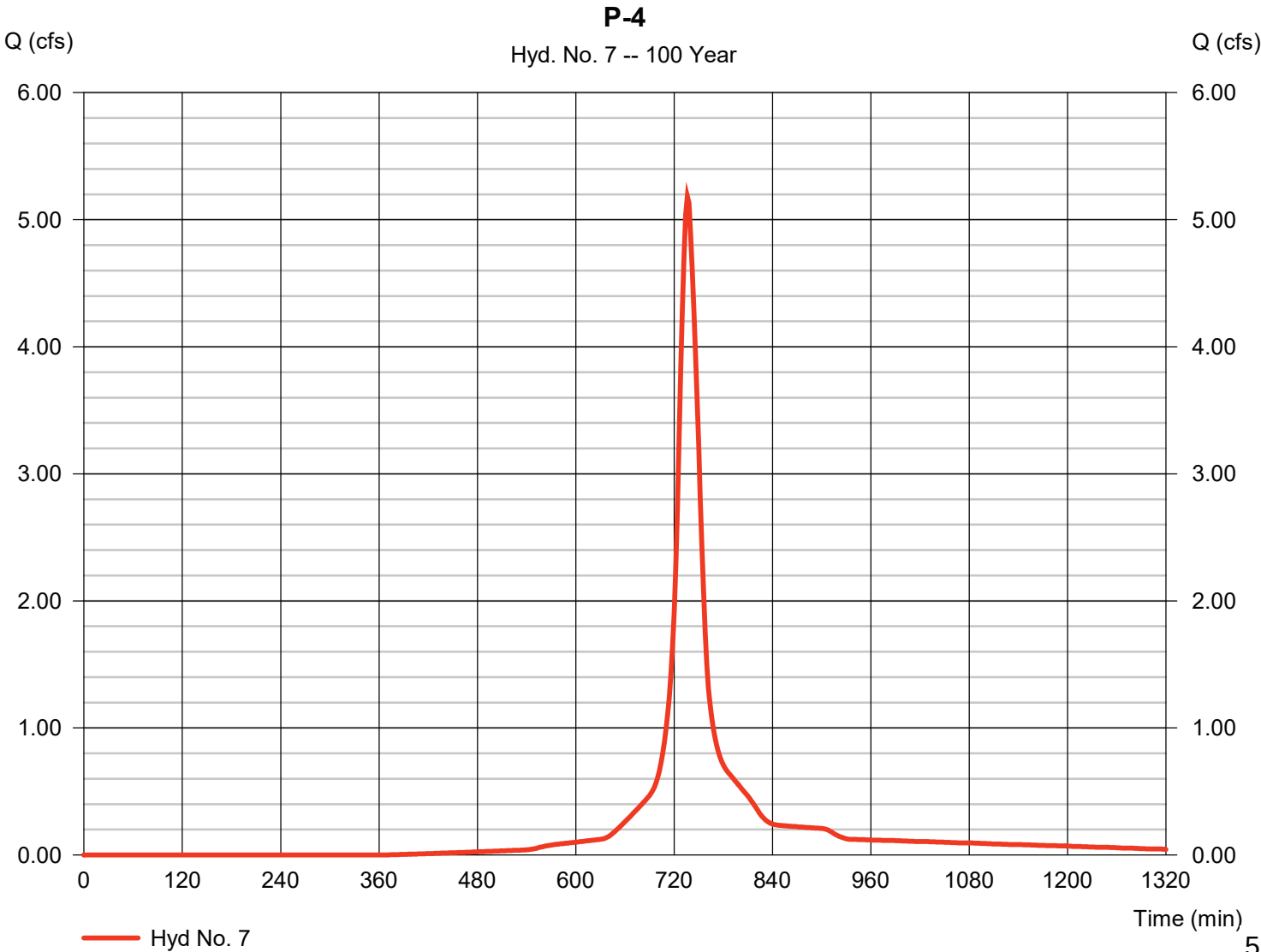
Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 5.183 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 0.414 acft
Drainage area	= 1.040 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.10 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

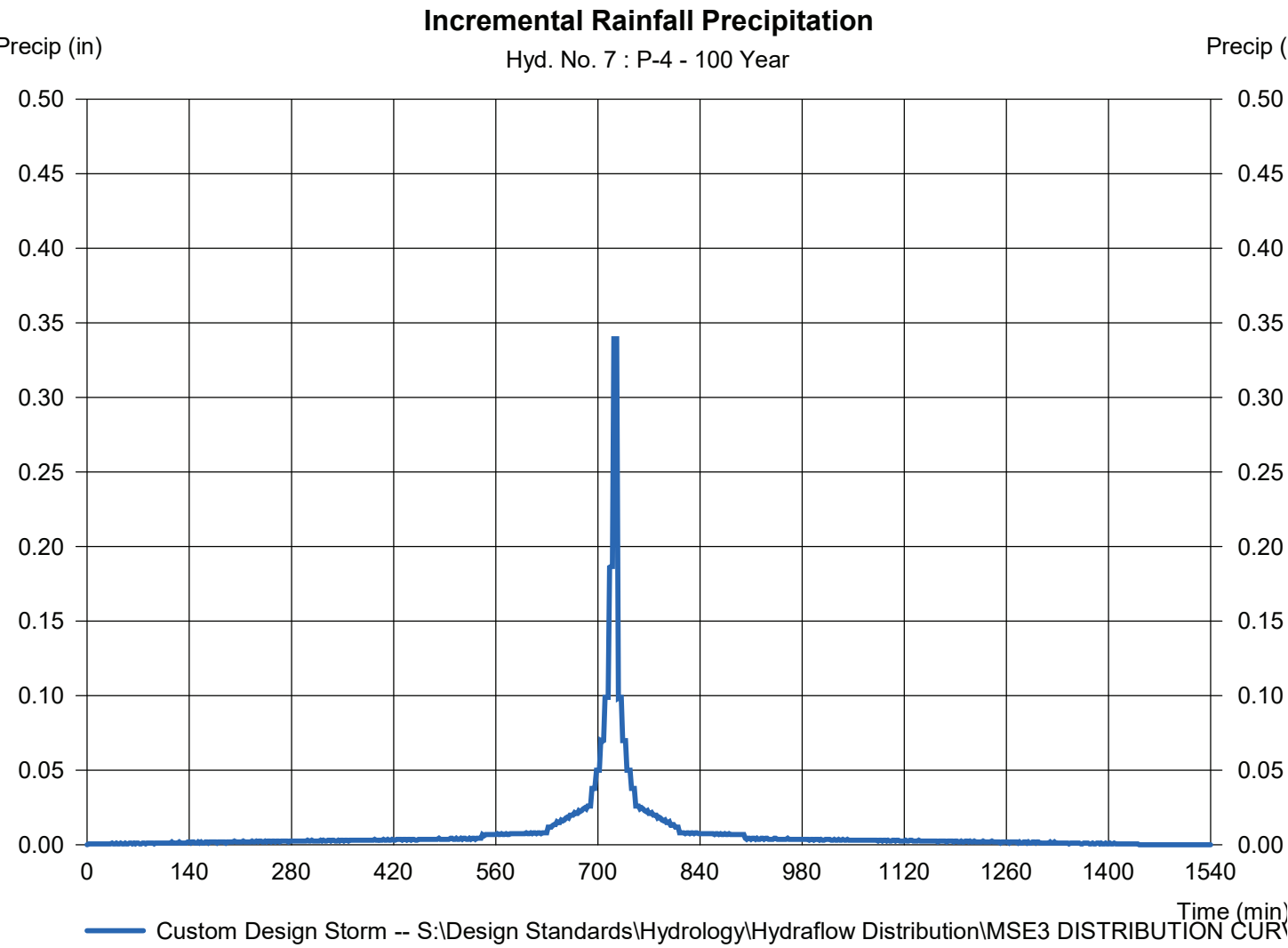
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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Hyd. No. 7

P-4

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

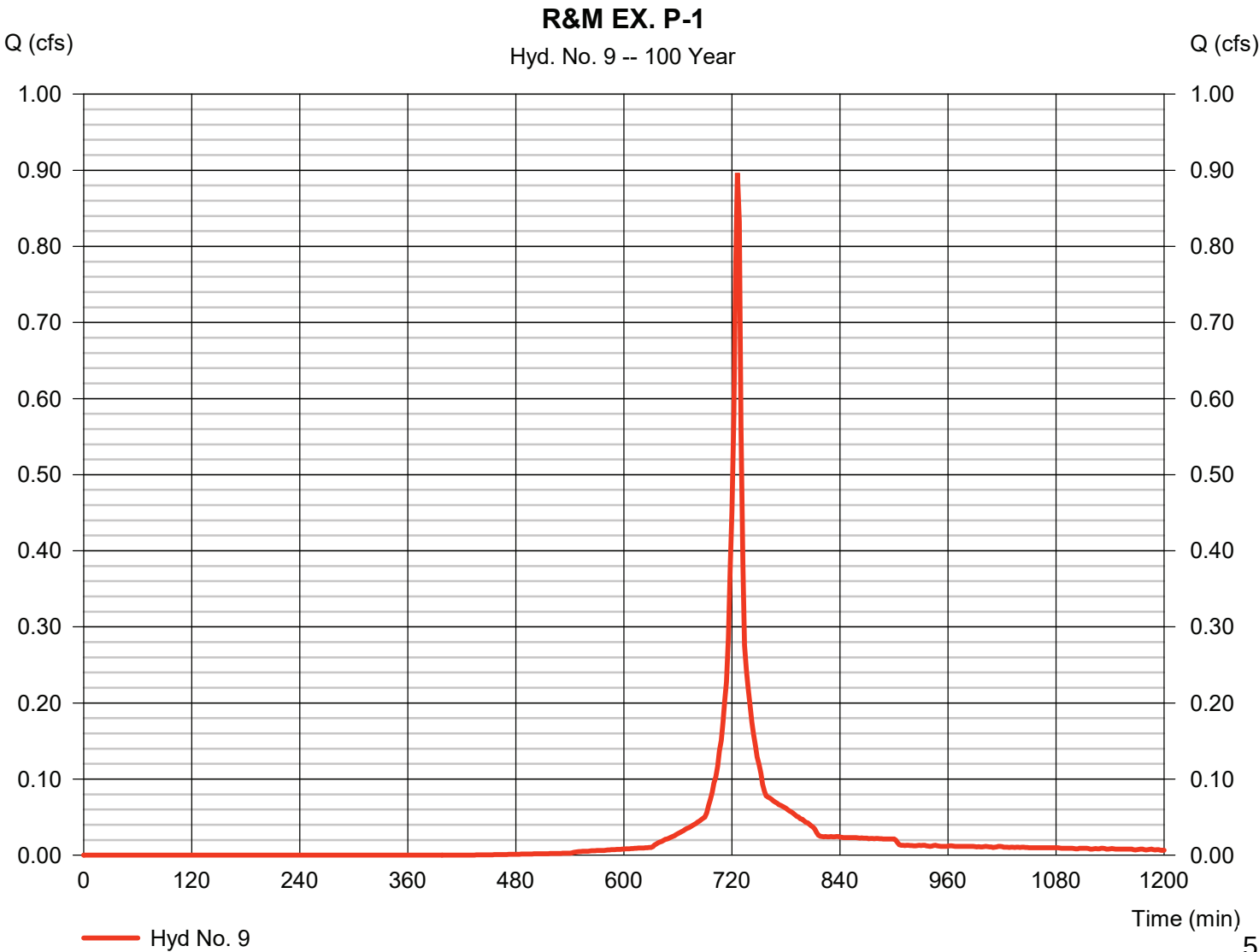
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Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.896 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.040 acft
Drainage area	= 0.120 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

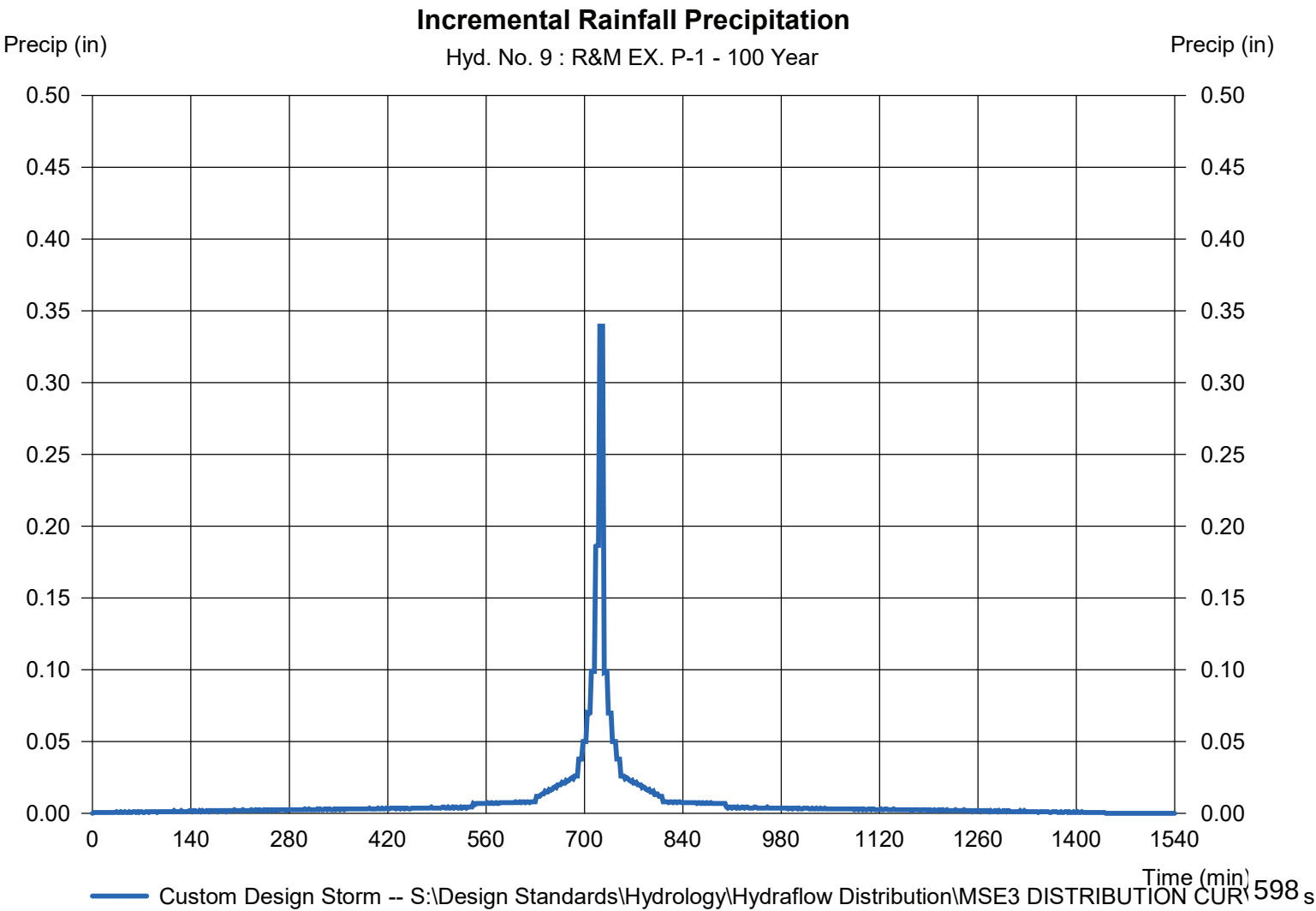
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

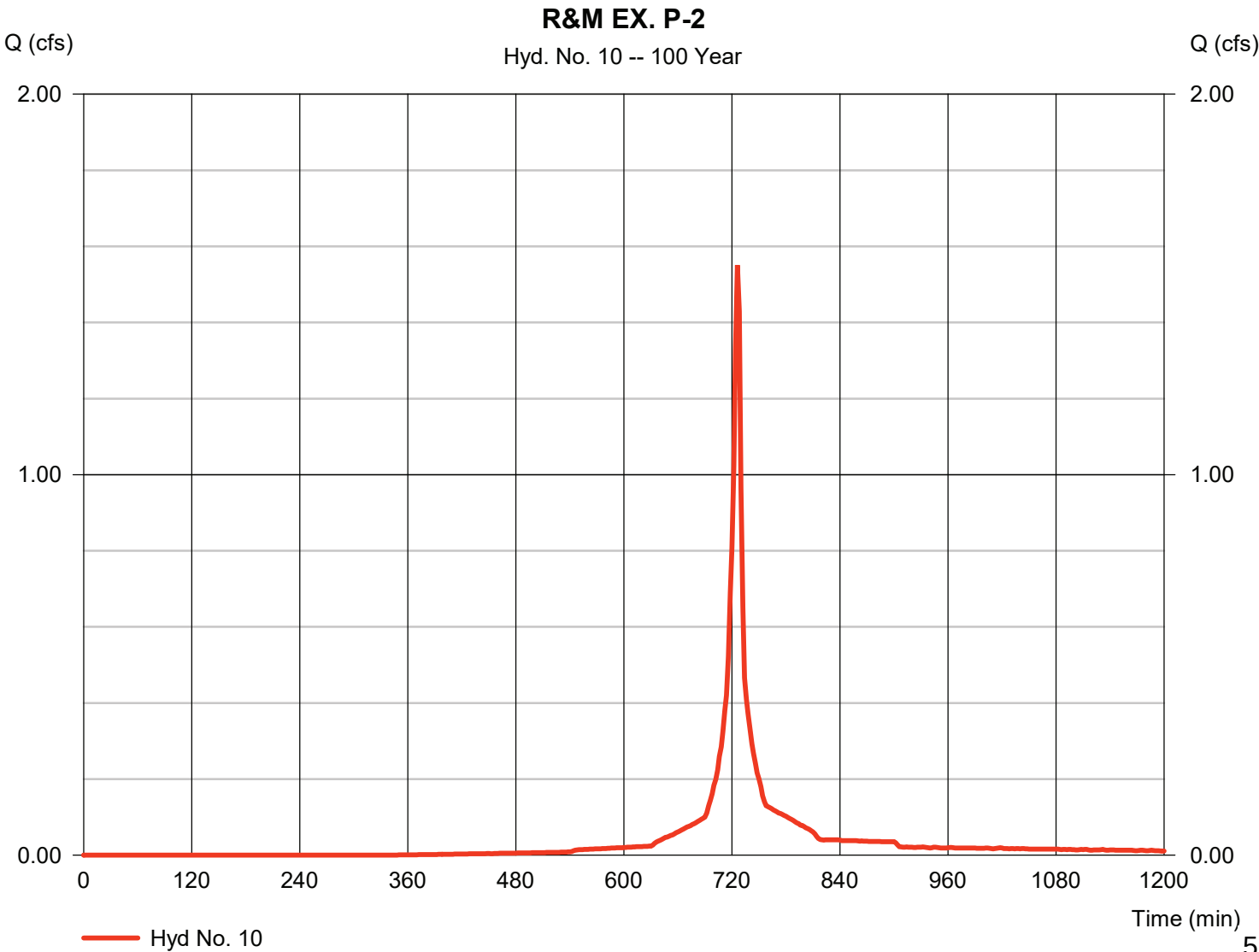
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Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.550 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.071 acft
Drainage area	= 0.190 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD3 DISTRIBUTION CU		



Precipitation Report

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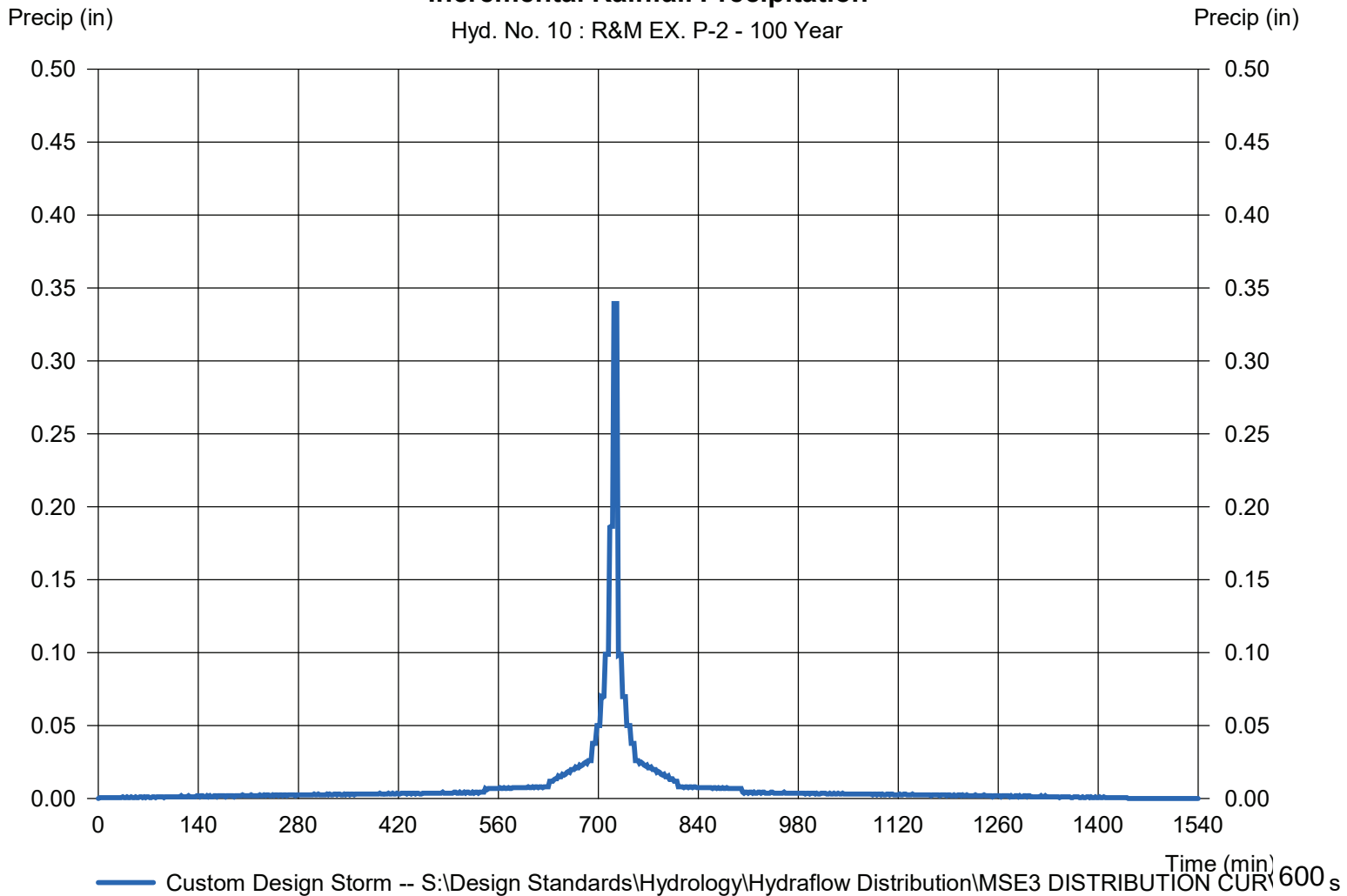
Hyd. No. 10

R&M EX. P-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 10 : R&M EX. P-2 - 100 Year



Hydrograph Report

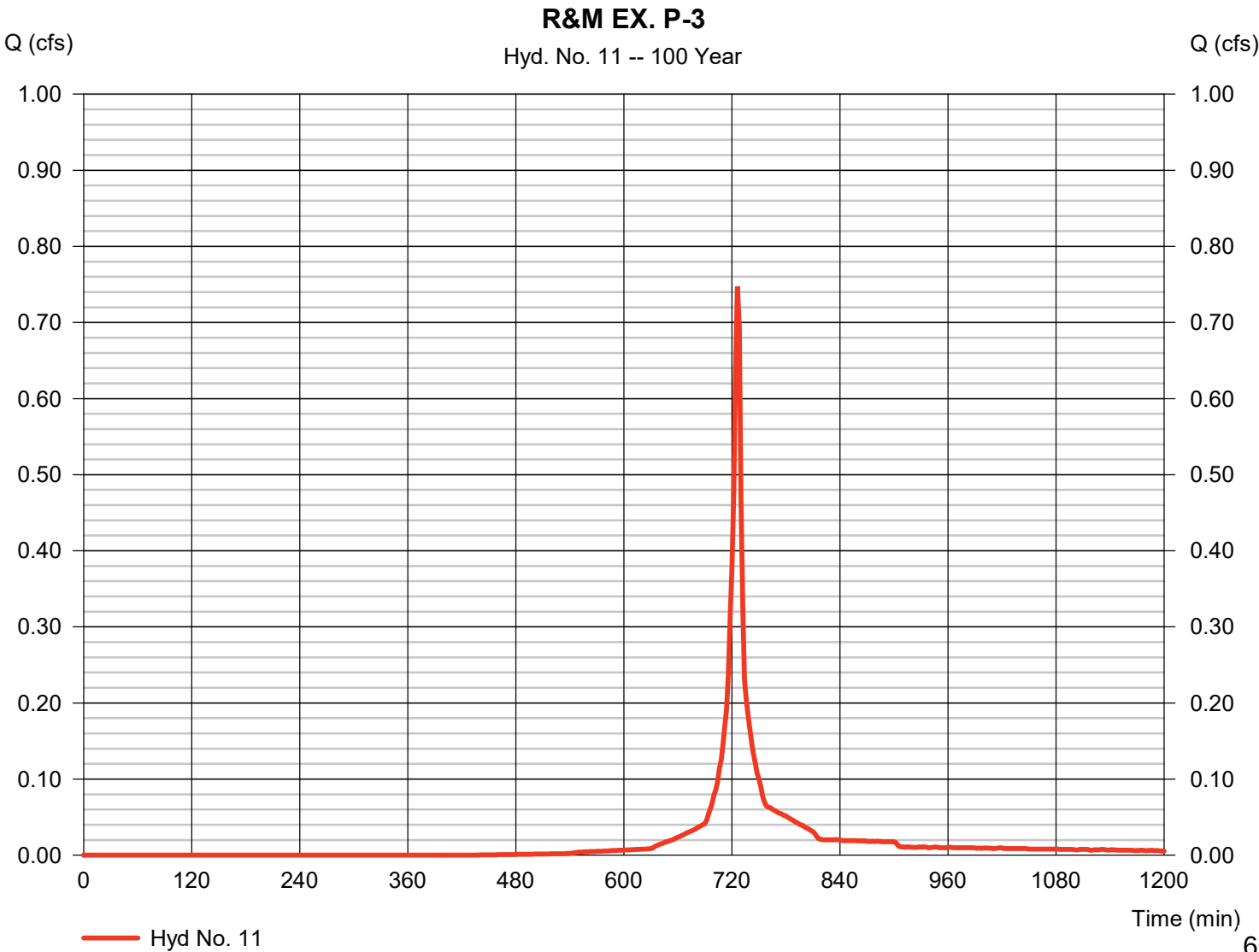
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Hyd. No. 11

R&M EX. P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.747 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.033 acft
Drainage area	= 0.100 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

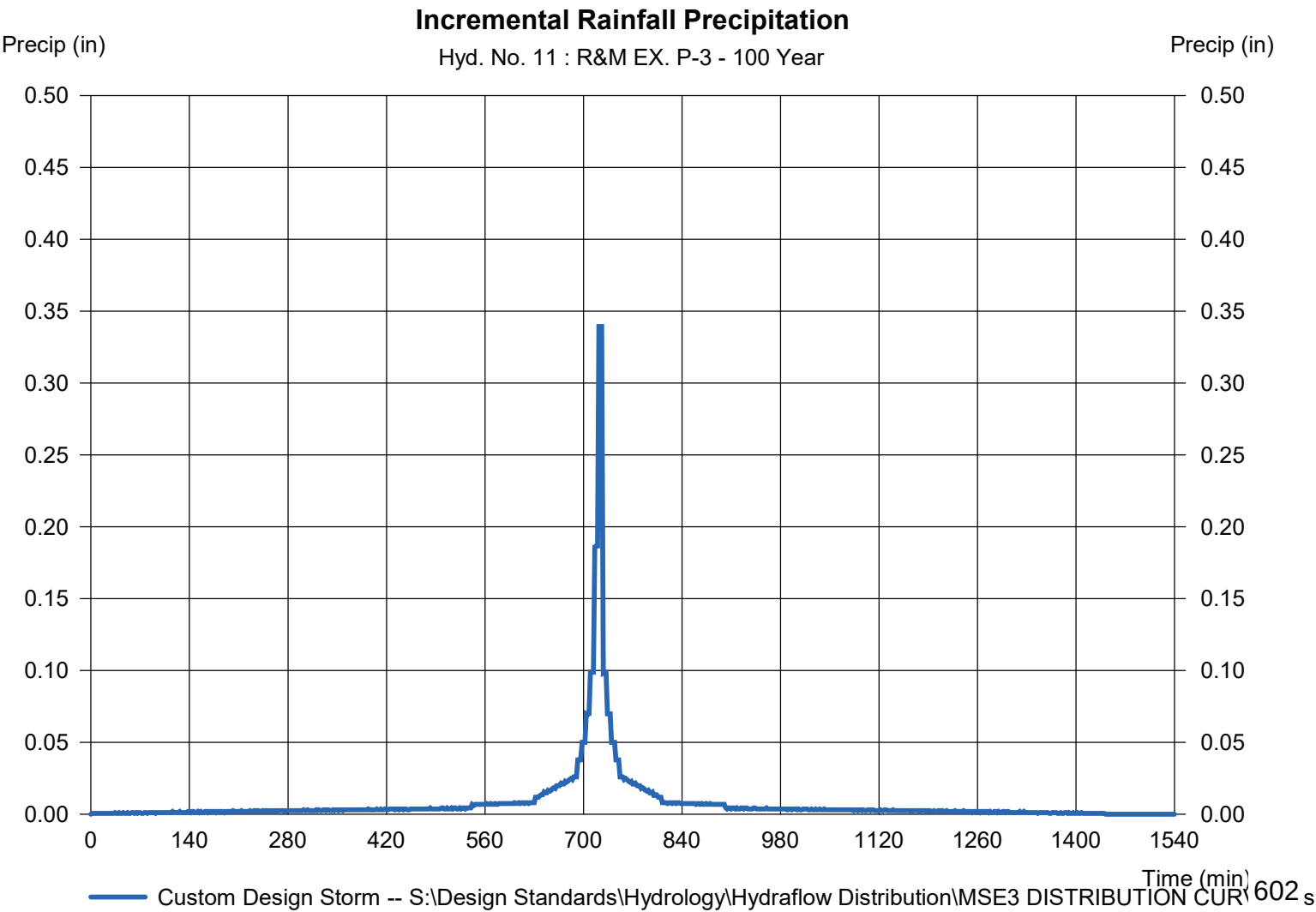
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Hyd. No. 11

R&M EX. P-3

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

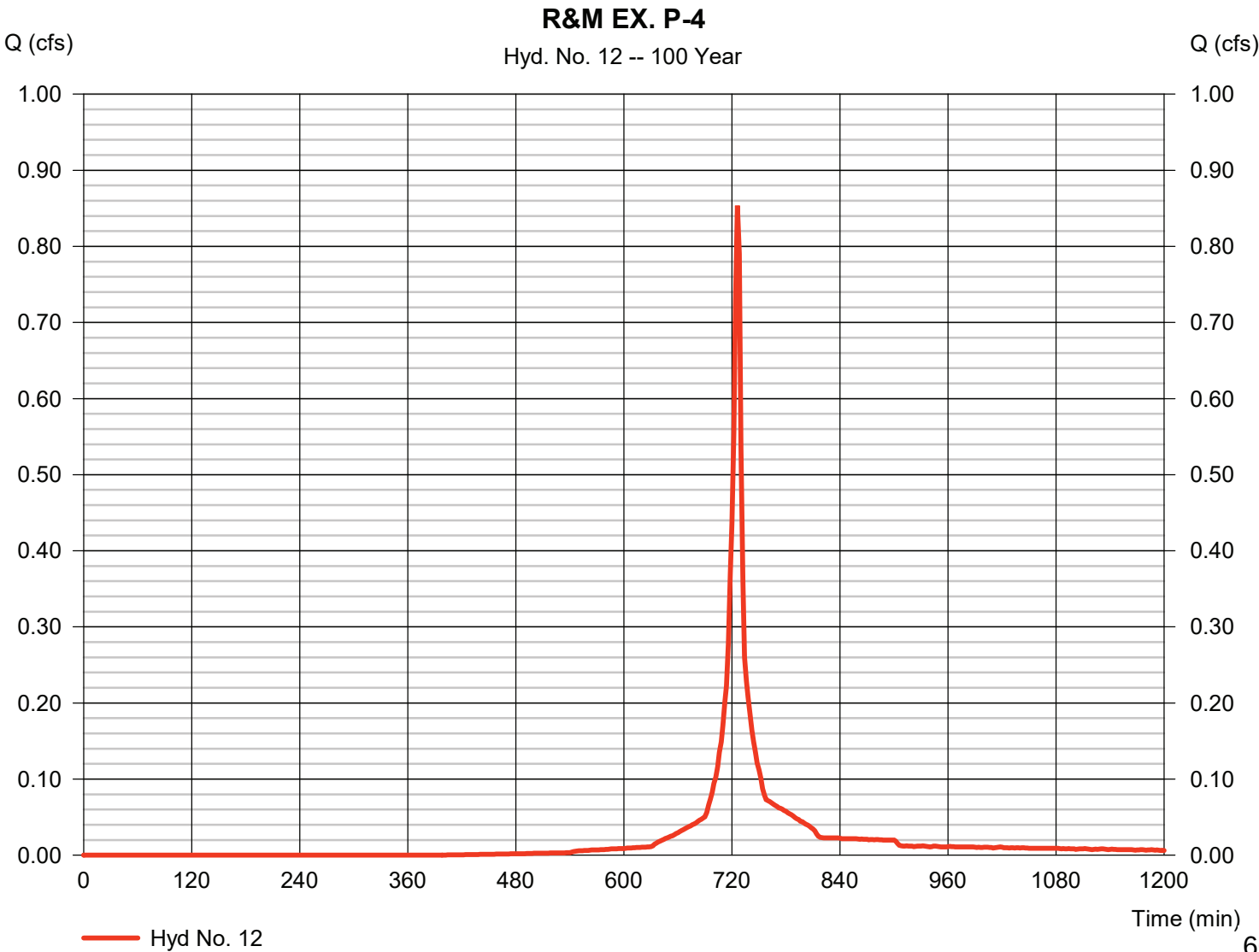
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Hyd. No. 12

R&M EX. P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.854 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.038 acft
Drainage area	= 0.110 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

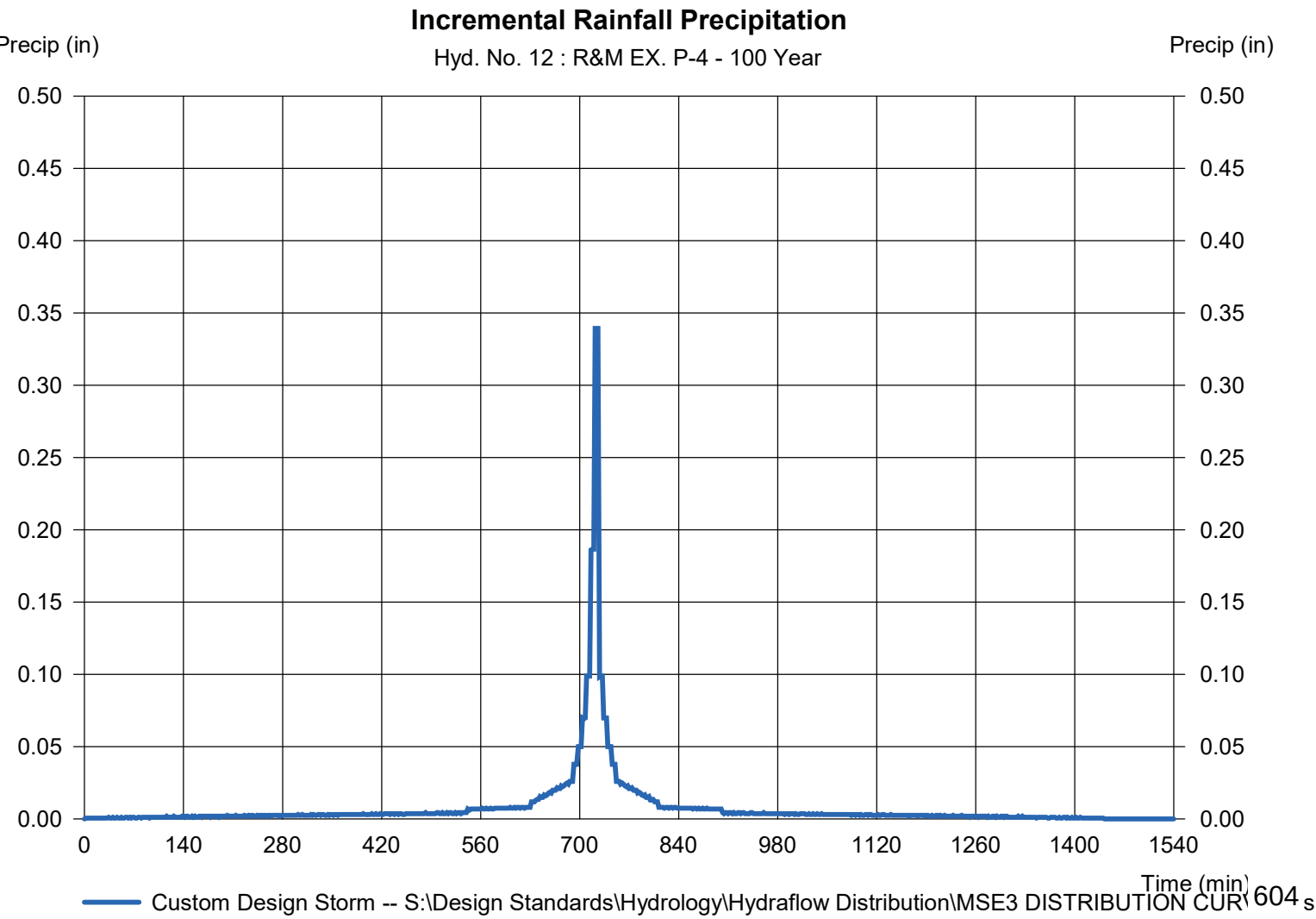
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

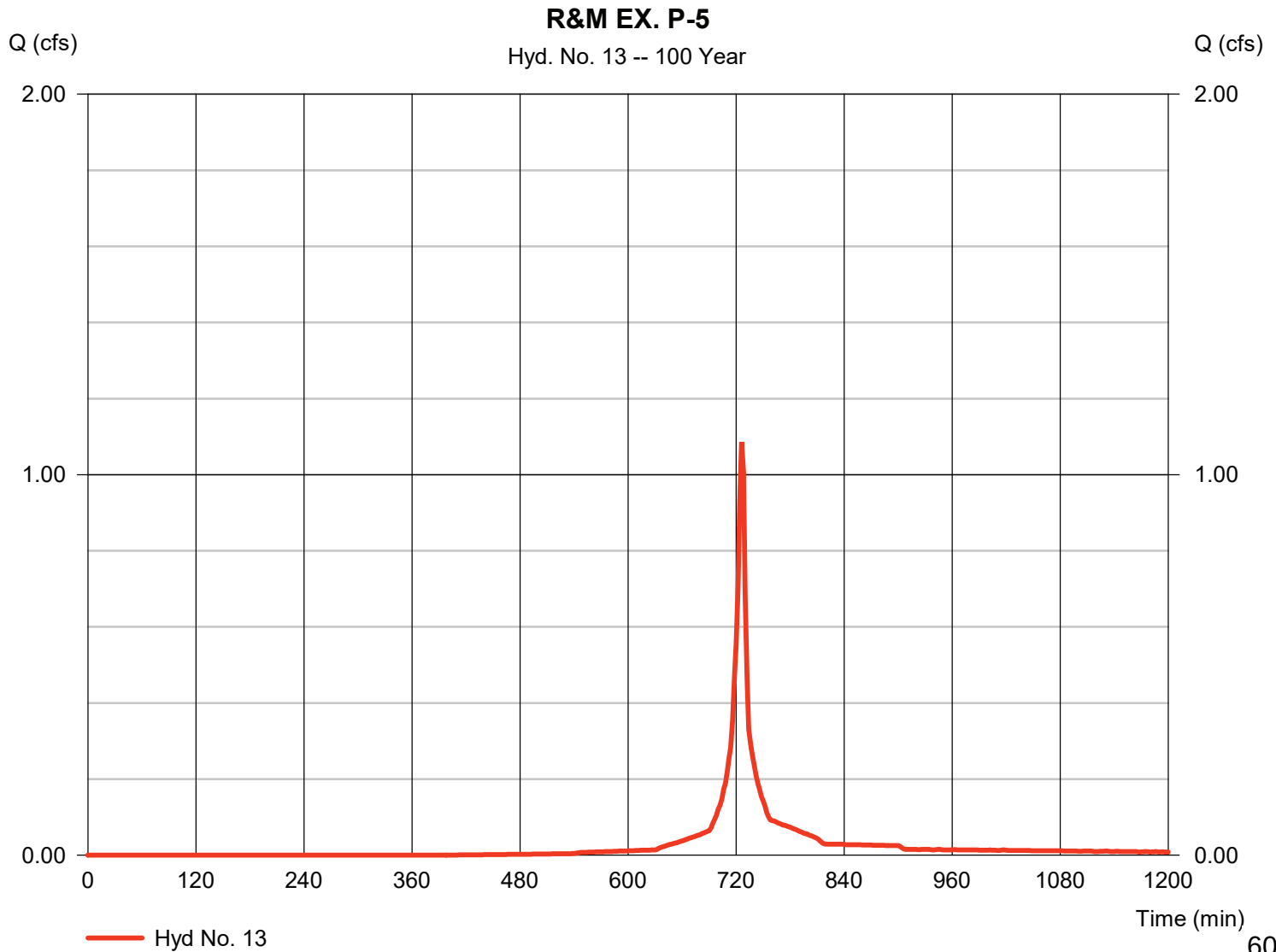
R&M EX. P-4

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



R&M EX. P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 1.086 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.049 acft
Drainage area	= 0.140 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSR3 DISTRIBUTION CURVE	Shyde factor	= 1.0



Precipitation Report

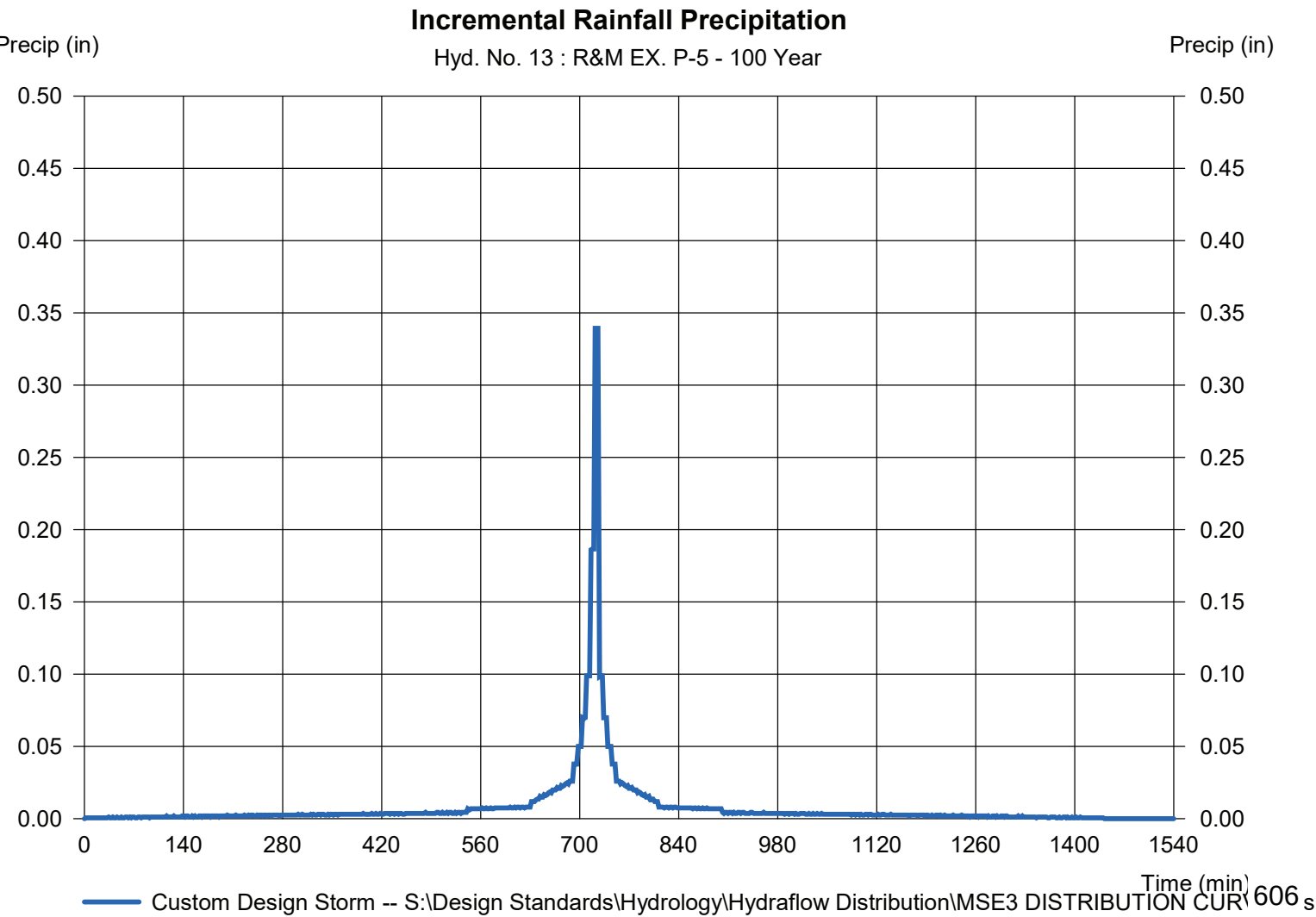
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Hyd. No. 13

R&M EX. P-5

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



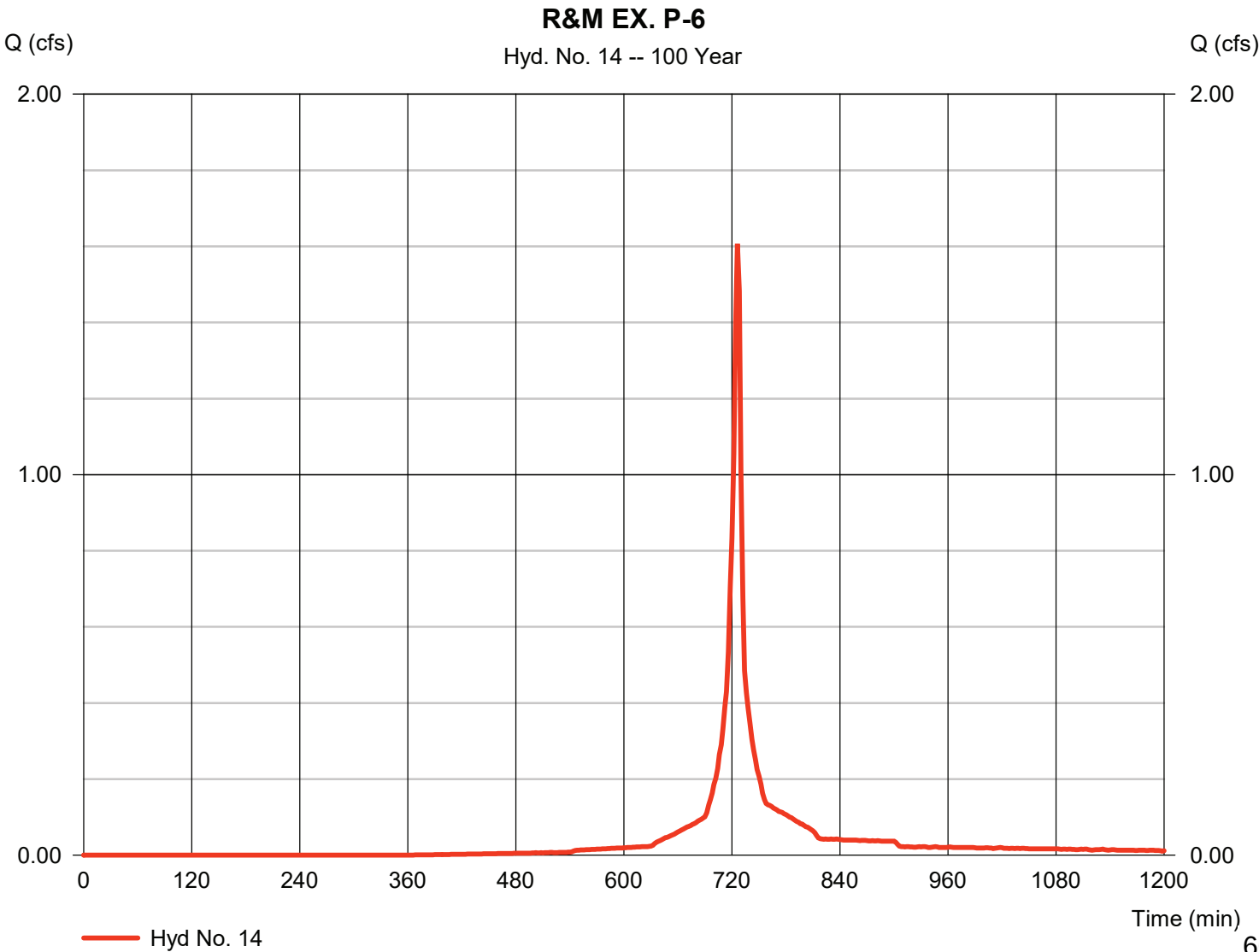
Hydrograph Report

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Hyd. No. 14

R&M EX. P-6

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.606 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	0.073 acft
Drainage area	=	0.200 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	6.18 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU			



Precipitation Report

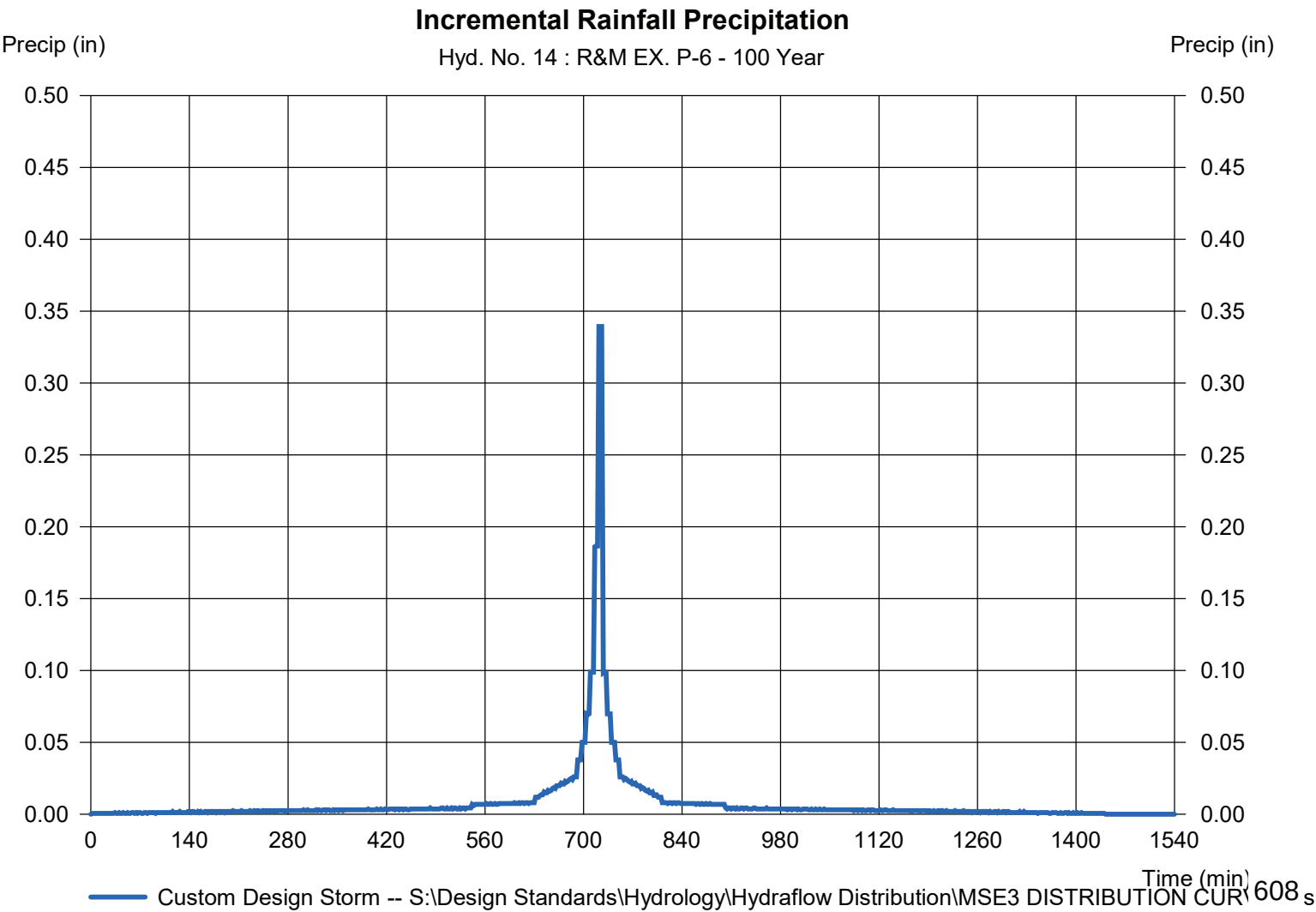
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

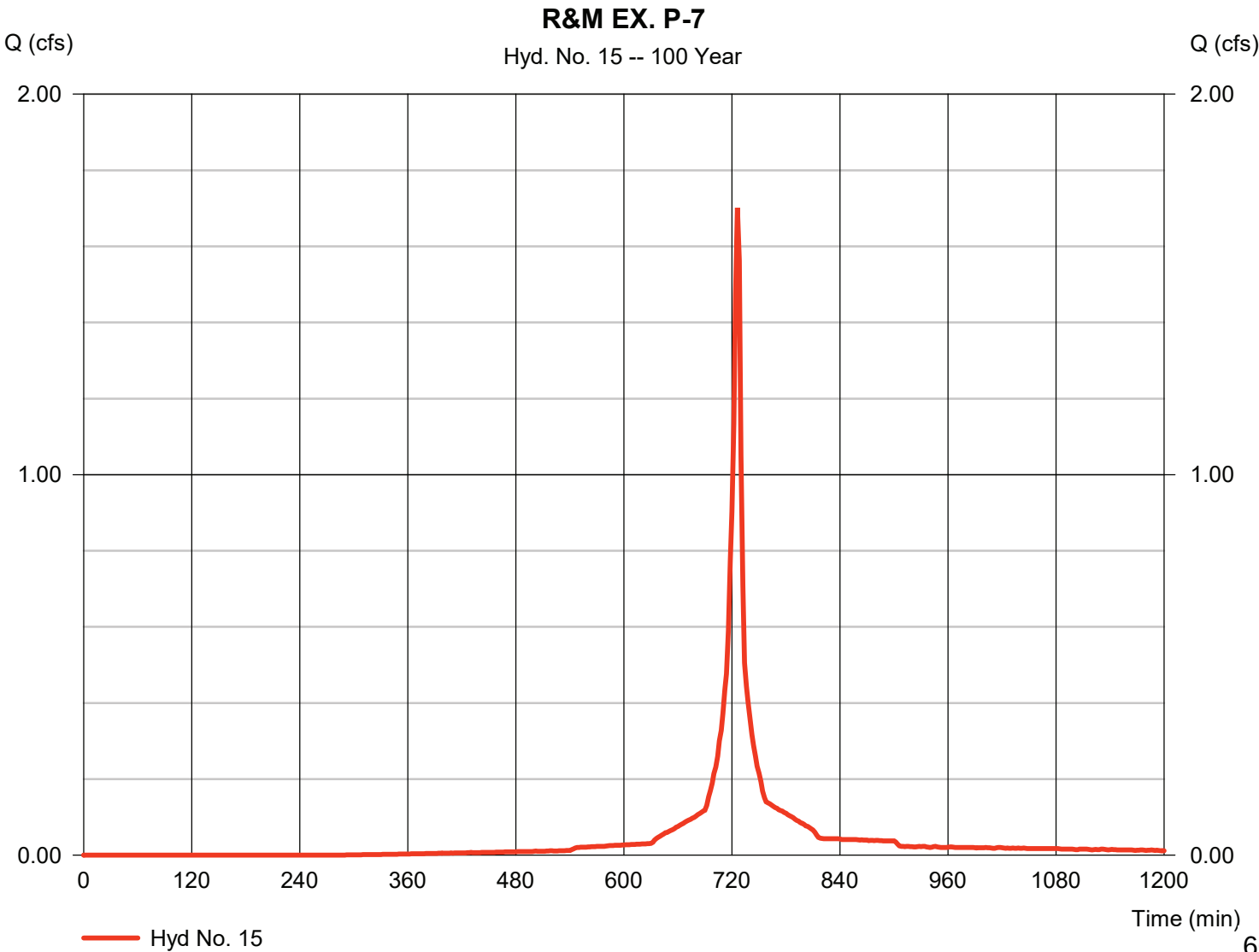
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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Hyd. No. 15

R&M EX. P-7

Hydrograph type	= SCS Runoff	Peak discharge	= 1.701 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.080 acft
Drainage area	= 0.200 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

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

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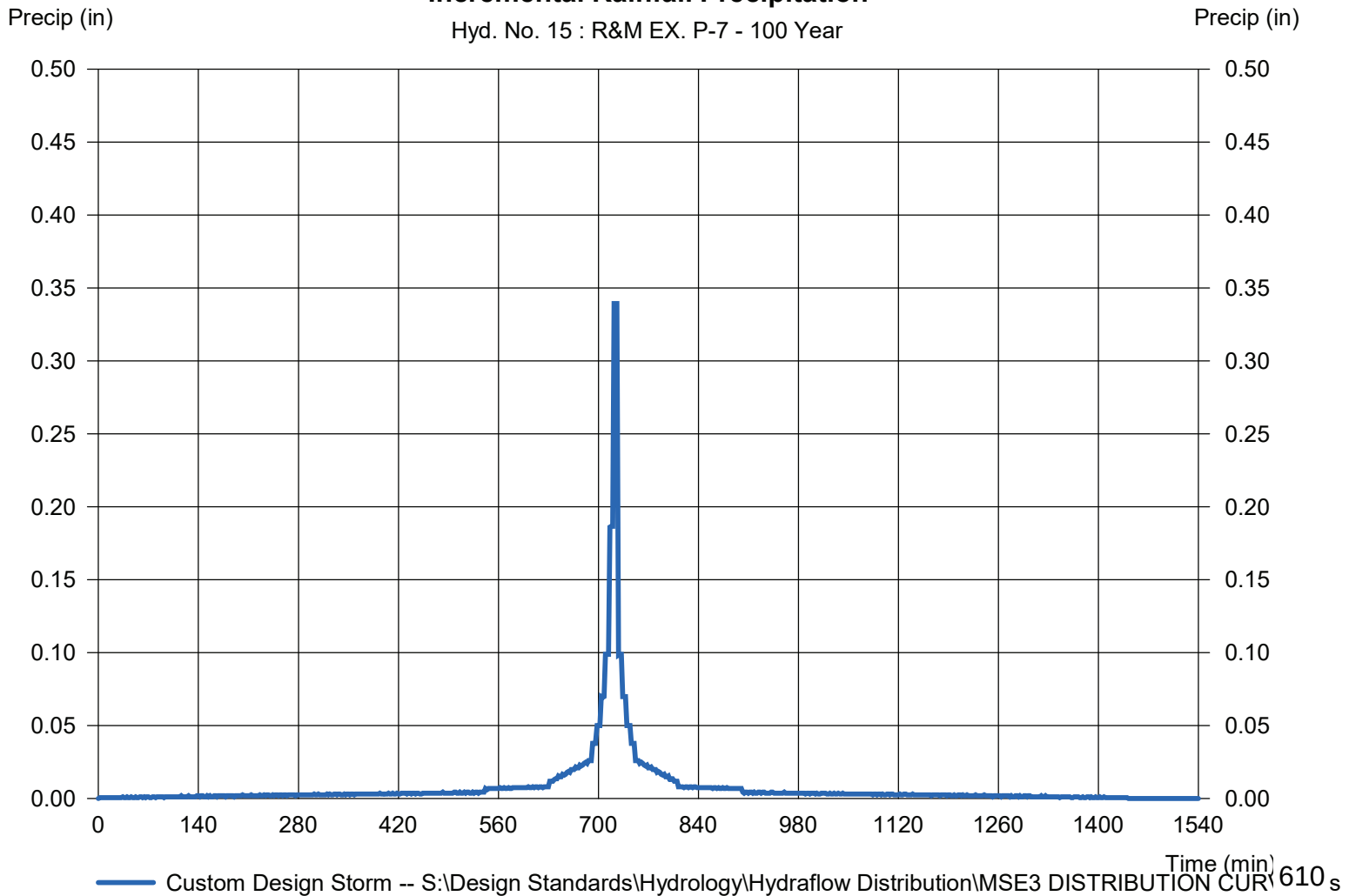
Hyd. No. 15

R&M EX. P-7

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 15 : R&M EX. P-7 - 100 Year



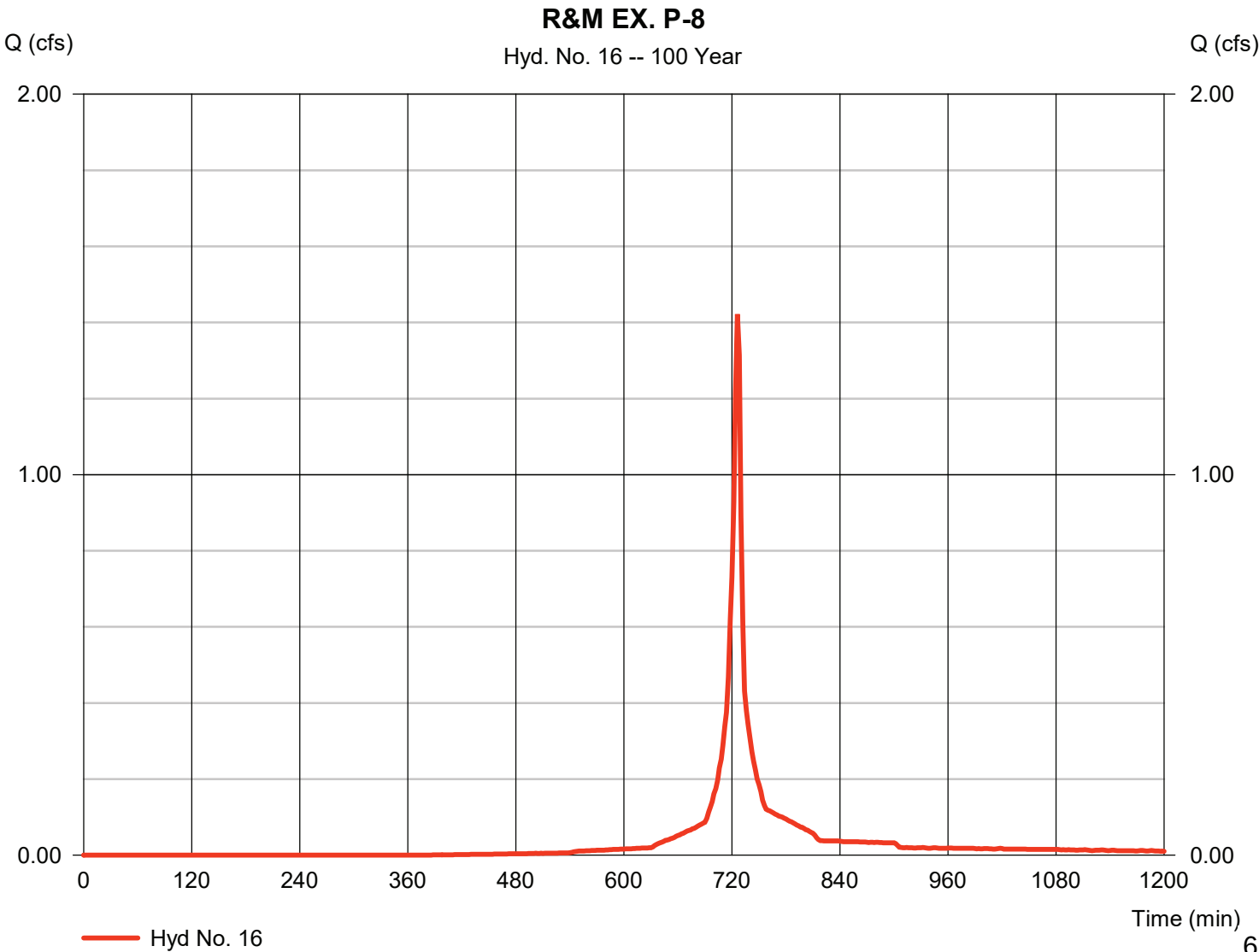
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020
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Hyd. No. 16

R&M EX. P-8

Hydrograph type	= SCS Runoff	Peak discharge	= 1.422 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.064 acft
Drainage area	= 0.180 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD DISTRIBUTION CURVE		



Precipitation Report

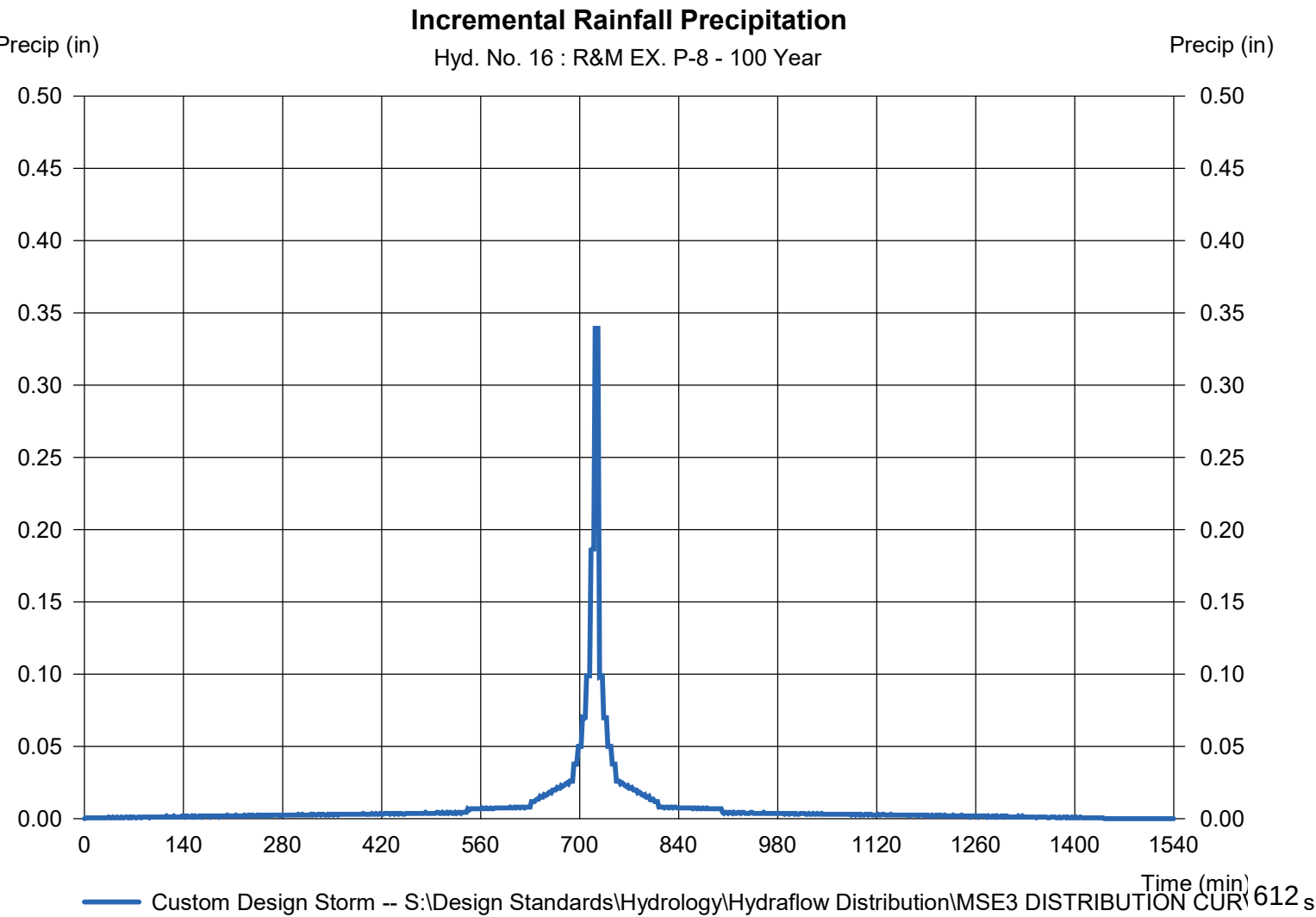
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Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

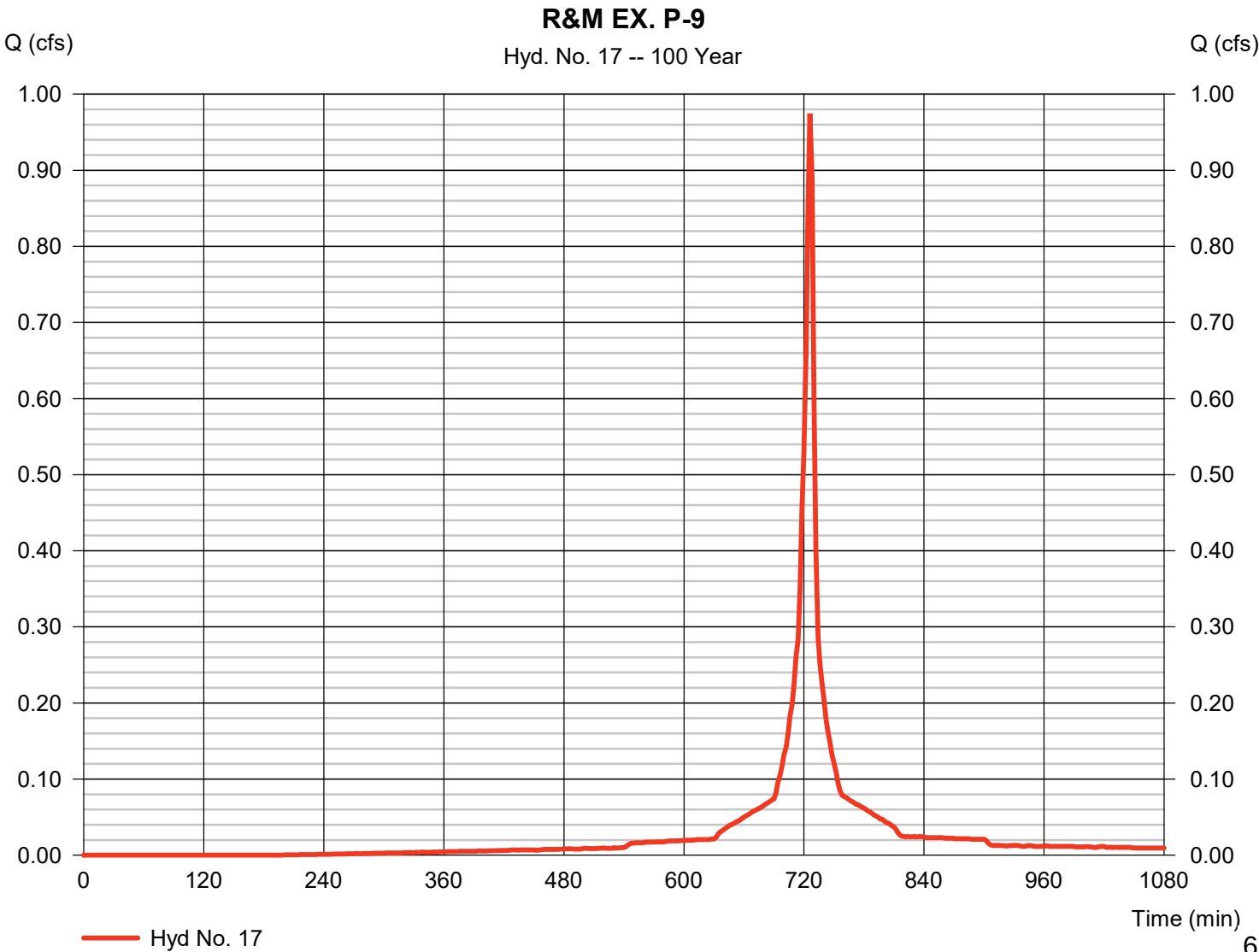
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Hyd. No. 17

R&M EX. P-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.975 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.048 acft
Drainage area	= 0.110 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

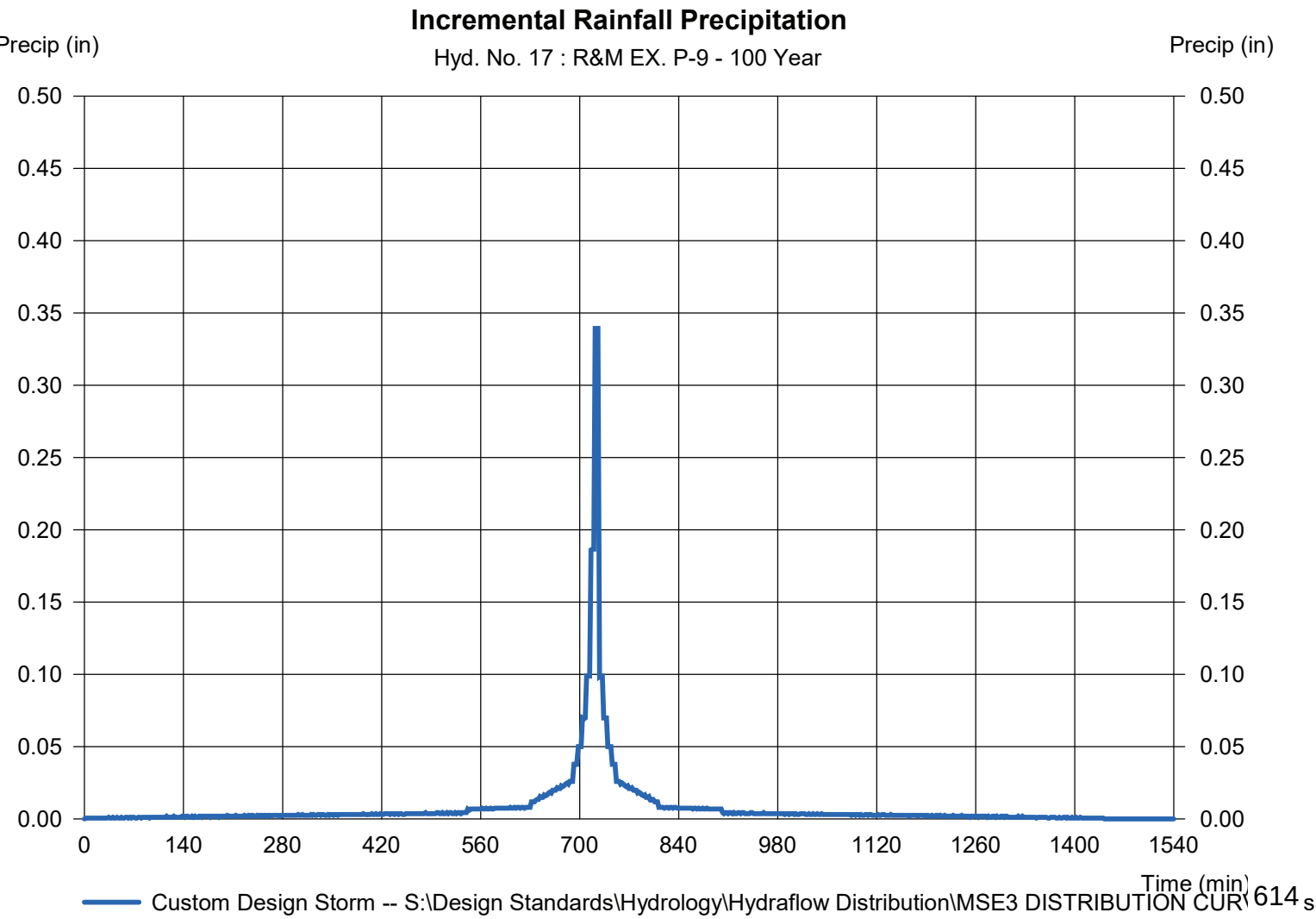
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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Hyd. No. 17

R&M EX. P-9

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

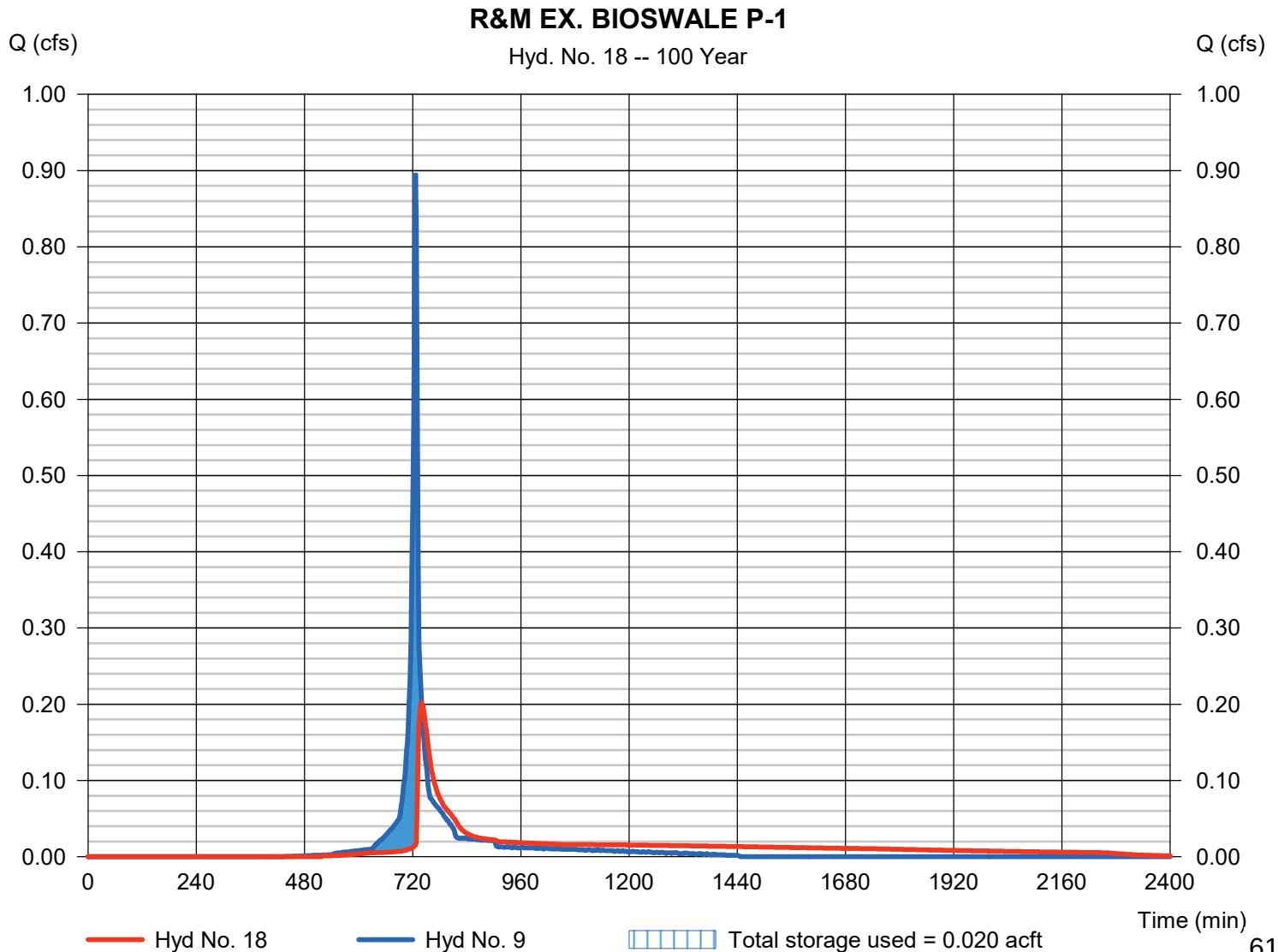
Friday, 06 / 28 / 2019

Hyd. No. 18

R&M EX. BIOSWALE P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.201 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 0.040 acft
Inflow hyd. No.	= 9 - R&M EX. P-1	Max. Elevation	= 851.73 ft
Reservoir name	= Ex. Bioswale P-1	Max. Storage	= 0.020 acft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

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

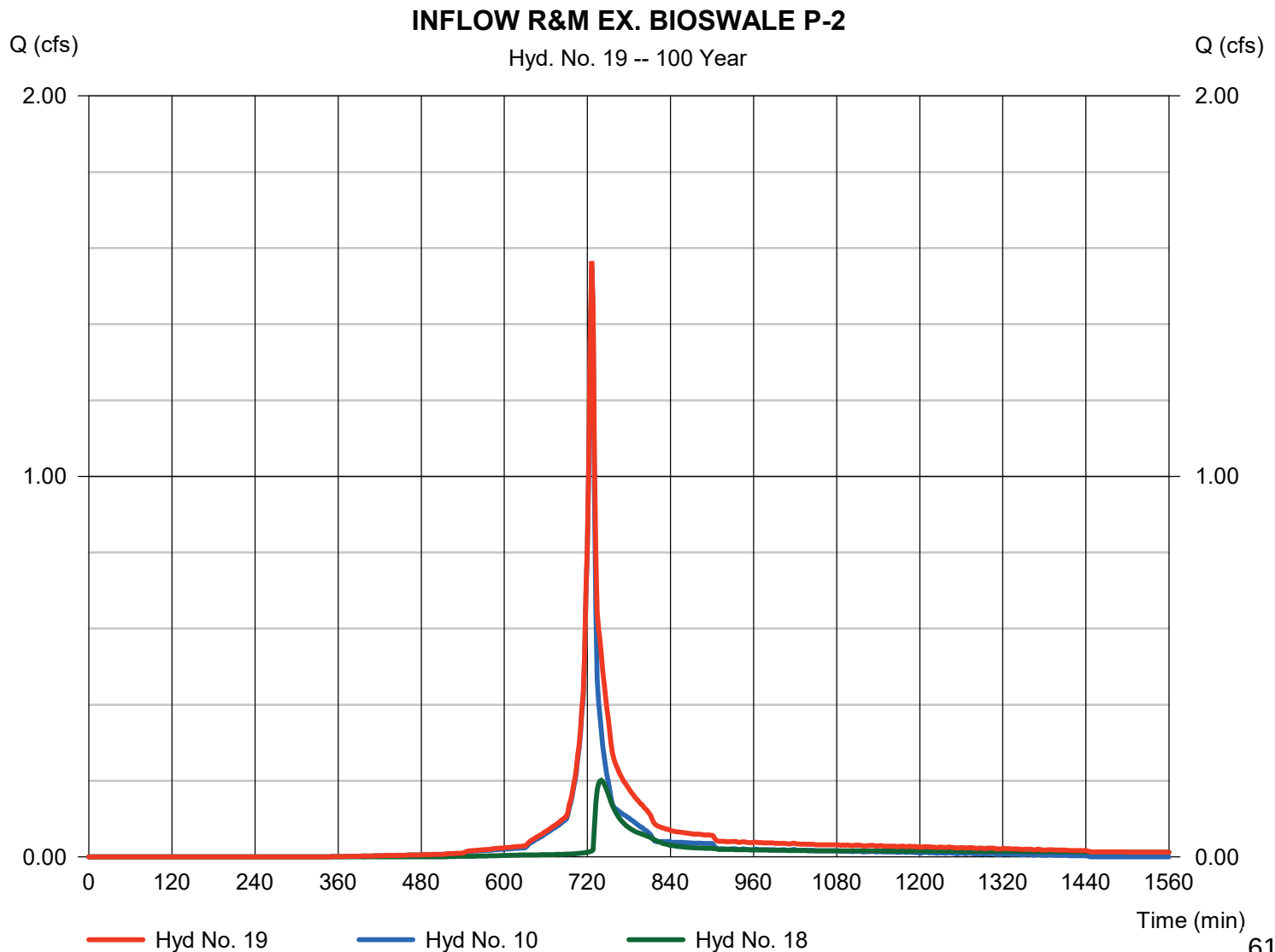
Friday, 06 / 28 / 2019

Hyd. No. 19

INFLOW R&M EX. BIOSWALE P-2

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 10, 18

Peak discharge = 1.566 cfs
Time to peak = 726 min
Hyd. volume = 0.111 acft
Contrib. drain. area = 0.190 ac



Hydrograph Report

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

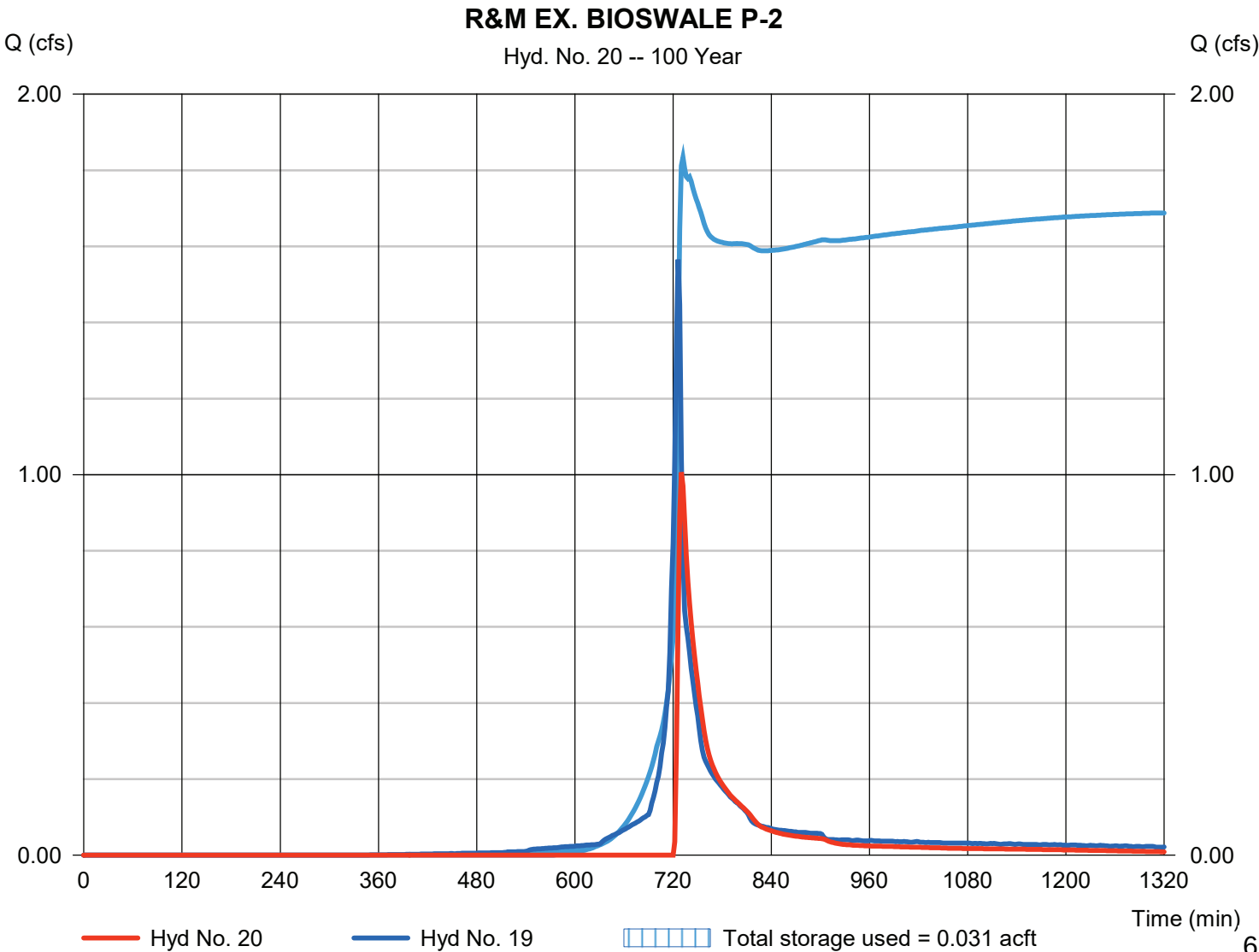
Friday, 06 / 28 / 2019

Hyd. No. 20

R&M EX. BIOSWALE P-2

Hydrograph type	= Reservoir	Peak discharge	= 1.007 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 0.062 acft
Inflow hyd. No.	= 19 - INFLOW R&M EX. BIOSWALE P-2	Max. Elevation	= 851.72 ft
Reservoir name	= Ex. Bioswale P-2	Max. Storage	= 0.031 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

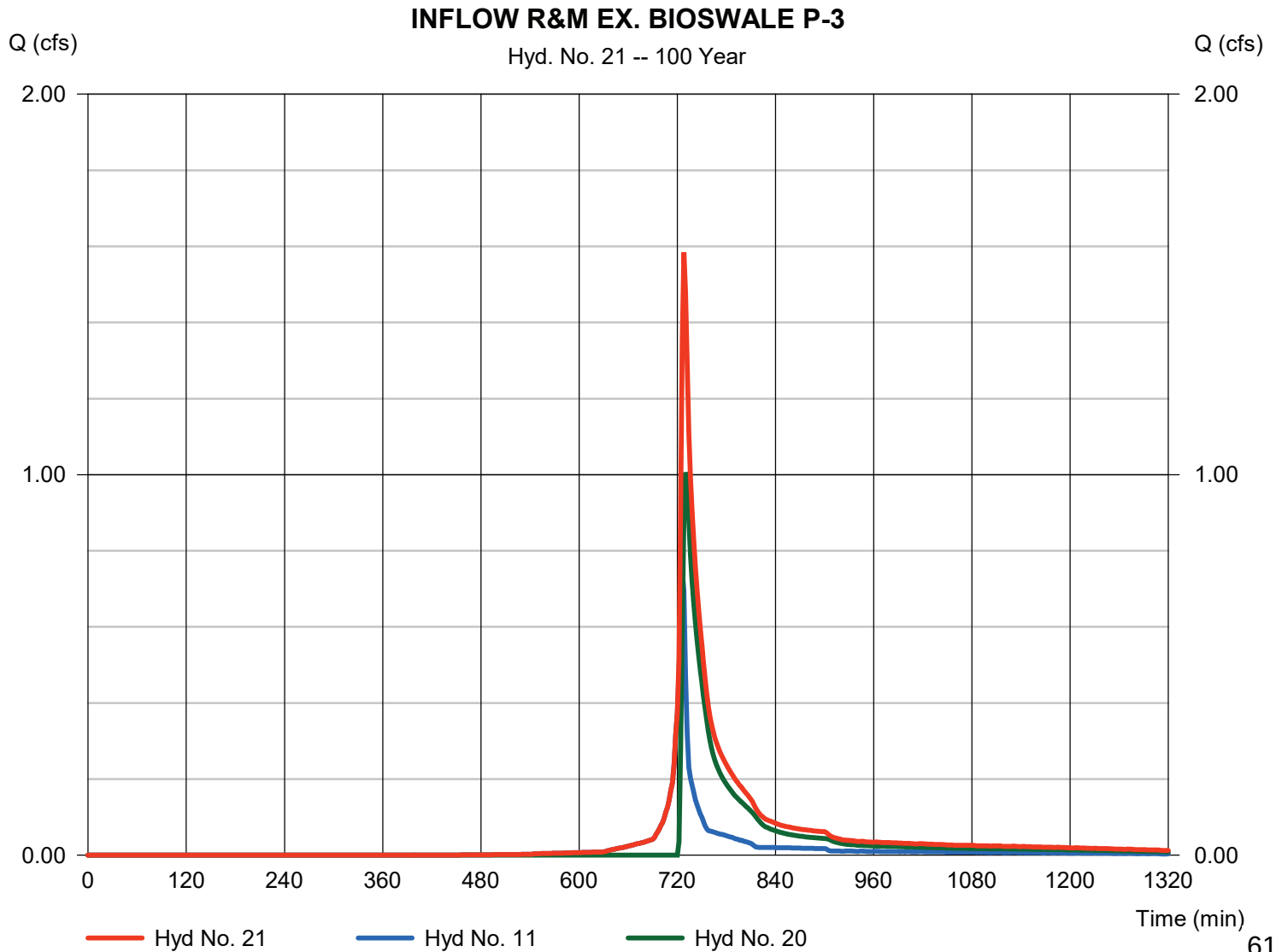
Friday, 06 / 28 / 2019

Hyd. No. 21

INFLOW R&M EX. BIOSWALE P-3

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 11, 20

Peak discharge = 1.584 cfs
Time to peak = 728 min
Hyd. volume = 0.096 acft
Contrib. drain. area = 0.100 ac



Hydrograph Report

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

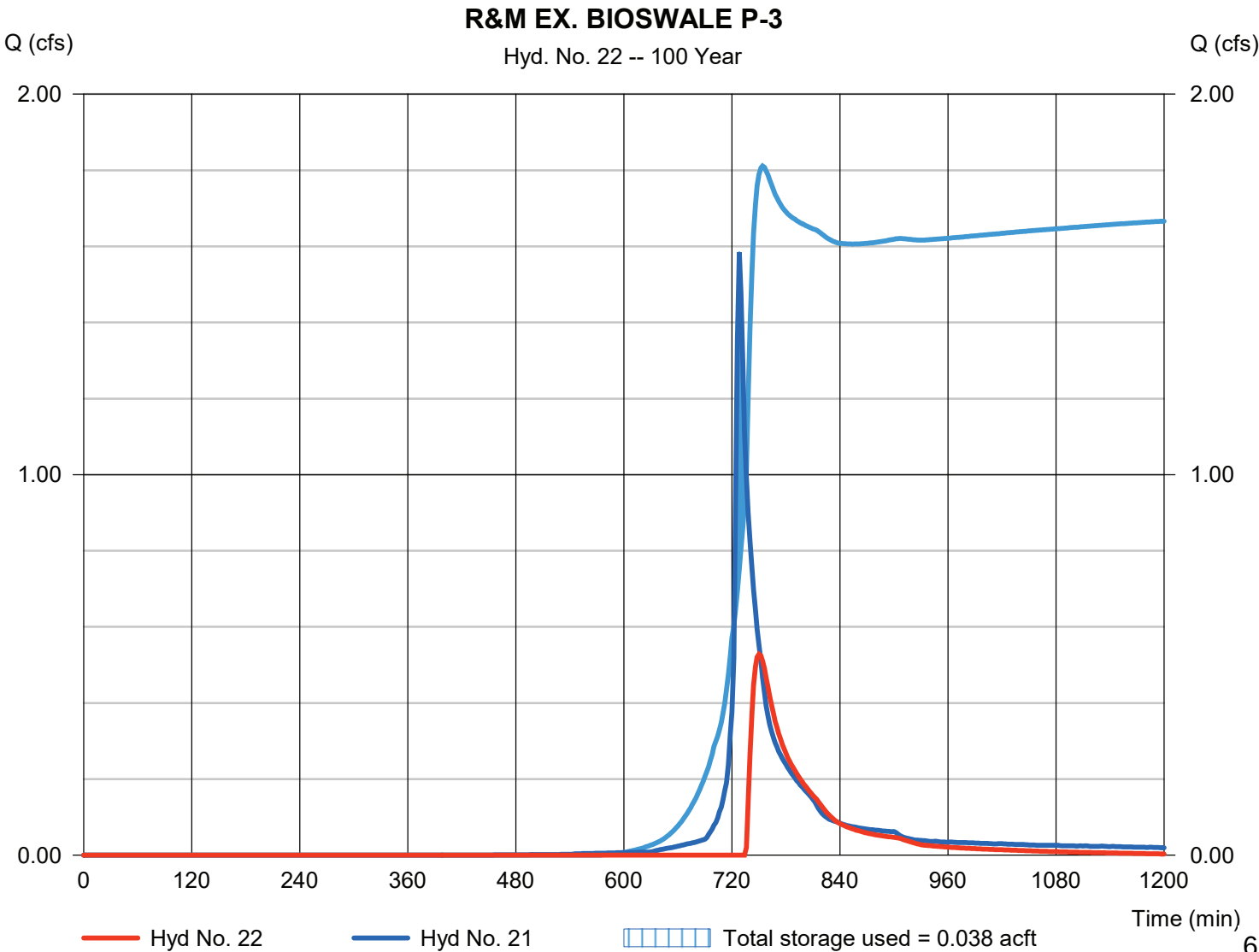
Friday, 06 / 28 / 2019

Hyd. No. 22

R&M EX. BIOSWALE P-3

Hydrograph type	= Reservoir	Peak discharge	= 0.529 cfs
Storm frequency	= 100 yrs	Time to peak	= 750 min
Time interval	= 2 min	Hyd. volume	= 0.047 acft
Inflow hyd. No.	= 21 - INFLOW R&M EX. BIOSWALE P-3	Max. Elevation	= 851.25 ft
Reservoir name	= Ex. Bioswale P-3	Max. Storage	= 0.038 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

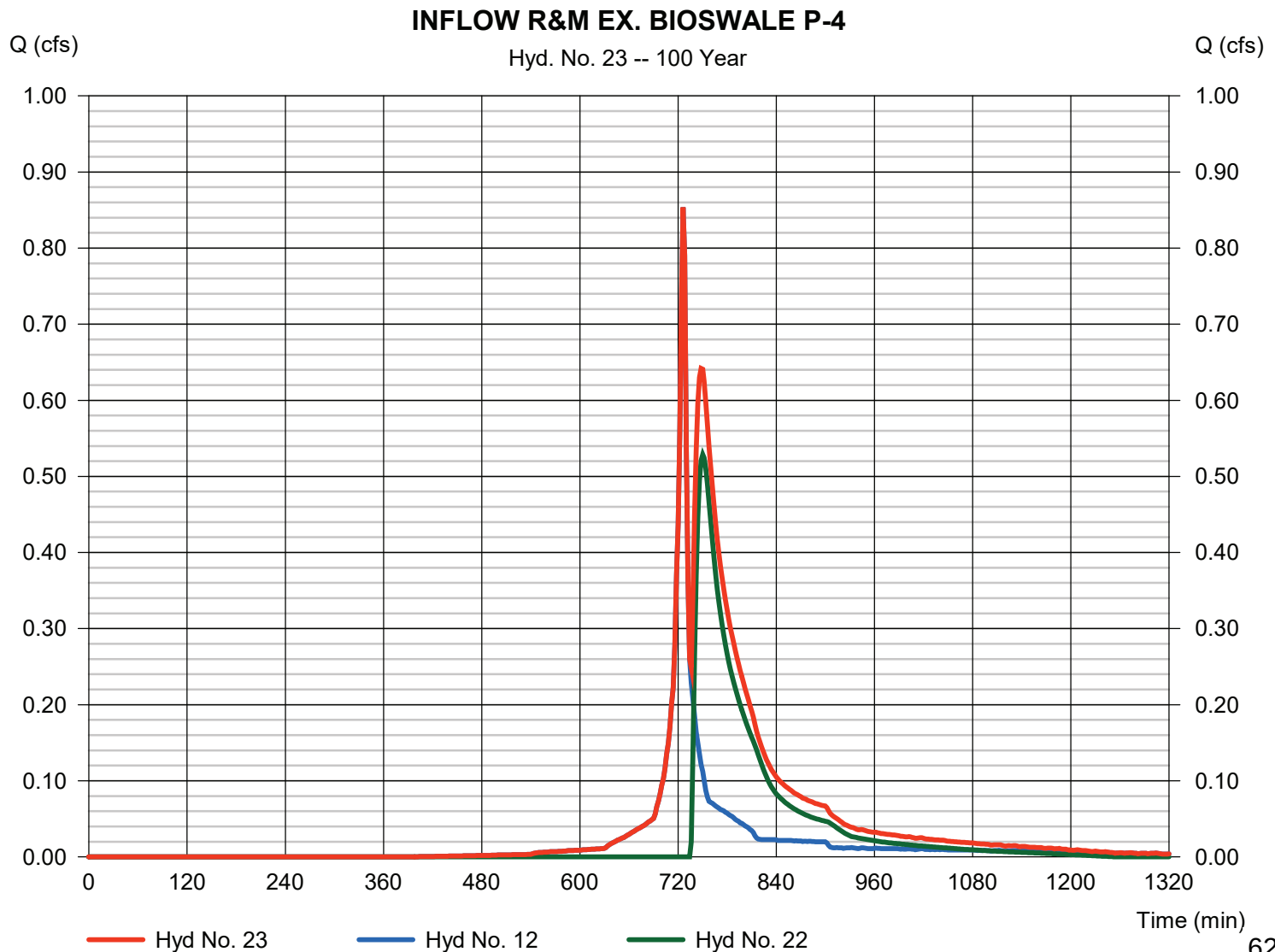
Friday, 06 / 28 / 2019

Hyd. No. 23

INFLOW R&M EX. BIOSWALE P-4

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 12, 22

Peak discharge = 0.854 cfs
Time to peak = 726 min
Hyd. volume = 0.086 acft
Contrib. drain. area = 0.110 ac



Hydrograph Report

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

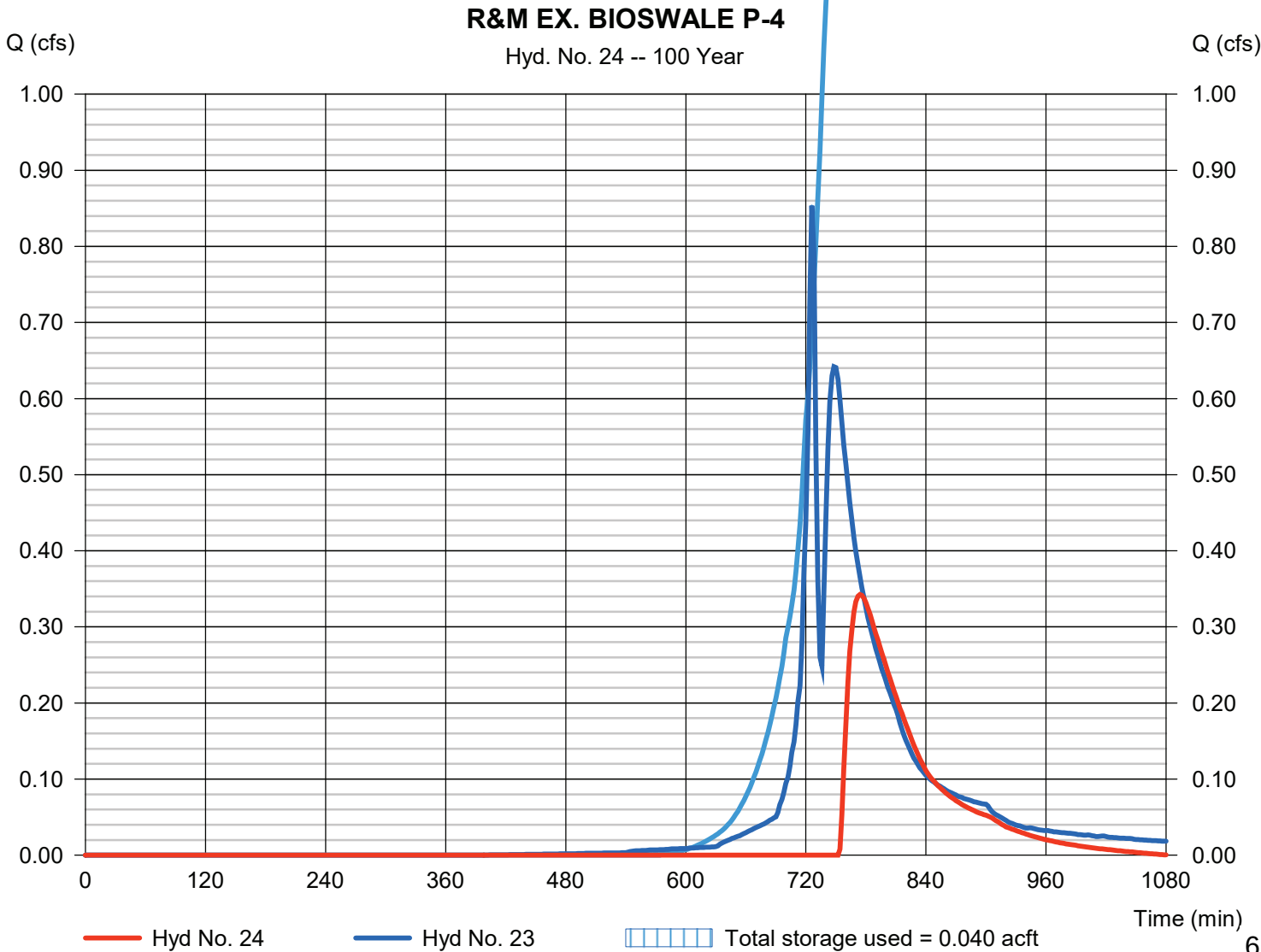
Friday, 06 / 28 / 2019

Hyd. No. 24

R&M EX. BIOSWALE P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.343 cfs
Storm frequency	= 100 yrs	Time to peak	= 774 min
Time interval	= 2 min	Hyd. volume	= 0.037 acft
Inflow hyd. No.	= 23 - INFLOW R&M EX. BIOSWALE P-4	Max. Elevation	= 850.37 ft
Reservoir name	= Ex. Bioswale P-4	Max. Storage	= 0.040 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

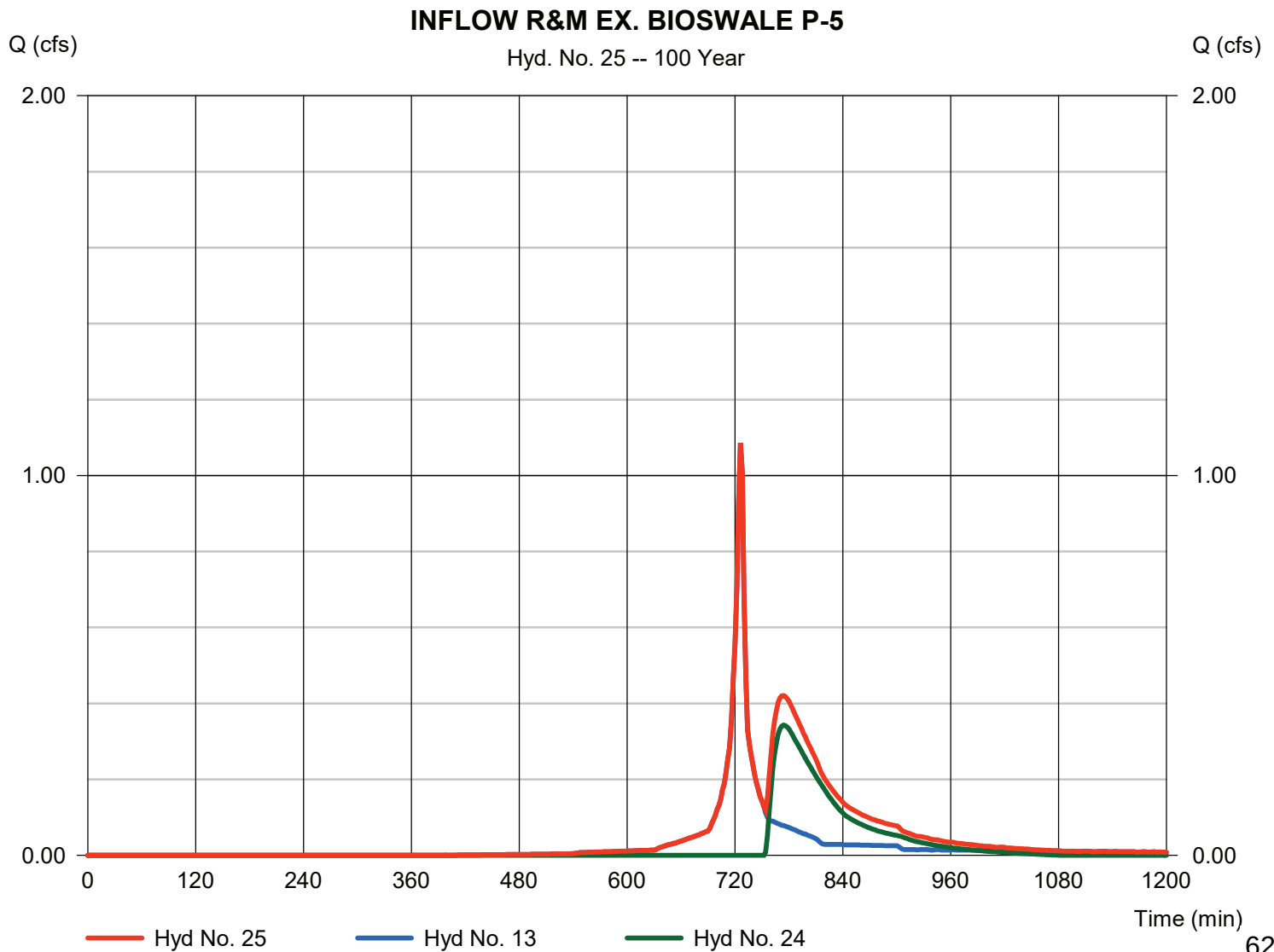
Friday, 06 / 28 / 2019

Hyd. No. 25

INFLOW R&M EX. BIOSWALE P-5

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 13, 24

Peak discharge = 1.086 cfs
 Time to peak = 726 min
 Hyd. volume = 0.086 acft
 Contrib. drain. area = 0.140 ac



Hydrograph Report

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

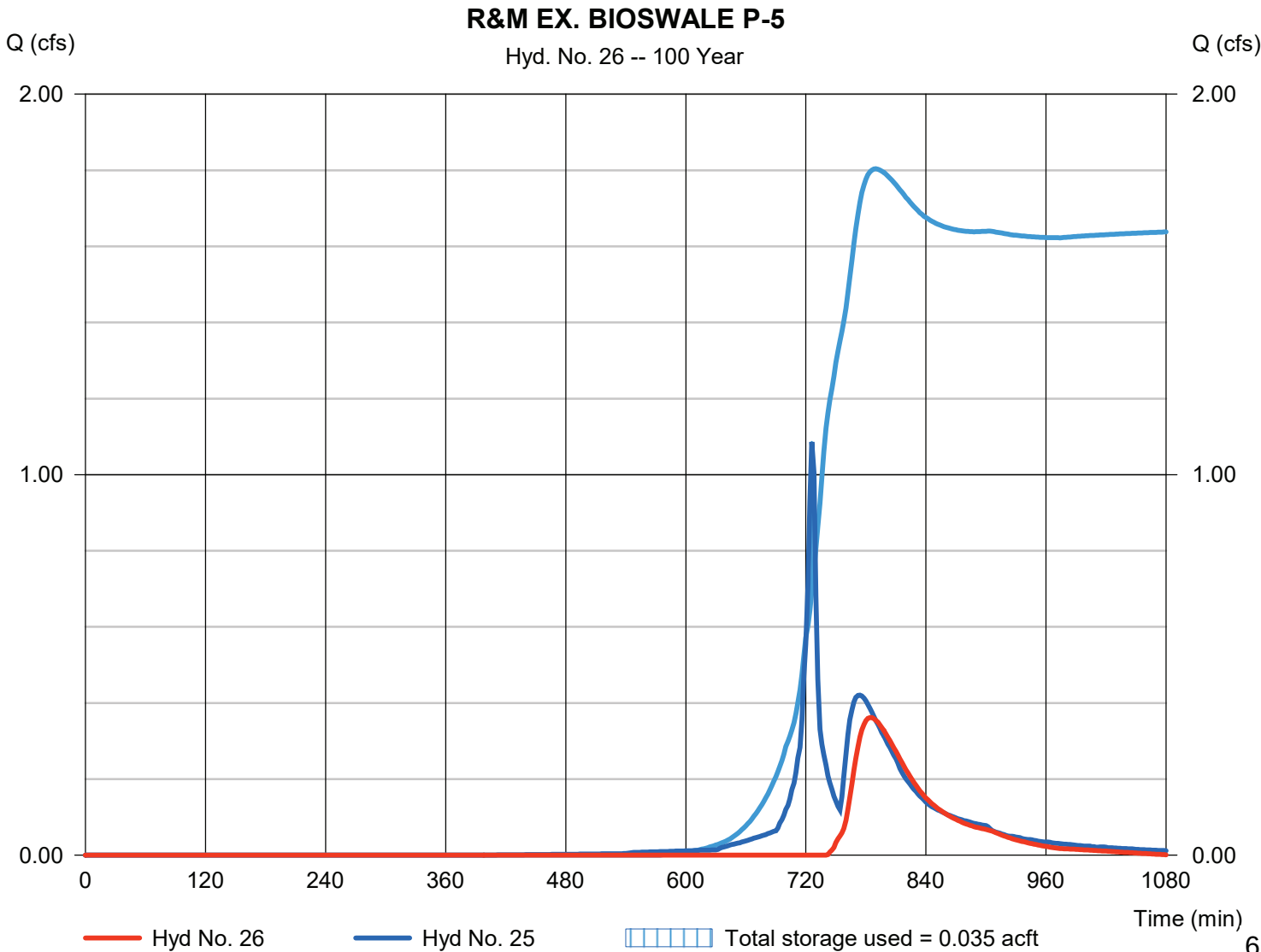
Friday, 06 / 28 / 2019

Hyd. No. 26

R&M EX. BIOSWALE P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.362 cfs
Storm frequency	= 100 yrs	Time to peak	= 784 min
Time interval	= 2 min	Hyd. volume	= 0.043 acft
Inflow hyd. No.	= 25 - INFLOW R&M EX. BIOSWALE P-5	Max. Elevation	= 848.90 ft
Reservoir name	= Ex. Bioswale P-5	Max. Storage	= 0.035 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

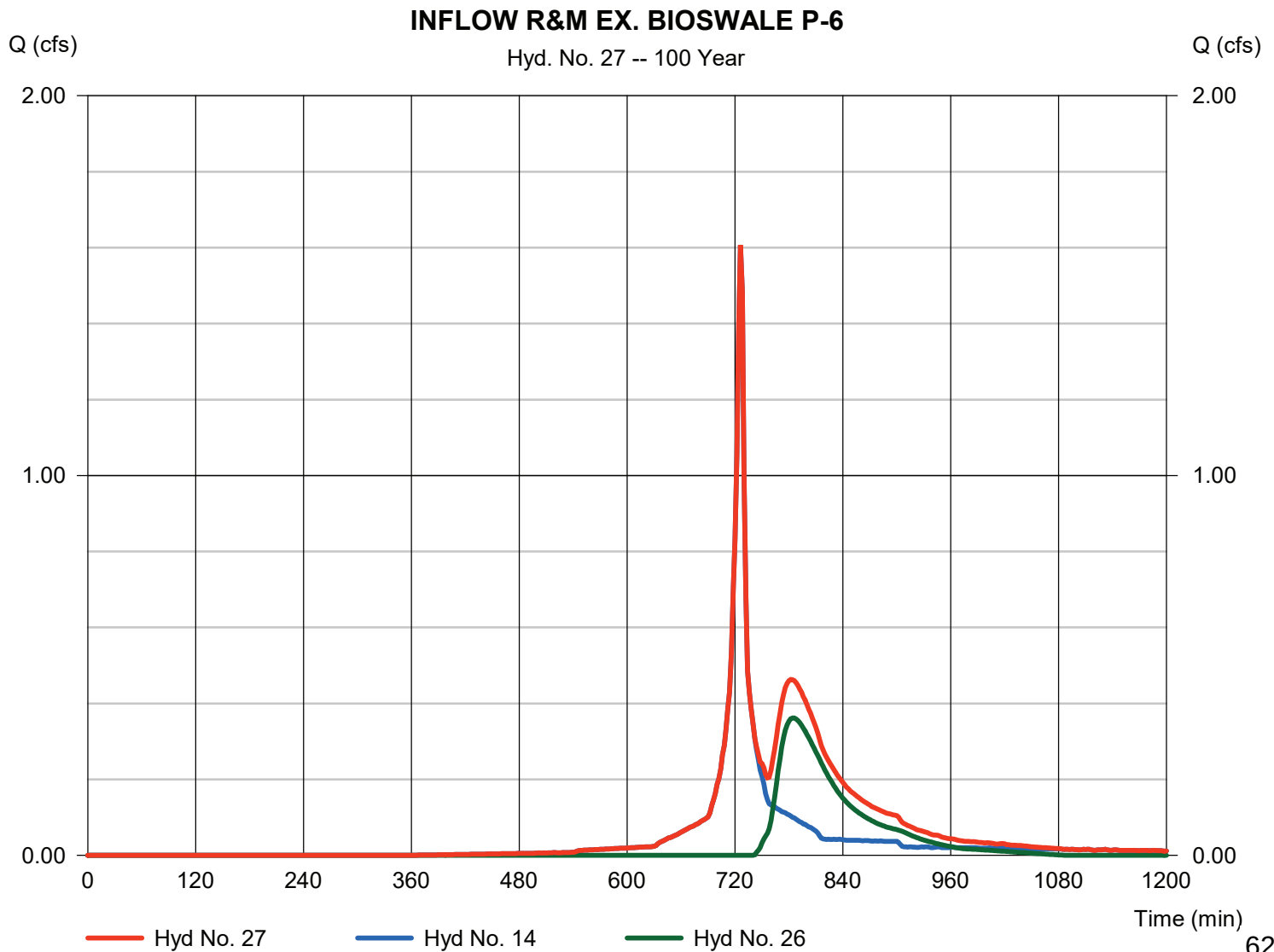
Friday, 06 / 28 / 2019

Hyd. No. 27

INFLOW R&M EX. BIOSWALE P-6

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 14, 26

Peak discharge = 1.606 cfs
Time to peak = 726 min
Hyd. volume = 0.117 acft
Contrib. drain. area = 0.200 ac



Hydrograph Report

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

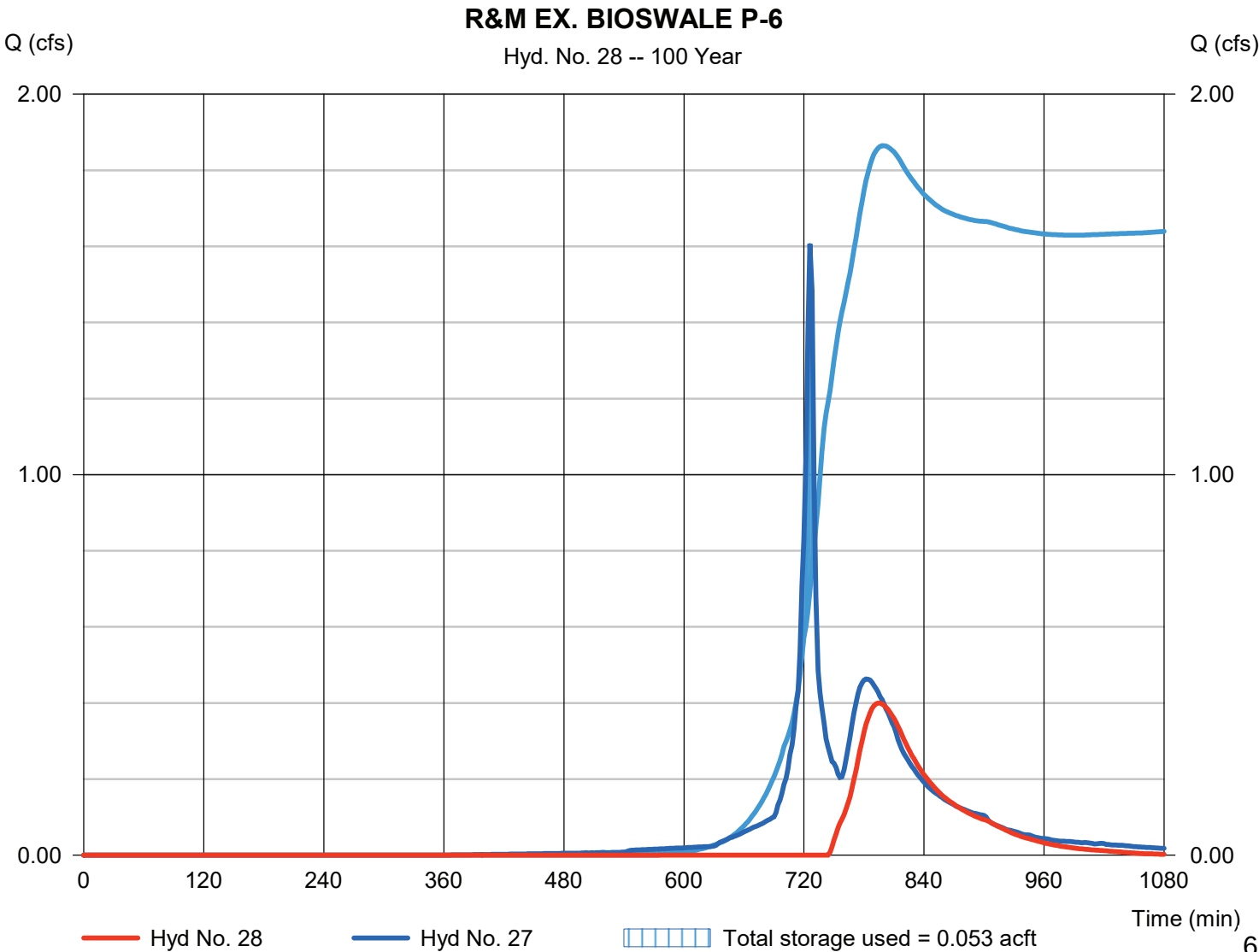
Friday, 06 / 28 / 2019

Hyd. No. 28

R&M EX. BIOSWALE P-6

Hydrograph type	= Reservoir	Peak discharge	= 0.400 cfs
Storm frequency	= 100 yrs	Time to peak	= 794 min
Time interval	= 2 min	Hyd. volume	= 0.053 acft
Inflow hyd. No.	= 27 - INFLOW R&M EX. BIOSWALE P-6	Max. Elevation	= 847.84 ft
Reservoir name	= Ex. Bioswale P-6	Max. Storage	= 0.053 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

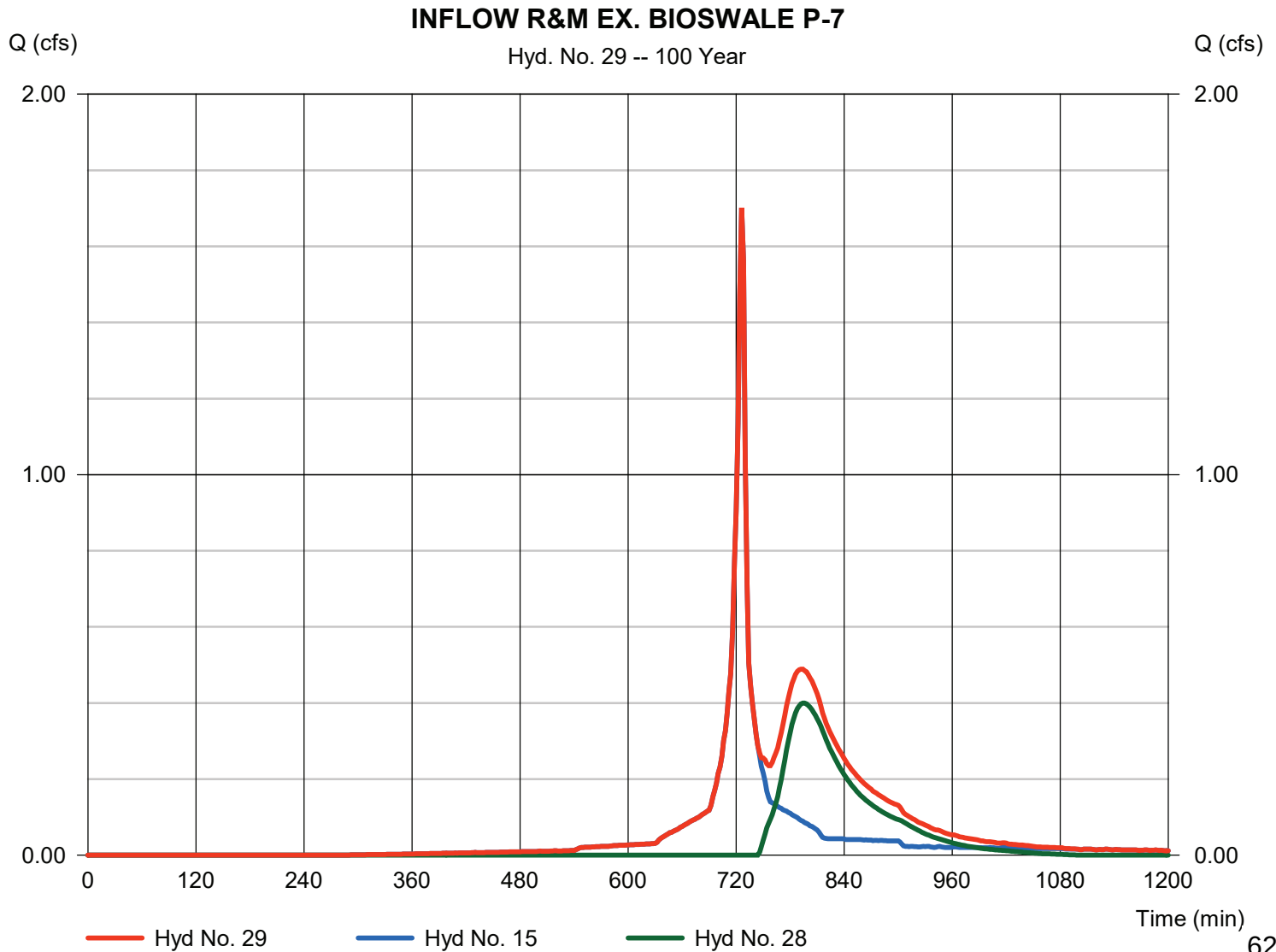
Friday, 06 / 28 / 2019

Hyd. No. 29

INFLOW R&M EX. BIOSWALE P-7

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 15, 28

Peak discharge = 1.701 cfs
Time to peak = 726 min
Hyd. volume = 0.133 acft
Contrib. drain. area = 0.200 ac



Hydrograph Report

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

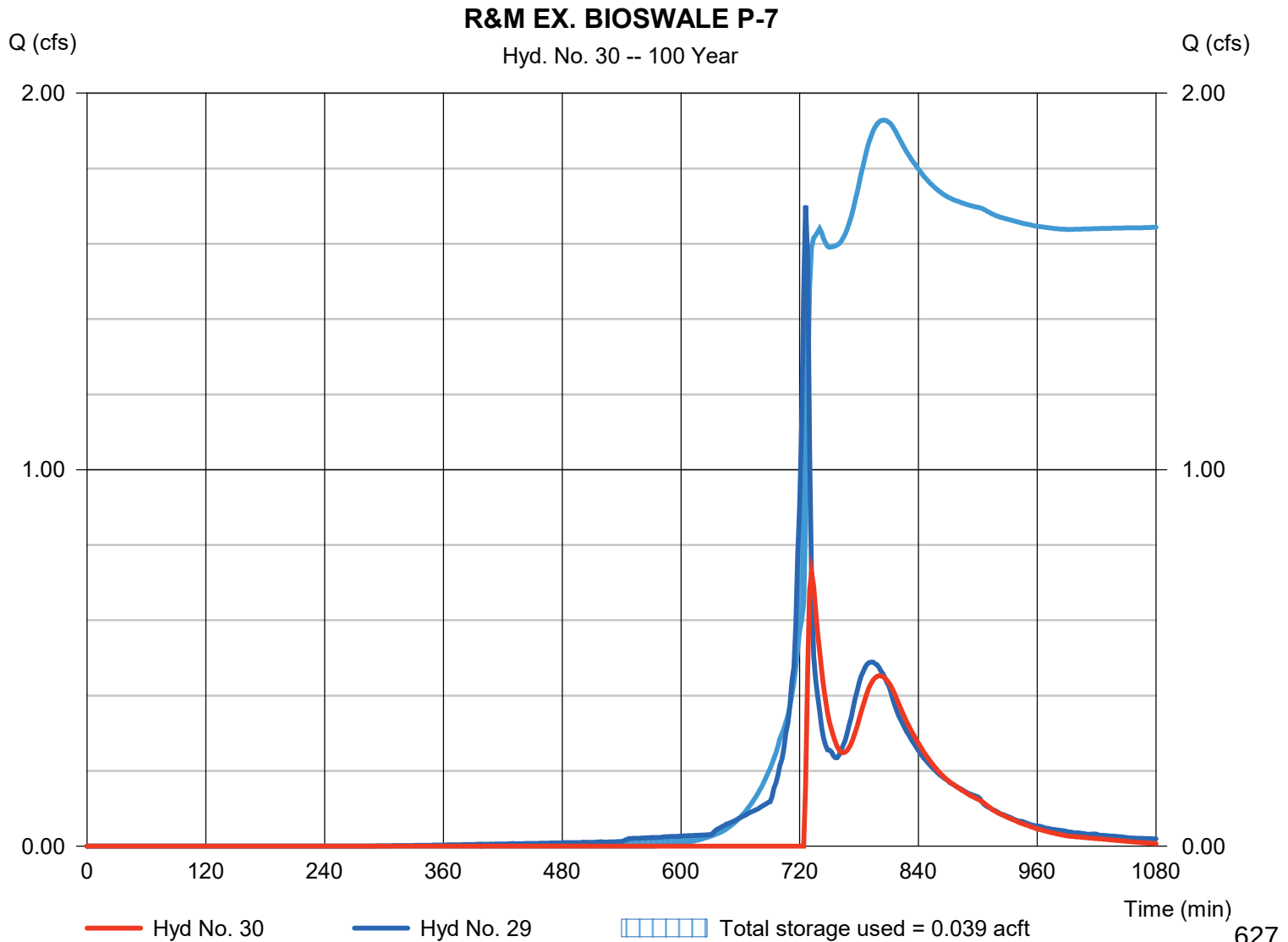
Friday, 06 / 28 / 2019

Hyd. No. 30

R&M EX. BIOSWALE P-7

Hydrograph type	= Reservoir	Peak discharge	= 0.728 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 0.086 acft
Inflow hyd. No.	= 29 - INFLOW R&M EX. BIOSWALE P-7	Max. Elevation	= 845.67 ft
Reservoir name	= Ex. Bioswale P-7	Max. Storage	= 0.039 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

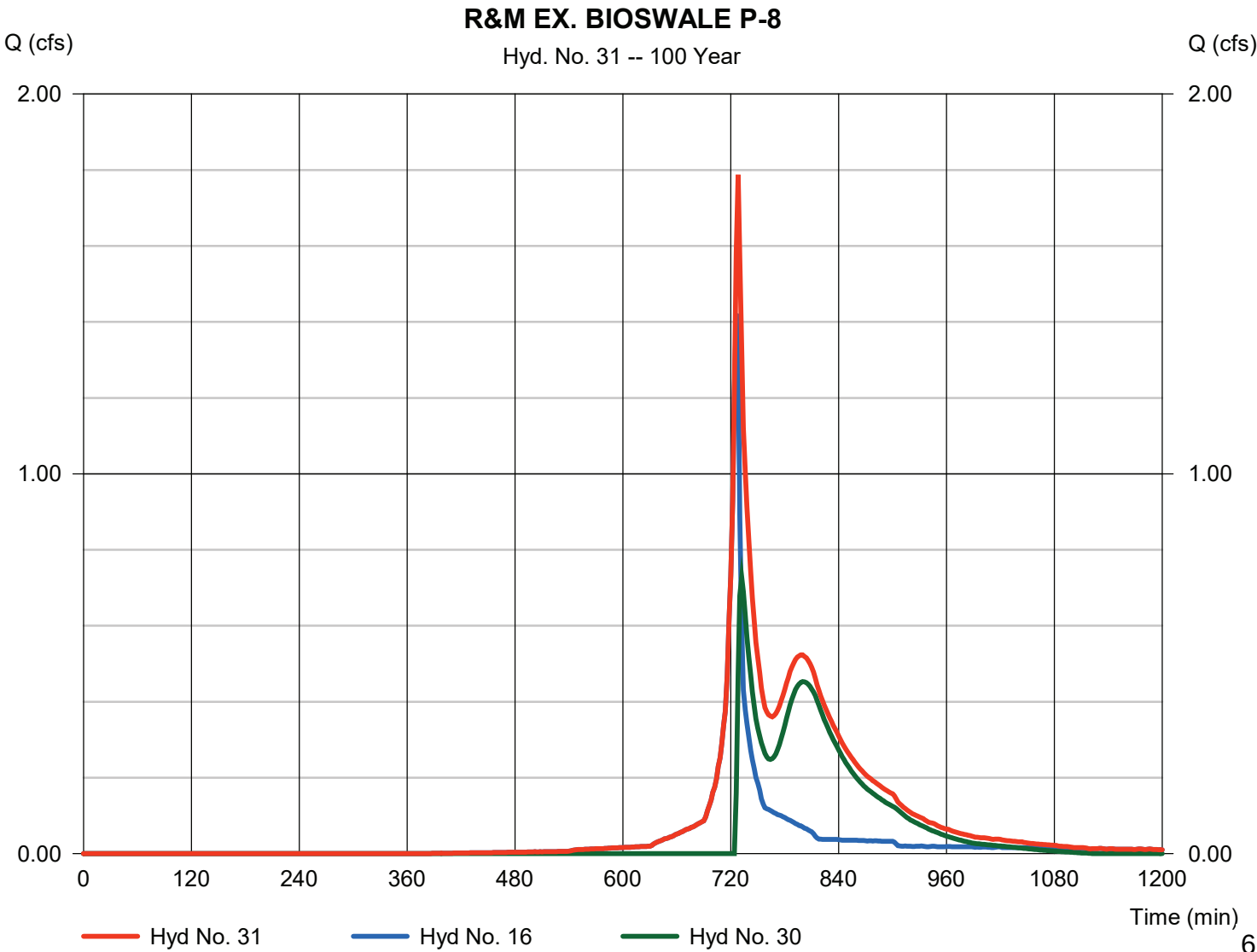
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Friday, 06 / 28 / 2019

Hyd. No. 31

R&M EX. BIOSWALE P-8

Hydrograph type	= Combine	Peak discharge	= 1.788 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 0.151 acft
Inflow hyds.	= 16, 30	Contrib. drain. area	= 0.180 ac



Hydrograph Report

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

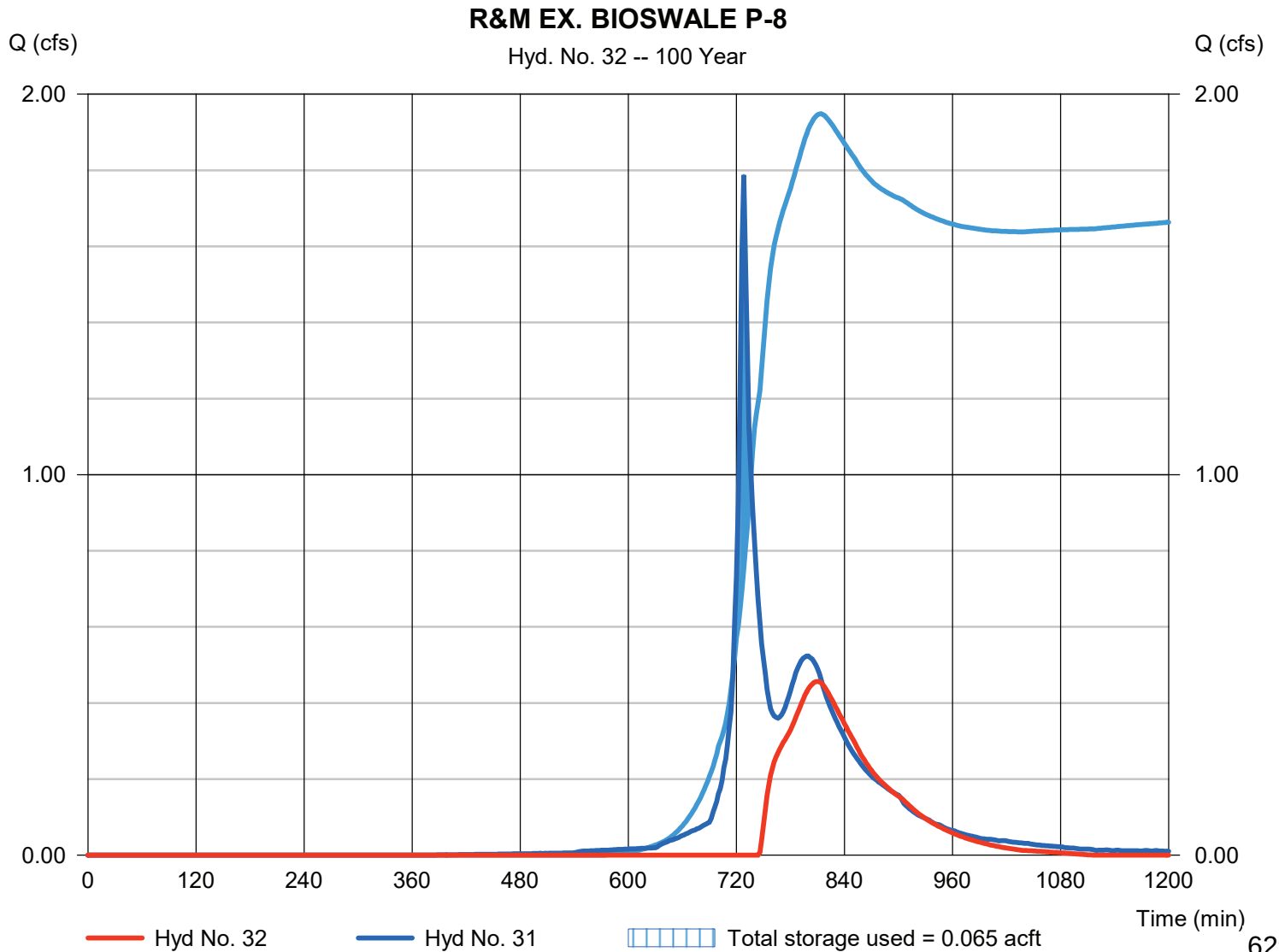
Friday, 06 / 28 / 2019

Hyd. No. 32

R&M EX. BIOSWALE P-8

Hydrograph type	= Reservoir	Peak discharge	= 0.456 cfs
Storm frequency	= 100 yrs	Time to peak	= 810 min
Time interval	= 2 min	Hyd. volume	= 0.076 acft
Inflow hyd. No.	= 31 - R&M EX. BIOSWALE P-8	Max. Elevation	= 845.07 ft
Reservoir name	= Ex. Bioswale P-8	Max. Storage	= 0.065 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

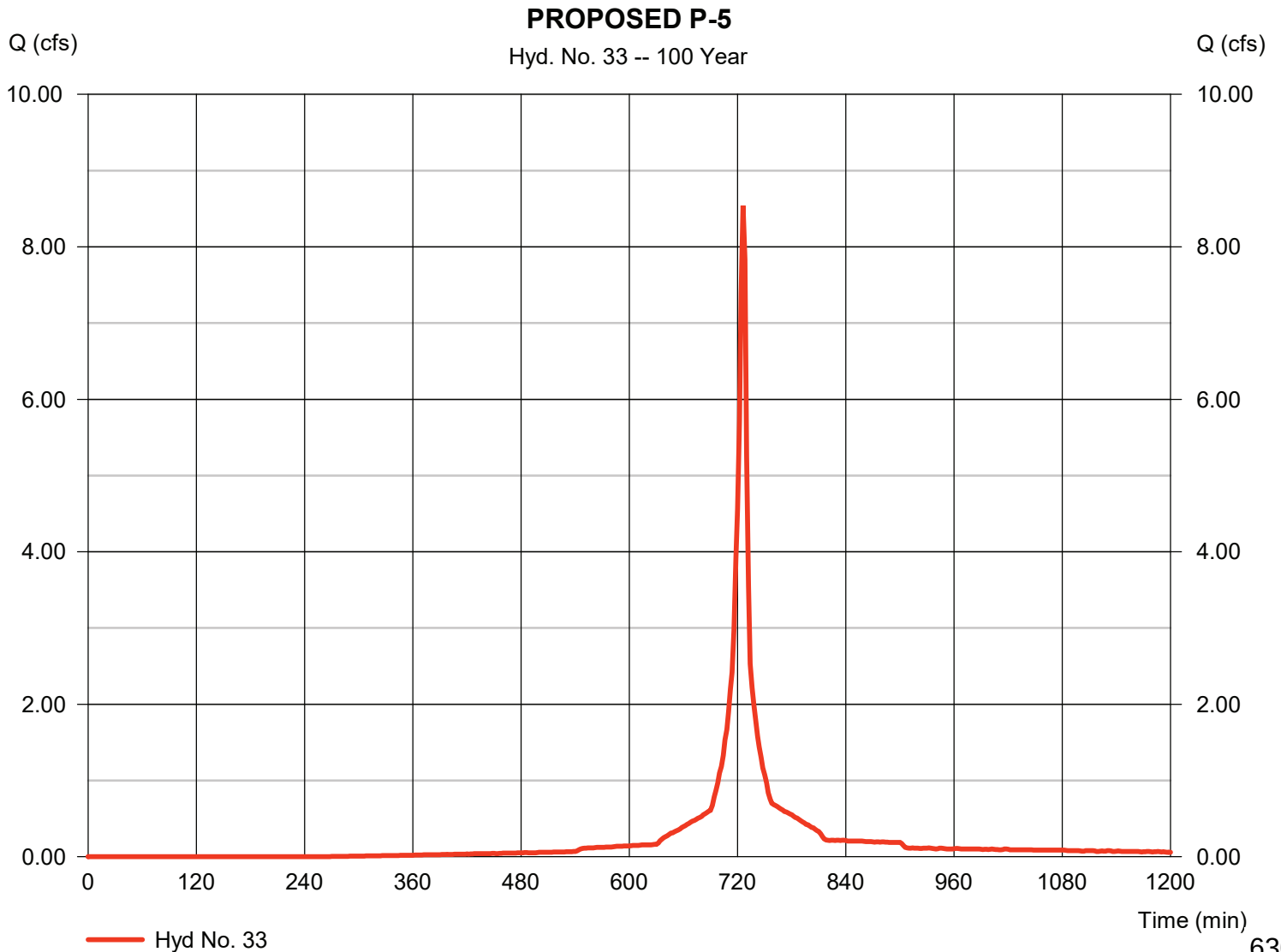
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 8.540 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.407 acft
Drainage area	= 0.992 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD3 DISTRIBUTION CU		



Precipitation Report

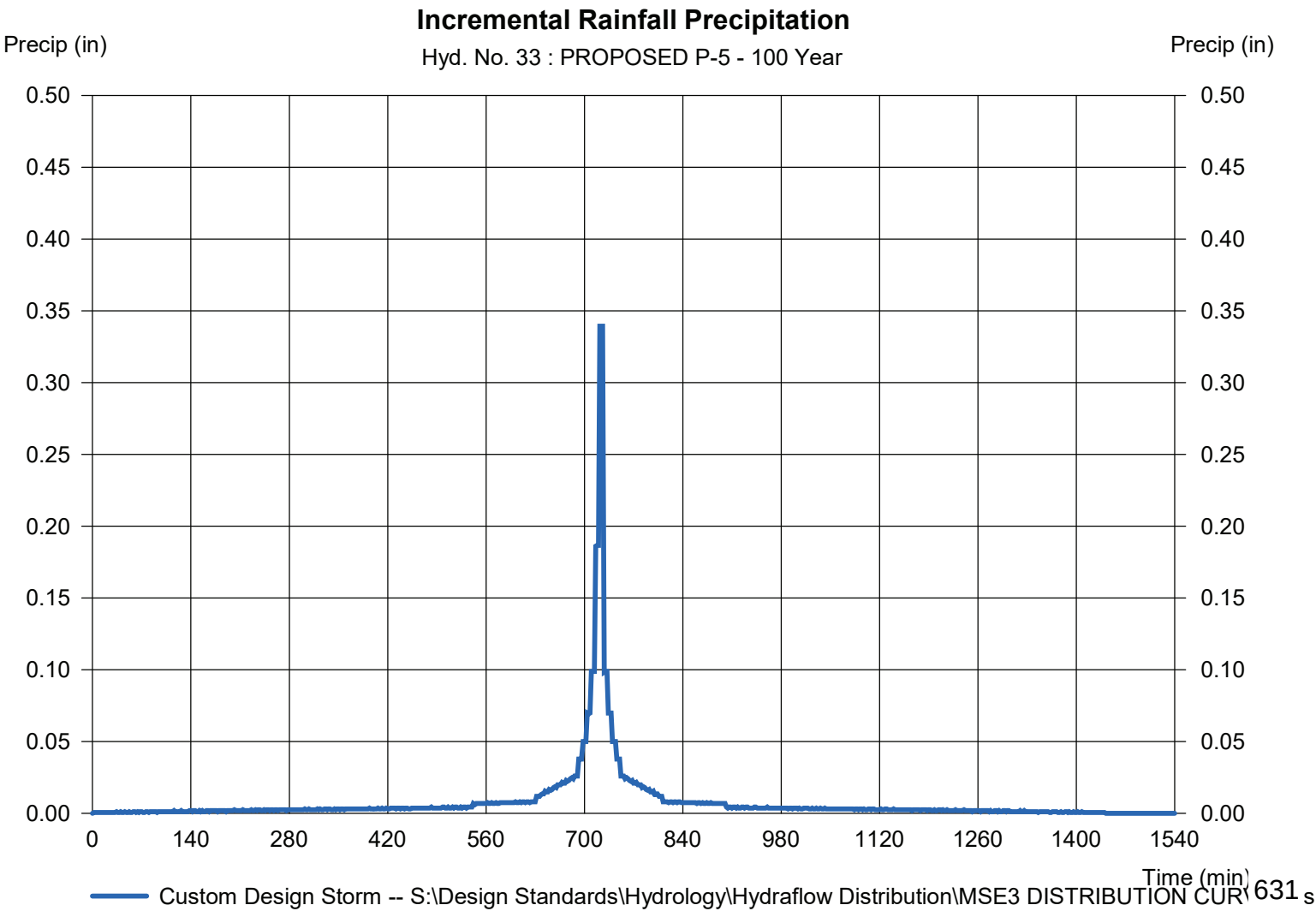
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



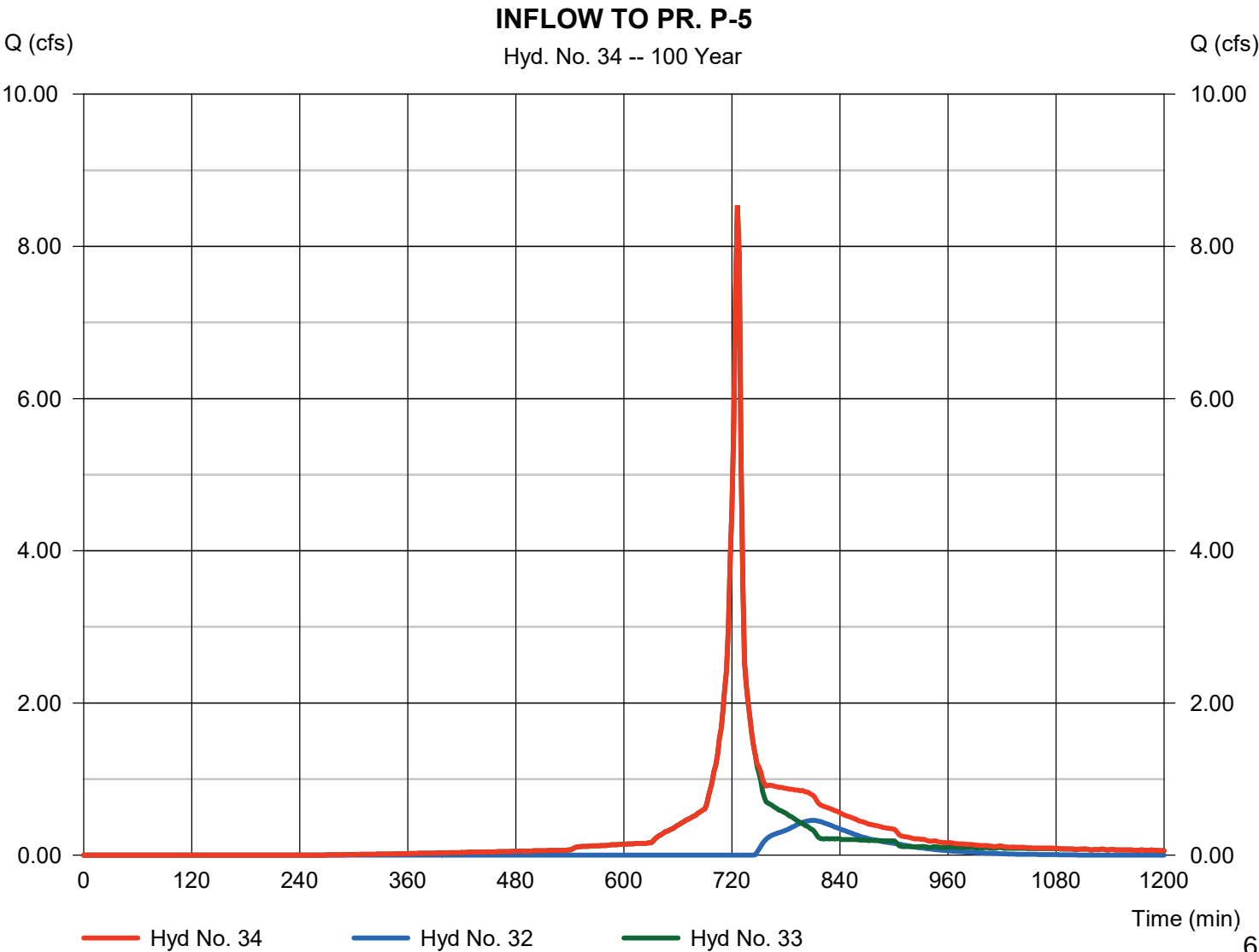
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020
Friday, 06 / 28 / 2019

Hyd. No. 34

INFLOW TO PR. P-5

Hydrograph type	= Combine	Peak discharge	= 8.540 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.482 acft
Inflow hyds.	= 32, 33	Contrib. drain. area	= 0.992 ac



Hydrograph Report

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

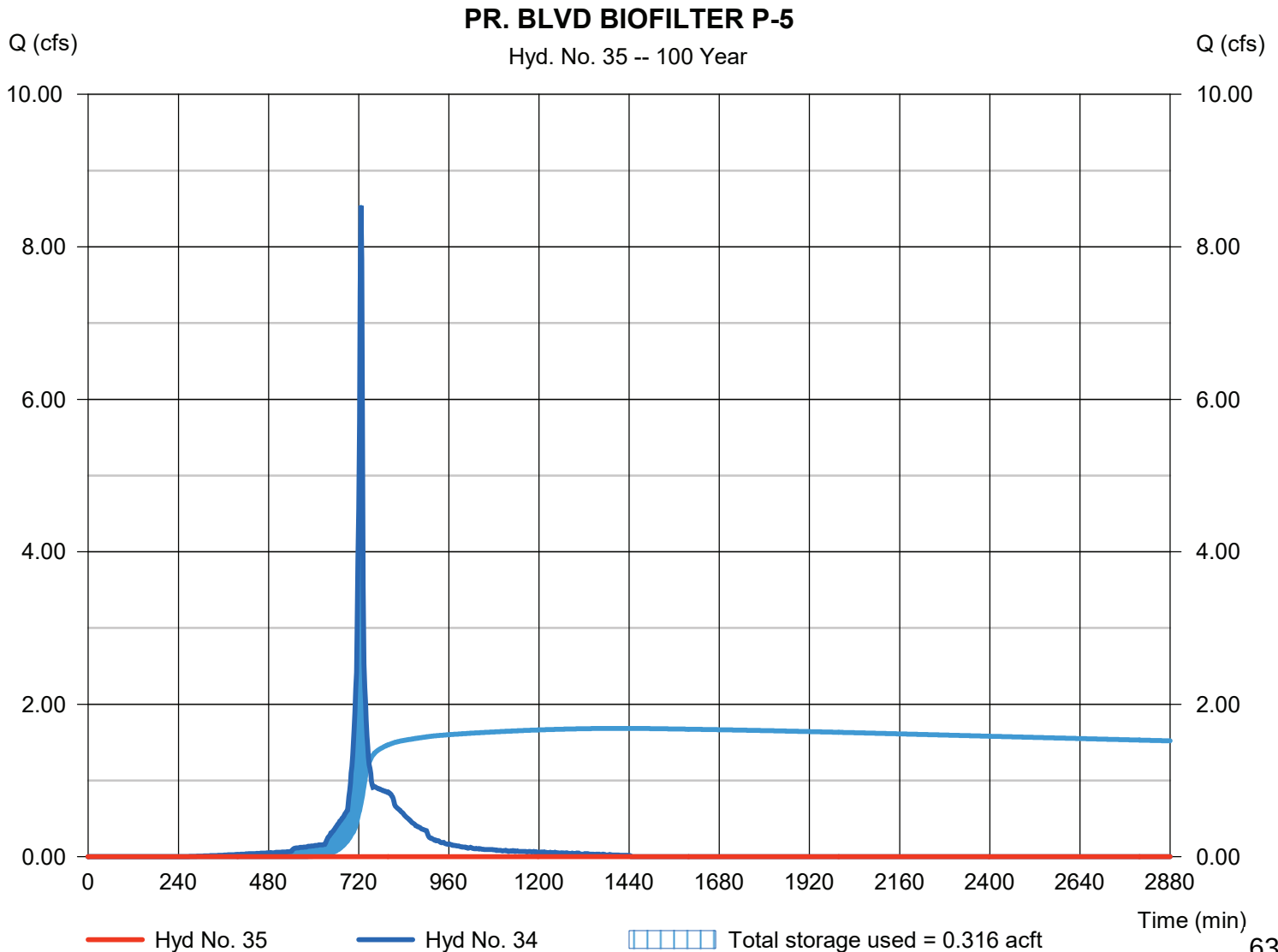
Friday, 06 / 28 / 2019

Hyd. No. 35

PR. BLVD BIOFILTER P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 34 - INFLOW TO PR. P-5	Max. Elevation	= 843.32 ft
Reservoir name	= BLVD BIOFILTER P-5	Max. Storage	= 0.316 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

Friday, 06 / 28 / 2019

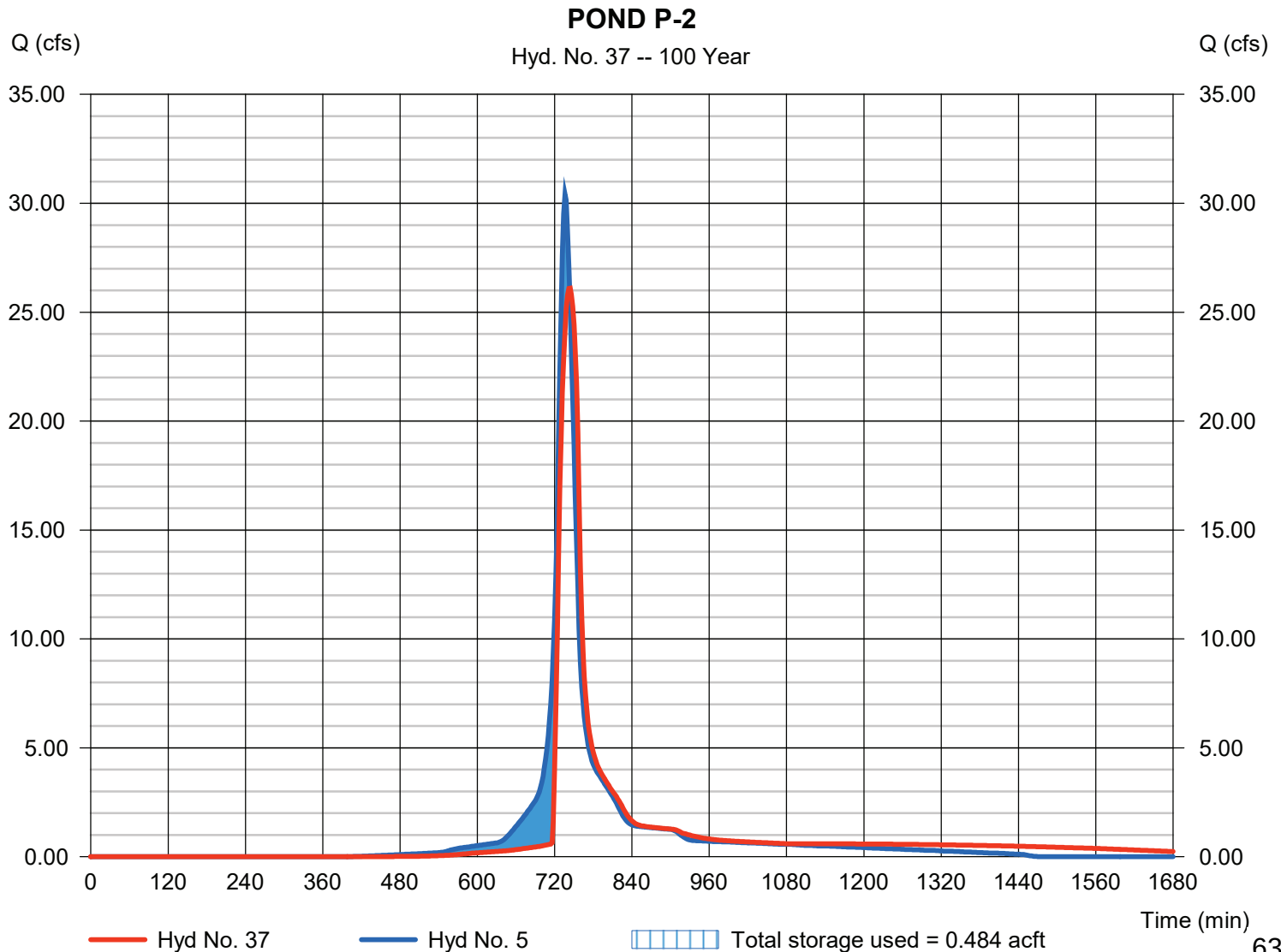
Hyd. No. 37

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 5 - P-2
 Reservoir name = POND P-2

Peak discharge = 26.10 cfs
 Time to peak = 744 min
 Hyd. volume = 2.404 acft
 Max. Elevation = 840.30 ft
 Max. Storage = 0.484 acft

Storage Indication method used.



Hydrograph Report

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

Friday, 06 / 28 / 2019

Hyd. No. 38

POND P-3

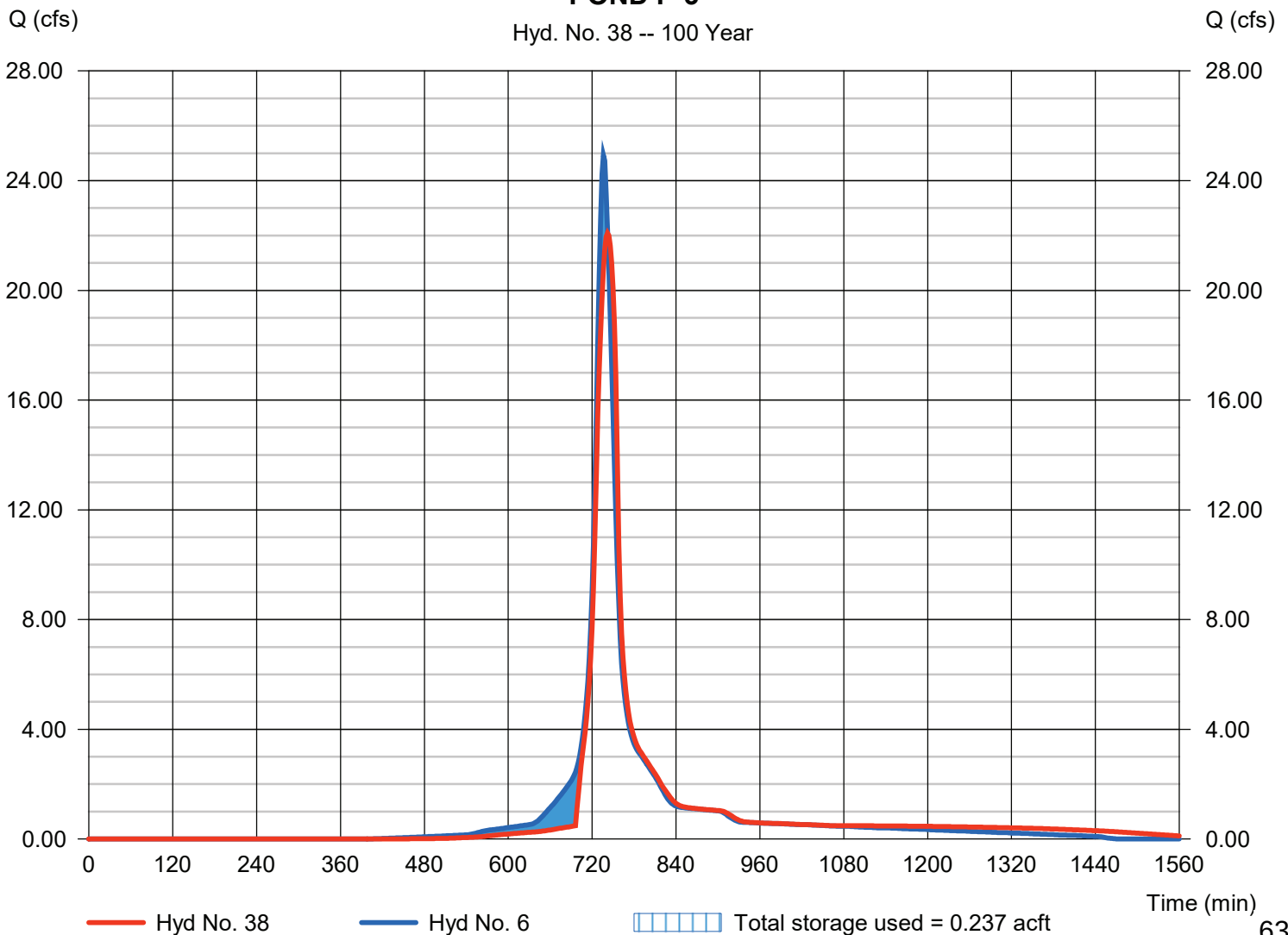
Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-3
 Reservoir name = POND P-3

Peak discharge = 22.09 cfs
 Time to peak = 742 min
 Hyd. volume = 1.972 acft
 Max. Elevation = 840.52 ft
 Max. Storage = 0.237 acft

Storage Indication method used.

POND P-3

Hyd. No. 38 -- 100 Year



Hydrograph Report

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

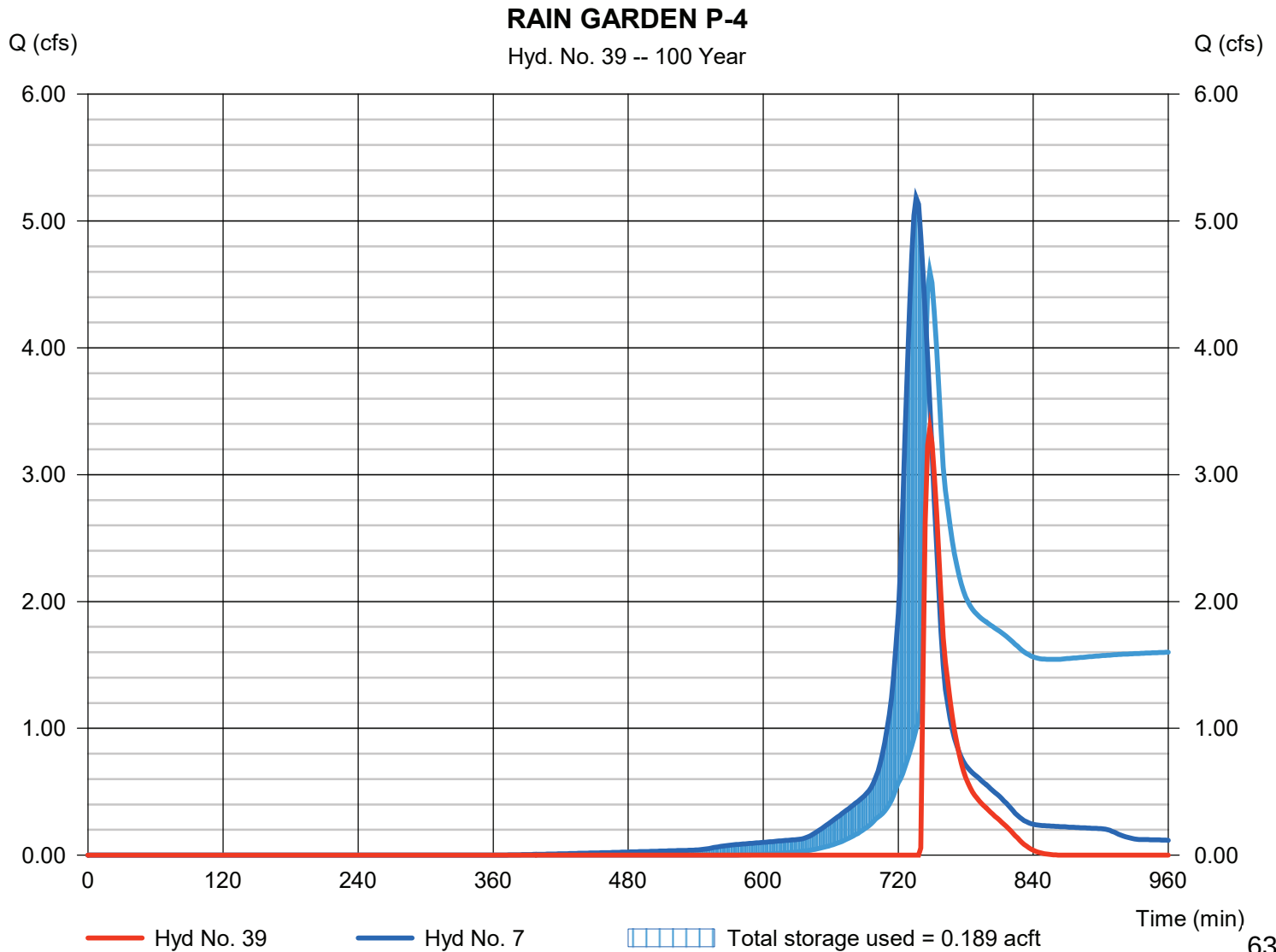
Friday, 06 / 28 / 2019

Hyd. No. 39

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 3.364 cfs
Storm frequency	= 100 yrs	Time to peak	= 748 min
Time interval	= 2 min	Hyd. volume	= 0.121 acft
Inflow hyd. No.	= 7 - P-4	Max. Elevation	= 840.86 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 0.189 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

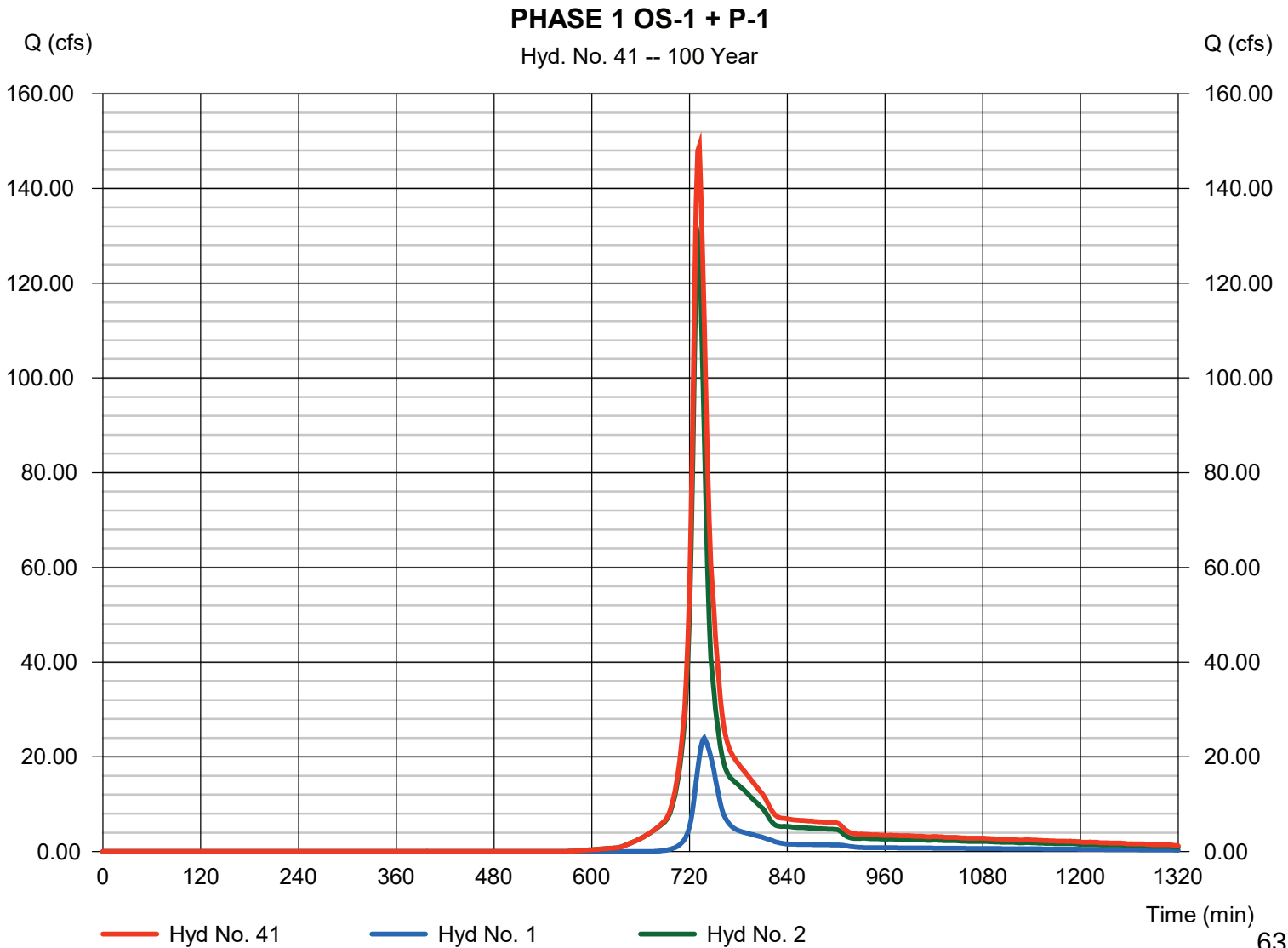
Friday, 06 / 28 / 2019

Hyd. No. 41

PHASE 1 OS-1 + P-1

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 2

Peak discharge = 149.04 cfs
 Time to peak = 732 min
 Hyd. volume = 9.616 acft
 Contrib. drain. area = 37.042 ac



Hydrograph Report

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

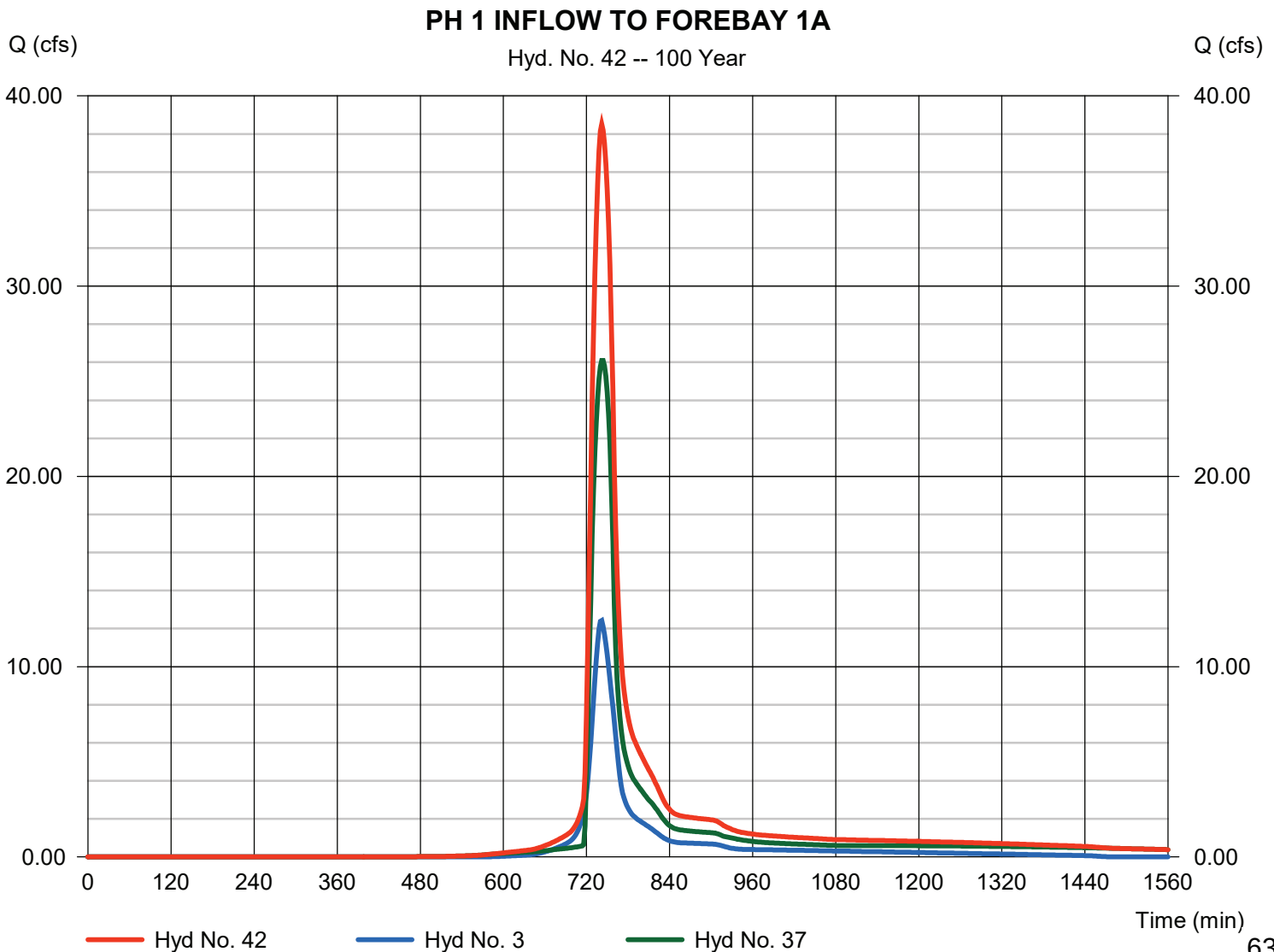
Friday, 06 / 28 / 2019

Hyd. No. 42

PH 1 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 3, 37

Peak discharge = 38.52 cfs
Time to peak = 742 min
Hyd. volume = 3.502 acft
Contrib. drain. area = 3.947 ac



Hydrograph Report

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

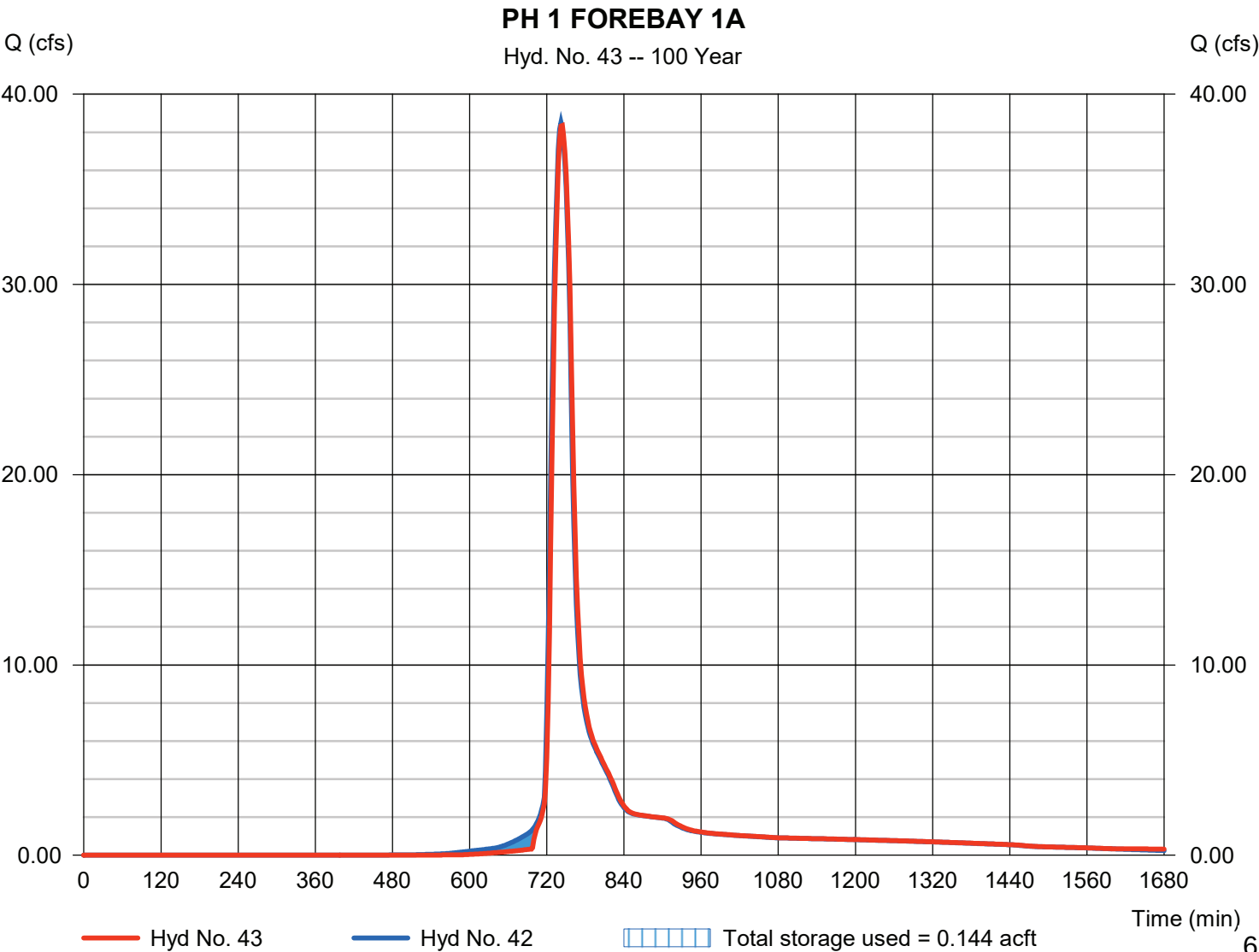
Friday, 06 / 28 / 2019

Hyd. No. 43

PH 1 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 38.36 cfs
Storm frequency	= 100 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 3.502 acft
Inflow hyd. No.	= 42 - PH 1 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.60 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 0.144 acft

Storage Indication method used.



Hydrograph Report

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

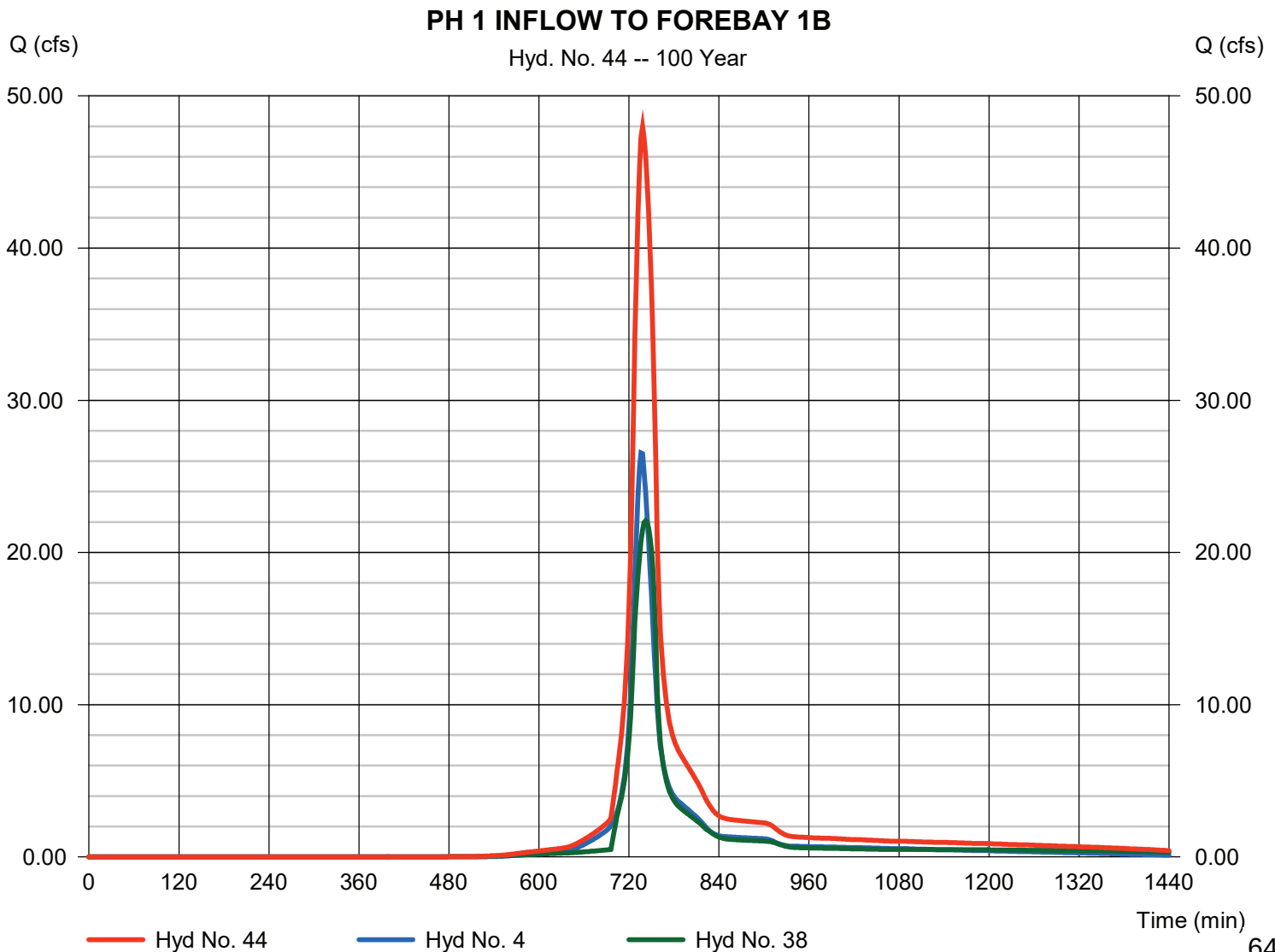
Friday, 06 / 28 / 2019

Hyd. No. 44

PH 1 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 4, 38

Peak discharge = 47.97 cfs
Time to peak = 738 min
Hyd. volume = 4.038 acft
Contrib. drain. area = 6.516 ac



Hydrograph Report

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

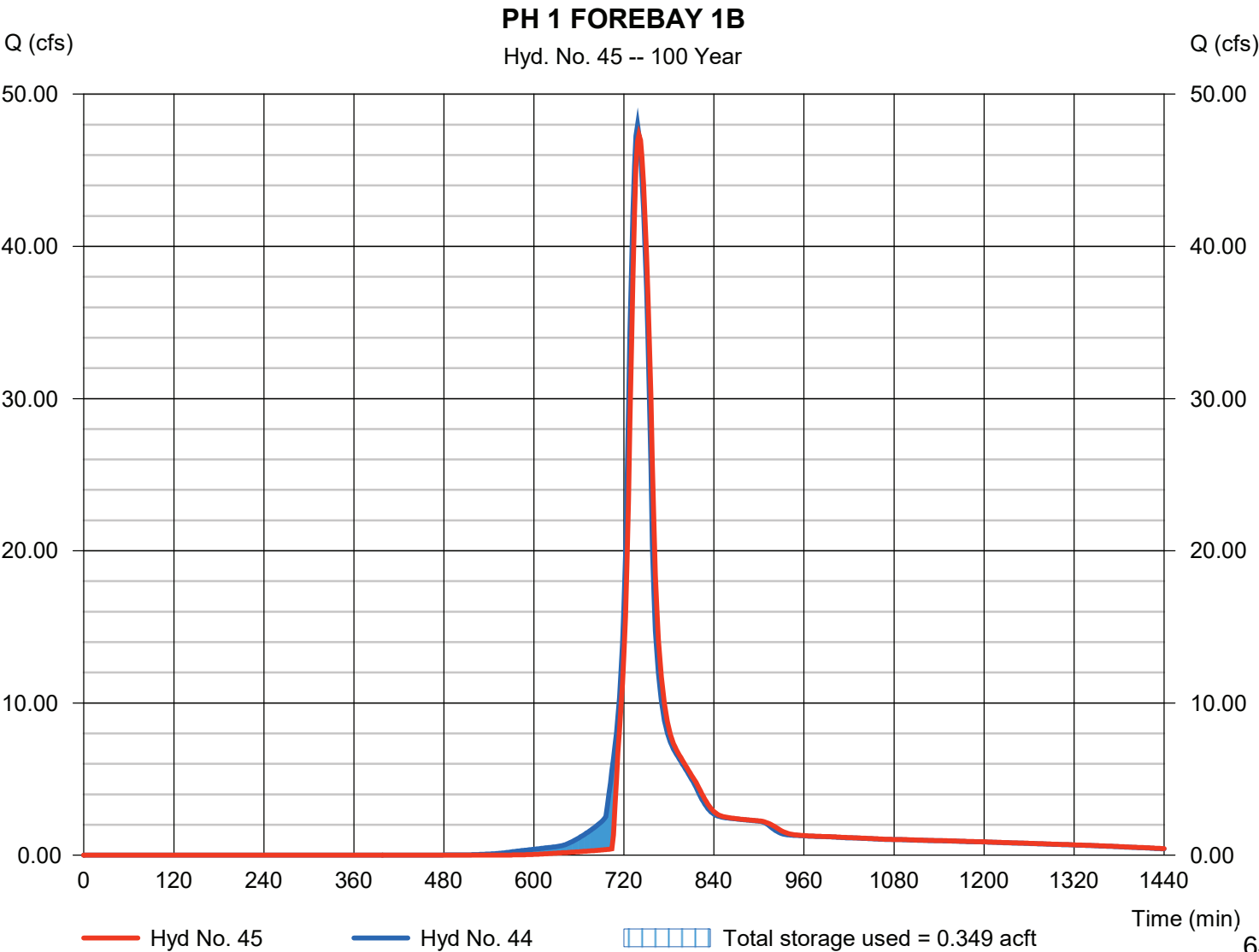
Friday, 06 / 28 / 2019

Hyd. No. 45

PH 1 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 47.32 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 4.037 acft
Inflow hyd. No.	= 44 - PH 1 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.61 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 0.349 acft

Storage Indication method used.



Hydrograph Report

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

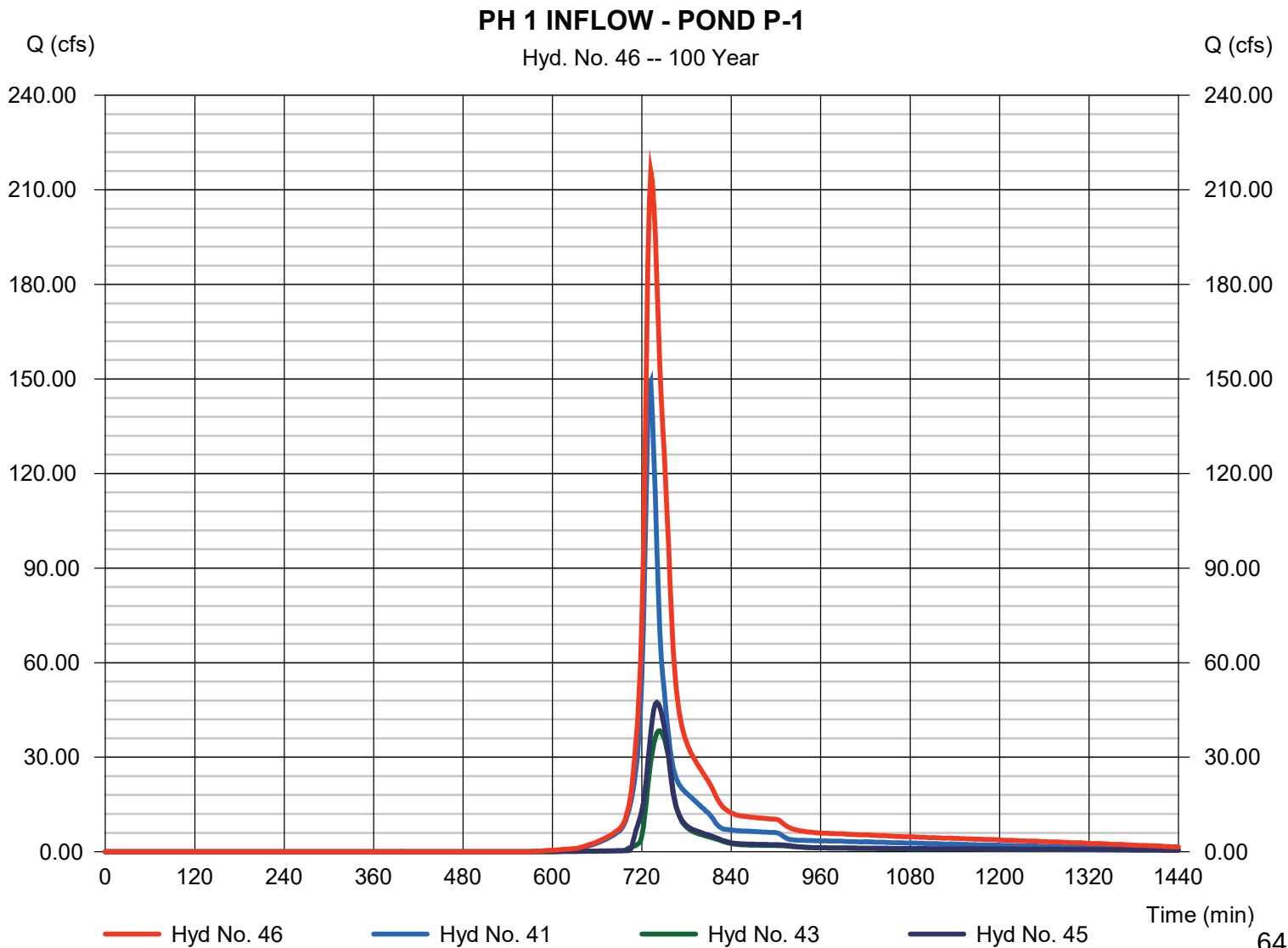
Friday, 06 / 28 / 2019

Hyd. No. 46

PH 1 INFLOW - POND P-1

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 41, 43, 45

Peak discharge = 215.64 cfs
Time to peak = 732 min
Hyd. volume = 17.155 acft
Contrib. drain. area = 0.000 ac



Hydrograph Report

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

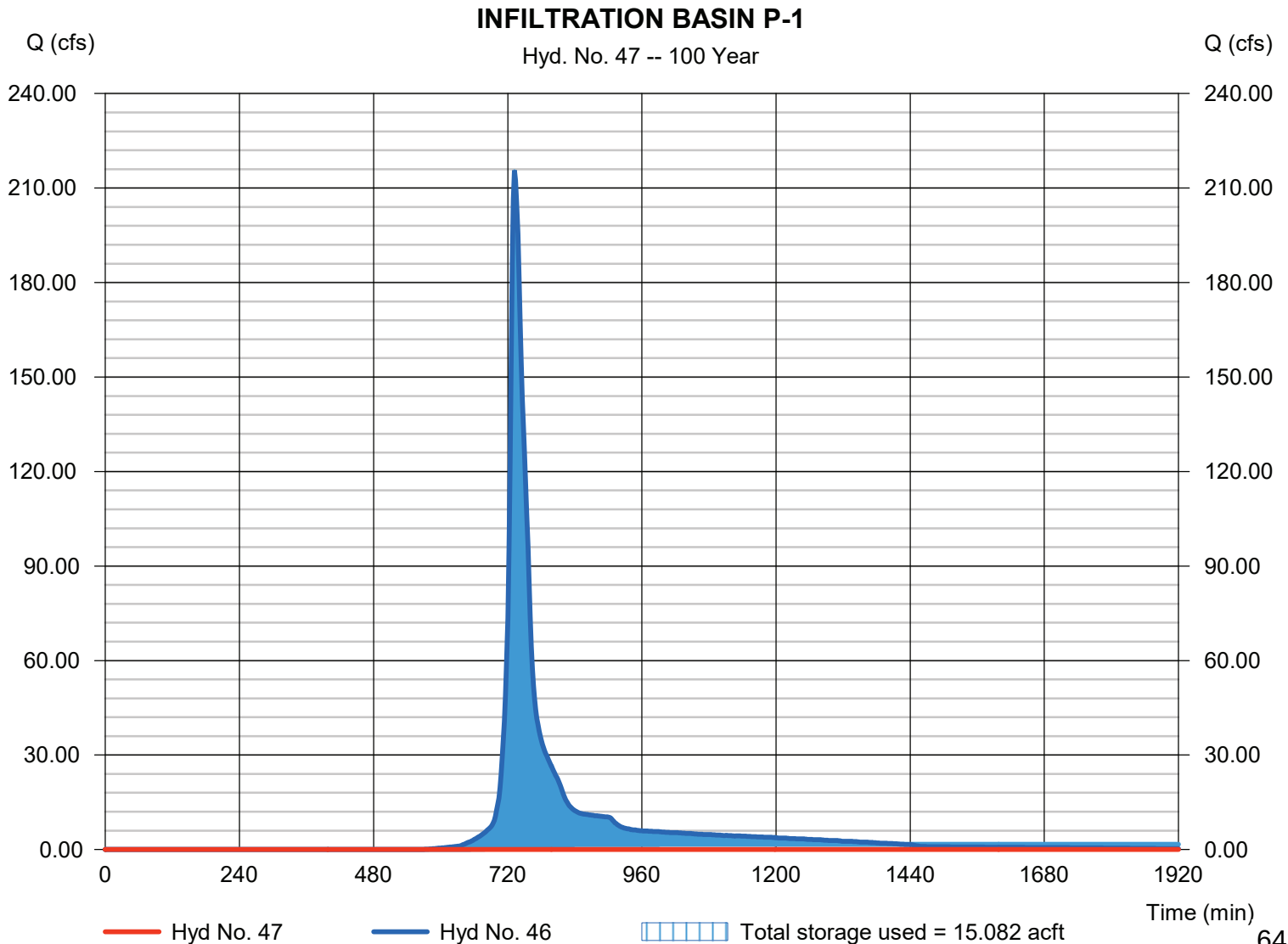
Friday, 06 / 28 / 2019

Hyd. No. 47

INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 1102 min
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 46 - PH 1 INFLOW - POND P-1	Max. Elevation	= 837.19 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 1	Max. Storage	= 15.082 acft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

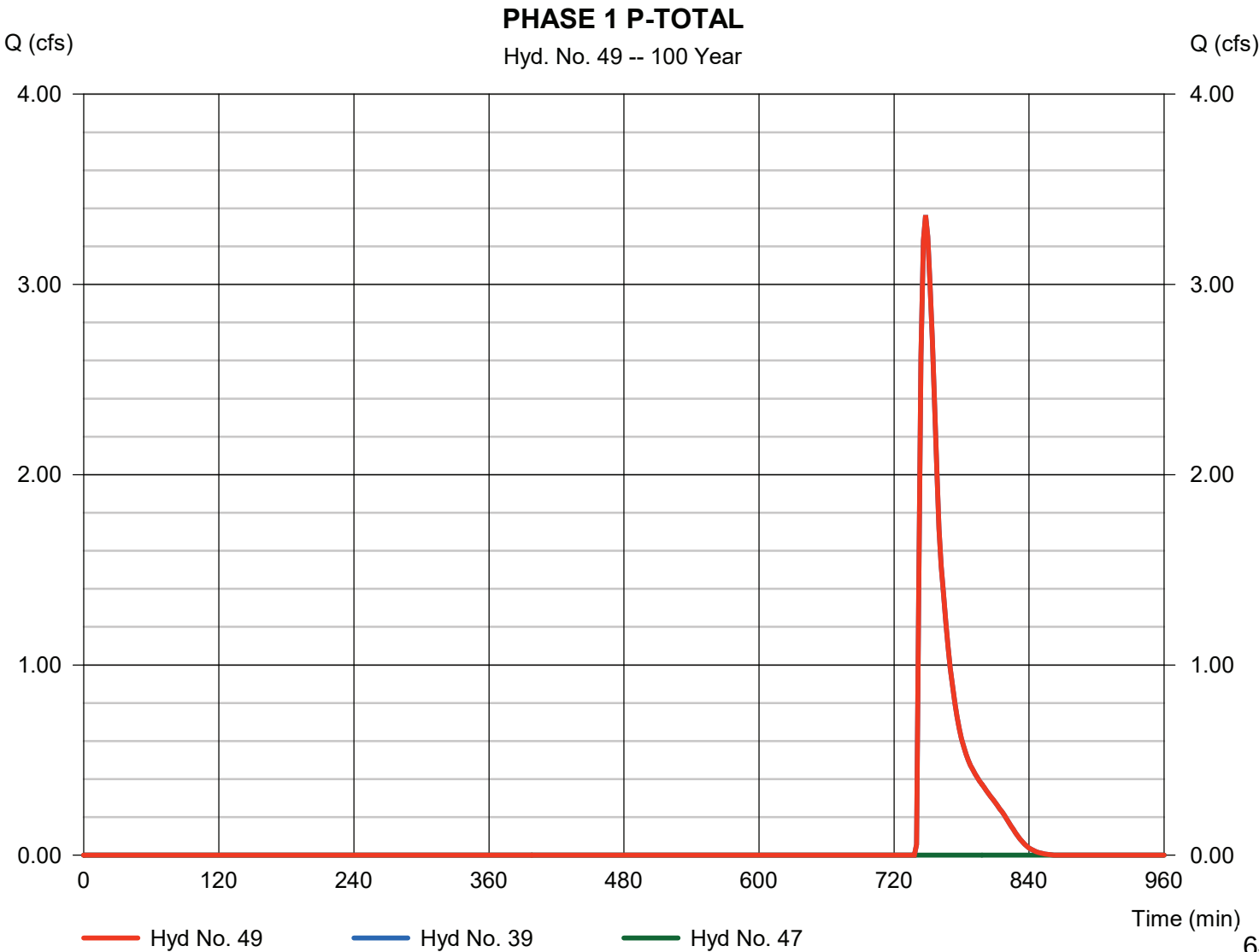
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 49

PHASE 1 P-TOTAL

Hydrograph type	= Combine	Peak discharge	= 3.364 cfs
Storm frequency	= 100 yrs	Time to peak	= 748 min
Time interval	= 2 min	Hyd. volume	= 0.121 acft
Inflow hyds.	= 39, 47	Contrib. drain. area	= 0.000 ac



Hydraflow Rainfall Report

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

Friday, 06 / 28 / 2019

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	22.8367	5.6000	0.7338	-----
2	25.4674	5.2000	0.7159	-----
3	0.0000	0.0000	0.0000	-----
5	30.5439	4.9000	0.7023	-----
10	33.5363	4.6000	0.6850	-----
25	36.2566	4.0000	0.6589	-----
50	35.2584	3.1000	0.6226	-----
100	34.0002	2.2000	0.5870	-----

File name: WAUKESHA ATLAS 14 IDF.IDF

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.04	3.04	2.48	2.11	1.85	1.66	1.51	1.38	1.28	1.20	1.12	1.06
2	4.83	3.63	2.96	2.53	2.22	1.99	1.81	1.66	1.54	1.44	1.36	1.28
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	6.11	4.58	3.74	3.19	2.81	2.52	2.29	2.11	1.96	1.83	1.72	1.63
10	7.12	5.35	4.37	3.74	3.29	2.96	2.70	2.49	2.31	2.17	2.04	1.93
25	8.52	6.37	5.21	4.47	3.94	3.55	3.24	3.00	2.79	2.62	2.47	2.34
50	9.59	7.11	5.81	4.99	4.42	3.99	3.66	3.39	3.16	2.97	2.81	2.67
100	10.67	7.83	6.40	5.51	4.89	4.43	4.07	3.78	3.54	3.34	3.16	3.01

T_c = time in minutes. Values may exceed 60.

gn Standards\Hydrology\Hydraflow UPDATED ATLAS 14\STATIONS\WAUKESHA\WAUKESHA ATLAS 14 Precip.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	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	2.40	2.70	0.00	0.00	3.81	4.65	0.00	6.18

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APPENDIX 6

PROPOSED Hydraflow Calculations – Frozen Ground Condition
(No Infiltration, CN = 98)

Watershed Model Schematic

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

37 - REMOVED P-5

35 - PR. BLVD BIOFILTER P-5
29 - INFLOW R&M EX. BIOSWALE P-5

1 - P-OS-1-PH 1

2 - P-1-PH 1

3 - P-1A-PH1

5 - P-2

Legend

Hyd.	Origin	Description
1	SCS Runoff	P-OS-1-PH 1
2	SCS Runoff	P-1-PH 1
3	SCS Runoff	P-1A-PH1
4	SCS Runoff	P-1B-PH1
5	SCS Runoff	P-2
6	SCS Runoff	P-3
7	SCS Runoff	P-4
9	SCS Runoff	R&M EX. P-1
10	SCS Runoff	R&M EX. P-2
11	SCS Runoff	R&M EX. P-3
12	SCS Runoff	R&M EX. P-4
13	SCS Runoff	R&M EX. P-5
14	SCS Runoff	R&M EX. P-6
15	SCS Runoff	R&M EX. P-7
16	SCS Runoff	R&M EX. P-8
17	SCS Runoff	R&M EX. P-9
18	Reservoir	R&M EX. BIOSWALE P-1
19	Combine	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	R&M EX. BIOSWALE P-2
21	Combine	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	R&M EX. BIOSWALE P-3
23	Combine	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	R&M EX. BIOSWALE P-4
25	Combine	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	R&M EX. BIOSWALE P-5
27	Combine	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	R&M EX. BIOSWALE P-6
29	Combine	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	R&M EX. BIOSWALE P-7
31	Combine	R&M EX. BIOSWALE P-8
32	Reservoir	R&M EX. BIOSWALE P-8
33	SCS Runoff	PROPOSED P-5
34	Combine	INFLOW TO PR. P-5
35	Reservoir	PR. BLVD BIOFILTER P-5
37	Reservoir	POND P-2
38	Reservoir	POND P-3
39	Reservoir	RAIN GARDEN P-4
41	Combine	PHASE 1 OS-1 + P-1
42	Combine	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	PH 1 FOREBAY 1A
44	Combine	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	PH 1 FOREBAY 1B
46	Combine	PH 1 INFLOW - POND P-1
47	Reservoir	INFILTRATION BASIN P-1
49	Combine	PHASE 1 P-TOTAL

4 - P-1B-PH1

6 - P-3

7 - P-4

10 - R&M EX. P-2

11 - R&M EX. P-3

12 - R&M EX. P-4

14 - R&M EX. P-6

13 - R&M EX. P-5

15 - R&M EX. P-7

16 - R&M EX. P-8

Hydrograph Return Period Recap

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

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	22.03	24.90	-----	-----	35.47	-----	-----	57.90	P-OS-1-PH 1
2	SCS Runoff	-----	76.39	86.31	-----	-----	122.85	-----	-----	200.45	P-1-PH 1
3	SCS Runoff	-----	7.426	8.395	-----	-----	11.96	-----	-----	19.53	P-1A-PH1
4	SCS Runoff	-----	14.12	15.95	-----	-----	22.72	-----	-----	37.10	P-1B-PH1
5	SCS Runoff	-----	13.73	15.52	-----	-----	22.11	-----	-----	36.09	P-2
6	SCS Runoff	-----	11.26	12.73	-----	-----	18.13	-----	-----	29.60	P-3
7	SCS Runoff	-----	2.253	2.547	-----	-----	3.627	-----	-----	5.921	P-4
9	SCS Runoff	-----	0.413	0.466	-----	-----	0.663	-----	-----	1.081	R&M EX. P-1
10	SCS Runoff	-----	0.654	0.738	-----	-----	1.050	-----	-----	1.712	R&M EX. P-2
11	SCS Runoff	-----	0.344	0.389	-----	-----	0.553	-----	-----	0.901	R&M EX. P-3
12	SCS Runoff	-----	0.379	0.427	-----	-----	0.608	-----	-----	0.991	R&M EX. P-4
13	SCS Runoff	-----	0.482	0.544	-----	-----	0.774	-----	-----	1.262	R&M EX. P-5
14	SCS Runoff	-----	0.688	0.777	-----	-----	1.105	-----	-----	1.802	R&M EX. P-6
15	SCS Runoff	-----	0.688	0.777	-----	-----	1.105	-----	-----	1.802	R&M EX. P-7
16	SCS Runoff	-----	0.619	0.700	-----	-----	0.995	-----	-----	1.622	R&M EX. P-8
17	SCS Runoff	-----	0.379	0.427	-----	-----	0.608	-----	-----	0.991	R&M EX. P-9
18	Reservoir	9	0.009	0.026	-----	-----	0.184	-----	-----	0.744	R&M EX. BIOSWALE P-1
19	Combine	10, 18	0.654	0.738	-----	-----	1.053	-----	-----	2.297	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	19	0.052	0.123	-----	-----	0.888	-----	-----	2.302	R&M EX. BIOSWALE P-2
21	Combine	11, 20	0.344	0.389	-----	-----	1.291	-----	-----	3.125	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	21	0.006	0.020	-----	-----	0.303	-----	-----	2.074	R&M EX. BIOSWALE P-3
23	Combine	12, 22	0.379	0.427	-----	-----	0.608	-----	-----	2.594	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	23	0.000	0.000	-----	-----	0.185	-----	-----	2.155	R&M EX. BIOSWALE P-4
25	Combine	13, 24	0.482	0.544	-----	-----	0.774	-----	-----	2.477	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	25	0.000	0.000	-----	-----	0.203	-----	-----	2.432	R&M EX. BIOSWALE P-5
27	Combine	14, 26	0.688	0.777	-----	-----	1.105	-----	-----	2.849	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	27	0.000	0.000	-----	-----	0.209	-----	-----	2.637	R&M EX. BIOSWALE P-6
29	Combine	15, 28	0.688	0.777	-----	-----	1.105	-----	-----	3.010	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	29	0.008	0.024	-----	-----	0.261	-----	-----	3.054	R&M EX. BIOSWALE P-7
31	Combine	16, 30	0.619	0.700	-----	-----	0.995	-----	-----	3.472	R&M EX. BIOSWALE P-8
32	Reservoir	31	0.000	0.000	-----	-----	0.235	-----	-----	3.223	R&M EX. BIOSWALE P-8
33	SCS Runoff	-----	3.413	3.855	-----	-----	5.483	-----	-----	8.940	PROPOSED P-5
34	Combine	32, 33	3.413	3.855	-----	-----	5.483	-----	-----	8.940	INFLOW TO PR. P-5
Proj. file: 2019-06-27_CHAPMAN FARMS_PHASE I_Frozen.gpw										Friday, 06 / 28 / 2019	

Hydrograph Return Period Recap

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

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	34	0.000	0.000	-----	-----	0.000	-----	-----	0.547	PR. BLVD BIOFILTER P-5
37	Reservoir	5	12.62	14.69	-----	-----	20.57	-----	-----	29.60	POND P-2
38	Reservoir	6	11.09	12.56	-----	-----	17.33	-----	-----	24.63	POND P-3
39	Reservoir	7	0.055	0.234	-----	-----	2.208	-----	-----	5.725	RAIN GARDEN P-4
41	Combine	1, 2,	95.12	107.50	-----	-----	153.10	-----	-----	249.91	PHASE 1 OS-1 + P-1
42	Combine	3, 37,	20.04	23.08	-----	-----	32.53	-----	-----	48.81	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	42	19.89	22.86	-----	-----	32.38	-----	-----	48.78	PH 1 FOREBAY 1A
44	Combine	4, 38,	25.00	28.32	-----	-----	39.67	-----	-----	60.37	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	44	24.43	27.69	-----	-----	39.13	-----	-----	59.47	PH 1 FOREBAY 1B
46	Combine	41, 43, 45	122.37	142.78	-----	-----	209.43	-----	-----	336.55	PH 1 INFLOW - POND P-1
47	Reservoir	46	0.000	0.000	-----	-----	0.000	-----	-----	0.000	INFILTRATION BASIN P-1
49	Combine	39, 47,	0.055	0.234	-----	-----	2.208	-----	-----	5.725	PHASE 1 P-TOTAL
655											
Proj. file: 2019-06-27_CHAPMAN FARMS_PHASE I_Frozen.gpw									Friday, 06 / 28 / 2019		

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	22.03	2	736	1.873	-----	-----	-----	P-OS-1-PH 1
2	SCS Runoff	76.39	2	730	5.014	-----	-----	-----	P-1-PH 1
3	SCS Runoff	7.426	2	740	0.714	-----	-----	-----	P-1A-PH1
4	SCS Runoff	14.12	2	736	1.200	-----	-----	-----	P-1B-PH1
5	SCS Runoff	13.73	2	736	1.167	-----	-----	-----	P-2
6	SCS Runoff	11.26	2	736	0.958	-----	-----	-----	P-3
7	SCS Runoff	2.253	2	736	0.192	-----	-----	-----	P-4
9	SCS Runoff	0.413	2	726	0.020	-----	-----	-----	R&M EX. P-1
10	SCS Runoff	0.654	2	726	0.032	-----	-----	-----	R&M EX. P-2
11	SCS Runoff	0.344	2	726	0.017	-----	-----	-----	R&M EX. P-3
12	SCS Runoff	0.379	2	726	0.019	-----	-----	-----	R&M EX. P-4
13	SCS Runoff	0.482	2	726	0.024	-----	-----	-----	R&M EX. P-5
14	SCS Runoff	0.688	2	726	0.034	-----	-----	-----	R&M EX. P-6
15	SCS Runoff	0.688	2	726	0.034	-----	-----	-----	R&M EX. P-7
16	SCS Runoff	0.619	2	726	0.031	-----	-----	-----	R&M EX. P-8
17	SCS Runoff	0.379	2	726	0.019	-----	-----	-----	R&M EX. P-9
18	Reservoir	0.009	2	884	0.004	9	851.61	0.017	R&M EX. BIOSWALE P-1
19	Combine	0.654	2	726	0.037	10, 18	-----	-----	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	0.052	2	758	0.015	19	851.33	0.023	R&M EX. BIOSWALE P-2
21	Combine	0.344	2	726	0.032	11, 20	-----	-----	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	0.006	2	1414	0.001	21	850.96	0.031	R&M EX. BIOSWALE P-3
23	Combine	0.379	2	726	0.020	12, 22	-----	-----	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	0.000	2	n/a	0.000	23	849.61	0.020	R&M EX. BIOSWALE P-4
25	Combine	0.482	2	726	0.024	13, 24	-----	-----	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	0.000	2	n/a	0.000	25	848.44	0.024	R&M EX. BIOSWALE P-5
27	Combine	0.688	2	726	0.034	14, 26	-----	-----	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	0.000	2	n/a	0.000	27	847.22	0.034	R&M EX. BIOSWALE P-6
29	Combine	0.688	2	726	0.034	15, 28	-----	-----	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	0.008	2	1006	0.004	29	845.31	0.030	R&M EX. BIOSWALE P-7
31	Combine	0.619	2	726	0.034	16, 30	-----	-----	R&M EX. BIOSWALE P-8
32	Reservoir	0.000	2	n/a	0.000	31	844.21	0.034	R&M EX. BIOSWALE P-8
33	SCS Runoff	3.413	2	726	0.168	-----	-----	-----	PROPOSED P-5
34	Combine	3.413	2	726	0.168	32, 33	-----	-----	INFLOW TO PR. P-5
2019-06-27_CHAPMAN FARMS_PHASE I_Floodmg Per					Return Period: 1 Year			Friday, 06 / 28 / 2019	

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
35	Reservoir	0.000	2	n/a	0.000	34	842.52	0.168	PR. BLVD BIOFILTER P-5
37	Reservoir	12.62	2	740	1.167	5	839.69	0.365	POND P-2
38	Reservoir	11.09	2	738	0.957	6	839.90	0.162	POND P-3
39	Reservoir	0.055	2	926	0.022	7	840.70	0.170	RAIN GARDEN P-4
41	Combine	95.12	2	730	6.887	1, 2,	-----	-----	PHASE 1 OS-1 + P-1
42	Combine	20.04	2	740	1.881	3, 37,	-----	-----	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	19.89	2	742	1.881	42	835.32	0.114	PH 1 FOREBAY 1A
44	Combine	25.00	2	736	2.157	4, 38,	-----	-----	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	24.43	2	740	2.156	44	835.30	0.285	PH 1 FOREBAY 1B
46	Combine	122.37	2	732	10.925	41, 43, 45	-----	-----	PH 1 INFLOW - POND P-1
47	Reservoir	0.000	2	n/a	0.000	46	835.85	10.9	INFILTRATION BASIN P-1
49	Combine	0.055	2	926	0.022	39, 47,	-----	-----	PHASE 1 P-TOTAL
2019-06-27_CHAPMAN FARMS_PHASE I_Flood Hydro					Return Period: 1 Year			Friday, 06 / 28 / 2019	

Hydrograph Report

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

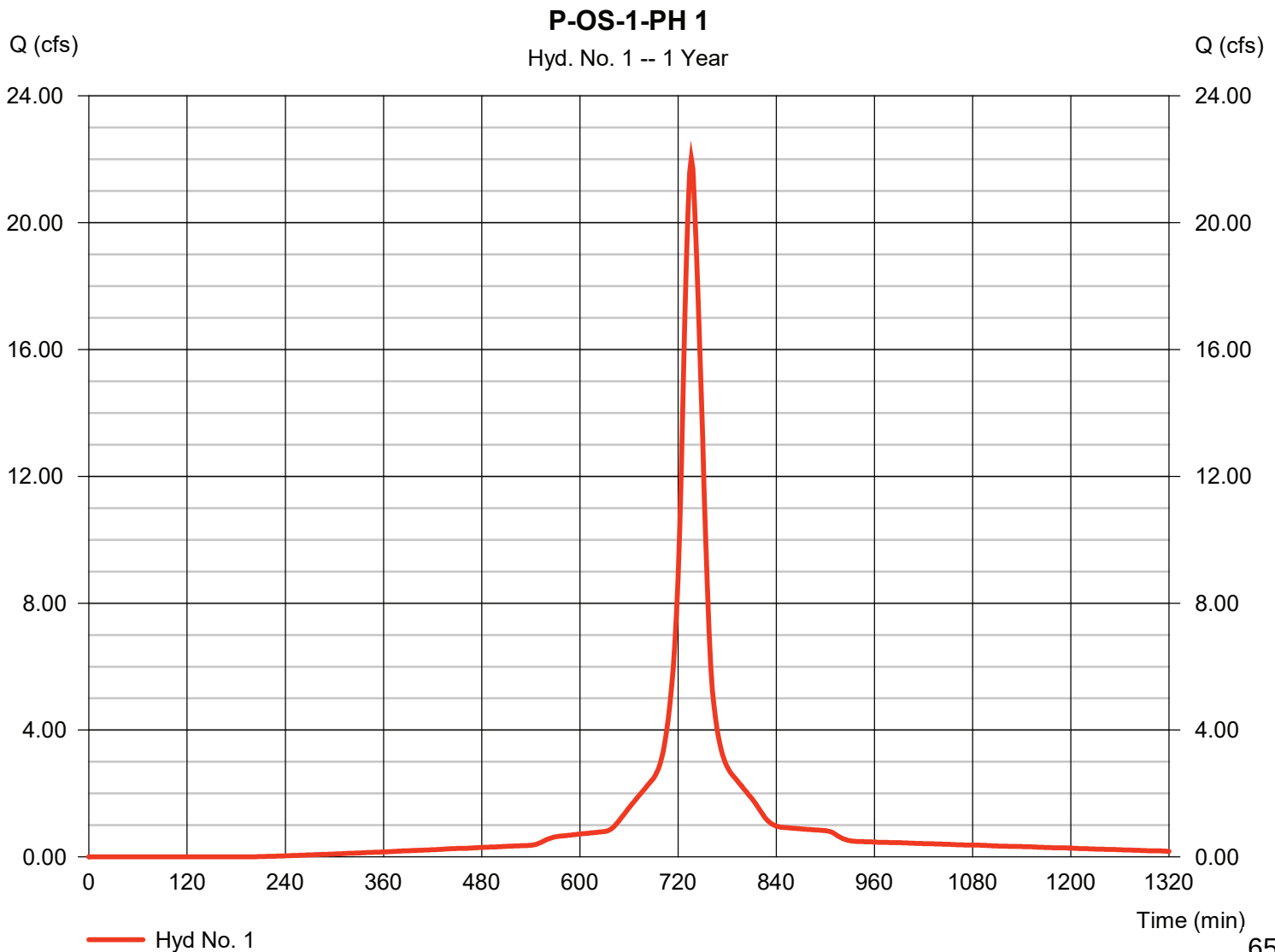
Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 22.03 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.873 acft
Drainage area	= 10.170 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.50 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSR3 DISTRIBUTION CU		

* Composite (Area/CN) = $[(8.870 \times 61) + (1.300 \times 86)] / 10.170$



Precipitation Report

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

Friday, 06 / 28 / 2019

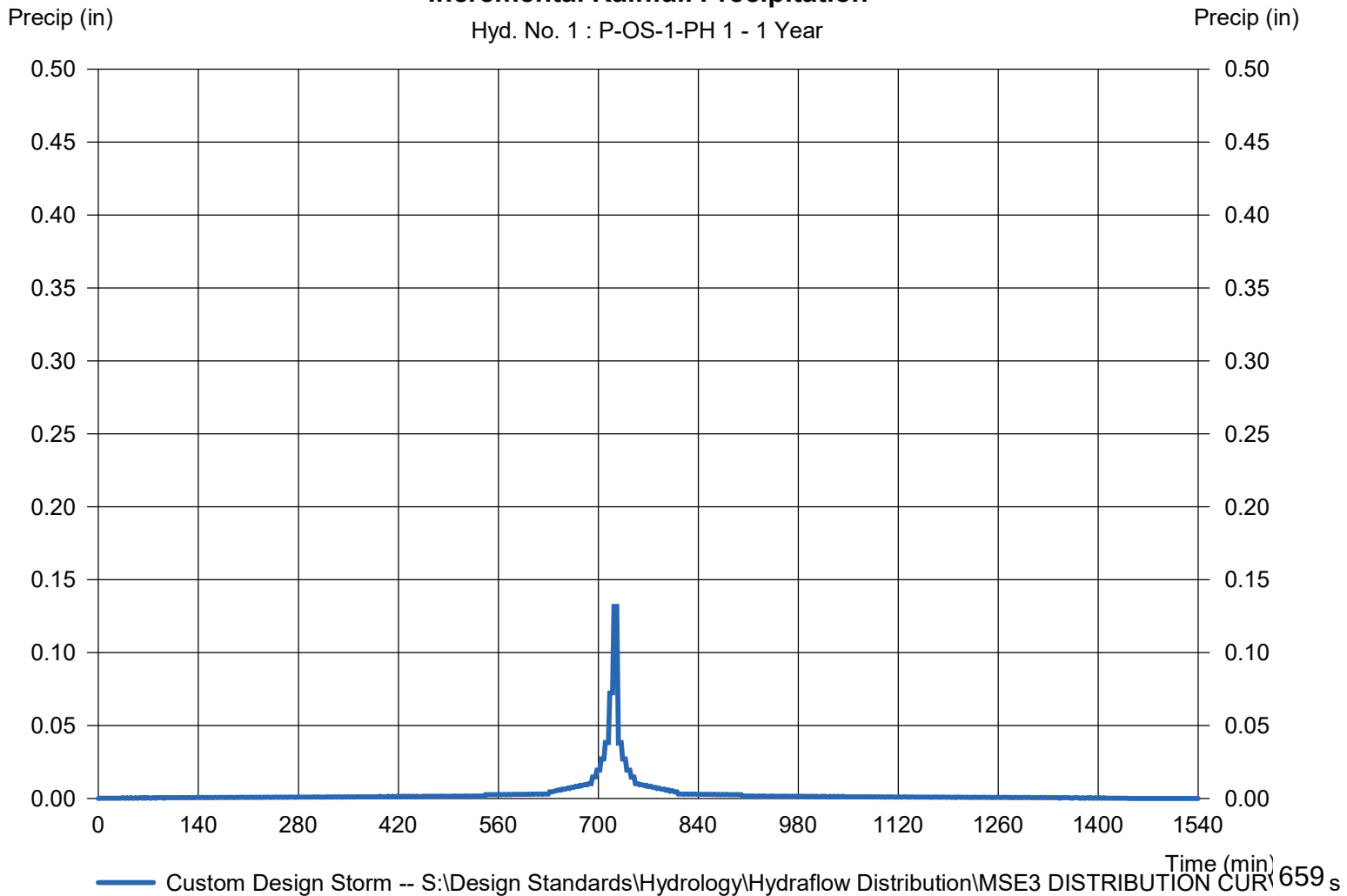
Hyd. No. 1

P-OS-1-PH 1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 1 : P-OS-1-PH 1 - 1 Year



Hydrograph Report

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

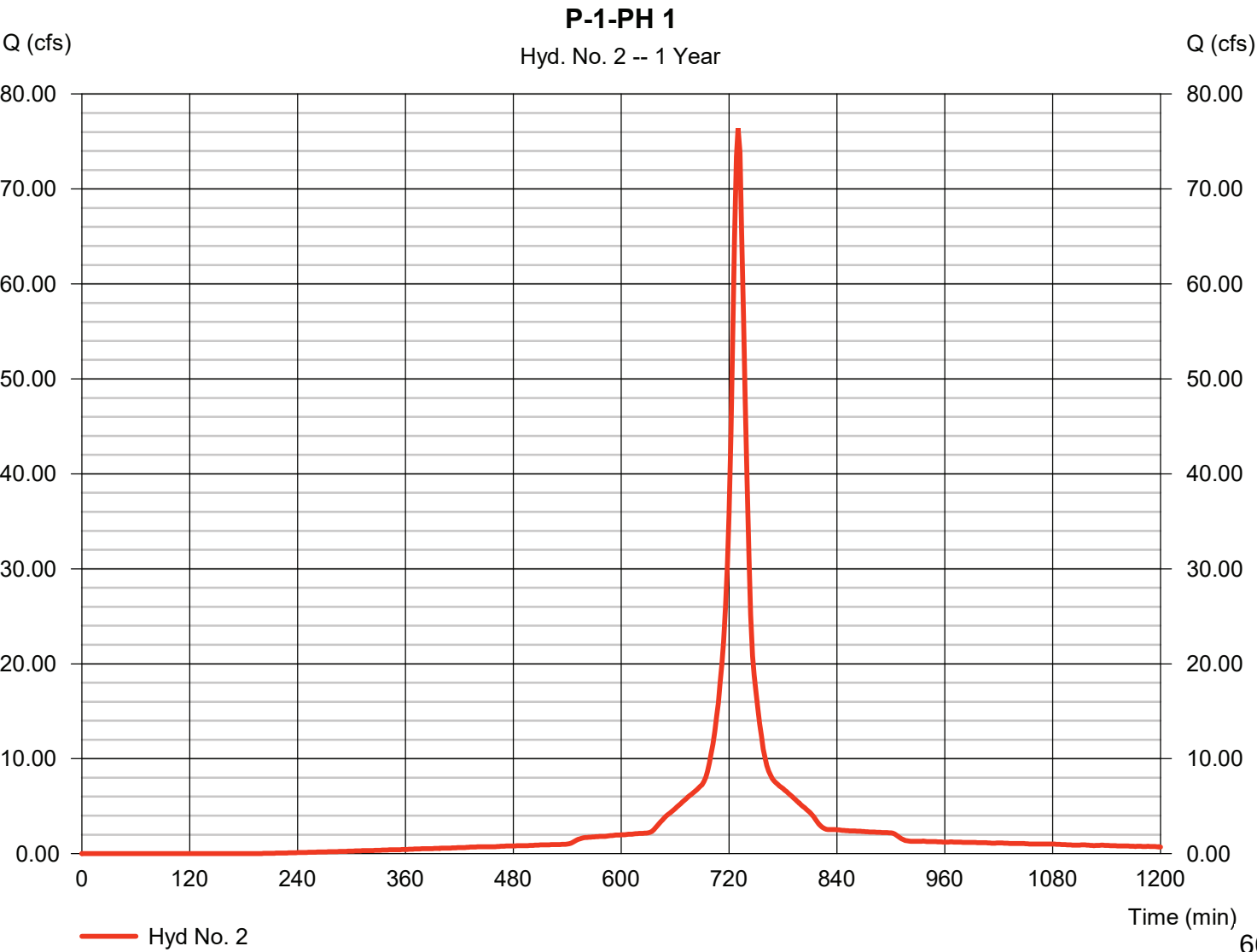
Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 76.39 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 5.014 acft
Drainage area	= 26.872 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSR3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 26.872



TR55 Tc Worksheet

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

Hyd. No. 2

P-1-PH 1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 70.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 4.00	0.00	0.00	
Travel Time (min)	= 8.85	+	0.00	+
			0.00	= 8.85
Shallow Concentrated Flow				
Flow length (ft)	= 360.00	0.00	0.00	
Watercourse slope (%)	= 2.50	0.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=2.55	0.00	0.00	
Travel Time (min)	= 2.35	+	0.00	+
			0.00	= 2.35
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				11.20 min

Precipitation Report

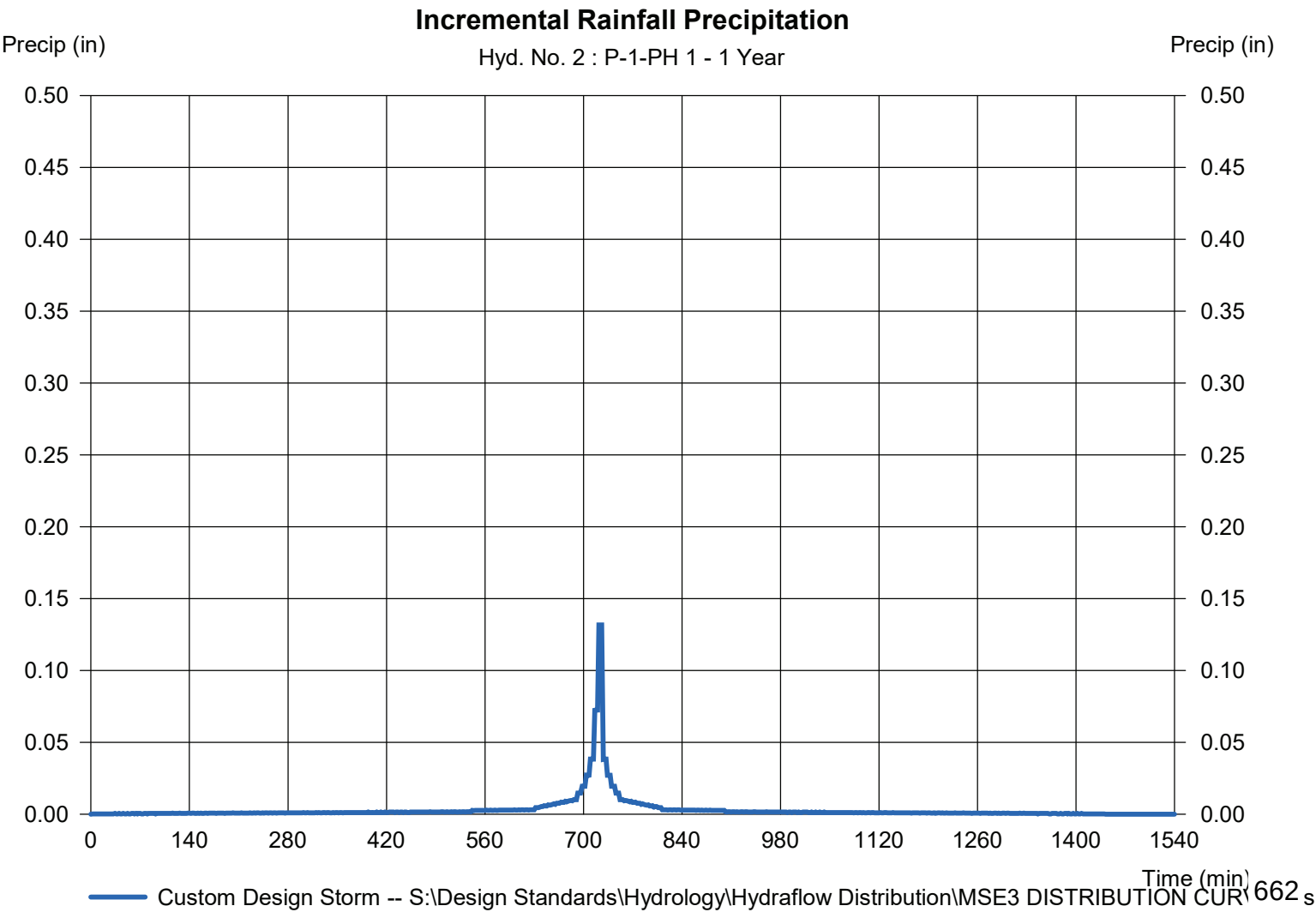
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

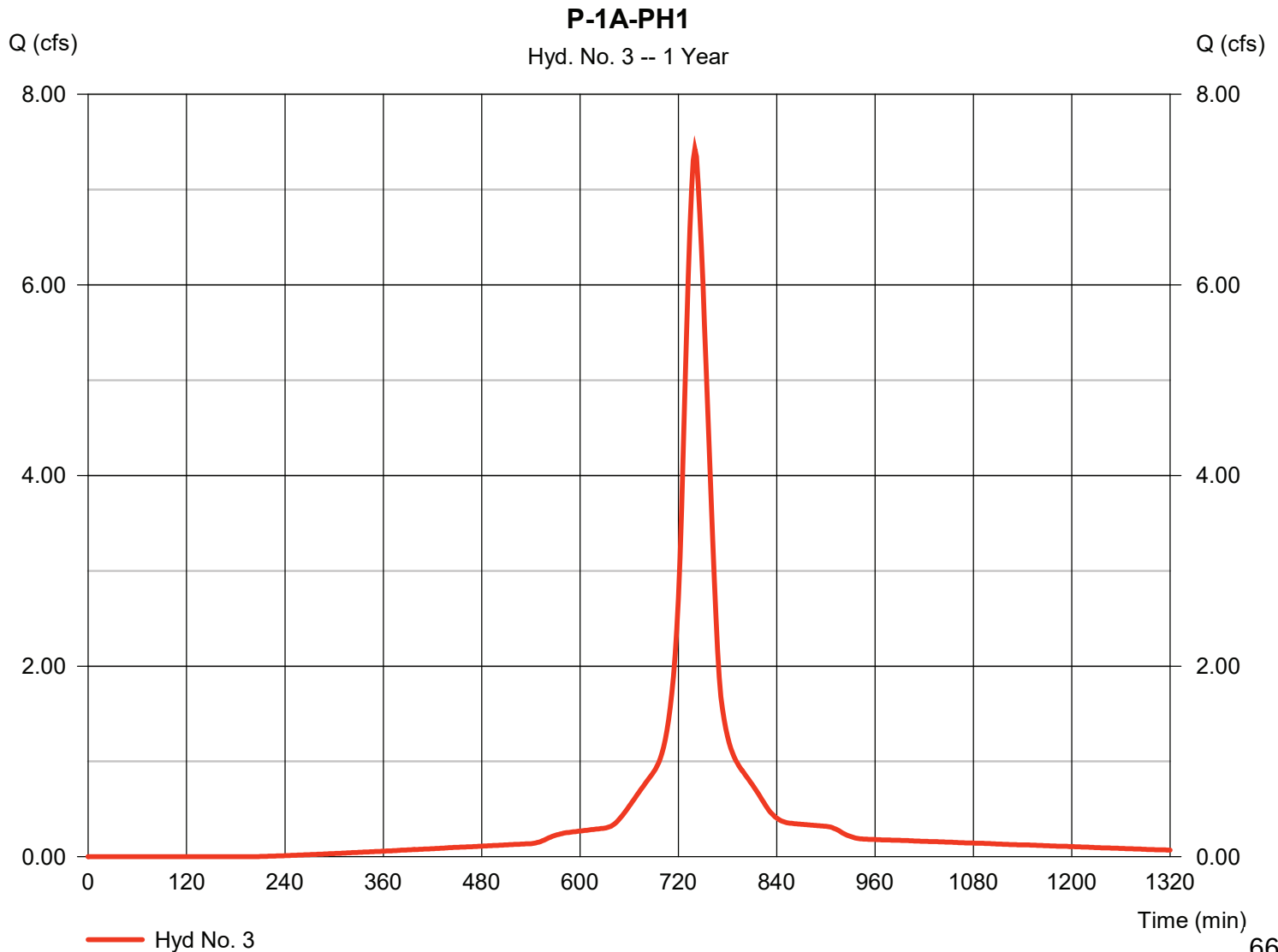
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 7.426 cfs
Storm frequency	= 1 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 0.714 acft
Drainage area	= 3.947 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 29.90 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



TR55 Tc Worksheet

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

Hyd. No. 3

P-1A-PH1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
Travel Time (min)	= 28.35	+	0.00	+
			0.00	= 28.35
Shallow Concentrated Flow				
Flow length (ft)	= 165.00	25.00	0.00	
Watercourse slope (%)	= 1.25	25.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=1.80	8.07	0.00	
Travel Time (min)	= 1.52	+	0.05	+
			0.00	= 1.58
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				29.90 min

Precipitation Report

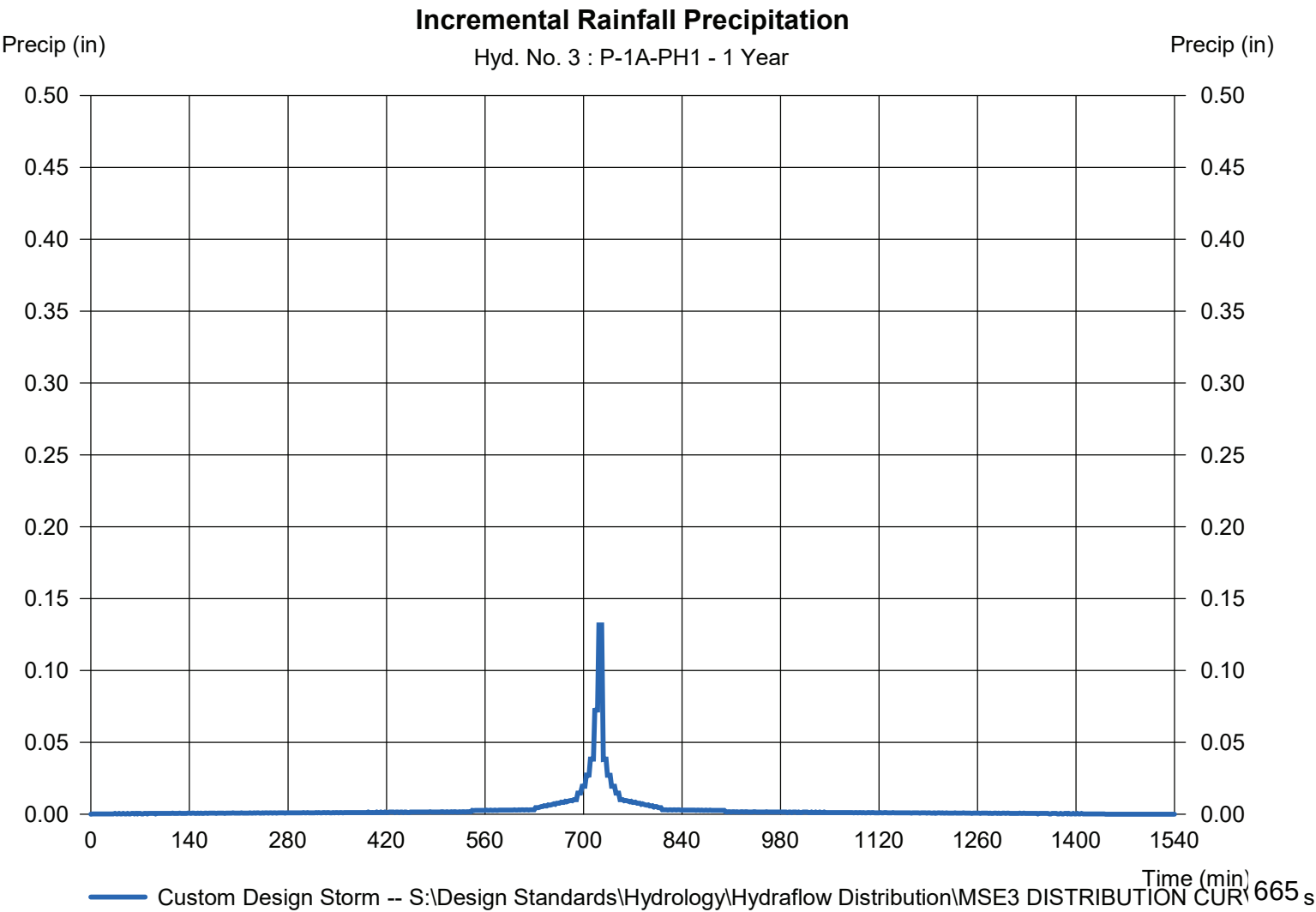
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

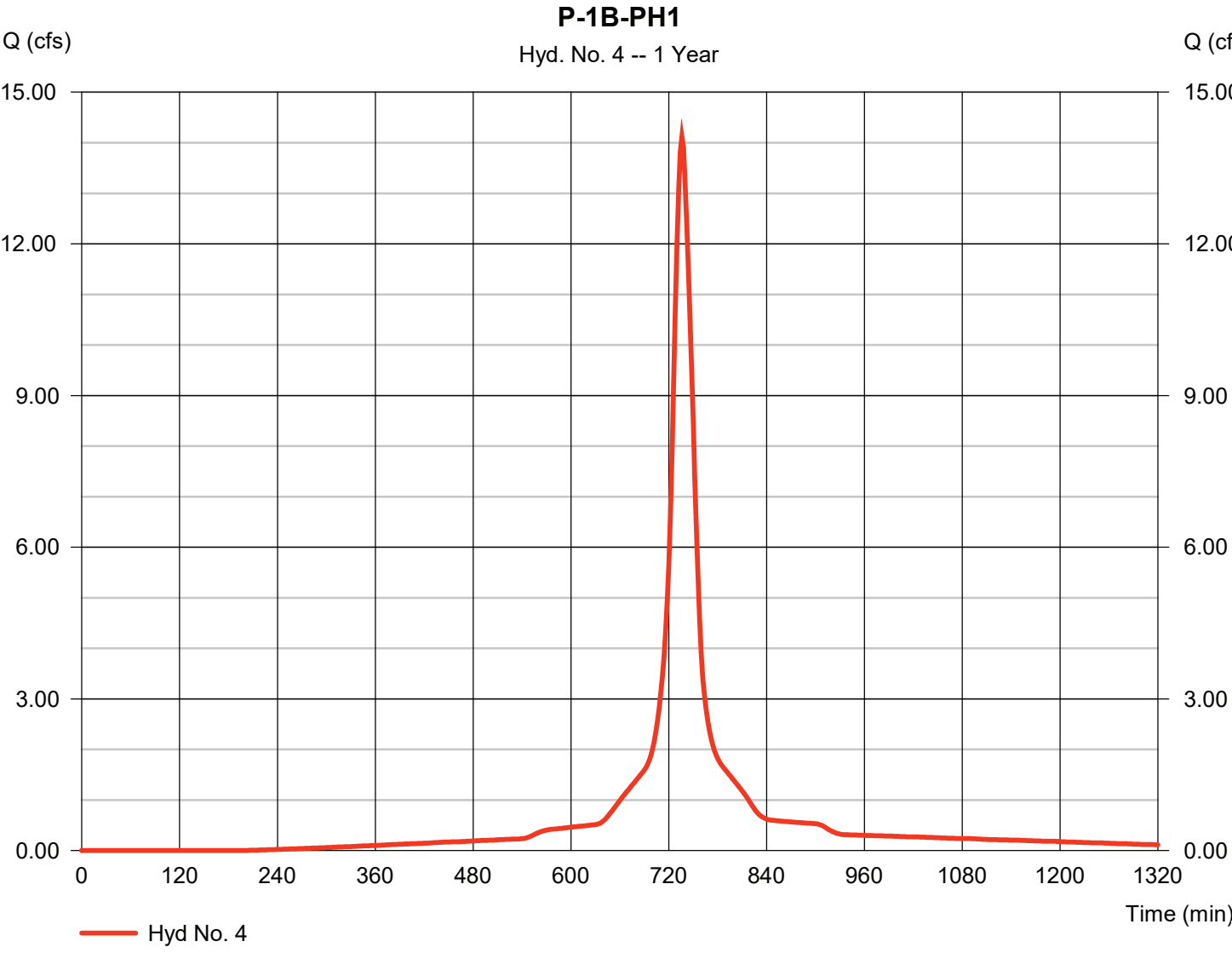
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 14.12 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.200 acft
Drainage area	= 6.516 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.60 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



TR55 Tc Worksheet

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

Hyd. No. 4

P-1B-PH1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 150.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00				
Land slope (%)	= 2.83	0.00	0.00				
Travel Time (min)	= 18.70	+	0.00	+	0.00	=	18.70
Shallow Concentrated Flow							
Flow length (ft)	= 275.00	33.00	0.00				
Watercourse slope (%)	= 1.00	20.00	0.00				
Surface description	= Unpaved	Unpaved	Paved				
Average velocity (ft/s)	=1.61	7.22	0.00				
Travel Time (min)	= 2.84	+	0.08	+	0.00	=	2.92
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc					21.60 min		

Precipitation Report

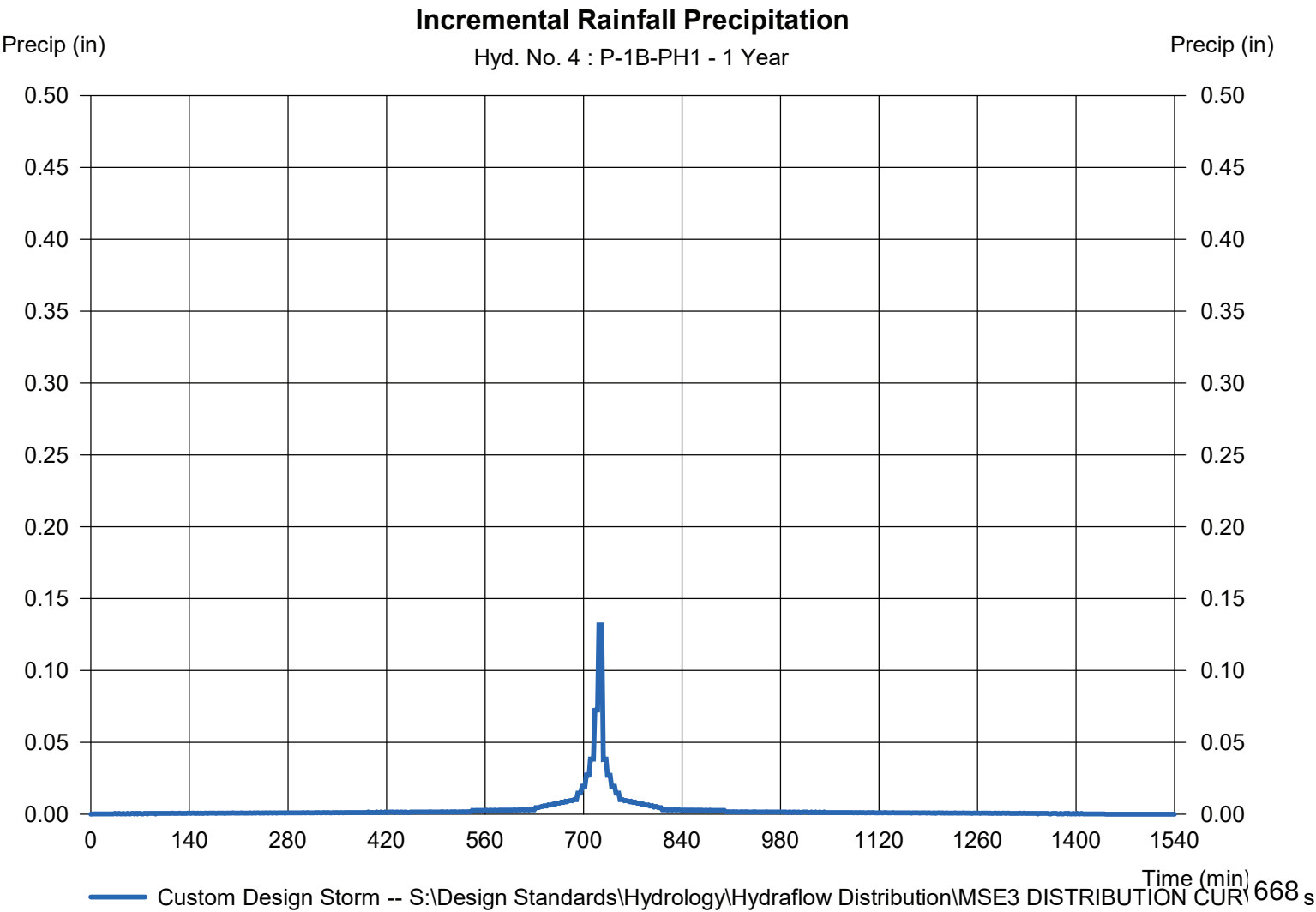
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

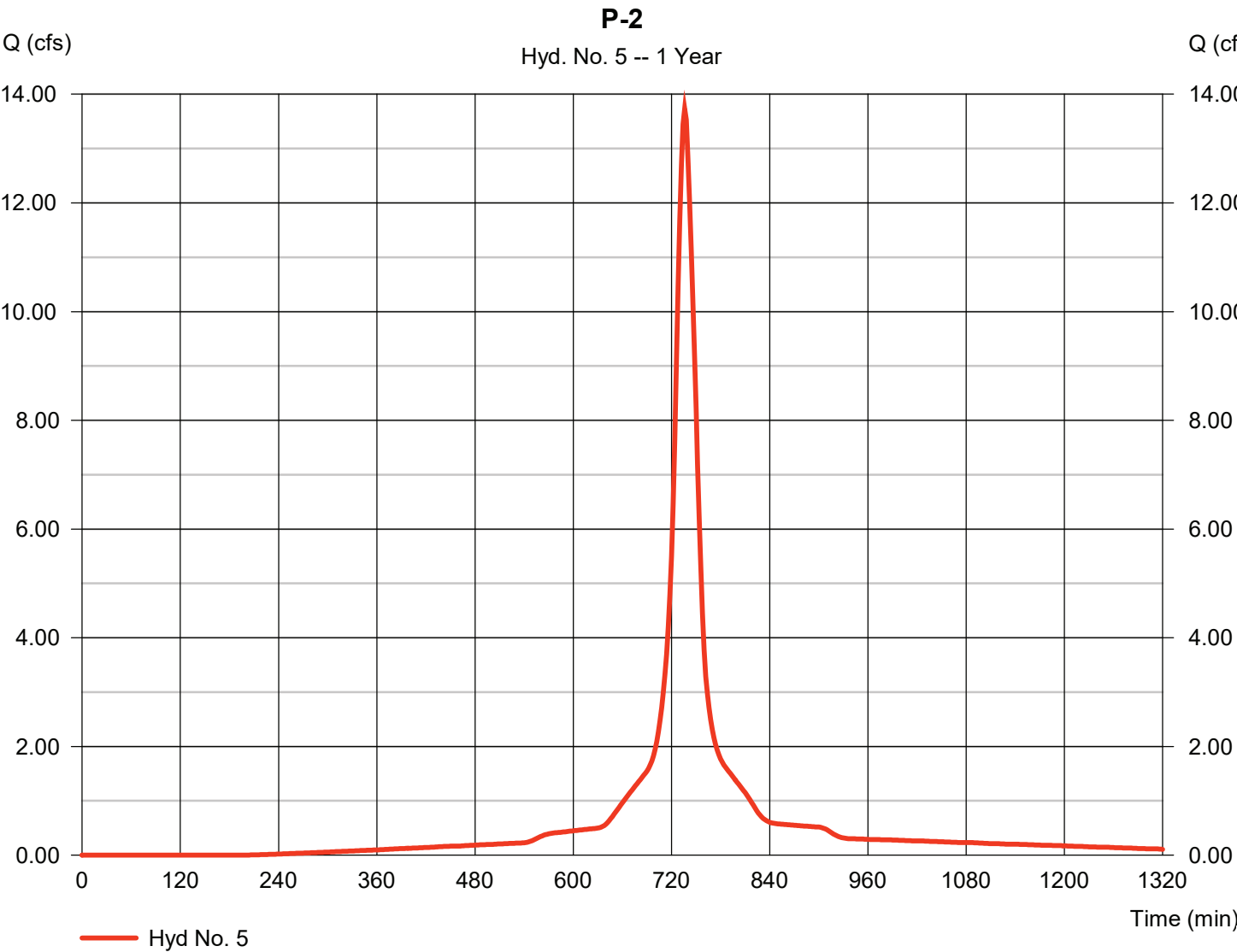
Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 13.73 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.167 acft
Drainage area	= 6.339 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.710 x 75)] / 6.339



TR55 Tc Worksheet

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

Hyd. No. 5

P-2

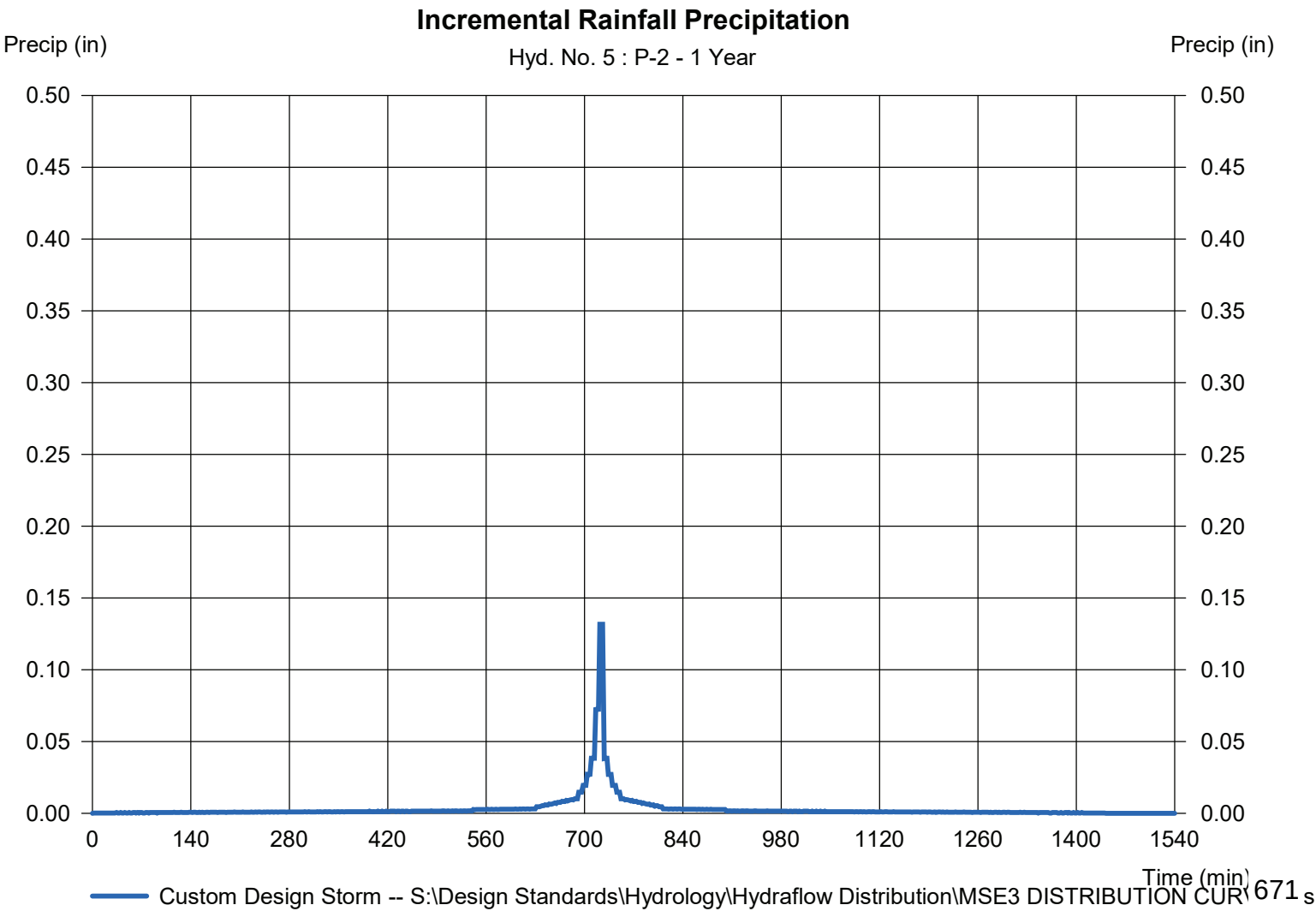
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 97.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
Travel Time (min)	= 20.01	+	0.00	+
			0.00	= 20.01
Shallow Concentrated Flow				
Flow length (ft)	= 132.00	0.00	0.00	
Watercourse slope (%)	= 1.50	0.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=1.98	0.00	0.00	
Travel Time (min)	= 1.11	+	0.00	+
			0.00	= 1.11
Channel Flow				
X sectional flow area (sqft)	= 1.23	0.00	0.00	
Wetted perimeter (ft)	= 3.93	0.00	0.00	
Channel slope (%)	= 0.50	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=3.72	0.00	0.00	
Flow length (ft)	(0)189.0	0.0	0.0	
Travel Time (min)	= 0.85	+	0.00	+
			0.00	= 0.85
Total Travel Time, Tc				22.00 min

Precipitation Report

Hyd. No. 5

P-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

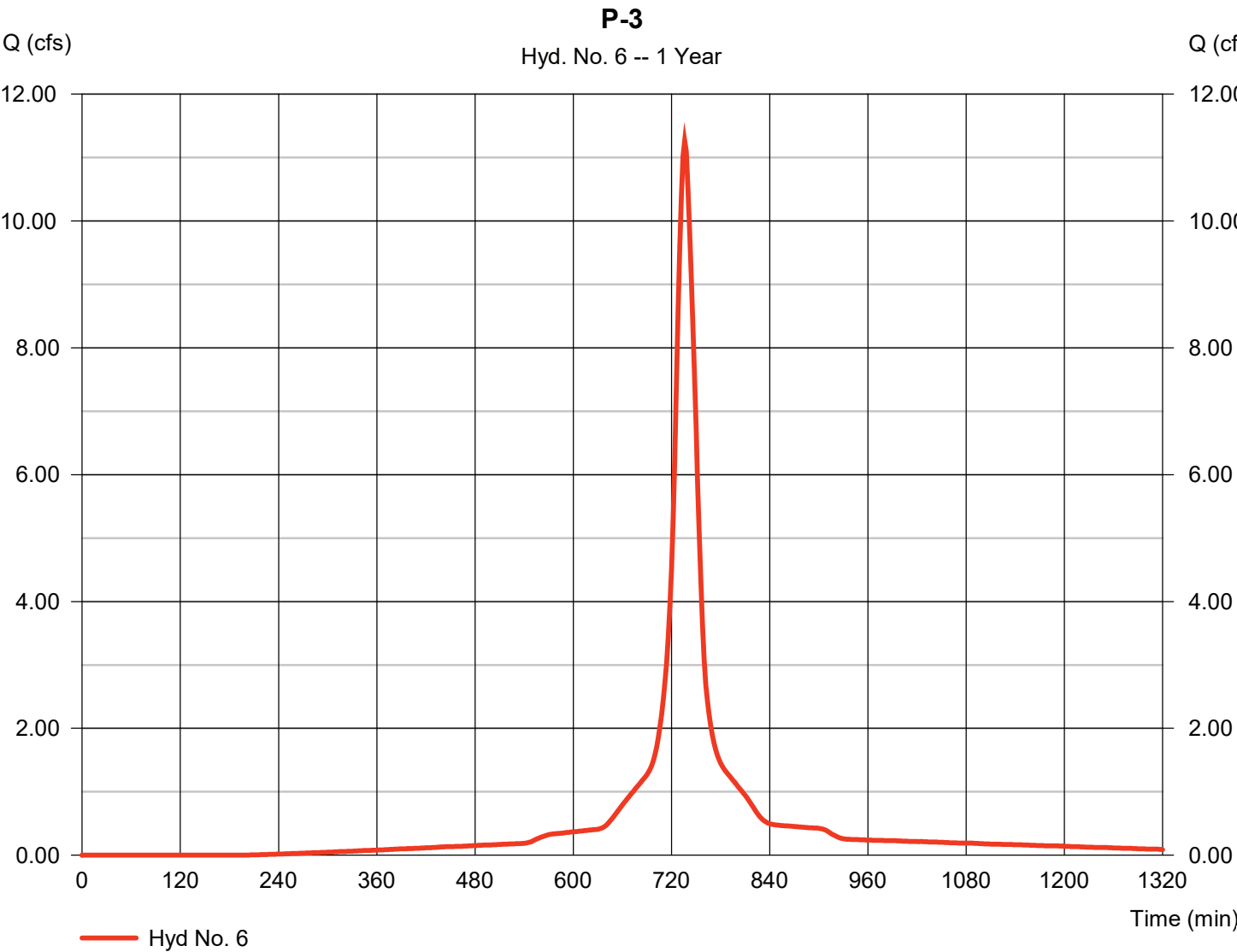
Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 11.26 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 0.958 acft
Drainage area	= 5.199 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.199



TR55 Tc Worksheet

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

Hyd. No. 6

P-3

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 92.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
Travel Time (min)	= 19.18	+	0.00	+
			0.00	= 19.18
Shallow Concentrated Flow				
Flow length (ft)	= 156.00	0.00	0.00	
Watercourse slope (%)	= 1.00	0.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=1.61	0.00	0.00	
Travel Time (min)	= 1.61	+	0.00	+
			0.00	= 1.61
Channel Flow				
X sectional flow area (sqft)	= 1.77	0.00	0.00	
Wetted perimeter (ft)	= 4.71	0.00	0.00	
Channel slope (%)	= 0.50	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=4.21	0.00	0.00	
Flow length (ft)	(0)614.0	0.0	0.0	
Travel Time (min)	= 2.43	+	0.00	+
			0.00	= 2.43
Total Travel Time, Tc				23.20 min

Precipitation Report

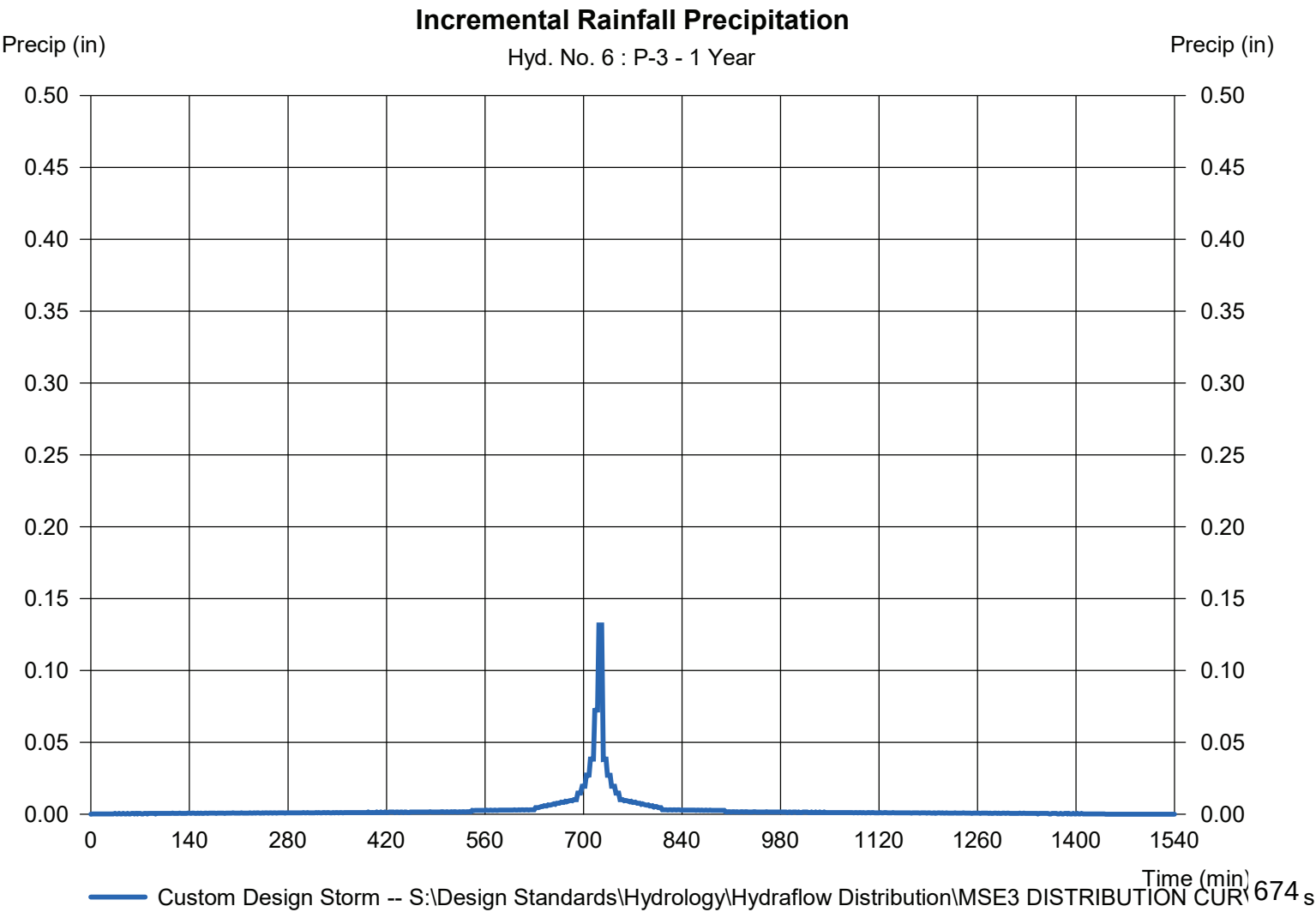
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

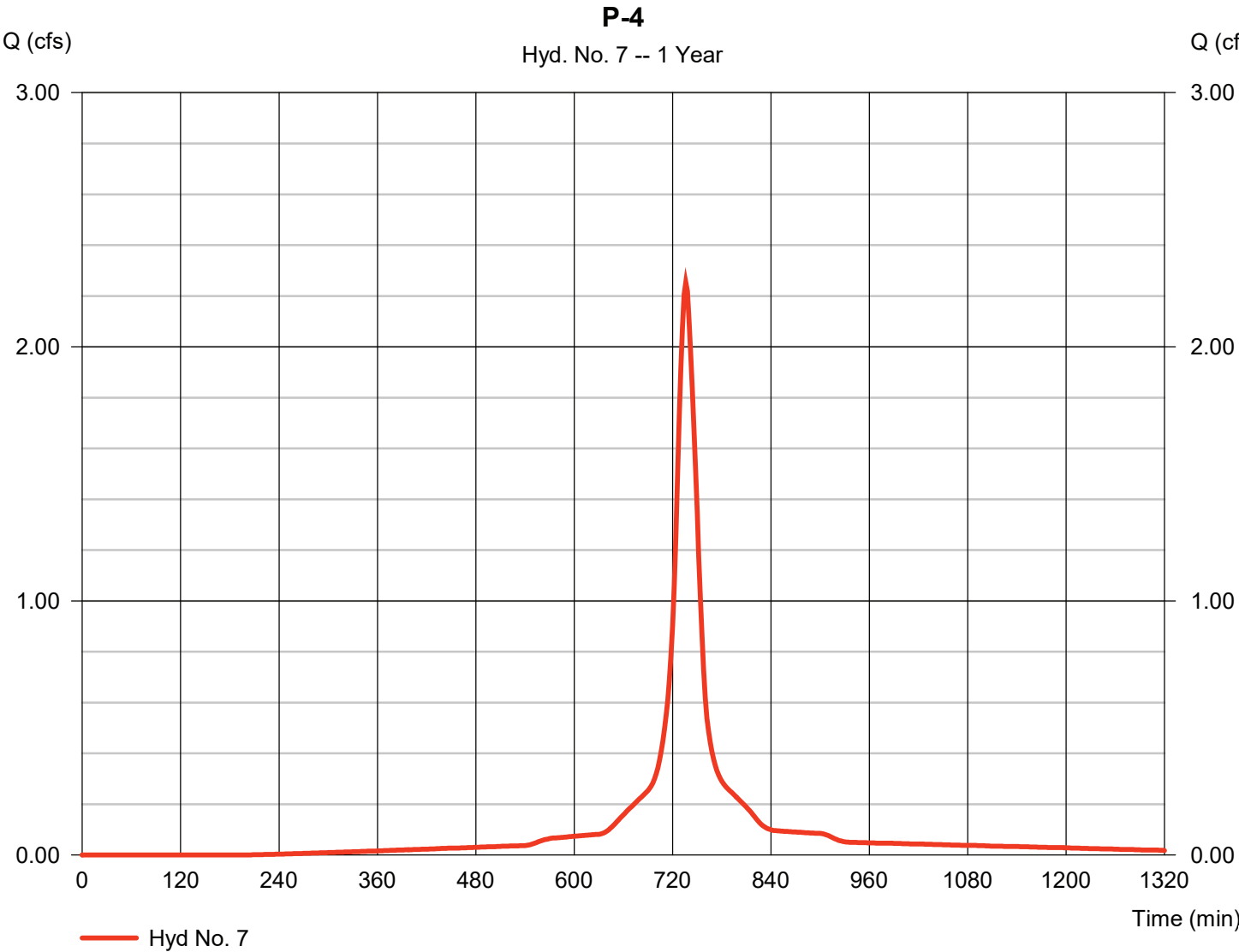
Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 2.253 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 0.192 acft
Drainage area	= 1.040 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.10 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



TR55 Tc Worksheet

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

Hyd. No. 7

P-4

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00				
Land slope (%)	= 1.00	0.00	0.00				
Travel Time (min)	= 20.50	+	0.00	+	0.00	=	20.50
Shallow Concentrated Flow							
Flow length (ft)	= 270.00	0.00	0.00				
Watercourse slope (%)	= 1.11	0.00	0.00				
Surface description	= Unpaved	Unpaved	Paved				
Average velocity (ft/s)	=1.70	0.00	0.00				
Travel Time (min)	= 2.65	+	0.00	+	0.00	=	2.65
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.013	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				23.10 min			

Precipitation Report

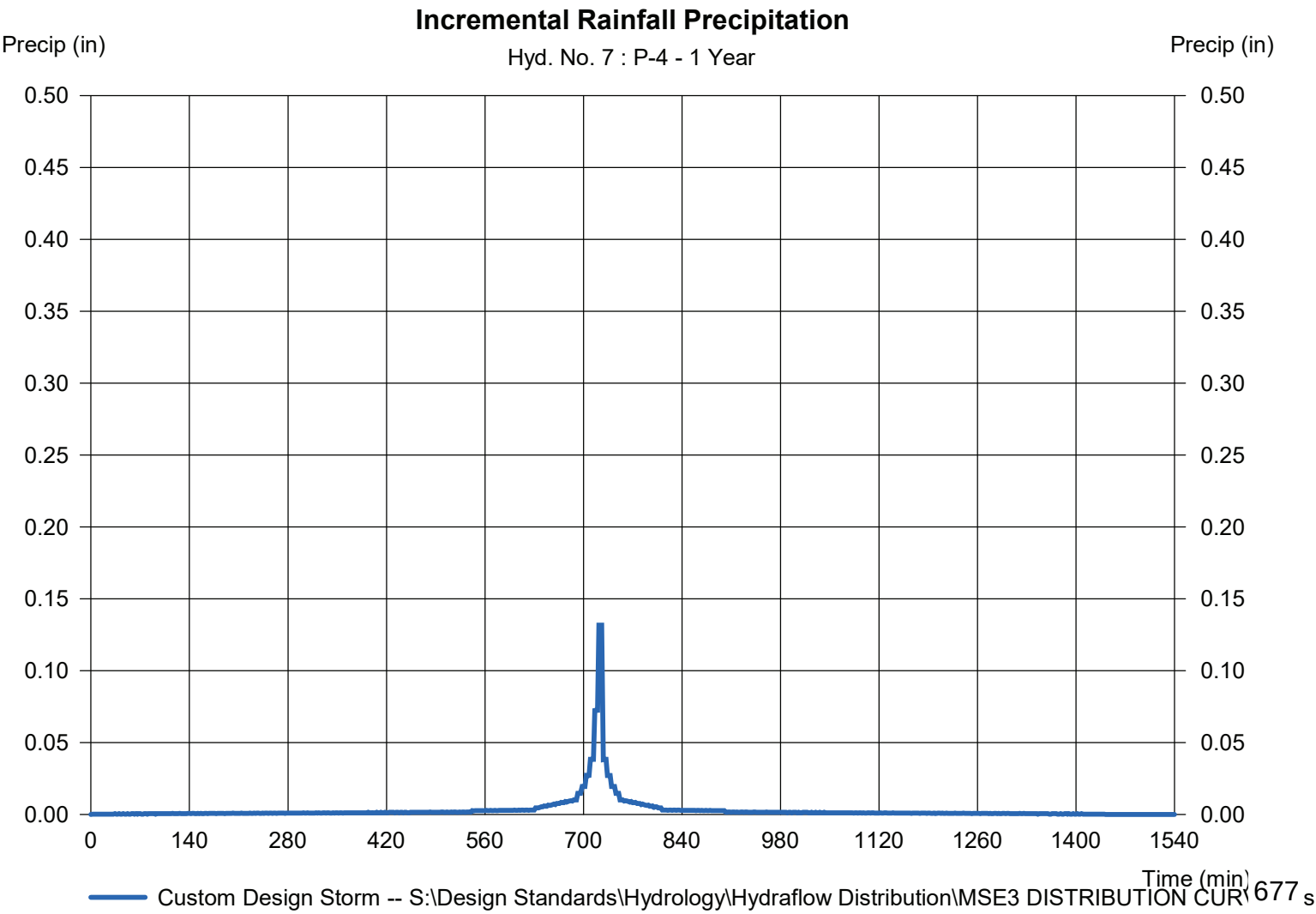
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

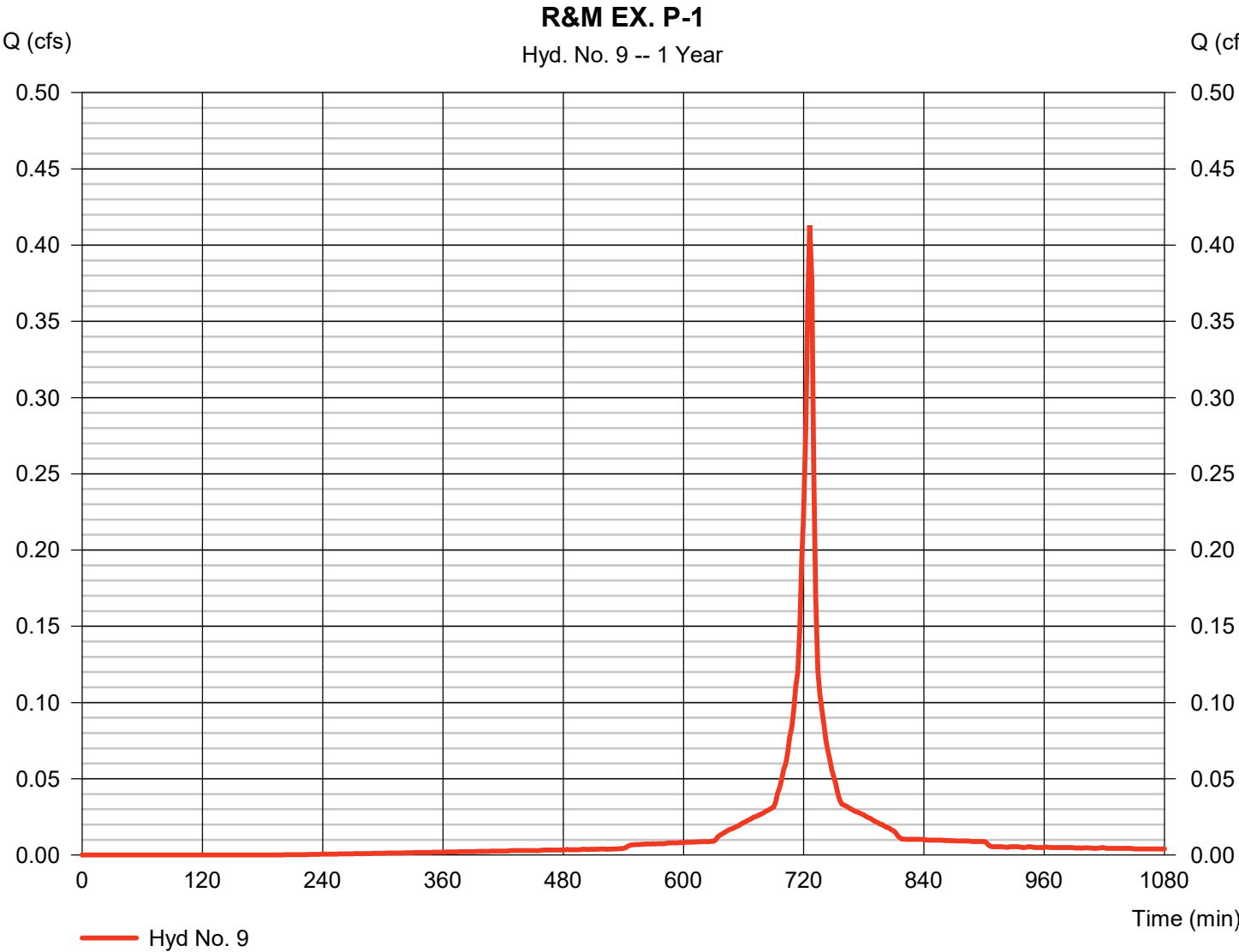
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.413 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.020 acft
Drainage area	= 0.120 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

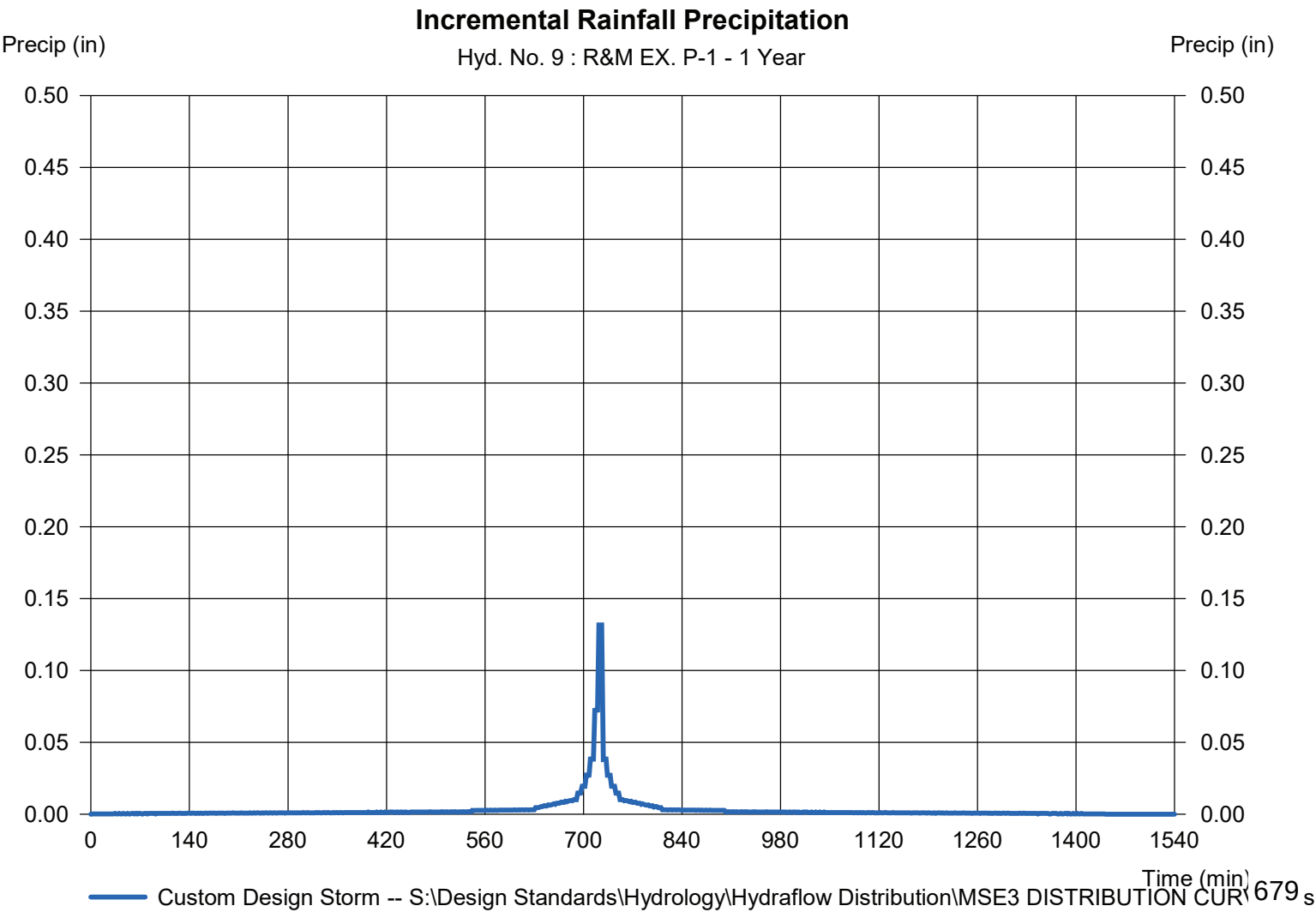
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

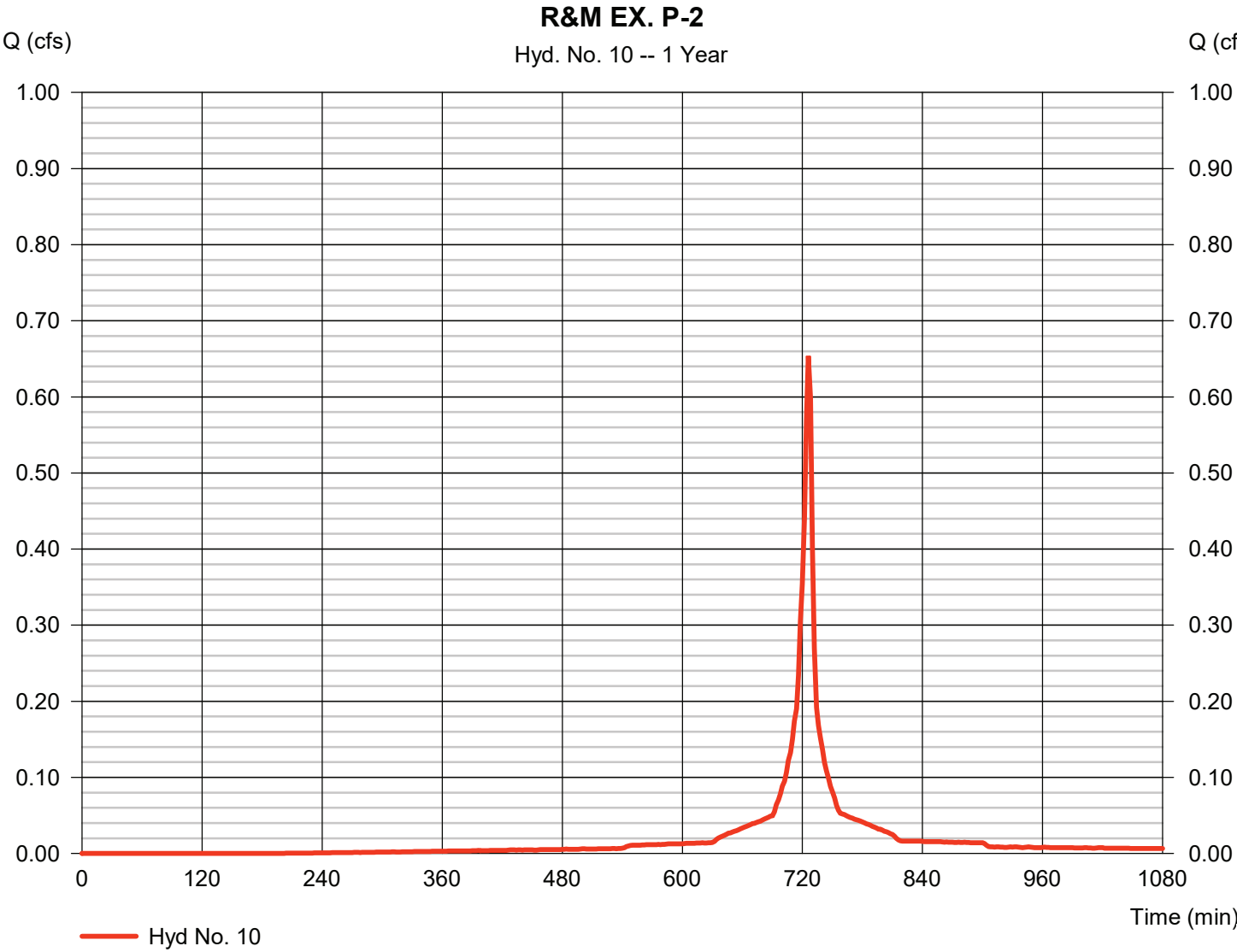
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.654 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.032 acft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD DISTRIBUTION CURVE		



Precipitation Report

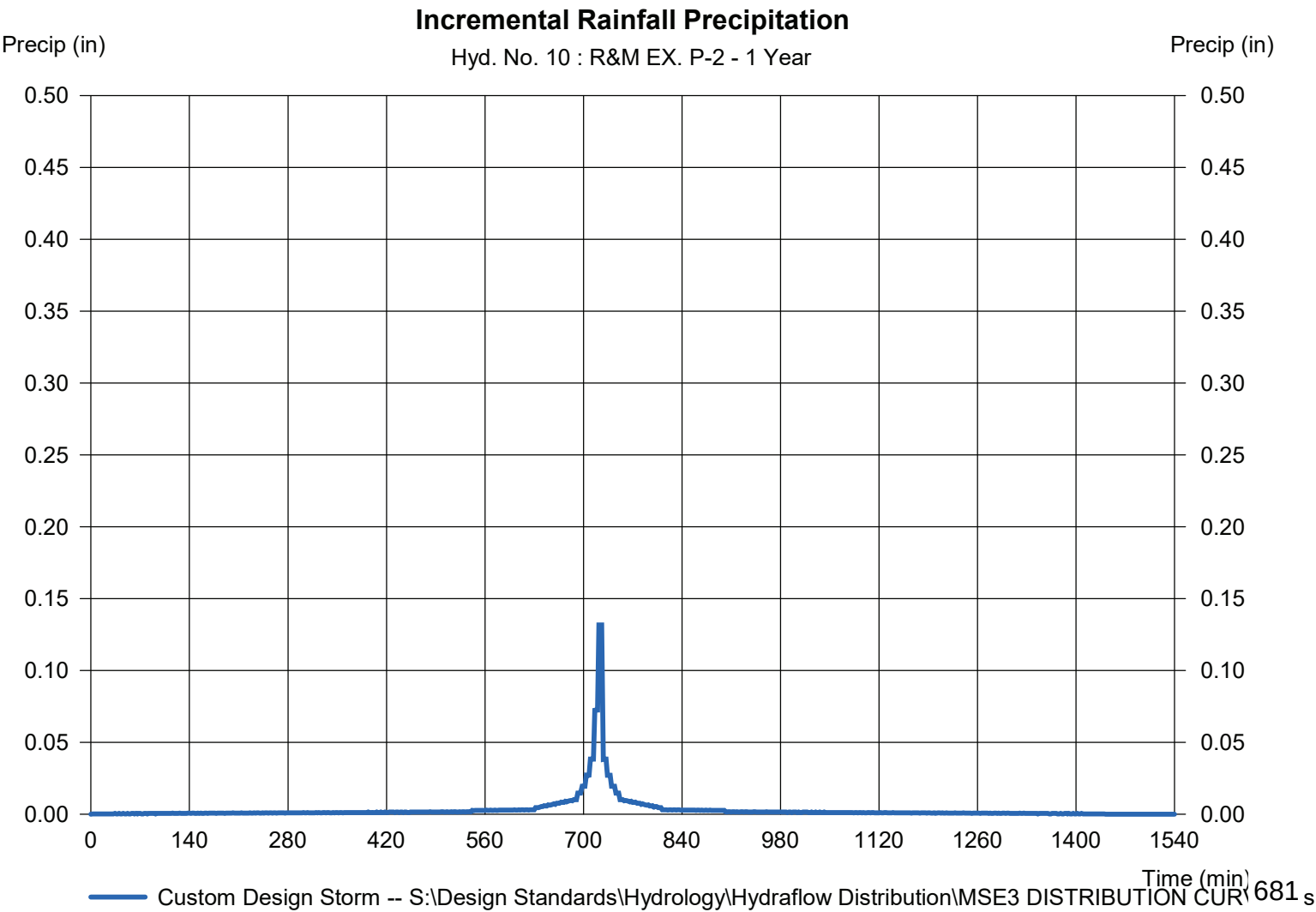
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

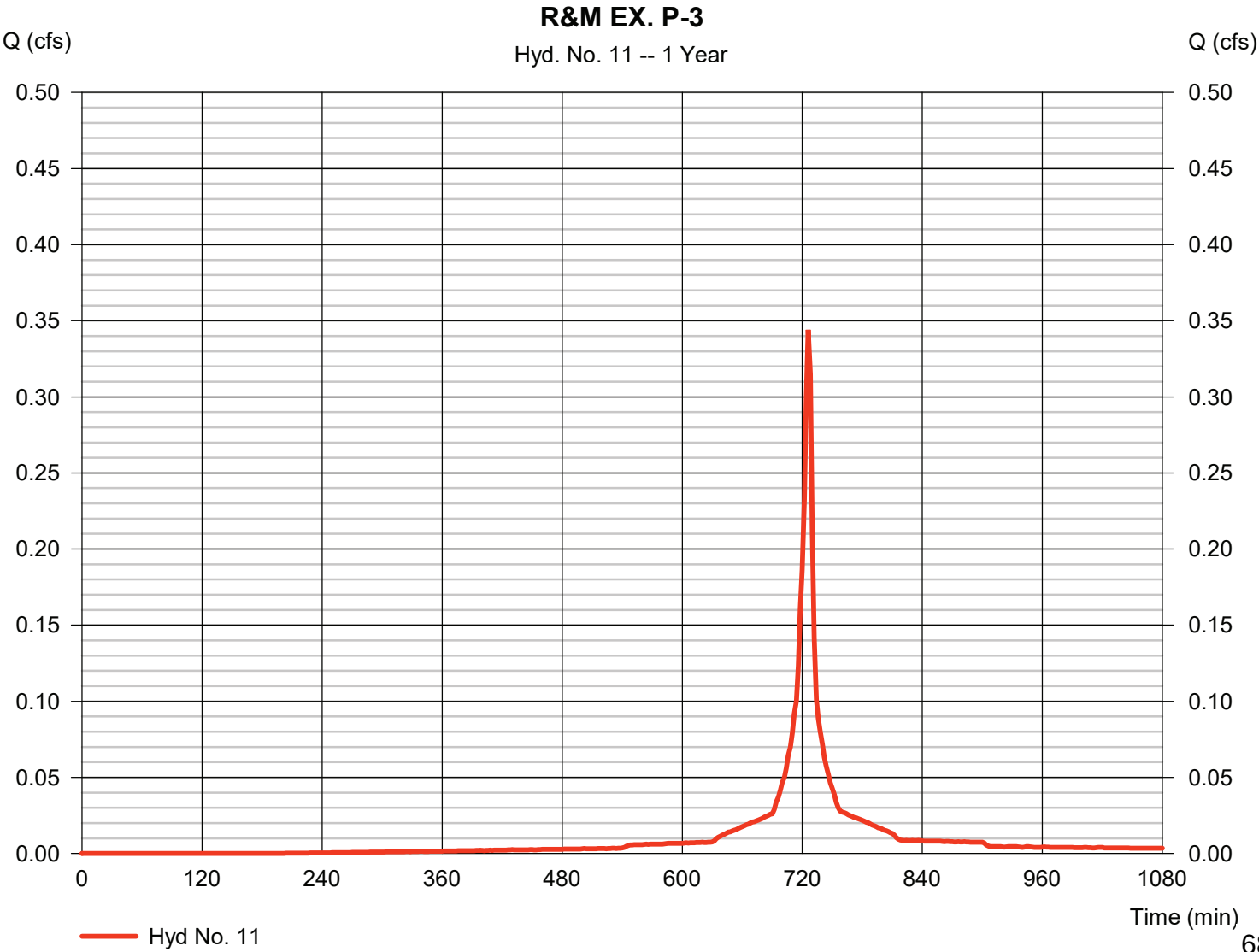
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Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.344 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.017 acft
Drainage area	= 0.100 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

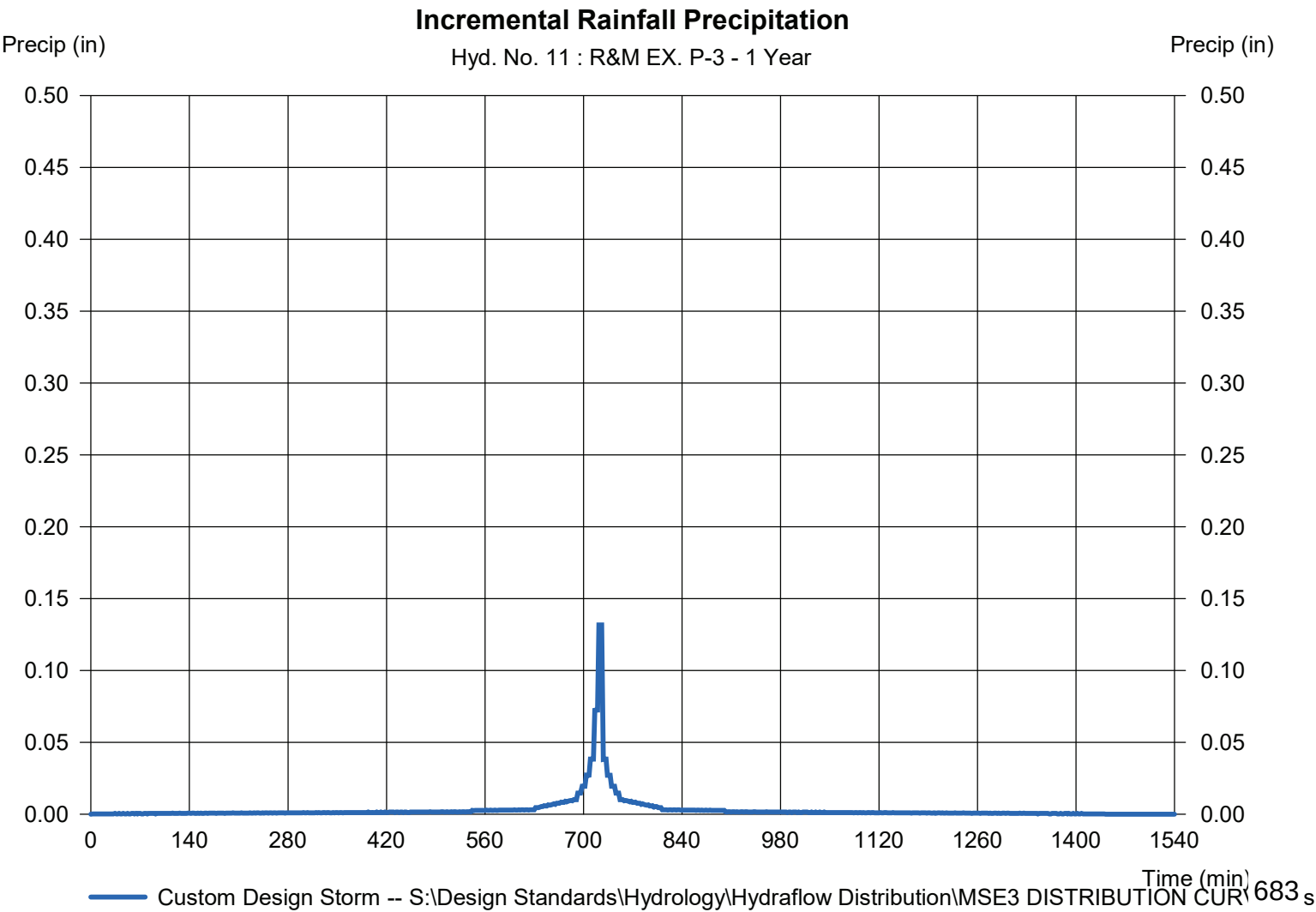
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION CUR		



Hydrograph Report

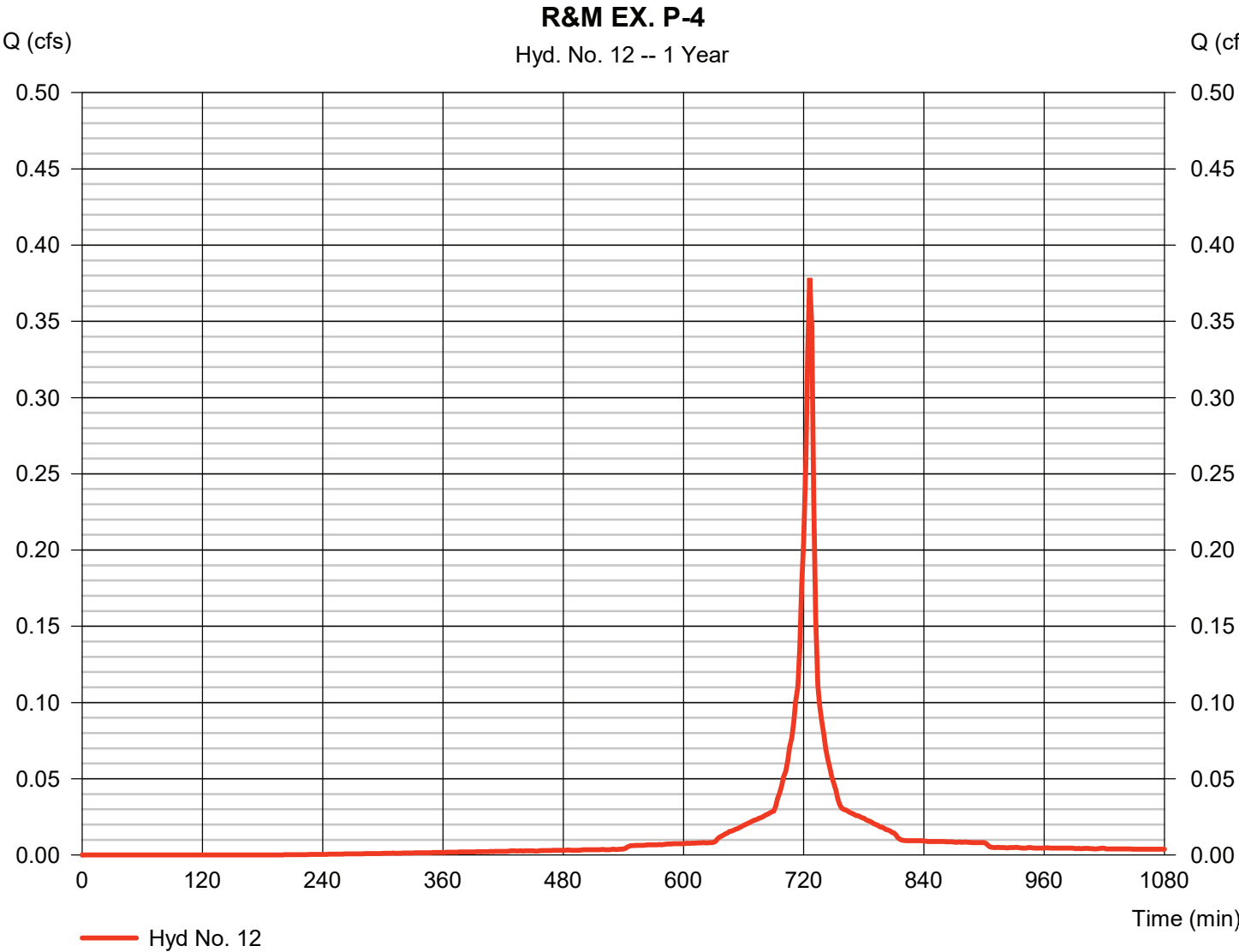
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Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.379 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.019 acft
Drainage area	= 0.110 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

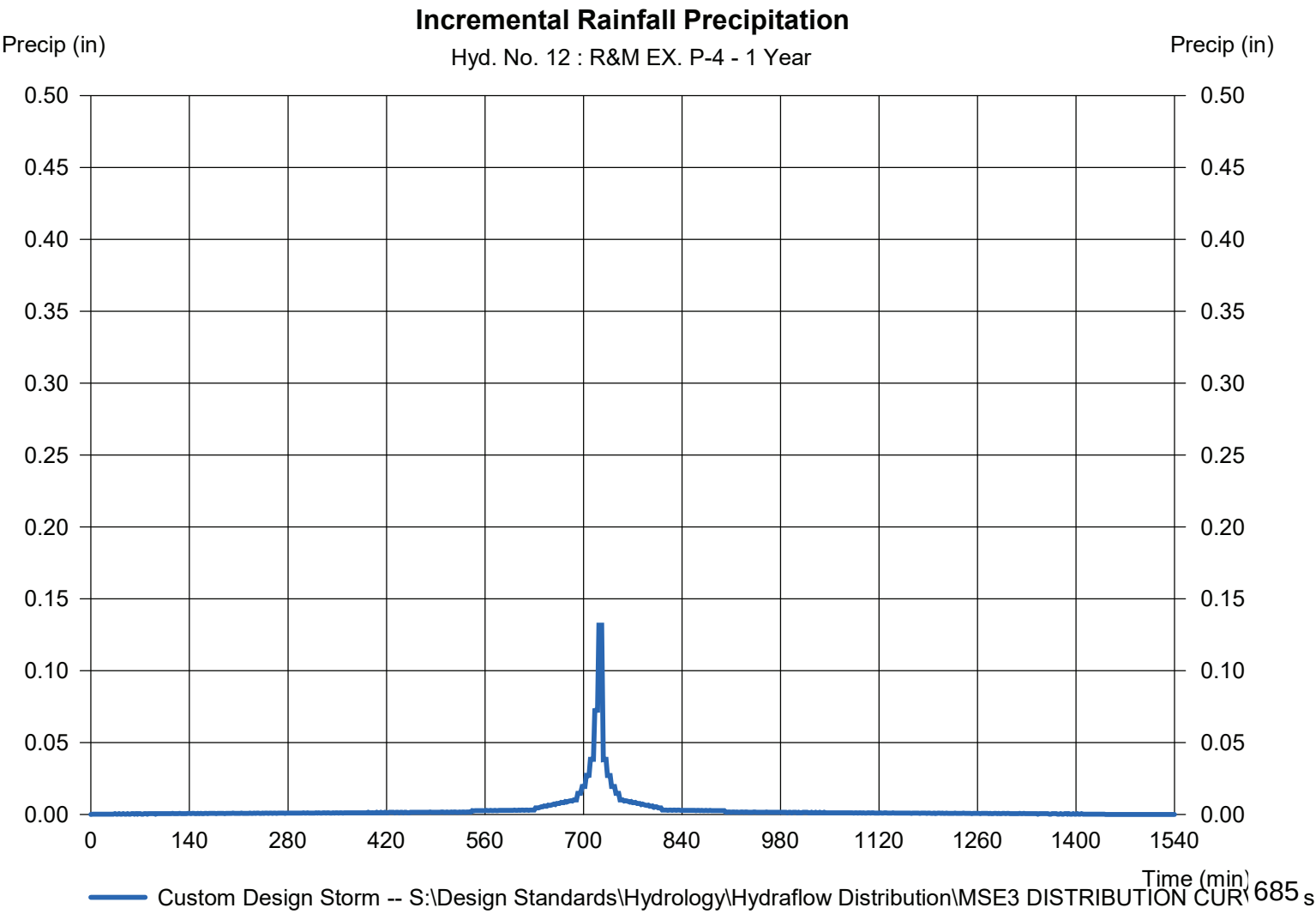
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

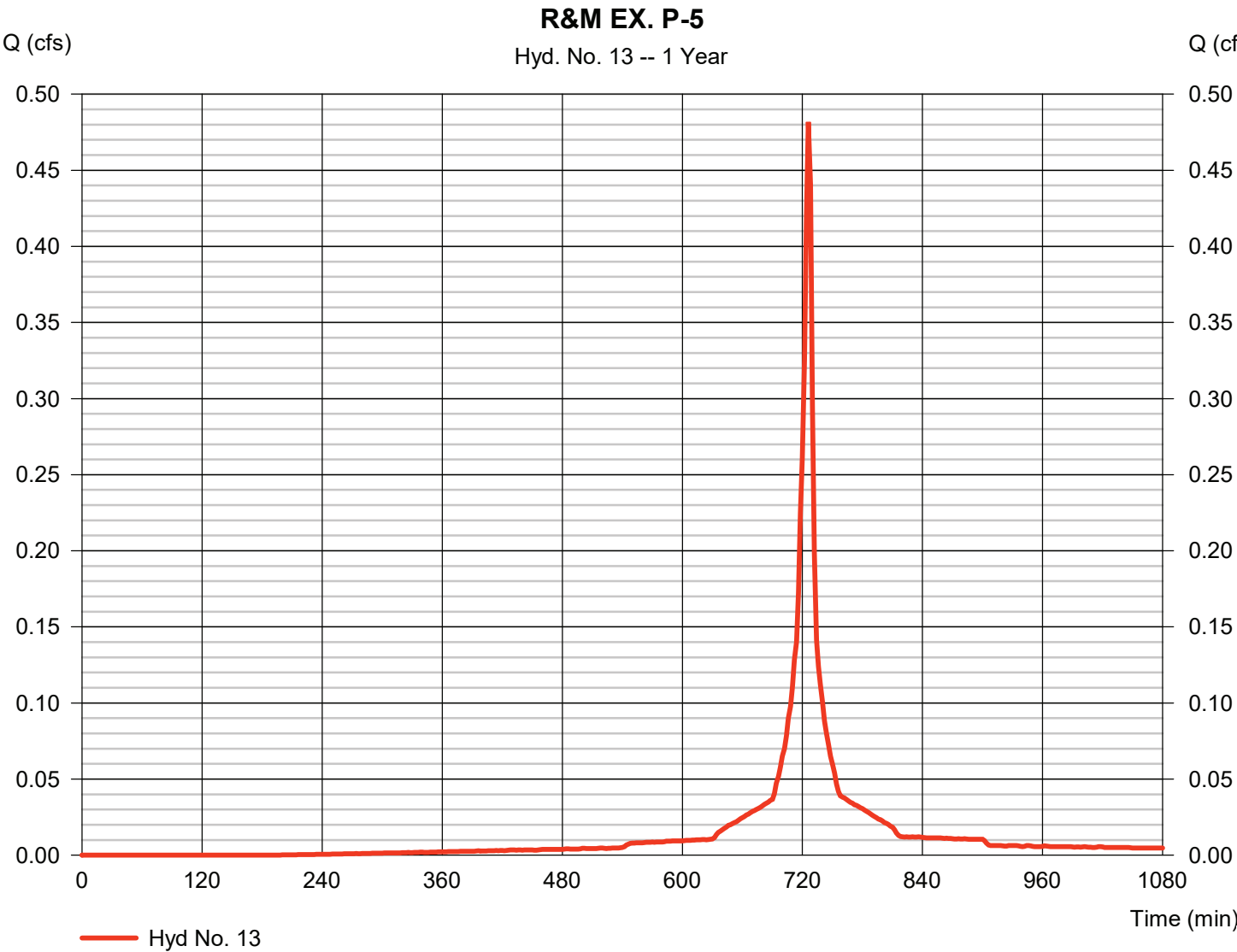
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Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.482 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.024 acft
Drainage area	= 0.140 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

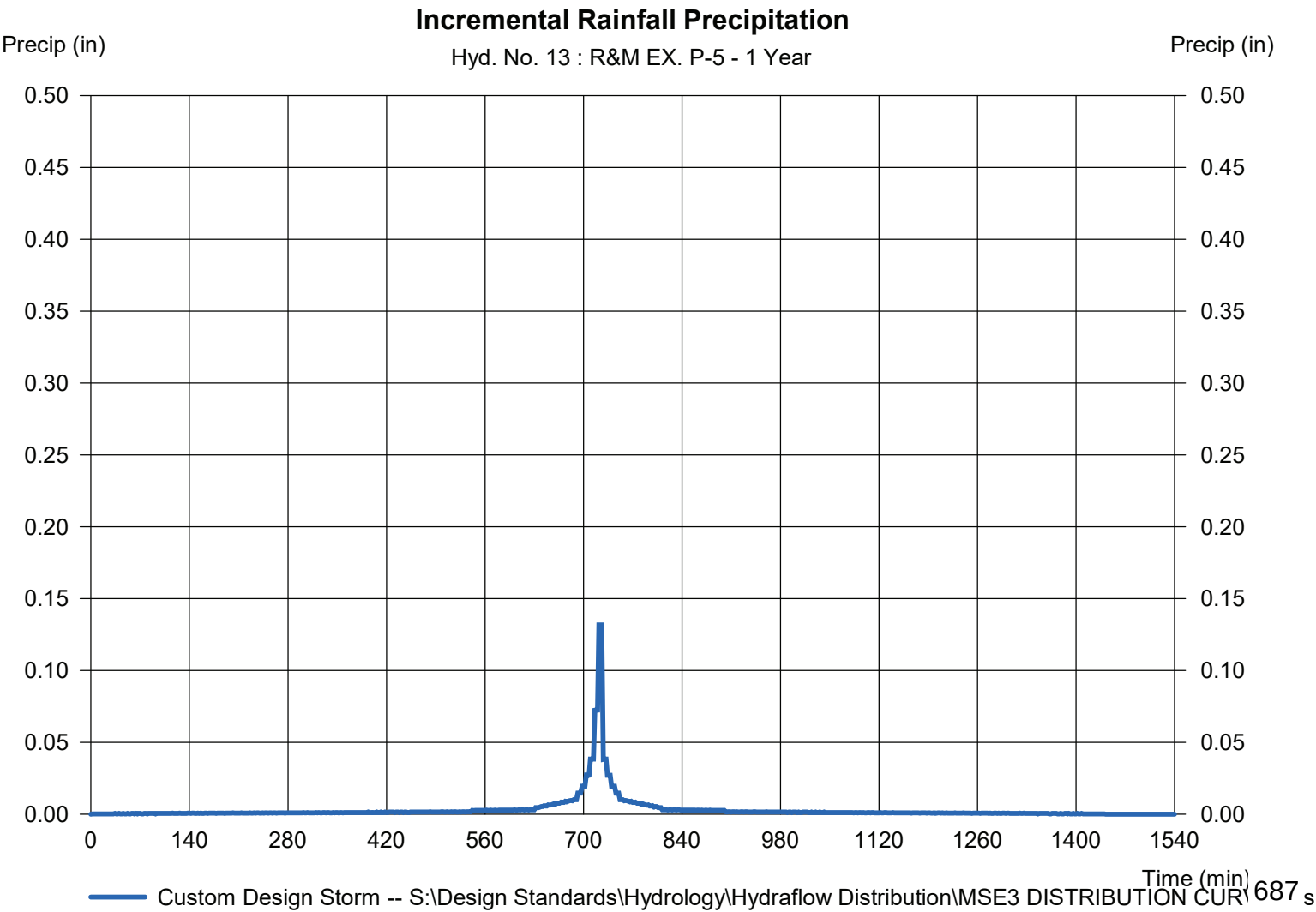
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

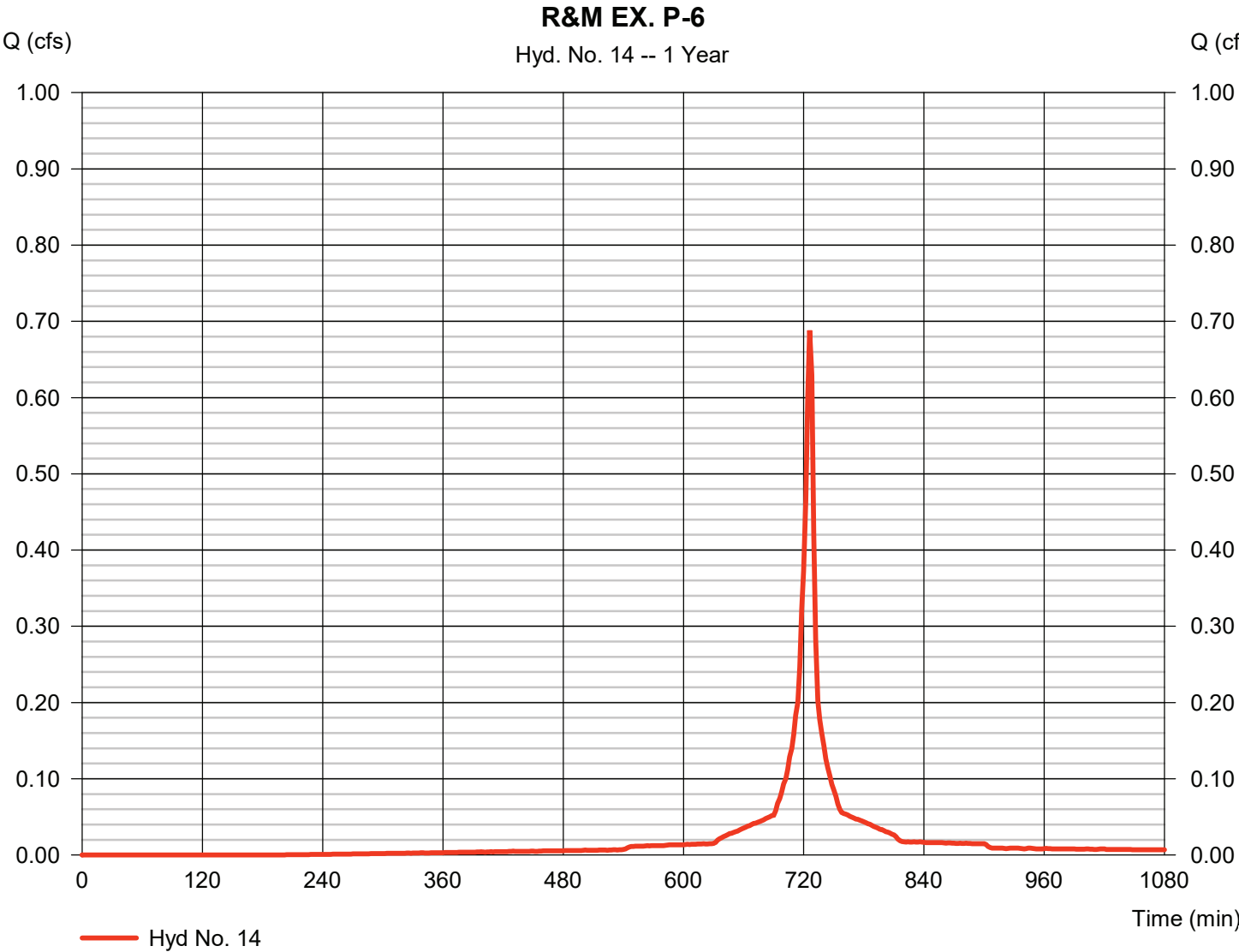
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Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.688 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.034 acft
Drainage area	= 0.200 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

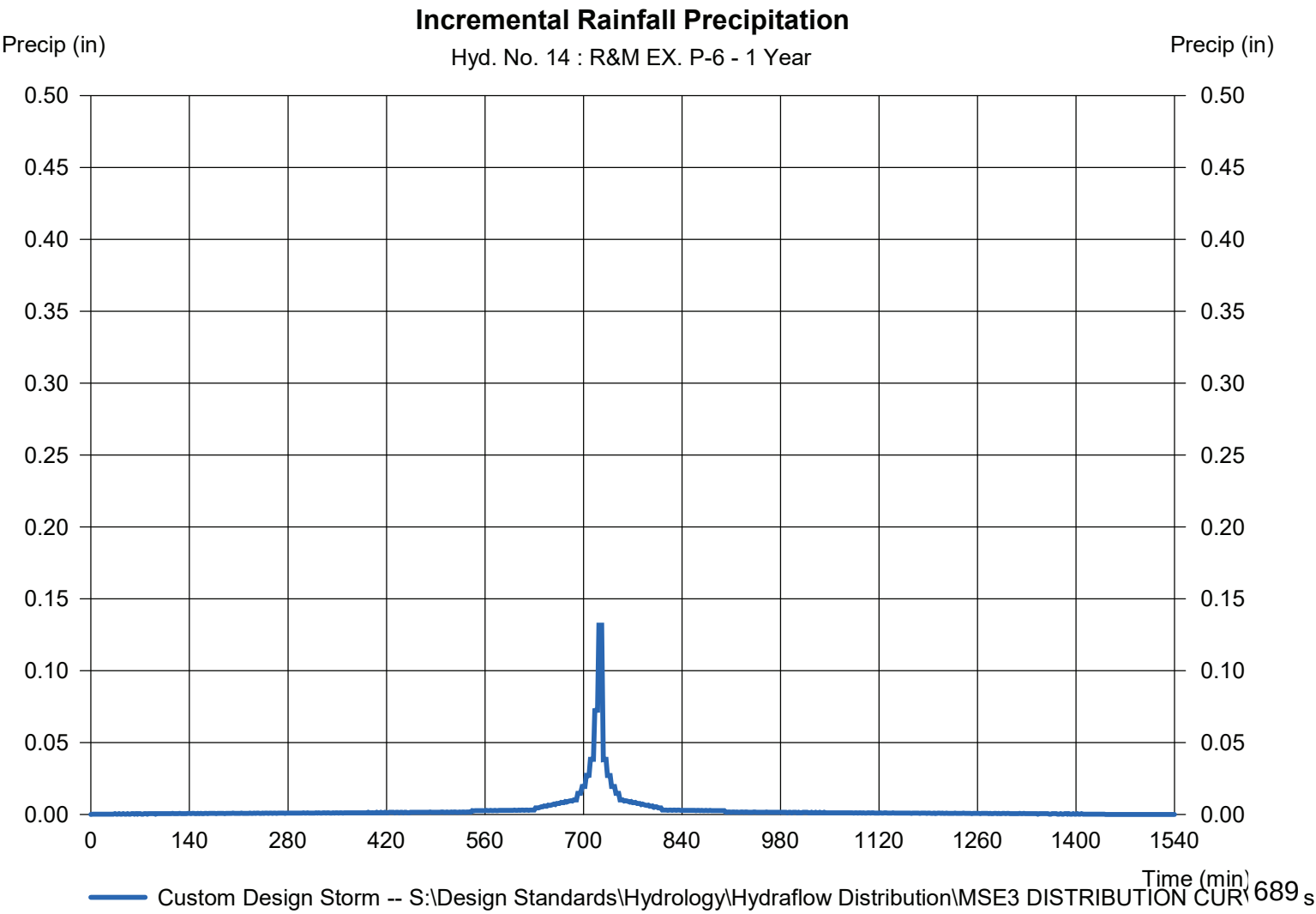
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

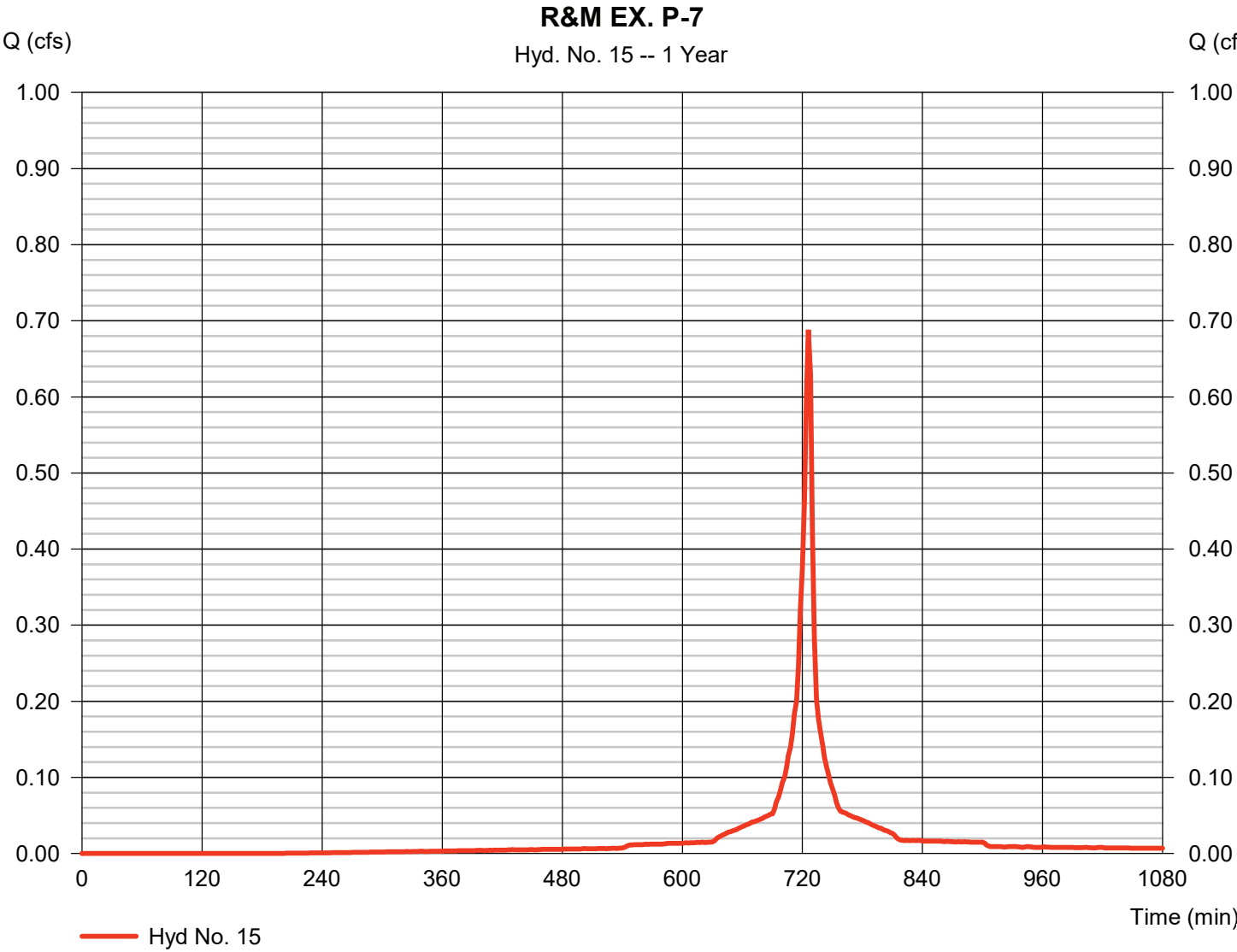
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.688 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.034 acft
Drainage area	= 0.200 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

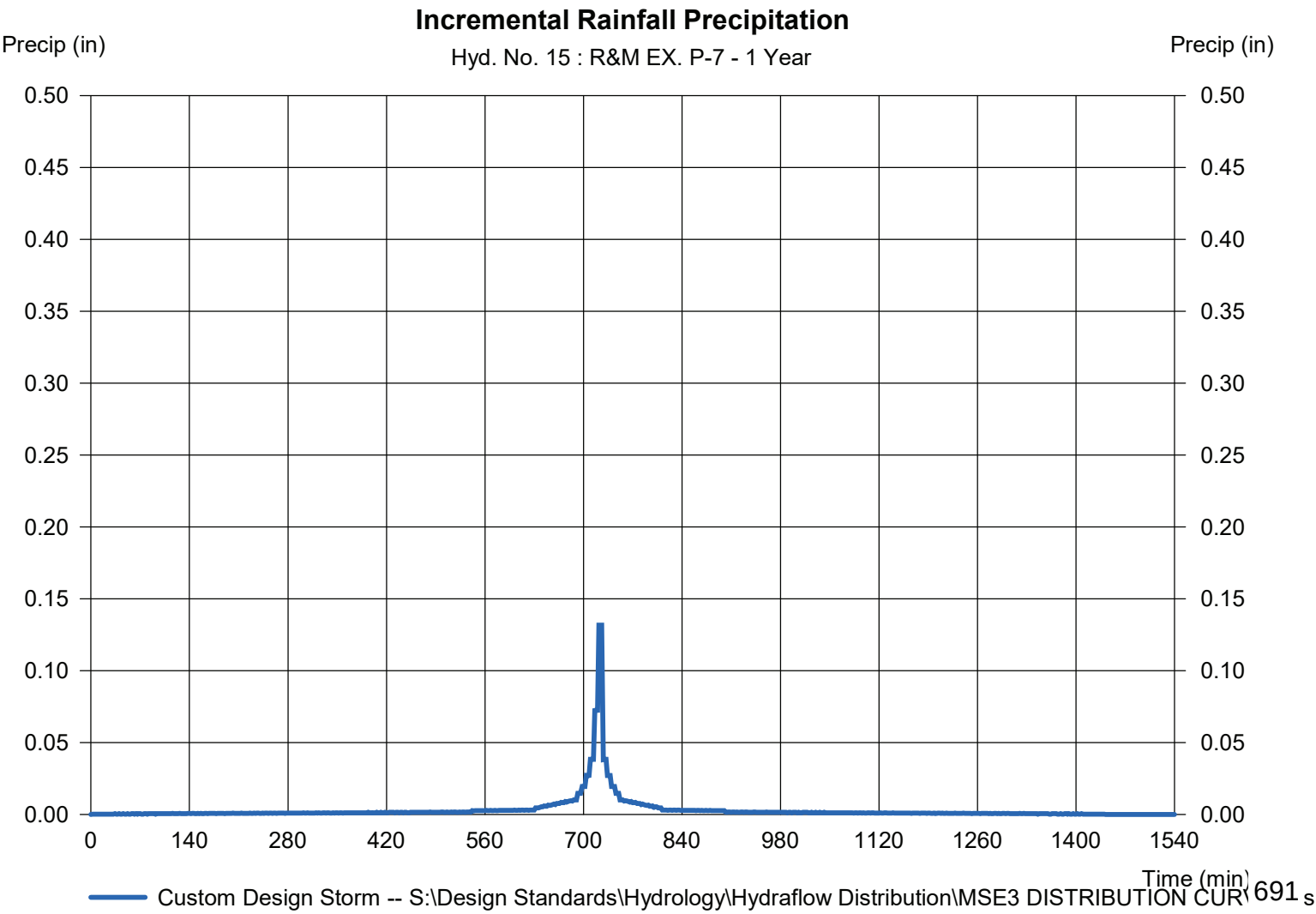
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

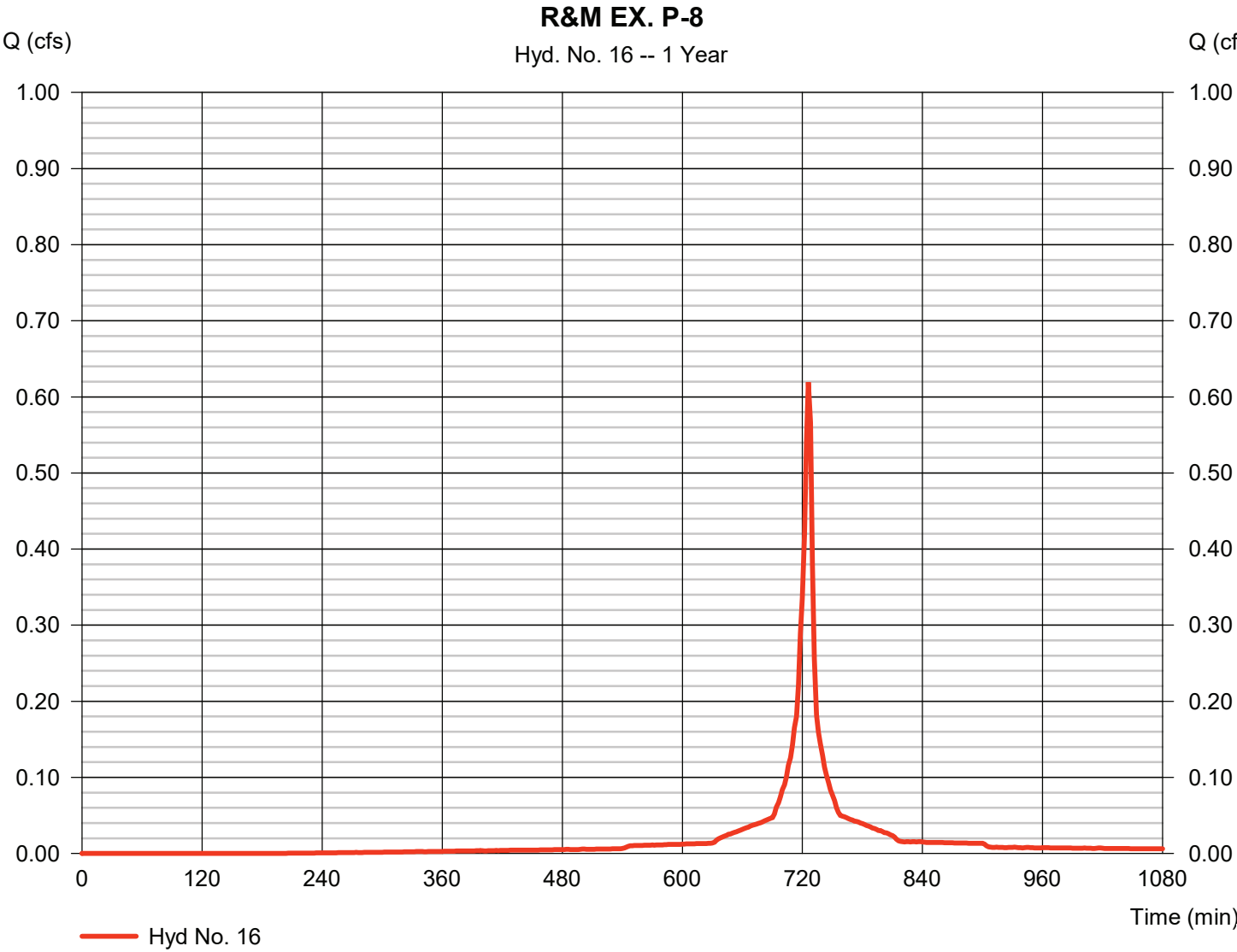
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.619 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.031 acft
Drainage area	= 0.180 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

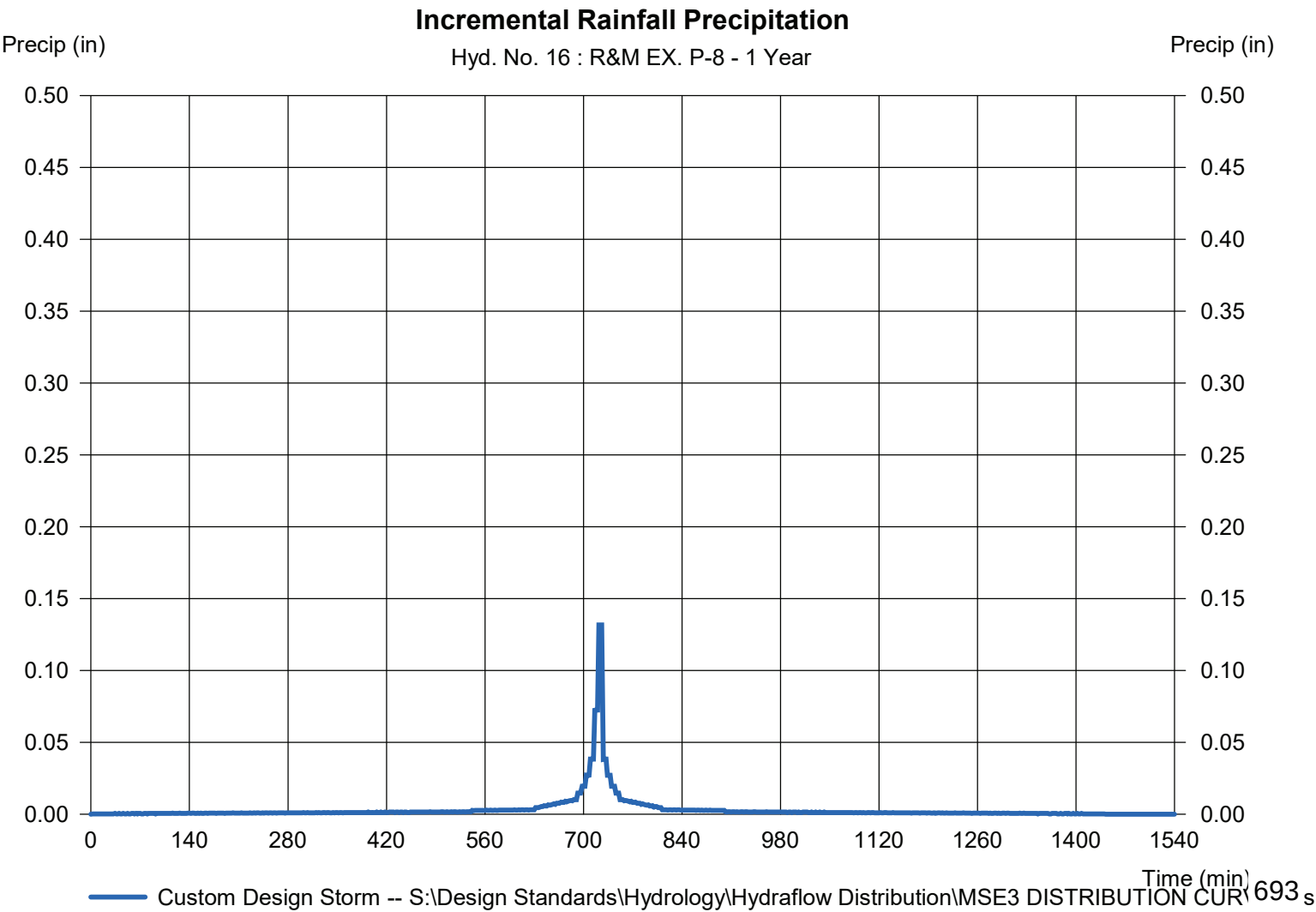
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION CUR		



Hydrograph Report

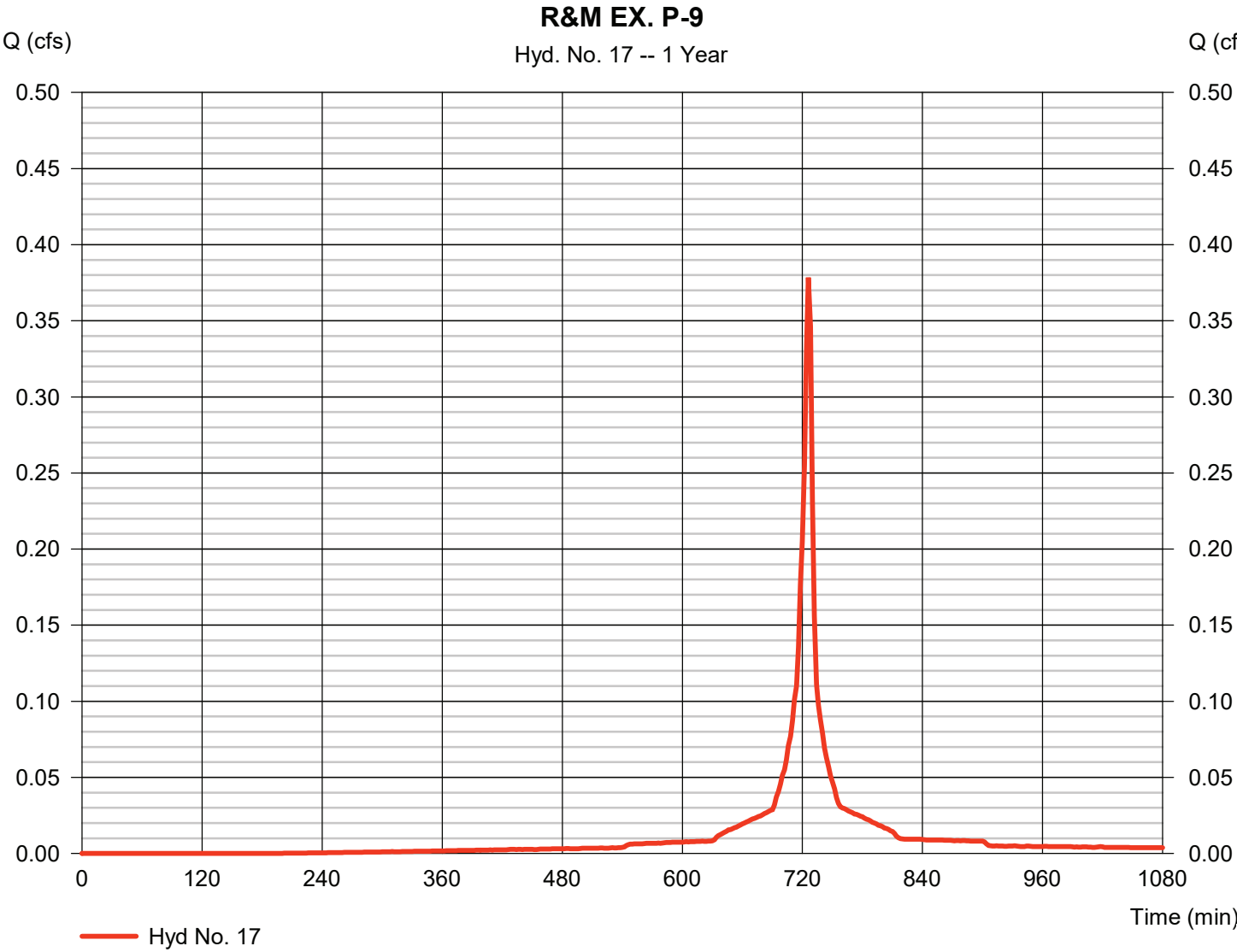
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.379 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.019 acft
Drainage area	= 0.110 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

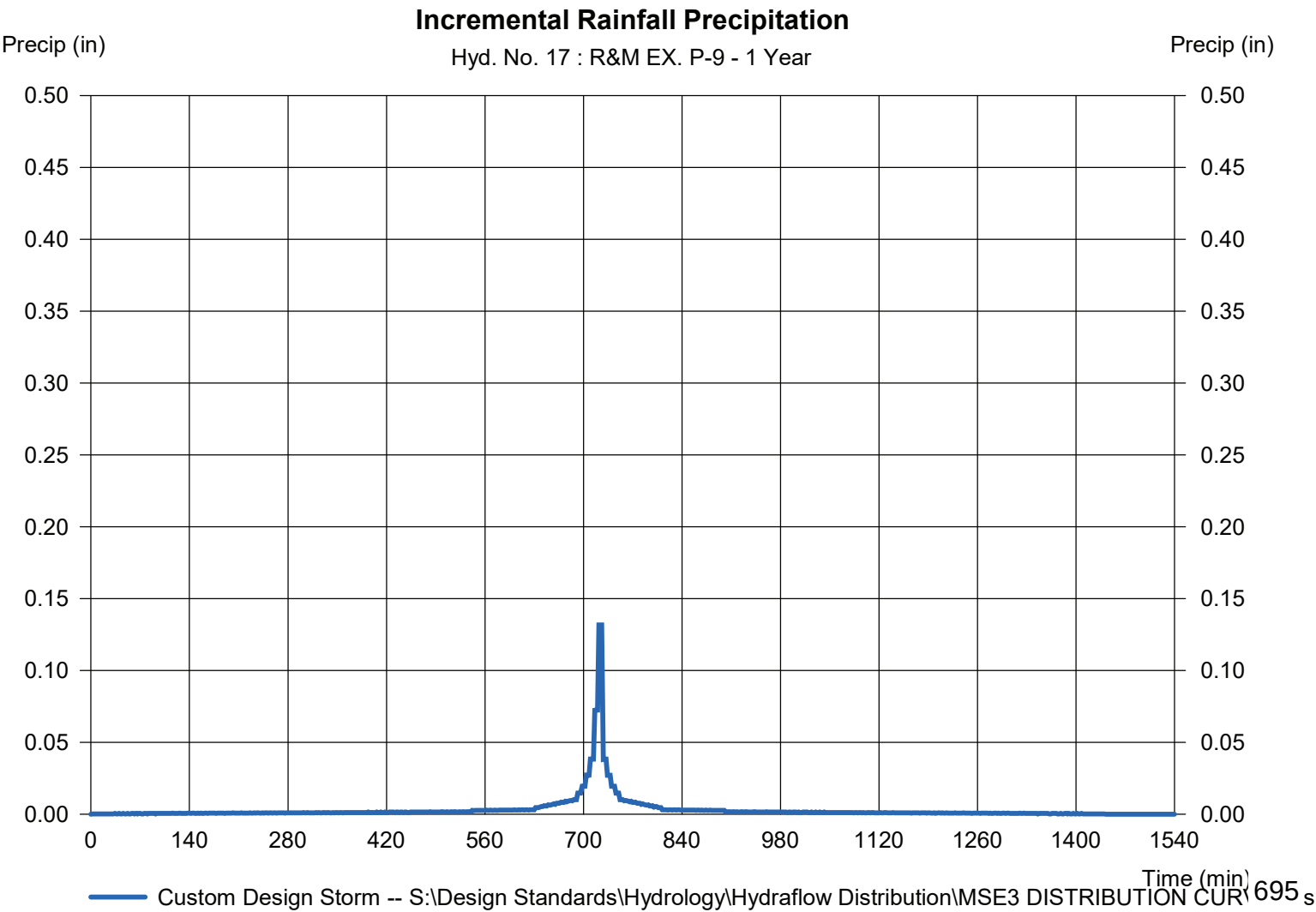
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

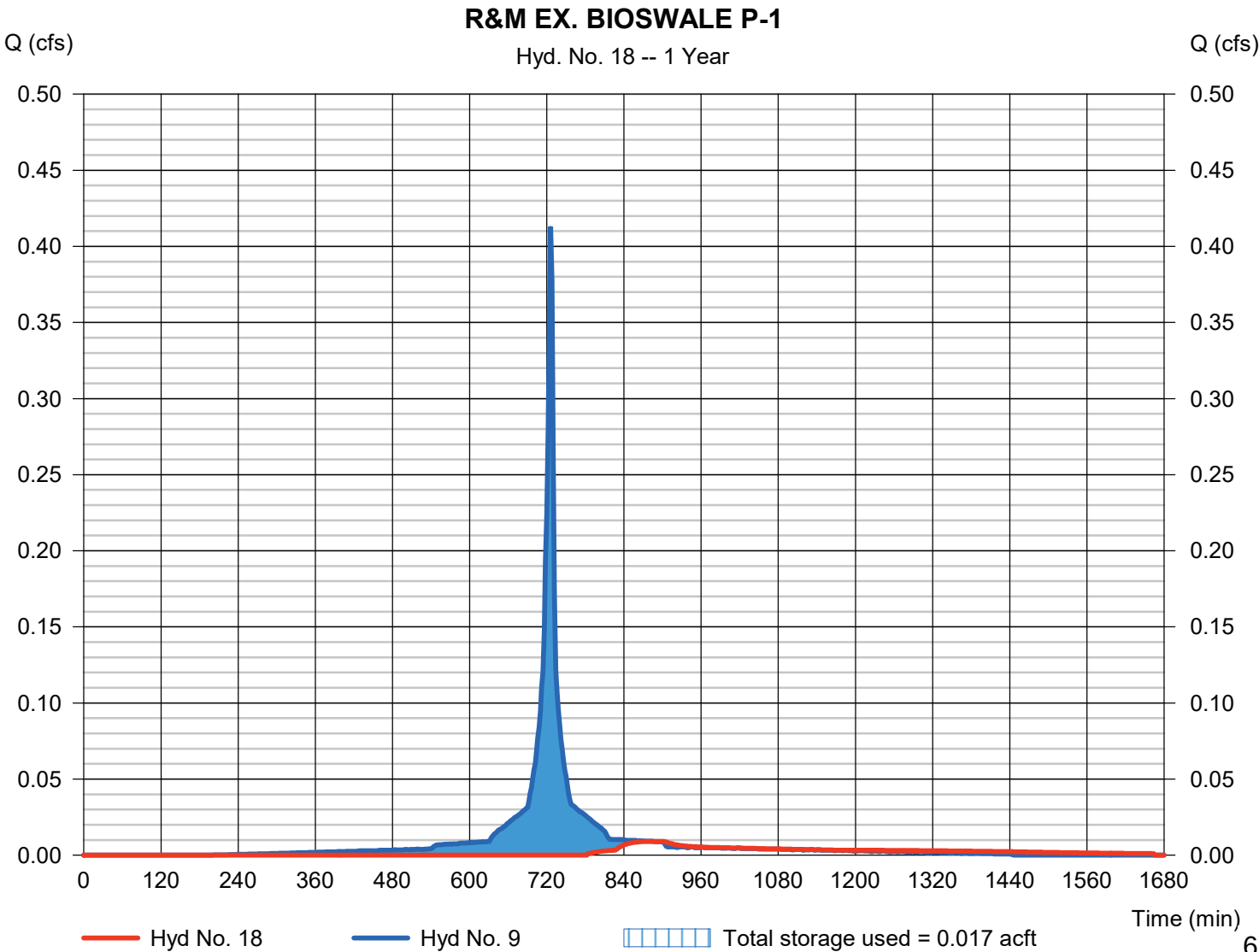
Friday, 06 / 28 / 2019

Hyd. No. 18

R&M EX. BIOSWALE P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.009 cfs
Storm frequency	= 1 yrs	Time to peak	= 884 min
Time interval	= 2 min	Hyd. volume	= 0.004 acft
Inflow hyd. No.	= 9 - R&M EX. P-1	Max. Elevation	= 851.61 ft
Reservoir name	= Ex. Bioswale P-1	Max. Storage	= 0.017 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 10 - Ex. Bioswale P-1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 850.40 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	850.40	247	0.000	0.000
0.10	850.50	307	0.001	0.001
0.60	851.00	608	0.005	0.006
1.10	851.50	914	0.009	0.014
1.60	852.00	1,225	0.012	0.027
1.69	852.09	1,284	0.003	0.029

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 851.59	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	850.40	---	---	---	---	0.00	---	---	---	---	---	0.000
0.01	0.000	850.41	---	---	---	---	0.00	---	---	---	---	---	0.000
0.02	0.000	850.42	---	---	---	---	0.00	---	---	---	---	---	0.000
0.03	0.000	850.43	---	---	---	---	0.00	---	---	---	---	---	0.000
0.04	0.000	850.44	---	---	---	---	0.00	---	---	---	---	---	0.000
0.05	0.000	850.45	---	---	---	---	0.00	---	---	---	---	---	0.000
0.06	0.000	850.46	---	---	---	---	0.00	---	---	---	---	---	0.000
0.07	0.000	850.47	---	---	---	---	0.00	---	---	---	---	---	0.000
0.08	0.001	850.48	---	---	---	---	0.00	---	---	---	---	---	0.000
0.09	0.001	850.49	---	---	---	---	0.00	---	---	---	---	---	0.000
0.10	0.001	850.50	---	---	---	---	0.00	---	---	---	---	---	0.000
0.15	0.001	850.55	---	---	---	---	0.00	---	---	---	---	---	0.000
0.20	0.002	850.60	---	---	---	---	0.00	---	---	---	---	---	0.000
0.25	0.002	850.65	---	---	---	---	0.00	---	---	---	---	---	0.000
0.30	0.003	850.70	---	---	---	---	0.00	---	---	---	---	---	0.000
0.35	0.003	850.75	---	---	---	---	0.00	---	---	---	---	---	0.000
0.40	0.004	850.80	---	---	---	---	0.00	---	---	---	---	---	0.000
0.45	0.004	850.85	---	---	---	---	0.00	---	---	---	---	---	0.000
0.50	0.005	850.90	---	---	---	---	0.00	---	---	---	---	---	0.000
0.55	0.005	850.95	---	---	---	---	0.00	---	---	---	---	---	0.000
0.60	0.006	851.00	---	---	---	---	0.00	---	---	---	---	---	0.000
0.65	0.007	851.05	---	---	---	---	0.00	---	---	---	---	---	0.000
0.70	0.008	851.10	---	---	---	---	0.00	---	---	---	---	---	0.000
0.75	0.008	851.15	---	---	---	---	0.00	---	---	---	---	---	0.000
0.80	0.009	851.20	---	---	---	---	0.00	---	---	---	---	---	0.000
0.85	0.010	851.25	---	---	---	---	0.00	---	---	---	---	---	0.000
0.90	0.011	851.30	---	---	---	---	0.00	---	---	---	---	---	0.000
0.95	0.012	851.35	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	0.013	851.40	---	---	---	---	0.00	---	---	---	---	---	0.000
1.05	0.014	851.45	---	---	---	---	0.00	---	---	---	---	---	0.000
1.10	0.014	851.50	---	---	---	---	0.00	---	---	---	---	---	0.000
1.15	0.016	851.55	---	---	---	---	0.00	---	---	---	---	---	0.000
1.20	0.017	851.60	---	---	---	---	0.00	---	---	---	---	---	0.003
1.25	0.018	851.65	---	---	---	---	0.05	---	---	---	---	---	0.049
1.30	0.019	851.70	---	---	---	---	0.12	---	---	---	---	---	0.121
1.35	0.021	851.75	---	---	---	---	0.21	---	---	---	---	---	0.213
1.40	0.022	851.80	---	---	---	---	0.32	---	---	---	---	---	0.320

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Continues on next page...

Ex. Bioswale P-1

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.45	0.023	851.85	---	---	---	---	0.44	---	---	---	---	---	0.441
1.50	0.024	851.90	---	---	---	---	0.57	---	---	---	---	---	0.574
1.55	0.025	851.95	---	---	---	---	0.72	---	---	---	---	---	0.719
1.60	0.027	852.00	---	---	---	---	0.87	---	---	---	---	---	0.874
1.61	0.027	852.01	---	---	---	---	0.90	---	---	---	---	---	0.903
1.62	0.027	852.02	---	---	---	---	0.93	---	---	---	---	---	0.932
1.63	0.027	852.03	---	---	---	---	0.96	---	---	---	---	---	0.962
1.64	0.028	852.04	---	---	---	---	0.99	---	---	---	---	---	0.991
1.64	0.028	852.04	---	---	---	---	1.02	---	---	---	---	---	1.021
1.65	0.028	852.05	---	---	---	---	1.05	---	---	---	---	---	1.052
1.66	0.029	852.06	---	---	---	---	1.08	---	---	---	---	---	1.083
1.67	0.029	852.07	---	---	---	---	1.11	---	---	---	---	---	1.113
1.68	0.029	852.08	---	---	---	---	1.14	---	---	---	---	---	1.145
1.69	0.029	852.09	---	---	---	---	1.18	---	---	---	---	---	1.177

...End

Hydrograph Report

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

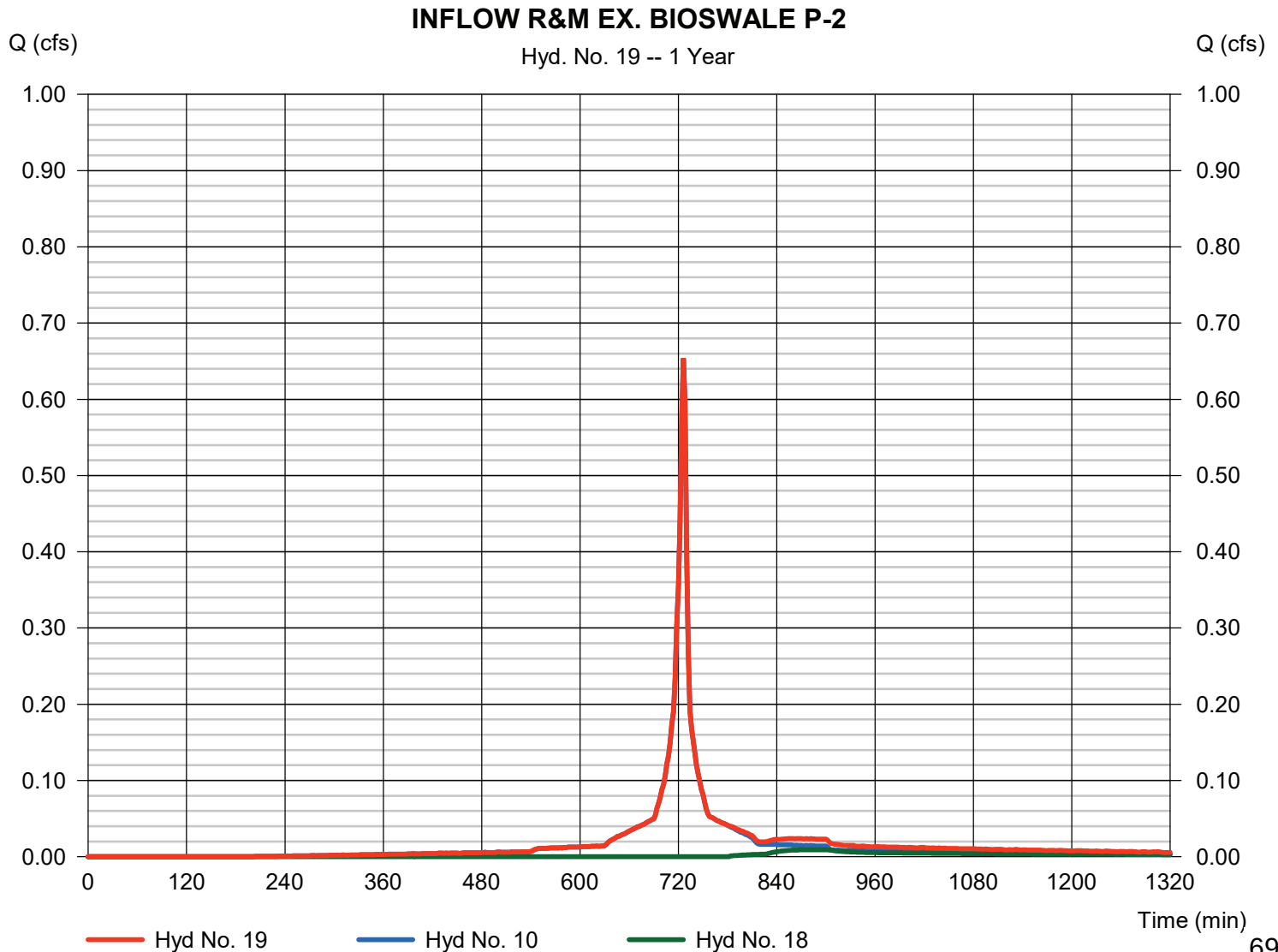
Friday, 06 / 28 / 2019

Hyd. No. 19

INFLOW R&M EX. BIOSWALE P-2

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 10, 18

Peak discharge = 0.654 cfs
 Time to peak = 726 min
 Hyd. volume = 0.037 acft
 Contrib. drain. area = 0.190 ac



Hydrograph Report

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

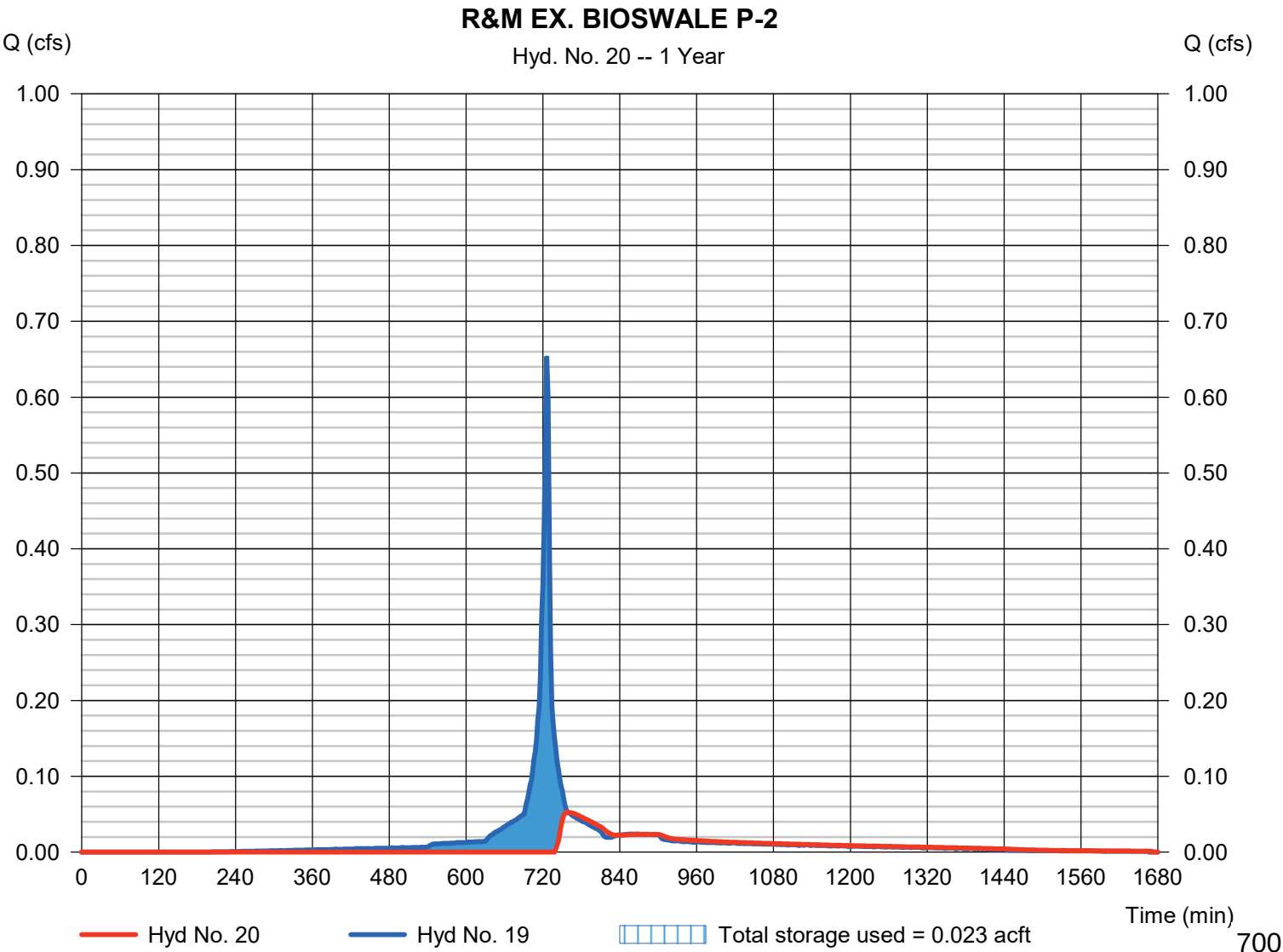
Friday, 06 / 28 / 2019

Hyd. No. 20

R&M EX. BIOSWALE P-2

Hydrograph type	= Reservoir	Peak discharge	= 0.052 cfs
Storm frequency	= 1 yrs	Time to peak	= 758 min
Time interval	= 2 min	Hyd. volume	= 0.015 acft
Inflow hyd. No.	= 19 - INFLOW R&M EX. BIOSWALE P-2	Max. Elevation	= 851.33 ft
Reservoir name	= Ex. Bioswale P-2	Max. Storage	= 0.023 acft

Storage Indication method used.



Pond Report

49

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

Friday, 06 / 28 / 2019

Pond No. 11 - Ex. Bioswale P-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 849.67 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	849.67	338	0.000	0.000
0.33	850.00	441	0.003	0.003
0.83	850.50	598	0.006	0.009
1.33	851.00	756	0.008	0.017
1.83	851.50	913	0.010	0.026
2.10	851.77	997	0.006	0.032

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	10.00	0.00	0.00
Crest El. (ft)	= 851.27	851.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	849.67	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.03	0.000	849.70	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.07	0.001	849.74	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.001	849.77	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.13	0.001	849.80	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.17	0.001	849.84	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.20	0.002	849.87	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.23	0.002	849.90	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.26	0.002	849.93	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.30	0.003	849.97	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.33	0.003	850.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.38	0.004	850.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.43	0.004	850.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.48	0.005	850.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.53	0.005	850.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.58	0.006	850.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.63	0.007	850.30	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.68	0.007	850.35	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.73	0.008	850.40	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.78	0.008	850.45	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.83	0.009	850.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.88	0.010	850.55	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.93	0.010	850.60	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.98	0.011	850.65	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.03	0.012	850.70	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.08	0.013	850.75	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.13	0.014	850.80	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.18	0.014	850.85	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.23	0.015	850.90	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.28	0.016	850.95	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.33	0.017	851.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.38	0.018	851.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.43	0.019	851.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.48	0.020	851.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.53	0.020	851.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.58	0.021	851.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.63	0.022	851.30	---	---	---	---	0.02	0.00	---	---	---	---	0.017

Continues on next page...

701

Ex. Bioswale P-2

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.68	0.023	851.35	---	---	---	---	0.08	0.00	---	---	---	---	0.075
1.73	0.024	851.40	---	---	---	---	0.16	0.00	---	---	---	---	0.156
1.78	0.025	851.45	---	---	---	---	0.25	0.00	---	---	---	---	0.254
1.83	0.026	851.50	---	---	---	---	0.37	0.00	---	---	---	---	0.367
1.86	0.027	851.53	---	---	---	---	0.43	0.15	---	---	---	---	0.581
1.88	0.027	851.55	---	---	---	---	0.50	0.42	---	---	---	---	0.921
1.91	0.028	851.58	---	---	---	---	0.58	0.77	---	---	---	---	1.344
1.94	0.029	851.61	---	---	---	---	0.65	1.18	---	---	---	---	1.834
1.97	0.029	851.63	---	---	---	---	0.73	1.65	---	---	---	---	2.384
1.99	0.030	851.66	---	---	---	---	0.82	2.17	---	---	---	---	2.985
2.02	0.030	851.69	---	---	---	---	0.90	2.73	---	---	---	---	3.635
2.05	0.031	851.72	---	---	---	---	0.99	3.34	---	---	---	---	4.330
2.07	0.032	851.74	---	---	---	---	1.08	3.98	---	---	---	---	5.066
2.10	0.032	851.77	---	---	---	---	1.18	4.67	---	---	---	---	5.848

...End

Hydrograph Report

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

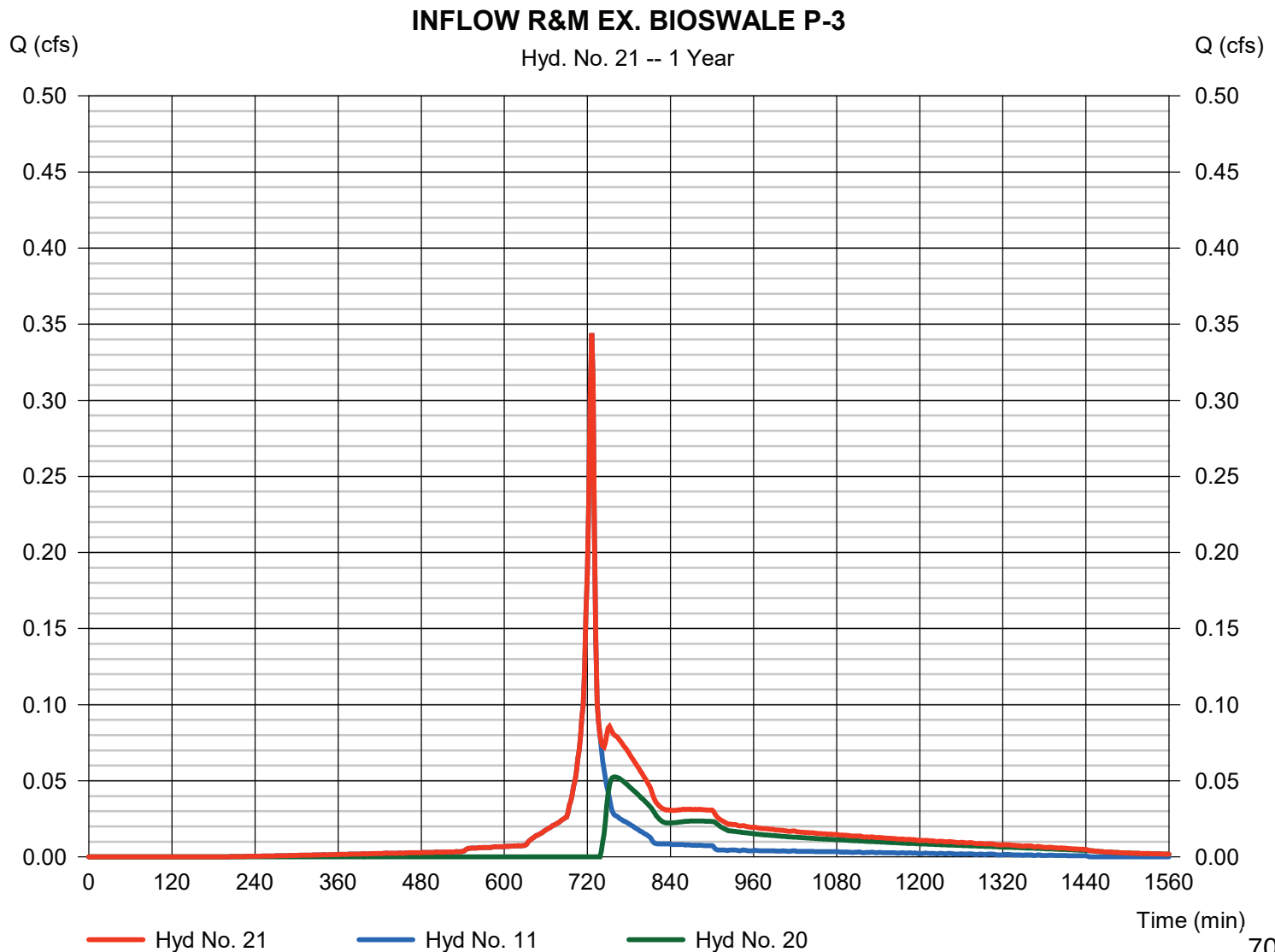
Friday, 06 / 28 / 2019

Hyd. No. 21

INFLOW R&M EX. BIOSWALE P-3

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 11, 20

Peak discharge = 0.344 cfs
 Time to peak = 726 min
 Hyd. volume = 0.032 acft
 Contrib. drain. area = 0.100 ac



Hydrograph Report

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

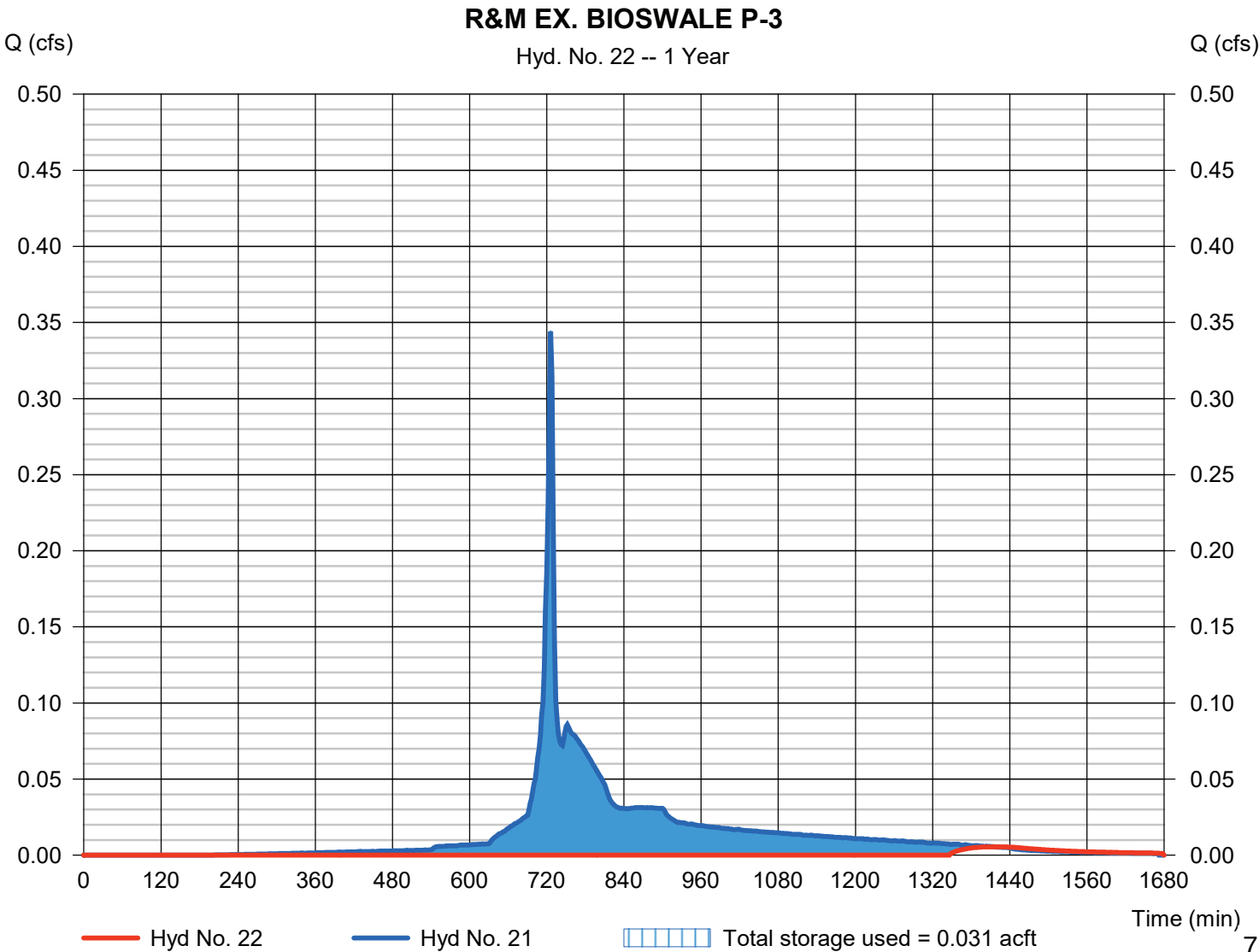
Friday, 06 / 28 / 2019

Hyd. No. 22

R&M EX. BIOSWALE P-3

Hydrograph type	= Reservoir	Peak discharge	= 0.006 cfs
Storm frequency	= 1 yrs	Time to peak	= 1414 min
Time interval	= 2 min	Hyd. volume	= 0.001 acft
Inflow hyd. No.	= 21 - INFLOW R&M EX. BIOSWALE P-3	Max. Elevation	= 850.96 ft
Reservoir name	= Ex. Bioswale P-3	Max. Storage	= 0.031 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 12 - Ex. Bioswale P-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 849.36 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	849.36	593	0.000	0.000
0.14	849.50	635	0.002	0.002
0.64	850.00	788	0.008	0.010
1.14	850.50	941	0.010	0.020
1.64	851.00	1,093	0.012	0.032
2.10	851.46	1,234	0.012	0.044
2.64	852.00	1,234	0.015	0.059

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 850.96	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	849.36	---	---	---	---	0.00	---	---	---	---	---	0.000
0.01	0.000	849.37	---	---	---	---	0.00	---	---	---	---	---	0.000
0.03	0.000	849.39	---	---	---	---	0.00	---	---	---	---	---	0.000
0.04	0.001	849.40	---	---	---	---	0.00	---	---	---	---	---	0.000
0.06	0.001	849.42	---	---	---	---	0.00	---	---	---	---	---	0.000
0.07	0.001	849.43	---	---	---	---	0.00	---	---	---	---	---	0.000
0.08	0.001	849.44	---	---	---	---	0.00	---	---	---	---	---	0.000
0.10	0.001	849.46	---	---	---	---	0.00	---	---	---	---	---	0.000
0.11	0.002	849.47	---	---	---	---	0.00	---	---	---	---	---	0.000
0.13	0.002	849.49	---	---	---	---	0.00	---	---	---	---	---	0.000
0.14	0.002	849.50	---	---	---	---	0.00	---	---	---	---	---	0.000
0.19	0.003	849.55	---	---	---	---	0.00	---	---	---	---	---	0.000
0.24	0.004	849.60	---	---	---	---	0.00	---	---	---	---	---	0.000
0.29	0.004	849.65	---	---	---	---	0.00	---	---	---	---	---	0.000
0.34	0.005	849.70	---	---	---	---	0.00	---	---	---	---	---	0.000
0.39	0.006	849.75	---	---	---	---	0.00	---	---	---	---	---	0.000
0.44	0.007	849.80	---	---	---	---	0.00	---	---	---	---	---	0.000
0.49	0.008	849.85	---	---	---	---	0.00	---	---	---	---	---	0.000
0.54	0.008	849.90	---	---	---	---	0.00	---	---	---	---	---	0.000
0.59	0.009	849.95	---	---	---	---	0.00	---	---	---	---	---	0.000
0.64	0.010	850.00	---	---	---	---	0.00	---	---	---	---	---	0.000
0.69	0.011	850.05	---	---	---	---	0.00	---	---	---	---	---	0.000
0.74	0.012	850.10	---	---	---	---	0.00	---	---	---	---	---	0.000
0.79	0.013	850.15	---	---	---	---	0.00	---	---	---	---	---	0.000
0.84	0.014	850.20	---	---	---	---	0.00	---	---	---	---	---	0.000
0.89	0.015	850.25	---	---	---	---	0.00	---	---	---	---	---	0.000
0.94	0.016	850.30	---	---	---	---	0.00	---	---	---	---	---	0.000
0.99	0.017	850.35	---	---	---	---	0.00	---	---	---	---	---	0.000
1.04	0.018	850.40	---	---	---	---	0.00	---	---	---	---	---	0.000
1.09	0.019	850.45	---	---	---	---	0.00	---	---	---	---	---	0.000
1.14	0.020	850.50	---	---	---	---	0.00	---	---	---	---	---	0.000
1.19	0.021	850.55	---	---	---	---	0.00	---	---	---	---	---	0.000
1.24	0.022	850.60	---	---	---	---	0.00	---	---	---	---	---	0.000
1.29	0.024	850.65	---	---	---	---	0.00	---	---	---	---	---	0.000
1.34	0.025	850.70	---	---	---	---	0.00	---	---	---	---	---	0.000
1.39	0.026	850.75	---	---	---	---	0.00	---	---	---	---	---	0.000

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Ex. Bioswale P-3

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.44	0.027	850.80	---	---	---	---	0.00	---	---	---	---	---	0.000
1.49	0.028	850.85	---	---	---	---	0.00	---	---	---	---	---	0.000
1.54	0.029	850.90	---	---	---	---	0.00	---	---	---	---	---	0.000
1.59	0.031	850.95	---	---	---	---	0.00	---	---	---	---	---	0.000
1.64	0.032	851.00	---	---	---	---	0.03	---	---	---	---	---	0.027
1.69	0.033	851.05	---	---	---	---	0.08	---	---	---	---	---	0.084
1.73	0.034	851.09	---	---	---	---	0.16	---	---	---	---	---	0.160
1.78	0.035	851.14	---	---	---	---	0.25	---	---	---	---	---	0.250
1.82	0.037	851.18	---	---	---	---	0.35	---	---	---	---	---	0.353
1.87	0.038	851.23	---	---	---	---	0.47	---	---	---	---	---	0.467
1.92	0.039	851.28	---	---	---	---	0.59	---	---	---	---	---	0.592
1.96	0.040	851.32	---	---	---	---	0.73	---	---	---	---	---	0.726
2.01	0.042	851.37	---	---	---	---	0.87	---	---	---	---	---	0.868
2.05	0.043	851.41	---	---	---	---	1.02	---	---	---	---	---	1.019
2.10	0.044	851.46	---	---	---	---	1.18	---	---	---	---	---	1.177
2.15	0.046	851.51	---	---	---	---	1.37	---	---	---	---	---	1.373
2.21	0.047	851.57	---	---	---	---	1.58	---	---	---	---	---	1.579
2.26	0.049	851.62	---	---	---	---	1.79	---	---	---	---	---	1.794
2.32	0.050	851.68	---	---	---	---	2.02	---	---	---	---	---	2.018
2.37	0.052	851.73	---	---	---	---	2.25	---	---	---	---	---	2.250
2.42	0.053	851.78	---	---	---	---	2.49	---	---	---	---	---	2.491
2.48	0.055	851.84	---	---	---	---	2.74	---	---	---	---	---	2.740
2.53	0.056	851.89	---	---	---	---	3.00	---	---	---	---	---	2.997
2.59	0.058	851.95	---	---	---	---	3.26	---	---	---	---	---	3.261
2.64	0.059	852.00	---	---	---	---	3.53	---	---	---	---	---	3.532

...End

Hydrograph Report

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

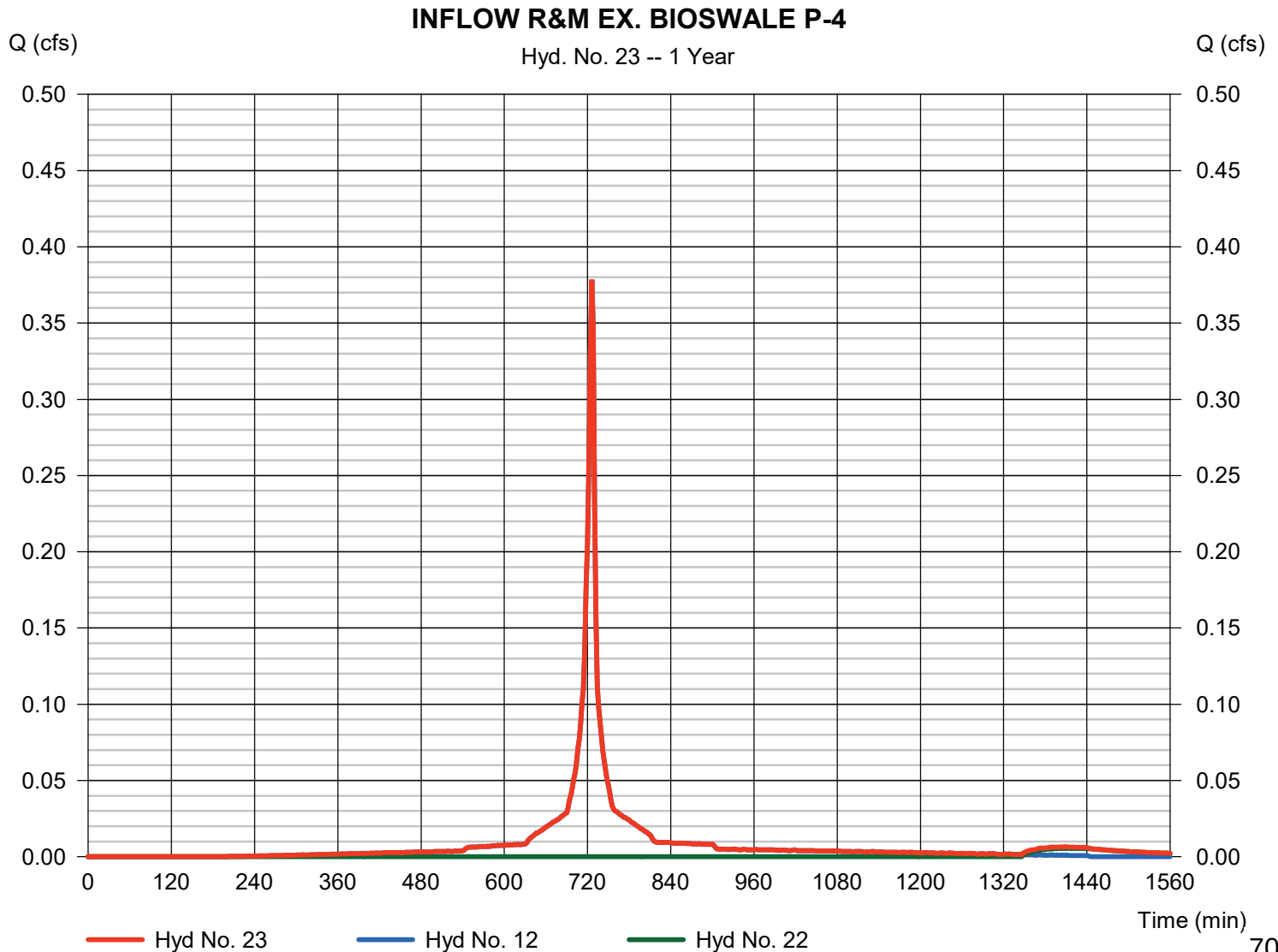
Friday, 06 / 28 / 2019

Hyd. No. 23

INFLOW R&M EX. BIOSWALE P-4

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 12, 22

Peak discharge = 0.379 cfs
 Time to peak = 726 min
 Hyd. volume = 0.020 acft
 Contrib. drain. area = 0.110 ac



Hydrograph Report

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

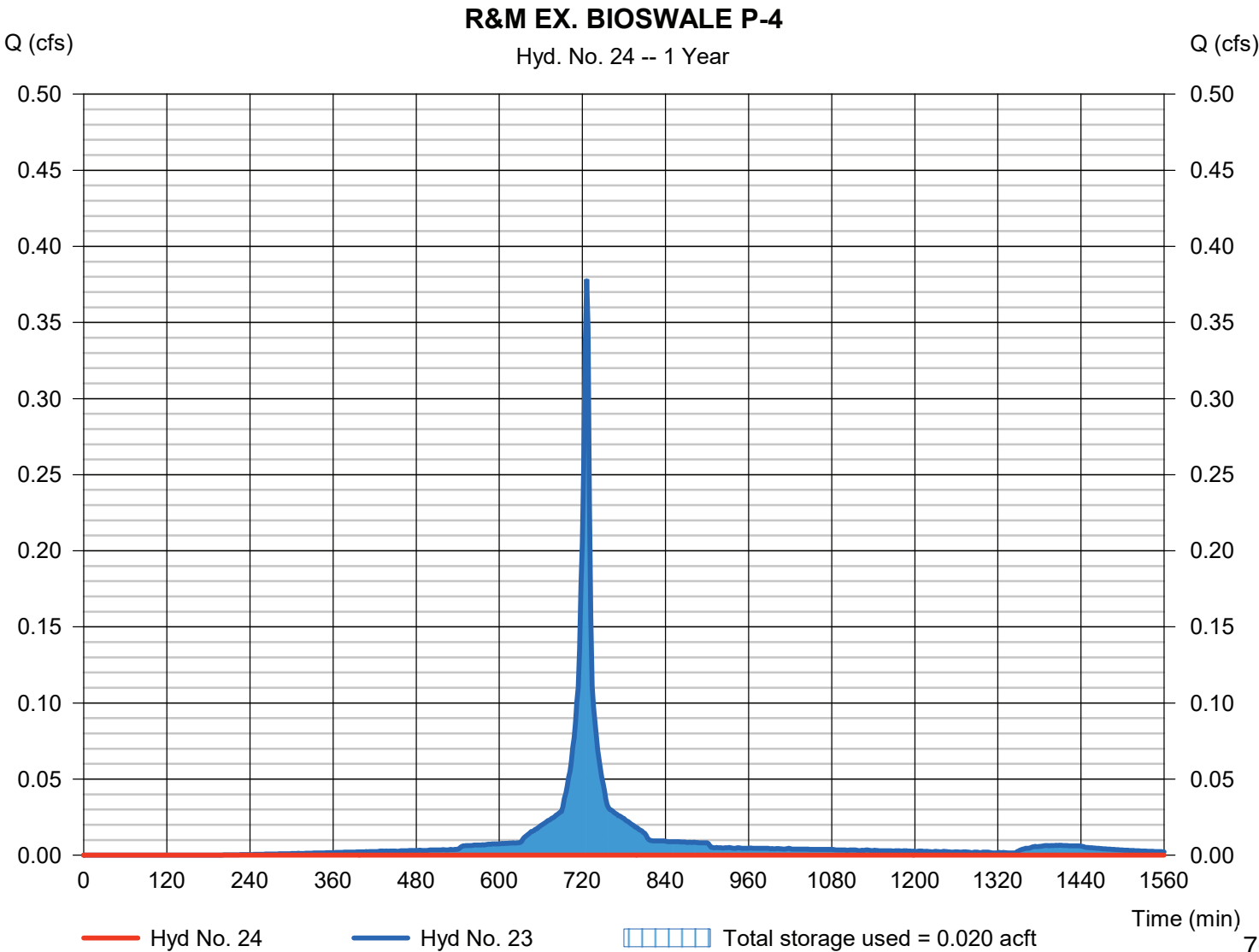
Friday, 06 / 28 / 2019

Hyd. No. 24

R&M EX. BIOSWALE P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 23 - INFLOW R&M EX. BIOSWALE P-4	Max. Elevation	= 849.61 ft
Reservoir name	= Ex. Bioswale P-4	Max. Storage	= 0.020 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 13 - Ex. Bioswale P-4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 848.55 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	848.55	625	0.000	0.000
0.45	849.00	791	0.007	0.007
0.95	849.50	976	0.010	0.017
1.45	850.00	1,161	0.012	0.030
1.95	850.50	1,346	0.014	0.044
2.10	850.65	1,404	0.005	0.049
2.25	850.80	1,404	0.005	0.054

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	25.00	0.00	0.00
Crest El. (ft)	= 850.15	850.65	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	848.55	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.05	0.001	848.59	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.09	0.001	848.64	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.14	0.002	848.68	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.18	0.003	848.73	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.22	0.004	848.77	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.27	0.004	848.82	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.31	0.005	848.86	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.36	0.006	848.91	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.40	0.007	848.95	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.45	0.007	849.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.50	0.008	849.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.55	0.009	849.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.60	0.010	849.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.65	0.011	849.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.70	0.012	849.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.75	0.013	849.30	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.80	0.014	849.35	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.85	0.015	849.40	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.90	0.016	849.45	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.95	0.017	849.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.00	0.019	849.55	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.05	0.020	849.60	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.10	0.021	849.65	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.15	0.022	849.70	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.20	0.024	849.75	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.25	0.025	849.80	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.30	0.026	849.85	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.35	0.027	849.90	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.40	0.028	849.95	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.45	0.030	850.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.50	0.031	850.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.55	0.033	850.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.60	0.034	850.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.65	0.035	850.20	---	---	---	---	0.04	0.00	---	---	---	---	0.037
1.70	0.037	850.25	---	---	---	---	0.11	0.00	---	---	---	---	0.105

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Ex. Bioswale P-4

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.75	0.038	850.30	---	---	---	---	0.19	0.00	---	---	---	---	0.193
1.80	0.040	850.35	---	---	---	---	0.30	0.00	---	---	---	---	0.298
1.85	0.041	850.40	---	---	---	---	0.42	0.00	---	---	---	---	0.416
1.90	0.043	850.45	---	---	---	---	0.55	0.00	---	---	---	---	0.547
1.95	0.044	850.50	---	---	---	---	0.69	0.00	---	---	---	---	0.689
1.97	0.045	850.52	---	---	---	---	0.73	0.00	---	---	---	---	0.734
1.98	0.045	850.53	---	---	---	---	0.78	0.00	---	---	---	---	0.780
2.00	0.045	850.54	---	---	---	---	0.83	0.00	---	---	---	---	0.827
2.01	0.046	850.56	---	---	---	---	0.87	0.00	---	---	---	---	0.875
2.03	0.046	850.58	---	---	---	---	0.92	0.00	---	---	---	---	0.923
2.04	0.047	850.59	---	---	---	---	0.97	0.00	---	---	---	---	0.972
2.06	0.047	850.61	---	---	---	---	1.02	0.00	---	---	---	---	1.022
2.07	0.048	850.62	---	---	---	---	1.07	0.00	---	---	---	---	1.073
2.09	0.048	850.64	---	---	---	---	1.12	0.00	---	---	---	---	1.125
2.10	0.049	850.65	---	---	---	---	1.18	0.00	---	---	---	---	1.177
2.12	0.049	850.66	---	---	---	---	1.23	0.15	---	---	---	---	1.383
2.13	0.050	850.68	---	---	---	---	1.28	0.43	---	---	---	---	1.717
2.14	0.050	850.70	---	---	---	---	1.34	0.79	---	---	---	---	2.134
2.16	0.051	850.71	---	---	---	---	1.40	1.22	---	---	---	---	2.619
2.17	0.051	850.72	---	---	---	---	1.45	1.71	---	---	---	---	3.160
2.19	0.052	850.74	---	---	---	---	1.51	2.25	---	---	---	---	3.760
2.20	0.052	850.76	---	---	---	---	1.57	2.84	---	---	---	---	4.404
2.22	0.053	850.77	---	---	---	---	1.63	3.46	---	---	---	---	5.089
2.23	0.053	850.79	---	---	---	---	1.69	4.13	---	---	---	---	5.818
2.25	0.054	850.80	---	---	---	---	1.74	4.83	---	---	---	---	6.580

...End

Hydrograph Report

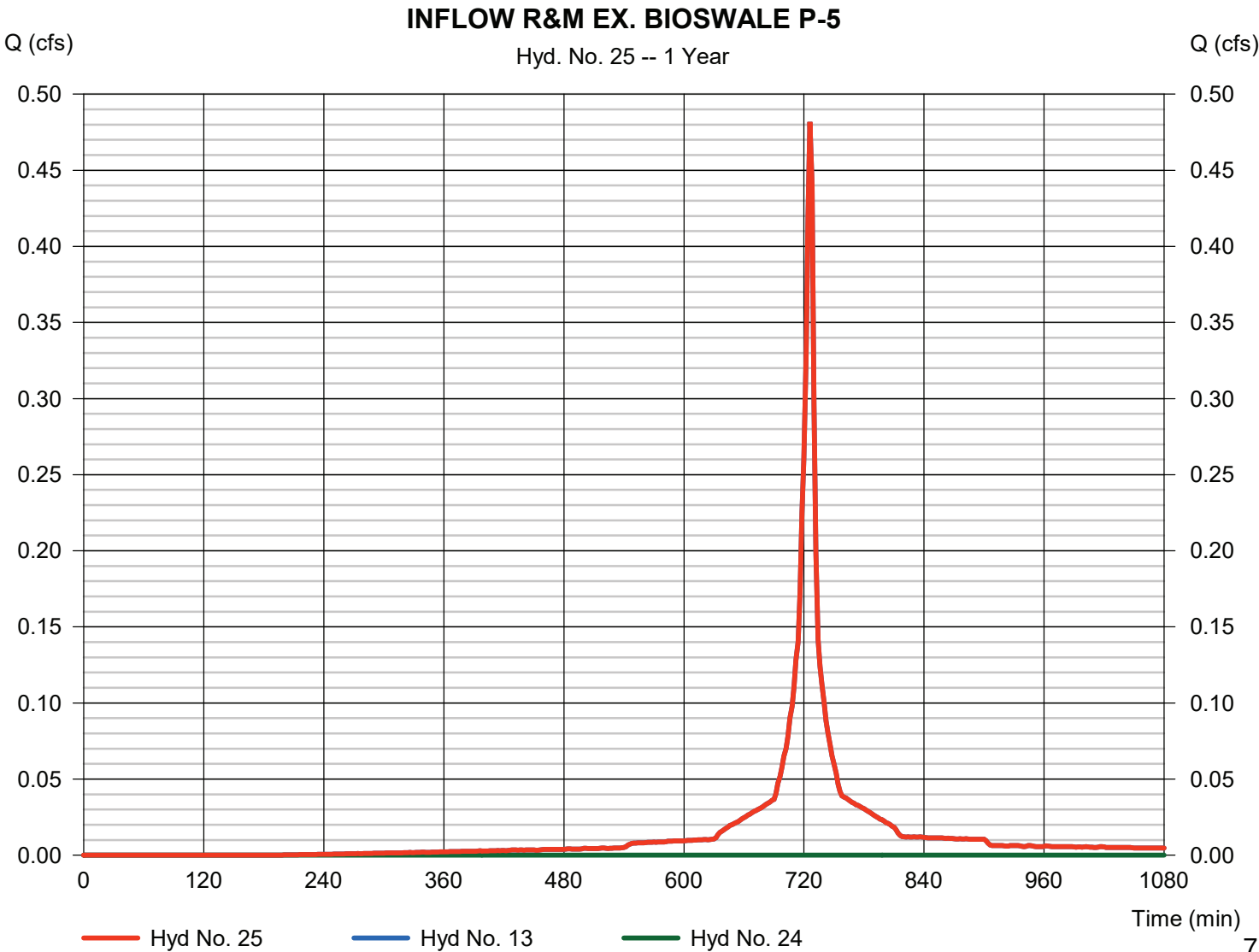
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 25

INFLOW R&M EX. BIOSWALE P-5

Hydrograph type	= Combine	Peak discharge	= 0.482 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.024 acft
Inflow hyds.	= 13, 24	Contrib. drain. area	= 0.140 ac



Hydrograph Report

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

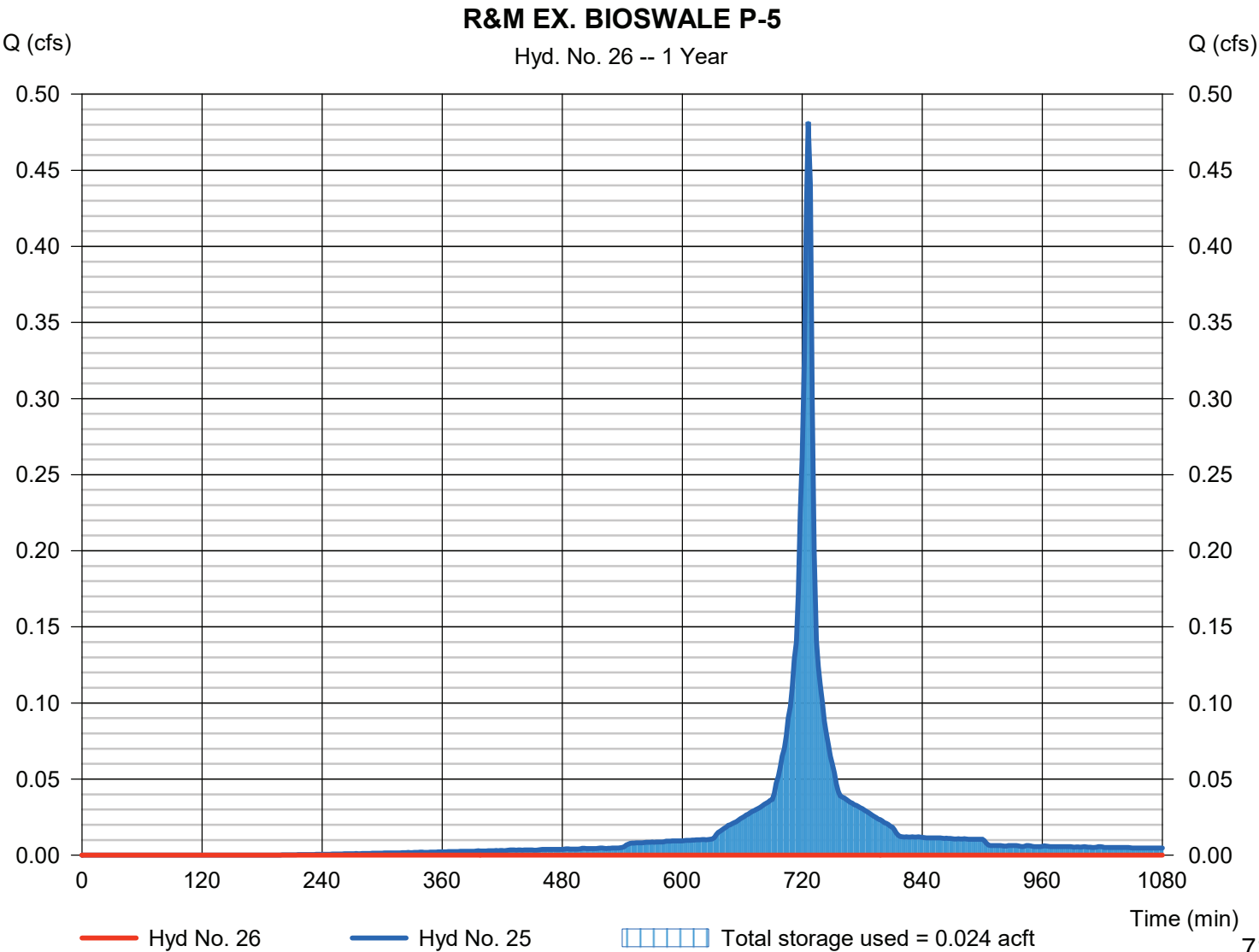
Friday, 06 / 28 / 2019

Hyd. No. 26

R&M EX. BIOSWALE P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 25 - INFLOW R&M EX. BIOSWALE P-5	Max. Elevation	= 848.44 ft
Reservoir name	= Ex. Bioswale P-5	Max. Storage	= 0.024 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 14 - Ex. Bioswale P-5

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 847.07 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	847.07	503	0.000	0.000
0.43	847.50	662	0.006	0.006
0.93	848.00	847	0.009	0.014
1.43	848.50	1,032	0.011	0.025
1.93	849.00	1,218	0.013	0.038
2.10	849.17	1,281	0.005	0.043
2.27	849.34	1,281	0.005	0.048

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	25.00	0.00	0.00
Crest El. (ft)	= 848.67	849.17	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	847.07	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.04	0.001	847.11	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.09	0.001	847.16	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.13	0.002	847.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.17	0.002	847.24	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.22	0.003	847.29	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.26	0.003	847.33	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.30	0.004	847.37	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.34	0.005	847.41	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.39	0.005	847.46	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.43	0.006	847.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.48	0.007	847.55	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.53	0.007	847.60	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.58	0.008	847.65	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.63	0.009	847.70	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.68	0.010	847.75	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.73	0.011	847.80	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.78	0.012	847.85	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.83	0.013	847.90	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.88	0.014	847.95	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.93	0.014	848.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.98	0.015	848.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.03	0.017	848.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.08	0.018	848.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.13	0.019	848.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.18	0.020	848.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.23	0.021	848.30	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.28	0.022	848.35	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.33	0.023	848.40	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.38	0.024	848.45	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.43	0.025	848.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.48	0.026	848.55	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.53	0.028	848.60	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.58	0.029	848.65	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.63	0.030	848.70	---	---	---	---	0.02	0.00	---	---	---	---	0.017
1.68	0.032	848.75	---	---	---	---	0.08	0.00	---	---	---	---	0.075

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Ex. Bioswale P-5

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.73	0.033	848.80	---	---	---	---	0.16	0.00	---	---	---	---	0.156
1.78	0.034	848.85	---	---	---	---	0.25	0.00	---	---	---	---	0.254
1.83	0.035	848.90	---	---	---	---	0.37	0.00	---	---	---	---	0.367
1.88	0.037	848.95	---	---	---	---	0.49	0.00	---	---	---	---	0.493
1.93	0.038	849.00	---	---	---	---	0.63	0.00	---	---	---	---	0.631
1.95	0.039	849.02	---	---	---	---	0.68	0.00	---	---	---	---	0.681
1.96	0.039	849.03	---	---	---	---	0.73	0.00	---	---	---	---	0.732
1.98	0.039	849.05	---	---	---	---	0.78	0.00	---	---	---	---	0.783
2.00	0.040	849.07	---	---	---	---	0.84	0.00	---	---	---	---	0.837
2.02	0.040	849.09	---	---	---	---	0.89	0.00	---	---	---	---	0.891
2.03	0.041	849.10	---	---	---	---	0.95	0.00	---	---	---	---	0.946
2.05	0.041	849.12	---	---	---	---	1.00	0.00	---	---	---	---	1.003
2.07	0.042	849.14	---	---	---	---	1.06	0.00	---	---	---	---	1.060
2.08	0.042	849.15	---	---	---	---	1.12	0.00	---	---	---	---	1.119
2.10	0.043	849.17	---	---	---	---	1.18	0.00	---	---	---	---	1.177
2.12	0.043	849.19	---	---	---	---	1.24	0.18	---	---	---	---	1.423
2.13	0.044	849.20	---	---	---	---	1.30	0.52	---	---	---	---	1.821
2.15	0.044	849.22	---	---	---	---	1.36	0.96	---	---	---	---	2.326
2.17	0.045	849.24	---	---	---	---	1.43	1.48	---	---	---	---	2.906
2.18	0.045	849.26	---	---	---	---	1.49	2.07	---	---	---	---	3.559
2.20	0.046	849.27	---	---	---	---	1.56	2.72	---	---	---	---	4.278
2.22	0.046	849.29	---	---	---	---	1.62	3.43	---	---	---	---	5.049
2.24	0.047	849.31	---	---	---	---	1.69	4.19	---	---	---	---	5.876
2.25	0.047	849.32	---	---	---	---	1.76	4.99	---	---	---	---	6.750
2.27	0.048	849.34	---	---	---	---	1.83	5.84	---	---	---	---	7.664

...End

Hydrograph Report

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

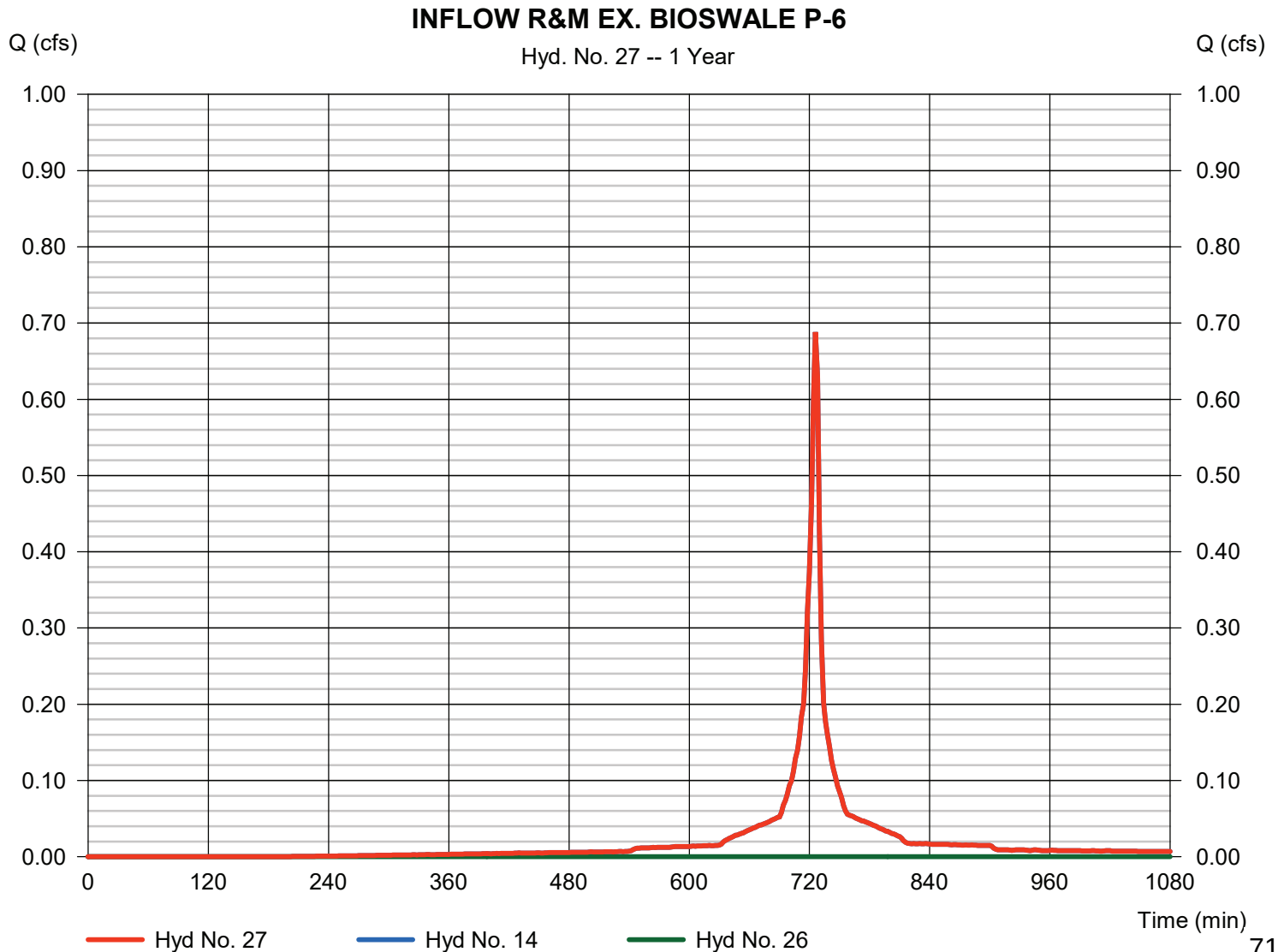
Friday, 06 / 28 / 2019

Hyd. No. 27

INFLOW R&M EX. BIOSWALE P-6

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 14, 26

Peak discharge = 0.688 cfs
 Time to peak = 726 min
 Hyd. volume = 0.034 acft
 Contrib. drain. area = 0.200 ac



Hydrograph Report

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

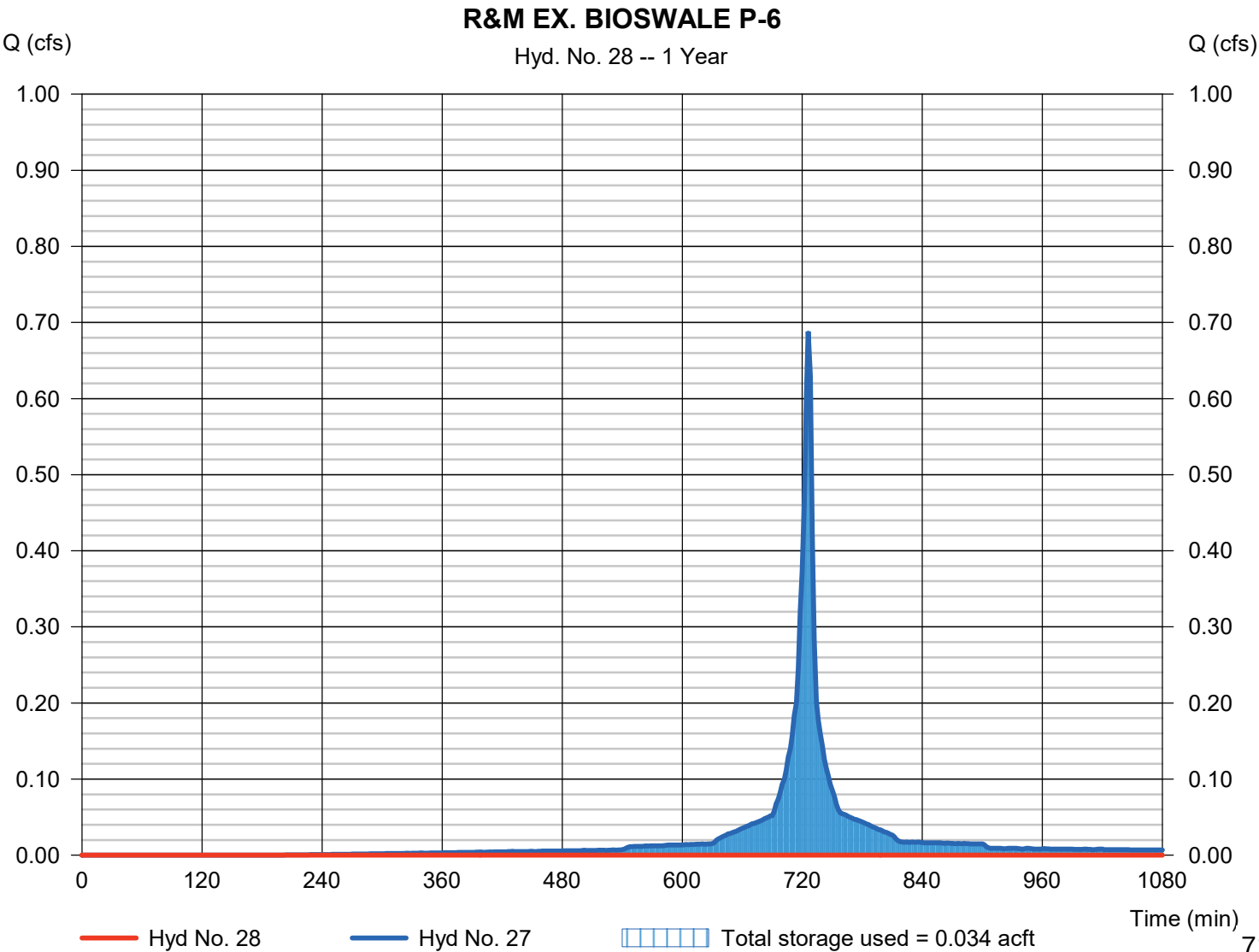
Friday, 06 / 28 / 2019

Hyd. No. 28

R&M EX. BIOSWALE P-6

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 27 - INFLOW R&M EX. BIOSWALE P-6	Max. Elevation	= 847.22 ft
Reservoir name	= Ex. Bioswale P-6	Max. Storage	= 0.034 acft

Storage Indication method used.



Pond No. 15 - Ex. Bioswale P-6

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 845.56 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	845.56	537	0.000	0.000
0.44	846.00	719	0.006	0.006
0.94	846.50	930	0.009	0.016
1.44	847.00	1,146	0.012	0.028
1.94	847.50	1,366	0.014	0.042
2.10	847.66	1,440	0.005	0.047
2.44	848.00	1,440	0.011	0.058
2.78	848.34	1,440	0.011	0.070

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	25.00	0.00	0.00
Crest El. (ft)	= 847.60	848.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	845.56	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.04	0.001	845.60	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.09	0.001	845.65	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.13	0.002	845.69	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.18	0.003	845.74	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.22	0.003	845.78	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.26	0.004	845.82	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.31	0.004	845.87	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.35	0.005	845.91	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.40	0.006	845.96	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.44	0.006	846.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.49	0.007	846.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.54	0.008	846.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.59	0.009	846.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.64	0.010	846.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.69	0.011	846.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.74	0.012	846.30	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.79	0.013	846.35	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.84	0.014	846.40	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.89	0.015	846.45	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.94	0.016	846.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.99	0.017	846.55	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.04	0.018	846.60	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.09	0.019	846.65	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.14	0.021	846.70	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.19	0.022	846.75	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.24	0.023	846.80	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.29	0.024	846.85	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.34	0.025	846.90	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.39	0.026	846.95	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.44	0.028	847.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.49	0.029	847.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.54	0.031	847.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.59	0.032	847.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.64	0.033	847.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000

Continues on next page...

Ex. Bioswale P-6

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.69	0.035	847.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.74	0.036	847.30	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.79	0.038	847.35	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.84	0.039	847.40	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.89	0.041	847.45	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.94	0.042	847.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.96	0.043	847.52	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.97	0.043	847.53	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.99	0.044	847.55	---	---	---	---	0.00	0.00	---	---	---	---	0.000
2.00	0.044	847.56	---	---	---	---	0.00	0.00	---	---	---	---	0.000
2.02	0.045	847.58	---	---	---	---	0.00	0.00	---	---	---	---	0.000
2.04	0.045	847.60	---	---	---	---	0.00	0.00	---	---	---	---	0.000
2.05	0.046	847.61	---	---	---	---	0.00	0.00	---	---	---	---	0.004
2.07	0.046	847.63	---	---	---	---	0.02	0.00	---	---	---	---	0.016
2.08	0.047	847.64	---	---	---	---	0.03	0.00	---	---	---	---	0.031
2.10	0.047	847.66	---	---	---	---	0.05	0.00	---	---	---	---	0.049
2.13	0.048	847.69	---	---	---	---	0.10	0.00	---	---	---	---	0.096
2.17	0.049	847.73	---	---	---	---	0.15	0.00	---	---	---	---	0.153
2.20	0.051	847.76	---	---	---	---	0.22	0.00	---	---	---	---	0.217
2.24	0.052	847.80	---	---	---	---	0.29	0.00	---	---	---	---	0.289
2.27	0.053	847.83	---	---	---	---	0.37	0.00	---	---	---	---	0.367
2.30	0.054	847.86	---	---	---	---	0.45	0.00	---	---	---	---	0.452
2.34	0.055	847.90	---	---	---	---	0.54	0.00	---	---	---	---	0.541
2.37	0.056	847.93	---	---	---	---	0.64	0.00	---	---	---	---	0.637
2.41	0.057	847.97	---	---	---	---	0.74	0.00	---	---	---	---	0.737
2.44	0.058	848.00	---	---	---	---	0.84	0.00	---	---	---	---	0.843
2.47	0.060	848.03	---	---	---	---	0.95	0.52	---	---	---	---	1.474
2.51	0.061	848.07	---	---	---	---	1.07	1.48	---	---	---	---	2.542
2.54	0.062	848.10	---	---	---	---	1.18	2.71	---	---	---	---	3.896
2.58	0.063	848.14	---	---	---	---	1.31	4.17	---	---	---	---	5.482
2.61	0.064	848.17	---	---	---	---	1.43	5.83	---	---	---	---	7.267
2.64	0.065	848.20	---	---	---	---	1.56	7.67	---	---	---	---	9.233
2.68	0.066	848.24	---	---	---	---	1.70	9.66	---	---	---	---	11.36
2.71	0.067	848.27	---	---	---	---	1.83	11.81	---	---	---	---	13.64
2.75	0.069	848.31	---	---	---	---	1.98	14.09	---	---	---	---	16.07
2.78	0.070	848.34	---	---	---	---	2.12	16.51	---	---	---	---	18.63

...End

Hydrograph Report

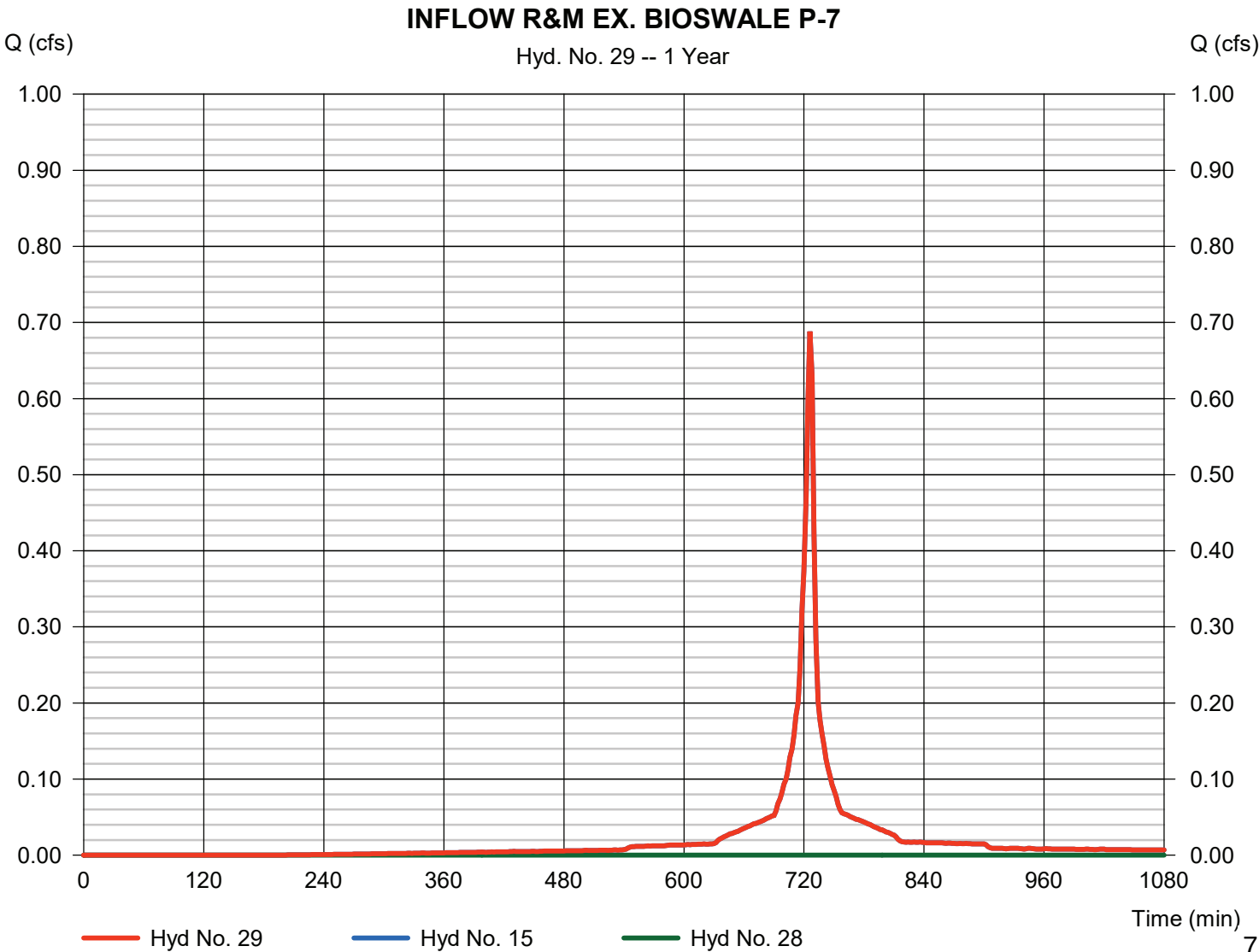
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 29

INFLOW R&M EX. BIOSWALE P-7

Hydrograph type	= Combine	Peak discharge	= 0.688 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.034 acft
Inflow hyds.	= 15, 28	Contrib. drain. area	= 0.200 ac



Hydrograph Report

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

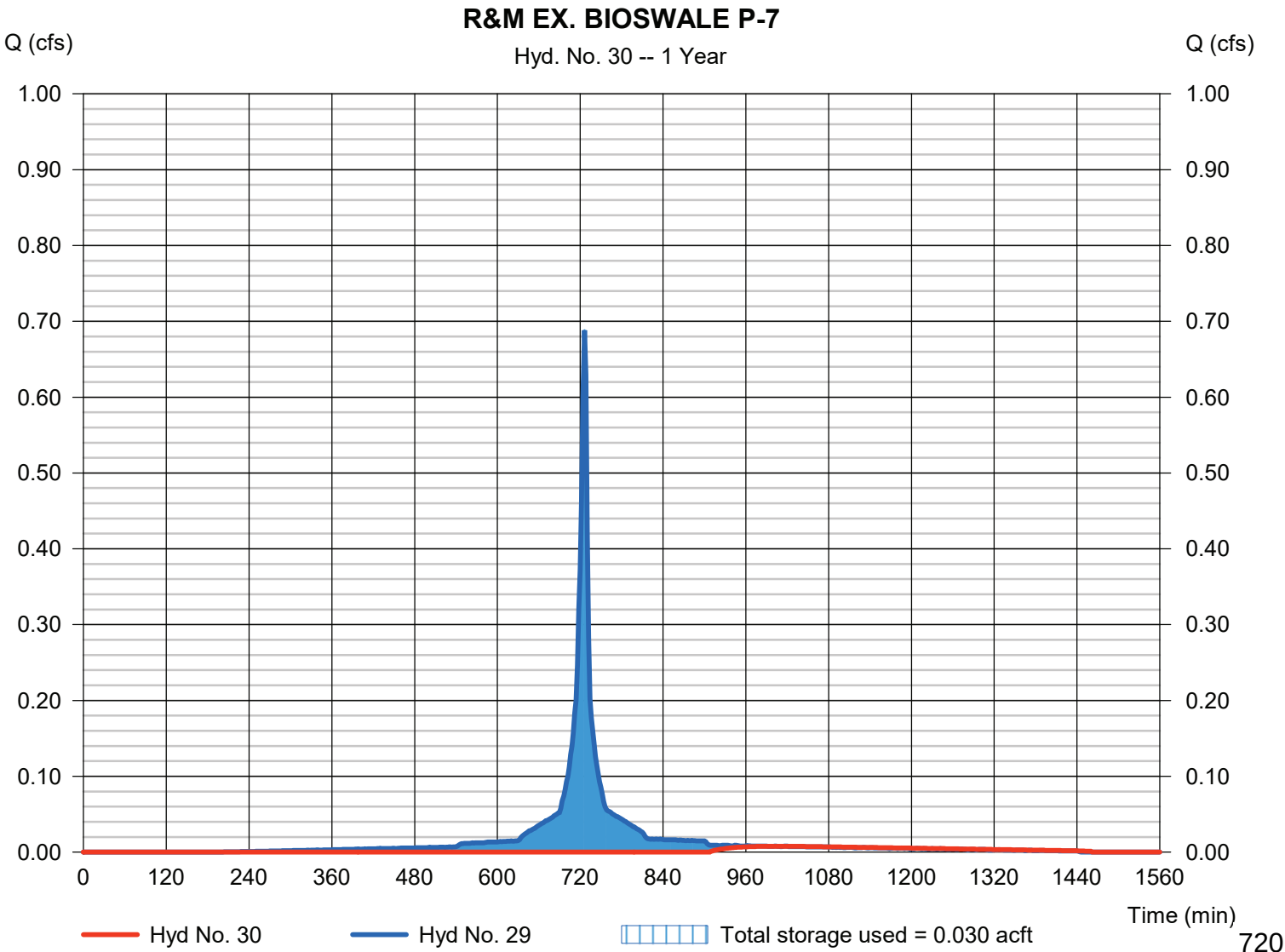
Friday, 06 / 28 / 2019

Hyd. No. 30

R&M EX. BIOSWALE P-7

Hydrograph type	= Reservoir	Peak discharge	= 0.008 cfs
Storm frequency	= 1 yrs	Time to peak	= 1006 min
Time interval	= 2 min	Hyd. volume	= 0.004 acft
Inflow hyd. No.	= 29 - INFLOW R&M EX. BIOSWALE P-7	Max. Elevation	= 845.31 ft
Reservoir name	= Ex. Bioswale P-7	Max. Storage	= 0.030 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 16 - Ex. Bioswale P-7

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 843.59 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	843.59	484	0.000	0.000
0.41	844.00	615	0.005	0.005
0.91	844.50	778	0.008	0.013
1.41	845.00	946	0.010	0.023
1.91	845.50	1,120	0.012	0.035
2.09	845.68	1,185	0.005	0.040
2.27	845.86	1,185	0.005	0.045

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	25.00	0.00	0.00
Crest El. (ft)	= 845.31	845.68	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	843.59	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.04	0.001	843.63	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.08	0.001	843.67	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.12	0.002	843.71	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.16	0.002	843.75	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.20	0.003	843.80	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.25	0.003	843.84	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.29	0.004	843.88	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.33	0.004	843.92	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.37	0.005	843.96	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.41	0.005	844.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.46	0.006	844.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.51	0.007	844.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.56	0.008	844.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.61	0.008	844.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.66	0.009	844.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.71	0.010	844.30	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.76	0.011	844.35	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.81	0.012	844.40	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.86	0.012	844.45	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.91	0.013	844.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.96	0.014	844.55	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.01	0.015	844.60	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.06	0.016	844.65	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.11	0.017	844.70	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.16	0.018	844.75	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.21	0.019	844.80	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.26	0.020	844.85	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.31	0.021	844.90	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.36	0.022	844.95	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.41	0.023	845.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.46	0.024	845.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.51	0.025	845.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.56	0.027	845.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.61	0.028	845.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.66	0.029	845.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000

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Ex. Bioswale P-7

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.71	0.030	845.30	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.76	0.031	845.35	---	---	---	---	0.03	0.00	---	---	---	---	0.027
1.81	0.032	845.40	---	---	---	---	0.09	0.00	---	---	---	---	0.090
1.86	0.034	845.45	---	---	---	---	0.17	0.00	---	---	---	---	0.174
1.91	0.035	845.50	---	---	---	---	0.28	0.00	---	---	---	---	0.276
1.93	0.035	845.52	---	---	---	---	0.32	0.00	---	---	---	---	0.316
1.95	0.036	845.54	---	---	---	---	0.36	0.00	---	---	---	---	0.358
1.96	0.036	845.55	---	---	---	---	0.40	0.00	---	---	---	---	0.401
1.98	0.037	845.57	---	---	---	---	0.45	0.00	---	---	---	---	0.447
2.00	0.037	845.59	---	---	---	---	0.49	0.00	---	---	---	---	0.493
2.02	0.038	845.61	---	---	---	---	0.54	0.00	---	---	---	---	0.542
2.04	0.038	845.63	---	---	---	---	0.59	0.00	---	---	---	---	0.591
2.05	0.039	845.64	---	---	---	---	0.64	0.00	---	---	---	---	0.643
2.07	0.039	845.66	---	---	---	---	0.70	0.00	---	---	---	---	0.695
2.09	0.040	845.68	---	---	---	---	0.75	0.00	---	---	---	---	0.750
2.11	0.040	845.70	---	---	---	---	0.81	0.20	---	---	---	---	1.008
2.13	0.041	845.72	---	---	---	---	0.86	0.57	---	---	---	---	1.434
2.14	0.041	845.73	---	---	---	---	0.92	1.05	---	---	---	---	1.967
2.16	0.042	845.75	---	---	---	---	0.98	1.61	---	---	---	---	2.590
2.18	0.042	845.77	---	---	---	---	1.04	2.25	---	---	---	---	3.290
2.20	0.043	845.79	---	---	---	---	1.10	2.96	---	---	---	---	4.059
2.22	0.043	845.81	---	---	---	---	1.16	3.73	---	---	---	---	4.891
2.23	0.044	845.82	---	---	---	---	1.23	4.55	---	---	---	---	5.782
2.25	0.044	845.84	---	---	---	---	1.29	5.43	---	---	---	---	6.726
2.27	0.045	845.86	---	---	---	---	1.36	6.36	---	---	---	---	7.715

...End

Hydrograph Report

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

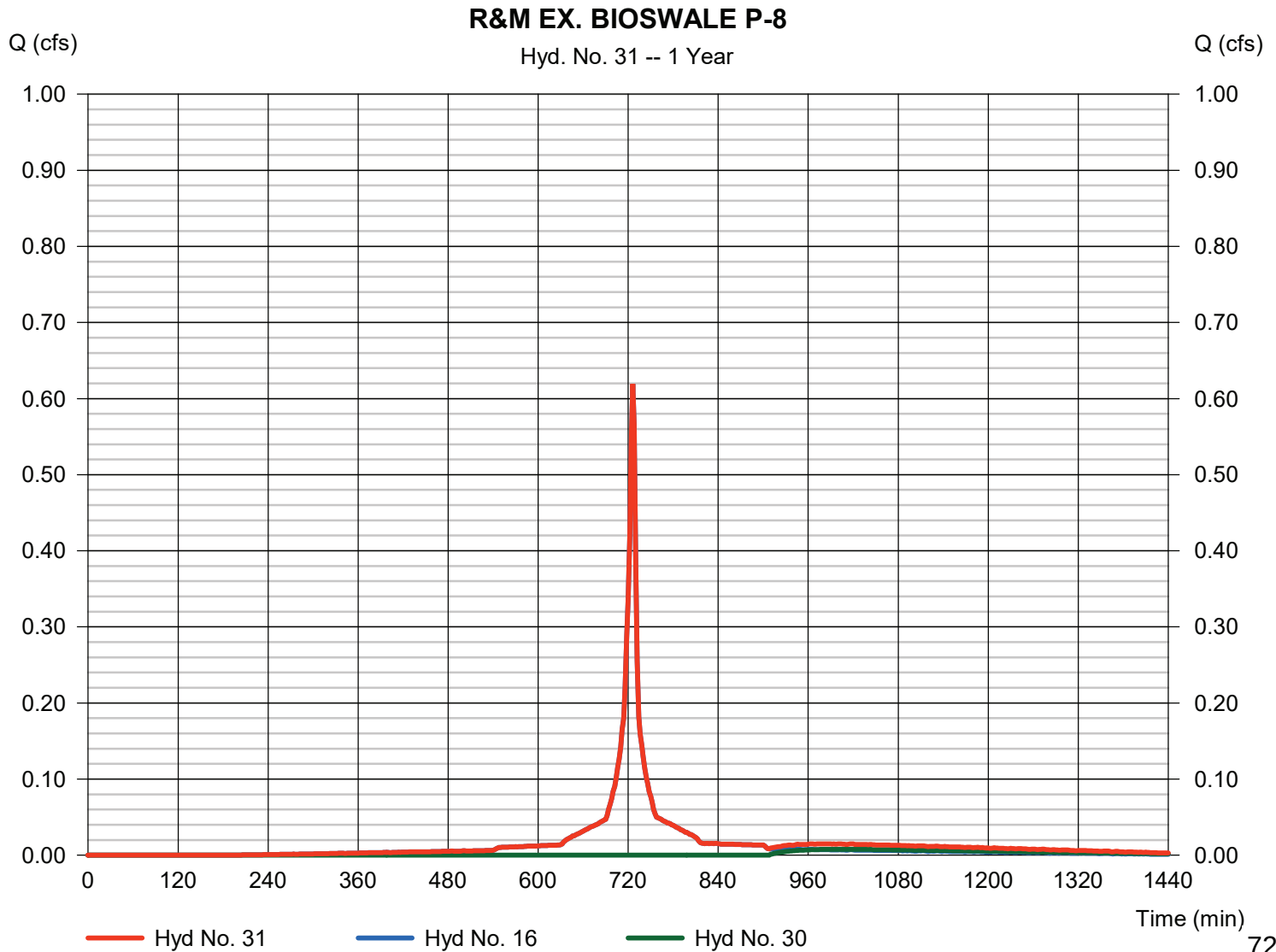
Friday, 06 / 28 / 2019

Hyd. No. 31

R&M EX. BIOSWALE P-8

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 16, 30

Peak discharge = 0.619 cfs
 Time to peak = 726 min
 Hyd. volume = 0.034 acft
 Contrib. drain. area = 0.180 ac



Hydrograph Report

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

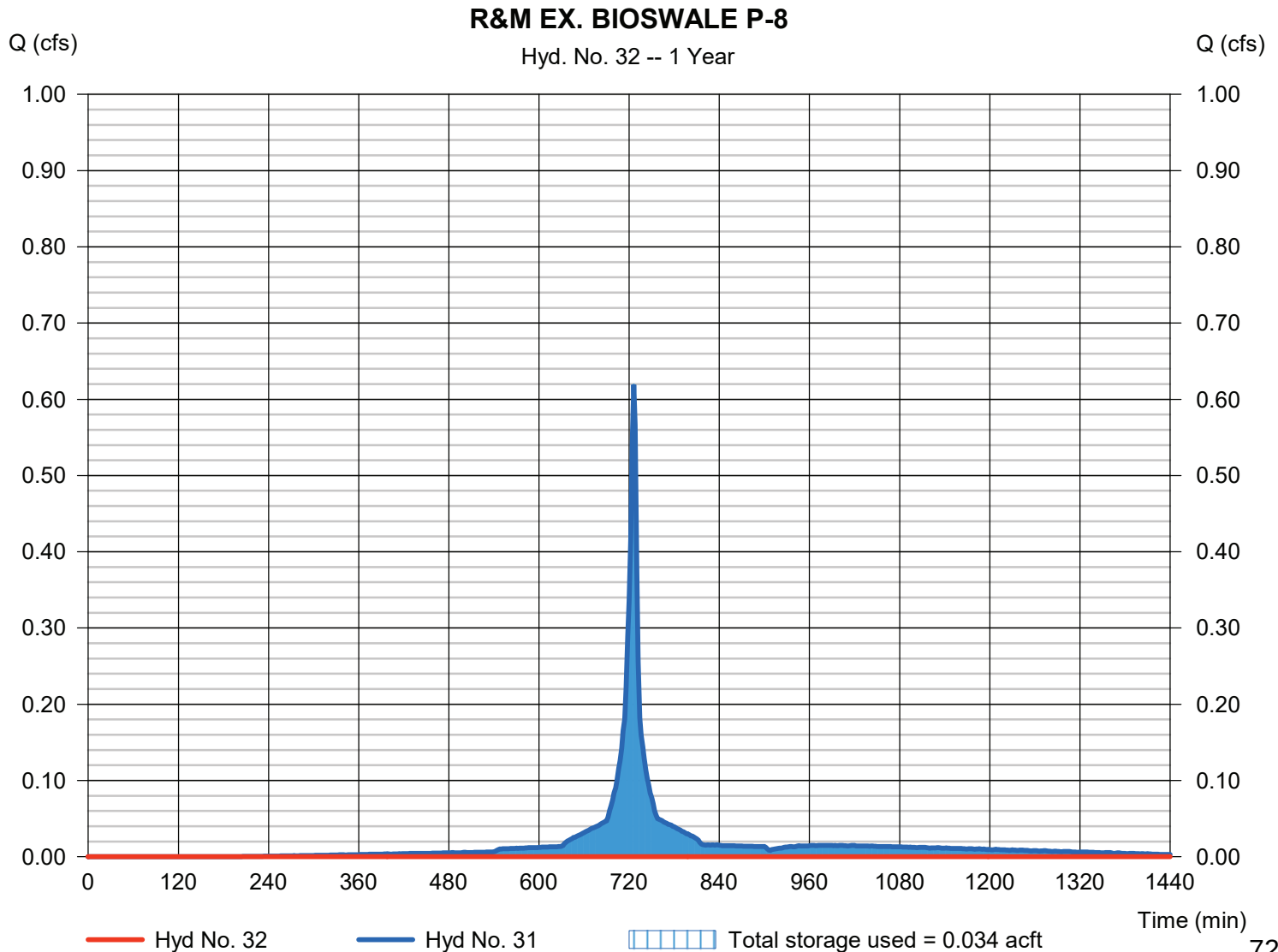
Friday, 06 / 28 / 2019

Hyd. No. 32

R&M EX. BIOSWALE P-8

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 31 - R&M EX. BIOSWALE P-8	Max. Elevation	= 844.21 ft
Reservoir name	= Ex. Bioswale P-8	Max. Storage	= 0.034 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 17 - Ex. Bioswale P-8

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 842.75 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	842.75	687	0.000	0.000
0.25	843.00	797	0.004	0.004
0.75	843.50	1,022	0.010	0.015
1.25	844.00	1,251	0.013	0.028
1.75	844.50	1,485	0.016	0.043
2.11	844.86	1,658	0.013	0.056
2.25	845.00	1,658	0.005	0.062
2.39	845.14	2,500	0.007	0.068
2.65	845.40	2,500	0.015	0.083

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	25.00	0.00	0.00
Crest El. (ft)	= 844.80	845.14	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	842.75	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.03	0.000	842.78	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.05	0.001	842.80	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.08	0.001	842.83	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.002	842.85	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.13	0.002	842.88	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.15	0.003	842.90	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.17	0.003	842.93	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.20	0.003	842.95	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.22	0.004	842.98	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.25	0.004	843.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.30	0.005	843.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.35	0.006	843.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.40	0.007	843.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.45	0.008	843.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.50	0.009	843.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.55	0.011	843.30	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.60	0.012	843.35	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.65	0.013	843.40	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.70	0.014	843.45	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.75	0.015	843.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.80	0.016	843.55	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.85	0.017	843.60	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.90	0.019	843.65	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.95	0.020	843.70	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.00	0.021	843.75	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.05	0.022	843.80	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.10	0.024	843.85	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.15	0.025	843.90	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.20	0.026	843.95	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.25	0.028	844.00	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.30	0.029	844.05	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.35	0.031	844.10	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.40	0.032	844.15	---	---	---	---	0.00	0.00	---	---	---	---	0.000

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Ex. Bioswale P-8

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.45	0.034	844.20	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.50	0.036	844.25	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.55	0.037	844.30	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.60	0.039	844.35	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.65	0.040	844.40	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.70	0.042	844.45	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.75	0.043	844.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.79	0.045	844.54	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.82	0.046	844.57	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.86	0.047	844.61	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.89	0.049	844.64	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.93	0.050	844.68	---	---	---	---	0.00	0.00	---	---	---	---	0.000
1.97	0.051	844.72	---	---	---	---	0.00	0.00	---	---	---	---	0.000
2.00	0.052	844.75	---	---	---	---	0.00	0.00	---	---	---	---	0.000
2.04	0.054	844.79	---	---	---	---	0.00	0.00	---	---	---	---	0.000
2.07	0.055	844.82	---	---	---	---	0.01	0.00	---	---	---	---	0.012
2.11	0.056	844.86	---	---	---	---	0.05	0.00	---	---	---	---	0.049
2.12	0.057	844.87	---	---	---	---	0.07	0.00	---	---	---	---	0.067
2.14	0.057	844.89	---	---	---	---	0.09	0.00	---	---	---	---	0.087
2.15	0.058	844.90	---	---	---	---	0.11	0.00	---	---	---	---	0.108
2.17	0.058	844.92	---	---	---	---	0.13	0.00	---	---	---	---	0.131
2.18	0.059	844.93	---	---	---	---	0.16	0.00	---	---	---	---	0.156
2.19	0.060	844.94	---	---	---	---	0.18	0.00	---	---	---	---	0.182
2.21	0.060	844.96	---	---	---	---	0.21	0.00	---	---	---	---	0.209
2.22	0.061	844.97	---	---	---	---	0.24	0.00	---	---	---	---	0.237
2.24	0.061	844.99	---	---	---	---	0.27	0.00	---	---	---	---	0.267
2.25	0.062	845.00	---	---	---	---	0.30	0.00	---	---	---	---	0.298
2.26	0.062	845.01	---	---	---	---	0.33	0.00	---	---	---	---	0.330
2.28	0.063	845.03	---	---	---	---	0.36	0.00	---	---	---	---	0.363
2.29	0.064	845.04	---	---	---	---	0.40	0.00	---	---	---	---	0.396
2.31	0.064	845.06	---	---	---	---	0.43	0.00	---	---	---	---	0.431
2.32	0.065	845.07	---	---	---	---	0.47	0.00	---	---	---	---	0.467
2.33	0.066	845.08	---	---	---	---	0.50	0.00	---	---	---	---	0.504
2.35	0.066	845.10	---	---	---	---	0.54	0.00	---	---	---	---	0.541
2.36	0.067	845.11	---	---	---	---	0.58	0.00	---	---	---	---	0.580
2.38	0.068	845.13	---	---	---	---	0.62	0.00	---	---	---	---	0.619
2.39	0.068	845.14	---	---	---	---	0.66	0.00	---	---	---	---	0.660
2.42	0.070	845.17	---	---	---	---	0.74	0.35	---	---	---	---	1.086
2.44	0.071	845.19	---	---	---	---	0.82	0.99	---	---	---	---	1.805
2.47	0.073	845.22	---	---	---	---	0.90	1.81	---	---	---	---	2.714
2.49	0.074	845.24	---	---	---	---	0.99	2.79	---	---	---	---	3.778
2.52	0.076	845.27	---	---	---	---	1.07	3.90	---	---	---	---	4.975
2.55	0.077	845.30	---	---	---	---	1.16	5.13	---	---	---	---	6.293
2.57	0.079	845.32	---	---	---	---	1.26	6.46	---	---	---	---	7.720
2.60	0.080	845.35	---	---	---	---	1.35	7.90	---	---	---	---	9.249
2.62	0.082	845.37	---	---	---	---	1.45	9.42	---	---	---	---	10.87
2.65	0.083	845.40	---	---	---	---	1.55	11.04	---	---	---	---	12.59

...End

Hydrograph Report

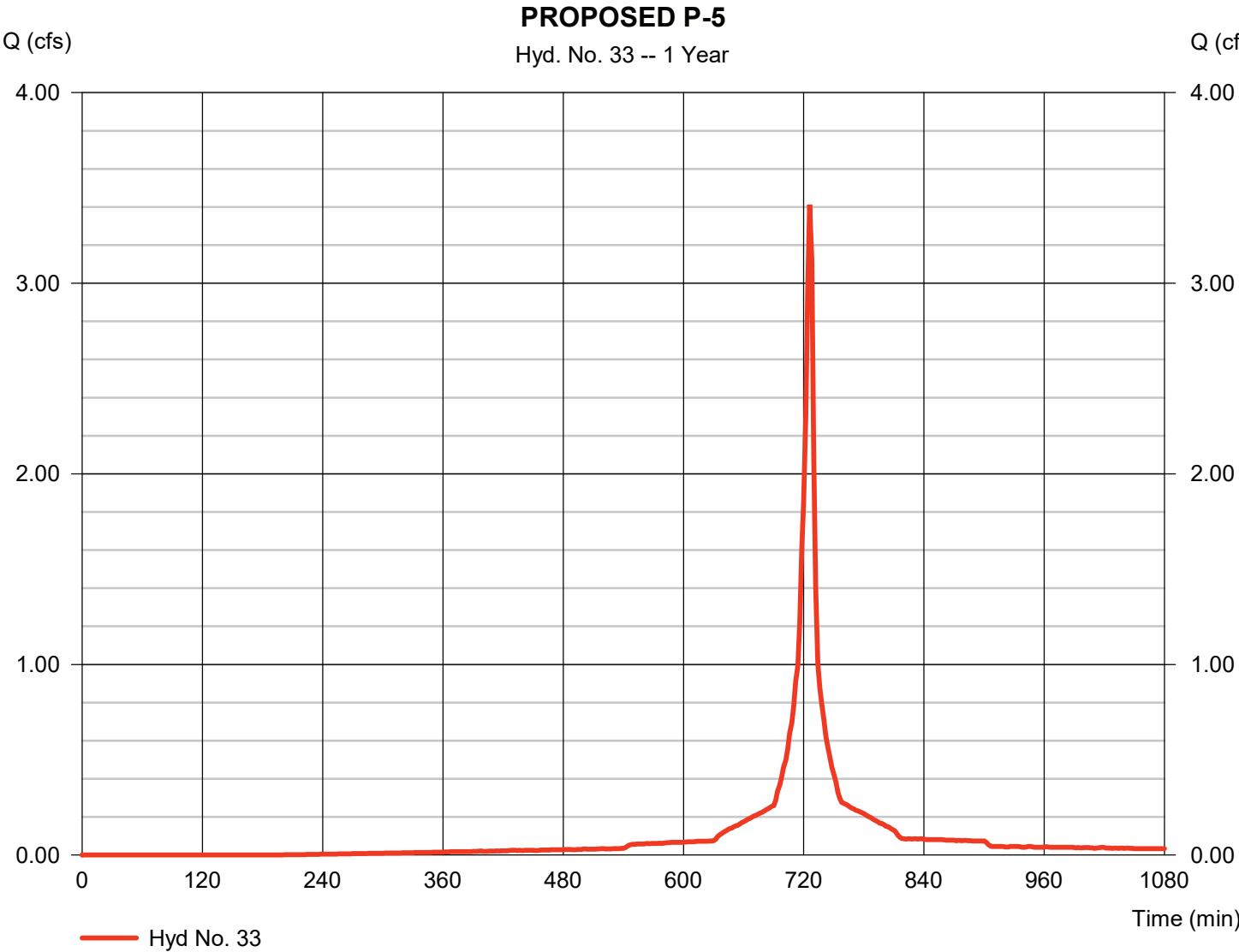
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 3.413 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.168 acft
Drainage area	= 0.992 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

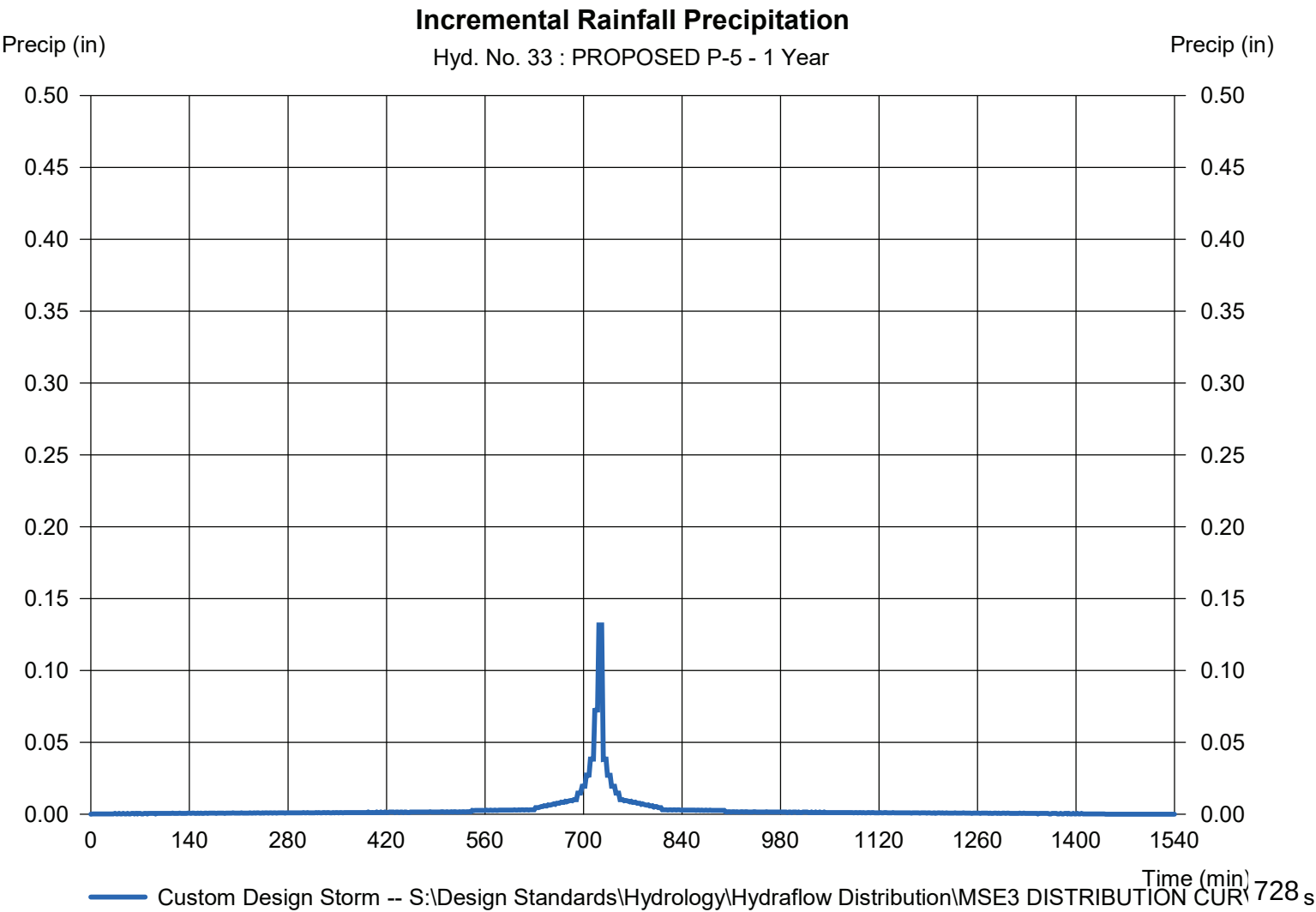
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

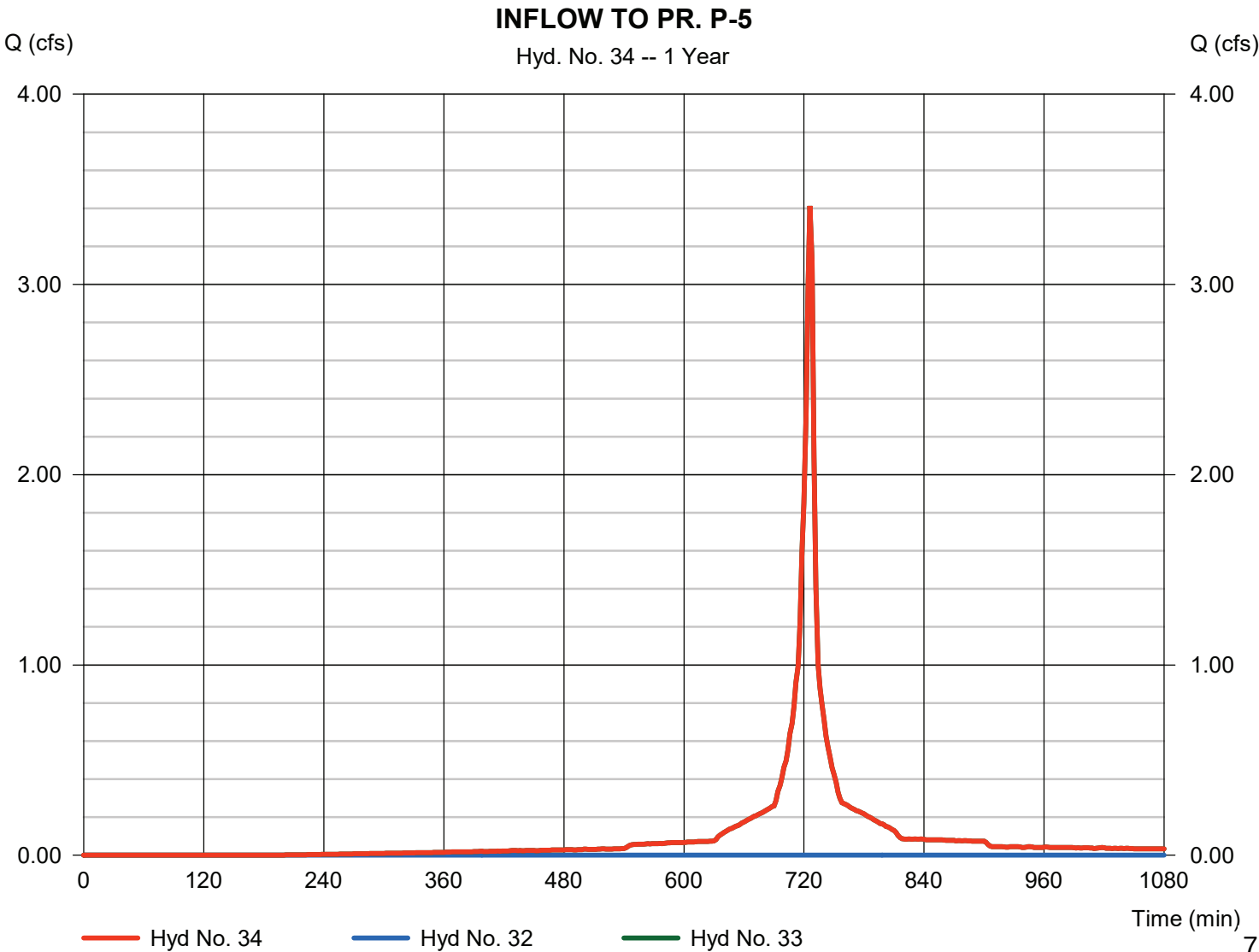
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 34

INFLOW TO PR. P-5

Hydrograph type	= Combine	Peak discharge	= 3.413 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.168 acft
Inflow hyds.	= 32, 33	Contrib. drain. area	= 0.992 ac



Hydrograph Report

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

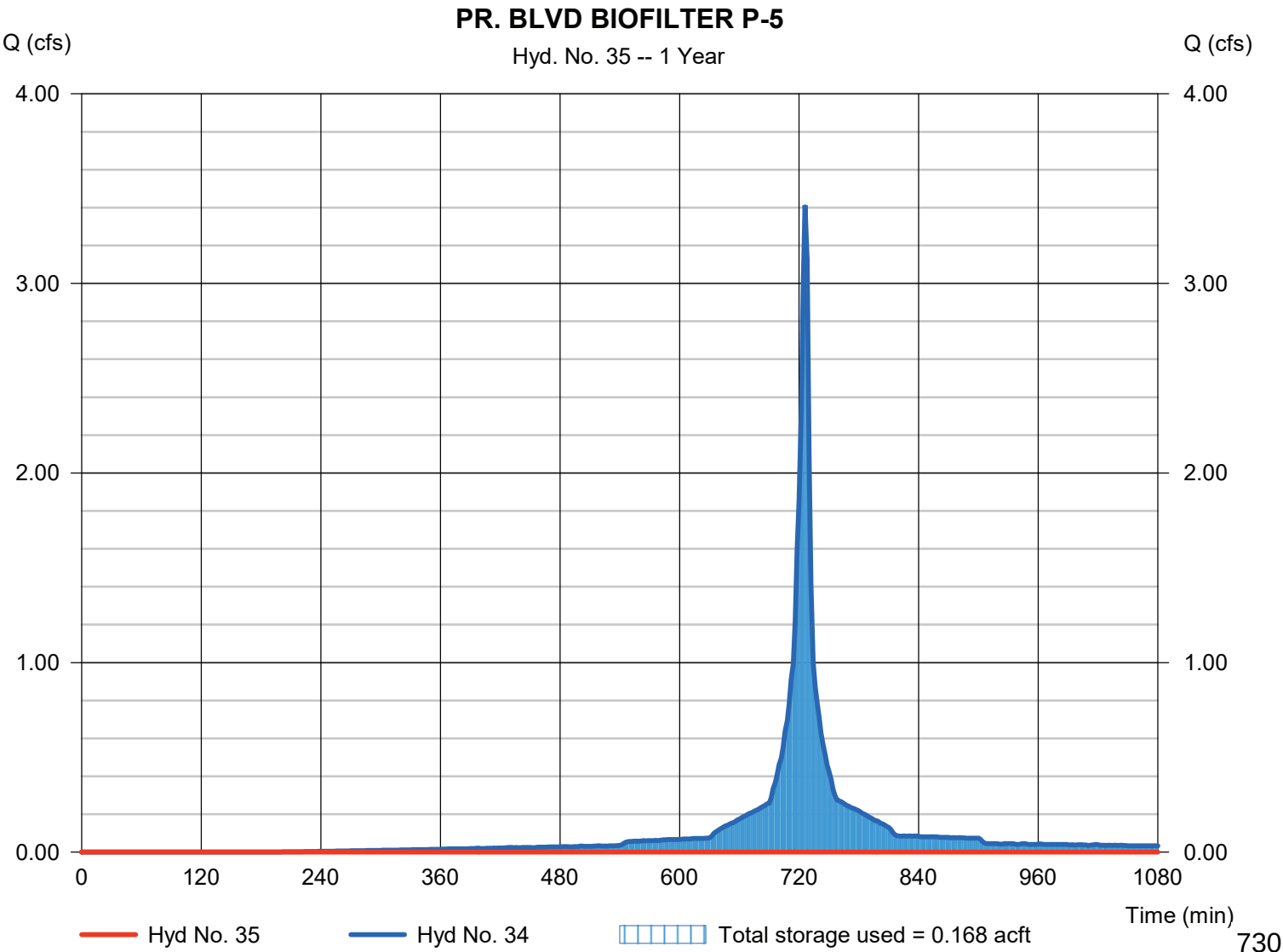
Friday, 06 / 28 / 2019

Hyd. No. 35

PR. BLVD BIOFILTER P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 34 - INFLOW TO PR. P-5	Max. Elevation	= 842.52 ft
Reservoir name	= BLVD BIOFILTER P-5	Max. Storage	= 0.168 acft

Storage Indication method used.



Pond Report

79

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

Friday, 06 / 28 / 2019

Pond No. 8 - BLVD BIOFILTER P-5

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 839.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	839.00	17	0.000	0.000
1.00	840.00	410	0.004	0.004
2.00	841.00	2,115	0.026	0.030
3.00	842.00	4,331	0.072	0.103
4.00	843.00	6,634	0.125	0.228
5.00	844.00	18,061	0.273	0.500
5.50	844.50	20,000	0.218	0.719

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 5.00	0.00	0.00	0.00
Crest El. (ft)	= 844.05	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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	839.00	---	---	---	---	0.00	---	---	---	---	---	0.000
0.10	0.000	839.10	---	---	---	---	0.00	---	---	---	---	---	0.000
0.20	0.001	839.20	---	---	---	---	0.00	---	---	---	---	---	0.000
0.30	0.001	839.30	---	---	---	---	0.00	---	---	---	---	---	0.000
0.40	0.002	839.40	---	---	---	---	0.00	---	---	---	---	---	0.000
0.50	0.002	839.50	---	---	---	---	0.00	---	---	---	---	---	0.000
0.60	0.002	839.60	---	---	---	---	0.00	---	---	---	---	---	0.000
0.70	0.003	839.70	---	---	---	---	0.00	---	---	---	---	---	0.000
0.80	0.003	839.80	---	---	---	---	0.00	---	---	---	---	---	0.000
0.90	0.004	839.90	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	0.004	840.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.10	0.007	840.10	---	---	---	---	0.00	---	---	---	---	---	0.000
1.20	0.009	840.20	---	---	---	---	0.00	---	---	---	---	---	0.000
1.30	0.012	840.30	---	---	---	---	0.00	---	---	---	---	---	0.000
1.40	0.014	840.40	---	---	---	---	0.00	---	---	---	---	---	0.000
1.50	0.017	840.50	---	---	---	---	0.00	---	---	---	---	---	0.000
1.60	0.020	840.60	---	---	---	---	0.00	---	---	---	---	---	0.000
1.70	0.022	840.70	---	---	---	---	0.00	---	---	---	---	---	0.000
1.80	0.025	840.80	---	---	---	---	0.00	---	---	---	---	---	0.000
1.90	0.028	840.90	---	---	---	---	0.00	---	---	---	---	---	0.000
2.00	0.030	841.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.10	0.038	841.10	---	---	---	---	0.00	---	---	---	---	---	0.000
2.20	0.045	841.20	---	---	---	---	0.00	---	---	---	---	---	0.000
2.30	0.052	841.30	---	---	---	---	0.00	---	---	---	---	---	0.000
2.40	0.059	841.40	---	---	---	---	0.00	---	---	---	---	---	0.000
2.50	0.067	841.50	---	---	---	---	0.00	---	---	---	---	---	0.000
2.60	0.074	841.60	---	---	---	---	0.00	---	---	---	---	---	0.000
2.70	0.081	841.70	---	---	---	---	0.00	---	---	---	---	---	0.000
2.80	0.088	841.80	---	---	---	---	0.00	---	---	---	---	---	0.000
2.90	0.096	841.90	---	---	---	---	0.00	---	---	---	---	---	0.000
3.00	0.103	842.00	---	---	---	---	0.00	---	---	---	---	---	0.000
3.10	0.115	842.10	---	---	---	---	0.00	---	---	---	---	---	0.000
3.20	0.128	842.20	---	---	---	---	0.00	---	---	---	---	---	0.000
3.30	0.140	842.30	---	---	---	---	0.00	---	---	---	---	---	0.000
3.40	0.153	842.40	---	---	---	---	0.00	---	---	---	---	---	0.000
3.50	0.165	842.50	---	---	---	---	0.00	---	---	---	---	---	0.000

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BLVD BIOFILTER P-5

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	0.178	842.60	---	---	---	---	0.00	---	---	---	---	---	0.000
3.70	0.190	842.70	---	---	---	---	0.00	---	---	---	---	---	0.000
3.80	0.203	842.80	---	---	---	---	0.00	---	---	---	---	---	0.000
3.90	0.215	842.90	---	---	---	---	0.00	---	---	---	---	---	0.000
4.00	0.228	843.00	---	---	---	---	0.00	---	---	---	---	---	0.000
4.10	0.255	843.10	---	---	---	---	0.00	---	---	---	---	---	0.000
4.20	0.282	843.20	---	---	---	---	0.00	---	---	---	---	---	0.000
4.30	0.310	843.30	---	---	---	---	0.00	---	---	---	---	---	0.000
4.40	0.337	843.40	---	---	---	---	0.00	---	---	---	---	---	0.000
4.50	0.364	843.50	---	---	---	---	0.00	---	---	---	---	---	0.000
4.60	0.391	843.60	---	---	---	---	0.00	---	---	---	---	---	0.000
4.70	0.419	843.70	---	---	---	---	0.00	---	---	---	---	---	0.000
4.80	0.446	843.80	---	---	---	---	0.00	---	---	---	---	---	0.000
4.90	0.473	843.90	---	---	---	---	0.00	---	---	---	---	---	0.000
5.00	0.500	844.00	---	---	---	---	0.00	---	---	---	---	---	0.000
5.05	0.522	844.05	---	---	---	---	0.00	---	---	---	---	---	0.000
5.10	0.544	844.10	---	---	---	---	0.15	---	---	---	---	---	0.145
5.15	0.566	844.15	---	---	---	---	0.41	---	---	---	---	---	0.411
5.20	0.588	844.20	---	---	---	---	0.75	---	---	---	---	---	0.755
5.25	0.610	844.25	---	---	---	---	1.16	---	---	---	---	---	1.162
5.30	0.631	844.30	---	---	---	---	1.62	---	---	---	---	---	1.624
5.35	0.653	844.35	---	---	---	---	2.14	---	---	---	---	---	2.135
5.40	0.675	844.40	---	---	---	---	2.69	---	---	---	---	---	2.691
5.45	0.697	844.45	---	---	---	---	3.29	---	---	---	---	---	3.288
5.50	0.719	844.50	---	---	---	---	3.92	---	---	---	---	---	3.924

...End

Hydrograph Report

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

Friday, 06 / 28 / 2019

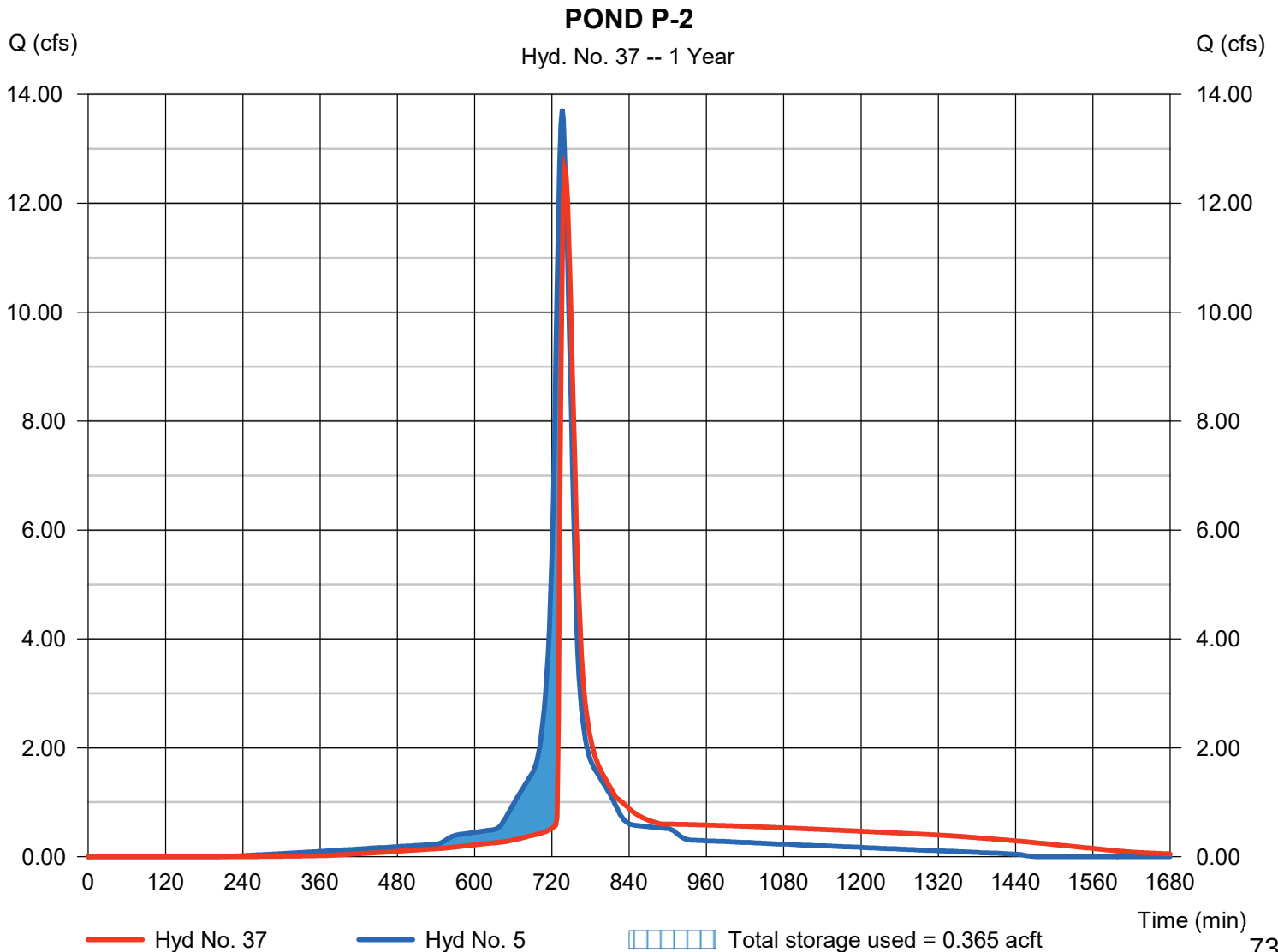
Hyd. No. 37

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyd. No. = 5 - P-2
 Reservoir name = POND P-2

Peak discharge = 12.62 cfs
 Time to peak = 740 min
 Hyd. volume = 1.167 acft
 Max. Elevation = 839.69 ft
 Max. Storage = 0.365 acft

Storage Indication method used.



Pond Report

82

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

Friday, 06 / 28 / 2019

Pond No. 2 - POND P-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 837.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	837.00	3,641	0.000	0.000
1.00	838.00	5,315	0.102	0.102
2.00	839.00	6,928	0.140	0.242
3.00	840.00	8,626	0.178	0.420
4.00	841.00	10,425	0.218	0.639
5.00	842.00	14,394	0.284	0.922
6.00	843.00	20,000	0.393	1.315

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 27.00	4.00	0.00	0.00
Span (in)	= 27.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 836.75	837.00	0.00	0.00
Length (ft)	= 53.50	1.00	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	20.00	0.00	0.00
Crest El. (ft)	= 839.25	841.90	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	837.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.010	837.10	0.43 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	0.020	837.20	0.43 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	0.031	837.30	0.43 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	0.041	837.40	0.43 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	0.051	837.50	0.43 ic	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	0.061	837.60	0.43 ic	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	0.072	837.70	0.43 ic	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	0.082	837.80	0.43 ic	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	0.092	837.90	0.43 ic	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	0.102	838.00	0.43 ic	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.384
1.10	0.116	838.10	0.43 ic	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	0.130	838.20	0.43 ic	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	0.144	838.30	0.47 ic	0.45 ic	---	---	0.00	0.00	---	---	---	---	0.447
1.40	0.158	838.40	0.47 ic	0.47 ic	---	---	0.00	0.00	---	---	---	---	0.467
1.50	0.172	838.50	0.51 ic	0.49 ic	---	---	0.00	0.00	---	---	---	---	0.485
1.60	0.186	838.60	0.51 ic	0.50 ic	---	---	0.00	0.00	---	---	---	---	0.503
1.70	0.200	838.70	0.55 ic	0.52 ic	---	---	0.00	0.00	---	---	---	---	0.520
1.80	0.214	838.80	0.55 ic	0.54 ic	---	---	0.00	0.00	---	---	---	---	0.537
1.90	0.228	838.90	0.55 ic	0.55 ic	---	---	0.00	0.00	---	---	---	---	0.553
2.00	0.242	839.00	0.59 ic	0.57 ic	---	---	0.00	0.00	---	---	---	---	0.569
2.10	0.260	839.10	0.59 ic	0.58 ic	---	---	0.00	0.00	---	---	---	---	0.584
2.20	0.278	839.20	0.60 ic	0.60 ic	---	---	0.00	0.00	---	---	---	---	0.599
2.30	0.296	839.30	1.12 ic	0.61 ic	---	---	0.47	0.00	---	---	---	---	1.081
2.40	0.314	839.40	3.11 oc	0.58 ic	---	---	2.43	0.00	---	---	---	---	3.012
2.50	0.331	839.50	5.87 oc	0.54 ic	---	---	5.23	0.00	---	---	---	---	5.764
2.60	0.349	839.60	9.22 oc	0.47 ic	---	---	8.66	0.00	---	---	---	---	9.130
2.70	0.367	839.70	12.96 oc	0.33 ic	---	---	12.63	0.00	---	---	---	---	12.96
2.80	0.385	839.80	17.04 oc	0.29 ic	---	---	16.75 s	0.00	---	---	---	---	17.04
2.90	0.403	839.90	19.71 oc	0.26 ic	---	---	19.45 s	0.00	---	---	---	---	19.71
3.00	0.420	840.00	21.77 oc	0.23 ic	---	---	21.53 s	0.00	---	---	---	---	21.77
3.10	0.442	840.10	23.46 oc	0.21 ic	---	---	23.25 s	0.00	---	---	---	---	23.46
3.20	0.464	840.20	24.92 oc	0.19 ic	---	---	24.72 s	0.00	---	---	---	---	24.91
3.30	0.486	840.30	26.20 oc	0.18 ic	---	---	26.02 s	0.00	---	---	---	---	26.19
3.40	0.508	840.40	27.36 oc	0.16 ic	---	---	27.19 s	0.00	---	---	---	---	27.36
3.50	0.530	840.50	28.42 oc	0.15 ic	---	---	28.26 s	0.00	---	---	---	---	28.42

Continues on next page...

POND P-2

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	0.551	840.60	29.42 oc	0.14 ic	---	---	29.28 s	0.00	---	---	---	---	29.42
3.70	0.573	840.70	30.35 oc	0.13 ic	---	---	30.21 s	0.00	---	---	---	---	30.34
3.80	0.595	840.80	31.24 oc	0.12 ic	---	---	31.11 s	0.00	---	---	---	---	31.24
3.90	0.617	840.90	32.10 oc	0.12 ic	---	---	31.97 s	0.00	---	---	---	---	32.09
4.00	0.639	841.00	32.92 oc	0.11 ic	---	---	32.79 s	0.00	---	---	---	---	32.90
4.10	0.667	841.10	33.71 oc	0.11 ic	---	---	33.59 s	0.00	---	---	---	---	33.69
4.20	0.696	841.20	34.47 oc	0.10 ic	---	---	34.37 s	0.00	---	---	---	---	34.47
4.30	0.724	841.30	35.15 ic	0.10 ic	---	---	35.05 s	0.00	---	---	---	---	35.15
4.40	0.752	841.40	35.69 ic	0.09 ic	---	---	35.59 s	0.00	---	---	---	---	35.68
4.50	0.781	841.50	36.23 ic	0.09 ic	---	---	36.11 s	0.00	---	---	---	---	36.20
4.60	0.809	841.60	36.75 ic	0.08 ic	---	---	36.65 s	0.00	---	---	---	---	36.74
4.70	0.837	841.70	37.26 ic	0.08 ic	---	---	37.17 s	0.00	---	---	---	---	37.25
4.80	0.866	841.80	37.76 ic	0.08 ic	---	---	37.66 s	0.00	---	---	---	---	37.74
4.90	0.894	841.90	38.25 ic	0.07 ic	---	---	38.16 s	0.00	---	---	---	---	38.24
5.00	0.922	842.00	38.74 ic	0.07 ic	---	---	38.66 s	1.64	---	---	---	---	40.37
5.10	0.962	842.10	39.22 ic	0.07 ic	---	---	39.13 s	4.65	---	---	---	---	43.85
5.20	1.001	842.20	39.69 ic	0.07 ic	---	---	39.57 s	8.54	---	---	---	---	48.18
5.30	1.040	842.30	40.16 ic	0.06 ic	---	---	40.09 s	13.15	---	---	---	---	53.30
5.40	1.080	842.40	40.62 ic	0.06 ic	---	---	40.51 s	18.38	---	---	---	---	58.95
5.50	1.119	842.50	41.07 ic	0.06 ic	---	---	41.00 s	24.16	---	---	---	---	65.22
5.60	1.158	842.60	41.52 ic	0.06 ic	---	---	41.44 s	30.45	---	---	---	---	71.95
5.70	1.198	842.70	41.97 ic	0.06 ic	---	---	41.85 s	37.19	---	---	---	---	79.11
5.80	1.237	842.80	42.40 ic	0.06 ic	---	---	42.32 s	44.38	---	---	---	---	86.75
5.90	1.276	842.90	42.84 ic	0.05 ic	---	---	42.70 s	51.98	---	---	---	---	94.73
6.00	1.315	843.00	43.27 ic	0.05 ic	---	---	43.14 s	59.99	---	---	---	---	103.18

...End

Hydrograph Report

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

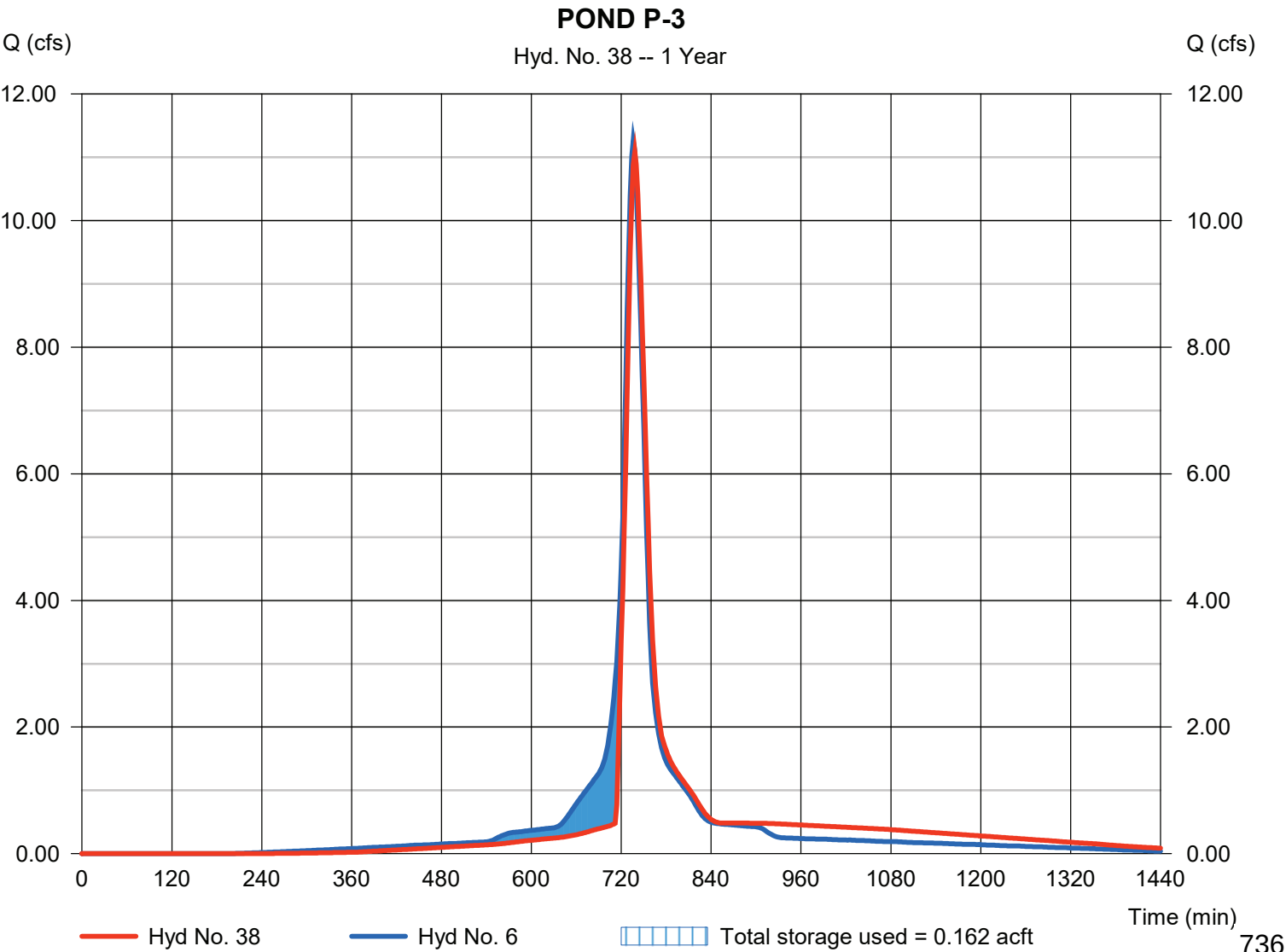
Friday, 06 / 28 / 2019

Hyd. No. 38

POND P-3

Hydrograph type	= Reservoir	Peak discharge	= 11.09 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.957 acft
Inflow hyd. No.	= 6 - P-3	Max. Elevation	= 839.90 ft
Reservoir name	= POND P-3	Max. Storage	= 0.162 acft

Storage Indication method used.



Pond Report

85

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

Friday, 06 / 28 / 2019

Pond No. 3 - POND P-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 838.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	838.00	2,707	0.000	0.000
1.00	839.00	3,721	0.073	0.073
2.00	840.00	4,846	0.098	0.172
3.00	841.00	6,075	0.125	0.297
4.00	842.00	7,400	0.154	0.451
5.00	843.00	20,000	0.303	0.754

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	4.00	0.00	0.00
Span (in)	= 24.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 837.25	838.00	0.00	0.00
Length (ft)	= 54.00	1.00	0.00	0.00
Slope (%)	= 0.96	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	5.00	0.00	0.00
Crest El. (ft)	= 839.50	841.70	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	838.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.007	838.10	3.18 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	0.015	838.20	3.18 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	0.022	838.30	3.18 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	0.029	838.40	3.18 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	0.037	838.50	3.18 ic	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	0.044	838.60	3.18 ic	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	0.051	838.70	3.18 ic	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	0.059	838.80	3.18 ic	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	0.066	838.90	3.18 ic	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	0.073	839.00	3.18 ic	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.384
1.10	0.083	839.10	3.18 ic	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	0.093	839.20	3.18 ic	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	0.103	839.30	3.18 ic	0.45 ic	---	---	0.00	0.00	---	---	---	---	0.447
1.40	0.113	839.40	3.18 ic	0.47 ic	---	---	0.00	0.00	---	---	---	---	0.467
1.50	0.122	839.50	3.18 ic	0.49 ic	---	---	0.00	0.00	---	---	---	---	0.485
1.60	0.132	839.60	3.18 ic	0.50 ic	---	---	1.32	0.00	---	---	---	---	1.825
1.70	0.142	839.70	4.30 ic	0.52 ic	---	---	3.74	0.00	---	---	---	---	4.259
1.80	0.152	839.80	7.36 ic	0.49 ic	---	---	6.87	0.00	---	---	---	---	7.359
1.90	0.162	839.90	11.06 oc	0.43 ic	---	---	10.58	0.00	---	---	---	---	11.01
2.00	0.172	840.00	15.08 oc	0.29 ic	---	---	14.79 s	0.00	---	---	---	---	15.08
2.10	0.184	840.10	17.36 oc	0.25 ic	---	---	17.11 s	0.00	---	---	---	---	17.36
2.20	0.197	840.20	18.87 oc	0.21 ic	---	---	18.66 s	0.00	---	---	---	---	18.87
2.30	0.209	840.30	20.06 oc	0.19 ic	---	---	19.87 s	0.00	---	---	---	---	20.06
2.40	0.222	840.40	21.07 oc	0.17 ic	---	---	20.90 s	0.00	---	---	---	---	21.06
2.50	0.234	840.50	21.95 oc	0.15 ic	---	---	21.80 s	0.00	---	---	---	---	21.95
2.60	0.247	840.60	22.67 ic	0.14 ic	---	---	22.53 s	0.00	---	---	---	---	22.66
2.70	0.259	840.70	23.25 ic	0.12 ic	---	---	23.13 s	0.00	---	---	---	---	23.25
2.80	0.272	840.80	23.81 ic	0.11 ic	---	---	23.69 s	0.00	---	---	---	---	23.80
2.90	0.284	840.90	24.33 ic	0.10 ic	---	---	24.23 s	0.00	---	---	---	---	24.33
3.00	0.297	841.00	24.84 ic	0.10 ic	---	---	24.72 s	0.00	---	---	---	---	24.82
3.10	0.312	841.10	25.33 ic	0.09 ic	---	---	25.23 s	0.00	---	---	---	---	25.32
3.20	0.327	841.20	25.80 ic	0.08 ic	---	---	25.70 s	0.00	---	---	---	---	25.78
3.30	0.343	841.30	26.26 ic	0.08 ic	---	---	26.16 s	0.00	---	---	---	---	26.24
3.40	0.358	841.40	26.71 ic	0.08 ic	---	---	26.62 s	0.00	---	---	---	---	26.69
3.50	0.374	841.50	27.14 ic	0.07 ic	---	---	27.04 s	0.00	---	---	---	---	27.12
3.60	0.389	841.60	27.57 ic	0.07 ic	---	---	27.49 s	0.00	---	---	---	---	27.56

Continues on next page...

POND P-3

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.70	0.405	841.70	28.00 ic	0.06 ic	---	---	27.93 s	0.00	---	---	---	---	27.99
3.80	0.420	841.80	28.41 ic	0.06 ic	---	---	28.32 s	0.41	---	---	---	---	28.79
3.90	0.436	841.90	28.82 ic	0.06 ic	---	---	28.74 s	1.16	---	---	---	---	29.96
4.00	0.451	842.00	29.22 ic	0.06 ic	---	---	29.15 s	2.14	---	---	---	---	31.34
4.10	0.481	842.10	29.61 ic	0.05 ic	---	---	29.53 s	3.29	---	---	---	---	32.87
4.20	0.512	842.20	30.00 ic	0.05 ic	---	---	29.93 s	4.60	---	---	---	---	34.58
4.30	0.542	842.30	30.38 ic	0.05 ic	---	---	30.28 s	6.04	---	---	---	---	36.37
4.40	0.572	842.40	30.76 ic	0.05 ic	---	---	30.66 s	7.61	---	---	---	---	38.32
4.50	0.602	842.50	31.13 ic	0.05 ic	---	---	31.04 s	9.30	---	---	---	---	40.39
4.60	0.633	842.60	31.50 ic	0.05 ic	---	---	31.39 s	11.10	---	---	---	---	42.53
4.70	0.663	842.70	31.86 ic	0.04 ic	---	---	31.81 s	13.00	---	---	---	---	44.85
4.80	0.693	842.80	32.22 ic	0.04 ic	---	---	32.15 s	14.99	---	---	---	---	47.19
4.90	0.723	842.90	32.58 ic	0.04 ic	---	---	32.53 s	17.08	---	---	---	---	49.65
5.00	0.754	843.00	32.93 ic	0.04 ic	---	---	32.77 s	19.27	---	---	---	---	52.08

...End

Hydrograph Report

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

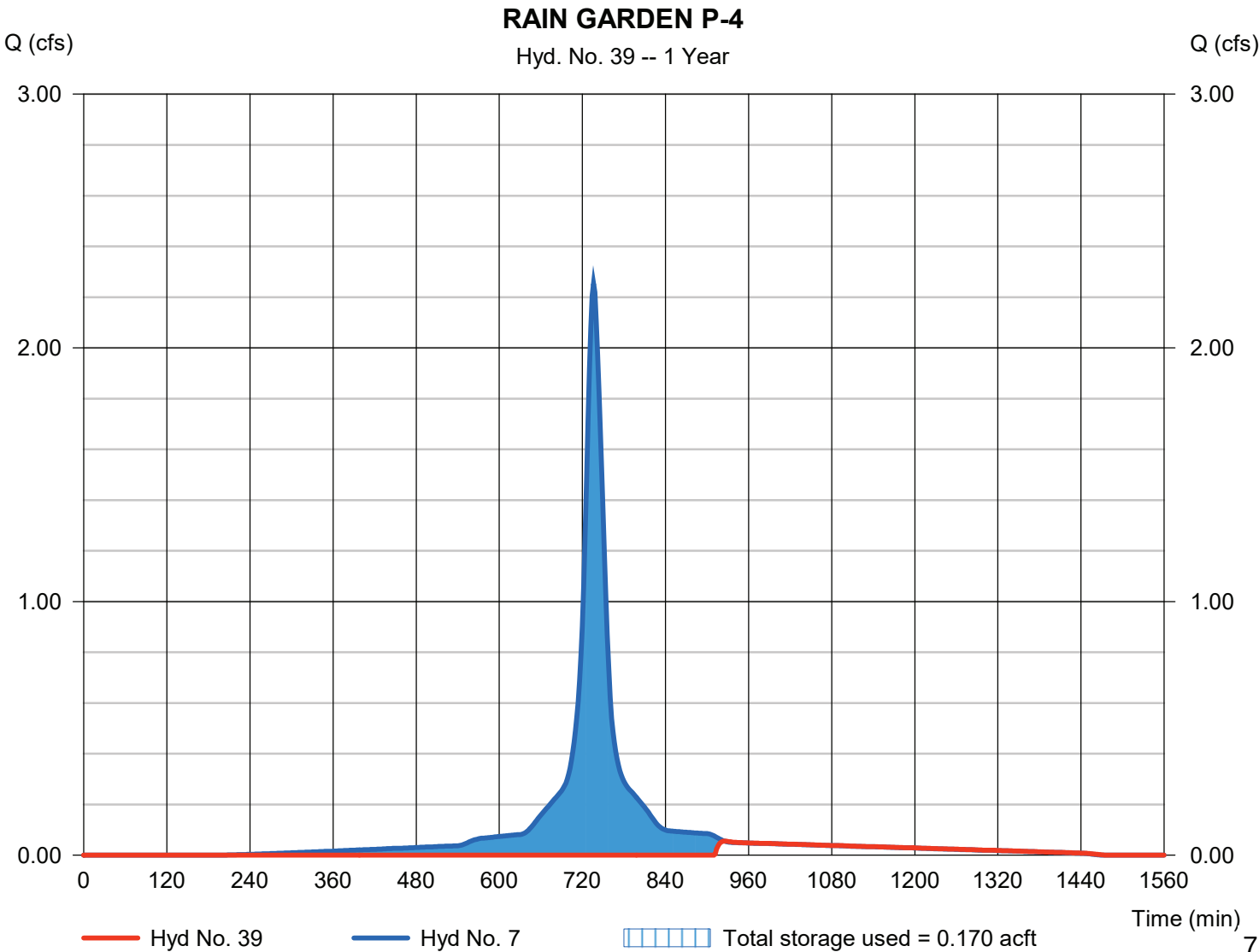
Friday, 06 / 28 / 2019

Hyd. No. 39

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.055 cfs
Storm frequency	= 1 yrs	Time to peak	= 926 min
Time interval	= 2 min	Hyd. volume	= 0.022 acft
Inflow hyd. No.	= 7 - P-4	Max. Elevation	= 840.70 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 0.170 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 4 - RAIN GARDEN P-4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 839.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	839.00	2,706	0.000	0.000
1.00	840.00	4,351	0.080	0.080
2.00	841.00	6,823	0.127	0.207
2.70	841.70	8,331	0.122	0.329

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 840.70	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).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	839.00	---	---	---	---	0.00	---	---	---	---	---	0.000
0.10	0.008	839.10	---	---	---	---	0.00	---	---	---	---	---	0.000
0.20	0.016	839.20	---	---	---	---	0.00	---	---	---	---	---	0.000
0.30	0.024	839.30	---	---	---	---	0.00	---	---	---	---	---	0.000
0.40	0.032	839.40	---	---	---	---	0.00	---	---	---	---	---	0.000
0.50	0.040	839.50	---	---	---	---	0.00	---	---	---	---	---	0.000
0.60	0.048	839.60	---	---	---	---	0.00	---	---	---	---	---	0.000
0.70	0.056	839.70	---	---	---	---	0.00	---	---	---	---	---	0.000
0.80	0.064	839.80	---	---	---	---	0.00	---	---	---	---	---	0.000
0.90	0.072	839.90	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	0.080	840.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.10	0.093	840.10	---	---	---	---	0.00	---	---	---	---	---	0.000
1.20	0.106	840.20	---	---	---	---	0.00	---	---	---	---	---	0.000
1.30	0.118	840.30	---	---	---	---	0.00	---	---	---	---	---	0.000
1.40	0.131	840.40	---	---	---	---	0.00	---	---	---	---	---	0.000
1.50	0.144	840.50	---	---	---	---	0.00	---	---	---	---	---	0.000
1.60	0.157	840.60	---	---	---	---	0.00	---	---	---	---	---	0.000
1.70	0.169	840.70	---	---	---	---	0.00	---	---	---	---	---	0.000
1.80	0.182	840.80	---	---	---	---	1.64	---	---	---	---	---	1.639
1.90	0.195	840.90	---	---	---	---	4.64	---	---	---	---	---	4.643
2.00	0.207	841.00	---	---	---	---	8.54	---	---	---	---	---	8.544
2.07	0.220	841.07	---	---	---	---	11.70	---	---	---	---	---	11.70
2.14	0.232	841.14	---	---	---	---	15.18	---	---	---	---	---	15.18
2.21	0.244	841.21	---	---	---	---	18.94	---	---	---	---	---	18.94
2.28	0.256	841.28	---	---	---	---	22.97	---	---	---	---	---	22.97
2.35	0.268	841.35	---	---	---	---	27.25	---	---	---	---	---	27.25
2.42	0.280	841.42	---	---	---	---	31.77	---	---	---	---	---	31.77
2.49	0.293	841.49	---	---	---	---	36.52	---	---	---	---	---	36.52
2.56	0.305	841.56	---	---	---	---	41.48	---	---	---	---	---	41.48
2.63	0.317	841.63	---	---	---	---	46.65	---	---	---	---	---	46.65
2.70	0.329	841.70	---	---	---	---	52.00	---	---	---	---	---	52.00

Hydrograph Report

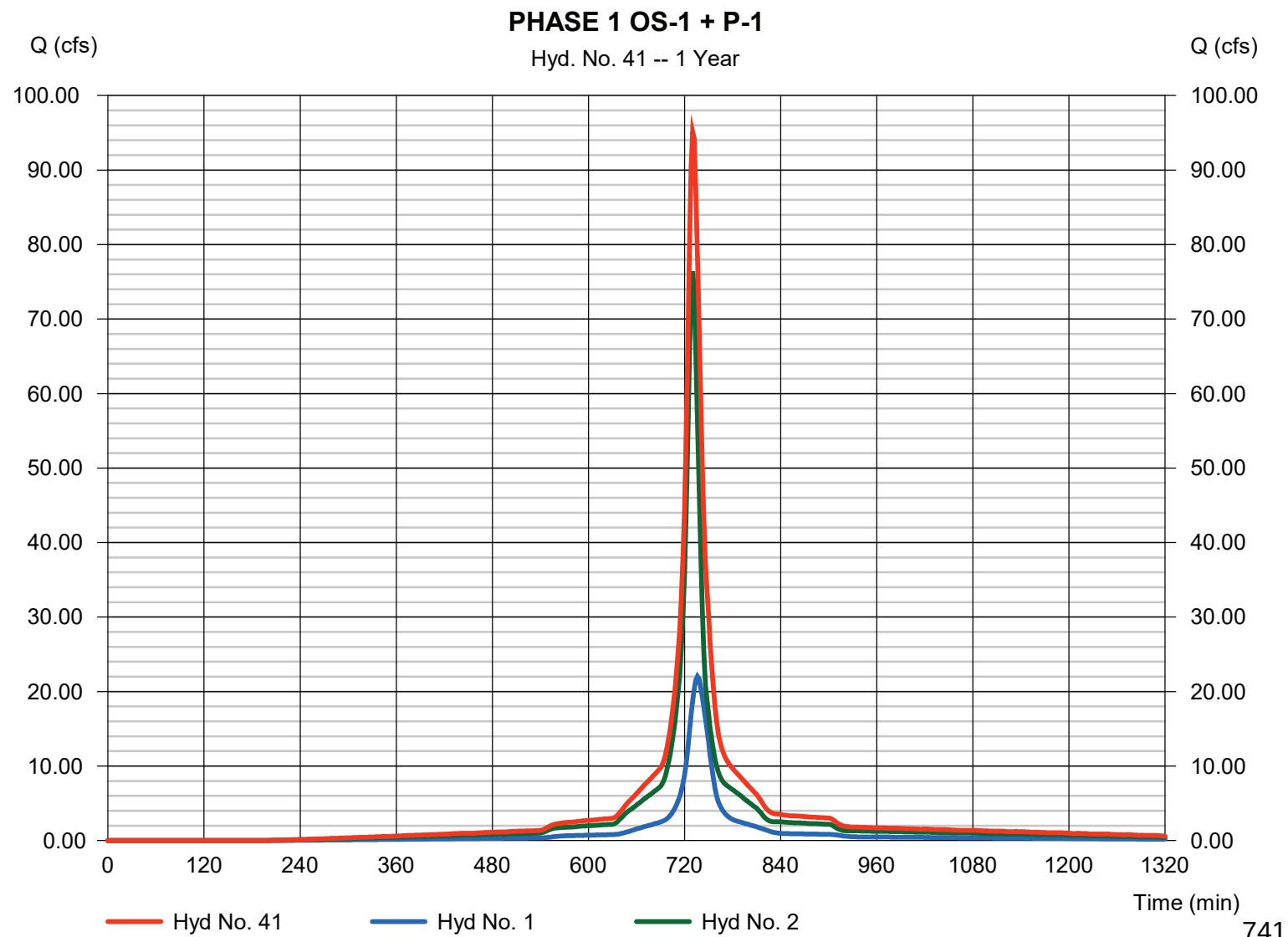
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 41

PHASE 1 OS-1 + P-1

Hydrograph type	= Combine	Peak discharge	= 95.12 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 6.887 acft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 37.042 ac



Hydrograph Report

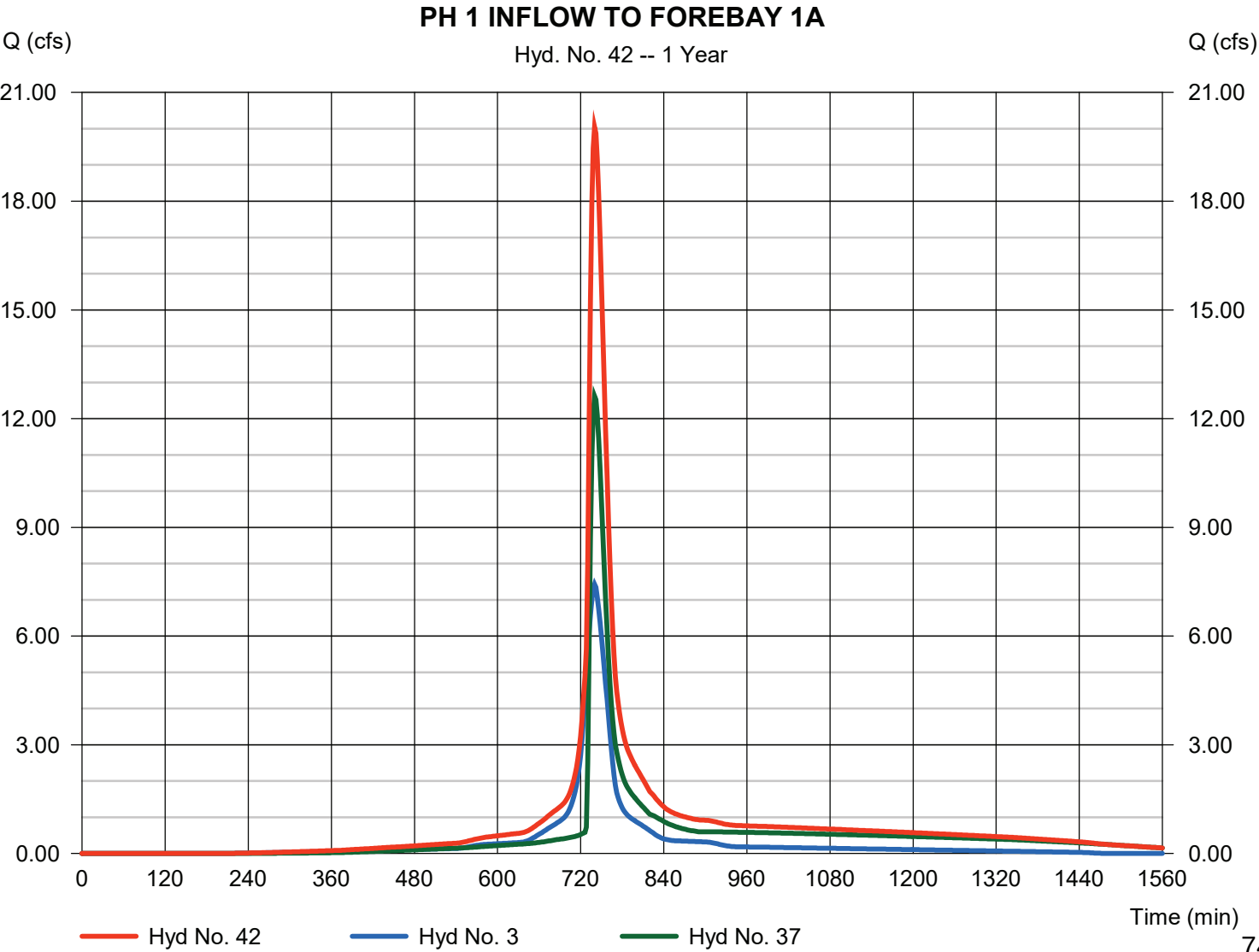
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 42

PH 1 INFLOW TO FOREBAY 1A

Hydrograph type	= Combine	Peak discharge	= 20.04 cfs
Storm frequency	= 1 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 1.881 acft
Inflow hyds.	= 3, 37	Contrib. drain. area	= 3.947 ac



Hydrograph Report

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

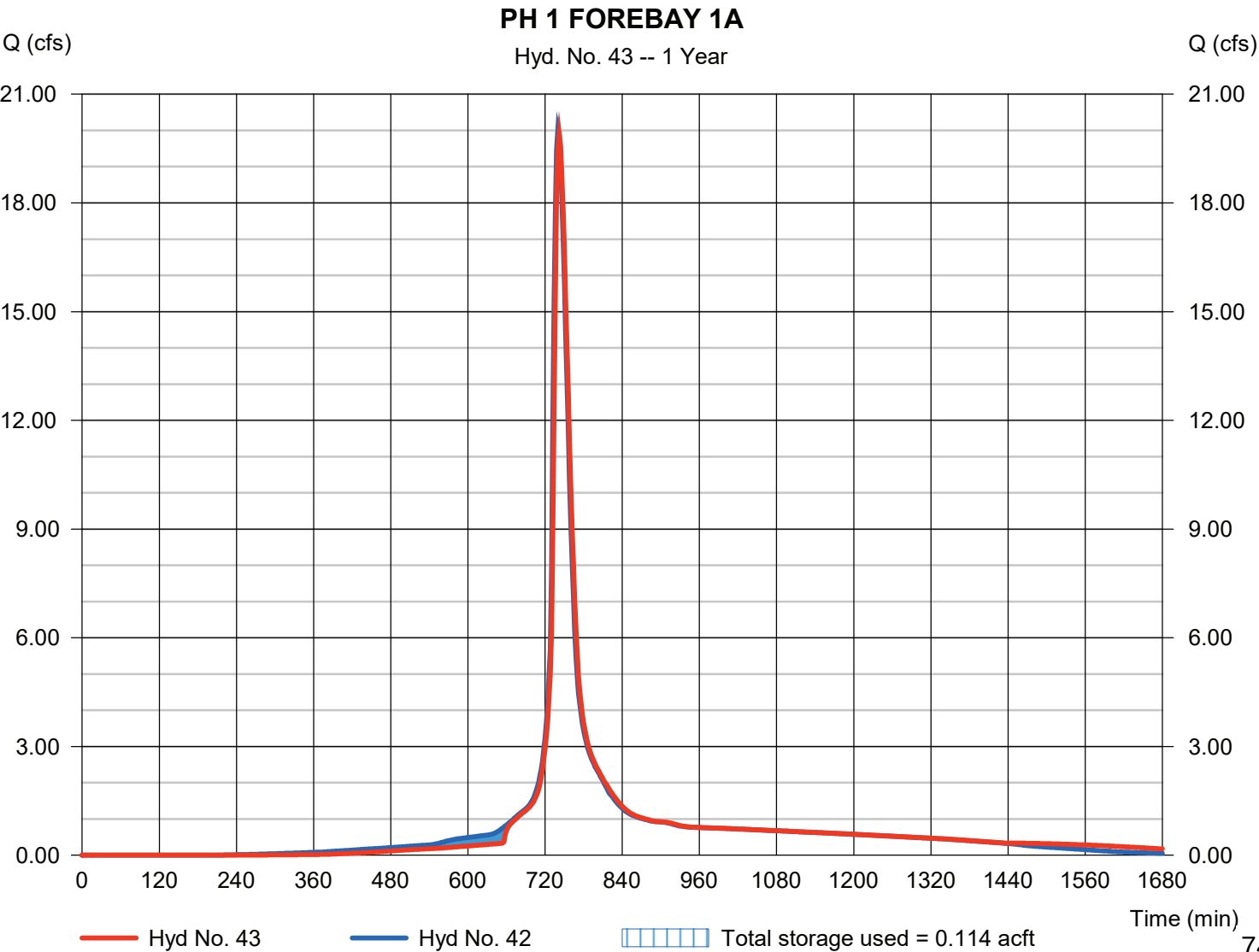
Friday, 06 / 28 / 2019

Hyd. No. 43

PH 1 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 19.89 cfs
Storm frequency	= 1 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 1.881 acft
Inflow hyd. No.	= 42 - PH 1 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.32 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 0.114 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 6 - FOREBAY 1A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 834.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	834.00	2,986	0.000	0.000
1.00	835.00	4,064	0.081	0.081
2.00	836.00	5,241	0.107	0.187
3.00	837.00	6,661	0.136	0.323
4.00	838.00	7,710	0.165	0.488
5.00	839.00	8,606	0.187	0.675
6.00	840.00	9,514	0.208	0.883

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	4.00	0.00	0.00
Span (in)	= 36.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 830.00	834.00	0.00	0.00
Length (ft)	= 43.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.71	10.00	0.00	0.00
Crest El. (ft)	= 834.80	835.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	834.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.008	834.10	46.48 oc	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	0.016	834.20	46.48 oc	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	0.024	834.30	46.48 oc	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	0.032	834.40	46.48 oc	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	0.040	834.50	46.48 oc	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	0.048	834.60	46.48 oc	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	0.056	834.70	46.48 oc	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	0.064	834.80	46.48 oc	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	0.073	834.90	46.48 oc	0.36 ic	---	---	1.65	0.00	---	---	---	---	2.009
1.00	0.081	835.00	46.48 oc	0.38 ic	---	---	4.68	0.00	---	---	---	---	5.063
1.10	0.091	835.10	46.48 oc	0.41 ic	---	---	8.60	0.00	---	---	---	---	9.001
1.20	0.102	835.20	46.48 oc	0.43 ic	---	---	13.24	0.00	---	---	---	---	13.66
1.30	0.113	835.30	46.48 oc	0.45 ic	---	---	18.49	0.00	---	---	---	---	18.94
1.40	0.123	835.40	46.48 oc	0.47 ic	---	---	24.31	0.00	---	---	---	---	24.77
1.50	0.134	835.50	46.48 oc	0.49 ic	---	---	30.63	0.00	---	---	---	---	31.12
1.60	0.145	835.60	46.48 oc	0.50 ic	---	---	37.43	0.82	---	---	---	---	38.75
1.70	0.155	835.70	46.48 oc	0.52 ic	---	---	44.65	2.32	---	---	---	---	47.50
1.80	0.166	835.80	52.81 oc	0.51 ic	---	---	52.30	4.27	---	---	---	---	57.07
1.90	0.176	835.90	60.56 oc	0.43 ic	---	---	60.13 s	6.57	---	---	---	---	67.13
2.00	0.187	836.00	64.82 oc	0.39 ic	---	---	64.43 s	9.19	---	---	---	---	74.01
2.10	0.201	836.10	67.26 ic	0.35 ic	---	---	66.90 s	12.08	---	---	---	---	79.34
2.20	0.214	836.20	69.11 ic	0.32 ic	---	---	68.79 s	15.23	---	---	---	---	84.33
2.30	0.228	836.30	70.67 ic	0.29 ic	---	---	70.37 s	18.60	---	---	---	---	89.27
2.40	0.242	836.40	72.05 ic	0.27 ic	---	---	71.77 s	22.20	---	---	---	---	94.24
2.50	0.255	836.50	73.29 ic	0.25 ic	---	---	73.04 s	26.00	---	---	---	---	99.29
2.60	0.269	836.60	74.44 ic	0.24 ic	---	---	74.20 s	29.99	---	---	---	---	104.43
2.70	0.283	836.70	75.50 ic	0.22 ic	---	---	75.27 s	34.17	---	---	---	---	109.66
2.80	0.296	836.80	76.50 ic	0.21 ic	---	---	76.29 s	38.53	---	---	---	---	115.02
2.90	0.310	836.90	77.45 ic	0.20 ic	---	---	77.25 s	43.06	---	---	---	---	120.50
3.00	0.323	837.00	78.36 ic	0.19 ic	---	---	78.16 s	47.77	---	---	---	---	126.12
3.10	0.340	837.10	79.24 ic	0.18 ic	---	---	79.06 s	52.62	---	---	---	---	131.86
3.20	0.356	837.20	80.09 ic	0.17 ic	---	---	79.91 s	57.63	---	---	---	---	137.71
3.30	0.373	837.30	80.91 ic	0.16 ic	---	---	80.74 s	62.78	---	---	---	---	143.69
3.40	0.389	837.40	81.71 ic	0.15 ic	---	---	81.55 s	68.09	---	---	---	---	149.79
3.50	0.406	837.50	82.50 ic	0.15 ic	---	---	82.33 s	73.53	---	---	---	---	156.01

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FOREBAY 1A

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	0.422	837.60	83.26 ic	0.14 ic	---	---	83.11 s	79.12	---	---	---	---	162.37
3.70	0.439	837.70	84.01 ic	0.14 ic	---	---	83.87 s	84.83	---	---	---	---	168.84
3.80	0.455	837.80	84.75 ic	0.13 ic	---	---	84.61 s	90.68	---	---	---	---	175.42
3.90	0.472	837.90	85.48 ic	0.13 ic	---	---	85.33 s	96.66	---	---	---	---	182.11
4.00	0.488	838.00	86.20 ic	0.12 ic	---	---	86.06 s	102.77	---	---	---	---	188.95
4.10	0.507	838.10	86.90 ic	0.12 ic	---	---	86.75 s	109.00	---	---	---	---	195.87
4.20	0.526	838.20	87.60 ic	0.11 ic	---	---	87.44 s	115.35	---	---	---	---	202.91
4.30	0.544	838.30	88.29 ic	0.11 ic	---	---	88.18 s	121.81	---	---	---	---	210.10
4.40	0.563	838.40	88.97 ic	0.11 ic	---	---	88.82 s	128.40	---	---	---	---	217.32
4.50	0.582	838.50	89.64 ic	0.10 ic	---	---	89.52 s	135.09	---	---	---	---	224.72
4.60	0.600	838.60	90.31 ic	0.10 ic	---	---	90.15 s	141.91	---	---	---	---	232.15
4.70	0.619	838.70	90.97 ic	0.10 ic	---	---	90.82 s	148.82	---	---	---	---	239.74
4.80	0.638	838.80	91.62 ic	0.10 ic	---	---	91.48 s	155.85	---	---	---	---	247.43
4.90	0.657	838.90	92.27 ic	0.09 ic	---	---	92.12 s	162.99	---	---	---	---	255.20
5.00	0.675	839.00	92.91 ic	0.09 ic	---	---	92.79 s	170.25	---	---	---	---	263.13
5.10	0.696	839.10	93.54 ic	0.09 ic	---	---	93.41 s	177.59	---	---	---	---	271.09
5.20	0.717	839.20	94.17 ic	0.09 ic	---	---	94.01 s	185.05	---	---	---	---	279.14
5.30	0.738	839.30	94.80 ic	0.08 ic	---	---	94.63 s	192.59	---	---	---	---	287.30
5.40	0.758	839.40	95.42 ic	0.08 ic	---	---	95.26 s	200.24	---	---	---	---	295.59
5.50	0.779	839.50	96.03 ic	0.08 ic	---	---	95.90 s	207.99	---	---	---	---	303.98
5.60	0.800	839.60	96.64 ic	0.08 ic	---	---	96.56 s	215.84	---	---	---	---	312.48
5.70	0.821	839.70	97.25 ic	0.08 ic	---	---	97.06 s	223.78	---	---	---	---	320.92
5.80	0.842	839.80	97.85 ic	0.08 ic	---	---	97.68 s	231.82	---	---	---	---	329.57
5.90	0.862	839.90	98.45 ic	0.07 ic	---	---	98.31 s	239.95	---	---	---	---	338.33
6.00	0.883	840.00	99.04 ic	0.07 ic	---	---	98.85 s	248.19	---	---	---	---	347.12

...End

Hydrograph Report

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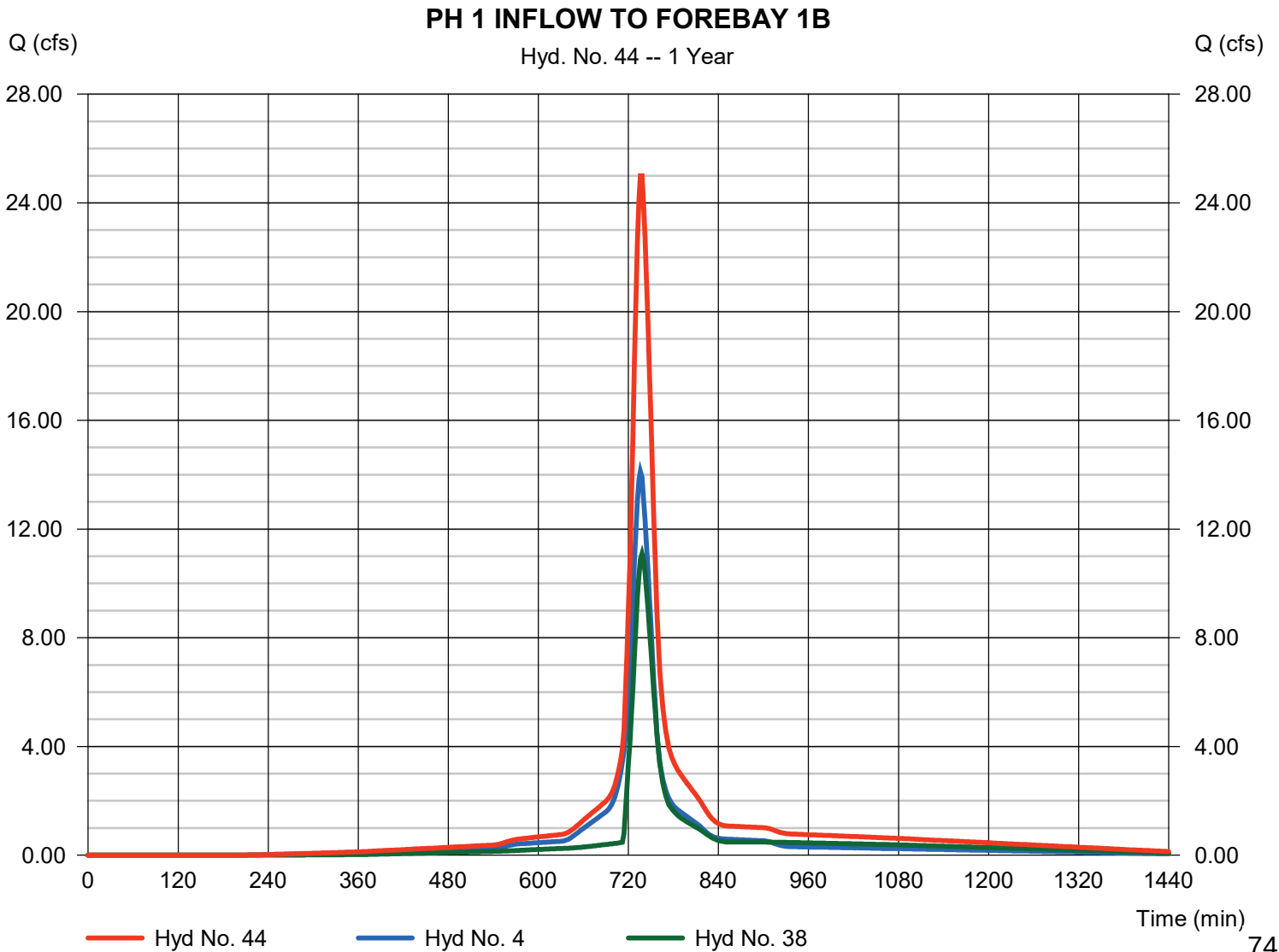
Friday, 06 / 28 / 2019

Hyd. No. 44

PH 1 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 4, 38

Peak discharge = 25.00 cfs
 Time to peak = 736 min
 Hyd. volume = 2.157 acft
 Contrib. drain. area = 6.516 ac



Hydrograph Report

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

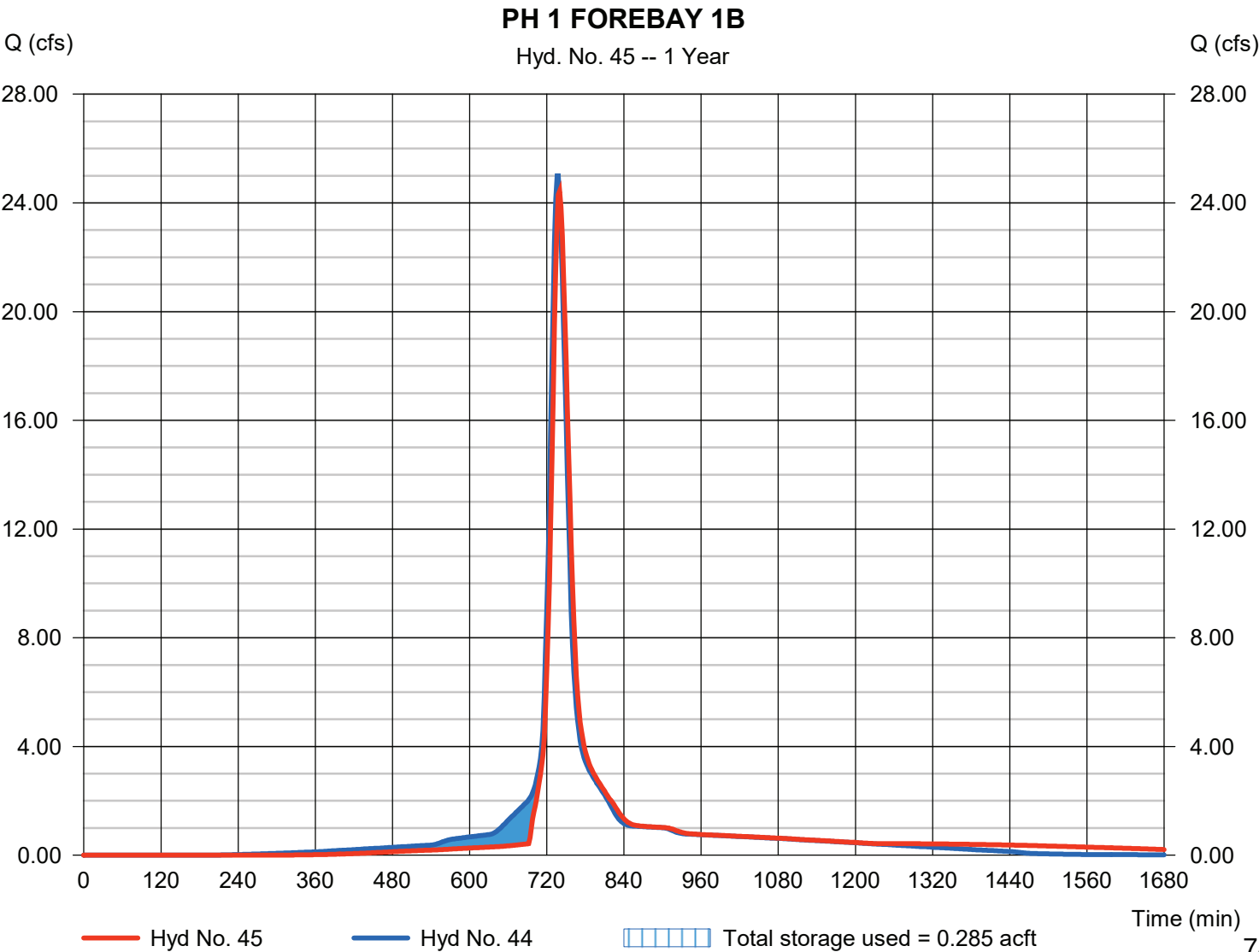
Friday, 06 / 28 / 2019

Hyd. No. 45

PH 1 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 24.43 cfs
Storm frequency	= 1 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 2.156 acft
Inflow hyd. No.	= 44 - PH 1 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.30 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 0.285 acft

Storage Indication method used.



Pond Report

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

Friday, 06 / 28 / 2019

Pond No. 7 - FOREBAY 1B

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 833.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	833.50	5,407	0.000	0.000
0.50	834.00	6,186	0.066	0.066
1.50	835.00	7,811	0.160	0.227
2.50	836.00	9,529	0.199	0.425
3.50	837.00	11,534	0.241	0.667
4.50	838.00	15,922	0.314	0.981
5.50	839.00	20,293	0.415	1.395
6.50	840.00	26,384	0.534	1.929

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	4.00	0.00	0.00
Span (in)	= 30.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 830.00	833.50	0.00	0.00
Length (ft)	= 38.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.71	25.00	0.00	0.00
Crest El. (ft)	= 834.70	835.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	833.50	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.05	0.007	833.55	31.61 oc	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.006
0.10	0.013	833.60	31.61 oc	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.15	0.020	833.65	31.61 oc	0.05 ic	---	---	0.00	0.00	---	---	---	---	0.051
0.20	0.027	833.70	31.61 oc	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.25	0.033	833.75	31.61 oc	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.120
0.30	0.040	833.80	31.61 oc	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.35	0.047	833.85	31.61 oc	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.180
0.40	0.053	833.90	31.61 oc	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.45	0.060	833.95	31.61 oc	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.224
0.50	0.066	834.00	31.61 oc	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	0.083	834.10	31.61 oc	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	0.099	834.20	31.61 oc	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	0.115	834.30	31.61 oc	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	0.131	834.40	31.61 oc	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	0.147	834.50	31.61 oc	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.383
1.10	0.163	834.60	31.61 oc	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	0.179	834.70	31.61 oc	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	0.195	834.80	31.61 oc	0.45 ic	---	---	1.65	0.00	---	---	---	---	2.096
1.40	0.211	834.90	31.61 oc	0.47 ic	---	---	4.67	0.00	---	---	---	---	5.138
1.50	0.227	835.00	31.61 oc	0.49 ic	---	---	8.60	0.00	---	---	---	---	9.081
1.60	0.247	835.10	31.61 oc	0.50 ic	---	---	13.23	0.00	---	---	---	---	13.74
1.70	0.267	835.20	31.61 oc	0.52 ic	---	---	18.50	0.00	---	---	---	---	19.02
1.80	0.286	835.30	31.61 oc	0.54 ic	---	---	24.31	0.00	---	---	---	---	24.85
1.90	0.306	835.40	31.61 oc	0.55 ic	---	---	30.63	0.00	---	---	---	---	31.18
2.00	0.326	835.50	37.94 oc	0.51 ic	---	---	37.42	0.00	---	---	---	---	37.93
2.10	0.346	835.60	44.47 ic	0.38 ic	---	---	44.10 s	2.05	---	---	---	---	46.53
2.20	0.366	835.70	46.51 ic	0.32 ic	---	---	46.19 s	5.81	---	---	---	---	52.32
2.30	0.386	835.80	47.88 ic	0.28 ic	---	---	47.60 s	10.67	---	---	---	---	58.55
2.40	0.406	835.90	48.98 ic	0.25 ic	---	---	48.72 s	16.43	---	---	---	---	65.40
2.50	0.425	836.00	49.91 ic	0.23 ic	---	---	49.68 s	22.98	---	---	---	---	72.89
2.60	0.450	836.10	50.74 ic	0.21 ic	---	---	50.53 s	30.21	---	---	---	---	80.94
2.70	0.474	836.20	51.49 ic	0.19 ic	---	---	51.30 s	38.07	---	---	---	---	89.56
2.80	0.498	836.30	52.19 ic	0.17 ic	---	---	52.01 s	46.50	---	---	---	---	98.69
2.90	0.522	836.40	52.85 ic	0.16 ic	---	---	52.67 s	55.49	---	---	---	---	108.32

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FOREBAY 1B

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.00	0.546	836.50	53.47 ic	0.15 ic	---	---	53.31 s	64.99	---	---	---	---	118.45
3.10	0.570	836.60	54.08 ic	0.14 ic	---	---	53.93 s	74.98	---	---	---	---	129.05
3.20	0.594	836.70	54.66 ic	0.13 ic	---	---	54.50 s	85.43	---	---	---	---	140.06
3.30	0.619	836.80	55.22 ic	0.13 ic	---	---	55.09 s	96.32	---	---	---	---	151.54
3.40	0.643	836.90	55.77 ic	0.12 ic	---	---	55.64 s	107.65	---	---	---	---	163.41
3.50	0.667	837.00	56.31 ic	0.11 ic	---	---	56.18 s	119.41	---	---	---	---	175.71
3.60	0.698	837.10	56.84 ic	0.11 ic	---	---	56.70 s	131.55	---	---	---	---	188.36
3.70	0.730	837.20	57.36 ic	0.10 ic	---	---	57.24 s	144.08	---	---	---	---	201.42
3.80	0.761	837.30	57.87 ic	0.10 ic	---	---	57.76 s	156.96	---	---	---	---	214.82
3.90	0.792	837.40	58.37 ic	0.09 ic	---	---	58.25 s	170.22	---	---	---	---	228.56
4.00	0.824	837.50	58.86 ic	0.09 ic	---	---	58.73 s	183.83	---	---	---	---	242.65
4.10	0.855	837.60	59.35 ic	0.09 ic	---	---	59.23 s	197.80	---	---	---	---	257.11
4.20	0.886	837.70	59.84 ic	0.08 ic	---	---	59.71 s	212.08	---	---	---	---	271.88
4.30	0.918	837.80	60.31 ic	0.08 ic	---	---	60.21 s	226.70	---	---	---	---	286.99
4.40	0.949	837.90	60.79 ic	0.08 ic	---	---	60.70 s	241.64	---	---	---	---	302.42
4.50	0.981	838.00	61.26 ic	0.07 ic	---	---	61.18 s	256.94	---	---	---	---	318.19
4.60	1.022	838.10	61.72 ic	0.07 ic	---	---	61.59 s	272.50	---	---	---	---	334.16
4.70	1.064	838.20	62.18 ic	0.07 ic	---	---	62.05 s	288.38	---	---	---	---	350.50
4.80	1.105	838.30	62.63 ic	0.07 ic	---	---	62.51 s	304.53	---	---	---	---	367.11
4.90	1.146	838.40	63.08 ic	0.07 ic	---	---	63.01 s	320.99	---	---	---	---	384.07
5.00	1.188	838.50	63.53 ic	0.06 ic	---	---	63.45 s	337.73	---	---	---	---	401.24
5.10	1.229	838.60	63.97 ic	0.06 ic	---	---	63.86 s	354.76	---	---	---	---	418.68
5.20	1.271	838.70	64.41 ic	0.06 ic	---	---	64.34 s	372.05	---	---	---	---	436.46
5.30	1.312	838.80	64.85 ic	0.06 ic	---	---	64.79 s	389.62	---	---	---	---	454.47
5.40	1.354	838.90	65.28 ic	0.06 ic	---	---	65.12 s	407.46	---	---	---	---	472.64
5.50	1.395	839.00	65.72 ic	0.06 ic	---	---	65.63 s	425.61	---	---	---	---	491.30
5.60	1.449	839.10	66.14 ic	0.05 ic	---	---	65.99 s	443.98	---	---	---	---	510.02
5.70	1.502	839.20	66.57 ic	0.05 ic	---	---	66.37 s	462.61	---	---	---	---	529.04
5.80	1.555	839.30	66.99 ic	0.05 ic	---	---	66.78 s	481.48	---	---	---	---	548.31
5.90	1.609	839.40	67.41 ic	0.05 ic	---	---	67.21 s	500.60	---	---	---	---	567.87
6.00	1.662	839.50	67.82 ic	0.05 ic	---	---	67.70 s	519.98	---	---	---	---	587.72
6.10	1.716	839.60	68.23 ic	0.05 ic	---	---	68.07 s	539.60	---	---	---	---	607.73
6.20	1.769	839.70	68.64 ic	0.05 ic	---	---	68.52 s	559.45	---	---	---	---	628.02
6.30	1.823	839.80	69.05 ic	0.05 ic	---	---	68.98 s	579.54	---	---	---	---	648.57
6.40	1.876	839.90	69.46 ic	0.05 ic	---	---	69.19 s	599.87	---	---	---	---	669.11
6.50	1.929	840.00	69.86 ic	0.04 ic	---	---	69.60 s	620.49	---	---	---	---	690.13

...End

Hydrograph Report

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

Friday, 06 / 28 / 2019

Hyd. No. 46

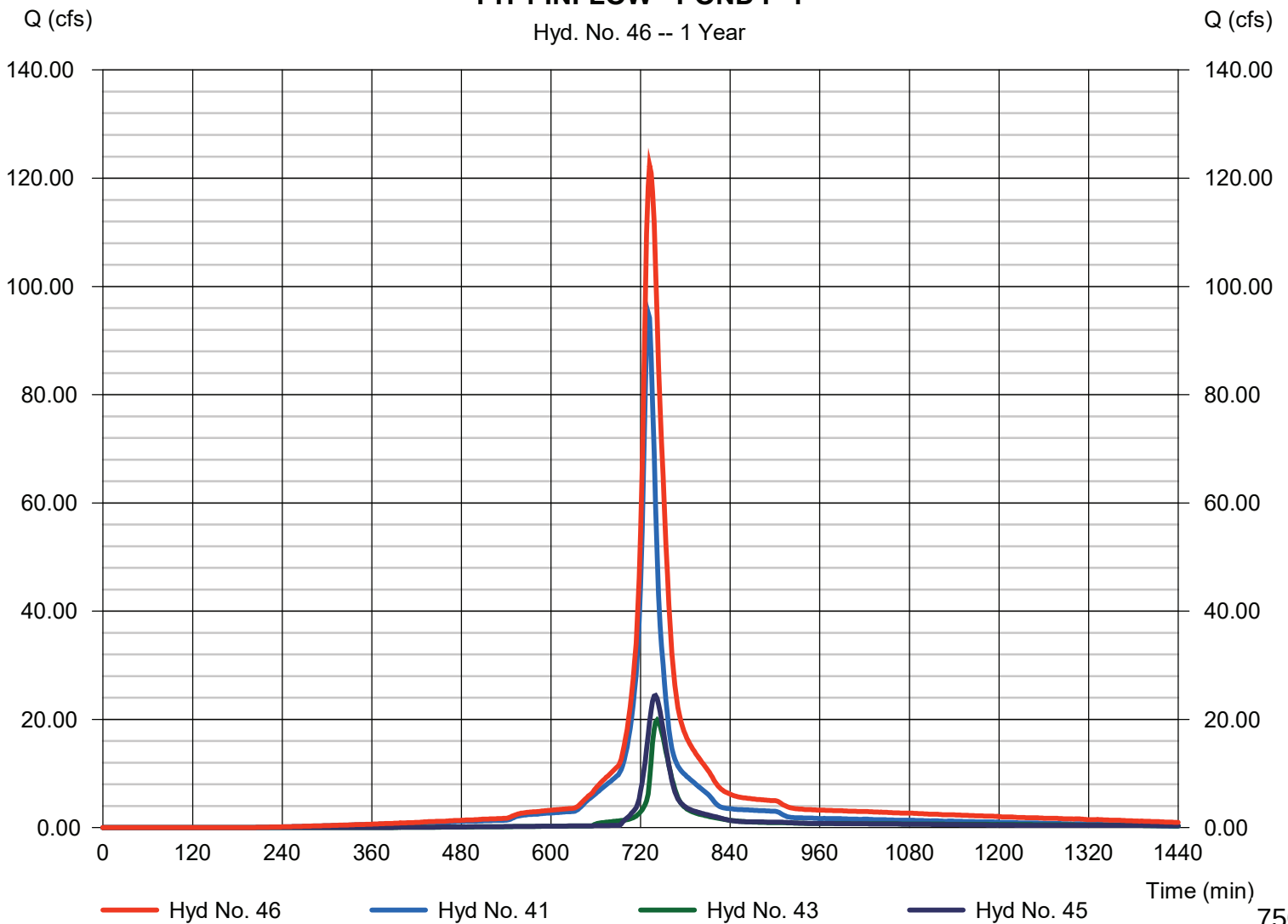
PH 1 INFLOW - POND P-1

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 41, 43, 45

Peak discharge = 122.37 cfs
Time to peak = 732 min
Hyd. volume = 10.925 acft
Contrib. drain. area = 0.000 ac

PH 1 INFLOW - POND P-1

Hyd. No. 46 -- 1 Year



Hydrograph Report

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

Friday, 06 / 28 / 2019

Hyd. No. 47

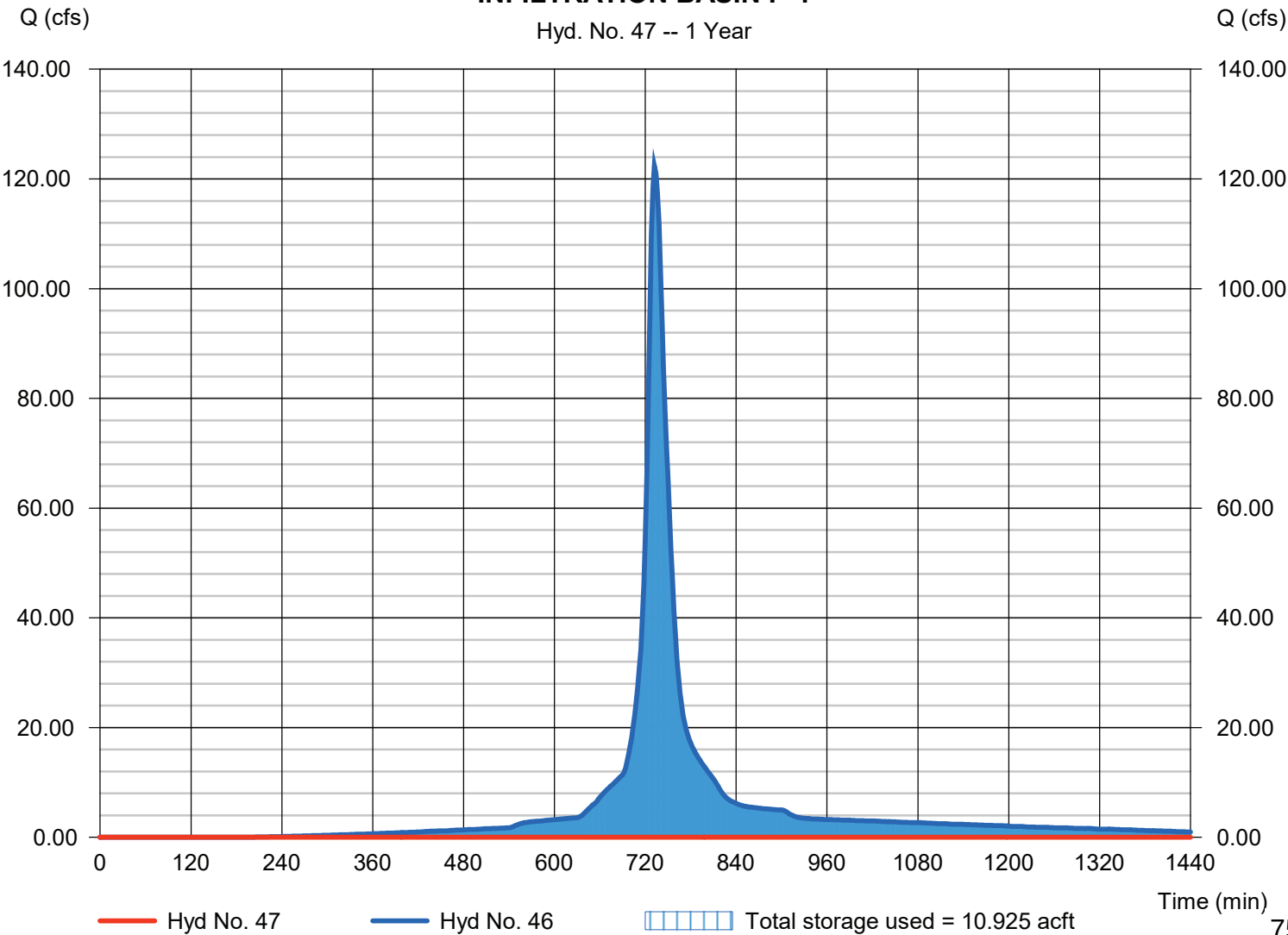
INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 46 - PH 1 INFLOW - POND P-1	Max. Elevation	= 835.85 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 1	Max. Storage	= 10.925 acft

Storage Indication method used.

INFILTRATION BASIN P-1

Hyd. No. 47 -- 1 Year



Pond Report

100

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

Friday, 06 / 28 / 2019

Pond No. 5 - INFILTRATION BASIN P-1-PH1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 829.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	829.00	14,687	0.000	0.000
1.00	830.00	25,075	0.451	0.451
2.00	831.00	48,705	0.832	1.283
3.00	832.00	63,719	1.286	2.569
4.00	833.00	77,550	1.619	4.188
5.00	834.00	98,330	2.014	6.202
6.00	835.00	111,632	2.408	8.610
7.00	836.00	125,971	2.725	11.336
8.00	837.00	141,877	3.072	14.408
9.00	838.00	160,442	3.468	17.876
10.00	839.00	180,300	3.909	21.784
11.00	840.00	204,214	4.410	26.195
12.00	841.00	236,239	5.051	31.245
13.00	842.00	329,855	6.467	37.713

Culvert / Orifice Structures

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

Weir Structures

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

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	829.00	---	---	---	---	---	---	---	---	---	---	0.000
0.10	0.045	829.10	---	---	---	---	---	---	---	---	---	---	0.000
0.20	0.090	829.20	---	---	---	---	---	---	---	---	---	---	0.000
0.30	0.135	829.30	---	---	---	---	---	---	---	---	---	---	0.000
0.40	0.180	829.40	---	---	---	---	---	---	---	---	---	---	0.000
0.50	0.226	829.50	---	---	---	---	---	---	---	---	---	---	0.000
0.60	0.271	829.60	---	---	---	---	---	---	---	---	---	---	0.000
0.70	0.316	829.70	---	---	---	---	---	---	---	---	---	---	0.000
0.80	0.361	829.80	---	---	---	---	---	---	---	---	---	---	0.000
0.90	0.406	829.90	---	---	---	---	---	---	---	---	---	---	0.000
1.00	0.451	830.00	---	---	---	---	---	---	---	---	---	---	0.000
1.10	0.534	830.10	---	---	---	---	---	---	---	---	---	---	0.000
1.20	0.617	830.20	---	---	---	---	---	---	---	---	---	---	0.000
1.30	0.701	830.30	---	---	---	---	---	---	---	---	---	---	0.000
1.40	0.784	830.40	---	---	---	---	---	---	---	---	---	---	0.000
1.50	0.867	830.50	---	---	---	---	---	---	---	---	---	---	0.000
1.60	0.950	830.60	---	---	---	---	---	---	---	---	---	---	0.000
1.70	1.033	830.70	---	---	---	---	---	---	---	---	---	---	0.000
1.80	1.117	830.80	---	---	---	---	---	---	---	---	---	---	0.000
1.90	1.200	830.90	---	---	---	---	---	---	---	---	---	---	0.000
2.00	1.283	831.00	---	---	---	---	---	---	---	---	---	---	0.000
2.10	1.412	831.10	---	---	---	---	---	---	---	---	---	---	0.000
2.20	1.540	831.20	---	---	---	---	---	---	---	---	---	---	0.000
2.30	1.669	831.30	---	---	---	---	---	---	---	---	---	---	0.000
2.40	1.798	831.40	---	---	---	---	---	---	---	---	---	---	0.000
2.50	1.926	831.50	---	---	---	---	---	---	---	---	---	---	0.000
2.60	2.055	831.60	---	---	---	---	---	---	---	---	---	---	0.000
2.70	2.184	831.70	---	---	---	---	---	---	---	---	---	---	0.000
2.80	2.312	831.80	---	---	---	---	---	---	---	---	---	---	0.000

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INFILTRATION BASIN P-1-PH1

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.90	2.441	831.90	---	---	---	---	---	---	---	---	---	---	0.000
3.00	2.569	832.00	---	---	---	---	---	---	---	---	---	---	0.000
3.10	2.731	832.10	---	---	---	---	---	---	---	---	---	---	0.000
3.20	2.893	832.20	---	---	---	---	---	---	---	---	---	---	0.000
3.30	3.055	832.30	---	---	---	---	---	---	---	---	---	---	0.000
3.40	3.217	832.40	---	---	---	---	---	---	---	---	---	---	0.000
3.50	3.379	832.50	---	---	---	---	---	---	---	---	---	---	0.000
3.60	3.541	832.60	---	---	---	---	---	---	---	---	---	---	0.000
3.70	3.703	832.70	---	---	---	---	---	---	---	---	---	---	0.000
3.80	3.864	832.80	---	---	---	---	---	---	---	---	---	---	0.000
3.90	4.026	832.90	---	---	---	---	---	---	---	---	---	---	0.000
4.00	4.188	833.00	---	---	---	---	---	---	---	---	---	---	0.000
4.10	4.390	833.10	---	---	---	---	---	---	---	---	---	---	0.000
4.20	4.591	833.20	---	---	---	---	---	---	---	---	---	---	0.000
4.30	4.792	833.30	---	---	---	---	---	---	---	---	---	---	0.000
4.40	4.994	833.40	---	---	---	---	---	---	---	---	---	---	0.000
4.50	5.195	833.50	---	---	---	---	---	---	---	---	---	---	0.000
4.60	5.397	833.60	---	---	---	---	---	---	---	---	---	---	0.000
4.70	5.598	833.70	---	---	---	---	---	---	---	---	---	---	0.000
4.80	5.799	833.80	---	---	---	---	---	---	---	---	---	---	0.000
4.90	6.001	833.90	---	---	---	---	---	---	---	---	---	---	0.000
5.00	6.202	834.00	---	---	---	---	---	---	---	---	---	---	0.000
5.10	6.443	834.10	---	---	---	---	---	---	---	---	---	---	0.000
5.20	6.684	834.20	---	---	---	---	---	---	---	---	---	---	0.000
5.30	6.925	834.30	---	---	---	---	---	---	---	---	---	---	0.000
5.40	7.165	834.40	---	---	---	---	---	---	---	---	---	---	0.000
5.50	7.406	834.50	---	---	---	---	---	---	---	---	---	---	0.000
5.60	7.647	834.60	---	---	---	---	---	---	---	---	---	---	0.000
5.70	7.888	834.70	---	---	---	---	---	---	---	---	---	---	0.000
5.80	8.129	834.80	---	---	---	---	---	---	---	---	---	---	0.000
5.90	8.370	834.90	---	---	---	---	---	---	---	---	---	---	0.000
6.00	8.610	835.00	---	---	---	---	---	---	---	---	---	---	0.000
6.10	8.883	835.10	---	---	---	---	---	---	---	---	---	---	0.000
6.20	9.155	835.20	---	---	---	---	---	---	---	---	---	---	0.000
6.30	9.428	835.30	---	---	---	---	---	---	---	---	---	---	0.000
6.40	9.700	835.40	---	---	---	---	---	---	---	---	---	---	0.000
6.50	9.973	835.50	---	---	---	---	---	---	---	---	---	---	0.000
6.60	10.246	835.60	---	---	---	---	---	---	---	---	---	---	0.000
6.70	10.518	835.70	---	---	---	---	---	---	---	---	---	---	0.000
6.80	10.791	835.80	---	---	---	---	---	---	---	---	---	---	0.000
6.90	11.063	835.90	---	---	---	---	---	---	---	---	---	---	0.000
7.00	11.336	836.00	---	---	---	---	---	---	---	---	---	---	0.000
7.10	11.643	836.10	---	---	---	---	---	---	---	---	---	---	0.000
7.20	11.950	836.20	---	---	---	---	---	---	---	---	---	---	0.000
7.30	12.257	836.30	---	---	---	---	---	---	---	---	---	---	0.000
7.40	12.565	836.40	---	---	---	---	---	---	---	---	---	---	0.000
7.50	12.872	836.50	---	---	---	---	---	---	---	---	---	---	0.000
7.60	13.179	836.60	---	---	---	---	---	---	---	---	---	---	0.000
7.70	13.486	836.70	---	---	---	---	---	---	---	---	---	---	0.000
7.80	13.794	836.80	---	---	---	---	---	---	---	---	---	---	0.000
7.90	14.101	836.90	---	---	---	---	---	---	---	---	---	---	0.000
8.00	14.408	837.00	---	---	---	---	---	---	---	---	---	---	0.000
8.10	14.755	837.10	---	---	---	---	---	---	---	---	---	---	0.000
8.20	15.102	837.20	---	---	---	---	---	---	---	---	---	---	0.000
8.30	15.448	837.30	---	---	---	---	---	---	---	---	---	---	0.000
8.40	15.795	837.40	---	---	---	---	---	---	---	---	---	---	0.000
8.50	16.142	837.50	---	---	---	---	---	---	---	---	---	---	0.000
8.60	16.489	837.60	---	---	---	---	---	---	---	---	---	---	0.000
8.70	16.835	837.70	---	---	---	---	---	---	---	---	---	---	0.000
8.80	17.182	837.80	---	---	---	---	---	---	---	---	---	---	0.000
8.90	17.529	837.90	---	---	---	---	---	---	---	---	---	---	0.000
9.00	17.876	838.00	---	---	---	---	---	---	---	---	---	---	0.000
9.10	18.267	838.10	---	---	---	---	---	---	---	---	---	---	0.000
9.20	18.657	838.20	---	---	---	---	---	---	---	---	---	---	0.000
9.30	19.048	838.30	---	---	---	---	---	---	---	---	---	---	0.000
9.40	19.439	838.40	---	---	---	---	---	---	---	---	---	---	0.000
9.50	19.830	838.50	---	---	---	---	---	---	---	---	---	---	0.000
9.60	20.221	838.60	---	---	---	---	---	---	---	---	---	---	0.000
9.70	20.612	838.70	---	---	---	---	---	---	---	---	---	---	0.000
9.80	21.003	838.80	---	---	---	---	---	---	---	---	---	---	0.000
9.90	21.393	838.90	---	---	---	---	---	---	---	---	---	---	0.000
10.00	21.784	839.00	---	---	---	---	---	---	---	---	---	---	0.000

INFILTRATION BASIN P-1-PH1

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
10.10	22.225	839.10	---	---	---	---	---	---	---	---	---	---	0.000
10.20	22.666	839.20	---	---	---	---	---	---	---	---	---	---	0.000
10.30	23.107	839.30	---	---	---	---	---	---	---	---	---	---	0.000
10.40	23.548	839.40	---	---	---	---	---	---	---	---	---	---	0.000
10.50	23.989	839.50	---	---	---	---	---	---	---	---	---	---	0.000
10.60	24.430	839.60	---	---	---	---	---	---	---	---	---	---	0.000
10.70	24.871	839.70	---	---	---	---	---	---	---	---	---	---	0.000
10.80	25.313	839.80	---	---	---	---	---	---	---	---	---	---	0.000
10.90	25.754	839.90	---	---	---	---	---	---	---	---	---	---	0.000
11.00	26.195	840.00	---	---	---	---	---	---	---	---	---	---	0.000
11.10	26.700	840.10	---	---	---	---	---	---	---	---	---	---	0.000
11.20	27.205	840.20	---	---	---	---	---	---	---	---	---	---	0.000
11.30	27.710	840.30	---	---	---	---	---	---	---	---	---	---	0.000
11.40	28.215	840.40	---	---	---	---	---	---	---	---	---	---	0.000
11.50	28.720	840.50	---	---	---	---	---	---	---	---	---	---	0.000
11.60	29.225	840.60	---	---	---	---	---	---	---	---	---	---	0.000
11.70	29.730	840.70	---	---	---	---	---	---	---	---	---	---	0.000
11.80	30.235	840.80	---	---	---	---	---	---	---	---	---	---	0.000
11.90	30.740	840.90	---	---	---	---	---	---	---	---	---	---	0.000
12.00	31.245	841.00	---	---	---	---	---	---	---	---	---	---	0.000
12.10	31.892	841.10	---	---	---	---	---	---	---	---	---	---	0.000
12.20	32.539	841.20	---	---	---	---	---	---	---	---	---	---	0.000
12.30	33.186	841.30	---	---	---	---	---	---	---	---	---	---	0.000
12.40	33.832	841.40	---	---	---	---	---	---	---	---	---	---	0.000
12.50	34.479	841.50	---	---	---	---	---	---	---	---	---	---	0.000
12.60	35.126	841.60	---	---	---	---	---	---	---	---	---	---	0.000
12.70	35.773	841.70	---	---	---	---	---	---	---	---	---	---	0.000
12.80	36.419	841.80	---	---	---	---	---	---	---	---	---	---	0.000
12.90	37.066	841.90	---	---	---	---	---	---	---	---	---	---	0.000
13.00	37.713	842.00	---	---	---	---	---	---	---	---	---	---	0.000

...End

Hydrograph Report

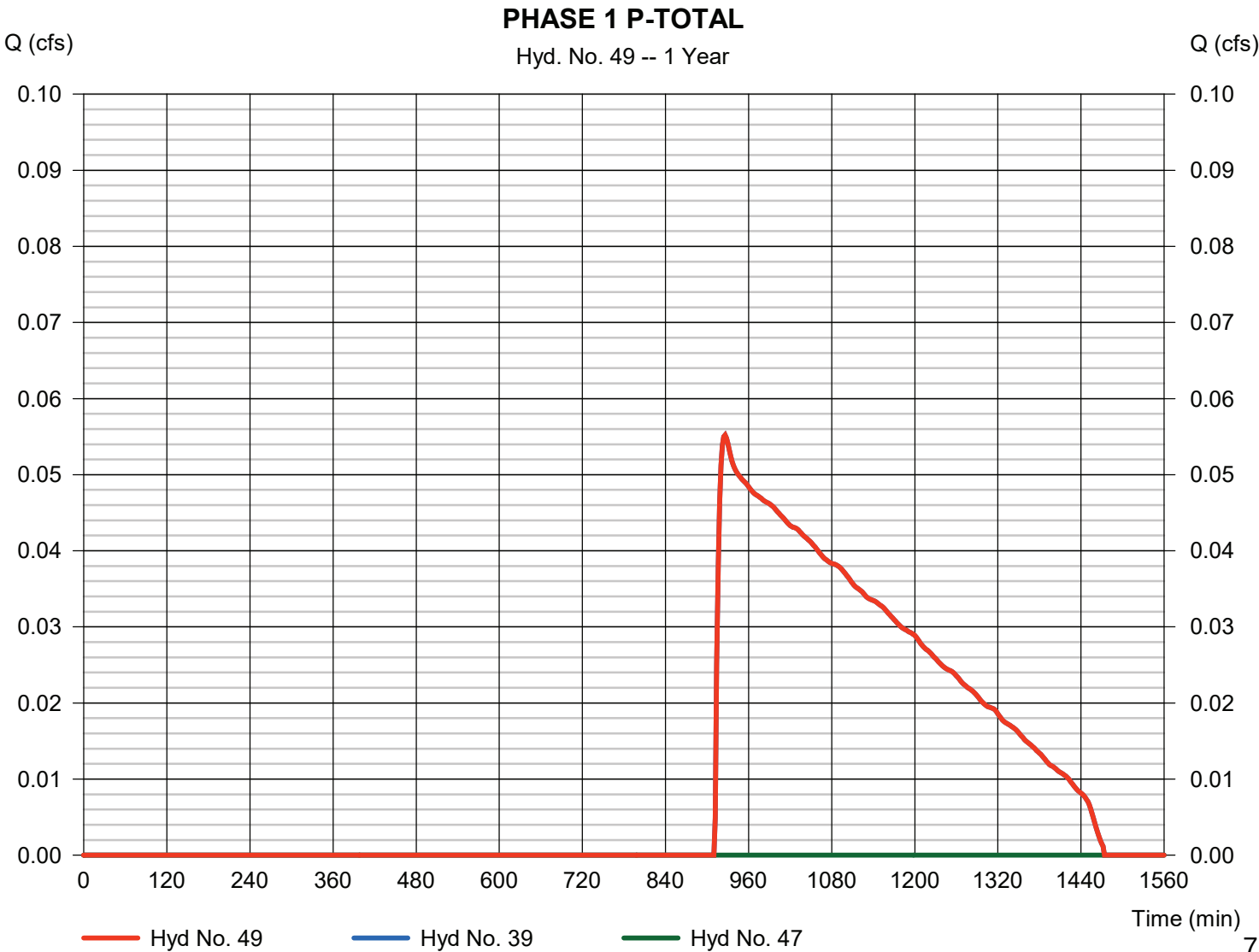
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 49

PHASE 1 P-TOTAL

Hydrograph type	= Combine	Peak discharge	= 0.055 cfs
Storm frequency	= 1 yrs	Time to peak	= 926 min
Time interval	= 2 min	Hyd. volume	= 0.022 acft
Inflow hyds.	= 39, 47	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	24.90	2	736	2.130	-----	-----	-----	P-OS-1-PH 1
2	SCS Runoff	86.31	2	730	5.703	-----	-----	-----	P-1-PH 1
3	SCS Runoff	8.395	2	740	0.812	-----	-----	-----	P-1A-PH1
4	SCS Runoff	15.95	2	736	1.365	-----	-----	-----	P-1B-PH1
5	SCS Runoff	15.52	2	736	1.328	-----	-----	-----	P-2
6	SCS Runoff	12.73	2	736	1.089	-----	-----	-----	P-3
7	SCS Runoff	2.547	2	736	0.218	-----	-----	-----	P-4
9	SCS Runoff	0.466	2	726	0.023	-----	-----	-----	R&M EX. P-1
10	SCS Runoff	0.738	2	726	0.037	-----	-----	-----	R&M EX. P-2
11	SCS Runoff	0.389	2	726	0.019	-----	-----	-----	R&M EX. P-3
12	SCS Runoff	0.427	2	726	0.021	-----	-----	-----	R&M EX. P-4
13	SCS Runoff	0.544	2	726	0.027	-----	-----	-----	R&M EX. P-5
14	SCS Runoff	0.777	2	726	0.039	-----	-----	-----	R&M EX. P-6
15	SCS Runoff	0.777	2	726	0.039	-----	-----	-----	R&M EX. P-7
16	SCS Runoff	0.700	2	726	0.035	-----	-----	-----	R&M EX. P-8
17	SCS Runoff	0.427	2	726	0.021	-----	-----	-----	R&M EX. P-9
18	Reservoir	0.026	2	788	0.007	9	851.63	0.018	R&M EX. BIOSWALE P-1
19	Combine	0.738	2	726	0.044	10, 18	-----	-----	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	0.123	2	744	0.022	19	851.38	0.024	R&M EX. BIOSWALE P-2
21	Combine	0.389	2	726	0.042	11, 20	-----	-----	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	0.020	2	988	0.011	21	850.99	0.031	R&M EX. BIOSWALE P-3
23	Combine	0.427	2	726	0.032	12, 22	-----	-----	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	0.000	2	n/a	0.000	23	850.09	0.032	R&M EX. BIOSWALE P-4
25	Combine	0.544	2	726	0.027	13, 24	-----	-----	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	0.000	2	n/a	0.000	25	848.57	0.027	R&M EX. BIOSWALE P-5
27	Combine	0.777	2	726	0.039	14, 26	-----	-----	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	0.000	2	n/a	0.000	27	847.38	0.039	R&M EX. BIOSWALE P-6
29	Combine	0.777	2	726	0.039	15, 28	-----	-----	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	0.024	2	814	0.008	29	845.35	0.031	R&M EX. BIOSWALE P-7
31	Combine	0.700	2	726	0.043	16, 30	-----	-----	R&M EX. BIOSWALE P-8
32	Reservoir	0.000	2	n/a	0.000	31	844.49	0.043	R&M EX. BIOSWALE P-8
33	SCS Runoff	3.855	2	726	0.191	-----	-----	-----	PROPOSED P-5
34	Combine	3.855	2	726	0.191	32, 33	-----	-----	INFLOW TO PR. P-5
2019-06-27_CHAPMAN FARMS_PHASE I_Floodmg Per					Return Period: 2 Year			Friday, 06 / 28 / 2019	

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
35	Reservoir	0.000	2	n/a	0.000	34	842.71	0.191	PR. BLVD BIOFILTER P-5
37	Reservoir	14.69	2	740	1.327	5	839.74	0.375	POND P-2
38	Reservoir	12.56	2	738	1.089	6	839.94	0.165	POND P-3
39	Reservoir	0.234	2	804	0.049	7	840.71	0.171	RAIN GARDEN P-4
41	Combine	107.50	2	730	7.834	1, 2,	-----	-----	PHASE 1 OS-1 + P-1
42	Combine	23.08	2	740	2.140	3, 37,	-----	-----	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	22.86	2	742	2.139	42	835.37	0.120	PH 1 FOREBAY 1A
44	Combine	28.32	2	736	2.454	4, 38,	-----	-----	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	27.69	2	740	2.453	44	835.35	0.295	PH 1 FOREBAY 1B
46	Combine	142.78	2	732	12.426	41, 43, 45	-----	-----	PH 1 INFLOW - POND P-1
47	Reservoir	0.000	2	n/a	0.000	46	836.35	12.4	INFILTRATION BASIN P-1
49	Combine	0.234	2	804	0.049	39, 47,	-----	-----	PHASE 1 P-TOTAL
2019-06-27_CHAPMAN FARMS_PHASE I_Flood Hydro					Return Period: 2 Year			Friday, 06 / 28 / 2019	

Hydrograph Report

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

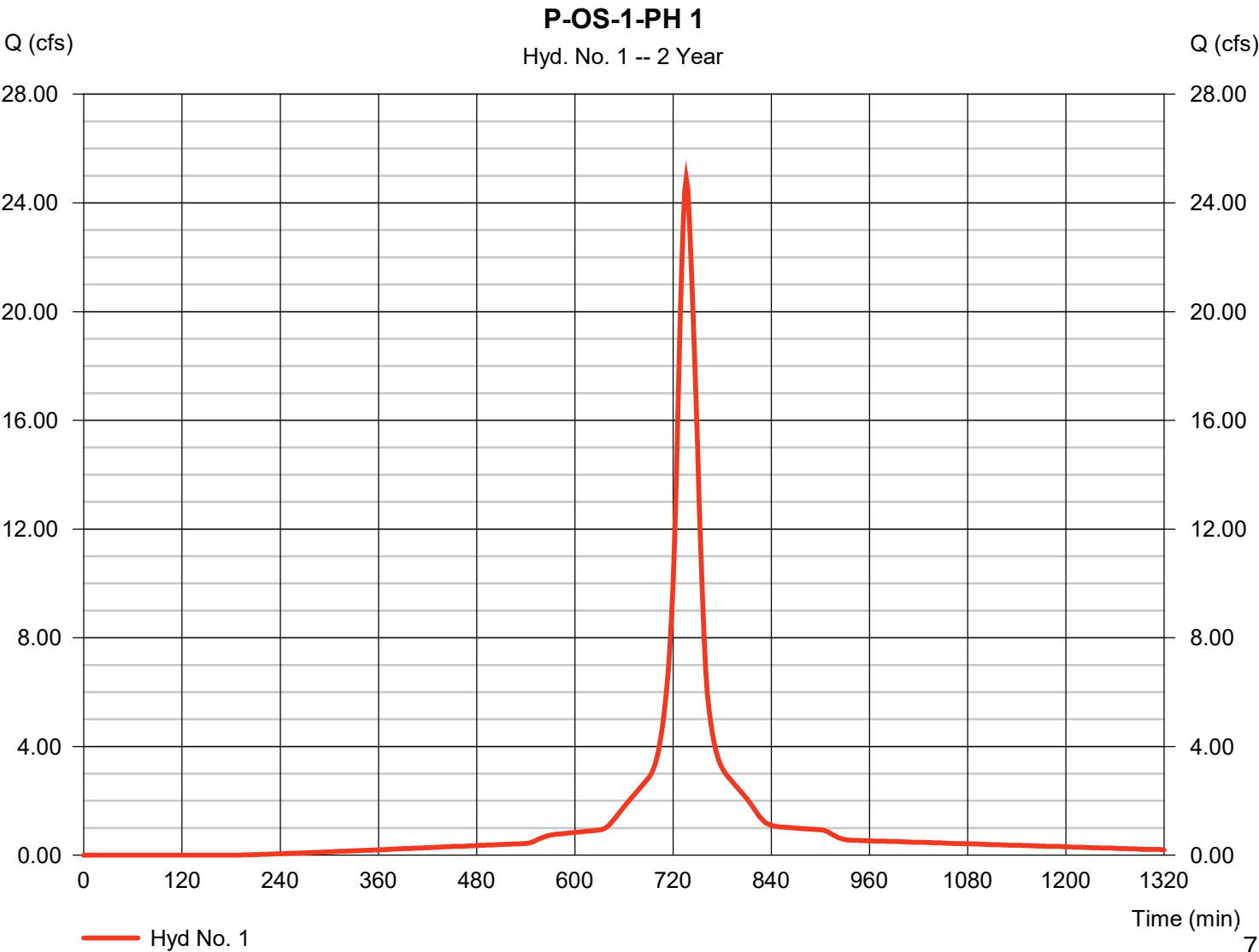
Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 24.90 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 2.130 acft
Drainage area	= 10.170 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.50 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

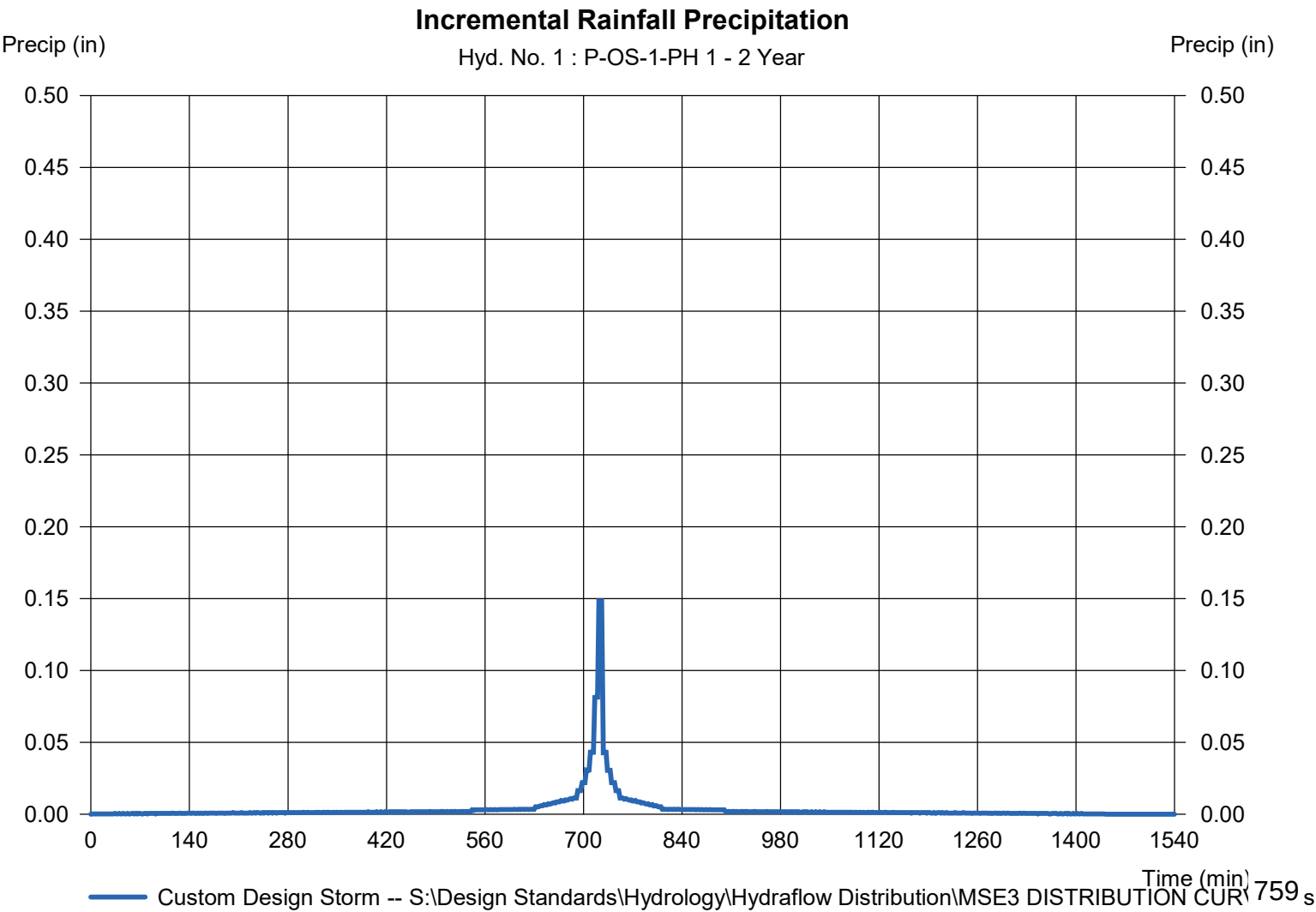
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

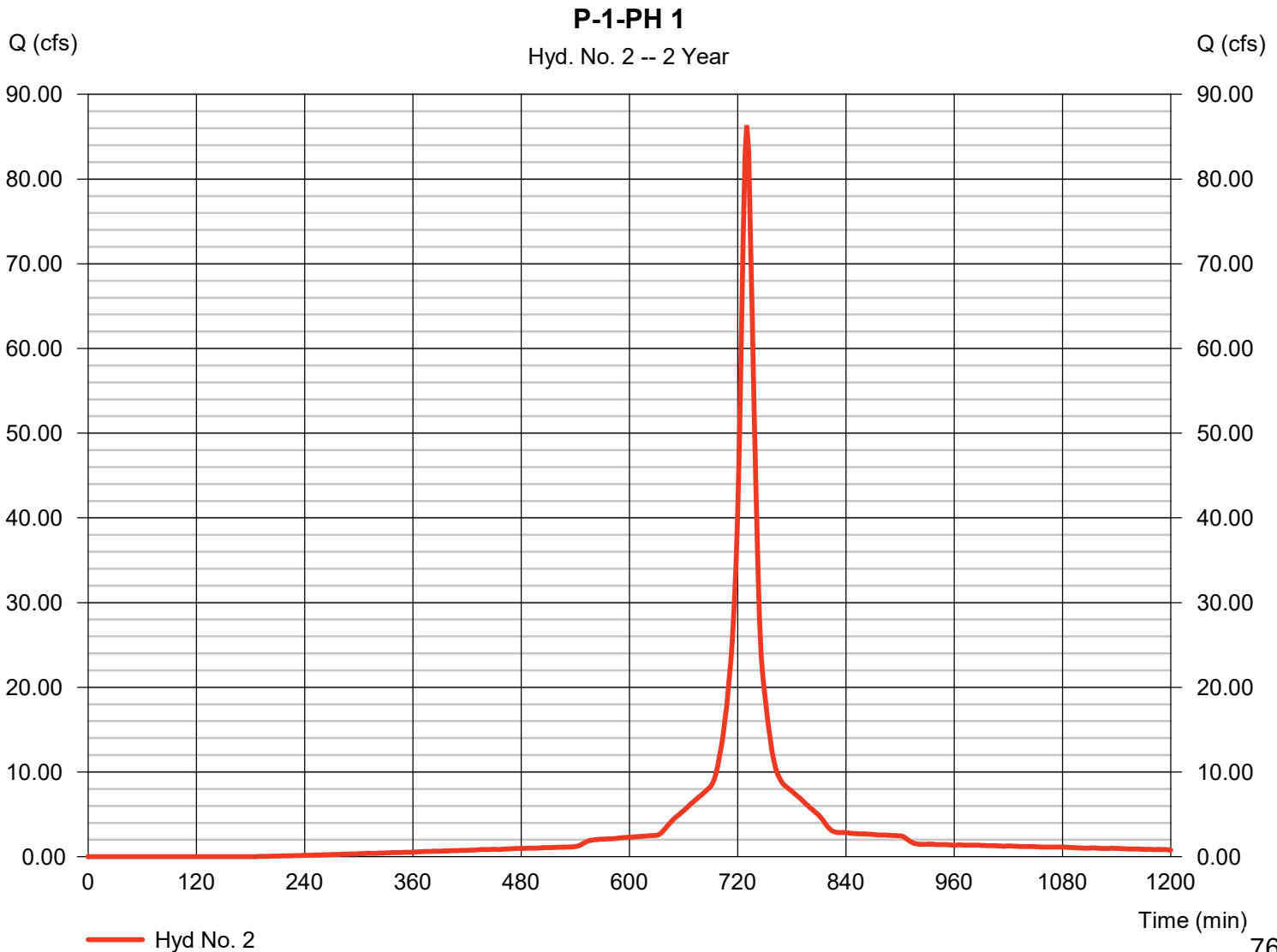
Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 86.31 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 5.703 acft
Drainage area	= 26.872 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSR3 DISTRIBUTION CU		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 26.872



Precipitation Report

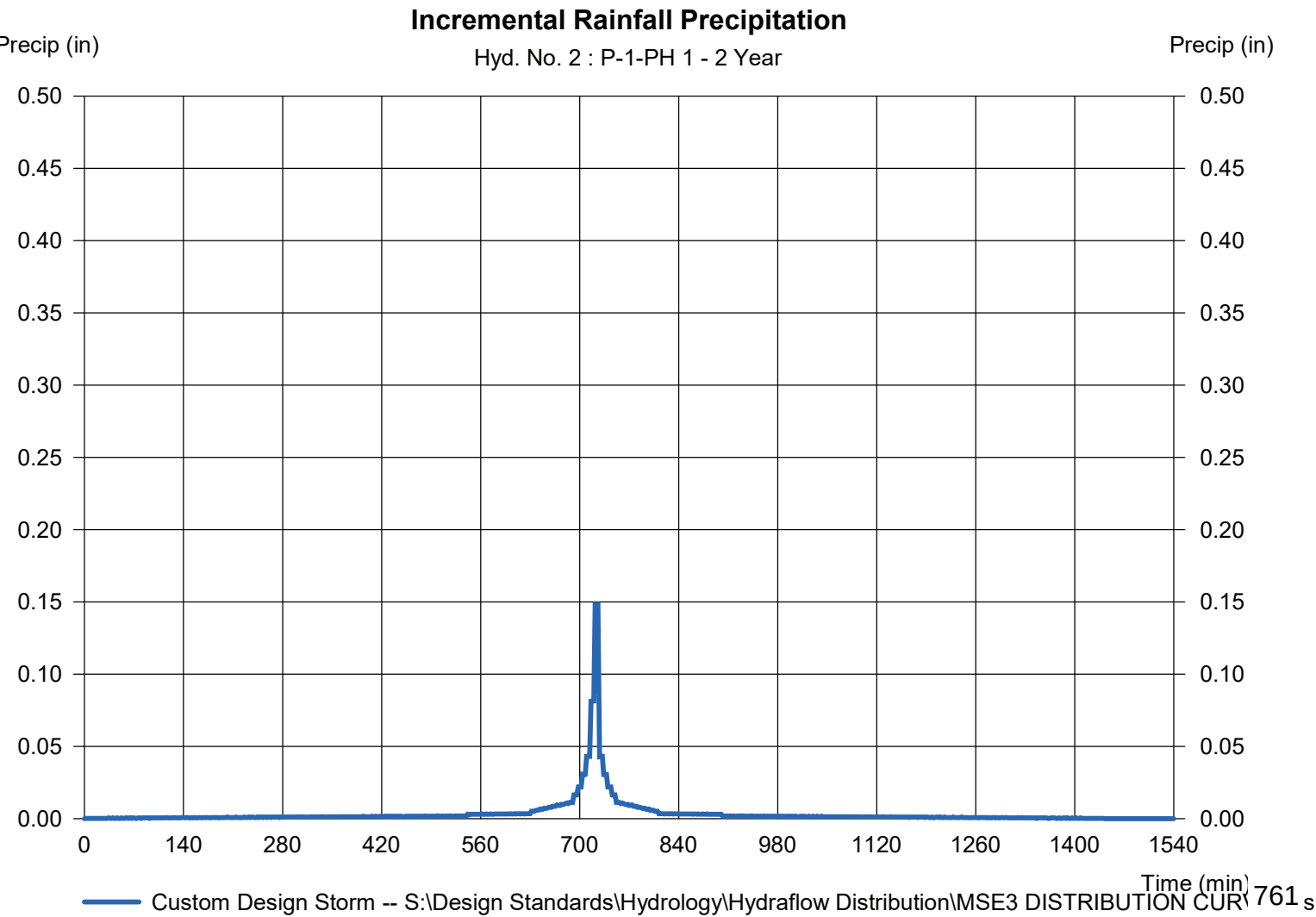
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

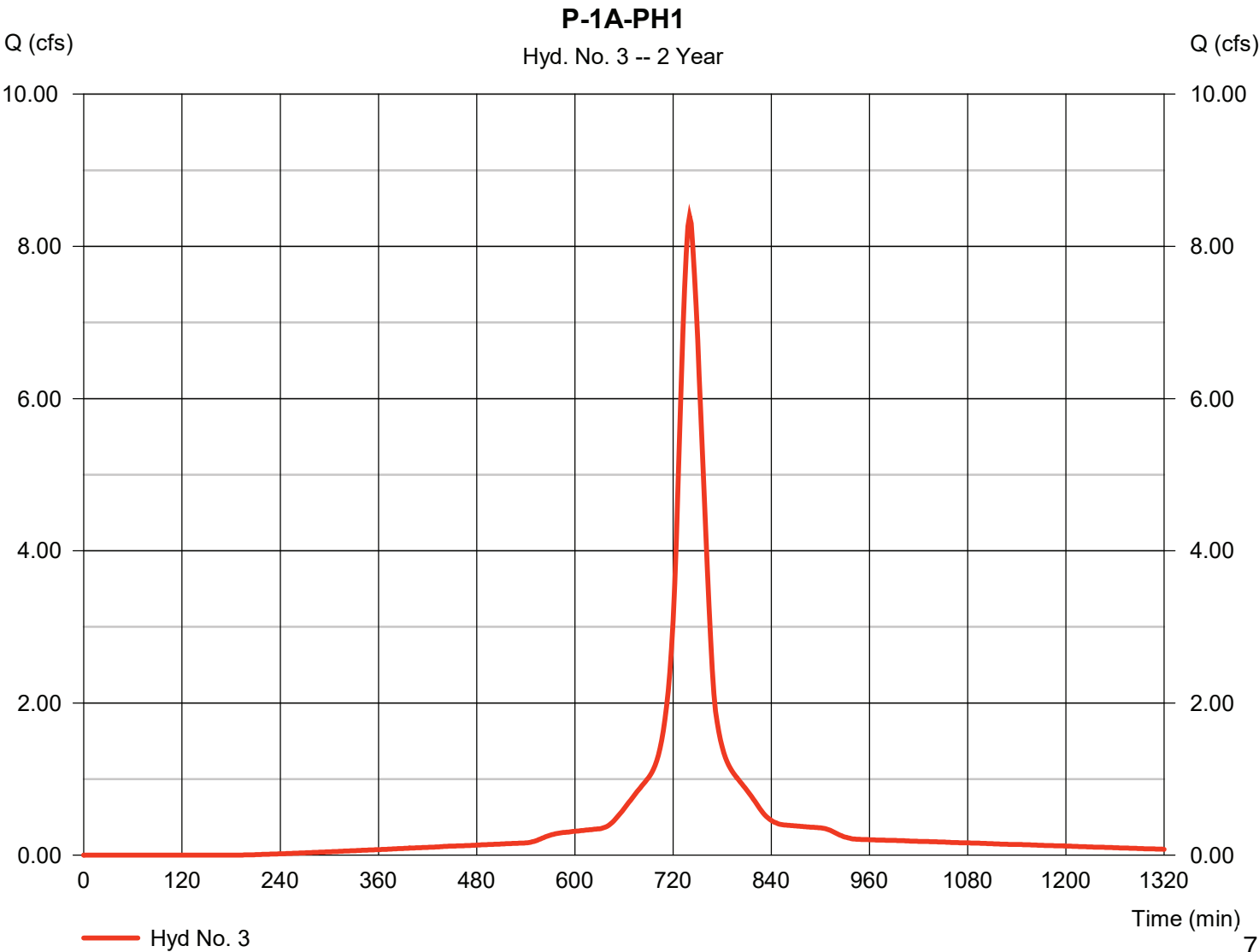
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 8.395 cfs
Storm frequency	= 2 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 0.812 acft
Drainage area	= 3.947 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 29.90 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

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

Friday, 06 / 28 / 2019

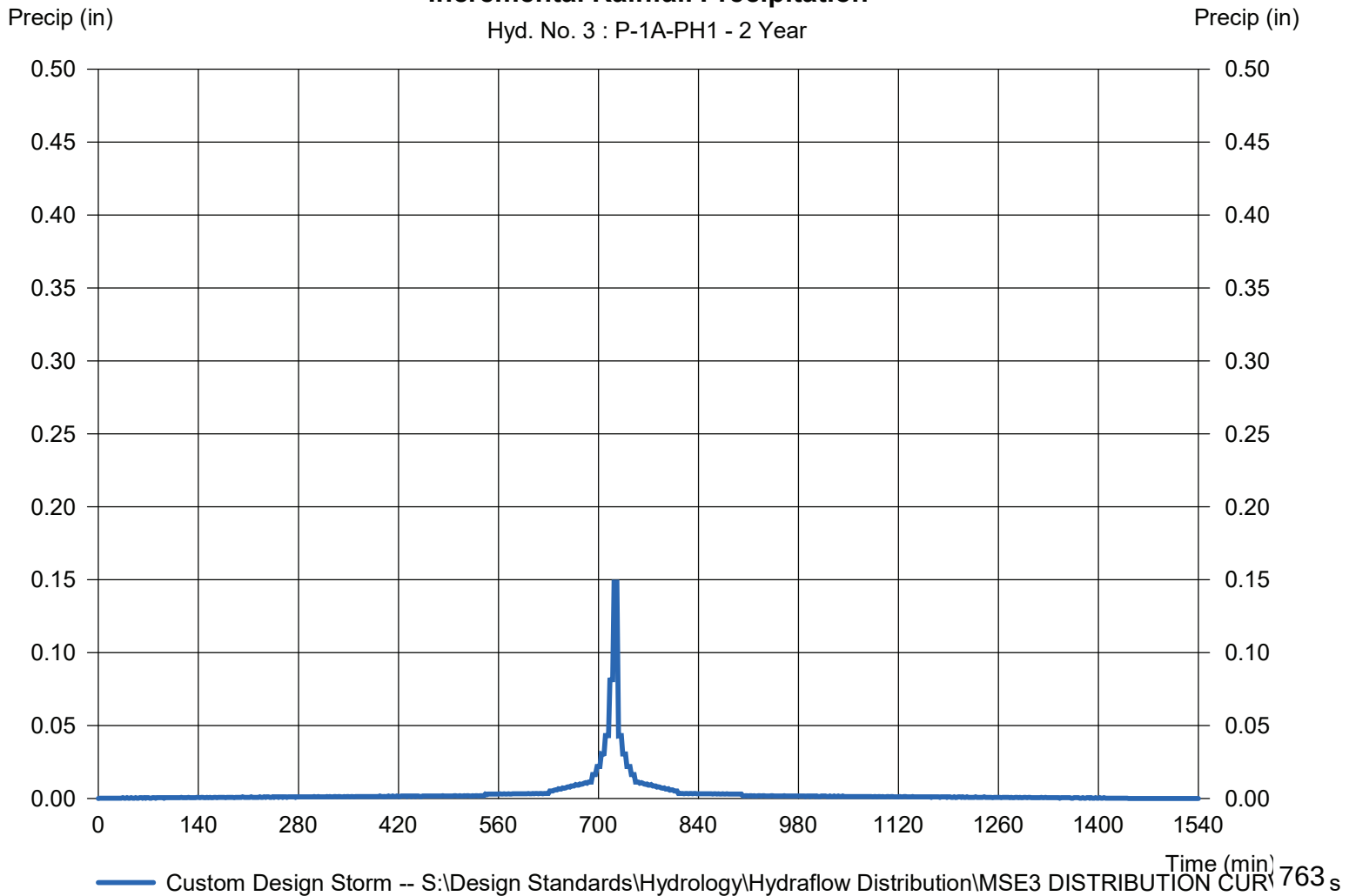
Hyd. No. 3

P-1A-PH1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 3 : P-1A-PH1 - 2 Year



Hydrograph Report

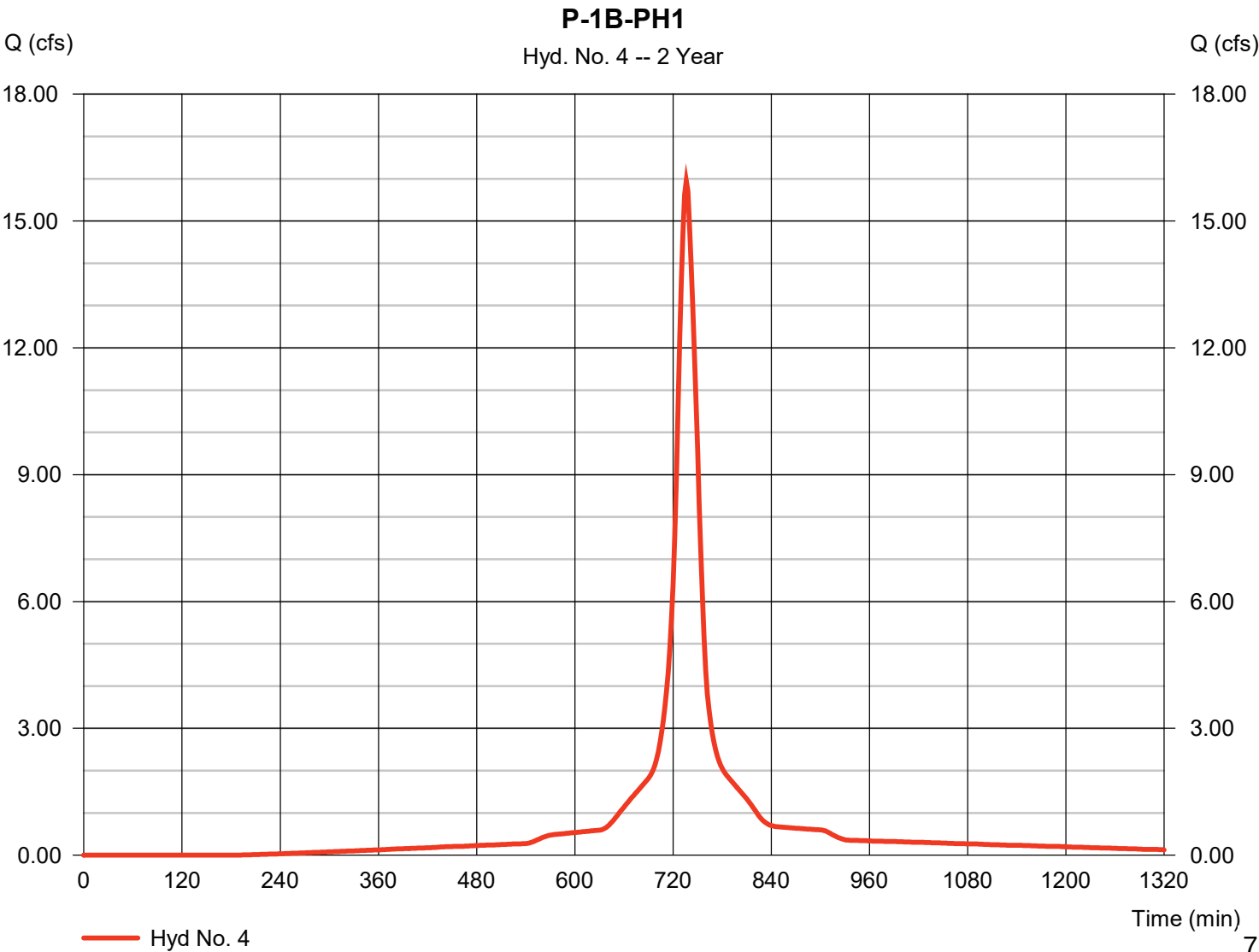
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 15.95 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.365 acft
Drainage area	= 6.516 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.60 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



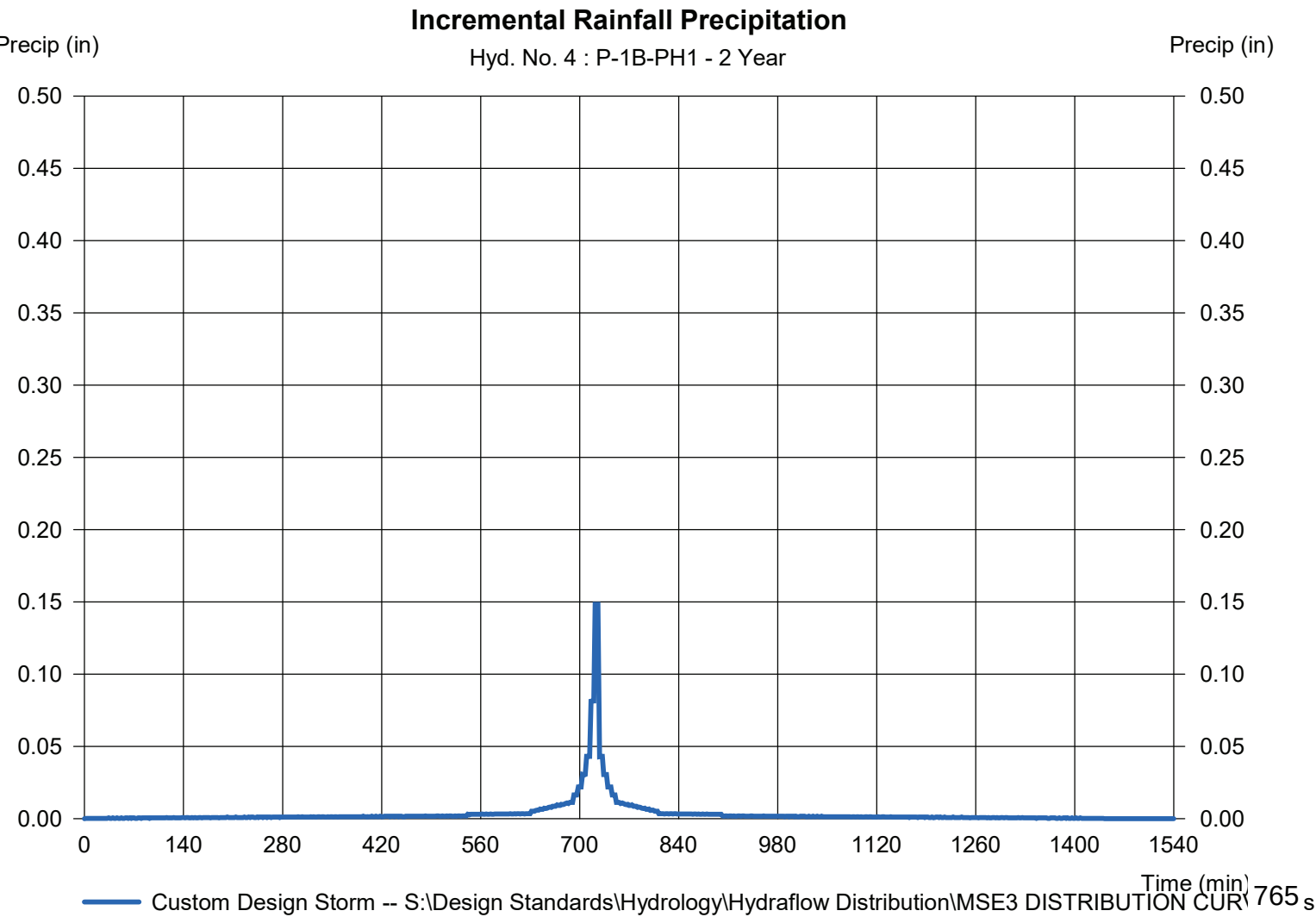
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

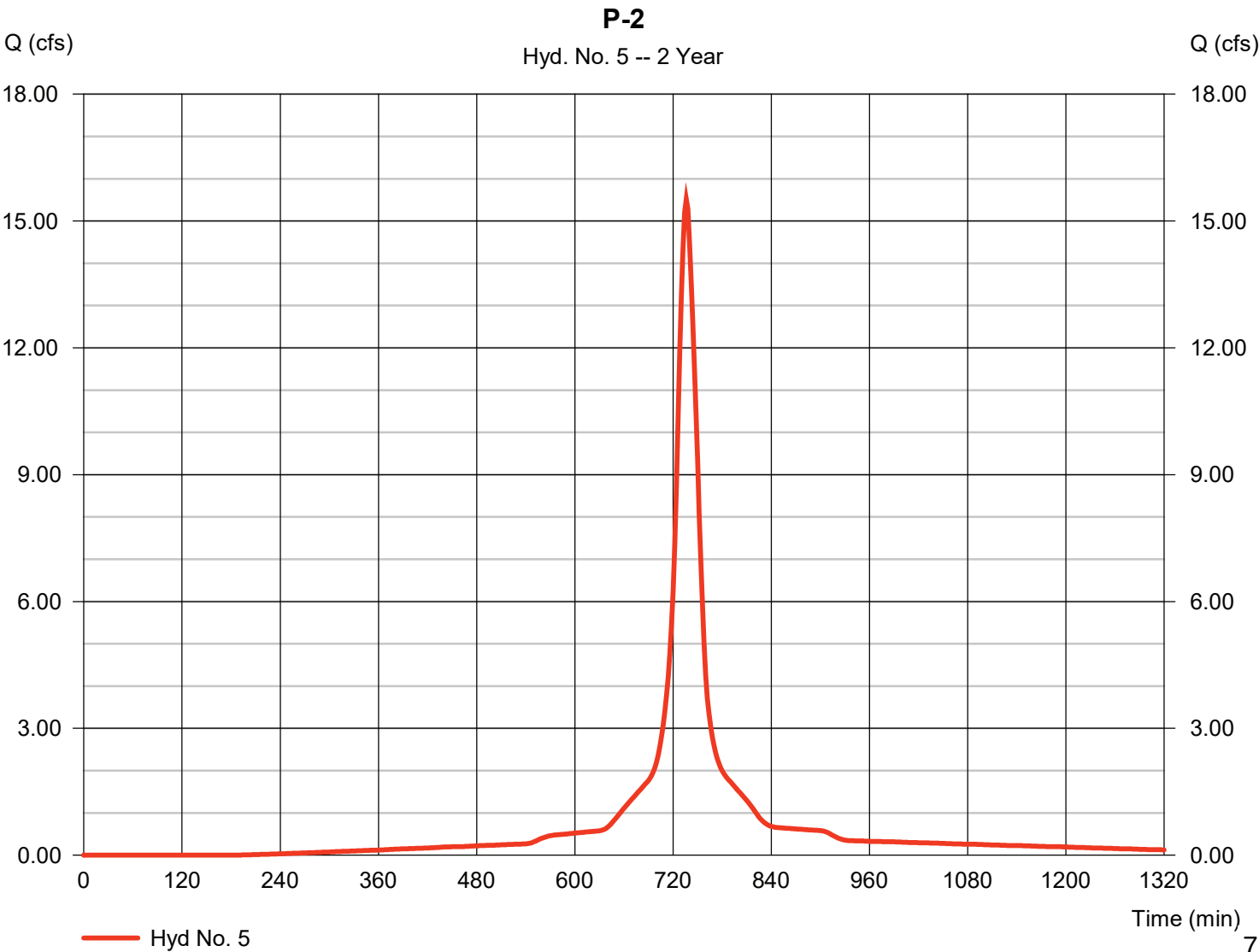
Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 15.52 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.328 acft
Drainage area	= 6.339 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.710 x 75)] / 6.339



Precipitation Report

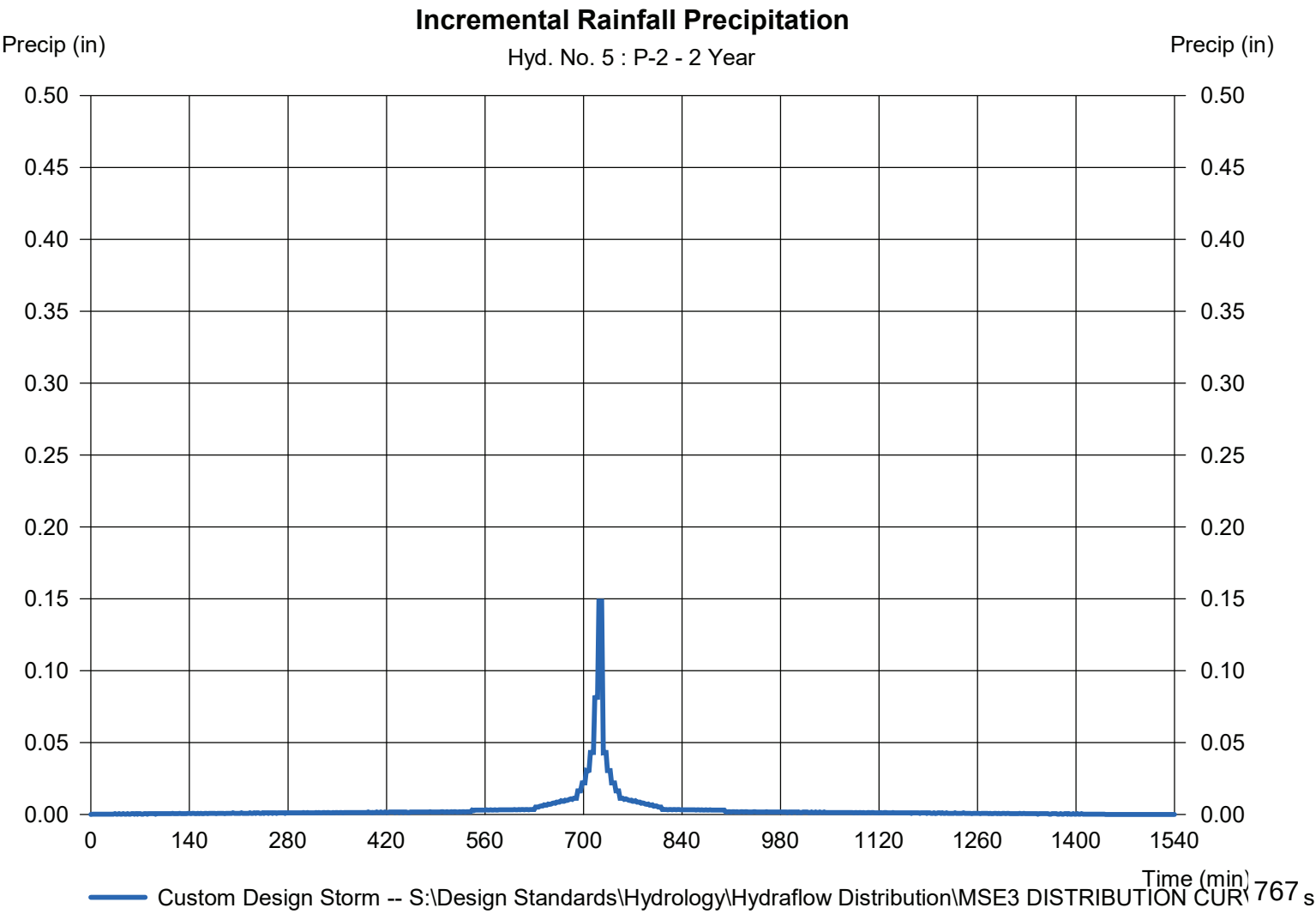
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

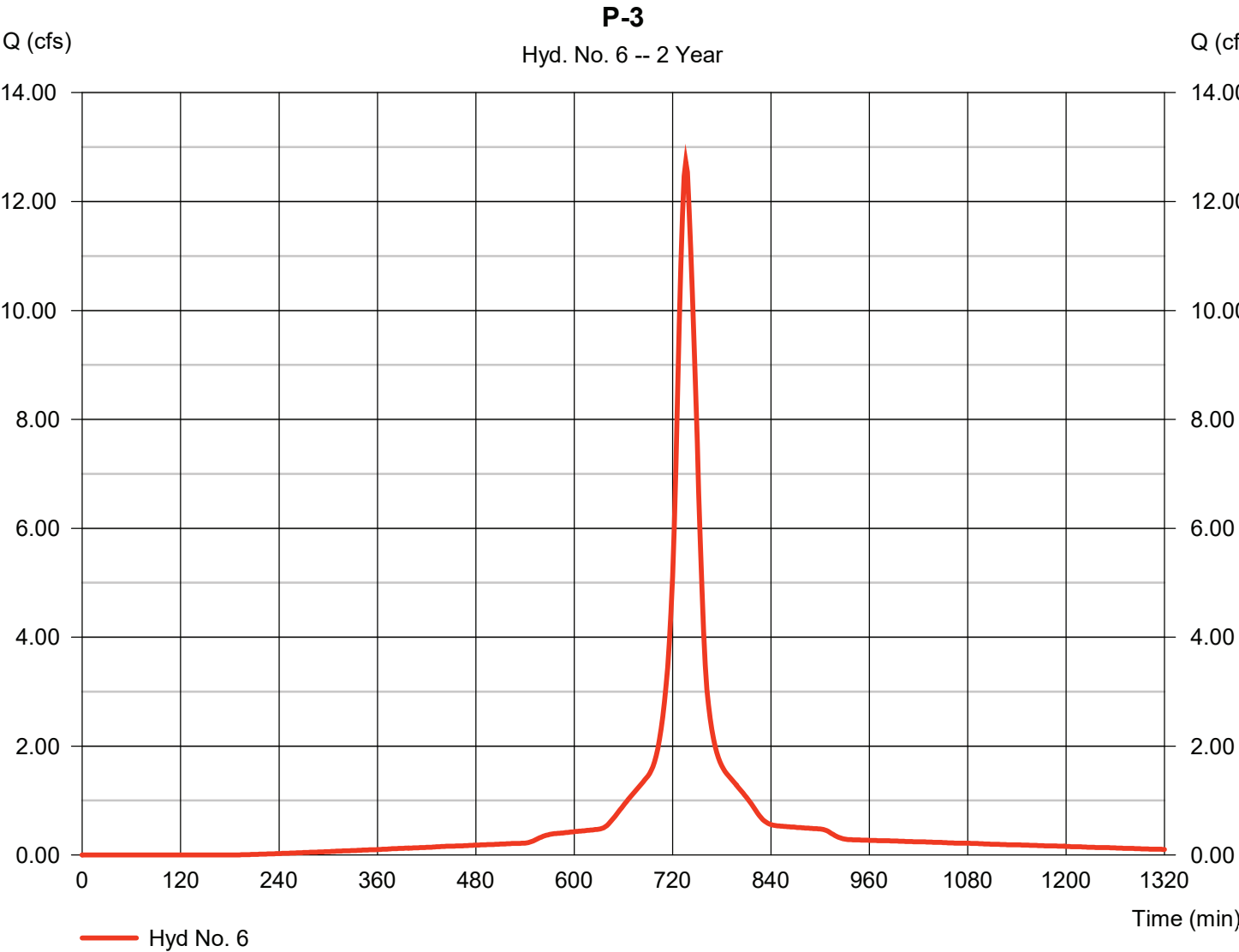
Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 12.73 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.089 acft
Drainage area	= 5.199 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.199



Precipitation Report

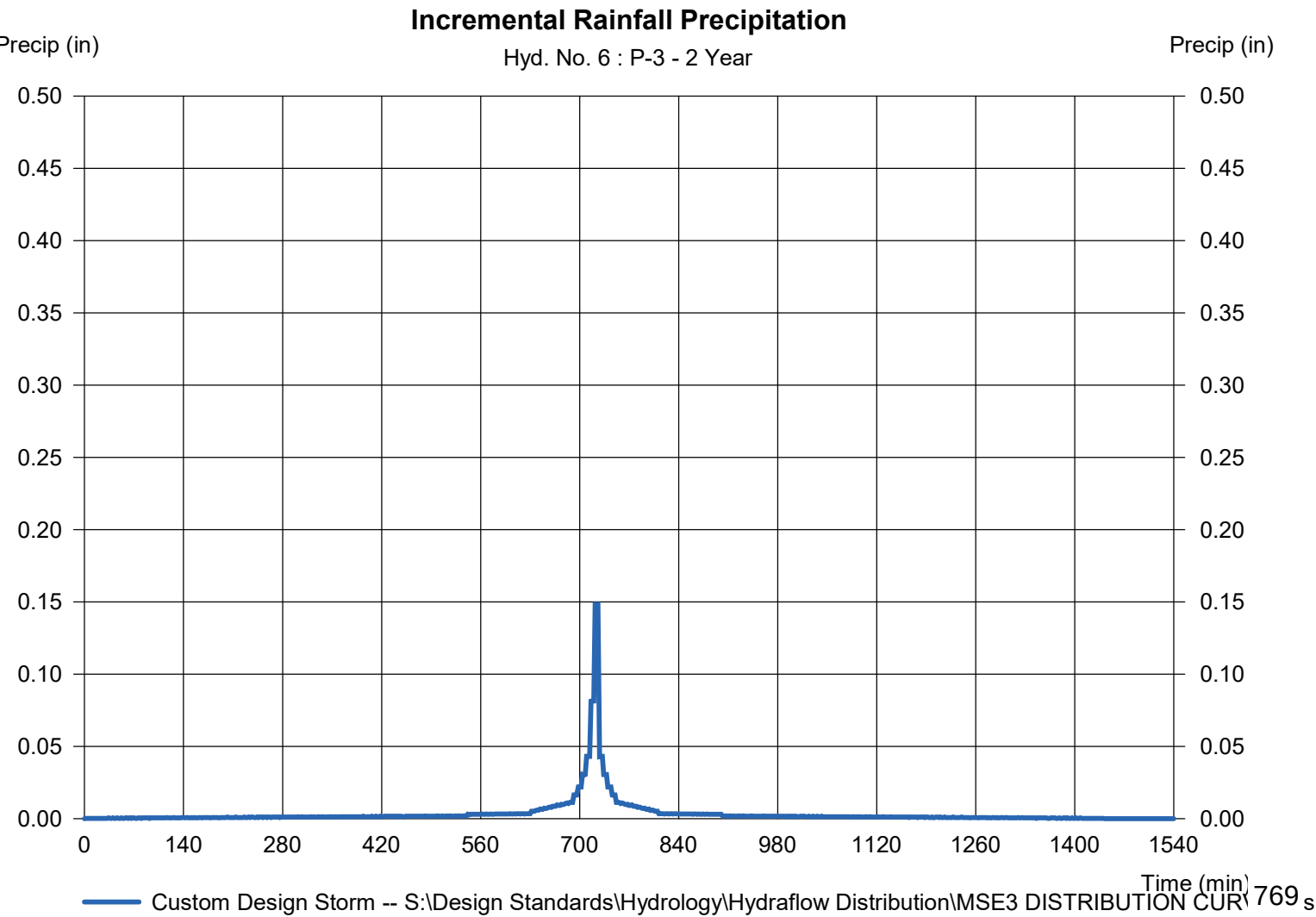
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

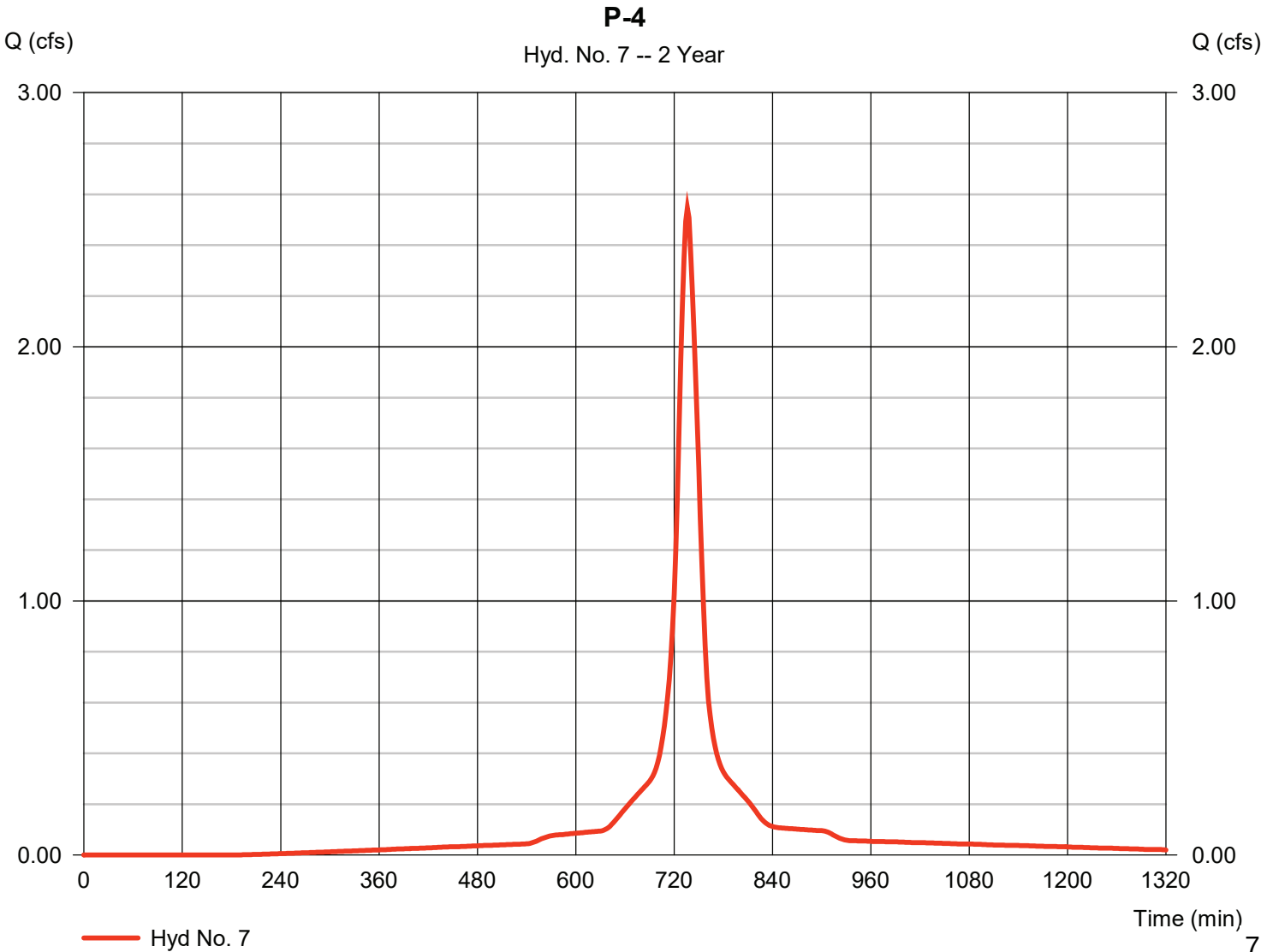
Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 2.547 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 0.218 acft
Drainage area	= 1.040 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.10 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

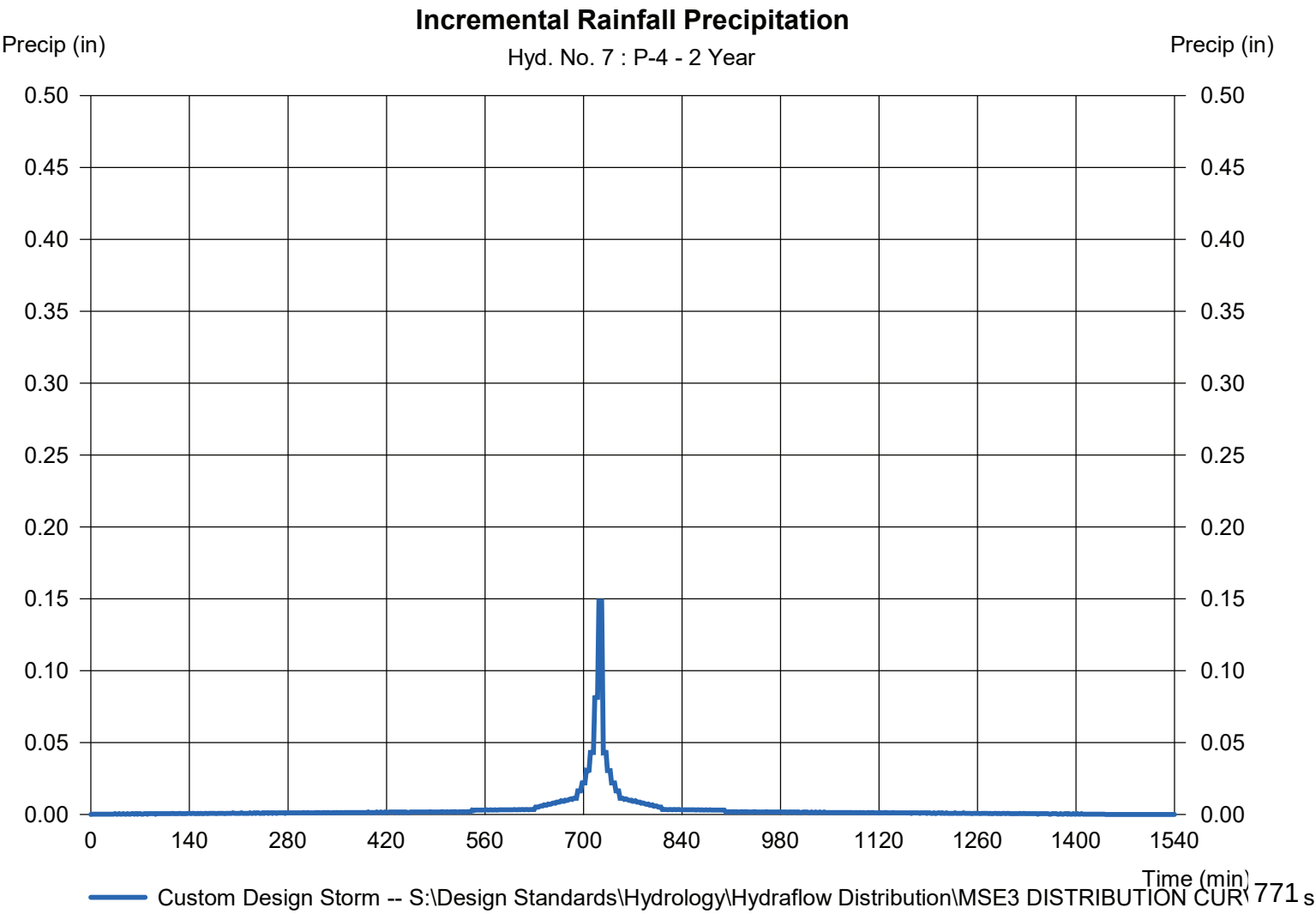
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

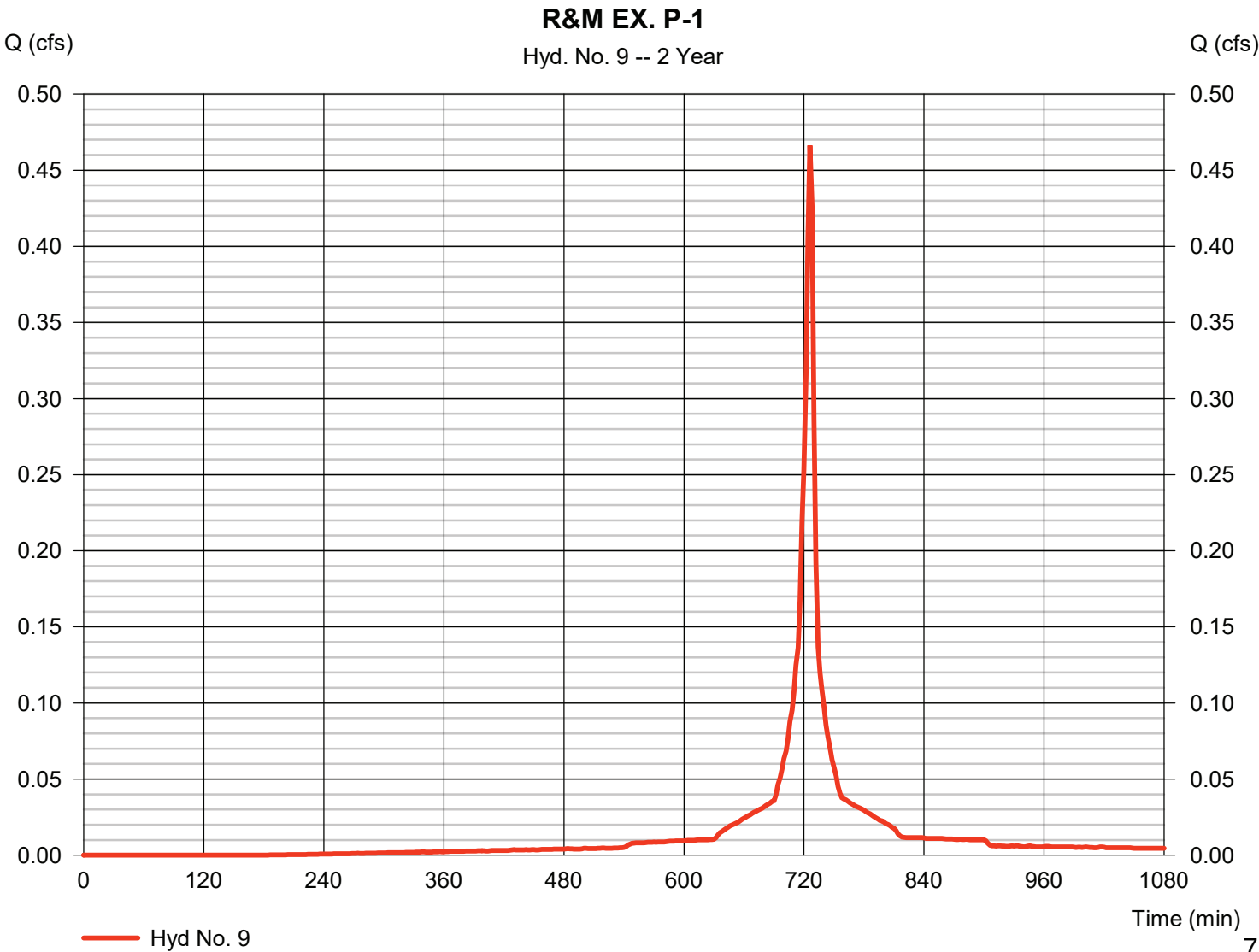


Hydrograph Report

Hyd. No. 9

R&M EX. P-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.466 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.023 acft
Drainage area	= 0.120 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

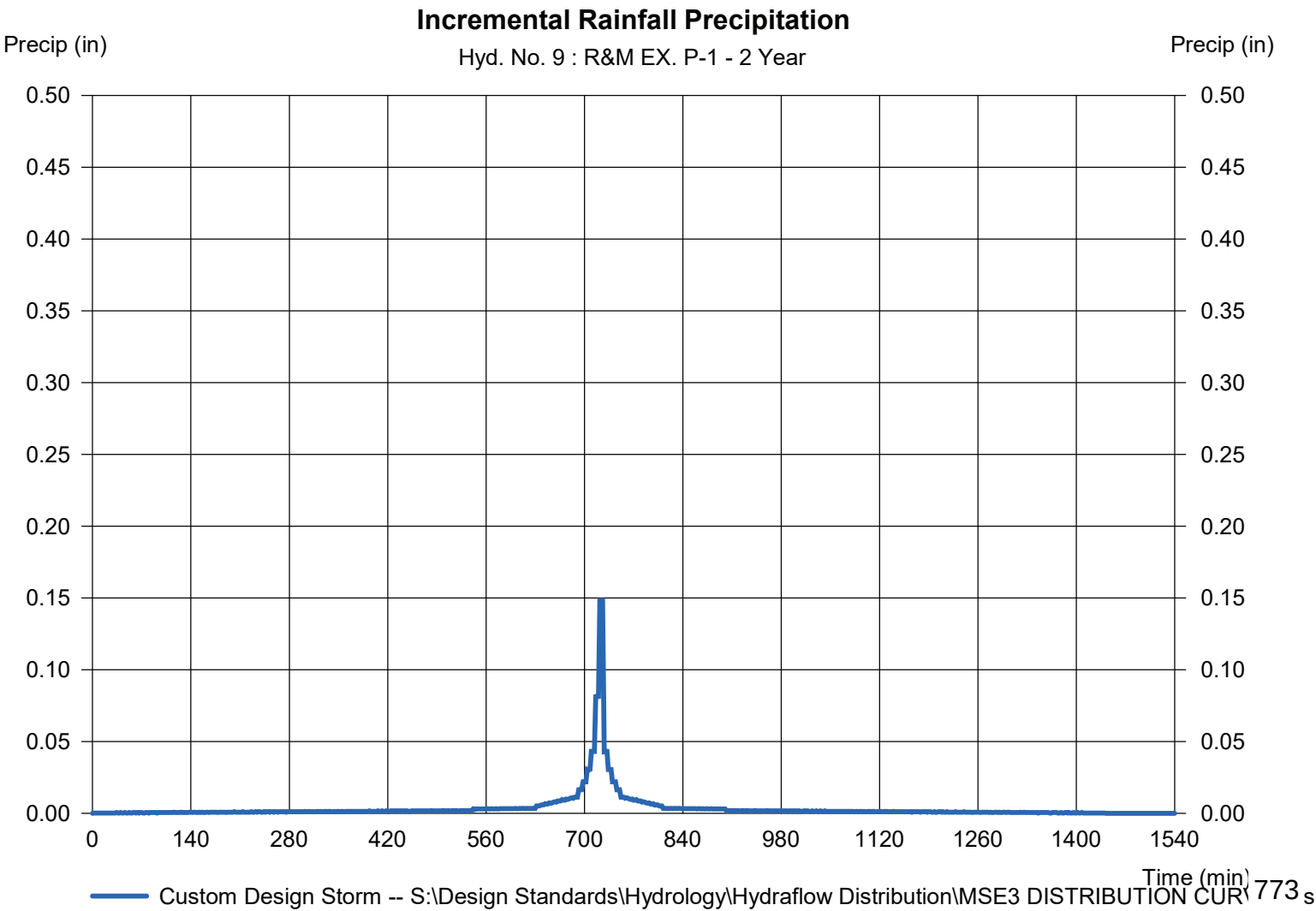
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

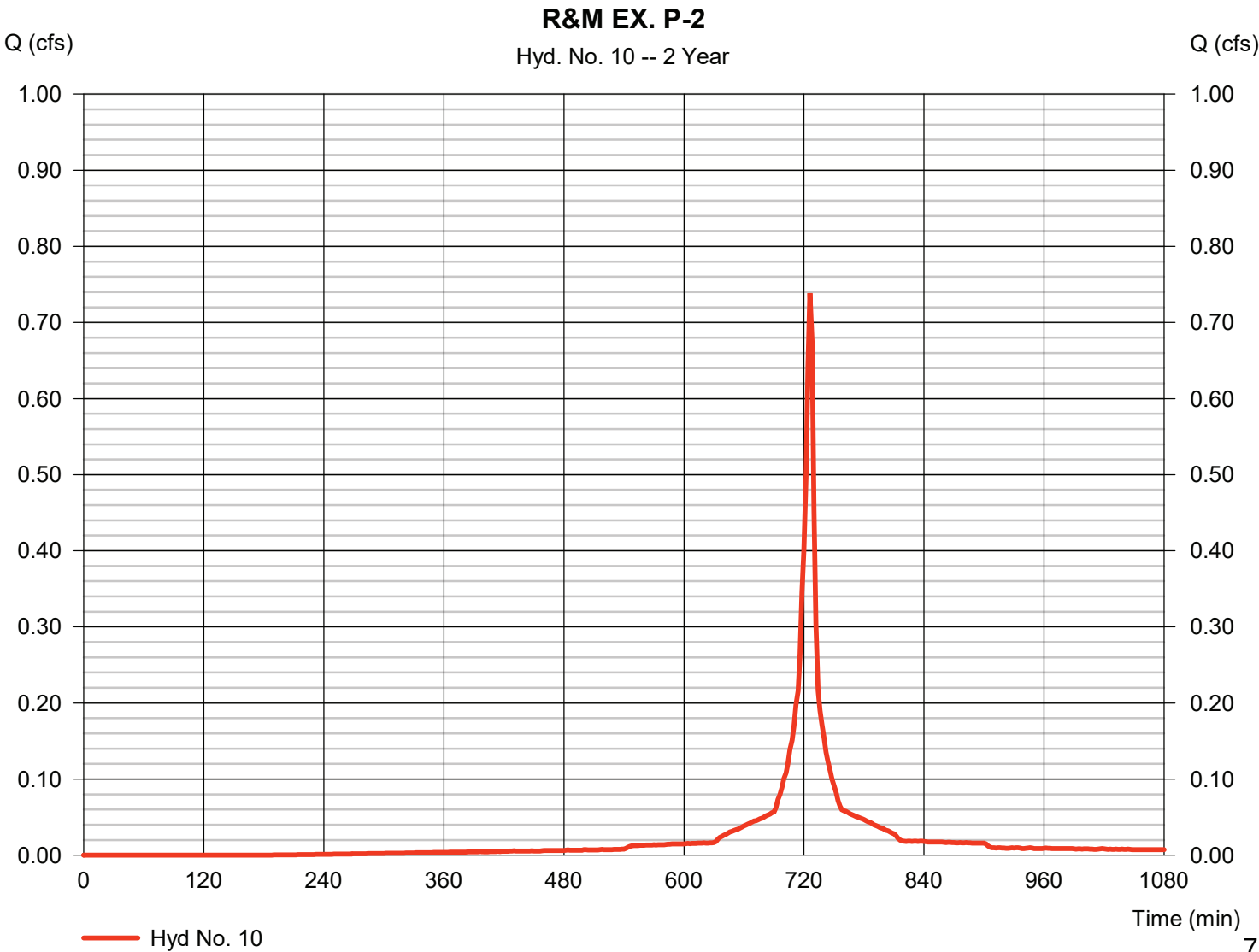
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.738 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.037 acft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

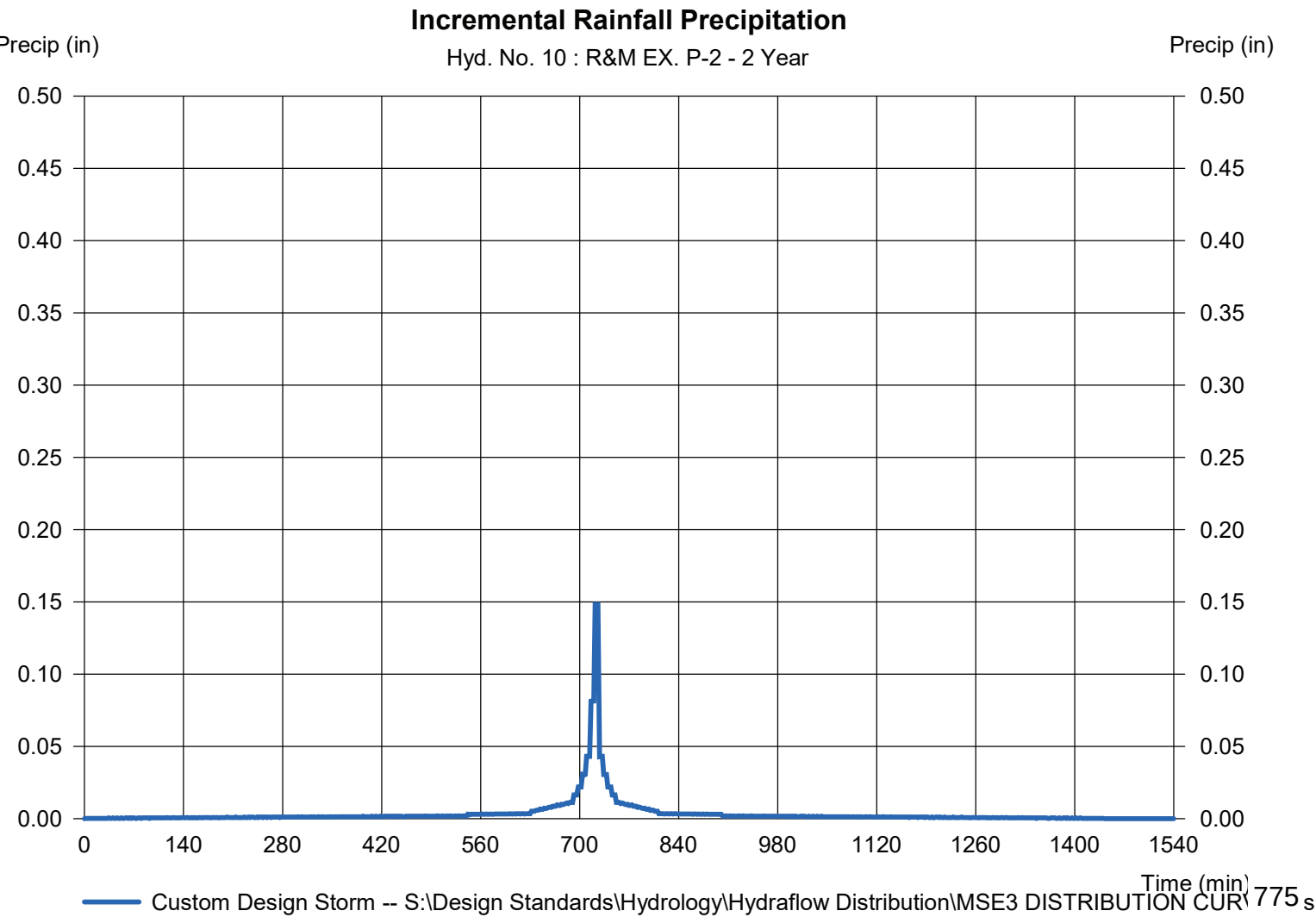
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

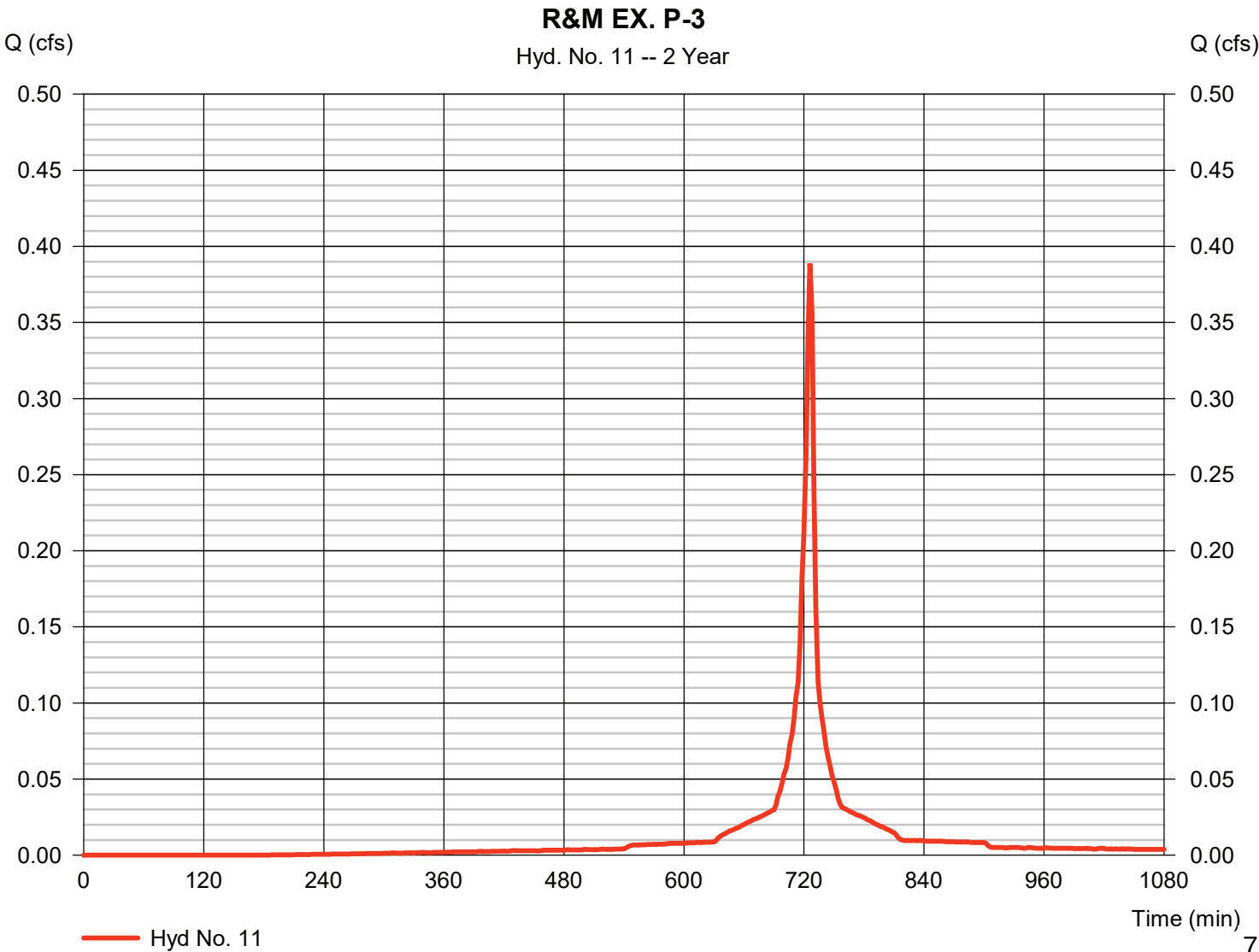
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.389 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.019 acft
Drainage area	= 0.100 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

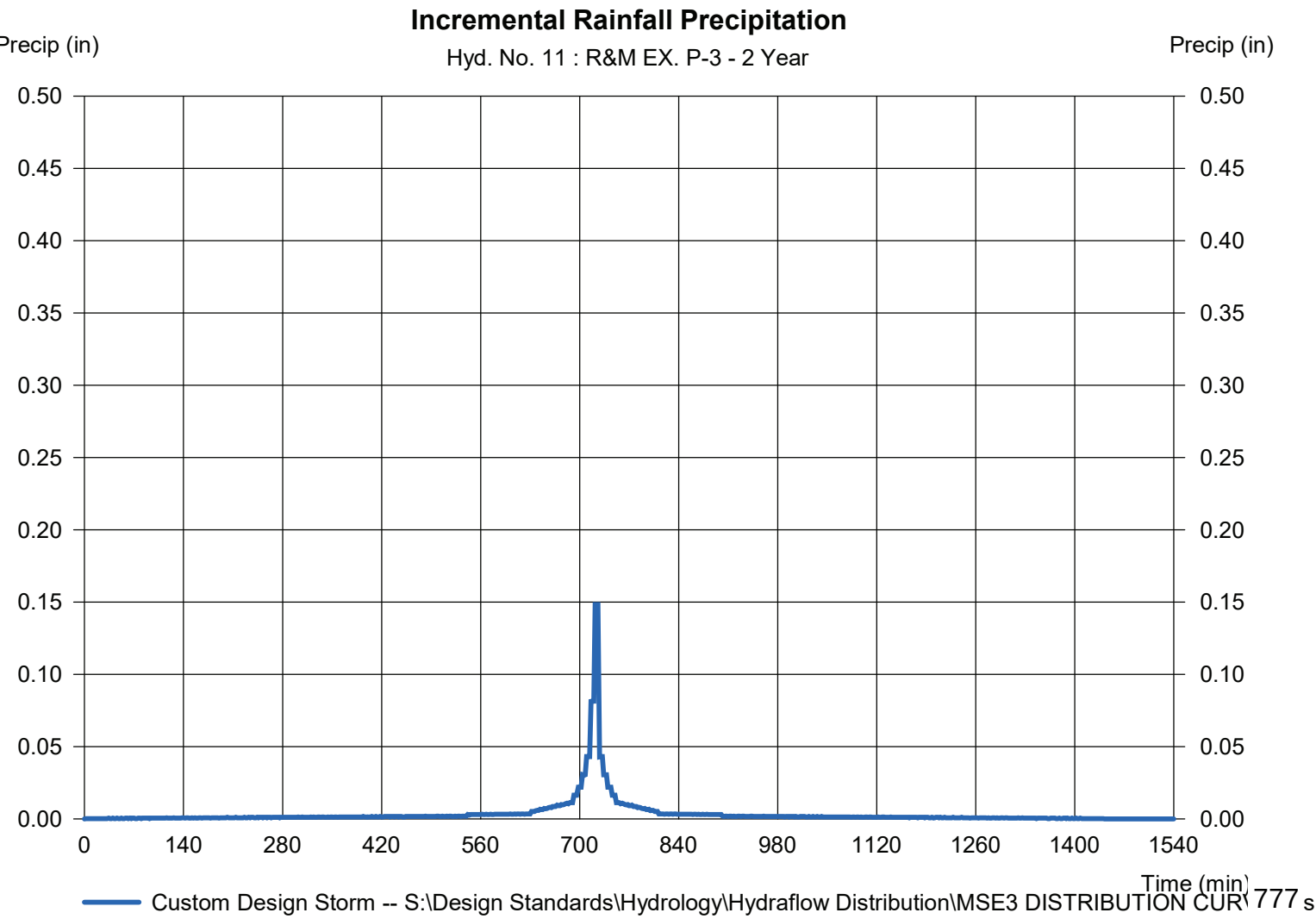
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

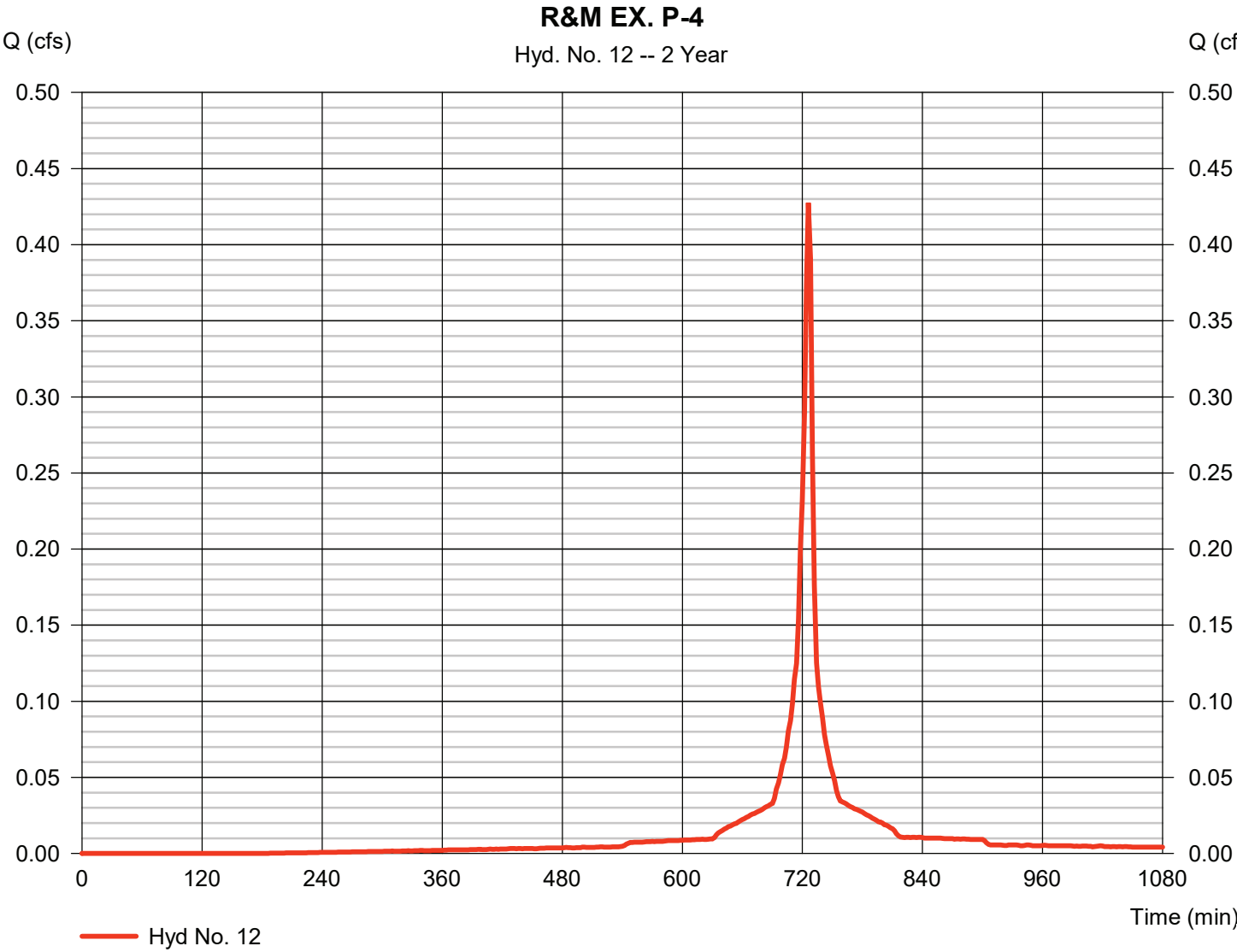
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Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.427 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.021 acft
Drainage area	= 0.110 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

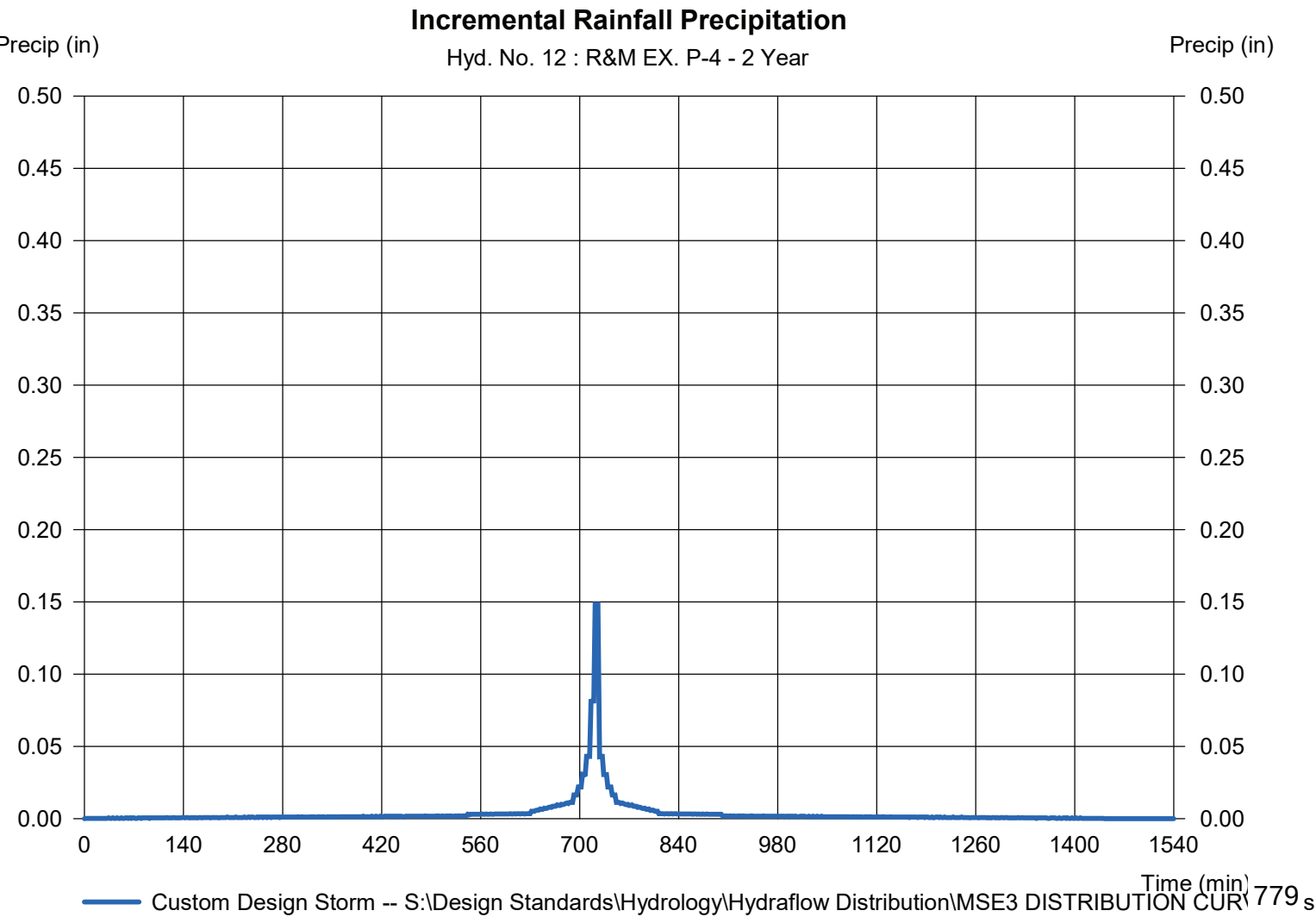
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

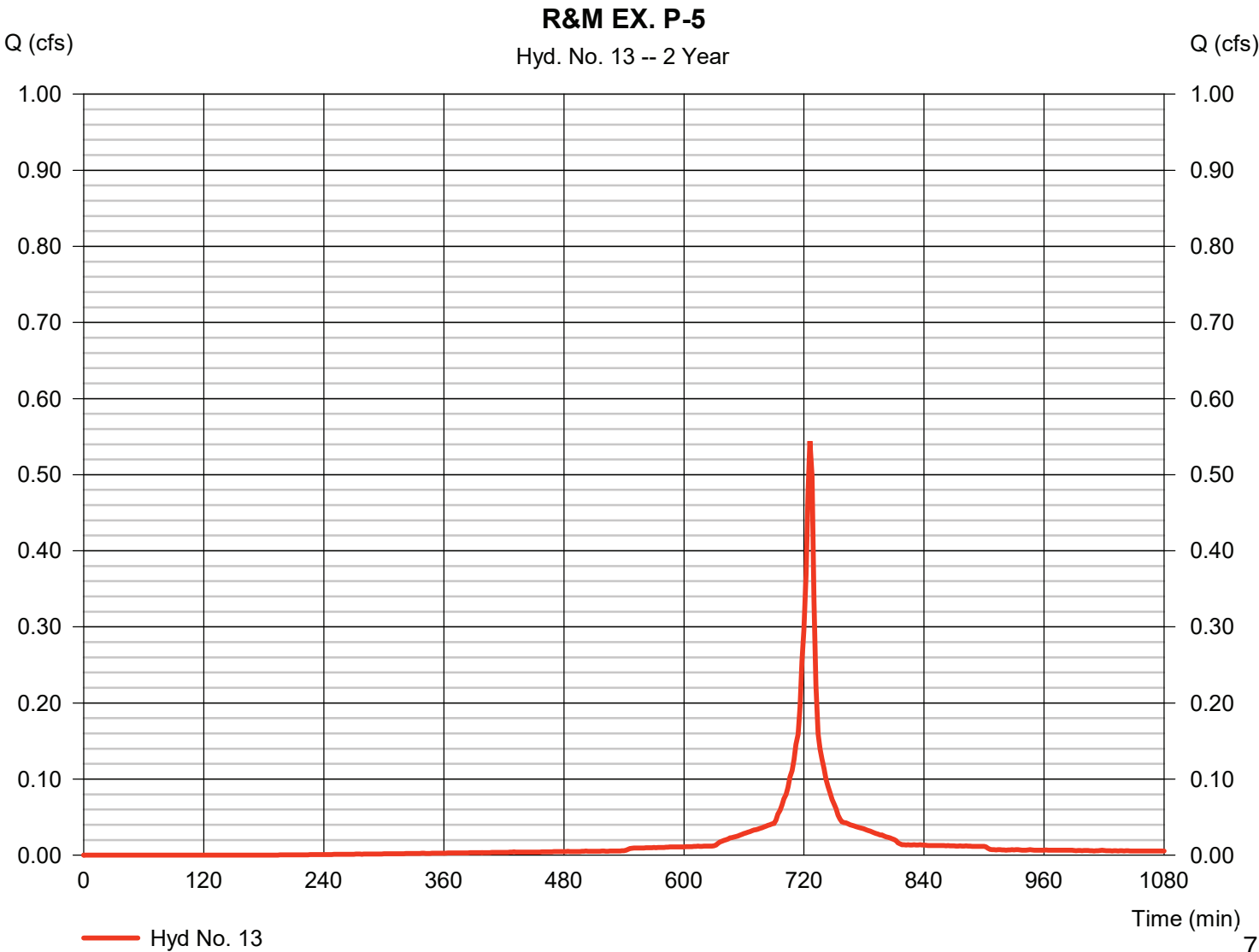
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Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.544 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.027 acft
Drainage area	= 0.140 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

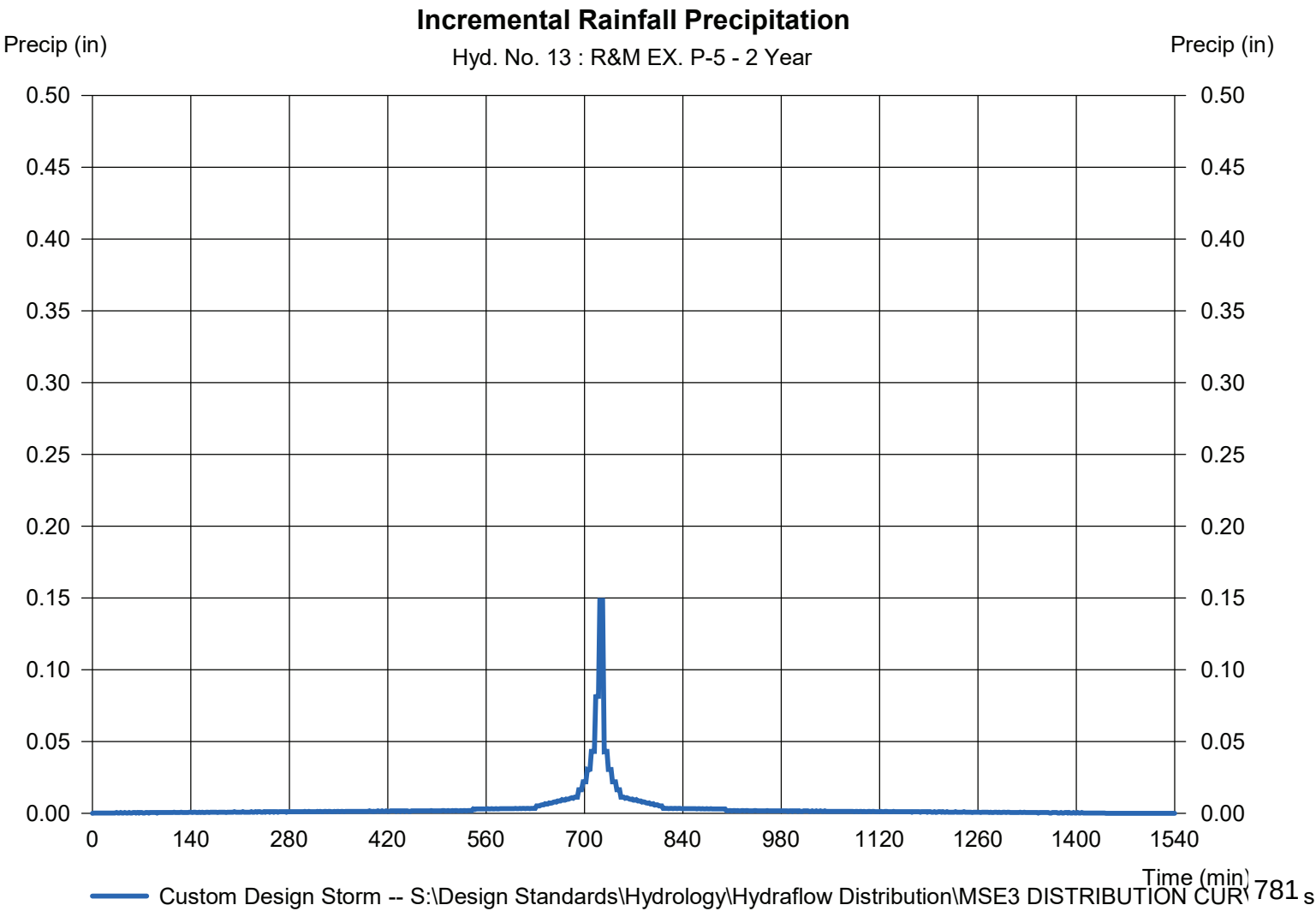
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

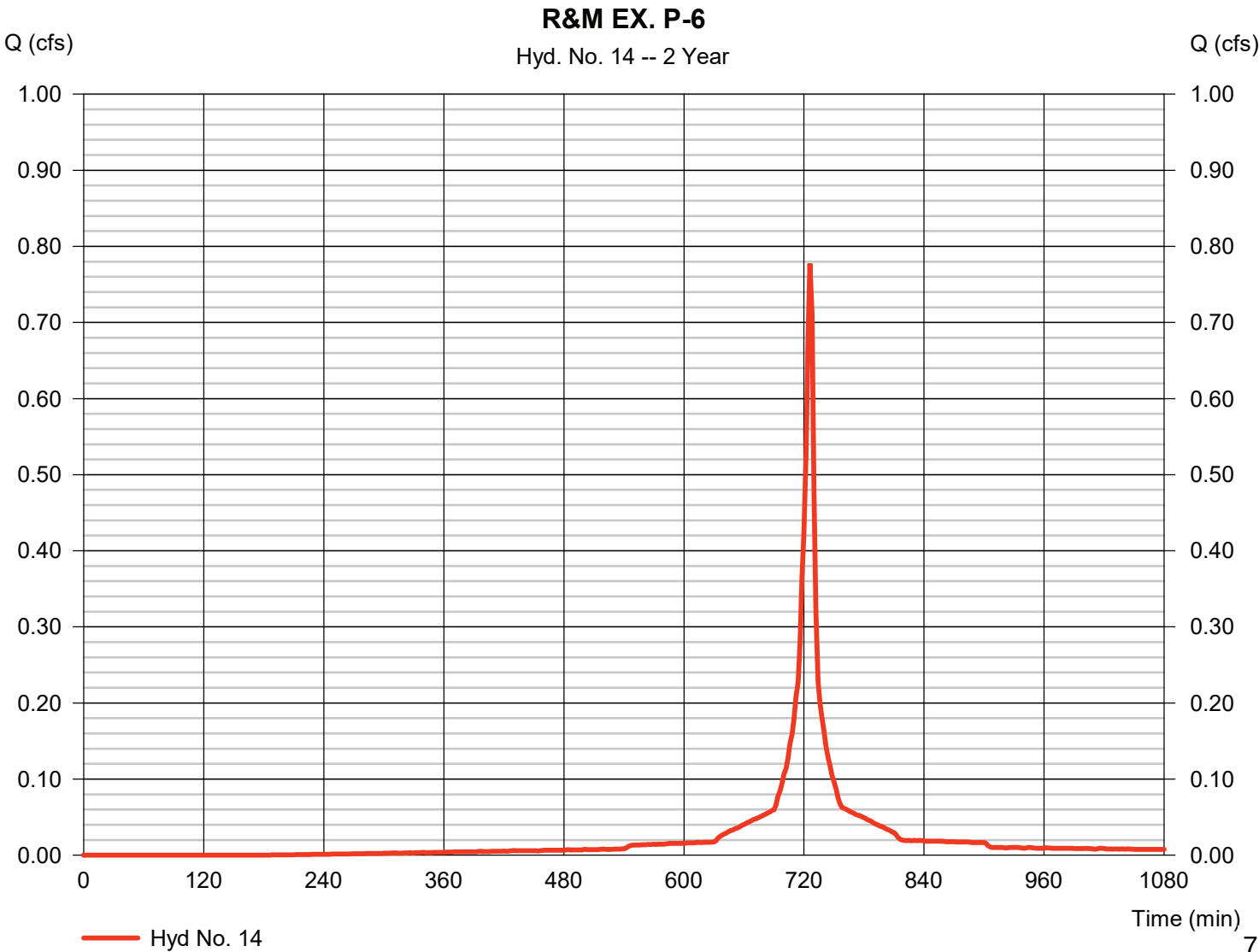
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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Hyd. No. 14

R&M EX. P-6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.777 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.039 acft
Drainage area	= 0.200 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

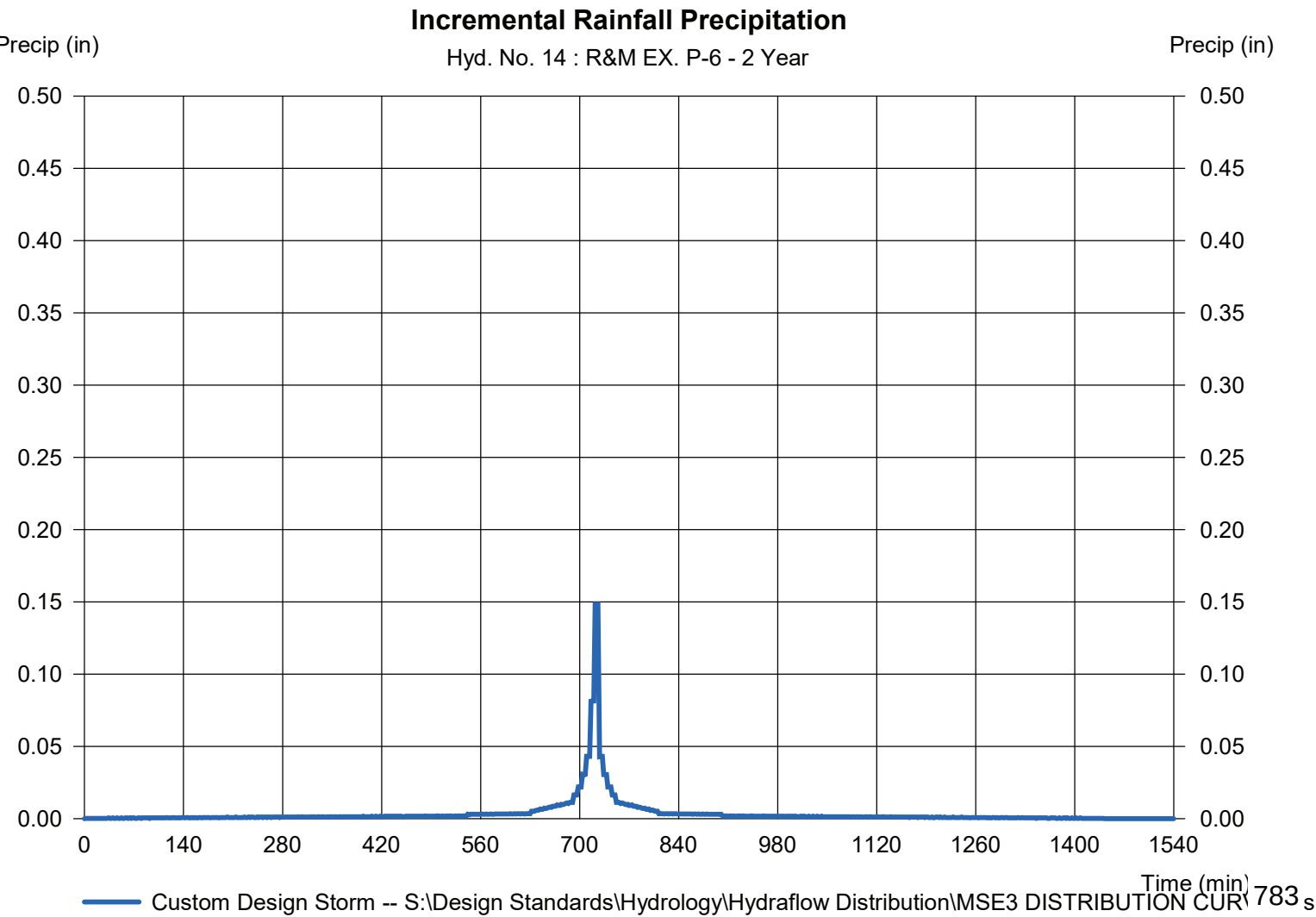
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

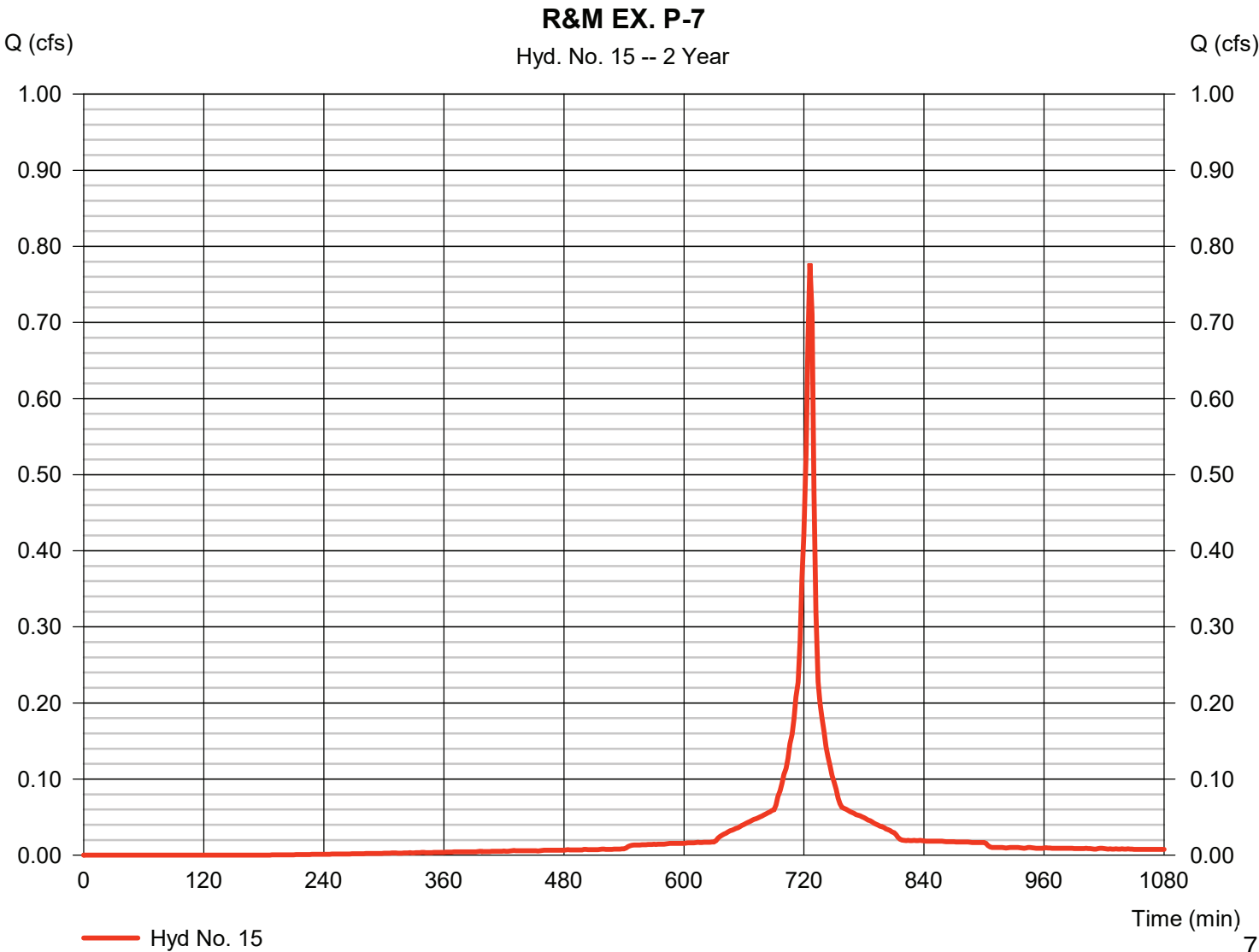
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.777 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.039 acft
Drainage area	= 0.200 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

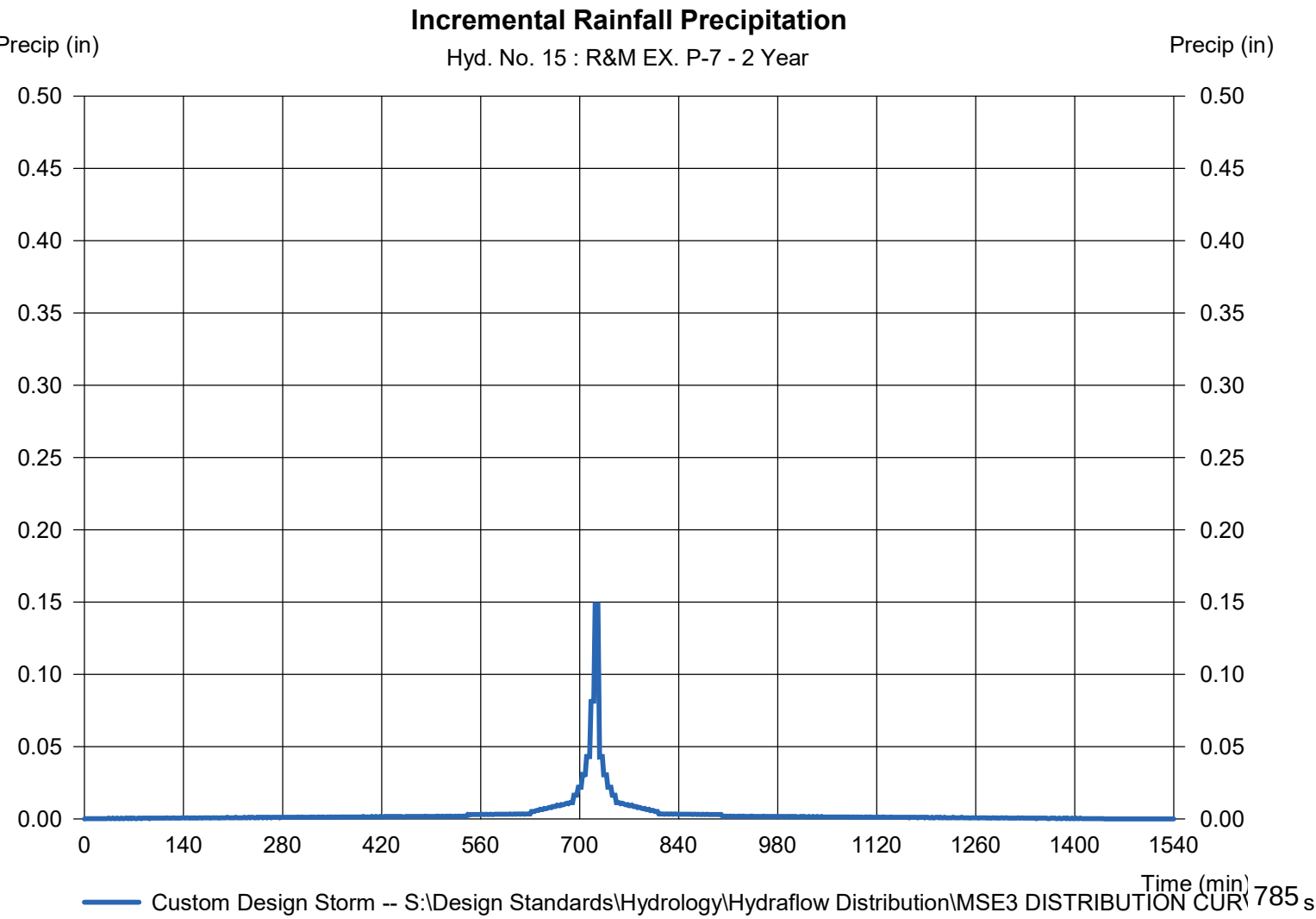
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

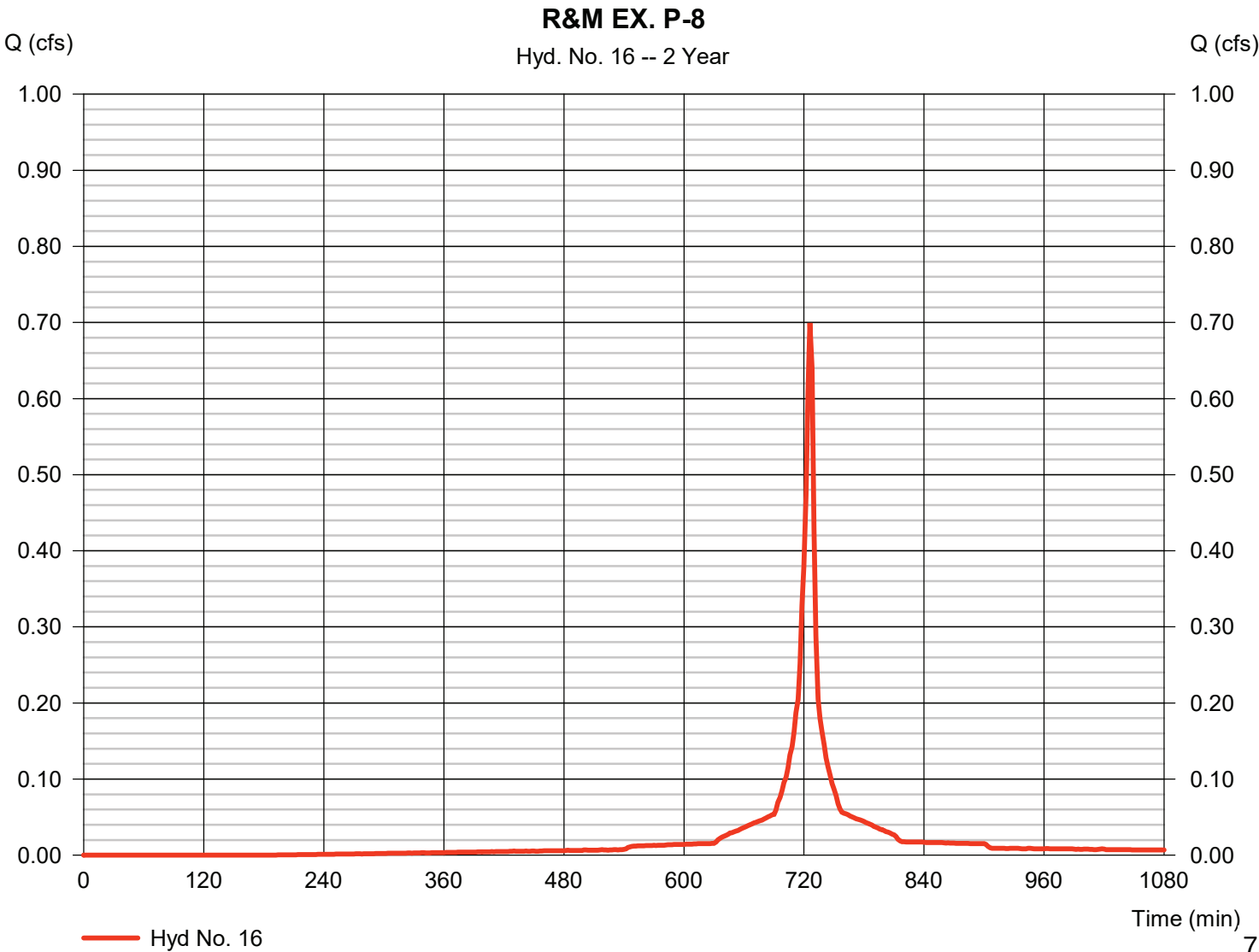
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Hyd. No. 16

R&M EX. P-8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.700 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.035 acft
Drainage area	= 0.180 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

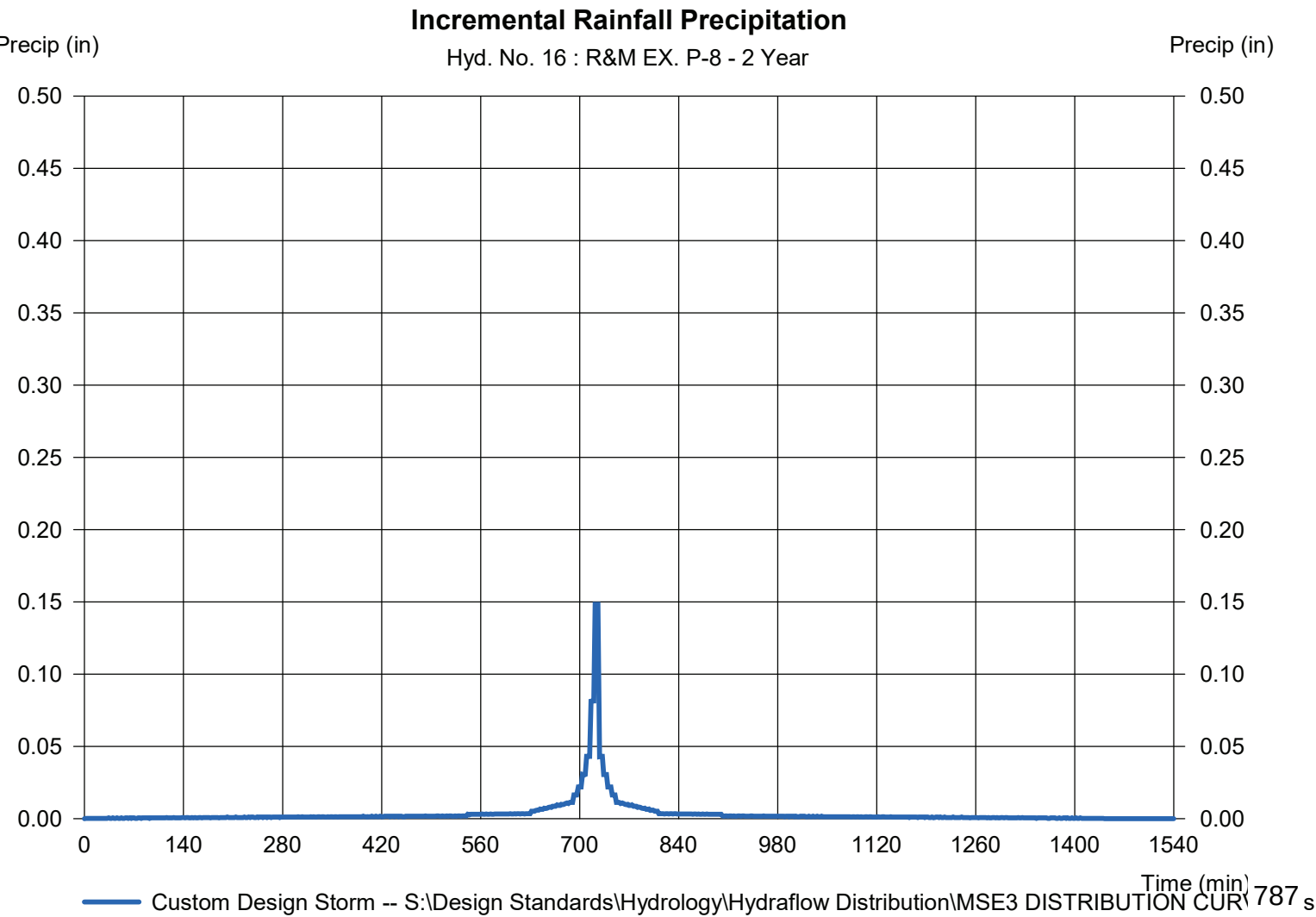
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

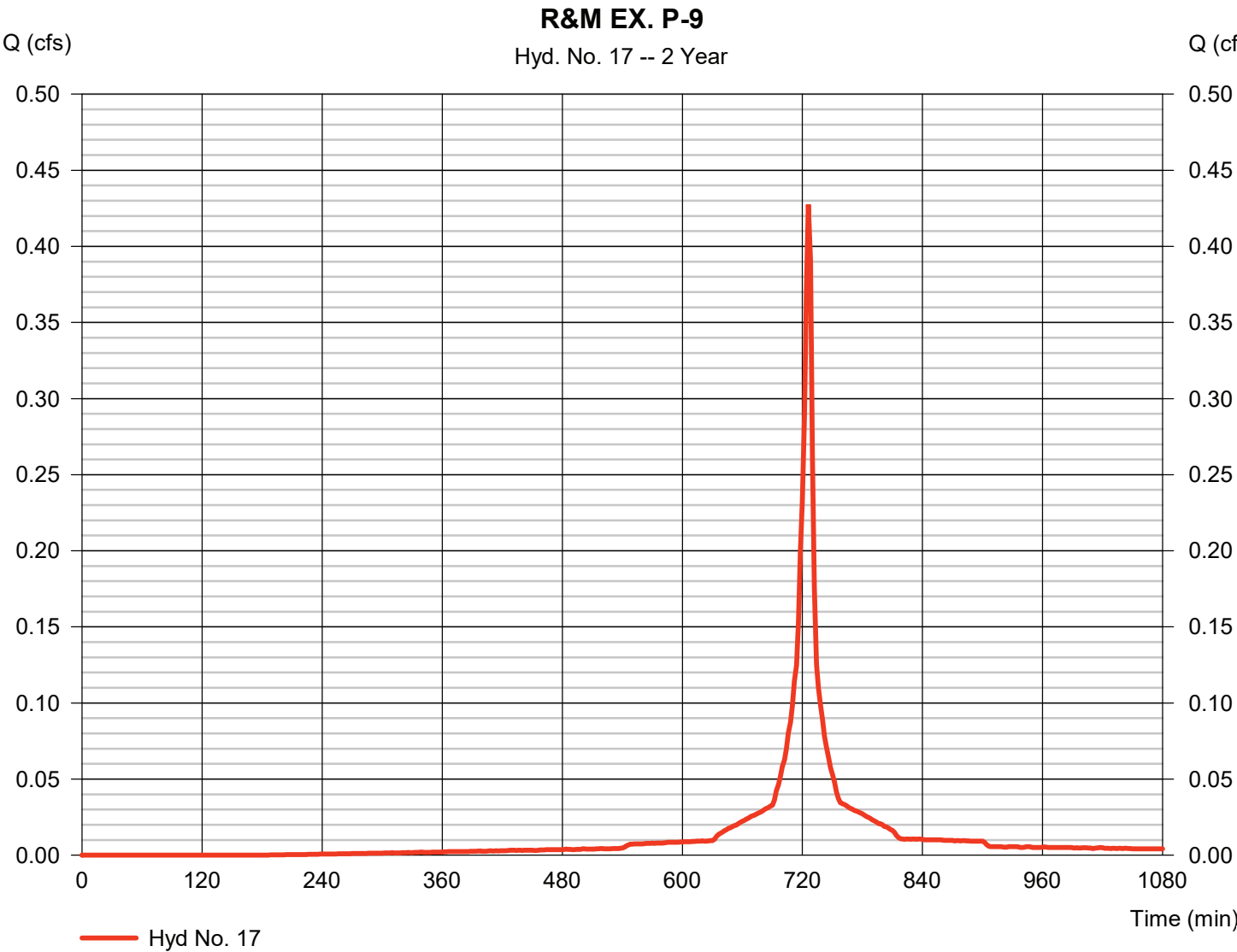
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.427 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.021 acft
Drainage area	= 0.110 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

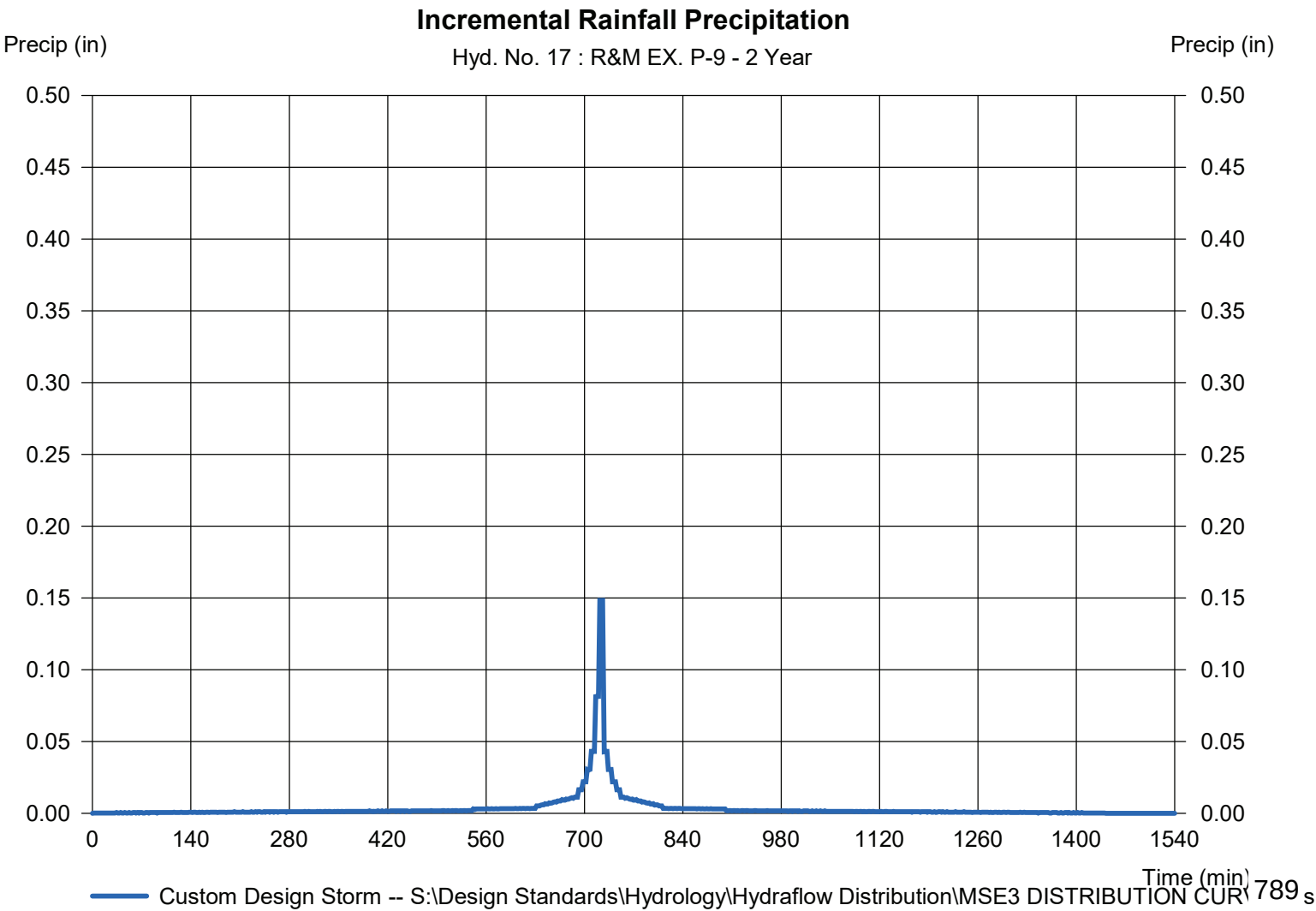
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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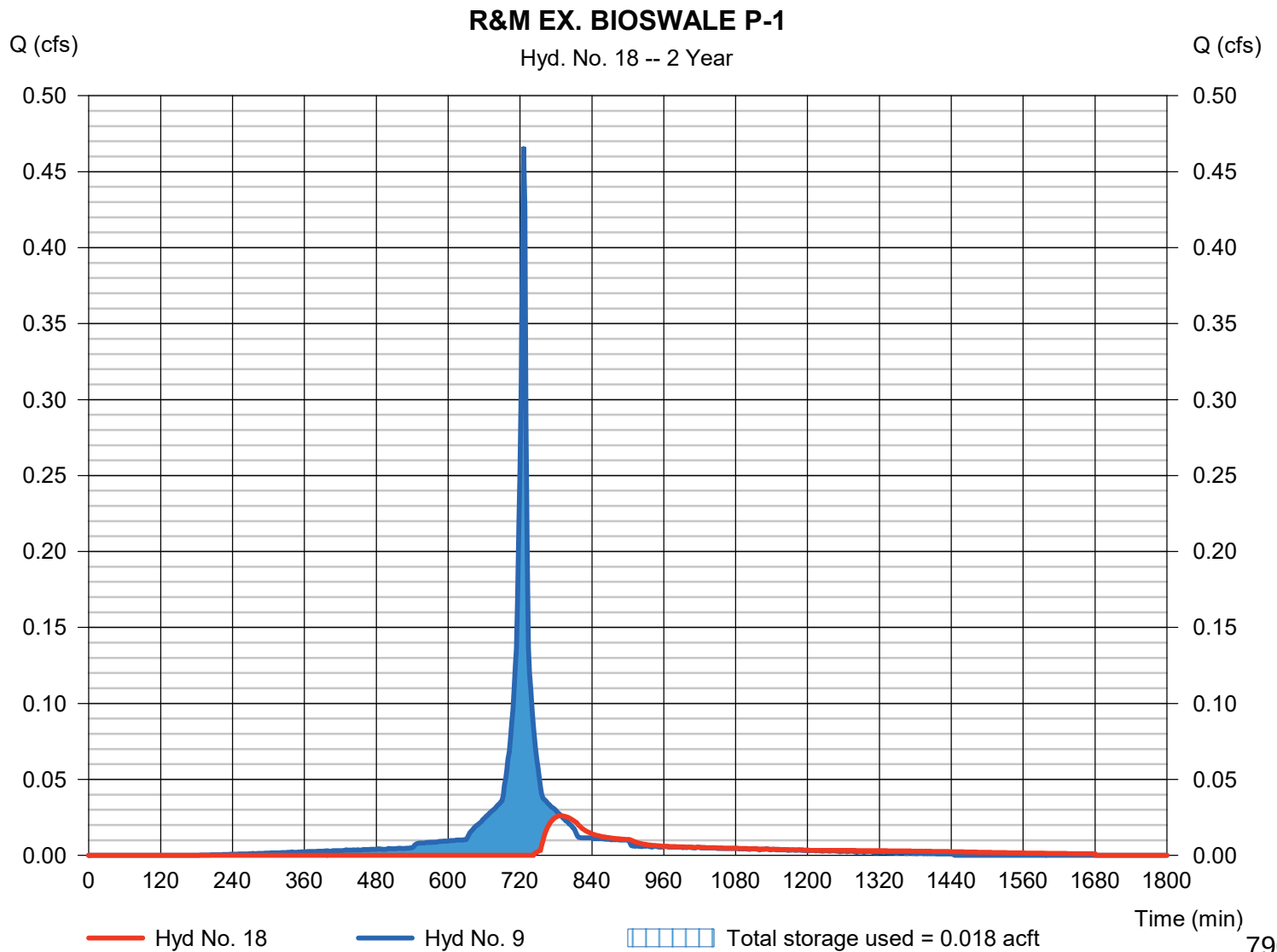
Friday, 06 / 28 / 2019

Hyd. No. 18

R&M EX. BIOSWALE P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.026 cfs
Storm frequency	= 2 yrs	Time to peak	= 788 min
Time interval	= 2 min	Hyd. volume	= 0.007 acft
Inflow hyd. No.	= 9 - R&M EX. P-1	Max. Elevation	= 851.63 ft
Reservoir name	= Ex. Bioswale P-1	Max. Storage	= 0.018 acft

Storage Indication method used.



Hydrograph Report

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

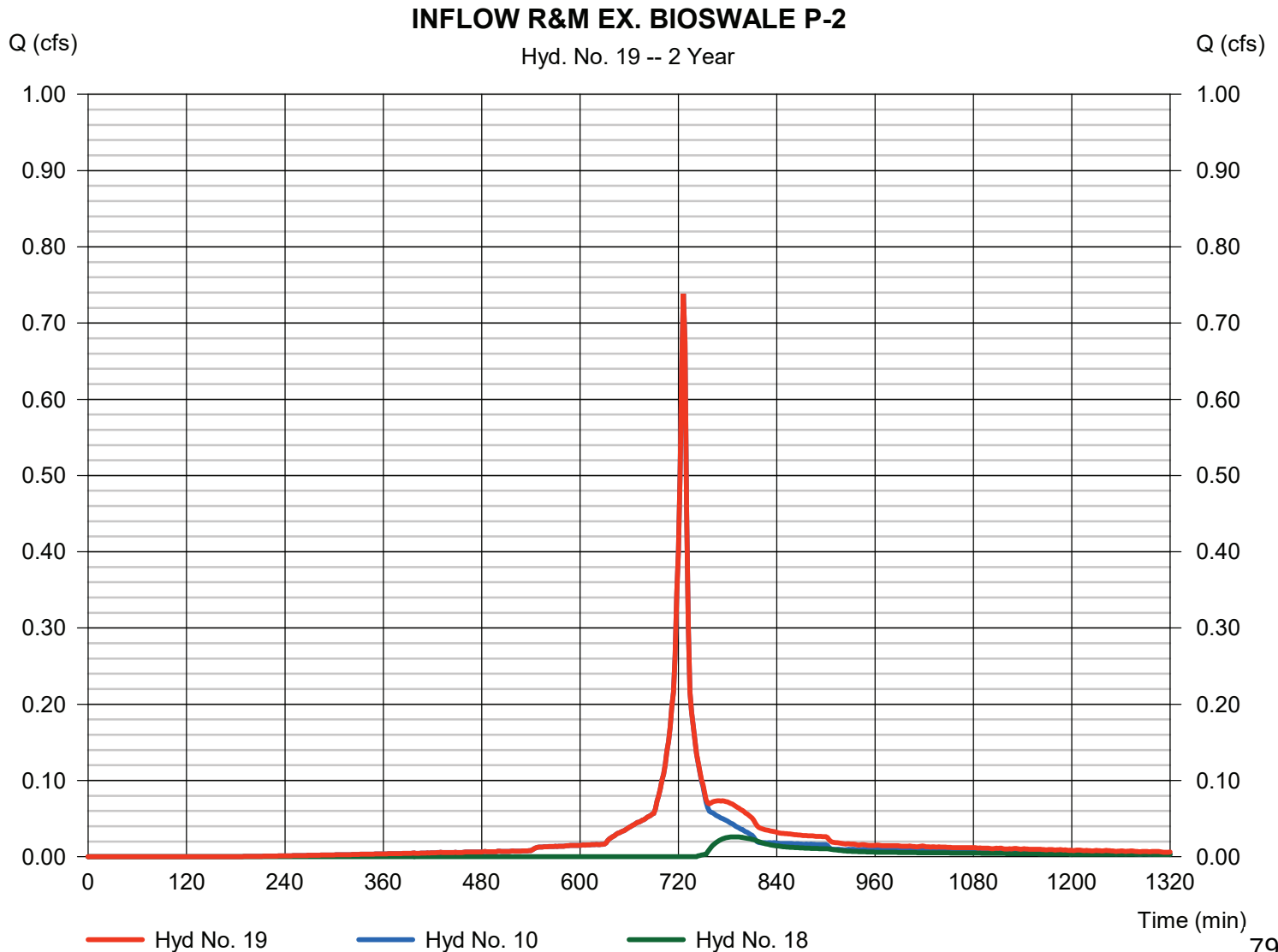
Friday, 06 / 28 / 2019

Hyd. No. 19

INFLOW R&M EX. BIOSWALE P-2

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 10, 18

Peak discharge = 0.738 cfs
Time to peak = 726 min
Hyd. volume = 0.044 acft
Contrib. drain. area = 0.190 ac



Hydrograph Report

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

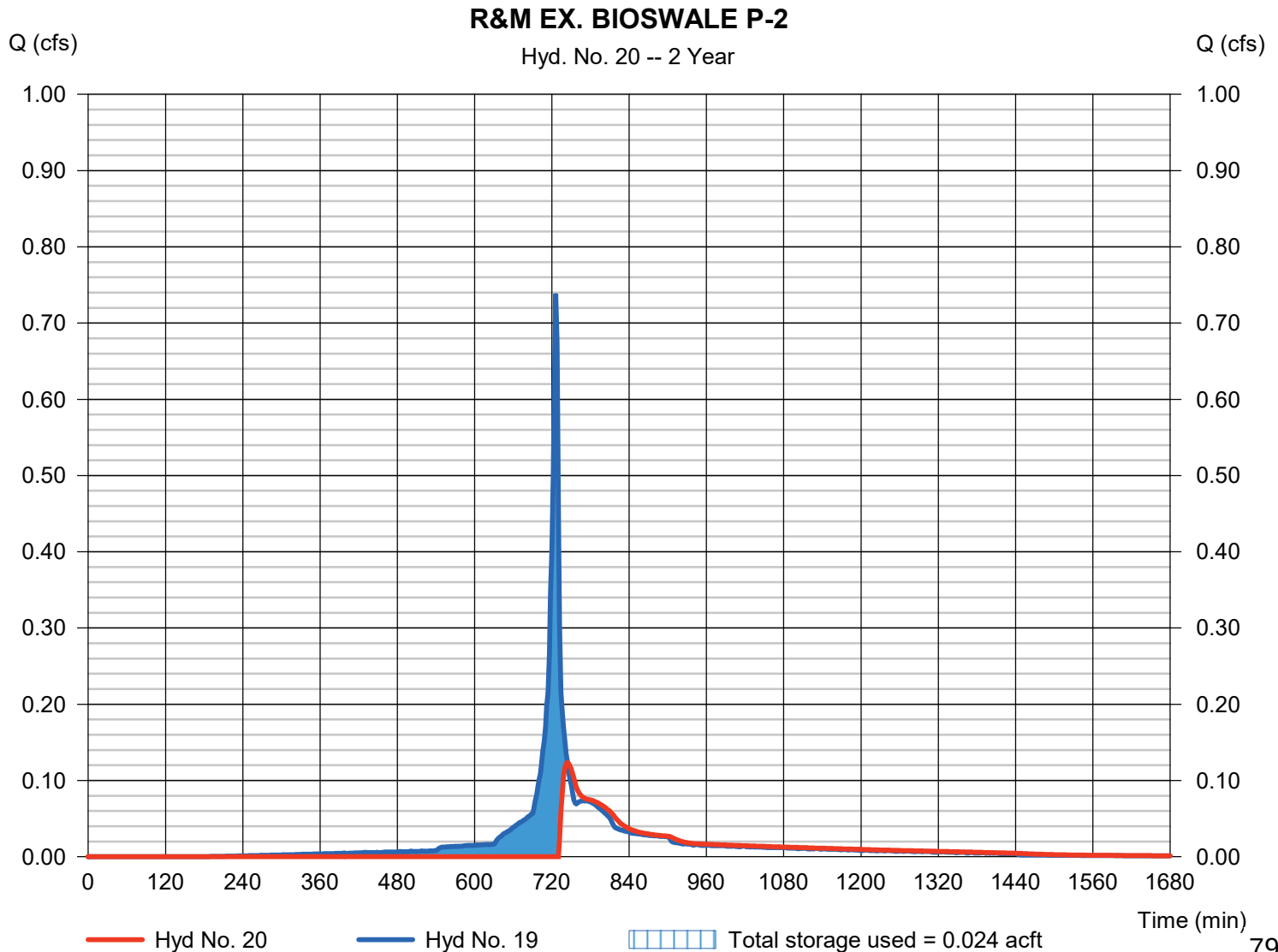
Friday, 06 / 28 / 2019

Hyd. No. 20

R&M EX. BIOSWALE P-2

Hydrograph type	= Reservoir	Peak discharge	= 0.123 cfs
Storm frequency	= 2 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 0.022 acft
Inflow hyd. No.	= 19 - INFLOW R&M EX. BIOSWALE P-2	Max. Elevation	= 851.38 ft
Reservoir name	= Ex. Bioswale P-2	Max. Storage	= 0.024 acft

Storage Indication method used.



Hydrograph Report

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

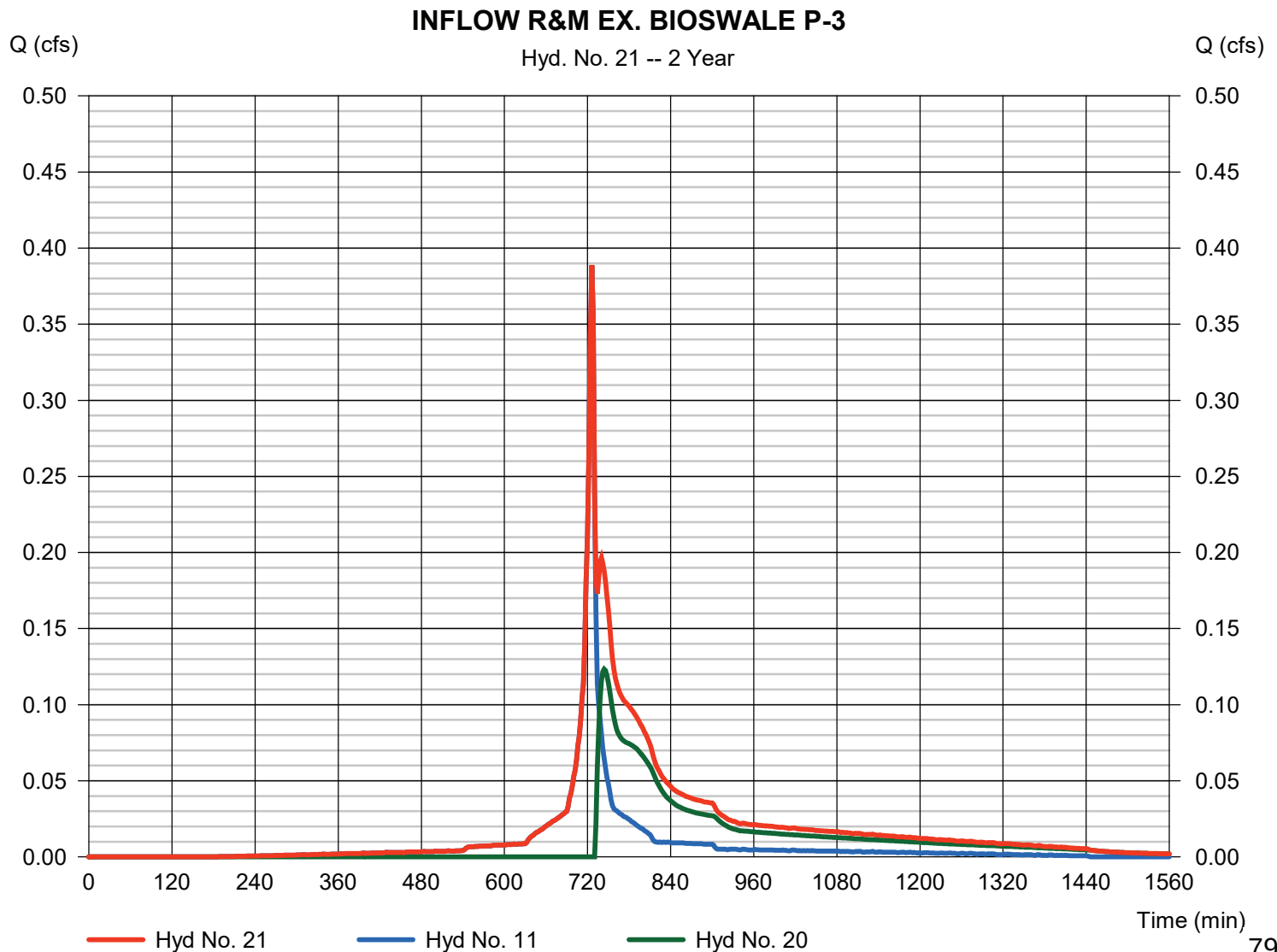
Friday, 06 / 28 / 2019

Hyd. No. 21

INFLOW R&M EX. BIOSWALE P-3

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 11, 20

Peak discharge = 0.389 cfs
Time to peak = 726 min
Hyd. volume = 0.042 acft
Contrib. drain. area = 0.100 ac



Hydrograph Report

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

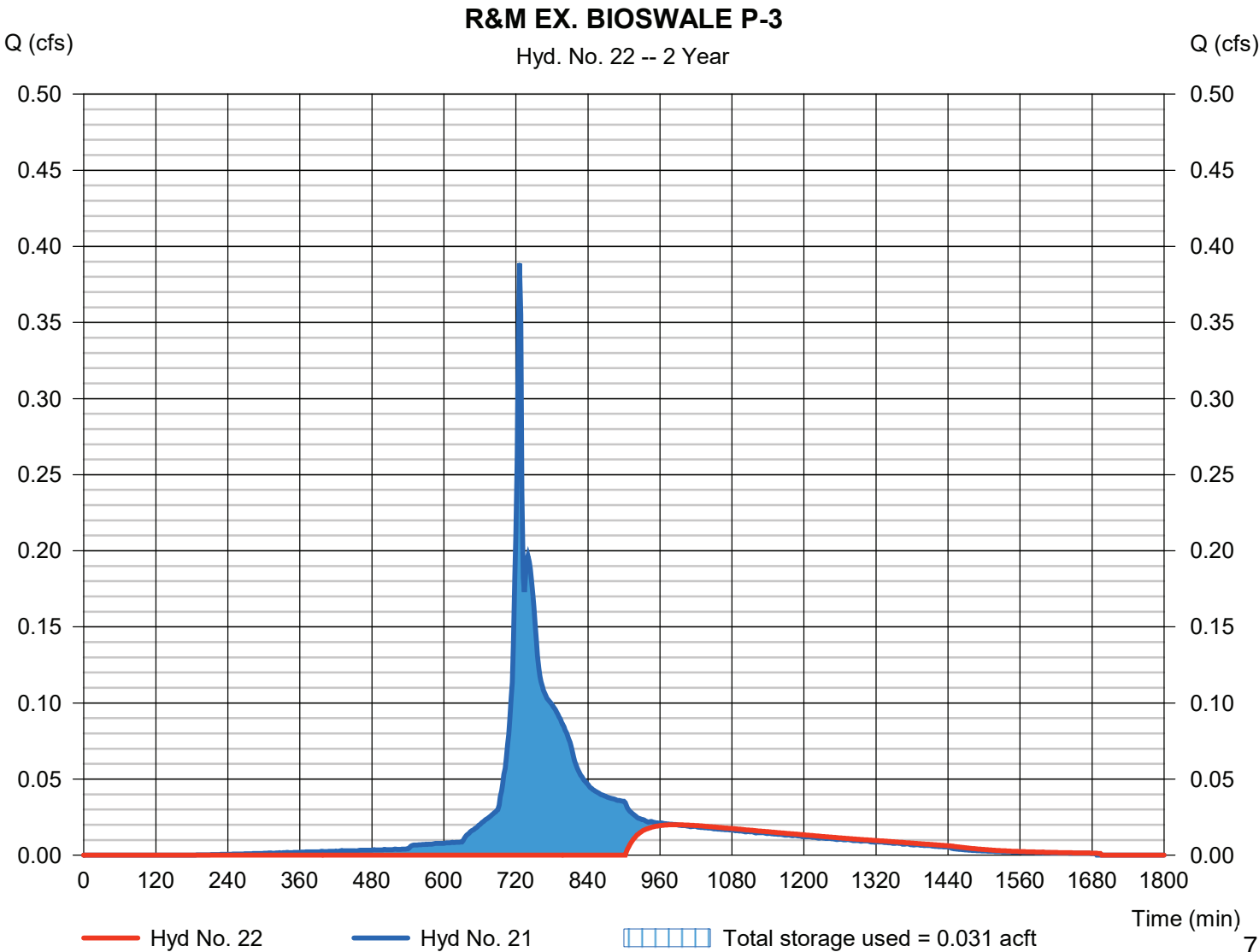
Friday, 06 / 28 / 2019

Hyd. No. 22

R&M EX. BIOSWALE P-3

Hydrograph type	= Reservoir	Peak discharge	= 0.020 cfs
Storm frequency	= 2 yrs	Time to peak	= 988 min
Time interval	= 2 min	Hyd. volume	= 0.011 acft
Inflow hyd. No.	= 21 - INFLOW R&M EX. BIOSWALE P-3	Max. Elevation	= 850.99 ft
Reservoir name	= Ex. Bioswale P-3	Max. Storage	= 0.031 acft

Storage Indication method used.



Hydrograph Report

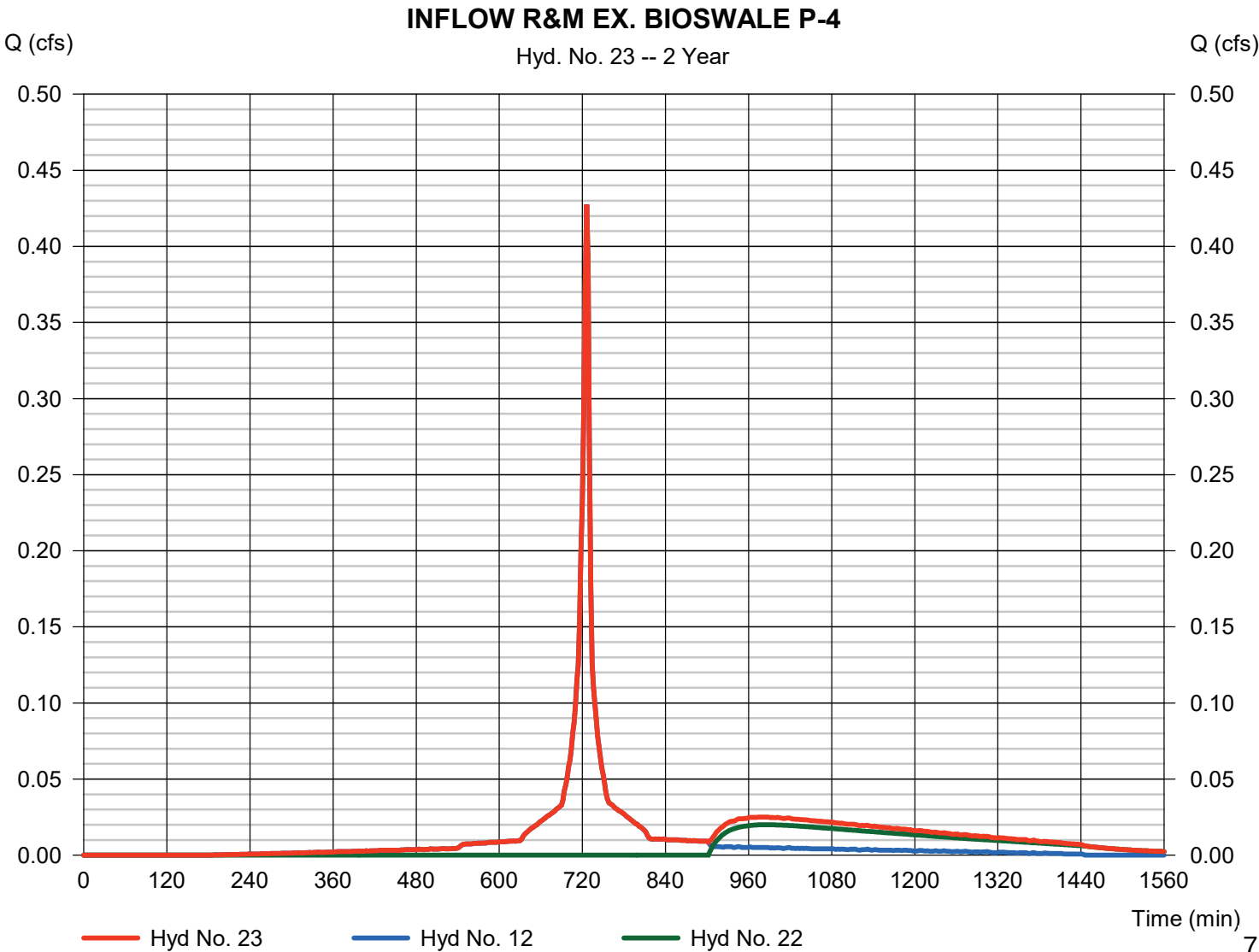
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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Hyd. No. 23

INFLOW R&M EX. BIOSWALE P-4

Hydrograph type	= Combine	Peak discharge	= 0.427 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.032 acft
Inflow hyds.	= 12, 22	Contrib. drain. area	= 0.110 ac



Hydrograph Report

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

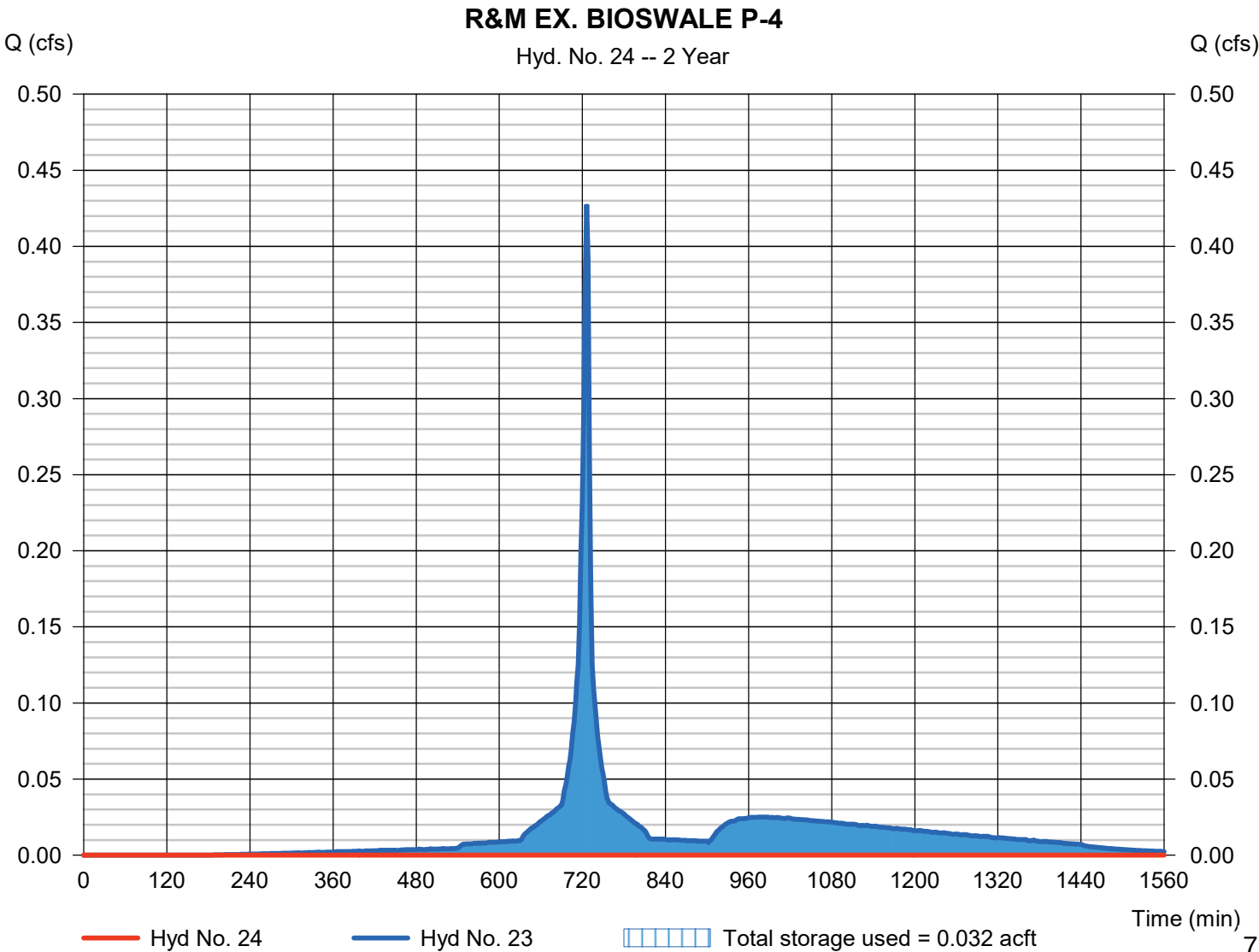
Friday, 06 / 28 / 2019

Hyd. No. 24

R&M EX. BIOSWALE P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 23 - INFLOW R&M EX. BIOSWALE P-4	Max. Elevation	= 850.09 ft
Reservoir name	= Ex. Bioswale P-4	Max. Storage	= 0.032 acft

Storage Indication method used.



Hydrograph Report

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

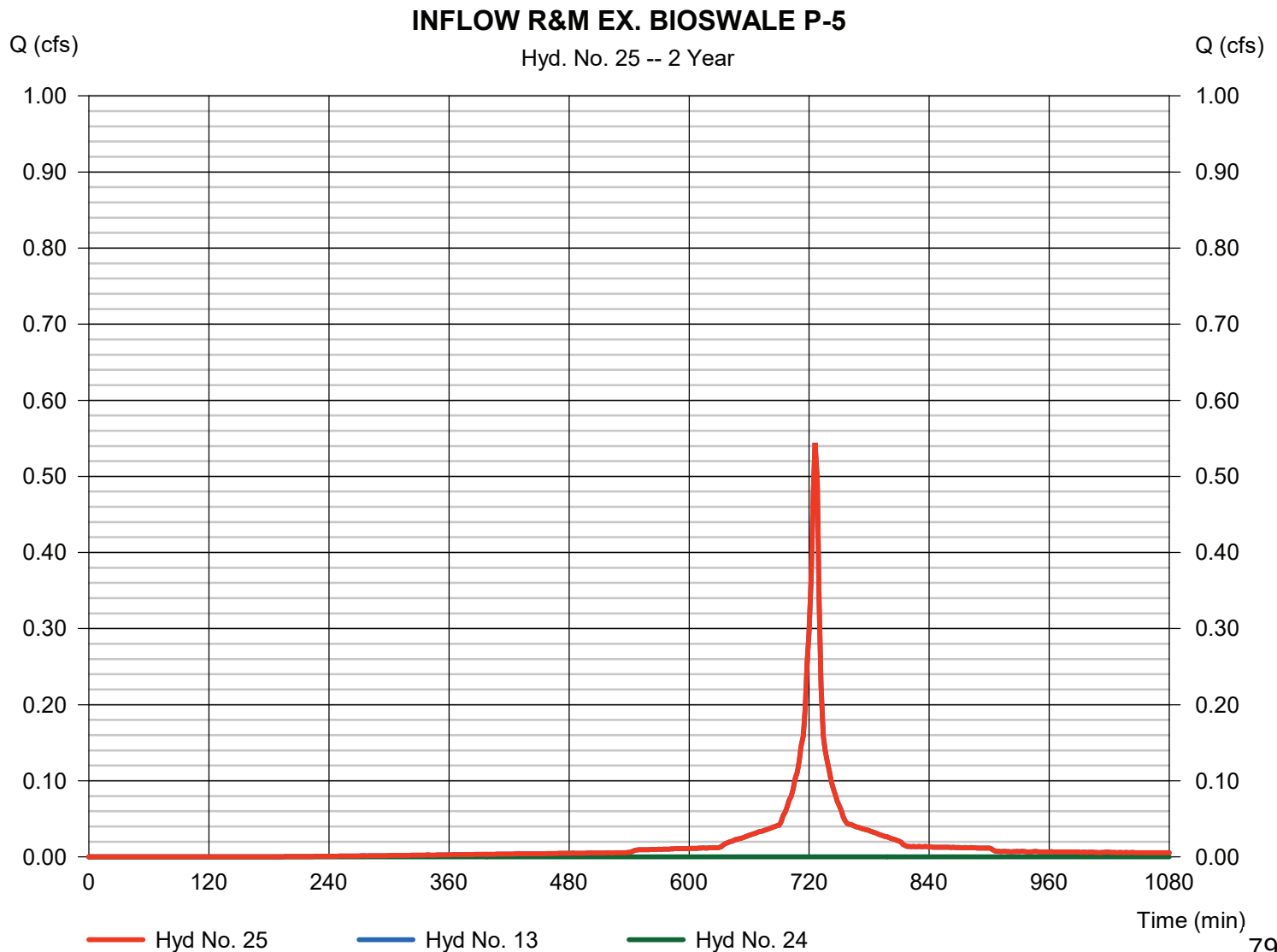
Friday, 06 / 28 / 2019

Hyd. No. 25

INFLOW R&M EX. BIOSWALE P-5

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 13, 24

Peak discharge = 0.544 cfs
 Time to peak = 726 min
 Hyd. volume = 0.027 acft
 Contrib. drain. area = 0.140 ac



Hydrograph Report

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

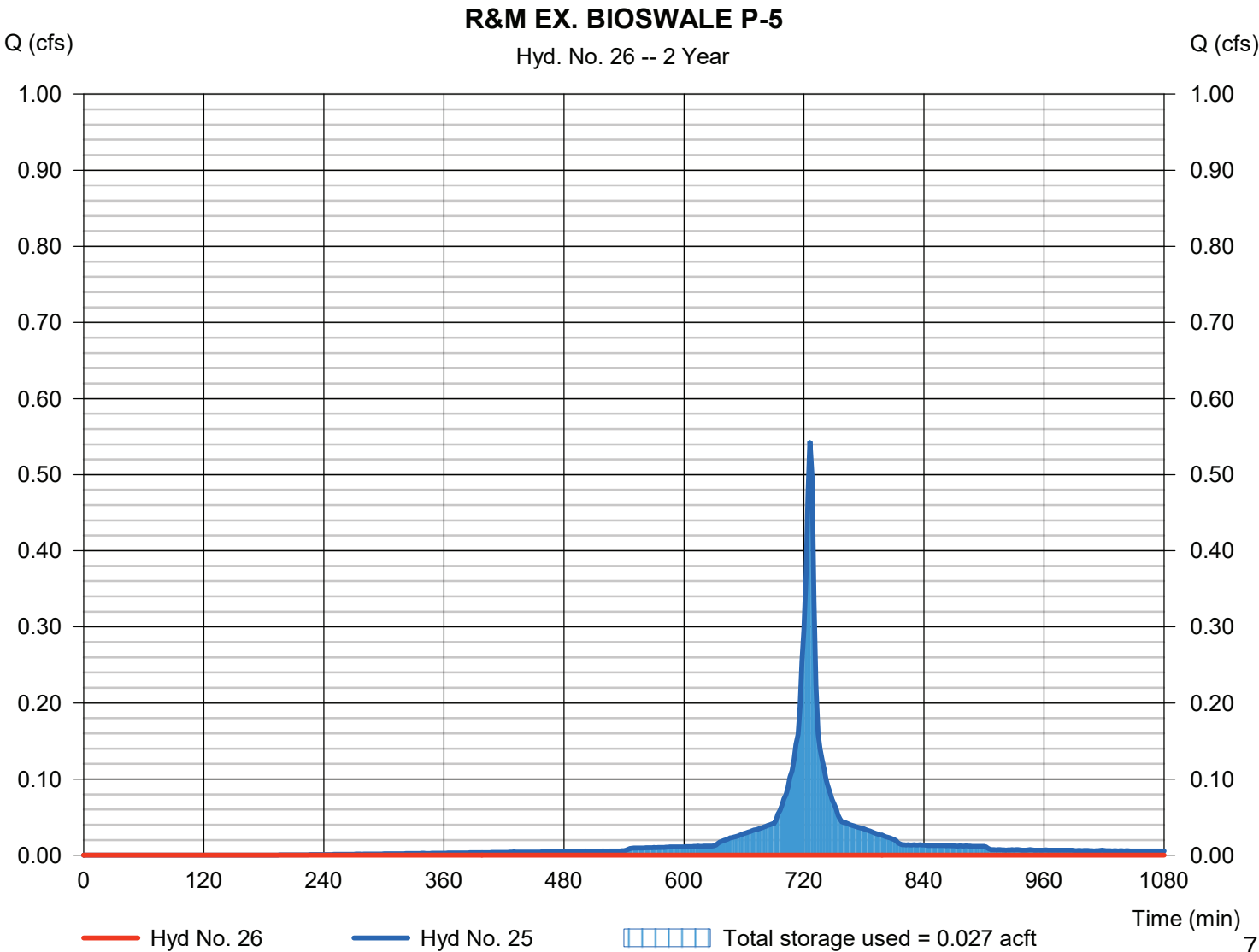
Friday, 06 / 28 / 2019

Hyd. No. 26

R&M EX. BIOSWALE P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 25 - INFLOW R&M EX. BIOSWALE P-5	Max. Elevation	= 848.57 ft
Reservoir name	= Ex. Bioswale P-5	Max. Storage	= 0.027 acft

Storage Indication method used.



Hydrograph Report

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

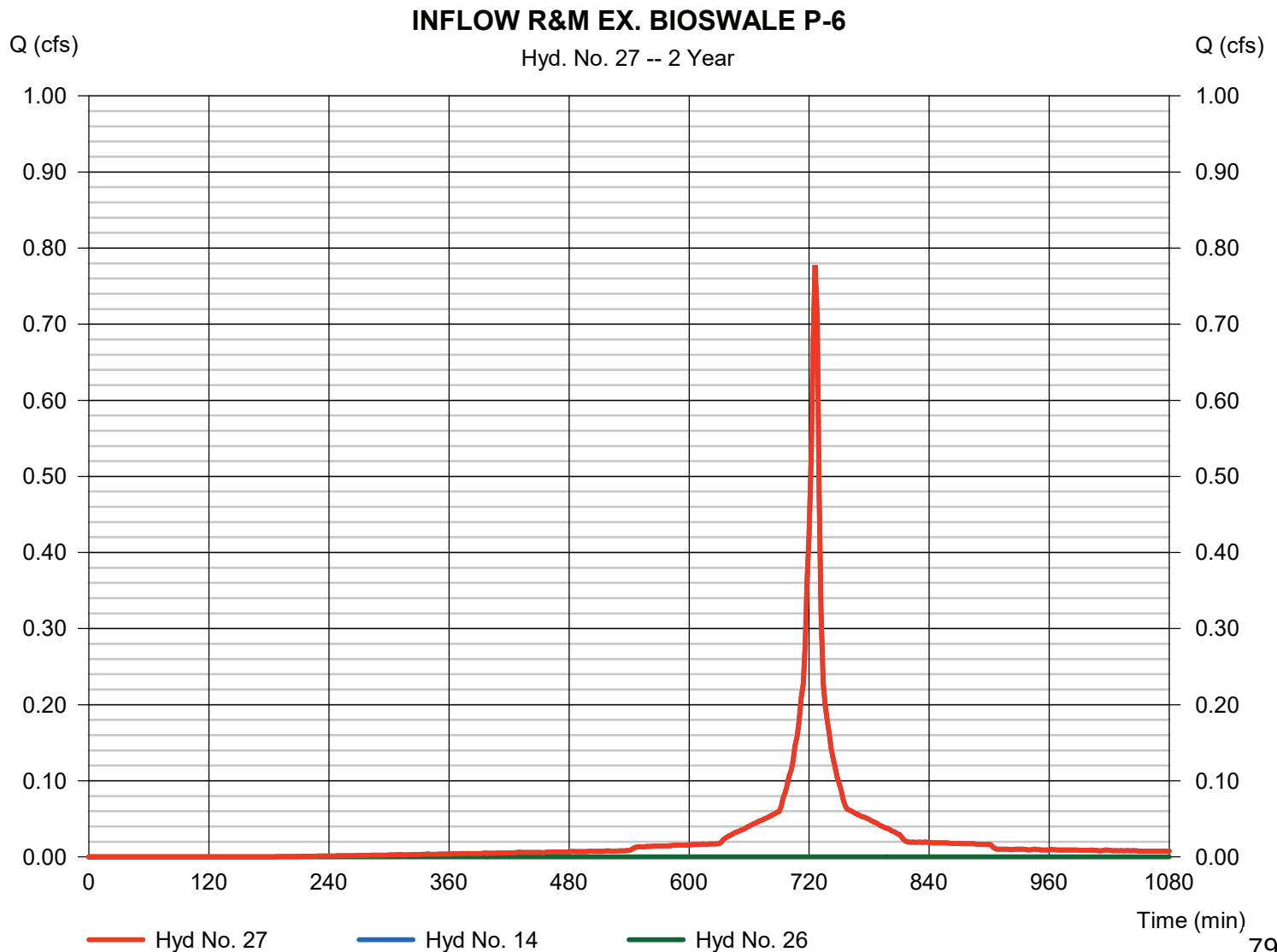
Friday, 06 / 28 / 2019

Hyd. No. 27

INFLOW R&M EX. BIOSWALE P-6

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 14, 26

Peak discharge = 0.777 cfs
Time to peak = 726 min
Hyd. volume = 0.039 acft
Contrib. drain. area = 0.200 ac



Hydrograph Report

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

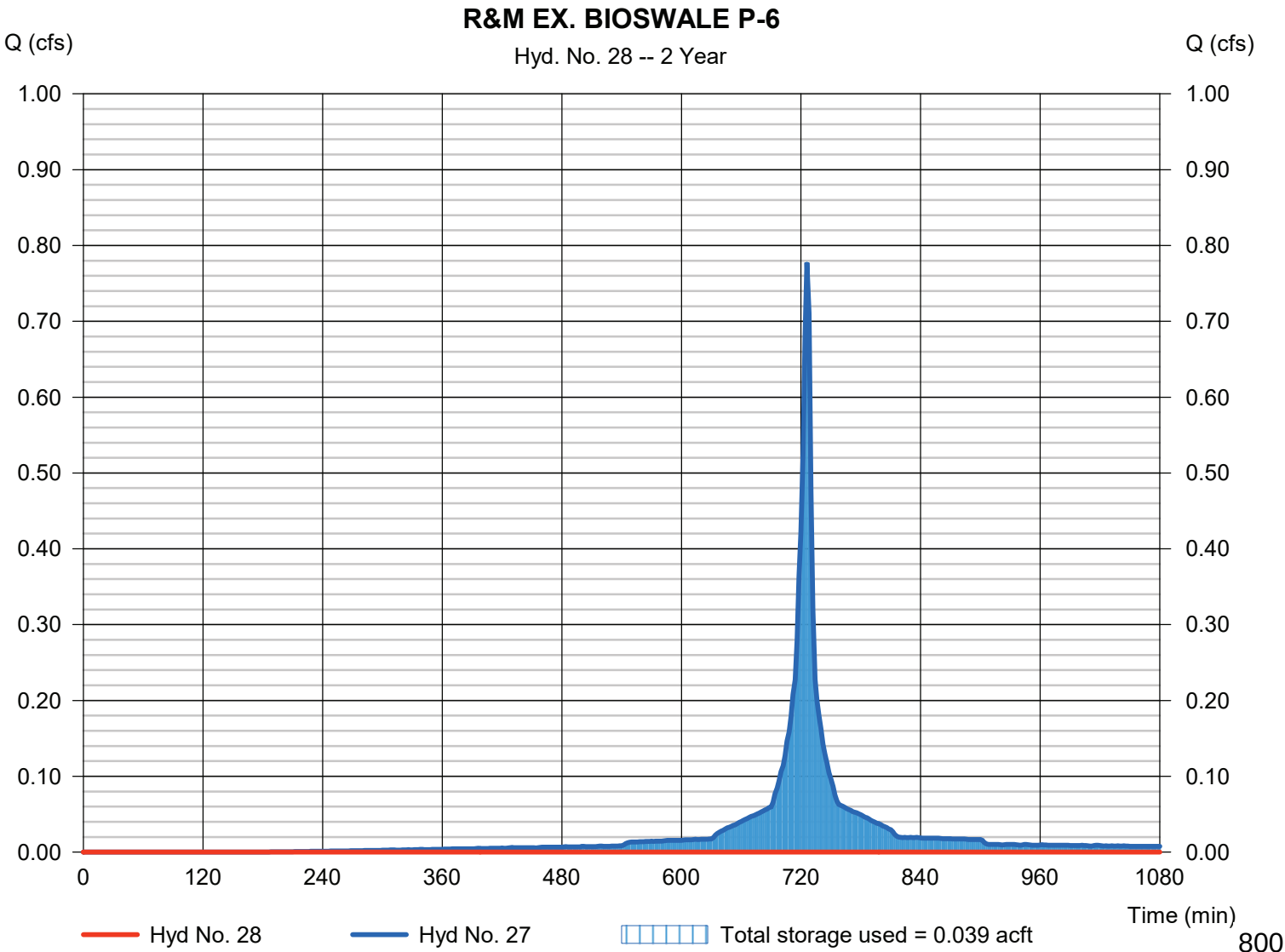
Friday, 06 / 28 / 2019

Hyd. No. 28

R&M EX. BIOSWALE P-6

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 27 - INFLOW R&M EX. BIOSWALE P-6	Max. Elevation	= 847.38 ft
Reservoir name	= Ex. Bioswale P-6	Max. Storage	= 0.039 acft

Storage Indication method used.



Hydrograph Report

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

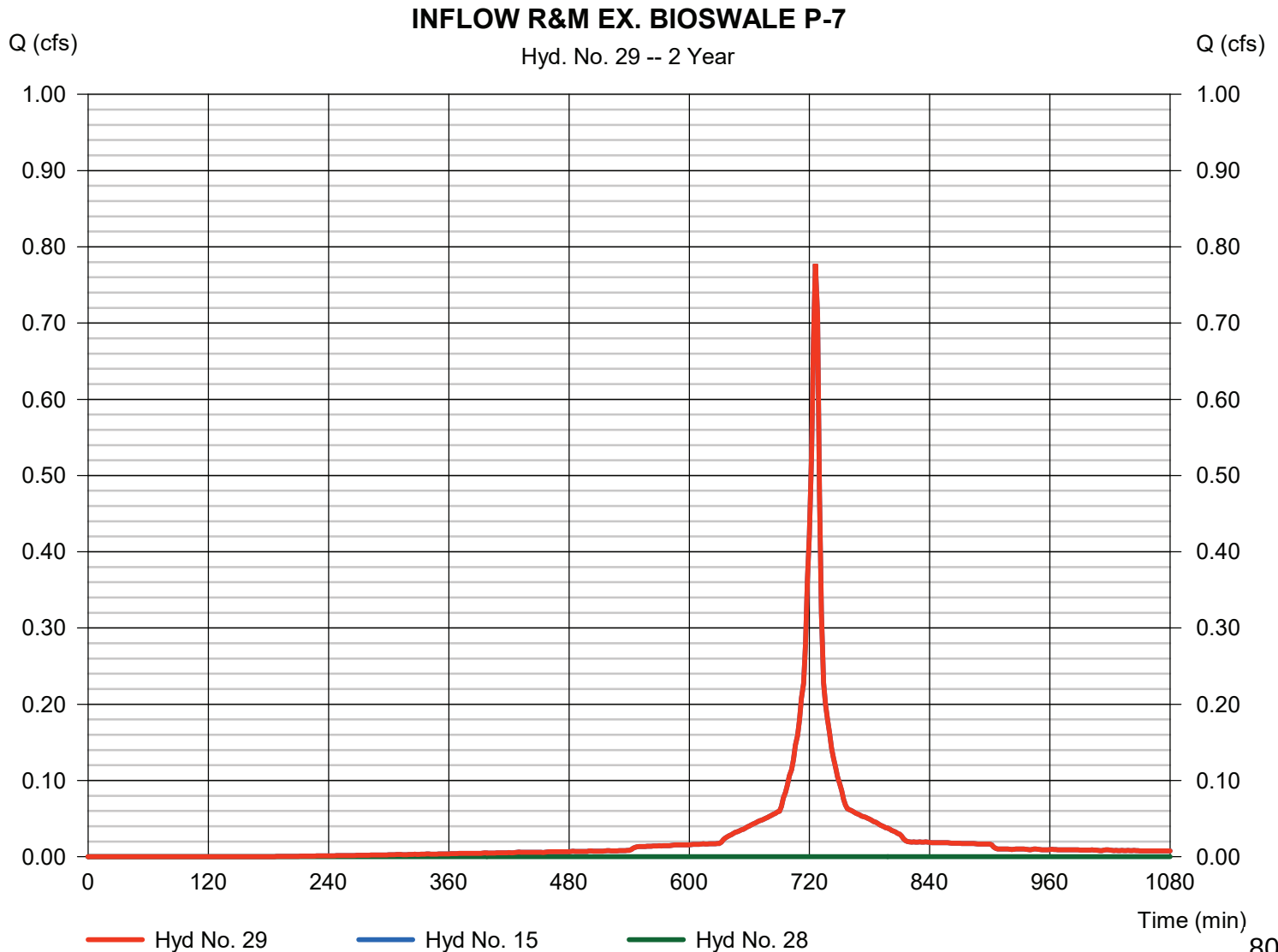
Friday, 06 / 28 / 2019

Hyd. No. 29

INFLOW R&M EX. BIOSWALE P-7

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 15, 28

Peak discharge = 0.777 cfs
 Time to peak = 726 min
 Hyd. volume = 0.039 acft
 Contrib. drain. area = 0.200 ac



Hydrograph Report

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

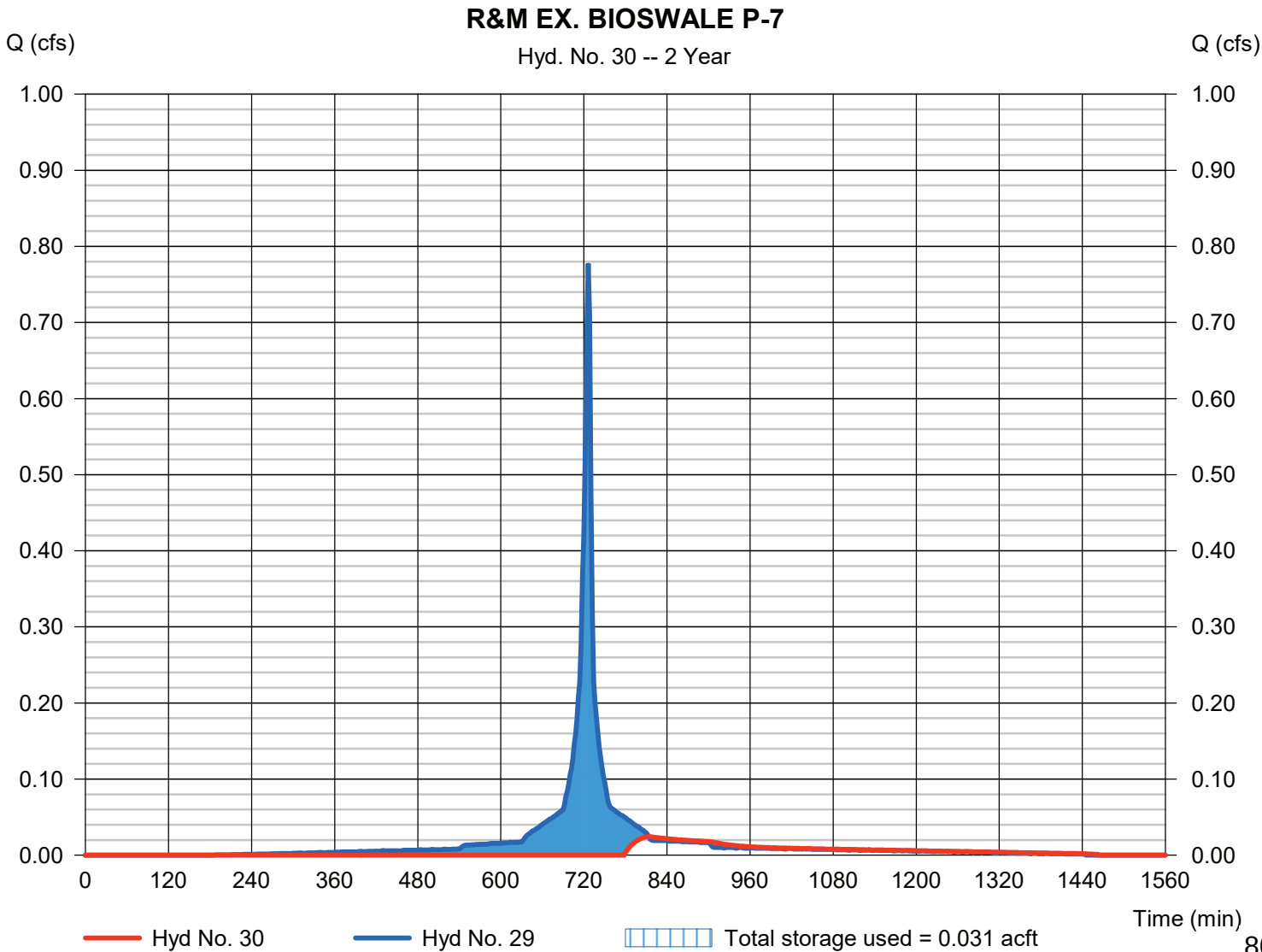
Friday, 06 / 28 / 2019

Hyd. No. 30

R&M EX. BIOSWALE P-7

Hydrograph type	= Reservoir	Peak discharge	= 0.024 cfs
Storm frequency	= 2 yrs	Time to peak	= 814 min
Time interval	= 2 min	Hyd. volume	= 0.008 acft
Inflow hyd. No.	= 29 - INFLOW R&M EX. BIOSWALE P-7	Max. Elevation	= 845.35 ft
Reservoir name	= Ex. Bioswale P-7	Max. Storage	= 0.031 acft

Storage Indication method used.



Hydrograph Report

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

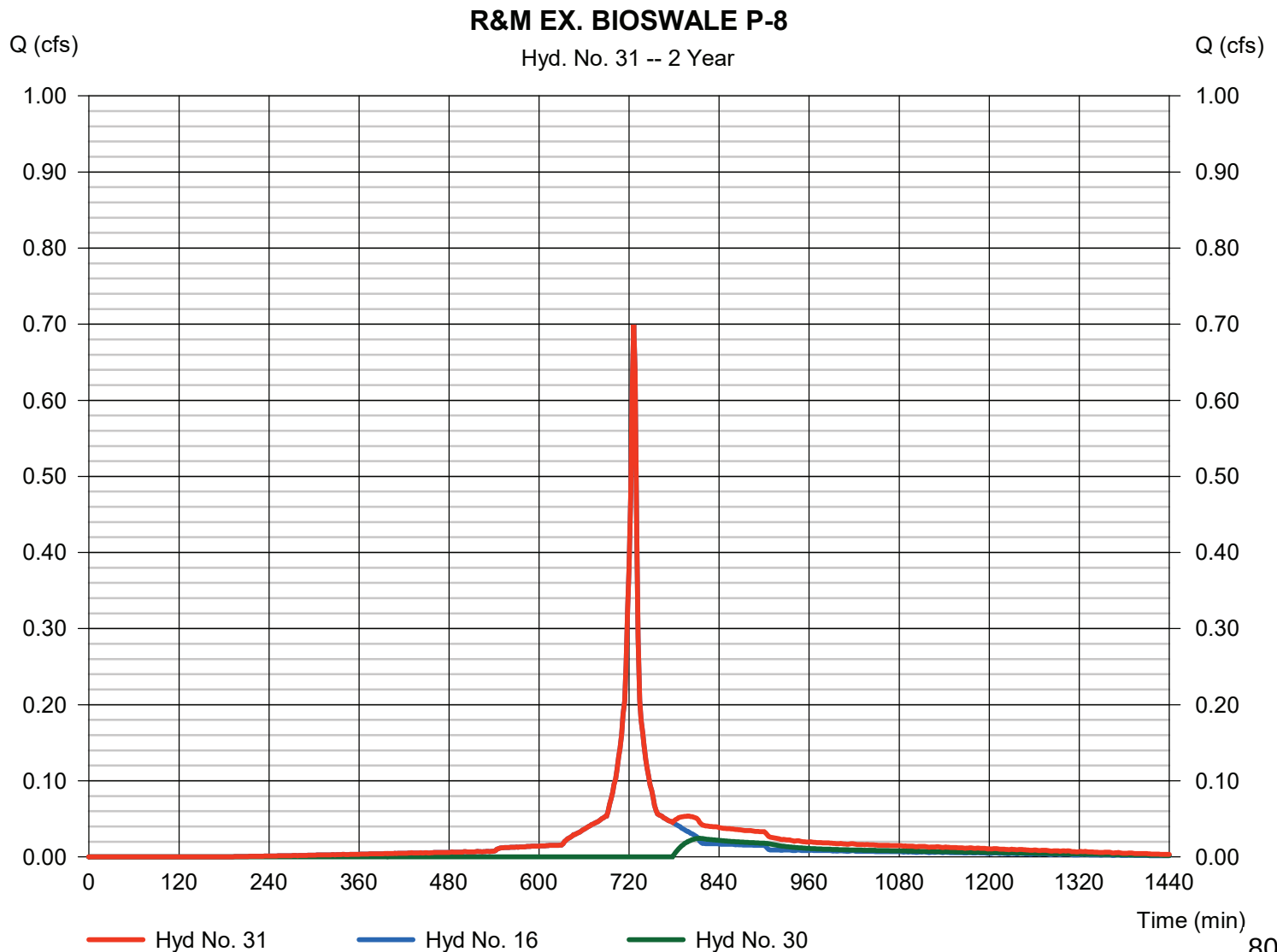
Friday, 06 / 28 / 2019

Hyd. No. 31

R&M EX. BIOSWALE P-8

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 16, 30

Peak discharge = 0.700 cfs
Time to peak = 726 min
Hyd. volume = 0.043 acft
Contrib. drain. area = 0.180 ac



803

Hydrograph Report

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

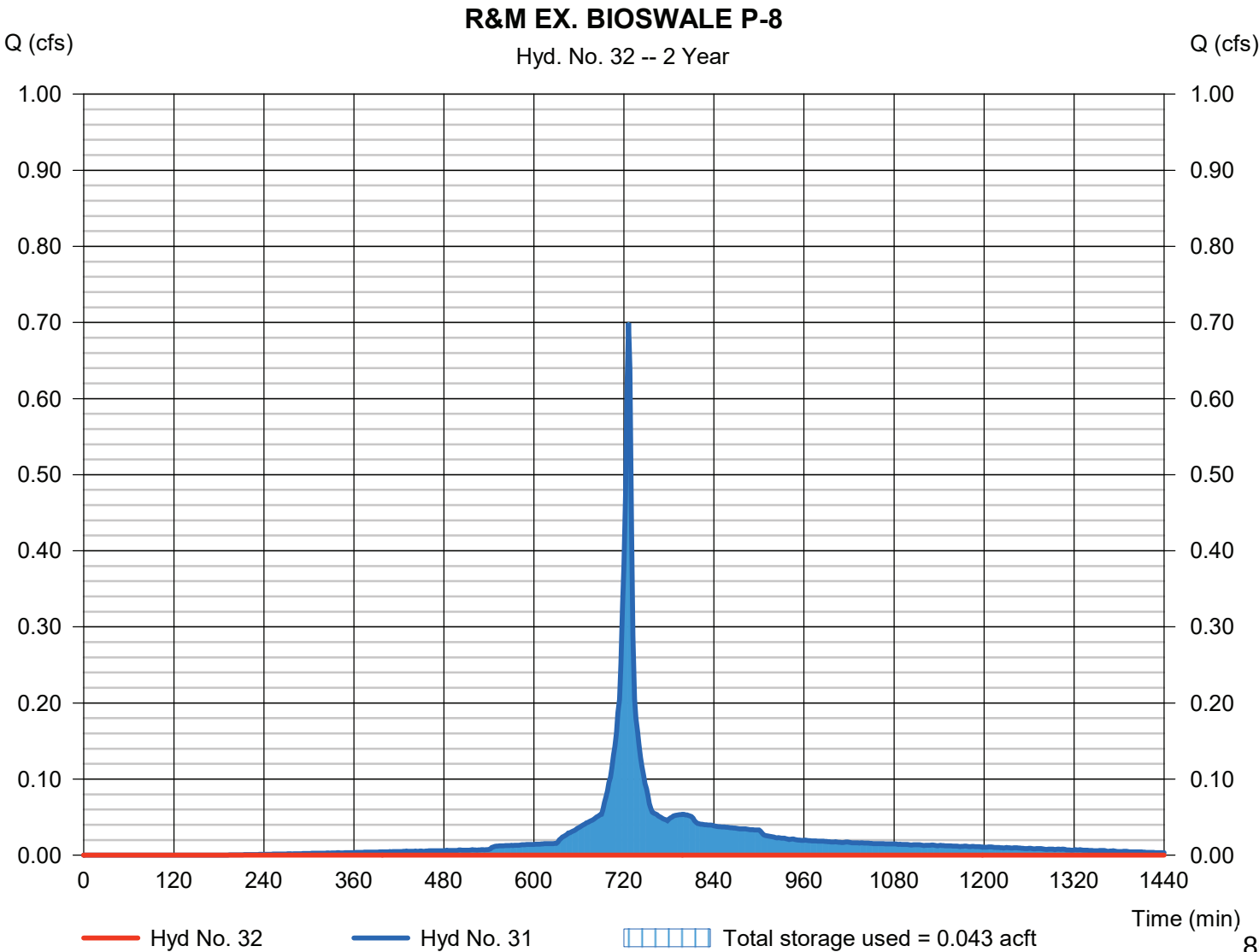
Friday, 06 / 28 / 2019

Hyd. No. 32

R&M EX. BIOSWALE P-8

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 31 - R&M EX. BIOSWALE P-8	Max. Elevation	= 844.49 ft
Reservoir name	= Ex. Bioswale P-8	Max. Storage	= 0.043 acft

Storage Indication method used.



Hydrograph Report

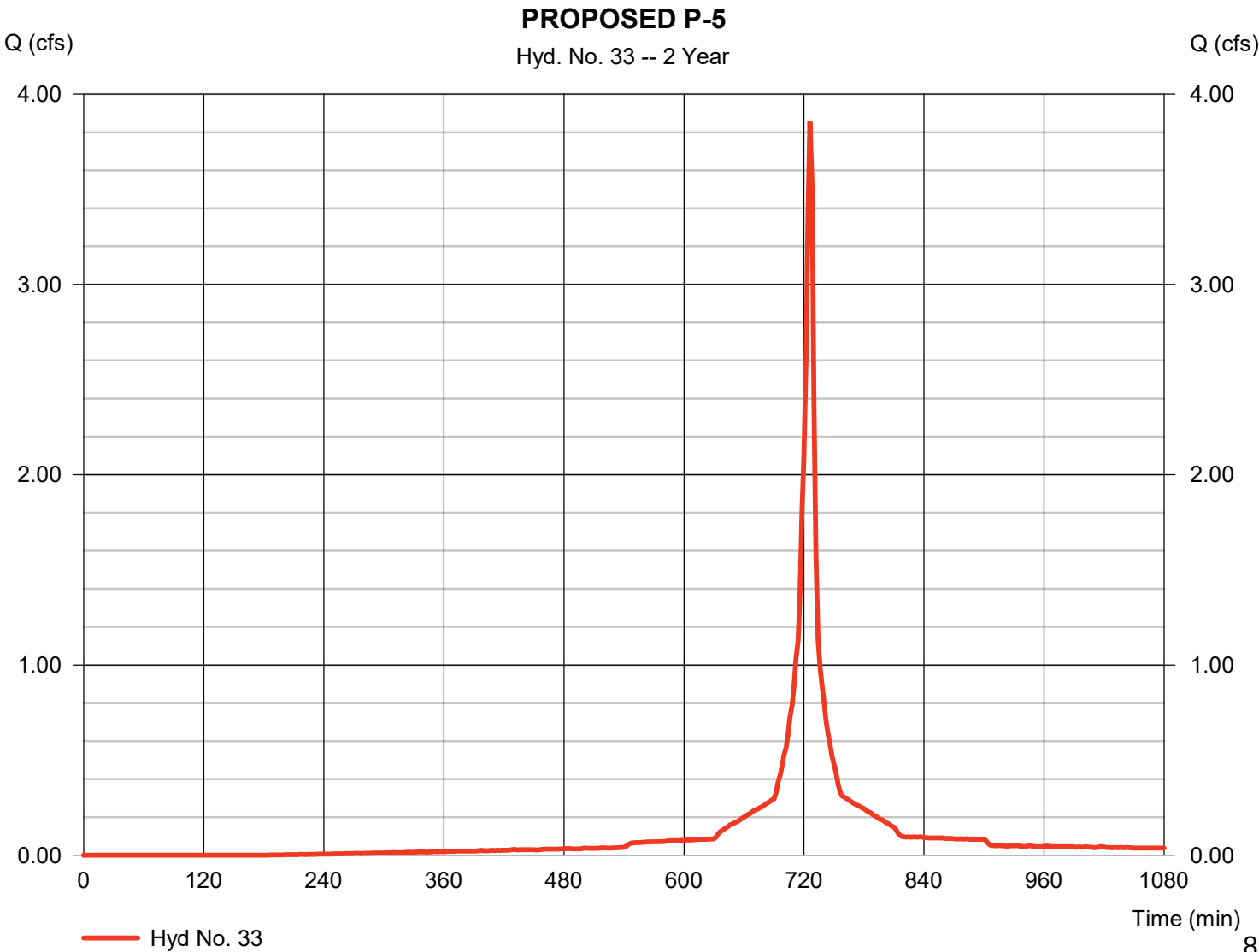
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 3.855 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.191 acft
Drainage area	= 0.992 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

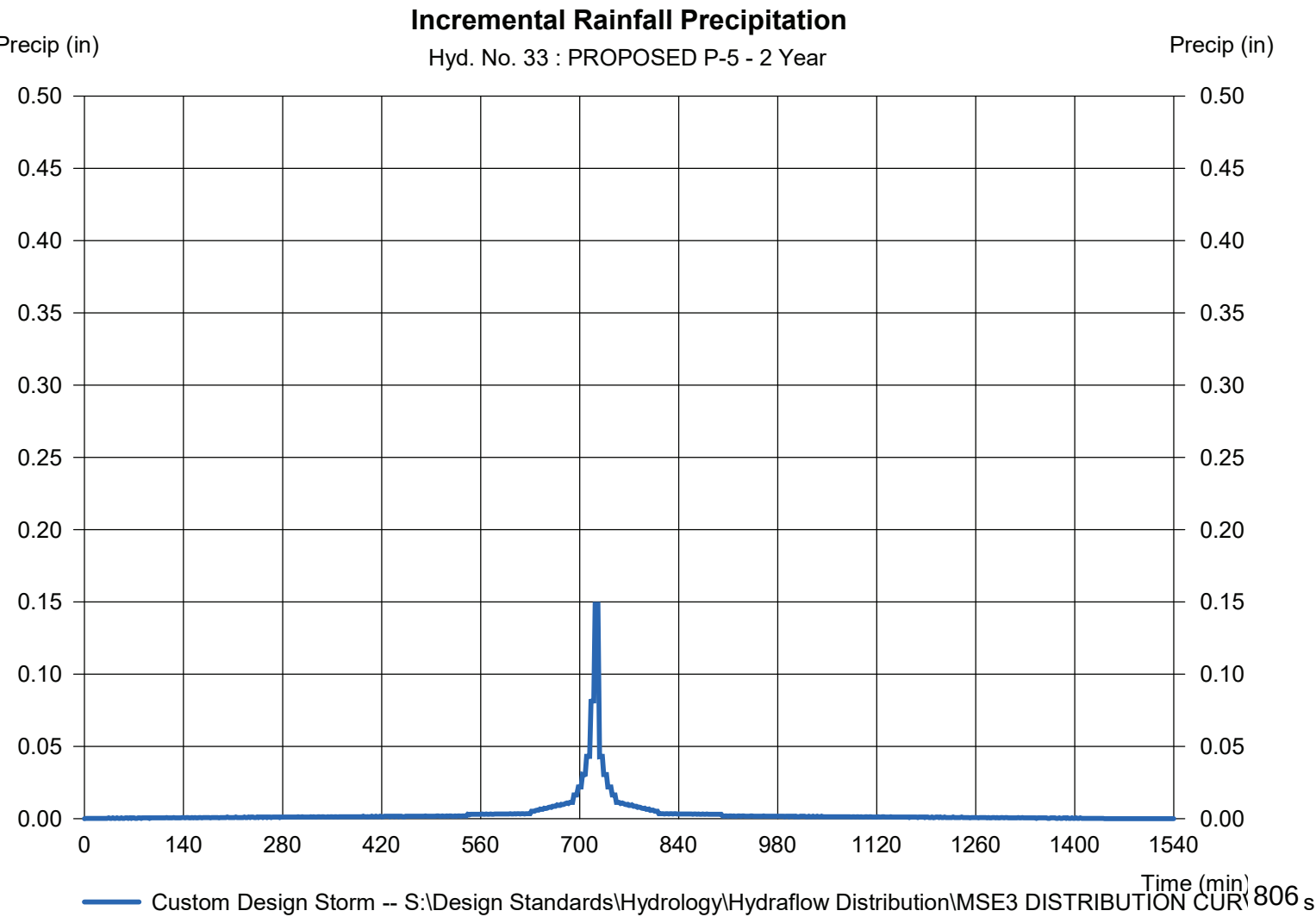
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

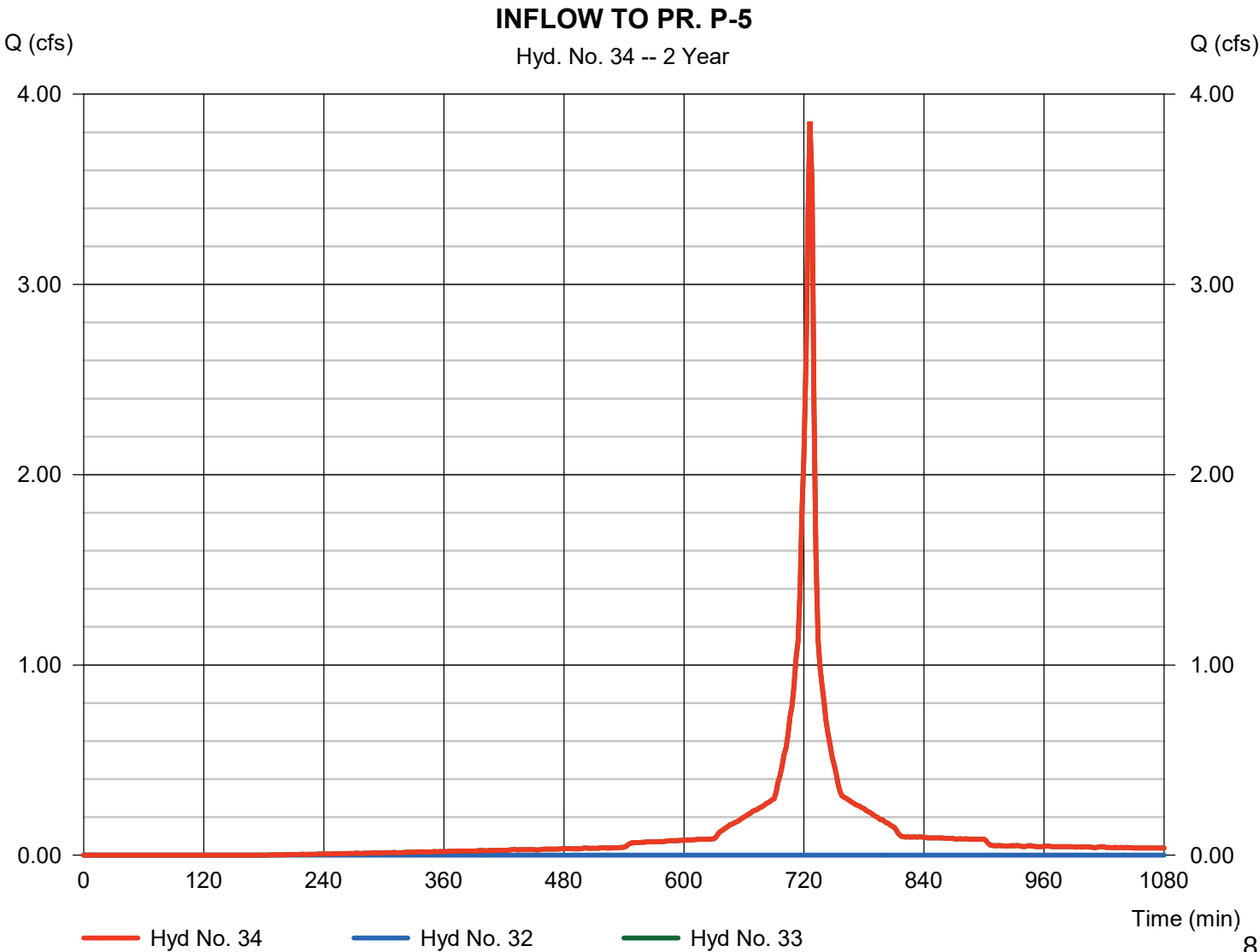
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 34

INFLOW TO PR. P-5

Hydrograph type	= Combine	Peak discharge	= 3.855 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.191 acft
Inflow hyds.	= 32, 33	Contrib. drain. area	= 0.992 ac



Hydrograph Report

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

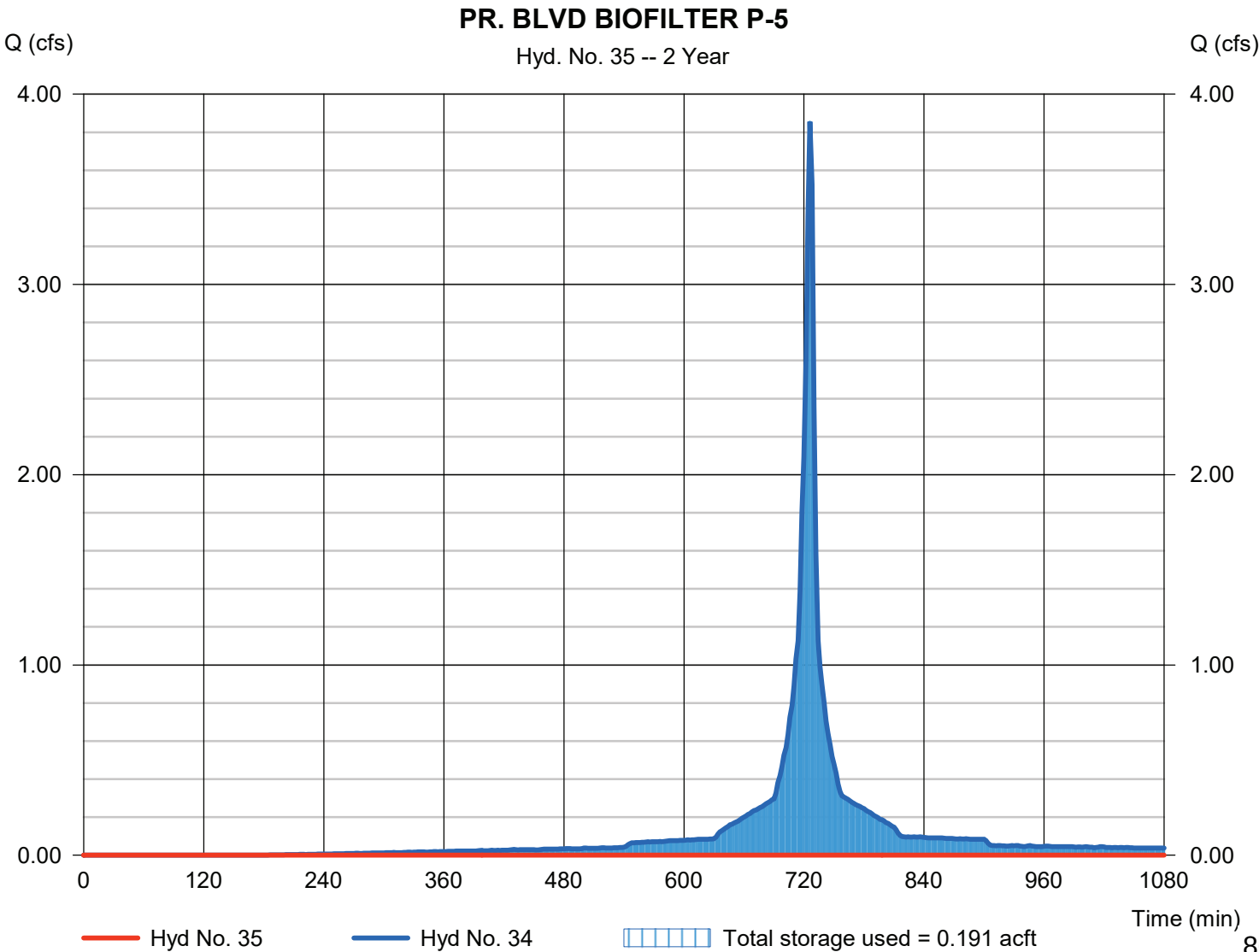
Friday, 06 / 28 / 2019

Hyd. No. 35

PR. BLVD BIOFILTER P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 34 - INFLOW TO PR. P-5	Max. Elevation	= 842.71 ft
Reservoir name	= BLVD BIOFILTER P-5	Max. Storage	= 0.191 acft

Storage Indication method used.



Hydrograph Report

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

Friday, 06 / 28 / 2019

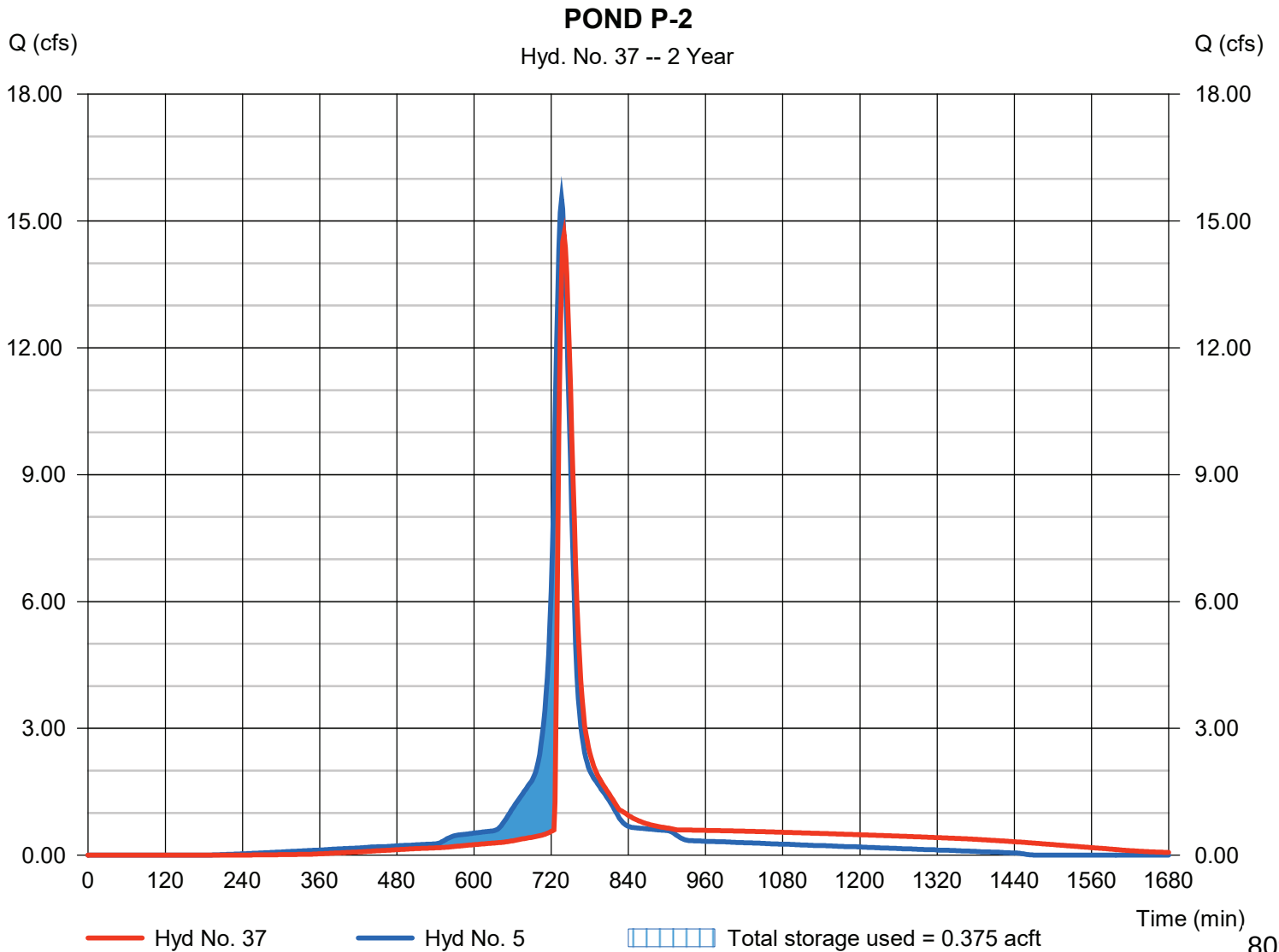
Hyd. No. 37

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyd. No. = 5 - P-2
 Reservoir name = POND P-2

Peak discharge = 14.69 cfs
 Time to peak = 740 min
 Hyd. volume = 1.327 acft
 Max. Elevation = 839.74 ft
 Max. Storage = 0.375 acft

Storage Indication method used.



Hydrograph Report

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

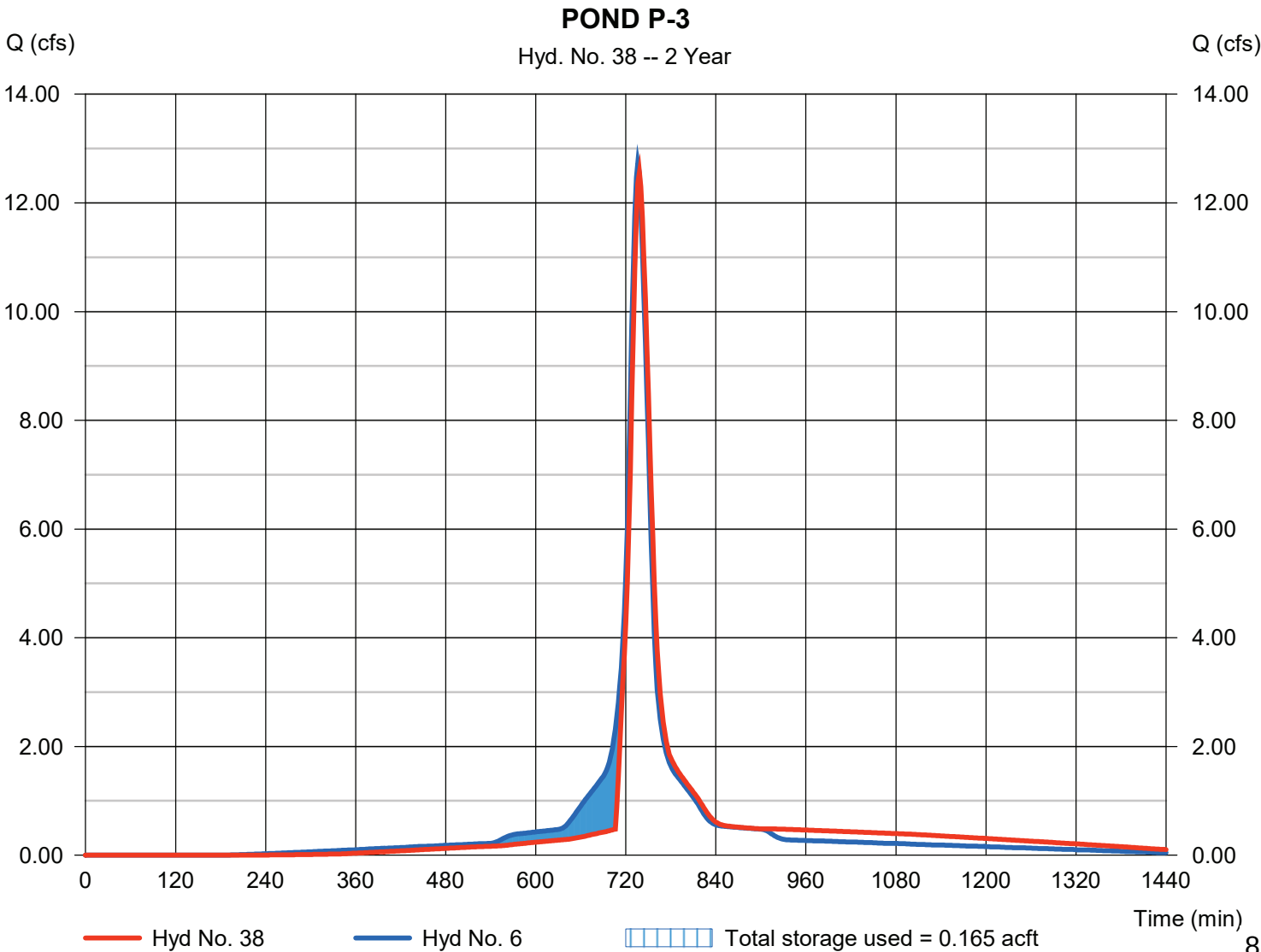
Friday, 06 / 28 / 2019

Hyd. No. 38

POND P-3

Hydrograph type	= Reservoir	Peak discharge	= 12.56 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 1.089 acft
Inflow hyd. No.	= 6 - P-3	Max. Elevation	= 839.94 ft
Reservoir name	= POND P-3	Max. Storage	= 0.165 acft

Storage Indication method used.



Hydrograph Report

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

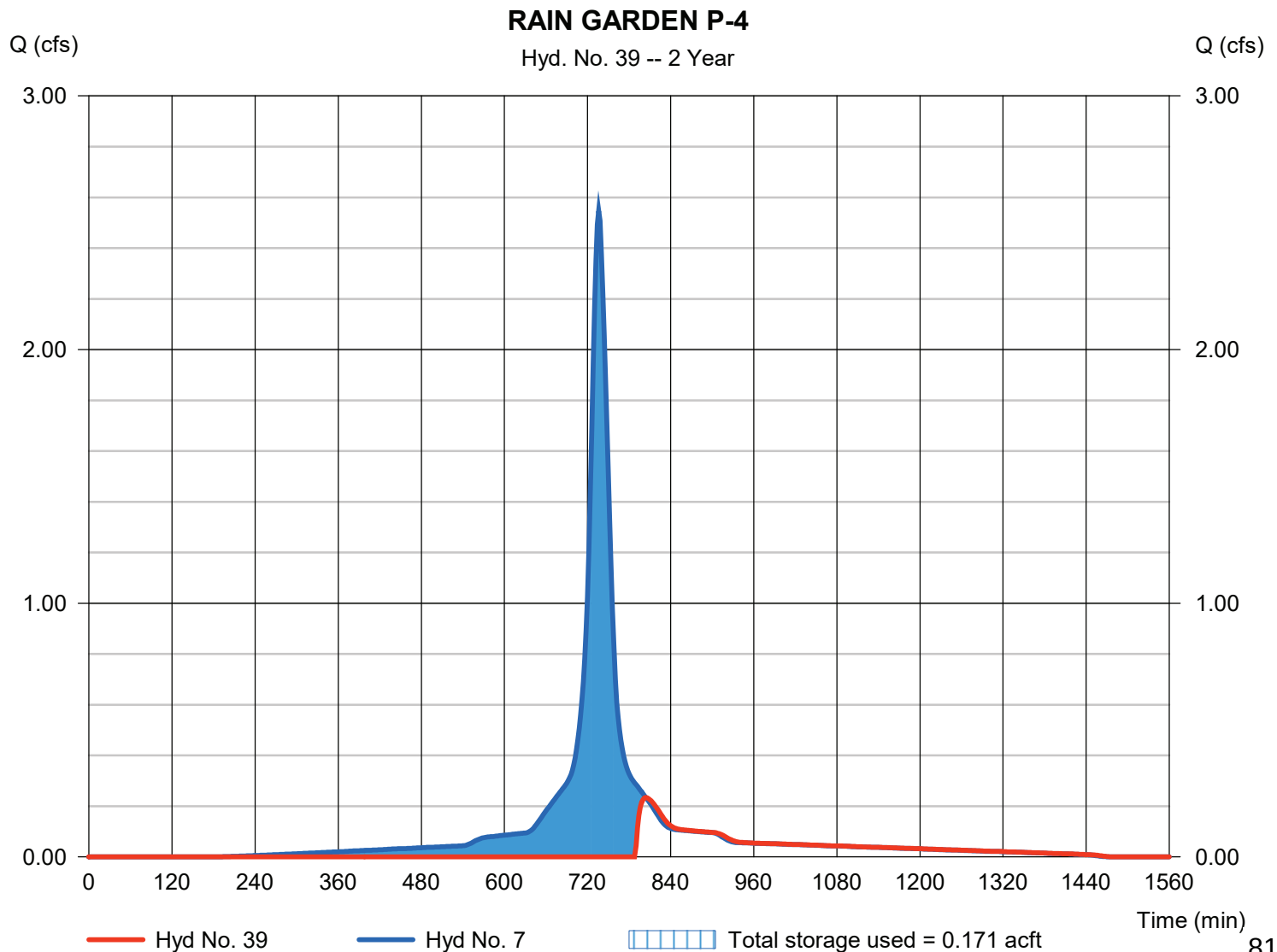
Friday, 06 / 28 / 2019

Hyd. No. 39

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.234 cfs
Storm frequency	= 2 yrs	Time to peak	= 804 min
Time interval	= 2 min	Hyd. volume	= 0.049 acft
Inflow hyd. No.	= 7 - P-4	Max. Elevation	= 840.71 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 0.171 acft

Storage Indication method used.



Hydrograph Report

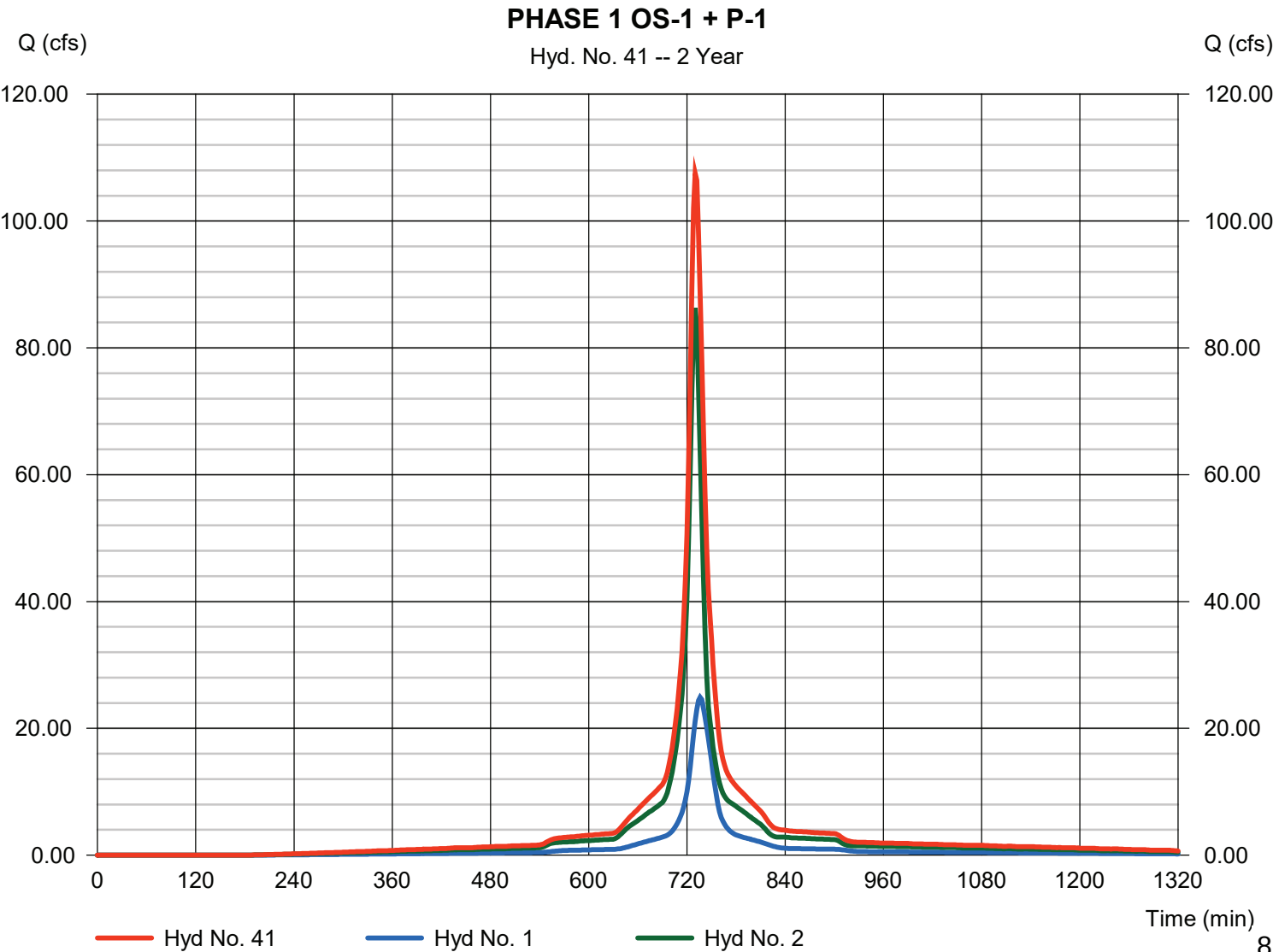
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 41

PHASE 1 OS-1 + P-1

Hydrograph type	= Combine	Peak discharge	= 107.50 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 7.834 acft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 37.042 ac



Hydrograph Report

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

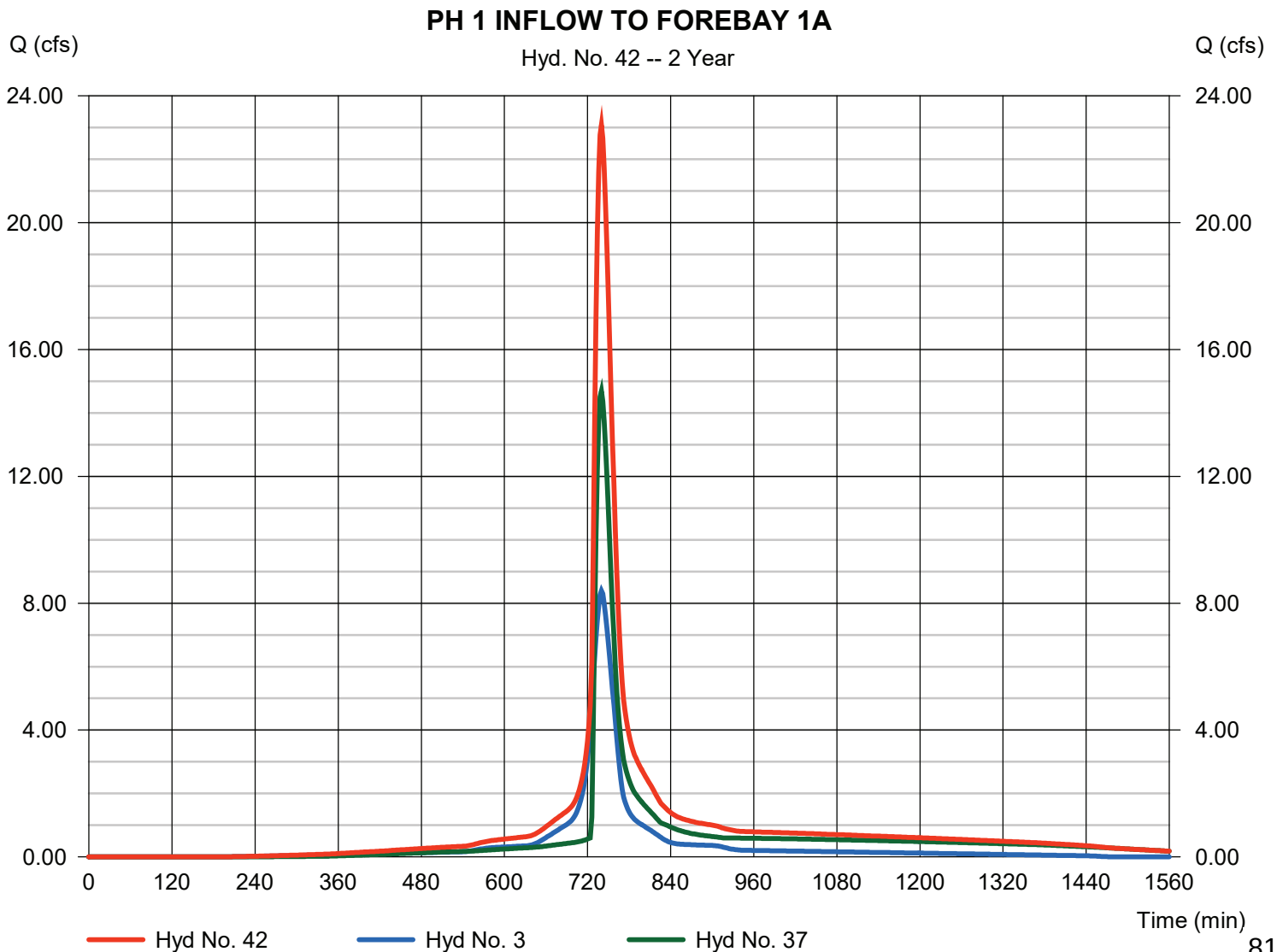
Friday, 06 / 28 / 2019

Hyd. No. 42

PH 1 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 3, 37

Peak discharge = 23.08 cfs
Time to peak = 740 min
Hyd. volume = 2.140 acft
Contrib. drain. area = 3.947 ac



Hydrograph Report

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

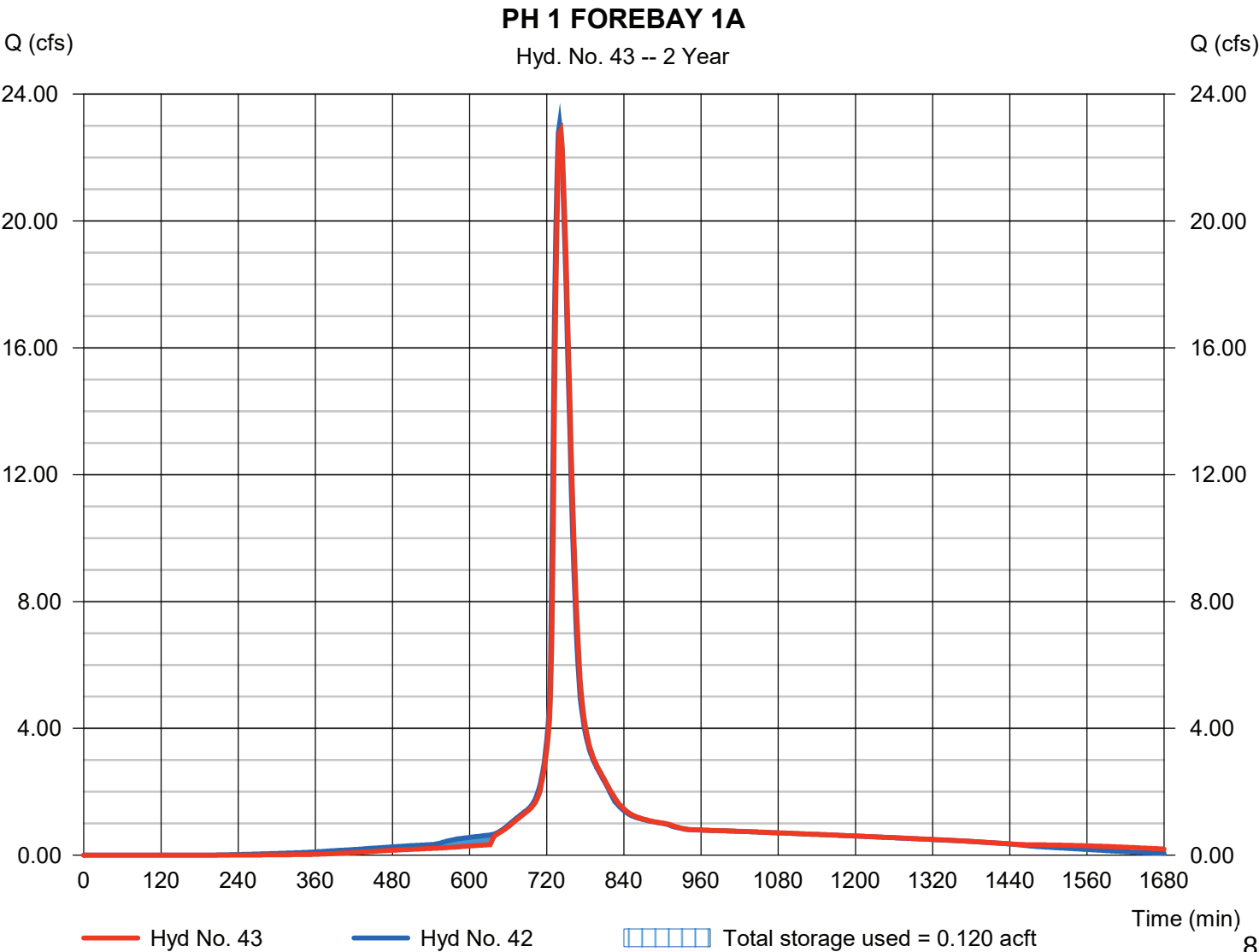
Friday, 06 / 28 / 2019

Hyd. No. 43

PH 1 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 22.86 cfs
Storm frequency	= 2 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 2.139 acft
Inflow hyd. No.	= 42 - PH 1 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.37 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 0.120 acft

Storage Indication method used.



Hydrograph Report

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

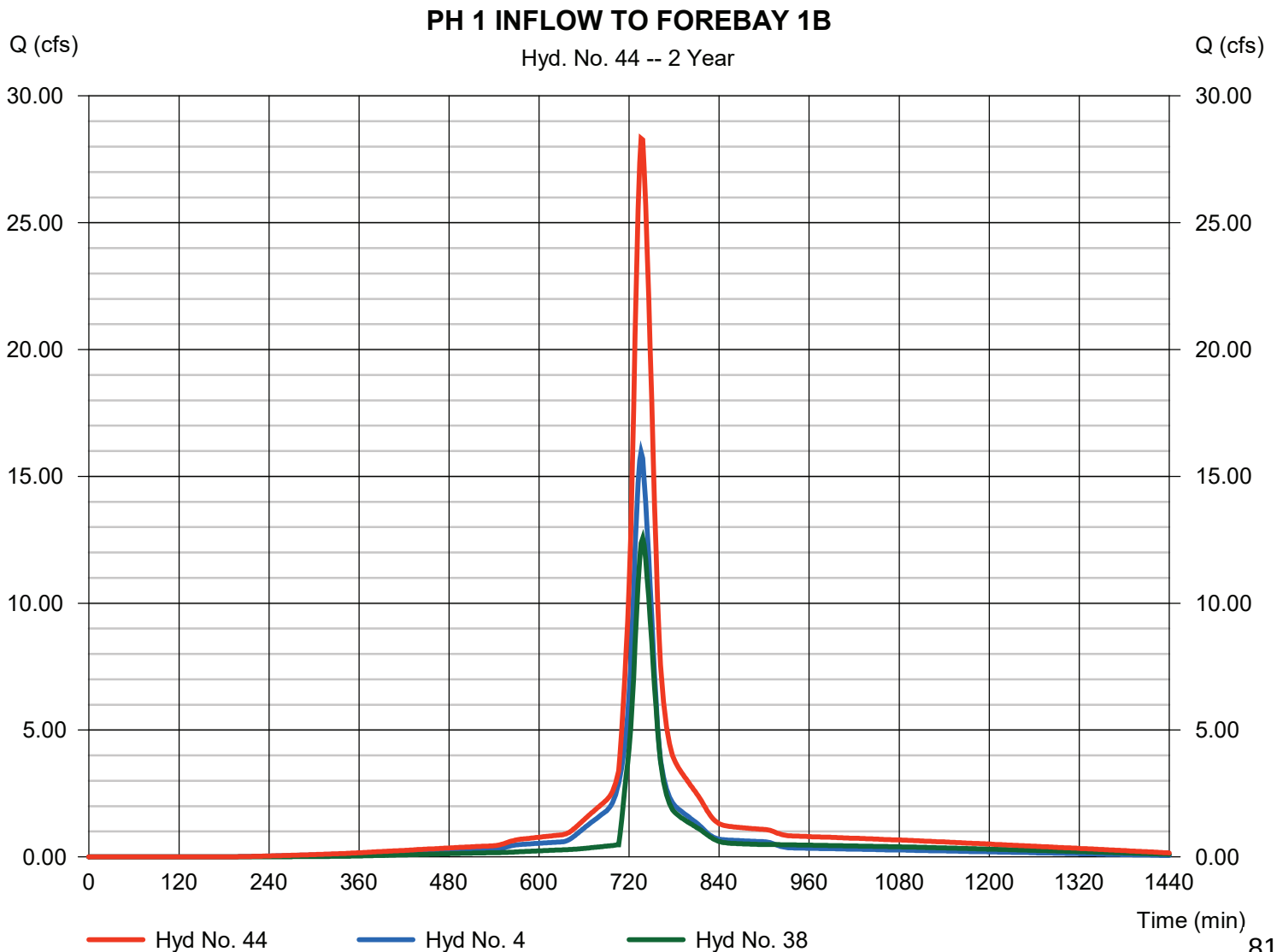
Friday, 06 / 28 / 2019

Hyd. No. 44

PH 1 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 4, 38

Peak discharge = 28.32 cfs
Time to peak = 736 min
Hyd. volume = 2.454 acft
Contrib. drain. area = 6.516 ac



Hydrograph Report

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

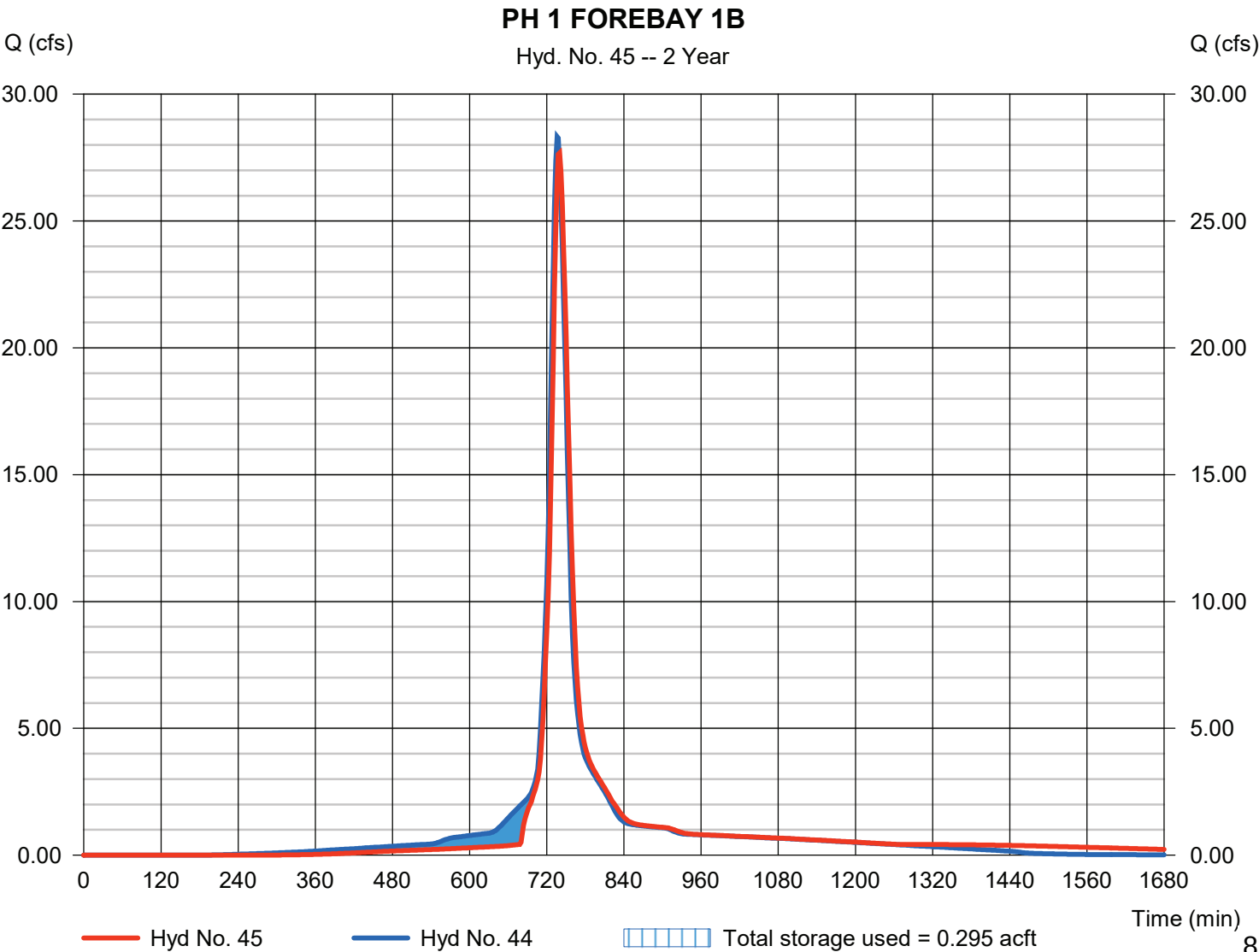
Friday, 06 / 28 / 2019

Hyd. No. 45

PH 1 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 27.69 cfs
Storm frequency	= 2 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 2.453 acft
Inflow hyd. No.	= 44 - PH 1 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.35 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 0.295 acft

Storage Indication method used.



Hydrograph Report

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

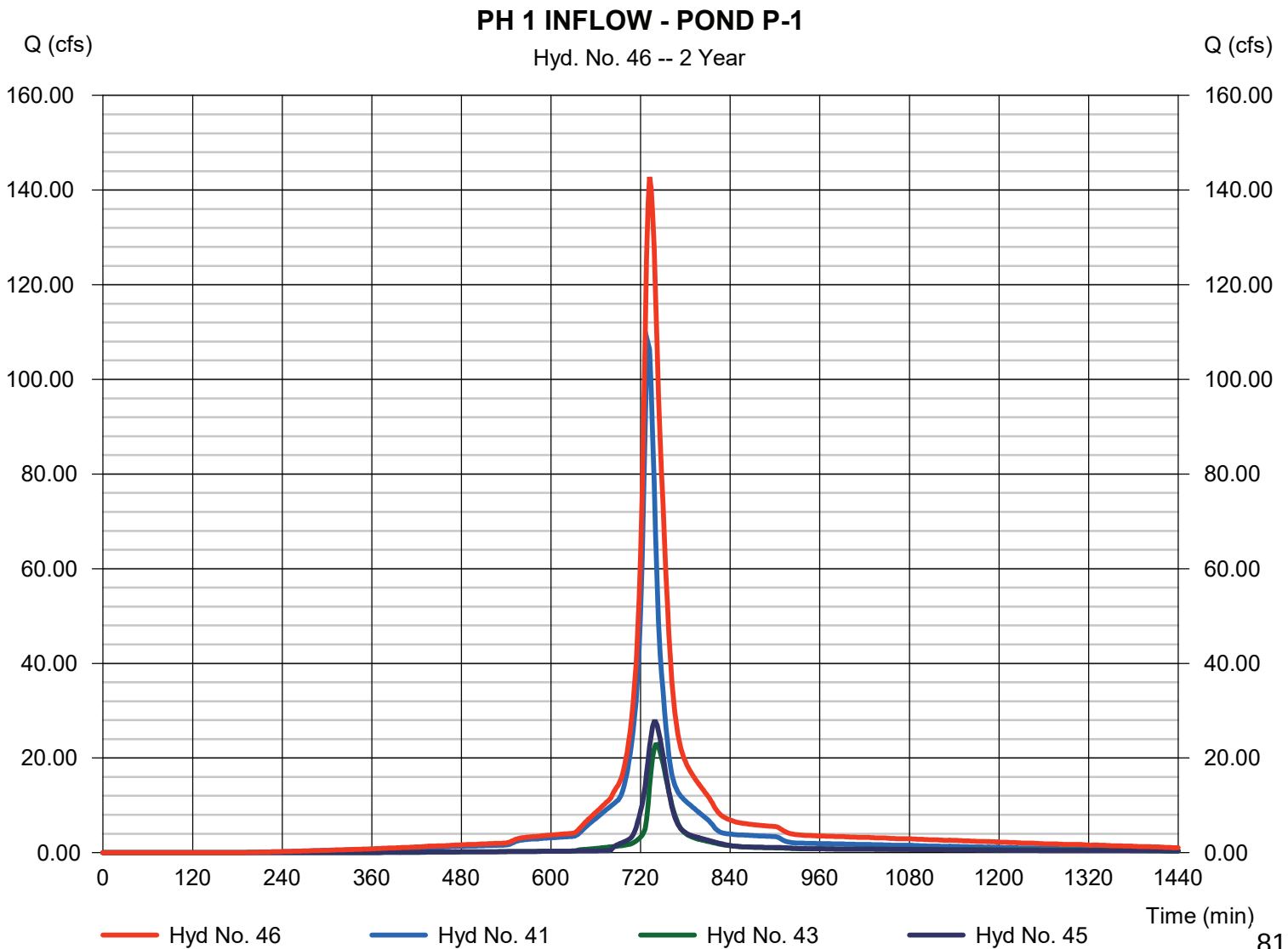
Friday, 06 / 28 / 2019

Hyd. No. 46

PH 1 INFLOW - POND P-1

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 41, 43, 45

Peak discharge = 142.78 cfs
Time to peak = 732 min
Hyd. volume = 12.426 acft
Contrib. drain. area = 0.000 ac



Hydrograph Report

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

Friday, 06 / 28 / 2019

Hyd. No. 47

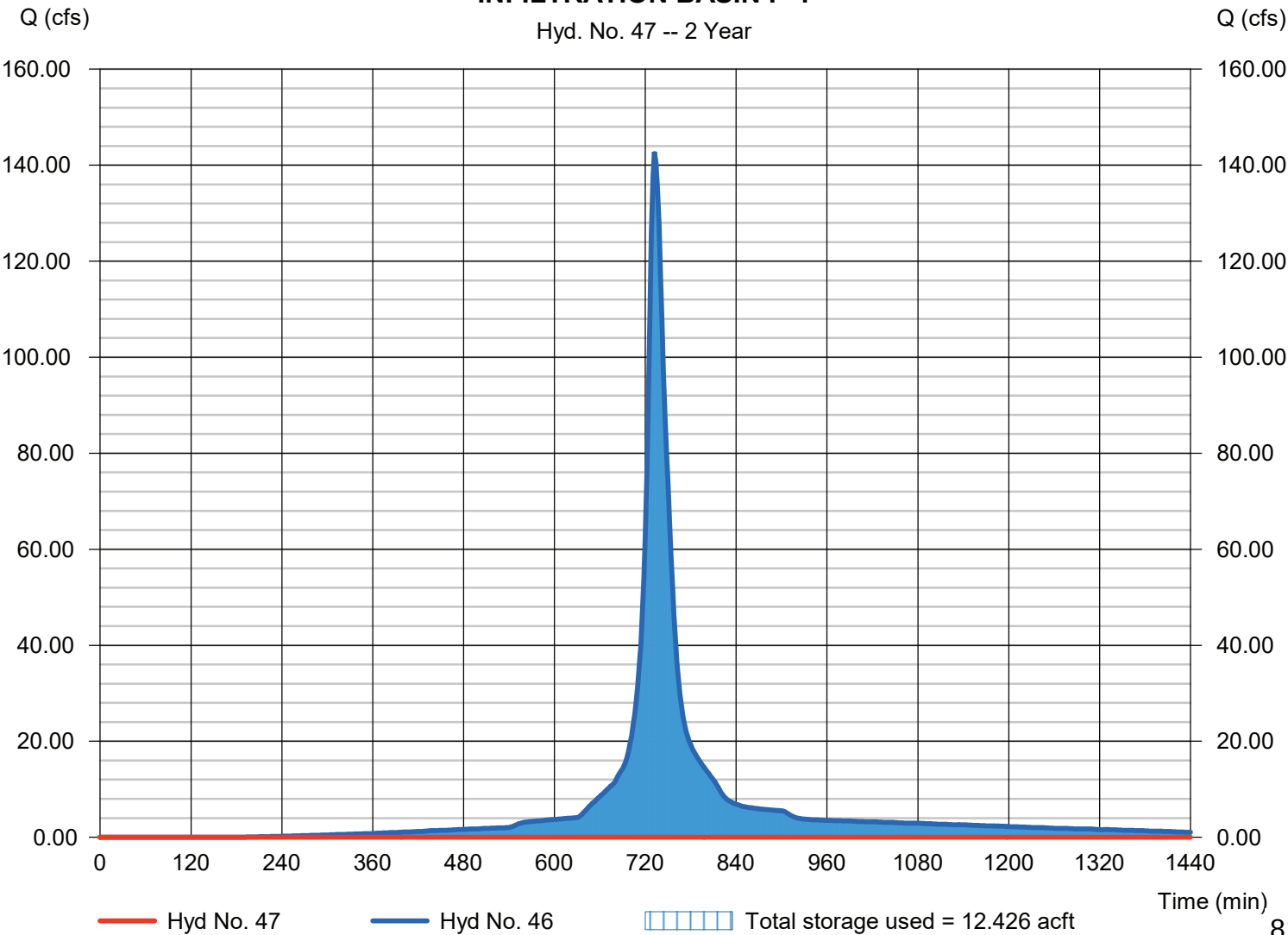
INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 46 - PH 1 INFLOW - POND P-1	Max. Elevation	= 836.35 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 1	Max. Storage	= 12.426 acft

Storage Indication method used.

INFILTRATION BASIN P-1

Hyd. No. 47 -- 2 Year



Hydrograph Report

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

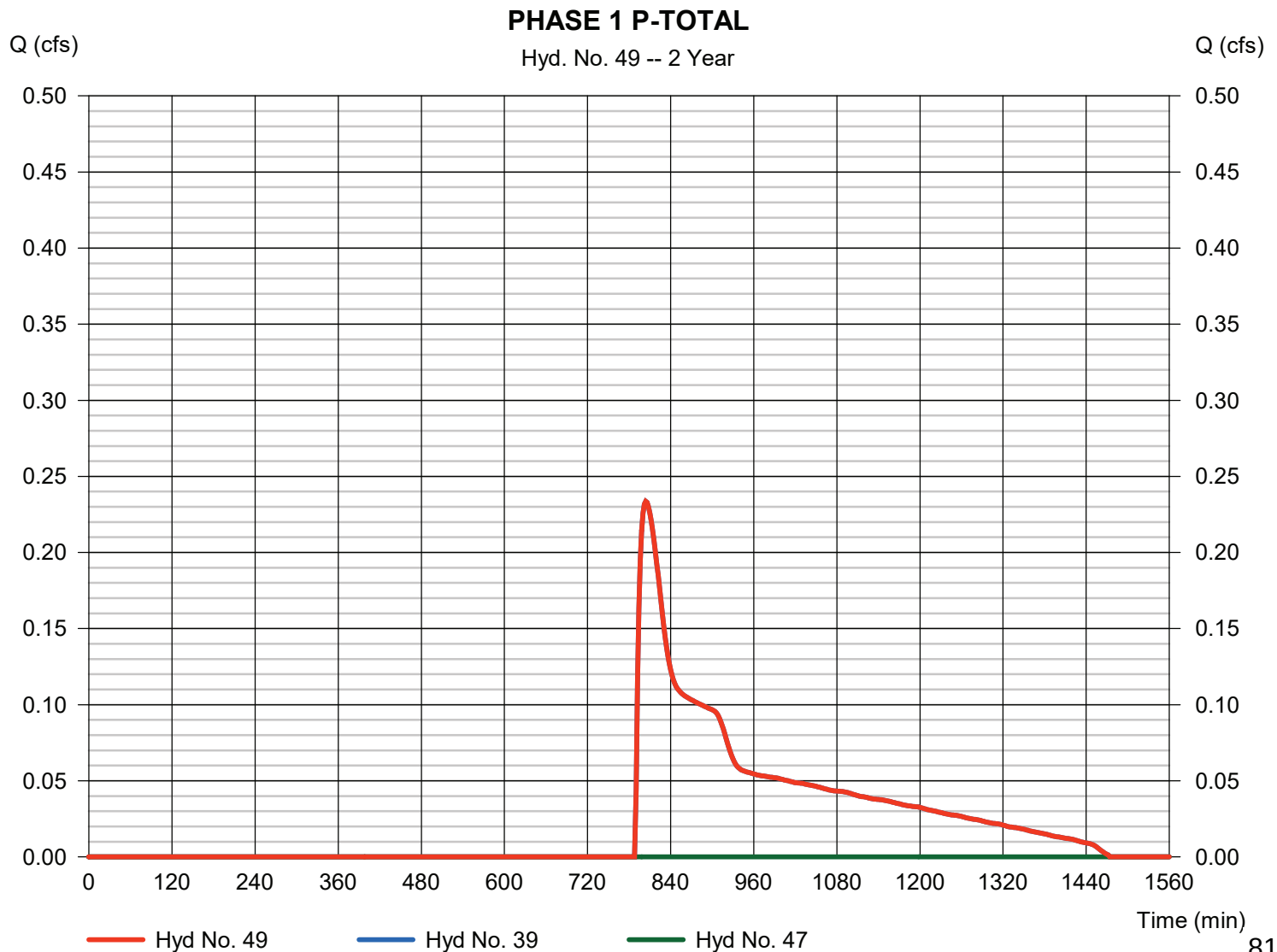
Friday, 06 / 28 / 2019

Hyd. No. 49

PHASE 1 P-TOTAL

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 39, 47

Peak discharge = 0.234 cfs
Time to peak = 804 min
Hyd. volume = 0.049 acft
Contrib. drain. area = 0.000 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	35.47	2	736	3.084	-----	-----	-----	P-OS-1-PH 1
2	SCS Runoff	122.85	2	730	8.257	-----	-----	-----	P-1-PH 1
3	SCS Runoff	11.96	2	740	1.176	-----	-----	-----	P-1A-PH1
4	SCS Runoff	22.72	2	736	1.976	-----	-----	-----	P-1B-PH1
5	SCS Runoff	22.11	2	736	1.923	-----	-----	-----	P-2
6	SCS Runoff	18.13	2	736	1.577	-----	-----	-----	P-3
7	SCS Runoff	3.627	2	736	0.315	-----	-----	-----	P-4
9	SCS Runoff	0.663	2	726	0.034	-----	-----	-----	R&M EX. P-1
10	SCS Runoff	1.050	2	726	0.053	-----	-----	-----	R&M EX. P-2
11	SCS Runoff	0.553	2	726	0.028	-----	-----	-----	R&M EX. P-3
12	SCS Runoff	0.608	2	726	0.031	-----	-----	-----	R&M EX. P-4
13	SCS Runoff	0.774	2	726	0.039	-----	-----	-----	R&M EX. P-5
14	SCS Runoff	1.105	2	726	0.056	-----	-----	-----	R&M EX. P-6
15	SCS Runoff	1.105	2	726	0.056	-----	-----	-----	R&M EX. P-7
16	SCS Runoff	0.995	2	726	0.050	-----	-----	-----	R&M EX. P-8
17	SCS Runoff	0.608	2	726	0.031	-----	-----	-----	R&M EX. P-9
18	Reservoir	0.184	2	734	0.017	9	851.73	0.020	R&M EX. BIOSWALE P-1
19	Combine	1.053	2	726	0.071	10, 18	-----	-----	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	0.888	2	730	0.049	19	851.56	0.027	R&M EX. BIOSWALE P-2
21	Combine	1.291	2	728	0.077	11, 20	-----	-----	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	0.303	2	756	0.046	21	851.16	0.036	R&M EX. BIOSWALE P-3
23	Combine	0.608	2	726	0.077	12, 22	-----	-----	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	0.185	2	798	0.043	23	850.30	0.038	R&M EX. BIOSWALE P-4
25	Combine	0.774	2	726	0.082	13, 24	-----	-----	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	0.203	2	810	0.053	25	848.82	0.033	R&M EX. BIOSWALE P-5
27	Combine	1.105	2	726	0.109	14, 26	-----	-----	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	0.209	2	824	0.064	27	847.76	0.050	R&M EX. BIOSWALE P-6
29	Combine	1.105	2	726	0.120	15, 28	-----	-----	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	0.261	2	738	0.089	29	845.49	0.035	R&M EX. BIOSWALE P-7
31	Combine	0.995	2	726	0.140	16, 30	-----	-----	R&M EX. BIOSWALE P-8
32	Reservoir	0.235	2	854	0.086	31	844.97	0.061	R&M EX. BIOSWALE P-8
33	SCS Runoff	5.483	2	726	0.277	-----	-----	-----	PROPOSED P-5
34	Combine	5.483	2	726	0.363	32, 33	-----	-----	INFLOW TO PR. P-5
2019-06-27_CHAPMAN FARMS_PHASE I_Floodmg					Return Period: 10 Year			Friday, 06 / 28 / 2019	

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
35	Reservoir	0.000	2	n/a	0.000	34	843.50	0.363	PR. BLVD BIOFILTER P-5
37	Reservoir	20.57	2	740	1.922	5	839.94	0.410	POND P-2
38	Reservoir	17.33	2	740	1.576	6	840.10	0.184	POND P-3
39	Reservoir	2.208	2	750	0.146	7	840.82	0.184	RAIN GARDEN P-4
41	Combine	153.10	2	730	11.342	1, 2,	-----	-----	PHASE 1 OS-1 + P-1
42	Combine	32.53	2	740	3.098	3, 37,	-----	-----	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	32.38	2	742	3.098	42	835.52	0.136	PH 1 FOREBAY 1A
44	Combine	39.67	2	738	3.553	4, 38,	-----	-----	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	39.13	2	738	3.552	44	835.52	0.329	PH 1 FOREBAY 1B
46	Combine	209.43	2	732	17.991	41, 43, 45	-----	-----	PH 1 INFLOW - POND P-1
47	Reservoir	0.000	2	n/a	0.000	46	838.03	18.0	INFILTRATION BASIN P-1
49	Combine	2.208	2	750	0.146	39, 47,	-----	-----	PHASE 1 P-TOTAL
2019-06-27_CHAPMAN FARMS_PHASE I_Flood Hydro					Return Period: 10 Year			Friday, 06 / 28 / 2019	

Hydrograph Report

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

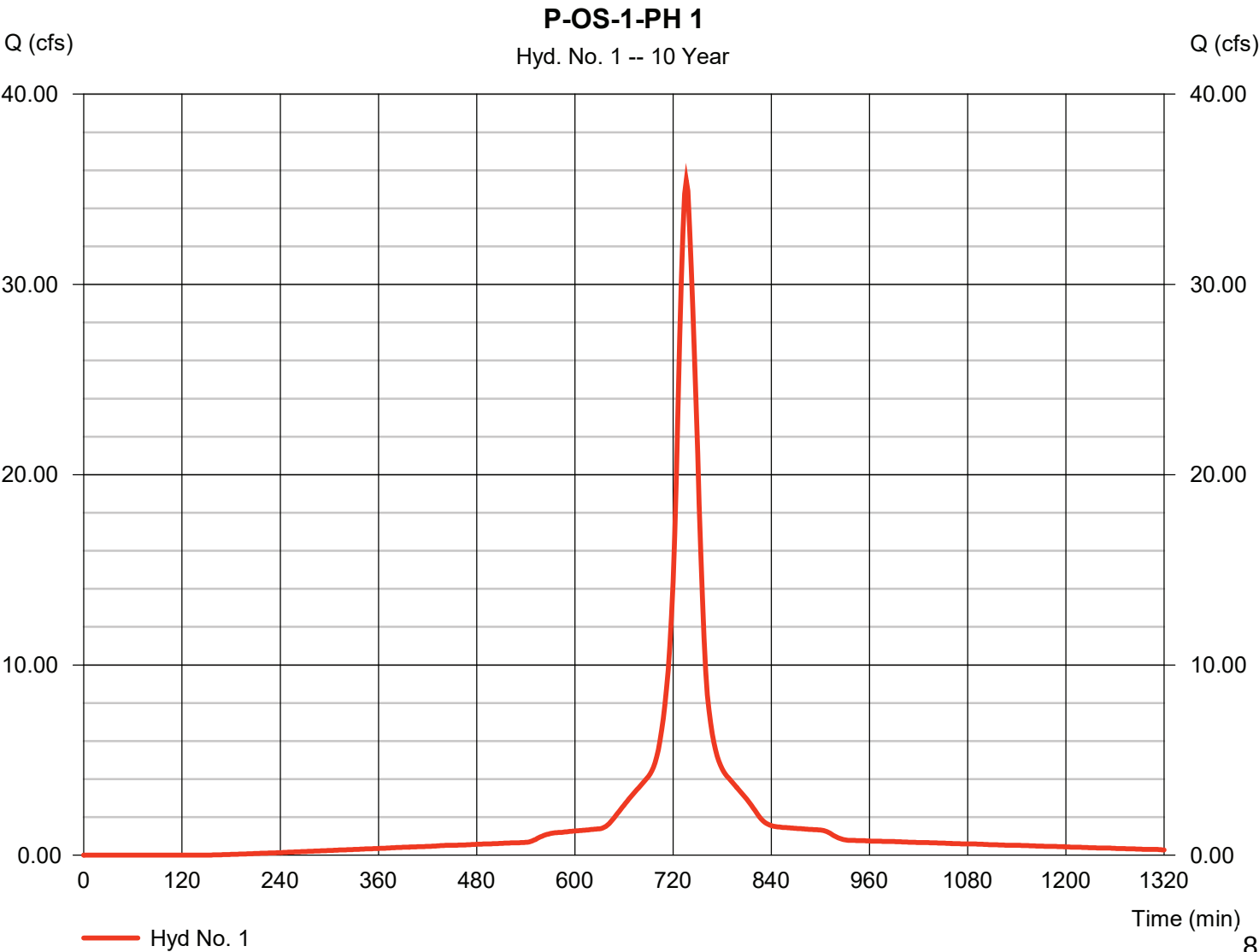
Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 35.47 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 3.084 acft
Drainage area	= 10.170 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.50 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSR3 DISTRIBUTION CU		

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

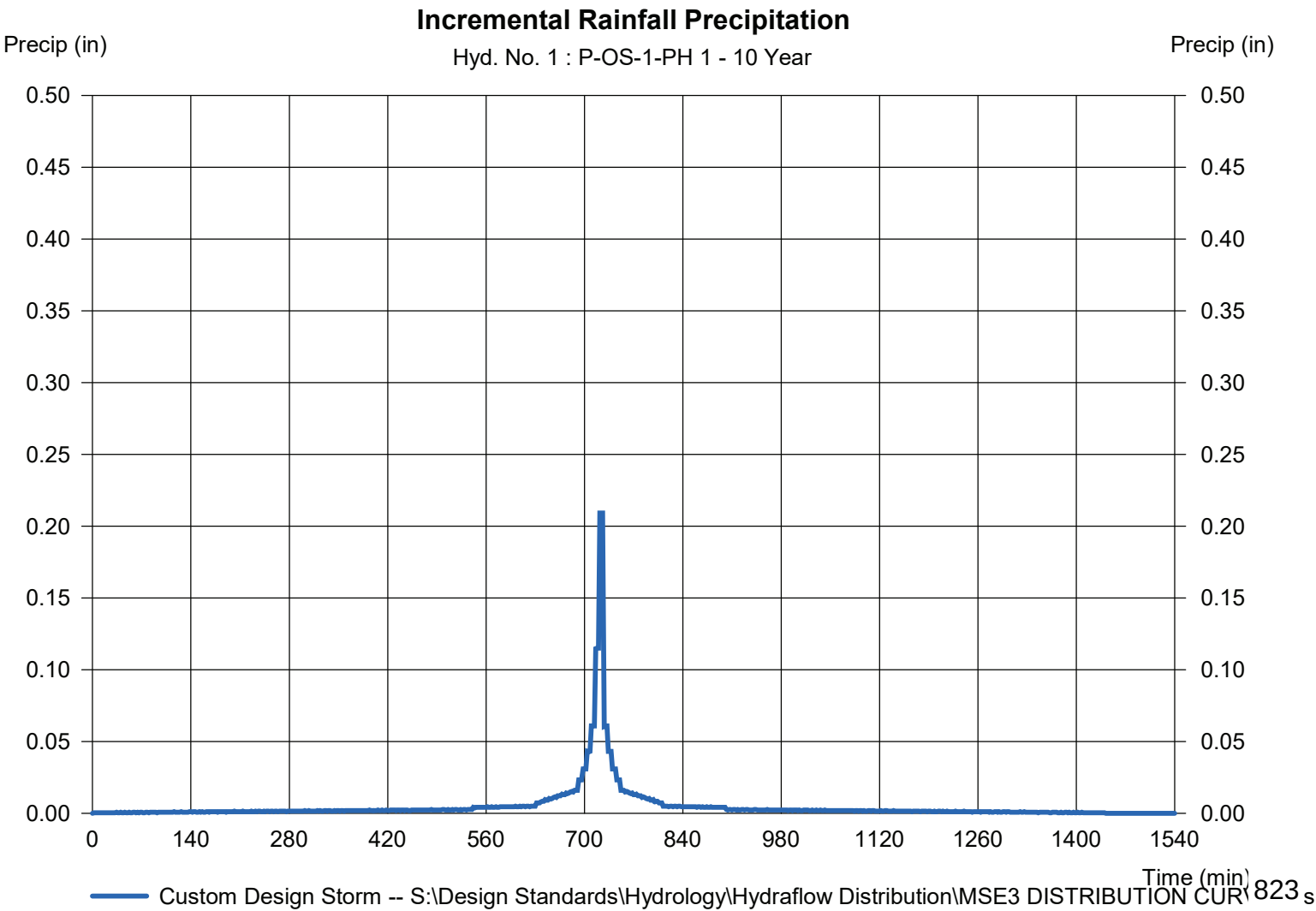
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

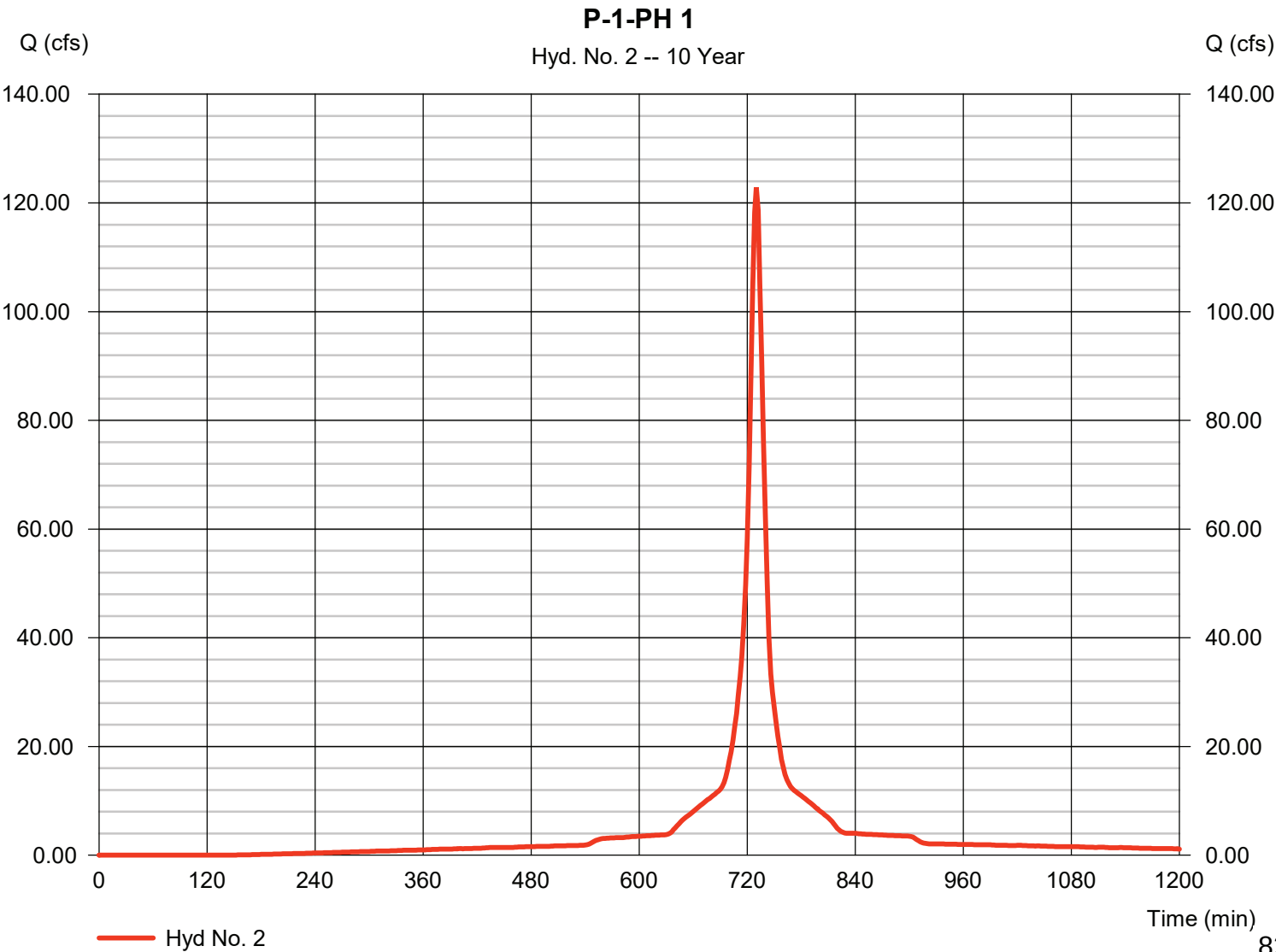
Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	122.85 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	8.257 acft
Drainage area	=	26.872 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.20 min
Total precip.	=	3.81 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CURVE			

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 26.872



Precipitation Report

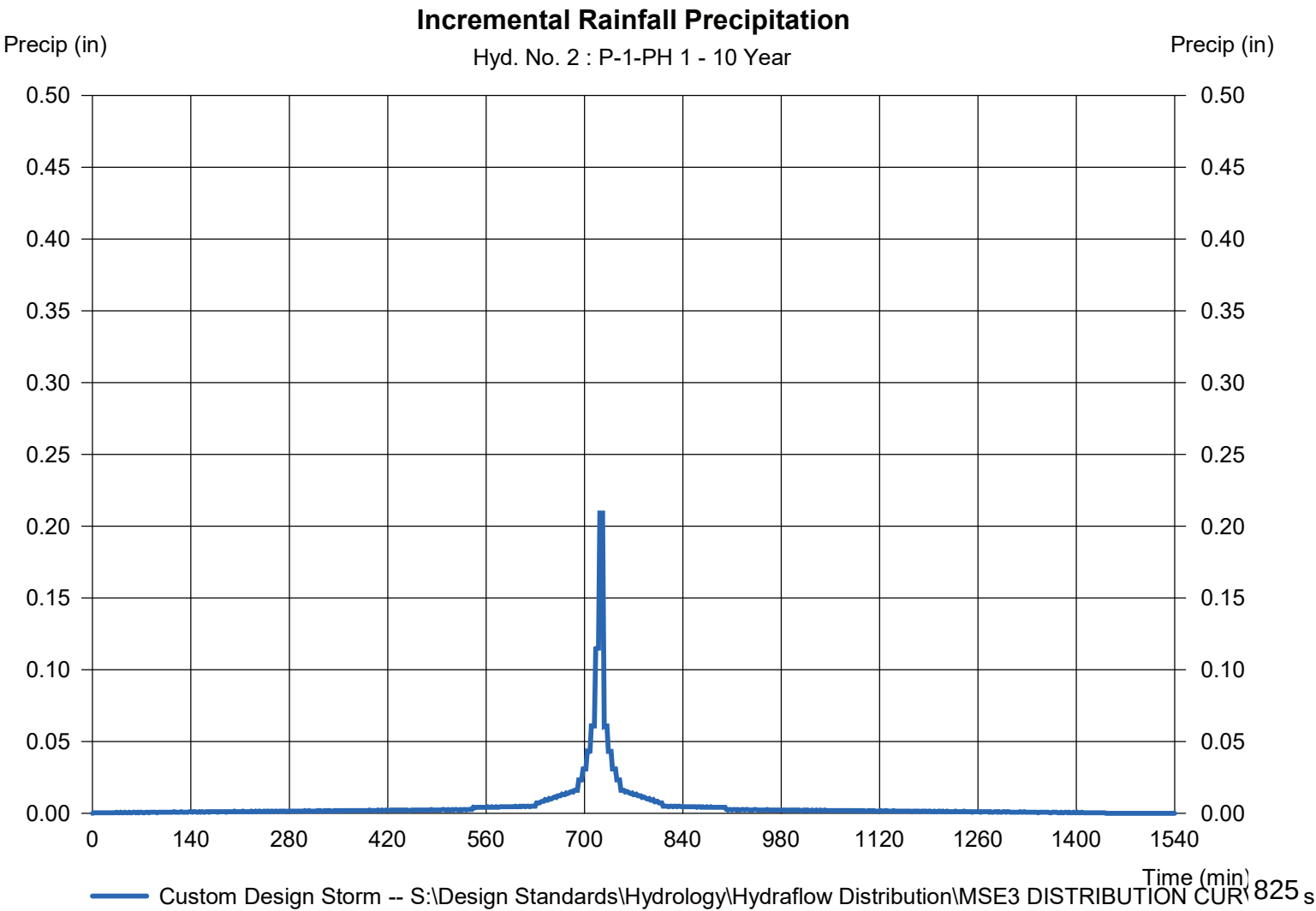
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

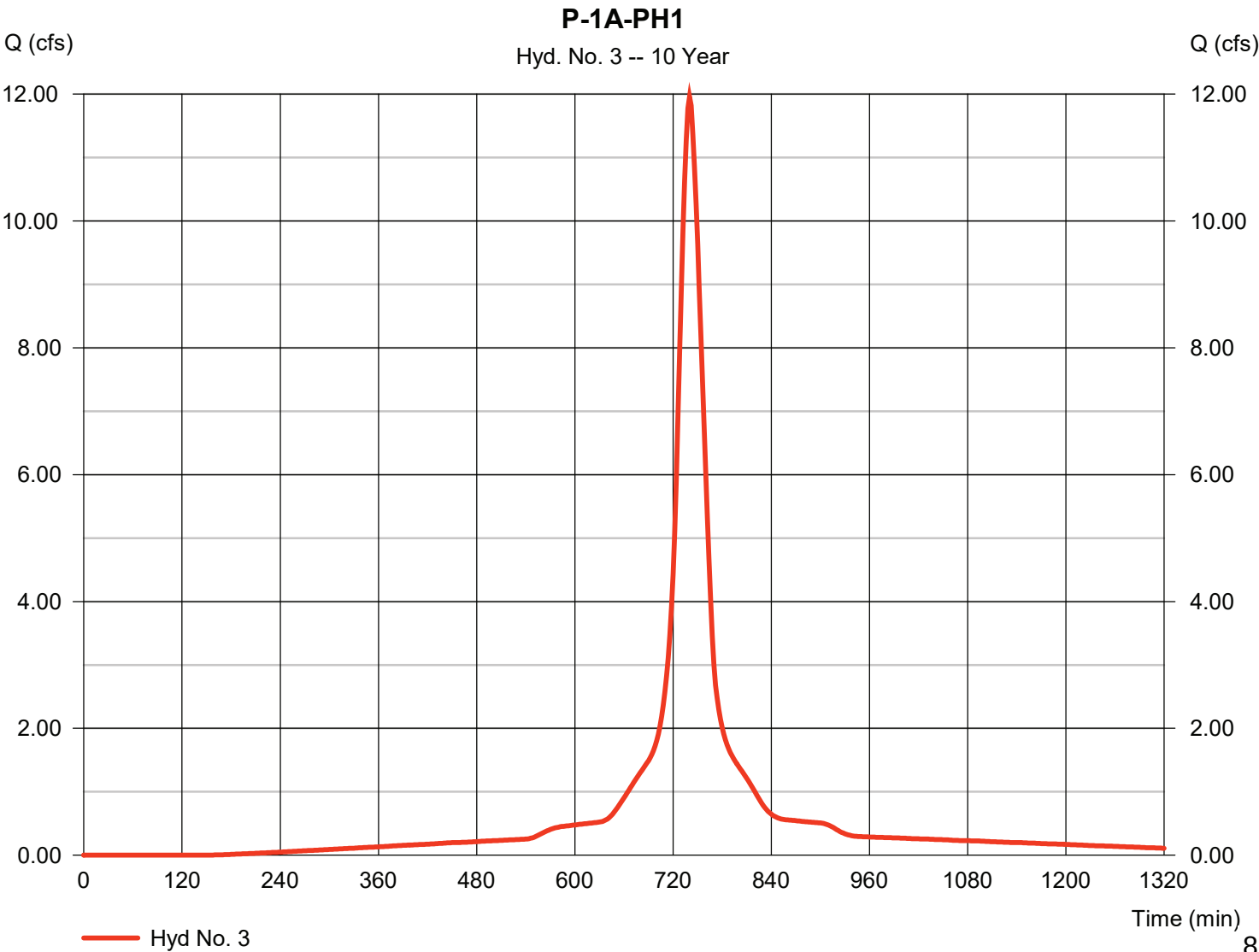
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 11.96 cfs
Storm frequency	= 10 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 1.176 acft
Drainage area	= 3.947 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 29.90 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD3 DISTRIBUTION CU		



Precipitation Report

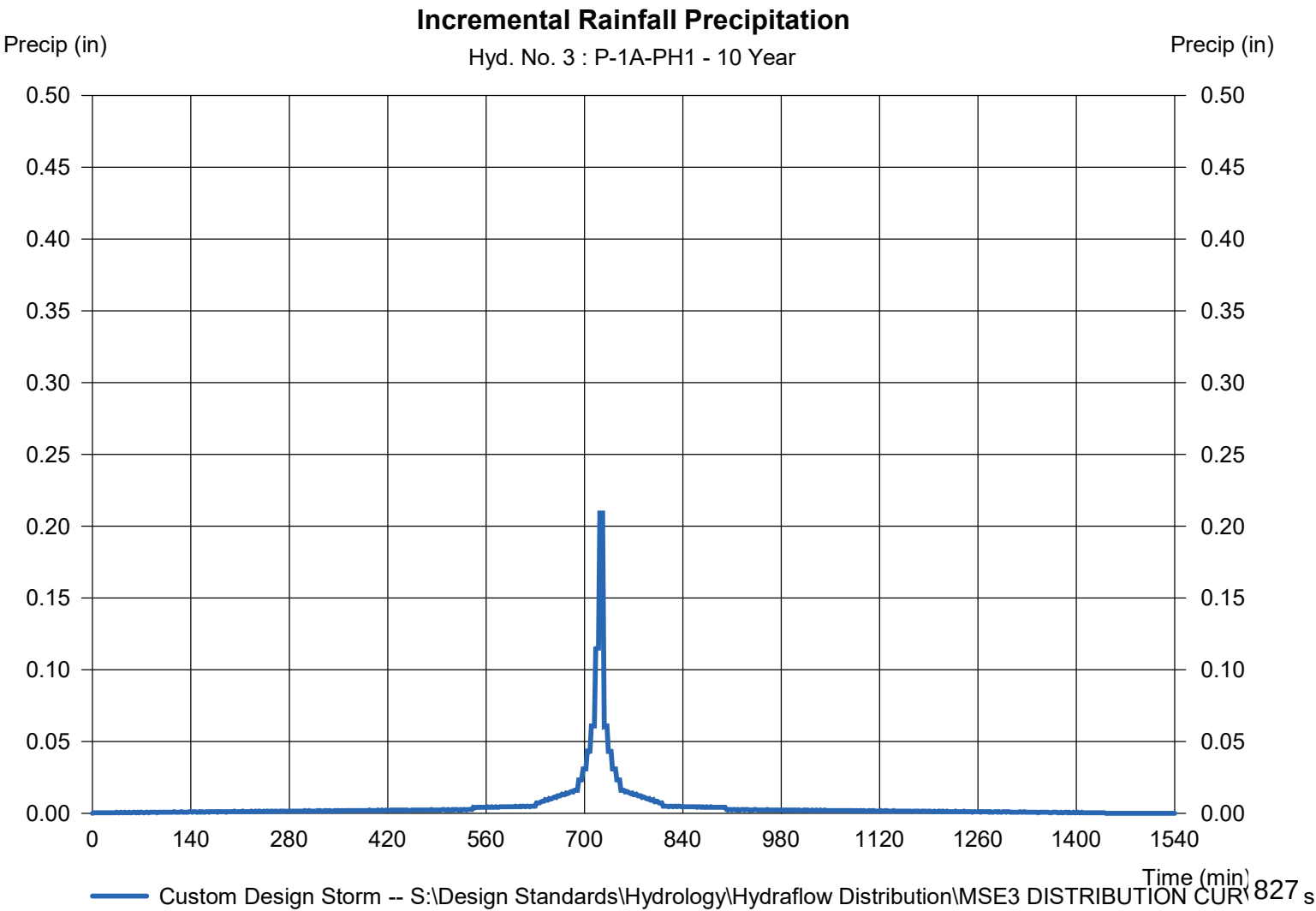
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

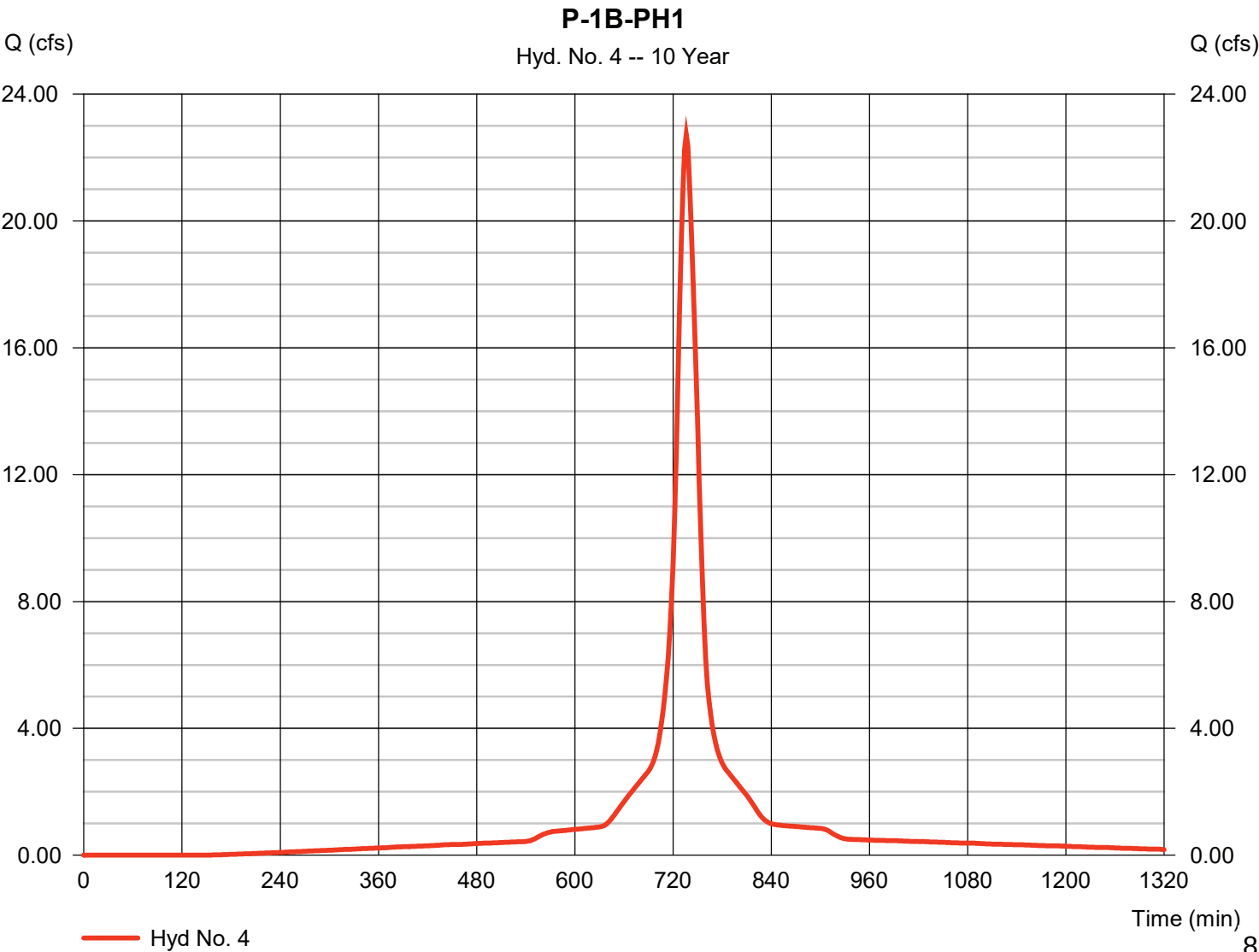
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 22.72 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.976 acft
Drainage area	= 6.516 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.60 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

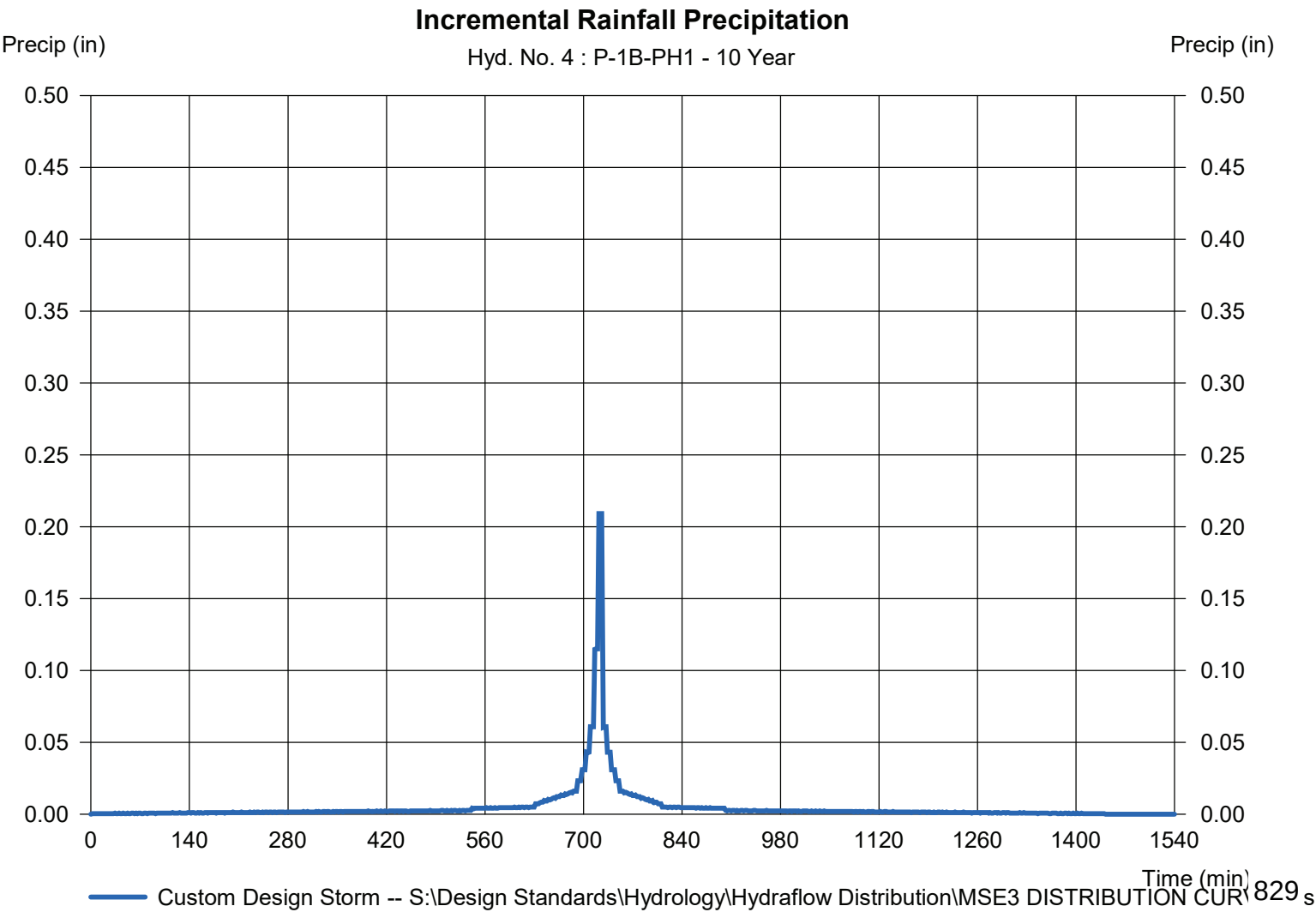
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

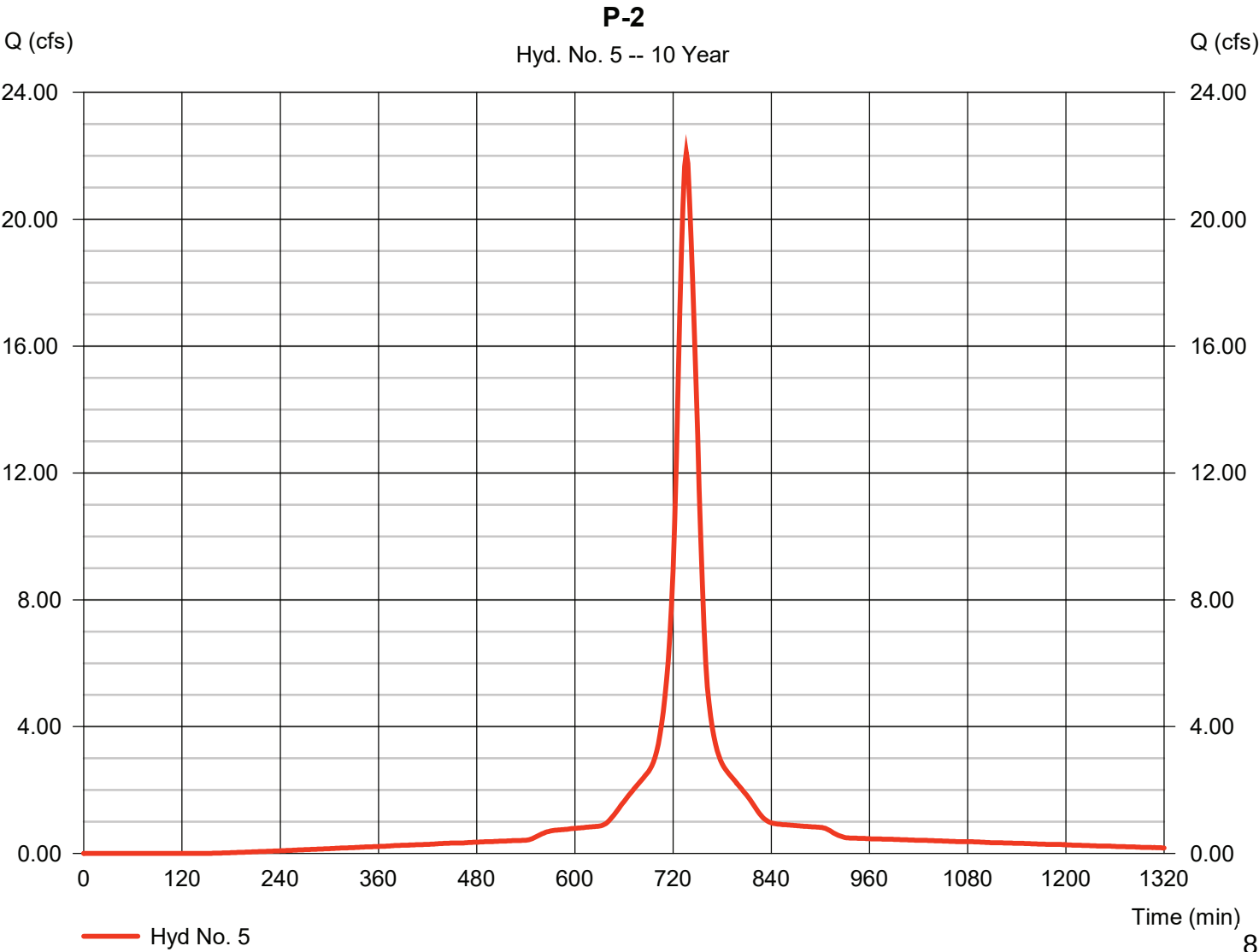
Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 22.11 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.923 acft
Drainage area	= 6.339 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.710 x 75)] / 6.339



Precipitation Report

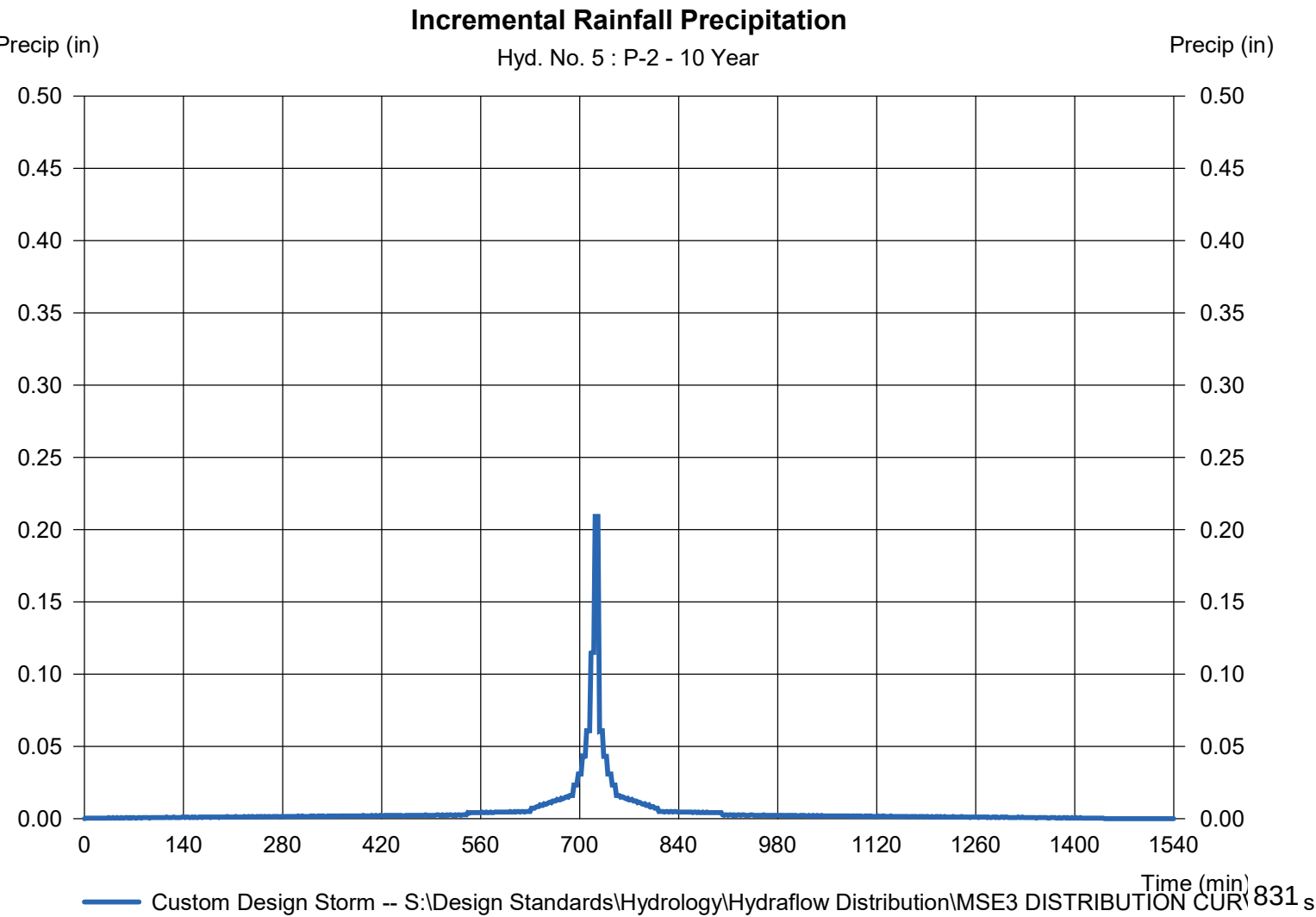
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

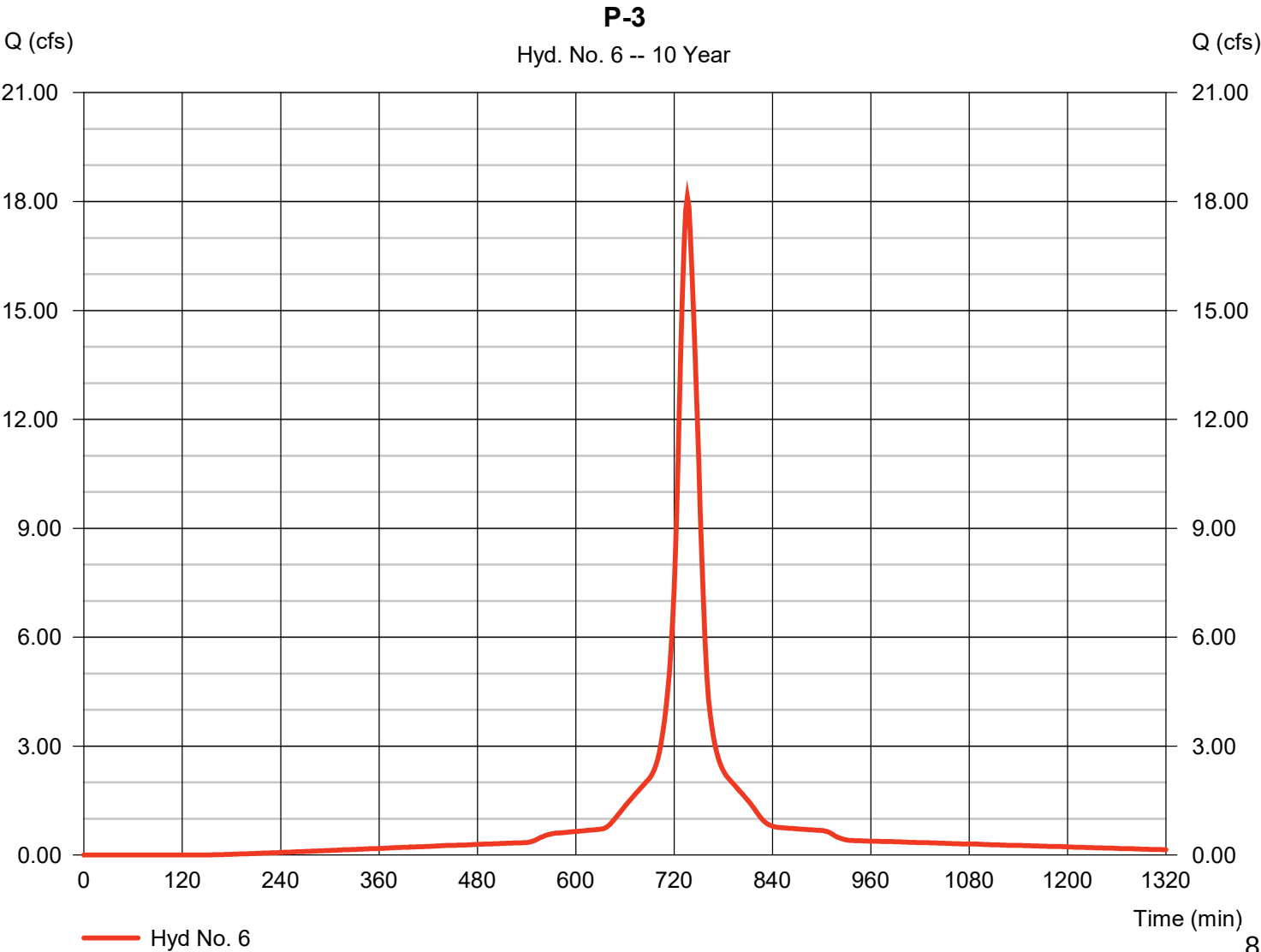
Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 18.13 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1.577 acft
Drainage area	= 5.199 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.260 x 75)] / 5.199



Precipitation Report

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

Friday, 06 / 28 / 2019

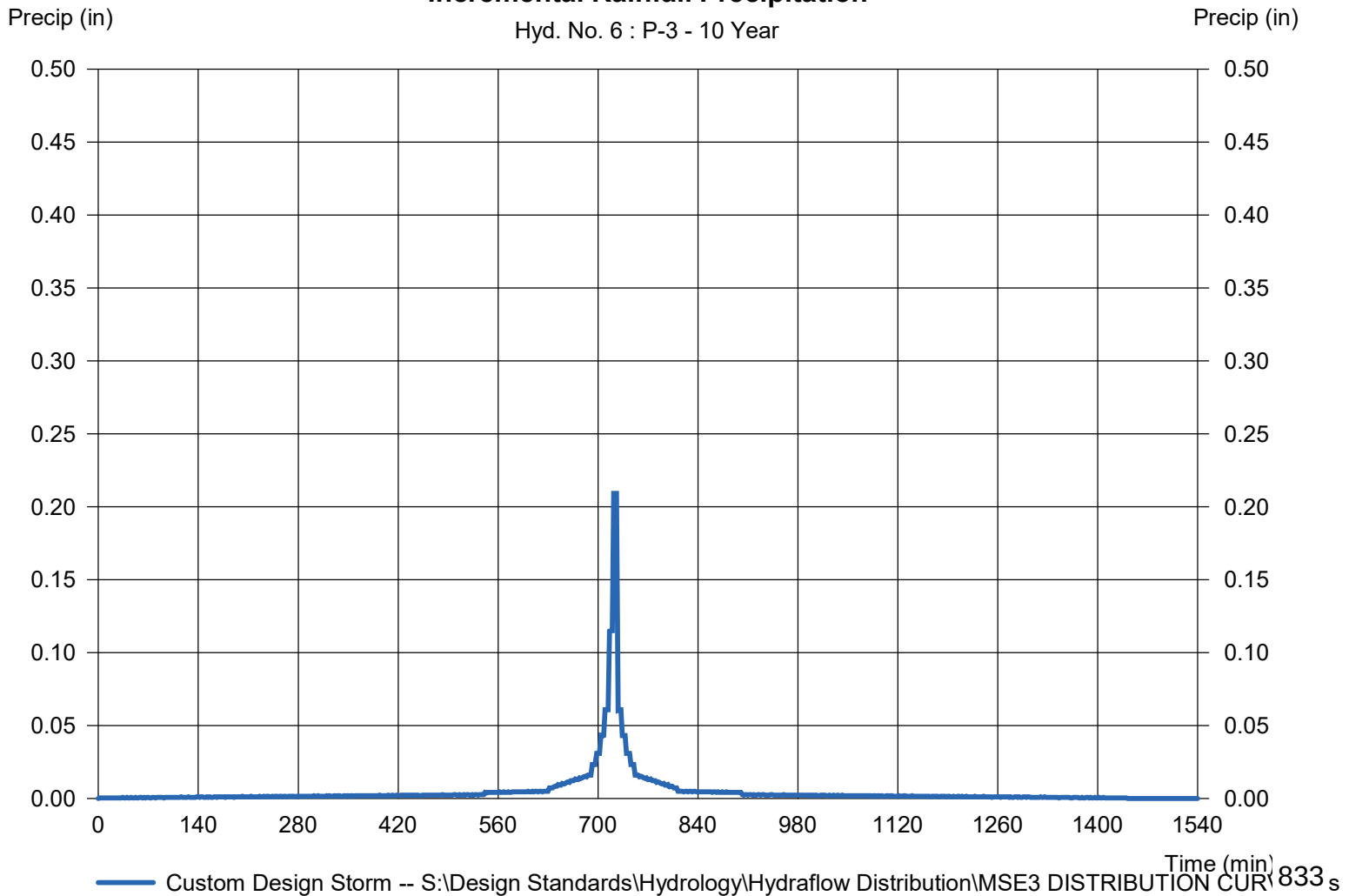
Hyd. No. 6

P-3

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 6 : P-3 - 10 Year



Hydrograph Report

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

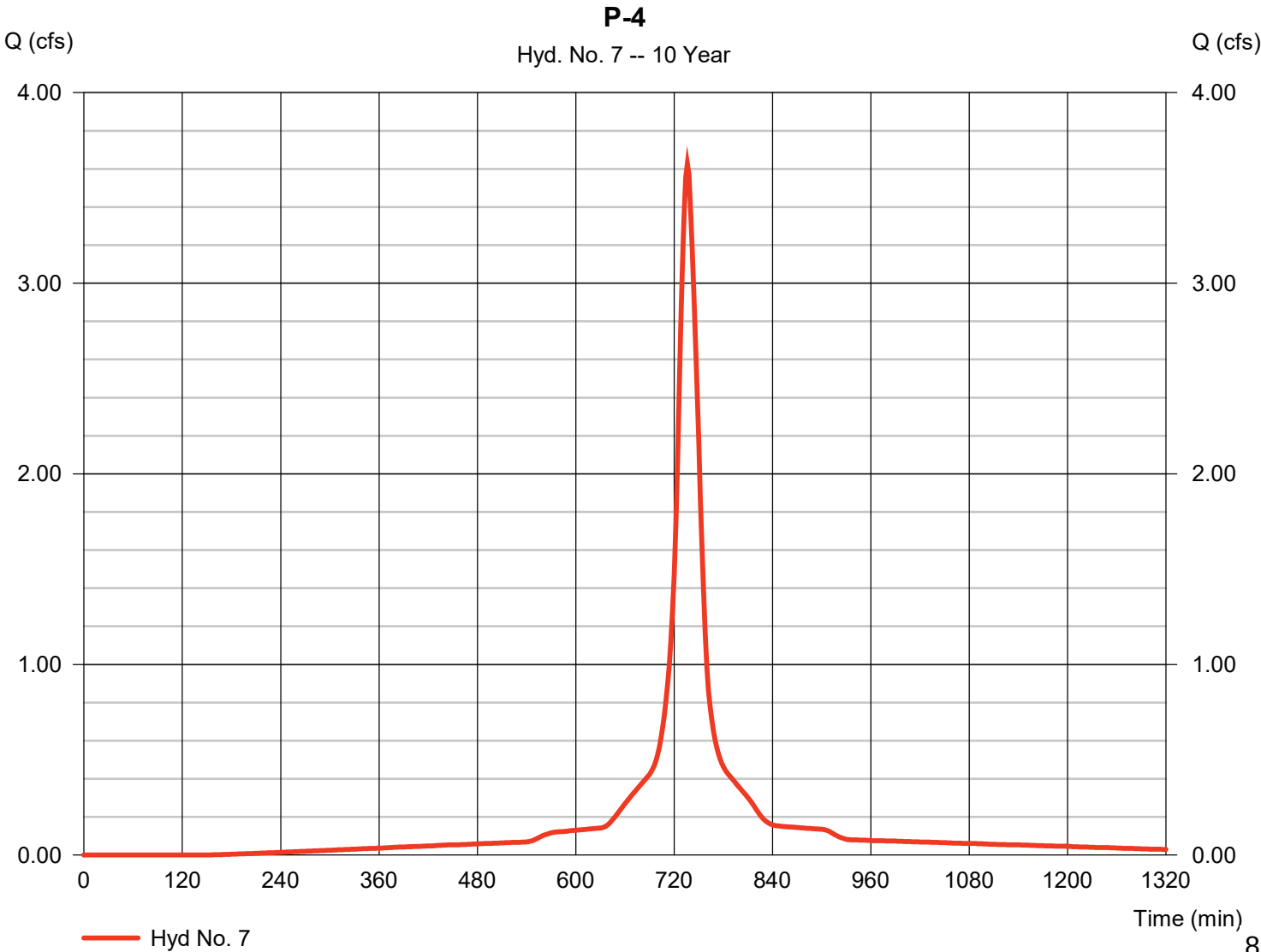
Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 3.627 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 0.315 acft
Drainage area	= 1.040 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.10 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

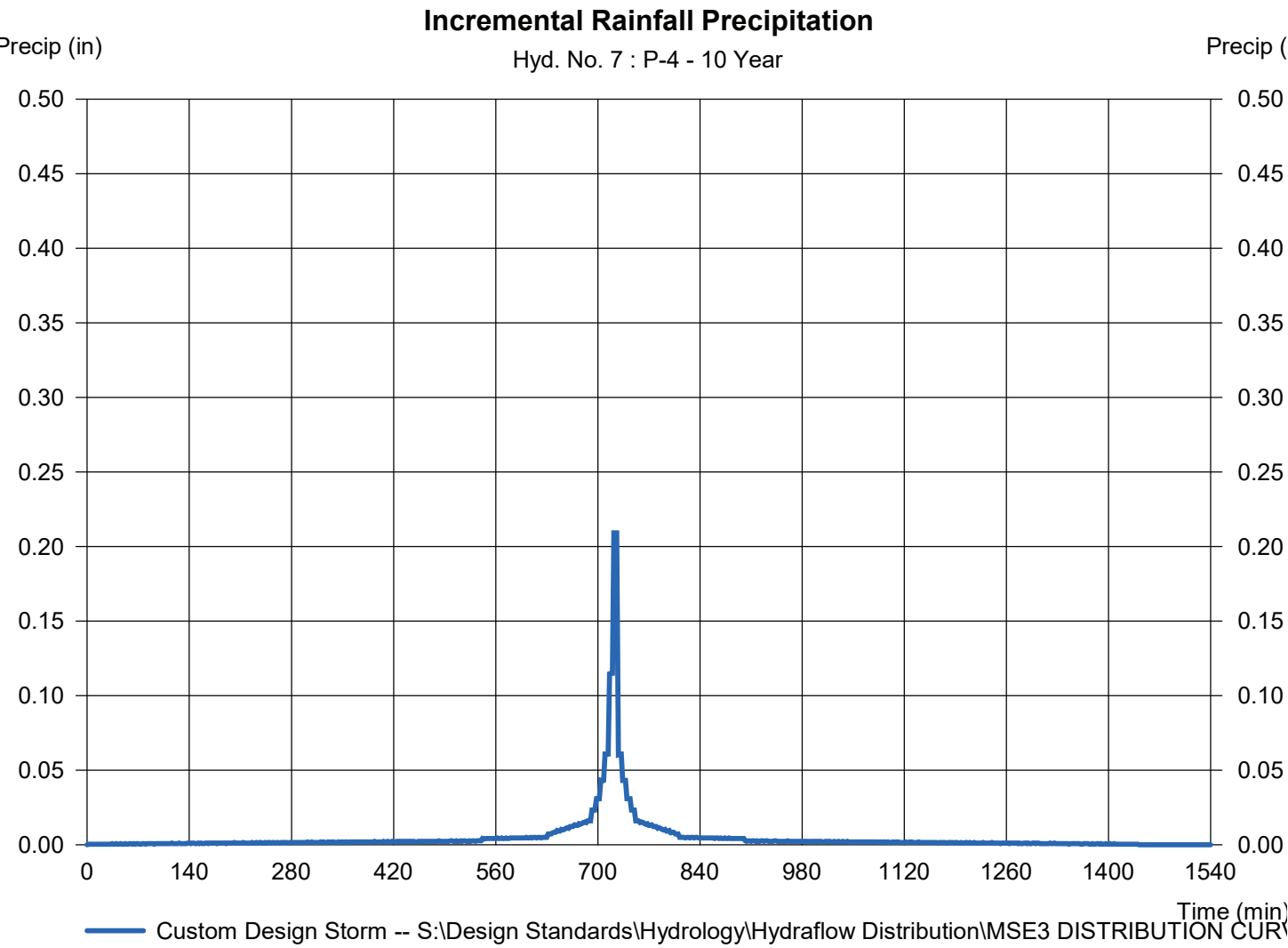
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

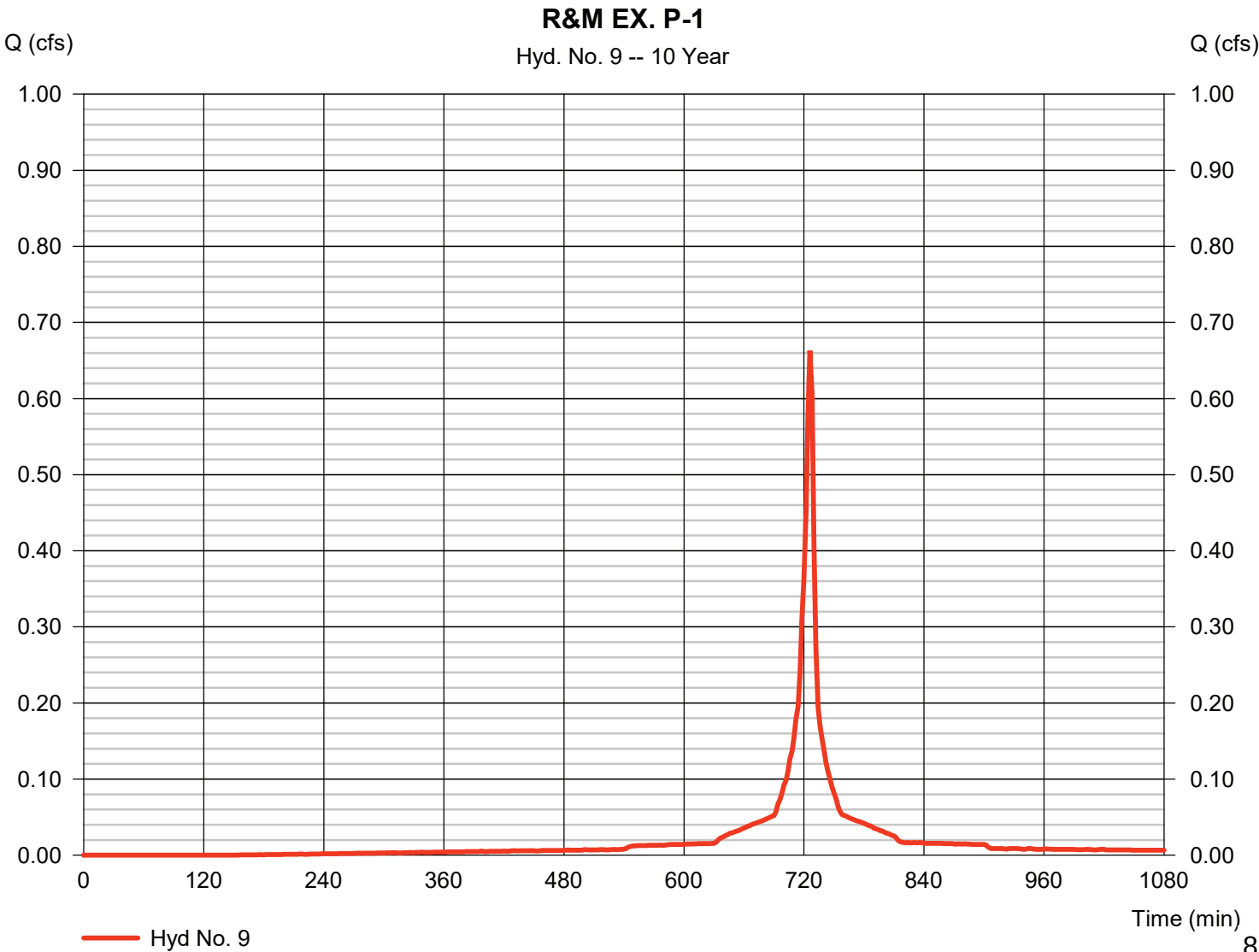
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.663 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.034 acft
Drainage area	= 0.120 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

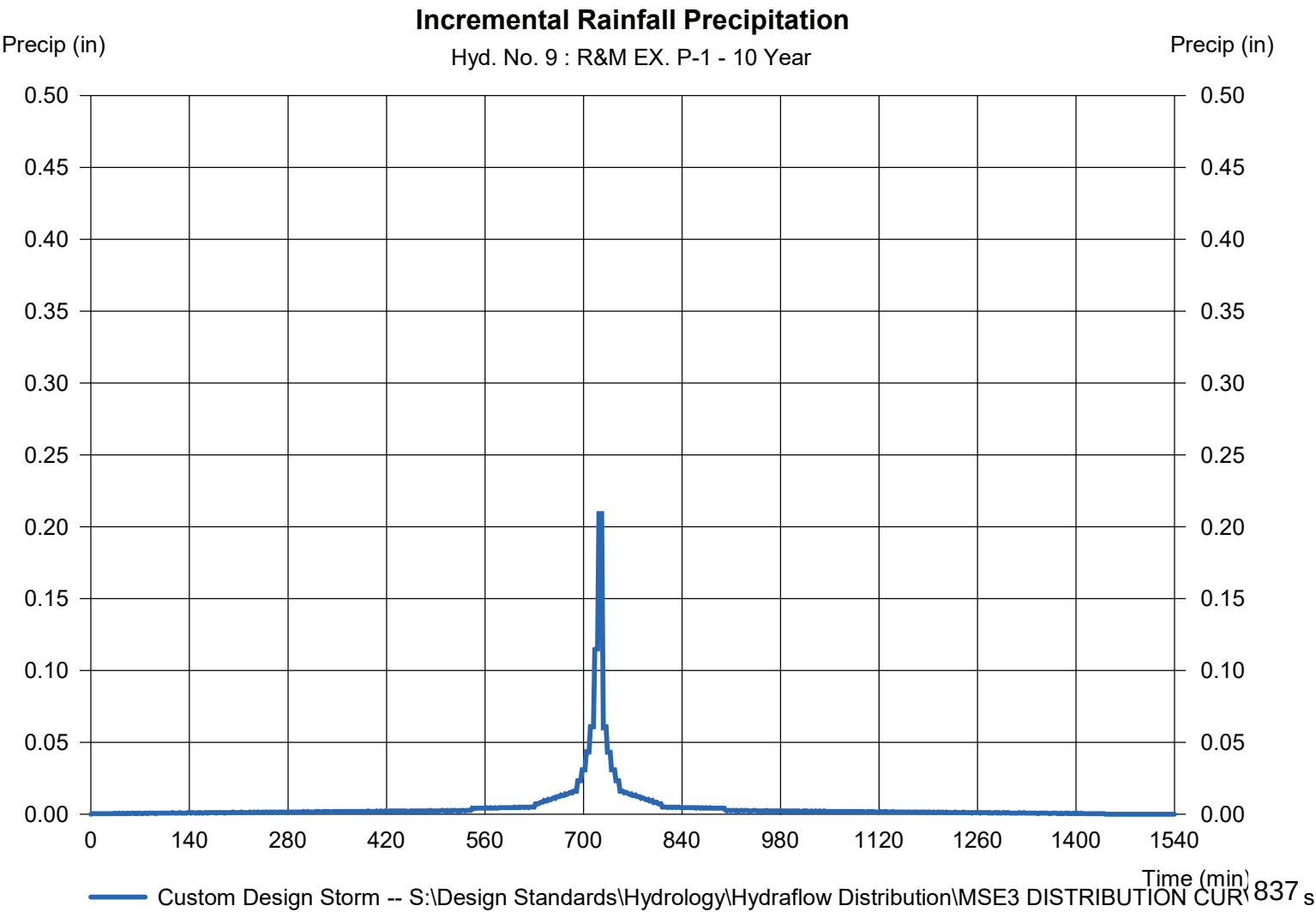
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

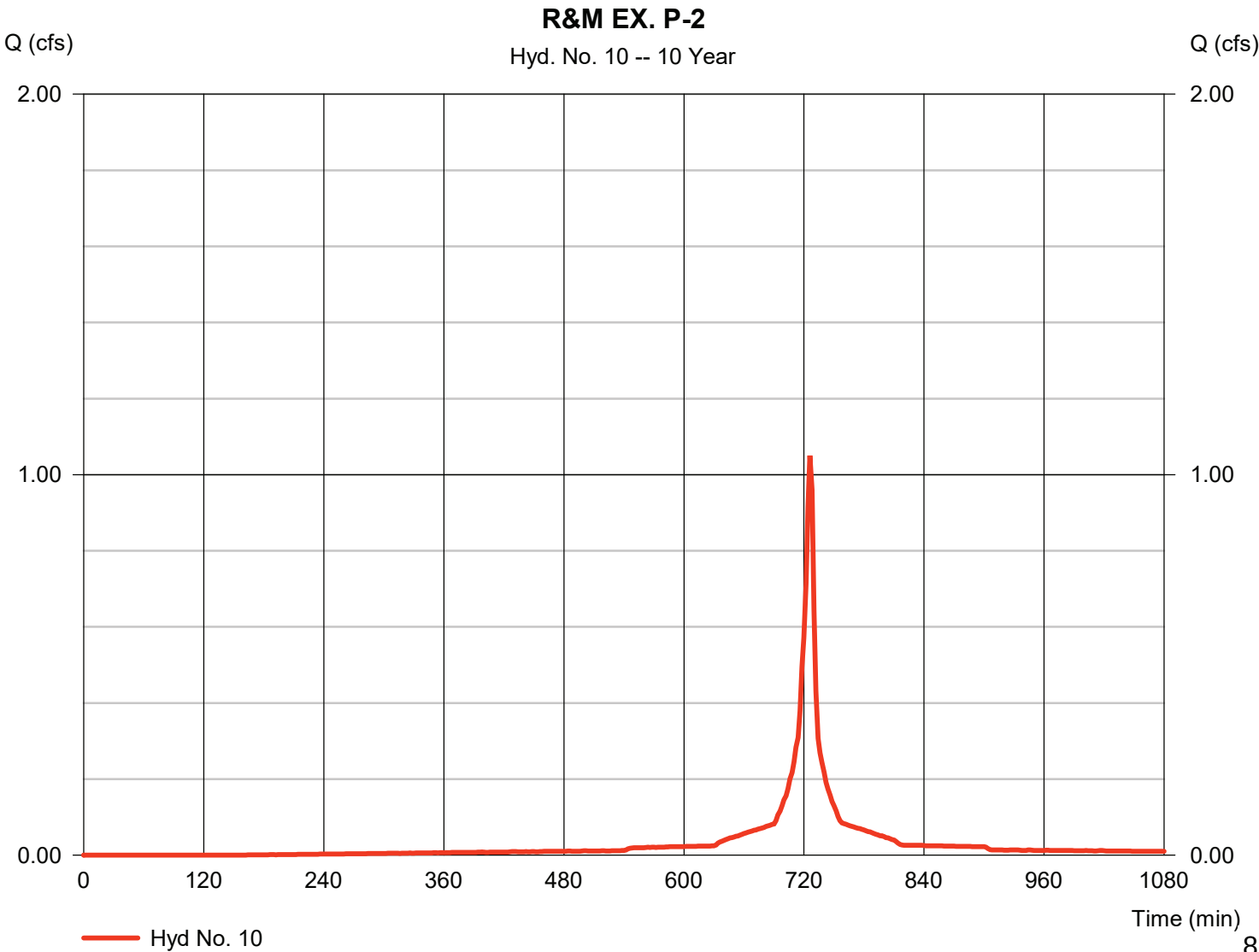
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.050 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.053 acft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

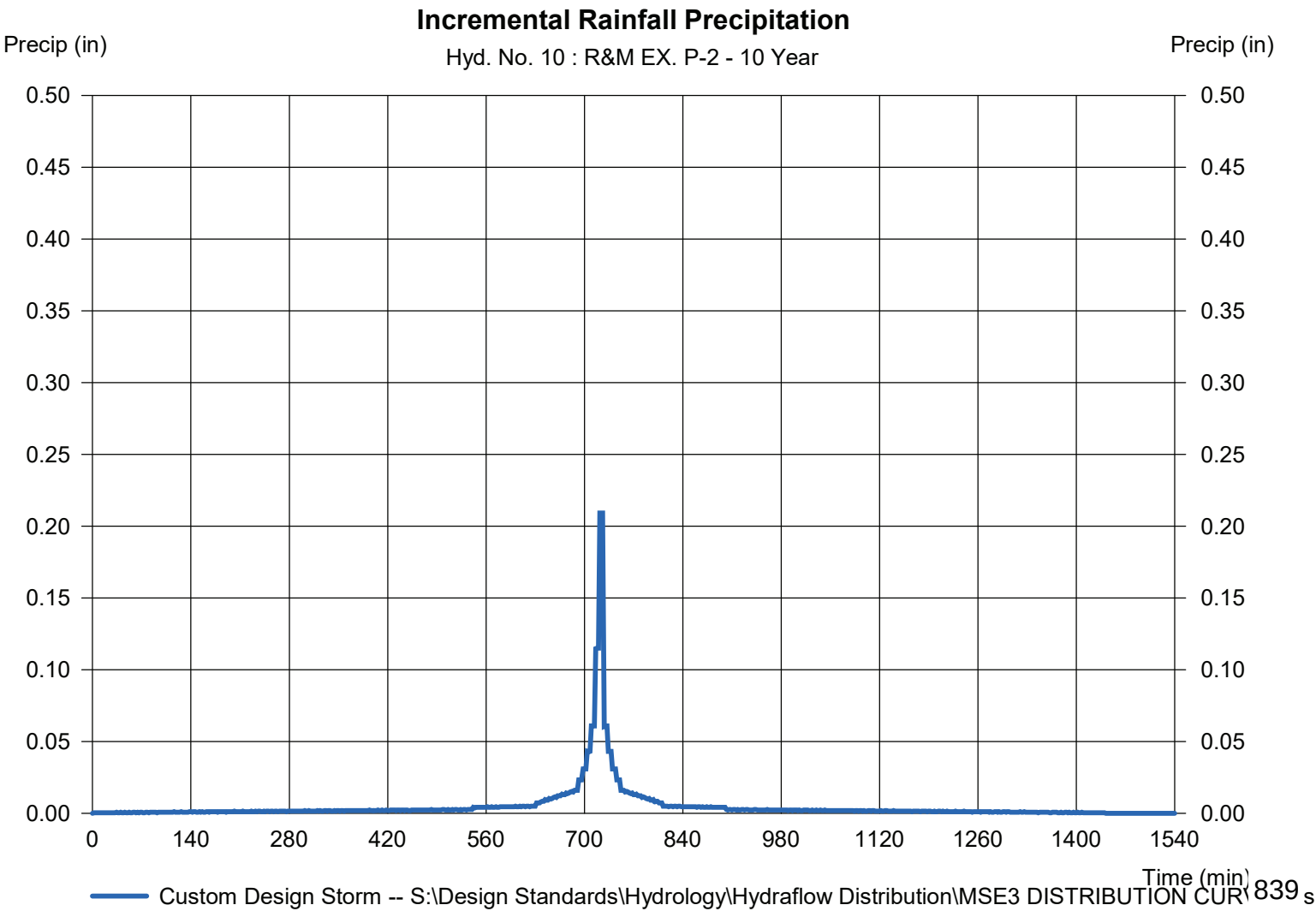
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

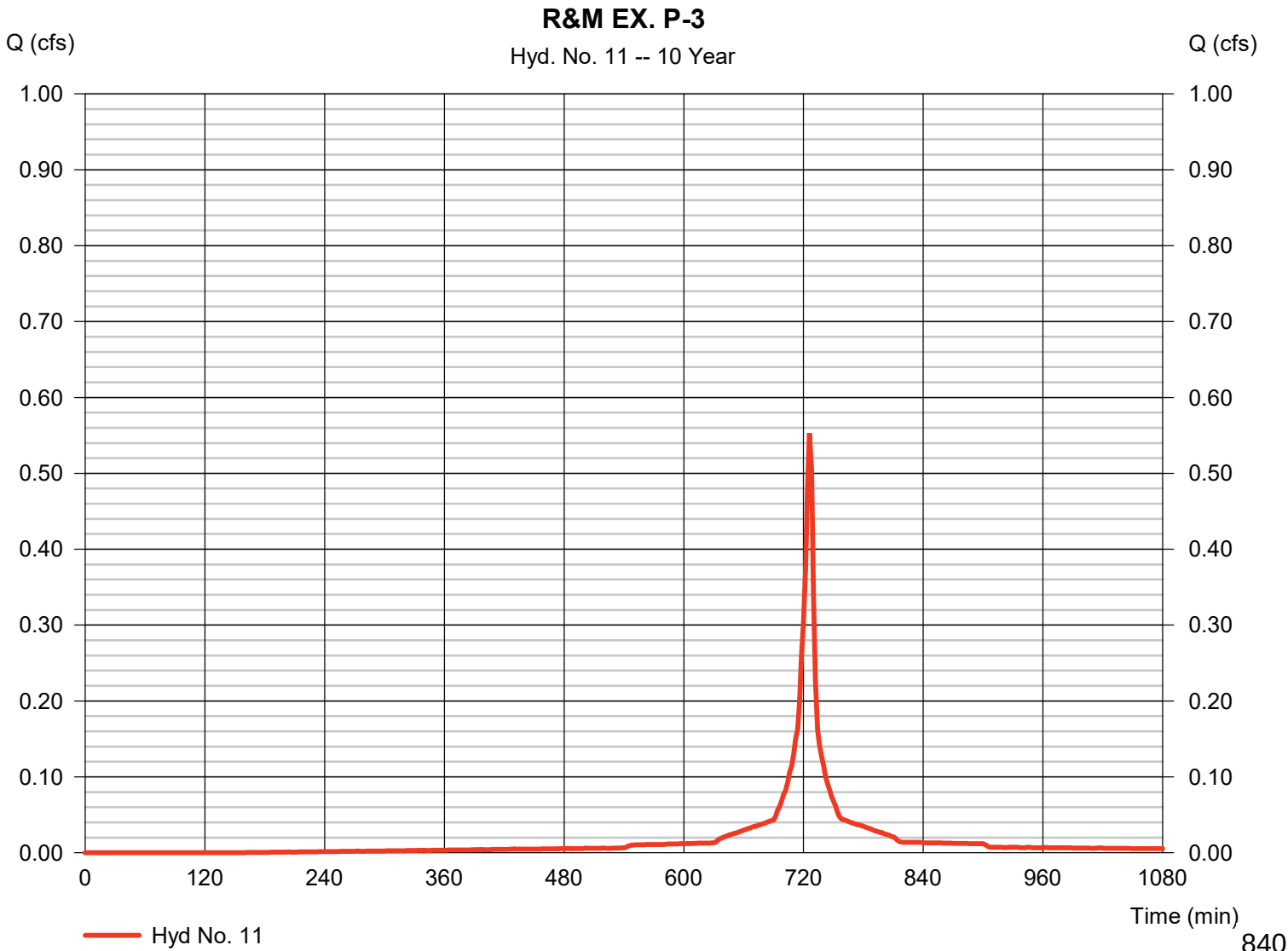
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.553 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.028 acft
Drainage area	= 0.100 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

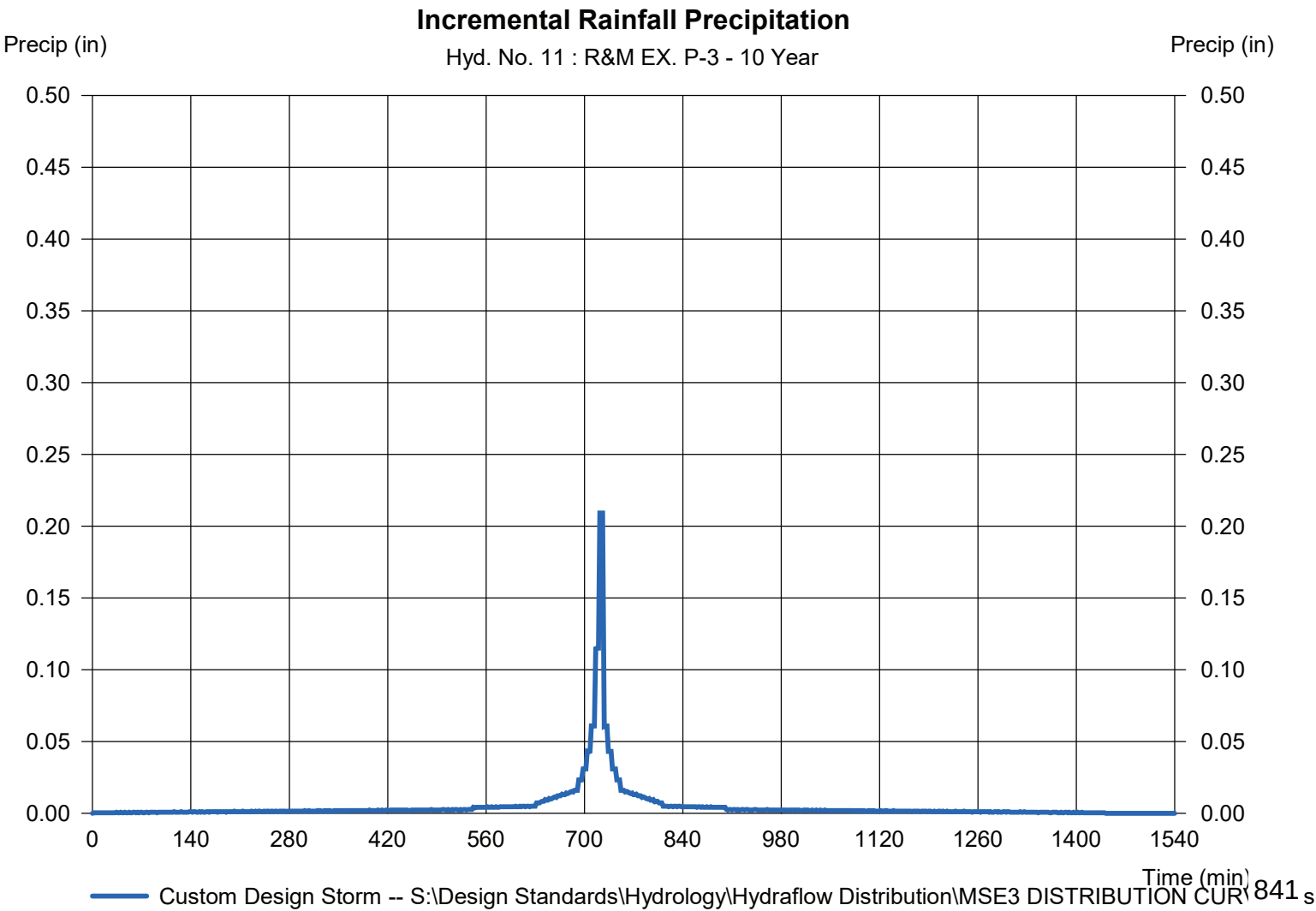
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Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

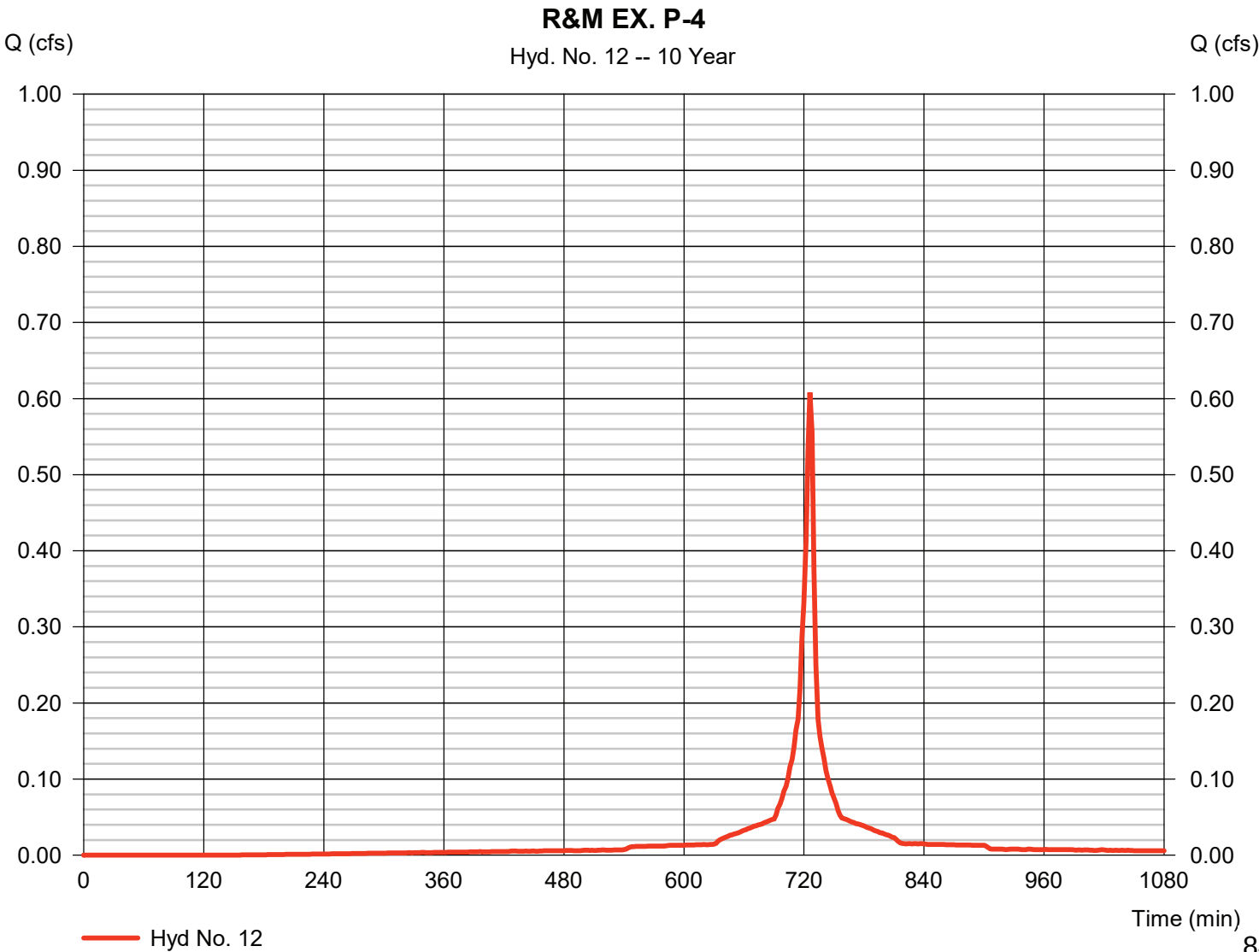
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Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.608 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.031 acft
Drainage area	= 0.110 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

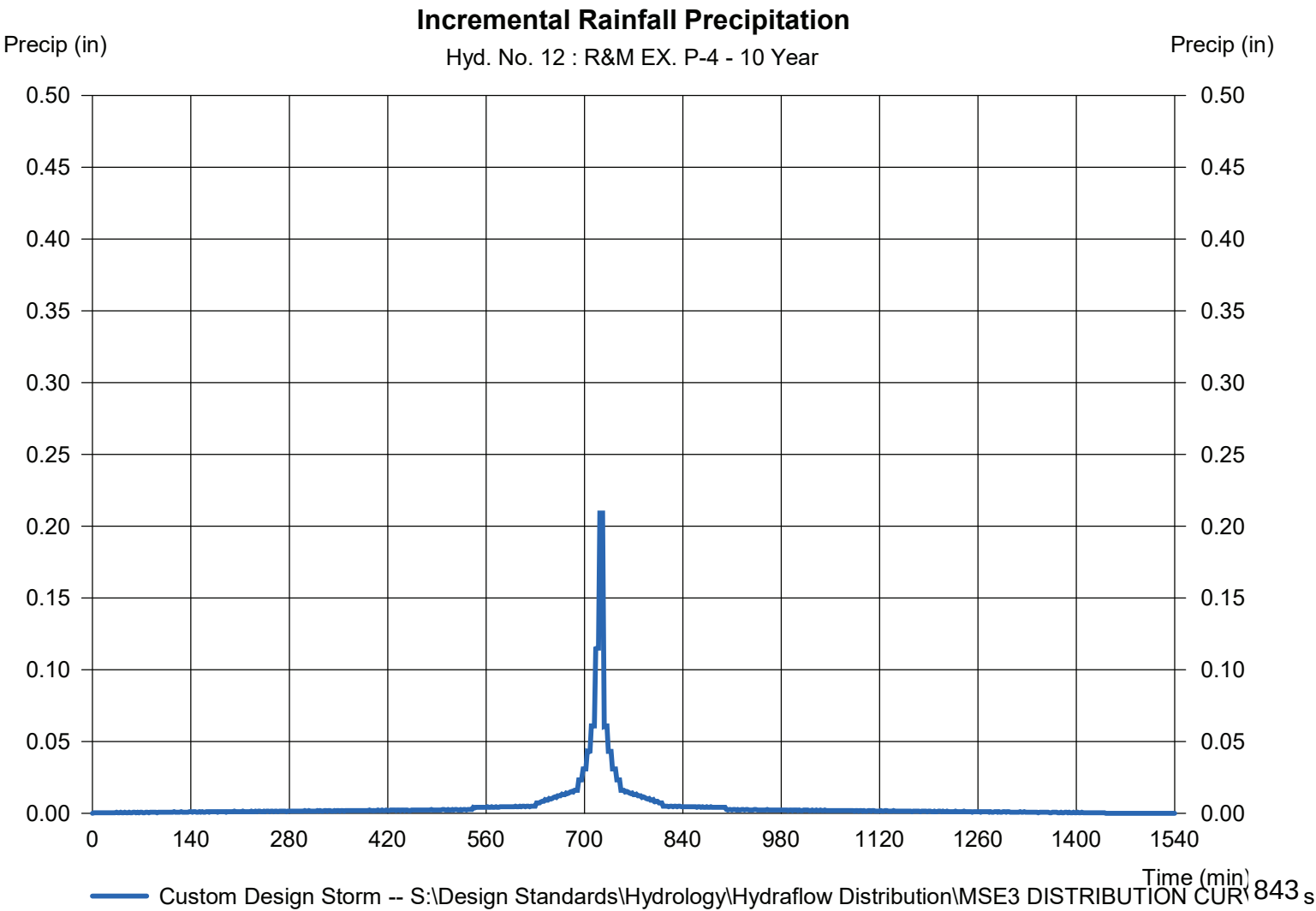
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Custom Design Storm -- S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION CUR

Hydrograph Report

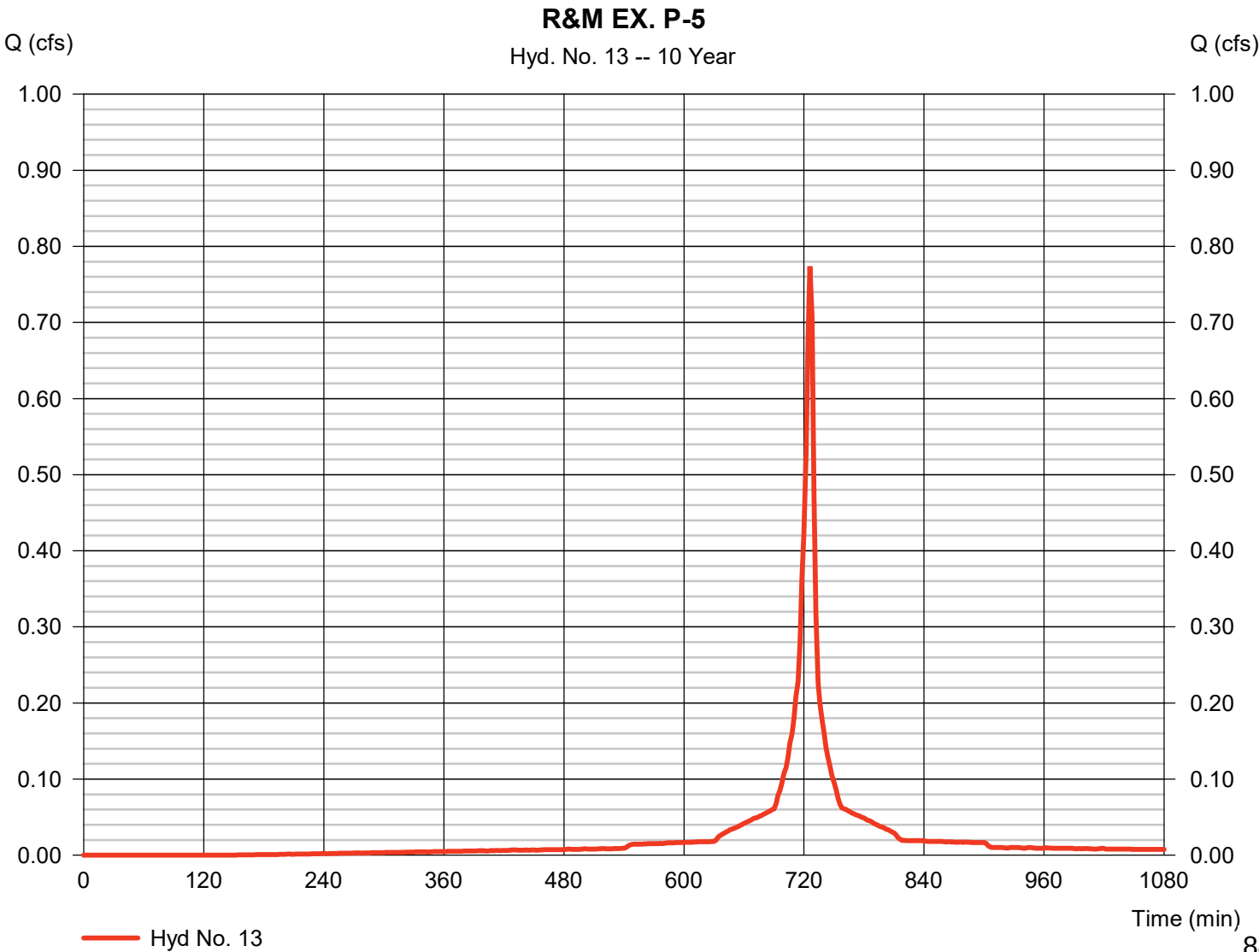
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.774 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.039 acft
Drainage area	= 0.140 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



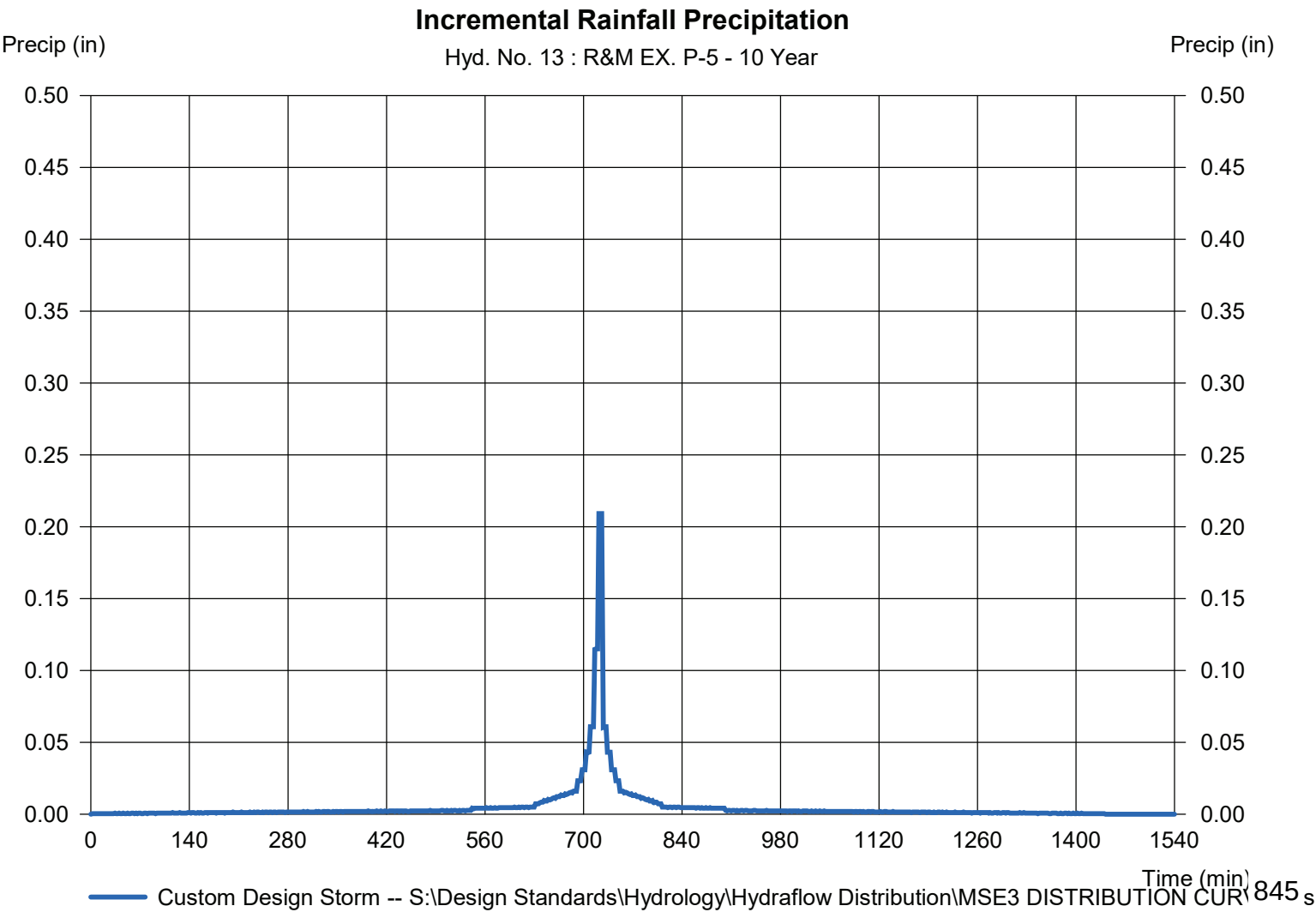
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

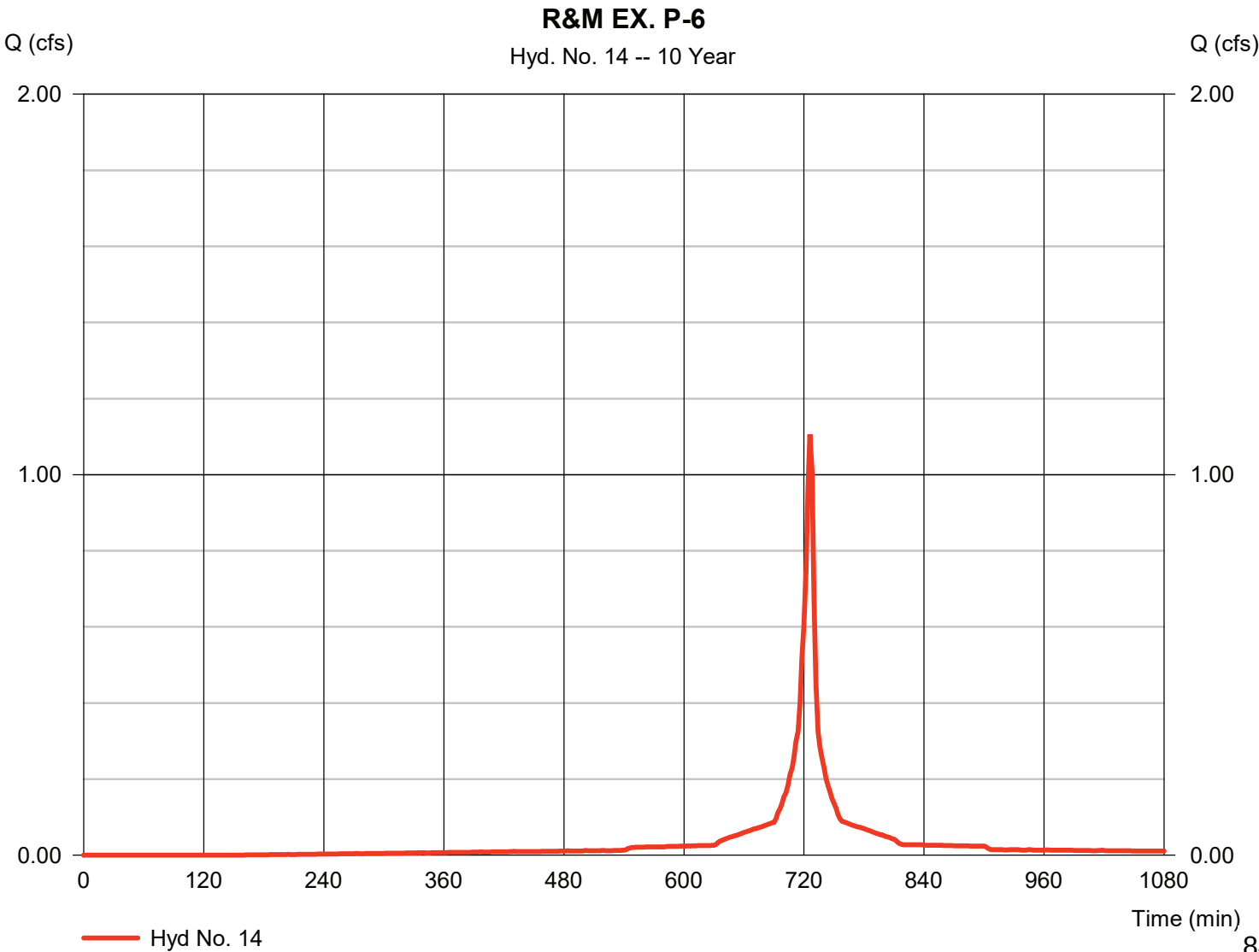
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Hydrograph type	= SCS Runoff	Peak discharge	= 1.105 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.056 acft
Drainage area	= 0.200 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

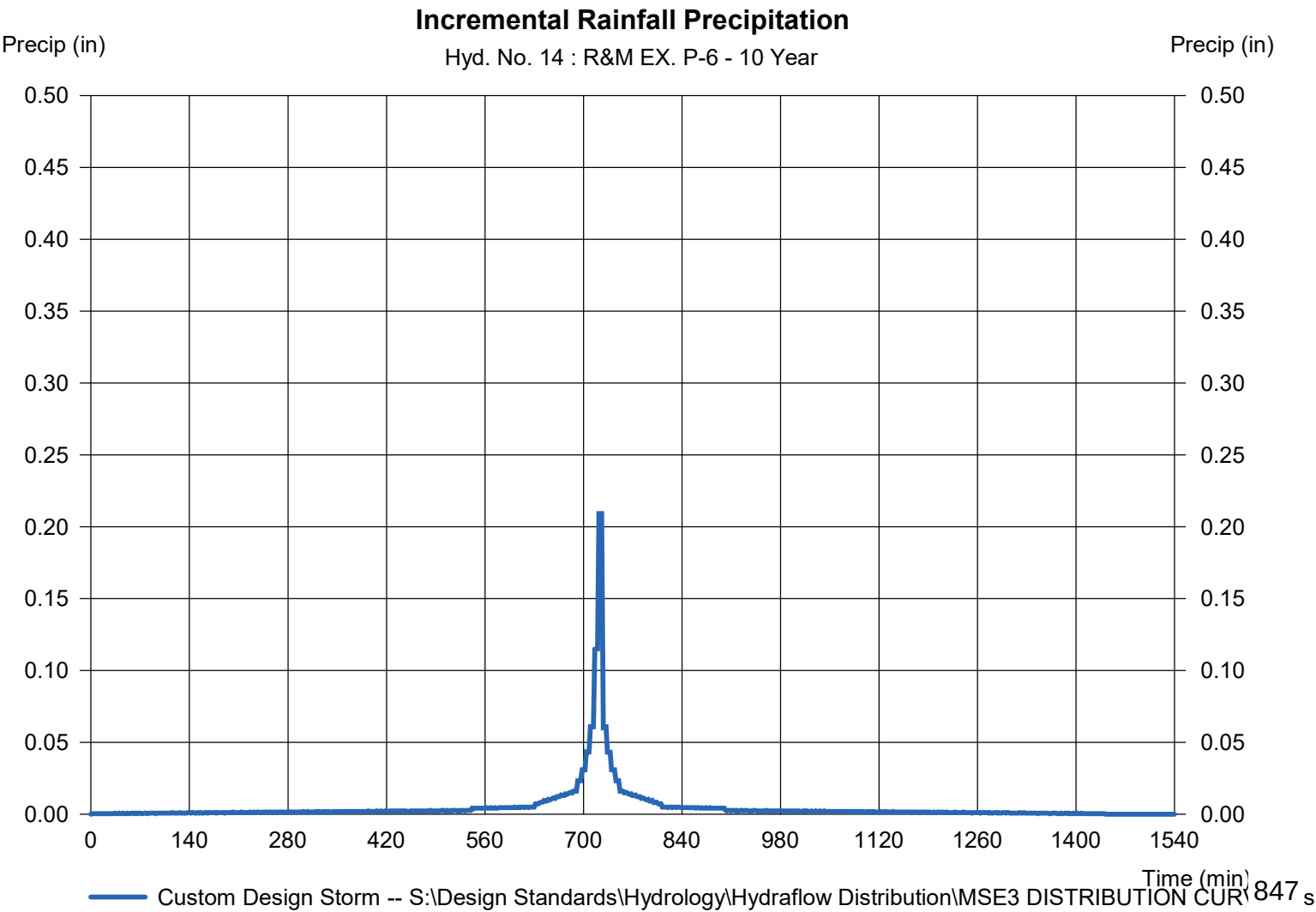
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

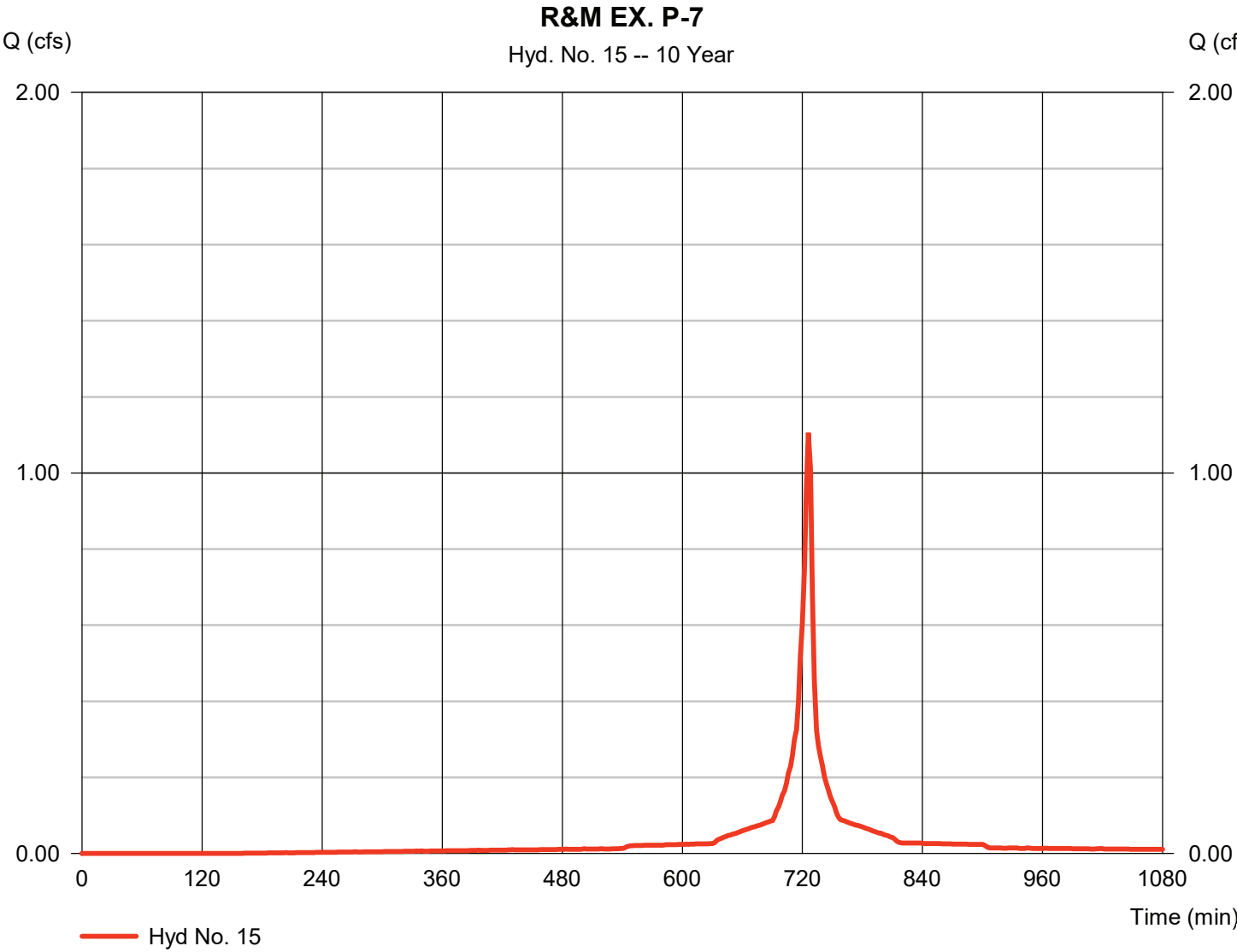
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Hydrograph type	= SCS Runoff	Peak discharge	= 1.105 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.056 acft
Drainage area	= 0.200 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

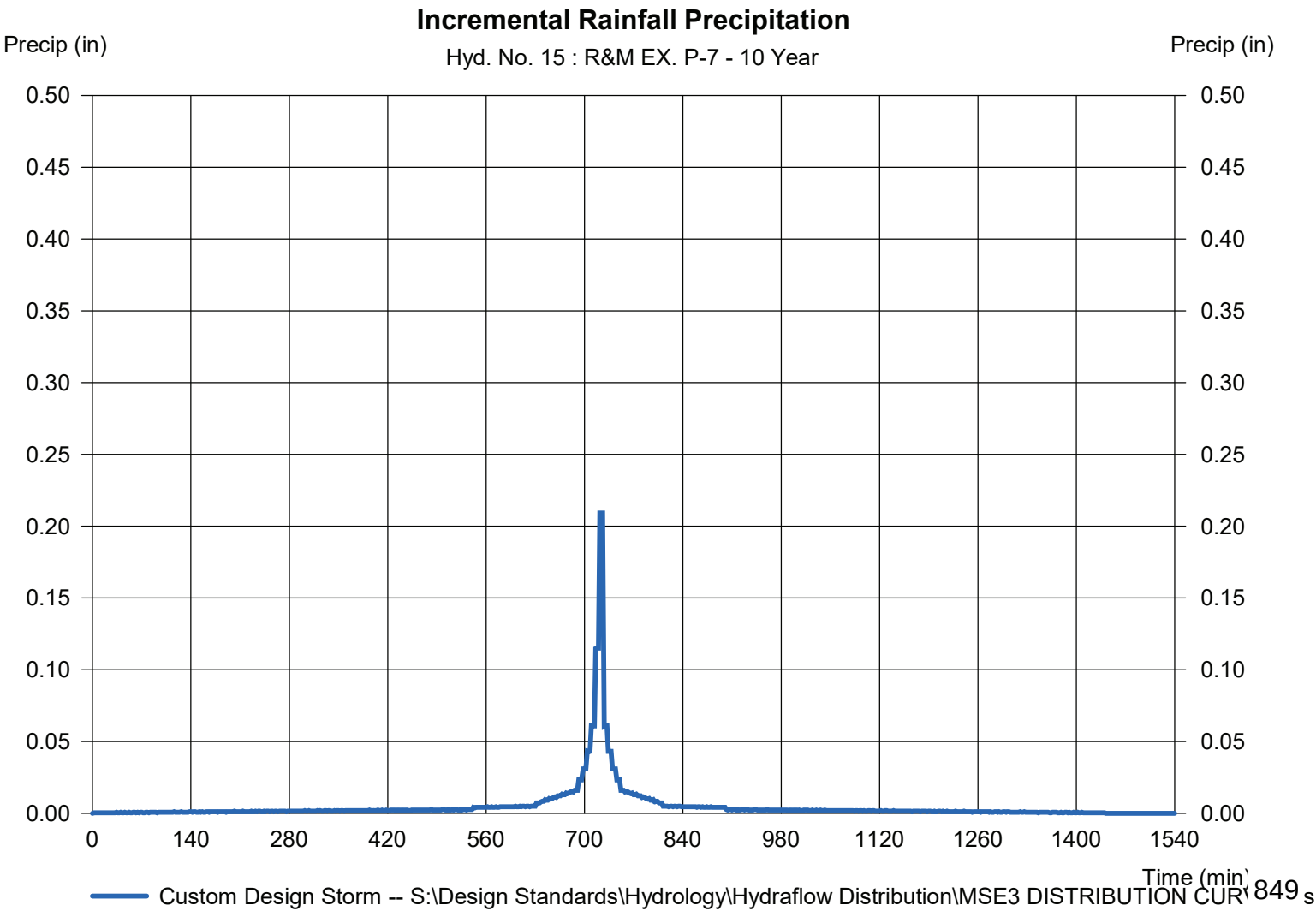
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

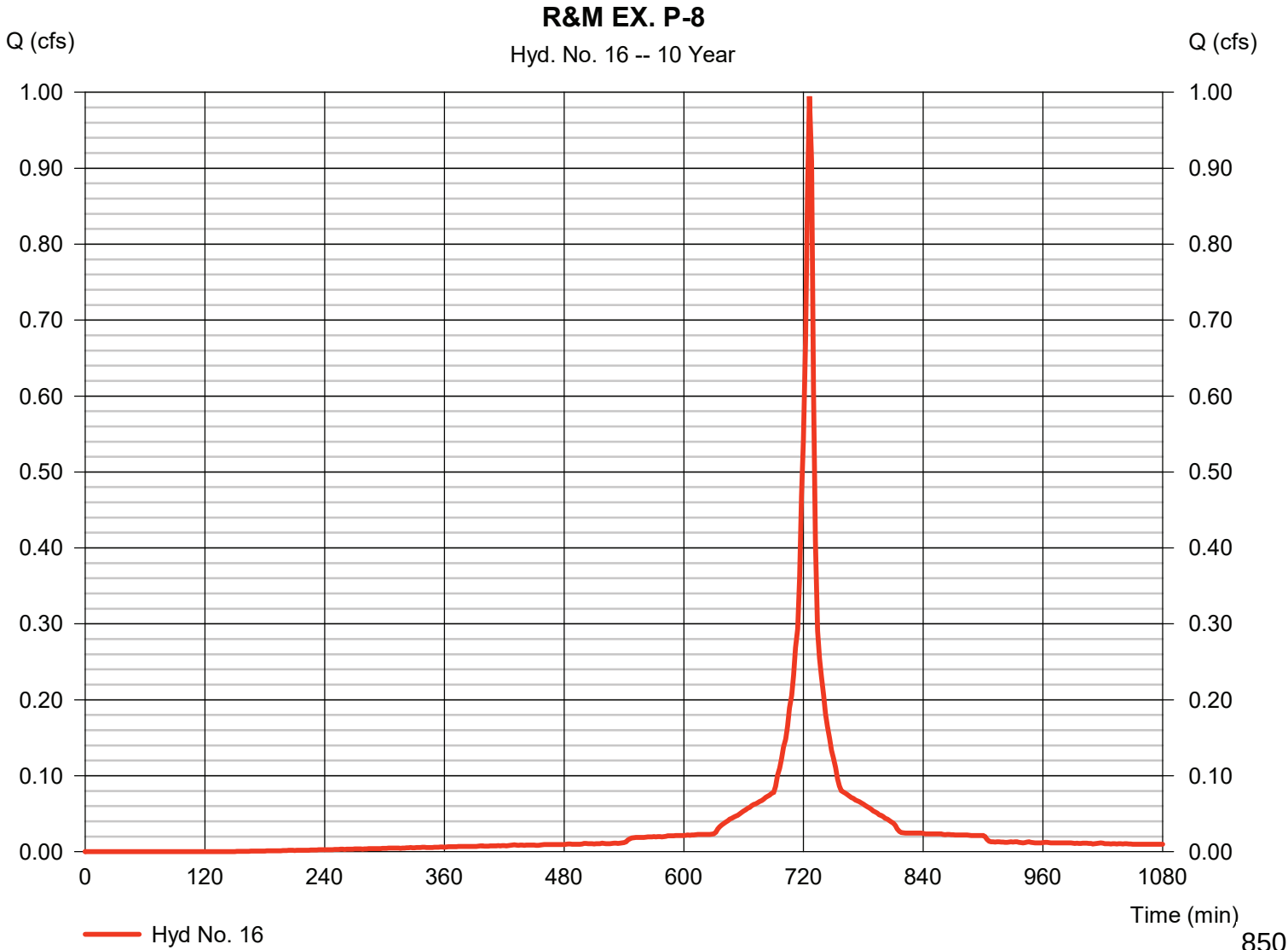
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.995 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.050 acft
Drainage area	= 0.180 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



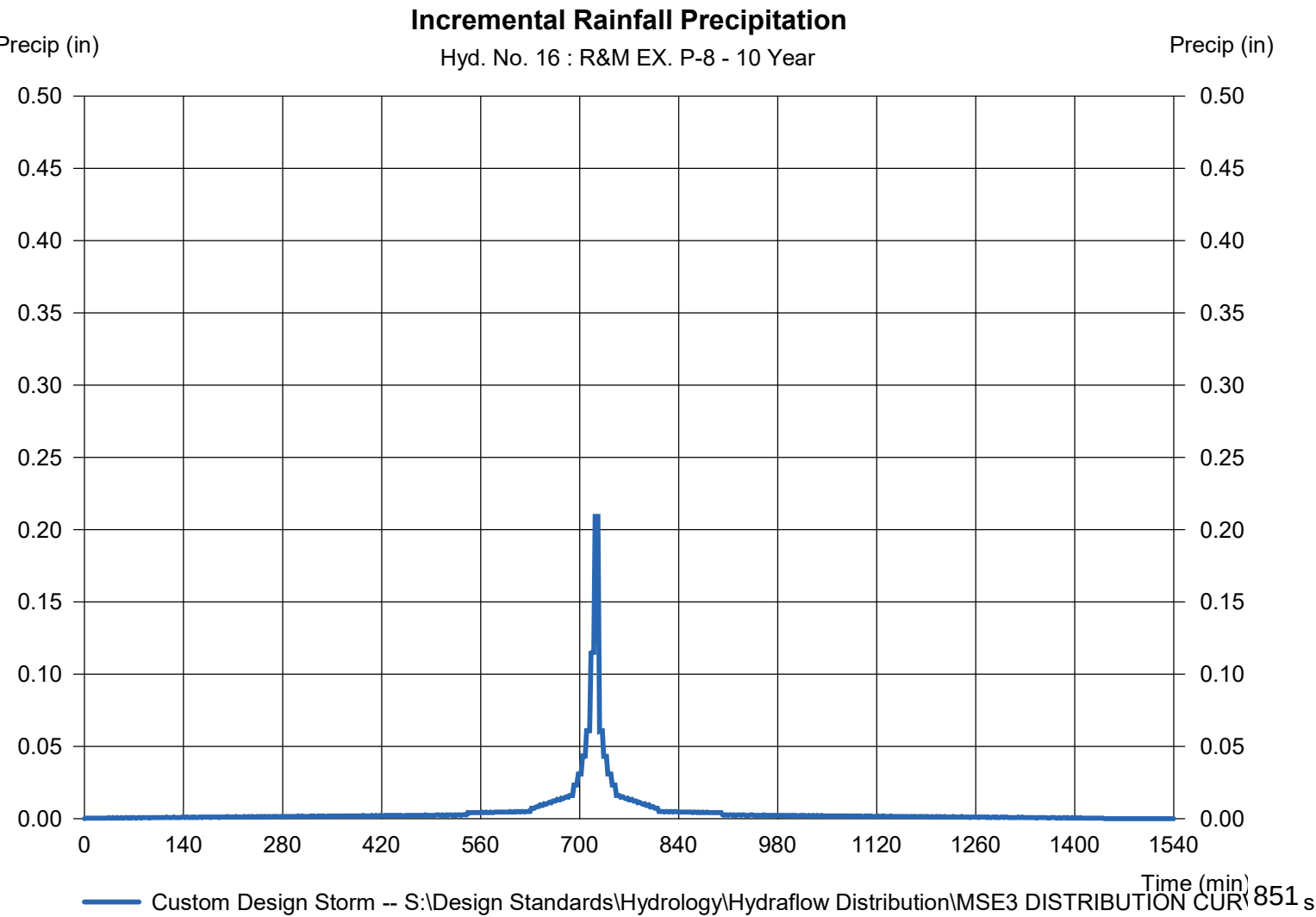
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

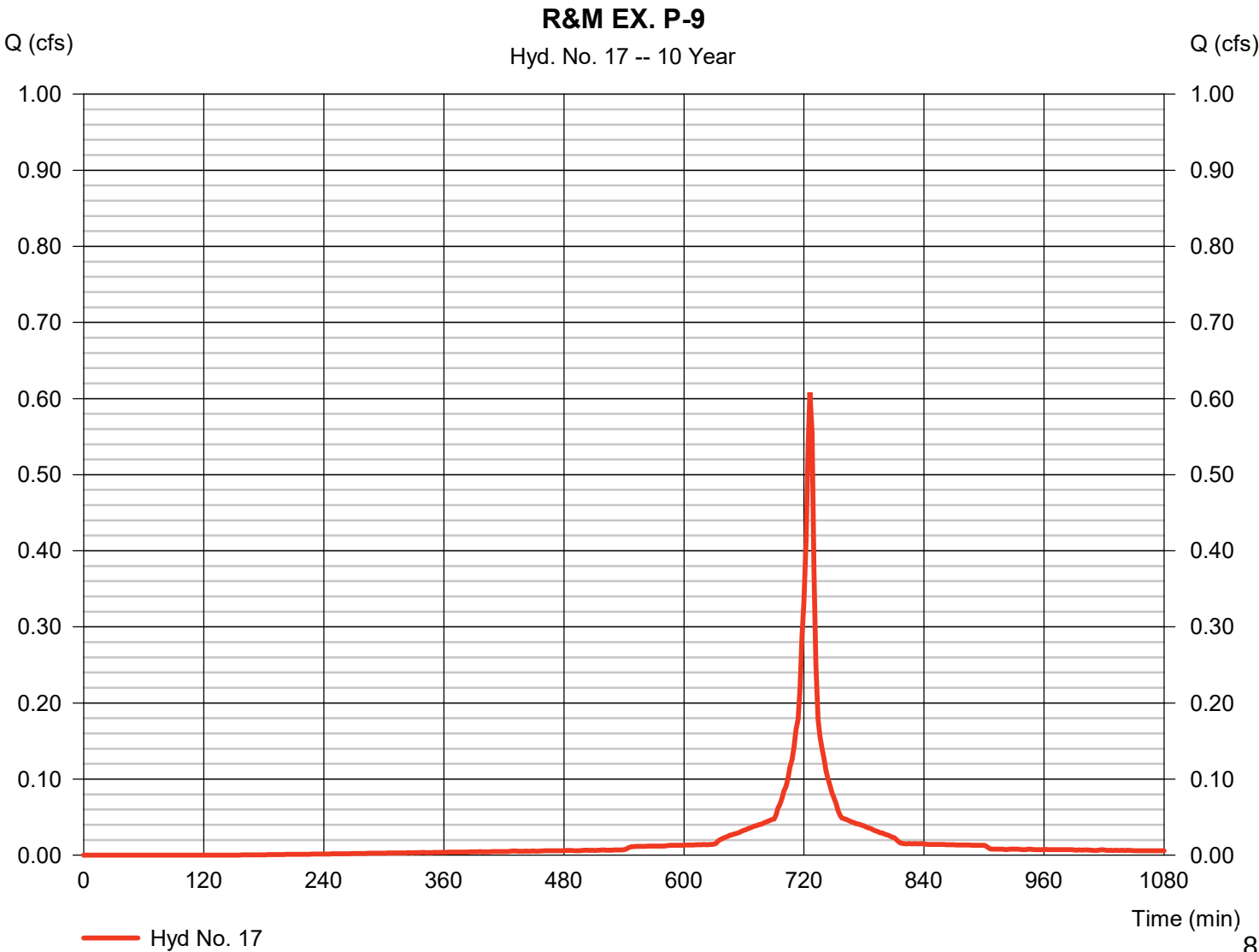
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.608 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.031 acft
Drainage area	= 0.110 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

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

Friday, 06 / 28 / 2019

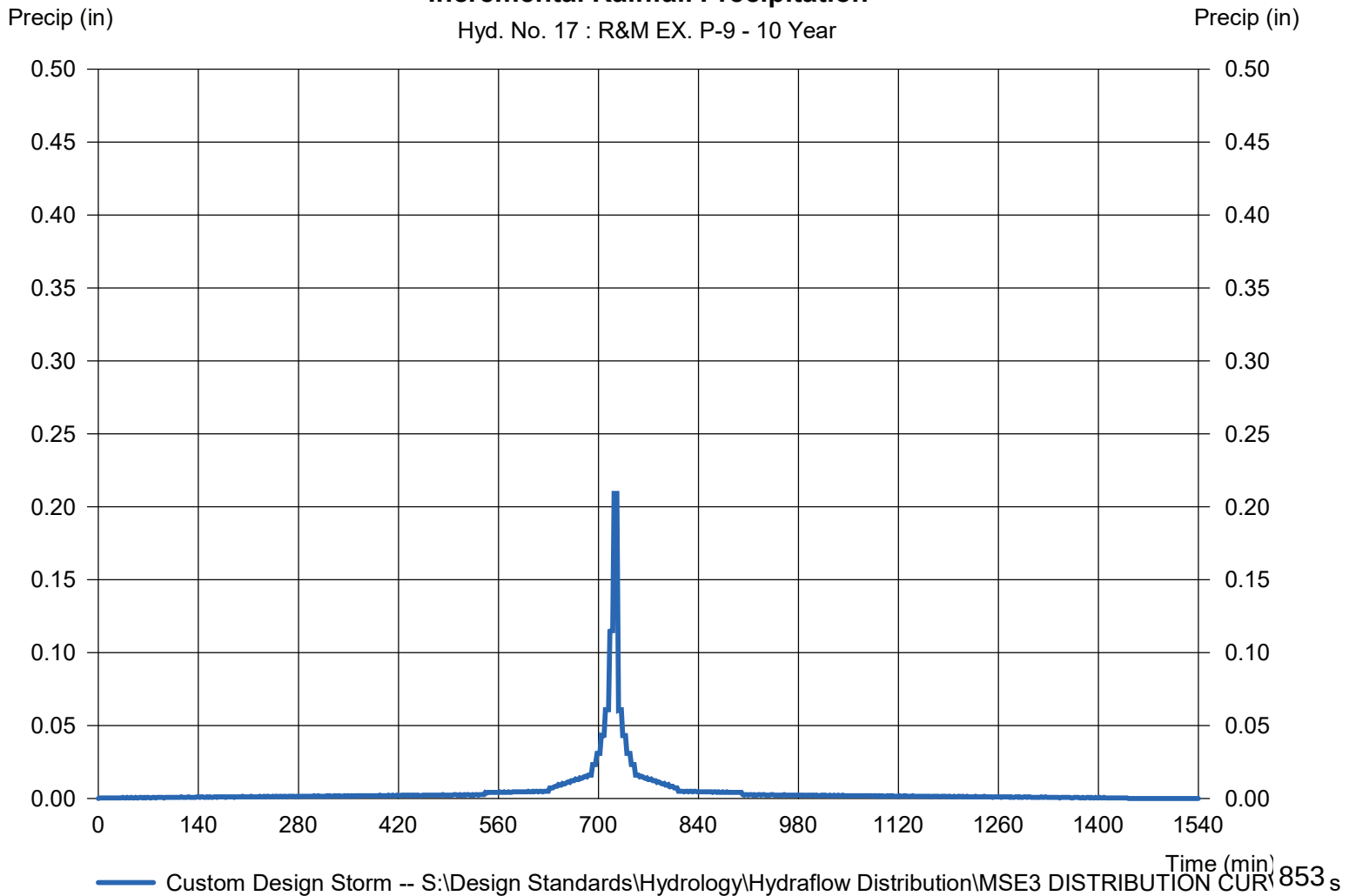
Hyd. No. 17

R&M EX. P-9

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 17 : R&M EX. P-9 - 10 Year



Hydrograph Report

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

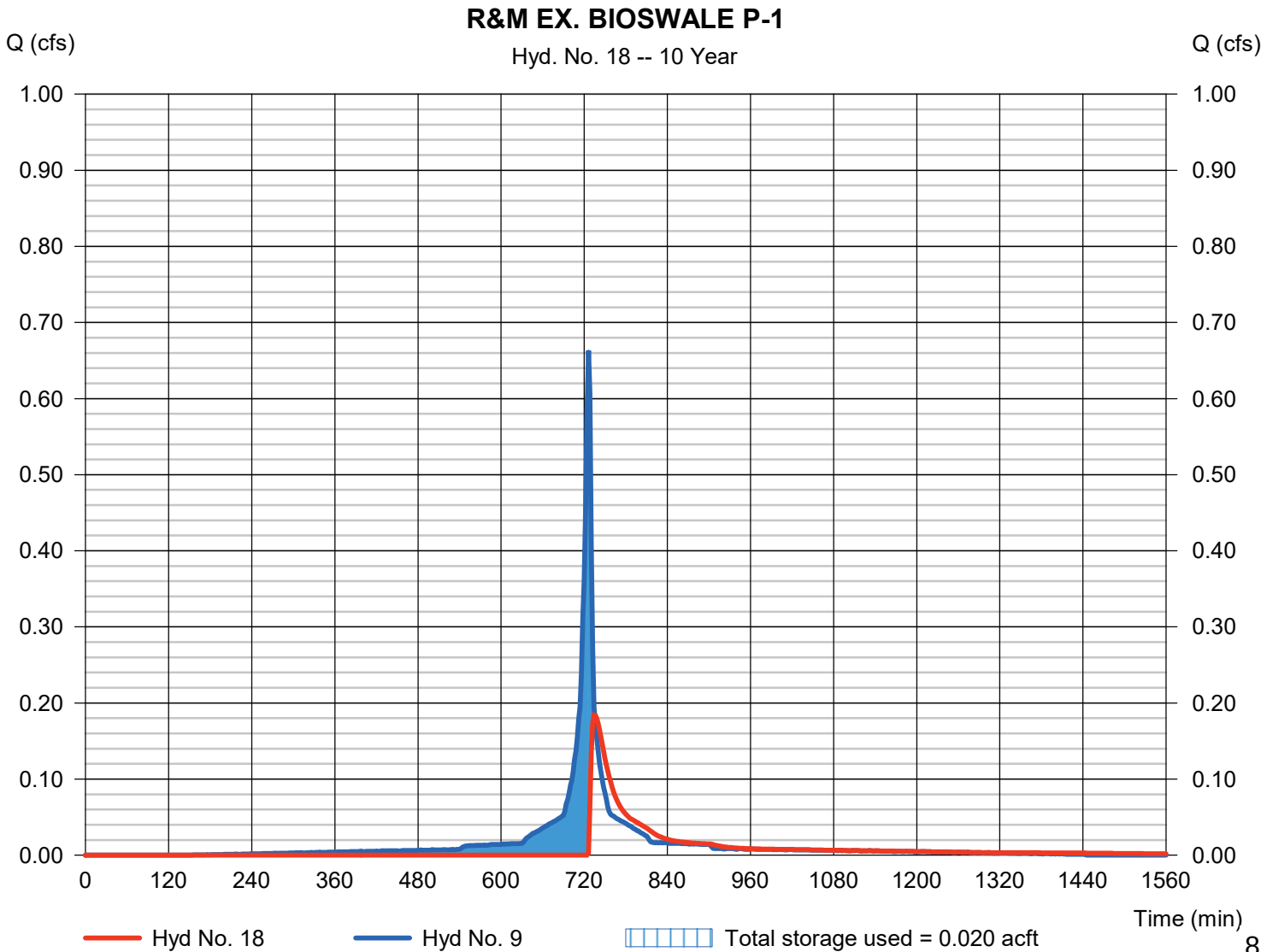
Friday, 06 / 28 / 2019

Hyd. No. 18

R&M EX. BIOSWALE P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.184 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 0.017 acft
Inflow hyd. No.	= 9 - R&M EX. P-1	Max. Elevation	= 851.73 ft
Reservoir name	= Ex. Bioswale P-1	Max. Storage	= 0.020 acft

Storage Indication method used.



Hydrograph Report

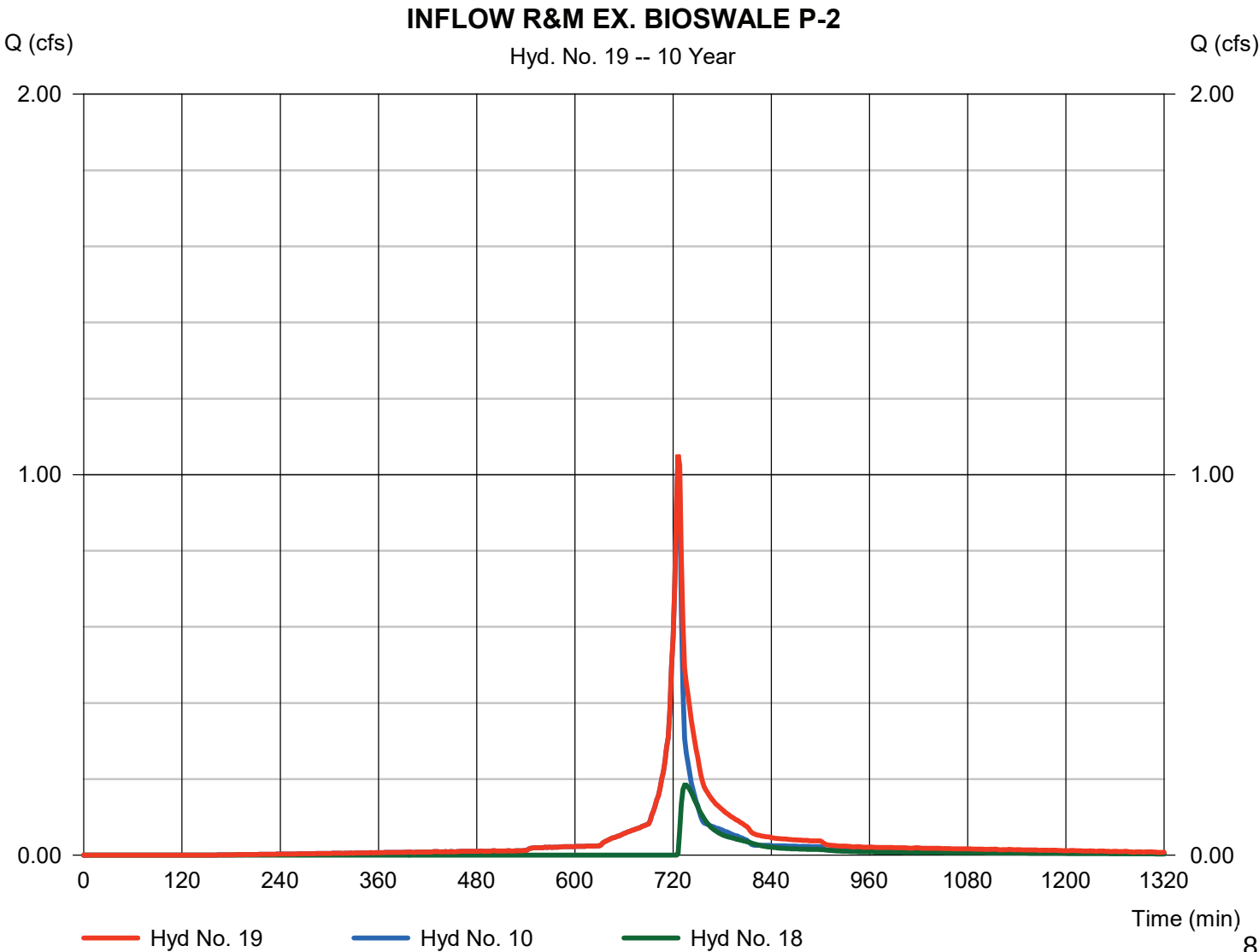
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 19

INFLOW R&M EX. BIOSWALE P-2

Hydrograph type	= Combine	Peak discharge	= 1.053 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.071 acft
Inflow hyds.	= 10, 18	Contrib. drain. area	= 0.190 ac



Hydrograph Report

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

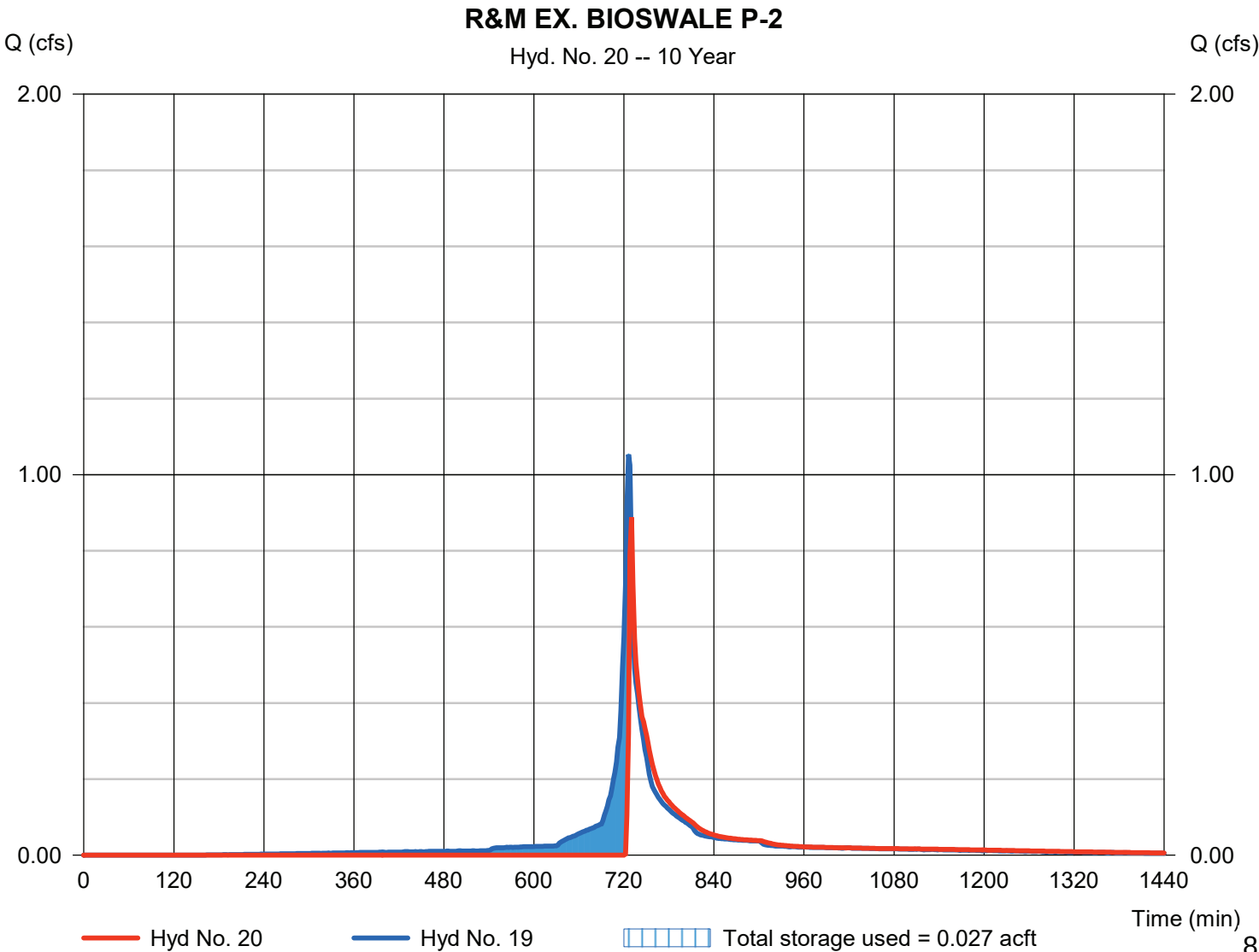
Friday, 06 / 28 / 2019

Hyd. No. 20

R&M EX. BIOSWALE P-2

Hydrograph type	= Reservoir	Peak discharge	= 0.888 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 0.049 acft
Inflow hyd. No.	= 19 - INFLOW R&M EX. BIOSWALE P-2	Max. Elevation	= 851.56 ft
Reservoir name	= Ex. Bioswale P-2	Max. Storage	= 0.027 acft

Storage Indication method used.



Hydrograph Report

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

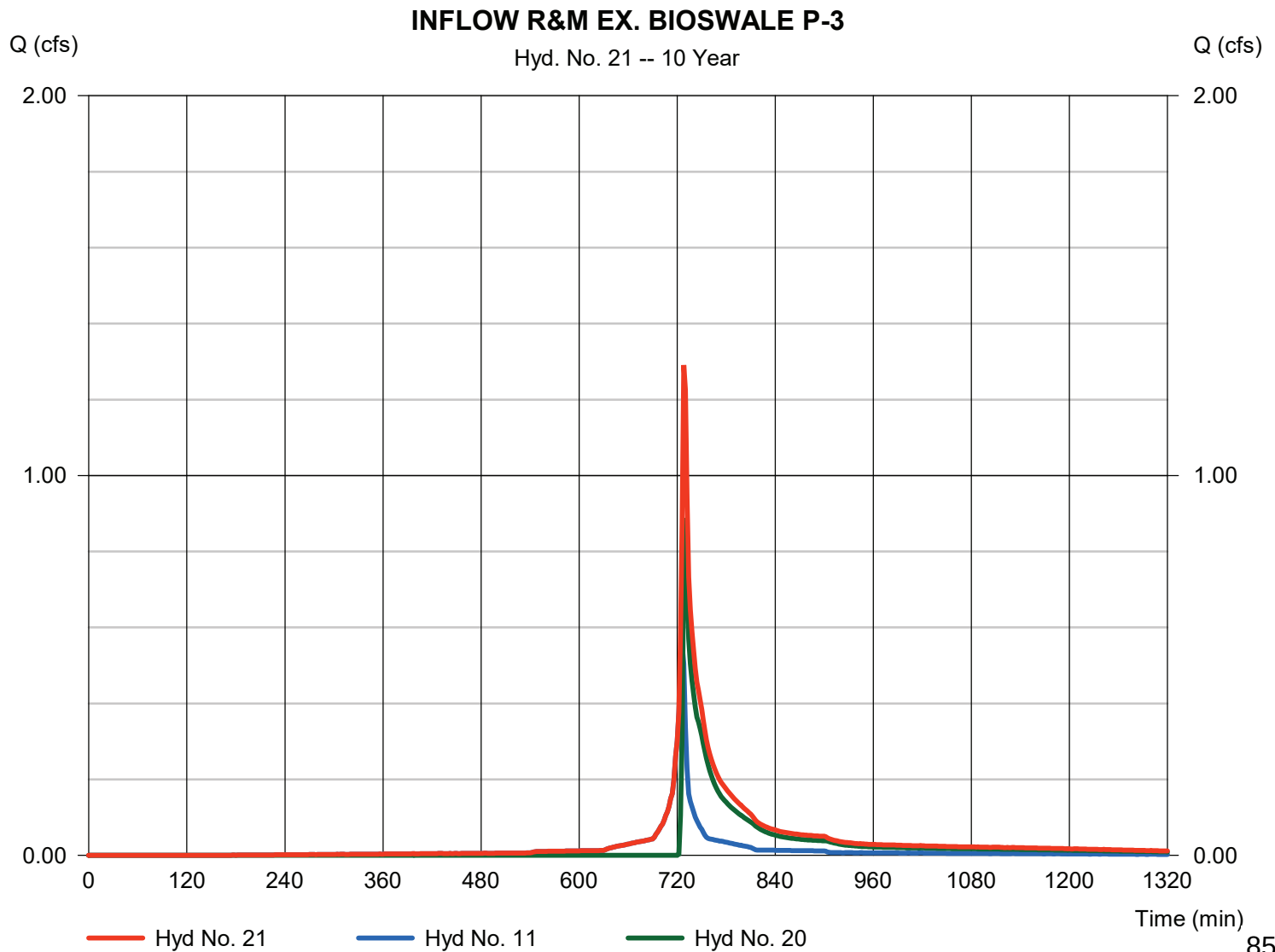
Friday, 06 / 28 / 2019

Hyd. No. 21

INFLOW R&M EX. BIOSWALE P-3

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 11, 20

Peak discharge = 1.291 cfs
Time to peak = 728 min
Hyd. volume = 0.077 acft
Contrib. drain. area = 0.100 ac



Hydrograph Report

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

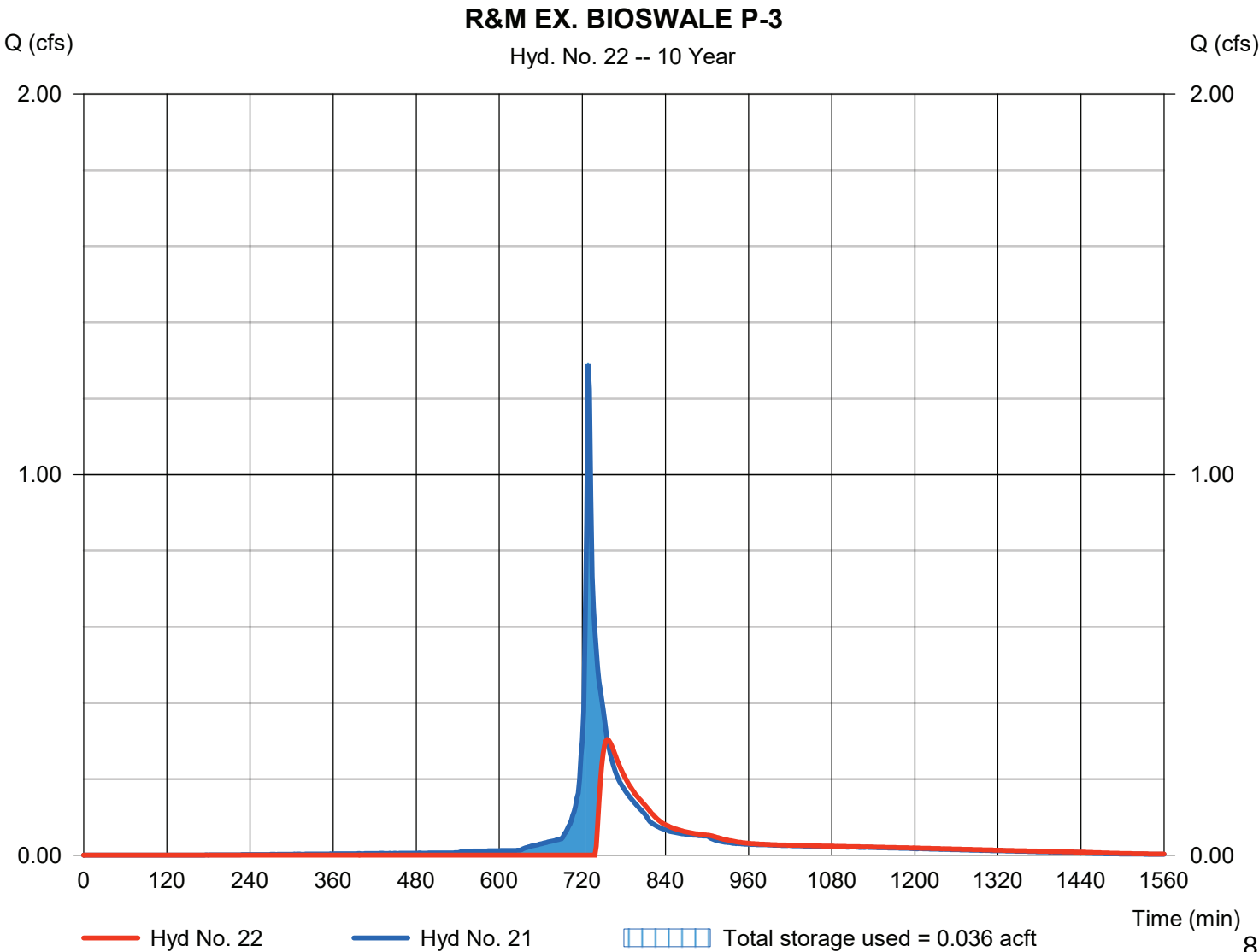
Friday, 06 / 28 / 2019

Hyd. No. 22

R&M EX. BIOSWALE P-3

Hydrograph type	= Reservoir	Peak discharge	= 0.303 cfs
Storm frequency	= 10 yrs	Time to peak	= 756 min
Time interval	= 2 min	Hyd. volume	= 0.046 acft
Inflow hyd. No.	= 21 - INFLOW R&M EX. BIOSWALE P-3	Max. Elevation	= 851.16 ft
Reservoir name	= Ex. Bioswale P-3	Max. Storage	= 0.036 acft

Storage Indication method used.



Hydrograph Report

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

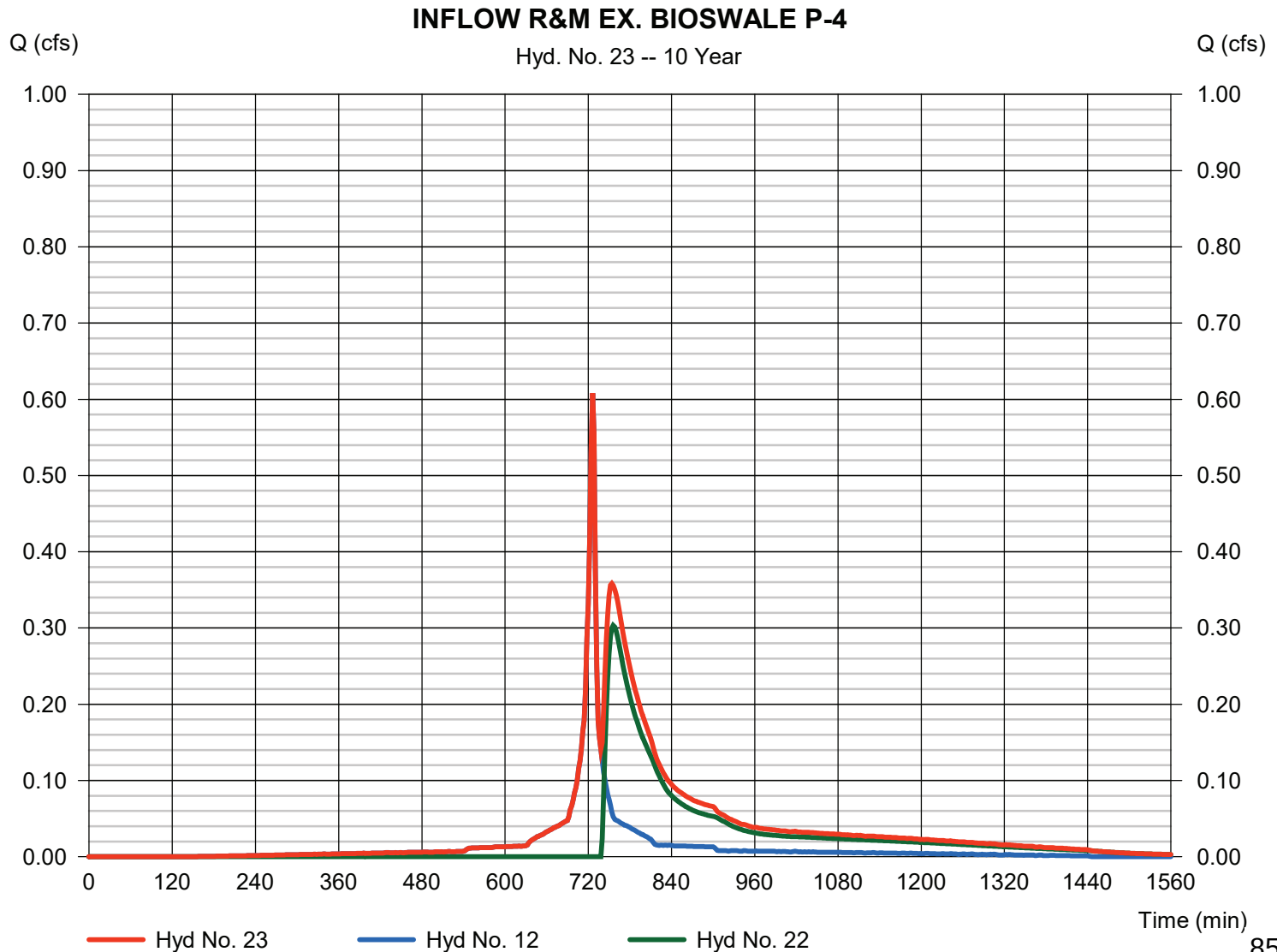
Friday, 06 / 28 / 2019

Hyd. No. 23

INFLOW R&M EX. BIOSWALE P-4

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 12, 22

Peak discharge = 0.608 cfs
Time to peak = 726 min
Hyd. volume = 0.077 acft
Contrib. drain. area = 0.110 ac



Hydrograph Report

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

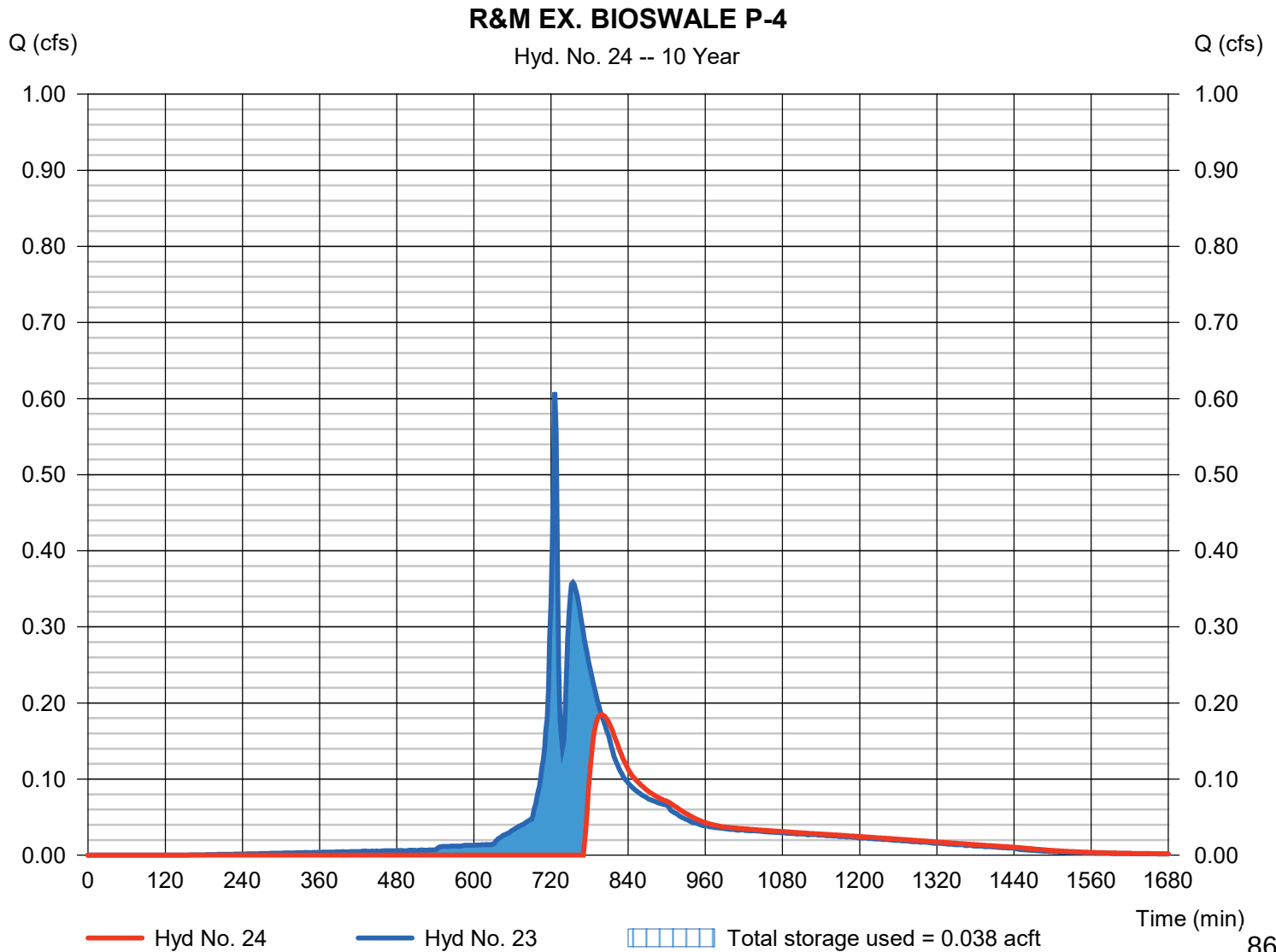
Friday, 06 / 28 / 2019

Hyd. No. 24

R&M EX. BIOSWALE P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.185 cfs
Storm frequency	= 10 yrs	Time to peak	= 798 min
Time interval	= 2 min	Hyd. volume	= 0.043 acft
Inflow hyd. No.	= 23 - INFLOW R&M EX. BIOSWALE P-4	Max. Elevation	= 850.30 ft
Reservoir name	= Ex. Bioswale P-4	Max. Storage	= 0.038 acft

Storage Indication method used.



Hydrograph Report

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

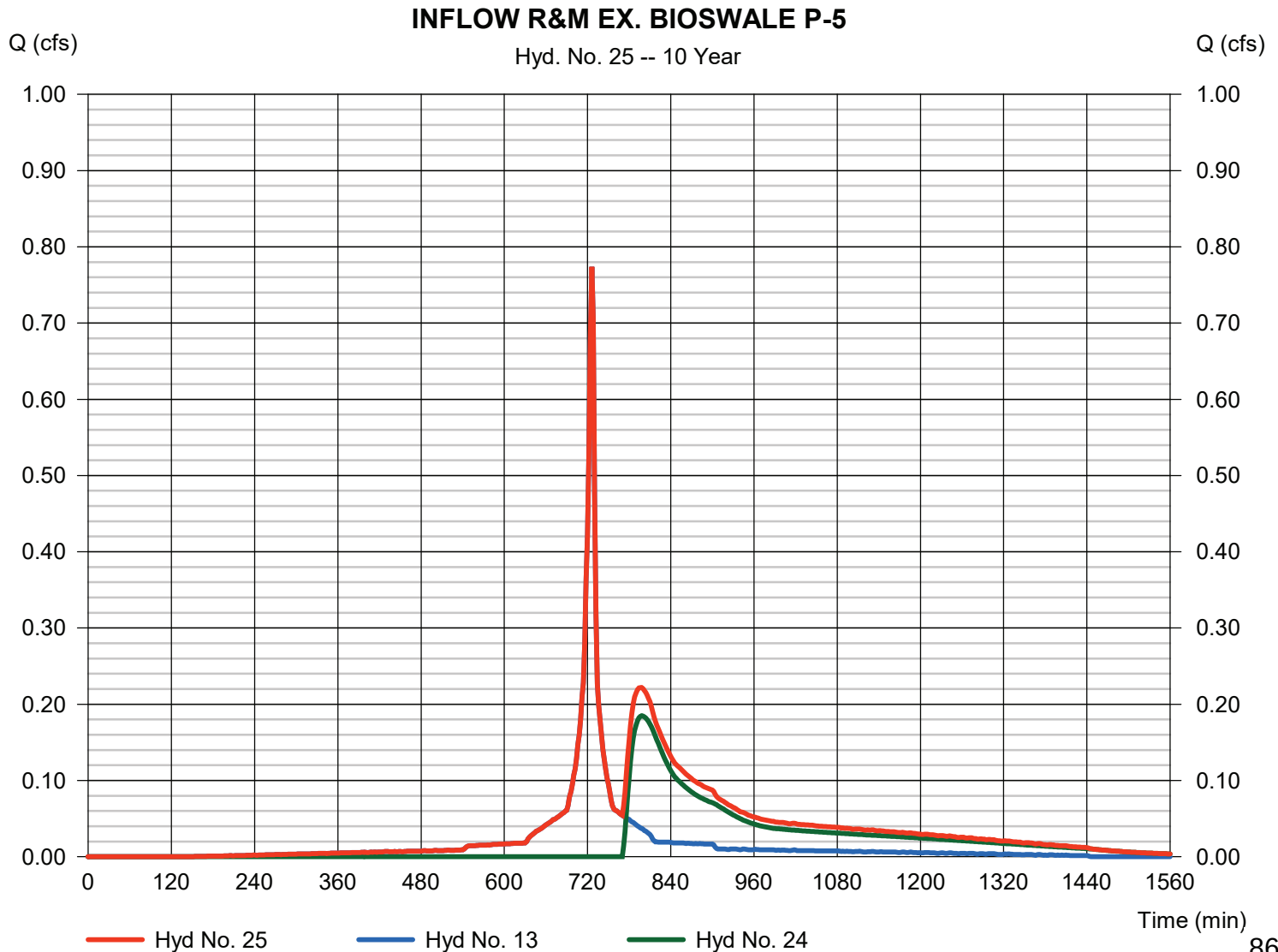
Friday, 06 / 28 / 2019

Hyd. No. 25

INFLOW R&M EX. BIOSWALE P-5

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 13, 24

Peak discharge = 0.774 cfs
 Time to peak = 726 min
 Hyd. volume = 0.082 acft
 Contrib. drain. area = 0.140 ac



Hydrograph Report

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

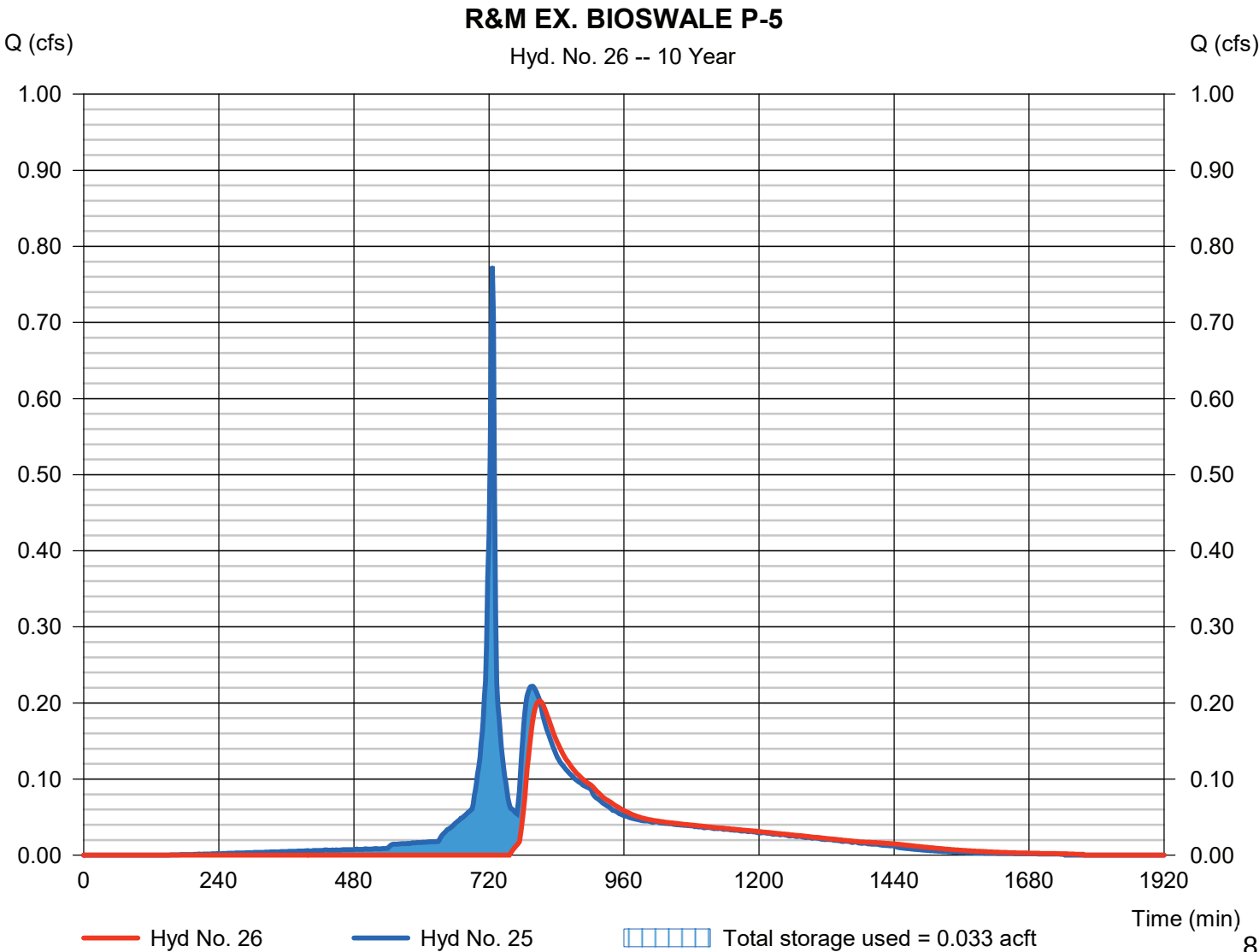
Friday, 06 / 28 / 2019

Hyd. No. 26

R&M EX. BIOSWALE P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.203 cfs
Storm frequency	= 10 yrs	Time to peak	= 810 min
Time interval	= 2 min	Hyd. volume	= 0.053 acft
Inflow hyd. No.	= 25 - INFLOW R&M EX. BIOSWALE P-5	Max. Elevation	= 848.82 ft
Reservoir name	= Ex. Bioswale P-5	Max. Storage	= 0.033 acft

Storage Indication method used.



Hydrograph Report

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

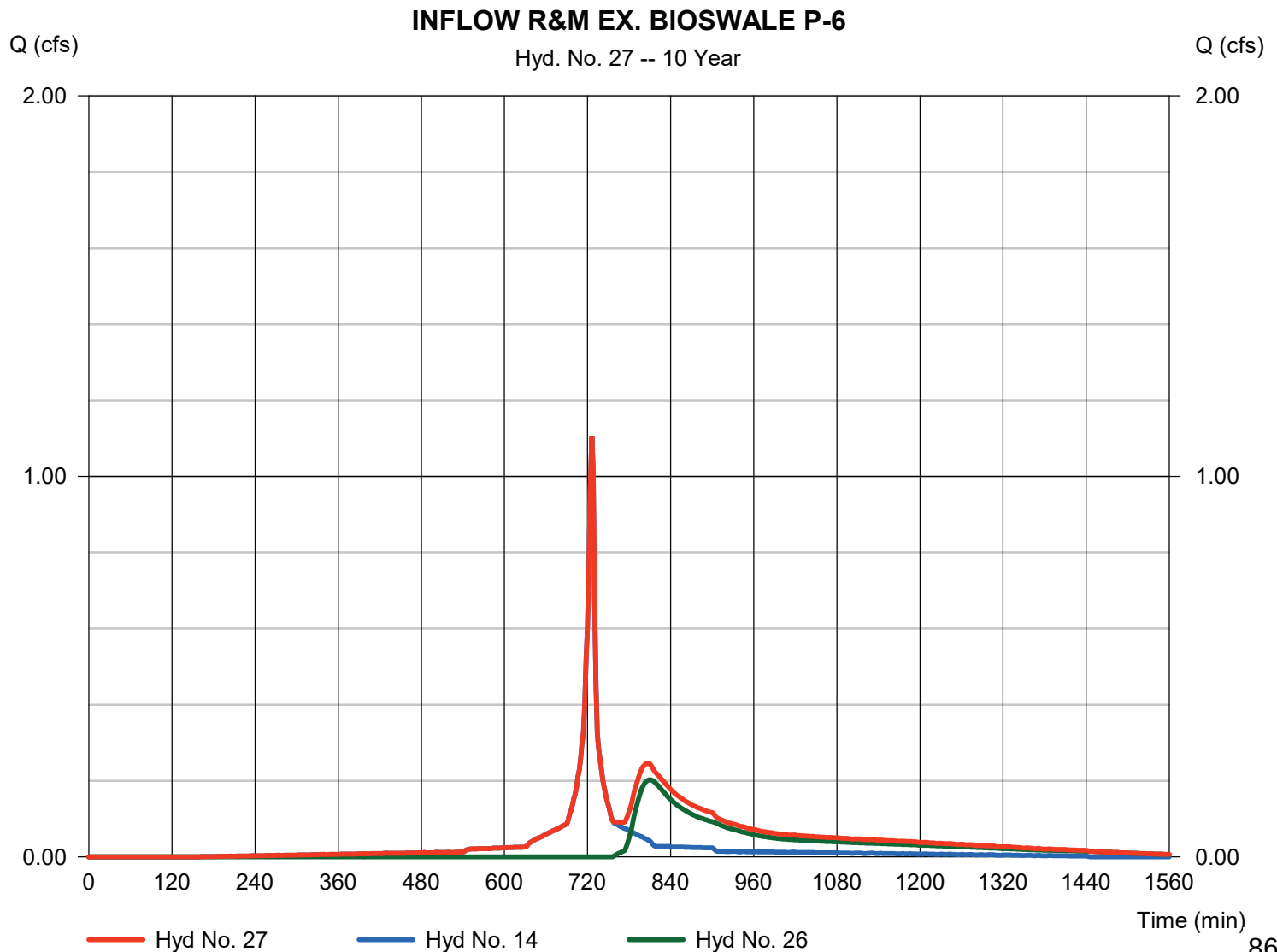
Friday, 06 / 28 / 2019

Hyd. No. 27

INFLOW R&M EX. BIOSWALE P-6

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 14, 26

Peak discharge = 1.105 cfs
Time to peak = 726 min
Hyd. volume = 0.109 acft
Contrib. drain. area = 0.200 ac



Hydrograph Report

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

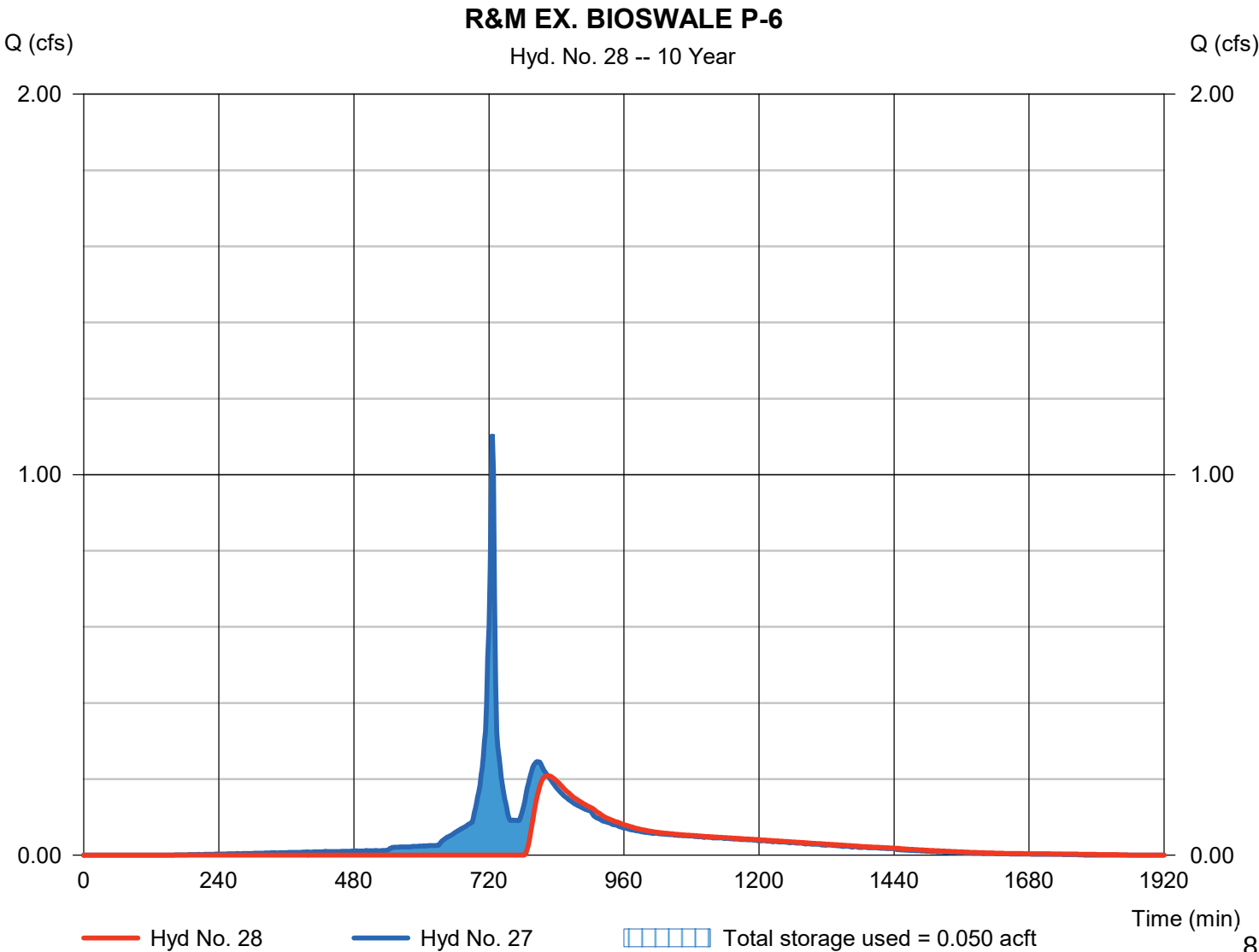
Friday, 06 / 28 / 2019

Hyd. No. 28

R&M EX. BIOSWALE P-6

Hydrograph type	= Reservoir	Peak discharge	= 0.209 cfs
Storm frequency	= 10 yrs	Time to peak	= 824 min
Time interval	= 2 min	Hyd. volume	= 0.064 acft
Inflow hyd. No.	= 27 - INFLOW R&M EX. BIOSWALE P-6	Max. Elevation	= 847.76 ft
Reservoir name	= Ex. Bioswale P-6	Max. Storage	= 0.050 acft

Storage Indication method used.



Hydrograph Report

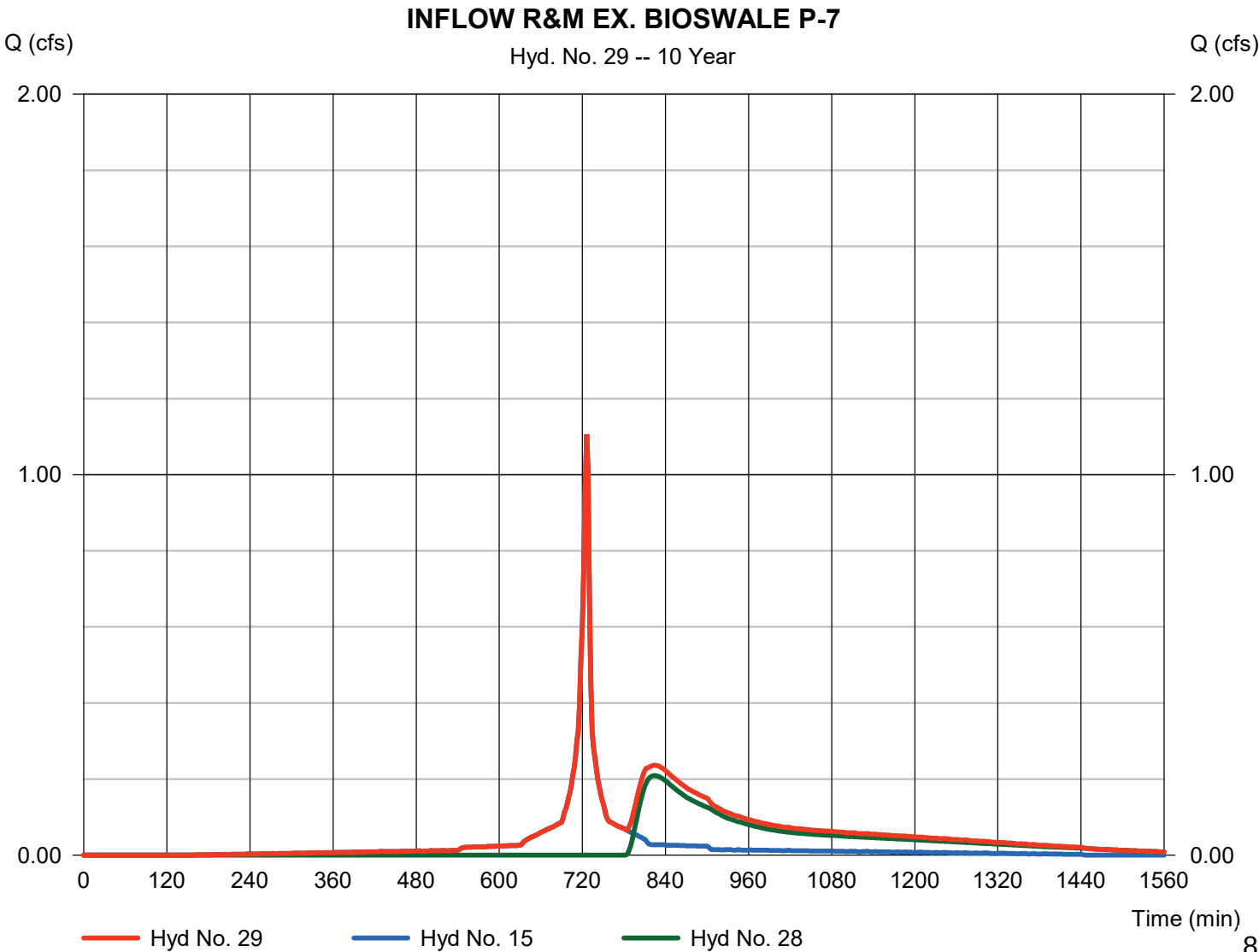
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 29

INFLOW R&M EX. BIOSWALE P-7

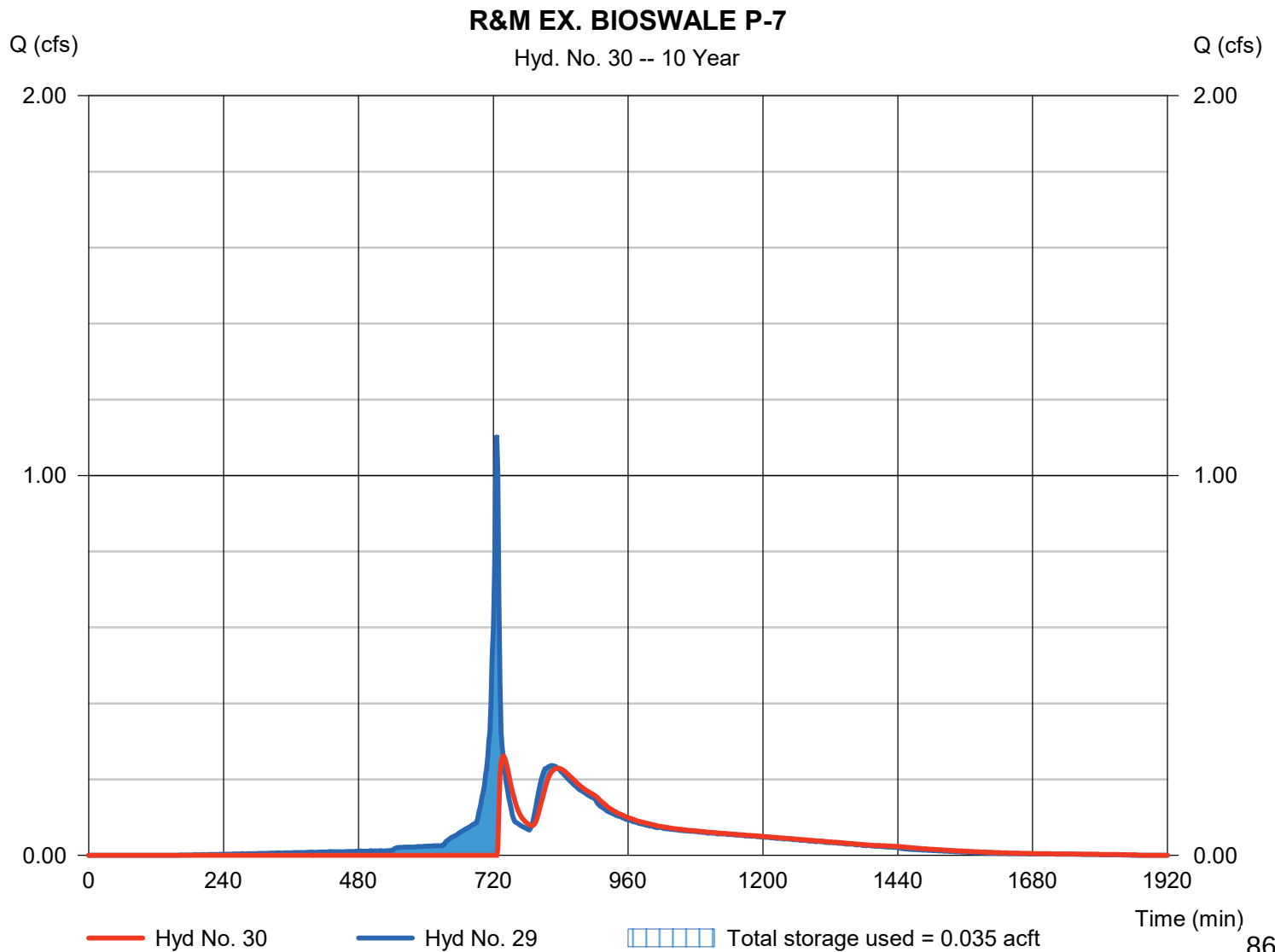
Hydrograph type	= Combine	Peak discharge	= 1.105 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.120 acft
Inflow hyds.	= 15, 28	Contrib. drain. area	= 0.200 ac



R&M EX. BIOSWALE P-7

Hydrograph type	= Reservoir	Peak discharge	= 0.261 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.089 acft
Inflow hyd. No.	= 29 - INFLOW R&M EX. BIOSWALE P-7	WAE Elevation	= 845.49 ft
Reservoir name	= Ex. Bioswale P-7	Max. Storage	= 0.035 acft

Storage Indication method used.



Hydrograph Report

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

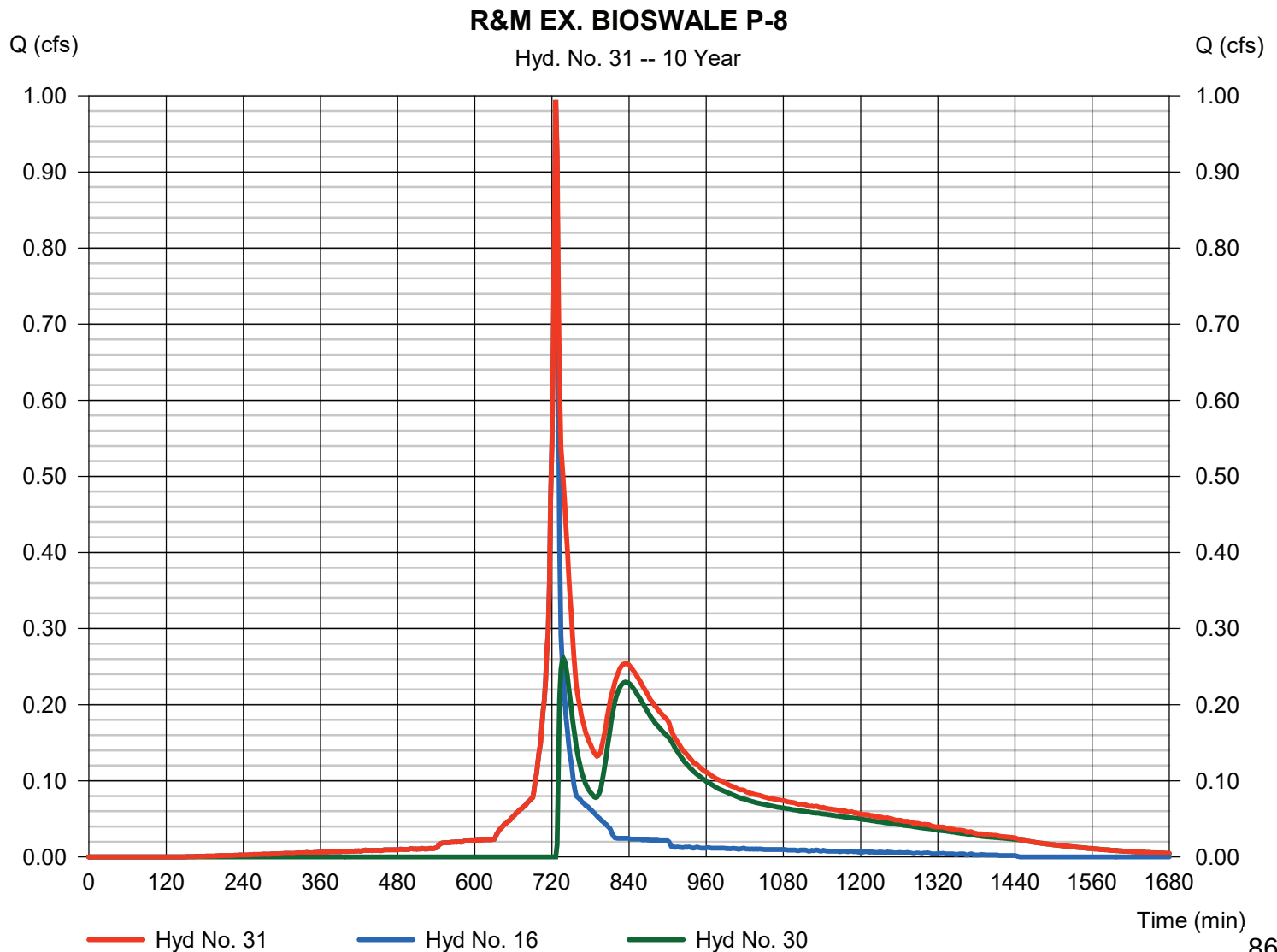
Friday, 06 / 28 / 2019

Hyd. No. 31

R&M EX. BIOSWALE P-8

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 16, 30

Peak discharge = 0.995 cfs
 Time to peak = 726 min
 Hyd. volume = 0.140 acft
 Contrib. drain. area = 0.180 ac



Hydrograph Report

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

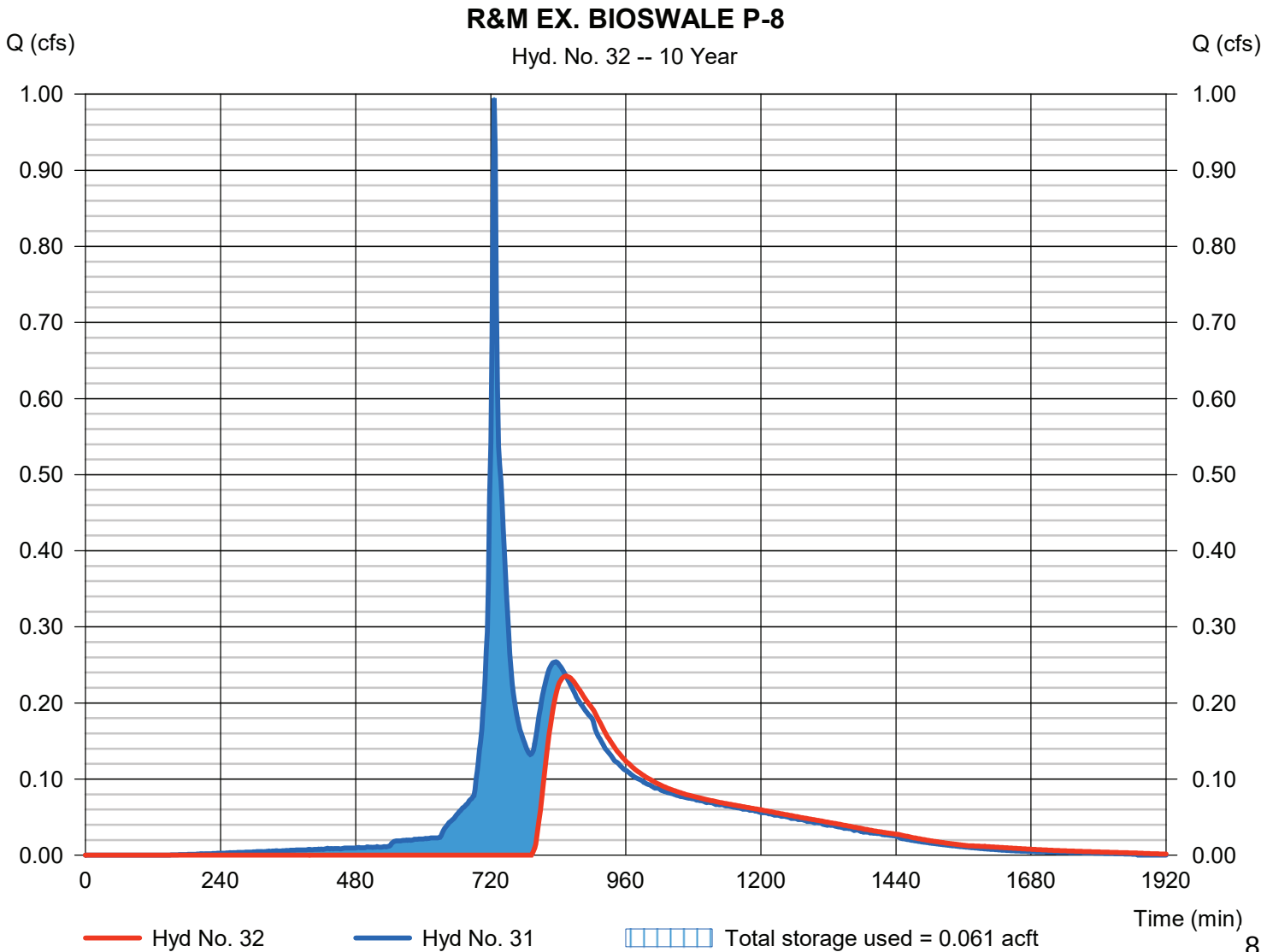
Friday, 06 / 28 / 2019

Hyd. No. 32

R&M EX. BIOSWALE P-8

Hydrograph type	= Reservoir	Peak discharge	= 0.235 cfs
Storm frequency	= 10 yrs	Time to peak	= 854 min
Time interval	= 2 min	Hyd. volume	= 0.086 acft
Inflow hyd. No.	= 31 - R&M EX. BIOSWALE P-8	Max. Elevation	= 844.97 ft
Reservoir name	= Ex. Bioswale P-8	Max. Storage	= 0.061 acft

Storage Indication method used.



Hydrograph Report

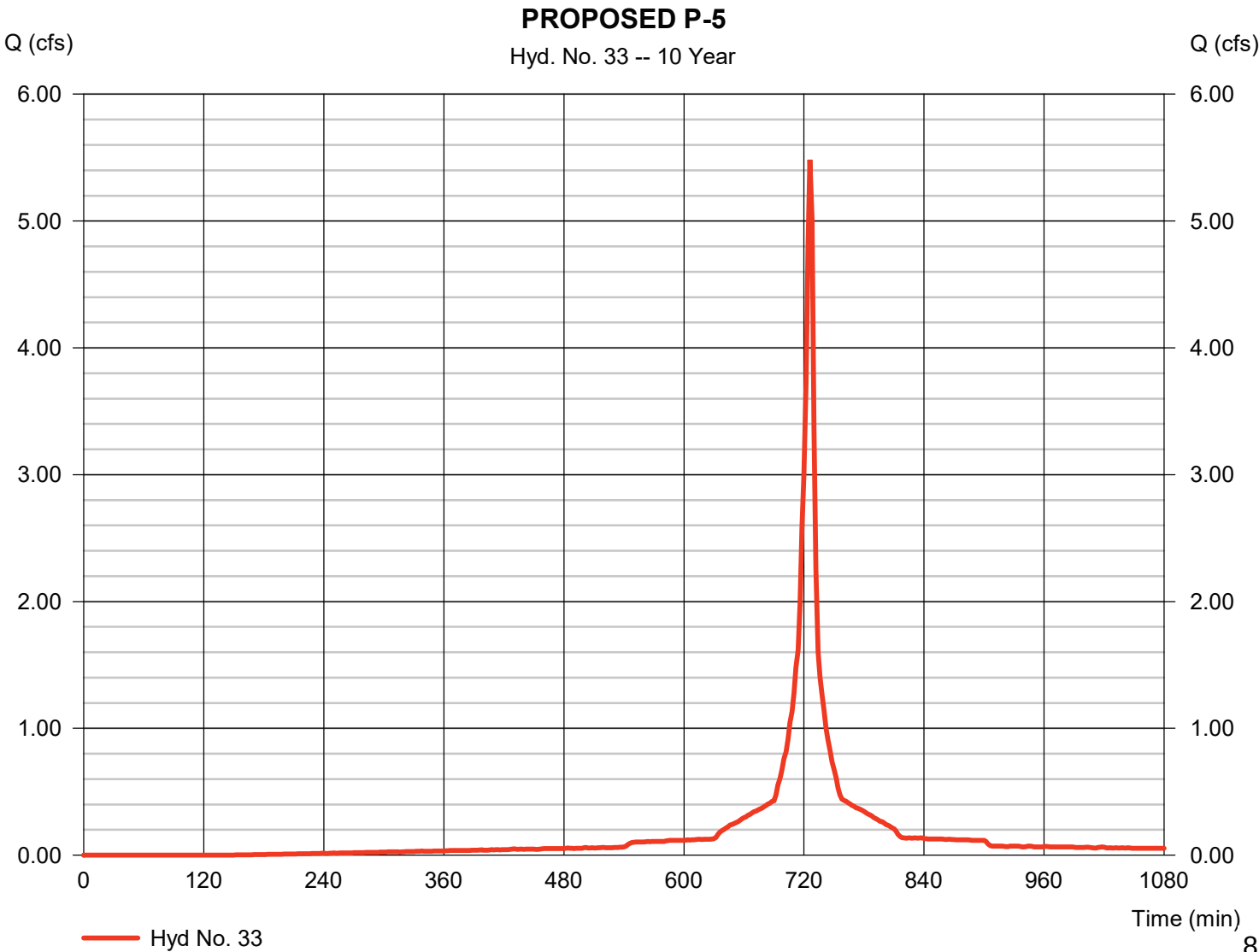
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 5.483 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.277 acft
Drainage area	= 0.992 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

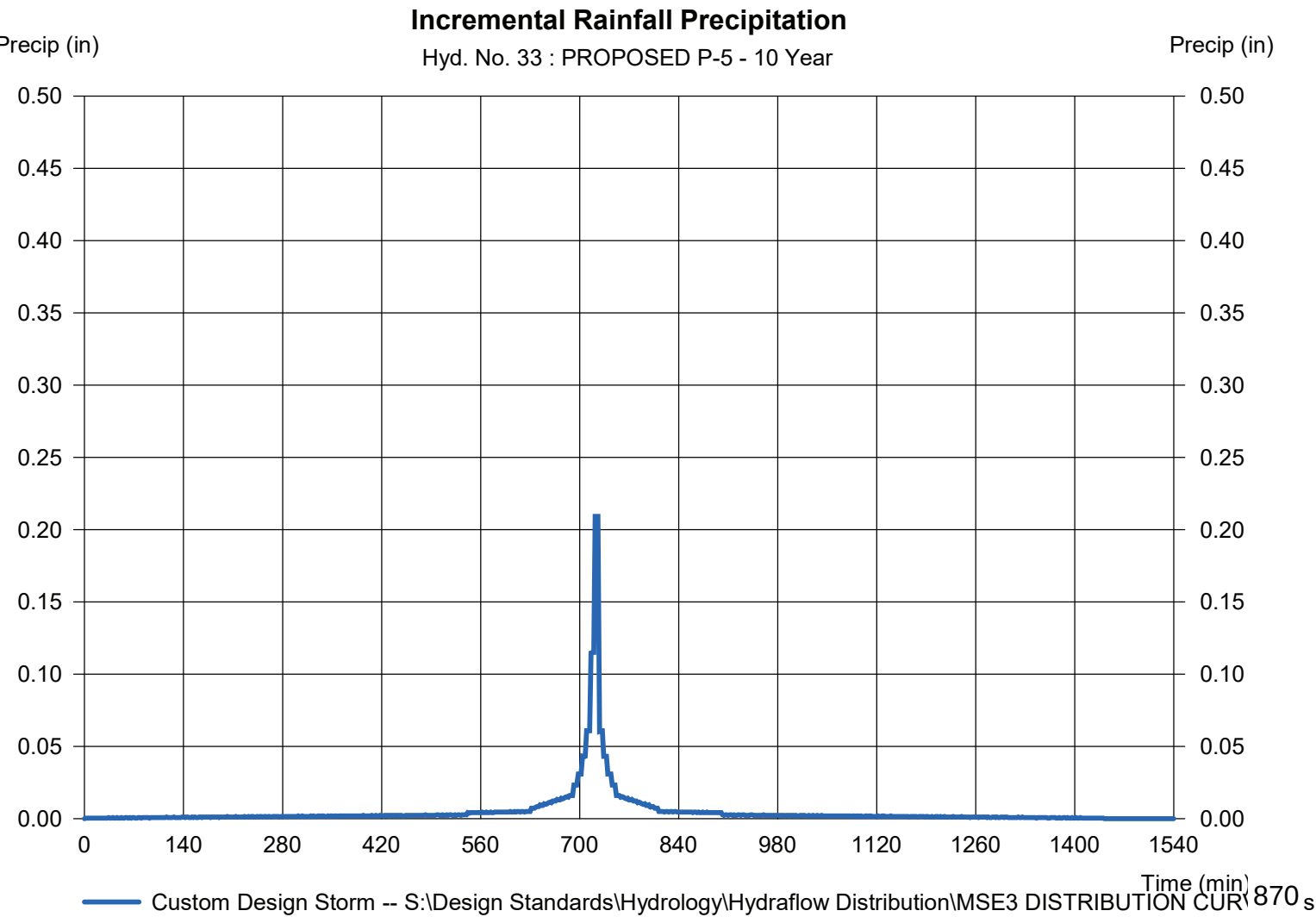
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

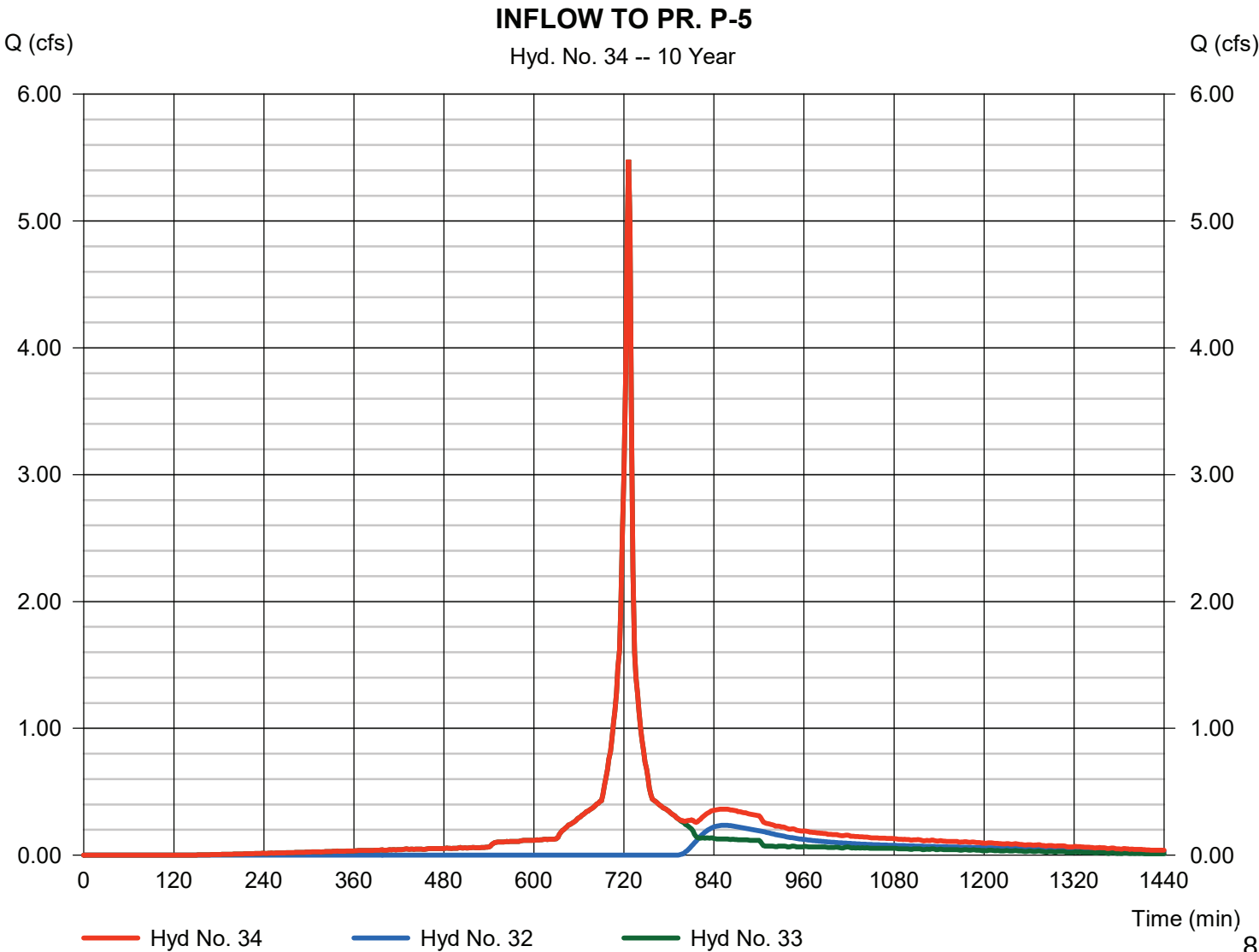
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 34

INFLOW TO PR. P-5

Hydrograph type	= Combine	Peak discharge	= 5.483 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.363 acft
Inflow hyds.	= 32, 33	Contrib. drain. area	= 0.992 ac



Hydrograph Report

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

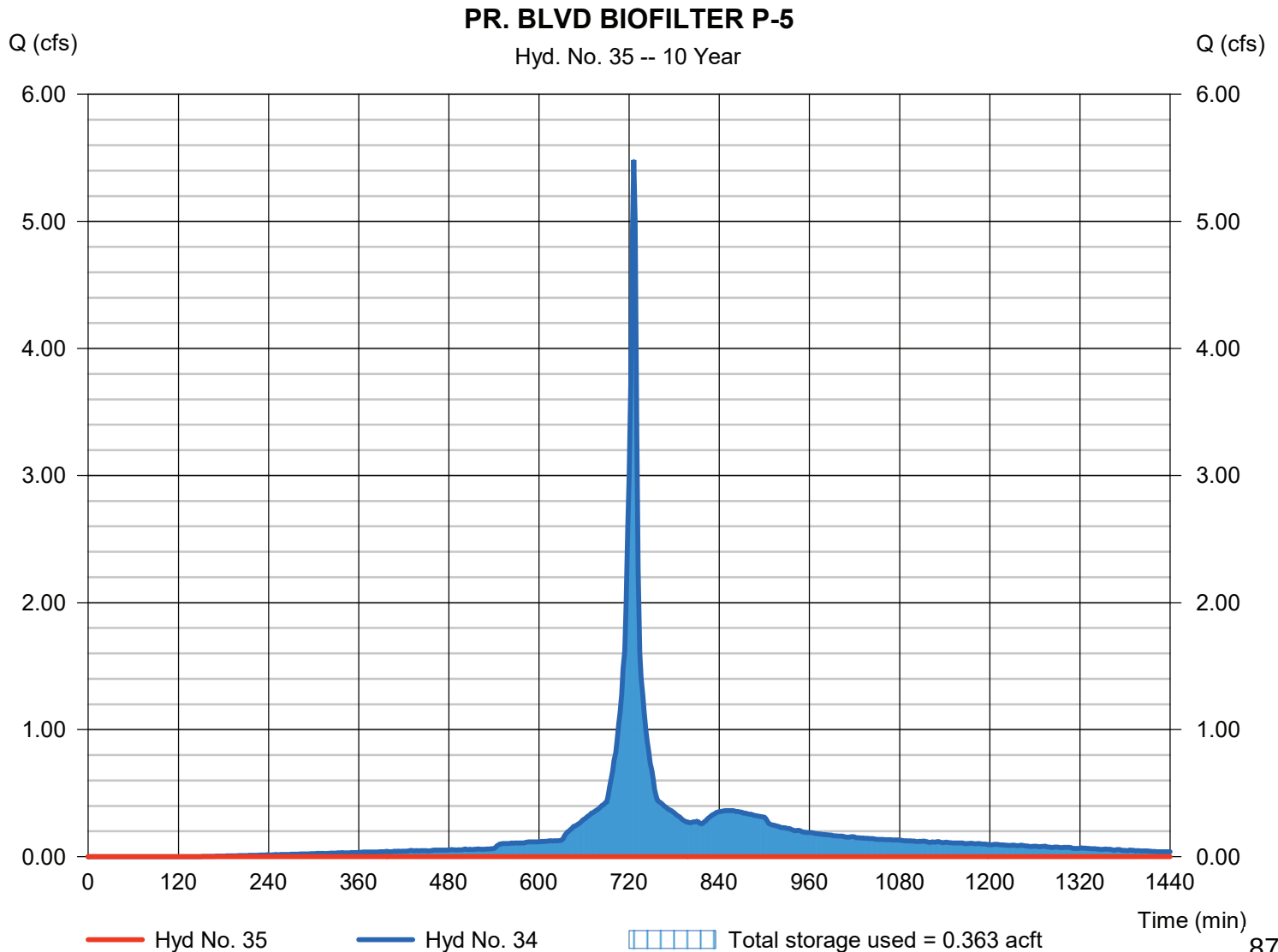
Friday, 06 / 28 / 2019

Hyd. No. 35

PR. BLVD BIOFILTER P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 34 - INFLOW TO PR. P-5	Max. Elevation	= 843.50 ft
Reservoir name	= BLVD BIOFILTER P-5	Max. Storage	= 0.363 acft

Storage Indication method used.



Hydrograph Report

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

Friday, 06 / 28 / 2019

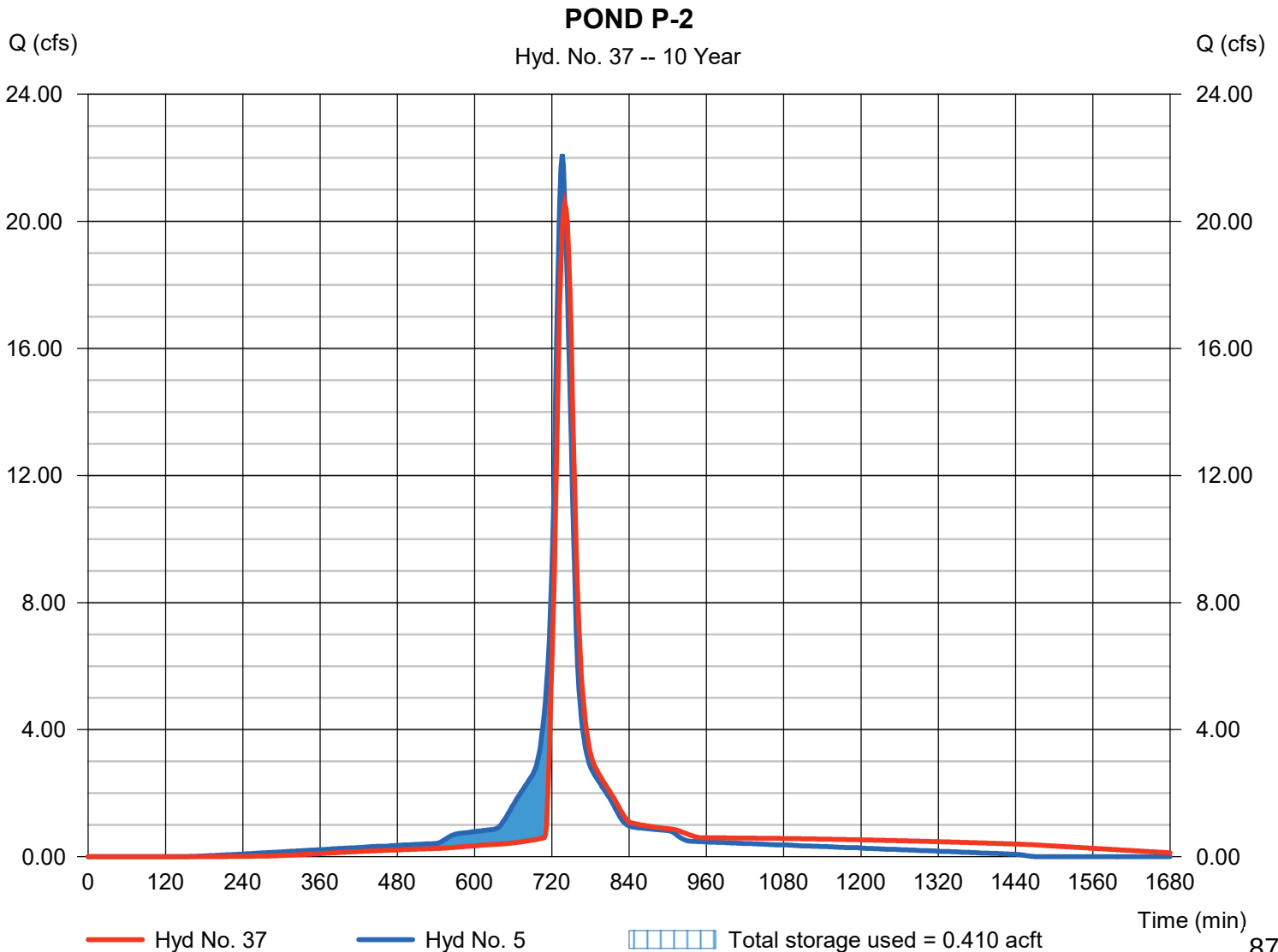
Hyd. No. 37

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 5 - P-2
 Reservoir name = POND P-2

Peak discharge = 20.57 cfs
 Time to peak = 740 min
 Hyd. volume = 1.922 acft
 Max. Elevation = 839.94 ft
 Max. Storage = 0.410 acft

Storage Indication method used.



Hydrograph Report

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

Friday, 06 / 28 / 2019

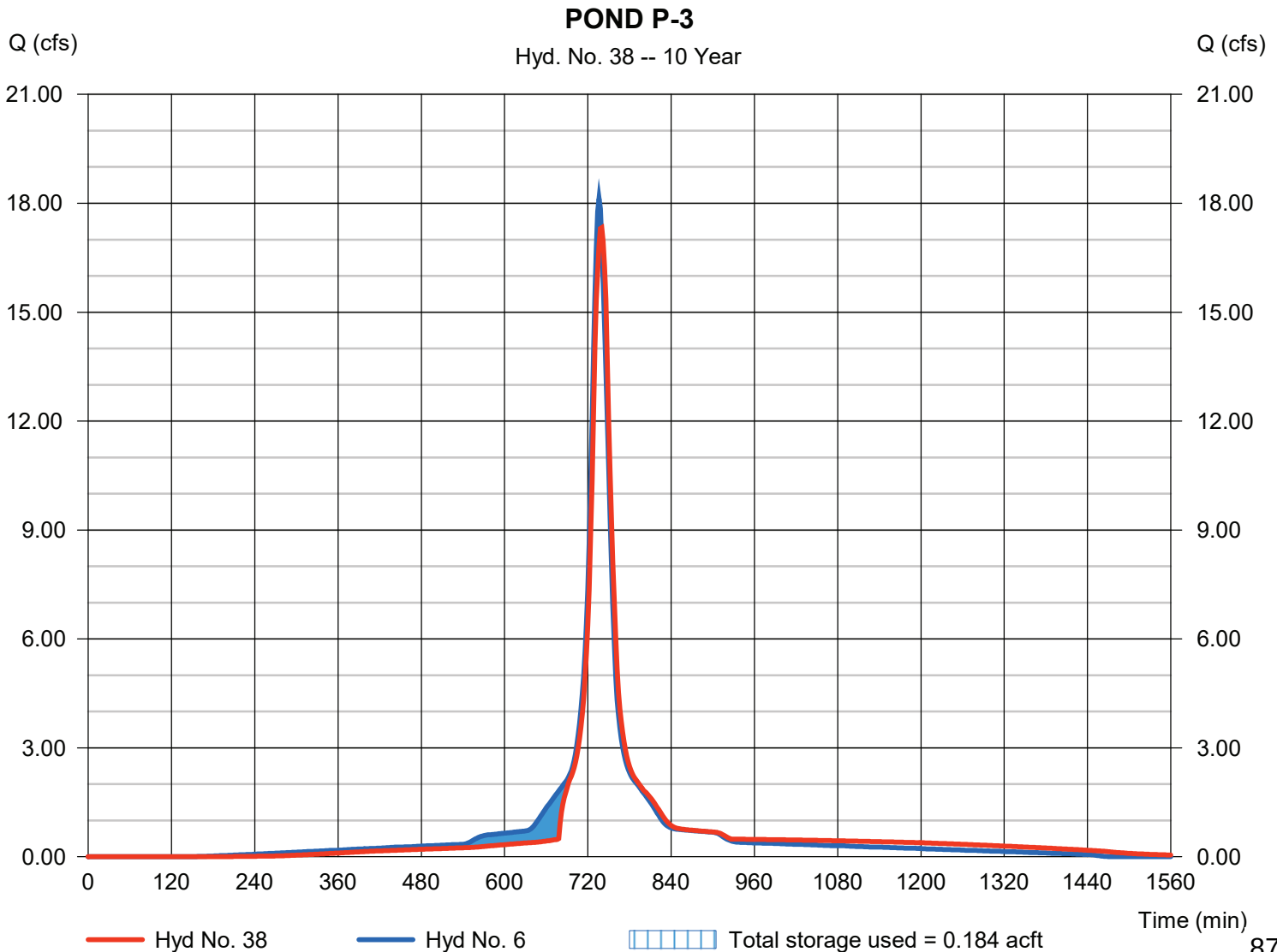
Hyd. No. 38

POND P-3

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-3
 Reservoir name = POND P-3

Peak discharge = 17.33 cfs
 Time to peak = 740 min
 Hyd. volume = 1.576 acft
 Max. Elevation = 840.10 ft
 Max. Storage = 0.184 acft

Storage Indication method used.



Hydrograph Report

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

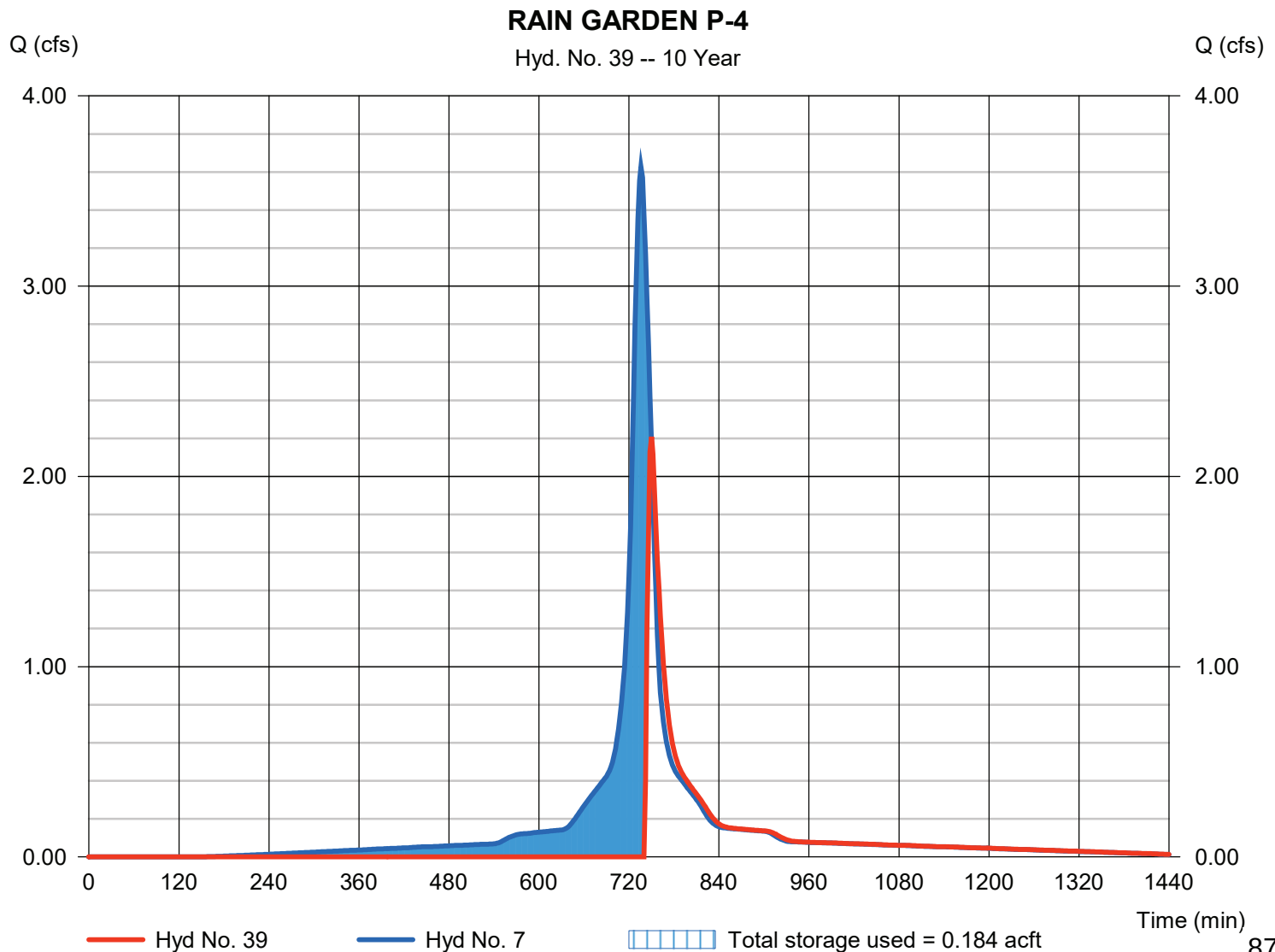
Friday, 06 / 28 / 2019

Hyd. No. 39

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 2.208 cfs
Storm frequency	= 10 yrs	Time to peak	= 750 min
Time interval	= 2 min	Hyd. volume	= 0.146 acft
Inflow hyd. No.	= 7 - P-4	Max. Elevation	= 840.82 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 0.184 acft

Storage Indication method used.



Hydrograph Report

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

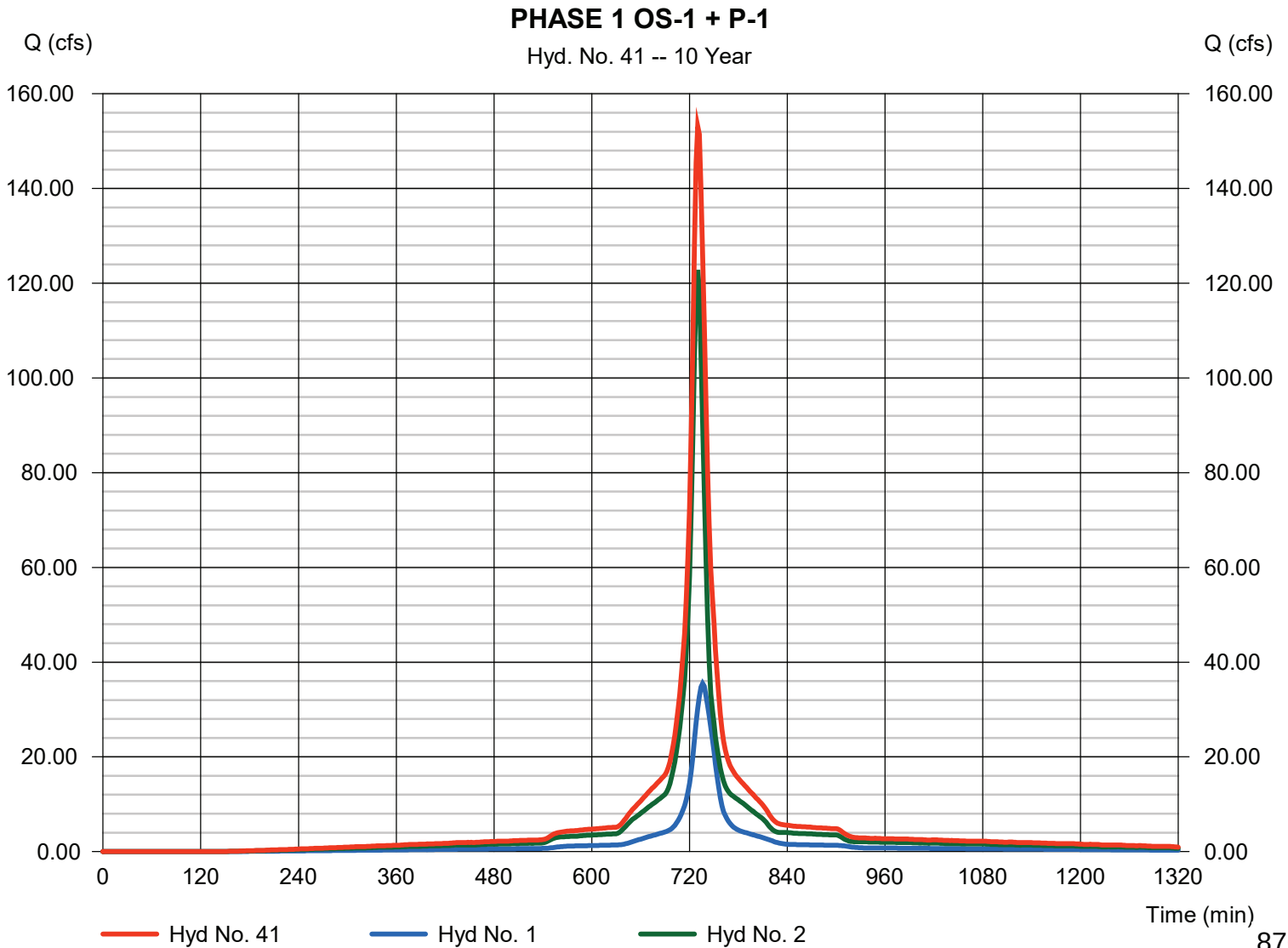
Friday, 06 / 28 / 2019

Hyd. No. 41

PHASE 1 OS-1 + P-1

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 1, 2

Peak discharge = 153.10 cfs
Time to peak = 730 min
Hyd. volume = 11.342 acft
Contrib. drain. area = 37.042 ac



Hydrograph Report

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

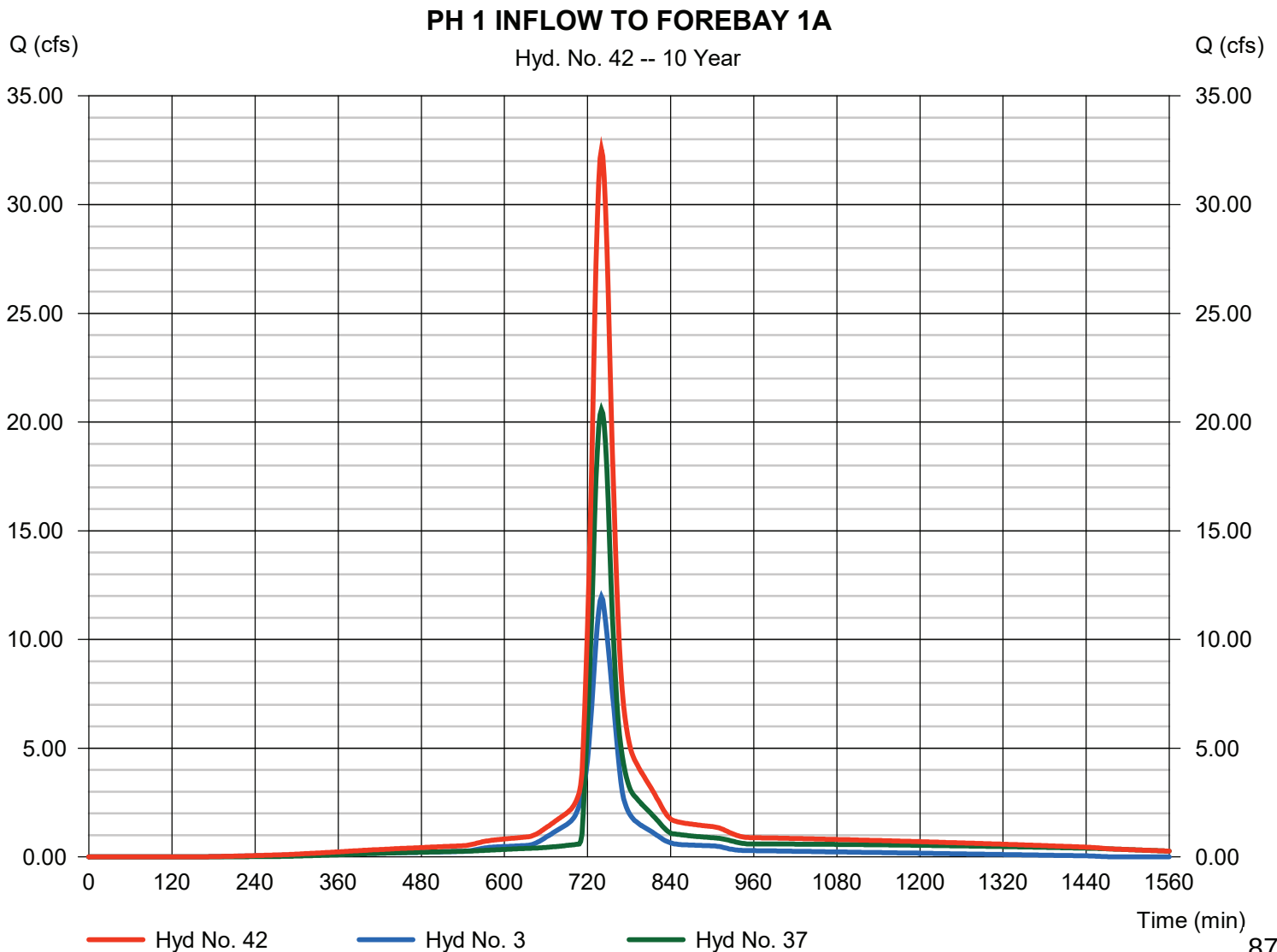
Friday, 06 / 28 / 2019

Hyd. No. 42

PH 1 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 3, 37

Peak discharge = 32.53 cfs
Time to peak = 740 min
Hyd. volume = 3.098 acft
Contrib. drain. area = 3.947 ac



Hydrograph Report

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

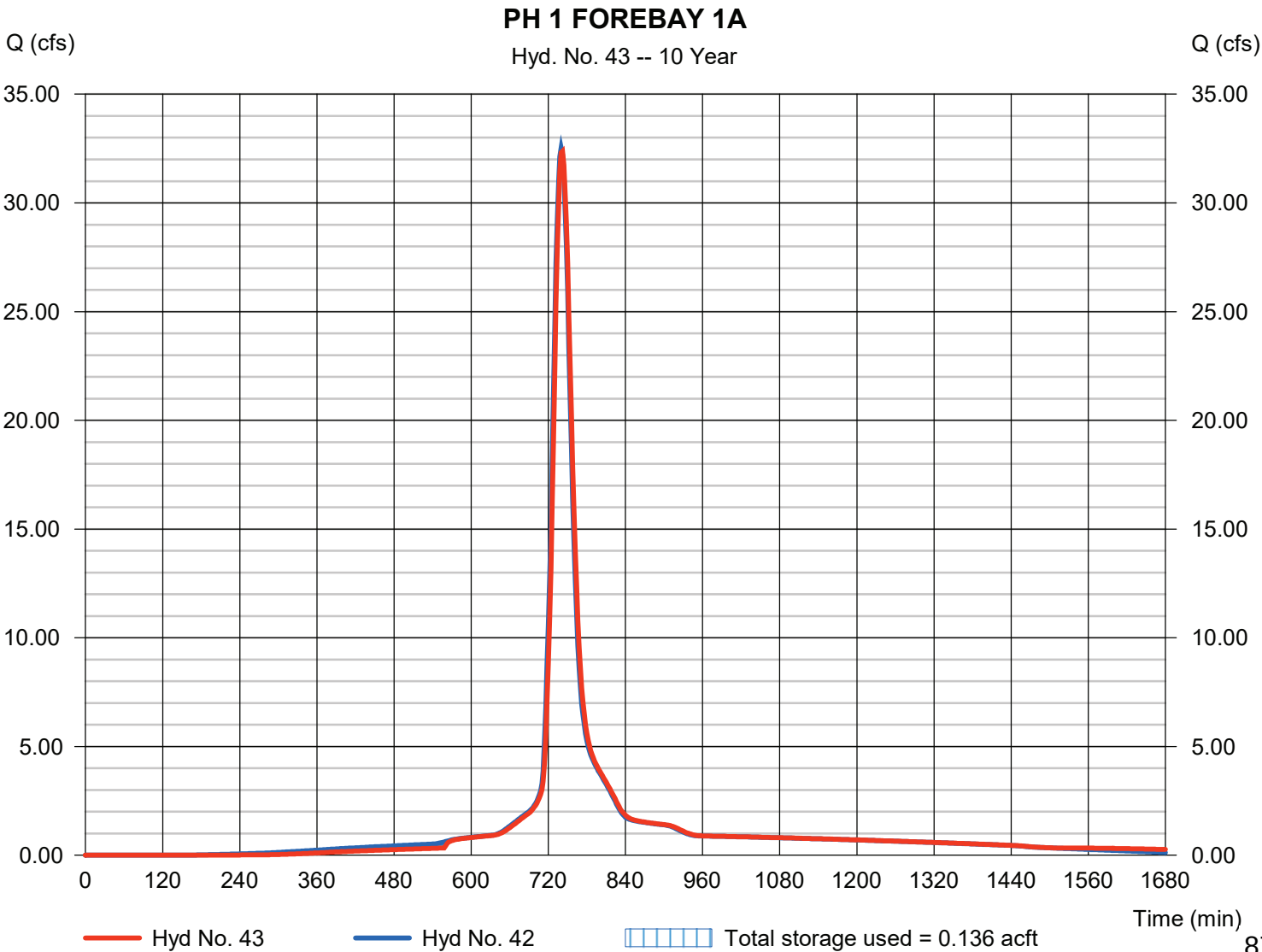
Friday, 06 / 28 / 2019

Hyd. No. 43

PH 1 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 32.38 cfs
Storm frequency	= 10 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 3.098 acft
Inflow hyd. No.	= 42 - PH 1 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.52 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 0.136 acft

Storage Indication method used.



Hydrograph Report

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

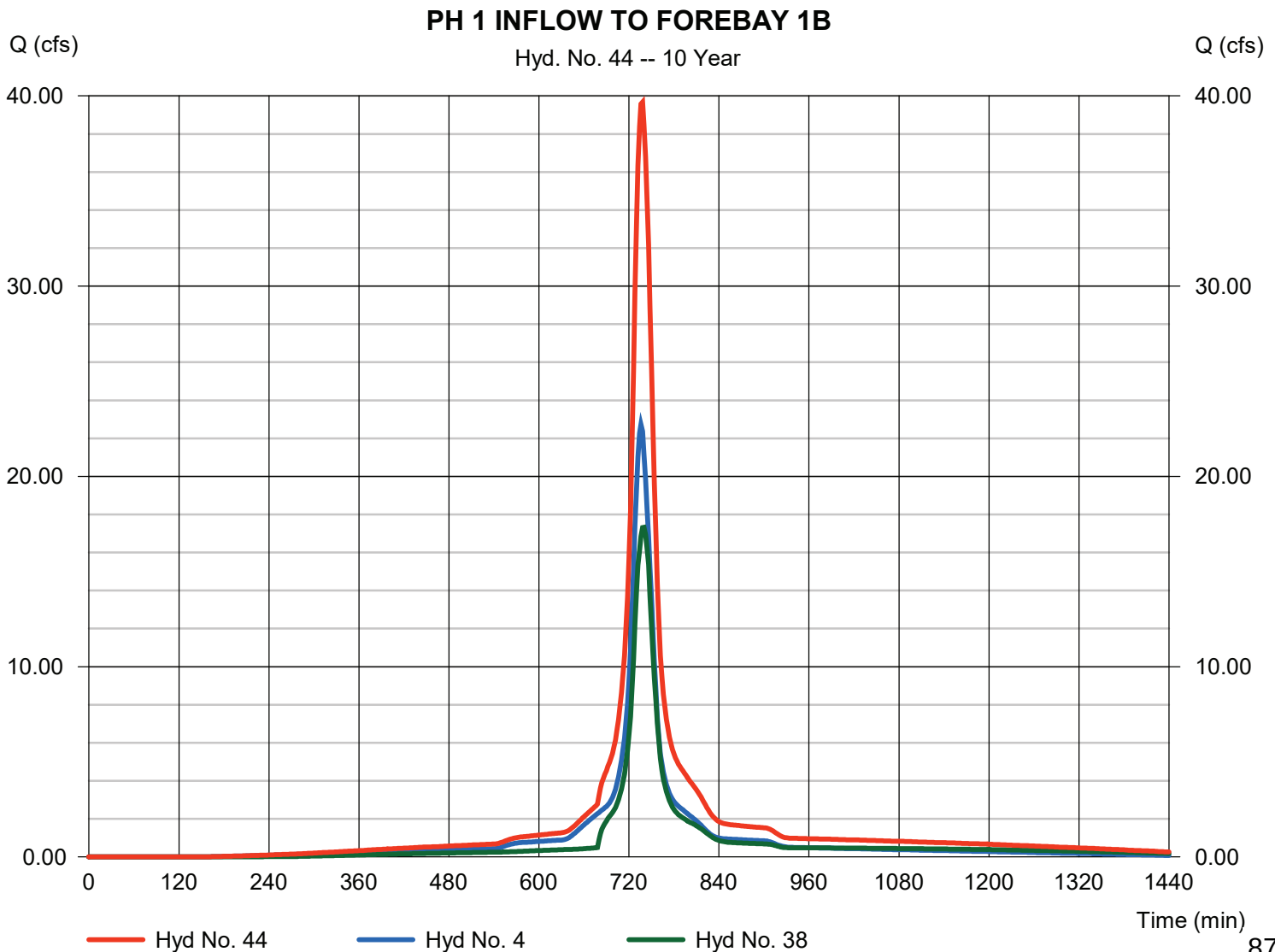
Friday, 06 / 28 / 2019

Hyd. No. 44

PH 1 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 4, 38

Peak discharge = 39.67 cfs
Time to peak = 738 min
Hyd. volume = 3.553 acft
Contrib. drain. area = 6.516 ac



Hydrograph Report

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

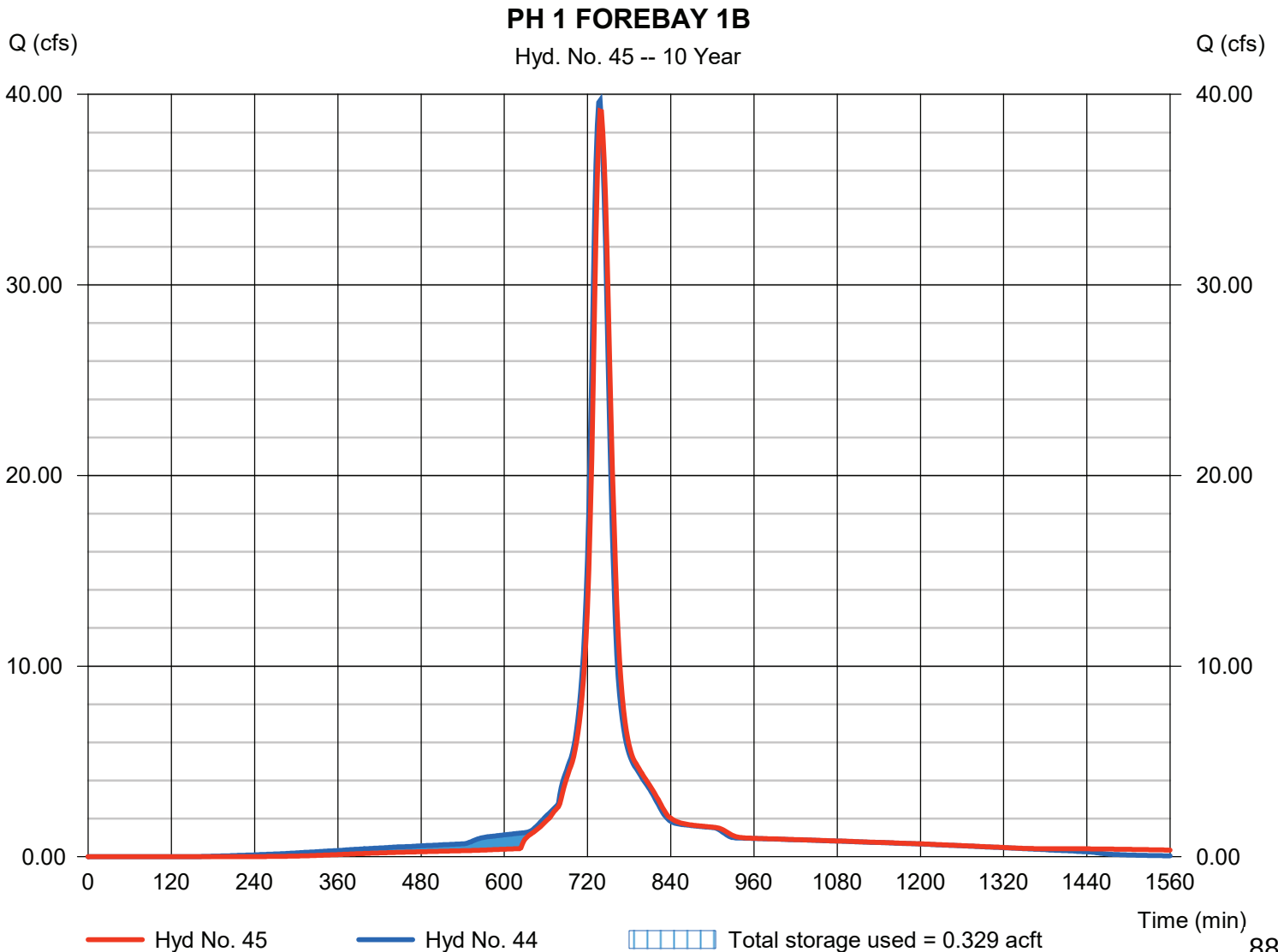
Friday, 06 / 28 / 2019

Hyd. No. 45

PH 1 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 39.13 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 3.552 acft
Inflow hyd. No.	= 44 - PH 1 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.52 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 0.329 acft

Storage Indication method used.



Hydrograph Report

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

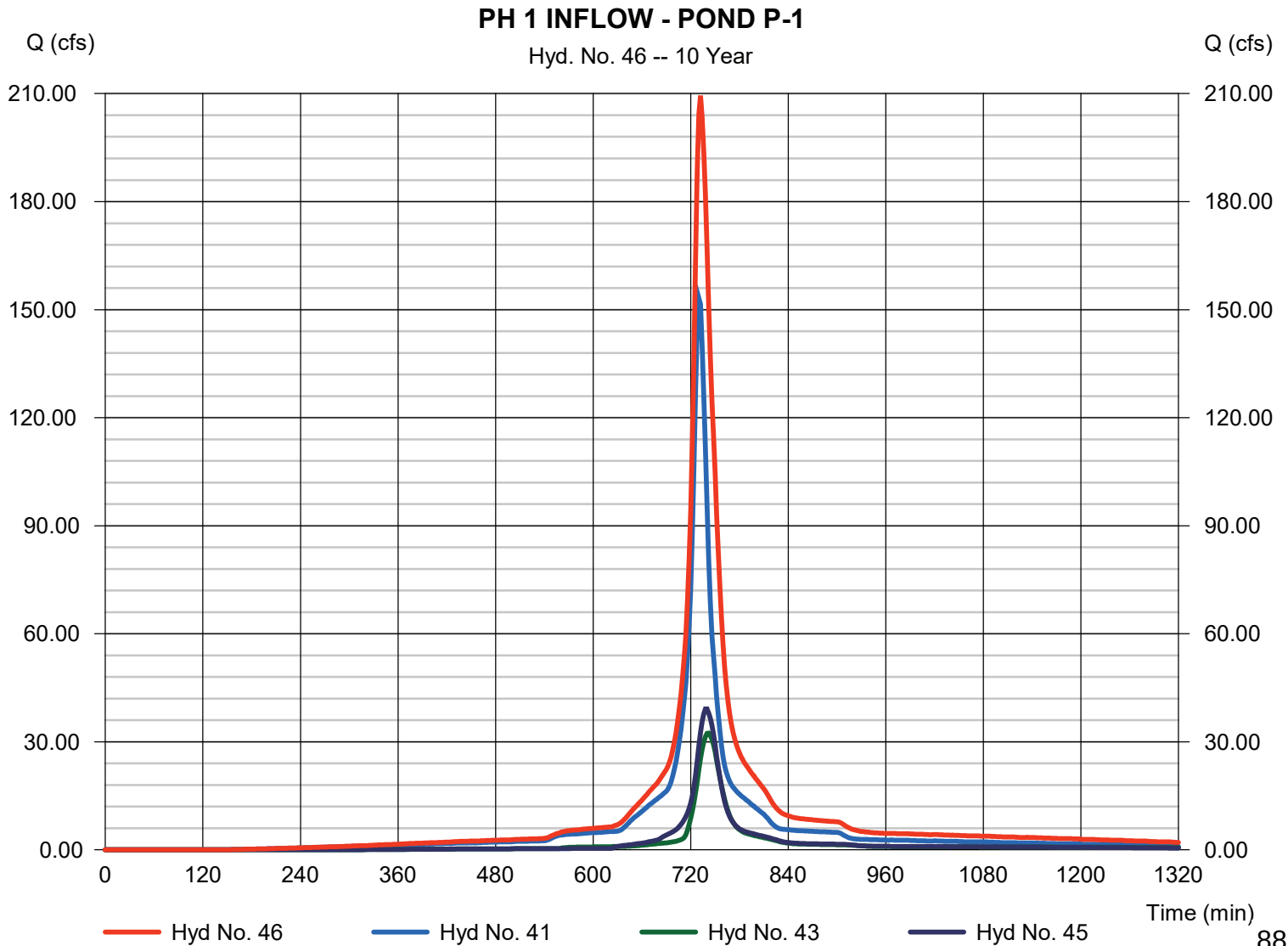
Friday, 06 / 28 / 2019

Hyd. No. 46

PH 1 INFLOW - POND P-1

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 41, 43, 45

Peak discharge = 209.43 cfs
Time to peak = 732 min
Hyd. volume = 17.991 acft
Contrib. drain. area = 0.000 ac



Hydrograph Report

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

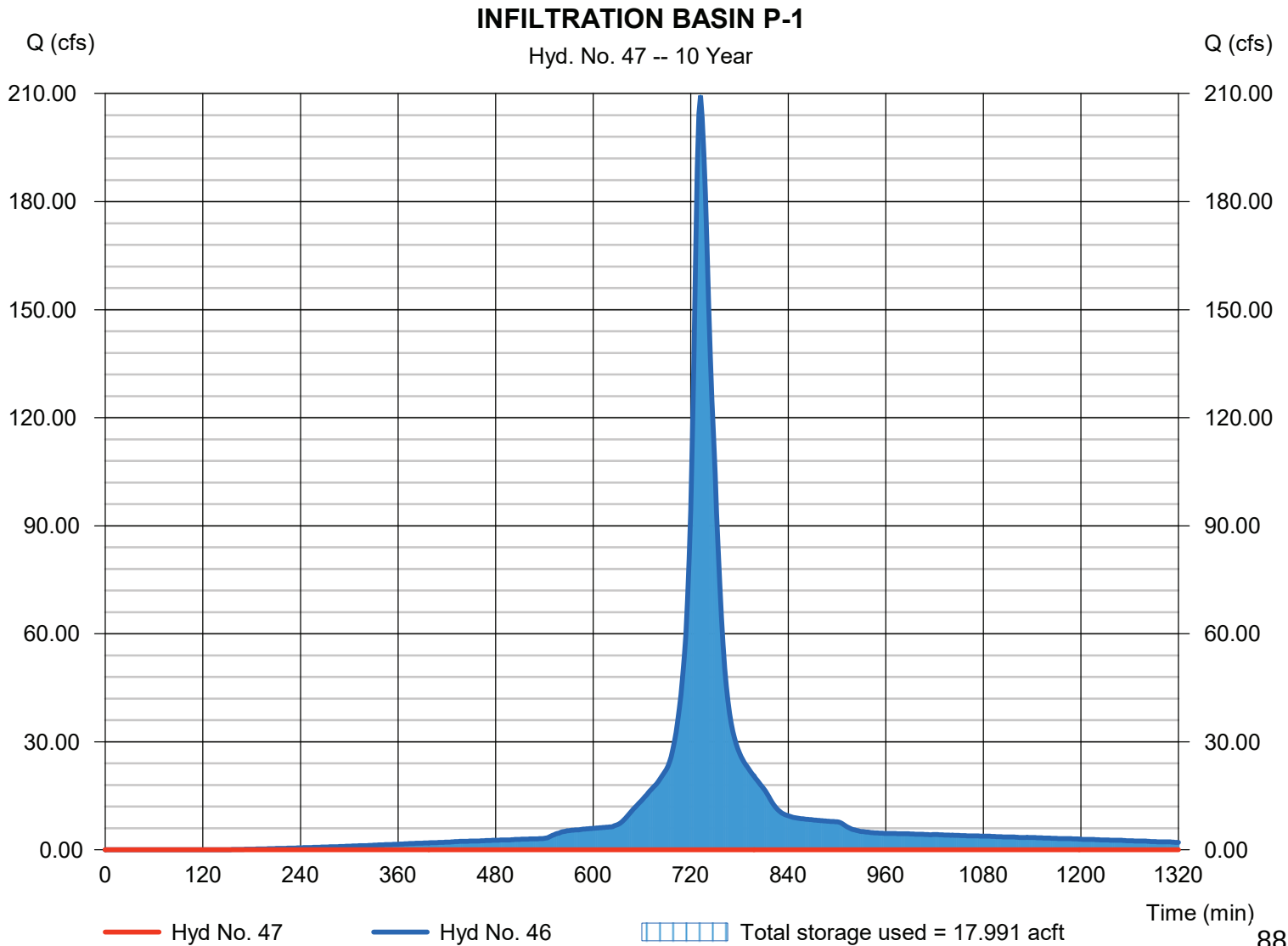
Friday, 06 / 28 / 2019

Hyd. No. 47

INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 46 - PH 1 INFLOW - POND P-1	Max. Elevation	= 838.03 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 1	Max. Storage	= 17.991 acft

Storage Indication method used.



Hydrograph Report

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

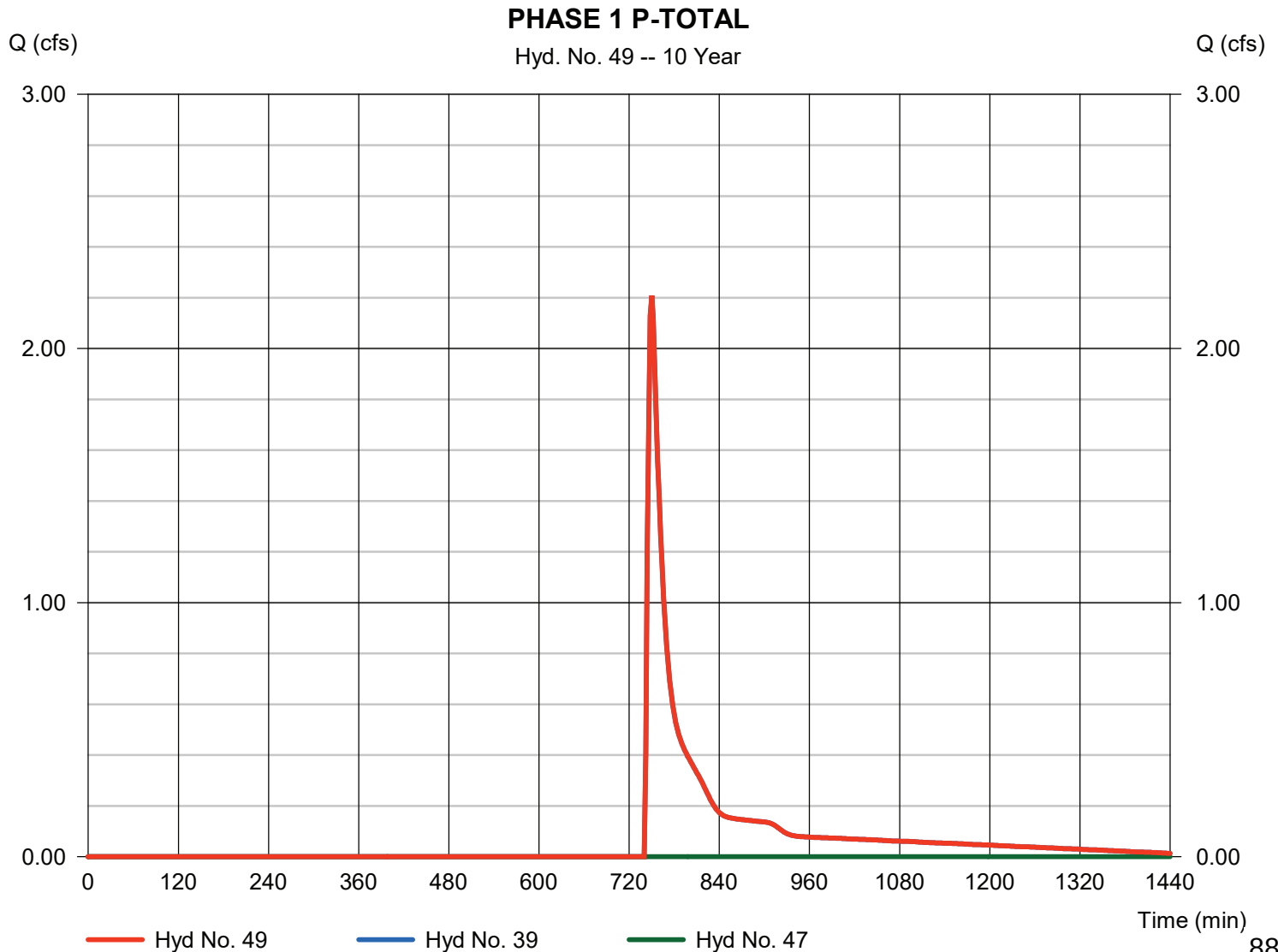
Friday, 06 / 28 / 2019

Hyd. No. 49

PHASE 1 P-TOTAL

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 39, 47

Peak discharge = 2.208 cfs
Time to peak = 750 min
Hyd. volume = 0.146 acft
Contrib. drain. area = 0.000 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	57.90	2	736	5.125	-----	-----	-----	P-OS-1-PH 1
2	SCS Runoff	200.45	2	730	13.721	-----	-----	-----	P-1-PH 1
3	SCS Runoff	19.53	2	740	1.954	-----	-----	-----	P-1A-PH1
4	SCS Runoff	37.10	2	736	3.284	-----	-----	-----	P-1B-PH1
5	SCS Runoff	36.09	2	736	3.195	-----	-----	-----	P-2
6	SCS Runoff	29.60	2	736	2.620	-----	-----	-----	P-3
7	SCS Runoff	5.921	2	736	0.524	-----	-----	-----	P-4
9	SCS Runoff	1.081	2	726	0.056	-----	-----	-----	R&M EX. P-1
10	SCS Runoff	1.712	2	726	0.088	-----	-----	-----	R&M EX. P-2
11	SCS Runoff	0.901	2	726	0.046	-----	-----	-----	R&M EX. P-3
12	SCS Runoff	0.991	2	726	0.051	-----	-----	-----	R&M EX. P-4
13	SCS Runoff	1.262	2	726	0.065	-----	-----	-----	R&M EX. P-5
14	SCS Runoff	1.802	2	726	0.093	-----	-----	-----	R&M EX. P-6
15	SCS Runoff	1.802	2	726	0.093	-----	-----	-----	R&M EX. P-7
16	SCS Runoff	1.622	2	726	0.084	-----	-----	-----	R&M EX. P-8
17	SCS Runoff	0.991	2	726	0.051	-----	-----	-----	R&M EX. P-9
18	Reservoir	0.744	2	730	0.040	9	851.96	0.026	R&M EX. BIOSWALE P-1
19	Combine	2.297	2	726	0.128	10, 18	-----	-----	INFLOW R&M EX. BIOSWALE P-2
20	Reservoir	2.302	2	728	0.106	19	851.63	0.029	R&M EX. BIOSWALE P-2
21	Combine	3.125	2	728	0.153	11, 20	-----	-----	INFLOW R&M EX. BIOSWALE P-3
22	Reservoir	2.074	2	732	0.122	21	851.70	0.050	R&M EX. BIOSWALE P-3
23	Combine	2.594	2	730	0.173	12, 22	-----	-----	INFLOW R&M EX. BIOSWALE P-4
24	Reservoir	2.155	2	736	0.139	23	850.70	0.050	R&M EX. BIOSWALE P-4
25	Combine	2.477	2	736	0.204	13, 24	-----	-----	INFLOW R&M EX. BIOSWALE P-5
26	Reservoir	2.432	2	738	0.175	25	849.24	0.044	R&M EX. BIOSWALE P-5
27	Combine	2.849	2	738	0.268	14, 26	-----	-----	INFLOW R&M EX. BIOSWALE P-6
28	Reservoir	2.637	2	740	0.223	27	848.08	0.061	R&M EX. BIOSWALE P-6
29	Combine	3.010	2	740	0.316	15, 28	-----	-----	INFLOW R&M EX. BIOSWALE P-7
30	Reservoir	3.054	2	740	0.285	29	845.77	0.042	R&M EX. BIOSWALE P-7
31	Combine	3.472	2	728	0.369	16, 30	-----	-----	R&M EX. BIOSWALE P-8
32	Reservoir	3.223	2	740	0.315	31	845.23	0.074	R&M EX. BIOSWALE P-8
33	SCS Runoff	8.940	2	726	0.460	-----	-----	-----	PROPOSED P-5
34	Combine	8.940	2	726	0.776	32, 33	-----	-----	INFLOW TO PR. P-5
2019-06-27_CHAPMAN FARMS_PHASE I_Floodmg Per					Return Period: 100 Year			Friday, 06 / 28 / 2019	

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
35	Reservoir	0.547	2	878	0.253	34	844.17	0.575	PR. BLVD BIOFILTER P-5
37	Reservoir	29.60	2	744	3.194	5	840.62	0.556	POND P-2
38	Reservoir	24.63	2	744	2.620	6	840.97	0.292	POND P-3
39	Reservoir	5.725	2	738	0.355	7	840.93	0.198	RAIN GARDEN P-4
41	Combine	249.91	2	730	18.847	1, 2,	-----	-----	PHASE 1 OS-1 + P-1
42	Combine	48.81	2	742	5.149	3, 37,	-----	-----	PH 1 INFLOW TO FOREBAY 1A
43	Reservoir	48.78	2	742	5.148	42	835.71	0.157	PH 1 FOREBAY 1A
44	Combine	60.37	2	738	5.904	4, 38,	-----	-----	PH 1 INFLOW TO FOREBAY 1B
45	Reservoir	59.47	2	740	5.903	44	835.82	0.388	PH 1 FOREBAY 1B
46	Combine	336.55	2	732	29.898	41, 43, 45	-----	-----	PH 1 INFLOW - POND P-1
47	Reservoir	0.000	2	n/a	0.000	46	840.73	29.9	INFILTRATION BASIN P-1
49	Combine	5.725	2	738	0.355	39, 47,	-----	-----	PHASE 1 P-TOTAL
2019-06-27_CHAPMAN FARMS_PHASE I_Flood hy					Return Period: 100 Year			Friday, 06 / 28 / 2019	

Hydrograph Report

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

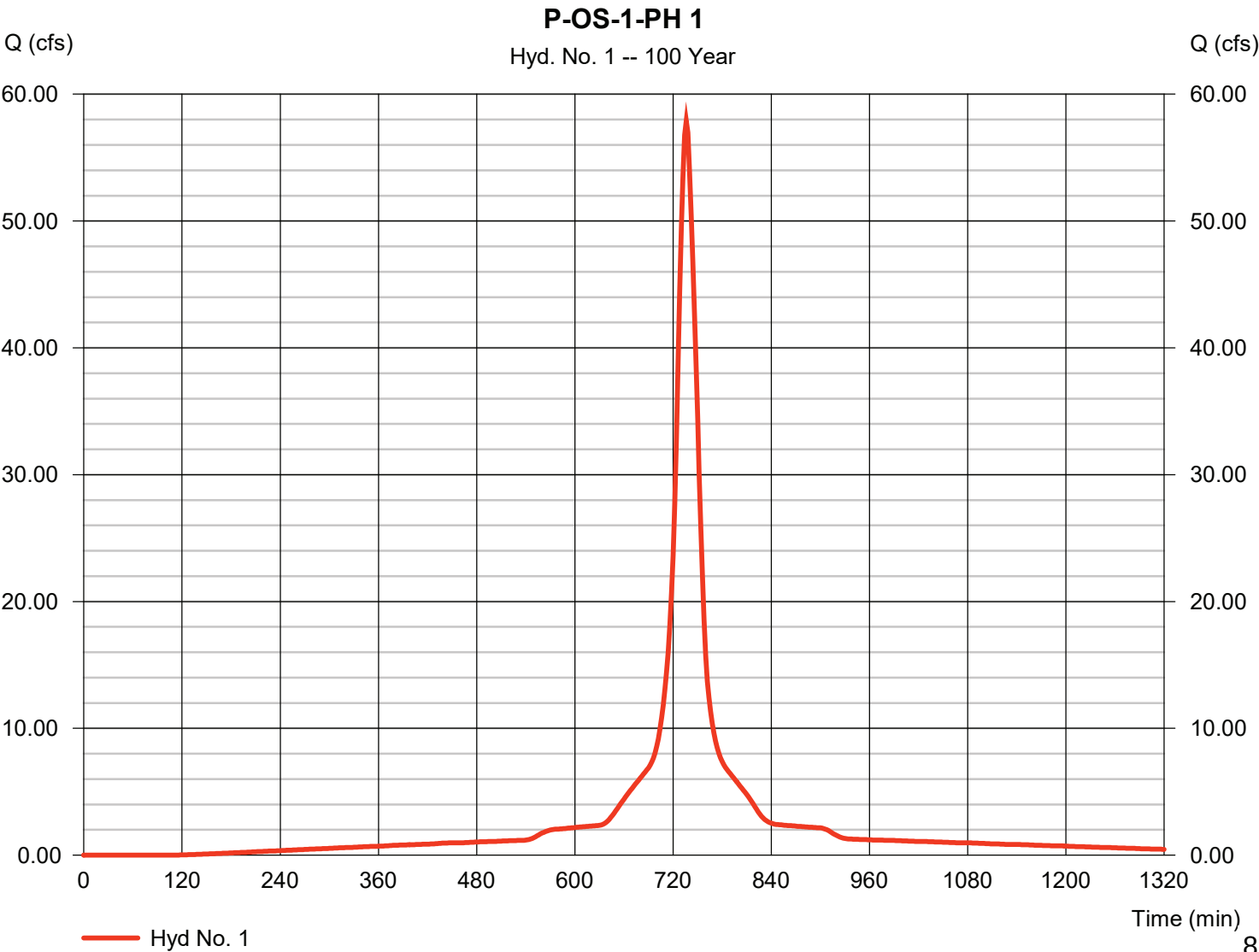
Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 57.90 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 5.125 acft
Drainage area	= 10.170 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.50 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

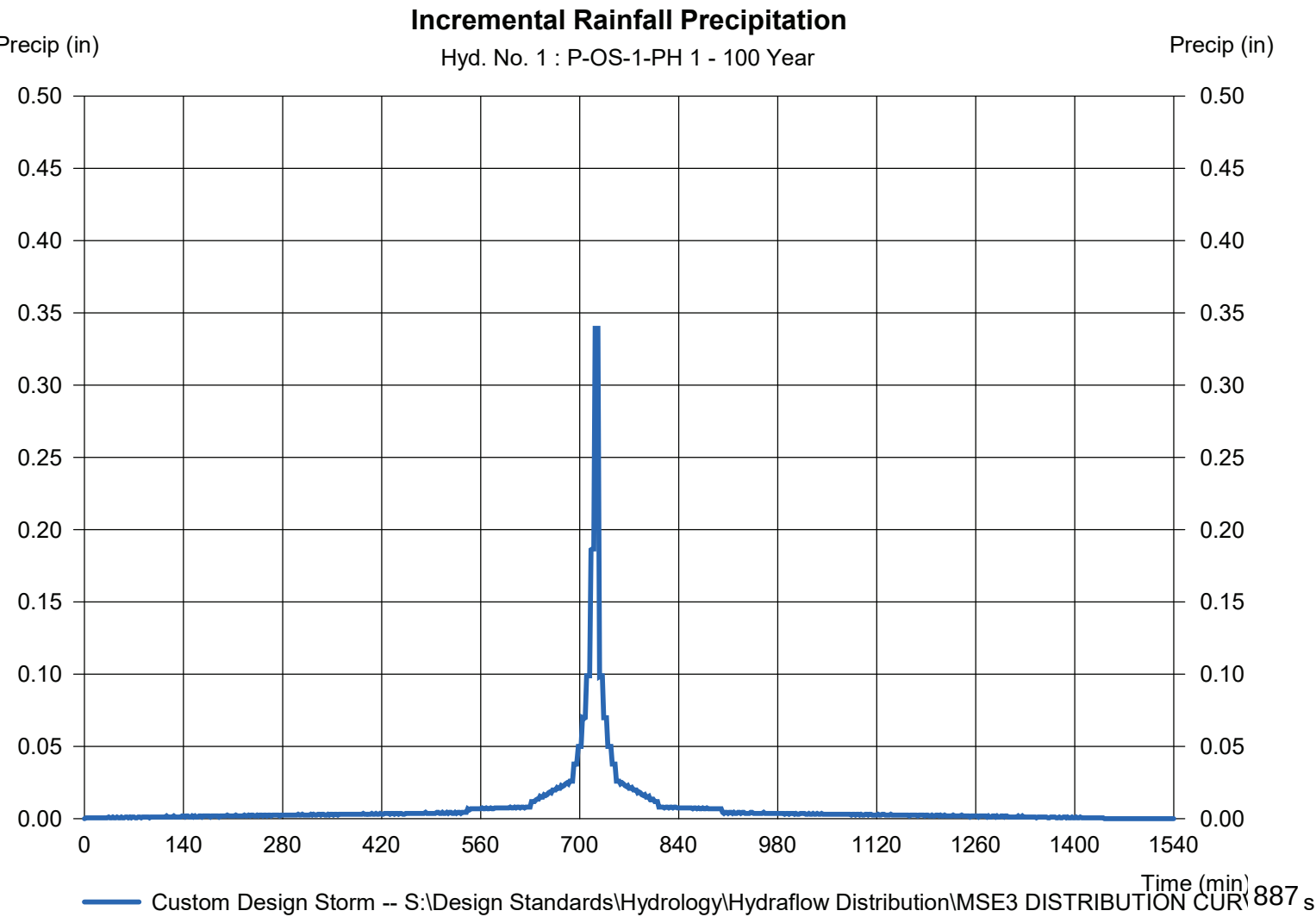
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 1

P-OS-1-PH 1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

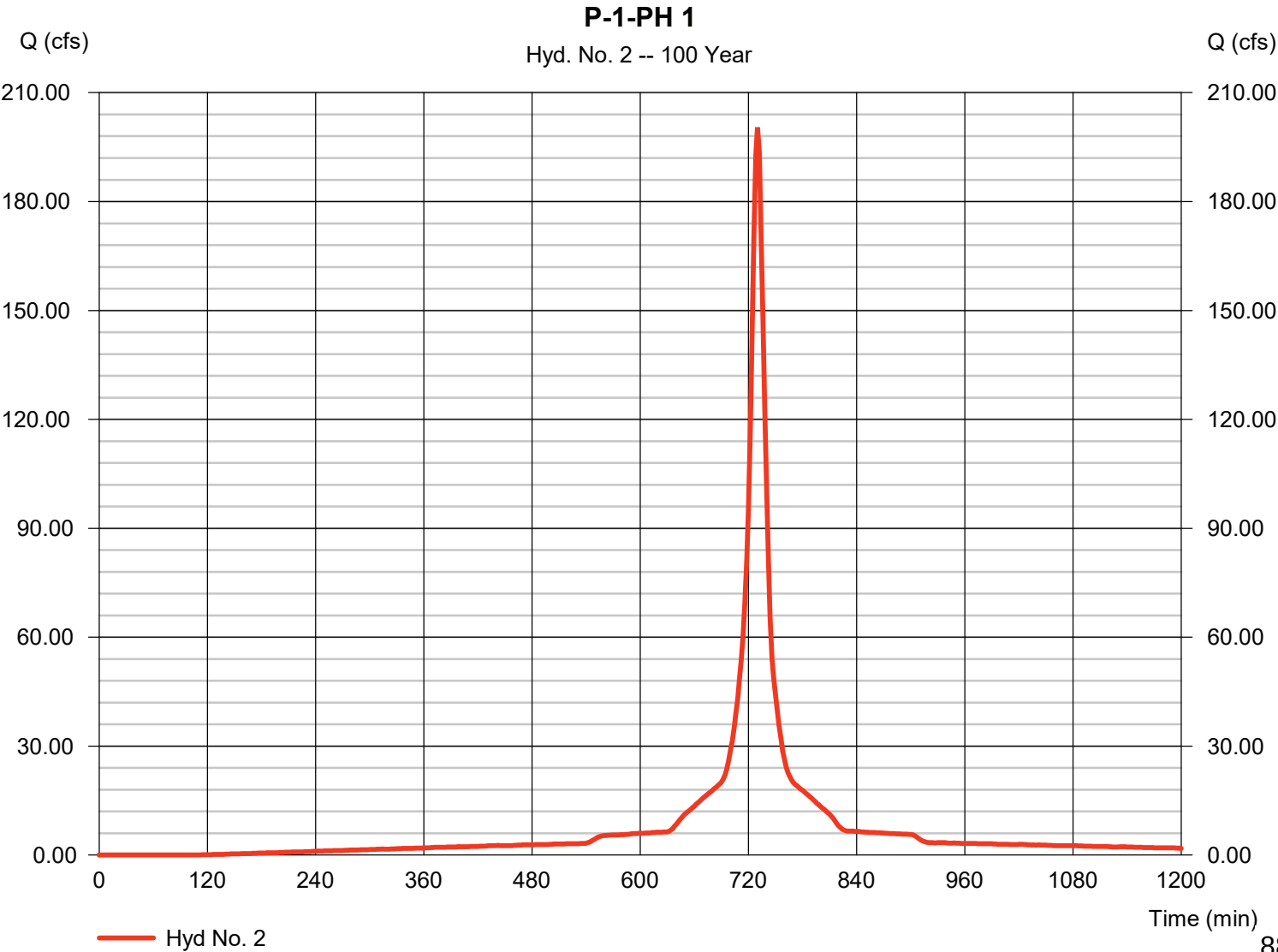
Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Hydrograph type	= SCS Runoff	Peak discharge	= 200.45 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 13.721 acft
Drainage area	= 26.872 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 26.872



Precipitation Report

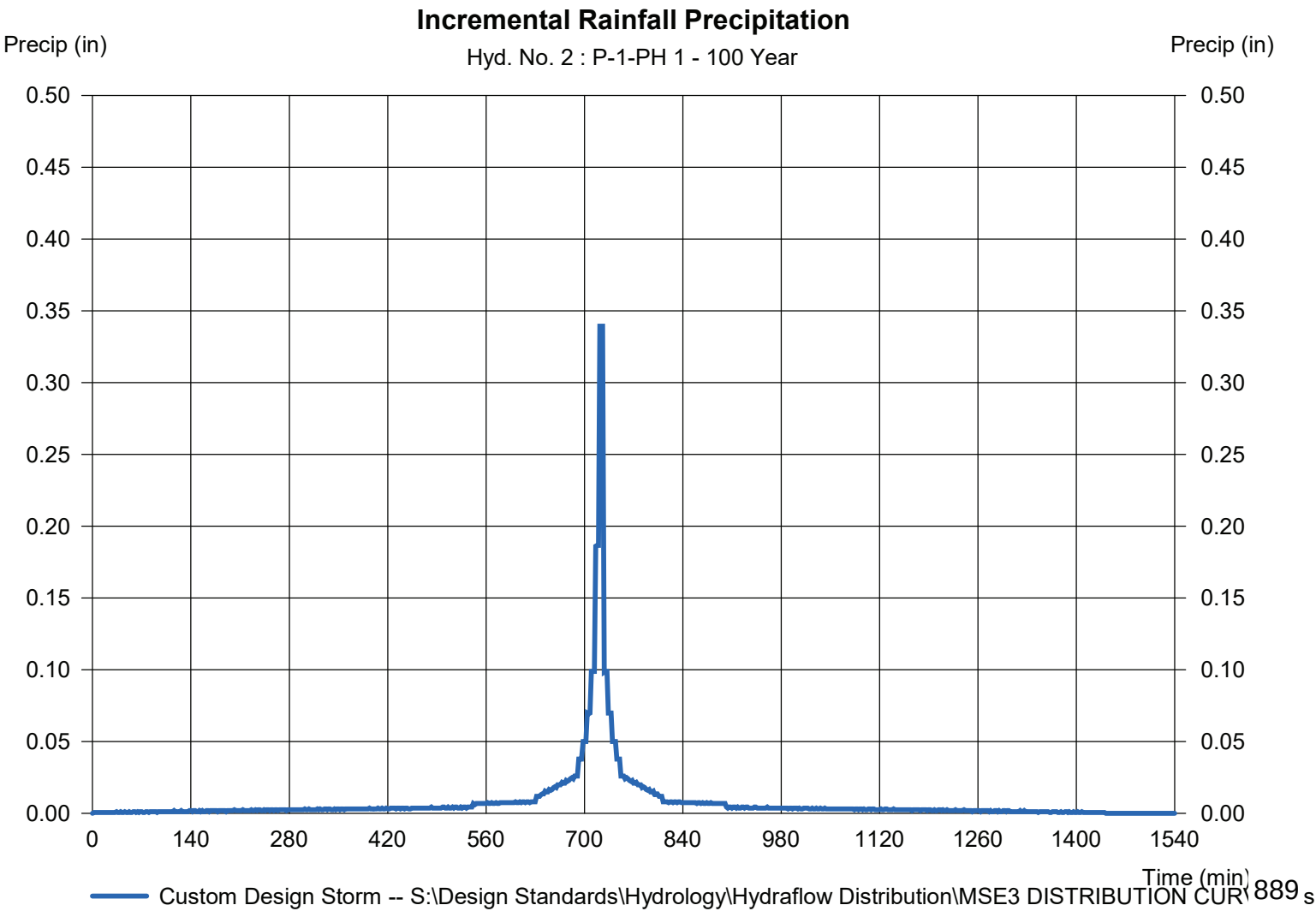
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 2

P-1-PH 1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

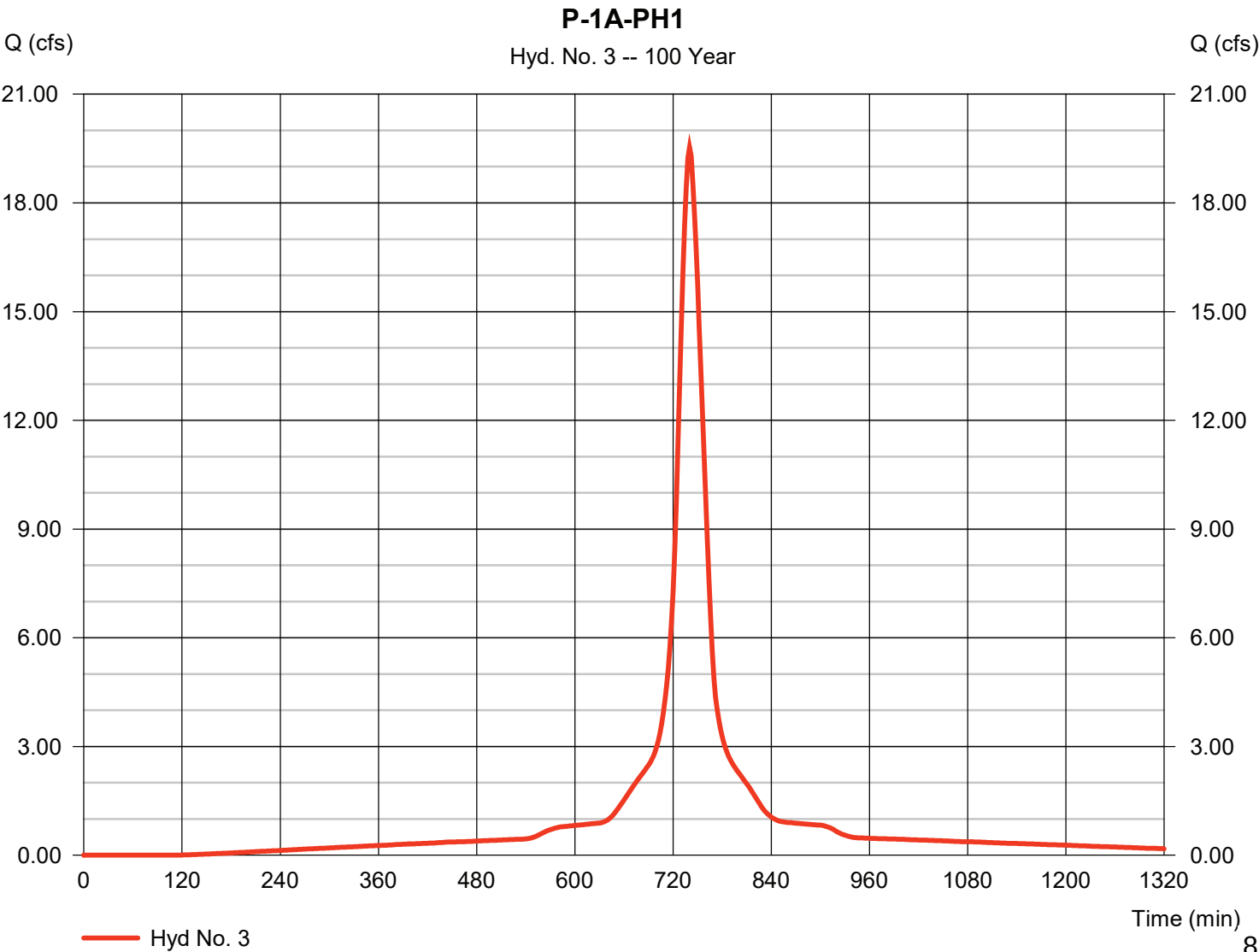
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Hydrograph type	= SCS Runoff	Peak discharge	= 19.53 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 1.954 acft
Drainage area	= 3.947 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 29.90 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

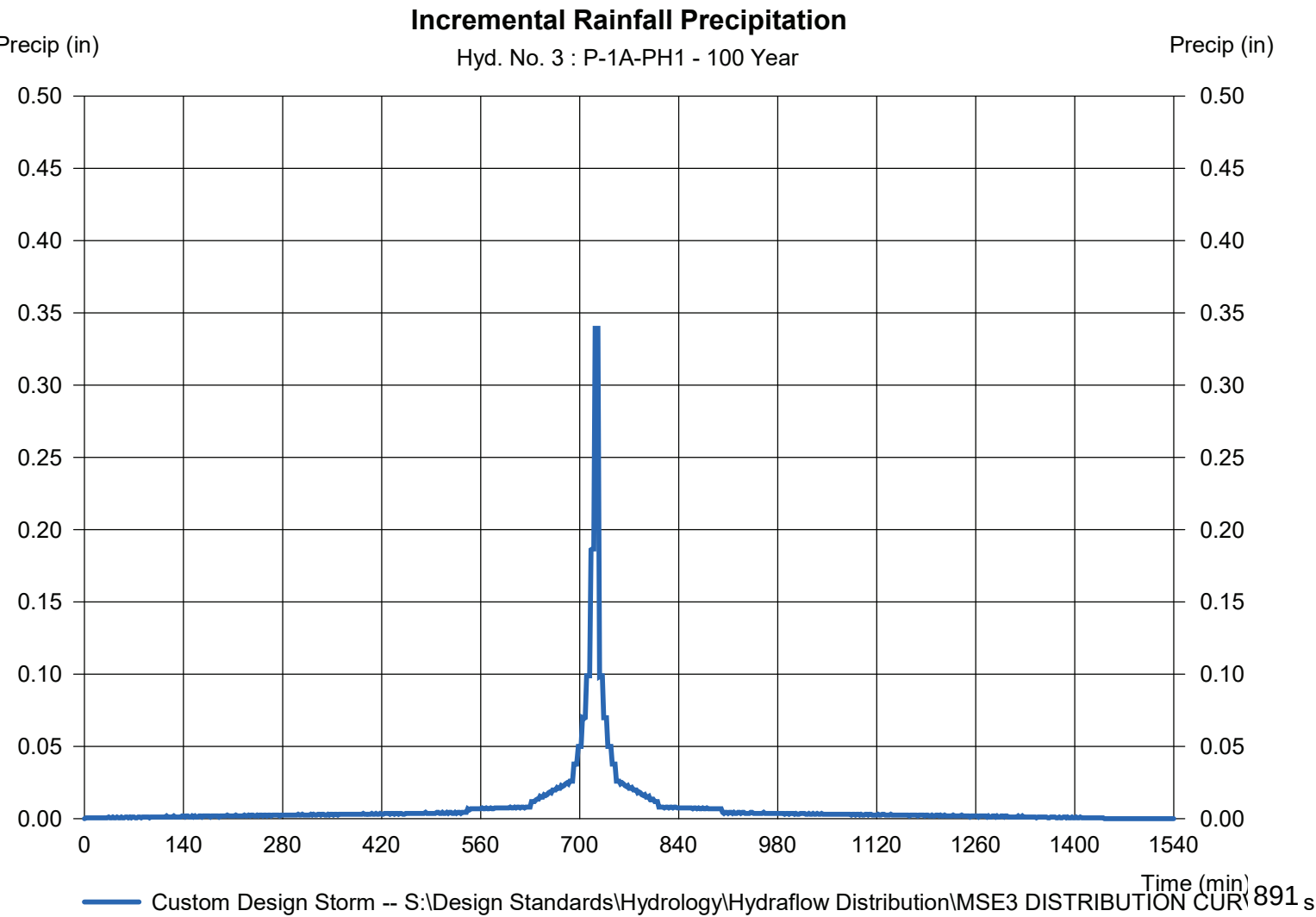
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 3

P-1A-PH1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

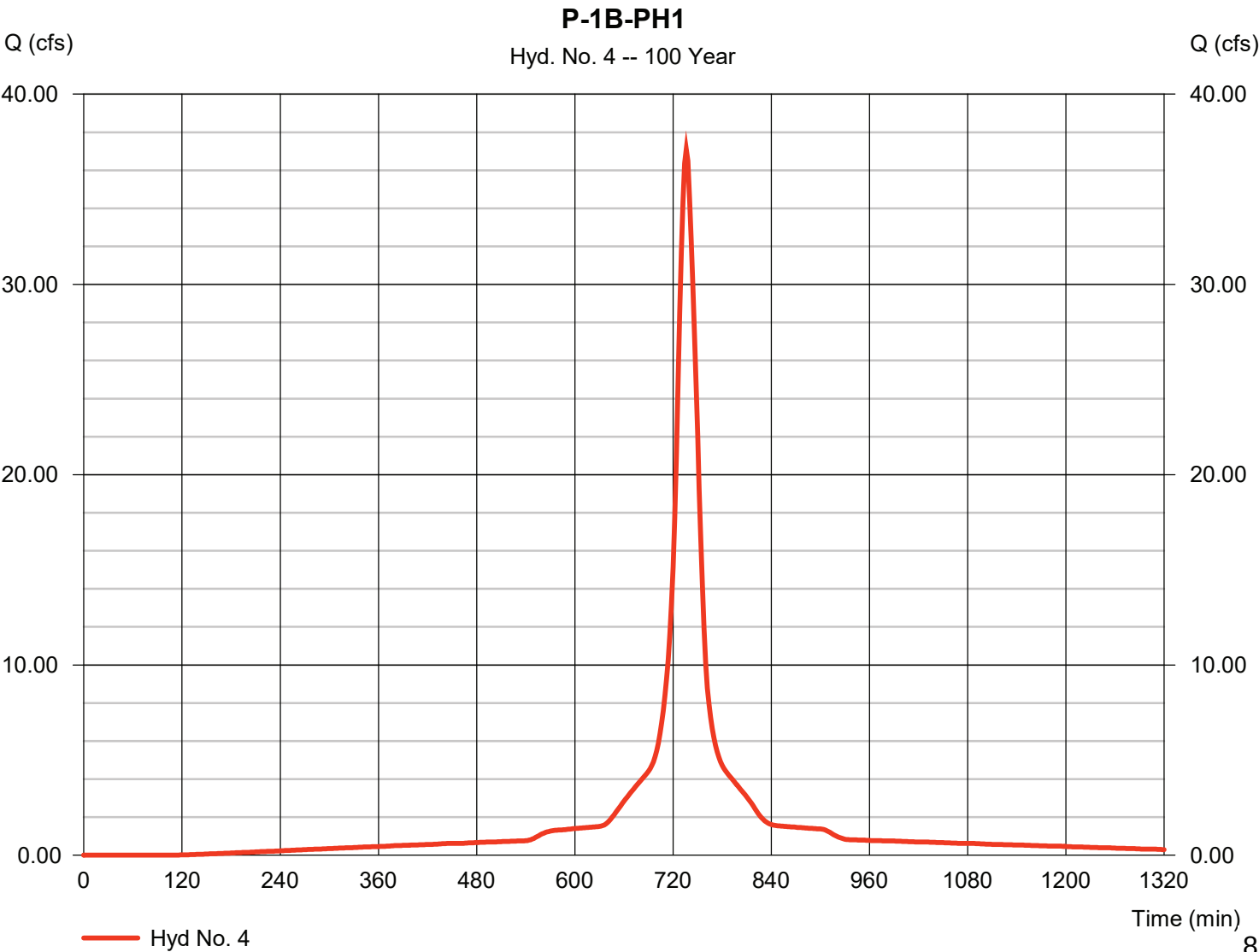
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 4

P-1B-PH1

Hydrograph type	=	SCS Runoff	Peak discharge	=	37.10 cfs
Storm frequency	=	100 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	3.284 acft
Drainage area	=	6.516 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.60 min
Total precip.	=	6.18 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE			



Precipitation Report

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

Friday, 06 / 28 / 2019

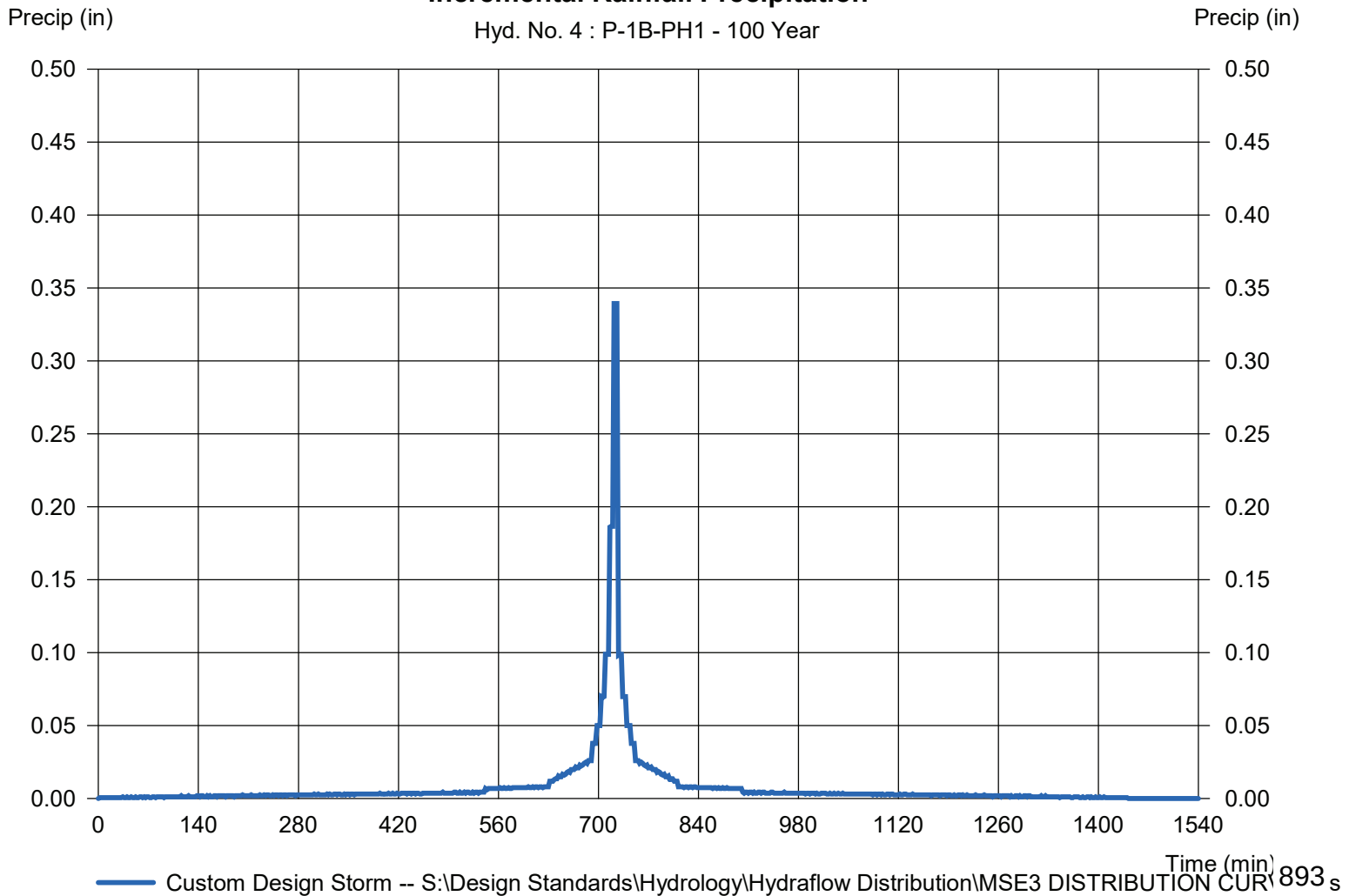
Hyd. No. 4

P-1B-PH1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 4 : P-1B-PH1 - 100 Year



Hydrograph Report

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

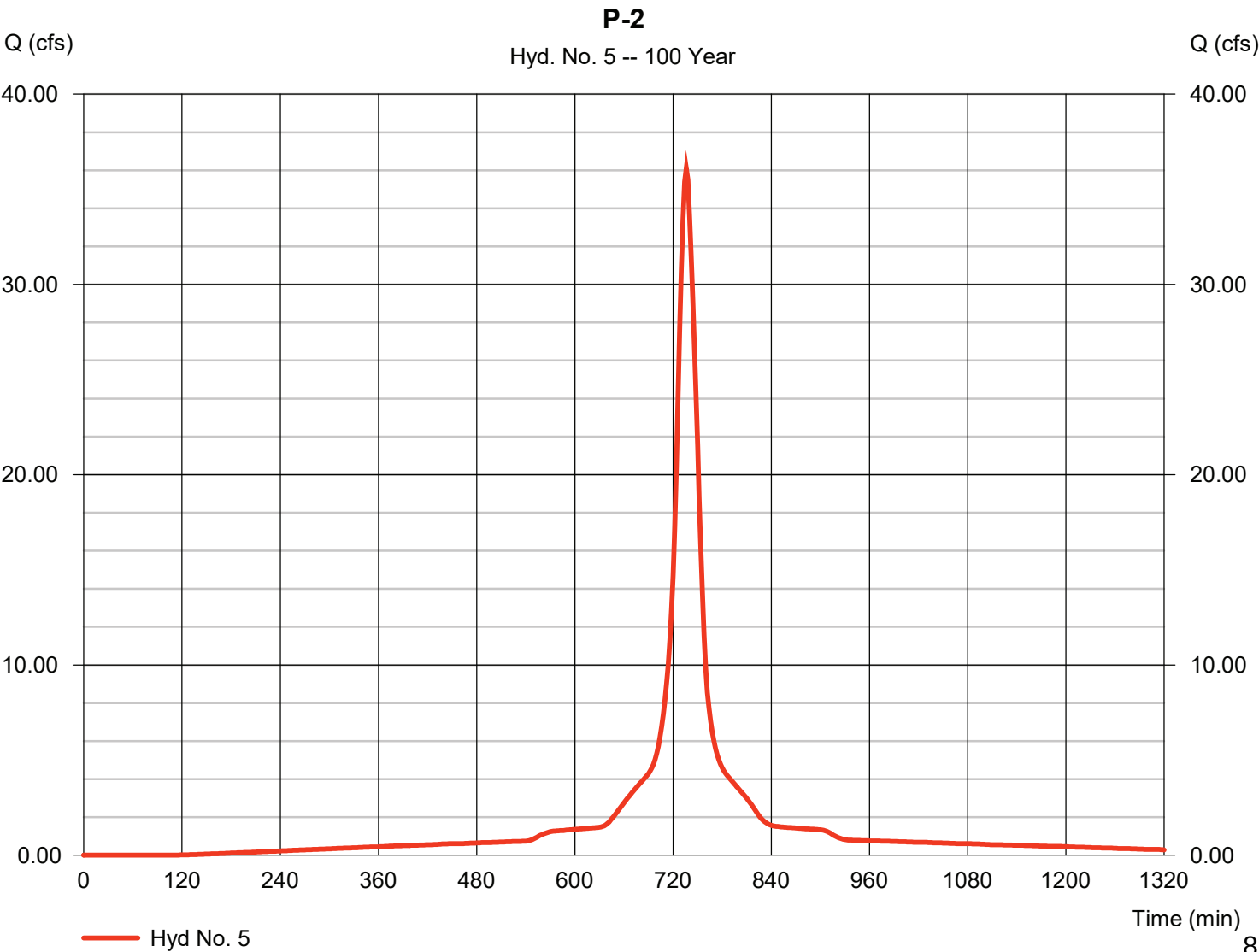
Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 36.09 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 3.195 acft
Drainage area	= 6.339 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 22.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.710 x 75)] / 6.339



Precipitation Report

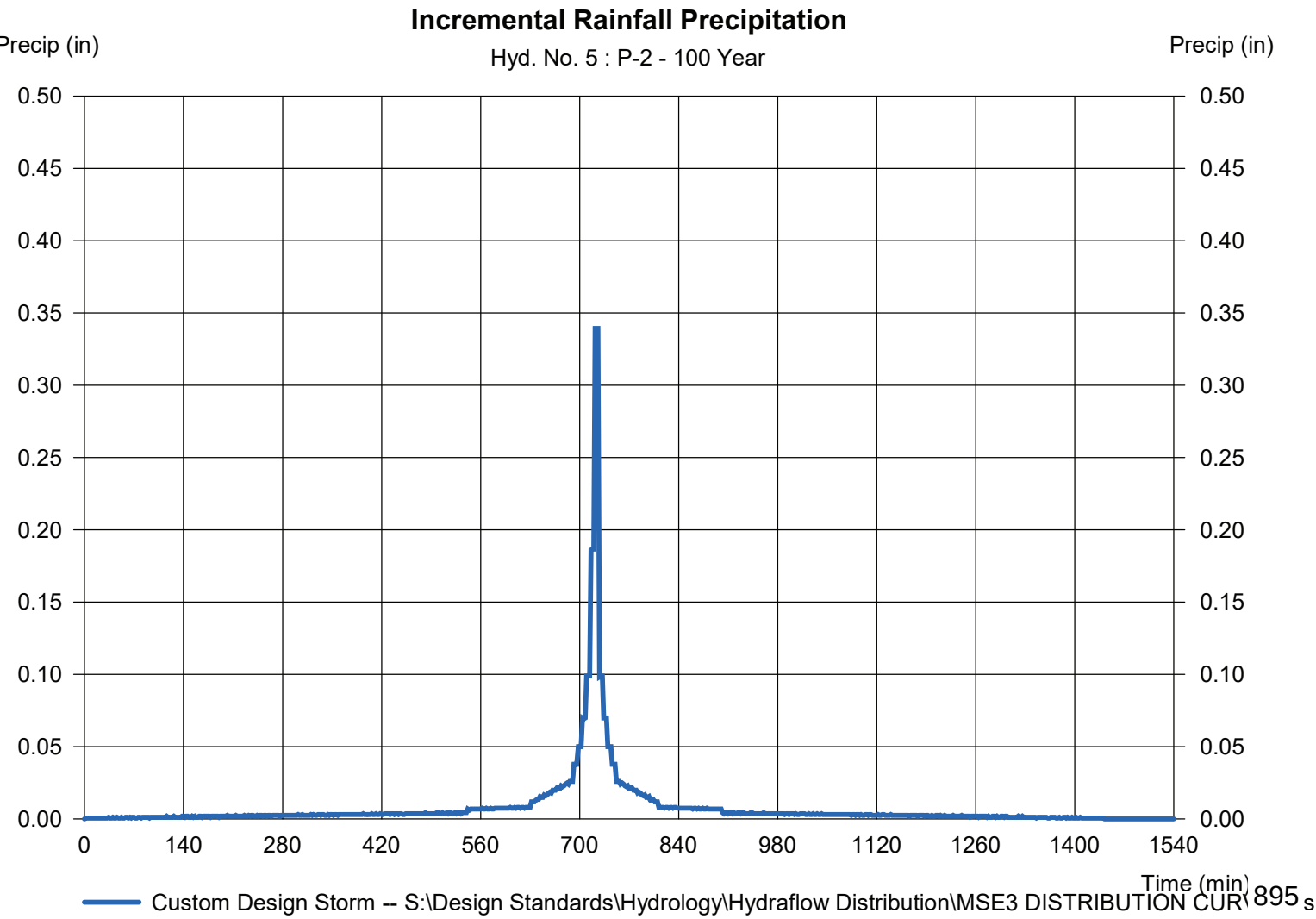
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 5

P-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

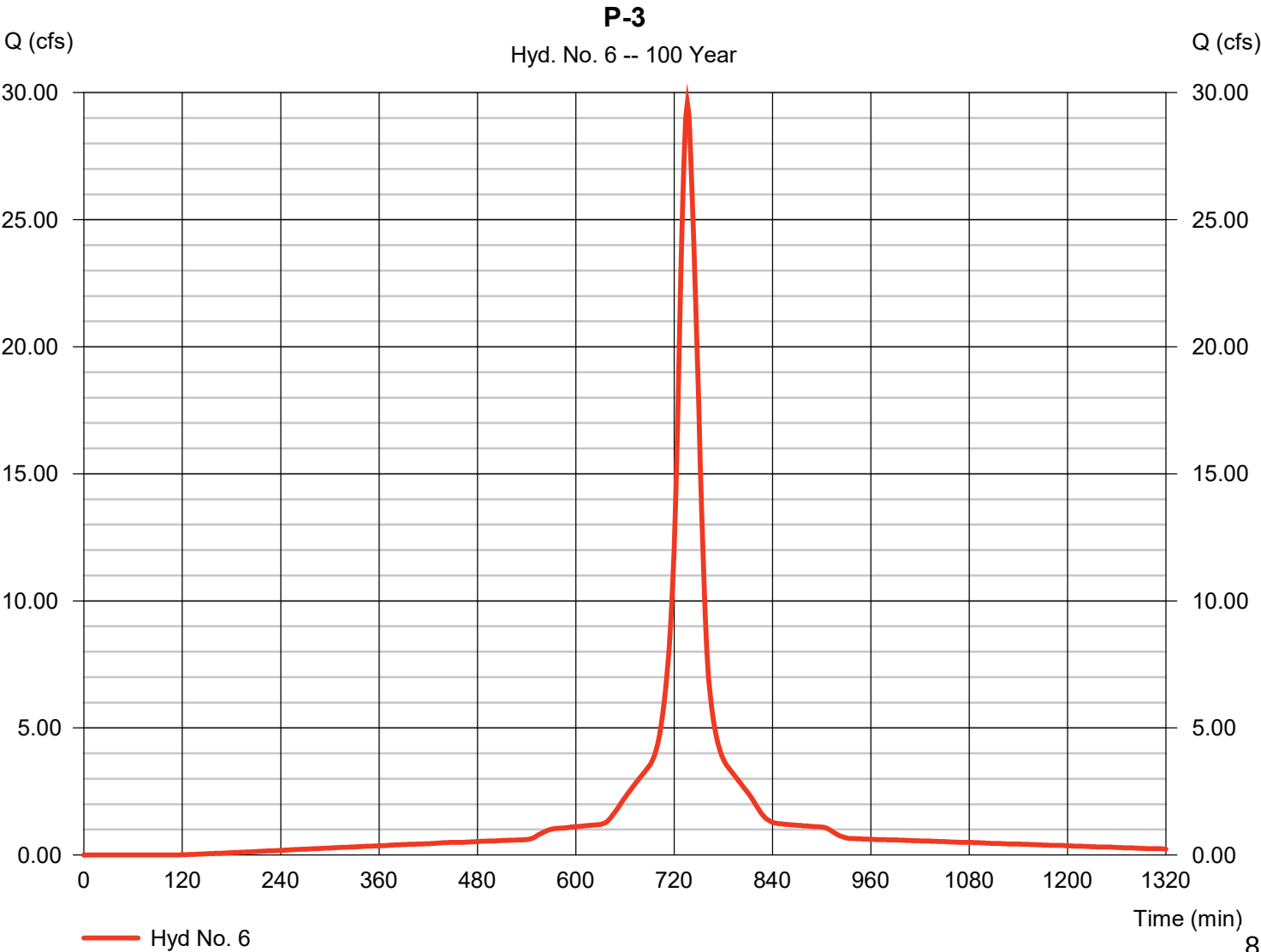
Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 29.60 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 2.620 acft
Drainage area	= 5.199 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.20 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.260 x 75)] / 5.199



Precipitation Report

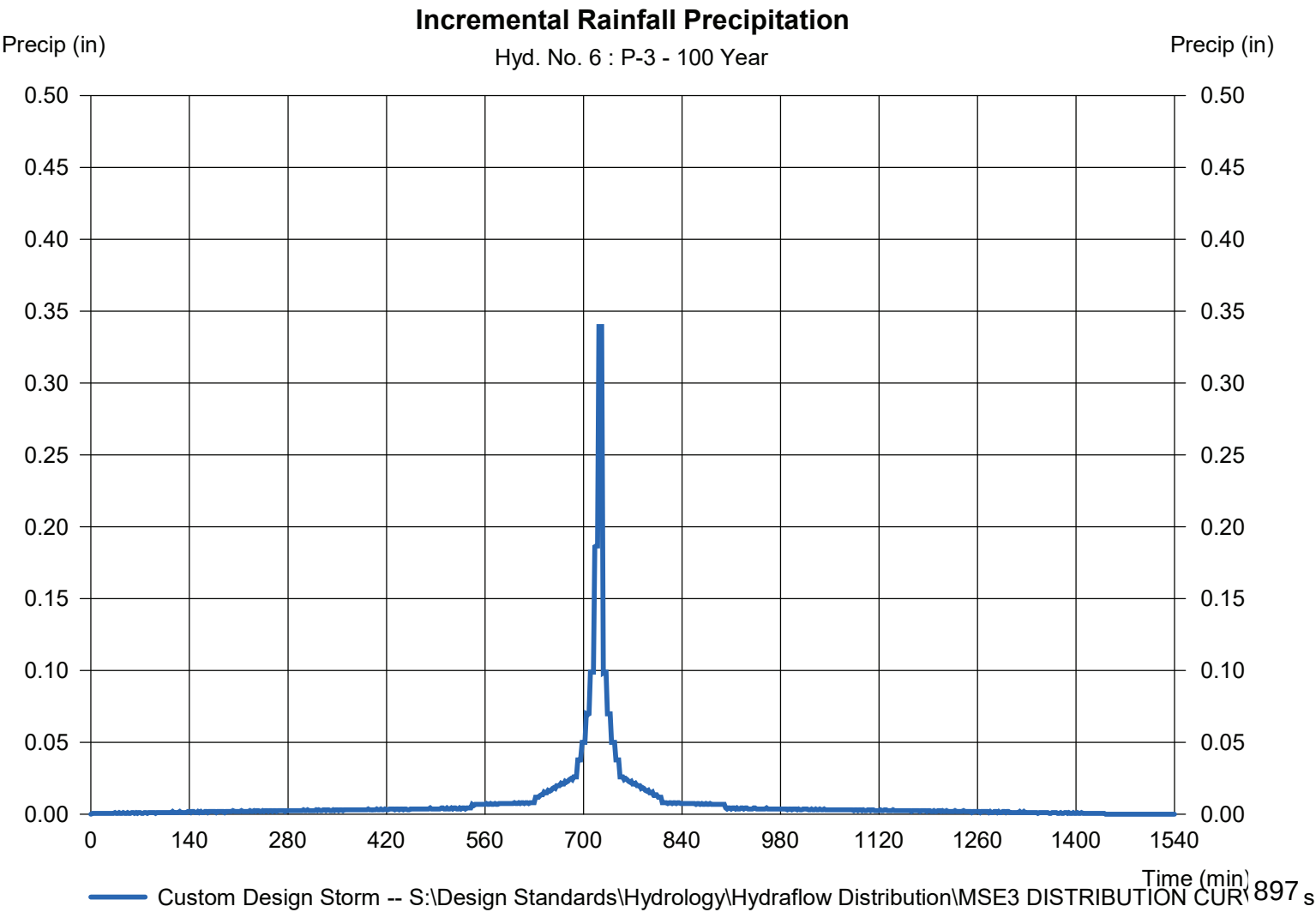
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 6

P-3

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

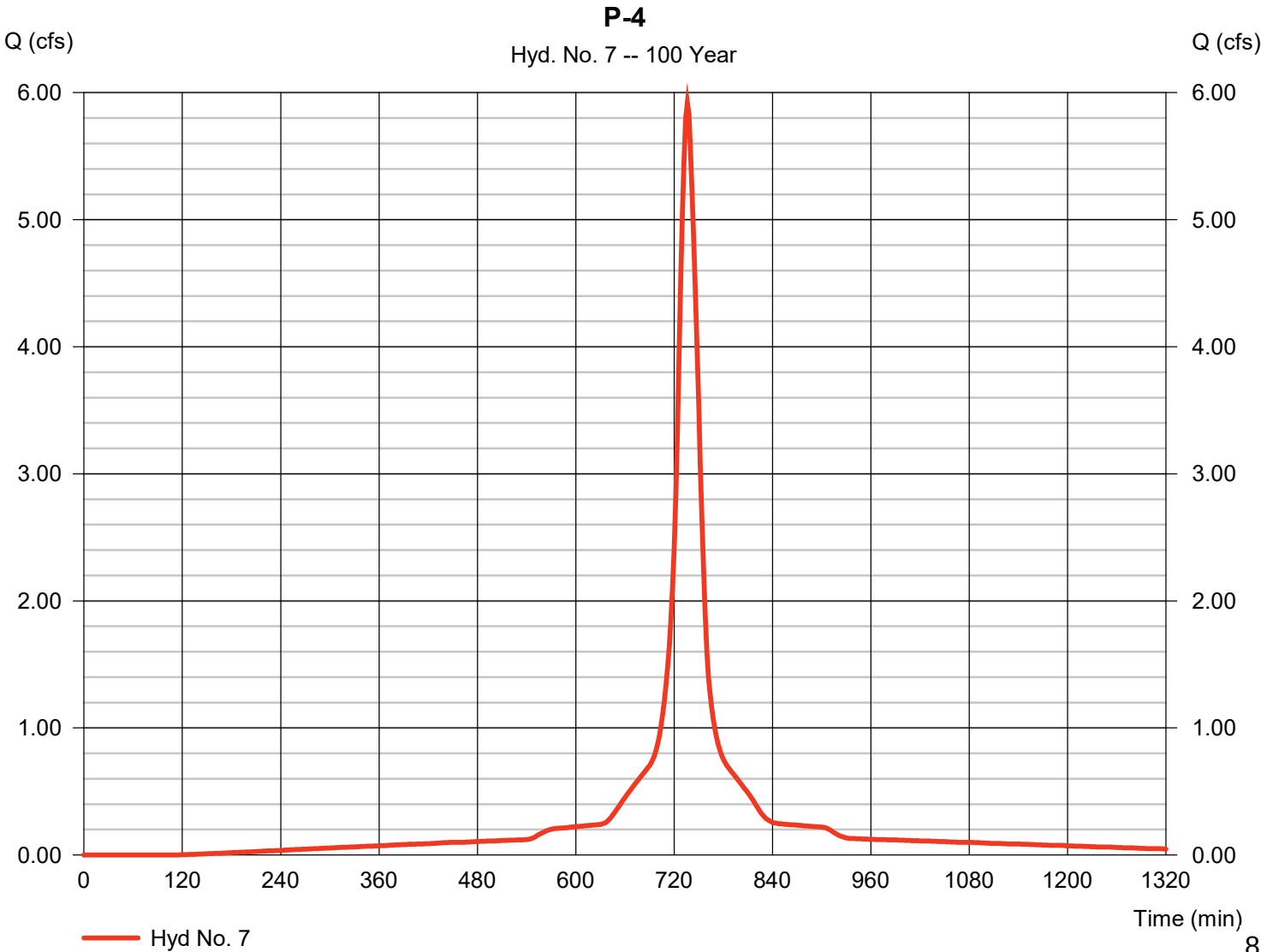
Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 5.921 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 0.524 acft
Drainage area	= 1.040 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.10 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

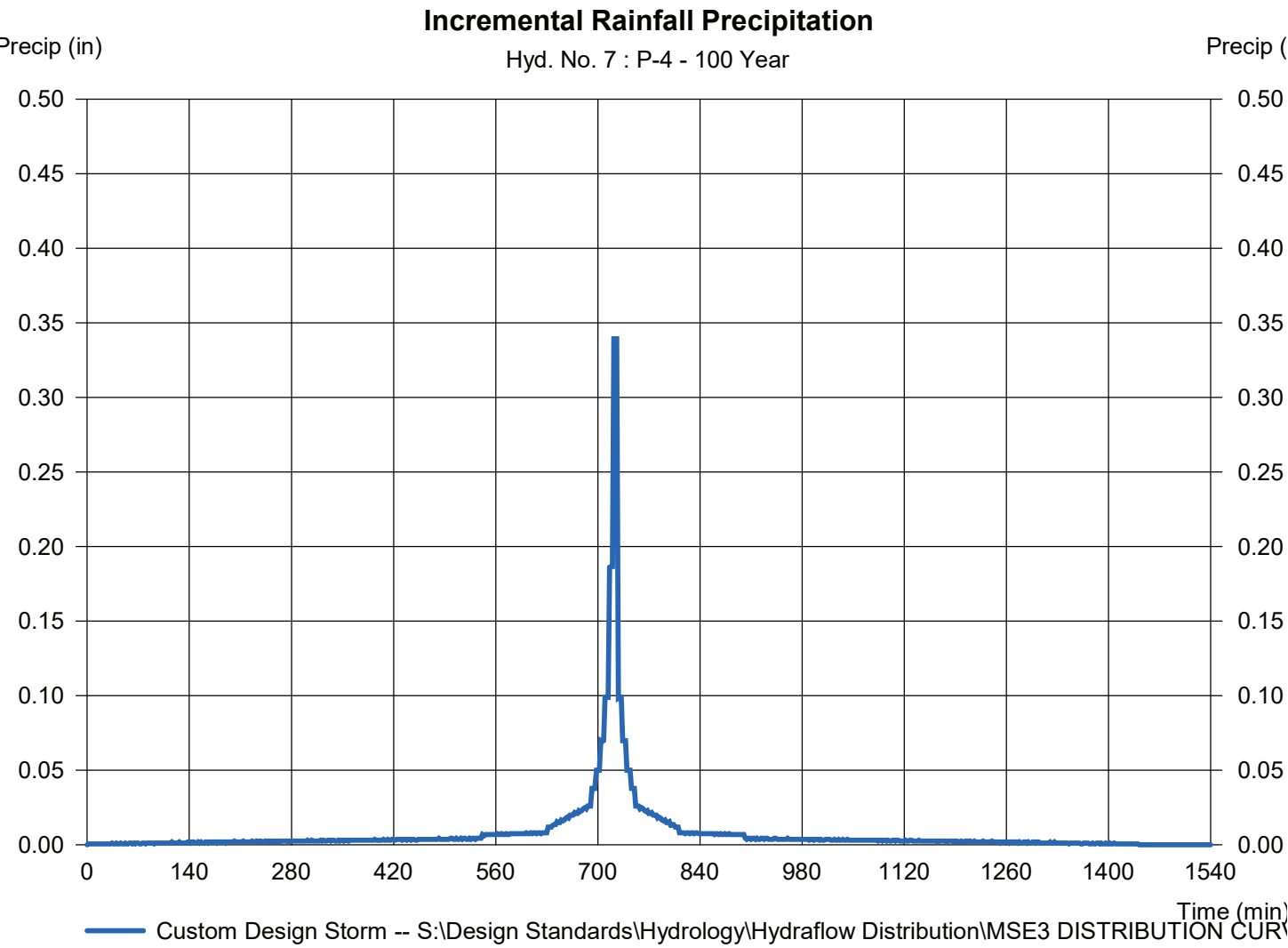
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 7

P-4

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

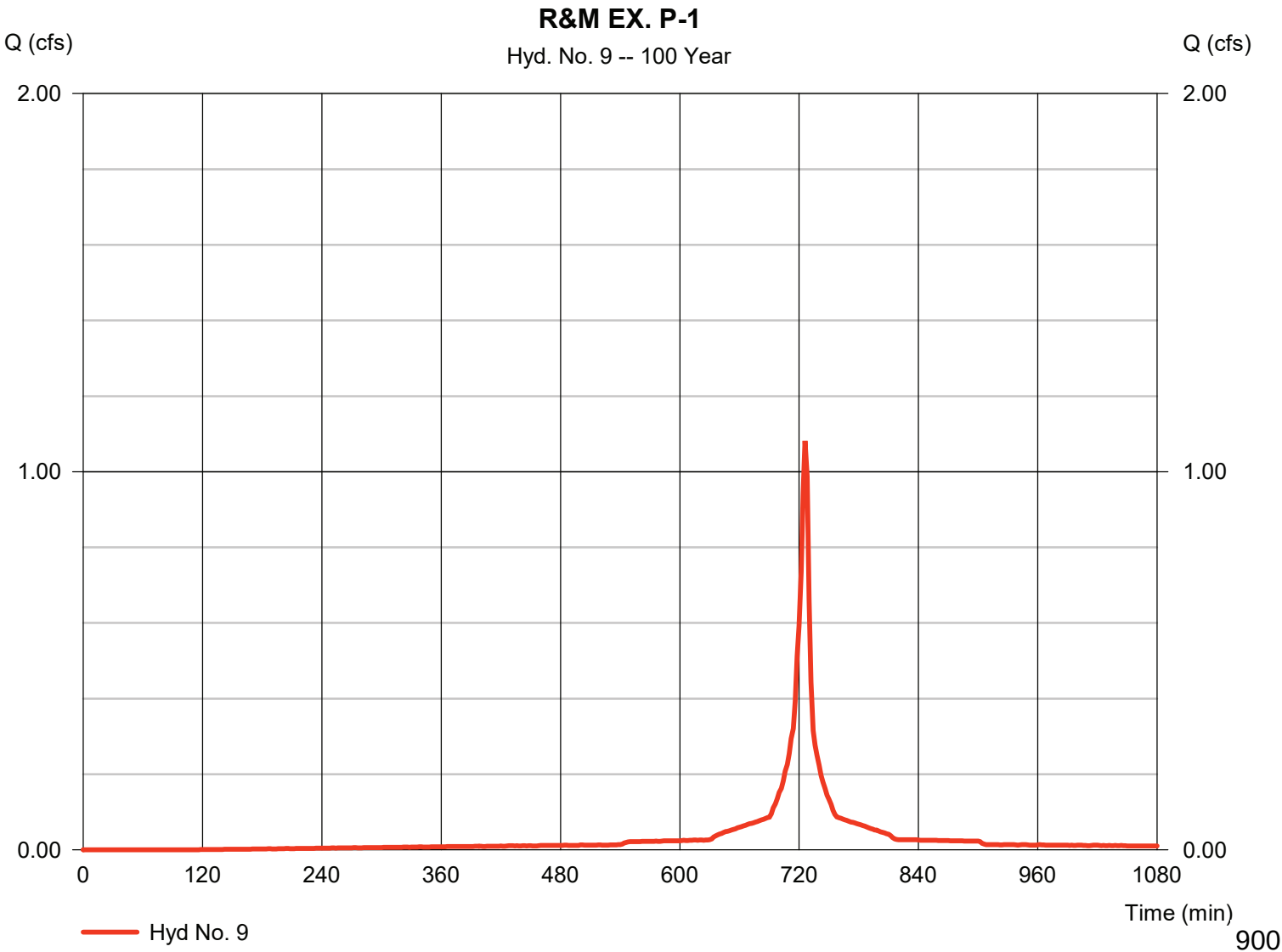
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.081 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.056 acft
Drainage area	= 0.120 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD DISTRIBUTION CURVE		



Precipitation Report

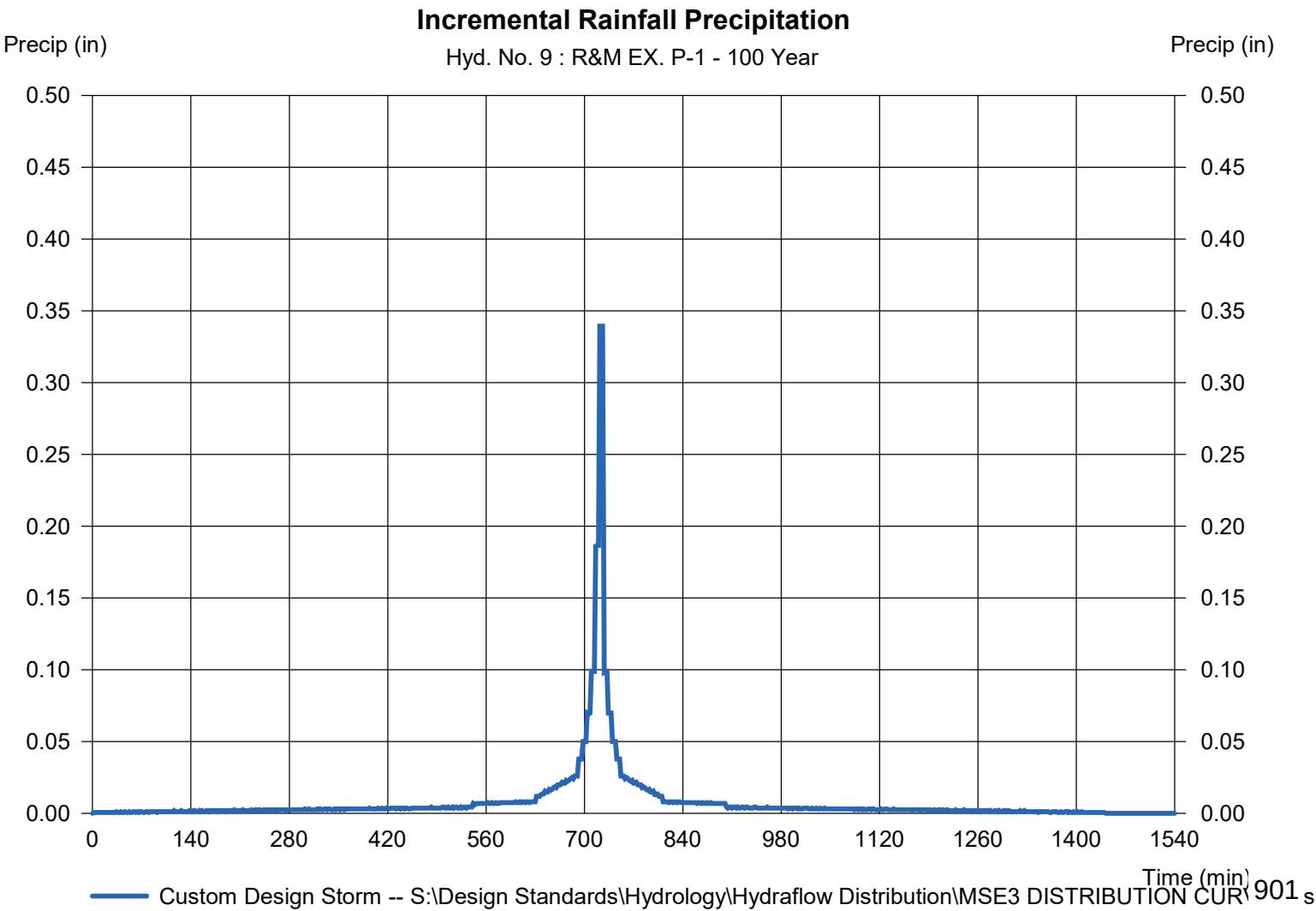
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 9

R&M EX. P-1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



901 s

Hydrograph Report

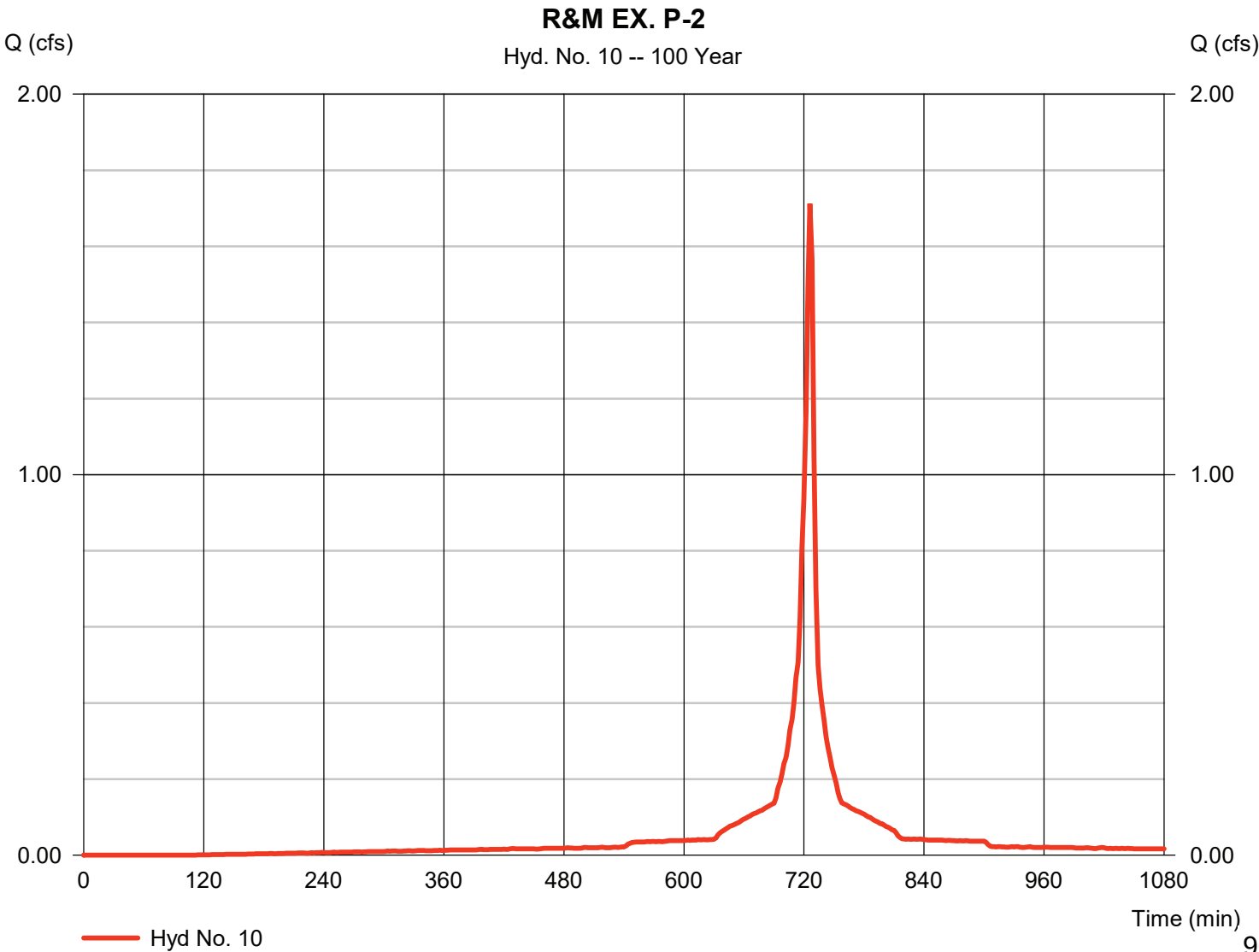
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 10

R&M EX. P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.712 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.088 acft
Drainage area	= 0.190 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

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Friday, 06 / 28 / 2019

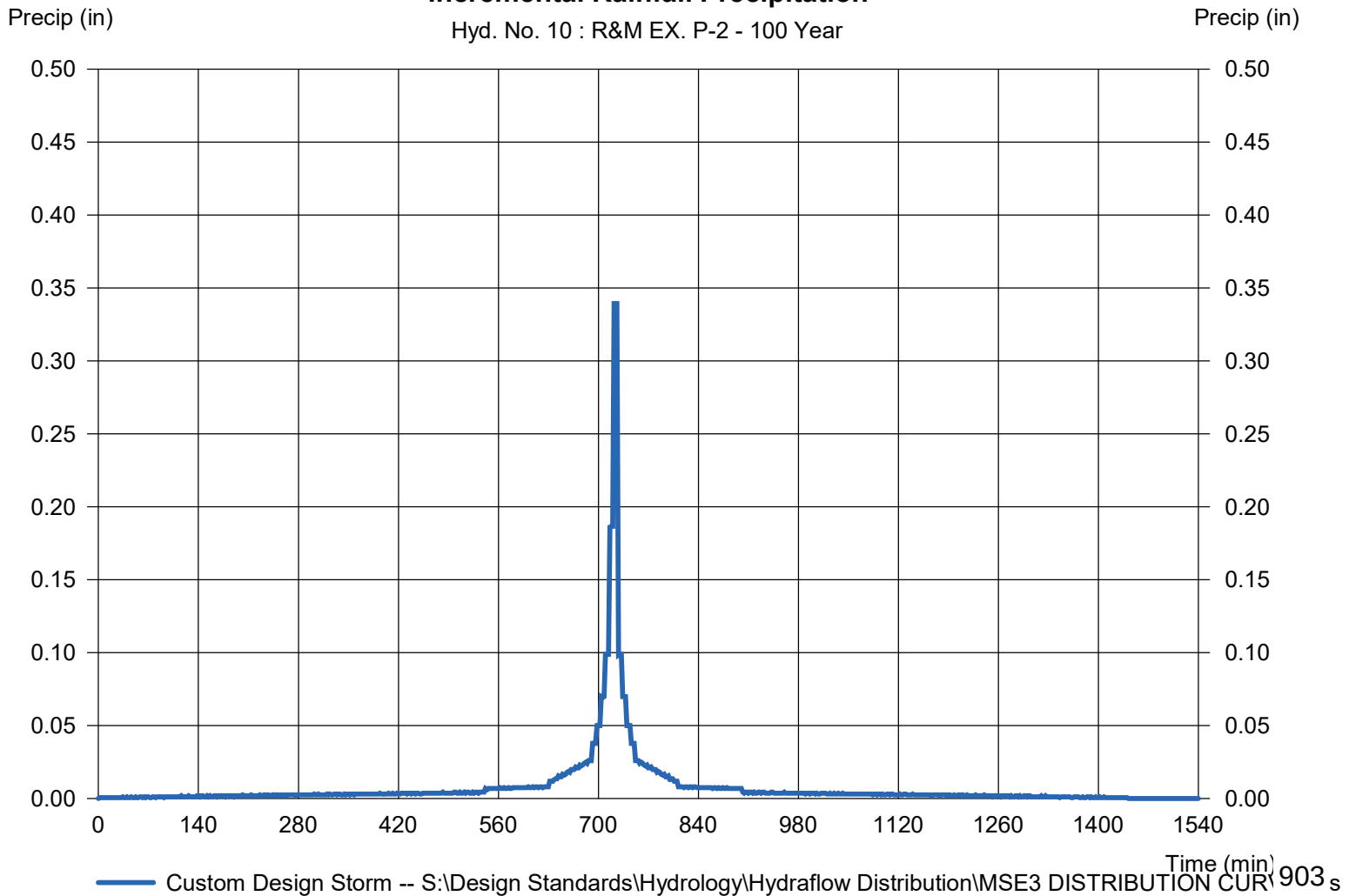
Hyd. No. 10

R&M EX. P-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 10 : R&M EX. P-2 - 100 Year



Hydrograph Report

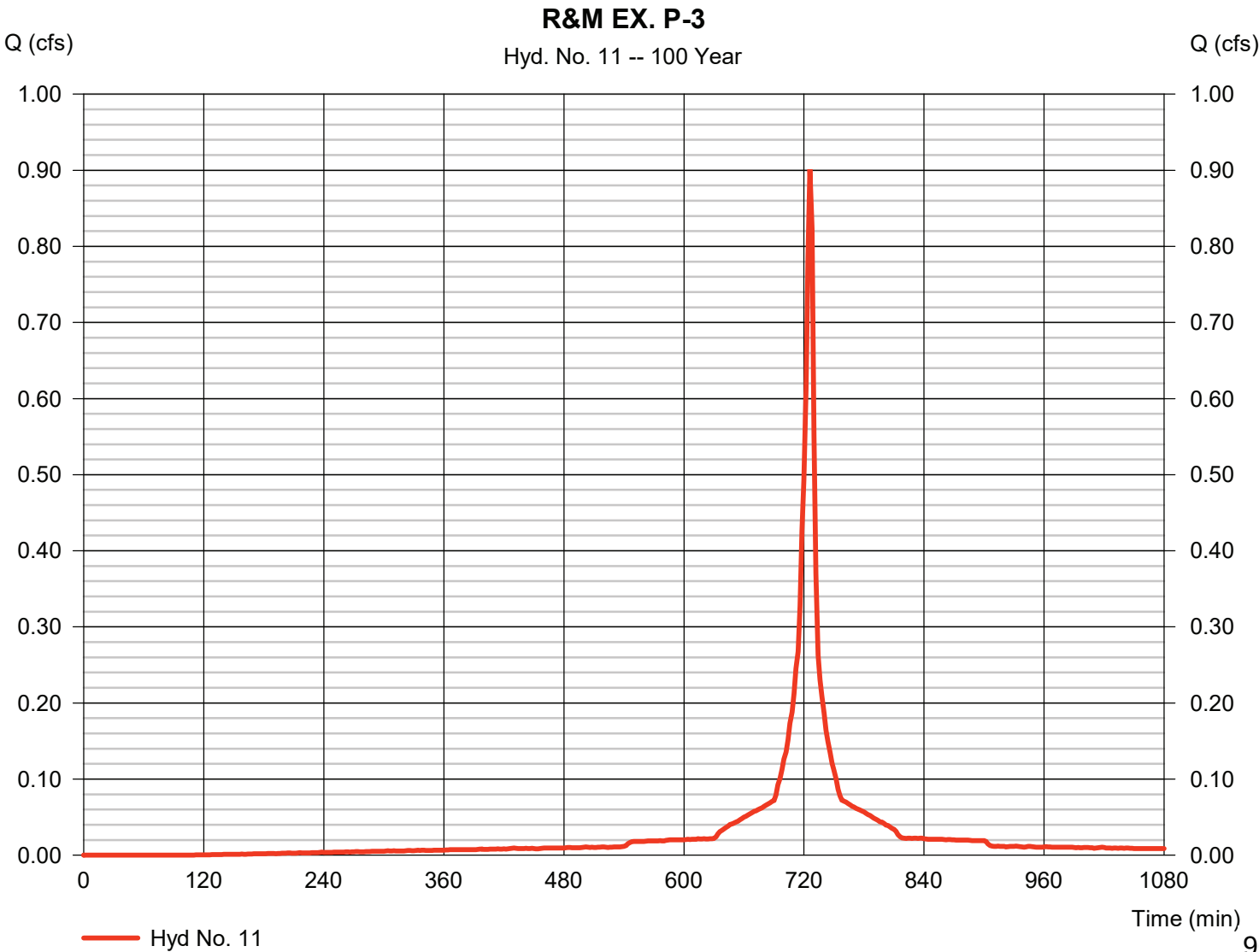
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.901 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.046 acft
Drainage area	= 0.100 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSR3 DISTRIBUTION CU		



Precipitation Report

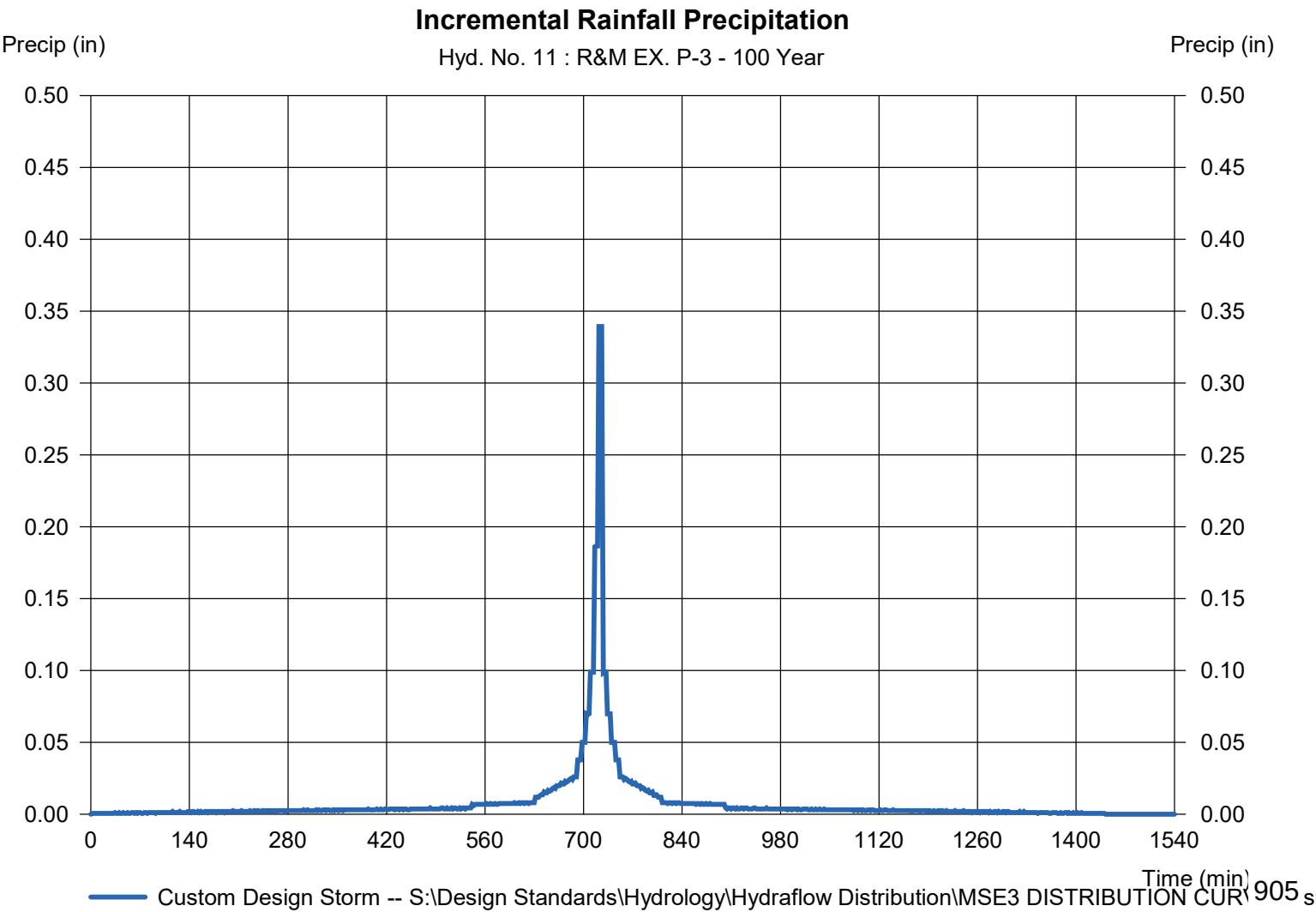
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 11

R&M EX. P-3

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

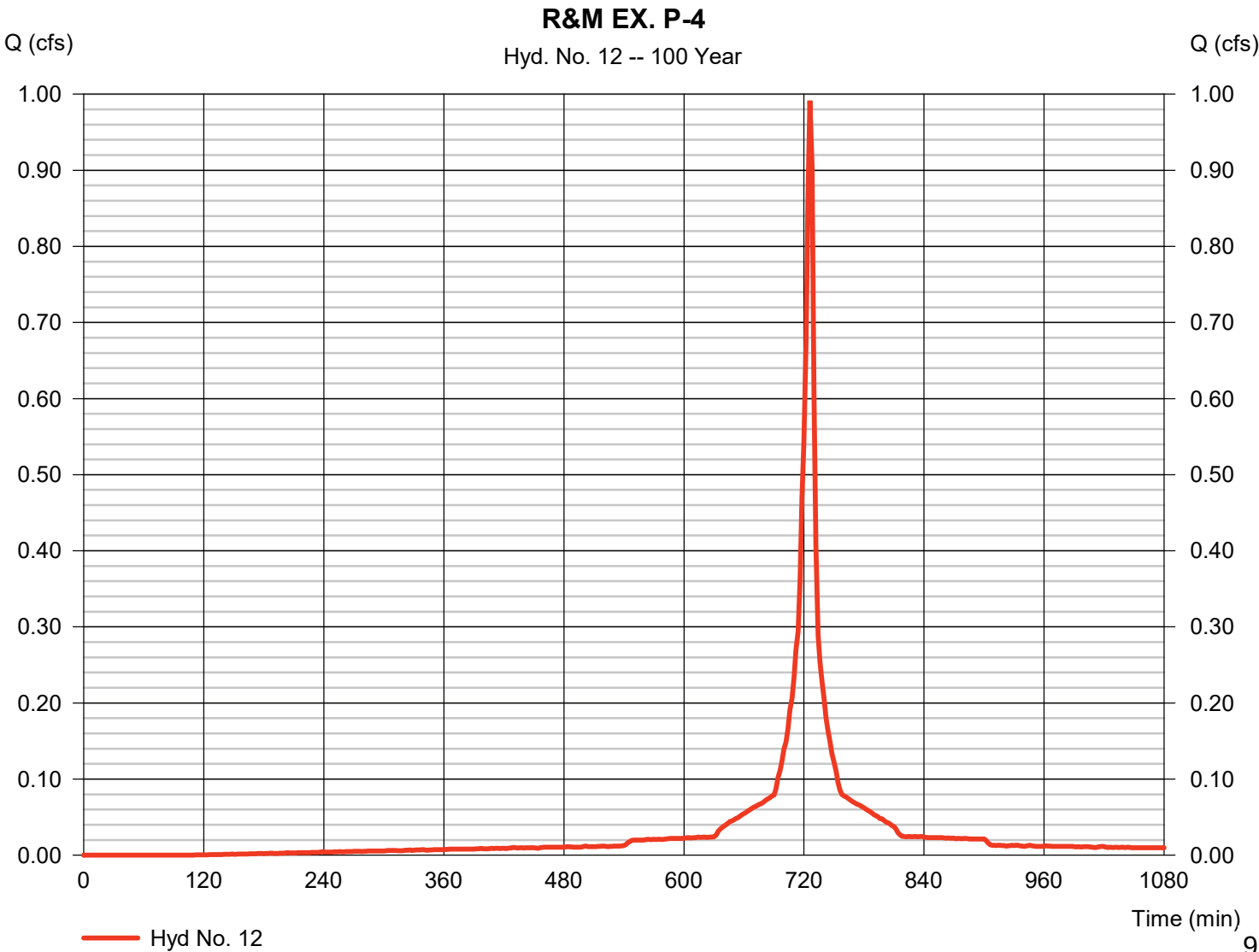
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Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.991 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.051 acft
Drainage area	= 0.110 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

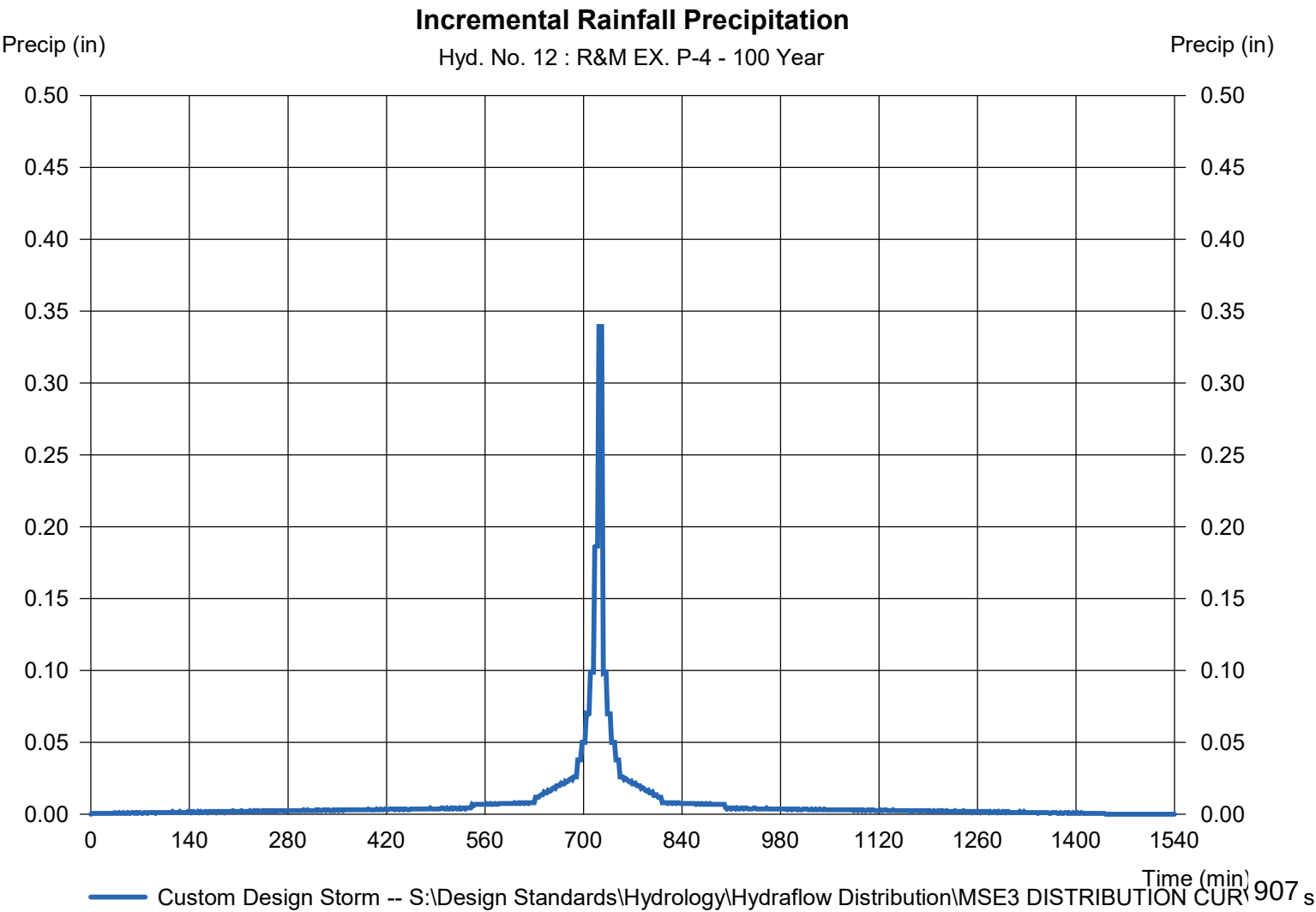
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 12

R&M EX. P-4

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

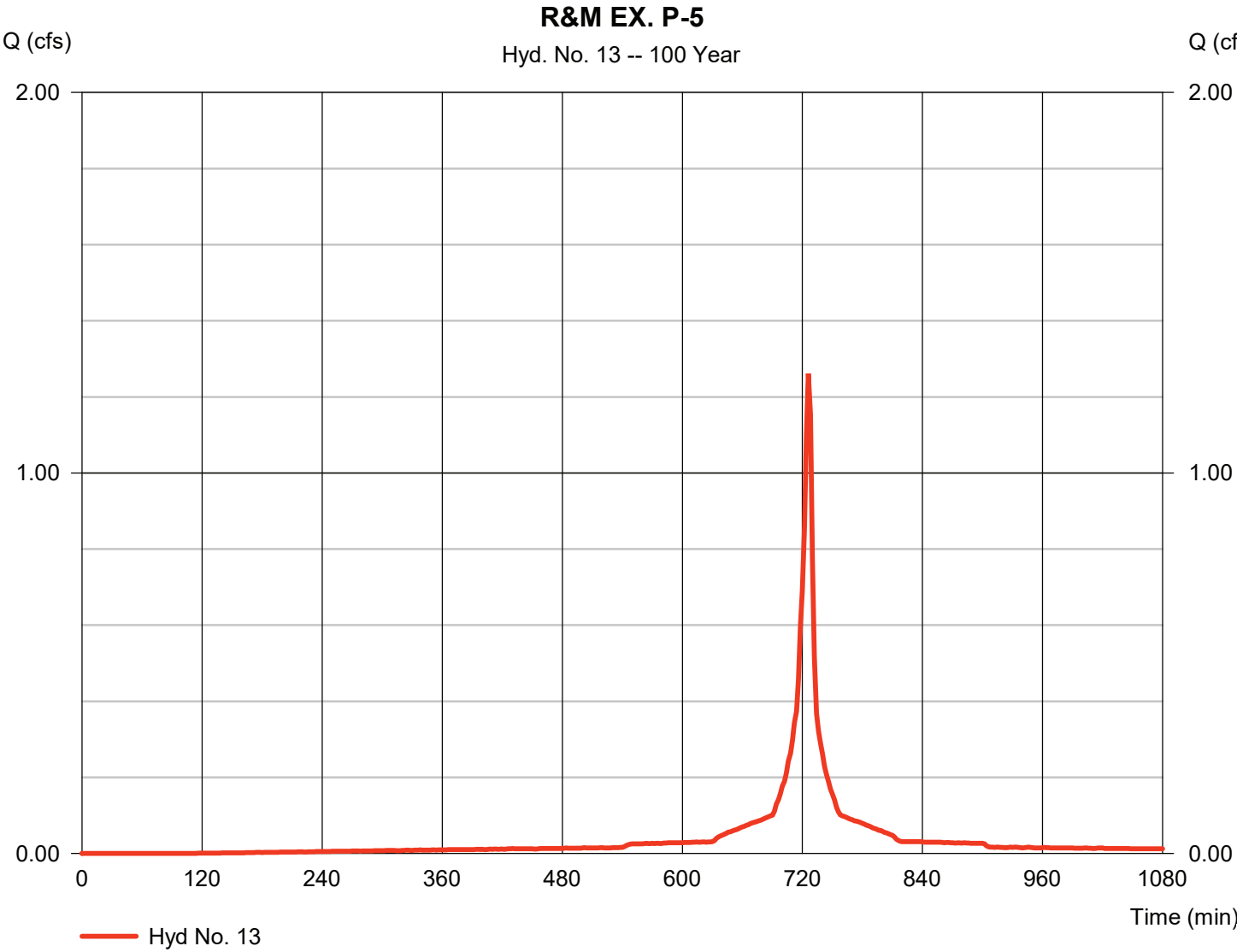
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 1.262 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.065 acft
Drainage area	= 0.140 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

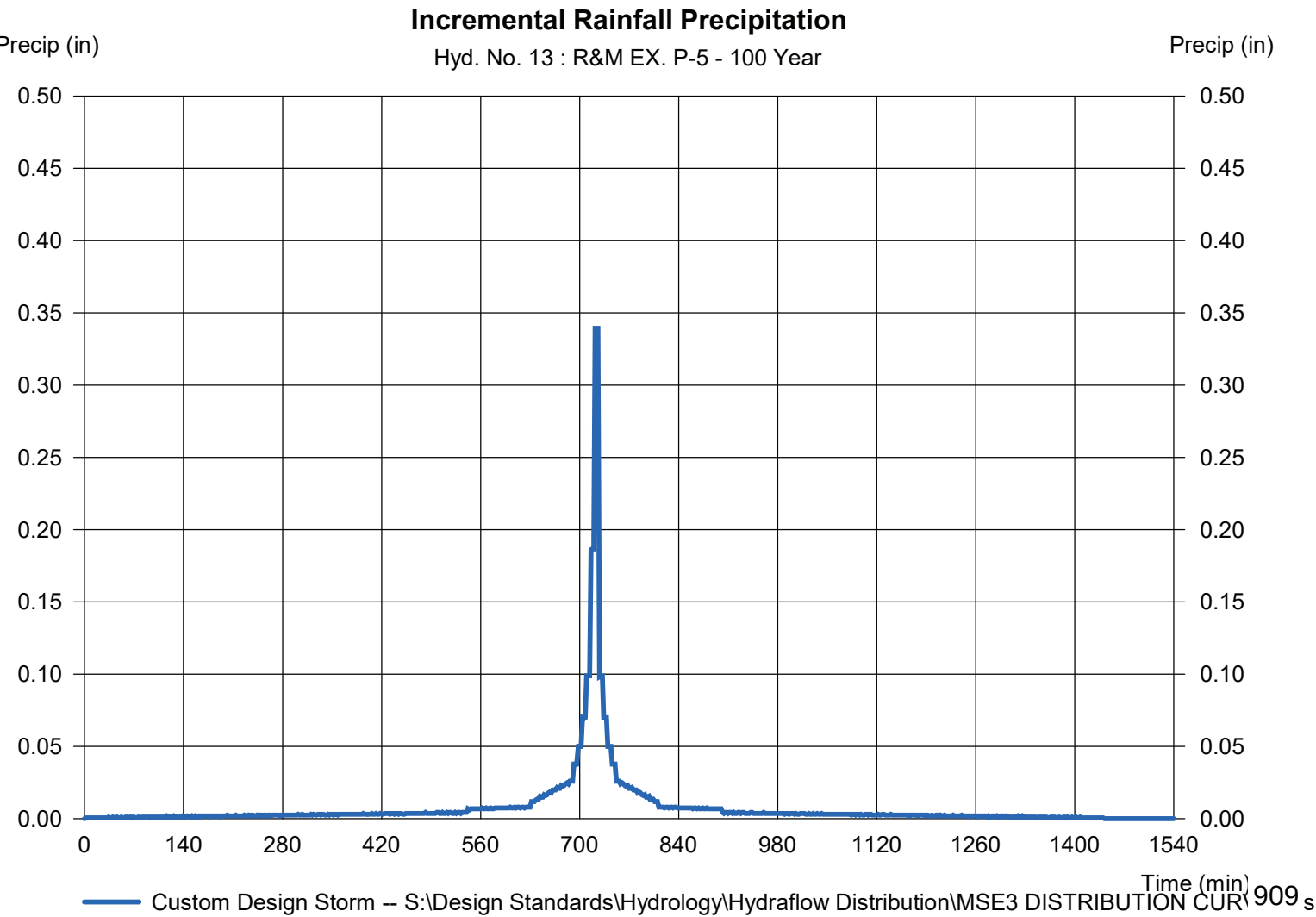
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 13

R&M EX. P-5

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

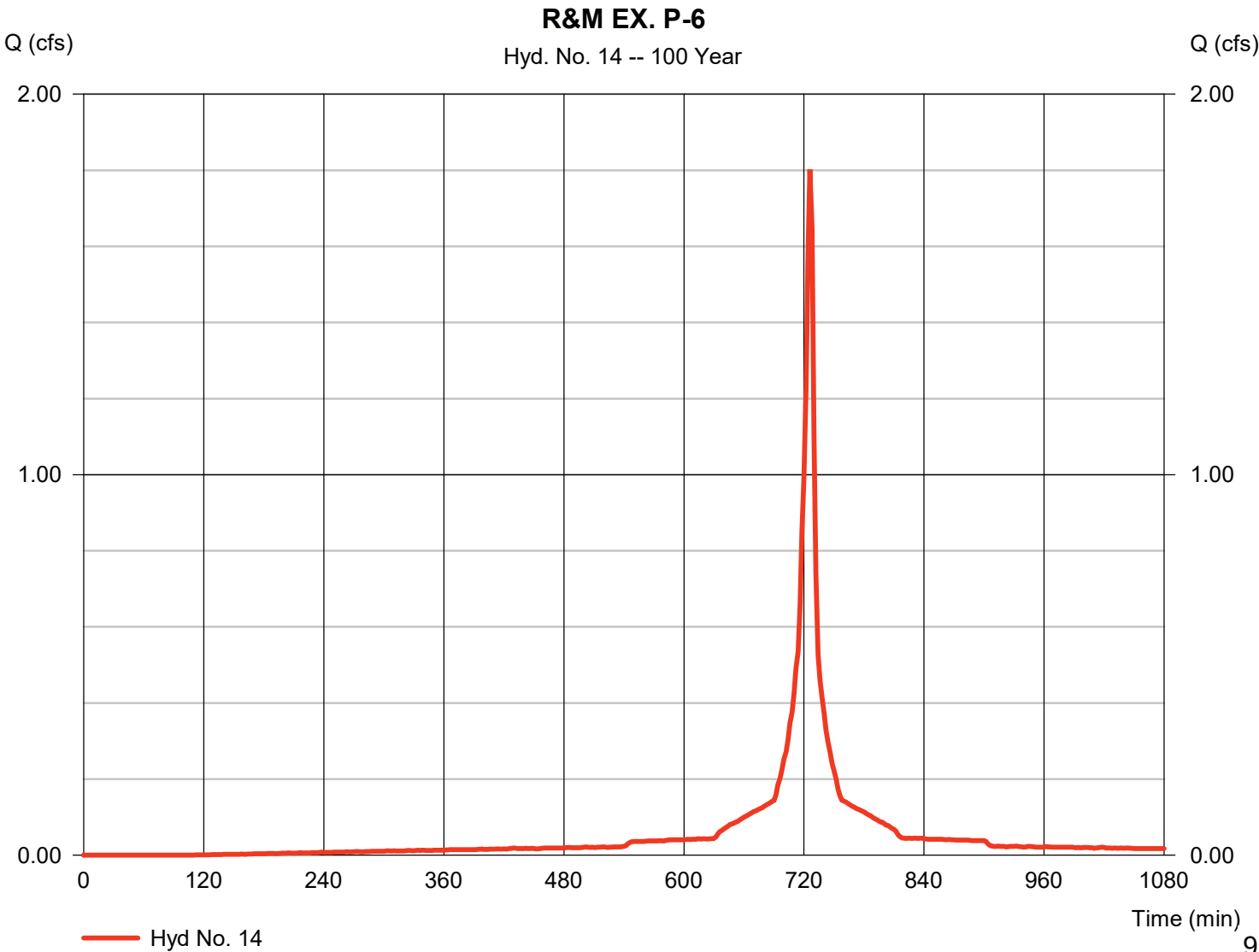
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Hydrograph type	= SCS Runoff	Peak discharge	= 1.802 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.093 acft
Drainage area	= 0.200 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CU		



Precipitation Report

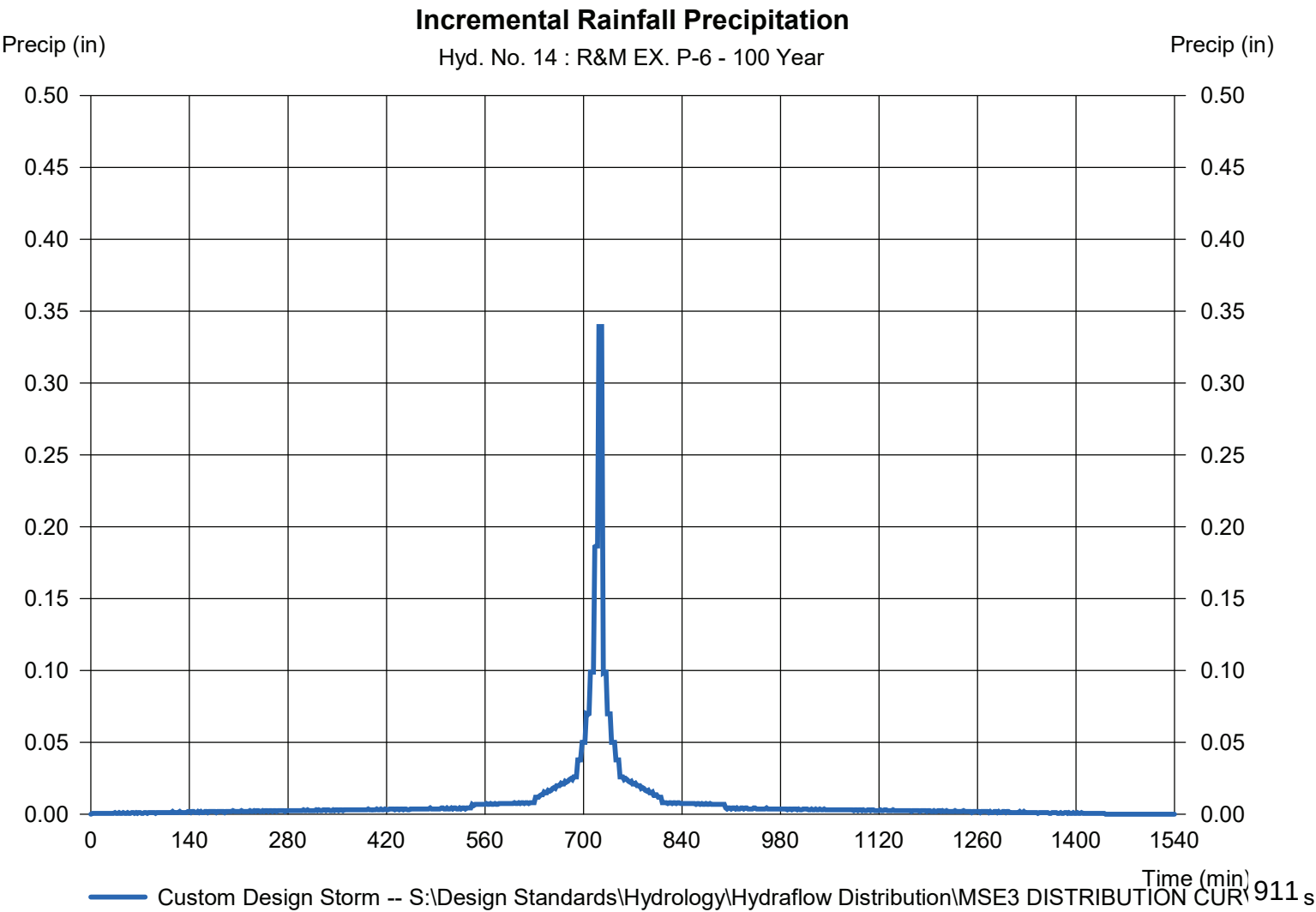
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 14

R&M EX. P-6

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

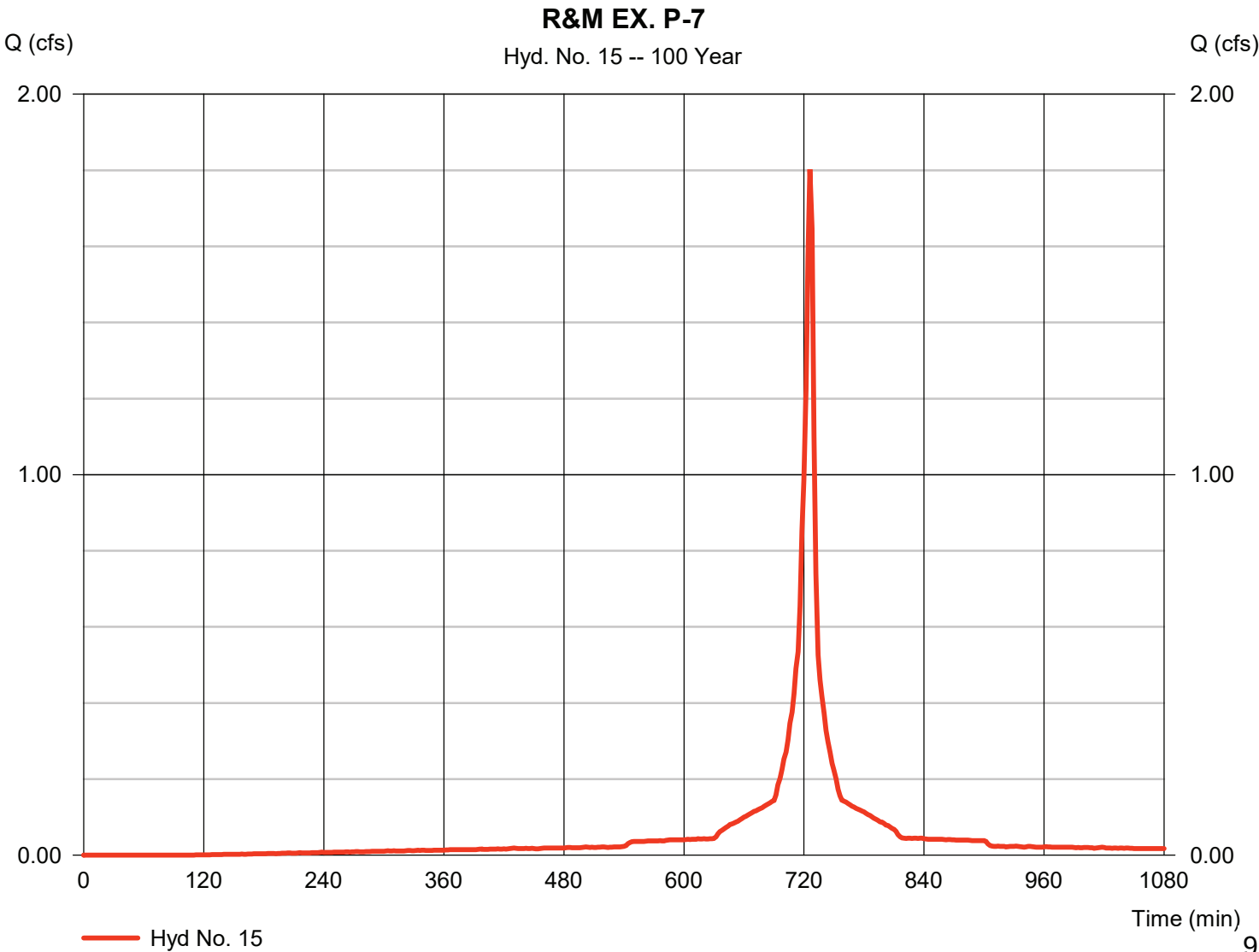
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 15

R&M EX. P-7

Hydrograph type	= SCS Runoff	Peak discharge	= 1.802 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.093 acft
Drainage area	= 0.200 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CU		



Precipitation Report

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

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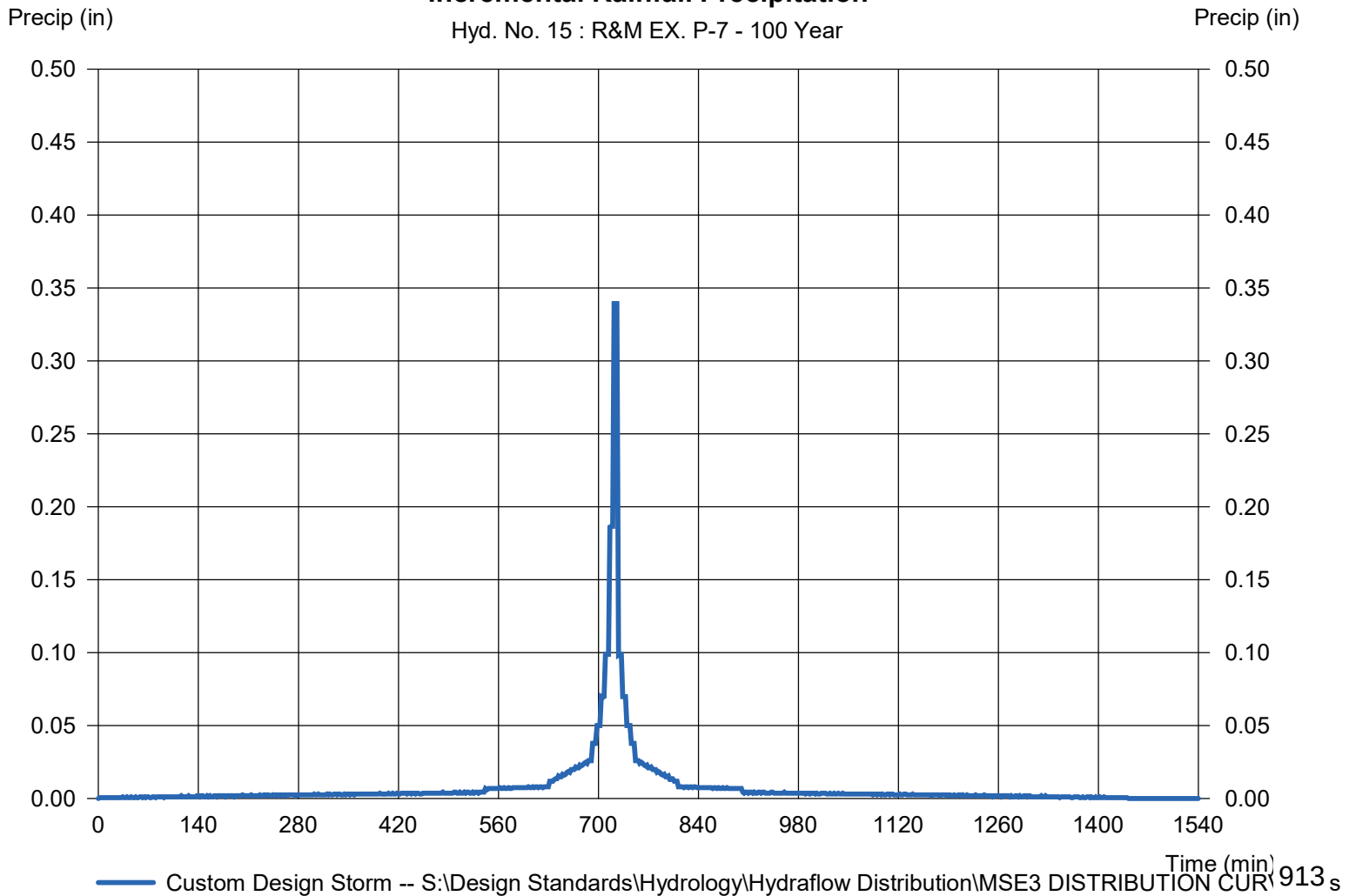
Hyd. No. 15

R&M EX. P-7

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		

Incremental Rainfall Precipitation

Hyd. No. 15 : R&M EX. P-7 - 100 Year



Hydrograph Report

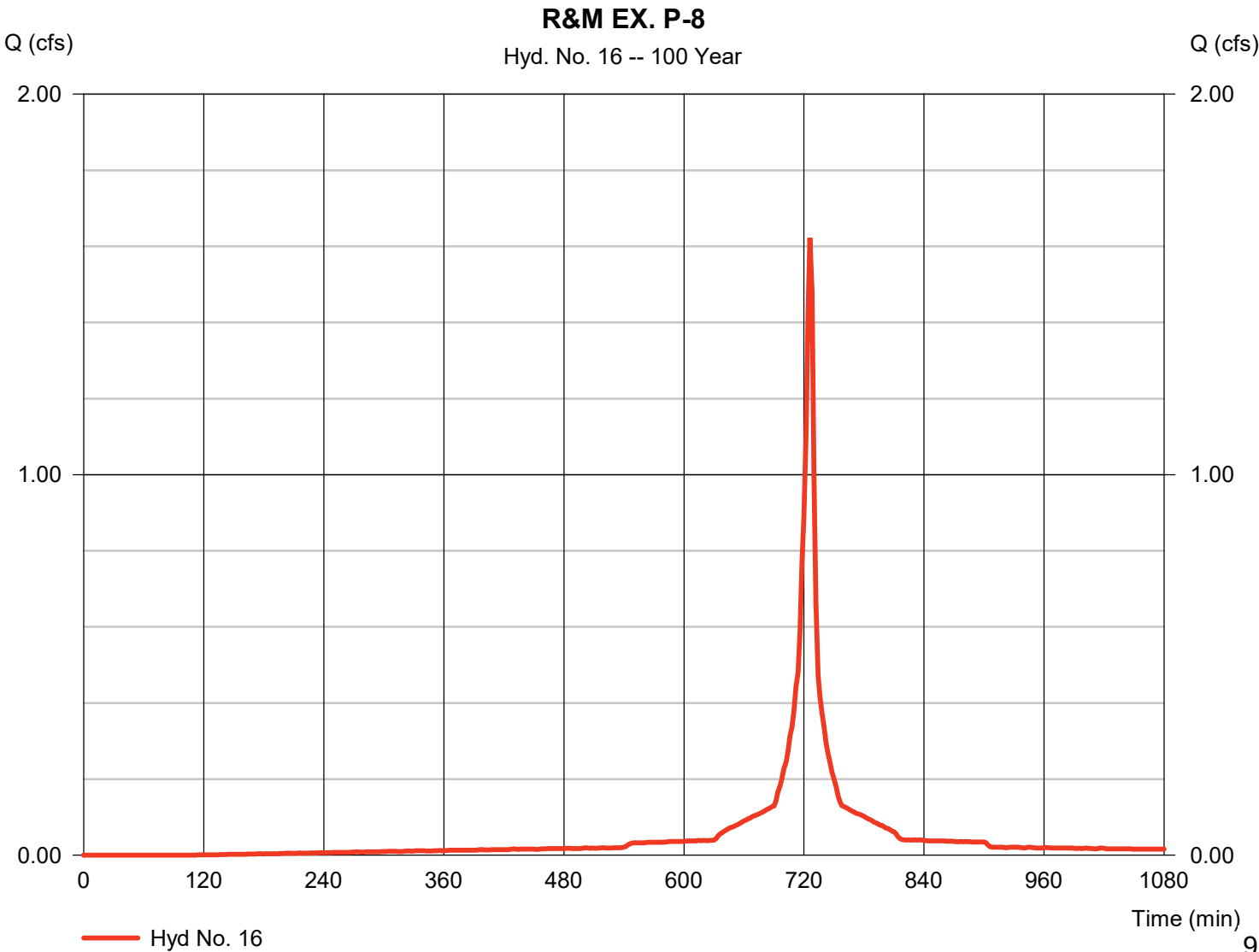
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Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Hydrograph type	= SCS Runoff	Peak discharge	= 1.622 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.084 acft
Drainage area	= 0.180 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

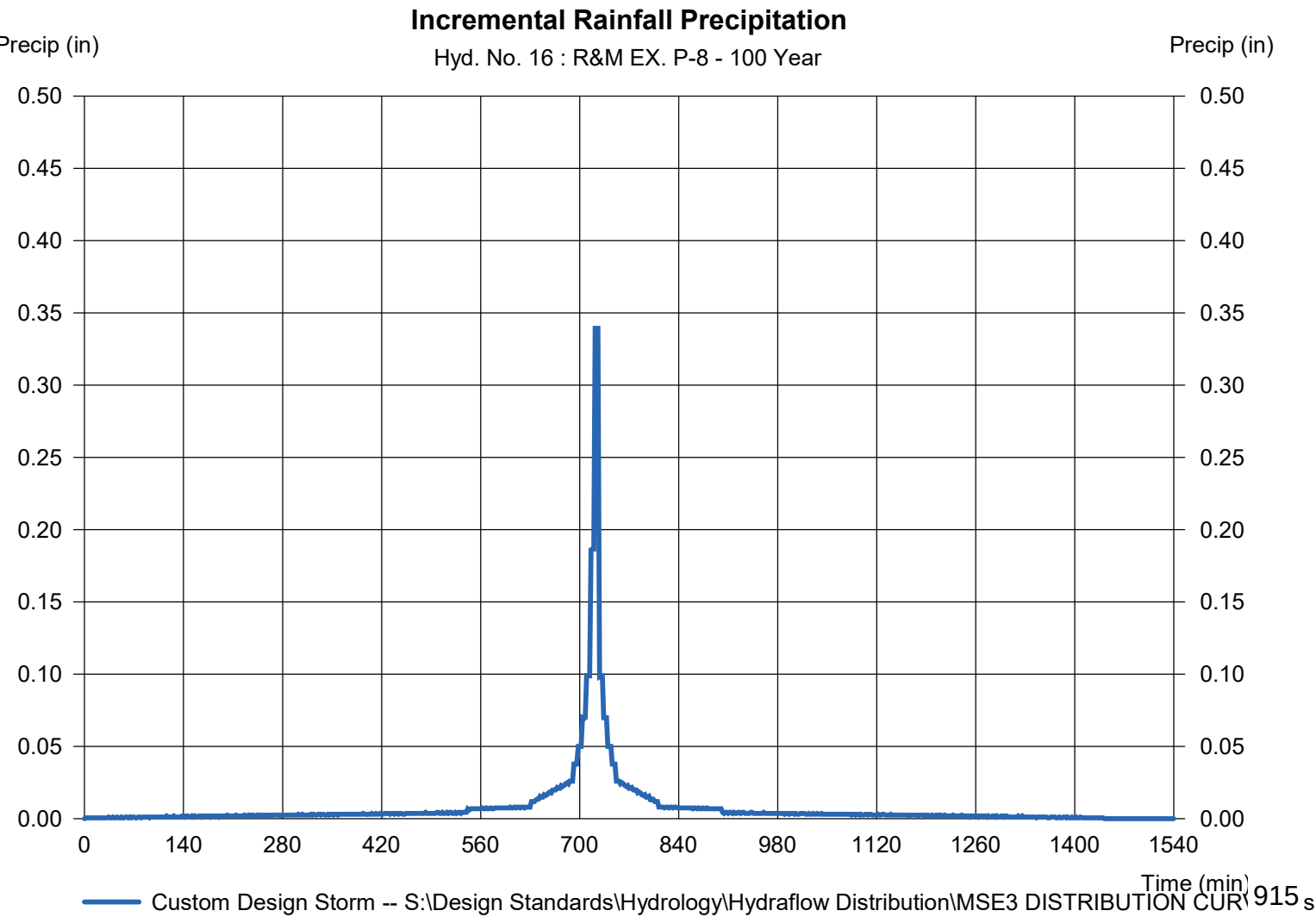
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 16

R&M EX. P-8

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

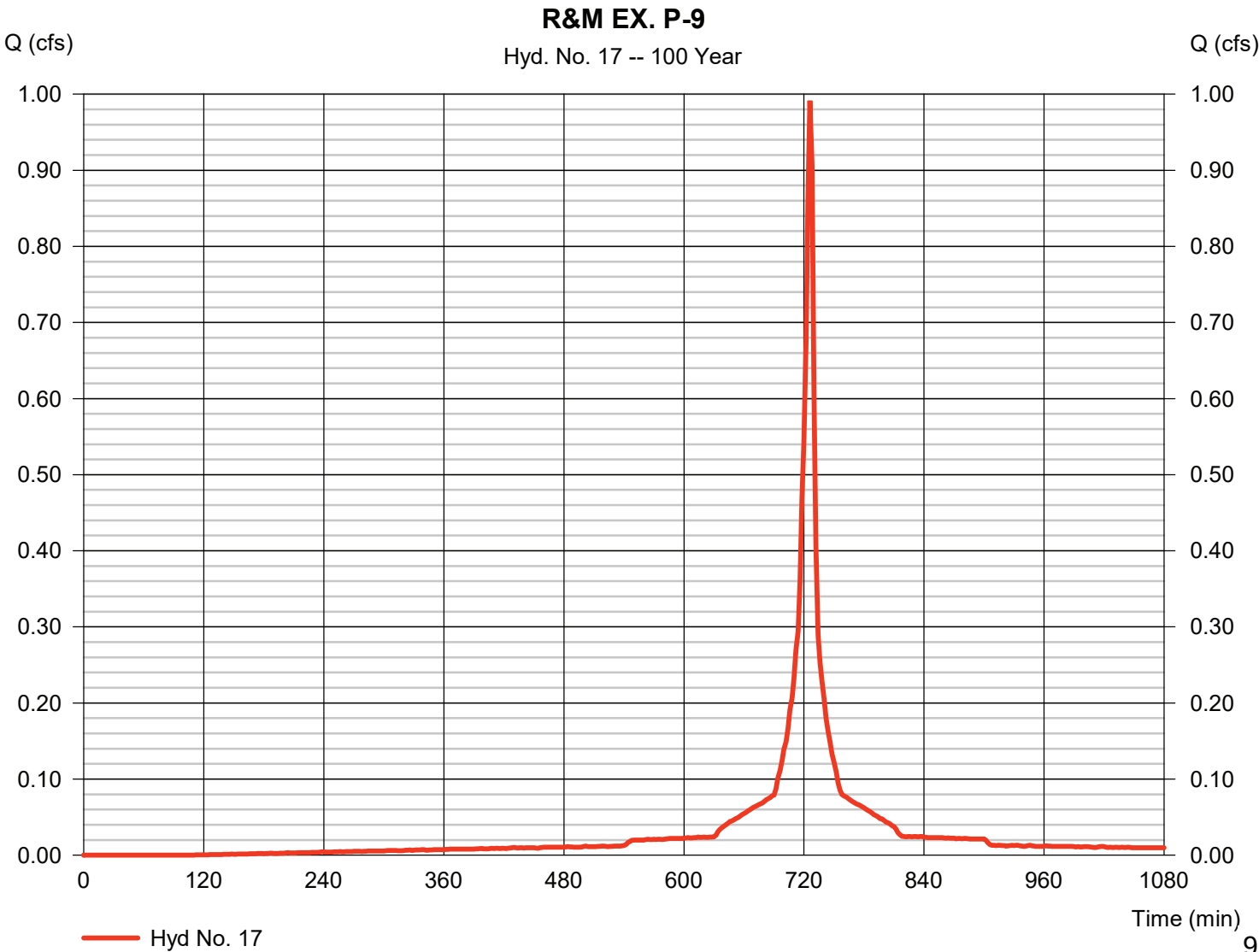
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Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.991 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.051 acft
Drainage area	= 0.110 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

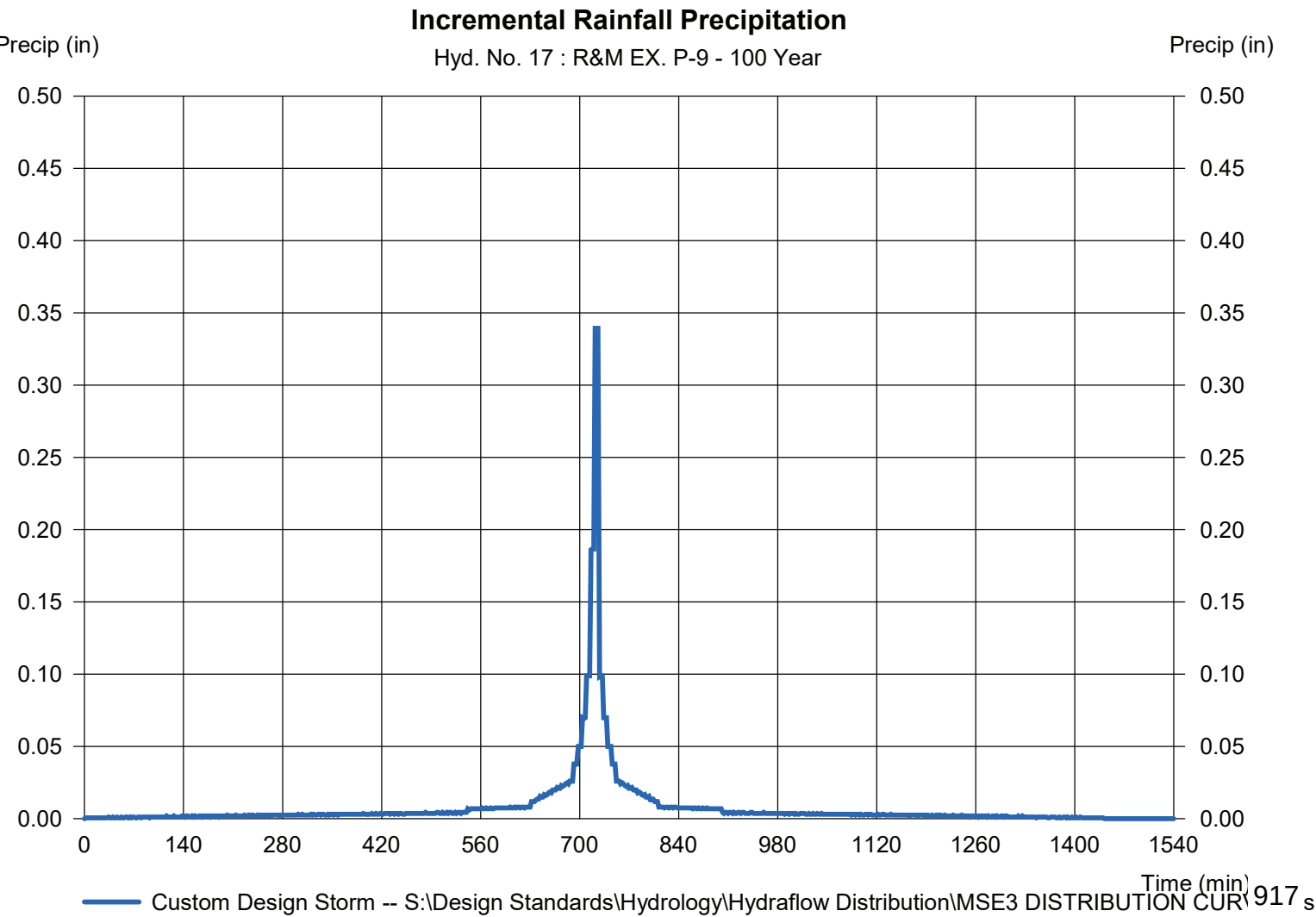
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 17

R&M EX. P-9

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

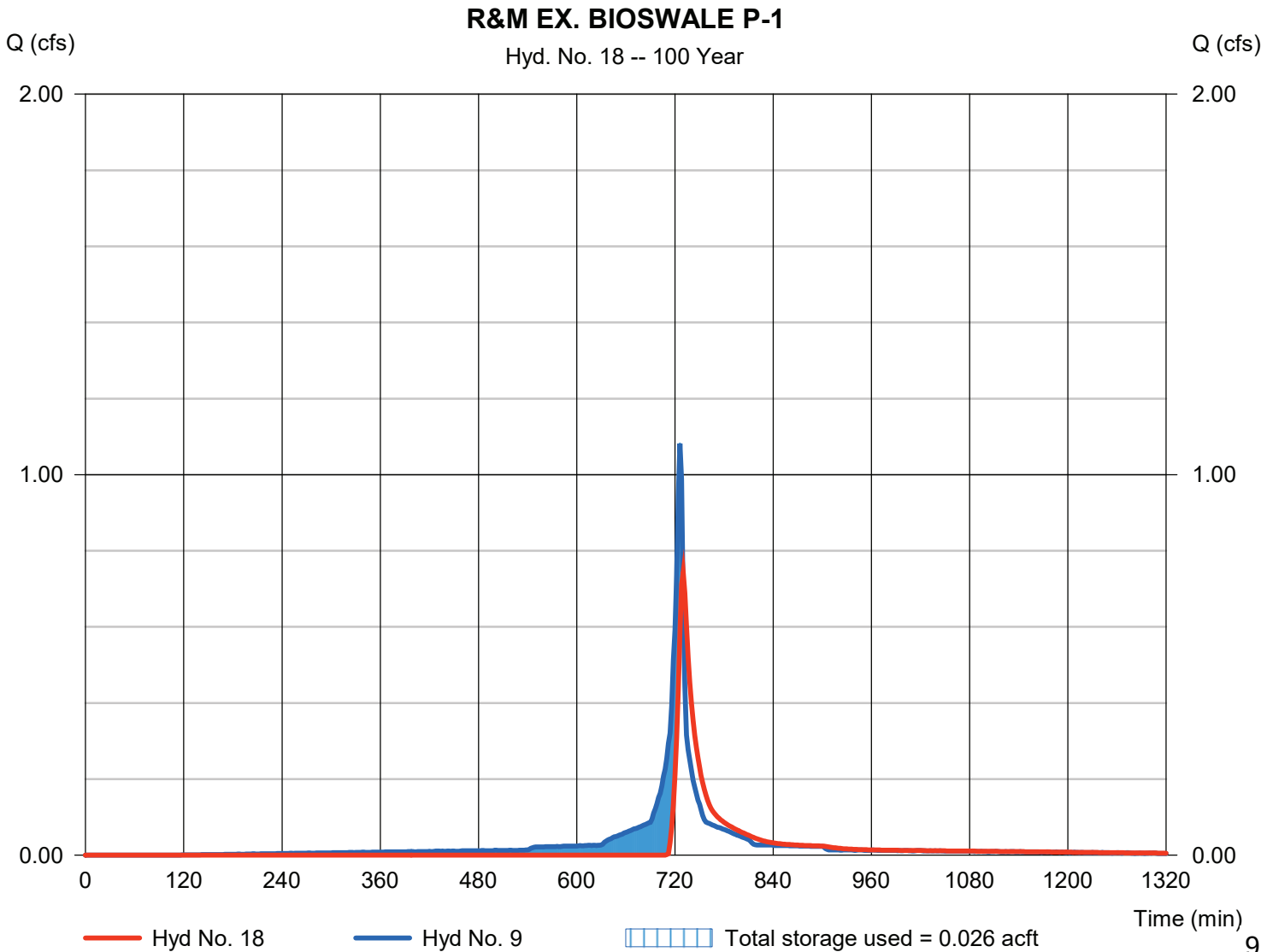
Friday, 06 / 28 / 2019

Hyd. No. 18

R&M EX. BIOSWALE P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.744 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 0.040 acft
Inflow hyd. No.	= 9 - R&M EX. P-1	Max. Elevation	= 851.96 ft
Reservoir name	= Ex. Bioswale P-1	Max. Storage	= 0.026 acft

Storage Indication method used.



Hydrograph Report

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

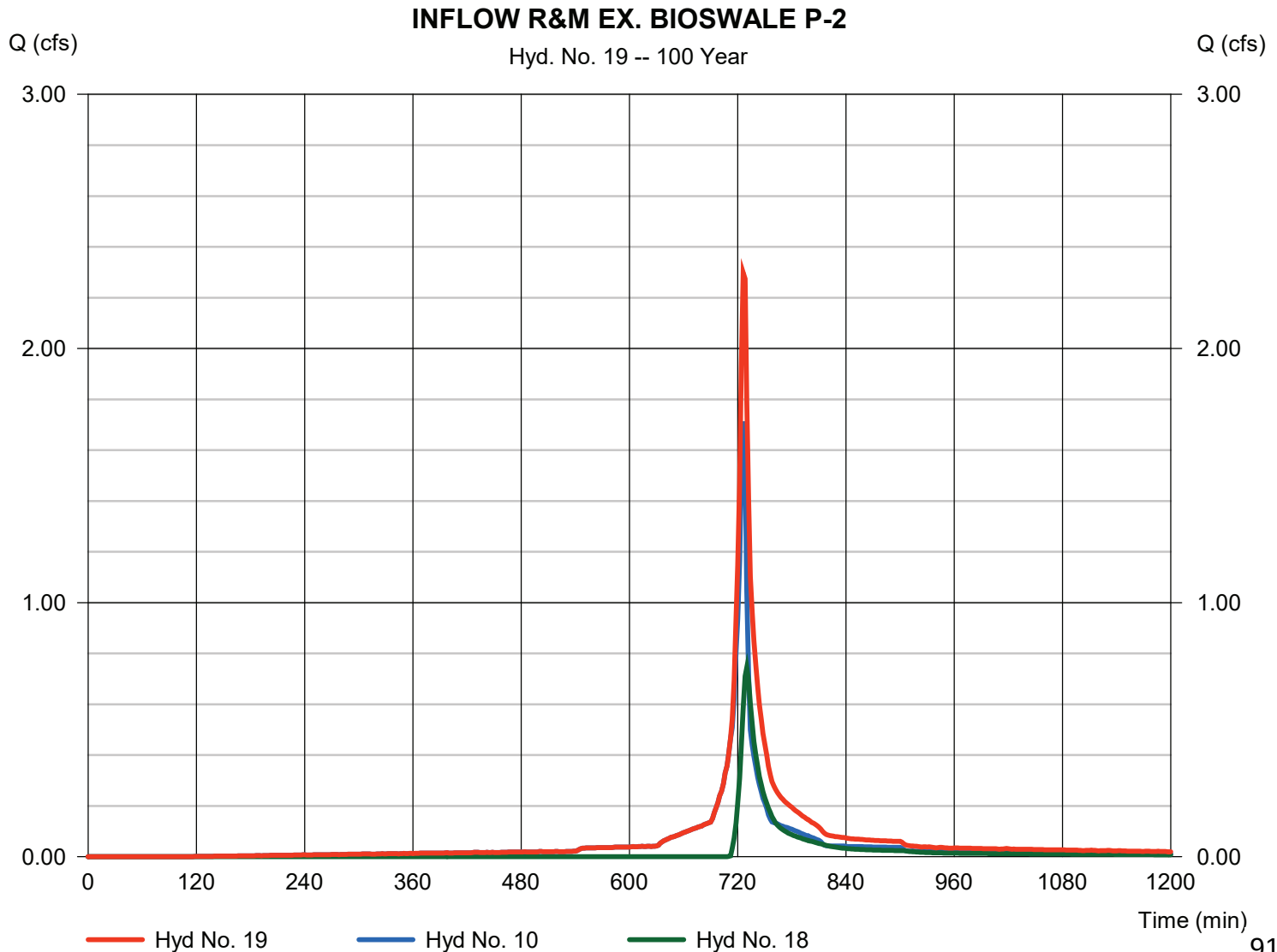
Friday, 06 / 28 / 2019

Hyd. No. 19

INFLOW R&M EX. BIOSWALE P-2

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 10, 18

Peak discharge = 2.297 cfs
Time to peak = 726 min
Hyd. volume = 0.128 acft
Contrib. drain. area = 0.190 ac



Hydrograph Report

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

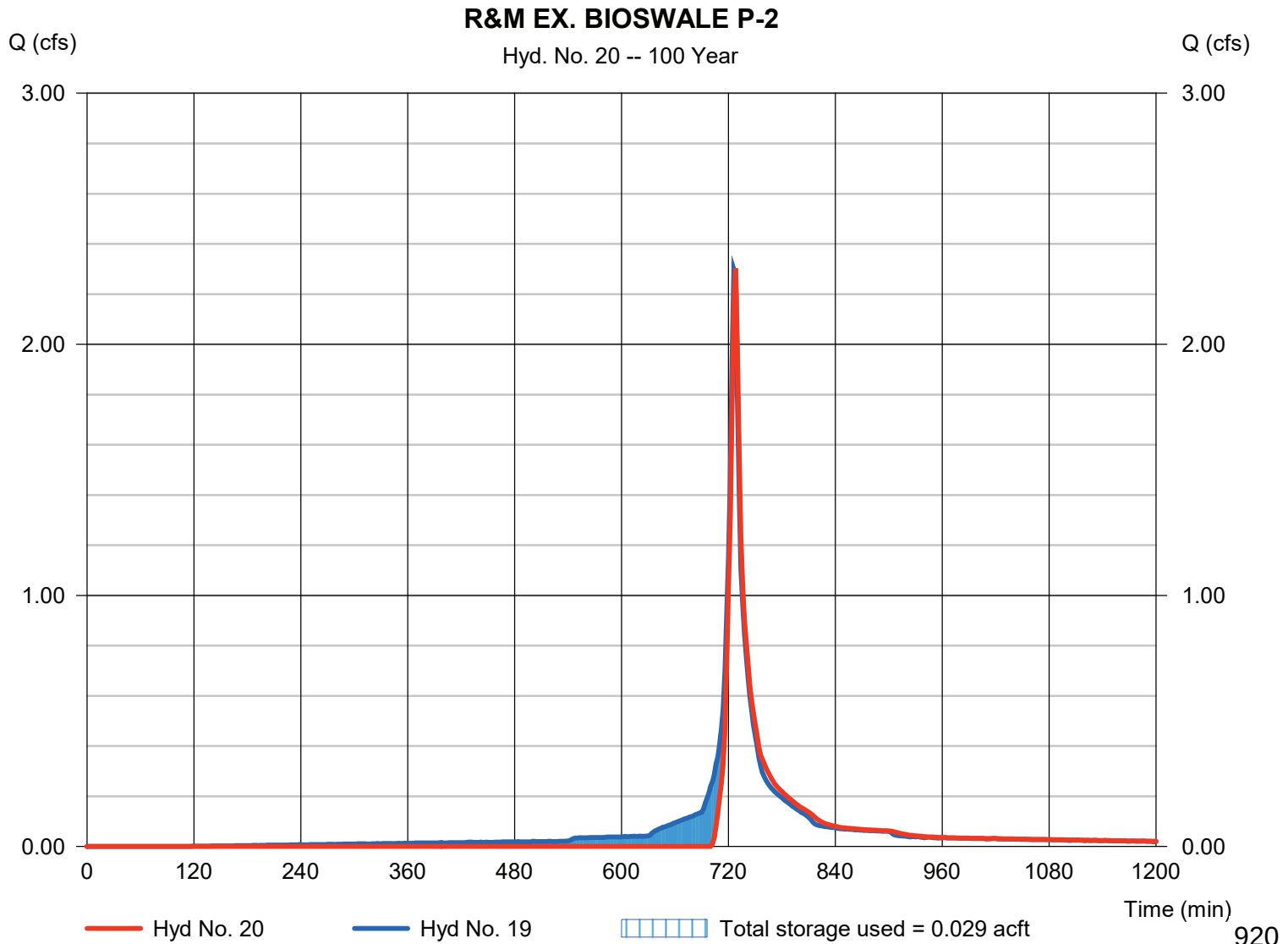
Friday, 06 / 28 / 2019

Hyd. No. 20

R&M EX. BIOSWALE P-2

Hydrograph type	= Reservoir	Peak discharge	= 2.302 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 0.106 acft
Inflow hyd. No.	= 19 - INFLOW R&M EX. BIOSWALE P-2	Max. Elevation	= 851.63 ft
Reservoir name	= Ex. Bioswale P-2	Max. Storage	= 0.029 acft

Storage Indication method used.



Hydrograph Report

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

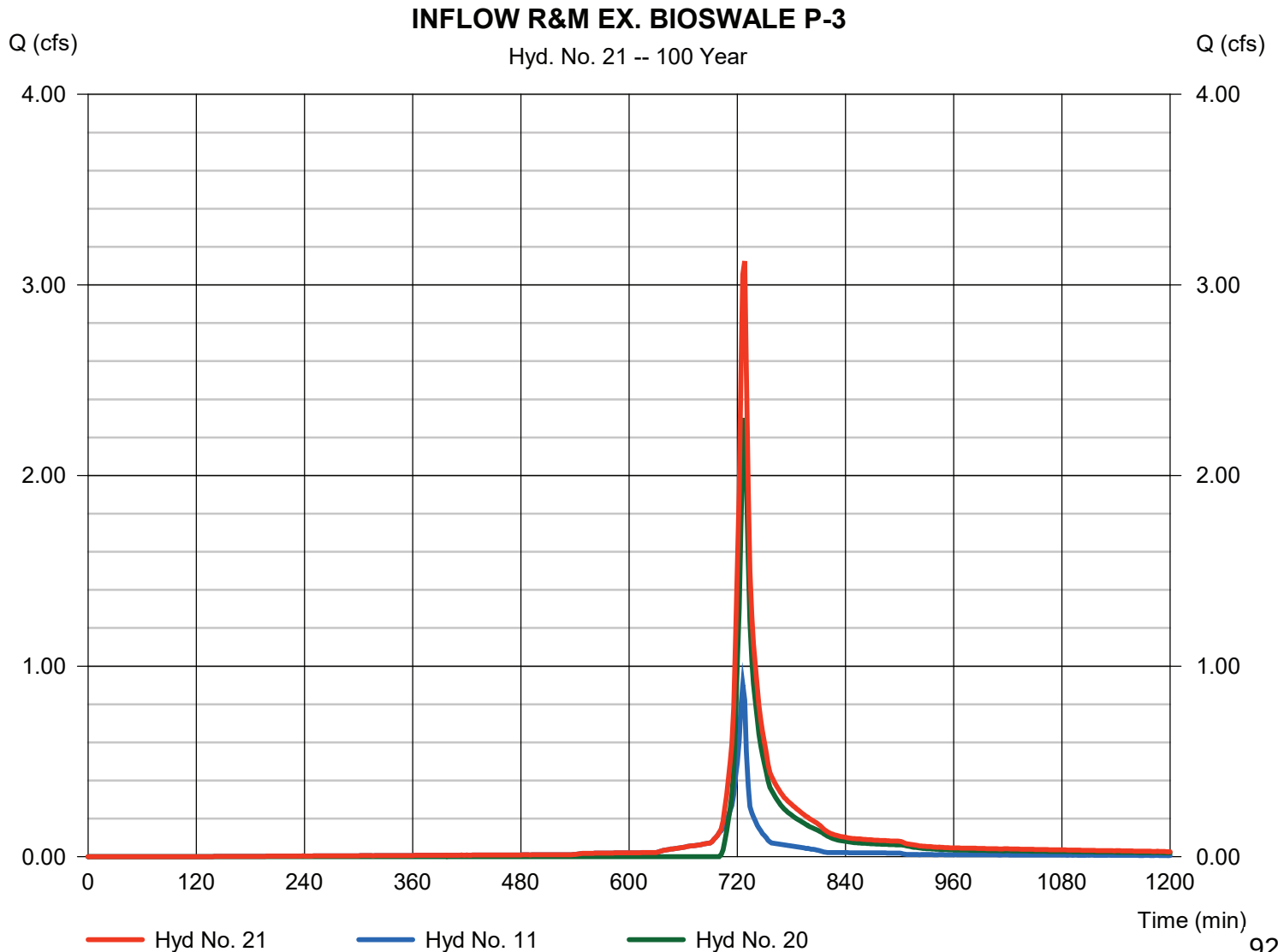
Friday, 06 / 28 / 2019

Hyd. No. 21

INFLOW R&M EX. BIOSWALE P-3

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 11, 20

Peak discharge = 3.125 cfs
Time to peak = 728 min
Hyd. volume = 0.153 acft
Contrib. drain. area = 0.100 ac



Hydrograph Report

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

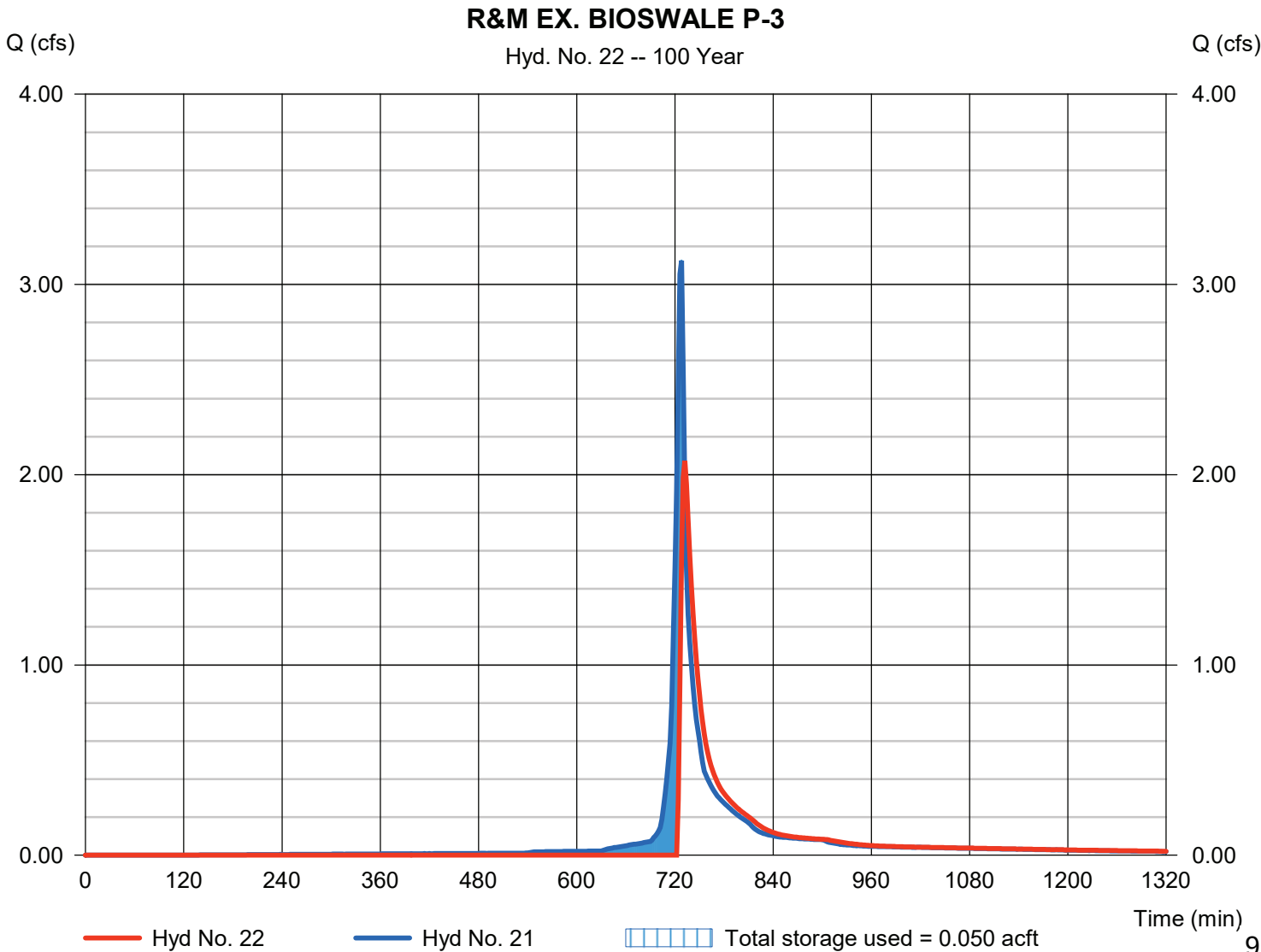
Friday, 06 / 28 / 2019

Hyd. No. 22

R&M EX. BIOSWALE P-3

Hydrograph type	= Reservoir	Peak discharge	= 2.074 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 0.122 acft
Inflow hyd. No.	= 21 - INFLOW R&M EX. BIOSWALE P-3	Max. Elevation	= 851.70 ft
Reservoir name	= Ex. Bioswale P-3	Max. Storage	= 0.050 acft

Storage Indication method used.



Hydrograph Report

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

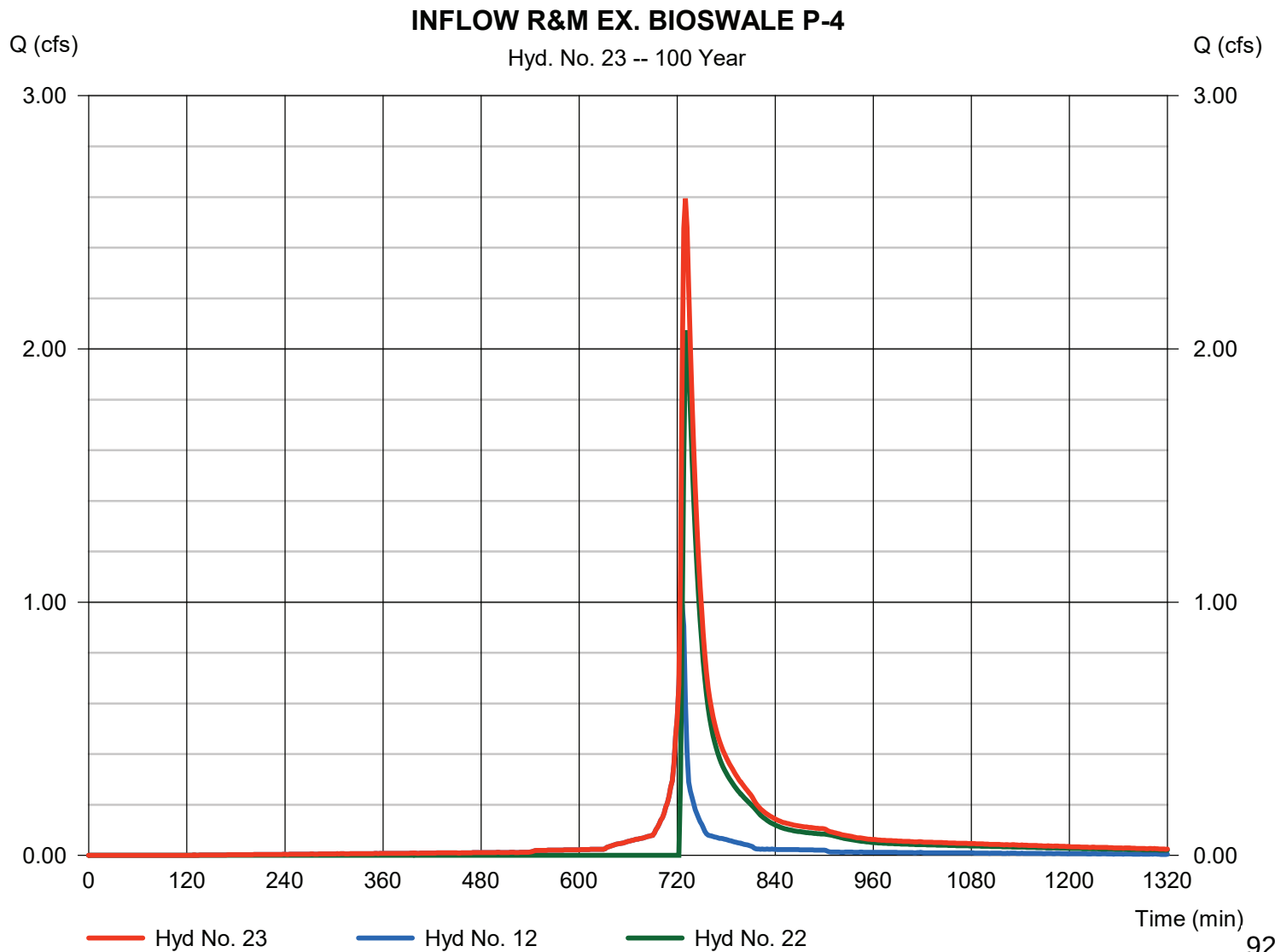
Friday, 06 / 28 / 2019

Hyd. No. 23

INFLOW R&M EX. BIOSWALE P-4

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 12, 22

Peak discharge = 2.594 cfs
Time to peak = 730 min
Hyd. volume = 0.173 acft
Contrib. drain. area = 0.110 ac



Hydrograph Report

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

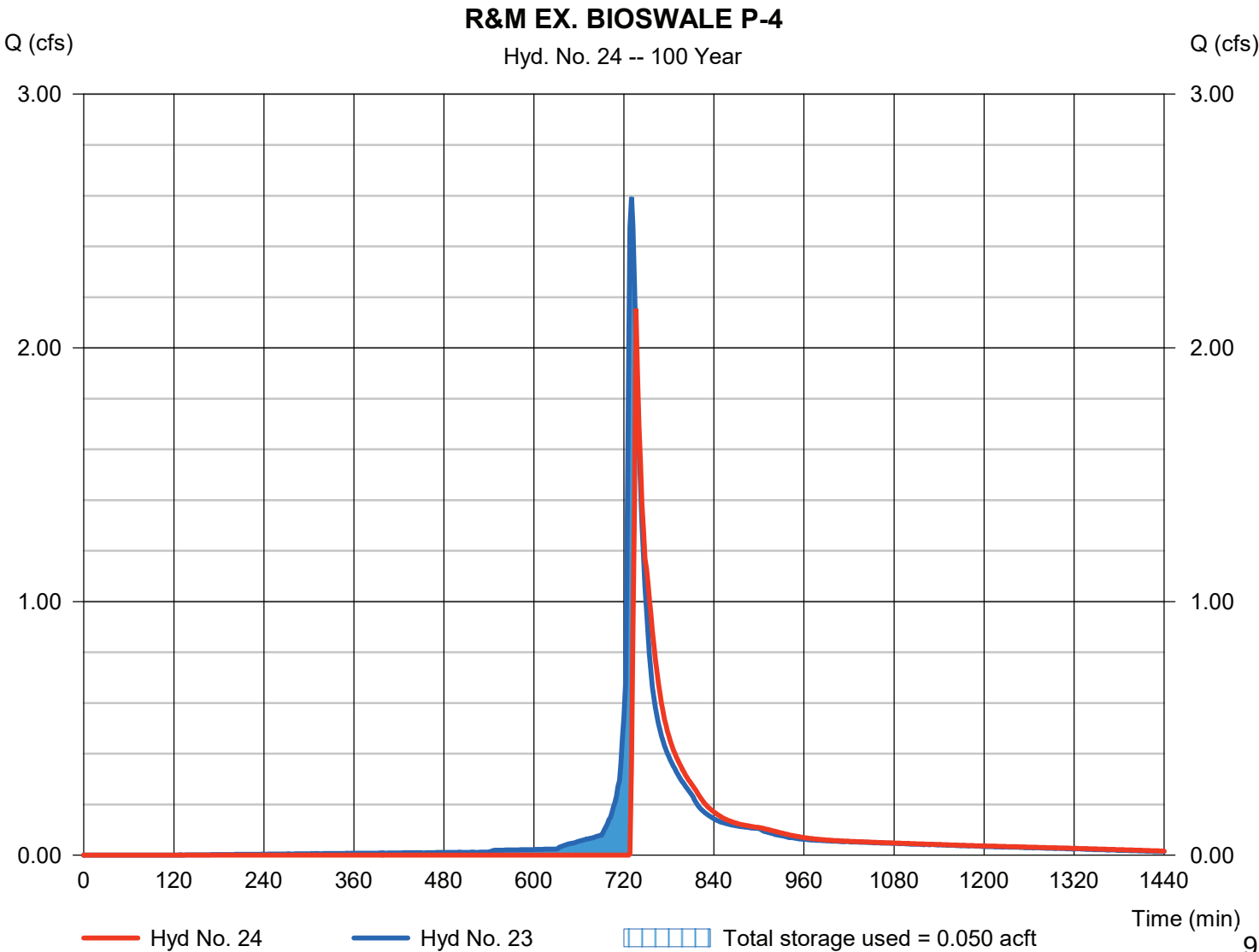
Friday, 06 / 28 / 2019

Hyd. No. 24

R&M EX. BIOSWALE P-4

Hydrograph type	= Reservoir	Peak discharge	= 2.155 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 0.139 acft
Inflow hyd. No.	= 23 - INFLOW R&M EX. BIOSWALE P-4	Max. Elevation	= 850.70 ft
Reservoir name	= Ex. Bioswale P-4	Max. Storage	= 0.050 acft

Storage Indication method used.



Hydrograph Report

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

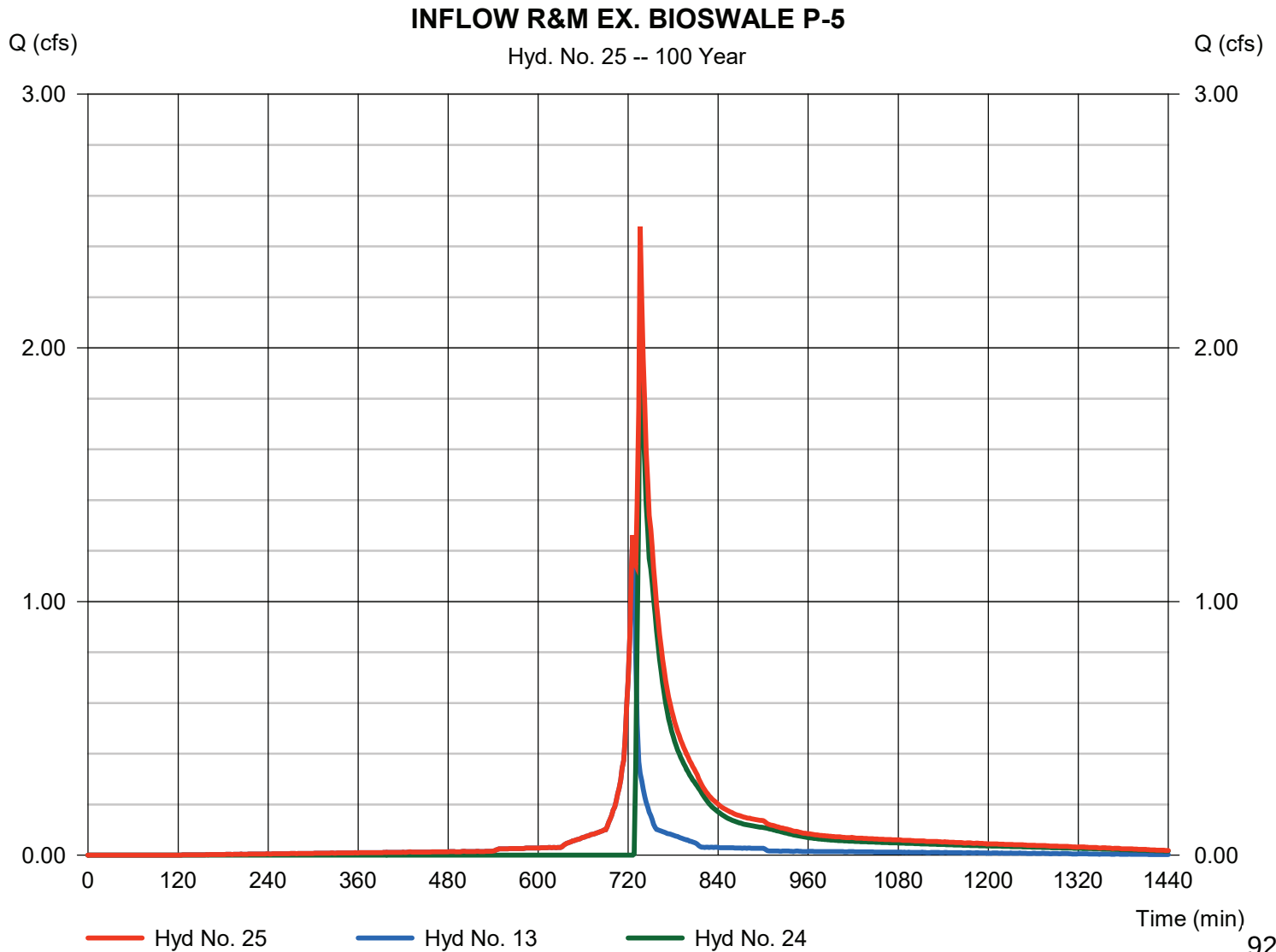
Friday, 06 / 28 / 2019

Hyd. No. 25

INFLOW R&M EX. BIOSWALE P-5

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 13, 24

Peak discharge = 2.477 cfs
Time to peak = 736 min
Hyd. volume = 0.204 acft
Contrib. drain. area = 0.140 ac



Hydrograph Report

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

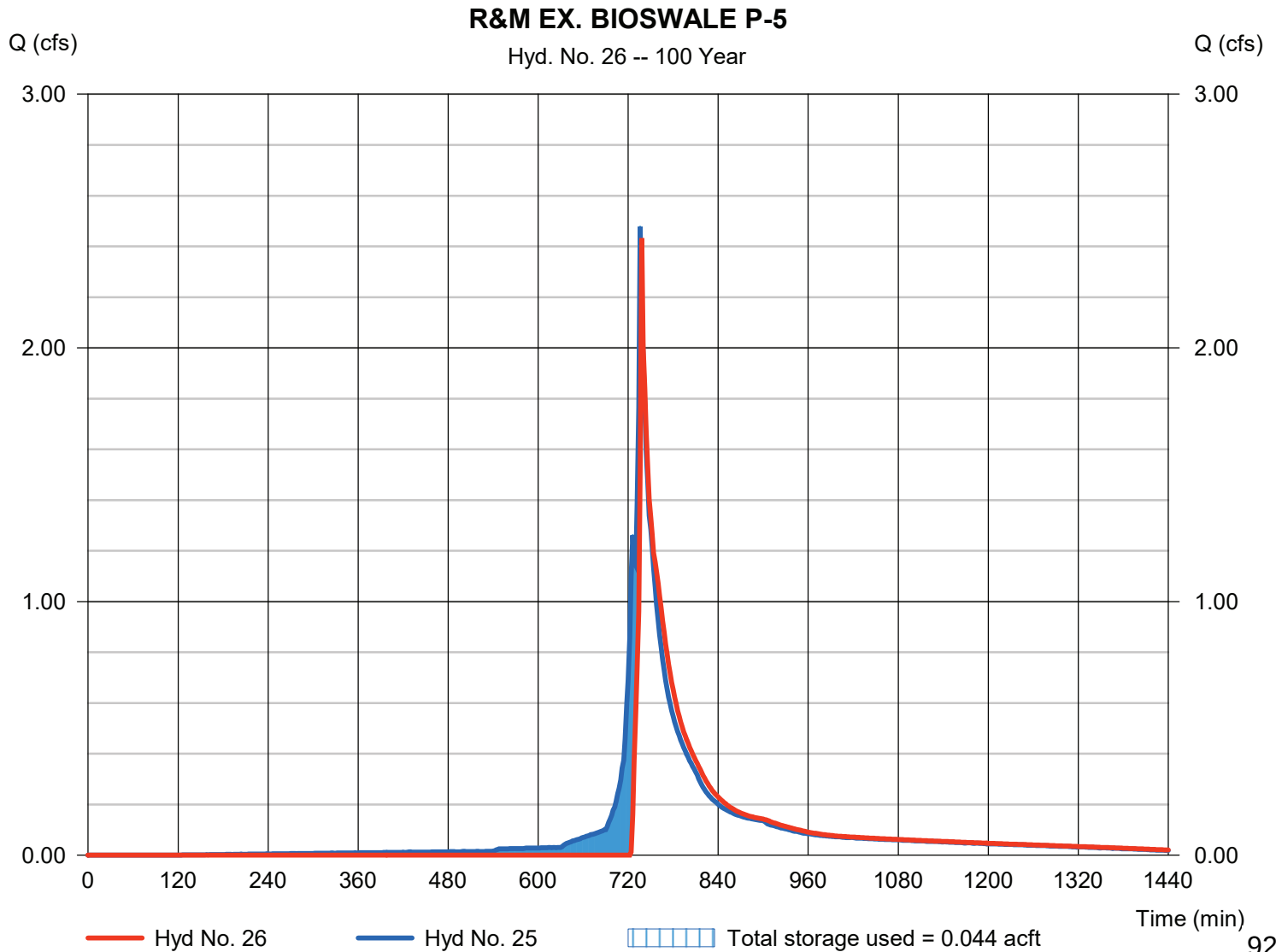
Friday, 06 / 28 / 2019

Hyd. No. 26

R&M EX. BIOSWALE P-5

Hydrograph type	= Reservoir	Peak discharge	= 2.432 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.175 acft
Inflow hyd. No.	= 25 - INFLOW R&M EX. BIOSWALE P-5	Max. Elevation	= 849.24 ft
Reservoir name	= Ex. Bioswale P-5	Max. Storage	= 0.044 acft

Storage Indication method used.



Hydrograph Report

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

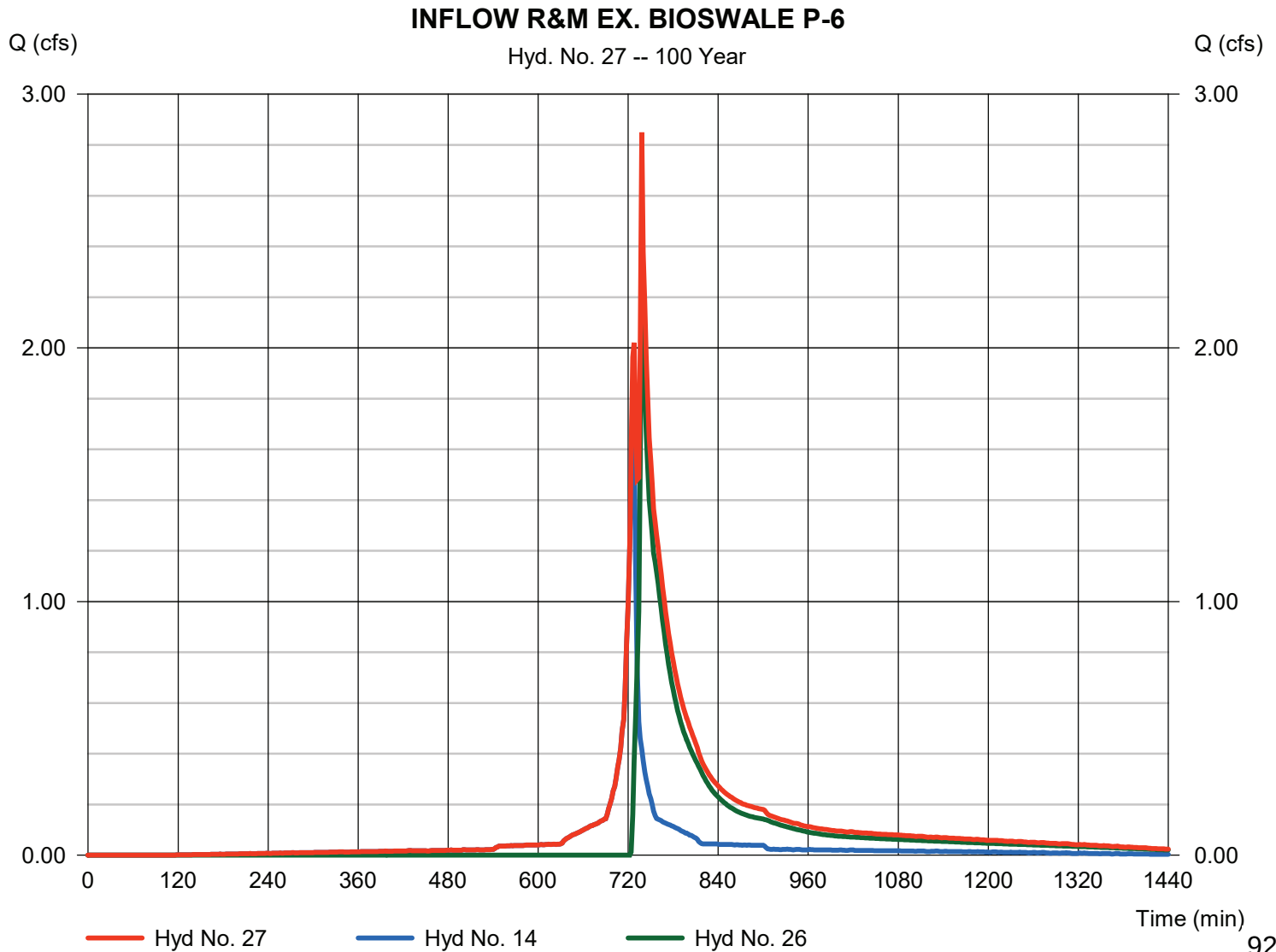
Friday, 06 / 28 / 2019

Hyd. No. 27

INFLOW R&M EX. BIOSWALE P-6

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 14, 26

Peak discharge = 2.849 cfs
Time to peak = 738 min
Hyd. volume = 0.268 acft
Contrib. drain. area = 0.200 ac



Hydrograph Report

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

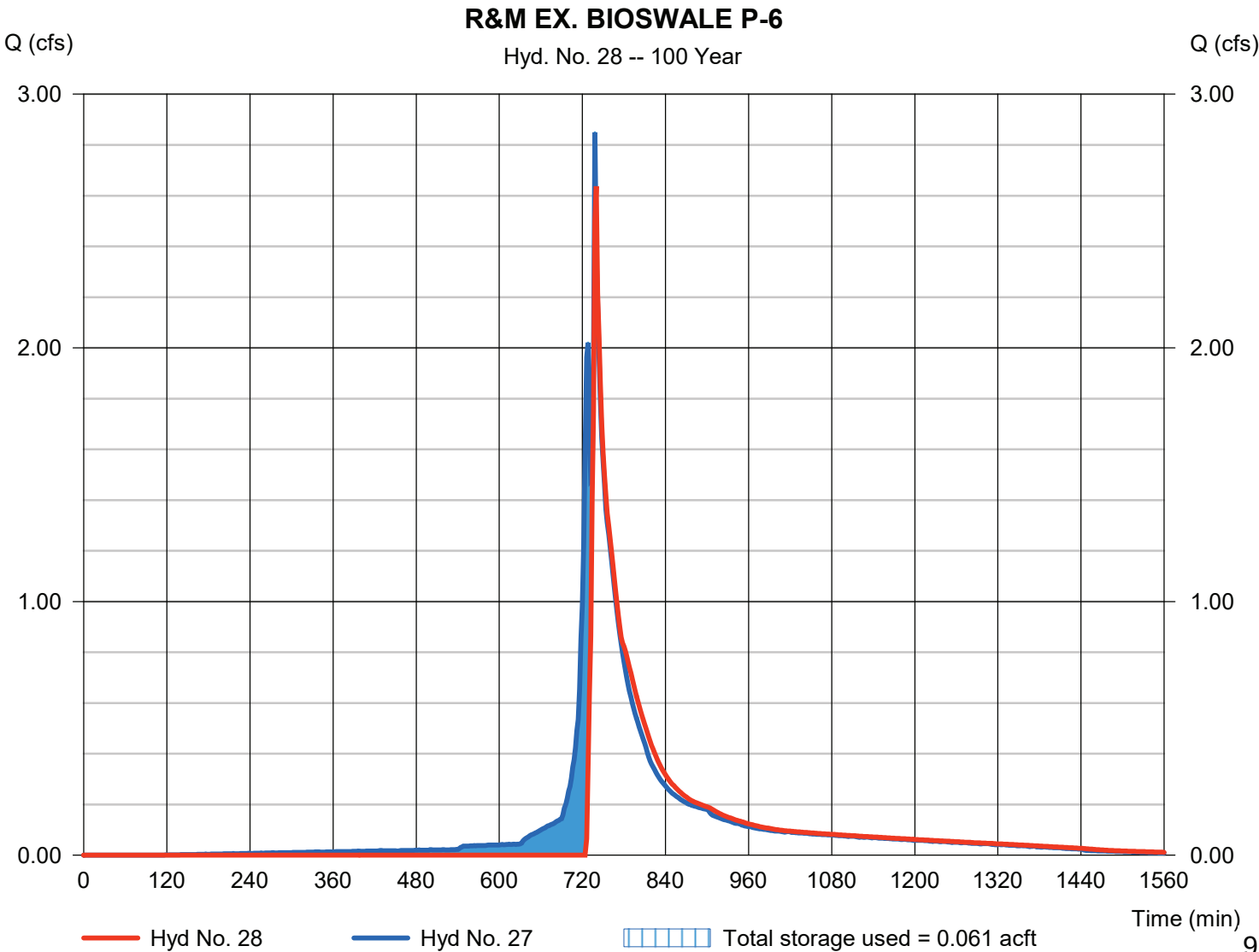
Friday, 06 / 28 / 2019

Hyd. No. 28

R&M EX. BIOSWALE P-6

Hydrograph type	= Reservoir	Peak discharge	= 2.637 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 0.223 acft
Inflow hyd. No.	= 27 - INFLOW R&M EX. BIOSWALE P-6	Max. Elevation	= 848.08 ft
Reservoir name	= Ex. Bioswale P-6	Max. Storage	= 0.061 acft

Storage Indication method used.



Hydrograph Report

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

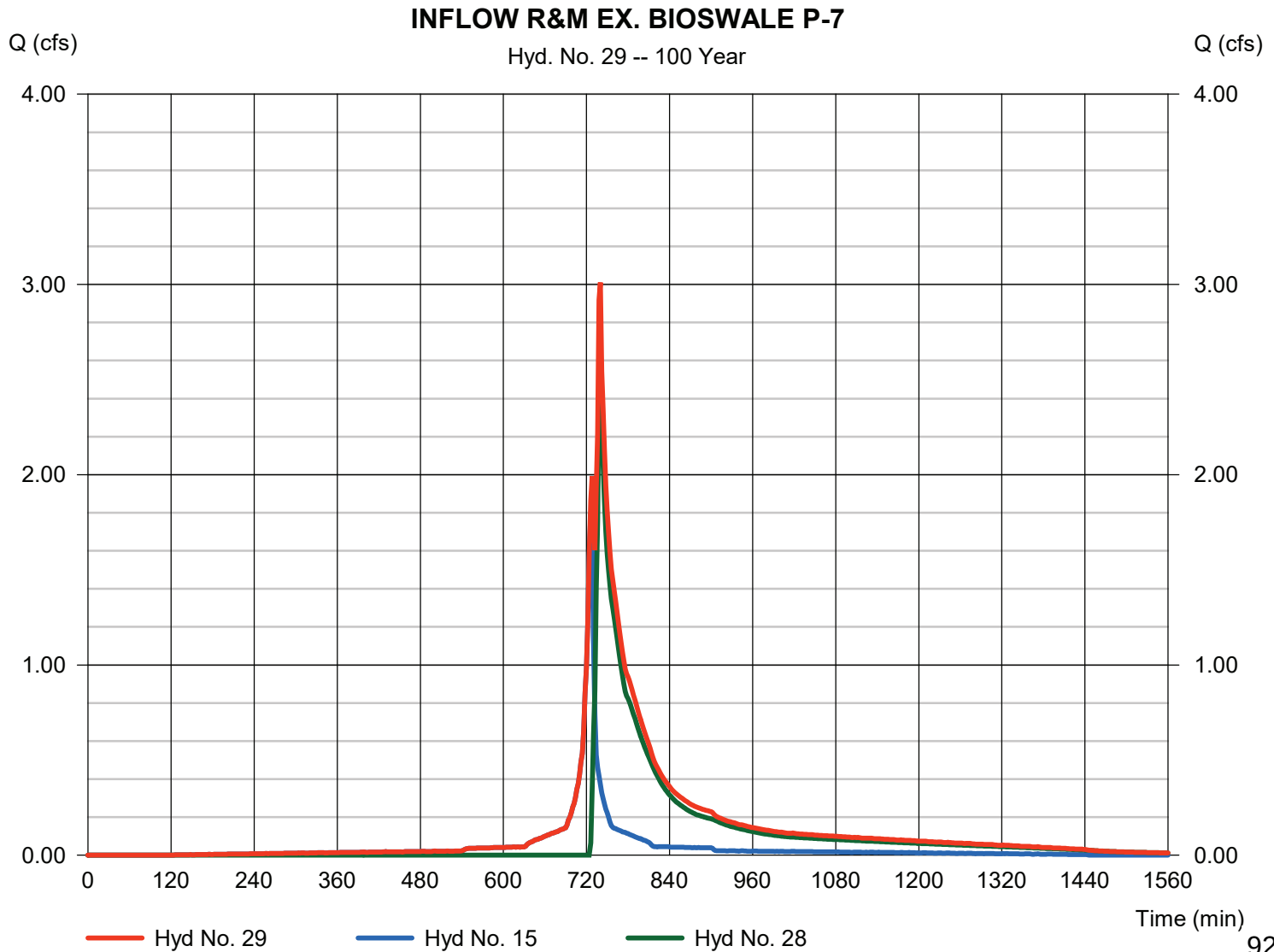
Friday, 06 / 28 / 2019

Hyd. No. 29

INFLOW R&M EX. BIOSWALE P-7

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 15, 28

Peak discharge = 3.010 cfs
Time to peak = 740 min
Hyd. volume = 0.316 acft
Contrib. drain. area = 0.200 ac



Hydrograph Report

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

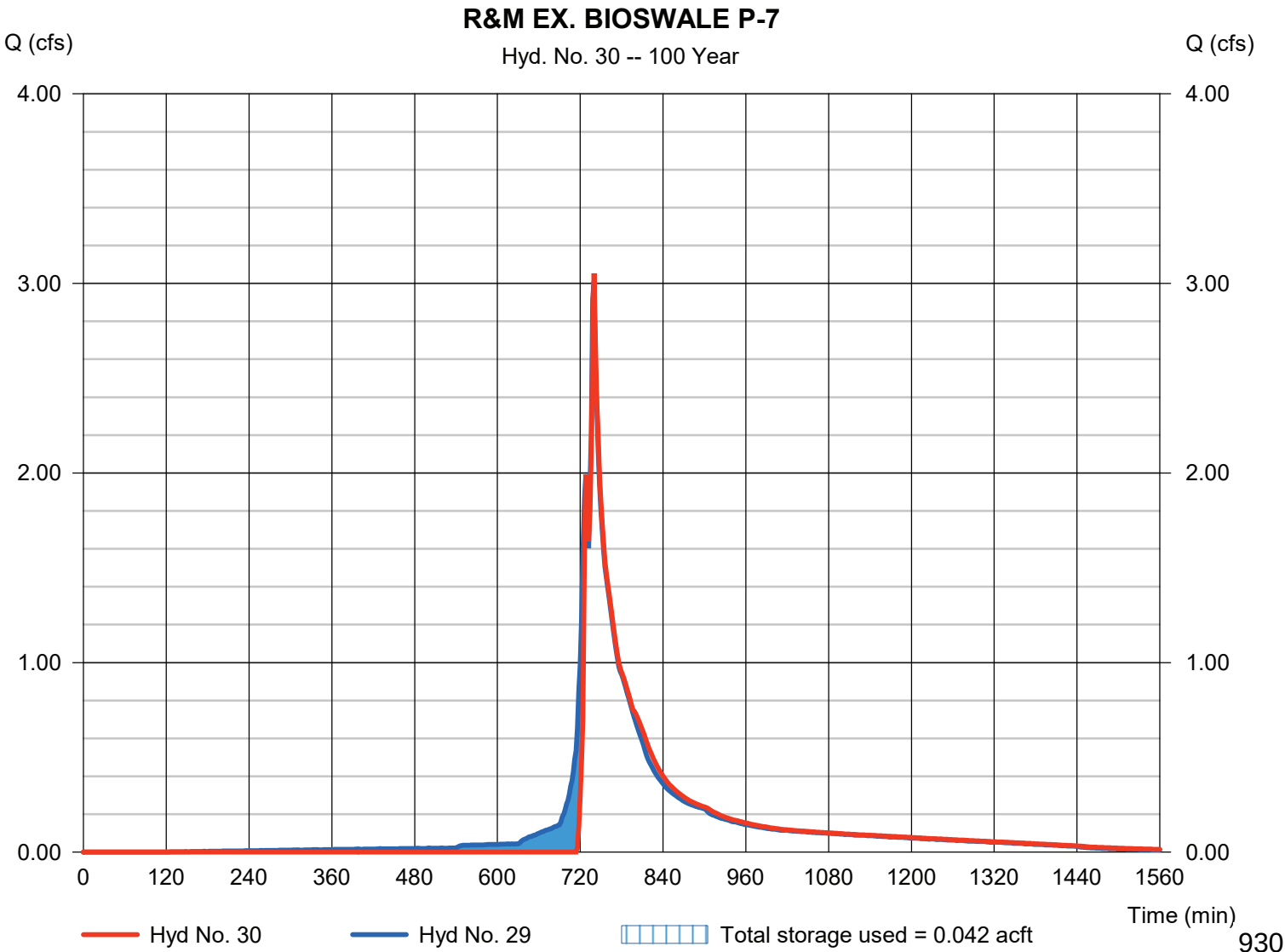
Friday, 06 / 28 / 2019

Hyd. No. 30

R&M EX. BIOSWALE P-7

Hydrograph type	= Reservoir	Peak discharge	= 3.054 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 0.285 acft
Inflow hyd. No.	= 29 - INFLOW R&M EX. BIOSWALE P-7	Max. Elevation	= 845.77 ft
Reservoir name	= Ex. Bioswale P-7	Max. Storage	= 0.042 acft

Storage Indication method used.



Hydrograph Report

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

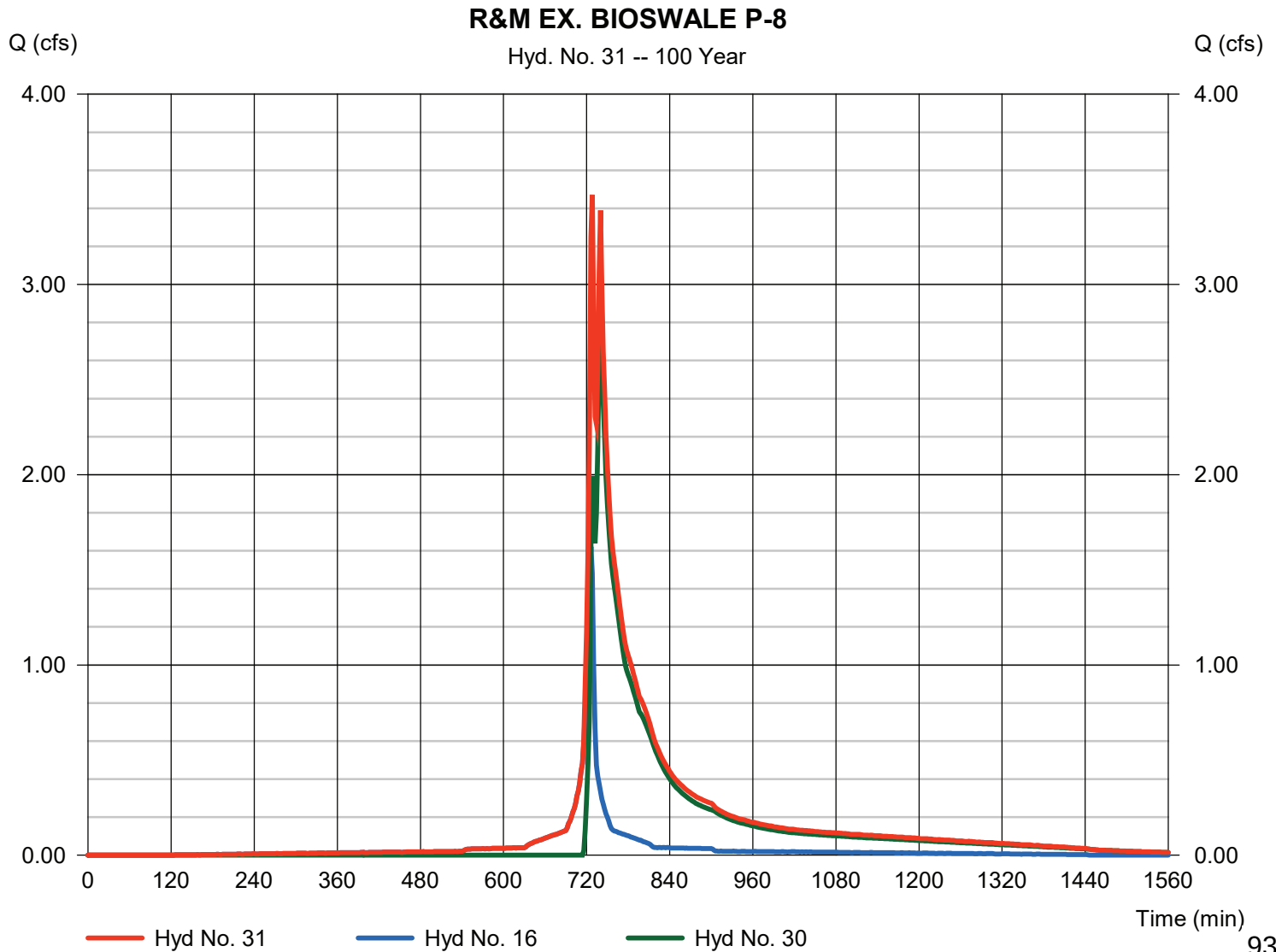
Friday, 06 / 28 / 2019

Hyd. No. 31

R&M EX. BIOSWALE P-8

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 16, 30

Peak discharge = 3.472 cfs
Time to peak = 728 min
Hyd. volume = 0.369 acft
Contrib. drain. area = 0.180 ac



Hydrograph Report

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

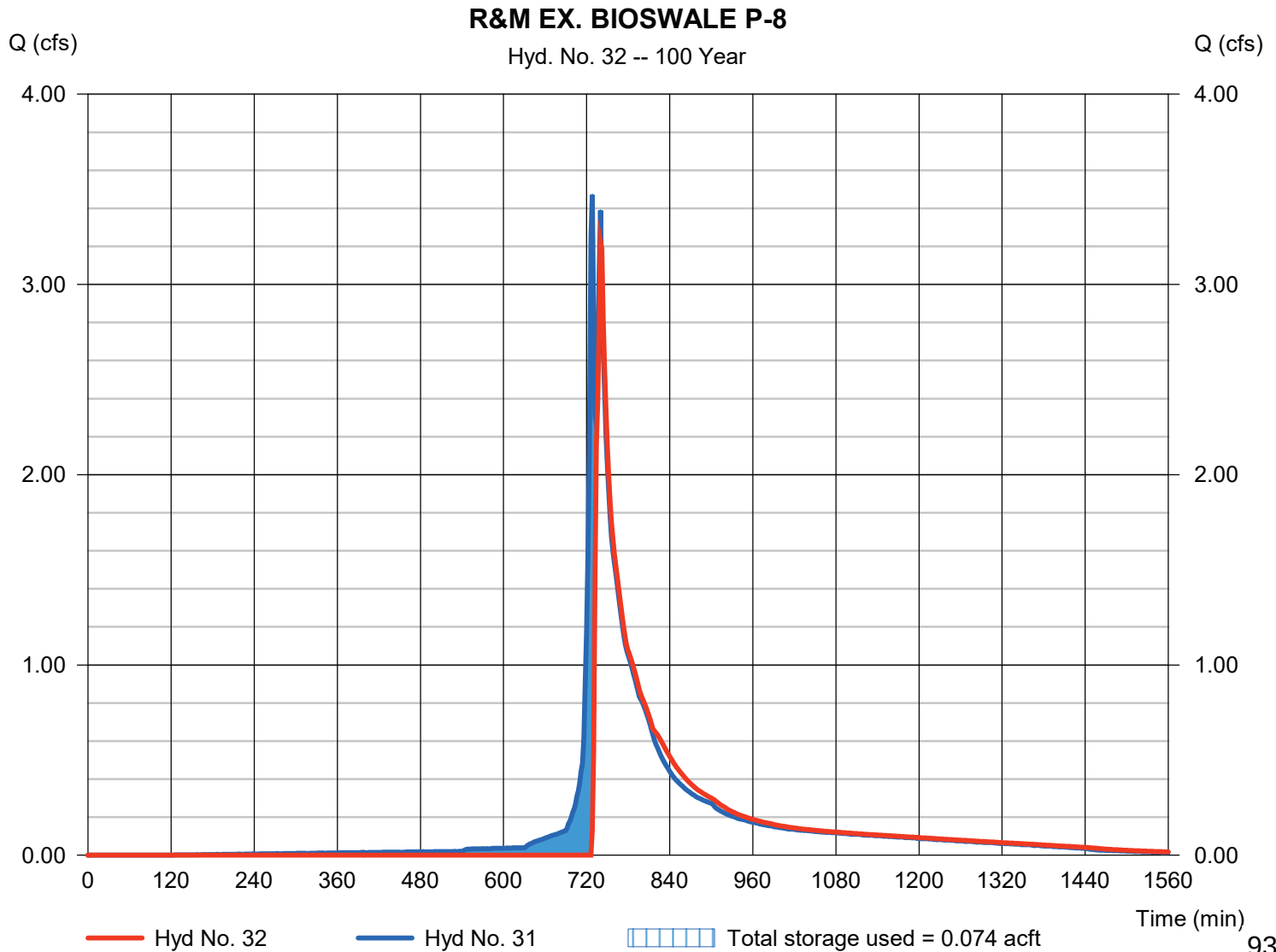
Friday, 06 / 28 / 2019

Hyd. No. 32

R&M EX. BIOSWALE P-8

Hydrograph type	= Reservoir	Peak discharge	= 3.223 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 0.315 acft
Inflow hyd. No.	= 31 - R&M EX. BIOSWALE P-8	Max. Elevation	= 845.23 ft
Reservoir name	= Ex. Bioswale P-8	Max. Storage	= 0.074 acft

Storage Indication method used.



Hydrograph Report

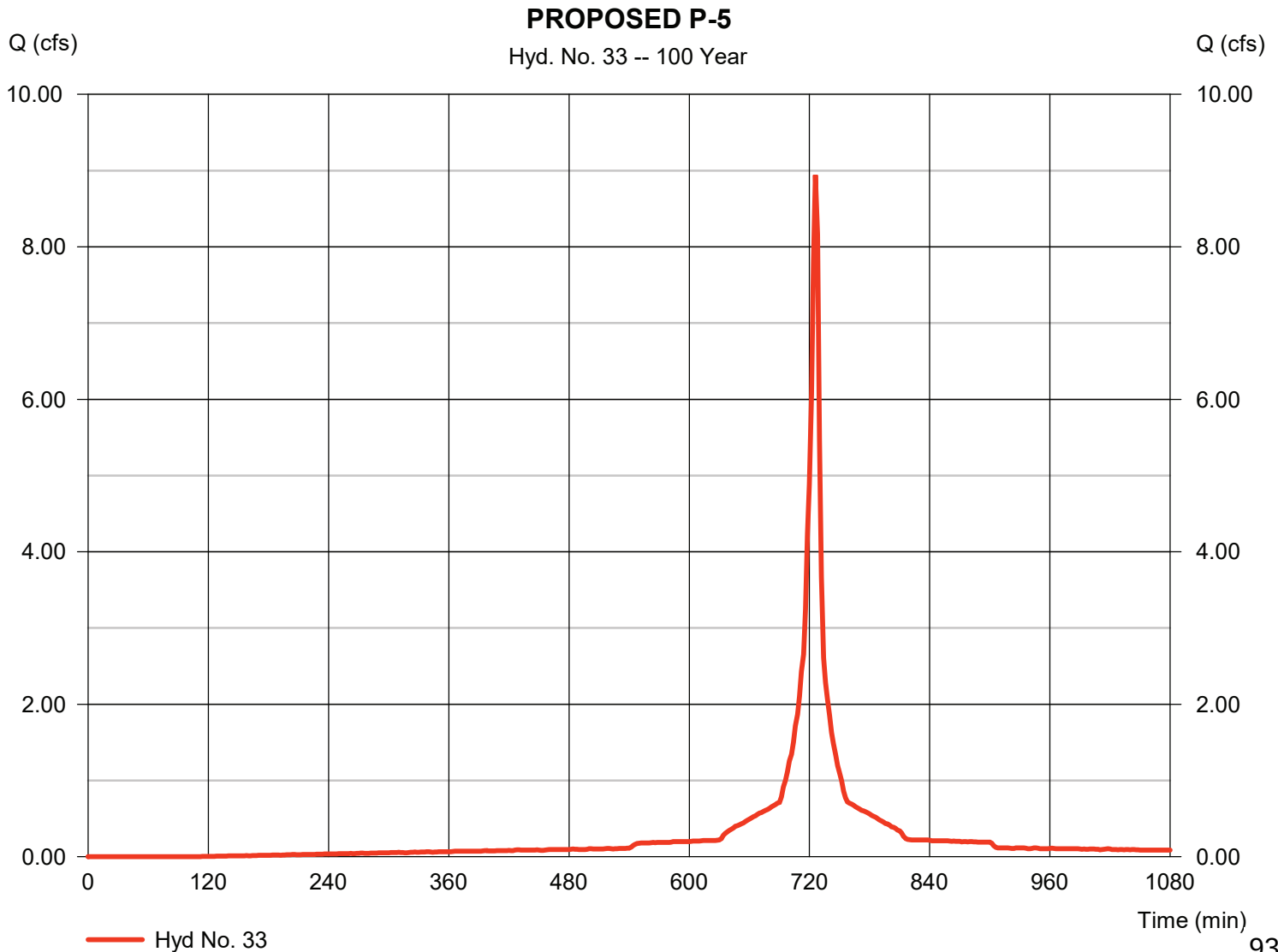
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Hydrograph type	= SCS Runoff	Peak discharge	= 8.940 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 0.460 acft
Drainage area	= 0.992 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

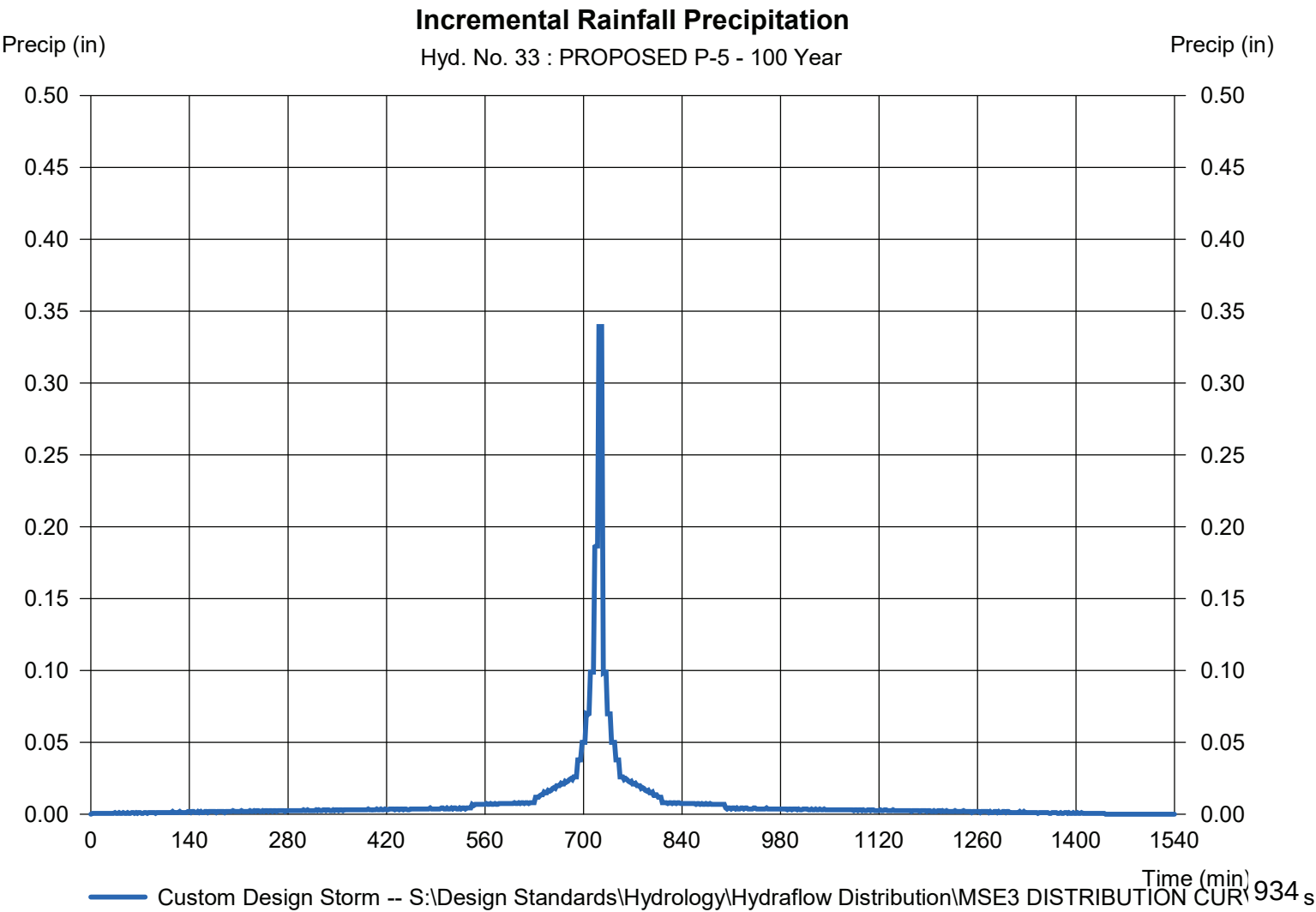
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 33

PROPOSED P-5

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

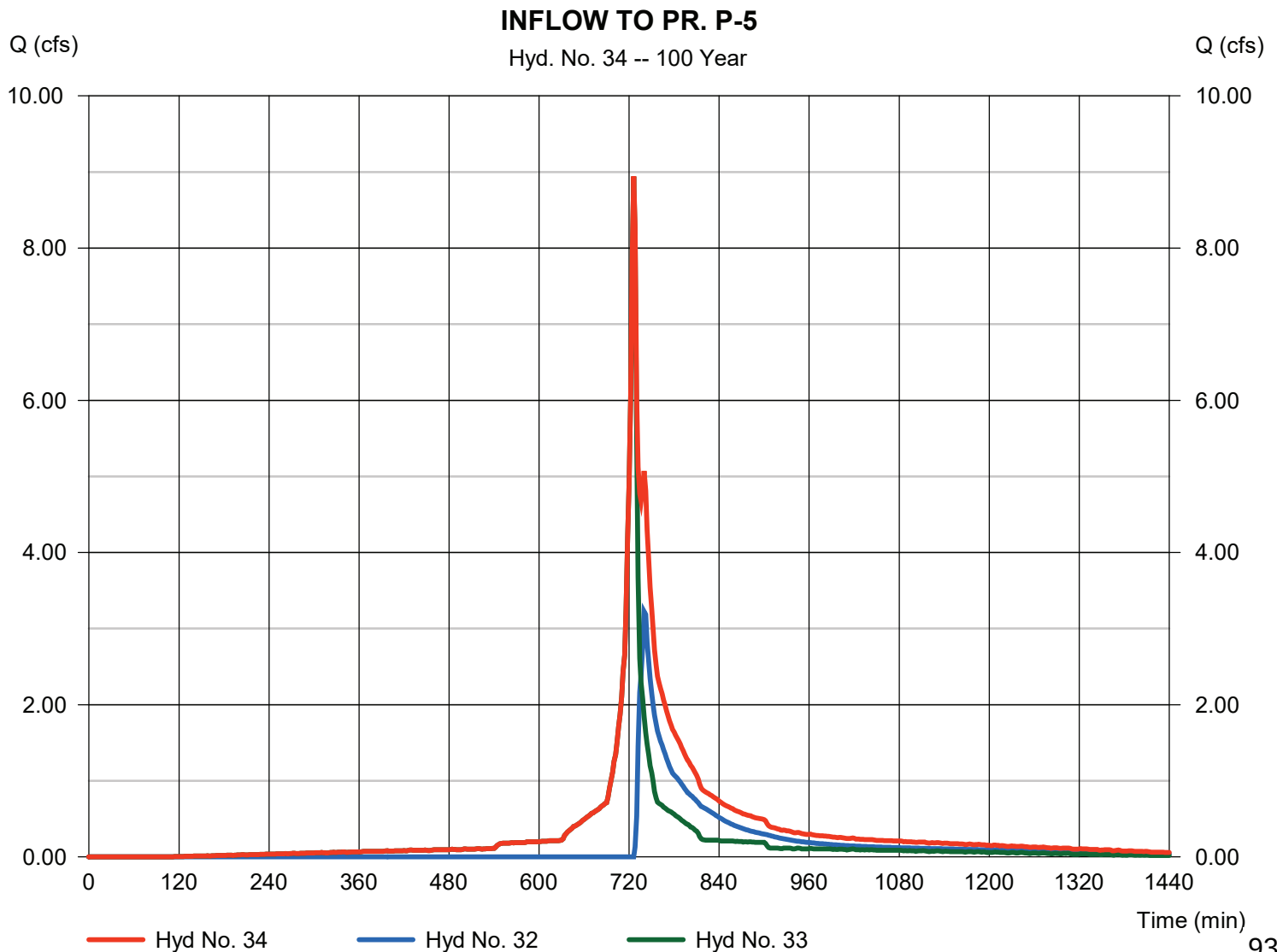
Friday, 06 / 28 / 2019

Hyd. No. 34

INFLOW TO PR. P-5

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 32, 33

Peak discharge = 8.940 cfs
Time to peak = 726 min
Hyd. volume = 0.776 acft
Contrib. drain. area = 0.992 ac



Hydrograph Report

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

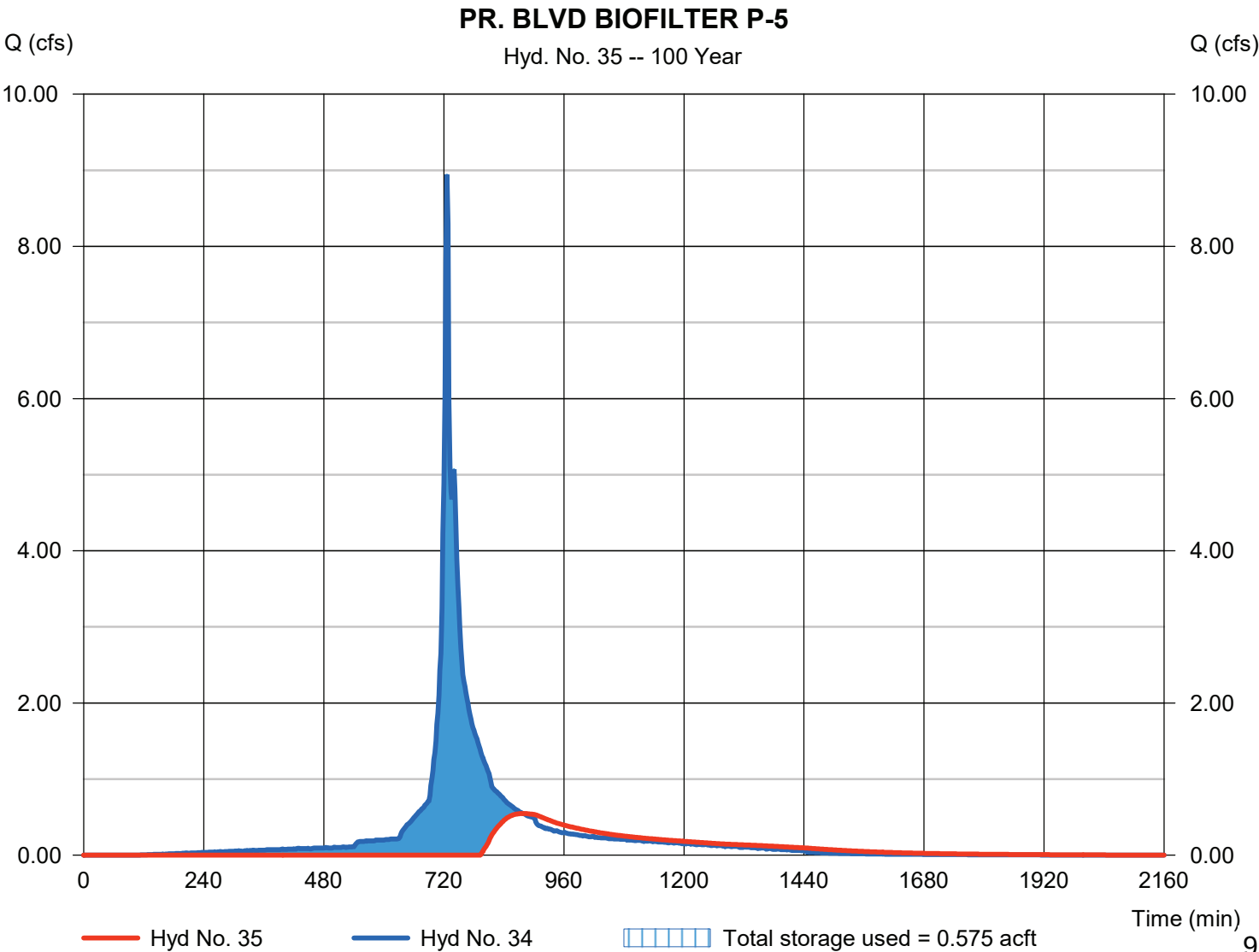
Friday, 06 / 28 / 2019

Hyd. No. 35

PR. BLVD BIOFILTER P-5

Hydrograph type	= Reservoir	Peak discharge	= 0.547 cfs
Storm frequency	= 100 yrs	Time to peak	= 878 min
Time interval	= 2 min	Hyd. volume	= 0.253 acft
Inflow hyd. No.	= 34 - INFLOW TO PR. P-5	Max. Elevation	= 844.17 ft
Reservoir name	= BLVD BIOFILTER P-5	Max. Storage	= 0.575 acft

Storage Indication method used.



Hydrograph Report

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

Friday, 06 / 28 / 2019

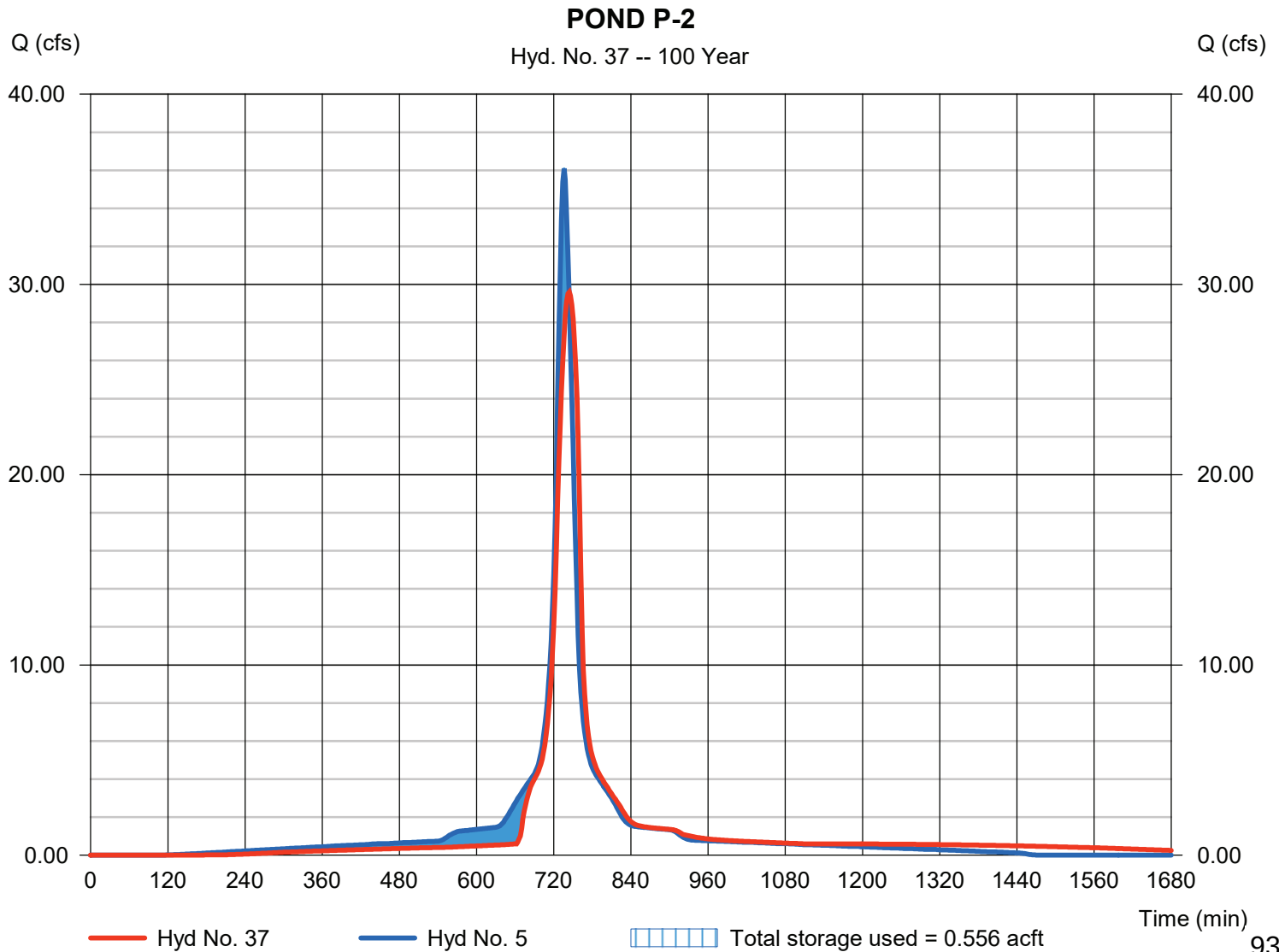
Hyd. No. 37

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 5 - P-2
 Reservoir name = POND P-2

Peak discharge = 29.60 cfs
 Time to peak = 744 min
 Hyd. volume = 3.194 acft
 Max. Elevation = 840.62 ft
 Max. Storage = 0.556 acft

Storage Indication method used.



Hydrograph Report

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

Friday, 06 / 28 / 2019

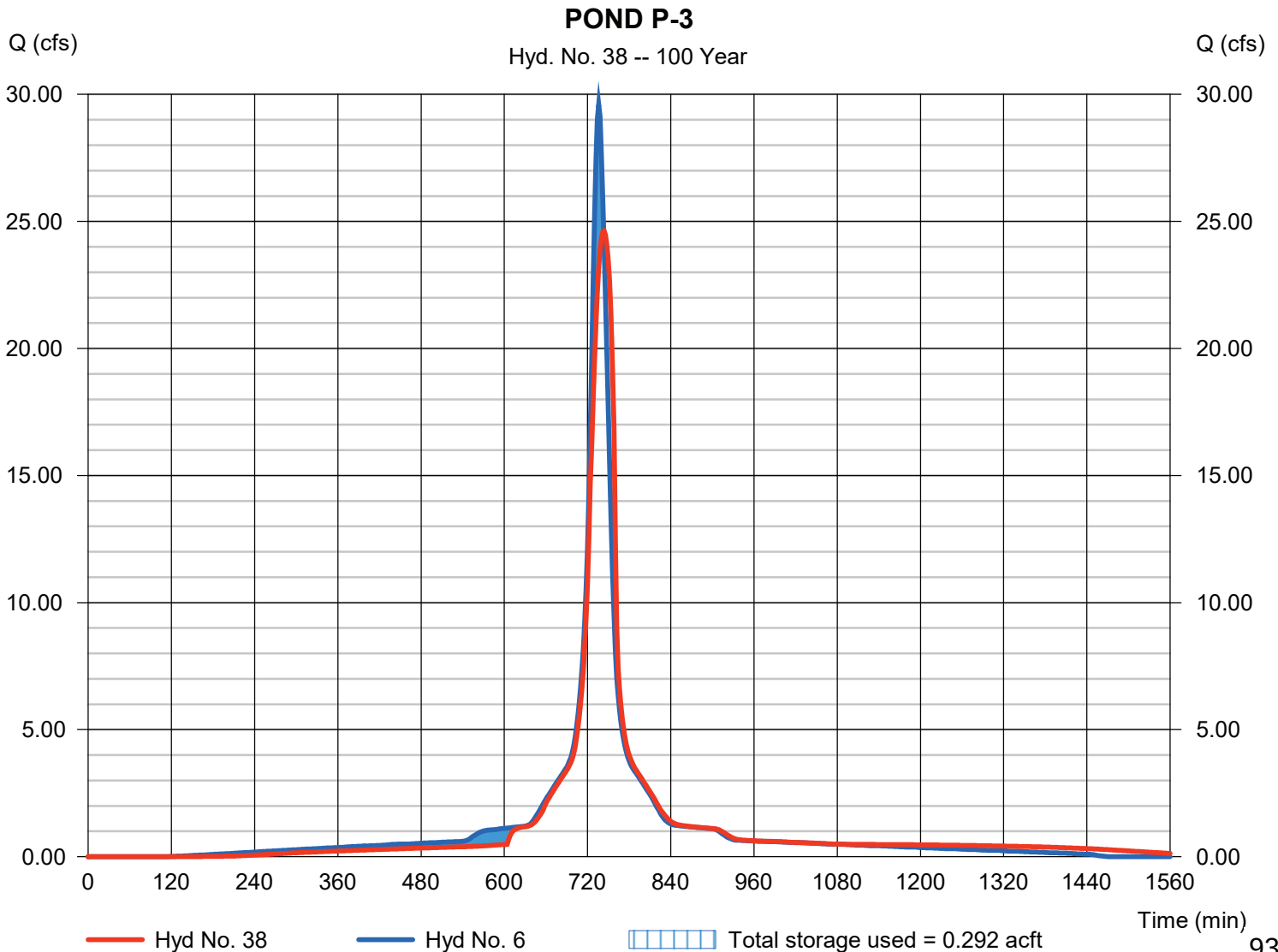
Hyd. No. 38

POND P-3

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-3
 Reservoir name = POND P-3

Peak discharge = 24.63 cfs
 Time to peak = 744 min
 Hyd. volume = 2.620 acft
 Max. Elevation = 840.97 ft
 Max. Storage = 0.292 acft

Storage Indication method used.



Hydrograph Report

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

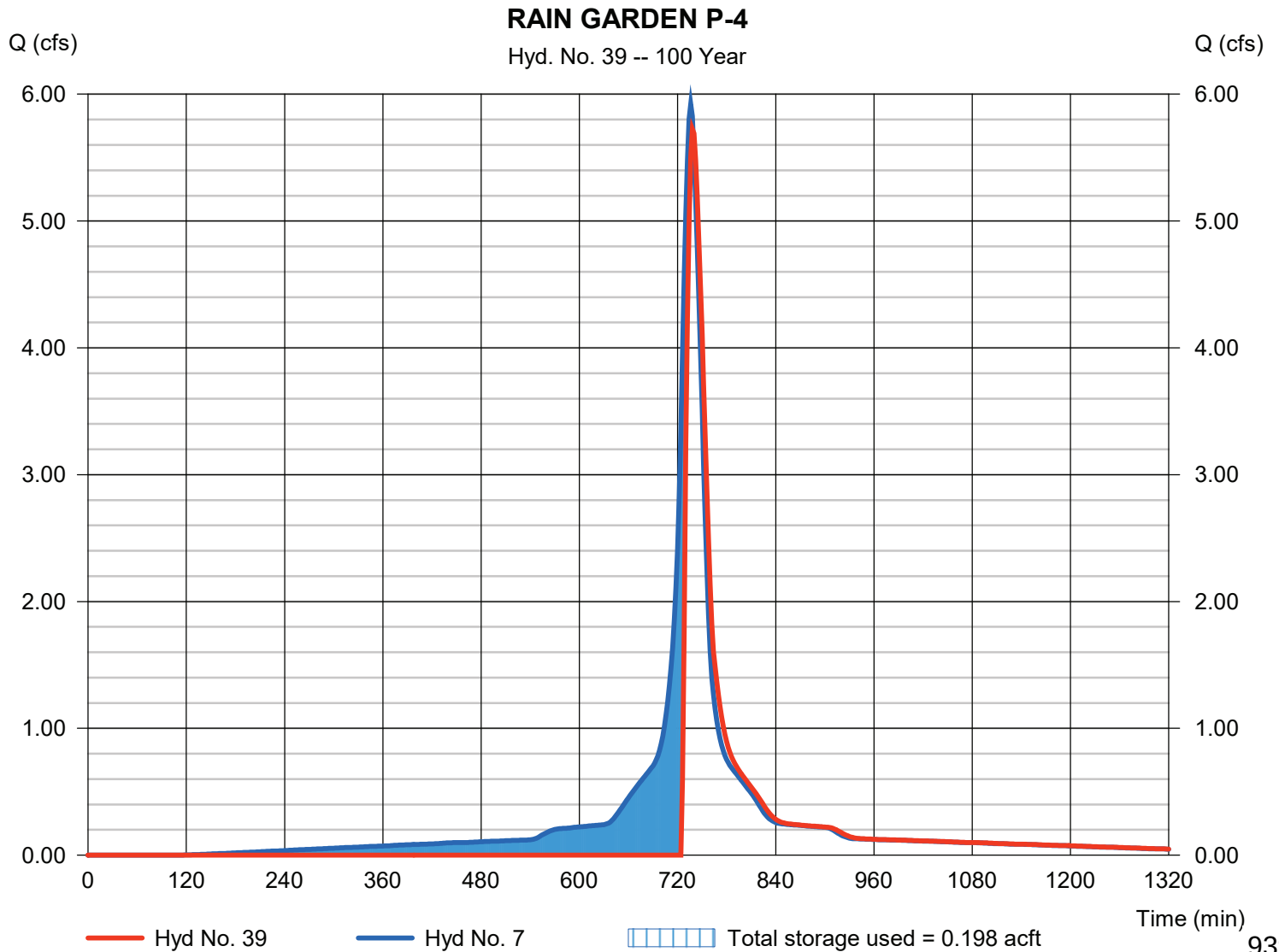
Friday, 06 / 28 / 2019

Hyd. No. 39

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 5.725 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.355 acft
Inflow hyd. No.	= 7 - P-4	Max. Elevation	= 840.93 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 0.198 acft

Storage Indication method used.



Hydrograph Report

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

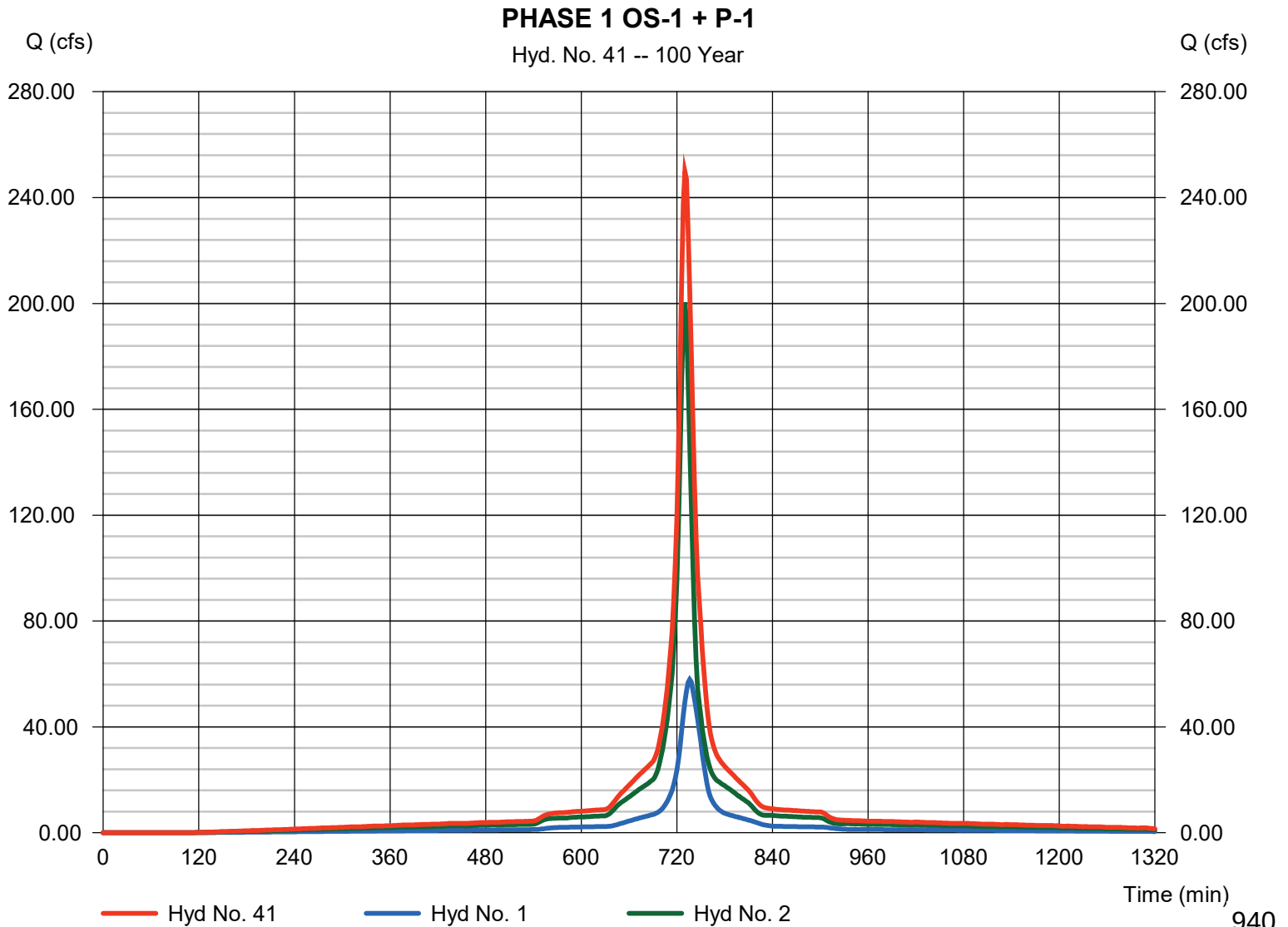
Friday, 06 / 28 / 2019

Hyd. No. 41

PHASE 1 OS-1 + P-1

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 1, 2

Peak discharge = 249.91 cfs
Time to peak = 730 min
Hyd. volume = 18.847 acft
Contrib. drain. area = 37.042 ac



Hydrograph Report

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

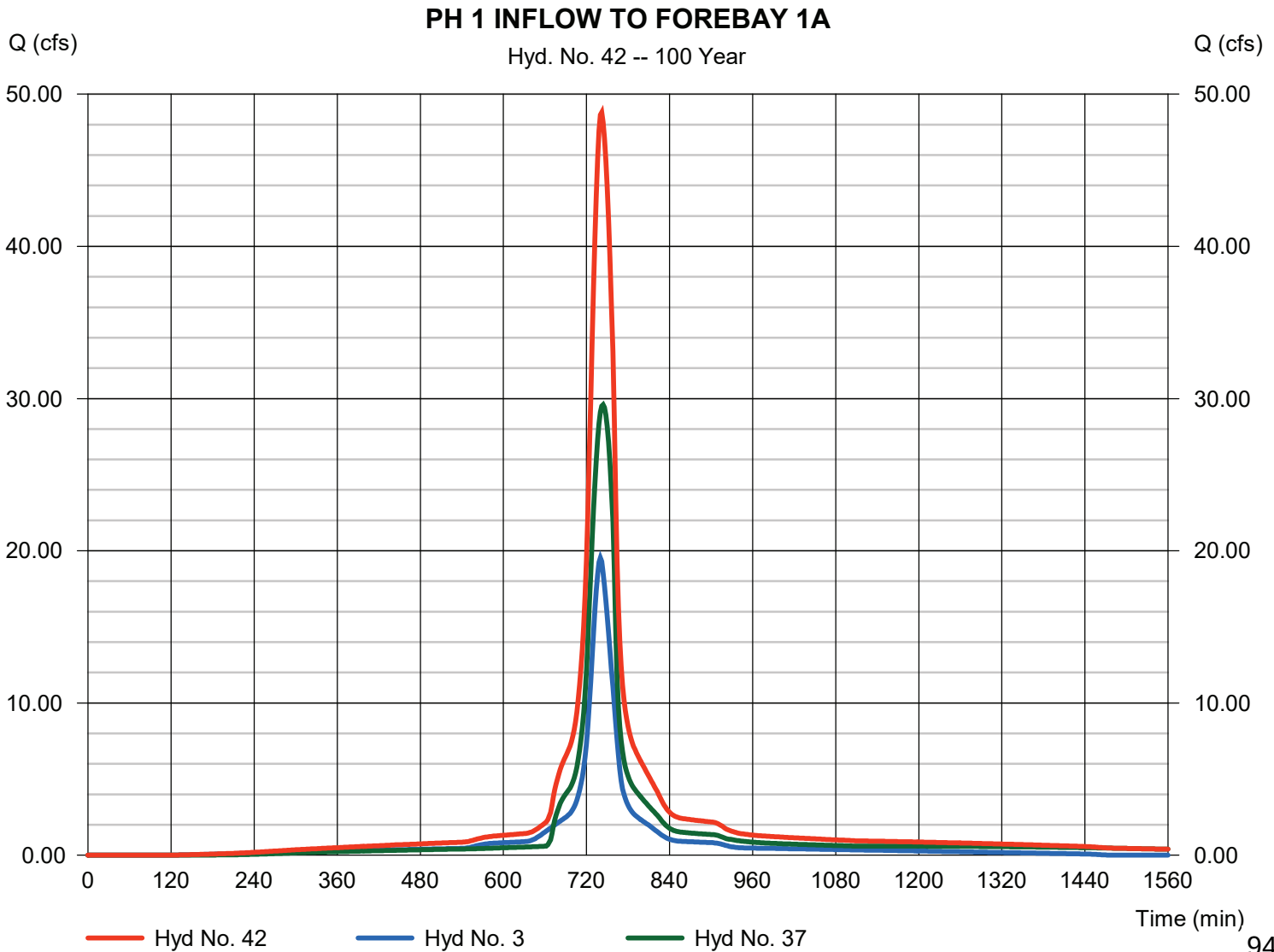
Friday, 06 / 28 / 2019

Hyd. No. 42

PH 1 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 3, 37

Peak discharge = 48.81 cfs
Time to peak = 742 min
Hyd. volume = 5.149 acft
Contrib. drain. area = 3.947 ac



Hydrograph Report

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

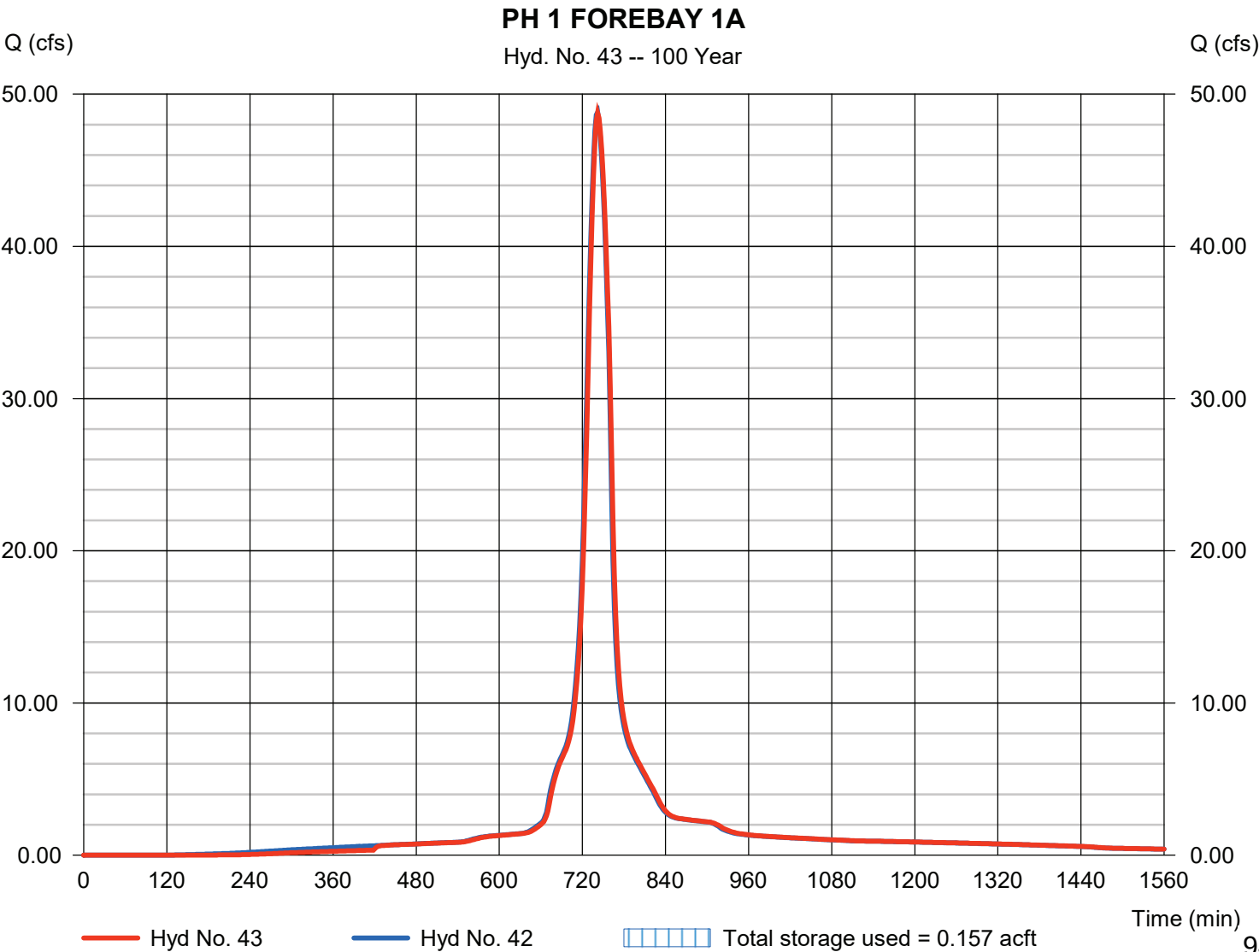
Friday, 06 / 28 / 2019

Hyd. No. 43

PH 1 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 48.78 cfs
Storm frequency	= 100 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 5.148 acft
Inflow hyd. No.	= 42 - PH 1 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.71 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 0.157 acft

Storage Indication method used.



Hydrograph Report

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

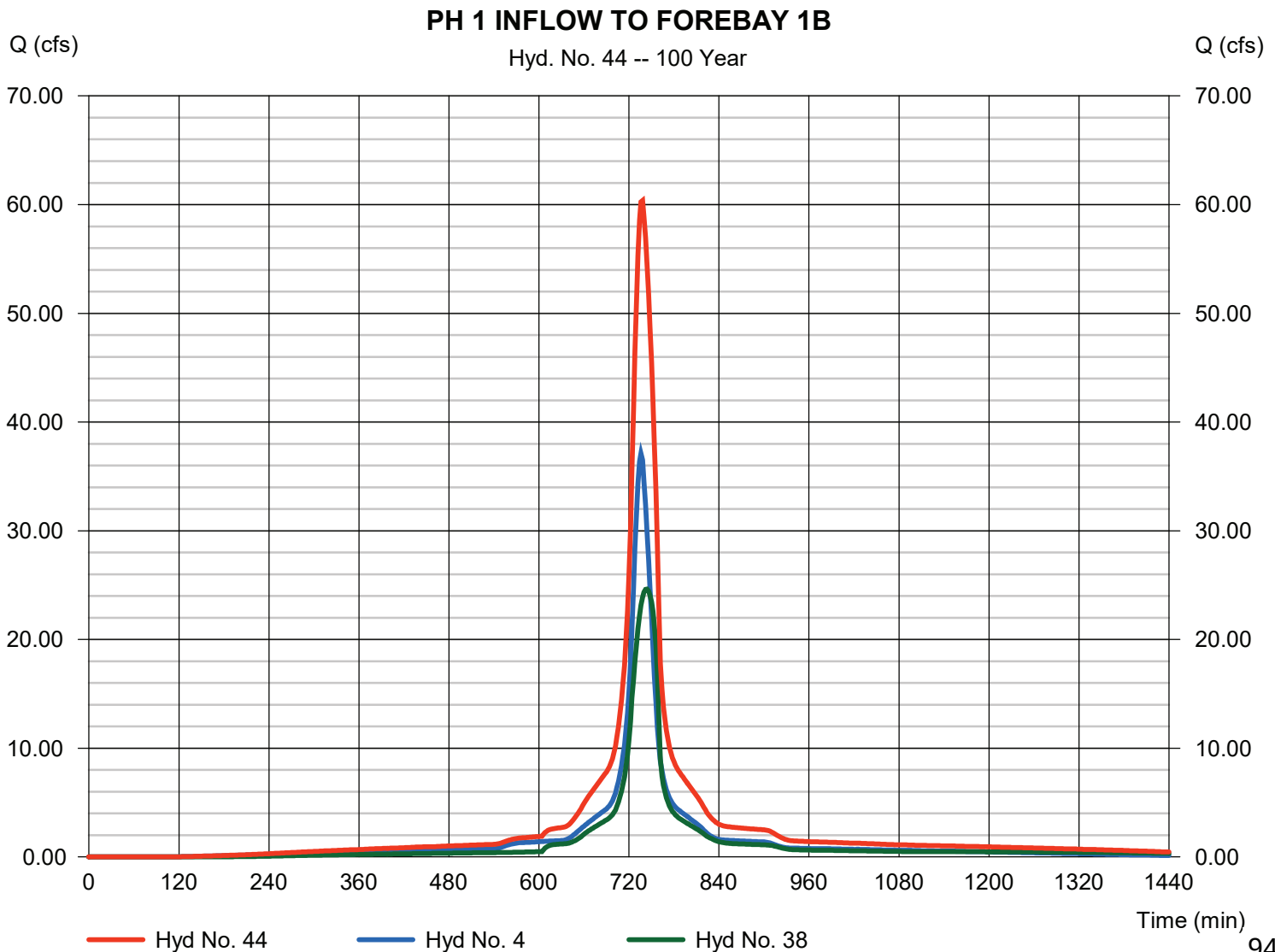
Friday, 06 / 28 / 2019

Hyd. No. 44

PH 1 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 4, 38

Peak discharge = 60.37 cfs
Time to peak = 738 min
Hyd. volume = 5.904 acft
Contrib. drain. area = 6.516 ac



Hydrograph Report

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

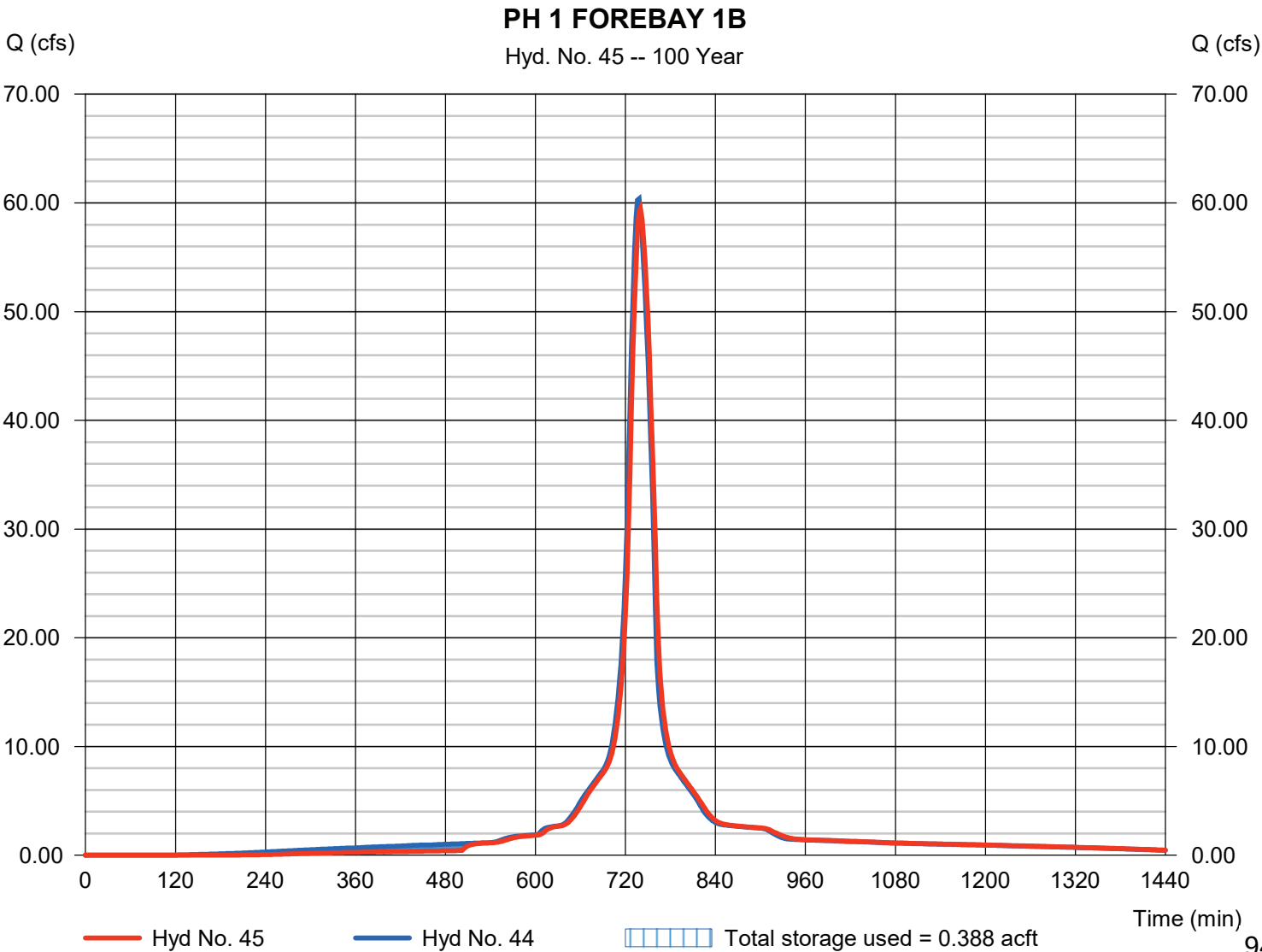
Friday, 06 / 28 / 2019

Hyd. No. 45

PH 1 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 59.47 cfs
Storm frequency	= 100 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 5.903 acft
Inflow hyd. No.	= 44 - PH 1 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.82 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 0.388 acft

Storage Indication method used.



Hydrograph Report

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

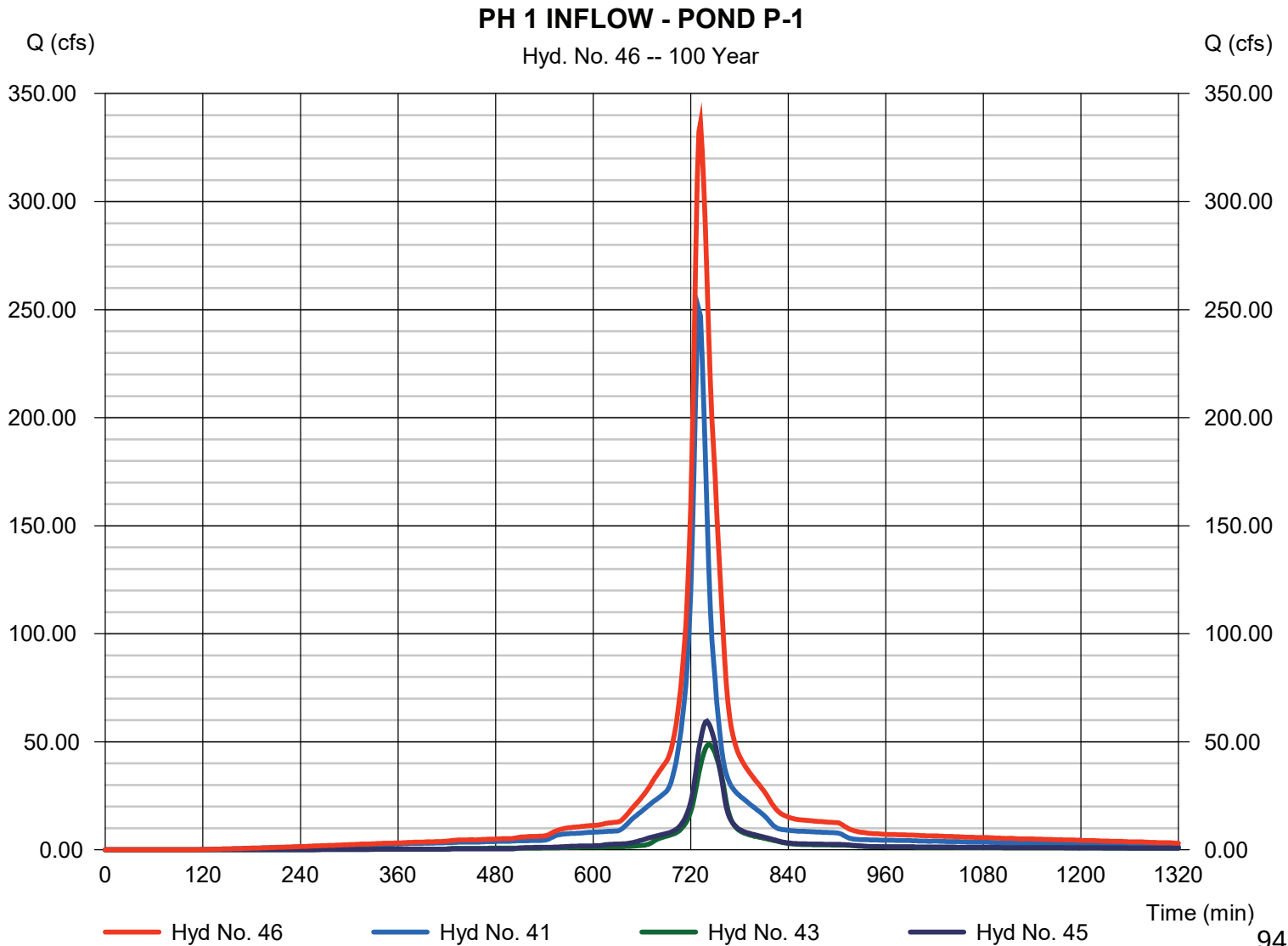
Friday, 06 / 28 / 2019

Hyd. No. 46

PH 1 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 41, 43, 45

Peak discharge = 336.55 cfs
 Time to peak = 732 min
 Hyd. volume = 29.898 acft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

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

Friday, 06 / 28 / 2019

Hyd. No. 47

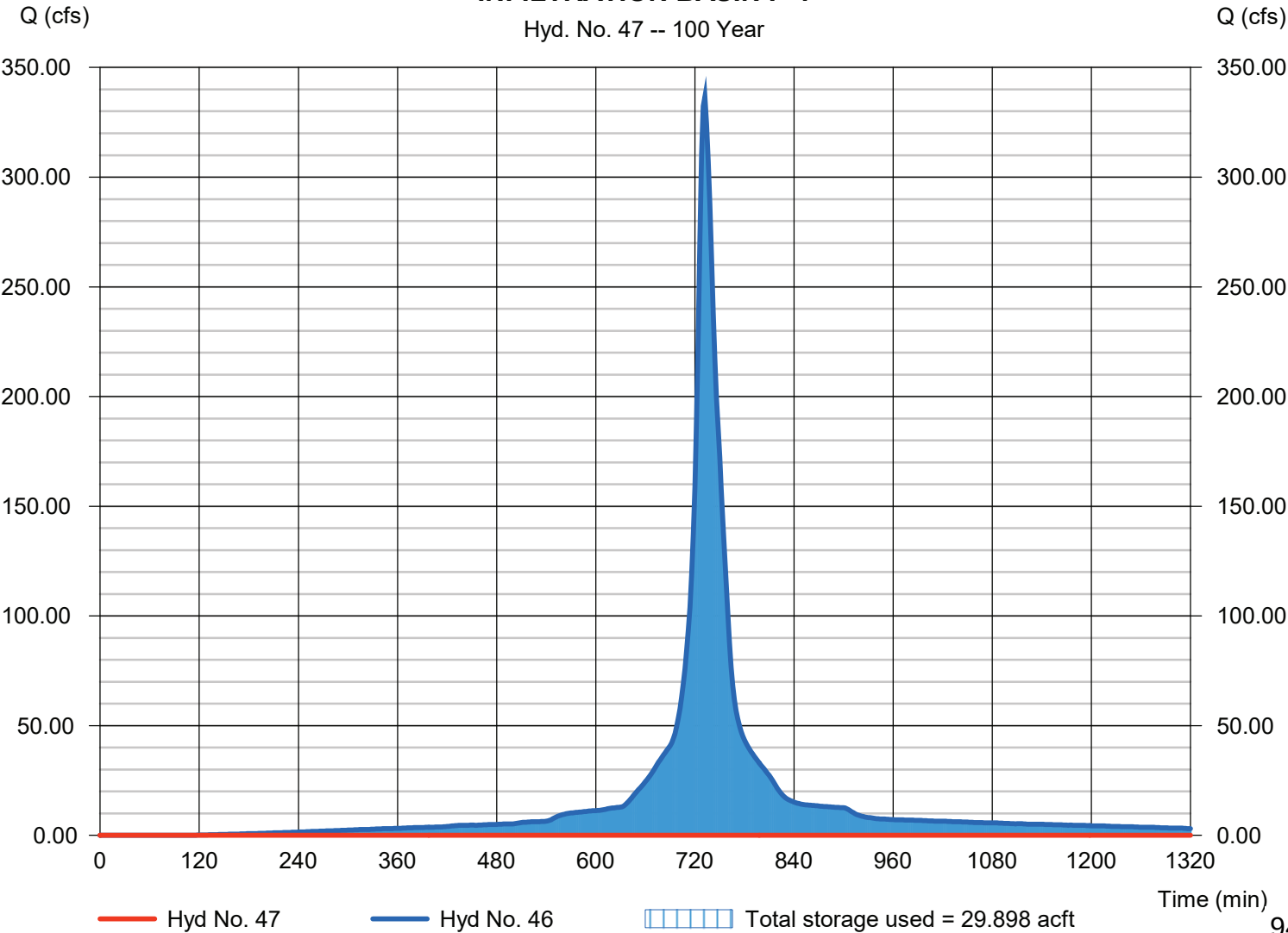
INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0.000 acft
Inflow hyd. No.	= 46 - PH 1 INFLOW - POND P-1	Max. Elevation	= 840.73 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 1	Max. Storage	= 29.898 acft

Storage Indication method used.

INFILTRATION BASIN P-1

Hyd. No. 47 -- 100 Year



Hydrograph Report

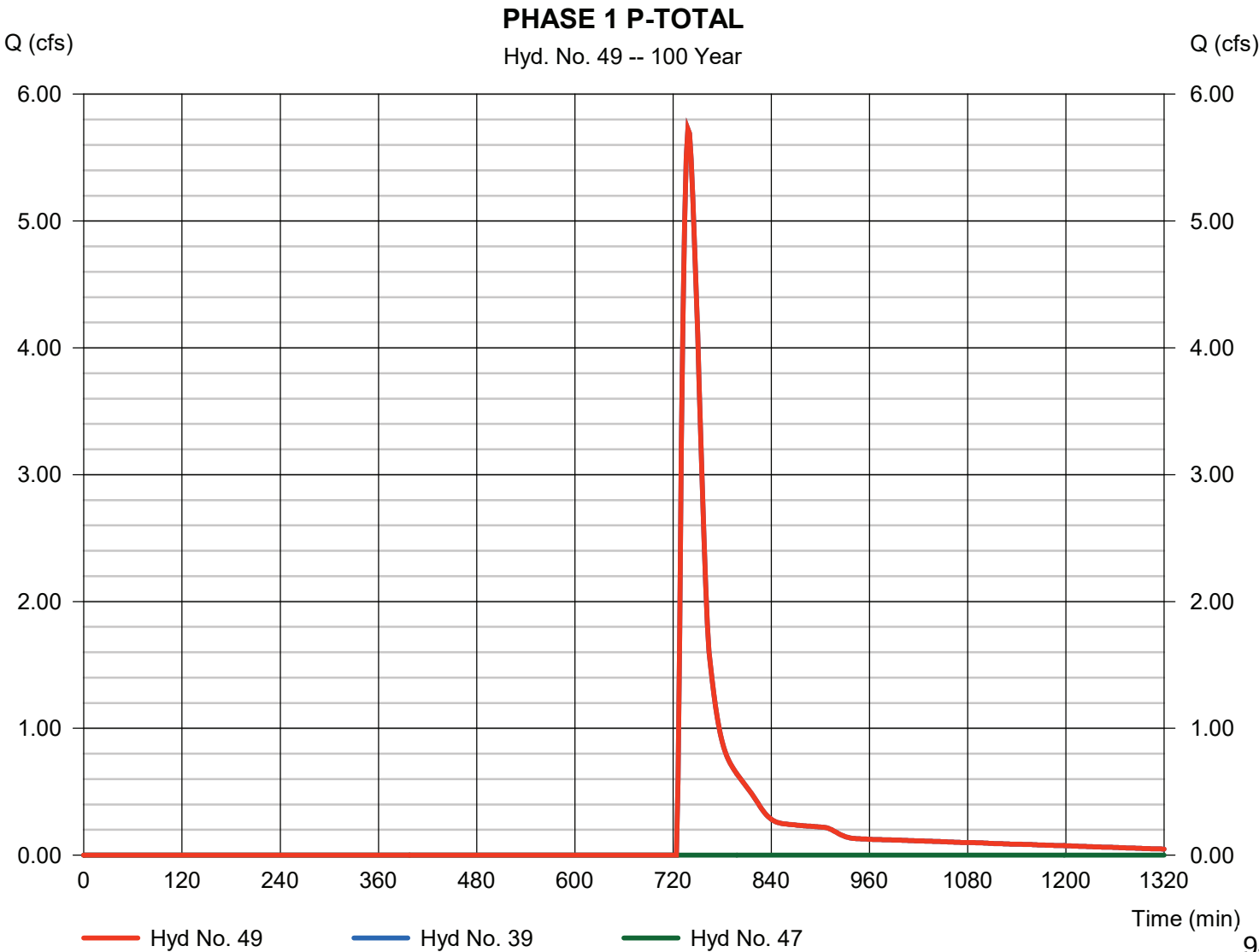
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Friday, 06 / 28 / 2019

Hyd. No. 49

PHASE 1 P-TOTAL

Hydrograph type	= Combine	Peak discharge	= 5.725 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0.355 acft
Inflow hyds.	= 39, 47	Contrib. drain. area	= 0.000 ac



Hydraflow Rainfall Report

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

Friday, 06 / 28 / 2019

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	22.8367	5.6000	0.7338	-----
2	25.4674	5.2000	0.7159	-----
3	0.0000	0.0000	0.0000	-----
5	30.5439	4.9000	0.7023	-----
10	33.5363	4.6000	0.6850	-----
25	36.2566	4.0000	0.6589	-----
50	35.2584	3.1000	0.6226	-----
100	34.0002	2.2000	0.5870	-----

File name: WAUKESHA ATLAS 14 IDF.IDF

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.04	3.04	2.48	2.11	1.85	1.66	1.51	1.38	1.28	1.20	1.12	1.06
2	4.83	3.63	2.96	2.53	2.22	1.99	1.81	1.66	1.54	1.44	1.36	1.28
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	6.11	4.58	3.74	3.19	2.81	2.52	2.29	2.11	1.96	1.83	1.72	1.63
10	7.12	5.35	4.37	3.74	3.29	2.96	2.70	2.49	2.31	2.17	2.04	1.93
25	8.52	6.37	5.21	4.47	3.94	3.55	3.24	3.00	2.79	2.62	2.47	2.34
50	9.59	7.11	5.81	4.99	4.42	3.99	3.66	3.39	3.16	2.97	2.81	2.67
100	10.67	7.83	6.40	5.51	4.89	4.43	4.07	3.78	3.54	3.34	3.16	3.01

T_c = time in minutes. Values may exceed 60.

gn Standards\Hydrology\Hydraflow UPDATED ATLAS 14\STATIONS\WAUKESHA\WAUKESHA ATLAS 14 Precip.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	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	2.40	2.70	0.00	0.00	3.81	4.65	0.00	6.18

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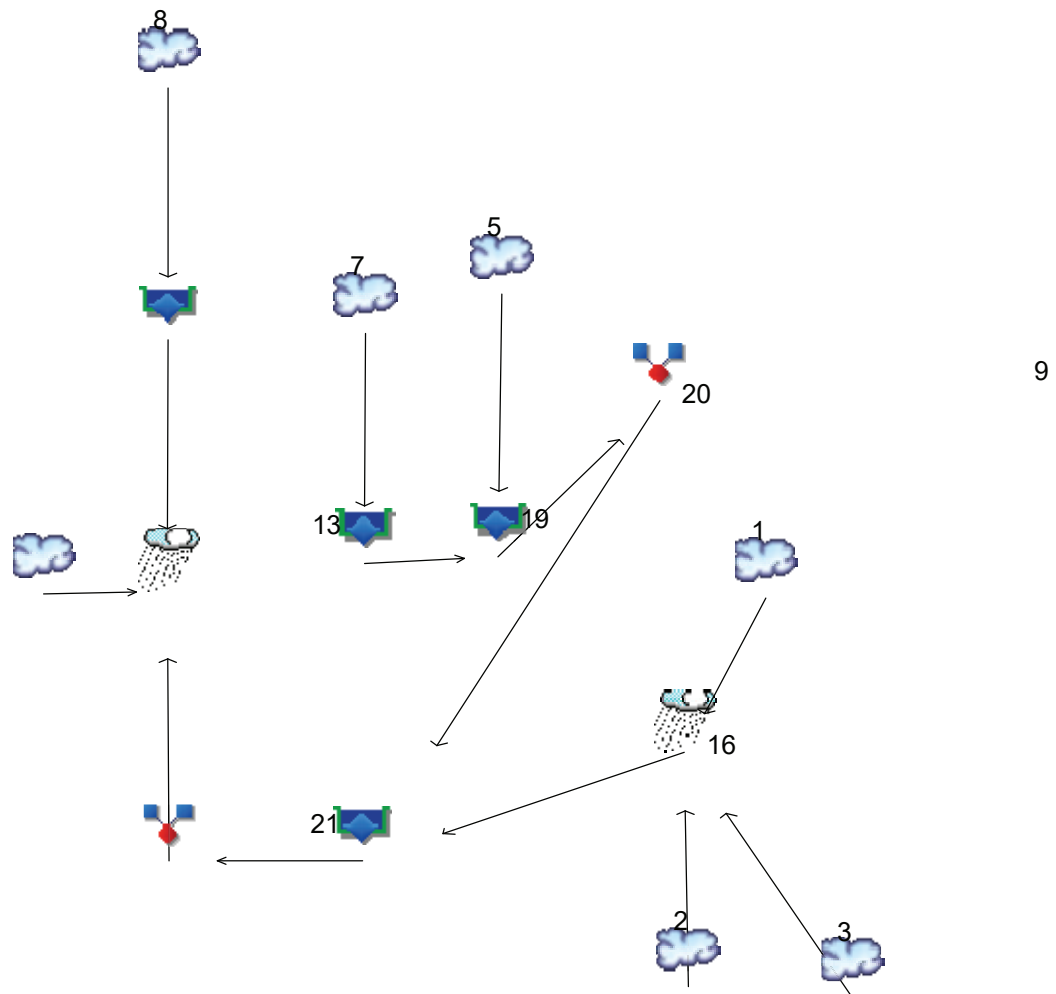
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APPENDIX 7

PROPOSED Future Phase Hydraflow Calculations – Normal Conditions

Watershed Model Schematic

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

11
23

Legend

Hyd. Origin Description

1	SCS Runoff	P-OS-1
2	SCS Runoff	P-OS-2
3	SCS Runoff	P-1-PH 2
4	SCS Runoff	P-1A-PH2
5	SCS Runoff	P-1B-PH2
6	SCS Runoff	P-2
7	SCS Runoff	P-3
8	SCS Runoff	P-4
9	SCS Runoff	P-UD-1
11	Reservoir	POND P-2
12	Reservoir	POND P-3
13	Reservoir	RAIN GARDEN P-4
15	Combine	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	PH 2 INFLOW TO FOREBAY 1A
17	Reservoir	PH 2 FOREBAY 1A
18	Combine	PH 2 INFLOW TO FOREBAY 1B
19	Reservoir	PH 2 FOREBAY 1B
20	Combine	PH 2 INFLOW - POND P-1
21	Reservoir	INFILTRATION BASIN P-1
23	Combine	PHASE 2 P-TOTAL

Hydrograph Return Period Recap

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

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	1.083	2.011	-----	-----	7.710	-----	-----	25.87	P-OS-1
2	SCS Runoff	-----	6.658	9.398	-----	-----	21.14	-----	-----	51.29	P-OS-2
3	SCS Runoff	-----	43.80	54.55	-----	-----	97.88	-----	-----	196.33	P-1-PH 2
4	SCS Runoff	-----	7.907	9.664	-----	-----	16.48	-----	-----	31.68	P-1A-PH2
5	SCS Runoff	-----	8.694	10.98	-----	-----	20.09	-----	-----	41.21	P-1B-PH2
6	SCS Runoff	-----	8.325	10.25	-----	-----	17.75	-----	-----	34.69	P-2
7	SCS Runoff	-----	6.677	8.160	-----	-----	13.92	-----	-----	26.75	P-3
8	SCS Runoff	-----	1.395	1.681	-----	-----	2.782	-----	-----	5.183	P-4
9	SCS Runoff	-----	1.337	1.628	-----	-----	2.747	-----	-----	5.199	P-UD-1
11	Reservoir	6	2.732	5.833	-----	-----	16.07	-----	-----	28.73	POND P-2
12	Reservoir	7	5.820	7.645	-----	-----	13.75	-----	-----	23.10	POND P-3
13	Reservoir	8	0.000	0.000	-----	-----	0.000	-----	-----	3.364	RAIN GARDEN P-4
15	Combine	1, 2, 3,	50.59	64.84	-----	-----	124.29	-----	-----	267.32	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	4, 11,	8.387	11.89	-----	-----	31.35	-----	-----	58.74	PH 2 INFLOW TO FOREBAY 1A
17	Reservoir	16	8.227	11.67	-----	-----	31.12	-----	-----	58.47	PH 2 FOREBAY 1A
18	Combine	5, 12,	14.06	18.57	-----	-----	33.78	-----	-----	63.88	PH 2 INFLOW TO FOREBAY 1B
19	Reservoir	18	12.61	17.19	-----	-----	33.09	-----	-----	62.98	PH 2 FOREBAY 1B
20	Combine	15, 17, 19	57.10	73.11	-----	-----	160.09	-----	-----	366.21	PH 2 INFLOW - POND P-1
21	Reservoir	20	0.000	0.000	-----	-----	0.000	-----	-----	0.000	INFILTRATION BASIN P-1
23	Combine	9, 13, 21,	1.337	1.628	-----	-----	2.747	-----	-----	5.199	PHASE 2 P-TOTAL
											957
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Hydrograph Summary Report

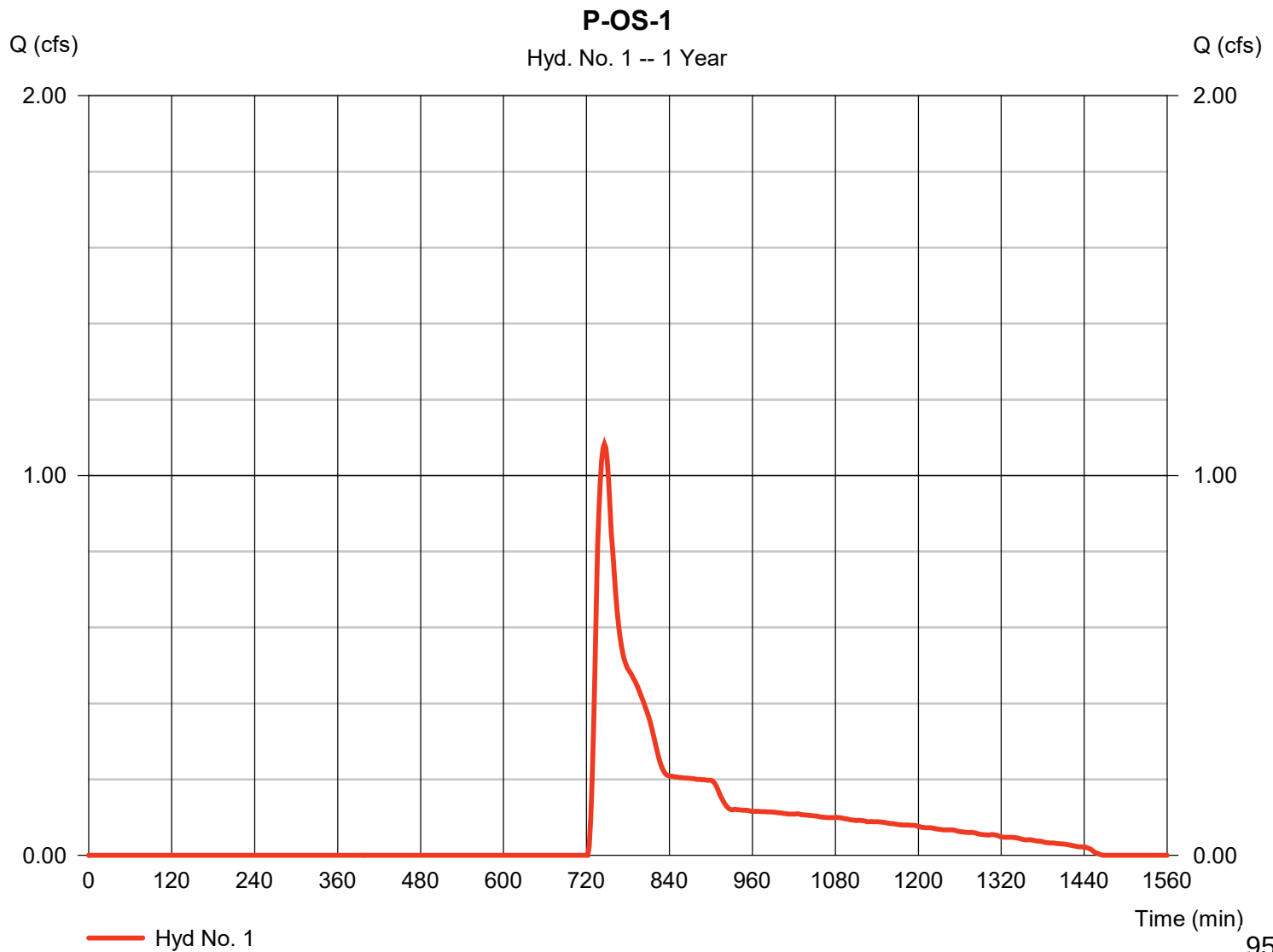
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.083	2	746	6,968	-----	-----	-----	P-OS-1
2	SCS Runoff	6.658	2	734	21,649	-----	-----	-----	P-OS-2
3	SCS Runoff	43.80	2	732	114,077	-----	-----	-----	P-1-PH 2
4	SCS Runoff	7.907	2	738	26,837	-----	-----	-----	P-1A-PH2
5	SCS Runoff	8.694	2	740	31,849	-----	-----	-----	P-1B-PH2
6	SCS Runoff	8.325	2	738	28,348	-----	-----	-----	P-2
7	SCS Runoff	6.677	2	738	22,661	-----	-----	-----	P-3
8	SCS Runoff	1.395	2	738	4,718	-----	-----	-----	P-4
9	SCS Runoff	1.337	2	726	2,507	-----	-----	-----	P-UD-1
11	Reservoir	2.732	2	760	28,330	6	839.39	13,546	POND P-2
12	Reservoir	5.820	2	744	22,648	7	839.75	6,405	POND P-3
13	Reservoir	0.000	2	746	0	8	839.81	2,846	RAIN GARDEN P-4
15	Combine	50.59	2	732	142,694	1, 2, 3,	-----	-----	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	8.387	2	738	55,167	4, 11,	-----	-----	PH 2 INFLOW TO FOREBAY 1A
17	Reservoir	8.227	2	740	55,152	16	835.08	3,884	PH 2 FOREBAY 1A
18	Combine	14.06	2	742	54,497	5, 12,	-----	-----	PH 2 INFLOW TO FOREBAY 1B
19	Reservoir	12.61	2	748	54,452	18	835.08	10,534	PH 2 FOREBAY 1B
20	Combine	57.10	2	732	252,298	15, 17, 19	-----	-----	PH 2 INFLOW - POND P-1
21	Reservoir	0.000	2	4454	0	20	831.57	193,334	INFILTRATION BASIN P-1
23	Combine	1.337	2	726	2,507	9, 13, 21,	-----	-----	PHASE 2 P-TOTAL
2020-02-27_CHAPMAN FARMS_PHASE II.gpr					Return Period: 1 Year			Thursday, 02 / 27 / 2020	

P-OS-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.083 cfs
Storm frequency	=	1 yrs	Time to peak	=	746 min
Time interval	=	2 min	Hyd. volume	=	6,968 cuft
Drainage area	=	10.170 ac	Curve number	=	62*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.90 min
Total precip.	=	2.40 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow\MSR3 DISTRIBUTION CU	Hydroflow Distribution	=	MSR3 DISTRIBUTION CU

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



TR55 Tc Worksheet

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

Hyd. No. 1

P-OS-1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 5.30	0.00	0.00	
Travel Time (min)	= 14.55	+ 0.00	+ 0.00	= 14.55
Shallow Concentrated Flow				
Flow length (ft)	= 790.00	0.00	0.00	
Watercourse slope (%)	= 8.10	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=4.59	0.00	0.00	
Travel Time (min)	= 2.87	+ 0.00	+ 0.00	= 2.87
Channel Flow				
X sectional flow area (sqft)	= 3.14	0.00	0.00	
Wetted perimeter (ft)	= 6.28	0.00	0.00	
Channel slope (%)	= 3.10	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=12.68	0.00	0.00	
Flow length (ft)	(0)1100.0	0.0	0.0	
Travel Time (min)	= 1.45	+ 0.00	+ 0.00	= 1.45
Total Travel Time, Tc				18.90 min

Precipitation Report

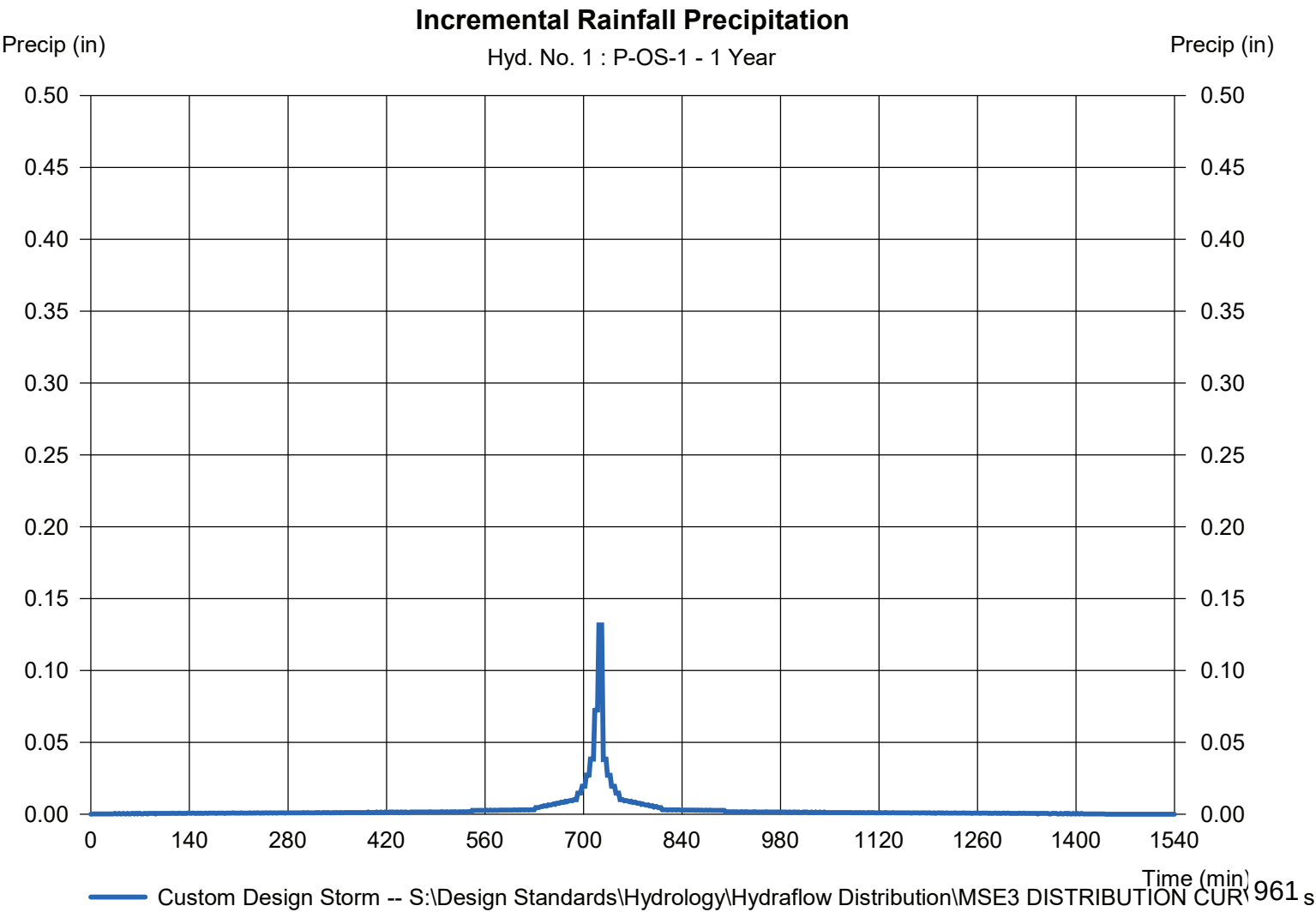
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 1

P-OS-1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

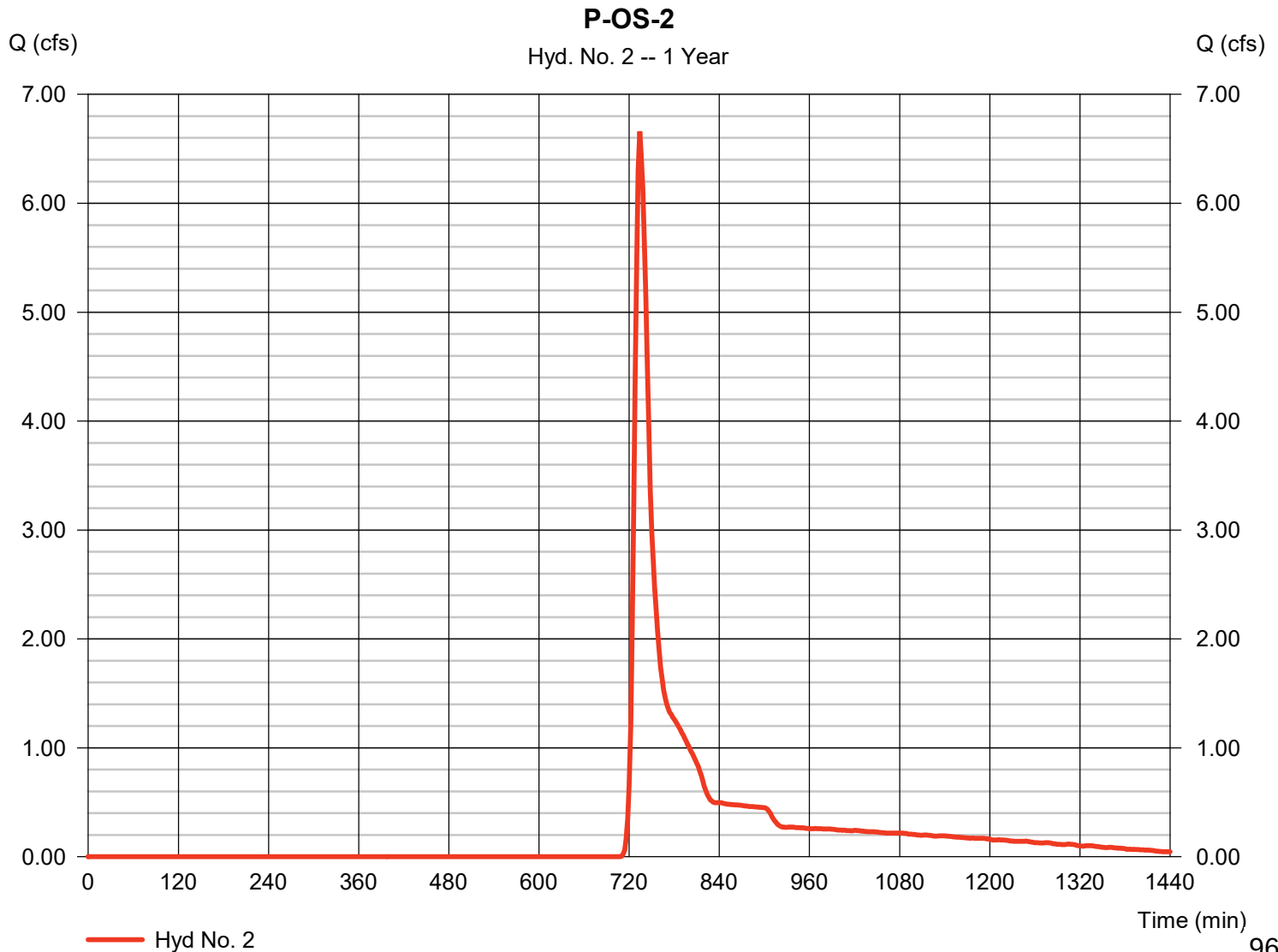
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Hydrograph type	= SCS Runoff	Peak discharge	= 6.658 cfs
Storm frequency	= 1 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 21,649 cuft
Drainage area	= 12.810 ac	Curve number	= 72
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.80 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



TR55 Tc Worksheet

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

Hyd. No. 2

P-OS-2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 9.30	0.00	0.00	
Travel Time (min)	= 11.62	+	0.00	+
			0.00	= 11.62
Shallow Concentrated Flow				
Flow length (ft)	= 780.00	0.00	0.00	
Watercourse slope (%)	= 8.70	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=4.76	0.00	0.00	
Travel Time (min)	= 2.73	+	0.00	+
			0.00	= 2.73
Channel Flow				
X sectional flow area (sqft)	= 3.14	0.00	0.00	
Wetted perimeter (ft)	= 6.28	0.00	0.00	
Channel slope (%)	= 2.10	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=10.44	0.00	0.00	
Flow length (ft)	(0)900.0	0.0	0.0	
Travel Time (min)	= 1.44	+	0.00	+
			0.00	= 1.44
Total Travel Time, Tc				15.80 min

Precipitation Report

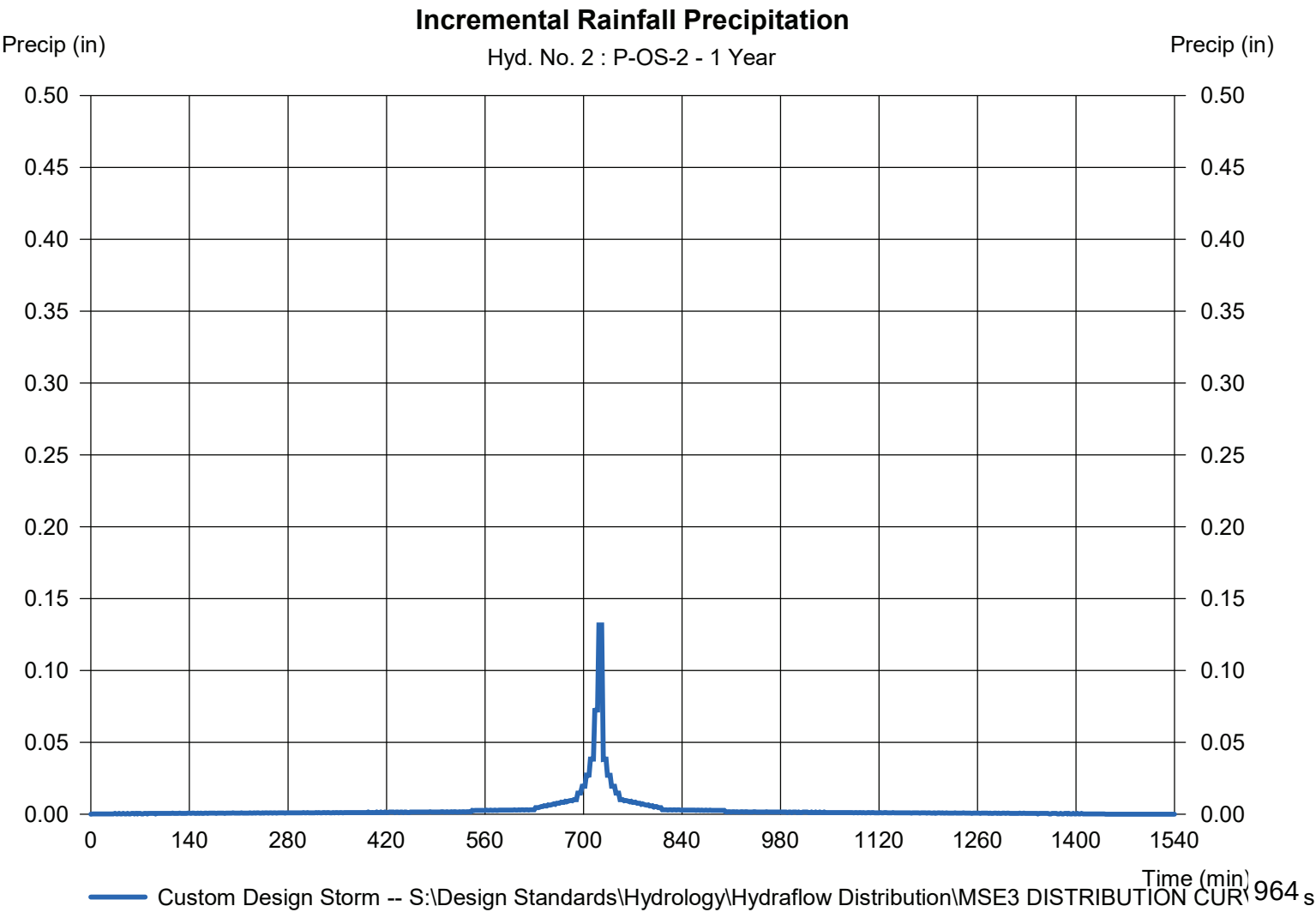
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

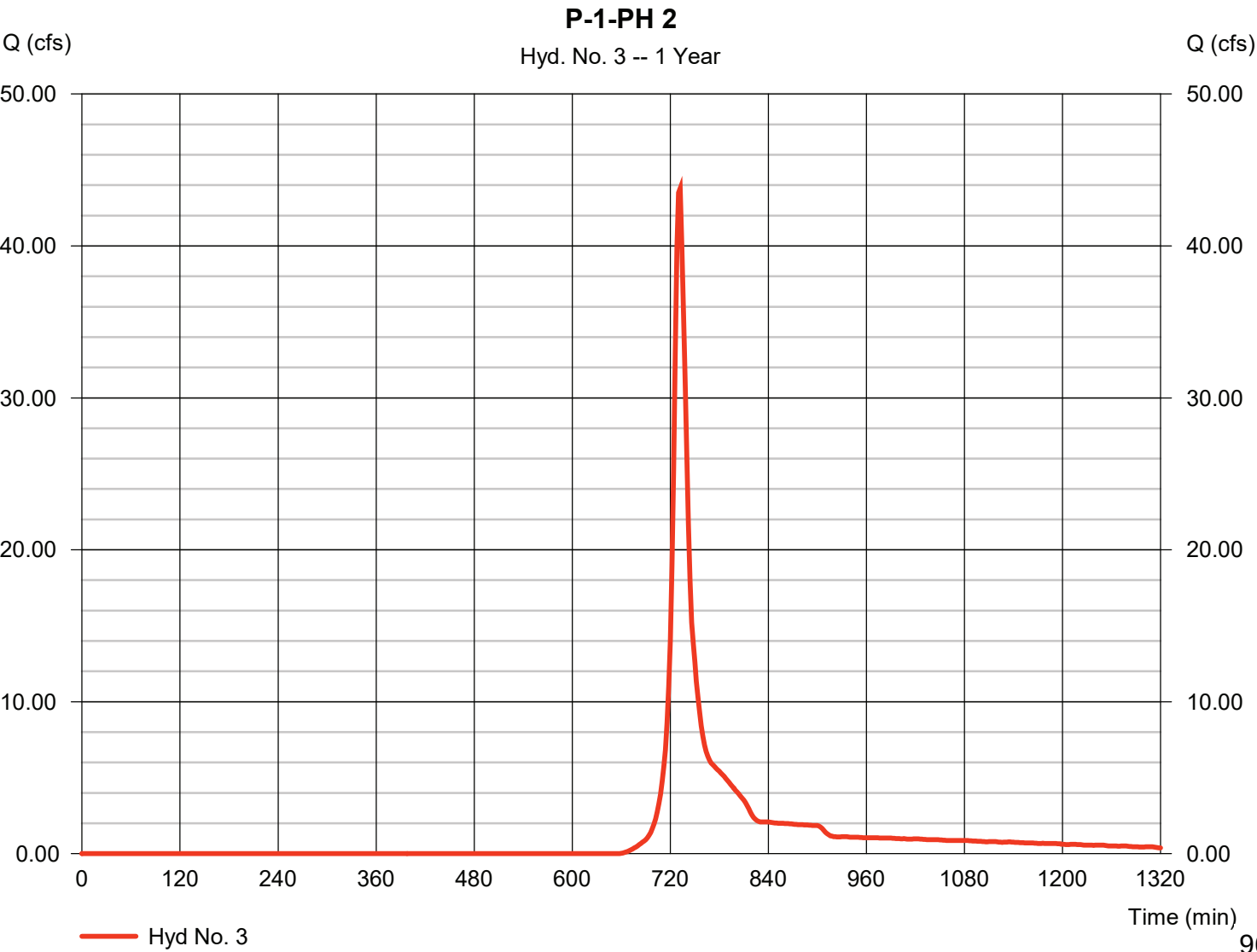
Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Hydrograph type	= SCS Runoff	Peak discharge	= 43.80 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 114,077 cuft
Drainage area	= 32.936 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 32.936



TR55 Tc Worksheet

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

Hyd. No. 3

P-1-PH 2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 70.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 4.00	0.00	0.00	
Travel Time (min)	= 8.85	+	0.00	+
			0.00	= 8.85
Shallow Concentrated Flow				
Flow length (ft)	= 360.00	0.00	0.00	
Watercourse slope (%)	= 2.50	0.00	0.00	
Surface description	= Unpaved	Unpaved	Paved	
Average velocity (ft/s)	=2.55	0.00	0.00	
Travel Time (min)	= 2.35	+	0.00	+
			0.00	= 2.35
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				11.20 min

Precipitation Report

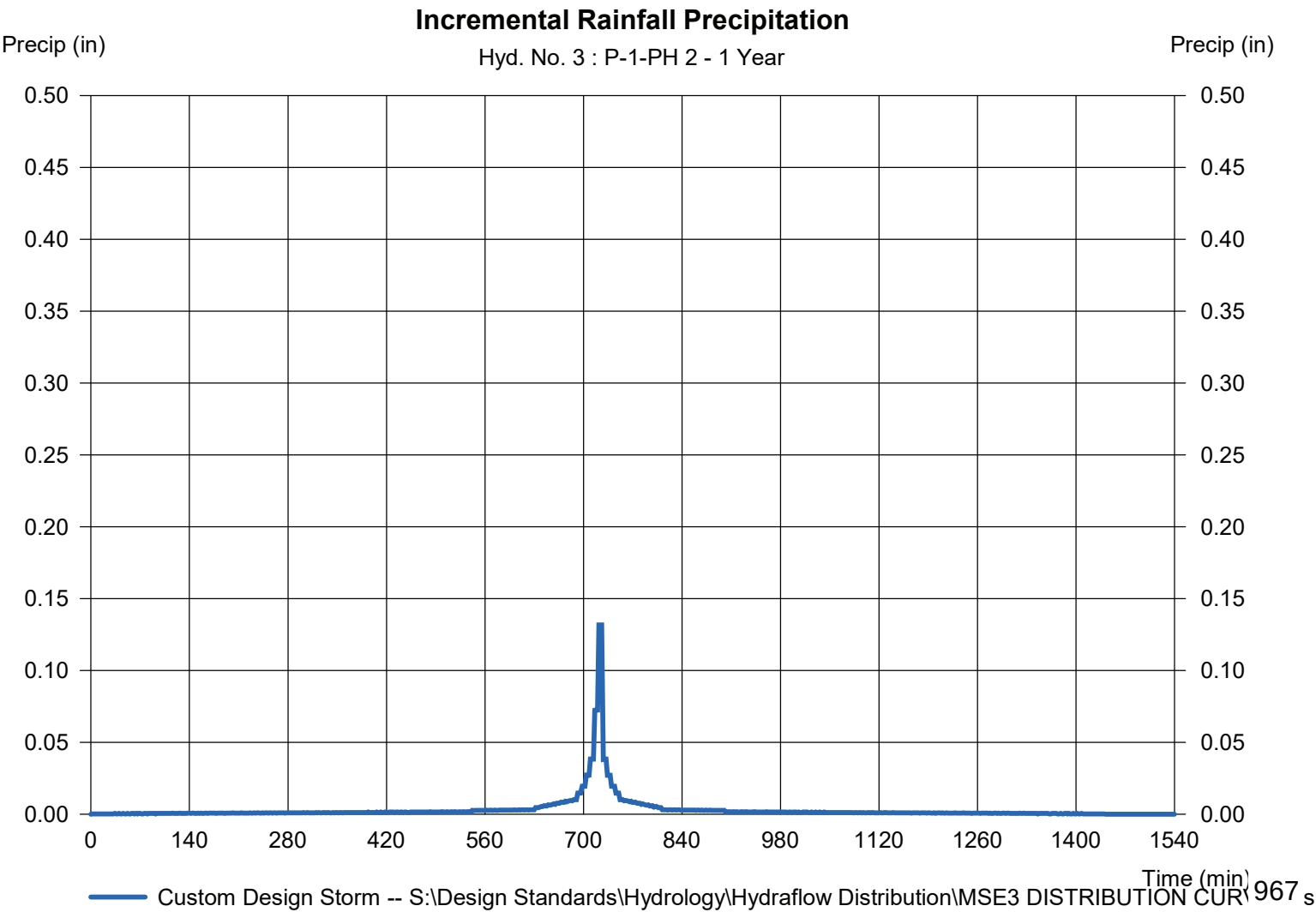
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

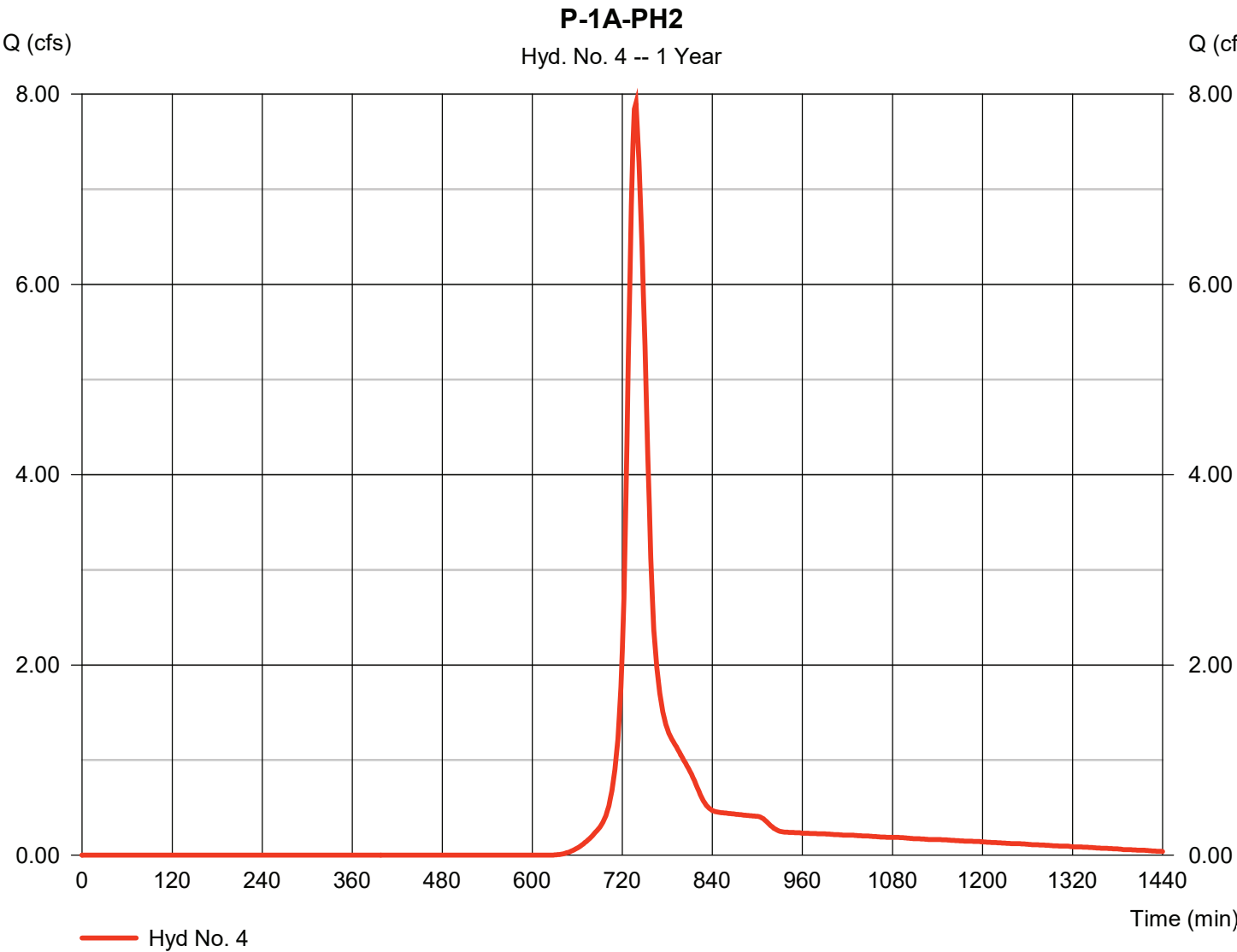
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 7.907 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 26,837 cuft
Drainage area	= 6.607 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD3 DISTRIBUTION CURVE		



TR55 Tc Worksheet

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

Hyd. No. 4

P-1A-PH2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 2.33	0.00	0.00	
Travel Time (min)	= 20.21	+	0.00	+
			0.00	= 20.21
Shallow Concentrated Flow				
Flow length (ft)	= 43.00	0.00	0.00	
Watercourse slope (%)	= 20.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=7.22	0.00	0.00	
Travel Time (min)	= 0.10	+	0.00	+
			0.00	= 0.10
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				20.30 min

Precipitation Report

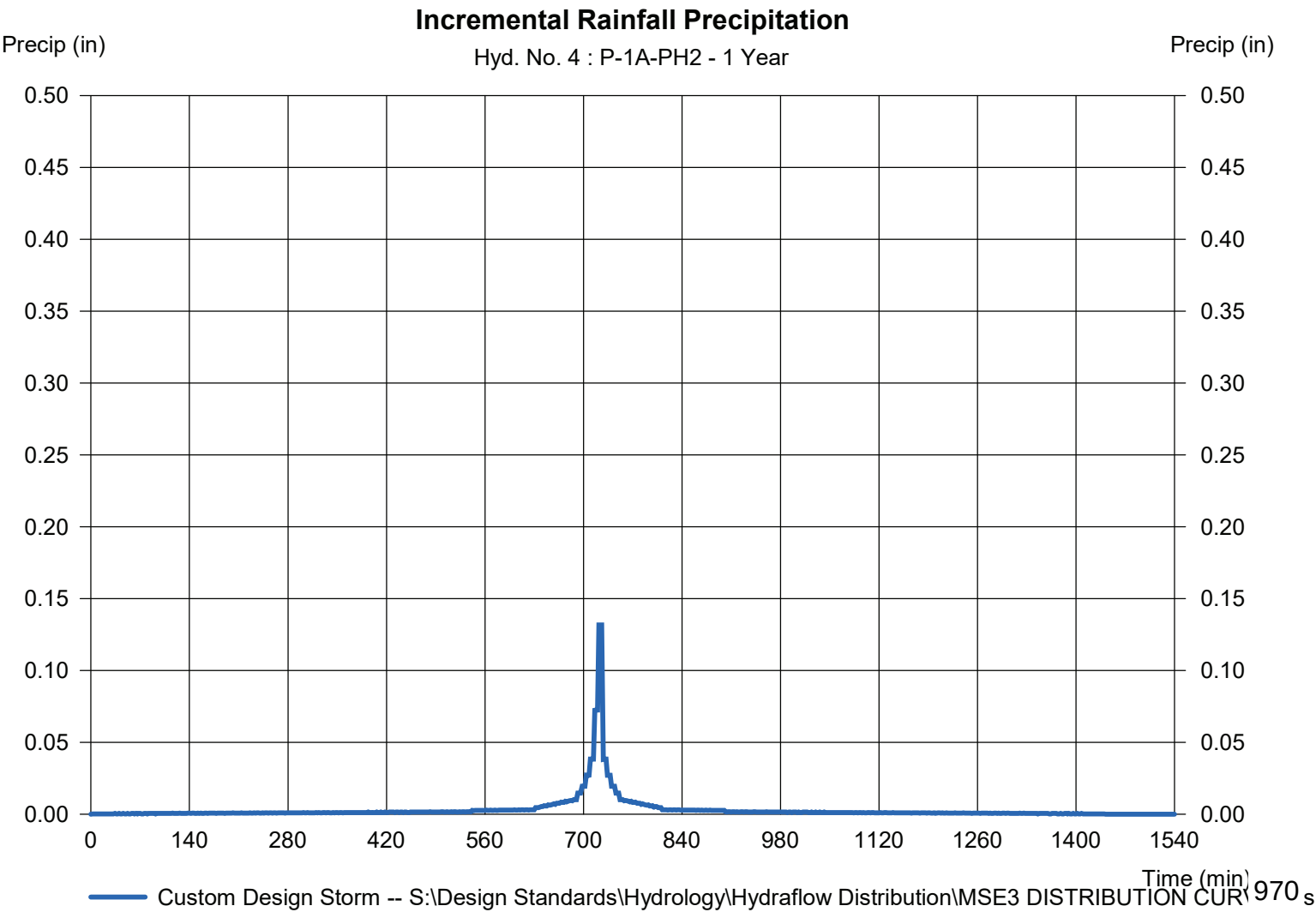
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

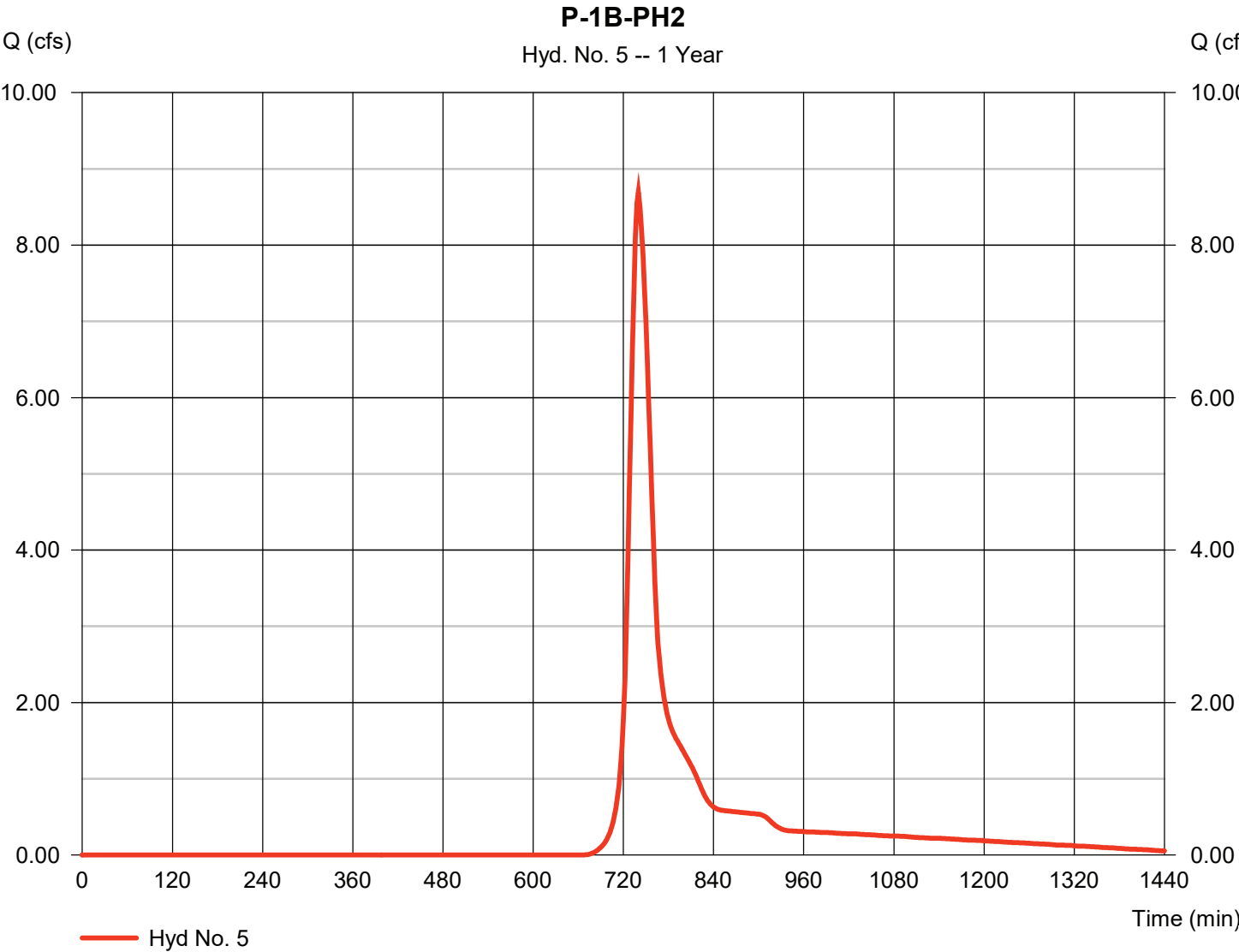
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 8.694 cfs
Storm frequency	= 1 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 31,849 cuft
Drainage area	= 10.224 ac	Curve number	= 81
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 26.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		



TR55 Tc Worksheet

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

Hyd. No. 5

P-1B-PH2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 2.00	0.00	0.00	
Travel Time (min)	= 21.49	+	0.00	+
			0.00	= 21.49
Shallow Concentrated Flow				
Flow length (ft)	= 60.00	0.00	0.00	
Watercourse slope (%)	= 1.25	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.80	0.00	0.00	
Travel Time (min)	= 0.55	+	0.00	+
			0.00	= 0.55
Channel Flow				
X sectional flow area (sqft)	= 1.23	3.14	0.00	
Wetted perimeter (ft)	= 3.93	6.28	0.00	
Channel slope (%)	= 0.50	0.50	0.00	
Manning's n-value	= 0.013	0.013	0.015	
Velocity (ft/s)	=3.72	5.09	0.00	
Flow length (ft)	(\{0\})577.0	406.0	0.0	
Travel Time (min)	= 2.58	+	1.33	+
			0.00	= 3.91
Total Travel Time, Tc				26.00 min

Precipitation Report

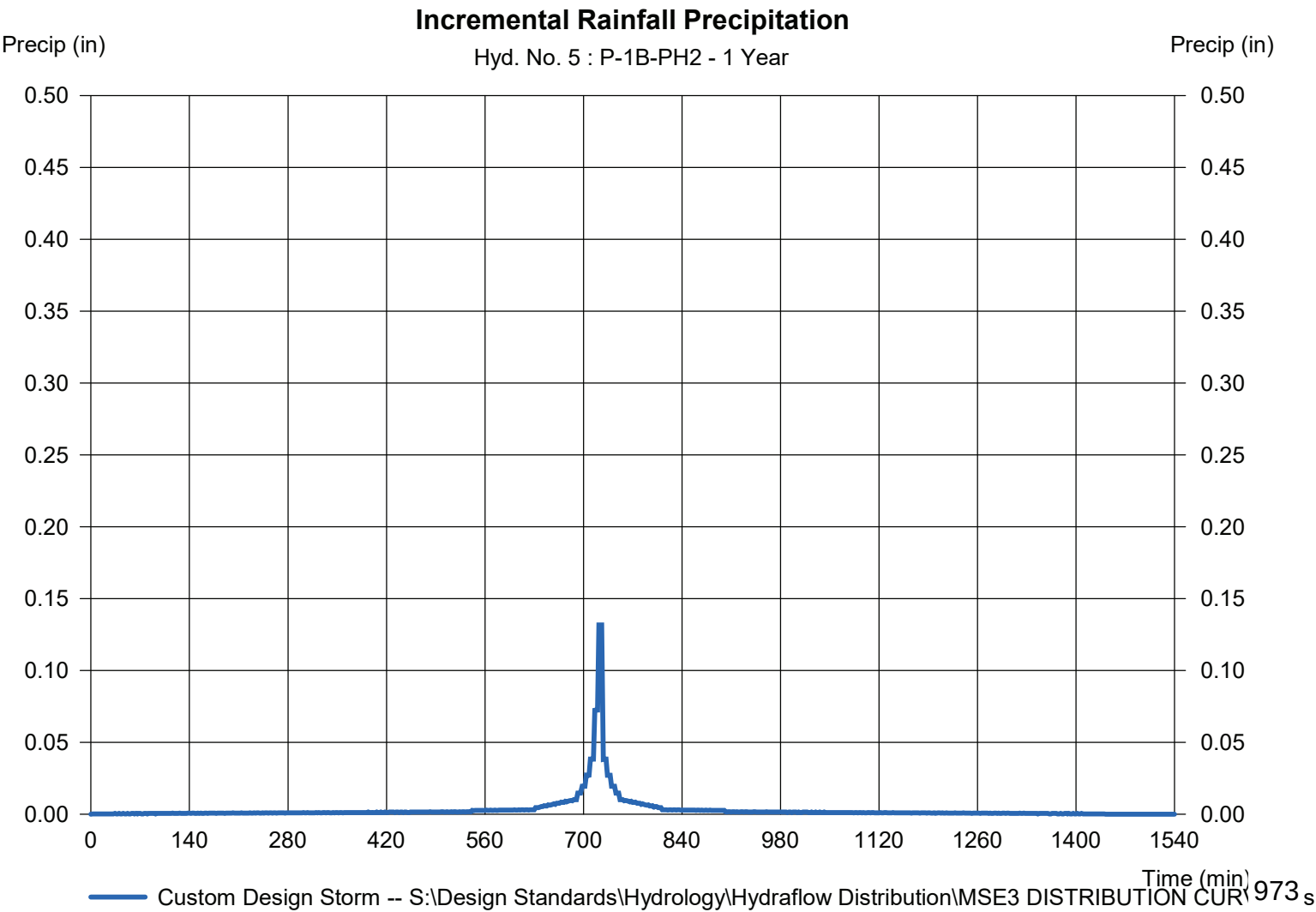
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

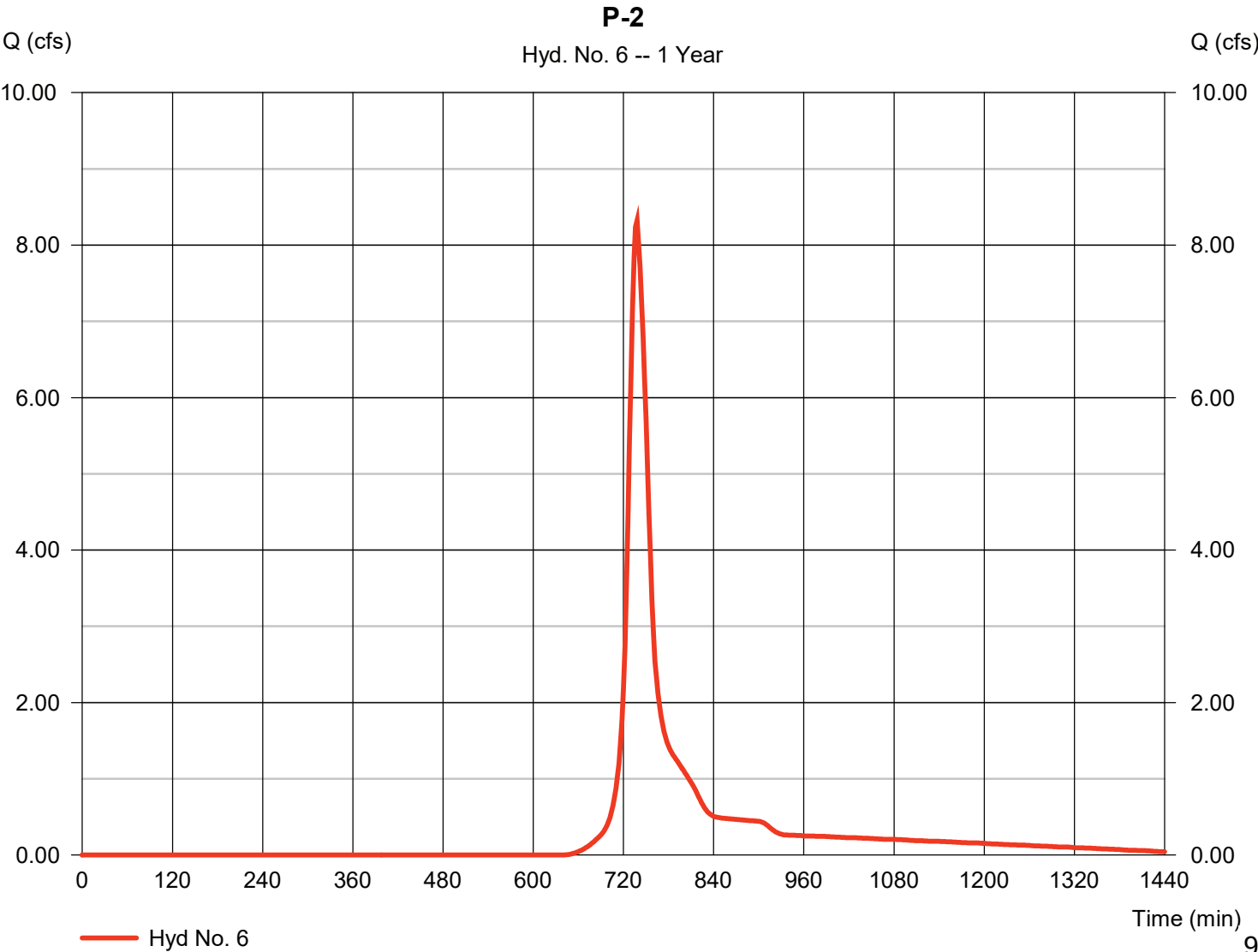
Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 8.325 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 28,348 cuft
Drainage area	= 7.385 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.710 x 75)] / 7.385



Precipitation Report

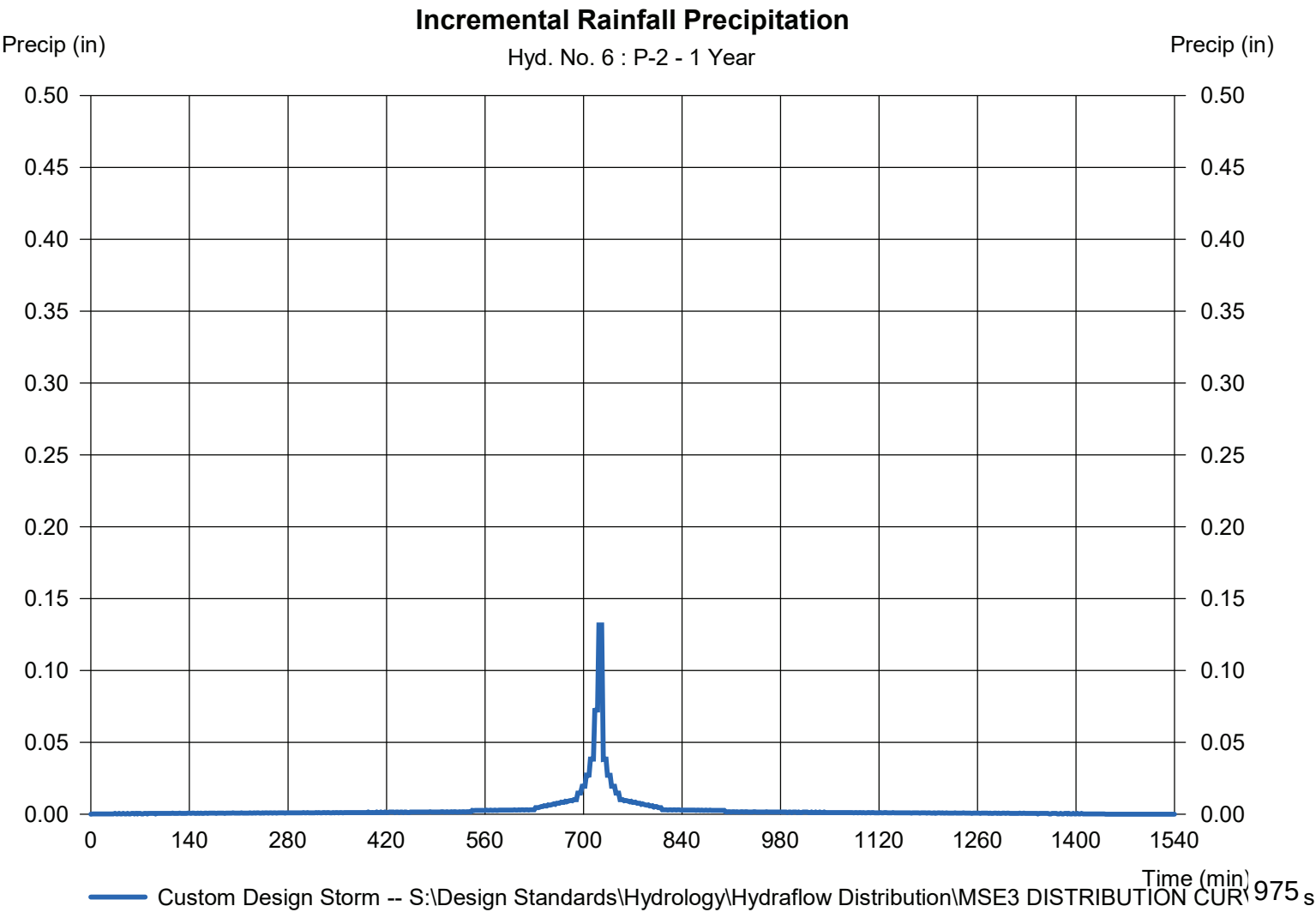
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

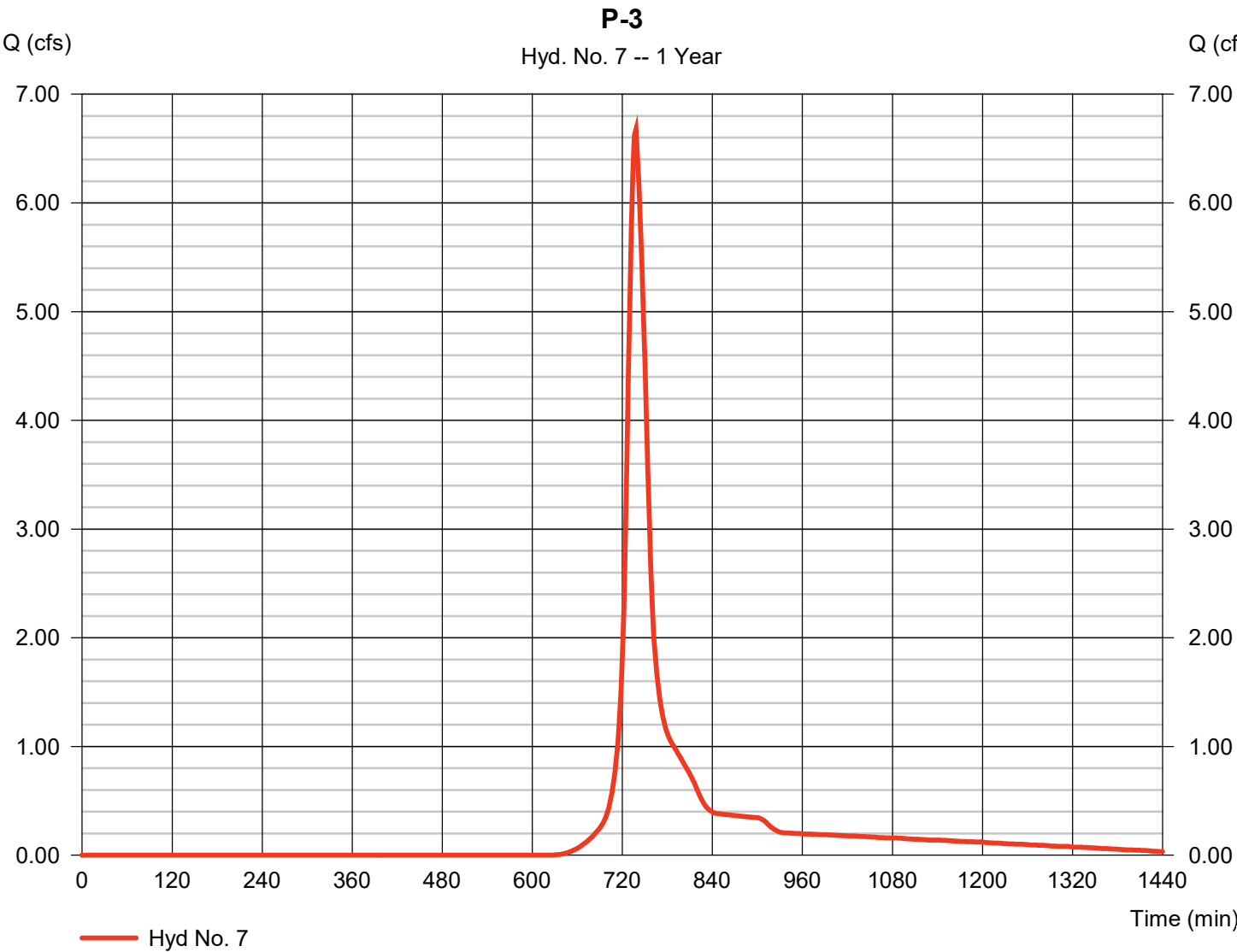
Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 6.677 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 22,661 cuft
Drainage area	= 5.579 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.20 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.579



Precipitation Report

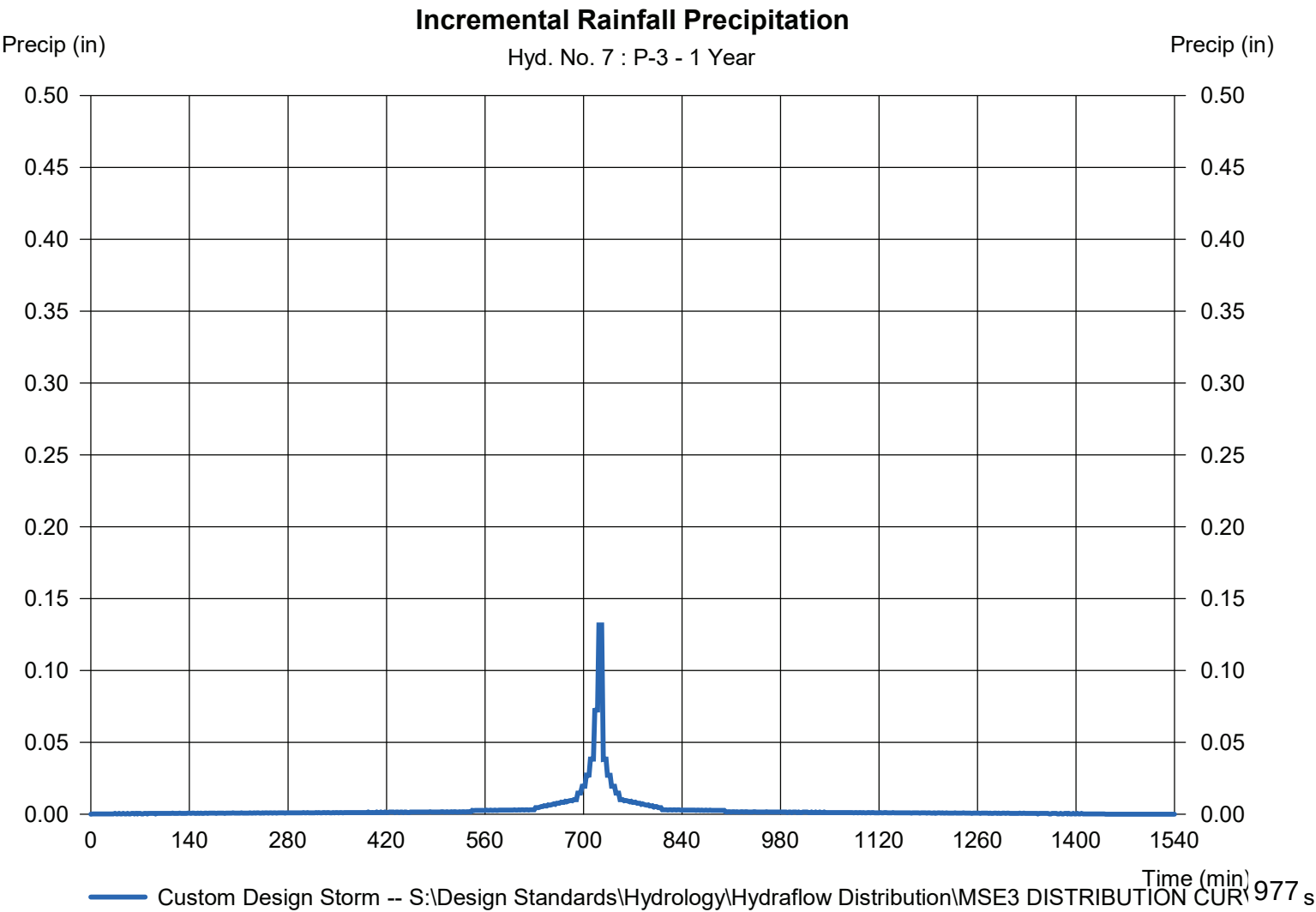
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

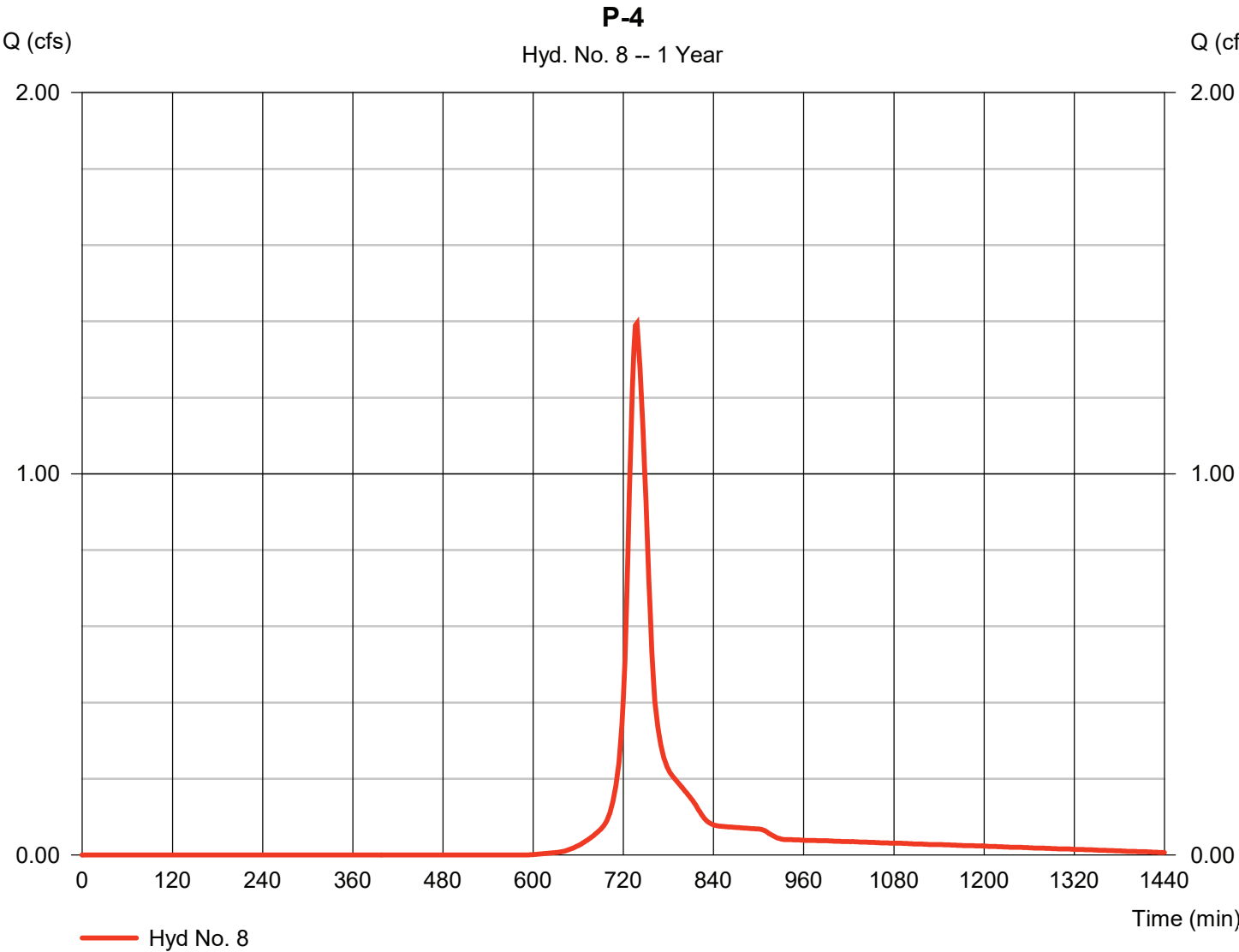
Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 1.395 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 4,718 cuft
Drainage area	= 1.040 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.10 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

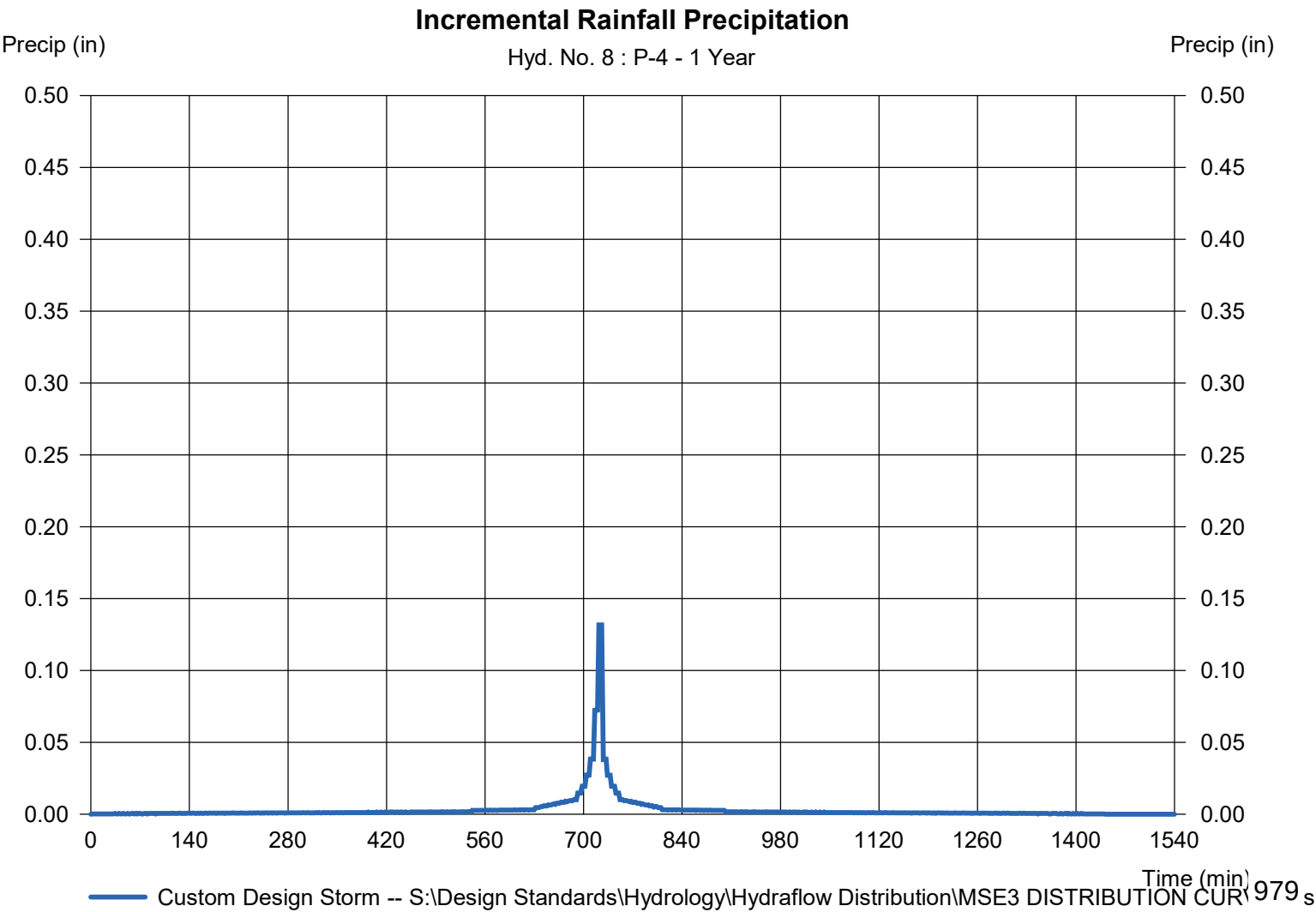
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

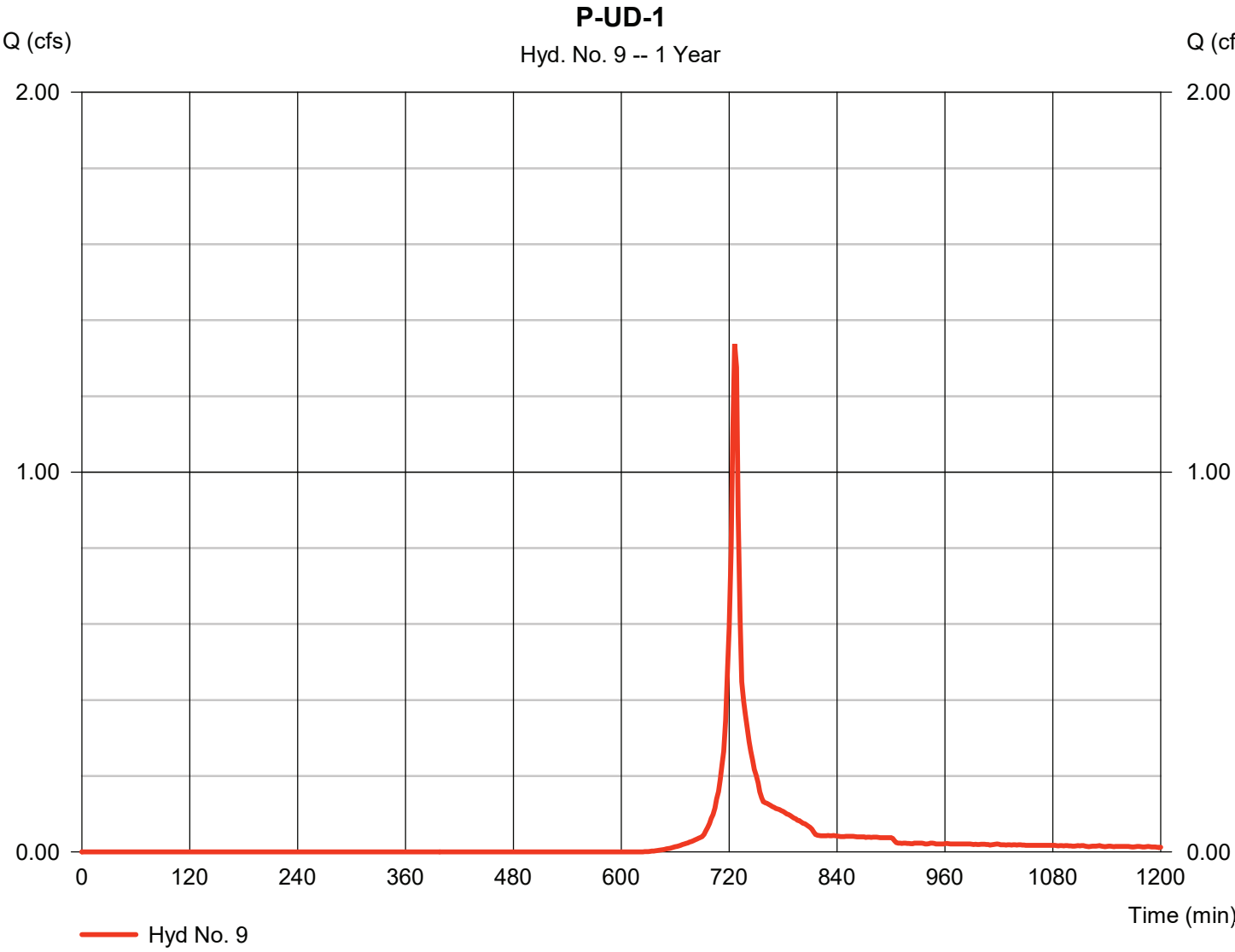
Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.337 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,507 cuft
Drainage area	= 0.670 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.300 x 61) + (0.370 x 98)] / 0.670



Precipitation Report

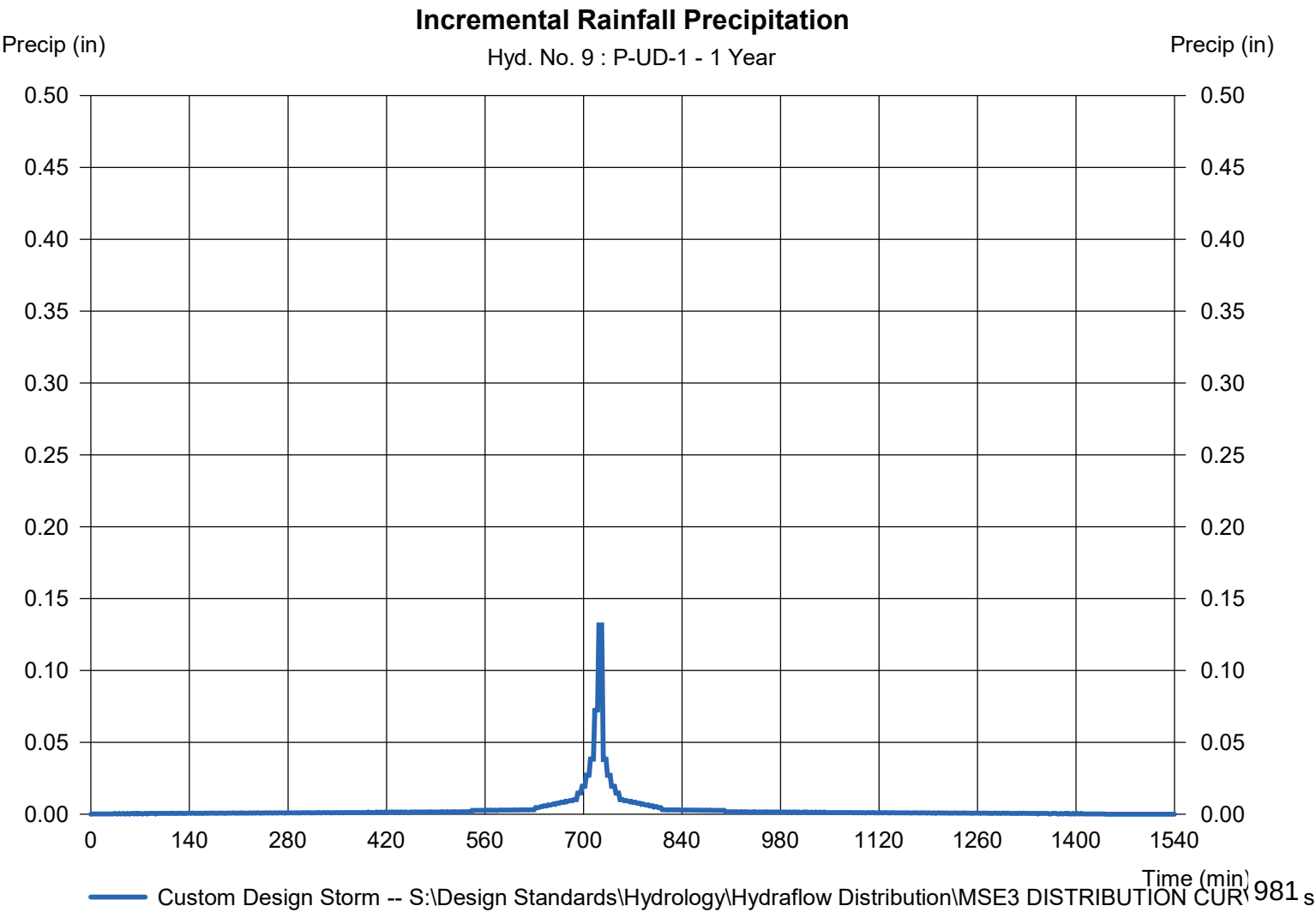
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

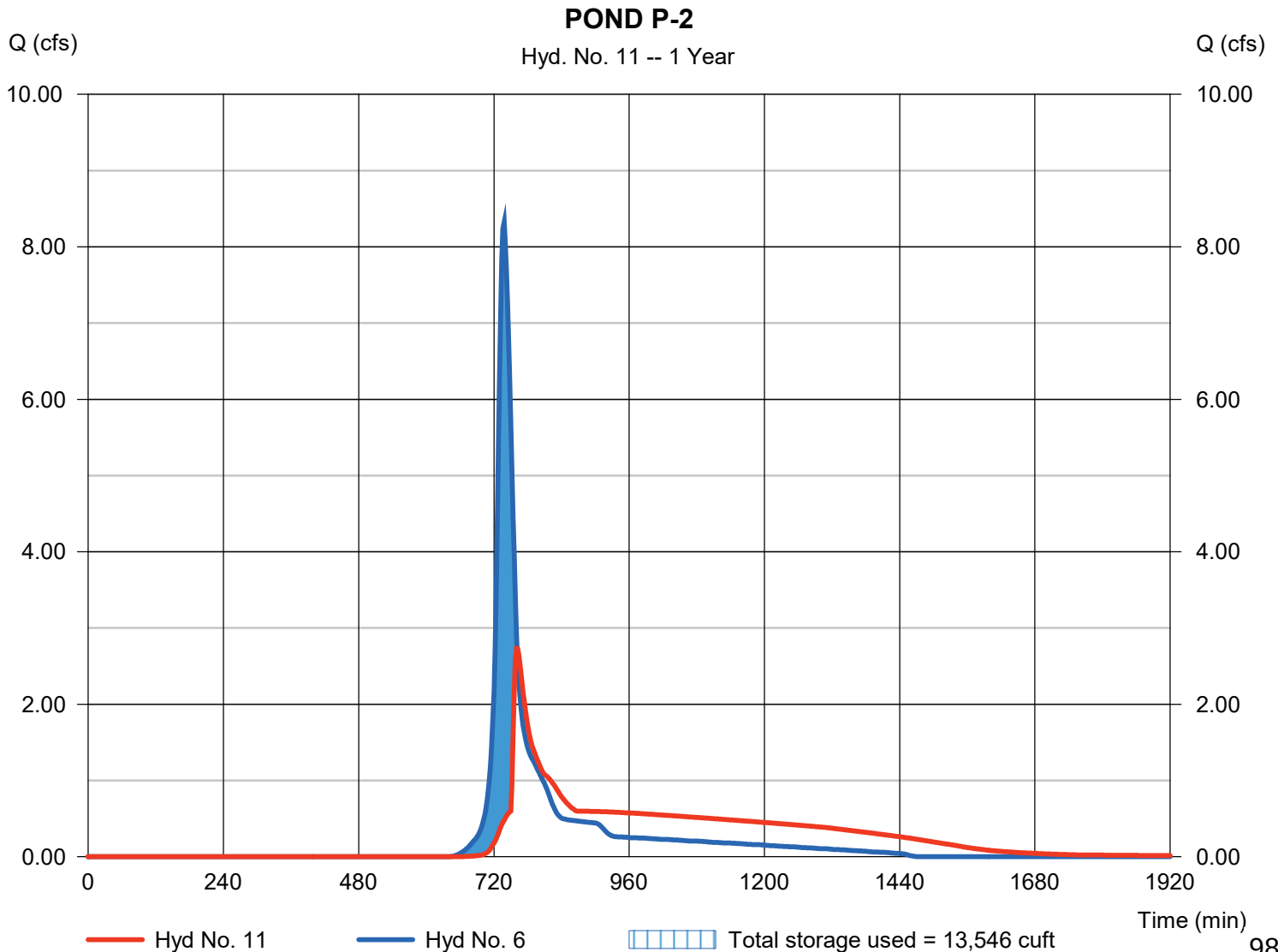
Thursday, 02 / 27 / 2020

Hyd. No. 11

POND P-2

Hydrograph type	= Reservoir	Peak discharge	= 2.732 cfs
Storm frequency	= 1 yrs	Time to peak	= 760 min
Time interval	= 2 min	Hyd. volume	= 28,330 cuft
Inflow hyd. No.	= 6 - P-2	Max. Elevation	= 839.39 ft
Reservoir name	= POND P-2	Max. Storage	= 13,546 cuft

Storage Indication method used.



Pond Report

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

Thursday, 02 / 27 / 2020

Pond No. 2 - POND P-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 837.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	837.00	3,641	0	0
1.00	838.00	5,315	4,451	4,451
2.00	839.00	6,928	6,103	10,554
3.00	840.00	8,626	7,761	18,315
4.00	841.00	10,425	9,510	27,825
5.00	842.00	14,394	12,355	40,180
6.00	843.00	20,000	17,119	57,299

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 27.00	4.00	0.00	0.00
Span (in)	= 27.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 836.75	837.00	0.00	0.00
Length (ft)	= 53.50	1.00	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	20.00	0.00	0.00
Crest El. (ft)	= 839.25	841.65	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	837.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	445	837.10	0.43 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	890	837.20	0.43 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	1,335	837.30	0.43 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	1,780	837.40	0.43 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	2,226	837.50	0.43 ic	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	2,671	837.60	0.43 ic	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	3,116	837.70	0.43 ic	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	3,561	837.80	0.43 ic	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	4,006	837.90	0.43 ic	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	4,451	838.00	0.43 ic	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.384
1.10	5,062	838.10	0.43 ic	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	5,672	838.20	0.43 ic	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	6,282	838.30	0.47 ic	0.45 ic	---	---	0.00	0.00	---	---	---	---	0.447
1.40	6,892	838.40	0.47 ic	0.47 ic	---	---	0.00	0.00	---	---	---	---	0.467
1.50	7,503	838.50	0.51 ic	0.49 ic	---	---	0.00	0.00	---	---	---	---	0.485
1.60	8,113	838.60	0.51 ic	0.50 ic	---	---	0.00	0.00	---	---	---	---	0.503
1.70	8,723	838.70	0.55 ic	0.52 ic	---	---	0.00	0.00	---	---	---	---	0.520
1.80	9,334	838.80	0.55 ic	0.54 ic	---	---	0.00	0.00	---	---	---	---	0.537
1.90	9,944	838.90	0.55 ic	0.55 ic	---	---	0.00	0.00	---	---	---	---	0.553
2.00	10,554	839.00	0.59 ic	0.57 ic	---	---	0.00	0.00	---	---	---	---	0.569
2.10	11,330	839.10	0.59 ic	0.58 ic	---	---	0.00	0.00	---	---	---	---	0.584
2.20	12,107	839.20	0.60 ic	0.60 ic	---	---	0.00	0.00	---	---	---	---	0.599
2.30	12,883	839.30	1.12 ic	0.61 ic	---	---	0.47	0.00	---	---	---	---	1.081
2.40	13,659	839.40	3.11 oc	0.58 ic	---	---	2.43	0.00	---	---	---	---	3.012
2.50	14,435	839.50	5.87 oc	0.54 ic	---	---	5.23	0.00	---	---	---	---	5.764
2.60	15,211	839.60	9.22 oc	0.47 ic	---	---	8.66	0.00	---	---	---	---	9.130
2.70	15,987	839.70	12.96 oc	0.33 ic	---	---	12.63	0.00	---	---	---	---	12.96
2.80	16,763	839.80	17.04 oc	0.29 ic	---	---	16.75 s	0.00	---	---	---	---	17.04
2.90	17,539	839.90	19.71 oc	0.26 ic	---	---	19.45 s	0.00	---	---	---	---	19.71
3.00	18,315	840.00	21.77 oc	0.23 ic	---	---	21.53 s	0.00	---	---	---	---	21.77
3.10	19,266	840.10	23.46 oc	0.21 ic	---	---	23.25 s	0.00	---	---	---	---	23.46
3.20	20,217	840.20	24.92 oc	0.19 ic	---	---	24.72 s	0.00	---	---	---	---	24.91
3.30	21,168	840.30	26.20 oc	0.18 ic	---	---	26.02 s	0.00	---	---	---	---	26.19
3.40	22,119	840.40	27.36 oc	0.16 ic	---	---	27.19 s	0.00	---	---	---	---	27.36
3.50	23,070	840.50	28.42 oc	0.15 ic	---	---	28.26 s	0.00	---	---	---	---	28.42

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Continues on next page...

POND P-2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	24,021	840.60	29.42 oc	0.14 ic	---	---	29.28 s	0.00	---	---	---	---	29.42
3.70	24,972	840.70	30.35 oc	0.13 ic	---	---	30.21 s	0.00	---	---	---	---	30.34
3.80	25,923	840.80	31.24 oc	0.12 ic	---	---	31.11 s	0.00	---	---	---	---	31.24
3.90	26,874	840.90	32.10 oc	0.12 ic	---	---	31.97 s	0.00	---	---	---	---	32.09
4.00	27,825	841.00	32.92 oc	0.11 ic	---	---	32.79 s	0.00	---	---	---	---	32.90
4.10	29,061	841.10	33.71 oc	0.11 ic	---	---	33.59 s	0.00	---	---	---	---	33.69
4.20	30,296	841.20	34.47 oc	0.10 ic	---	---	34.37 s	0.00	---	---	---	---	34.47
4.30	31,532	841.30	35.15 ic	0.10 ic	---	---	35.05 s	0.00	---	---	---	---	35.15
4.40	32,767	841.40	35.69 ic	0.09 ic	---	---	35.59 s	0.00	---	---	---	---	35.68
4.50	34,003	841.50	36.23 ic	0.09 ic	---	---	36.11 s	0.00	---	---	---	---	36.20
4.60	35,238	841.60	36.75 ic	0.08 ic	---	---	36.65 s	0.00	---	---	---	---	36.74
4.70	36,474	841.70	37.26 ic	0.08 ic	---	---	37.17 s	0.58	---	---	---	---	37.83
4.80	37,709	841.80	37.76 ic	0.08 ic	---	---	37.66 s	3.01	---	---	---	---	40.75
4.90	38,945	841.90	38.25 ic	0.07 ic	---	---	38.16 s	6.49	---	---	---	---	44.73
5.00	40,180	842.00	38.74 ic	0.07 ic	---	---	38.66 s	10.77	---	---	---	---	49.49
5.10	41,892	842.10	39.22 ic	0.07 ic	---	---	39.13 s	15.69	---	---	---	---	54.90
5.20	43,604	842.20	39.69 ic	0.07 ic	---	---	39.57 s	21.21	---	---	---	---	60.85
5.30	45,316	842.30	40.16 ic	0.06 ic	---	---	40.09 s	27.24	---	---	---	---	67.40
5.40	47,028	842.40	40.62 ic	0.06 ic	---	---	40.51 s	33.77	---	---	---	---	74.34
5.50	48,740	842.50	41.07 ic	0.06 ic	---	---	41.00 s	40.74	---	---	---	---	81.80
5.60	50,452	842.60	41.52 ic	0.06 ic	---	---	41.44 s	48.14	---	---	---	---	89.64
5.70	52,164	842.70	41.97 ic	0.06 ic	---	---	41.85 s	55.93	---	---	---	---	97.84
5.80	53,875	842.80	42.40 ic	0.06 ic	---	---	42.32 s	64.11	---	---	---	---	106.48
5.90	55,587	842.90	42.84 ic	0.05 ic	---	---	42.70 s	72.65	---	---	---	---	115.40
6.00	57,299	843.00	43.27 ic	0.05 ic	---	---	43.14 s	81.56	---	---	---	---	124.76

...End

Hydrograph Report

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

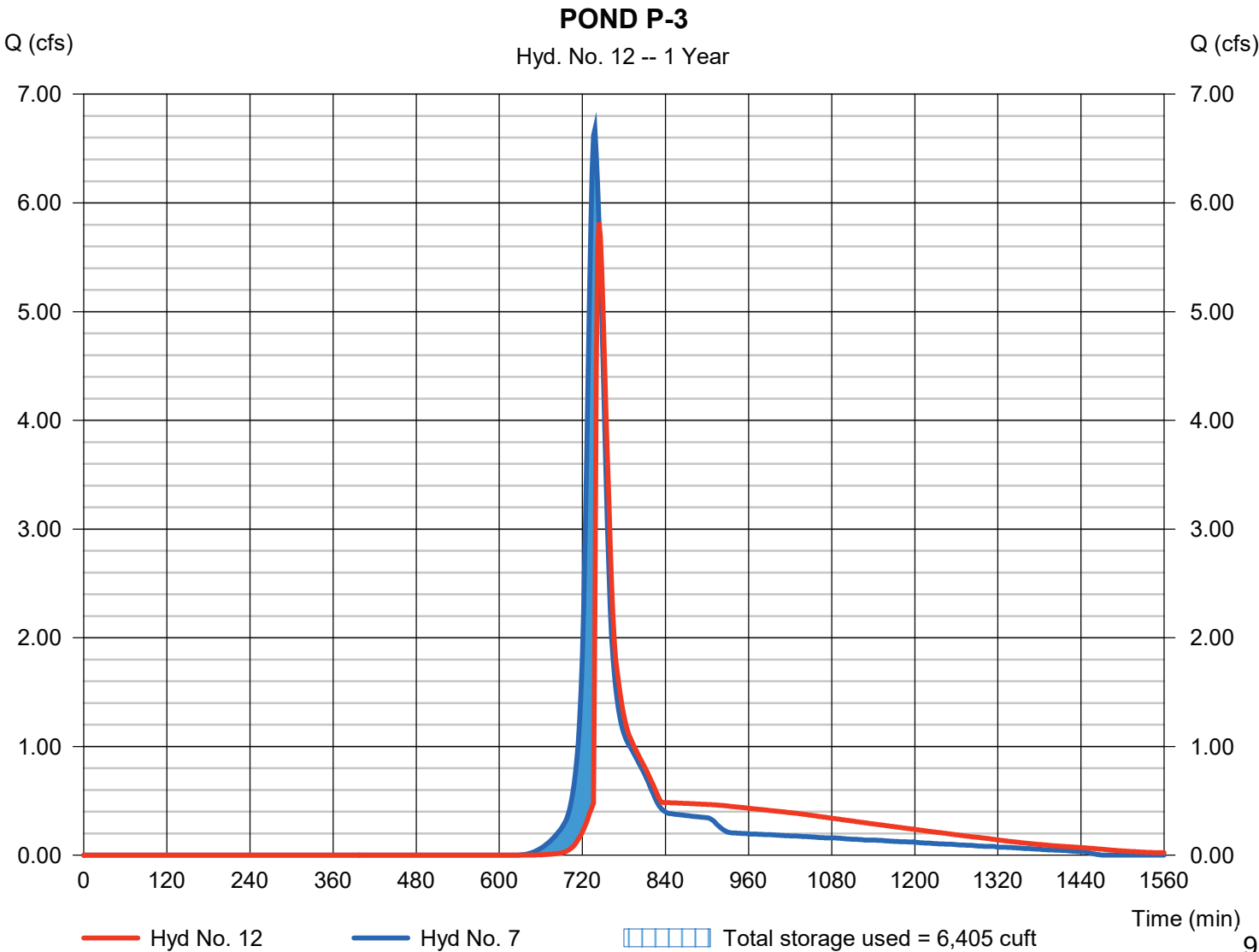
Thursday, 02 / 27 / 2020

Hyd. No. 12

POND P-3

Hydrograph type	= Reservoir	Peak discharge	= 5.820 cfs
Storm frequency	= 1 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 22,648 cuft
Inflow hyd. No.	= 7 - P-3	Max. Elevation	= 839.75 ft
Reservoir name	= POND P-3	Max. Storage	= 6,405 cuft

Storage Indication method used.



Pond Report

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

Thursday, 02 / 27 / 2020

Pond No. 3 - POND P-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 838.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	838.00	2,707	0	0
1.00	839.00	3,721	3,200	3,200
2.00	840.00	4,846	4,271	7,471
3.00	841.00	6,075	5,448	12,919
4.00	842.00	7,400	6,726	19,645
5.00	843.00	20,000	13,187	32,833

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	4.00	0.00	0.00
Span (in)	= 24.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 837.25	838.00	0.00	0.00
Length (ft)	= 54.00	1.00	0.00	0.00
Slope (%)	= 0.96	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	5.00	0.00	0.00
Crest El. (ft)	= 839.50	841.70	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	838.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	320	838.10	3.18 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	640	838.20	3.18 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	960	838.30	3.18 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	1,280	838.40	3.18 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	1,600	838.50	3.18 ic	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	1,920	838.60	3.18 ic	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	2,240	838.70	3.18 ic	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	2,560	838.80	3.18 ic	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	2,880	838.90	3.18 ic	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	3,200	839.00	3.18 ic	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.384
1.10	3,627	839.10	3.18 ic	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	4,054	839.20	3.18 ic	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	4,481	839.30	3.18 ic	0.45 ic	---	---	0.00	0.00	---	---	---	---	0.447
1.40	4,909	839.40	3.18 ic	0.47 ic	---	---	0.00	0.00	---	---	---	---	0.467
1.50	5,336	839.50	3.18 ic	0.49 ic	---	---	0.00	0.00	---	---	---	---	0.485
1.60	5,763	839.60	3.18 ic	0.50 ic	---	---	1.32	0.00	---	---	---	---	1.825
1.70	6,190	839.70	4.30 ic	0.52 ic	---	---	3.74	0.00	---	---	---	---	4.259
1.80	6,617	839.80	7.36 ic	0.49 ic	---	---	6.87	0.00	---	---	---	---	7.359
1.90	7,044	839.90	11.06 oc	0.43 ic	---	---	10.58	0.00	---	---	---	---	11.01
2.00	7,471	840.00	15.08 oc	0.29 ic	---	---	14.79 s	0.00	---	---	---	---	15.08
2.10	8,016	840.10	17.36 oc	0.25 ic	---	---	17.11 s	0.00	---	---	---	---	17.36
2.20	8,561	840.20	18.87 oc	0.21 ic	---	---	18.66 s	0.00	---	---	---	---	18.87
2.30	9,105	840.30	20.06 oc	0.19 ic	---	---	19.87 s	0.00	---	---	---	---	20.06
2.40	9,650	840.40	21.07 oc	0.17 ic	---	---	20.90 s	0.00	---	---	---	---	21.06
2.50	10,195	840.50	21.95 oc	0.15 ic	---	---	21.80 s	0.00	---	---	---	---	21.95
2.60	10,740	840.60	22.67 ic	0.14 ic	---	---	22.53 s	0.00	---	---	---	---	22.66
2.70	11,285	840.70	23.25 ic	0.12 ic	---	---	23.13 s	0.00	---	---	---	---	23.25
2.80	11,830	840.80	23.81 ic	0.11 ic	---	---	23.69 s	0.00	---	---	---	---	23.80
2.90	12,375	840.90	24.33 ic	0.10 ic	---	---	24.23 s	0.00	---	---	---	---	24.33
3.00	12,919	841.00	24.84 ic	0.10 ic	---	---	24.72 s	0.00	---	---	---	---	24.82
3.10	13,592	841.10	25.33 ic	0.09 ic	---	---	25.23 s	0.00	---	---	---	---	25.32
3.20	14,265	841.20	25.80 ic	0.08 ic	---	---	25.70 s	0.00	---	---	---	---	25.78
3.30	14,937	841.30	26.26 ic	0.08 ic	---	---	26.16 s	0.00	---	---	---	---	26.24
3.40	15,610	841.40	26.71 ic	0.08 ic	---	---	26.62 s	0.00	---	---	---	---	26.69
3.50	16,282	841.50	27.14 ic	0.07 ic	---	---	27.04 s	0.00	---	---	---	---	27.12
3.60	16,955	841.60	27.57 ic	0.07 ic	---	---	27.49 s	0.00	---	---	---	---	27.56

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POND P-3

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.70	17,628	841.70	28.00 ic	0.06 ic	---	---	27.93 s	0.00	---	---	---	---	27.99
3.80	18,300	841.80	28.41 ic	0.06 ic	---	---	28.32 s	0.41	---	---	---	---	28.79
3.90	18,973	841.90	28.82 ic	0.06 ic	---	---	28.74 s	1.16	---	---	---	---	29.96
4.00	19,645	842.00	29.22 ic	0.06 ic	---	---	29.15 s	2.14	---	---	---	---	31.34
4.10	20,964	842.10	29.61 ic	0.05 ic	---	---	29.53 s	3.29	---	---	---	---	32.87
4.20	22,283	842.20	30.00 ic	0.05 ic	---	---	29.93 s	4.60	---	---	---	---	34.58
4.30	23,601	842.30	30.38 ic	0.05 ic	---	---	30.28 s	6.04	---	---	---	---	36.37
4.40	24,920	842.40	30.76 ic	0.05 ic	---	---	30.66 s	7.61	---	---	---	---	38.32
4.50	26,239	842.50	31.13 ic	0.05 ic	---	---	31.04 s	9.30	---	---	---	---	40.39
4.60	27,558	842.60	31.50 ic	0.05 ic	---	---	31.39 s	11.10	---	---	---	---	42.53
4.70	28,876	842.70	31.86 ic	0.04 ic	---	---	31.81 s	13.00	---	---	---	---	44.85
4.80	30,195	842.80	32.22 ic	0.04 ic	---	---	32.15 s	14.99	---	---	---	---	47.19
4.90	31,514	842.90	32.58 ic	0.04 ic	---	---	32.53 s	17.08	---	---	---	---	49.65
5.00	32,833	843.00	32.93 ic	0.04 ic	---	---	32.77 s	19.27	---	---	---	---	52.08

...End

Hydrograph Report

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

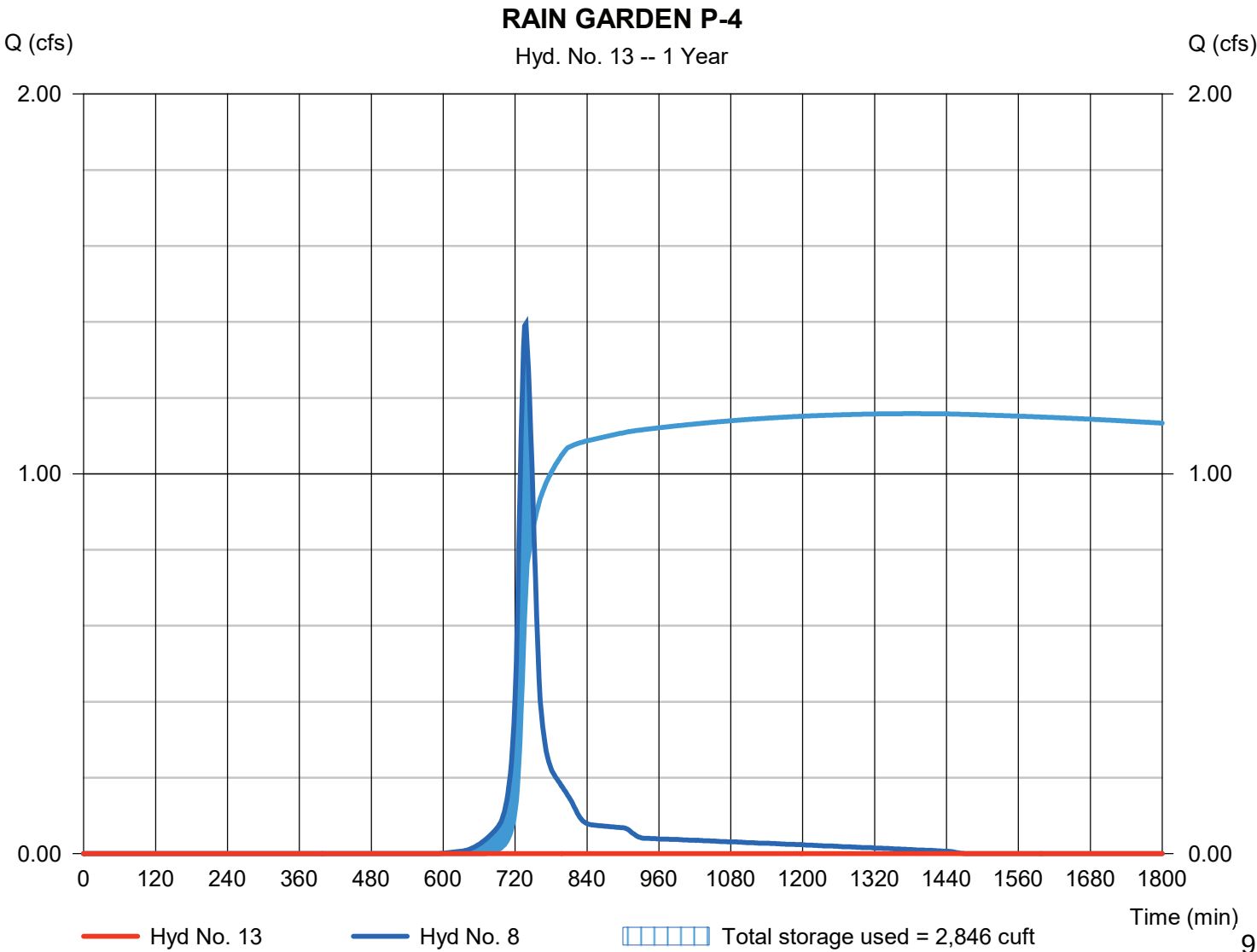
Thursday, 02 / 27 / 2020

Hyd. No. 13

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 746 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 8 - P-4	Max. Elevation	= 839.81 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 2,846 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 4 - RAIN GARDEN P-4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 839.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	839.00	2,706	0	0
1.00	840.00	4,351	3,496	3,496
2.00	841.00	6,823	5,540	9,036
2.70	841.70	8,331	5,295	14,331

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 840.70	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)	= 1.630 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	839.00	---	---	---	---	0.00	---	---	---	0.000	---	0.000
0.10	350	839.10	---	---	---	---	0.00	---	---	---	0.016	---	0.016
0.20	699	839.20	---	---	---	---	0.00	---	---	---	0.033	---	0.033
0.30	1,049	839.30	---	---	---	---	0.00	---	---	---	0.049	---	0.049
0.40	1,398	839.40	---	---	---	---	0.00	---	---	---	0.066	---	0.066
0.50	1,748	839.50	---	---	---	---	0.00	---	---	---	0.082	---	0.082
0.60	2,097	839.60	---	---	---	---	0.00	---	---	---	0.099	---	0.099
0.70	2,447	839.70	---	---	---	---	0.00	---	---	---	0.115	---	0.115
0.80	2,797	839.80	---	---	---	---	0.00	---	---	---	0.131	---	0.131
0.90	3,146	839.90	---	---	---	---	0.00	---	---	---	0.148	---	0.148
1.00	3,496	840.00	---	---	---	---	0.00	---	---	---	0.164	---	0.164
1.10	4,050	840.10	---	---	---	---	0.00	---	---	---	0.173	---	0.173
1.20	4,604	840.20	---	---	---	---	0.00	---	---	---	0.183	---	0.183
1.30	5,158	840.30	---	---	---	---	0.00	---	---	---	0.192	---	0.192
1.40	5,712	840.40	---	---	---	---	0.00	---	---	---	0.201	---	0.201
1.50	6,266	840.50	---	---	---	---	0.00	---	---	---	0.211	---	0.211
1.60	6,820	840.60	---	---	---	---	0.00	---	---	---	0.220	---	0.220
1.70	7,374	840.70	---	---	---	---	0.00	---	---	---	0.229	---	0.229
1.80	7,928	840.80	---	---	---	---	1.64	---	---	---	0.239	---	1.878
1.90	8,482	840.90	---	---	---	---	4.64	---	---	---	0.248	---	4.891
2.00	9,036	841.00	---	---	---	---	8.54	---	---	---	0.257	---	8.801
2.07	9,566	841.07	---	---	---	---	11.70	---	---	---	0.263	---	11.97
2.14	10,095	841.14	---	---	---	---	15.18	---	---	---	0.269	---	15.45
2.21	10,624	841.21	---	---	---	---	18.94	---	---	---	0.275	---	19.21
2.28	11,154	841.28	---	---	---	---	22.97	---	---	---	0.280	---	23.25
2.35	11,683	841.35	---	---	---	---	27.25	---	---	---	0.286	---	27.54
2.42	12,213	841.42	---	---	---	---	31.77	---	---	---	0.292	---	32.06
2.49	12,742	841.49	---	---	---	---	36.52	---	---	---	0.297	---	36.81
2.56	13,272	841.56	---	---	---	---	41.47	---	---	---	0.303	---	41.78
2.63	13,801	841.63	---	---	---	---	46.64	---	---	---	0.309	---	46.95
2.70	14,331	841.70	---	---	---	---	52.00	---	---	---	0.314	---	52.31

Hydrograph Report

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

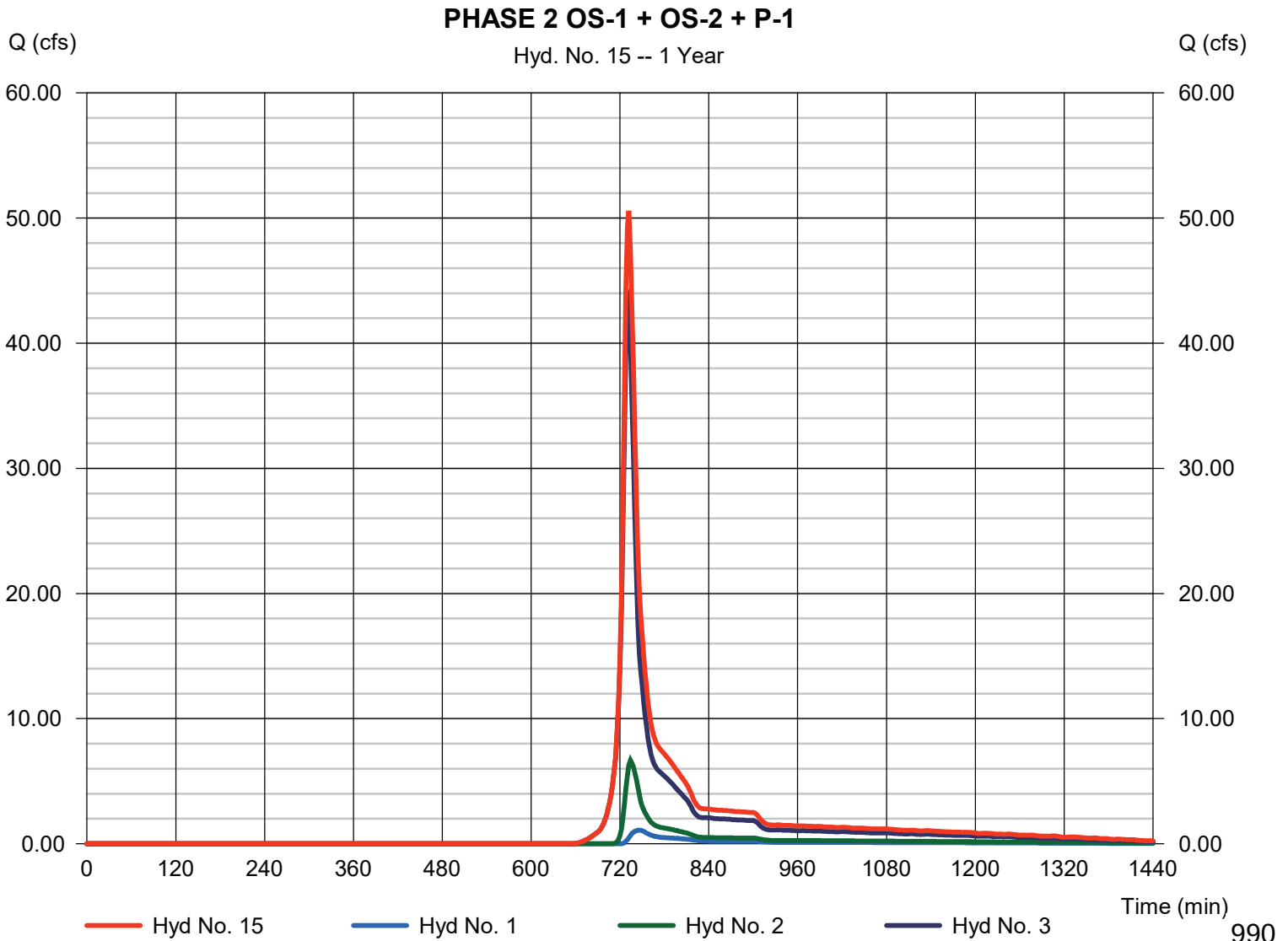
Thursday, 02 / 27 / 2020

Hyd. No. 15

PHASE 2 OS-1 + OS-2 + P-1

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 2, 3

Peak discharge = 50.59 cfs
 Time to peak = 732 min
 Hyd. volume = 142,694 cuft
 Contrib. drain. area = 55.916 ac



Hydrograph Report

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

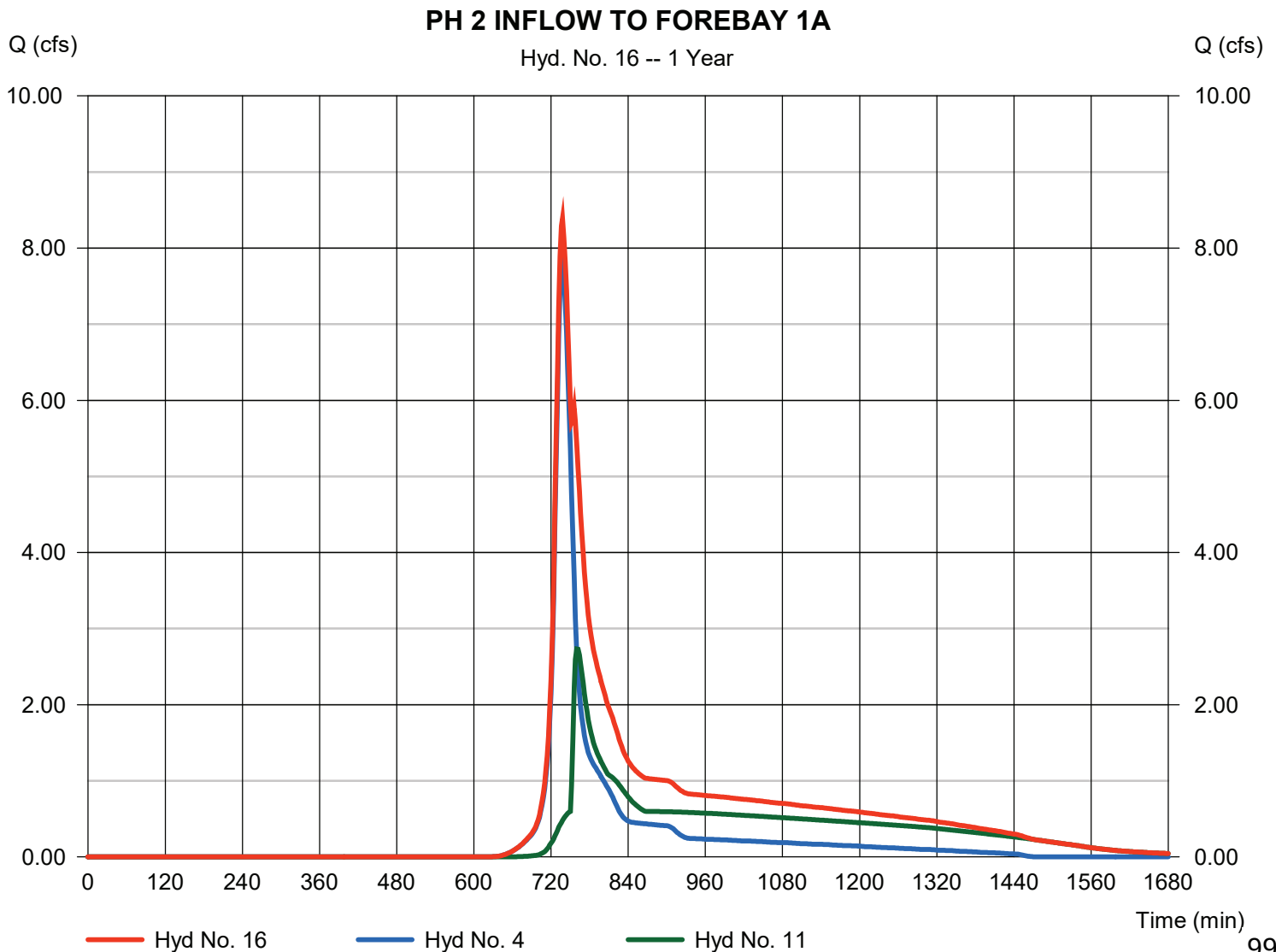
Thursday, 02 / 27 / 2020

Hyd. No. 16

PH 2 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 4, 11

Peak discharge = 8.387 cfs
 Time to peak = 738 min
 Hyd. volume = 55,167 cuft
 Contrib. drain. area = 6.607 ac



Hydrograph Report

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

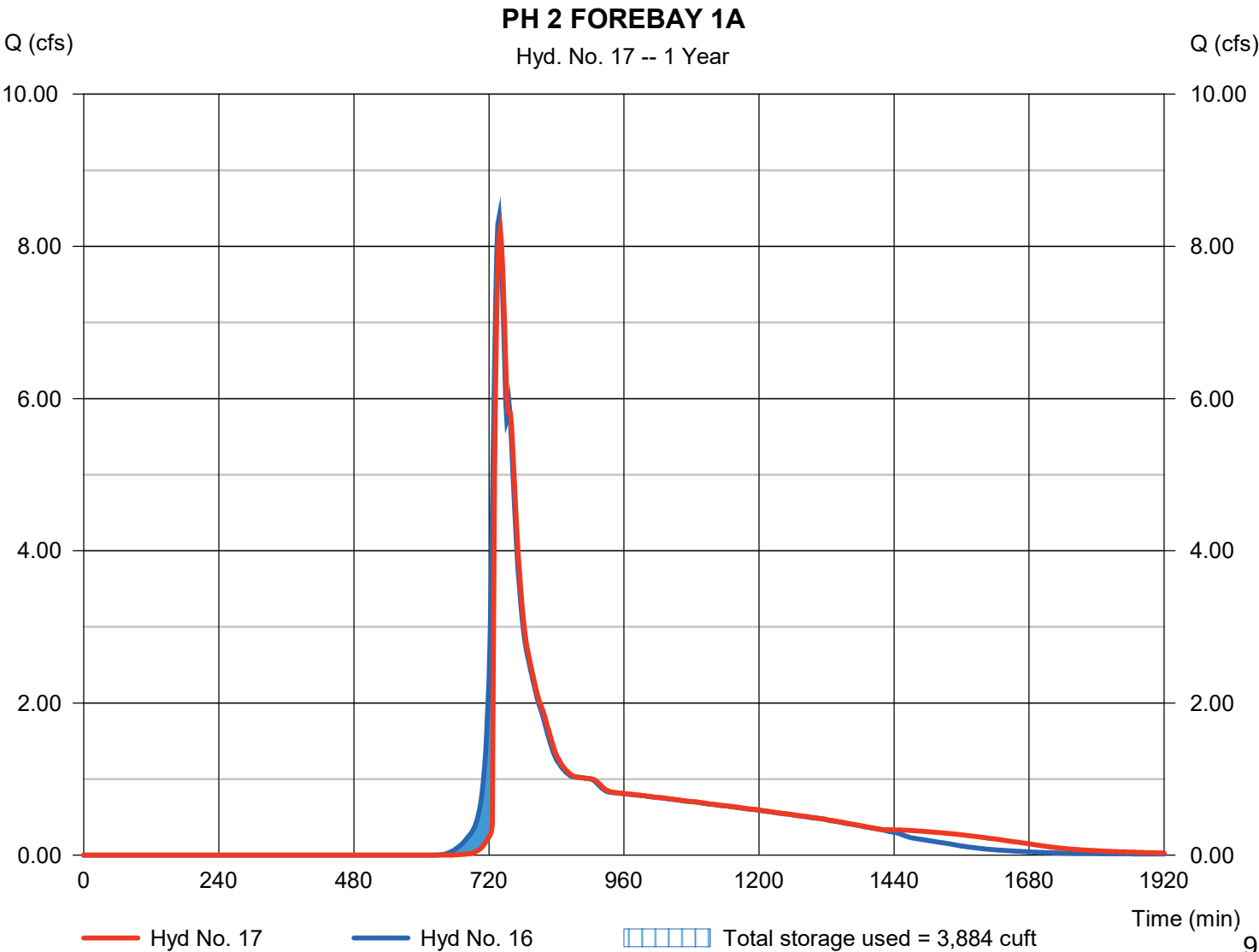
Thursday, 02 / 27 / 2020

Hyd. No. 17

PH 2 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 8.227 cfs
Storm frequency	= 1 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 55,152 cuft
Inflow hyd. No.	= 16 - PH 2 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.08 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 3,884 cuft

Storage Indication method used.



Pond Report

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

Thursday, 02 / 27 / 2020

Pond No. 6 - FOREBAY 1A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 834.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	834.00	2,986	0	0
1.00	835.00	4,064	3,511	3,511
2.00	836.00	5,241	4,640	8,150
3.00	837.00	6,661	5,936	14,087
4.00	838.00	7,710	7,178	21,265
5.00	839.00	8,606	8,153	29,418
6.00	840.00	9,514	9,055	38,473

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	4.00	0.00	0.00
Span (in)	= 36.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 830.00	834.00	0.00	0.00
Length (ft)	= 43.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.71	10.00	0.00	0.00
Crest El. (ft)	= 834.80	835.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	834.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	351	834.10	46.48 oc	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	702	834.20	46.48 oc	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	1,053	834.30	46.48 oc	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	1,404	834.40	46.48 oc	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	1,755	834.50	46.48 oc	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	2,106	834.60	46.48 oc	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	2,458	834.70	46.48 oc	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	2,809	834.80	46.48 oc	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	3,160	834.90	46.48 oc	0.36 ic	---	---	1.65	0.00	---	---	---	---	2.009
1.00	3,511	835.00	46.48 oc	0.38 ic	---	---	4.68	0.00	---	---	---	---	5.063
1.10	3,975	835.10	46.48 oc	0.41 ic	---	---	8.60	0.00	---	---	---	---	9.001
1.20	4,439	835.20	46.48 oc	0.43 ic	---	---	13.24	0.00	---	---	---	---	13.66
1.30	4,903	835.30	46.48 oc	0.45 ic	---	---	18.49	0.00	---	---	---	---	18.94
1.40	5,367	835.40	46.48 oc	0.47 ic	---	---	24.31	0.00	---	---	---	---	24.77
1.50	5,831	835.50	46.48 oc	0.49 ic	---	---	30.63	0.00	---	---	---	---	31.12
1.60	6,295	835.60	46.48 oc	0.50 ic	---	---	37.43	0.82	---	---	---	---	38.75
1.70	6,759	835.70	46.48 oc	0.52 ic	---	---	44.65	2.32	---	---	---	---	47.50
1.80	7,222	835.80	52.81 oc	0.51 ic	---	---	52.30	4.27	---	---	---	---	57.07
1.90	7,686	835.90	60.56 oc	0.43 ic	---	---	60.13 s	6.57	---	---	---	---	67.13
2.00	8,150	836.00	64.82 oc	0.39 ic	---	---	64.43 s	9.19	---	---	---	---	74.01
2.10	8,744	836.10	67.26 ic	0.35 ic	---	---	66.90 s	12.08	---	---	---	---	79.34
2.20	9,338	836.20	69.11 ic	0.32 ic	---	---	68.79 s	15.23	---	---	---	---	84.33
2.30	9,931	836.30	70.67 ic	0.29 ic	---	---	70.37 s	18.60	---	---	---	---	89.27
2.40	10,525	836.40	72.05 ic	0.27 ic	---	---	71.77 s	22.20	---	---	---	---	94.24
2.50	11,119	836.50	73.29 ic	0.25 ic	---	---	73.04 s	26.00	---	---	---	---	99.29
2.60	11,712	836.60	74.44 ic	0.24 ic	---	---	74.20 s	29.99	---	---	---	---	104.43
2.70	12,306	836.70	75.50 ic	0.22 ic	---	---	75.27 s	34.17	---	---	---	---	109.66
2.80	12,899	836.80	76.50 ic	0.21 ic	---	---	76.29 s	38.53	---	---	---	---	115.02
2.90	13,493	836.90	77.45 ic	0.20 ic	---	---	77.25 s	43.06	---	---	---	---	120.50
3.00	14,087	837.00	78.36 ic	0.19 ic	---	---	78.16 s	47.77	---	---	---	---	126.12
3.10	14,804	837.10	79.24 ic	0.18 ic	---	---	79.06 s	52.62	---	---	---	---	131.86
3.20	15,522	837.20	80.09 ic	0.17 ic	---	---	79.91 s	57.63	---	---	---	---	137.71
3.30	16,240	837.30	80.91 ic	0.16 ic	---	---	80.74 s	62.78	---	---	---	---	143.69
3.40	16,958	837.40	81.71 ic	0.15 ic	---	---	81.55 s	68.09	---	---	---	---	149.79
3.50	17,676	837.50	82.50 ic	0.15 ic	---	---	82.33 s	73.53	---	---	---	---	156.01

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Continues on next page...

FOREBAY 1A

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	18,394	837.60	83.26 ic	0.14 ic	---	---	83.11 s	79.12	---	---	---	---	162.37
3.70	19,112	837.70	84.01 ic	0.14 ic	---	---	83.87 s	84.83	---	---	---	---	168.84
3.80	19,829	837.80	84.75 ic	0.13 ic	---	---	84.61 s	90.68	---	---	---	---	175.42
3.90	20,547	837.90	85.48 ic	0.13 ic	---	---	85.33 s	96.66	---	---	---	---	182.11
4.00	21,265	838.00	86.20 ic	0.12 ic	---	---	86.06 s	102.77	---	---	---	---	188.95
4.10	22,080	838.10	86.90 ic	0.12 ic	---	---	86.75 s	109.00	---	---	---	---	195.87
4.20	22,896	838.20	87.60 ic	0.11 ic	---	---	87.44 s	115.35	---	---	---	---	202.91
4.30	23,711	838.30	88.29 ic	0.11 ic	---	---	88.18 s	121.81	---	---	---	---	210.10
4.40	24,526	838.40	88.97 ic	0.11 ic	---	---	88.82 s	128.40	---	---	---	---	217.32
4.50	25,342	838.50	89.64 ic	0.10 ic	---	---	89.52 s	135.09	---	---	---	---	224.72
4.60	26,157	838.60	90.31 ic	0.10 ic	---	---	90.15 s	141.91	---	---	---	---	232.15
4.70	26,972	838.70	90.97 ic	0.10 ic	---	---	90.82 s	148.82	---	---	---	---	239.74
4.80	27,788	838.80	91.62 ic	0.10 ic	---	---	91.48 s	155.85	---	---	---	---	247.43
4.90	28,603	838.90	92.27 ic	0.09 ic	---	---	92.12 s	162.99	---	---	---	---	255.20
5.00	29,418	839.00	92.91 ic	0.09 ic	---	---	92.79 s	170.25	---	---	---	---	263.13
5.10	30,324	839.10	93.54 ic	0.09 ic	---	---	93.41 s	177.59	---	---	---	---	271.09
5.20	31,229	839.20	94.17 ic	0.09 ic	---	---	94.01 s	185.05	---	---	---	---	279.14
5.30	32,135	839.30	94.80 ic	0.08 ic	---	---	94.63 s	192.59	---	---	---	---	287.30
5.40	33,040	839.40	95.42 ic	0.08 ic	---	---	95.26 s	200.24	---	---	---	---	295.59
5.50	33,946	839.50	96.03 ic	0.08 ic	---	---	95.90 s	207.99	---	---	---	---	303.98
5.60	34,851	839.60	96.64 ic	0.08 ic	---	---	96.56 s	215.84	---	---	---	---	312.48
5.70	35,757	839.70	97.25 ic	0.08 ic	---	---	97.06 s	223.78	---	---	---	---	320.92
5.80	36,662	839.80	97.85 ic	0.08 ic	---	---	97.68 s	231.82	---	---	---	---	329.57
5.90	37,568	839.90	98.45 ic	0.07 ic	---	---	98.31 s	239.95	---	---	---	---	338.33
6.00	38,473	840.00	99.04 ic	0.07 ic	---	---	98.85 s	248.19	---	---	---	---	347.12

...End

Hydrograph Report

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

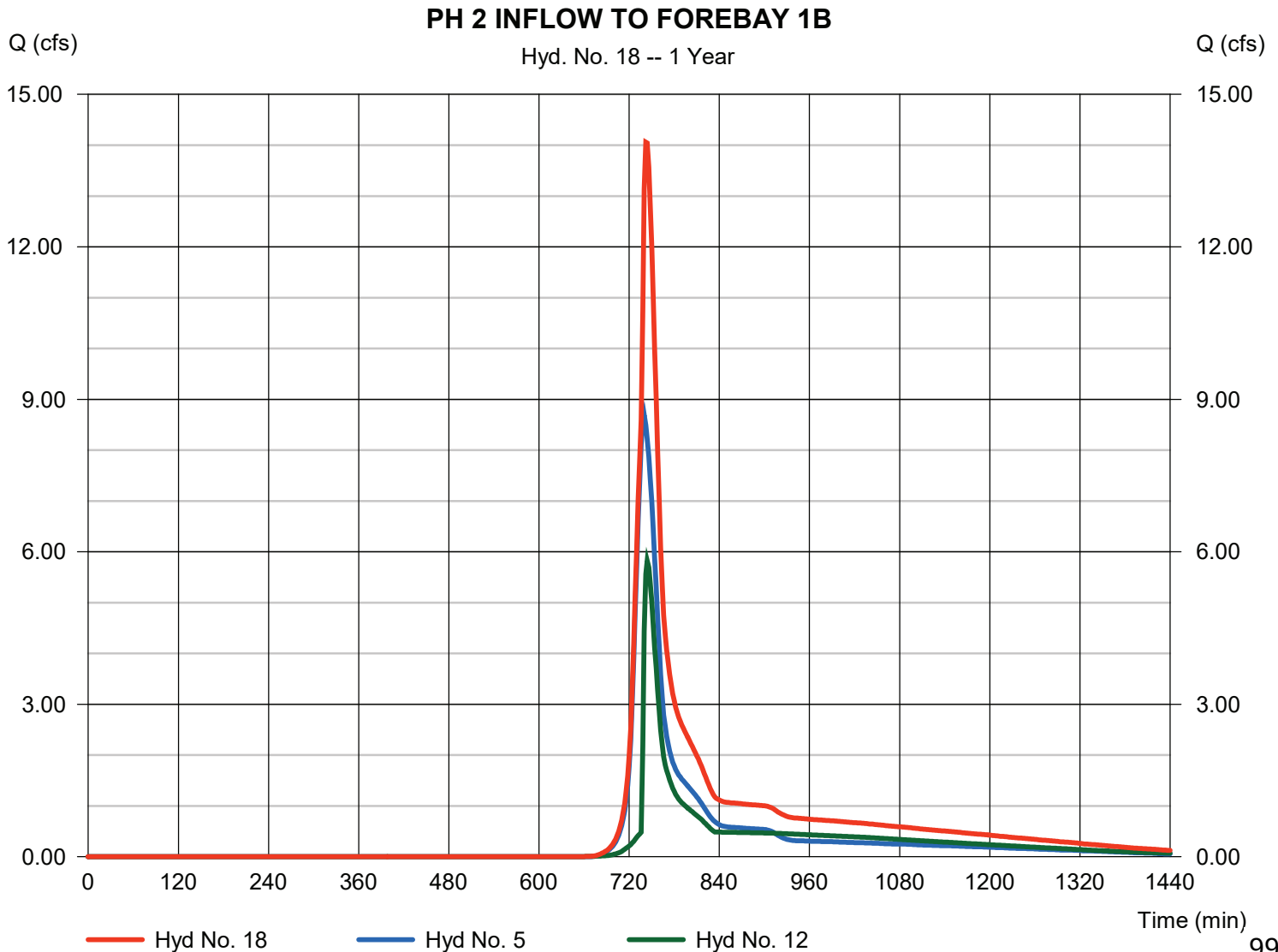
Thursday, 02 / 27 / 2020

Hyd. No. 18

PH 2 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 5, 12

Peak discharge = 14.06 cfs
 Time to peak = 742 min
 Hyd. volume = 54,497 cuft
 Contrib. drain. area = 10.224 ac



Hydrograph Report

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

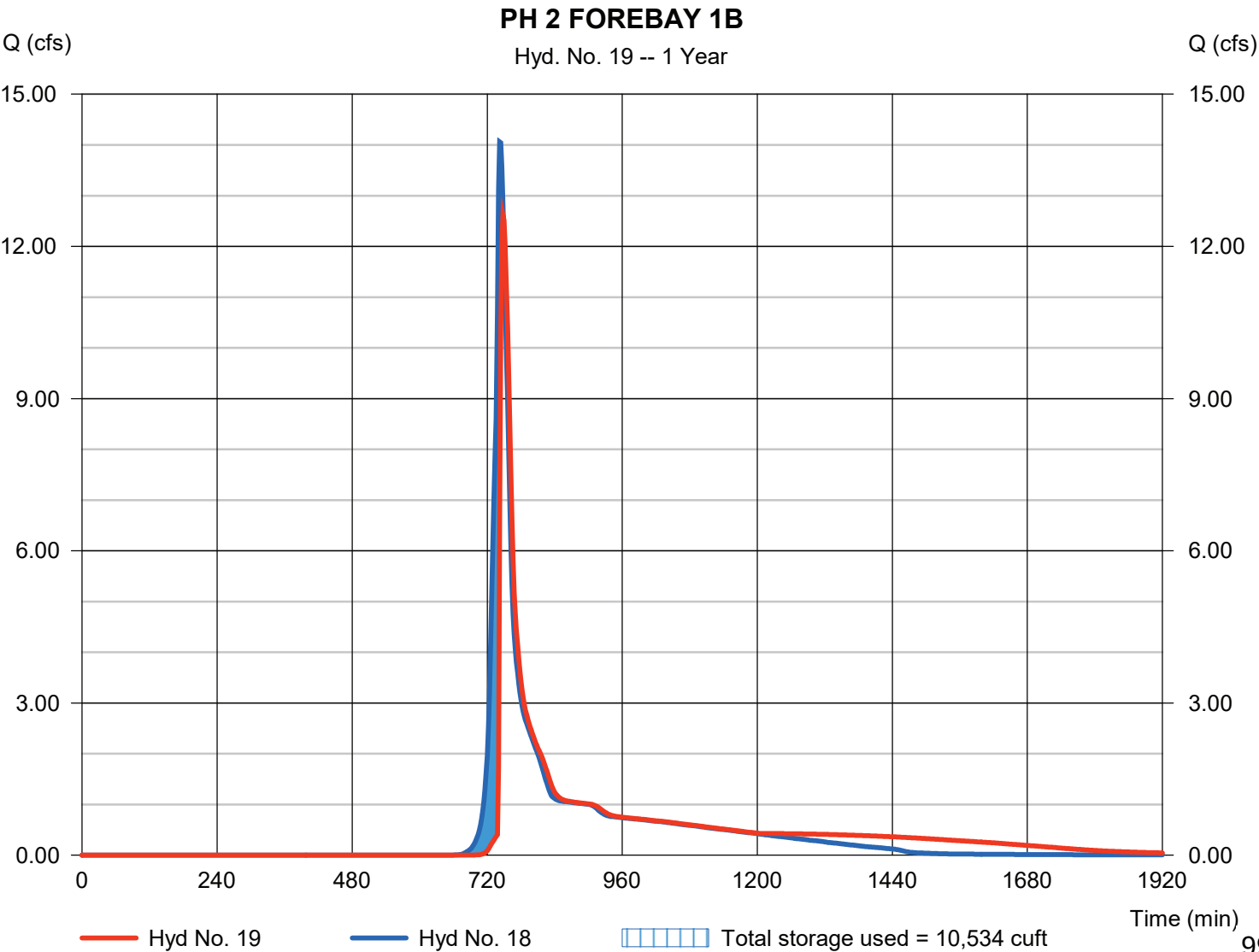
Thursday, 02 / 27 / 2020

Hyd. No. 19

PH 2 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 12.61 cfs
Storm frequency	= 1 yrs	Time to peak	= 748 min
Time interval	= 2 min	Hyd. volume	= 54,452 cuft
Inflow hyd. No.	= 18 - PH 2 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.08 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 10,534 cuft

Storage Indication method used.



Pond No. 7 - FOREBAY 1B

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 833.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	833.50	5,407	0	0
0.50	834.00	6,186	2,896	2,896
1.50	835.00	7,811	6,982	9,878
2.50	836.00	9,529	8,655	18,533
3.50	837.00	11,534	10,515	29,047
4.50	838.00	15,922	13,668	42,715
5.50	839.00	20,293	18,062	60,777
6.50	840.00	26,384	23,270	84,046

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	4.00	0.00	0.00
Span (in)	= 30.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 830.00	833.50	0.00	0.00
Length (ft)	= 38.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.71	25.00	0.00	0.00
Crest El. (ft)	= 834.70	835.50	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	833.50	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.05	290	833.55	31.61 oc	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.006
0.10	579	833.60	31.61 oc	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.15	869	833.65	31.61 oc	0.05 ic	---	---	0.00	0.00	---	---	---	---	0.051
0.20	1,158	833.70	31.61 oc	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.25	1,448	833.75	31.61 oc	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.120
0.30	1,737	833.80	31.61 oc	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.35	2,027	833.85	31.61 oc	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.180
0.40	2,317	833.90	31.61 oc	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.45	2,606	833.95	31.61 oc	0.22 ic	---	---	0.00	0.00	---	---	---	---	0.224
0.50	2,896	834.00	31.61 oc	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	3,594	834.10	31.61 oc	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	4,292	834.20	31.61 oc	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	4,990	834.30	31.61 oc	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	5,689	834.40	31.61 oc	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	6,387	834.50	31.61 oc	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.383
1.10	7,085	834.60	31.61 oc	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	7,783	834.70	31.61 oc	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	8,481	834.80	31.61 oc	0.45 ic	---	---	1.65	0.00	---	---	---	---	2.096
1.40	9,180	834.90	31.61 oc	0.47 ic	---	---	4.67	0.00	---	---	---	---	5.138
1.50	9,878	835.00	31.61 oc	0.49 ic	---	---	8.60	0.00	---	---	---	---	9.081
1.60	10,743	835.10	31.61 oc	0.50 ic	---	---	13.23	0.00	---	---	---	---	13.74
1.70	11,609	835.20	31.61 oc	0.52 ic	---	---	18.50	0.00	---	---	---	---	19.02
1.80	12,474	835.30	31.61 oc	0.54 ic	---	---	24.31	0.00	---	---	---	---	24.85
1.90	13,340	835.40	31.61 oc	0.55 ic	---	---	30.63	0.00	---	---	---	---	31.18
2.00	14,205	835.50	37.94 oc	0.51 ic	---	---	37.42	0.00	---	---	---	---	37.93
2.10	15,071	835.60	44.47 ic	0.38 ic	---	---	44.10 s	2.05	---	---	---	---	46.53
2.20	15,936	835.70	46.51 ic	0.32 ic	---	---	46.19 s	5.81	---	---	---	---	52.32
2.30	16,802	835.80	47.88 ic	0.28 ic	---	---	47.60 s	10.67	---	---	---	---	58.55
2.40	17,667	835.90	48.98 ic	0.25 ic	---	---	48.72 s	16.43	---	---	---	---	65.40
2.50	18,533	836.00	49.91 ic	0.23 ic	---	---	49.68 s	22.98	---	---	---	---	72.89
2.60	19,584	836.10	50.74 ic	0.21 ic	---	---	50.53 s	30.21	---	---	---	---	80.94
2.70	20,636	836.20	51.49 ic	0.19 ic	---	---	51.30 s	38.07	---	---	---	---	89.56
2.80	21,687	836.30	52.19 ic	0.17 ic	---	---	52.01 s	46.50	---	---	---	---	98.69
2.90	22,739	836.40	52.85 ic	0.16 ic	---	---	52.67 s	55.49	---	---	---	---	108.32

FOREBAY 1B

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.00	23,790	836.50	53.47 ic	0.15 ic	---	---	53.31 s	64.99	---	---	---	---	118.45
3.10	24,841	836.60	54.08 ic	0.14 ic	---	---	53.93 s	74.98	---	---	---	---	129.05
3.20	25,893	836.70	54.66 ic	0.13 ic	---	---	54.50 s	85.43	---	---	---	---	140.06
3.30	26,944	836.80	55.22 ic	0.13 ic	---	---	55.09 s	96.32	---	---	---	---	151.54
3.40	27,996	836.90	55.77 ic	0.12 ic	---	---	55.64 s	107.65	---	---	---	---	163.41
3.50	29,047	837.00	56.31 ic	0.11 ic	---	---	56.18 s	119.41	---	---	---	---	175.71
3.60	30,414	837.10	56.84 ic	0.11 ic	---	---	56.70 s	131.55	---	---	---	---	188.36
3.70	31,781	837.20	57.36 ic	0.10 ic	---	---	57.24 s	144.08	---	---	---	---	201.42
3.80	33,148	837.30	57.87 ic	0.10 ic	---	---	57.76 s	156.96	---	---	---	---	214.82
3.90	34,514	837.40	58.37 ic	0.09 ic	---	---	58.25 s	170.22	---	---	---	---	228.56
4.00	35,881	837.50	58.86 ic	0.09 ic	---	---	58.73 s	183.83	---	---	---	---	242.65
4.10	37,248	837.60	59.35 ic	0.09 ic	---	---	59.23 s	197.80	---	---	---	---	257.11
4.20	38,615	837.70	59.84 ic	0.08 ic	---	---	59.71 s	212.08	---	---	---	---	271.88
4.30	39,981	837.80	60.31 ic	0.08 ic	---	---	60.21 s	226.70	---	---	---	---	286.99
4.40	41,348	837.90	60.79 ic	0.08 ic	---	---	60.70 s	241.64	---	---	---	---	302.42
4.50	42,715	838.00	61.26 ic	0.07 ic	---	---	61.18 s	256.94	---	---	---	---	318.19
4.60	44,521	838.10	61.72 ic	0.07 ic	---	---	61.59 s	272.50	---	---	---	---	334.16
4.70	46,327	838.20	62.18 ic	0.07 ic	---	---	62.05 s	288.38	---	---	---	---	350.50
4.80	48,134	838.30	62.63 ic	0.07 ic	---	---	62.51 s	304.53	---	---	---	---	367.11
4.90	49,940	838.40	63.08 ic	0.07 ic	---	---	63.01 s	320.99	---	---	---	---	384.07
5.00	51,746	838.50	63.53 ic	0.06 ic	---	---	63.45 s	337.73	---	---	---	---	401.24
5.10	53,552	838.60	63.97 ic	0.06 ic	---	---	63.86 s	354.76	---	---	---	---	418.68
5.20	55,358	838.70	64.41 ic	0.06 ic	---	---	64.34 s	372.05	---	---	---	---	436.46
5.30	57,164	838.80	64.85 ic	0.06 ic	---	---	64.79 s	389.62	---	---	---	---	454.47
5.40	58,970	838.90	65.28 ic	0.06 ic	---	---	65.12 s	407.46	---	---	---	---	472.64
5.50	60,777	839.00	65.72 ic	0.06 ic	---	---	65.63 s	425.61	---	---	---	---	491.30
5.60	63,104	839.10	66.14 ic	0.05 ic	---	---	65.99 s	443.98	---	---	---	---	510.02
5.70	65,431	839.20	66.57 ic	0.05 ic	---	---	66.37 s	462.61	---	---	---	---	529.04
5.80	67,758	839.30	66.99 ic	0.05 ic	---	---	66.78 s	481.48	---	---	---	---	548.31
5.90	70,084	839.40	67.41 ic	0.05 ic	---	---	67.21 s	500.60	---	---	---	---	567.87
6.00	72,411	839.50	67.82 ic	0.05 ic	---	---	67.70 s	519.98	---	---	---	---	587.72
6.10	74,738	839.60	68.23 ic	0.05 ic	---	---	68.07 s	539.60	---	---	---	---	607.73
6.20	77,065	839.70	68.64 ic	0.05 ic	---	---	68.52 s	559.45	---	---	---	---	628.02
6.30	79,392	839.80	69.05 ic	0.05 ic	---	---	68.98 s	579.54	---	---	---	---	648.57
6.40	81,719	839.90	69.46 ic	0.05 ic	---	---	69.19 s	599.87	---	---	---	---	669.11
6.50	84,046	840.00	69.86 ic	0.04 ic	---	---	69.60 s	620.49	---	---	---	---	690.13

...End

Hydrograph Report

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

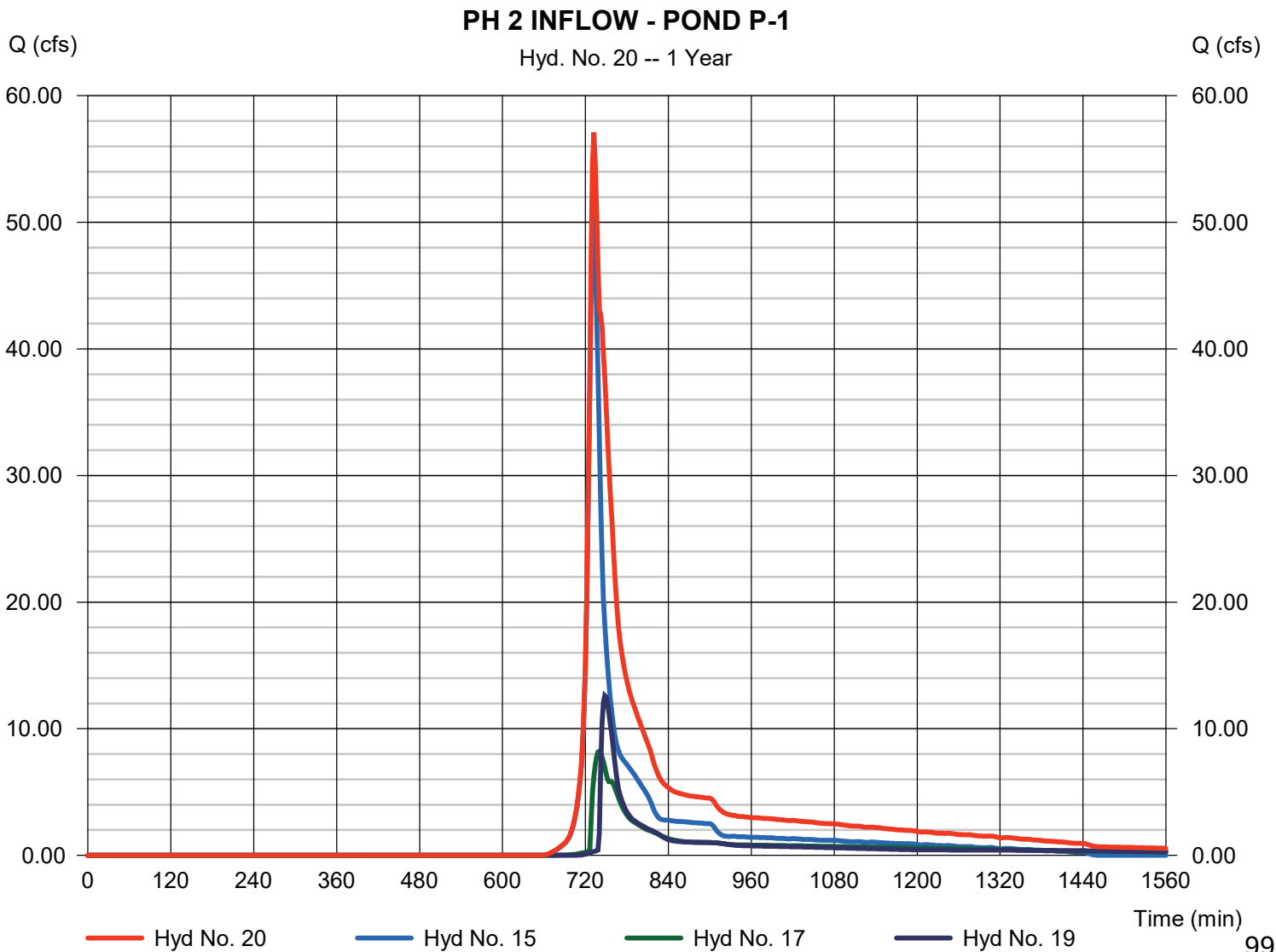
Thursday, 02 / 27 / 2020

Hyd. No. 20

PH 2 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 15, 17, 19

Peak discharge = 57.10 cfs
 Time to peak = 732 min
 Hyd. volume = 252,298 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

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

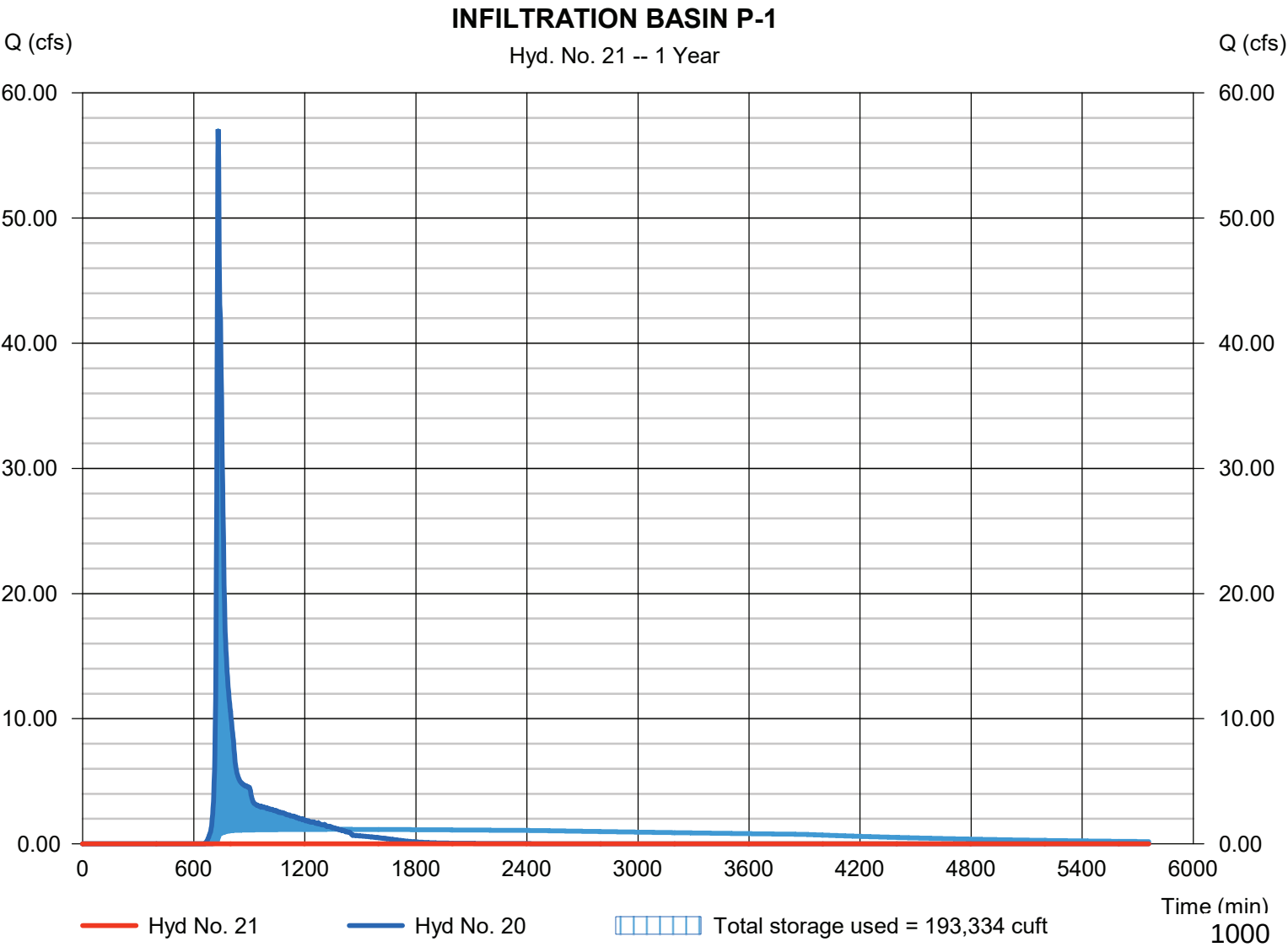
Thursday, 02 / 27 / 2020

Hyd. No. 21

INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 4454 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 20 - PH 2 INFLOW - POND P-1	Max. Elevation	= 831.57 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 2	Max. Storage	= 193,334 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - INFILTRATION BASIN P-1-PH2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 829.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	829.00	51,625	0	0
1.00	830.00	65,711	58,521	58,521
2.00	831.00	92,295	78,620	137,141
3.00	832.00	106,034	99,075	236,216
4.00	833.00	116,184	111,059	347,275
5.00	834.00	122,474	119,303	466,578
6.00	835.00	127,304	124,869	591,447
7.00	836.00	132,237	129,750	721,197
8.00	837.00	179,333	155,173	876,369
9.00	838.00	195,392	187,287	1,063,656
10.00	839.00	211,591	203,417	1,267,073
11.00	840.00	232,025	221,708	1,488,781
12.00	841.00	260,000	245,855	1,734,636
13.00	842.00	280,000	269,911	2,004,547

Culvert / Orifice Structures

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

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.500 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	829.00	---	---	---	---	---	---	---	---	0.000	---	0.000
0.10	5,852	829.10	---	---	---	---	---	---	---	---	0.076	---	0.076
0.20	11,704	829.20	---	---	---	---	---	---	---	---	0.152	---	0.152
0.30	17,556	829.30	---	---	---	---	---	---	---	---	0.228	---	0.228
0.40	23,408	829.40	---	---	---	---	---	---	---	---	0.304	---	0.304
0.50	29,260	829.50	---	---	---	---	---	---	---	---	0.380	---	0.380
0.60	35,112	829.60	---	---	---	---	---	---	---	---	0.456	---	0.456
0.70	40,965	829.70	---	---	---	---	---	---	---	---	0.532	---	0.532
0.80	46,817	829.80	---	---	---	---	---	---	---	---	0.608	---	0.608
0.90	52,669	829.90	---	---	---	---	---	---	---	---	0.684	---	0.684
1.00	58,521	830.00	---	---	---	---	---	---	---	---	0.761	---	0.761
1.10	66,383	830.10	---	---	---	---	---	---	---	---	0.791	---	0.791
1.20	74,245	830.20	---	---	---	---	---	---	---	---	0.822	---	0.822
1.30	82,107	830.30	---	---	---	---	---	---	---	---	0.853	---	0.853
1.40	89,969	830.40	---	---	---	---	---	---	---	---	0.884	---	0.884
1.50	97,831	830.50	---	---	---	---	---	---	---	---	0.914	---	0.914
1.60	105,693	830.60	---	---	---	---	---	---	---	---	0.945	---	0.945
1.70	113,555	830.70	---	---	---	---	---	---	---	---	0.976	---	0.976
1.80	121,417	830.80	---	---	---	---	---	---	---	---	1.007	---	1.007
1.90	129,279	830.90	---	---	---	---	---	---	---	---	1.037	---	1.037
2.00	137,141	831.00	---	---	---	---	---	---	---	---	1.068	---	1.068
2.10	147,048	831.10	---	---	---	---	---	---	---	---	1.084	---	1.084
2.20	156,956	831.20	---	---	---	---	---	---	---	---	1.100	---	1.100
2.30	166,863	831.30	---	---	---	---	---	---	---	---	1.116	---	1.116
2.40	176,771	831.40	---	---	---	---	---	---	---	---	1.132	---	1.132
2.50	186,678	831.50	---	---	---	---	---	---	---	---	1.148	---	1.148
2.60	196,586	831.60	---	---	---	---	---	---	---	---	1.164	---	1.164
2.70	206,493	831.70	---	---	---	---	---	---	---	---	1.180	---	1.180
2.80	216,401	831.80	---	---	---	---	---	---	---	---	1.195	---	1.195

Continues on next page...

INFILTRATION BASIN P-1-PH2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.90	226,308	831.90	---	---	---	---	---	---	---	---	1.211	---	1.211
3.00	236,216	832.00	---	---	---	---	---	---	---	---	1.227	---	1.227
3.10	247,322	832.10	---	---	---	---	---	---	---	---	1.239	---	1.239
3.20	258,428	832.20	---	---	---	---	---	---	---	---	1.251	---	1.251
3.30	269,533	832.30	---	---	---	---	---	---	---	---	1.262	---	1.262
3.40	280,639	832.40	---	---	---	---	---	---	---	---	1.274	---	1.274
3.50	291,745	832.50	---	---	---	---	---	---	---	---	1.286	---	1.286
3.60	302,851	832.60	---	---	---	---	---	---	---	---	1.298	---	1.298
3.70	313,957	832.70	---	---	---	---	---	---	---	---	1.309	---	1.309
3.80	325,063	832.80	---	---	---	---	---	---	---	---	1.321	---	1.321
3.90	336,169	832.90	---	---	---	---	---	---	---	---	1.333	---	1.333
4.00	347,275	833.00	---	---	---	---	---	---	---	---	1.345	---	1.345
4.10	359,205	833.10	---	---	---	---	---	---	---	---	1.352	---	1.352
4.20	371,136	833.20	---	---	---	---	---	---	---	---	1.359	---	1.359
4.30	383,066	833.30	---	---	---	---	---	---	---	---	1.367	---	1.367
4.40	394,996	833.40	---	---	---	---	---	---	---	---	1.374	---	1.374
4.50	406,927	833.50	---	---	---	---	---	---	---	---	1.381	---	1.381
4.60	418,857	833.60	---	---	---	---	---	---	---	---	1.388	---	1.388
4.70	430,787	833.70	---	---	---	---	---	---	---	---	1.396	---	1.396
4.80	442,717	833.80	---	---	---	---	---	---	---	---	1.403	---	1.403
4.90	454,648	833.90	---	---	---	---	---	---	---	---	1.410	---	1.410
5.00	466,578	834.00	---	---	---	---	---	---	---	---	1.418	---	1.418
5.10	479,065	834.10	---	---	---	---	---	---	---	---	1.423	---	1.423
5.20	491,552	834.20	---	---	---	---	---	---	---	---	1.429	---	1.429
5.30	504,039	834.30	---	---	---	---	---	---	---	---	1.434	---	1.434
5.40	516,526	834.40	---	---	---	---	---	---	---	---	1.440	---	1.440
5.50	529,013	834.50	---	---	---	---	---	---	---	---	1.445	---	1.445
5.60	541,499	834.60	---	---	---	---	---	---	---	---	1.451	---	1.451
5.70	553,986	834.70	---	---	---	---	---	---	---	---	1.457	---	1.457
5.80	566,473	834.80	---	---	---	---	---	---	---	---	1.462	---	1.462
5.90	578,960	834.90	---	---	---	---	---	---	---	---	1.468	---	1.468
6.00	591,447	835.00	---	---	---	---	---	---	---	---	1.473	---	1.473
6.10	604,422	835.10	---	---	---	---	---	---	---	---	1.479	---	1.479
6.20	617,397	835.20	---	---	---	---	---	---	---	---	1.485	---	1.485
6.30	630,372	835.30	---	---	---	---	---	---	---	---	1.491	---	1.491
6.40	643,347	835.40	---	---	---	---	---	---	---	---	1.496	---	1.496
6.50	656,322	835.50	---	---	---	---	---	---	---	---	1.502	---	1.502
6.60	669,297	835.60	---	---	---	---	---	---	---	---	1.508	---	1.508
6.70	682,272	835.70	---	---	---	---	---	---	---	---	1.513	---	1.513
6.80	695,247	835.80	---	---	---	---	---	---	---	---	1.519	---	1.519
6.90	708,222	835.90	---	---	---	---	---	---	---	---	1.525	---	1.525
7.00	721,197	836.00	---	---	---	---	---	---	---	---	1.531	---	1.531
7.10	736,714	836.10	---	---	---	---	---	---	---	---	1.585	---	1.585
7.20	752,231	836.20	---	---	---	---	---	---	---	---	1.640	---	1.640
7.30	767,748	836.30	---	---	---	---	---	---	---	---	1.694	---	1.694
7.40	783,266	836.40	---	---	---	---	---	---	---	---	1.749	---	1.749
7.50	798,783	836.50	---	---	---	---	---	---	---	---	1.803	---	1.803
7.60	814,300	836.60	---	---	---	---	---	---	---	---	1.858	---	1.858
7.70	829,817	836.70	---	---	---	---	---	---	---	---	1.912	---	1.912
7.80	845,335	836.80	---	---	---	---	---	---	---	---	1.967	---	1.967
7.90	860,852	836.90	---	---	---	---	---	---	---	---	2.021	---	2.021
8.00	876,369	837.00	---	---	---	---	---	---	---	---	2.076	---	2.076
8.10	895,098	837.10	---	---	---	---	---	---	---	---	2.094	---	2.094
8.20	913,827	837.20	---	---	---	---	---	---	---	---	2.113	---	2.113
8.30	932,555	837.30	---	---	---	---	---	---	---	---	2.131	---	2.131
8.40	951,284	837.40	---	---	---	---	---	---	---	---	2.150	---	2.150
8.50	970,013	837.50	---	---	---	---	---	---	---	---	2.169	---	2.169
8.60	988,741	837.60	---	---	---	---	---	---	---	---	2.187	---	2.187
8.70	1,007,470	837.70	---	---	---	---	---	---	---	---	2.206	---	2.206
8.80	1,026,198	837.80	---	---	---	---	---	---	---	---	2.224	---	2.224
8.90	1,044,927	837.90	---	---	---	---	---	---	---	---	2.243	---	2.243
9.00	1,063,656	838.00	---	---	---	---	---	---	---	---	2.261	---	2.261
9.10	1,083,998	838.10	---	---	---	---	---	---	---	---	2.280	---	2.280
9.20	1,104,339	838.20	---	---	---	---	---	---	---	---	2.299	---	2.299
9.30	1,124,681	838.30	---	---	---	---	---	---	---	---	2.318	---	2.318
9.40	1,145,023	838.40	---	---	---	---	---	---	---	---	2.336	---	2.336
9.50	1,165,365	838.50	---	---	---	---	---	---	---	---	2.355	---	2.355
9.60	1,185,706	838.60	---	---	---	---	---	---	---	---	2.374	---	2.374
9.70	1,206,048	838.70	---	---	---	---	---	---	---	---	2.393	---	2.393
9.80	1,226,390	838.80	---	---	---	---	---	---	---	---	2.411	---	2.411
9.90	1,246,732	838.90	---	---	---	---	---	---	---	---	2.430	---	2.430
10.00	1,267,073	839.00	---	---	---	---	---	---	---	---	2.449	---	2.449

Continues on next page...

INFILTRATION BASIN P-1-PH2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
10.10	1,289,244	839.10	---	---	---	---	---	---	---	---	2.473	---	2.473
10.20	1,311,415	839.20	---	---	---	---	---	---	---	---	2.496	---	2.496
10.30	1,333,585	839.30	---	---	---	---	---	---	---	---	2.520	---	2.520
10.40	1,355,756	839.40	---	---	---	---	---	---	---	---	2.544	---	2.544
10.50	1,377,927	839.50	---	---	---	---	---	---	---	---	2.567	---	2.567
10.60	1,400,098	839.60	---	---	---	---	---	---	---	---	2.591	---	2.591
10.70	1,422,268	839.70	---	---	---	---	---	---	---	---	2.615	---	2.615
10.80	1,444,439	839.80	---	---	---	---	---	---	---	---	2.638	---	2.638
10.90	1,466,610	839.90	---	---	---	---	---	---	---	---	2.662	---	2.662
11.00	1,488,781	840.00	---	---	---	---	---	---	---	---	2.685	---	2.685
11.10	1,513,366	840.10	---	---	---	---	---	---	---	---	2.718	---	2.718
11.20	1,537,952	840.20	---	---	---	---	---	---	---	---	2.750	---	2.750
11.30	1,562,537	840.30	---	---	---	---	---	---	---	---	2.783	---	2.783
11.40	1,587,123	840.40	---	---	---	---	---	---	---	---	2.815	---	2.815
11.50	1,611,708	840.50	---	---	---	---	---	---	---	---	2.847	---	2.847
11.60	1,636,294	840.60	---	---	---	---	---	---	---	---	2.880	---	2.880
11.70	1,660,879	840.70	---	---	---	---	---	---	---	---	2.912	---	2.912
11.80	1,685,465	840.80	---	---	---	---	---	---	---	---	2.944	---	2.944
11.90	1,710,050	840.90	---	---	---	---	---	---	---	---	2.977	---	2.977
12.00	1,734,636	841.00	---	---	---	---	---	---	---	---	3.009	---	3.009
12.10	1,761,627	841.10	---	---	---	---	---	---	---	---	3.032	---	3.032
12.20	1,788,618	841.20	---	---	---	---	---	---	---	---	3.056	---	3.056
12.30	1,815,609	841.30	---	---	---	---	---	---	---	---	3.079	---	3.079
12.40	1,842,600	841.40	---	---	---	---	---	---	---	---	3.102	---	3.102
12.50	1,869,591	841.50	---	---	---	---	---	---	---	---	3.125	---	3.125
12.60	1,896,582	841.60	---	---	---	---	---	---	---	---	3.148	---	3.148
12.70	1,923,574	841.70	---	---	---	---	---	---	---	---	3.171	---	3.171
12.80	1,950,565	841.80	---	---	---	---	---	---	---	---	3.194	---	3.194
12.90	1,977,556	841.90	---	---	---	---	---	---	---	---	3.218	---	3.218
13.00	2,004,547	842.00	---	---	---	---	---	---	---	---	3.241	---	3.241

...End

Hydrograph Report

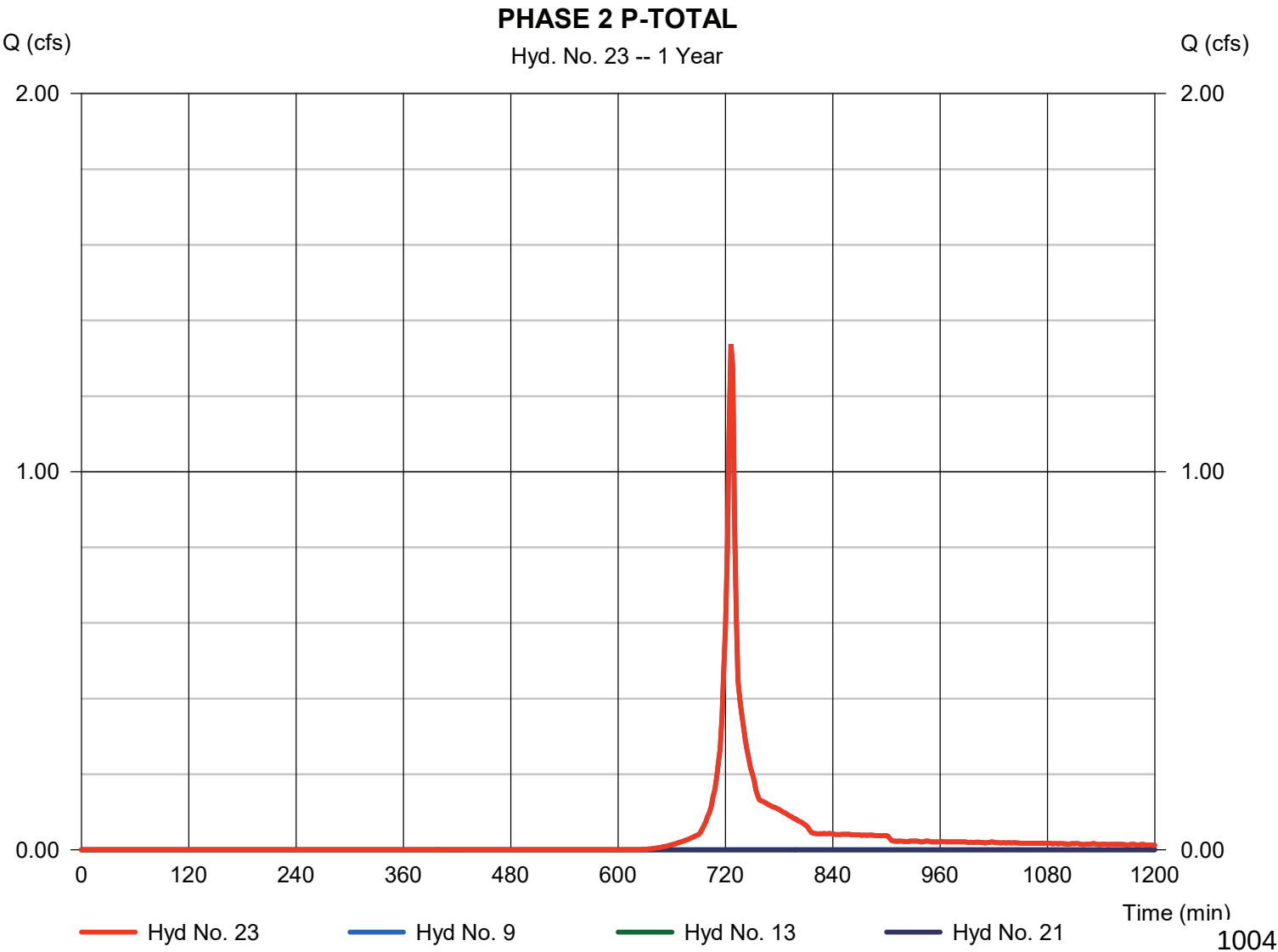
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 23

PHASE 2 P-TOTAL

Hydrograph type	= Combine	Peak discharge	= 1.337 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,507 cuft
Inflow hyds.	= 9, 13, 21	Contrib. drain. area	= 0.670 ac



Hydrograph Summary Report

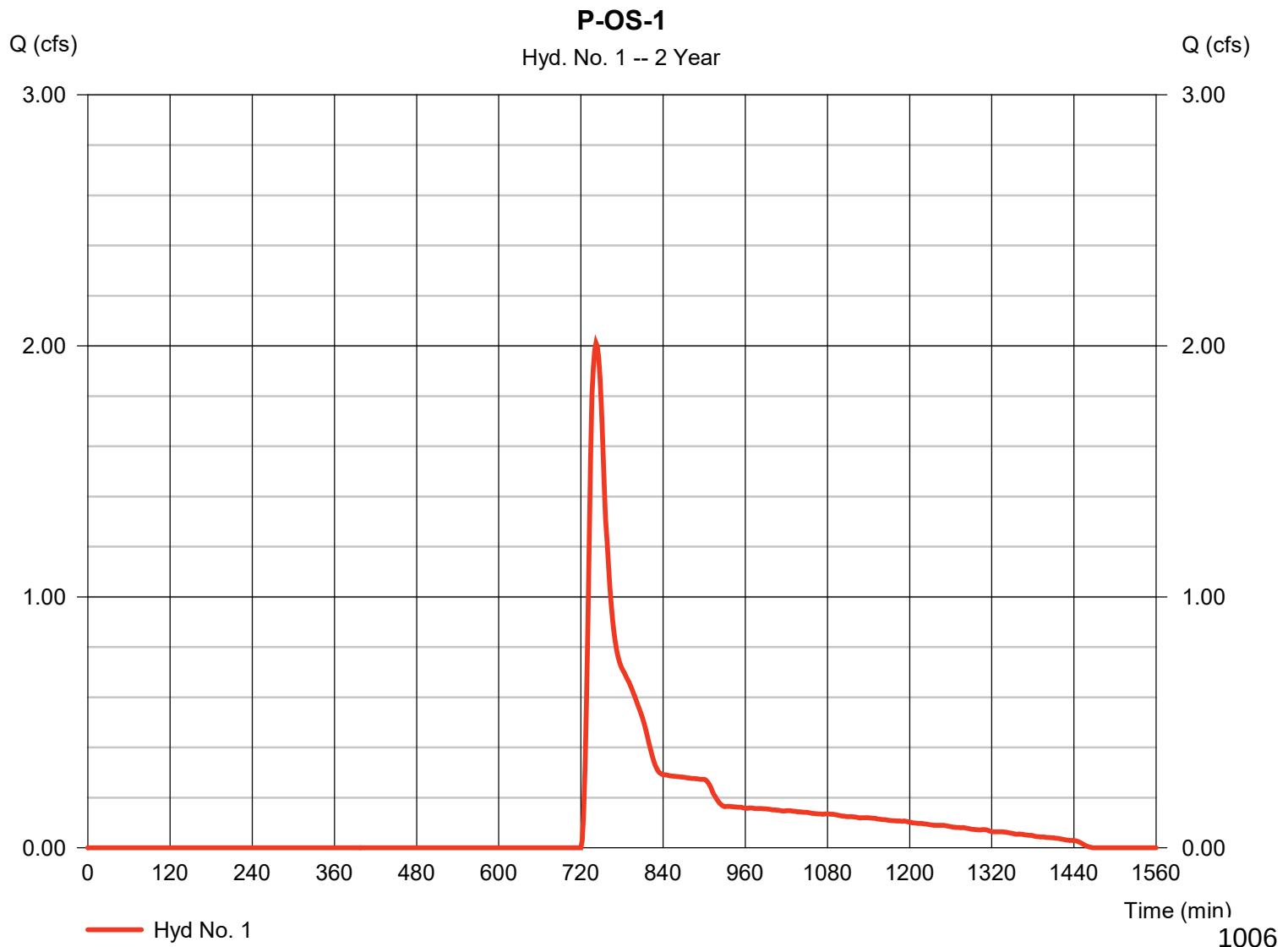
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.011	2	742	10,549	-----	-----	-----	P-OS-1
2	SCS Runoff	9.398	2	734	28,827	-----	-----	-----	P-OS-2
3	SCS Runoff	54.55	2	732	141,442	-----	-----	-----	P-1-PH 2
4	SCS Runoff	9.664	2	738	32,705	-----	-----	-----	P-1A-PH2
5	SCS Runoff	10.98	2	740	39,728	-----	-----	-----	P-1B-PH2
6	SCS Runoff	10.25	2	738	34,742	-----	-----	-----	P-2
7	SCS Runoff	8.160	2	738	27,617	-----	-----	-----	P-3
8	SCS Runoff	1.681	2	738	5,687	-----	-----	-----	P-4
9	SCS Runoff	1.628	2	726	3,055	-----	-----	-----	P-UD-1
11	Reservoir	5.833	2	752	34,724	6	839.50	14,451	POND P-2
12	Reservoir	7.645	2	742	27,603	7	839.81	6,650	POND P-3
13	Reservoir	0.000	2	738	0	8	839.99	3,459	RAIN GARDEN P-4
15	Combine	64.84	2	732	180,818	1, 2, 3,	-----	-----	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	11.89	2	750	67,429	4, 11,	-----	-----	PH 2 INFLOW TO FOREBAY 1A
17	Reservoir	11.67	2	752	67,414	16	835.16	4,241	PH 2 FOREBAY 1A
18	Combine	18.57	2	740	67,331	5, 12,	-----	-----	PH 2 INFLOW TO FOREBAY 1B
19	Reservoir	17.19	2	746	67,286	18	835.17	11,310	PH 2 FOREBAY 1B
20	Combine	73.11	2	732	315,517	15, 17, 19	-----	-----	PH 2 INFLOW - POND P-1
21	Reservoir	0.000	2	728	0	20	832.14	251,360	INFILTRATION BASIN P-1
23	Combine	1.628	2	726	3,055	9, 13, 21,	-----	-----	PHASE 2 P-TOTAL
2020-02-27_CHAPMAN FARMS_PHASE II.gpr					Return Period: 2 Year			Thursday, 02 / 27 / 2020	

P-OS-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.011 cfs
Storm frequency	=	2 yrs	Time to peak	=	742 min
Time interval	=	2 min	Hyd. volume	=	10,549 cuft
Drainage area	=	10.170 ac	Curve number	=	62*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.90 min
Total precip.	=	2.70 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow\	Hydroflow Distribution	=	MSE3 DISTRIBUTION CURVE

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

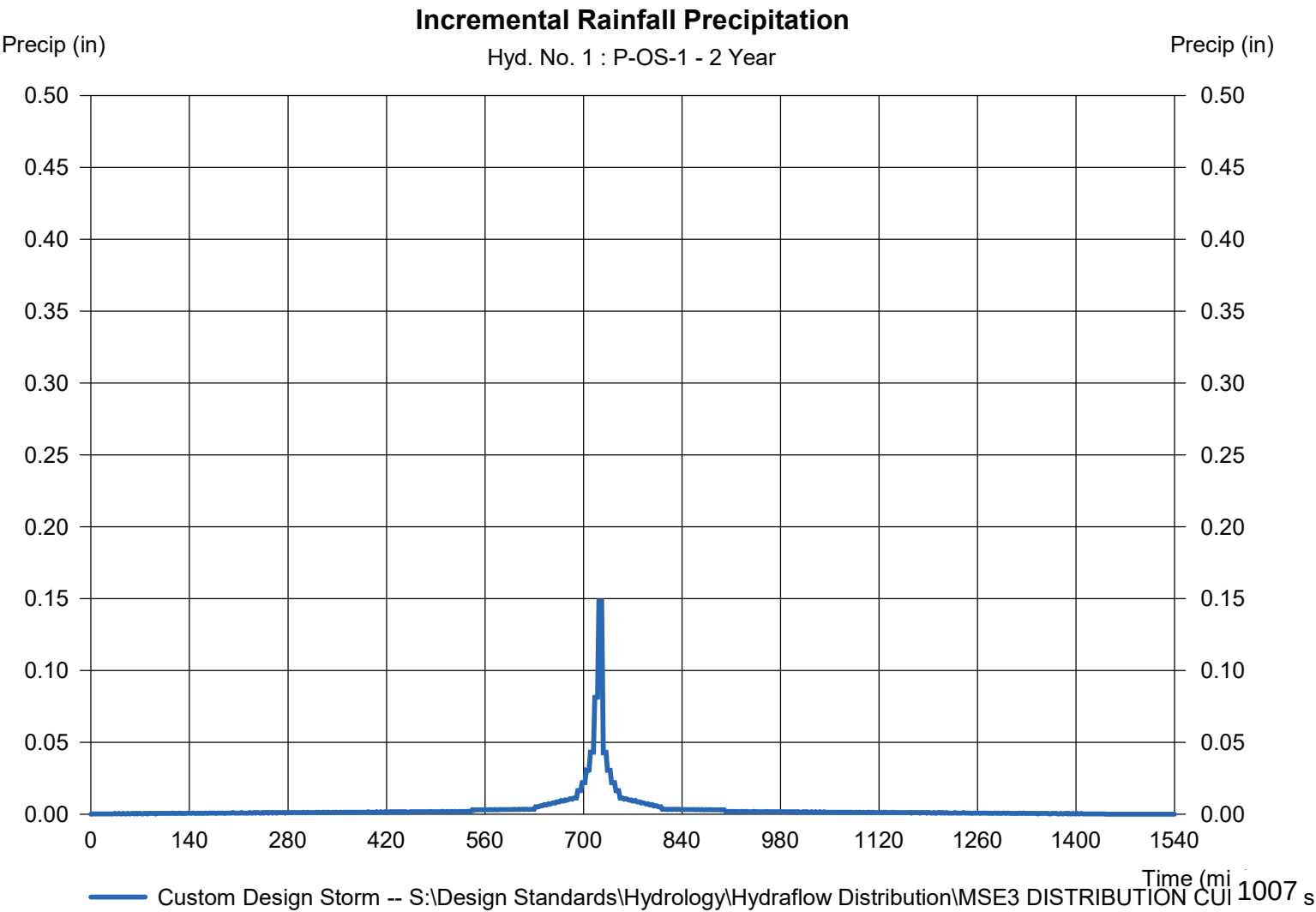
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 1

P-OS-1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

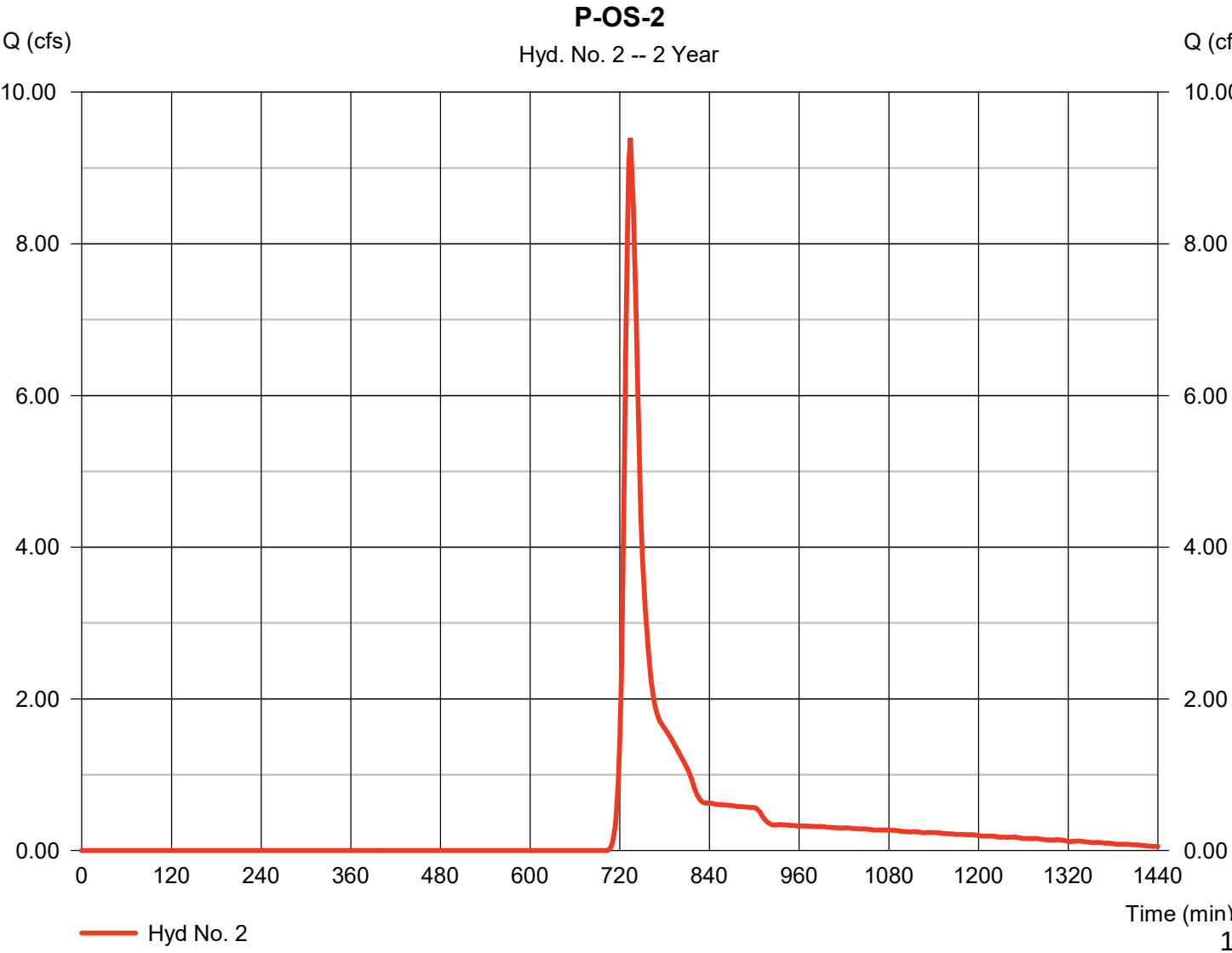
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Hydrograph type	= SCS Runoff	Peak discharge	= 9.398 cfs
Storm frequency	= 2 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 28,827 cuft
Drainage area	= 12.810 ac	Curve number	= 72
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.80 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

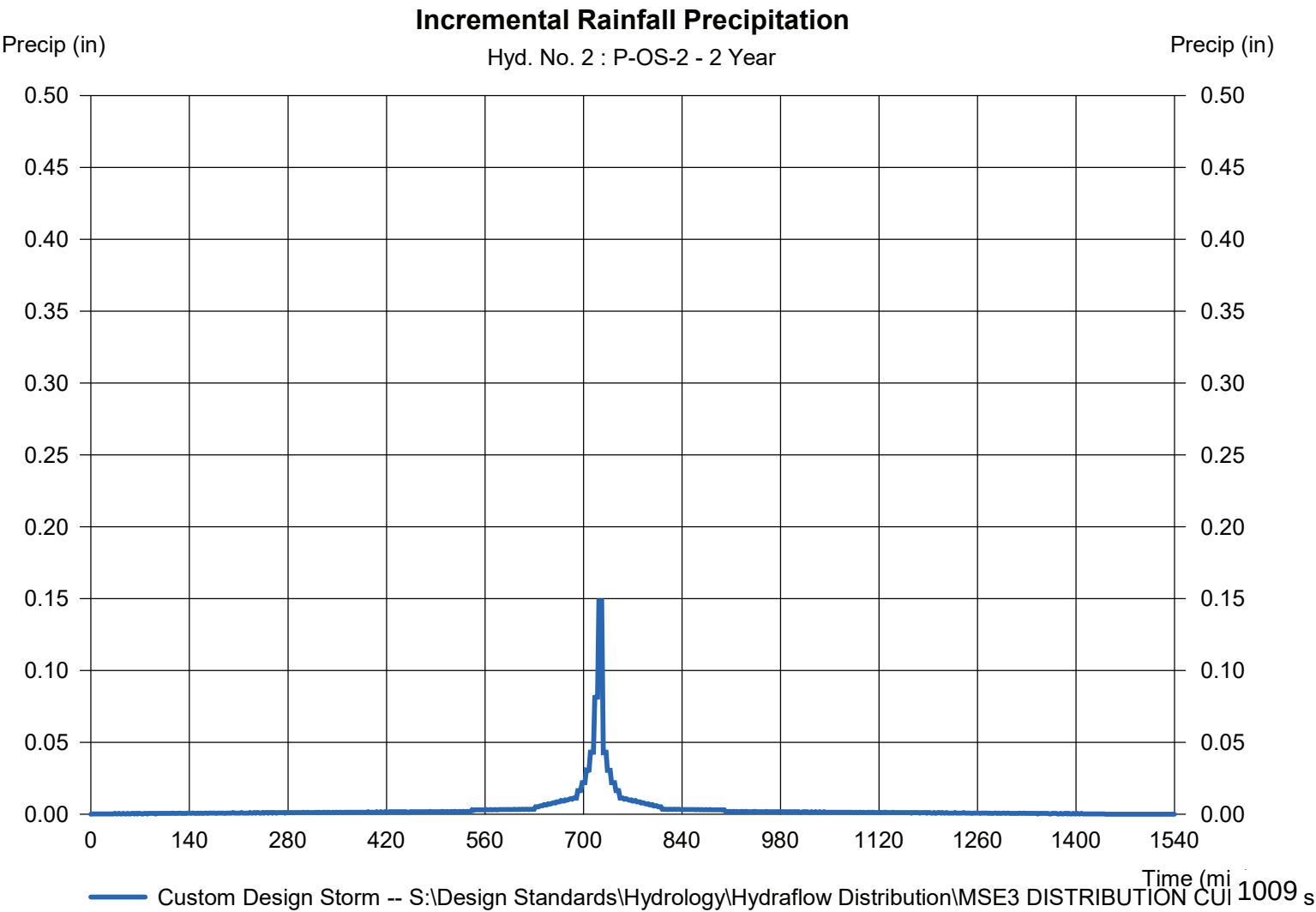
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION CUI		



Hydrograph Report

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

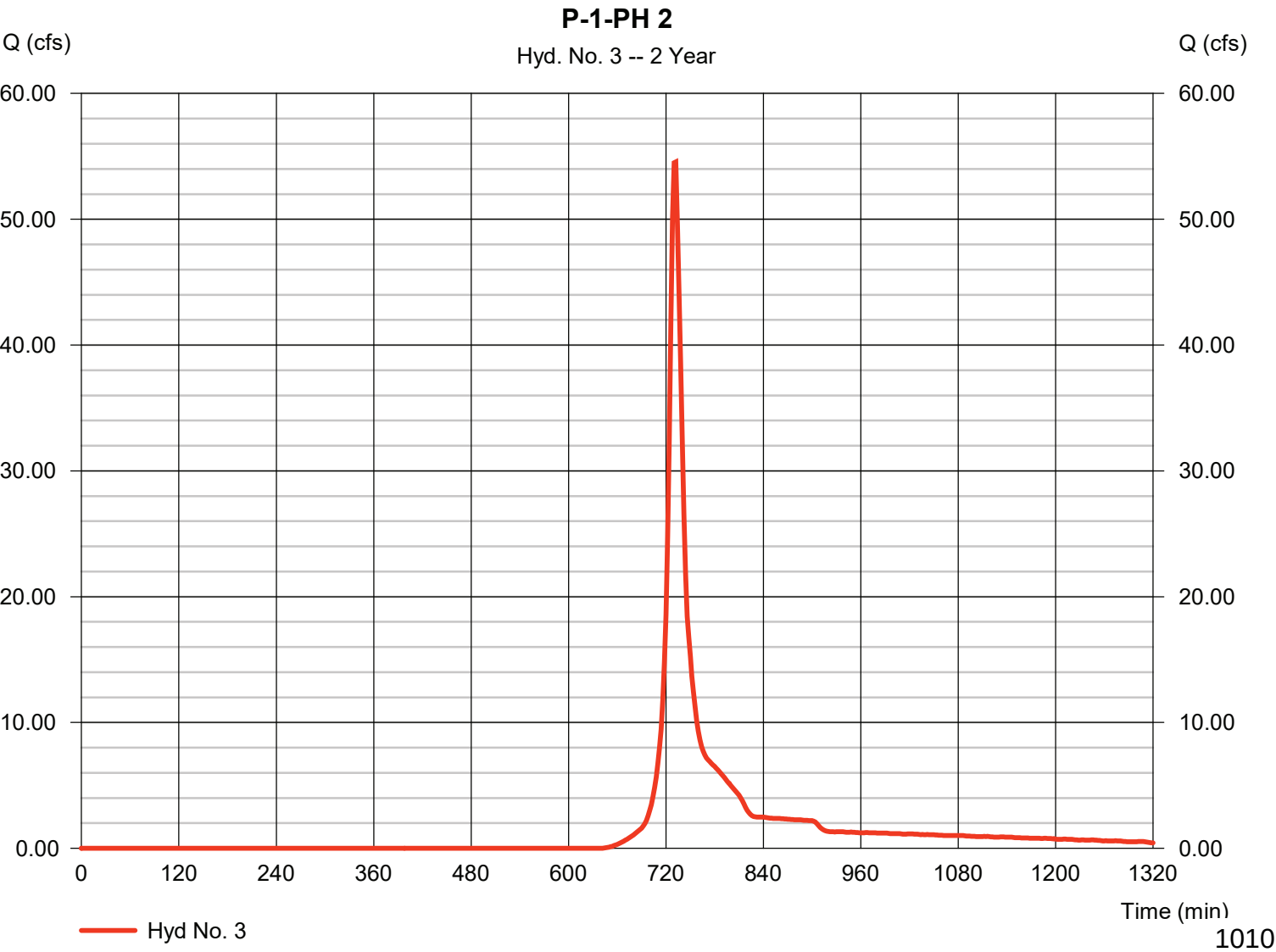
Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	54.55 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	141,442 cuft
Drainage area	=	32.936 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.20 min
Total precip.	=	2.70 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydrographs\MSR3 DISTRIBUTION CURVE			

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 32.936



Precipitation Report

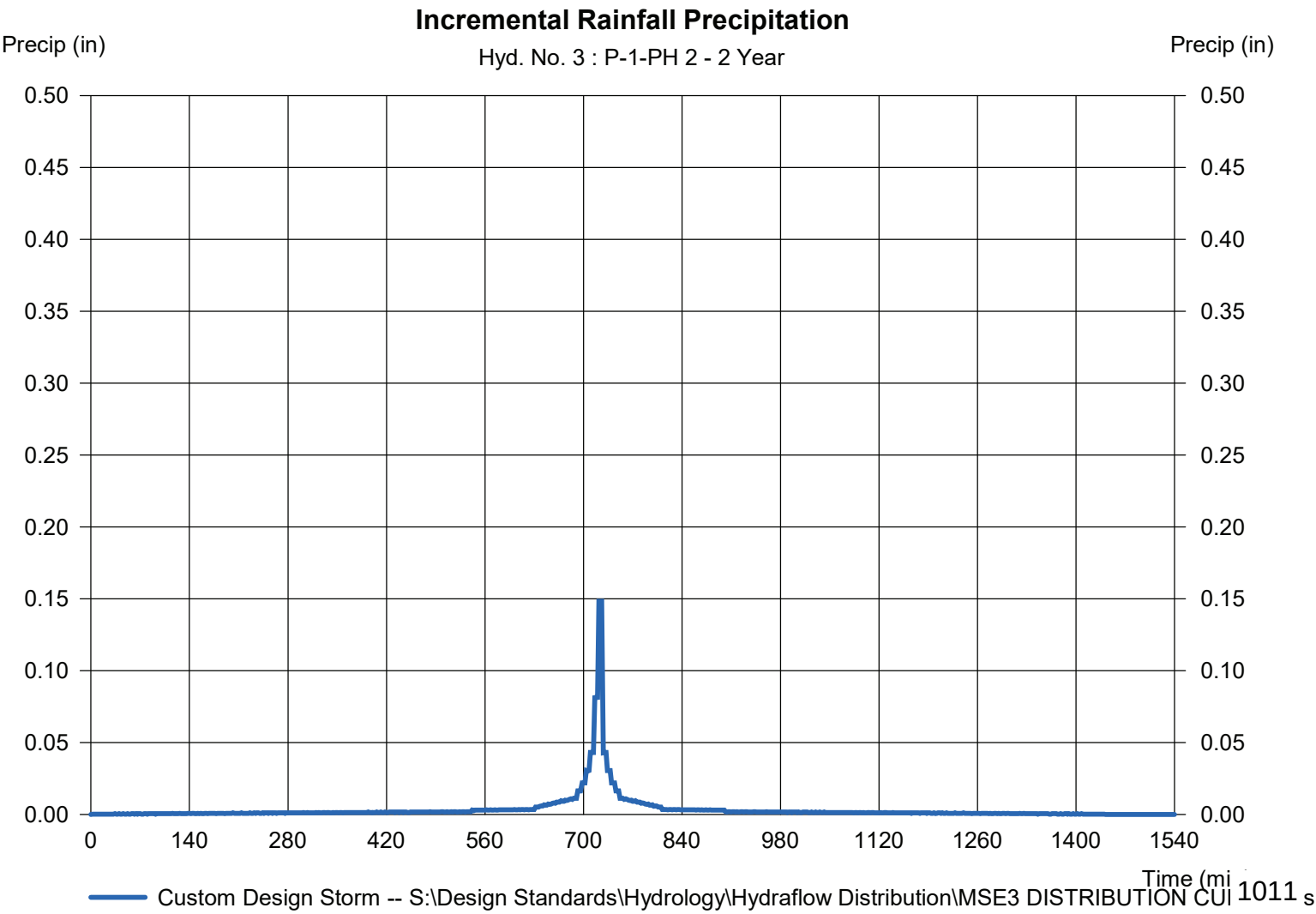
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

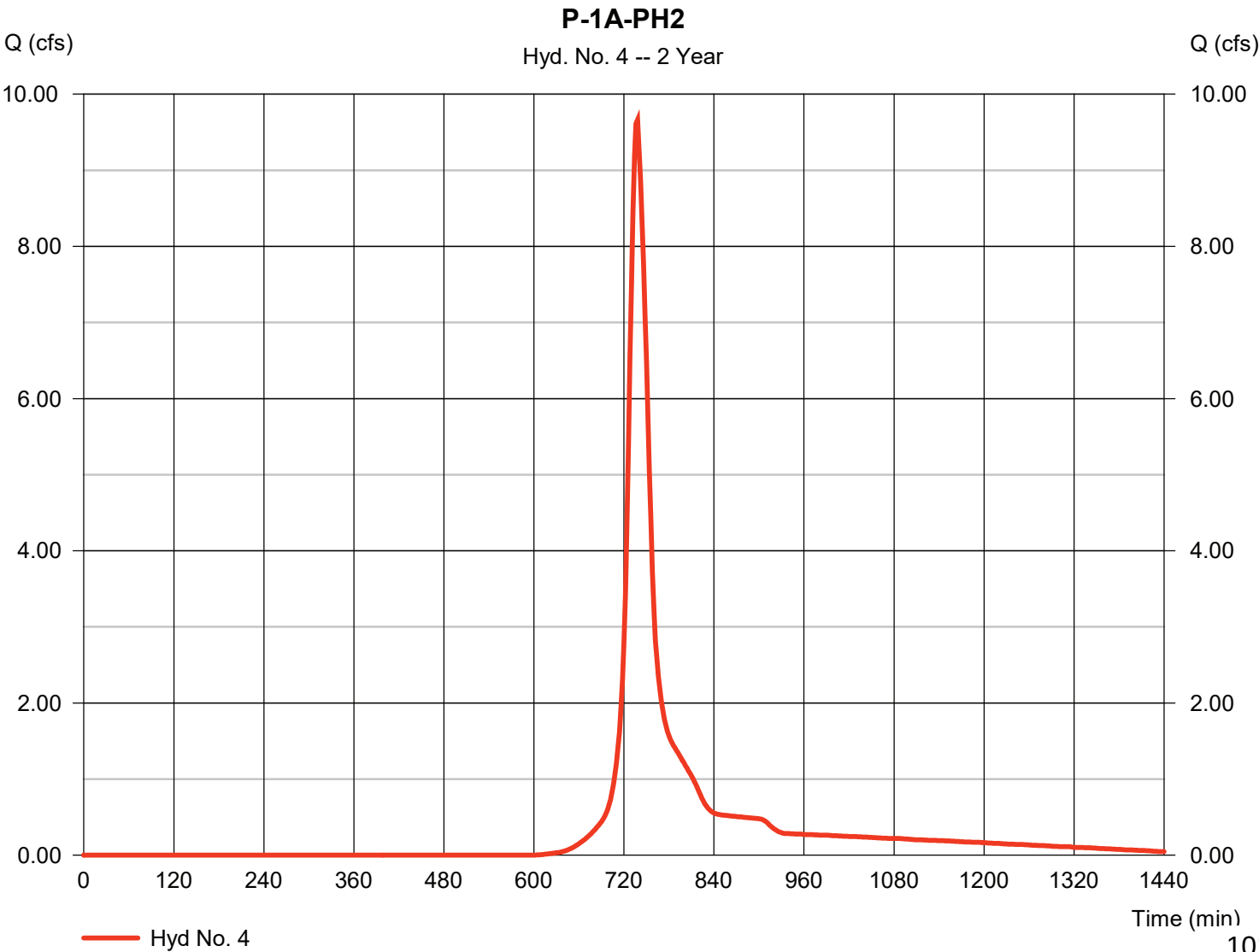
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 9.664 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 32,705 cuft
Drainage area	= 6.607 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

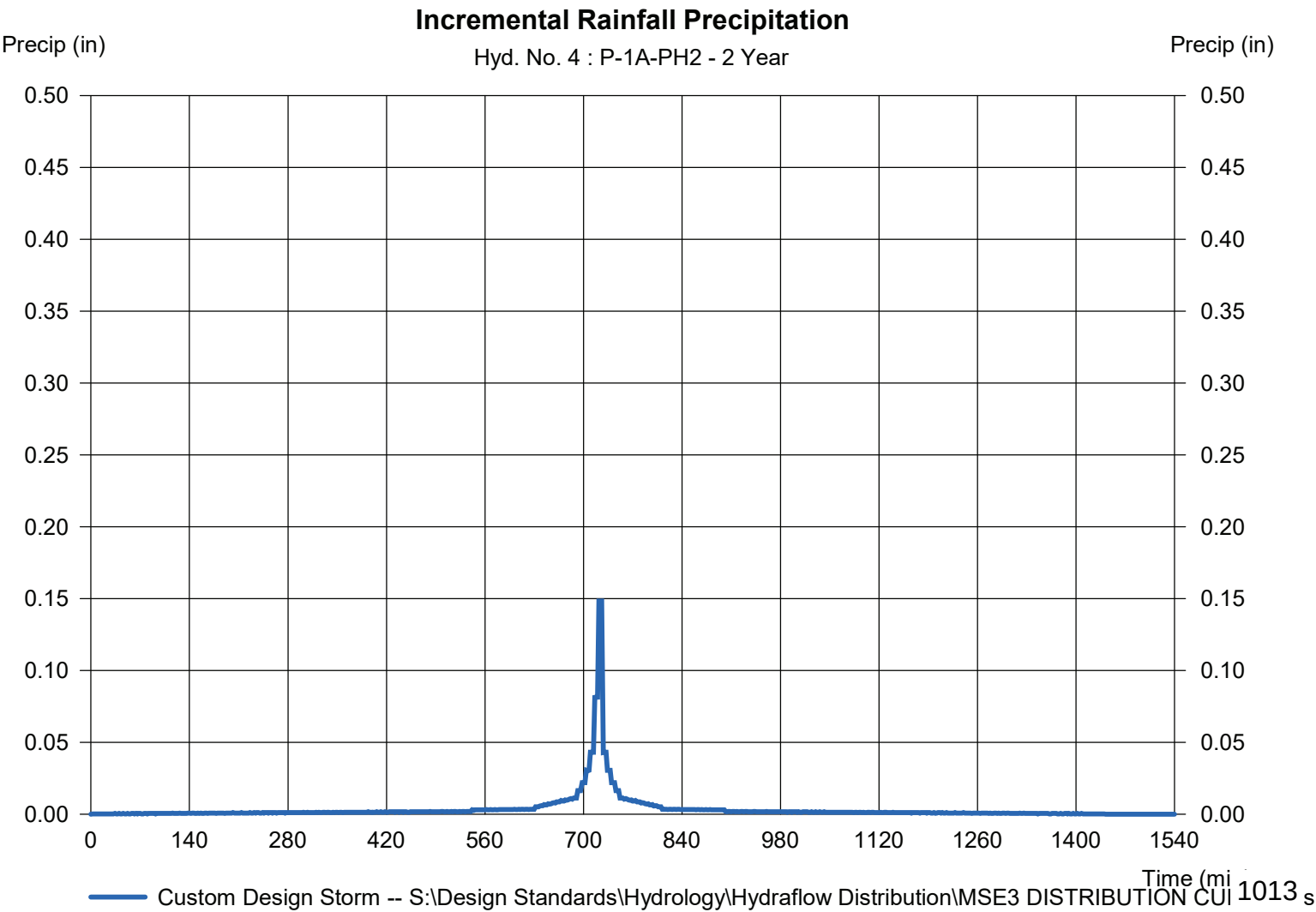
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

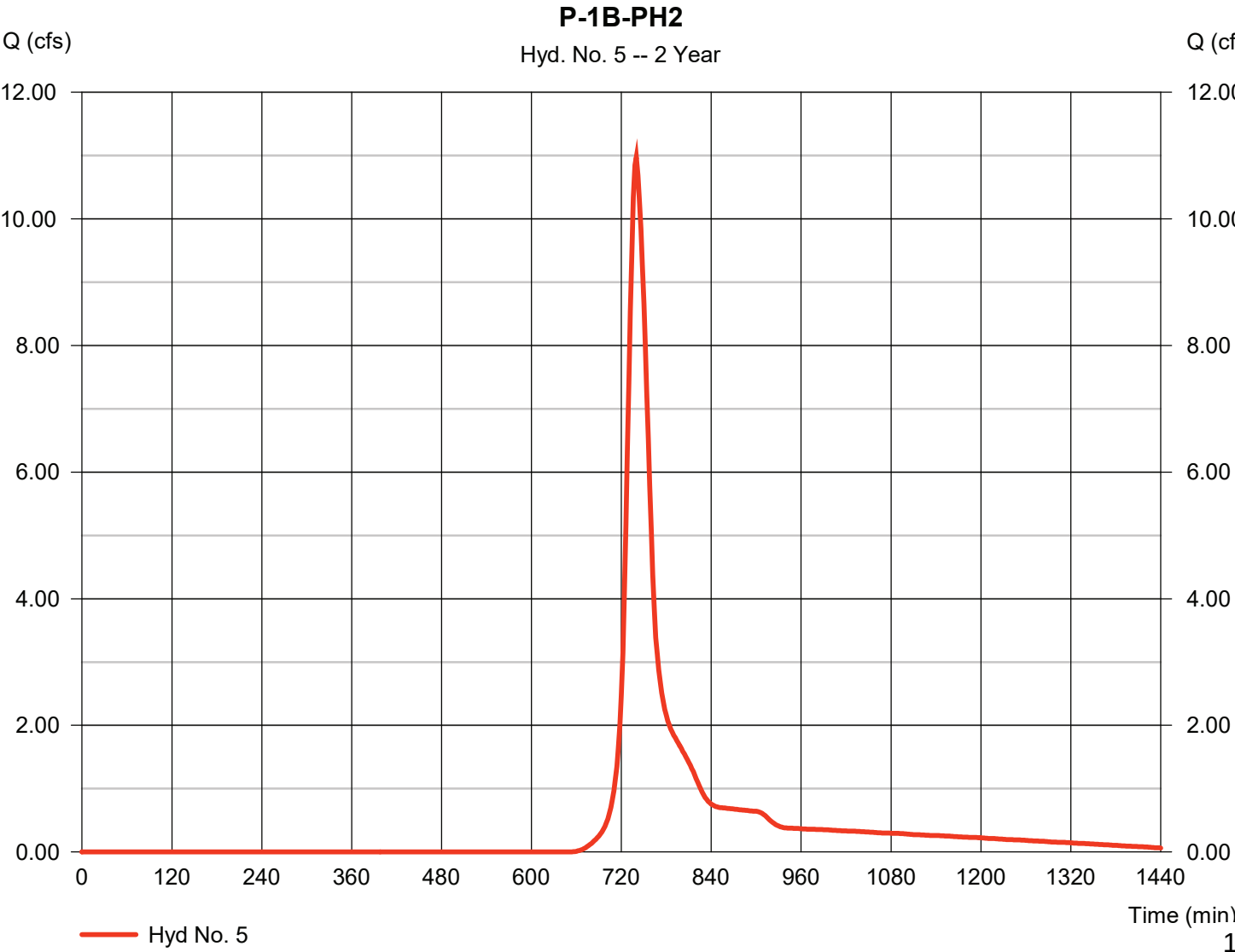
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 10.98 cfs
Storm frequency	= 2 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 39,728 cuft
Drainage area	= 10.224 ac	Curve number	= 81
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 26.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD3 DISTRIBUTION CURVE		



Precipitation Report

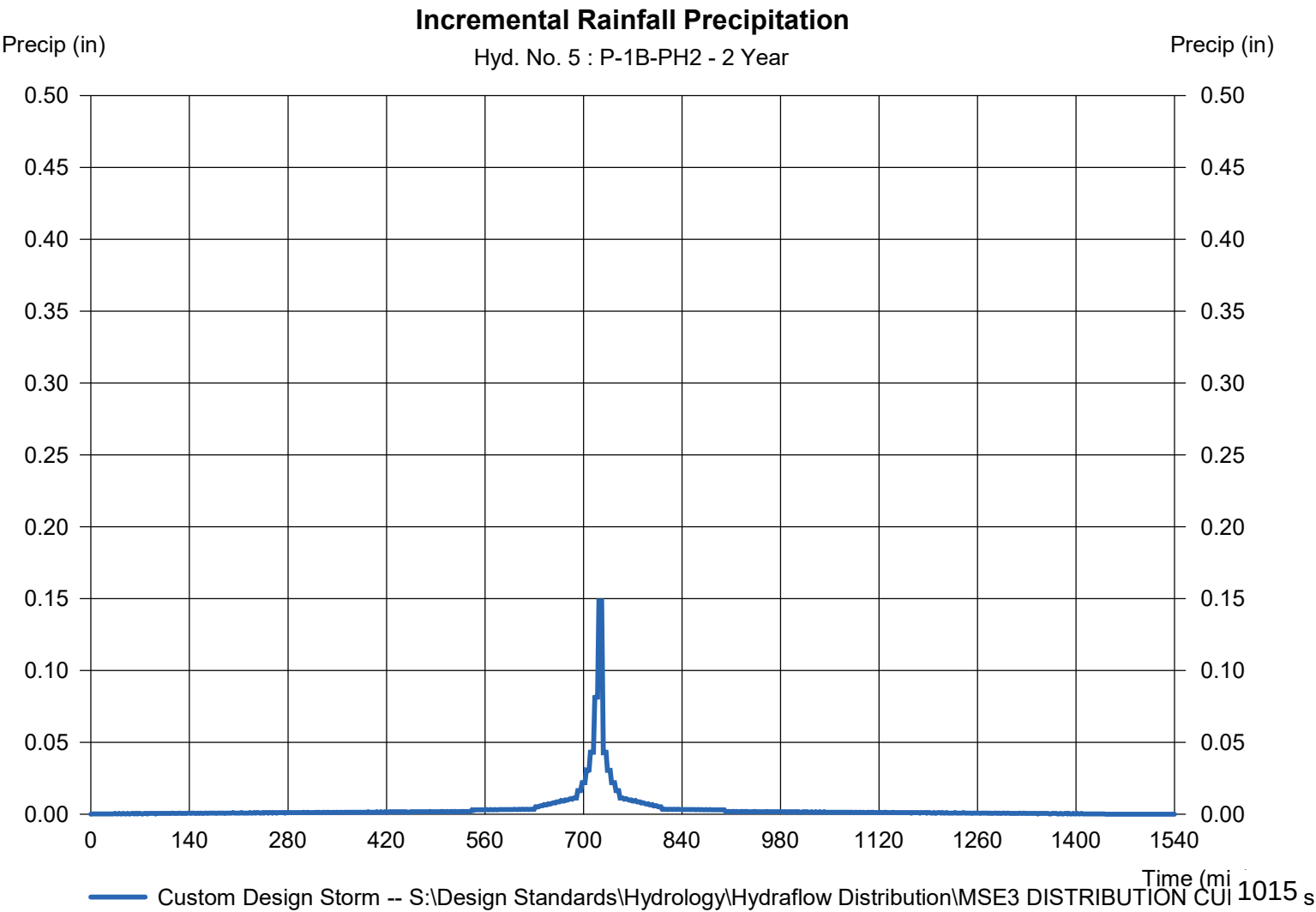
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

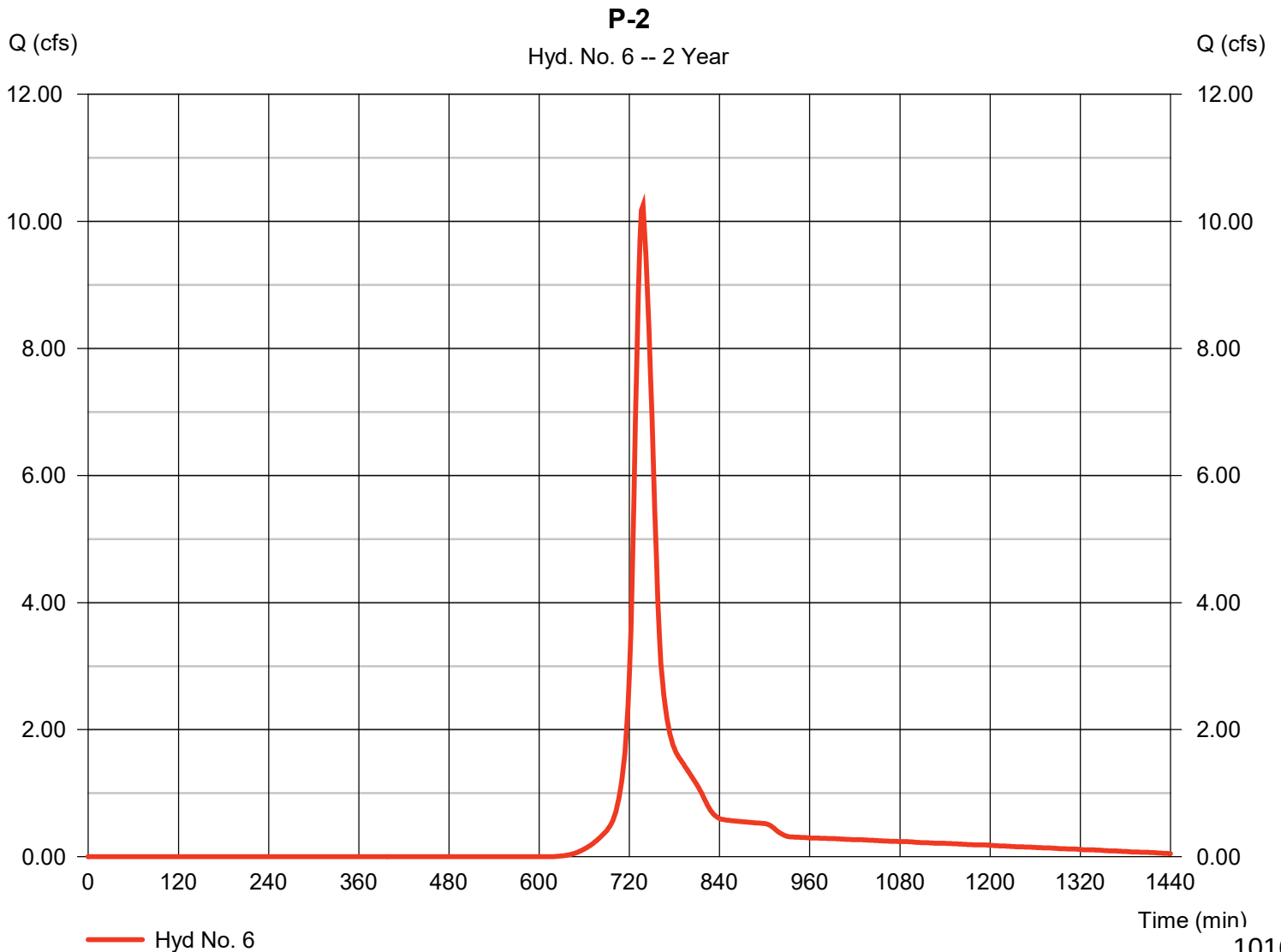
Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 10.25 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 34,742 cuft
Drainage area	= 7.385 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.710 x 75)] / 7.385



Precipitation Report

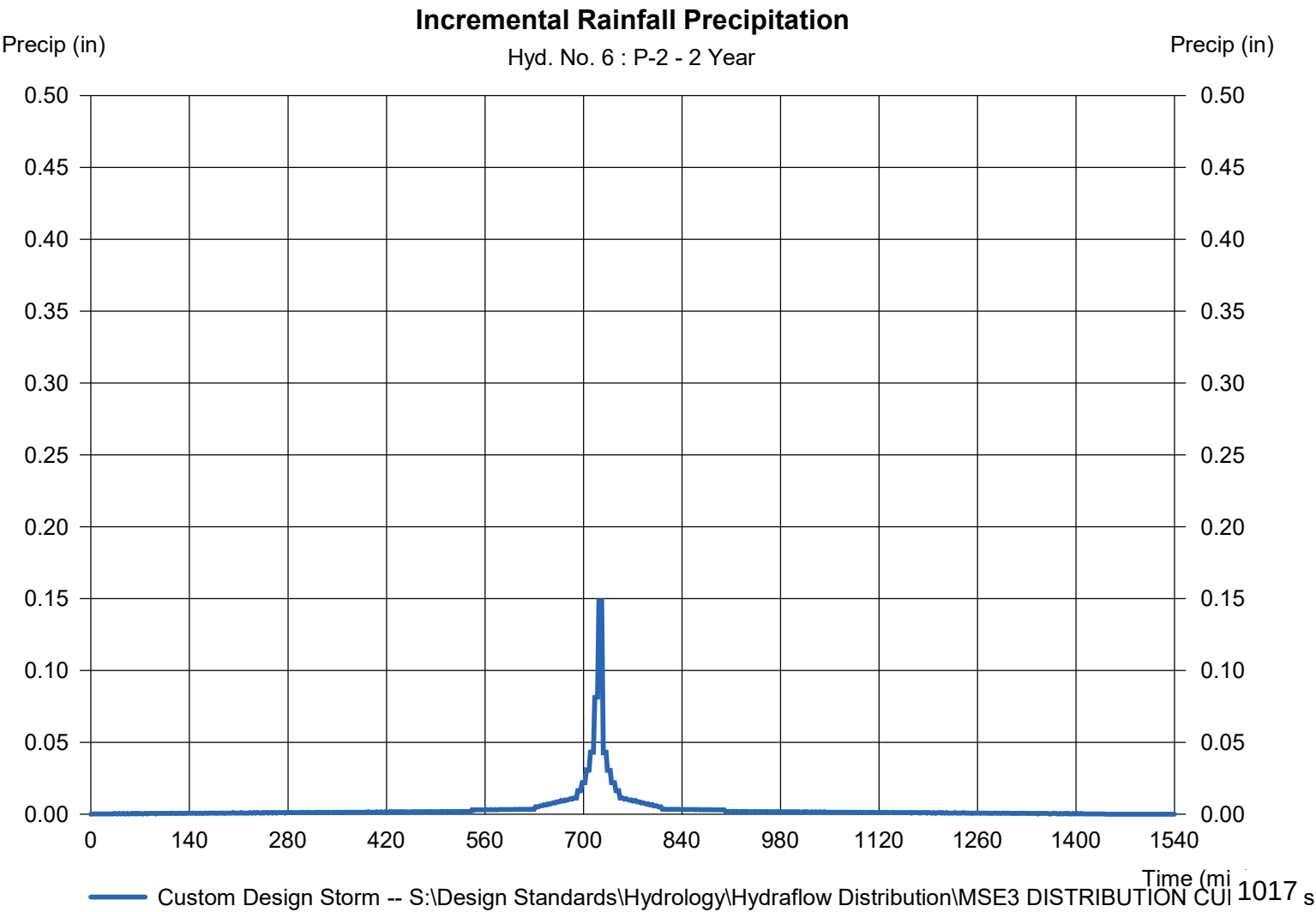
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

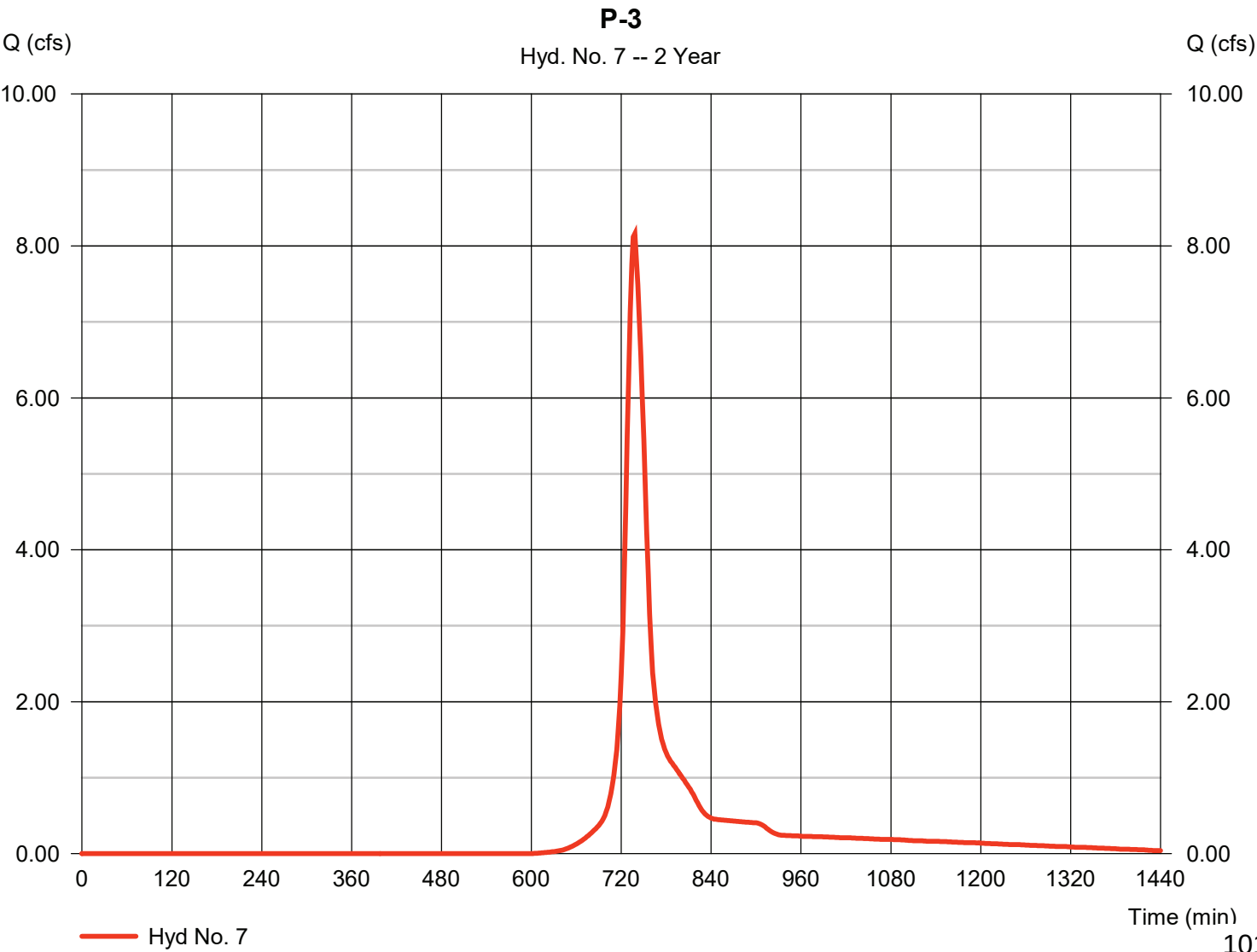
Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 8.160 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 27,617 cuft
Drainage area	= 5.579 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.20 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.260 x 75)] / 5.579



Precipitation Report

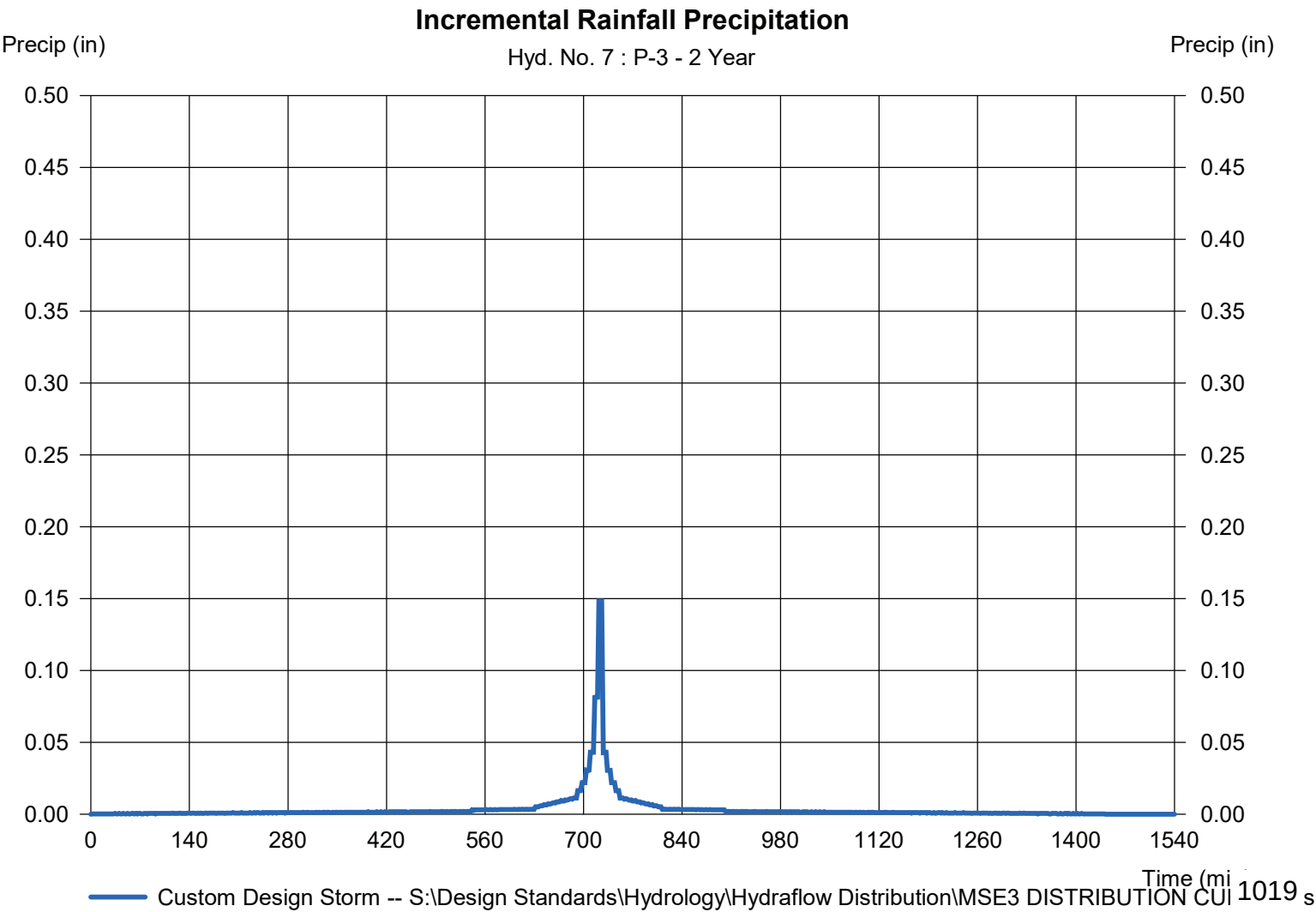
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

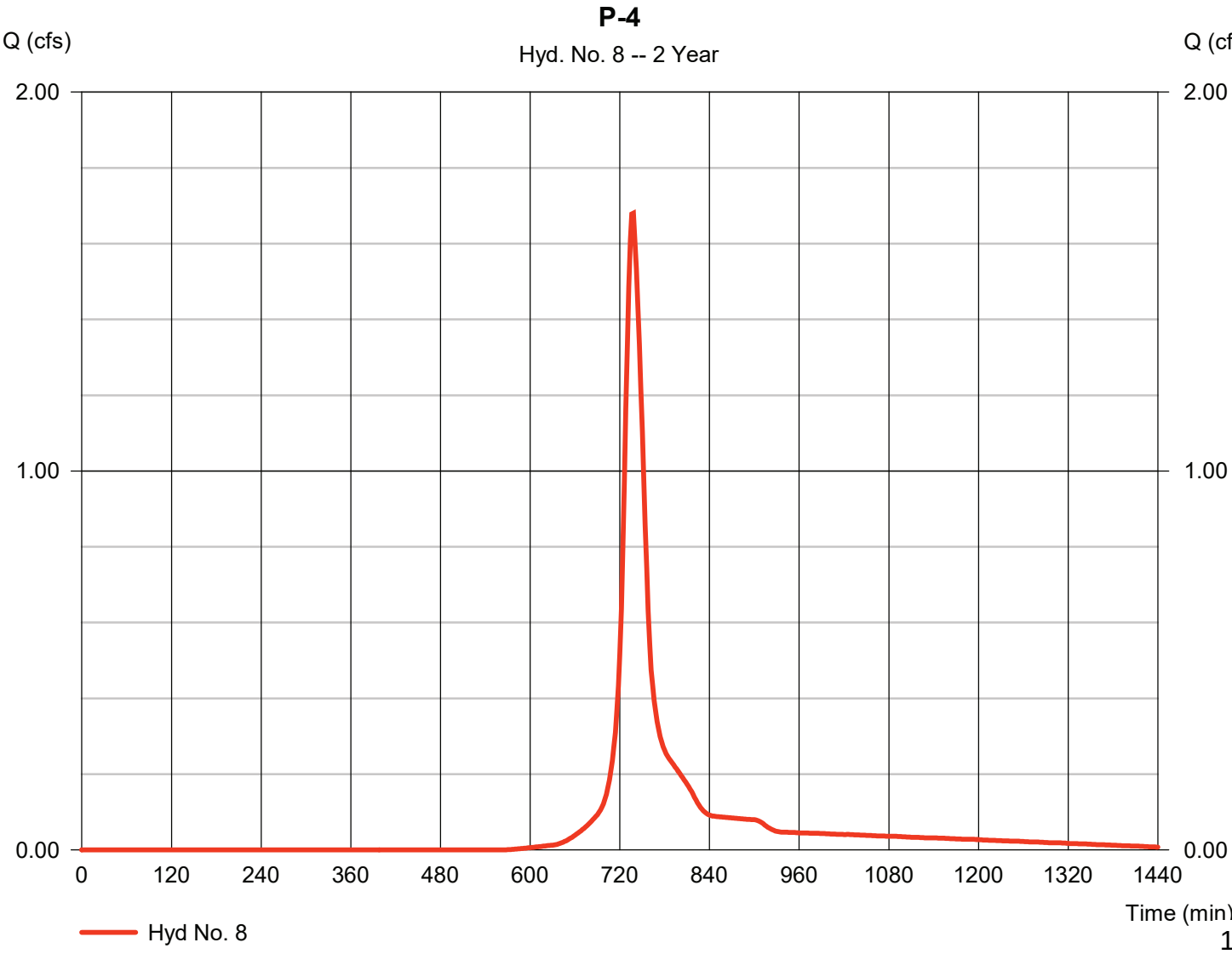
Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 1.681 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 5,687 cuft
Drainage area	= 1.040 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.10 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

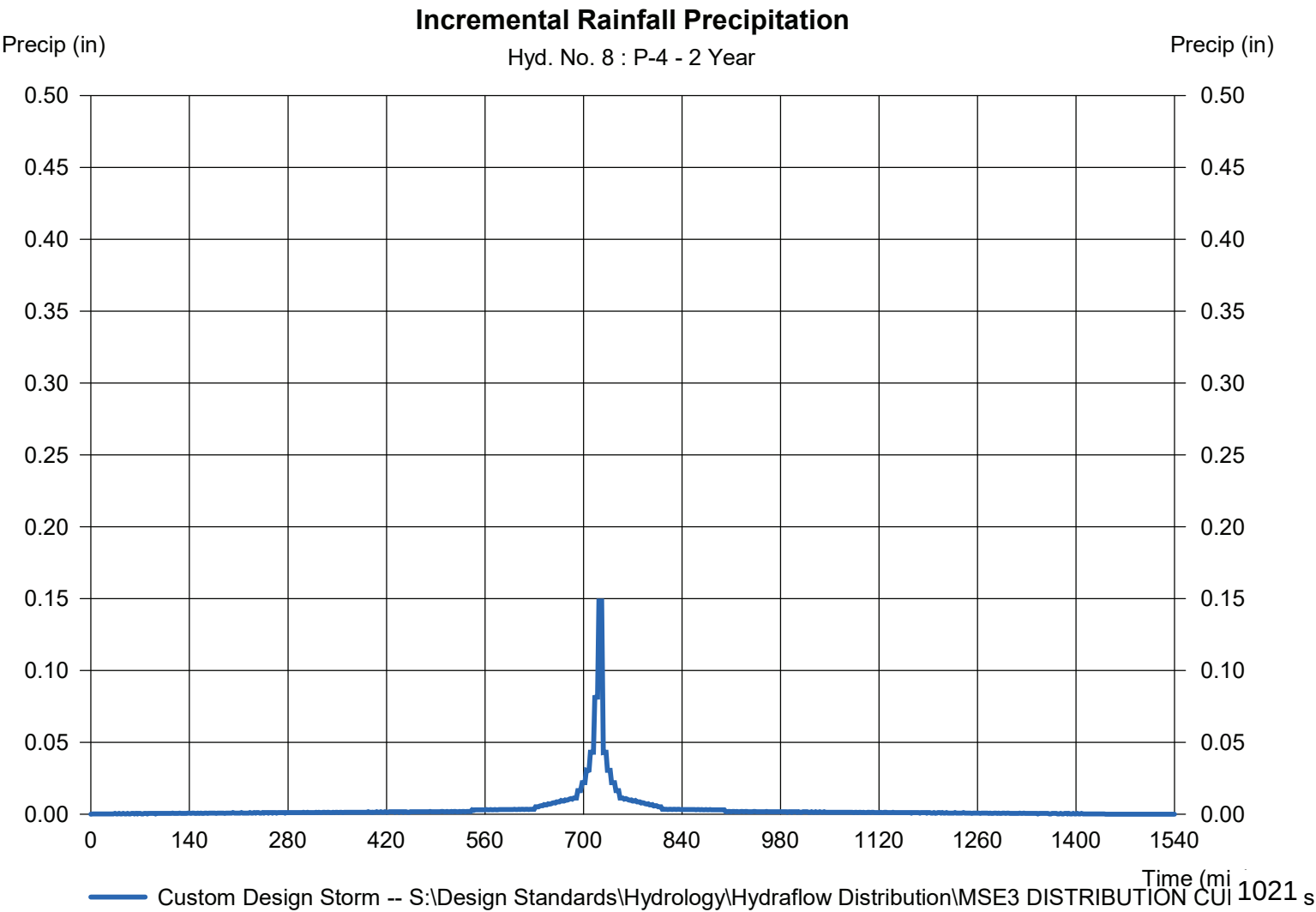
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION CUI		



Hydrograph Report

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

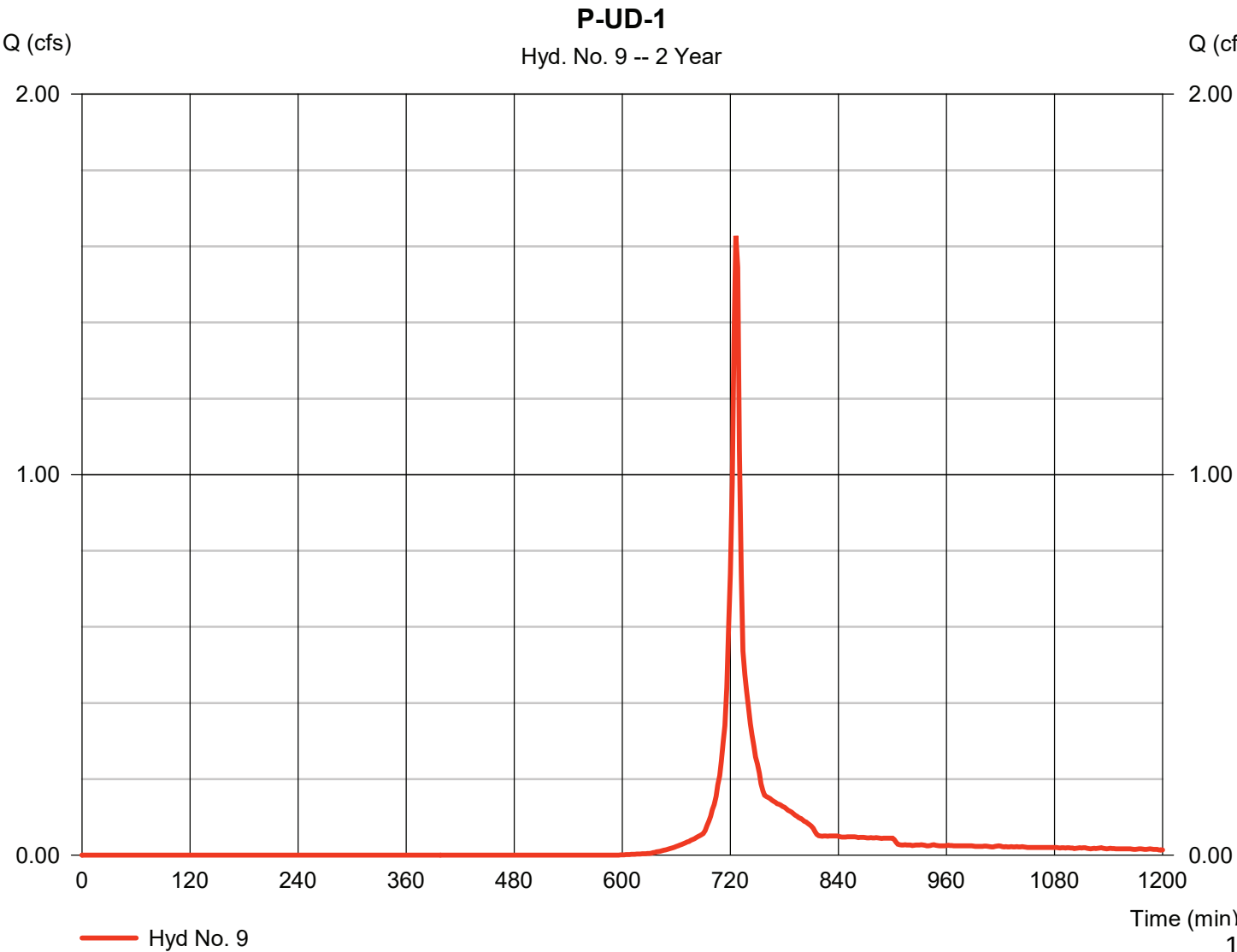
Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.628 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 3,055 cuft
Drainage area	= 0.670 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.300 x 61) + (0.370 x 98)] / 0.670



Precipitation Report

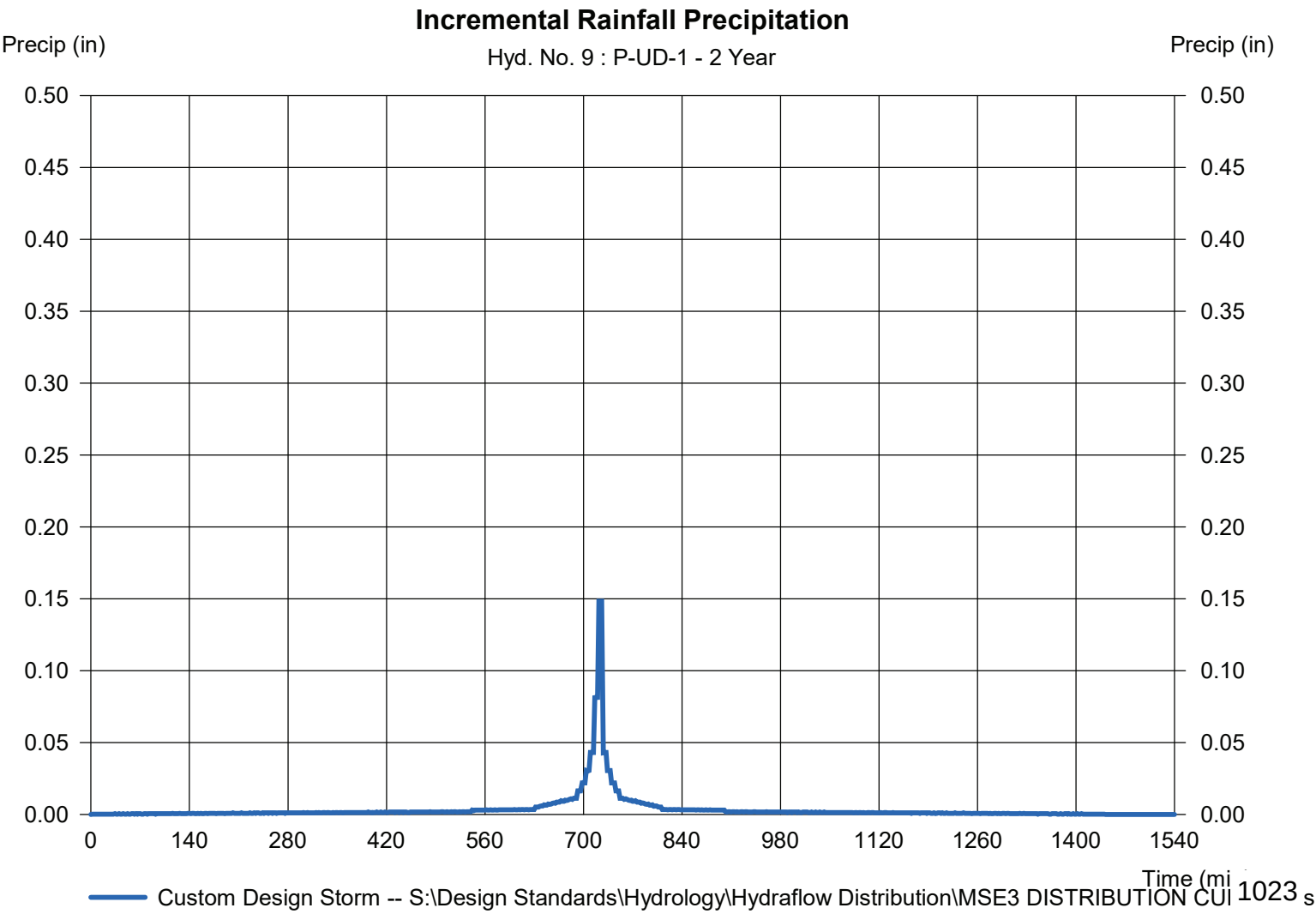
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

Thursday, 02 / 27 / 2020

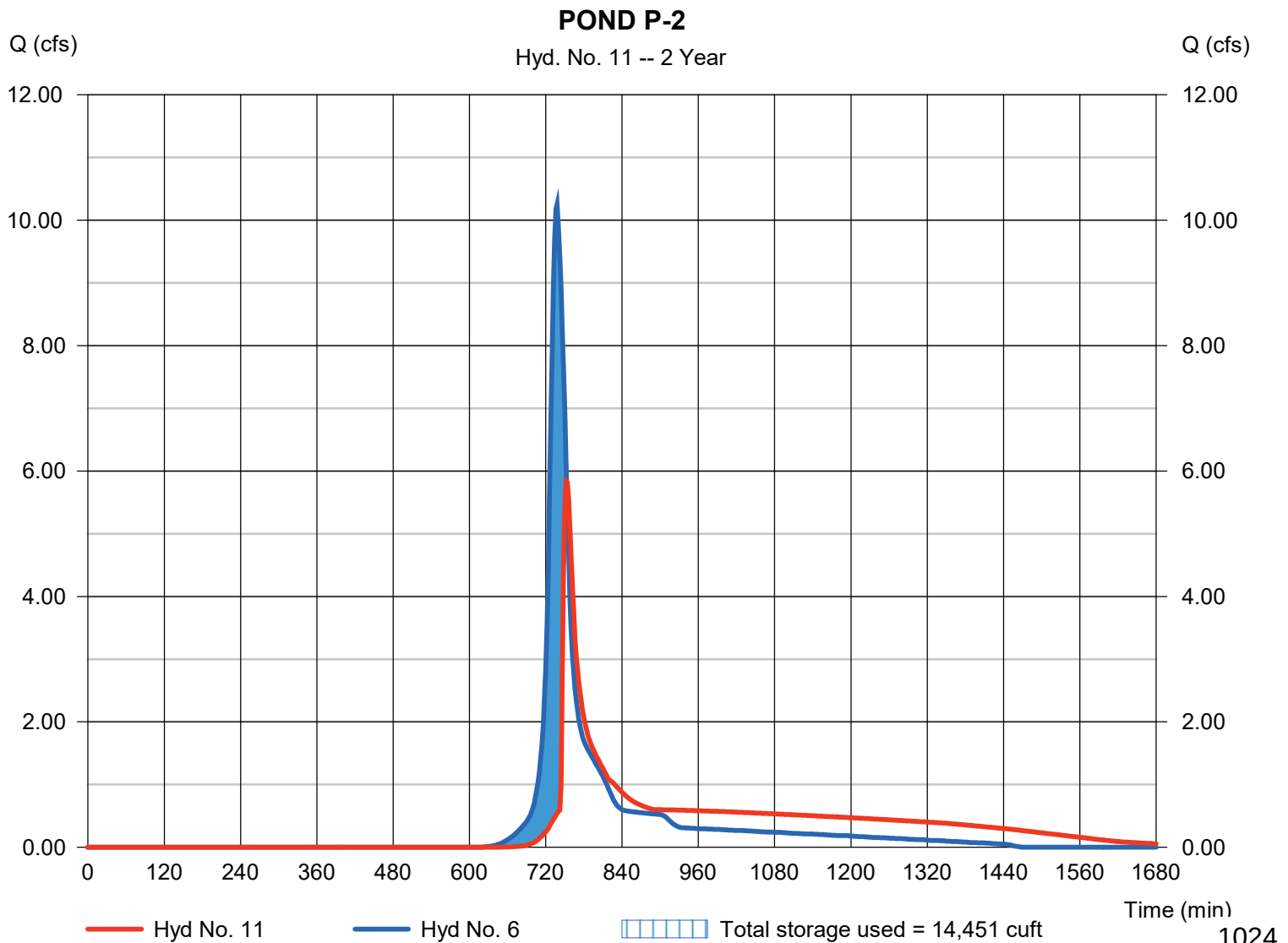
Hyd. No. 11

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-2
 Reservoir name = POND P-2

Peak discharge = 5.833 cfs
 Time to peak = 752 min
 Hyd. volume = 34,724 cuft
 Max. Elevation = 839.50 ft
 Max. Storage = 14,451 cuft

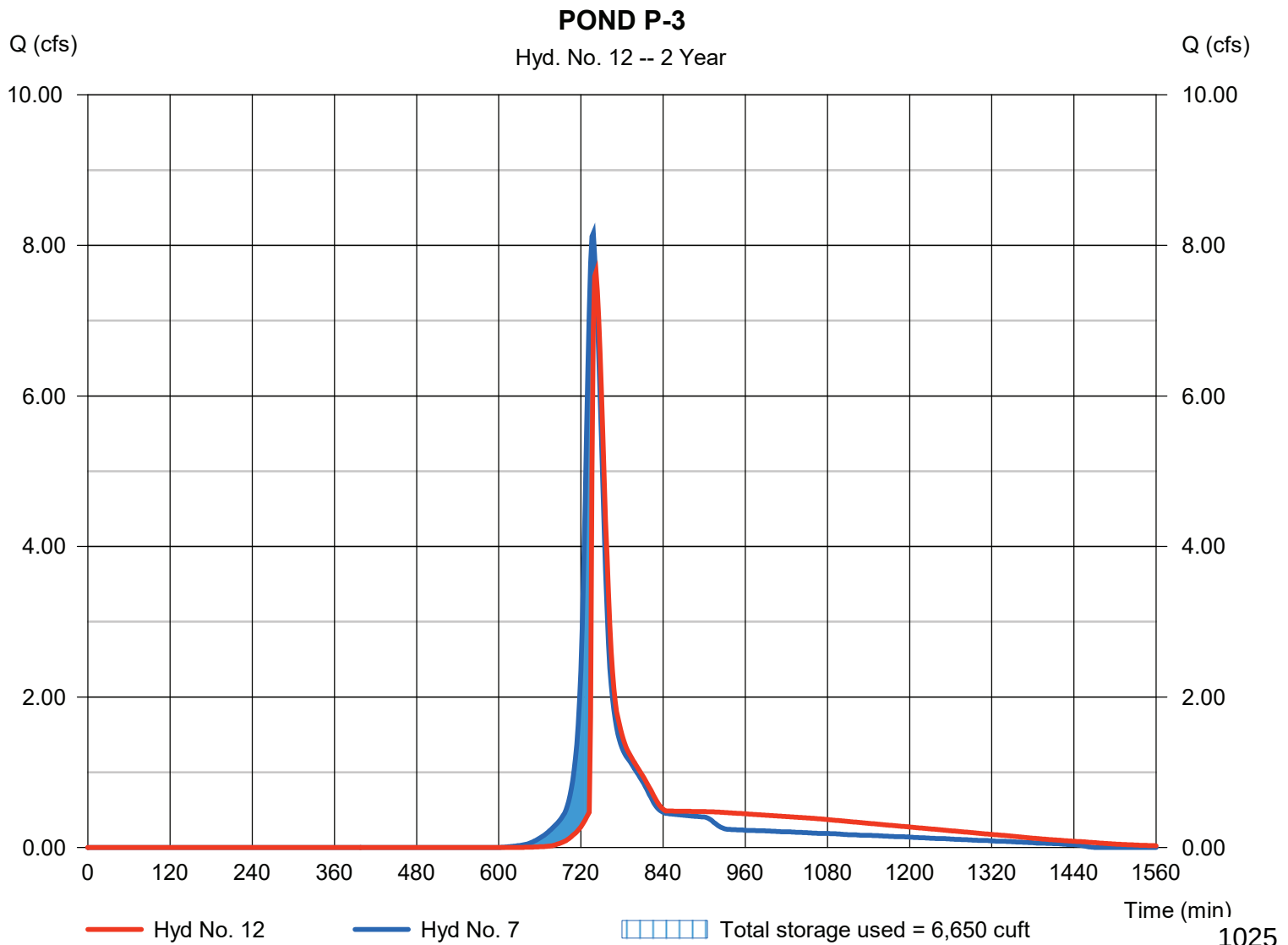
Storage Indication method used.



POND P-3

Peak discharge	= 7.645 cfs
Time to peak	= 742 min
Hyd. volume	= 27,603 cuft
Max. Elevation	= 839.81 ft
Max. Storage	= 6,650 cuft

Storage Indication method used.



Hydrograph Report

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

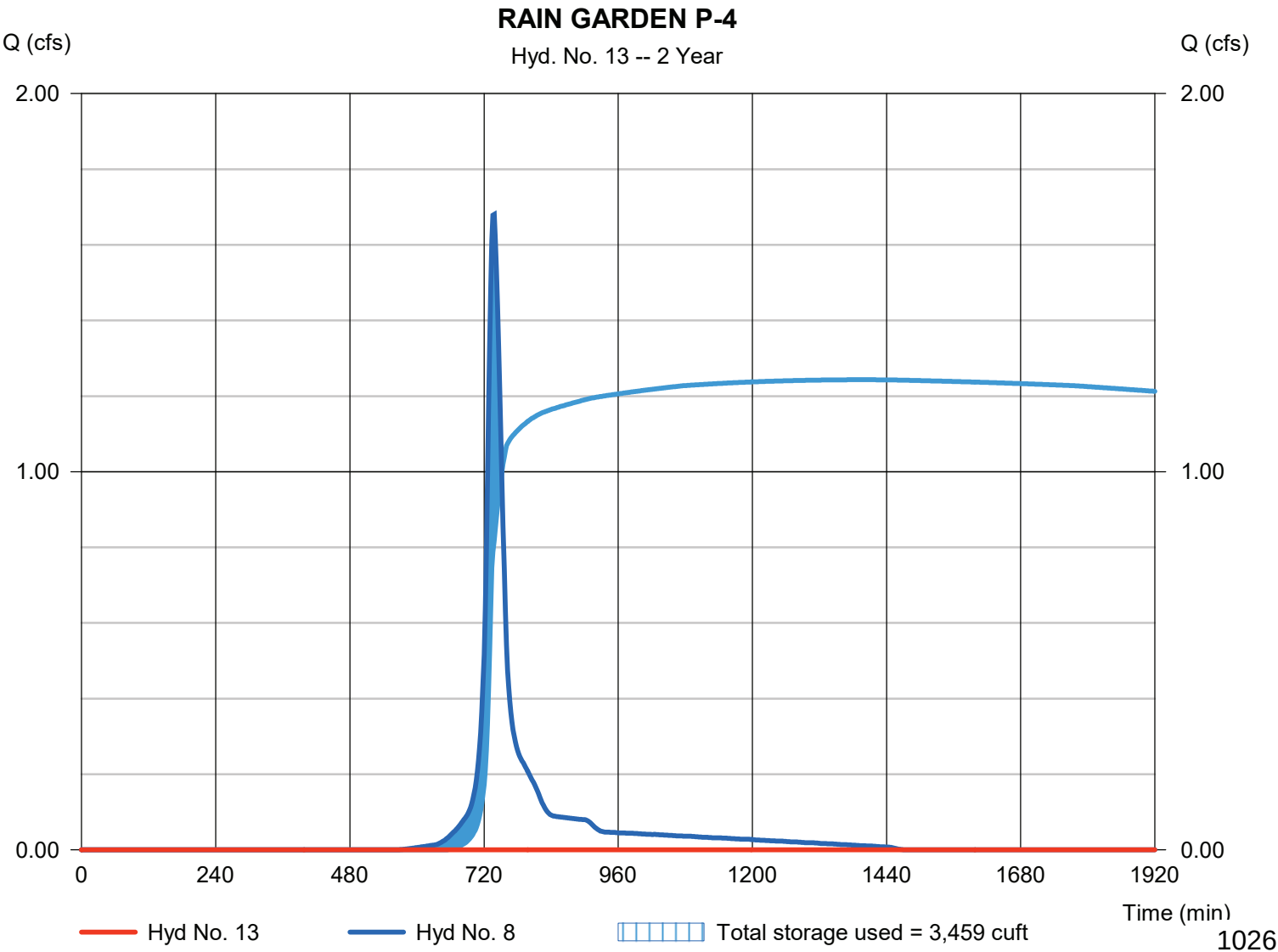
Thursday, 02 / 27 / 2020

Hyd. No. 13

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 8 - P-4	Max. Elevation	= 839.99 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 3,459 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

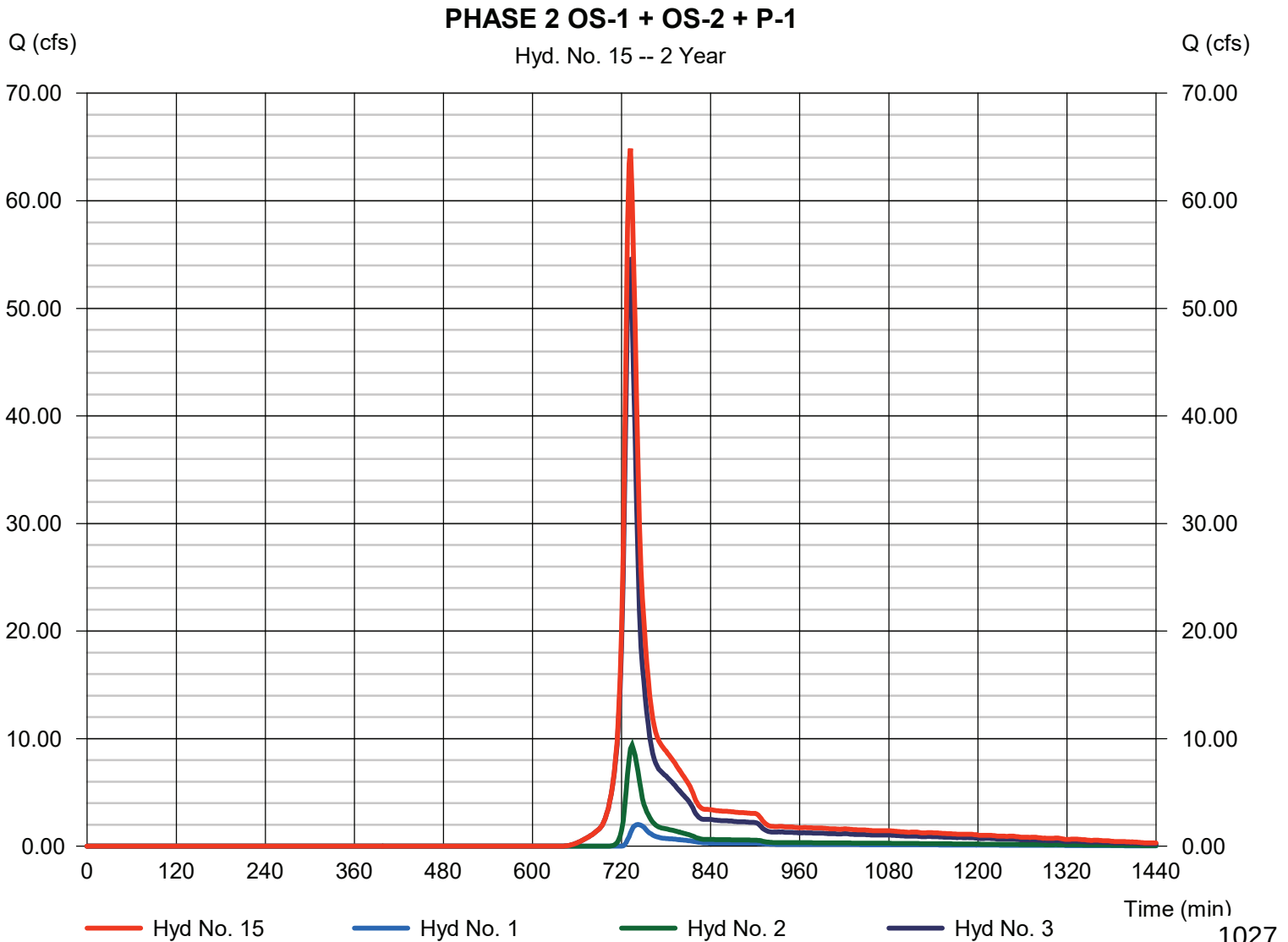
Thursday, 02 / 27 / 2020

Hyd. No. 15

PHASE 2 OS-1 + OS-2 + P-1

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 2, 3

Peak discharge = 64.84 cfs
 Time to peak = 732 min
 Hyd. volume = 180,818 cuft
 Contrib. drain. area = 55.916 ac



Hydrograph Report

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

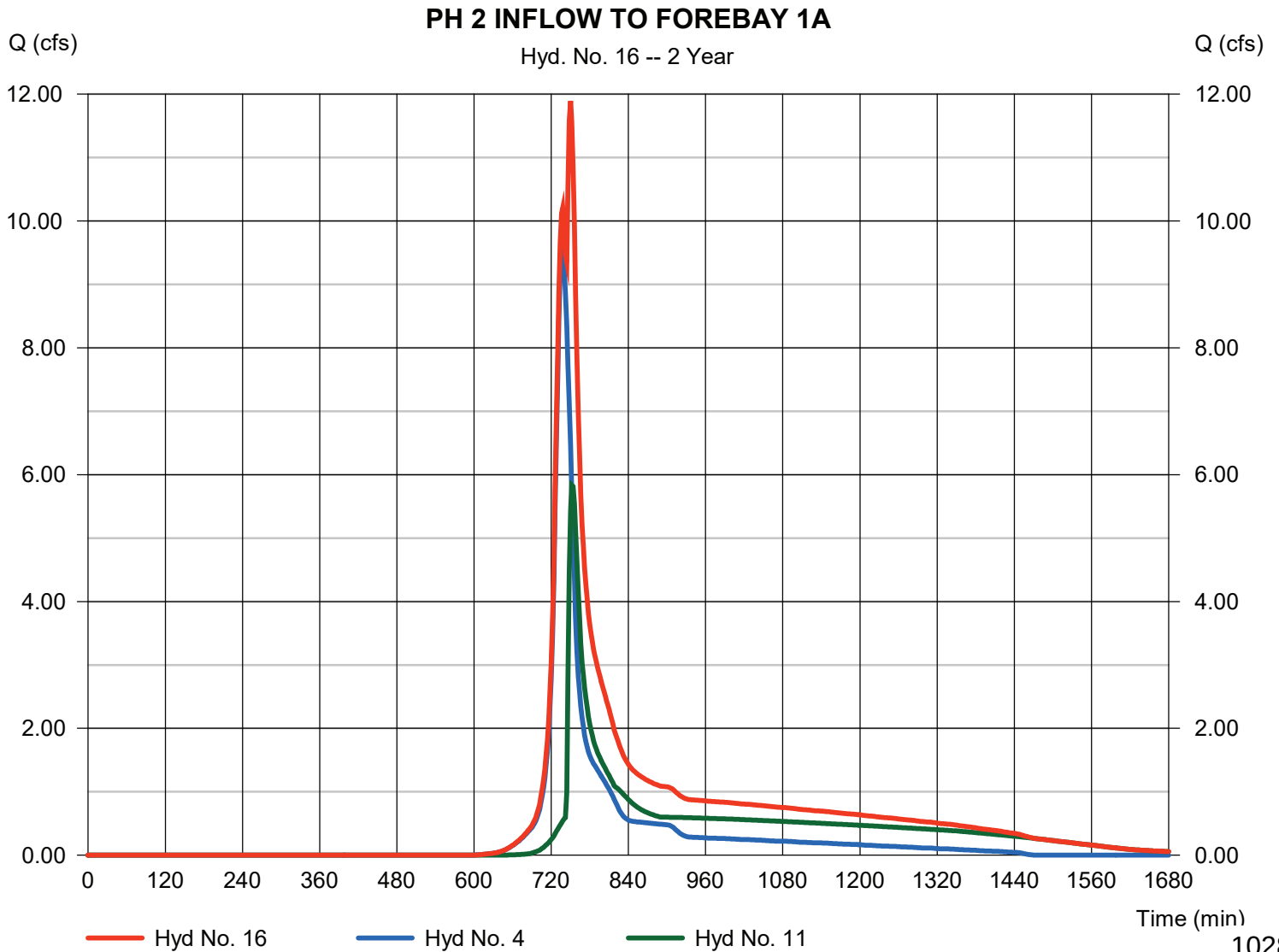
Thursday, 02 / 27 / 2020

Hyd. No. 16

PH 2 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 4, 11

Peak discharge = 11.89 cfs
 Time to peak = 750 min
 Hyd. volume = 67,429 cuft
 Contrib. drain. area = 6.607 ac



Hydrograph Report

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

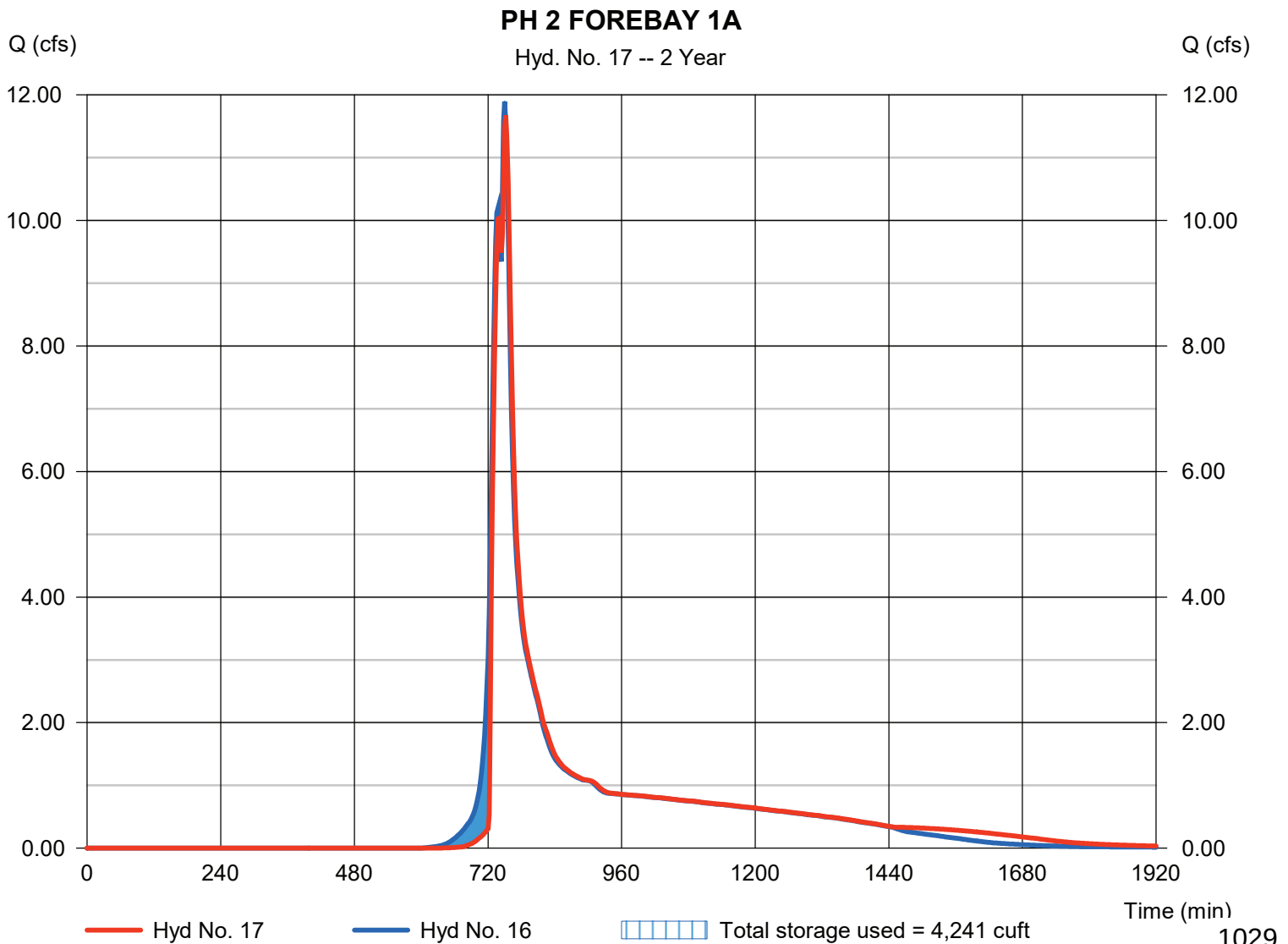
Thursday, 02 / 27 / 2020

Hyd. No. 17

PH 2 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 11.67 cfs
Storm frequency	= 2 yrs	Time to peak	= 752 min
Time interval	= 2 min	Hyd. volume	= 67,414 cuft
Inflow hyd. No.	= 16 - PH 2 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.16 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 4,241 cuft

Storage Indication method used.



Hydrograph Report

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

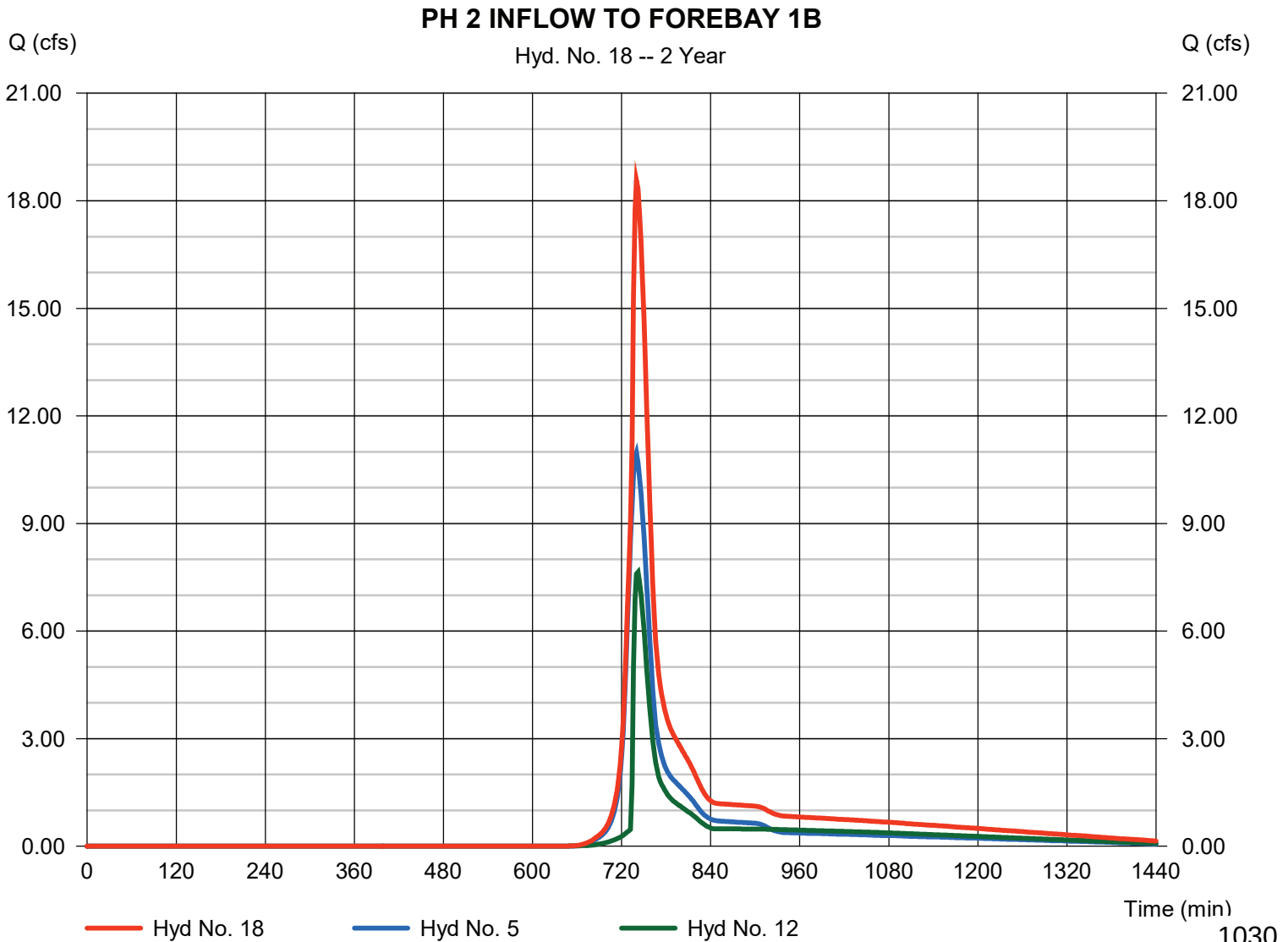
Thursday, 02 / 27 / 2020

Hyd. No. 18

PH 2 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 5, 12

Peak discharge = 18.57 cfs
 Time to peak = 740 min
 Hyd. volume = 67,331 cuft
 Contrib. drain. area = 10.224 ac



Hydrograph Report

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

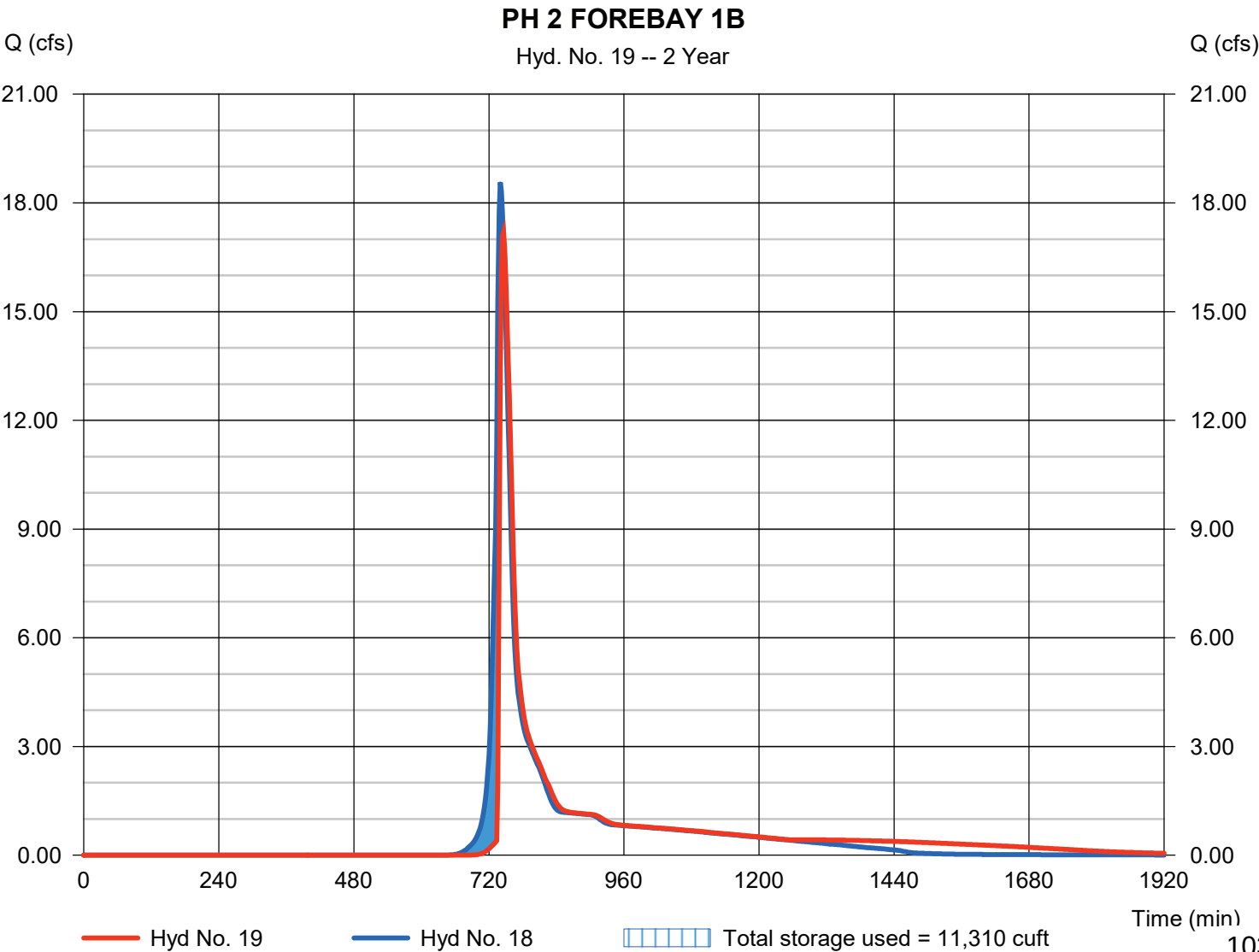
Thursday, 02 / 27 / 2020

Hyd. No. 19

PH 2 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 17.19 cfs
Storm frequency	= 2 yrs	Time to peak	= 746 min
Time interval	= 2 min	Hyd. volume	= 67,286 cuft
Inflow hyd. No.	= 18 - PH 2 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.17 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 11,310 cuft

Storage Indication method used.



Hydrograph Report

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

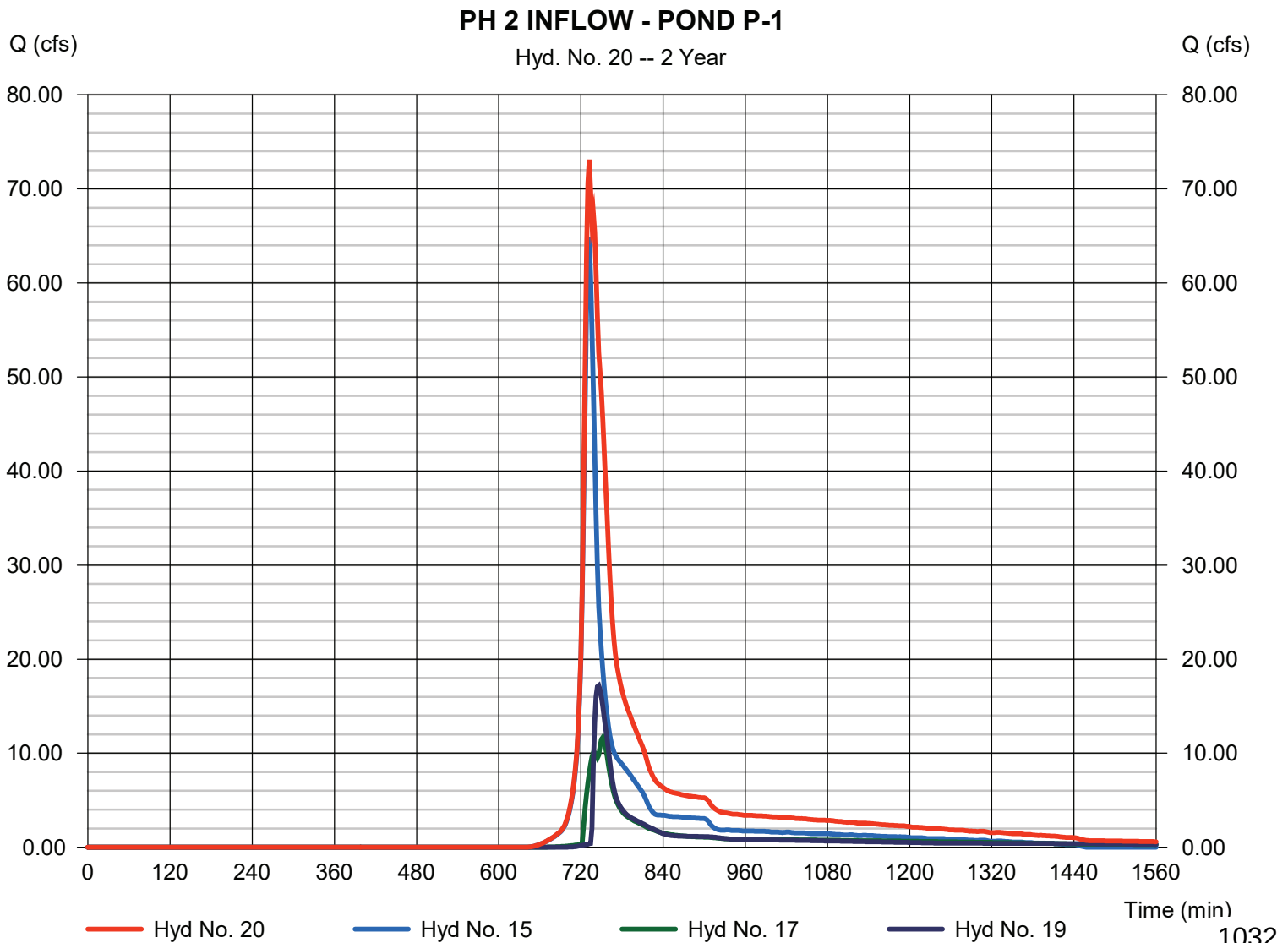
Thursday, 02 / 27 / 2020

Hyd. No. 20

PH 2 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 15, 17, 19

Peak discharge = 73.11 cfs
 Time to peak = 732 min
 Hyd. volume = 315,517 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

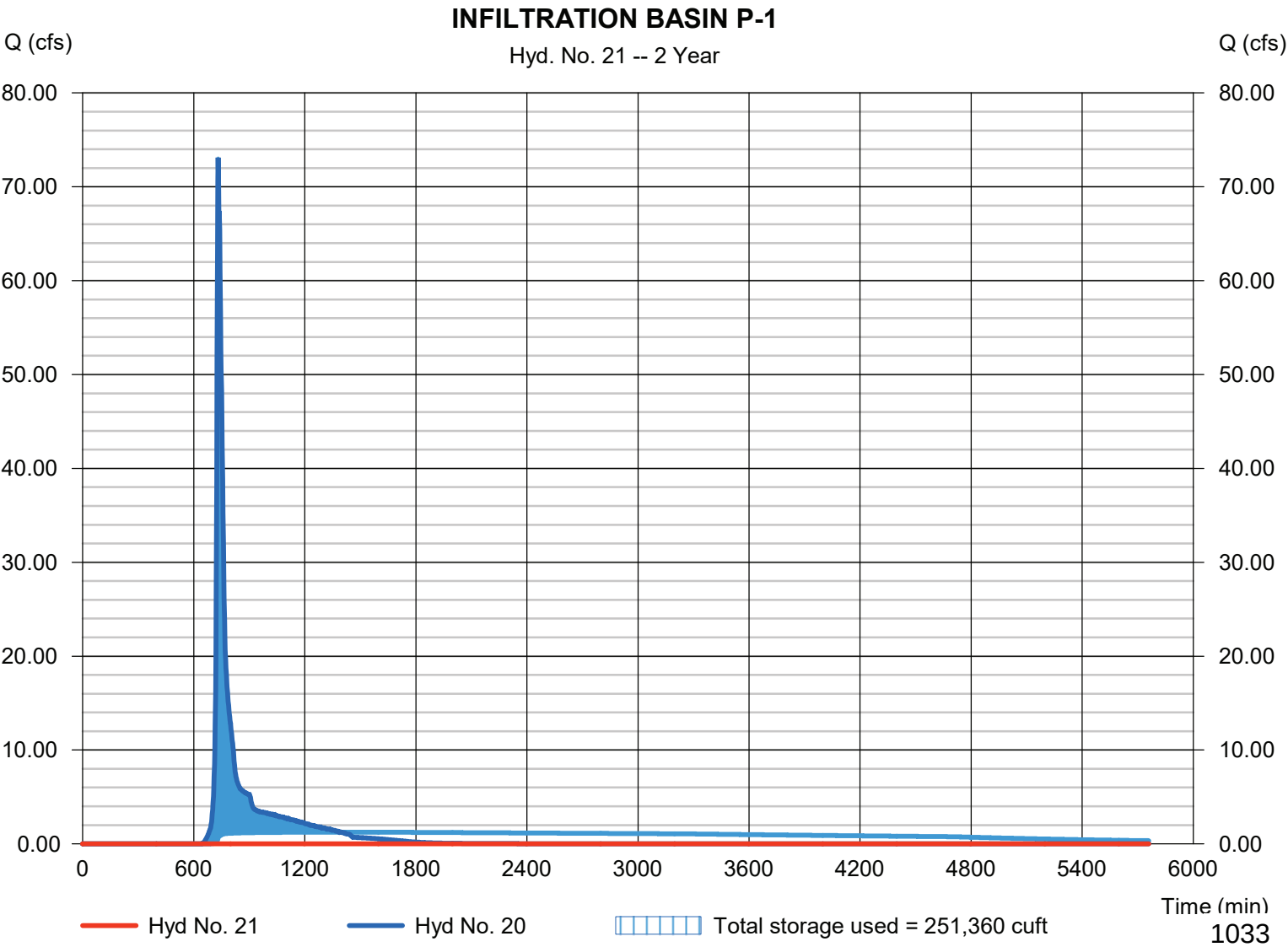
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020
Thursday, 02 / 27 / 2020

Hyd. No. 21

INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 20 - PH 2 INFLOW - POND P-1	Max. Elevation	= 832.14 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 2	Max. Storage	= 251,360 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

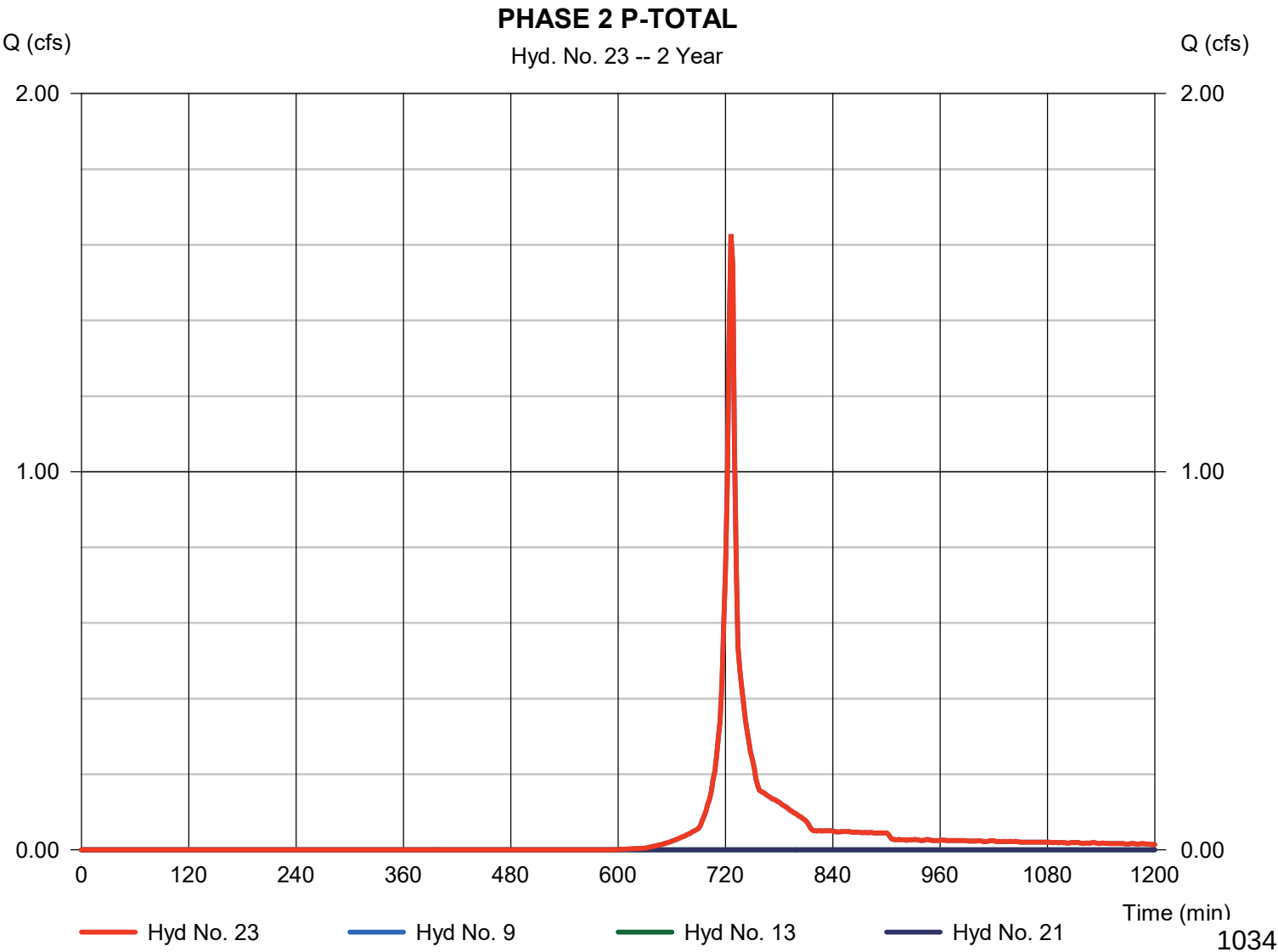
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 23

PHASE 2 P-TOTAL

Hydrograph type	= Combine	Peak discharge	= 1.628 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 3,055 cuft
Inflow hyds.	= 9, 13, 21	Contrib. drain. area	= 0.670 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	7.710	2	736	28,294	-----	-----	-----	P-OS-1
2	SCS Runoff	21.14	2	734	60,229	-----	-----	-----	P-OS-2
3	SCS Runoff	97.88	2	730	251,711	-----	-----	-----	P-1-PH 2
4	SCS Runoff	16.48	2	736	55,872	-----	-----	-----	P-1A-PH2
5	SCS Runoff	20.09	2	740	71,706	-----	-----	-----	P-1B-PH2
6	SCS Runoff	17.75	2	736	60,152	-----	-----	-----	P-2
7	SCS Runoff	13.92	2	736	47,179	-----	-----	-----	P-3
8	SCS Runoff	2.782	2	736	9,464	-----	-----	-----	P-4
9	SCS Runoff	2.747	2	726	5,219	-----	-----	-----	P-UD-1
11	Reservoir	16.07	2	742	60,134	6	839.78	16,578	POND P-2
12	Reservoir	13.75	2	738	47,165	7	839.97	7,331	POND P-3
13	Reservoir	0.000	2	1346	0	8	840.47	6,117	RAIN GARDEN P-4
15	Combine	124.29	2	732	340,233	1, 2, 3,	-----	-----	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	31.35	2	740	116,006	4, 11,	-----	-----	PH 2 INFLOW TO FOREBAY 1A
17	Reservoir	31.12	2	742	115,991	16	835.50	5,831	PH 2 FOREBAY 1A
18	Combine	33.78	2	738	118,872	5, 12,	-----	-----	PH 2 INFLOW TO FOREBAY 1B
19	Reservoir	33.09	2	742	118,826	18	835.43	13,584	PH 2 FOREBAY 1B
20	Combine	160.09	2	732	575,051	15, 17, 19	-----	-----	PH 2 INFLOW - POND P-1
21	Reservoir	0.000	2	704	0	20	834.25	497,620	INFILTRATION BASIN P-1
23	Combine	2.747	2	726	5,219	9, 13, 21,	-----	-----	PHASE 2 P-TOTAL
2020-02-27_CHAPMAN FARMS_PHASE II.gpw					Return Period: 10 Year			Thursday, 02 / 27 / 2020	

Hydrograph Report

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

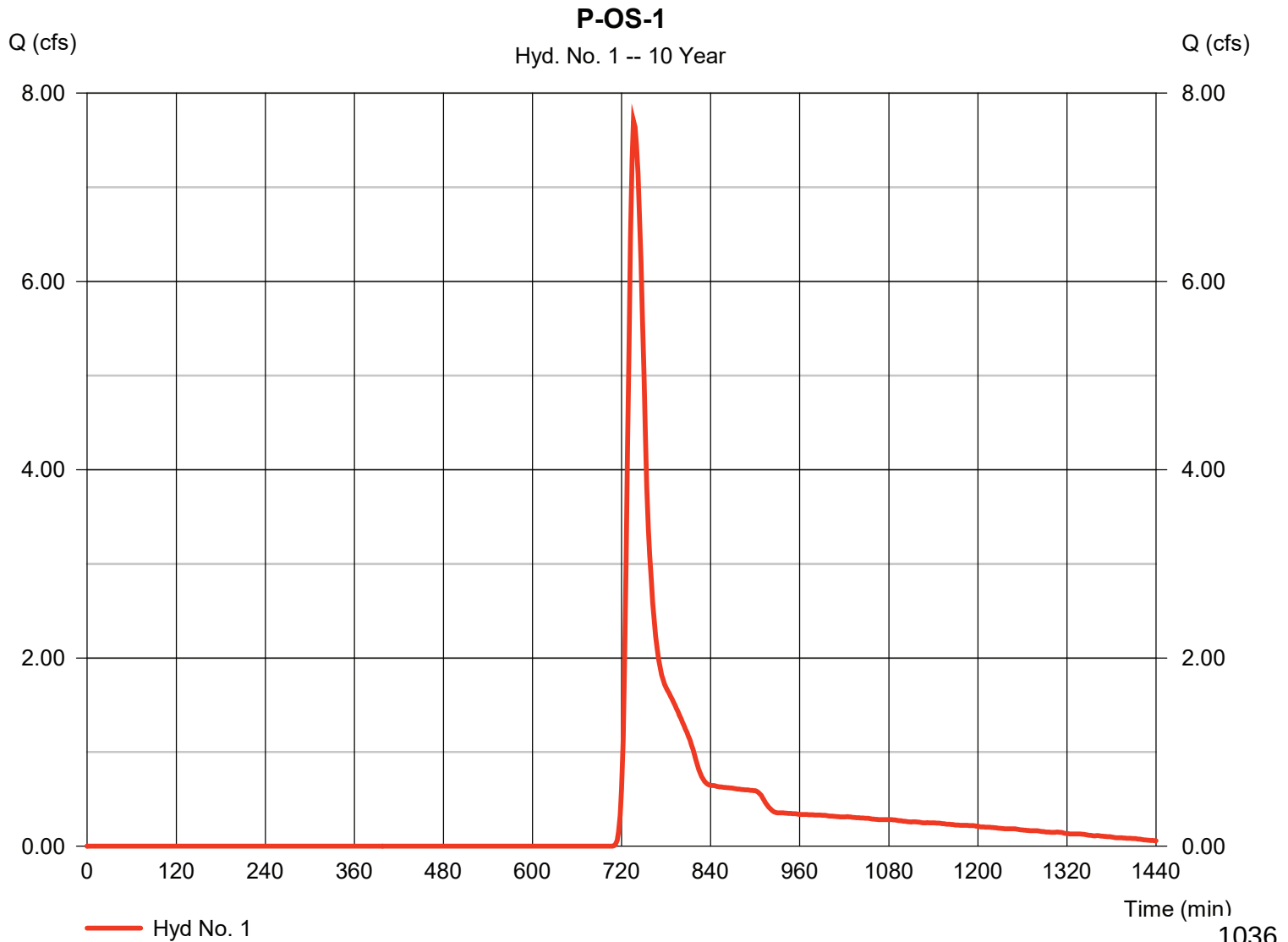
Thursday, 02 / 27 / 2020

Hyd. No. 1

P-OS-1

Hydrograph type	= SCS Runoff	Peak discharge	= 7.710 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 28,294 cuft
Drainage area	= 10.170 ac	Curve number	= 62*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.90 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = $[(8.870 \times 61) + (1.300 \times 86)] / 10.170$



Precipitation Report

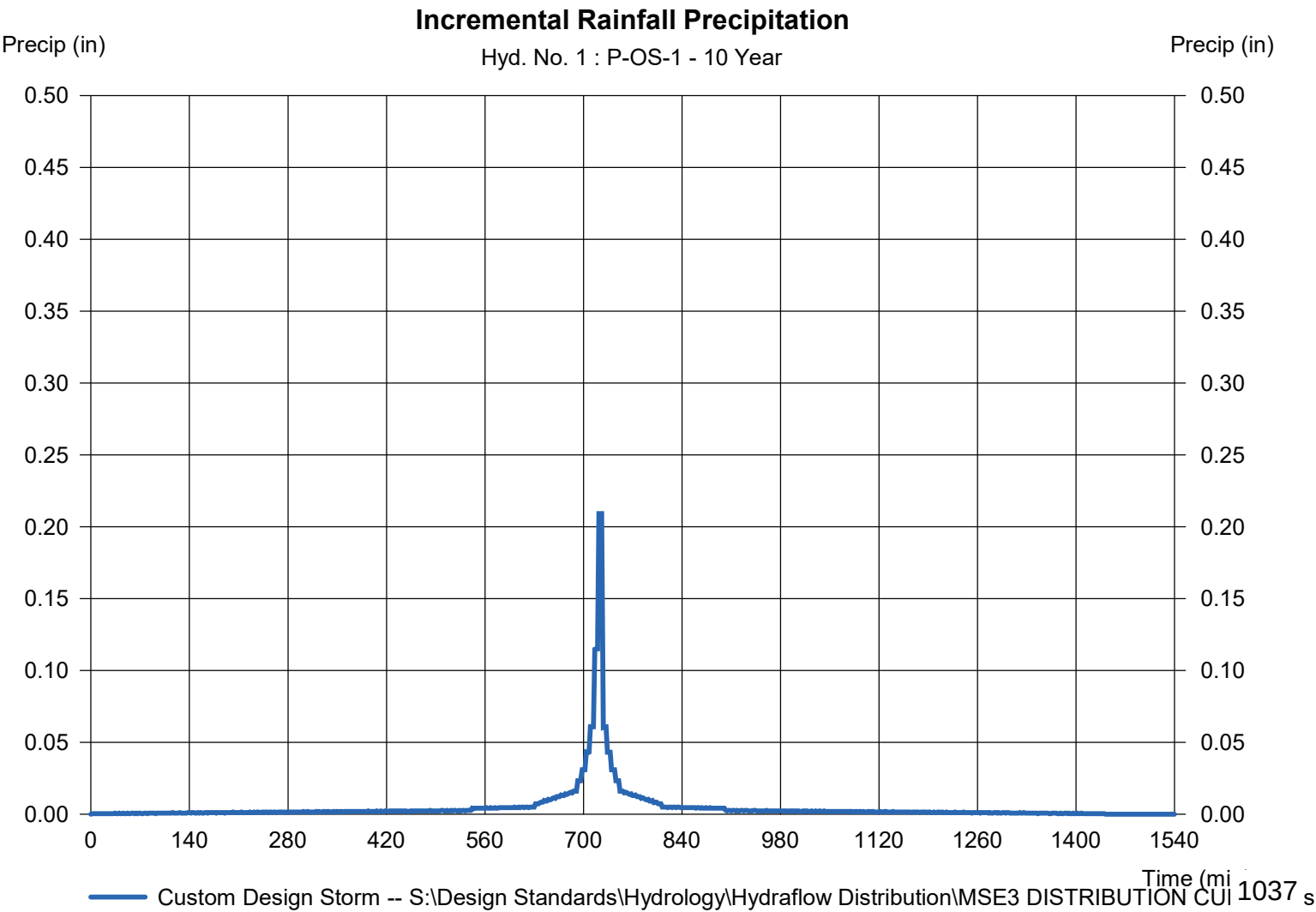
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 1

P-OS-1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

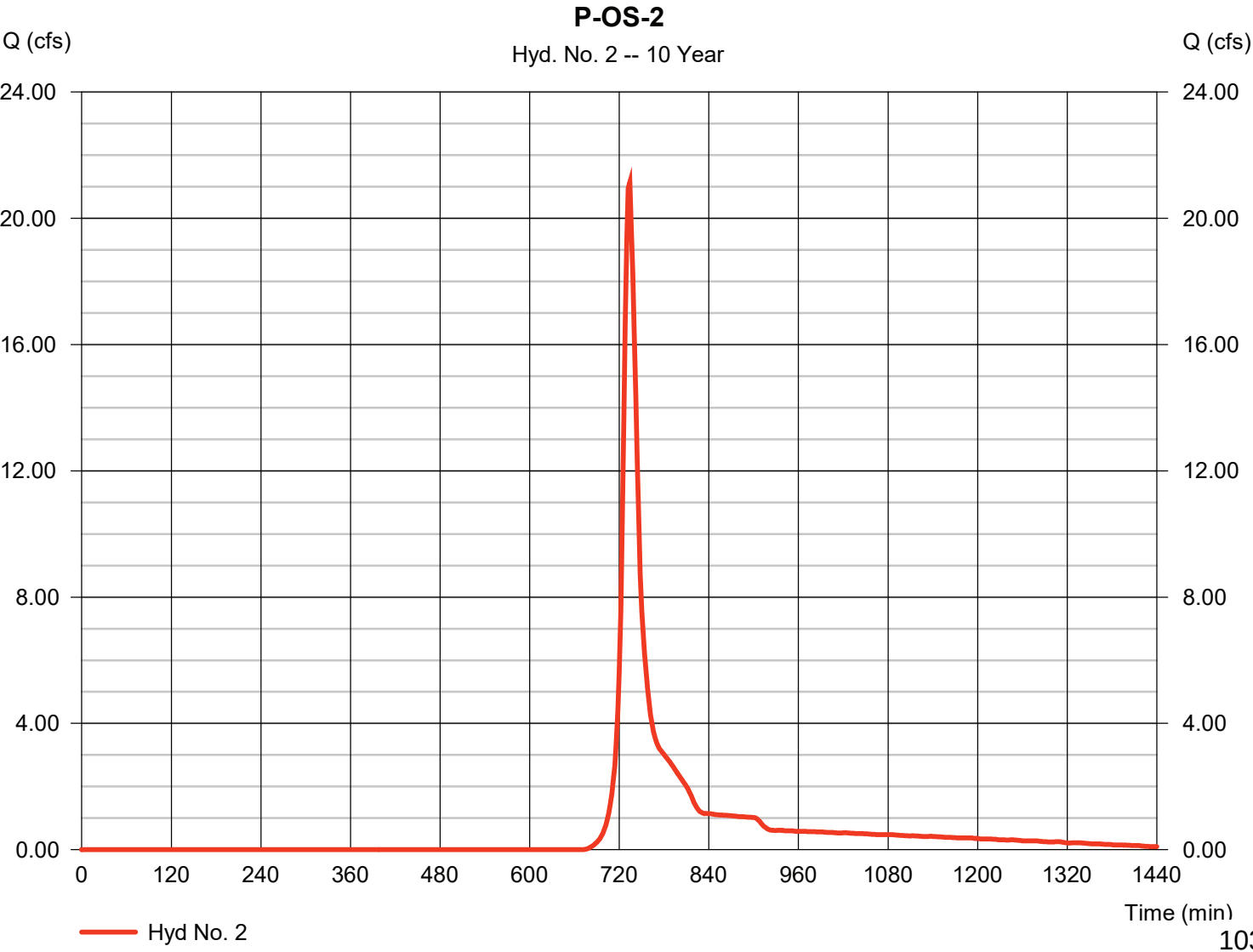
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Hydrograph type	= SCS Runoff	Peak discharge	= 21.14 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 60,229 cuft
Drainage area	= 12.810 ac	Curve number	= 72
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.80 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

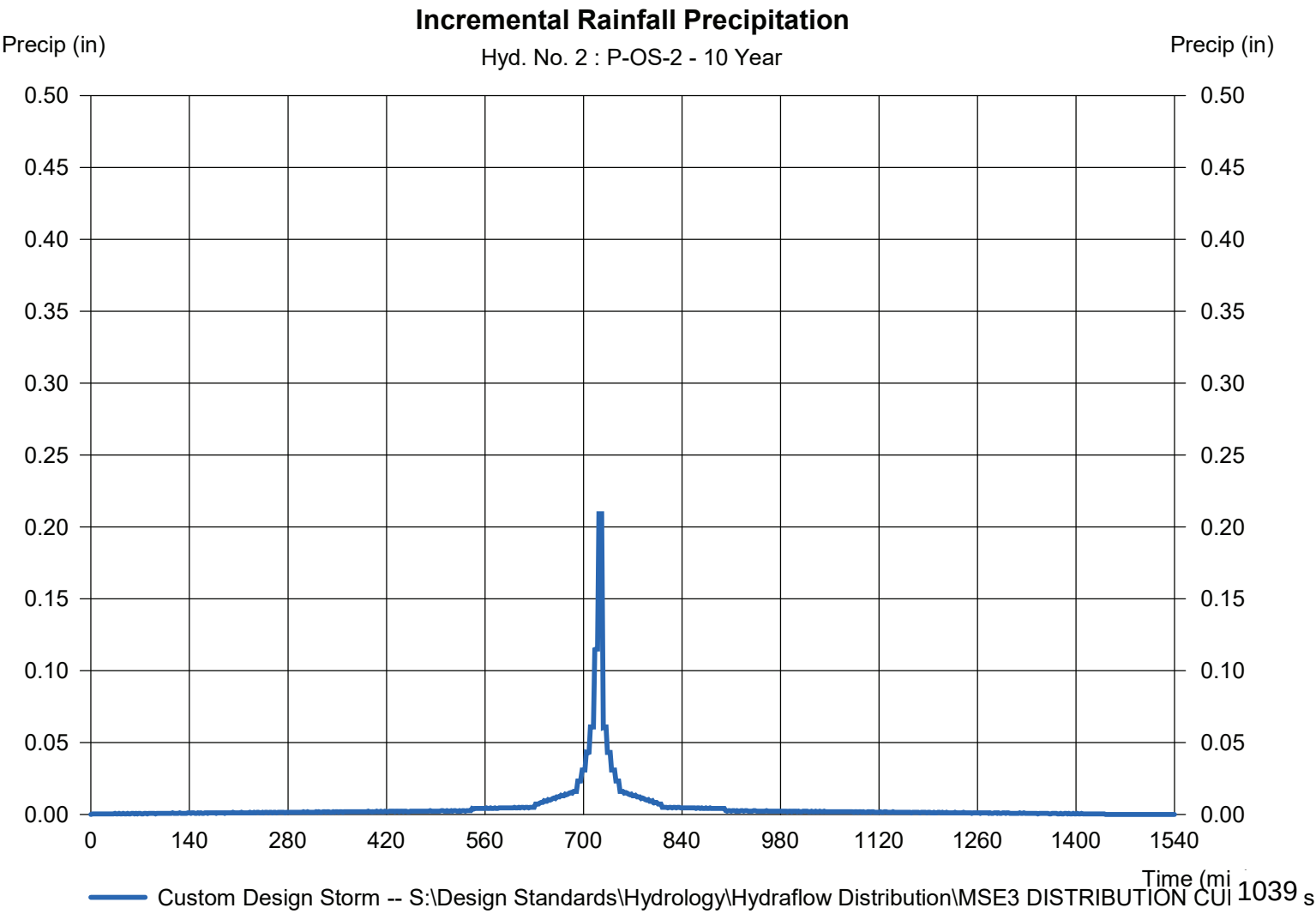
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

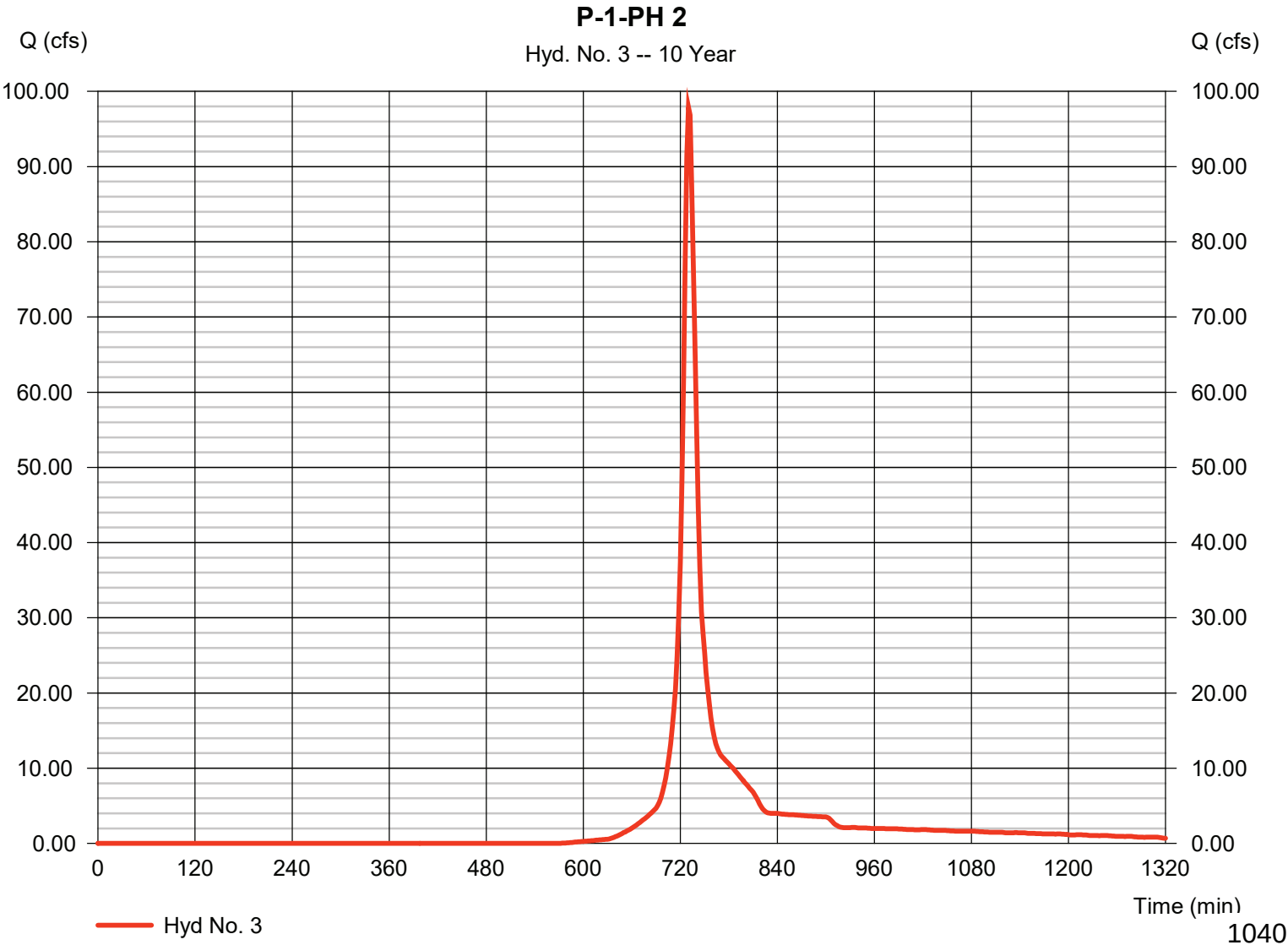
Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Hydrograph type	= SCS Runoff	Peak discharge	= 97.88 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 251,711 cuft
Drainage area	= 32.936 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 32.936



Precipitation Report

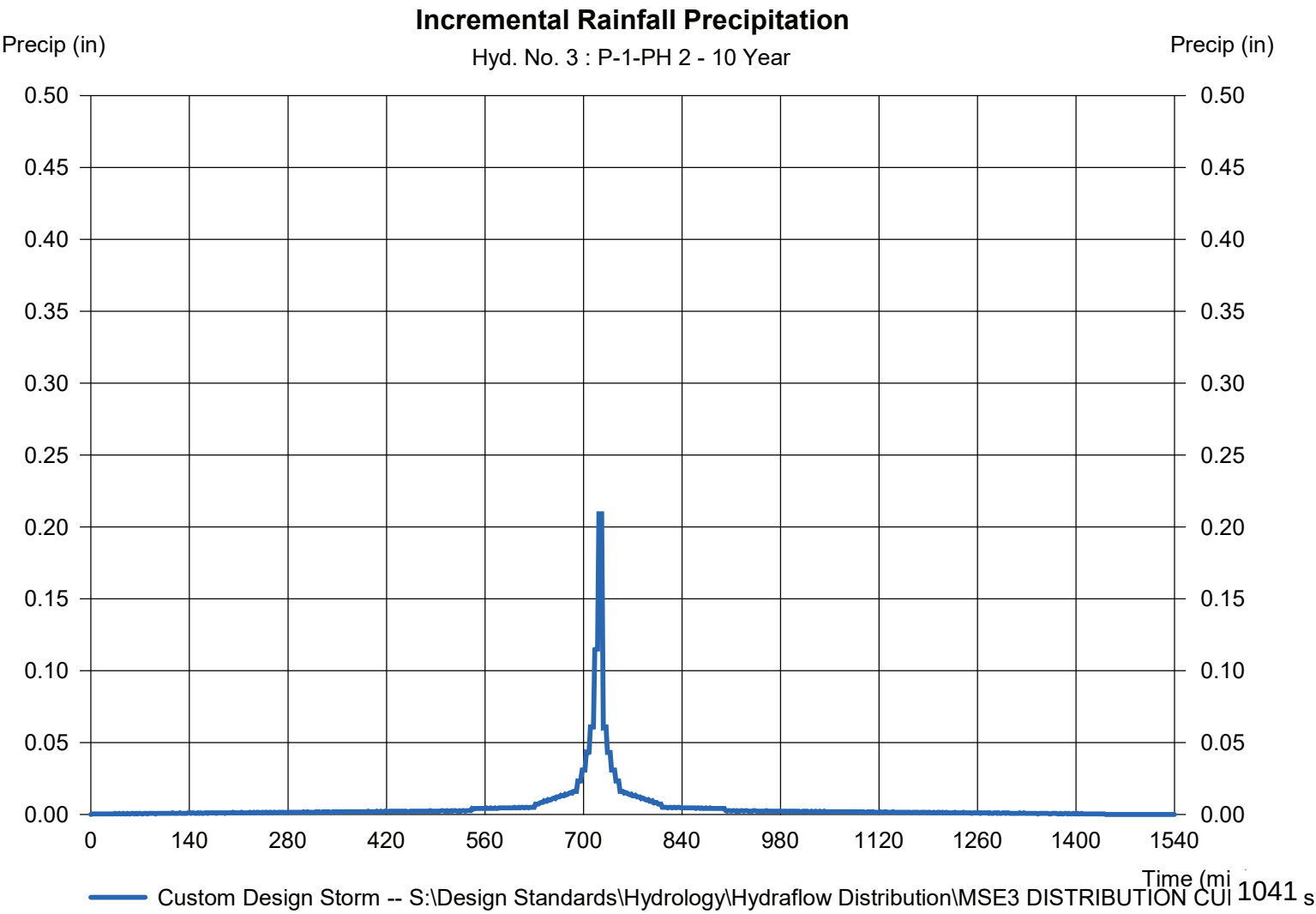
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

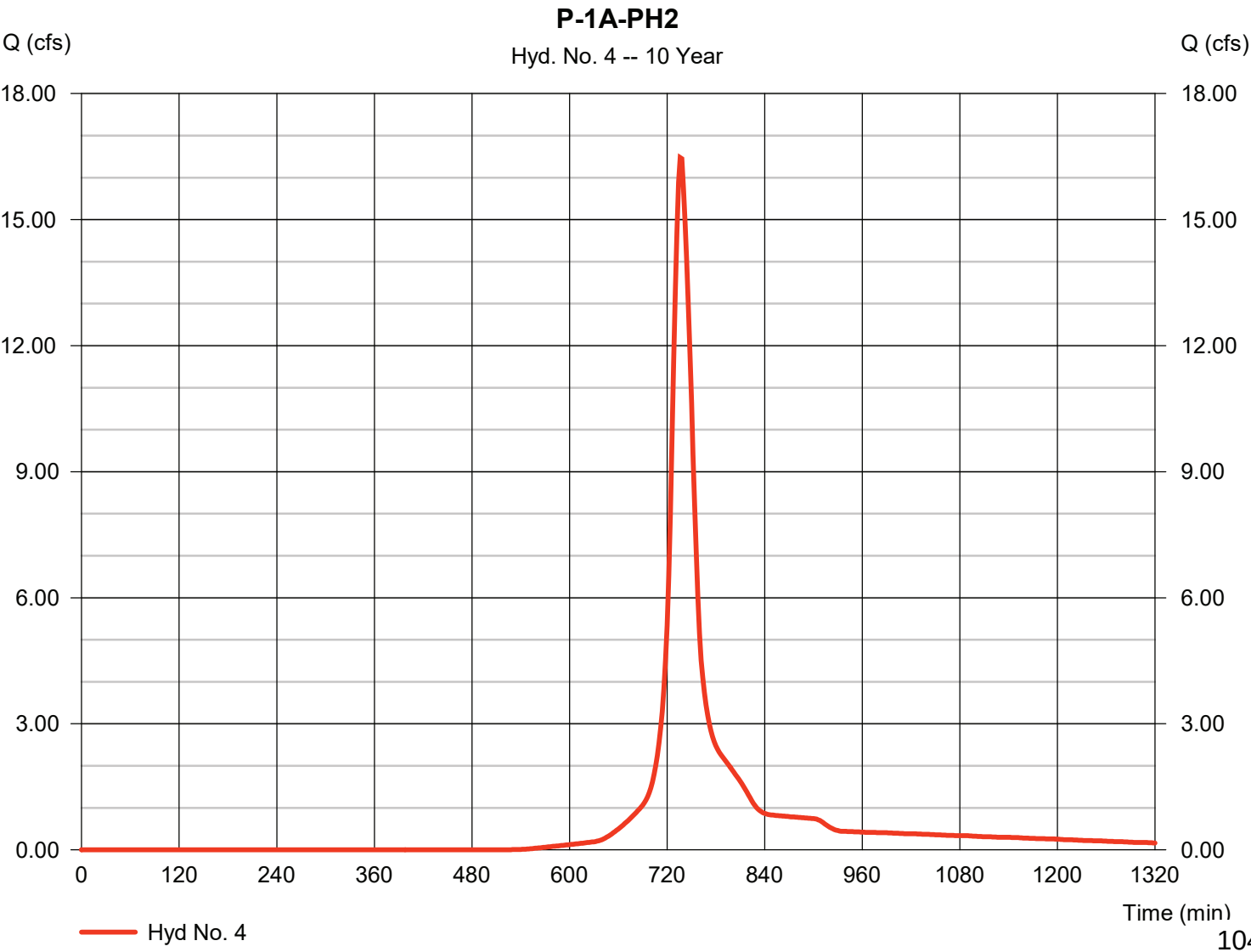
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 16.48 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 55,872 cuft
Drainage area	= 6.607 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

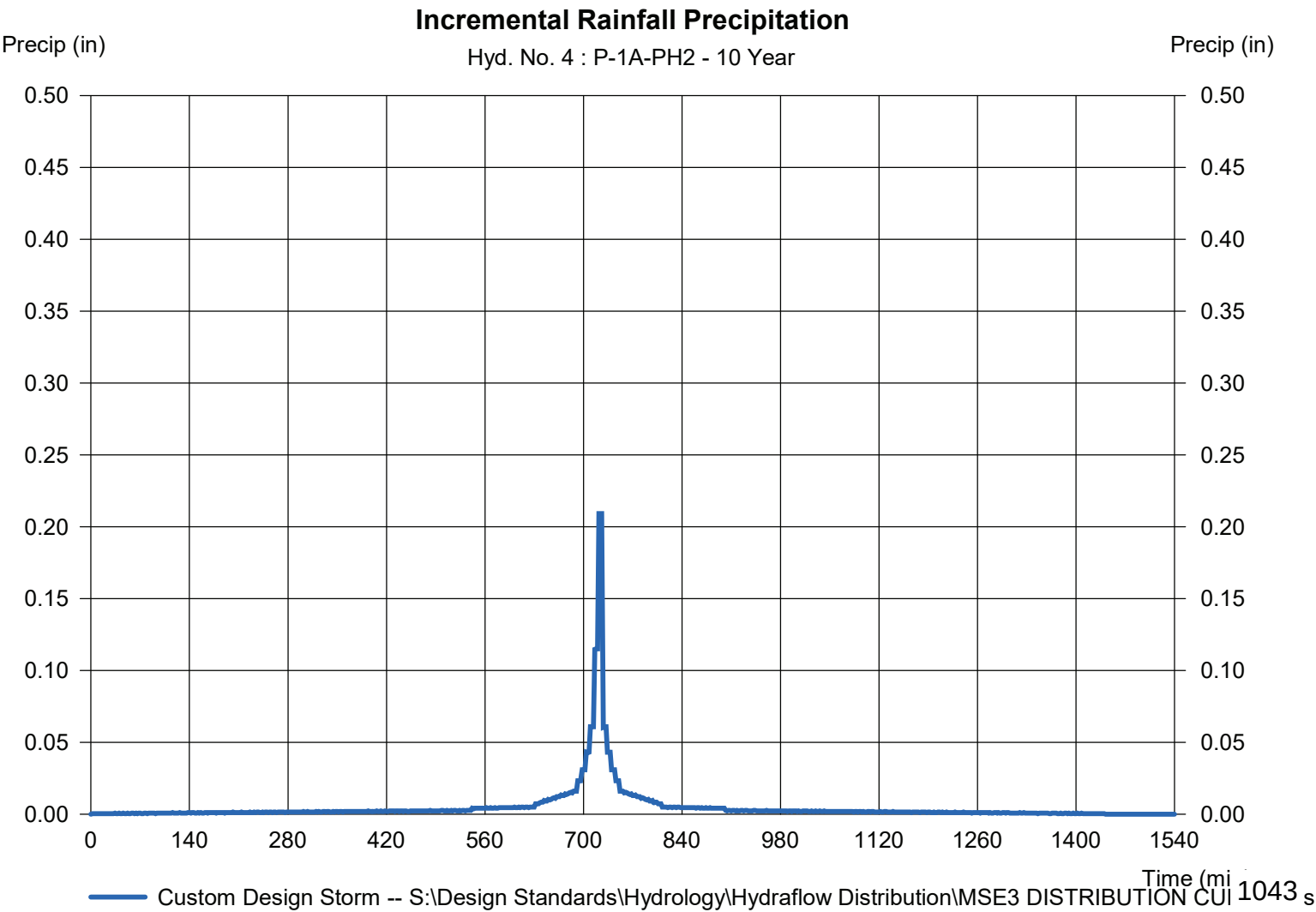
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

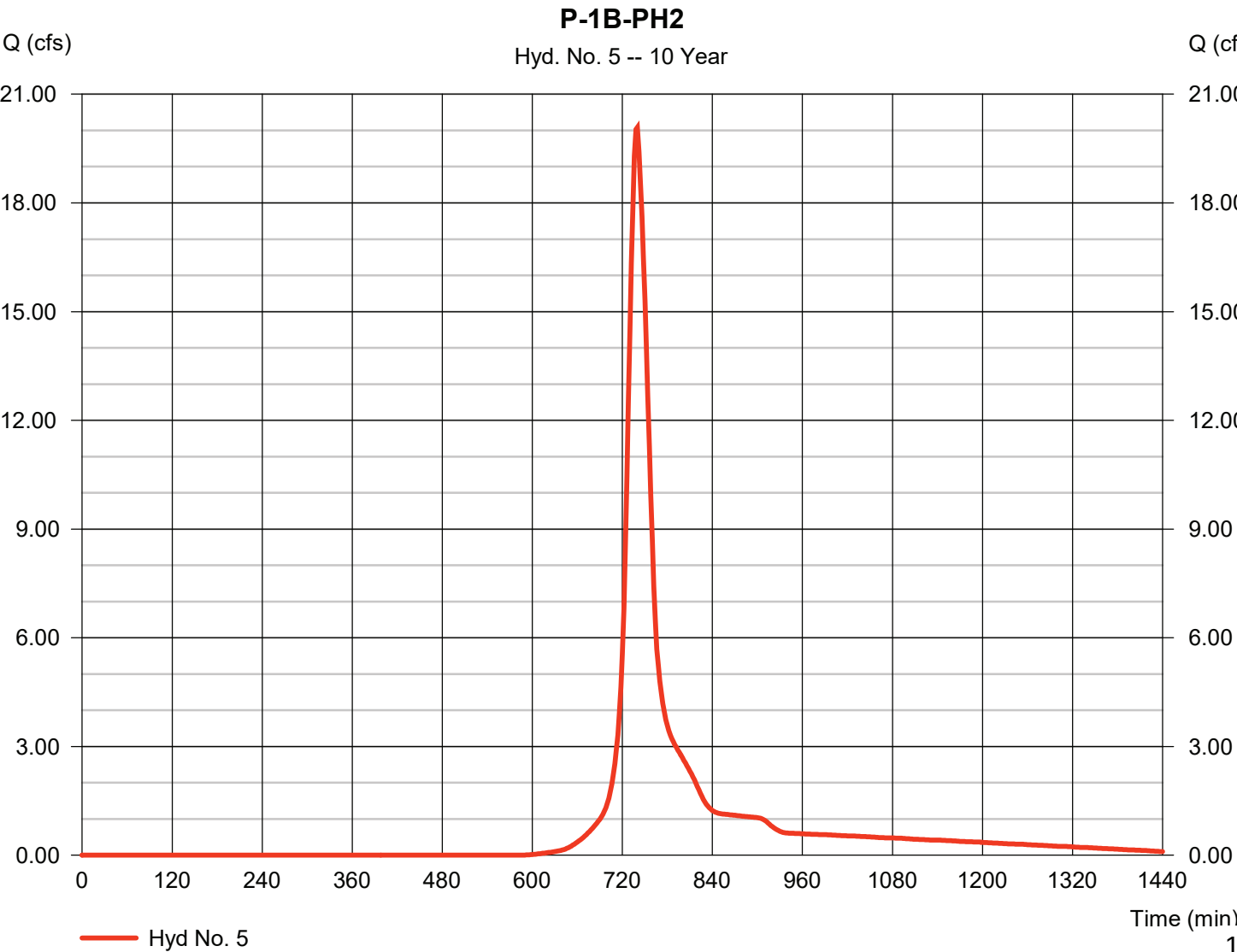
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 20.09 cfs
Storm frequency	= 10 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 71,706 cuft
Drainage area	= 10.224 ac	Curve number	= 81
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 26.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD DISTRIBUTION CURVE		



Precipitation Report

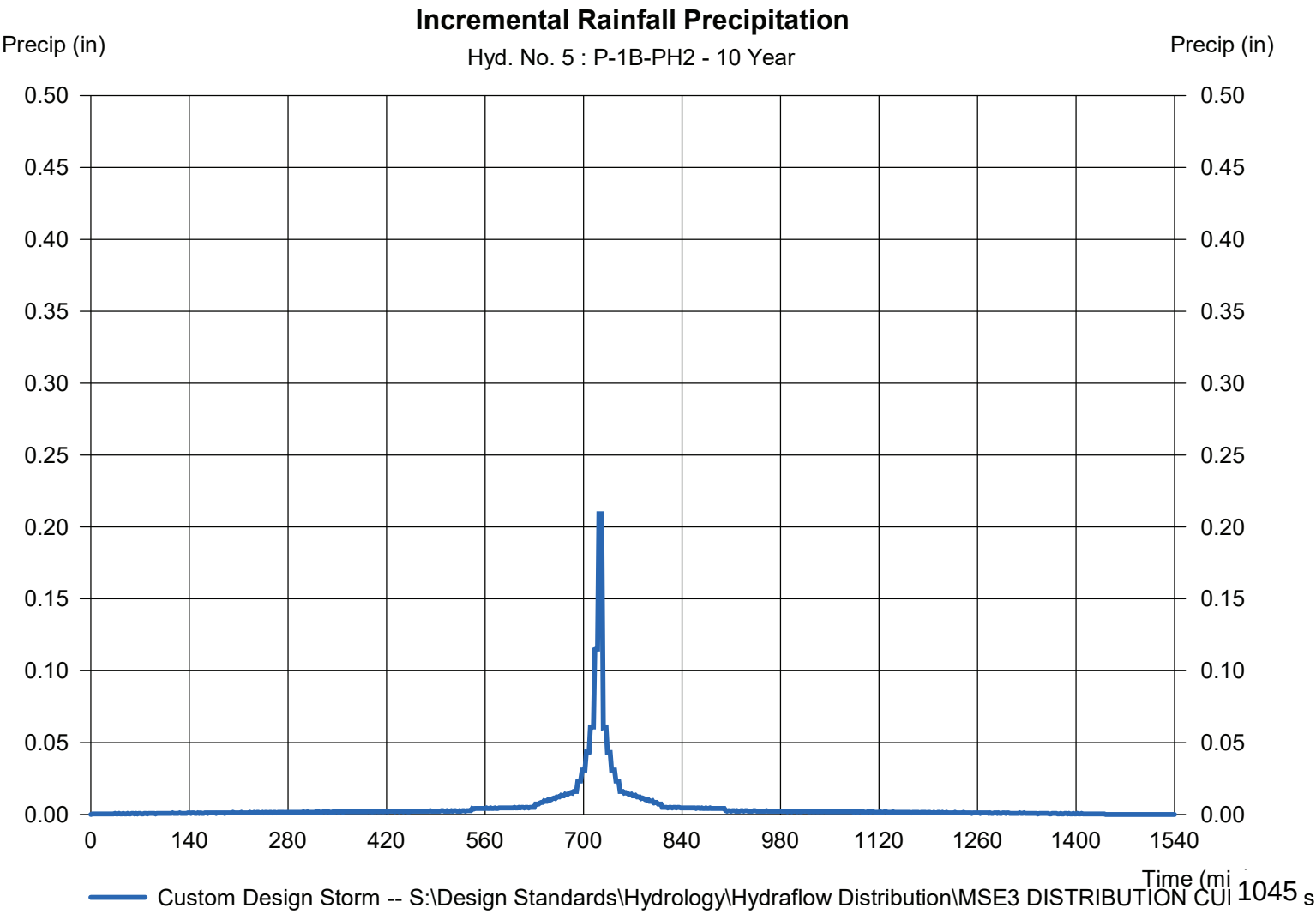
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION CUI		



Hydrograph Report

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

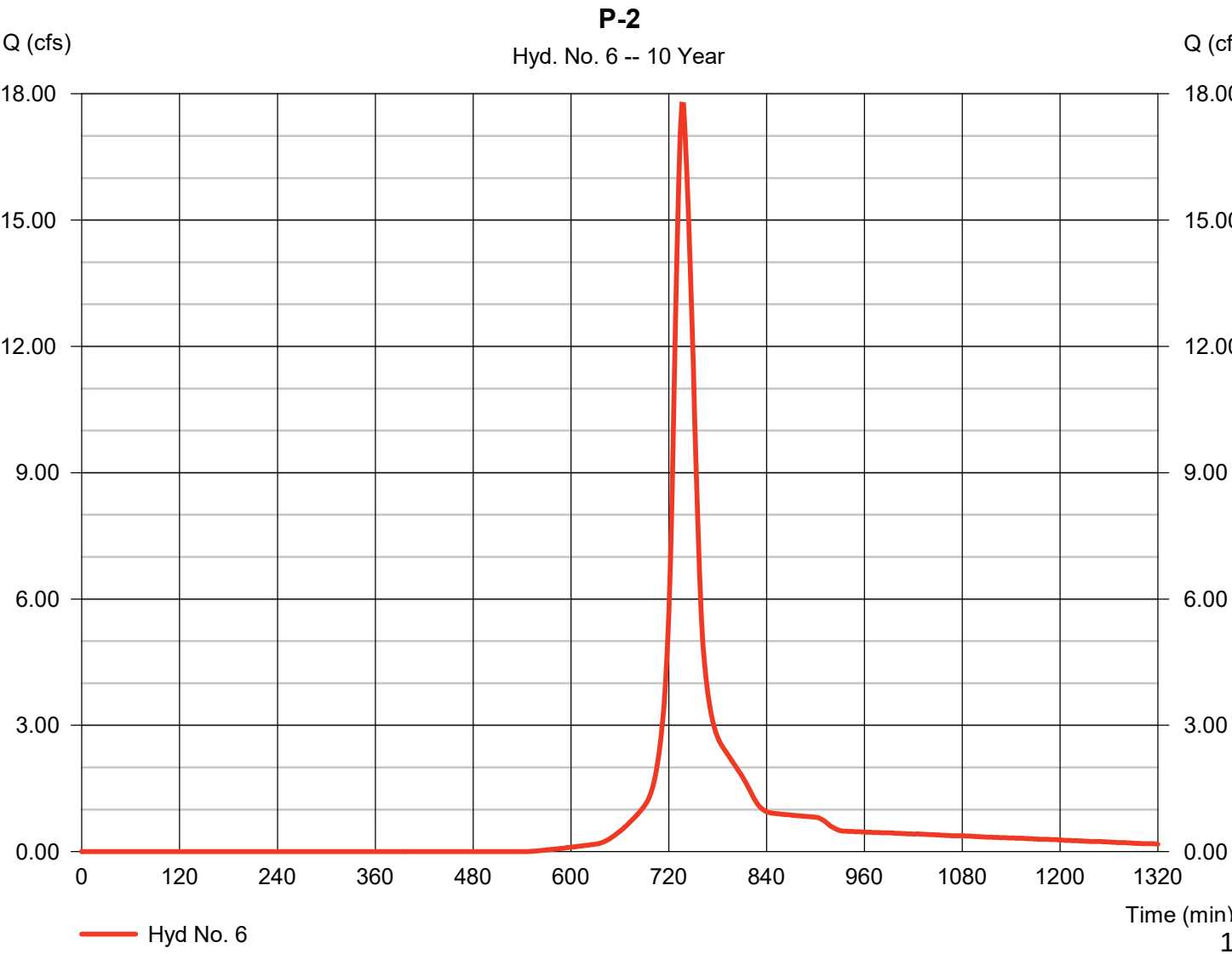
Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 17.75 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 60,152 cuft
Drainage area	= 7.385 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.710 x 75)] / 7.385



Precipitation Report

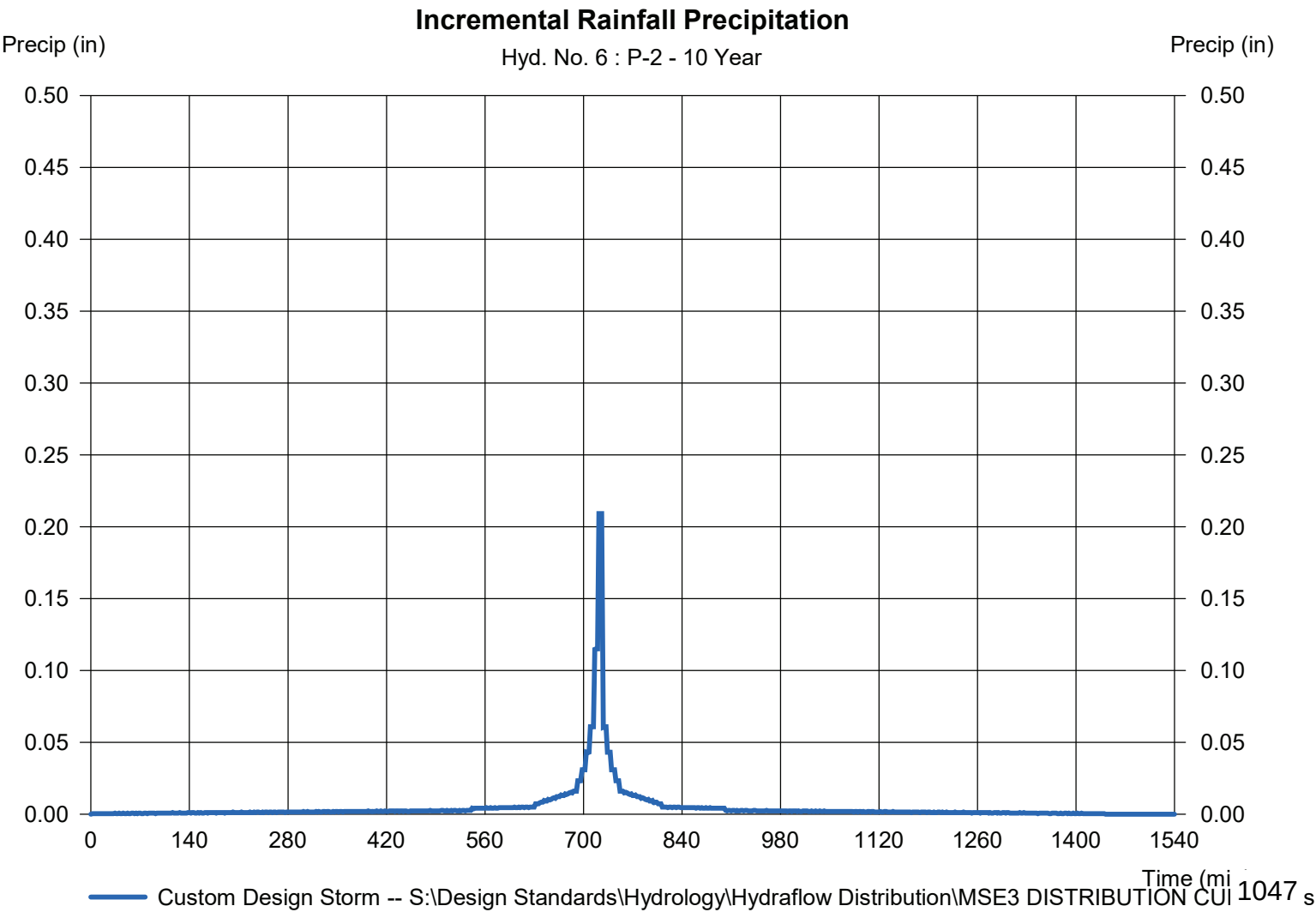
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION CUI		



Hydrograph Report

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

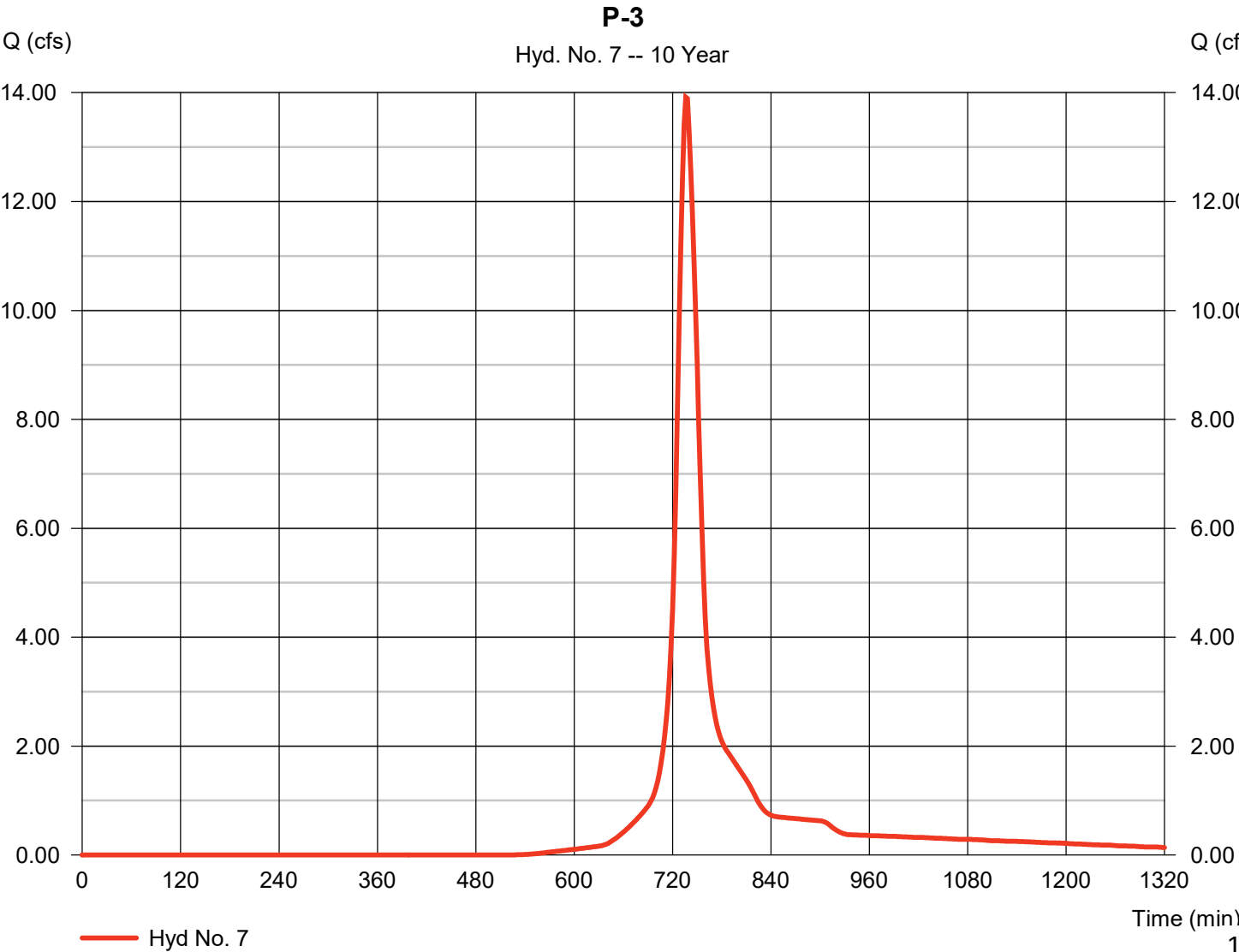
Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 13.92 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 47,179 cuft
Drainage area	= 5.579 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.20 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.579



Precipitation Report

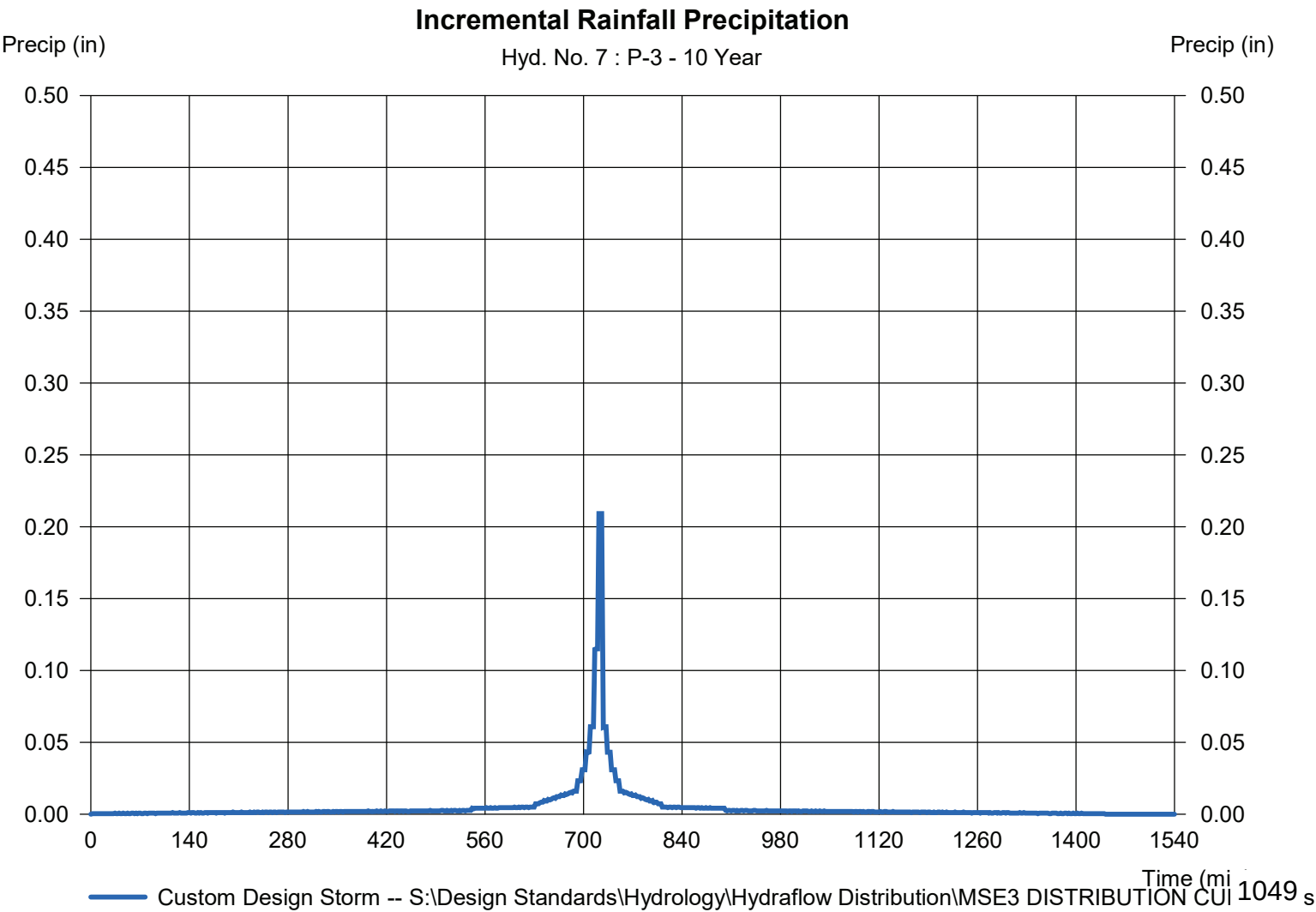
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

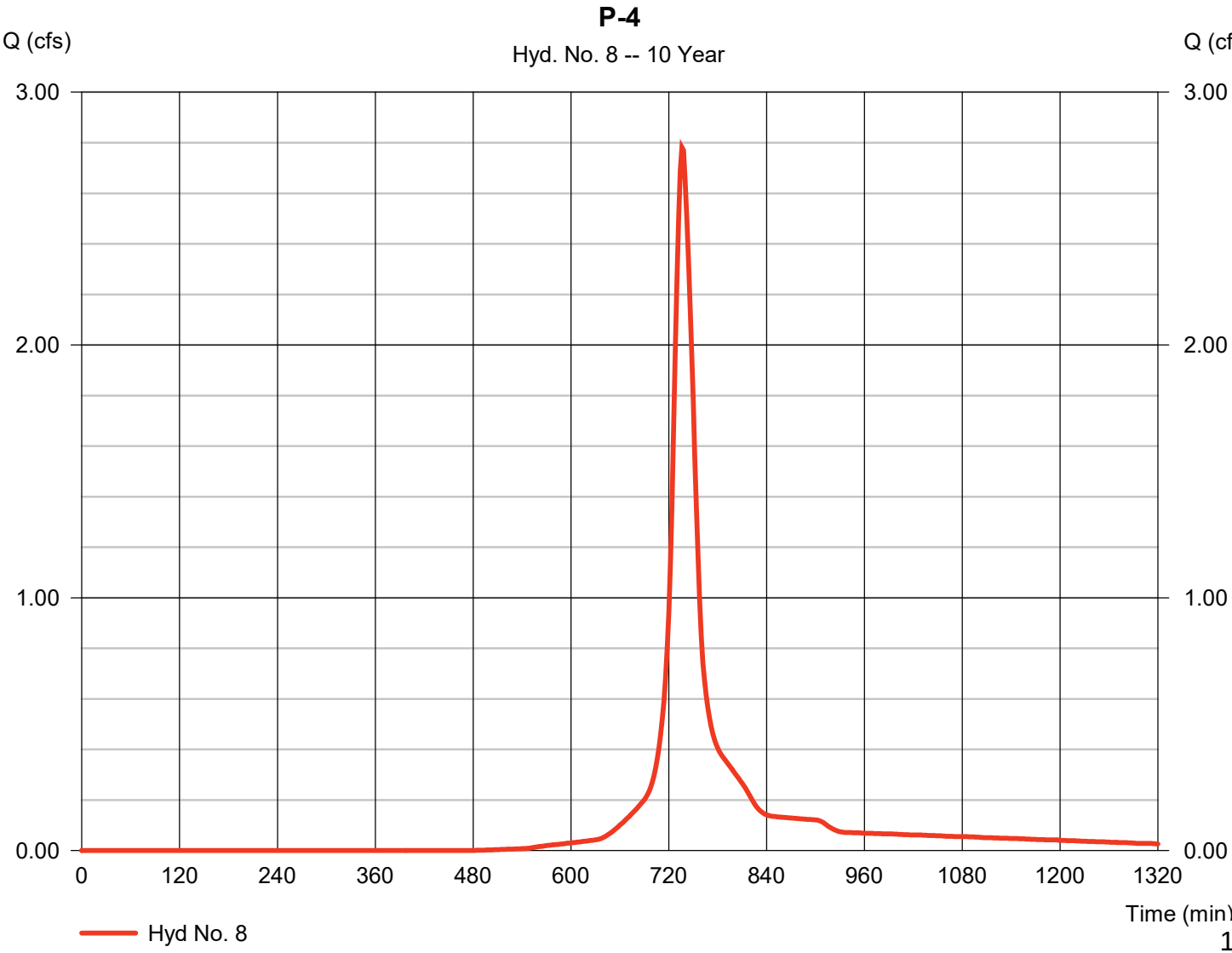
Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 2.782 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 9,464 cuft
Drainage area	= 1.040 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.10 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

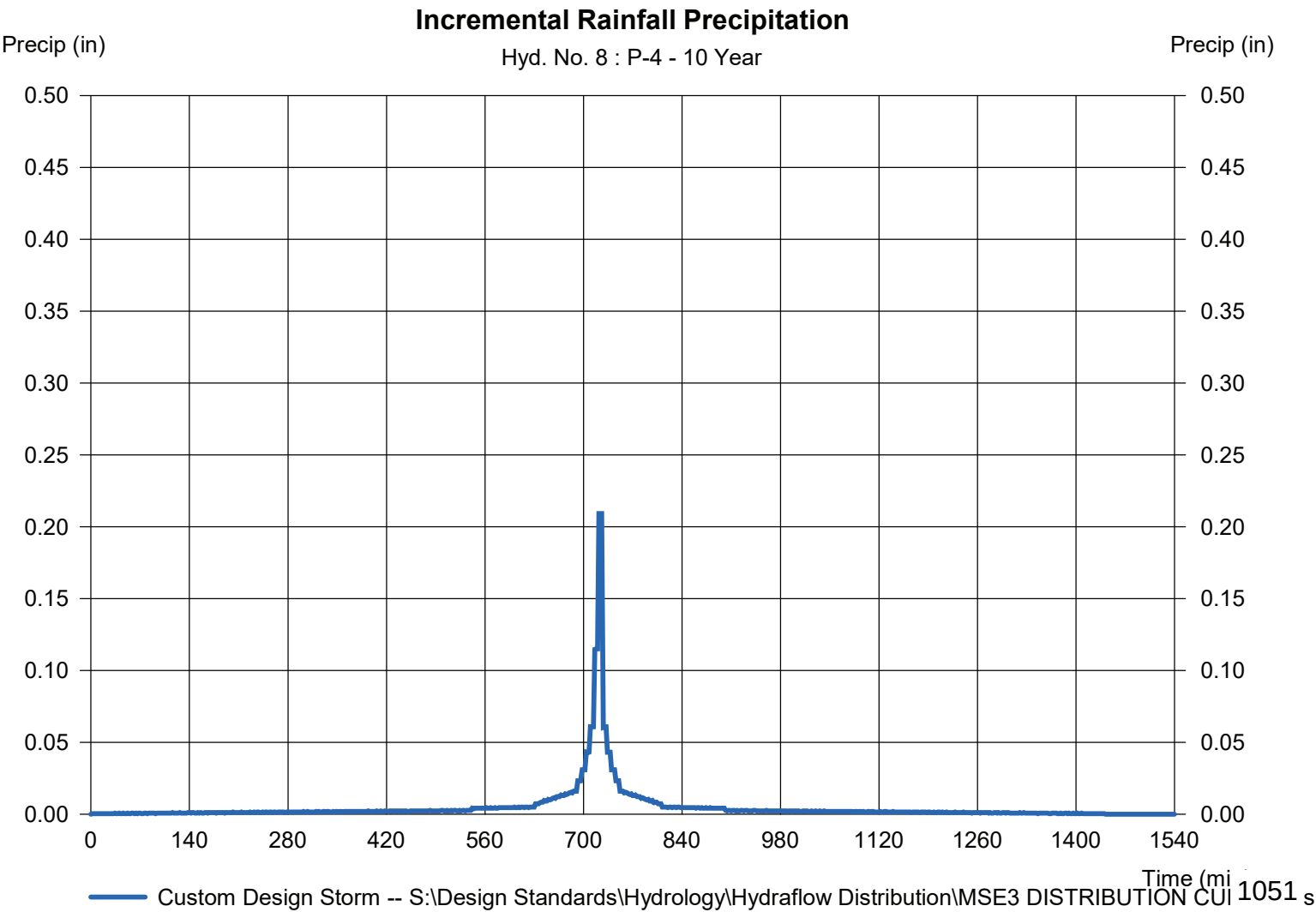
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

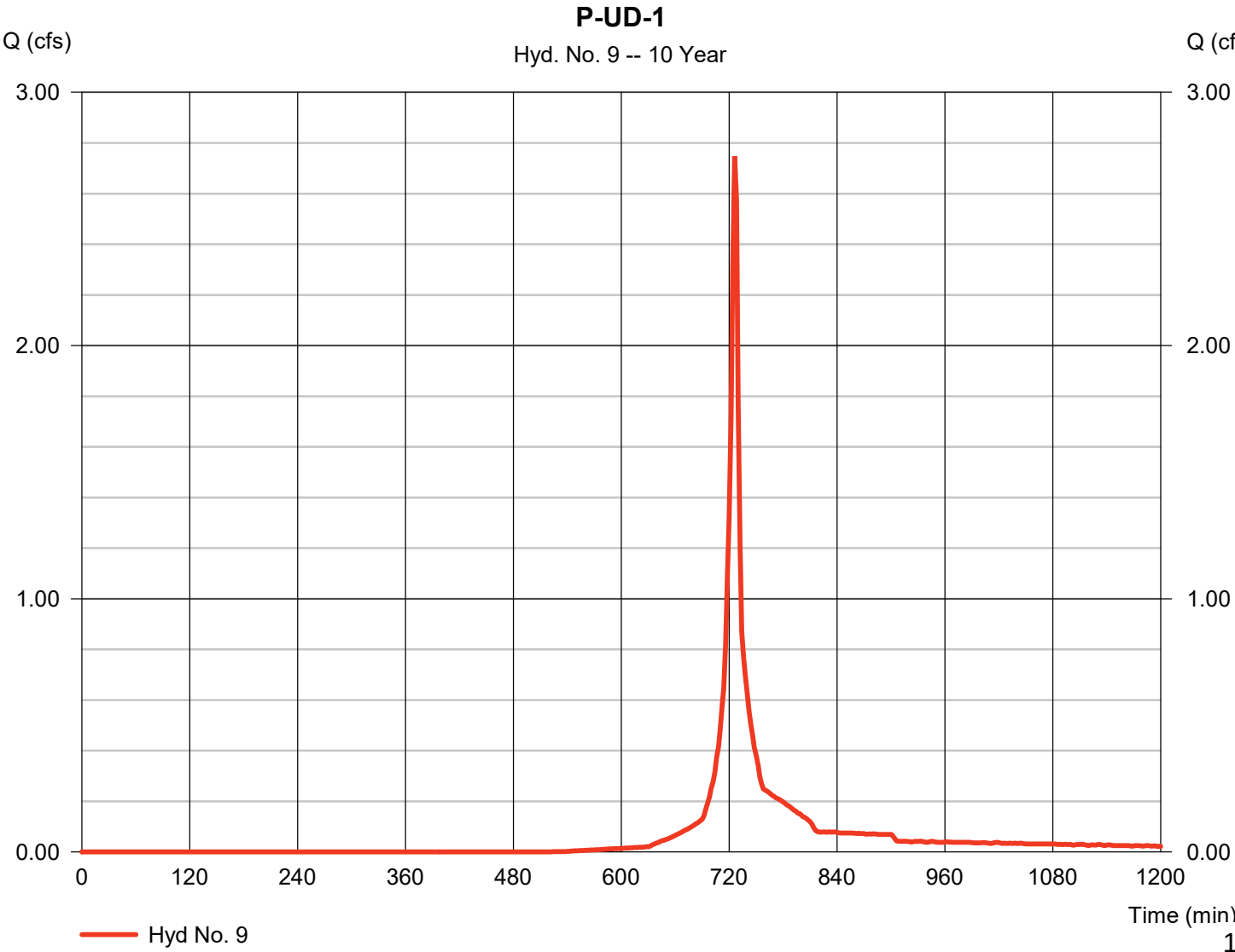
Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.747 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	5,219 cuft
Drainage area	=	0.670 ac	Curve number	=	85*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.81 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CURVE			

* Composite (Area/CN) = [(0.300 x 61) + (0.370 x 98)] / 0.670



Precipitation Report

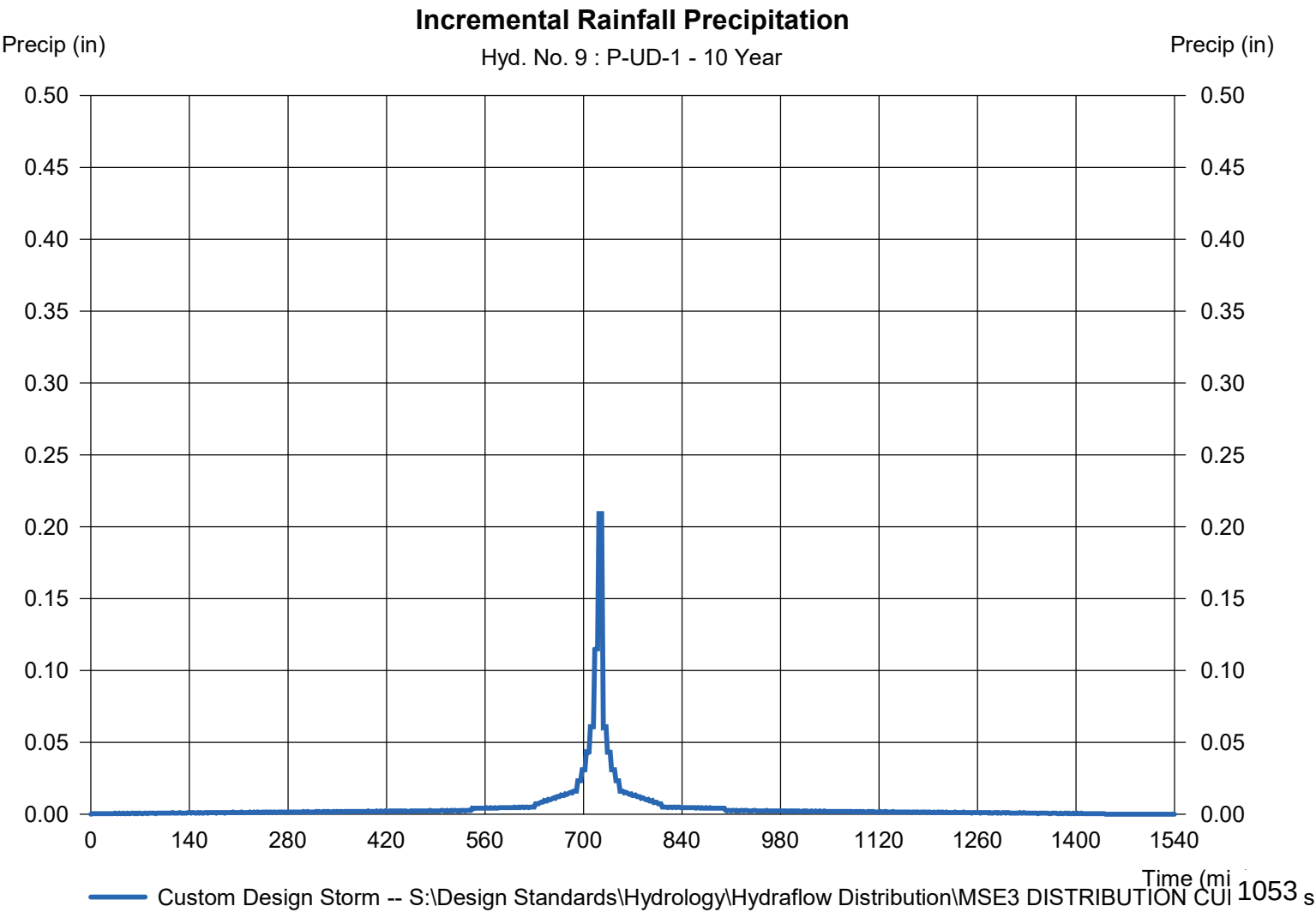
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

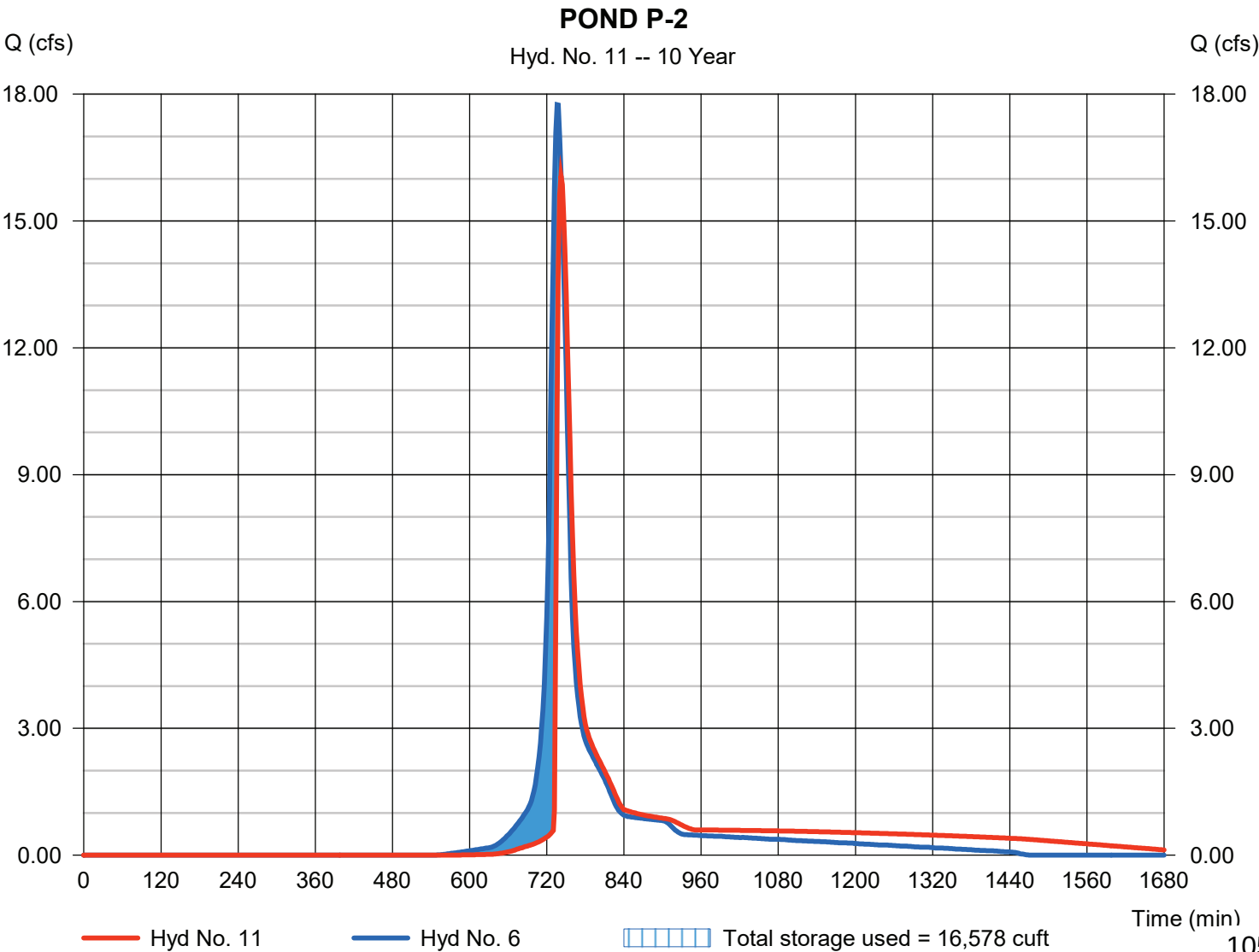
Thursday, 02 / 27 / 2020

Hyd. No. 11

POND P-2

Hydrograph type	= Reservoir	Peak discharge	= 16.07 cfs
Storm frequency	= 10 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 60,134 cuft
Inflow hyd. No.	= 6 - P-2	Max. Elevation	= 839.78 ft
Reservoir name	= POND P-2	Max. Storage	= 16,578 cuft

Storage Indication method used.



Hydrograph Report

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

Thursday, 02 / 27 / 2020

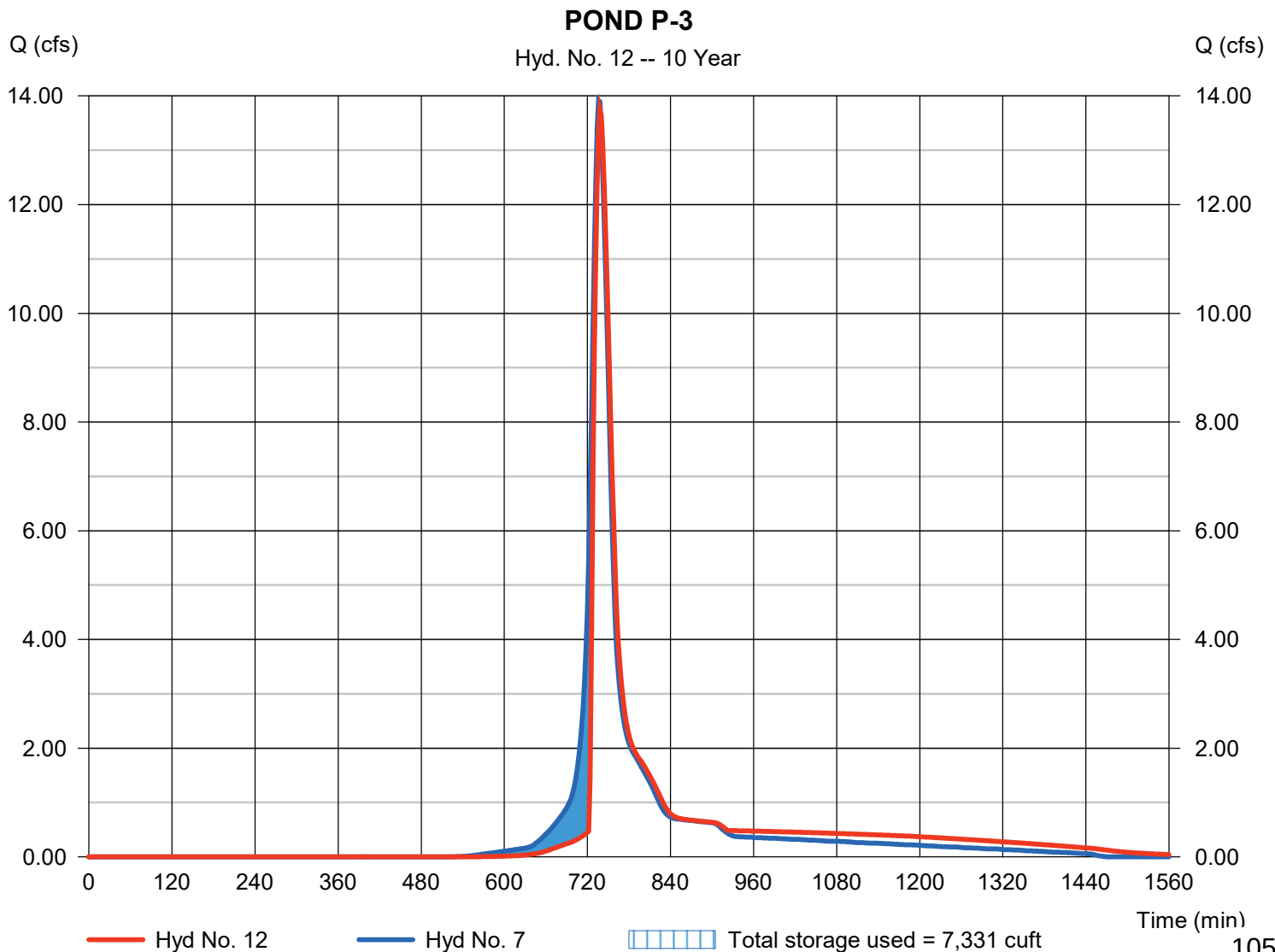
Hyd. No. 12

POND P-3

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - P-3
 Reservoir name = POND P-3

Peak discharge = 13.75 cfs
 Time to peak = 738 min
 Hyd. volume = 47,165 cuft
 Max. Elevation = 839.97 ft
 Max. Storage = 7,331 cuft

Storage Indication method used.

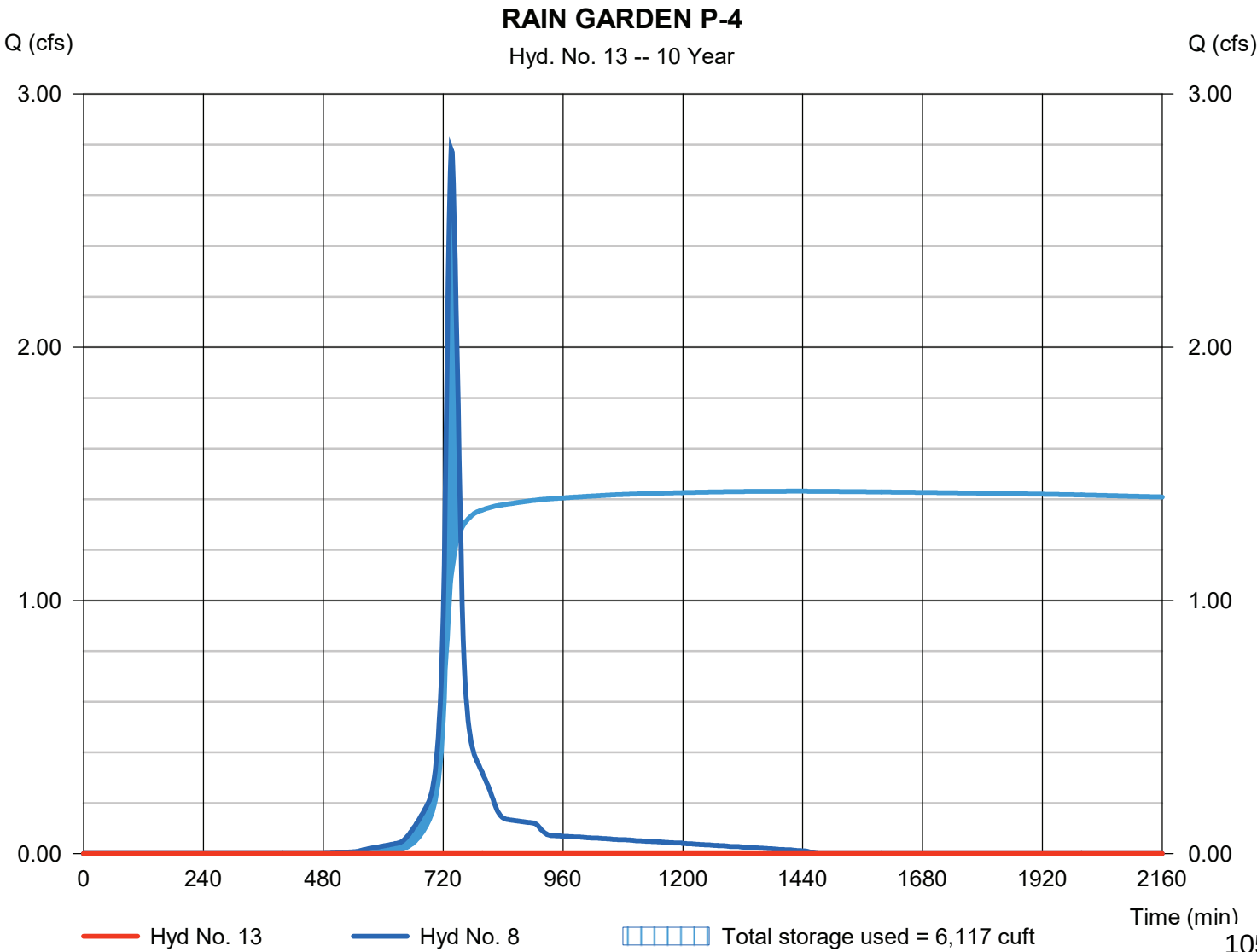


Hyd. No. 13

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 1346 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 8 - P-4	Max. Elevation	= 840.47 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 6,117 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

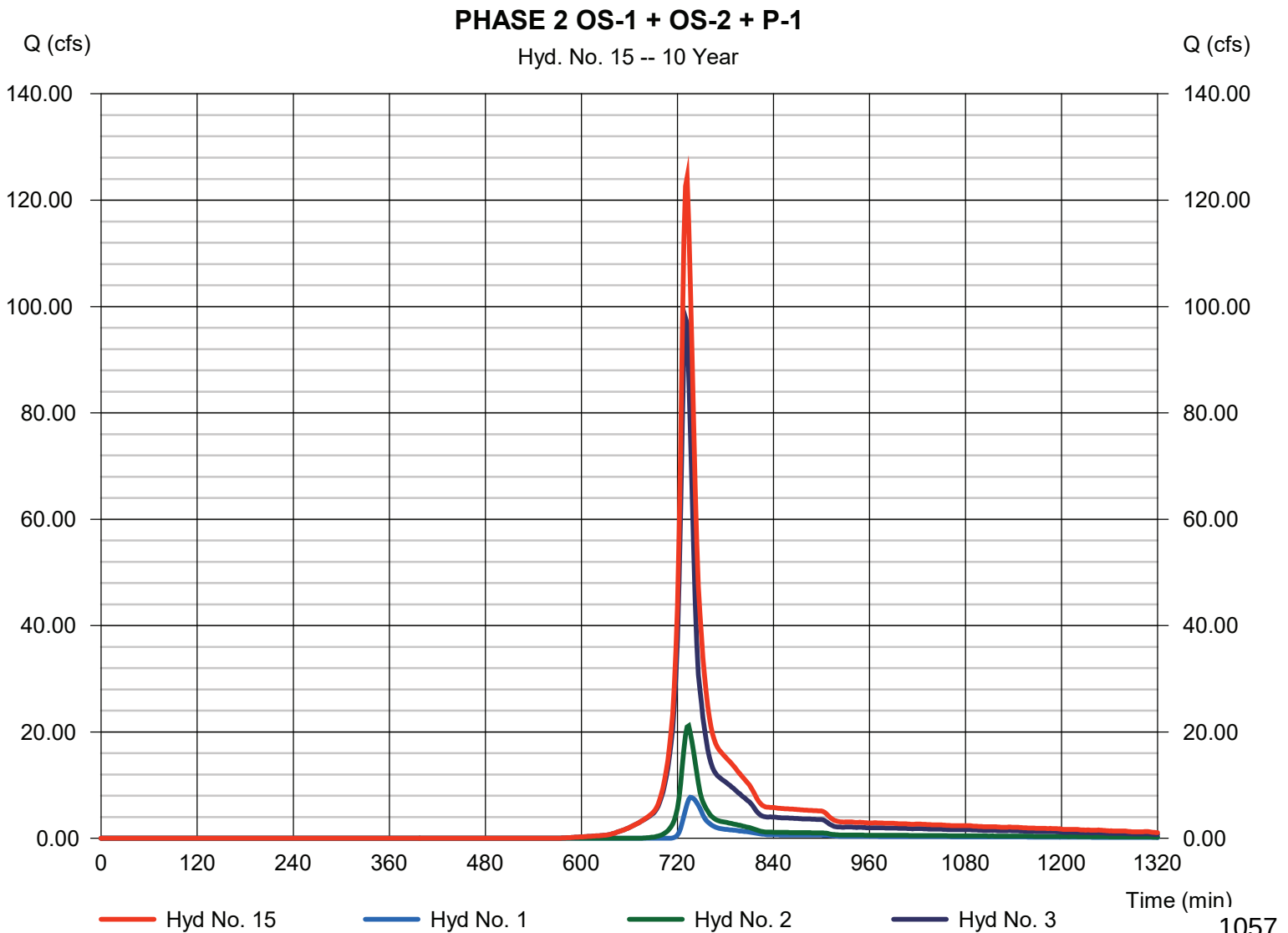
Thursday, 02 / 27 / 2020

Hyd. No. 15

PHASE 2 OS-1 + OS-2 + P-1

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 2, 3

Peak discharge = 124.29 cfs
 Time to peak = 732 min
 Hyd. volume = 340,233 cuft
 Contrib. drain. area = 55.916 ac



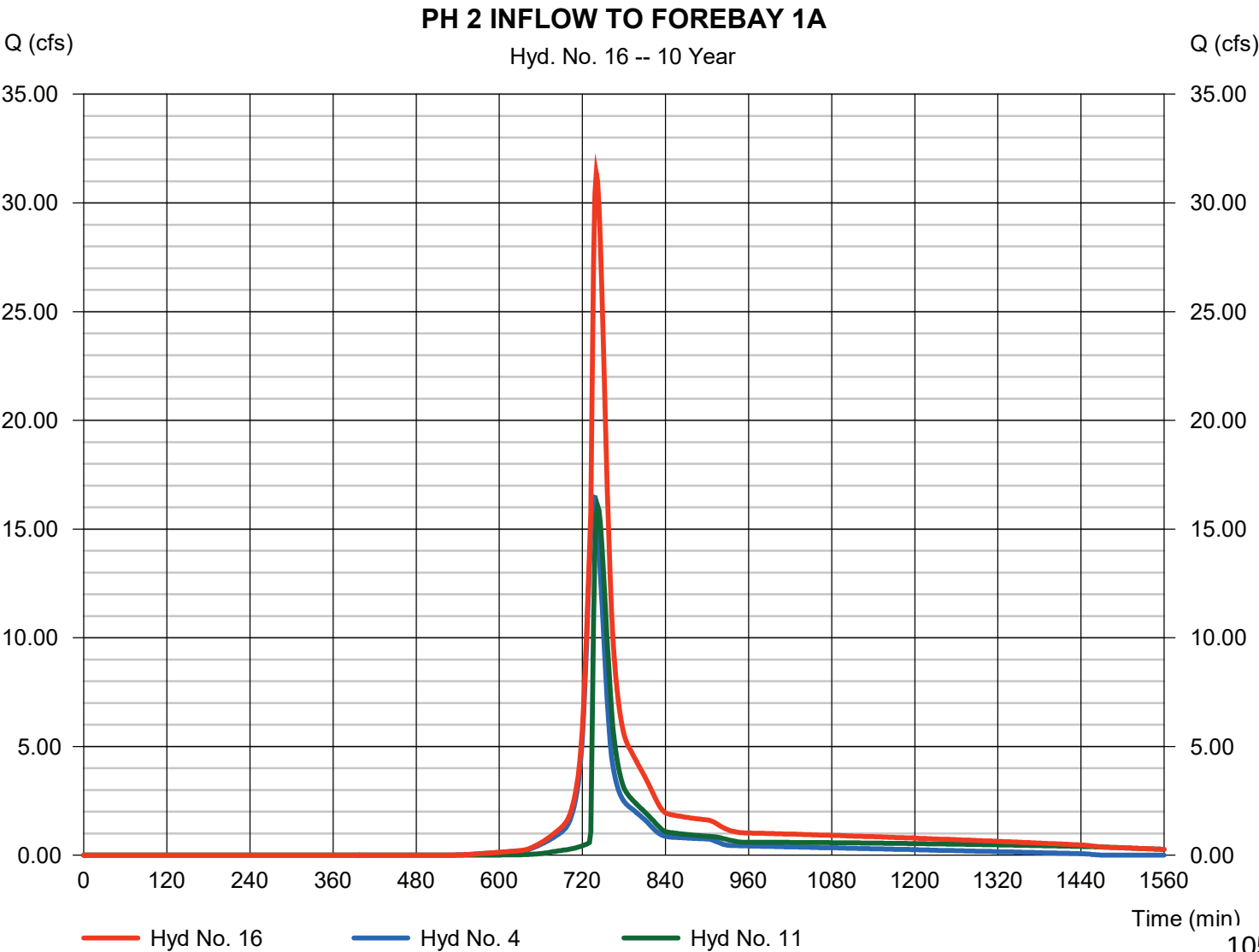
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020
Thursday, 02 / 27 / 2020

Hyd. No. 16

PH 2 INFLOW TO FOREBAY 1A

Hydrograph type	= Combine	Peak discharge	= 31.35 cfs
Storm frequency	= 10 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 116,006 cuft
Inflow hyds.	= 4, 11	Contrib. drain. area	= 6.607 ac



Hydrograph Report

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

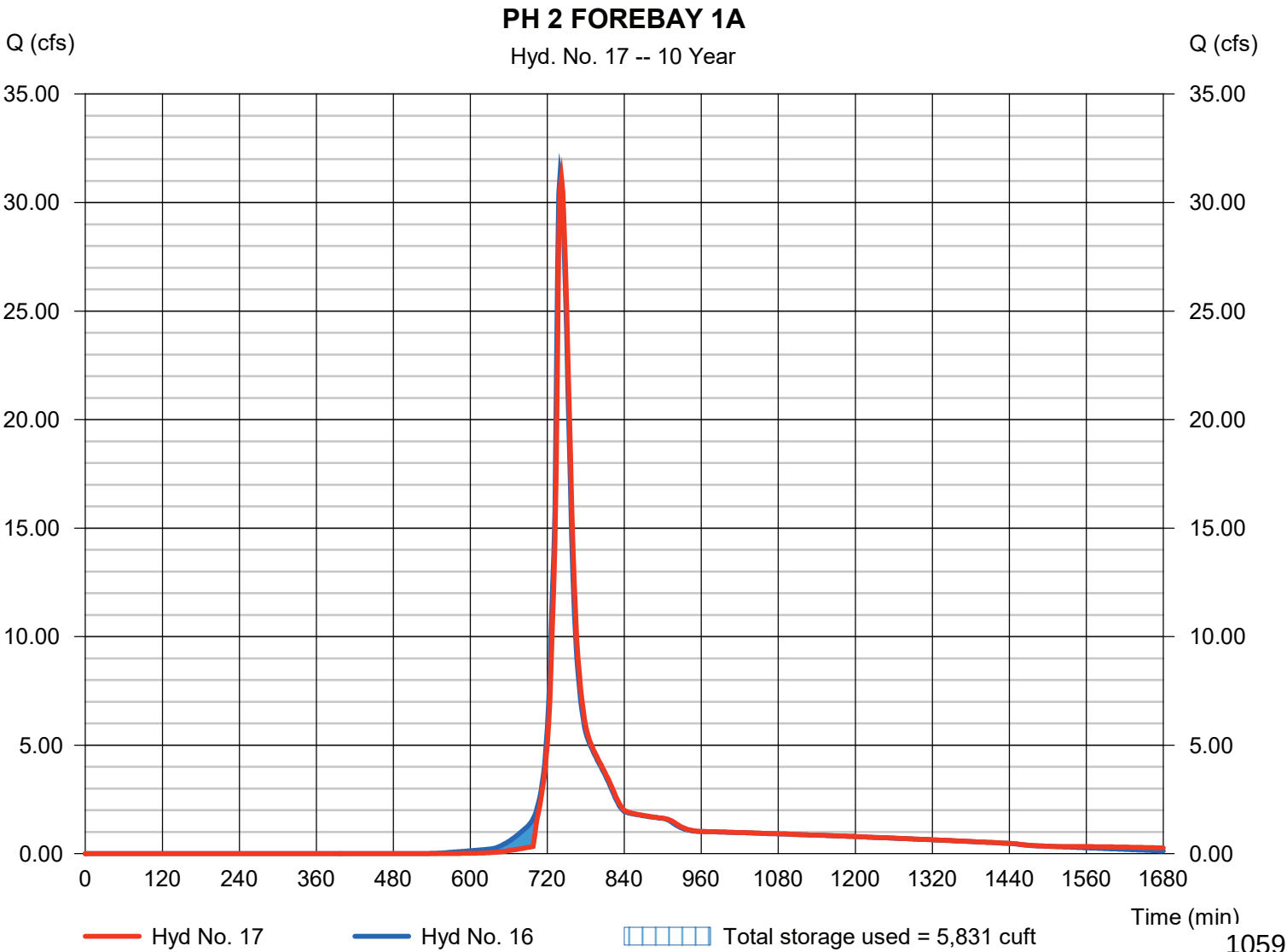
Thursday, 02 / 27 / 2020

Hyd. No. 17

PH 2 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 31.12 cfs
Storm frequency	= 10 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 115,991 cuft
Inflow hyd. No.	= 16 - PH 2 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.50 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 5,831 cuft

Storage Indication method used.



Hydrograph Report

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

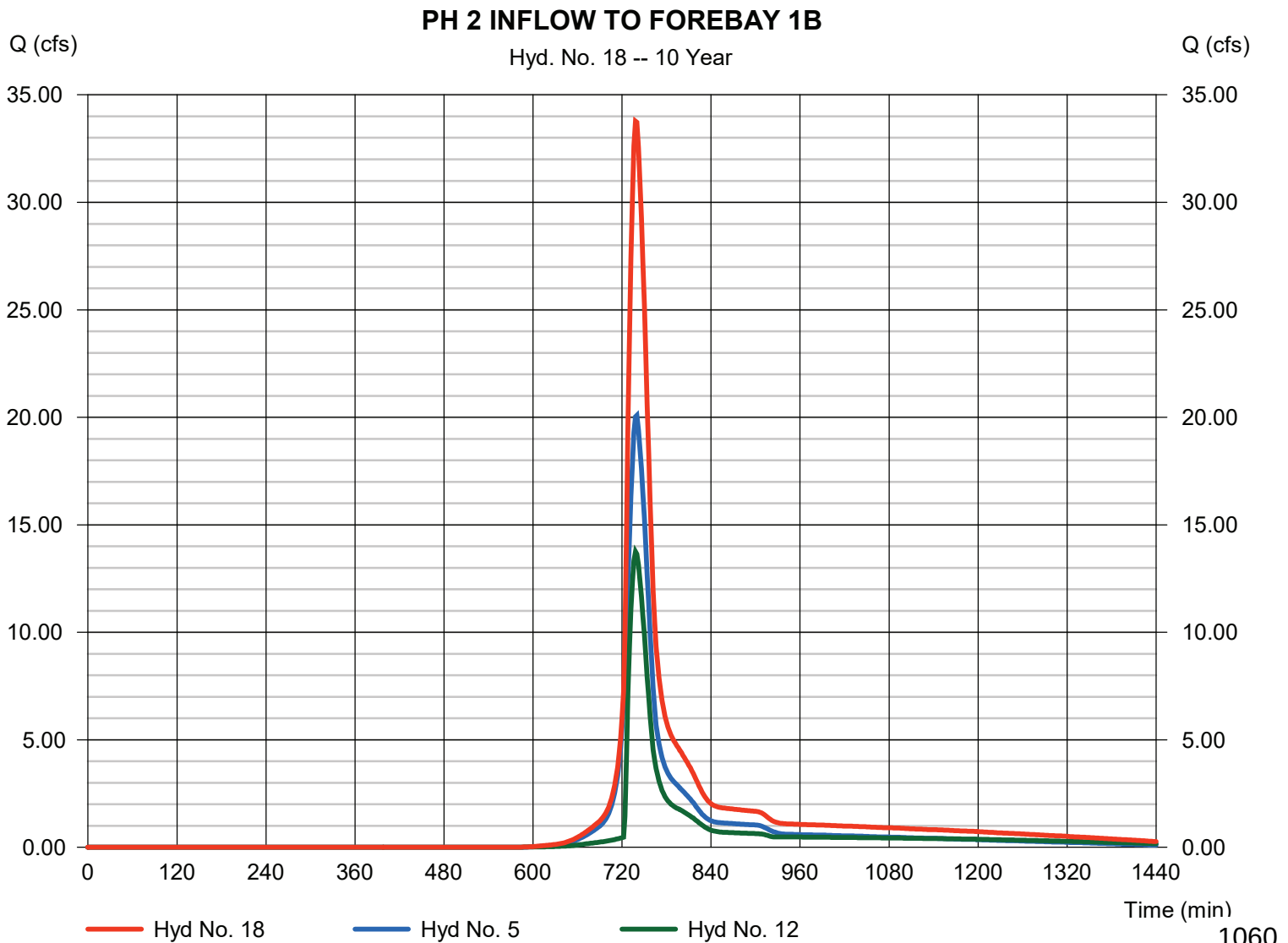
Thursday, 02 / 27 / 2020

Hyd. No. 18

PH 2 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 5, 12

Peak discharge = 33.78 cfs
Time to peak = 738 min
Hyd. volume = 118,872 cuft
Contrib. drain. area = 10.224 ac



Hydrograph Report

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

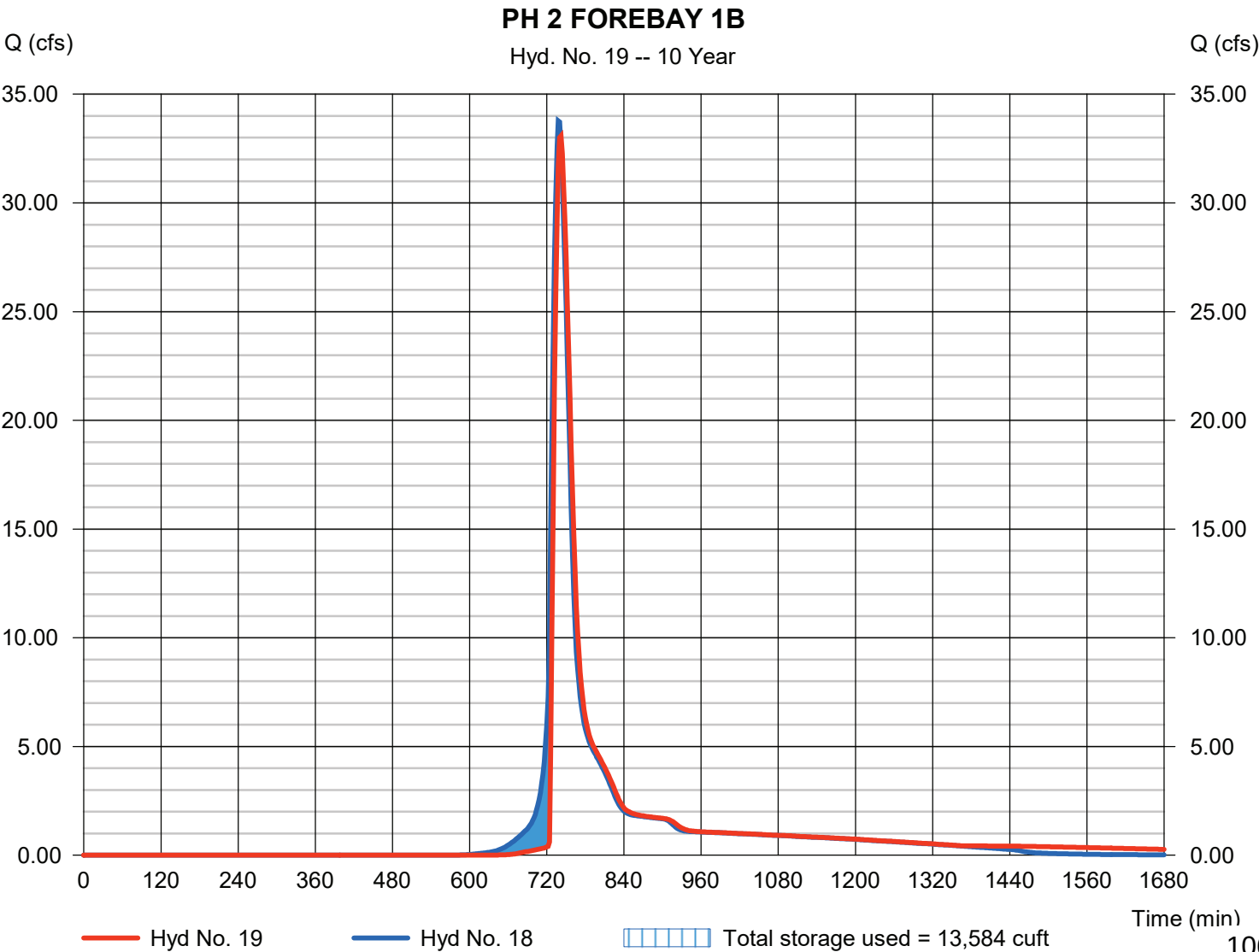
Thursday, 02 / 27 / 2020

Hyd. No. 19

PH 2 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 33.09 cfs
Storm frequency	= 10 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 118,826 cuft
Inflow hyd. No.	= 18 - PH 2 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.43 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 13,584 cuft

Storage Indication method used.



Hydrograph Report

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

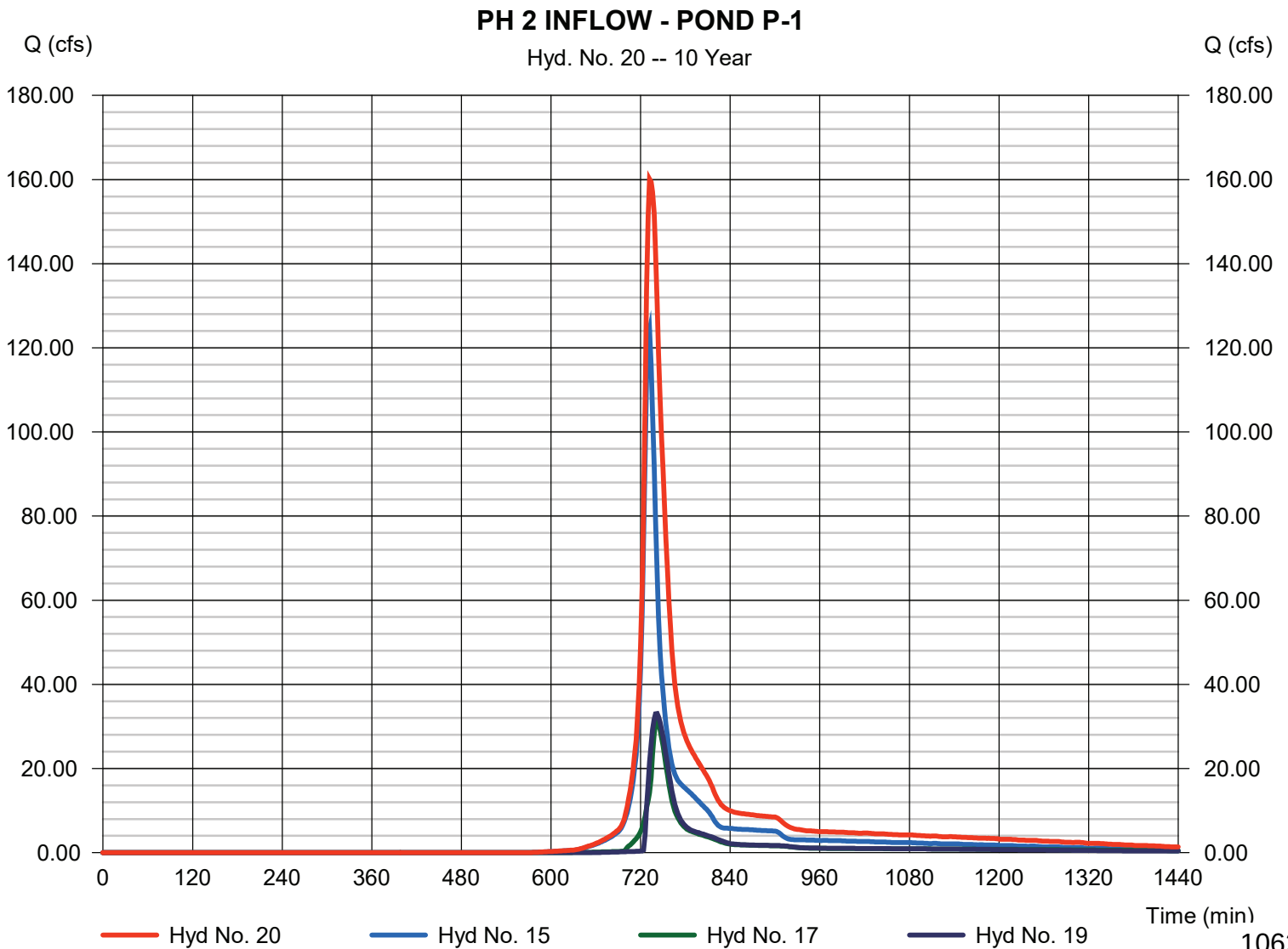
Thursday, 02 / 27 / 2020

Hyd. No. 20

PH 2 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 15, 17, 19

Peak discharge = 160.09 cfs
 Time to peak = 732 min
 Hyd. volume = 575,051 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

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

Thursday, 02 / 27 / 2020

Hyd. No. 21

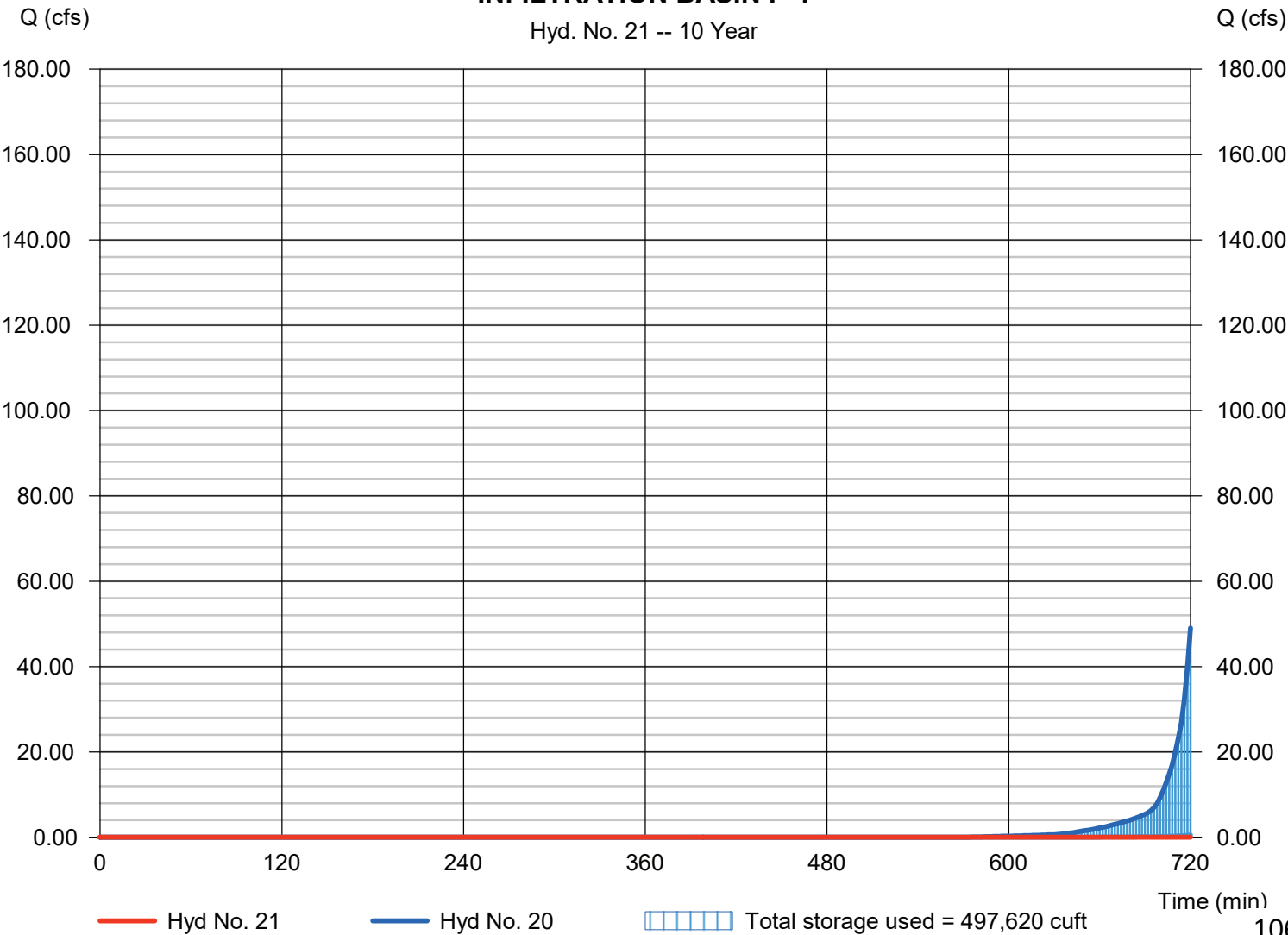
INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 704 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 20 - PH 2 INFLOW - POND P-1	Max. Elevation	= 834.25 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 2	Max. Storage	= 497,620 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

INFILTRATION BASIN P-1

Hyd. No. 21 -- 10 Year



Hydrograph Report

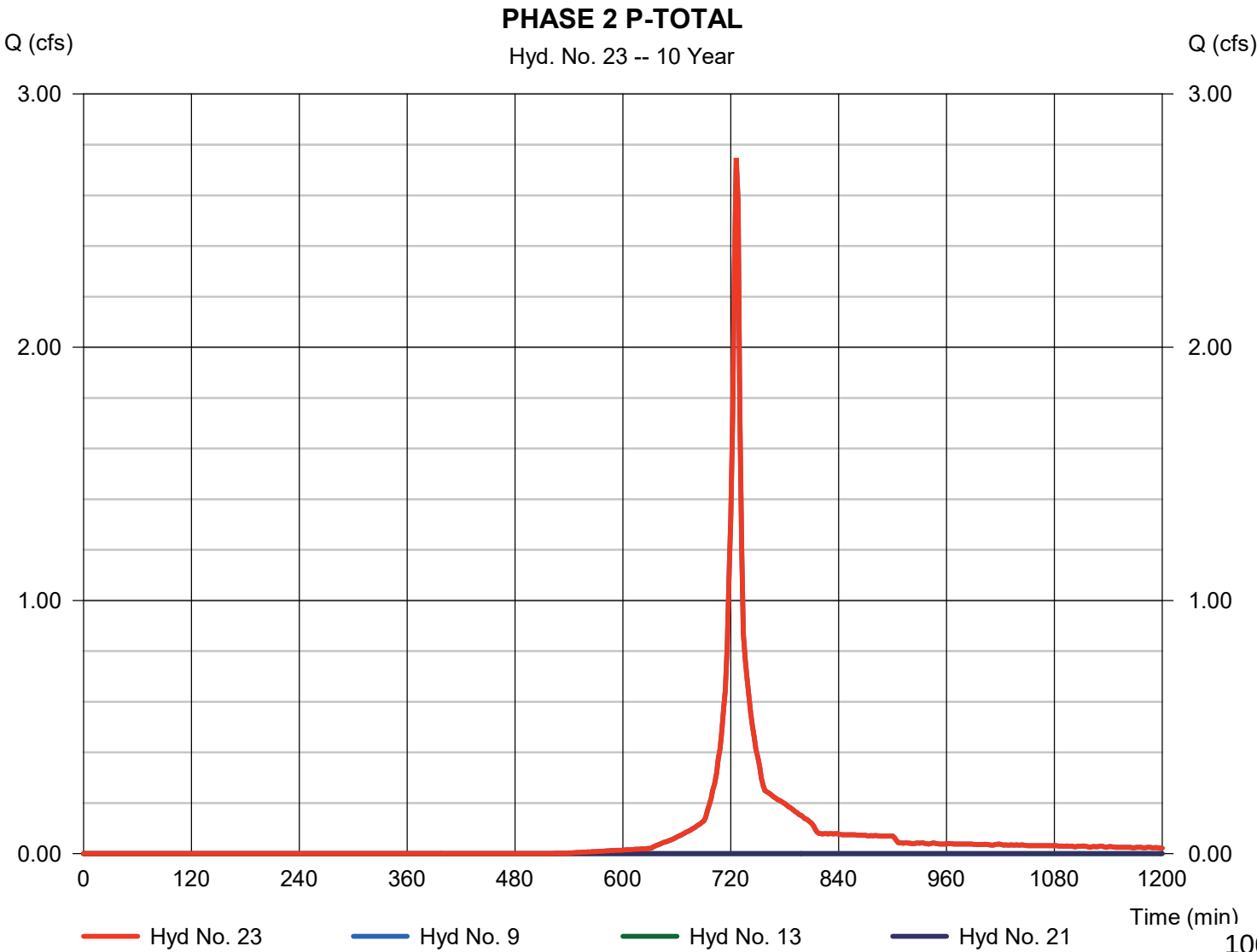
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 23

PHASE 2 P-TOTAL

Hydrograph type	= Combine	Peak discharge	= 2.747 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 5,219 cuft
Inflow hyds.	= 9, 13, 21	Contrib. drain. area	= 0.670 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	25.87	2	736	81,754	-----	-----	-----	P-OS-1
2	SCS Runoff	51.29	2	732	142,409	-----	-----	-----	P-OS-2
3	SCS Runoff	196.33	2	730	512,042	-----	-----	-----	P-1-PH 2
4	SCS Runoff	31.68	2	736	109,183	-----	-----	-----	P-1A-PH2
5	SCS Runoff	41.21	2	738	147,891	-----	-----	-----	P-1B-PH2
6	SCS Runoff	34.69	2	736	119,111	-----	-----	-----	P-2
7	SCS Runoff	26.75	2	736	92,195	-----	-----	-----	P-3
8	SCS Runoff	5.183	2	736	18,020	-----	-----	-----	P-4
9	SCS Runoff	5.199	2	726	10,198	-----	-----	-----	P-UD-1
11	Reservoir	28.73	2	744	119,092	6	840.53	23,373	POND P-2
12	Reservoir	23.10	2	742	92,181	7	840.68	11,138	POND P-3
13	Reservoir	3.364	2	748	5,264	8	840.86	8,246	RAIN GARDEN P-4
15	Combine	267.32	2	732	736,205	1, 2, 3,	-----	-----	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	58.74	2	738	228,275	4, 11,	-----	-----	PH 2 INFLOW TO FOREBAY 1A
17	Reservoir	58.47	2	738	228,260	16	835.82	7,287	PH 2 FOREBAY 1A
18	Combine	63.88	2	740	240,073	5, 12,	-----	-----	PH 2 INFLOW TO FOREBAY 1B
19	Reservoir	62.98	2	742	240,027	18	835.87	17,361	PH 2 FOREBAY 1B
20	Combine	366.21	2	732	1,204,489	15, 17, 19	-----	-----	PH 2 INFLOW - POND P-1
21	Reservoir	0.000	2	3236	0	20	838.11	1,086,032	INFILTRATION BASIN P-1
23	Combine	5.199	2	726	15,462	9, 13, 21,	-----	-----	PHASE 2 P-TOTAL
2020-02-27_CHAPMAN FARMS_PHASE II.gpr					Return Period: 100 Year			Thursday, 02 / 27 / 2020	

Hydrograph Report

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

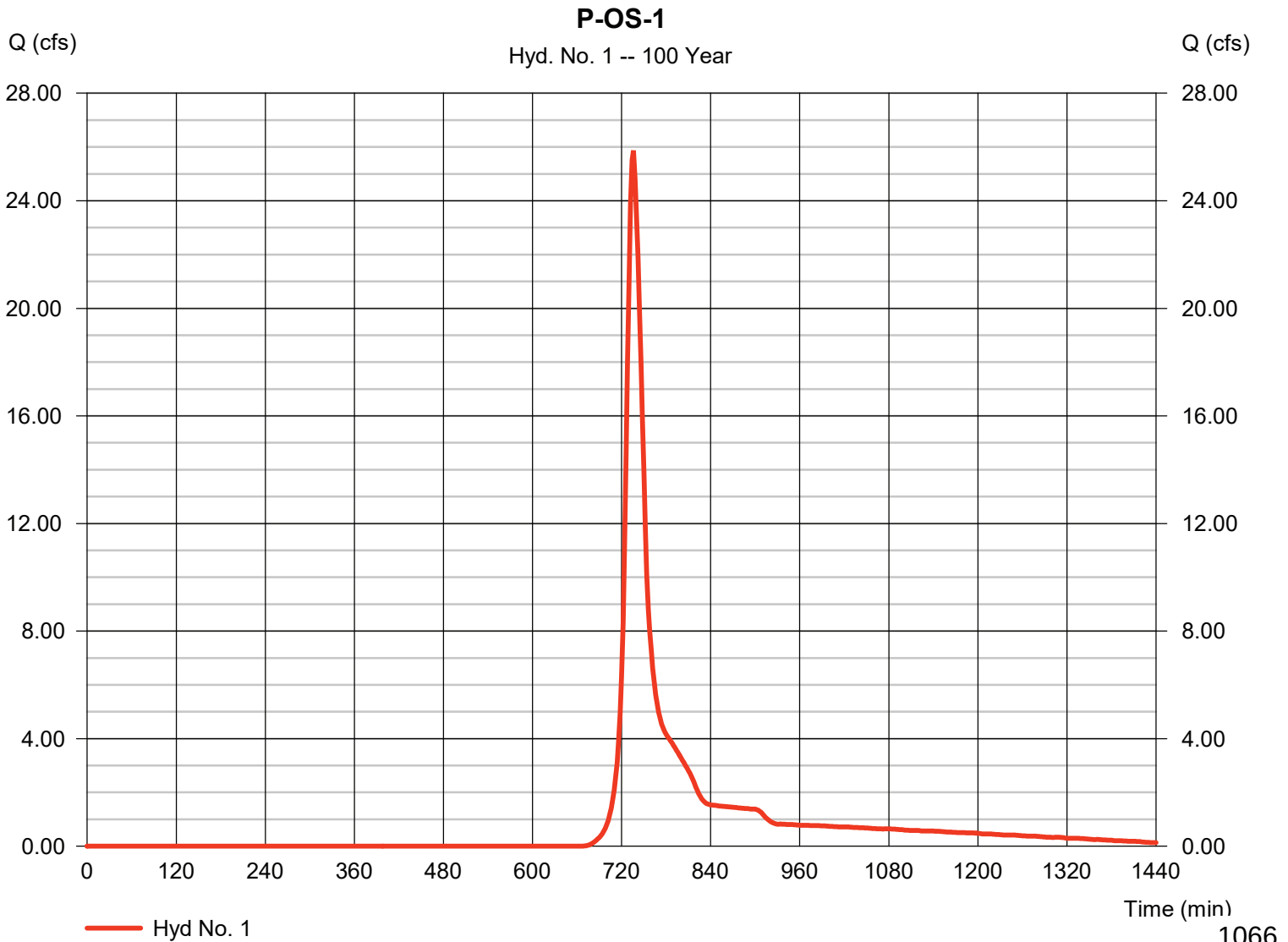
Thursday, 02 / 27 / 2020

Hyd. No. 1

P-OS-1

Hydrograph type	= SCS Runoff	Peak discharge	= 25.87 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 81,754 cuft
Drainage area	= 10.170 ac	Curve number	= 62*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.90 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

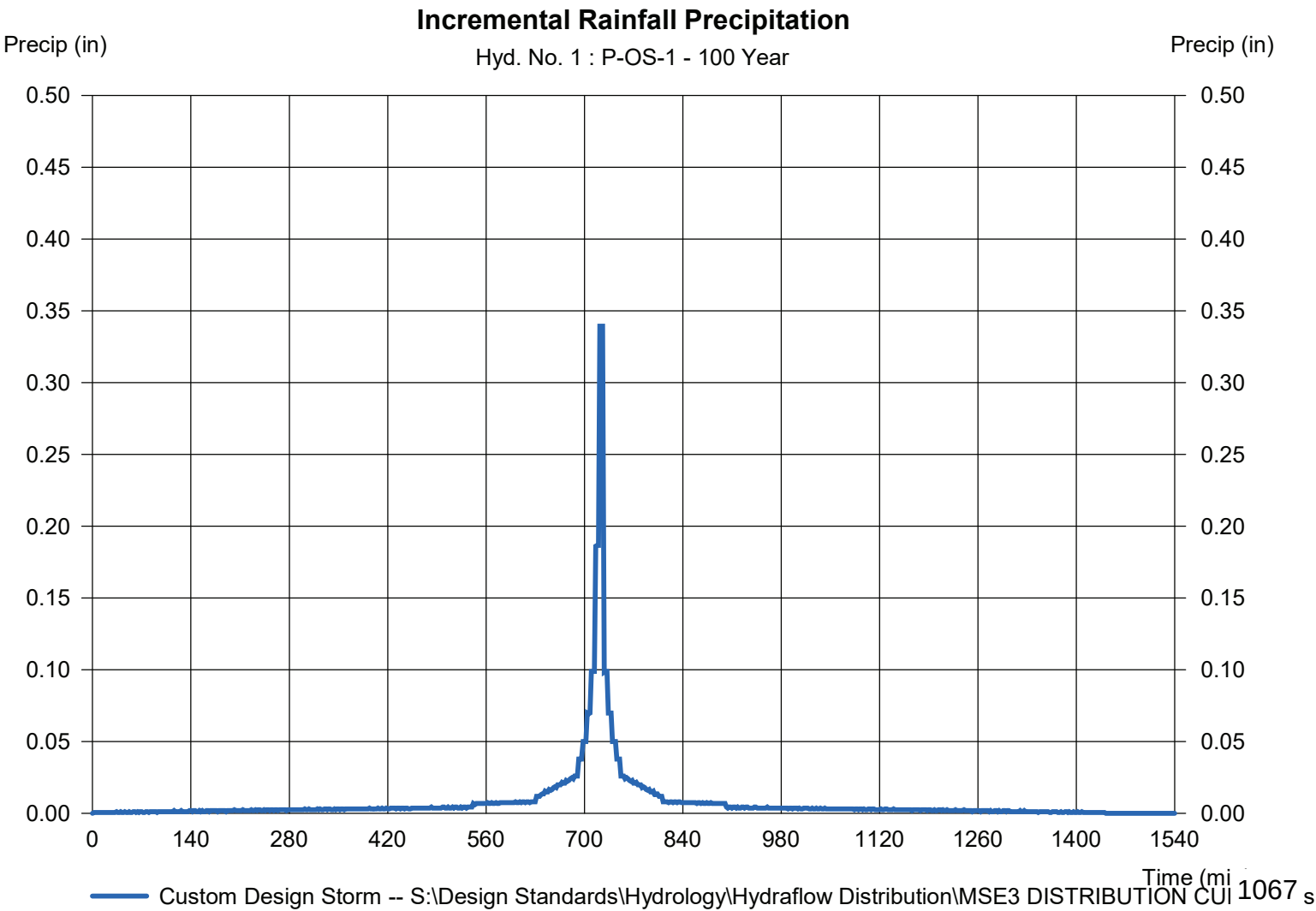
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 1

P-OS-1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

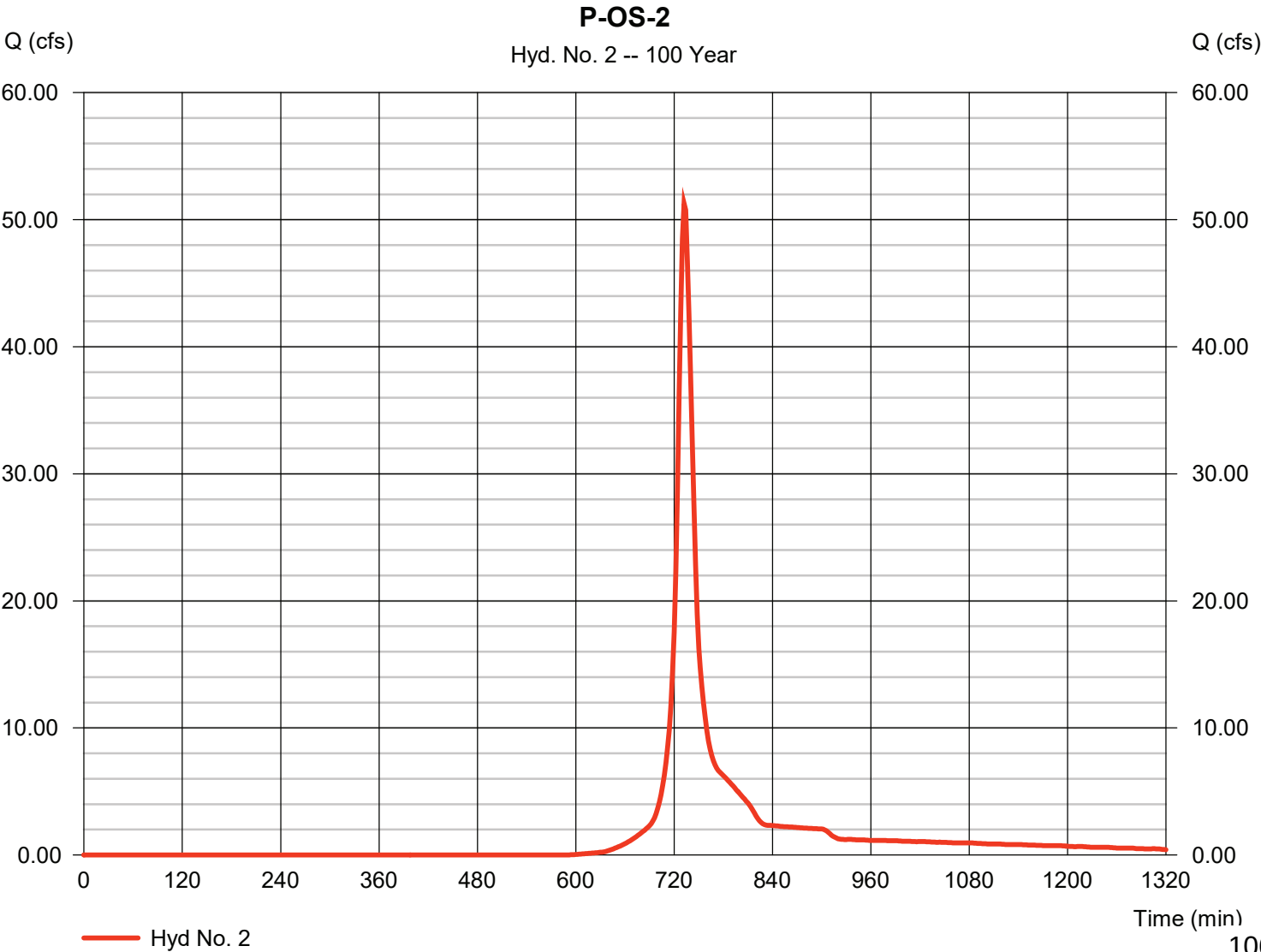
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Hydrograph type	= SCS Runoff	Peak discharge	= 51.29 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 142,409 cuft
Drainage area	= 12.810 ac	Curve number	= 72
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.80 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSR3 DISTRIBUTION CU		



Precipitation Report

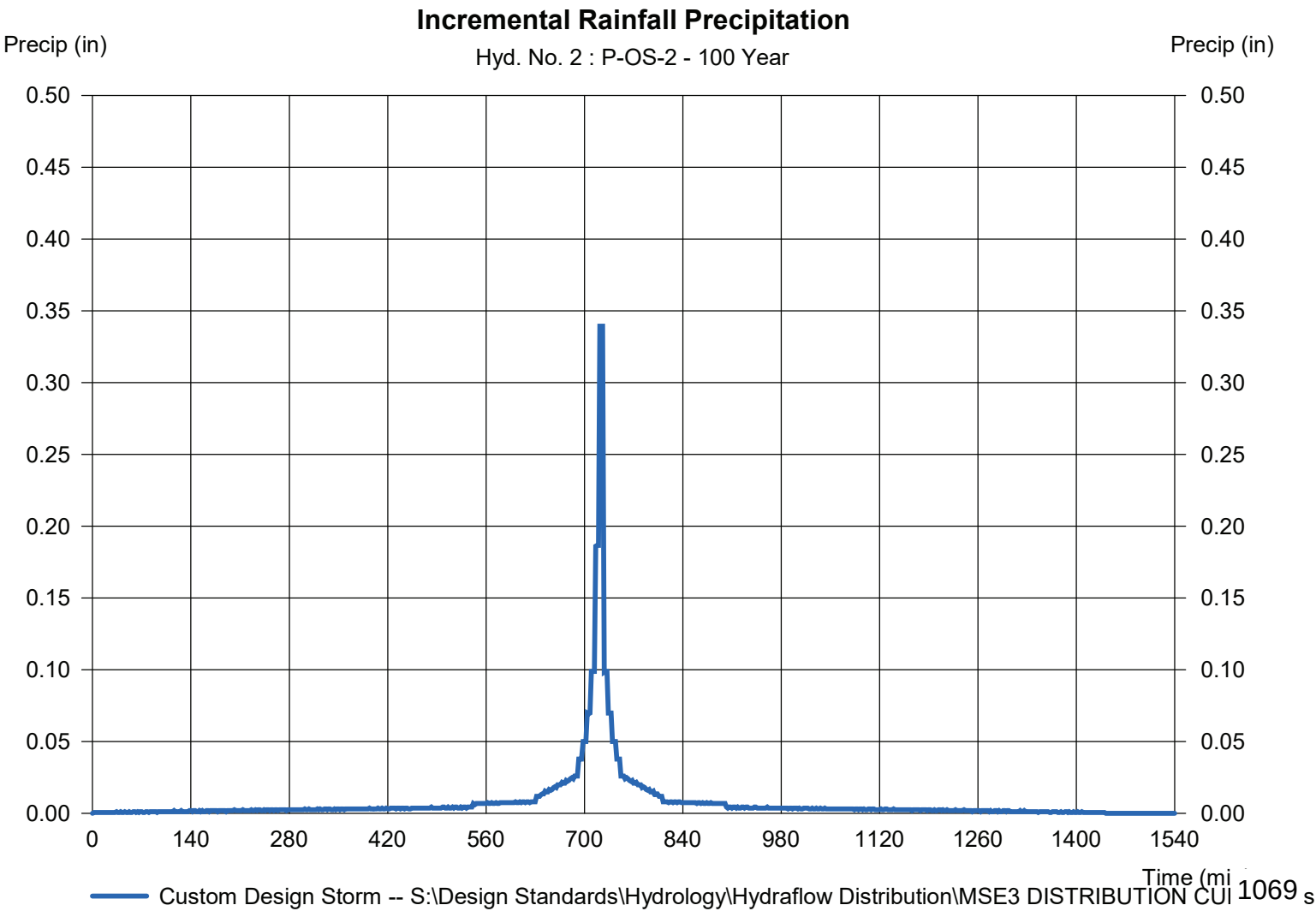
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

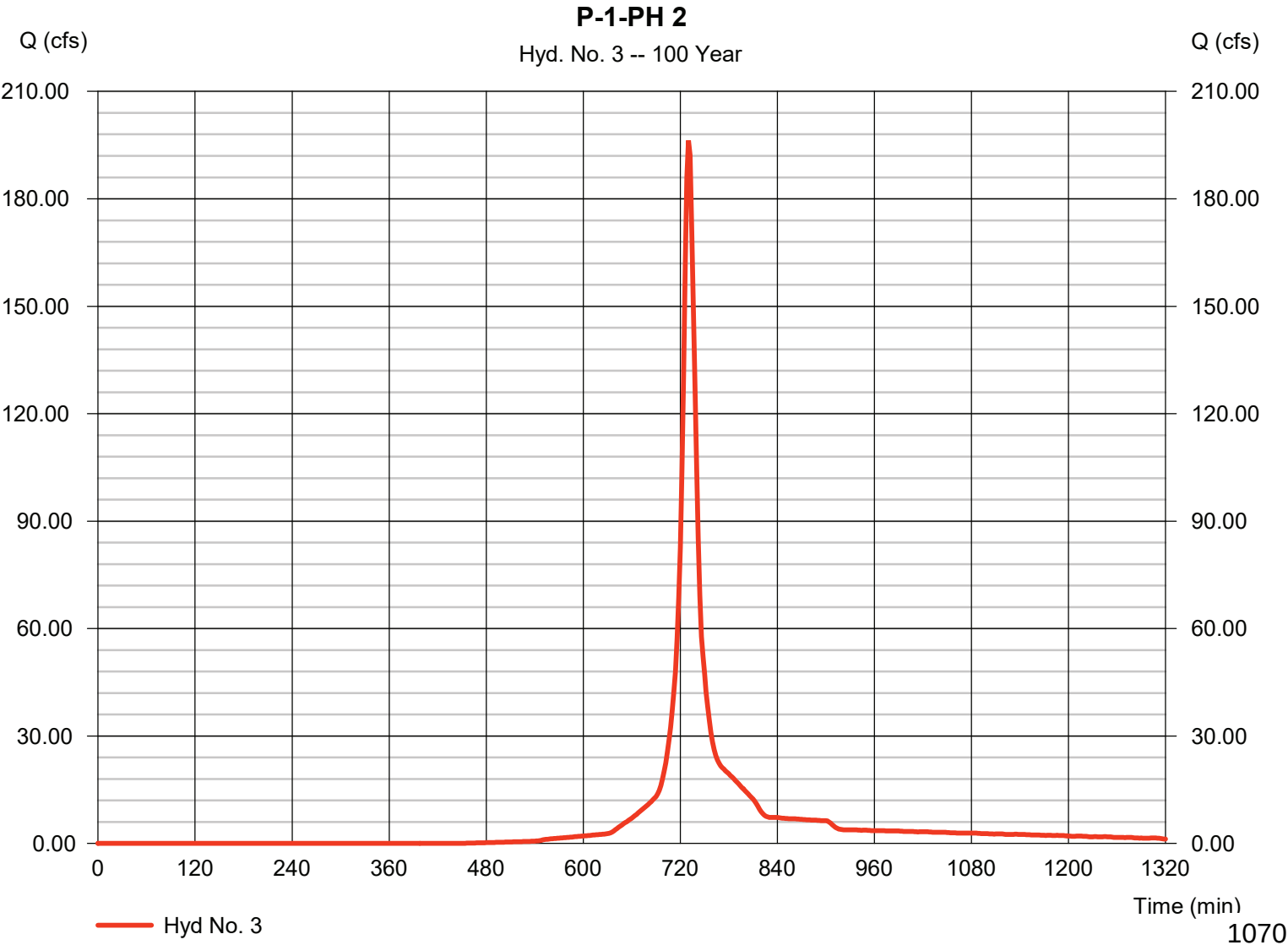
Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Hydrograph type	= SCS Runoff	Peak discharge	= 196.33 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 512,042 cuft
Drainage area	= 32.936 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSR3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 32.936



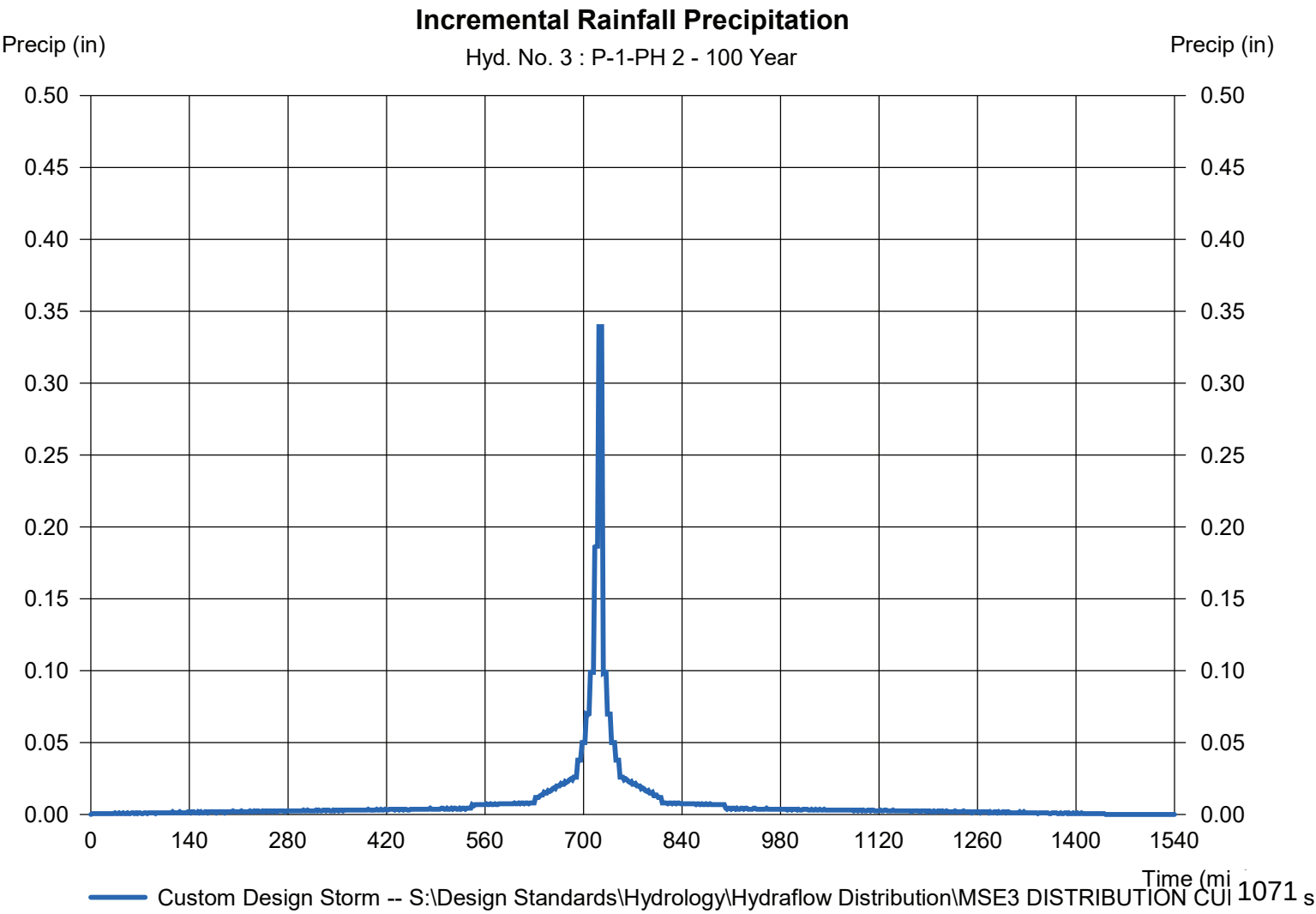
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

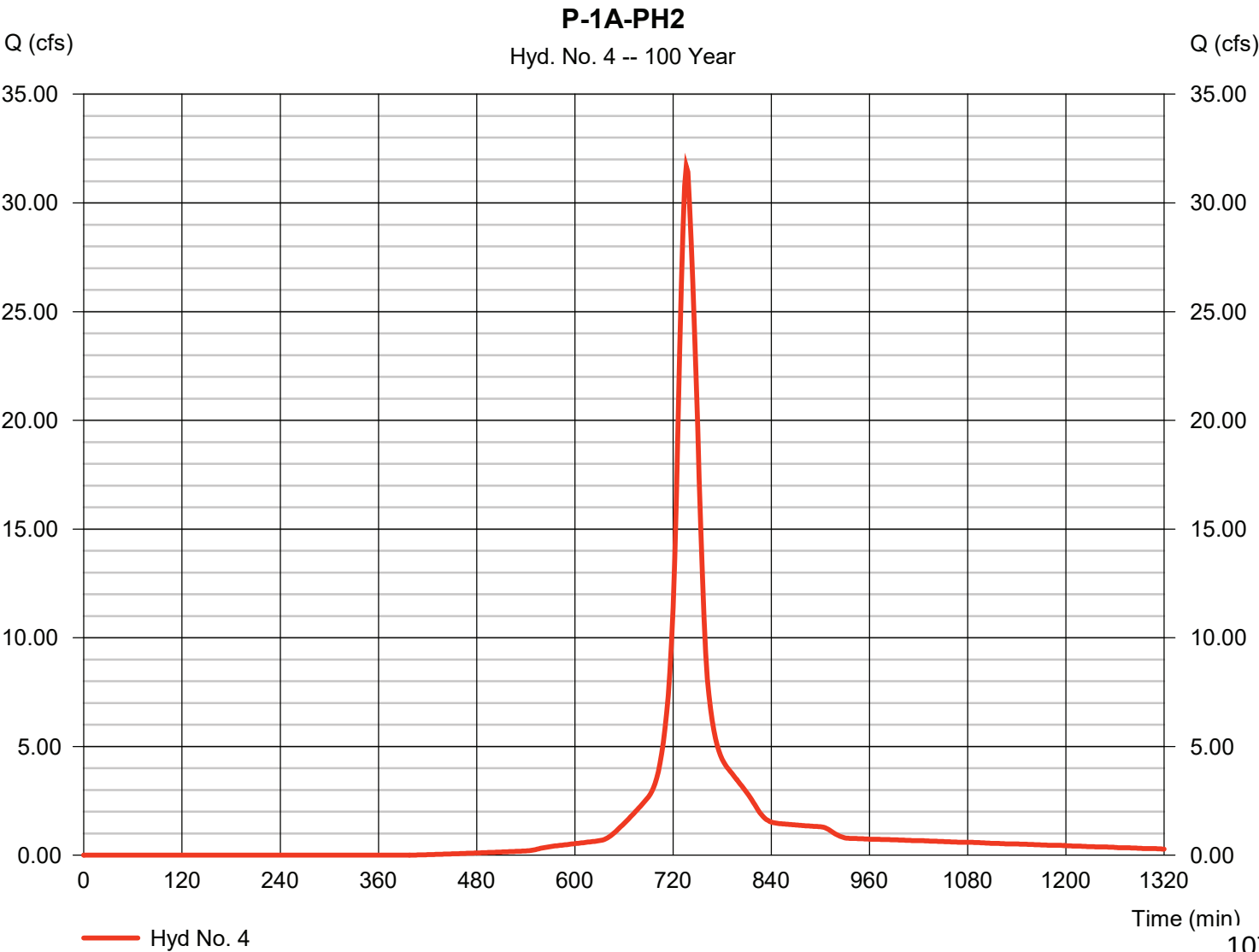
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 31.68 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 109,183 cuft
Drainage area	= 6.607 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



— Hyd No. 4

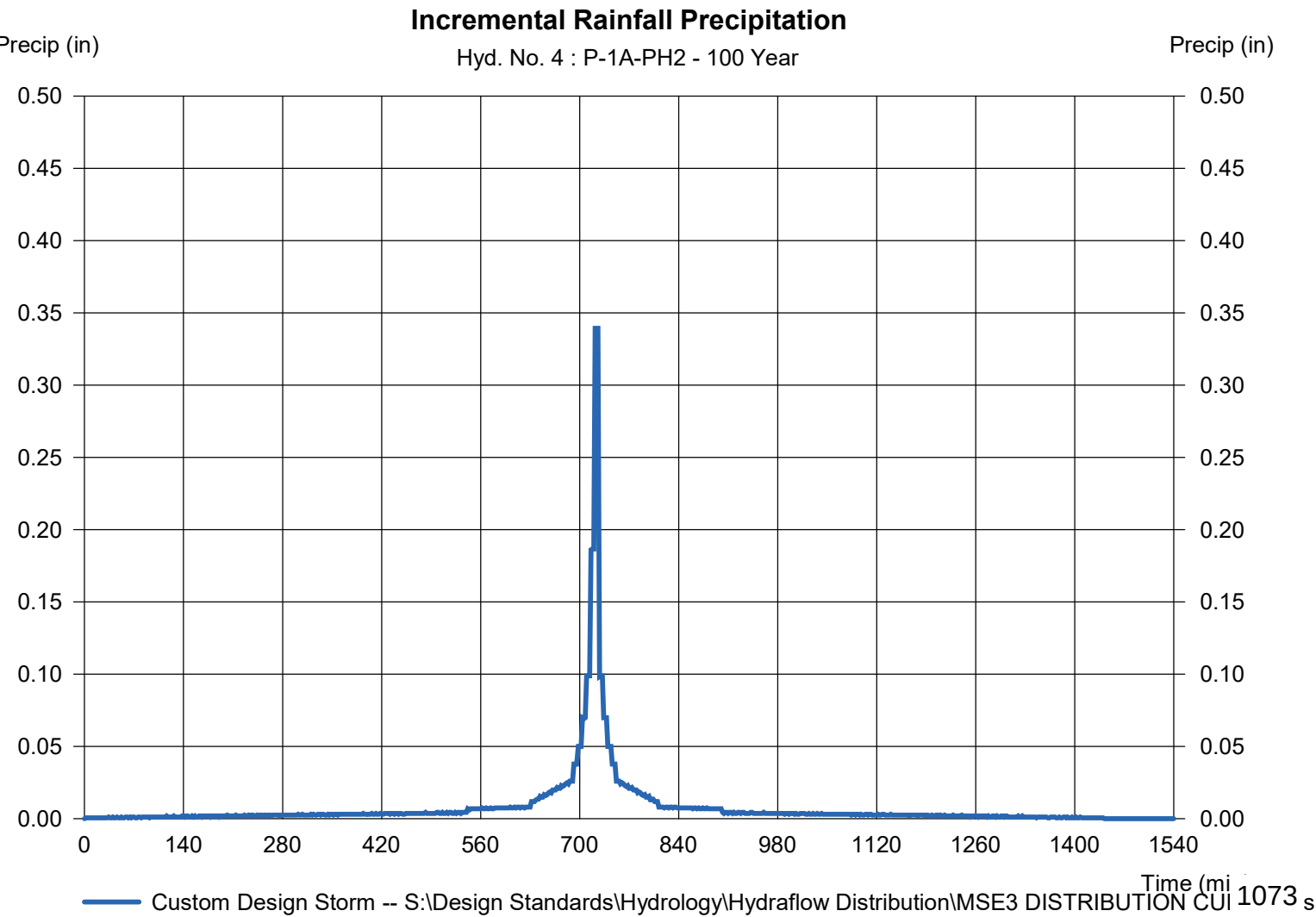
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

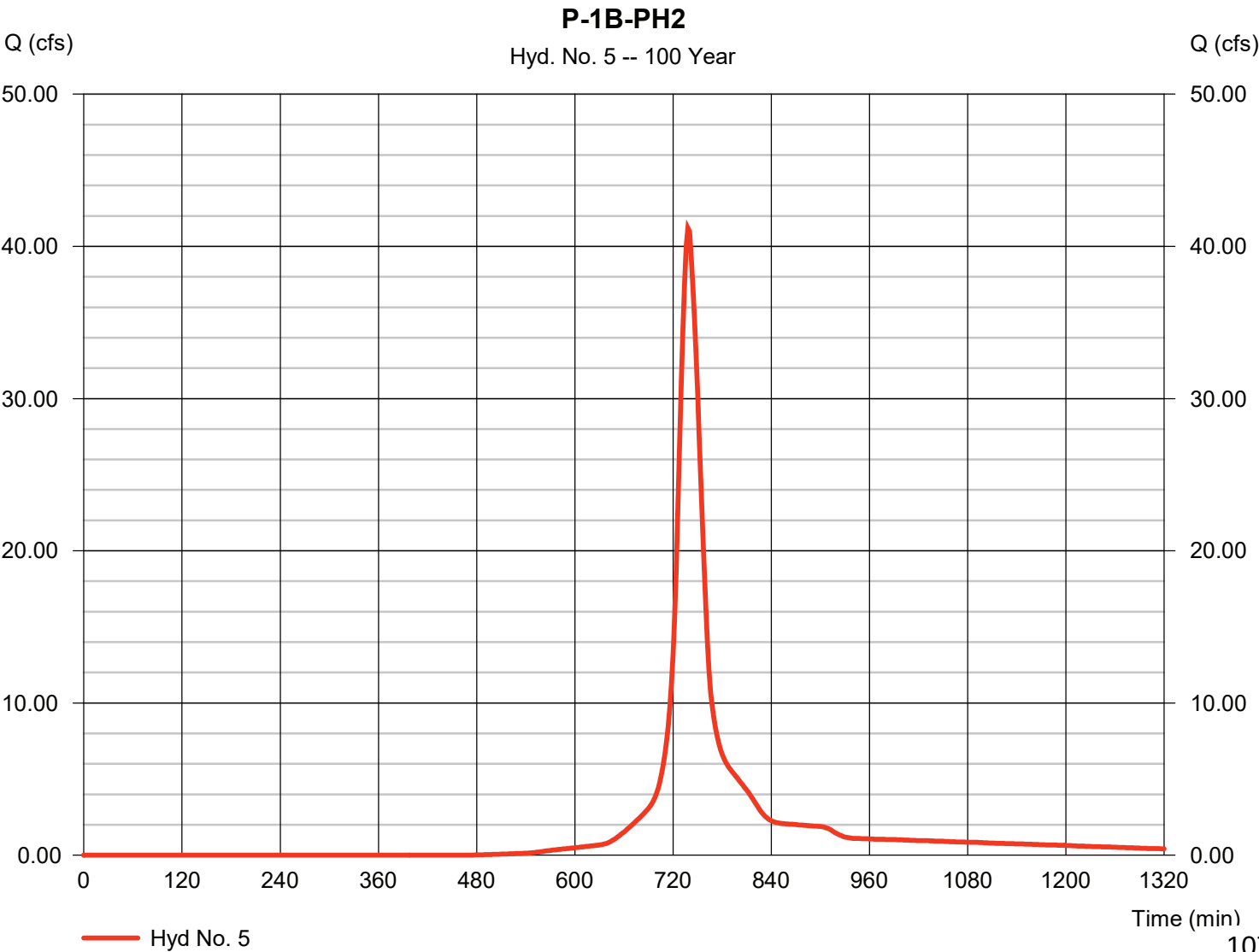
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 41.21 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 147,891 cuft
Drainage area	= 10.224 ac	Curve number	= 81
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 26.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		



Precipitation Report

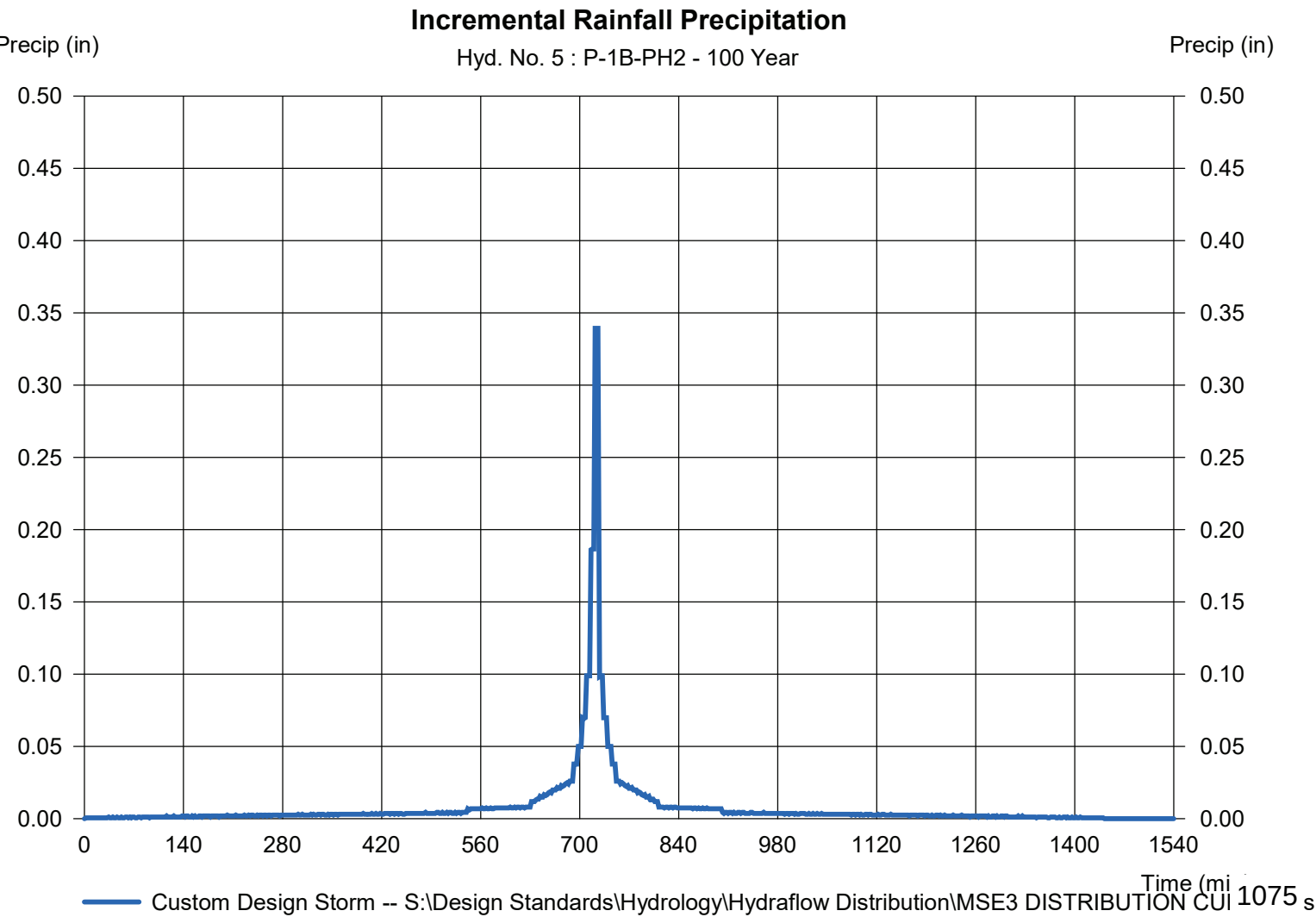
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

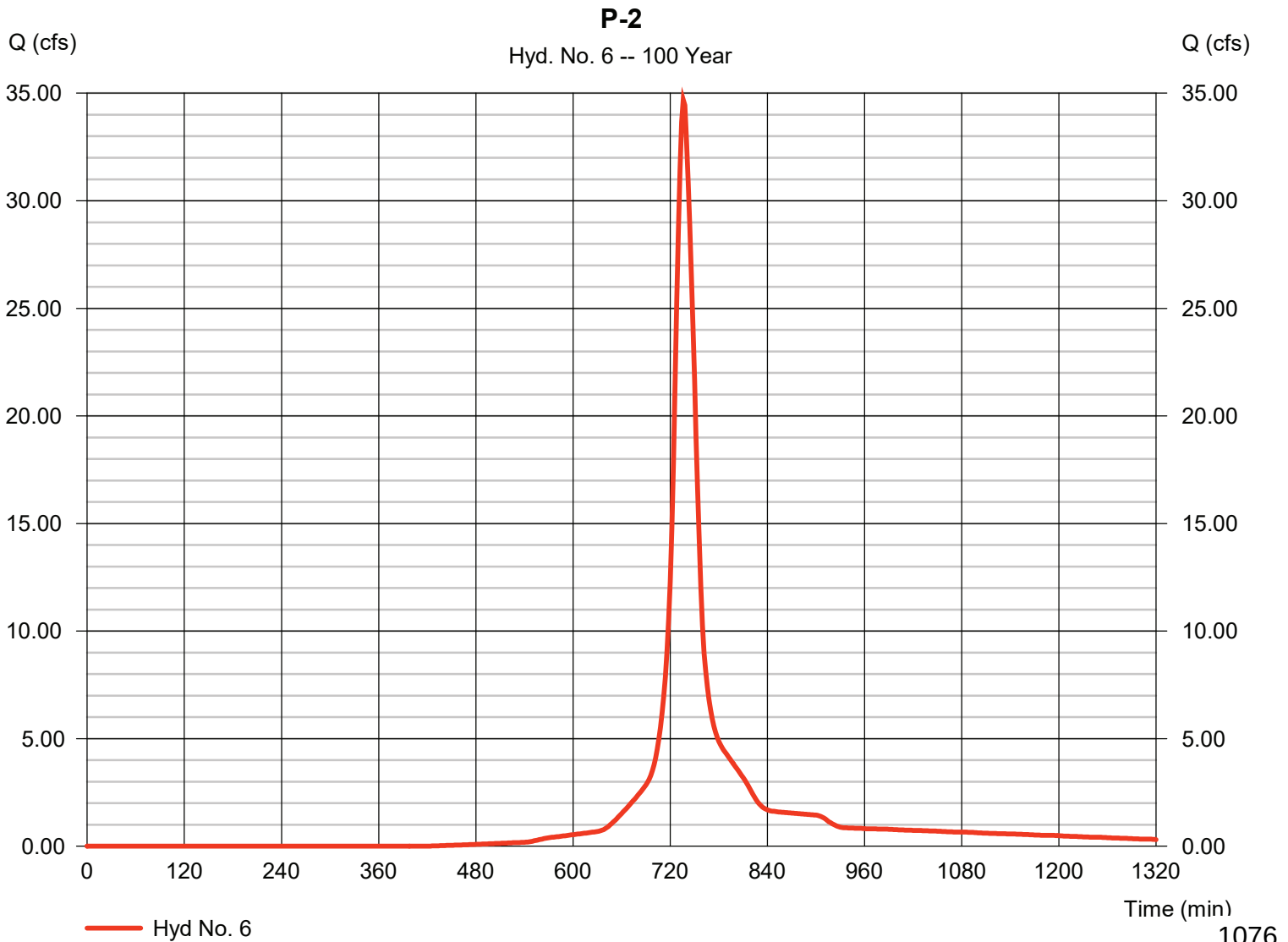
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 34.69 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 119,111 cuft
Drainage area	= 7.385 ac	Curve number	= 84*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = $[(6.710 \times 75)] / 7.385$ 

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Precipitation Report

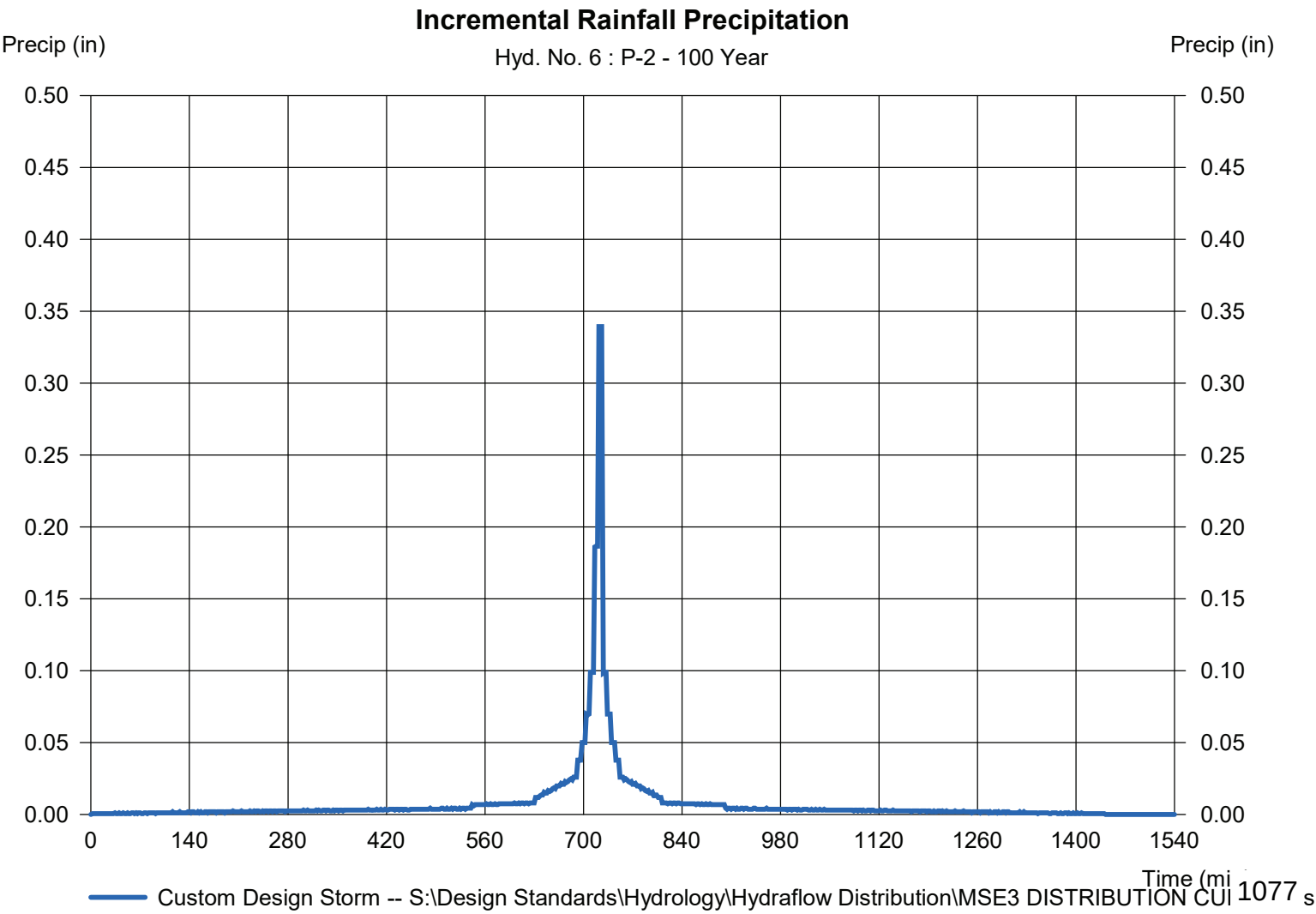
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

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Hyd. No. 6

P-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

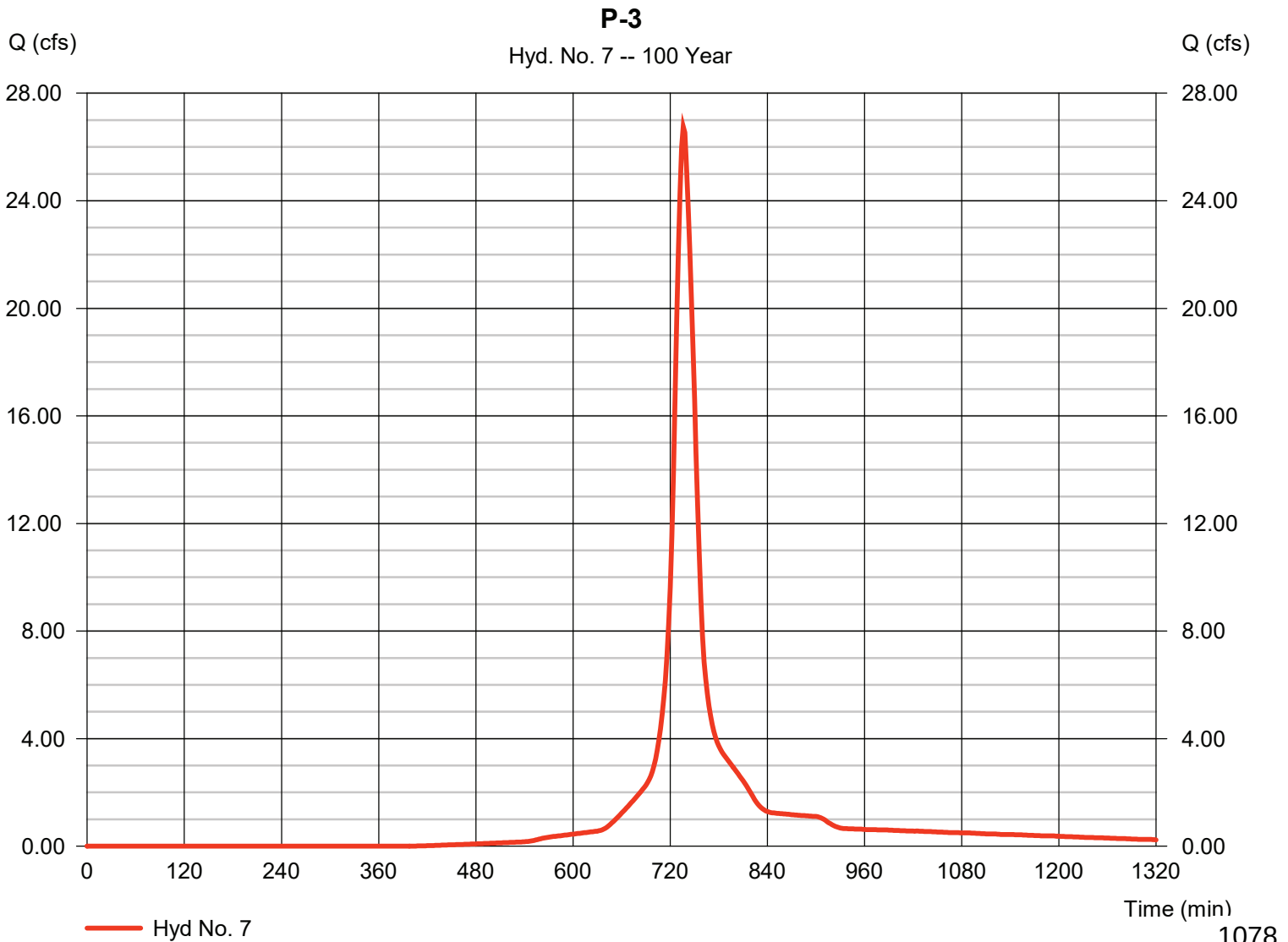
Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 26.75 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 92,195 cuft
Drainage area	= 5.579 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.20 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\Hydrograph Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.260 x 75)] / 5.579



1078

Precipitation Report

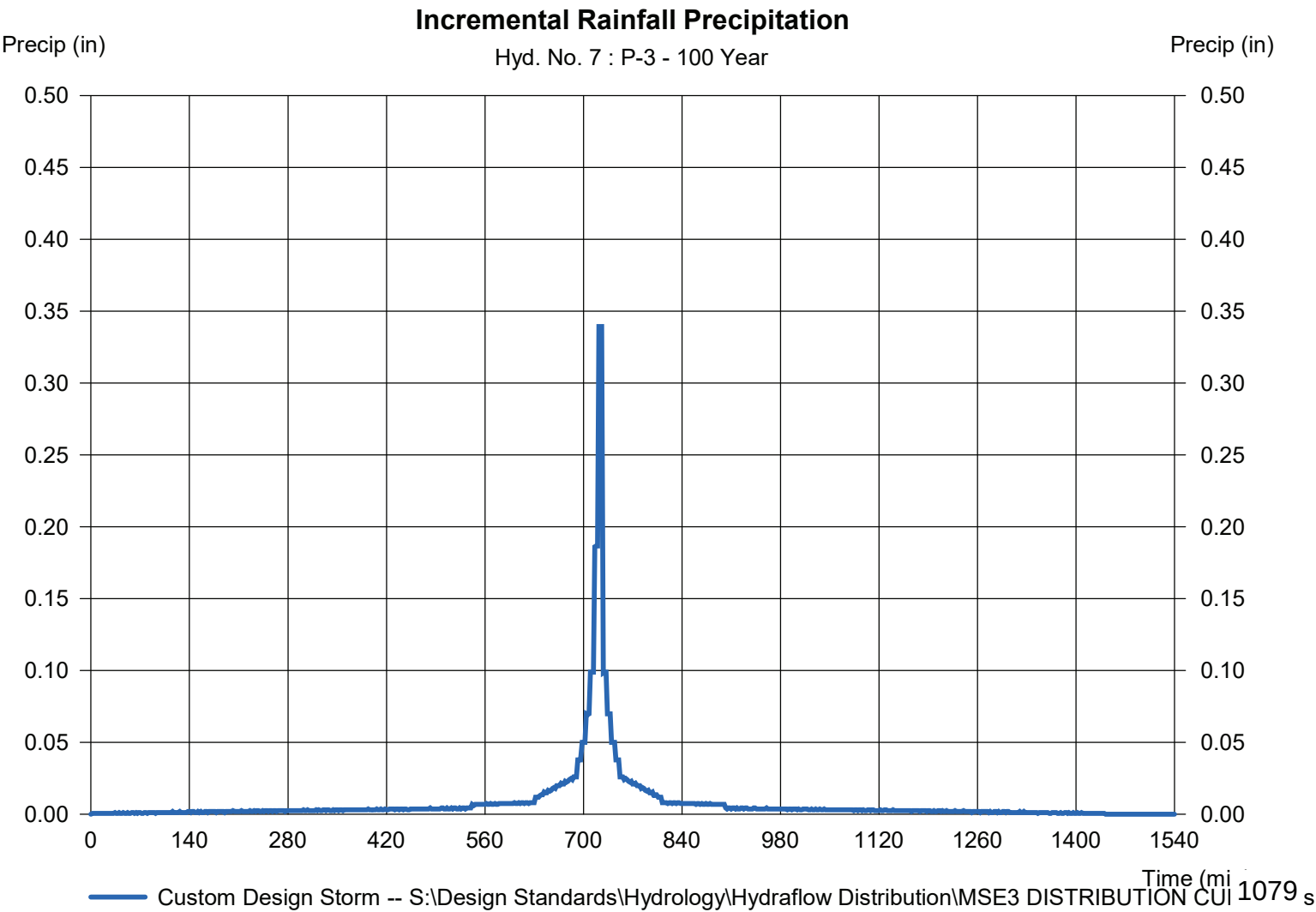
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

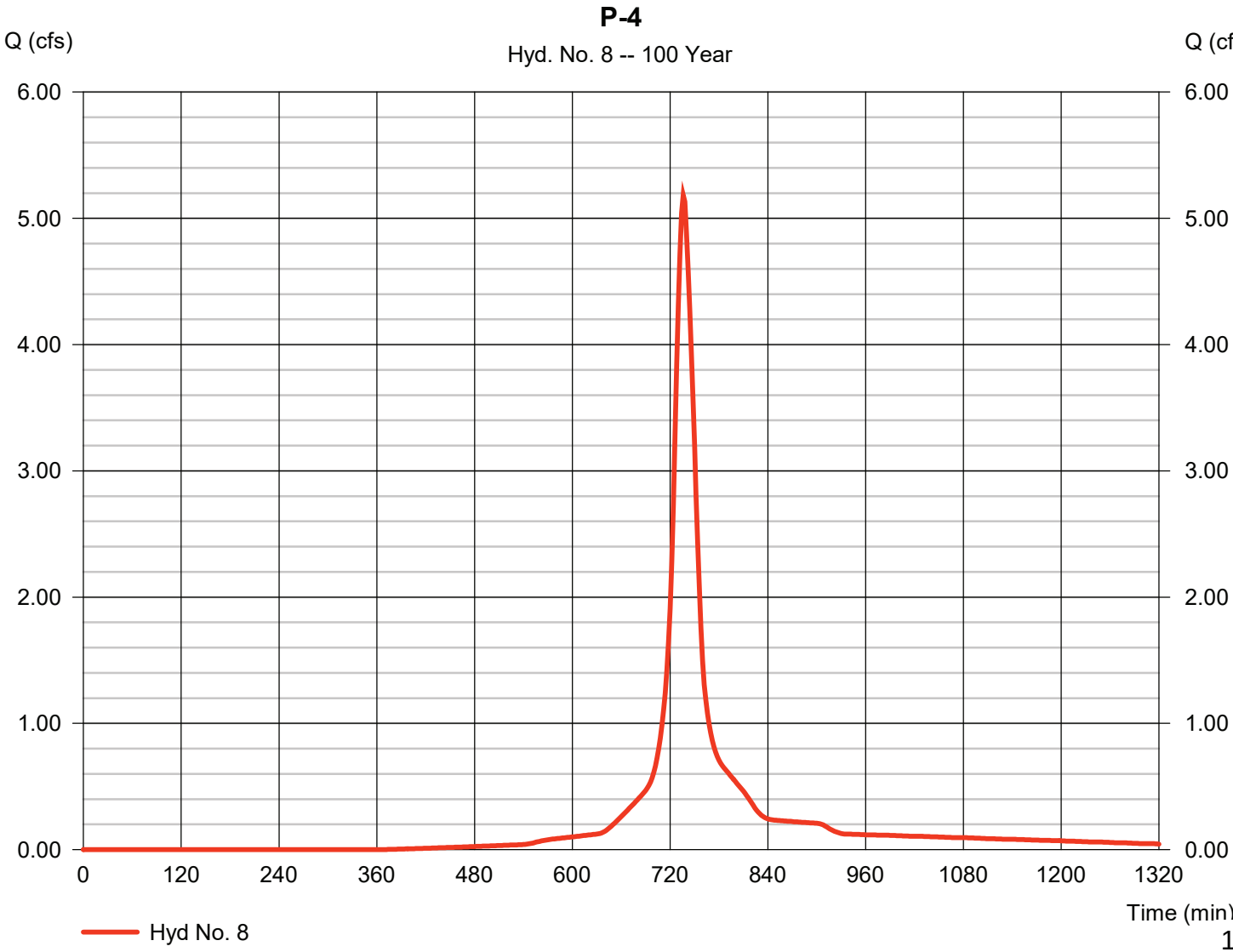
Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 5.183 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 18,020 cuft
Drainage area	= 1.040 ac	Curve number	= 87*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.10 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

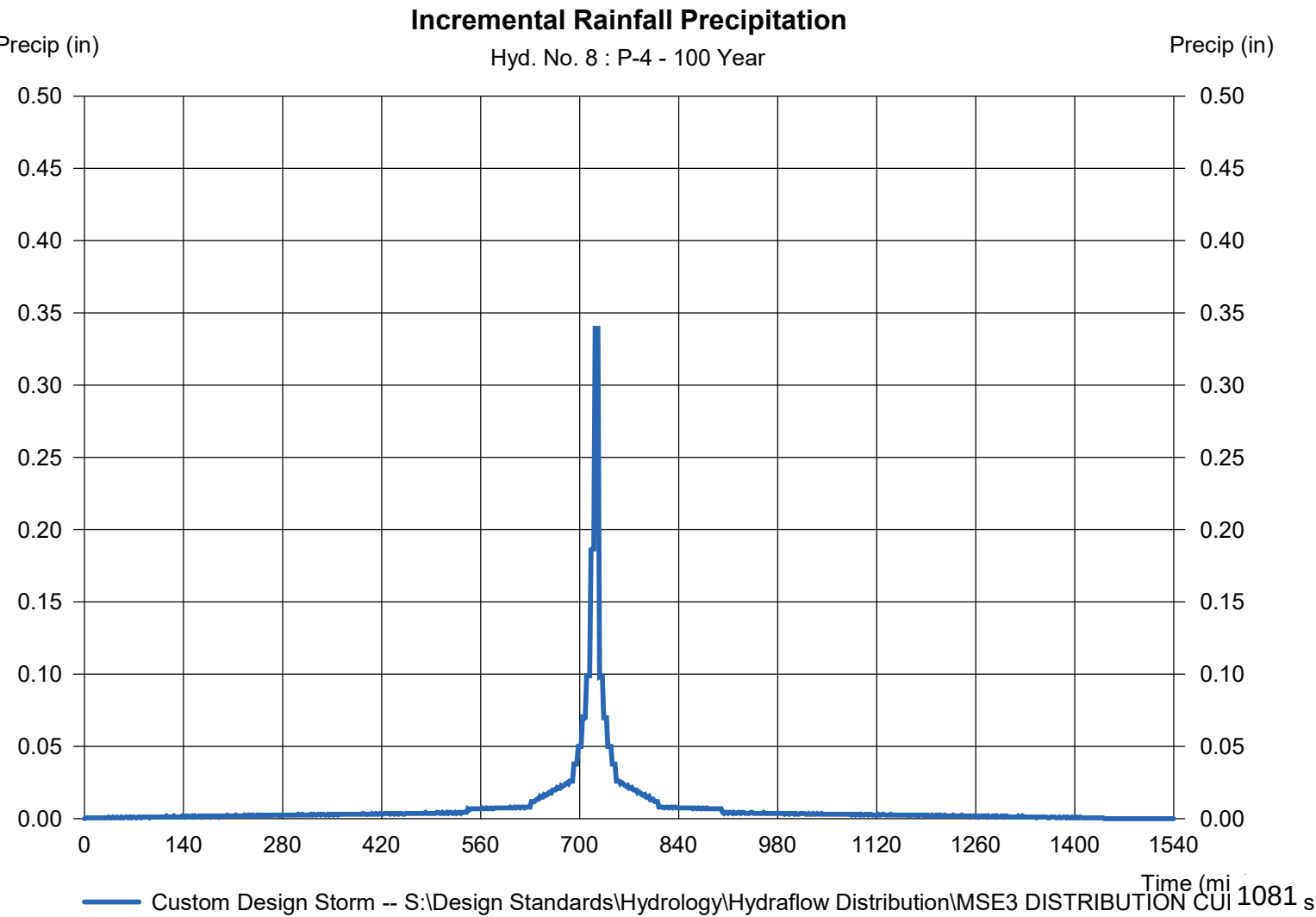
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

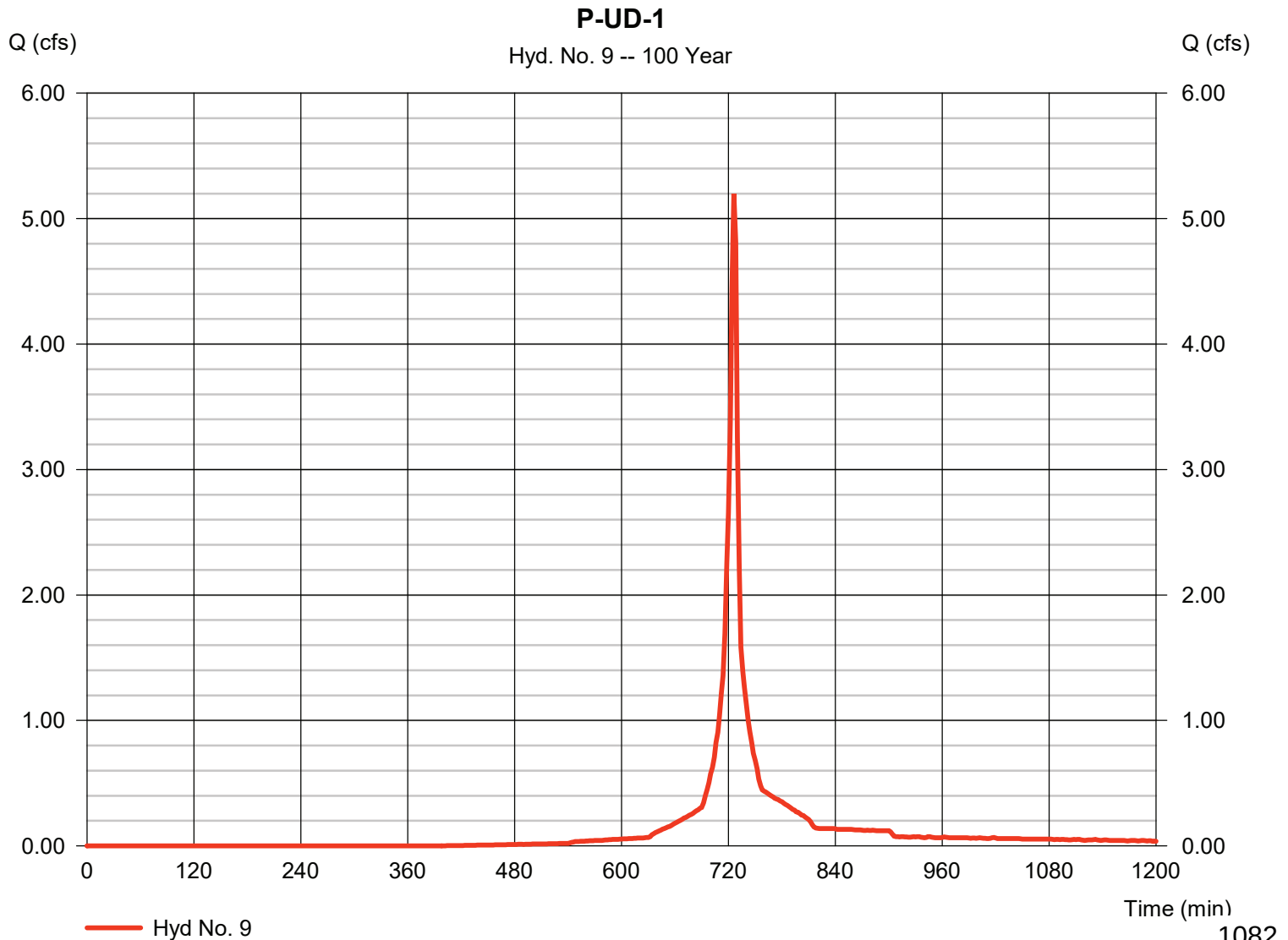
Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Hydrograph type	= SCS Runoff	Peak discharge	= 5.199 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 10,198 cuft
Drainage area	= 0.670 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = $[(0.300 \times 61) + (0.370 \times 98)] / 0.670$



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Precipitation Report

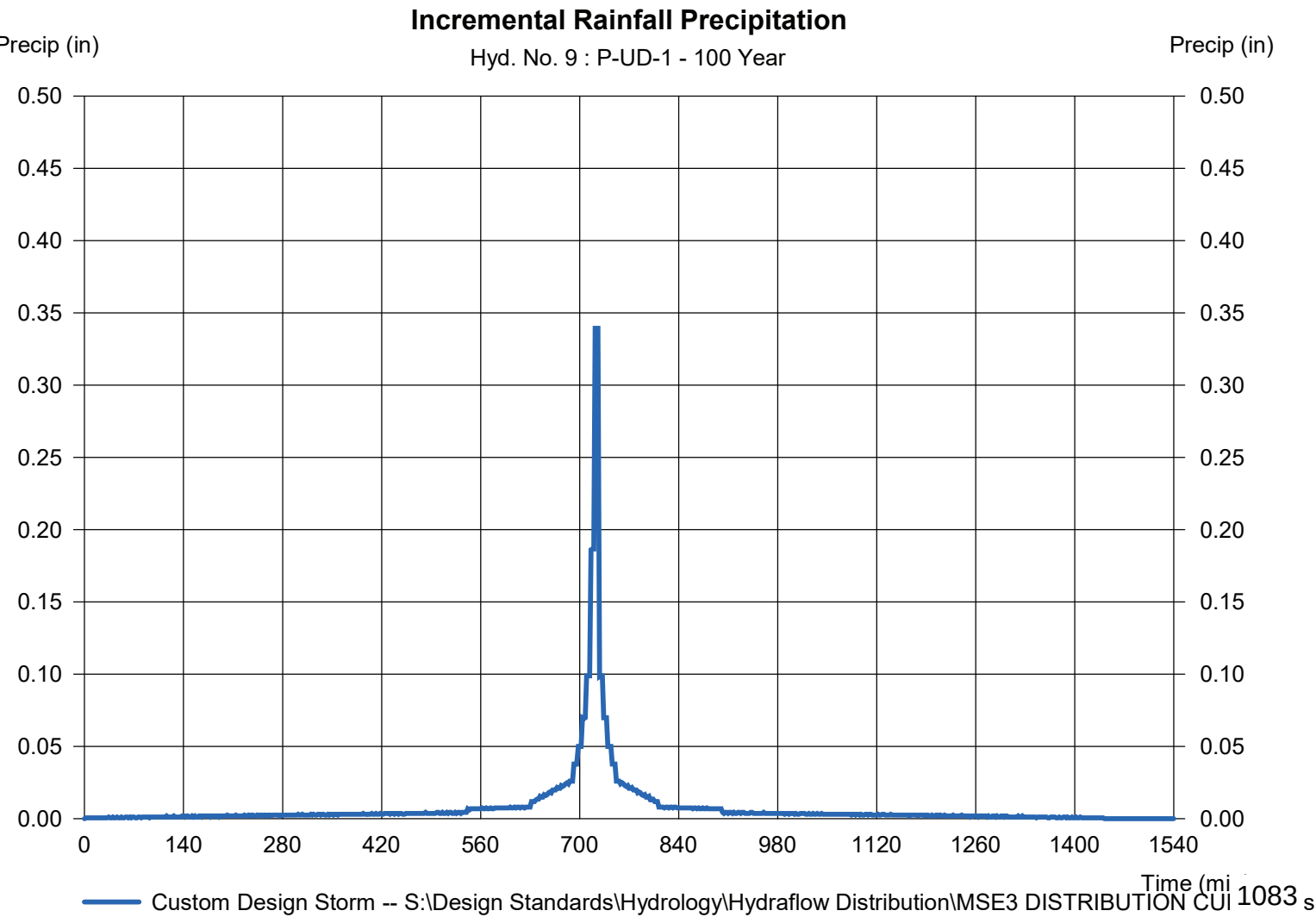
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

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

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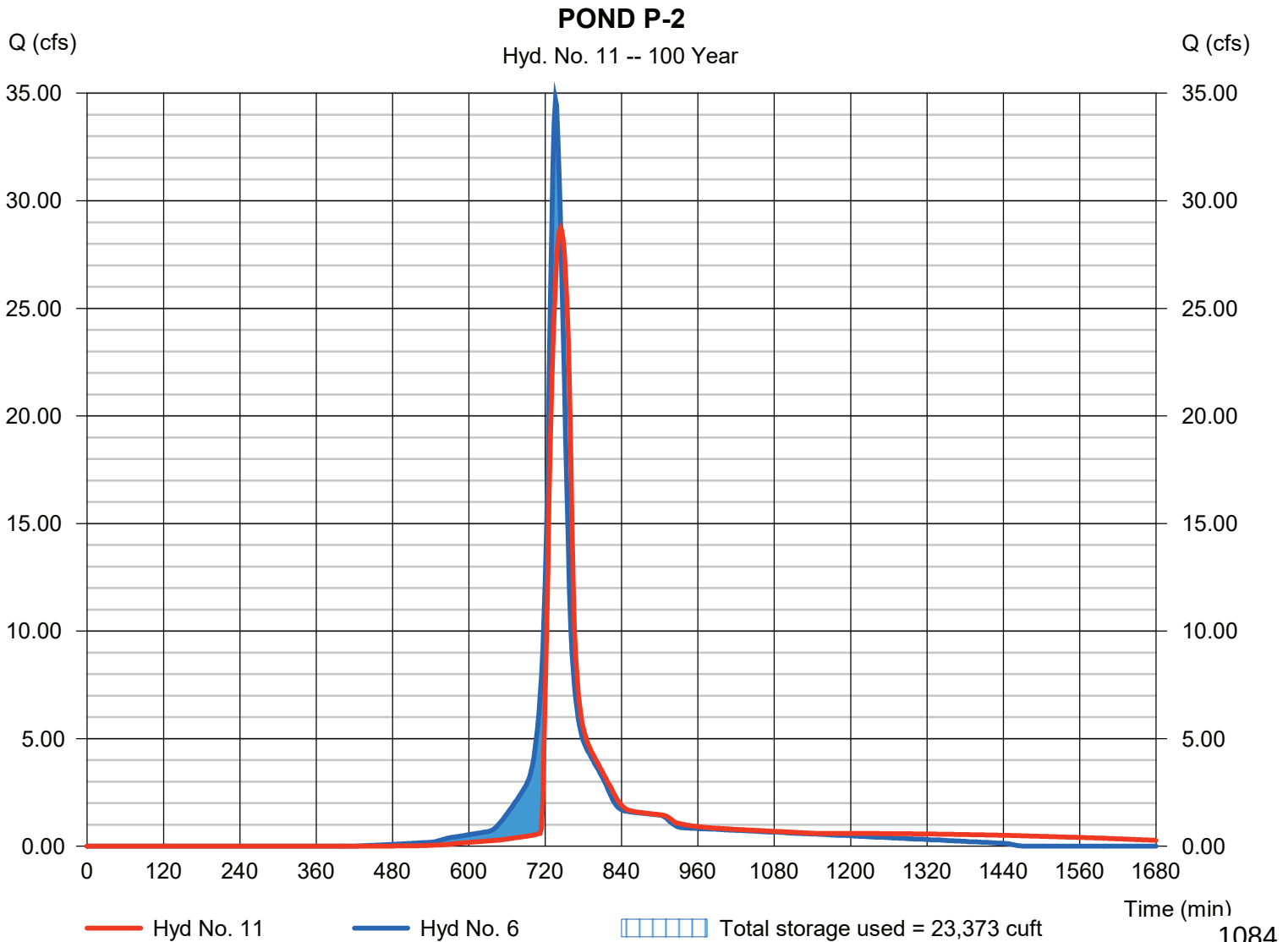
Hyd. No. 11

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-2
 Reservoir name = POND P-2

Peak discharge = 28.73 cfs
 Time to peak = 744 min
 Hyd. volume = 119,092 cuft
 Max. Elevation = 840.53 ft
 Max. Storage = 23,373 cuft

Storage Indication method used.



Hydrograph Report

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

Thursday, 02 / 27 / 2020

Hyd. No. 12

POND P-3

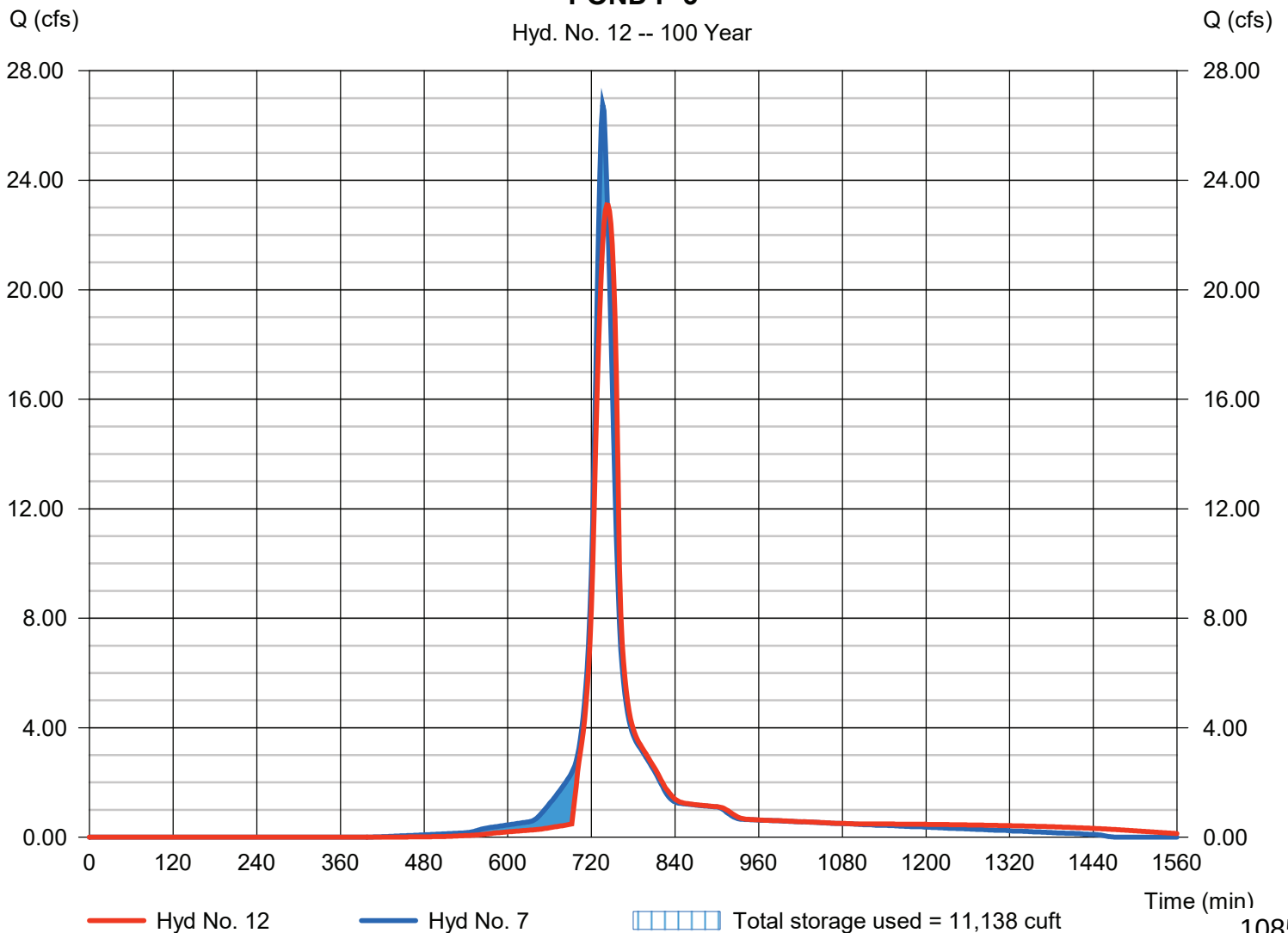
Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - P-3
 Reservoir name = POND P-3

Peak discharge = 23.10 cfs
 Time to peak = 742 min
 Hyd. volume = 92,181 cuft
 Max. Elevation = 840.68 ft
 Max. Storage = 11,138 cuft

Storage Indication method used.

POND P-3

Hyd. No. 12 -- 100 Year



1085

Hydrograph Report

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

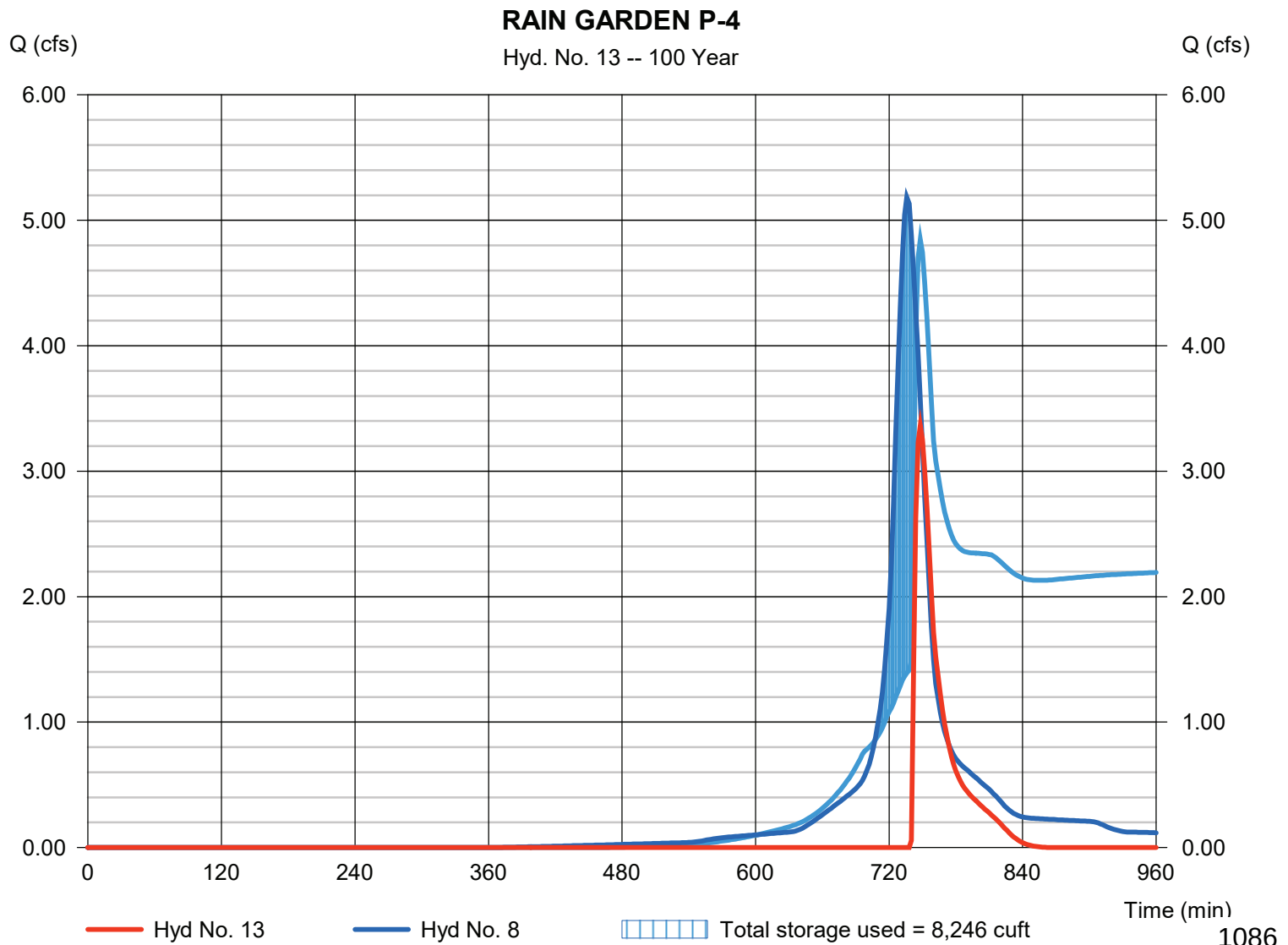
Thursday, 02 / 27 / 2020

Hyd. No. 13

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 3.364 cfs
Storm frequency	= 100 yrs	Time to peak	= 748 min
Time interval	= 2 min	Hyd. volume	= 5,264 cuft
Inflow hyd. No.	= 8 - P-4	Max. Elevation	= 840.86 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 8,246 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

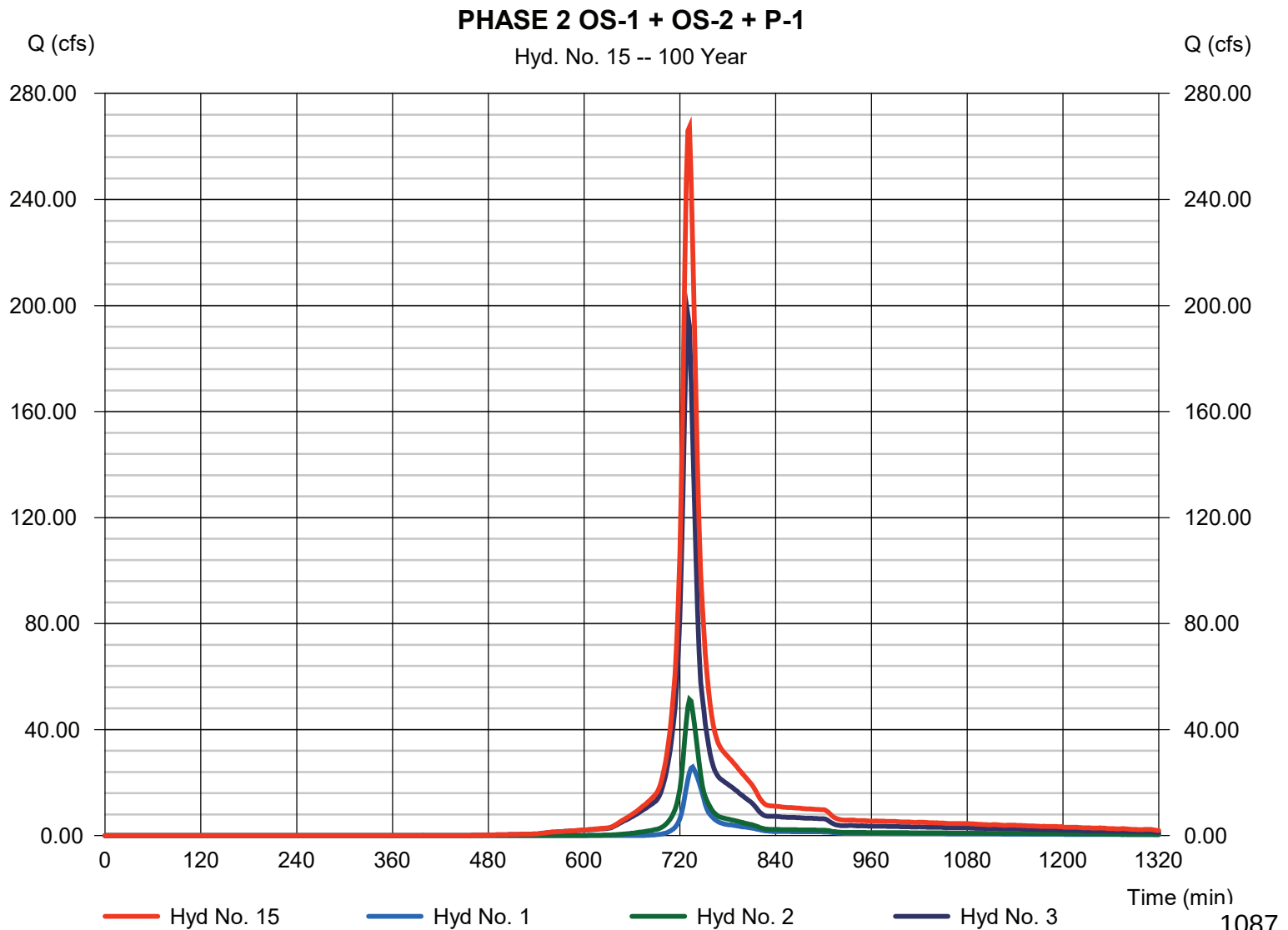
Thursday, 02 / 27 / 2020

Hyd. No. 15

PHASE 2 OS-1 + OS-2 + P-1

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 1, 2, 3

Peak discharge = 267.32 cfs
Time to peak = 732 min
Hyd. volume = 736,205 cuft
Contrib. drain. area = 55.916 ac



Hydrograph Report

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

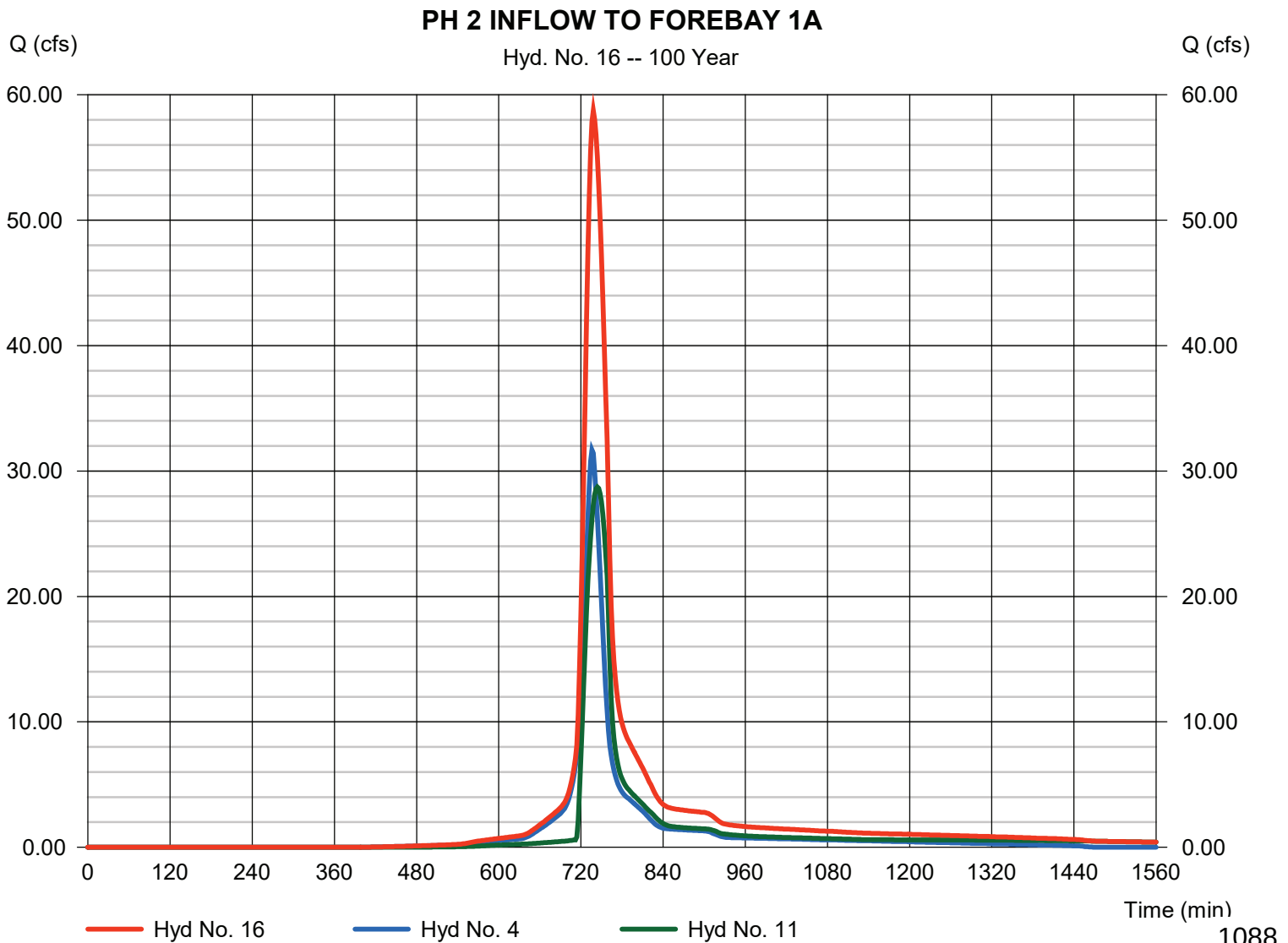
Thursday, 02 / 27 / 2020

Hyd. No. 16

PH 2 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 4, 11

Peak discharge = 58.74 cfs
 Time to peak = 738 min
 Hyd. volume = 228,275 cuft
 Contrib. drain. area = 6.607 ac



Hydrograph Report

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

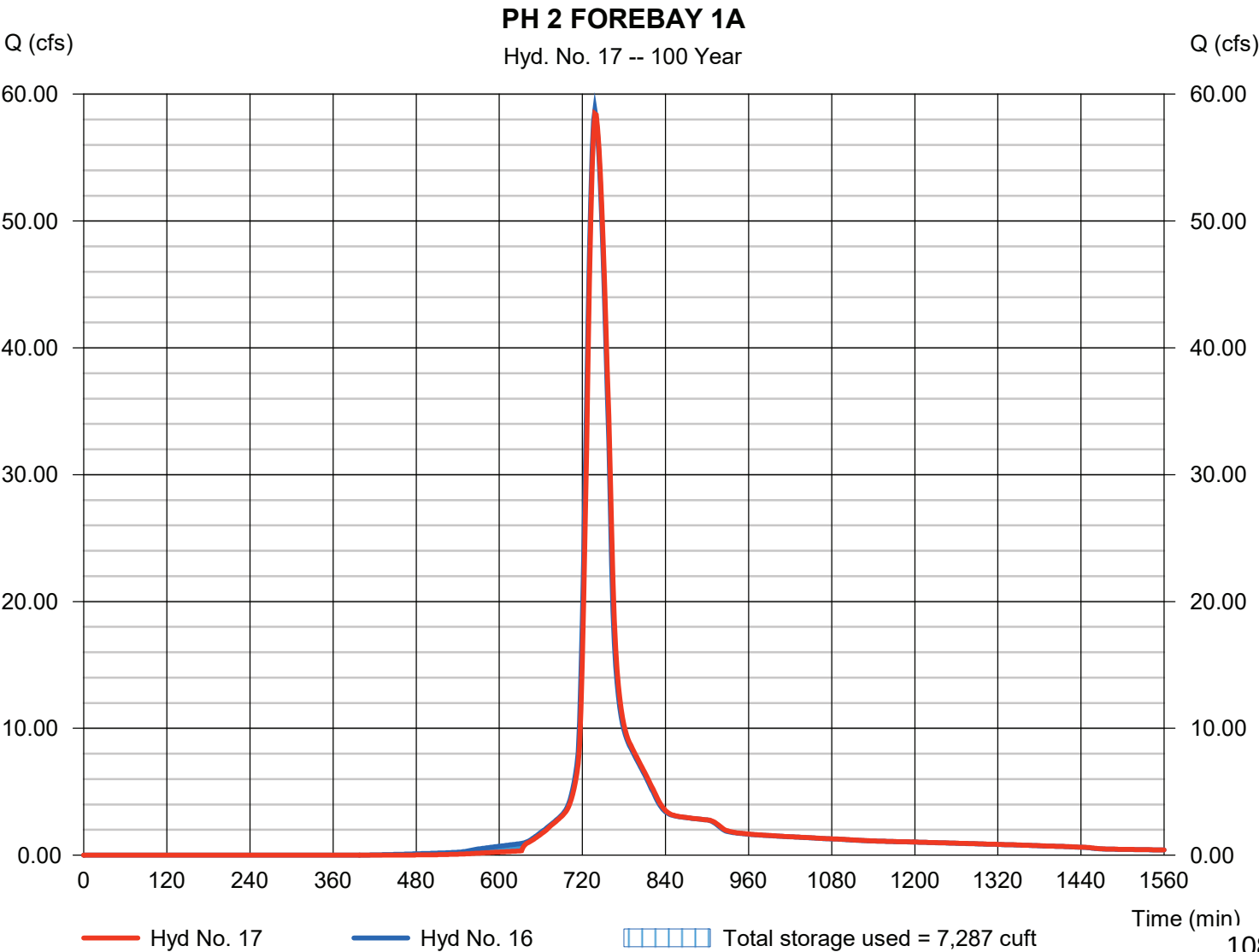
Thursday, 02 / 27 / 2020

Hyd. No. 17

PH 2 FOREBAY 1A

Hydrograph type	= Reservoir	Peak discharge	= 58.47 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 228,260 cuft
Inflow hyd. No.	= 16 - PH 2 INFLOW TO FOREBAY 1A	Max. Elevation	= 835.82 ft
Reservoir name	= FOREBAY 1A	Max. Storage	= 7,287 cuft

Storage Indication method used.



Hydrograph Report

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

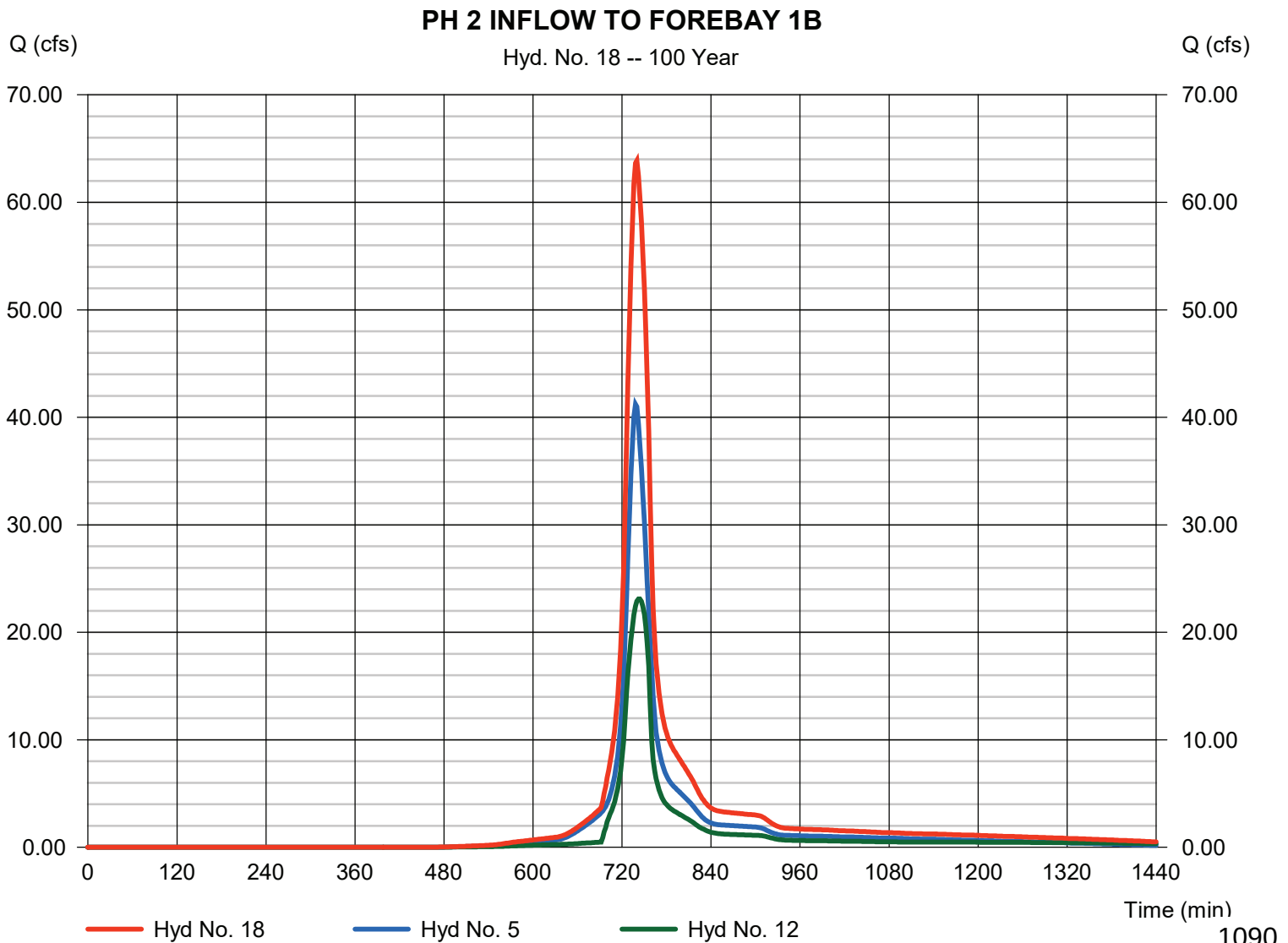
Thursday, 02 / 27 / 2020

Hyd. No. 18

PH 2 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 5, 12

Peak discharge = 63.88 cfs
Time to peak = 740 min
Hyd. volume = 240,073 cuft
Contrib. drain. area = 10.224 ac



Hydrograph Report

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

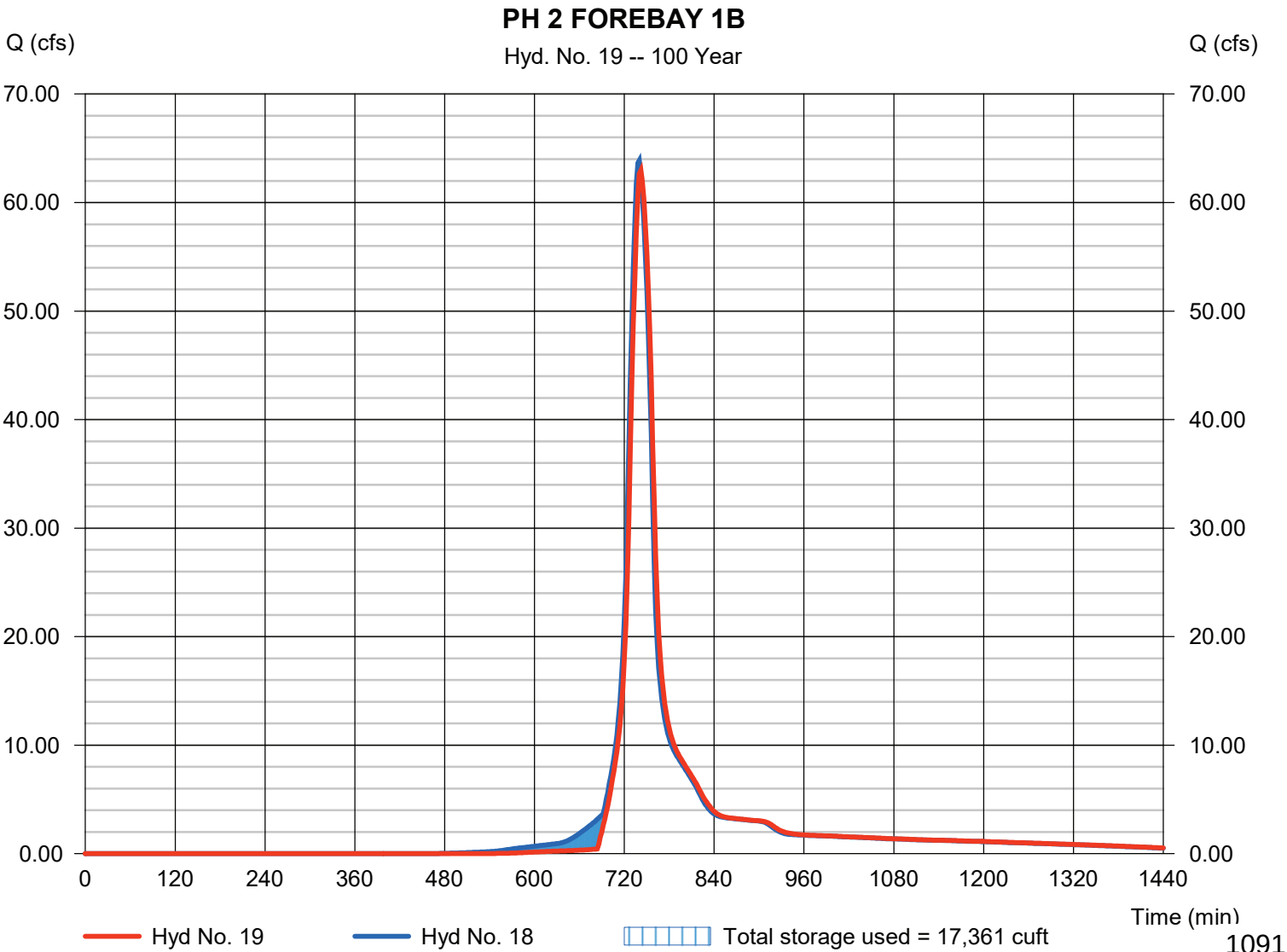
Thursday, 02 / 27 / 2020

Hyd. No. 19

PH 2 FOREBAY 1B

Hydrograph type	= Reservoir	Peak discharge	= 62.98 cfs
Storm frequency	= 100 yrs	Time to peak	= 742 min
Time interval	= 2 min	Hyd. volume	= 240,027 cuft
Inflow hyd. No.	= 18 - PH 2 INFLOW TO FOREBAY 1B	Max. Elevation	= 835.87 ft
Reservoir name	= FOREBAY 1B	Max. Storage	= 17,361 cuft

Storage Indication method used.



Hydrograph Report

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

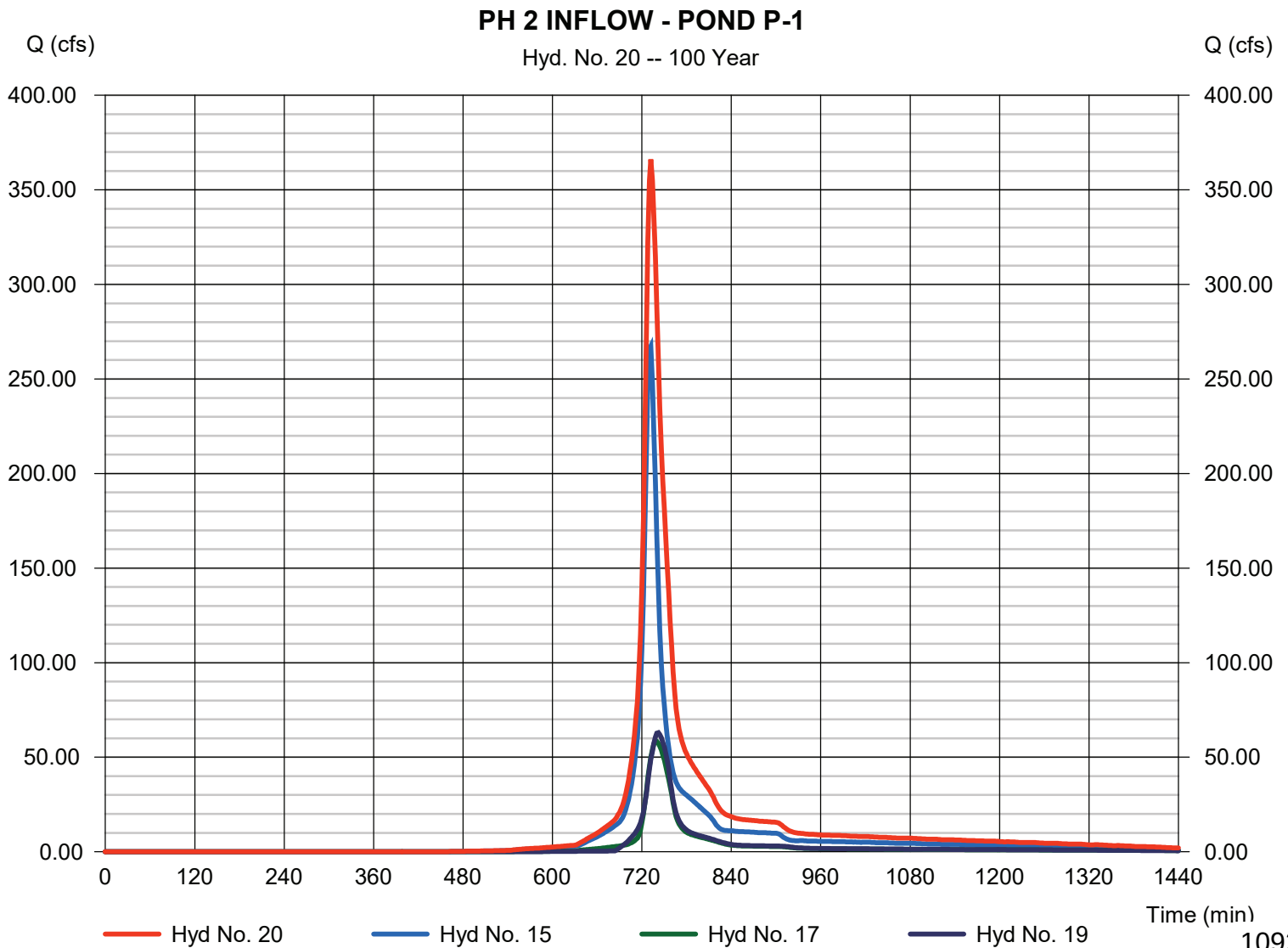
Thursday, 02 / 27 / 2020

Hyd. No. 20

PH 2 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 15, 17, 19

Peak discharge = 366.21 cfs
 Time to peak = 732 min
 Hyd. volume = 1,204,489 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

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

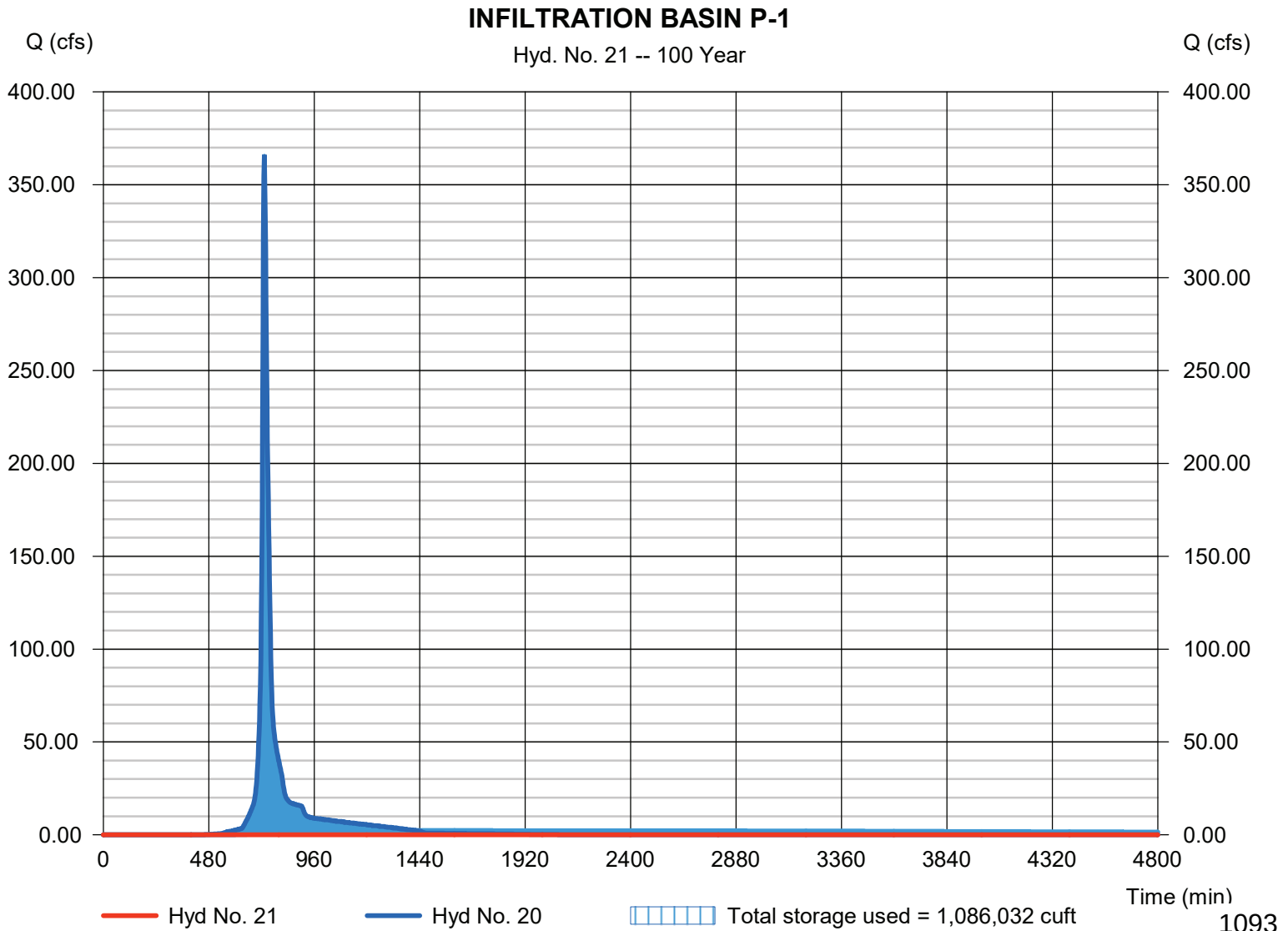
Thursday, 02 / 27 / 2020

Hyd. No. 21

INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 3236 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 20 - PH 2 INFLOW - POND P-1	Max. Elevation	= 838.11 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 2	Max. Storage	= 1,086,032 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

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

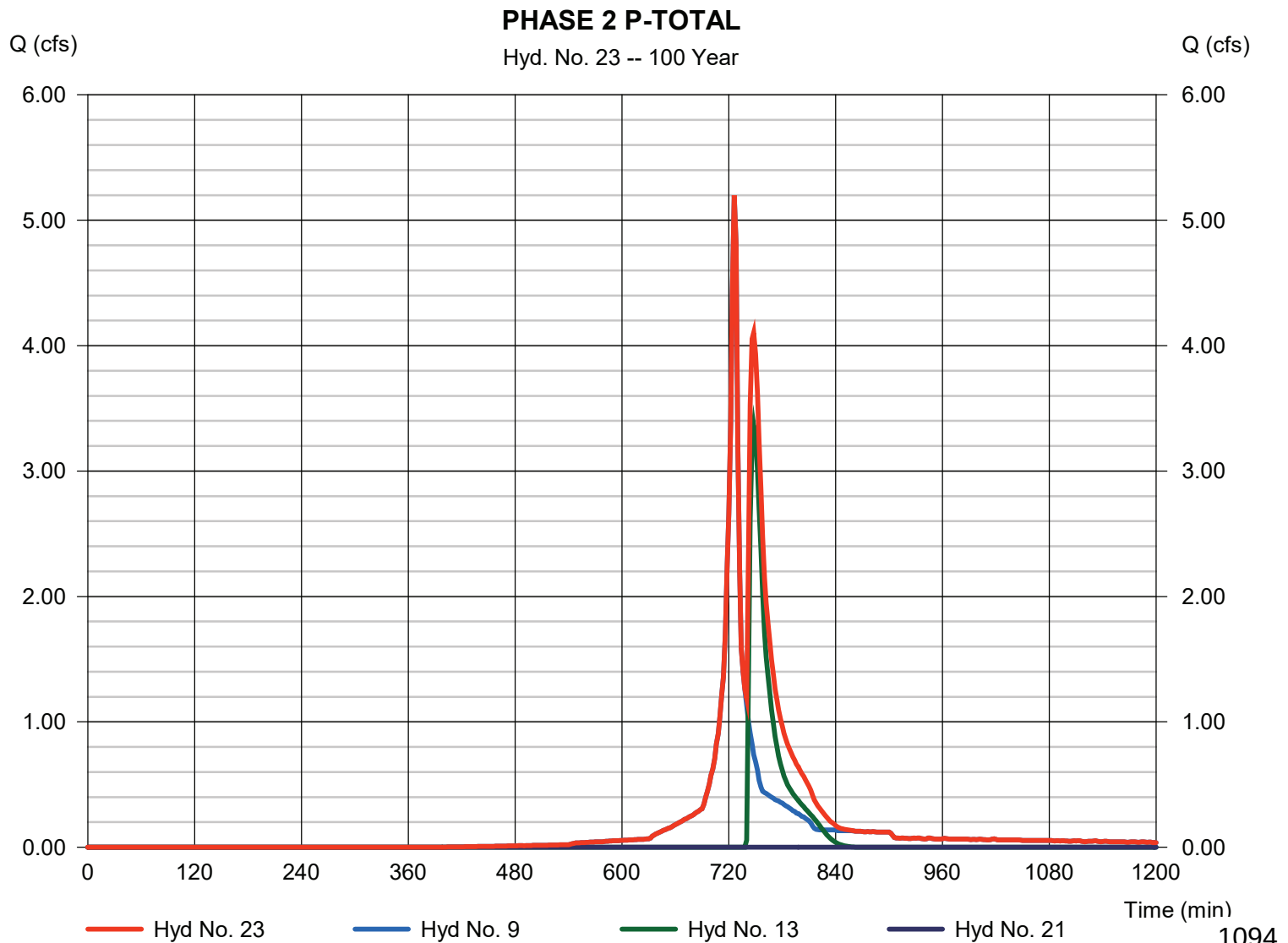
Thursday, 02 / 27 / 2020

Hyd. No. 23

PHASE 2 P-TOTAL

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 9, 13, 21

Peak discharge = 5.199 cfs
 Time to peak = 726 min
 Hyd. volume = 15,462 cuft
 Contrib. drain. area = 0.670 ac



Hydraflow Rainfall Report

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

Thursday, 02 / 27 / 2020

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	22.8367	5.6000	0.7338	-----
2	25.4674	5.2000	0.7159	-----
3	0.0000	0.0000	0.0000	-----
5	30.5439	4.9000	0.7023	-----
10	33.5363	4.6000	0.6850	-----
25	36.2566	4.0000	0.6589	-----
50	35.2584	3.1000	0.6226	-----
100	34.0002	2.2000	0.5870	-----

File name: WAUKESHA ATLAS 14 IDF.IDF

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.04	3.04	2.48	2.11	1.85	1.66	1.51	1.38	1.28	1.20	1.12	1.06
2	4.83	3.63	2.96	2.53	2.22	1.99	1.81	1.66	1.54	1.44	1.36	1.28
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	6.11	4.58	3.74	3.19	2.81	2.52	2.29	2.11	1.96	1.83	1.72	1.63
10	7.12	5.35	4.37	3.74	3.29	2.96	2.70	2.49	2.31	2.17	2.04	1.93
25	8.52	6.37	5.21	4.47	3.94	3.55	3.24	3.00	2.79	2.62	2.47	2.34
50	9.59	7.11	5.81	4.99	4.42	3.99	3.66	3.39	3.16	2.97	2.81	2.67
100	10.67	7.83	6.40	5.51	4.89	4.43	4.07	3.78	3.54	3.34	3.16	3.01

T_c = time in minutes. Values may exceed 60.

gn Standards\Hydrology\Hydraflow UPDATED ATLAS 14\STATIONS\WAUKESHA\WAUKESHA ATLAS 14 Precip.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	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	2.40	2.70	0.00	0.00	3.81	4.65	0.00	6.18

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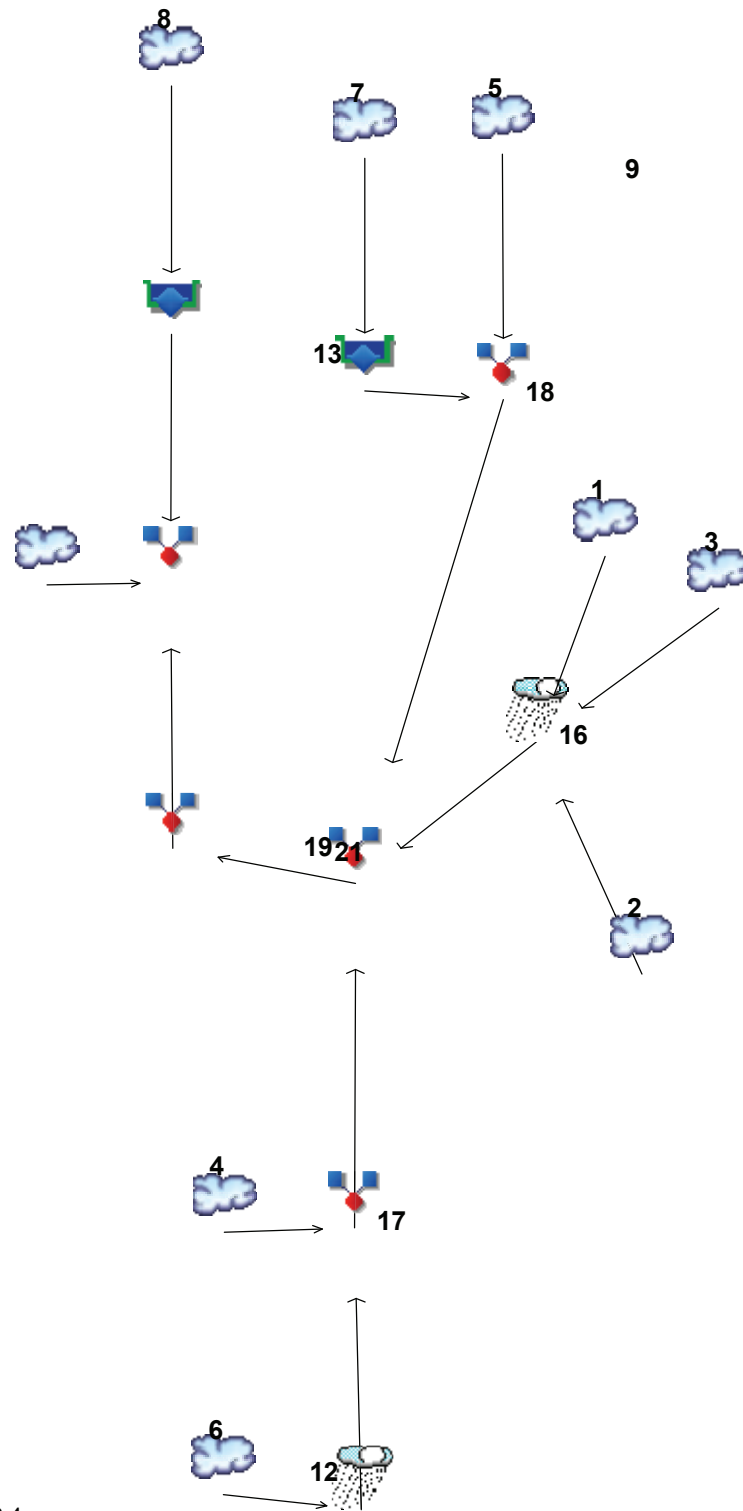
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APPENDIX 8

PROPOSED Future Phase Hydraflow Calculations – Frozen Ground Condition
(No Infiltration, CN = 98)

Watershed Model Schematic

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

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15

Legend

Hyd. Origin **Description**

1	SCS Runoff	P-OS-1
2	SCS Runoff	P-OS-2
3	SCS Runoff	P-1-PH 2
4	SCS Runoff	P-1A-PH2
5	SCS Runoff	P-1B-PH2
6	SCS Runoff	P-2
7	SCS Runoff	P-3
8	SCS Runoff	P-4
9	SCS Runoff	P-UD-1
11	Reservoir	POND P-2
12	Reservoir	POND P-3
13	Reservoir	RAIN GARDEN P-4
15	Combine	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	PH 2 INFLOW TO FOREBAY 1A
17	Combine	PH 2 INFLOW TO FOREBAY 1B
18	Combine	PH 2 INFLOW - POND P-1
19	Reservoir	INFILTRATION BASIN P-1
21	Combine	PHASE 2 P-TOTAL

1100

Hydrograph Return Period Recap

Hydrow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	23.59	26.66	-----	-----	37.96	-----	-----	61.96	P-OS-1
2	SCS Runoff	-----	31.97	36.13	-----	-----	51.43	-----	-----	83.92	P-OS-2
3	SCS Runoff	-----	93.63	105.79	-----	-----	150.58	-----	-----	245.69	P-1-PH 2
4	SCS Runoff	-----	14.31	16.18	-----	-----	23.04	-----	-----	37.62	P-1A-PH2
5	SCS Runoff	-----	20.34	23.00	-----	-----	32.76	-----	-----	53.47	P-1B-PH2
6	SCS Runoff	-----	16.00	18.08	-----	-----	25.76	-----	-----	42.05	P-2
7	SCS Runoff	-----	12.09	13.66	-----	-----	19.46	-----	-----	31.76	P-3
8	SCS Runoff	-----	2.253	2.547	-----	-----	3.627	-----	-----	5.921	P-4
9	SCS Runoff	-----	2.305	2.604	-----	-----	3.703	-----	-----	6.038	P-UD-1
11	Reservoir	6	15.17	17.23	-----	-----	23.15	-----	-----	32.94	POND P-2
12	Reservoir	7	11.92	13.48	-----	-----	18.32	-----	-----	25.63	POND P-3
13	Reservoir	8	0.055	0.234	-----	-----	2.208	-----	-----	5.725	RAIN GARDEN P-4
15	Combine	1, 2, 3,	146.18	165.20	-----	-----	235.25	-----	-----	383.96	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	4, 11,	29.11	33.11	-----	-----	45.44	-----	-----	68.23	PH 2 INFLOW TO FOREBAY 1A
17	Combine	5, 12,	32.27	36.48	-----	-----	50.95	-----	-----	78.26	PH 2 INFLOW TO FOREBAY 1B
18	Combine	15, 16, 17	197.39	224.73	-----	-----	319.57	-----	-----	512.01	PH 2 INFLOW - POND P-1
19	Reservoir	18	0.000	0.000	-----	-----	0.000	-----	-----	0.000	INFILTRATION BASIN P-1
21	Combine	9, 13, 19,	2.305	2.604	-----	-----	3.703	-----	-----	7.259	PHASE 2 P-TOTAL
1101											
Proj. file: 2020-02-27_CHAPMAN FARMS_PHASE II_Frozen.gpw									Thursday, 02 / 27 / 2020		

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

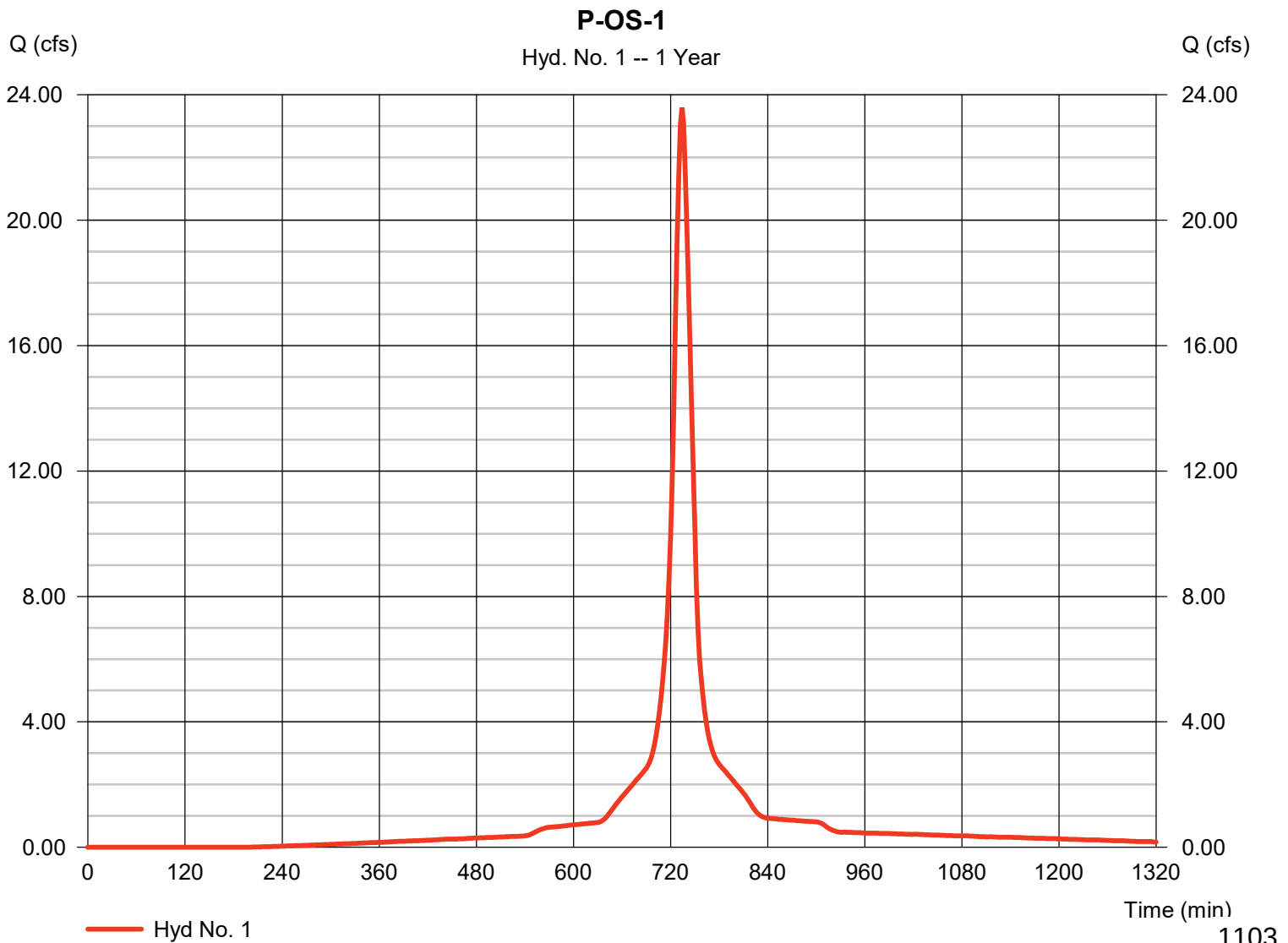
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	23.59	2	734	80,160	-----	-----	-----	P-OS-1
2	SCS Runoff	31.97	2	732	98,444	-----	-----	-----	P-OS-2
3	SCS Runoff	93.63	2	730	267,714	-----	-----	-----	P-1-PH 2
4	SCS Runoff	14.31	2	736	53,006	-----	-----	-----	P-1A-PH2
5	SCS Runoff	20.34	2	738	79,326	-----	-----	-----	P-1B-PH2
6	SCS Runoff	16.00	2	736	59,248	-----	-----	-----	P-2
7	SCS Runoff	12.09	2	736	44,759	-----	-----	-----	P-3
8	SCS Runoff	2.253	2	736	8,344	-----	-----	-----	P-4
9	SCS Runoff	2.305	2	726	4,951	-----	-----	-----	P-UD-1
11	Reservoir	15.17	2	740	59,229	6	839.76	16,407	POND P-2
12	Reservoir	11.92	2	738	44,746	7	839.92	7,139	POND P-3
13	Reservoir	0.055	2	926	969	8	840.70	7,393	RAIN GARDEN P-4
15	Combine	146.18	2	730	446,319	1, 2, 3,	-----	-----	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	29.11	2	738	112,236	4, 11,	-----	-----	PH 2 INFLOW TO FOREBAY 1A
17	Combine	32.27	2	738	124,072	5, 12,	-----	-----	PH 2 INFLOW TO FOREBAY 1B
18	Combine	197.39	2	732	682,627	15, 16, 17	-----	-----	PH 2 INFLOW - POND P-1
19	Reservoir	0.000	2	n/a	0	18	835.62	682,626	INFILTRATION BASIN P-1
21	Combine	2.305	2	726	5,920	9, 13, 19,	-----	-----	PHASE 2 P-TOTAL
2020-02-27_CHAPMAN FARMS_PHASE II_Freeze					Return Period: 1 Year			Thursday, 02 / 27 / 2020	

Hyd. No. 1

P-OS-1

Hydrograph type	= SCS Runoff	Peak discharge	= 23.59 cfs
Storm frequency	= 1 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 80,160 cuft
Drainage area	= 10.170 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.90 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\	Hydroflow Distribution	= MSF3 DISTRIBUTION CURVE

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 1

P-OS-1

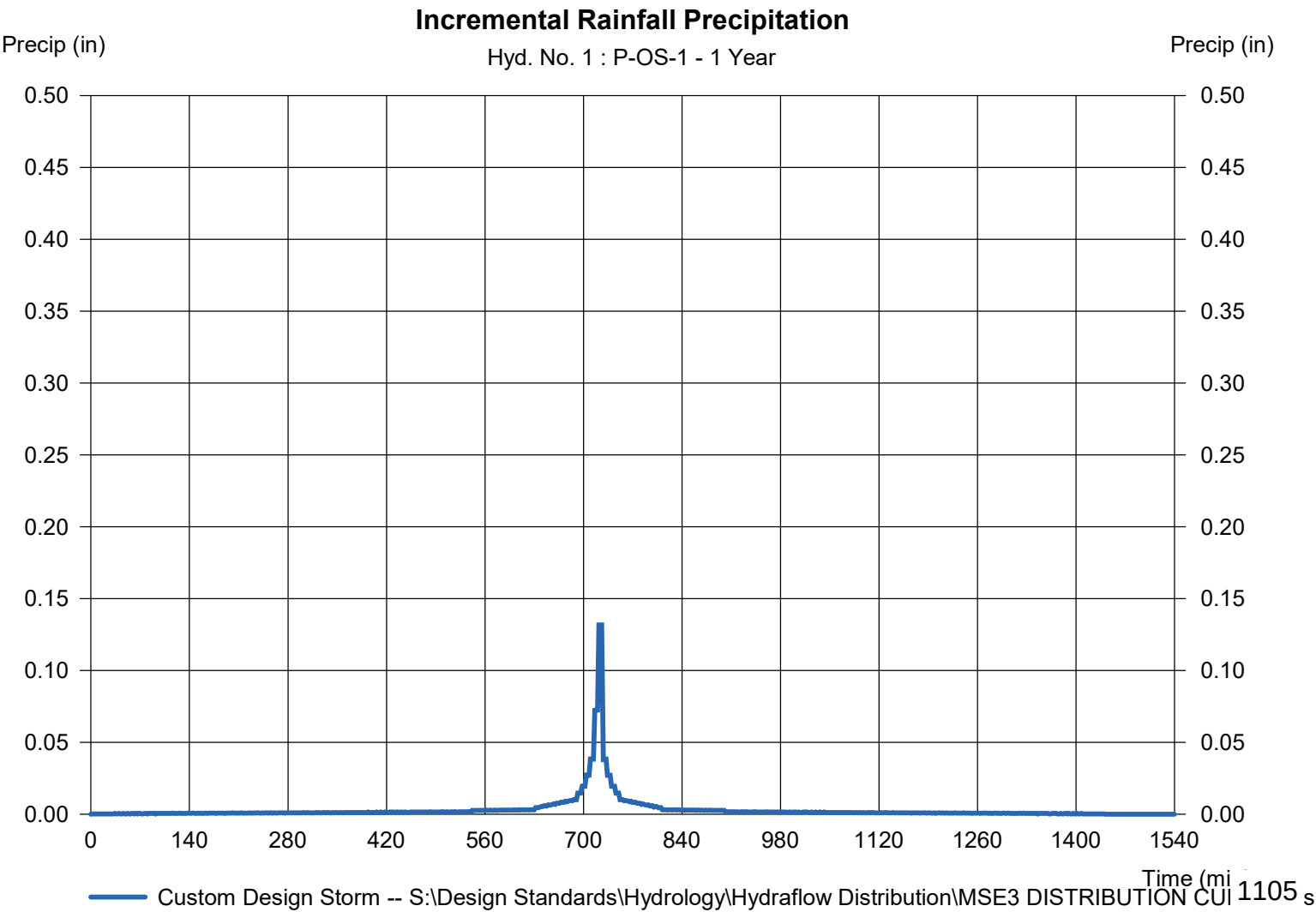
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 5.30	0.00	0.00	
Travel Time (min)	= 14.55	+ 0.00	+ 0.00	= 14.55
Shallow Concentrated Flow				
Flow length (ft)	= 790.00	0.00	0.00	
Watercourse slope (%)	= 8.10	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=4.59	0.00	0.00	
Travel Time (min)	= 2.87	+ 0.00	+ 0.00	= 2.87
Channel Flow				
X sectional flow area (sqft)	= 3.14	0.00	0.00	
Wetted perimeter (ft)	= 6.28	0.00	0.00	
Channel slope (%)	= 3.10	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=12.68	0.00	0.00	
Flow length (ft)	(0)1100.0	0.0	0.0	
Travel Time (min)	= 1.45	+ 0.00	+ 0.00	= 1.45
Total Travel Time, Tc				18.90 min

Precipitation Report

Hyd. No. 1

P-OS-1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

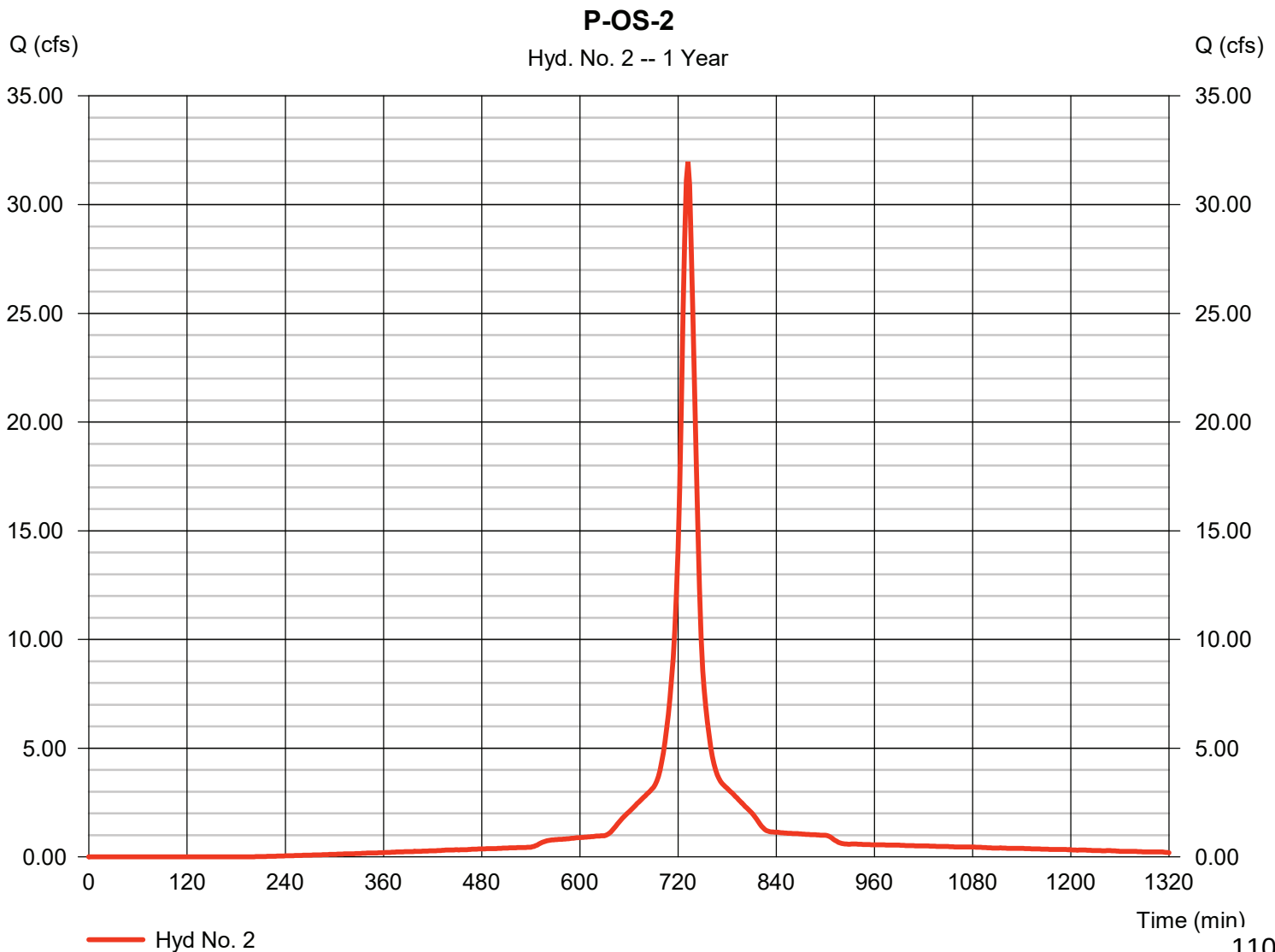
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Hydrograph type	= SCS Runoff	Peak discharge	= 31.97 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 98,444 cuft
Drainage area	= 12.810 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.80 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CU		



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 2

P-OS-2

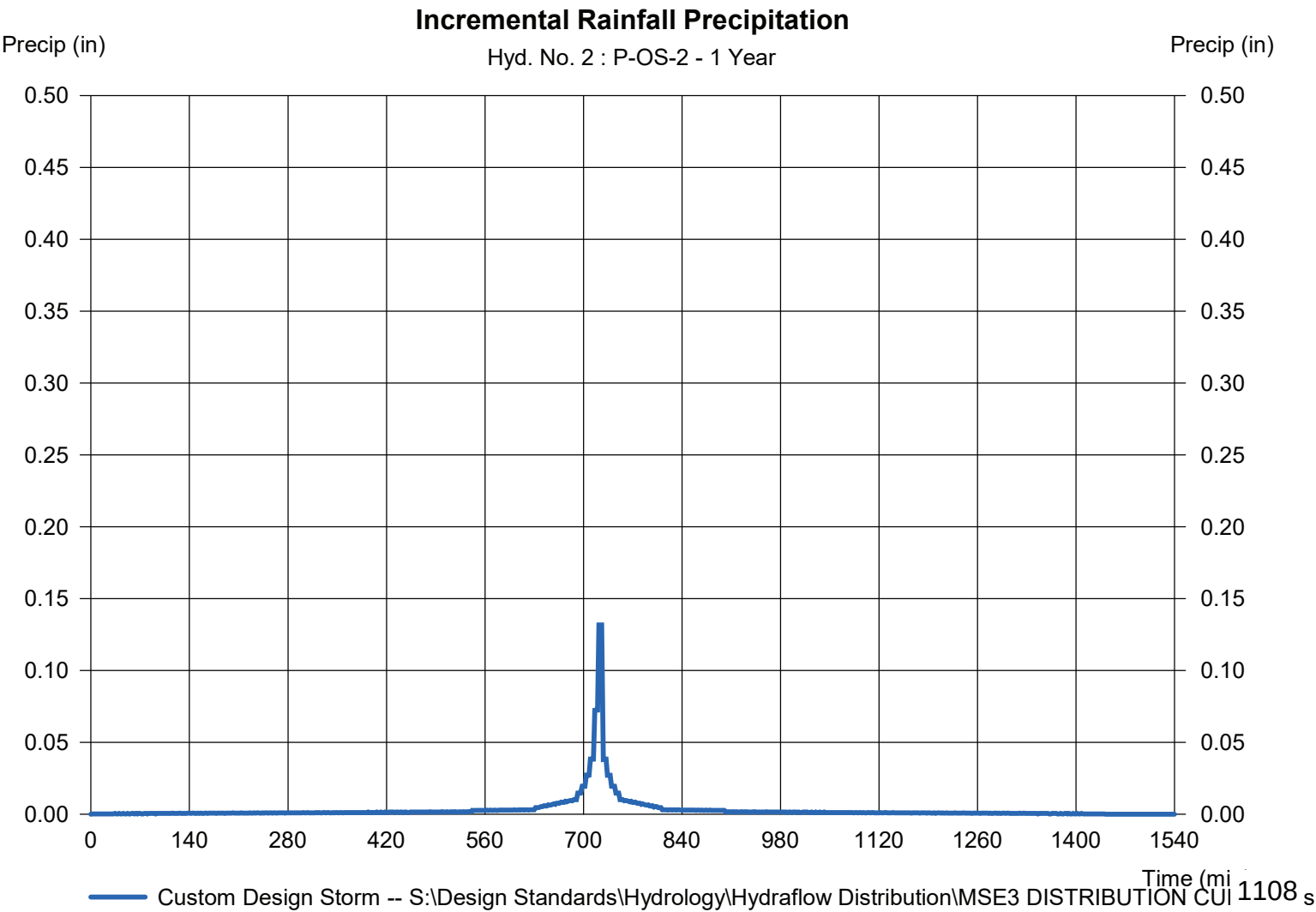
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 9.30	0.00	0.00	
Travel Time (min)	= 11.62	+ 0.00	+ 0.00	= 11.62
Shallow Concentrated Flow				
Flow length (ft)	= 780.00	0.00	0.00	
Watercourse slope (%)	= 8.70	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=4.76	0.00	0.00	
Travel Time (min)	= 2.73	+ 0.00	+ 0.00	= 2.73
Channel Flow				
X sectional flow area (sqft)	= 3.14	0.00	0.00	
Wetted perimeter (ft)	= 6.28	0.00	0.00	
Channel slope (%)	= 2.10	0.00	0.00	
Manning's n-value	= 0.013	0.015	0.015	
Velocity (ft/s)	=10.44	0.00	0.00	
Flow length (ft)	(0)900.0	0.0	0.0	
Travel Time (min)	= 1.44	+ 0.00	+ 0.00	= 1.44
Total Travel Time, Tc				15.80 min

Precipitation Report

Hyd. No. 2

P-OS-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

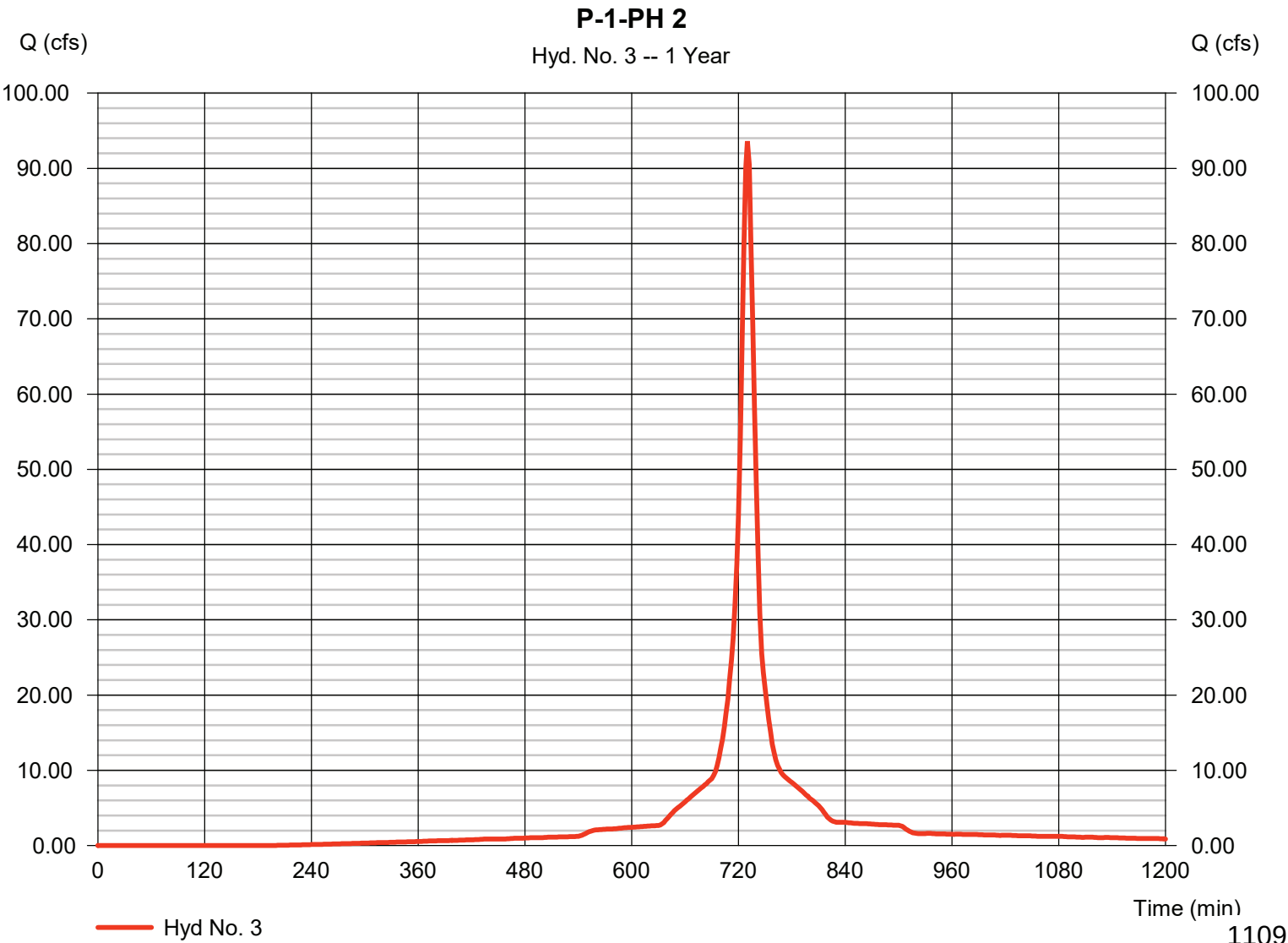
Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Hydrograph type	= SCS Runoff	Peak discharge	= 93.63 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 267,714 cuft
Drainage area	= 32.936 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSR3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 32.936



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 3

P-1-PH 2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 70.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00				
Land slope (%)	= 4.00	0.00	0.00				
Travel Time (min)	= 8.85	+	0.00	+	0.00	=	8.85
Shallow Concentrated Flow							
Flow length (ft)	= 360.00	0.00	0.00				
Watercourse slope (%)	= 2.50	0.00	0.00				
Surface description	= Unpaved	Unpaved	Paved				
Average velocity (ft/s)	=2.55	0.00	0.00				
Travel Time (min)	= 2.35	+	0.00	+	0.00	=	2.35
Channel Flow							
X sectional flow area (sqft)	= 0.00	0.00	0.00				
Wetted perimeter (ft)	= 0.00	0.00	0.00				
Channel slope (%)	= 0.00	0.00	0.00				
Manning's n-value	= 0.013	0.015	0.015				
Velocity (ft/s)	=0.00	0.00	0.00				
Flow length (ft)	(0)0.0	0.0	0.0				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc				11.20 min			

Precipitation Report

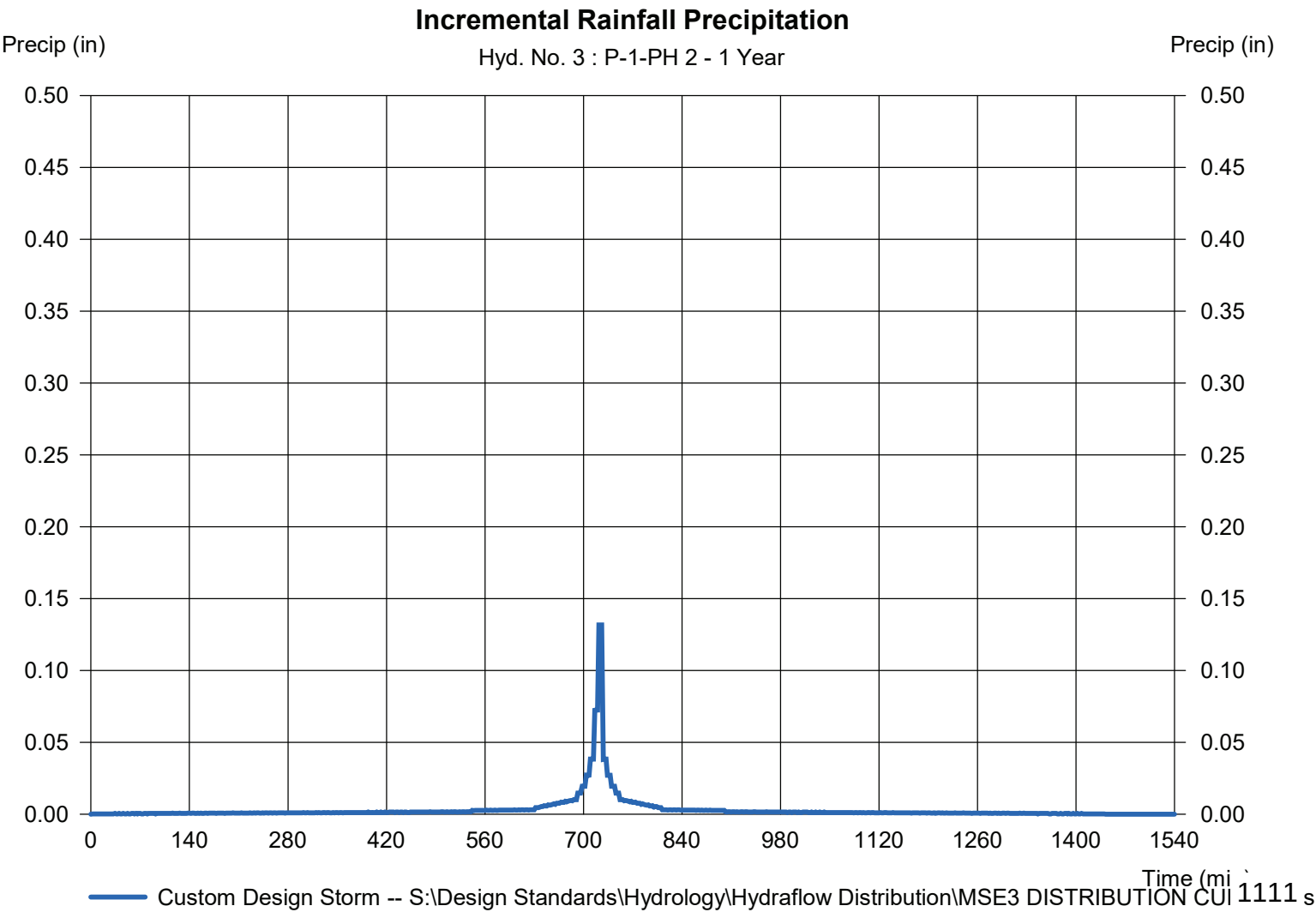
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

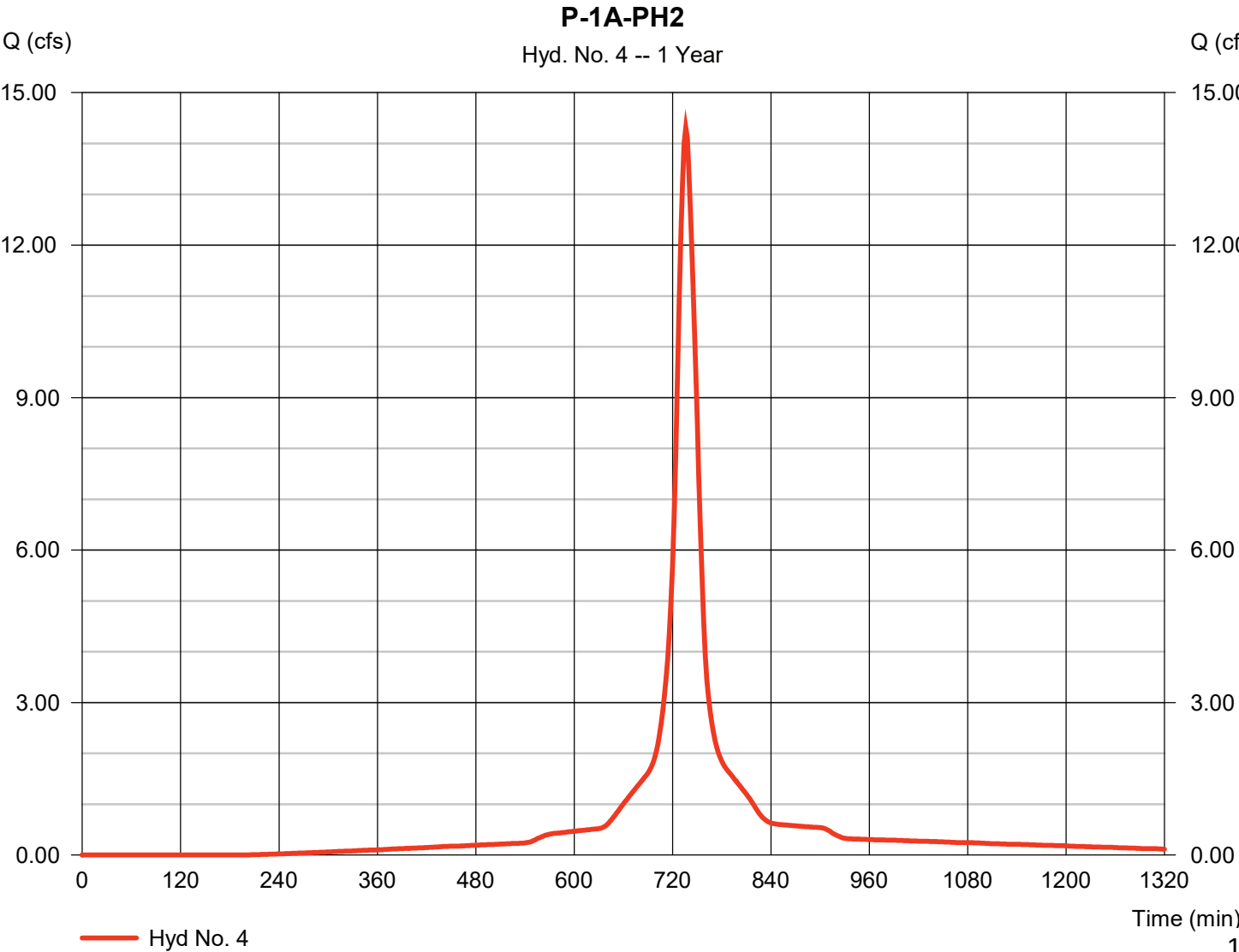
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 14.31 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 53,006 cuft
Drainage area	= 6.607 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 4

P-1A-PH2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 2.33	0.00	0.00	
Travel Time (min)	= 20.21	+	0.00	+
			0.00	= 20.21
Shallow Concentrated Flow				
Flow length (ft)	= 43.00	0.00	0.00	
Watercourse slope (%)	= 20.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=7.22	0.00	0.00	
Travel Time (min)	= 0.10	+	0.00	+
			0.00	= 0.10
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				20.30 min

Precipitation Report

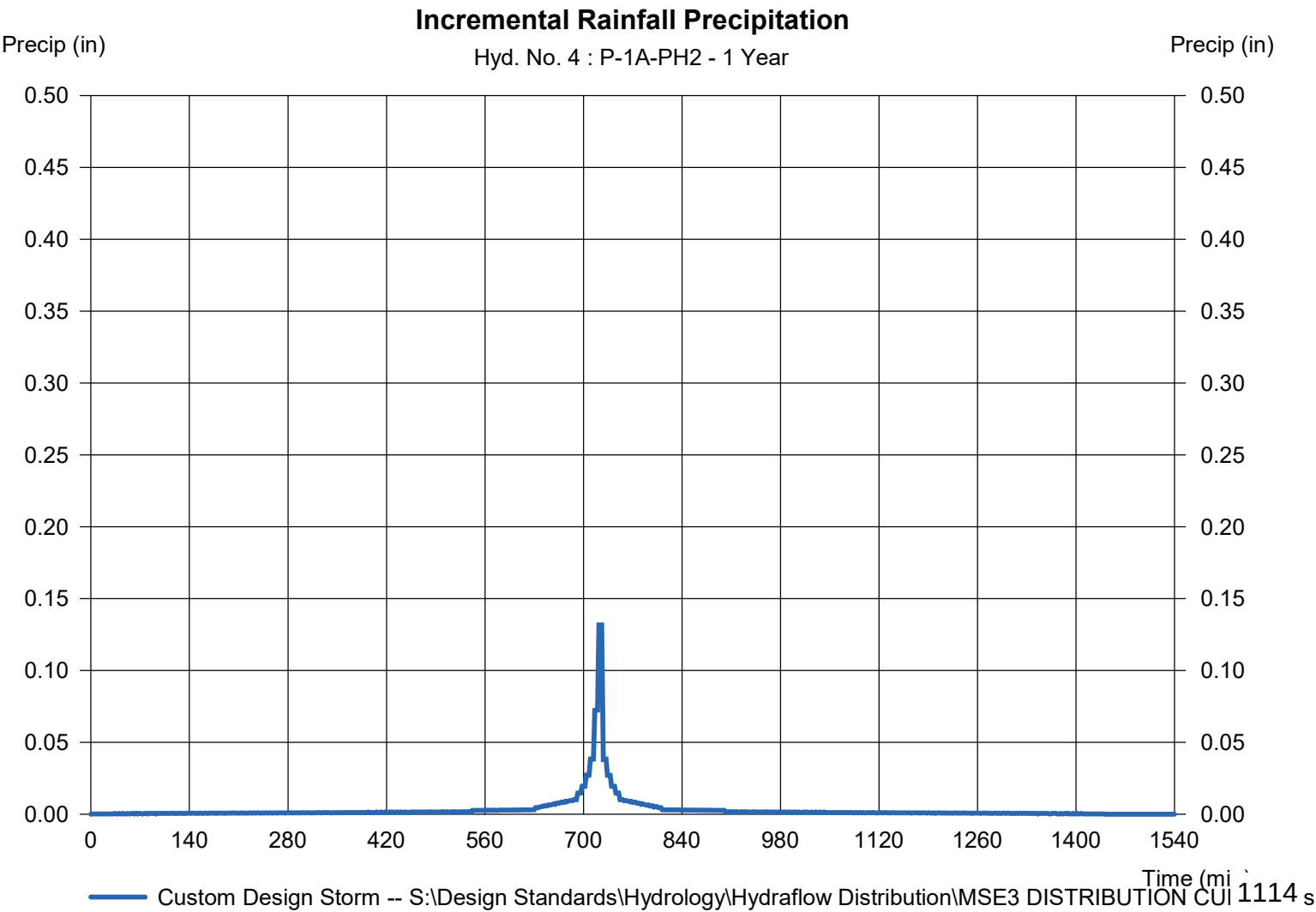
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

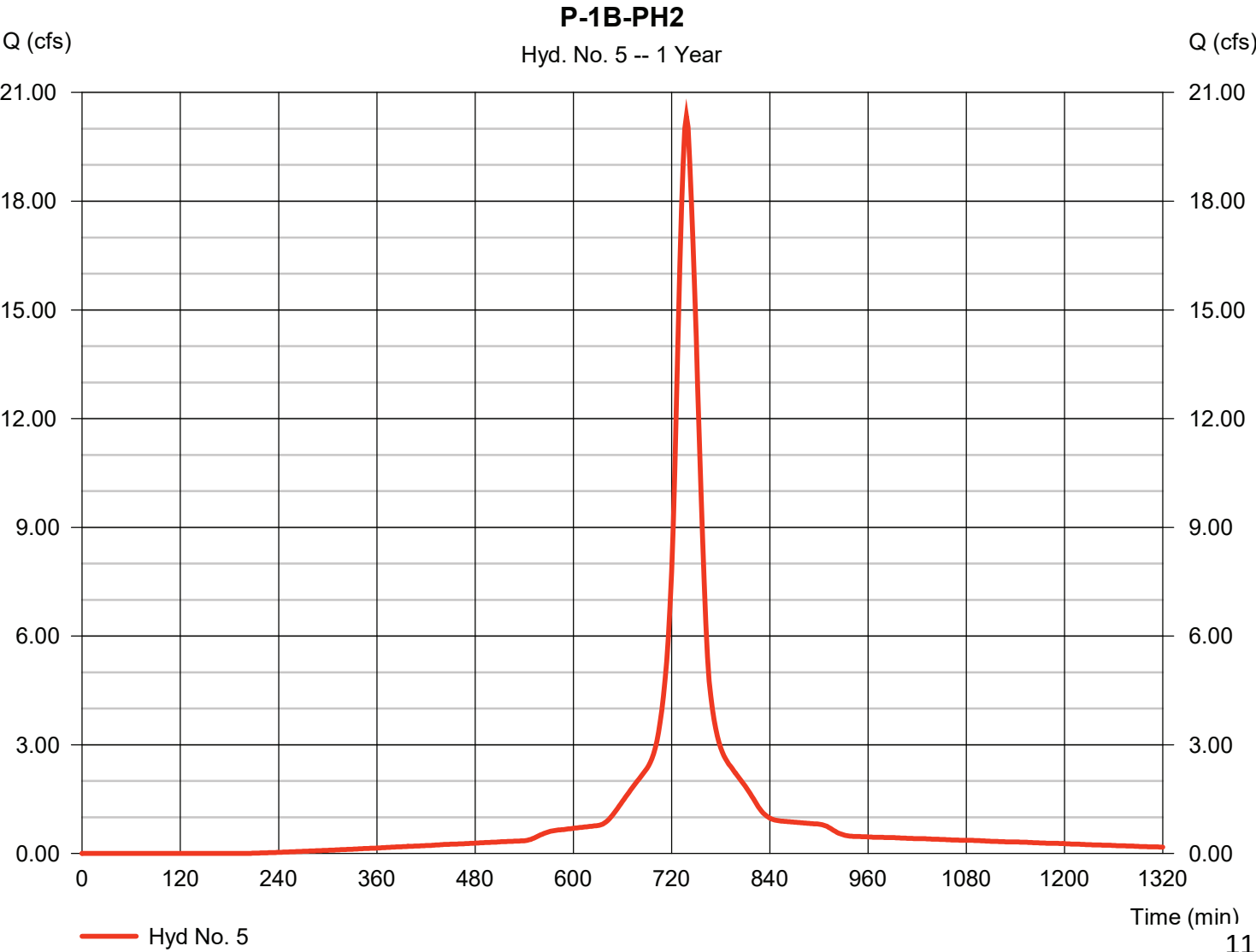
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 20.34 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 79,326 cuft
Drainage area	= 10.224 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 26.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD DISTRIBUTION CURVE		



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 5

P-1B-PH2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.240	0.011	0.011	
Flow length (ft)	= 150.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 2.70	0.00	0.00	
Land slope (%)	= 2.00	0.00	0.00	
Travel Time (min)	= 21.49	+	0.00	+
			0.00	= 21.49
Shallow Concentrated Flow				
Flow length (ft)	= 60.00	0.00	0.00	
Watercourse slope (%)	= 1.25	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=1.80	0.00	0.00	
Travel Time (min)	= 0.55	+	0.00	+
			0.00	= 0.55
Channel Flow				
X sectional flow area (sqft)	= 1.23	3.14	0.00	
Wetted perimeter (ft)	= 3.93	6.28	0.00	
Channel slope (%)	= 0.50	0.50	0.00	
Manning's n-value	= 0.013	0.013	0.015	
Velocity (ft/s)	=3.72	5.09	0.00	
Flow length (ft)	(\{0\})577.0	406.0	0.0	
Travel Time (min)	= 2.58	+	1.33	+
			0.00	= 3.91
Total Travel Time, Tc				26.00 min

Precipitation Report

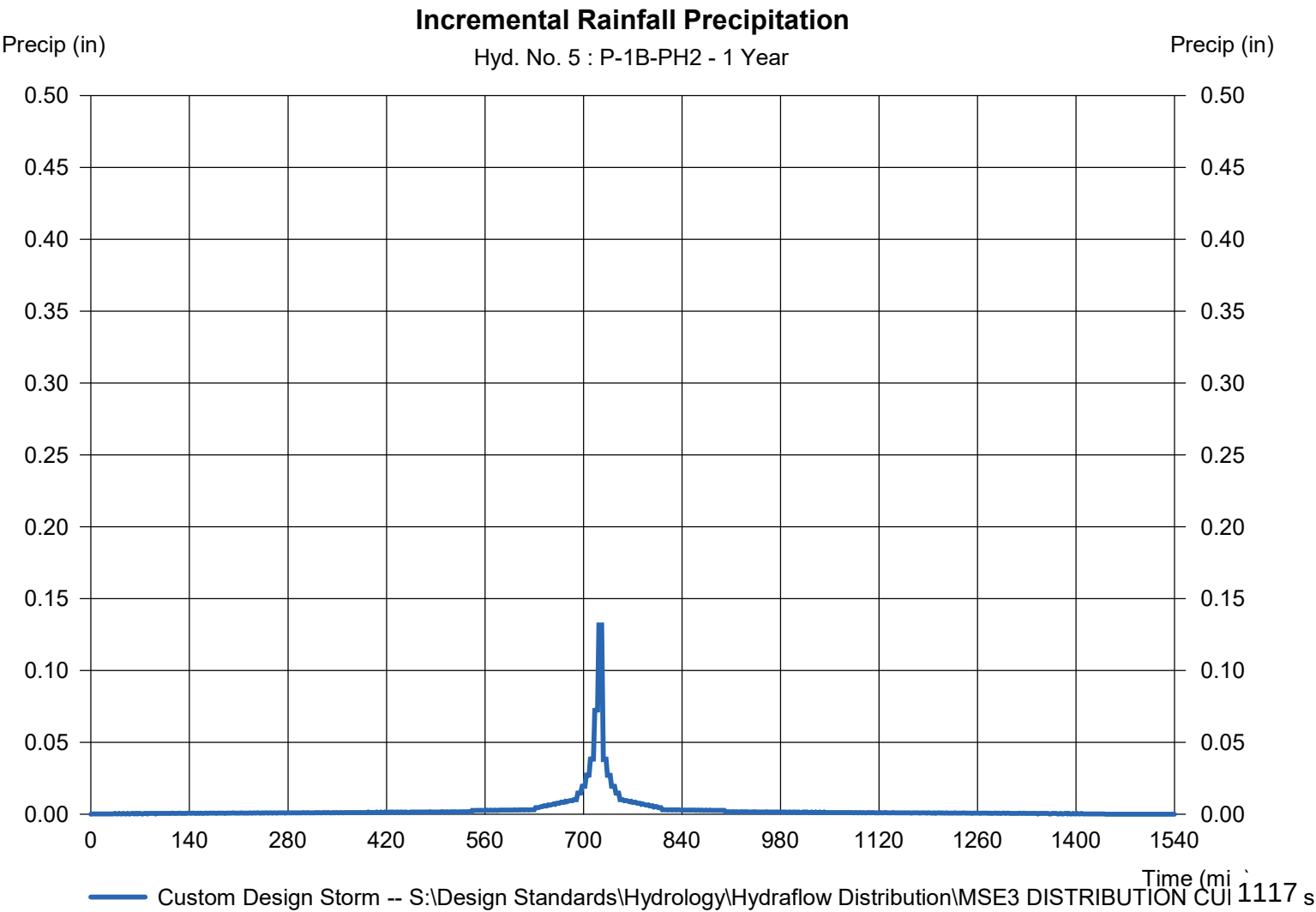
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

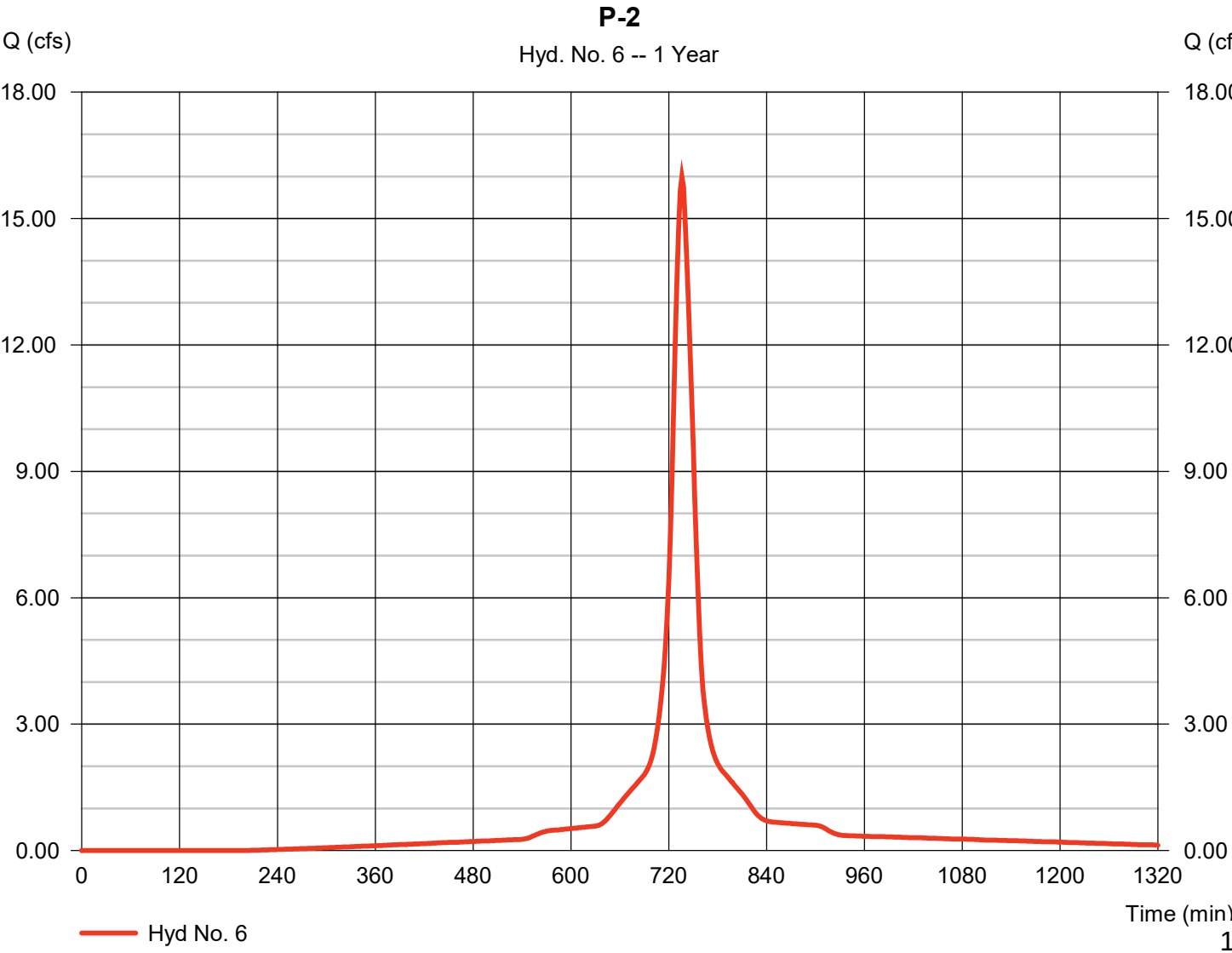
Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 16.00 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 59,248 cuft
Drainage area	= 7.385 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.710 x 75)] / 7.385



Precipitation Report

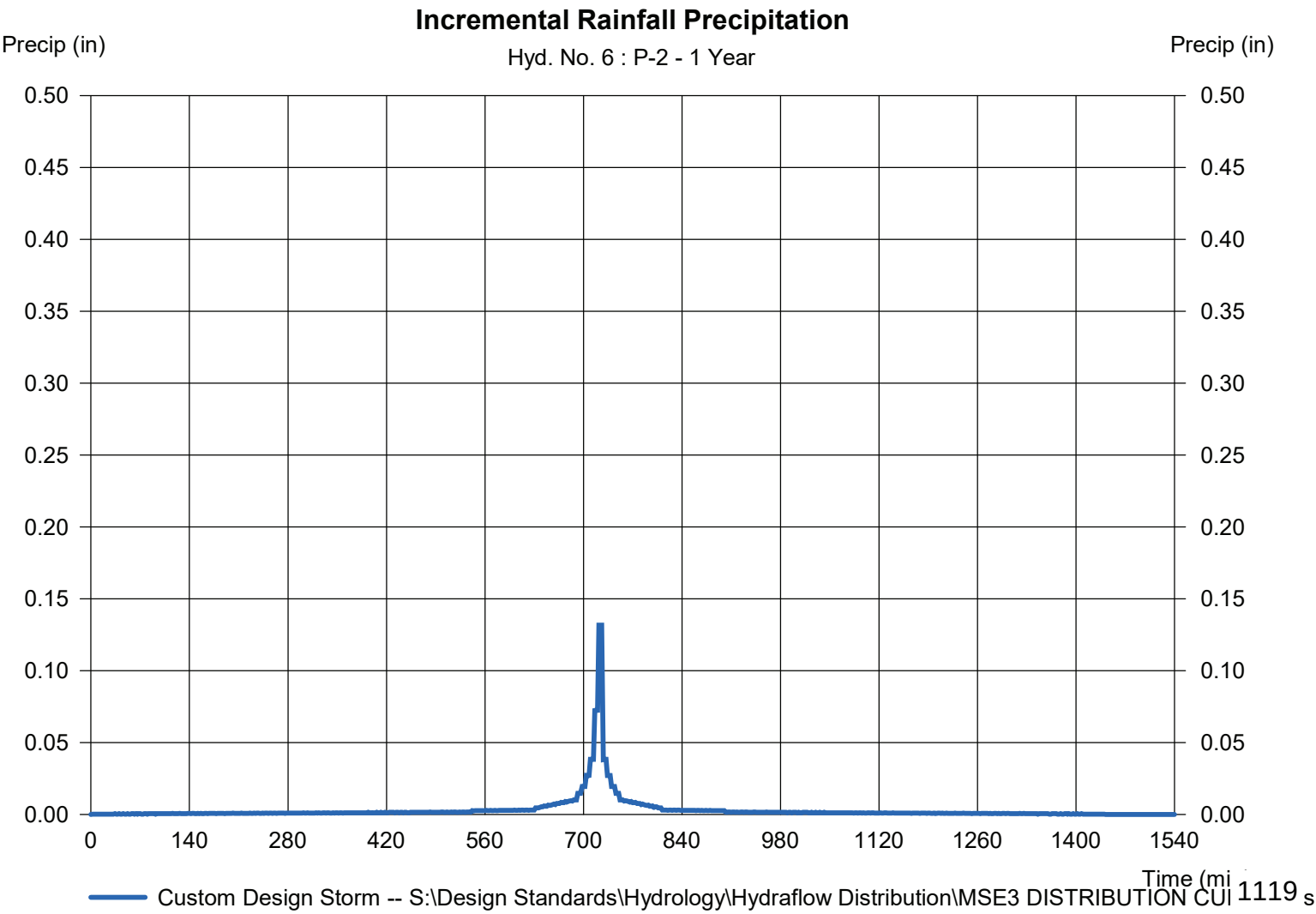
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

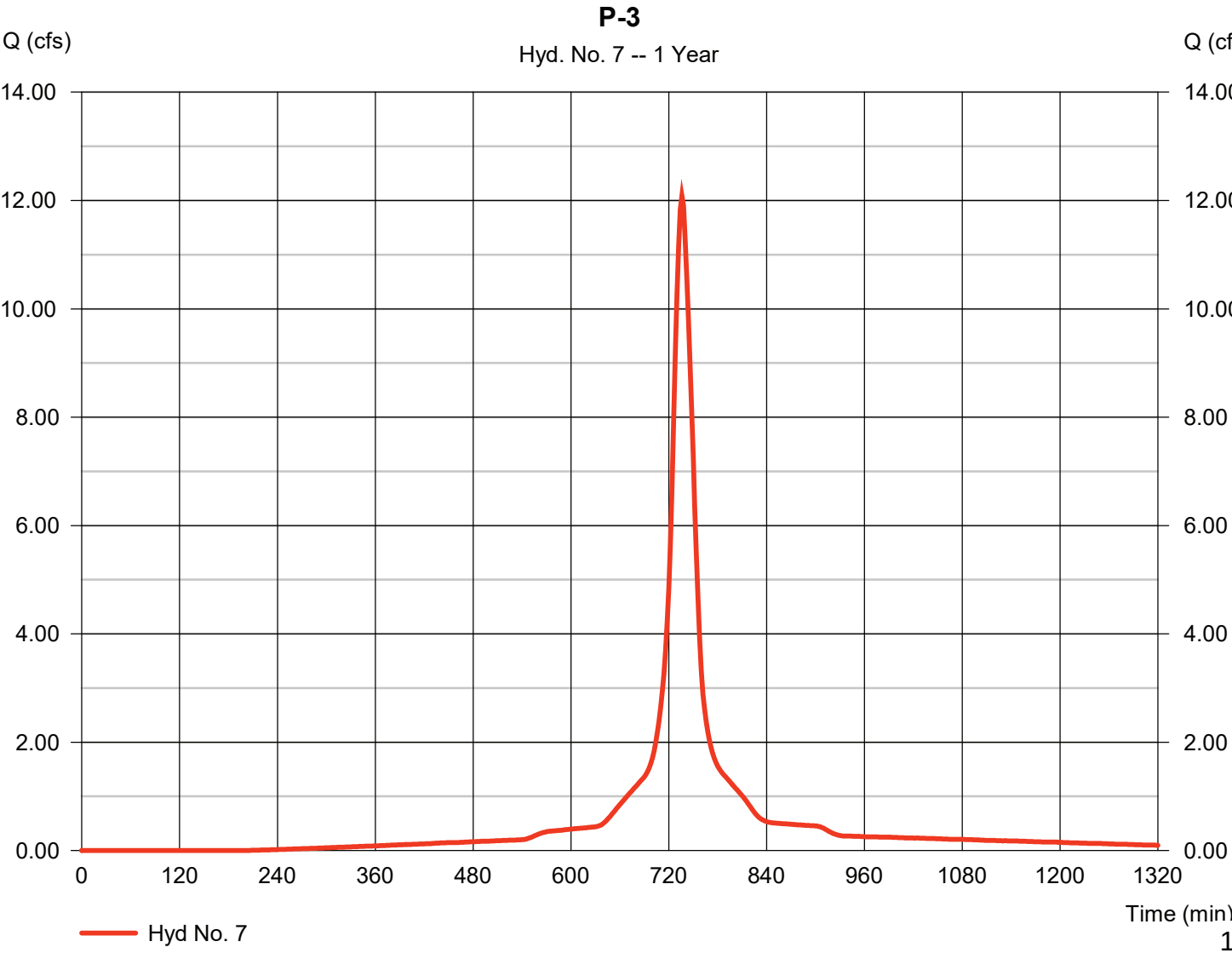
Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 12.09 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 44,759 cuft
Drainage area	= 5.579 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.20 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.579



Precipitation Report

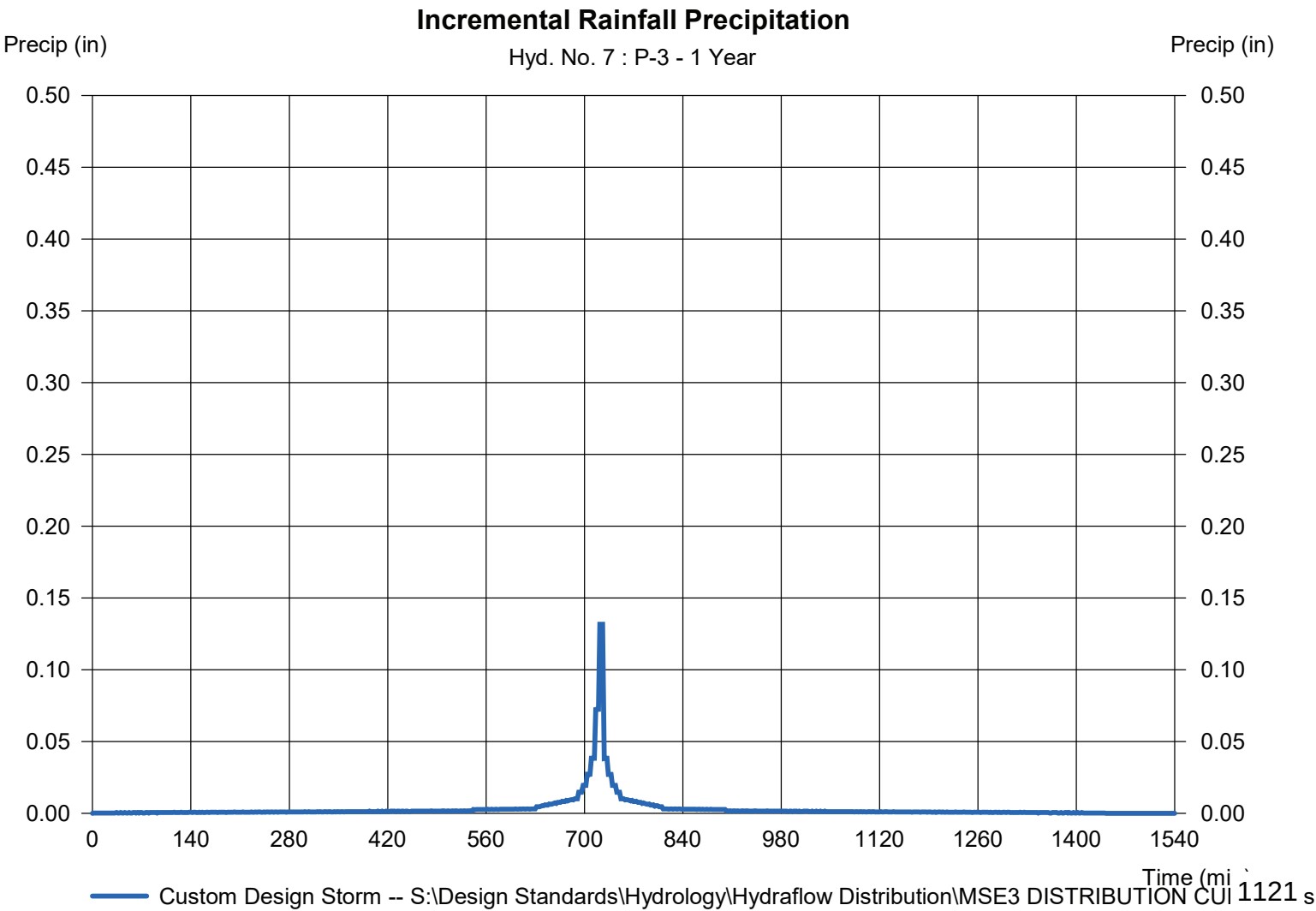
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION CUI		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

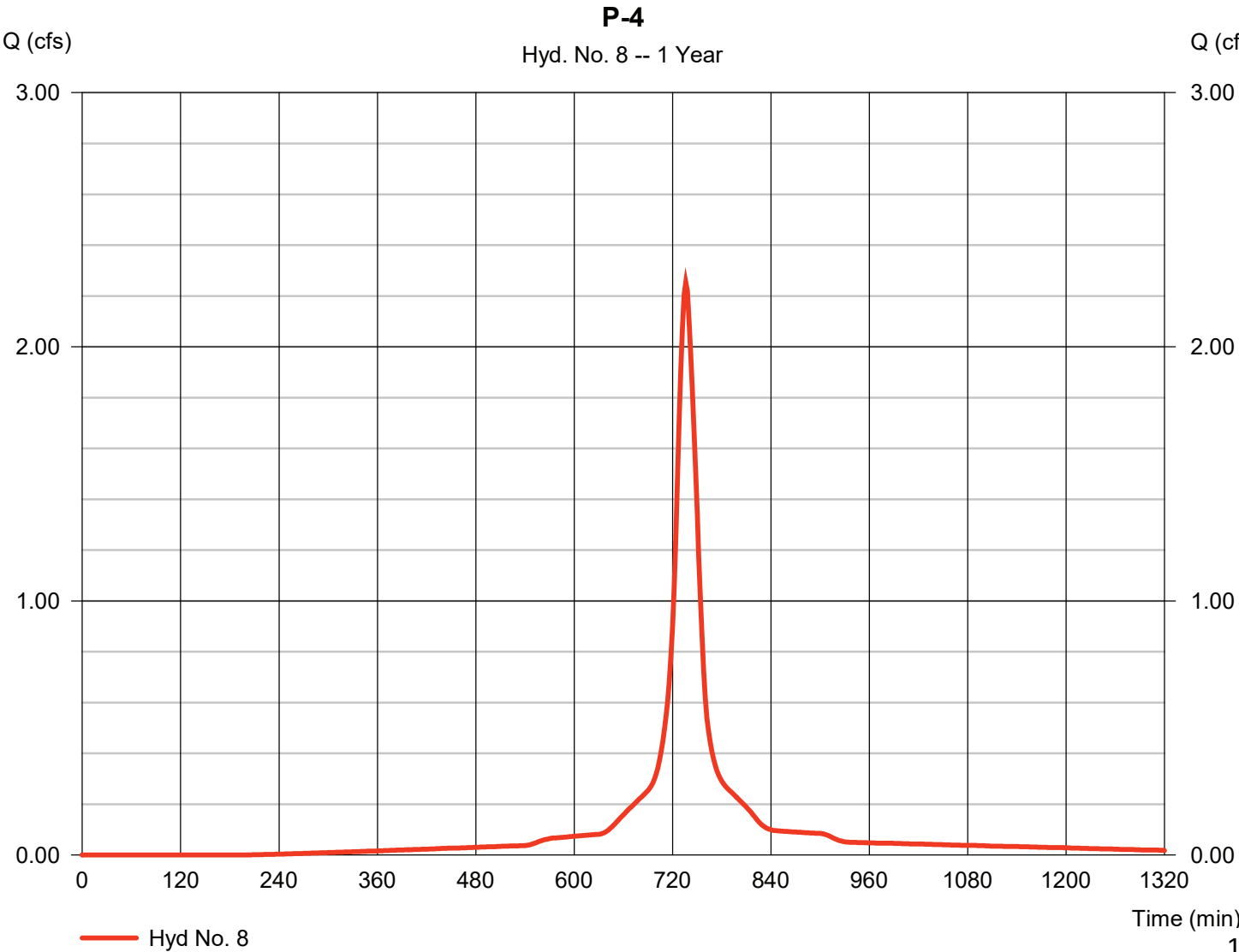
Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.253 cfs
Storm frequency	=	1 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	8,344 cuft
Drainage area	=	1.040 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	23.10 min
Total precip.	=	2.40 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE			

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

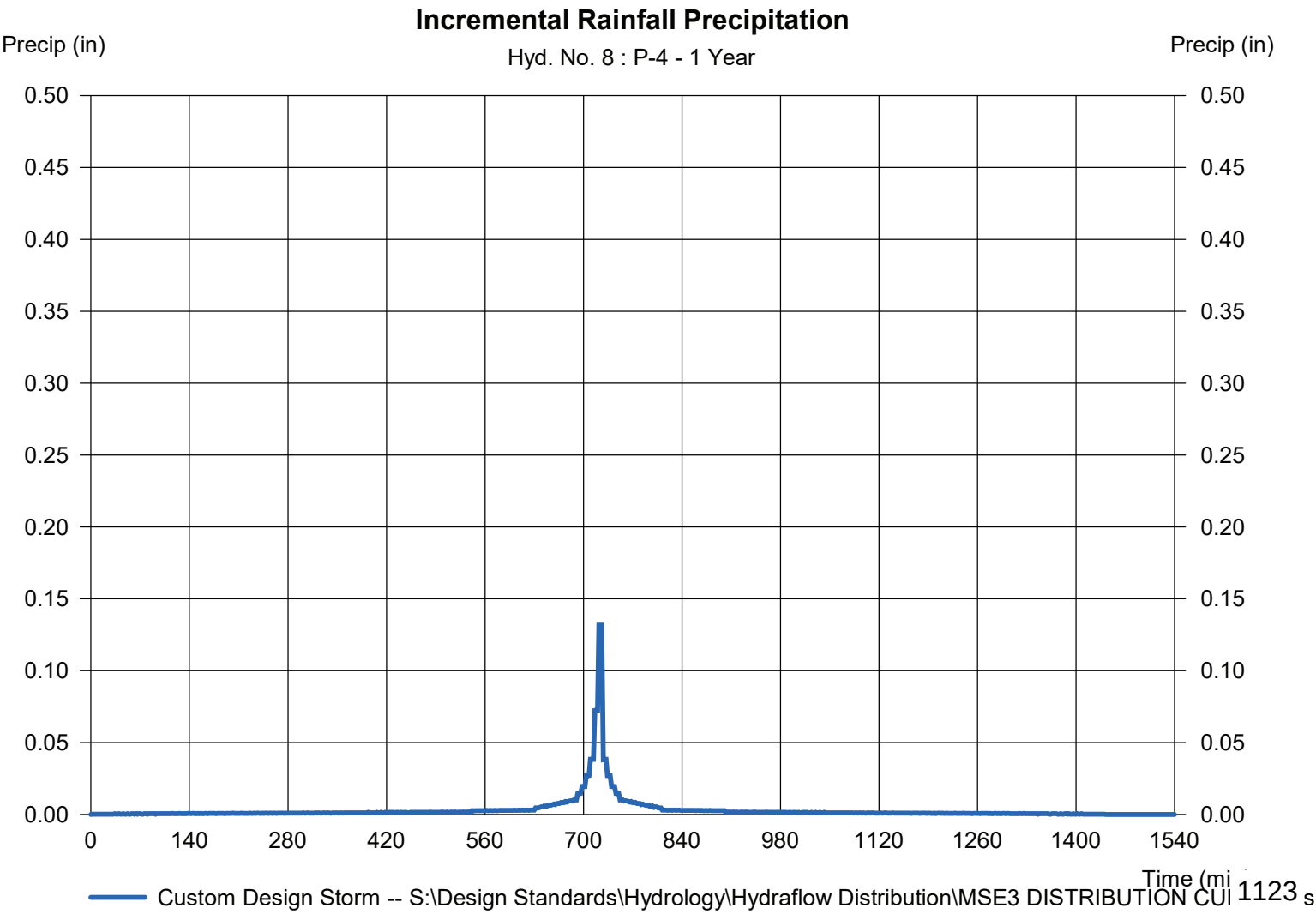
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

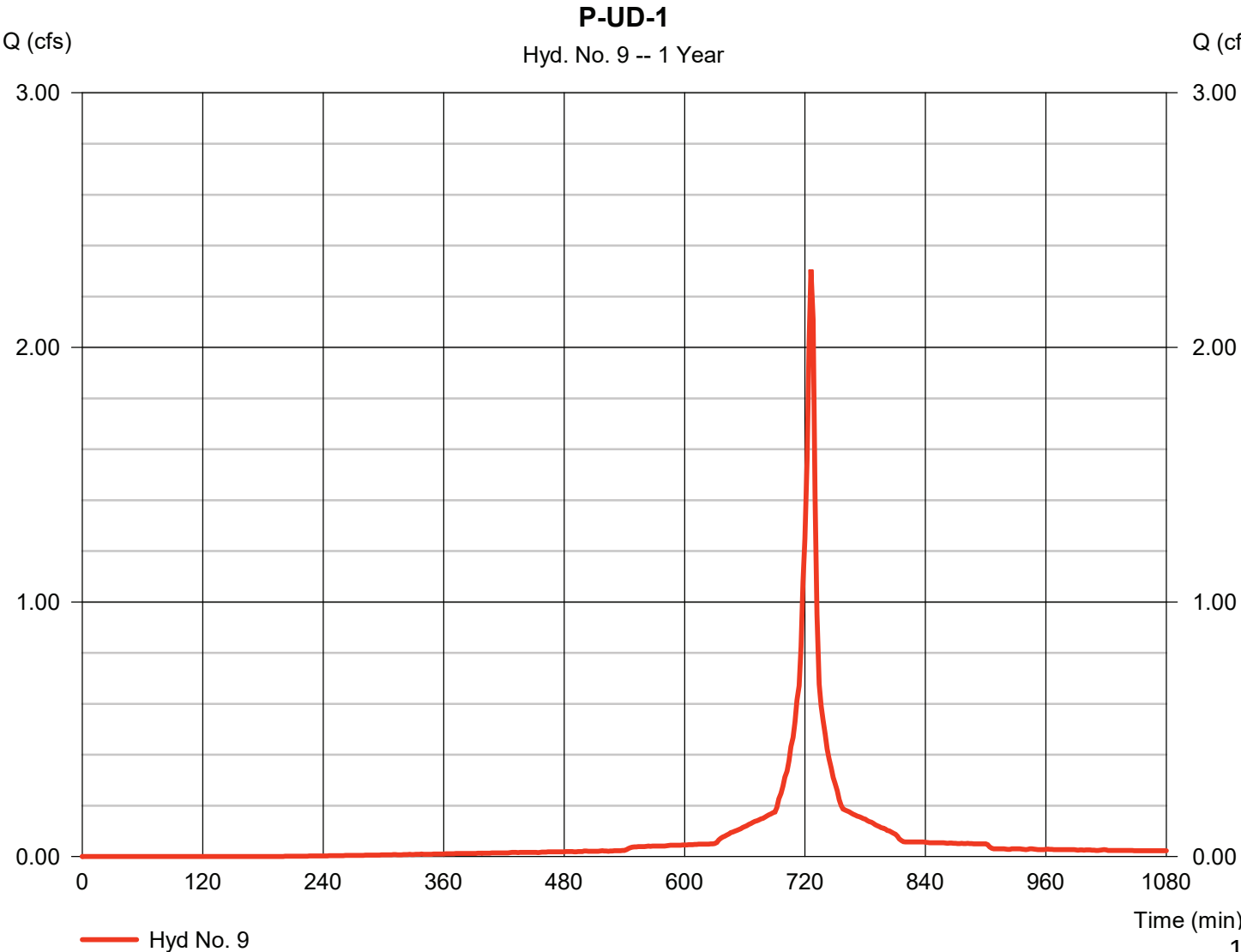
Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.305 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 4,951 cuft
Drainage area	= 0.670 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.40 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.300 x 61) + (0.370 x 98)] / 0.670

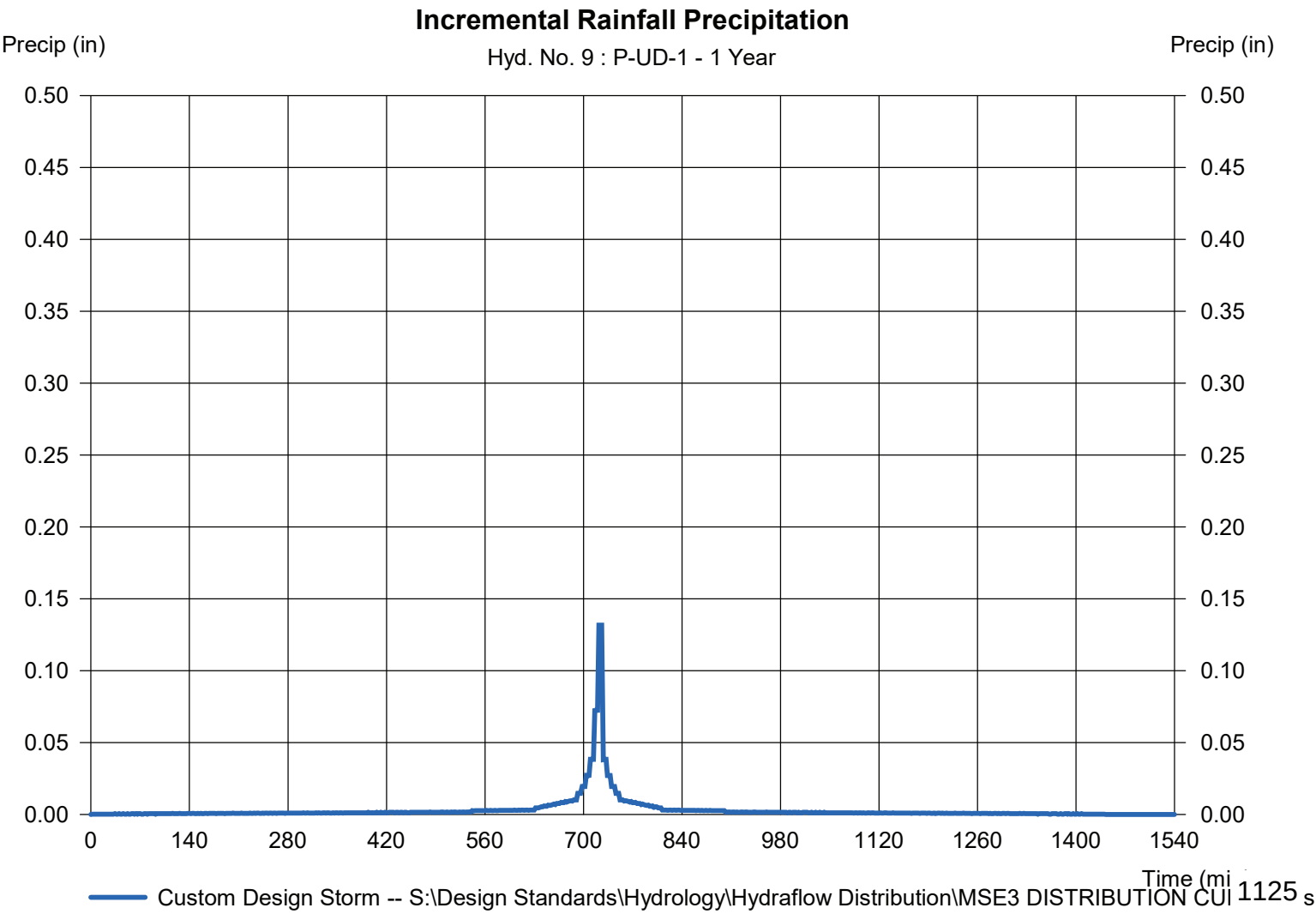


Precipitation Report

Hyd. No. 9

P-UD-1

Storm Frequency	= 1 yrs	Time interval	= 2 min
Total precip.	= 2.4000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

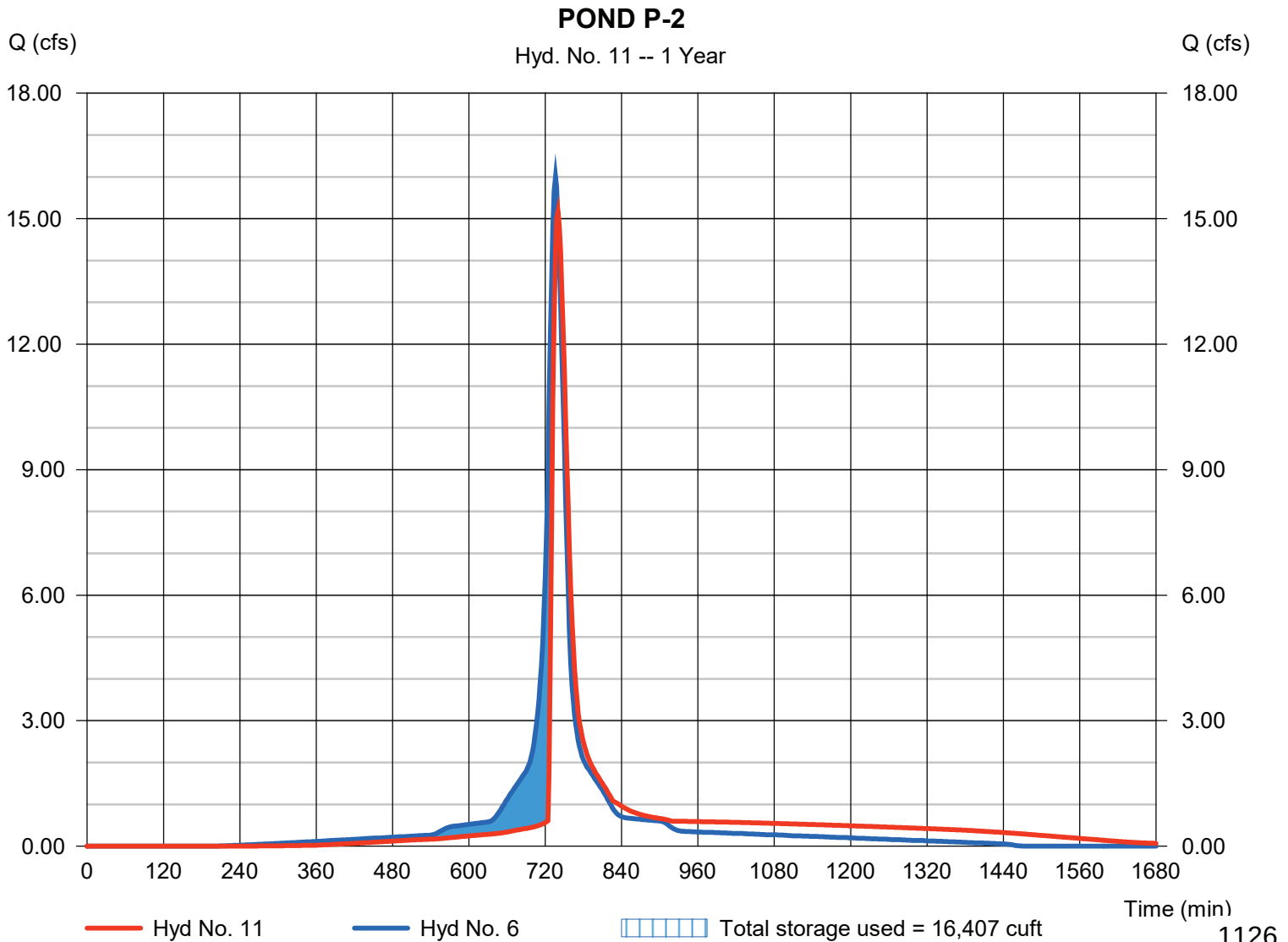
Hyd. No. 11

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-2
 Reservoir name = POND P-2

Peak discharge = 15.17 cfs
 Time to peak = 740 min
 Hyd. volume = 59,229 cuft
 Max. Elevation = 839.76 ft
 Max. Storage = 16,407 cuft

Storage Indication method used.



Pond Report

28

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Pond No. 2 - POND P-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 837.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	837.00	3,641	0	0
1.00	838.00	5,315	4,451	4,451
2.00	839.00	6,928	6,103	10,554
3.00	840.00	8,626	7,761	18,315
4.00	841.00	10,425	9,510	27,825
5.00	842.00	14,394	12,355	40,180
6.00	843.00	20,000	17,119	57,299

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 27.00	4.00	0.00	0.00
Span (in)	= 27.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 836.75	837.00	0.00	0.00
Length (ft)	= 53.50	1.00	0.00	0.00
Slope (%)	= 0.50	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	20.00	0.00	0.00
Crest El. (ft)	= 839.25	841.65	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	837.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	445	837.10	0.43 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	890	837.20	0.43 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	1,335	837.30	0.43 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	1,780	837.40	0.43 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	2,226	837.50	0.43 ic	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	2,671	837.60	0.43 ic	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	3,116	837.70	0.43 ic	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	3,561	837.80	0.43 ic	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	4,006	837.90	0.43 ic	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	4,451	838.00	0.43 ic	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.384
1.10	5,062	838.10	0.43 ic	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	5,672	838.20	0.43 ic	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	6,282	838.30	0.47 ic	0.45 ic	---	---	0.00	0.00	---	---	---	---	0.447
1.40	6,892	838.40	0.47 ic	0.47 ic	---	---	0.00	0.00	---	---	---	---	0.467
1.50	7,503	838.50	0.51 ic	0.49 ic	---	---	0.00	0.00	---	---	---	---	0.485
1.60	8,113	838.60	0.51 ic	0.50 ic	---	---	0.00	0.00	---	---	---	---	0.503
1.70	8,723	838.70	0.55 ic	0.52 ic	---	---	0.00	0.00	---	---	---	---	0.520
1.80	9,334	838.80	0.55 ic	0.54 ic	---	---	0.00	0.00	---	---	---	---	0.537
1.90	9,944	838.90	0.55 ic	0.55 ic	---	---	0.00	0.00	---	---	---	---	0.553
2.00	10,554	839.00	0.59 ic	0.57 ic	---	---	0.00	0.00	---	---	---	---	0.569
2.10	11,330	839.10	0.59 ic	0.58 ic	---	---	0.00	0.00	---	---	---	---	0.584
2.20	12,107	839.20	0.60 ic	0.60 ic	---	---	0.00	0.00	---	---	---	---	0.599
2.30	12,883	839.30	1.12 ic	0.61 ic	---	---	0.47	0.00	---	---	---	---	1.081
2.40	13,659	839.40	3.11 oc	0.58 ic	---	---	2.43	0.00	---	---	---	---	3.012
2.50	14,435	839.50	5.87 oc	0.54 ic	---	---	5.23	0.00	---	---	---	---	5.764
2.60	15,211	839.60	9.22 oc	0.47 ic	---	---	8.66	0.00	---	---	---	---	9.130
2.70	15,987	839.70	12.96 oc	0.33 ic	---	---	12.63	0.00	---	---	---	---	12.96
2.80	16,763	839.80	17.04 oc	0.29 ic	---	---	16.75 s	0.00	---	---	---	---	17.04
2.90	17,539	839.90	19.71 oc	0.26 ic	---	---	19.45 s	0.00	---	---	---	---	19.71
3.00	18,315	840.00	21.77 oc	0.23 ic	---	---	21.53 s	0.00	---	---	---	---	21.77
3.10	19,266	840.10	23.46 oc	0.21 ic	---	---	23.25 s	0.00	---	---	---	---	23.46
3.20	20,217	840.20	24.92 oc	0.19 ic	---	---	24.72 s	0.00	---	---	---	---	24.92
3.30	21,168	840.30	26.20 oc	0.18 ic	---	---	26.02 s	0.00	---	---	---	---	26.20
3.40	22,119	840.40	27.36 oc	0.16 ic	---	---	27.19 s	0.00	---	---	---	---	27.36
3.50	23,070	840.50	28.42 oc	0.15 ic	---	---	28.26 s	0.00	---	---	---	---	28.42

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Continues on next page...

POND P-2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.60	24,021	840.60	29.42 oc	0.14 ic	---	---	29.28 s	0.00	---	---	---	---	29.42
3.70	24,972	840.70	30.35 oc	0.13 ic	---	---	30.21 s	0.00	---	---	---	---	30.34
3.80	25,923	840.80	31.24 oc	0.12 ic	---	---	31.11 s	0.00	---	---	---	---	31.24
3.90	26,874	840.90	32.10 oc	0.12 ic	---	---	31.97 s	0.00	---	---	---	---	32.09
4.00	27,825	841.00	32.92 oc	0.11 ic	---	---	32.79 s	0.00	---	---	---	---	32.90
4.10	29,061	841.10	33.71 oc	0.11 ic	---	---	33.59 s	0.00	---	---	---	---	33.69
4.20	30,296	841.20	34.47 oc	0.10 ic	---	---	34.37 s	0.00	---	---	---	---	34.47
4.30	31,532	841.30	35.15 ic	0.10 ic	---	---	35.05 s	0.00	---	---	---	---	35.15
4.40	32,767	841.40	35.69 ic	0.09 ic	---	---	35.59 s	0.00	---	---	---	---	35.68
4.50	34,003	841.50	36.23 ic	0.09 ic	---	---	36.11 s	0.00	---	---	---	---	36.20
4.60	35,238	841.60	36.75 ic	0.08 ic	---	---	36.65 s	0.00	---	---	---	---	36.74
4.70	36,474	841.70	37.26 ic	0.08 ic	---	---	37.17 s	0.58	---	---	---	---	37.83
4.80	37,709	841.80	37.76 ic	0.08 ic	---	---	37.66 s	3.01	---	---	---	---	40.75
4.90	38,945	841.90	38.25 ic	0.07 ic	---	---	38.16 s	6.49	---	---	---	---	44.73
5.00	40,180	842.00	38.74 ic	0.07 ic	---	---	38.66 s	10.77	---	---	---	---	49.49
5.10	41,892	842.10	39.22 ic	0.07 ic	---	---	39.13 s	15.69	---	---	---	---	54.90
5.20	43,604	842.20	39.69 ic	0.07 ic	---	---	39.57 s	21.21	---	---	---	---	60.85
5.30	45,316	842.30	40.16 ic	0.06 ic	---	---	40.09 s	27.24	---	---	---	---	67.40
5.40	47,028	842.40	40.62 ic	0.06 ic	---	---	40.51 s	33.77	---	---	---	---	74.34
5.50	48,740	842.50	41.07 ic	0.06 ic	---	---	41.00 s	40.74	---	---	---	---	81.80
5.60	50,452	842.60	41.52 ic	0.06 ic	---	---	41.44 s	48.14	---	---	---	---	89.64
5.70	52,164	842.70	41.97 ic	0.06 ic	---	---	41.85 s	55.93	---	---	---	---	97.84
5.80	53,875	842.80	42.40 ic	0.06 ic	---	---	42.32 s	64.11	---	---	---	---	106.48
5.90	55,587	842.90	42.84 ic	0.05 ic	---	---	42.70 s	72.65	---	---	---	---	115.40
6.00	57,299	843.00	43.27 ic	0.05 ic	---	---	43.14 s	81.56	---	---	---	---	124.76

...End

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

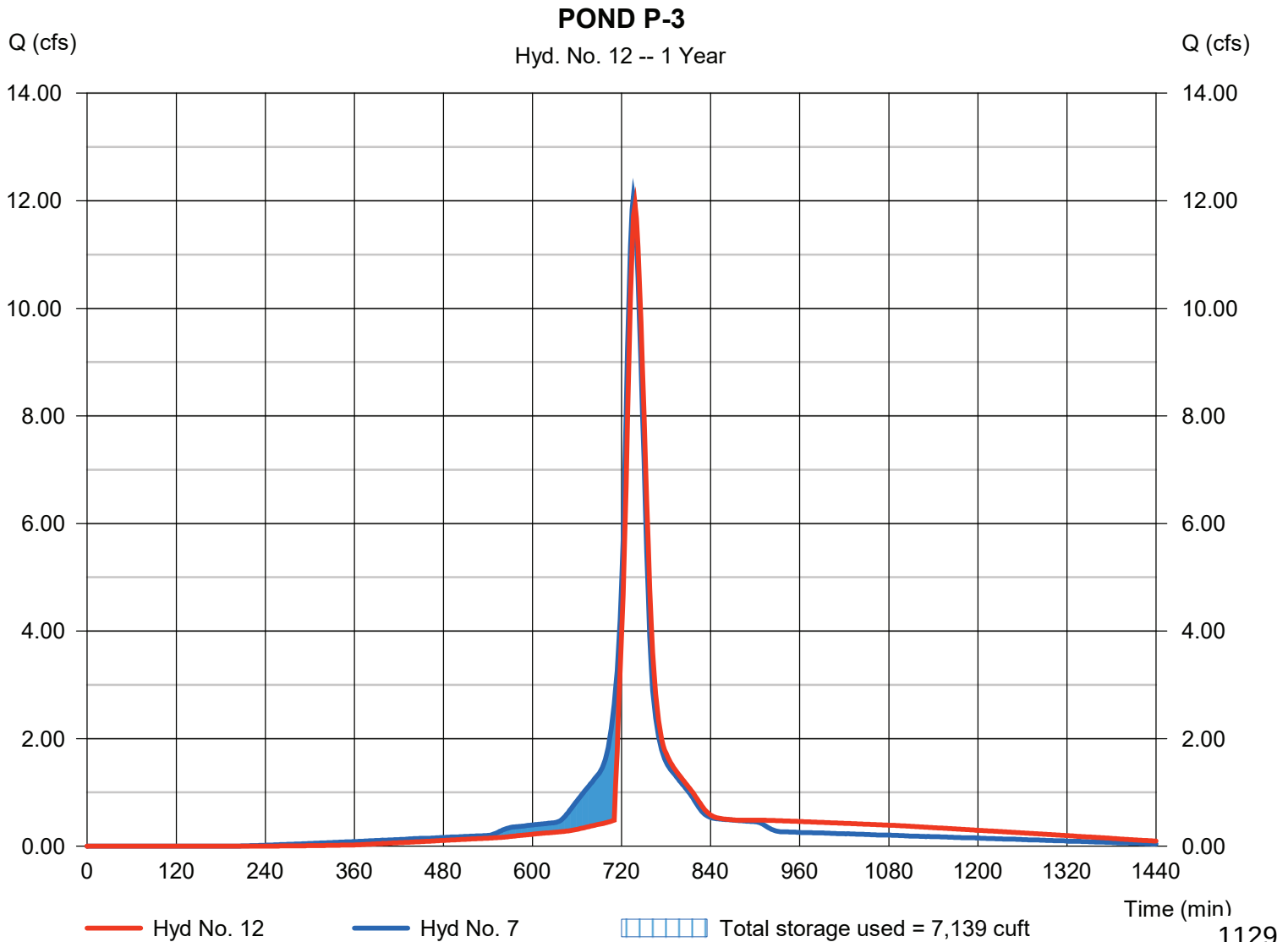
Hyd. No. 12

POND P-3

Hydrograph type = Reservoir
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - P-3
 Reservoir name = POND P-3

Peak discharge = 11.92 cfs
 Time to peak = 738 min
 Hyd. volume = 44,746 cuft
 Max. Elevation = 839.92 ft
 Max. Storage = 7,139 cuft

Storage Indication method used.



Pond Report

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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Pond No. 3 - POND P-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 838.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	838.00	2,707	0	0
1.00	839.00	3,721	3,200	3,200
2.00	840.00	4,846	4,271	7,471
3.00	841.00	6,075	5,448	12,919
4.00	842.00	7,400	6,726	19,645
5.00	843.00	20,000	13,187	32,833

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	4.00	0.00	0.00
Span (in)	= 24.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 837.25	838.00	0.00	0.00
Length (ft)	= 54.00	1.00	0.00	0.00
Slope (%)	= 0.96	0.50	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	5.00	0.00	0.00
Crest El. (ft)	= 839.50	841.60	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	838.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	320	838.10	3.18 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.024
0.20	640	838.20	3.18 ic	0.08 ic	---	---	0.00	0.00	---	---	---	---	0.083
0.30	960	838.30	3.18 ic	0.15 ic	---	---	0.00	0.00	---	---	---	---	0.154
0.40	1,280	838.40	3.18 ic	0.20 ic	---	---	0.00	0.00	---	---	---	---	0.203
0.50	1,600	838.50	3.18 ic	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.243
0.60	1,920	838.60	3.18 ic	0.28 ic	---	---	0.00	0.00	---	---	---	---	0.277
0.70	2,240	838.70	3.18 ic	0.31 ic	---	---	0.00	0.00	---	---	---	---	0.307
0.80	2,560	838.80	3.18 ic	0.33 ic	---	---	0.00	0.00	---	---	---	---	0.334
0.90	2,880	838.90	3.18 ic	0.36 ic	---	---	0.00	0.00	---	---	---	---	0.360
1.00	3,200	839.00	3.18 ic	0.38 ic	---	---	0.00	0.00	---	---	---	---	0.384
1.10	3,627	839.10	3.18 ic	0.41 ic	---	---	0.00	0.00	---	---	---	---	0.406
1.20	4,054	839.20	3.18 ic	0.43 ic	---	---	0.00	0.00	---	---	---	---	0.427
1.30	4,481	839.30	3.18 ic	0.45 ic	---	---	0.00	0.00	---	---	---	---	0.447
1.40	4,909	839.40	3.18 ic	0.47 ic	---	---	0.00	0.00	---	---	---	---	0.467
1.50	5,336	839.50	3.18 ic	0.49 ic	---	---	0.00	0.00	---	---	---	---	0.485
1.60	5,763	839.60	3.18 ic	0.50 ic	---	---	1.32	0.00	---	---	---	---	1.825
1.70	6,190	839.70	4.30 ic	0.52 ic	---	---	3.74	0.00	---	---	---	---	4.259
1.80	6,617	839.80	7.36 ic	0.49 ic	---	---	6.87	0.00	---	---	---	---	7.359
1.90	7,044	839.90	11.06 oc	0.43 ic	---	---	10.58	0.00	---	---	---	---	11.01
2.00	7,471	840.00	15.08 oc	0.29 ic	---	---	14.79 s	0.00	---	---	---	---	15.08
2.10	8,016	840.10	17.36 oc	0.25 ic	---	---	17.11 s	0.00	---	---	---	---	17.36
2.20	8,561	840.20	18.87 oc	0.21 ic	---	---	18.66 s	0.00	---	---	---	---	18.87
2.30	9,105	840.30	20.06 oc	0.19 ic	---	---	19.87 s	0.00	---	---	---	---	20.06
2.40	9,650	840.40	21.07 oc	0.17 ic	---	---	20.90 s	0.00	---	---	---	---	21.06
2.50	10,195	840.50	21.95 oc	0.15 ic	---	---	21.80 s	0.00	---	---	---	---	21.95
2.60	10,740	840.60	22.67 ic	0.14 ic	---	---	22.53 s	0.00	---	---	---	---	22.66
2.70	11,285	840.70	23.25 ic	0.12 ic	---	---	23.13 s	0.00	---	---	---	---	23.25
2.80	11,830	840.80	23.81 ic	0.11 ic	---	---	23.69 s	0.00	---	---	---	---	23.80
2.90	12,375	840.90	24.33 ic	0.10 ic	---	---	24.23 s	0.00	---	---	---	---	24.33
3.00	12,919	841.00	24.84 ic	0.10 ic	---	---	24.72 s	0.00	---	---	---	---	24.82
3.10	13,592	841.10	25.33 ic	0.09 ic	---	---	25.23 s	0.00	---	---	---	---	25.32
3.20	14,265	841.20	25.80 ic	0.08 ic	---	---	25.70 s	0.00	---	---	---	---	25.78
3.30	14,937	841.30	26.26 ic	0.08 ic	---	---	26.16 s	0.00	---	---	---	---	26.11
3.40	15,610	841.40	26.71 ic	0.08 ic	---	---	26.62 s	0.00	---	---	---	---	26.61
3.50	16,282	841.50	27.14 ic	0.07 ic	---	---	27.04 s	0.00	---	---	---	---	27.12
3.60	16,955	841.60	27.57 ic	0.07 ic	---	---	27.49 s	0.00	---	---	---	---	27.56

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POND P-3

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.70	17,628	841.70	28.00 ic	0.06 ic	---	---	27.93 s	0.41	---	---	---	---	28.40
3.80	18,300	841.80	28.41 ic	0.06 ic	---	---	28.32 s	1.16	---	---	---	---	29.54
3.90	18,973	841.90	28.82 ic	0.06 ic	---	---	28.74 s	2.13	---	---	---	---	30.93
4.00	19,645	842.00	29.22 ic	0.06 ic	---	---	29.15 s	3.29	---	---	---	---	32.49
4.10	20,964	842.10	29.61 ic	0.05 ic	---	---	29.53 s	4.60	---	---	---	---	34.18
4.20	22,283	842.20	30.00 ic	0.05 ic	---	---	29.93 s	6.04	---	---	---	---	36.02
4.30	23,601	842.30	30.38 ic	0.05 ic	---	---	30.28 s	7.61	---	---	---	---	37.94
4.40	24,920	842.40	30.76 ic	0.05 ic	---	---	30.66 s	9.30	---	---	---	---	40.01
4.50	26,239	842.50	31.13 ic	0.05 ic	---	---	31.04 s	11.10	---	---	---	---	42.18
4.60	27,558	842.60	31.50 ic	0.05 ic	---	---	31.39 s	13.00	---	---	---	---	44.43
4.70	28,876	842.70	31.86 ic	0.04 ic	---	---	31.81 s	14.99	---	---	---	---	46.85
4.80	30,195	842.80	32.22 ic	0.04 ic	---	---	32.15 s	17.09	---	---	---	---	49.28
4.90	31,514	842.90	32.58 ic	0.04 ic	---	---	32.53 s	19.26	---	---	---	---	51.84
5.00	32,833	843.00	32.93 ic	0.04 ic	---	---	32.77 s	21.54	---	---	---	---	54.34

...End

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

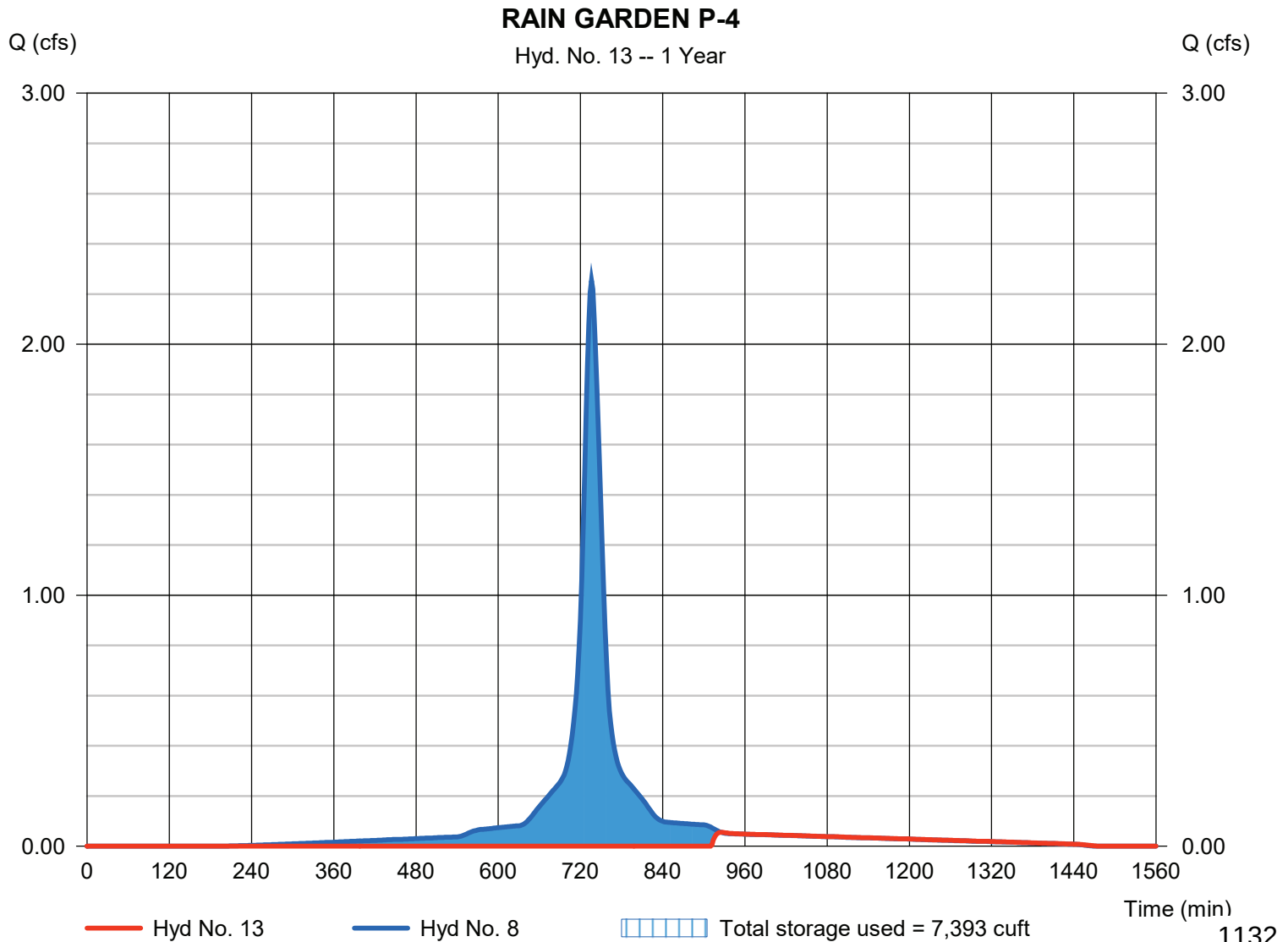
Thursday, 02 / 27 / 2020

Hyd. No. 13

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.055 cfs
Storm frequency	= 1 yrs	Time to peak	= 926 min
Time interval	= 2 min	Hyd. volume	= 969 cuft
Inflow hyd. No.	= 8 - P-4	Max. Elevation	= 840.70 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 7,393 cuft

Storage Indication method used.



Pond No. 4 - RAIN GARDEN P-4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 839.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	839.00	2,706	0	0
1.00	840.00	4,351	3,496	3,496
2.00	841.00	6,823	5,540	9,036
2.70	841.70	8,331	5,295	14,331

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 840.70	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).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	839.00	---	---	---	---	0.00	---	---	---	---	---	0.000
0.10	350	839.10	---	---	---	---	0.00	---	---	---	---	---	0.000
0.20	699	839.20	---	---	---	---	0.00	---	---	---	---	---	0.000
0.30	1,049	839.30	---	---	---	---	0.00	---	---	---	---	---	0.000
0.40	1,398	839.40	---	---	---	---	0.00	---	---	---	---	---	0.000
0.50	1,748	839.50	---	---	---	---	0.00	---	---	---	---	---	0.000
0.60	2,097	839.60	---	---	---	---	0.00	---	---	---	---	---	0.000
0.70	2,447	839.70	---	---	---	---	0.00	---	---	---	---	---	0.000
0.80	2,797	839.80	---	---	---	---	0.00	---	---	---	---	---	0.000
0.90	3,146	839.90	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	3,496	840.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.10	4,050	840.10	---	---	---	---	0.00	---	---	---	---	---	0.000
1.20	4,604	840.20	---	---	---	---	0.00	---	---	---	---	---	0.000
1.30	5,158	840.30	---	---	---	---	0.00	---	---	---	---	---	0.000
1.40	5,712	840.40	---	---	---	---	0.00	---	---	---	---	---	0.000
1.50	6,266	840.50	---	---	---	---	0.00	---	---	---	---	---	0.000
1.60	6,820	840.60	---	---	---	---	0.00	---	---	---	---	---	0.000
1.70	7,374	840.70	---	---	---	---	0.00	---	---	---	---	---	0.000
1.80	7,928	840.80	---	---	---	---	1.64	---	---	---	---	---	1.639
1.90	8,482	840.90	---	---	---	---	4.64	---	---	---	---	---	4.643
2.00	9,036	841.00	---	---	---	---	8.54	---	---	---	---	---	8.544
2.07	9,566	841.07	---	---	---	---	11.70	---	---	---	---	---	11.70
2.14	10,095	841.14	---	---	---	---	15.18	---	---	---	---	---	15.18
2.21	10,624	841.21	---	---	---	---	18.94	---	---	---	---	---	18.94
2.28	11,154	841.28	---	---	---	---	22.97	---	---	---	---	---	22.97
2.35	11,683	841.35	---	---	---	---	27.25	---	---	---	---	---	27.25
2.42	12,213	841.42	---	---	---	---	31.77	---	---	---	---	---	31.77
2.49	12,742	841.49	---	---	---	---	36.52	---	---	---	---	---	36.52
2.56	13,272	841.56	---	---	---	---	41.48	---	---	---	---	---	41.48
2.63	13,801	841.63	---	---	---	---	46.65	---	---	---	---	---	46.65
2.70	14,331	841.70	---	---	---	---	52.00	---	---	---	---	---	52.00

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 15

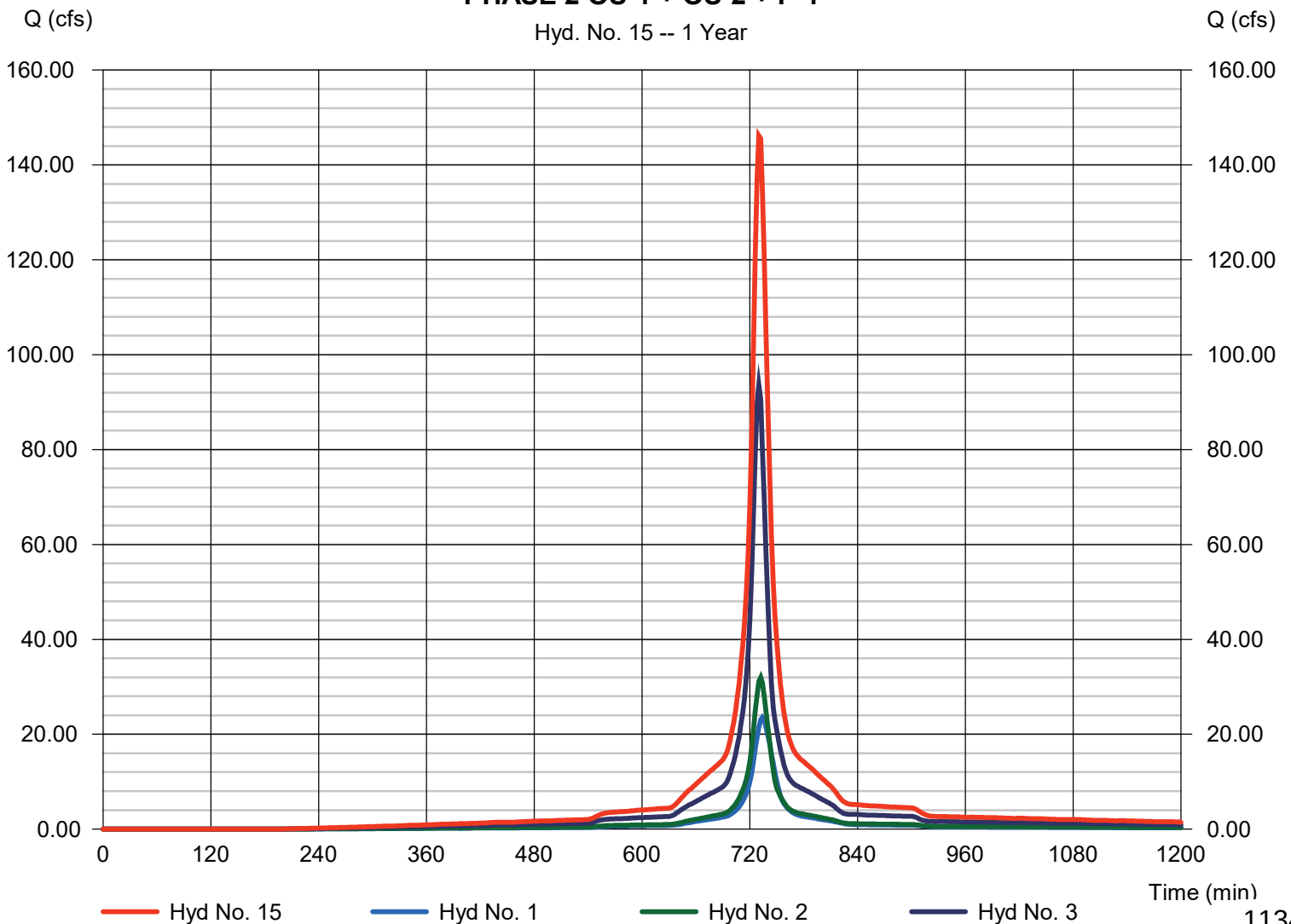
PHASE 2 OS-1 + OS-2 + P-1

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 2, 3

Peak discharge = 146.18 cfs
 Time to peak = 730 min
 Hyd. volume = 446,319 cuft
 Contrib. drain. area = 55.916 ac

PHASE 2 OS-1 + OS-2 + P-1

Hyd. No. 15 -- 1 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

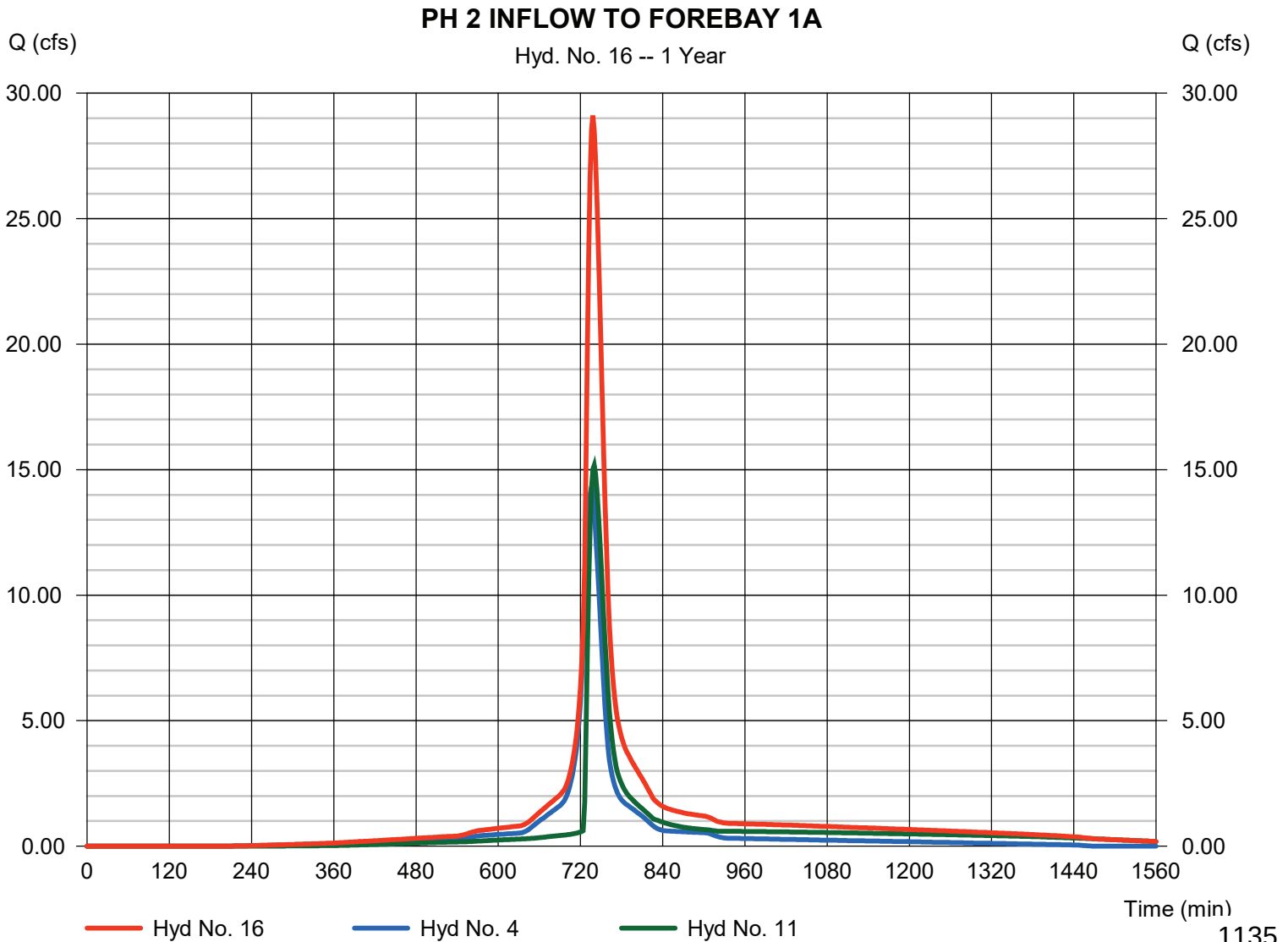
Thursday, 02 / 27 / 2020

Hyd. No. 16

PH 2 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 4, 11

Peak discharge = 29.11 cfs
Time to peak = 738 min
Hyd. volume = 112,236 cuft
Contrib. drain. area = 6.607 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

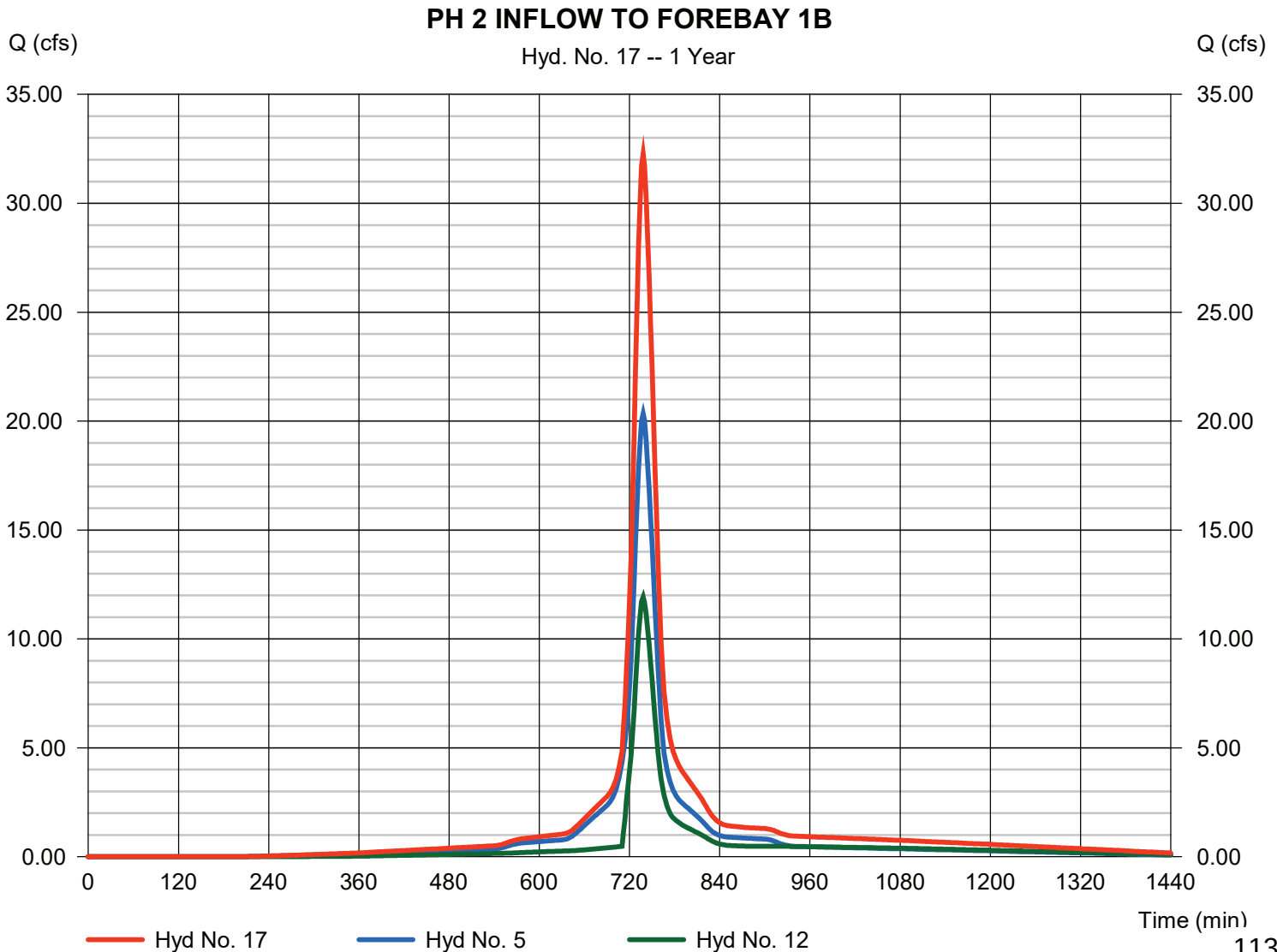
Thursday, 02 / 27 / 2020

Hyd. No. 17

PH 2 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 5, 12

Peak discharge = 32.27 cfs
 Time to peak = 738 min
 Hyd. volume = 124,072 cuft
 Contrib. drain. area = 10.224 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

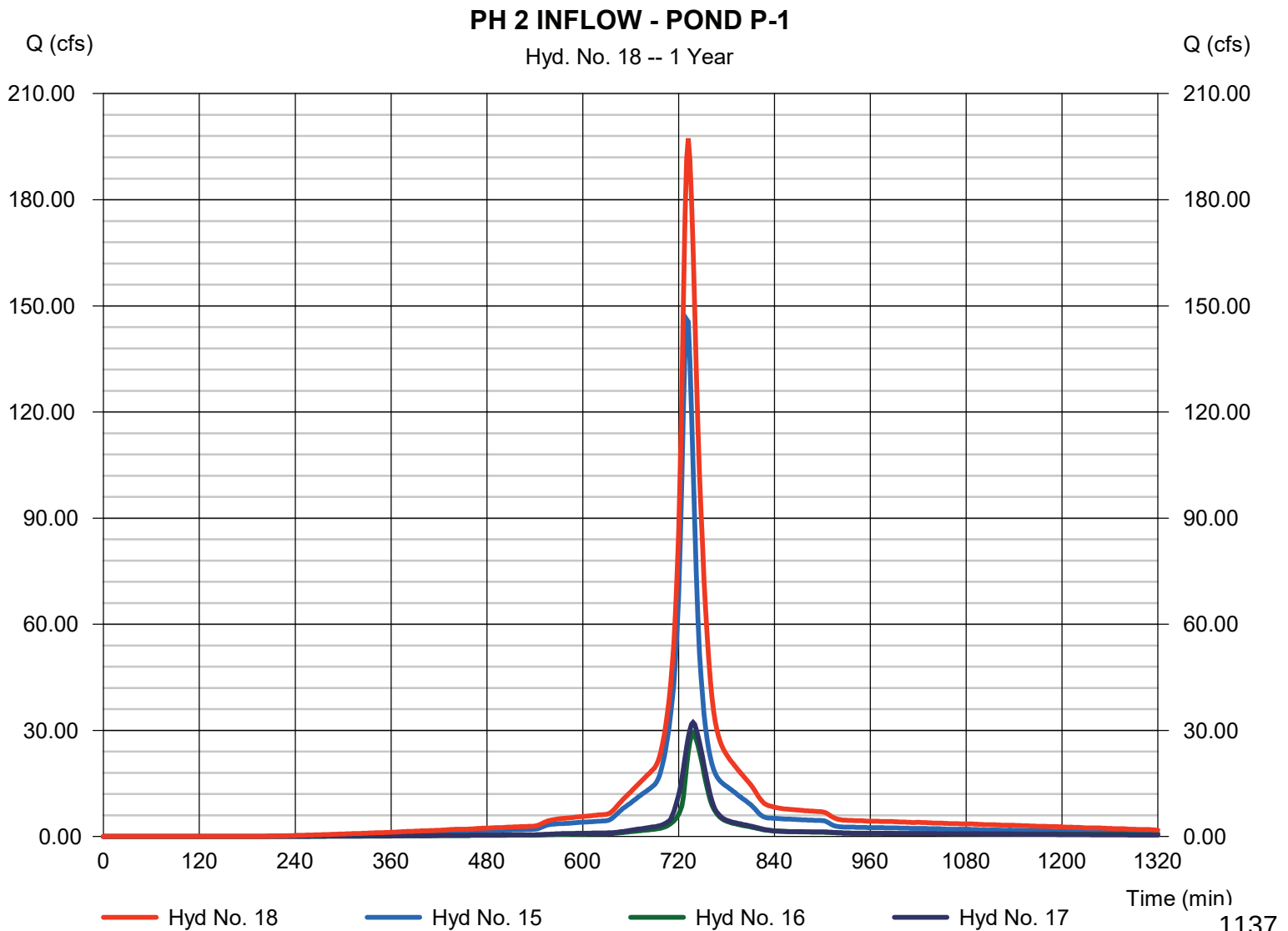
Thursday, 02 / 27 / 2020

Hyd. No. 18

PH 2 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 15, 16, 17

Peak discharge = 197.39 cfs
 Time to peak = 732 min
 Hyd. volume = 682,627 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 19

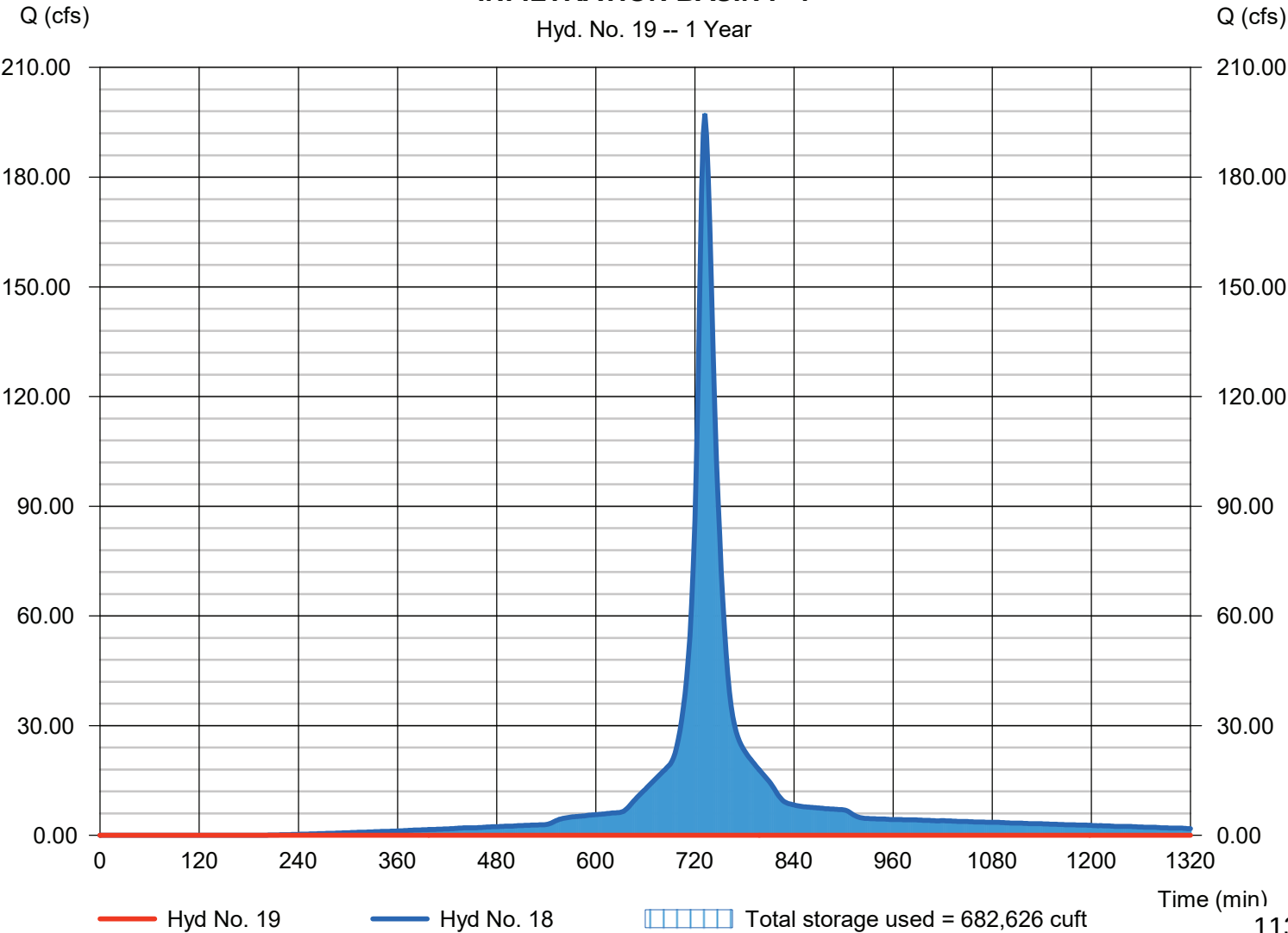
INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 18 - PH 2 INFLOW - POND P-1	Max. Elevation	= 835.62 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 2	Max. Storage	= 682,626 cuft

Storage Indication method used.

INFILTRATION BASIN P-1

Hyd. No. 19 -- 1 Year



Pond Report

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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Pond No. 1 - INFILTRATION BASIN P-1-PH2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 829.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	829.00	51,625	0	0
1.00	830.00	65,711	58,521	58,521
2.00	831.00	92,295	78,620	137,141
3.00	832.00	106,034	99,075	236,216
4.00	833.00	116,184	111,059	347,275
5.00	834.00	122,474	119,303	466,578
6.00	835.00	127,913	125,171	591,749
7.00	836.00	166,895	146,958	738,707
8.00	837.00	179,333	173,059	911,767
9.00	838.00	195,392	187,286	1,099,053
10.00	839.00	211,591	203,417	1,302,470
11.00	840.00	232,025	221,708	1,524,178
12.00	841.00	260,000	245,855	1,770,033
13.00	842.00	280,000	269,911	2,039,944

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	829.00	---	---	---	---	---	---	---	---	---	---	0.000
0.10	5,852	829.10	---	---	---	---	---	---	---	---	---	---	0.000
0.20	11,704	829.20	---	---	---	---	---	---	---	---	---	---	0.000
0.30	17,556	829.30	---	---	---	---	---	---	---	---	---	---	0.000
0.40	23,408	829.40	---	---	---	---	---	---	---	---	---	---	0.000
0.50	29,260	829.50	---	---	---	---	---	---	---	---	---	---	0.000
0.60	35,112	829.60	---	---	---	---	---	---	---	---	---	---	0.000
0.70	40,965	829.70	---	---	---	---	---	---	---	---	---	---	0.000
0.80	46,817	829.80	---	---	---	---	---	---	---	---	---	---	0.000
0.90	52,669	829.90	---	---	---	---	---	---	---	---	---	---	0.000
1.00	58,521	830.00	---	---	---	---	---	---	---	---	---	---	0.000
1.10	66,383	830.10	---	---	---	---	---	---	---	---	---	---	0.000
1.20	74,245	830.20	---	---	---	---	---	---	---	---	---	---	0.000
1.30	82,107	830.30	---	---	---	---	---	---	---	---	---	---	0.000
1.40	89,969	830.40	---	---	---	---	---	---	---	---	---	---	0.000
1.50	97,831	830.50	---	---	---	---	---	---	---	---	---	---	0.000
1.60	105,693	830.60	---	---	---	---	---	---	---	---	---	---	0.000
1.70	113,555	830.70	---	---	---	---	---	---	---	---	---	---	0.000
1.80	121,417	830.80	---	---	---	---	---	---	---	---	---	---	0.000
1.90	129,279	830.90	---	---	---	---	---	---	---	---	---	---	0.000
2.00	137,141	831.00	---	---	---	---	---	---	---	---	---	---	0.000
2.10	147,048	831.10	---	---	---	---	---	---	---	---	---	---	0.000
2.20	156,956	831.20	---	---	---	---	---	---	---	---	---	---	0.000
2.30	166,863	831.30	---	---	---	---	---	---	---	---	---	---	0.000
2.40	176,771	831.40	---	---	---	---	---	---	---	---	---	---	0.000
2.50	186,678	831.50	---	---	---	---	---	---	---	---	---	---	0.000
2.60	196,586	831.60	---	---	---	---	---	---	---	---	---	---	0.000
2.70	206,493	831.70	---	---	---	---	---	---	---	---	---	---	0.000
2.80	216,401	831.80	---	---	---	---	---	---	---	---	---	---	0.000

Continues on next page...

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INFILTRATION BASIN P-1-PH2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.90	226,308	831.90	---	---	---	---	---	---	---	---	---	---	0.000
3.00	236,216	832.00	---	---	---	---	---	---	---	---	---	---	0.000
3.10	247,322	832.10	---	---	---	---	---	---	---	---	---	---	0.000
3.20	258,428	832.20	---	---	---	---	---	---	---	---	---	---	0.000
3.30	269,533	832.30	---	---	---	---	---	---	---	---	---	---	0.000
3.40	280,639	832.40	---	---	---	---	---	---	---	---	---	---	0.000
3.50	291,745	832.50	---	---	---	---	---	---	---	---	---	---	0.000
3.60	302,851	832.60	---	---	---	---	---	---	---	---	---	---	0.000
3.70	313,957	832.70	---	---	---	---	---	---	---	---	---	---	0.000
3.80	325,063	832.80	---	---	---	---	---	---	---	---	---	---	0.000
3.90	336,169	832.90	---	---	---	---	---	---	---	---	---	---	0.000
4.00	347,275	833.00	---	---	---	---	---	---	---	---	---	---	0.000
4.10	359,205	833.10	---	---	---	---	---	---	---	---	---	---	0.000
4.20	371,136	833.20	---	---	---	---	---	---	---	---	---	---	0.000
4.30	383,066	833.30	---	---	---	---	---	---	---	---	---	---	0.000
4.40	394,996	833.40	---	---	---	---	---	---	---	---	---	---	0.000
4.50	406,927	833.50	---	---	---	---	---	---	---	---	---	---	0.000
4.60	418,857	833.60	---	---	---	---	---	---	---	---	---	---	0.000
4.70	430,787	833.70	---	---	---	---	---	---	---	---	---	---	0.000
4.80	442,717	833.80	---	---	---	---	---	---	---	---	---	---	0.000
4.90	454,648	833.90	---	---	---	---	---	---	---	---	---	---	0.000
5.00	466,578	834.00	---	---	---	---	---	---	---	---	---	---	0.000
5.10	479,095	834.10	---	---	---	---	---	---	---	---	---	---	0.000
5.20	491,612	834.20	---	---	---	---	---	---	---	---	---	---	0.000
5.30	504,130	834.30	---	---	---	---	---	---	---	---	---	---	0.000
5.40	516,647	834.40	---	---	---	---	---	---	---	---	---	---	0.000
5.50	529,164	834.50	---	---	---	---	---	---	---	---	---	---	0.000
5.60	541,681	834.60	---	---	---	---	---	---	---	---	---	---	0.000
5.70	554,198	834.70	---	---	---	---	---	---	---	---	---	---	0.000
5.80	566,715	834.80	---	---	---	---	---	---	---	---	---	---	0.000
5.90	579,232	834.90	---	---	---	---	---	---	---	---	---	---	0.000
6.00	591,749	835.00	---	---	---	---	---	---	---	---	---	---	0.000
6.10	606,445	835.10	---	---	---	---	---	---	---	---	---	---	0.000
6.20	621,141	835.20	---	---	---	---	---	---	---	---	---	---	0.000
6.30	635,837	835.30	---	---	---	---	---	---	---	---	---	---	0.000
6.40	650,533	835.40	---	---	---	---	---	---	---	---	---	---	0.000
6.50	665,228	835.50	---	---	---	---	---	---	---	---	---	---	0.000
6.60	679,924	835.60	---	---	---	---	---	---	---	---	---	---	0.000
6.70	694,620	835.70	---	---	---	---	---	---	---	---	---	---	0.000
6.80	709,316	835.80	---	---	---	---	---	---	---	---	---	---	0.000
6.90	724,012	835.90	---	---	---	---	---	---	---	---	---	---	0.000
7.00	738,707	836.00	---	---	---	---	---	---	---	---	---	---	0.000
7.10	756,013	836.10	---	---	---	---	---	---	---	---	---	---	0.000
7.20	773,319	836.20	---	---	---	---	---	---	---	---	---	---	0.000
7.30	790,625	836.30	---	---	---	---	---	---	---	---	---	---	0.000
7.40	807,931	836.40	---	---	---	---	---	---	---	---	---	---	0.000
7.50	825,237	836.50	---	---	---	---	---	---	---	---	---	---	0.000
7.60	842,543	836.60	---	---	---	---	---	---	---	---	---	---	0.000
7.70	859,849	836.70	---	---	---	---	---	---	---	---	---	---	0.000
7.80	877,155	836.80	---	---	---	---	---	---	---	---	---	---	0.000
7.90	894,461	836.90	---	---	---	---	---	---	---	---	---	---	0.000
8.00	911,767	837.00	---	---	---	---	---	---	---	---	---	---	0.000
8.10	930,495	837.10	---	---	---	---	---	---	---	---	---	---	0.000
8.20	949,224	837.20	---	---	---	---	---	---	---	---	---	---	0.000
8.30	967,953	837.30	---	---	---	---	---	---	---	---	---	---	0.000
8.40	986,681	837.40	---	---	---	---	---	---	---	---	---	---	0.000
8.50	1,005,410	837.50	---	---	---	---	---	---	---	---	---	---	0.000
8.60	1,024,138	837.60	---	---	---	---	---	---	---	---	---	---	0.000
8.70	1,042,867	837.70	---	---	---	---	---	---	---	---	---	---	0.000
8.80	1,061,596	837.80	---	---	---	---	---	---	---	---	---	---	0.000
8.90	1,080,324	837.90	---	---	---	---	---	---	---	---	---	---	0.000
9.00	1,099,053	838.00	---	---	---	---	---	---	---	---	---	---	0.000
9.10	1,119,395	838.10	---	---	---	---	---	---	---	---	---	---	0.000
9.20	1,139,737	838.20	---	---	---	---	---	---	---	---	---	---	0.000
9.30	1,160,078	838.30	---	---	---	---	---	---	---	---	---	---	0.000
9.40	1,180,420	838.40	---	---	---	---	---	---	---	---	---	---	0.000
9.50	1,200,762	838.50	---	---	---	---	---	---	---	---	---	---	0.000
9.60	1,221,104	838.60	---	---	---	---	---	---	---	---	---	---	0.000
9.70	1,241,445	838.70	---	---	---	---	---	---	---	---	---	---	0.000
9.80	1,261,787	838.80	---	---	---	---	---	---	---	---	---	---	0.000
9.90	1,282,129	838.90	---	---	---	---	---	---	---	---	---	---	0.000
10.00	1,302,470	839.00	---	---	---	---	---	---	---	---	---	---	0.000

INFILTRATION BASIN P-1-PH2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
10.10	1,324,641	839.10	---	---	---	---	---	---	---	---	---	---	0.000
10.20	1,346,812	839.20	---	---	---	---	---	---	---	---	---	---	0.000
10.30	1,368,983	839.30	---	---	---	---	---	---	---	---	---	---	0.000
10.40	1,391,153	839.40	---	---	---	---	---	---	---	---	---	---	0.000
10.50	1,413,324	839.50	---	---	---	---	---	---	---	---	---	---	0.000
10.60	1,435,495	839.60	---	---	---	---	---	---	---	---	---	---	0.000
10.70	1,457,666	839.70	---	---	---	---	---	---	---	---	---	---	0.000
10.80	1,479,836	839.80	---	---	---	---	---	---	---	---	---	---	0.000
10.90	1,502,007	839.90	---	---	---	---	---	---	---	---	---	---	0.000
11.00	1,524,178	840.00	---	---	---	---	---	---	---	---	---	---	0.000
11.10	1,548,763	840.10	---	---	---	---	---	---	---	---	---	---	0.000
11.20	1,573,349	840.20	---	---	---	---	---	---	---	---	---	---	0.000
11.30	1,597,934	840.30	---	---	---	---	---	---	---	---	---	---	0.000
11.40	1,622,520	840.40	---	---	---	---	---	---	---	---	---	---	0.000
11.50	1,647,105	840.50	---	---	---	---	---	---	---	---	---	---	0.000
11.60	1,671,691	840.60	---	---	---	---	---	---	---	---	---	---	0.000
11.70	1,696,276	840.70	---	---	---	---	---	---	---	---	---	---	0.000
11.80	1,720,862	840.80	---	---	---	---	---	---	---	---	---	---	0.000
11.90	1,745,447	840.90	---	---	---	---	---	---	---	---	---	---	0.000
12.00	1,770,033	841.00	---	---	---	---	---	---	---	---	---	---	0.000
12.10	1,797,024	841.10	---	---	---	---	---	---	---	---	---	---	0.000
12.20	1,824,015	841.20	---	---	---	---	---	---	---	---	---	---	0.000
12.30	1,851,006	841.30	---	---	---	---	---	---	---	---	---	---	0.000
12.40	1,877,998	841.40	---	---	---	---	---	---	---	---	---	---	0.000
12.50	1,904,989	841.50	---	---	---	---	---	---	---	---	---	---	0.000
12.60	1,931,980	841.60	---	---	---	---	---	---	---	---	---	---	0.000
12.70	1,958,971	841.70	---	---	---	---	---	---	---	---	---	---	0.000
12.80	1,985,962	841.80	---	---	---	---	---	---	---	---	---	---	0.000
12.90	2,012,953	841.90	---	---	---	---	---	---	---	---	---	---	0.000
13.00	2,039,944	842.00	---	---	---	---	---	---	---	---	---	---	0.000

...End

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

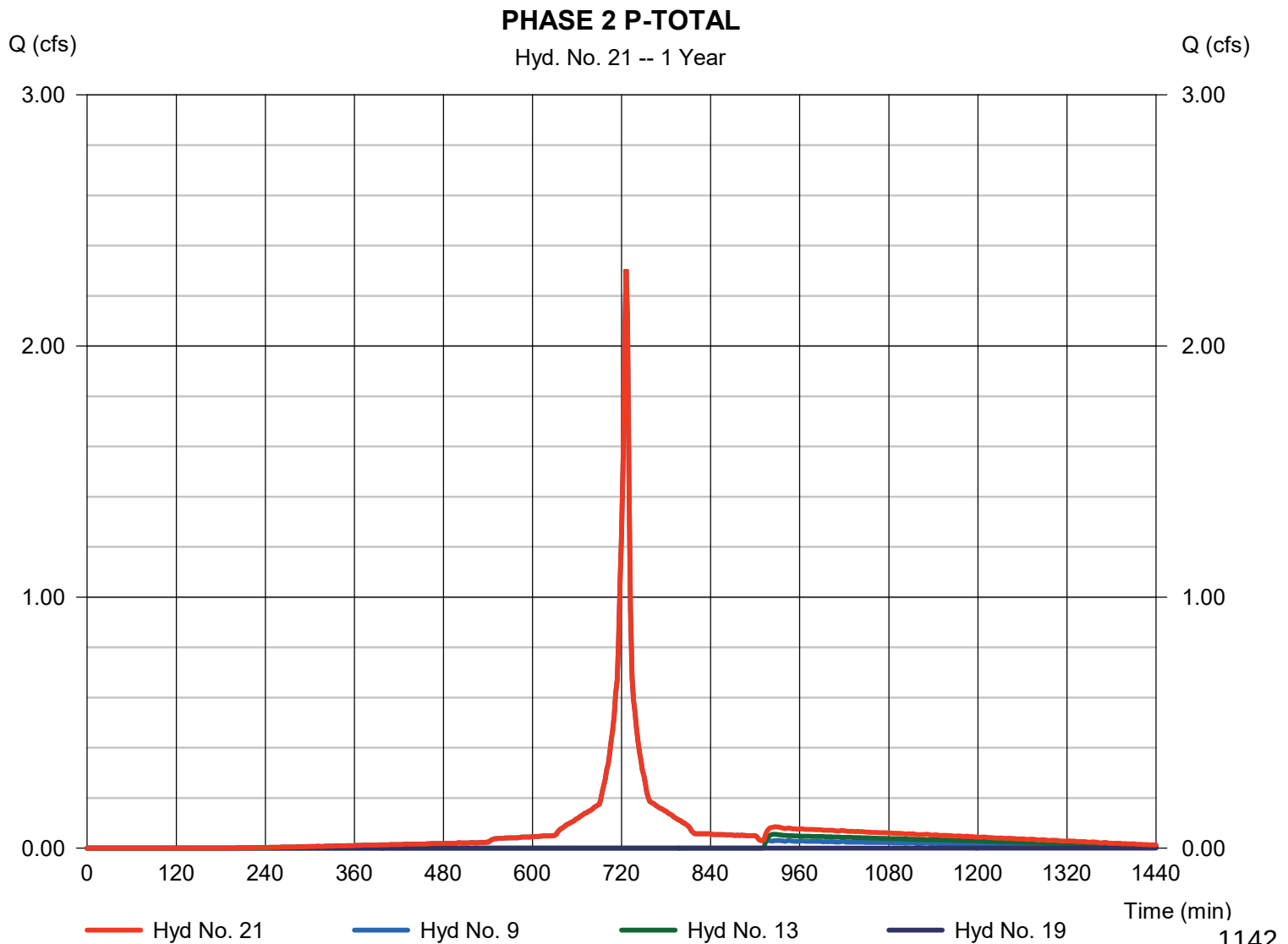
Thursday, 02 / 27 / 2020

Hyd. No. 21

PHASE 2 P-TOTAL

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 9, 13, 19

Peak discharge = 2.305 cfs
 Time to peak = 726 min
 Hyd. volume = 5,920 cuft
 Contrib. drain. area = 0.670 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	26.66	2	734	91,172	-----	-----	-----	P-OS-1
2	SCS Runoff	36.13	2	732	111,968	-----	-----	-----	P-OS-2
3	SCS Runoff	105.79	2	730	304,492	-----	-----	-----	P-1-PH 2
4	SCS Runoff	16.18	2	736	60,288	-----	-----	-----	P-1A-PH2
5	SCS Runoff	23.00	2	738	90,224	-----	-----	-----	P-1B-PH2
6	SCS Runoff	18.08	2	736	67,387	-----	-----	-----	P-2
7	SCS Runoff	13.66	2	736	50,908	-----	-----	-----	P-3
8	SCS Runoff	2.547	2	736	9,490	-----	-----	-----	P-4
9	SCS Runoff	2.604	2	726	5,631	-----	-----	-----	P-UD-1
11	Reservoir	17.23	2	740	67,369	6	839.81	16,818	POND P-2
12	Reservoir	13.48	2	738	50,895	7	839.96	7,303	POND P-3
13	Reservoir	0.234	2	804	2,116	8	840.71	7,453	RAIN GARDEN P-4
15	Combine	165.20	2	730	507,633	1, 2, 3,	-----	-----	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	33.11	2	738	127,657	4, 11,	-----	-----	PH 2 INFLOW TO FOREBAY 1A
17	Combine	36.48	2	738	141,119	5, 12,	-----	-----	PH 2 INFLOW TO FOREBAY 1B
18	Combine	224.73	2	732	776,409	15, 16, 17	-----	-----	PH 2 INFLOW - POND P-1
19	Reservoir	0.000	2	n/a	0	18	836.22	776,409	INFILTRATION BASIN P-1
21	Combine	2.604	2	726	7,747	9, 13, 19,	-----	-----	PHASE 2 P-TOTAL
2020-02-27_CHAPMAN FARMS_PHASE II_Freeze					Runup Period: 2 Year			Thursday, 02 / 27 / 2020	

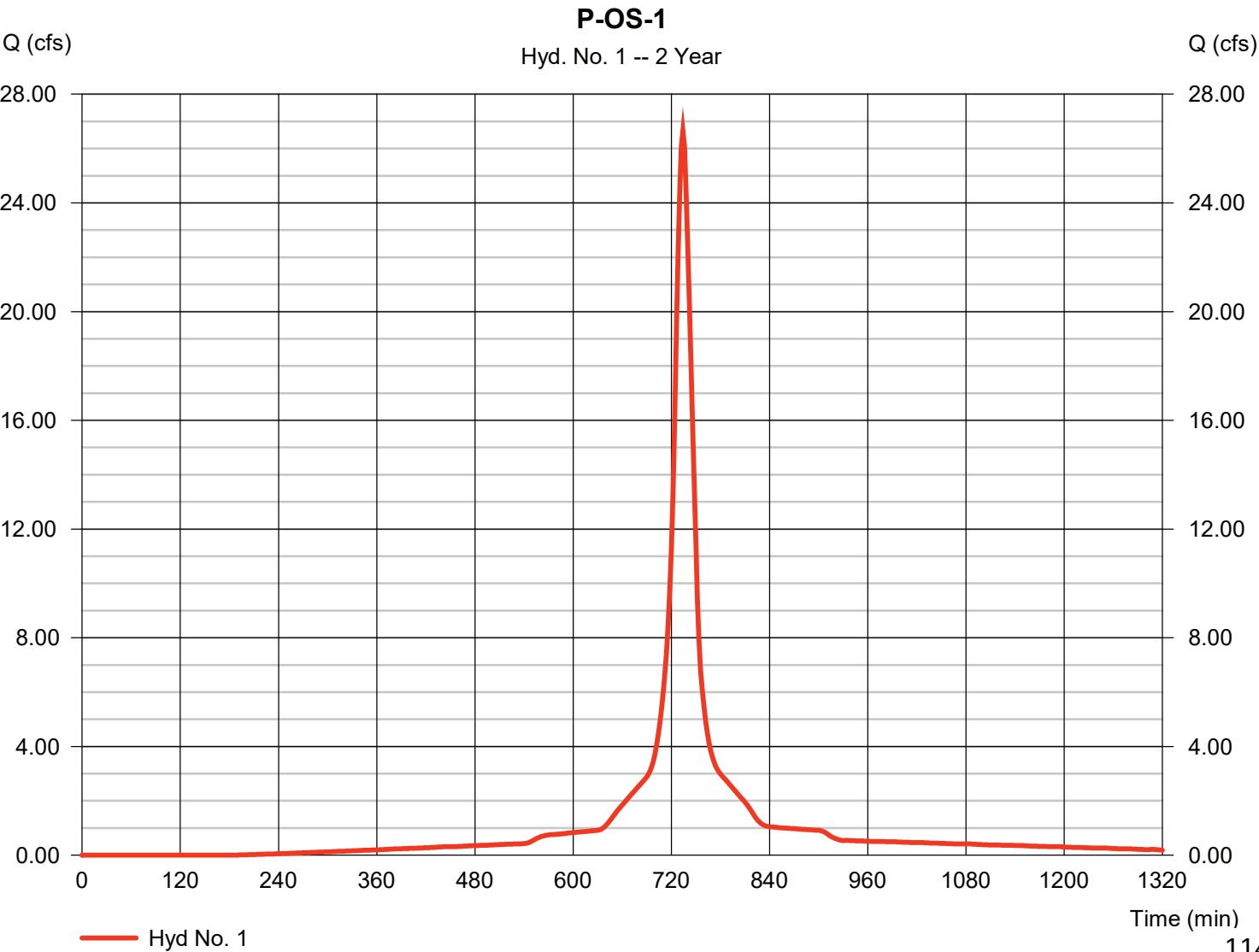
Hydrograph Report

Hyd. No. 1

P-OS-1

Hydrograph type	= SCS Runoff	Peak discharge	= 26.66 cfs
Storm frequency	= 2 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 91,172 cuft
Drainage area	= 10.170 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.90 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

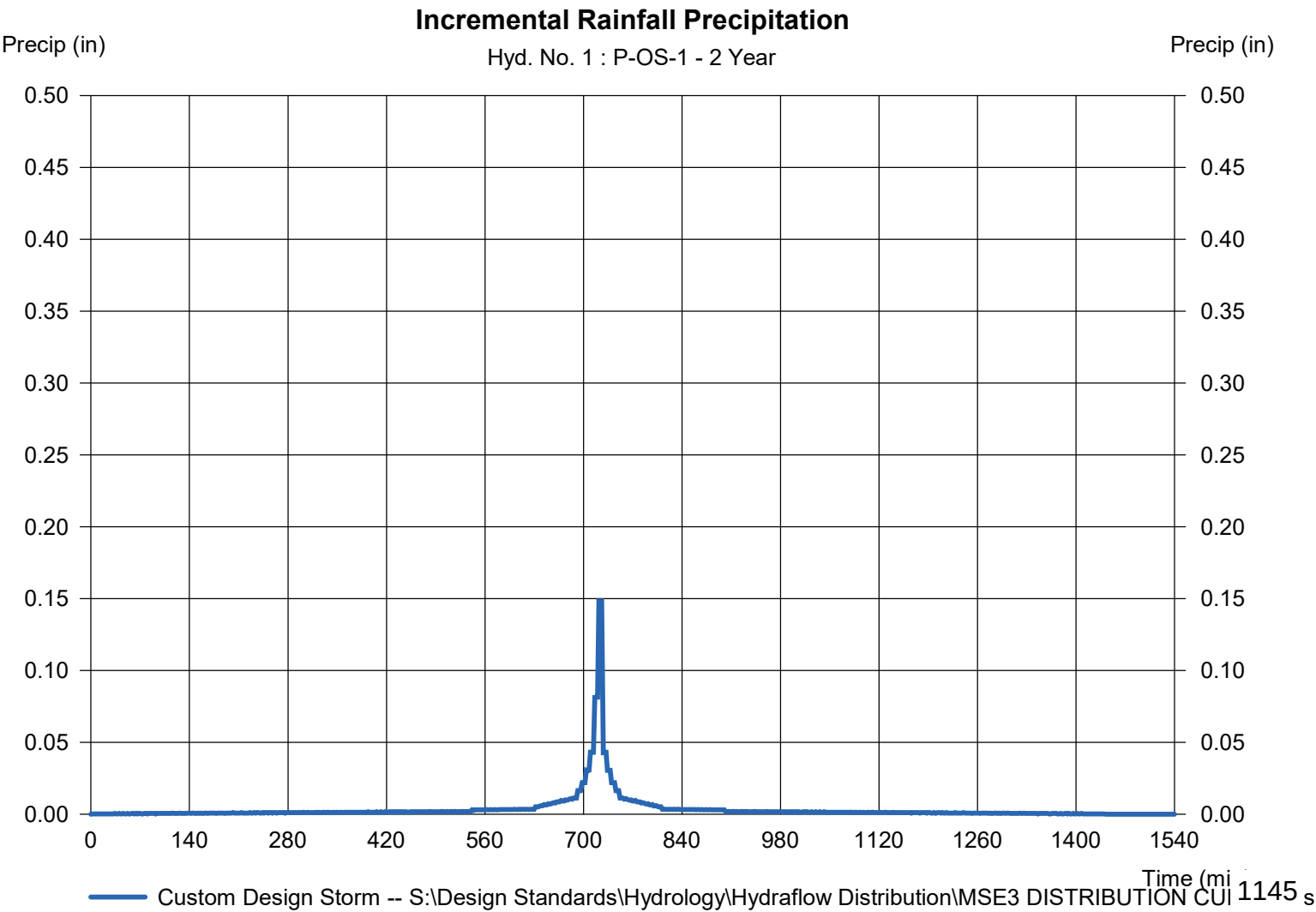
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 1

P-OS-1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

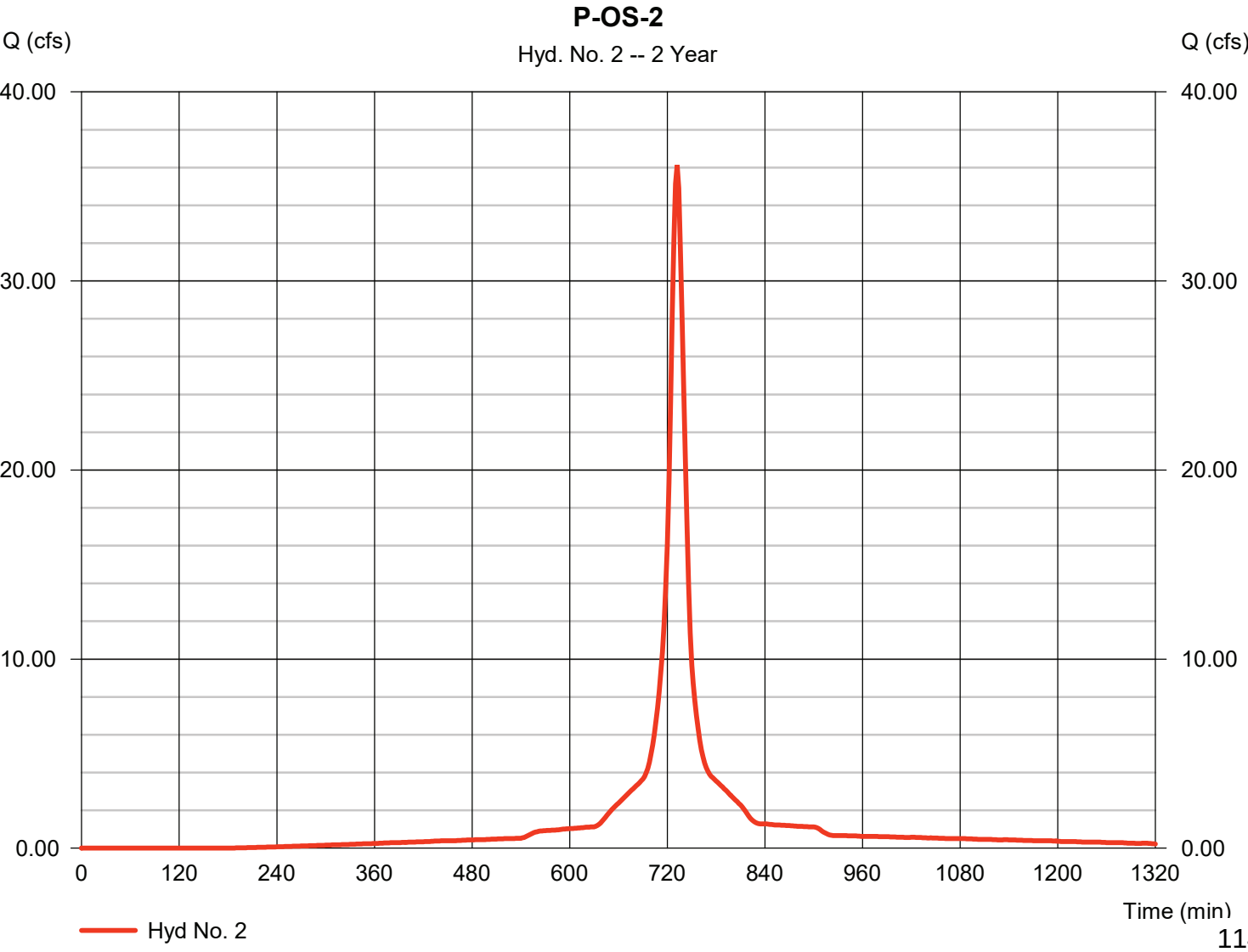
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Hydrograph type	= SCS Runoff	Peak discharge	= 36.13 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 111,968 cuft
Drainage area	= 12.810 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.80 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

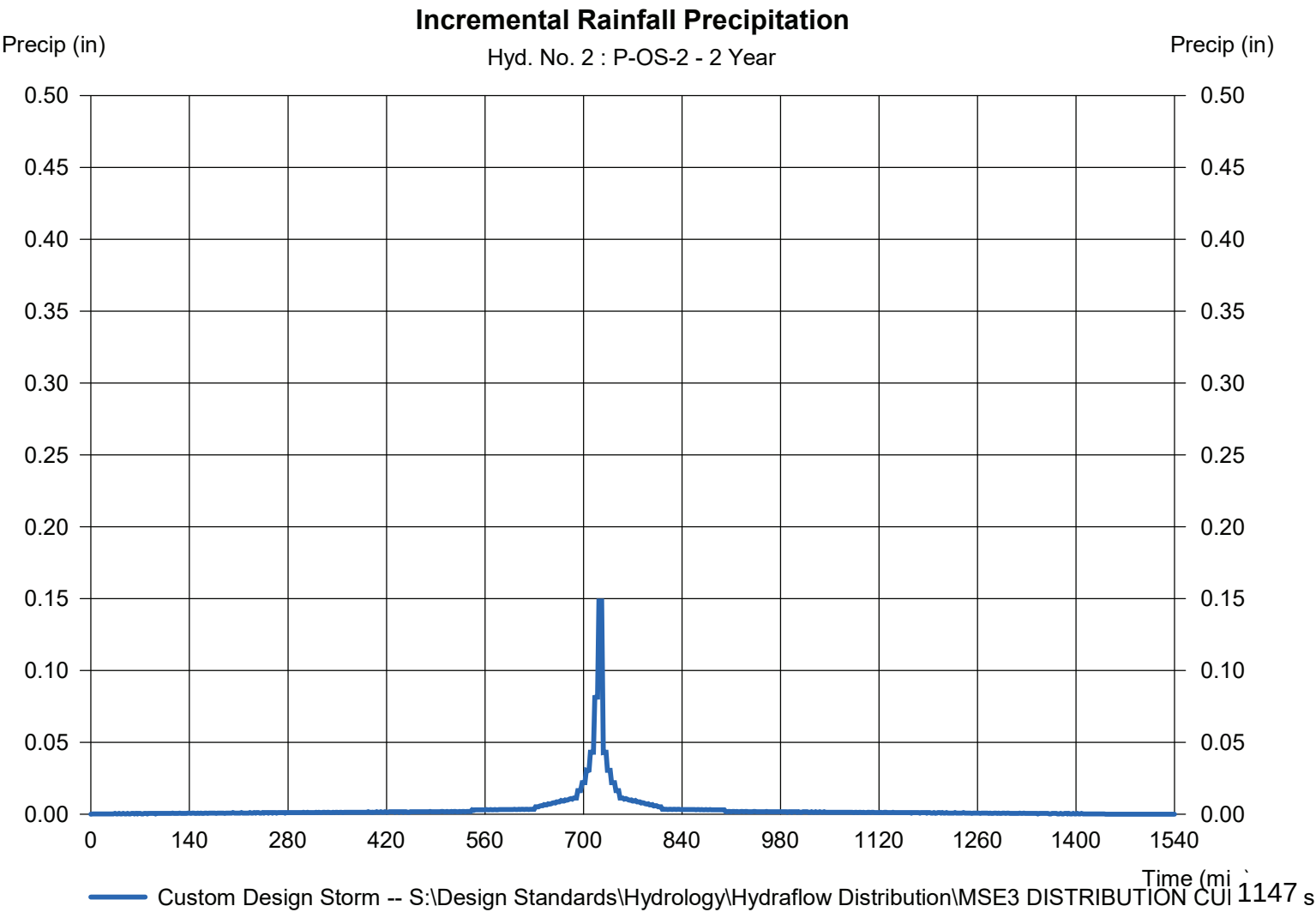
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

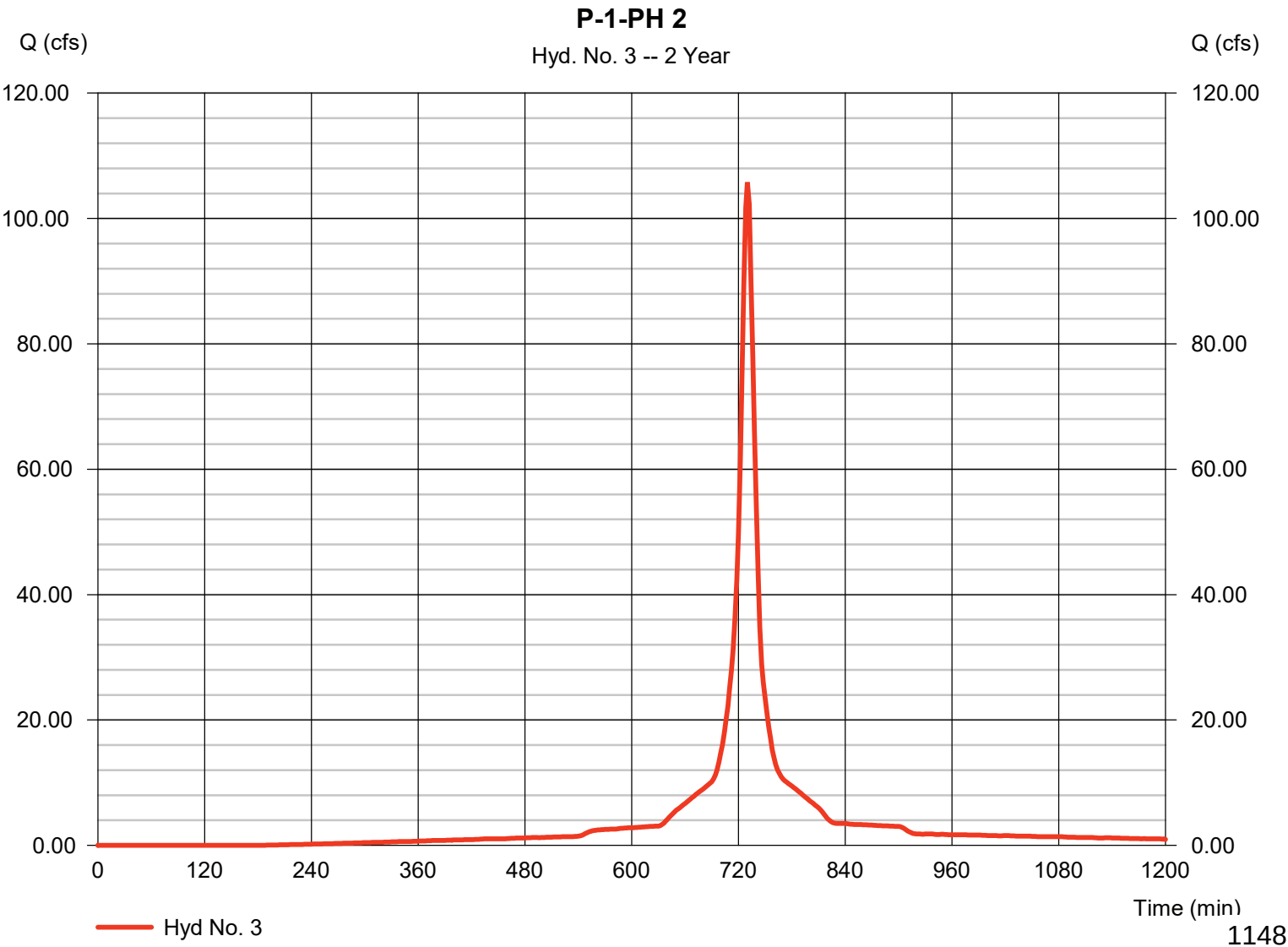
Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Hydrograph type	=	SCS Runoff	Peak discharge	=	105.79 cfs
Storm frequency	=	2 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	304,492 cuft
Drainage area	=	32.936 ac	Curve number	=	98*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.20 min
Total precip.	=	2.70 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD DISTRIBUTION CURVE			

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 32.936



Precipitation Report

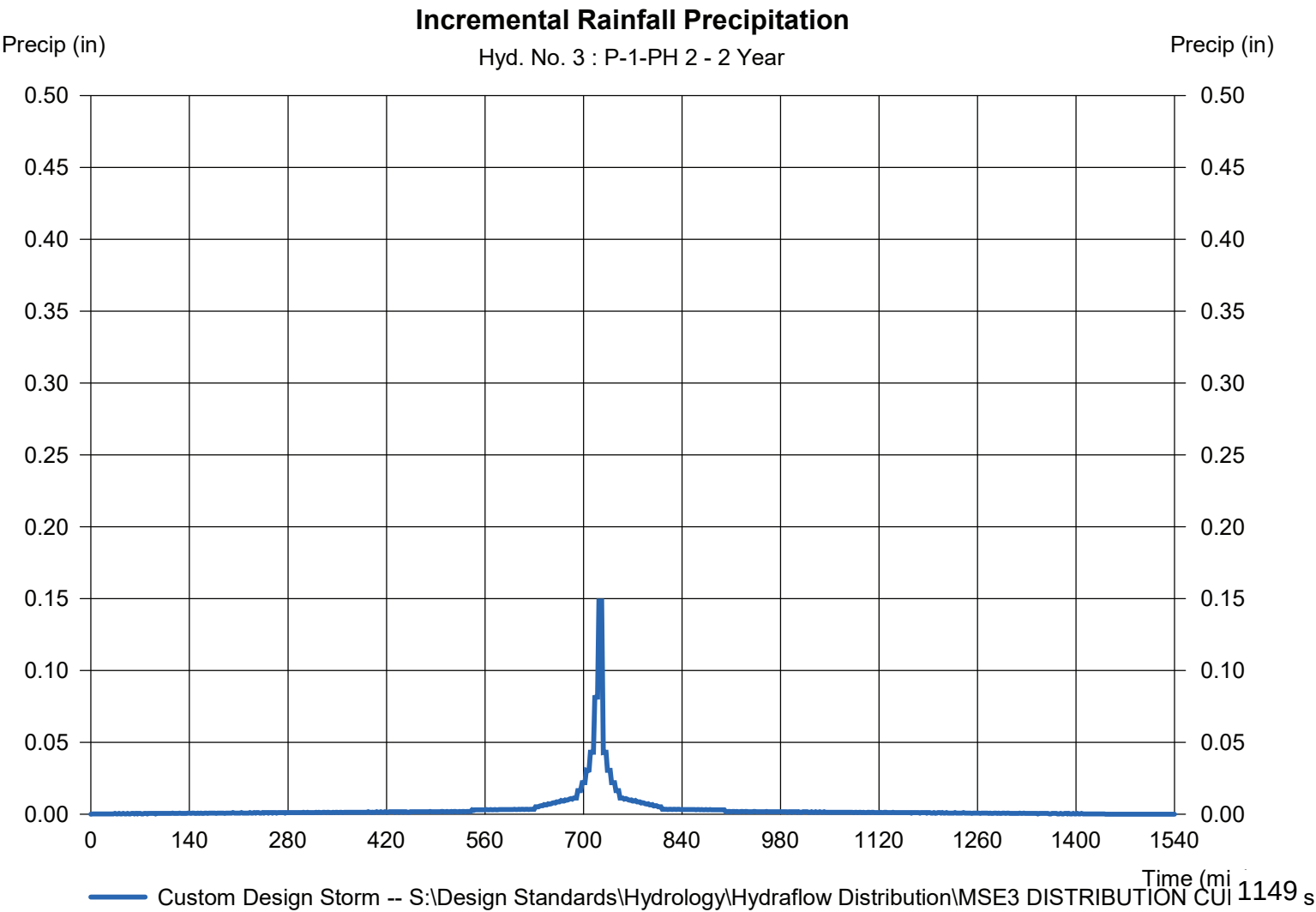
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

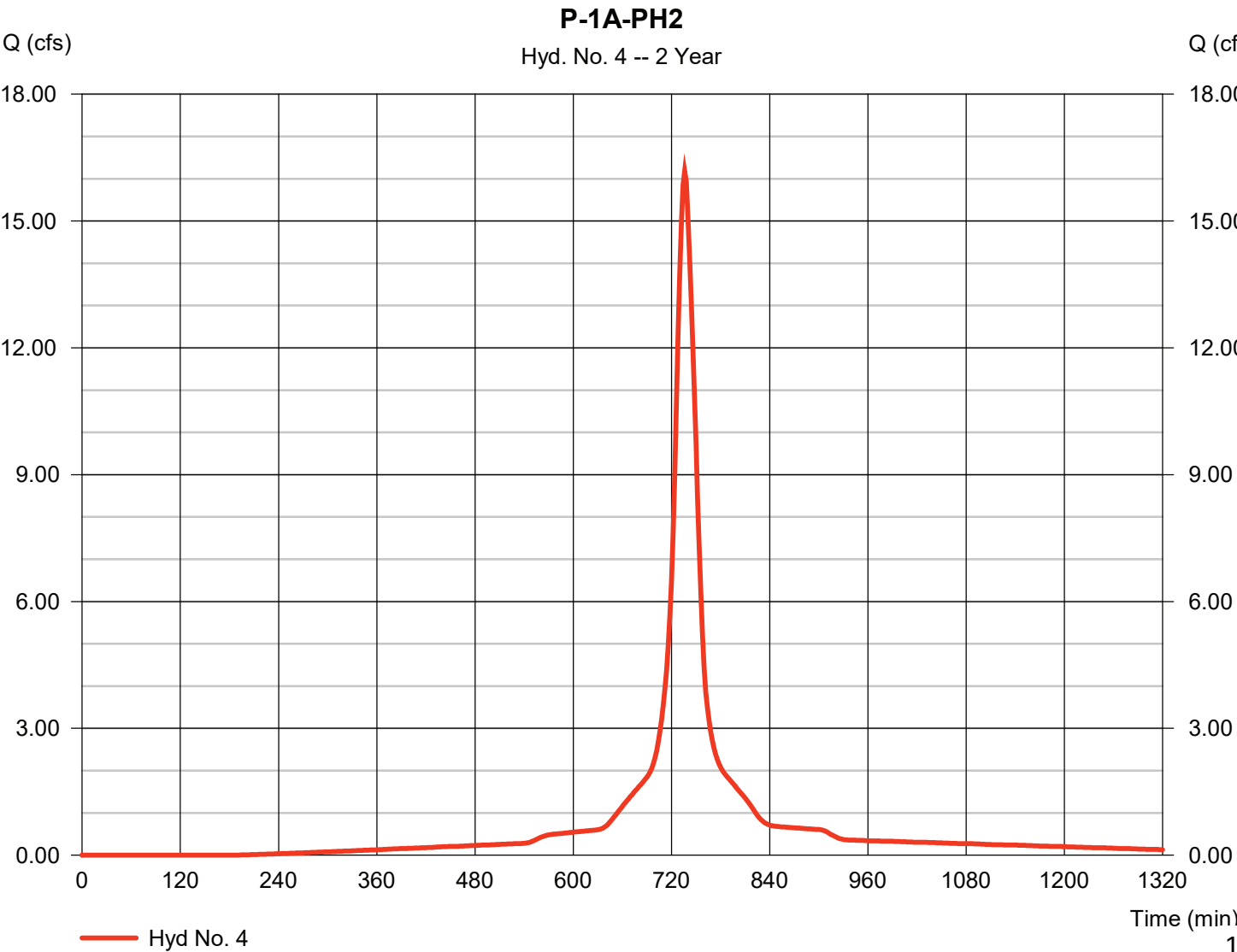
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 16.18 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 60,288 cuft
Drainage area	= 6.607 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

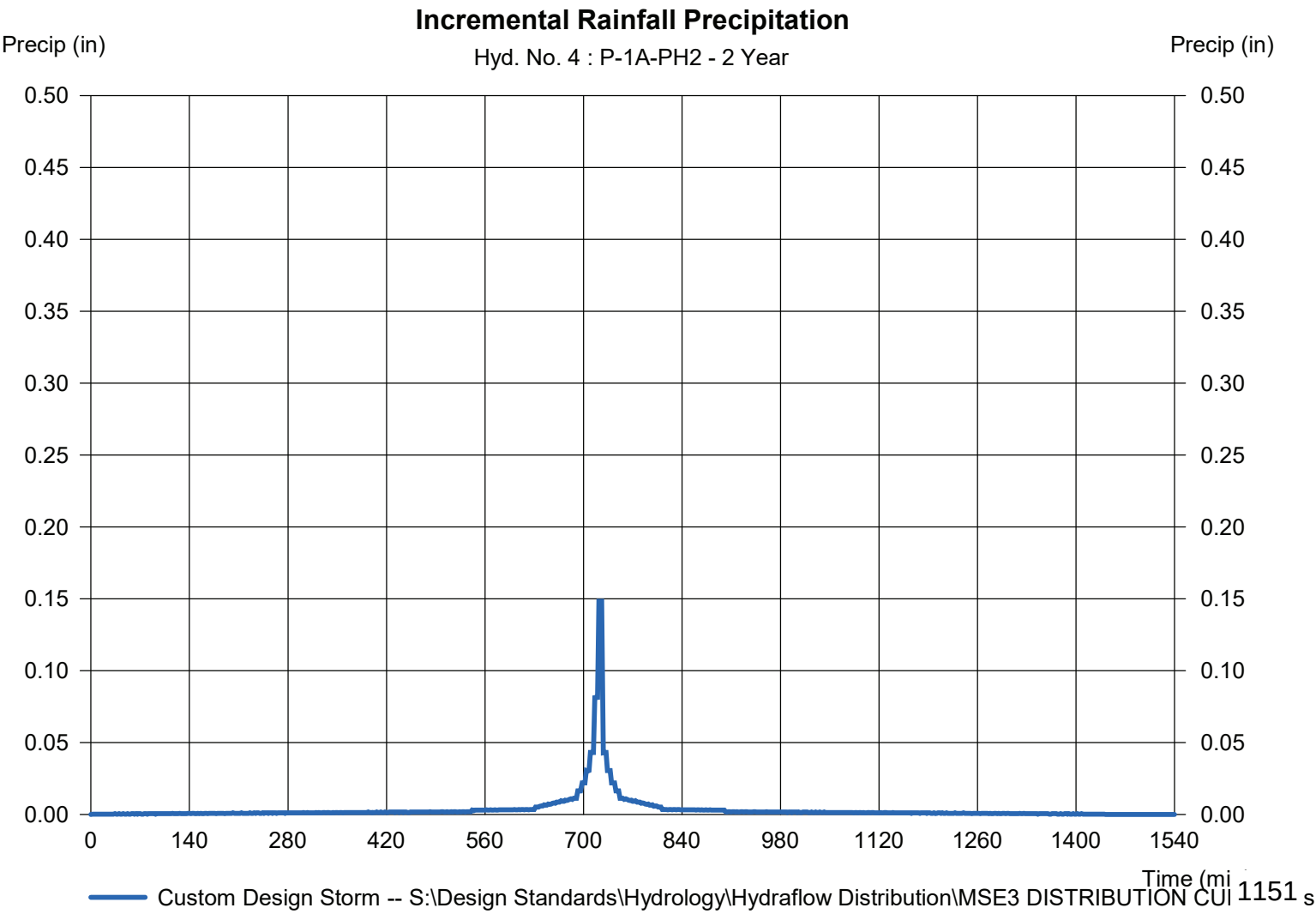
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

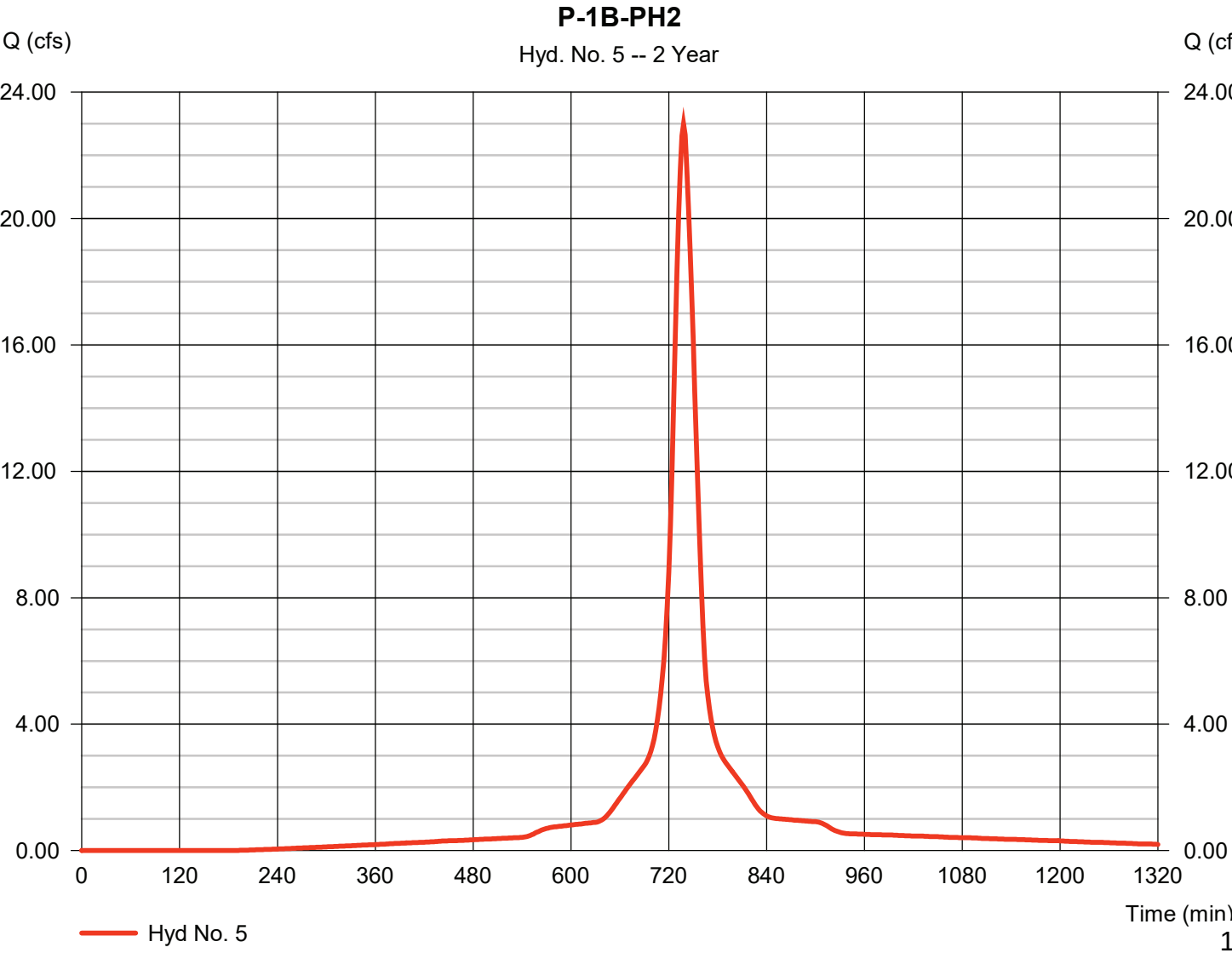
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 23.00 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 90,224 cuft
Drainage area	= 10.224 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 26.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

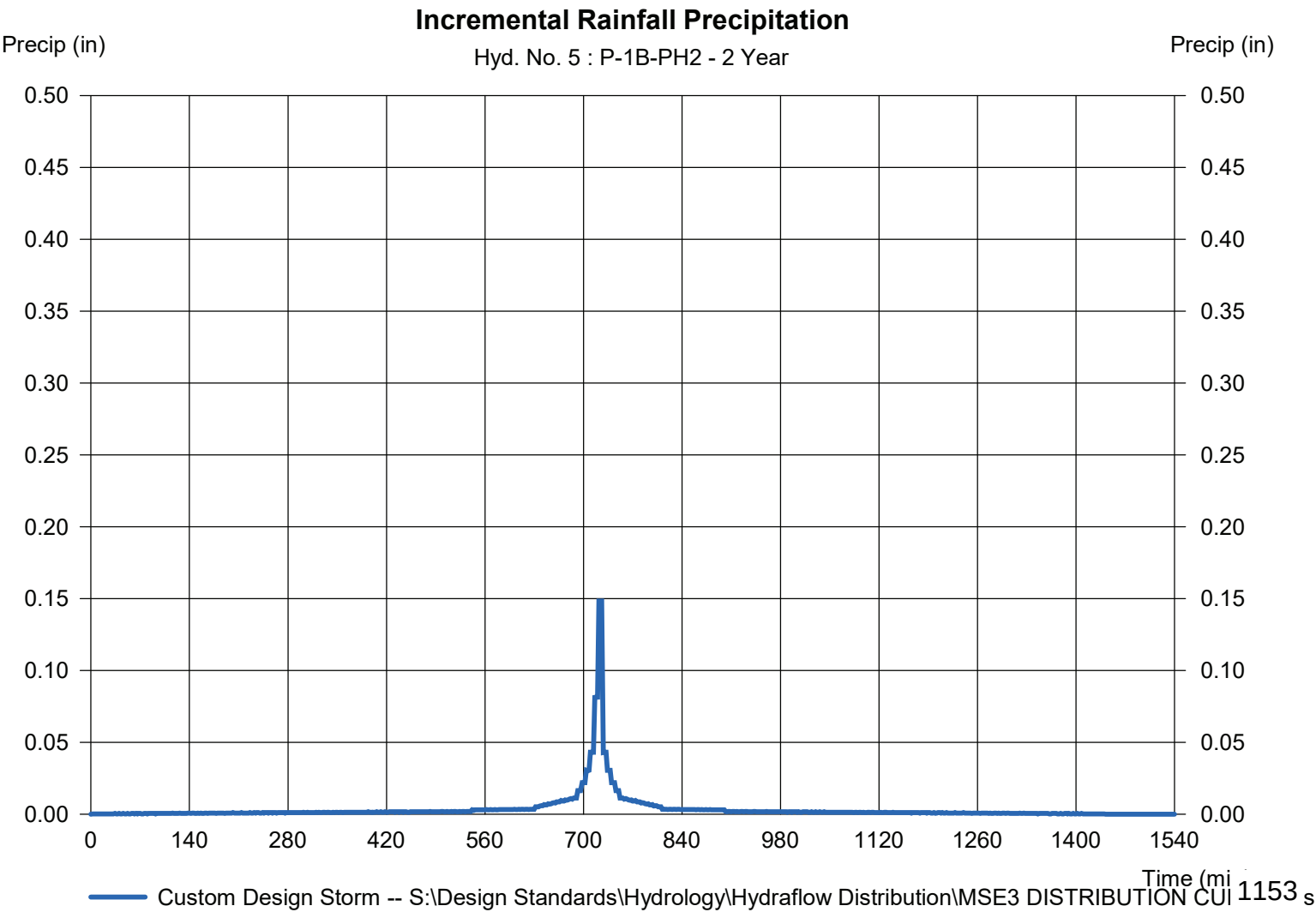
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

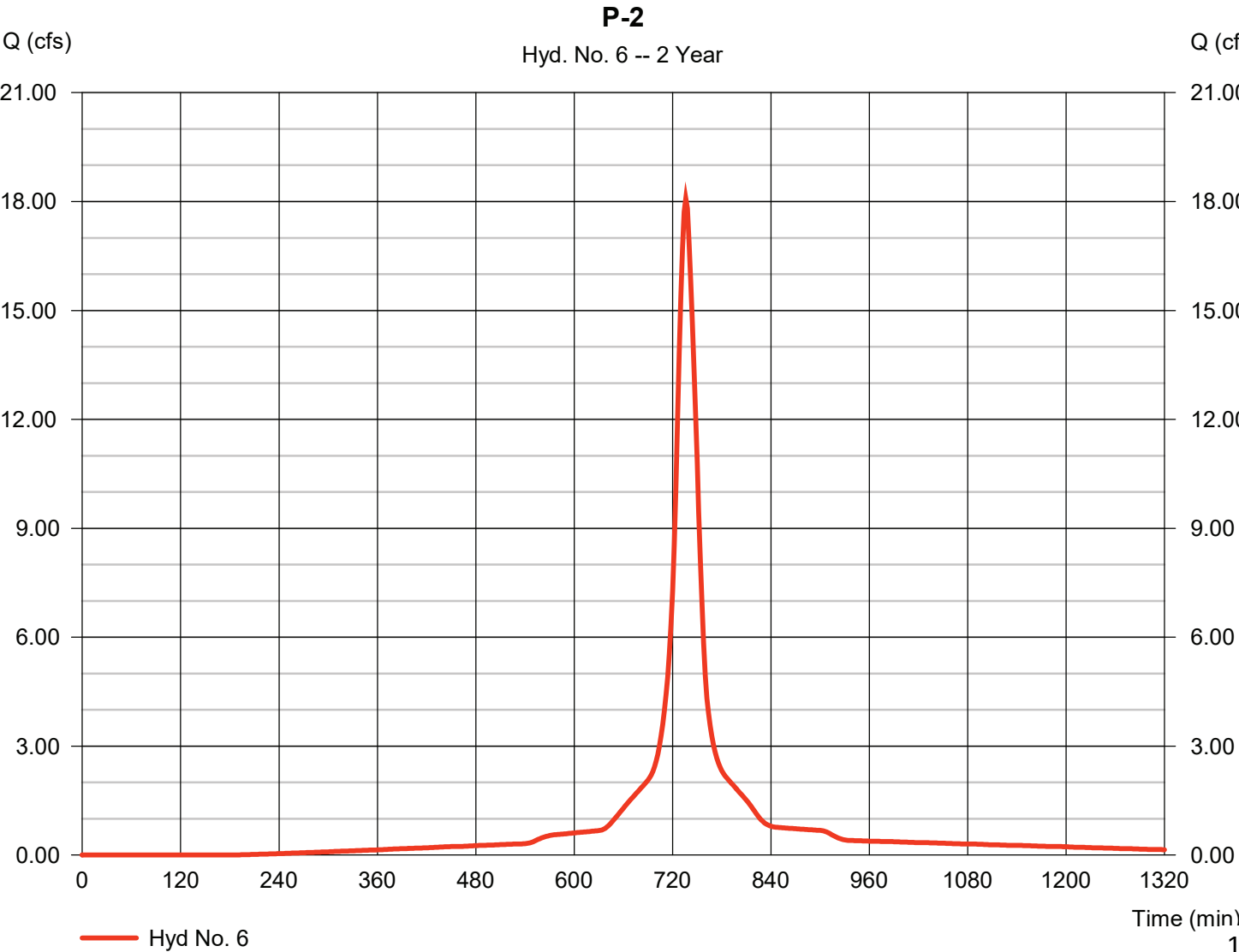
Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 18.08 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 67,387 cuft
Drainage area	= 7.385 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.710 x 75)] / 7.385



Precipitation Report

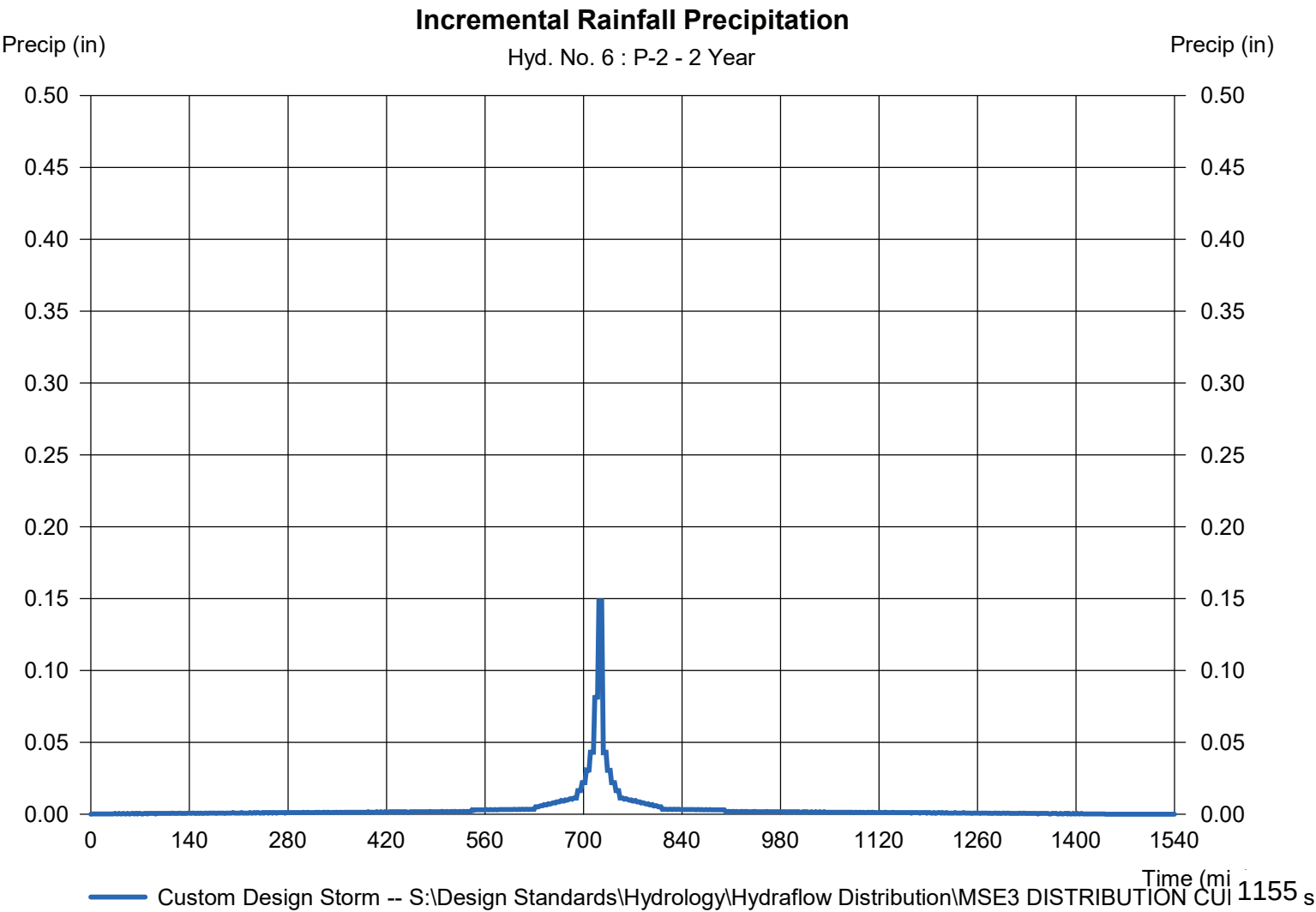
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

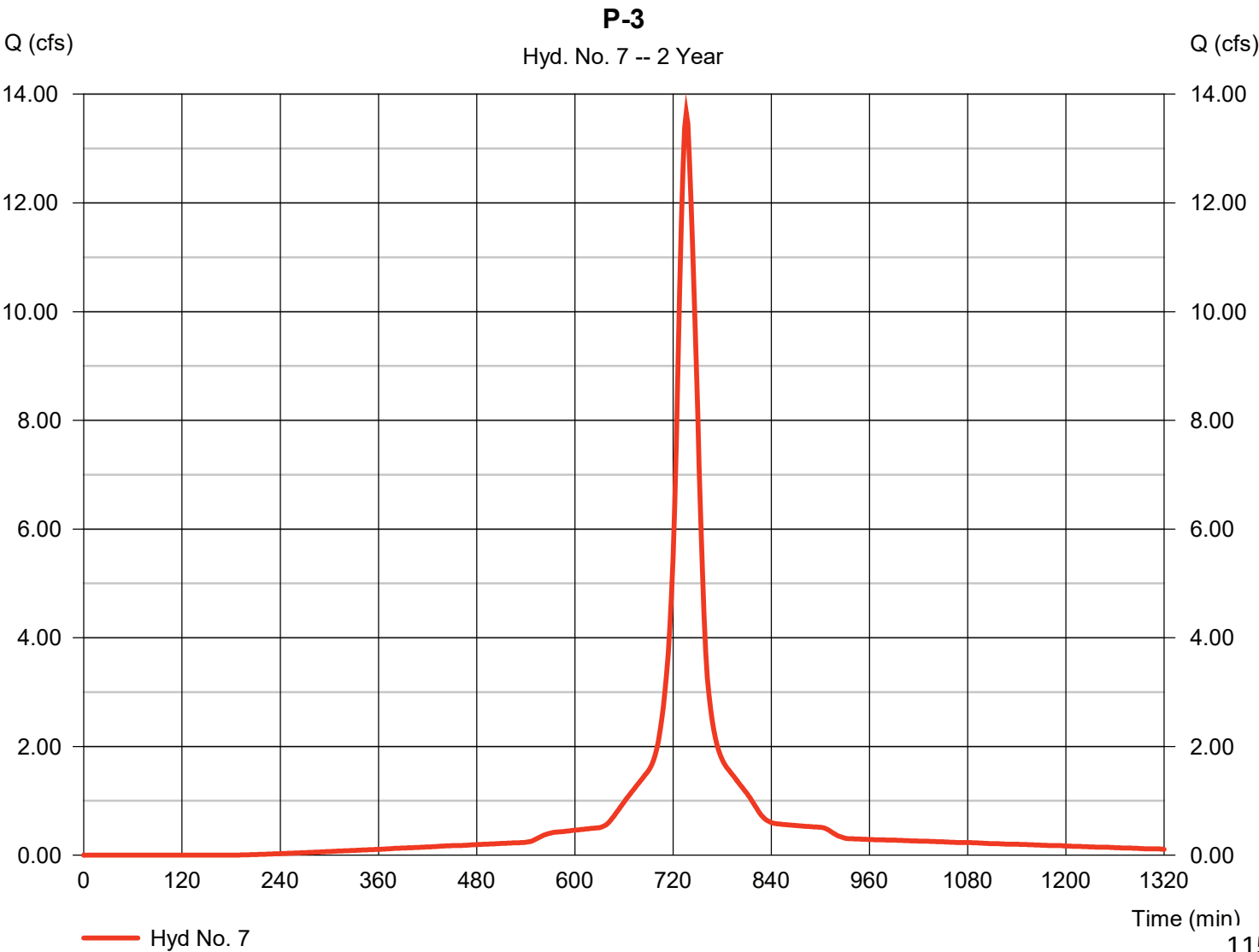
Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 13.66 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 50,908 cuft
Drainage area	= 5.579 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.20 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.579



Precipitation Report

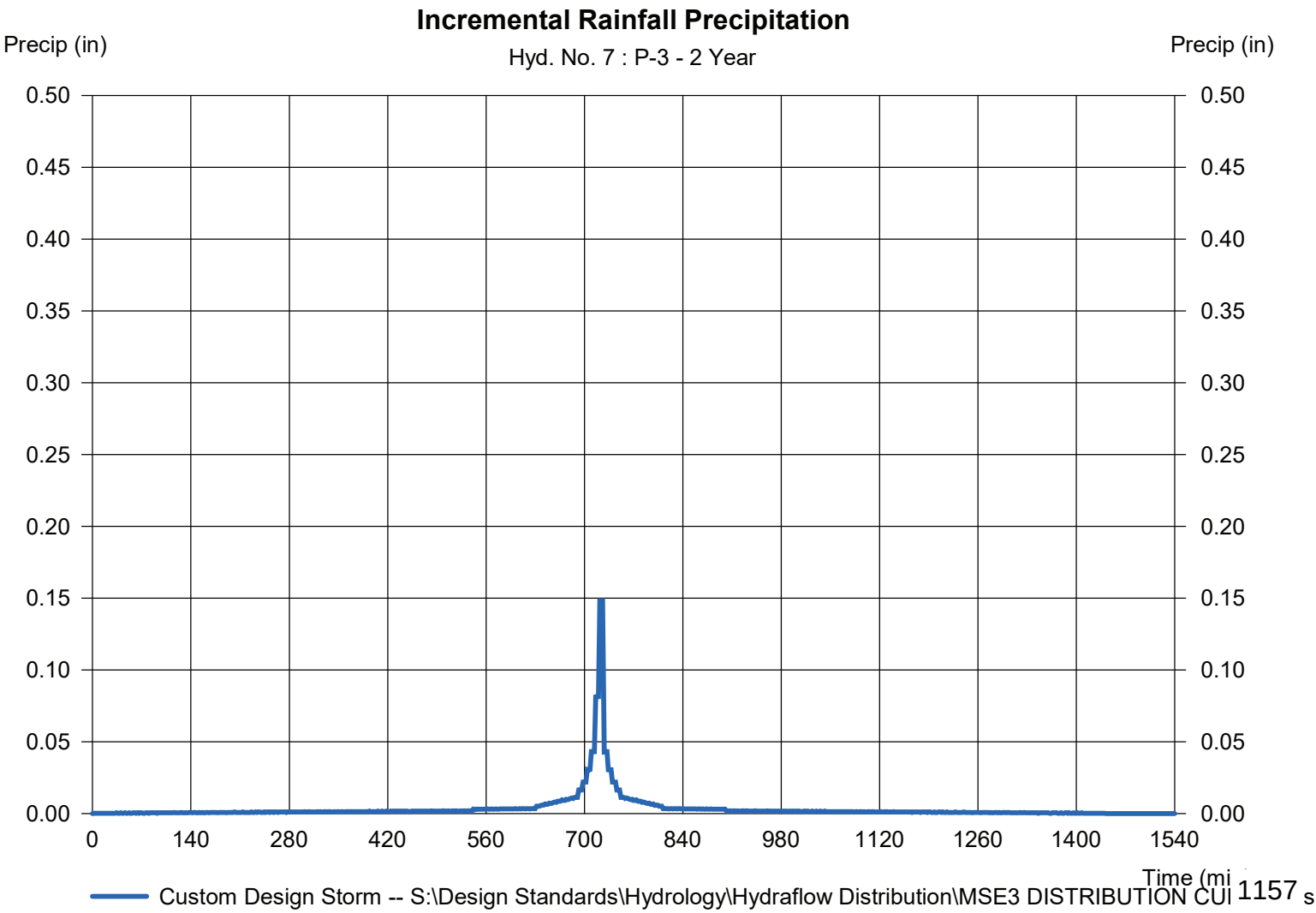
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

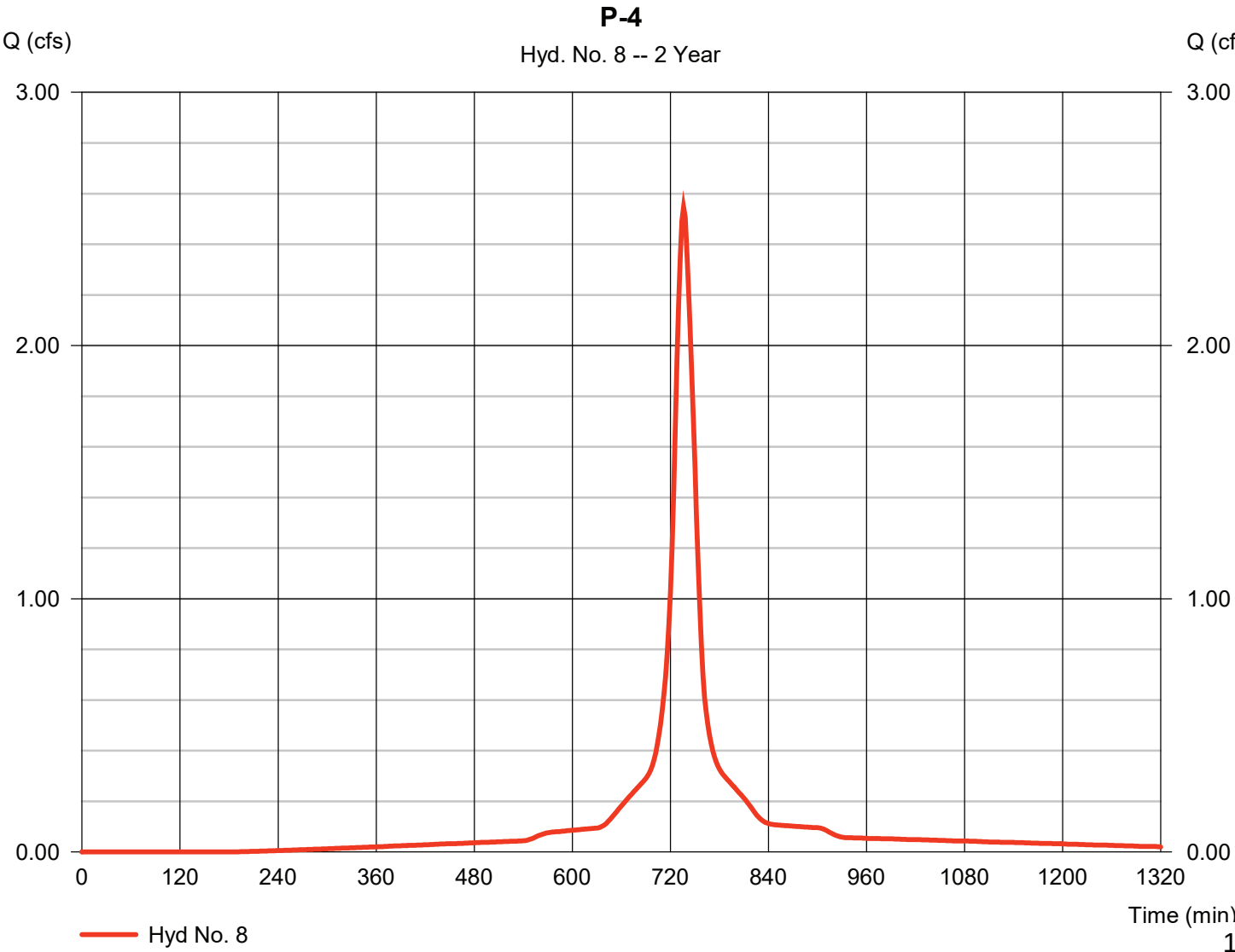
Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 2.547 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 9,490 cuft
Drainage area	= 1.040 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.10 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

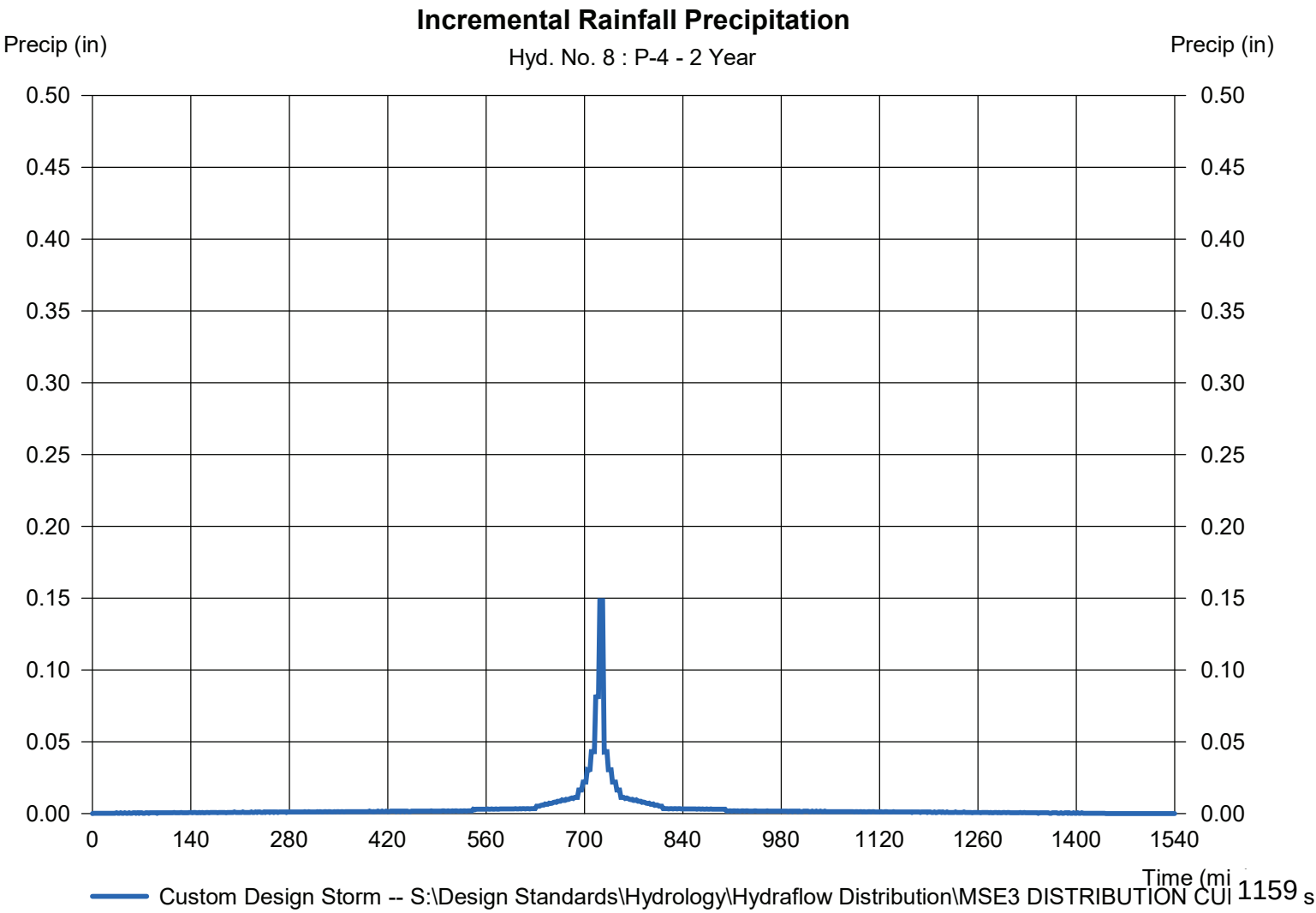
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

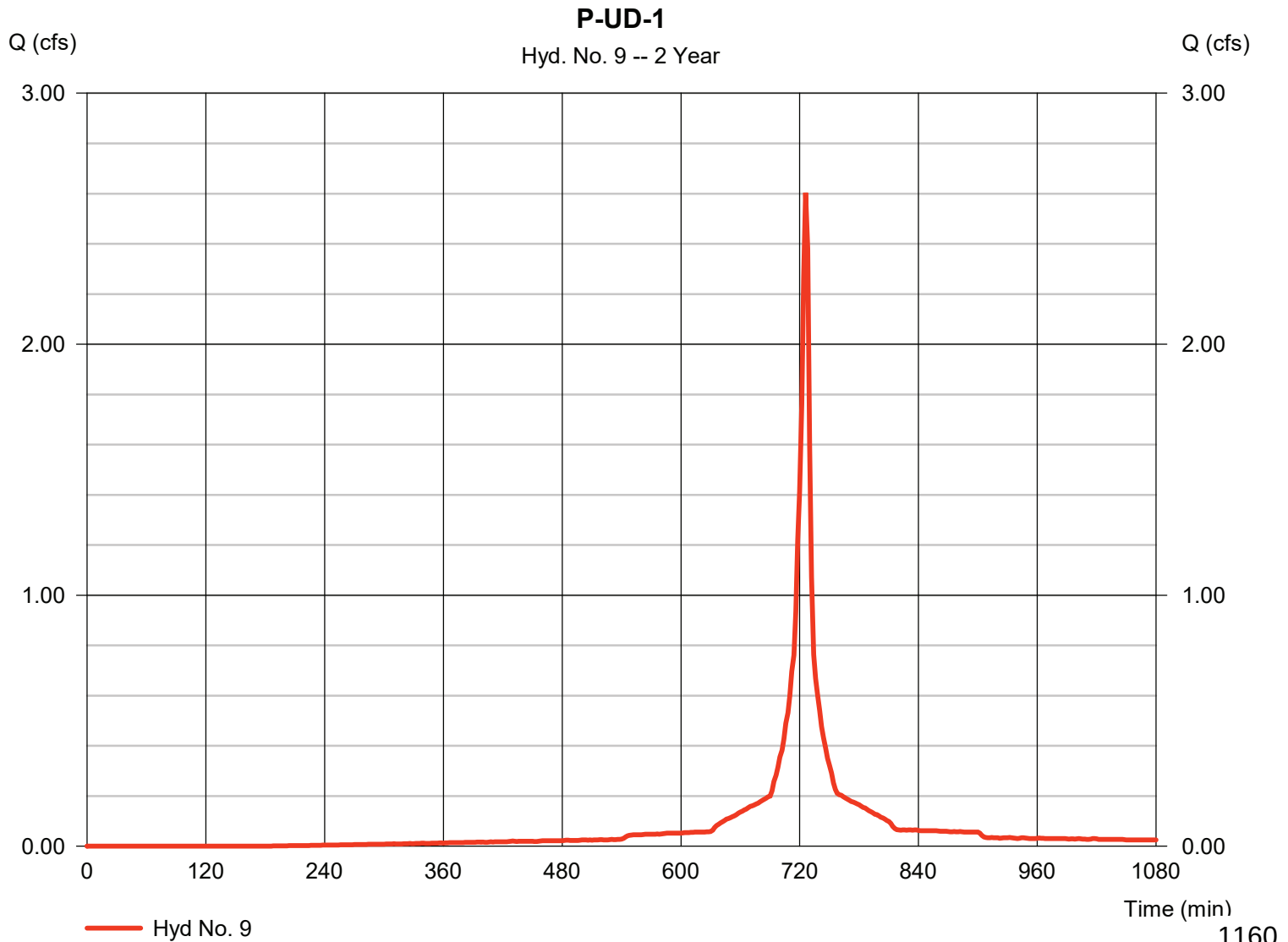
Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.604 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 5,631 cuft
Drainage area	= 0.670 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.70 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = $[(0.300 \times 61) + (0.370 \times 98)] / 0.670$



1160

Precipitation Report

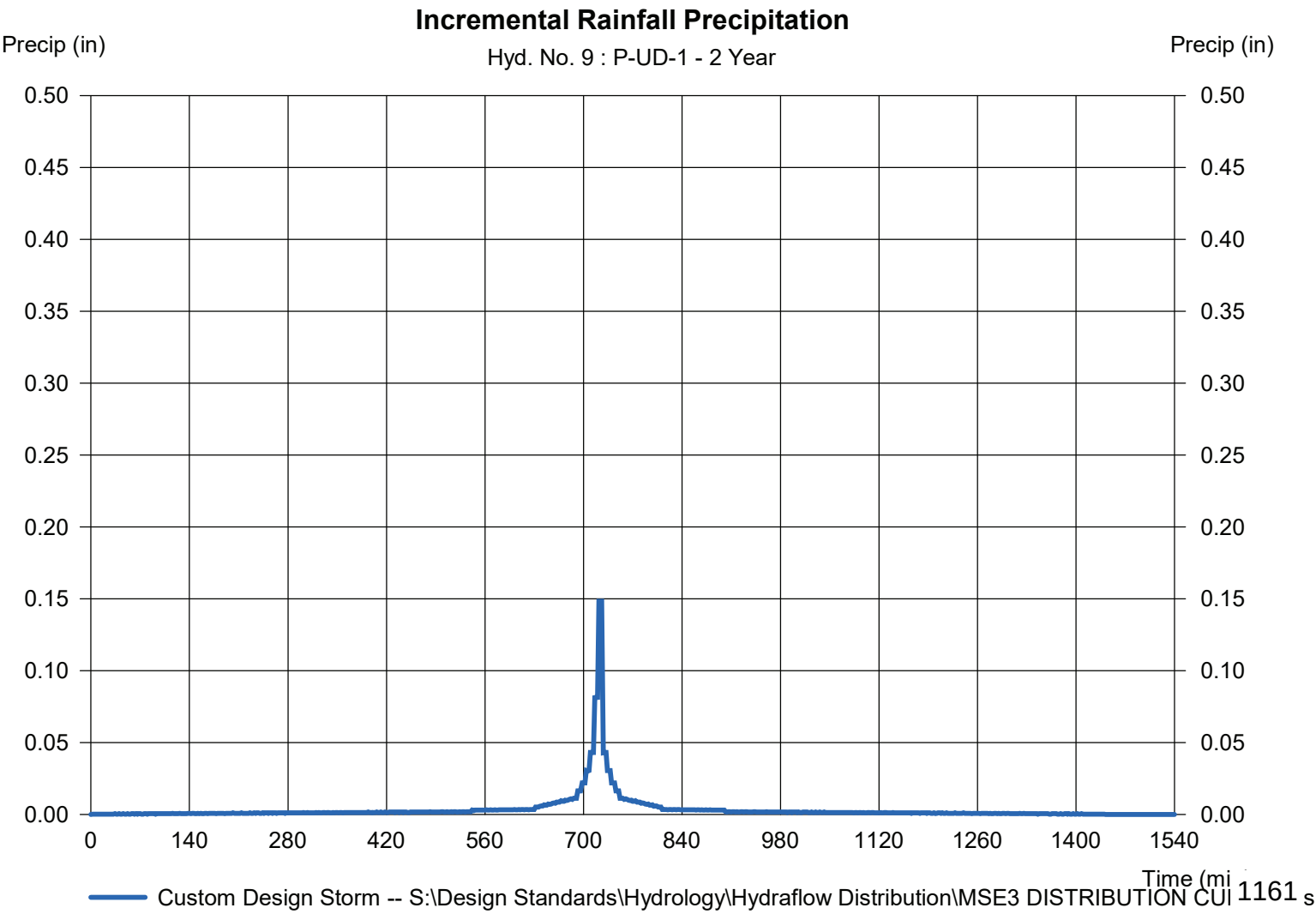
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Storm Frequency	= 2 yrs	Time interval	= 2 min
Total precip.	= 2.7000 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

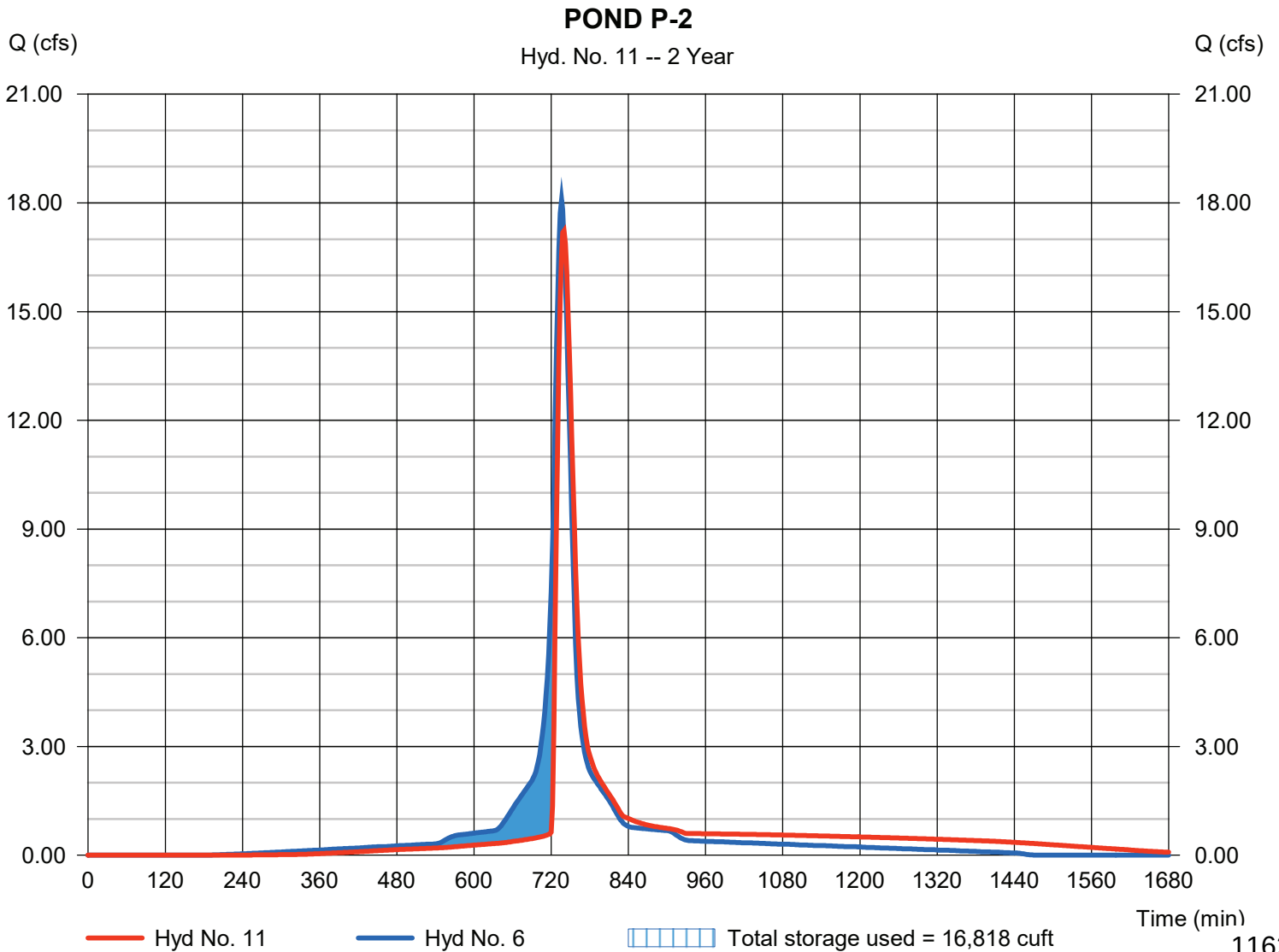
Thursday, 02 / 27 / 2020

Hyd. No. 11

POND P-2

Hydrograph type	= Reservoir	Peak discharge	= 17.23 cfs
Storm frequency	= 2 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 67,369 cuft
Inflow hyd. No.	= 6 - P-2	Max. Elevation	= 839.81 ft
Reservoir name	= POND P-2	Max. Storage	= 16,818 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

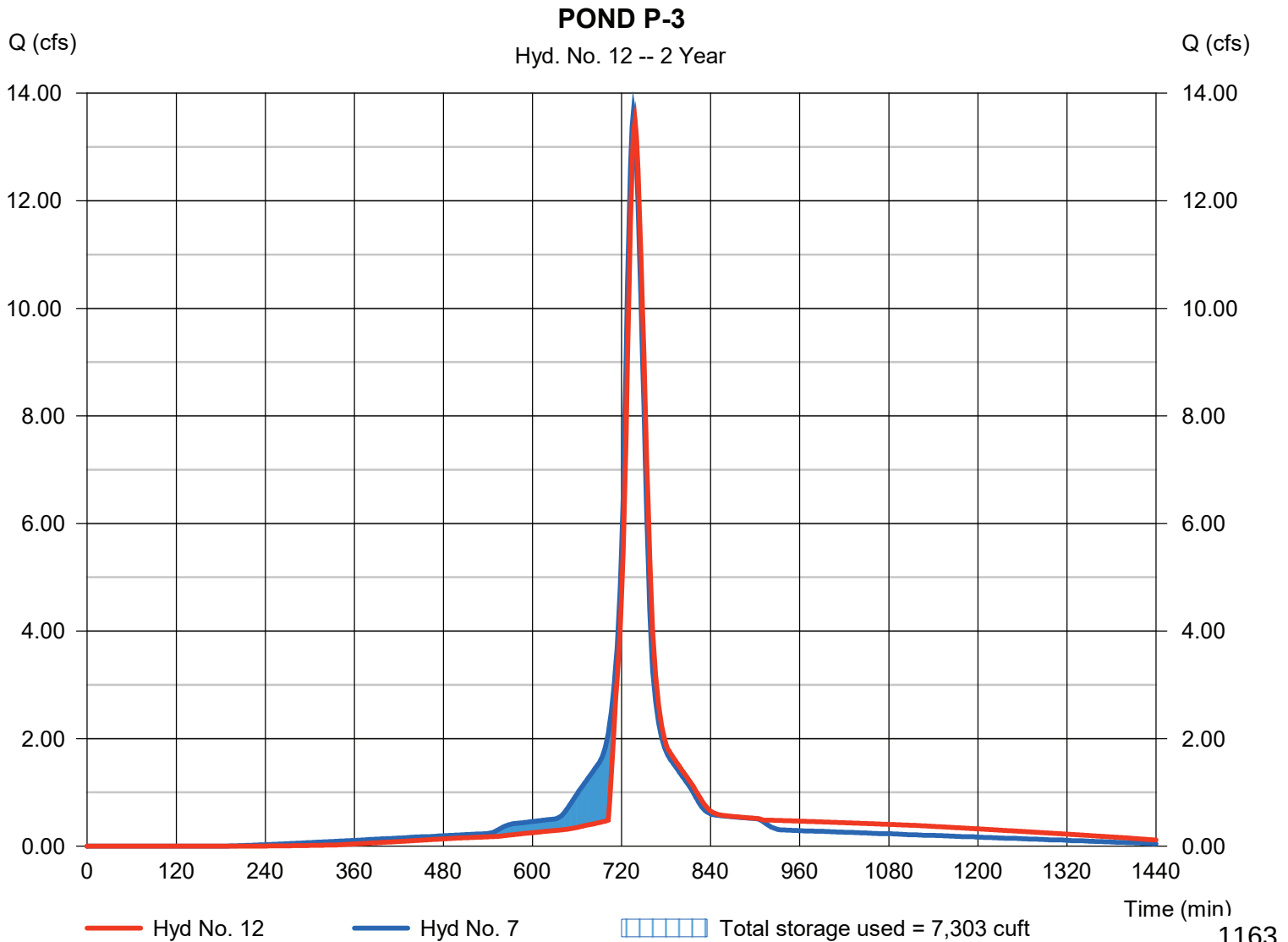
Hyd. No. 12

POND P-3

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - P-3
 Reservoir name = POND P-3

Peak discharge = 13.48 cfs
 Time to peak = 738 min
 Hyd. volume = 50,895 cuft
 Max. Elevation = 839.96 ft
 Max. Storage = 7,303 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

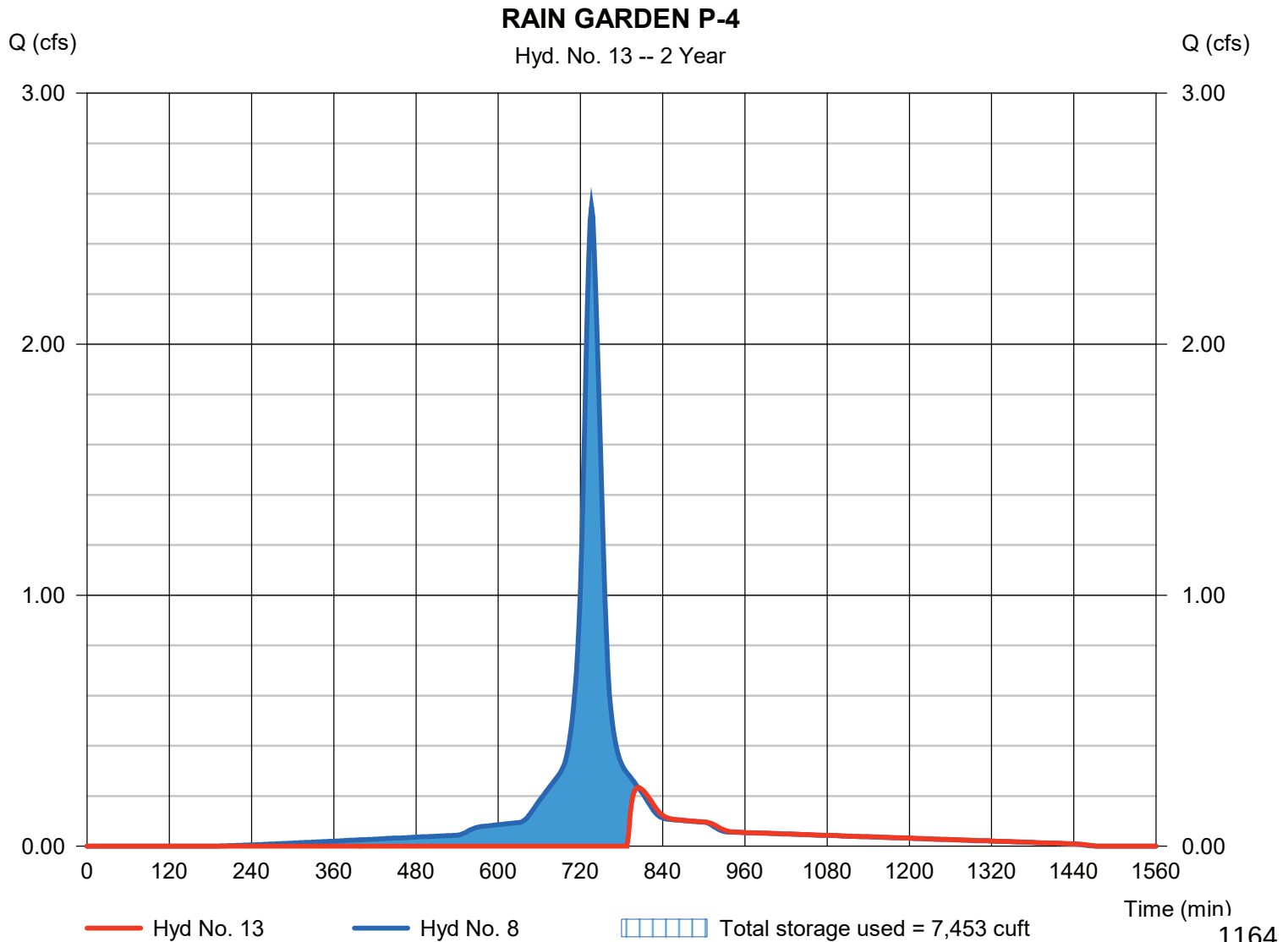
Thursday, 02 / 27 / 2020

Hyd. No. 13

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 0.234 cfs
Storm frequency	= 2 yrs	Time to peak	= 804 min
Time interval	= 2 min	Hyd. volume	= 2,116 cuft
Inflow hyd. No.	= 8 - P-4	Max. Elevation	= 840.71 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 7,453 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 15

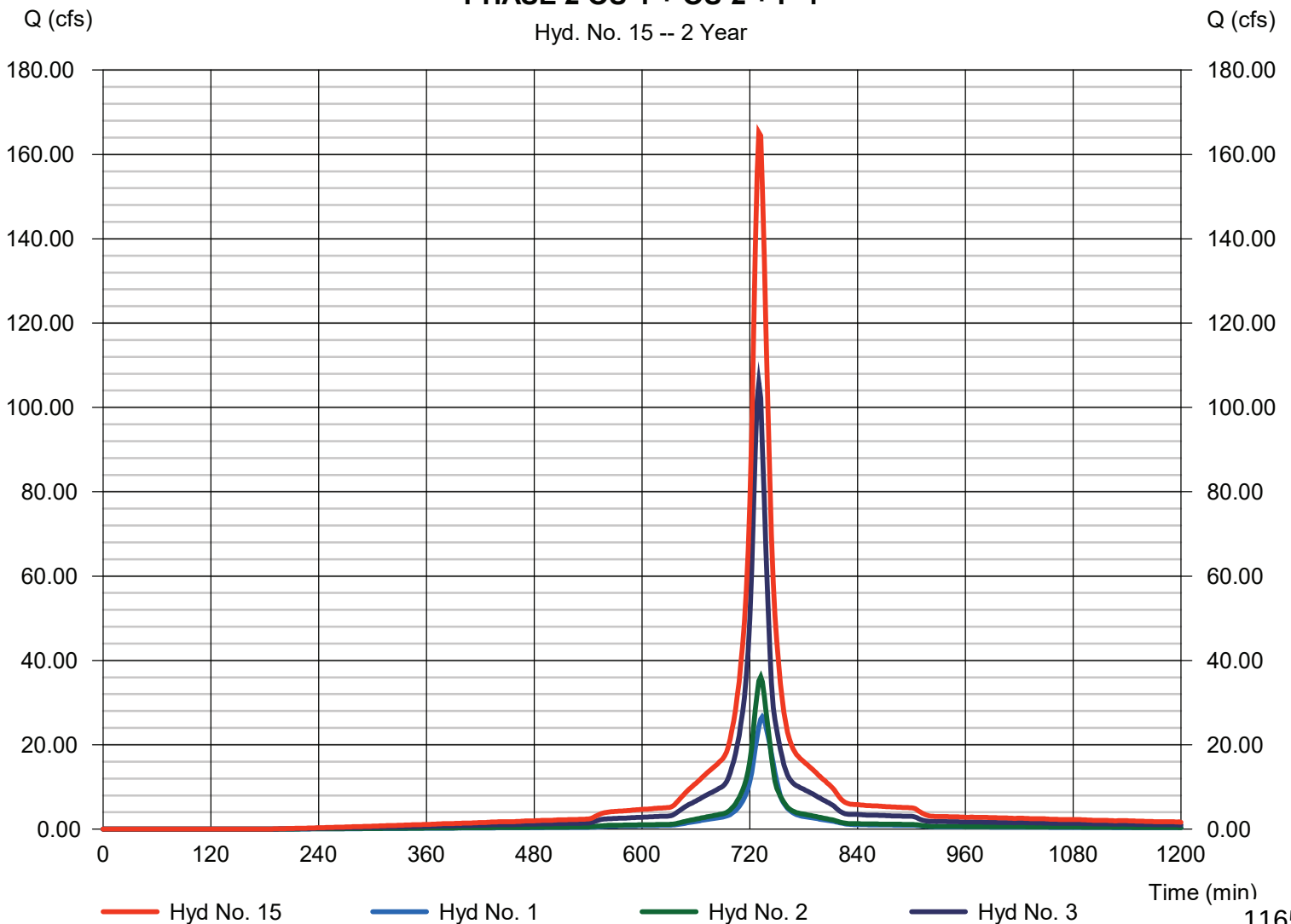
PHASE 2 OS-1 + OS-2 + P-1

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 2, 3

Peak discharge = 165.20 cfs
 Time to peak = 730 min
 Hyd. volume = 507,633 cuft
 Contrib. drain. area = 55.916 ac

PHASE 2 OS-1 + OS-2 + P-1

Hyd. No. 15 -- 2 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

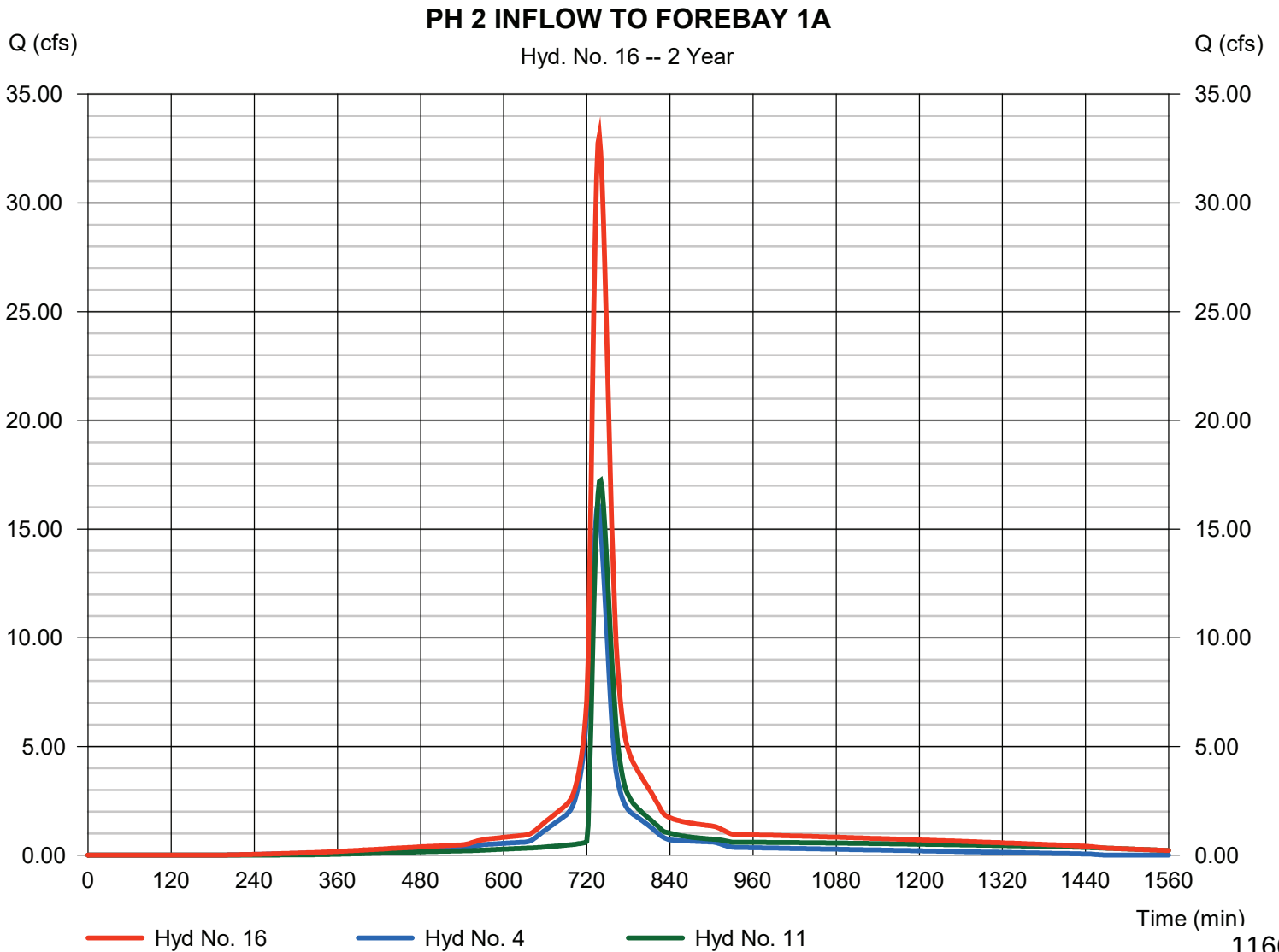
Thursday, 02 / 27 / 2020

Hyd. No. 16

PH 2 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 4, 11

Peak discharge = 33.11 cfs
 Time to peak = 738 min
 Hyd. volume = 127,657 cuft
 Contrib. drain. area = 6.607 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

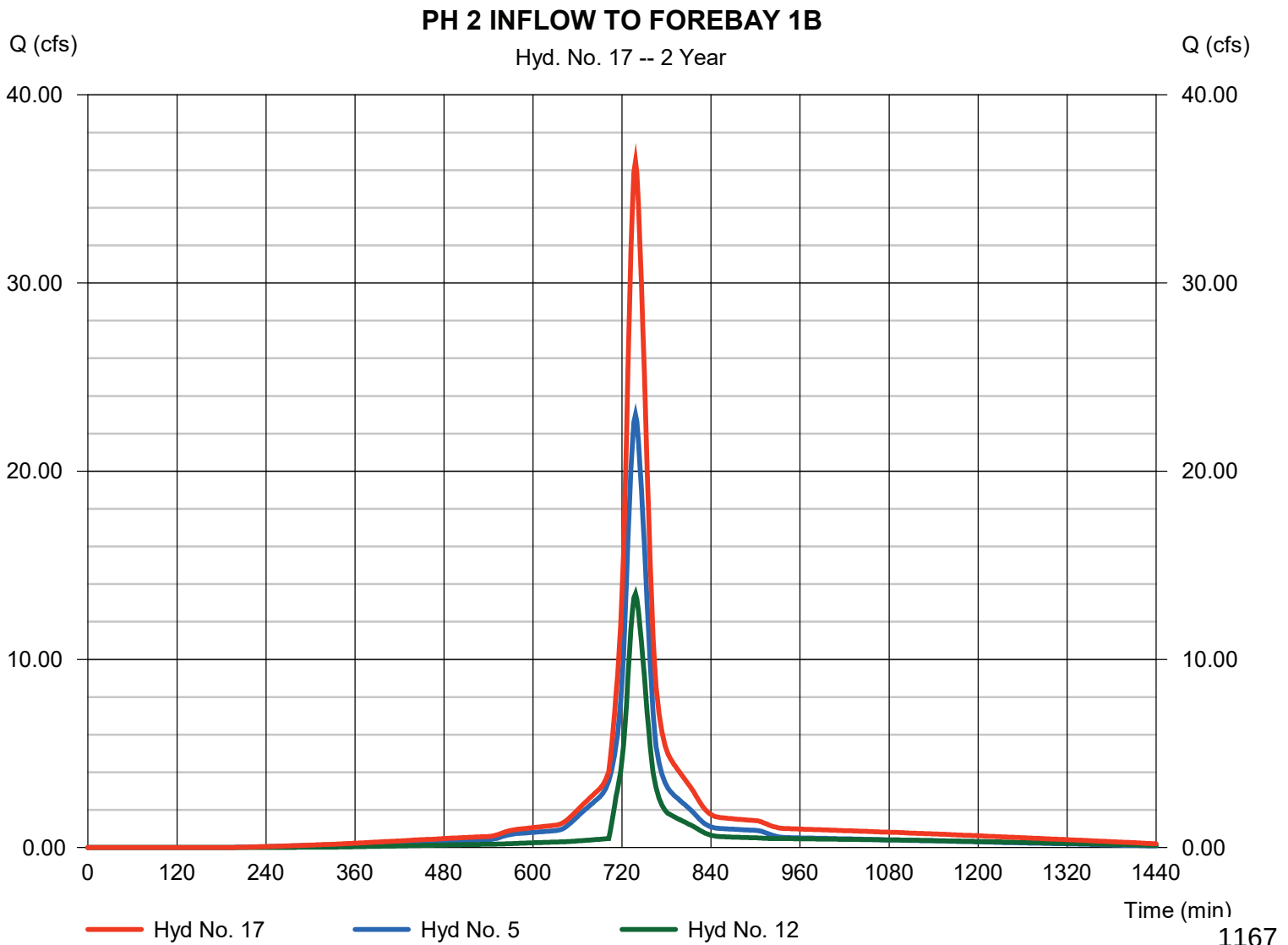
Thursday, 02 / 27 / 2020

Hyd. No. 17

PH 2 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 5, 12

Peak discharge = 36.48 cfs
 Time to peak = 738 min
 Hyd. volume = 141,119 cuft
 Contrib. drain. area = 10.224 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

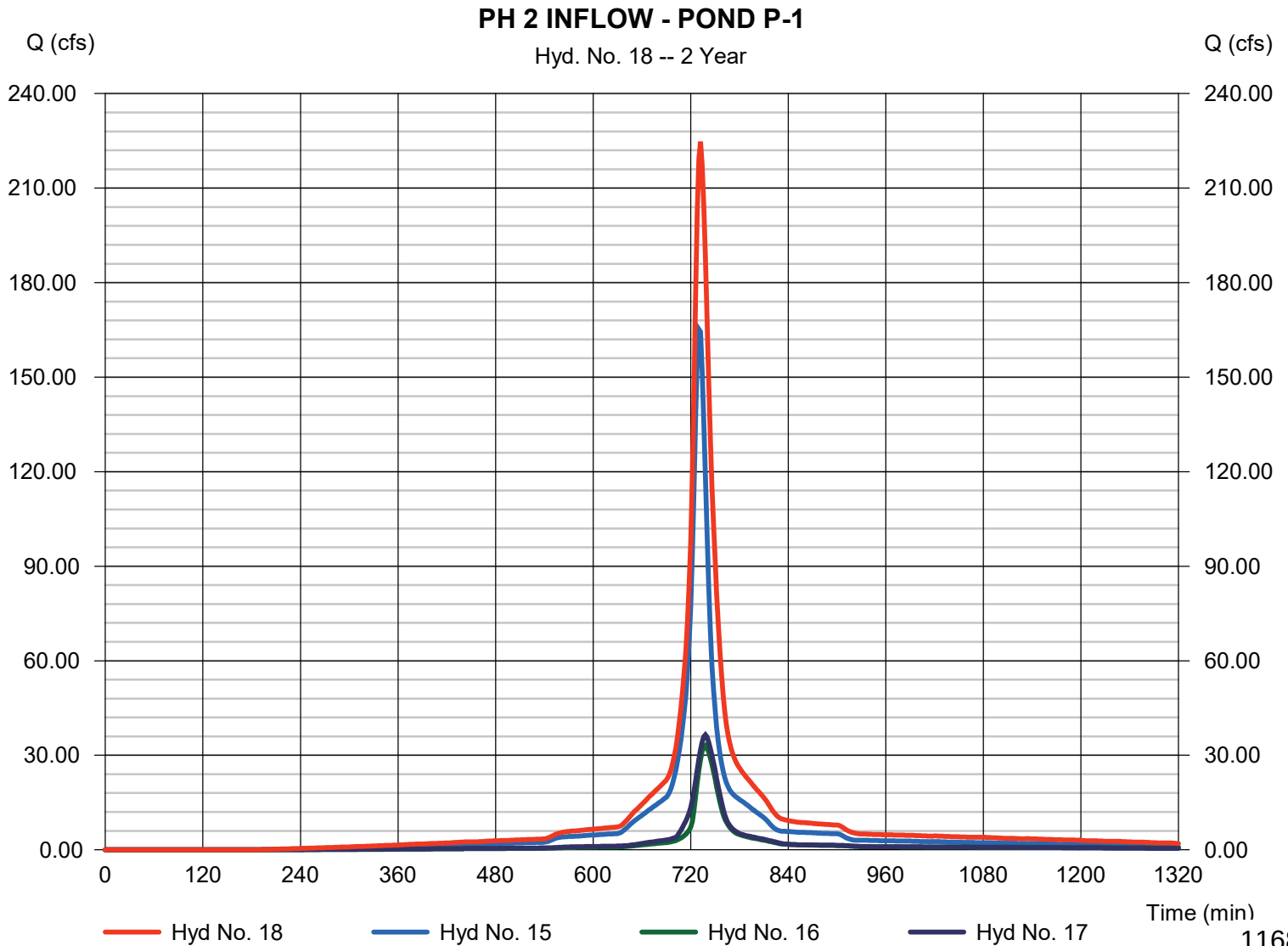
Thursday, 02 / 27 / 2020

Hyd. No. 18

PH 2 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 15, 16, 17

Peak discharge = 224.73 cfs
 Time to peak = 732 min
 Hyd. volume = 776,409 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 19

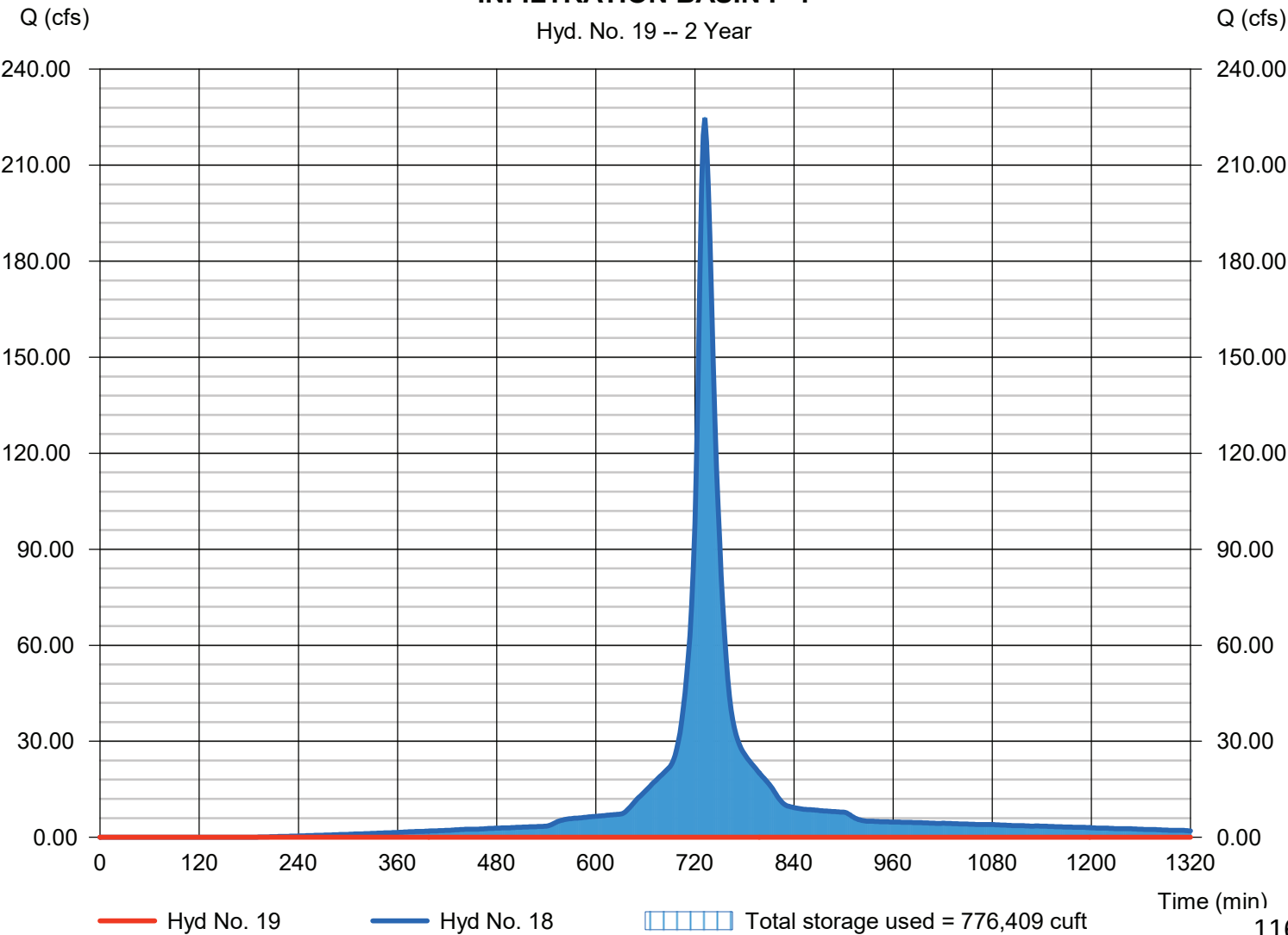
INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 18 - PH 2 INFLOW - POND P-1	Max. Elevation	= 836.22 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 2	Max. Storage	= 776,409 cuft

Storage Indication method used.

INFILTRATION BASIN P-1

Hyd. No. 19 -- 2 Year



Hydrograph Report

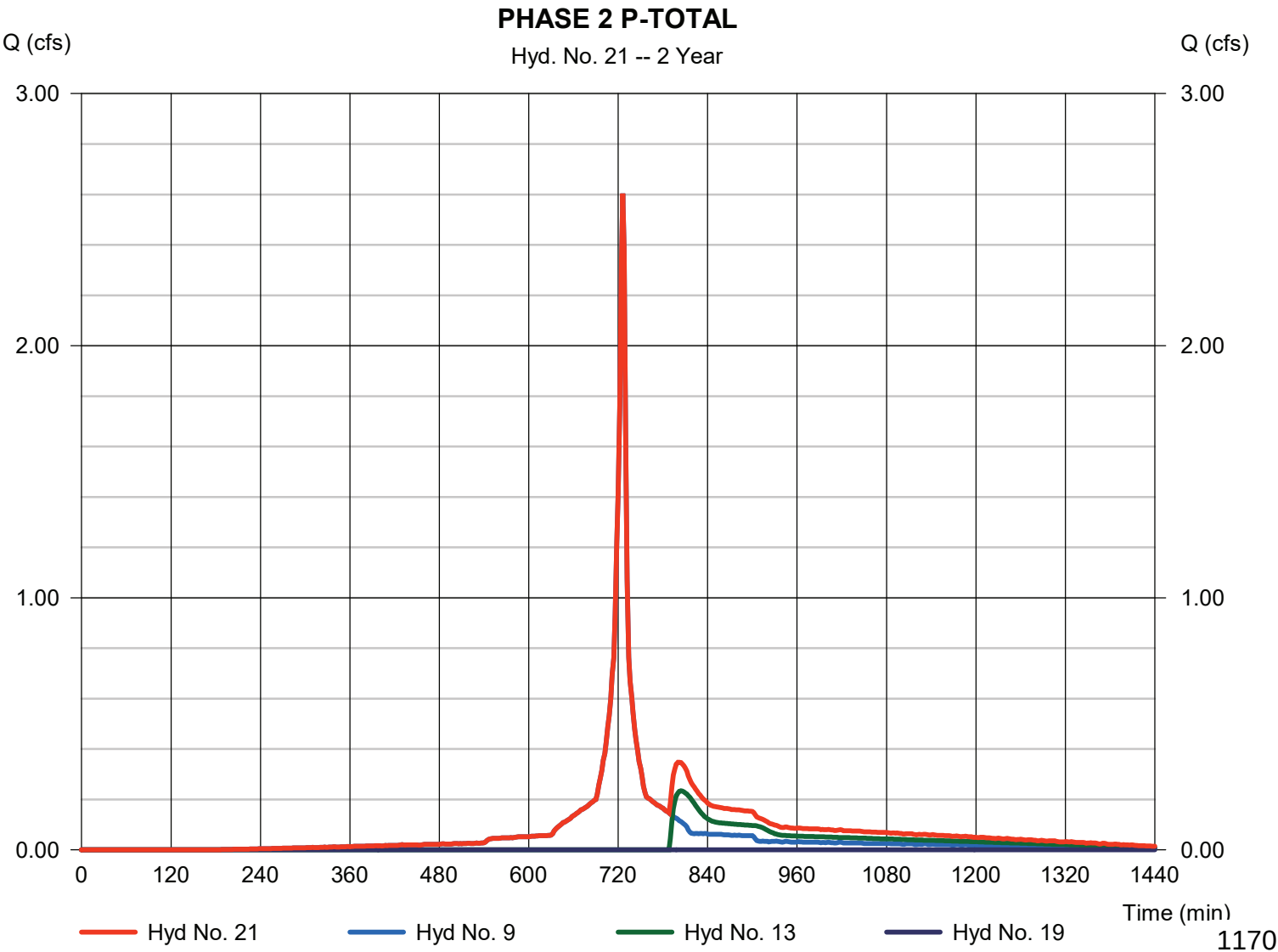
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 21

PHASE 2 P-TOTAL

Hydrograph type	= Combine	Peak discharge	= 2.604 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 7,747 cuft
Inflow hyds.	= 9, 13, 19	Contrib. drain. area	= 0.670 ac



Hydrograph Summary Report

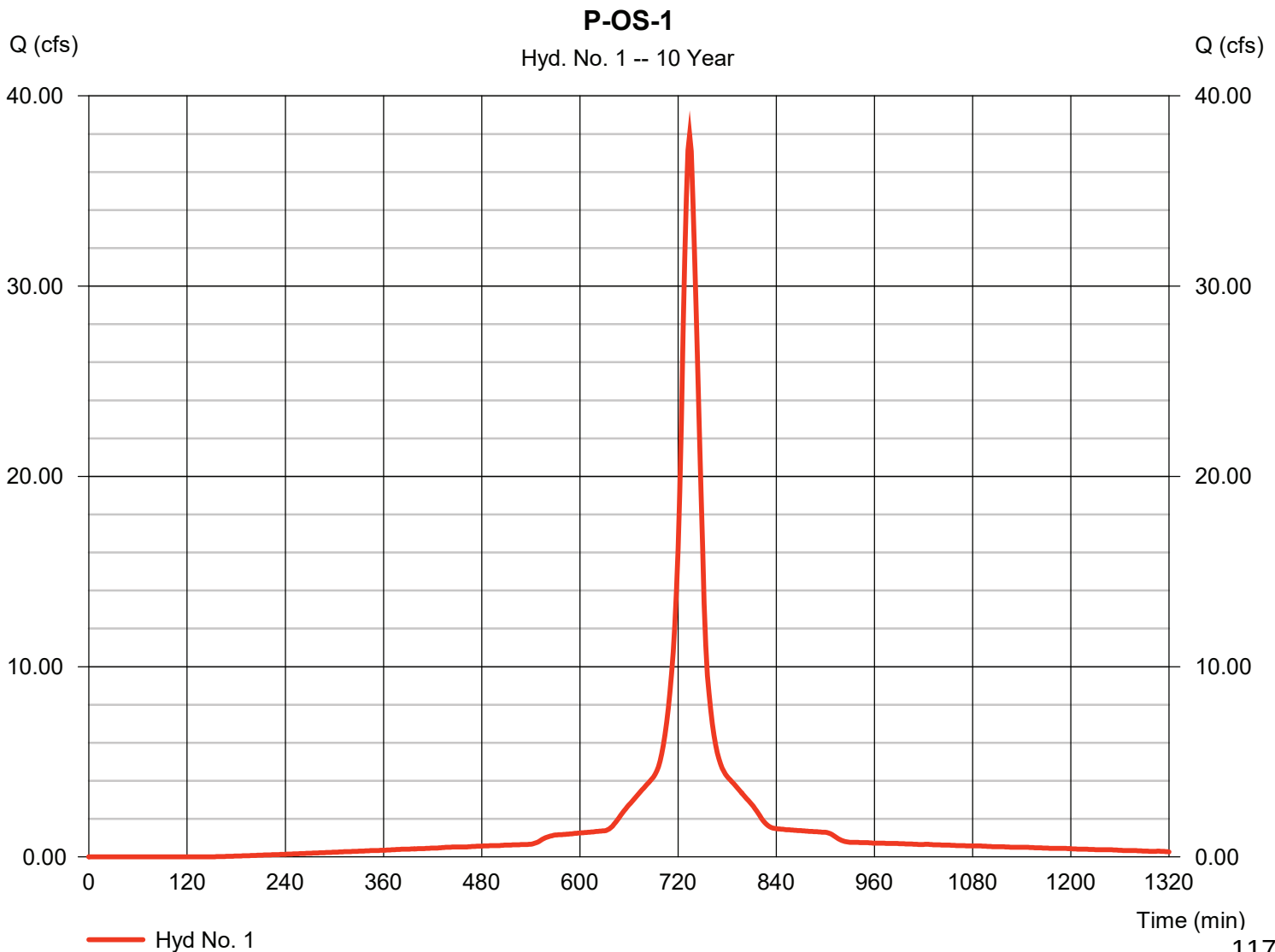
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	37.96	2	734	132,000	-----	-----	-----	P-OS-1
2	SCS Runoff	51.43	2	732	162,109	-----	-----	-----	P-OS-2
3	SCS Runoff	150.58	2	730	440,848	-----	-----	-----	P-1-PH 2
4	SCS Runoff	23.04	2	736	87,286	-----	-----	-----	P-1A-PH2
5	SCS Runoff	32.76	2	738	130,628	-----	-----	-----	P-1B-PH2
6	SCS Runoff	25.76	2	736	97,564	-----	-----	-----	P-2
7	SCS Runoff	19.46	2	736	73,705	-----	-----	-----	P-3
8	SCS Runoff	3.627	2	736	13,740	-----	-----	-----	P-4
9	SCS Runoff	3.703	2	726	8,153	-----	-----	-----	P-UD-1
11	Reservoir	23.15	2	742	97,546	6	840.09	19,090	POND P-2
12	Reservoir	18.32	2	740	73,692	7	840.17	8,361	POND P-3
13	Reservoir	2.208	2	750	6,365	8	840.82	8,033	RAIN GARDEN P-4
15	Combine	235.25	2	730	734,957	1, 2, 3,	-----	-----	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	45.44	2	738	184,832	4, 11,	-----	-----	PH 2 INFLOW TO FOREBAY 1A
17	Combine	50.95	2	738	204,319	5, 12,	-----	-----	PH 2 INFLOW TO FOREBAY 1B
18	Combine	319.57	2	732	1,124,106	15, 16, 17	-----	-----	PH 2 INFLOW - POND P-1
19	Reservoir	0.000	2	n/a	0	18	838.12	1,124,108	INFILTRATION BASIN P-1
21	Combine	3.703	2	726	14,518	9, 13, 19,	-----	-----	PHASE 2 P-TOTAL
2020-02-27_CHAPMAN FARMS_PHASE II_Firestorm					Return Period: 10 Year			Thursday, 02 / 27 / 2020	

P-OS-1

Hydrograph type	= SCS Runoff	Peak discharge	= 37.96 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 132,000 cuft
Drainage area	= 10.170 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.90 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSR3 DISTRIBUTION CU	Shyeflow Distribution	MSR3 DISTRIBUTION CU

* Composite (Area/CN) = [(8.870 x 61) + (1.300 x 86)] / 10.170



Precipitation Report

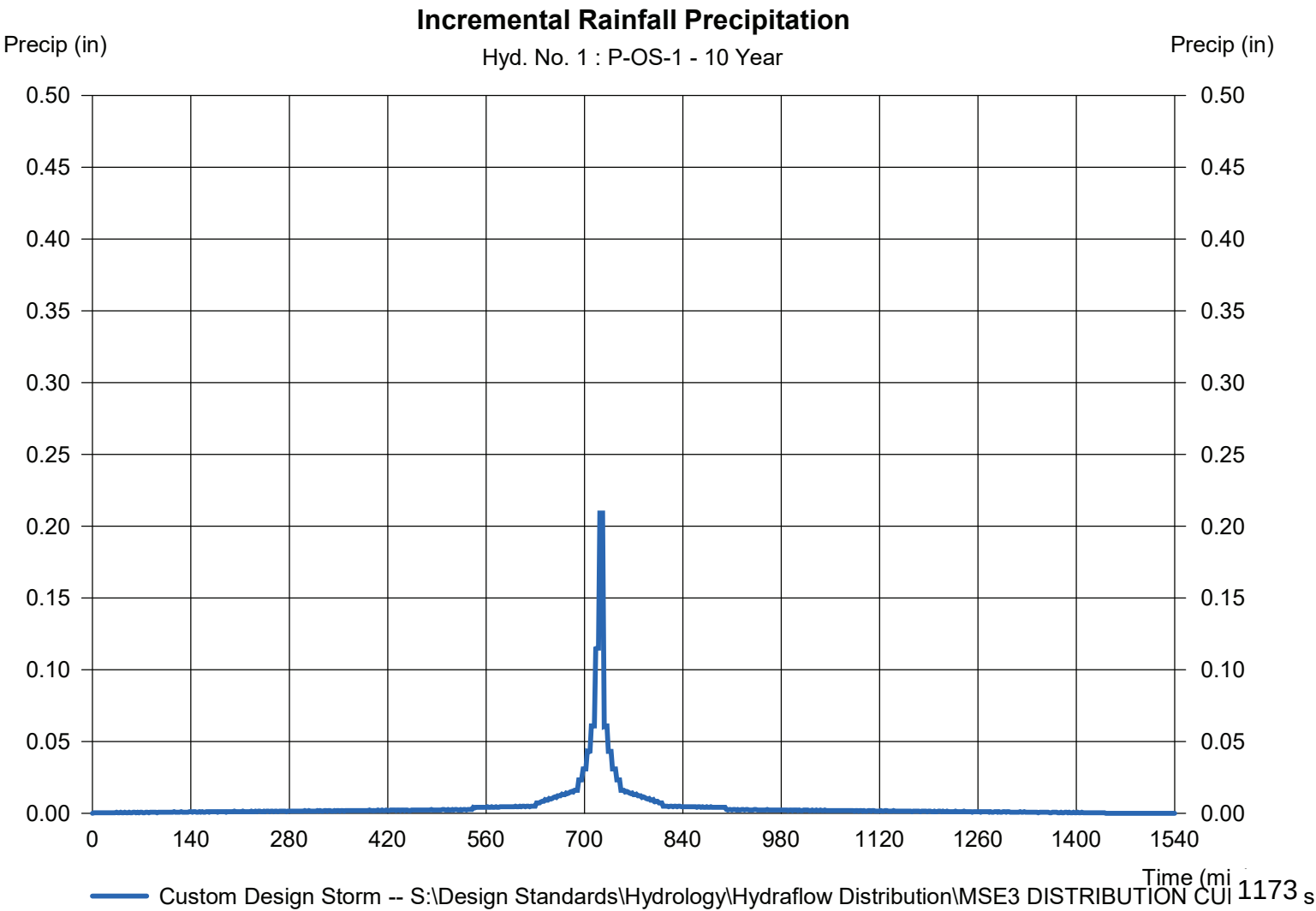
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 1

P-OS-1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

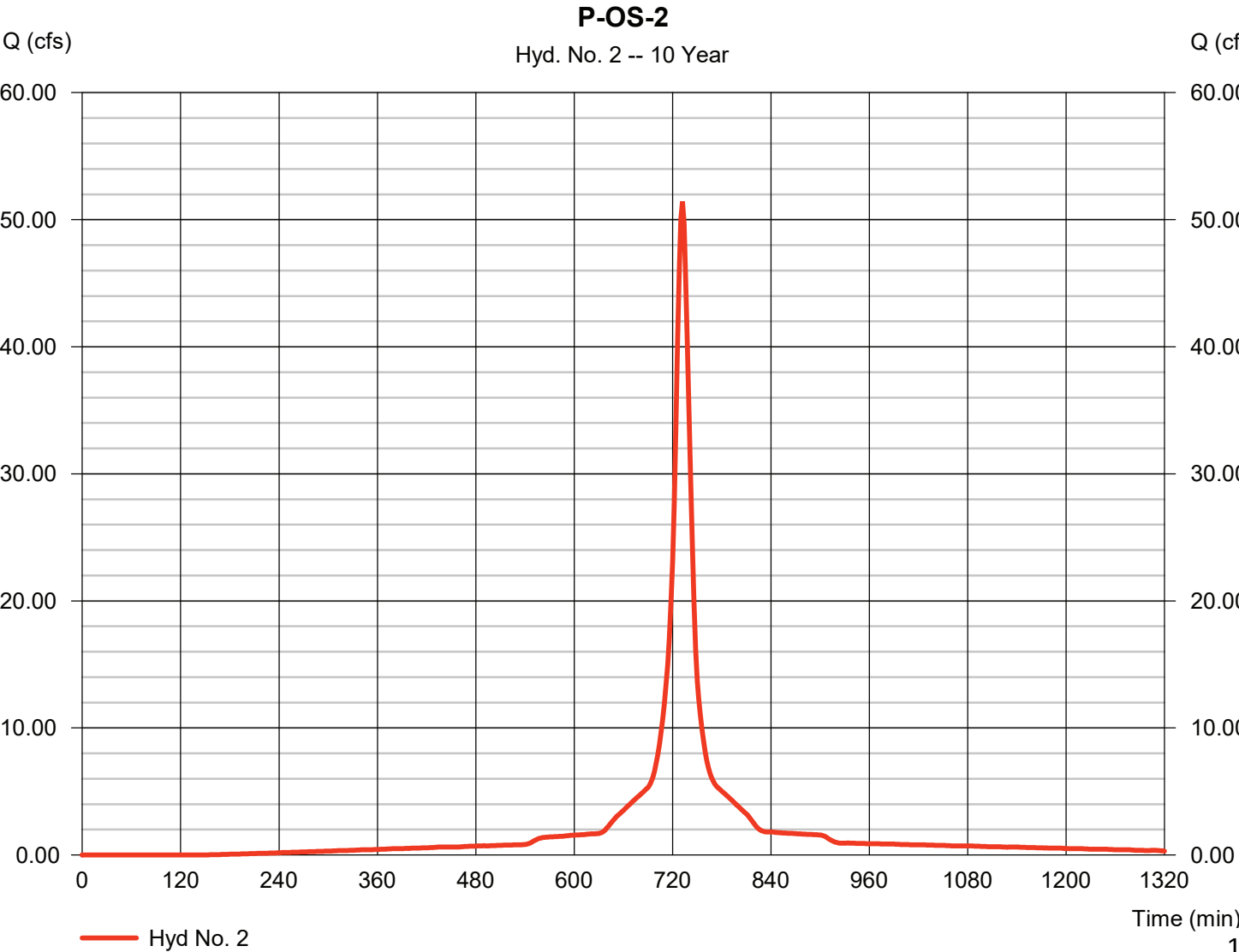
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Hydrograph type	= SCS Runoff	Peak discharge	= 51.43 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 162,109 cuft
Drainage area	= 12.810 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 15.80 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD DISTRIBUTION CURVE		



Precipitation Report

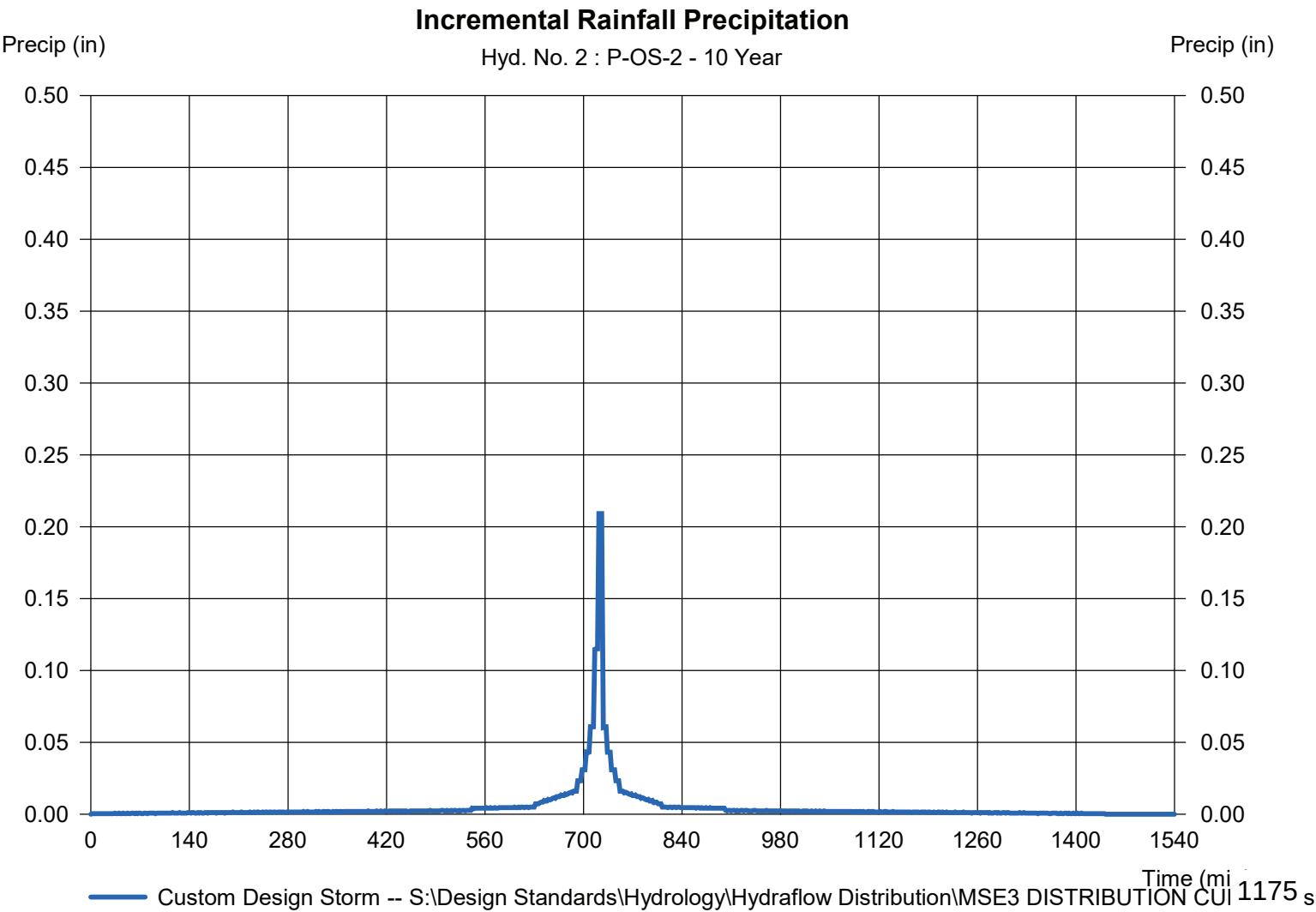
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

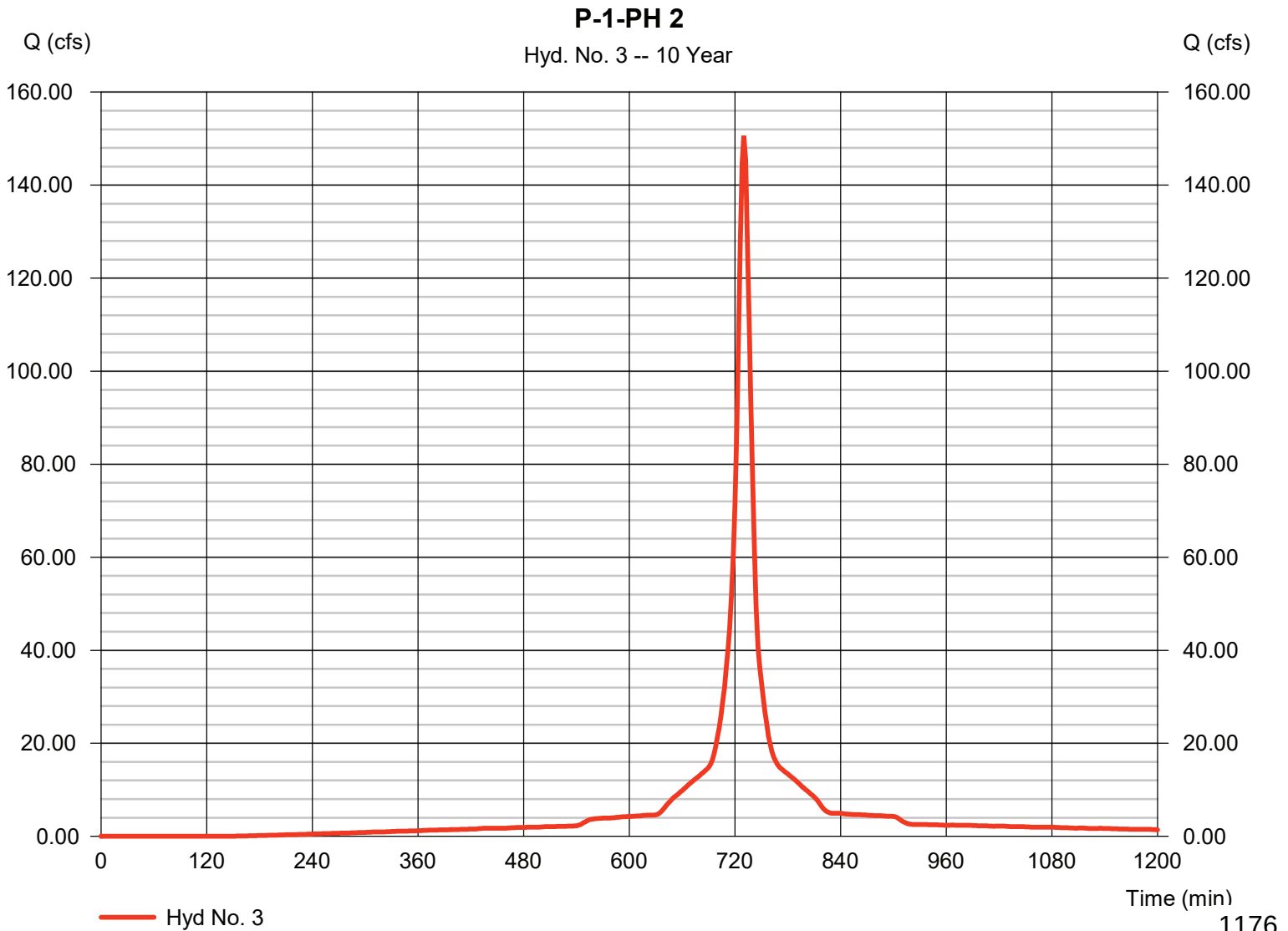
Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Hydrograph type	= SCS Runoff	Peak discharge	= 150.58 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 440,848 cuft
Drainage area	= 32.936 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 32.936



1176

Precipitation Report

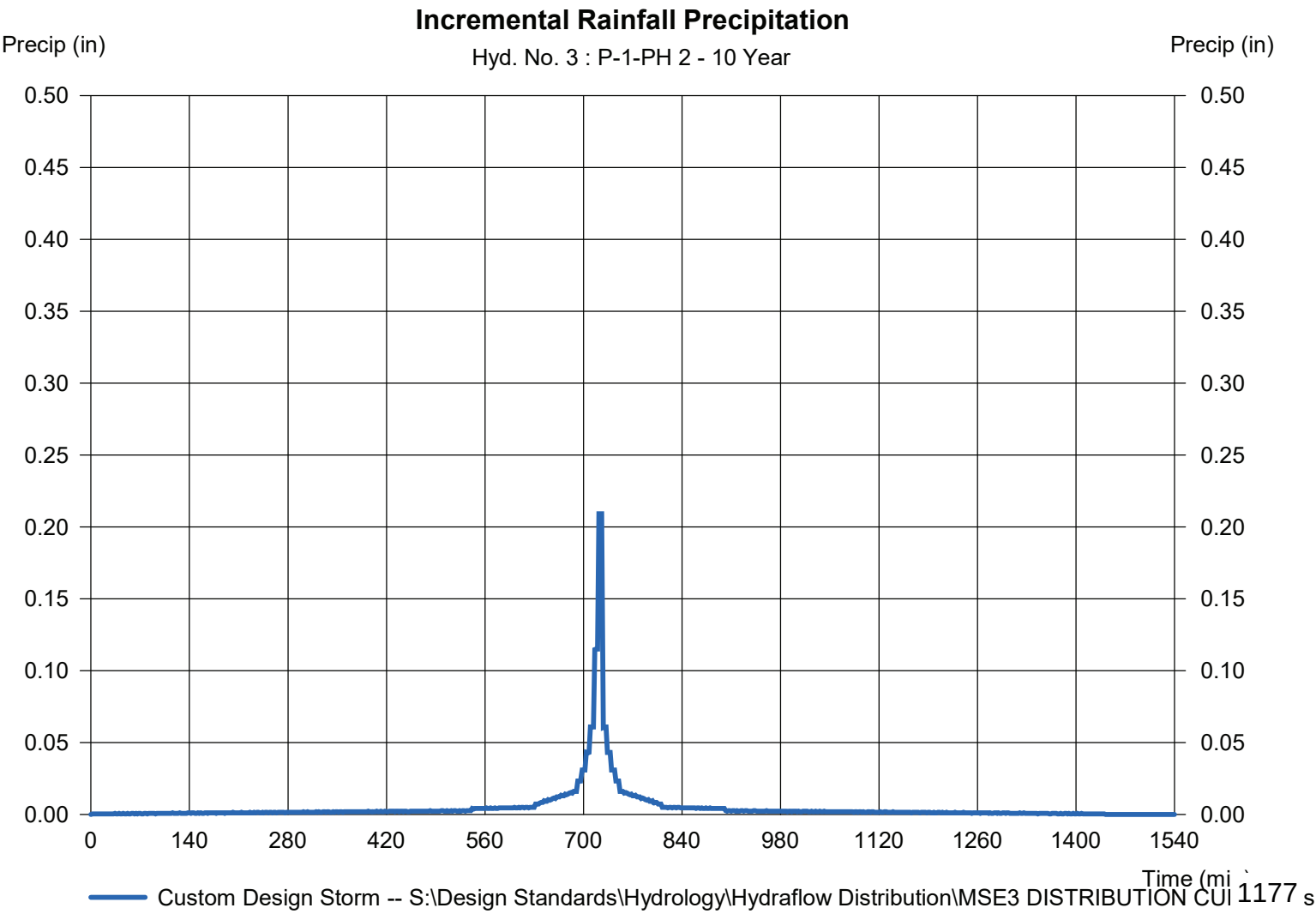
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

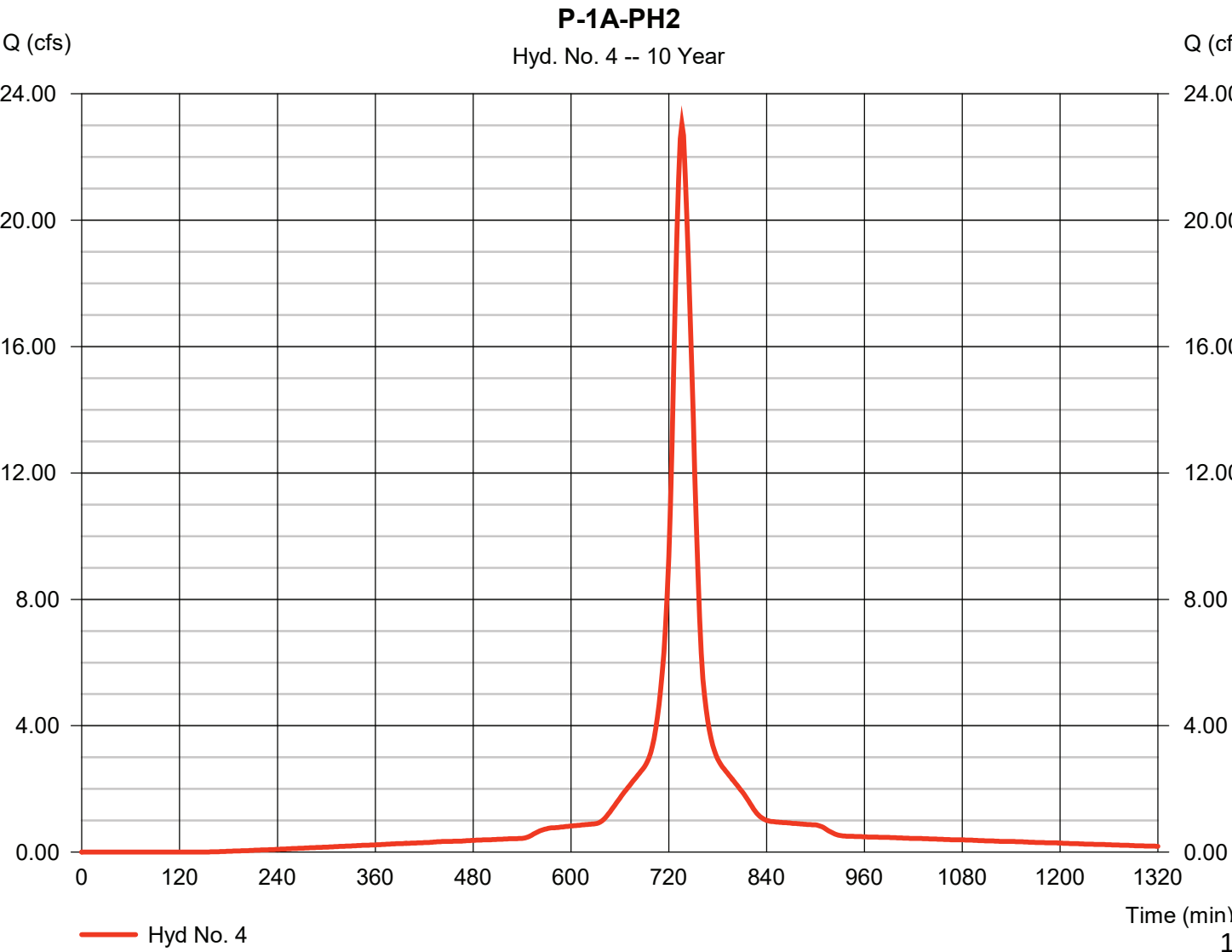
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 23.04 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 87,286 cuft
Drainage area	= 6.607 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

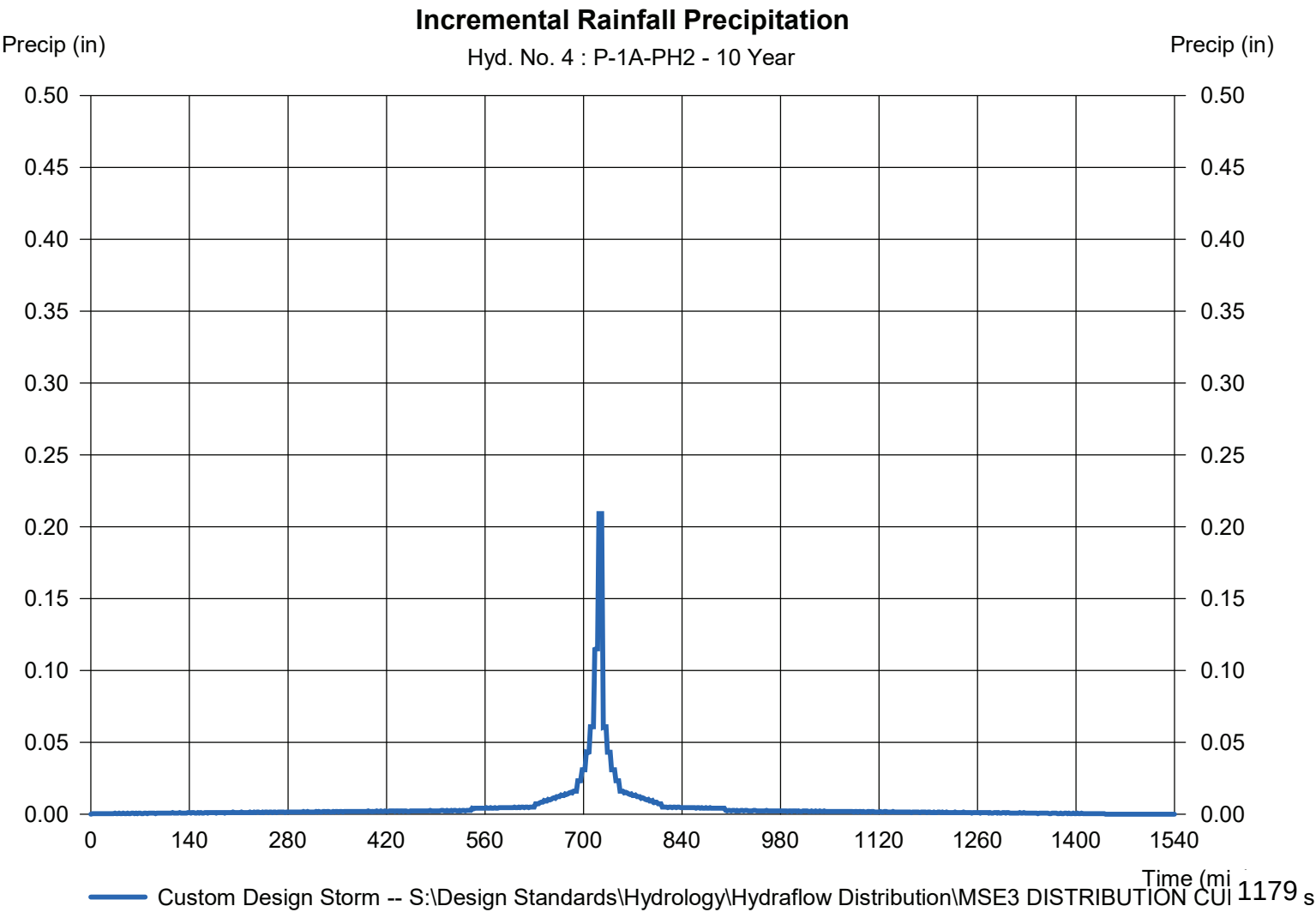
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

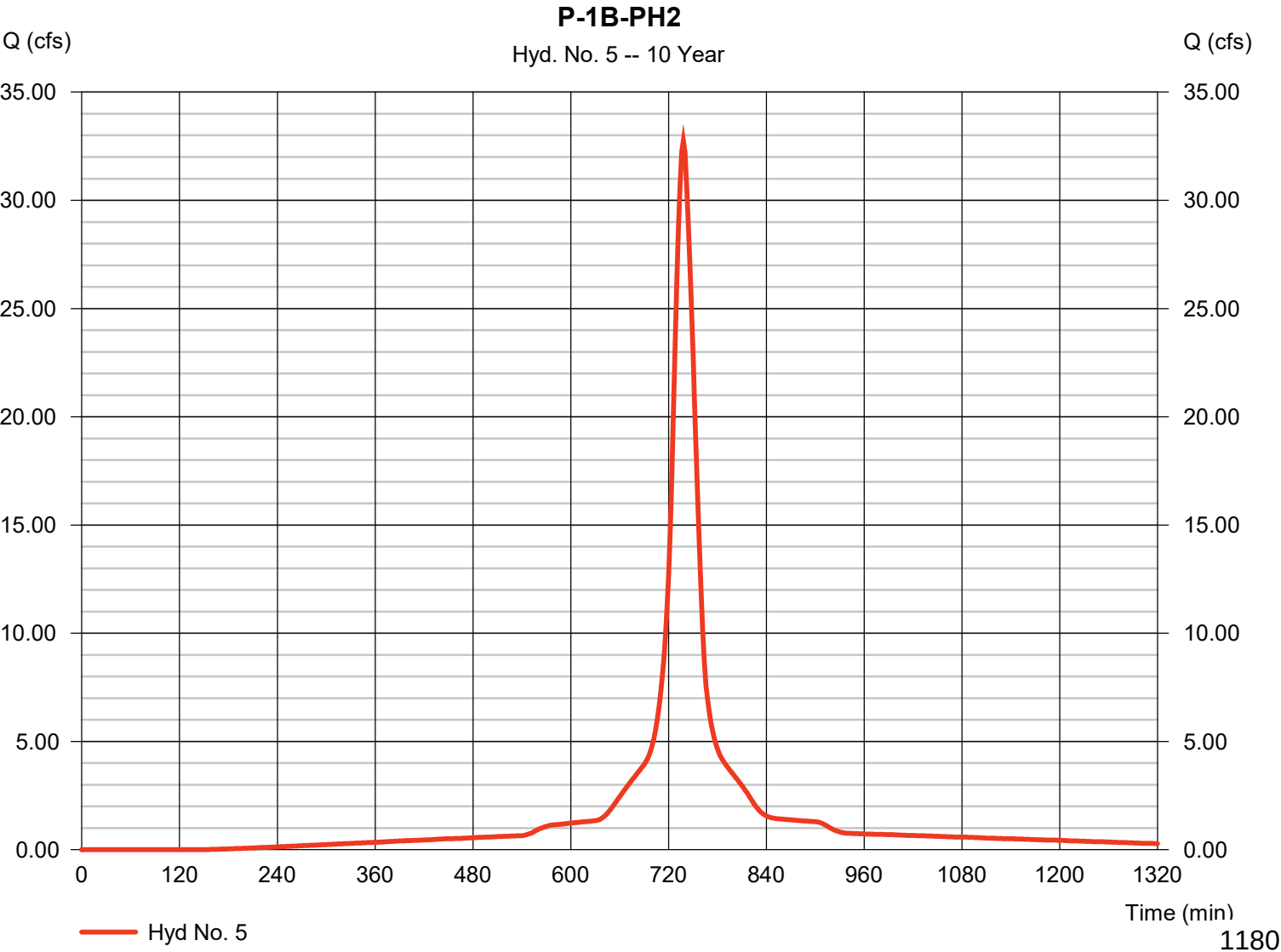
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 32.76 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 130,628 cuft
Drainage area	= 10.224 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 26.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		



Precipitation Report

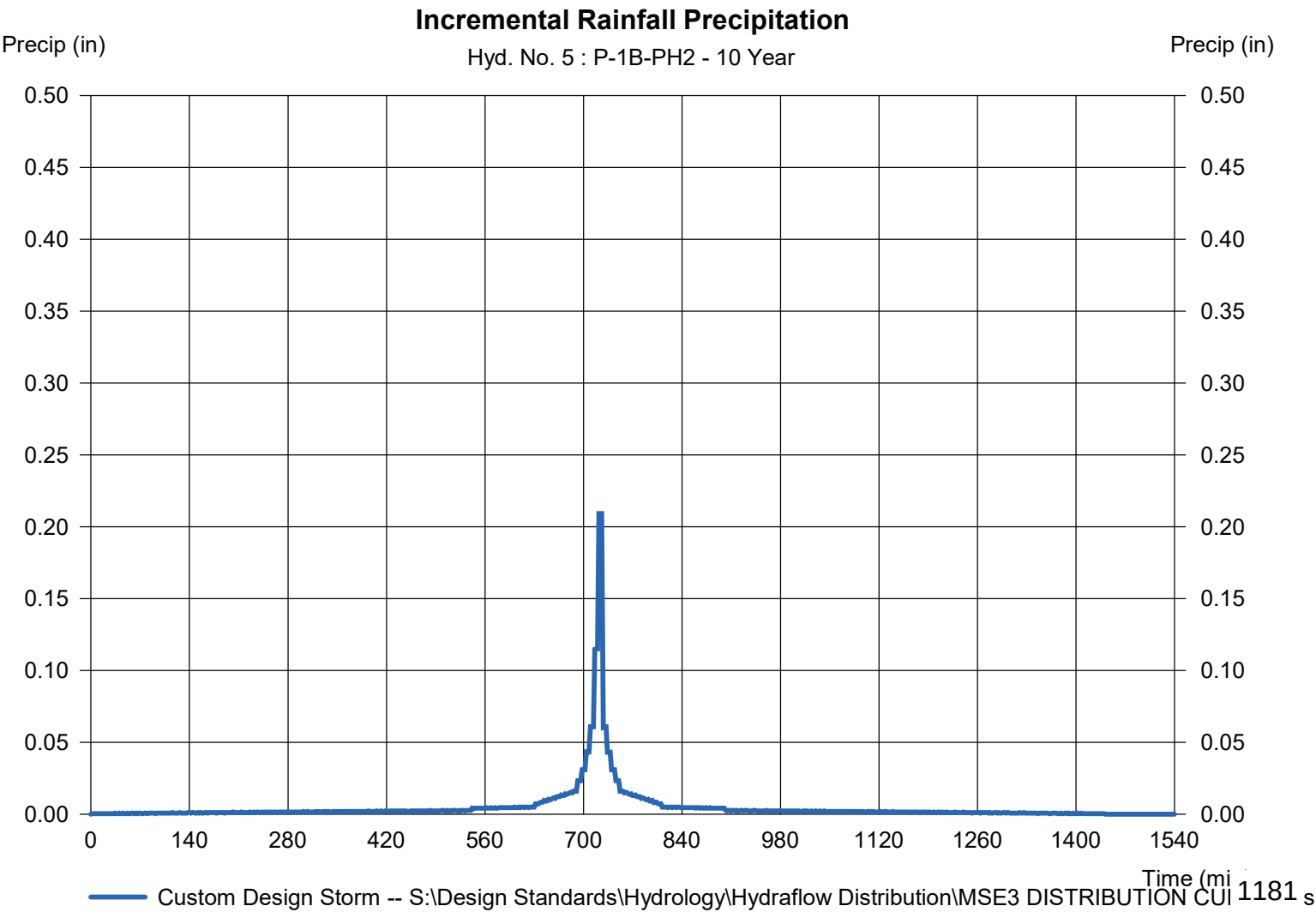
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



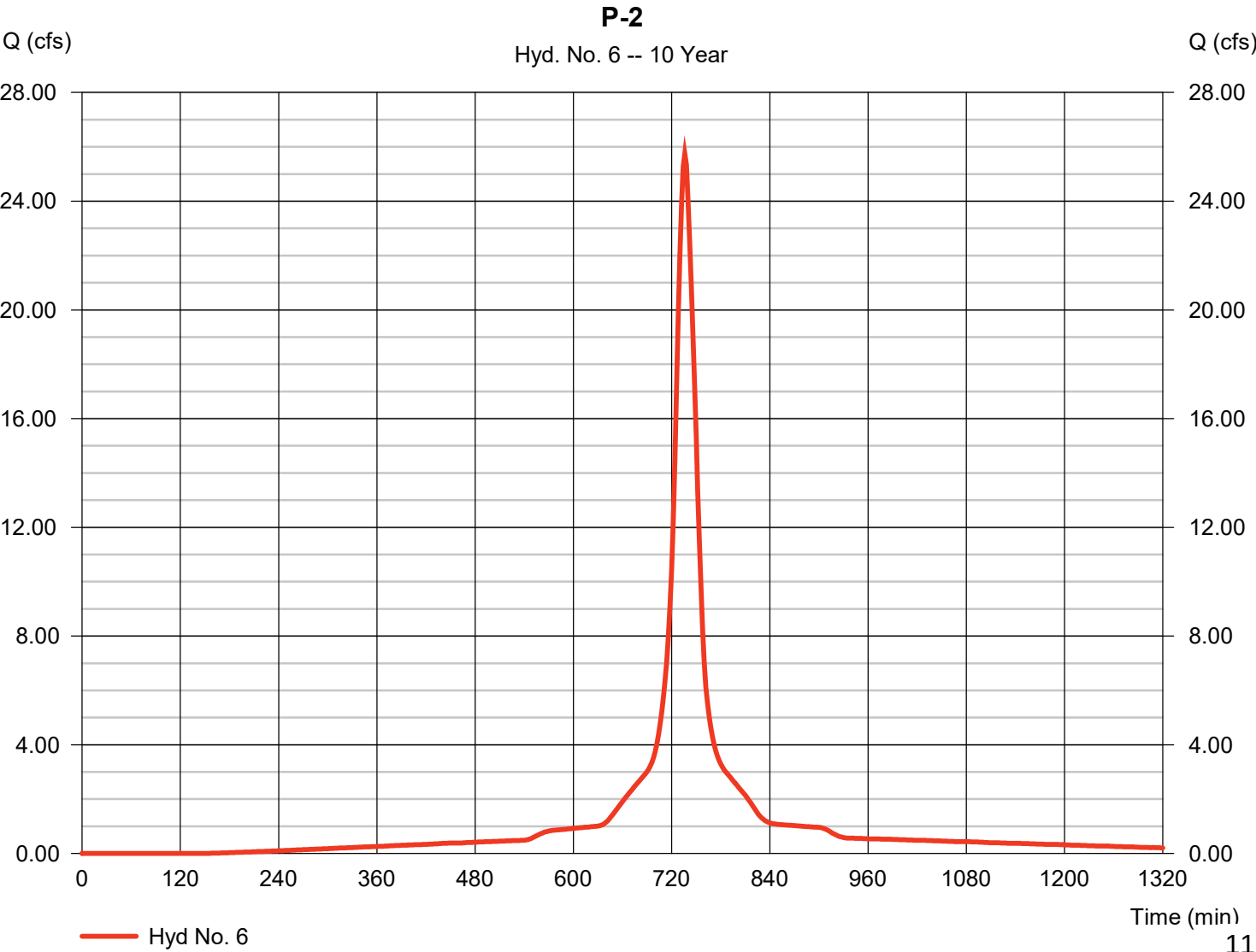
Hydrograph Report

Hyd. No. 6

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 25.76 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 97,564 cuft
Drainage area	= 7.385 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.710 x 75)] / 7.385



Precipitation Report

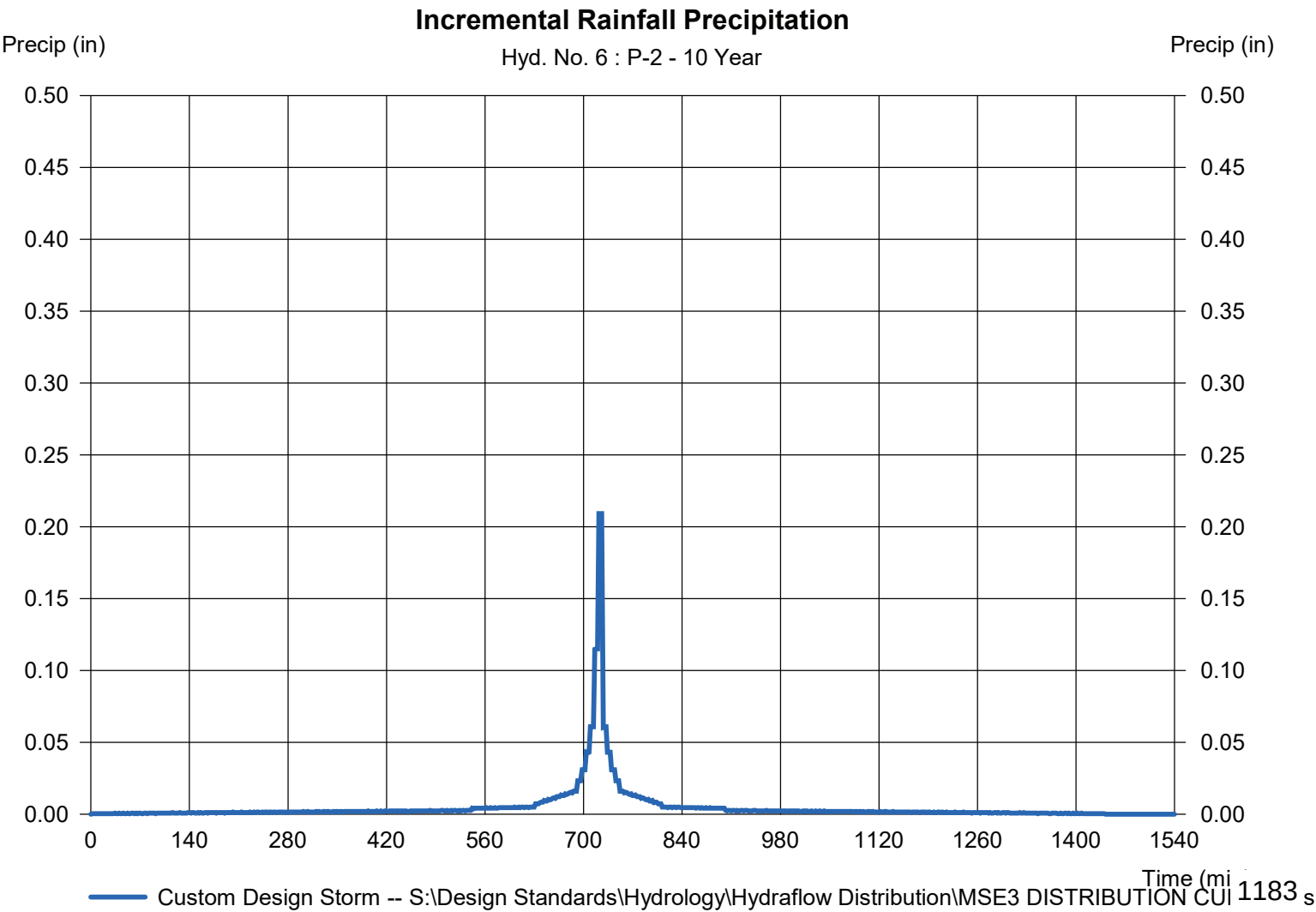
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

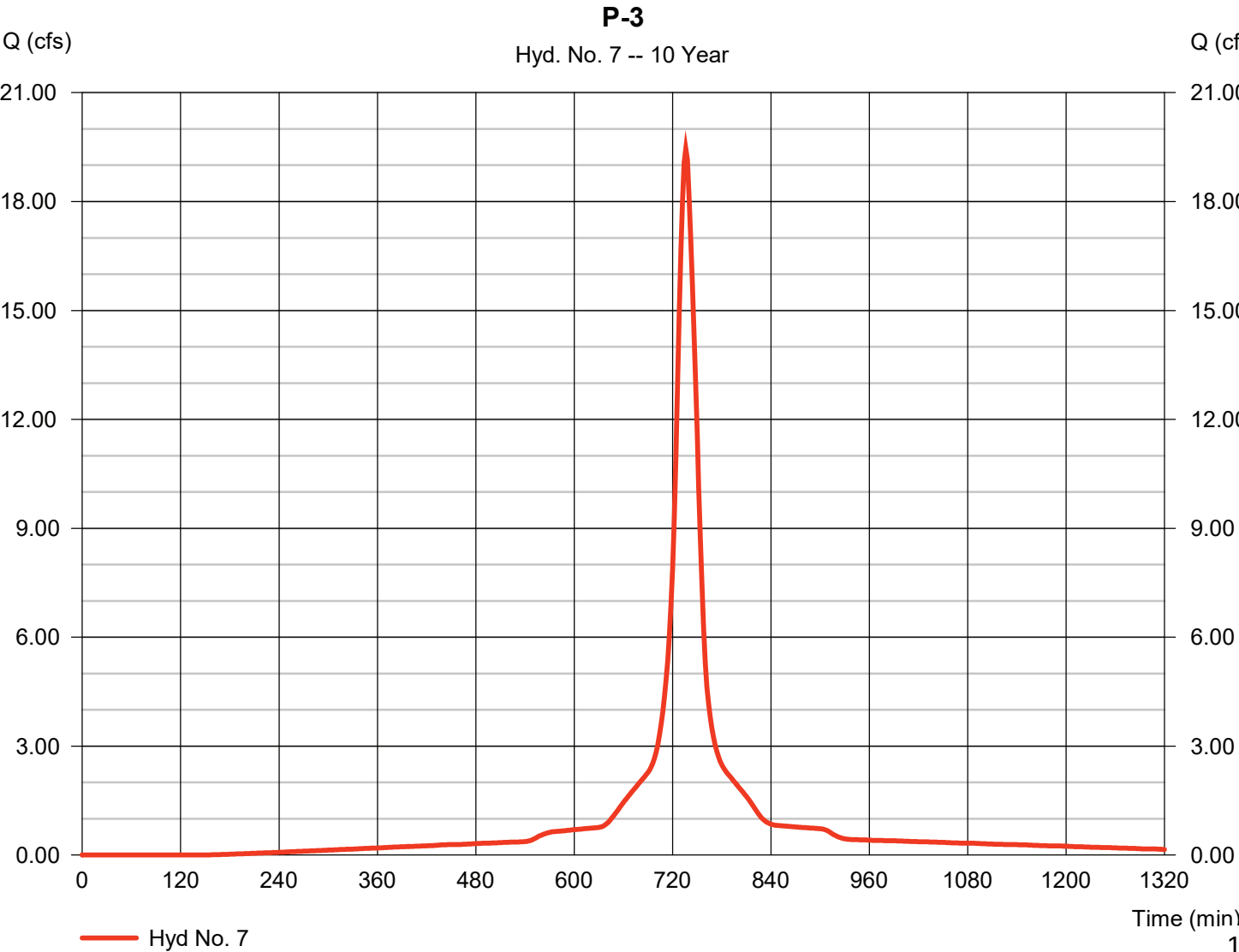
Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 19.46 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 73,705 cuft
Drainage area	= 5.579 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.20 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(6.260 x 75)] / 5.579



Precipitation Report

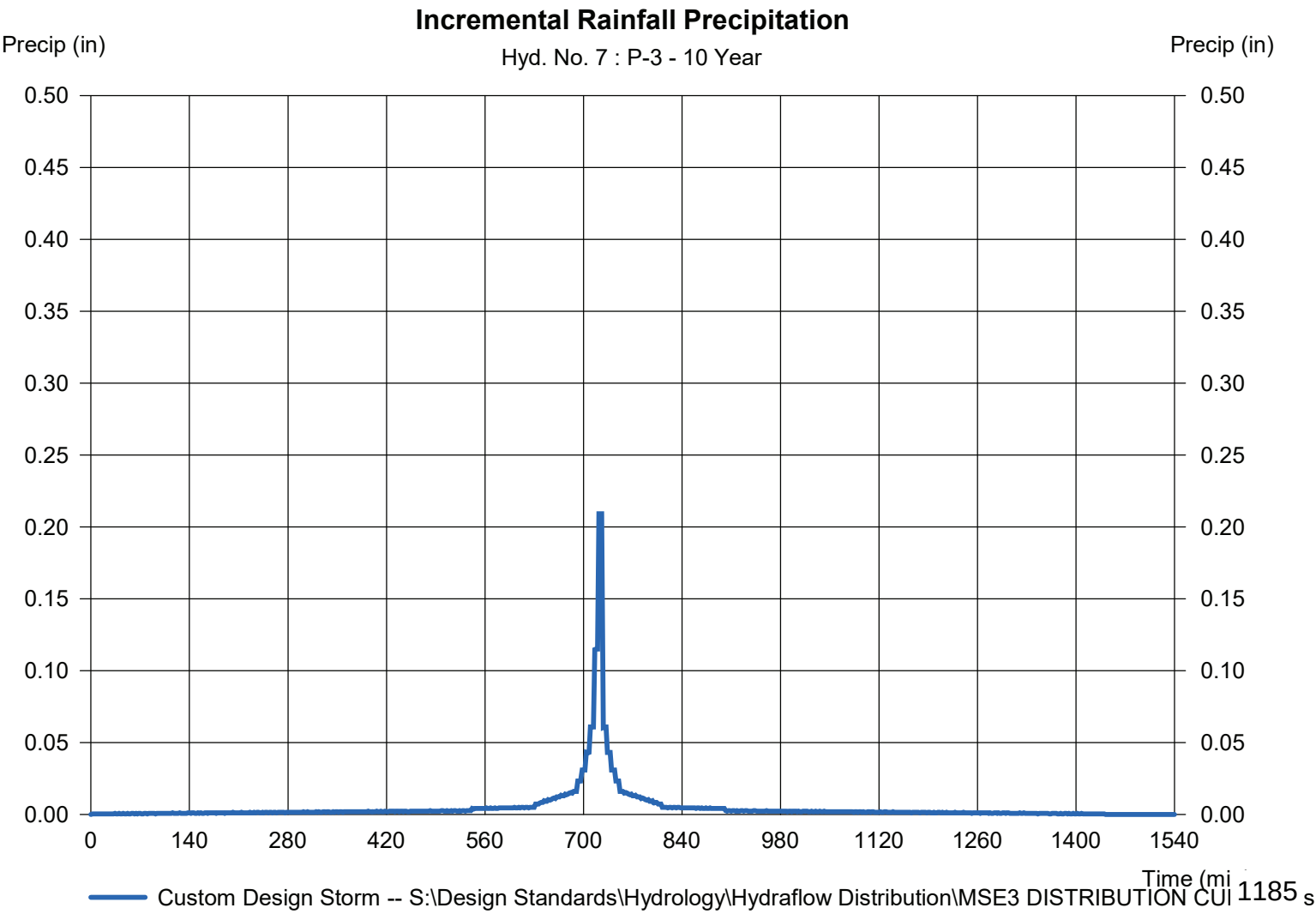
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

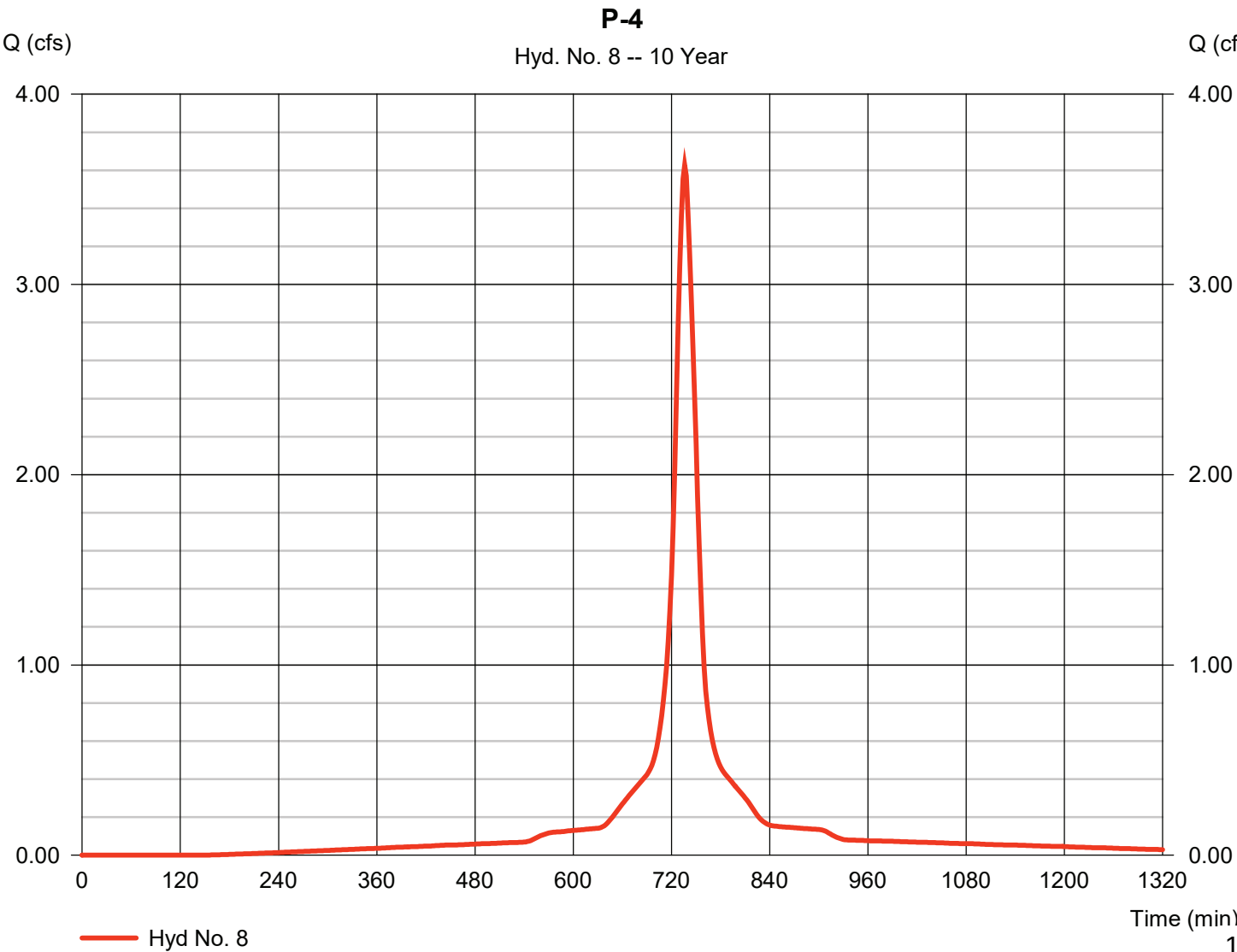
Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 3.627 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 13,740 cuft
Drainage area	= 1.040 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.10 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CURVE		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

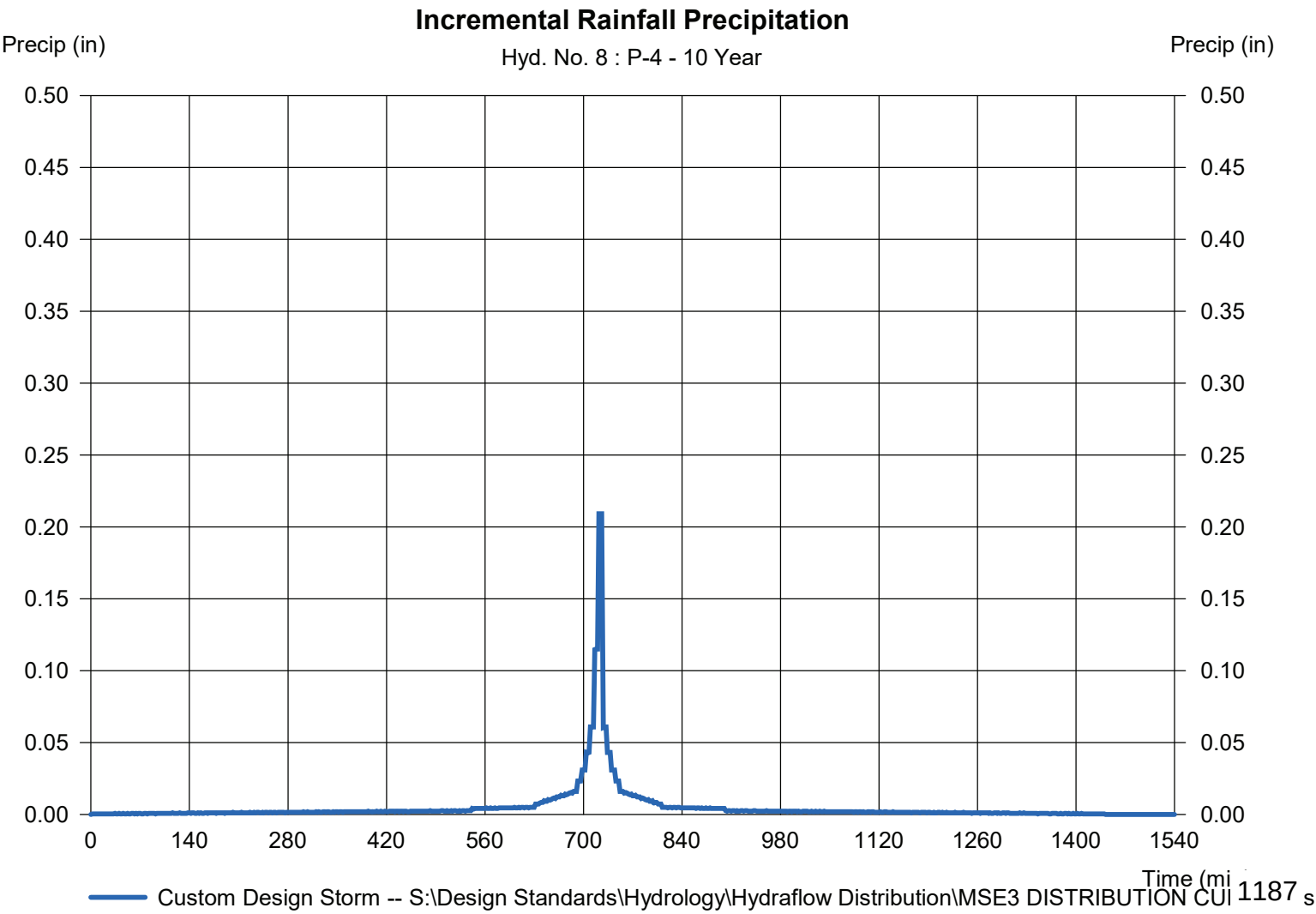
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

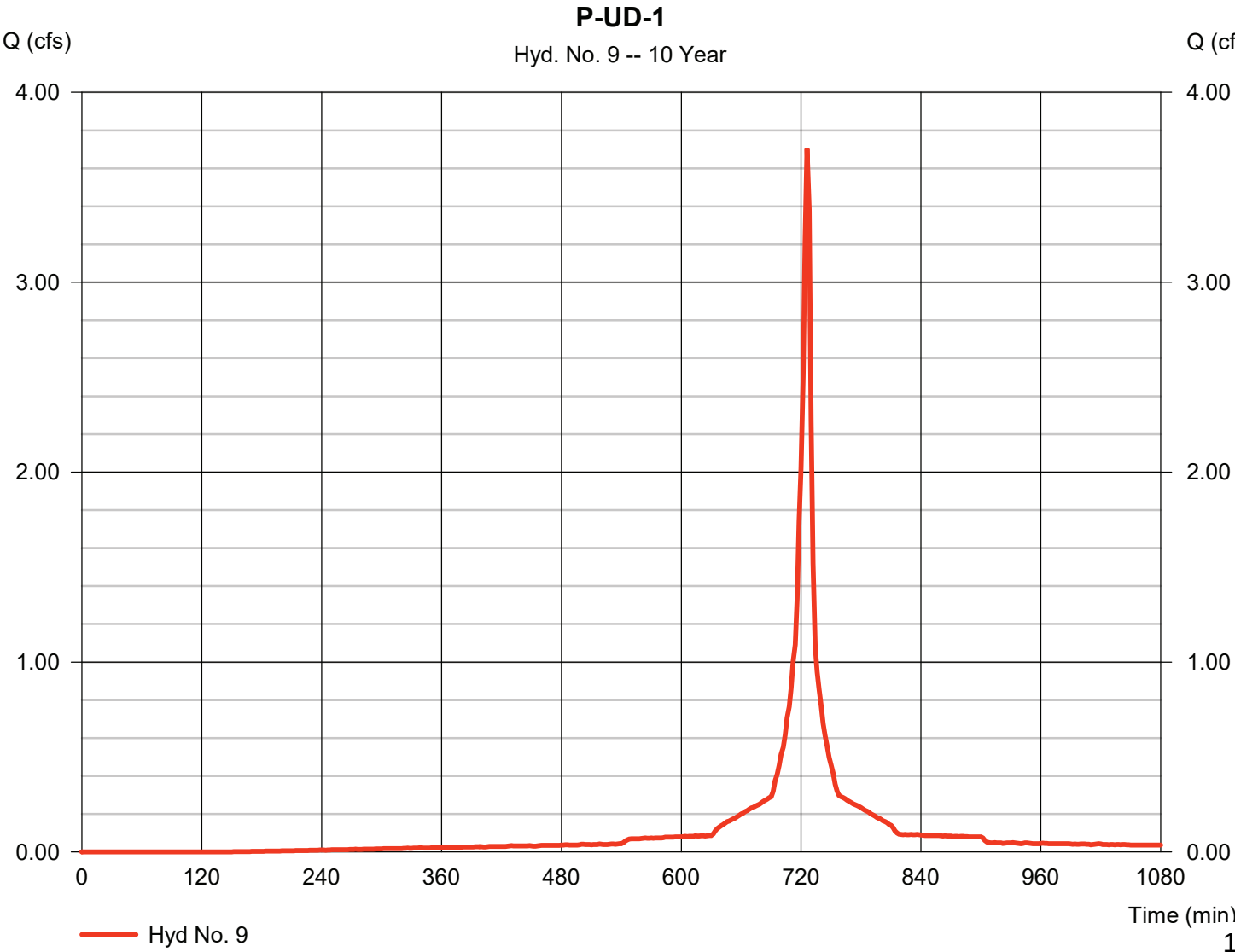
Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Hydrograph type	= SCS Runoff	Peak discharge	= 3.703 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 8,153 cuft
Drainage area	= 0.670 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.81 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD DISTRIBUTION CURVE		

* Composite (Area/CN) = [(0.300 x 61) + (0.370 x 98)] / 0.670



Precipitation Report

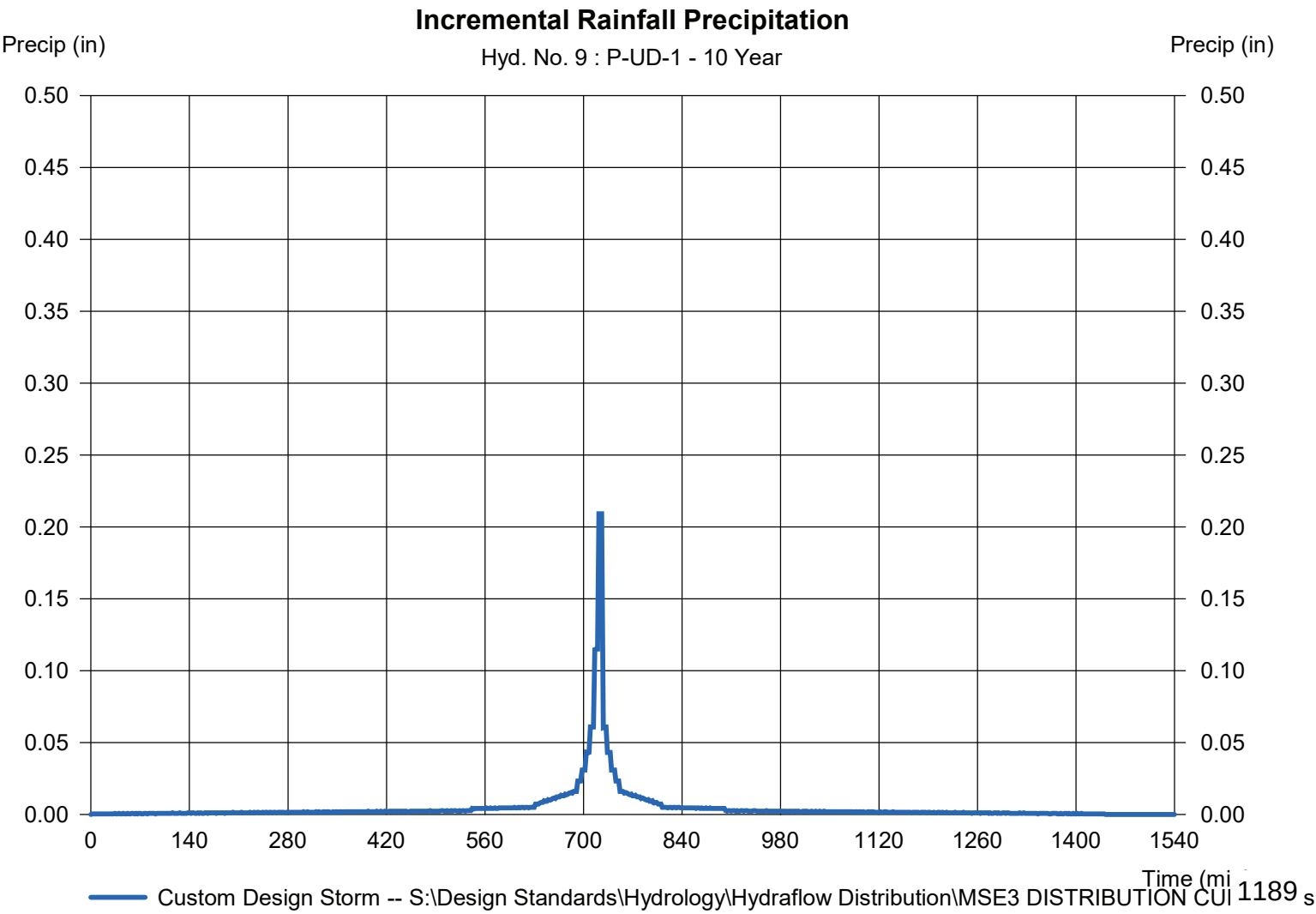
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Storm Frequency	= 10 yrs	Time interval	= 2 min
Total precip.	= 3.8100 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

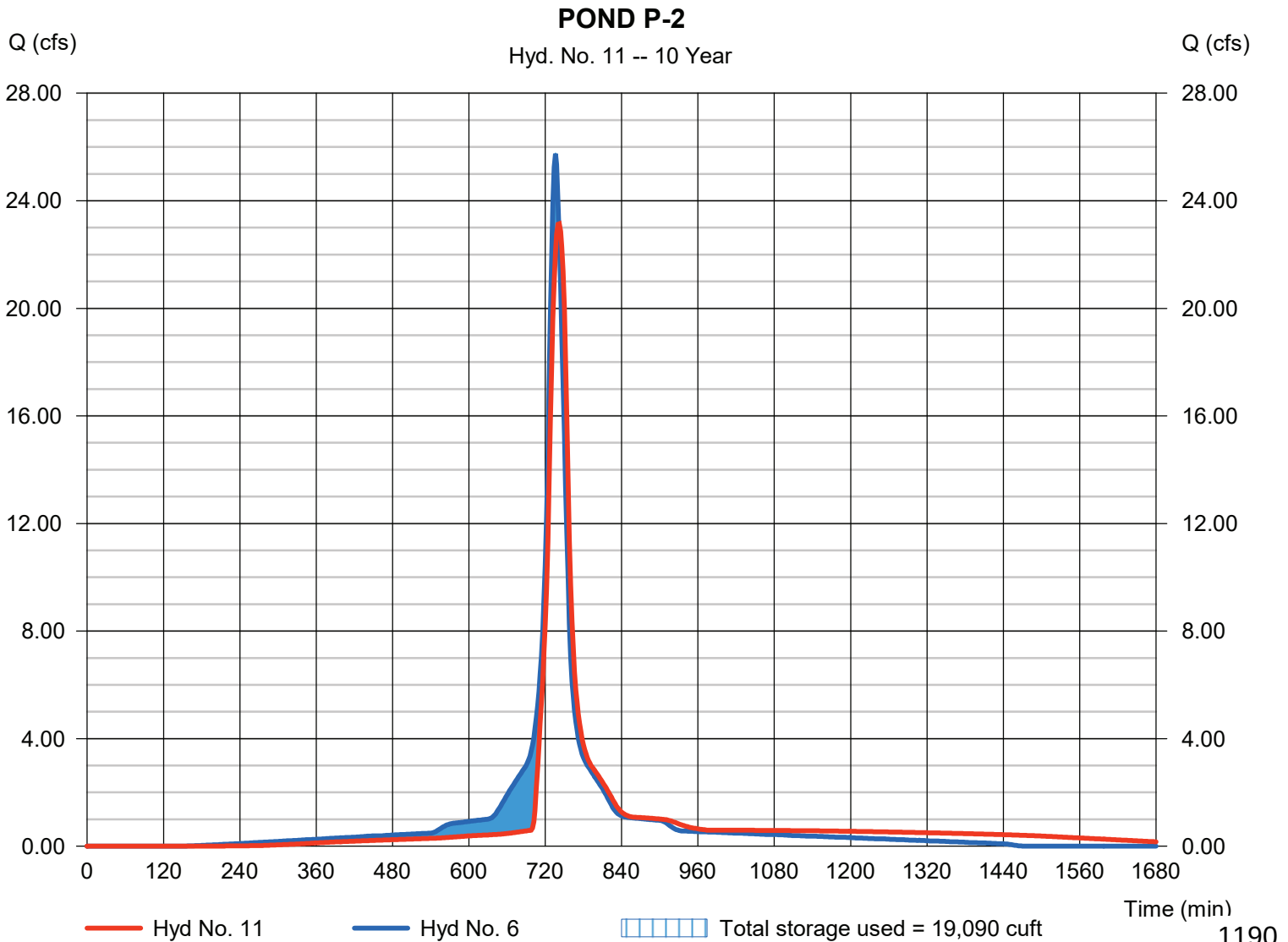
Hyd. No. 11

POND P-2

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-2
 Reservoir name = POND P-2

Peak discharge = 23.15 cfs
 Time to peak = 742 min
 Hyd. volume = 97,546 cuft
 Max. Elevation = 840.09 ft
 Max. Storage = 19,090 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

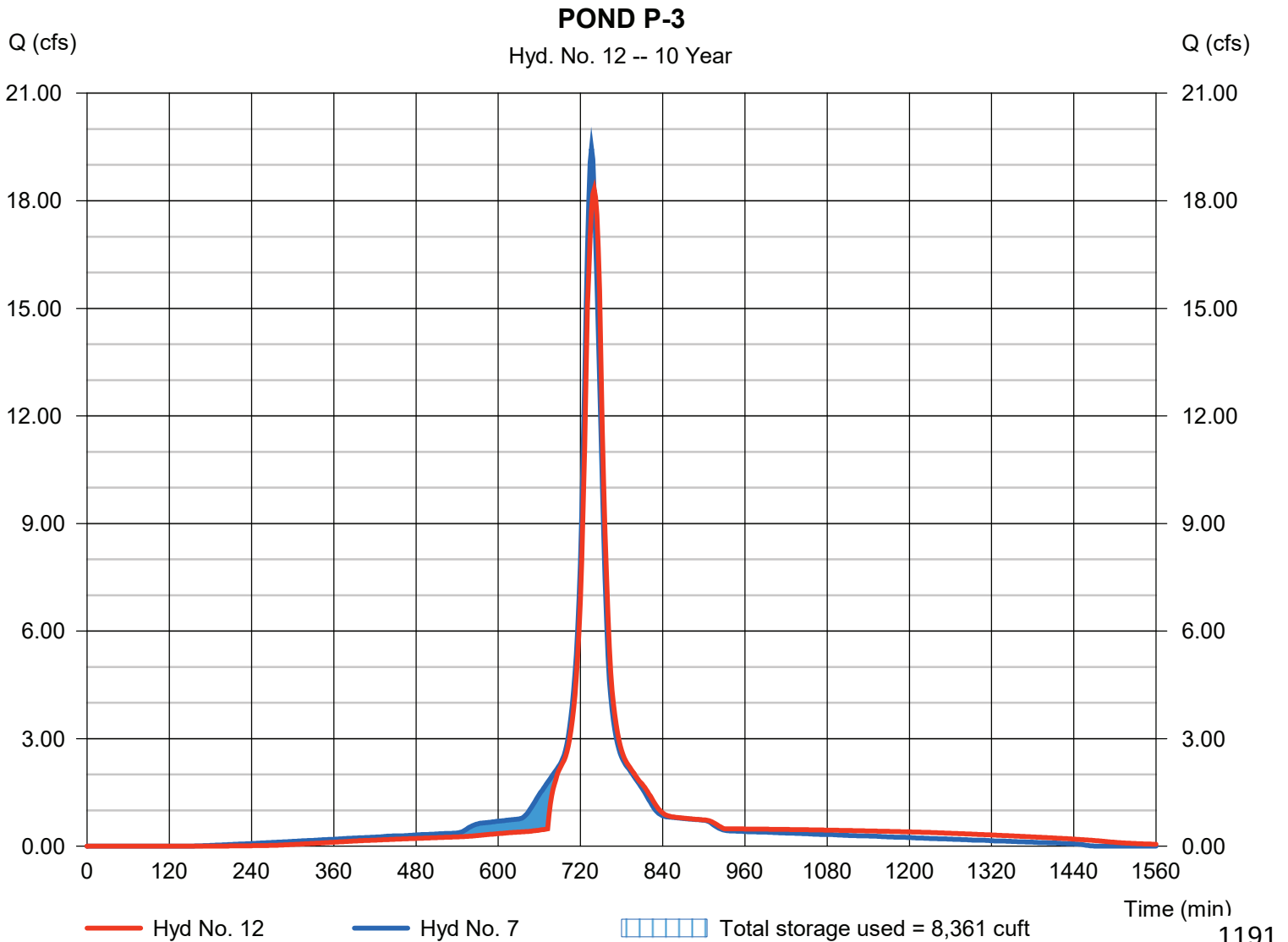
Hyd. No. 12

POND P-3

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - P-3
 Reservoir name = POND P-3

Peak discharge = 18.32 cfs
 Time to peak = 740 min
 Hyd. volume = 73,692 cuft
 Max. Elevation = 840.17 ft
 Max. Storage = 8,361 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

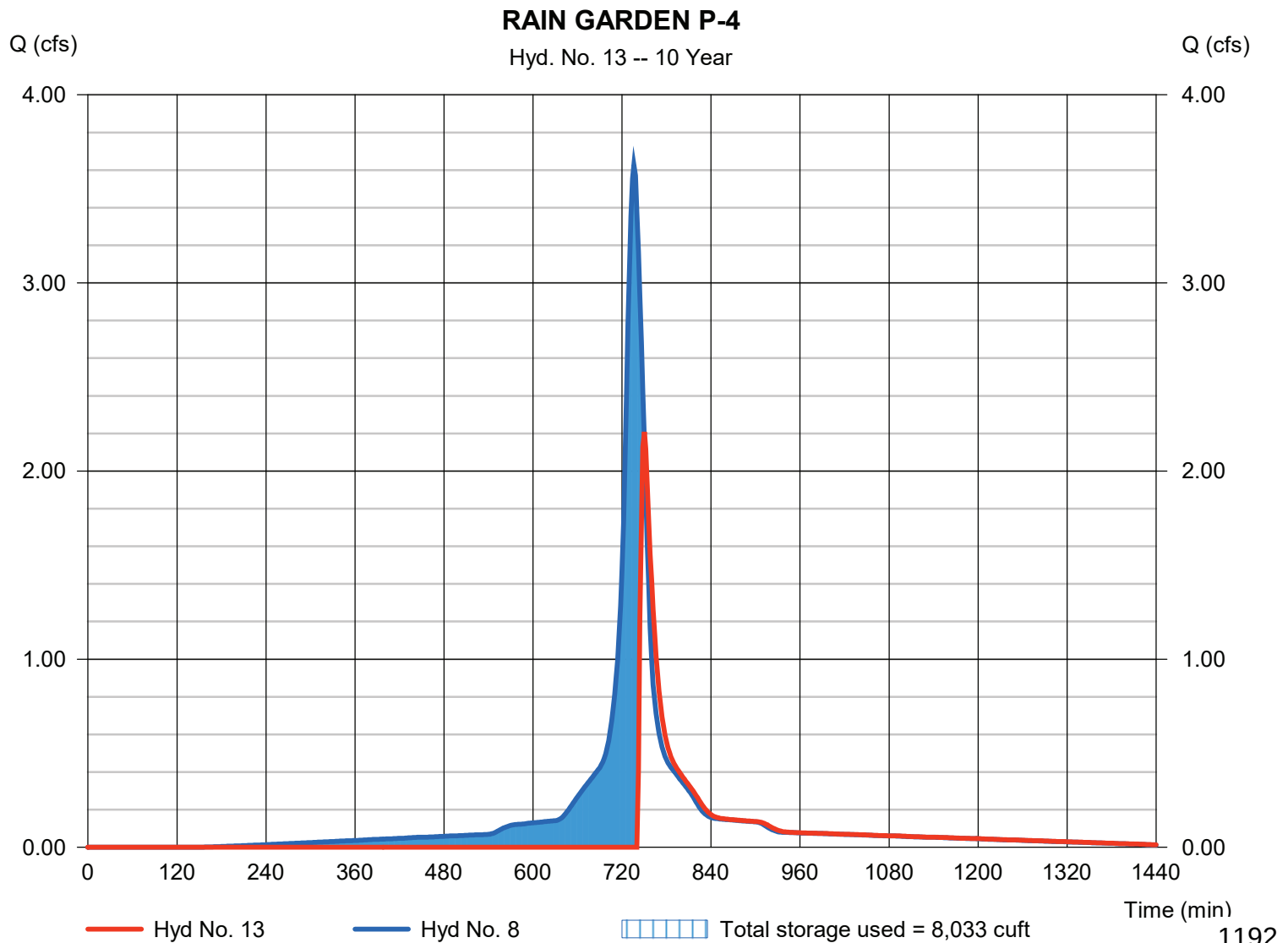
Thursday, 02 / 27 / 2020

Hyd. No. 13

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 2.208 cfs
Storm frequency	= 10 yrs	Time to peak	= 750 min
Time interval	= 2 min	Hyd. volume	= 6,365 cuft
Inflow hyd. No.	= 8 - P-4	Max. Elevation	= 840.82 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 8,033 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 15

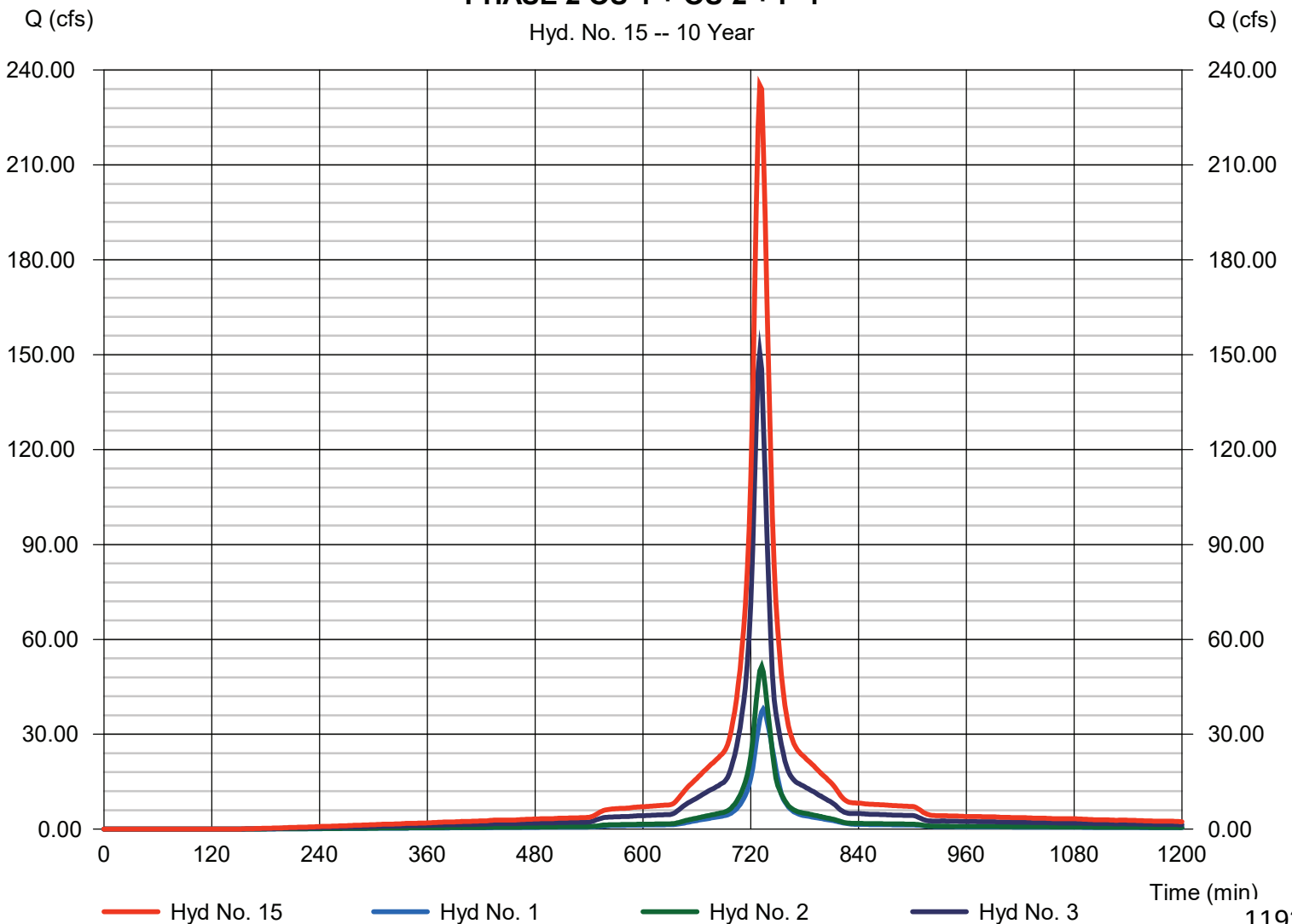
PHASE 2 OS-1 + OS-2 + P-1

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 1, 2, 3

Peak discharge = 235.25 cfs
 Time to peak = 730 min
 Hyd. volume = 734,957 cuft
 Contrib. drain. area = 55.916 ac

PHASE 2 OS-1 + OS-2 + P-1

Hyd. No. 15 -- 10 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

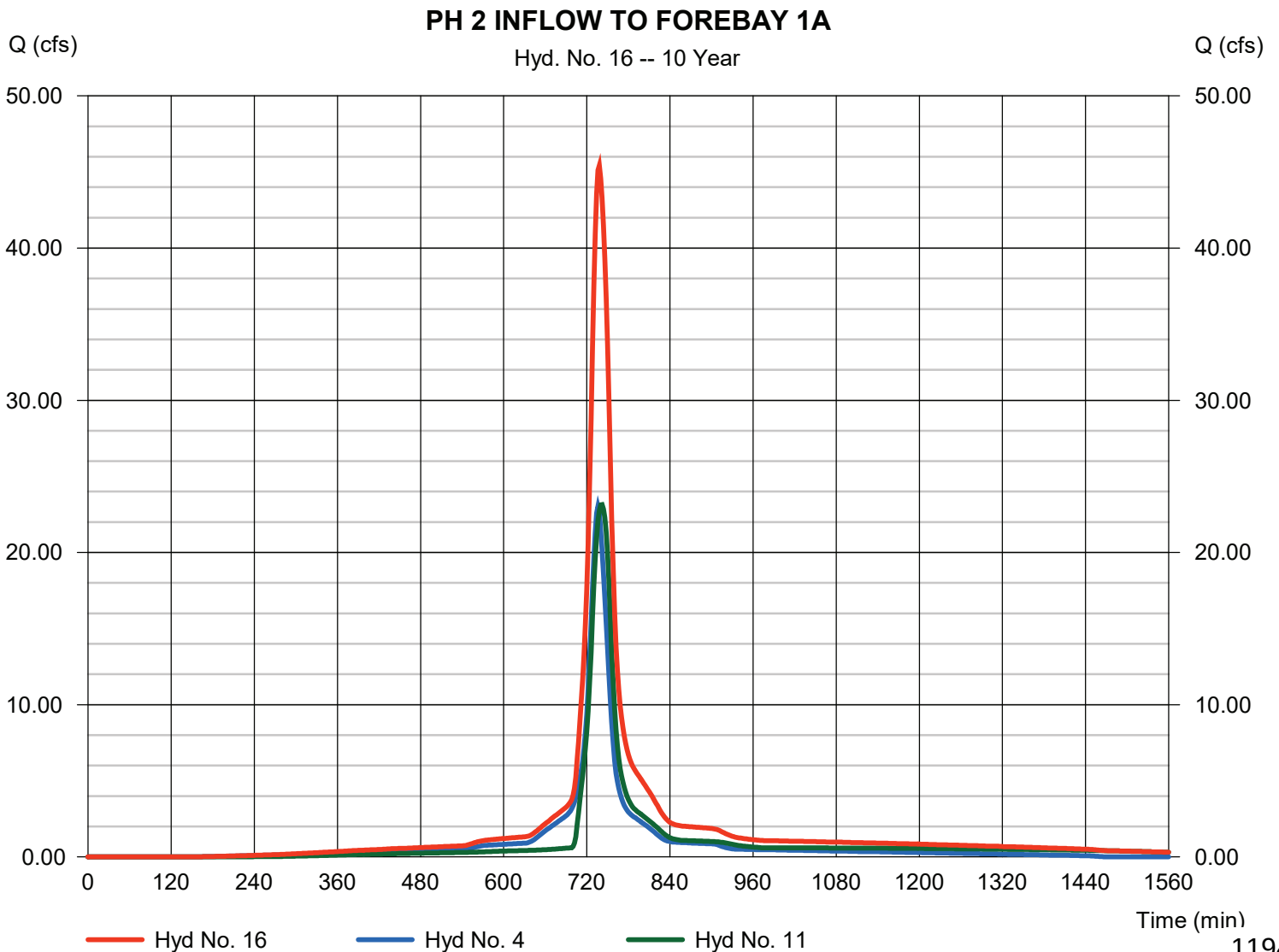
Thursday, 02 / 27 / 2020

Hyd. No. 16

PH 2 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 4, 11

Peak discharge = 45.44 cfs
 Time to peak = 738 min
 Hyd. volume = 184,832 cuft
 Contrib. drain. area = 6.607 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

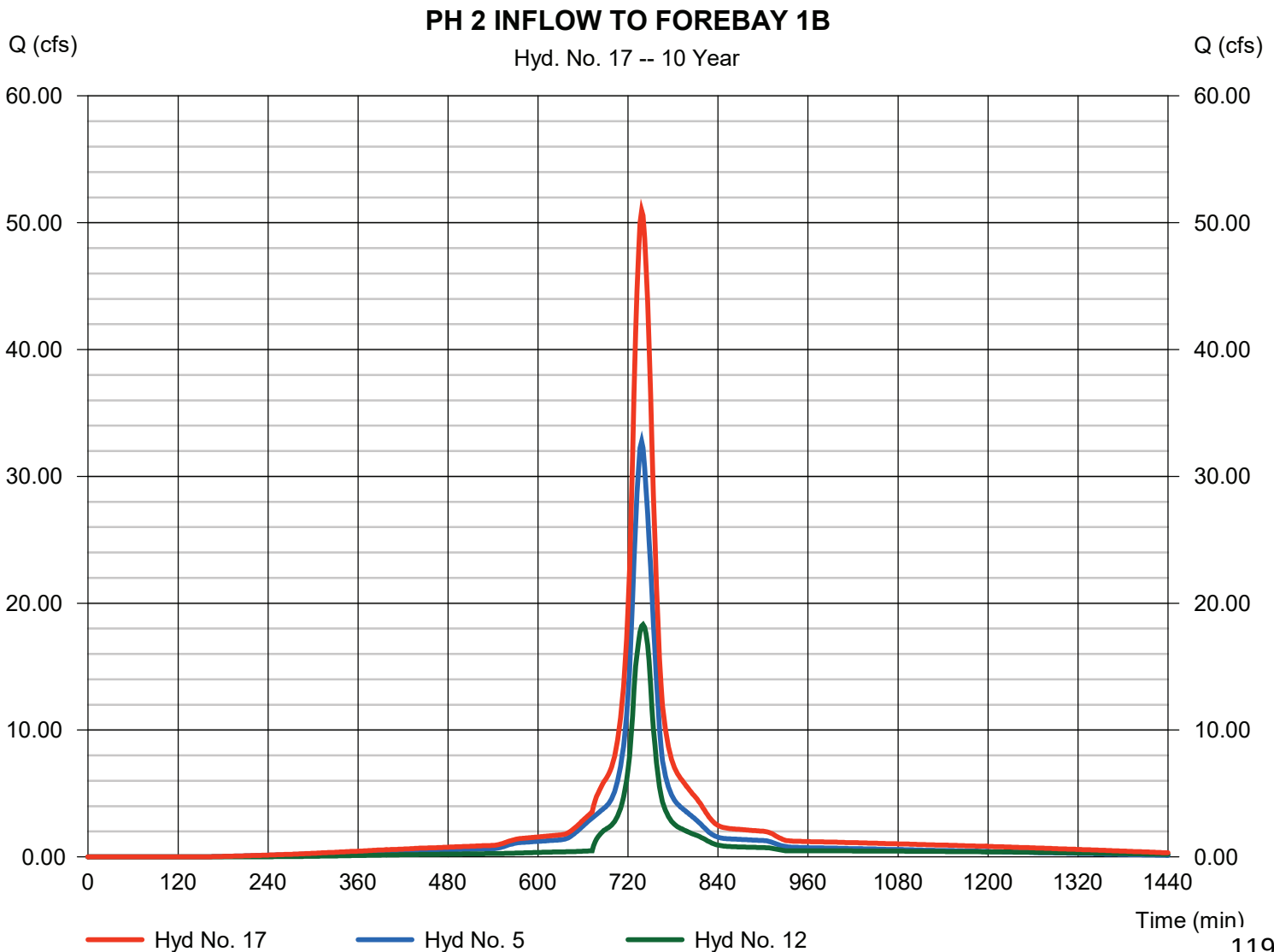
Thursday, 02 / 27 / 2020

Hyd. No. 17

PH 2 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 5, 12

Peak discharge = 50.95 cfs
Time to peak = 738 min
Hyd. volume = 204,319 cuft
Contrib. drain. area = 10.224 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

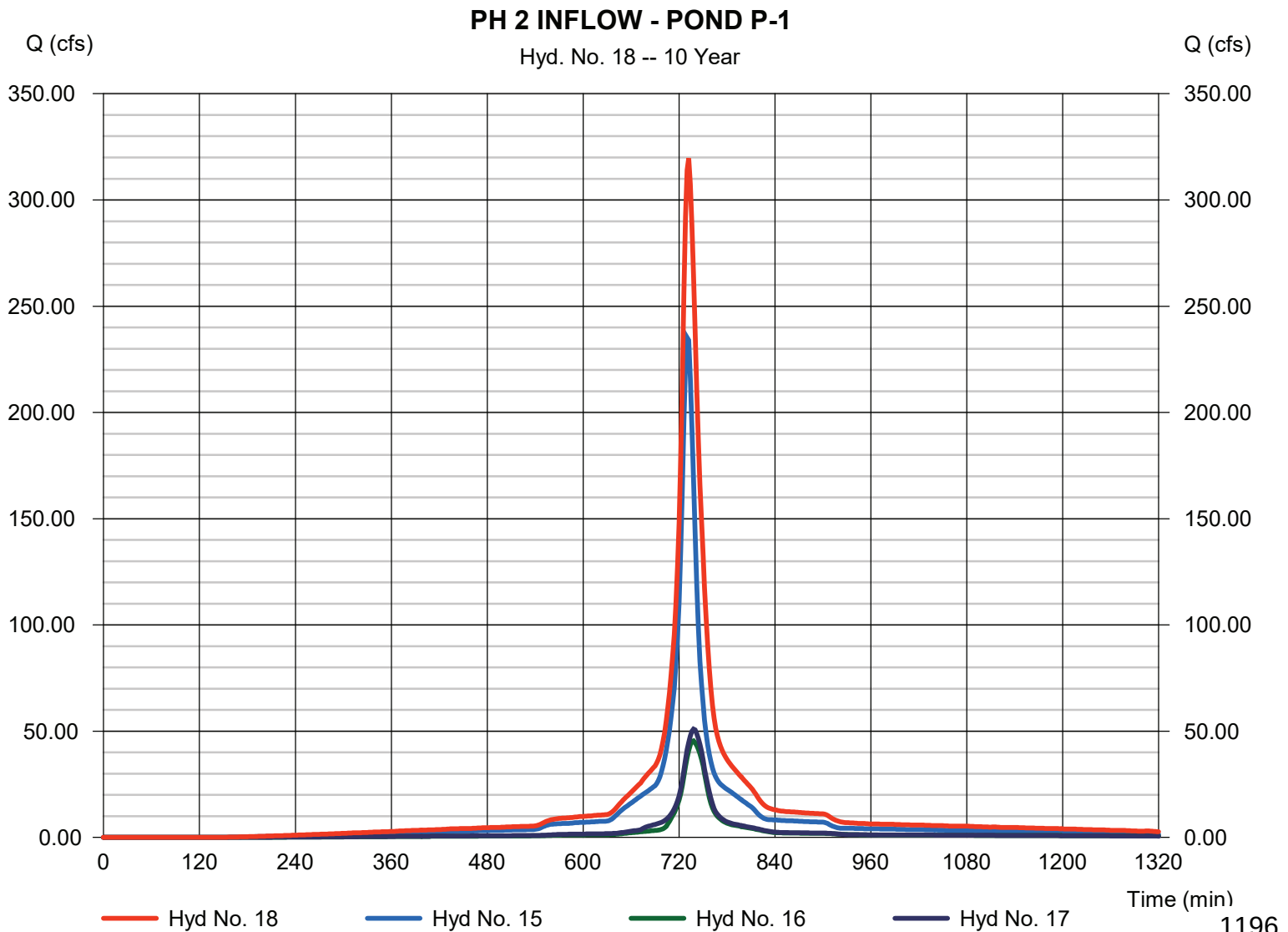
Thursday, 02 / 27 / 2020

Hyd. No. 18

PH 2 INFLOW - POND P-1

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 15, 16, 17

Peak discharge = 319.57 cfs
 Time to peak = 732 min
 Hyd. volume = 1,124,106 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 19

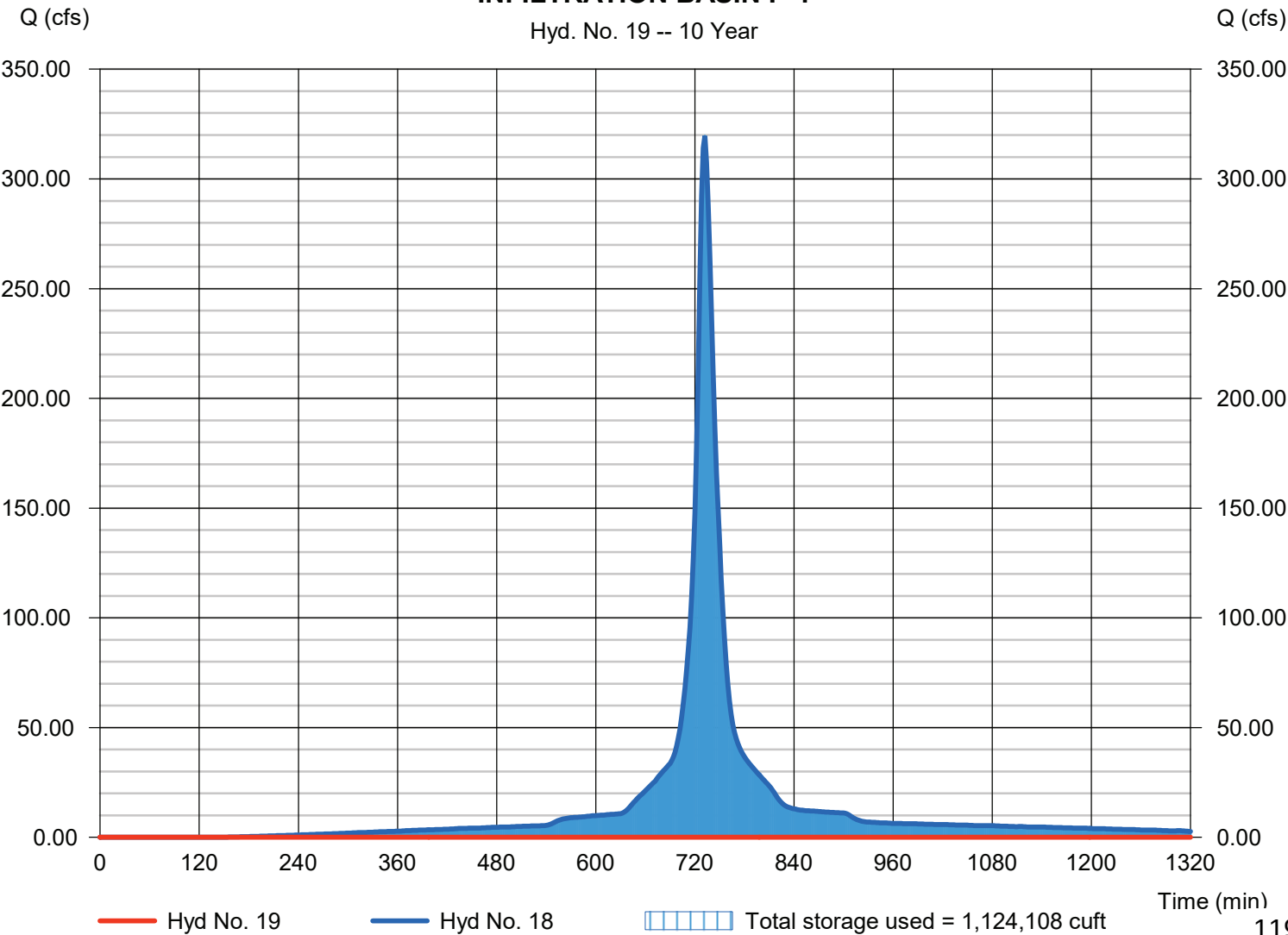
INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 18 - PH 2 INFLOW - POND P-1	Max. Elevation	= 838.12 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 2	Max. Storage	= 1,124,108 cuft

Storage Indication method used.

INFILTRATION BASIN P-1

Hyd. No. 19 -- 10 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

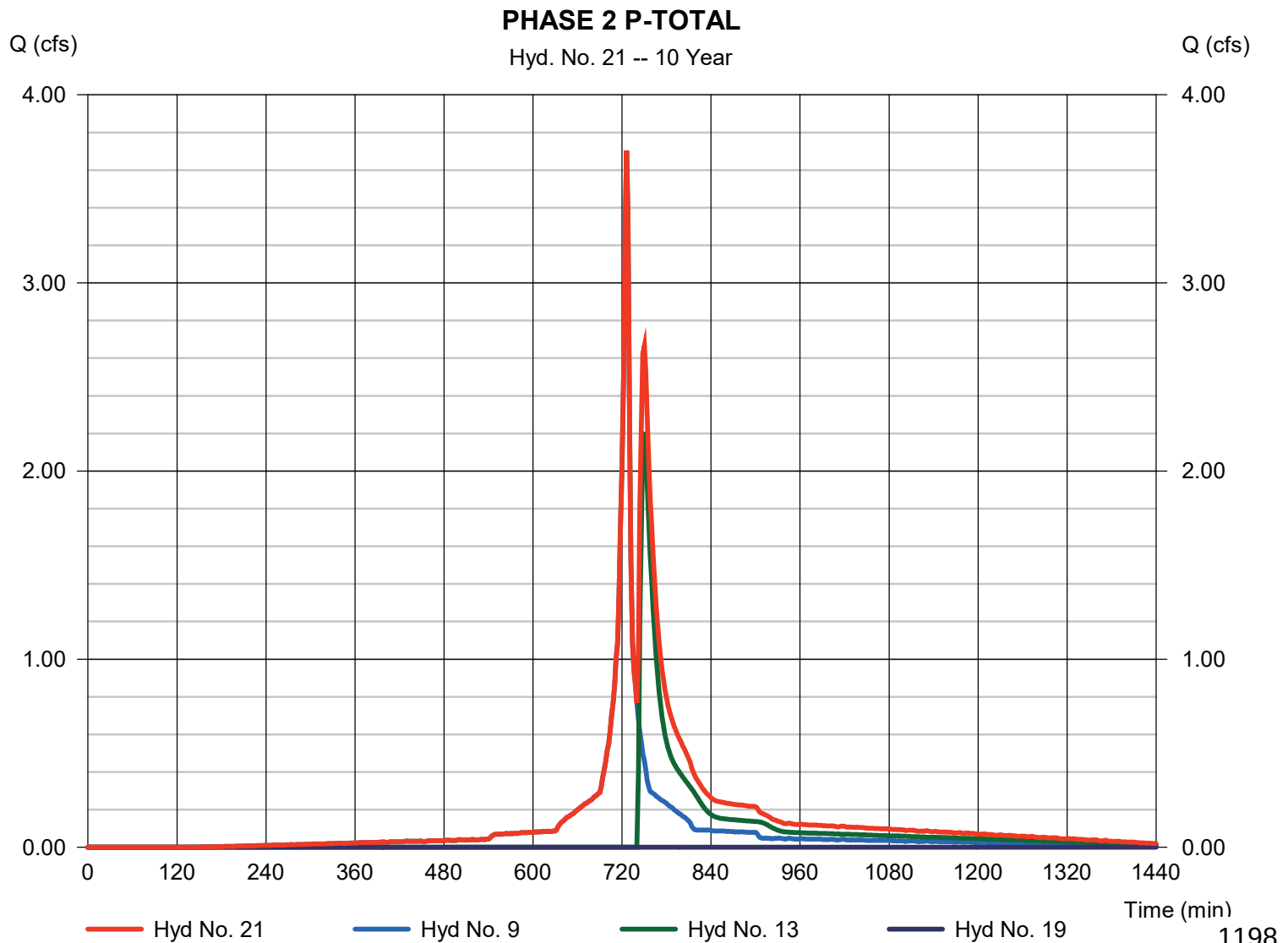
Thursday, 02 / 27 / 2020

Hyd. No. 21

PHASE 2 P-TOTAL

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 9, 13, 19

Peak discharge = 3.703 cfs
 Time to peak = 726 min
 Hyd. volume = 14,518 cuft
 Contrib. drain. area = 0.670 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	61.96	2	734	219,349	-----	-----	-----	P-OS-1
2	SCS Runoff	83.92	2	732	269,382	-----	-----	-----	P-OS-2
3	SCS Runoff	245.69	2	730	732,571	-----	-----	-----	P-1-PH 2
4	SCS Runoff	37.62	2	736	145,046	-----	-----	-----	P-1A-PH2
5	SCS Runoff	53.47	2	738	217,068	-----	-----	-----	P-1B-PH2
6	SCS Runoff	42.05	2	736	162,126	-----	-----	-----	P-2
7	SCS Runoff	31.76	2	736	122,478	-----	-----	-----	P-3
8	SCS Runoff	5.921	2	736	22,832	-----	-----	-----	P-4
9	SCS Runoff	6.038	2	726	13,548	-----	-----	-----	P-UD-1
11	Reservoir	32.94	2	744	162,107	6	841.01	27,891	POND P-2
12	Reservoir	25.63	2	744	122,465	7	841.17	14,049	POND P-3
13	Reservoir	5.725	2	738	15,457	8	840.93	8,636	RAIN GARDEN P-4
15	Combine	383.96	2	730	1,221,302	1, 2, 3,	-----	-----	PHASE 2 OS-1 + OS-2 + P-1
16	Combine	68.23	2	738	307,153	4, 11,	-----	-----	PH 2 INFLOW TO FOREBAY 1A
17	Combine	78.26	2	738	339,533	5, 12,	-----	-----	PH 2 INFLOW TO FOREBAY 1B
18	Combine	512.01	2	732	1,867,988	15, 16, 17	-----	-----	PH 2 INFLOW - POND P-1
19	Reservoir	0.000	2	n/a	0	18	841.36	1,867,989	INFILTRATION BASIN P-1
21	Combine	7.259	2	728	29,005	9, 13, 19,	-----	-----	PHASE 2 P-TOTAL
2020-02-27_CHAPMAN FARMS_PHASE II_Flood Example					Return Period: 100 Year			Thursday, 02 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 1

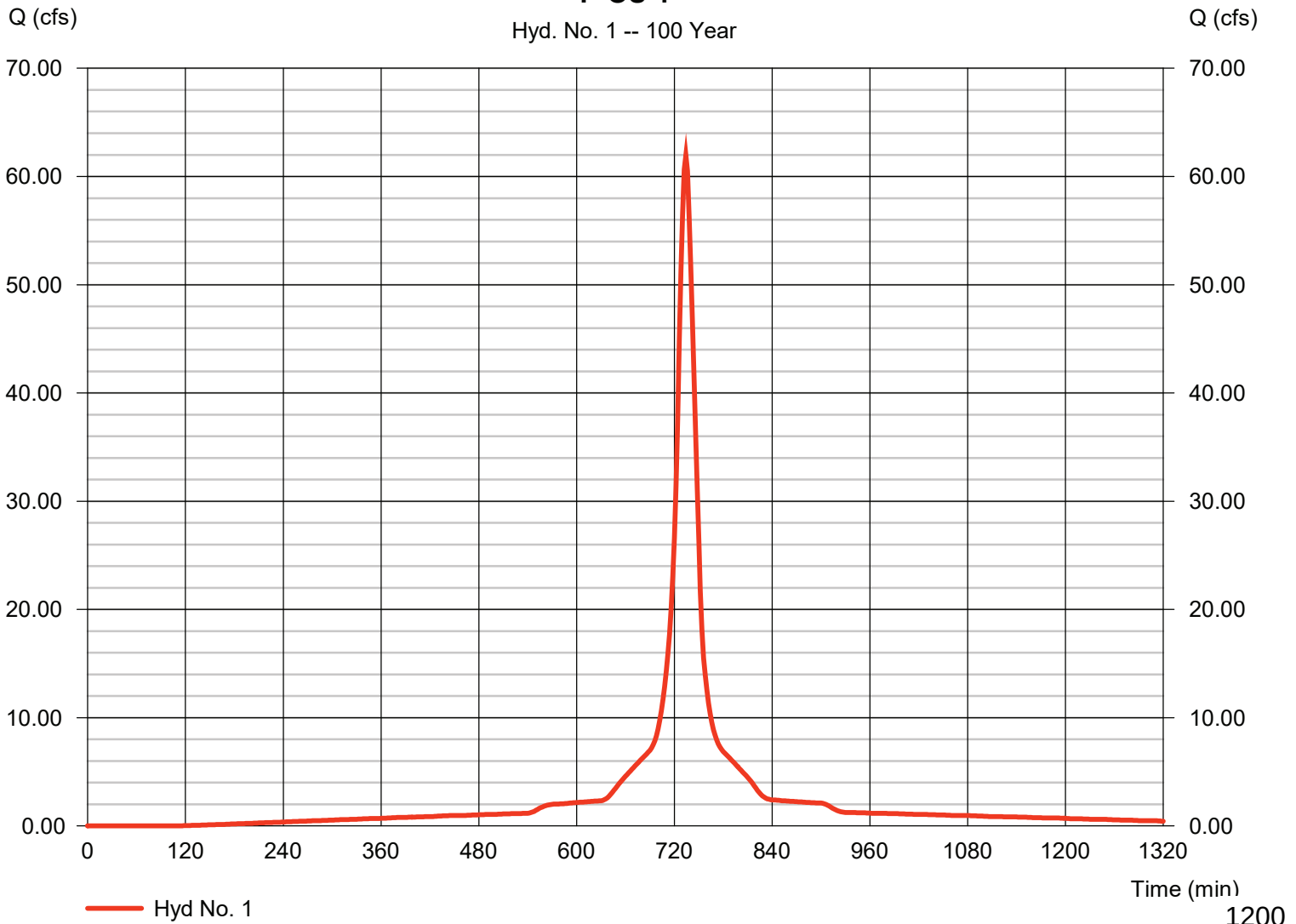
P-OS-1

Hydrograph type	= SCS Runoff	Peak discharge	= 61.96 cfs
Storm frequency	= 100 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 219,349 cuft
Drainage area	= 10.170 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.90 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSR3 DISTRIBUTION CU		

* Composite (Area/CN) = $[(8.870 \times 61) + (1.300 \times 86)] / 10.170$

P-OS-1

Hyd. No. 1 -- 100 Year



Precipitation Report

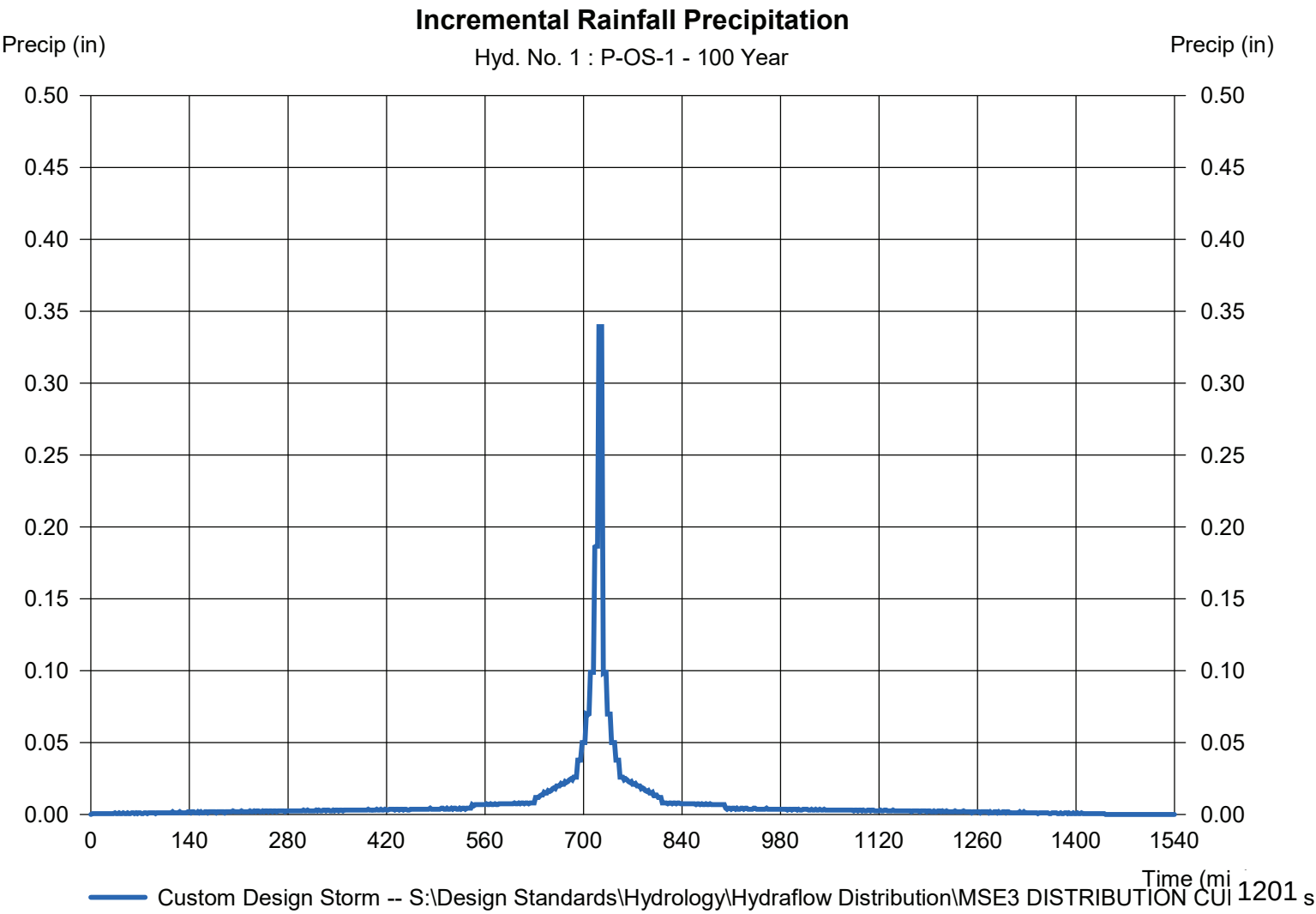
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 1

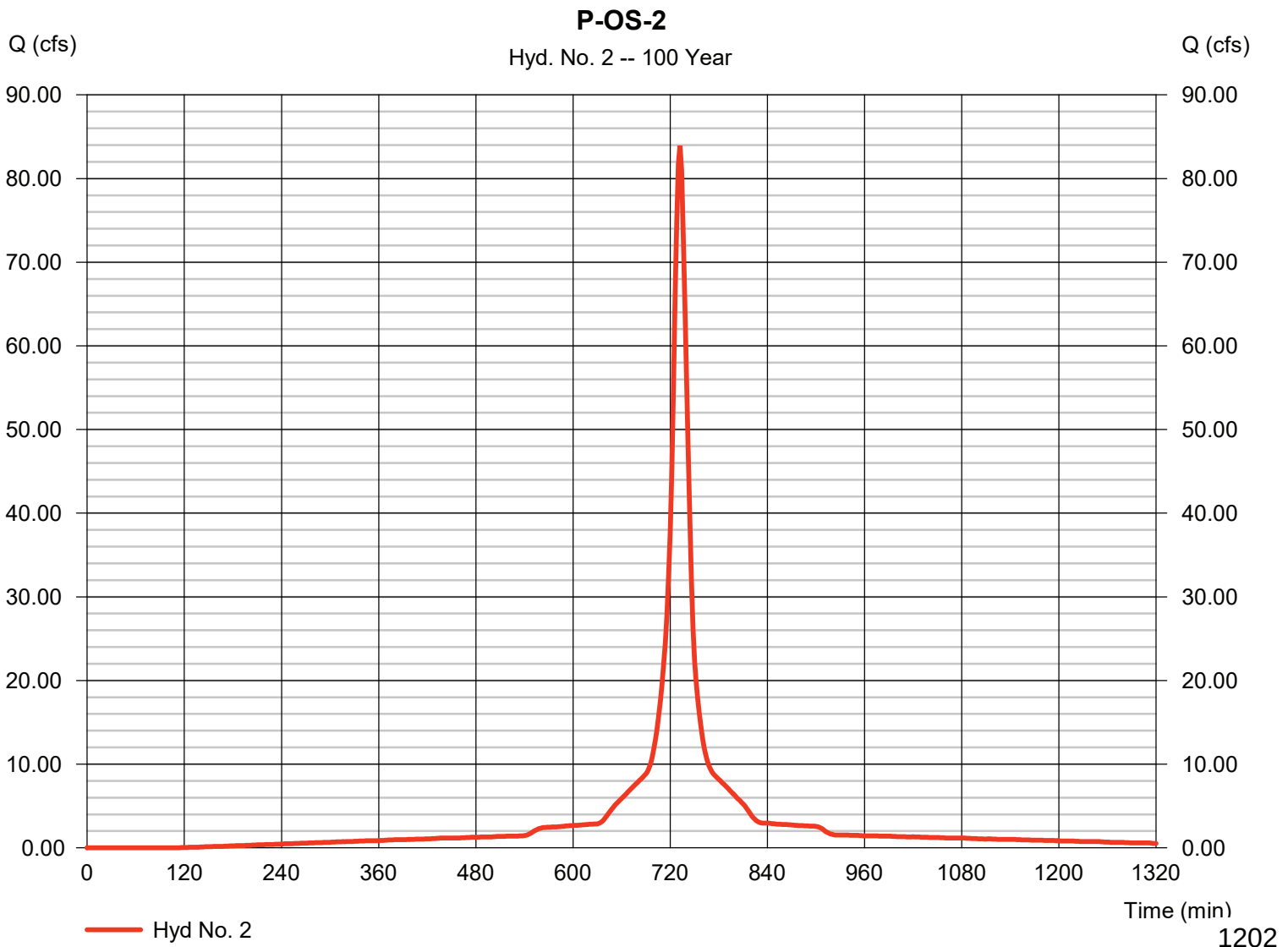
P-OS-1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



P-OS-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	83.92 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	269,382 cuft
Drainage area	=	12.810 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.80 min
Total precip.	=	6.18 in	Distribution	=	Custom
Storm duration	=	S:\Design Standards\Hydrology\Hydroflow\Distribution\MSE3 DISTRIBUTION CU			



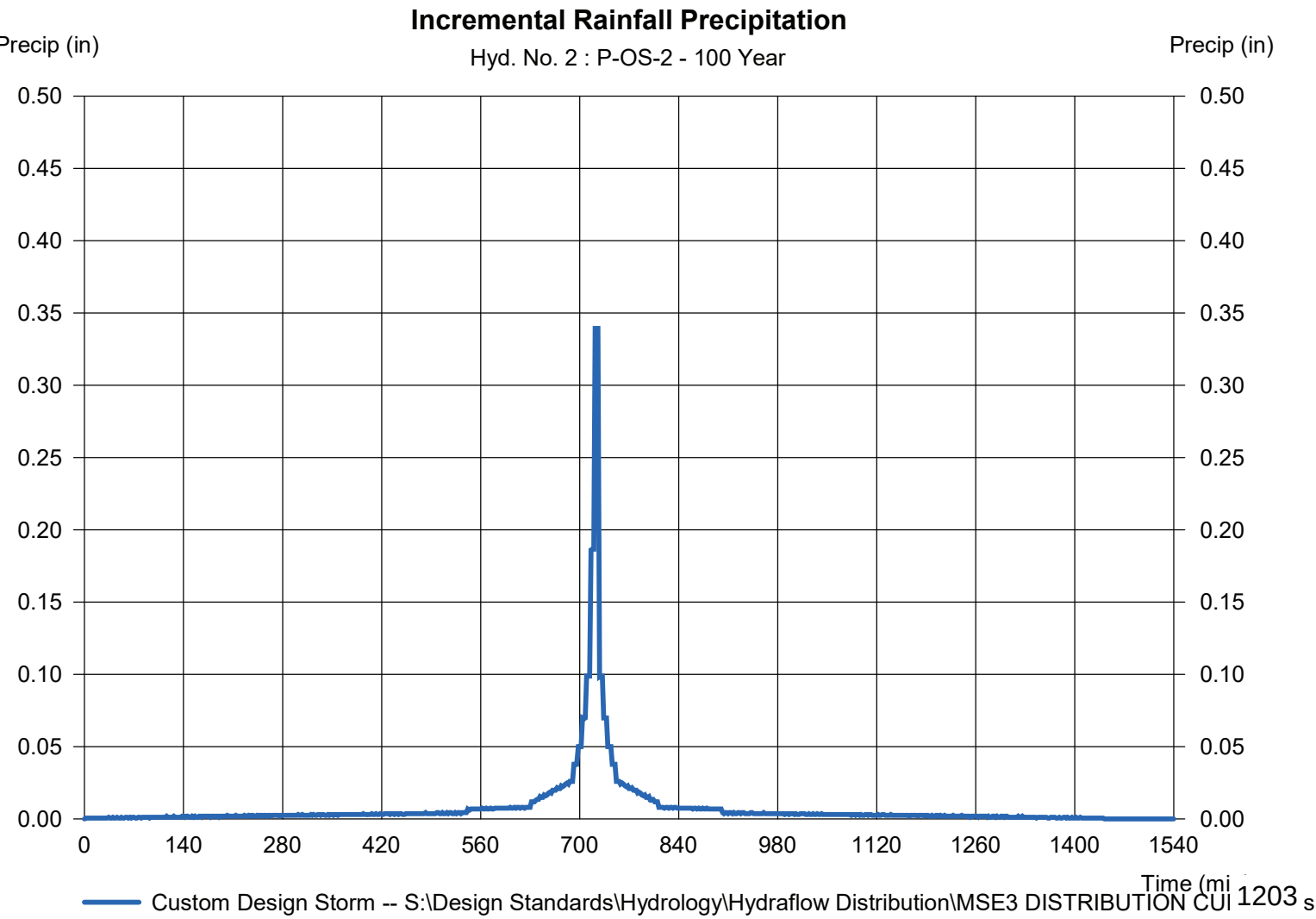
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 02 / 27 / 2020

Hyd. No. 2

P-OS-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

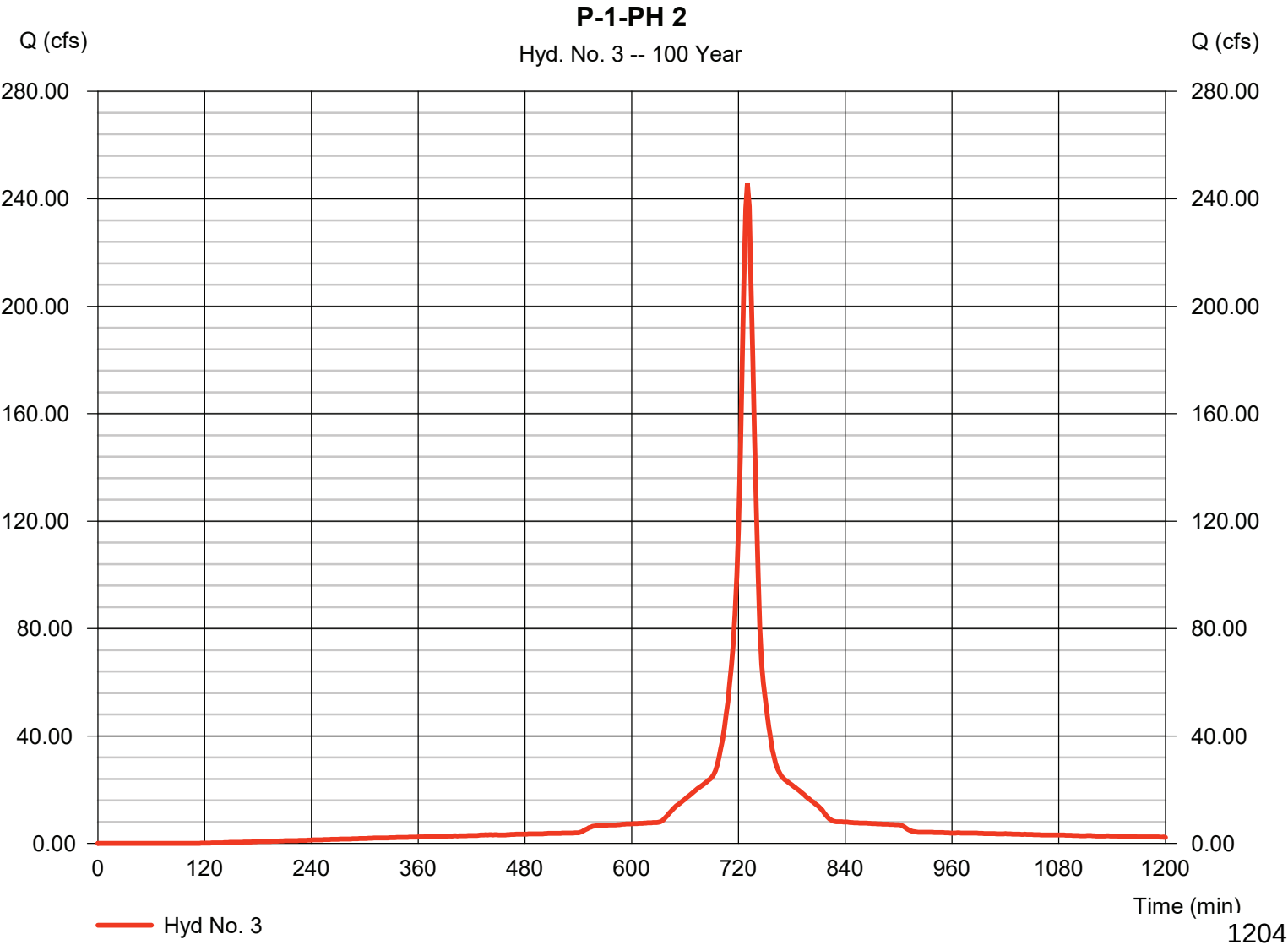
Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Hydrograph type	= SCS Runoff	Peak discharge	= 245.69 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 732,571 cuft
Drainage area	= 32.936 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.20 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(0.520 x 98) + (3.770 x 61) + (1.000 x 74) + (31.960 x 72) + (12.560 x 81)] / 32.936



Precipitation Report

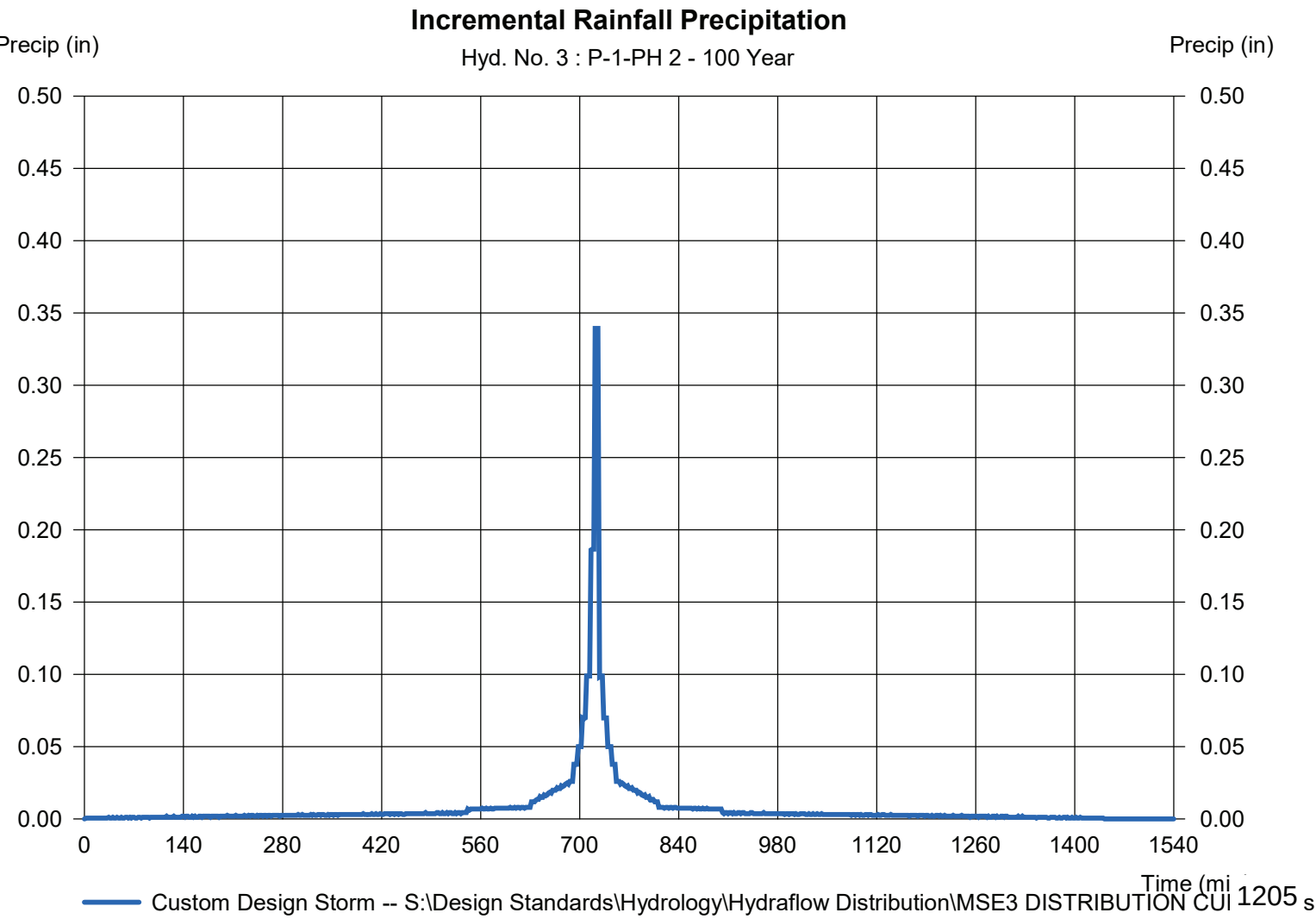
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 3

P-1-PH 2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

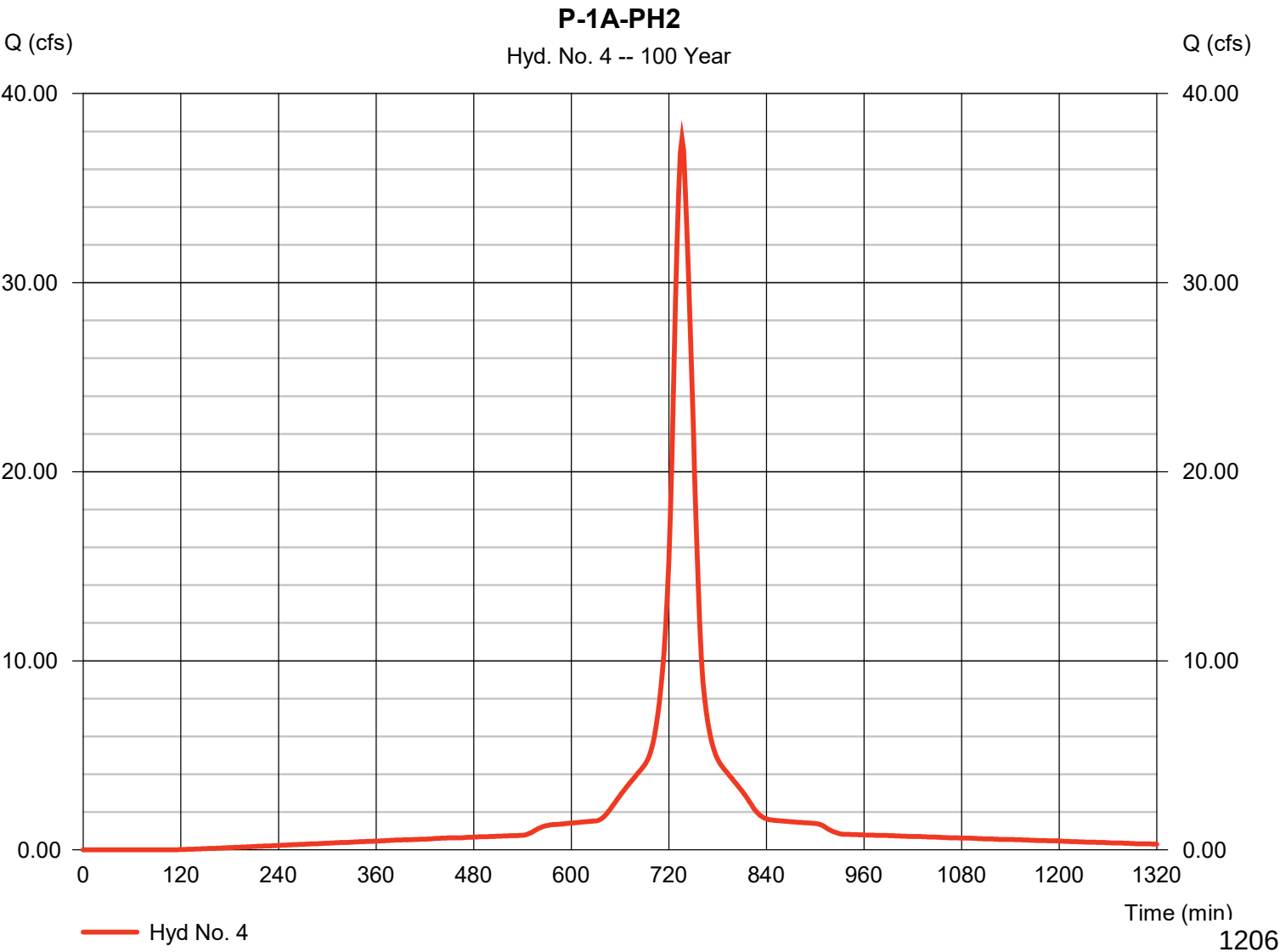
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 37.62 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 145,046 cuft
Drainage area	= 6.607 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.30 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrograph Distribution\MSD3 DISTRIBUTION CURVE		



Precipitation Report

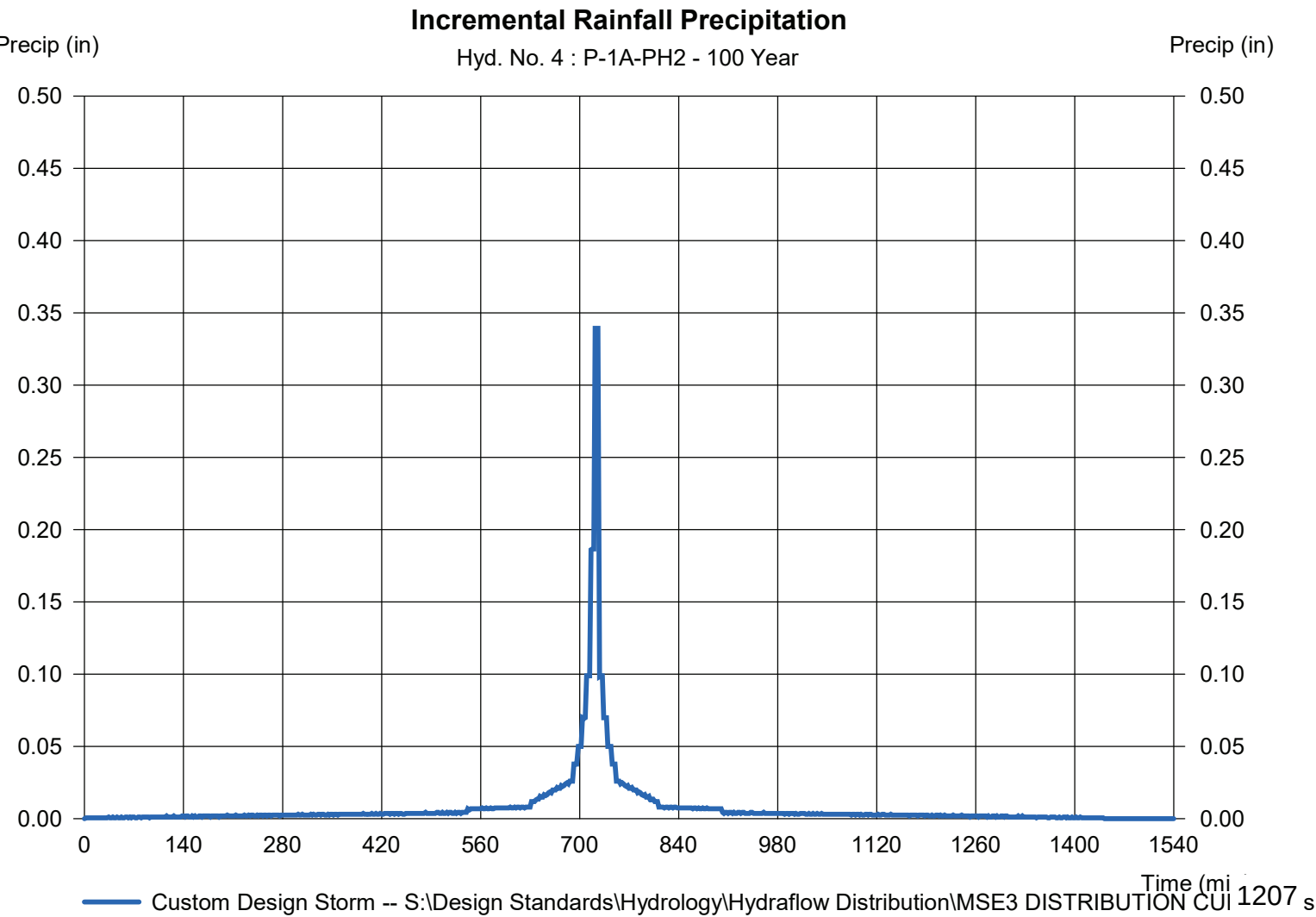
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 4

P-1A-PH2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

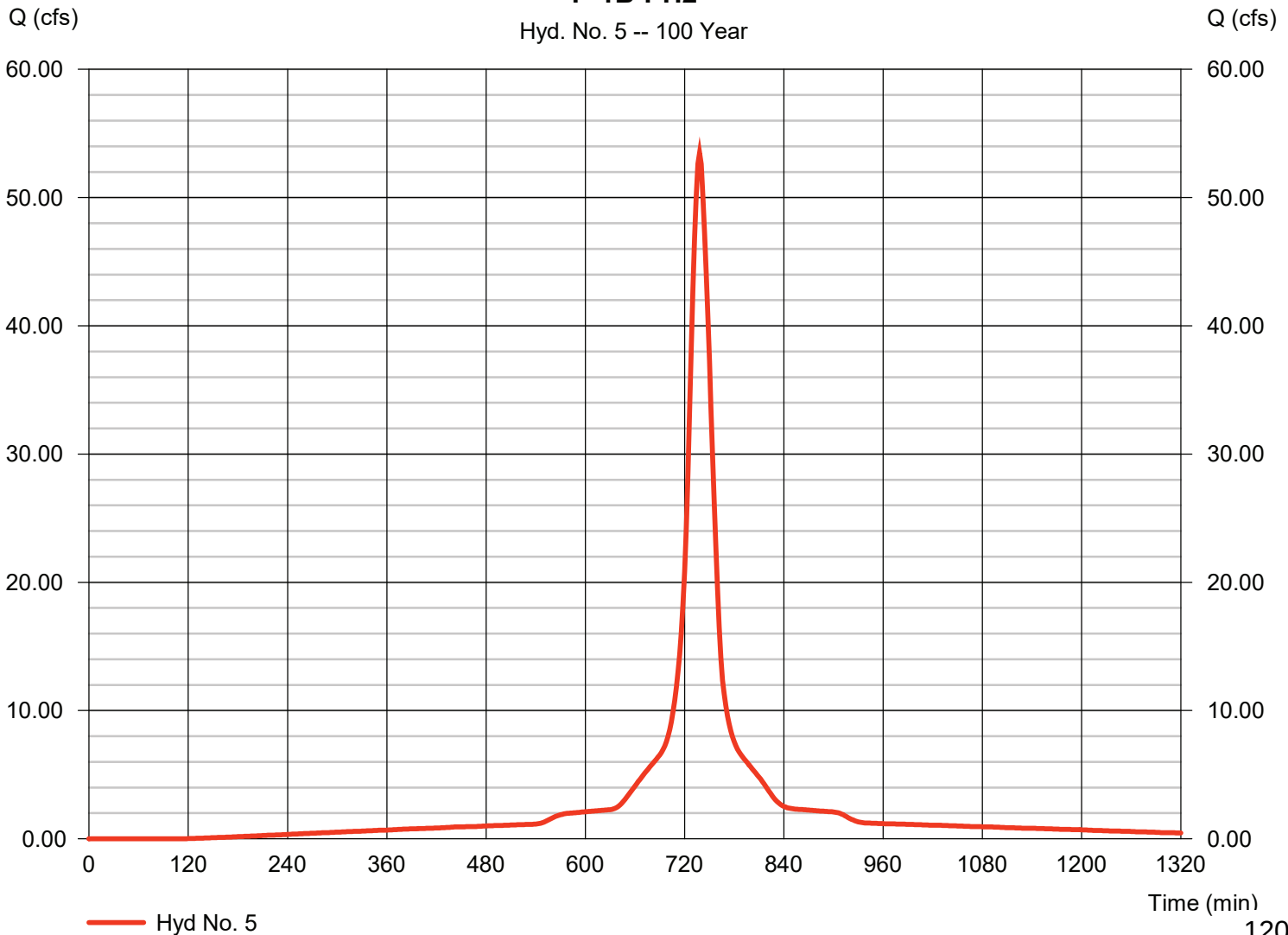
Hyd. No. 5

P-1B-PH2

Hydrograph type	= SCS Runoff	Peak discharge	= 53.47 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 217,068 cuft
Drainage area	= 10.224 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 26.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\Hydrograph Distribution\MSD3 DISTRIBUTION CU		

P-1B-PH2

Hyd. No. 5 -- 100 Year



1208

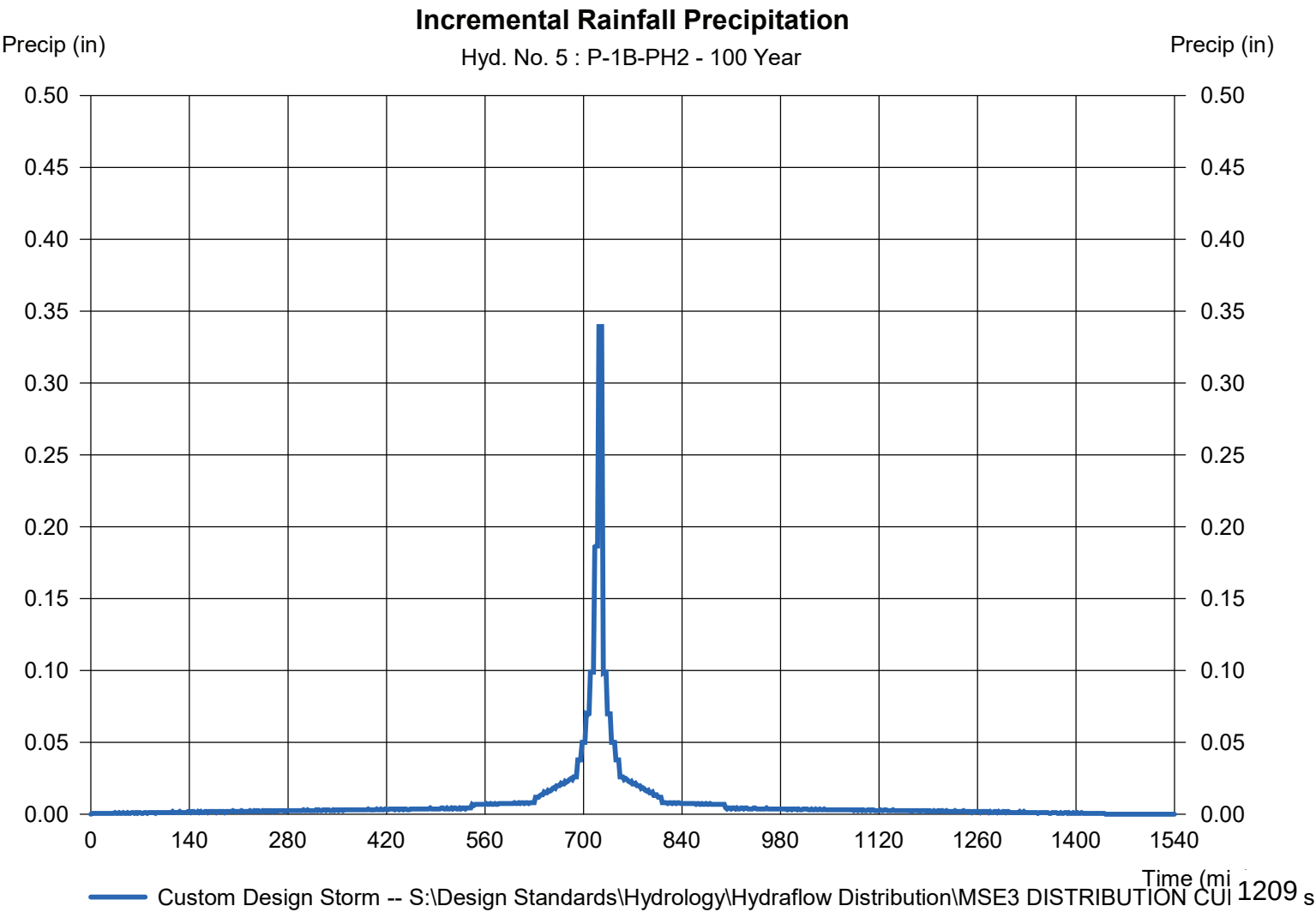
Precipitation Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Thursday, 02 / 27 / 2020

Hyd. No. 5

P-1B-PH2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

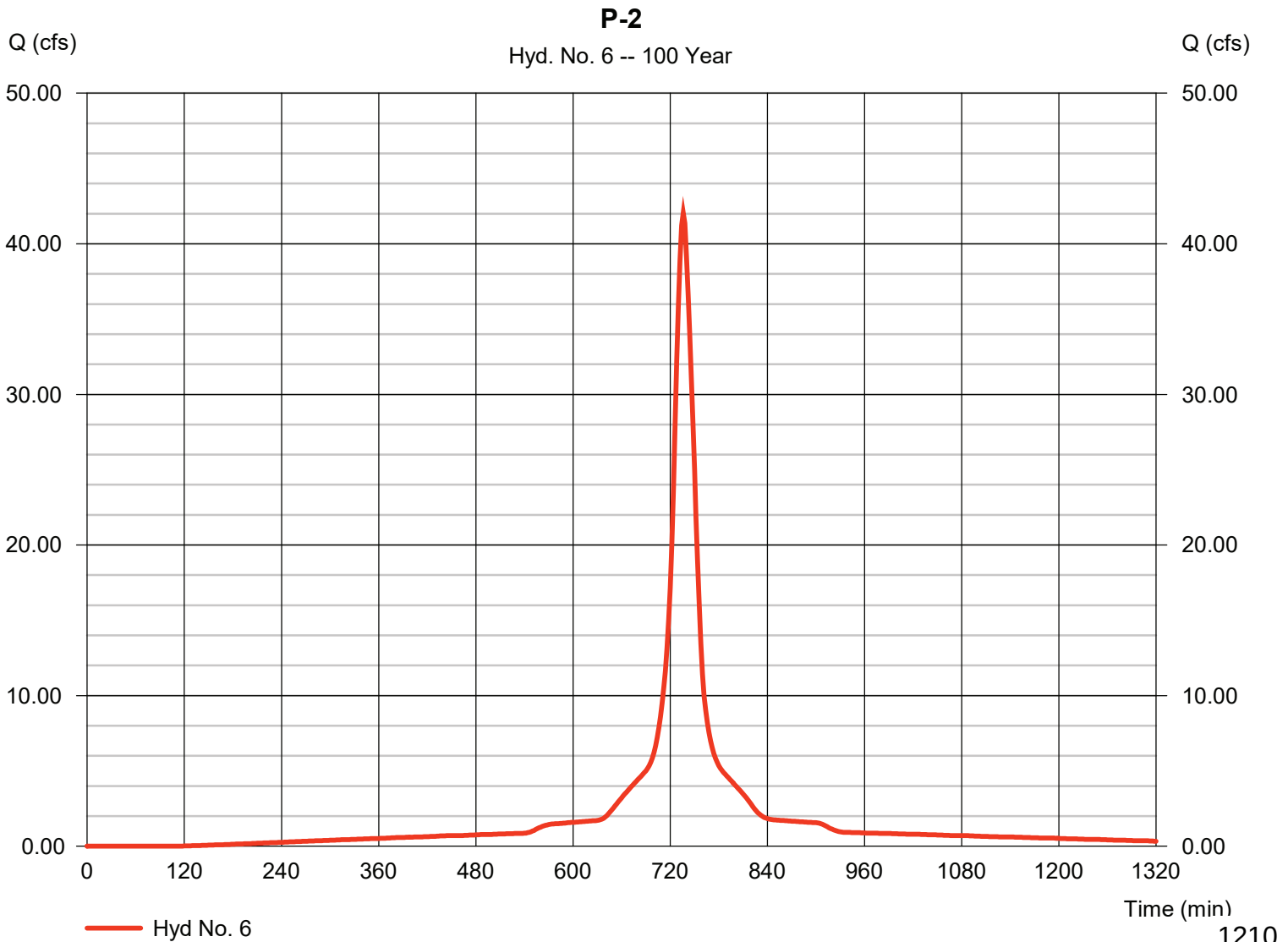
Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Hydrograph type	= SCS Runoff	Peak discharge	= 42.05 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 162,126 cuft
Drainage area	= 7.385 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.710 x 75)] / 7.385



1210

Precipitation Report

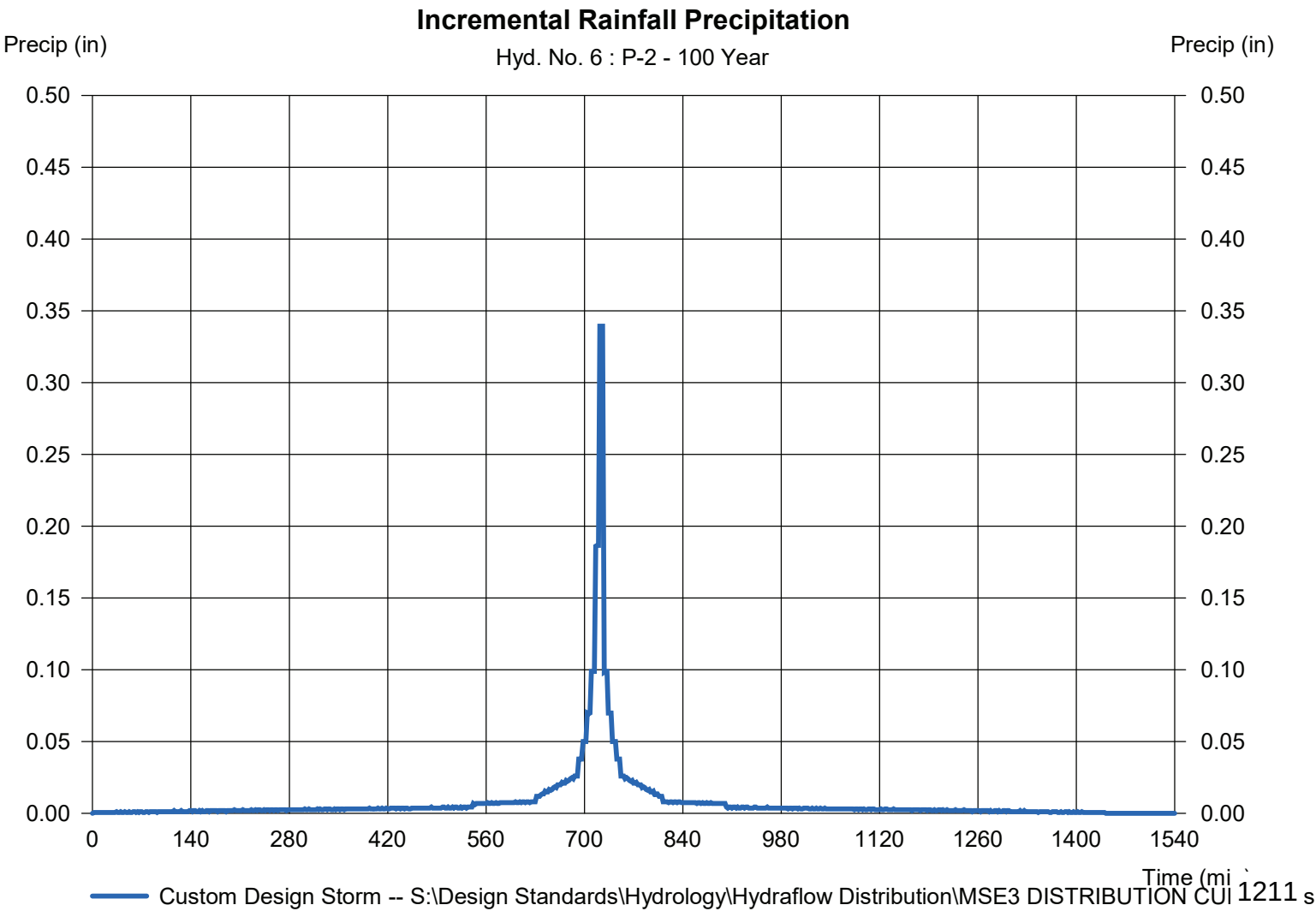
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 6

P-2

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

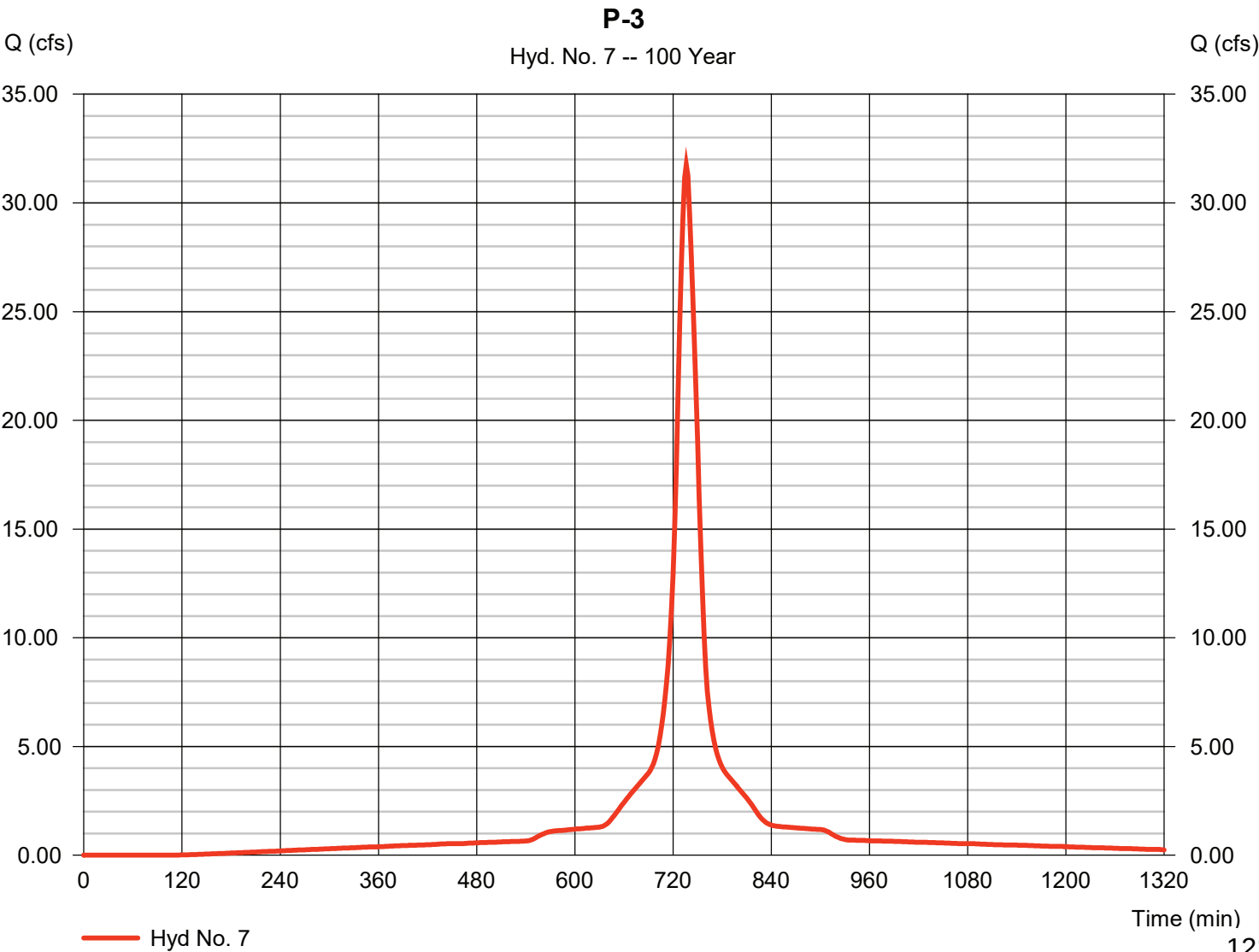
Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Hydrograph type	= SCS Runoff	Peak discharge	= 31.76 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 122,478 cuft
Drainage area	= 5.579 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.20 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow Distribution\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(6.260 x 75)] / 5.579



Precipitation Report

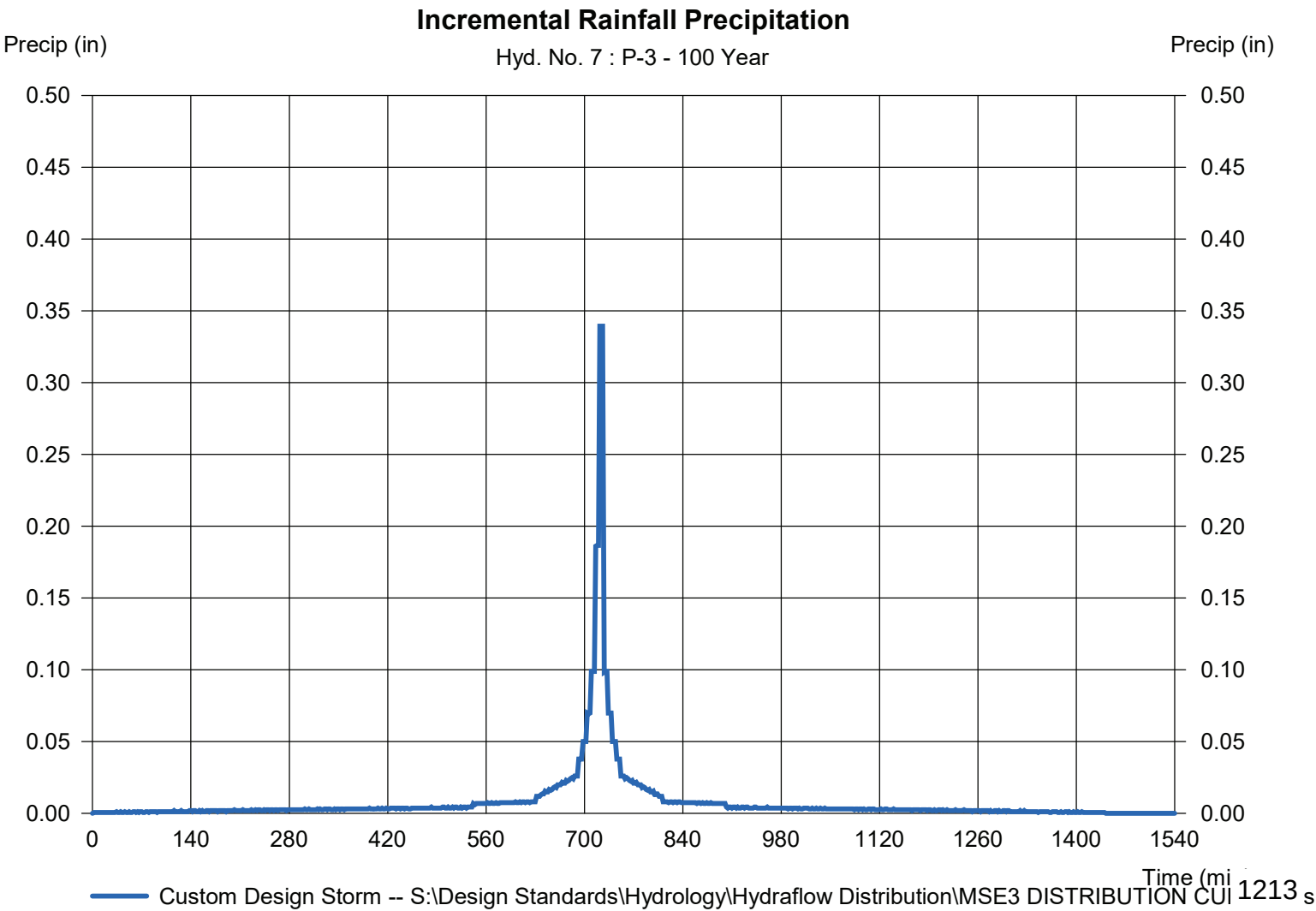
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 7

P-3

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

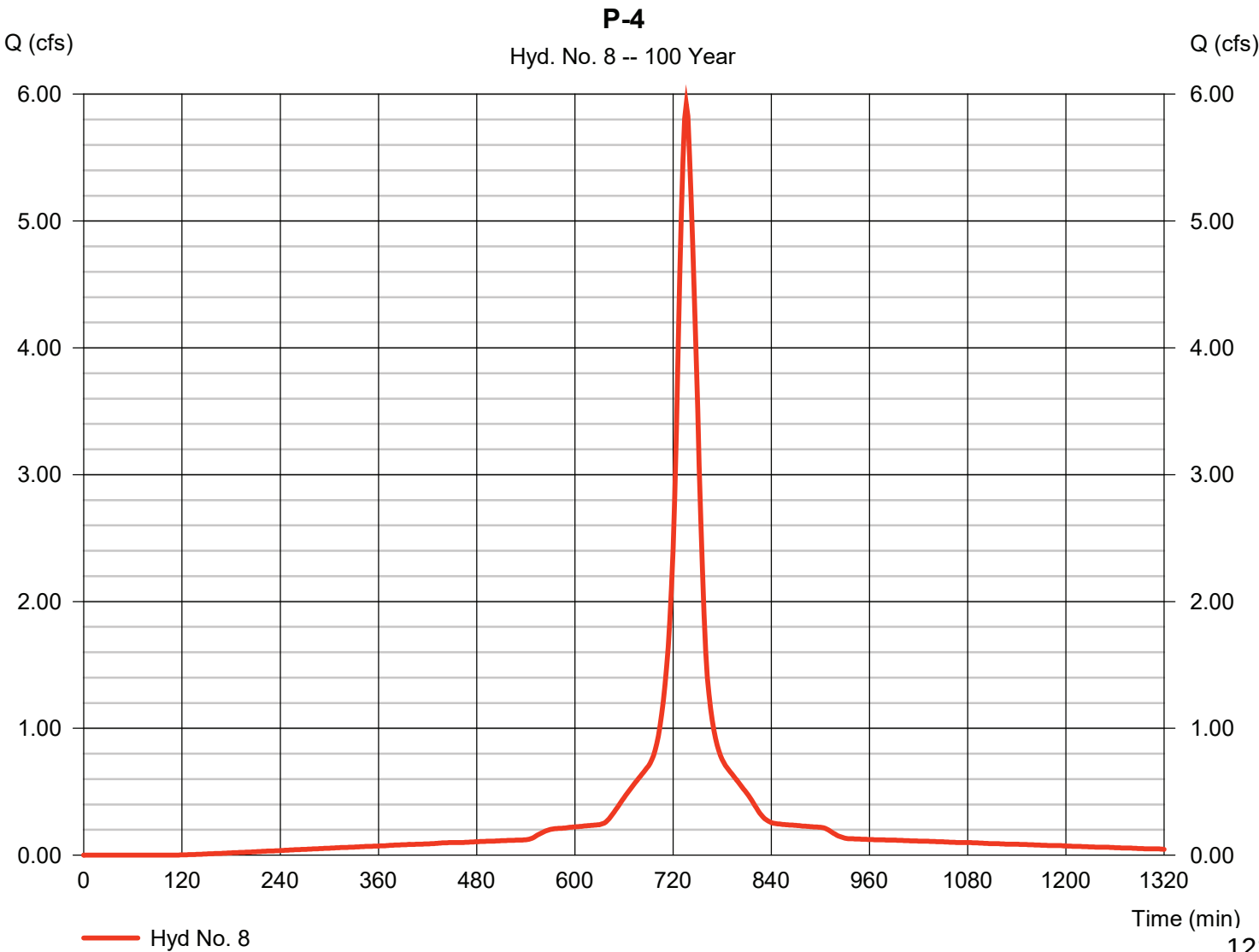
Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Hydrograph type	= SCS Runoff	Peak discharge	= 5.921 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 22,832 cuft
Drainage area	= 1.040 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.10 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydrographs\MSD3 DISTRIBUTION CU		

* Composite (Area/CN) = [(1.040 x 68)] / 1.040



Precipitation Report

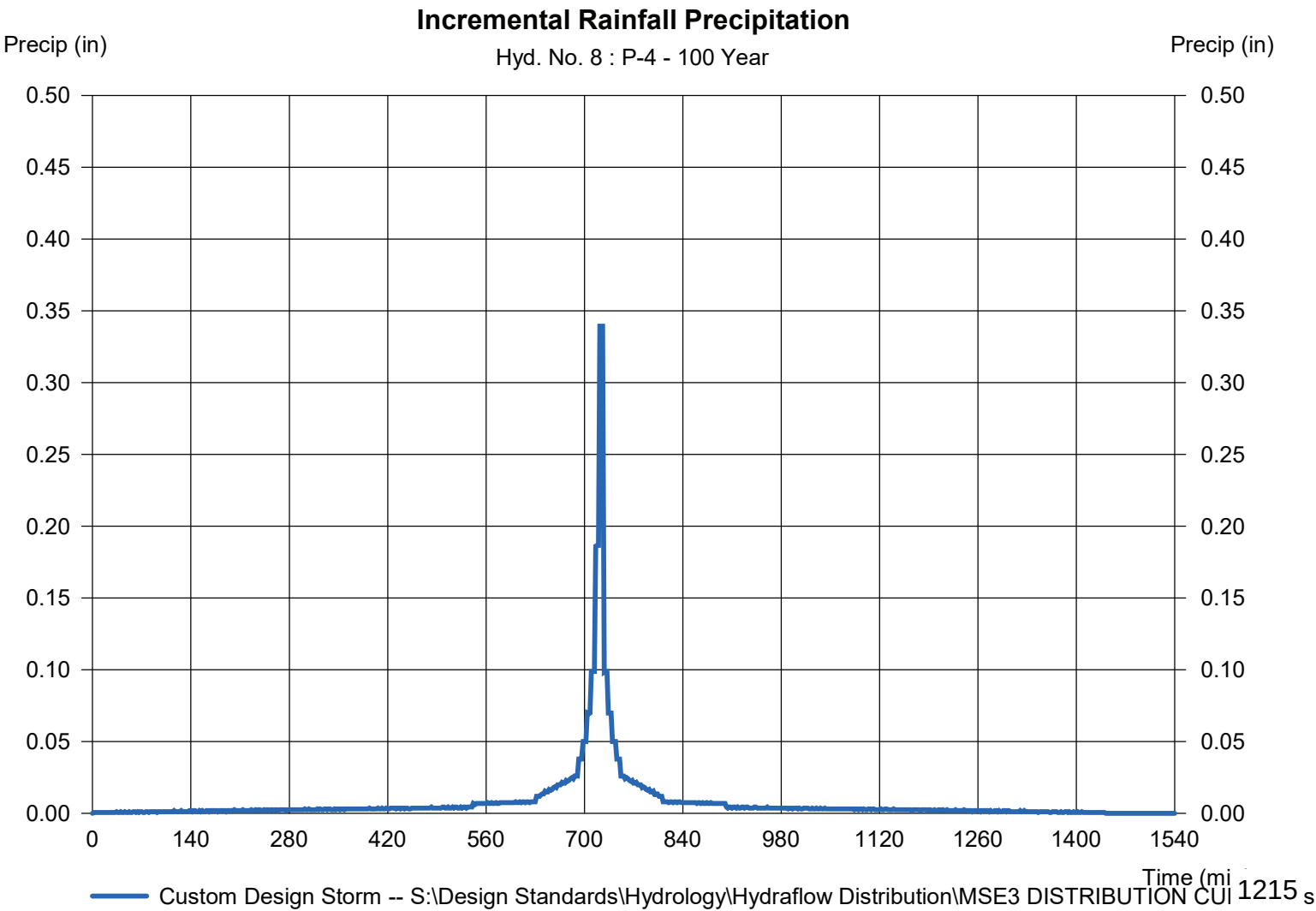
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 8

P-4

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

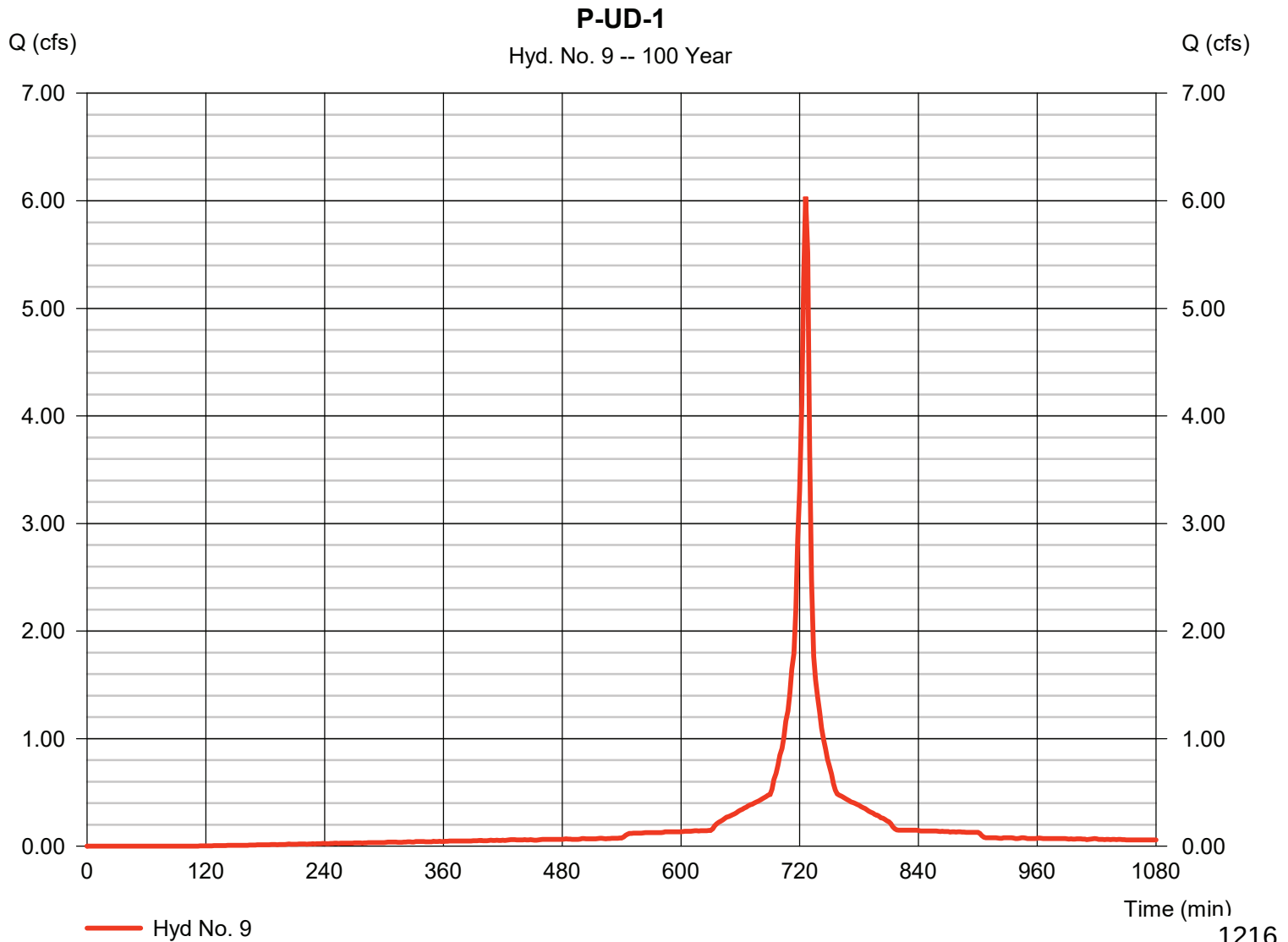
Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Hydrograph type	= SCS Runoff	Peak discharge	= 6.038 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 13,548 cuft
Drainage area	= 0.670 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.18 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydroflow\Distribution\MSR3 DISTRIBUTION CU		

* Composite (Area/CN) = $[(0.300 \times 61) + (0.370 \times 98)] / 0.670$



1216

Precipitation Report

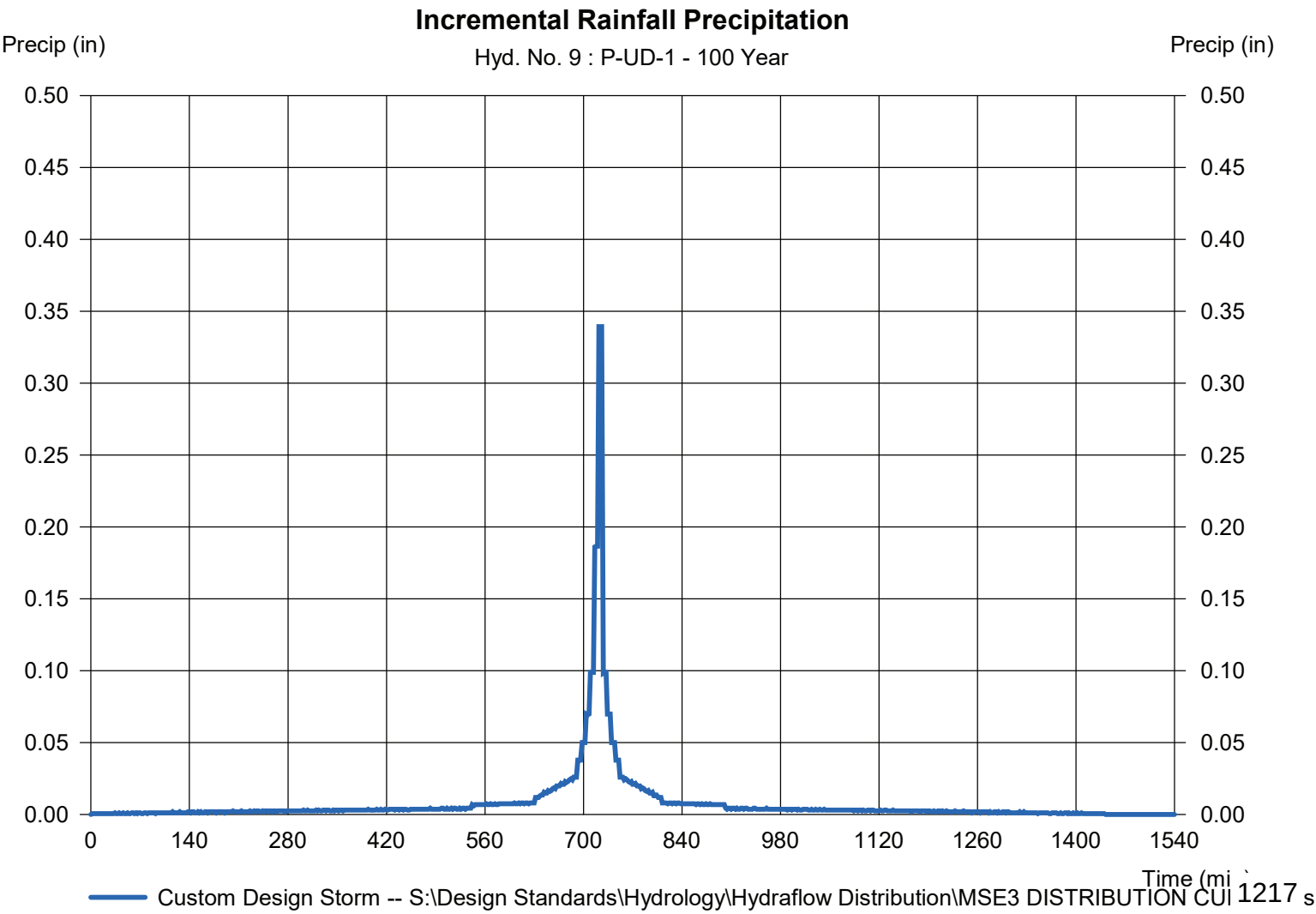
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 9

P-UD-1

Storm Frequency	= 100 yrs	Time interval	= 2 min
Total precip.	= 6.1800 in	Distribution	= Custom
Storm duration	= S:\Design Standards\Hydrology\Hydraflow Distribution\MSE3 DISTRIBUTION C		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 11

POND P-2

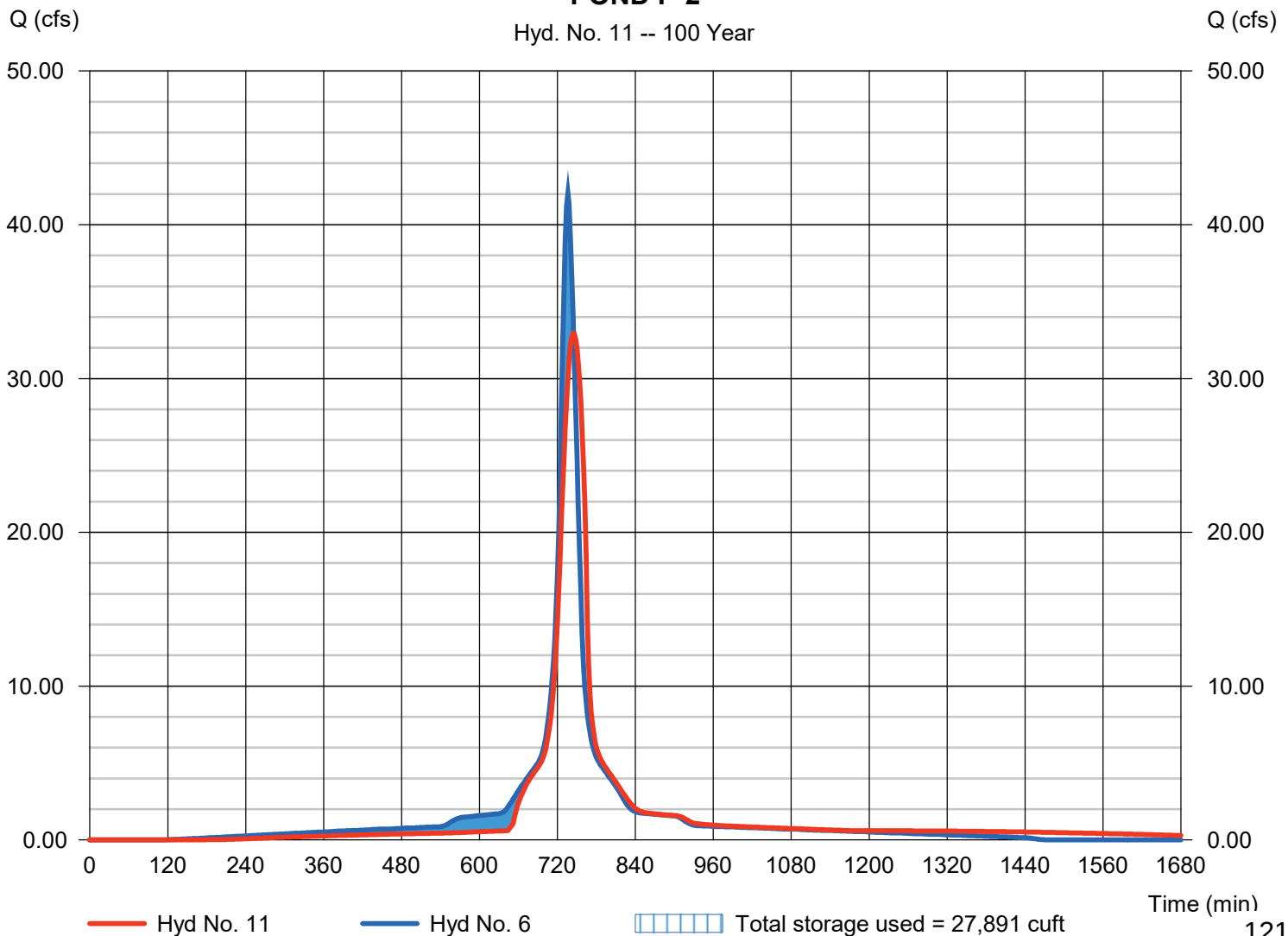
Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 6 - P-2
 Reservoir name = POND P-2

Peak discharge = 32.94 cfs
 Time to peak = 744 min
 Hyd. volume = 162,107 cuft
 Max. Elevation = 841.01 ft
 Max. Storage = 27,891 cuft

Storage Indication method used.

POND P-2

Hyd. No. 11 -- 100 Year



1218

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 12

POND P-3

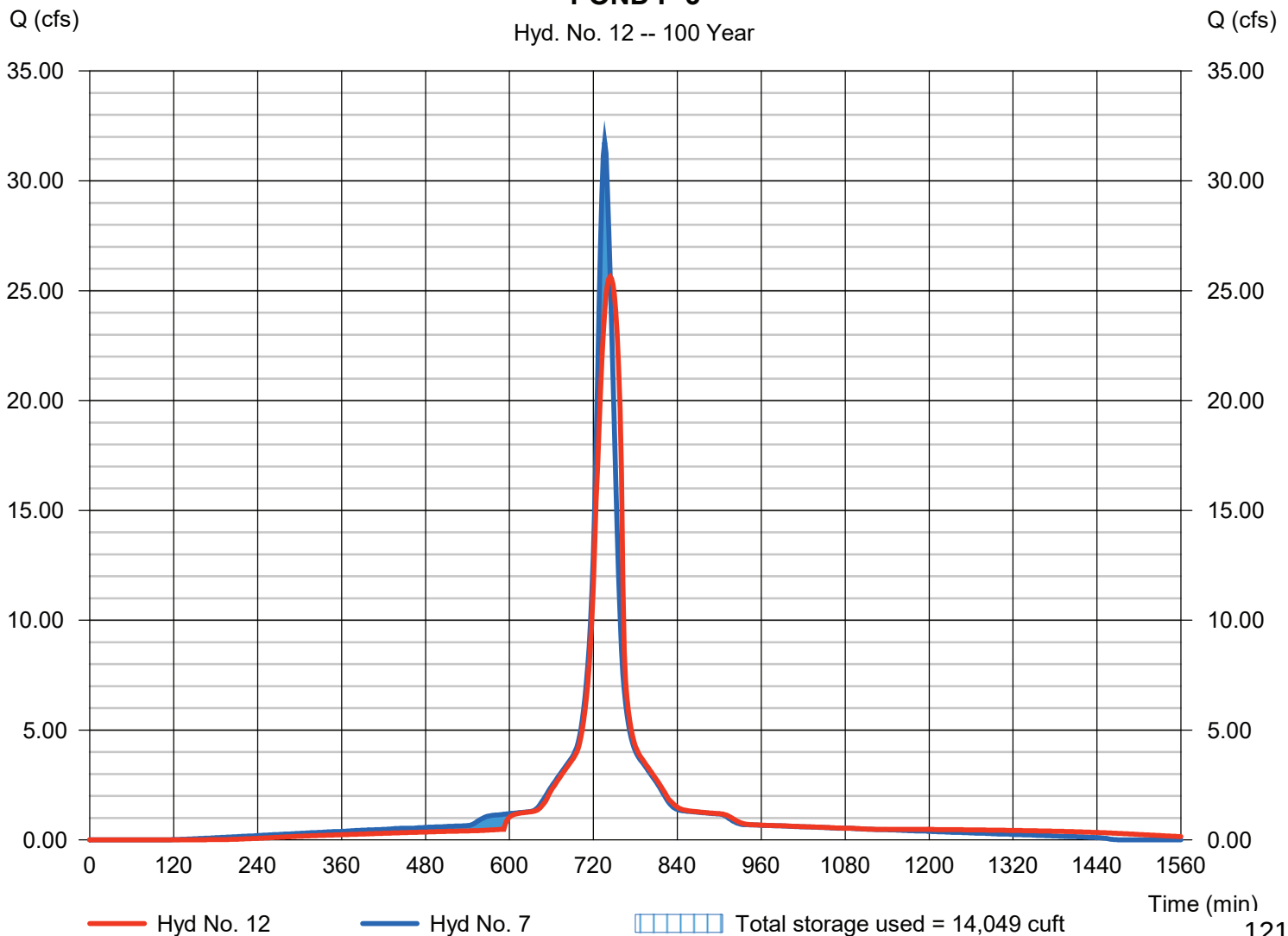
Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 7 - P-3
 Reservoir name = POND P-3

Peak discharge = 25.63 cfs
 Time to peak = 744 min
 Hyd. volume = 122,465 cuft
 Max. Elevation = 841.17 ft
 Max. Storage = 14,049 cuft

Storage Indication method used.

POND P-3

Hyd. No. 12 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

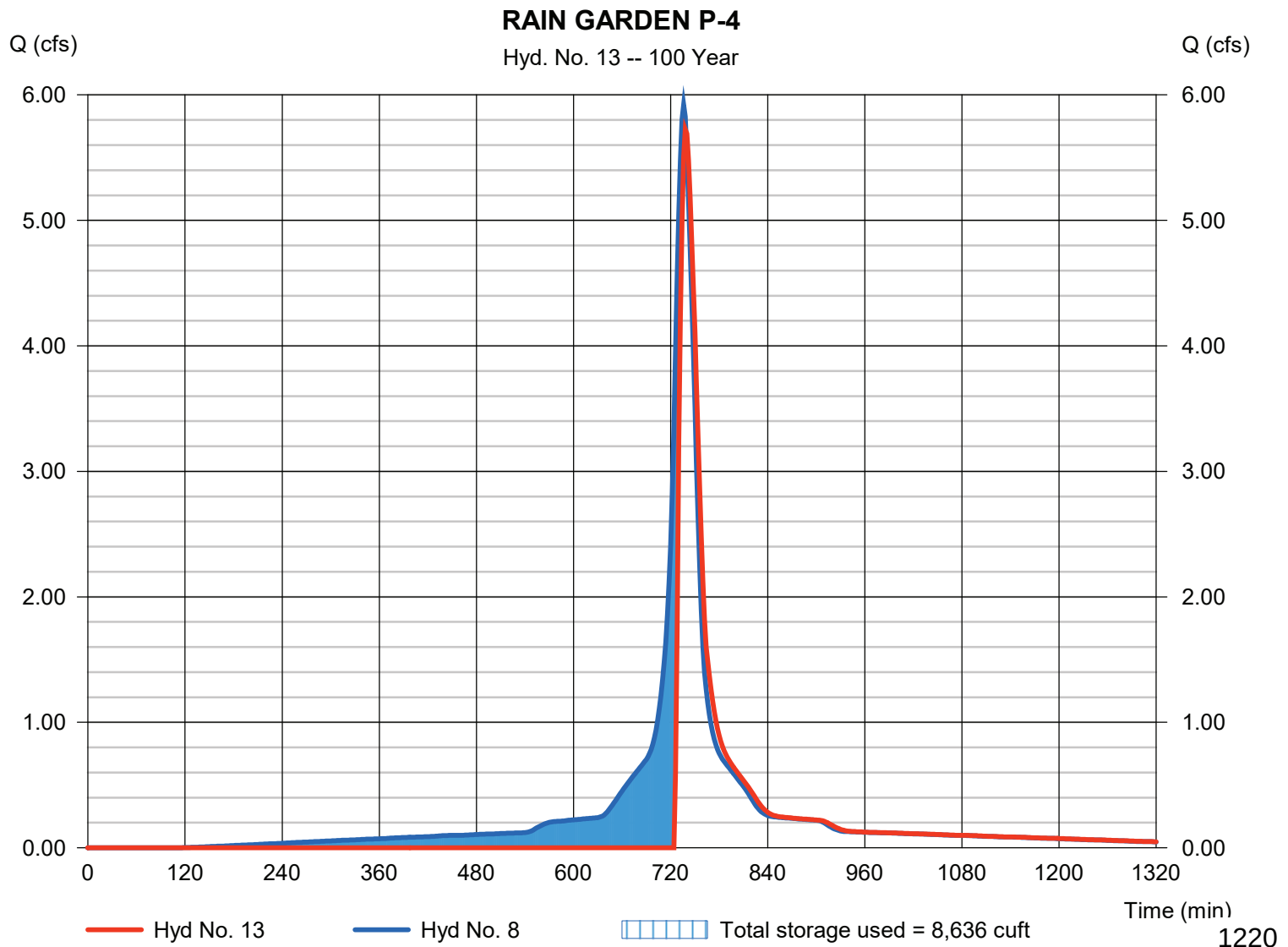
Thursday, 02 / 27 / 2020

Hyd. No. 13

RAIN GARDEN P-4

Hydrograph type	= Reservoir	Peak discharge	= 5.725 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 15,457 cuft
Inflow hyd. No.	= 8 - P-4	Max. Elevation	= 840.93 ft
Reservoir name	= RAIN GARDEN P-4	Max. Storage	= 8,636 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 15

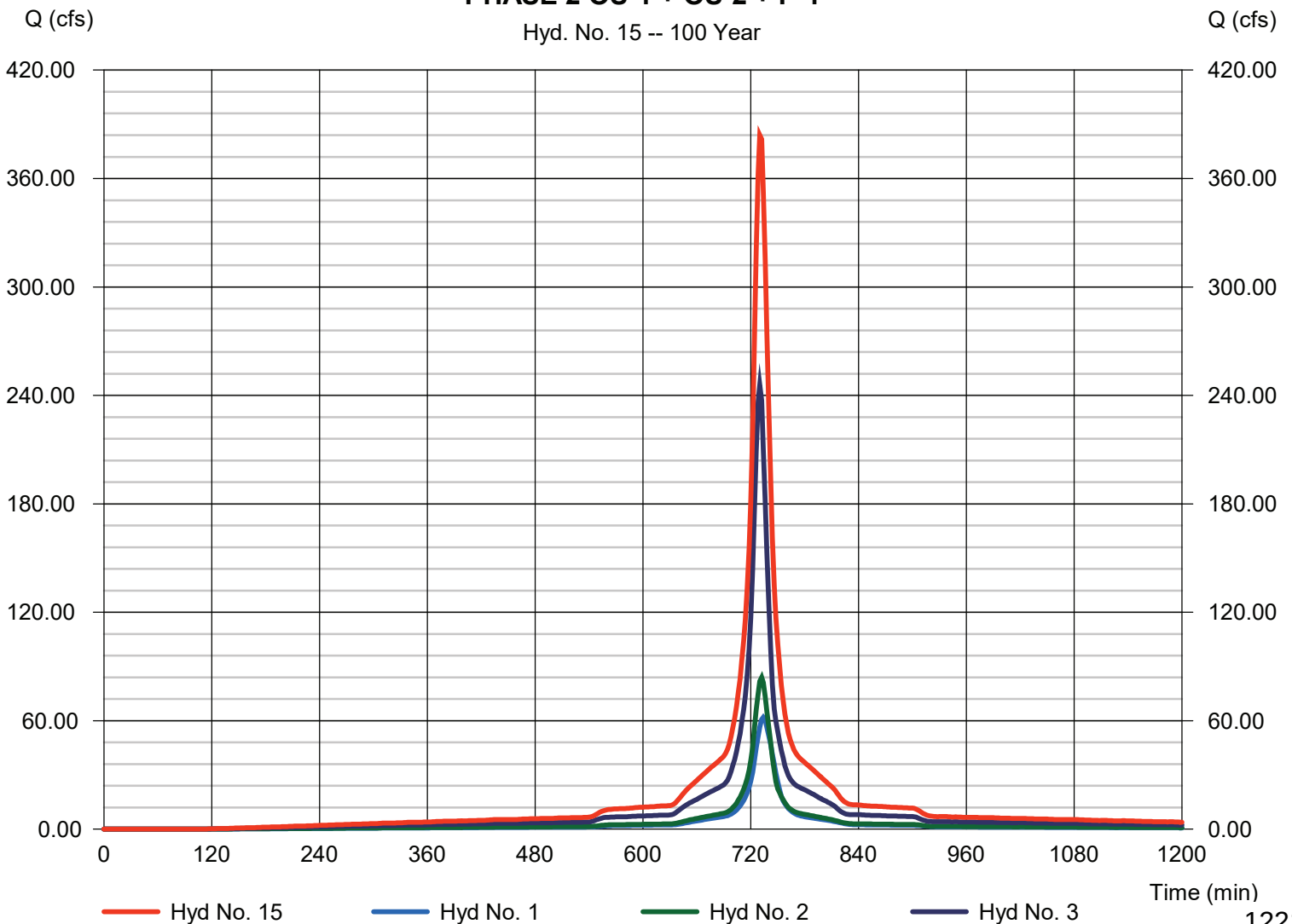
PHASE 2 OS-1 + OS-2 + P-1

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 1, 2, 3

Peak discharge = 383.96 cfs
Time to peak = 730 min
Hyd. volume = 1,221,302 cuft
Contrib. drain. area = 55.916 ac

PHASE 2 OS-1 + OS-2 + P-1

Hyd. No. 15 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

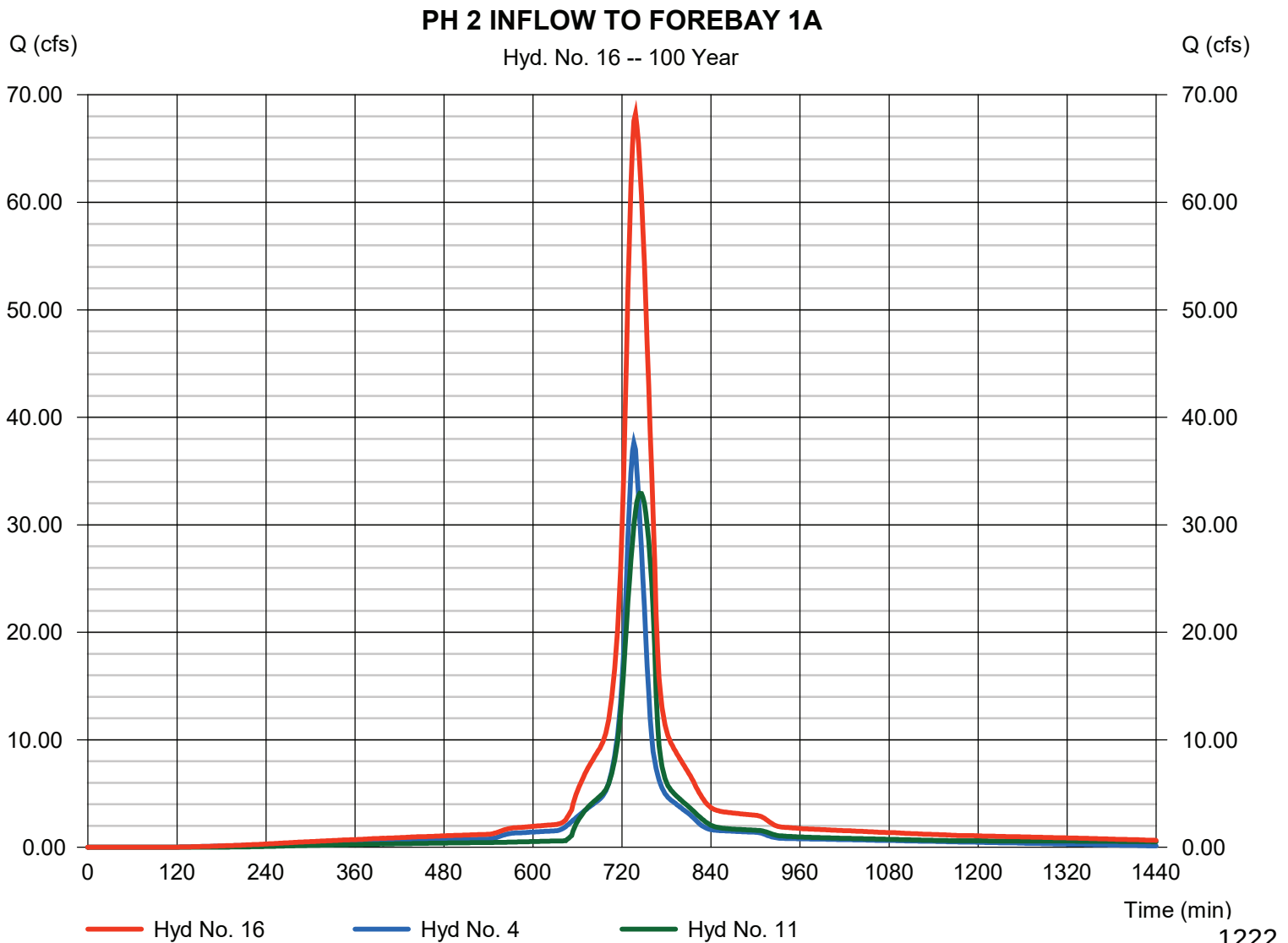
Thursday, 02 / 27 / 2020

Hyd. No. 16

PH 2 INFLOW TO FOREBAY 1A

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 4, 11

Peak discharge = 68.23 cfs
Time to peak = 738 min
Hyd. volume = 307,153 cuft
Contrib. drain. area = 6.607 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

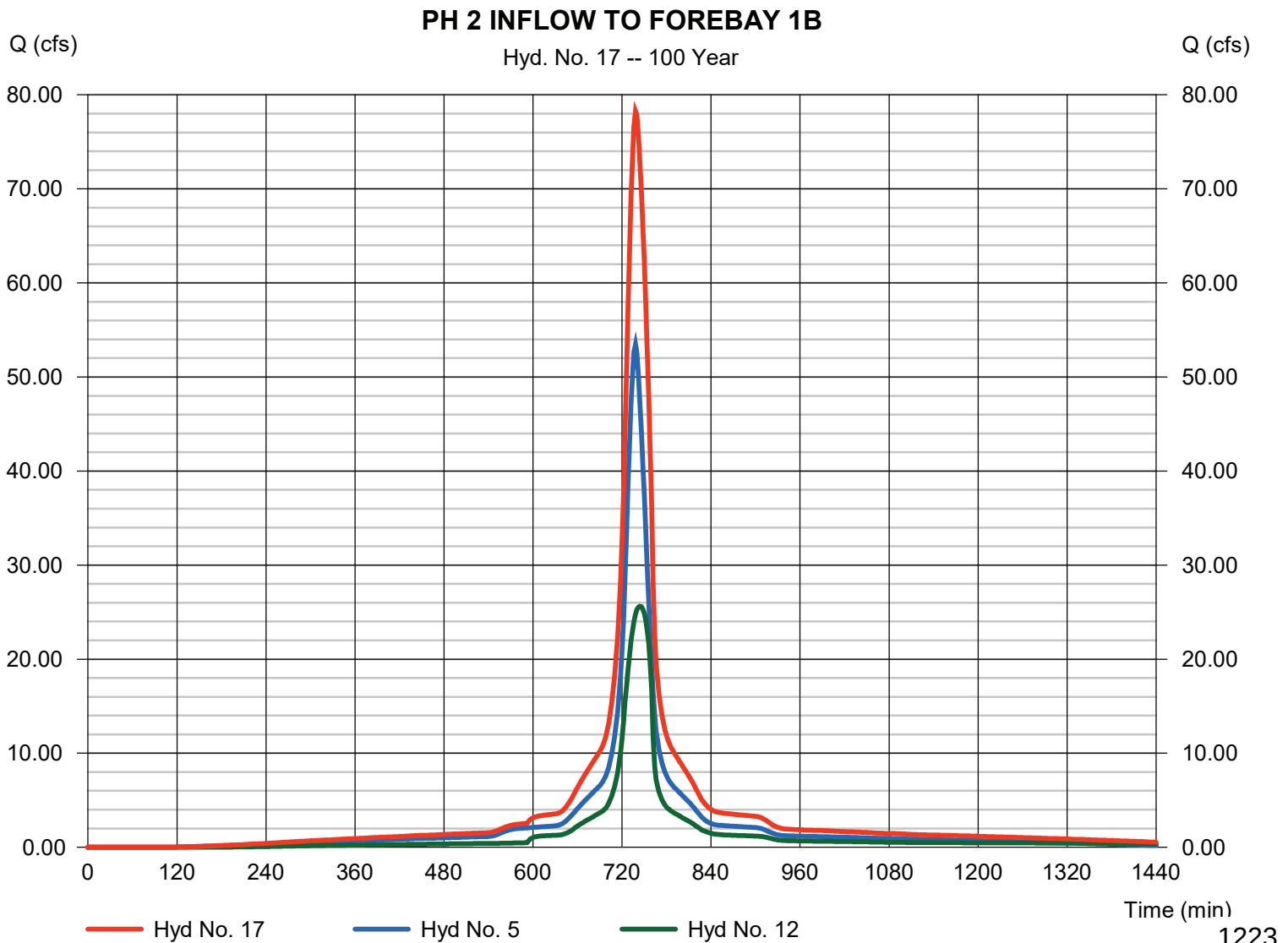
Thursday, 02 / 27 / 2020

Hyd. No. 17

PH 2 INFLOW TO FOREBAY 1B

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 5, 12

Peak discharge = 78.26 cfs
 Time to peak = 738 min
 Hyd. volume = 339,533 cuft
 Contrib. drain. area = 10.224 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

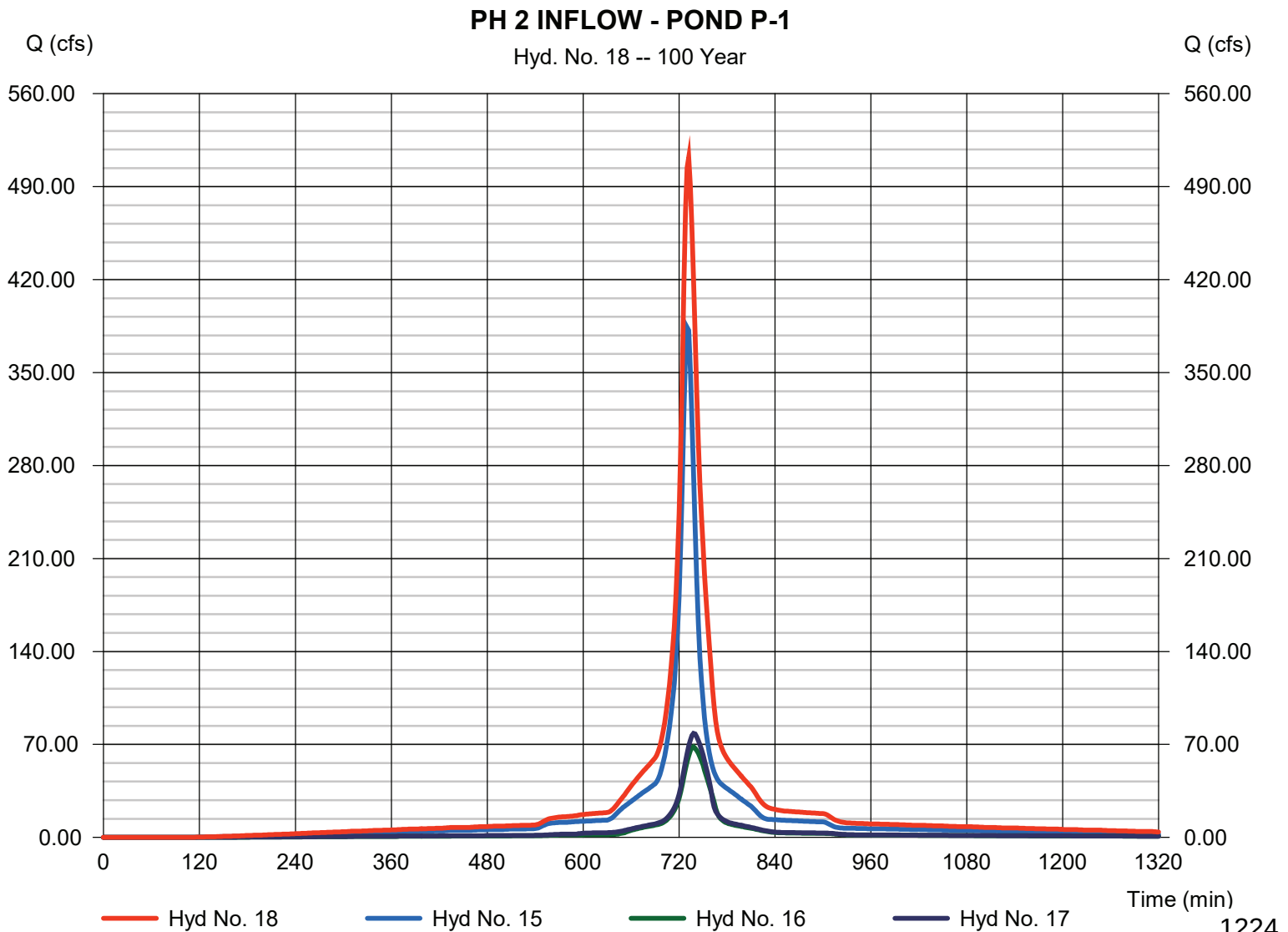
Thursday, 02 / 27 / 2020

Hyd. No. 18

PH 2 INFLOW - POND P-1

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 15, 16, 17

Peak discharge = 512.01 cfs
Time to peak = 732 min
Hyd. volume = 1,867,988 cuft
Contrib. drain. area = 0.000 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Hyd. No. 19

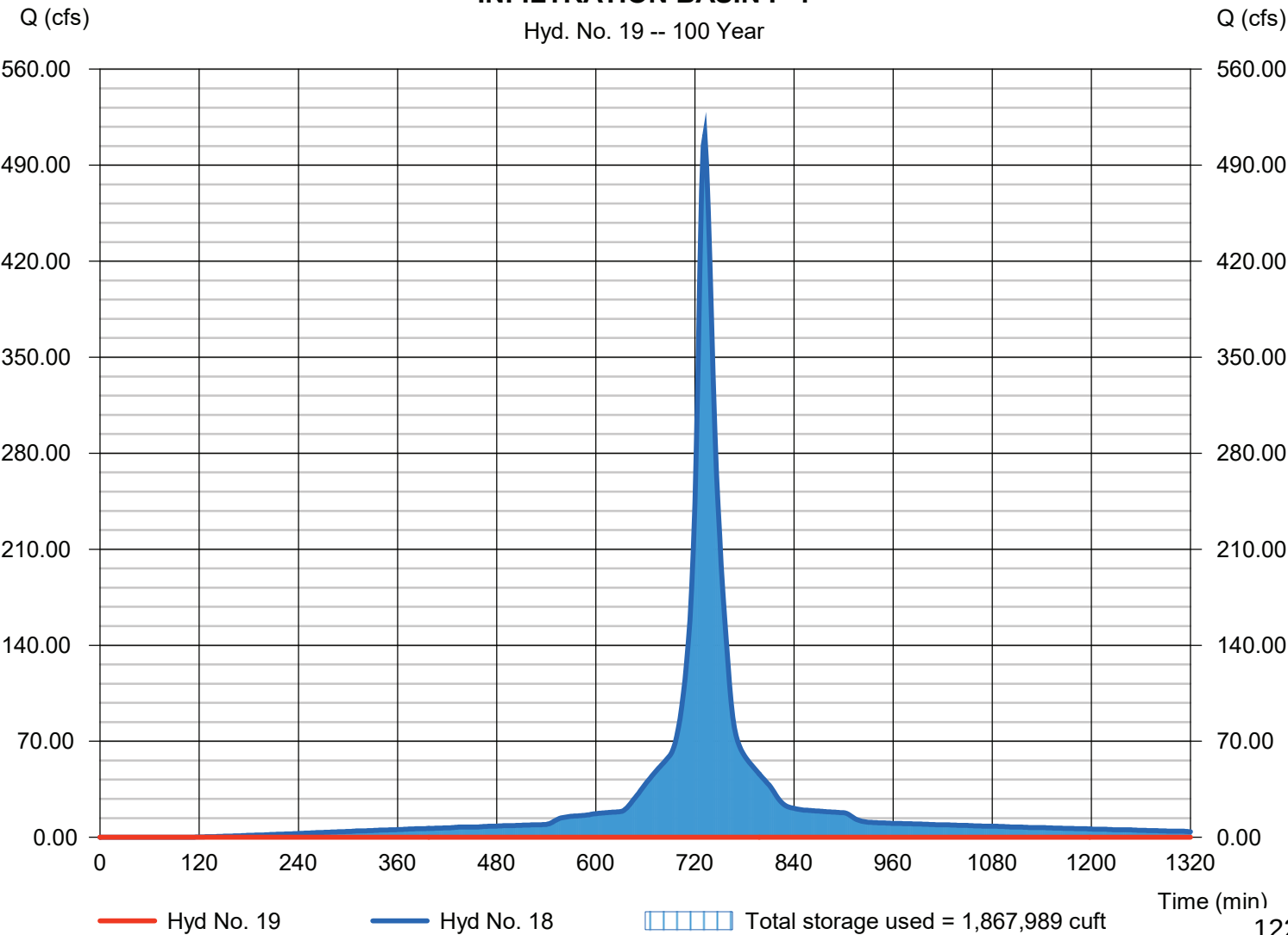
INFILTRATION BASIN P-1

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 18 - PH 2 INFLOW - POND P-1	Max. Elevation	= 841.36 ft
Reservoir name	= INFILTRATION BASIN P-1-PH 2	Max. Storage	= 1,867,989 cuft

Storage Indication method used.

INFILTRATION BASIN P-1

Hyd. No. 19 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

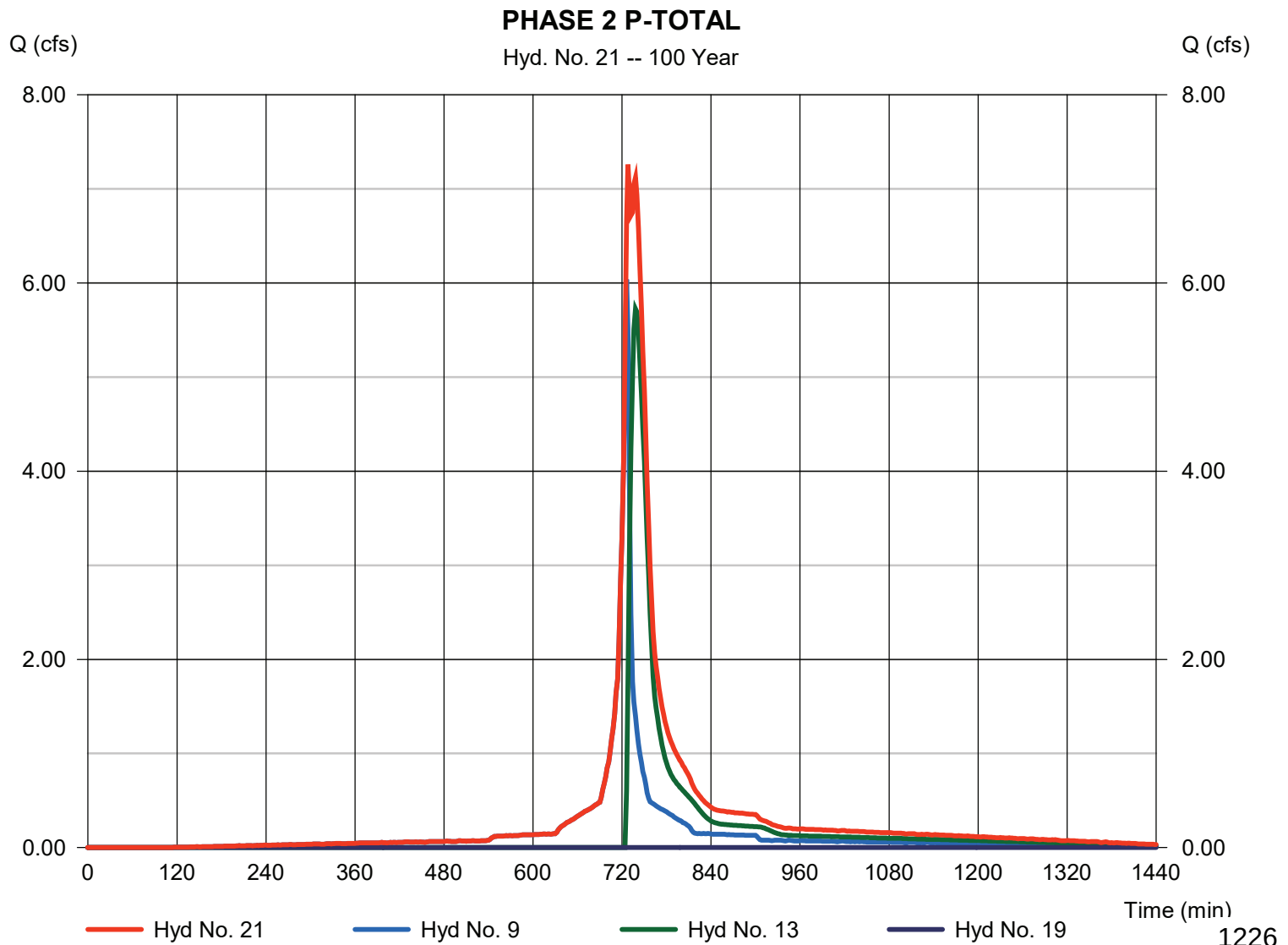
Thursday, 02 / 27 / 2020

Hyd. No. 21

PHASE 2 P-TOTAL

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 9, 13, 19

Peak discharge = 7.259 cfs
 Time to peak = 728 min
 Hyd. volume = 29,005 cuft
 Contrib. drain. area = 0.670 ac



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 02 / 27 / 2020

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	22.8367	5.6000	0.7338	-----
2	25.4674	5.2000	0.7159	-----
3	0.0000	0.0000	0.0000	-----
5	30.5439	4.9000	0.7023	-----
10	33.5363	4.6000	0.6850	-----
25	36.2566	4.0000	0.6589	-----
50	35.2584	3.1000	0.6226	-----
100	34.0002	2.2000	0.5870	-----

File name: WAUKESHA ATLAS 14 IDF.IDF

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.04	3.04	2.48	2.11	1.85	1.66	1.51	1.38	1.28	1.20	1.12	1.06
2	4.83	3.63	2.96	2.53	2.22	1.99	1.81	1.66	1.54	1.44	1.36	1.28
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	6.11	4.58	3.74	3.19	2.81	2.52	2.29	2.11	1.96	1.83	1.72	1.63
10	7.12	5.35	4.37	3.74	3.29	2.96	2.70	2.49	2.31	2.17	2.04	1.93
25	8.52	6.37	5.21	4.47	3.94	3.55	3.24	3.00	2.79	2.62	2.47	2.34
50	9.59	7.11	5.81	4.99	4.42	3.99	3.66	3.39	3.16	2.97	2.81	2.67
100	10.67	7.83	6.40	5.51	4.89	4.43	4.07	3.78	3.54	3.34	3.16	3.01

Tc = time in minutes. Values may exceed 60.

gn Standards\Hydrology\Hydraflow UPDATED ATLAS 14\STATIONS\WAUKESHA\WAUKESHA ATLAS 14 Precip.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	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	2.40	2.70	0.00	0.00	3.81	4.65	0.00	6.18

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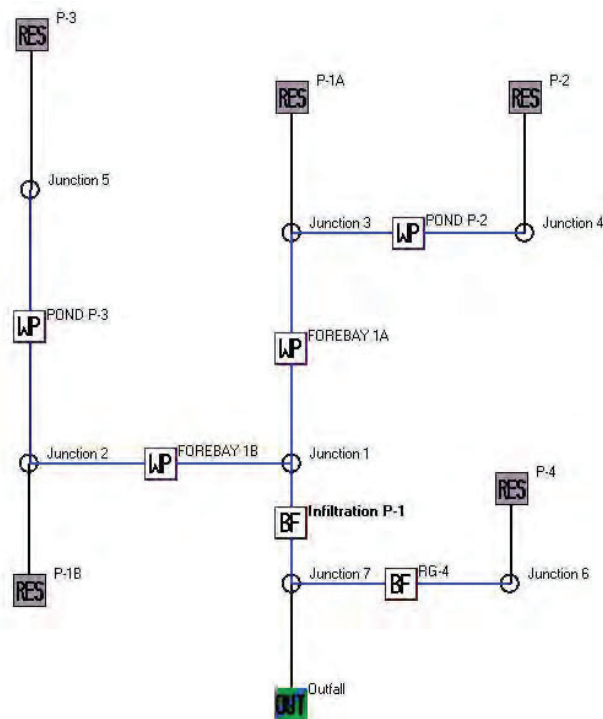
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APPENDIX 9

WinSlamm Input/Output File

Modeling of Proposed Rain Garden, Wet Ponds & Forebays



Phase 1

INPUT DATA

Data file name: L:\LOBBYS\WPDOCS\DOCUMENT\966\14023-02 CHAPMAN-Mukwonago\284-Storm Water Management Plan\WinSlamm Calculation\2019-06-28_Phase 1_WinSlamm Calc.mdb

WinSLAMM Version 10.4.0

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdX

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations

Seed for random number generator: -42

Study period starting date: 01/01/81 Study period ending date: 12/31/81

Start of Winter Season: 12/02 End of Winter Season: 03/12

Date: 06-28-2019 Time: 10:23:06

Site information:

LU# 1 - Residential: P-1A Total area (ac): 3.486

45 - Large Landscaped Areas 1: 3.486 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Residential: P-1B Total area (ac): 5.501

1 - Roofs 1: 0.289 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.083 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.092 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 0.667 ac. Smooth Street Length = 0.268 curb-mi Street Width (assuming two curb-mi per street mile) = 41.0653 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 4.370 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Residential: P-2 Total area (ac): 6.709

1 - Roofs 1: 1.288 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.348 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.278 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 0.583 ac. Smooth Street Length = 0.24 curb-mi Street Width (assuming two curb-mi per street mile) = 40.08125 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 4.128 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.084 ac. Source Area PSD File: C:\WinSLAMM Files\Residential Land Use

LU# 4 - Residential: P-3 Total area (ac): 6.256

1 - Roofs 1: 1.288 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.412 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.278 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 0.655 ac. Smooth Street Length = 0.27 curb-mi Street Width (assuming two curb-mi per street mile) = 40.02777 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 3.561 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.062 ac. Source Area PSD File: C:\WinSLAMM Files\Residential Land Use

LU# 5 - Residential: P-4 Total area (ac): 1.043

1 - Roofs 1: 0.468 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.101 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.474 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - POND P-3

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 20
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 8.7

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 6.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0010	0.00	0.00
2	1.00	0.0020	0.00	0.00
3	2.00	0.0060	0.00	0.00
4	3.00	0.0110	0.00	0.00
5	4.00	0.0170	0.00	0.00
6	5.00	0.0620	0.00	0.00
7	6.00	0.0850	0.00	0.00
8	7.00	0.1110	0.00	0.00
9	8.00	0.1390	0.00	0.00
10	9.00	0.1699	0.00	0.00
11	10.00	0.4591	0.00	0.00

Control Practice 2: Wet Detention Pond CP# 2 (DS) - POND P-2

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 20
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 7.9

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 4

2. Stand pipe height above datum (ft): 7.25

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0080	0.00	0.00
2	1.00	0.0130	0.00	0.00
3	2.00	0.0180	0.00	0.00
4	3.00	0.0240	0.00	0.00
5	4.00	0.0320	0.00	0.00
6	5.00	0.0840	0.00	0.00
7	6.00	0.1220	0.00	0.00
8	7.00	0.1590	0.00	0.00
9	8.00	0.1980	0.00	0.00
10	9.00	0.2390	0.00	0.00
11	10.00	0.3304	0.00	0.00
12	11.00	0.4591	0.00	0.00

Control Practice 3: Wet Detention Pond CP# 3 (DS) - FOREBAY 1B

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 25
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 7

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 5
2. Stand pipe height above datum (ft): 6.2

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0150	0.00	0.00
2	1.00	0.0210	0.00	0.00
3	2.00	0.0290	0.00	0.00
4	3.00	0.0390	0.00	0.00
5	4.00	0.0500	0.00	0.00
6	5.00	0.1240	0.00	0.00
7	5.50	0.1420	0.00	0.00
8	6.50	0.1790	0.00	0.00
9	7.50	0.2190	0.00	0.00
10	8.50	0.2650	0.00	0.00
11	9.50	0.3655	0.00	0.00

12	10.50	0.4659	0.00	0.00
13	11.50	0.6057	0.00	0.00

Control Practice 4: Wet Detention Pond CP# 4 (DS) - FOREBAY 1A

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 6.5

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 5
2. Stand pipe height above datum (ft): 5.8

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0030	0.00	0.00
2	1.00	0.0060	0.00	0.00
3	2.00	0.0100	0.00	0.00
4	3.00	0.0150	0.00	0.00
5	4.00	0.0210	0.00	0.00
6	5.00	0.0690	0.00	0.00
7	6.00	0.0930	0.00	0.00
8	7.00	0.1200	0.00	0.00
9	8.00	0.1529	0.00	0.00
10	9.00	0.1770	0.00	0.00
11	10.00	0.1976	0.00	0.00
12	11.00	0.2184	0.00	0.00

Control Practice 5: Biofilter CP# 1 (DS) - RG-4

1. Top area (square feet) = 8331
2. Bottom area (square feet) = 2706
3. Depth (ft): 2.7
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 1.63
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0

12. Engineered soil depth (ft) = 0
 13. Engineered soil porosity = 0
 14. Percent solids reduction due to flow through engineered soil = 0
 15. Biofilter peak to average flow ratio = 3.8
 16. Number of biofiltration control devices = 1
 17. Particle size distribution file: Not needed - calculated by program
 18. Initial water surface elevation (ft): 0
- Soil Data Soil Type Fraction in Eng. Soil
- Biofilter Outlet/Discharge Characteristics:
- Outlet type: Broad Crested Weir
1. Weir crest length (ft): 20
 2. Weir crest width (ft): 10
 3. Height of datum to bottom of weir opening: 1.7

Control Practice 6: Biofilter CP# 2 (DS) - Infiltration P-1

1. Top area (square feet) = 329855
 2. Bottom area (square feet) = 14687
 3. Depth (ft): 13
 4. Biofilter width (ft) - for Cost Purposes Only: 10
 5. Infiltration rate (in/hr) = 0.5
 6. Random infiltration rate generation? No
 7. Infiltration rate fraction (side): 1
 8. Infiltration rate fraction (bottom): 1
 9. Depth of biofilter that is rock filled (ft) 0
 10. Porosity of rock filled volume = 0
 11. Engineered soil infiltration rate: 0
 12. Engineered soil depth (ft) = 0
 13. Engineered soil porosity = 0
 14. Percent solids reduction due to flow through engineered soil = 0
 15. Biofilter peak to average flow ratio = 3.8
 16. Number of biofiltration control devices = 1
 17. Particle size distribution file: Not needed - calculated by program
 18. Initial water surface elevation (ft): 0
- Soil Data Soil Type Fraction in Eng. Soil
- Biofilter Outlet/Discharge Characteristics:
- Outlet type: Broad Crested Weir
1. Weir crest length (ft): 10
 2. Weir crest width (ft): 10
 3. Height of datum to bottom of weir opening: 12.99

OUTPUT SUMMARY

SLAMM for Windows Version 10.4.0
(c) Copyright Robert Pitt and John Voorhees 2012
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Data file name: L:\LOBBYS\WPDOCS\DOCUMENT\966\14023-02 CHAPMAN-Mukwonago\284-Storm Water Management Plan\WinSlamm Calculation\2019-06-28_Phase 1_WinSlamm Calc.mdb

Data file description:

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN

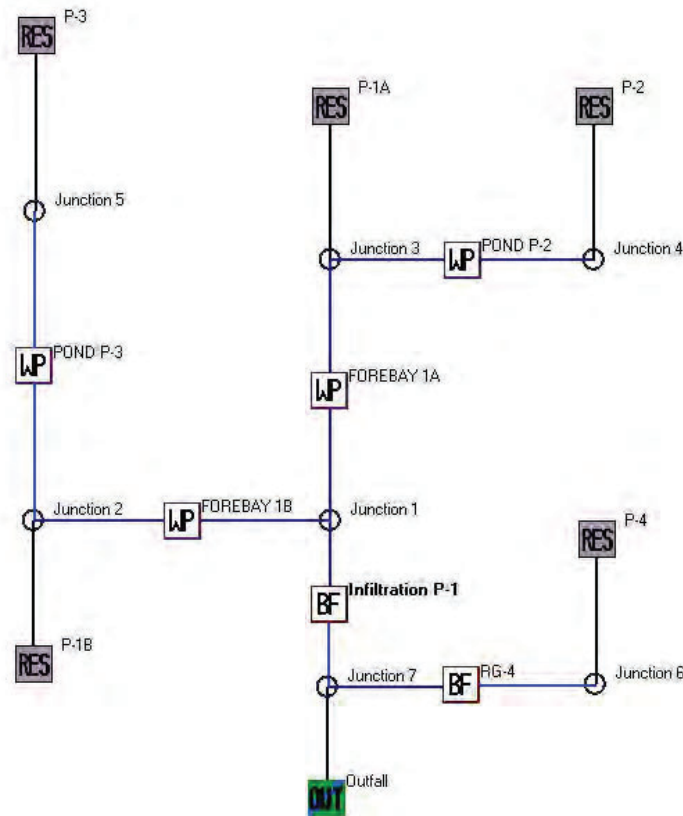
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppd
Start of Winter Season: 12/02 End of Winter Season: 03/12
Model Run Start Date: 01/01/81 Model Run End Date: 12/31/81
Date of run: 06-28-2019 Time of run: 10:22:55
Total Area Modeled (acres): 22.995
Years in Model Run: 1.00

Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
-----------------------------	--	--	---	---

Total of all Land Uses without Controls:	371126	-	152.9	3543	-
Outfall Total with Controls:	0	100.00%	0	0	100.00%
Annualized Total After Outfall Controls:	0		0		

Pollutant Percent	Concentration - No Controls	Concentration - With Controls	Conc. Units	Pollutant Yield No Controls	Pollutant Yield With Controls	Pol. Yield Units
Particulate Solids	152.9	0	mg/L	3543	0	lbs 100.00 %
Particulate Phosphorus	0.4937	0	mg/L	11.44	0	lbs 100.00 %
Filterable Phosphorus	0.2433	0	mg/L	5.637	0	lbs 100.00 %
Total Phosphorus	0.7370	0	mg/L	17.08	0	lbs 100.00 %

Col. #:	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Control Practice No.	Control Practice Type	Control Practice Name or Location	Total Inflow Volume (cf)	Total Outflow Volume (cf)	Percent Volume Reduction	Total Influent Load (lbs)	Total Effluent Load (lbs)	Percent Load Reduction	Flow Weighted Influent Conc (mg/L)	Flow Weighted Effluent Conc (mg/L)	Percent Conc. Reduction	Influent Median Part. Size (microns)	Effluent Median Part. Size (microns)	Notes	Maximum Flushing Ratio	Maximum Peak Reduction Factor	Maximum Stage (ft)	Hydraulic Volume Out (cf)
1	Wet Detention Pond	POND P-3	126910	127217	-0.242	1141	362.6	68.22	144.0	45.65	68.308	7.80	2.25	No Pond Overflows	6.6	0.89	6.62	127217
2	Wet Detention Pond	POND P-2	121650	121940	-0.238	1090	285.1	73.84	143.5	37.45	73.903	7.80	1.95	No Pond Overflows	3.4	0.90	6.83	121940
3	Wet Detention Pond	FOREBAY 1B	221354	221545	-0.0863	1312	538.7	58.94	94.95	38.95	58.976	4.87	1.95	No Pond Overflows	3.9	0.90	6.34	221545
4	Wet Detention Pond	FOREBAY 1A	143822	143829	-0.00487	595.2	381.7	35.87	66.29	42.51	35.872	2.96	2.00	No Pond Overflows	6.8	0.71	5.86	143829
5	Biofilter	RG-4	6547	0	100.0	51.92	0	100.0	127.0	0	100.000	7.80	0.00	No Biofilter Overflows			0.10	0
6	Biofilter	Infiltration P-1	365374	0	100.0	320.4	0	100.0	40.35	0	100.000	1.97	0.00	No Biofilter Overflows			1.72	0



Phase 2

INPUT DATA

Data file name: L:\LOBBYS\WPDOCS\DOCUMENT\966\14023-02 CHAPMAN-Mukwonago\284-Storm Water Management Plan\2020-02-27_WinSlamm Calculation\2020-02-27_Phase 2_WinSlamm Calc.mdb

WinSLAMM Version 10.4.1

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdX

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

Seed for random number generator: -42

Study period starting date: 01/01/81 Study period ending date: 12/31/81

Start of Winter Season: 12/02 End of Winter Season: 03/12

Date: 02-27-2020 Time: 16:53:49

Site information:

LU# 1 - Residential: P-1A Total area (ac): 6.607

1 - Roofs 1: 0.992 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.537 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.401 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 1.100 ac. Smooth Street Length = 0.454 curb-mi Street Width (assuming two curb-mi per street mile) = 39.97797 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 3.509 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.068 ac. Source Area PSD File: C:\WinSLAMM Files\Residential Land Use

LU# 2 - Residential: P-1B Total area (ac): 10.224

1 - Roofs 1: 1.359 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.455 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.440 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 0.413 ac. Smooth Street Length = 0.268 curb-mi Street Width (assuming two curb-mi per street mile) = 25.42724 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 7.433 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.124 ac. Source Area PSD File: C:\WinSLAMM Files\Residential Land Use

LU# 3 - Residential: P-2 Total area (ac): 7.385

1 - Roofs 1: 1.706 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.348 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.355 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 0.583 ac. Smooth Street Length = 0.24 curb-mi Street Width (assuming two curb-mi per street mile) = 40.08125 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 4.309 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.084 ac. Source Area PSD File: C:\WinSLAMM Files\Residential Land Use

LU# 4 - Residential: P-3 Total area (ac): 5.579

1 - Roofs 1: 1.164 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 25 - Driveways 1: 0.412 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 31 - Sidewalks 1: 0.248 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 37 - Streets 1: 0.655 ac. Smooth Street Length = 0.27 curb-mi Street Width (assuming two curb-mi per street mile) = 40.02777 ft
 Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 45 - Large Landscaped Areas 1: 3.038 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 70 - Water Body Areas: 0.062 ac. Source Area PSD File: C:\WinSLAMM Files\Residential Land Use

LU# 5 - Residential: P-4 Total area (ac): 1.043

1 - Roofs 1: 0.468 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 31 - Sidewalks 1: 0.101 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 45 - Large Landscaped Areas 1: 0.474 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - POND P-3

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 20
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 8.7

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 6.5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0010	0.00	0.00
2	1.00	0.0020	0.00	0.00

3	2.00	0.0060	0.00	0.00
4	3.00	0.0110	0.00	0.00
5	4.00	0.0170	0.00	0.00
6	5.00	0.0620	0.00	0.00
7	6.00	0.0850	0.00	0.00
8	7.00	0.1110	0.00	0.00
9	8.00	0.1390	0.00	0.00
10	9.00	0.1699	0.00	0.00
11	10.00	0.4591	0.00	0.00

Control Practice 2: Wet Detention Pond CP# 2 (DS) - POND P-2

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 20
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 7.9

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 7.25

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0080	0.00	0.00
2	1.00	0.0130	0.00	0.00
3	2.00	0.0180	0.00	0.00
4	3.00	0.0240	0.00	0.00
5	4.00	0.0320	0.00	0.00
6	5.00	0.0840	0.00	0.00
7	6.00	0.1220	0.00	0.00
8	7.00	0.1590	0.00	0.00
9	8.00	0.1980	0.00	0.00
10	9.00	0.2390	0.00	0.00
11	10.00	0.3304	0.00	0.00
12	11.00	0.4591	0.00	0.00

Control Practice 3: Wet Detention Pond CP# 3 (DS) - FOREBAY 1B

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 25
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 7

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 5
2. Stand pipe height above datum (ft): 6.2

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0150	0.00	0.00
2	1.00	0.0210	0.00	0.00
3	2.00	0.0290	0.00	0.00
4	3.00	0.0390	0.00	0.00
5	4.00	0.0500	0.00	0.00
6	5.00	0.1240	0.00	0.00
7	5.50	0.1420	0.00	0.00
8	6.50	0.1790	0.00	0.00
9	7.50	0.2190	0.00	0.00
10	8.50	0.2650	0.00	0.00
11	9.50	0.3655	0.00	0.00
12	10.50	0.4659	0.00	0.00
13	11.50	0.6057	0.00	0.00

Control Practice 4: Wet Detention Pond CP# 4 (DS) - FOREBAY 1A

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 6.5

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 5
2. Stand pipe height above datum (ft): 5.8

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0030	0.00	0.00
2	1.00	0.0060	0.00	0.00
3	2.00	0.0100	0.00	0.00
4	3.00	0.0150	0.00	0.00
5	4.00	0.0210	0.00	0.00
6	5.00	0.0690	0.00	0.00
7	6.00	0.0930	0.00	0.00
8	7.00	0.1200	0.00	0.00
9	8.00	0.1529	0.00	0.00
10	9.00	0.1770	0.00	0.00
11	10.00	0.1976	0.00	0.00
12	11.00	0.2184	0.00	0.00

Control Practice 5: Biofilter CP# 1 (DS) - RG-4

1. Top area (square feet) = 6823
2. Bottom area (square feet) = 2706
3. Depth (ft): 2.7
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 1.63
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0

- 15. Biofilter peak to average flow ratio = 3.8
- 16. Number of biofiltration control devices = 1
- 17. Particle size distribution file: Not needed - calculated by program
- 18. Initial water surface elevation (ft): 0
- Soil Data Soil Type Fraction in Eng. Soil
- Biofilter Outlet/Discharge Characteristics:
 - Outlet type: Broad Crested Weir
 - 1. Weir crest length (ft): 20
 - 2. Weir crest width (ft): 10
 - 3. Height of datum to bottom of weir opening: 1.7

Control Practice 6: Biofilter CP# 2 (DS) - Infiltratio P-1

- 1. Top area (square feet) = 280000
- 2. Bottom aea (square feet) = 51625
- 3. Depth (ft): 13
- 4. Biofilter width (ft) - for Cost Purposes Only: 10
- 5. Infiltration rate (in/hr) = 0.5
- 6. Random infiltration rate generation? No
- 7. Infiltration rate fraction (side): 1
- 8. Infiltration rate fraction (bottom): 1
- 9. Depth of biofilter that is rock filled (ft) 0
- 10. Porosity of rock filled volume = 0
- 11. Engineered soil infiltration rate: 0
- 12. Engineered soil depth (ft) = 0
- 13. Engineered soil porosity = 0
- 14. Percent solids reduction due to flow through engineered soil = 0
- 15. Biofilter peak to average flow ratio = 3.8
- 16. Number of biofiltration control devices = 1
- 17. Particle size distribution file: Not needed - calculated by program
- 18. Initial water surface elevation (ft): 0
- Soil Data Soil Type Fraction in Eng. Soil
- Biofilter Outlet/Discharge Characteristics:
 - Outlet type: Broad Crested Weir
 - 1. Weir crest length (ft): 10
 - 2. Weir crest width (ft): 10
 - 3. Height of datum to bottom of weir opening: 12.99

OUTPUT SUMMARY

SLAMM for Windows Version 10.4.1
(c) Copyright Robert Pitt and John Voorhees 2019, All Rights Reserved

Data file name: L:\LOBBYS\WPDOCS\DOCUMENT\966\14023-02 CHAPMAN-Mukwonago\284-Storm Water Management Plan\2020-02-27_WinSlamm Calculation\2020-02-27_Phase 2_WinSlamm Calc.mdb

Data file description:

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdX

Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

Seed for random number generator: -42

Start of Winter Season: 12/02 End of Winter Season: 03/12

Model Run Start Date: 01/01/81 Model Run End Date: 12/31/81

Date of run: 02-27-2020 Time of run: 16:53:30

Total Area Modeled (acres): 30.838

Years in Model Run: 1.00

Runoff Volume (cu ft) Percent Particulate Solids Reduction (mg/L) Particulate Solids Yield (lbs) Percent Particulate Solids Reduction

Total of all Land Uses without Controls: 570797 - 149.9 5343 -
Outfall Total with Controls: 0 100.00% 0 0 100.00%
Annualized Total After Outfall Controls: 0 0

Pollutant	Concentration - No Controls	Concentration - With Controls	Conc. Units	Pollutant Yield No Controls	Pollutant Yield With Controls	Pol. Yield Units
Percent Particulate Solids	149.9	0	mg/L	5343	0	lbs 100.00 %
Particulate Phosphorus	0.4560	0	mg/L	16.25	0	lbs 100.00 %
Filterable Phosphorus	0.2087	0	mg/L	7.436	0	lbs 100.00 %
Total Phosphorus	0.6647	0	mg/L	23.69	0	lbs 100.00 %

Site Description:													
Col. #:	2	3	4	5	6	7	8	9	10	11	12	13	14
Control Practice No.	Control Practice Type	Control Practice Name or Location	Total Inflow Volume (cf)	Total Outflow Volume (cf)	Percent Volume Reduction	Total Influent Load (lbs)	Total Effluent Load (lbs)	Percent Load Reduction	Flow Weighted Influent Conc (mg/L)	Flow Weighted Effluent Conc (mg/L)	Percent Conc. Reduction	Influent Median Part. Size (microns)	Effluent Median Part. Size (microns)
1	Wet Detention Pond	POND P-3	122661	122962	-0.245	1092	340.7	68.80	142.6	44.38	68.883	7.80	2.22
2	Wet Detention Pond	POND P-2	125893	126189	-0.235	1114	294.9	73.53	141.8	37.44	73.591	7.80	1.97
3	Wet Detention Pond	FOREBAY 1B	264338	264623	-0.108	1860	732.3	60.63	112.7	44.33	60.665	5.78	2.06
4	Wet Detention Pond	FOREBAY 1A	300509	300918	-0.136	1861	890.2	52.17	99.19	47.39	52.224	5.90	2.33
5	Biofilter	RG-4	6547	0	100.0	51.92	0	100.0	127.0	0	100.000	7.80	0.00
6	Biofilter	Infiltratio P-1	565541	0	100.0	1623	0	100.0	45.96	0	100.000	2.20	0.00

March 24, 2020

Mr. Dave Brown
Utility Director
Village of Mukwonago
440 River Crest Court
Mukwonago, WI 53149

RE: I-43 Elevated Tank Painting Final Payment

Dear Mr. Brown:

In accordance with the Contract Documents, the Contractor for this Project, The Osseo Construction Co., LLC, has submitted a final Application for Payment and has furnished the enclosed Contract-required items:

1. Maintenance and operating instructions for mechanical mixer.
2. Consent of Surety to Final Payment.
3. Releases or waivers of lien from first tier Subcontractors and Suppliers.
4. Certificate or other evidence of completed operations insurance.

You may want to have your legal counsel and insurance advisor review the respective lien waivers and insurance documents to verify legal effectiveness. If all are satisfactory, we recommend final payment, and give notice (enclosed), that the completed Work is acceptable subject to the provisions of General Conditions paragraph 15.07.

In accordance with paragraph 15.08 of the General Conditions, the Contractor is required to promptly repair or correct defective Work for a period of one year from the date of Substantial Completion which was July 16, 2019. You may wish to review the Project a month or so before the anniversary date to check for any warranty items. If we can be of assistance to you in this regard, please contact us.

Respectfully,

RUEKERT & MIELKE, INC.



Taryn S. Nall, P.E. (WI, MI, MN)
Senior Project Manager
tnall@ruekert-mielke.com

TSN:cal

Enclosures

cc: Jerad Wegner, Ruekert & Mielke, Inc.
The Osseo Construction Co., LLC (w/Notice of Acceptability)

Contractor's Application for Payment No. 7

To (Owner): Village of Mukwonago		Application Date: 2/17/2020		Application Period: 7/25/2019 - 2/17/2020	
Contact: Dave Brown cc: Judy Taubert and Diana Doherty		From (Contractor): The Osseo Construction Co., LLC		Via (Engineer): Ruekert & Melke, Inc.	
Project: I-43 Elevated Tank Painting		Contact: Timothy J. Popple, Owner		Contact: Taryn S. Nail, P.E.	
Address: 14248 10th Street Osseo, WI 54758		Address: 14248 10th Street Osseo, WI 54758		Address: W233 N2080 Ridgeway Parkway Waukesha, WI 53188	
Owner's Contract No.:		Contractor's Project No.:		Engineer's Project No.: 12-10095.300	

Change Order Summary

Approved Change Orders	Number	Additions	Deductions (Enter as Positive Number)
1	1	\$75,000.00	\$6,000.00
1	1	\$95,000.00	
1	1	\$91,000.00	
1	1	\$40,000.00	
1	1	\$5,000.00	
2	2	\$3,000.00	
3	3	\$3,633.00	
4	4	\$1,000.00	
TOTALS		\$231,000.00	\$88,633.00
NET CHANGE BY CHANGE ORDERS		\$142,367.00	

1. ORIGINAL CONTRACT PRICE	\$ 300,900.00
2. Net change by Change Orders	\$ 142,367.00
3. CURRENT CONTR, 1	\$ 443,267.00
4. TOTAL COMPLETED TO DATE (Column L Total on Progress Estimates)	\$ 443,267.00
5. RETAINAGE:	
a. X \$443,267.00 Work Completed	\$ -
6. RETAINAGE REDUCTION TO DATE (Enter as Positive Number)	\$ 443,267.00
7. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5a. + Line 6)	\$ 410,780.00
8. LESS PREVIOUS PAYMENTS (Line 7 from Prior Application)	\$ 32,487.00
9. AMOUNT DUE THIS APPLICATION	\$ 32,487.00

\$ 332,487.00

(Line 9 or other - attach explanation of the other amount)

Taryn S. Nail, P.E. (Engineer)

3/9/20

(Date)

Recommended by:

\$ (Line 9 or other - attach explanation of the other amount)

Payment of:

(Owner)

(Date)

Contractor's Certification

The undersigned Contractor certifies that to the best of its knowledge:

(1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment;

(2) title to all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner per Article 15 of the General Conditions; and

(3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By:

Taryn S. Nail

Date:

3-9-2020

Progress Estimate - Unit Price Work

Contractor's Application for Payment No. 7

1249

For (Project): 143 Elevated Tank Painting												
Application Date: 2/17/2020												
Application Period: 7/25/2019 - 2/17/2020												
Engineer's Project No.: 12-10095.300												
A	B	C	D	E	F	G	H	I	J	K	L	
Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Item Value (\$)	Work Completed Previously	Value of Work Installed (\$)	Estimated Quantity Installed	Value of Work Installed (\$)	Total Work Completed to Date	Value of Work Installed (\$)	
1	Repeats and modifications	LS	1.00	\$41,800.00	\$ 41,800.00	1.0000	\$ 41,800.00		\$ -	1.0000	\$ 41,800.00	
2	Exterior painting, from 2 feet above foundation to top	LS	1.00	\$87,000.00	\$ 87,000.00	0.2322	\$ 20,200.00	0.7678	\$ 66,800.00	1.0000	\$ 87,000.00	
3	Exterior painting, from foundation to 2 feet above foundation	LS	1.00	\$12,000.00	\$ 12,000.00	1.0000	\$ 12,000.00		\$ -	1.0000	\$ 12,000.00	
4	Wet interior painting	LS	1.00	\$116,000.00	\$ 116,000.00	1.0000	\$ 116,000.00		\$ -	1.0000	\$ 116,000.00	
5	Dry interior painting	LS	1.00	\$21,000.00	\$ 21,000.00	1.0000	\$ 21,000.00		\$ -	1.0000	\$ 21,000.00	
6	Pit filling	EA	1.00	\$1,000.00	\$ 1,000.00		\$ -		\$ -		\$ -	
7	Type A mechanical tank mixer	LS	1.00	\$19,000.00	\$ 19,000.00	0.5000	\$ 9,500.00	0.5000	\$ 9,500.00	1.0000	\$ 19,000.00	
8	Pressure transmitter enclosure and related work	LS	1.00	\$3,000.00	\$ 3,000.00		\$ -		\$ -		\$ -	
TOTAL BID ITEMS 1-8							\$ 220,600.00		\$ 76,300.00		\$ 296,900.00	
CHANGE ORDERS												
CO-1	Delete 3 coat system exterior painting	L.S.	1	\$ (75,000.00)	\$ (75,000.00)	1.0000	\$ (75,000.00)		\$ -	1.0000	\$ (75,000.00)	
CO-1	Reduce pressure washing work	L.S.	1	\$ (6,000.00)	\$ (6,000.00)	1.0000	\$ (6,000.00)		\$ -	1.0000	\$ (6,000.00)	
CO-1	Provide commercial blast SP-6 of exterior	L.S.	1	\$ 85,000.00	\$ 85,000.00	1.0000	\$ 85,000.00		\$ -	1.0000	\$ 85,000.00	
CO-1	Provide 4-coat system exterior painting	L.S.	1	\$ 91,000.00	\$ 91,000.00	0.8440	\$ 78,800.00	0.1560	\$ 14,200.00	1.0000	\$ 91,000.00	
CO-1	Provide tank containment	L.S.	1	\$ 40,000.00	\$ 40,000.00	1.0000	\$ 40,000.00		\$ -	1.0000	\$ 40,000.00	
CO-1	Pressure wash exterior of northside EST	L.S.	1	\$ 5,000.00	\$ 5,000.00		\$ -	1.0000	\$ 5,000.00	1.0000	\$ 5,000.00	
CO-2	Delete Bid No. 8 work "Pressure transmitter enclosure and related work" from the Contract	L.S.	1	\$ (3,000.00)	\$ (3,000.00)		\$ -		\$ -		\$ -	
CO-3	Extra professional services to address paint overspray	L.S.	1	\$ (3,633.00)	\$ (3,633.00)		\$ -	1.0000	\$ -3,633.00	1.0000	\$ (3,633.00)	
CO-4	Delete "pit filling" from the Bid No. 6 work	L.S.	1	\$ (1,000.00)	\$ (1,000.00)		\$ -		\$ -		\$ -	
TOTAL CHANGE ORDER ITEMS							\$ 130,800.00		\$ 15,567.00		\$ 146,367.00	
ADDITIONAL ITEMS												
				\$ -	\$ -		\$ -		\$ -		\$ -	
				\$ -	\$ -		\$ -		\$ -		\$ -	
TOTAL ADDITIONAL ITEMS							\$ -		\$ -		\$ -	
TOTAL ALL ITEMS							\$ 443,267.00		\$ 91,867.00		\$ 443,267.00	

NOTICE OF ACCEPTABILITY OF WORK

PROJECT: I-43 elevated Tank Painting
OWNER: Village of Mukwonago
CONTRACTOR: The Osseo Construction Co., LLC
EFFECTIVE DATE OF THE CONSTRUCTION CONTRACT: July 27, 2018
ENGINEER: Ruekert & Mielke, Inc.
NOTICE DATE: March 24, 2020

To: Village of Mukwonago
Owner

And To: The Osseo Construction Co., LLC
Contractor

From: Ruekert & Mielke, Inc.
Engineer

The Engineer hereby gives notice to the above Owner and Contractor that the completed Work furnished and performed by Contractor under the above Contract is acceptable expressly subject to the provisions of the related Contract Documents, the Agreement between Owner and Engineer for Professional Services and the terms and conditions set forth as follows:

CONDITIONS OF NOTICE OF ACCEPTABILITY OF WORK

The Notice of Acceptability of Work ("Notice") is expressly made subject to the following terms and conditions to which all those who receive said Notice and rely thereon agree:

1. This Notice is given with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.
2. This Notice reflects and is an expression of the professional judgment of Engineer.
3. This Notice is given as to the best of Engineer's knowledge, information, and belief as of the Notice Date.
4. This Notice is based entirely on and expressly limited by the scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Contractor's work) under Engineer's Agreement with Owner and under the Construction Contract referred to in this Notice, and applies only to facts that are within Engineer's knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under such Agreement and Construction Contract.
5. This Notice is not a guarantee or warranty of Contractor's performance under the Construction Contract referred to in this Notice, nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents.

By: Taryn S. Nall, P.E.

Title: Senior Project Manager

Dated: March 24, 2020

1250

AFFIDAVIT OF TOTAL RELEASE AND CERTIFICATION OF ALL BILLS PAID

THE UNDERSIGNED hereby certifies that he (or she) has examined and is authorized and empowered to execute this Affidavit as the owner, partner, or office as the case may be, of the contractor named below ("the Contractor") employed in connection with the construction project ("the Project") mentioned below.

In consideration for the full and final payment to the Contractor for all services in connection with the Project, the Contractor hereby releases and waives all liens and claims to liens which the Contractor may have on or affecting the Project or Project property as a result of the Contractor's contract(s) for the Project or for performing labor and/or furnishing materials that are in any way connected with any construction of any building(s) or improvement(s) for the Project whether on the Project property or elsewhere. The Contractor further certifies and warrants that all subcontractors of labor and/or materials supplied to, for, through or at the direct or indirect request of the Contractor and/or subcontractor have been paid.

1. The Osseo Construction Co. LLC
(Print or type the firm or individual name of the Contractor)
2. 14248 10th St. P.O. Box 143 Osseo, WI 54758
(Print or type the Contractor's address)
3. Timothy J. Popple
(Print or type the name of the person signing for the Contractor)
4. Owner
(Print or type the position of the person signing for the Contractor)
5. Description of the Project (use an additional page, if necessary): Village of Mukwonago, WI
I-43 Elevated Tank Painting 12-10095.200
6. Date that the project was totally completed: 7-31-2019

The undersigned certifies that the foregoing information is true and correct and acknowledges that the owner of the Project has placed a material reliance on such information in directing final payment to the Contractor.

EXECUTED this 28th day of February, 2020.

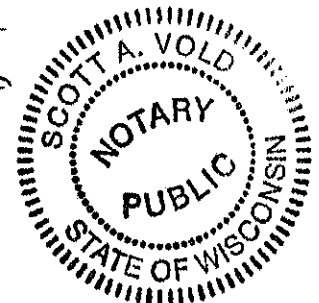
Timothy J. Popple
(To be signed by the person shown in Item 3 above)

Subscribed and sworn before me this 28th day of February, 2020.

Notary Public: Scott A. Vold

My Commission Expires: 2-24-22

END OF AFFIDAVIT



WAIVER AND RELEASE OF LIEN

WHEREAS the undersigned,

Badger Stainless, Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER OR SUBCONTRACTOR

has furnished to The Osseo Construction Co. LLC the following:

NAME OF CONTRACTOR

Steel + Structural material

for

KIND OF MATERIAL AND SERVICES FURNISHED

use in the construction of a project belonging to

The Village of Mukwonago, WI

NAME OF OWNER

NOW, THEREFORE, the undersigned,

Badger Stainless, Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER, OR SUBCONTRACTOR

\$8,910.50

for and in consideration of \$ _____ and other good and valuable consideration, the receipt whereof is hereby acknowledged, do(es) hereby waive and release any and all liens, or right to or claim of lien, on the above described project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or for the account of

said The Osseo Construction Co. LLC for said project.

NAME OF CONTRACTOR

Given under my (our) hand(s) and seal(s) this 27th day of February, 2020.

Badger Stainless Inc

Name of Manufacturer, Material Supplier, or Subcontractor

By

Kathleen Heston CFO

President/Authorized Officer

This Waiver and Release of Lien must be signed with the full name of the Manufacturer, Material Supplier, or Subcontractor. If the Manufacturer, Material Supplier, or Subcontractor is a partnership, this Waiver and Release of Lien must be signed in the partnership name by a partner. If the Manufacturer, Material Supplier, or Subcontractor is a corporation, this Waiver and Release of Lien must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the Corporation.

WAIVER AND RELEASE OF LIEN

WHEREAS the undersigned,

Abrasives inc.

NAME OF MANUFACTURER, MATERIAL SUPPLIER OR SUBCONTRACTOR

has furnished to The Osseo Construction Co. LLC the following:

NAME OF CONTRACTOR

Abrasives material

for

KIND OF MATERIAL AND SERVICES FURNISHED

use in the construction of a project belonging to

Village of Mukwonago, WI

NAME OF OWNER

NOW, THEREFORE, the undersigned,

Abrasives inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER, OR SUBCONTRACTOR

for and in consideration of \$ \$11,906.11 and other good and valuable consideration, the receipt whereof is hereby acknowledged, do(es) hereby waive and release any and all liens, or right to or claim of lien, on the above described project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or for the account of

said The Osseo Construction Co. LLC for said project.

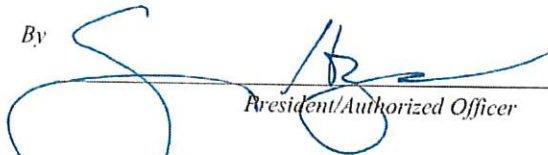
NAME OF CONTRACTOR

Given under my (our) hand(s) and seal(s) this 18 day of November, 2019.

ABRASIVES INC

Name of Manufacturer, Material Supplier, or Subcontractor

By



President/Authorized Officer

This Waiver and Release of Lien must be signed with the full name of the Manufacturer, Material Supplier, or Subcontractor. If the Manufacturer, Material Supplier, or Subcontractor is a partnership, this Waiver and Release of Lien must be signed in the partnership name by a partner. If the Manufacturer, Material Supplier, or Subcontractor is a corporation, this Waiver and Release of Lien must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the Corporation.

WAIVER AND RELEASE OF LIEN

WHEREAS the undersigned,

General Construction Services, Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER OR SUBCONTRACTOR

has furnished to The Osseo Construction Co. LLC the following:

NAME OF CONTRACTOR

Structural materials for

KIND OF MATERIAL AND SERVICES FURNISHED

use in the construction of a project belonging to

The Village of Mukwonago, WI

NAME OF OWNER

NOW, THEREFORE, the undersigned,

General Construction Services, Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER, OR SUBCONTRACTOR

\$4880.27

for and in consideration of \$ _____ and other good and valuable consideration, the receipt whereof is hereby acknowledged, do(es) hereby waive and release any and all liens, or right to or claim of lien, on the above described project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or for the account of

said The Osseo Construction Co. LLC for said project.

NAME OF CONTRACTOR

Given under my (our) hand(s) and seal(s) this 3rd day of March, 2020.

General Construction Services, Inc

Name of Manufacturer, Material Supplier, or Subcontractor

By

David C. Galt

President/Authorized Officer

This Waiver and Release of Lien must be signed with the full name of the Manufacturer, Material Supplier, or Subcontractor. If the Manufacturer, Material Supplier, or Subcontractor is a partnership, this Waiver and Release of Lien must be signed in the partnership name by a partner. If the Manufacturer, Material Supplier, or Subcontractor is a corporation, this Waiver and Release of Lien must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the Corporation.

WAIVER AND RELEASE OF LIEN

WHEREAS the undersigned,

KLM Engineering Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER OR SUBCONTRACTOR

has furnished to

The Osseo Construction Co. LLC

NAME OF CONTRACTOR

the following:

GS-9 mixer - 120V with SCADA

KIND OF MATERIAL AND SERVICES FURNISHED

for

use in the construction of a project belonging to

The Village of Mukwonago, WI

NAME OF OWNER

NOW, THEREFORE, the undersigned,

KLM Engineering Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER, OR SUBCONTRACTOR

\$8,265.00

for and in consideration of \$ _____ and other good and valuable consideration, the receipt whereof is hereby acknowledged, do(es) hereby waive and release any and all liens, or right to or claim of lien, on the above described project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or for the account of

said

The Osseo Construction Co. LLC

for said project.

NAME OF CONTRACTOR

Given under my (our) hand(s) and seal(s) this 26th day of February, 2020.

KLM Engineering Inc

Name of Manufacturer, Material Supplier, or Subcontractor

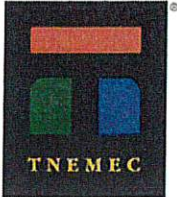
By

Jamie Sytle, Finance manager
President/Authorized Officer

This Waiver and Release of Lien must be signed with the full name of the Manufacturer, Material Supplier, or Subcontractor. If the Manufacturer, Material Supplier, or Subcontractor is a partnership, this Waiver and Release of Lien must be signed in the partnership name by a partner. If the Manufacturer, Material Supplier, or Subcontractor is a corporation, this Waiver and Release of Lien must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the Corporation.

TNEMEC COMPANY INC.

6800 Corporate Drive Kansas City, MO 64120-1372 TEL: 816-483-3400 FAX: 816-326-4296 www.tnemeccom



FINAL WAIVER OF LIEN

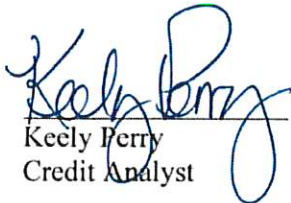
TO WHOM IT MAY CONCERN:

Whereas, the undersigned, TNEMEC COMPANY, INC., has furnished material to: **OSSEO CONSTRUCTION** for the job described as:

**MUKWONAGO TANK
MUKWONAGO WI
\$33,001.12**

Now, therefore, the undersigned, does hereby waive and release any and all lien or claim of or right to lien, with respect to and on the above material, fixtures, apparatus, or machinery furnished, and on the moneys or other consideration due or to become due from the owner.

FEBRUARY 27, 2020


Keely Perry
Credit Analyst

Contractor's Application for Payment No. 7

		Application Date: 2/17/2020	Application Period: 7/25/2019 - 2/17/2020
To (Owner): Village of Mukwonago	From (Contractor): The Osseo Construction Co., LLC	Via (Engineer): Ruekert & Mielke, Inc.	
Contact: Dave Brown cc: Judy Taubert and Diana Doherty	Contact: Timothy J. Popple, Owner	Contact: Taryn S. Nall, P.E.	
Project: I-43 Elevated Tank Painting	Address: 14248 10th Street Osseo, WI 54758	Address: W233 N2080 Ridgeview Parkway Waukesha, WI 53188	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.: 12-10095.300	

Change Order Summary

Approved Change Orders			
Number	Additions	Deductions (Enter as Positive Number)	
1		\$75,000.00	
1		\$6,000.00	
1	\$95,000.00		
1	\$91,000.00		
1	\$40,000.00		
1	\$5,000.00		
2		\$3,000.00	
3		\$3,633.00	
4		\$1,000.00	
TOTALS	\$231,000.00	\$88,633.00	
NET CHANGE BY CHANGE ORDERS	\$142,367.00		

1. ORIGINAL CONTRACT PRICE	\$ 300,900.00
2. Net change by Change Orders	\$ 142,367.00
3. CURRENT CONTR. 1	\$ 443,267.00
4. TOTAL COMPLETED TO DATE (Column L Total on Progress Estimates)	\$ 443,267.00
5. RETAINAGE:	
a. X \$443,267.00 Work Completed	\$ -
6. RETAINAGE REDUCTION TO DATE (Enter as Positive Number) ...	\$
7. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5a. + Line 6)	\$ 443,267.00
8. LESS PREVIOUS PAYMENTS (Line 7 from Prior Application)	\$ 410,780.00
9. AMOUNT DUE THIS APPLICATION	\$ 32,487.00

Contractor's Certification

The undersigned Contractor certifies that to the best of its knowledge:

(1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment;

(2) title to all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner per Article 15 of the General Conditions; and

(3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By: Timothy J. Popple Date: 3-9-2020

\$ 32,487.00
(Line 9 or other - attach explanation of the other amount)

Recommended by: Taryn S. Nall 3/9/20
Taryn S. Nall, P.E. (Engineer) (Date)

Payment of: \$ _____
(Line 9 or other - attach explanation of the other amount)

Approved by: _____
(Owner) (Date)

Progress Estimate - Unit Price Work

Contractor's Application for Payment No.

1258
7

For (Project): I-43 Elevated Tank Painting								Application Date: 2/17/2020			
Application Period: 7/25/2019 - 2/17/2020								Engineer's Project No.: 12-10095.300			
A	B	C	D	E	F	G	H	I	J	K	L
Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Item Value (\$)	Work Completed Previously		Work Completed This Period		Total Work Completed to Date	
						Estimated Quantity Installed	Value of Work Installed (\$)	Estimated Quantity Installed	Value of Work Installed (\$)	Estimated Quantity Installed	Value of Work Installed (\$)
1	Repairs and modifications	LS	1.00	\$41,900.00	\$ 41,900.00	1.0000	\$ 41,900.00		\$ -	1.0000	\$ 41,900.00
2	Exterior painting, from 2 feet above foundation to top	LS	1.00	\$87,000.00	\$ 87,000.00	0.2322	\$ 20,200.00	0.7678	\$ 66,800.00	1.0000	\$ 87,000.00
3	Exterior painting, from foundation to 2 feet above foundation	LS	1.00	\$12,000.00	\$ 12,000.00	1.0000	\$ 12,000.00		\$ -	1.0000	\$ 12,000.00
4	Wet interior painting	LS	1.00	\$116,000.00	\$ 116,000.00	1.0000	\$ 116,000.00		\$ -	1.0000	\$ 116,000.00
5	Dry interior painting	LS	1.00	\$21,000.00	\$ 21,000.00	1.0000	\$ 21,000.00		\$ -	1.0000	\$ 21,000.00
6	Pit filling	EA	1.00	\$1,000.00	\$ 1,000.00		\$ -		\$ -		\$ -
7	Type A mechanical tank mixer	LS	1.00	\$19,000.00	\$ 19,000.00	0.5000	\$ 9,500.00	0.5000	\$ 9,500.00	1.0000	\$ 19,000.00
8	Pressure transmitter enclosure and related work	LS	1.00	\$3,000.00	\$ 3,000.00		\$ -		\$ -		\$ -
TOTAL BID ITEMS 1-8						\$300,900.00		\$ 220,600.00		\$ 76,300.00	\$ 296,900.00
CHANGE ORDERS											
CO-1	Delete 3 coat system exterior painting	LS	1	\$ (75,000.00)	\$ (75,000.00)	1.0000	\$ (75,000.00)			1.0000	\$ (75,000.00)
CO-1	Reduce pressure washing work	LS	1	\$ (6,000.00)	\$ (6,000.00)	1.0000	\$ (6,000.00)			1.0000	\$ (6,000.00)
CO-1	Provide commercial blast SP-6 of exterior	LS	1	\$ 95,000.00	\$ 95,000.00	1.0000	\$ 95,000.00			1.0000	\$ 95,000.00
CO-1	Provide 4-coat system exterior painting	LS	1	\$ 91,000.00	\$ 91,000.00	0.8440	\$ 76,800.00	0.1560	14,200.00	1.0000	\$ 91,000.00
CO-1	Provide tank containment	LS	1	\$ 40,000.00	\$ 40,000.00	1.0000	\$ 40,000.00			1.0000	\$ 40,000.00
CO-1	Pressure wash exterior of northside EST	LS	1	\$ 5,000.00	\$ 5,000.00		\$ -	1.0000	5,000.00	1.0000	\$ 5,000.00
CO-2	Delete Bid No. 8 work "Pressure transmitter enclosure and related work" from the Contract	LS	1	\$ (3,000.00)	\$ (3,000.00)		\$ -				\$ -
CO-3	Extra professional services to address paint overspray	LS	1	\$ (3,633.00)	\$ (3,633.00)		\$ -	1.0000	-3,633.00	1.0000	\$ (3,633.00)
CO-4	Delete "pit filling" from the Bid No. 6 work	LS	1	\$ (1,000.00)	\$ (1,000.00)		\$ -				\$ -
TOTAL CHANGE ORDER ITEMS						\$142,367.00		\$ 130,800.00		\$ 15,567.00	\$ 146,367.00
ADDITIONAL ITEMS											
					\$ -		\$ -				\$ -
					\$ -		\$ -				\$ -
TOTAL ADDITIONAL ITEMS						\$ -		\$ -		\$ -	\$ -
TOTAL ALL ITEMS						\$443,267.00		\$ 351,400.00		\$ 91,867.00	\$ 443,267.00

AFFIDAVIT OF TOTAL RELEASE AND CERTIFICATION OF ALL BILLS PAID

THE UNDERSIGNED hereby certifies that he (or she) has examined and is authorized and empowered to execute this Affidavit as the owner, partner, or office as the case may be, of the contractor named below ("the Contractor") employed in connection with the construction project ("the Project") mentioned below.

In consideration for the full and final payment to the Contractor for all services in connection with the Project, the Contractor hereby releases and waives all liens and claims to liens which the Contractor may have on or affecting the Project or Project property as a result of the Contractor's contract(s) for the Project or for performing labor and/or furnishing materials that are in any way connected with any construction of any building(s) or improvement(s) for the Project whether on the Project property or elsewhere. The Contractor further certifies and warrants that all subcontractors of labor and/or materials supplied to, for, through or at the direct or indirect request of the Contractor and/or subcontractor have been paid.

1. The Osseo Construction Co. LLC
(Print or type the firm or individual name of the Contractor)
2. 14248 10th St. P.O. Box 143 Osseo, WI 54758
(Print or type the Contractor's address)
3. Timothy J. Popple
(Print or type the name of the person signing for the Contractor)
4. owner
(Print or type the position of the person signing for the Contractor)
5. Description of the Project (use an additional page, if necessary): Village of Mukwonago, WI
I-43 Elevated Tank Painting 12-10095.200
6. Date that the project was totally completed: 7-31-2019

The undersigned certifies that the foregoing information is true and correct and acknowledges that the owner of the Project has placed a material reliance on such information in directing final payment to the Contractor.

EXECUTED this 28th day of February, 2020.

Timothy J. Popple
(To be signed by the person shown in Item 3 above)

Subscribed and sworn before me this 28th day of February, 2020.

Notary Public: Scott A. Vold

My Commission Expires: 2-24-22

END OF AFFIDAVIT



TNEMEC COMPANY INC.

6800 Corporate Drive Kansas City, MO 64120-1372 TEL: 816-483-3400 FAX: 816-326-4296 www.tnemeccom



FINAL WAIVER OF LIEN

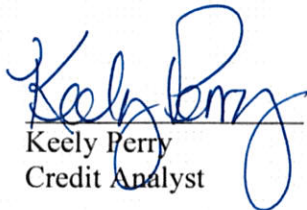
TO WHOM IT MAY CONCERN:

Whereas, the undersigned, TNEMEC COMPANY, INC., has furnished material to: **OSSEO CONSTRUCTION** for the job described as:

**MUKWONAGO TANK
MUKWONAGO WI
\$33,001.12**

Now, therefore, the undersigned, does hereby waive and release any and all lien or claim of or right to lien, with respect to and on the above material, fixtures, apparatus, or machinery furnished, and on the moneys or other consideration due or to become due from the owner.

FEBRUARY 27, 2020


Keely Perry
Credit Analyst

WAIVER AND RELEASE OF LIEN

WHEREAS the undersigned,

Badger Stainless, Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER OR SUBCONTRACTOR

has furnished to The Osseo Construction Co. LLC the following:

NAME OF CONTRACTOR

Steel + structural material

for

KIND OF MATERIAL AND SERVICES FURNISHED

use in the construction of a project belonging to

The Village of Mukwonago, WI

NAME OF OWNER

NOW, THEREFORE, the undersigned,

Badger Stainless, Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER, OR SUBCONTRACTOR

\$8,910.50

for and in consideration of \$ _____ and other good and valuable consideration, the receipt whereof is hereby acknowledged, do(es) hereby waive and release any and all liens, or right to or claim of lien, on the above described project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or for the account of

said The Osseo Construction Co. LLC for said project.

NAME OF CONTRACTOR

Given under my (our) hand(s) and seal(s) this 27th day of February, 2020.

Badger Stainless Inc

Name of Manufacturer, Material Supplier, or Subcontractor

By

Kathleen Hsieh CFO

President/Authorized Officer

This Waiver and Release of Lien must be signed with the full name of the Manufacturer, Material Supplier, or Subcontractor. If the Manufacturer, Material Supplier, or Subcontractor is a partnership, this Waiver and Release of Lien must be signed in the partnership name by a partner. If the Manufacturer, Material Supplier, or Subcontractor is a corporation, this Waiver and Release of Lien must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the Corporation.

WAIVER AND RELEASE OF LIEN

WHEREAS the undersigned,

Abrasives inc.

NAME OF MANUFACTURER, MATERIAL SUPPLIER OR SUBCONTRACTOR

has furnished to The Osseo Construction Co. LLC the following:

NAME OF CONTRACTOR

Abrasives material

for

KIND OF MATERIAL AND SERVICES FURNISHED

use in the construction of a project belonging to

Village of Mukwonago, WI

NAME OF OWNER

NOW, THEREFORE, the undersigned,

Abrasives inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER, OR SUBCONTRACTOR

for and in consideration of \$ \$11,906.11 and other good and valuable consideration, the receipt whereof is hereby acknowledged, do(es) hereby waive and release any and all liens, or right to or claim of lien, on the above described project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or for the account of

said The Osseo Construction Co. LLC for said project.

NAME OF CONTRACTOR

Given under my (our) hand(s) and seal(s) this 18 day of November, 2019.

ABRASIVES INC

Name of Manufacturer, Material Supplier, or Subcontractor

By



President/Authorized Officer

This Waiver and Release of Lien must be signed with the full name of the Manufacturer, Material Supplier, or Subcontractor. If the Manufacturer, Material Supplier, or Subcontractor is a partnership, this Waiver and Release of Lien must be signed in the partnership name by a partner. If the Manufacturer, Material Supplier, or Subcontractor is a corporation, this Waiver and Release of Lien must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the Corporation.

WAIVER AND RELEASE OF LIEN

WHEREAS the undersigned,

General Construction Services, Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER OR SUBCONTRACTOR

has furnished to The Osseo Construction Co. LLC the following:

NAME OF CONTRACTOR

Structural materials

for

KIND OF MATERIAL AND SERVICES FURNISHED

use in the construction of a project belonging to

The Village of Mukwonago, WI

NAME OF OWNER

NOW, THEREFORE, the undersigned,

General Construction Services, Inc

NAME OF MANUFACTURER, MATERIAL SUPPLIER, OR SUBCONTRACTOR

\$4880.27

for and in consideration of \$ _____ and other good and valuable consideration, the receipt whereof is hereby acknowledged, do(es) hereby waive and release any and all liens, or right to or claim of lien, on the above described project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or for the account of

said The Osseo Construction Co. LLC for said project.

NAME OF CONTRACTOR

Given under my (our) hand(s) and seal(s) this 3rd day of March, 2020.

General Construction Services, Inc

Name of Manufacturer, Material Supplier, or Subcontractor

By

David C. Galt

President/Authorized Officer

This Waiver and Release of Lien must be signed with the full name of the Manufacturer, Material Supplier, or Subcontractor. If the Manufacturer, Material Supplier, or Subcontractor is a partnership, this Waiver and Release of Lien must be signed in the partnership name by a partner. If the Manufacturer, Material Supplier, or Subcontractor is a corporation, this Waiver and Release of Lien must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the Corporation.

WAIVER AND RELEASE OF LIEN

WHEREAS the undersigned,

KLM Engineering Inc.
NAME OF MANUFACTURER, MATERIAL SUPPLIER OR SUBCONTRACTOR

has furnished to The Osseo Construction Co. LLC the following:
NAME OF CONTRACTOR

GS-9 mixer - 120v with SCADA for
KIND OF MATERIAL AND SERVICES FURNISHED

use in the construction of a project belonging to

The Village of Mukwonago, WI

NAME OF OWNER

NOW, THEREFORE, the undersigned,

KLM Engineering Inc.
NAME OF MANUFACTURER, MATERIAL SUPPLIER, OR SUBCONTRACTOR

for and in consideration of \$ \$8,265.00 and other good and valuable consideration, the receipt whereof is hereby acknowledged, do(es) hereby waive and release any and all liens, or right to or claim of lien, on the above described project and premises, under any law, common or statutory, on account of labor or materials, or both, heretofore or hereafter furnished by the undersigned to or for the account of

said The Osseo Construction Co. LLC for said project.

NAME OF CONTRACTOR

Given under my (our) hand(s) and seal(s) this 26th day of February, 2020.

KLM Engineering Inc.
Name of Manufacturer, Material Supplier, or Subcontractor

By

Jamie Sytle, Finance manager
President/Authorized Officer

This Waiver and Release of Lien must be signed with the full name of the Manufacturer, Material Supplier, or Subcontractor. If the Manufacturer, Material Supplier, or Subcontractor is a partnership, this Waiver and Release of Lien must be signed in the partnership name by a partner. If the Manufacturer, Material Supplier, or Subcontractor is a corporation, this Waiver and Release of Lien must be signed in the corporate name by a duly authorized officer and the corporate seal affixed and attested by the Secretary of the Corporation.

AFFIDAVIT OF TOTAL RELEASE AND CERTIFICATION OF ALL BILLS PAID

THE UNDERSIGNED hereby certifies that he (or she) has examined and is authorized and empowered to execute this Affidavit as the owner, partner, or office as the case may be, of the contractor named below ("the Contractor") employed in connection with the construction project ("the Project") mentioned below.

In consideration for the full and final payment to the Contractor for all services in connection with the Project, the Contractor hereby releases and waives all liens and claims to liens which the Contractor may have on or affecting the Project or Project property as a result of the Contractor's contract(s) for the Project or for performing labor and/or furnishing materials that are in any way connected with any construction of any building(s) or improvement(s) for the Project whether on the Project property or elsewhere. The Contractor further certifies and warrants that all subcontractors of labor and/or materials supplied to, for, through or at the direct or indirect request of the Contractor and/or subcontractor have been paid.

1. The Osseo Construction Co. LLC
(Print or type the firm or individual name of the Contractor)
2. 14248 10th St. P.O. Box 143 Osseo, WI 54758
(Print or type the Contractor's address)
3. Timothy J. Popple
(Print or type the name of the person signing for the Contractor)
4. owner
(Print or type the position of the person signing for the Contractor)
5. Description of the Project (use an additional page, if necessary): Village of Mukwonago, WI
I-43 Elevated Tank Painting 12-10095.200
6. Date that the project was totally completed: 7-31-2019

The undersigned certifies that the foregoing information is true and correct and acknowledges that the owner of the Project has placed a material reliance on such information in directing final payment to the Contractor.

EXECUTED this 28th day of February, 2020.

Timothy J. Popple
(To be signed by the person shown in Item 3 above)

Subscribed and sworn before me this 28th day of February, 2020.

Notary Public: Scott A. Vold

My Commision Expires: 2-24-22

END OF AFFIDAVIT



From: [Diana Doherty](#)
To: [Nall, Taryn](#)
Cc: [Diana Dykstra](#)
Subject: FW: I-43 Elevated Tank Painting
Date: Friday, March 13, 2020 11:33:25 AM
Attachments: [image880076.png](#)
[image671088.png](#)
[image546830.png](#)
[image305511.png](#)
[image600013.png](#)
[image625806.png](#)
[image944549.png](#)
[Payment Request No. 7 Mukwonago 3.9.2020.pdf](#)
[Affidavit of Total Release & Cert of All Bills Paid - The Osseo Construction Co. LLC.pdf](#)
[BCS abrasive material - Mukwonago WI - Waiver and Release of Lien.pdf](#)
[Badger Stainless - steel & structural - Waiver and Release of lien.pdf](#)
[General Construction - structural materials.pdf](#)
[KLM - mixer - Waiver and Release of Lien.pdf](#)
[Tnemec - paint - Waiver and Release of Lien.pdf](#)
[GS-9 Operations & Maintenance Manual - Mukwonago WI.pdf](#)
[image001.png](#)

Taryn

Thanks for the documents. Do you have a close-out letter that goes with all of this paperwork?
Our clerk, Diana Dykstra, will put it on the April 1st Committee meeting for approval.

Thanks
Diana Doherty

From: Nall, Taryn [mailto:TNall@ruekert-mielke.com]
Sent: Tuesday, March 10, 2020 2:14 PM
To: Diana Doherty <ddoherty@villageofmukwonago.com>
Cc: David Brown <dbrown@villageofmukwonago.com>; Wegner, Jerad <jwegner@ruekert-mielke.com>; Schultz, Ryan <RSchultz@ruekert-mielke.com>; Arnott, David <darnott@ruekert-mielke.com>
Subject: I-43 Elevated Tank Painting

Diana,

Attached is the final Pay Request No. 7, lien Waivers, and mixer O & M Manual from Osseo Construction Company for the I-43 Elevated Tank Painting project. Please contact me if you have any questions or if you need additional information

Taryn S. Nall, P.E.
Project Manager



✉ TNall@ruekert-mielke.com

🌐 ruekertmielke.com

Explore our new **Video Gallery**
to watch the latest expert webinars.



R/M was named a Top Workplace! Learn more about [our culture](#).

-

Date of Issuance: August 26, 2019

Effective Date:

August 26, 2019

Owner:

Village of Mukwonago

Contract: I-43 Elevated Tank Painting

Contractor: Osseo Construction Company

Engineer:

Ruekert & Mielke, Inc.

Address: 14248 10th Street

Engineer's Project No.:

12-10095

P.O. Box 143

Effective Date of Contract: July 27, 2018

Osseo, WI 54758

The Contract is modified as follows upon execution of this Change Order:

Description: Extra professional services time was required to address paint overspray issues resulting from tank containment failure in the amount of \$3,633. Extra time was required for inspection and documentation of private property damage; coordination of paint overspray damage correction; meeting with and obtaining contact information for EMC Insurance Companies for all claimants known to have damage; collecting and transmitting contract information to Village Attorney Blum; discussions with Mr. Dave Brown, Osseo, Mukwonago Yamaha, Mr. Robert Jones, and EMC Insurance Companies (Jennifer Carrera) on addressing overspray damage, checking on status of EMC Claim 1519860 resolution and claimant acceptance; and coordinating and processing Osseo pay request with adequate documentation to Village that claims are being resolved.

Reason for Change Order: Action was required because paint spray from the I-43 Elevated Tank Painting resulting from containment failure damaged vehicles and machines at Mukwonago Yamaha and other vehicles east of tank site.

Attachments: None.

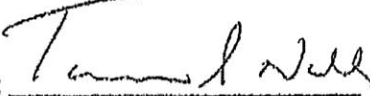
CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES
Original Contract Price \$ 300,900	Original Contract Times: Substantial Completion: <u>October 20, 2018</u> Ready for Final Payment: <u>November 19, 2018</u> days or dates
Increase from previously approved Change Order No. 1: \$ 150,000	● Increase ● ● Decrease ● from previously approved Change Orders No. ___ to No. ___:
Decrease from previously approved Change Order No. 2: \$ 3,000	Substantial Completion: Ready for Final Payment: _____ days
Contract Price prior to this Change Order: \$ 447,900	Contract Times prior to this Change Order: Substantial Completion: Ready for Final Payment: _____ days or dates
Decrease of this Change Order: \$ 3,633	● Increase ● ● Decrease ● of this Change Order: Substantial Completion: Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: \$ 444,267	Contract Times with all approved Change Orders: Substantial Completion: <u>June 15, 2019</u> Ready for Final Payment: <u>July 15, 2019</u> days or dates

RECOMMENDED:

ACCEPTED:

ACCEPTED:

By:



Engineer (Authorized Signature)

By:



Owner (Authorized Signature)

By:



Contractor (Authorized Signature)

Date: 10-8-19Date: 10-8-19Date: 2-28-2020

00 63 63-1

08/27/19

Ruekert & Mielke, Inc.
~Mukwonago Village 12-10095 I-43 Tower Painting > Construction > Changes > 00 63 63 Change Order No. 3.doc~

1268

Date of Issuance: February 28, 2020

Effective Date:

February 28, 2020

Owner:

Village of Mukwonago

Contract: I-43 Elevated Tank Painting

Contractor: Osseo Construction Company

Engineer:

Ruekert & Mielke, Inc.

Address: 14248 10th Street

Engineer's Project No.:

12-10095

P.O. Box 143

Effective Date of Contract: July 27, 2018

Osseo, WI 54758

The Contract is modified as follows upon execution of this Change Order:

Description: Delete bid Item No. 6 Pit Filling from Contract.

Reason for Change Order: Final adjustment of contract price.

Attachments: None.

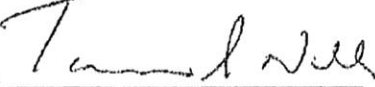
CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES
Original Contract Price	Original Contract Times:
\$ 300,900	Substantial Completion: <u>October 20, 2018</u>
	Ready for Final Payment: <u>November 19, 2018</u>
	days or dates
Increase from previously approved Change Order No. 1:	● Increase ● ● Decrease ● from previously approved
\$ 150,000	Change Orders No. <u> </u> to No. <u> </u> :
	Substantial Completion: <u> </u>
Decrease from previously approved Change Order No. 2:	Ready for Final Payment: <u> </u>
\$ 3,000	days
Decrease from previously approved Change Order No. 3:	
\$ 3,633	
Contract Price prior to this Change Order:	Contract Times prior to this Change Order:
\$ 444,267	Substantial Completion: <u> </u>
	Ready for Final Payment: <u> </u>
	days or dates
Decrease of this Change Order:	● Increase ● ● Decrease ● of this Change Order:
\$ 1,000	Substantial Completion: <u> </u>
	Ready for Final Payment: <u> </u>
	days or dates
Contract Price incorporating this Change Order:	Contract Times with all approved Change Orders:
\$ 443,267	Substantial Completion: <u>June 15, 2019</u>
	Ready for Final Payment: <u>July 15, 2019</u>
	days or dates

RECOMMENDED:

ACCEPTED:

ACCEPTED:

By:


 Engineer (Authorized Signature)

By:


 Owner (Authorized Signature)

By:


 Contractor (Authorized Signature)

Date:

2/28/20

Date:

2/28/2020

Date:

3-2-2020



**PATE
BONDING
INC.**

1276 So. Robert St. • West St. Paul, MN 55118 • Phone: (651) 457-6842 • Fax: (651) 457-7531 • Web Site: www.patebonding.com

The Osseo Construction Co. LLC
14248 - 10th Street
P.O. Box 143
Osseo, WI 54758

Emilio Mail



AIA® Document G707™ – 1994

Consent of Surety to Final Payment

PROJECT: *(Name and address)*

Engineer's Project No. 12-10095.200-1-43 Elevated Tank Painting
(Base Bid): repairs, modifications, and painting of a 500,000 gallon
welded construction spheroid water storage tank, work as further
outlined in Bid Form, Mukwonago, Wisconsin

ARCHITECT'S PROJECT NUMBER:
OWNER ☐
CONTRACT FOR:
ARCHITECT ☐CONTRACTOR ☐
CONTRACT DATED: 7/27/2018
SURETY ☐OTHER ☐
TO OWNER: *(Name and address)*

Village of Mukwonago

440 River Crest Court

Mukwonago, WI 53149

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety.)

Granite Re, Inc.

14001 Quailbrook Drive

Oklahoma City, OK 73134

, SURETY,

on bond of

(Insert name and address of Contractor.)

The Osseo Construction Co. LLC

14248 - 10th Street P.O. Box 143

Osseo, WI 54758

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve
the Surety of any of its obligations to
(Insert name and address of Owner.)

Village of Mukwonago

440 River Crest Court

Mukwonago, WI 53149

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date: March 3rd 2020
(Insert in writing the month followed by the numeric date and year.)

Granite Re, Inc.
(Surety)

(Signature of authorized representative)

Zachary Pate, Attorney-in-fact
(Printed name and title)

Attest:
(Seal)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that
changes will not be obscured.

AIA® Document G707™ – 1994 Instructions

Consent of Surety to Final Payment

GENERAL INFORMATION

Purpose. AIA Document G707™ is intended for use as a companion to AIA Document G706™, Contractor's Affidavit of Payment of Debts and Claims, on construction projects where the Contractor is required to furnish a bond. By obtaining the Surety's approval of final payment to the Contractor and its agreement that final payment will not relieve the Surety of any of its obligations, the Owner may preserve its rights under the bond.

Related Documents. This document may be used with most of the AIA's Owner-Contractor agreements and general conditions, such as A201 and its related family of documents. As noted above, this is a companion document to AIA Document G706.

Use of Current Documents. Prior to using any AIA Contract Document, users should consult www.aia.org or a local AIA component to verify the most recent edition.

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CHANGES FROM THE PREVIOUS EDITION

Changes in the location of various items of information were made, without revision to the substance of the document.

COMPLETING G707-1994

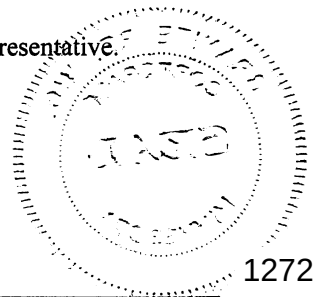
General. The bond form is the usual source of required information such as the contract date and the names and addresses of the Surety, Owner, Contractor and Project.

Architect's Project No. This information is typically supplied by the Architect and entered on the form by the Contractor.

Contract For. This refers to the scope of the contract, such as "General Construction" or "Mechanical Work."

EXECUTING THE DOCUMENT

AIA Document G707 requires both the Surety's seal and the signature of the Surety's authorized representative.



1272

GRANITE RE, INC.
GENERAL POWER OF ATTORNEY

Know all Men by these Presents:

That GRANITE RE, INC., a corporation organized and existing under the laws of the State of MINNESOTA and having its principal office at the City of OKLAHOMA CITY in the State of OKLAHOMA does hereby constitute and appoint:

JONATHAN PATE; WANDA FRANZ; TOM LAHL; LISA M. FRANCOUR; JENNIFER BOYLES; ZACHARY PATE; TROY STAPLES; NICHOLAS HOCHBAN its true and lawful Attorney-in-Fact(s) for the following purposes, to wit:

To sign its name as surety to, and to execute, seal and acknowledge any and all bonds, and to respectively do and perform any and all acts and things set forth in the resolution of the Board of Directors of the said GRANITE RE, INC. a certified copy of which is hereto annexed and made a part of this Power of Attorney; and the said GRANITE RE, INC. through us, its Board of Directors, hereby ratifies and confirms all and whatsoever the said:

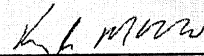
JONATHAN PATE; WANDA FRANZ; TOM LAHL; LISA M. FRANCOUR; JENNIFER BOYLES; ZACHARY PATE; TROY STAPLES; NICHOLAS HOCHBAN may lawfully do in the premises by virtue of these presents.

In Witness Whereof, the said GRANITE RE, INC. has caused this instrument to be sealed with its corporate seal, duly attested by the signatures of its President and Secretary/Treasurer, this 3rd day of January, 2020.

STATE OF OKLAHOMA)
) SS:
COUNTY OF OKLAHOMA)




Kenneth D. Whittington, President


Kyle P. McDonald, Treasurer

On this 3rd day of January, 2020, before me personally came Kenneth D. Whittington, President of the GRANITE RE, INC. Company and Kyle P. McDonald, Secretary/Treasurer of said Company, with both of whom I am personally acquainted, who being by me severally duly sworn, said, that they, the said Kenneth D. Whittington and Kyle P. McDonald were respectively the President and the Secretary/Treasurer of GRANITE RE, INC., the corporation described in and which executed the foregoing Power of Attorney; that they each knew the seal of said corporation; that the seal affixed to said Power of Attorney was such corporate seal, that it was so fixed by order of the Board of Directors of said corporation, and that they signed their name thereto by like order as President and Secretary/Treasurer, respectively, of the Company.

My Commission Expires:
August 8, 2021
Commission #: 01013257



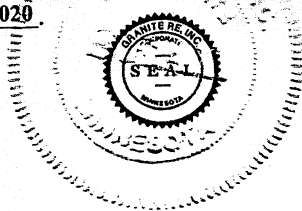

Notary Public

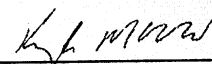
GRANITE RE, INC.
Certificate

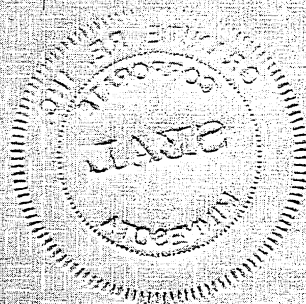
THE UNDERSIGNED, being the duly elected and acting Secretary/Treasurer of Granite Re, Inc., a Minnesota Corporation, HEREBY CERTIFIES that the following resolution is a true and correct excerpt from the July 15, 1987, minutes of the meeting of the Board of Directors of Granite Re, Inc. and that said Power of Attorney has not been revoked and is now in full force and effect.

"RESOLVED, that the President, any Vice President, the Secretary, and any Assistant Vice President shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the Company in the course of its business. On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the Company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

IN WITNESS WHEREOF, the undersigned has subscribed this Certificate and affixed the corporate seal of the Corporation this
3rd day of March, 2020.




Kyle P. McDonald, Secretary/Treasurer





Committee/Board:	Public Works / Village Board
Topic:	Atkinson Pump Station Capacity Study
From:	Jerad Wegner
Department:	Public Works
Presenter:	Jerad Wegner
Date of Committee Action (if required):	April 1, 2020
Date of Village Board Action (if required):	April 15, 2020

Information

Subject: The Village has a need to analyze the capacity of the Atkinson Pump Station, which is located at the intersection of Atkinson Street and Shore Drive. The Village has noticed an increase in pumping times over the last several years, suspecting that inflow and infiltration (I&I) of clear water is entering the sanitary sewer system. This project will involve placing six portable flow meters in strategic locations throughout the sanitary sewer system upstream of the pump station. These meters will be left in place for up to six months, collecting flow characteristics during rainfall events and hopefully helping to pinpoint the location of I&I in the system. The results of the metering will be analyzed and recommendations for improvements to the collection system and the pump station will be made. The Utility Department is anticipating a follow up Task Order to this one that will involve the design of these recommended improvements. It is anticipated that these recommendations will be made prior to the Village's CIP planning process for 2021 construction.

Background Information/Rationale: N/A

Key Issues for Consideration: The Atkinson Pump Station receives sewer flow from the entire northwest side of the Village, including several future residential developments that are anticipated to add several new connections and contribute significant future flows.

Fiscal Impact (If any): The Village will contract with Mulcahy Shaw to install, maintain, collect flow information, and remove the flow meters in the six manholes identified. Mulcahy Shaw has a quotation of \$27,110 for this service.

Ruekert & Mielke, Inc. will perform the preliminary system analysis, locate the six manholes, analyze the flow metered data as it is collected, and provide recommendation of improvements for a cost of \$22,960.

Requested Action by Committee/Board: Approve Task Order 2020-04 for Mulcahy Shaw to install, collect data, maintain, and remove the flow meters and Ruekert & Mielke, Inc. to evaluate,



analyze, and recommend improvements associated with the Atkinson Pump Station Capacity Study.

Attachments

Task Order 2020-04
Level of Effort Spreadsheet for R/M Services
Mulcahy Shaw Quotation

TASK ORDER

This is Task Order No. (2020-04),
consisting of 3 pages
Village of Mukwonago
Atkinson Pump Station Capacity Study

Task Order

In accordance with the Agreement Amendment between Village of Mukwonago (Owner) and Ruekert-Mielke, Inc. (Engineer) dated December 21, 2017, Owner and Engineer agree as follows:

1. Specific Project Data

- A. Title: Atkinson Drive Pump Station Capacity Study
- B. Description: Install flow meters in critical flow manholes, evaluate the theoretical sanitary sewer flows, dry and wet weather actual flows, determine future peak hour flow rate to pump station, analyze flow meter results, and determine the conceptual approach to increase the capacity of the Atkinson pump station.

2. Services of Engineer

Phase 100 – Preliminary Analysis, Flow Metering, and Recommendation of Improvements

- Provide preliminary analysis of sanitary sewer system tributary to the Atkinson Pump Station.
- Identify critical manholes that would be good candidates for flow meters.
- Coordinate with Mulcahy Shaw Water, Inc. to arrange the lease of six flow meters for a total of six months of metering.
- Calculate an estimated base flow of sewer given the existing customers that are tributary to each flow meter location.
- Coordinate with Mulcahy Shaw Water, Inc. on their monthly downloads of flow meter data.
- Compare estimated base flow to the observed dry and wet weather sewer flows.
- Meet with Village Utility staff to review results and discuss options for sewer improvement projects that include the removal of inflow/infiltration sources in the system and pump station improvements.
- Identify and confirm future service area tributary to pump station.
- Calculate future peak hour flow from planned immediate and future developments.
- Determine conceptual design of upgraded pump station. Consider hydraulics, need for second force main, existing generator size, and site constraints.
- Identify and confirm future service area tributary to pump station.
- Calculate future peak hour flow rate to pump station from planned immediate and future developments.
- Determine conceptual design of upgraded pump station. Consider hydraulics, need for second force main, existing generator size, and site constraints.
- Document results in a letter report.

3. Owner's Responsibilities

- Coordinate with Mulcahy Shaw staff when the flow meters are installed and when monthly downloads take place.
- Coordinate with R/M staff to review flow meter results and discuss improvement projects.

4. Times for Rendering Services

Phase

100

Completion Date

October 31, 2020

TASK ORDER

5. Payments to Engineer

A. Owner shall pay Engineer for services rendered as follows:

<u>Category of Services</u>	<u>Compensation Method</u>	<u>Lump Sum Estimate of Compensation for Services</u>
Basic Services Study and Recommendations	Lump Sum	\$22,960
Mulcahy Shaw Flow Meters	Separate Contract	\$27,110
Additional Services	Standard Hourly Rates	

B. The terms of payment are set forth in the Standard Terms and Conditions.

6. Consultants

Mulcahy Shaw will be providing the flow meters (6 total) for a duration of six months. Their quotation is attached to this Task Order.

7. Other Modifications to Standard Terms and Conditions

N/A

8. Attachments

- Level of Effort Spreadsheet
- Mulcahy Shaw Quotation

9. Documents Incorporated by Reference

Ruekert & Mielke, Inc. / Village of Mukwonago Master Agreement

TASK ORDER

Terms and Conditions: Execution of this Task Order by Owner and Engineer shall make it subject to terms and conditions, (as modified above) set forth in the Master Engineering Agreement Amendment between Owner and Engineer, dated December 21, 2017, which are incorporated by this reference. Engineer is authorized to begin performance upon its receipt of a copy of this Task Order signed by Owner.

The Effective Date of this Task Order is _____, _____.

OWNER:

Village of Mukwonago

By: _____

Name: _____

Title: _____

Date: _____

ENGINEER:

Ruekert & Mielke, Inc.

By: _____

Name: Steven C. Wurster, P.E.

Title: Senior Vice President/COO

Date: _____

DESIGNATED REPRESENTATIVE FOR TASK ORDER

Name: _____

Title: _____

Address: _____

Email: _____

Phone: _____

Fax: _____

Name: Jerad J Wegner, P.E.

Title: Team Leader/Project Manager

Address: W233 N2080 Ridgeview Parkway
Waukesha, WI 53188-1020

Email: jwegner@ruekert-mielke.com

Phone: 262-953-3006

Fax: 262-542-5631

**Atkinson Pump Station Capacity Study
Study and Recommendation Services**

March 24, 2020

	Jerad Wegner	Peter Gesch	Dave Arnott	Sue Shird			
Initials	JJW	PWG	DWA	SJS			
Employee Class	E6	E2	E7	AA		Task Total	Task Total
Hourly Rates	\$ 170	\$ 122	\$ 188	\$ 78	w/o Expenses	Expenses	Dollars
Preliminary Analysis, Flow Metering, and Recommendation of Improvements Phase							
Provide preliminary analysis of sanitary sewer system tributary to the Atkinson Pump Station.	12				\$ 2,040	\$ 100	\$ 2,140
Identify critical manholes that would be good candidates for flow meters.	4				\$ 680	\$ 100	\$ 780
Coordinate with Mulcahy Shaw to arrange the lease of six flow meters for a total of six months of metering.	2				\$ 340		\$ 340
Calculate an estimated base flow of sewer given the existing customers that are tributary to each flow meter location.	2	16	2		\$ 2,668	\$ 100	\$ 2,768
Coordinate with Mulcahy Shaw on their monthly downloads of flow meter data.	2	6			\$ 1,072	\$ 100	\$ 1,172
Compare estimated base flow to the observed dry and wet weather sewer flows.	6	24	4	4	\$ 5,012	\$ 100	\$ 5,112
Identify and confirm future service area tributary to pump station.	2	2			\$ 584	\$ 101	\$ 685
Calculate future peak hour flow rate to pump station from planned immediate and future developments .	2	8			\$ 1,316	\$ 102	\$ 1,418
Determine conceptual design of upgraded pump station. Consider hydraulics, need for second force main, existing generator size, and site constraints	1	24	6		\$ 4,226	\$ 103	\$ 4,329
Documentt results in a letter report.	2	10	2	2	\$ 2,092	\$ 104	\$ 2,196
Meet with Village Utility staff to review results and discuss options for sewer improvement projects that include the removal of inflow/infiltration sources in the system and pump station improvements.	4	4	4		\$ 1,920	\$ 100	\$ 2,020
Study and Recommendation Phase Subtotal (Hours) =	39	94	18	6			
Study and Recommendation Phase Subtotal (Dollars) =	\$ 6,630	\$ 11,468	\$ 3,384	\$ 468	\$ 21,950	\$ 1,010	\$22,960



Quotation

Date: 3/19/2020
Company: Mukwonago WWTP
Address:

ATTN: Dave Brown

Project: 6 month lease

Mulcahy Shaw Water
 N57 W6316 Center Street
 Cedarburg, WI 53012

Phone: (262) 241-1199
 Fax: (262) 241-4997
 Email: info@mulcahyshaw.com

Quote #: 12994
Terms: Net 30 Days
Shipping: FOB Factory
Freight: Not Included
Valid for: 30 Days
Delivery: 2-3 weeks

Part Number	Qty	Description	Each	EXTENDED
<u>6 Month Lease Agreement</u>				
68-2050-002	6	*Lease price includes (6) 2150, av sensor and hardware (**NEED TO SPECIFY PIPE SIZES** pricing based on 6 month lease	\$3,510.00/ month	\$21,060.00/ 6 months
	1	Installing 6 Meters, training and startup with 2 people	\$2,500.00	\$2,500.00
	1	Monthly site visit for downloading and maintenace for a total of 6 visits at \$450.00/ month	\$2,700.00	\$2,700.00
	1	Removal of Equipment	\$850.00	\$850.00
	1	Plus Freight		

*** User supply their own batteries. Two 9 Volt Energizers recommended**

Plus tax if applicable/ Tax Exempt Required

Please note the following:

1) Please make out Purchase Order to Mulcahy Shaw Water Inc. N57 W6316 Center Street Cedarburg, WI 53012

Approved for purchase by: