

STORMWATER MANAGEMENT REPORT

FOR

**WEST ORANGE PLAZA
BLOCK 152.01 LOT 1445 AND LOT 1445.05
TOWNSHIP OF WEST ORANGE, ESSEX COUNTY, NEW JERSEY**

SUBMITTED TO:

**TOWNSHIP OF WEST ORANGE
ZONING BOARD**

PREPARED FOR:

**WEST ORANGE PLAZA
P.O. Box 326
PLAINFIELD, NEW JERSEY 07061**

PREPARED BY:

**PETRY ENGINEERING, LLC
155 PASSAIC AVENUE
FAIRFIELD, NEW JERSEY 07004
973-227-7004**



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**J. MICHAEL PETRY, PE
NJ PROFESSIONAL ENGINEER # 36662
DECEMBER 9, 2020
REVISED: MARCH 3, 2023**



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INTRODUCTION

The existing site is located at 235 Prospect Avenue, at the corner of Prospect Avenue and Eagle Rock Avenue in the Township of West Orange, NJ. The property consists of 32.67± acres of land. It is split zoned, with the front portion (easterly portion) in the PC Zone and the Rear Portion (Westerly Portion) Zoned R-5. All of the existing development is within the PC Zone. The adjacent properties to the north and west are primarily residential with the exception of Mayfair Farms catering bordering the lot along the rear of the existing main building. To the south of the property, across Eagle Rock Avenue, is retail. Finally, to the east of the property, across Prospect, is the Eagle Rock Reservation.

Currently, the site contains a shopping center consisting of 3 buildings and a paved parking lot that services the buildings. The property slopes substantially from the southeast to the northwest. The main building has a footprint of approximately 167,600 square feet and consists of 3 stories that step down with the grade. There are also 2 smaller buildings on the lot, located in the northeast and southeast corners.

The NRCS Websoil survey mapping indicates that the portion of the site subject to development contains Hydrologic Group "D" soils, Urban land, Boonton Substratum, (URBONB) with Urban Land. The stormwater analysis considers this soil group. (See attached Websoil Survey Mapping.)

PROPOSED IMPROVEMENTS

The proposed improvements call for the construction of 3 additional buildings, along with an addition to the existing building in the southeast corner of the site. These new buildings are proposed along the northern and eastern property lines and are all located within existing paved areas. In addition, the existing parking lot is to be reconfigured to allow for improved traffic patterns. The new parking lot will contain substantially more landscape islands throughout which will help to guide traffic as well as allow for improved plantings. Subsequently, the proposed development will reduce the overall impervious on the site. The entirety of the proposed disturbance is limited to previously developed areas.

METHODOLOGY

The USDA Natural Resources Conservation Service (NRCS) methodology described in the Technical Release 55 – Urban Hydrology for Small Water Sheds (TR-55) is used for computing stormwater runoff rates, volumes, and hydrographs for both existing and proposed conditions. In computing stormwater runoff from all design storms, the relative stormwater runoff rates and



volumes of pervious and impervious surfaces are analyzed separately. The rainfall-duration-frequency data was taken from the NOAA National Weather Service. (See attached.) The NRCS Type D Design Storm Rainfall Distribution was used to analyze both pre- and post-conditions. Hydraflow Hydrographs Extension 2022 Modeling Software was used to compute the site's pre and post-development runoff of the site.

EXISTING CONDITIONS

The existing site has been modeled in two drainage areas totaling 19.89 acres. (See Fig.1 Existing Drainage Area Map.)

DRAINAGE AREA 1 (DA-1)

Drainage Area 1 consists of 2.39 acres of both pervious and impervious surfaces, which drain off-site along the eastern property line to the prospect avenue drainage system. The impervious area, 2.12 acres, is comprised entirely of the existing parking lot. The pervious area, 0.27 acres, is comprised of landscaped and lawn areas that are in good condition. The calculated time of concentration is 4.7 minutes.

DRAINAGE AREA 2 (DA-2)

Drainage Area 2 consists of 17.50 acres of both pervious and impervious surfaces, which drains off the northern edge of the parking lot to an existing tributary to the Peckman River. The impervious area, 15.99 acres, is comprised of the parking lot and roof area. The pervious area, 1.51 acres, is comprised of landscaped islands as well as woods located along the northern edge of the parking lot. The calculated time of concentration is 9.4 minutes.

CURVE NUMBERS

The CN values used have been taken from the TR-55 Manual "Urban Hydrology for Small Watersheds," Table 2-2a and Table 2-2c, based on land cover and hydrologic soil groups.

Table 1 – Curve Number (Existing Conditions)

Description	Hydrologic Group	Curve Number
Landscaped Islands (Open Space-Good Conditions)	D	80
Woods (Good Conditions)	C	70
Impervious	D	98



PEAK FLOWS

Using the information described above, the peak flows during the 2-, 10-, and 100-year storm events were calculated. Table 2 below summarizes the peak flows during each storm event. (See attached Hydraflow Output for Existing Conditions Hydrographs, CN Values, and Time of Concentration Calculations.)

Table 2 – Existing Peak Runoff Rates

Storm Event	Existing Site Peak Runoff	Existing Site Runoff Volume
2 Year	55.21 cfs	218,202 cf
10 Year	85.81 cfs	344,069 cf
100 Year	146.15 cfs	594,086 cf

POST-DEVELOPMENT RUNOFF TARGET

The runoff reductions are consistent with both the Township of West Orange Stormwater Management Rules as well as the NJDEP Stormwater Management regulations. These regulations state *“demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the 2, 10 and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events.”* Since the proposed development calls for an increase in the overall pervious on the site, the amount of runoff will be reduced.

Therefore, the target runoff rates for the proposed development are to show either no increase or a decrease at every time interval in the runoff rates from the existing to proposed conditions.

PROPOSED CONDITIONS

The proposed site has been modeled in two drainage areas totaling 19.89 acres. (See Fig.2 Proposed Drainage Area Map.)

DRAINAGE AREA 1 (DA-1)

Drainage Area 1 consists of 2.43 acres of both pervious and impervious surfaces, which are to drain off-site along the eastern property line to the existing drainage system on prospect avenue. The impervious area, 1.74 acres, is comprised of pavement. The pervious area, 0.69 acres is comprised of landscaped islands and lawn areas, which are in good condition. The calculated time of concentration is 3.3 minutes.



DRAINAGE AREA 2 (DA-2)

Drainage Area 2 consists of 17.46 acres of both pervious and impervious surfaces, which drain along the northern property line. The impervious area, 15.68 acres, is comprised of parking lot and roof areas. The pervious area, 1.78 acres, is comprised of lawn, landscaped islands, and woods. The calculated time of concentration is 9.8 minutes.

CURVE NUMBERS

The CN values used have been taken from the TR-55 Manual "Urban Hydrology for Small Watersheds," Table 2-2a and Table 2-2c, based on land cover and hydrologic soil groups.

Table 3 – Curve Number (Proposed Conditions)

Description	Hydrologic Group	Curve Number
Landscaped Islands (Open Space-Good Conditions)	D	80
Woods (Good Conditions)	C	70
Impervious	D	98

PEAK FLOWS

Using the information described above, the peak flows during the 2-, 10-, and 100-year storm events were calculated. Table 4 below summarizes the peak flows during each storm event. (See attached Hydraflow Output for Proposed Conditions Hydrographs, CN Values, and Time of Concentration Calculations.) As shown in this table, the proposed runoff rates and volumes are reduced from the existing to proposed conditions. Since this regulation requires that we show reductions at each time interval, we have included Table 7 in the appendix of this report which shows the minute-by-minute flows leaving the site for each storm event and compares existing and proposed conditions.

Table 4 – Overall Peak Runoff Rates

Storm Event	Existing Site Peak Runoff	Existing Site Runoff Volume	Proposed Site Peak Runoff	Proposed Site Runoff Volume
2 Year	55.21 cfs	218,202 cf	54.41 cfs	214,313 cuft
10 Year	85.81 cfs	344,069 cf	85.04 cfs	339,544 cuft
100 Year	146.15 cfs	594,086 cf	145.50 cfs	588,944 cuft

DRAINAGE AREA RUNOFF

To ensure that the neighboring properties would not be negatively affected, we performed an additional analysis for each individual drainage area. Tables 5 and 6 below summarize the existing and proposed peak runoff flows and volumes for Drainage Area 1 and Drainage Area 2, which drain to the eastern, and northern property lines respectively.



Table 5 – Existing Drainage Area Peak Runoff Rates

Storm Event	Existing DA-1 Peak Runoff	Existing DA-1 Runoff Volume	Existing DA-2 Peak Runoff	Existing DA-2 Runoff Volume
2 Year	7.941 cfs	26,066 cuft	48.41 cfs	192,136 cuft
10 Year	12.36 cfs	41,199 cuft	75.23 cfs	302,869 cuft
100 Year	21.07 cfs	71,262 cuft	128.15 cfs	522,824 cuft

Table 6 – Proposed Drainage Area Peak Runoff Rates

Storm Event	Proposed DA-1 Peak Runoff	Proposed DA-1 Runoff Volume	Proposed DA-2 Peak Runoff	Proposed DA-2 Runoff Volume
2 Year	7.458 cfs	24,068 cuft	48.00 cfs	190,244 cuft
10 Year	11.96 cfs	39,031 cuft	74.78 cfs	300,513 cuft
100 Year	20.89 cfs	69,174 cuft	127.63 cfs	519,771 cuft

As seen in the tables above, both the peak runoff values and the runoff volumes have decreased for each storm event for each drainage area. As such, the adjacent properties will not experience any adverse impacts from stormwater leaving the subject property.

WATER QUALITY

Since the Proposed Development does not result in a net increase of $\frac{1}{4}$ of an acre or more of impervious surface, the water quality aspect of the Stormwater Management Rules is not required.

GROUNDWATER RECHARGE

The site is located within the Metropolitan Planning Area. No groundwater recharge is required for the site. A map from Geo Web showing the site within this planning area can be found in the appendix of this report.

STORM SEWER COMPUTATIONS

A storm sewer system has been designed to collect the runoff associated with the proposed parking areas, roofs, drive aisles, and lawn areas. Currently, the County has a storm sewer that runs through the subject property, combines with collected on-site stormwater, and discharges into the tributary that is north of the subject property. This off-site drainage has been established using aerial topography provided by Essex County. The primary purpose of the system is to



properly drain the proposed site and deliver the runoff to the existing drainage swale located to the north of the property. The pipes are designed to carry the flows for the 25-year storm.

The rational method was used to calculate runoff rates. Manning's equation was used to determine the capacity of each system. Storm Sewer Computations are included in the appendix of this report. Also, Fig.-3 and Fig.-4 show the drainage areas to each inlet.

The majority of the site is mapped with soils considered Hydrologic Group D except for the soil in the Eagle Rock Reservation with is Group C. For this analysis, all the drainage areas were assumed to have 0.99 as a Runoff Coefficient (C value), which is the most conservative value. The woods in the Reservation were assumed to have 0.45, woods in good condition, Group C.

CONCLUSION

The proposed improvements meet all of the stormwater management regulations for both the Township of West Orange as well as the NJDEP. The stormwater quantity is satisfied through the use of non-structural strategies, specifically the reduction in impervious surfaces. The existing parking lot is comprised entirely of pavement with very little landscape islands. The proposed development calls for approximately 0.9 acres of landscape islands to be constructed. The decrease in impervious also means that water quality measures are not required.

The site is located in the Metropolitan Planning Area, which means that storm water recharge is not required. However, it should be noted that the reduction of impervious surfaces will allow more water to be absorbed into the ground naturally.

Finally, in existing conditions, the site has a few inlets scattered throughout the site. However the majority of the water sheet flows across the parking lot and ultimately flows into the tributary just beyond the northern property line. The proposed improvements call for additional inlets to be installed. These inlets will more efficiently capture the water and prevent the runoff from sheet flowing across the entire property. These storm sewers, as shown in the Storm Sewer computations, are adequately sized to convey the 25-year storm.



**EXISTING CONDITIONS
HYDROGRAPHS**



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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

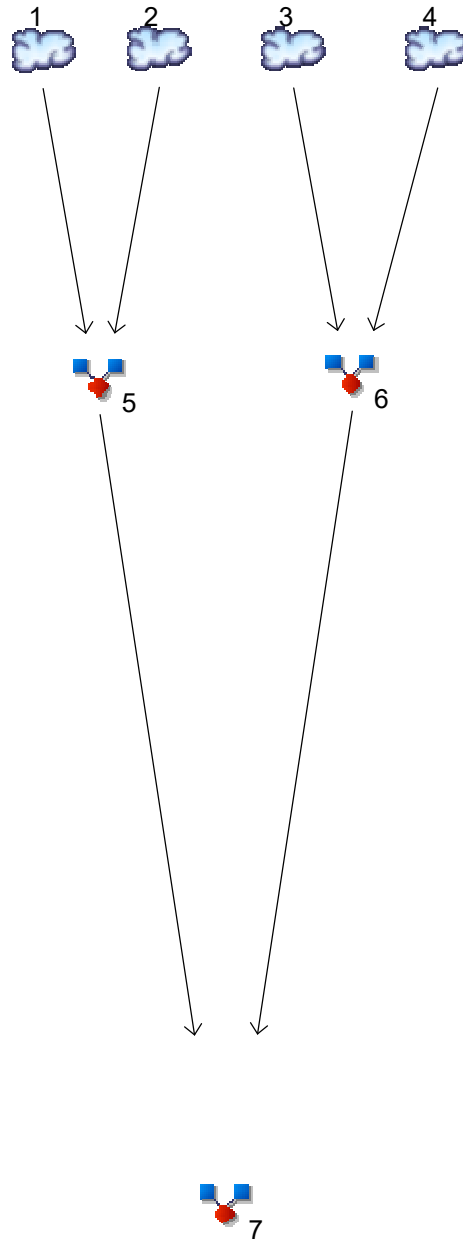
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Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023



Legend

Hyd.	Origin	Description
1	SCS Runoff	DA-1(Pervious)
2	SCS Runoff	DA-1(Impervious)
3	SCS Runoff	DA-2(Pervious)
4	SCS Runoff	DA-2(Impervious)
5	Combine	DA-1
6	Combine	DA-2
7	Combine	<no description>

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	-----	-----	0.542	-----	-----	1.047	-----	-----	2.075	DA-1(Pervious)
2	SCS Runoff	-----	-----	7.399	-----	-----	11.32	-----	-----	18.99	DA-1(Impervious)
3	SCS Runoff	-----	-----	2.033	-----	-----	4.257	-----	-----	8.969	DA-2(Pervious)
4	SCS Runoff	-----	-----	46.41	-----	-----	71.01	-----	-----	119.21	DA-2(Impervious)
5	Combine	1, 2,	-----	7.941	-----	-----	12.36	-----	-----	21.07	DA-1
6	Combine	3, 4,	-----	48.41	-----	-----	75.23	-----	-----	128.15	DA-2
7	Combine	5, 6	-----	55.21	-----	-----	85.81	-----	-----	146.15	<no description>
Proj. file: Existing.gpw										Thursday, 03 / 2 / 2023	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.542	1	726	1,542	-----	-----	-----	DA-1(Pervious)
2	SCS Runoff	7.399	1	726	24,524	-----	-----	-----	DA-1(Impervious)
3	SCS Runoff	2.033	1	729	7,167	-----	-----	-----	DA-2(Pervious)
4	SCS Runoff	46.41	1	728	184,970	-----	-----	-----	DA-2(Impervious)
5	Combine	7.941	1	726	26,066	1, 2,	-----	-----	DA-1
6	Combine	48.41	1	728	192,136	3, 4,	-----	-----	DA-2
7	Combine	55.21	1	728	218,202	5, 6	-----	-----	<no description>
Existing.gpw					Return Period: 2 Year			Thursday, 03 / 2 / 2023	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

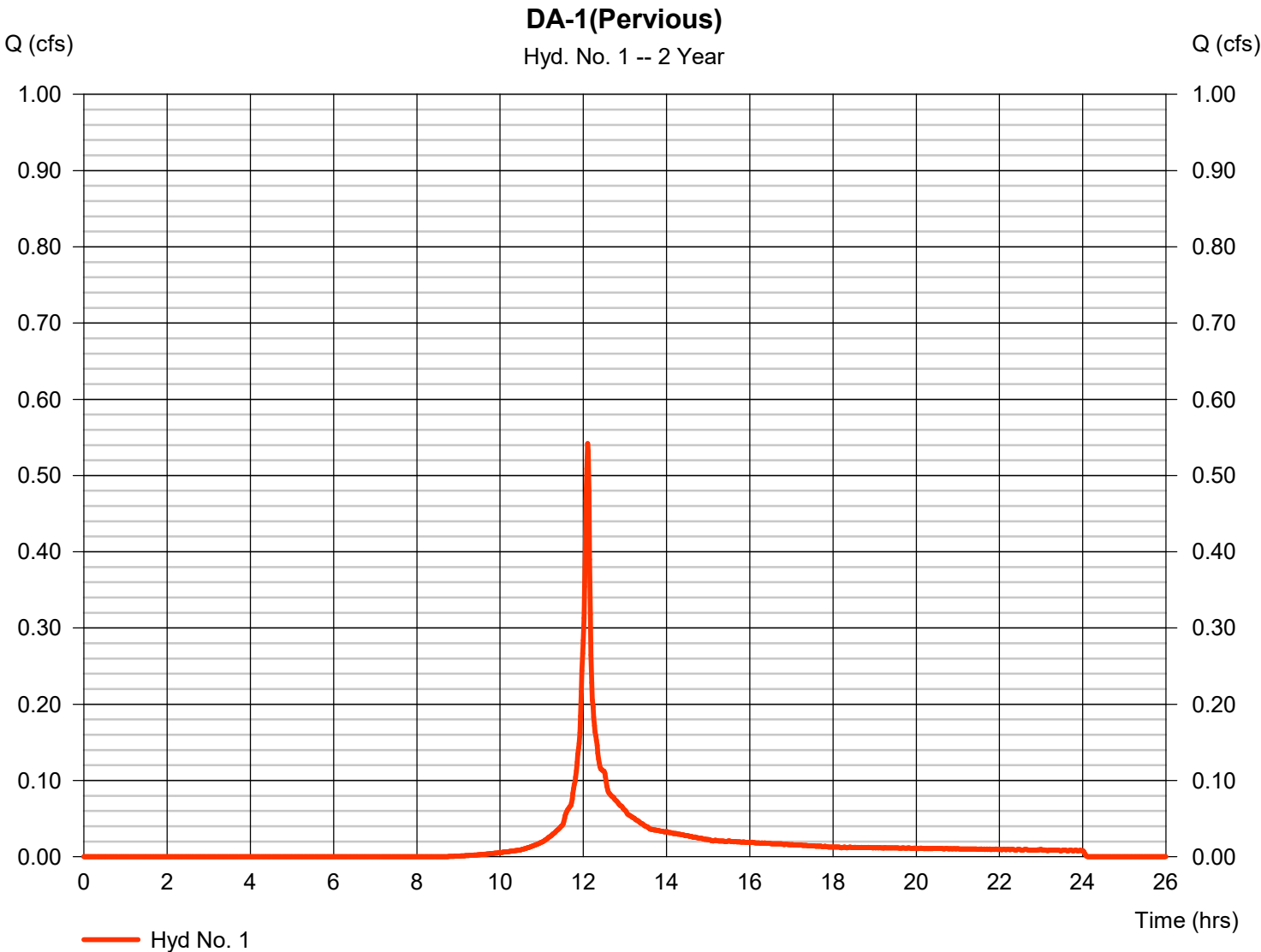
Thursday, 03 / 2 / 2023

Hyd. No. 1

DA-1(Pervious)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.542 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	1,542 cuft
Drainage area	=	0.270 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.70 min
Total precip.	=	3.42 in	Distribution	=	Custom
Storm duration	=	S:\Petry Engineering Cad Projects\181010078 Kruvan184 West Orange Plaza - V			

* Composite (Area/CN) = + (0.270 x 80)] / 0.270



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No. 1

DA-1(Pervious)

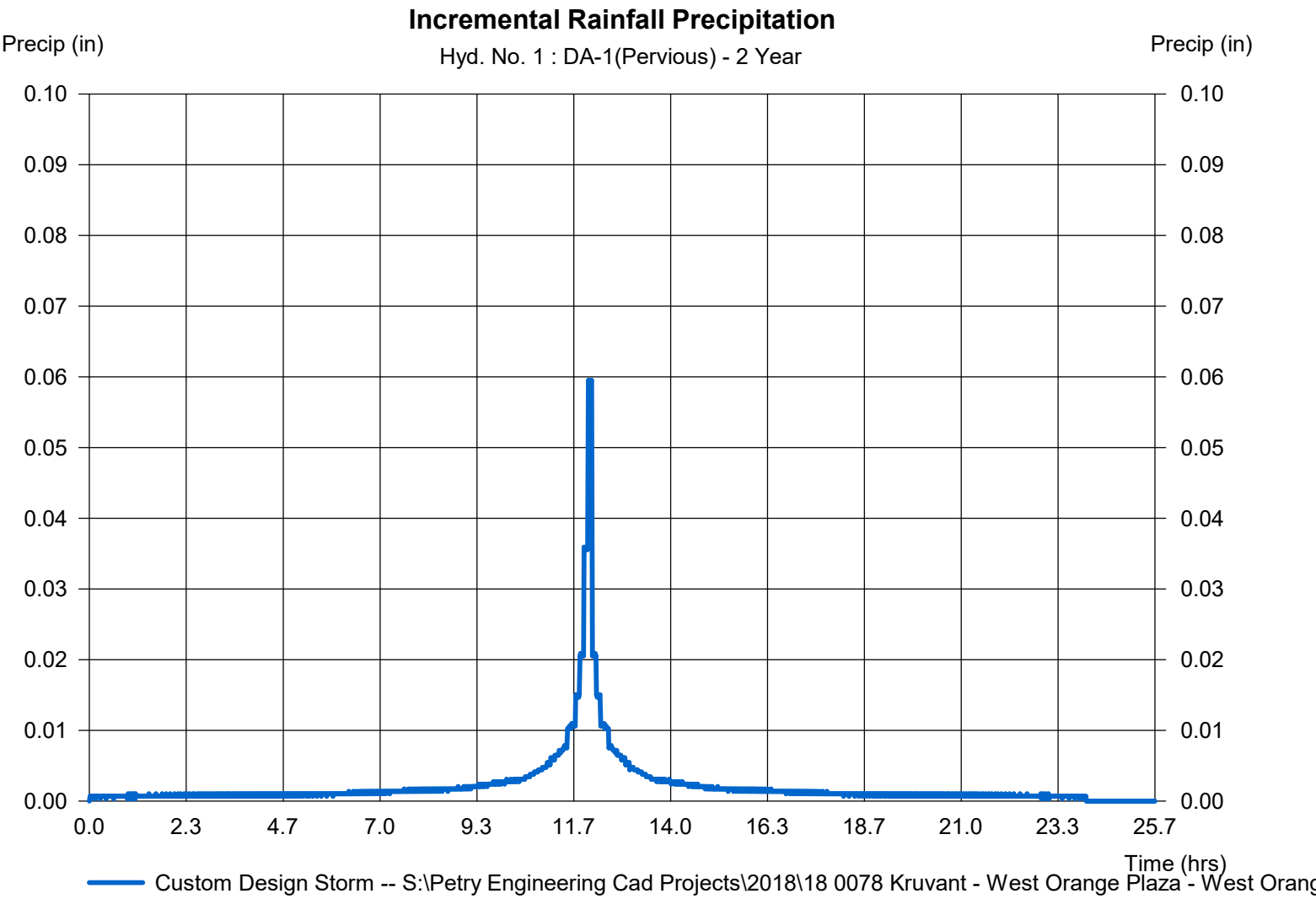
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.011	0.011	0.011				
Flow length (ft)	= 150.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.44	0.00	0.00				
Land slope (%)	= 4.62	0.00	0.00				
Travel Time (min)	= 1.16	+	0.00	+	0.00	=	1.16
Shallow Concentrated Flow							
Flow length (ft)	= 531.00	160.00	215.00				
Watercourse slope (%)	= 3.77	6.25	5.11				
Surface description	= Paved	Paved	Paved				
Average velocity (ft/s)	=3.95	5.08	4.60				
Travel Time (min)	= 2.24	+	0.52	+	0.78	=	3.55
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				4.70 min			

Precipitation Report

Hyd. No. 1

DA-1(Pervious)

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4200 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

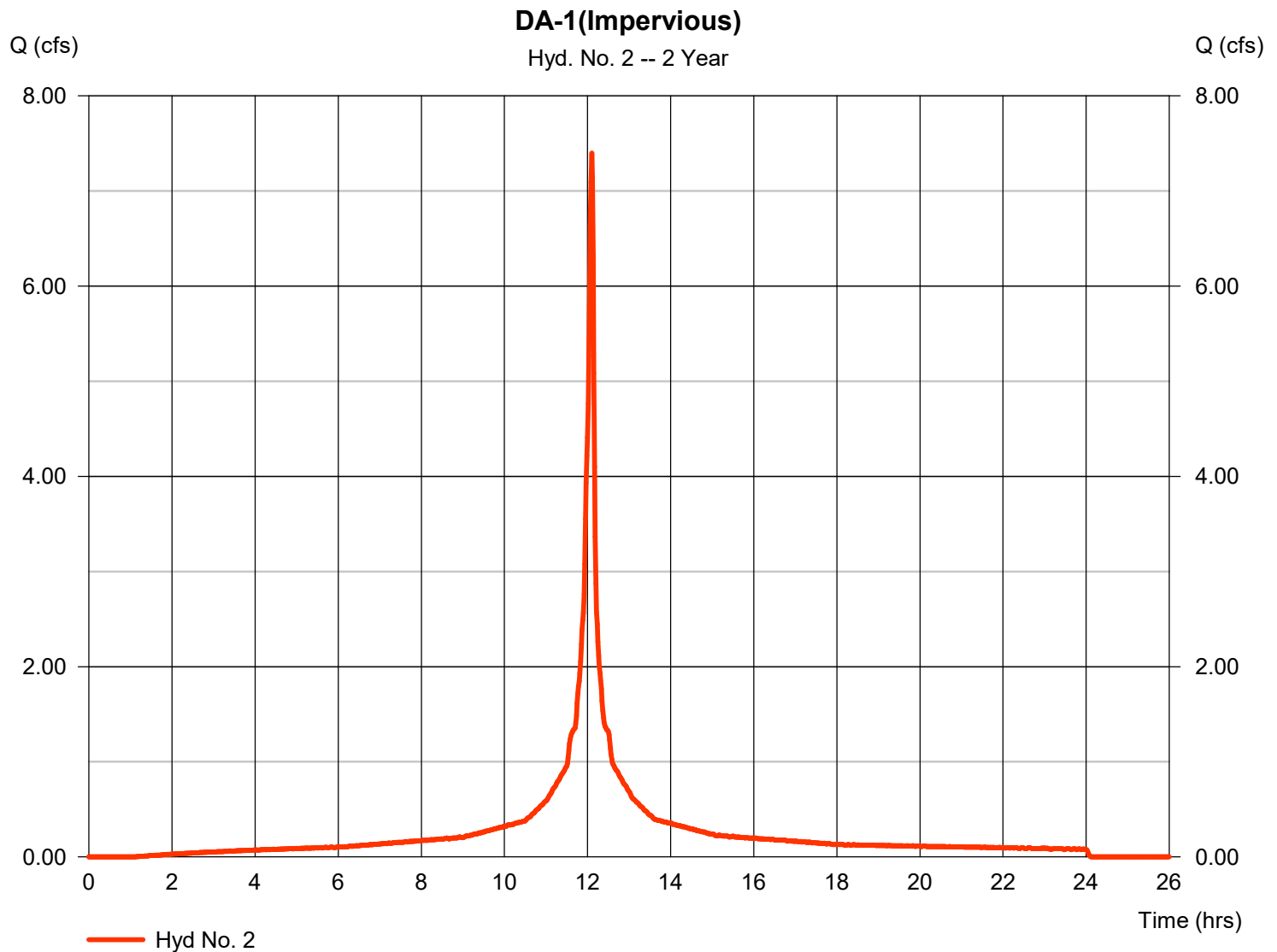
Hyd. No. 2

DA-1(Impervious)

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 1 min
 Drainage area = 2.120 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 3.42 in
 Storm duration = S:\Petry Engineering Cad Projects\1810078 Kruvanan\184 West Orange Plaza - V

Peak discharge = 7.399 cfs
 Time to peak = 12.10 hrs
 Hyd. volume = 24,524 cuft
 Curve number = 98*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 4.70 min
 Distribution = Custom

* Composite (Area/CN) = $[(11.010 \times 98)] / 2.120$

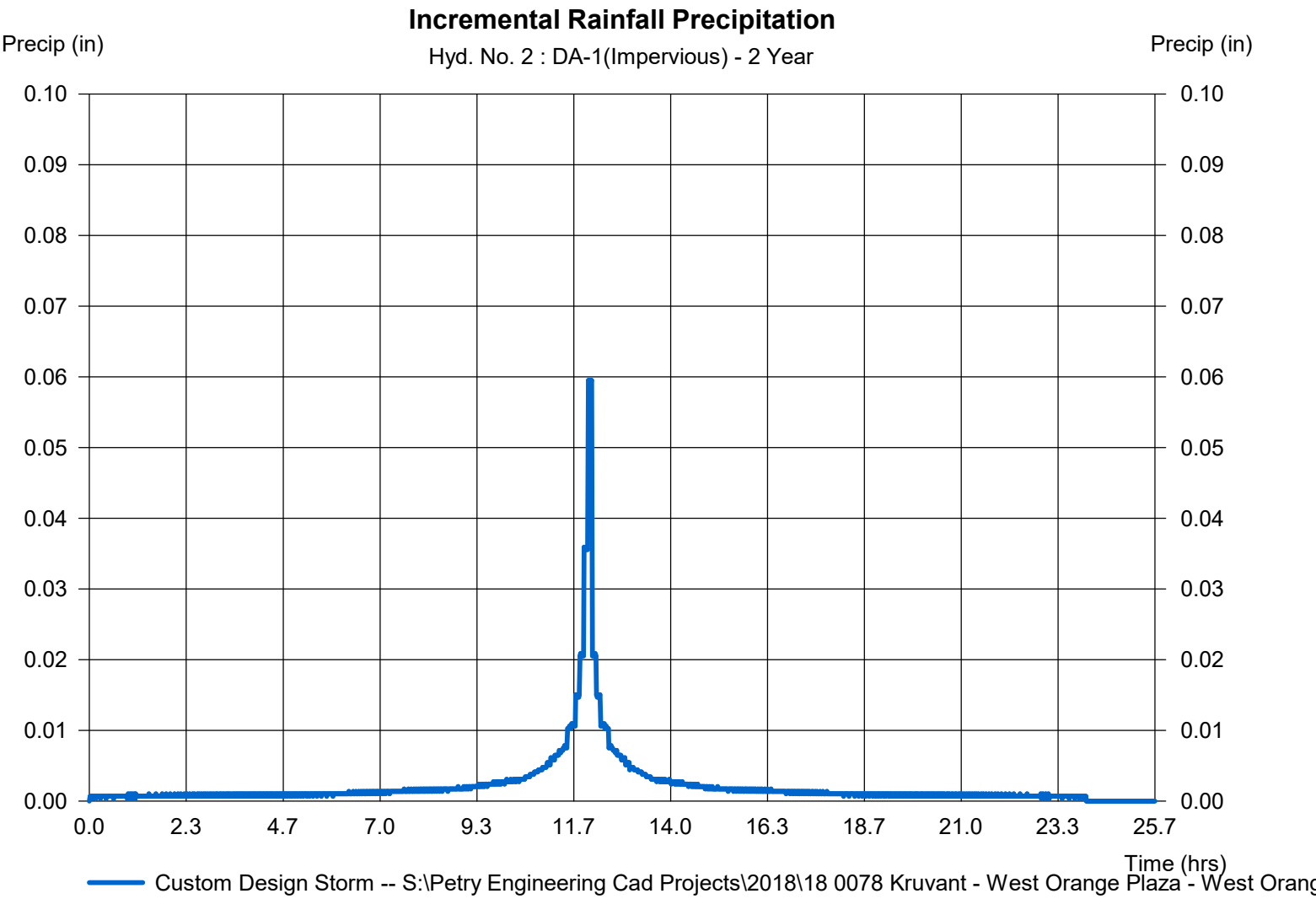


Precipitation Report

Hyd. No. 2

DA-1(Impervious)

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4200 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

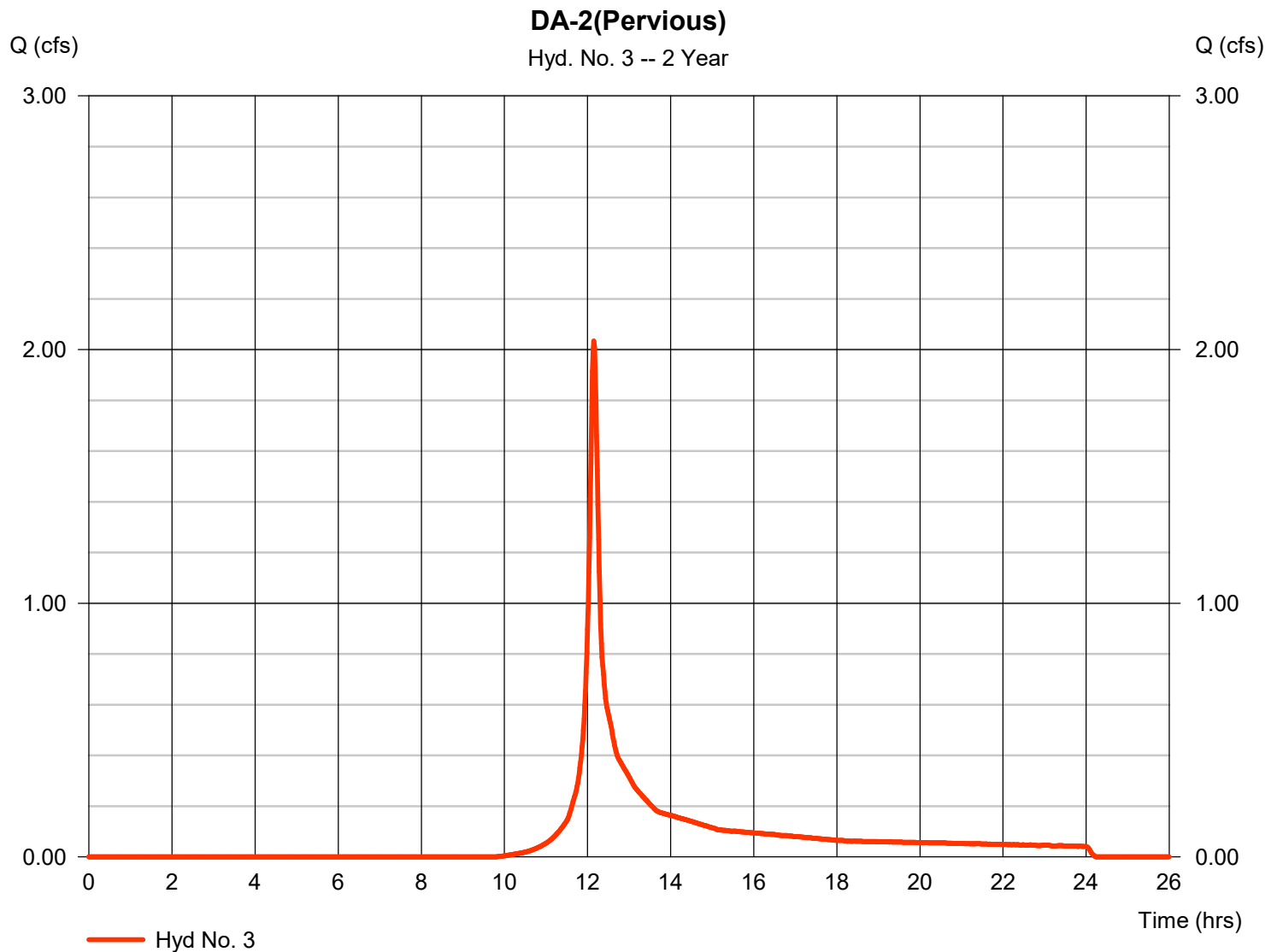
Thursday, 03 / 2 / 2023

Hyd. No. 3

DA-2(Pervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 2.033 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.15 hrs
Time interval	= 1 min	Hyd. volume	= 7,167 cuft
Drainage area	= 1.510 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.40 min
Total precip.	= 3.42 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\18100078 Kruvan 184 West Orange Plaza - V		

* Composite (Area/CN) = $[(0.550 \times 70) + (0.960 \times 80)] / 1.510$



TR55 Tc Worksheet

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Hyd. No. 3

DA-2(Pervious)

<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)	= 60.0	40.0	0.0	
Two-year 24-hr precip. (in)	= 3.44	3.44	0.00	
Land slope (%)	= 6.00	6.00	0.00	
Travel Time (min)	= 5.89	+	0.36	+
			0.00	= 6.26
Shallow Concentrated Flow				
Flow length (ft)	= 220.00	85.00	0.00	
Watercourse slope (%)	= 6.00	4.60	0.00	
Surface description	= Paved	Paved	Paved	
Average velocity (ft/s)	=4.98	4.36	0.00	
Travel Time (min)	= 0.74	+	0.32	+
			0.00	= 1.06
Channel Flow				
X sectional flow area (sqft)	= 1.77	3.14	4.91	
Wetted perimeter (ft)	= 4.71	6.28	7.85	
Channel slope (%)	= 3.50	3.00	2.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=9.65	10.81	10.26	
Flow length (ft)	({})170.0	1000.0	150.0	
Travel Time (min)	= 0.29	+	1.54	+
			0.24	= 2.08
Total Travel Time, Tc				9.40 min

Precipitation Report

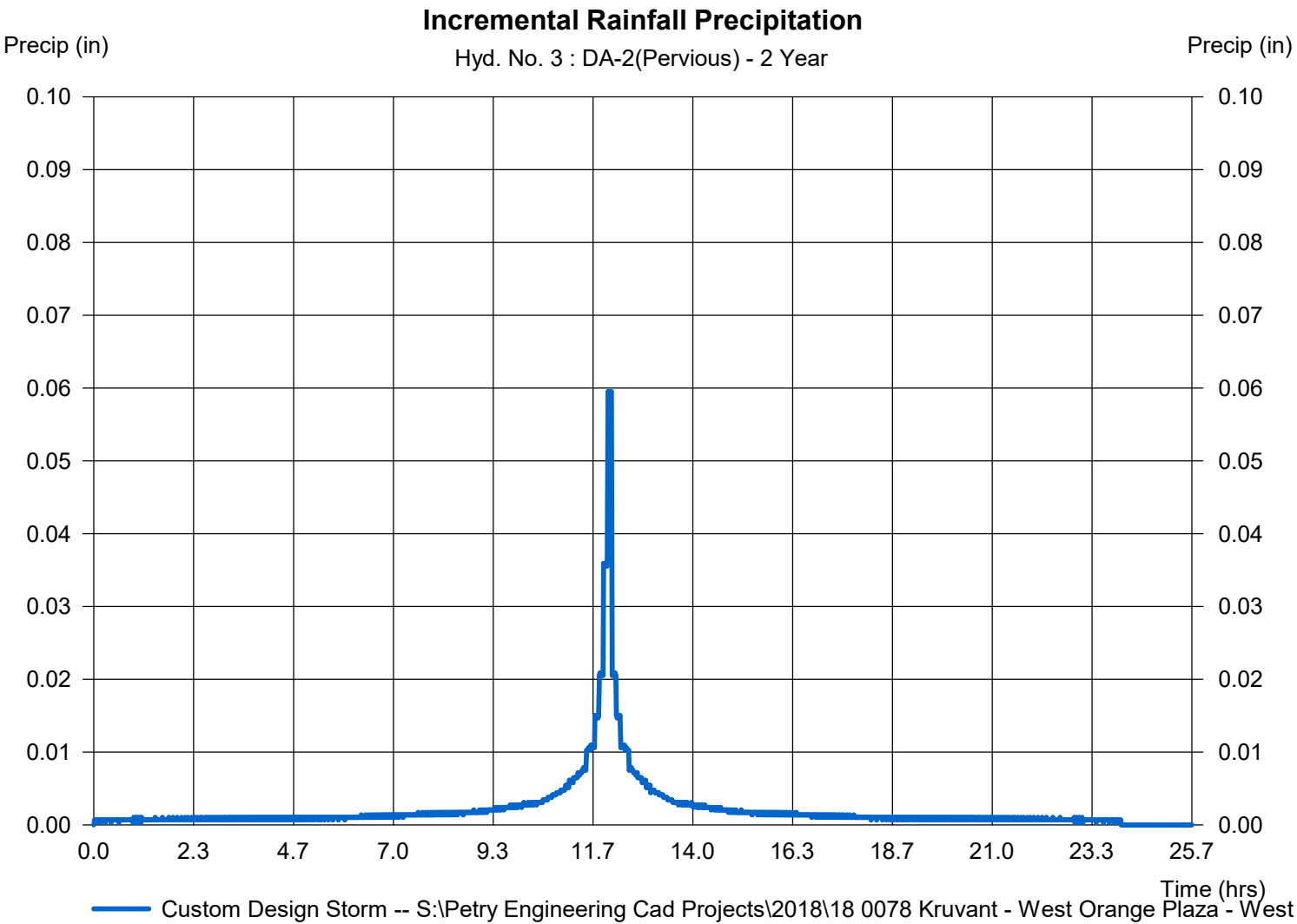
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 3

DA-2(Pervious)

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4200 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		

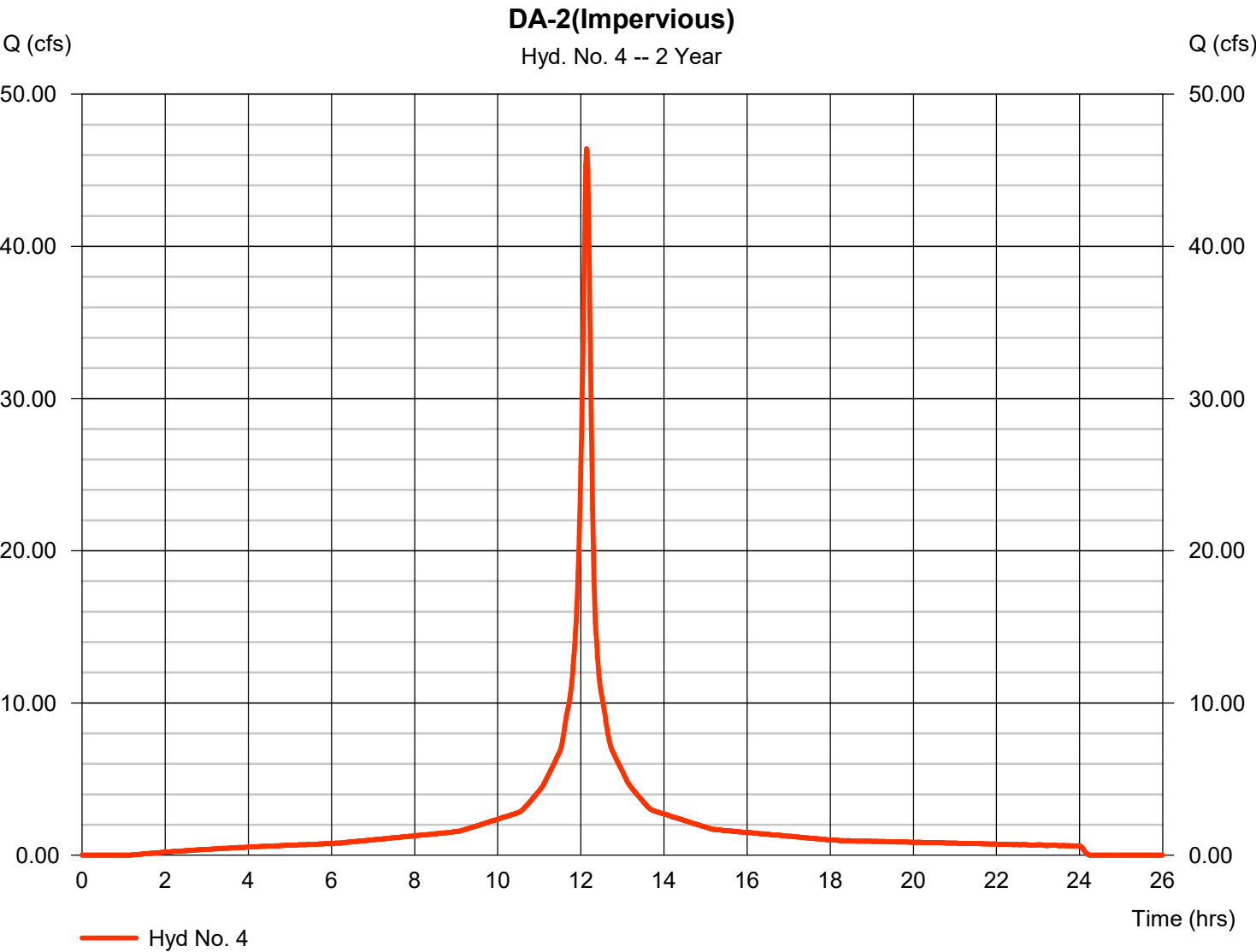


Hydrograph Report

Hyd. No. 4

DA-2(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 46.41 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 184,970 cuft
Drainage area	= 15.990 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.40 min
Total precip.	= 3.42 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvan184 West Orange Plaza - V		



Precipitation Report

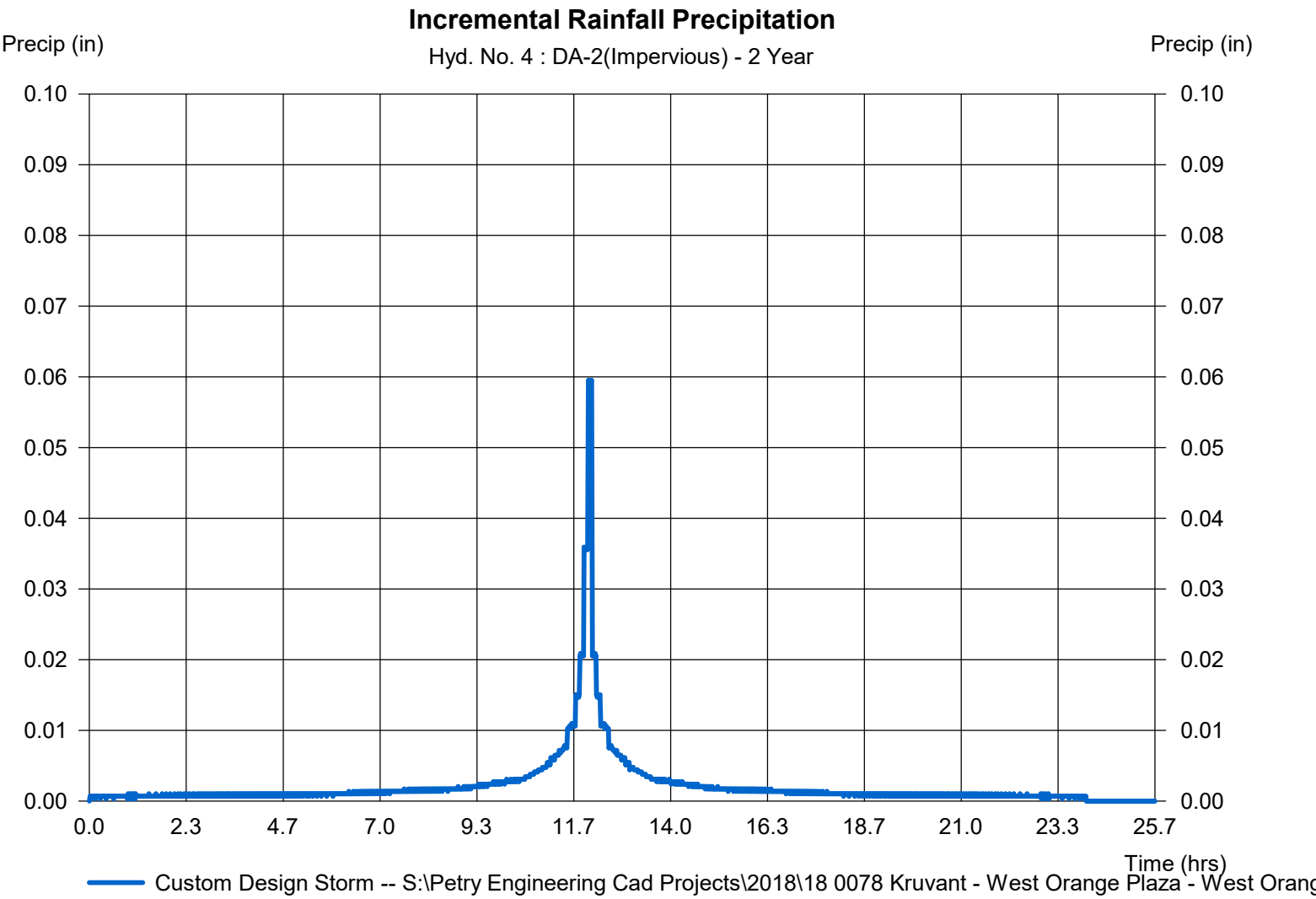
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 4

DA-2(Impervious)

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4200 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		

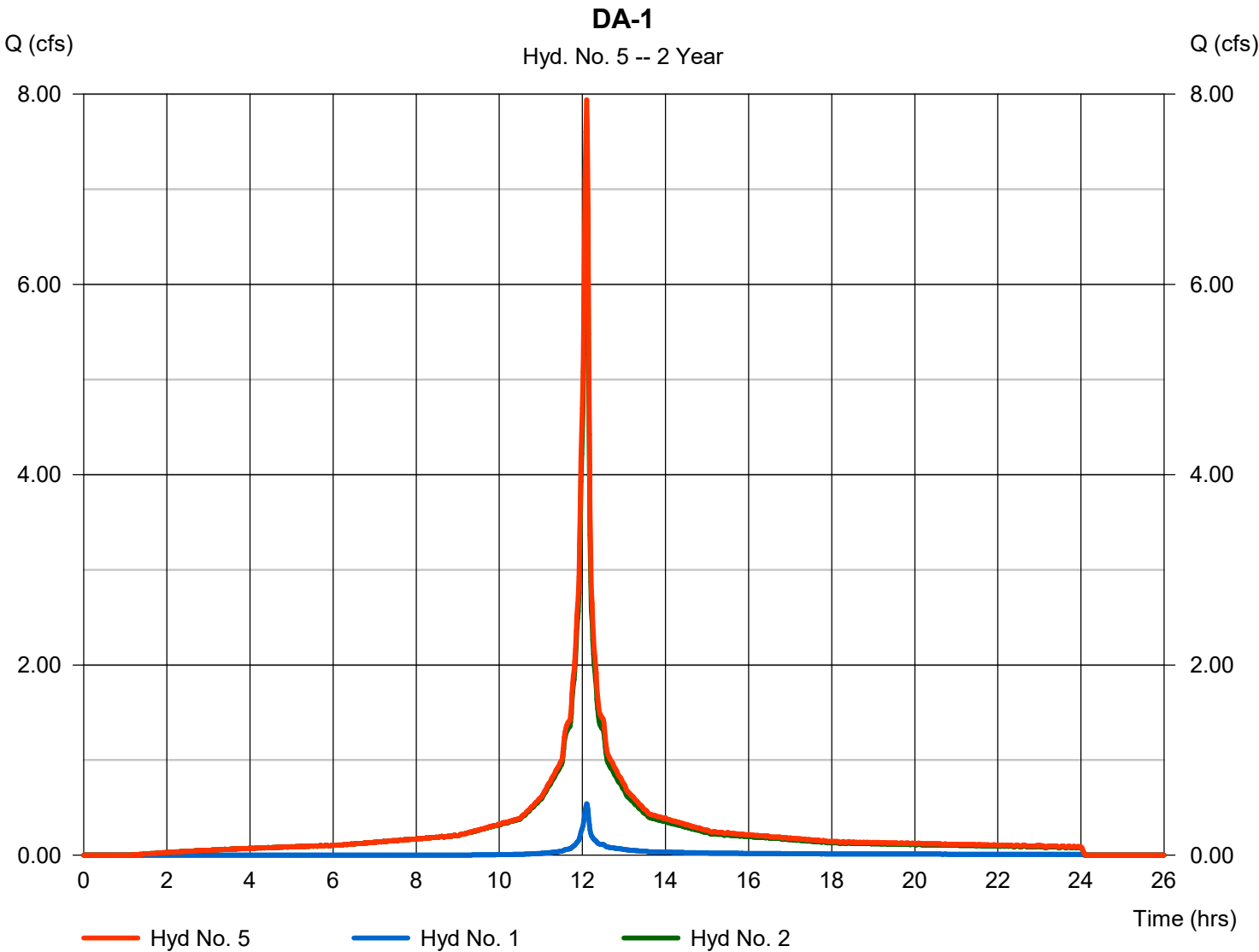


Hydrograph Report

Hyd. No. 5

DA-1

Hydrograph type	= Combine	Peak discharge	= 7.941 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 26,066 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 2.390 ac



Hydrograph Report

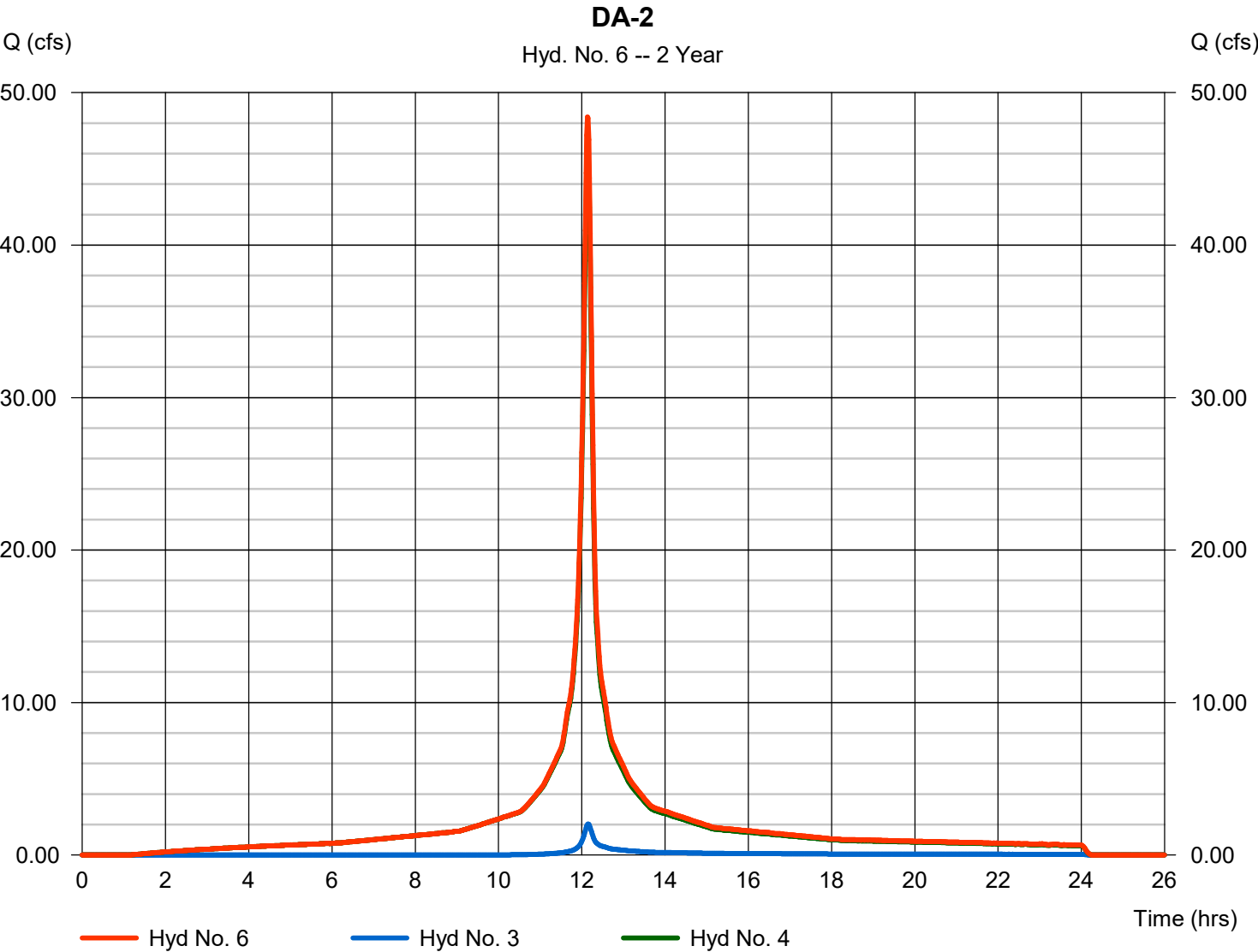
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 6

DA-2

Hydrograph type	= Combine	Peak discharge	= 48.41 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 192,136 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 17.500 ac



Hydrograph Report

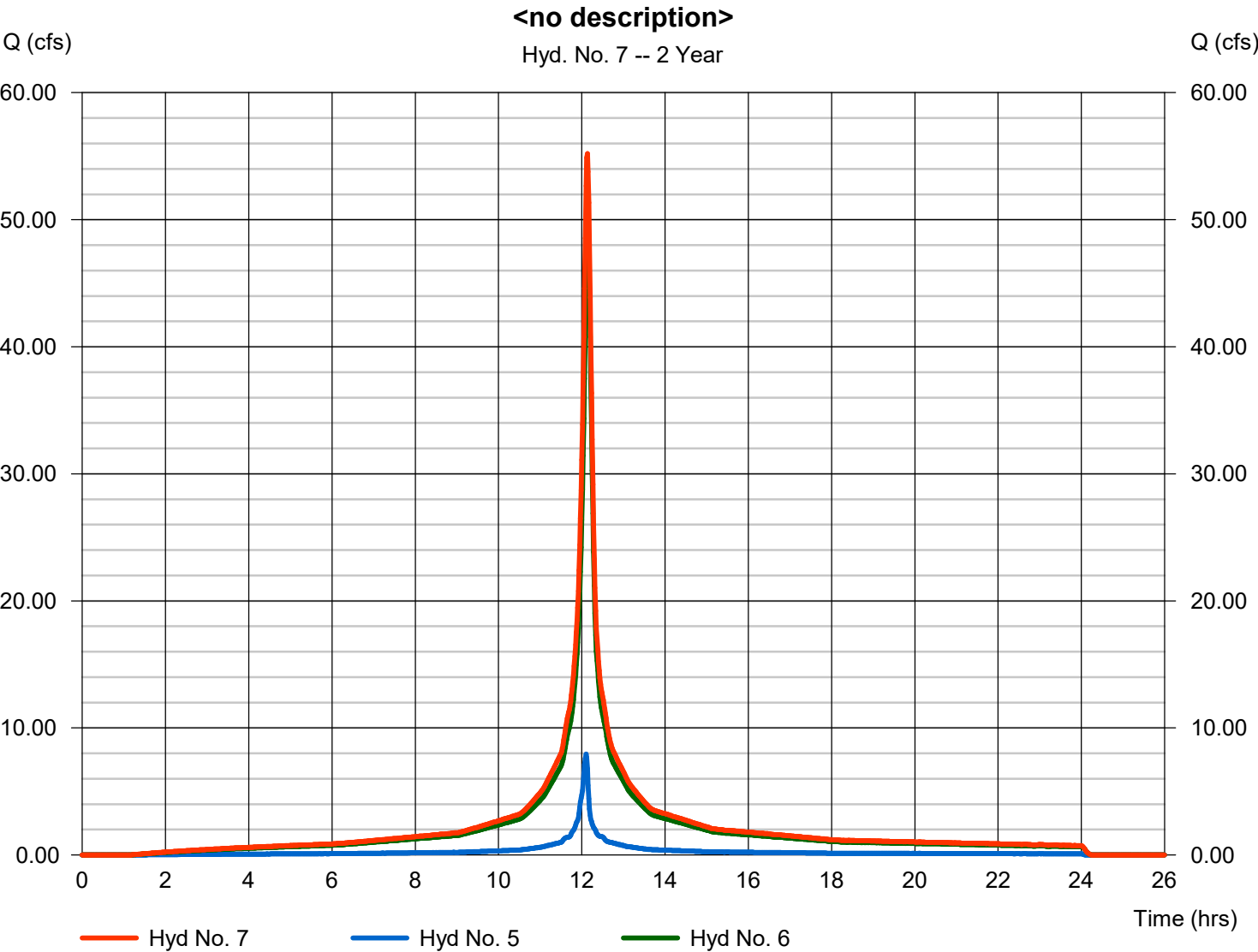
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 7

<no description>

Hydrograph type	= Combine	Peak discharge	= 55.21 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 218,202 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	1.047	1	726	3,007	-----	-----	-----	DA-1(Pervious)
2	SCS Runoff	11.32	1	726	38,192	-----	-----	-----	DA-1(Impervious)
3	SCS Runoff	4.257	1	729	14,806	-----	-----	-----	DA-2(Pervious)
4	SCS Runoff	71.01	1	728	288,063	-----	-----	-----	DA-2(Impervious)
5	Combine	12.36	1	726	41,199	1, 2,	-----	-----	DA-1
6	Combine	75.23	1	728	302,869	3, 4,	-----	-----	DA-2
7	Combine	85.81	1	728	344,069	5, 6	-----	-----	<no description>
Existing.gpw					Return Period: 10 Year			Thursday, 03 / 2 / 2023	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

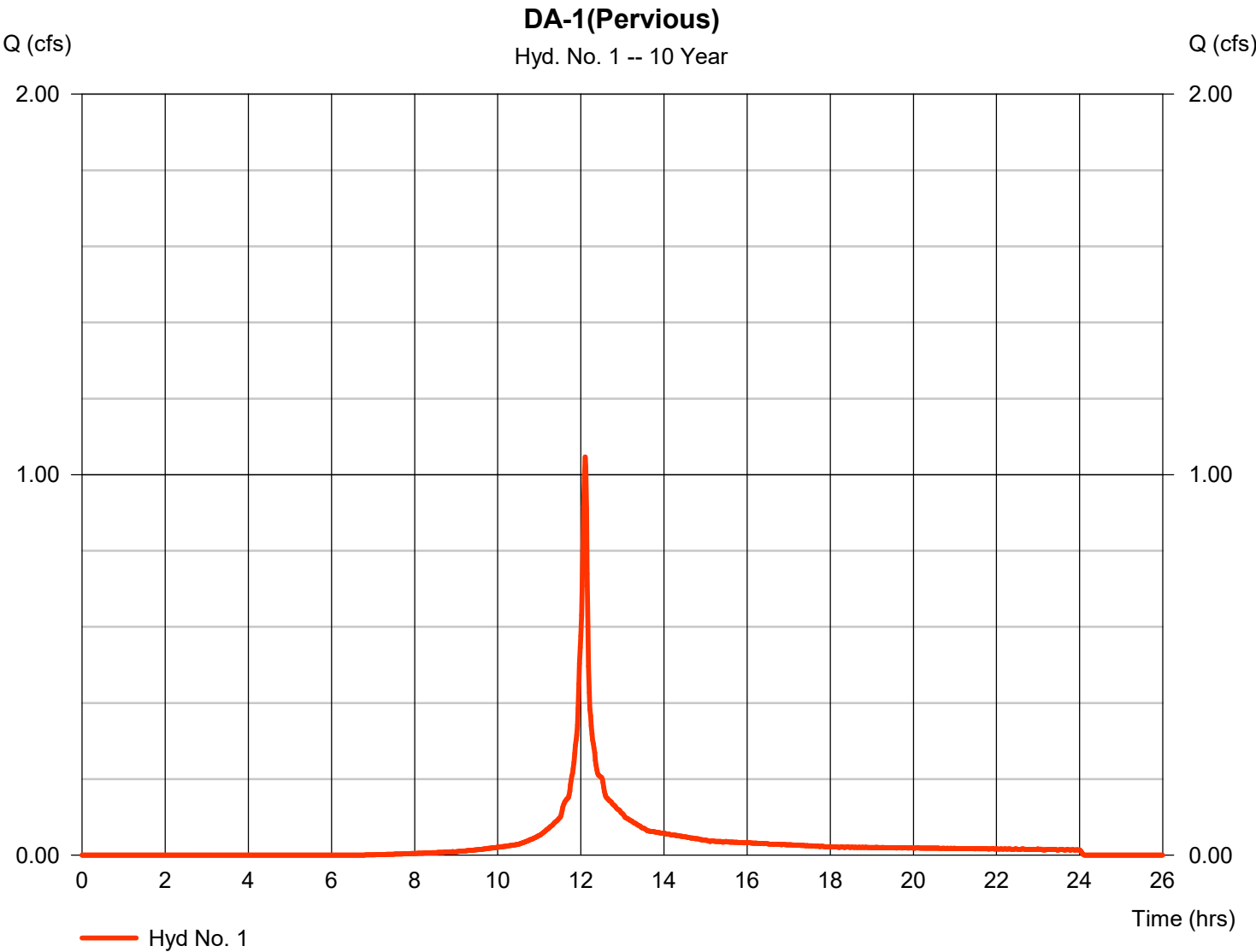
Thursday, 03 / 2 / 2023

Hyd. No. 1

DA-1(Pervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 1.047 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 3,007 cuft
Drainage area	= 0.270 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 4.70 min
Total precip.	= 5.20 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\181010078 Kruvan 184 West Orange Plaza - V		

* Composite (Area/CN) = + (0.270 x 80)] / 0.270

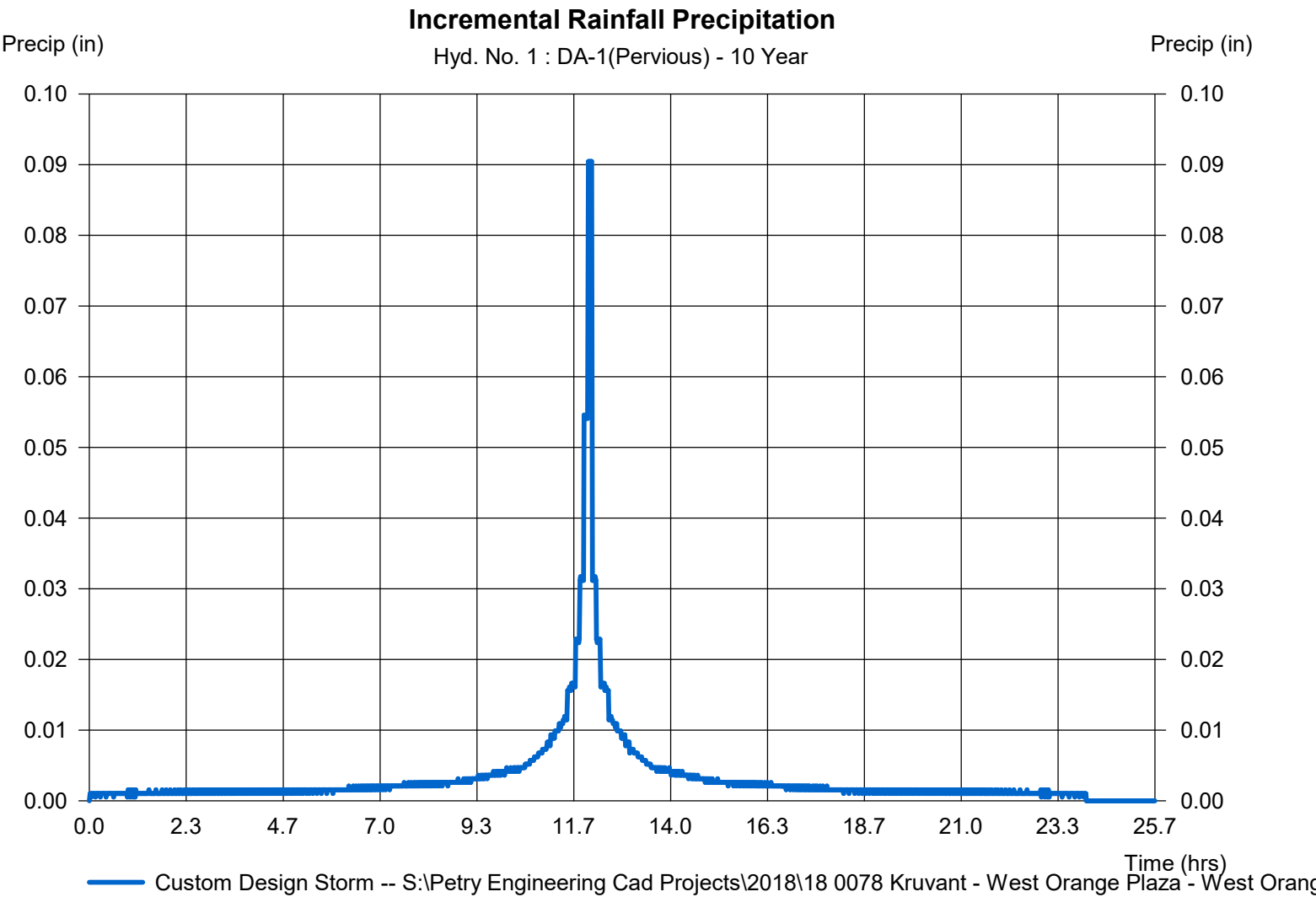


Precipitation Report

Hyd. No. 1

DA-1(Pervious)

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.2000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

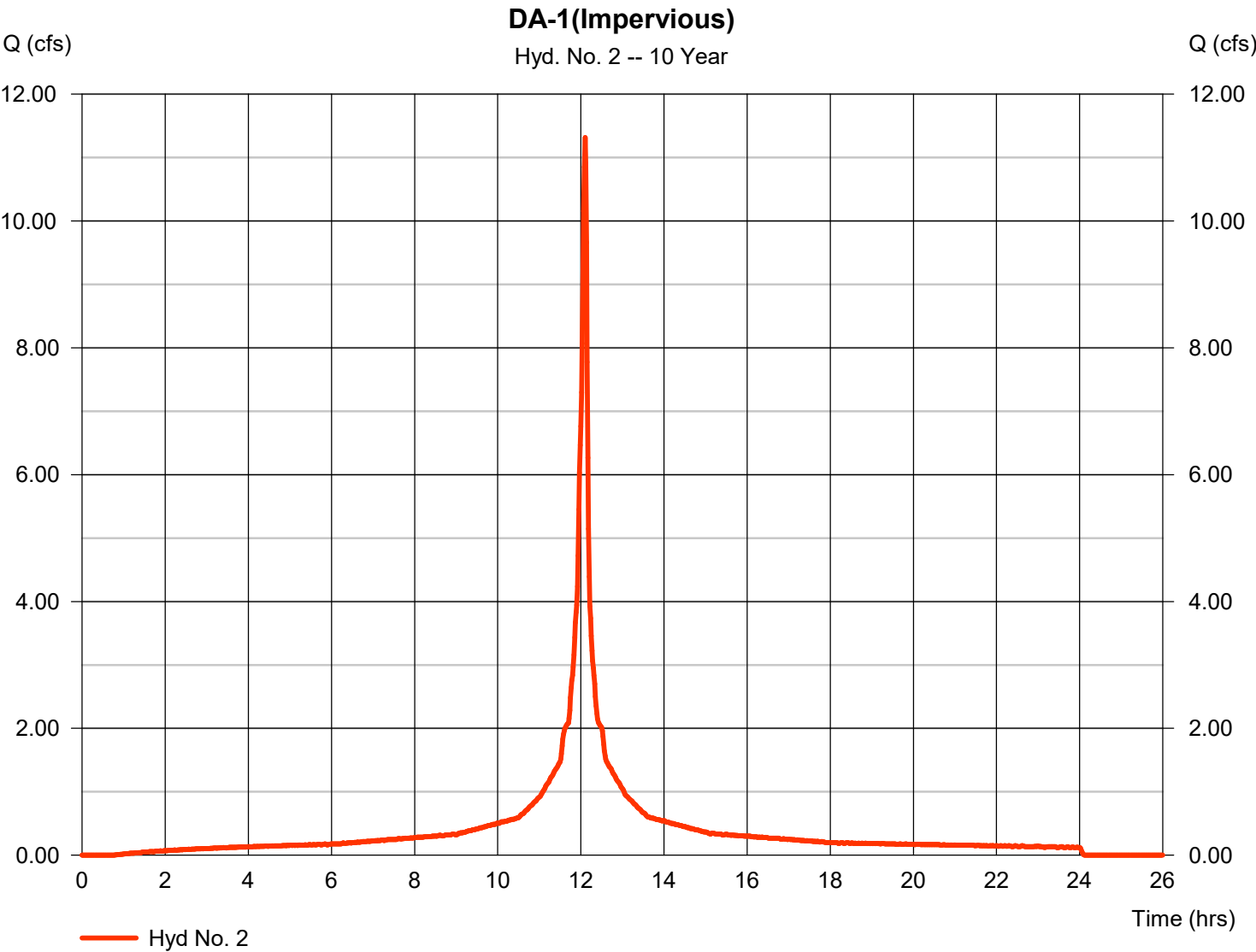
Thursday, 03 / 2 / 2023

Hyd. No. 2

DA-1(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 11.32 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 38,192 cuft
Drainage area	= 2.120 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.70 min
Total precip.	= 5.20 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\181010078 Kruvan184 West Orange Plaza - V		

* Composite (Area/CN) = [(11.010 x 98)] / 2.120

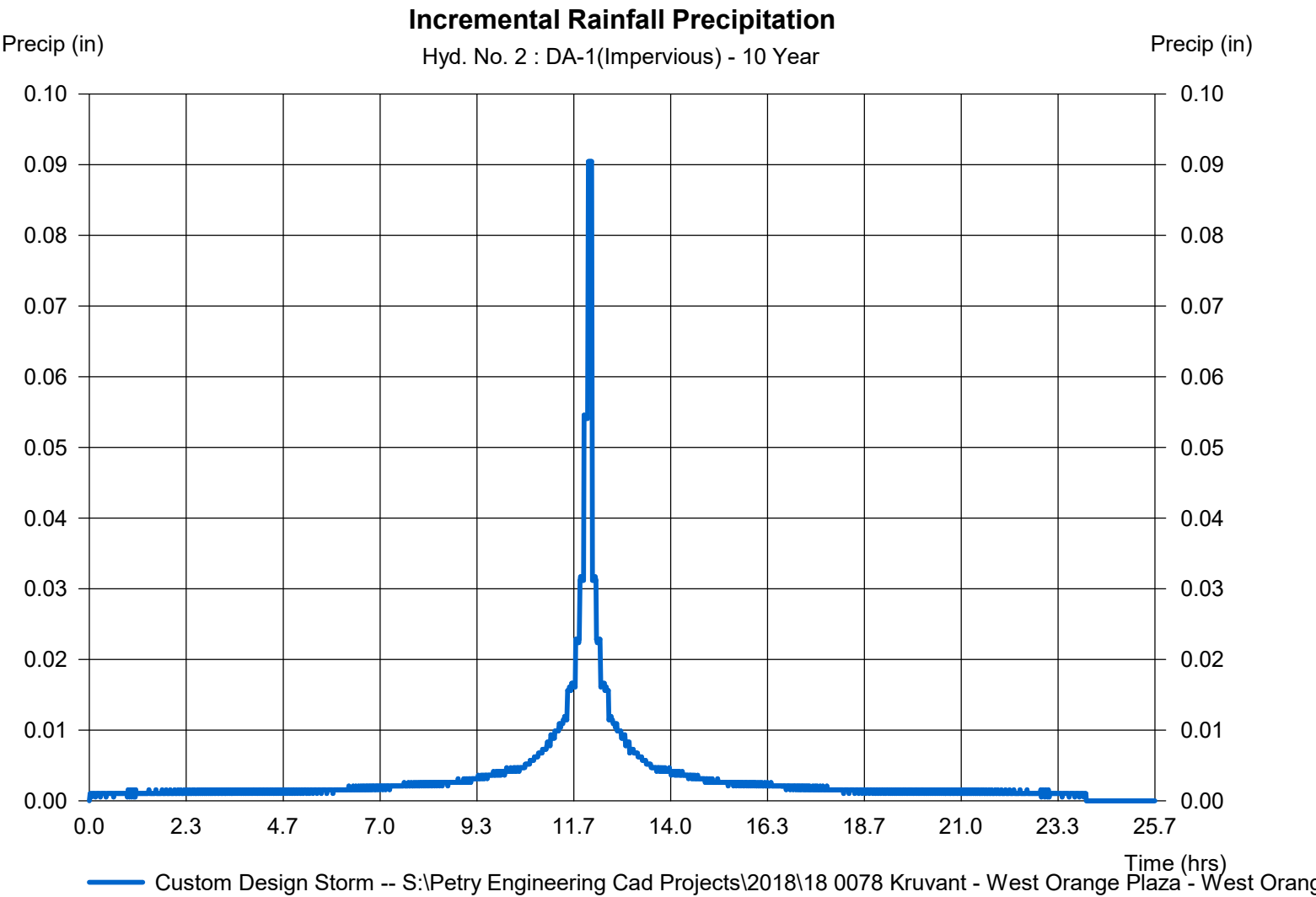


Precipitation Report

Hyd. No. 2

DA-1(Impervious)

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.2000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

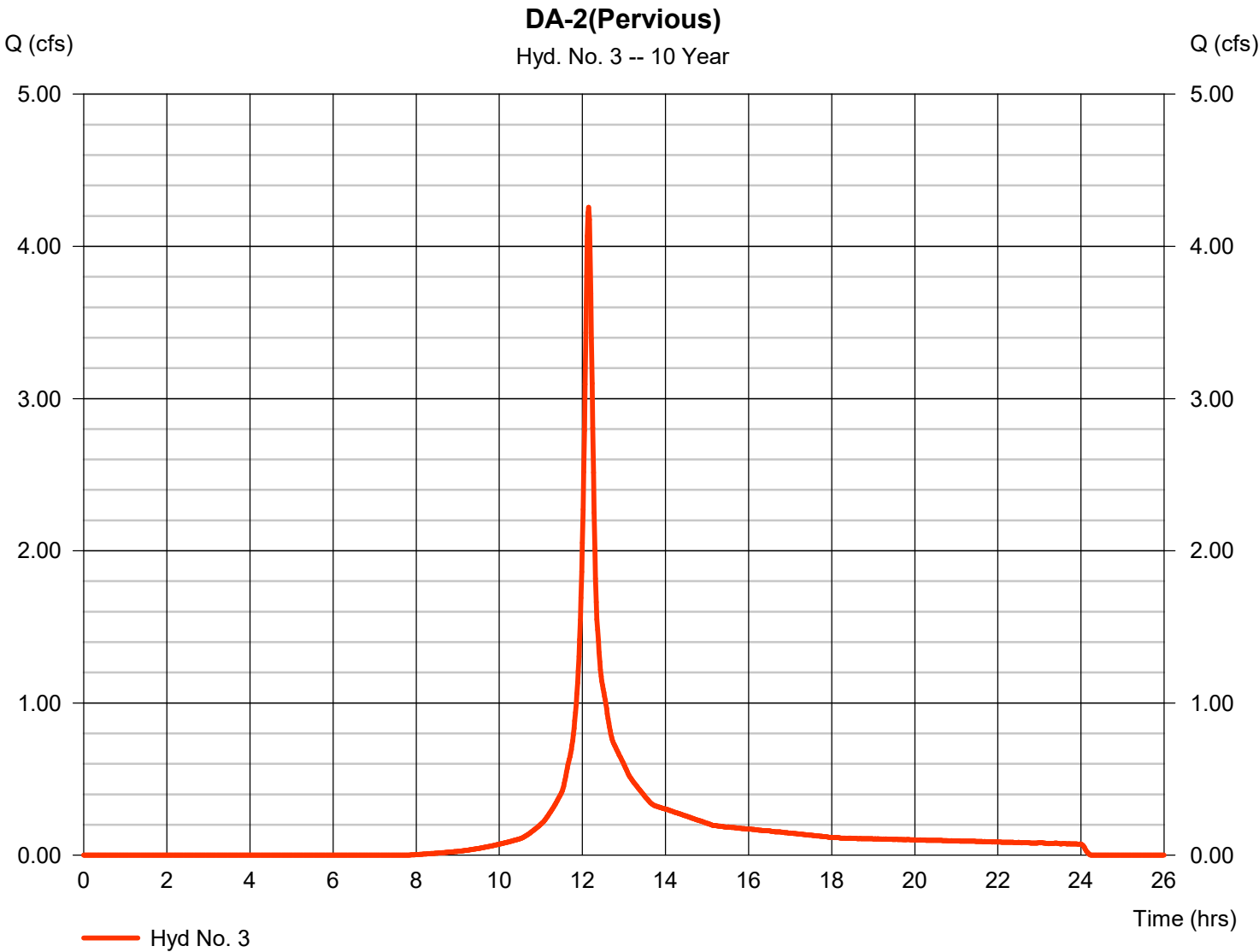
Thursday, 03 / 2 / 2023

Hyd. No. 3

DA-2(Pervious)

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.257 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.15 hrs
Time interval	=	1 min	Hyd. volume	=	14,806 cuft
Drainage area	=	1.510 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.40 min
Total precip.	=	5.20 in	Distribution	=	Custom
Storm duration	=	S:\Petry Engineering Cad Projects\1810078 Kruvan184 West Orange Plaza - V			

* Composite (Area/CN) = [(0.550 x 70) + (0.960 x 80)] / 1.510



Precipitation Report

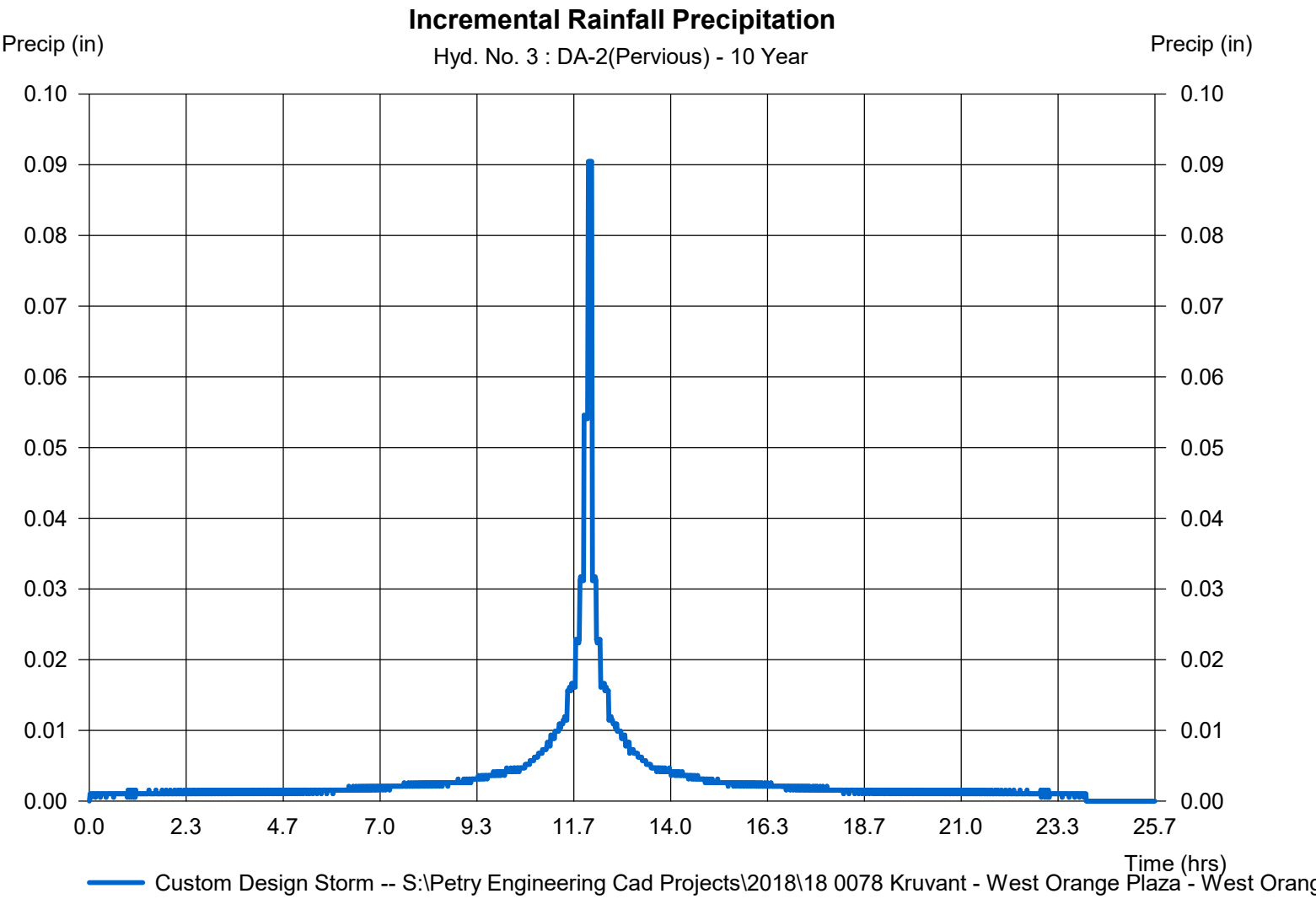
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 3

DA-2(Pervious)

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.2000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		

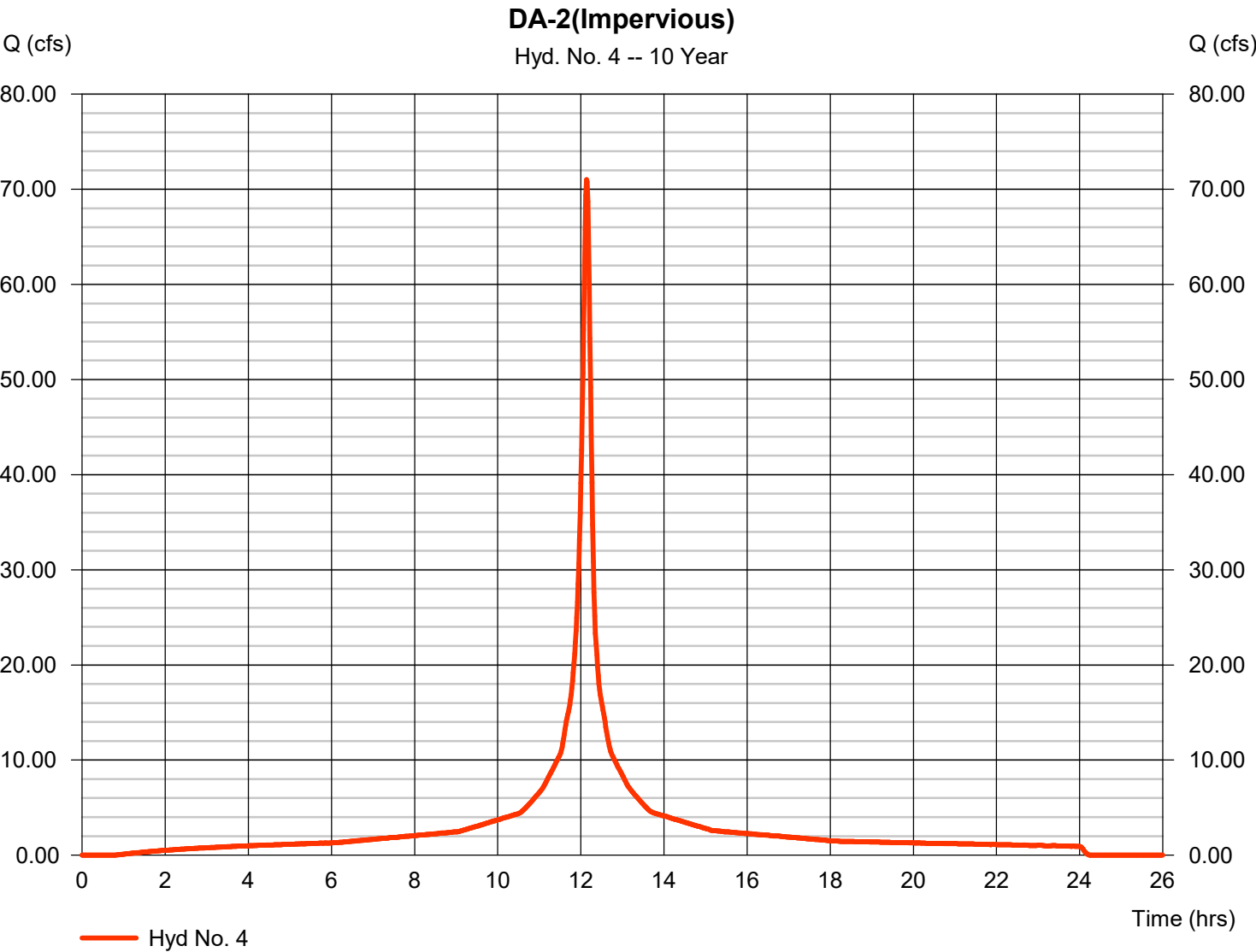


Hydrograph Report

Hyd. No. 4

DA-2(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 71.01 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 288,063 cuft
Drainage area	= 15.990 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.40 min
Total precip.	= 5.20 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvanak\1810078 Kruvanak - V		



Precipitation Report

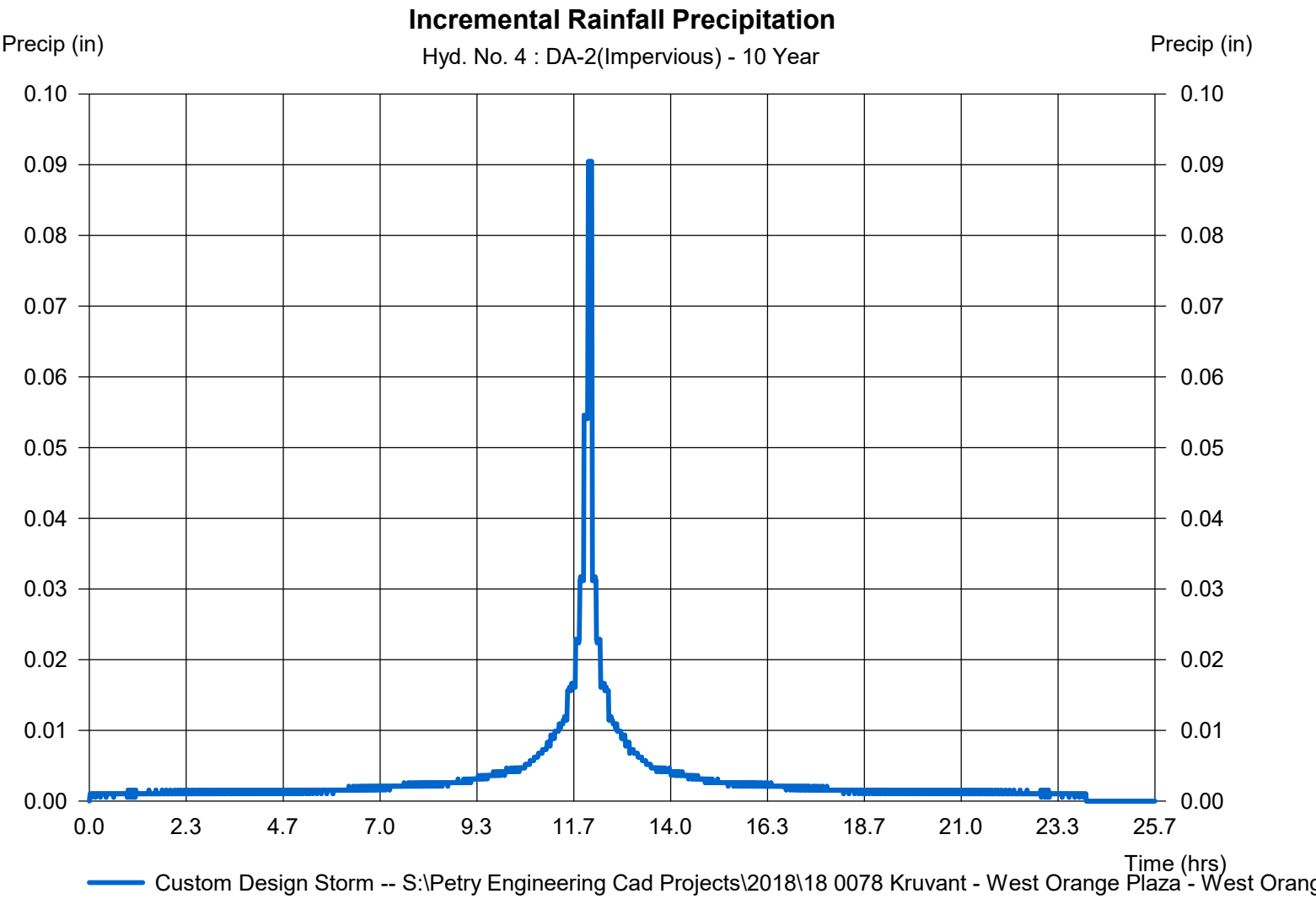
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 4

DA-2(Impervious)

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.2000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

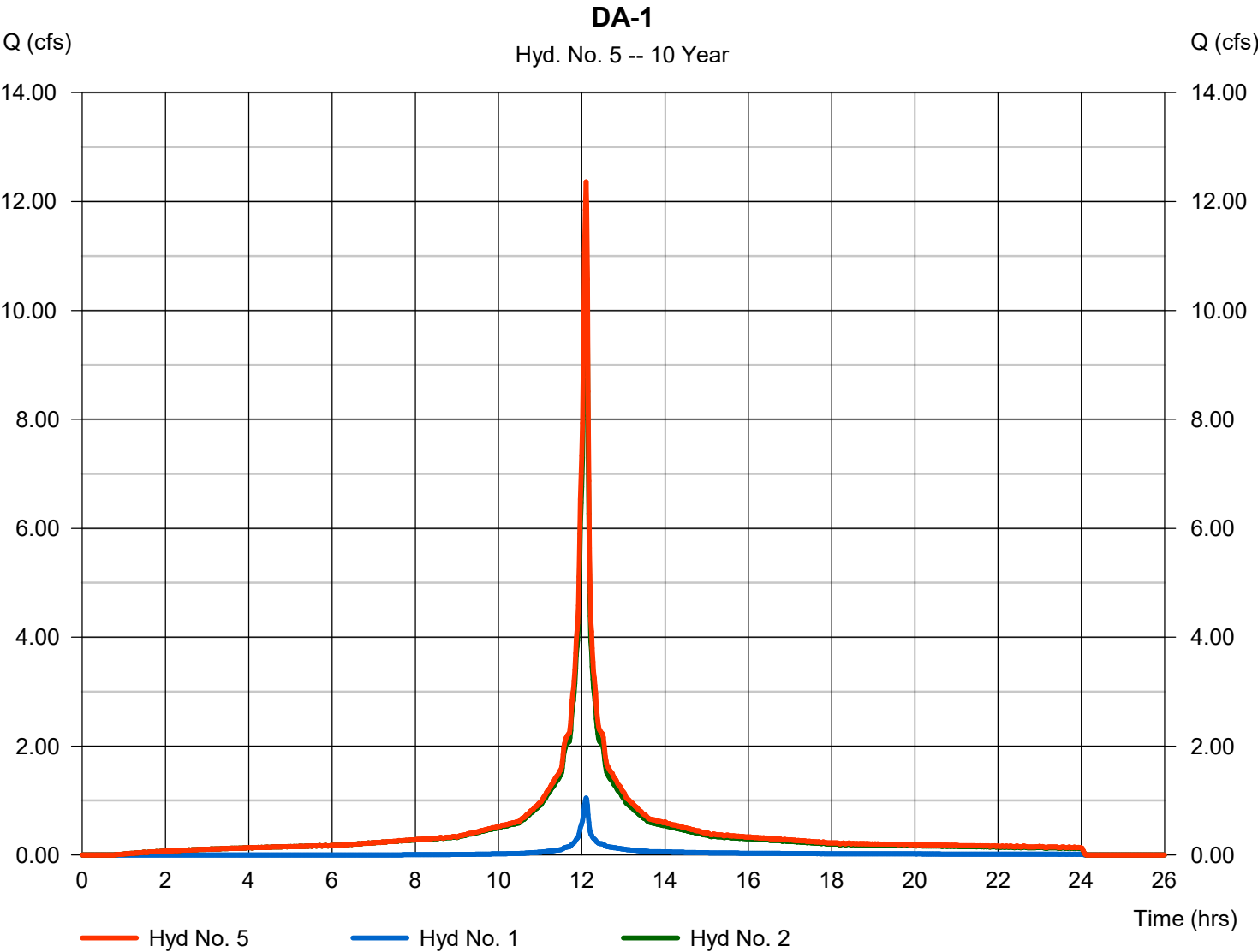
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 5

DA-1

Hydrograph type	= Combine	Peak discharge	= 12.36 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 41,199 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 2.390 ac



Hydrograph Report

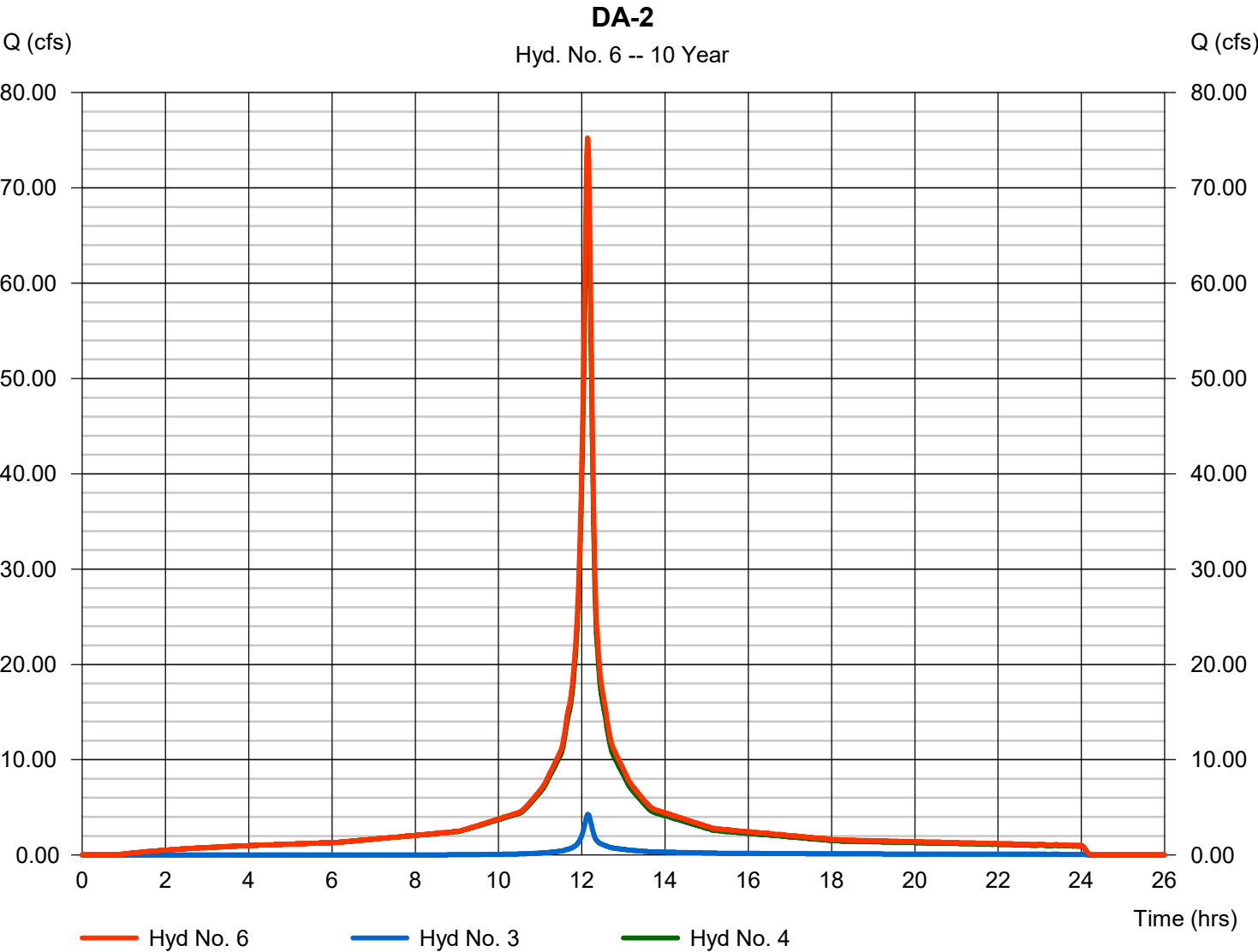
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 6

DA-2

Hydrograph type	= Combine	Peak discharge	= 75.23 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 302,869 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 17.500 ac



Hydrograph Report

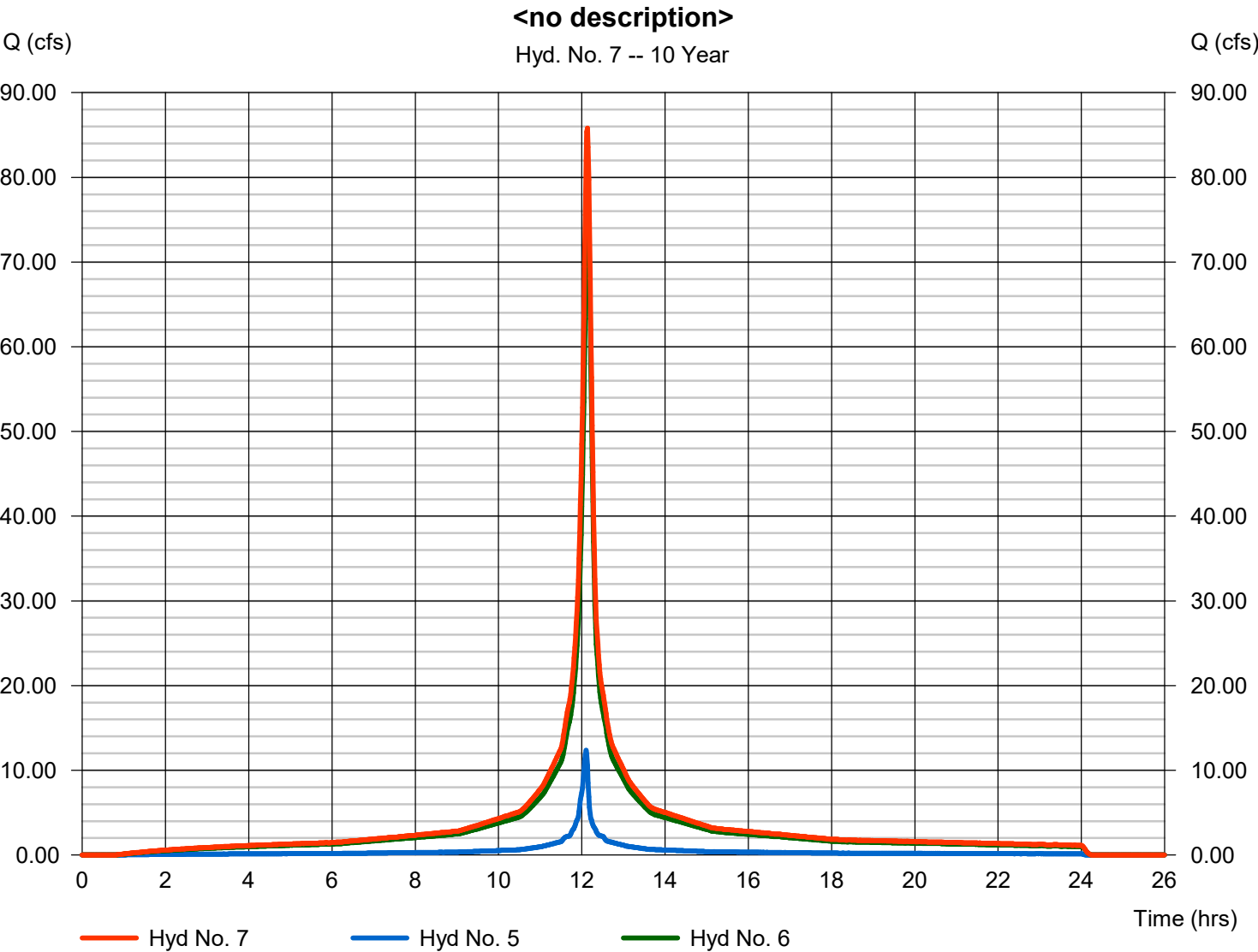
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 7

<no description>

Hydrograph type	= Combine	Peak discharge	= 85.81 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 344,069 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	2.075	1	726	6,159	-----	-----	-----	DA-1(Pervious)
2	SCS Runoff	18.99	1	726	65,103	-----	-----	-----	DA-1(Impervious)
3	SCS Runoff	8.969	1	729	31,785	-----	-----	-----	DA-2(Pervious)
4	SCS Runoff	119.21	1	728	491,038	-----	-----	-----	DA-2(Impervious)
5	Combine	21.07	1	726	71,262	1, 2,	-----	-----	DA-1
6	Combine	128.15	1	728	522,824	3, 4,	-----	-----	DA-2
7	Combine	146.15	1	728	594,086	5, 6	-----	-----	<no description>
Existing.gpw					Return Period: 100 Year			Thursday, 03 / 2 / 2023	

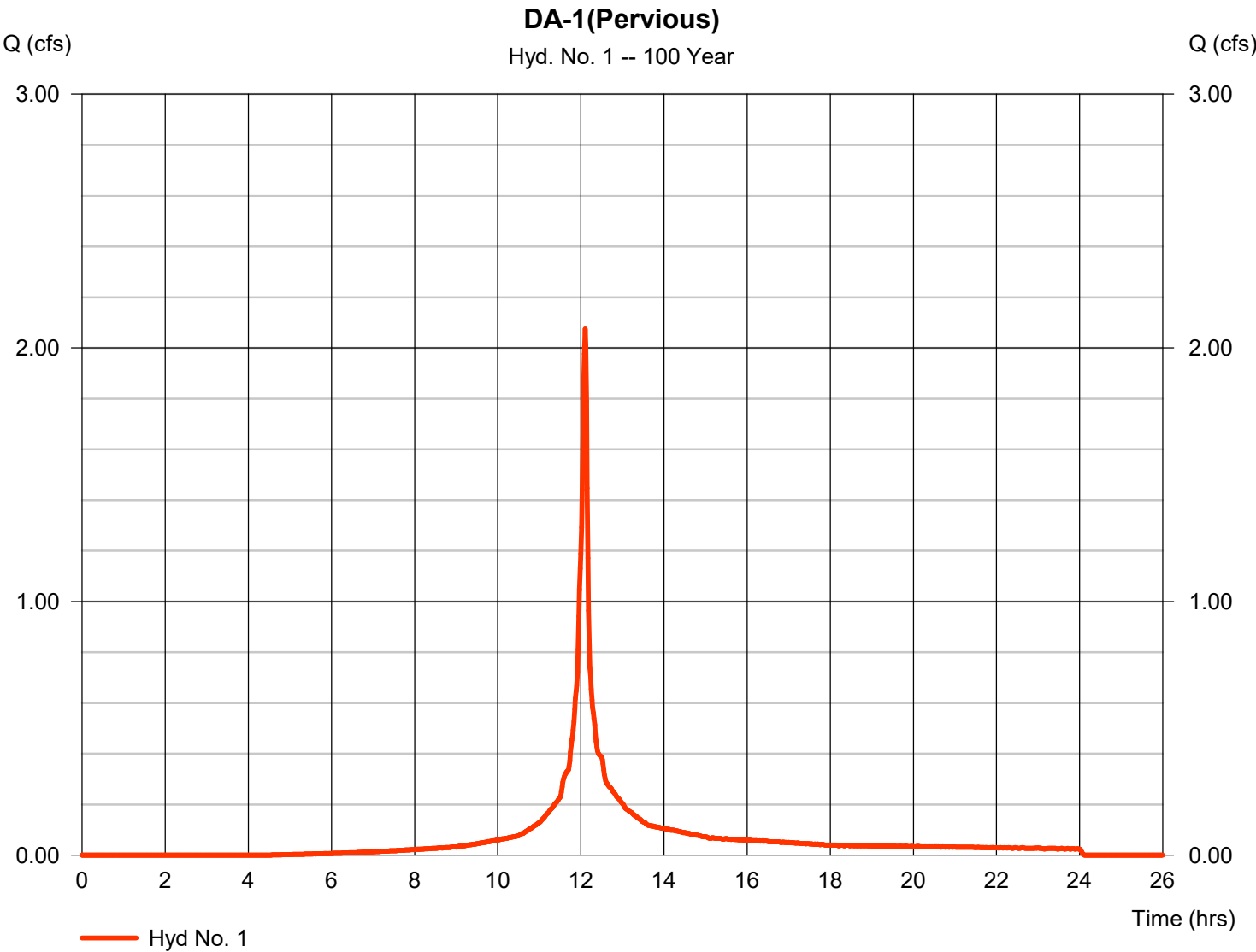
Hydrograph Report

Hyd. No. 1

DA-1(Pervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 2.075 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 6,159 cuft
Drainage area	= 0.270 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 4.70 min
Total precip.	= 8.70 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvan 184 West Orange Plaza - V		

* Composite (Area/CN) = + (0.270 x 80)] / 0.270



Precipitation Report

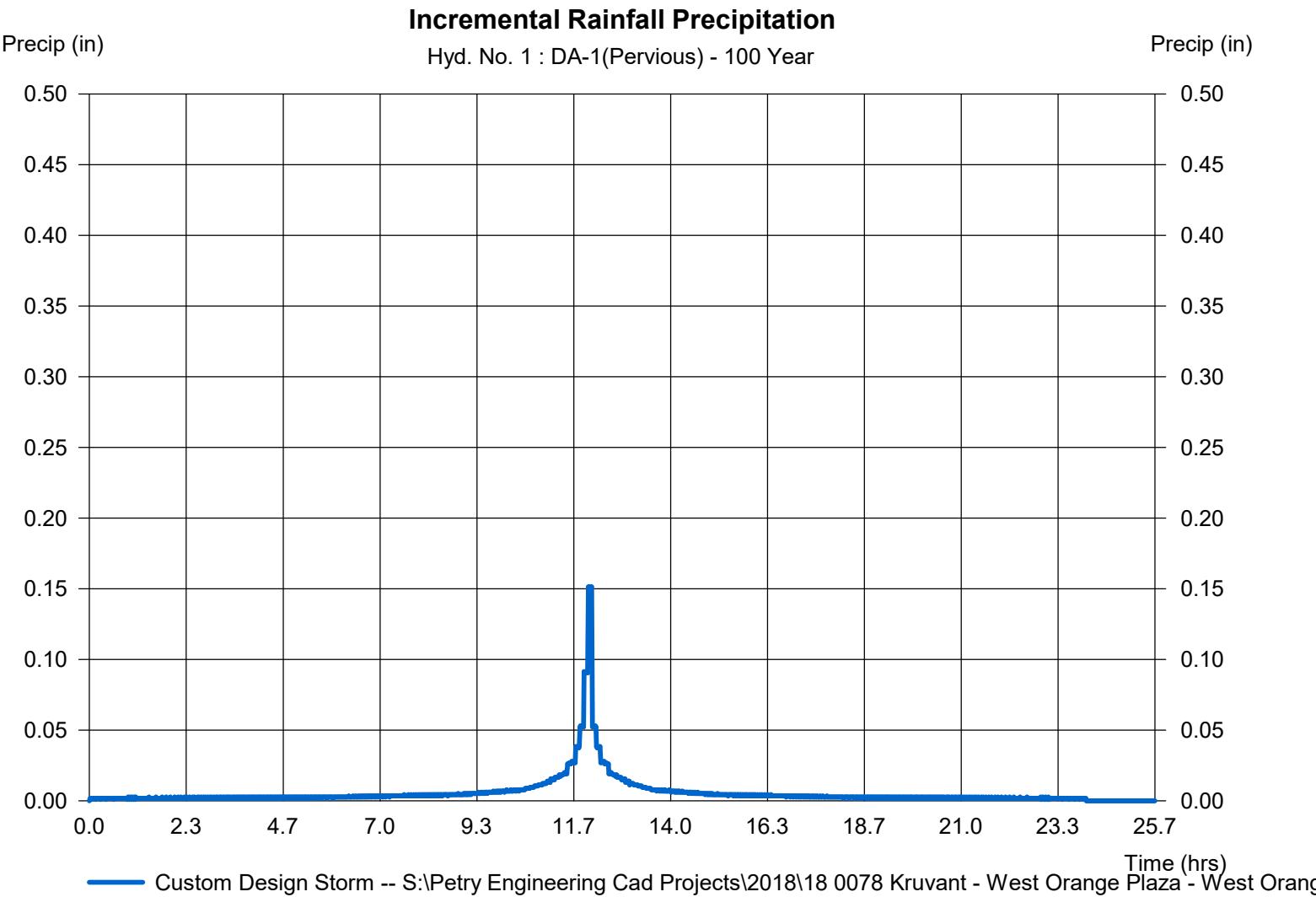
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 1

DA-1(Pervious)

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 8.7000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

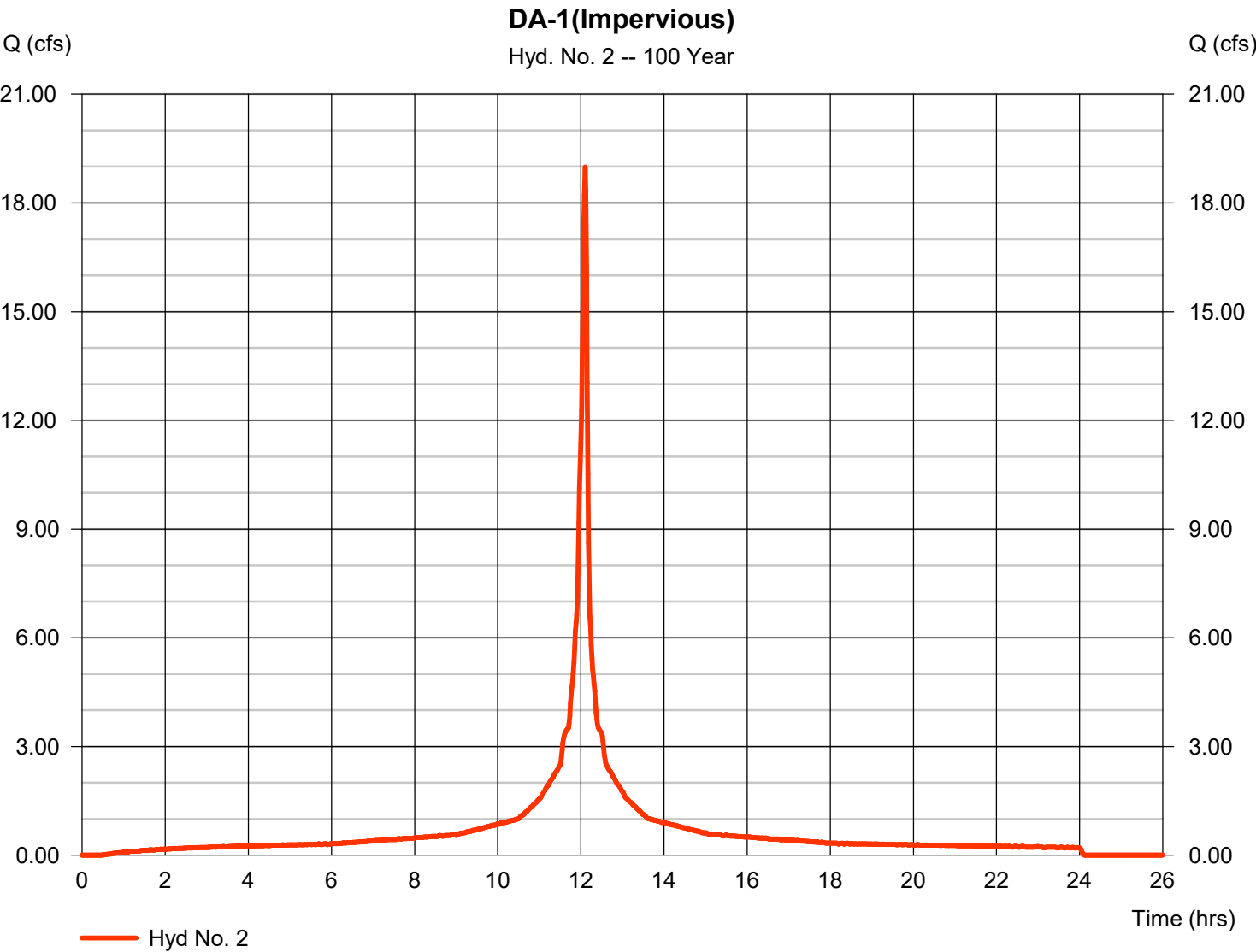
Thursday, 03 / 2 / 2023

Hyd. No. 2

DA-1(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 18.99 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 65,103 cuft
Drainage area	= 2.120 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 4.70 min
Total precip.	= 8.70 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\181010078 Kruvan184 West Orange Plaza - V		

* Composite (Area/CN) = [(11.010 x 98)] / 2.120



Precipitation Report

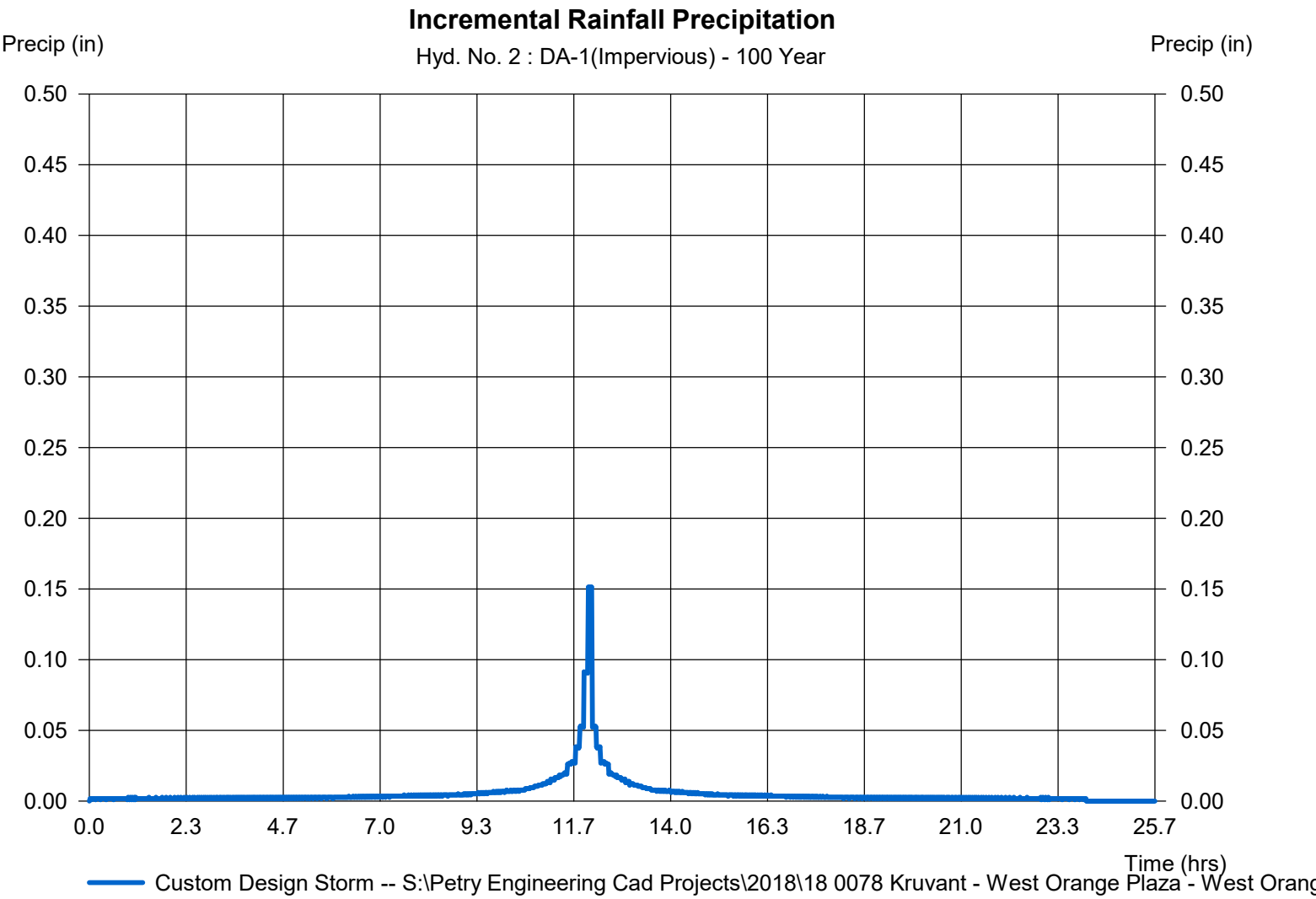
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 2

DA-1(Impervious)

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 8.7000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



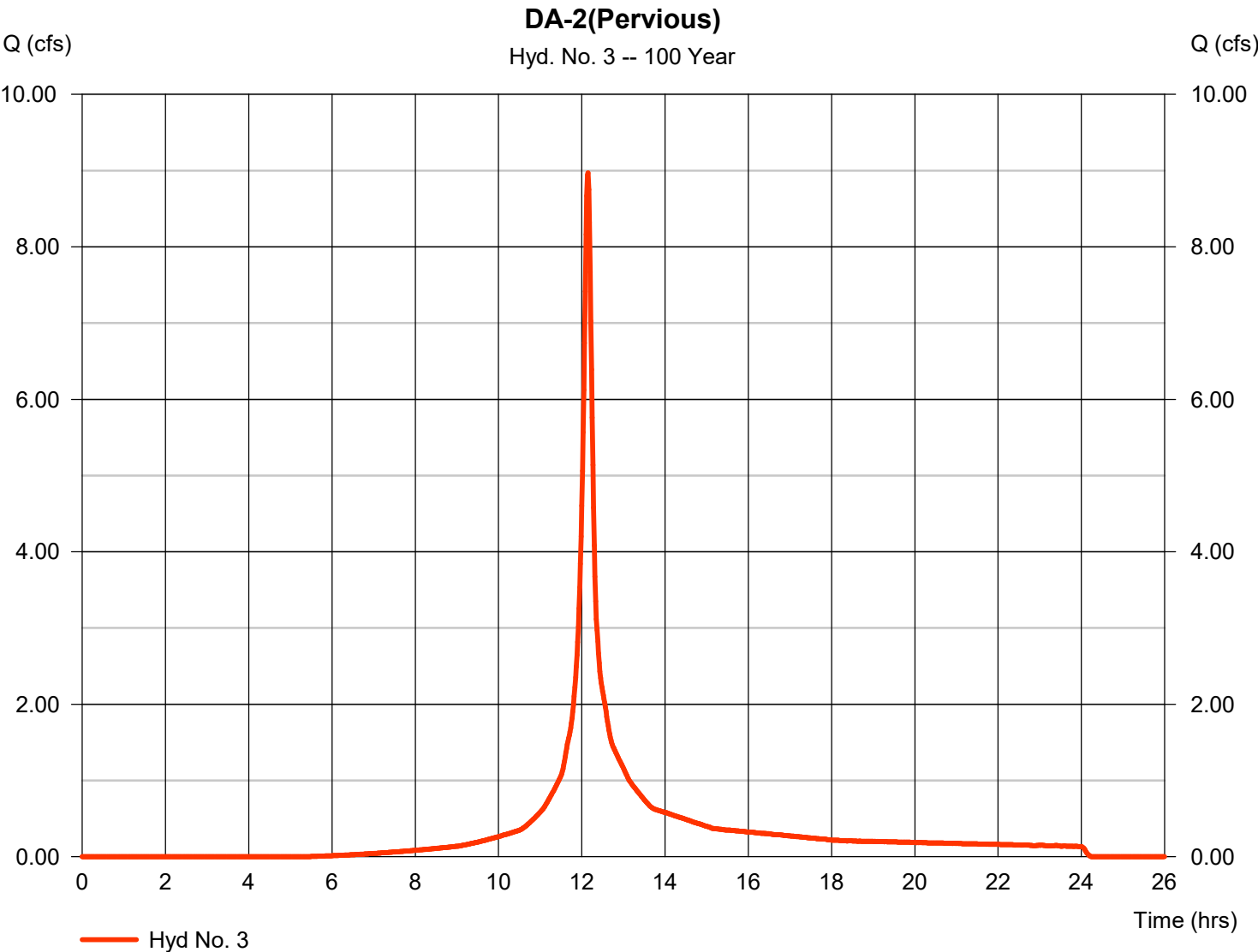
Hydrograph Report

Hyd. No. 3

DA-2(Pervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 8.969 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.15 hrs
Time interval	= 1 min	Hyd. volume	= 31,785 cuft
Drainage area	= 1.510 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.40 min
Total precip.	= 8.70 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\181010078 Kruvan184 West Orange Plaza - V		

* Composite (Area/CN) = [(0.550 x 70) + (0.960 x 80)] / 1.510



Precipitation Report

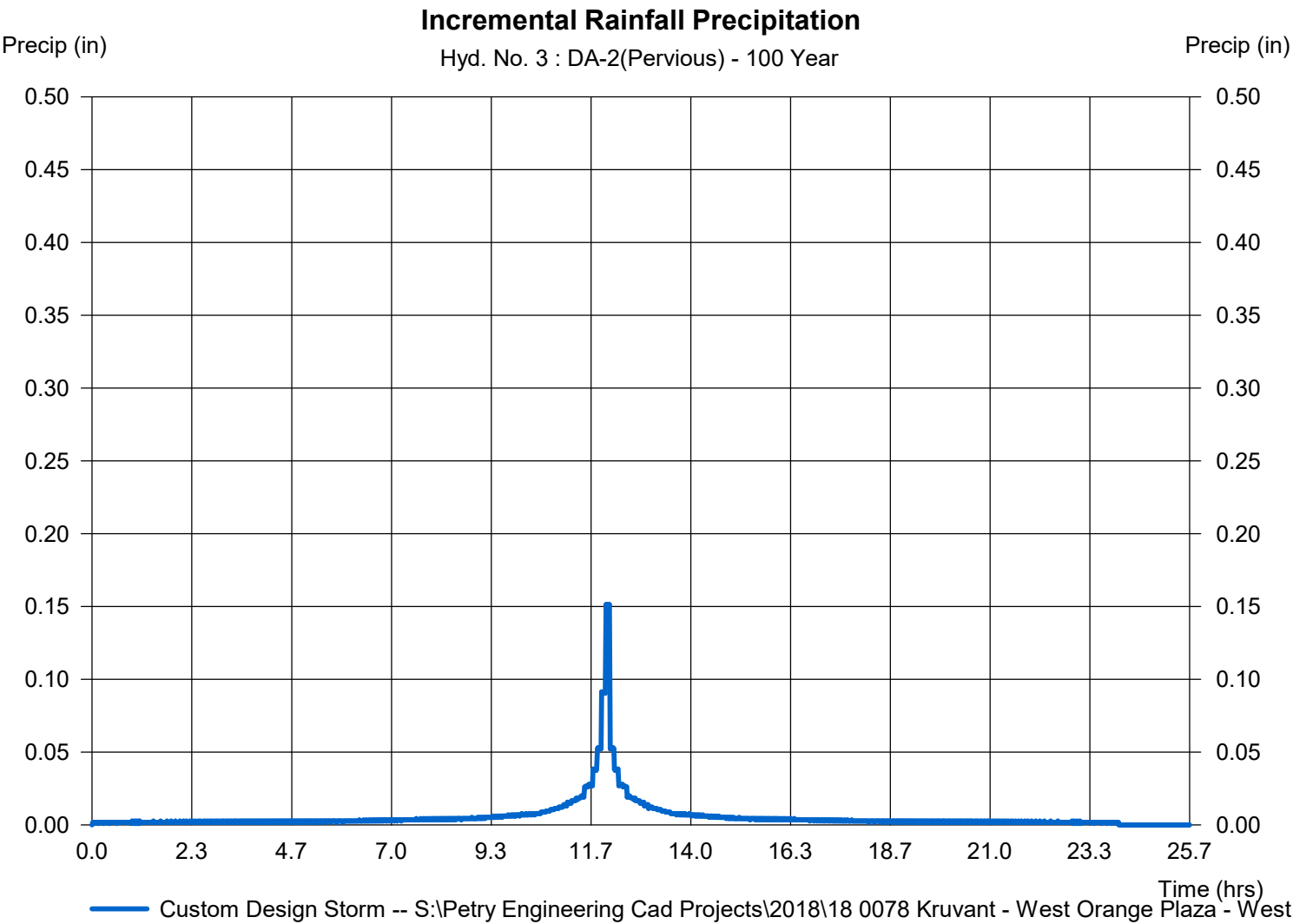
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 3

DA-2(Pervious)

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 8.7000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

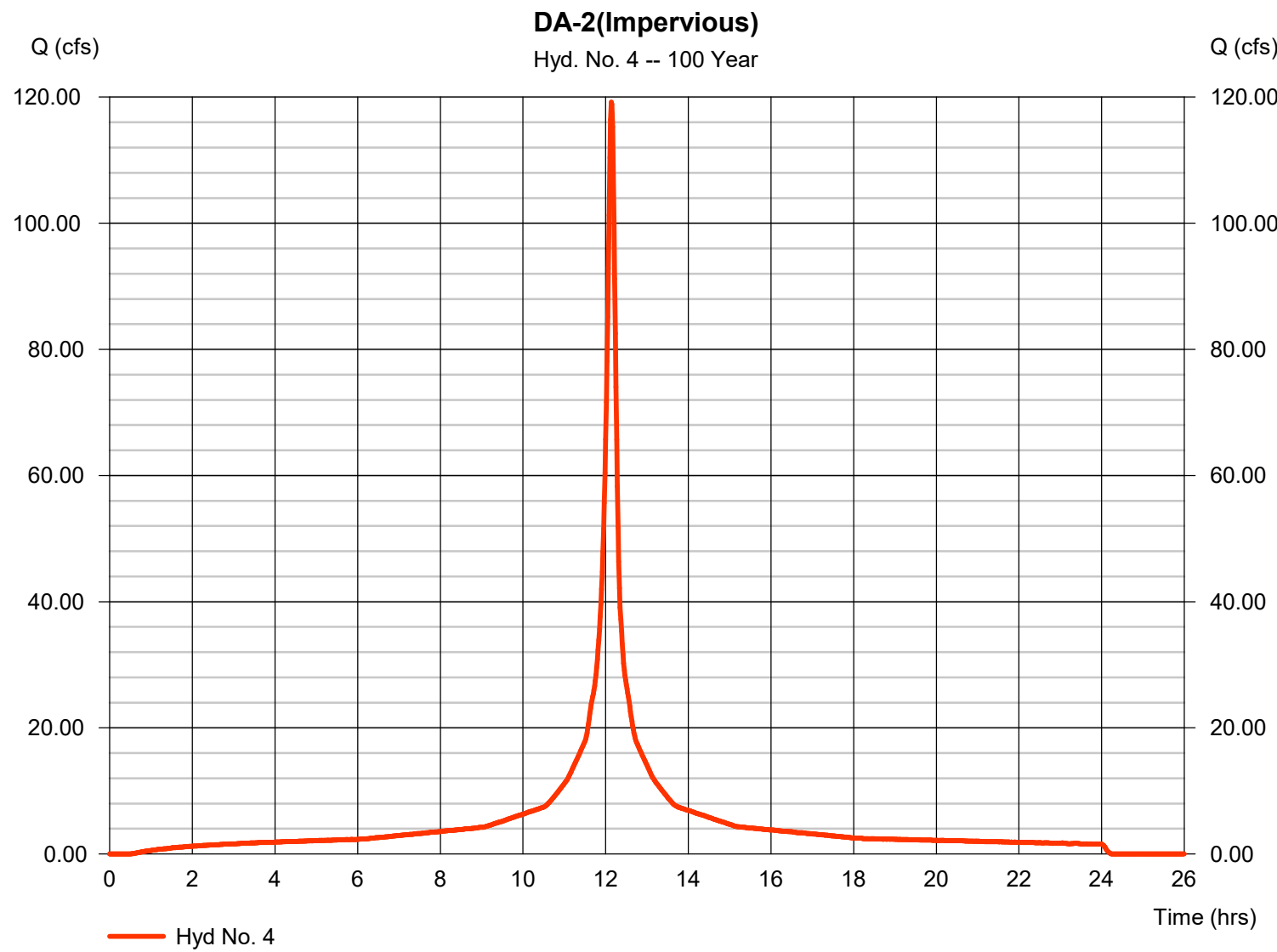
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 4

DA-2(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 119.21 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 491,038 cuft
Drainage area	= 15.990 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.40 min
Total precip.	= 8.70 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvanak\1810078 Kruvanak.dwg		



Precipitation Report

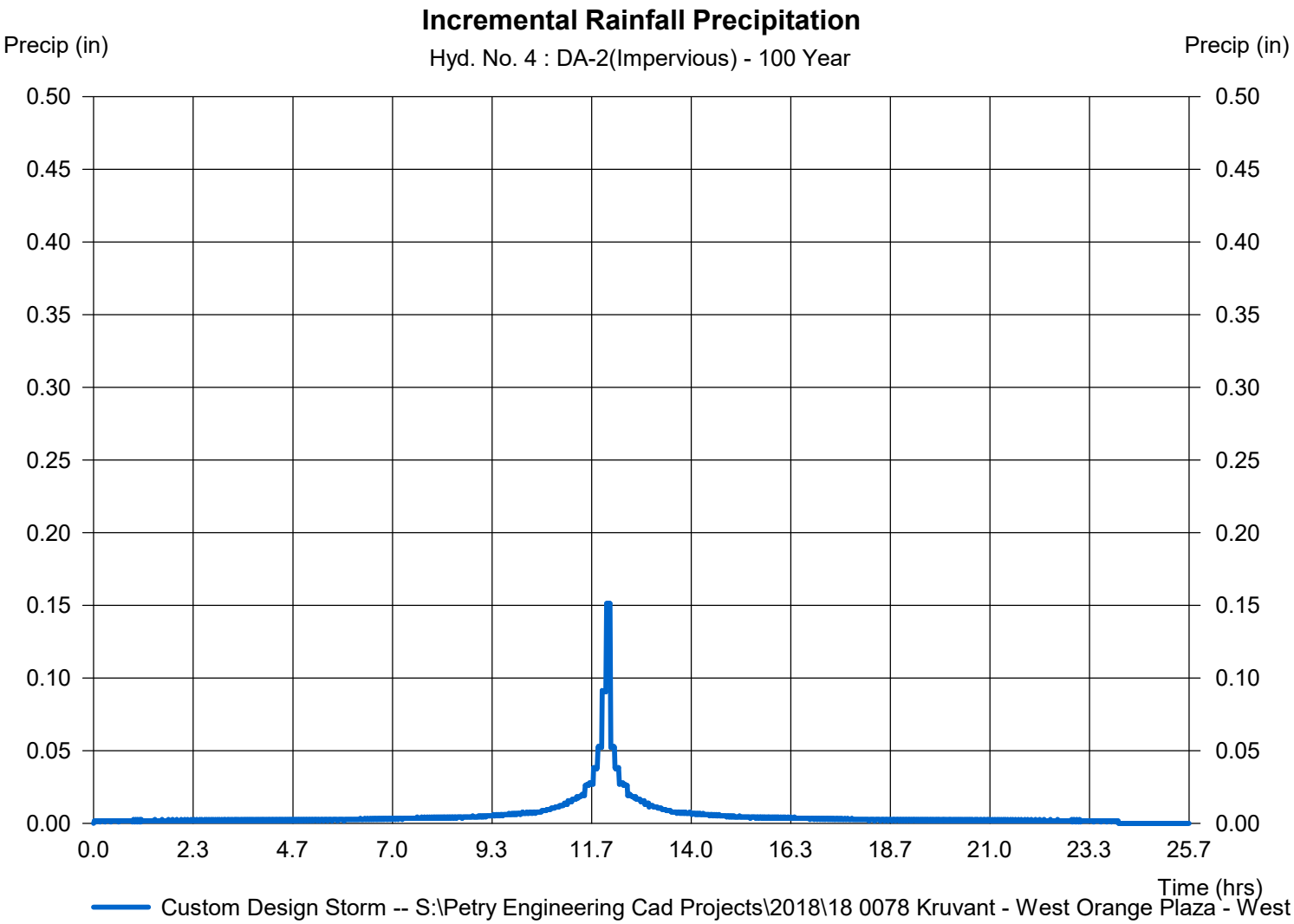
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 4

DA-2(Impervious)

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 8.7000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		

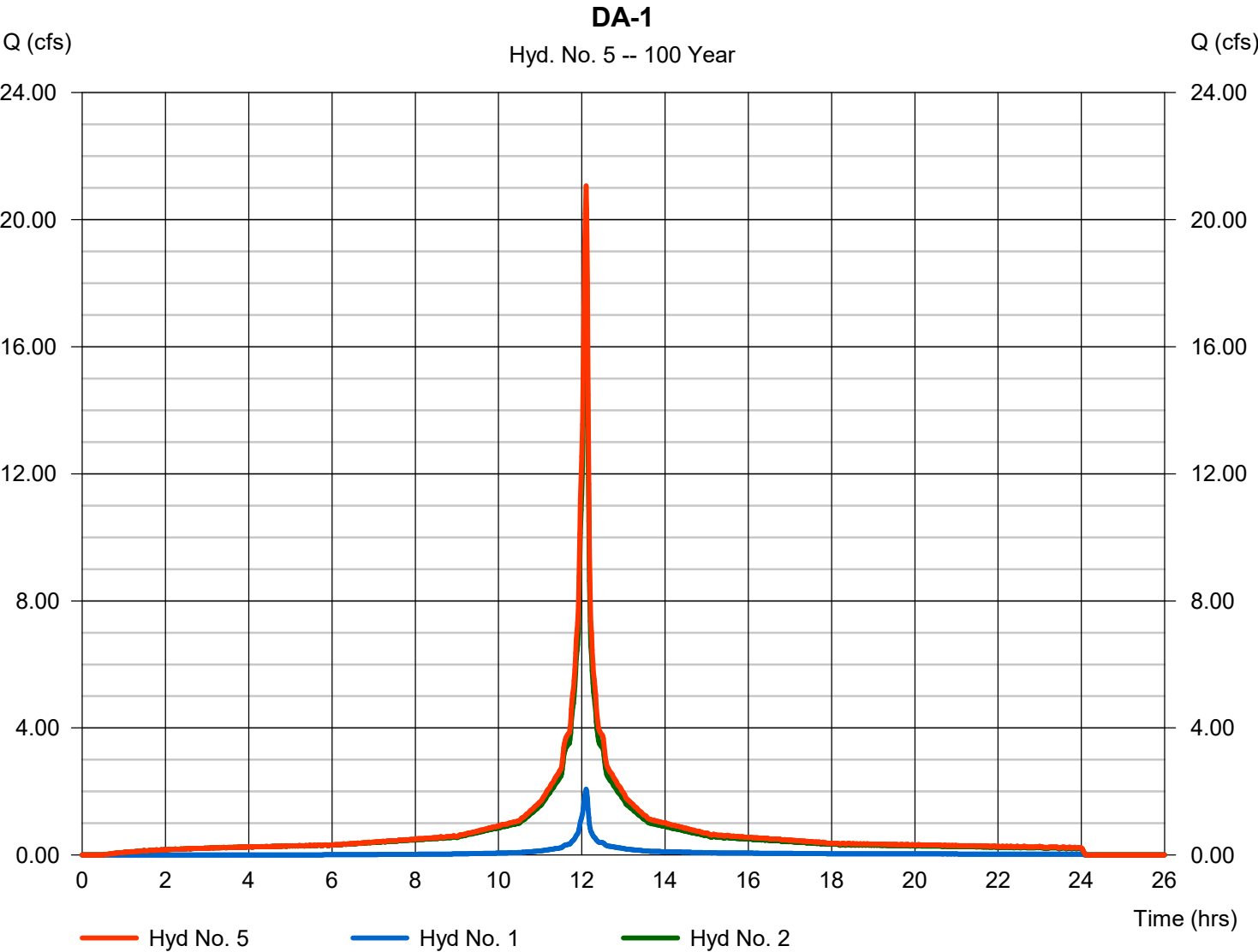


Hydrograph Report

Hyd. No. 5

DA-1

Hydrograph type	= Combine	Peak discharge	= 21.07 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 71,262 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 2.390 ac



Hydrograph Report

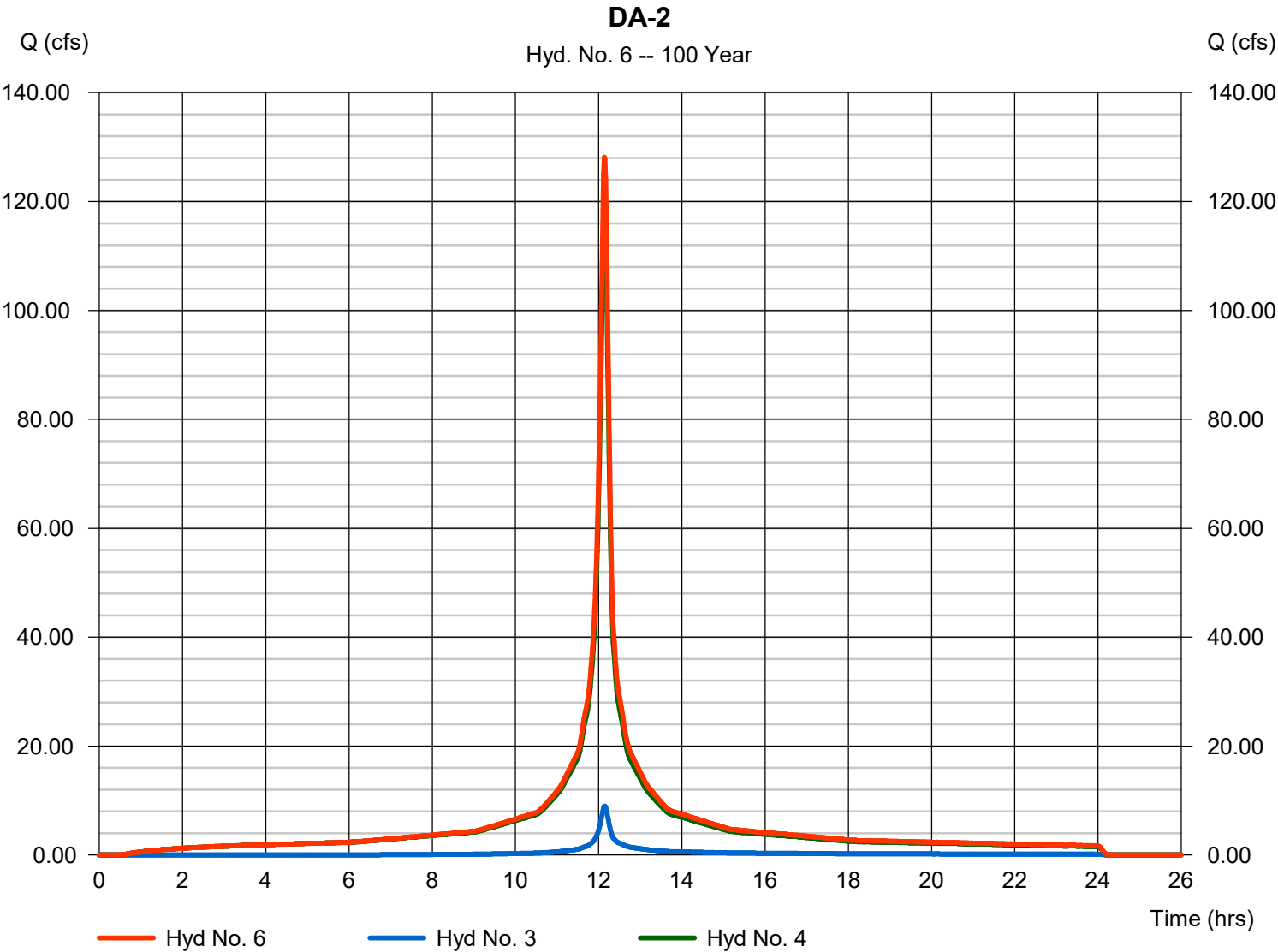
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 6

DA-2

Hydrograph type	= Combine	Peak discharge	= 128.15 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 522,824 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 17.500 ac



Hydrograph Report

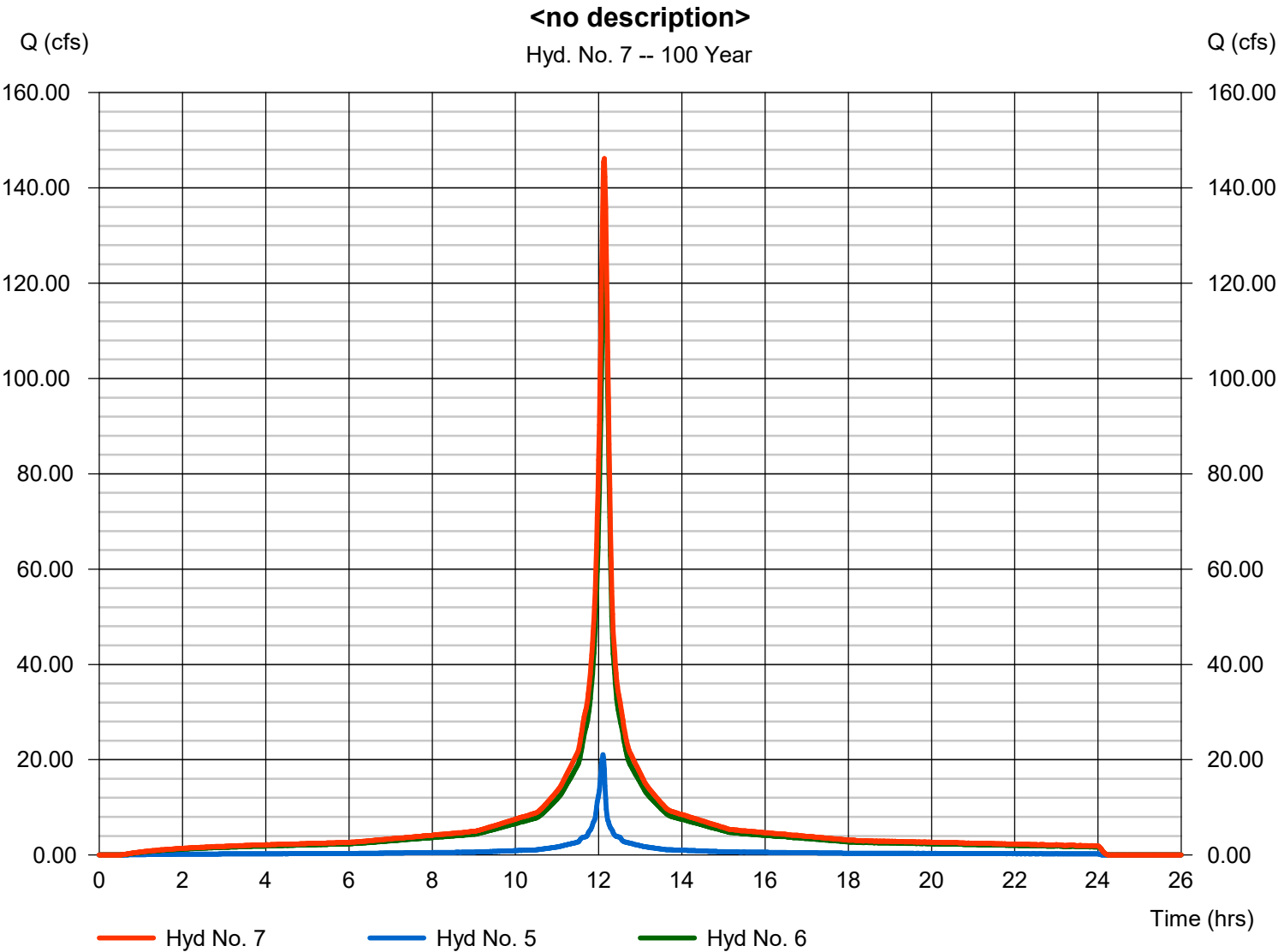
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 7

<no description>

Hydrograph type	= Combine	Peak discharge	= 146.15 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 594,086 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.000 ac



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	-----
2	69.8703	13.1000	0.8658	-----
3	0.0000	0.0000	0.0000	-----
5	79.2597	14.6000	0.8369	-----
10	88.2351	15.5000	0.8279	-----
25	102.6072	16.5000	0.8217	-----
50	114.8193	17.2000	0.8199	-----
100	127.1596	17.8000	0.8186	-----

File name: SampleFHA.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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
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	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

T_c = time in minutes. Values may exceed 60.

ng Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange\Civil\Current\Stormwater\Rainfall Data.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	0.00	3.42	0.00	0.00	5.20	0.00	0.00	8.70

PROPOSED CONDITIONS HYDROGRAPHS



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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

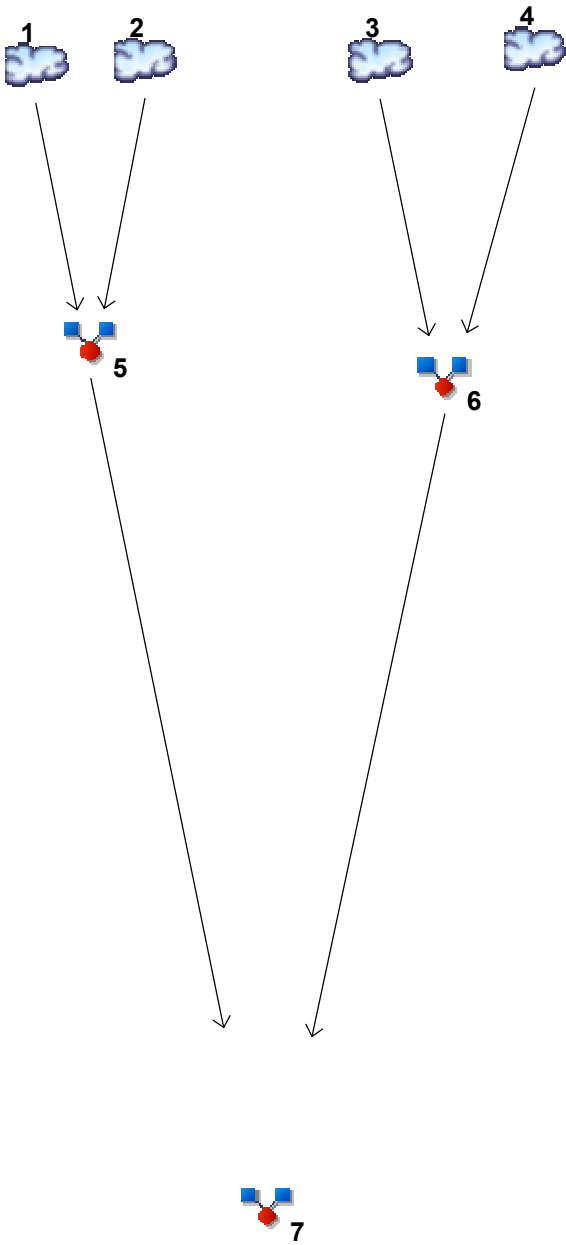
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Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023



Legend

Hyd.	Origin	Description
1	SCS Runoff	DA-1(Pervious)
2	SCS Runoff	DA-1(Impervious)
3	SCS Runoff	DA-2(Pervious)
4	SCS Runoff	DA-2(Impervious)
5	Combine	DA-1
6	Combine	DA-2
7	Combine	<no description>

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	-----	-----	1.385	-----	-----	2.675	-----	-----	5.303	DA-1(Pervious)
2	SCS Runoff	-----	-----	6.072	-----	-----	9.287	-----	-----	15.59	DA-1(Impervious)
3	SCS Runoff	-----	-----	2.525	-----	-----	5.182	-----	-----	10.76	DA-2(Pervious)
4	SCS Runoff	-----	-----	45.51	-----	-----	69.64	-----	-----	116.90	DA-2(Impervious)
5	Combine	1, 2,	-----	7.458	-----	-----	11.96	-----	-----	20.89	DA-1
6	Combine	3, 4,	-----	48.00	-----	-----	74.78	-----	-----	127.63	DA-2
7	Combine	5, 6	-----	54.41	-----	-----	85.04	-----	-----	145.50	<no description>
Proj. file: Proposed.gpw										Thursday, 03 / 2 / 2023	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	1.385	1	726	3,940	-----	-----	-----	DA-1(Pervious)
2	SCS Runoff	6.072	1	726	20,128	-----	-----	-----	DA-1(Impervious)
3	SCS Runoff	2.525	1	729	8,861	-----	-----	-----	DA-2(Pervious)
4	SCS Runoff	45.51	1	728	181,383	-----	-----	-----	DA-2(Impervious)
5	Combine	7.458	1	726	24,068	1, 2,	-----	-----	DA-1
6	Combine	48.00	1	728	190,244	3, 4,	-----	-----	DA-2
7	Combine	54.41	1	728	214,313	5, 6	-----	-----	<no description>
Proposed.gpw					Return Period: 2 Year			Thursday, 03 / 2 / 2023	

Hydrograph Report

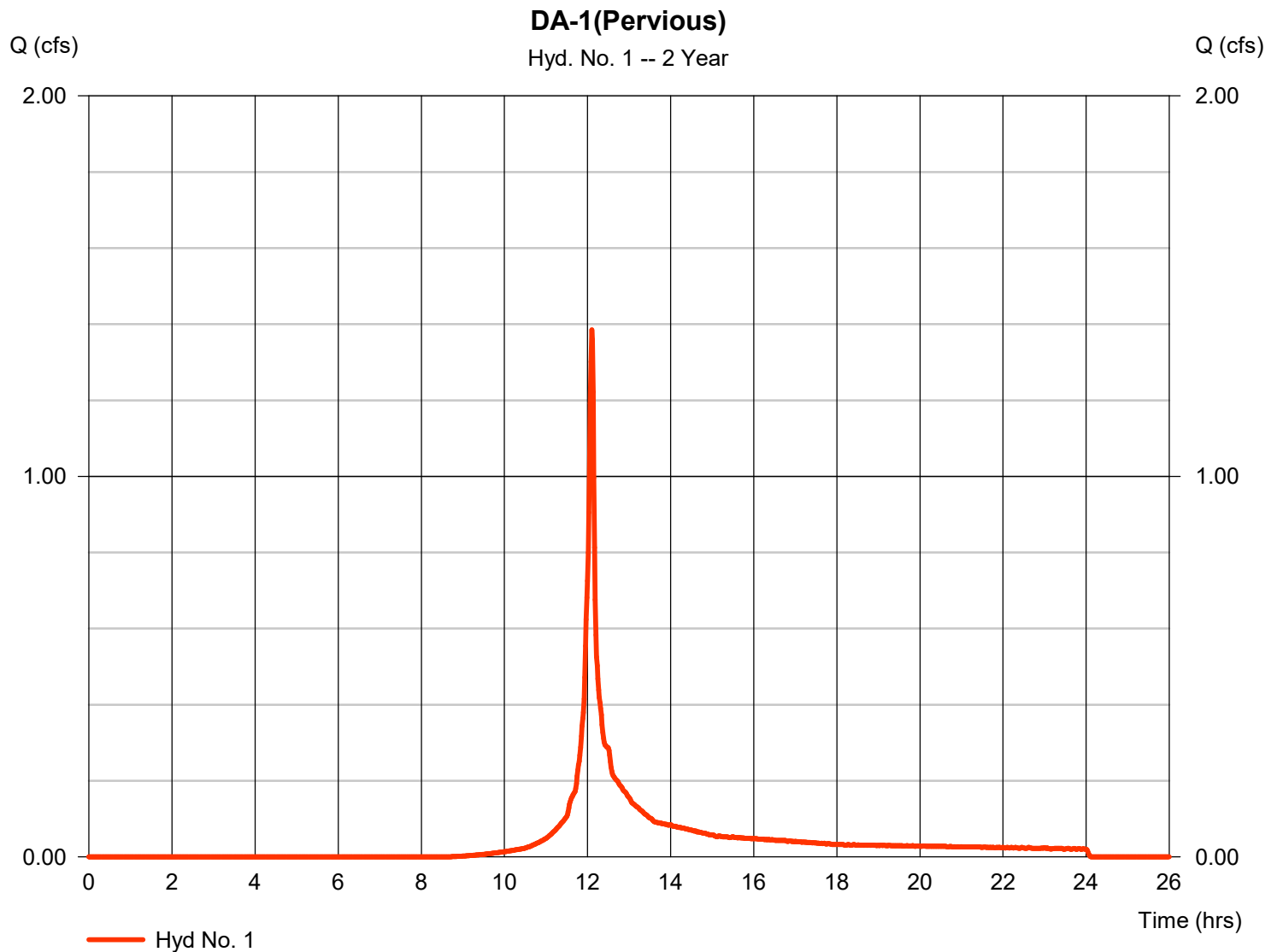
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 1

DA-1(Pervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 1.385 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 3,940 cuft
Drainage area	= 0.690 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 3.30 min
Total precip.	= 3.42 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\181010078 Kruvan184 West Orange Plaza - V		



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No. 1

DA-1(Pervious)

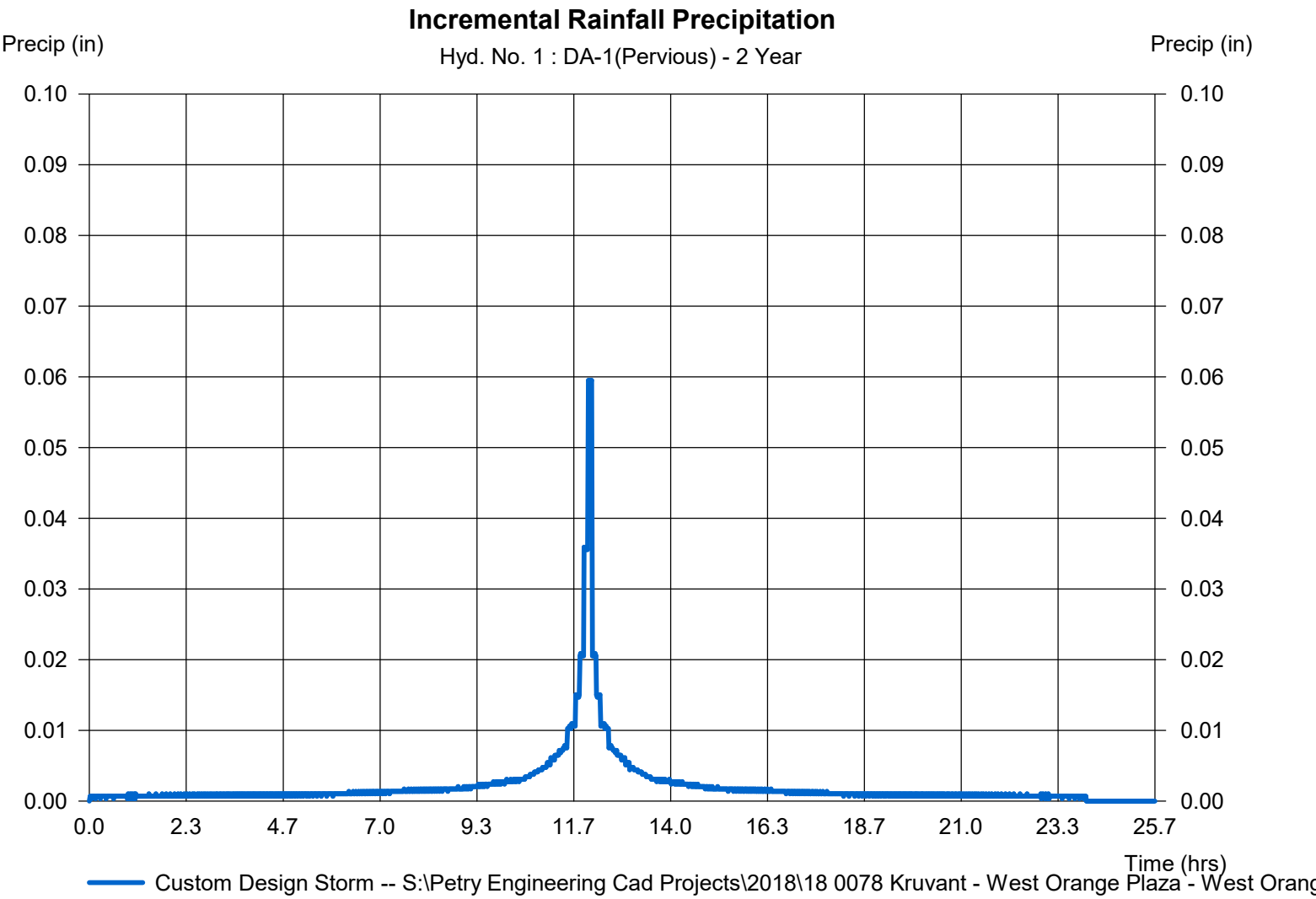
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.011	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 3.44	0.00	0.00				
Land slope (%)	= 4.00	0.00	0.00				
Travel Time (min)	= 0.89	+	0.00	+	0.00	=	0.89
Shallow Concentrated Flow							
Flow length (ft)	= 380.00	0.00	0.00				
Watercourse slope (%)	= 4.00	0.00	0.00				
Surface description	= Paved	Paved	Paved				
Average velocity (ft/s)	=4.07	0.00	0.00				
Travel Time (min)	= 1.56	+	0.00	+	0.00	=	1.56
Channel Flow							
X sectional flow area (sqft)	= 1.23	1.23	0.00				
Wetted perimeter (ft)	= 3.93	3.93	0.00				
Channel slope (%)	= 4.00	2.00	0.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	=9.11	6.44	0.00				
Flow length (ft)	(95.0)	250.0	0.0				
Travel Time (min)	= 0.17	+	0.65	+	0.00	=	0.82
Total Travel Time, Tc					3.30 min		

Precipitation Report

Hyd. No. 1

DA-1(Pervious)

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4200 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hyd. No. 2

DA-1 (Impervious)

Hydrograph type = SCS Runoff

Storm frequency = 2 yrs

Time interval = 1 min

Drainage area = 1.740 ac

Basin Slope = 0.0 %

Tc method = User

Total precip. = 3.42 in

Storm duration = S:\Petry Engineering Cad Projects\181010078 Kruvan-484 West Orange Plaza - V

Peak discharge = 6.072 cfs

Time to peak = 12.10 hrs

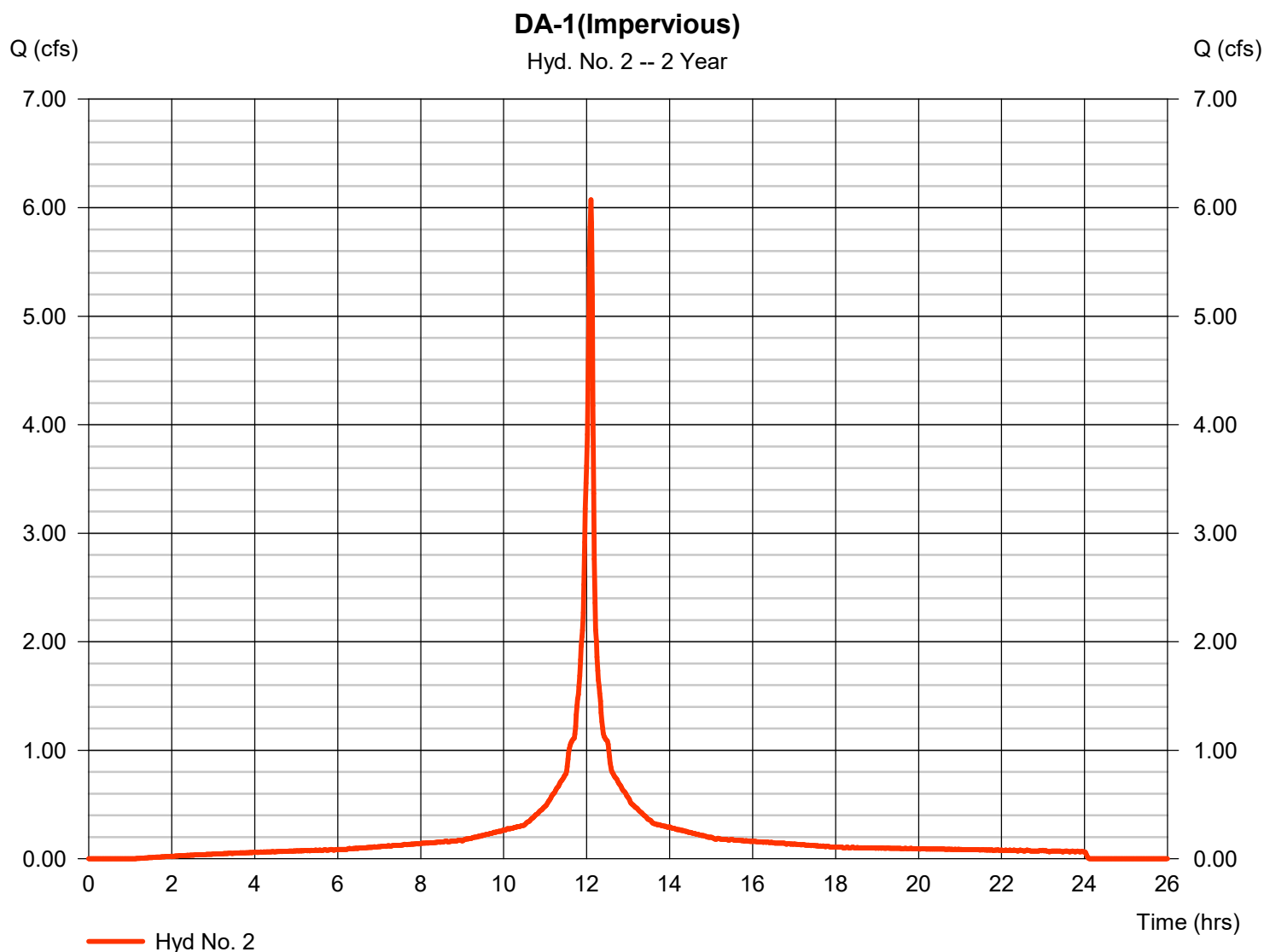
$$\text{Hyd. volume} = 20,128 \text{ cuft}$$

Curve number = 98

Hydraulic length = 0 ft

Time of conc. (T_c) = 3.30 min

Distribution = Custom

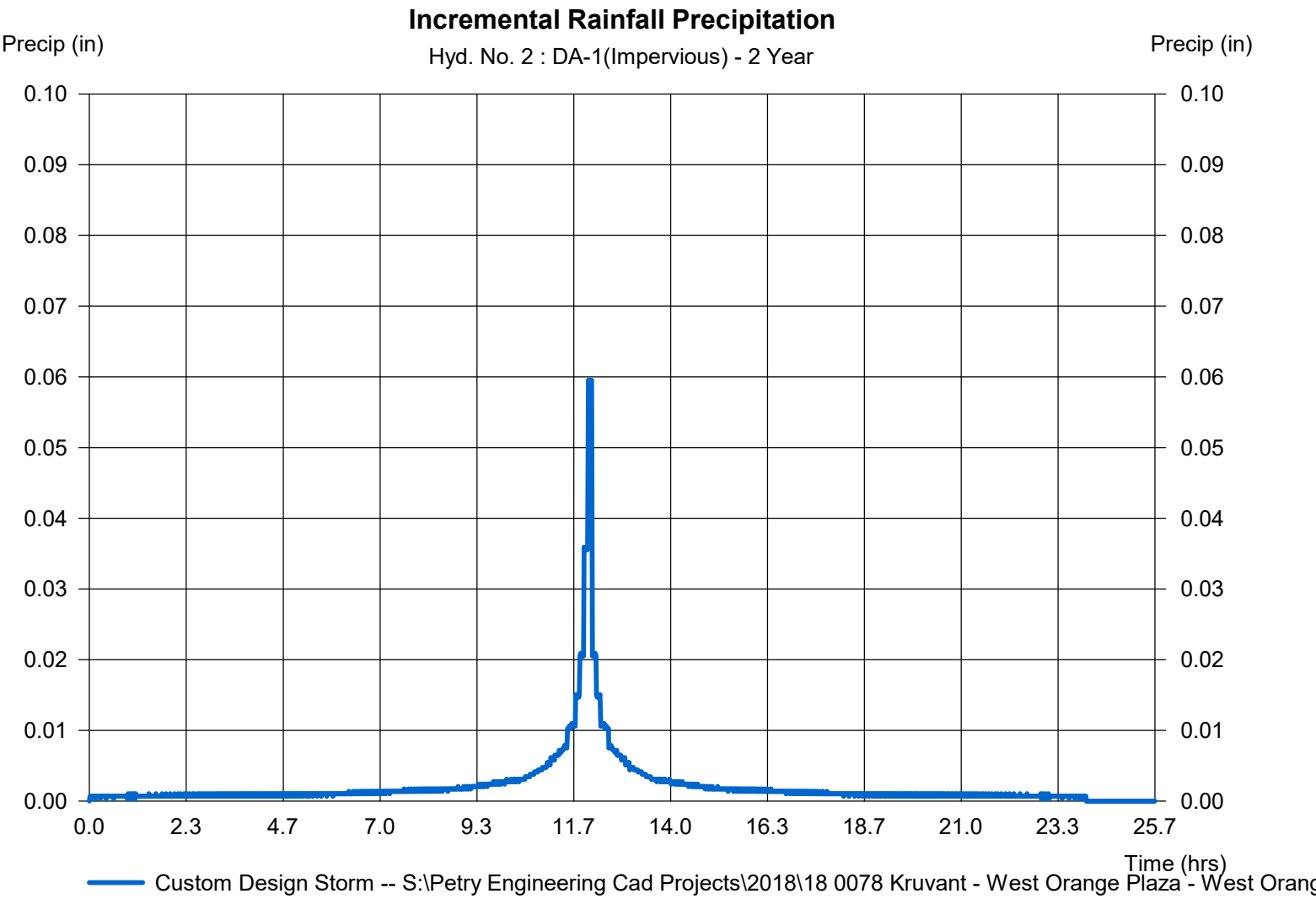


Precipitation Report

Hyd. No. 2

DA-1(Impervious)

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4200 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

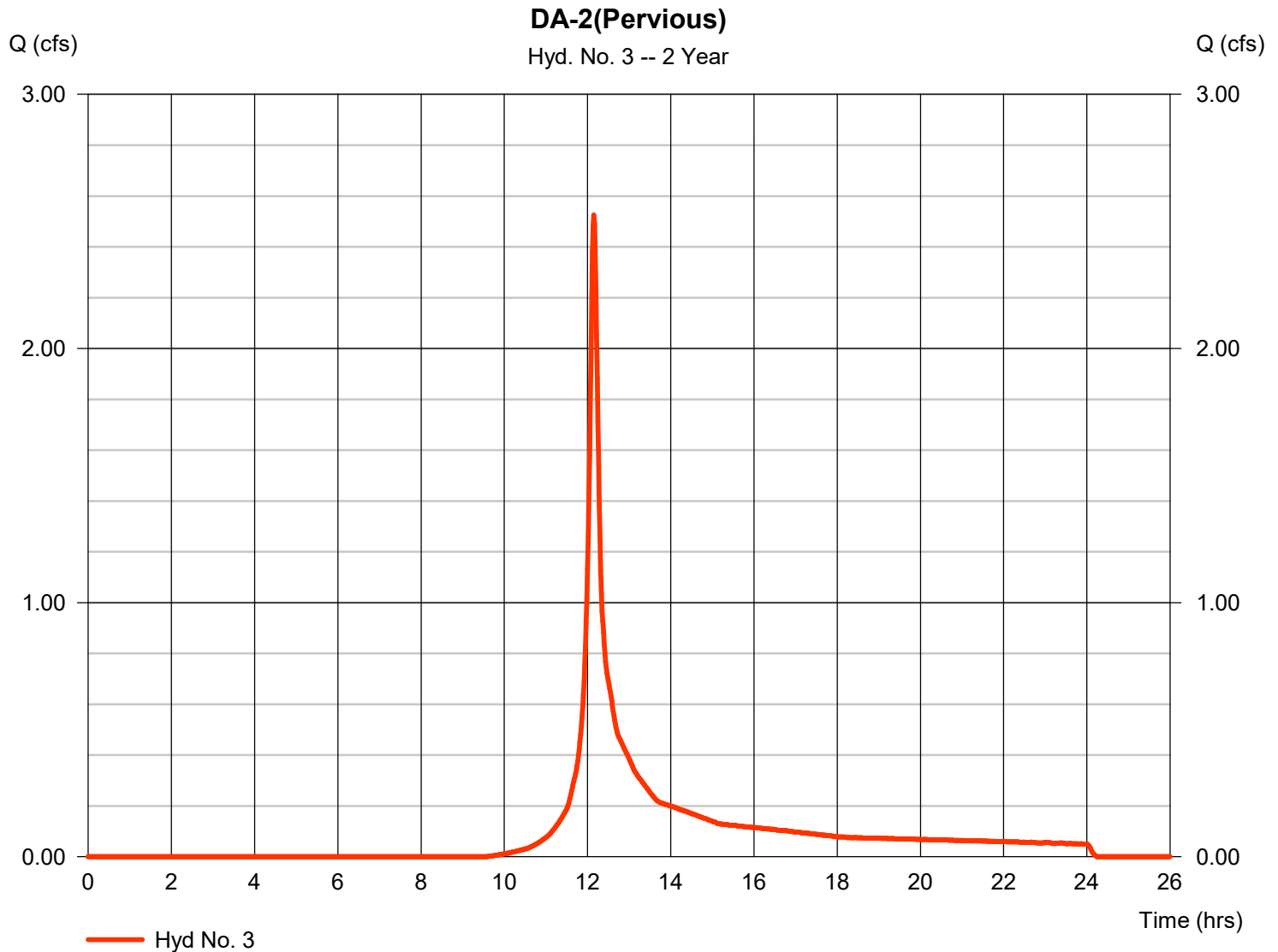
Thursday, 03 / 2 / 2023

Hyd. No. 3

DA-2(Pervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 2.525 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.15 hrs
Time interval	= 1 min	Hyd. volume	= 8,861 cuft
Drainage area	= 1.780 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.80 min
Total precip.	= 3.42 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvanan\1810078 Kruvanan - V		

* Composite (Area/CN) = $[(0.550 \times 70) + (1.230 \times 80)] / 1.780$



Precipitation Report

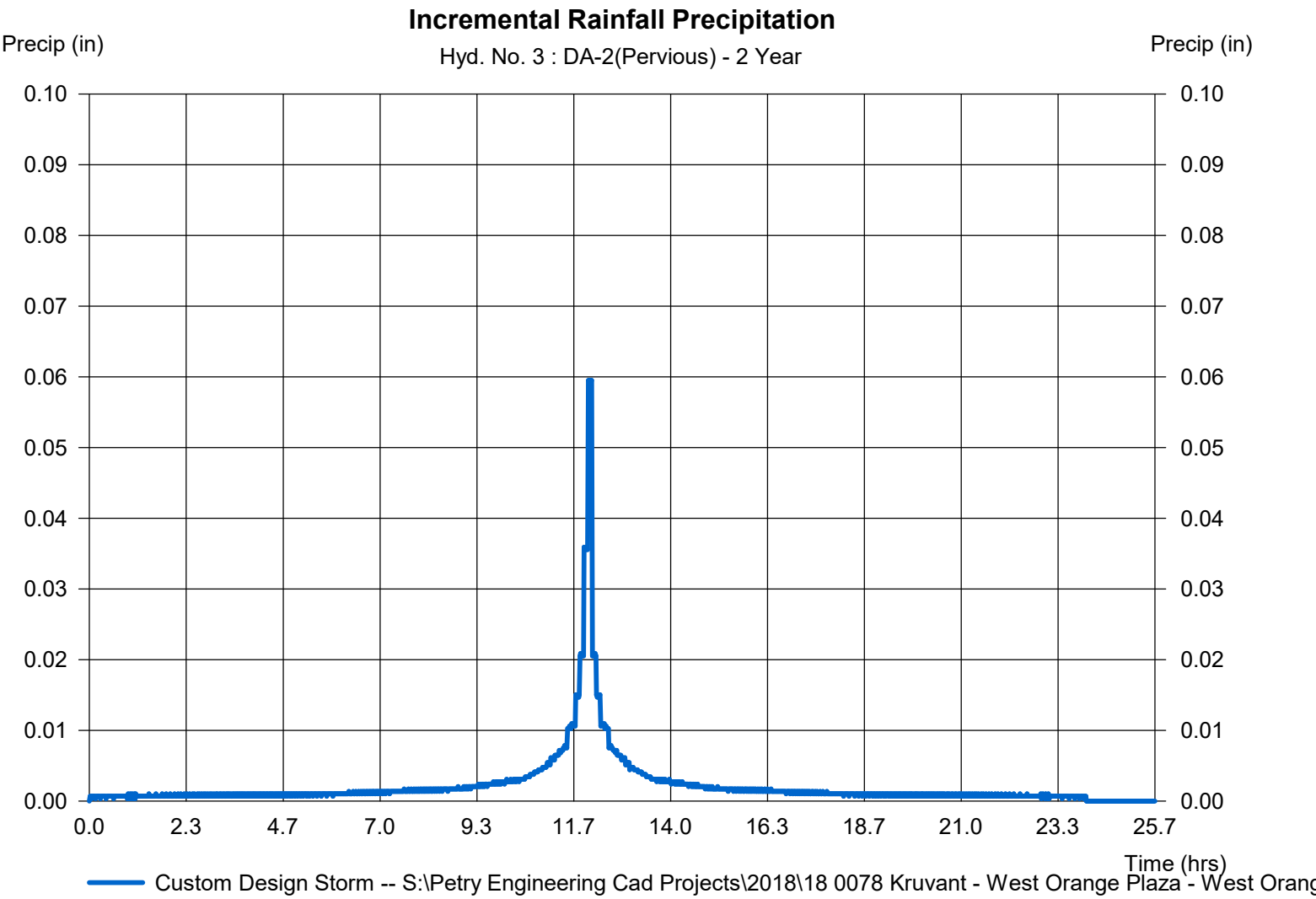
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 3

DA-2(Pervious)

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4200 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		

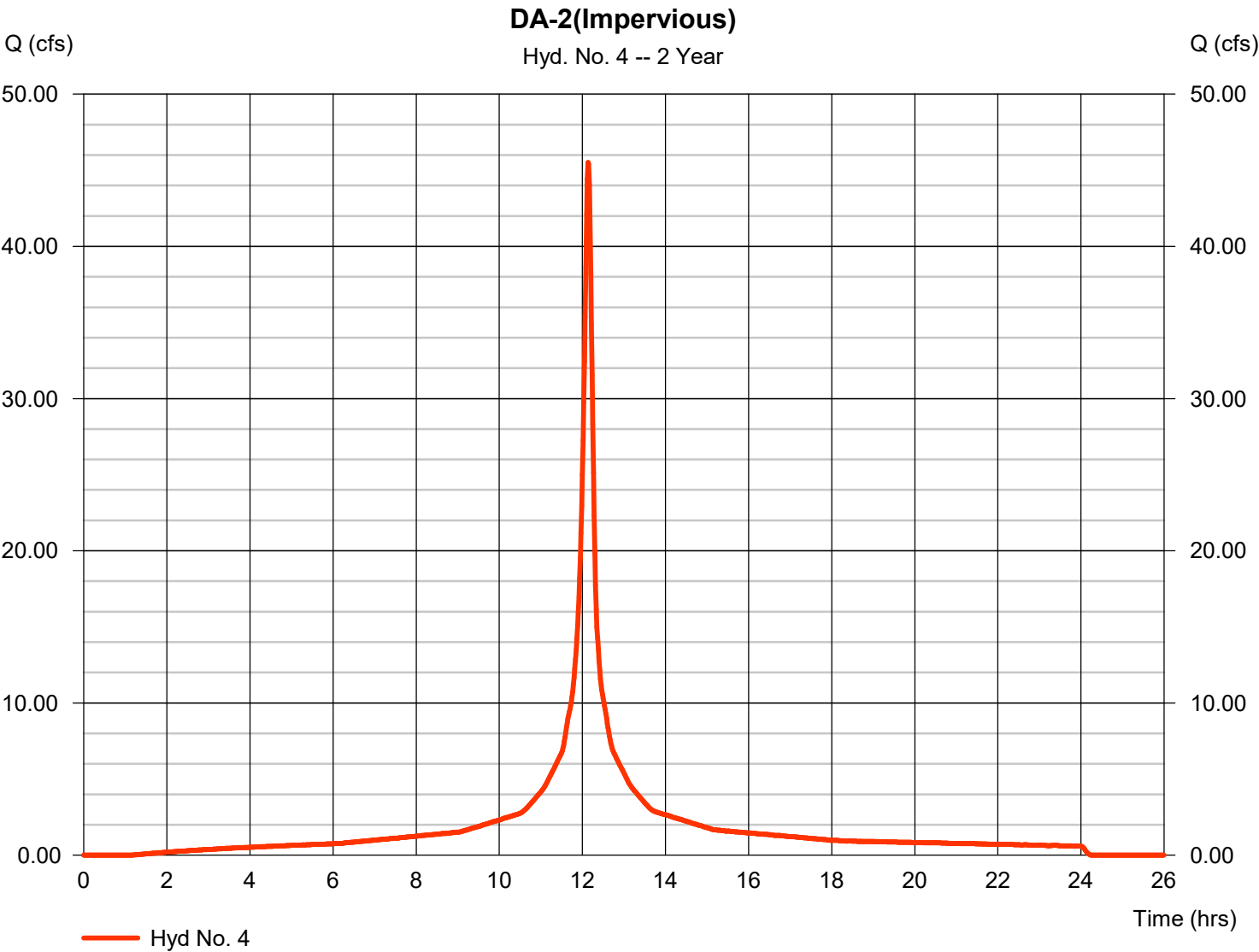


Hydrograph Report

Hyd. No. 4

DA-2(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 45.51 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 181,383 cuft
Drainage area	= 15.680 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 3.42 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18-0078 Kruvanak\184 West Orange Plaza - V		



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No. 4

DA-2(Impervious)

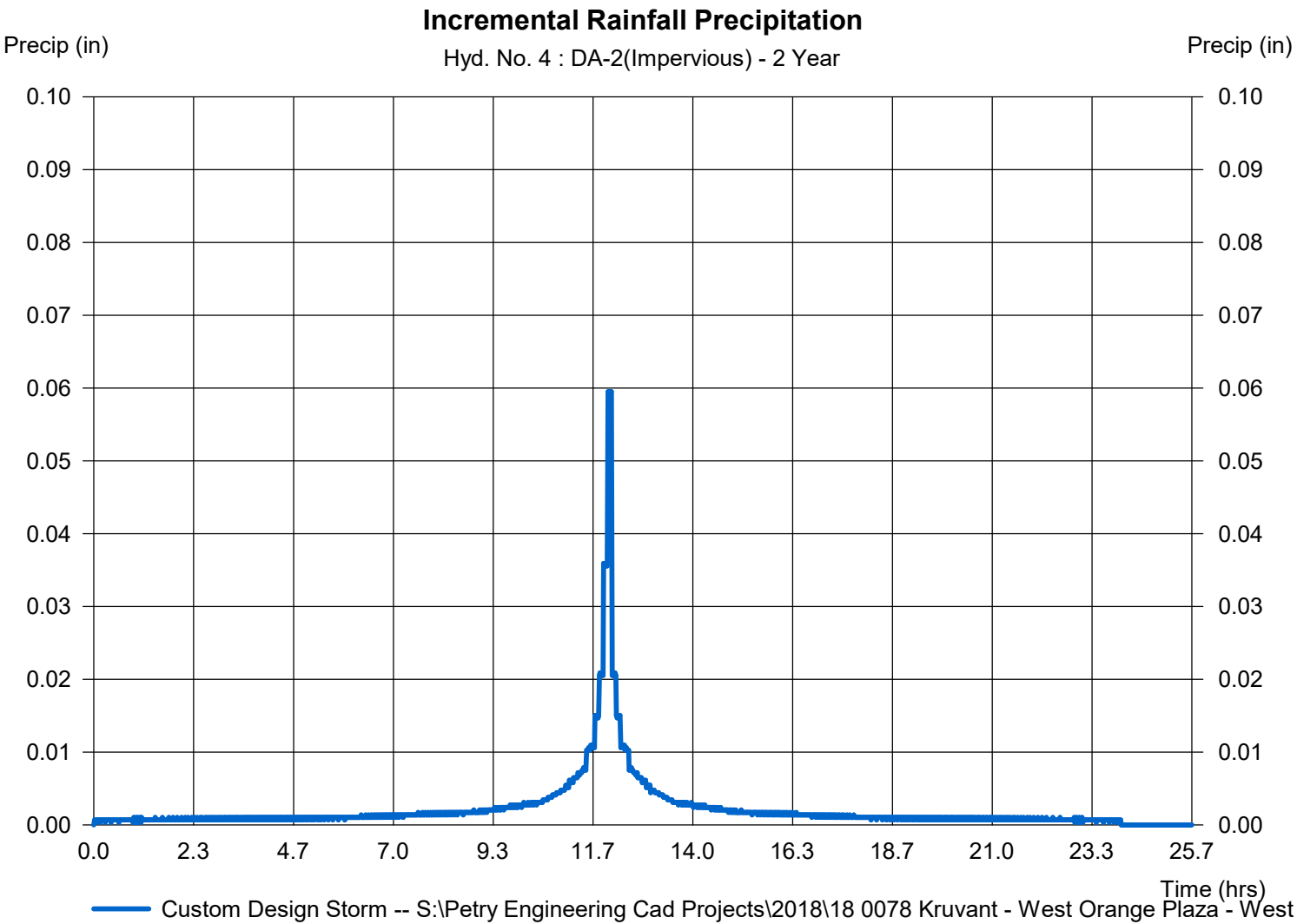
<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 60.0	40.0	0.0				
Two-year 24-hr precip. (in)	= 3.44	3.44	0.00				
Land slope (%)	= 7.00	6.00	0.00				
Travel Time (min)	= 5.54	+	0.36	+	0.00	=	5.90
Shallow Concentrated Flow							
Flow length (ft)	= 20.00	140.00	375.00				
Watercourse slope (%)	= 6.00	3.50	5.00				
Surface description	= Paved	Paved	Paved				
Average velocity (ft/s)	=4.98	3.80	4.55				
Travel Time (min)	= 0.07	+	0.61	+	1.37	=	2.06
Channel Flow							
X sectional flow area (sqft)	= 1.77	3.14	4.91				
Wetted perimeter (ft)	= 4.71	6.28	7.85				
Channel slope (%)	= 2.50	3.00	2.00				
Manning's n-value	= 0.015	0.015	0.015				
Velocity (ft/s)	=8.15	10.81	10.26				
Flow length (ft)	(0)65.0	950.0	150.0				
Travel Time (min)	= 0.13	+	1.46	+	0.24	=	1.84
Total Travel Time, Tc					9.80 min		

Precipitation Report

Hyd. No. 4

DA-2(Impervious)

Storm Frequency	= 2 yrs	Time interval	= 1 min
Total precip.	= 3.4200 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		

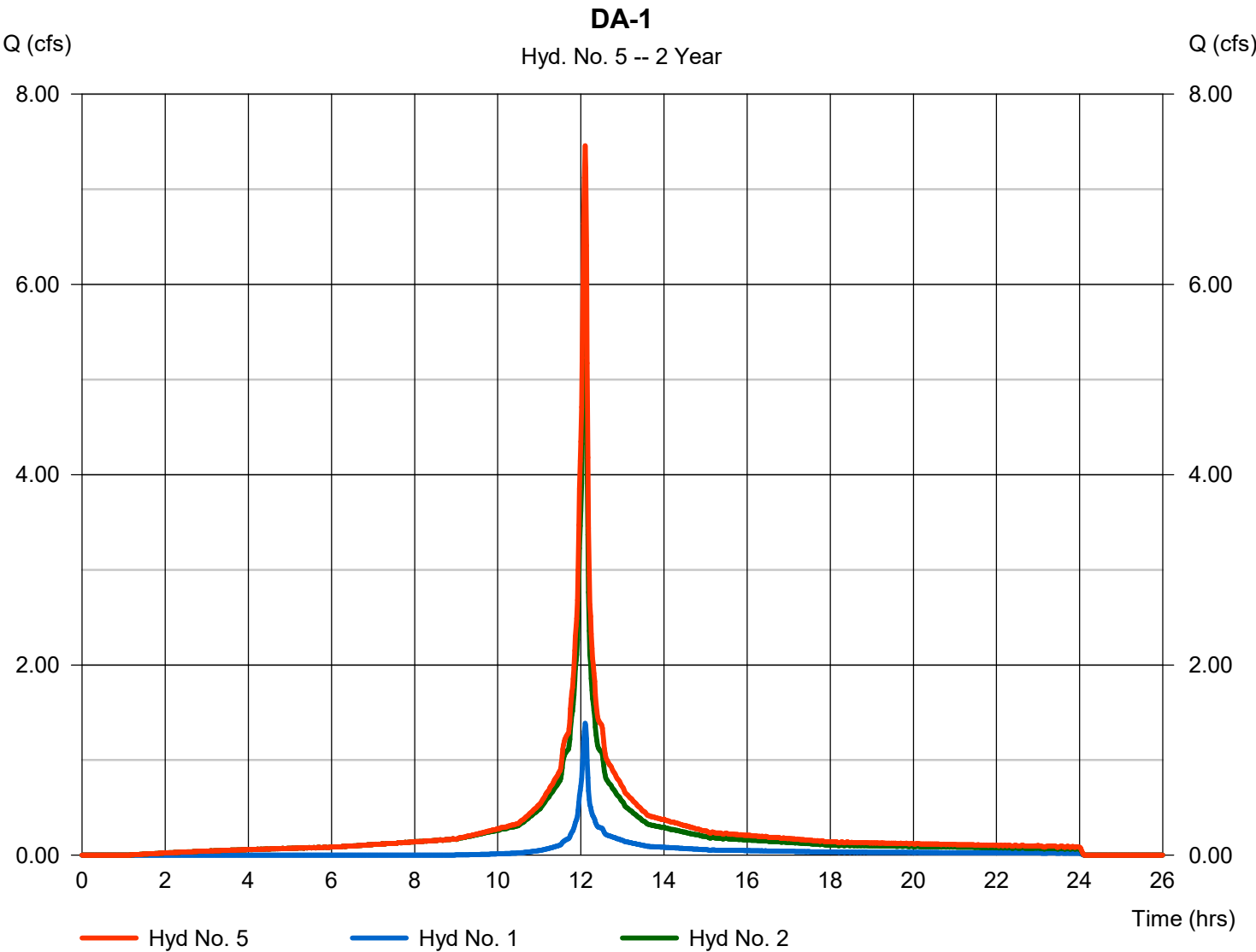


Hydrograph Report

Hyd. No. 5

DA-1

Hydrograph type	= Combine	Peak discharge	= 7.458 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 24,068 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 2.430 ac

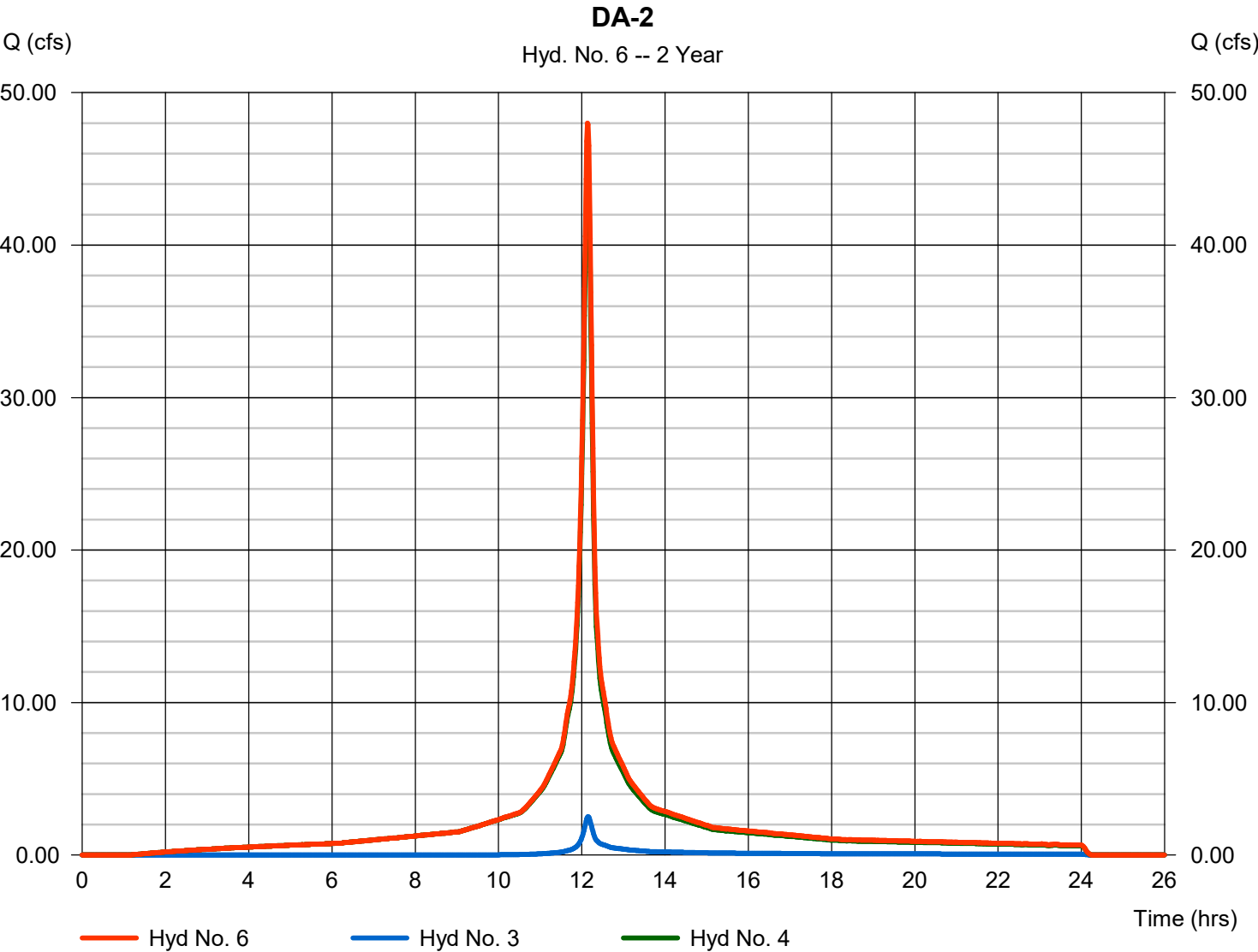


Hydrograph Report

Hyd. No. 6

DA-2

Hydrograph type	= Combine	Peak discharge	= 48.00 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 190,244 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 17.460 ac



Hydrograph Report

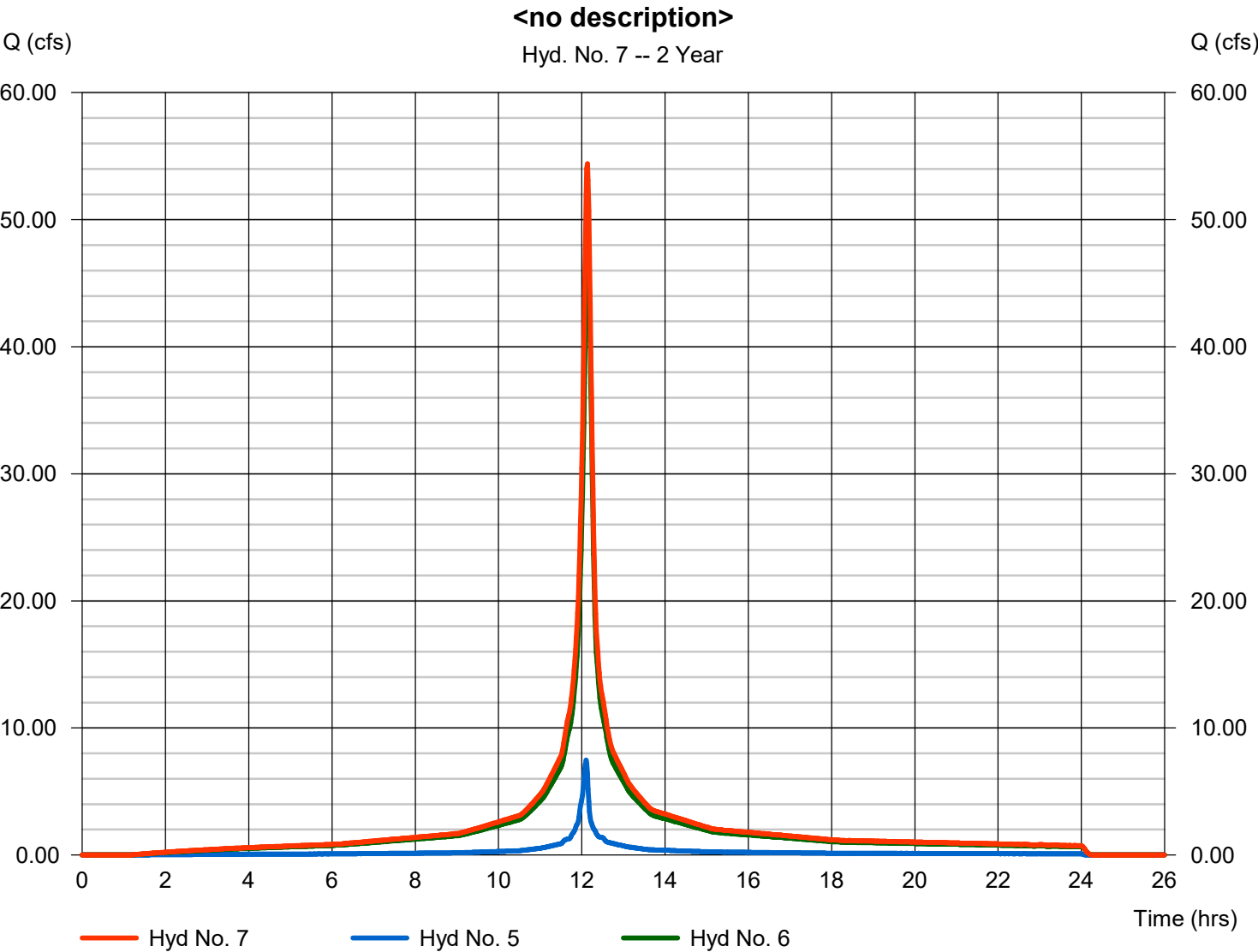
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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Hyd. No. 7

<no description>

Hydrograph type	= Combine	Peak discharge	= 54.41 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 214,313 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

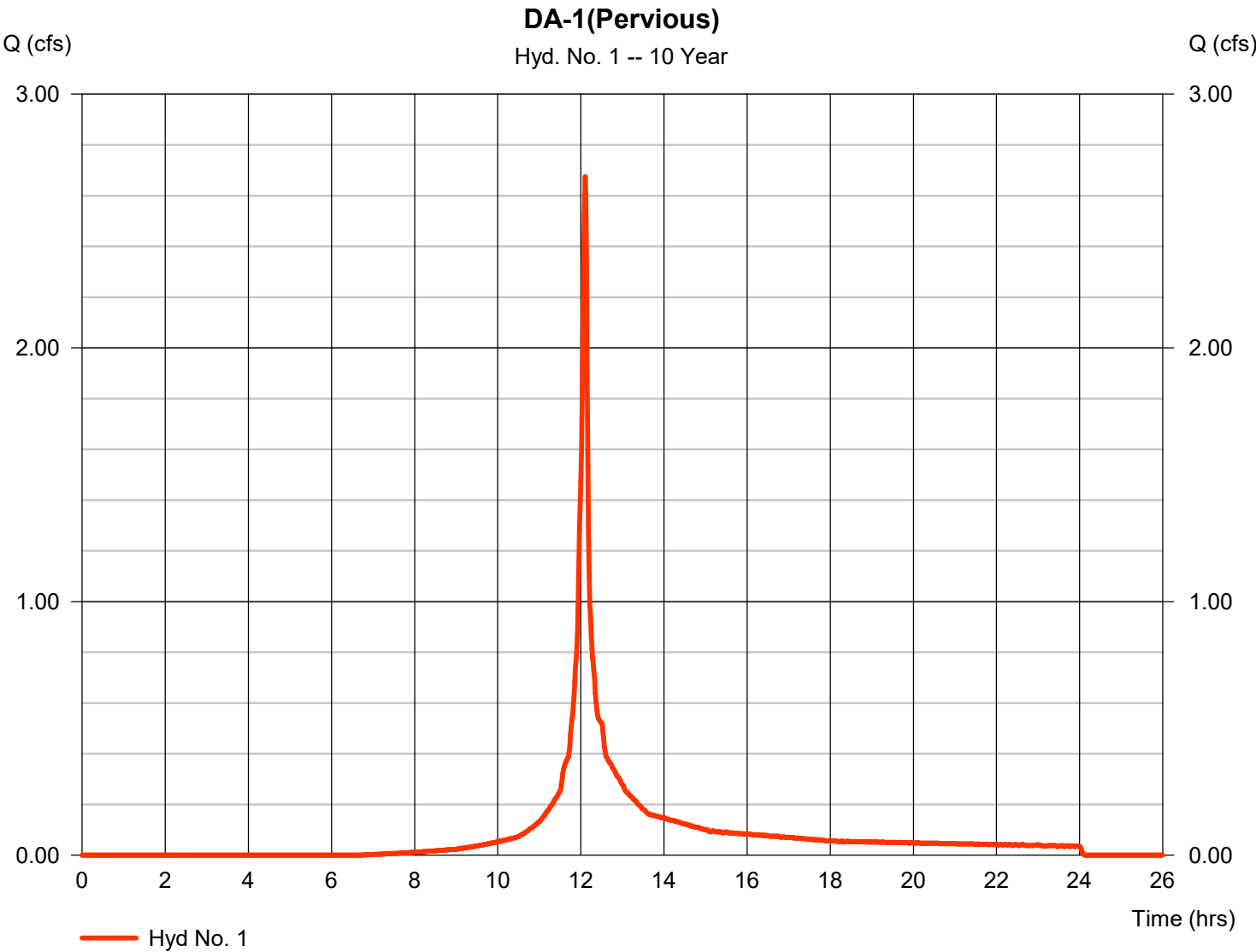
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.675	1	726	7,685	-----	-----	-----	DA-1(Pervious)
2	SCS Runoff	9.287	1	726	31,346	-----	-----	-----	DA-1(Impervious)
3	SCS Runoff	5.182	1	729	18,035	-----	-----	-----	DA-2(Pervious)
4	SCS Runoff	69.64	1	728	282,478	-----	-----	-----	DA-2(Impervious)
5	Combine	11.96	1	726	39,031	1, 2,	-----	-----	DA-1
6	Combine	74.78	1	728	300,513	3, 4,	-----	-----	DA-2
7	Combine	85.04	1	728	339,544	5, 6	-----	-----	<no description>
Proposed.gpw					Return Period: 10 Year			Thursday, 03 / 2 / 2023	

Hydrograph Report

Hyd. No. 1

DA-1(Pervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 2.675 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 7,685 cuft
Drainage area	= 0.690 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 3.30 min
Total precip.	= 5.20 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\181010078 Kruvan184 West Orange Plaza - V		

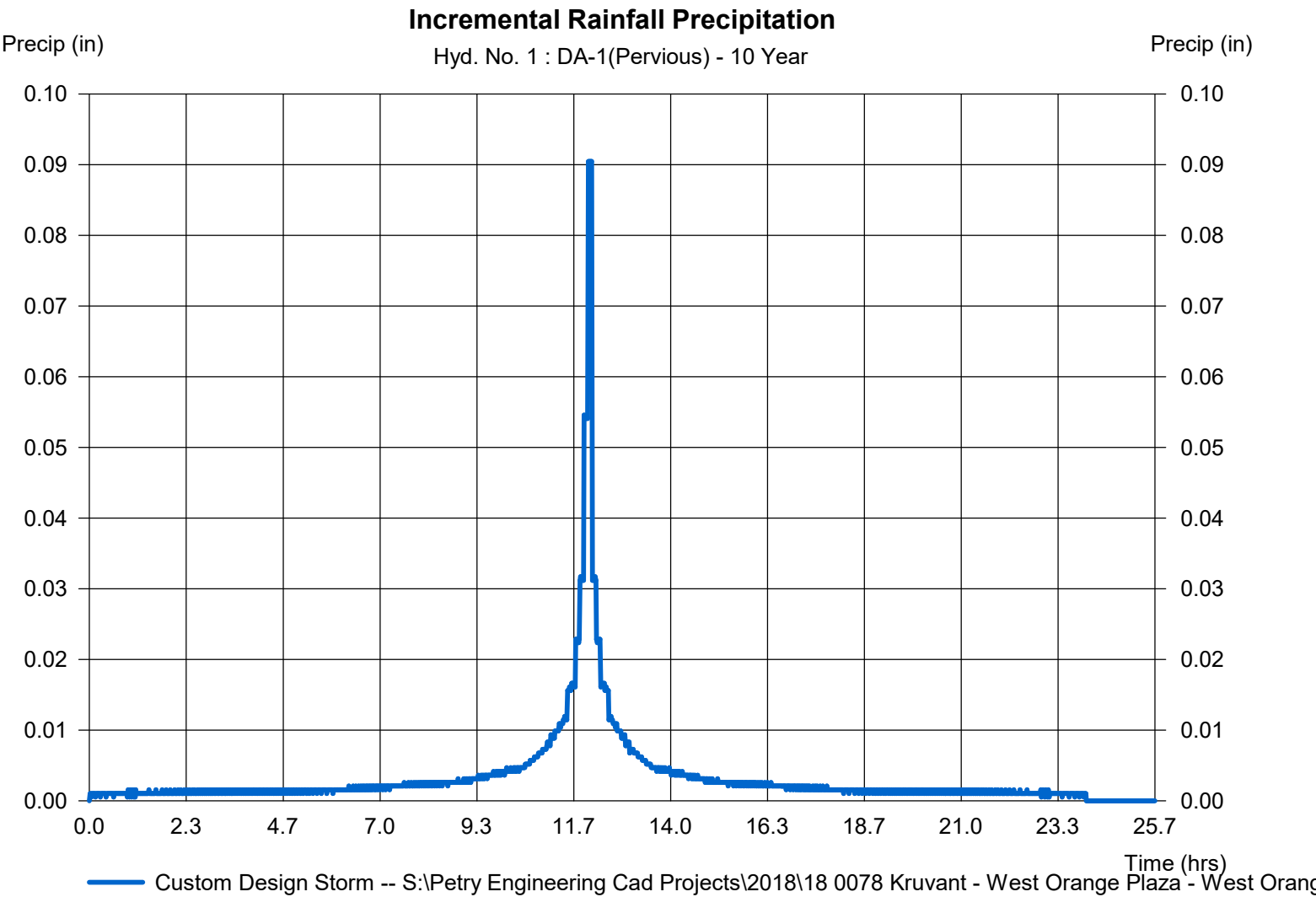


Precipitation Report

Hyd. No. 1

DA-1(Pervious)

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.2000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

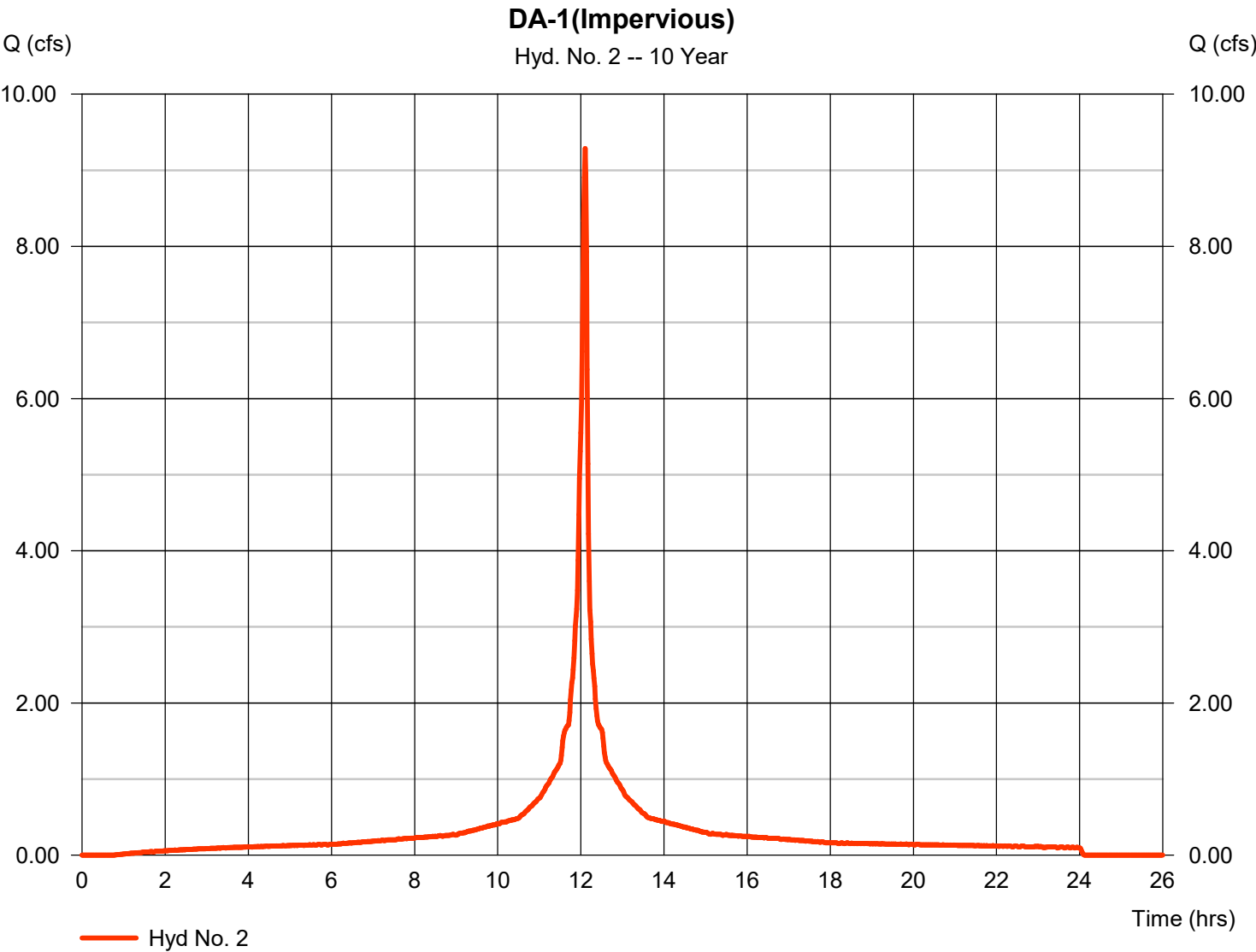
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Thursday, 03 / 2 / 2023

Hyd. No. 2

DA-1(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 9.287 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 31,346 cuft
Drainage area	= 1.740 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 3.30 min
Total precip.	= 5.20 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvan184 West Orange Plaza - V		



Precipitation Report

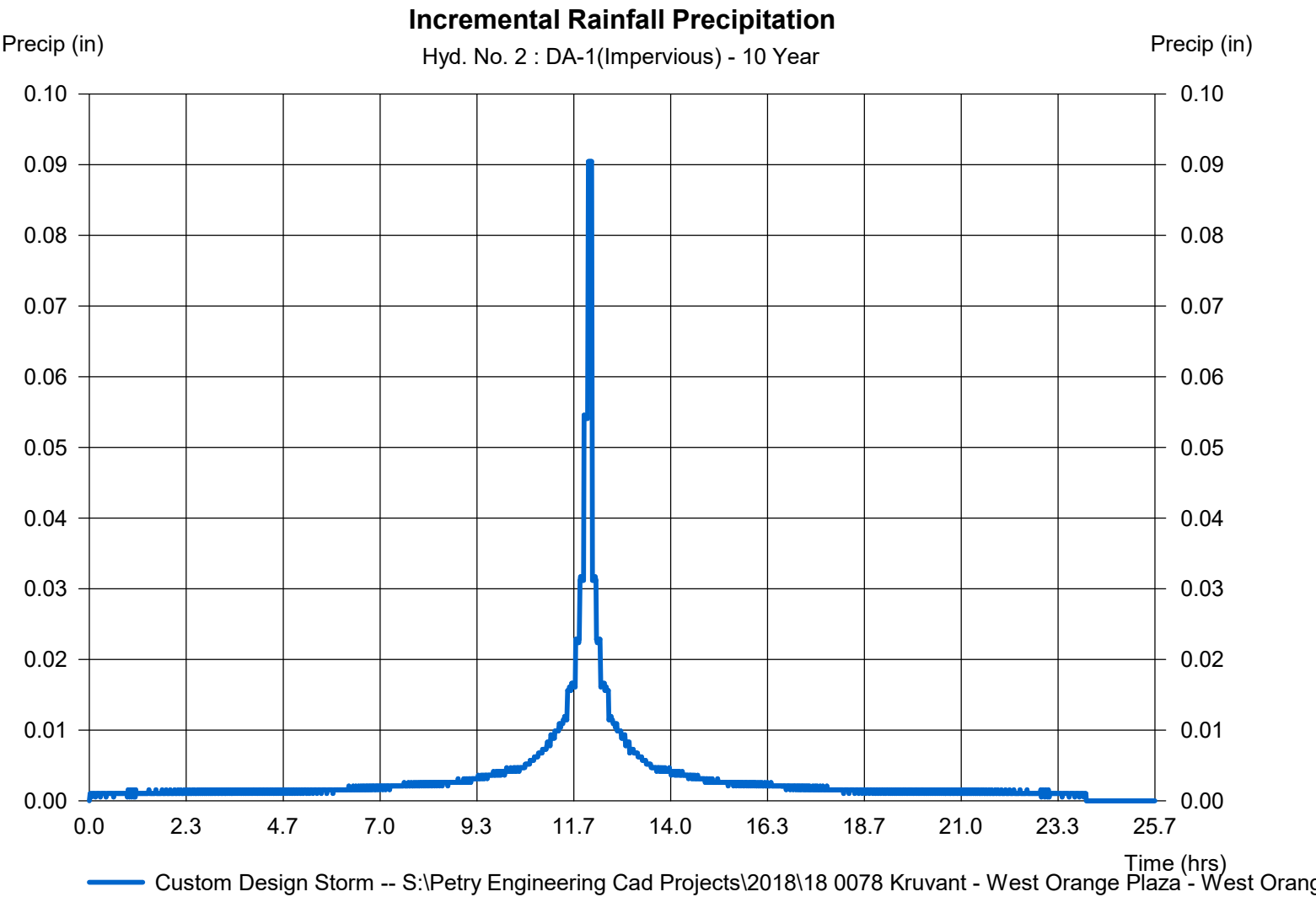
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Thursday, 03 / 2 / 2023

Hyd. No. 2

DA-1(Impervious)

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.2000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

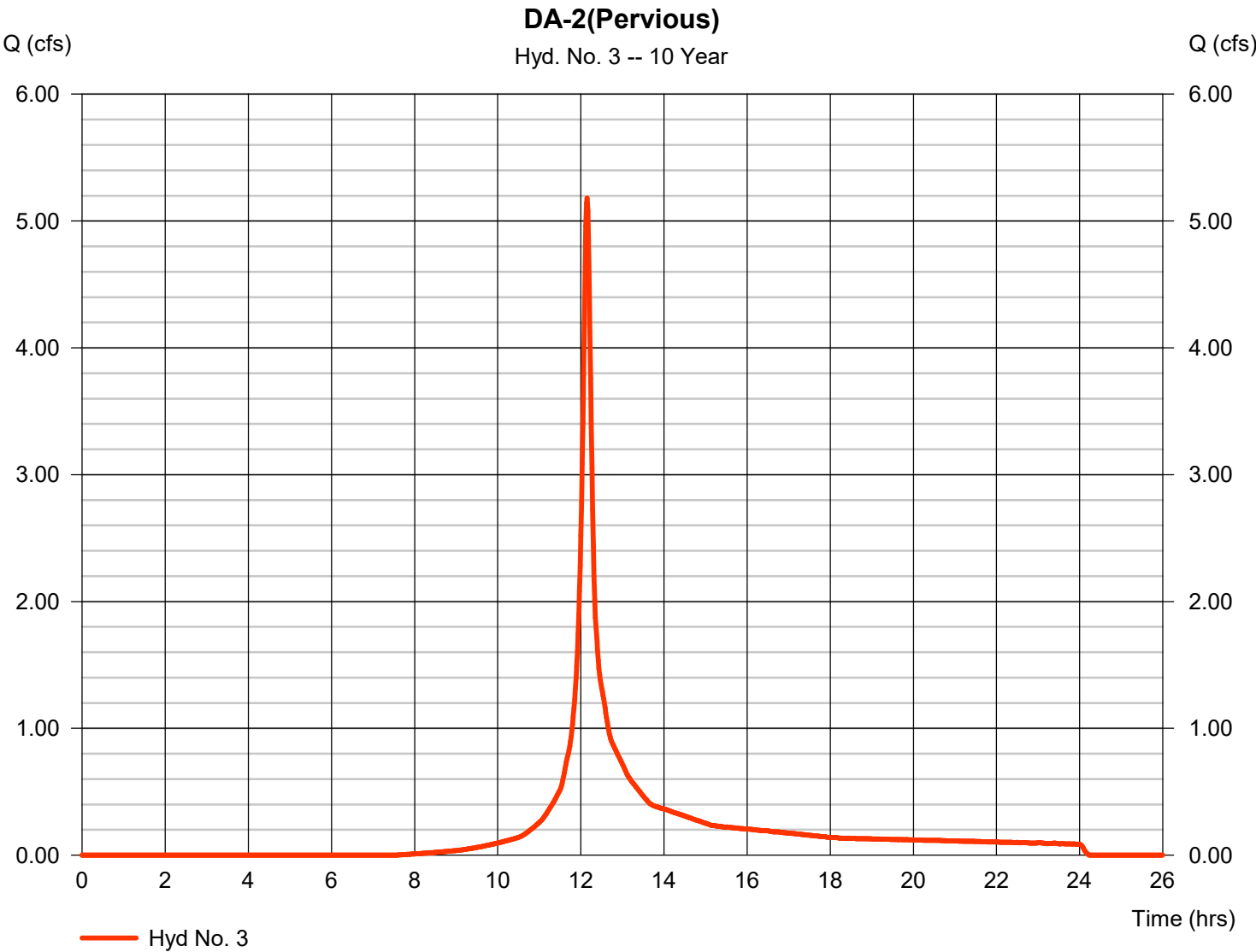
Thursday, 03 / 2 / 2023

Hyd. No. 3

DA-2(Pervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 5.182 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.15 hrs
Time interval	= 1 min	Hyd. volume	= 18,035 cuft
Drainage area	= 1.780 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.80 min
Total precip.	= 5.20 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvan184 West Orange Plaza - V		

* Composite (Area/CN) = [(0.550 x 70) + (1.230 x 80)] / 1.780

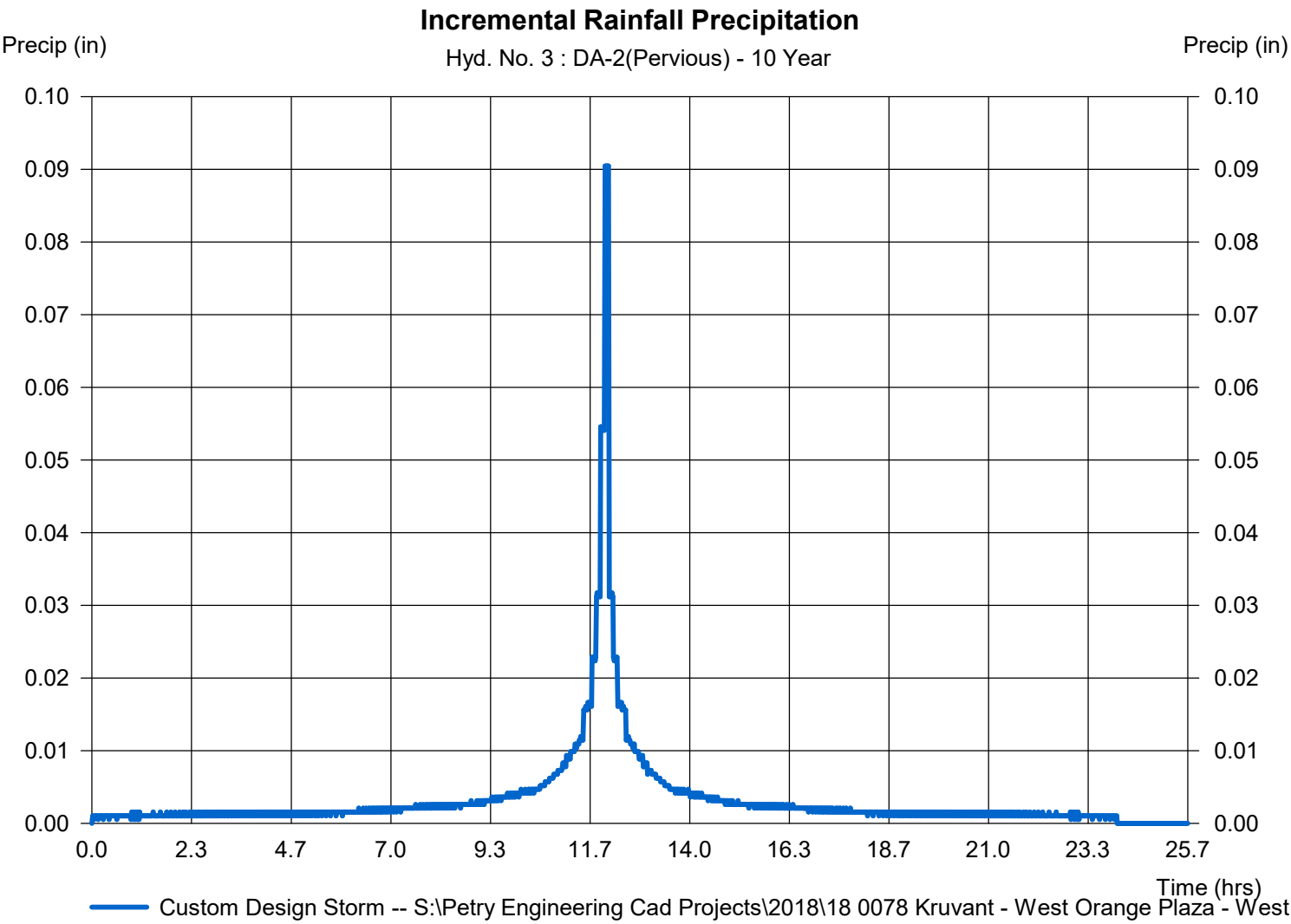


Precipitation Report

Hyd. No. 3

DA-2(Pervious)

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.2000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		

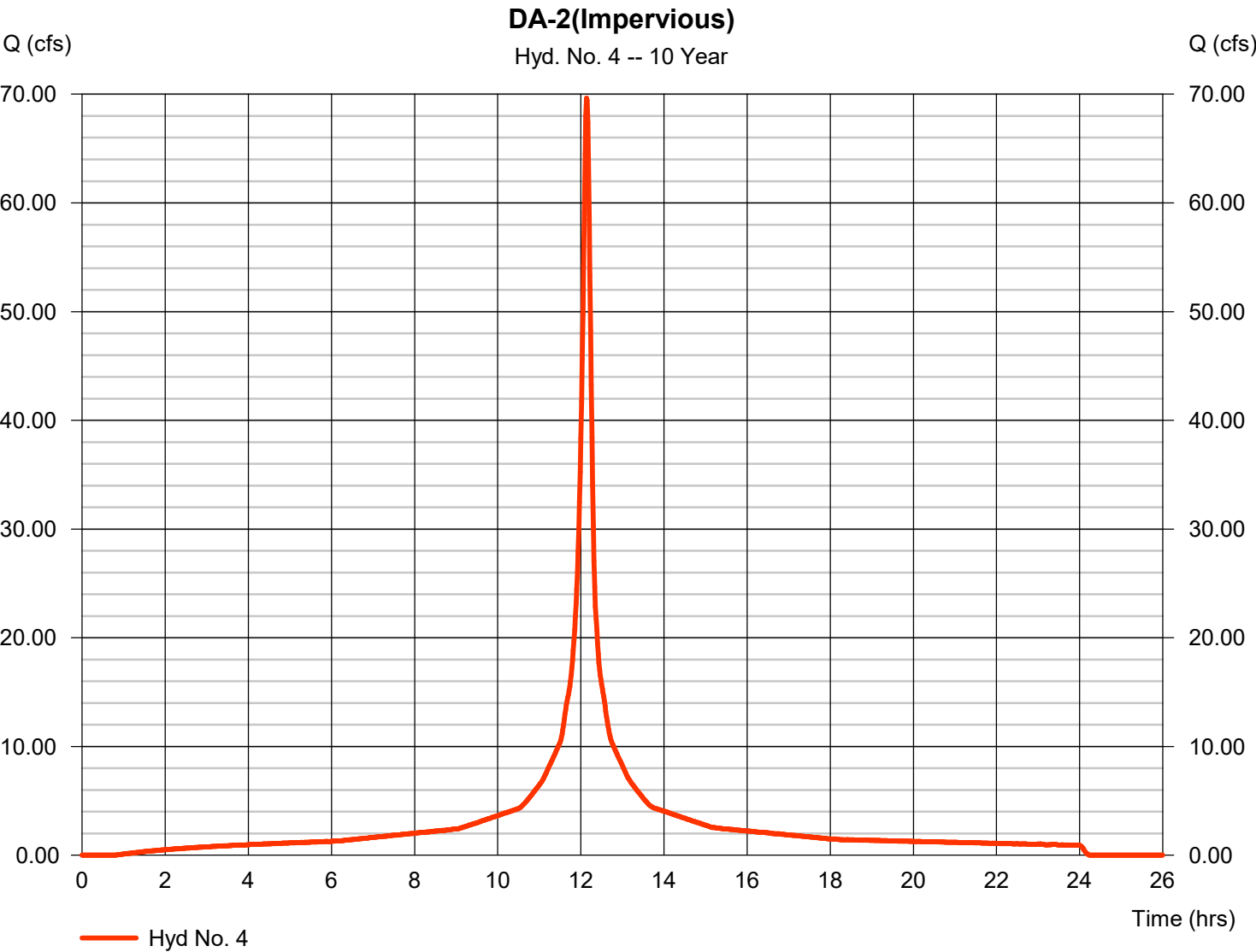


Hydrograph Report

Hyd. No. 4

DA-2(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 69.64 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 282,478 cuft
Drainage area	= 15.680 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 5.20 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvanak\1810078 Kruvanak - V		



Precipitation Report

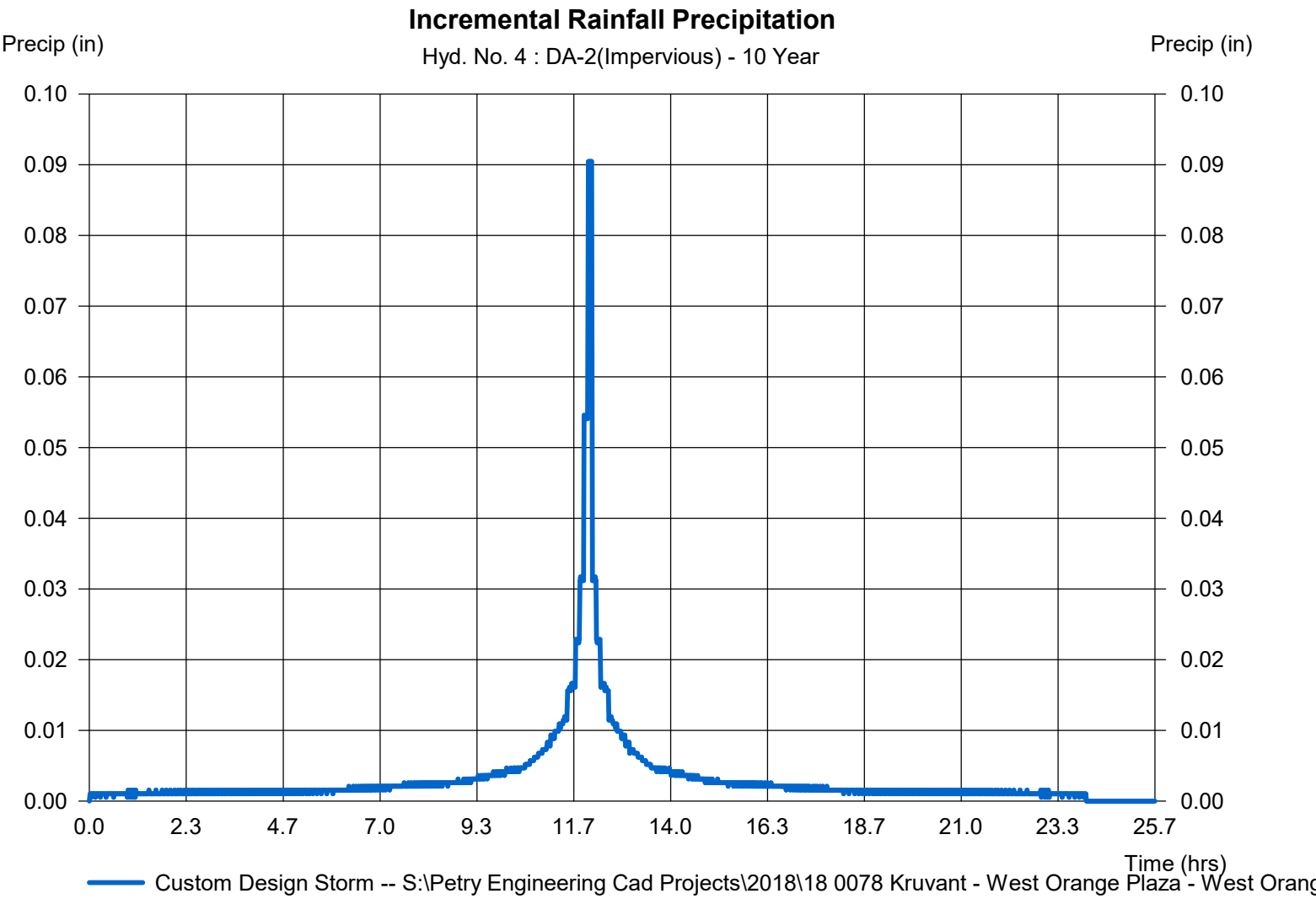
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 4

DA-2(Impervious)

Storm Frequency	= 10 yrs	Time interval	= 1 min
Total precip.	= 5.2000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

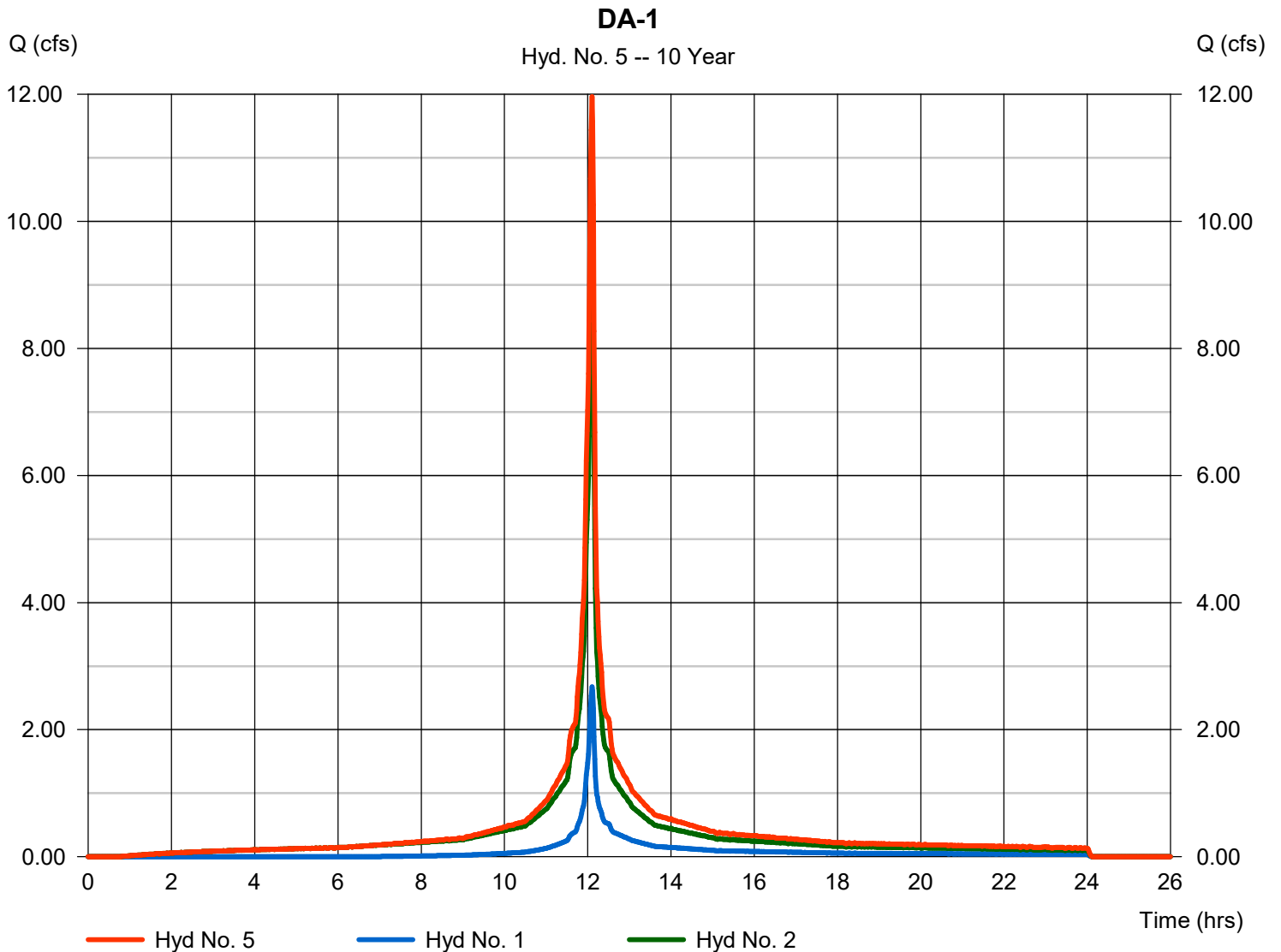
Thursday, 03 / 2 / 2023

Hyd. No. 5

DA-1

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyds. = 1, 2

Peak discharge = 11.96 cfs
Time to peak = 12.10 hrs
Hyd. volume = 39,031 cuft
Contrib. drain. area = 2.430 ac



Hydrograph Report

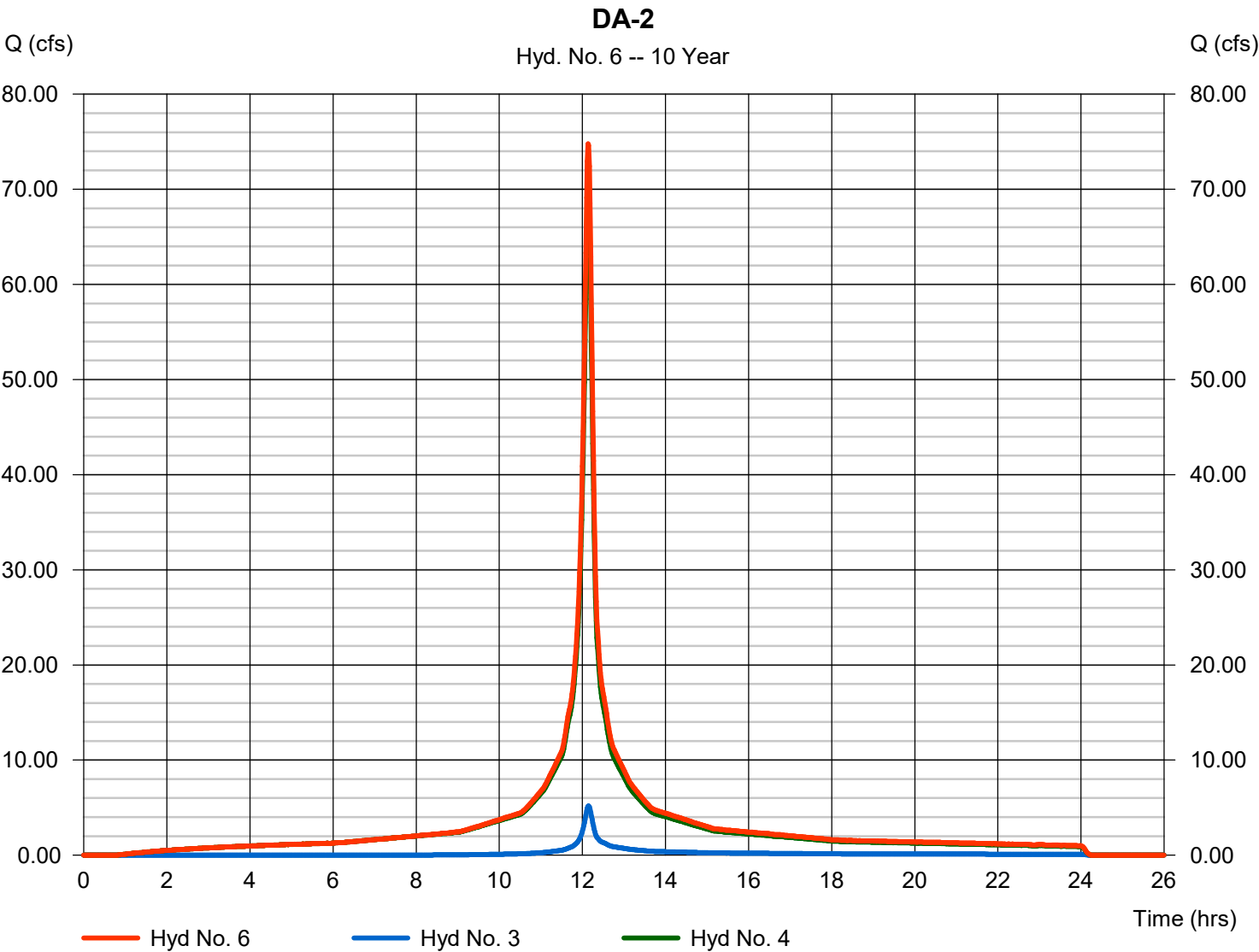
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 6

DA-2

Hydrograph type	= Combine	Peak discharge	= 74.78 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 300,513 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 17.460 ac



Hydrograph Report

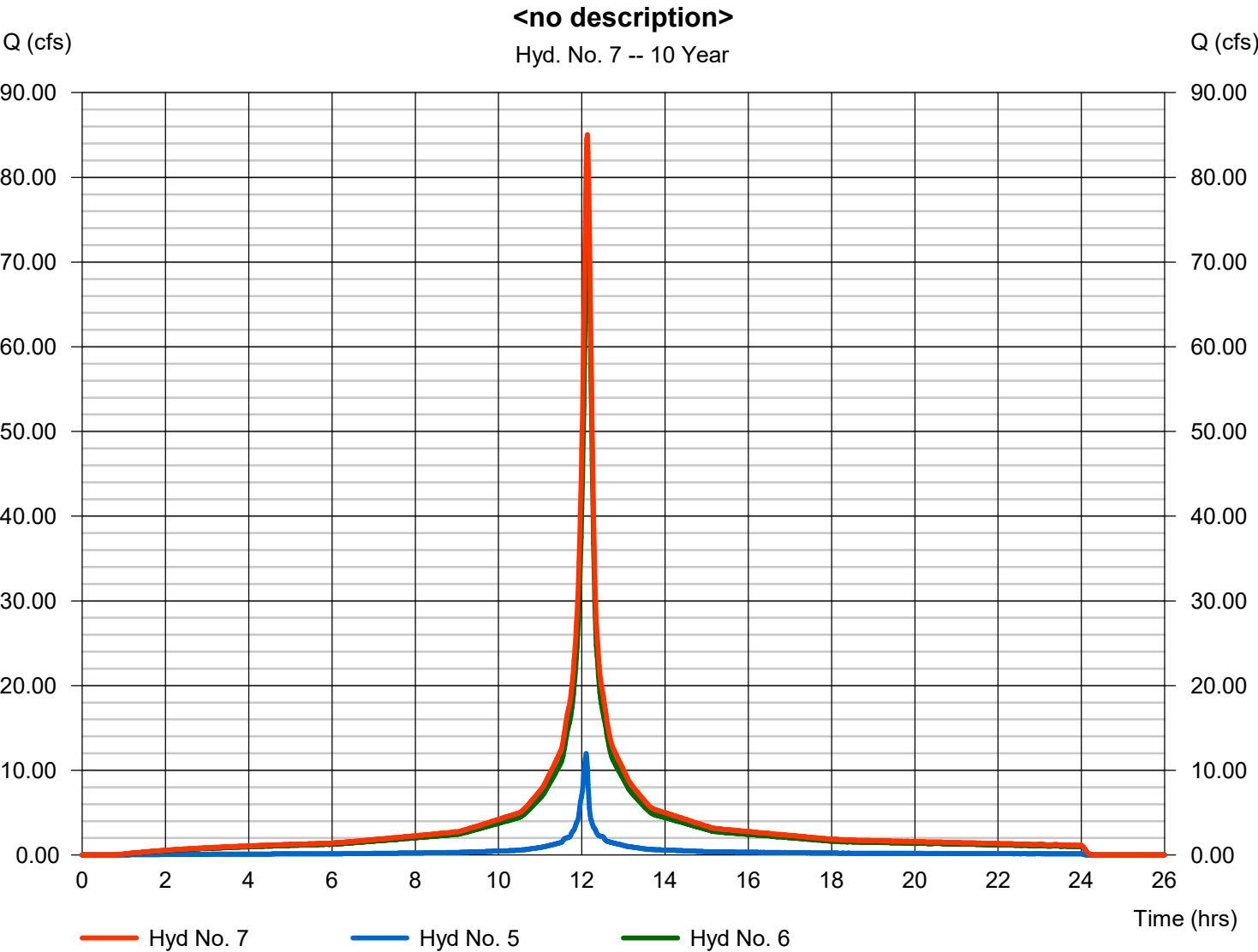
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 7

<no description>

Hydrograph type	= Combine	Peak discharge	= 85.04 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 339,544 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

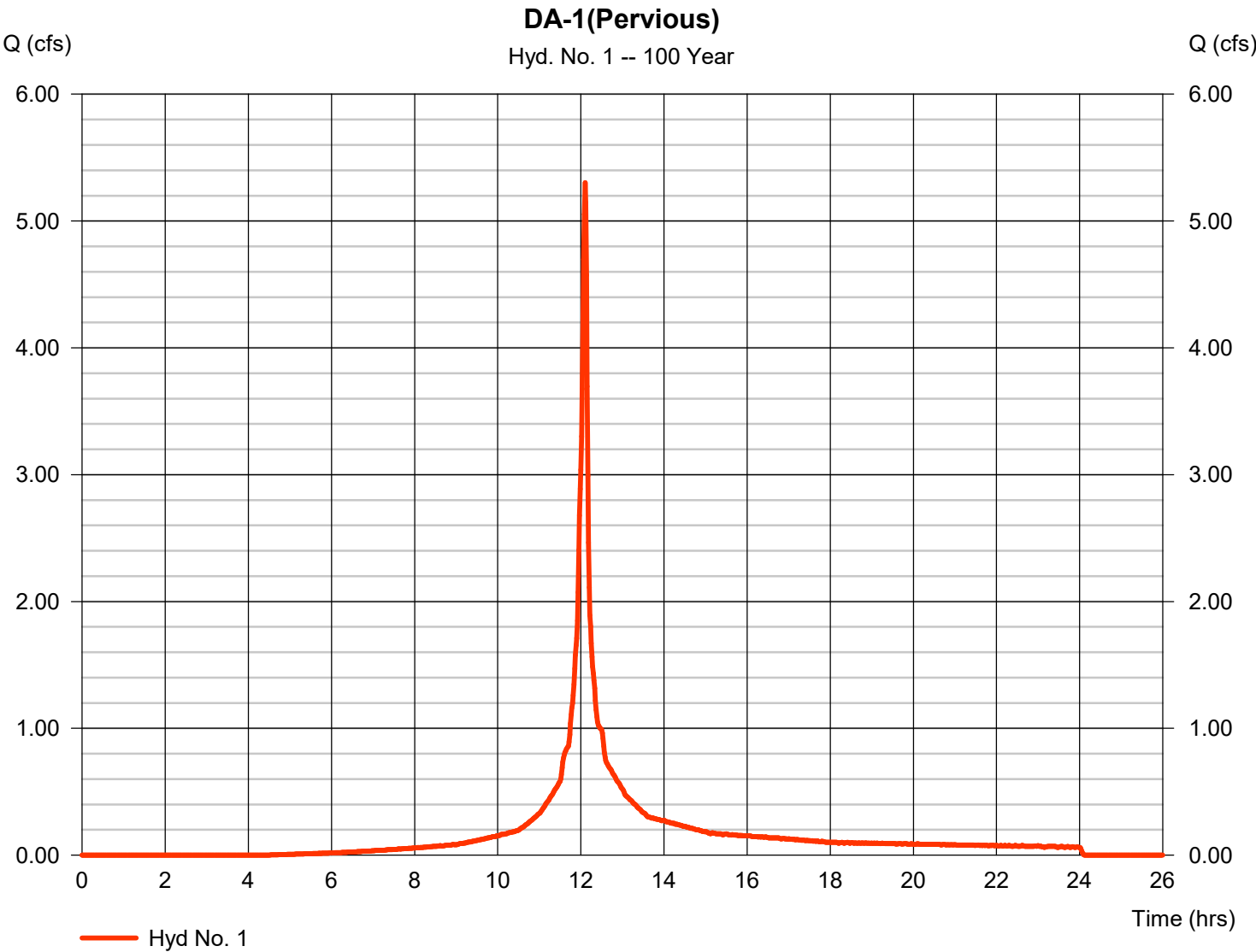
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	5.303	1	726	15,740	-----	-----	-----	DA-1(Pervious)
2	SCS Runoff	15.59	1	726	53,434	-----	-----	-----	DA-1(Impervious)
3	SCS Runoff	10.76	1	729	38,252	-----	-----	-----	DA-2(Pervious)
4	SCS Runoff	116.90	1	728	481,518	-----	-----	-----	DA-2(Impervious)
5	Combine	20.89	1	726	69,174	1, 2,	-----	-----	DA-1
6	Combine	127.63	1	728	519,771	3, 4,	-----	-----	DA-2
7	Combine	145.50	1	728	588,944	5, 6	-----	-----	<no description>
Proposed.gpw					Return Period: 100 Year			Thursday, 03 / 2 / 2023	

Hydrograph Report

Hyd. No. 1

DA-1(Pervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 5.303 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 15,740 cuft
Drainage area	= 0.690 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 3.30 min
Total precip.	= 8.70 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvanak\1810078 Kruvanak - V		



Precipitation Report

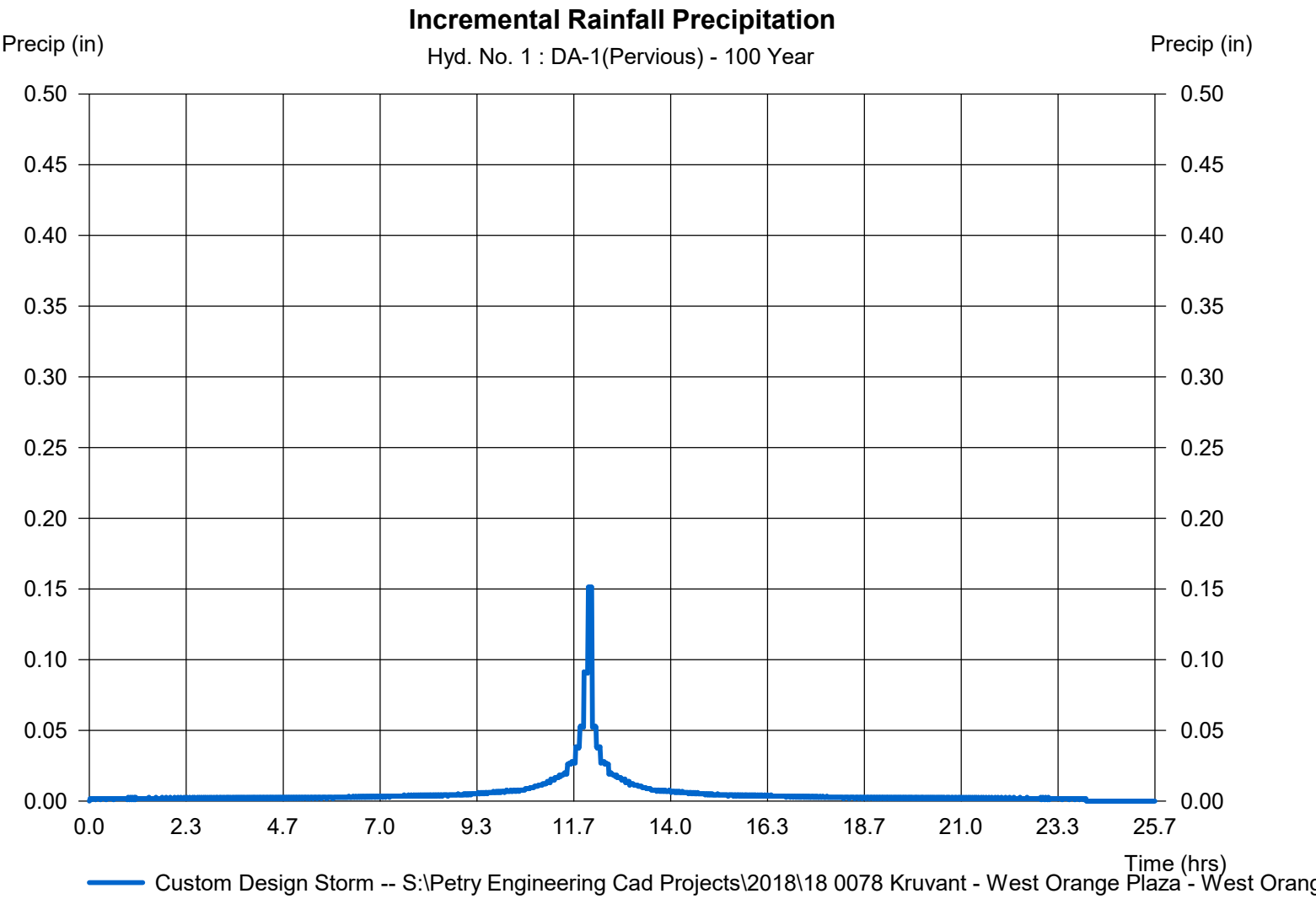
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 1

DA-1(Pervious)

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 8.7000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		

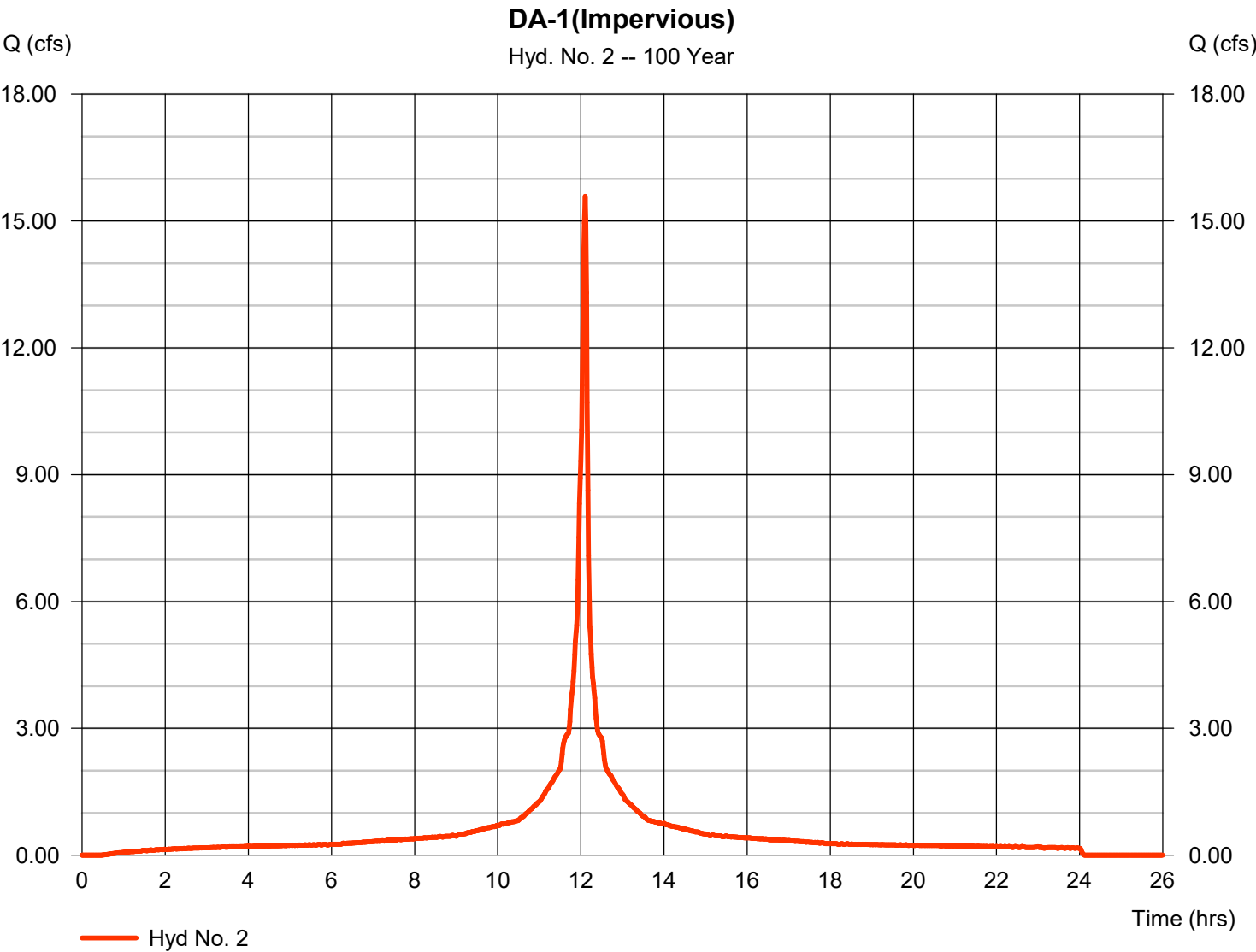


Hydrograph Report

Hyd. No. 2

DA-1(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 15.59 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 53,434 cuft
Drainage area	= 1.740 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 3.30 min
Total precip.	= 8.70 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvan184 West Orange Plaza - V		



Precipitation Report

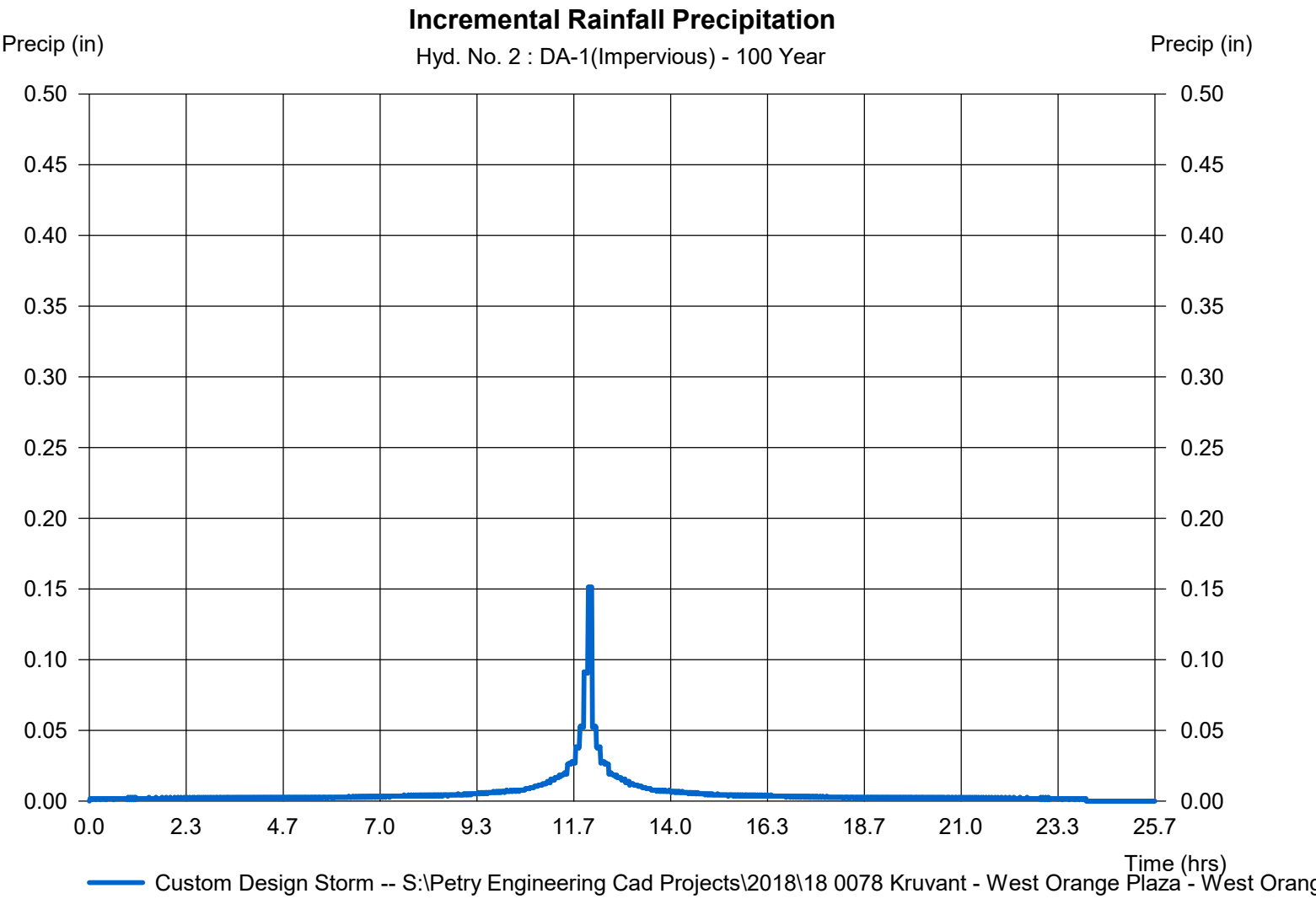
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 2

DA-1(Impervious)

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 8.7000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		

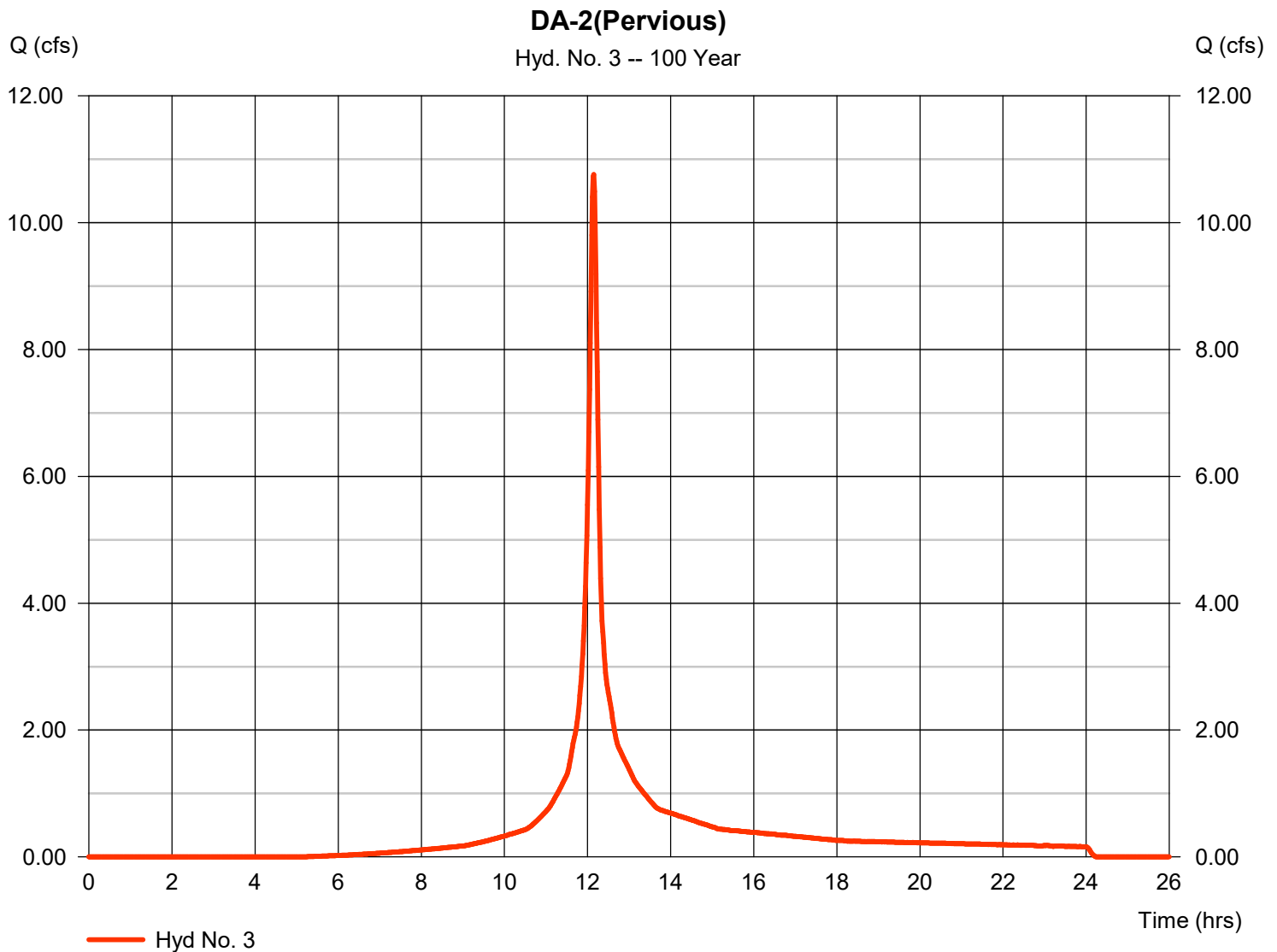


Hyd. No. 3

DA-2(Pervious)

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.76 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.15 hrs
Time interval	=	1 min	Hyd. volume	=	38,252 cuft
Drainage area	=	1.780 ac	Curve number	=	77*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	9.80 min
Total precip.	=	8.70 in	Distribution	=	Custom
Storm duration	=	5 min			

* Composite (Area/CN) = [(0.550 x 70) + (1.230 x 80)] / 1.780



Precipitation Report

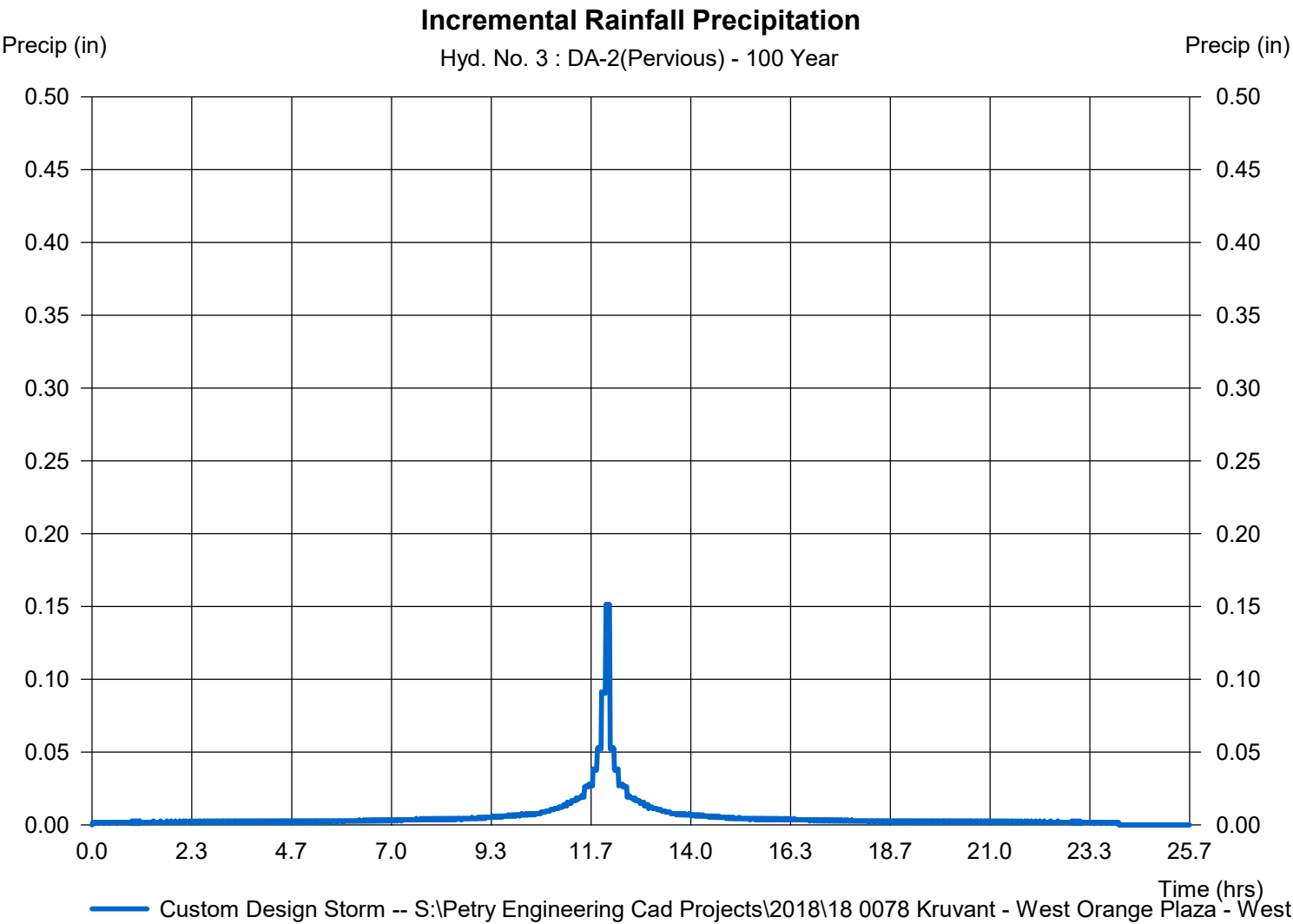
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 3

DA-2(Pervious)

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 8.7000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

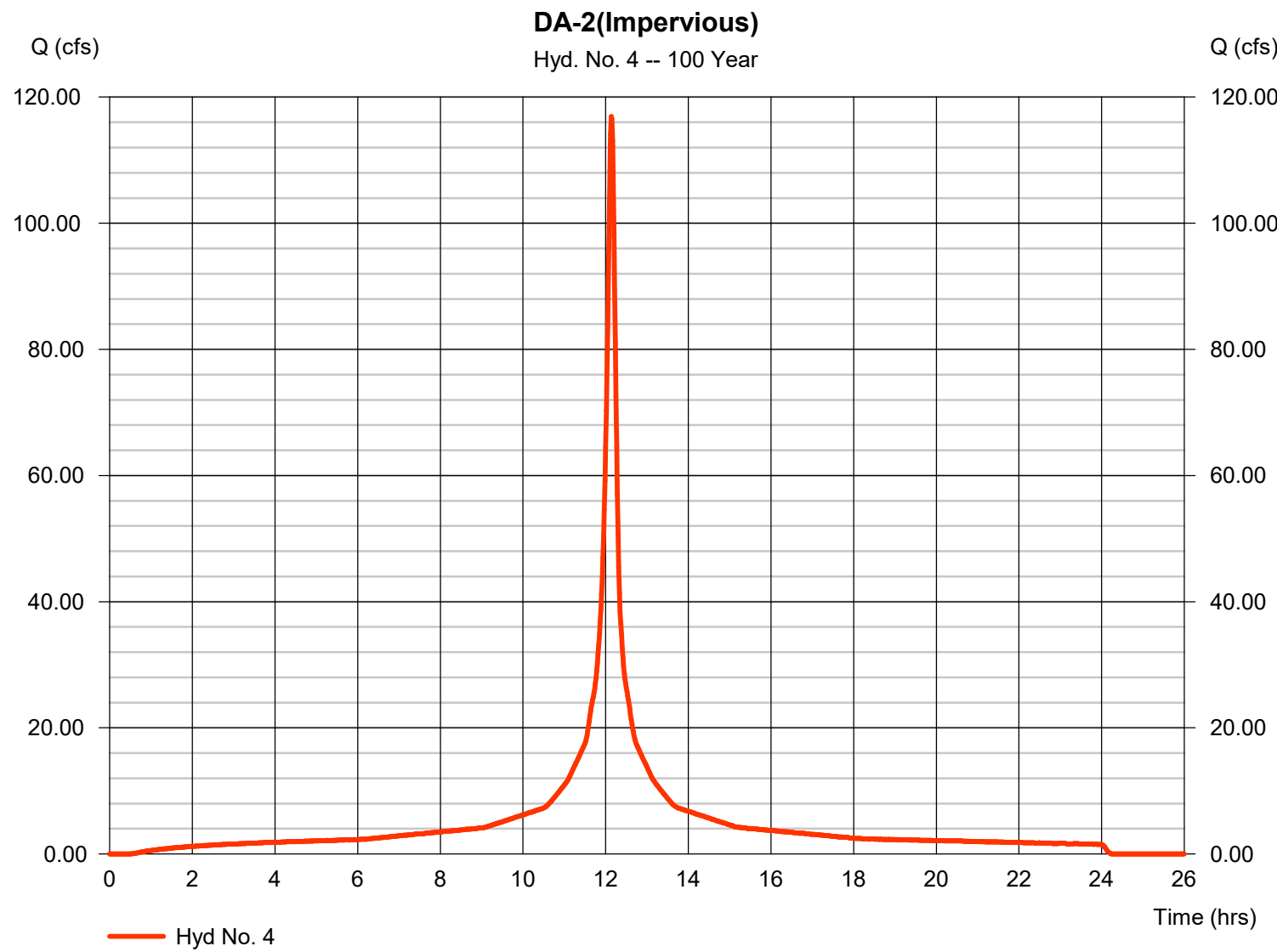
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 4

DA-2(Impervious)

Hydrograph type	= SCS Runoff	Peak discharge	= 116.90 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 481,518 cuft
Drainage area	= 15.680 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 9.80 min
Total precip.	= 8.70 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\1810078 Kruvanak\1810078 Kruvanak.dwg		

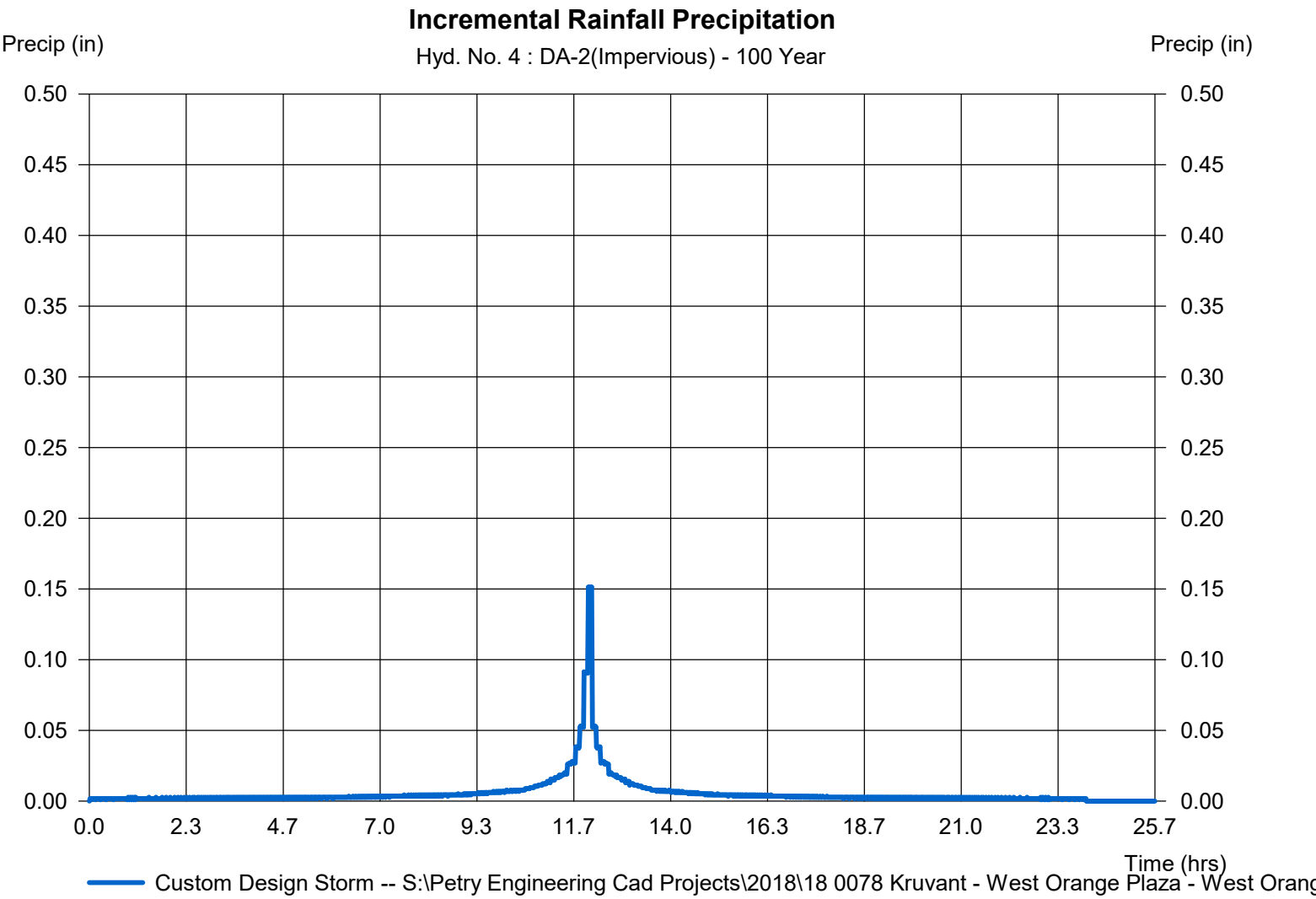


Precipitation Report

Hyd. No. 4

DA-2(Impervious)

Storm Frequency	= 100 yrs	Time interval	= 1 min
Total precip.	= 8.7000 in	Distribution	= Custom
Storm duration	= S:\Petry Engineering Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange		



Hydrograph Report

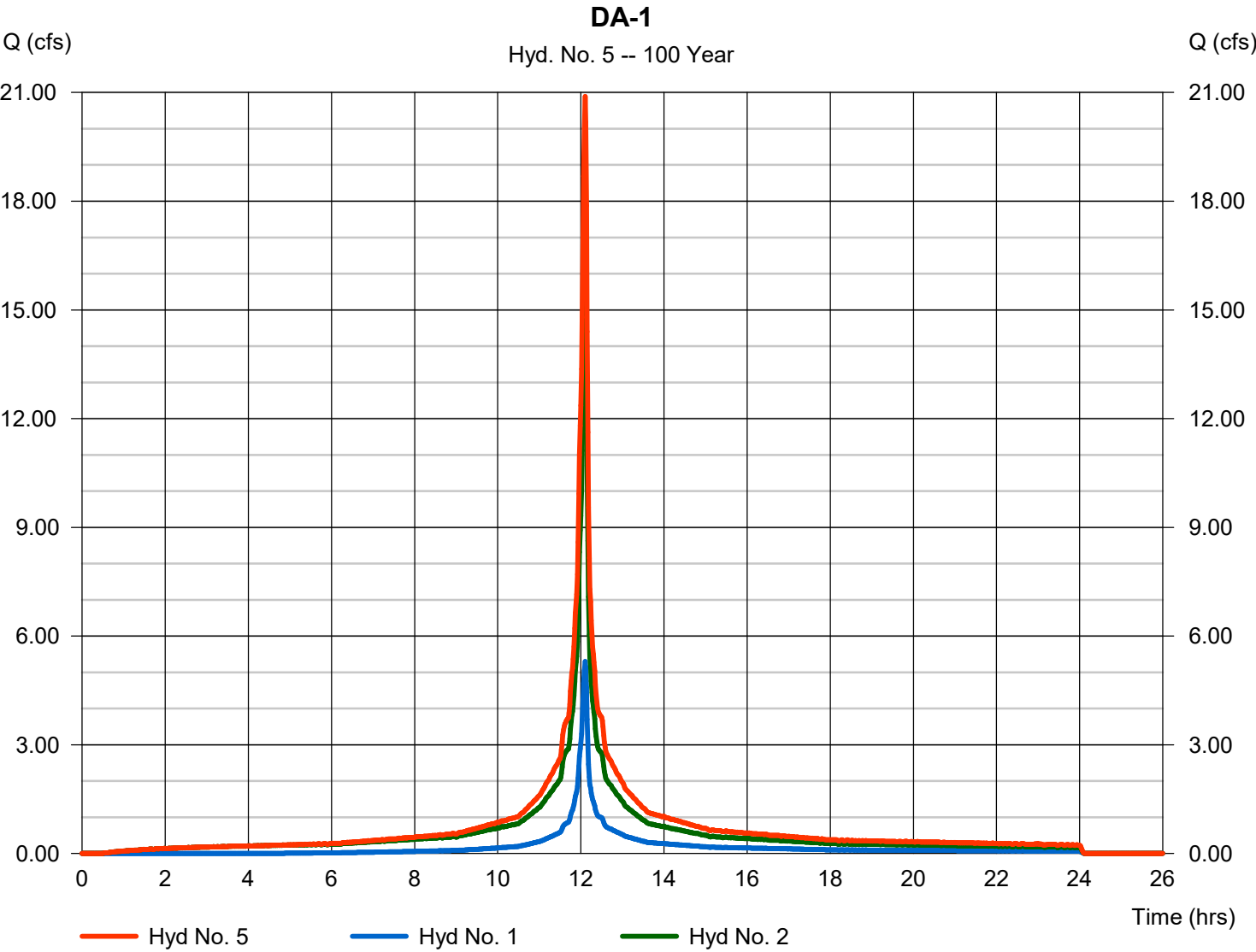
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 5

DA-1

Hydrograph type	= Combine	Peak discharge	= 20.89 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 69,174 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 2.430 ac



Hydrograph Report

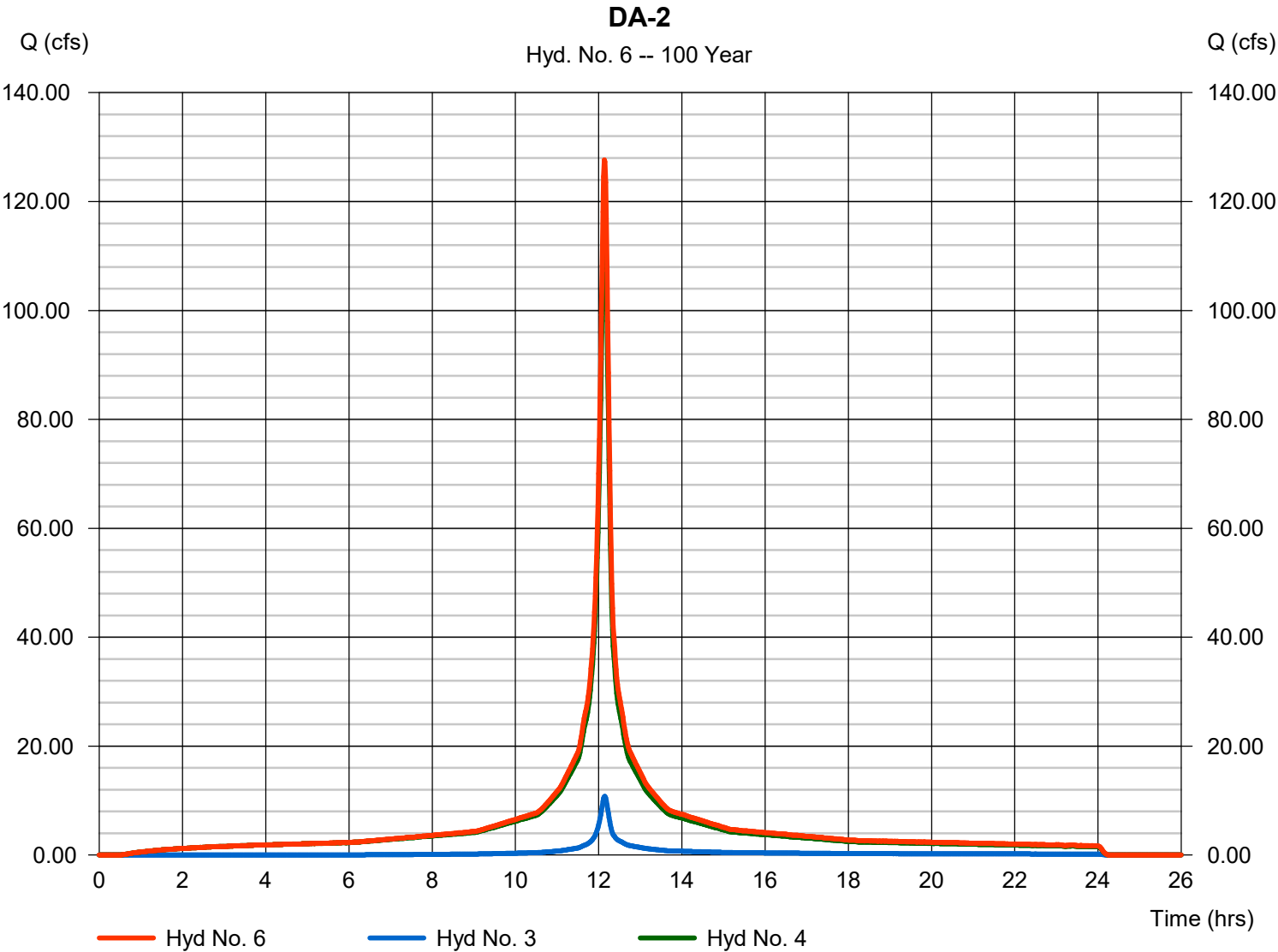
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Hyd. No. 6

DA-2

Hydrograph type	= Combine	Peak discharge	= 127.63 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 519,771 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 17.460 ac

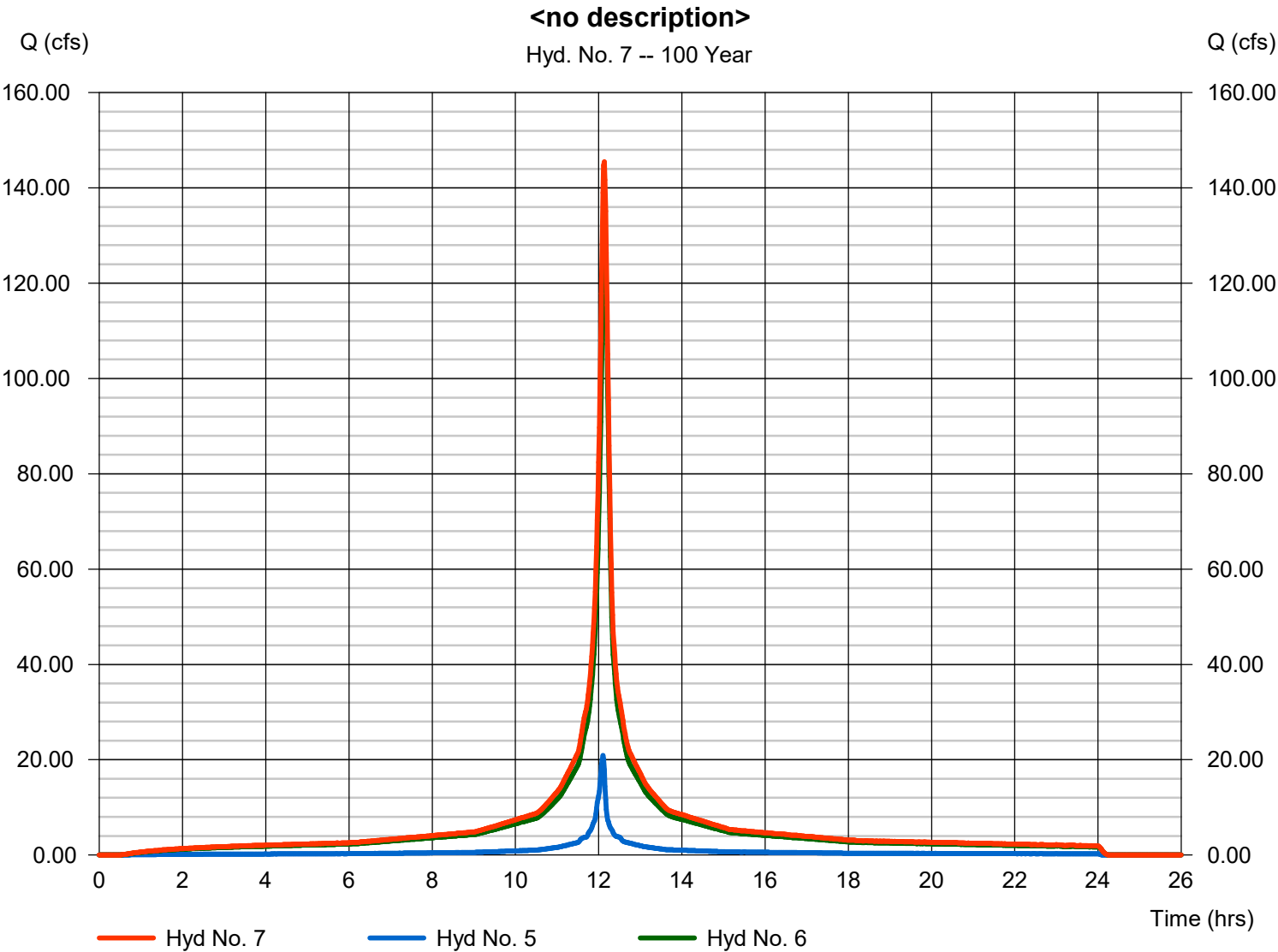


Hydrograph Report

Hyd. No. 7

<no description>

Hydrograph type	= Combine	Peak discharge	= 145.50 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 1 min	Hyd. volume	= 588,944 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.000 ac



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Thursday, 03 / 2 / 2023

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	-----
2	69.8703	13.1000	0.8658	-----
3	0.0000	0.0000	0.0000	-----
5	79.2597	14.6000	0.8369	-----
10	88.2351	15.5000	0.8279	-----
25	102.6072	16.5000	0.8217	-----
50	114.8193	17.2000	0.8199	-----
100	127.1596	17.8000	0.8186	-----

File name: SampleFHA.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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
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	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

T_c = time in minutes. Values may exceed 60.

ng Cad Projects\2018\18 0078 Kruvant - West Orange Plaza - West Orange\Civil\Current\Stormwater\Rainfall Data.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	0.00	3.42	0.00	0.00	5.20	0.00	0.00	8.70

APPENDIX



Soil Map—Essex County, New Jersey



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

4/24/2018
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils



Soil Map Unit Polygons



Soil Map Unit Lines



Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Essex County, New Jersey

Survey Area Data: Version 13, Oct 6, 2017

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

Date(s) aerial images were photographed: Aug 25, 2014—Sep 27, 2014

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BogBc	Boonton loam, 0 to 8 percent slopes, extremely stony	11.8	13.8%
BogCc	Boonton loam, 8 to 15 percent slopes, extremely stony	22.4	26.1%
BouB	Boonton - Urban land, Boonton substratum complex, 0 to 8 percent slopes	1.4	1.7%
BouC	Boonton - Urban land, Boonton substratum complex, 8 to 15 percent slopes	8.5	9.9%
HanBc	Haledon silt loam, 0 to 8 percent slopes, extremely stony	4.1	4.8%
URBONB	Urban land, Boonton substratum, 0 to 8 percent slopes	27.6	32.3%
YaoRcc	Yalesville - Rock outcrop complex, 8 to 15 percent slopes, extremely stony	9.8	11.4%
Totals for Area of Interest		85.6	100.0%

Interpretative Groups

Land Capability Classification (non-irrigated): 8s

Hydrologic Group: D

Minor Components

- Well drained Bigapple soils derived from clean sandy dredge material
- Loamy fill derived from fine dredge material with less than 10 percent construction debris

Use and Management

For further information about managing this map unit, see the following sections in this publication: Recreation, Wildlife Habitat, Engineering, and Soil Properties.

URBONB—Urban land, Boonton substratum, 0 to 8 percent slopes

Map Unit Setting

Slope: Nearly level and gently sloping

Landscape: Till plain

Anthropogenic Feature: Urban land

Landform: Ground moraines

Map Unit Composition

Urban land, Boonton substratum and similar soils: 90 percent

Minor components: 10 percent

Major Component Descriptions**Urban land, Boonton substratum and similar soils**

The typical sequence, depth, and composition of the layers of the soil are as follows:

Surface layer:	H1 0 to 12 inches; impervious material
	H2 12 to 47 inches; silt loam
Substratum:	2CBt1 47 to 58 inches; loamy sand
	2CBt2 58 to 72 inches; loamy sand

Component Properties and Qualities

Parent Material: surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Permeability: moderate to moderately rapid beneath the surface layer

Available Water Capacity: moderate

Reaction: very strongly acid to moderately acid

Depth to High Water Table: greater than 6 feet

Interpretative Groups

Land Capability Classification (non-irrigated): 8s

Hydrologic Group: D

Minor Components

- Udorthents, Boonton substratum soils with some type of disturbance resulting from construction such as grading and/or the addition of fill material
- Well drained Boonton soils

Use and Management

For further information about managing this map unit, see the following sections in this publication: Recreation, Wildlife Habitat, Engineering, and Soil Properties.

URBOOB—Urban land, Boonton substratum, 0 to 8 percent slopes, red sandstone lowland

Map Unit Setting

Slope: Nearly level and gently sloping

Landscape: Till plain

Anthropogenic Feature: Urban land

Landform: Ground moraines

Map Unit Composition

Urban land, Boonton substratum and similar soils: 90 percent

Minor components: 10 percent

Major Component Descriptions

Urban land, Boonton substratum and similar soils

The typical sequence, depth, and composition of the layers of the soil are as follows:

Surface layer:	H1 0 to 12 inches; impervious material
	H2 12 to 67 inches; gravelly loam
Substratum:	2CB 67 to 83 inches; gravelly sandy loam

Component Properties and Qualities

Parent Material: surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Permeability: slow to moderate beneath the surface layer

Available Water Capacity: high

Reaction: very strongly acid

Depth to High Water Table: greater than 6 feet

Interpretative Groups

Land Capability Classification (non-irrigated): 8s

Hydrologic Group: D

Minor Components

- Udorthents, Boonton red sandstone lowland substratum soils with some type of disturbance resulting from construction such as grading and/or the addition of fill material
- Well drained Boonton red sandstone lowland soils

Interpretative Groups

Land Capability Classification (non-irrigated): 3e
Hydrologic Group: C

Minor Components

- Moderately well drained Boonton soils
- Somewhat poorly drained Haledon soils

Use and Management

For further information about managing this map unit, see the following sections in this publication: Recreation, Wildlife Habitat, Engineering, and Soil Properties.

BogCc—Boonton loam, 8 to 15 percent slopes, extremely stony

Map Unit Setting

Slope: Strongly sloping
Landscape: Till plain
Landform: Ground moraines
Surface Cover: 3 to 15 percent basalt stones

Map Unit Composition

Boonton and similar soils: 85 percent
Minor components: 15 percent

Major Component Description

Boonton and similar soils

The typical sequence, depth, and composition of the layers of the soil are as follows:

Surface layer:	Oi 0 to 1 inches; slightly decomposed plant material
	Oa 1 to 3 inches; highly decomposed plant material
	A 3 to 5 inches; loam
Subsoil layer:	BA 5 to 8 inches; silt loam
	BE 8 to 17 inches; silt loam
	Bt 17 to 30 inches; silt loam
	Btx1 30 to 40 inches; gravelly fine sandy loam
	Btx2 40 to 47 inches; fine sandy loam
Substratum:	CBt1 47 to 58 inches; loamy sand
	CBt2 58 to 72 inches; loamy sand

Component Properties and Qualities

Drainage Class: well drained
Parent Material: coarse-loamy basal till derived from basalt
Permeability: slow to moderately rapid
Available Water Capacity: high
Reaction: extremely acid to moderately acid
Depth to Restrictive Feature: 20 to 36 inches to fragipan
Depth to High Water Table: greater than 6 feet

Interpretative Groups

Land Capability Classification (non-irrigated): 7s
Hydrologic Group: C

Minor Components

- Moderately well drained Boonton soils
- Somewhat poorly drained Haledon soils

Use and Management

For further information about managing this map unit, see the following sections in this publication: Recreation, Wildlife Habitat, Engineering, and Soil Properties.

BogDc—Boonton loam, 15 to 35 percent slopes, extremely stony

Map Unit Setting

Slope: Moderately steep to steep
Landscape: Till plain
Landform: Ground moraines
Surface Cover: 3 to 15 percent basalt stones

Map Unit Composition

Boonton and similar soils: 95 percent
Minor components: 5 percent

Major Component Descriptions

Boonton and similar soils

The typical sequence, depth, and composition of the layers of the soil are as follows:

Surface layer:	Oi 0 to 1 inches; slightly decomposed plant material
	Oa 1 to 3 inches; highly decomposed plant material
	A 3 to 5 inches; loam
Subsoil layer:	BA 5 to 8 inches; silt loam
	BE 8 to 17 inches; silt loam
	Bt 17 to 30 inches; silt loam
	Btx1 30 to 40 inches; gravelly fine sandy loam
	Btx2 40 to 47 inches; fine sandy loam
Substratum:	CBt1 47 to 58 inches; loamy sand
	CBt2 58 to 72 inches; loamy sand

Component Properties and Qualities

Drainage Class: well drained
Parent Material: coarse-loamy basal till derived from basalt
Permeability: slow to moderately rapid
Available Water Capacity: high
Reaction: extremely acid to moderately acid
Depth to Restrictive Feature: 20 to 36 inches to fragipan
Depth to High Water Table: greater than 6 feet

NEW JERSEY 24 HOUR RAINFALL FREQUENCY DATA

Rainfall amounts in Inches

County	1 year	2 year	5 year	10 year	25 year	50 year	100 year
Atlantic	2.72	3.31	4.30	5.16	6.46	7.61	8.90
Bergen	2.75	3.34	4.27	5.07	6.28	7.32	8.47
Burlington	2.77	3.36	4.34	5.18	6.45	7.56	8.81
Camden	2.73	3.31	4.25	5.06	6.28	7.34	8.52
Cape May	2.67	3.25	4.22	5.07	6.34	7.47	8.73
Cumberland	2.69	3.27	4.25	5.09	6.37	7.49	8.76
Essex	2.85	3.44	4.40	5.22	6.44	7.49	8.66
Gloucester	2.71	3.29	4.24	5.05	6.29	7.36	8.55
Hudson	2.73	3.31	4.23	5.02	6.19	7.20	8.31
Hunterdon	2.80	3.38	4.26	5.00	6.09	7.02	8.03
Mercer	2.74	3.31	4.23	5.01	6.19	7.20	8.33
Middlesex	2.76	3.35	4.30	5.12	6.36	7.43	8.63
Monmouth	2.79	3.38	4.38	5.23	6.53	7.66	8.94
Morris	2.94	3.54	4.47	5.24	6.37	7.32	8.35
Ocean	2.81	3.42	4.45	5.33	6.68	7.87	9.20
Passaic	2.87	3.47	4.42	5.23	6.43	7.47	8.62
Salem	2.69	3.26	4.20	5.00	6.22	7.28	8.45
Somerset	2.76	3.34	4.25	5.01	6.15	7.13	8.21
Sussex	2.68	3.22	4.02	4.70	5.72	6.60	7.58
Union	2.80	3.39	4.35	5.17	6.42	7.49	8.69
Warren	2.78	3.34	4.18	4.89	5.93	6.83	7.82

Notes: The average point rainfall amounts listed above were developed from data contained in NOAA Atlas 14 Volume 2.

Point rainfall estimates for specific locations may be obtained from the Precipitation Frequency Data Server located at <http://www.nws.noaa.gov/ohd/hdsc/>

For most hydrologic design procedures, the rainfall amounts listed above may be rounded to the nearest tenth of an inch.

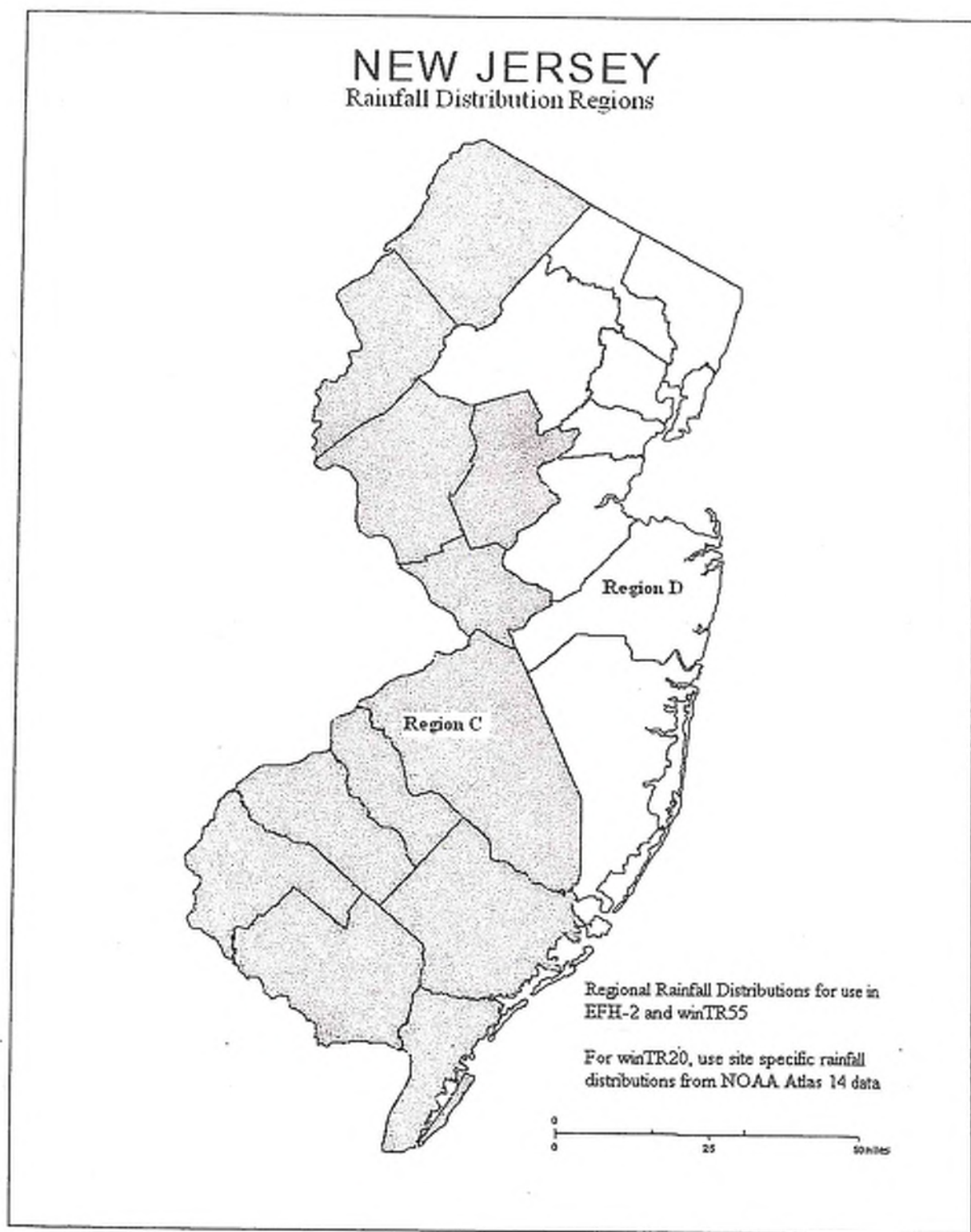
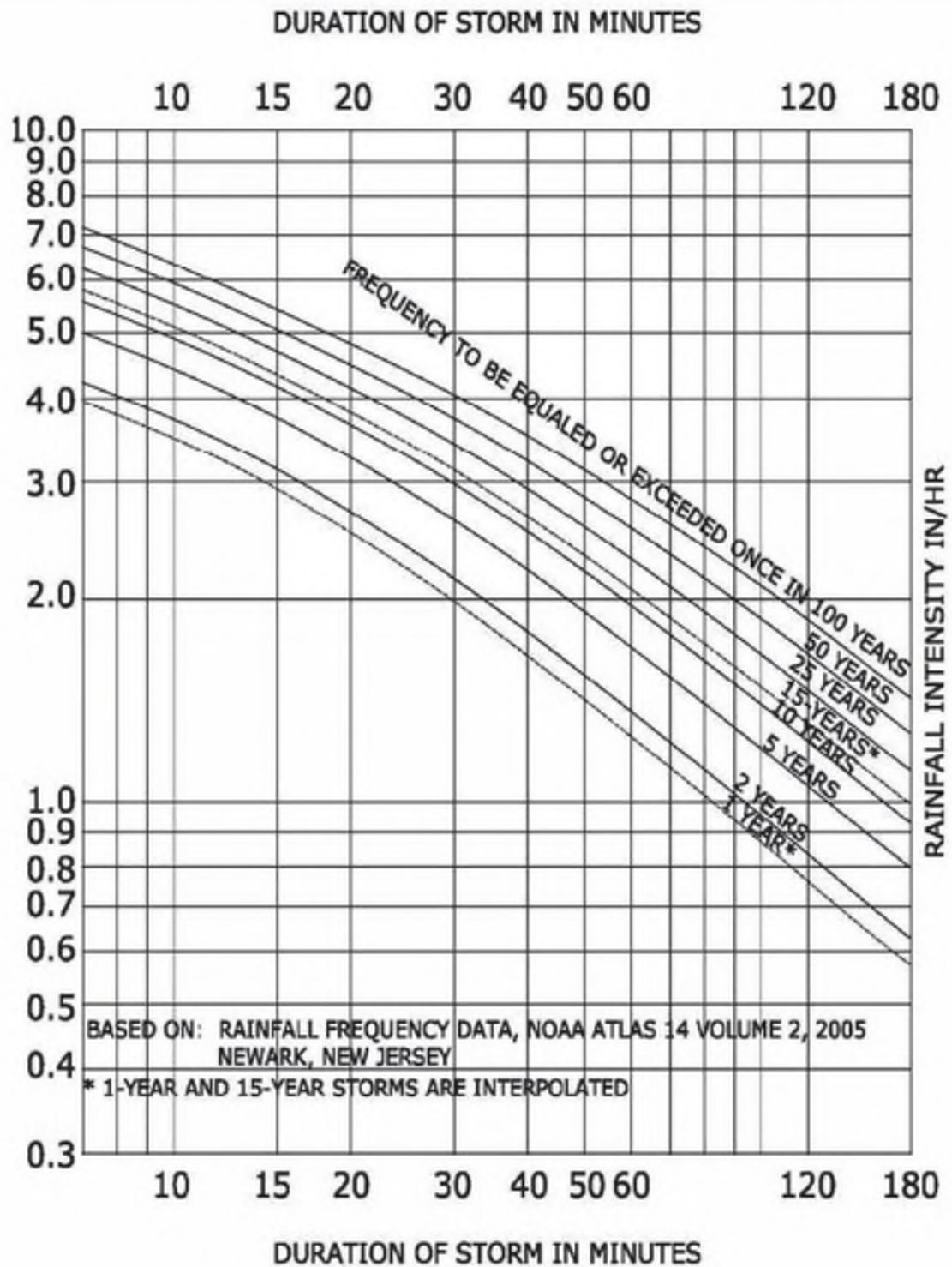


Table 2-2a Runoff curve numbers for urban areas ^{1/}

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area ^{2/}	A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.) ^{3/} :					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) ^{4/}		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
<i>Developing urban areas</i>					
Newly graded areas					
(pervious areas only, no vegetation) ^{5/}		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

¹ Average runoff condition, and $I_a = 0.2S$.² The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.³ CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.⁴ Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.⁵ Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

**FIGURE 10-B:
RAINFALL INTENSITY-DURATION FREQUENCY CURVE –
NORTHERN REGION**



REV. DATE: JUNE 30, 2015

TABLE 7 EXISTING VS. PROPOSED RUNOFF RATES									
Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
0	0	0	0	0	0	0	0.000	0.000	0.000
1	0	0	0	0	0	0	0.000	0.000	0.000
2	0	0	0	0	0	0	0.000	0.000	0.000
3	0	0	0	0	0	0	0.000	0.000	0.000
4	0	0	0	0	0	0	0.000	0.000	0.000
5	0	0	0	0	0	0	0.000	0.000	0.000
6	0	0	0	0	0	0	0.000	0.000	0.000
7	0	0	0	0	0	0	0.000	0.000	0.000
8	0	0	0	0	0	0	0.000	0.000	0.000
9	0	0	0	0	0	0	0.000	0.000	0.000
10	0	0	0	0	0	0	0.000	0.000	0.000
11	0	0	0	0	0	0	0.000	0.000	0.000
12	0	0	0	0	0	0	0.000	0.000	0.000
13	0	0	0	0	0	0	0.000	0.000	0.000
14	0	0	0	0	0	0	0.000	0.000	0.000
15	0	0	0	0	0	0	0.000	0.000	0.000
16	0	0	0	0	0	0	0.000	0.000	0.000
17	0	0	0	0	0	0	0.000	0.000	0.000
18	0	0	0	0	0	0	0.000	0.000	0.000
19	0	0	0	0	0	0	0.000	0.000	0.000
20	0	0	0	0	0	0	0.000	0.000	0.000
21	0	0	0	0	0	0	0.000	0.000	0.000
22	0	0	0	0	0	0	0.000	0.000	0.000
23	0	0	0	0	0	0	0.000	0.000	0.000
24	0	0	0	0	0	0	0.000	0.000	0.000
25	0	0	0	0	0	0	0.000	0.000	0.000
26	0	0	3.78E-05	0	0	3.49E-05	0.000	0.000	0.000
27	0	0	0.001016	0	0	0.00094	0.000	0.000	0.000
28	0	0	0.003814	0	0	0.003529	0.000	0.000	0.000
29	0	0	0.00927	0	0	0.008579	0.000	0.000	-0.001
30	0	0	0.017721	0	0	0.016454	0.000	0.000	-0.001
31	0	0	0.029494	0	0	0.027509	0.000	0.000	-0.002
32	0	0	0.044871	0	0	0.042051	0.000	0.000	-0.003
33	0	0	0.063222	0	0	0.059494	0.000	0.000	-0.004
34	0	0	0.083941	0	0	0.079273	0.000	0.000	-0.005
35	0	0	0.102824	0	0	0.097474	0.000	0.000	-0.005
36	0	0	0.122905	0	0	0.116883	0.000	0.000	-0.006
37	0	0	0.143804	0	0	0.137125	0.000	0.000	-0.007
38	0	0	0.167254	0	0	0.159563	0.000	0.000	-0.008
39	0	0	0.190988	0	0	0.182278	0.000	0.000	-0.009
40	0	0	0.214648	0	0	0.204918	0.000	0.000	-0.010

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
41	0	0	0.241853	0	0	0.231033	0.000	0.000	-0.011
42	0	0	0.268687	0	0	0.256782	0.000	0.000	-0.012
43	0	0.000245	0.294373	0	0.000226	0.28153	0.000	0.000	-0.013
44	0	0.001055	0.319639	0	0.000976	0.305876	0.000	0.000	-0.014
45	0	0.002747	0.344499	0	0.002541	0.329833	0.000	0.000	-0.015
46	0	0.005495	0.368966	0	0.005098	0.353414	0.000	0.000	-0.016
47	0	0.009429	0.393053	0	0.008785	0.376632	0.000	-0.001	-0.016
48	0	0.014676	0.416772	0	0.013737	0.399498	0.000	-0.001	-0.017
49	0	0.021104	0.440135	0	0.019837	0.422023	0.000	-0.001	-0.018
50	0	0.028501	0.463154	0	0.026889	0.444219	0.000	-0.002	-0.019
51	0	0.03671	0.484351	0	0.034739	0.464637	0.000	-0.002	-0.020
52	0	0.045592	0.505085	0	0.043251	0.484608	0.000	-0.002	-0.020
53	0	0.05501	0.525368	0	0.052292	0.504145	0.000	-0.003	-0.021
54	0	0.064828	0.545214	0	0.061729	0.523261	0.000	-0.003	-0.022
55	0	0.072984	0.5551	0	0.069645	0.533145	0.000	-0.003	-0.022
56	0	0.083208	0.574108	0	0.079486	0.551453	0.000	-0.004	-0.023
57	0	0.093442	0.592714	0	0.089339	0.569374	0.000	-0.004	-0.023
58	0	0.102302	0.605993	0	0.097804	0.581799	0.000	-0.004	-0.024
59	0	0.112272	0.623831	0	0.107403	0.59898	0.000	-0.005	-0.025
60	0	0.122099	0.641299	0	0.116864	0.615804	0.000	-0.005	-0.025
61	0	0.132388	0.663175	0	0.126724	0.636652	0.000	-0.006	-0.027
62	0	0.141935	0.679935	0	0.135916	0.652795	0.000	-0.006	-0.027
63	4.61E-05	0.150946	0.694374	4.27E-05	0.144648	0.666984	0.000	-0.006	-0.027
64	0.000168	0.161089	0.715699	0.000155	0.154358	0.687287	0.000	-0.007	-0.028
65	0.000726	0.170237	0.731469	0.000671	0.163166	0.702475	0.000	-0.007	-0.029
66	0.001472	0.175468	0.732927	0.001365	0.168395	0.704631	0.000	-0.007	-0.028
67	0.003024	0.188897	0.765815	0.002807	0.181132	0.735598	0.000	-0.008	-0.030
68	0.005067	0.197668	0.780669	0.00473	0.189577	0.749904	0.000	-0.008	-0.031
69	0.00781	0.207589	0.799557	0.00731	0.198947	0.767479	-0.001	-0.009	-0.032
70	0.011004	0.219331	0.825849	0.010352	0.21031	0.793011	-0.001	-0.009	-0.033
71	0.014475	0.226989	0.83612	0.013666	0.217669	0.802837	-0.001	-0.009	-0.033
72	0.018516	0.238107	0.859887	0.017544	0.228525	0.826284	-0.001	-0.010	-0.034
73	0.022596	0.246295	0.873369	0.021458	0.236408	0.839267	-0.001	-0.010	-0.034
74	0.026842	0.252773	0.880119	0.025543	0.242725	0.846048	-0.001	-0.010	-0.034
75	0.0313	0.260742	0.893098	0.029829	0.250397	0.858548	-0.001	-0.010	-0.035
76	0.035862	0.268605	0.905836	0.034217	0.257966	0.870815	-0.002	-0.011	-0.035
77	0.040472	0.275301	0.914075	0.038653	0.264394	0.878674	-0.002	-0.011	-0.035
78	0.045074	0.282956	0.926348	0.043083	0.271764	0.890493	-0.002	-0.011	-0.036
79	0.049631	0.29051	0.938396	0.047469	0.279036	0.902095	-0.002	-0.011	-0.036
80	0.054101	0.296761	0.945722	0.05177	0.285032	0.909071	-0.002	-0.012	-0.037
81	0.05857	0.304119	0.957337	0.056072	0.292115	0.920256	-0.002	-0.012	-0.037
82	0.0629	0.310084	0.964089	0.060237	0.297835	0.926676	-0.003	-0.012	-0.037
83	0.067284	0.317252	0.975293	0.064457	0.304735	0.937465	-0.003	-0.013	-0.038

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
84	0.071626	0.324327	0.986298	0.068636	0.311546	0.948062	-0.003	-0.013	-0.038
85	0.075927	0.331311	0.997108	0.072776	0.318269	0.958473	-0.003	-0.013	-0.039
86	0.081704	0.343587	1.022857	0.078279	0.329885	0.982697	-0.003	-0.014	-0.040
87	0.087496	0.355863	1.048552	0.083796	0.341498	1.006864	-0.004	-0.014	-0.042
88	0.093304	0.36814	1.074194	0.089325	0.353109	1.030975	-0.004	-0.015	-0.043
89	0.098286	0.377434	1.091398	0.094176	0.362268	1.048149	-0.004	-0.015	-0.043
90	0.103253	0.38668	1.108482	0.099015	0.371385	1.065212	-0.004	-0.015	-0.043
91	0.108204	0.39588	1.125447	0.103842	0.38046	1.082168	-0.004	-0.015	-0.043
92	0.111555	0.399407	1.126482	0.107102	0.383978	1.083508	-0.004	-0.015	-0.043
93	0.114833	0.402798	1.127268	0.110293	0.387367	1.084613	-0.005	-0.015	-0.043
94	0.118355	0.407173	1.130957	0.113675	0.391546	1.088067	-0.005	-0.016	-0.043
95	0.121816	0.411434	1.134434	0.116998	0.395614	1.091318	-0.005	-0.016	-0.043
96	0.127295	0.421836	1.154103	0.122186	0.405359	1.109539	-0.005	-0.016	-0.045
97	0.132767	0.432204	1.173678	0.127364	0.415069	1.127666	-0.005	-0.017	-0.046
98	0.138231	0.44254	1.193166	0.132533	0.424743	1.145702	-0.006	-0.018	-0.047
99	0.142536	0.449376	1.20347	0.136747	0.431537	1.156185	-0.006	-0.018	-0.047
100	0.146805	0.456138	1.21363	0.140928	0.438263	1.166532	-0.006	-0.018	-0.047
101	0.15104	0.462827	1.223647	0.145078	0.44492	1.176743	-0.006	-0.018	-0.047
102	0.153663	0.465016	1.222309	0.14765	0.447168	1.175827	-0.006	-0.018	-0.046
103	0.156221	0.467087	1.220771	0.15016	0.449306	1.174721	-0.006	-0.018	-0.046
104	0.159146	0.470344	1.222445	0.152963	0.452401	1.176226	-0.006	-0.018	-0.046
105	0.164558	0.480456	1.241326	0.158066	0.461835	1.193643	-0.006	-0.019	-0.048
106	0.169965	0.490541	1.260135	0.16316	0.47124	1.210986	-0.007	-0.019	-0.049
107	0.175365	0.5006	1.278873	0.168247	0.480616	1.228256	-0.007	-0.020	-0.051
108	0.179351	0.506778	1.287908	0.17217	0.4868	1.237549	-0.007	-0.020	-0.050
109	0.183306	0.512891	1.296823	0.176064	0.492925	1.246729	-0.007	-0.020	-0.050
110	0.187229	0.518942	1.305621	0.179929	0.498991	1.2558	-0.007	-0.020	-0.050
111	0.191302	0.525051	1.314106	0.183786	0.504709	1.263574	-0.008	-0.020	-0.051
112	0.196153	0.533544	1.328895	0.188407	0.512764	1.27753	-0.008	-0.021	-0.051
113	0.201519	0.543445	1.347217	0.193447	0.521968	1.294373	-0.008	-0.021	-0.053
114	0.205307	0.549225	1.355517	0.197189	0.527785	1.302978	-0.008	-0.021	-0.053
115	0.209066	0.554948	1.363713	0.200905	0.533548	1.311486	-0.008	-0.021	-0.052
116	0.212796	0.560615	1.371806	0.204595	0.539259	1.319897	-0.008	-0.021	-0.052
117	0.216648	0.566295	1.379519	0.208233	0.544555	1.326916	-0.008	-0.022	-0.053
118	0.220468	0.571913	1.387122	0.21184	0.54979	1.333827	-0.009	-0.022	-0.053
119	0.224845	0.579005	1.398354	0.215899	0.556225	1.343699	-0.009	-0.023	-0.055
120	0.227472	0.581729	1.399235	0.218515	0.559063	1.345059	-0.009	-0.023	-0.054
121	0.23105	0.587098	1.4068	0.222066	0.5645	1.352977	-0.009	-0.023	-0.054
122	0.234601	0.592416	1.414274	0.225593	0.56989	1.360811	-0.009	-0.023	-0.053
123	0.238248	0.597707	1.42131	0.229029	0.574803	1.367166	-0.009	-0.023	-0.054
124	0.241866	0.602942	1.428247	0.232435	0.57966	1.373425	-0.009	-0.023	-0.055
125	0.246101	0.609741	1.438938	0.236343	0.585792	1.382749	-0.010	-0.024	-0.056
126	0.248441	0.611966	1.439016	0.238691	0.588161	1.383349	-0.010	-0.024	-0.056

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
127	0.251851	0.617015	1.446026	0.242089	0.593302	1.390749	-0.010	-0.024	-0.055
128	0.258829	0.630492	1.472338	0.248789	0.606241	1.416007	-0.010	-0.024	-0.056
129	0.262287	0.635429	1.478773	0.252037	0.610805	1.421775	-0.010	-0.025	-0.057
130	0.265716	0.640314	1.485123	0.255256	0.615318	1.427458	-0.010	-0.025	-0.058
131	0.267828	0.64215	1.484592	0.25739	0.61732	1.42748	-0.010	-0.025	-0.057
132	0.273661	0.652625	1.503631	0.262965	0.627314	1.445606	-0.011	-0.025	-0.058
133	0.280711	0.66614	1.529886	0.269735	0.640289	1.47081	-0.011	-0.026	-0.059
134	0.284018	0.670803	1.535868	0.272833	0.644583	1.476132	-0.011	-0.026	-0.060
135	0.285214	0.67059	1.530862	0.274193	0.644868	1.472425	-0.011	-0.026	-0.058
136	0.28711	0.672065	1.529777	0.276125	0.64653	1.471923	-0.011	-0.026	-0.058
137	0.292925	0.682453	1.548605	0.281681	0.656438	1.489842	-0.011	-0.026	-0.059
138	0.294806	0.683724	1.546828	0.283379	0.657405	1.487556	-0.011	-0.026	-0.059
139	0.297971	0.688133	1.552399	0.286337	0.661448	1.492477	-0.012	-0.027	-0.060
140	0.2997	0.68933	1.550897	0.288111	0.662849	1.49158	-0.012	-0.026	-0.059
141	0.305503	0.699655	1.569571	0.293654	0.672693	1.509349	-0.012	-0.027	-0.060
142	0.311304	0.709966	1.588213	0.299195	0.682524	1.527087	-0.012	-0.027	-0.061
143	0.312965	0.710879	1.585904	0.300677	0.683139	1.52428	-0.012	-0.028	-0.062
144	0.313717	0.709958	1.579866	0.301631	0.682769	1.519612	-0.012	-0.027	-0.060
145	0.319511	0.720225	1.598402	0.307163	0.692556	1.537246	-0.012	-0.028	-0.061
146	0.325302	0.73048	1.616909	0.312693	0.702331	1.55485	-0.013	-0.028	-0.062
147	0.326793	0.731119	1.614199	0.314006	0.702675	1.55165	-0.013	-0.028	-0.063
148	0.327359	0.729907	1.607749	0.314789	0.702037	1.546599	-0.013	-0.028	-0.061
149	0.333143	0.740122	1.626159	0.320312	0.711772	1.564109	-0.013	-0.028	-0.062
150	0.338926	0.750327	1.644545	0.325833	0.721496	1.581594	-0.013	-0.029	-0.063
151	0.340254	0.750706	1.641462	0.326984	0.721585	1.578028	-0.013	-0.029	-0.063
152	0.343616	0.75544	1.647709	0.330271	0.726255	1.584291	-0.013	-0.029	-0.063
153	0.349394	0.765608	1.666007	0.335785	0.735943	1.60169	-0.014	-0.030	-0.064
154	0.35517	0.775766	1.68428	0.341298	0.74562	1.619065	-0.014	-0.030	-0.065
155	0.353839	0.770508	1.669259	0.340241	0.741042	1.605644	-0.014	-0.029	-0.064
156	0.357104	0.775075	1.675251	0.343436	0.745554	1.611664	-0.014	-0.030	-0.064
157	0.362876	0.785201	1.693446	0.348944	0.755198	1.628962	-0.014	-0.030	-0.064
158	0.36393	0.785151	1.689761	0.349824	0.754865	1.624804	-0.014	-0.030	-0.065
159	0.367123	0.789596	1.69557	0.352951	0.75926	1.630649	-0.014	-0.030	-0.065
160	0.371234	0.796028	1.705673	0.35683	0.765282	1.640012	-0.014	-0.031	-0.066
161	0.377002	0.806115	1.723777	0.362332	0.774888	1.65722	-0.015	-0.031	-0.067
162	0.380126	0.810442	1.729408	0.365393	0.779172	1.662897	-0.015	-0.031	-0.067
163	0.38323	0.814736	1.734993	0.368437	0.783424	1.668529	-0.015	-0.031	-0.066
164	0.387281	0.821056	1.74492	0.372255	0.789336	1.677719	-0.015	-0.032	-0.067
165	0.390337	0.82527	1.750386	0.375252	0.793513	1.683238	-0.015	-0.032	-0.067
166	0.393375	0.829453	1.755808	0.378233	0.79766	1.688715	-0.015	-0.032	-0.067
167	0.397381	0.835692	1.765607	0.382006	0.80349	1.697779	-0.015	-0.032	-0.068
168	0.400372	0.839798	1.770917	0.384942	0.807565	1.703149	-0.015	-0.032	-0.068
169	0.403345	0.843874	1.776183	0.387862	0.811611	1.708478	-0.015	-0.032	-0.068

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
170	0.407309	0.850034	1.785862	0.391592	0.817364	1.717424	-0.016	-0.033	-0.068
171	0.408427	0.85017	1.782762	0.392694	0.817549	1.714552	-0.016	-0.033	-0.068
172	0.411338	0.854144	1.787881	0.395555	0.821498	1.719742	-0.016	-0.033	-0.068
173	0.41526	0.860229	1.797444	0.399243	0.827176	1.728573	-0.016	-0.033	-0.069
174	0.416277	0.860215	1.794143	0.400249	0.827217	1.725509	-0.016	-0.033	-0.069
175	0.419128	0.864092	1.799124	0.403053	0.831074	1.730567	-0.016	-0.033	-0.069
176	0.42301	0.870107	1.808579	0.406702	0.836683	1.739292	-0.016	-0.033	-0.069
177	0.42393	0.869947	1.805087	0.407613	0.836583	1.736044	-0.016	-0.033	-0.069
178	0.426723	0.873731	1.809938	0.410363	0.840353	1.740978	-0.016	-0.033	-0.069
179	0.430568	0.879678	1.819293	0.413974	0.845894	1.749605	-0.017	-0.034	-0.070
180	0.431392	0.879377	1.815617	0.414795	0.84566	1.74618	-0.017	-0.034	-0.069
181	0.434129	0.883072	1.820344	0.417492	0.849345	1.750997	-0.017	-0.034	-0.069
182	0.437937	0.888955	1.829601	0.421066	0.854822	1.759527	-0.017	-0.034	-0.070
183	0.43867	0.888519	1.825751	0.421799	0.85446	1.755936	-0.017	-0.034	-0.070
184	0.441353	0.892128	1.83036	0.424446	0.858063	1.760641	-0.017	-0.034	-0.070
185	0.450664	0.90898	1.861911	0.433108	0.873685	1.789792	-0.018	-0.035	-0.072
186	0.451307	0.908415	1.857894	0.433755	0.873198	1.78604	-0.018	-0.035	-0.072
187	0.453938	0.911941	1.862389	0.436352	0.876723	1.790636	-0.018	-0.035	-0.072
188	0.460224	0.922716	1.881548	0.442534	0.887357	1.809614	-0.018	-0.035	-0.072
189	0.460781	0.922027	1.877373	0.443098	0.88675	1.80571	-0.018	-0.035	-0.072
190	0.469036	0.936673	1.904326	0.450898	0.900563	1.831082	-0.018	-0.036	-0.073
191	0.469532	0.935898	1.900042	0.451405	0.899874	1.827074	-0.018	-0.036	-0.073
192	0.470006	0.935089	1.895716	0.451889	0.899153	1.823026	-0.018	-0.036	-0.073
193	0.476294	0.945838	1.914812	0.458076	0.909767	1.841947	-0.018	-0.036	-0.073
194	0.476708	0.944946	1.910381	0.458504	0.908966	1.837799	-0.018	-0.036	-0.073
195	0.482905	0.955378	1.928645	0.464281	0.918641	1.854645	-0.019	-0.037	-0.074
196	0.483262	0.954405	1.924113	0.464655	0.917762	1.8504	-0.019	-0.037	-0.074
197	0.483597	0.9534	1.919544	0.465006	0.916853	1.846119	-0.019	-0.037	-0.073
198	0.487749	0.95984	1.929849	0.469102	0.923246	1.856425	-0.019	-0.037	-0.073
199	0.488028	0.958757	1.925183	0.469401	0.922261	1.85205	-0.019	-0.036	-0.073
200	0.494216	0.969151	1.94337	0.475165	0.931895	1.868819	-0.019	-0.037	-0.075
201	0.494441	0.967992	1.938611	0.475412	0.930838	1.864355	-0.019	-0.037	-0.074
202	0.500625	0.978373	1.956772	0.481171	0.940457	1.881096	-0.019	-0.038	-0.076
203	0.504727	0.984727	1.966954	0.485221	0.946769	1.891286	-0.020	-0.038	-0.076
204	0.510908	0.995093	1.985086	0.490976	0.956372	1.907998	-0.020	-0.039	-0.077
205	0.513772	0.999038	1.99048	0.494007	0.960704	1.914252	-0.020	-0.038	-0.076
206	0.51387	0.997705	1.985508	0.494133	0.95948	1.909584	-0.020	-0.038	-0.076
207	0.516704	1.001605	1.990843	0.497137	0.963771	1.915784	-0.020	-0.038	-0.075
208	0.514506	0.995784	1.976911	0.495011	0.958147	1.902332	-0.019	-0.038	-0.075
209	0.520681	1.00612	1.994983	0.500757	0.967717	1.918981	-0.020	-0.038	-0.076
210	0.518412	1.000206	1.980945	0.498563	0.962004	1.905426	-0.020	-0.038	-0.076
211	0.524585	1.01053	1.998995	0.504305	0.97156	1.922052	-0.020	-0.039	-0.077
212	0.528603	1.016742	2.00898	0.508278	0.97774	1.932056	-0.020	-0.039	-0.077

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
213	0.532478	1.022576	2.018066	0.511764	0.982891	1.939891	-0.021	-0.040	-0.078
214	0.535214	1.026329	2.023211	0.514683	0.987049	1.945917	-0.021	-0.039	-0.077
215	0.539067	1.032128	2.032252	0.518146	0.992166	1.953706	-0.021	-0.040	-0.079
216	0.541775	1.03584	2.037345	0.521041	0.996287	1.959685	-0.021	-0.040	-0.078
217	0.545607	1.041605	2.04634	0.524482	1.001368	1.967427	-0.021	-0.040	-0.079
218	0.548289	1.045279	2.051383	0.527352	1.005454	1.973361	-0.021	-0.040	-0.078
219	0.552099	1.051011	2.060335	0.530772	1.010502	1.98106	-0.021	-0.041	-0.079
220	0.554755	1.054646	2.065331	0.533619	1.014554	1.986951	-0.021	-0.040	-0.078
221	0.558545	1.060346	2.074238	0.537017	1.019568	1.994606	-0.022	-0.041	-0.080
222	0.558791	1.05936	2.070137	0.537504	1.019093	1.991579	-0.021	-0.040	-0.079
223	0.56256	1.065029	2.079004	0.540881	1.024075	1.999192	-0.022	-0.041	-0.080
224	0.562763	1.063985	2.074835	0.541328	1.023545	1.996101	-0.021	-0.040	-0.079
225	0.566513	1.069623	2.083663	0.544684	1.028495	2.003675	-0.022	-0.041	-0.080
226	0.566672	1.068521	2.079427	0.545091	1.027912	2.000523	-0.022	-0.041	-0.079
227	0.570404	1.07413	2.088217	0.548428	1.032832	2.008058	-0.022	-0.041	-0.080
228	0.570521	1.072972	2.083916	0.548796	1.032197	2.004845	-0.022	-0.041	-0.079
229	0.574234	1.078552	2.092669	0.552113	1.037087	2.012342	-0.022	-0.041	-0.080
230	0.57431	1.077339	2.088306	0.552443	1.036401	2.009071	-0.022	-0.041	-0.079
231	0.578005	1.082892	2.097022	0.555741	1.041263	2.016531	-0.022	-0.042	-0.080
232	0.57804	1.081625	2.092595	0.556033	1.040527	2.013202	-0.022	-0.041	-0.079
233	0.581717	1.087151	2.10128	0.559313	1.045362	2.02063	-0.022	-0.042	-0.081
234	0.581712	1.085833	2.096796	0.559568	1.044577	2.017246	-0.022	-0.041	-0.080
235	0.585372	1.091331	2.105446	0.562829	1.049384	2.024638	-0.023	-0.042	-0.081
236	0.585328	1.089961	2.100902	0.563049	1.048551	2.0212	-0.022	-0.041	-0.080
237	0.588971	1.095434	2.109519	0.566292	1.053332	2.028558	-0.023	-0.042	-0.081
238	0.595657	1.106497	2.128801	0.572739	1.064002	2.047163	-0.023	-0.042	-0.082
239	0.599284	1.111945	2.137386	0.575965	1.068758	2.054489	-0.023	-0.043	-0.083
240	0.60597	1.123001	2.156652	0.582411	1.079421	2.073078	-0.024	-0.044	-0.084
241	0.605828	1.121505	2.151965	0.58254	1.078472	2.069506	-0.023	-0.043	-0.082
242	0.612515	1.132555	2.17122	0.588987	1.08913	2.088084	-0.024	-0.043	-0.083
243	0.612336	1.131011	2.166481	0.589082	1.088136	2.084463	-0.023	-0.043	-0.082
244	0.611945	1.129005	2.160754	0.58859	1.085992	2.078545	-0.023	-0.043	-0.082
245	0.611731	1.127414	2.155963	0.588652	1.084954	2.074876	-0.023	-0.042	-0.081
246	0.61271	1.127954	2.15515	0.589278	1.084892	2.072981	-0.023	-0.043	-0.082
247	0.619397	1.138988	2.174374	0.595725	1.095535	2.091531	-0.024	-0.043	-0.083
248	0.620345	1.139486	2.173513	0.596319	1.095431	2.08959	-0.024	-0.044	-0.084
249	0.627033	1.150517	2.192726	0.602768	1.106071	2.108129	-0.024	-0.044	-0.085
250	0.624104	1.143952	2.178481	0.600174	1.100162	2.095194	-0.024	-0.044	-0.083
251	0.630793	1.154977	2.197684	0.606624	1.110797	2.113724	-0.024	-0.044	-0.084
252	0.634843	1.161123	2.207534	0.610486	1.116647	2.123082	-0.024	-0.044	-0.084
253	0.63428	1.158897	2.201566	0.609824	1.114287	2.116929	-0.024	-0.045	-0.085
254	0.640969	1.169915	2.220753	0.616275	1.124916	2.135442	-0.025	-0.045	-0.085
255	0.637916	1.163198	2.206346	0.613564	1.118864	2.122355	-0.024	-0.044	-0.084

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
256	0.644607	1.174213	2.225524	0.620015	1.129489	2.140861	-0.025	-0.045	-0.085
257	0.648621	1.180306	2.235305	0.623843	1.135287	2.150152	-0.025	-0.045	-0.085
258	0.647965	1.177965	2.229215	0.623091	1.132816	2.143879	-0.025	-0.045	-0.085
259	0.651967	1.184037	2.238976	0.626905	1.138595	2.153149	-0.025	-0.045	-0.086
260	0.648794	1.177176	2.224416	0.624082	1.132407	2.139919	-0.025	-0.045	-0.084
261	0.652782	1.183229	2.23416	0.627884	1.138167	2.149186	-0.025	-0.045	-0.085
262	0.656763	1.189271	2.243904	0.631678	1.143916	2.158475	-0.025	-0.045	-0.085
263	0.65602	1.186821	2.237733	0.630841	1.14134	2.152178	-0.025	-0.045	-0.086
264	0.659988	1.192844	2.247483	0.634624	1.14707	2.161518	-0.025	-0.046	-0.086
265	0.663949	1.198857	2.25723	0.638399	1.152791	2.170873	-0.026	-0.046	-0.086
266	0.667905	1.204862	2.266974	0.642169	1.158504	2.180232	-0.026	-0.046	-0.087
267	0.671854	1.210857	2.276709	0.645933	1.164208	2.189589	-0.026	-0.047	-0.087
268	0.667009	1.20109	2.25692	0.641715	1.155609	2.172125	-0.025	-0.045	-0.085
269	0.670945	1.207067	2.266633	0.645466	1.161295	2.18146	-0.025	-0.046	-0.085
270	0.674876	1.213034	2.276335	0.649212	1.166971	2.190786	-0.026	-0.046	-0.086
271	0.671223	1.205392	2.26053	0.645521	1.159302	2.175099	-0.026	-0.046	-0.085
272	0.675142	1.211343	2.270215	0.649256	1.164963	2.184408	-0.026	-0.046	-0.086
273	0.679053	1.217283	2.279884	0.652983	1.170614	2.193704	-0.026	-0.047	-0.086
274	0.682961	1.223218	2.289548	0.656707	1.176259	2.202994	-0.026	-0.047	-0.087
275	0.686863	1.229144	2.299203	0.660424	1.181895	2.212276	-0.026	-0.047	-0.087
276	0.686431	1.227277	2.294226	0.660134	1.180324	2.208004	-0.026	-0.047	-0.086
277	0.690322	1.233187	2.303862	0.663841	1.185946	2.217268	-0.026	-0.047	-0.087
278	0.694206	1.239088	2.313489	0.667541	1.191558	2.226523	-0.027	-0.048	-0.087
279	0.693728	1.237165	2.308451	0.667208	1.189933	2.222189	-0.027	-0.047	-0.086
280	0.697602	1.243051	2.318059	0.670899	1.195531	2.231427	-0.027	-0.048	-0.087
281	0.70147	1.248929	2.327656	0.674583	1.201121	2.240655	-0.027	-0.048	-0.087
282	0.700946	1.24695	2.322554	0.674207	1.199445	2.236255	-0.027	-0.048	-0.086
283	0.704804	1.252812	2.332136	0.677882	1.205019	2.245469	-0.027	-0.048	-0.087
284	0.705796	1.253546	2.332128	0.678746	1.205565	2.245279	-0.027	-0.048	-0.087
285	0.705227	1.251516	2.326967	0.678327	1.203839	2.240818	-0.027	-0.048	-0.086
286	0.70907	1.257356	2.336523	0.681987	1.209392	2.250008	-0.027	-0.048	-0.087
287	0.710028	1.258048	2.336471	0.682818	1.209896	2.249776	-0.027	-0.048	-0.087
288	0.709417	1.255965	2.331258	0.682359	1.208121	2.245261	-0.027	-0.048	-0.086
289	0.720856	1.275184	2.3656	0.693047	1.226052	2.277485	-0.028	-0.049	-0.088
290	0.72178	1.275833	2.365507	0.693845	1.226515	2.277215	-0.028	-0.049	-0.088
291	0.721128	1.273701	2.360238	0.693347	1.224692	2.272642	-0.028	-0.049	-0.088
292	0.728374	1.285515	2.380783	0.700595	1.236546	2.293382	-0.028	-0.049	-0.087
293	0.729266	1.286126	2.38065	0.701362	1.236972	2.293073	-0.028	-0.049	-0.088
294	0.728572	1.283945	2.375328	0.700825	1.235104	2.288445	-0.028	-0.049	-0.087
295	0.727864	1.281748	2.369988	0.700274	1.23322	2.283798	-0.028	-0.049	-0.086
296	0.736433	1.295821	2.394728	0.708142	1.246099	2.306626	-0.028	-0.050	-0.088
297	0.737283	1.296381	2.39454	0.708867	1.246475	2.306267	-0.028	-0.050	-0.088
298	0.736535	1.294137	2.389151	0.708279	1.244547	2.301568	-0.028	-0.050	-0.088

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
299	0.740839	1.300728	2.400003	0.712646	1.251284	2.312794	-0.028	-0.049	-0.087
300	0.749421	1.314807	2.424754	0.720523	1.264166	2.335646	-0.029	-0.051	-0.089
301	0.748635	1.312518	2.419319	0.719899	1.262195	2.330899	-0.029	-0.050	-0.088
302	0.744867	1.304978	2.404177	0.716351	1.255075	2.316636	-0.029	-0.050	-0.088
303	0.749154	1.311544	2.414995	0.720703	1.26179	2.327841	-0.028	-0.050	-0.087
304	0.757747	1.325627	2.43975	0.728588	1.274673	2.350747	-0.029	-0.051	-0.089
305	0.75691	1.323279	2.434251	0.727917	1.272647	2.345994	-0.029	-0.051	-0.088
306	0.75307	1.315656	2.419025	0.7243	1.265448	2.331742	-0.029	-0.050	-0.087
307	0.75734	1.322199	2.429813	0.728636	1.272141	2.343048	-0.029	-0.050	-0.087
308	0.765945	1.33629	2.45458	0.736531	1.285029	2.366144	-0.029	-0.051	-0.088
309	0.762053	1.328607	2.439299	0.732865	1.277774	2.351965	-0.029	-0.051	-0.087
310	0.758142	1.320905	2.423994	0.72918	1.2705	2.337802	-0.029	-0.050	-0.086
311	0.762395	1.327425	2.434749	0.733503	1.277173	2.349246	-0.029	-0.050	-0.086
312	0.771012	1.341522	2.459522	0.741407	1.290064	2.372511	-0.030	-0.051	-0.087
313	0.774977	1.347489	2.469308	0.745008	1.295435	2.38185	-0.030	-0.052	-0.087
314	0.770998	1.339711	2.453924	0.741258	1.288088	2.367697	-0.030	-0.052	-0.086
315	0.775236	1.346209	2.464652	0.745567	1.294742	2.3792	-0.030	-0.051	-0.085
316	0.779471	1.352703	2.475379	0.749874	1.301392	2.39071	-0.030	-0.051	-0.085
317	0.783417	1.358644	2.485154	0.753455	1.306736	2.400076	-0.030	-0.052	-0.085
318	0.779371	1.350791	2.469721	0.749642	1.299318	2.385861	-0.030	-0.051	-0.084
319	0.775309	1.34292	2.454293	0.745814	1.291882	2.371624	-0.029	-0.051	-0.083
320	0.779529	1.349393	2.465065	0.750107	1.298513	2.383107	-0.029	-0.051	-0.082
321	0.785105	1.358164	2.480196	0.755023	1.306176	2.396899	-0.030	-0.052	-0.083
322	0.789028	1.364075	2.490094	0.75858	1.31149	2.406244	-0.030	-0.053	-0.084
323	0.784901	1.356133	2.47473	0.75469	1.303986	2.391917	-0.030	-0.052	-0.083
324	0.789109	1.362589	2.48563	0.758973	1.310602	2.403381	-0.030	-0.052	-0.082
325	0.790223	1.363677	2.48675	0.760222	1.311954	2.405211	-0.030	-0.052	-0.082
326	0.794128	1.369564	2.496751	0.763762	1.317245	2.414539	-0.030	-0.052	-0.082
327	0.79803	1.375446	2.506767	0.767298	1.322529	2.423862	-0.031	-0.053	-0.083
328	0.801927	1.381321	2.516791	0.770829	1.327807	2.433178	-0.031	-0.054	-0.084
329	0.806117	1.387752	2.527763	0.775097	1.334401	2.44461	-0.031	-0.053	-0.083
330	0.807192	1.388792	2.528917	0.77631	1.335708	2.446382	-0.031	-0.053	-0.083
331	0.806584	1.386942	2.524758	0.776142	1.334642	2.443651	-0.030	-0.052	-0.081
332	0.810465	1.392796	2.534789	0.779656	1.339899	2.452957	-0.031	-0.053	-0.082
333	0.814341	1.398646	2.544811	0.783165	1.34515	2.462255	-0.031	-0.053	-0.083
334	0.815081	1.399084	2.544985	0.783599	1.345095	2.461872	-0.031	-0.054	-0.083
335	0.816117	1.400081	2.546095	0.784776	1.346362	2.463591	-0.031	-0.054	-0.083
336	0.817145	1.401067	2.547192	0.785945	1.347619	2.465296	-0.031	-0.053	-0.082
337	0.816477	1.39915	2.542952	0.785722	1.346493	2.462471	-0.031	-0.053	-0.080
338	0.820335	1.404976	2.552954	0.789212	1.35172	2.471756	-0.031	-0.053	-0.081
339	0.821034	1.405366	2.55308	0.789605	1.351616	2.471329	-0.031	-0.054	-0.082
340	0.821724	1.405746	2.553194	0.789988	1.351503	2.470891	-0.032	-0.054	-0.082
341	0.830955	1.420731	2.579785	0.798748	1.365713	2.496505	-0.032	-0.055	-0.083

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
342	0.84019	1.435719	2.606384	0.807509	1.379924	2.522129	-0.033	-0.056	-0.084
343	0.839465	1.433739	2.602067	0.807235	1.37874	2.519213	-0.032	-0.055	-0.083
344	0.83873	1.431748	2.597742	0.806951	1.377545	2.516283	-0.032	-0.054	-0.081
345	0.834805	1.424291	2.583498	0.803539	1.370991	2.503594	-0.031	-0.053	-0.080
346	0.835448	1.424617	2.583555	0.803876	1.370824	2.503106	-0.032	-0.054	-0.080
347	0.836082	1.424934	2.583604	0.804203	1.370648	2.50261	-0.032	-0.054	-0.081
348	0.836709	1.425242	2.583638	0.804522	1.370463	2.502103	-0.032	-0.055	-0.082
349	0.845965	1.440244	2.610265	0.813304	1.384686	2.527767	-0.033	-0.056	-0.082
350	0.855225	1.455247	2.636894	0.822089	1.398911	2.553434	-0.033	-0.056	-0.083
351	0.859562	1.461848	2.648222	0.826322	1.405364	2.56475	-0.033	-0.056	-0.083
352	0.855545	1.454292	2.633862	0.822825	1.398718	2.551927	-0.033	-0.056	-0.082
353	0.851513	1.446721	2.619486	0.819314	1.392058	2.539083	-0.032	-0.055	-0.080
354	0.847468	1.439137	2.605091	0.815791	1.385386	2.526218	-0.032	-0.054	-0.079
355	0.848041	1.439385	2.605066	0.816057	1.38514	2.525659	-0.032	-0.054	-0.079
356	0.848607	1.439624	2.605033	0.816315	1.384886	2.52509	-0.032	-0.055	-0.080
357	0.849165	1.439855	2.60499	0.816566	1.384624	2.524514	-0.033	-0.055	-0.080
358	0.858448	1.454876	2.631651	0.825372	1.398864	2.550228	-0.033	-0.056	-0.081
359	0.864496	1.464382	2.648342	0.831006	1.407697	2.566131	-0.033	-0.057	-0.082
360	0.868805	1.470946	2.659638	0.835212	1.414114	2.577415	-0.034	-0.057	-0.082
361	0.873112	1.477506	2.67093	0.839416	1.420528	2.588693	-0.034	-0.057	-0.082
362	0.877415	1.484061	2.682215	0.843616	1.426938	2.599965	-0.034	-0.057	-0.082
363	0.881715	1.490611	2.693499	0.847813	1.433342	2.611237	-0.034	-0.057	-0.082
364	0.886012	1.497159	2.704781	0.852009	1.439744	2.622507	-0.034	-0.057	-0.082
365	0.890306	1.503704	2.716057	0.8562	1.446144	2.633769	-0.034	-0.058	-0.082
366	0.894597	1.510244	2.72733	0.860389	1.452539	2.64503	-0.034	-0.058	-0.082
367	0.898886	1.51678	2.738601	0.864576	1.45893	2.656287	-0.034	-0.058	-0.082
368	0.899896	1.517762	2.739849	0.865548	1.459875	2.657679	-0.034	-0.058	-0.082
369	0.9009	1.518739	2.741089	0.866514	1.460816	2.659061	-0.034	-0.058	-0.082
370	0.901896	1.519708	2.74232	0.867474	1.461749	2.660434	-0.034	-0.058	-0.082
371	0.902885	1.520668	2.743545	0.868425	1.462672	2.661802	-0.034	-0.058	-0.082
372	0.903869	1.521621	2.744762	0.869372	1.463589	2.663161	-0.034	-0.058	-0.082
373	0.904846	1.522568	2.745968	0.870312	1.4645	2.664509	-0.035	-0.058	-0.081
374	0.905817	1.523506	2.747168	0.871247	1.465403	2.665851	-0.035	-0.058	-0.081
375	0.915349	1.538799	2.774324	0.880101	1.479587	2.691662	-0.035	-0.059	-0.083
376	0.924882	1.554094	2.801484	0.888957	1.493772	2.717481	-0.036	-0.060	-0.084
377	0.934419	1.569388	2.828646	0.897816	1.507957	2.743305	-0.037	-0.061	-0.085
378	0.939206	1.576722	2.841258	0.902777	1.515608	2.756556	-0.036	-0.061	-0.085
379	0.943992	1.584055	2.853871	0.907736	1.523258	2.769805	-0.036	-0.061	-0.084
380	0.948775	1.591383	2.866477	0.912693	1.530904	2.783049	-0.036	-0.060	-0.083
381	0.953218	1.598104	2.878123	0.91684	1.537157	2.794261	-0.036	-0.061	-0.084
382	0.957659	1.604822	2.889766	0.920984	1.543408	2.805475	-0.037	-0.061	-0.084
383	0.963878	1.614524	2.906863	0.926587	1.552106	2.821401	-0.037	-0.062	-0.085
384	0.965316	1.616232	2.909368	0.928266	1.554243	2.824688	-0.037	-0.062	-0.085

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
385	0.975403	1.632376	2.93794	0.937947	1.569736	2.852585	-0.037	-0.063	-0.085
386	0.985493	1.648525	2.966514	0.94763	1.585233	2.880487	-0.038	-0.063	-0.086
387	0.986572	1.649607	2.968042	0.948478	1.585956	2.881738	-0.038	-0.064	-0.086
388	0.982845	1.642671	2.954939	0.945379	1.580097	2.870296	-0.037	-0.063	-0.085
389	0.989589	1.653195	2.973413	0.951782	1.59008	2.888249	-0.038	-0.063	-0.085
390	0.996332	1.663721	2.991885	0.958184	1.600063	2.906204	-0.038	-0.064	-0.086
391	0.997384	1.664774	2.993382	0.959004	1.600757	2.907427	-0.038	-0.064	-0.086
392	1.002326	1.672292	3.006372	0.963927	1.608271	2.920628	-0.038	-0.064	-0.086
393	1.009066	1.682809	3.02484	0.970326	1.618246	2.938581	-0.039	-0.065	-0.086
394	1.015806	1.693329	3.043311	0.976723	1.628223	2.956538	-0.039	-0.065	-0.087
395	1.017367	1.695196	3.046155	0.978331	1.6302	2.959741	-0.039	-0.065	-0.086
396	1.018922	1.697059	3.048991	0.979933	1.632178	2.962934	-0.039	-0.065	-0.086
397	1.034416	1.722129	3.093662	0.99443	1.655642	3.005674	-0.040	-0.066	-0.088
398	1.035956	1.723995	3.096483	0.996018	1.657654	3.008851	-0.040	-0.066	-0.088
399	1.037491	1.725863	3.099295	0.997602	1.659675	3.012019	-0.040	-0.066	-0.087
400	1.044759	1.737244	3.119139	1.004807	1.671035	3.031979	-0.040	-0.066	-0.087
401	1.04628	1.739104	3.121936	1.006377	1.673062	3.035128	-0.040	-0.066	-0.087
402	1.056596	1.755547	3.150985	1.016084	1.688597	3.063124	-0.041	-0.067	-0.088
403	1.054702	1.751723	3.143603	1.014306	1.685052	3.056242	-0.040	-0.067	-0.087
404	1.061618	1.762497	3.162491	1.020678	1.695028	3.074229	-0.041	-0.067	-0.088
405	1.068879	1.773872	3.182335	1.027878	1.706388	3.094186	-0.041	-0.067	-0.088
406	1.07579	1.784642	3.201216	1.034246	1.716362	3.11217	-0.042	-0.068	-0.089
407	1.077811	1.787299	3.205349	1.036599	1.719651	3.117266	-0.041	-0.068	-0.088
408	1.084721	1.798065	3.224235	1.042964	1.729625	3.135258	-0.042	-0.068	-0.089
409	1.08673	1.800709	3.22835	1.045307	1.732898	3.140331	-0.041	-0.068	-0.088
410	1.09021	1.805779	3.237029	1.048309	1.737287	3.148267	-0.042	-0.068	-0.089
411	1.101081	1.823075	3.26749	1.058851	1.754142	3.178301	-0.042	-0.069	-0.089
412	1.104551	1.828135	3.276158	1.061843	1.758523	3.18623	-0.043	-0.070	-0.090
413	1.115425	1.845432	3.306625	1.072389	1.775379	3.216274	-0.043	-0.070	-0.090
414	1.113964	1.84233	3.300488	1.07133	1.773015	3.211226	-0.043	-0.069	-0.089
415	1.121402	1.853922	3.320743	1.078506	1.784277	3.231205	-0.043	-0.070	-0.090
416	1.128837	1.865509	3.341	1.085679	1.795536	3.251184	-0.043	-0.070	-0.090
417	1.126994	1.861778	3.333875	1.083754	1.791774	3.244159	-0.043	-0.070	-0.090
418	1.134426	1.873365	3.354125	1.090924	1.803031	3.264134	-0.044	-0.070	-0.090
419	1.138401	1.879227	3.364142	1.094705	1.808676	3.274018	-0.044	-0.071	-0.090
420	1.145831	1.890807	3.384392	1.101872	1.819929	3.293994	-0.044	-0.071	-0.090
421	1.149797	1.896661	3.394399	1.105645	1.825566	3.303869	-0.044	-0.071	-0.091
422	1.15191	1.899442	3.39884	1.107894	1.82866	3.308859	-0.044	-0.071	-0.090
423	1.164835	1.920052	3.435318	1.119954	1.847997	3.343863	-0.045	-0.072	-0.091
424	1.168788	1.925888	3.445311	1.123714	1.853617	3.353725	-0.045	-0.072	-0.092
425	1.167407	1.922912	3.439474	1.122539	1.851064	3.348576	-0.045	-0.072	-0.091
426	1.175369	1.935312	3.4611	1.130526	1.863587	3.370515	-0.045	-0.072	-0.091
427	1.188308	1.955933	3.497596	1.142598	1.882941	3.405552	-0.046	-0.073	-0.092

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
428	1.186898	1.952927	3.491726	1.141395	1.880356	3.400364	-0.046	-0.073	-0.091
429	1.18548	1.94991	3.485843	1.140186	1.87776	3.395161	-0.045	-0.072	-0.091
430	1.189948	1.956546	3.497184	1.144747	1.884629	3.406953	-0.045	-0.072	-0.090
431	1.199404	1.97142	3.523418	1.153403	1.898354	3.431881	-0.046	-0.073	-0.092
432	1.206994	1.983211	3.544074	1.160527	1.909519	3.4519	-0.046	-0.074	-0.092
433	1.211083	1.989238	3.554437	1.164217	1.915031	3.461766	-0.047	-0.074	-0.093
434	1.215534	1.995851	3.565764	1.168763	1.921876	3.473538	-0.047	-0.074	-0.092
435	1.21998	2.002461	3.577083	1.173305	1.928716	3.485301	-0.047	-0.074	-0.092
436	1.219041	2.000201	3.572507	1.172866	1.927317	3.481966	-0.046	-0.073	-0.091
437	1.223111	2.00621	3.582855	1.176538	1.932815	3.491822	-0.047	-0.073	-0.091
438	1.227177	2.012213	3.593197	1.180205	1.938308	3.501673	-0.047	-0.074	-0.092
439	1.231235	2.018214	3.603537	1.183865	1.943799	3.511522	-0.047	-0.074	-0.092
440	1.241234	2.033916	3.631159	1.193349	1.958804	3.538432	-0.048	-0.075	-0.093
441	1.251231	2.049616	3.658787	1.202833	1.973809	3.565349	-0.048	-0.076	-0.093
442	1.259347	2.062212	3.680815	1.210773	1.986223	3.587317	-0.049	-0.076	-0.093
443	1.267463	2.074806	3.702842	1.218711	1.998636	3.609282	-0.049	-0.076	-0.094
444	1.272046	2.081605	3.714538	1.223185	2.005366	3.621056	-0.049	-0.076	-0.093
445	1.276623	2.0884	3.726228	1.227656	2.012091	3.632822	-0.049	-0.076	-0.093
446	1.281195	2.095187	3.737916	1.23212	2.018815	3.644586	-0.049	-0.076	-0.093
447	1.285762	2.101971	3.749594	1.23658	2.025547	3.656339	-0.049	-0.076	-0.093
448	1.290326	2.10875	3.761266	1.241036	2.032293	3.668087	-0.049	-0.076	-0.093
449	1.294883	2.115521	3.772936	1.245487	2.039054	3.679831	-0.049	-0.076	-0.093
450	1.295888	2.116482	3.774247	1.246454	2.040149	3.681352	-0.049	-0.076	-0.093
451	1.296886	2.117431	3.77555	1.247414	2.04127	3.682864	-0.049	-0.076	-0.093
452	1.297875	2.118377	3.776843	1.248366	2.042422	3.684367	-0.050	-0.076	-0.092
453	1.298859	2.119311	3.778129	1.249312	2.043597	3.685862	-0.050	-0.076	-0.092
454	1.299834	2.120243	3.779412	1.250252	2.044795	3.687352	-0.050	-0.075	-0.092
455	1.310001	2.136176	3.807477	1.259693	2.060015	3.714381	-0.050	-0.076	-0.093
456	1.320168	2.152107	3.835537	1.269136	2.075256	3.741408	-0.051	-0.077	-0.094
457	1.330333	2.16804	3.863602	1.278576	2.090518	3.768443	-0.052	-0.078	-0.095
458	1.3354	2.175583	3.876615	1.283832	2.098733	3.782068	-0.052	-0.077	-0.095
459	1.340461	2.183124	3.889615	1.289083	2.106955	3.795679	-0.051	-0.076	-0.094
460	1.345517	2.190654	3.902611	1.294329	2.115172	3.809285	-0.051	-0.075	-0.093
461	1.350192	2.197605	3.914643	1.298689	2.122101	3.821047	-0.052	-0.076	-0.094
462	1.35486	2.204561	3.926672	1.303044	2.12903	3.832807	-0.052	-0.076	-0.094
463	1.361437	2.214662	3.944343	1.308964	2.138597	3.849594	-0.052	-0.076	-0.095
464	1.362888	2.216359	3.946919	1.310677	2.141063	3.852903	-0.052	-0.075	-0.094
465	1.373596	2.233152	3.976375	1.320954	2.157624	3.88188	-0.053	-0.076	-0.094
466	1.384306	2.249971	4.005829	1.331232	2.174186	3.910854	-0.053	-0.076	-0.095
467	1.385354	2.251159	4.007419	1.332037	2.175348	3.91231	-0.053	-0.076	-0.095
468	1.38126	2.243928	3.993891	1.32862	2.169371	3.900245	-0.053	-0.075	-0.094
469	1.388366	2.25499	4.012924	1.335365	2.180188	3.918933	-0.053	-0.075	-0.094
470	1.39547	2.266074	4.031961	1.342108	2.191005	3.937625	-0.053	-0.075	-0.094

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
471	1.396492	2.267338	4.03352	1.342886	2.192137	3.939051	-0.054	-0.075	-0.094
472	1.401664	2.275298	4.046884	1.348042	2.200279	3.952673	-0.054	-0.075	-0.094
473	1.40876	2.286427	4.065911	1.354777	2.211086	3.971357	-0.054	-0.075	-0.095
474	1.415852	2.297567	4.084936	1.361508	2.221894	3.99004	-0.054	-0.076	-0.095
475	1.417393	2.299674	4.087839	1.363104	2.224249	3.993327	-0.054	-0.075	-0.095
476	1.418929	2.301779	4.090736	1.364695	2.226598	3.996609	-0.054	-0.075	-0.094
477	1.426008	2.312923	4.109753	1.371415	2.237398	4.015286	-0.055	-0.076	-0.094
478	1.42753	2.315014	4.11264	1.372993	2.23973	4.018552	-0.055	-0.075	-0.094
479	1.429045	2.317099	4.11552	1.374563	2.242056	4.021812	-0.054	-0.075	-0.094
480	1.441844	2.337556	4.151087	1.386373	2.261312	4.056004	-0.055	-0.076	-0.095
481	1.443347	2.339626	4.153953	1.387932	2.263623	4.059247	-0.055	-0.076	-0.095
482	1.454211	2.356908	4.183841	1.398153	2.280191	4.088352	-0.056	-0.077	-0.095
483	1.461824	2.368863	4.204217	1.405704	2.292227	4.108899	-0.056	-0.077	-0.095
484	1.469045	2.38025	4.22363	1.412353	2.302999	4.127659	-0.057	-0.077	-0.096
485	1.474714	2.389015	4.238312	1.418309	2.312327	4.14309	-0.056	-0.077	-0.095
486	1.481928	2.400394	4.257722	1.424951	2.323094	4.16185	-0.057	-0.077	-0.096
487	1.483939	2.403246	4.261918	1.427321	2.326602	4.166915	-0.057	-0.077	-0.095
488	1.491147	2.414619	4.281322	1.433956	2.337366	4.185673	-0.057	-0.077	-0.096
489	1.493147	2.417457	4.285509	1.436316	2.340859	4.190724	-0.057	-0.077	-0.095
490	1.496696	2.422915	4.294422	1.439362	2.345804	4.19912	-0.057	-0.077	-0.095
491	1.498682	2.425741	4.298588	1.441709	2.349283	4.204145	-0.057	-0.076	-0.094
492	1.502221	2.431187	4.307489	1.444745	2.35422	4.212532	-0.057	-0.077	-0.095
493	1.509965	2.443376	4.328265	1.452217	2.366218	4.23316	-0.058	-0.077	-0.095
494	1.513494	2.448813	4.337153	1.455243	2.371147	4.241537	-0.058	-0.078	-0.096
495	1.521234	2.461	4.357921	1.462711	2.383144	4.262156	-0.059	-0.078	-0.096
496	1.519521	2.457859	4.351538	1.461434	2.380746	4.256745	-0.058	-0.077	-0.095
497	1.527255	2.470038	4.372303	1.468895	2.392735	4.277363	-0.058	-0.077	-0.095
498	1.534985	2.482216	4.393066	1.476354	2.404724	4.29798	-0.059	-0.077	-0.095
499	1.532853	2.478477	4.385693	1.474142	2.401048	4.290782	-0.059	-0.077	-0.095
500	1.540577	2.490651	4.406449	1.481595	2.413033	4.311392	-0.059	-0.078	-0.095
501	1.544619	2.496875	4.416685	1.485436	2.419165	4.321604	-0.059	-0.078	-0.095
502	1.552336	2.509043	4.437437	1.492882	2.431145	4.342211	-0.059	-0.078	-0.095
503	1.55637	2.515258	4.447658	1.496716	2.437267	4.352408	-0.060	-0.078	-0.095
504	1.55843	2.518251	4.452145	1.498929	2.440633	4.357421	-0.060	-0.078	-0.095
505	1.571947	2.539841	4.489568	1.511537	2.461213	4.393733	-0.060	-0.079	-0.096
506	1.575964	2.546039	4.499777	1.515355	2.467319	4.403917	-0.061	-0.079	-0.096
507	1.574313	2.543049	4.4937	1.513929	2.464794	4.398483	-0.060	-0.078	-0.095
508	1.582566	2.556028	4.515823	1.522217	2.477992	4.420929	-0.060	-0.078	-0.095
509	1.596086	2.577627	4.553261	1.534825	2.498587	4.457267	-0.061	-0.079	-0.096
510	1.594413	2.574608	4.54716	1.533379	2.496032	4.451802	-0.061	-0.079	-0.095
511	1.59273	2.571584	4.541047	1.531923	2.49347	4.446323	-0.061	-0.078	-0.095
512	1.59727	2.578581	4.552596	1.536569	2.500776	4.458313	-0.061	-0.078	-0.094
513	1.607083	2.594213	4.579483	1.545544	2.515504	4.48423	-0.062	-0.079	-0.095

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
514	1.614922	2.606607	4.600626	1.552896	2.527457	4.504938	-0.062	-0.079	-0.096
515	1.619045	2.613016	4.611201	1.556606	2.533516	4.515199	-0.062	-0.079	-0.096
516	1.633119	2.635456	4.650027	1.570075	2.555362	4.553404	-0.063	-0.080	-0.097
517	1.6472	2.657896	4.688861	1.583557	2.57721	4.591618	-0.064	-0.081	-0.097
518	1.646024	2.655628	4.684053	1.582933	2.575794	4.587885	-0.063	-0.080	-0.096
519	1.644851	2.653352	4.679236	1.582325	2.57437	4.584141	-0.063	-0.079	-0.095
520	1.643673	2.651064	4.674407	1.581724	2.572932	4.58038	-0.062	-0.078	-0.094
521	1.6478	2.657444	4.684948	1.585488	2.578967	4.590614	-0.062	-0.078	-0.094
522	1.648199	2.657816	4.684897	1.585604	2.579086	4.590371	-0.063	-0.079	-0.095
523	1.648592	2.658182	4.684843	1.585714	2.5792	4.590127	-0.063	-0.079	-0.095
524	1.658978	2.674632	4.713104	1.595625	2.595156	4.617893	-0.063	-0.079	-0.095
525	1.669363	2.691081	4.741359	1.605535	2.611112	4.645654	-0.064	-0.080	-0.096
526	1.674024	2.698262	4.753251	1.610147	2.618341	4.657686	-0.064	-0.080	-0.096
527	1.678678	2.705437	4.765139	1.614755	2.625565	4.669712	-0.064	-0.080	-0.095
528	1.683328	2.712612	4.777028	1.619358	2.632787	4.681739	-0.064	-0.080	-0.095
529	1.687974	2.719776	4.788907	1.623957	2.639999	4.693756	-0.064	-0.080	-0.095
530	1.692616	2.726942	4.800783	1.628553	2.647213	4.70577	-0.064	-0.080	-0.095
531	1.697254	2.734099	4.812657	1.633143	2.654417	4.71778	-0.064	-0.080	-0.095
532	1.701886	2.741255	4.824525	1.637728	2.661619	4.729783	-0.064	-0.080	-0.095
533	1.716159	2.763979	4.863812	1.651252	2.683519	4.7682	-0.065	-0.080	-0.096
534	1.726685	2.78067	4.892475	1.661101	2.699476	4.796109	-0.066	-0.081	-0.096
535	1.737208	2.797364	4.921143	1.670949	2.715439	4.824026	-0.066	-0.082	-0.097
536	1.74237	2.805321	4.934367	1.676365	2.723824	4.837812	-0.066	-0.081	-0.097
537	1.747529	2.813278	4.947587	1.681779	2.732209	4.851593	-0.066	-0.081	-0.096
538	1.752683	2.821229	4.960799	1.687186	2.740587	4.865366	-0.065	-0.081	-0.095
539	1.747758	2.812988	4.945572	1.682711	2.73301	4.850991	-0.065	-0.080	-0.095
540	1.742823	2.804737	4.930333	1.678225	2.725421	4.836602	-0.065	-0.079	-0.094
541	1.749575	2.815372	4.948358	1.684379	2.735422	4.853998	-0.065	-0.080	-0.094
542	1.756327	2.826009	4.966378	1.690533	2.745425	4.871394	-0.066	-0.081	-0.095
543	1.772771	2.852278	5.011887	1.705683	2.770207	4.915303	-0.067	-0.082	-0.097
544	1.783829	2.869787	5.041924	1.716372	2.787373	4.945027	-0.067	-0.082	-0.097
545	1.804595	2.90295	5.09948	1.736071	2.819341	5.001299	-0.069	-0.084	-0.098
546	1.81997	2.927347	5.141552	1.751298	2.843682	5.043364	-0.069	-0.084	-0.098
547	1.83495	2.951169	5.182659	1.765634	2.866832	5.083789	-0.069	-0.084	-0.099
548	1.844529	2.966214	5.208269	1.775485	2.882339	5.109983	-0.069	-0.084	-0.098
549	1.85951	2.99004	5.249377	1.789823	2.905495	5.150414	-0.070	-0.085	-0.099
550	1.878816	3.020766	5.302527	1.808707	2.935837	5.20319	-0.070	-0.085	-0.099
551	1.890018	3.038519	5.332971	1.81934	2.953012	5.233069	-0.071	-0.086	-0.100
552	1.905543	3.063173	5.375461	1.834518	2.977371	5.275296	-0.071	-0.086	-0.100
553	1.917288	3.081757	5.407288	1.845988	2.995748	5.306969	-0.071	-0.086	-0.100
554	1.938779	3.116044	5.466685	1.866517	3.028992	5.36527	-0.072	-0.087	-0.101
555	1.956489	3.144253	5.515408	1.883338	3.056248	5.413009	-0.073	-0.088	-0.102
556	1.968379	3.163076	5.547633	1.894756	3.07463	5.444832	-0.074	-0.088	-0.103

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
557	1.990426	3.198205	5.608419	1.916135	3.10909	5.504935	-0.074	-0.089	-0.103
558	2.008682	3.22725	5.658522	1.933796	3.137554	5.554465	-0.075	-0.090	-0.104
559	2.024902	3.252992	5.70281	1.949763	3.163133	5.598644	-0.075	-0.090	-0.104
560	2.037329	3.272638	5.736408	1.962011	3.182707	5.63224	-0.075	-0.090	-0.104
561	2.049751	3.292285	5.770011	1.974254	3.202281	5.665841	-0.075	-0.090	-0.104
562	2.068167	3.321592	5.820552	1.991881	3.230778	5.715572	-0.076	-0.091	-0.105
563	2.086581	3.350898	5.871092	2.009507	3.259277	5.765303	-0.077	-0.092	-0.106
564	2.101195	3.374103	5.910928	2.023408	3.281763	5.80444	-0.078	-0.092	-0.106
565	2.110343	3.38846	5.935194	2.032738	3.296493	5.8292	-0.078	-0.092	-0.106
566	2.129301	3.418601	5.987115	2.051197	3.32619	5.880707	-0.078	-0.092	-0.106
567	2.14445	3.442635	6.028334	2.065923	3.349868	5.921619	-0.079	-0.093	-0.107
568	2.159218	3.466093	6.06859	2.079788	3.372387	5.96095	-0.079	-0.094	-0.108
569	2.168504	3.480689	6.093259	2.089072	3.387123	5.985865	-0.079	-0.094	-0.107
570	2.189668	3.51441	6.151454	2.109241	3.41977	6.042972	-0.080	-0.095	-0.108
571	2.205353	3.539272	6.194053	2.124839	3.444633	6.085648	-0.081	-0.095	-0.108
572	2.220654	3.56356	6.235684	2.13961	3.468342	6.126746	-0.081	-0.095	-0.109
573	2.240311	3.594798	6.289431	2.15899	3.499272	6.180232	-0.081	-0.096	-0.109
574	2.261643	3.628793	6.348059	2.179284	3.531978	6.237555	-0.082	-0.097	-0.111
575	2.277477	3.653911	6.39107	2.195	3.556872	6.28041	-0.082	-0.097	-0.111
576	2.289483	3.67289	6.423353	2.207	3.575713	6.312643	-0.082	-0.097	-0.111
577	2.305849	3.698826	6.467745	2.223608	3.601776	6.357251	-0.082	-0.097	-0.110
578	2.327723	3.733659	6.527771	2.244875	3.635683	6.416361	-0.083	-0.098	-0.111
579	2.343711	3.759031	6.571205	2.260686	3.660612	6.459417	-0.083	-0.098	-0.112
580	2.355862	3.778255	6.603896	2.272754	3.679478	6.49183	-0.083	-0.099	-0.112
581	2.374444	3.807779	6.654566	2.291157	3.708511	6.542062	-0.083	-0.099	-0.113
582	2.393026	3.837311	6.705235	2.309571	3.737551	6.592294	-0.083	-0.100	-0.113
583	2.405706	3.857355	6.739287	2.322487	3.757585	6.626434	-0.083	-0.100	-0.113
584	2.428302	3.893295	6.801132	2.344664	3.792735	6.687525	-0.084	-0.101	-0.114
585	2.447074	3.923083	6.852221	2.363075	3.821819	6.737963	-0.084	-0.101	-0.114
586	2.465871	3.952873	6.903316	2.381489	3.850907	6.788407	-0.084	-0.102	-0.115
587	2.475312	3.967571	6.927974	2.391451	3.866017	6.813608	-0.084	-0.102	-0.114
588	2.49472	3.998185	6.980456	2.410698	3.896271	6.865799	-0.084	-0.102	-0.115
589	2.514165	4.028802	7.032933	2.429946	3.92653	6.917986	-0.084	-0.102	-0.115
590	2.533279	4.058855	7.084447	2.448361	3.955673	6.968648	-0.085	-0.103	-0.116
591	2.543015	4.073781	7.109501	2.458293	3.970795	6.994022	-0.085	-0.103	-0.115
592	2.564808	4.10801	7.168279	2.479295	4.004069	7.051891	-0.086	-0.104	-0.116
593	2.58106	4.133286	7.211356	2.495588	4.029406	7.095129	-0.085	-0.104	-0.116
594	2.59696	4.15799	7.253474	2.511046	4.053626	7.136849	-0.086	-0.104	-0.117
595	2.607304	4.173725	7.279877	2.521784	4.069885	7.163911	-0.086	-0.104	-0.116
596	2.619364	4.192238	7.311203	2.533444	4.087998	7.19494	-0.086	-0.104	-0.116
597	2.635835	4.217763	7.354688	2.549724	4.113374	7.238373	-0.086	-0.104	-0.116
598	2.654026	4.246078	7.403106	2.566942	4.140623	7.285797	-0.087	-0.105	-0.117
599	2.676629	4.281408	7.4637	2.588789	4.175136	7.345643	-0.088	-0.106	-0.118

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
600	2.689229	4.300732	7.496386	2.601262	4.194392	7.378371	-0.088	-0.106	-0.118
601	2.706239	4.327078	7.541253	2.618361	4.220917	7.423519	-0.088	-0.106	-0.118
602	2.719374	4.347224	7.575309	2.631647	4.241323	7.45795	-0.088	-0.106	-0.117
603	2.742163	4.38282	7.636335	2.653505	4.275908	7.518039	-0.089	-0.107	-0.118
604	2.764947	4.418414	7.697357	2.675362	4.310492	7.57813	-0.090	-0.108	-0.119
605	2.783854	4.447807	7.747568	2.693407	4.33896	7.627506	-0.090	-0.109	-0.120
606	2.807557	4.484804	7.81094	2.716915	4.375803	7.690801	-0.091	-0.109	-0.120
607	2.827378	4.515597	7.86349	2.736604	4.406519	7.743367	-0.091	-0.109	-0.120
608	2.8451	4.54301	7.910141	2.754509	4.434225	7.790416	-0.091	-0.109	-0.120
609	2.858558	4.563634	7.945006	2.767764	4.454701	7.825256	-0.091	-0.109	-0.120
610	2.872014	4.584261	7.979868	2.781016	4.475178	7.860092	-0.091	-0.109	-0.120
611	2.883679	4.602041	8.0098	2.792226	4.492524	7.889717	-0.091	-0.110	-0.120
612	2.889702	4.610784	8.023942	2.798621	4.501789	7.904527	-0.091	-0.109	-0.119
613	2.905795	4.635602	8.066075	2.814472	4.526413	7.946578	-0.091	-0.109	-0.119
614	2.931971	4.676514	8.136223	2.839795	4.566414	8.0159	-0.092	-0.110	-0.120
615	2.947688	4.700756	8.177388	2.854826	4.589952	8.056482	-0.093	-0.111	-0.121
616	2.963949	4.725822	8.219923	2.870673	4.61463	8.098751	-0.093	-0.111	-0.121
617	2.976669	4.745217	8.252574	2.883485	4.634218	8.131721	-0.093	-0.111	-0.121
618	2.999493	4.78073	8.313257	2.905794	4.66922	8.19199	-0.094	-0.112	-0.121
619	3.020201	4.812853	8.368011	2.926296	4.701189	8.246693	-0.094	-0.112	-0.121
620	3.040538	4.844409	8.42181	2.945988	4.73209	8.299956	-0.095	-0.112	-0.122
621	3.057327	4.870289	8.46571	2.962634	4.757894	8.343895	-0.095	-0.112	-0.122
622	3.070195	4.889917	8.498755	2.975422	4.777522	8.377069	-0.095	-0.112	-0.122
623	3.087522	4.916619	8.544032	2.992872	4.804452	8.422683	-0.095	-0.112	-0.121
624	3.106598	4.946139	8.594273	3.011331	4.833355	8.47243	-0.095	-0.113	-0.122
625	3.12355	4.972259	8.638579	3.027972	4.85921	8.516599	-0.096	-0.113	-0.122
626	3.136572	4.99212	8.672017	3.040744	4.878882	8.549986	-0.096	-0.113	-0.122
627	3.15619	5.022464	8.723636	3.060013	4.908916	8.601412	-0.096	-0.114	-0.122
628	3.171876	5.046549	8.76438	3.075413	4.932766	8.642052	-0.096	-0.114	-0.122
629	3.185432	5.067225	8.799175	3.088982	4.953554	8.677086	-0.096	-0.114	-0.122
630	3.209152	5.104086	8.862082	3.112126	4.989846	8.739544	-0.097	-0.114	-0.123
631	3.239116	5.150877	8.942231	3.140988	5.035468	8.818646	-0.098	-0.115	-0.124
632	3.279269	5.213871	9.050523	3.179454	5.096622	8.925214	-0.100	-0.117	-0.125
633	3.319981	5.277705	9.160211	3.218744	5.158916	9.03347	-0.101	-0.119	-0.127
634	3.365194	5.348646	9.28218	3.262734	5.228545	9.15421	-0.102	-0.120	-0.128
635	3.41491	5.426708	9.416446	3.311429	5.305515	9.287445	-0.103	-0.121	-0.129
636	3.458559	5.495099	9.533879	3.354416	5.37323	9.404271	-0.104	-0.122	-0.130
637	3.502396	5.563757	9.651751	3.397429	5.441037	9.521377	-0.105	-0.123	-0.130
638	3.552516	5.642384	9.78691	3.446209	5.518227	9.655201	-0.106	-0.124	-0.132
639	3.608921	5.730996	9.93937	3.500758	5.604821	9.80576	-0.108	-0.126	-0.134
640	3.665893	5.820459	10.09324	3.556137	5.692564	9.958008	-0.110	-0.128	-0.135
641	3.723435	5.910769	10.24849	3.612344	5.781446	10.11192	-0.111	-0.129	-0.137
642	3.781542	6.00193	10.40516	3.669374	5.871471	10.26753	-0.112	-0.130	-0.138

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
643	3.839854	6.093377	10.5623	3.726451	5.961612	10.42346	-0.113	-0.132	-0.139
644	3.898362	6.185104	10.71988	3.783569	6.051867	10.57968	-0.115	-0.133	-0.140
645	3.95922	6.28054	10.88386	3.842591	6.145339	10.74186	-0.117	-0.135	-0.142
646	4.020646	6.376832	11.04926	3.90244	6.239956	10.90571	-0.118	-0.137	-0.144
647	4.082642	6.473979	11.21606	3.963113	6.335714	11.07124	-0.120	-0.138	-0.145
648	4.145207	6.571975	11.38426	4.024608	6.432606	11.23844	-0.121	-0.139	-0.146
649	4.207975	6.670259	11.55292	4.086155	6.529624	11.40596	-0.122	-0.141	-0.147
650	4.270951	6.768837	11.72204	4.147754	6.626773	11.5738	-0.123	-0.142	-0.148
651	4.336285	6.871149	11.89759	4.211278	6.727178	11.74763	-0.125	-0.144	-0.150
652	4.398211	6.967989	12.06362	4.271706	6.822469	11.91228	-0.127	-0.146	-0.151
653	4.460706	7.065685	12.23106	4.332955	6.918892	12.0786	-0.128	-0.147	-0.152
654	4.52377	7.164232	12.3999	4.395022	7.016445	12.24658	-0.129	-0.148	-0.153
655	4.587038	7.26307	12.5692	4.457143	7.11413	12.41489	-0.130	-0.149	-0.154
656	4.650517	7.362204	12.73895	4.519327	7.211958	12.58352	-0.131	-0.150	-0.155
657	4.716362	7.465069	12.91514	4.583451	7.313053	12.75817	-0.133	-0.152	-0.157
658	4.778784	7.562461	13.08179	4.644459	7.40902	12.92362	-0.134	-0.153	-0.158
659	4.841773	7.660703	13.24986	4.706279	7.506108	13.09072	-0.135	-0.155	-0.159
660	4.905325	7.759794	13.41932	4.768912	7.604316	13.25946	-0.136	-0.155	-0.160
661	4.96909	7.859177	13.58923	4.831608	7.702664	13.42854	-0.137	-0.157	-0.161
662	5.043435	7.975263	13.78798	4.904203	7.816973	13.62576	-0.139	-0.158	-0.162
663	5.120164	8.095102	13.99319	4.978767	7.934589	13.82905	-0.141	-0.161	-0.164
664	5.203853	8.225882	14.21723	5.060062	8.062899	14.05093	-0.144	-0.163	-0.166
665	5.292695	8.364723	14.45506	5.146937	8.199729	14.287	-0.146	-0.165	-0.168
666	5.382118	8.504427	14.69431	5.234638	8.337688	14.52473	-0.147	-0.167	-0.170
667	5.486748	8.668088	14.97484	5.33706	8.499074	14.80324	-0.150	-0.169	-0.172
668	5.585406	8.82224	15.23886	5.4337	8.651182	15.06548	-0.152	-0.171	-0.173
669	5.696899	8.99664	15.5378	5.542251	8.822536	15.36173	-0.155	-0.174	-0.176
670	5.805532	9.166405	15.8286	5.648474	8.989843	15.65038	-0.157	-0.177	-0.178
671	5.908544	9.327221	16.10383	5.749643	9.148822	15.92404	-0.159	-0.178	-0.180
672	6.018924	9.499592	16.3989	5.858329	9.319503	16.21764	-0.161	-0.180	-0.181
673	6.119285	9.656074	16.66645	5.957239	9.474585	16.48401	-0.162	-0.181	-0.182
674	6.224115	9.819539	16.94593	6.060293	9.636315	16.76205	-0.164	-0.183	-0.184
675	6.339984	10.00041	17.25544	6.173278	9.81427	17.06907	-0.167	-0.186	-0.186
676	6.442146	10.15956	17.52732	6.273226	9.971245	17.33918	-0.169	-0.188	-0.188
677	6.545465	10.32043	17.80205	6.37479	10.13044	17.61257	-0.171	-0.190	-0.189
678	6.656164	10.49289	18.09663	6.483883	10.30135	17.90588	-0.172	-0.192	-0.191
679	6.76731	10.66595	18.39217	6.593162	10.47263	18.19999	-0.174	-0.193	-0.192
680	6.882941	10.84602	18.69968	6.706616	10.65059	18.50579	-0.176	-0.195	-0.194
681	6.996957	11.02352	19.00267	6.818133	10.82565	18.80684	-0.179	-0.198	-0.196
682	7.104029	11.18995	19.28647	6.92327	10.99027	19.08924	-0.181	-0.200	-0.197
683	7.216295	11.3645	19.58411	7.033997	11.1634	19.3858	-0.182	-0.201	-0.198
684	7.335629	11.5501	19.90071	7.151584	11.34737	19.70113	-0.184	-0.203	-0.200
685	7.44486	11.71973	20.18968	7.259308	11.51565	19.98912	-0.186	-0.204	-0.201

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
686	7.548043	11.87977	20.46207	7.361166	11.67455	20.26074	-0.187	-0.205	-0.201
687	7.666992	12.06458	20.777	7.477911	11.8573	20.57412	-0.189	-0.207	-0.203
688	7.774326	12.23105	21.06022	7.583426	12.02213	20.85619	-0.191	-0.209	-0.204
689	7.886521	12.40508	21.35638	7.69385	12.19457	21.15123	-0.193	-0.211	-0.205
690	7.989284	12.56419	21.62672	7.79575	12.35304	21.42125	-0.194	-0.211	-0.205
691	8.162294	12.83369	22.08694	7.964543	12.6184	21.87812	-0.198	-0.215	-0.209
692	8.399712	13.20432	22.72093	8.195059	12.98212	22.50638	-0.205	-0.222	-0.215
693	8.698847	13.67186	23.52149	8.483916	13.43927	23.29833	-0.215	-0.233	-0.223
694	9.033751	14.19522	24.41755	8.809567	13.95328	24.18647	-0.224	-0.242	-0.231
695	9.393278	14.75693	25.37906	9.161097	14.50689	25.14097	-0.232	-0.250	-0.238
696	9.786199	15.37071	26.4296	9.547362	15.11391	26.18541	-0.239	-0.257	-0.244
697	10.13811	15.91975	27.36838	9.894527	15.65822	27.1199	-0.244	-0.262	-0.248
698	10.4568	16.41632	28.21652	10.20992	16.15162	27.96517	-0.247	-0.265	-0.251
699	10.74938	16.8718	28.99378	10.49926	16.60403	28.73979	-0.250	-0.268	-0.254
700	11.00351	17.26672	29.66671	10.75104	16.99687	29.41104	-0.252	-0.270	-0.256
701	11.23425	17.62477	30.27604	10.98015	17.35359	30.01937	-0.254	-0.271	-0.257
702	11.43911	17.94211	30.81524	11.18371	17.66999	30.55801	-0.255	-0.272	-0.257
703	11.73085	18.39549	31.58761	11.46992	18.11818	31.32646	-0.261	-0.277	-0.261
704	12.10554	18.97863	32.58225	11.83495	18.69207	32.31403	-0.271	-0.287	-0.268
705	12.57829	19.71521	33.83981	12.29324	19.41466	33.56083	-0.285	-0.301	-0.279
706	13.06656	20.47545	35.13703	12.76941	20.16327	34.84903	-0.297	-0.312	-0.288
707	13.59035	21.29076	36.52789	13.28364	20.9694	36.23251	-0.307	-0.321	-0.295
708	14.17978	22.20834	38.09344	13.86472	21.87891	37.79114	-0.315	-0.329	-0.302
709	14.85689	23.26251	39.89209	14.53037	22.92206	39.58076	-0.327	-0.340	-0.311
710	15.64058	24.48277	41.97426	15.29879	24.12769	41.65131	-0.342	-0.355	-0.323
711	16.55055	25.90004	44.39299	16.18791	25.52501	44.05455	-0.363	-0.375	-0.338
712	17.48979	27.36199	46.88668	17.10901	26.96967	46.53463	-0.381	-0.392	-0.352
713	18.45858	28.86907	49.45615	18.06321	28.46288	49.09272	-0.395	-0.406	-0.363
714	19.45413	30.41696	52.09399	19.04704	29.99962	51.72094	-0.407	-0.417	-0.373
715	20.77331	32.46885	55.59155	20.34331	32.02995	55.20163	-0.430	-0.439	-0.390
716	22.40763	35.01105	59.92477	21.94374	34.54054	59.51134	-0.464	-0.471	-0.413
717	24.40551	38.11905	65.22242	23.89396	37.60432	64.77718	-0.512	-0.515	-0.445
718	26.47995	41.34332	70.71417	25.92902	40.79229	70.24226	-0.551	-0.551	-0.472
719	28.71102	44.80906	76.61436	28.12739	44.22786	76.11909	-0.584	-0.581	-0.495
720	31.09028	48.50303	82.90033	30.48049	47.89756	82.38469	-0.610	-0.605	-0.516
721	33.87269	52.82047	90.24274	33.22591	52.18179	89.70233	-0.647	-0.639	-0.540
722	37.06907	57.7775	98.66794	36.37569	57.09798	98.09951	-0.693	-0.680	-0.568
723	40.78599	63.5401	108.4589	40.02871	62.80531	107.8553	-0.757	-0.735	-0.604
724	44.59441	69.43851	118.4713	43.78587	68.66006	117.8394	-0.809	-0.778	-0.632
725	48.54982	75.55951	128.854	47.70127	74.74733	128.1987	-0.849	-0.812	-0.655
726	52.66766	81.92718	139.6481	51.78953	81.09013	138.9731	-0.878	-0.837	-0.675
727	54.88805	85.34357	145.413	54.02621	84.52175	144.7428	-0.862	-0.822	-0.670
728	55.20737	85.80557	146.1477	54.40554	85.03651	145.5041	-0.802	-0.769	-0.644

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
729	53.78957	83.57115	142.296	53.0783	82.88045	141.6936	-0.711	-0.691	-0.602
730	51.33266	79.7264	135.7076	50.70433	79.10976	135.1512	-0.628	-0.617	-0.556
731	48.03512	74.58169	126.9144	47.48051	74.03329	126.4074	-0.555	-0.548	-0.507
732	43.87367	68.10166	115.8577	43.38486	67.61697	115.4042	-0.489	-0.485	-0.453
733	39.98343	62.04639	105.5291	39.54673	61.6137	105.1231	-0.437	-0.433	-0.406
734	36.3481	56.39008	95.88401	35.95116	55.99902	95.52057	-0.397	-0.391	-0.363
735	32.71131	50.73413	86.244	32.35589	50.38551	85.92209	-0.355	-0.349	-0.322
736	29.16992	45.22868	76.86391	28.85305	44.91978	76.5817	-0.317	-0.309	-0.282
737	26.0305	40.35025	68.55544	25.74615	40.07518	68.30782	-0.284	-0.275	-0.248
738	23.29739	36.10485	61.32773	23.04003	35.85813	61.10984	-0.257	-0.247	-0.218
739	21.01983	32.5682	55.3086	20.78536	32.34523	55.11508	-0.234	-0.223	-0.194
740	19.21315	29.76345	50.53633	18.99773	29.55983	50.36185	-0.215	-0.204	-0.174
741	17.82945	27.61575	46.88287	17.63129	27.42867	46.72266	-0.198	-0.187	-0.160
742	16.96082	26.26729	44.58874	16.77448	26.09132	44.43762	-0.186	-0.176	-0.151
743	16.09118	24.91773	42.29346	15.91552	24.75208	42.15135	-0.176	-0.166	-0.142
744	15.22935	23.58074	40.02016	15.06317	23.42449	39.88692	-0.166	-0.156	-0.133
745	14.50962	22.46413	38.12141	14.35098	22.31551	37.99567	-0.159	-0.149	-0.126
746	13.92255	21.55322	36.57228	13.76937	21.41042	36.45282	-0.153	-0.143	-0.119
747	13.44677	20.81483	35.31628	13.29843	20.67706	35.20198	-0.148	-0.138	-0.114
748	13.08185	20.24826	34.35221	12.93733	20.11447	34.242	-0.145	-0.134	-0.110
749	12.77039	19.76457	33.52893	12.62911	19.6342	33.42231	-0.141	-0.130	-0.107
750	12.49026	19.32947	32.78831	12.35203	19.20228	32.68496	-0.138	-0.127	-0.103
751	12.1835	18.8533	31.97826	12.04947	18.73005	31.87813	-0.134	-0.123	-0.100
752	11.85933	18.35029	31.12299	11.73037	18.23156	31.02596	-0.129	-0.119	-0.097
753	11.49464	17.7847	30.16176	11.37208	17.67136	30.06792	-0.123	-0.113	-0.094
754	11.1626	17.26981	29.28678	11.04533	17.16107	29.19592	-0.117	-0.109	-0.091
755	10.79192	16.69527	28.31086	10.6796	16.59102	28.22338	-0.112	-0.104	-0.087
756	10.39087	16.07389	27.25564	10.28299	15.97389	27.17191	-0.108	-0.100	-0.084
757	10.03444	15.52161	26.3177	9.930345	15.42529	26.23734	-0.104	-0.096	-0.080
758	9.717363	15.03035	25.48335	9.616232	14.93706	25.40609	-0.101	-0.093	-0.077
759	9.427989	14.58197	24.72186	9.329744	14.49157	24.6474	-0.098	-0.090	-0.074
760	9.156593	14.16148	24.00774	9.061064	14.07379	23.93589	-0.096	-0.088	-0.072
761	8.914923	13.78698	23.37167	8.82181	13.70171	23.30218	-0.093	-0.085	-0.069
762	8.705324	13.46216	22.81988	8.614234	13.37895	22.7525	-0.091	-0.083	-0.067
763	8.525318	13.18313	22.34586	8.436007	13.10175	22.28031	-0.089	-0.081	-0.066
764	8.364243	12.93344	21.92164	8.276752	12.85381	21.85768	-0.087	-0.080	-0.064
765	8.219761	12.70942	21.541	8.134227	12.63158	21.47839	-0.086	-0.078	-0.063
766	8.116084	12.54856	21.26744	8.032063	12.47208	21.20584	-0.084	-0.076	-0.062
767	8.006972	12.37933	20.97977	7.924328	12.30415	20.91927	-0.083	-0.075	-0.060
768	7.8944	12.20476	20.6831	7.81307	12.13087	20.62375	-0.081	-0.074	-0.059
769	7.777163	12.02301	20.37428	7.697268	11.95046	20.31606	-0.080	-0.073	-0.058
770	7.659592	11.84077	20.06464	7.581216	11.76961	20.00751	-0.078	-0.071	-0.057
771	7.543818	11.66131	19.75979	7.467071	11.59159	19.70369	-0.077	-0.070	-0.056

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
772	7.43131	11.4869	19.46355	7.356005	11.41851	19.40849	-0.075	-0.068	-0.055
773	7.317699	11.31085	19.16453	7.24368	11.2437	19.11054	-0.074	-0.067	-0.054
774	7.207879	11.14068	18.87548	7.135036	11.07467	18.82258	-0.073	-0.066	-0.053
775	7.097734	10.97003	18.58571	7.026159	10.90522	18.53383	-0.072	-0.065	-0.052
776	6.994135	10.80951	18.31312	6.923746	10.74583	18.26219	-0.070	-0.064	-0.051
777	6.878757	10.63079	18.00973	6.809952	10.56849	17.95974	-0.069	-0.062	-0.050
778	6.770963	10.46383	17.72631	6.70353	10.40276	17.67725	-0.067	-0.061	-0.049
779	6.669341	10.30643	17.45908	6.603082	10.24646	17.41092	-0.066	-0.060	-0.048
780	6.559929	10.13698	17.17149	6.494813	10.07811	17.12433	-0.065	-0.059	-0.047
781	6.450198	9.967085	16.88315	6.386312	9.909361	16.83695	-0.064	-0.058	-0.046
782	6.335802	9.789994	16.58269	6.273264	9.733488	16.53743	-0.063	-0.057	-0.045
783	6.209641	9.594722	16.25142	6.148837	9.539681	16.20707	-0.061	-0.055	-0.044
784	6.104669	9.432226	15.97572	6.045113	9.378309	15.93222	-0.060	-0.054	-0.044
785	5.994272	9.261363	15.68586	5.935844	9.208521	15.64332	-0.058	-0.053	-0.043
786	5.876053	9.078464	15.37568	5.818723	9.026704	15.33418	-0.057	-0.052	-0.041
787	5.78036	8.930363	15.12441	5.723953	8.879508	15.08377	-0.056	-0.051	-0.041
788	5.691226	8.7924	14.89037	5.635672	8.742386	14.85053	-0.056	-0.050	-0.040
789	5.601545	8.653593	14.6549	5.547034	8.604517	14.61579	-0.055	-0.049	-0.039
790	5.524349	8.534118	14.45218	5.470727	8.485853	14.41372	-0.054	-0.048	-0.038
791	5.446617	8.413807	14.24809	5.39381	8.366312	14.2103	-0.053	-0.047	-0.038
792	5.3727	8.299387	14.05397	5.320609	8.252596	14.01684	-0.052	-0.047	-0.037
793	5.30296	8.191458	13.87085	5.251602	8.145358	13.83433	-0.051	-0.046	-0.037
794	5.233089	8.083307	13.68741	5.182506	8.037924	13.65147	-0.051	-0.045	-0.036
795	5.165028	7.977943	13.5087	5.11532	7.933317	13.47328	-0.050	-0.045	-0.035
796	5.105127	7.885198	13.35139	5.056171	7.841232	13.31642	-0.049	-0.044	-0.035
797	5.040343	7.784954	13.18131	4.992095	7.741642	13.14688	-0.048	-0.043	-0.034
798	4.975011	7.683857	13.00987	4.927401	7.641164	12.97602	-0.048	-0.043	-0.034
799	4.909545	7.582554	12.83808	4.862617	7.540497	12.80477	-0.047	-0.042	-0.033
800	4.84391	7.481002	12.66587	4.797707	7.439605	12.63309	-0.046	-0.041	-0.033
801	4.775745	7.375563	12.48706	4.730392	7.334894	12.45476	-0.045	-0.041	-0.032
802	4.711392	7.276031	12.31825	4.666795	7.236028	12.28643	-0.045	-0.040	-0.032
803	4.646513	7.175668	12.14809	4.602602	7.136293	12.11679	-0.044	-0.039	-0.031
804	4.581074	7.074473	11.97652	4.537779	7.035694	11.94578	-0.043	-0.039	-0.031
805	4.5155	6.973072	11.8046	4.472866	6.934908	11.77438	-0.043	-0.038	-0.030
806	4.449783	6.871443	11.63231	4.407851	6.833916	11.6026	-0.042	-0.038	-0.030
807	4.38153	6.765908	11.45342	4.340426	6.729087	11.42417	-0.041	-0.037	-0.029
808	4.317106	6.666265	11.28454	4.276736	6.630087	11.25575	-0.040	-0.036	-0.029
809	4.252139	6.565805	11.1143	4.212435	6.530236	11.086	-0.040	-0.036	-0.028
810	4.186654	6.464551	10.94267	4.147547	6.429558	10.9149	-0.039	-0.035	-0.028
811	4.132245	6.380401	10.80003	4.0936	6.345875	10.77275	-0.039	-0.035	-0.027
812	4.077674	6.296021	10.65702	4.039534	6.26198	10.63018	-0.038	-0.034	-0.027
813	4.020582	6.207747	10.50739	3.98307	6.174261	10.48097	-0.038	-0.033	-0.026
814	3.96096	6.115565	10.35119	3.924203	6.082703	10.32513	-0.037	-0.033	-0.026

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
815	3.900806	6.022581	10.19363	3.864736	5.990308	10.16798	-0.036	-0.032	-0.026
816	3.840105	5.928766	10.0347	3.804657	5.897056	10.00949	-0.035	-0.032	-0.025
817	3.778885	5.834146	9.874372	3.74399	5.802965	9.849648	-0.035	-0.031	-0.025
818	3.728752	5.756642	9.743045	3.694277	5.725882	9.718746	-0.034	-0.031	-0.024
819	3.689716	5.696284	9.640744	3.655524	5.665834	9.616814	-0.034	-0.030	-0.024
820	3.648157	5.632026	9.531843	3.614372	5.601956	9.508241	-0.034	-0.030	-0.024
821	3.610952	5.574502	9.434325	3.577549	5.544782	9.411009	-0.033	-0.030	-0.023
822	3.57811	5.523688	9.348166	3.54506	5.49429	9.325105	-0.033	-0.029	-0.023
823	3.555958	5.489419	9.290006	3.52302	5.460185	9.26721	-0.033	-0.029	-0.023
824	3.526936	5.444532	9.213892	3.494261	5.415557	9.191352	-0.033	-0.029	-0.023
825	3.502262	5.406359	9.149153	3.469823	5.377615	9.126832	-0.032	-0.029	-0.022
826	3.482343	5.375507	9.096809	3.450219	5.347014	9.074604	-0.032	-0.028	-0.022
827	3.473133	5.361212	9.072493	3.441085	5.332812	9.050415	-0.032	-0.028	-0.022
828	3.450284	5.325868	9.01256	3.418569	5.297737	8.99062	-0.032	-0.028	-0.022
829	3.43381	5.300343	8.969242	3.402214	5.272354	8.947487	-0.032	-0.028	-0.022
830	3.417704	5.275401	8.926908	3.386332	5.247603	8.905276	-0.031	-0.028	-0.022
831	3.39671	5.242918	8.871806	3.365525	5.215312	8.850376	-0.031	-0.028	-0.021
832	3.38496	5.224722	8.840881	3.353972	5.197276	8.819534	-0.031	-0.027	-0.021
833	3.368338	5.198969	8.797177	3.337511	5.171685	8.775988	-0.031	-0.027	-0.021
834	3.35607	5.179934	8.764865	3.325377	5.152784	8.743801	-0.031	-0.027	-0.021
835	3.332534	5.143559	8.703187	3.302147	5.116663	8.682276	-0.030	-0.027	-0.021
836	3.30901	5.107158	8.6415	3.278929	5.080515	8.620735	-0.030	-0.027	-0.021
837	3.292238	5.081186	8.597456	3.262359	5.054724	8.576822	-0.030	-0.026	-0.021
838	3.279434	5.061343	8.563781	3.249627	5.034985	8.543312	-0.030	-0.026	-0.020
839	3.270982	5.048227	8.541456	3.24122	5.021945	8.521118	-0.030	-0.026	-0.020
840	3.264924	5.038795	8.525385	3.235128	5.012543	8.505195	-0.030	-0.026	-0.020
841	3.24562	5.008918	8.474746	3.216144	4.982906	8.454641	-0.029	-0.026	-0.020
842	3.226315	4.979049	8.424057	3.197159	4.953277	8.404037	-0.029	-0.026	-0.020
843	3.211359	4.955898	8.384782	3.182496	4.930337	8.364815	-0.029	-0.026	-0.020
844	3.191125	4.924602	8.33175	3.162416	4.899211	8.31198	-0.029	-0.025	-0.020
845	3.17526	4.900056	8.29009	3.146679	4.874806	8.270479	-0.029	-0.025	-0.020
846	3.150524	4.861818	8.225274	3.122165	4.836784	8.205871	-0.028	-0.025	-0.019
847	3.137427	4.841545	8.190856	3.109221	4.816649	8.171564	-0.028	-0.025	-0.019
848	3.117438	4.810636	8.13847	3.089528	4.785971	8.119279	-0.028	-0.025	-0.019
849	3.101436	4.785871	8.096463	3.073695	4.761362	8.077404	-0.028	-0.025	-0.019
850	3.07417	4.743742	8.025076	3.046767	4.719509	8.006172	-0.027	-0.024	-0.019
851	3.053253	4.711415	7.970277	3.025984	4.687341	7.951587	-0.027	-0.024	-0.019
852	3.032722	4.679678	7.9165	3.005687	4.655807	7.897954	-0.027	-0.024	-0.019
853	3.018565	4.657758	7.879328	2.991559	4.633976	7.860982	-0.027	-0.024	-0.018
854	3.006773	4.639479	7.84833	2.979949	4.615842	7.830055	-0.027	-0.024	-0.018
855	2.990078	4.61367	7.804593	2.963404	4.590182	7.786463	-0.027	-0.023	-0.018
856	2.97139	4.584754	7.75561	2.945039	4.561498	7.737536	-0.026	-0.023	-0.018
857	2.954697	4.558956	7.711885	2.928494	4.535846	7.693961	-0.026	-0.023	-0.018

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
858	2.942379	4.539896	7.679536	2.916297	4.516905	7.661725	-0.026	-0.023	-0.018
859	2.925151	4.513278	7.634423	2.899157	4.49041	7.616805	-0.026	-0.023	-0.018
860	2.905923	4.483565	7.584054	2.880193	4.460904	7.566536	-0.026	-0.023	-0.018
861	2.893453	4.464268	7.551322	2.867885	4.441744	7.533889	-0.026	-0.023	-0.017
862	2.880988	4.44498	7.518601	2.85558	4.422592	7.501249	-0.025	-0.022	-0.017
863	2.861238	4.414426	7.466857	2.836034	4.392223	7.449645	-0.025	-0.022	-0.017
864	2.841495	4.383904	7.415143	2.816494	4.361882	7.398072	-0.025	-0.022	-0.017
865	2.828508	4.363792	7.381069	2.803608	4.341882	7.364125	-0.025	-0.022	-0.017
866	2.804249	4.326323	7.317595	2.779617	4.304639	7.300802	-0.025	-0.022	-0.017
867	2.784358	4.295599	7.265508	2.759968	4.274112	7.248828	-0.024	-0.021	-0.017
868	2.764453	4.264843	7.213399	2.740304	4.24355	7.196835	-0.024	-0.021	-0.017
869	2.75528	4.250679	7.189326	2.731149	4.229445	7.172903	-0.024	-0.021	-0.016
870	2.734847	4.219093	7.135848	2.710899	4.198034	7.119583	-0.024	-0.021	-0.016
871	2.714412	4.187515	7.082363	2.690647	4.16663	7.066256	-0.024	-0.021	-0.016
872	2.694372	4.156547	7.029908	2.670885	4.135875	7.013882	-0.023	-0.021	-0.016
873	2.685059	4.142118	7.005503	2.661631	4.121521	6.989584	-0.023	-0.021	-0.016
874	2.662106	4.106659	6.945438	2.638972	4.086293	6.929625	-0.023	-0.020	-0.016
875	2.645522	4.081023	6.902002	2.622487	4.060778	6.886356	-0.023	-0.020	-0.016
876	2.629323	4.055997	6.859592	2.606482	4.035912	6.844043	-0.023	-0.020	-0.016
877	2.608225	4.0234	6.8044	2.585547	4.00348	6.789025	-0.023	-0.020	-0.015
878	2.585126	3.987695	6.743993	2.562782	3.968019	6.72869	-0.022	-0.020	-0.015
879	2.56839	3.96183	6.700163	2.546183	3.942293	6.685	-0.022	-0.020	-0.015
880	2.556035	3.942714	6.66776	2.53394	3.923285	6.652706	-0.022	-0.019	-0.015
881	2.538764	3.916046	6.622621	2.516749	3.896733	6.607755	-0.022	-0.019	-0.015
882	2.515123	3.879519	6.560824	2.493382	3.860428	6.546077	-0.022	-0.019	-0.015
883	2.498235	3.853463	6.516658	2.476673	3.834525	6.502022	-0.022	-0.019	-0.015
884	2.48573	3.83415	6.483883	2.464315	3.815335	6.469321	-0.021	-0.019	-0.015
885	2.46594	3.803586	6.432119	2.444717	3.784942	6.417691	-0.021	-0.019	-0.014
886	2.446129	3.773014	6.380339	2.425097	3.754539	6.366044	-0.021	-0.018	-0.014
887	2.433087	3.752847	6.346211	2.412149	3.734476	6.332034	-0.021	-0.018	-0.014
888	2.420052	3.732693	6.312094	2.399208	3.714426	6.298035	-0.021	-0.018	-0.014
889	2.411382	3.719295	6.289344	2.390606	3.701101	6.275369	-0.021	-0.018	-0.014
890	2.391442	3.688508	6.237222	2.370895	3.670498	6.223353	-0.021	-0.018	-0.014
891	2.37587	3.664446	6.196484	2.355528	3.646593	6.182681	-0.020	-0.018	-0.014
892	2.360302	3.640391	6.155752	2.340162	3.622693	6.142012	-0.020	-0.018	-0.014
893	2.339831	3.608764	6.102236	2.319864	3.591231	6.088646	-0.020	-0.018	-0.014
894	2.31935	3.577153	6.048741	2.299556	3.559783	6.035305	-0.020	-0.017	-0.013
895	2.291961	3.534872	5.977237	2.272475	3.517747	5.963929	-0.019	-0.017	-0.013
896	2.282621	3.520441	5.952775	2.263185	3.503383	5.93957	-0.019	-0.017	-0.013
897	2.262011	3.488623	5.898923	2.242785	3.471742	5.885838	-0.019	-0.017	-0.013
898	2.24537	3.462933	5.855447	2.226236	3.446167	5.842525	-0.019	-0.017	-0.013
899	2.229133	3.43786	5.812984	2.210183	3.421243	5.800144	-0.019	-0.017	-0.013
900	2.219279	3.422607	5.787135	2.200324	3.406039	5.774444	-0.019	-0.017	-0.013

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
901	2.207411	3.404269	5.756059	2.188614	3.38782	5.743418	-0.019	-0.016	-0.013
902	2.19064	3.378358	5.712246	2.171973	3.362039	5.699732	-0.019	-0.016	-0.013
903	2.171862	3.349351	5.663166	2.153489	3.333233	5.65068	-0.018	-0.016	-0.012
904	2.148191	3.312817	5.60134	2.130082	3.296909	5.588964	-0.018	-0.016	-0.012
905	2.128896	3.283029	5.550916	2.111024	3.267301	5.538621	-0.018	-0.016	-0.012
906	2.100306	3.238943	5.476303	2.082666	3.223432	5.464201	-0.018	-0.016	-0.012
907	2.076106	3.201609	5.413091	2.058674	3.186284	5.401148	-0.017	-0.015	-0.012
908	2.069936	3.192071	5.396918	2.052457	3.176763	5.385113	-0.017	-0.015	-0.012
909	2.063764	3.182535	5.380763	2.046237	3.167245	5.369093	-0.018	-0.015	-0.012
910	2.061971	3.179733	5.376001	2.044373	3.164433	5.364434	-0.018	-0.015	-0.012
911	2.053786	3.167097	5.35461	2.036304	3.151883	5.343075	-0.017	-0.015	-0.012
912	2.049989	3.161211	5.344634	2.032598	3.146057	5.333093	-0.017	-0.015	-0.012
913	2.046202	3.155326	5.334656	2.028902	3.14023	5.323109	-0.017	-0.015	-0.012
914	2.035103	3.138209	5.305645	2.017936	3.123218	5.294154	-0.017	-0.015	-0.011
915	2.024002	3.121077	5.276636	2.006968	3.106189	5.265198	-0.017	-0.015	-0.011
916	2.019688	3.114388	5.26529	2.002691	3.099541	5.253898	-0.017	-0.015	-0.011
917	2.015371	3.107694	5.253932	1.99841	3.092886	5.242585	-0.017	-0.015	-0.011
918	2.01105	3.101003	5.242588	1.994124	3.086235	5.231285	-0.017	-0.015	-0.011
919	2.006717	3.094307	5.231228	1.989827	3.079579	5.219968	-0.017	-0.015	-0.011
920	2.002388	3.087595	5.219847	1.985536	3.072907	5.208638	-0.017	-0.015	-0.011
921	1.998076	3.080899	5.208506	1.98126	3.066252	5.197339	-0.017	-0.015	-0.011
922	1.993739	3.074218	5.197142	1.97696	3.05961	5.186022	-0.017	-0.015	-0.011
923	1.978132	3.050139	5.156369	1.961547	3.035676	5.145306	-0.017	-0.014	-0.011
924	1.966902	3.032784	5.127015	1.950485	3.018438	5.115973	-0.016	-0.014	-0.011
925	1.955667	3.015419	5.097654	1.939419	3.001192	5.086632	-0.016	-0.014	-0.011
926	1.95081	3.007906	5.084919	1.934545	2.9937	5.073996	-0.016	-0.014	-0.011
927	1.945947	3.000401	5.072177	1.929665	2.986217	5.061351	-0.016	-0.014	-0.011
928	1.941089	2.992877	5.059441	1.92479	2.978714	5.048712	-0.016	-0.014	-0.011
929	1.947894	3.003355	5.077111	1.931512	2.98914	5.066388	-0.016	-0.014	-0.011
930	1.954712	3.013853	5.0948	1.938248	2.999586	5.084076	-0.016	-0.014	-0.011
931	1.947853	3.003248	5.076851	1.931532	2.98907	5.066114	-0.016	-0.014	-0.011
932	1.940995	2.992641	5.058917	1.924817	2.978552	5.048164	-0.016	-0.014	-0.011
933	1.934138	2.982034	5.040996	1.918102	2.968034	5.030225	-0.016	-0.014	-0.011
934	1.933645	2.981252	5.039652	1.917569	2.967247	5.028948	-0.016	-0.014	-0.011
935	1.921882	2.963082	5.008916	1.90592	2.949175	4.998282	-0.016	-0.014	-0.011
936	1.910118	2.944905	4.978168	1.894268	2.931097	4.967604	-0.016	-0.014	-0.011
937	1.910023	2.944757	4.977845	1.894221	2.930972	4.96726	-0.016	-0.014	-0.011
938	1.916314	2.954434	4.994164	1.900377	2.940582	4.983634	-0.016	-0.014	-0.011
939	1.904553	2.936278	4.963417	1.88873	2.922521	4.952956	-0.016	-0.014	-0.010
940	1.892787	2.918137	4.932674	1.877077	2.904479	4.922286	-0.016	-0.014	-0.010
941	1.8927	2.917997	4.932372	1.877038	2.904361	4.921962	-0.016	-0.014	-0.010
942	1.887699	2.910281	4.919272	1.872058	2.896681	4.908927	-0.016	-0.014	-0.010
943	1.880307	2.898867	4.899916	1.864753	2.885338	4.889607	-0.016	-0.014	-0.010

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
944	1.872913	2.887453	4.880584	1.857448	2.873996	4.870312	-0.015	-0.013	-0.010
945	1.872284	2.886485	4.878877	1.856816	2.873034	4.868633	-0.015	-0.013	-0.010
946	1.871673	2.885489	4.877186	1.856199	2.872047	4.86697	-0.015	-0.013	-0.010
947	1.853004	2.856667	4.828473	1.837772	2.843396	4.818299	-0.015	-0.013	-0.010
948	1.852383	2.855692	4.826808	1.837146	2.842428	4.816665	-0.015	-0.013	-0.010
949	1.851762	2.8547	4.825139	1.83652	2.841446	4.815025	-0.015	-0.013	-0.010
950	1.843844	2.842471	4.804447	1.828637	2.82927	4.79442	-0.015	-0.013	-0.010
951	1.84323	2.841488	4.802773	1.828019	2.828296	4.792778	-0.015	-0.013	-0.010
952	1.831323	2.823094	4.771685	1.81626	2.81001	4.761728	-0.015	-0.013	-0.010
953	1.835069	2.828848	4.781393	1.819978	2.815746	4.77143	-0.015	-0.013	-0.010
954	1.827538	2.817217	4.761693	1.81257	2.804196	4.751736	-0.015	-0.013	-0.010
955	1.819611	2.804995	4.740985	1.804679	2.792027	4.731116	-0.015	-0.013	-0.010
956	1.812087	2.793376	4.721273	1.797278	2.780488	4.711407	-0.015	-0.013	-0.010
957	1.810941	2.791589	4.718208	1.796076	2.778695	4.708426	-0.015	-0.013	-0.010
958	1.803405	2.779973	4.698528	1.788664	2.767159	4.688747	-0.015	-0.013	-0.010
959	1.802252	2.778183	4.69547	1.787455	2.765363	4.685771	-0.015	-0.013	-0.010
960	1.799096	2.773279	4.687177	1.784398	2.760512	4.677445	-0.015	-0.013	-0.010
961	1.797945	2.77148	4.684112	1.783193	2.758708	4.674464	-0.015	-0.013	-0.010
962	1.794787	2.766603	4.675852	1.780133	2.753881	4.666175	-0.015	-0.013	-0.010
963	1.793626	2.764799	4.672806	1.778916	2.752071	4.663209	-0.015	-0.013	-0.010
964	1.790464	2.759896	4.664495	1.775853	2.747221	4.654867	-0.015	-0.013	-0.010
965	1.782412	2.747468	4.643422	1.767872	2.734858	4.633848	-0.015	-0.013	-0.010
966	1.779269	2.742605	4.63516	1.764827	2.730047	4.625553	-0.014	-0.013	-0.010
967	1.771203	2.730165	4.614111	1.756832	2.717673	4.60456	-0.014	-0.012	-0.010
968	1.763153	2.71771	4.593063	1.748852	2.705283	4.583564	-0.014	-0.012	-0.009
969	1.755085	2.705274	4.572002	1.740857	2.692912	4.562563	-0.014	-0.012	-0.009
970	1.747027	2.692844	4.550956	1.732868	2.680545	4.541567	-0.014	-0.012	-0.009
971	1.745731	2.69083	4.547554	1.731553	2.678536	4.538218	-0.014	-0.012	-0.009
972	1.737676	2.678396	4.526482	1.723569	2.666167	4.517198	-0.014	-0.012	-0.009
973	1.733989	2.672698	4.516793	1.719928	2.660507	4.507529	-0.014	-0.012	-0.009
974	1.732703	2.670689	4.513367	1.718623	2.658503	4.504155	-0.014	-0.012	-0.009
975	1.717725	2.647576	4.474297	1.703841	2.635526	4.465108	-0.014	-0.012	-0.009
976	1.714042	2.641887	4.464667	1.700204	2.629872	4.455498	-0.014	-0.012	-0.009
977	1.717136	2.646625	4.472667	1.703256	2.63459	4.463512	-0.014	-0.012	-0.009
978	1.708536	2.633366	4.450217	1.694676	2.621381	4.441176	-0.014	-0.012	-0.009
979	1.69795	2.617017	4.422584	1.68426	2.605139	4.413532	-0.014	-0.012	-0.009
980	1.701033	2.621753	4.43057	1.687301	2.609853	4.421538	-0.014	-0.012	-0.009
981	1.704129	2.626498	4.438563	1.690353	2.61458	4.429544	-0.014	-0.012	-0.009
982	1.699909	2.619979	4.427532	1.686131	2.608083	4.418584	-0.014	-0.012	-0.009
983	1.689315	2.603643	4.39988	1.675707	2.591854	4.390922	-0.014	-0.012	-0.009
984	1.681111	2.590976	4.378467	1.667608	2.579262	4.369527	-0.014	-0.012	-0.009
985	1.688569	2.602455	4.39784	1.675	2.590693	4.388883	-0.014	-0.012	-0.009
986	1.684354	2.595938	4.386815	1.670782	2.584198	4.377931	-0.014	-0.012	-0.009

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
987	1.680137	2.589421	4.375766	1.666562	2.577702	4.366959	-0.014	-0.012	-0.009
988	1.676331	2.583519	4.365756	1.662835	2.57185	4.356934	-0.013	-0.012	-0.009
989	1.672496	2.57761	4.355757	1.659082	2.565989	4.34692	-0.013	-0.012	-0.009
990	1.668668	2.571691	4.345725	1.655333	2.560118	4.336872	-0.013	-0.012	-0.009
991	1.653157	2.547779	4.305309	1.639968	2.536325	4.296537	-0.013	-0.011	-0.009
992	1.642039	2.530646	4.276308	1.628968	2.519284	4.267578	-0.013	-0.011	-0.009
993	1.633302	2.51718	4.253498	1.620285	2.505878	4.244845	-0.013	-0.011	-0.009
994	1.624545	2.503692	4.230668	1.611584	2.492452	4.222092	-0.013	-0.011	-0.009
995	1.615815	2.490209	4.20785	1.60291	2.479029	4.199348	-0.013	-0.011	-0.009
996	1.611458	2.483487	4.196469	1.598584	2.472342	4.18801	-0.013	-0.011	-0.008
997	1.607111	2.47674	4.185078	1.594267	2.465631	4.176659	-0.013	-0.011	-0.008
998	1.602758	2.470013	4.173683	1.589946	2.458937	4.165303	-0.013	-0.011	-0.008
999	1.598411	2.463298	4.16232	1.58563	2.452257	4.153977	-0.013	-0.011	-0.008
1000	1.594076	2.456591	4.150953	1.581327	2.445583	4.142648	-0.013	-0.011	-0.008
1001	1.594107	2.456625	4.150952	1.581365	2.445625	4.142653	-0.013	-0.011	-0.008
1002	1.594137	2.456629	4.150969	1.5814	2.445635	4.142675	-0.013	-0.011	-0.008
1003	1.594153	2.456651	4.150969	1.581425	2.445666	4.142682	-0.013	-0.011	-0.008
1004	1.59417	2.456693	4.15099	1.58145	2.445714	4.142712	-0.013	-0.011	-0.008
1005	1.594192	2.456708	4.151023	1.581478	2.445738	4.142749	-0.013	-0.011	-0.008
1006	1.594205	2.456726	4.15105	1.581499	2.445761	4.142784	-0.013	-0.011	-0.008
1007	1.582938	2.43934	4.121689	1.570385	2.428477	4.11343	-0.013	-0.011	-0.008
1008	1.571671	2.421971	4.092306	1.55927	2.41121	4.084056	-0.012	-0.011	-0.008
1009	1.560406	2.404597	4.062911	1.548156	2.393937	4.054668	-0.012	-0.011	-0.008
1010	1.555529	2.397058	4.050169	1.543263	2.386421	4.042027	-0.012	-0.011	-0.008
1011	1.550648	2.389522	4.037412	1.538364	2.378905	4.029366	-0.012	-0.011	-0.008
1012	1.545766	2.381979	4.024647	1.533464	2.371383	4.016697	-0.012	-0.011	-0.008
1013	1.541274	2.375059	4.012902	1.529037	2.364506	4.004953	-0.012	-0.011	-0.008
1014	1.53679	2.368121	4.001192	1.524617	2.357612	3.993249	-0.012	-0.011	-0.008
1015	1.529888	2.357487	3.983199	1.517844	2.34705	3.975227	-0.012	-0.010	-0.008
1016	1.529387	2.35669	3.981856	1.517303	2.346249	3.973943	-0.012	-0.010	-0.008
1017	1.517581	2.338465	3.951055	1.5056	2.328113	3.943203	-0.012	-0.010	-0.008
1018	1.505767	2.320266	3.920285	1.493891	2.310003	3.912494	-0.012	-0.010	-0.008
1019	1.505652	2.320075	3.919945	1.493817	2.309828	3.912129	-0.012	-0.010	-0.008
1020	1.511934	2.329716	3.936223	1.499971	2.319406	3.928469	-0.012	-0.010	-0.008
1021	1.504517	2.318292	3.916845	1.492633	2.308042	3.909122	-0.012	-0.010	-0.008
1022	1.4971	2.306859	3.897502	1.485294	2.296672	3.889808	-0.012	-0.010	-0.008
1023	1.497001	2.30668	3.89719	1.485236	2.296509	3.889463	-0.012	-0.010	-0.008
1024	1.491983	2.298937	3.884058	1.480233	2.288799	3.876394	-0.012	-0.010	-0.008
1025	1.484576	2.287484	3.864701	1.472906	2.27741	3.857065	-0.012	-0.010	-0.008
1026	1.477155	2.276064	3.845365	1.465565	2.26605	3.837756	-0.012	-0.010	-0.008
1027	1.476524	2.275064	3.843679	1.464926	2.265054	3.8361	-0.012	-0.010	-0.008
1028	1.475894	2.274055	3.841979	1.464288	2.26405	3.834426	-0.012	-0.010	-0.008
1029	1.457158	2.245195	3.793194	1.445776	2.235342	3.785672	-0.011	-0.010	-0.008

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1030	1.456523	2.244194	3.791508	1.445135	2.234348	3.784011	-0.011	-0.010	-0.007
1031	1.455878	2.243204	3.789821	1.444483	2.233361	3.782353	-0.011	-0.010	-0.007
1032	1.447926	2.230942	3.769077	1.436562	2.22115	3.761693	-0.011	-0.010	-0.007
1033	1.447279	2.229952	3.767374	1.435908	2.220165	3.760018	-0.011	-0.010	-0.007
1034	1.435327	2.211533	3.736251	1.424092	2.201843	3.72892	-0.011	-0.010	-0.007
1035	1.439074	2.217277	3.745961	1.427808	2.207565	3.738622	-0.011	-0.010	-0.007
1036	1.43151	2.205606	3.726219	1.420358	2.195964	3.718874	-0.011	-0.010	-0.007
1037	1.423543	2.193349	3.705488	1.412422	2.183756	3.698227	-0.011	-0.010	-0.007
1038	1.415976	2.181675	3.685792	1.404969	2.172153	3.678522	-0.011	-0.010	-0.007
1039	1.41481	2.179881	3.682688	1.403748	2.170349	3.675499	-0.011	-0.010	-0.007
1040	1.407262	2.168233	3.66298	1.396311	2.158771	3.655786	-0.011	-0.009	-0.007
1041	1.406104	2.16644	3.659889	1.395098	2.156971	3.652779	-0.011	-0.009	-0.007
1042	1.402936	2.16154	3.651596	1.392017	2.152115	3.644446	-0.011	-0.009	-0.007
1043	1.390478	2.142324	3.619076	1.379648	2.132986	3.612011	-0.011	-0.009	-0.007
1044	1.387306	2.137412	3.610782	1.376565	2.128117	3.603675	-0.011	-0.009	-0.007
1045	1.374828	2.118168	3.578305	1.364174	2.10896	3.571282	-0.011	-0.009	-0.007
1046	1.378035	2.123108	3.586665	1.367305	2.11387	3.579691	-0.011	-0.009	-0.007
1047	1.369949	2.110651	3.565609	1.359283	2.101469	3.558684	-0.011	-0.009	-0.007
1048	1.36186	2.098166	3.544506	1.351258	2.089044	3.537631	-0.011	-0.009	-0.007
1049	1.36546	2.103699	3.553858	1.35486	2.094563	3.546944	-0.011	-0.009	-0.007
1050	1.357373	2.091238	3.532749	1.34684	2.08216	3.525881	-0.011	-0.009	-0.007
1051	1.353668	2.085513	3.523068	1.343175	2.076465	3.516217	-0.010	-0.009	-0.007
1052	1.345582	2.073024	3.501947	1.335153	2.064034	3.495139	-0.010	-0.009	-0.007
1053	1.341875	2.067307	3.492269	1.331487	2.05835	3.485476	-0.010	-0.009	-0.007
1054	1.340562	2.065319	3.48888	1.330153	2.056363	3.482137	-0.010	-0.009	-0.007
1055	1.325545	2.042171	3.449752	1.315317	2.033336	3.443023	-0.010	-0.009	-0.007
1056	1.321832	2.036451	3.440111	1.311647	2.027647	3.433399	-0.010	-0.009	-0.007
1057	1.324923	2.041191	3.44808	1.314693	2.032366	3.441387	-0.010	-0.009	-0.007
1058	1.316308	2.027894	3.425645	1.306096	2.019119	3.419058	-0.010	-0.009	-0.007
1059	1.3013	2.004767	3.386517	1.291269	1.996114	3.379945	-0.010	-0.009	-0.007
1060	1.304382	2.009478	3.394505	1.294308	2.000803	3.387945	-0.010	-0.009	-0.007
1061	1.307467	2.014222	3.402508	1.297349	2.005524	3.395964	-0.010	-0.009	-0.007
1062	1.303234	2.007702	3.391441	1.293111	1.999027	3.384967	-0.010	-0.009	-0.006
1063	1.292595	1.991327	3.363784	1.28263	1.982744	3.357291	-0.010	-0.009	-0.006
1064	1.284369	1.978613	3.342301	1.2745	1.970097	3.335819	-0.010	-0.009	-0.006
1065	1.280529	1.972689	3.3323	1.270734	1.964214	3.325797	-0.010	-0.008	-0.007
1066	1.276294	1.966161	3.321229	1.266494	1.957708	3.314799	-0.010	-0.008	-0.006
1067	1.272066	1.959635	3.310171	1.26226	1.951202	3.303813	-0.010	-0.008	-0.006
1068	1.274615	1.963544	3.316817	1.26472	1.95508	3.310533	-0.010	-0.008	-0.006
1069	1.270785	1.957618	3.306746	1.260962	1.949192	3.300441	-0.010	-0.008	-0.006
1070	1.266929	1.951701	3.296717	1.257179	1.943314	3.290392	-0.010	-0.008	-0.006
1071	1.263072	1.945765	3.286664	1.253396	1.937419	3.280318	-0.010	-0.008	-0.006
1072	1.251912	1.928557	3.257598	1.242347	1.920294	3.251286	-0.010	-0.008	-0.006

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1073	1.240758	1.911336	3.22856	1.231304	1.903158	3.222283	-0.009	-0.008	-0.006
1074	1.231996	1.897865	3.20573	1.222593	1.889741	3.199521	-0.009	-0.008	-0.006
1075	1.22324	1.884366	3.18294	1.213886	1.876298	3.176801	-0.009	-0.008	-0.006
1076	1.21887	1.877614	3.17154	1.209543	1.869576	3.165438	-0.009	-0.008	-0.006
1077	1.214494	1.87088	3.160132	1.205195	1.862871	3.154068	-0.009	-0.008	-0.006
1078	1.210124	1.864132	3.148725	1.200851	1.856154	3.142703	-0.009	-0.008	-0.006
1079	1.205744	1.857381	3.137303	1.196498	1.849435	3.131317	-0.009	-0.008	-0.006
1080	1.201376	1.850623	3.125922	1.192158	1.842707	3.119974	-0.009	-0.008	-0.006
1081	1.197011	1.843896	3.114541	1.187819	1.836008	3.10863	-0.009	-0.008	-0.006
1082	1.197026	1.843912	3.114544	1.187839	1.836028	3.108635	-0.009	-0.008	-0.006
1083	1.197044	1.843922	3.114558	1.187861	1.836044	3.10865	-0.009	-0.008	-0.006
1084	1.197059	1.843935	3.114593	1.18788	1.836063	3.108686	-0.009	-0.008	-0.006
1085	1.197072	1.843979	3.114606	1.187897	1.836108	3.108706	-0.009	-0.008	-0.006
1086	1.197086	1.843989	3.114625	1.187915	1.836123	3.108726	-0.009	-0.008	-0.006
1087	1.197101	1.844008	3.114622	1.187934	1.836145	3.108728	-0.009	-0.008	-0.006
1088	1.197114	1.84402	3.114632	1.187949	1.836161	3.108743	-0.009	-0.008	-0.006
1089	1.197128	1.844042	3.114653	1.187968	1.836185	3.108769	-0.009	-0.008	-0.006
1090	1.185829	1.826642	3.08524	1.176811	1.818876	3.079355	-0.009	-0.008	-0.006
1091	1.174535	1.809213	3.055845	1.165661	1.801539	3.049956	-0.009	-0.008	-0.006
1092	1.163244	1.791816	3.026408	1.154511	1.78423	3.020517	-0.009	-0.008	-0.006
1093	1.158339	1.784238	3.013629	1.149586	1.776675	3.007832	-0.009	-0.008	-0.006
1094	1.153428	1.776693	3.000844	1.144658	1.76915	2.995143	-0.009	-0.008	-0.006
1095	1.148527	1.769143	2.988095	1.139738	1.761621	2.982488	-0.009	-0.008	-0.006
1096	1.155334	1.779605	3.005784	1.146466	1.772036	3.000184	-0.009	-0.008	-0.006
1097	1.162131	1.790089	3.023428	1.153185	1.782472	3.017834	-0.009	-0.008	-0.006
1098	1.155217	1.779426	3.005407	1.146389	1.771872	2.999777	-0.009	-0.008	-0.006
1099	1.148301	1.768768	2.98738	1.139593	1.761279	2.981713	-0.009	-0.007	-0.006
1100	1.141401	1.758105	2.969371	1.13281	1.750679	2.963665	-0.009	-0.007	-0.006
1101	1.140895	1.757302	2.967999	1.132262	1.749871	2.962357	-0.009	-0.007	-0.006
1102	1.140385	1.756521	2.966626	1.131711	1.749085	2.961045	-0.009	-0.007	-0.006
1103	1.139866	1.755707	2.965264	1.131151	1.748267	2.959745	-0.009	-0.007	-0.006
1104	1.151052	1.772931	2.994365	1.142236	1.765415	2.988818	-0.009	-0.008	-0.006
1105	1.16225	1.790159	3.023449	1.153332	1.782568	3.017877	-0.009	-0.008	-0.006
1106	1.155336	1.779508	3.005462	1.146536	1.771981	2.999856	-0.009	-0.008	-0.006
1107	1.148417	1.768839	2.98748	1.139735	1.761377	2.981835	-0.009	-0.007	-0.006
1108	1.141501	1.758191	2.969462	1.132938	1.75079	2.963782	-0.009	-0.007	-0.006
1109	1.140989	1.757402	2.968111	1.132385	1.749996	2.962495	-0.009	-0.007	-0.006
1110	1.14048	1.756603	2.966778	1.131836	1.749193	2.961227	-0.009	-0.007	-0.006
1111	1.139975	1.755831	2.965447	1.131289	1.748417	2.959958	-0.009	-0.007	-0.005
1112	1.139845	1.755626	2.965118	1.131193	1.748224	2.959594	-0.009	-0.007	-0.006
1113	1.139722	1.755424	2.964774	1.131105	1.748034	2.959216	-0.009	-0.007	-0.006
1114	1.132822	1.744756	2.946728	1.124322	1.737429	2.941131	-0.008	-0.007	-0.006
1115	1.132305	1.743951	2.945387	1.123766	1.73662	2.939856	-0.009	-0.007	-0.006

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1116	1.131786	1.743167	2.944013	1.123206	1.735831	2.938544	-0.009	-0.007	-0.005
1117	1.119961	1.724934	2.913212	1.111478	1.717678	2.9078	-0.008	-0.007	-0.005
1118	1.11983	1.724748	2.912836	1.111383	1.717503	2.90739	-0.008	-0.007	-0.005
1119	1.119716	1.724552	2.912466	1.111304	1.717318	2.906987	-0.008	-0.007	-0.005
1120	1.123589	1.730522	2.922557	1.115114	1.723259	2.917103	-0.008	-0.007	-0.005
1121	1.127458	1.736487	2.932632	1.118919	1.729194	2.927203	-0.009	-0.007	-0.005
1122	1.115632	1.718243	2.901855	1.107188	1.711103	2.89648	-0.008	-0.007	-0.005
1123	1.115515	1.718049	2.901512	1.107106	1.710845	2.896106	-0.008	-0.007	-0.005
1124	1.115395	1.717858	2.90116	1.10702	1.710665	2.895724	-0.008	-0.007	-0.005
1125	1.11926	1.72383	2.911253	1.110823	1.716606	2.905844	-0.008	-0.007	-0.005
1126	1.123128	1.729793	2.92128	1.114629	1.722538	2.915904	-0.008	-0.007	-0.005
1127	1.115687	1.718328	2.901892	1.10726	1.711127	2.896539	-0.008	-0.007	-0.005
1128	1.115562	1.71813	2.901533	1.10717	1.710941	2.896148	-0.008	-0.007	-0.005
1129	1.115428	1.717931	2.901212	1.107071	1.710752	2.895792	-0.008	-0.007	-0.005
1130	1.119304	1.723895	2.911267	1.110884	1.716687	2.905876	-0.008	-0.007	-0.005
1131	1.123179	1.729846	2.921322	1.114696	1.722608	2.91596	-0.008	-0.007	-0.005
1132	1.115741	1.718389	2.901963	1.10733	1.711205	2.896625	-0.008	-0.007	-0.005
1133	1.115623	1.718191	2.901663	1.107246	1.711018	2.896289	-0.008	-0.007	-0.005
1134	1.115503	1.718001	2.901308	1.10716	1.71084	2.895899	-0.008	-0.007	-0.005
1135	1.119382	1.723939	2.911343	1.110976	1.716752	2.905964	-0.008	-0.007	-0.005
1136	1.111935	1.712452	2.891958	1.103601	1.705318	2.886599	-0.008	-0.007	-0.005
1137	1.104507	1.700998	2.872616	1.096245	1.693918	2.867279	-0.008	-0.007	-0.005
1138	1.104384	1.700801	2.872276	1.096157	1.693731	2.866905	-0.008	-0.007	-0.005
1139	1.110668	1.71047	2.88857	1.10232	1.703346	2.883265	-0.008	-0.007	-0.005
1140	1.103204	1.699014	2.869179	1.09493	1.691943	2.863896	-0.008	-0.007	-0.005
1141	1.095761	1.687549	2.849803	1.08756	1.680531	2.844542	-0.008	-0.007	-0.005
1142	1.100044	1.694113	2.860863	1.091854	1.68708	2.855537	-0.008	-0.007	-0.005
1143	1.106307	1.703767	2.877146	1.097997	1.696681	2.871891	-0.008	-0.007	-0.005
1144	1.098846	1.692269	2.857749	1.090609	1.685235	2.852514	-0.008	-0.007	-0.005
1145	1.091409	1.68082	2.83837	1.083243	1.67384	2.833158	-0.008	-0.007	-0.005
1146	1.095692	1.687387	2.849437	1.087538	1.68039	2.844158	-0.008	-0.007	-0.005
1147	1.106361	1.703808	2.877206	1.098063	1.69673	2.871961	-0.008	-0.007	-0.005
1148	1.098911	1.692349	2.857817	1.090685	1.685324	2.852593	-0.008	-0.007	-0.005
1149	1.091463	1.68087	2.838436	1.08331	1.6739	2.833233	-0.008	-0.007	-0.005
1150	1.095746	1.687443	2.849534	1.087603	1.680458	2.844262	-0.008	-0.007	-0.005
1151	1.095079	1.686426	2.847801	1.086928	1.679447	2.842556	-0.008	-0.007	-0.005
1152	1.087637	1.674945	2.828406	1.079558	1.668018	2.823184	-0.008	-0.007	-0.005
1153	1.080197	1.66345	2.809008	1.072189	1.656577	2.803807	-0.008	-0.007	-0.005
1154	1.090864	1.679893	2.836774	1.082713	1.67294	2.831608	-0.008	-0.007	-0.005
1155	1.09021	1.678891	2.835076	1.08205	1.671941	2.829935	-0.008	-0.007	-0.005
1156	1.082769	1.667425	2.815689	1.074681	1.660527	2.810568	-0.008	-0.007	-0.005
1157	1.087046	1.67398	2.826746	1.078968	1.667066	2.821557	-0.008	-0.007	-0.005
1158	1.086392	1.672973	2.82502	1.078305	1.666064	2.819859	-0.008	-0.007	-0.005

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1159	1.083338	1.668288	2.817064	1.075301	1.661407	2.81189	-0.008	-0.007	-0.005
1160	1.075889	1.656806	2.79769	1.067924	1.649978	2.792537	-0.008	-0.007	-0.005
1161	1.075239	1.655799	2.795989	1.067266	1.648975	2.790862	-0.008	-0.007	-0.005
1162	1.074589	1.654781	2.794285	1.066608	1.647963	2.789183	-0.008	-0.007	-0.005
1163	1.071527	1.650081	2.786344	1.063595	1.643289	2.781232	-0.008	-0.007	-0.005
1164	1.070878	1.649054	2.784622	1.062937	1.642267	2.779536	-0.008	-0.007	-0.005
1165	1.070223	1.648036	2.782889	1.062272	1.641251	2.77783	-0.008	-0.007	-0.005
1166	1.06717	1.643337	2.774919	1.059268	1.636579	2.769848	-0.008	-0.007	-0.005
1167	1.066521	1.642319	2.773187	1.058611	1.635564	2.768143	-0.008	-0.007	-0.005
1168	1.065871	1.641316	2.771485	1.057953	1.634564	2.766466	-0.008	-0.007	-0.005
1169	1.062814	1.636602	2.763521	1.054944	1.629878	2.758489	-0.008	-0.007	-0.005
1170	1.066557	1.642363	2.773272	1.058655	1.635615	2.768234	-0.008	-0.007	-0.005
1171	1.065908	1.641374	2.771571	1.057998	1.63463	2.766559	-0.008	-0.007	-0.005
1172	1.062855	1.636649	2.763579	1.054993	1.629933	2.758557	-0.008	-0.007	-0.005
1173	1.066581	1.642401	2.773295	1.058689	1.635663	2.768264	-0.008	-0.007	-0.005
1174	1.065932	1.641406	2.771581	1.058032	1.634671	2.766576	-0.008	-0.007	-0.005
1175	1.051556	1.619264	2.734179	1.043837	1.612637	2.729152	-0.008	-0.007	-0.005
1176	1.055287	1.625017	2.743862	1.047536	1.618368	2.738831	-0.008	-0.007	-0.005
1177	1.054632	1.623992	2.742178	1.046872	1.617347	2.737172	-0.008	-0.007	-0.005
1178	1.046668	1.611713	2.72146	1.038936	1.605115	2.716533	-0.008	-0.007	-0.005
1179	1.050411	1.617456	2.731129	1.042649	1.610835	2.726196	-0.008	-0.007	-0.005
1180	1.049749	1.616429	2.729368	1.041978	1.609811	2.724465	-0.008	-0.007	-0.005
1181	1.053503	1.622161	2.739073	1.0457	1.615524	2.73416	-0.008	-0.007	-0.005
1182	1.057256	1.627927	2.748771	1.049421	1.621267	2.743852	-0.008	-0.007	-0.005
1183	1.042868	1.605777	2.711329	1.035213	1.599225	2.706386	-0.008	-0.007	-0.005
1184	1.046609	1.611533	2.721025	1.038924	1.60496	2.716076	-0.008	-0.007	-0.005
1185	1.050354	1.617305	2.730741	1.042638	1.610709	2.725784	-0.008	-0.007	-0.005
1186	1.042388	1.60502	2.709996	1.0347	1.598471	2.70512	-0.008	-0.007	-0.005
1187	1.046113	1.61077	2.719705	1.038394	1.604199	2.714823	-0.008	-0.007	-0.005
1188	1.049856	1.616518	2.729401	1.042105	1.609925	2.724513	-0.008	-0.007	-0.005
1189	1.053611	1.622273	2.739142	1.045829	1.615656	2.734247	-0.008	-0.007	-0.005
1190	1.057335	1.62802	2.74885	1.049523	1.62138	2.74395	-0.008	-0.007	-0.005
1191	1.042947	1.605882	2.711453	1.035315	1.599348	2.70653	-0.008	-0.007	-0.005
1192	1.04669	1.611638	2.721185	1.039027	1.605082	2.716254	-0.008	-0.007	-0.005
1193	1.039104	1.599968	2.701456	1.031542	1.59347	2.696509	-0.008	-0.006	-0.005
1194	1.031109	1.587686	2.680705	1.023576	1.581235	2.675839	-0.008	-0.006	-0.005
1195	1.034842	1.59345	2.690414	1.027279	1.586976	2.685543	-0.008	-0.006	-0.005
1196	1.033671	1.591637	2.687321	1.026058	1.585161	2.682538	-0.008	-0.006	-0.005
1197	1.037415	1.59736	2.697026	1.029769	1.590866	2.692235	-0.008	-0.006	-0.005
1198	1.029826	1.585678	2.677273	1.022281	1.579242	2.672466	-0.008	-0.006	-0.005
1199	1.033575	1.591444	2.68702	1.025999	1.584986	2.682204	-0.008	-0.006	-0.005
1200	1.026001	1.579739	2.667284	1.018525	1.573339	2.66245	-0.007	-0.006	-0.005
1201	1.022412	1.57421	2.657941	1.014942	1.56783	2.653156	-0.007	-0.006	-0.005

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1202	1.01482	1.56251	2.638222	1.007451	1.556189	2.633414	-0.007	-0.006	-0.005
1203	1.013635	1.560698	2.63514	1.006217	1.554375	2.63042	-0.007	-0.006	-0.005
1204	1.021767	1.573213	2.656226	1.014296	1.566841	2.651468	-0.007	-0.006	-0.005
1205	1.020585	1.571383	2.65314	1.013063	1.565011	2.648473	-0.008	-0.006	-0.005
1206	1.02872	1.583907	2.674245	1.021145	1.577487	2.669541	-0.008	-0.006	-0.005
1207	1.021134	1.572236	2.654485	1.013659	1.565873	2.649765	-0.007	-0.006	-0.005
1208	1.029271	1.584741	2.67556	1.021742	1.578331	2.670801	-0.008	-0.006	-0.005
1209	1.021685	1.573061	2.655832	1.014255	1.566707	2.651052	-0.007	-0.006	-0.005
1210	1.01811	1.567545	2.646503	1.010686	1.56121	2.641769	-0.007	-0.006	-0.005
1211	1.014914	1.562622	2.638186	1.007567	1.556319	2.633396	-0.007	-0.006	-0.005
1212	1.013733	1.560799	2.635118	1.006336	1.554495	2.630417	-0.007	-0.006	-0.005
1213	1.010538	1.55588	2.626835	1.003218	1.549608	2.622081	-0.007	-0.006	-0.005
1214	1.009369	1.554065	2.62379	1.002	1.547793	2.619128	-0.007	-0.006	-0.005
1215	1.006177	1.549151	2.615471	0.998884	1.542909	2.610759	-0.007	-0.006	-0.005
1216	1.004987	1.547317	2.612362	0.997645	1.541076	2.607743	-0.007	-0.006	-0.005
1217	1.001792	1.542407	2.604062	0.994527	1.536196	2.599393	-0.007	-0.006	-0.005
1218	1.000602	1.540562	2.600975	0.993288	1.53435	2.596395	-0.007	-0.006	-0.005
1219	0.997406	1.535624	2.592623	0.990169	1.529444	2.587992	-0.007	-0.006	-0.005
1220	1.00062	1.54057	2.600966	0.99331	1.534365	2.596391	-0.007	-0.006	-0.005
1221	0.997429	1.535643	2.592656	0.990195	1.529469	2.588029	-0.007	-0.006	-0.005
1222	1.000642	1.540571	2.600982	0.993337	1.534372	2.59641	-0.007	-0.006	-0.005
1223	0.997452	1.53566	2.59267	0.990223	1.529492	2.588046	-0.007	-0.006	-0.005
1224	1.000669	1.5406	2.600985	0.993369	1.534406	2.596415	-0.007	-0.006	-0.005
1225	0.997481	1.535683	2.592694	0.990257	1.529518	2.58807	-0.007	-0.006	-0.005
1226	1.000692	1.540626	2.601009	0.993397	1.534434	2.59644	-0.007	-0.006	-0.005
1227	0.997494	1.535706	2.59265	0.990275	1.529545	2.588032	-0.007	-0.006	-0.005
1228	1.000703	1.540648	2.600939	0.993412	1.534464	2.596378	-0.007	-0.006	-0.005
1229	0.997512	1.535734	2.592656	0.990297	1.529579	2.588039	-0.007	-0.006	-0.005
1230	1.000724	1.540672	2.60097	0.993439	1.53449	2.596408	-0.007	-0.006	-0.005
1231	0.99753	1.535757	2.592635	0.990321	1.529607	2.588017	-0.007	-0.006	-0.005
1232	1.000743	1.5407	2.601009	0.993463	1.534523	2.596448	-0.007	-0.006	-0.005
1233	0.997554	1.53578	2.592732	0.99035	1.529634	2.588115	-0.007	-0.006	-0.005
1234	1.000768	1.540719	2.601067	0.993493	1.534548	2.596511	-0.007	-0.006	-0.005
1235	0.997565	1.535782	2.592748	0.990366	1.529641	2.588143	-0.007	-0.006	-0.005
1236	1.00078	1.540717	2.601099	0.993511	1.534552	2.596551	-0.007	-0.006	-0.005
1237	0.997591	1.535784	2.592796	0.990398	1.529649	2.588196	-0.007	-0.006	-0.005
1238	0.989468	1.523282	2.571709	0.982334	1.5172	2.567151	-0.007	-0.006	-0.005
1239	0.986278	1.518346	2.563377	0.979219	1.512293	2.558766	-0.007	-0.006	-0.005
1240	0.978157	1.505844	2.542294	0.971156	1.499841	2.537728	-0.007	-0.006	-0.005
1241	0.981369	1.510791	2.550634	0.974298	1.504762	2.546127	-0.007	-0.006	-0.005
1242	0.973255	1.498291	2.529484	0.96624	1.492312	2.52502	-0.007	-0.006	-0.004
1243	0.976461	1.50325	2.53781	0.969375	1.497247	2.533402	-0.007	-0.006	-0.004
1244	0.980063	1.508796	2.547127	0.972975	1.502777	2.542673	-0.007	-0.006	-0.004

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1245	0.971941	1.496307	2.525994	0.964911	1.49034	2.521582	-0.007	-0.006	-0.004
1246	0.973153	1.498146	2.529097	0.966175	1.492183	2.524601	-0.007	-0.006	-0.004
1247	0.965036	1.485671	2.508014	0.958115	1.47976	2.50356	-0.007	-0.006	-0.004
1248	0.972646	1.497377	2.527741	0.965632	1.491414	2.523313	-0.007	-0.006	-0.004
1249	0.964528	1.484872	2.506624	0.957573	1.478961	2.50224	-0.007	-0.006	-0.004
1250	0.960804	1.479121	2.496909	0.953885	1.473237	2.492534	-0.007	-0.006	-0.004
1251	0.964413	1.484678	2.506268	0.957491	1.478777	2.501847	-0.007	-0.006	-0.004
1252	0.960693	1.478935	2.496574	0.953807	1.473059	2.492161	-0.007	-0.006	-0.004
1253	0.968296	1.490627	2.516311	0.961317	1.4847	2.511922	-0.007	-0.006	-0.004
1254	0.960178	1.478123	2.495224	0.953257	1.472247	2.490881	-0.007	-0.006	-0.004
1255	0.956462	1.472386	2.485539	0.949576	1.466535	2.481206	-0.007	-0.006	-0.004
1256	0.960053	1.477924	2.494894	0.953166	1.472058	2.490517	-0.007	-0.006	-0.004
1257	0.956328	1.47216	2.485191	0.949477	1.466321	2.480826	-0.007	-0.006	-0.004
1258	0.963933	1.483881	2.504959	0.95699	1.477993	2.500617	-0.007	-0.006	-0.004
1259	0.960211	1.478166	2.495302	0.953302	1.472304	2.490968	-0.007	-0.006	-0.004
1260	0.956488	1.472407	2.485629	0.949614	1.466571	2.481302	-0.007	-0.006	-0.004
1261	0.960087	1.477947	2.494985	0.95321	1.472096	2.490612	-0.007	-0.006	-0.004
1262	0.956378	1.472214	2.485313	0.949536	1.466389	2.480951	-0.007	-0.006	-0.004
1263	0.952654	1.466486	2.475602	0.945848	1.460686	2.471249	-0.007	-0.006	-0.004
1264	0.948929	1.460742	2.4659	0.942157	1.454967	2.461556	-0.007	-0.006	-0.004
1265	0.945198	1.454998	2.456227	0.938462	1.44925	2.451893	-0.007	-0.006	-0.004
1266	0.943876	1.45299	2.452739	0.93712	1.447244	2.448458	-0.007	-0.006	-0.004
1267	0.940152	1.447272	2.443083	0.933432	1.441551	2.438811	-0.007	-0.006	-0.004
1268	0.936421	1.441533	2.433398	0.929736	1.435838	2.42914	-0.007	-0.006	-0.004
1269	0.9395	1.446266	2.441398	0.932773	1.44055	2.437156	-0.007	-0.006	-0.004
1270	0.935778	1.440538	2.431727	0.929085	1.434849	2.427495	-0.007	-0.006	-0.004
1271	0.932069	1.434801	2.422004	0.925411	1.429138	2.417785	-0.007	-0.006	-0.004
1272	0.935142	1.439522	2.429987	0.928443	1.43384	2.425787	-0.007	-0.006	-0.004
1273	0.931418	1.433773	2.420289	0.924754	1.428116	2.416095	-0.007	-0.006	-0.004
1274	0.932089	1.434793	2.421993	0.925438	1.429138	2.417772	-0.007	-0.006	-0.004
1275	0.935158	1.439518	2.429964	0.928467	1.433843	2.425762	-0.007	-0.006	-0.004
1276	0.931434	1.433771	2.420277	0.924778	1.428121	2.416087	-0.007	-0.006	-0.004
1277	0.932101	1.43479	2.421986	0.925457	1.42914	2.417775	-0.007	-0.006	-0.004
1278	0.935173	1.439519	2.429955	0.928487	1.43385	2.425759	-0.007	-0.006	-0.004
1279	0.931467	1.433772	2.420261	0.924815	1.428131	2.416076	-0.007	-0.006	-0.004
1280	0.932138	1.434808	2.421974	0.925498	1.429165	2.417769	-0.007	-0.006	-0.004
1281	0.935206	1.439564	2.429955	0.928525	1.433903	2.425771	-0.007	-0.006	-0.004
1282	0.931491	1.433845	2.420288	0.924844	1.428207	2.416112	-0.007	-0.006	-0.004
1283	0.932155	1.434861	2.422012	0.925521	1.429223	2.417812	-0.007	-0.006	-0.004
1284	0.935232	1.439593	2.430025	0.928559	1.433935	2.425841	-0.007	-0.006	-0.004
1285	0.931513	1.433875	2.420352	0.924875	1.428243	2.416178	-0.007	-0.006	-0.004
1286	0.932176	1.434915	2.422107	0.925551	1.429283	2.417906	-0.007	-0.006	-0.004
1287	0.935258	1.439639	2.430104	0.928592	1.433987	2.425925	-0.007	-0.006	-0.004

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1288	0.920202	1.416453	2.390969	0.913696	1.410902	2.386785	-0.007	-0.006	-0.004
1289	0.920872	1.417498	2.392673	0.914379	1.411948	2.388467	-0.006	-0.006	-0.004
1290	0.92395	1.422218	2.400675	0.917414	1.416649	2.396485	-0.007	-0.006	-0.004
1291	0.9153	1.408895	2.378183	0.908782	1.403371	2.374099	-0.007	-0.006	-0.004
1292	0.915976	1.409904	2.379909	0.90947	1.404381	2.3758	-0.007	-0.006	-0.004
1293	0.919063	1.414663	2.387894	0.912517	1.409121	2.383805	-0.007	-0.006	-0.004
1294	0.922125	1.419378	2.395823	0.915539	1.413816	2.391755	-0.007	-0.006	-0.004
1295	0.911464	1.402938	2.368104	0.905017	1.39745	2.363997	-0.006	-0.005	-0.004
1296	0.912142	1.40398	2.369816	0.905707	1.398492	2.365688	-0.006	-0.005	-0.004
1297	0.915209	1.408726	2.377787	0.908733	1.403217	2.373677	-0.006	-0.006	-0.004
1298	0.910948	1.402191	2.366716	0.904468	1.396705	2.362679	-0.006	-0.005	-0.004
1299	0.900276	1.385751	2.338965	0.893935	1.380339	2.334888	-0.006	-0.005	-0.004
1300	0.903367	1.390494	2.346998	0.896984	1.385063	2.342937	-0.006	-0.005	-0.004
1301	0.91085	1.401996	2.366438	0.904404	1.396522	2.362363	-0.006	-0.005	-0.004
1302	0.906596	1.395446	2.355354	0.900146	1.389996	2.351357	-0.006	-0.005	-0.004
1303	0.895928	1.379003	2.3276	0.889616	1.373627	2.323565	-0.006	-0.005	-0.004
1304	0.899015	1.383739	2.335603	0.892661	1.378341	2.331586	-0.006	-0.005	-0.004
1305	0.906496	1.395244	2.35502	0.90008	1.389801	2.350987	-0.006	-0.005	-0.004
1306	0.902234	1.388677	2.343953	0.895812	1.383258	2.339993	-0.006	-0.005	-0.004
1307	0.891574	1.372249	2.316244	0.88529	1.366904	2.312243	-0.006	-0.005	-0.004
1308	0.887709	1.366279	2.3062	0.881487	1.360965	2.302166	-0.006	-0.005	-0.004
1309	0.89519	1.377807	2.325632	0.888905	1.372448	2.321586	-0.006	-0.005	-0.004
1310	0.890925	1.371239	2.314586	0.884637	1.365903	2.310614	-0.006	-0.005	-0.004
1311	0.886665	1.36469	2.303519	0.880373	1.359377	2.299623	-0.006	-0.005	-0.004
1312	0.882821	1.358739	2.293519	0.87659	1.353455	2.289592	-0.006	-0.005	-0.004
1313	0.890277	1.370259	2.312888	0.883984	1.36493	2.308948	-0.006	-0.005	-0.004
1314	0.897733	1.381763	2.332292	0.891377	1.376391	2.32834	-0.006	-0.005	-0.004
1315	0.893479	1.375215	2.321247	0.88712	1.369863	2.317368	-0.006	-0.005	-0.004
1316	0.887206	1.36557	2.304936	0.880962	1.360266	2.300984	-0.006	-0.005	-0.004
1317	0.883348	1.359641	2.294888	0.877167	1.354363	2.290905	-0.006	-0.005	-0.004
1318	0.890816	1.371153	2.314235	0.884571	1.365833	2.310241	-0.006	-0.005	-0.004
1319	0.886567	1.364575	2.303166	0.880317	1.359277	2.299247	-0.006	-0.005	-0.004
1320	0.886734	1.364818	2.303495	0.880458	1.359517	2.299618	-0.006	-0.005	-0.004
1321	0.882867	1.358863	2.293431	0.876652	1.353592	2.289522	-0.006	-0.005	-0.004
1322	0.879011	1.352906	2.283389	0.872858	1.347665	2.279446	-0.006	-0.005	-0.004
1323	0.875144	1.346927	2.273331	0.869053	1.341716	2.269356	-0.006	-0.005	-0.004
1324	0.870884	1.340367	2.262301	0.864791	1.335179	2.258399	-0.006	-0.005	-0.004
1325	0.871027	1.340598	2.262629	0.864908	1.335407	2.258769	-0.006	-0.005	-0.004
1326	0.873565	1.344516	2.269256	0.867367	1.339302	2.265482	-0.006	-0.005	-0.004
1327	0.869708	1.338559	2.259175	0.863572	1.333376	2.255373	-0.006	-0.005	-0.004
1328	0.865842	1.332599	2.249123	0.859768	1.327446	2.245291	-0.006	-0.005	-0.004
1329	0.866389	1.333431	2.250539	0.860353	1.328282	2.246641	-0.006	-0.005	-0.004
1330	0.866538	1.333641	2.250897	0.860476	1.328491	2.247038	-0.006	-0.005	-0.004

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1331	0.866668	1.333855	2.25131	0.860581	1.328703	2.247489	-0.006	-0.005	-0.004
1332	0.869218	1.33777	2.25791	0.863054	1.332596	2.254173	-0.006	-0.005	-0.004
1333	0.865345	1.331836	2.247904	0.859242	1.32669	2.244137	-0.006	-0.005	-0.004
1334	0.865886	1.332654	2.24927	0.859822	1.32751	2.24544	-0.006	-0.005	-0.004
1335	0.866412	1.33346	2.250617	0.860387	1.32832	2.246724	-0.006	-0.005	-0.004
1336	0.866547	1.333689	2.250968	0.860497	1.328547	2.247114	-0.006	-0.005	-0.004
1337	0.8667	1.33392	2.251345	0.860624	1.328776	2.247534	-0.006	-0.005	-0.004
1338	0.869243	1.337851	2.257959	0.863089	1.332685	2.254234	-0.006	-0.005	-0.004
1339	0.865381	1.331873	2.247885	0.859287	1.326734	2.244132	-0.006	-0.005	-0.004
1340	0.865917	1.332697	2.249295	0.859863	1.327561	2.245477	-0.006	-0.005	-0.004
1341	0.866455	1.33352	2.250637	0.86044	1.328387	2.246754	-0.006	-0.005	-0.004
1342	0.855264	1.316285	2.221545	0.849346	1.311223	2.217684	-0.006	-0.005	-0.004
1343	0.844063	1.299037	2.192423	0.838243	1.294045	2.188587	-0.006	-0.005	-0.004
1344	0.835274	1.285489	2.169605	0.829501	1.28055	2.165833	-0.006	-0.005	-0.004
1345	0.837831	1.28944	2.176267	0.83198	1.28448	2.172579	-0.006	-0.005	-0.004
1346	0.844781	1.300107	2.194268	0.83883	1.295102	2.190633	-0.006	-0.005	-0.004
1347	0.851722	1.310784	2.212323	0.84567	1.305735	2.208743	-0.006	-0.005	-0.004
1348	0.852264	1.311608	2.213697	0.846252	1.306562	2.21005	-0.006	-0.005	-0.004
1349	0.852811	1.312449	2.215077	0.846836	1.307405	2.211367	-0.006	-0.005	-0.004
1350	0.853344	1.313272	2.216413	0.847409	1.30823	2.21264	-0.006	-0.005	-0.004
1351	0.842139	1.296005	2.187284	0.836303	1.291034	2.183534	-0.006	-0.005	-0.004
1352	0.835336	1.285558	2.169607	0.829575	1.280631	2.165848	-0.006	-0.005	-0.004
1353	0.830938	1.278797	2.15816	0.8252	1.273895	2.154434	-0.006	-0.005	-0.004
1354	0.826539	1.272033	2.146744	0.820825	1.267157	2.143054	-0.006	-0.005	-0.004
1355	0.833472	1.282693	2.164751	0.827659	1.277772	2.161114	-0.006	-0.005	-0.004
1356	0.840422	1.293358	2.182811	0.834508	1.288395	2.179224	-0.006	-0.005	-0.004
1357	0.847376	1.304079	2.20085	0.841363	1.299071	2.197317	-0.006	-0.005	-0.004
1358	0.8479	1.304899	2.202203	0.841927	1.29989	2.198604	-0.006	-0.005	-0.004
1359	0.84844	1.305712	2.203585	0.842506	1.300708	2.199923	-0.006	-0.005	-0.004
1360	0.848972	1.306519	2.204949	0.843077	1.301518	2.201224	-0.006	-0.005	-0.004
1361	0.842179	1.296082	2.187326	0.836359	1.291126	2.183589	-0.006	-0.005	-0.004
1362	0.835383	1.285613	2.169663	0.829638	1.280702	2.165917	-0.006	-0.005	-0.004
1363	0.830983	1.278842	2.158258	0.825262	1.273957	2.154546	-0.006	-0.005	-0.004
1364	0.826606	1.272094	2.14686	0.820907	1.267234	2.143183	-0.006	-0.005	-0.004
1365	0.822217	1.26534	2.135467	0.816541	1.260505	2.131824	-0.006	-0.005	-0.004
1366	0.817832	1.258601	2.124076	0.81218	1.253793	2.120466	-0.006	-0.005	-0.004
1367	0.813424	1.251825	2.112638	0.807797	1.247044	2.109061	-0.006	-0.005	-0.004
1368	0.809031	1.245075	2.101227	0.803427	1.240319	2.097682	-0.006	-0.005	-0.004
1369	0.804641	1.238314	2.089825	0.799059	1.233586	2.086313	-0.006	-0.005	-0.004
1370	0.800241	1.231514	2.078391	0.794683	1.226815	2.074913	-0.006	-0.005	-0.003
1371	0.800247	1.231494	2.078369	0.79469	1.226799	2.074893	-0.006	-0.005	-0.003
1372	0.800235	1.231502	2.078367	0.79468	1.226807	2.074894	-0.006	-0.005	-0.003
1373	0.800255	1.231505	2.07834	0.794701	1.226812	2.074867	-0.006	-0.005	-0.003

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1374	0.800258	1.231503	2.078295	0.794706	1.226809	2.074827	-0.006	-0.005	-0.003
1375	0.811606	1.248966	2.107764	0.805933	1.244203	2.104315	-0.006	-0.005	-0.003
1376	0.811603	1.248974	2.10777	0.805932	1.244211	2.10432	-0.006	-0.005	-0.003
1377	0.811618	1.248984	2.107814	0.805949	1.244224	2.104363	-0.006	-0.005	-0.003
1378	0.816572	1.256571	2.120611	0.810918	1.251789	2.117064	-0.006	-0.005	-0.004
1379	0.827904	1.27404	2.150109	0.82213	1.269189	2.146583	-0.006	-0.005	-0.004
1380	0.83926	1.291519	2.179554	0.833366	1.286597	2.17605	-0.006	-0.005	-0.004
1381	0.821119	1.26357	2.132384	0.815421	1.258765	2.128851	-0.006	-0.005	-0.004
1382	0.826068	1.271164	2.145181	0.820385	1.266336	2.14155	-0.006	-0.005	-0.004
1383	0.833394	1.282463	2.164243	0.827676	1.277593	2.160559	-0.006	-0.005	-0.004
1384	0.833004	1.281864	2.163285	0.827226	1.276991	2.159708	-0.006	-0.005	-0.004
1385	0.814862	1.253925	2.116156	0.80928	1.249165	2.11255	-0.006	-0.005	-0.004
1386	0.810466	1.247145	2.104734	0.804908	1.242412	2.101159	-0.006	-0.005	-0.004
1387	0.806457	1.240994	2.094376	0.800984	1.236291	2.090725	-0.005	-0.005	-0.004
1388	0.797132	1.226658	2.070169	0.791667	1.222005	2.066653	-0.005	-0.005	-0.004
1389	0.778992	1.198748	2.023003	0.773724	1.194208	2.019459	-0.005	-0.005	-0.004
1390	0.76967	1.184376	1.998746	0.76441	1.179888	1.995335	-0.005	-0.004	-0.003
1391	0.776479	1.194877	2.016458	0.771149	1.190347	2.013058	-0.005	-0.005	-0.003
1392	0.767149	1.18053	1.992211	0.761827	1.176053	1.988946	-0.005	-0.004	-0.003
1393	0.767165	1.180525	1.992217	0.761846	1.17605	1.988954	-0.005	-0.004	-0.003
1394	0.773959	1.191007	2.009849	0.768567	1.186493	2.0066	-0.005	-0.005	-0.003
1395	0.778367	1.197769	2.021283	0.772956	1.19323	2.018003	-0.005	-0.005	-0.003
1396	0.782769	1.204568	2.032697	0.777337	1.200005	2.029385	-0.005	-0.005	-0.003
1397	0.782791	1.204575	2.032676	0.777359	1.200012	2.029364	-0.005	-0.005	-0.003
1398	0.787202	1.211333	2.044089	0.781749	1.206748	2.040745	-0.005	-0.005	-0.003
1399	0.791595	1.218111	2.055534	0.786123	1.213502	2.052162	-0.005	-0.005	-0.003
1400	0.796007	1.224887	2.067009	0.790514	1.220254	2.063601	-0.005	-0.005	-0.003
1401	0.796015	1.224876	2.06701	0.790524	1.220245	2.063603	-0.005	-0.005	-0.003
1402	0.800433	1.231652	2.078461	0.794921	1.226998	2.075021	-0.006	-0.005	-0.003
1403	0.800431	1.231649	2.078505	0.79492	1.226996	2.075066	-0.006	-0.005	-0.003
1404	0.80044	1.231661	2.07853	0.79493	1.227008	2.07509	-0.006	-0.005	-0.003
1405	0.800452	1.231671	2.07852	0.794945	1.227021	2.075082	-0.006	-0.005	-0.003
1406	0.789111	1.214216	2.049077	0.783726	1.209635	2.045623	-0.005	-0.005	-0.003
1407	0.777769	1.196781	2.019605	0.772505	1.192272	2.016135	-0.005	-0.005	-0.003
1408	0.766417	1.179331	1.990128	0.761275	1.174891	1.986641	-0.005	-0.004	-0.003
1409	0.761495	1.171762	1.977352	0.756341	1.167348	1.973966	-0.005	-0.004	-0.003
1410	0.756572	1.164196	1.964541	0.751405	1.159807	1.961254	-0.005	-0.004	-0.003
1411	0.751646	1.156629	1.951765	0.746465	1.152266	1.948577	-0.005	-0.004	-0.003
1412	0.758449	1.16712	1.969399	0.753198	1.162717	1.966225	-0.005	-0.004	-0.003
1413	0.765263	1.177598	1.987092	0.759941	1.173154	1.983927	-0.005	-0.004	-0.003
1414	0.769667	1.184366	1.998508	0.764325	1.1799	1.99531	-0.005	-0.004	-0.003
1415	0.774069	1.191121	2.009952	0.768707	1.186633	2.00672	-0.005	-0.004	-0.003
1416	0.767127	1.180437	1.991958	0.761865	1.175996	1.988675	-0.005	-0.004	-0.003

Time (Min)	Existing Conditions			Proposed Conditions			Difference		
	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)	2-Year (CFS)	10-Year (CFS)	100-Year (CFS)
1417	0.760195	1.169747	1.973924	0.755031	1.165351	1.97059	-0.005	-0.004	-0.003
1418	0.753269	1.159056	1.955945	0.748204	1.154702	1.952558	-0.005	-0.004	-0.003
1419	0.752742	1.158256	1.954571	0.747642	1.153903	1.951252	-0.005	-0.004	-0.003
1420	0.75221	1.157442	1.953189	0.747076	1.153091	1.949938	-0.005	-0.004	-0.003
1421	0.751695	1.156649	1.951832	0.746527	1.152301	1.94865	-0.005	-0.004	-0.003
1422	0.758506	1.167122	1.969456	0.753267	1.162734	1.966289	-0.005	-0.004	-0.003
1423	0.765318	1.177599	1.987166	0.760008	1.173172	1.984013	-0.005	-0.004	-0.003
1424	0.758377	1.166916	1.969122	0.753167	1.162534	1.965917	-0.005	-0.004	-0.003
1425	0.751444	1.156232	1.951079	0.746334	1.151894	1.947823	-0.005	-0.004	-0.003
1426	0.744499	1.145544	1.933057	0.739491	1.14125	1.929749	-0.005	-0.004	-0.003
1427	0.743984	1.144759	1.931685	0.73894	1.140465	1.928444	-0.005	-0.004	-0.003
1428	0.743449	1.143963	1.930279	0.738371	1.139671	1.927108	-0.005	-0.004	-0.003
1429	0.742926	1.143156	1.928909	0.737812	1.138865	1.925804	-0.005	-0.004	-0.003
1430	0.754144	1.160416	1.958005	0.748938	1.156063	1.954881	-0.005	-0.004	-0.003
1431	0.754007	1.160193	1.95768	0.748828	1.155843	1.954514	-0.005	-0.004	-0.003
1432	0.74707	1.149507	1.939682	0.741991	1.145202	1.936462	-0.005	-0.004	-0.003
1433	0.740131	1.138821	1.921646	0.735151	1.134562	1.918375	-0.005	-0.004	-0.003
1434	0.7396	1.138004	1.920283	0.734585	1.133747	1.917078	-0.005	-0.004	-0.003
1435	0.739081	1.137219	1.918936	0.734032	1.132962	1.915798	-0.005	-0.004	-0.003
1436	0.738559	1.136389	1.917575	0.733474	1.132135	1.9145	-0.005	-0.004	-0.003
1437	0.738433	1.136174	1.917215	0.733375	1.131924	1.914102	-0.005	-0.004	-0.003
1438	0.738308	1.135973	1.916838	0.733279	1.131727	1.913691	-0.005	-0.004	-0.003
1439	0.735775	1.13207	1.910296	0.730822	1.127841	1.907062	-0.005	-0.004	-0.003
1440	0.735255	1.131252	1.908935	0.730267	1.127025	1.90577	-0.005	-0.004	-0.003
1441	0.712033	1.095518	1.848646	0.70725	1.091426	1.845507	-0.005	-0.004	-0.003
1442	0.666116	1.024884	1.72942	0.661775	1.021063	1.726264	-0.004	-0.004	-0.003
1443	0.609246	0.937379	1.581757	0.605527	0.933899	1.578453	-0.004	-0.003	-0.003
1444	0.542508	0.834694	1.408497	0.539383	0.831607	1.405246	-0.003	-0.003	-0.003
1445	0.463505	0.713129	1.203349	0.460998	0.710502	1.200306	-0.003	-0.003	-0.003
1446	0.374635	0.576393	0.972607	0.372717	0.574276	0.969969	-0.002	-0.002	-0.003
1447	0.294979	0.453836	0.765815	0.293529	0.452173	0.763639	-0.001	-0.002	-0.002
1448	0.228939	0.352229	0.594367	0.227813	0.350938	0.592679	-0.001	-0.001	-0.002
1449	0.171704	0.264175	0.445772	0.17086	0.263207	0.444507	-0.001	-0.001	-0.001
1450	0.123273	0.189669	0.320041	0.122667	0.188973	0.319133	-0.001	-0.001	-0.001
1451	0.083651	0.12871	0.217175	0.08324	0.128238	0.216559	0.000	0.000	-0.001
1452	0.052832	0.081286	0.137161	0.052572	0.080988	0.136772	0.000	0.000	0.000
1453	0.026416	0.040643	0.06858	0.026286	0.040494	0.068386	0.000	0.000	0.000
1454	0.008806	0.013548	0.022852	0.008763	0.013498	0.022788	0.000	0.000	0.000

STORM SEWER COMPUTATIONS
RATIONAL METHOD - (Q=CIA)
25 YR. STORM

Project: West Orange Plaza
By: SPD

PIPE SEGMENT														
FROM	TO	A-Incremental	C-Runoff Coef.	AxC-Incremental	Tc (MIN.)	I-Rainfall Int. (in./hr)	Qp-Peak Runoff (cfs)	Qp-Peak Runoff (cfs) (Cumulative)	Pipe/Box Length (FT.)	Slope (%)	Pipe/Box Size (IN.)	Capacity (FULL) (cfs)	Velocity (Design) (fps)	Pipe Travel Time(min)
Roof "D"	Type "B" #7-3	0.161	0.96	0.155	10.0	5.5	0.85	0.85		2.0%	8" PVC	2.03	5.80	0.00
Type "B" #7-3	Type "B" #7-2	0.076	0.96	0.073	10.0	5.6	0.41	1.26	64	1.5%	18" HDPE	16.77	9.49	0.11
Type "B" #7-2	Type "B" #7-1	0.370	0.96	0.355	10.0	5.6	1.99	3.25	60	1.5%	18" HDPE	16.77	9.49	0.11
Type "B" #7-1	Ex. Type "E" #1	0.420	0.96	0.403	10.0	5.6	2.26	5.51	60	2.0%	18" HDPE	19.36	10.96	0.09
Ex. Type "E" #1	Type "E" #5-1	0.979	0.96	0.940	10.0	5.6	5.26	10.77	60	3.5%	18" HDPE	25.62	14.50	0.07
Type "B" #5-5	Type "B" #5-4	0.431	0.96	0.414	10.0	5.6	2.32	2.32	23	2.5%	15" HDPE	13.31	10.85	0.04
Type "B" #5-4	Type "B" #5-3	0.156	0.96	0.150	10.0	5.6	0.84	3.16	18	2.5%	15" HDPE	13.31	10.85	0.03
Type "B" #5-3	Type "B" #5-2	0.087	0.96	0.084	10.0	5.6	0.47	3.62	151	2.5%	15" HDPE	13.31	10.85	0.23
Type "B" #5-2A	Type "B" #5-2	1.303	0.96	1.251	10.0	5.6	7.00	7.00	42	2.0%	15" HDPE	11.91	9.70	0.07
Type "B" #5-2	Type "E" #5-1	0.123	0.96	0.118	10.0	5.6	0.66	11.29	85	2.5%	18" HDPE	21.65	12.25	0.12
Type "E" #5-1	Ex. Type "E" #2	0.18	0.96	0.173	10.0	5.6	0.97	23.03	220	1.5%	24" HDPE	36.12	11.50	0.32
Ex. Type "E" #2	Type "E" #6-1	0.223	0.96	0.214	10.0	5.6	1.20	24.22	186	3.5%	24" RCP	50.15	15.96	0.19
Type "B" #6-2	Type "E" #6-1	1.814	0.96	1.741	10.0	5.6	9.75	9.75	193	2.0%	15" HDPE	11.91	9.70	0.33
Main Roof "A"	Type "E" #6-1	3.374	0.99	3.340	10.0	5.6	18.71	18.71						
Type "E" #6-1	Type "E" #1-1	0	0.96	0.000	10.0	5.6	0.00	52.68	200	3.5%	24" HDPE	55.48	17.66	0.19

FROM	TO	A-Incremental	C-Runoff Coef.	AxC-Incremental	Tc (MIN.)	I-Rainfall Int. (in./hr)	Qp-Peak Runoff (cfs)	Qp-Peak Runoff (cfs) (Cumulative)	Pipe/Box Length (FT.)	Slope (%)	Pipe/Box Size (IN.)	Capacity (FULL) (cfs)	Velocity (Design) (fps)	Pipe Travel Time(min)
Type "B" #1-3	Type "B" #1-2	0.075	0.96	0.072	10.0	5.6	0.40	0.40	27	1.0%	12" HDPE	4.64	5.91	0.08
Type "B" #1-2	Type "E" #1-1	0.094	0.96	0.090	10.0	5.6	0.51	0.91	22	1.0%	12" HDPE	4.64	5.91	0.06
Area Roof A	Type "E" #1-1	0.359	0.99	0.355	10.0	5.6	1.99	1.99		2.0%	8" PVC	2.03	5.80	0.00
Type "E" #1-1	Type "B" #4-1	0	0.96	0.000	10.0	5.6	0.00	55.58	12	4.0%	24" HDPE	58.98	18.77	0.01
Type "B" #4-2	Type "B" #4-1	0.058	0.96	0.056	10.0	5.6	0.31	0.31	12	2.0%	15" HDPE	11.91	9.70	0.02
Type "B" #4-1	Ex. Type "E" #3	0.466	0.96	0.447	10.0	5.6	2.51	58.40	25	4.0%	24" HDPE	58.98	18.77	0.02
Type "B" #13-6	Type "B" #13-5	0.812	0.96	0.780	10.0	5.6	4.37	4.37	25	3.5%	15" RCP	13.13	10.70	0.04
Type "B" #13-5	Type "B" #13-4	0.349	0.96	0.335	10.0	5.6	1.88	6.24	25	2.0%	15" RCP	9.92	8.09	0.05
Type "B" #13-4	Type "B" #13-3	0.082	0.96	0.079	10.0	5.6	0.44	6.68	25	2.0%	15" RCP	9.92	8.09	0.05
Trench Drains	Type "B" #13-3	0.399	0.96	0.383	10.0	5.6	2.15	2.15	25	2.0%	15" RCP	9.92	8.09	0.05
Type "B" #13-3	Type "B" #13-2	0.075	0.96	0.072	10.0	5.6	0.40	9.23	25	2.0%	15" RCP	9.92	8.09	0.05
Type "B" #13-2	Ex. Type "A" #4	0.113	0.96	0.108	10.0	5.6	0.61	9.84	25	1.0%	18" RCP	11.41	6.46	0.06
Ex. Type "A" #4	Ex. Type "E" #3	0.028	0.96	0.027	10.0	5.6	0.15	9.99	25	1.5%	18" RCP	13.97	7.91	0.05
Main Roof "B"	Ex. Type "E" #3	0.472	0.99	0.467	10.0	5.6	2.62	2.62						
Ex. Type "E" #3	Outfall #1	0.062	0.96	0.060	10.0	5.6	0.33	71.34	25	2.0%	30" HDPE	75.61	15.40	0.03

FROM	TO	A-Incremental	C-Runoff Coef.	AxC-Incremental	Tc (MIN.)	I-Rainfall Int. (in./hr)	Qp-Peak Runoff (cfs)	Qp-Peak Runoff (cfs) (Cumulative)	Pipe/Box Length (FT.)	Slope (%)	Pipe/Box Size (IN.)	Capacity (FULL) (cfs)	Velocity (Design) (fps)	Pipe Travel Time(min)
Type "E" #2-3	Type "E" #2-2	0.068	0.96	0.065	10.0	5.6	0.37	0.37		1.0%	12" HDPE	4.64	5.91	0.00
Roof Area Mavis	Type "E" #2-2	0.176	0.99	0.174	10.0	5.6	0.98	0.98		2.0%	8" PVC	2.03	5.80	0.00
Roof Area B	Type "E" #2-2	0.185	0.99	0.183	10.0	5.6	1.03	1.03	49	2.0%	8" PVC	2.03	5.80	0.14
Type "E" #2-2	MH #2-1	0.121	0.96	0.116	10.0	5.6	0.65	3.02	49	1.0%	12" HDPE	4.64	5.91	0.14
Prospect Avenue	MH #9-1	4.59	0.53	2.433	15.0	4.6	11.19	11.19						
Type "B" #9-2	MH #9-1	0.824	0.96	0.791	10.0	5.6	4.43	15.62	224	2.0%	15" HDPE	11.91	9.70	0.38
MH #9-1	Type "B" #8-2	0	0.96	0.000	10.0	5.6	0.00	26.81	224	1.1%	24" RCP	28.12	8.95	0.42

Type "B" #8-4	Type "B" #8-3	0.072	0.96	0.069	10.0	5.6	0.39	0.39	58	1.0%	15" HDPE	8.42	6.86	0.14
Type "B" #8-3	Type "B" #8-2	0.237	0.96	0.228	10.0	5.6	1.27	1.66	5	1.0%	15" HDPE	8.42	6.86	0.01
Type "B" #8-2	Type "B" #8-1	0.237	0.96	0.228	10.0	5.6	1.27	29.75	5	1.1%	24" RCP	SEE CALCULATION FOR CAPACITY WITH HEAD		
Type "B" #8-1	MH #2-1	0.315	0.96	0.302	10.0	5.6	1.69	31.44	60	1.1%	24" RCP			
MH #2-1	Outfall #2	0	0.96	0.000	10.0	5.6	0.00	34.46	202	1.1%	24" RCP			
Type "B" #10-7	Type "B" #10-6	0.574	0.96	0.551	10.0	5.6	3.09	3.09	51	1.0%	15" HDPE	8.42	6.86	0.12
Roof Area C	Type "B" #10-6	0.192	0.99	0.190	10.0	5.6	1.06	1.06		2.0%	8" PVC	2.03	5.80	0.00
Type "B" #10-6	Type "B" #10-5	0.021	0.96	0.020	10.0	5.6	0.11	4.26	103	4.0%	15" HDPE	16.84	13.72	0.13
Type "B" #10-5	Type "B" #10-4	0.173	0.96	0.166	10.0	5.6	0.93	5.19	24	4.0%	15" HDPE	16.84	13.72	0.03
Type "B" #10-4	MH #10-3	0.18	0.96	0.173	10.0	5.6	0.97	6.16	70	4.0%	15" HDPE	16.84	13.72	0.09
Type "B" #12-2	Type "B" #12-1	0.18	0.96	0.173	10.0	5.6	0.97	0.97	50	2.0%	15" HDPE	11.91	9.70	0.09
Type "B" #12-1	MH #10-3	0.149	0.96	0.143	10.0	5.6	0.80	1.77	58	2.0%	15" HDPE	11.91	9.70	0.10

FROM	TO	A-Incremental	C-Runoff Coef.	AxC-Incremental	Tc (MIN.)	I-Rainfall Int. (in./hr)	Qp-Peak Runoff (cfs)	Qp-Peak Runoff (cfs) (Cumulative)	Pipe/Box Length (FT.)	Slope (%)	Pipe/Box Size (IN.)	Capacity (FULL) (cfs)	Velocity (Design) (fps)	Pipe Travel Time(min)
MH #10-3	Type "B" #10-2	0	0.96	0.000	10.0	5.6	0.00	7.93	188	4.0%	15" HDPE	16.84	13.72	0.23
Type "B" #11-3	Type "B" #11-2	0.065	0.96	0.062	10.0	5.6	0.35	0.35	5	0.5%	15" HDPE	5.95	4.85	0.02
Type "B" #11-2	Type "B" #11-1	0.195	0.96	0.187	10.0	5.6	1.05	1.40	5	0.5%	15" HDPE	5.95	4.85	0.02
Type "B" #11-1	Type "B" #10-2	0.114	0.96	0.109	10.0	5.6	0.61	2.01	70	0.5%	15" HDPE	5.95	4.85	0.24
Type "B" #10-2	Type "E" #10-1	0.312	0.96	0.300	10.0	5.6	1.68	11.62	54	4.0%	15" HDPE	16.84	13.72	0.07

Capacity of 24" HDPE Pipe with Head

Knowns:

$$\rho = 62.4 \frac{lb}{ft^3}$$

$$g = 32.2 ft/s^2$$

$$h = 540.87 - 533.60 = 7.27 ft$$

$$D_h = 2 ft$$

$$v_{50} = 1.41 * 10^{-5}$$

$$L = 134 ft$$

$$A = \pi r^2 = \pi \left(\frac{D}{2}\right)^2 = \pi \left(\frac{2}{2}\right)^2 = 3.14 sf$$

Equations:

$$Q = VA$$

$$P_1 + \frac{1}{2}\rho V_1^2 + \rho gh_1 = P_2 + \frac{1}{2}\rho V_2^2 + \rho gh_2 + h_f$$

$$h_f = \frac{fLV^2}{2Dg}$$

$$f = \frac{0.316}{R_e^{0.25}}$$

$$R_e = \frac{D_h V}{v}$$

Solution:

$$R_e = \frac{D_h V}{v} = \frac{(2)V}{1.41 * 10^{-5}} = 141843.97 * V$$

$$f = \frac{0.316}{R_e^{0.25}} = \frac{0.316}{(141843.97 * V)^{0.25}} = \frac{0.0163}{V^{0.25}}$$

$$h_f = \frac{fLV^2}{2Dg} = \frac{\left(\frac{0.0163}{V^{0.25}}\right)(134)V^2}{(2)(2)(32.2)} = 0.017V^{1.75}$$

$$P_1 + \frac{1}{2}\rho V_1^2 + \rho gh_1 = P_2 + \frac{1}{2}\rho V_2^2 + \rho gh_2 + h_f$$

$$0 + 0 + 62.4 * 32.2 * 7.27 = 0 + \frac{1}{2}(62.4)V^2 + 0 + 0.017V^{1.75}$$

$$14607.47 = 31.2V^2 + 0.017V^{1.75}$$

$$V = 21.63 fps$$

$$Q = VA = 21.63 * 3.14 = \mathbf{67.92 cfs > 34.46 cfs at Outfall \#2}$$



Time of Concentration Calculations

Project #: 18-0078

Project: West Orange Plaza

County: Essex

Pre-Development ☐

Post-Development ☒

Drainage Area: Prospect/Eagle Rock Reservation

Sheet Flow

	Segment 1	Segment 2	Segment 3	
Surface Description (Table 3-1)	Woods, Light Underbrush			
Manning's Roughness Coeff., n (Table 3-1)	0.4		-	
Flow Length, L (total ≤ 100 ft)	100			
Two-Year 24-Hour Rainfall, P_2	3.44	3.44	3.44	
Land Slope, s (ft/ft)	0.07			
T_t	12.55		-	12.55

Shallow Concentrated Flow

	Segment 1	Segment 2	Segment 3	
Surface Description	Unpaved	Unpaved	Unpaved	
Flow Length, L	90	180	375	
Watercourse Slope, s	0.16	0.067	0.05	
Average Velocity	6.4	4.1	3.6	
T_t	0.23	0.73	1.76	2.72

Channel Flow

	Segment 1	Segment 2	Segment 3	
Cross Sectional Flow Area, a				
Wetted Perimeter, P_w				
Hydraulic Radius, r	-			
Channel Slope, s				
Manning's Roughness Description				
Manning's Roughness	-			
Velocity	-			
Flow Length				
T_t	-	-	-	0.00
				15.27



Time of Concentration Calculations

Project #: 18-0078

Project: West Orange Plaza

County: Essex

Pre-Development ☒

Post-Development ☐

Drainage Area: 1

Sheet Flow

	Segment 1	Segment 2	Segment 3	
Surface Description (Table 3-1)	Smooth Surfaces (Concrete, Asphalt, Gravel, or Bare Soil)			
Manning's Roughness Coeff., n (Table 3-1)	0.011	-	-	
Flow Length, L (total ≤ 100 ft)	100			
Two-Year 24-Hour Rainfall, P ₂	3.44	3.44	3.44	
Land Slope, s (ft/ft)	0.05			
T _t	0.81	-	-	0.81

Shallow Concentrated Flow

	Segment 1	Segment 2	Segment 3	
Surface Description	paved			
Flow Length, L	950			
Watercourse Slope, s	0.04			
Average Velocity	4.1		-	
T _t	3.90		-	3.90

Channel Flow

	Segment 1	Segment 2	Segment 3	
Cross Sectional Flow Area, a				
Wetted Perimeter, P _w				
Hydraulic Radius, r	-	-	-	
Channel Slope, s				
Manning's Roughness Description				
Manning's Roughness	-	-	-	
Velocity	-	-	-	
Flow Length				
T _t	-	-	-	0.00
				4.71



Time of Concentration Calculations

Project #: 18-0078

Project: West Orange Plaza

County: Essex

Pre-Development ☒

Post-Development ☐

Drainage Area: 2

Sheet Flow

	Segment 1	Segment 2	Segment 3	
Surface Description (Table 3-1)	Smooth Surfaces (Concrete, Asphalt, Grass, Dense Grasses Gravel, or Bare Soil)			
Manning's Roughness Coeff., n (Table 3-1)	0.24	0.011	-	
Flow Length, L (total ≤ 100 ft)	60	40		
Two-Year 24-Hour Rainfall, P ₂	3.44	3.44	3.44	
Land Slope, s (ft/ft)	0.06	0.06		
T _t	5.89	0.36	-	6.26

Shallow Concentrated Flow

	Segment 1	Segment 2	Segment 3	
Surface Description	paved	paved		
Flow Length, L	220	85		
Watercourse Slope, s	0.06	0.05		
Average Velocity	5.0	4.6		
T _t	0.73	0.31		1.05

Channel Flow

	Segment 1	Segment 2	Segment 3	
Cross Sectional Flow Area, a	0.7854	1.767	3.1416	
Wetted Perimeter, P _w	3.1416	4.712	6.283	
Hydraulic Radius, r	0.25	0.38	0.50	
Channel Slope, s	0.04	0.03	0.045	
Manning's Roughness Description	Corrugated metal Pipe	Corrugated metal Pipe	Corrugated metal Pipe	
Manning's Roughness	0.023	0.023	0.023	
Velocity	5.14	5.83	8.66	
Flow Length	180	130	810	
T _t	0.58	0.37	1.56	2.51
				9.82



Time of Concentration Calculations

Project #: 18-0078

Project: West Orange Plaza

County: Essex

Pre-Development ☐

Post-Development ☒

Drainage Area: 1

Sheet Flow

	Segment 1	Segment 2	Segment 3	
Surface Description (Table 3-1)	Smooth Surfaces (Concrete, Asphalt, Gravel, or Bare Soil)			
Manning's Roughness Coeff., n (Table 3-1)	0.011	-	-	
Flow Length, L (total ≤ 100 ft)	100			
Two-Year 24-Hour Rainfall, P ₂	3.44	3.44	3.44	
Land Slope, s (ft/ft)	0.04			
T _t	0.89	-	-	0.89

Shallow Concentrated Flow

	Segment 1	Segment 2	Segment 3	
Surface Description	paved			
Flow Length, L	380			
Watercourse Slope, s	0.04			
Average Velocity	4.1			
T _t	1.56			1.56

Channel Flow

	Segment 1	Segment 2	Segment 3	
Cross Sectional Flow Area, a	1.2272	1.2272		
Wetted Perimeter, P _w	3.927	3.927		
Hydraulic Radius, r	0.31	0.31		
Channel Slope, s	0.04	0.02		
Manning's Roughness Description	PVC Pipe	PVC Pipe		
Manning's Roughness	0.01	0.01		
Velocity	13.72	9.70		
Flow Length	95	250		
T _t	0.12	0.43		0.54
				2.99



Time of Concentration Calculations

Project #: 18-0078

Project: West Orange Plaza

County: Essex

Pre-Development ☐

Post-Development ☒

Drainage Area: 2

Sheet Flow

	Segment 1	Segment 2	Segment 3	
Surface Description (Table 3-1)	Smooth Surfaces (Concrete, Asphalt, Grass, Dense Grasses Gravel, or Bare Soil)			
Manning's Roughness Coeff., n (Table 3-1)	0.24	0.011	-	
Flow Length, L (total ≤ 100 ft)	60	40		
Two-Year 24-Hour Rainfall, P ₂	3.44	3.44	3.44	
Land Slope, s (ft/ft)	0.06	0.06		
T _t	5.89	0.36	-	6.26

Shallow Concentrated Flow

	Segment 1	Segment 2	Segment 3	
Surface Description	paved	paved	paved	
Flow Length, L	20	140	375	
Watercourse Slope, s	0.06	0.02	0.05	
Average Velocity	5.0	2.9	4.6	
T _t	0.07	0.82	1.37	2.26

Channel Flow

	Segment 1	Segment 2	Segment 3	
Cross Sectional Flow Area, a	1.2272	3.1416	3.1416	
Wetted Perimeter, P _w	3.927	6.283	6.283	
Hydraulic Radius, r	0.31	0.50	0.50	
Channel Slope, s	0.02	0.02	0.025	
Manning's Roughness Description	PVC Pipe	PVC Pipe	PVC Pipe	
Manning's Roughness	0.01	0.01	0.01	
Velocity	9.70	13.27	14.84	
Flow Length	70	695	345	
T _t	0.12	0.87	0.39	1.38
				9.89