PRELIMINARY DRAINAGE STUDY

FOR:

Pacific Industrial

(Sierra Hwy and Rancho Vista Bl)

IN THE CITY OF PALMDALE,

LOS ANGELES COUNTY

PREPARED BY:



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Submittal Date: 03/06/2025

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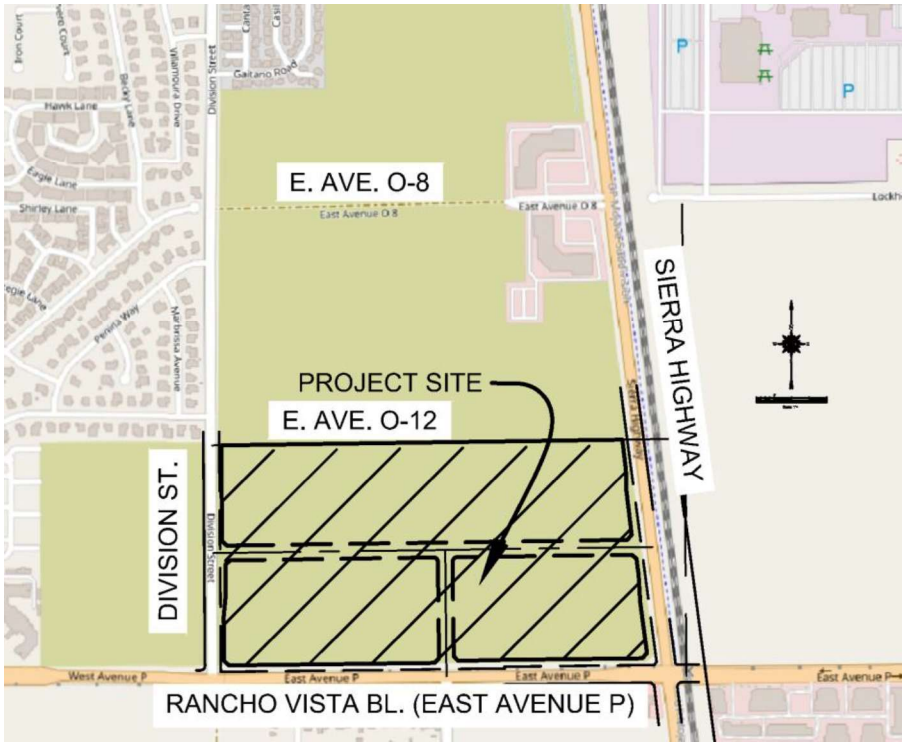


Figure 1 - Vicinity Map

1.0 Introduction

The project site is a 67-acre undeveloped land with minor vegetation, bordered by Rancho Vista Blvd. (E. Ave P) on the south, Division Street on the west, Sierra Highway on the east, and vacant lots on the north. It belongs to the Anaverde Watershed. The existing drainage pattern is sheet-flow and generally drains to a north-easterly direction, at an average slope of about 1%. Off-site runoff approaching the site is captured by Division Street and Rancho Vista Boulevard, and carried north, and east, respectively. Site drainage is carried north along the west shoulder of Sierra Highway in an earthen ditch and ultimately discharges into an existing retention basin just north of Avenue O. See the Figure 2.

The proposed development is an industrial park with a large building and parking lot that will occupy most of the available area. Runoff will be captured on-site from an area of 65.07 acres out of the total 67 acres, the remainder draining away from the site.

Along the north side of the project, Avenue O-12 will be improved and paved, and will provide the primary access to the site.

On-site runoff will be collected in extended retention basins for infiltration. Excess flow will be spilled over onto nearby streets through parkway culverts.

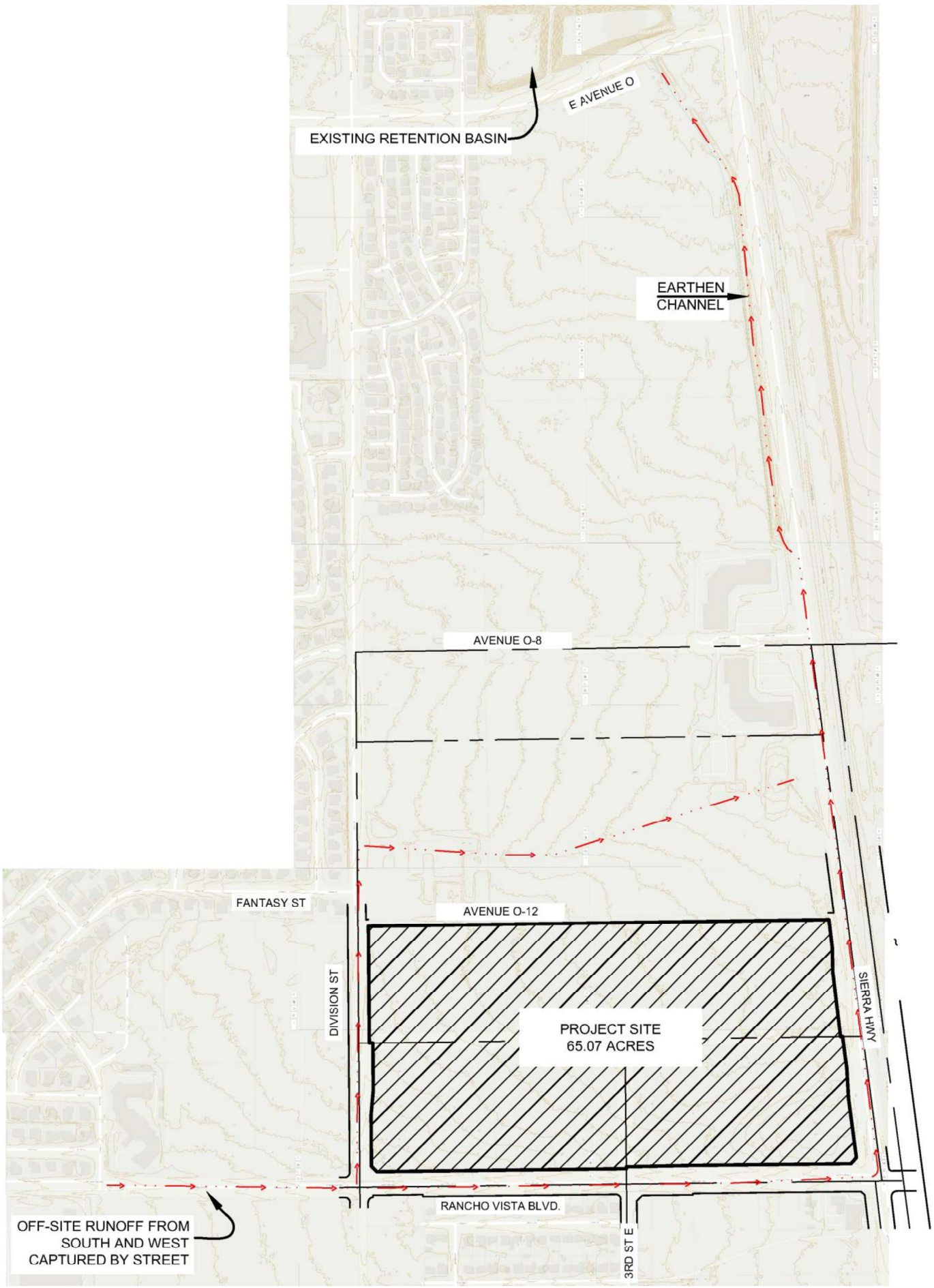


Figure 2 - Overall Drainage Exhibit

Hydrology Maps for the existing and proposed condition of the site are attached to this report.

2.0 Hydrologic Calculations.

2.1 Parameters

See Appendix A for the relevant figures and charts.

```
Soil type number = 134
50-year Isohyet = 3.6”
Imperviousness = 1% undeveloped; 91% developed
Basin Name = Antelope Valley
Infiltration Rate = 0.5 in/hr
```

2.2 Design Criteria

The City of Palmdale requires the use of an Extended Detention Basin if the new system will be discharging to the street, as is the case at hand. The basin has to be equipped with a duplex pump system capable of discharging a maximum “Q” of no greater than the gutter line capacity of the street, not exceeding 85% of pre-developed rainfall excess.

2.3 Runoff for Existing Conditions

LA County’s Hydrocalc program is used for the peak runoff calculations of the 25-year existing runoff. Details are shown in Appendix B, and the results are summarized in Table 1.

Table 1 - Runoff Summary, Existing Conditions

25-year Peak Runoff, Existing Conditions, cfs	
Clear	**5.7**
Burned	**10.7**
85% of Burned (limit for proposed runoff)	**9.1**

2.4 Runoff for Developed Conditions

The Modified Rational Method is used to determine the runoff rate and volume from the developed site. Details are shown in Appendix C.

The project site is divided into three drainage areas and the runoff is captured in two separate extended detention basins. The summary of results is shown in Table 2.

Table 2 - Runoff Summary, Proposed Conditions

25-year Runoff, Developed Conditions	
Peak Runoff	**52.6 cfs**
Runoff Volume, Ac-ft	**13.71 ac-ft**

2.5 Required Basin Volume

The outflow rate from the basins is limited by the lesser value of the 85% of the existing peak runoff rate, or the gutter capacity of Sierra Highway. Since the street slope is only about 0.5%, gutter capacity is small, approximately **0.6** cfs in one gutter, or **1.2** cfs if both sides of the street are used. The basins will also be drained by infiltration. At this point we do not have a design infiltration rate. Assuming a conservative design infiltration rate of **0.5** inches per hour, an outflow rate can be estimated for the basins.

Table 3 - Basin Drainage Rate

	Basin Discharge Rate, cfs
Infiltration	1.5
Gutter	1.2
Total	2.7

The calculated outflow rate is less than 10% of the inflow rate, therefore, the bulk of the hydrograph must be retained inside the basins. Preliminary routing calculation shows that the required retention volume is about **10** acre-feet, or about 73% of the volume of the inflow hydrograph. With the given outflow rate, the basins(s) will be emptied in about **60** hours.

Table 4 - Basin Storage

Volume of Runoff Hydrograph		13.71 ac-ft
Required Storage Volume		10.0 ac-ft
Provided Storage Volume	North Basin	0.74 ac-ft
	South Basin	15.71 ac-ft
	Total	16.45 ac-ft

The North basin is 5 feet deep from the top, and 4 feet from the emergency spillway elevation. The North basin is 7 feet deep from the top and 6 feet from the emergency spillway elevation. Table 4 shows stored volumes in the basins when the water surface is one foot below the emergency spillway elevation.

2.6 Emergency Spillway

Emergency spillways will be installed for both basins, with inverts 1 foot below the top of the basin elevation. They are designed to carry 125% of the peak 25-year discharge for the proposed condition. The two spillways transition to a rectangular channel, ultimately discharging through a culvert under the sidewalk onto Avenue O-12 on the north.

Broad-crested weir equation for sizing of the emergency spillway:

Weir equation:

$$Q := D^{1.5} \cdot C \cdot W$$

$D := 1$	Desired water depth at weir entrance, FT
$Q := 52.6$	25-yr peak flowrate, CFS
$C := 2.8$	Weir coefficient for broad-crested weir
W	Required width of weir, FT

Rearranging for width, and applying 125% flow rate::

$$W := \frac{1.25 \cdot Q}{D^{1.5} \cdot C} = 23.5 \text{ FT, Use 24 FT}$$

The spillway transitions to a rectanguar channel, open at some portions of it, and a closed box at some others
The channel can be narrowed to 15 feet, as the following normal depth calculation indicates:

$S := 0.005$	Channel slope
$N := 0.015$	Manning coefficient
$D := 0.75$	Assumed depth of flow, FT
$B := 17$	Width of channel, FT
$A := B \cdot D = 12.75$	Area of flow cross-section, FT^2
$P := B + 2 \cdot D = 18.5$	Perimeter of flow cross-section, FT

$$Q := \frac{1.486}{N} \cdot \left(\frac{A^5}{P^2} \right)^{\frac{1}{3}} \cdot \sqrt{S} = 69.6865 \quad > 1.25 \cdot 52.6 = 65.75 \quad \text{CFS}$$

2.7 Nuisance Water

The amount of nuisance water generated on site will likely to be small, because there is little or no landscaping. Preliminarily, it is estimated that two drywells, placed on both of the storm drain lines will suffice. The storm drain will have a bypass device that directs low flow rates into the drywell. The cut-off rate will be determined later. The hydrology map shows the proposed location of the drywells.

3.0 Design Alternative

As an alternative to the Extended Detention Basins, Detention Basins can be used, provided the basins discharge into a storm drain. It is depicted on the attached "DESIGN ALTERNATE WITH STORM DRAIN". The advantage of the alternative is not having to install and maintain a pump system, and smaller required basin volumes, at the expense of off-site storm drain construction.

At this point of the development process, the developer wishes to consider both of these two options until the cost of these can be reliably ascertained, and a choice can be made.

3.1 Peak Discharge from Detention Basin

In the table below a summary of results can be seen for the 2, 5, 10, 25, and 50-year storms. The last line shows the peak flow values outflowing from the detention basin, as a result of routing calculations. All values remain below the maximum permittable values listed 2 rows above, for the 85% of the existing peak runoff values.

Freq	**2-yr**	**5-yr**	**10-yr**	**25-yr**	**50-yr**
Ex. Q_{CLEAR}, cfs	2.5	3.8	4.6	5.7	6.5
Ex. Q_{BURN}, cfs	4.3	6.8	8.5	10.7	12.3
85% Ex. Q_{BURN}, cfs	**3.7**	**5.8**	**7.2**	**9.1**	**10.5**
Prop Q, cfs	19.2	31.9	40.9	52.6	62.1
Prop Q, cfs, Basin outflow	**3.1**	**4.3**	**4.9**	**5.6**	**6.0**

The oulet from the detention basin is a 24-inch RCP. At the entrance, a 9-inch diameter restrictor plate is placed to reduce the capacity. Routing calculations are shown in Appendix D.

APPENDIX A

-118° 15' 00"

SLEEPY VALLEY 1-H1.56

LITTLE ROCK 1-H1.59

PROJECT SITE

DPA - 8

DPA - 9

DPA - 5

DPA - 11

DPA - 10

DPA - 8

DPA - 5

DPA - 8

DPA - 9

DPA - 8

DPA - 10

DPA - 9

DPA - 8

DPA - 11

DPA - 10

DPA - 9

DPA - 8

Palmdale

Lake Palmdale

Pearland

Littlerock Wash

Amargosa Creek

Anaverde Creek

Oak Ranch Creek

Bitter Ridge

San Andreas Rift Zone

Antelope Valley

Sierra Pelona

ACTON 1-H1.47

PACIFICO MOUNTAIN 1-H1.48

34° 30' 00"

-118° 00' 00"

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878

10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

RITTER RIDGE
50-YEAR 24-HOUR ISOHYET

1-H1.57

P A L M D A L E
50-YEAR 24-HOUR ISOHYET

1-H1.58

APPENDIX B

Peak Flow Hydrologic Analysis

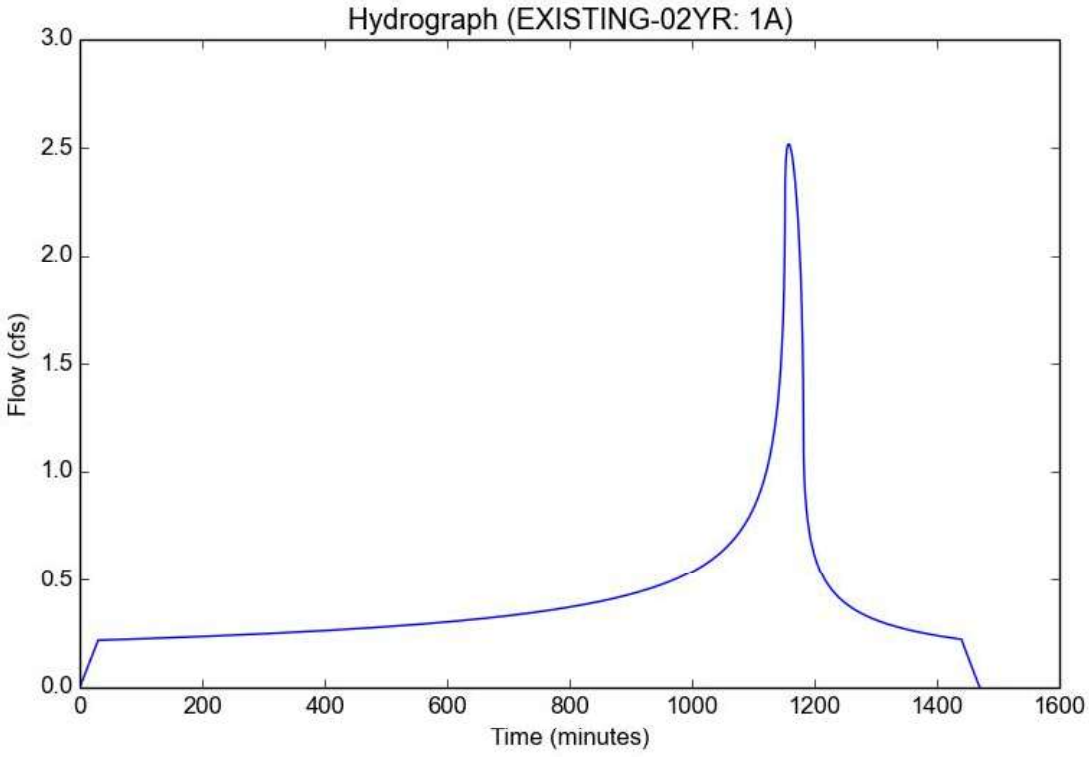
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	EXISTING-02YR
Subarea ID	1A
Area (ac)	65.07
Flow Path Length (ft)	2087.0
Flow Path Slope (vft/hft)	0.01006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.01
Soil Type	134
Design Storm Frequency	2-yr
Fire Factor	0.34
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.3932
Peak Intensity (in/hr)	0.3581
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	2.5165
Burned Peak Flow Rate (cfs)	4.2706
24-Hr Clear Runoff Volume (ac-ft)	0.8092
24-Hr Clear Runoff Volume (cu-ft)	35247.2724



Peak Flow Hydrologic Analysis

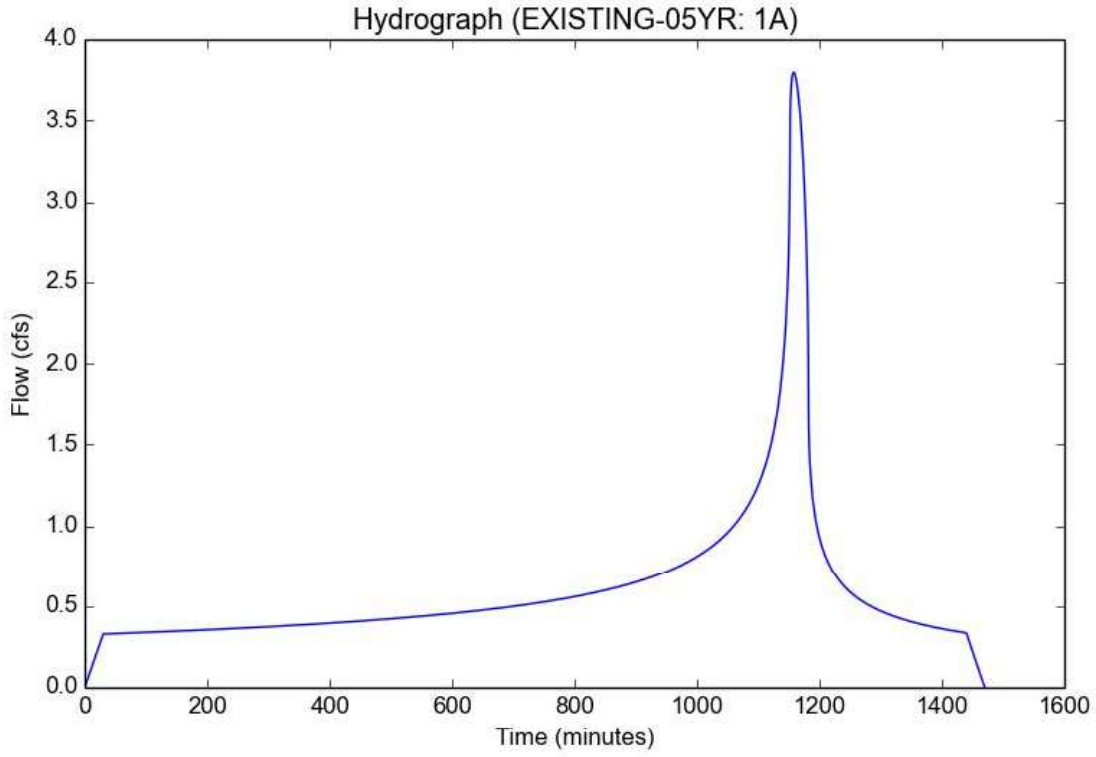
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Subarea ID	1A
Area (ac)	65.07
Flow Path Length (ft)	2087.0
Flow Path Slope (vft/hft)	0.01006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.01
Soil Type	134
Design Storm Frequency	5-yr
Fire Factor	0.34
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	2.1024
Peak Intensity (in/hr)	0.5404
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	3.7974
Burned Peak Flow Rate (cfs)	6.7741
24-Hr Clear Runoff Volume (ac-ft)	1.2211
24-Hr Clear Runoff Volume (cu-ft)	53189.6824



Peak Flow Hydrologic Analysis

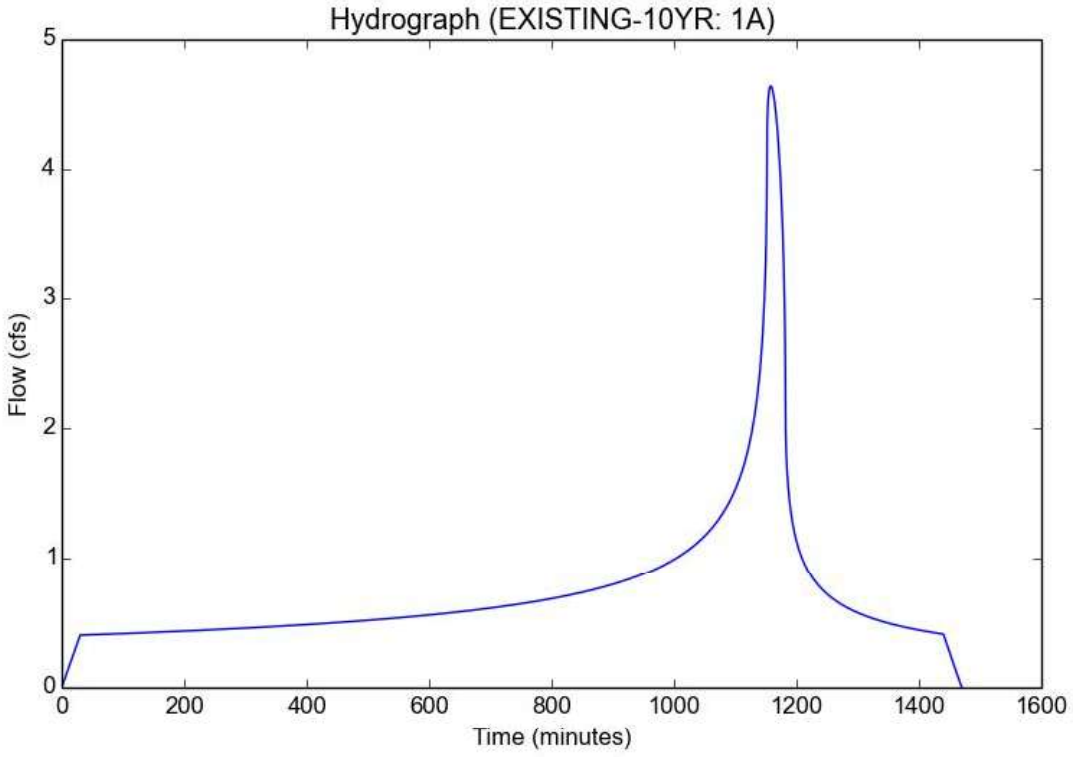
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Input Parameters

Project Name	EXISTING-10YR
Subarea ID	1A
Area (ac)	65.07
Flow Path Length (ft)	2087.0
Flow Path Slope (vft/hft)	0.01006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.01
Soil Type	134
Design Storm Frequency	10-yr
Fire Factor	0.34
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.5704
Peak Intensity (in/hr)	0.6607
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	4.6428
Burned Peak Flow Rate (cfs)	8.4727
24-Hr Clear Runoff Volume (ac-ft)	1.4929
24-Hr Clear Runoff Volume (cu-ft)	65029.8514



Peak Flow Hydrologic Analysis

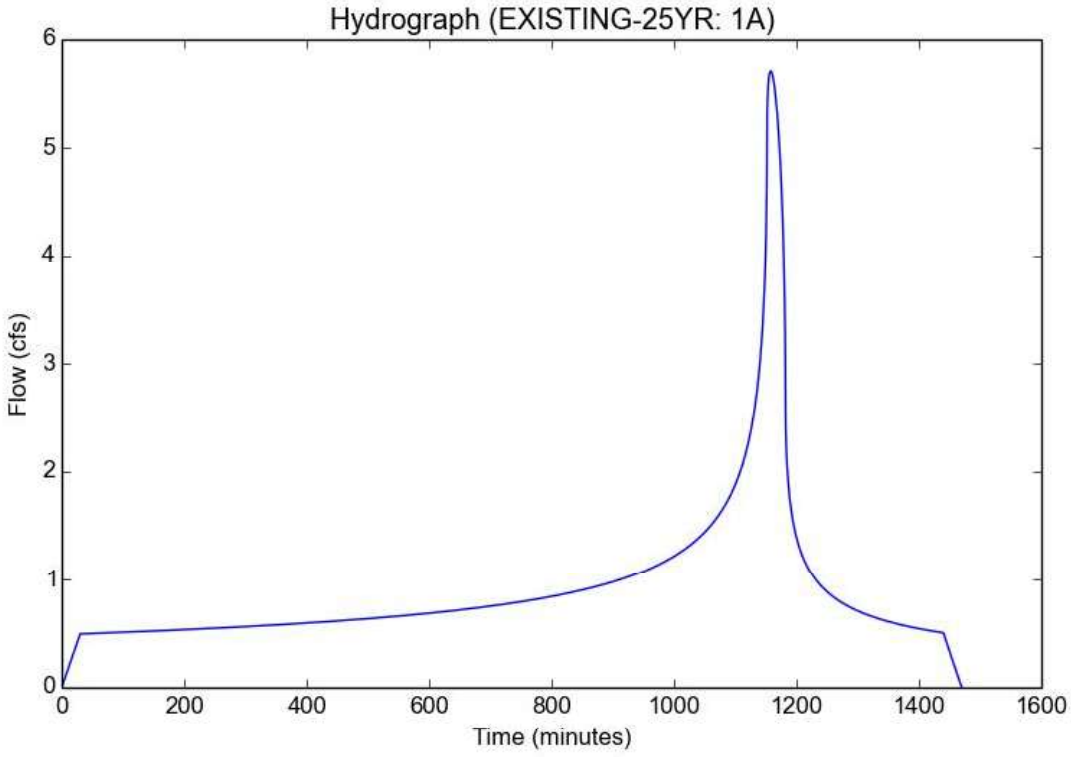
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Input Parameters

Project Name	EXISTING-25YR
Subarea ID	1A
Area (ac)	65.07
Flow Path Length (ft)	2087.0
Flow Path Slope (vft/hft)	0.01006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.01
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0.34
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.1608
Peak Intensity (in/hr)	0.8124
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	5.7092
Burned Peak Flow Rate (cfs)	10.6551
24-Hr Clear Runoff Volume (ac-ft)	1.8358
24-Hr Clear Runoff Volume (cu-ft)	79966.6801



Peak Flow Hydrologic Analysis

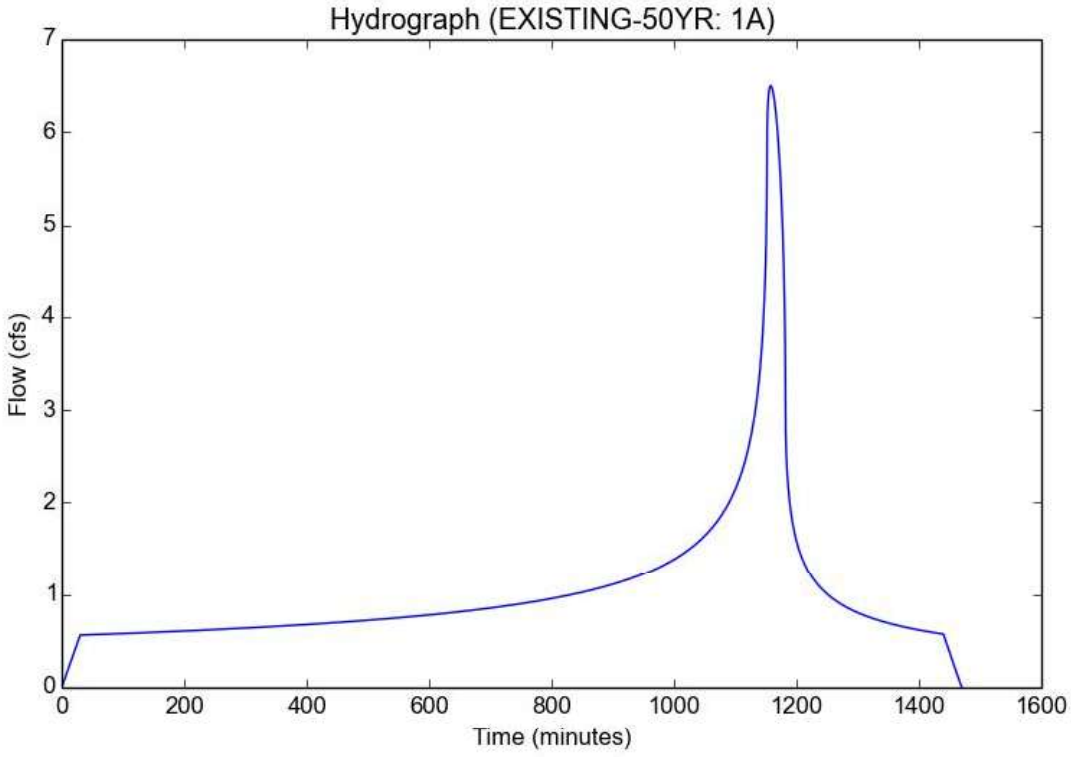
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Subarea ID	1A
Area (ac)	65.07
Flow Path Length (ft)	2087.0
Flow Path Slope (vft/hft)	0.01006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.01
Soil Type	134
Design Storm Frequency	50-yr
Fire Factor	0.34
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.6
Peak Intensity (in/hr)	0.9253
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.108
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	6.5025
Burned Peak Flow Rate (cfs)	12.3021
24-Hr Clear Runoff Volume (ac-ft)	2.0909
24-Hr Clear Runoff Volume (cu-ft)	91078.2233



APPENDIX C

Peak Flow Hydrologic Analysis

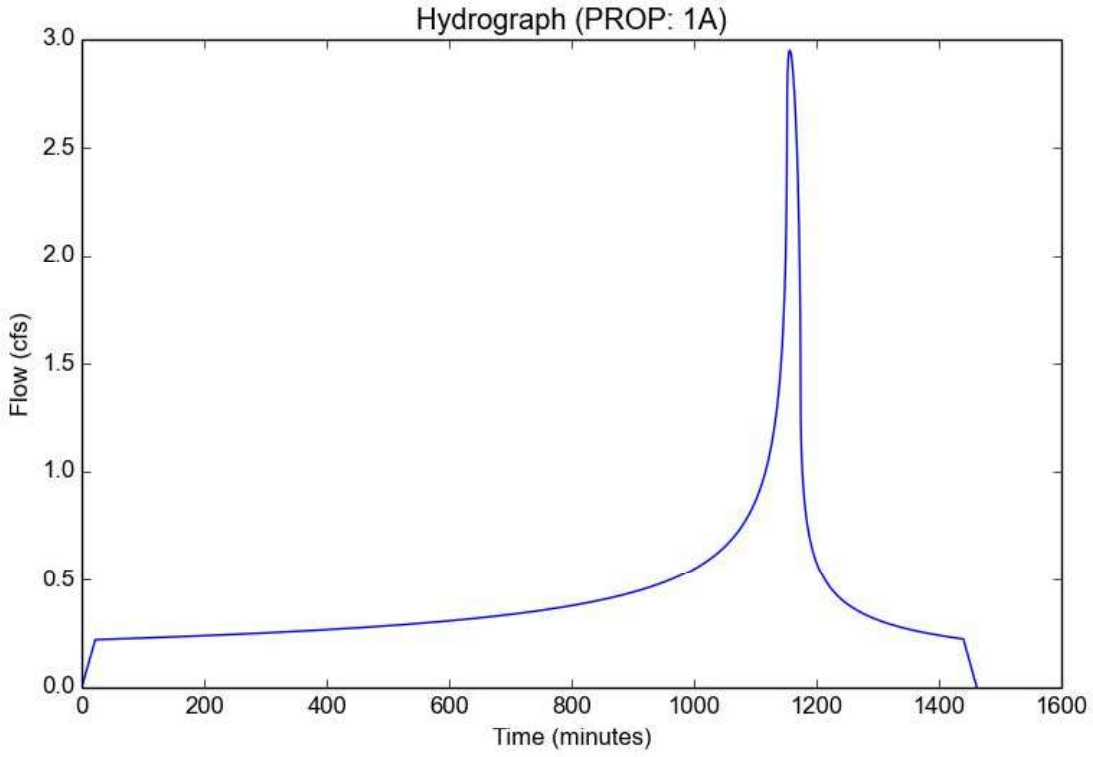
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	1A
Area (ac)	8.6
Flow Path Length (ft)	615.0
Flow Path Slope (vft/hft)	0.0128
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.3932
Peak Intensity (in/hr)	0.4143
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	22.0
Clear Peak Flow Rate (cfs)	2.95
Burned Peak Flow Rate (cfs)	2.95
24-Hr Clear Runoff Volume (ac-ft)	0.8199
24-Hr Clear Runoff Volume (cu-ft)	35714.7342



Peak Flow Hydrologic Analysis

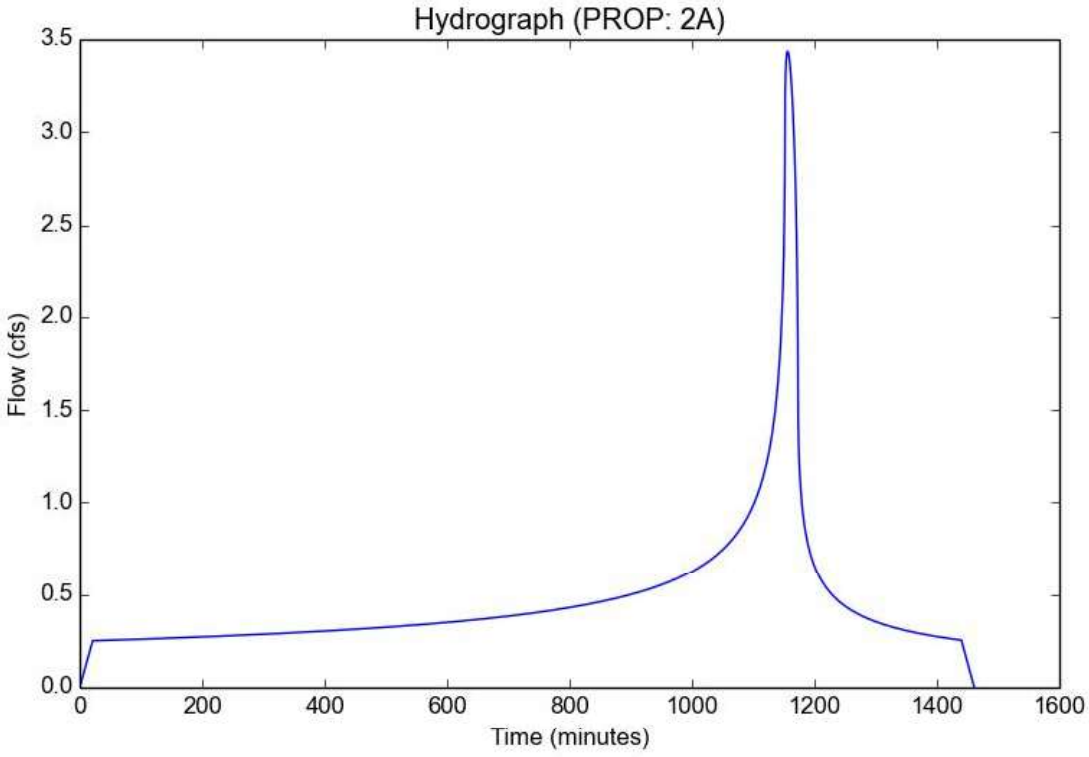
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Input Parameters

Project Name	PROP
Subarea ID	2A
Area (ac)	9.8
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.3932
Peak Intensity (in/hr)	0.4234
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	3.4359
Burned Peak Flow Rate (cfs)	3.4359
24-Hr Clear Runoff Volume (ac-ft)	0.9343
24-Hr Clear Runoff Volume (cu-ft)	40698.1631



Peak Flow Hydrologic Analysis

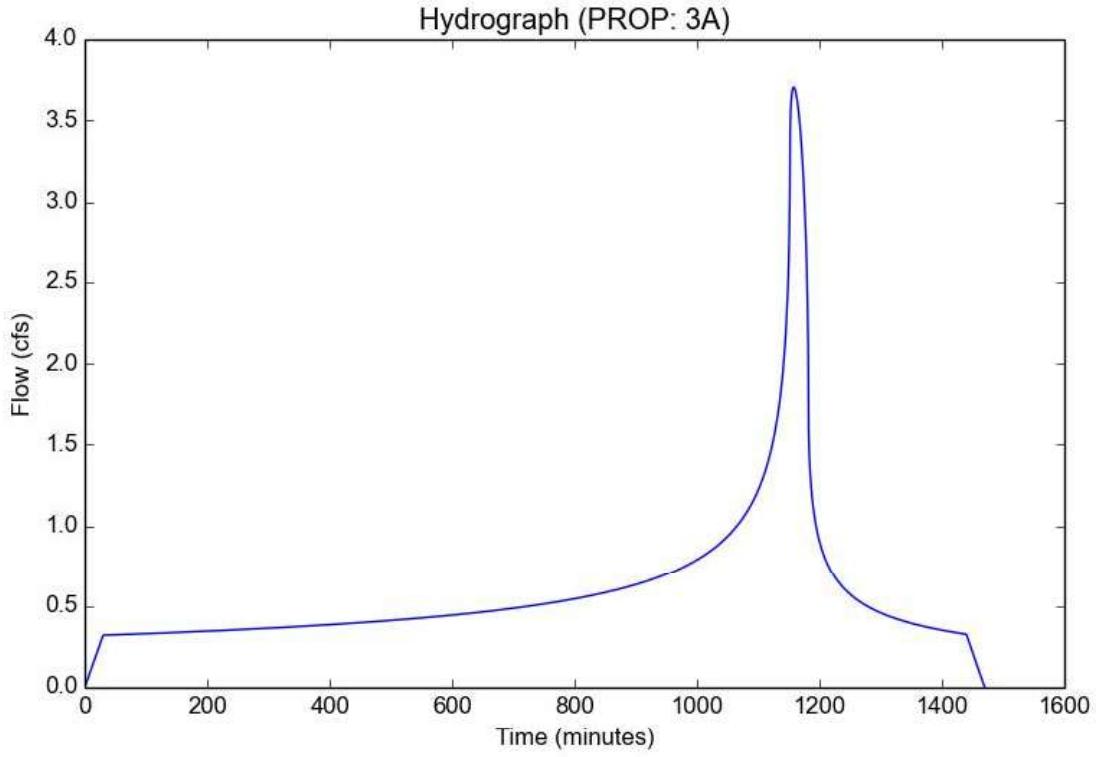
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Input Parameters

Project Name	PROP
Subarea ID	3A
Area (ac)	12.5
Flow Path Length (ft)	1163.0
Flow Path Slope (vft/hft)	0.006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.3932
Peak Intensity (in/hr)	0.3581
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	3.7062
Burned Peak Flow Rate (cfs)	3.7062
24-Hr Clear Runoff Volume (ac-ft)	1.1917
24-Hr Clear Runoff Volume (cu-ft)	51911.228



Peak Flow Hydrologic Analysis

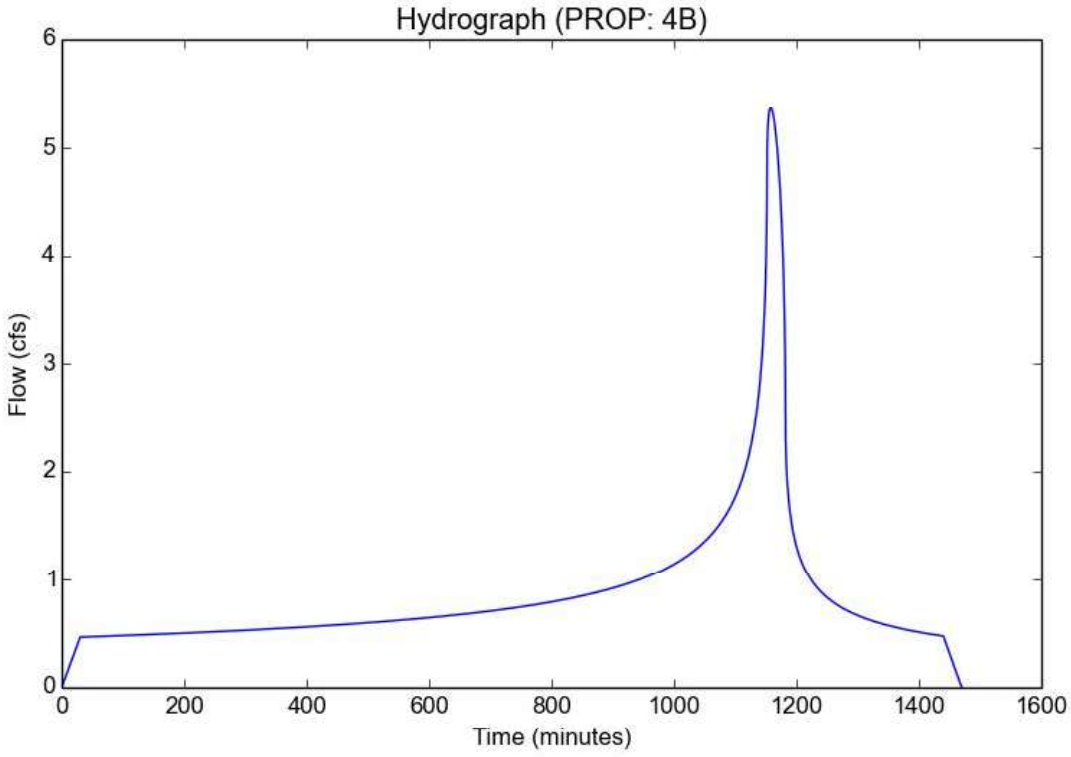
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Input Parameters

Project Name	PROP
Subarea ID	4B
Area (ac)	18.1
Flow Path Length (ft)	955.0
Flow Path Slope (vft/hft)	0.0103
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.3932
Peak Intensity (in/hr)	0.3581
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	5.3665
Burned Peak Flow Rate (cfs)	5.3665
24-Hr Clear Runoff Volume (ac-ft)	1.7256
24-Hr Clear Runoff Volume (cu-ft)	75167.4582



Peak Flow Hydrologic Analysis

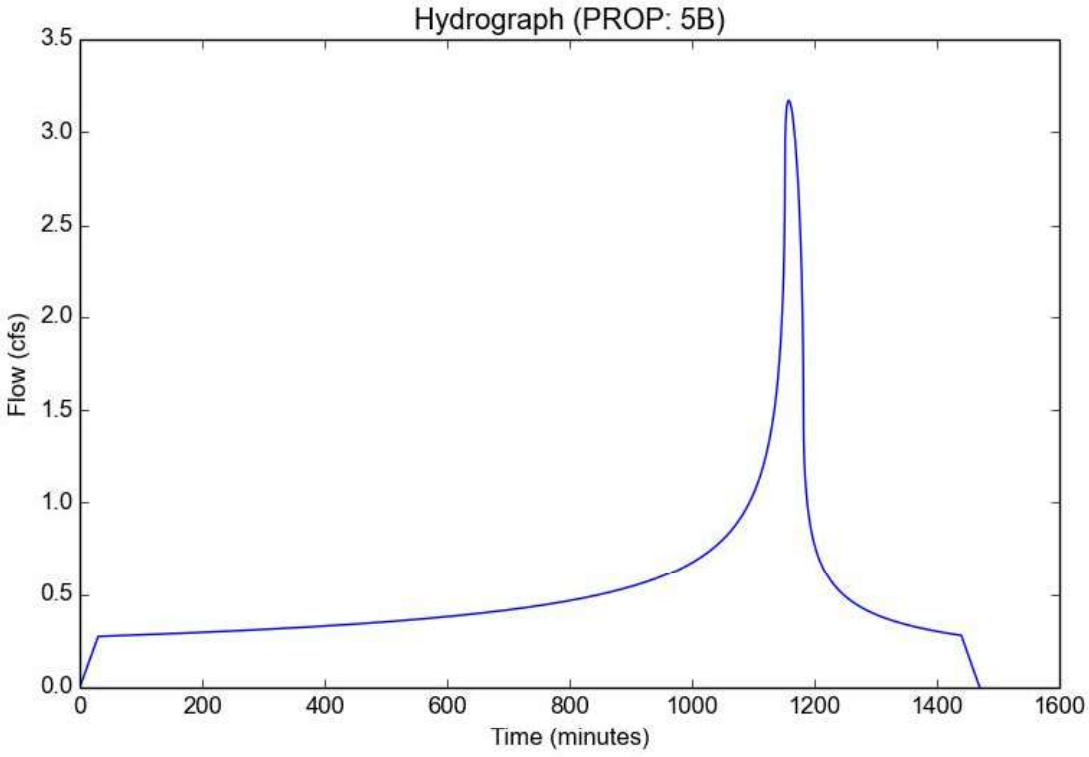
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Input Parameters

Project Name	PROP
Subarea ID	5B
Area (ac)	10.7
Flow Path Length (ft)	1284.0
Flow Path Slope (vft/hft)	0.0113
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.3932
Peak Intensity (in/hr)	0.3581
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	3.1725
Burned Peak Flow Rate (cfs)	3.1725
24-Hr Clear Runoff Volume (ac-ft)	1.0201
24-Hr Clear Runoff Volume (cu-ft)	44436.0112



Peak Flow Hydrologic Analysis

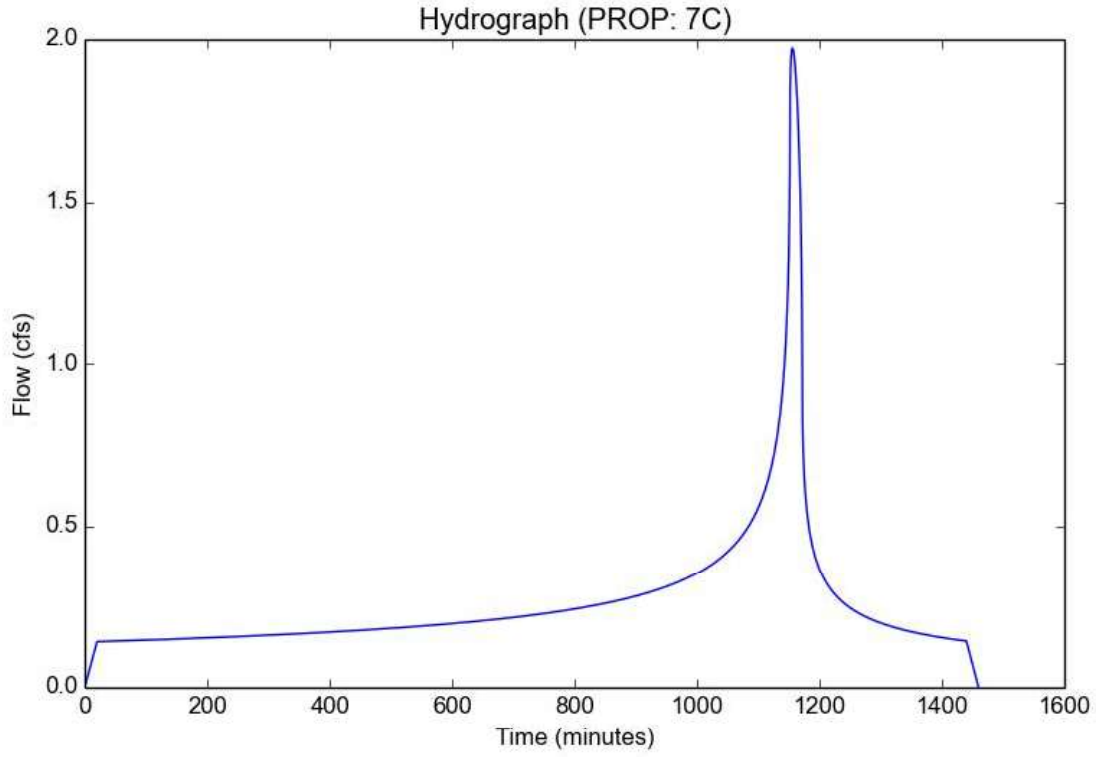
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	7C
Area (ac)	5.5
Flow Path Length (ft)	527.0
Flow Path Slope (vft/hft)	0.0119
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	1.3932
Peak Intensity (in/hr)	0.4333
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	1.9731
Burned Peak Flow Rate (cfs)	1.9731
24-Hr Clear Runoff Volume (ac-ft)	0.5244
24-Hr Clear Runoff Volume (cu-ft)	22840.7939



Peak Flow Hydrologic Analysis

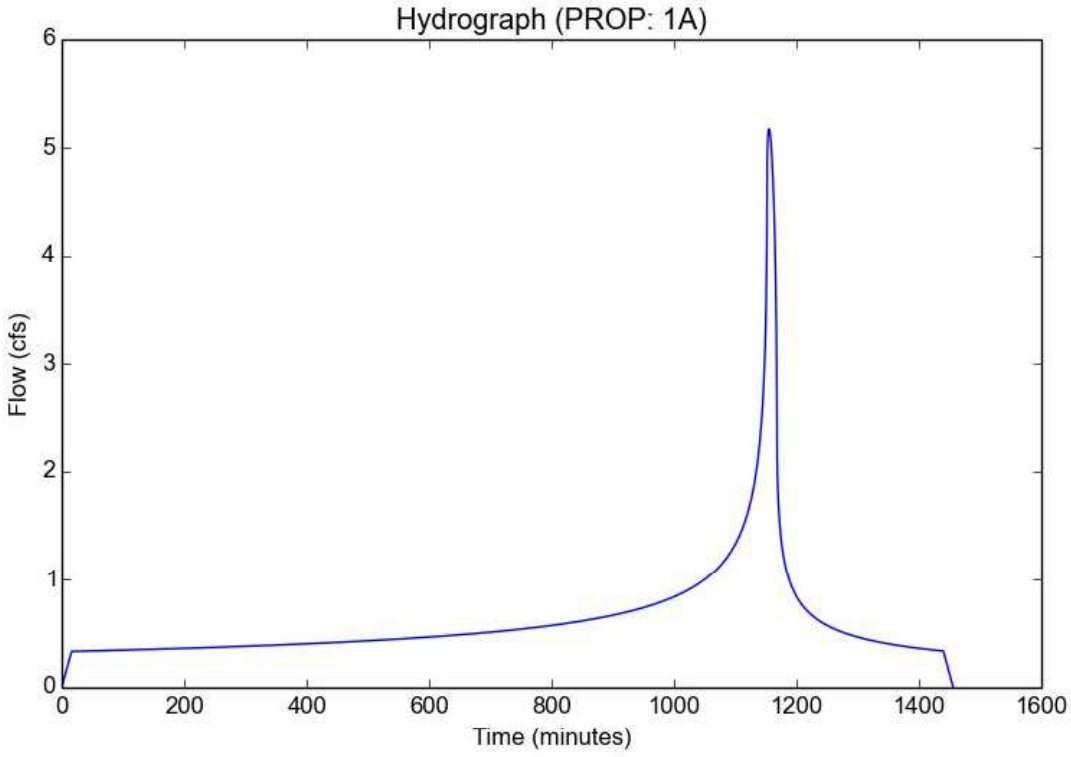
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	1A
Area (ac)	8.6
Flow Path Length (ft)	615.0
Flow Path Slope (vft/hft)	0.0128
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	2.1024
Peak Intensity (in/hr)	0.7261
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	5.1704
Burned Peak Flow Rate (cfs)	5.1704
24-Hr Clear Runoff Volume (ac-ft)	1.2373
24-Hr Clear Runoff Volume (cu-ft)	53894.9461



Peak Flow Hydrologic Analysis

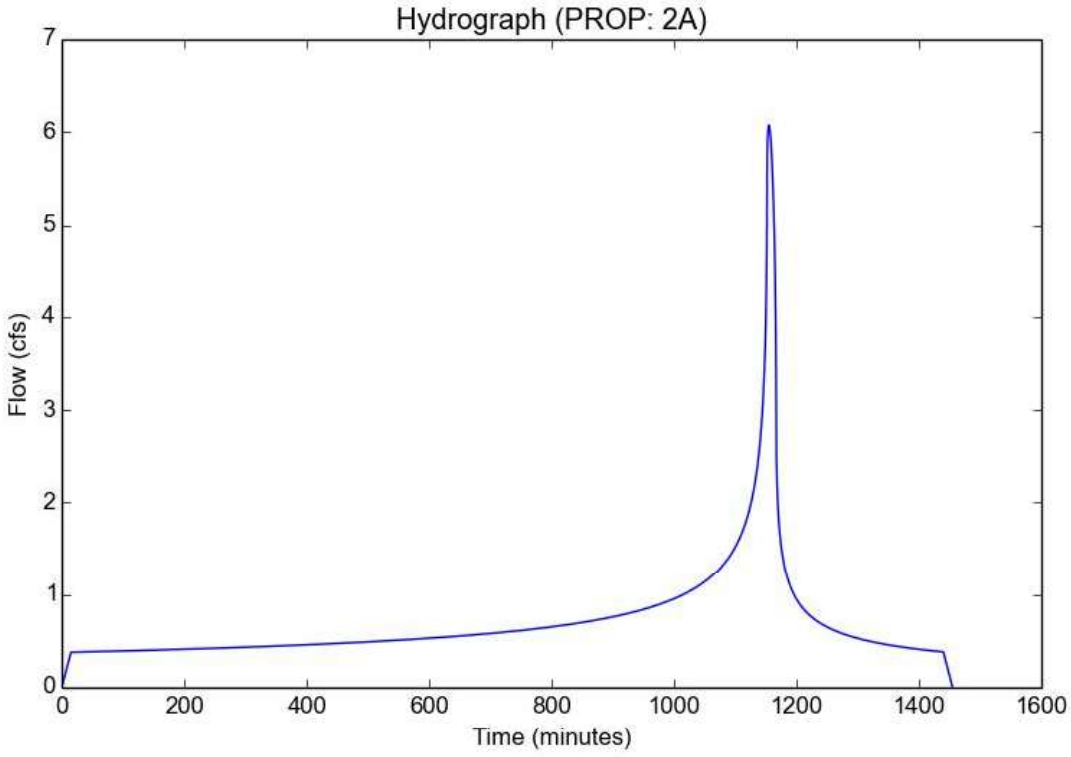
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	2A
Area (ac)	9.8
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	2.1024
Peak Intensity (in/hr)	0.7485
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	6.0733
Burned Peak Flow Rate (cfs)	6.0733
24-Hr Clear Runoff Volume (ac-ft)	1.4099
24-Hr Clear Runoff Volume (cu-ft)	61415.147



Peak Flow Hydrologic Analysis

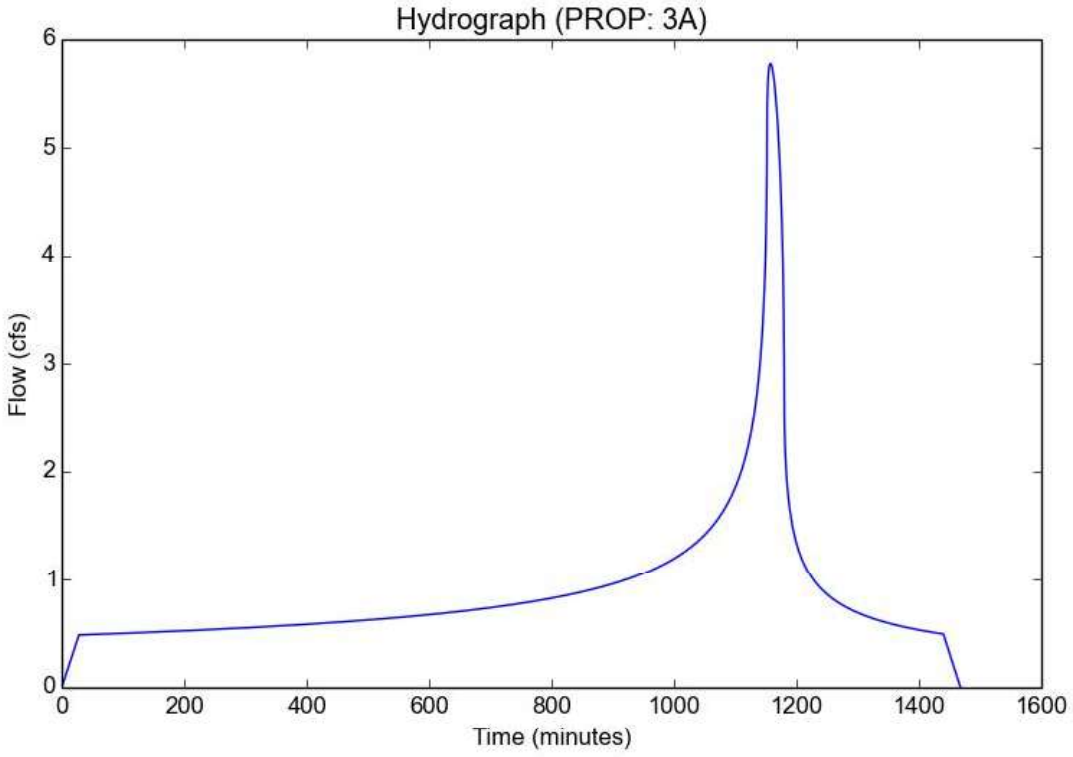
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	3A
Area (ac)	12.5
Flow Path Length (ft)	1163.0
Flow Path Slope (vft/hft)	0.006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	2.1024
Peak Intensity (in/hr)	0.5582
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	5.7771
Burned Peak Flow Rate (cfs)	5.7771
24-Hr Clear Runoff Volume (ac-ft)	1.7984
24-Hr Clear Runoff Volume (cu-ft)	78336.2065



Peak Flow Hydrologic Analysis

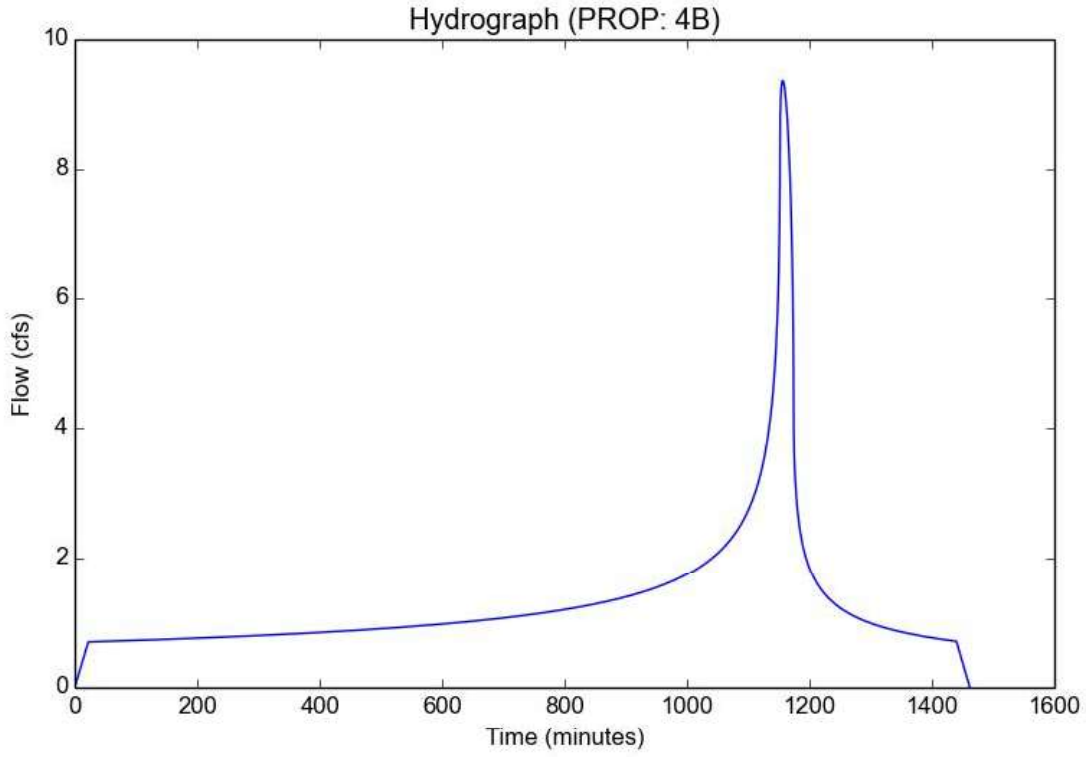
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	4B
Area (ac)	18.1
Flow Path Length (ft)	955.0
Flow Path Slope (vft/hft)	0.0103
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	2.1024
Peak Intensity (in/hr)	0.6252
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	22.0
Clear Peak Flow Rate (cfs)	9.3692
Burned Peak Flow Rate (cfs)	9.3692
24-Hr Clear Runoff Volume (ac-ft)	2.604
24-Hr Clear Runoff Volume (cu-ft)	113430.3907



Peak Flow Hydrologic Analysis

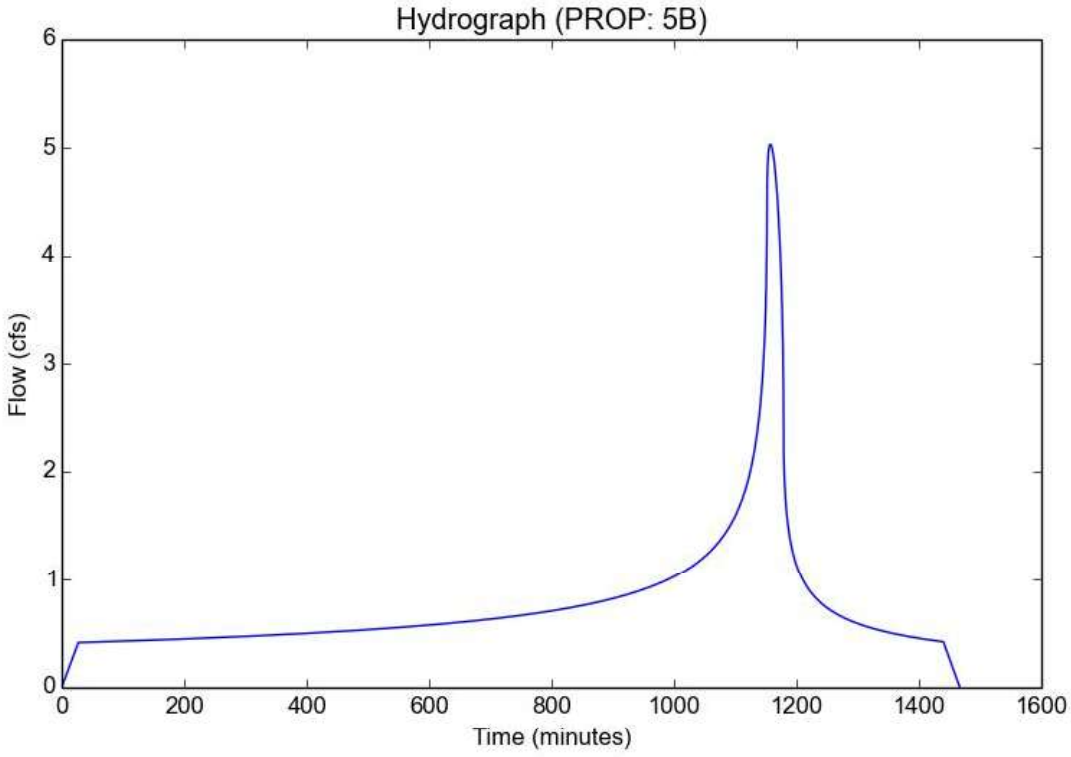
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	5B
Area (ac)	10.7
Flow Path Length (ft)	1284.0
Flow Path Slope (vft/hft)	0.0113
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	2.1024
Peak Intensity (in/hr)	0.5678
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	27.0
Clear Peak Flow Rate (cfs)	5.0305
Burned Peak Flow Rate (cfs)	5.0305
24-Hr Clear Runoff Volume (ac-ft)	1.5394
24-Hr Clear Runoff Volume (cu-ft)	67055.7453



Peak Flow Hydrologic Analysis

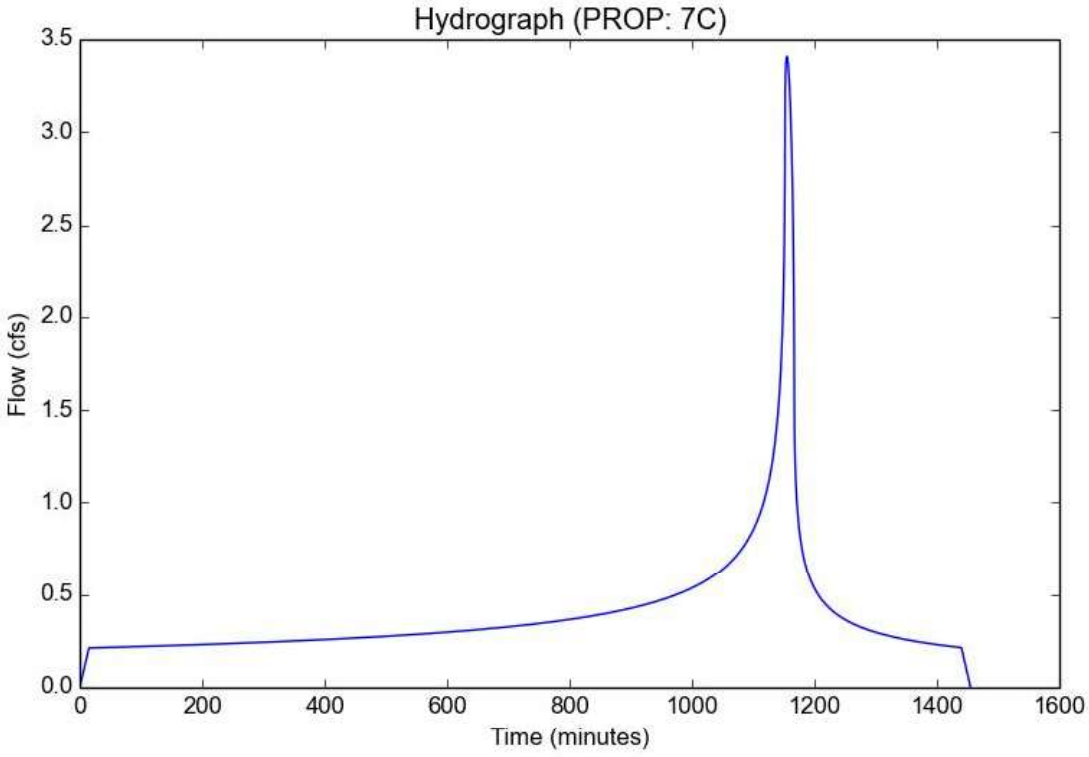
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	7C
Area (ac)	5.5
Flow Path Length (ft)	527.0
Flow Path Slope (vft/hft)	0.0119
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	2.1024
Peak Intensity (in/hr)	0.7485
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	3.4085
Burned Peak Flow Rate (cfs)	3.4085
24-Hr Clear Runoff Volume (ac-ft)	0.7913
24-Hr Clear Runoff Volume (cu-ft)	34467.6845



Peak Flow Hydrologic Analysis

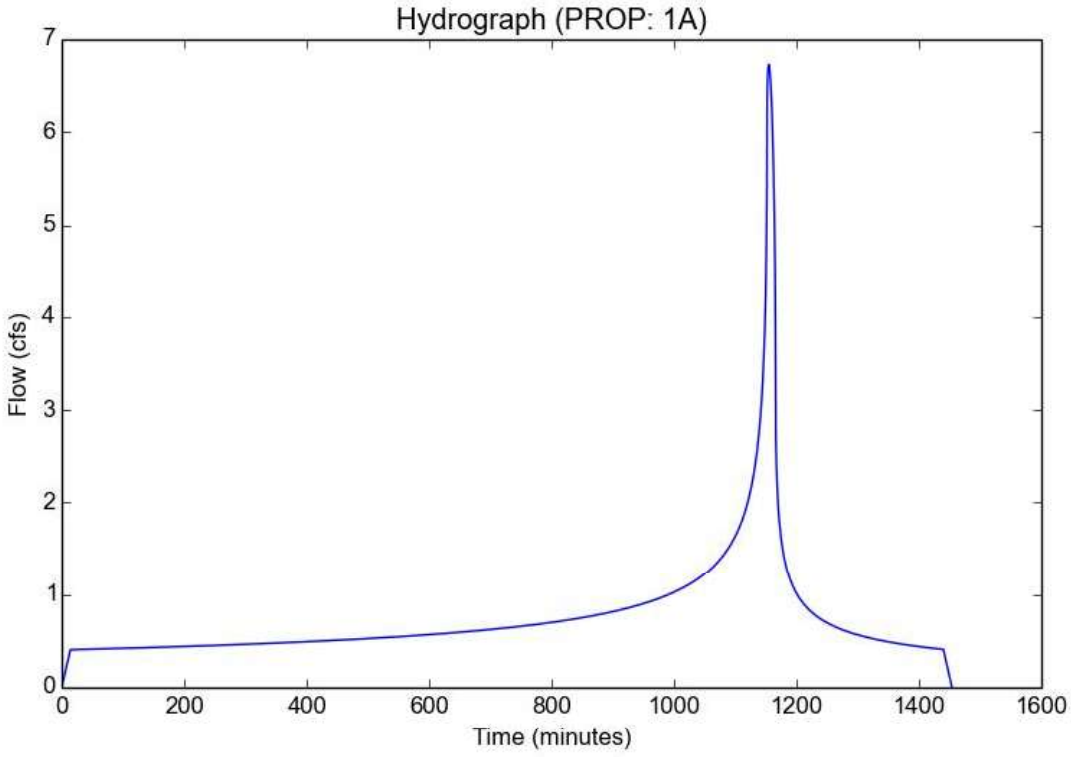
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Input Parameters

Project Name	PROP
Subarea ID	1A
Area (ac)	8.6
Flow Path Length (ft)	615.0
Flow Path Slope (vft/hft)	0.0128
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.5704
Peak Intensity (in/hr)	0.9452
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	6.7308
Burned Peak Flow Rate (cfs)	6.7308
24-Hr Clear Runoff Volume (ac-ft)	1.5127
24-Hr Clear Runoff Volume (cu-ft)	65892.0586



Peak Flow Hydrologic Analysis

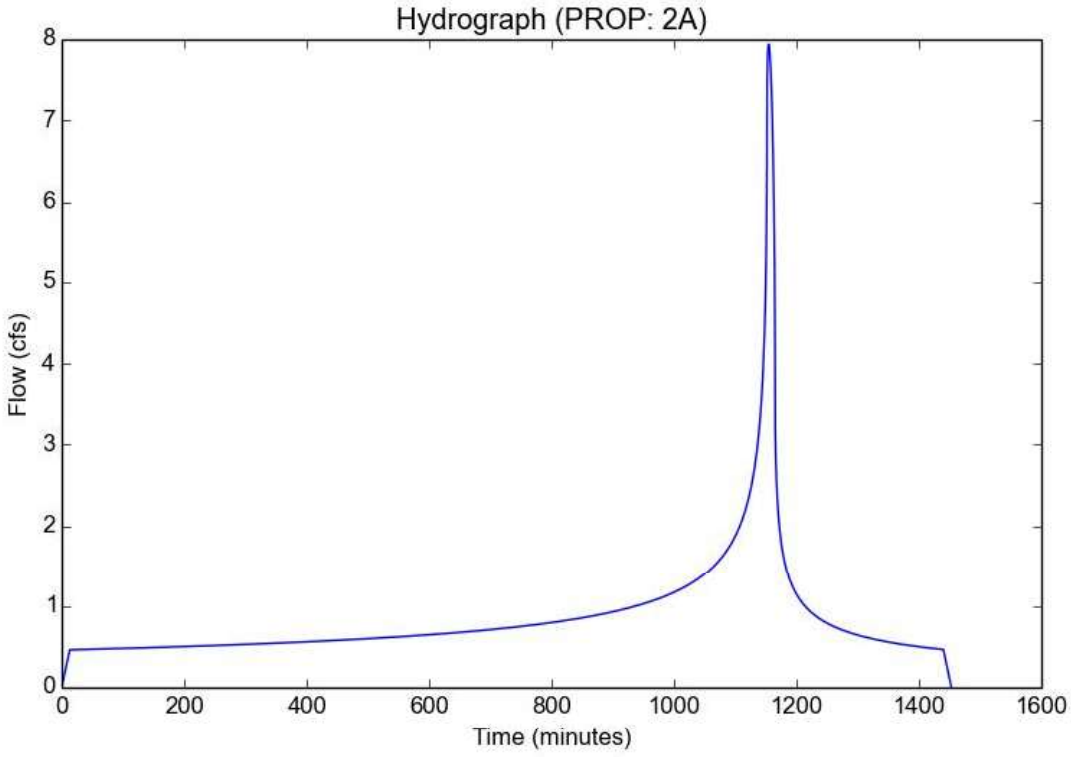
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	2A
Area (ac)	9.8
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.5704
Peak Intensity (in/hr)	0.9787
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	7.9419
Burned Peak Flow Rate (cfs)	7.9419
24-Hr Clear Runoff Volume (ac-ft)	1.7237
24-Hr Clear Runoff Volume (cu-ft)	75086.2736



Peak Flow Hydrologic Analysis

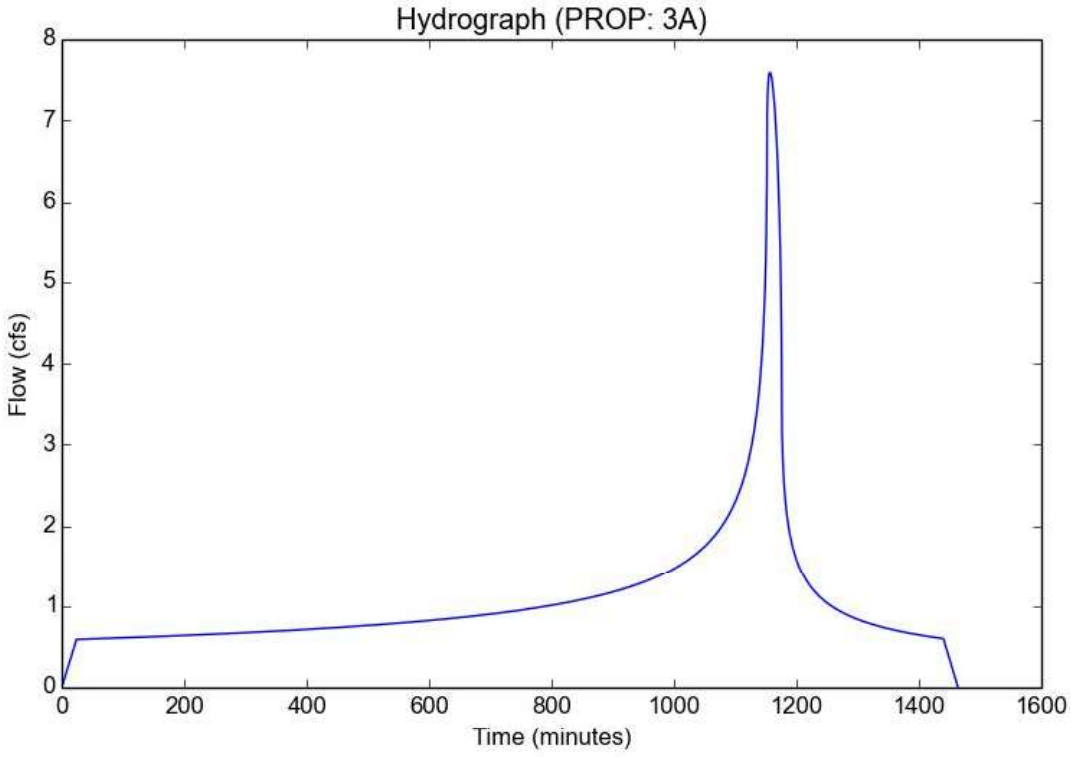
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	3A
Area (ac)	12.5
Flow Path Length (ft)	1163.0
Flow Path Slope (vft/hft)	0.006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.5704
Peak Intensity (in/hr)	0.7337
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	7.5938
Burned Peak Flow Rate (cfs)	7.5938
24-Hr Clear Runoff Volume (ac-ft)	2.1987
24-Hr Clear Runoff Volume (cu-ft)	95773.805



Peak Flow Hydrologic Analysis

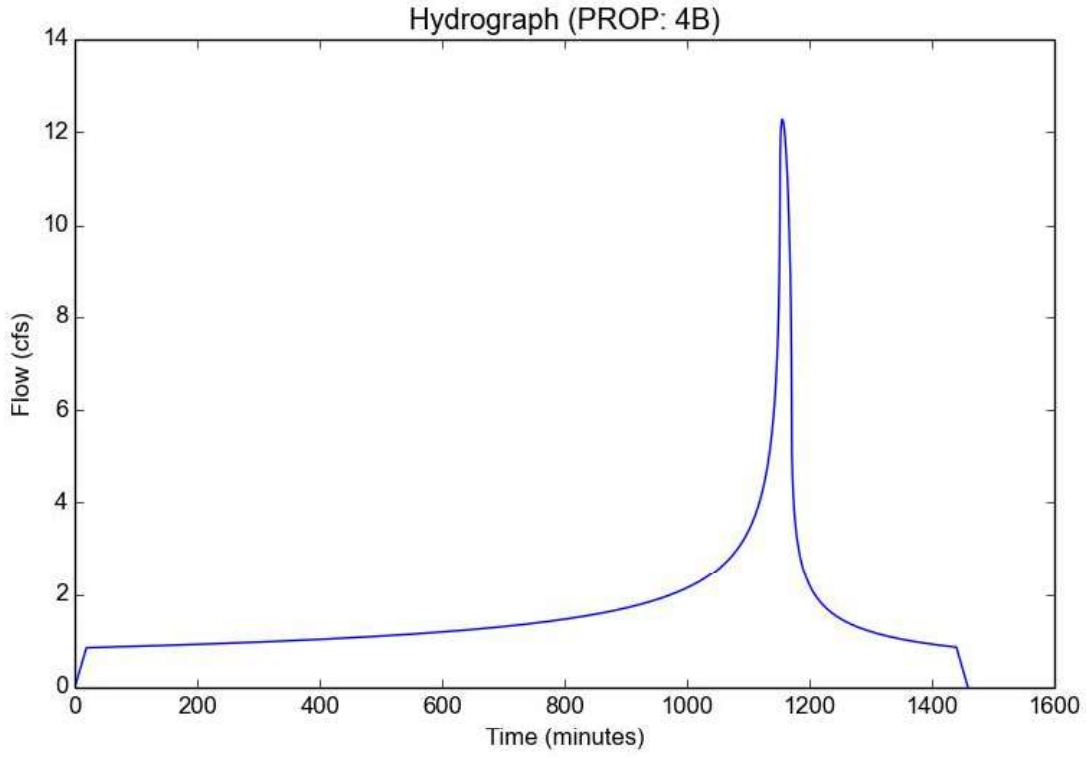
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	4B
Area (ac)	18.1
Flow Path Length (ft)	955.0
Flow Path Slope (vft/hft)	0.0103
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.5704
Peak Intensity (in/hr)	0.8189
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	12.272
Burned Peak Flow Rate (cfs)	12.272
24-Hr Clear Runoff Volume (ac-ft)	3.1837
24-Hr Clear Runoff Volume (cu-ft)	138680.0887



Peak Flow Hydrologic Analysis

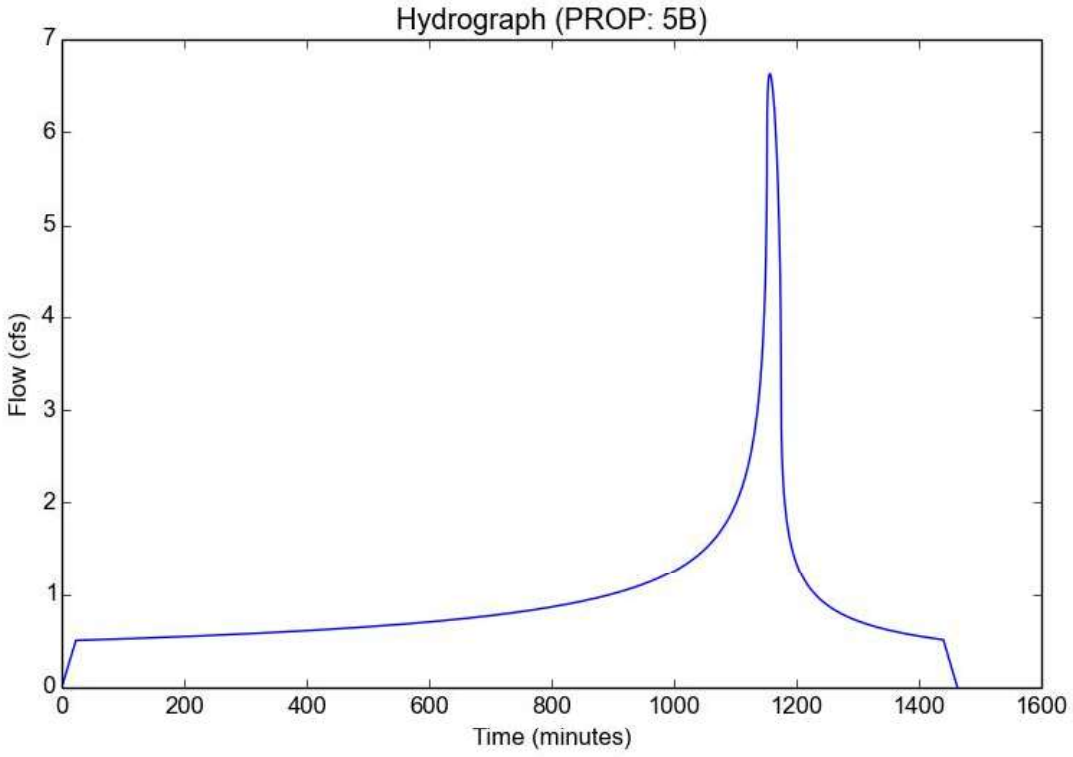
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	5B
Area (ac)	10.7
Flow Path Length (ft)	1284.0
Flow Path Slope (vft/hft)	0.0113
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.5704
Peak Intensity (in/hr)	0.7485
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	6.6317
Burned Peak Flow Rate (cfs)	6.6317
24-Hr Clear Runoff Volume (ac-ft)	1.8821
24-Hr Clear Runoff Volume (cu-ft)	81982.3278



Peak Flow Hydrologic Analysis

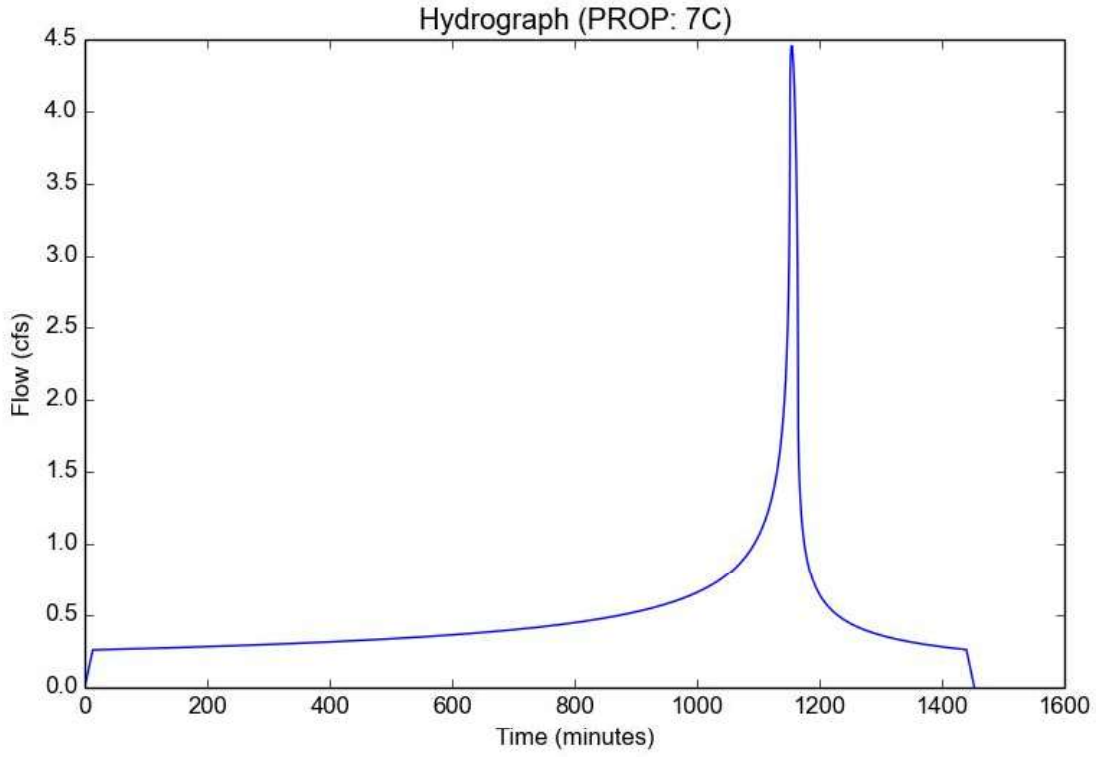
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	7C
Area (ac)	5.5
Flow Path Length (ft)	527.0
Flow Path Slope (vft/hft)	0.0119
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	2.5704
Peak Intensity (in/hr)	0.9787
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	4.4572
Burned Peak Flow Rate (cfs)	4.4572
24-Hr Clear Runoff Volume (ac-ft)	0.9674
24-Hr Clear Runoff Volume (cu-ft)	42140.2556



Peak Flow Hydrologic Analysis

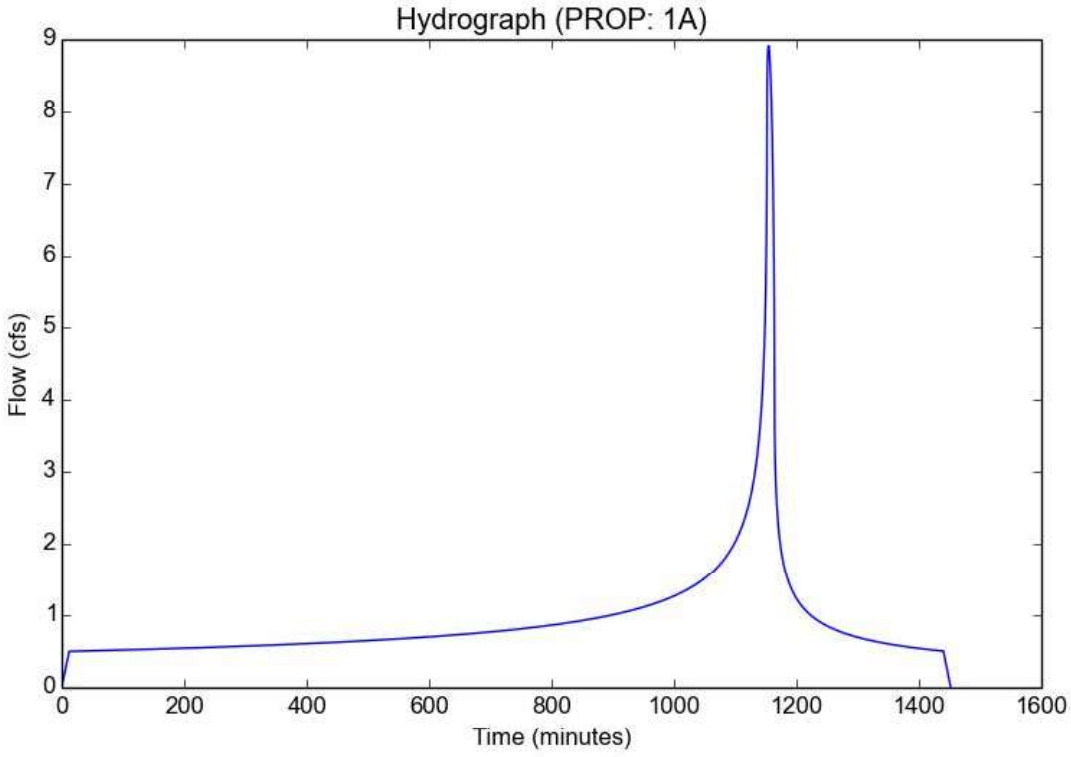
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	1A
Area (ac)	8.6
Flow Path Length (ft)	615.0
Flow Path Slope (vft/hft)	0.0128
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.1608
Peak Intensity (in/hr)	1.2497
Undeveloped Runoff Coefficient (Cu)	0.1149
Developed Runoff Coefficient (Cd)	0.8293
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	8.9132
Burned Peak Flow Rate (cfs)	8.9132
24-Hr Clear Runoff Volume (ac-ft)	1.8602
24-Hr Clear Runoff Volume (cu-ft)	81029.8847



Peak Flow Hydrologic Analysis

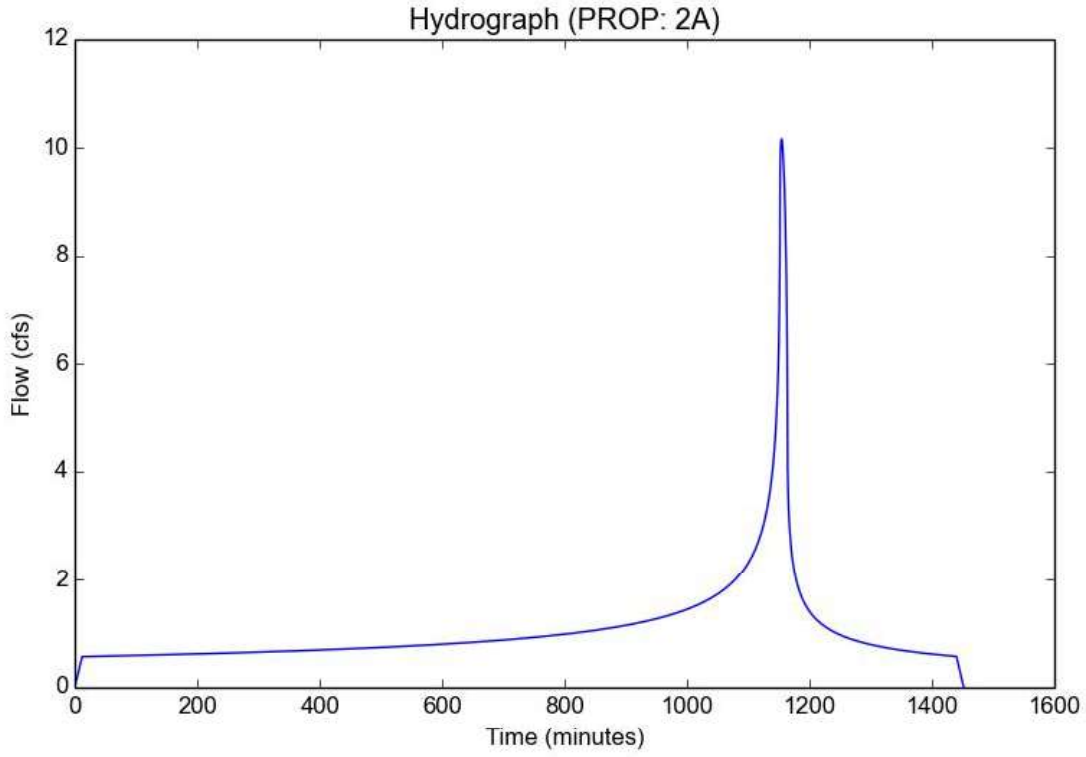
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	2A
Area (ac)	9.8
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.1608
Peak Intensity (in/hr)	1.2497
Undeveloped Runoff Coefficient (Cu)	0.1149
Developed Runoff Coefficient (Cd)	0.8293
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	10.1569
Burned Peak Flow Rate (cfs)	10.1569
24-Hr Clear Runoff Volume (ac-ft)	2.1198
24-Hr Clear Runoff Volume (cu-ft)	92336.3802



Peak Flow Hydrologic Analysis

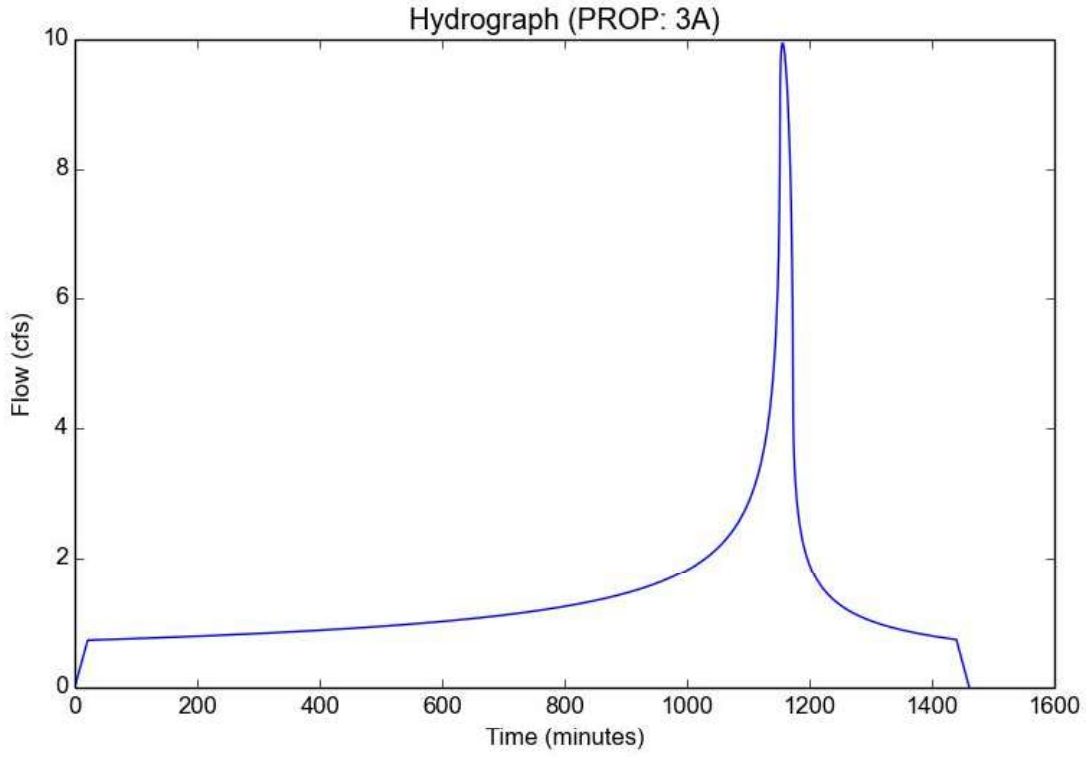
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	3A
Area (ac)	12.5
Flow Path Length (ft)	1163.0
Flow Path Slope (vft/hft)	0.006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.1608
Peak Intensity (in/hr)	0.9607
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	9.9429
Burned Peak Flow Rate (cfs)	9.9429
24-Hr Clear Runoff Volume (ac-ft)	2.7037
24-Hr Clear Runoff Volume (cu-ft)	117772.0667



Peak Flow Hydrologic Analysis

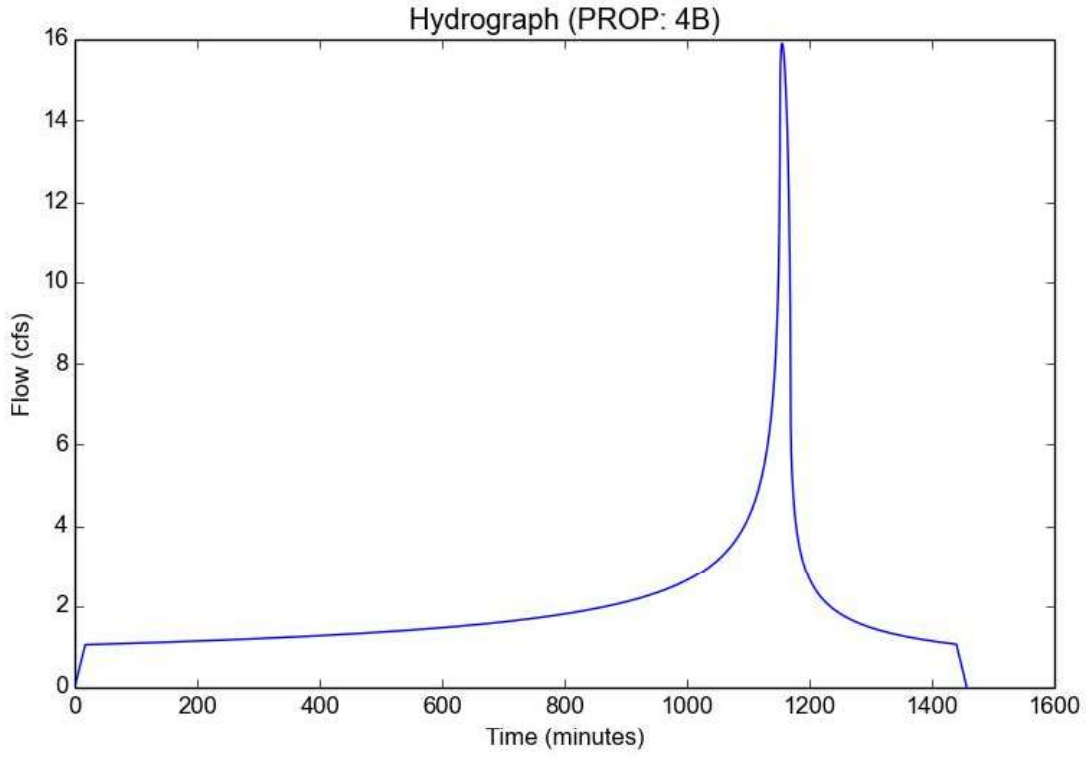
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	4B
Area (ac)	18.1
Flow Path Length (ft)	955.0
Flow Path Slope (vft/hft)	0.0103
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.1608
Peak Intensity (in/hr)	1.061
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	15.9006
Burned Peak Flow Rate (cfs)	15.9006
24-Hr Clear Runoff Volume (ac-ft)	3.9149
24-Hr Clear Runoff Volume (cu-ft)	170533.6222



Peak Flow Hydrologic Analysis

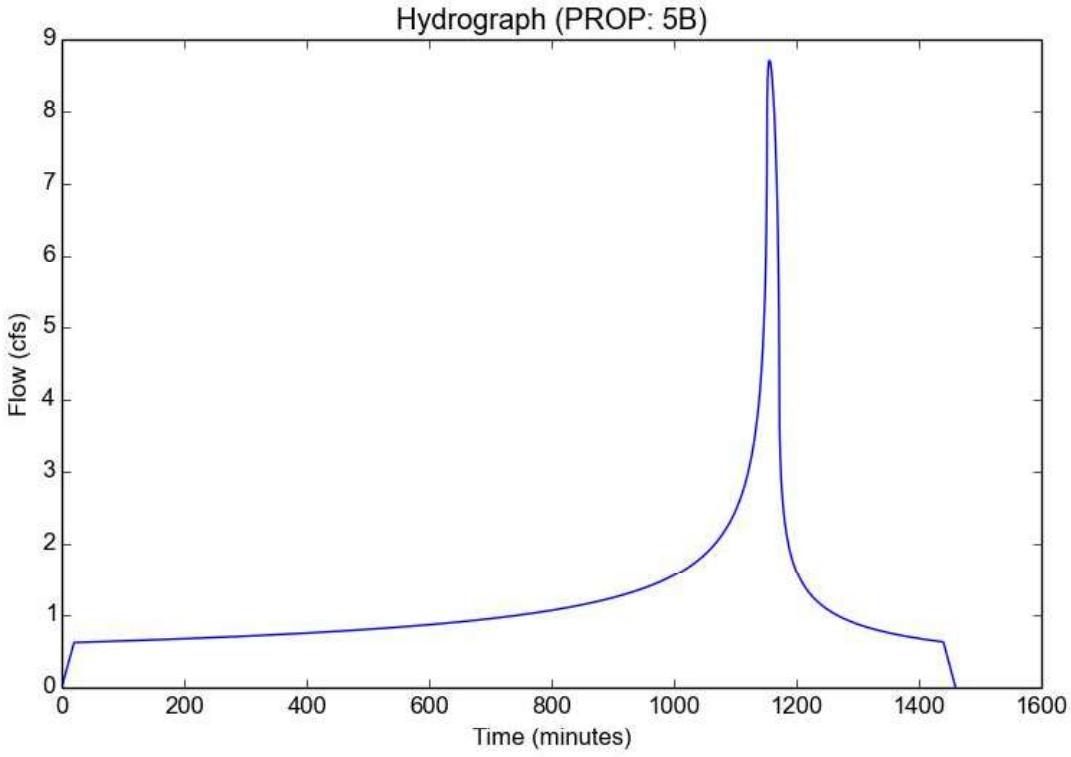
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	5B
Area (ac)	10.7
Flow Path Length (ft)	1284.0
Flow Path Slope (vft/hft)	0.0113
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.1608
Peak Intensity (in/hr)	0.983
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	8.7086
Burned Peak Flow Rate (cfs)	8.7086
24-Hr Clear Runoff Volume (ac-ft)	2.3143
24-Hr Clear Runoff Volume (cu-ft)	100812.8363



Peak Flow Hydrologic Analysis

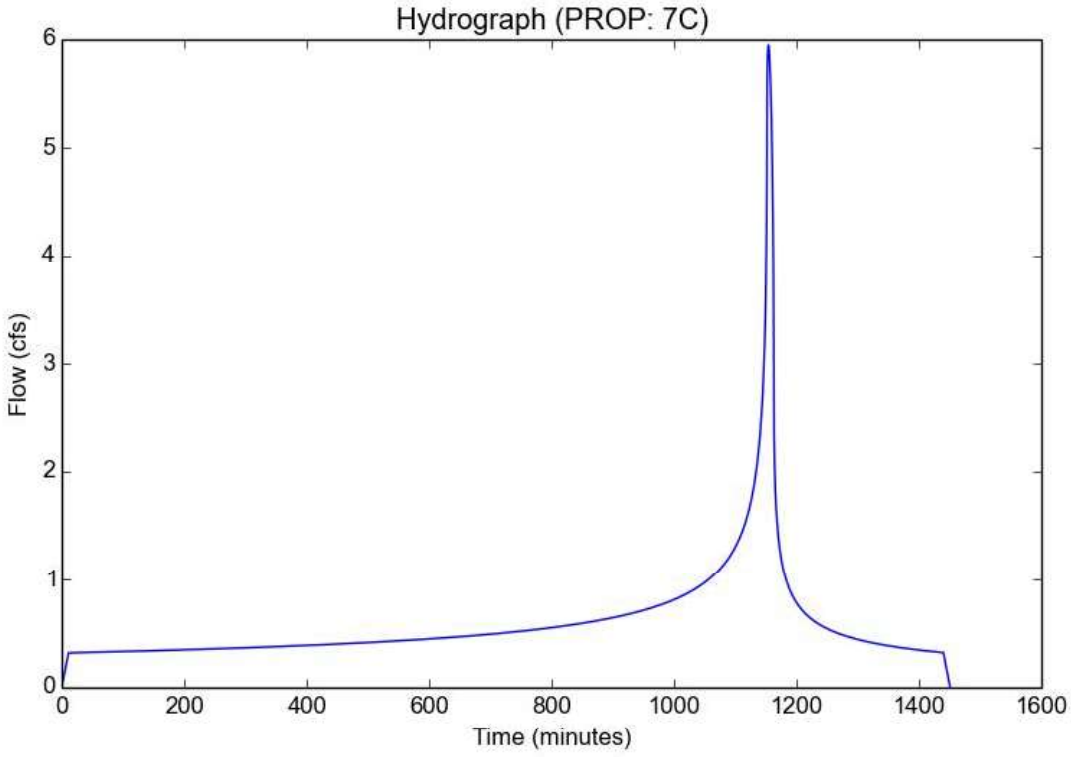
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	7C
Area (ac)	5.5
Flow Path Length (ft)	527.0
Flow Path Slope (vft/hft)	0.0119
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.1608
Peak Intensity (in/hr)	1.3019
Undeveloped Runoff Coefficient (Cu)	0.1305
Developed Runoff Coefficient (Cd)	0.8307
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	5.9483
Burned Peak Flow Rate (cfs)	5.9483
24-Hr Clear Runoff Volume (ac-ft)	1.1897
24-Hr Clear Runoff Volume (cu-ft)	51824.5909



Peak Flow Hydrologic Analysis

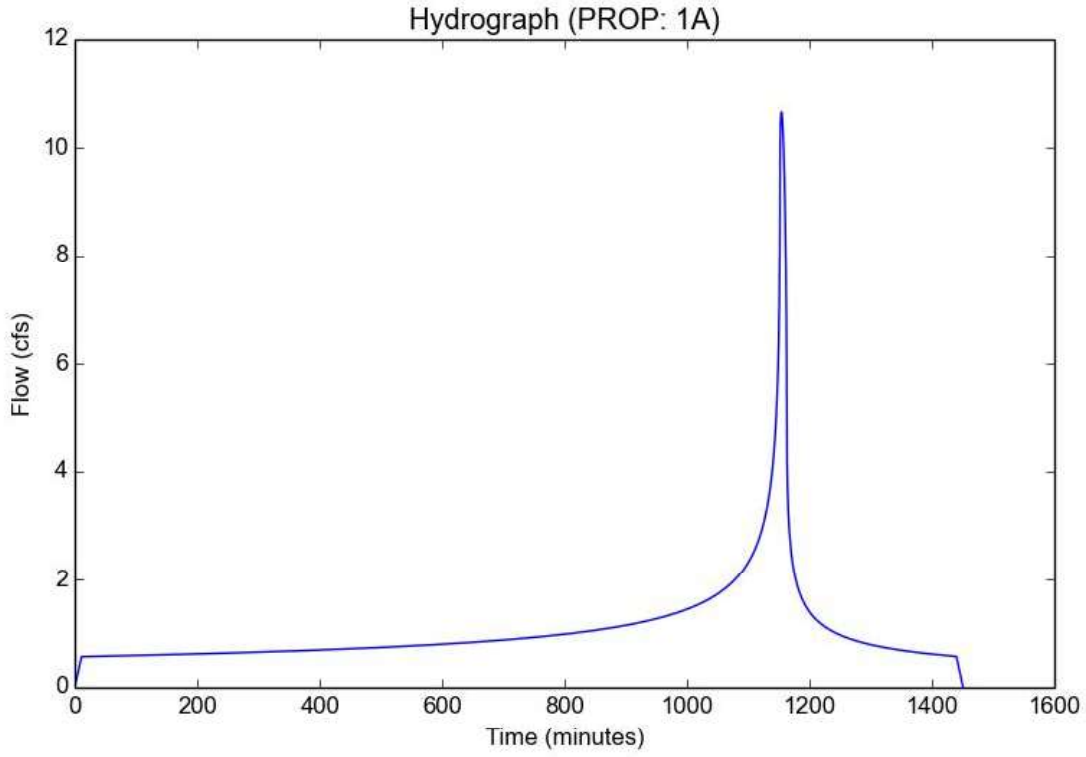
File location: X:/Civil3D/5124-003/Storm/Hydrology/Report/HYDROCALC/Proposed/PROP-Report-50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	1A
Area (ac)	8.6
Flow Path Length (ft)	615.0
Flow Path Slope (vft/hft)	0.0128
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.6
Peak Intensity (in/hr)	1.4827
Undeveloped Runoff Coefficient (Cu)	0.1847
Developed Runoff Coefficient (Cd)	0.8356
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	10.6556
Burned Peak Flow Rate (cfs)	10.6556
24-Hr Clear Runoff Volume (ac-ft)	2.1194
24-Hr Clear Runoff Volume (cu-ft)	92321.4158



Peak Flow Hydrologic Analysis

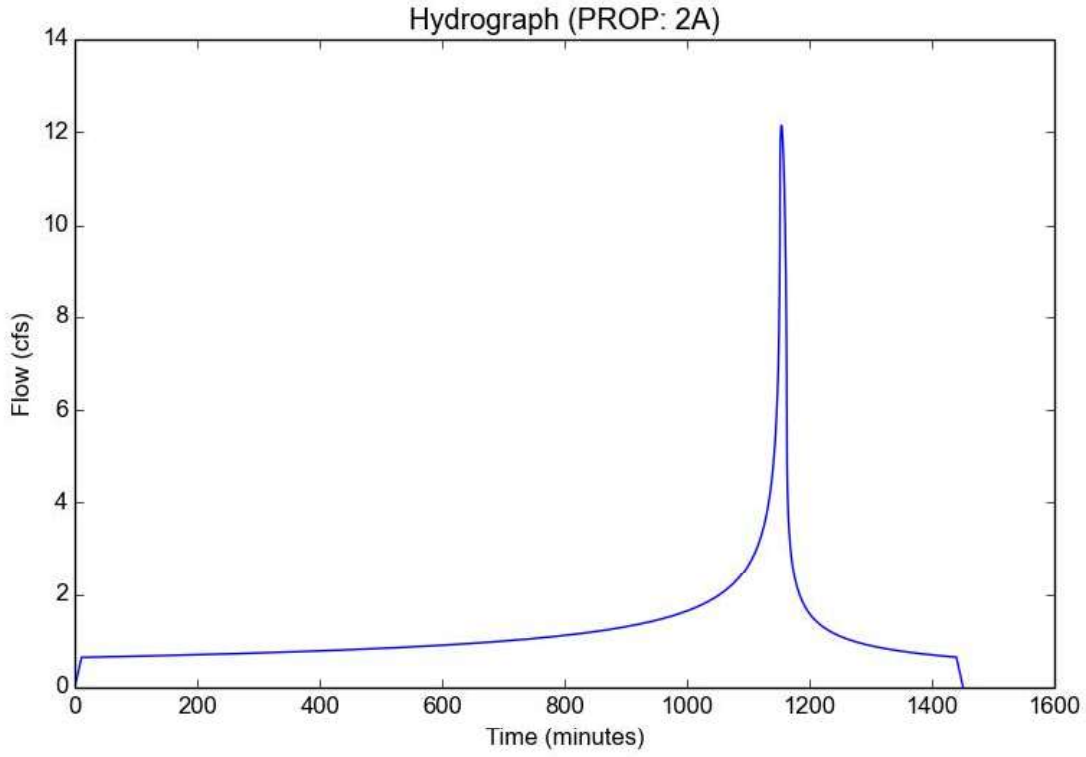
File location: X:/Civil3D/5124-003/Storm/Hydrology/Report/HYDROCALC/Proposed/PROP-Report-50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	2A
Area (ac)	9.8
Flow Path Length (ft)	547.0
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.6
Peak Intensity (in/hr)	1.4827
Undeveloped Runoff Coefficient (Cu)	0.1847
Developed Runoff Coefficient (Cd)	0.8356
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	12.1424
Burned Peak Flow Rate (cfs)	12.1424
24-Hr Clear Runoff Volume (ac-ft)	2.4151
24-Hr Clear Runoff Volume (cu-ft)	105203.4738



Peak Flow Hydrologic Analysis

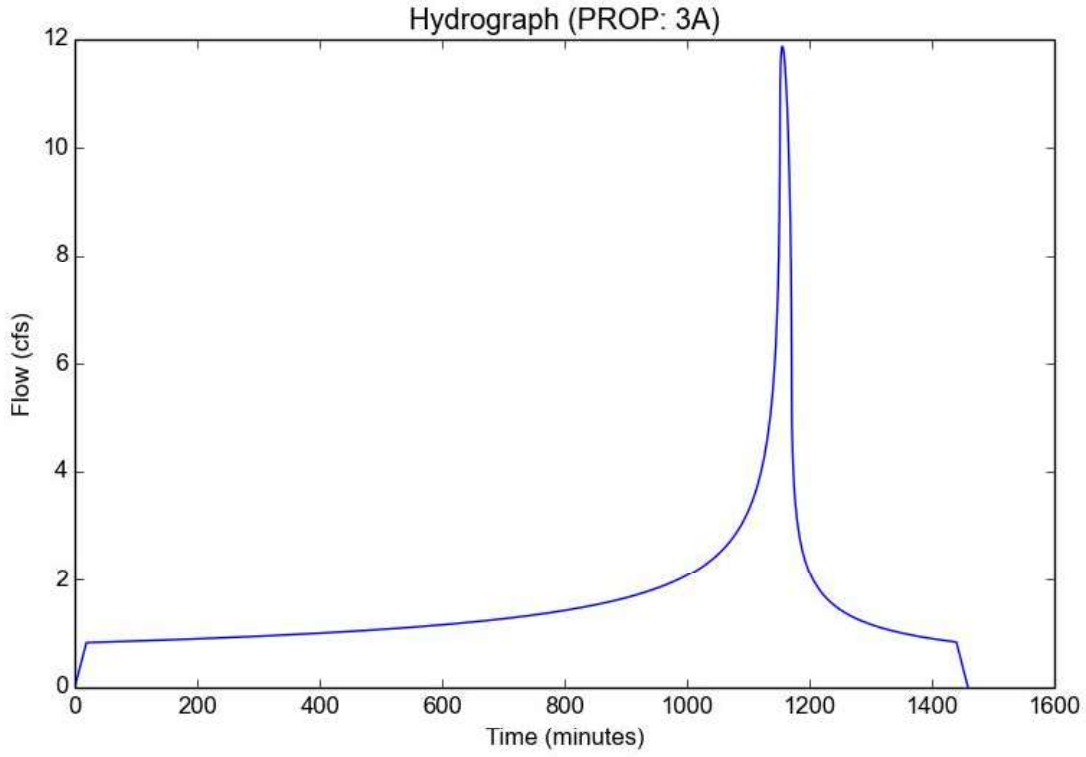
File location: X:/Civil3D/5124-003/Storm/Hydrology/Report/HYDROCALC/Proposed/PROP-Report-50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	3A
Area (ac)	12.5
Flow Path Length (ft)	1163.0
Flow Path Slope (vft/hft)	0.006
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.6
Peak Intensity (in/hr)	1.1469
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	11.8699
Burned Peak Flow Rate (cfs)	11.8699
24-Hr Clear Runoff Volume (ac-ft)	3.0794
24-Hr Clear Runoff Volume (cu-ft)	134136.6133



Peak Flow Hydrologic Analysis

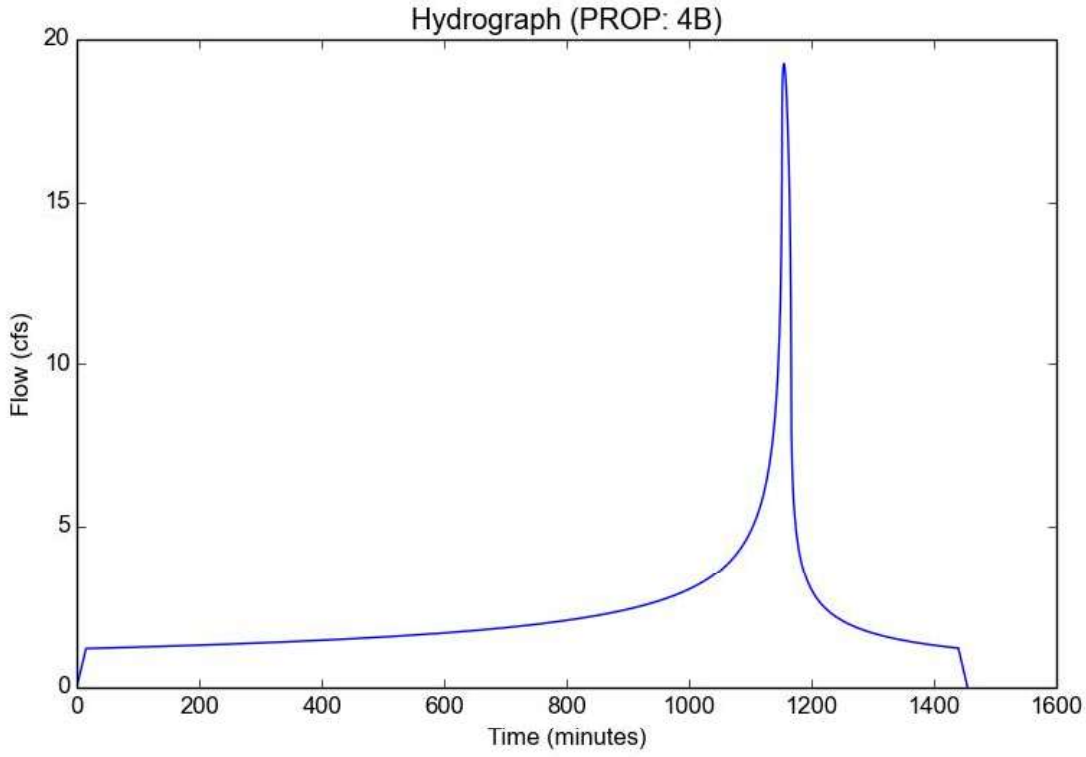
File location: X:/Civil3D/5124-003/Storm/Hydrology/Report/HYDROCALC/Proposed/PROP-Report-50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	4B
Area (ac)	18.1
Flow Path Length (ft)	955.0
Flow Path Slope (vft/hft)	0.0103
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.6
Peak Intensity (in/hr)	1.2816
Undeveloped Runoff Coefficient (Cu)	0.1245
Developed Runoff Coefficient (Cd)	0.8302
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	19.2584
Burned Peak Flow Rate (cfs)	19.2584
24-Hr Clear Runoff Volume (ac-ft)	4.4593
24-Hr Clear Runoff Volume (cu-ft)	194245.9858



Peak Flow Hydrologic Analysis

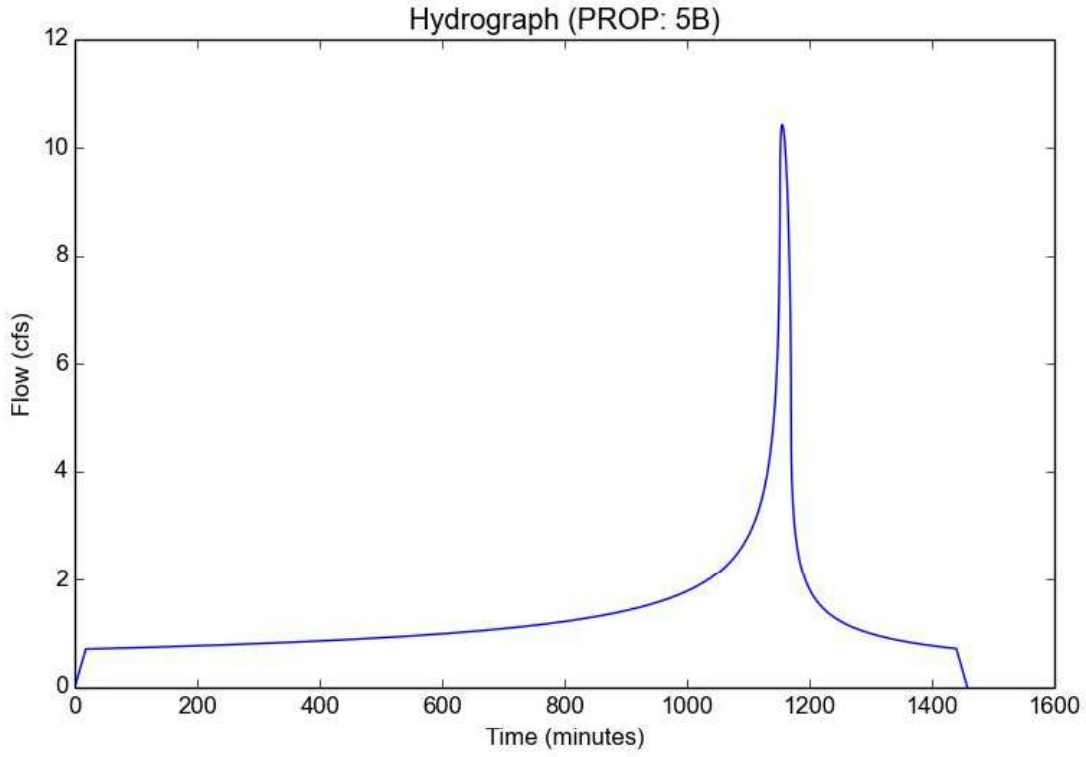
File location: X:/Civil3D/5124-003/Storm/Hydrology/Report/HYDROCALC/Proposed/PROP-Report-50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	5B
Area (ac)	10.7
Flow Path Length (ft)	1284.0
Flow Path Slope (vft/hft)	0.0113
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.6
Peak Intensity (in/hr)	1.1764
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.828
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	10.4222
Burned Peak Flow Rate (cfs)	10.4222
24-Hr Clear Runoff Volume (ac-ft)	2.6359
24-Hr Clear Runoff Volume (cu-ft)	114820.8869



Peak Flow Hydrologic Analysis

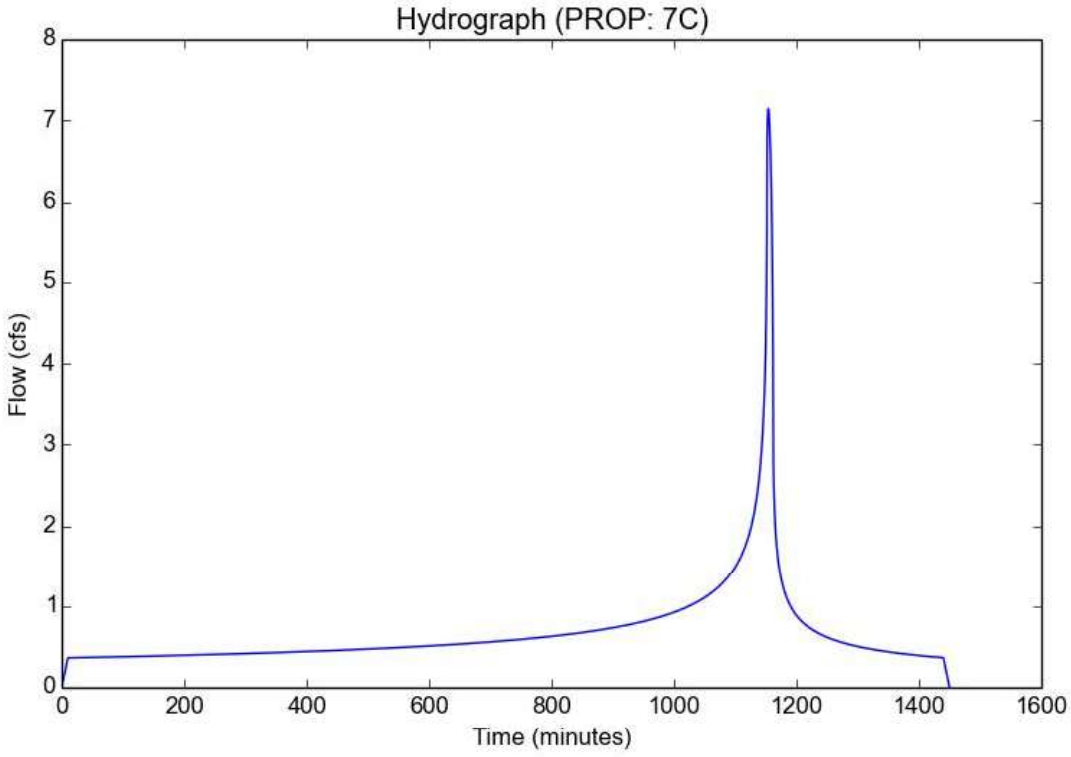
File location: X:/Civil3D/5124-003/Storm/Hydrology/Report/HYDROCALC/Proposed/PROP-Report-50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	PROP
Subarea ID	7C
Area (ac)	5.5
Flow Path Length (ft)	527.0
Flow Path Slope (vft/hft)	0.0119
50-yr Rainfall Depth (in)	3.6
Percent Impervious	0.91
Soil Type	134
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.6
Peak Intensity (in/hr)	1.5507
Undeveloped Runoff Coefficient (Cu)	0.2051
Developed Runoff Coefficient (Cd)	0.8375
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	7.1425
Burned Peak Flow Rate (cfs)	7.1425
24-Hr Clear Runoff Volume (ac-ft)	1.3556
24-Hr Clear Runoff Volume (cu-ft)	59048.5849



MODRAT Calculations, Proposed Condition

March 6, 2025

Contents

1 MODRAT, Proposed **2**

1.1 Proposed, 2-yr, Input . . . 2
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1.4 Proposed, 5-yr, Output . . . 5
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1 MODRAT, Proposed

1.1 Proposed, 2-yr, Input

```
006     2    1A 134 91 8.622A184 1290   400     2.00            1  012
006     2    2A 134 91 9.821A184  815   400     2.00               012
006     2    3A 134 9112.530A184  627   400     2.25               012
006     2    4B 134 9118.130A184  900  1000     2.00               012
006     2    5B 134 9110.730A18
006     2    6AB134         A18
006     2    7C 134 91 5.520A18
006     2    8AC134         A18                          2  2
```

1.2 Proposed, 2-yr, Output

```
 Program Package Serial Number:  2083
03/06/25   FILE: P-02     INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units     PAGE     1
                                    LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                    PROG F0601M

Version 11, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR =  2  SOIL DATA FILE: C:\civild\scr_soilx_34.dat
BEGIN                                                                                                  STORM DAY 4
                SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV  CONTROL SOIL       RAIN  PCT
LOCATION        AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)   Z     Q(CFS) NAME  TC   ZONE  IMPV
   2    1A       8.6       2.95       8.6     2.95   4     1290.    .00400     2.00    .00       0.  134  22    A18   .91
   2    2A       9.8       3.44      18.4     5.92   4      815.    .00400     2.00    .00       0.  134  21    A18   .91
   2    3A      12.5       3.70      30.9     9.37   4      627.    .00400     2.25    .00       0.  134  30    A18   .91
   2    4B      18.1       5.35      18.1     5.35   4      900.    .01000     2.00    .00       0.  134  30    A18   .91
   2    5B      10.7       3.17      28.8     8.46   0        0.    .00000      .00    .00       0.  134  30    A18   .91
   2    6AB     28.8       8.46      59.7    17.49   0        0.    .00000      .00    .00       0.  134   0    A18   .00
   2    7C       5.5       1.98       5.5     1.98   0        0.    .00000      .00    .00       0.  134  20    A18   .91
   2    8AC      5.5       1.98      65.2    19.17   0        0.    .00000      .00    .00       0.  134   0    A18   .00
```

1.3 Proposed, 5-yr, Input

```
006     5    1A 134 91 8.616A184 1290   400     2.00            1  012
006     5    2A 134 91 9.815A184  815   400     2.00               012
006     5    3A 134 9112.528A184  627   400     2.25               012
006     5    4B 134 9118.122A184  900  1000     2.00               012
006     5    5B 134 9110.727A18
006     5    6AB134         A18
006     5    7C 134 91 5.515A18
006     5    8AC134         A18                          2  2
```

1.4 Proposed, 5-yr, Output

```
 Program Package Serial Number:  2083
03/06/25   FILE: P-05     INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units     PAGE     1
                                    LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                    PROG F0601M

Version 11, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR =  5  SOIL DATA FILE: C:\civild\scr_soilx_34.dat
BEGIN                                                                                                  STORM DAY 4
                SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV  CONTROL SOIL       RAIN  PCT
LOCATION        AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)   Z     Q(CFS) NAME  TC   ZONE  IMPV
   5    1A       8.6       5.16       8.6     5.16   4     1290.    .00400     2.00    .00       0.  134  16    A18   .91
   5    2A       9.8       6.07      18.4    10.14   4      815.    .00400     2.00    .00       0.  134  15    A18   .91
   5    3A      12.5       5.78      30.9    15.57   4      627.    .00400     2.25    .00       0.  134  28    A18   .91
   5    4B      18.1       9.36      18.1     9.36   4      900.    .01000     2.00    .00       0.  134  22    A18   .91
   5    5B      10.7       5.04      28.8    14.29   0        0.    .00000      .00    .00       0.  134  27    A18   .91
   5    6AB     28.8      14.29      59.7    29.11   0        0.    .00000      .00    .00       0.  134   0    A18   .00
   5    7C       5.5       3.40       5.5     3.40   0        0.    .00000      .00    .00       0.  134  15    A18   .91
   5    8AC      5.5       3.40      65.2    31.88   0        0.    .00000      .00    .00       0.  134   0    A18   .00
```

1.5 Proposed, 10-yr, Input

```
006    10    1A 134 91 8.614A184 1290   400     2.00           1  012
006    10    2A 134 91 9.813A184  815   400     2.00              012
006    10    3A 134 9112.524A184  627   400     2.25              012
006    10    4B 134 9118.119A184  900  1000     2.00              012
006    10    5B 134 9110.723A18
006    10    6AB134         A18
006    10    7C 134 91 5.513A18
006    10    8AC134         A18                          2  2
```

1.6 Proposed, 10-yr, Output

```
 Program Package Serial Number:  2083
03/06/25   FILE: P-10     INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units     PAGE     1
                                    LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                    PROG F0601M

Version 11, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 10  SOIL DATA FILE: C:\civild\scr_soilx_34.dat
BEGIN                                                                                                  STORM DAY 4
                SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV  CONTROL SOIL       RAIN  PCT
LOCATION        AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)   Z     Q(CFS) NAME  TC   ZONE  IMPV
  10    1A       8.6       6.71       8.6     6.71   4     1290.    .00400     2.00    .00       0.  134  14    A18   .91
  10    2A       9.8       7.92      18.4    13.05   4      815.    .00400     2.00    .00       0.  134  13    A18   .91
  10    3A      12.5       7.59      30.9    20.06   4      627.    .00400     2.25    .00       0.  134  24    A18   .91
  10    4B      18.1      12.27      18.1    12.27   4      900.    .01000     2.00    .00       0.  134  19    A18   .91
  10    5B      10.7       6.63      28.8    18.70   0        0.    .00000      .00    .00       0.  134  23    A18   .91
  10    6AB     28.8      18.70      59.7    37.48   0        0.    .00000      .00    .00       0.  134   0    A18   .00
  10    7C       5.5       4.44       5.5     4.44   0        0.    .00000      .00    .00       0.  134  13    A18   .91
  10    8AC      5.5       4.44      65.2    40.92   0        0.    .00000      .00    .00       0.  134   0    A18   .00
```

1.7 Proposed, 25-yr, Input

```
006    25    1A 134 91 8.612A184 1290   400                    1  012
006    25    2A 134 91 9.812A184  815   400                       012
006    25    3A 134 9112.521A184  627   400                       012
006    25    4B 134 9118.117A184  900  1000                       012
006    25    5B 134 9110.720A18
006    25    6AB134         A18
006    25    7C 134 91 5.511A18
006    25    8AC134         A18                          2  2
```

1.8 Proposed, 25-yr, Output

```
 Program Package Serial Number:  2083
03/06/25   FILE: P-25     INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units     PAGE     1
                                    LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                    PROG F0601M

Version 11, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25  SOIL DATA FILE: C:\civild\scr_soilx_34.dat
BEGIN                                                                                                  STORM DAY 4
                SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV      CONV   CONV  CONTROL SOIL       RAIN  PCT
LOCATION        AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)   Z     Q(CFS) NAME  TC   ZONE  IMPV
  25    1A       8.6       8.90       8.6     8.90   4     1290.    .00400     2.00    .00       0.  134   12   A18   .91
  25    2A       9.8      10.14      18.4    16.85   4      815.    .00400     2.25    .00       0.  134   12   A18   .91
  25    3A      12.5       9.94      30.9    25.93   4      627.    .00400     2.50    .00       0.  134   21   A18   .91
  25    4B      18.1      15.88      18.1    15.88   4      900.    .01000     2.00    .00       0.  134   17   A18   .91
  25    5B      10.7       8.73      28.8    24.26   0        0.    .00000      .00    .00       0.  134   20   A18   .91
  25    6AB     28.8      24.26      59.7    48.52   0        0.    .00000      .00    .00       0.  134    0   A18   .00
  25    7C       5.5       5.94       5.5     5.94   0        0.    .00000      .00    .00       0.  134   11   A18   .91
  25    8AC      5.5       5.94      65.2    52.63   0        0.    .00000      .00    .00       0.  134    0   A18   .00
```

1.9 Proposed, 50-yr, Input

```
006    50    1A 134 91 8.611A184 1290   400     2.00            1  012
006    50    2A 134 91 9.811A184  815   400     2.00               012
006    50    3A 134 9112.519A184  627   400     2.25               012
006    50    4B 134 9118.115A184  900  1000     2.00               012
006    50    5B 134 9110.718A18
006    50    6AB134         A18
006    50    7C 134 91 5.510A18
006    50    8AC134         A18                          2  2
```

1.10 Proposed, 50-yr, Output

```
 Program Package Serial Number:  2083
03/06/25   FILE: P-50     INPUT DATA: English Units  RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units     PAGE     1
                                    LOS ANGELES COUNTY FLOOD CONTROL DISTRICT                    PROG F0601M

Version 11, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50  SOIL DATA FILE: C:\civild\scr_soilx_34.dat
BEGIN                                                                                                  STORM DAY 4
                SUBAREA   SUBAREA     TOTAL   TOTAL  CONV   CONV      CONV     CONV   CONV  CONTROL SOIL       RAIN  PCT
LOCATION        AREA(Ac)  Q(CFS)    AREA(Ac) Q(CFS) TYPE  LNGTH(Ft) SLOPE  SIZE(Ft)   Z    Q(CFS) NAME  TC   ZONE  IMPV
  50    1A       8.6      10.64       8.6     10.64   4     1290.   .00400     2.00    .00       0.  134   11   A18   .91
  50    2A       9.8      12.12      18.4     19.96   4      815.   .00400     2.00    .00       0.  134   11   A18   .91
  50    3A      12.5      11.86      30.9     31.46   4      627.   .00400     2.25    .00       0.  134   19   A18   .91
  50    4B      18.1      19.25      18.1     19.25   4      900.   .01000     2.00    .00       0.  134   15   A18   .91
  50    5B      10.7      10.40      28.8     29.20   0        0.   .00000      .00    .00       0.  134   18   A18   .91
  50    6AB     28.8      29.20      59.7     60.38   0        0.   .00000      .00    .00       0.  134    0   A18   .00
  50    7C       5.5       7.17       5.5      7.17   0        0.   .00000      .00    .00       0.  134   10   A18   .91
  50    8AC      5.5       7.17      65.2     66.05   0        0.   .00000      .00    .00       0.  134    0   A18   .00
```

APPENDIX D

Hydrograph Routing Calculations

March 6, 2025

Contents

1 2-year, Proposed **2**

2 5-year, Proposed **6**

3 10-year, Proposed **11**

4 25-year, Proposed **15**

5 50-year, Proposed **20**

1 2-year, Proposed

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
------------------------------------------------------------------------
Study Date : 03/06/25 Input hydrograph file name : P02.HYD
Output hydrograph file name: PR02.hin
2-YR PROPOSED CLEAR
24-IN OUTLET PIPE



------------------------------------------------------------------------


User entry of depth-outflow-storage data
------------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
------------------------------------------------------------------------
  0.000      0.000      0.000      0.000        0.000
  1.000      1.285      1.200      1.284        1.286
  2.000      2.569      2.400      2.568        2.571
  3.000      4.019      3.500      4.016        4.021
  4.000      5.468      4.400      5.465        5.471
  5.000      6.917      5.100      6.913        6.920
  6.000      8.366      5.700      8.362        8.370
  7.000      9.815      6.100      9.811        9.819
------------------------------------------------------------------------
                Hydrograph Detention Basin Routing
Hydrograph at 2 8 A Storm Day: 4 Drainage Area =   65.20
Total flood hydrograph volume this storm day =    6.15 Ac. Ft.
------------------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
------------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                    Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       4.8     9.5    14.3    19.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     2.0     0.1      0.133  O  I    |       |       |       |      0.1
  200     2.0     0.4      0.376  O  I    |       |       |       |      0.3
  300     2.0     0.6      0.589  O  I    |       |       |       |      0.5
  400     2.0     0.7      0.776  |O I    |       |       |       |      0.6
  500     2.0     0.9      0.941  |O I    |       |       |       |      0.7
  600     2.0     1.0      1.086  |O I    |       |       |       |      0.8
  700     2.0     1.1      1.213  |O I    |       |       |       |      0.9
  800     3.0     1.3      1.392  | O  I  |       |       |       |      1.1
```

900	3.0	1.5	1.612	O I					1.3
1000	4.0	1.7	1.872	O I					1.5
1050	5.0	1.9	2.056	O I					1.6
1100	6.0	2.1	2.296	O	I				1.8
1110	6.0	2.2	2.349	O	I				1.8
1120	7.0	2.2	2.408	O	I				1.9
1130	8.0	2.3	2.481	O	I				1.9
1131	8.0	2.3	2.489	O	I				1.9
1132	8.0	2.3	2.496	O	I				1.9
1133	8.0	2.3	2.504	O	I				1.9
1134	8.0	2.3	2.512	O	I				2.0
1135	9.0	2.4	2.521	O	I				2.0
1136	9.0	2.4	2.530	O	I				2.0
1137	9.0	2.4	2.539	O	I				2.0
1138	9.0	2.4	2.549	O	I				2.0
1139	9.0	2.4	2.558	O	I				2.0
1140	9.0	2.4	2.567	O	I				2.0
1141	10.0	2.4	2.577	O	I				2.0
1142	10.0	2.4	2.588	O	I				2.0
1143	10.0	2.4	2.598	O	I				2.0
1144	10.0	2.4	2.609	O	I				2.0
1145	10.0	2.4	2.619	O	I				2.0
1146	11.0	2.4	2.631	O	I				2.0
1147	11.0	2.5	2.643	O	I				2.1
1148	11.0	2.5	2.654	O	I				2.1
1149	12.0	2.5	2.668	O	I				2.1
1150	12.0	2.5	2.681	O	I				2.1
1151	13.0	2.5	2.695	O	I				2.1
1152	14.0	2.5	2.711	O	I				2.1
1153	15.0	2.5	2.728	O	I				2.1
1154	16.0	2.5	2.747	O	I				2.1
1155	16.0	2.5	2.765	O	I				2.1
1156	17.0	2.6	2.785	O	I				2.1
1157	17.0	2.6	2.805	O	I				2.2
1158	18.0	2.6	2.826	O	I				2.2
1159	18.0	2.6	2.847	O	I				2.2
1160	19.0	2.6	2.870	O	I				2.2
1161	19.0	2.6	2.893	O	I				2.2
1162	19.0	2.7	2.915	O	I				2.2
1163	19.0	2.7	2.938	O	I				2.3
1164	19.0	2.7	2.960	O	I				2.3
1165	19.0	2.7	2.982	O	I				2.3
1166	19.0	2.7	3.005	O	I				2.3
1167	19.0	2.7	3.027	O	I				2.3
1168	19.0	2.8	3.050	O	I				2.3
1169	19.0	2.8	3.072	O	I				2.3
1170	19.0	2.8	3.094	O	I				2.4
1171	18.0	2.8	3.115	O	I				2.4
1172	18.0	2.8	3.136	O	I				2.4
1173	18.0	2.8	3.157	O	I				2.4
1174	17.0	2.9	3.177	O	I				2.4
1175	17.0	2.9	3.196	O	I				2.4
1176	16.0	2.9	3.214	O	I				2.4
1177	16.0	2.9	3.232	O	I				2.5
1178	16.0	2.9	3.250	O	I				2.5
1179	15.0	2.9	3.267	O	I				2.5
1180	14.0	2.9	3.282	O	I				2.5

1181	13.0	3.0	3.296	O			I		2.5
1182	13.0	3.0	3.310	O			I		2.5
1183	12.0	3.0	3.322	O			I		2.5
1184	11.0	3.0	3.333	O		I			2.5
1185	10.0	3.0	3.343	O		I			2.5
1186	9.0	3.0	3.351	O		I			2.5
1187	9.0	3.0	3.359	O		I			2.5
1188	8.0	3.0	3.366	O	I				2.5
1189	8.0	3.0	3.373	O	I				2.6
1190	7.0	3.0	3.379	O	I				2.6
1191	7.0	3.0	3.384	O	I				2.6
1192	7.0	3.0	3.390	O	I				2.6
1193	7.0	3.0	3.395	O	I				2.6
1194	6.0	3.0	3.399	O	I				2.6
1195	6.0	3.0	3.403	O	I				2.6
1196	6.0	3.0	3.407	O	I				2.6
1197	6.0	3.0	3.411	O	I				2.6
1198	6.0	3.0	3.416	O	I				2.6
1199	6.0	3.0	3.420	O	I				2.6
1200	5.0	3.0	3.422	O	I				2.6
1201	5.0	3.0	3.425	O	I				2.6
1202	5.0	3.1	3.428	O	I				2.6
1203	5.0	3.1	3.430	O	I				2.6
1204	5.0	3.1	3.433	O	I				2.6
1205	5.0	3.1	3.436	O	I				2.6
1206	5.0	3.1	3.438	O	I				2.6
1207	5.0	3.1	3.441	O	I				2.6
1208	5.0	3.1	3.444	O	I				2.6
1209	5.0	3.1	3.446	O	I				2.6
1210	5.0	3.1	3.449	O	I				2.6
1211	4.0	3.1	3.450	OI					2.6
1212	4.0	3.1	3.452	OI					2.6
1213	4.0	3.1	3.453	OI					2.6
1214	4.0	3.1	3.454	OI					2.6
1215	4.0	3.1	3.455	OI					2.6
1216	4.0	3.1	3.457	OI					2.6
1217	4.0	3.1	3.458	OI					2.6
1218	4.0	3.1	3.459	OI					2.6
1219	4.0	3.1	3.461	OI					2.6
1220	4.0	3.1	3.462	OI					2.6
1221	4.0	3.1	3.463	OI					2.6
1222	4.0	3.1	3.464	OI					2.6
1223	4.0	3.1	3.466	OI					2.6
1224	4.0	3.1	3.467	OI					2.6
1225	4.0	3.1	3.468	OI					2.6
1226	4.0	3.1	3.469	OI					2.6
1227	4.0	3.1	3.471	OI					2.6
1228	4.0	3.1	3.472	OI					2.6
1229	4.0	3.1	3.473	OI					2.6
1230	4.0	3.1	3.474	OI					2.6
1231	4.0	3.1	3.476	OI					2.6
1232	4.0	3.1	3.477	OI					2.6
1233	4.0	3.1	3.478	OI					2.6
1234	3.0	3.1	3.478	O					2.6
1235	3.0	3.1	3.478	O					2.6
1236	3.0	3.1	3.478	O					2.6
1237	3.0	3.1	3.478	O					2.6

1238	3.0	3.1	3.478	0				2.6
1239	3.0	3.1	3.477	0				2.6
1240	3.0	3.1	3.477	0				2.6
1241	3.0	3.1	3.477	0				2.6
1242	3.0	3.1	3.477	0				2.6
1243	3.0	3.1	3.477	0				2.6
1244	3.0	3.1	3.477	0				2.6
1245	3.0	3.1	3.477	0				2.6
1246	3.0	3.1	3.477	0				2.6
1247	3.0	3.1	3.477	0				2.6
1248	3.0	3.1	3.476	0				2.6
1249	3.0	3.1	3.476	0				2.6
1250	3.0	3.1	3.476	0				2.6
1251	3.0	3.1	3.476	0				2.6
1252	3.0	3.1	3.476	0				2.6
1253	3.0	3.1	3.476	0				2.6
1254	3.0	3.1	3.476	0				2.6
1255	3.0	3.1	3.476	0				2.6
1256	3.0	3.1	3.475	0				2.6
1257	3.0	3.1	3.475	0				2.6
1258	3.0	3.1	3.475	0				2.6
1259	3.0	3.1	3.475	0				2.6
1260	3.0	3.1	3.475	0				2.6
1261	3.0	3.1	3.475	0				2.6
1262	3.0	3.1	3.475	0				2.6
1263	3.0	3.1	3.475	0				2.6
1264	3.0	3.1	3.474	0				2.6
1265	3.0	3.1	3.474	0				2.6
1266	3.0	3.1	3.474	0				2.6
1267	3.0	3.1	3.474	0				2.6
1268	3.0	3.1	3.474	0				2.6
1269	3.0	3.1	3.474	0				2.6
1270	3.0	3.1	3.474	0				2.6
1271	3.0	3.1	3.474	0				2.6
1272	3.0	3.1	3.473	0				2.6
1273	3.0	3.1	3.473	0				2.6
1274	3.0	3.1	3.473	0				2.6
1275	3.0	3.1	3.473	0				2.6
1276	3.0	3.1	3.473	0				2.6
1277	3.0	3.1	3.473	0				2.6
1278	3.0	3.1	3.473	0				2.6
1279	3.0	3.1	3.473	0				2.6
1280	3.0	3.1	3.473	0				2.6
1281	3.0	3.1	3.472	0				2.6
1282	3.0	3.1	3.472	0				2.6
1283	3.0	3.1	3.472	0				2.6
1284	3.0	3.1	3.472	0				2.6
1285	3.0	3.1	3.472	0				2.6
1286	3.0	3.1	3.472	0				2.6
1287	3.0	3.1	3.472	0				2.6
1288	3.0	3.1	3.472	0				2.6
1289	3.0	3.1	3.471	0				2.6
1290	3.0	3.1	3.471	0				2.6
1291	3.0	3.1	3.471	0				2.6
1292	3.0	3.1	3.471	0				2.6
1293	3.0	3.1	3.471	0				2.6
1294	3.0	3.1	3.471	0				2.6

```
1295     3.0     3.1      3.471  |    O  |       |       |       |      2.6
1296     2.0     3.1      3.469  |  I O  |       |       |       |      2.6
1297     2.0     3.1      3.468  |  I O  |       |       |       |      2.6
1298     2.0     3.1      3.466  |  I O  |       |       |       |      2.6
1299     2.0     3.1      3.465  |  I O  |       |       |       |      2.6
1300     2.0     3.1      3.463  |  I O  |       |       |       |      2.6
1310     2.0     3.1      3.449  |  I O  |       |       |       |      2.6
1320     2.0     3.1      3.434  |  I O  |       |       |       |      2.6
1330     2.0     3.0      3.419  |  I O  |       |       |       |      2.6
1340     2.0     3.0      3.405  |  I O  |       |       |       |      2.6
1350     2.0     3.0      3.391  |  I O  |       |       |       |      2.6
1360     2.0     3.0      3.377  |  I O  |       |       |       |      2.6
1370     2.0     3.0      3.363  |  I O  |       |       |       |      2.5
1380     2.0     3.0      3.349  |  I O  |       |       |       |      2.5
1390     2.0     3.0      3.336  |  I O  |       |       |       |      2.5
1400     2.0     3.0      3.322  |  I O  |       |       |       |      2.5
1420     2.0     3.0      3.296  |  IO   |       |       |       |      2.5
1440     2.0     2.9      3.270  |  IO   |       |       |       |      2.5
1460     1.0     2.9      3.230  |I  O   |       |       |       |      2.5
1500     1.0     2.8      3.126  |I  O   |       |       |       |      2.4


Remaining water in basin =    3.13 (Ac.Ft)
Peak flow out of basin =     3.09(CFS)
Peak flow time = 1233 Min., time interval # = 119
Maximum depth in basin =    2.63(Ft.)
```

2 5-year, Proposed

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
------------------------------------------------------------------------
Study Date : 03/06/25 Input hydrograph file name : P05.HYD
Output hydrograph file name: PR05.hin
5-YR PROP CLEAR AT 8A
24-IN OUTLET PIPE
005     5   17B WEST WATERHSED

------------------------------------------------------------------------


User entry of depth-outflow-storage data
------------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
```

Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
1.000	1.285	1.200	1.284	1.286
2.000	2.569	2.400	2.568	2.571
3.000	4.019	3.500	4.016	4.021
4.000	5.468	4.400	5.465	5.471
5.000	6.917	5.100	6.913	6.920
6.000	8.366	5.700	8.362	8.370
7.000	9.815	6.100	9.811	9.819

Hydrograph Detention Basin Routing

Hydrograph at 5 8 A Storm Day: 4 Drainage Area = 65.20

Total flood hydrograph volume this storm day = 9.38 Ac. Ft.

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Min)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 8.0 16.0 24.0 32.0	Depth (Ft.)
0	0.0	0.0	0.000	O | | | |	0.0
100	3.0	0.2	0.200	O I | | | |	0.2
200	3.0	0.5	0.564	O I | | | |	0.4
300	3.0	0.8	0.883	O I | | | |	0.7
400	3.0	1.1	1.164	|O I | | | |	0.9
500	3.0	1.3	1.412	|O I | | | |	1.1
600	3.0	1.5	1.629	|O I | | | |	1.3
700	4.0	1.8	1.887	|O I | | | |	1.5
800	4.0	2.0	2.176	| O I | | | |	1.7
900	5.0	2.3	2.497	| O I | | | |	1.9
1000	6.0	2.7	2.911	| O I | | | |	2.2
1050	7.0	2.9	3.170	| O I| | | |	2.4
1100	9.0	3.1	3.517	| O |I | | |	2.7
1110	10.0	3.2	3.605	| O | I | | |	2.7
1120	11.0	3.3	3.706	| O | I | | |	2.8
1130	13.0	3.4	3.827	| O | I | | |	2.9
1131	13.0	3.4	3.841	| O | I | | |	2.9
1132	13.0	3.4	3.854	| O | I | | |	2.9
1133	13.0	3.4	3.867	| O | I | | |	2.9
1134	13.0	3.4	3.880	| O | I | | |	2.9
1135	14.0	3.4	3.895	| O | I | | |	2.9
1136	14.0	3.4	3.910	| O | I | | |	2.9
1137	14.0	3.4	3.924	| O | I | | |	2.9
1138	14.0	3.4	3.939	| O | I | | |	2.9
1139	14.0	3.5	3.953	| O | I | | |	3.0
1140	15.0	3.5	3.969	| O | I| | |	3.0
1141	15.0	3.5	3.985	| O | I| | |	3.0
1142	15.0	3.5	4.001	| O | I| | |	3.0
1143	16.0	3.5	4.018	| O | I | |	3.0
1144	16.0	3.5	4.035	| O | I | |	3.0
1145	17.0	3.5	4.054	| O | |I | |	3.0
1146	17.0	3.5	4.072	| O | |I | |	3.0
1147	18.0	3.5	4.092	| O | | I | |	3.1
1148	18.0	3.6	4.112	| O | | I | |	3.1
1149	19.0	3.6	4.133	| O | | I |	3.1

```
1150    20.0     3.6      4.156  |  O    |       |   I   |       |      3.1
1151    21.0     3.6      4.180  |  O    |       |    I  |       |      3.1
1152    23.0     3.6      4.207  |  O    |       |      I|       |      3.1
1153    25.0     3.6      4.236  |  O    |       |       |I      |      3.2
1154    26.0     3.7      4.267  |  O    |       |       | I     |      3.2
1155    27.0     3.7      4.299  |  O    |       |       |  I    |      3.2
1156    29.0     3.7      4.334  |  O    |       |       |    I  |      3.2
1157    30.0     3.7      4.370  |  O    |       |       |     I |      3.2
1158    30.0     3.7      4.406  |  O    |       |       |     I |      3.3
1159    31.0     3.8      4.444  |  O    |       |       |      I|      3.3
1160    31.0     3.8      4.481  |  O    |       |       |      I|      3.3
1161    32.0     3.8      4.520  |  O    |       |       |       I      3.3
1162    32.0     3.8      4.559  |  O    |       |       |       I      3.4
1163    32.0     3.9      4.598  |  O    |       |       |       I      3.4
1164    32.0     3.9      4.637  |  O    |       |       |       I      3.4
1165    31.0     3.9      4.674  |  O    |       |       |      I|      3.5
1166    31.0     3.9      4.711  |  O    |       |       |      I|      3.5
1167    30.0     4.0      4.747  |  O    |       |       |     I |      3.5
1168    30.0     4.0      4.783  |  O    |       |       |     I |      3.5
1169    29.0     4.0      4.817  |  O    |       |       |    I  |      3.6
1170    29.0     4.0      4.852  |   O   |       |       |    I  |      3.6
1171    28.0     4.0      4.885  |   O   |       |       |   I   |      3.6
1172    27.0     4.1      4.917  |   O   |       |       |  I    |      3.6
1173    26.0     4.1      4.947  |   O   |       |       | I     |      3.6
1174    24.0     4.1      4.974  |   O   |       |       I       |      3.7
1175    23.0     4.1      5.000  |   O   |       |      I|       |      3.7
1176    22.0     4.1      5.025  |   O   |       |     I |       |      3.7
1177    20.0     4.1      5.047  |   O   |       |   I   |       |      3.7
1178    19.0     4.2      5.067  |   O   |       |  I    |       |      3.7
1179    17.0     4.2      5.085  |   O   |       |I      |       |      3.7
1180    16.0     4.2      5.101  |   O   |       I       |       |      3.7
1181    15.0     4.2      5.116  |   O   |      I|       |       |      3.8
1182    14.0     4.2      5.130  |   O   |     I |       |       |      3.8
1183    13.0     4.2      5.142  |   O   |    I  |       |       |      3.8
1184    12.0     4.2      5.152  |   O   |   I   |       |       |      3.8
1185    11.0     4.2      5.162  |   O   |  I    |       |       |      3.8
1186    11.0     4.2      5.171  |   O   |  I    |       |       |      3.8
1187    10.0     4.2      5.179  |   O   | I     |       |       |      3.8
1188    10.0     4.2      5.187  |   O   | I     |       |       |      3.8
1189    10.0     4.2      5.195  |   O   | I     |       |       |      3.8
1190     9.0     4.2      5.202  |   O   |I      |       |       |      3.8
1191     9.0     4.2      5.208  |   O   |I      |       |       |      3.8
1192     9.0     4.2      5.215  |   O   |I      |       |       |      3.8
1193     9.0     4.2      5.221  |   O   |I      |       |       |      3.8
1194     8.0     4.3      5.226  |   O   I       |       |       |      3.8
1195     8.0     4.3      5.232  |   O   I       |       |       |      3.8
1196     8.0     4.3      5.237  |   O   I       |       |       |      3.8
1197     8.0     4.3      5.242  |   O   I       |       |       |      3.8
1198     8.0     4.3      5.247  |   O   I       |       |       |      3.8
1199     8.0     4.3      5.252  |   O   I       |       |       |      3.9
1200     7.0     4.3      5.256  |   O  I|       |       |       |      3.9
1201     7.0     4.3      5.260  |   O  I|       |       |       |      3.9
1202     7.0     4.3      5.263  |   O  I|       |       |       |      3.9
1203     7.0     4.3      5.267  |   O  I|       |       |       |      3.9
1204     7.0     4.3      5.271  |   O  I|       |       |       |      3.9
1205     7.0     4.3      5.275  |   O  I|       |       |       |      3.9
1206     7.0     4.3      5.278  |   O  I|       |       |       |      3.9
```

1207	7.0	4.3	5.282	O I				3.9
1208	7.0	4.3	5.286	O I				3.9
1209	7.0	4.3	5.290	O I				3.9
1210	6.0	4.3	5.292	O I				3.9
1211	6.0	4.3	5.294	O I				3.9
1212	6.0	4.3	5.297	O I				3.9
1213	6.0	4.3	5.299	O I				3.9
1214	6.0	4.3	5.301	O I				3.9
1215	6.0	4.3	5.304	O I				3.9
1216	6.0	4.3	5.306	O I				3.9
1217	6.0	4.3	5.308	O I				3.9
1218	6.0	4.3	5.311	O I				3.9
1219	6.0	4.3	5.313	O I				3.9
1220	6.0	4.3	5.315	O I				3.9
1221	6.0	4.3	5.318	O I				3.9
1222	6.0	4.3	5.320	O I				3.9
1223	6.0	4.3	5.322	O I				3.9
1224	6.0	4.3	5.325	O I				3.9
1225	6.0	4.3	5.327	O I				3.9
1226	5.0	4.3	5.328	OI				3.9
1227	5.0	4.3	5.329	OI				3.9
1228	5.0	4.3	5.330	OI				3.9
1229	5.0	4.3	5.331	OI				3.9
1230	5.0	4.3	5.332	OI				3.9
1231	5.0	4.3	5.333	OI				3.9
1232	5.0	4.3	5.334	OI				3.9
1233	5.0	4.3	5.335	OI				3.9
1234	5.0	4.3	5.336	OI				3.9
1235	5.0	4.3	5.337	OI				3.9
1236	5.0	4.3	5.337	OI				3.9
1237	5.0	4.3	5.338	OI				3.9
1238	5.0	4.3	5.339	OI				3.9
1239	5.0	4.3	5.340	OI				3.9
1240	5.0	4.3	5.341	OI				3.9
1241	5.0	4.3	5.342	OI				3.9
1242	5.0	4.3	5.343	OI				3.9
1243	5.0	4.3	5.344	OI				3.9
1244	5.0	4.3	5.345	OI				3.9
1245	5.0	4.3	5.346	OI				3.9
1246	5.0	4.3	5.347	OI				3.9
1247	5.0	4.3	5.348	OI				3.9
1248	5.0	4.3	5.349	OI				3.9
1249	5.0	4.3	5.350	OI				3.9
1250	5.0	4.3	5.351	OI				3.9
1251	5.0	4.3	5.351	OI				3.9
1252	5.0	4.3	5.352	OI				3.9
1253	5.0	4.3	5.353	OI				3.9
1254	4.0	4.3	5.353	O				3.9
1255	4.0	4.3	5.352	O				3.9
1256	4.0	4.3	5.352	O				3.9
1257	4.0	4.3	5.352	O				3.9
1258	4.0	4.3	5.351	O				3.9
1259	4.0	4.3	5.351	O				3.9
1260	4.0	4.3	5.350	O				3.9
1261	4.0	4.3	5.350	O				3.9
1262	4.0	4.3	5.349	O				3.9
1263	4.0	4.3	5.349	O				3.9

1264	4.0	4.3	5.348	O				3.9
1265	4.0	4.3	5.348	O				3.9
1266	4.0	4.3	5.347	O				3.9
1267	4.0	4.3	5.347	O				3.9
1268	4.0	4.3	5.347	O				3.9
1269	4.0	4.3	5.346	O				3.9
1270	4.0	4.3	5.346	O				3.9
1271	4.0	4.3	5.345	O				3.9
1272	4.0	4.3	5.345	O				3.9
1273	4.0	4.3	5.344	O				3.9
1274	4.0	4.3	5.344	O				3.9
1275	4.0	4.3	5.343	O				3.9
1276	4.0	4.3	5.343	O				3.9
1277	4.0	4.3	5.343	O				3.9
1278	4.0	4.3	5.342	O				3.9
1279	4.0	4.3	5.342	O				3.9
1280	4.0	4.3	5.341	O				3.9
1281	4.0	4.3	5.341	O				3.9
1282	4.0	4.3	5.340	O				3.9
1283	4.0	4.3	5.340	O				3.9
1284	4.0	4.3	5.339	O				3.9
1285	4.0	4.3	5.339	O				3.9
1286	4.0	4.3	5.339	O				3.9
1287	4.0	4.3	5.338	O				3.9
1288	4.0	4.3	5.338	O				3.9
1289	4.0	4.3	5.337	O				3.9
1290	4.0	4.3	5.337	O				3.9
1291	4.0	4.3	5.336	O				3.9
1292	4.0	4.3	5.336	O				3.9
1293	4.0	4.3	5.336	O				3.9
1294	4.0	4.3	5.335	O				3.9
1295	4.0	4.3	5.335	O				3.9
1296	4.0	4.3	5.334	O				3.9
1297	4.0	4.3	5.334	O				3.9
1298	4.0	4.3	5.333	O				3.9
1299	4.0	4.3	5.333	O				3.9
1300	4.0	4.3	5.332	O				3.9
1310	4.0	4.3	5.328	O				3.9
1320	3.0	4.3	5.316	IO				3.9
1330	3.0	4.3	5.298	IO				3.9
1340	3.0	4.3	5.281	IO				3.9
1350	3.0	4.3	5.263	IO				3.9
1360	3.0	4.3	5.246	IO				3.8
1370	3.0	4.3	5.228	IO				3.8
1380	3.0	4.2	5.211	IO				3.8
1390	3.0	4.2	5.194	IO				3.8
1400	3.0	4.2	5.177	IO				3.8
1420	3.0	4.2	5.144	IO				3.8
1440	3.0	4.2	5.111	IO				3.8
1460	2.0	4.1	5.065	I O				3.7
1500	2.0	4.1	4.945	I O				3.6

Remaining water in basin = 4.95 (Ac.Ft)
Peak flow out of basin = 4.33(CFS)
Peak flow time = 1253 Min., time interval # = 139
Maximum depth in basin = 3.92(Ft.)

3 10-year, Proposed

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
------------------------------------------------------------------------
Study Date : 03/06/25 Input hydrograph file name : P10.HYD
Output hydrograph file name: PR10.hin
10-YR PROPOSED CLEAR
24-IN OUTLET PIPE


------------------------------------------------------------------------


User entry of depth-outflow-storage data
------------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
------------------------------------------------------------------------
  0.000      0.000      0.000      0.000        0.000
  1.000      1.285      1.200      1.284        1.286
  2.000      2.569      2.400      2.568        2.571
  3.000      4.019      3.500      4.016        4.021
  4.000      5.468      4.400      5.465        5.471
  5.000      6.917      5.100      6.913        6.920
  6.000      8.366      5.700      8.362        8.370
  7.000      9.815      6.100      9.811        9.819
------------------------------------------------------------------------
                Hydrograph Detention Basin Routing
Hydrograph at 10 8 A Storm Day: 4 Drainage Area =   65.20
Total flood hydrograph volume this storm day =   11.17 Ac. Ft.
------------------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
------------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                    Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0      10.3    20.5    30.8    41.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     3.0     0.2      0.200  O I     |       |       |       |      0.2
  200     3.0     0.5      0.564  O I     |       |       |       |      0.4
  300     3.0     0.8      0.883  O I     |       |       |       |      0.7
```

400	4.0	1.1	1.231	O I	|	|	|	|	1.0
500	4.0	1.5	1.599	|O I	|	|	|	|	1.2
600	4.0	1.8	1.923	|O I	|	|	|	|	1.5
700	5.0	2.1	2.275	|O I	|	|	|	|	1.8
800	5.0	2.5	2.647	|O I	|	|	|	|	2.1
900	6.0	2.8	3.046	| O I	|	|	|	|	2.3
1000	7.0	3.1	3.537	| O I	|	|	|	|	2.7
1050	8.0	3.4	3.831	| O I	|	|	|	|	2.9
1100	11.0	3.6	4.246	| O I	|	|	|	|	3.2
1110	12.0	3.7	4.355	| O |I	|	|	|	|	3.2
1120	14.0	3.8	4.484	| O | I	|	|	|	|	3.3
1130	16.0	3.9	4.639	| O | I	|	|	|	|	3.4
1131	16.0	3.9	4.655	| O | I	|	|	|	|	3.4
1132	16.0	3.9	4.672	| O | I	|	|	|	|	3.5
1133	16.0	3.9	4.689	| O | I	|	|	|	|	3.5
1134	17.0	3.9	4.707	| O | I	|	|	|	|	3.5
1135	17.0	3.9	4.725	| O | I	|	|	|	|	3.5
1136	17.0	3.9	4.743	| O | I	|	|	|	|	3.5
1137	17.0	4.0	4.761	| O | I	|	|	|	|	3.5
1138	18.0	4.0	4.780	| O | I |	|	|	|	|	3.5
1139	18.0	4.0	4.799	| O | I |	|	|	|	|	3.5
1140	19.0	4.0	4.820	| O | I |	|	|	|	|	3.6
1141	19.0	4.0	4.841	| O | I |	|	|	|	|	3.6
1142	19.0	4.0	4.861	| O | I |	|	|	|	|	3.6
1143	20.0	4.0	4.883	| O | I|	|	|	|	|	3.6
1144	20.0	4.1	4.905	| O | I|	|	|	|	|	3.6
1145	21.0	4.1	4.929	| O | I	|	|	|	|	3.6
1146	22.0	4.1	4.953	| O | |I	|	|	|	|	3.6
1147	22.0	4.1	4.978	| O | |I	|	|	|	|	3.7
1148	23.0	4.1	5.004	| O | |I	|	|	|	|	3.7
1149	24.0	4.1	5.031	| O | | I	|	|	|	|	3.7
1150	26.0	4.1	5.062	| O | | I	|	|	|	|	3.7
1151	28.0	4.2	5.094	| O | | I	|	|	|	|	3.7
1152	30.0	4.2	5.130	| O | | I|	|	|	|	|	3.8
1153	32.0	4.2	5.168	| O | | I	|	|	|	|	3.8
1154	34.0	4.2	5.209	| O | | I	|	|	|	|	3.8
1155	36.0	4.3	5.253	| O | | I	|	|	|	|	3.9
1156	38.0	4.3	5.299	| O | | I	|	|	|	|	3.9
1157	39.0	4.3	5.347	| O | | I	|	|	|	|	3.9
1158	40.0	4.4	5.396	| O | | I	|	|	|	|	4.0
1159	40.0	4.4	5.445	| O | | I	|	|	|	|	4.0
1160	41.0	4.4	5.496	| O | | I	|	|	|	|	4.0
1161	41.0	4.4	5.546	| O | | I	|	|	|	|	4.1
1162	41.0	4.5	5.597	| O | | I	|	|	|	|	4.1
1163	40.0	4.5	5.645	| O | | I	|	|	|	|	4.1
1164	40.0	4.5	5.694	| O | | I	|	|	|	|	4.2
1165	39.0	4.5	5.742	| O | | I	|	|	|	|	4.2
1166	39.0	4.6	5.789	| O | | I	|	|	|	|	4.2
1167	38.0	4.6	5.835	| O | | I	|	|	|	|	4.3
1168	37.0	4.6	5.880	| O | | I	|	|	|	|	4.3
1169	36.0	4.6	5.923	| O | | I	|	|	|	|	4.3
1170	35.0	4.6	5.965	| O | | I	|	|	|	|	4.3
1171	33.0	4.7	6.004	| O | | I	|	|	|	|	4.4
1172	31.0	4.7	6.040	| O | | I	|	|	|	|	4.4
1173	28.0	4.7	6.072	| O | | I	|	|	|	|	4.4
1174	26.0	4.7	6.102	| O | | I	|	|	|	|	4.4
1175	24.0	4.7	6.128	| O | | I	|	|	|	|	4.5

1176	22.0	4.7	6.152	O		I			4.5
1177	20.0	4.7	6.173	O		I			4.5
1178	18.0	4.7	6.191	O		I			4.5
1179	17.0	4.8	6.208	O		I			4.5
1180	16.0	4.8	6.224	O		I			4.5
1181	15.0	4.8	6.238	O		I			4.5
1182	14.0	4.8	6.251	O	I				4.5
1183	14.0	4.8	6.263	O	I				4.5
1184	13.0	4.8	6.275	O	I				4.6
1185	13.0	4.8	6.286	O	I				4.6
1186	12.0	4.8	6.296	O	I				4.6
1187	12.0	4.8	6.306	O	I				4.6
1188	11.0	4.8	6.314	O	I				4.6
1189	11.0	4.8	6.323	O	I				4.6
1190	11.0	4.8	6.331	O	I				4.6
1191	11.0	4.8	6.340	O	I				4.6
1192	10.0	4.8	6.347	O	I				4.6
1193	10.0	4.8	6.354	O	I				4.6
1194	10.0	4.8	6.361	O	I				4.6
1195	10.0	4.8	6.368	O	I				4.6
1196	9.0	4.8	6.374	O	I				4.6
1197	9.0	4.8	6.380	O	I				4.6
1198	9.0	4.8	6.386	O	I				4.6
1199	9.0	4.8	6.391	O	I				4.6
1200	9.0	4.8	6.397	O	I				4.6
1201	9.0	4.9	6.403	O	I				4.6
1202	9.0	4.9	6.408	O	I				4.6
1203	8.0	4.9	6.413	O	I				4.7
1204	8.0	4.9	6.417	O	I				4.7
1205	8.0	4.9	6.421	O	I				4.7
1206	8.0	4.9	6.426	O	I				4.7
1207	8.0	4.9	6.430	O	I				4.7
1208	8.0	4.9	6.434	O	I				4.7
1209	8.0	4.9	6.439	O	I				4.7
1210	8.0	4.9	6.443	O	I				4.7
1211	8.0	4.9	6.447	O	I				4.7
1212	8.0	4.9	6.452	O	I				4.7
1213	7.0	4.9	6.455	O	I				4.7
1214	7.0	4.9	6.457	O	I				4.7
1215	7.0	4.9	6.460	O	I				4.7
1216	7.0	4.9	6.463	O	I				4.7
1217	7.0	4.9	6.466	O	I				4.7
1218	7.0	4.9	6.469	O	I				4.7
1219	7.0	4.9	6.472	O	I				4.7
1220	7.0	4.9	6.475	O	I				4.7
1221	7.0	4.9	6.478	O	I				4.7
1222	7.0	4.9	6.481	O	I				4.7
1223	7.0	4.9	6.484	O	I				4.7
1224	7.0	4.9	6.487	O	I				4.7
1225	7.0	4.9	6.489	O	I				4.7
1226	7.0	4.9	6.492	O	I				4.7
1227	6.0	4.9	6.494	O	I				4.7
1228	6.0	4.9	6.495	O	I				4.7
1229	6.0	4.9	6.497	O	I				4.7
1230	6.0	4.9	6.498	O	I				4.7
1231	6.0	4.9	6.500	O	I				4.7
1232	6.0	4.9	6.501	O	I				4.7

1233	6.0	4.9	6.503	OI				4.7
1234	6.0	4.9	6.505	OI				4.7
1235	6.0	4.9	6.506	OI				4.7
1236	6.0	4.9	6.508	OI				4.7
1237	6.0	4.9	6.509	OI				4.7
1238	6.0	4.9	6.511	OI				4.7
1239	6.0	4.9	6.512	OI				4.7
1240	6.0	4.9	6.514	OI				4.7
1241	6.0	4.9	6.515	OI				4.7
1242	6.0	4.9	6.517	OI				4.7
1243	6.0	4.9	6.518	OI				4.7
1244	6.0	4.9	6.520	OI				4.7
1245	6.0	4.9	6.521	OI				4.7
1246	6.0	4.9	6.523	OI				4.7
1247	6.0	4.9	6.524	OI				4.7
1248	6.0	4.9	6.526	OI				4.7
1249	6.0	4.9	6.527	OI				4.7
1250	6.0	4.9	6.529	OI				4.7
1251	6.0	4.9	6.530	OI				4.7
1252	5.0	4.9	6.530	O				4.7
1253	5.0	4.9	6.530	O				4.7
1254	5.0	4.9	6.530	O				4.7
1255	5.0	4.9	6.531	O				4.7
1256	5.0	4.9	6.531	O				4.7
1257	5.0	4.9	6.531	O				4.7
1258	5.0	4.9	6.531	O				4.7
1259	5.0	4.9	6.531	O				4.7
1260	5.0	4.9	6.531	O				4.7
1261	5.0	4.9	6.531	O				4.7
1262	5.0	4.9	6.531	O				4.7
1263	5.0	4.9	6.532	O				4.7
1264	5.0	4.9	6.532	O				4.7
1265	5.0	4.9	6.532	O				4.7
1266	5.0	4.9	6.532	O				4.7
1267	5.0	4.9	6.532	O				4.7
1268	5.0	4.9	6.532	O				4.7
1269	5.0	4.9	6.532	O				4.7
1270	5.0	4.9	6.532	O				4.7
1271	5.0	4.9	6.532	O				4.7
1272	5.0	4.9	6.533	O				4.7
1273	5.0	4.9	6.533	O				4.7
1274	5.0	4.9	6.533	O				4.7
1275	5.0	4.9	6.533	O				4.7
1276	5.0	4.9	6.533	O				4.7
1277	5.0	4.9	6.533	O				4.7
1278	5.0	4.9	6.533	O				4.7
1279	5.0	4.9	6.533	O				4.7
1280	5.0	4.9	6.534	O				4.7
1281	5.0	4.9	6.534	O				4.7
1282	5.0	4.9	6.534	O				4.7
1283	5.0	4.9	6.534	O				4.7
1284	5.0	4.9	6.534	O				4.7
1285	5.0	4.9	6.534	O				4.7
1286	5.0	4.9	6.534	O				4.7
1287	5.0	4.9	6.534	O				4.7
1288	5.0	4.9	6.534	O				4.7
1289	5.0	4.9	6.535	O				4.7

1290	5.0	4.9	6.535	| O	|	|	|	|	4.7
1291	5.0	4.9	6.535	| O	|	|	|	|	4.7
1292	5.0	4.9	6.535	| O	|	|	|	|	4.7
1293	5.0	4.9	6.535	| O	|	|	|	|	4.7
1294	5.0	4.9	6.535	| O	|	|	|	|	4.7
1295	5.0	4.9	6.535	| O	|	|	|	|	4.7
1296	4.0	4.9	6.534	| O	|	|	|	|	4.7
1297	4.0	4.9	6.533	| O	|	|	|	|	4.7
1298	4.0	4.9	6.532	| O	|	|	|	|	4.7
1299	4.0	4.9	6.530	| O	|	|	|	|	4.7
1300	4.0	4.9	6.529	| O	|	|	|	|	4.7
1310	4.0	4.9	6.516	| O	|	|	|	|	4.7
1320	4.0	4.9	6.504	| O	|	|	|	|	4.7
1330	4.0	4.9	6.492	| O	|	|	|	|	4.7
1340	4.0	4.9	6.479	| O	|	|	|	|	4.7
1350	4.0	4.9	6.467	| O	|	|	|	|	4.7
1360	4.0	4.9	6.455	| O	|	|	|	|	4.7
1370	4.0	4.9	6.443	| O	|	|	|	|	4.7
1380	4.0	4.9	6.431	| O	|	|	|	|	4.7
1390	3.0	4.9	6.412	| IO	|	|	|	|	4.7
1400	3.0	4.8	6.386	| IO	|	|	|	|	4.6
1420	3.0	4.8	6.336	| IO	|	|	|	|	4.6
1440	3.0	4.8	6.286	| IO	|	|	|	|	4.6
1460	2.0	4.8	6.222	|I O	|	|	|	|	4.5
1500	2.0	4.7	6.069	|I O	|	|	|	|	4.4

```
Remaining water in basin =    6.07 (Ac.Ft)
Peak flow out of basin =     4.92(CFS)
Peak flow time = 1295 Min., time interval # = 181
Maximum depth in basin =    4.74(Ft.)
```

4 25-year, Proposed

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
------------------------------------------------------------------------
Study Date : 03/06/25 Input hydrograph file name : P25.HYD
Output hydrograph file name: PR25.hin
25-YEAR PROPOSED CLEAR AT 8A
24-IN OUTLET PIPE


------------------------------------------------------------------------


User entry of depth-outflow-storage data
------------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
```

```
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
------------------------------------------------------------------------
  0.000      0.000      0.000      0.000        0.000
  1.000      1.285      1.200      1.284        1.286
  2.000      2.569      2.400      2.568        2.571
  3.000      4.019      3.500      4.016        4.021
  4.000      5.468      4.400      5.465        5.471
  5.000      6.917      5.100      6.913        6.920
  6.000      8.366      5.700      8.362        8.370
  7.000      9.815      6.100      9.811        9.819
------------------------------------------------------------------------
                Hydrograph Detention Basin Routing
Hydrograph at 25 8 A Storm Day: 4 Drainage Area =   65.20
Total flood hydrograph volume this storm day =   13.72 Ac. Ft.
------------------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
------------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                    Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0      13.3    26.5    39.8    53.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     4.0     0.2      0.267  O I     |       |       |       |      0.2
  200     4.0     0.7      0.751  O I     |       |       |       |      0.6
  300     4.0     1.1      1.178  O I     |       |       |       |      0.9
  400     4.0     1.5      1.552  O I     |       |       |       |      1.2
  500     5.0     1.8      1.949  |O I    |       |       |       |      1.5
  600     5.0     2.2      2.360  |O I    |       |       |       |      1.8
  700     6.0     2.6      2.789  |O I    |       |       |       |      2.2
  800     6.0     2.9      3.238  |O I    |       |       |       |      2.5
  900     7.0     3.3      3.710  |O  I   |       |       |       |      2.8
 1000     9.0     3.7      4.334  | O  I  |       |       |       |      3.2
 1050    10.0     3.9      4.726  | O   I |       |       |       |      3.5
 1100    13.0     4.3      5.238  | O    I|       |       |       |      3.8
 1110    15.0     4.3      5.373  | O     |I      |       |       |      3.9
 1120    17.0     4.4      5.535  | O     | I     |       |       |      4.0
 1130    20.0     4.5      5.730  | O     |   I   |       |       |      4.2
 1131    20.0     4.5      5.751  | O     |   I   |       |       |      4.2
 1132    20.0     4.5      5.773  | O     |   I   |       |       |      4.2
 1133    21.0     4.6      5.795  | O     |   I   |       |       |      4.2
 1134    21.0     4.6      5.818  | O     |   I   |       |       |      4.2
 1135    21.0     4.6      5.840  | O     |   I   |       |       |      4.3
 1136    22.0     4.6      5.864  | O     |    I  |       |       |      4.3
 1137    22.0     4.6      5.888  | O     |    I  |       |       |      4.3
 1138    22.0     4.6      5.912  | O     |    I  |       |       |      4.3
 1139    23.0     4.6      5.938  | O     |    I  |       |       |      4.3
 1140    23.0     4.6      5.963  | O     |    I  |       |       |      4.3
 1141    24.0     4.7      5.990  | O     |     I |       |       |      4.4
 1142    24.0     4.7      6.016  | O     |     I |       |       |      4.4
 1143    25.0     4.7      6.044  | O     |      I|       |       |      4.4
 1144    26.0     4.7      6.074  | O     |      I|       |       |      4.4
```

```
1145    26.0    4.7     6.103  | O     |      I|       |       |      4.4
1146    27.0    4.7     6.134  | O     |       I       |       |      4.5
1147    28.0    4.7     6.166  | O     |       I       |       |      4.5
1148    29.0    4.8     6.199  | O     |       |I      |       |      4.5
1149    31.0    4.8     6.235  | O     |       | I     |       |      4.5
1150    33.0    4.8     6.274  | O     |       |  I    |       |      4.6
1151    36.0    4.8     6.317  | O     |       |    I  |       |      4.6
1152    39.0    4.8     6.364  | O     |       |      I|       |      4.6
1153    42.0    4.9     6.415  | O     |       |       |I      |      4.7
1154    45.0    4.9     6.471  | O     |       |       |  I    |      4.7
1155    47.0    4.9     6.529  | O     |       |       |   I   |      4.7
1156    49.0    4.9     6.589  | O     |       |       |    I  |      4.8
1157    51.0    5.0     6.653  |  O    |       |       |     I |      4.8
1158    52.0    5.0     6.718  |  O    |       |       |      I|      4.9
1159    53.0    5.0     6.784  |  O    |       |       |       I      4.9
1160    53.0    5.1     6.850  |  O    |       |       |       I      5.0
1161    52.0    5.1     6.914  |  O    |       |       |      I|      5.0
1162    52.0    5.1     6.979  |  O    |       |       |      I|      5.0
1163    51.0    5.2     7.042  |  O    |       |       |     I |      5.1
1164    50.0    5.2     7.104  |  O    |       |       |     I |      5.1
1165    50.0    5.2     7.166  |  O    |       |       |     I |      5.2
1166    49.0    5.2     7.226  |  O    |       |       |    I  |      5.2
1167    47.0    5.3     7.283  |  O    |       |       |   I   |      5.3
1168    45.0    5.3     7.338  |  O    |       |       |  I    |      5.3
1169    43.0    5.3     7.390  |  O    |       |       |I      |      5.3
1170    39.0    5.3     7.436  |  O    |       |      I|       |      5.4
1171    36.0    5.3     7.479  |  O    |       |    I  |       |      5.4
1172    33.0    5.3     7.517  |  O    |       |  I    |       |      5.4
1173    29.0    5.4     7.549  |  O    |       |I      |       |      5.4
1174    27.0    5.4     7.579  |  O    |       I       |       |      5.5
1175    25.0    5.4     7.606  |  O    |      I|       |       |      5.5
1176    23.0    5.4     7.630  |  O    |    I  |       |       |      5.5
1177    21.0    5.4     7.652  |  O    |   I   |       |       |      5.5
1178    20.0    5.4     7.672  |  O    |   I   |       |       |      5.5
1179    19.0    5.4     7.691  |  O    |  I    |       |       |      5.5
1180    18.0    5.4     7.708  | O     | I     |       |       |      5.5
1181    17.0    5.4     7.724  |  O    | I     |       |       |      5.6
1182    16.0    5.4     7.739  |  O    |I      |       |       |      5.6
1183    15.0    5.4     7.752  |  O    |I      |       |       |      5.6
1184    15.0    5.5     7.765  |  O    |I      |       |       |      5.6
1185    14.0    5.5     7.777  |  O    I       |       |       |      5.6
1186    14.0    5.5     7.788  |  O    I       |       |       |      5.6
1187    14.0    5.5     7.800  |  O    I       |       |       |      5.6
1188    13.0    5.5     7.811  |  O   I|       |       |       |      5.6
1189    13.0    5.5     7.821  |  O   I|       |       |       |      5.6
1190    13.0    5.5     7.831  |  O   I|       |       |       |      5.6
1191    12.0    5.5     7.840  |  O   I|       |       |       |      5.6
1192    12.0    5.5     7.849  |  O   I|       |       |       |      5.6
1193    12.0    5.5     7.858  |  O   I|       |       |       |      5.6
1194    12.0    5.5     7.867  |  O   I|       |       |       |      5.7
1195    11.0    5.5     7.875  |  O  I |       |       |       |      5.7
1196    11.0    5.5     7.882  |  O  I |       |       |       |      5.7
1197    11.0    5.5     7.890  |  O  I |       |       |       |      5.7
1198    11.0    5.5     7.897  |  O  I |       |       |       |      5.7
1199    11.0    5.5     7.905  |  O  I |       |       |       |      5.7
1200    11.0    5.5     7.913  |  O  I |       |       |       |      5.7
1201    10.0    5.5     7.919  |  O  I |       |       |       |      5.7
```

1202	10.0	5.5	7.925	O I				5.7
1203	10.0	5.5	7.931	O I				5.7
1204	10.0	5.5	7.937	O I				5.7
1205	10.0	5.5	7.943	O I				5.7
1206	10.0	5.5	7.950	O I				5.7
1207	10.0	5.5	7.956	O I				5.7
1208	9.0	5.5	7.961	O I				5.7
1209	9.0	5.5	7.965	O I				5.7
1210	9.0	5.5	7.970	O I				5.7
1211	9.0	5.5	7.975	O I				5.7
1212	9.0	5.5	7.980	O I				5.7
1213	9.0	5.5	7.984	O I				5.7
1214	9.0	5.5	7.989	O I				5.7
1215	9.0	5.5	7.994	O I				5.7
1216	9.0	5.5	7.999	O I				5.7
1217	9.0	5.5	8.003	O I				5.7
1218	9.0	5.6	8.008	O I				5.8
1219	8.0	5.6	8.012	OI				5.8
1220	8.0	5.6	8.015	OI				5.8
1221	8.0	5.6	8.018	OI				5.8
1222	8.0	5.6	8.022	OI				5.8
1223	8.0	5.6	8.025	OI				5.8
1224	8.0	5.6	8.028	OI				5.8
1225	8.0	5.6	8.032	OI				5.8
1226	8.0	5.6	8.035	OI				5.8
1227	8.0	5.6	8.038	OI				5.8
1228	8.0	5.6	8.042	OI				5.8
1229	8.0	5.6	8.045	OI				5.8
1230	8.0	5.6	8.048	OI				5.8
1231	8.0	5.6	8.052	OI				5.8
1232	8.0	5.6	8.055	OI				5.8
1233	8.0	5.6	8.059	OI				5.8
1234	7.0	5.6	8.061	OI				5.8
1235	7.0	5.6	8.062	OI				5.8
1236	7.0	5.6	8.064	OI				5.8
1237	7.0	5.6	8.066	OI				5.8
1238	7.0	5.6	8.068	OI				5.8
1239	7.0	5.6	8.070	OI				5.8
1240	7.0	5.6	8.072	OI				5.8
1241	7.0	5.6	8.074	OI				5.8
1242	7.0	5.6	8.076	OI				5.8
1243	7.0	5.6	8.078	OI				5.8
1244	7.0	5.6	8.080	OI				5.8
1245	7.0	5.6	8.082	OI				5.8
1246	7.0	5.6	8.084	OI				5.8
1247	7.0	5.6	8.086	OI				5.8
1248	7.0	5.6	8.088	OI				5.8
1249	7.0	5.6	8.090	OI				5.8
1250	7.0	5.6	8.092	OI				5.8
1251	7.0	5.6	8.094	OI				5.8
1252	7.0	5.6	8.096	OI				5.8
1253	7.0	5.6	8.098	OI				5.8
1254	7.0	5.6	8.100	OI				5.8
1255	7.0	5.6	8.102	OI				5.8
1256	7.0	5.6	8.103	OI				5.8
1257	7.0	5.6	8.105	OI				5.8
1258	7.0	5.6	8.107	OI				5.8

1259	6.0	5.6	8.108	| O	|	|	|	|	5.8
1260	6.0	5.6	8.108	| O	|	|	|	|	5.8
1261	6.0	5.6	8.109	| O	|	|	|	|	5.8
1262	6.0	5.6	8.110	| O	|	|	|	|	5.8
1263	6.0	5.6	8.110	| O	|	|	|	|	5.8
1264	6.0	5.6	8.111	| O	|	|	|	|	5.8
1265	6.0	5.6	8.111	| O	|	|	|	|	5.8
1266	6.0	5.6	8.112	| O	|	|	|	|	5.8
1267	6.0	5.6	8.112	| O	|	|	|	|	5.8
1268	6.0	5.6	8.113	| O	|	|	|	|	5.8
1269	6.0	5.6	8.113	| O	|	|	|	|	5.8
1270	6.0	5.6	8.114	| O	|	|	|	|	5.8
1271	6.0	5.6	8.115	| O	|	|	|	|	5.8
1272	6.0	5.6	8.115	| O	|	|	|	|	5.8
1273	6.0	5.6	8.116	| O	|	|	|	|	5.8
1274	6.0	5.6	8.116	| O	|	|	|	|	5.8
1275	6.0	5.6	8.117	| O	|	|	|	|	5.8
1276	6.0	5.6	8.117	| O	|	|	|	|	5.8
1277	6.0	5.6	8.118	| O	|	|	|	|	5.8
1278	6.0	5.6	8.118	| O	|	|	|	|	5.8
1279	6.0	5.6	8.119	| O	|	|	|	|	5.8
1280	6.0	5.6	8.120	| O	|	|	|	|	5.8
1281	6.0	5.6	8.120	| O	|	|	|	|	5.8
1282	6.0	5.6	8.121	| O	|	|	|	|	5.8
1283	6.0	5.6	8.121	| O	|	|	|	|	5.8
1284	6.0	5.6	8.122	| O	|	|	|	|	5.8
1285	6.0	5.6	8.122	| O	|	|	|	|	5.8
1286	6.0	5.6	8.123	| O	|	|	|	|	5.8
1287	6.0	5.6	8.123	| O	|	|	|	|	5.8
1288	6.0	5.6	8.124	| O	|	|	|	|	5.8
1289	6.0	5.6	8.125	| O	|	|	|	|	5.8
1290	6.0	5.6	8.125	| O	|	|	|	|	5.8
1291	6.0	5.6	8.126	| O	|	|	|	|	5.8
1292	6.0	5.6	8.126	| O	|	|	|	|	5.8
1293	6.0	5.6	8.127	| O	|	|	|	|	5.8
1294	6.0	5.6	8.127	| O	|	|	|	|	5.8
1295	6.0	5.6	8.128	| O	|	|	|	|	5.8
1296	5.0	5.6	8.127	| O	|	|	|	|	5.8
1297	5.0	5.6	8.126	| O	|	|	|	|	5.8
1298	5.0	5.6	8.125	| O	|	|	|	|	5.8
1299	5.0	5.6	8.125	| O	|	|	|	|	5.8
1300	5.0	5.6	8.124	| O	|	|	|	|	5.8
1310	5.0	5.6	8.115	| O	|	|	|	|	5.8
1320	5.0	5.6	8.107	| O	|	|	|	|	5.8
1330	5.0	5.6	8.099	| O	|	|	|	|	5.8
1340	5.0	5.6	8.091	| O	|	|	|	|	5.8
1350	5.0	5.6	8.083	| O	|	|	|	|	5.8
1360	5.0	5.6	8.075	| O	|	|	|	|	5.8
1370	4.0	5.6	8.059	| IO	|	|	|	|	5.8
1380	4.0	5.6	8.038	| IO	|	|	|	|	5.8
1390	4.0	5.6	8.016	| IO	|	|	|	|	5.8
1400	4.0	5.5	7.995	| IO	|	|	|	|	5.7
1420	4.0	5.5	7.953	| IO	|	|	|	|	5.7
1440	4.0	5.5	7.911	| IO	|	|	|	|	5.7
1460	3.0	5.5	7.855	|I O	|	|	|	|	5.6
1500	3.0	5.4	7.715	|I O	|	|	|	|	5.6

```
Remaining water in basin =    7.72 (Ac.Ft)
Peak flow out of basin =     5.60(CFS)
Peak flow time = 1295 Min., time interval # = 181
Maximum depth in basin =    5.84(Ft.)
```

5 50-year, Proposed

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
------------------------------------------------------------------------
Study Date : 03/06/25 Input hydrograph file name : P50.HYD
Output hydrograph file name: PR50.hin
50-YR PROPOSED CLEAR AT 8A
24-INCH OUTLET PIPE


------------------------------------------------------------------------


User entry of depth-outflow-storage data
------------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
------------------------------------------------------------------------
------------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
------------------------------------------------------------------------
------------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
------------------------------------------------------------------------
  0.000      0.000      0.000      0.000        0.000
  1.000      1.285      1.200      1.284        1.286
  2.000      2.569      2.400      2.568        2.571
  3.000      4.019      3.500      4.016        4.021
  4.000      5.468      4.400      5.465        5.471
  5.000      6.917      5.100      6.913        6.920
  6.000      8.366      5.700      8.362        8.370
  7.000      9.815      6.100      9.811        9.819
------------------------------------------------------------------------
                Hydrograph Detention Basin Routing
Hydrograph at 50 8 A Storm Day: 4 Drainage Area =   65.20
Total flood hydrograph volume this storm day =   15.58 Ac. Ft.
------------------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
------------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                   Depth
```

(Min)	(CFS)	(CFS)	(Ac.Ft)	.0	16.5	33.0	49.5	66.0	(Ft.)
0	0.0	0.0	0.000	O	|	|	|	|	0.0
100	4.0	0.2	0.267	OI	|	|	|	|	0.2
200	5.0	0.8	0.818	O I	|	|	|	|	0.6
300	5.0	1.3	1.366	O I	|	|	|	|	1.1
400	5.0	1.7	1.847	O I	|	|	|	|	1.4
500	5.0	2.1	2.270	|OI	|	|	|	|	1.8
600	6.0	2.5	2.709	|OI	|	|	|	|	2.1
700	6.0	2.9	3.166	|OI	|	|	|	|	2.4
800	7.0	3.2	3.645	|O I	|	|	|	|	2.7
900	8.0	3.6	4.208	|O I	|	|	|	|	3.1
1000	10.0	4.1	4.921	|O I	|	|	|	|	3.6
1050	12.0	4.4	5.391	| O I	|	|	|	|	3.9
1100	15.0	4.7	6.013	| O I|	|	|	|	|	4.4
1110	17.0	4.7	6.170	| O I	|	|	|	|	4.5
1120	20.0	4.8	6.361	| O |I	|	|	|	|	4.6
1130	23.0	4.9	6.592	| O | I	|	|	|	|	4.8
1131	23.0	5.0	6.616	| O | I	|	|	|	|	4.8
1132	23.0	5.0	6.641	| O | I	|	|	|	|	4.8
1133	24.0	5.0	6.668	| O | I	|	|	|	|	4.8
1134	24.0	5.0	6.694	| O | I	|	|	|	|	4.8
1135	24.0	5.0	6.720	| O | I	|	|	|	|	4.9
1136	25.0	5.0	6.747	| O | I	|	|	|	|	4.9
1137	25.0	5.0	6.775	| O | I	|	|	|	|	4.9
1138	26.0	5.0	6.804	| O | I	|	|	|	|	4.9
1139	26.0	5.1	6.833	| O | I	|	|	|	|	4.9
1140	27.0	5.1	6.863	| O | I	|	|	|	|	5.0
1141	28.0	5.1	6.894	| O | I	|	|	|	|	5.0
1142	28.0	5.1	6.926	| O | I	|	|	|	|	5.0
1143	29.0	5.1	6.959	| O | I	|	|	|	|	5.0
1144	30.0	5.1	6.993	| O | I	|	|	|	|	5.1
1145	31.0	5.1	7.029	| O | I|	|	|	|	|	5.1
1146	32.0	5.2	7.066	| O | I|	|	|	|	|	5.1
1147	33.0	5.2	7.104	| O | I	|	|	|	|	5.1
1148	34.0	5.2	7.144	| O | I	|	|	|	|	5.2
1149	37.0	5.2	7.188	| O |I	|	|	|	|	5.2
1150	39.0	5.2	7.234	| O | I	|	|	|	|	5.2
1151	42.0	5.3	7.285	| O | I	|	|	|	|	5.3
1152	46.0	5.3	7.341	| O | I	|	|	|	|	5.3
1153	50.0	5.3	7.402	| O | I	|	|	|	|	5.3
1154	53.0	5.3	7.468	| O | I	|	|	|	|	5.4
1155	55.0	5.4	7.537	| O | I	|	|	|	|	5.4
1156	58.0	5.4	7.609	| O | I	|	|	|	|	5.5
1157	64.0	5.4	7.690	| O | I	|	|	|	|	5.5
1158	61.0	5.5	7.766	| O | I	|	|	|	|	5.6
1159	66.0	5.5	7.850	| O | I	|	|	|	|	5.6
1160	63.0	5.5	7.929	| O | I	|	|	|	|	5.7
1161	64.0	5.6	8.009	| O | I	|	|	|	|	5.8
1162	62.0	5.6	8.087	| O | I	|	|	|	|	5.8
1163	61.0	5.6	8.163	| O | I	|	|	|	|	5.9
1164	58.0	5.6	8.236	| O | I	|	|	|	|	5.9
1165	56.0	5.7	8.305	| O | I	|	|	|	|	6.0
1166	53.0	5.7	8.370	| O | I	|	|	|	|	6.0
1167	50.0	5.7	8.431	| O | I	|	|	|	|	6.0
1168	46.0	5.7	8.487	| O | I	|	|	|	|	6.1
1169	43.0	5.7	8.538	| O | I	|	|	|	|	6.1
1170	38.0	5.8	8.582	| O | I	|	|	|	|	6.1

1171	35.0	5.8	8.623	O		I			6.2
1172	33.0	5.8	8.660	O		I			6.2
1173	31.0	5.8	8.695	O		I			6.2
1174	28.0	5.8	8.725	O	I				6.2
1175	26.0	5.8	8.753	O	I				6.3
1176	24.0	5.8	8.778	O	I				6.3
1177	23.0	5.8	8.802	O	I				6.3
1178	21.0	5.8	8.823	O	I				6.3
1179	20.0	5.8	8.842	O	I				6.3
1180	19.0	5.8	8.860	O	I				6.3
1181	18.0	5.8	8.877	O	I				6.4
1182	18.0	5.8	8.894	O	I				6.4
1183	17.0	5.9	8.909	O	I				6.4
1184	16.0	5.9	8.923	O	I				6.4
1185	16.0	5.9	8.937	O	I				6.4
1186	15.0	5.9	8.950	O	I				6.4
1187	15.0	5.9	8.962	O	I				6.4
1188	15.0	5.9	8.975	O	I				6.4
1189	14.0	5.9	8.986	O	I				6.4
1190	14.0	5.9	8.997	O	I				6.4
1191	14.0	5.9	9.009	O	I				6.4
1192	13.0	5.9	9.018	O	I				6.5
1193	13.0	5.9	9.028	O	I				6.5
1194	13.0	5.9	9.038	O	I				6.5
1195	13.0	5.9	9.048	O	I				6.5
1196	13.0	5.9	9.058	O	I				6.5
1197	12.0	5.9	9.066	O	I				6.5
1198	12.0	5.9	9.074	O	I				6.5
1199	12.0	5.9	9.083	O	I				6.5
1200	12.0	5.9	9.091	O	I				6.5
1201	12.0	5.9	9.100	O	I				6.5
1202	11.0	5.9	9.107	O	I				6.5
1203	11.0	5.9	9.114	O	I				6.5
1204	11.0	5.9	9.121	O	I				6.5
1205	11.0	5.9	9.128	O	I				6.5
1206	11.0	5.9	9.135	O	I				6.5
1207	11.0	5.9	9.142	O	I				6.5
1208	11.0	5.9	9.149	O	I				6.5
1209	10.0	5.9	9.154	O	I				6.5
1210	10.0	5.9	9.160	O	I				6.5
1211	10.0	5.9	9.166	O	I				6.6
1212	10.0	5.9	9.171	O	I				6.6
1213	10.0	5.9	9.177	O	I				6.6
1214	10.0	5.9	9.182	O	I				6.6
1215	10.0	5.9	9.188	O	I				6.6
1216	10.0	5.9	9.194	O	I				6.6
1217	10.0	5.9	9.199	O	I				6.6
1218	10.0	5.9	9.205	O	I				6.6
1219	9.0	5.9	9.209	O	I				6.6
1220	9.0	5.9	9.213	O	I				6.6
1221	9.0	5.9	9.218	O	I				6.6
1222	9.0	5.9	9.222	O	I				6.6
1223	9.0	5.9	9.226	O	I				6.6
1224	9.0	5.9	9.230	O	I				6.6
1225	9.0	5.9	9.234	O	I				6.6
1226	9.0	5.9	9.239	O	I				6.6
1227	9.0	5.9	9.243	O	I				6.6

1228	9.0	5.9	9.247	O I				6.6
1229	9.0	5.9	9.251	O I				6.6
1230	9.0	5.9	9.255	O I				6.6
1231	9.0	5.9	9.260	O I				6.6
1232	9.0	5.9	9.264	O I				6.6
1233	9.0	5.9	9.268	O I				6.6
1234	8.0	5.9	9.271	OI				6.6
1235	8.0	6.0	9.274	OI				6.6
1236	8.0	6.0	9.277	OI				6.6
1237	8.0	6.0	9.279	OI				6.6
1238	8.0	6.0	9.282	OI				6.6
1239	8.0	6.0	9.285	OI				6.6
1240	8.0	6.0	9.288	OI				6.6
1241	8.0	6.0	9.291	OI				6.6
1242	8.0	6.0	9.293	OI				6.6
1243	8.0	6.0	9.296	OI				6.6
1244	8.0	6.0	9.299	OI				6.6
1245	8.0	6.0	9.302	OI				6.6
1246	8.0	6.0	9.305	OI				6.6
1247	8.0	6.0	9.308	OI				6.6
1248	8.0	6.0	9.310	OI				6.7
1249	8.0	6.0	9.313	OI				6.7
1250	8.0	6.0	9.316	OI				6.7
1251	8.0	6.0	9.319	OI				6.7
1252	8.0	6.0	9.322	OI				6.7
1253	8.0	6.0	9.324	OI				6.7
1254	7.0	6.0	9.326	OI				6.7
1255	7.0	6.0	9.327	OI				6.7
1256	7.0	6.0	9.329	OI				6.7
1257	7.0	6.0	9.330	OI				6.7
1258	7.0	6.0	9.331	OI				6.7
1259	7.0	6.0	9.333	OI				6.7
1260	7.0	6.0	9.334	OI				6.7
1261	7.0	6.0	9.336	OI				6.7
1262	7.0	6.0	9.337	OI				6.7
1263	7.0	6.0	9.339	OI				6.7
1264	7.0	6.0	9.340	OI				6.7
1265	7.0	6.0	9.341	OI				6.7
1266	7.0	6.0	9.343	OI				6.7
1267	7.0	6.0	9.344	OI				6.7
1268	7.0	6.0	9.346	OI				6.7
1269	7.0	6.0	9.347	OI				6.7
1270	7.0	6.0	9.349	OI				6.7
1271	7.0	6.0	9.350	OI				6.7
1272	7.0	6.0	9.351	OI				6.7
1273	7.0	6.0	9.353	OI				6.7
1274	7.0	6.0	9.354	OI				6.7
1275	7.0	6.0	9.356	OI				6.7
1276	7.0	6.0	9.357	OI				6.7
1277	7.0	6.0	9.358	OI				6.7
1278	7.0	6.0	9.360	OI				6.7
1279	7.0	6.0	9.361	OI				6.7
1280	7.0	6.0	9.363	OI				6.7
1281	7.0	6.0	9.364	OI				6.7
1282	7.0	6.0	9.365	OI				6.7
1283	7.0	6.0	9.367	OI				6.7
1284	7.0	6.0	9.368	OI				6.7

1285	6.0	6.0	9.368	| O	|	|	|	|	6.7
1286	6.0	6.0	9.368	| O	|	|	|	|	6.7
1287	6.0	6.0	9.368	| O	|	|	|	|	6.7
1288	6.0	6.0	9.368	| O	|	|	|	|	6.7
1289	6.0	6.0	9.368	| O	|	|	|	|	6.7
1290	6.0	6.0	9.369	| O	|	|	|	|	6.7
1291	6.0	6.0	9.369	| O	|	|	|	|	6.7
1292	6.0	6.0	9.369	| O	|	|	|	|	6.7
1293	6.0	6.0	9.369	| O	|	|	|	|	6.7
1294	6.0	6.0	9.369	| O	|	|	|	|	6.7
1295	6.0	6.0	9.369	| O	|	|	|	|	6.7
1296	6.0	6.0	9.369	| O	|	|	|	|	6.7
1297	6.0	6.0	9.369	| O	|	|	|	|	6.7
1298	6.0	6.0	9.369	| O	|	|	|	|	6.7
1299	6.0	6.0	9.369	| O	|	|	|	|	6.7
1300	6.0	6.0	9.369	| O	|	|	|	|	6.7
1310	6.0	6.0	9.369	| O	|	|	|	|	6.7
1320	6.0	6.0	9.369	| O	|	|	|	|	6.7
1330	6.0	6.0	9.370	| O	|	|	|	|	6.7
1340	5.0	6.0	9.363	| O	|	|	|	|	6.7
1350	5.0	6.0	9.349	| O	|	|	|	|	6.7
1360	5.0	6.0	9.336	| O	|	|	|	|	6.7
1370	5.0	6.0	9.322	| O	|	|	|	|	6.7
1380	5.0	6.0	9.309	| O	|	|	|	|	6.7
1390	5.0	6.0	9.296	| O	|	|	|	|	6.6
1400	5.0	6.0	9.283	| O	|	|	|	|	6.6
1420	5.0	5.9	9.257	| O	|	|	|	|	6.6
1440	4.0	5.9	9.216	|IO	|	|	|	|	6.6
1460	3.0	5.9	9.149	|IO	|	|	|	|	6.5
1500	3.0	5.9	8.985	|IO	|	|	|	|	6.4

```
Remaining water in basin =    8.99 (Ac.Ft)
Peak flow out of basin =     5.98(CFS)
Peak flow time = 1330 Min., time interval # = 189
Maximum depth in basin =    6.69(Ft.)
```

APPENDIX E

FANTASY ST

DIVISION ST

SIERRA HWY

ELEV=2616.4

(2615)

(2620)

(2625)

(2630)

(2635)

(2640)

L=2,087'
Δ=2638 - 2617 = 21'
S = 21' / 2,087' = 0.01006

PROJECT SITE
65.07 ACRES

HYDROLOGICAL PARAMETERS

50-YEAR ISOHYET = 3.6"
DEBRIS POTENTIAL AREA = DPA-11
SOIL CLASSIFICATION AREA = 134
25-YR RUNOFF:
Qclear = 5.7 CFS
Qburn = 10.7 CFS

ELEV=2638.4

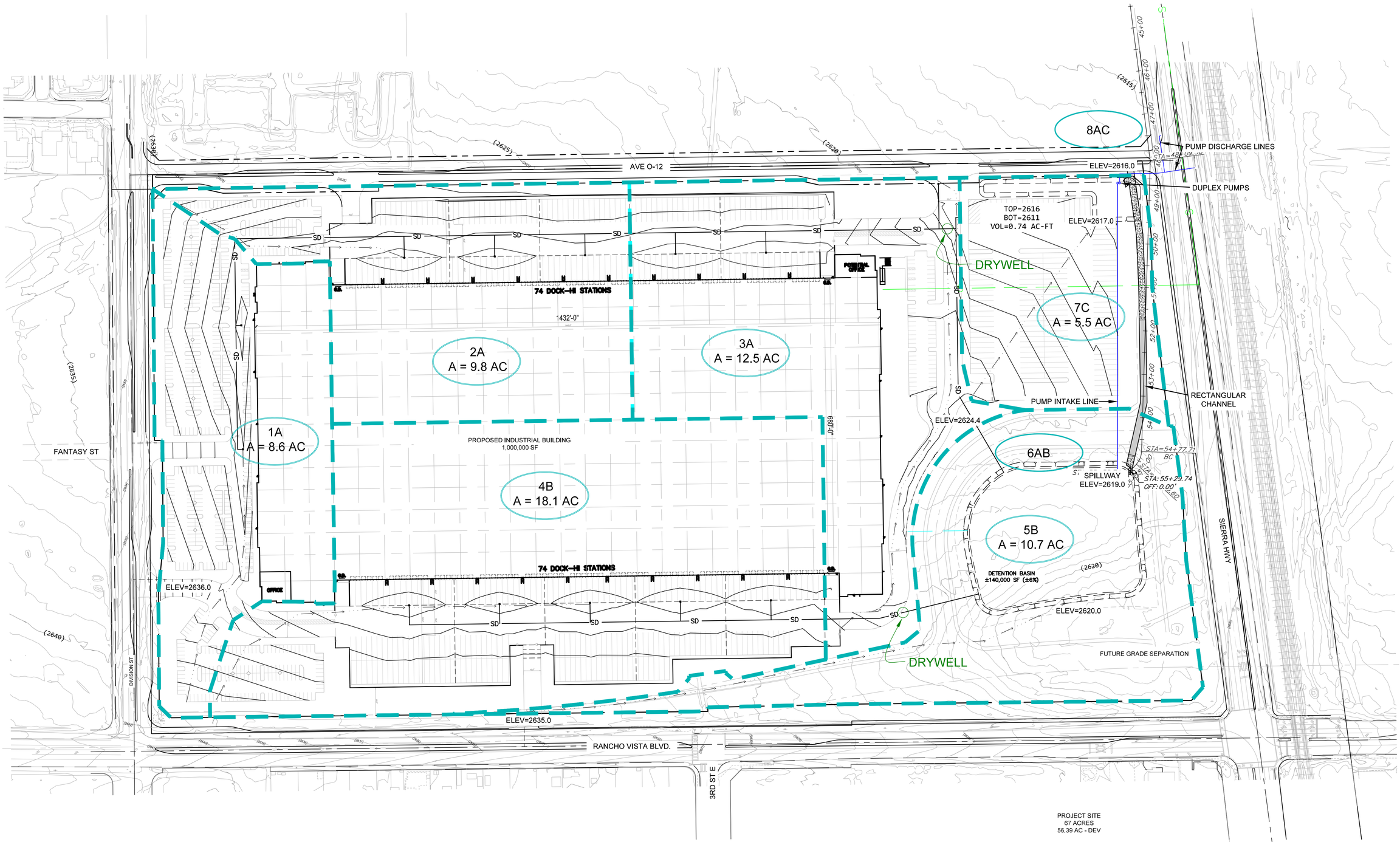
RANCHO VISTA BLVD.

3RD ST E

N

EXISTING HYDROLOGY MAP
SCALE: 1" = 200'

X:\CIVIL3D\5124-003\STORM HYDROLOGY\DWG\PRELIMINARY-DRAINAGE..DWG



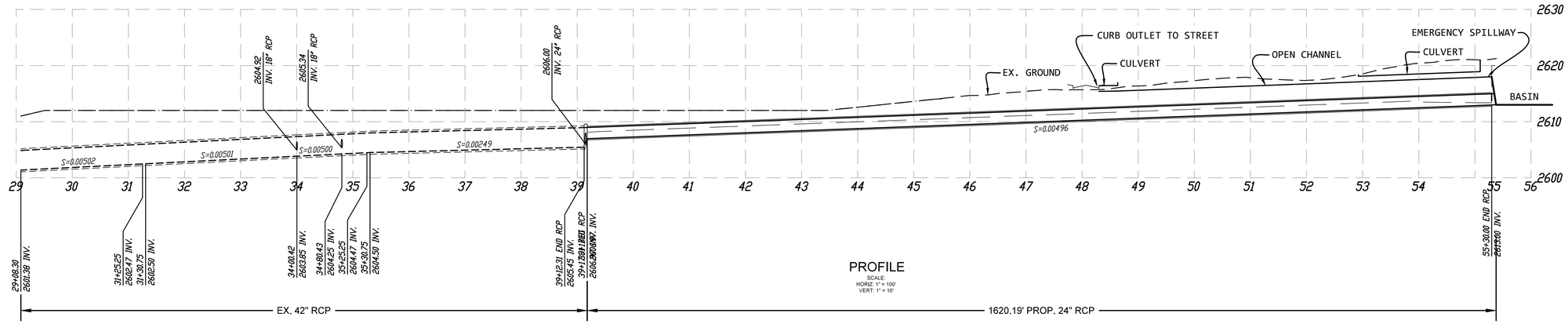
PROJECT SITE
67 ACRES
56.39 AC - DEV

HYDROLOGICAL PARAMETERS

50-YEAR ISOHYET = 3.6"
DEBRIS POTENTIAL AREA = DPA-11
SOIL CLASSIFICATION AREA = 134

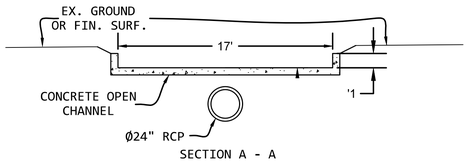
PROPOSED HYDROLOGY MAP

SCALE: 1" = 100'

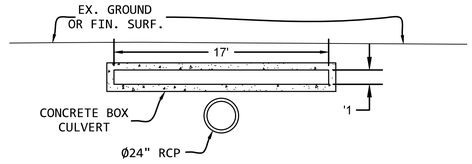


PROFILE

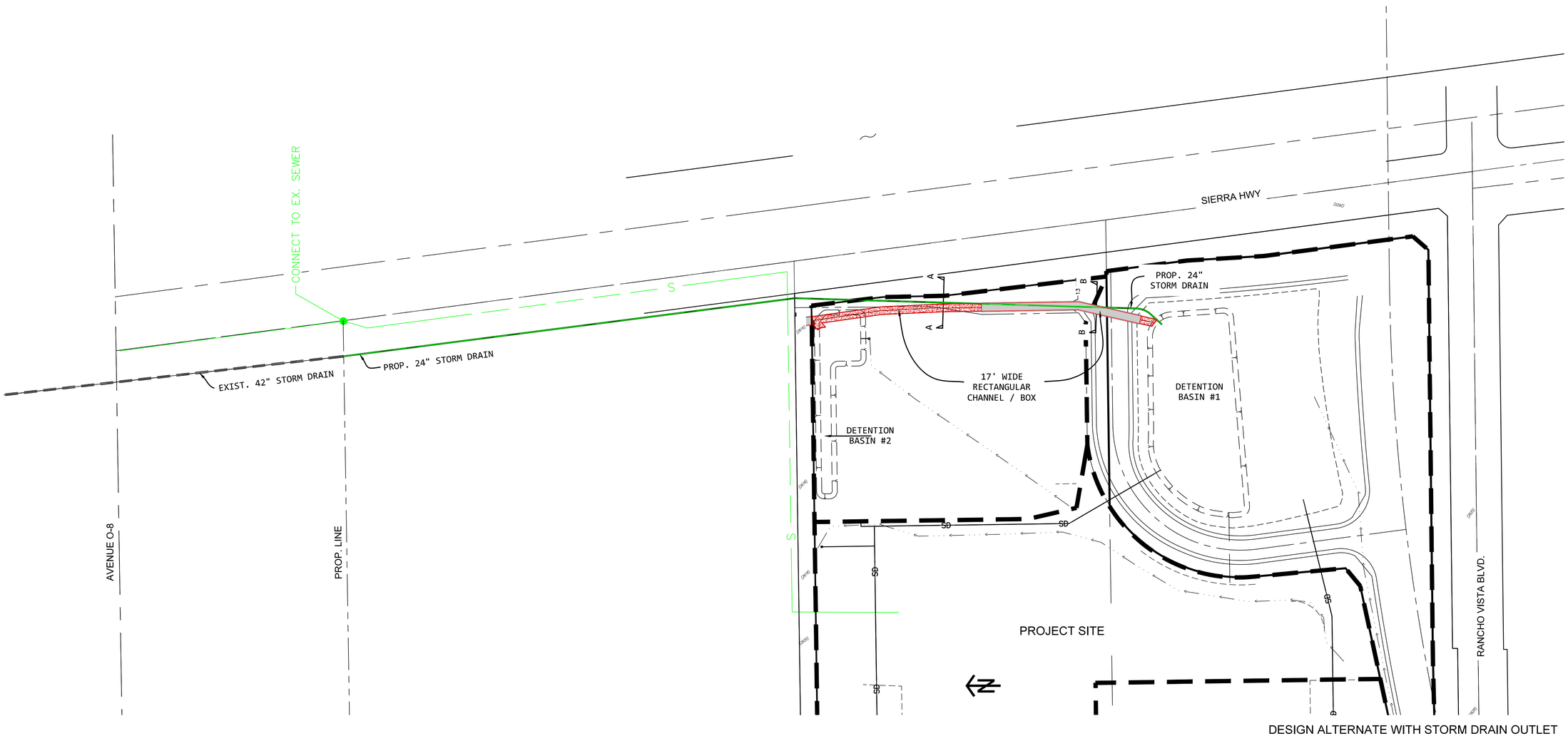
SCALE:
HORIZ: 1" = 100'
VERT: 1" = 10'



SECTION A - A



SECTION B - B



DESIGN ALTERNATE WITH STORM DRAIN OUTLET

SCALE: 1" = 100'