Appendix E

Preliminary Hydrology and Hydraulics Report

PRELIMINARY HYDROLOGY AND HYDRAULICS REPORT

1433 Crestfield Drive
City of Duarte, County of Los Angeles

Project Address:
1433 Crestfield Drive
City of Duarte, County of Los Angeles

Prepared For:

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Prepared: August 2024

Preliminary Hydrology and Hydraulic Report For 1433 Crestfield Drive

Acknowledgement and Signature Page

This Preliminary Hydrology and Hydraulic Report was prepared by C&V Consulting, Inc. under the supervision of Dane P. McDougall, P.E.

_____ _____

Dane P. McDougall, P.E. 80705 Date
C&V Consulting, Inc.

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APPENDICES

I. Purpose

This hydrology and hydraulics study anticipates whether detention or other peak flow mitigation methods will be required by comparing the development's proposed conditions to existing conditions peak flow rates for the 25-, 50- and 100-year storm events. This study provides quantitative information to verify the adequacy of the proposed storm drain infrastructure design, which fulfills the hydrologic methodology of the project site. The values and statements within the study confirm the subject site is designed and planned in accordance with the Los Angeles County Hydrology Manual and the City of Duarte drainage requirements.

II. Site Description

The proposed project site consists of a dual lot that forms a rectangular shaped area of approximately 13 acres. The dual lot is split roughly down the middle with 7.04 acres devoted to the residential development as parcel 1 and the remaining 5 acres devoted to a park as parcel 2. Parcel 2 will be a future development while parcel 1 is the focus of this current project. The site is located at 1433 Crestfield Drive (APN:8604-017-903). It is bounded by existing residential lots to the north, Bradbury Channel and parcel 2 to the west, Crestfield Drive to the east, and Central Avenue to the south.

Refer to Appendix A for additional information on site location.

According to the federal Emergency Management Agency (FEMA) FIRM rate map number 06037C1415F, effective date September 26, 2008, the site is located within flood Zone X, area of minimal flood hazard.

Refer to separate LOMR application document prepared to address flood protection.

III. Existing Conditions

The existing conditions of the entire site consist of a vacant Andres Duarte Elementary School buildings in the east, Otis Gordan Sports Park in the western corner, Mount Olive High School in the northwest corner and the currently active Andres Duarte Preschool and associated parking lot in the southeast. Parcel 1 only includes the vacant elementary school and the active preschool, whereas the high school and sports park are part of parcel 2. The majority of the site is engulfed with existing buildings and paved asphalt with moderate landscaping spread throughout the site.

The existing drainage of the project site generally surface flows south-westerly towards the center where the storm runoff generated onsite eventually enters a few grated inlet catch basins. There is no other evidence of an underground storm drain system due to limited information, but it is assumed the captured stormwater is conveyed directly to the existing Bradbury Channel (LACFCD Facility) roughly 700 feet west of the site. As the existing site currently slopes in the southwest direction, some of the surface runoff flows into the adjacent lot before spilling into the public right-of-way of Central Avenue. From here, the stormwater flows west until it is intercepted by a catch basin and conveyed directly to Bradbury Channel. Bradbury Channel flows south until ultimately discharging to the Santa Fe Spreading Grounds/ Santa Fe Dam.

Refer to the Existing Conditions Hydrology Maps located within Appendix D.

IV. Proposed Conditions

The proposed development includes the construction of twenty-five (25) buildings consisting of 169 attached 3-story apartment units. The proposed 7.04-acre site will include private drive aisles, private garages, sidewalks, guest parking, and associated landscaping, recreational/ leasing office building with pool, and public open space area. The proposed residential development has been designed to collect and convey stormwater runoff within the proposed drive aisles within the proposed curb and gutter to proposed catch basins and an underground private storm drain system. The storm drain system will direct stormwater runoff to a proposed ADS StormTech Detention/ Infiltration to promote subsurface infiltration of the entire Storm Water Quality Design Volume (SWQDv).

The ADS StormTech System has been designed to capture 100% of the Storm Water Quality Design Volume (SWQDv) and infiltrate that volume over a maximum drawdown time of 72 hours. Once the system has reached capacity, stormwater runoff will overflow within a proposed junction structure and discharge stormwater runoff through a parkway drain on Central Avenue. The proposed site has been designed to match the historic drainage pattern. The proposed ADS StormTech System will be located within the public park area under the proposed parking lot. It has been oversized to accommodate the design SWQDv for both the residential and future park development.

Refer to the Proposed Conditions Hydrology Maps located within Appendix D.

V. Methodology

The site was analyzed using the Los Angeles County Department of Public Works Hydrology Manual. The initial subarea was analyzed for acreage, land-use, soil type, peak flow rate and time of concentration according to the Rational Method described in the manual. Drainage management areas are delineated for each proposed inlet. Onsite conditions impervious area percentage values were analyzed with an 86% impervious based selected land use per Los Angeles County Department of Public Works Hydrology Manual.

In accordance with the Los Angeles County Department of Public Works Hydrology Manual all habitable structures must have a finished floor elevation to allow 1 ft of freeboard during the 100-year storm event. Catch basin sizing and the 100-year water surface elevation calculation has been provided in Appendix E.

VI. Design Assumption

1. The property is in the City of Duarte, Los Angeles County rainfall region.
2. According to the Los Angeles County Department of Public Works Hydrology Manual 50-Year 24-Hour Isohyet Map 1-H1.31, the drainage area is in Soil Group 007, the site receives 7.5 inches of rainfall over a 24-Hr storm (Q_{50}).
3. The LACDPW HydroCalc was utilized to determine the time of concentration, run-off peak flow rate for site.
4. The site was analyzed for the 25-, 50- and 100-year storm events per the requirements of the January 2006 Los Angeles County Department of Public Works Hydrology Manual. The Rational Method Analysis was performed, and the appropriate calculations are provided herein.
5. 100-year storm event flood level protection analysis required for habitable structures per the requirements of the Los Angeles County Department of Public Works Hydrology Manual.
6. The existing offsite area is analyzed with an 86% impervious based selected land use per Los Angeles County Department of Public Works Hydrology Manual.

VII. Hydrology Results

A summary of the project site's existing and proposed conditions peak runoff values generated from the project site has been provided below.

Hydrology Summary

Existing conditions generated runoff peak flowrate summary:

Pre-Development Conditions	Area (ac)	Q_{25} (cfs)	Q_{50} (cfs)	Q_{100} (cfs)
DMA-X-1	7.04	21.33	24.65	30.71
Total	7.04	21.33	24.65	30.71

Proposed conditions onsite generated runoff peak flowrate for the confluence outlets summary:

Post-Development Conditions (Riverside Drive Outlet)	Area (ac)	Q_{25} (cfs)	Q_{50} (cfs)	Q_{100} (cfs)
DMA-A-1	0.23	0.79	0.91	1.02
DMA-A-2	0.42	0.31	0.35	0.40
DMA-A-3	0.28	2.27	2.60	2.93
DMA-A-4	1.47	1.73	2.17	2.44
DMA-A-5	0.35	1.07	1.22	1.38
DMA-A-6	0.64	1.07	1.22	1.38
DMA-A-7	0.34	0.86	0.99	1.11
DMA-A-8	0.42	11.16	12.79	15.57
DMA-A-9	0.53	0.31	0.35	0.40
DMA-A-10	0.42	2.20	2.76	3.11

Post-Development Conditions	Area (ac)	Q_{25} (cfs)	Q_{50} (cfs)	Q_{100} (cfs)
On-site Total	5.09	21.77	25.36	29.75

Refer to Appendix B of this report for additional information.

VIII. Hydraulic Result

Catch Basin Inlet Capacity Sizing

The onsite inlets will be sized during final engineering to fully intercept its onsite tributary area generated runoff during the 25-year storm event.

Pipe Sizing

Onsite storm drainage pipes will be sized for 25-year frequency storm event. The Qs are developed from pro-rating the flow generated in hydrology analysis. Pipes are sized to flow in an open flow condition. A 4" pipe is the minimum size and used for single yard drains. A 6" pipe size will collect multiple yard drains. Pipe sizes 18" and larger are considered the mainline drainage pipes that are used to convey run-off to the proposed infiltration system.

Since all pipes are sized for open flow WSPG hydraulic pressure analysis is not warranted. Instead,

$Q_{max} = \frac{k'}{n} d^{8/3} s^{1/2}$ per King's Handbook

k'=0.463; d=pipe diameter (ft)

n=0.013*
S=0.005

Pipe Diameter	Max. Q (cfs)
8"	0.854
12"	2.518
15"	4.566
18"	7.425
24"	15.990
36"	47.146

n=0.013*
S=0.010

Pipe Diameter	Max. Q (cfs)
8"	1.208
12"	3.562
15"	6.457
18"	10.500
24"	22.614
36"	66.675

*A Manning's Roughness Coefficient of 0.013 has been utilized to represent the roughness coefficient of PVC and/or HDPE piping.

Parkway Culvert Sizing

The parkway drain will be sized for the 100-year storm event during final engineering using Hydraflow Express for Autodesk Civil 3D. Refer to Appendix E.

100-Year Water Surface Elevation (WSE)

The elevation of the 100-year water surface will be analyzed during final engineering. Building finished floors will be set at a minimum of at least one foot above the 100-year WSE.

Refer to Appendix E of this report for additional information for hydraulic calculation.

IX. Conclusion

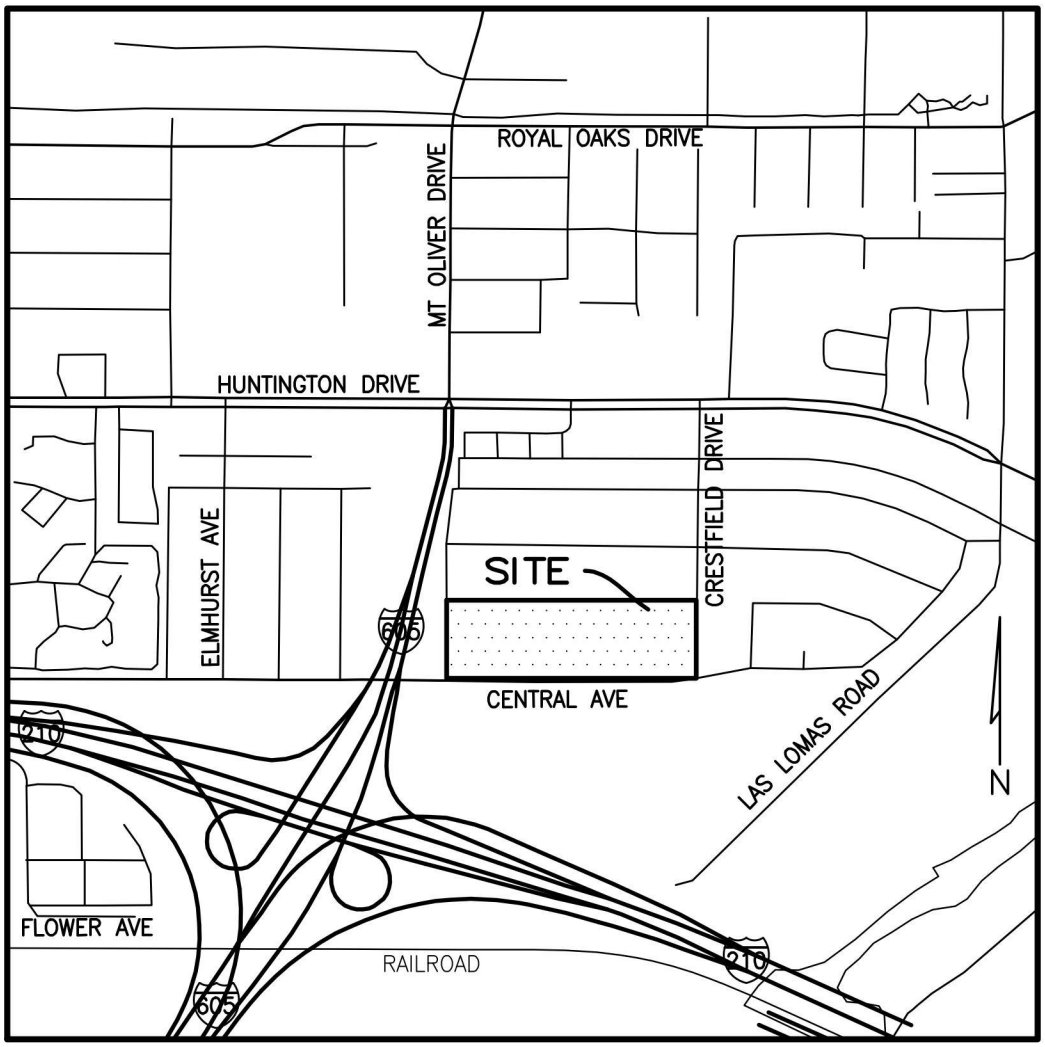
The result from this hydrology study demonstrates that the overall proposed development condition will generate a slightly higher peak runoff flowrates for the 25- and 50-year storm events and slightly lower peak runoff flowrates for the 100-year storm event. However, as the difference is within 5%, detention mitigation will not be required per hydrology requirements. An infiltration system is provided for water quality treatment which will also assist slightly in reducing the peak flow runoff. Refer to separate LID report for additional information regarding the infiltration system. Furthermore, the proposed project will have no hydrologic or hydraulic impacts on the existing downstream drainage facilities. In cases of higher storm event, runoff will overflow through a proposed parkway drain and onto Central Ave following the existing drainage pattern.

X. References

1. Los Angeles County Department of Public Works, “Hydrology Manual”, January 2006.
2. Los Angeles County Department of Public Works, “HydroCalc” Outputs and Data
3. Hydraulic Toolbox 5.0. Federal Highways Administration. Build: 21 Aug 2021
4. Hydraflow Express Extensions for Civil 3D 2021.

APPENDIX A

Vicinity Map

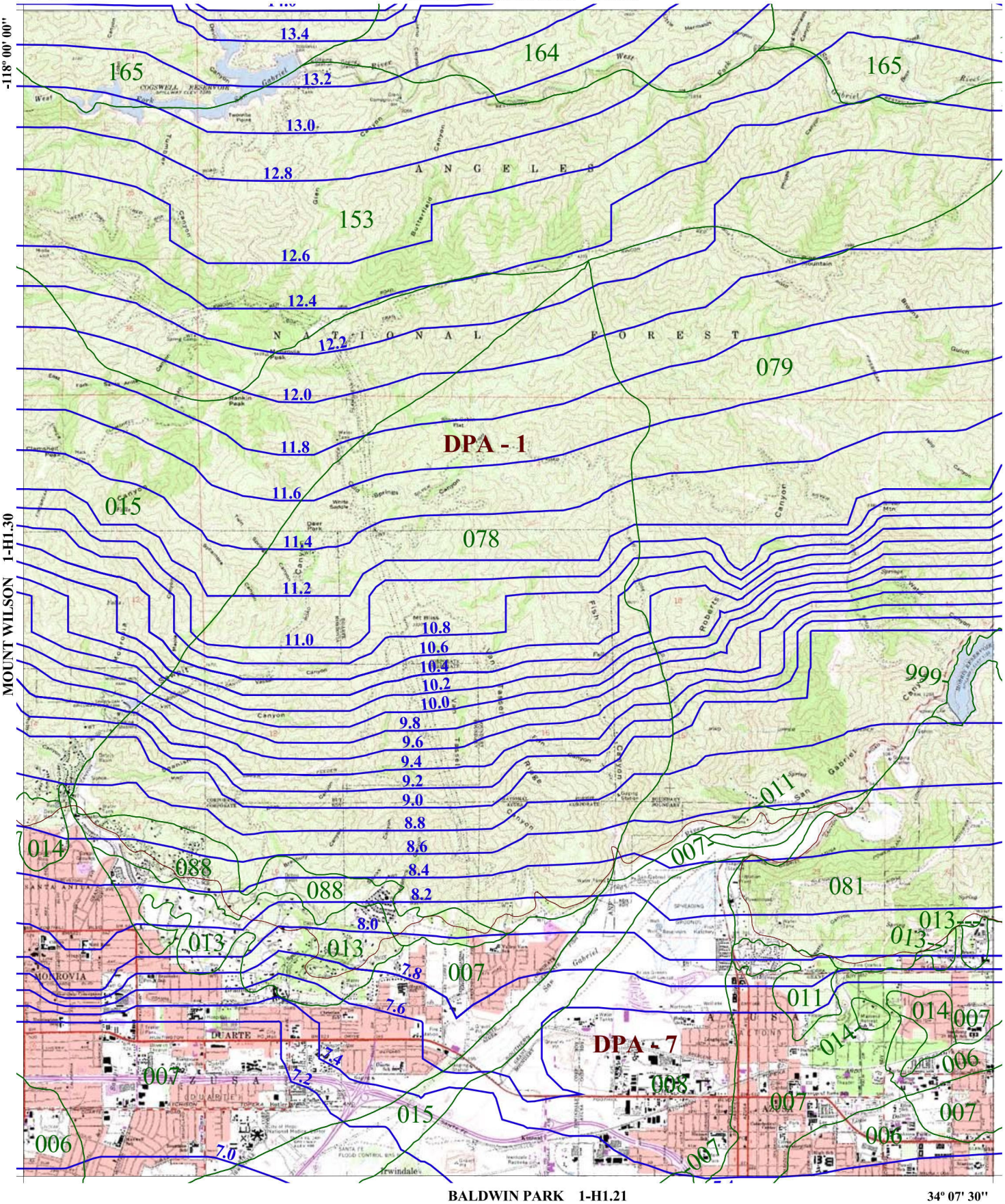


VICINITY MAP

NTS

APPENDIX B

Isohyet Map


34° 15' 00"
WATERMAN MOUNTAIN 1-H1.40
-118° 00' 00"
MOUNT WILSON 1-H1.30
GLENDORA 1-H1.32
-117° 52' 30"
BALDWIN PARK 1-H1.21
34° 07' 30"
13.4
13.2
13.0
12.8
12.6
12.4
12.2
12.0
11.8
11.6
11.4
11.2
11.0
10.8
10.6
10.4
10.2
10.0
9.8
9.6
9.4
9.2
9.0
8.8
8.6
8.4
8.2
8.0
7.8
7.6
7.4
7.2
7.0
DPA - 1
DPA - 7
ANGELES NATIONAL FOREST
COGSWELL RESERVOIR
SANTA ANITA
MONROVIA
DUARTE
AZUSA
Irwindale
164
165
153
079
078
081
088
015
014
013
011
007
008
006
999
1 0 1 2 Miles
N
W
E
S
016 SOIL CLASSIFICATION AREA
7.2 INCHES OF RAINFALL
DPA - 6 DEBRIS POTENTIAL AREA
25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714
A Z U S A
50-YEAR 24-HOUR ISOHYET
1-H1.31
LOS ANGELES COUNTY PUBLIC WORKS
Public Service That Works

APPENDIX C

Hydrology Calculations

Existing Conditions – HydroCalc Outputs

Peak Flow Hydrologic Analysis

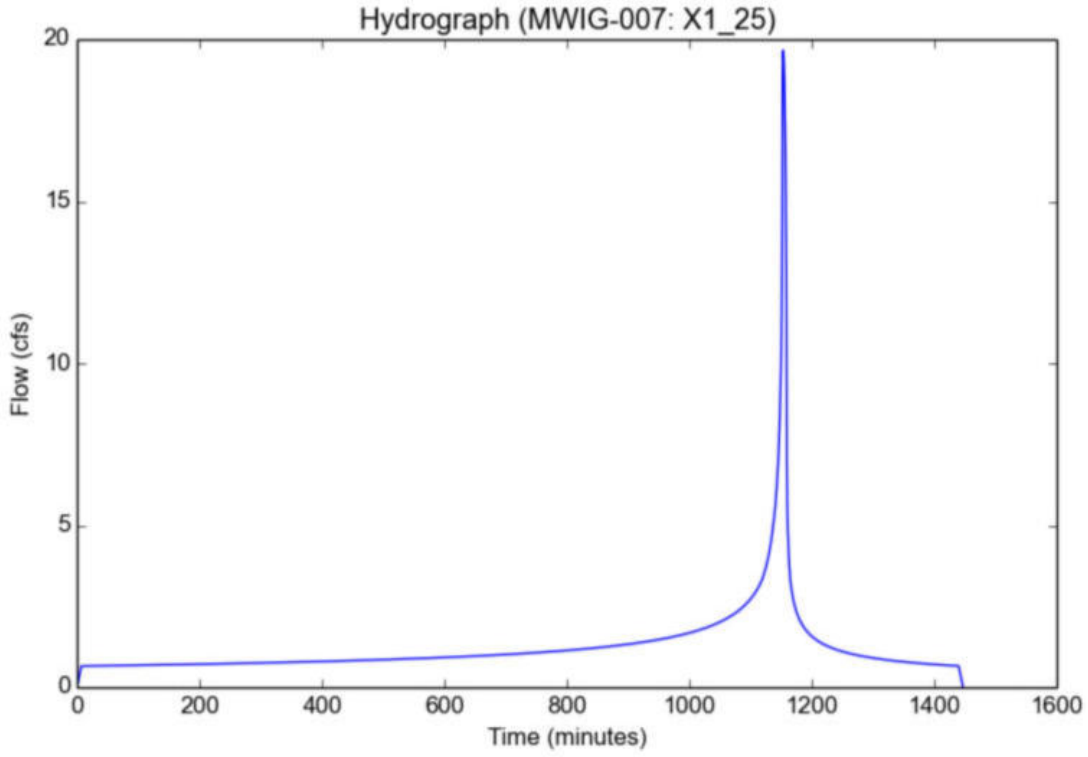
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Existing/MWIG-007 - X1_25.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	X1_25
Area (ac)	7.04
Flow Path Length (ft)	520.0
Flow Path Slope (vft/hft)	0.0134
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.675
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.3541
Undeveloped Runoff Coefficient (Cu)	0.6925
Developed Runoff Coefficient (Cd)	0.8325
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	19.6589
Burned Peak Flow Rate (cfs)	19.6589
24-Hr Clear Runoff Volume (ac-ft)	2.5174
24-Hr Clear Runoff Volume (cu-ft)	109656.187



Peak Flow Hydrologic Analysis

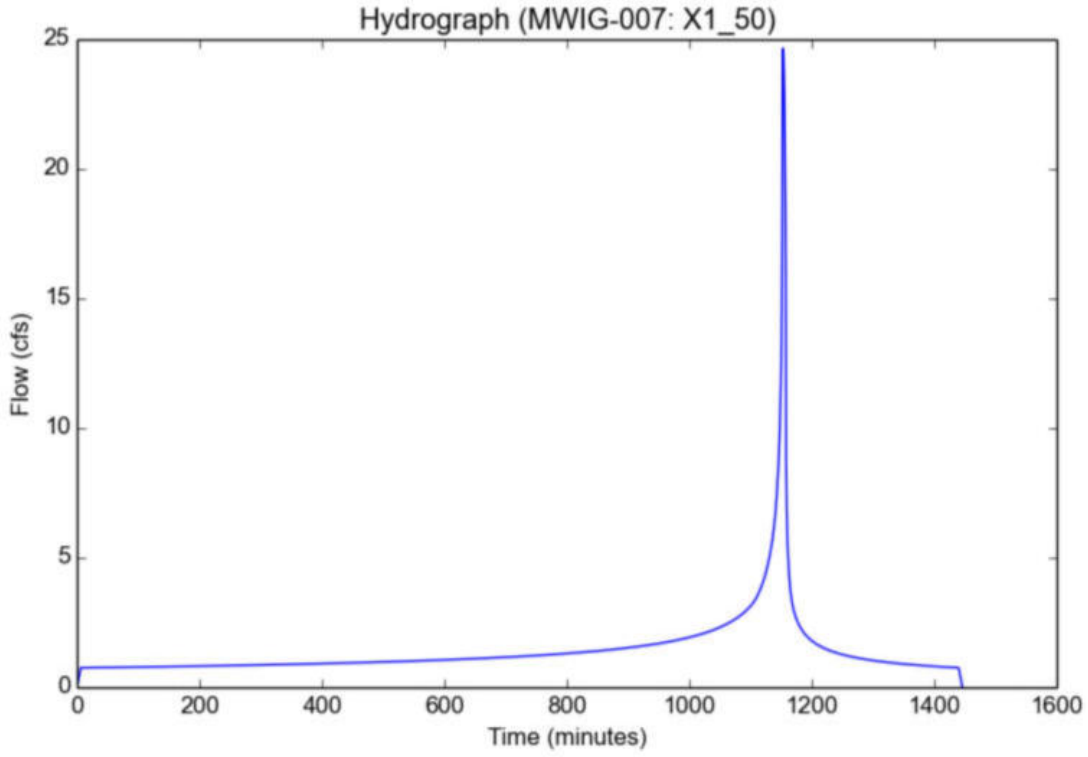
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Existing/MWIG-007 - X1_50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	X1_50
Area (ac)	7.04
Flow Path Length (ft)	490.0
Flow Path Slope (vft/hft)	0.0143
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.68
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.1072
Undeveloped Runoff Coefficient (Cu)	0.7519
Developed Runoff Coefficient (Cd)	0.8526
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	24.6527
Burned Peak Flow Rate (cfs)	24.6527
24-Hr Clear Runoff Volume (ac-ft)	2.8966
24-Hr Clear Runoff Volume (cu-ft)	126174.3874



Peak Flow Hydrologic Analysis

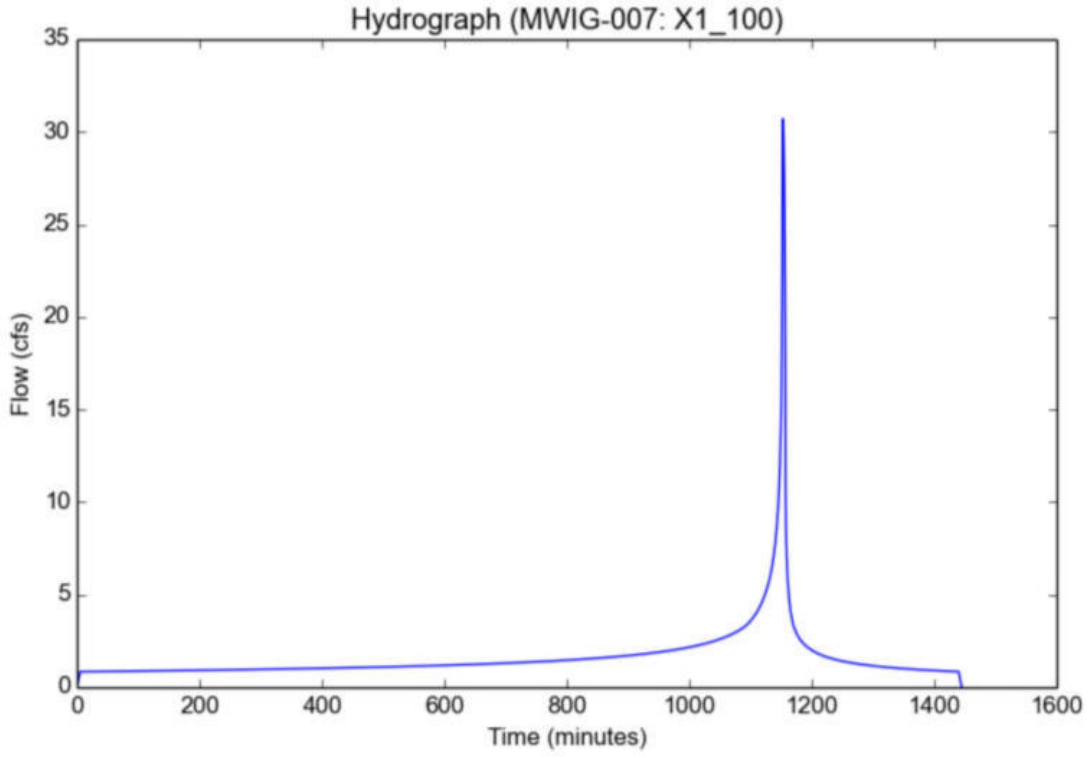
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Existing/MWIG-007 - X1_100.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	X1_100
Area (ac)	7.04
Flow Path Length (ft)	490.0
Flow Path Slope (vft/hft)	0.0143
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.68
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	5.0206
Undeveloped Runoff Coefficient (Cu)	0.8024
Developed Runoff Coefficient (Cd)	0.8688
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	30.7073
Burned Peak Flow Rate (cfs)	30.7073
24-Hr Clear Runoff Volume (ac-ft)	3.2646
24-Hr Clear Runoff Volume (cu-ft)	142206.9866



Proposed Conditions – HydroCalc Outputs

Peak Flow Hydrologic Analysis

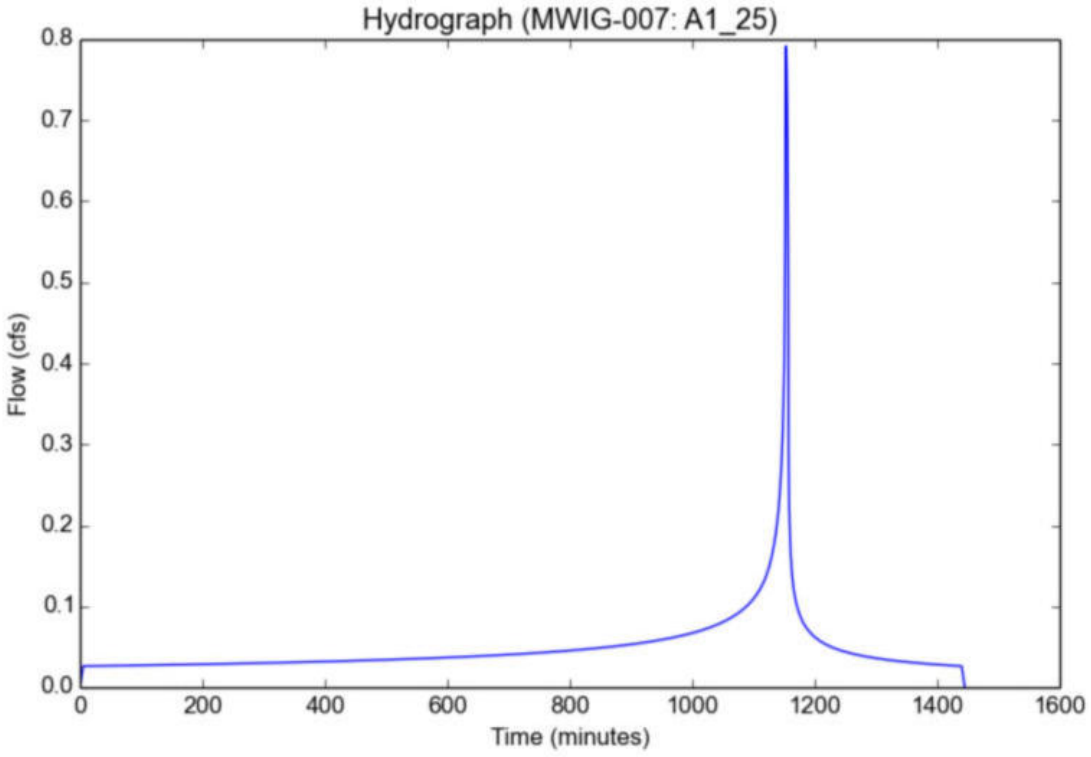
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A1_25.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A1_25
Area (ac)	0.23
Flow Path Length (ft)	85.0
Flow Path Slope (vft/hft)	0.0223
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.9288
Undeveloped Runoff Coefficient (Cu)	0.74
Developed Runoff Coefficient (Cd)	0.876
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.7916
Burned Peak Flow Rate (cfs)	0.7916
24-Hr Clear Runoff Volume (ac-ft)	0.0986
24-Hr Clear Runoff Volume (cu-ft)	4296.3851



Peak Flow Hydrologic Analysis

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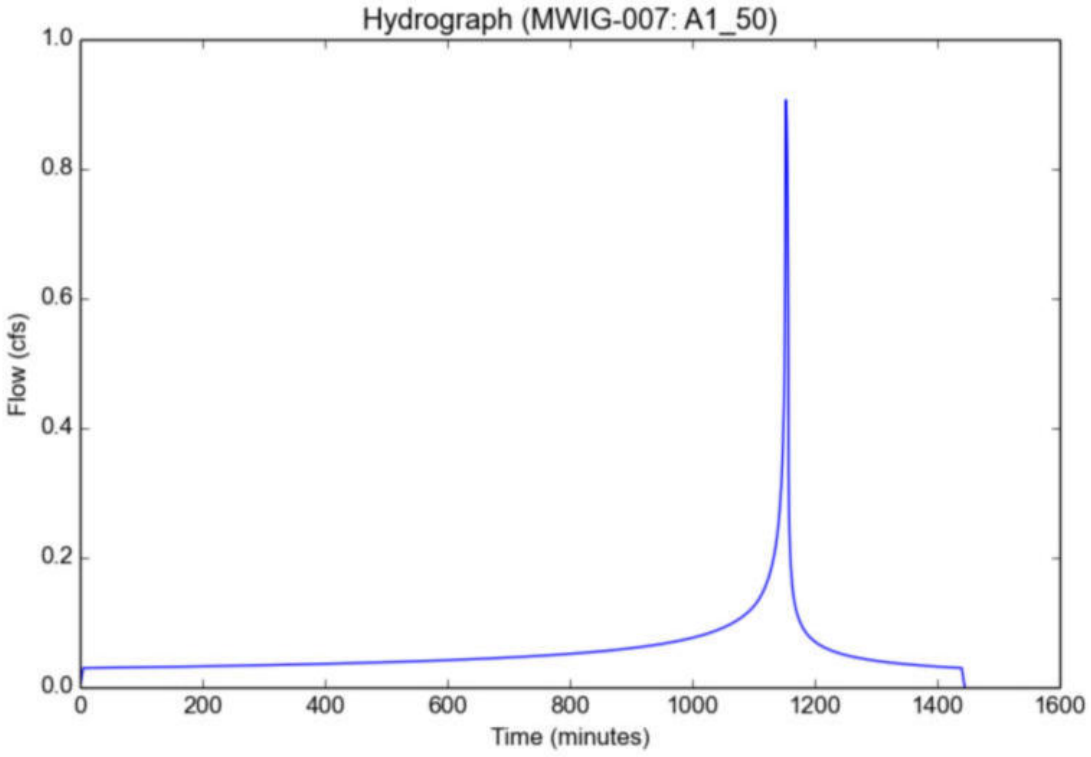
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A1_50
Area (ac)	0.23
Flow Path Length (ft)	85.0
Flow Path Slope (vft/hft)	0.0223
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.4747
Undeveloped Runoff Coefficient (Cu)	0.7724
Developed Runoff Coefficient (Cd)	0.8809
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.9066
Burned Peak Flow Rate (cfs)	0.9066
24-Hr Clear Runoff Volume (ac-ft)	0.1125
24-Hr Clear Runoff Volume (cu-ft)	4901.7115



Peak Flow Hydrologic Analysis

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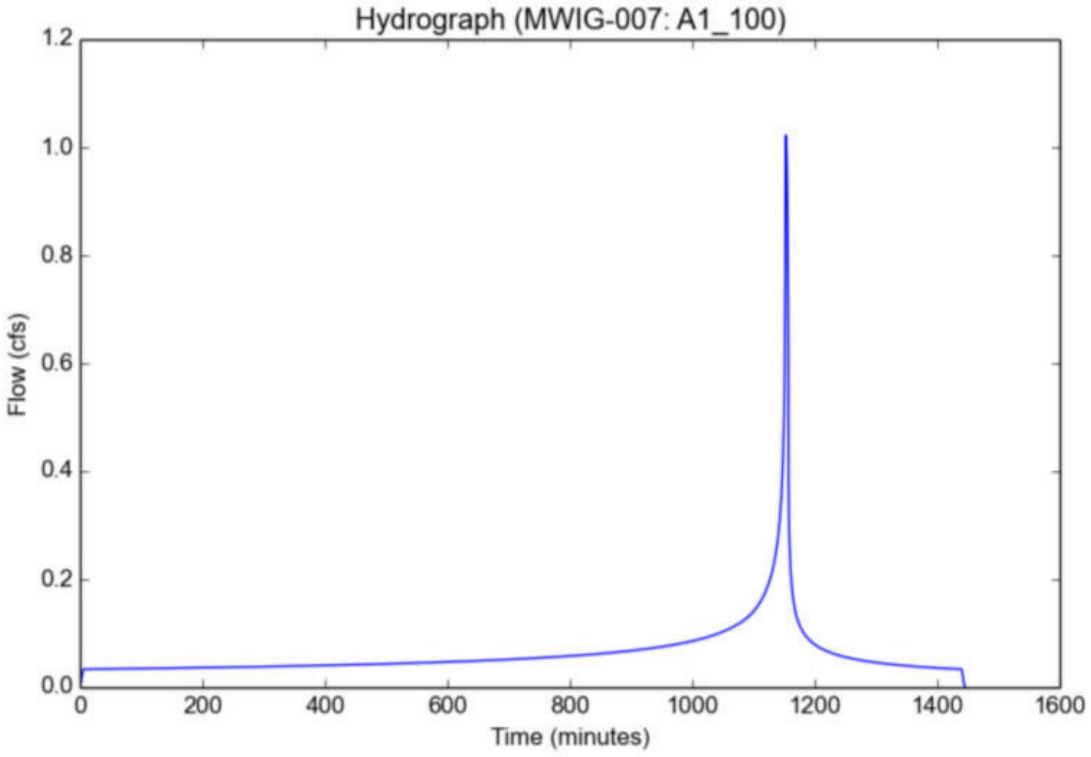
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A1_100
Area (ac)	0.23
Flow Path Length (ft)	85.0
Flow Path Slope (vft/hft)	0.0223
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	5.0206
Undeveloped Runoff Coefficient (Cu)	0.8024
Developed Runoff Coefficient (Cd)	0.8854
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.0224
Burned Peak Flow Rate (cfs)	1.0224
24-Hr Clear Runoff Volume (ac-ft)	0.1265
24-Hr Clear Runoff Volume (cu-ft)	5509.1913



Peak Flow Hydrologic Analysis

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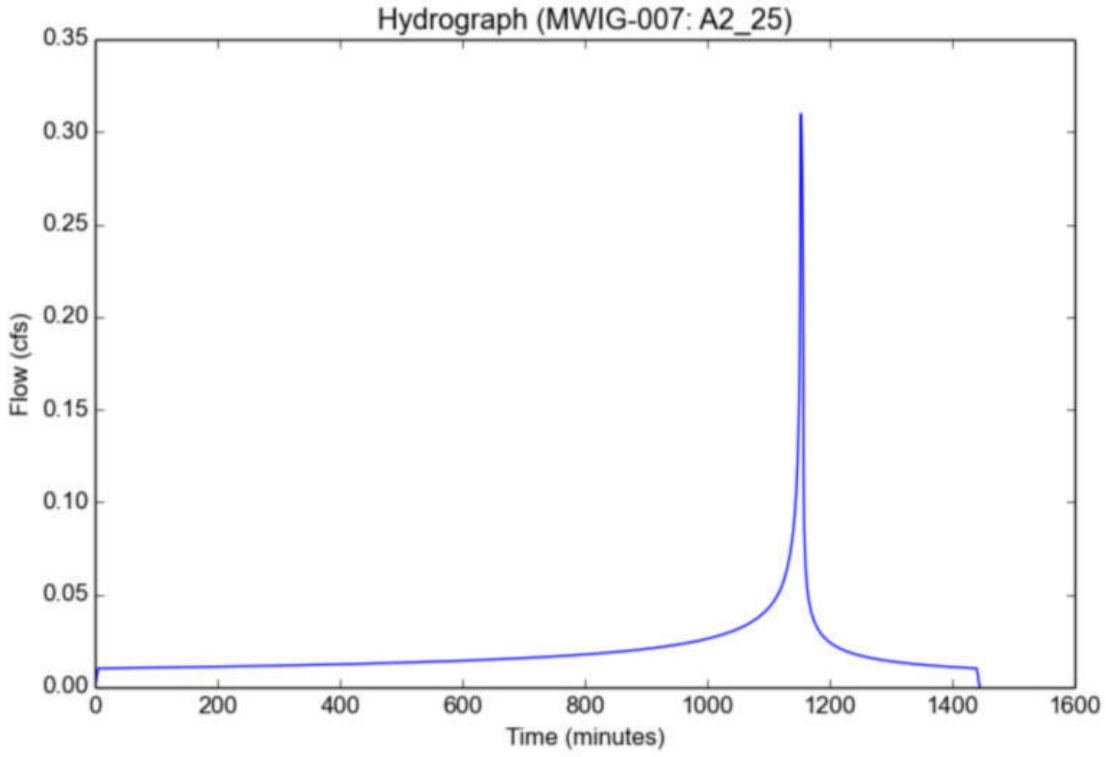
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A2_25
Area (ac)	0.09
Flow Path Length (ft)	54.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.9288
Undeveloped Runoff Coefficient (Cu)	0.74
Developed Runoff Coefficient (Cd)	0.876
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3097
Burned Peak Flow Rate (cfs)	0.3097
24-Hr Clear Runoff Volume (ac-ft)	0.0386
24-Hr Clear Runoff Volume (cu-ft)	1681.1942



Peak Flow Hydrologic Analysis

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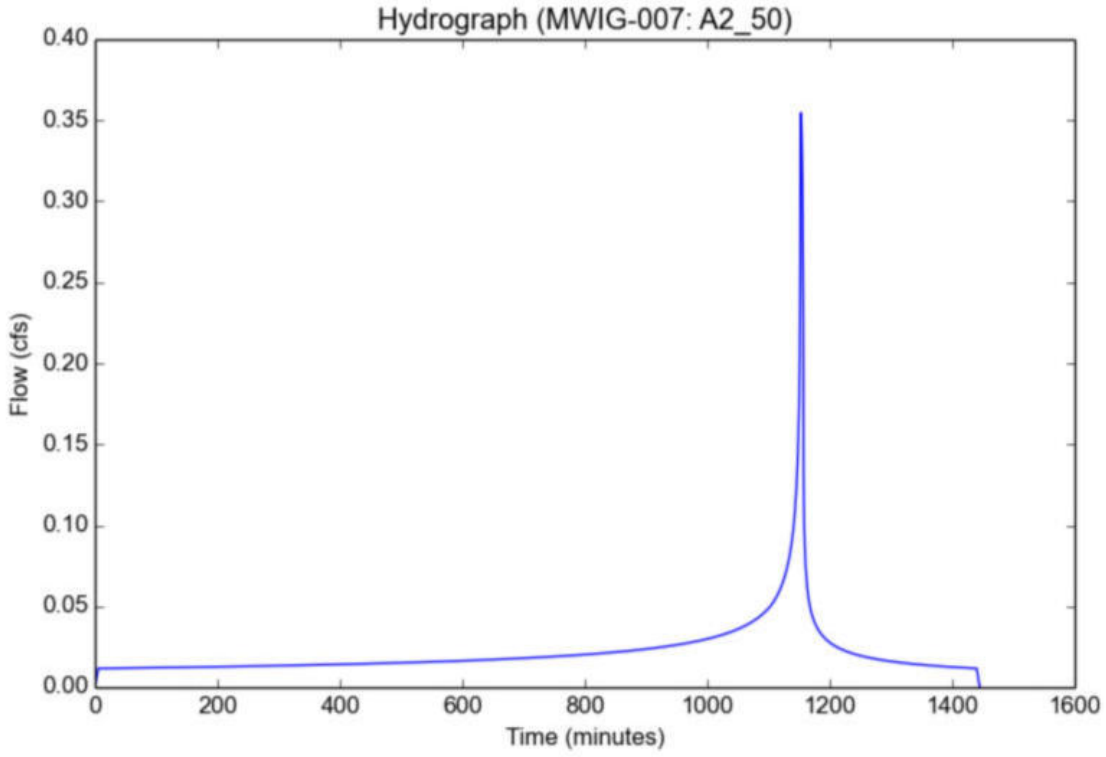
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A2_50
Area (ac)	0.09
Flow Path Length (ft)	54.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.4747
Undeveloped Runoff Coefficient (Cu)	0.7724
Developed Runoff Coefficient (Cd)	0.8809
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3547
Burned Peak Flow Rate (cfs)	0.3547
24-Hr Clear Runoff Volume (ac-ft)	0.044
24-Hr Clear Runoff Volume (cu-ft)	1918.061



Peak Flow Hydrologic Analysis

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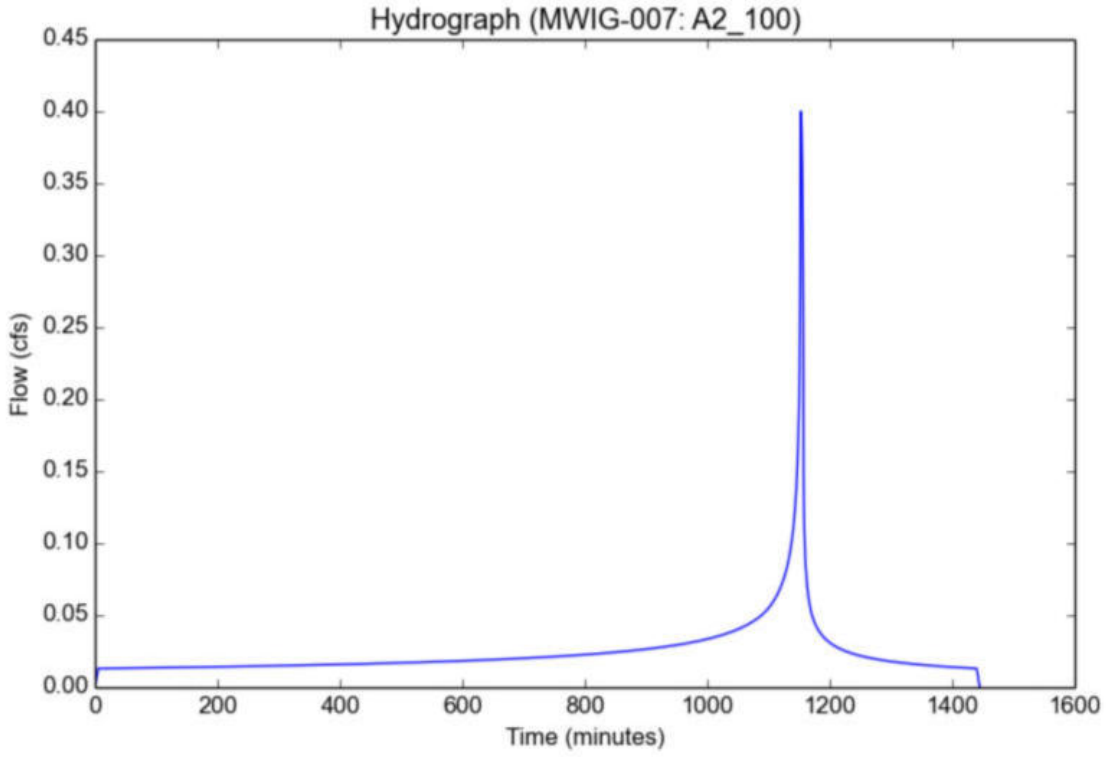
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A2_100
Area (ac)	0.09
Flow Path Length (ft)	54.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	5.0206
Undeveloped Runoff Coefficient (Cu)	0.8024
Developed Runoff Coefficient (Cd)	0.8854
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.4001
Burned Peak Flow Rate (cfs)	0.4001
24-Hr Clear Runoff Volume (ac-ft)	0.0495
24-Hr Clear Runoff Volume (cu-ft)	2155.7705



Peak Flow Hydrologic Analysis

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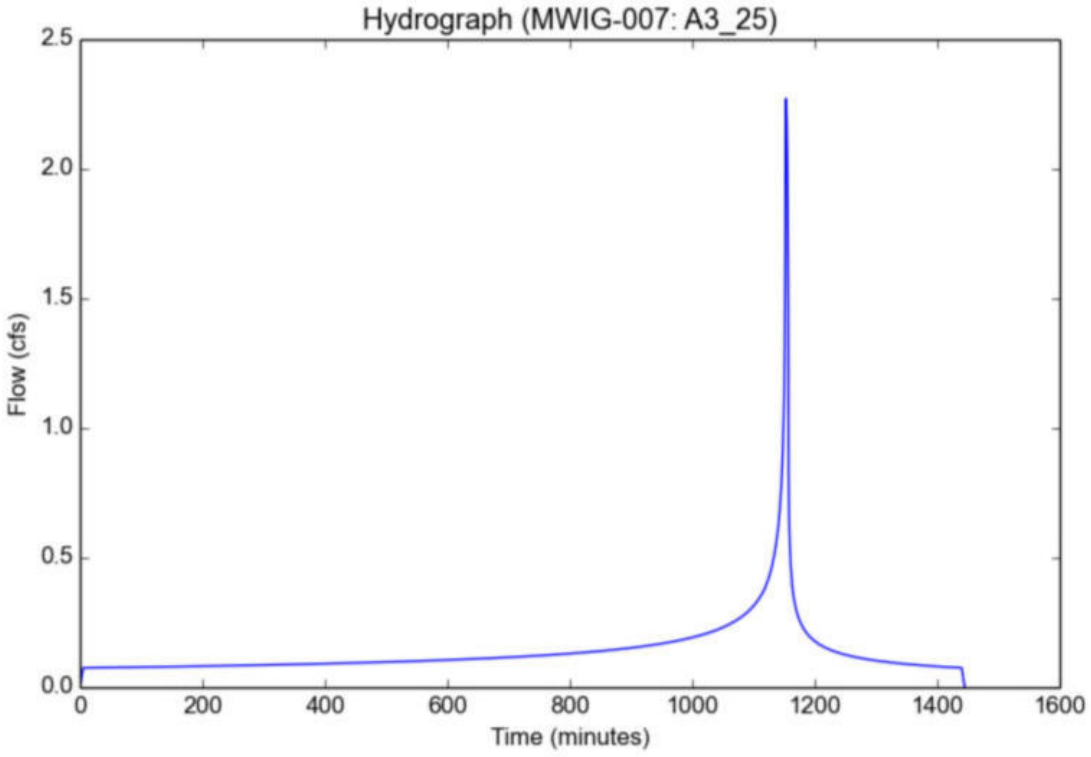
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A3_25
Area (ac)	0.66
Flow Path Length (ft)	297.0
Flow Path Slope (vft/hft)	0.0178
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.9288
Undeveloped Runoff Coefficient (Cu)	0.74
Developed Runoff Coefficient (Cd)	0.876
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.2715
Burned Peak Flow Rate (cfs)	2.2715
24-Hr Clear Runoff Volume (ac-ft)	0.283
24-Hr Clear Runoff Volume (cu-ft)	12328.7574



Peak Flow Hydrologic Analysis

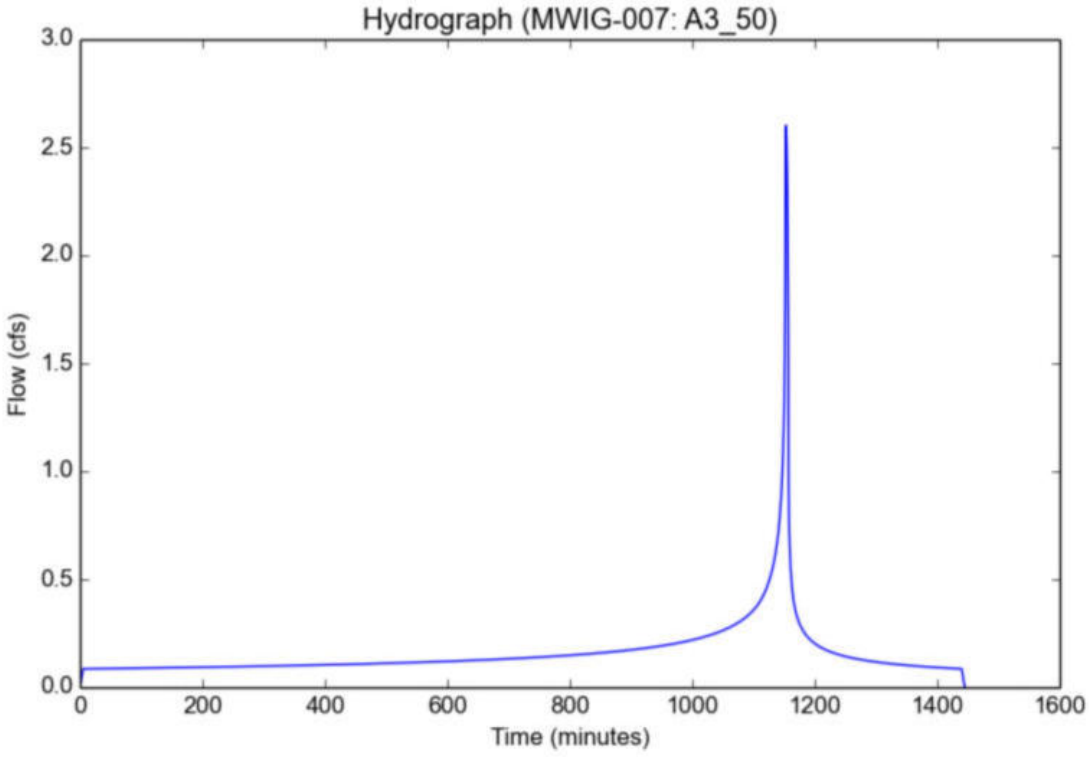
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A3_50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A3_50
Area (ac)	0.66
Flow Path Length (ft)	297.0
Flow Path Slope (vft/hft)	0.0178
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.4747
Undeveloped Runoff Coefficient (Cu)	0.7724
Developed Runoff Coefficient (Cd)	0.8809
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.6014
Burned Peak Flow Rate (cfs)	2.6014
24-Hr Clear Runoff Volume (ac-ft)	0.3229
24-Hr Clear Runoff Volume (cu-ft)	14065.7808



Peak Flow Hydrologic Analysis

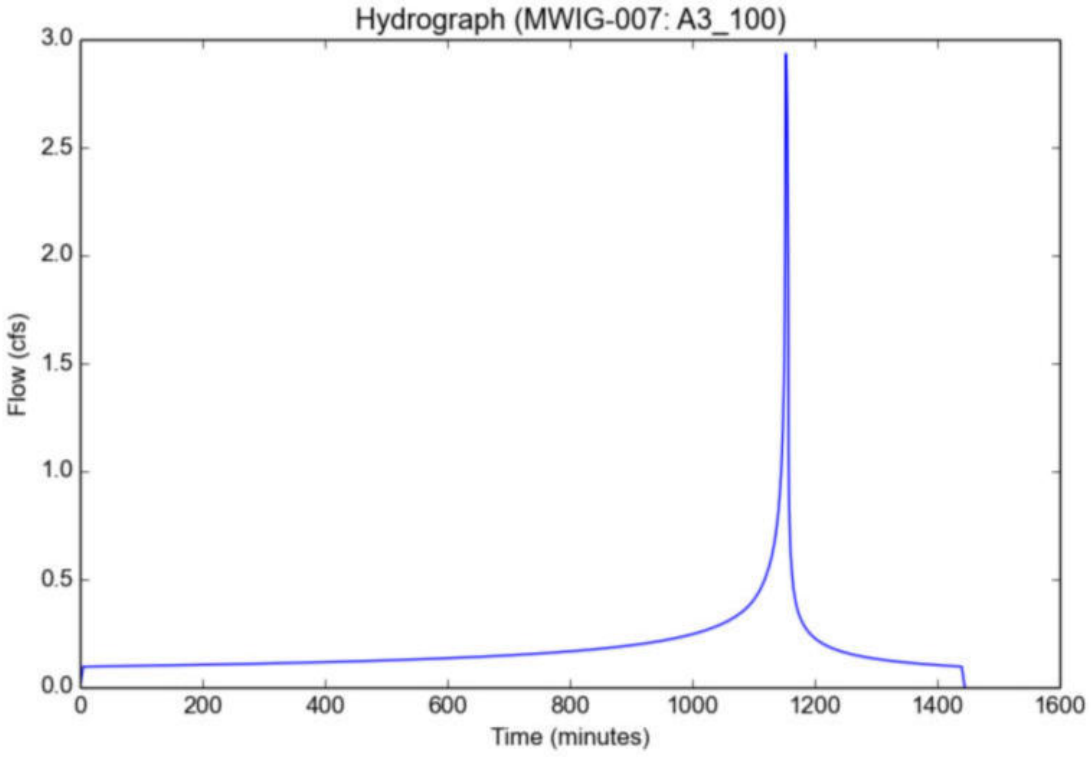
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A3_100.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A3_100
Area (ac)	0.66
Flow Path Length (ft)	297.0
Flow Path Slope (vft/hft)	0.0178
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	5.0206
Undeveloped Runoff Coefficient (Cu)	0.8024
Developed Runoff Coefficient (Cd)	0.8854
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.9338
Burned Peak Flow Rate (cfs)	2.9338
24-Hr Clear Runoff Volume (ac-ft)	0.3629
24-Hr Clear Runoff Volume (cu-ft)	15808.9838



Peak Flow Hydrologic Analysis

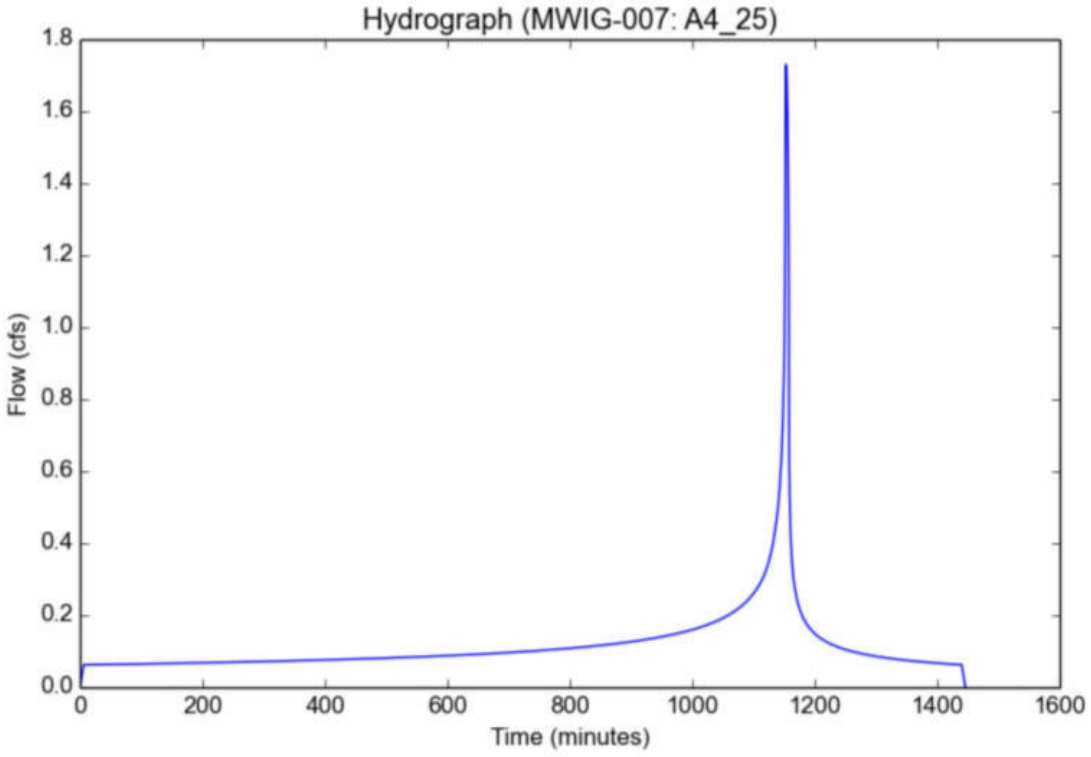
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A4_25.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A4_25
Area (ac)	0.55
Flow Path Length (ft)	433.0
Flow Path Slope (vft/hft)	0.0148
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.6062
Undeveloped Runoff Coefficient (Cu)	0.7133
Developed Runoff Coefficient (Cd)	0.872
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	1.7295
Burned Peak Flow Rate (cfs)	1.7295
24-Hr Clear Runoff Volume (ac-ft)	0.2358
24-Hr Clear Runoff Volume (cu-ft)	10273.142



Peak Flow Hydrologic Analysis

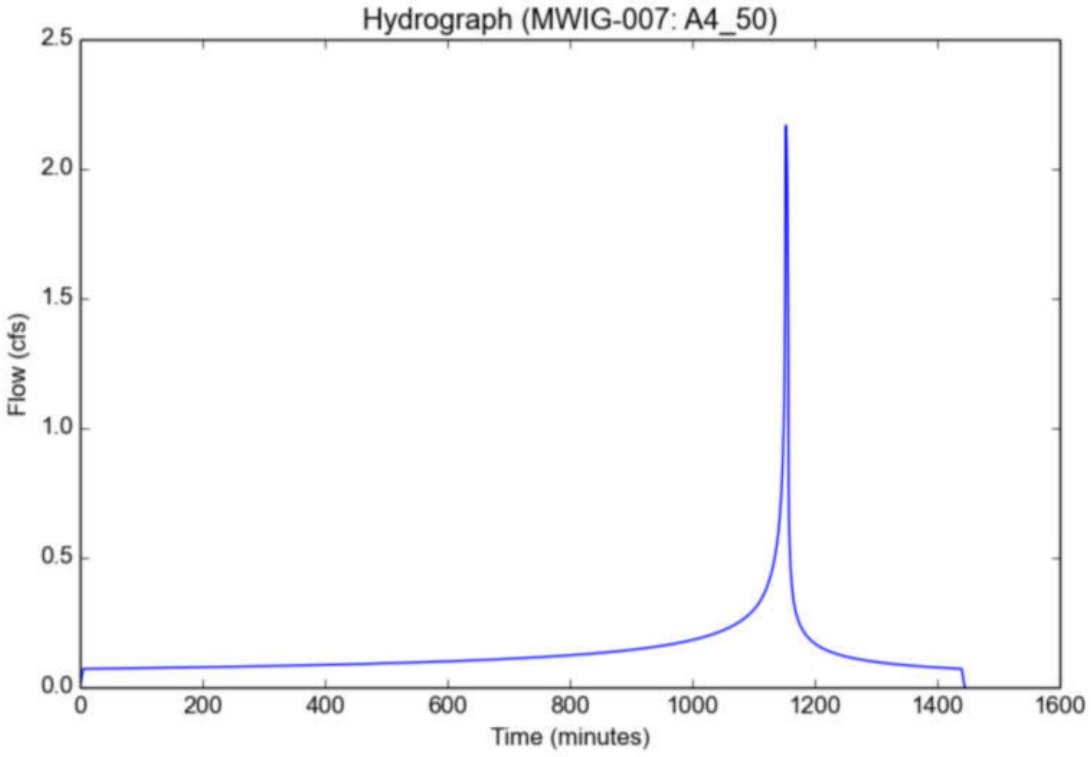
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A4_50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A4_50
Area (ac)	0.55
Flow Path Length (ft)	433.0
Flow Path Slope (vft/hft)	0.0148
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.4747
Undeveloped Runoff Coefficient (Cu)	0.7724
Developed Runoff Coefficient (Cd)	0.8809
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.1679
Burned Peak Flow Rate (cfs)	2.1679
24-Hr Clear Runoff Volume (ac-ft)	0.2691
24-Hr Clear Runoff Volume (cu-ft)	11721.484



Peak Flow Hydrologic Analysis

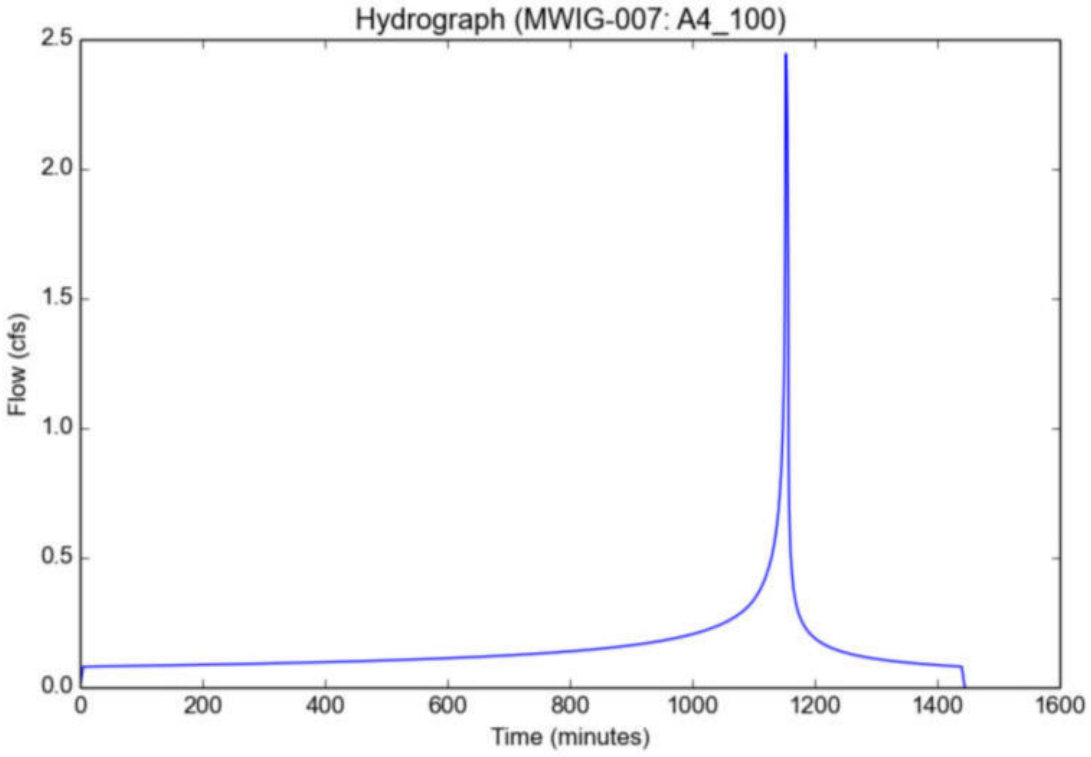
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A4_100.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A4_100
Area (ac)	0.55
Flow Path Length (ft)	433.0
Flow Path Slope (vft/hft)	0.0148
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	5.0206
Undeveloped Runoff Coefficient (Cu)	0.8024
Developed Runoff Coefficient (Cd)	0.8854
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.4448
Burned Peak Flow Rate (cfs)	2.4448
24-Hr Clear Runoff Volume (ac-ft)	0.3024
24-Hr Clear Runoff Volume (cu-ft)	13174.1532



Peak Flow Hydrologic Analysis

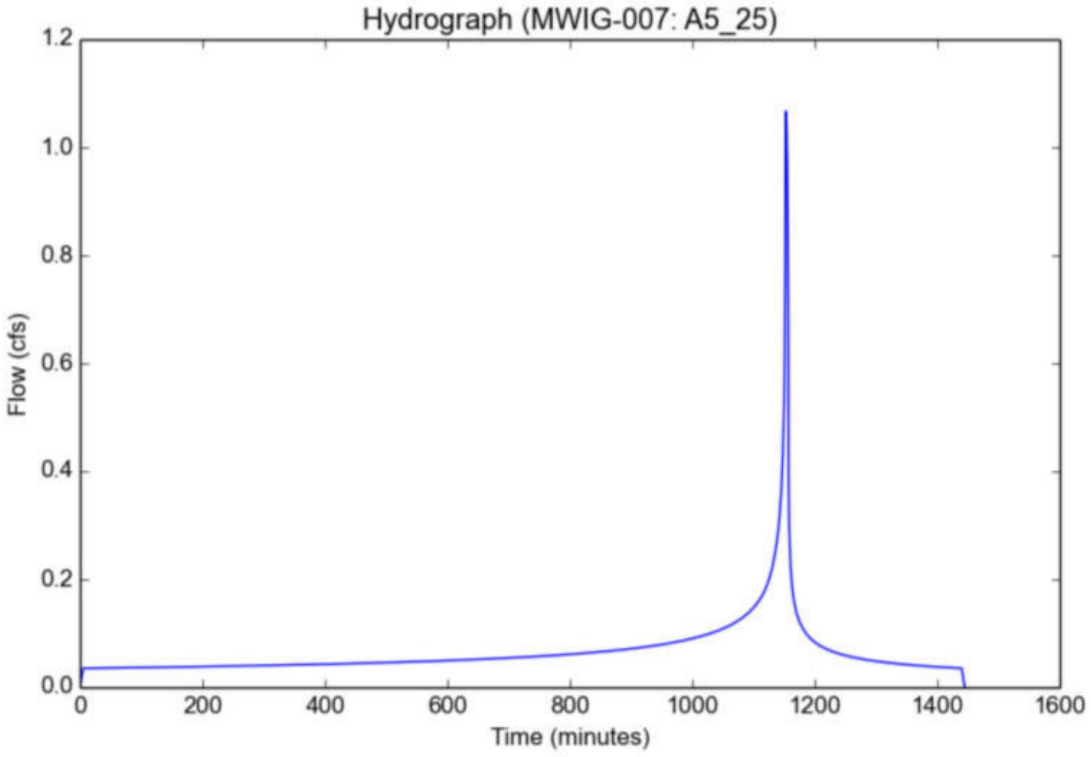
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A5_25.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A5_25
Area (ac)	0.31
Flow Path Length (ft)	86.0
Flow Path Slope (vft/hft)	0.0209
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.9288
Undeveloped Runoff Coefficient (Cu)	0.74
Developed Runoff Coefficient (Cd)	0.876
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.0669
Burned Peak Flow Rate (cfs)	1.0669
24-Hr Clear Runoff Volume (ac-ft)	0.1329
24-Hr Clear Runoff Volume (cu-ft)	5790.78



Peak Flow Hydrologic Analysis

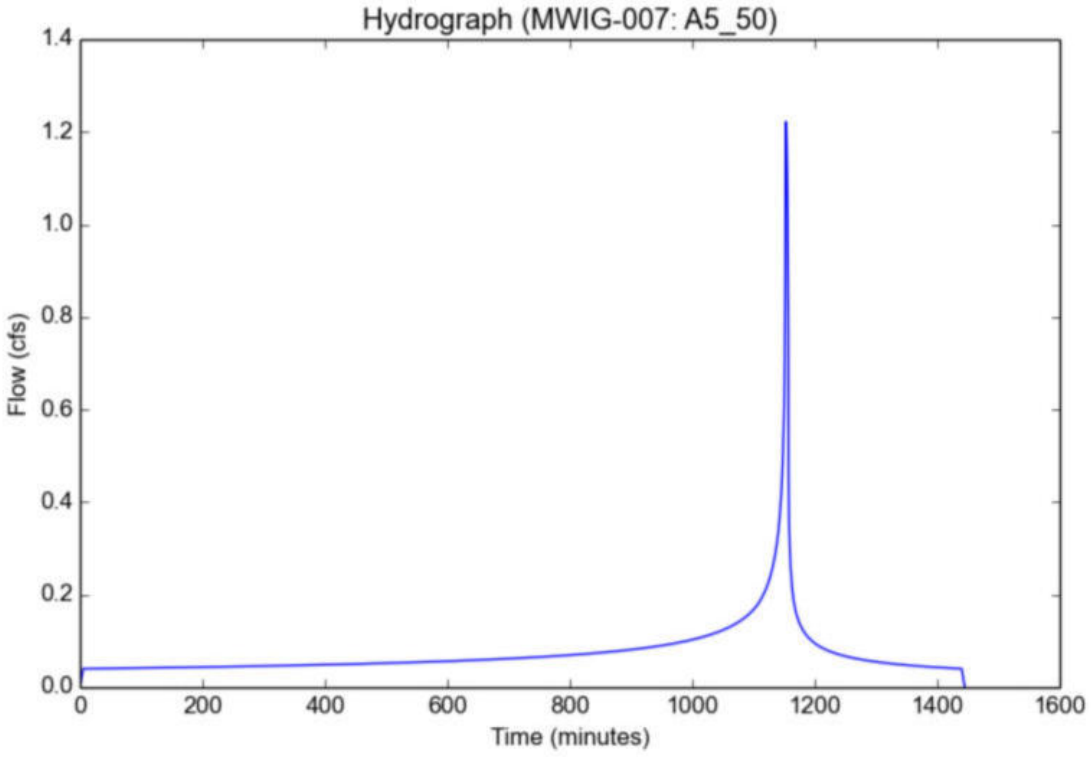
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A5_50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A5_50
Area (ac)	0.31
Flow Path Length (ft)	86.0
Flow Path Slope (vft/hft)	0.0209
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.4747
Undeveloped Runoff Coefficient (Cu)	0.7724
Developed Runoff Coefficient (Cd)	0.8809
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.2219
Burned Peak Flow Rate (cfs)	1.2219
24-Hr Clear Runoff Volume (ac-ft)	0.1517
24-Hr Clear Runoff Volume (cu-ft)	6606.6546



Peak Flow Hydrologic Analysis

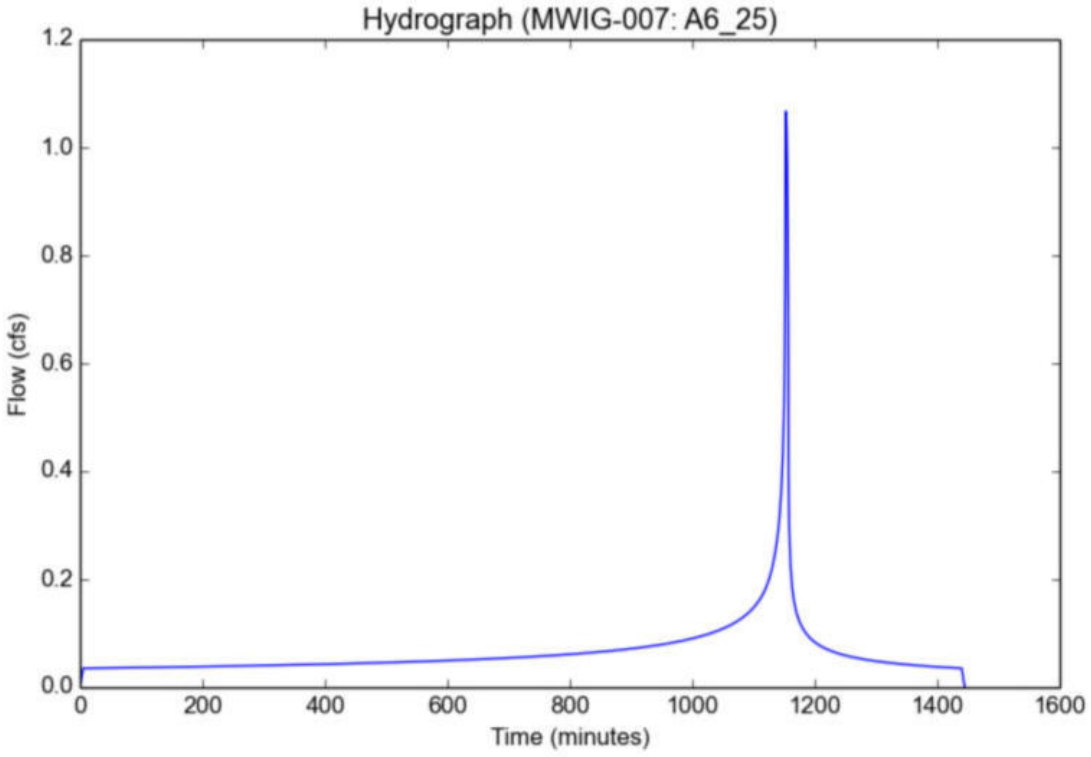
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A6_25.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A6_25
Area (ac)	0.31
Flow Path Length (ft)	86.0
Flow Path Slope (vft/hft)	0.0209
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.9288
Undeveloped Runoff Coefficient (Cu)	0.74
Developed Runoff Coefficient (Cd)	0.876
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.0669
Burned Peak Flow Rate (cfs)	1.0669
24-Hr Clear Runoff Volume (ac-ft)	0.1329
24-Hr Clear Runoff Volume (cu-ft)	5790.78



Peak Flow Hydrologic Analysis

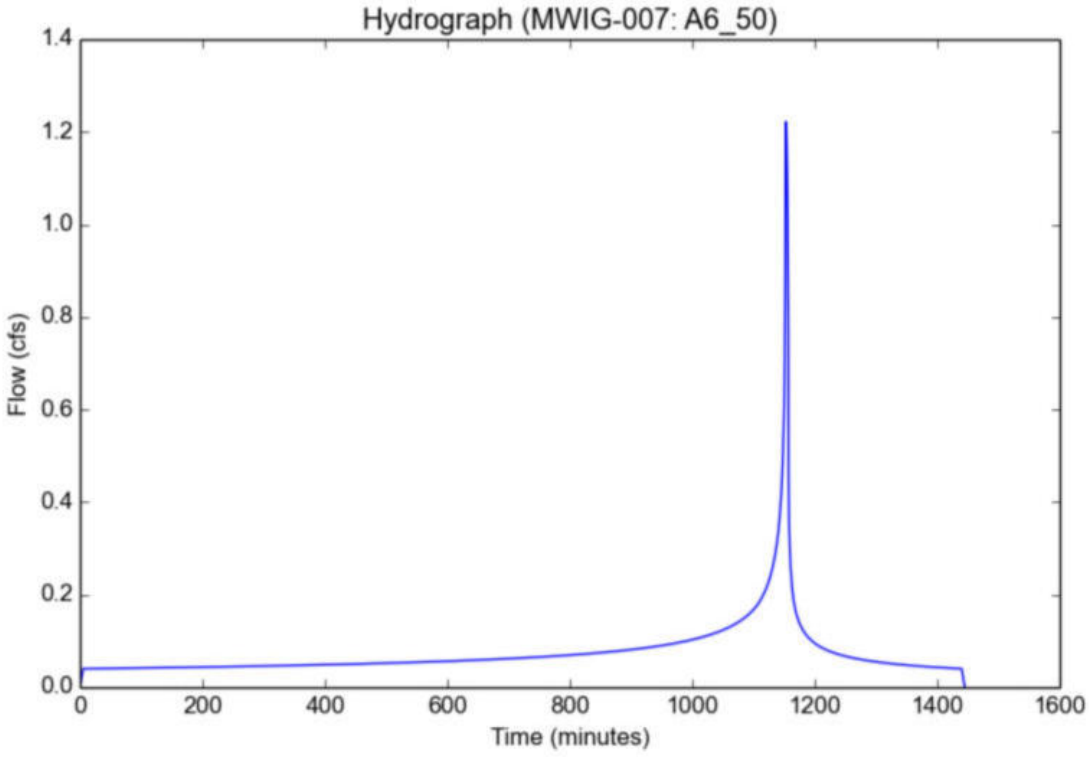
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A6_50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A6_50
Area (ac)	0.31
Flow Path Length (ft)	86.0
Flow Path Slope (vft/hft)	0.0209
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.4747
Undeveloped Runoff Coefficient (Cu)	0.7724
Developed Runoff Coefficient (Cd)	0.8809
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.2219
Burned Peak Flow Rate (cfs)	1.2219
24-Hr Clear Runoff Volume (ac-ft)	0.1517
24-Hr Clear Runoff Volume (cu-ft)	6606.6546



Peak Flow Hydrologic Analysis

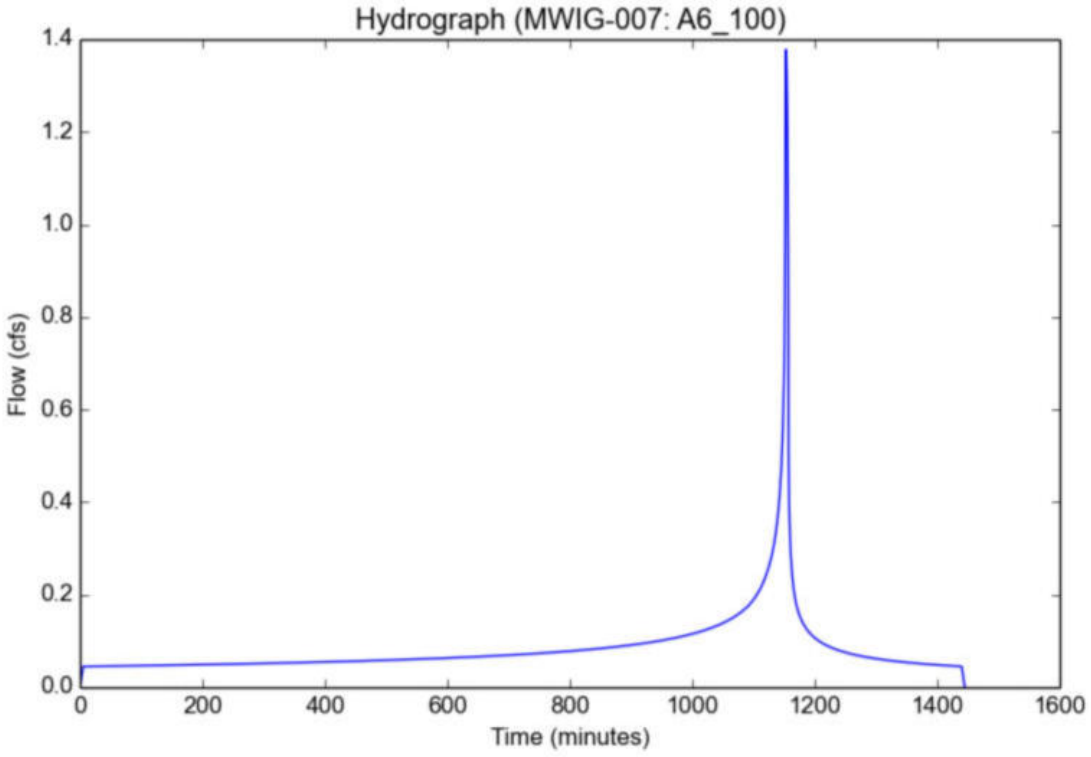
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A6_100.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A6_100
Area (ac)	0.31
Flow Path Length (ft)	86.0
Flow Path Slope (vft/hft)	0.0209
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	5.0206
Undeveloped Runoff Coefficient (Cu)	0.8024
Developed Runoff Coefficient (Cd)	0.8854
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.378
Burned Peak Flow Rate (cfs)	1.378
24-Hr Clear Runoff Volume (ac-ft)	0.1705
24-Hr Clear Runoff Volume (cu-ft)	7425.4318



Peak Flow Hydrologic Analysis

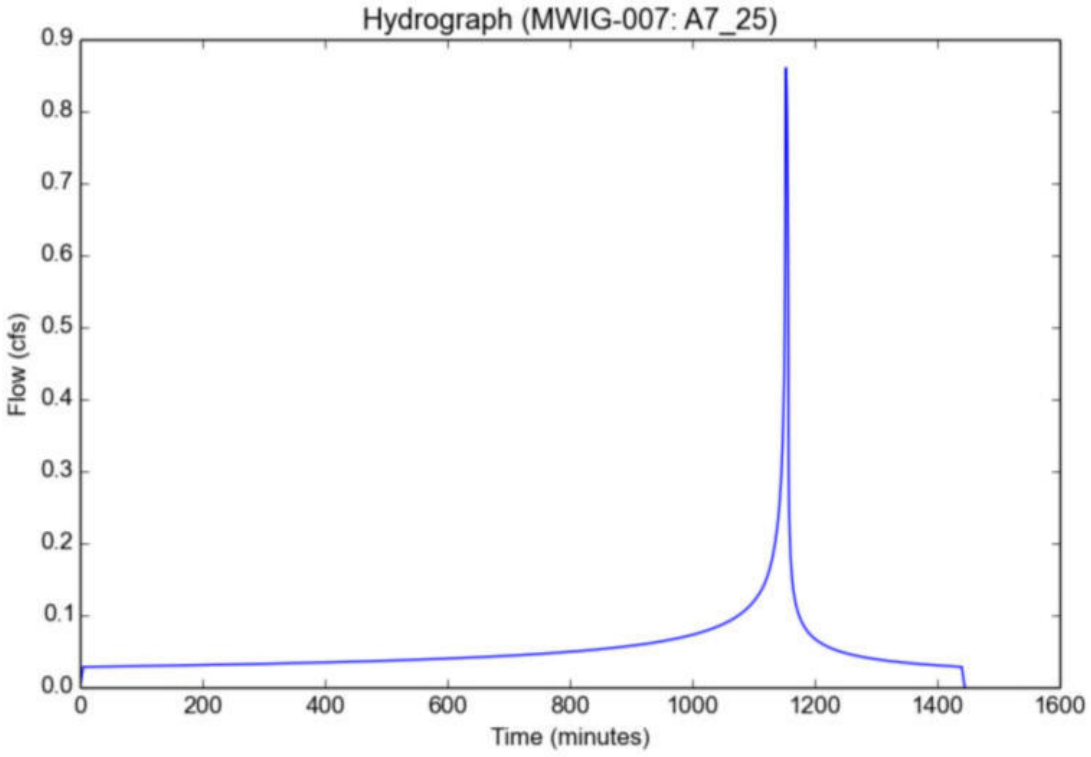
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A7_25.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A7_25
Area (ac)	0.25
Flow Path Length (ft)	86.0
Flow Path Slope (vft/hft)	0.0197
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.9288
Undeveloped Runoff Coefficient (Cu)	0.74
Developed Runoff Coefficient (Cd)	0.876
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.8604
Burned Peak Flow Rate (cfs)	0.8604
24-Hr Clear Runoff Volume (ac-ft)	0.1072
24-Hr Clear Runoff Volume (cu-ft)	4669.9838



Peak Flow Hydrologic Analysis

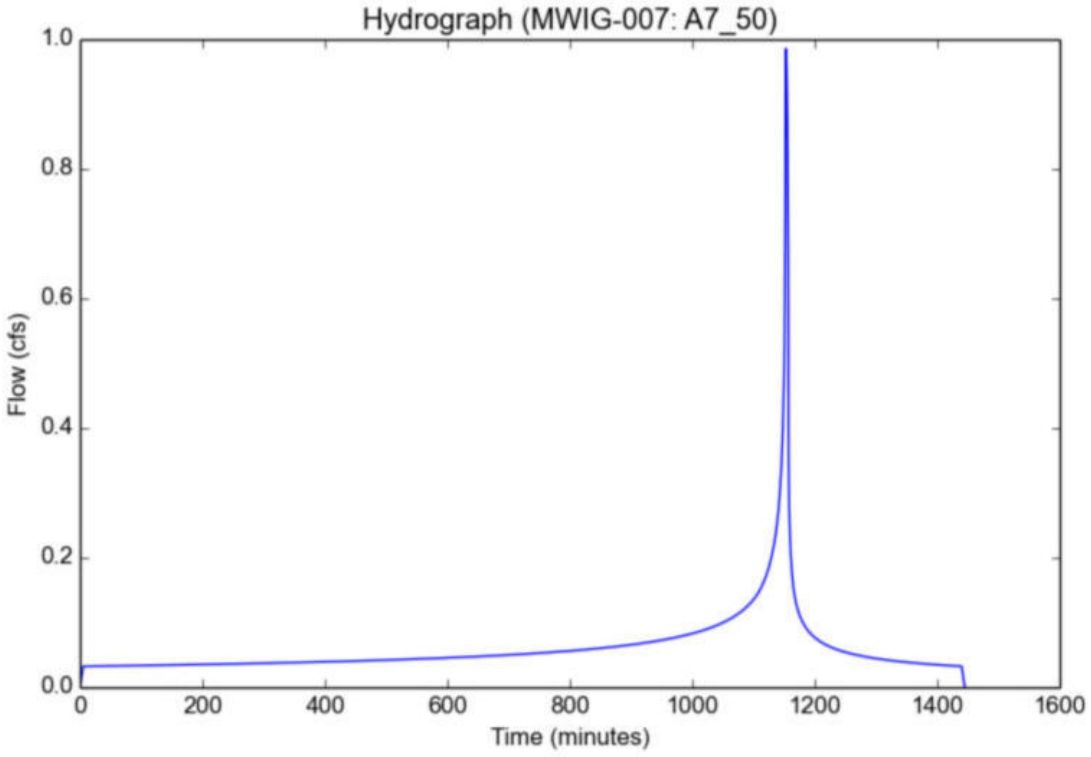
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A7_50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A7_50
Area (ac)	0.25
Flow Path Length (ft)	86.0
Flow Path Slope (vft/hft)	0.0197
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.4747
Undeveloped Runoff Coefficient (Cu)	0.7724
Developed Runoff Coefficient (Cd)	0.8809
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.9854
Burned Peak Flow Rate (cfs)	0.9854
24-Hr Clear Runoff Volume (ac-ft)	0.1223
24-Hr Clear Runoff Volume (cu-ft)	5327.9473



Peak Flow Hydrologic Analysis

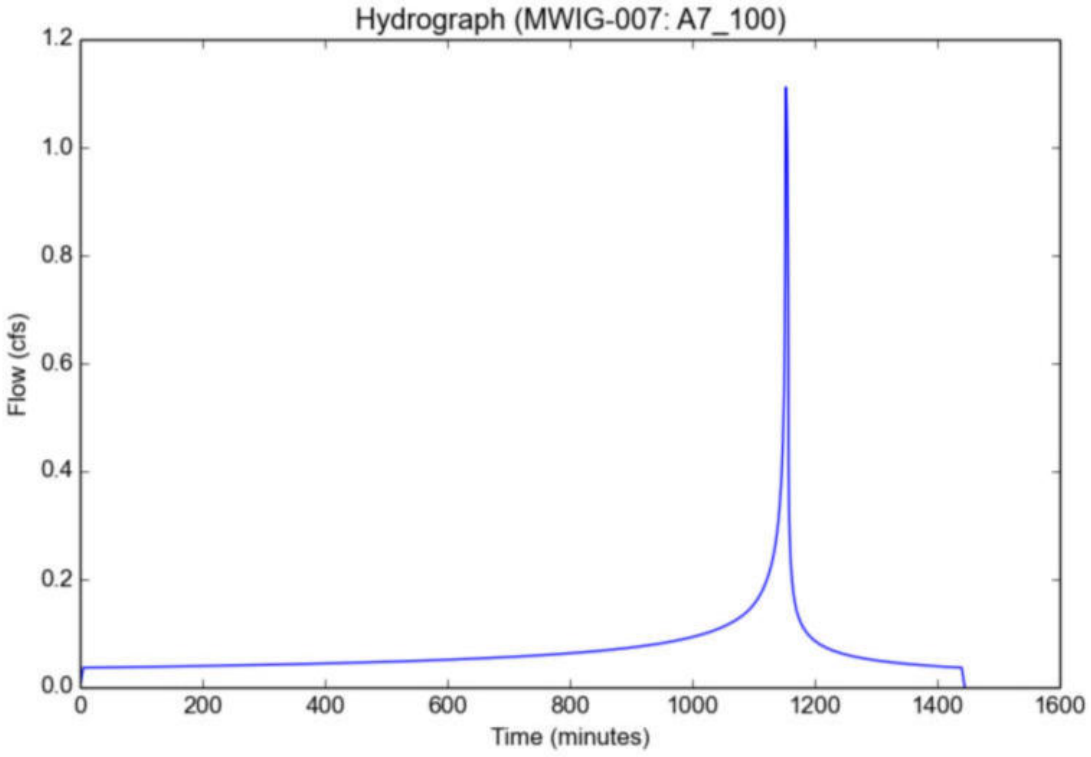
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A7_100.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A7_100
Area (ac)	0.25
Flow Path Length (ft)	86.0
Flow Path Slope (vft/hft)	0.0197
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	5.0206
Undeveloped Runoff Coefficient (Cu)	0.8024
Developed Runoff Coefficient (Cd)	0.8854
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.1113
Burned Peak Flow Rate (cfs)	1.1113
24-Hr Clear Runoff Volume (ac-ft)	0.1375
24-Hr Clear Runoff Volume (cu-ft)	5988.2515



Peak Flow Hydrologic Analysis

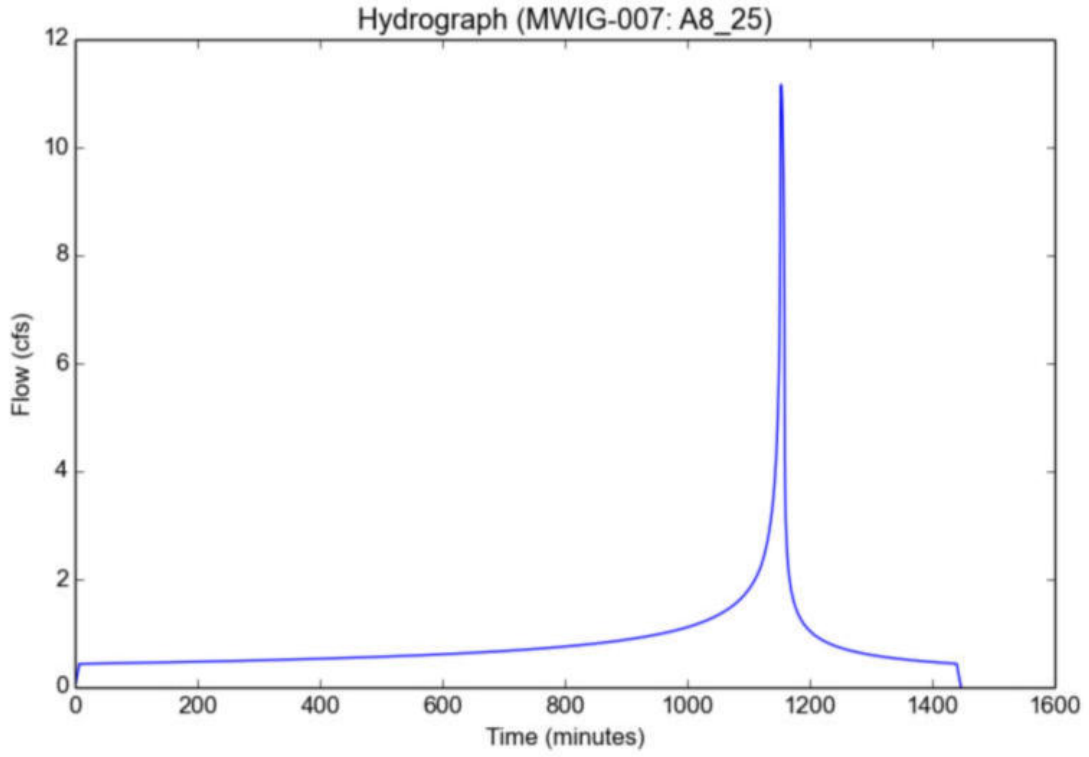
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A8_25.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A8_25
Area (ac)	3.83
Flow Path Length (ft)	630.0
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.3541
Undeveloped Runoff Coefficient (Cu)	0.6925
Developed Runoff Coefficient (Cd)	0.8689
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	11.1617
Burned Peak Flow Rate (cfs)	11.1617
24-Hr Clear Runoff Volume (ac-ft)	1.6422
24-Hr Clear Runoff Volume (cu-ft)	71534.05



Peak Flow Hydrologic Analysis

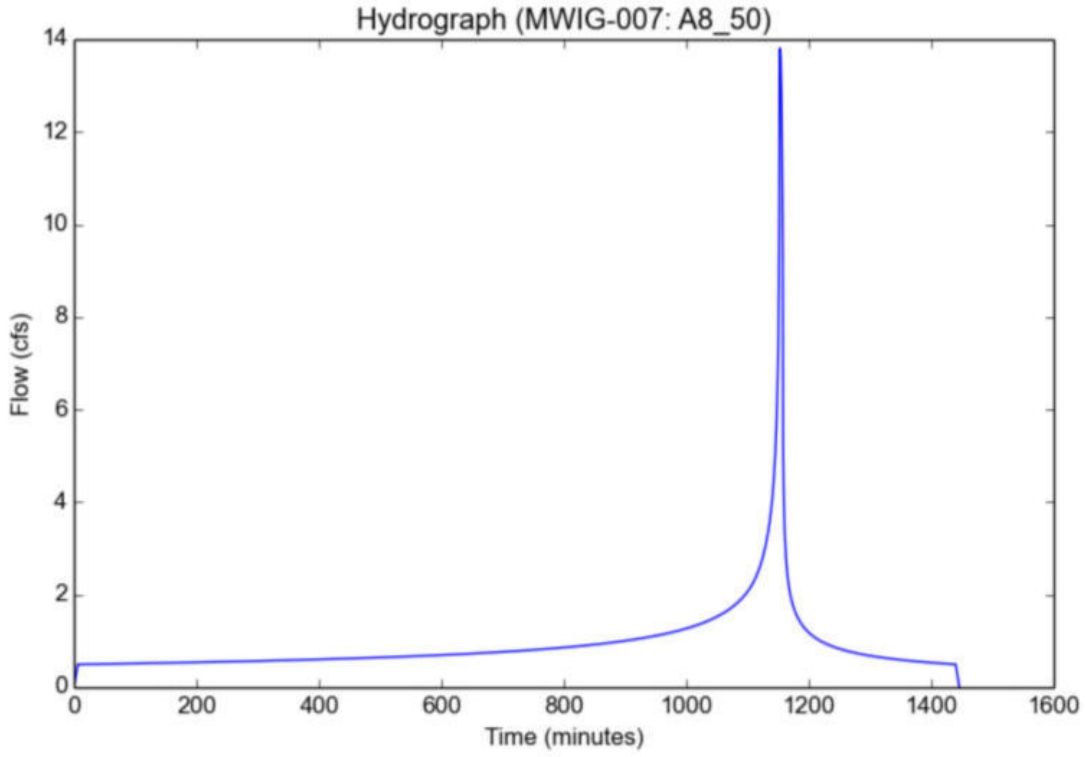
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A8_50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A8_50
Area (ac)	3.83
Flow Path Length (ft)	564.0
Flow Path Slope (vft/hft)	0.014
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.1072
Undeveloped Runoff Coefficient (Cu)	0.7519
Developed Runoff Coefficient (Cd)	0.8778
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	13.8081
Burned Peak Flow Rate (cfs)	13.8081
24-Hr Clear Runoff Volume (ac-ft)	1.8737
24-Hr Clear Runoff Volume (cu-ft)	81619.4136



Peak Flow Hydrologic Analysis

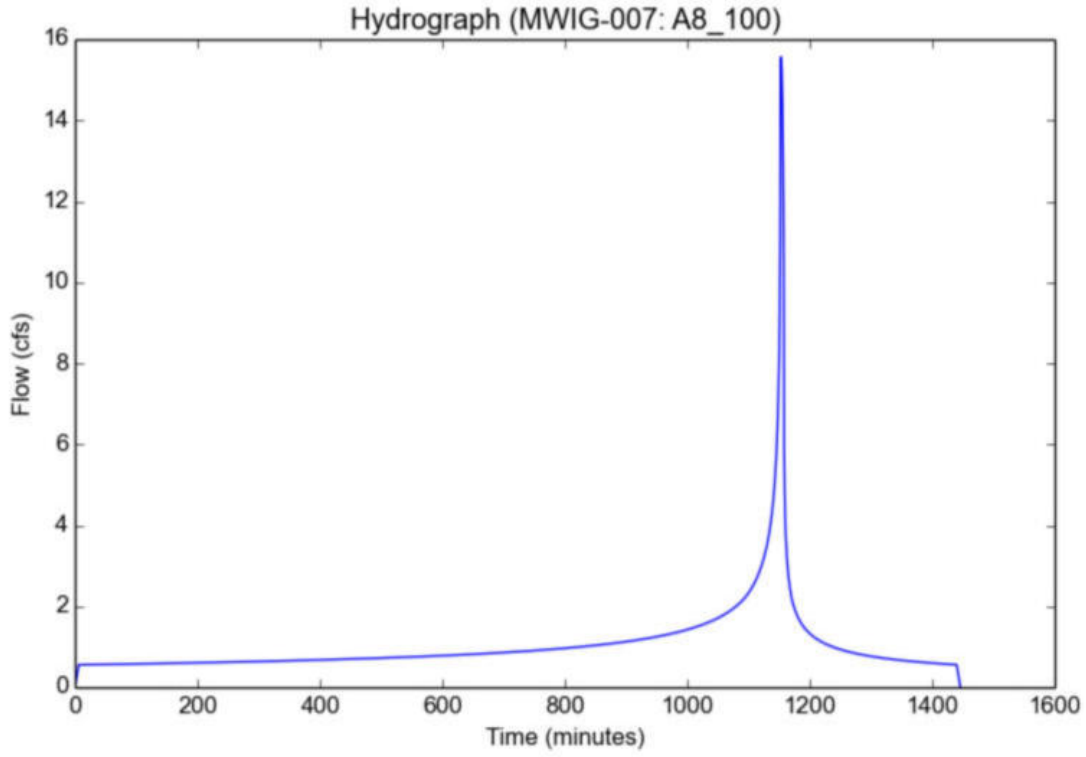
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A8_100.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A8_100
Area (ac)	3.83
Flow Path Length (ft)	630.0
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	4.6083
Undeveloped Runoff Coefficient (Cu)	0.7799
Developed Runoff Coefficient (Cd)	0.882
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	15.5668
Burned Peak Flow Rate (cfs)	15.5668
24-Hr Clear Runoff Volume (ac-ft)	2.1059
24-Hr Clear Runoff Volume (cu-ft)	91734.1691



Peak Flow Hydrologic Analysis

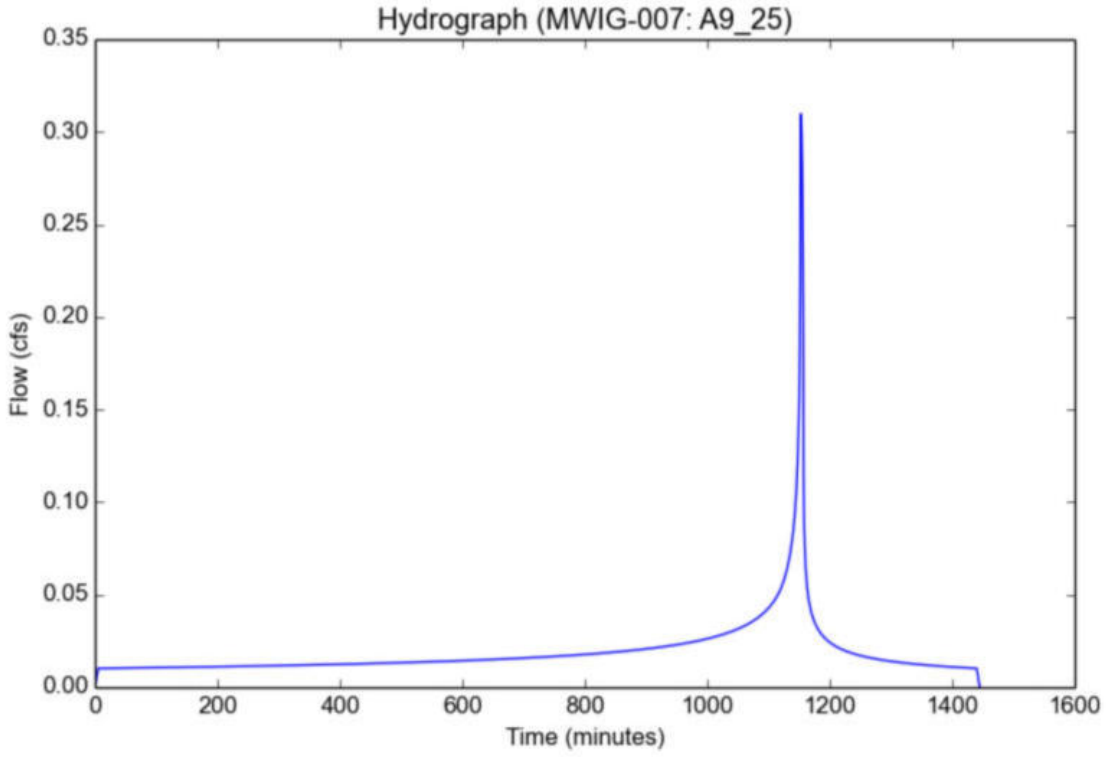
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A9_25.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A9_25
Area (ac)	0.09
Flow Path Length (ft)	84.0
Flow Path Slope (vft/hft)	0.019
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.9288
Undeveloped Runoff Coefficient (Cu)	0.74
Developed Runoff Coefficient (Cd)	0.876
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3097
Burned Peak Flow Rate (cfs)	0.3097
24-Hr Clear Runoff Volume (ac-ft)	0.0386
24-Hr Clear Runoff Volume (cu-ft)	1681.1942



Peak Flow Hydrologic Analysis

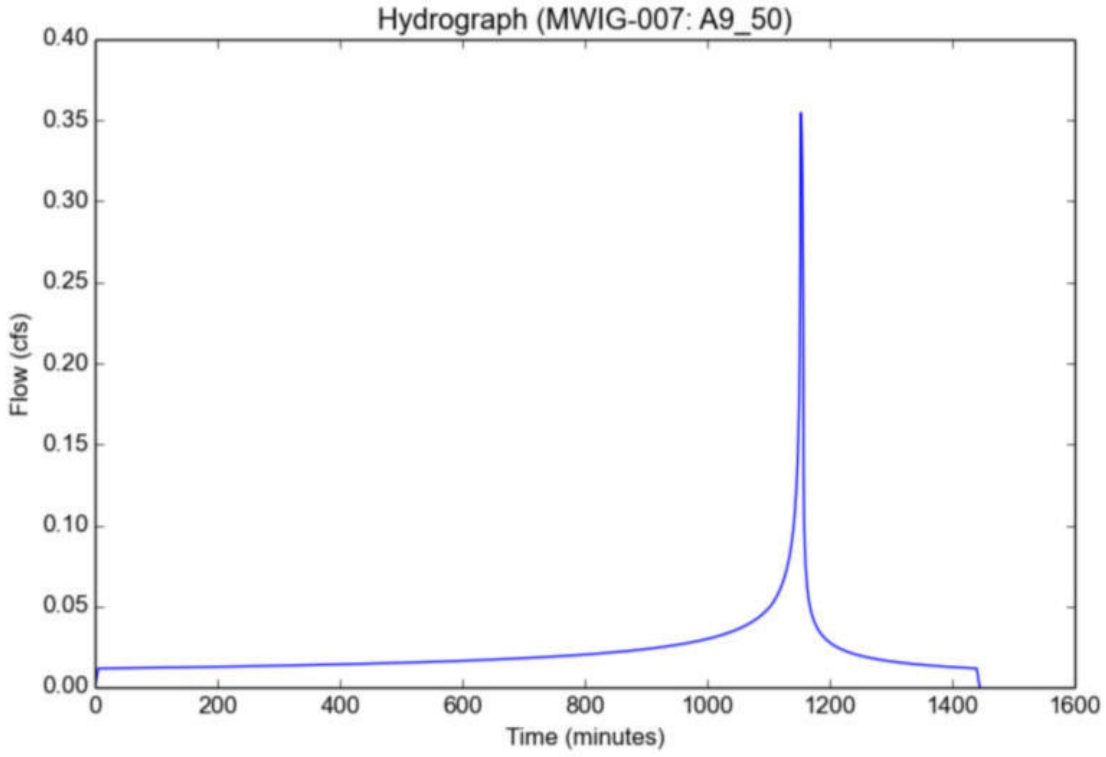
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A9_50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A9_50
Area (ac)	0.09
Flow Path Length (ft)	84.0
Flow Path Slope (vft/hft)	0.019
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.4747
Undeveloped Runoff Coefficient (Cu)	0.7724
Developed Runoff Coefficient (Cd)	0.8809
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3547
Burned Peak Flow Rate (cfs)	0.3547
24-Hr Clear Runoff Volume (ac-ft)	0.044
24-Hr Clear Runoff Volume (cu-ft)	1918.061



Peak Flow Hydrologic Analysis

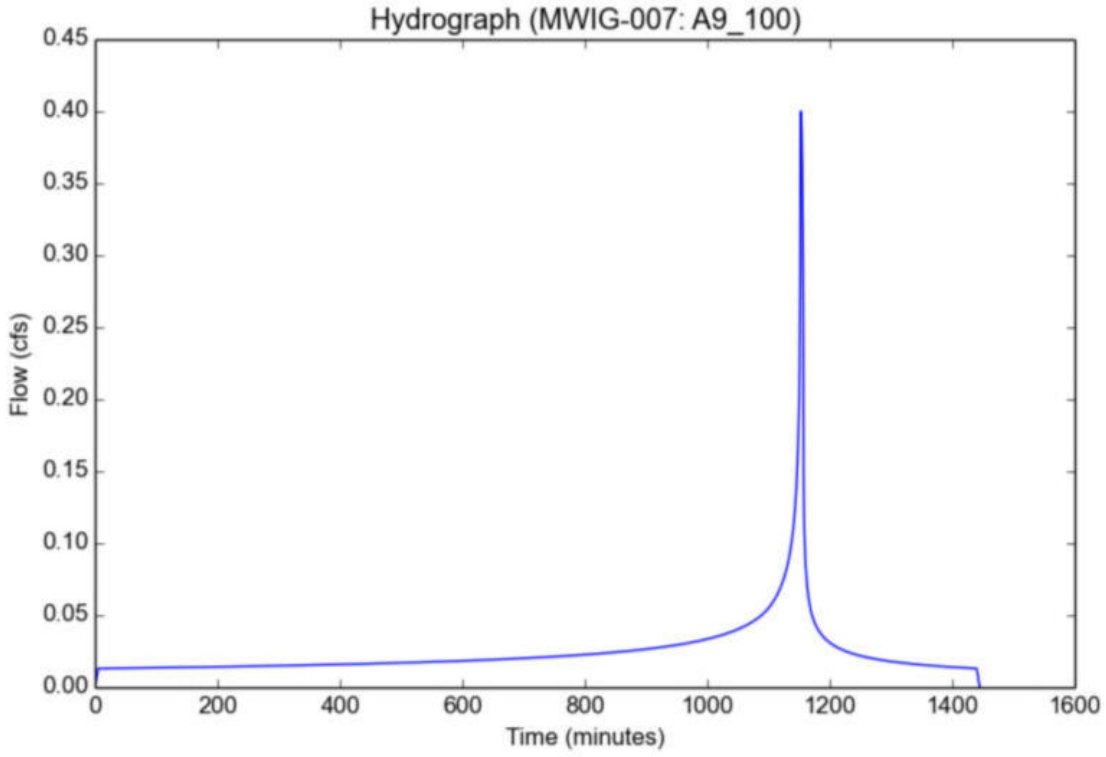
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A9_100.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A9_100
Area (ac)	0.09
Flow Path Length (ft)	84.0
Flow Path Slope (vft/hft)	0.019
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	5.0206
Undeveloped Runoff Coefficient (Cu)	0.8024
Developed Runoff Coefficient (Cd)	0.8854
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.4001
Burned Peak Flow Rate (cfs)	0.4001
24-Hr Clear Runoff Volume (ac-ft)	0.0495
24-Hr Clear Runoff Volume (cu-ft)	2155.7705



Peak Flow Hydrologic Analysis

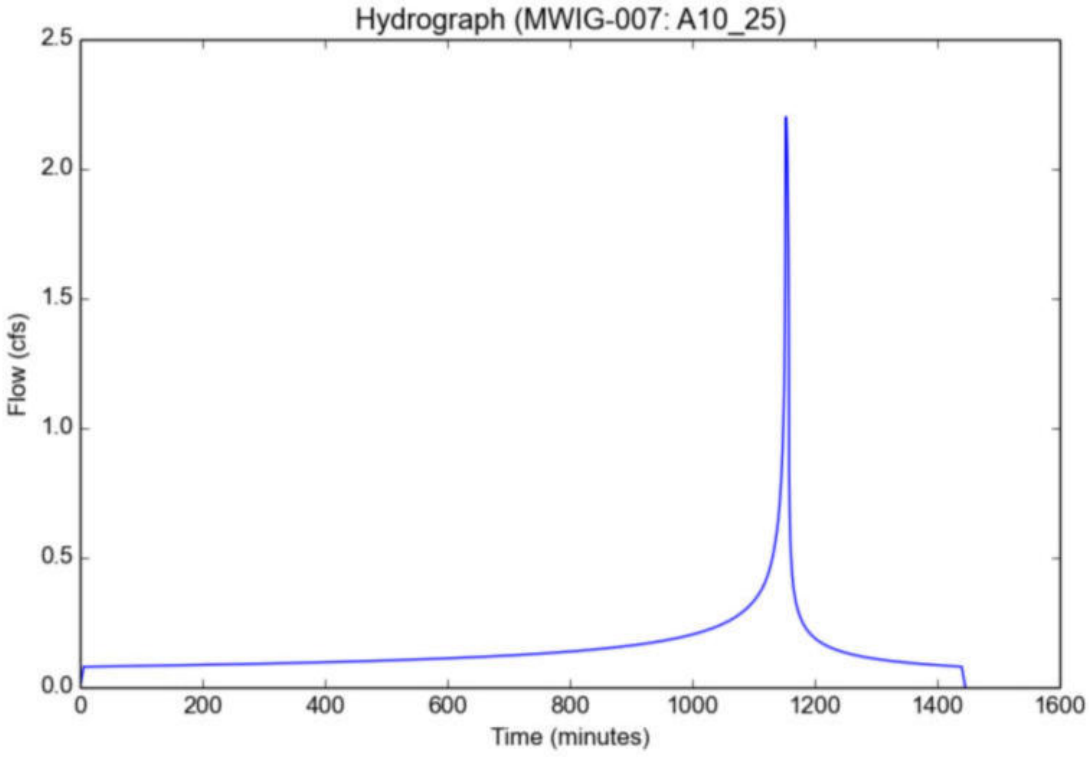
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A10_25.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A10_25
Area (ac)	0.7
Flow Path Length (ft)	432.0
Flow Path Slope (vft/hft)	0.0139
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.585
Peak Intensity (in/hr)	3.6062
Undeveloped Runoff Coefficient (Cu)	0.7133
Developed Runoff Coefficient (Cd)	0.872
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	2.2012
Burned Peak Flow Rate (cfs)	2.2012
24-Hr Clear Runoff Volume (ac-ft)	0.3002
24-Hr Clear Runoff Volume (cu-ft)	13074.908



Peak Flow Hydrologic Analysis

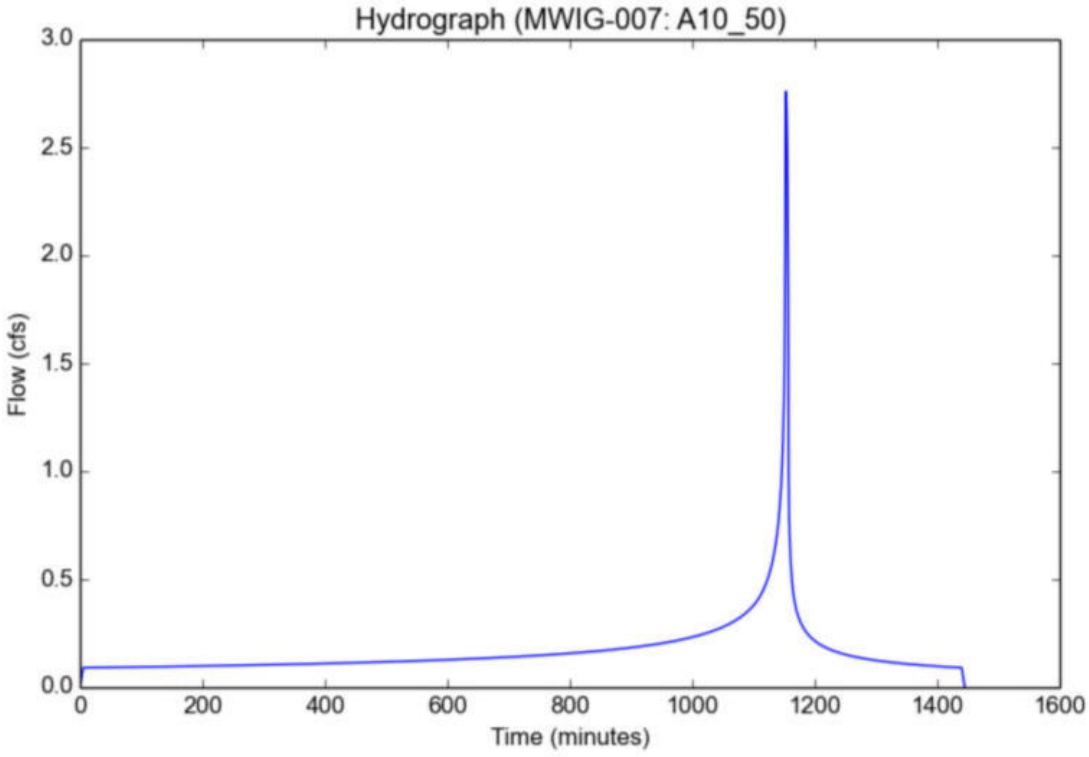
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A10_50.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A10_50
Area (ac)	0.7
Flow Path Length (ft)	432.0
Flow Path Slope (vft/hft)	0.0139
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.5
Peak Intensity (in/hr)	4.4747
Undeveloped Runoff Coefficient (Cu)	0.7724
Developed Runoff Coefficient (Cd)	0.8809
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.7591
Burned Peak Flow Rate (cfs)	2.7591
24-Hr Clear Runoff Volume (ac-ft)	0.3425
24-Hr Clear Runoff Volume (cu-ft)	14918.2524



Peak Flow Hydrologic Analysis

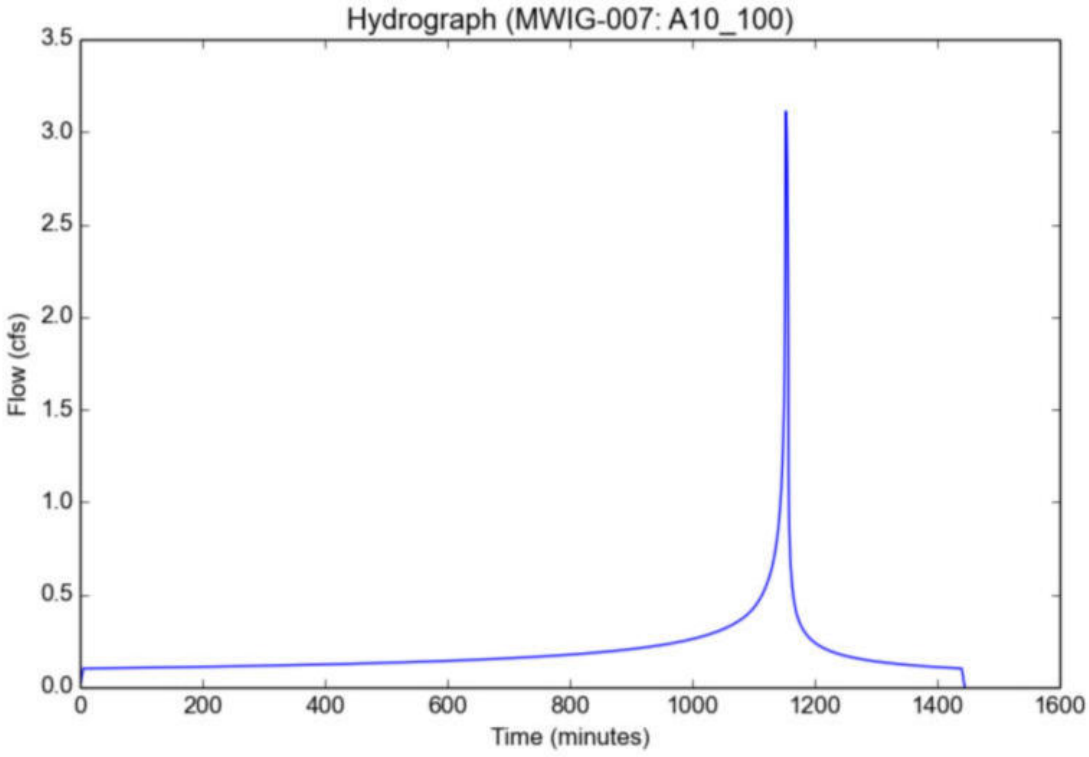
File location: P:/M/MWIG-007/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations/Proposed/MWIG-007 - A10_100.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	MWIG-007
Subarea ID	A10_100
Area (ac)	0.7
Flow Path Length (ft)	432.0
Flow Path Slope (vft/hft)	0.0139
50-yr Rainfall Depth (in)	7.5
Percent Impervious	0.85
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	8.415
Peak Intensity (in/hr)	5.0206
Undeveloped Runoff Coefficient (Cu)	0.8024
Developed Runoff Coefficient (Cd)	0.8854
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.1116
Burned Peak Flow Rate (cfs)	3.1116
24-Hr Clear Runoff Volume (ac-ft)	0.3849
24-Hr Clear Runoff Volume (cu-ft)	16767.1041



APPENDIX D

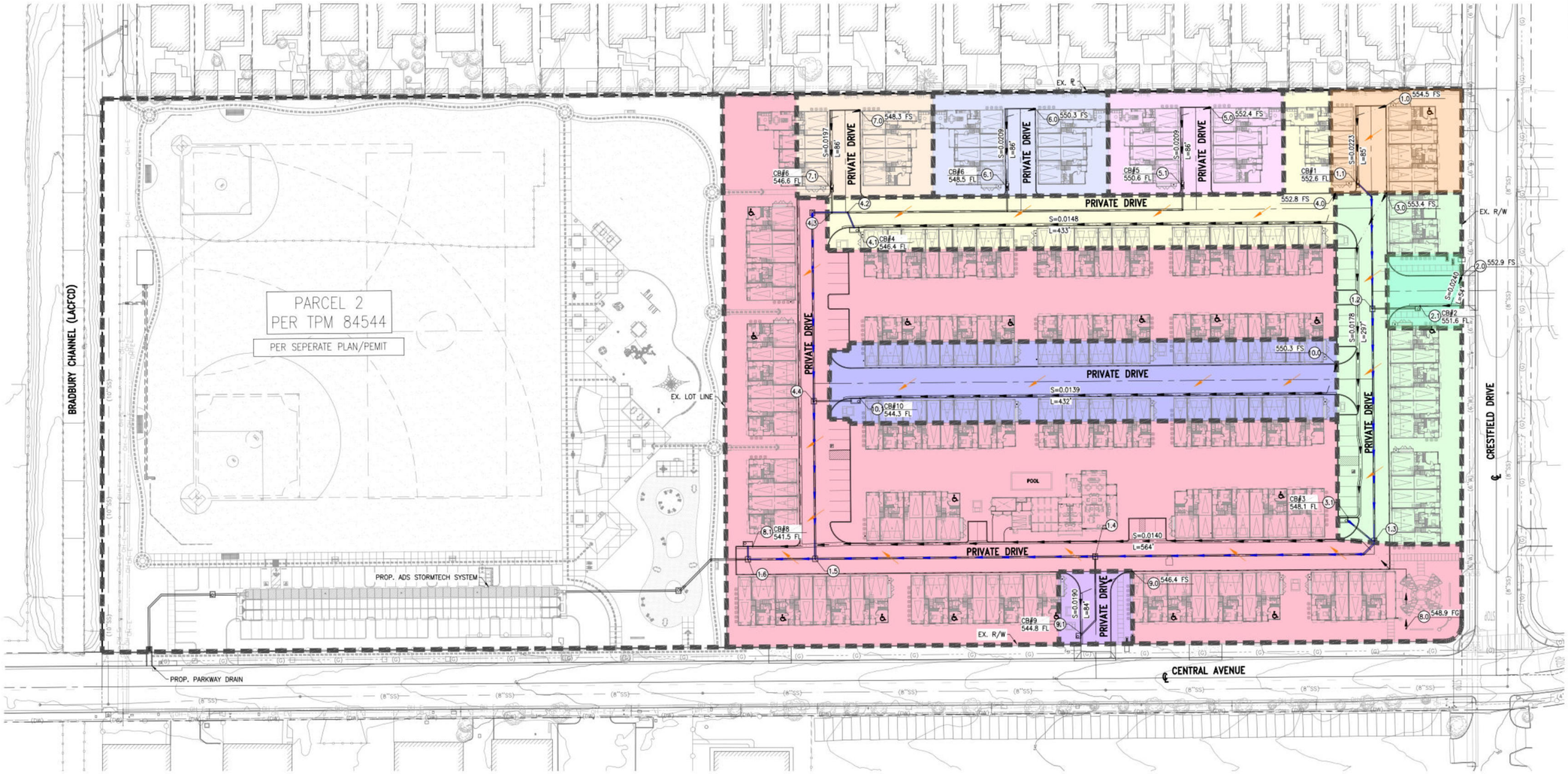
Maps

PROPOSED CONDITIONS HYDROLOGY MAP

TPM 84544

1433 CRESTFIELD DRIVE

CITY OF DUARTE, COUNTY OF LOS ANGELES



VICINITY MAP
NOT TO SCALE

LEGEND

- EXISTING RIGHT-OF-WAY/ BOUNDARY
- PROPOSED PROPERTY LINE
- DRAINAGE MANAGEMENT AREA (DMA)
- PROPOSED STORM DRAIN
- DRAINAGE FLOW ARROWS
- SURFACE FLOW PATH
- PIPE FLOW PATH
- PROPOSED CATCH BASIN
- DMA X, X.XX AC — DRAINAGE MANAGEMENT AREA (DMA)
- PERVIOUS AREA
- 1 / 00.00 — INITIAL SUBAREA NODE / SPOT ELEVATION
- Q=X.XX CFS, Tc=X.X MIN — PEAK RUNOFF IN CUBIC FEET PER SECOND (CFS); TIME OF CONCENTRATION IN MINUTES (MIN) PROVIDED FOR 100-YR STORM EVENT

DMA	COLOR	AREA (SF)	AREA (AC)	SOIL	SUBAREA Q_{25}	SUBAREA Q_{50}	SUBAREA Q_{100}	T_C (Q_{100})
A-1 (NODE 1.1)		10,226	0.230	007	0.79	0.91	1.02	5
A-2 (NODE 2.1)		4,134	0.090	007	0.31	0.35	0.4	5
A-3 (NODE 3.1)		28,847	0.660	007	2.27	2.6	2.93	5
A-4 (NODE 4.1)		23,896	0.550	007	1.73	2.17	2.44	5
A-5 (NODE 5.1)		13,713	0.310	007	1.07	1.22	1.38	5
A-6 (NODE 6.1)		13,714	0.310	007	1.07	1.22	1.38	5
A-7 (NODE 7.1)		10,690	0.250	007	0.86	0.99	1.11	5
A-8 (NODE 8.1)		166,898	3.830	007	11.16	12.79	15.57	6
A-9 (NODE 9.1)		4,032	0.090	007	0.31	0.35	0.4	5
A-10 (NODE 10.1)		30,611	0.700	007	2.2	2.763	3.11	5

HYDROLOGY SUMMARY	Q_{25} FLOW (CFS)	Q_{50} FLOW (CFS)	Q_{100} FLOW (CFS)	T_C (Q_{100})
CONFLUENCE NODE (1.5)	10.61	12.57	14.18	5.0
CONFLUENCE NODE (1.6)	21.77	25.36	29.75	6.0

NOTE: CONFLUENCE FLOWRATES ARE SUMMATION OF ALL UPSTREAM TRIBUTARY AREA FLOW. REFER TO CALCULATION WITHIN THE HYDROLOGY REPORT FOR DETAILS.

SCALE: 1" = 40'

0 20 40 80

REGISTERED PROFESSIONAL ENGINEER — DANE P. MCDOUGALL — C 80705 — CIVIL — STATE OF CALIFORNIA

REVISIONS

REV	DATE	DESCRIPTION

PREPARED FOR:

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CITY OF DUARTE
PUBLIC WORKS/ ENGINEERING DEPARTMENT

TENTATIVE PARCEL MAP NO. 84544
1433 CRESTFIELD DRIVE
DUARTE, CALIFORNIA

PROPOSED CONDITIONS HYDROLOGY MAP

SHEET 1 OF 1

JOB NO. 3101-2001
DATE: 8/29/2024

APPENDIX E

Hydraulics Analysis

Inlet Sizing / Water Surface Elevation Analysis

Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 29 2024

CB#1_Q25

Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 1.00
Grate Width (ft)	= 1.00
Grate Length (ft)	= 1.00

Gutter

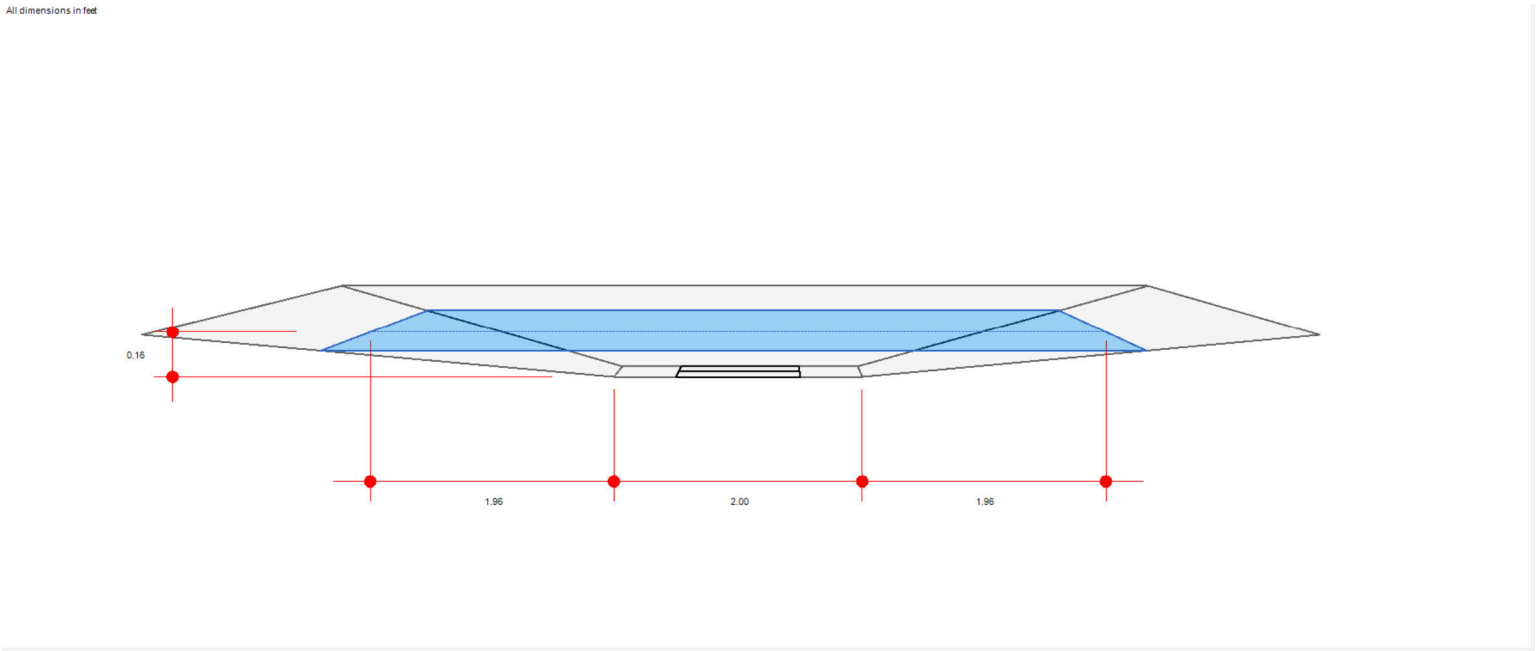
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.083
Local Depr (in)	= 2.00
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= 0.013

Calculations

Compute by:	Known Q
Q (cfs)	= 0.79

Highlighted

Q Total (cfs)	= 0.79
Q Capt (cfs)	= 0.79
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 1.95
Efficiency (%)	= 100
Gutter Spread (ft)	= 5.93
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 29 2024

CB#2_Q25

Curb Inlet

Location	= Sag
Curb Length (ft)	= 3.50
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

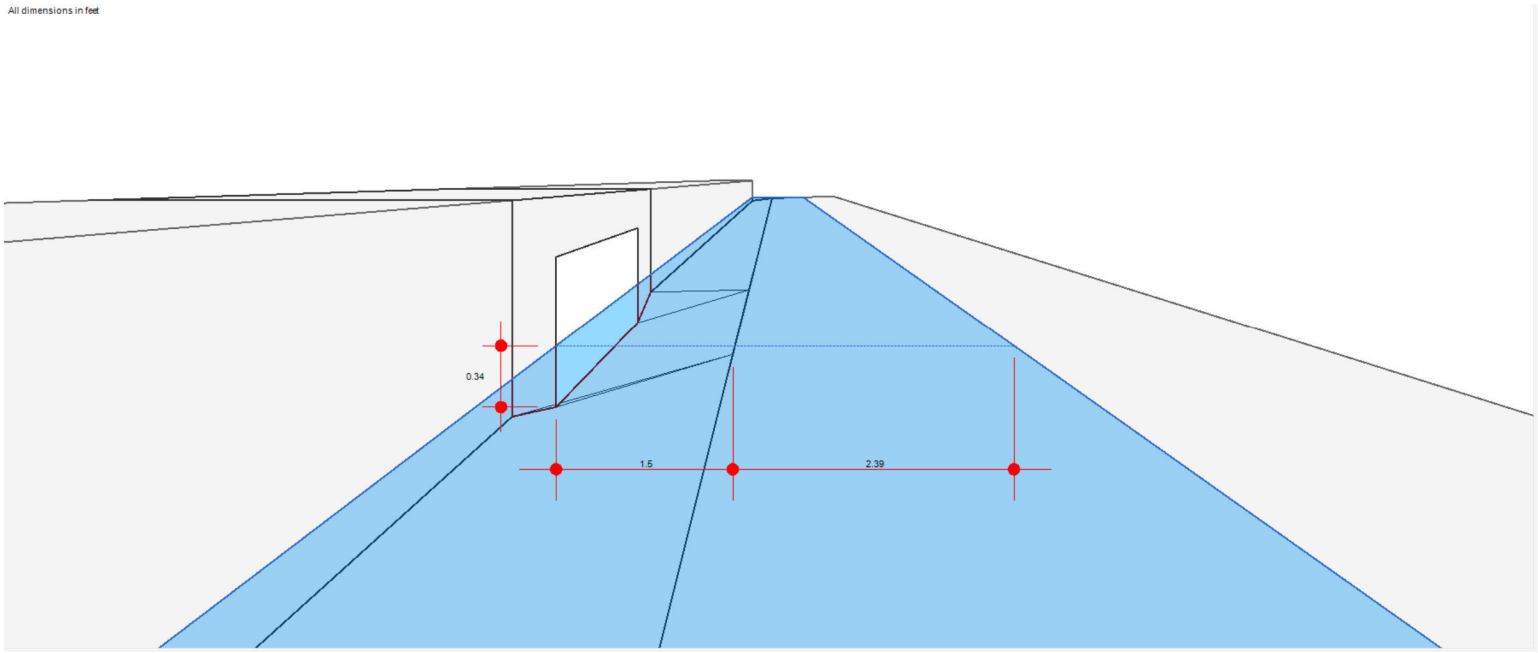
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 2.00
Gutter Width (ft)	= 1.50
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 0.31

Highlighted

Q Total (cfs)	= 0.31
Q Capt (cfs)	= 0.31
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 4.07
Efficiency (%)	= 100
Gutter Spread (ft)	= 3.89
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 29 2024

CB#3_Q25

Curb Inlet

Location	= Sag
Curb Length (ft)	= 7.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

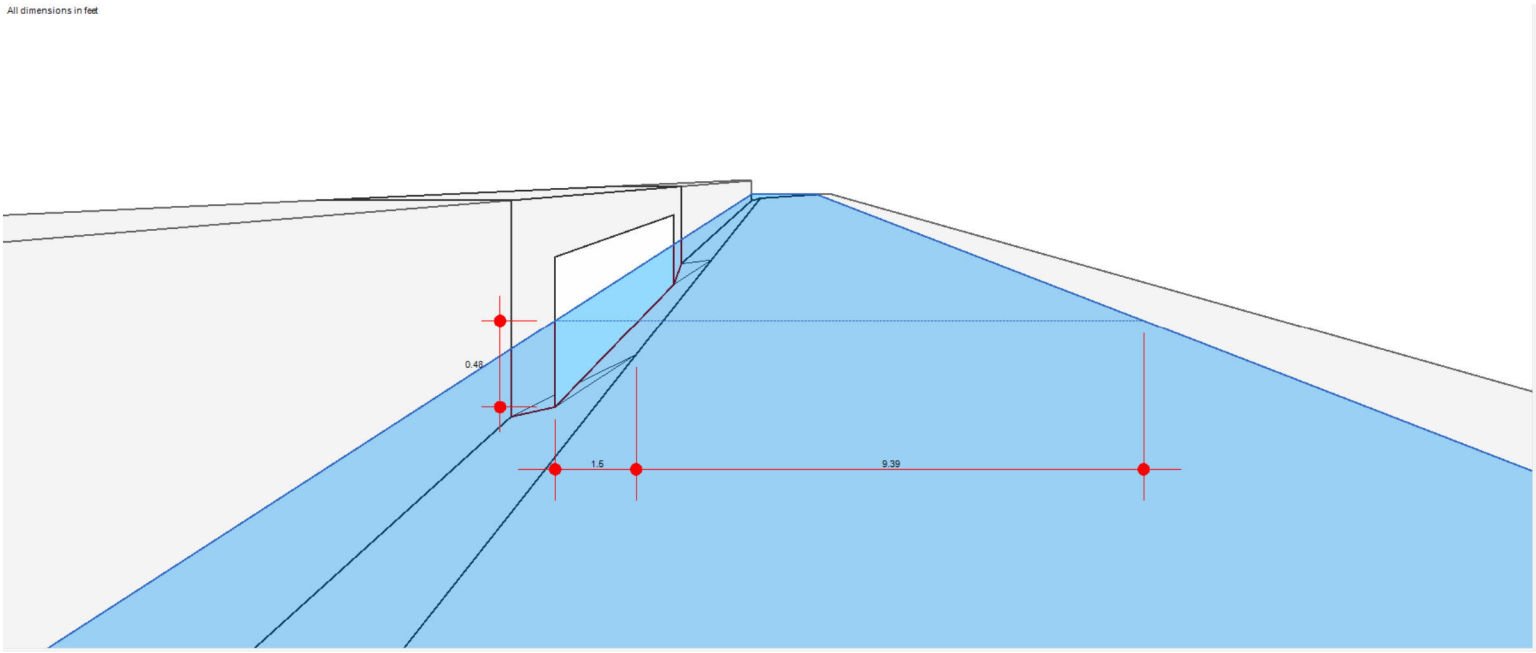
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 2.00
Gutter Width (ft)	= 1.50
Gutter Slope (%)	= -0-
Gutter n-value	= 0.013

Calculations

Compute by:	Known Q
Q (cfs)	= 2.27

Highlighted

Q Total (cfs)	= 2.27
Q Capt (cfs)	= 2.27
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 5.75
Efficiency (%)	= 100
Gutter Spread (ft)	= 10.89
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 29 2024

CB#4_Q25

Curb Inlet

Location	= Sag
Curb Length (ft)	= 7.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

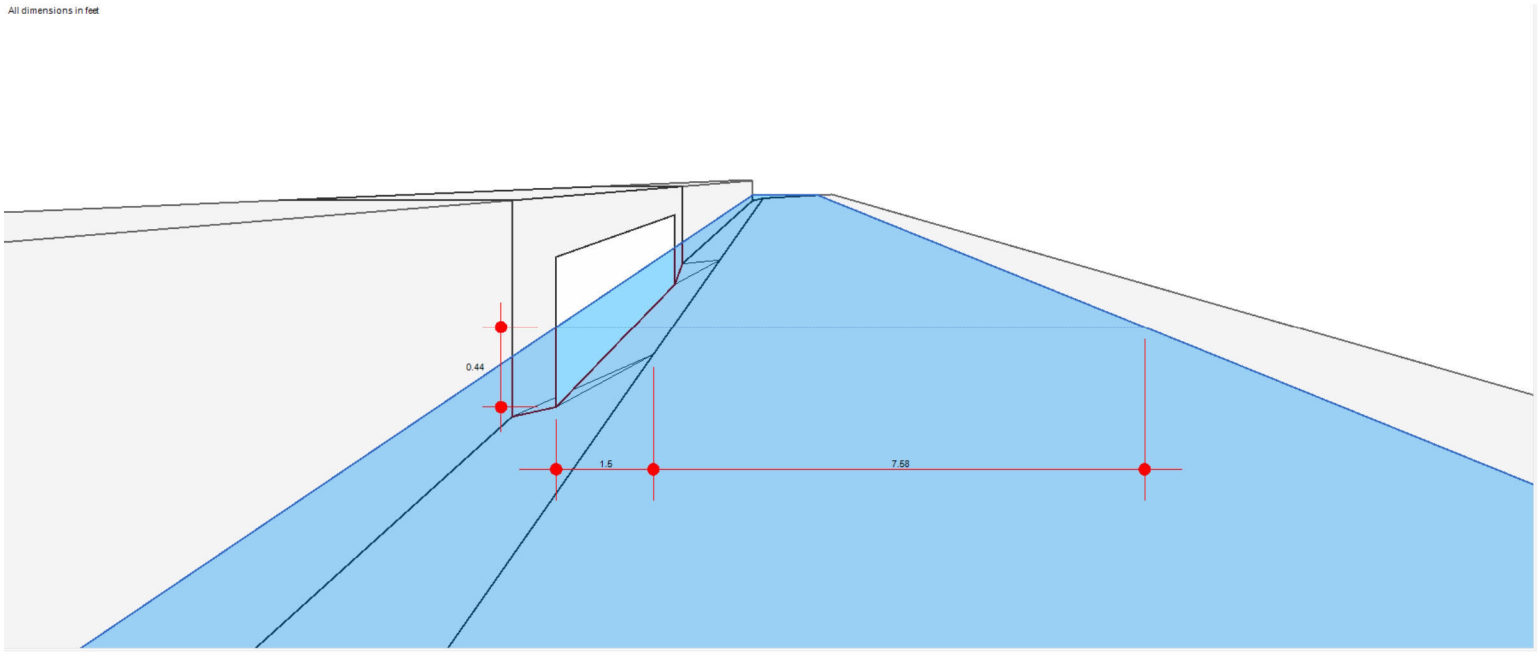
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 2.00
Gutter Width (ft)	= 1.50
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 1.73

Highlighted

Q Total (cfs)	= 1.73
Q Capt (cfs)	= 1.73
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 5.31
Efficiency (%)	= 100
Gutter Spread (ft)	= 9.08
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 29 2024

CB#5_Q25

Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 1.00
Grate Width (ft)	= 1.00
Grate Length (ft)	= 1.00

Gutter

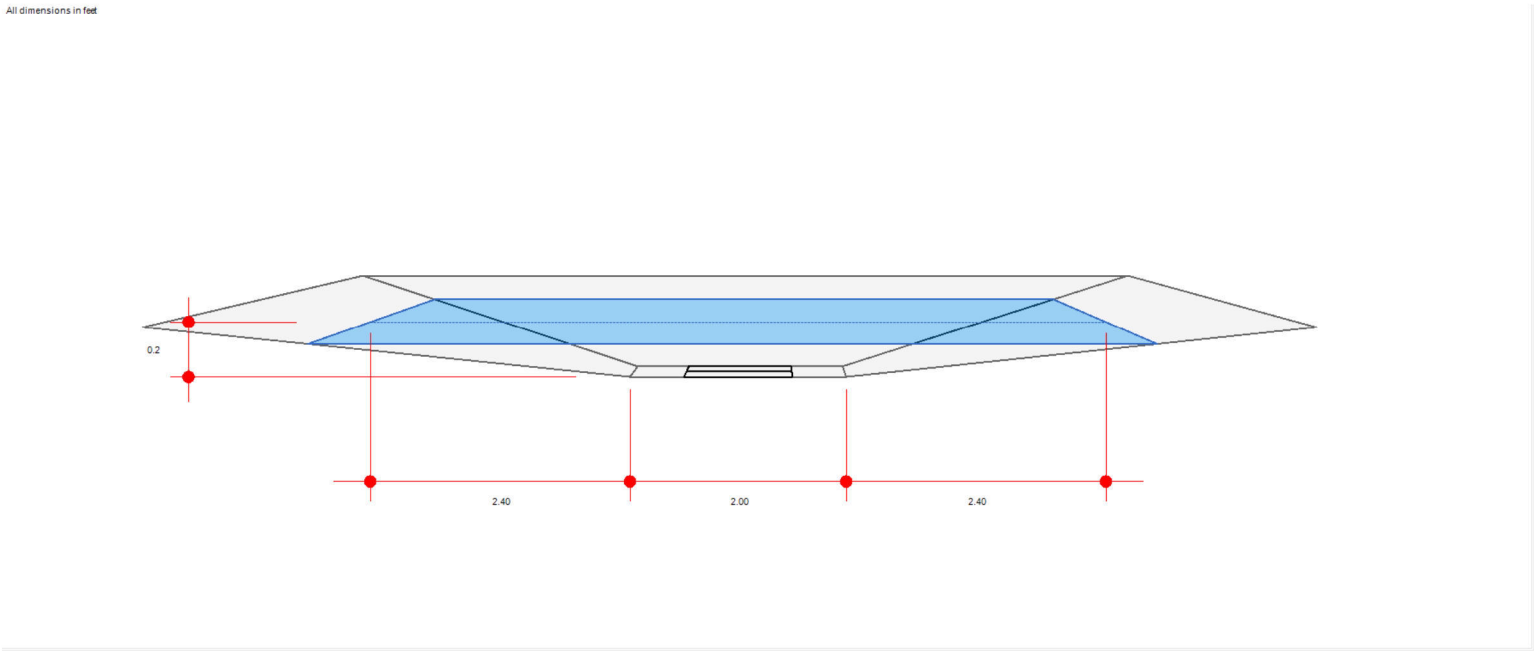
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.083
Local Depr (in)	= 2.00
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= 0.013

Calculations

Compute by:	Known Q
Q (cfs)	= 1.07

Highlighted

Q Total (cfs)	= 1.07
Q Capt (cfs)	= 1.07
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 2.39
Efficiency (%)	= 100
Gutter Spread (ft)	= 6.81
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 29 2024

CB#6_Q25

Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 1.00
Grate Width (ft)	= 1.00
Grate Length (ft)	= 1.00

Gutter

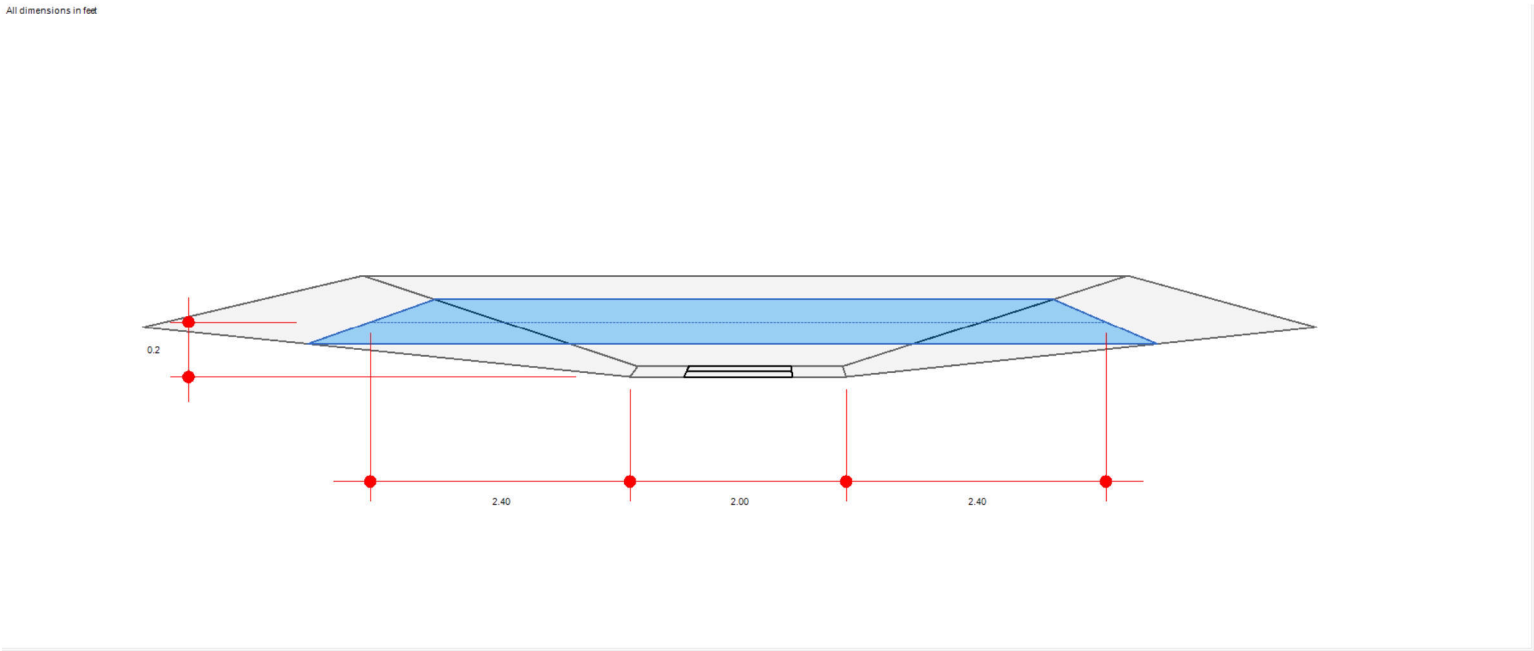
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.083
Local Depr (in)	= -0-
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 1.07

Highlighted

Q Total (cfs)	= 1.07
Q Capt (cfs)	= 1.07
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 2.39
Efficiency (%)	= 100
Gutter Spread (ft)	= 6.81
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 29 2024

CB#7_Q25

Drop Grate Inlet

Location	= Sag
Curb Length (ft)	= -0-
Throat Height (in)	= -0-
Grate Area (sqft)	= 1.00
Grate Width (ft)	= 1.00
Grate Length (ft)	= 1.00

Gutter

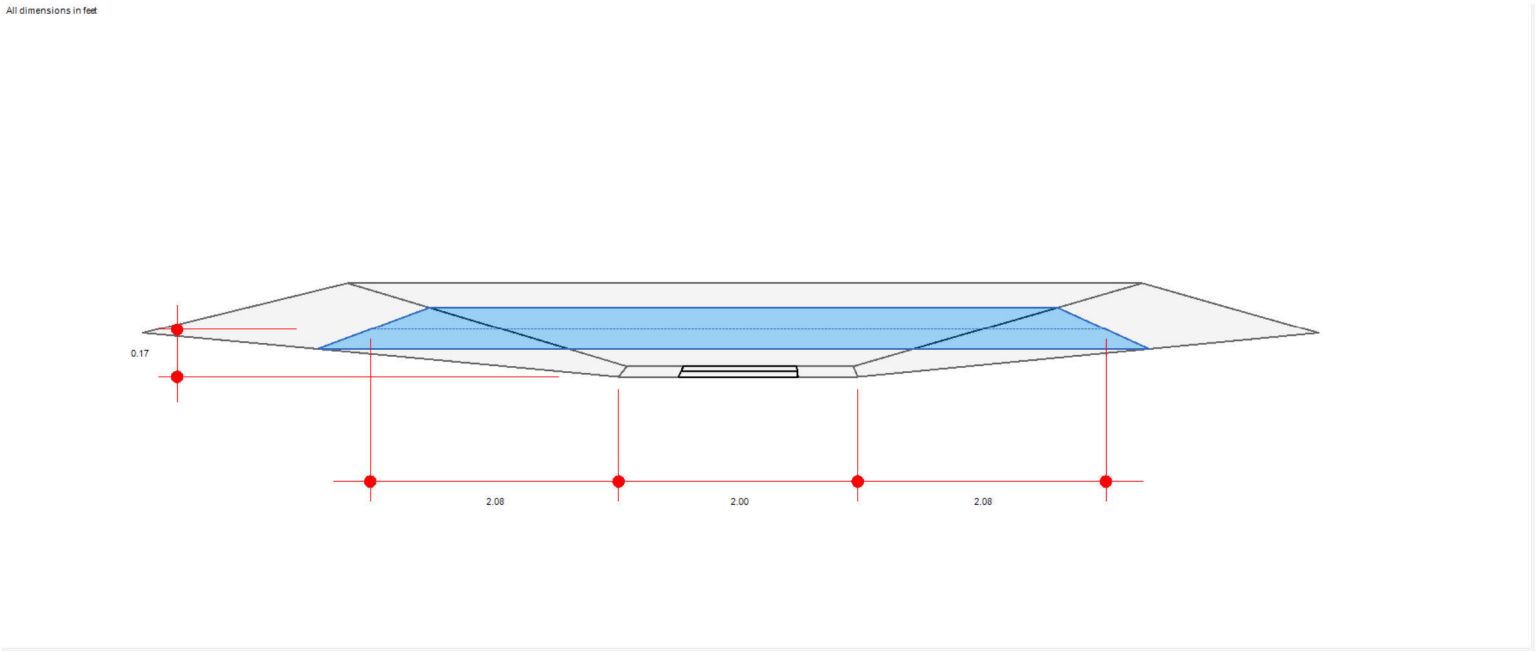
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.083
Local Depr (in)	= -0-
Gutter Width (ft)	= 2.00
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 0.86

Highlighted

Q Total (cfs)	= 0.86
Q Capt (cfs)	= 0.86
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 2.07
Efficiency (%)	= 100
Gutter Spread (ft)	= 6.15
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

CB#8_Q25

Curb Inlet

Location	= Sag
Curb Length (ft)	= 7.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

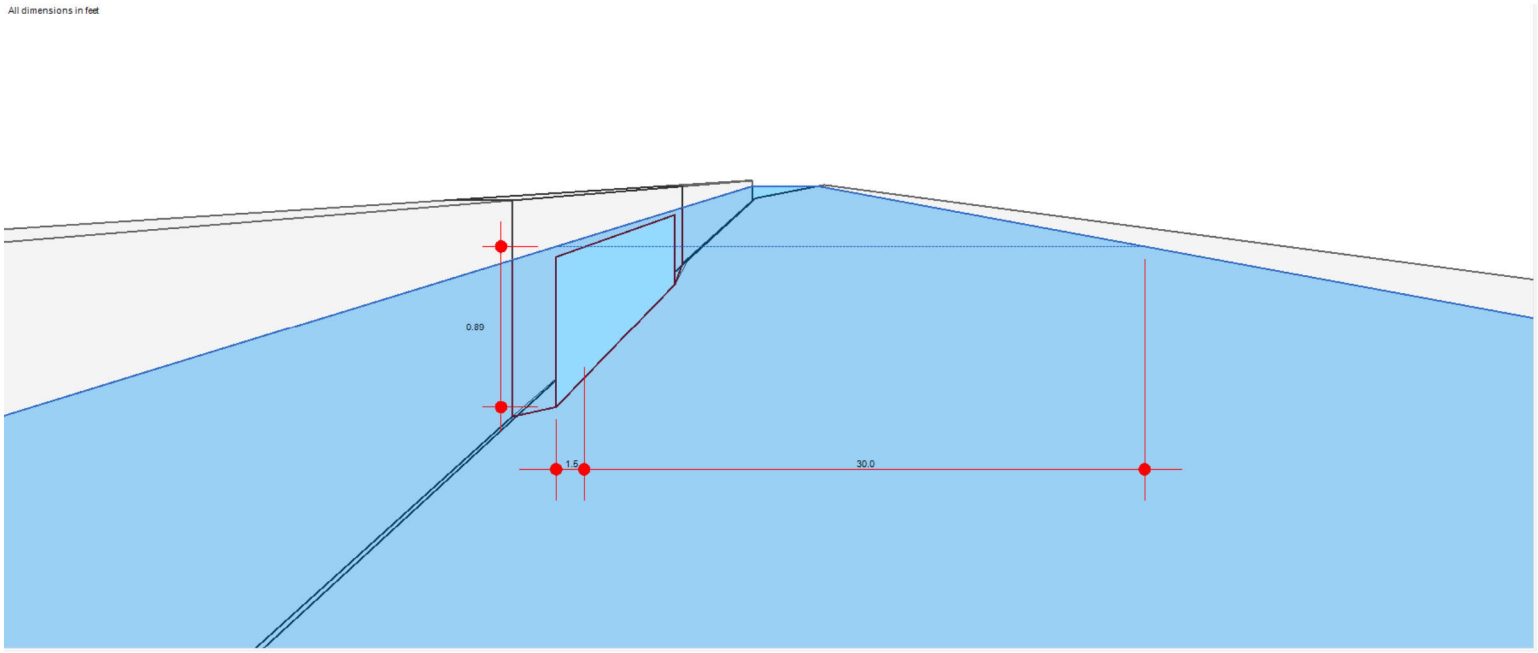
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 2.00
Gutter Width (ft)	= 1.50
Gutter Slope (%)	= -0-
Gutter n-value	= 0.013

Calculations

Compute by:	Known Q
Q (cfs)	= 11.16

Highlighted

Q Total (cfs)	= 11.16
Q Capt (cfs)	= 11.16
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 10.69
Efficiency (%)	= 100
Gutter Spread (ft)	= 31.50
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 29 2024

CB#9_Q25

Curb Inlet

Location	= Sag
Curb Length (ft)	= 3.50
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

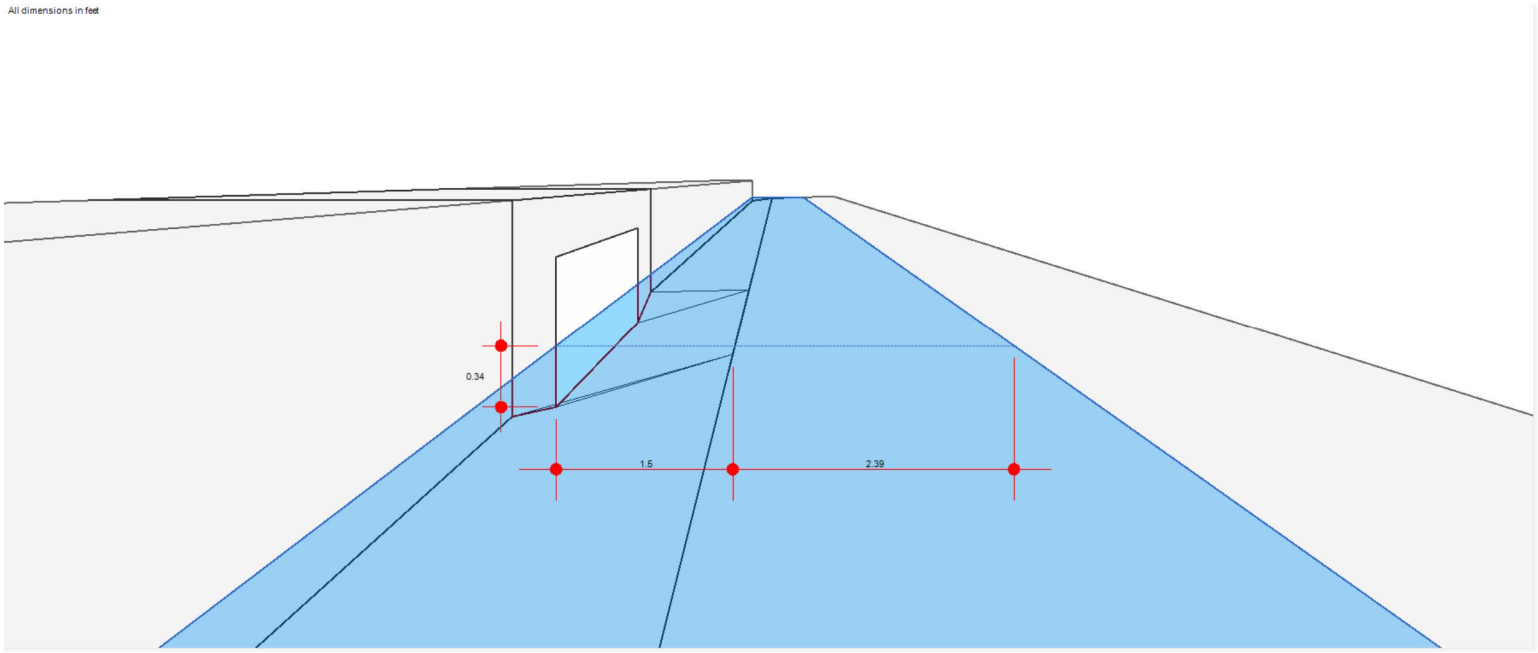
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 2.00
Gutter Width (ft)	= 1.50
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 0.31

Highlighted

Q Total (cfs)	= 0.31
Q Capt (cfs)	= 0.31
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 4.07
Efficiency (%)	= 100
Gutter Spread (ft)	= 3.89
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 29 2024

CB#10_Q25

Curb Inlet

Location	= Sag
Curb Length (ft)	= 7.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

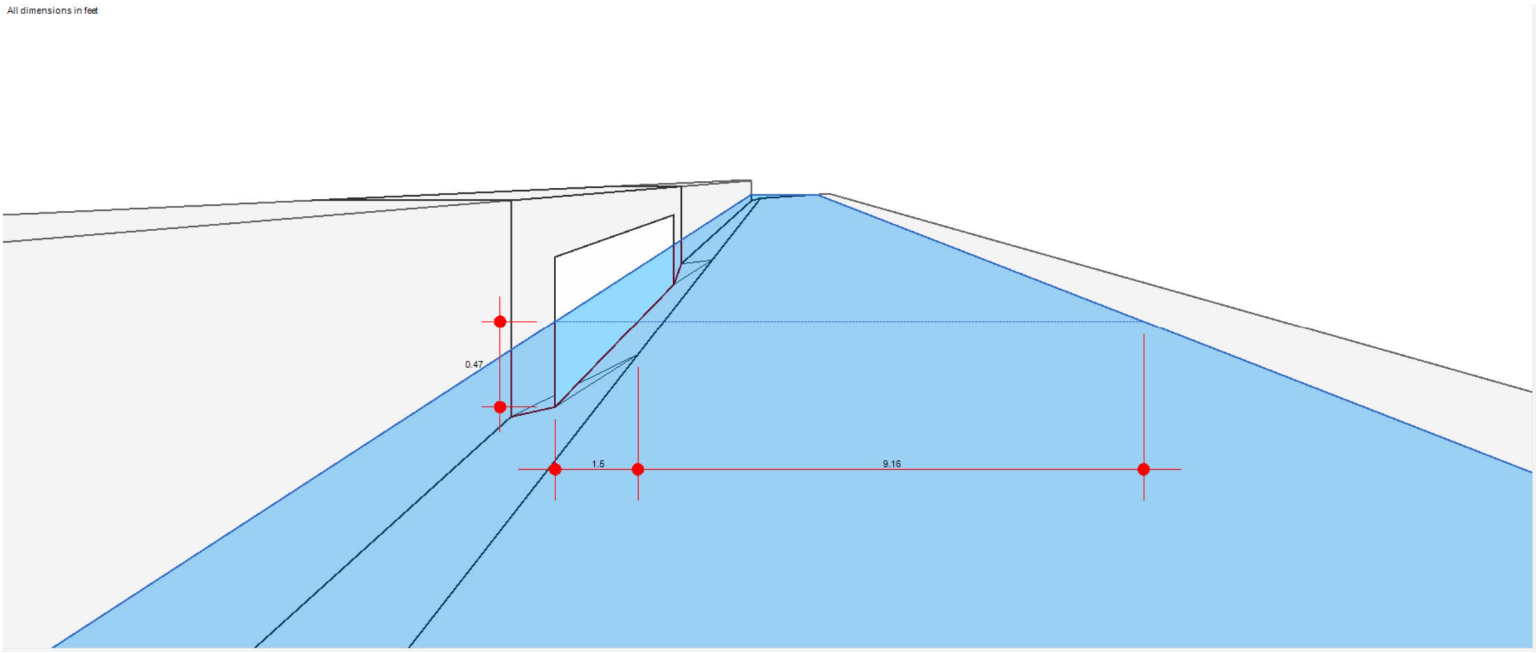
Slope, Sw (ft/ft)	= 0.083
Slope, Sx (ft/ft)	= 0.020
Local Depr (in)	= 2.00
Gutter Width (ft)	= 1.50
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 2.20

Highlighted

Q Total (cfs)	= 2.20
Q Capt (cfs)	= 2.20
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 5.69
Efficiency (%)	= 100
Gutter Spread (ft)	= 10.66
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Pipe Sizing – WSPG

To be provided during final engineering

Parkway Culvert Sizing

To be provided during final engineering

APPENDIX F

Reference Materials