Appendix H

Preliminary Hydrology and Hydraulic Report

PRELIMINARY
HYDROLOGY AND HYDRAULIC REPORT
SCENARIO 2

FOR

Roberts Campus East

Northeast Corner of
Claremont Boulevard and West Arrow Route
Upland and Claremont, California

Owner:

Claremont McKenna College
500 E Ninth Street
Claremont, CA 91711

Prepared by:

Atlas Civil Design
872 Higuera Street
San Luis Obispo, California
(213) 810-8470

Tyler H. Johnson, PE

This Drainage Report was prepared under my supervision:

By: _____ Date:_____

Atlas Job No. 21-055

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Introduction

This Hydrology Study is for the proposed Roberts Campus Sports Bowl Project in the city of Claremont and Upland, CA to satisfy the Los Angeles County Department of Public Works Hydrology requirements. The development project proposes new athletic fields, ancillary facilities and an underground infiltration system within the limits of an existing quarry bounded by Foothill Boulevard to the north, Monte Vista Boulevard to the east, Arrow Route to the south, and Claremont Boulevard to the west.

The Quarry site is divided between the County of Los Angeles and the County of San Bernardino. Within the Los Angeles County portion of the project site, the City of Claremont maintains jurisdiction, while the portion of land located within the County of San Bernardino is in the City of Upland's jurisdiction.

The purpose of this report is to analyze the 24-hour, 50 and 100-year storm events of the pre- and post-developed conditions.

Existing Site Drainage Condition

The total area of the existing undeveloped site is 74.42 acres. The site is a former sand and gravel quarry that has been partially backfilled and graded to control surface runoff.
There are two on-site drainage basins and two off-site basins that drain through culverts onto the property. The two off-site basins flow into DA-3 where the runoff drains south through multiple sub-basins as it infiltrates. The lowest sub-basin is near the south of the site with an elevation of 1184. There is no outlet from basin DA-3 as the runoff infiltrates on-site. Basin DA-4 runs along the west property line in a shallow swale and along the southern property line. From the southwest corner of the site, surface stormwater currently drains onto Claremont Boulevard. Stormwater is then conveyed with surface stormwater in Claremont Boulevard south in the gutter until it is captured by a catch basin at the northeast intersection of Claremont Boulevard and Huntington Drive. Drainage then flows west in a 27" RCP storm drain (LACFCD BI 1122) along East 1st Street until it joins a 66" RCP and then turns south. The storm drain then generally flows southeast until it discharges into San Antonio Creek Channel south of Arrow Highway in San Bernardino County. San Antonio Creek Channel flows south until it merges with Chino Creek and the flow southeast where it joins the Santa Ana River. The Santa Ana Rover flows southwest until it reaches the Pacific Ocean.

Proposed Site Drainage

There are twenty on-site drainage basins (DA-3 & DA-22) and two off-site basins (DA-1 & DA-2) that drain through box culverts onto the property. The two off-site basins are currently conveyed under Foothill Boulevard within existing culverts and will flow into a 232' x 20' riprap lined swale. There will be two 48-inch inlets that will then connect to a 36-inch storm drainpipe. The 36-inch storm drainpipe will convey stormwater to the proposed underground storage facility on-site. A riprap lined emergency overflow spillway will be provided downstream of the swale at the top of the steep slope for an overflow condition in the upper parking lot. Under Phase 1, the emergency overflow would be connected to the sediment pond in phase 1.

Stormwater within the proposed onsite basins will be directed to an adjoining sediment basin in the north half of the project in the undeveloped condition. Overflow runoff will be conveyed to a storm drain and captured within a series of dry wells, eventually being conveyed to the underground storage facility.

Runoff within the remaining onsite basins will be captured in a series of dry wells as the runoff flows south to the underground storage facility. Incoming water from the surface grated inlets or connecting pipes is received

in the Primary Settling Chamber of the dry well, where silt and other heavy particles settle to the bottom. A PureFlo Debris Shield ensures containment by trapping floating debris and pavement oil. The pre-treated flow is then regulated to a design rate of up to 0.25cfs and directed to a Secondary Settling Chamber. The settling and Containment process is repeated, thereby effectively achieving controlled, Uniform treatment. The system is drained as water rises under the PureFlo Debris Shield and spills into the top of the overflow pipe. The drainage assembly returns the cleaned water into the surrounding soil through the FloFast® Drainage Screen thus reducing the overall volume of project runoff. Excess runoff that cannot be infiltrated will then drain through an overflow outlet to storm pipes that will be directed to the underground storage facility.

Bio-swales will be utilized to capture runoff from the steep slopes of the project for pre-treatment. Stormwater will then be captured in catch basins and directed to the underground storage facility. These areas will not retain water beyond 48-hours after a storm event.

Under Phase 1, a temporary sediment pond will capture surface stormwater from the northern half of the site via temporary interceptor swales. There will be two 48” drop inlets with beehive type grates that will serve as outlets from the pond where stormwater will be conveyed to the underground storage facility via 18” storm pipes. The proposed capacity of the sediment pond is 141,686 cf, with 117,571 cf of stormwater being contributed from the north basin.

The total volume of the sediment pond is equal to the amount of import soil needed to construct the south half of the project.

Surface water will not be retained beyond 48-hours after a storm event due to the natural infiltration of the pond soils. The field percolation test performed in the area of the pond was 5.37 in/hr. Under Phase 1, no stormwater will be conveyed off of the site but will be directed to the underground storage facility.

The 100-year storm event will be captured and infiltrated onsite through an underground storage facility and then into adjacent dry wells. The underground storage facility has dimensions of 434’ long by 247’ wide and 7.75’ in height. In the proposed condition the site will generate 480,632 cubic feet.
The volume capacity of the underground storage facility is 481,992.8 cubic feet per manufacturer. The capacity is adequate to accommodate a 100-year storm event without causing overflow onto the track and field/football field.

Infiltration rates based on Geotechnical Engineer’s infiltration testing)

Unit Of Measurement, Inches Per Hour.

Table 1 – Field Percolation Test Results (LA County)

Field Percolation Test #	Depth (Feet)	Ground Surface Elevation (Feet, NAVD88)	Soil Type	Measured Field Percolation Rate
FP-1	12	1,235	SM	1.08

Table 2 – Field Percolation Test Results (SB County)

Field Percolation Test #	Depth (Feet)	Ground Surface Elevation (Feet, NAVD88)	Soil Type	Measured Field Percolation Rate

Unit Of Measurement, Inches Per Hour.

FP-2	10	1,215	SP-SM	3.79
FP-3	10	1,229	SP-SM	3.18
FP-4	19	1,195	SP-SM	1.14
FP-5	70	1,247	SP-SM	5.37
FP-6	40	1,185	SP-SM	9.69

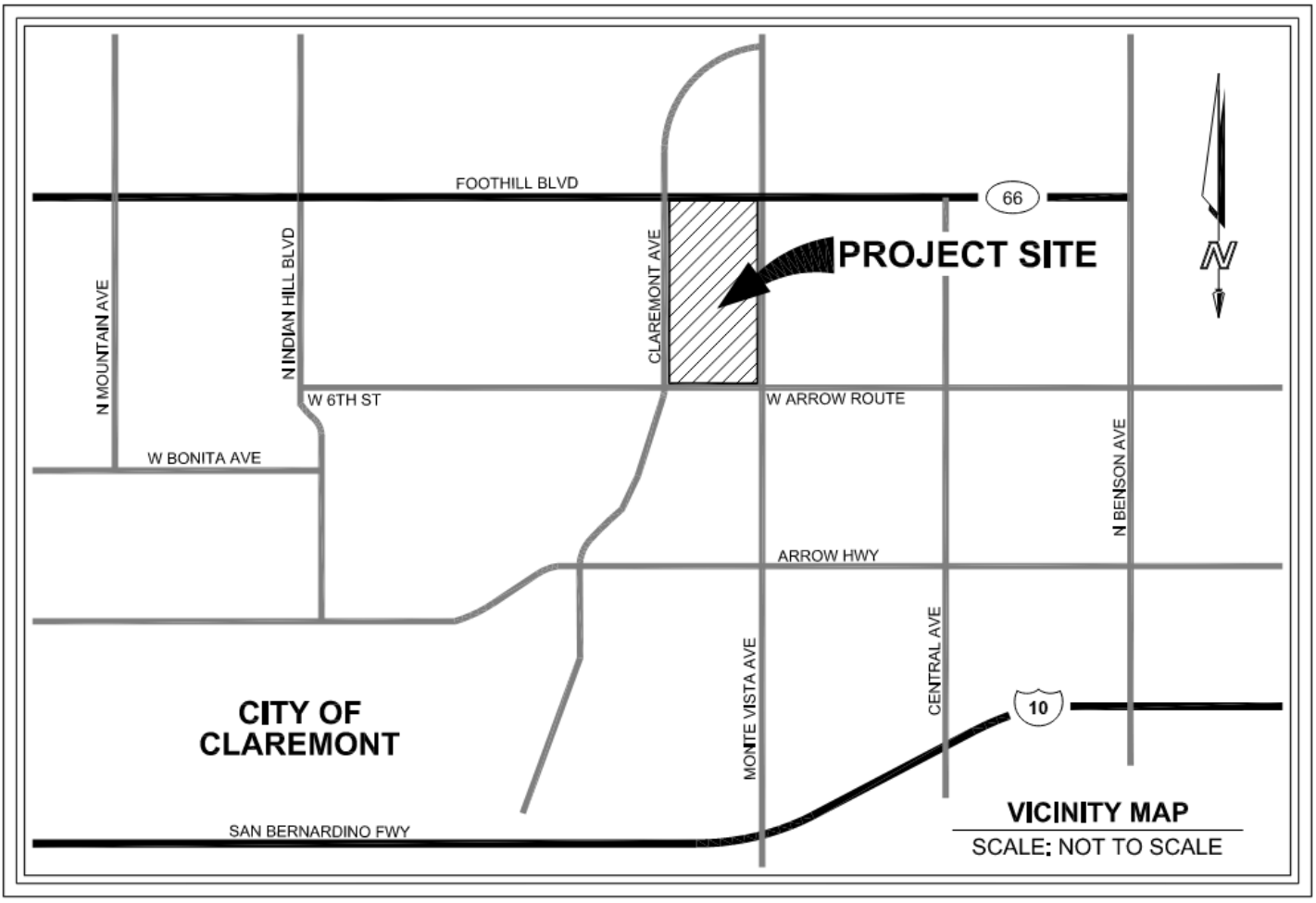
The results of the field percolation testing are presented in Appendix A.

Please note the above test results do not include factors of safety that may be required by each respective county.

In the existing condition, basin DA-4 flows offsite and into Claremont Boulevard. In the proposed condition this area will now be captured onsite and directed to the underground storage facility. No stormwater will be conveyed off-site.

In the interim phase 1 condition the south half of the site will be constructed to a final build out while the north half of the site will be rough graded with erosion control measures in place. the rough graded northerly area is expected to be approximately 8 acres.

Vicinity Map



HYDROLOGY ANALYSIS / METHODOLGY

The requirements and recommendations found in the Los Angeles County Hydrology Manual (January 2006) provided by the Los Angeles County Department of Public Works was used as the basis for the methodology and calculations found in this Study. On-site and Off-site calculations were performed for the 50-year and 100-year, 24-hour storm using HydroCalc software (Kinematic Wave Method) provided by the County, per County requirements for the Los Angeles River watershed.

DESIGN PARAMETERS

1. The onsite drainage area was analyzed using the HydroCalc software from Los Angeles County.
2. The drainage area is located in Soil Type 015.
3. The rainfall intensity for all of the storm events varies.
4. All flows are based on the complete future development of land and roads.
5. The Hydrology Maps attached to the back of this study are made a part of the study.
6. There is pre-existing off-tract flow that is being directed toward the proposed storm drain.

RUNOFF FLOWS

Table 1:

Pre-Development Condition

Tributary Area	**DA-1**
Acreage (acres)	12.82
Time of Concentration; Tc (min)	19
50 yr Runoff; Q_{50} (cfs)	8.03
100 yr Runoff; Q_{100} (cfs)	11.48

Tributary Area	**DA-2**
Acreage (acres)	5.76
Time of Concentration; Tc (min)	18
50 yr Runoff; Q_{50} (cfs)	4.297
100 yr Runoff; Q_{100} (cfs)	5.843

Tributary Area	**DA-3**
Acreage (acres)	62.56
Time of Concentration; Tc (min)	21
50 yr Runoff; Q_{50} (cfs)	33.72
100 yr Runoff; Q_{100} (cfs)	48.51

Tributary Area	**DA-4**
Acreage (acres)	11.86
Time of Concentration; Tc (min)	27
50 yr Runoff; Q_{50} (cfs)	7.94
100 yr Runoff; Q_{100} (cfs)	11.48

Total Runoff Flow	
50 yr Runoff; Q_{50} (cfs)	53.99
100 yr Runoff; Q_{100} (cfs)	77.31

Post-Development Condition

Tributary Area	DA-1
Acreage (acres)	12.82
Time of Concentration; Tc (min)	19
50 yr Runoff; Q_{50} (cfs)	8.03
100 yr Runoff; Q_{100} (cfs)	11.48

Tributary Area	DA-2
Acreage (acres)	5.76
Time of Concentration; Tc (min)	18
50 yr Runoff; Q_{50} (cfs)	4.297
100 yr Runoff; Q_{100} (cfs)	5.843

Tributary Area	DA-3
Acreage (acres)	0.517
Time of Concentration; Tc (min)	7.0
50 yr Runoff; Q_{50} (cfs)	1.0
100 yr Runoff; Q_{100} (cfs)	1.27

Tributary Area	DA-4
Acreage (acres)	0.89
Time of Concentration; Tc (min)	6.0
50 yr Runoff; Q_{50} (cfs)	2.98
100 yr Runoff; Q_{100} (cfs)	3.37

Tributary Area	DA-5
Acreage (acres)	4.47
Time of Concentration; Tc (min)	6.8
50 yr Runoff; Q_{50} (cfs)	10.60
100 yr Runoff; Q_{100} (cfs)	12.52

Tributary Area	**DA-6**
Acreage (acres)	1.61
Time of Concentration; Tc (min)	5.0
50 yr Runoff; Q_{50} (cfs)	4.11
100 yr Runoff; Q_{100} (cfs)	4.80

Tributary Area	**DA-7**
Acreage (acres)	4.2
Time of Concentration; Tc (min)	8.0
50 yr Runoff; Q_{50} (cfs)	6.65
100 yr Runoff; Q_{100} (cfs)	8.82

Tributary Area	**DA-8**
Acreage (acres)	4.49
Time of Concentration; Tc (min)	6.0
50 yr Runoff; Q_{50} (cfs)	9.11
100 yr Runoff; Q_{100} (cfs)	12.32

Tributary Area	**DA-9**
Acreage (acres)	2.36
Time of Concentration; Tc (min)	5.0
50 yr Runoff; Q_{50} (cfs)	5.52
100 yr Runoff; Q_{100} (cfs)	6.53

Tributary Area	**DA-10**
Acreage (acres)	8.25
Time of Concentration; Tc (min)	8.0
50 yr Runoff; Q_{50} (cfs)	13.87
100 yr Runoff; Q_{100} (cfs)	18.17

Tributary Area	**DA-11**
Acreage (acres)	6.32
Time of Concentration; Tc (min)	10.0
50 yr Runoff; Q_{50} (cfs)	10.02
100 yr Runoff; Q_{100} (cfs)	12.63

Tributary Area	**DA-12**
Acreage (acres)	2.84
Time of Concentration; Tc (min)	5.0
50 yr Runoff; Q_{50} (cfs)	6.94
100 yr Runoff; Q_{100} (cfs)	8.16

Tributary Area	**DA-13**
Acreage (acres)	5.36
Time of Concentration; Tc (min)	8.0
50 yr Runoff; Q_{50} (cfs)	8.49
100 yr Runoff; Q_{100} (cfs)	11.26

Tributary Area	**DA-14**
Acreage (acres)	3.24
Time of Concentration; Tc (min)	9.0
50 yr Runoff; Q_{50} (cfs)	4.79
100 yr Runoff; Q_{100} (cfs)	6.25

Tributary Area	**DA-15**
Acreage (acres)	4.83
Time of Concentration; Tc (min)	8.0
50 yr Runoff; Q_{50} (cfs)	7.62
100 yr Runoff; Q_{100} (cfs)	10.1

Tributary Area	**DA-16**
Acreage (acres)	4.20
Time of Concentration; Tc (min)	7.0
50 yr Runoff; Q_{50} (cfs)	7.67
100 yr Runoff; Q_{100} (cfs)	10.20

Tributary Area	**DA-17**
Acreage (acres)	1.58
Time of Concentration; Tc (min)	6.0
50 yr Runoff; Q_{50} (cfs)	2.84
100 yr Runoff; Q_{100} (cfs)	3.46

Tributary Area	**DA-18**
Acreage (acres)	7.68
Time of Concentration; Tc (min)	11.0
50 yr Runoff; Q_{50} (cfs)	10.5
100 yr Runoff; Q_{100} (cfs)	13.36

Tributary Area	**DA-19**
Acreage (acres)	1.27
Time of Concentration; Tc (min)	7.0
50 yr Runoff; Q_{50} (cfs)	4.64
100 yr Runoff; Q_{100} (cfs)	5.75

Tributary Area	**DA-20**
Acreage (acres)	2.75
Time of Concentration; Tc (min)	5.0
50 yr Runoff; Q_{50} (cfs)	8.95
100 yr Runoff; Q_{100} (cfs)	10.16

Tributary Area	**DA-21**
Acreage (acres)	5.35
Time of Concentration; Tc (min)	13.0
50 yr Runoff; Q_{50} (cfs)	5.20
100 yr Runoff; Q_{100} (cfs)	7.34

Tributary Area	**DA-22**
Acreage (acres)	2.84
Time of Concentration; Tc (min)	5.0
50 yr Runoff; Q_{50} (cfs)	6.92
100 yr Runoff; Q_{100} (cfs)	8.15

Total Runoff Flow	
50 yr Runoff; Q_{50} (cfs)	149.19
100 yr Runoff; Q_{100} (cfs)	190.62

RUNOFF VOLUMES

Table 2: Estimated Storm Runoff Volumes

Pre-Development Condition

Tributary Area	**DA-1**
Acreage (acre)	12.82
CN (Weighted)	0.3682
50-year Volume V_{50} (cu-ft)	48,444
100-year Volume V_{100} (cu-ft)	56,146

Tributary Area	**DA-2**
Acreage (acre)	5.76
CN (Weighted)	0.4069
50-year Volume V_{50} (cu-ft)	28,152
100-year Volume V_{100} (cu-ft)	32,302

Tributary Area	**DA-3**
Acreage (acre)	62.56
CN (Weighted)	0.3344
50-year Volume V_{50} (cu-ft)	244,489
100-year Volume V_{100} (cu-ft)	223,839

Tributary Area	**DA-4**
Acreage (acre)	11.86
CN (Weighted)	0.3247
50-year Volume V_{50} (cu-ft)	43,832
100-year Volume V_{100} (cu-ft)	50,793

Total Runoff Volume	
50-year Volume V_{50} (cu-ft)	311,801
100-year Volume V_{100} (cu-ft)	363,080

Post-Development Condition

Tributary Area	**DA-1**
Acreage (acre)	12.82
CN (Weighted)	0.3682
50-year Volume V_{50} (cu-ft)	48,444
100-year Volume V_{100} (cu-ft)	56,146

Tributary Area	**DA-2**
Acreage (acre)	5.76
CN (Weighted)	0.4069
50-year Volume V_{50} (cu-ft)	28,152
100-year Volume V_{100} (cu-ft)	32,302

Tributary Area	**DA-3**
Acreage (acre)	0.517
CN (Weighted)	0.63
50-year Volume V_{50} (cu-ft)	4,922
100-year Volume V_{100} (cu-ft)	5,569

Tributary Area	**DA-4**
Acreage (acre)	0.89
CN (Weighted)	0.83
50-year Volume V_{50} (cu-ft)	16,384
100-year Volume V_{100} (cu-ft)	18,403

Tributary Area	**DA-5**
Acreage (acre)	4.47
CN (Weighted)	0.584
50-year Volume V_{50} (cu-ft)	29,801
100-year Volume V_{100} (cu-ft)	33,867

Tributary Area	**DA-6**
Acreage (acre)	1.61
CN (Weighted)	0.63
50-year Volume V_{50} (cu-ft)	14,215
100-year Volume V_{100} (cu-ft)	16,083

Tributary Area	**DA-7**
Acreage (acre)	4.20
CN (Weighted)	0.486
50-year Volume V_{50} (cu-ft)	21,542
100-year Volume V_{100} (cu-ft)	24,671

Tributary Area	**DA-8**
Acreage (acre)	4.49
CN (Weighted)	0.54
50-year Volume V_{50} (cu-ft)	26,803
100-year Volume V_{100} (cu-ft)	30,597

Tributary Area	**DA-9**
Acreage (acre)	2.36
CN (Weighted)	0.60
50-year Volume V_{50} (cu-ft)	14,838
100-year Volume V_{100} (cu-ft)	16,882

Tributary Area	**DA-10**
Acreage (acre)	8.25
CN (Weighted)	0.52
50-year Volume V_{50} (cu-ft)	52,510
100-year Volume V_{100} (cu-ft)	59,830

Tributary Area	**DA-11**
Acreage (acre)	6.32
CN (Weighted)	0.54
50-year Volume V_{50} (cu-ft)	52,612
100-year Volume V_{100} (cu-ft)	59,629

Tributary Area	**DA-12**
Acreage (acre)	2.84
CN (Weighted)	0.60
50-year Volume V_{50} (cu-ft)	21,412
100-year Volume V_{100} (cu-ft)	24,282

Tributary Area	**DA-13**
Acreage (acre)	5.36
CN (Weighted)	0.49
50-year Volume V_{50} (cu-ft)	27,593
100-year Volume V_{100} (cu-ft)	31,599

Tributary Area	**DA-14**
Acreage (acre)	3.24
CN (Weighted)	0.48
50-year Volume V_{50} (cu-ft)	17,755
100-year Volume V_{100} (cu-ft)	20,292

Tributary Area	**DA-15**
Acreage (acre)	4.83
CN (Weighted)	0.56
50-year Volume V_{50} (cu-ft)	24,498
100-year Volume V_{100} (cu-ft)	28,065

Tributary Area	**DA-16**
Acreage (acre)	4.20
CN (Weighted)	0.53
50-year Volume V_{50} (cu-ft)	25,659
100-year Volume V_{100} (cu-ft)	29,272

Tributary Area	**DA-17**
Acreage (acre)	1.23
CN (Weighted)	0.62
50-year Volume V_{50} (cu-ft)	12,582
100-year Volume V_{100} (cu-ft)	14,278

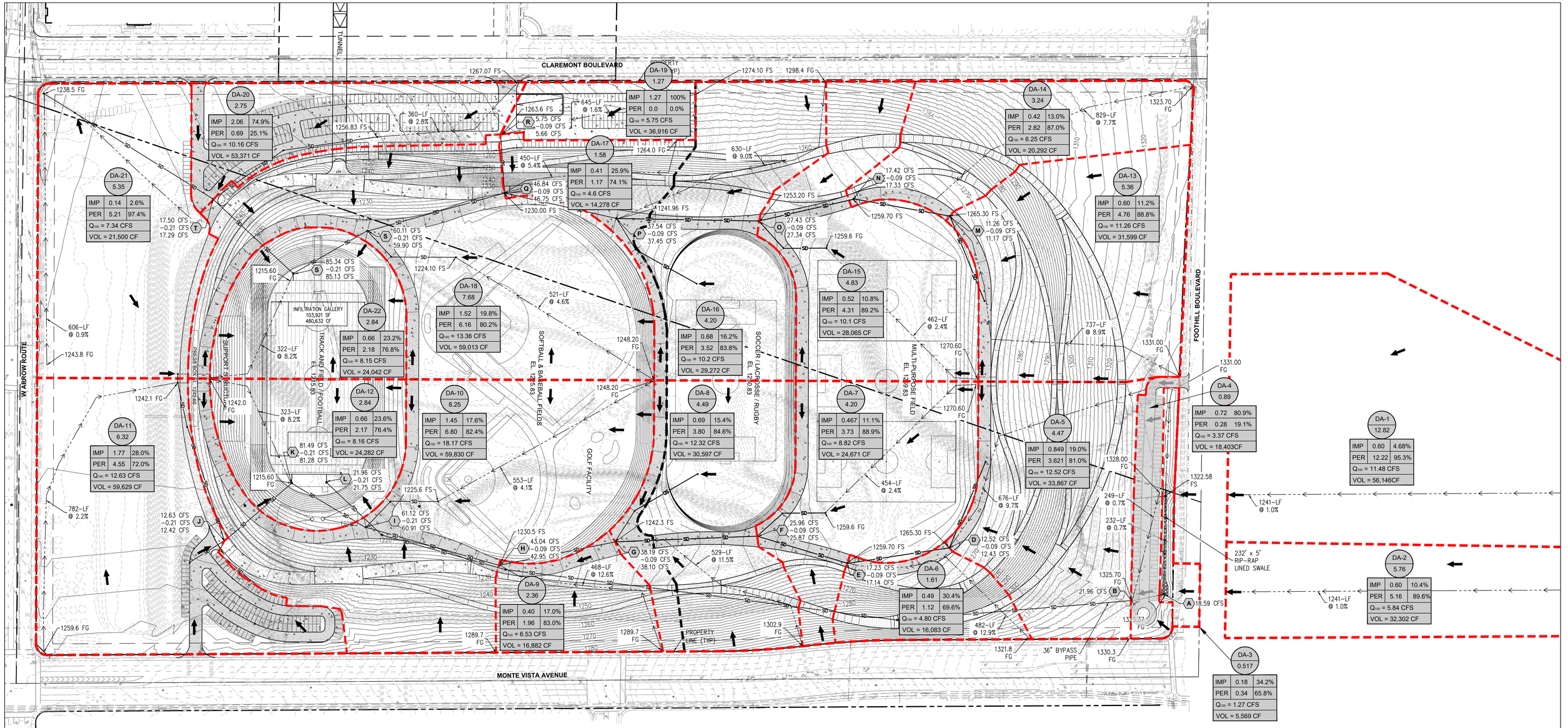
Tributary Area	**DA-18**
Acreage (acre)	7.68
CN (Weighted)	0.49
50-year Volume V_{50} (cu-ft)	51,871
100-year Volume V_{100} (cu-ft)	59,013

Tributary Area	**DA-19**
Acreage (acre)	1.81
CN (Weighted)	0.81
50-year Volume V_{50} (cu-ft)	27,981
100-year Volume V_{100} (cu-ft)	36,916

Tributary Area	**DA-20**
Acreage (acre)	39.32
CN (Weighted)	0.80
50-year Volume V_{50} (cu-ft)	47,494
100-year Volume V_{100} (cu-ft)	53,371

Tributary Area	**DA-21**
Acreage (acre)	5.35
CN (Weighted)	0.38
50-year Volume V_{50} (cu-ft)	18,496
100-year Volume V_{100} (cu-ft)	21,500

Tributary Area	**DA-22**
Acreage (acre)	2.84
CN (Weighted)	0.60
50-year Volume V_{50} (cu-ft)	21,196
100-year Volume V_{100} (cu-ft)	24,042



LEGEND

- PROPERTY BOUNDARY LINE
- CENTERLINE
- 335 EXISTING CONTOURS
- 335 PROPOSED CONTOURS
- SD STORM DRAIN
- DRY WELL
- STORM DRAIN MANHOLE
- DMA# / 0.52 — DRAINAGE MANAGEMENT AREA / AREA IN ACRE
- IMP 0.52 100% — IMPERVIOUS AREA
- PER 0.00 0% — PERVIOUS AREA
- Q = 0.13CFS — Q TREATMENT
- VOLUME = 1,444CF — VOLUME TREATMENT
- FLOW PATH
- FLOW DIRECTION
- DRAINAGE BASIN BOUNDARY
- X — NODE (DRY WELL)

DRY WELL DATA:
24 HR INFILTRATION:
0.09 CFS / 7,776 CF
0.21 CFS / 18,144

GRAPHIC SCALE
100 0 100 200
(IN FEET)
1" = 100'

PLAN PREPARED BY:

DATE

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REGISTERED PROFESSIONAL ENGINEER
TYLER HILDING JOHNSON
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CIVIL
STATE OF CALIFORNIA

DATE	REVISION

POST-DEVELOPMENT HYDROLOGY MAP
SCENARIO 2

CITY OF CLAREMONT

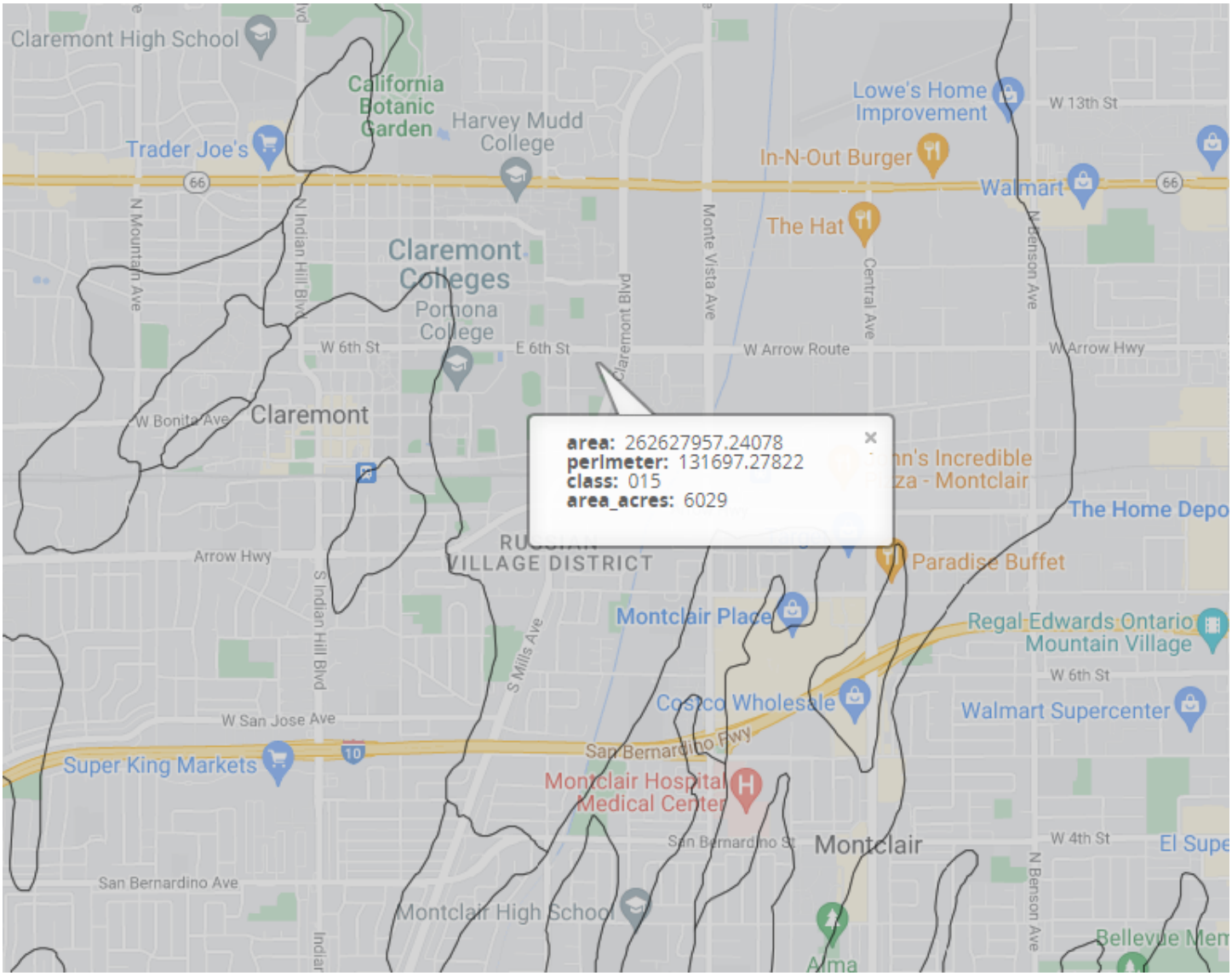
CLAREMONT MCKENNA COLLEGE
EAST CAMPUS EXPANSION

SCALE: AS NOTED	DRAWN BY: GMH	DRAWING NO.
DATE: -	CHECKED BY: THJ	G02-XXXX
F.B. NO.	RECOMMENDED BY: THJ	
APPROVED:		SHEET PG 2 OF PG 3

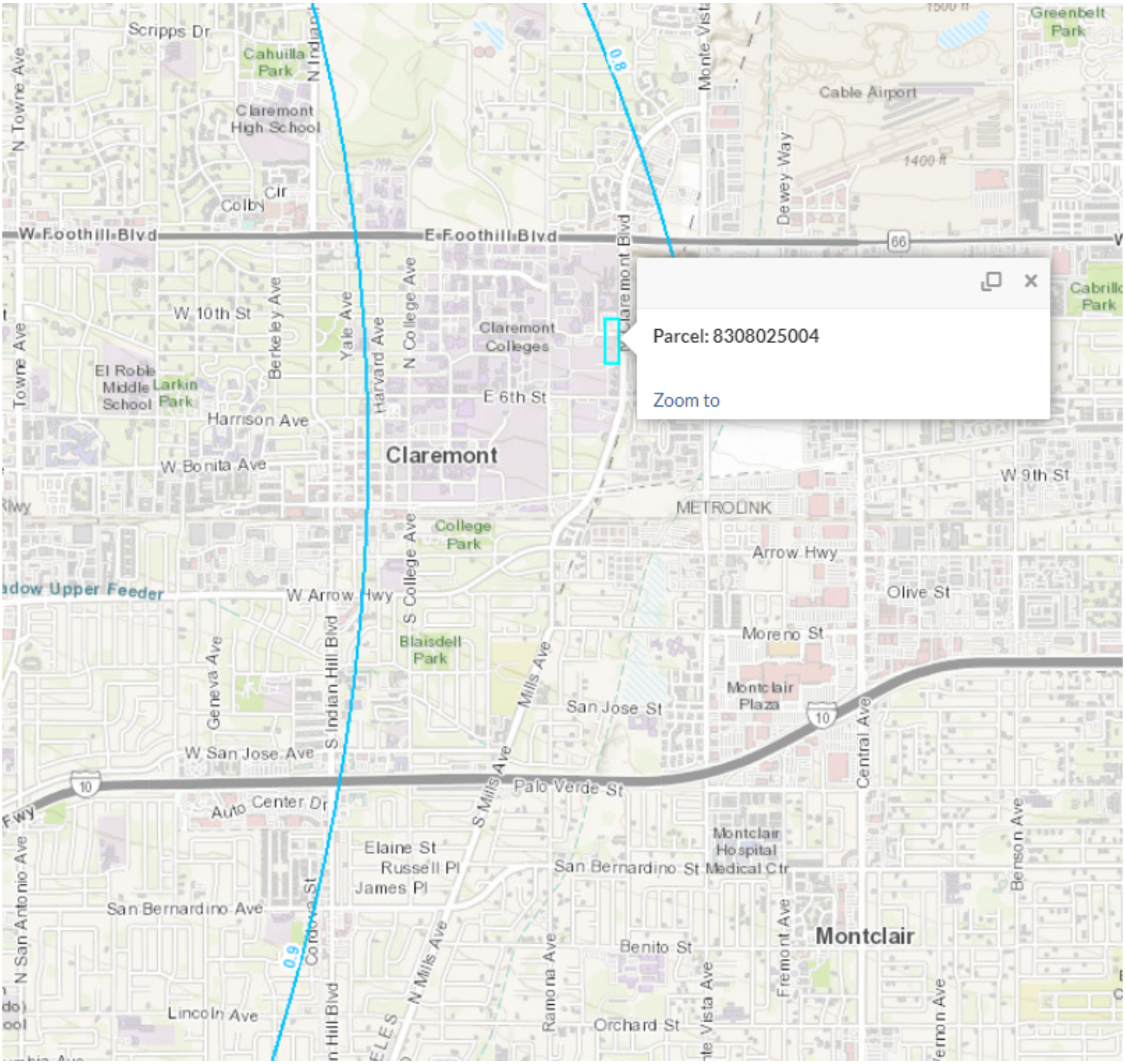
CITY ENGINEER R.C.E DATE:

Attachment A
Figures

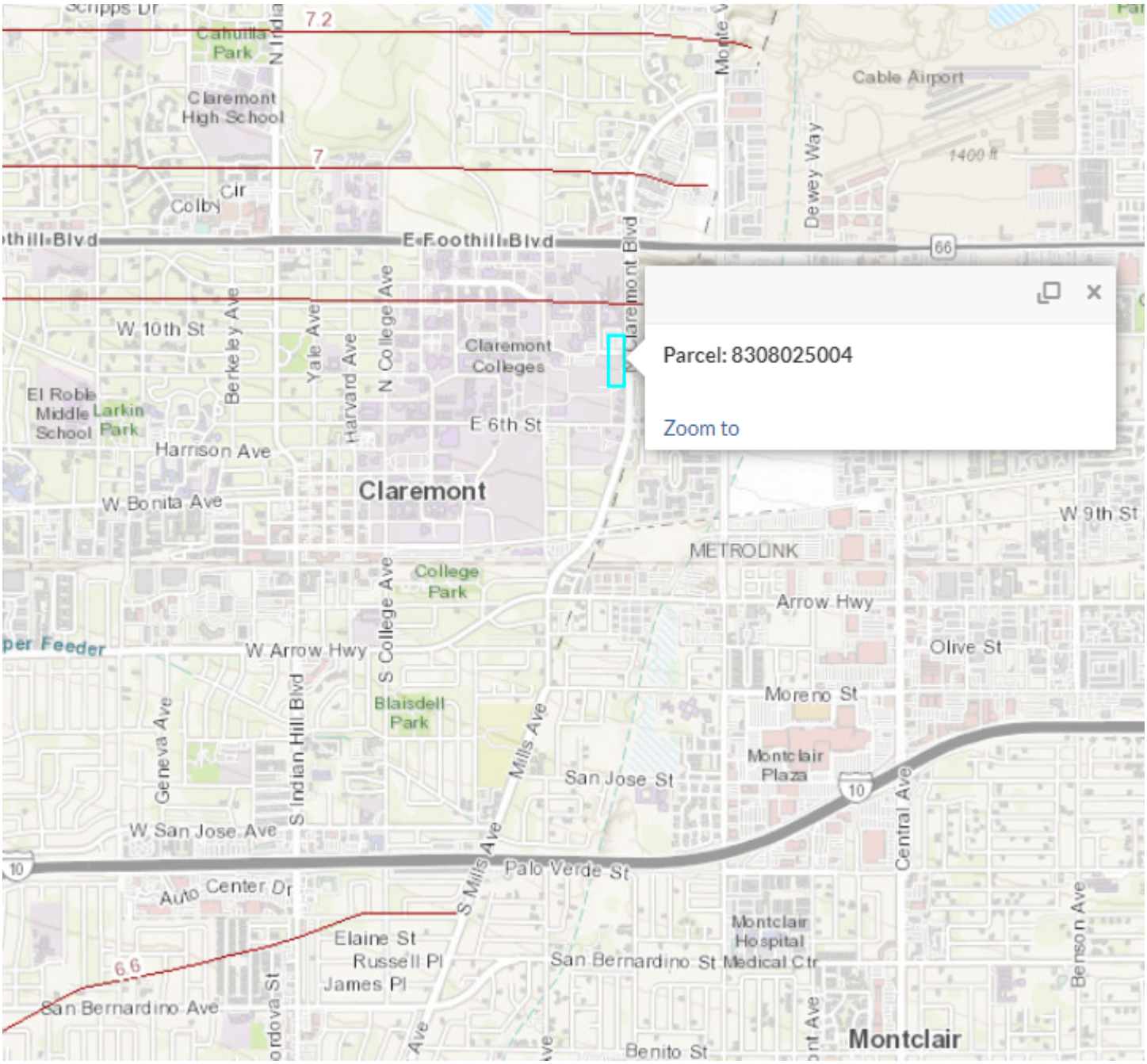
Soils Group Map



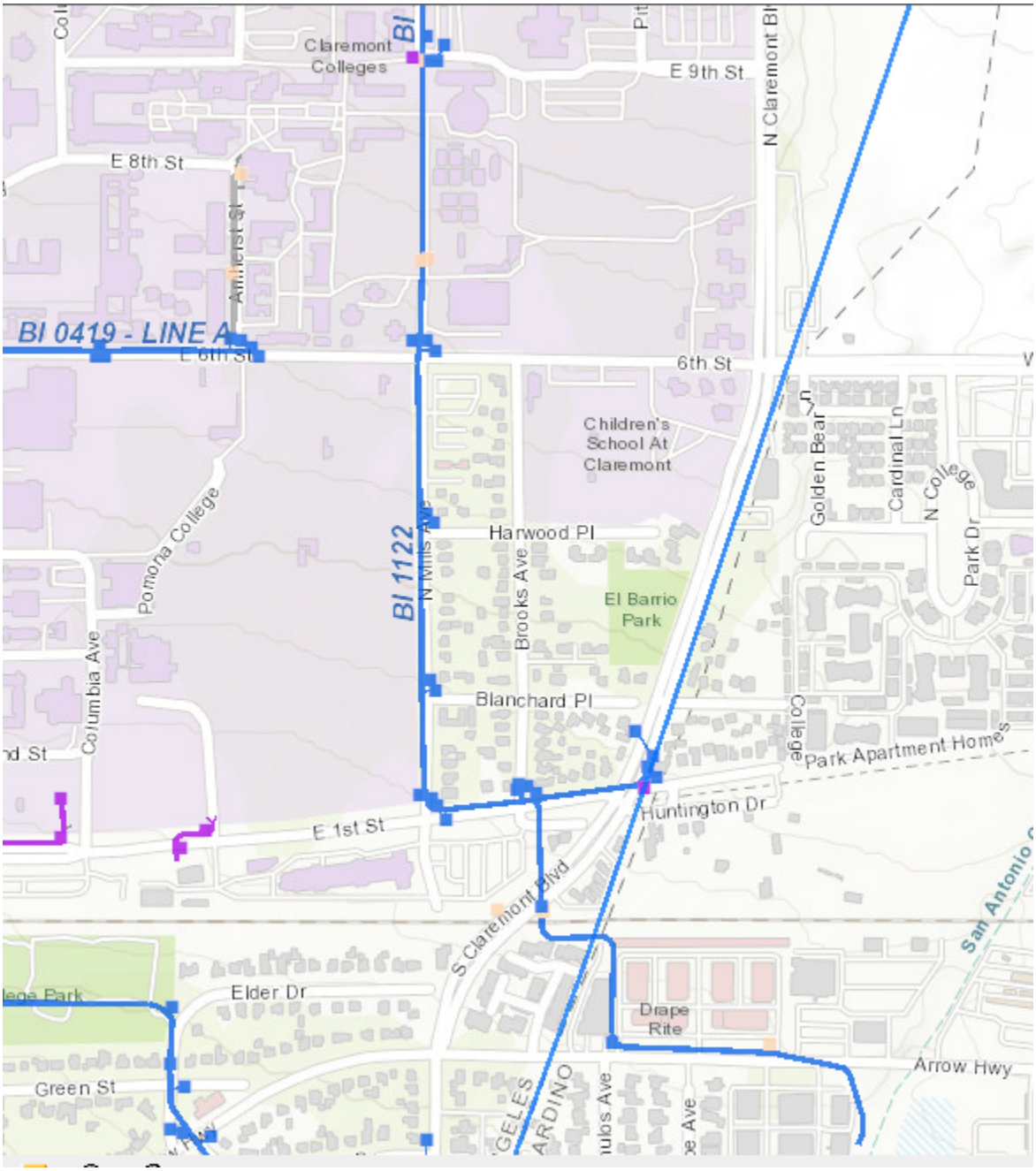
85th Percentile Storm Rainfall Map

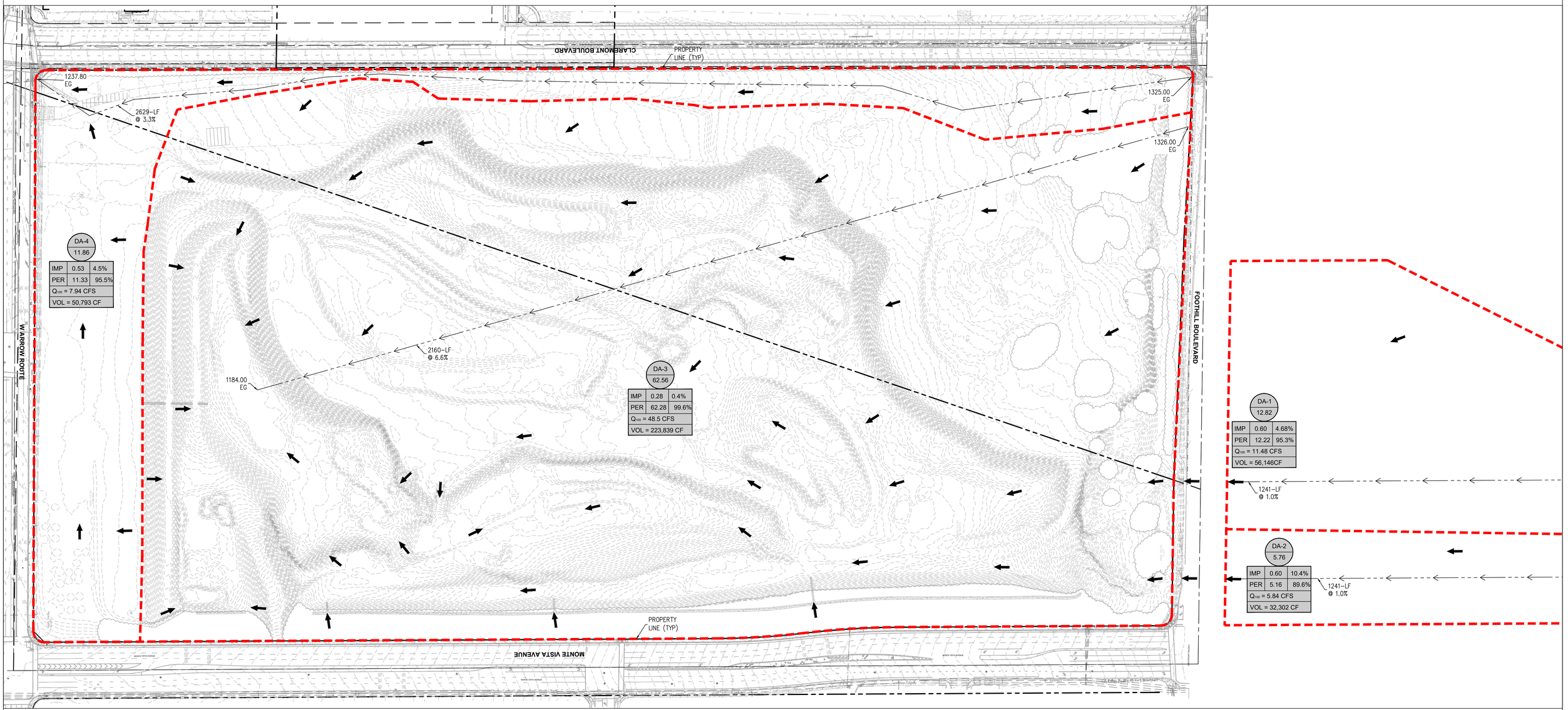


50-year Storm Rainfall Map



Regional Storm Drainage Outfall Map





LEGEND

- PROPERTY BOUNDARY LINE
- CENTERLINE
- 335 EXISTING CONTOURS
- 335 PROPOSED CONTOURS
- SD STORM DRAIN

DMA#
0.52
DRAINAGE MANAGEMENT AREA
AREA IN ACRE

IMP	0.52	100%
PER	0.00	0%
QTREAT = 0.13CFS		
SWQDV = 1,444CF		

IMPERVIOUS AREA
PERVIOUS AREA
Q TREATMENT
VOLUME TREATMENT

FLOW PATH
FLOW DIRECTION
DRAINAGE BASIN BOUNDARY

GRAPHIC SCALE
100 0 100 200
(IN FEET)
1" = 100'

PRE-DEVELOPMENT HYDROLOGY MAP

CITY OF CLAREMONT

CLAREMONT MCKENNA COLLEGE
EAST CAMPUS EXPANSION

PLAN PREPARED BY:

DATE

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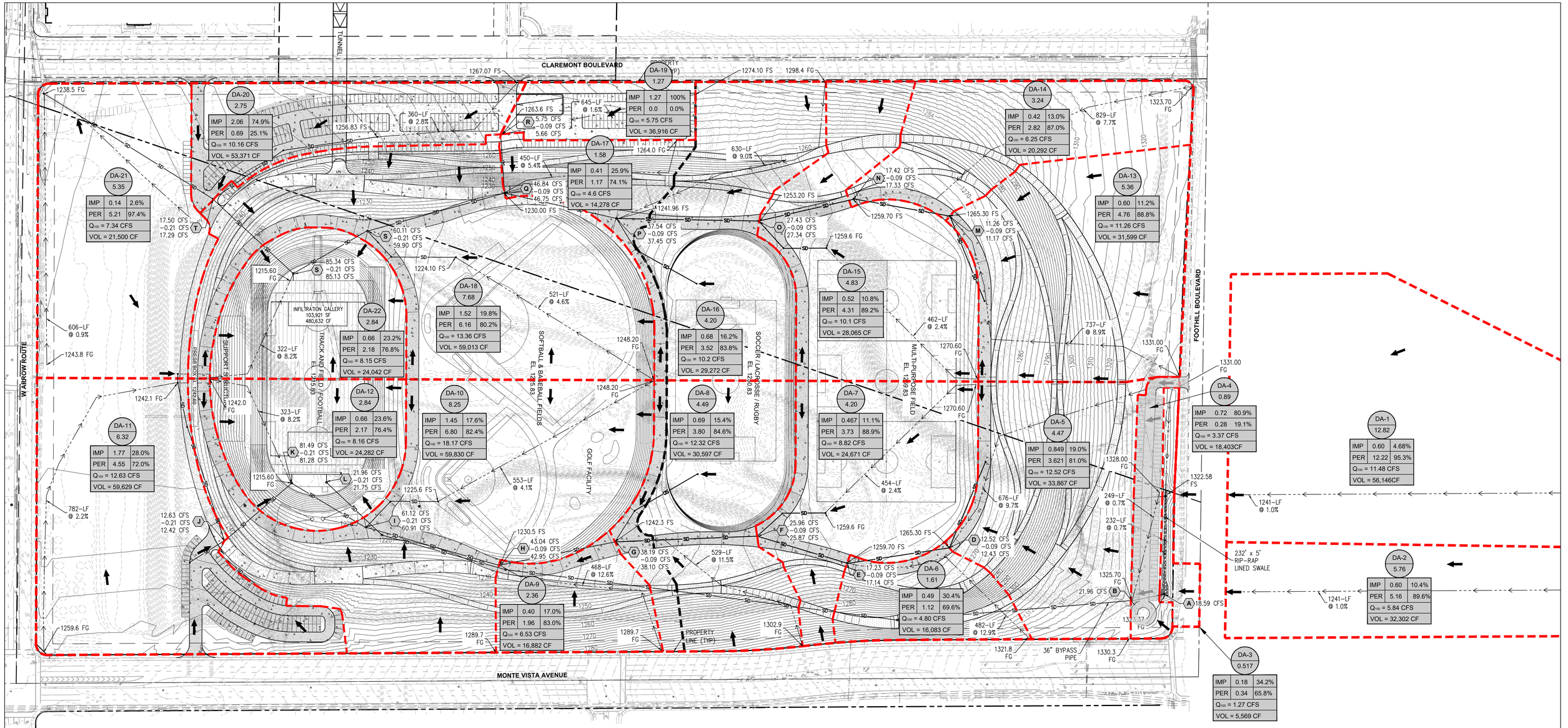
DATE	REVISION

SCALE: AS NOTED	DRAWN BY: GMH	DRAWING NO. G02-XXXX
DATE: -	CHECKED BY: THJ	
F.B. NO.	RECOMMENDED BY: THJ	
APPROVED:		SHEET PG 1 OF PG 3

CITY ENGINEER R.C.E DATE:



LEGEND

- PROPERTY BOUNDARY LINE
- CENTERLINE
- 335 EXISTING CONTOURS
- 335 PROPOSED CONTOURS
- SD STORM DRAIN
- DRY WELL
- STORM DRAIN MANHOLE
- DMA# / 0.52 — DRAINAGE MANAGEMENT AREA / AREA IN ACRE
- IMP 0.52 100% — IMPERVIOUS AREA
- PER 0.00 0% — PERVIOUS AREA
- Q = 0.13CFS — Q TREATMENT
- VOLUME = 1,444CF — VOLUME TREATMENT
- FLOW PATH
- FLOW DIRECTION
- DRAINAGE BASIN BOUNDARY
- X — NODE (DRY WELL)

DRY WELL DATA:
24 HR INFILTRATION:
0.09 CFS / 7,776 CF
0.21 CFS / 18,144

GRAPHIC SCALE
100 0 100 200
(IN FEET)
1" = 100'

PLAN PREPARED BY:

DATE

Civil Engineering • Site Optimization
www.AtlasCivilDesign.com
Tel: 1-213-810-8470
San Diego • Orange County • Los Angeles • San Luis Obispo • Monterey

REGISTERED PROFESSIONAL ENGINEER
TYLER HILDING JOHNSON
No. 85839
CIVIL
STATE OF CALIFORNIA

DATE	REVISION

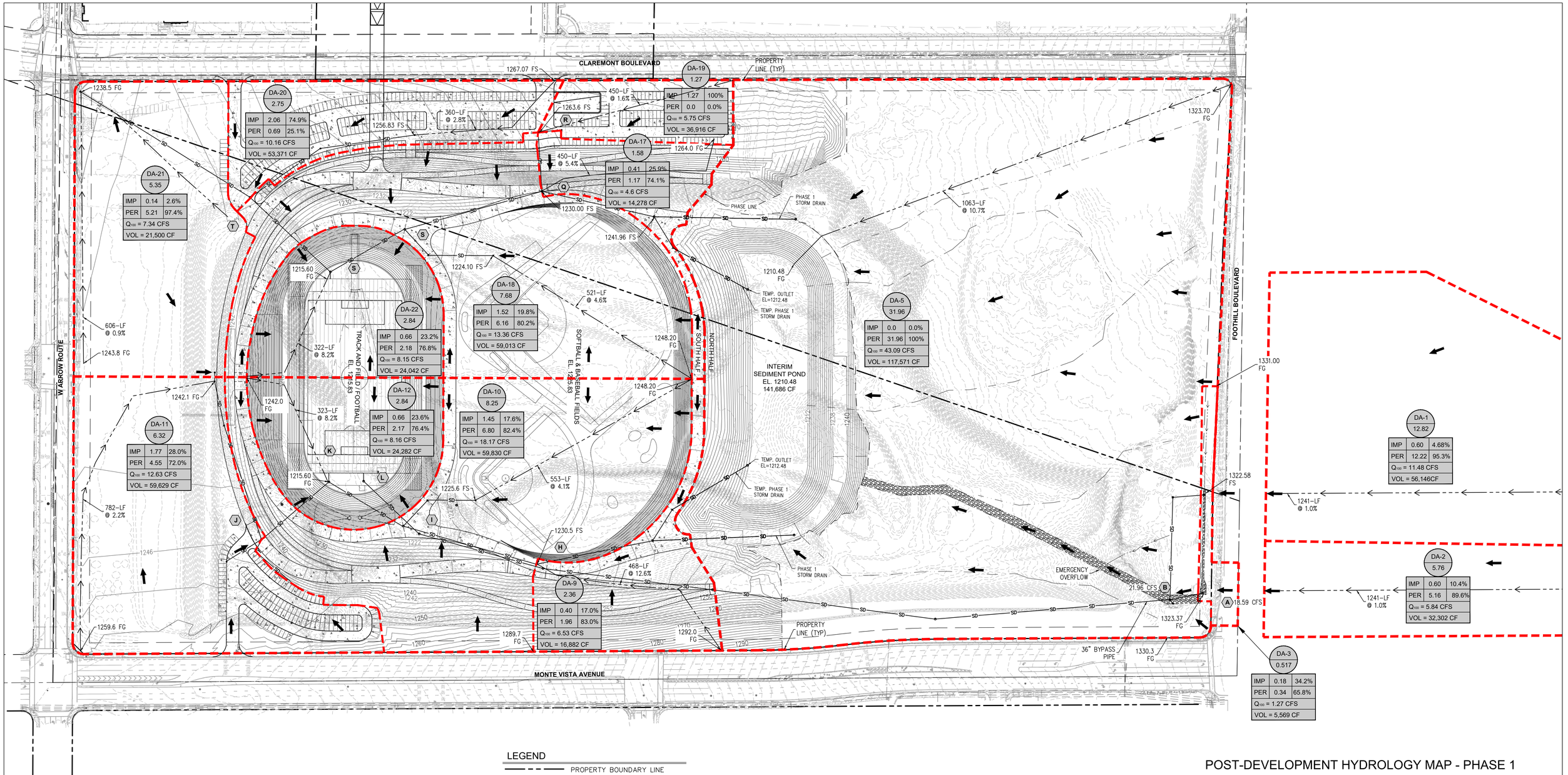
POST-DEVELOPMENT HYDROLOGY MAP
SCENARIO 2

CITY OF CLAREMONT

CLAREMONT MCKENNA COLLEGE
EAST CAMPUS EXPANSION

SCALE: AS NOTED	DRAWN BY: GMH	DRAWING NO.
DATE: -	CHECKED BY: THJ	G02-XXXX
F.B. NO.	RECOMMENDED BY: THJ	
APPROVED:		SHEET PG 2 OF PG 3

CITY ENGINEER R.C.E DATE:



LEGEND

- PROPERTY BOUNDARY LINE
- CENTERLINE
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- 335 PROPOSED CONTOURS
- SD STORM DRAIN
- DRY WELL
- STORM DRAIN MANHOLE
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DRY WELL DATA:
24 HR INFILTRATION:
0.09 CFS / 7,776 CF
0.21 CFS / 18,144

GRAPHIC SCALE
100 0 100 200
(IN FEET)
1" = 100'

POST-DEVELOPMENT HYDROLOGY MAP - PHASE 1

CITY OF CLAREMONT

CLAREMONT MCKENNA COLLEGE
EAST CAMPUS EXPANSION

PLAN PREPARED BY:
DATE

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REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

DATE	REVISION

SCALE: AS NOTED	DRAWN BY: GMH	DRAWING NO. G02-XXXX
DATE: -	CHECKED BY: THJ	
F.B. NO.	RECOMMENDED BY: THJ	
APPROVED:		SHEET PG 3 OF PG 3
CITY ENGINEER	R.C.E DATE:	

User Inputs

Chamber Model:	MC-7200
Outlet Control Structure:	Yes
Project Name:	21-055
Engineer:	GREG HOWELL
Project Location:	California
Measurement Type:	Imperial
Required Storage Volume:	480632 cubic ft.
Stone Porosity:	40%
Stone Foundation Depth:	9 in.
Stone Above Chambers:	12 in.
Average Cover Over Chambers:	24 in.
Design Constraint Dimensions:	(300 ft. x 450 ft.)

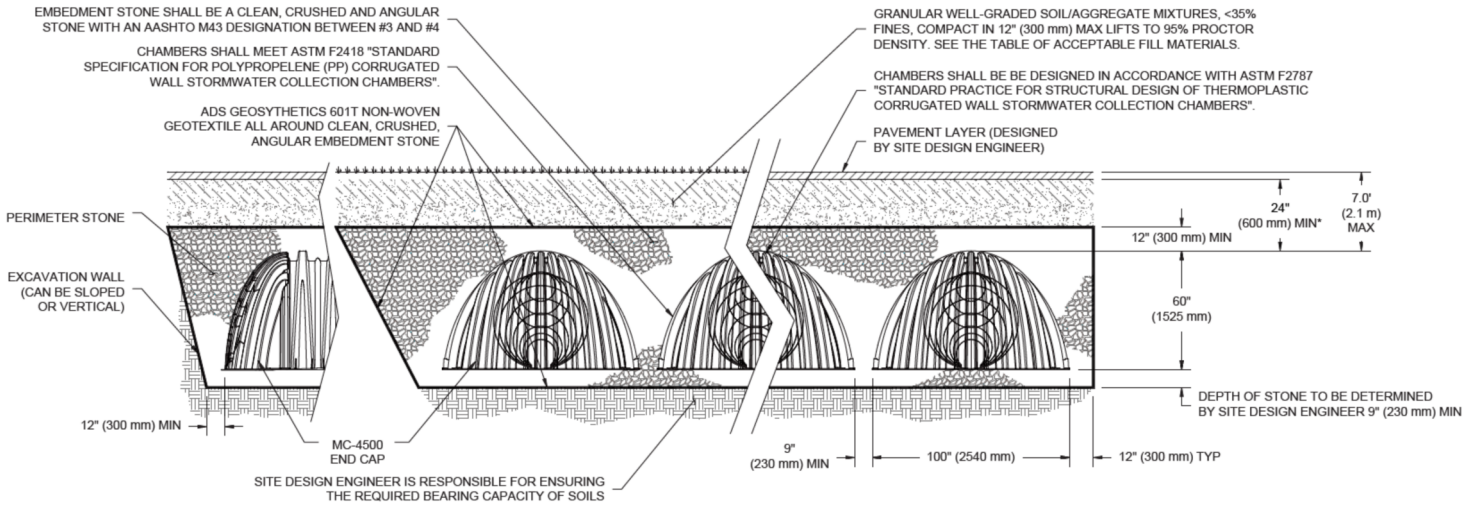
Results

System Volume and Bed Size

Installed Storage Volume:	481992.84 cubic ft.
Storage Volume Per Chamber:	175.90 cubic ft.
Number Of Chambers Required:	1767
Number Of End Caps Required:	56
Chamber Rows:	28
Maximum Length:	433.82 ft.
Maximum Width:	256.18 ft.
Approx. Bed Size Required:	108954.24 square ft.

System Components

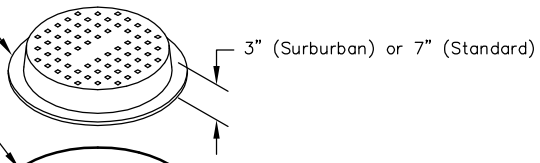
Amount Of Stone Required:	15645 cubic yards
Volume Of Excavation (Not Including Fill):	27239 cubic yards
Total Non-woven Geotextile Required:	30304 square yards
Woven Geotextile Required (excluding Isolator Row):	192 square yards
Woven Geotextile Required (Isolator Row):	998 square yards
Total Woven Geotextile Required:	1189 square yards
Impervious Liner Required:	0 square yards



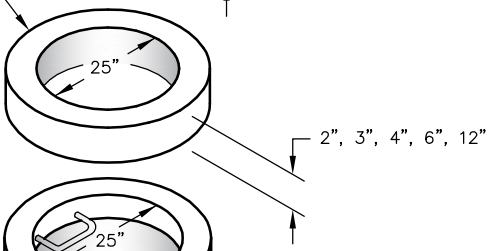
*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

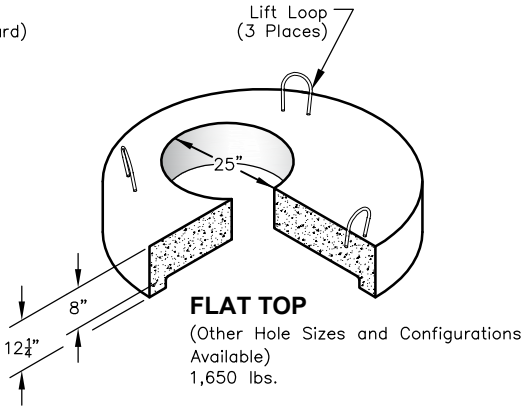
48" DRYWELL MANHOLE

FRAME AND COVER
3" = 275 lbs.
7" = 350 lbs.



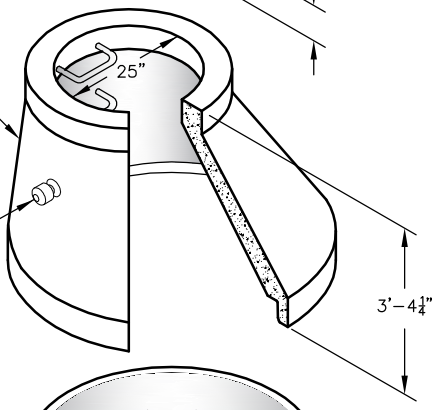
GRADE RING
2" = 80 lbs.
3" = 125 lbs.
4" = 165 lbs.
6" = 245 lbs.
12" = 490 lbs.

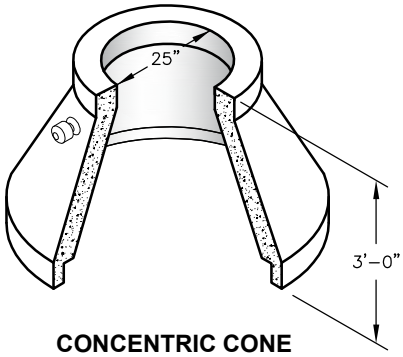




FLAT TOP
(Other Hole Sizes and Configurations Available)
1,650 lbs.

ECCENTRIC CONE
2,480 lbs.

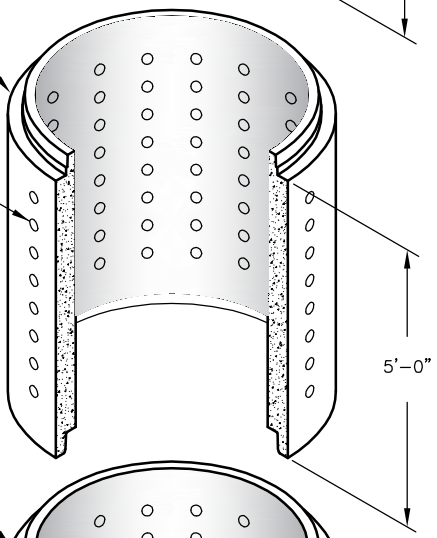


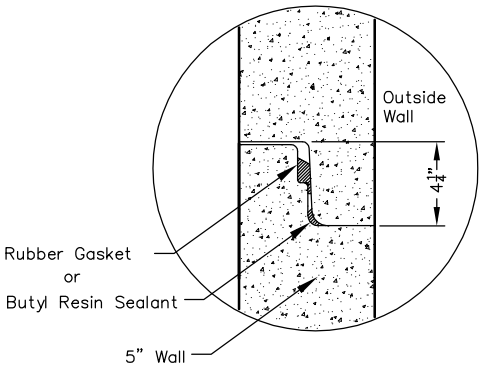


CONCENTRIC CONE
2,080 lbs.

DRYWELL RISER

Height	Weight
5'–0"	4,060 lbs.

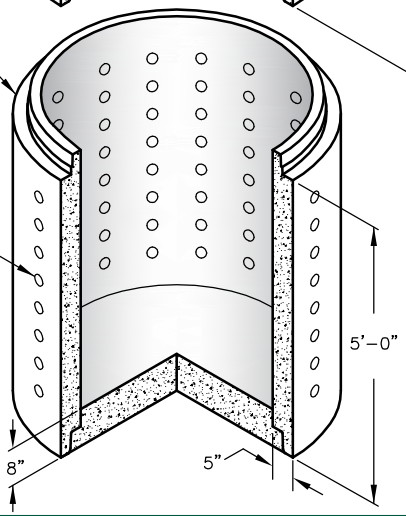




JOINT DETAIL

DRYWELL BASE

Height	Weight
5'–0"	5,390 lbs.



Notes:
- Manholes per Specification: ASTM C478
- Rubber Gasket: ASTM C443
- Holes: Cored as Required.
- Frame & Cover: Gray Cast Iron ASTM A48 Class 30, Watertight/Tamperproof Cover Available.
- Optional Extended Base Available.

Oldcastle Precast®
PO Box 323, Wilsonville, Oregon 97070-0323
Tel: (503) 682-2844 Fax: (503) 682-2657

48" DRYWELL MANHOLE

File Name: 020-48MH-D
Issue Date: 2018
oldcastleprecast.com/wilsonville

48" DRYWELL MANHOLE

The watermark for drainage solutions.®

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Site Drainage Systems
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- French Drains
- Piping
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- Pump Systems

Technical Analysis
- Design Review
- Percolation Testing
- Geologic Database
- ADEQ Drywell Registration

Recharge Systems
- Municipal/Private Recharge Wells
- Injection Wells & Galleries

Environmental Applications
- Pattern Drilling/Soil Remediation
- Drainage Rehabilitation
- Drywell Abandonments
- OSHA HAZMAT-Certified

Drainage Renovation
- Problem Assessment
- Site Redesign/Modification
- System Retrofit

Drainage Maintenance
- Preventive Maintenance
- Service Contracts
- Drywell Cleaning

TORRENT RESOURCES INCORPORATED

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fax 602~268~0820

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AZ Lic. ROC070465 A,
ROC047067 B-4; ADWR 363

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NV Lic. 0035350 A

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TORRENT RESOURCES (CA) INCORPORATED

phone 661~947~9836

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An evolution of McGuckin Drilling

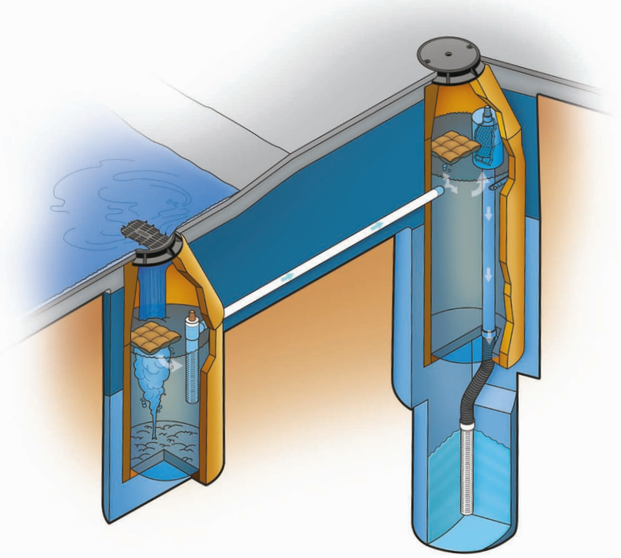
1/12

MaxWell® Plus DRAINAGE SYSTEM

Product Information and Design Features

TORRENT RESOURCES

The ***MaxWell® Plus,*** as manufactured and installed exclusively by Torrent Resources Incorporated, is the industry standard for draining large paved surfaces, nuisance water and other demanding applications. This patented system incorporates state-of-the-art pre-treatment technology.



THE ULTIMATE IN DESIGN

Since 1974, nearly 65,000 MaxWell® Systems have proven their value as a cost-effective solution in a wide variety of drainage applications. They are accepted by state and municipal agencies and are a standard detail in numerous drainage manuals. Many municipalities have recognized the inherent benefits of the MaxWell Plus and now require it for drainage of all paved surfaces.

SUPERIOR PRE-TREATMENT

Industry research, together with Torrent Resources' own experience, have shown that initial storm drainage flows have the greatest impact on system performance. This "first flush" occurs during the first few minutes of runoff, and carries the majority of sediment and debris. Larger paved surfaces or connecting pipes from catch basins, underground storage, etc. can also generate high peak flows which may strain system function. In addition, nuisance water flows require controlled processing separate from normal storm runoff demands.

Manufactured and Installed Exclusively by Torrent Resources Incorporated
Please see reverse side for additional information
U.S. Patent No. 4,923,330

In the ***MaxWell® Plus,*** preliminary treatment is provided through collection and separation in deep large-volume settling chambers. The standard MaxWell Plus System has over 2,500 gallons of capacity to contain sediment and debris carried by incoming water. Floating trash, paper, pavement oil, etc. are effectively stopped by the **PureFlo®** Debris Shields in each chamber. These shielding devices are equipped with an effective screen to filter suspended material and are vented to prevent siphoning of floating surface debris as the system drains.

EFFECTIVE PROCESSING

Incoming water from the surface grated inlets or connecting pipes is received in the Primary Settling Chamber where silt and other heavy particles settle to the bottom. A PureFlo Debris Shield ensures containment by trapping floating debris and pavement oil. The pre-treated flow is then regulated to a design rate of up to 0.25cfs and directed to a Secondary Settling Chamber. The settling and containment process is repeated, thereby effectively achieving controlled, uniform treatment. The system is drained as water rises under the PureFlo Debris Shield and spills into the top of the overflow pipe. The drainage assembly returns the cleaned water into the surrounding soil through the **FloFast®** Drainage Screen.

ABSORBENT TECHNOLOGY

Both MaxWell Plus settling chambers are equipped with absorbent sponges to provide prompt removal of pavement oils. These floating pillow-like devices are 100% water repellent and literally wick petrochemical compounds from the water. Each sponge has a capacity of up to 128 ounces to accommodate effective, long-term treatment. The absorbent is completely inert and will safely remove runoff constituents down to rainbow sheens that are typically no more than one molecule thick.

SECURITY FEATURES

MaxWell Plus Systems include bolted, theft-deterrent, cast iron gratings and covers as standard security features. Special inset castings which are resistant to loosening from accidental impact are available for use in landscaped applications. Machined mating surfaces and "Storm Water Only" wording are standard.

THE MAXWELL FIVE-YEAR WARRANTY

Innovative engineering, quality materials and exacting construction are standard with every MaxWell System designed, manufactured and installed by Torrent Resources Incorporated. The MaxWell Drainage Systems Warranty is the best in the industry and guarantees against failures due to workmanship or materials for a period of five years from date of completion.

MAXWELL® PLUS DRAINAGE SYSTEM DETAIL AND SPECIFICATIONS

CALCULATING MAXWELL PLUS REQUIREMENTS:

The type of property, soil permeability, rainfall intensity and local drainage ordinances determine the number and design of MaxWell Systems. For general applications draining retained stormwater, use one standard ***MaxWell® Plus*** per the instructions below for up to 5 acres of landscaped contributory area, and up to 2 acres of paved surface. To drain nuisance water flows in storm runoff systems, add a remote inlet to the system. For smaller drainage needs, refer to our ***MaxWell® IV.*** For industrial drainage, our ***Envibro® System*** may be recommended. For additional considerations, please refer to **"Design Suggestions For Retention And Drainage Systems"** or consult our Design Staff.

COMPLETING THE MAXWELL PLUS DRAWING

To apply the MaxWell Plus drawing to your specific project, simply fill in the blue boxes per the following instructions. For assistance, please consult our Design Staff.

' PRIMARY SETTLING CHAMBER DEPTH

The overall depth of the Primary Settling Chamber is determined by the amount of surface area being drained. Use a standard depth of **15 feet** for the initial acre of contributory drainage area, **plus 2 feet** for each additional acre, up to the design limits of the property type noted in "Calculating MaxWell Plus Requirements" noted above. Other conditions that would require increased chamber depths are property usage, maintenance scheduling, and severe or unusual service conditions. Connecting pipe depth may dictate deeper chambers so as to maintain the effectiveness of the settling process. Maximum chamber depth is 25 feet.
A pump and lift station is recommended for systems with deeper requirements.

' ESTIMATED TOTAL DEPTH

The Estimated Total Depth is the approximate total system depth required to achieve 10 continuous feet of penetration into permeable soils, based upon known soil information. Torrent utilizes specialized **"crowd"** equipped rigs to get through the difficult cemented soil and to reach clean drainage soils at depths up to **180 feet.** An extensive drilling log database is available to use as a reference.

' SETTLING CHAMBER DEPTH

On MaxWell Plus Systems of over 30 feet overall depth and up to 0.25cfs design rate, the standard Settling Chamber Depth is **18 feet.** Maximum chamber depth is 25 feet.

' OVERFLOW HEIGHT

The Overflow Height and Secondary Settling Chamber Depth determine the effectiveness of the settling process. The higher the overflow pipe, the deeper the chamber, the greater the settling capacity. An overflow height of **13 feet** is used with the standard settling chamber depth of **18 feet.**

"Ø DRAINAGE PIPE

This dimension also applies to the **PureFlo®** Debris Shields, the **FloFast®** Drainage Screen, and fittings. The size is based upon system design rates, multiple primary settling chambers, soil conditions, and need for adequate venting. Choices are 6", 8", or 12" diameter. Refer to our company's **"Design Suggestions for Retention and Drainage Systems"** for recommendations on which size best matches your application.

"Ø BOLTED RING & GRATE/COVER

Standard models are quality cast iron and available to fit 24" Ø or 30" Ø manhole openings. All units are bolted in two locations with wording "Storm Water Only" in raised letters. For other surface treatments, please refer to "Design Suggestions for Retention and Drainage Systems."

' INLET PIPE INVERT

Pipes up to 12" in diameter from catch basins, underground storage, etc. may be connected into the primary settling chamber. Larger pipe diameters dictate the use of manhole material for the primary setting chamber with 48" grates on the cone.Inverts deeper than 5 feet will require additional depth in both system settling chambers to maintain respective effective settling capacities.

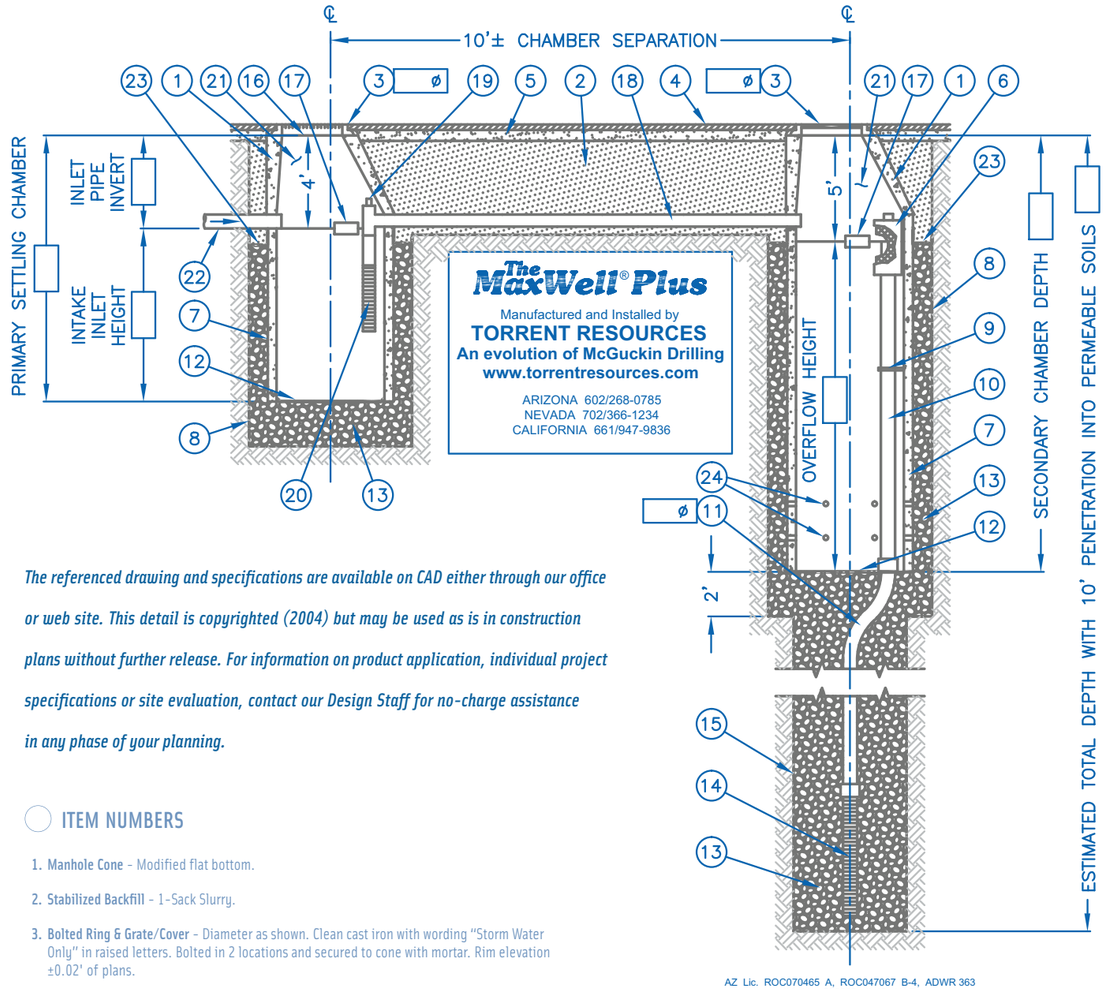
' INTAKE INLET HEIGHT

The Intake Inlet Height determines the effectiveness of the settling process in the Primary Settling Chamber. A minimum inlet height of **11 feet** is used with the standard primary settling chamber depth of 15 feet. Greater inlet heights would be required with increased system demands as noted in Primary Settling Chamber Depth. Freeboard Depth Varies with inlet pipe elevation. Increase primary/secondary settling chamber depths as needed to maintain all inlet pipe elevations above connector pipe overflow.

' CHAMBER SEPARATION

The standard separation between chambers is **10 feet** from center to center.
Soil conditions and deeper inverts may dictate required variations in chamber separation.

The MaxWell® Plus Drainage System Detail And Specifications



The referenced drawing and specifications are available on CAD either through our office or web site. This detail is copyrighted (2004) but may be used as is in construction plans without further release. For information on product application, individual project specifications or site evaluation, contact our Design Staff for no-charge assistance in any phase of your planning.

AZ Lic. ROC070465 A, ROC047067 B-4, ADWR 363
CA Lic. 528080, C-42, HAZ.
NV Lic. 0035350 A - NM Lic. 90504 GF04

ITEM NUMBERS

1. **Manhole Cone** - Modified flat bottom.
2. **Stabilized Backfill** - 1-Sack Slurry.
3. **Bolted Ring & Grate/Cover** - Diameter as shown. Clean cast iron with wording "Storm Water Only" in raised letters. Bolted in 2 locations and secured to cone with mortar. Rim elevation ±0.02' of plans.
4. **Graded Basin or Paving** (by Others).
5. **Compacted Base Material** (by Others).
6. **PureFlo® Debris Shield** - Rolled 16 Ga. steel X 24" length with vented anti-siphon and internal .265" Max. SWO flattened expanded steel screen X 12" length. **Fusion bonded epoxy coated.**
7. **Pre-cast Liner** - 4000 PSI concrete 48" ID. X 54" OD. **Center in hole** and align sections to **maximize bearing surface.**
8. **Min. 6' Ø Drilled Shaft.**
9. **Support Bracket** - Formed 12 Ga. steel. **Fusion bonded epoxy coated.**
10. **Overflow Pipe** - Sch. 40 PVC mated to drainage pipe at base seal.
11. **Drainage Pipe** - ADS highway grade with TRI-A coupler. **Suspend pipe** during backfill operations to prevent buckling or breakage. Diameter as noted.
12. **Base Seal** - Geotextile or concrete slurry.
13. **Rock** - Washed, sized between 3/8" and 1-1/2" to **best complement soil conditions.**
14. **FloFast® Drainage Screen** - Sch. 40 PVC 0.120" slotted well screen with 32 slots per row/ft. Diameter varies 120" overall length with TRI-B coupler.
15. **Min. 4' Ø Shaft** - Drilled to **maintain permeability** of drainage soils.
16. **Fabric Seal** - U.V. Resistant Geotextile - **To be removed by customer** at project completion.
17. **Absorbent** – Hydrophobic Petrochemical Sponge. Min 128 oz. capacity.
18. **Connector Pipe** – 4" Ø Sch. 40 PVC.
19. **Anti-Siphon Vent** with flow regulator.
20. **Intake Screen** – Sch. 40 PVC 0.120" modified slotted well screen with 32 slots per row/ft. 48" overall length with TRI-C end cap.
21. **Freeboard Depth Varies** with inlet pipe elevation. Increase primary/secondary settling chamber depths as needed to maintain all inlet pipe elevations above connector pipe overflow.
22. **Optional Inlet Pipe** (by Others).
23. **Moisture Membrane** – 6 mil. Plastic. Place securely against eccentric cone and hole sidewall. Used in lieu of slurry in landscaped areas.
24. **Eight** – (8) **perforations per foot,** 2 row minimum.

Attachment B

Peak Flow Hydrologic Analysis

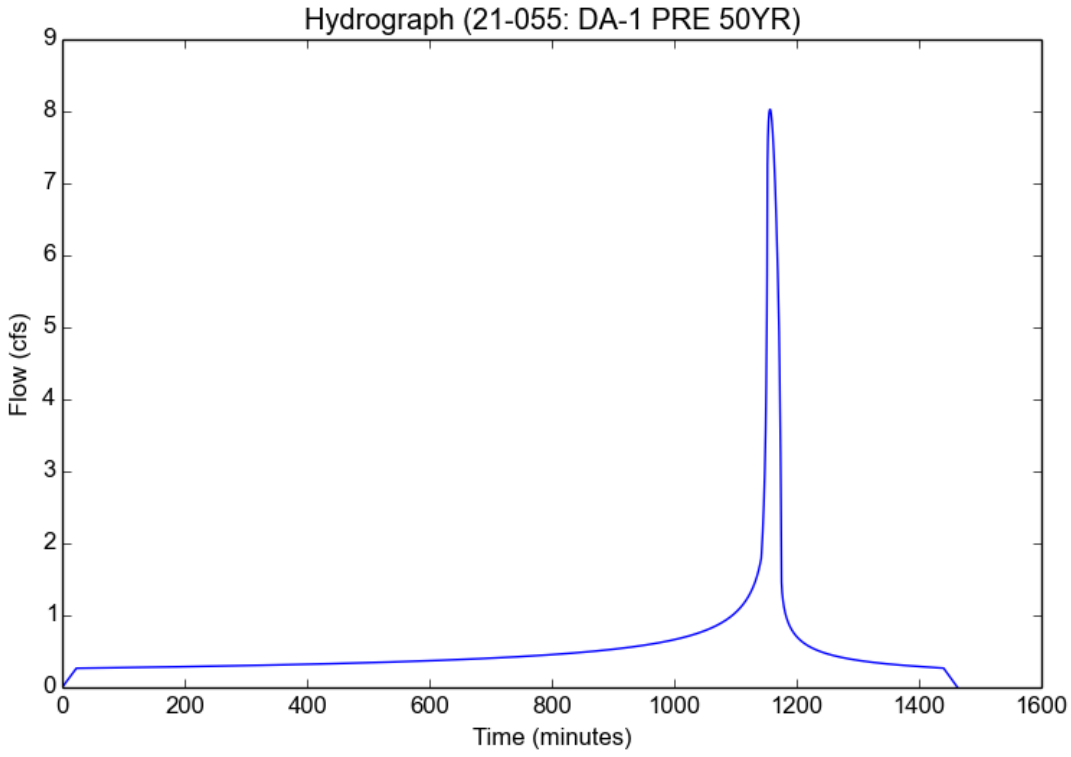
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-1 PRE 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-1 PRE 50YR
Area (ac)	12.82
Flow Path Length (ft)	1241.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.0468
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	1.9802
Undeveloped Runoff Coefficient (Cu)	0.2876
Developed Runoff Coefficient (Cd)	0.3162
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	8.0282
Burned Peak Flow Rate (cfs)	8.0282
24-Hr Clear Runoff Volume (ac-ft)	1.1121
24-Hr Clear Runoff Volume (cu-ft)	48443.9215



Peak Flow Hydrologic Analysis

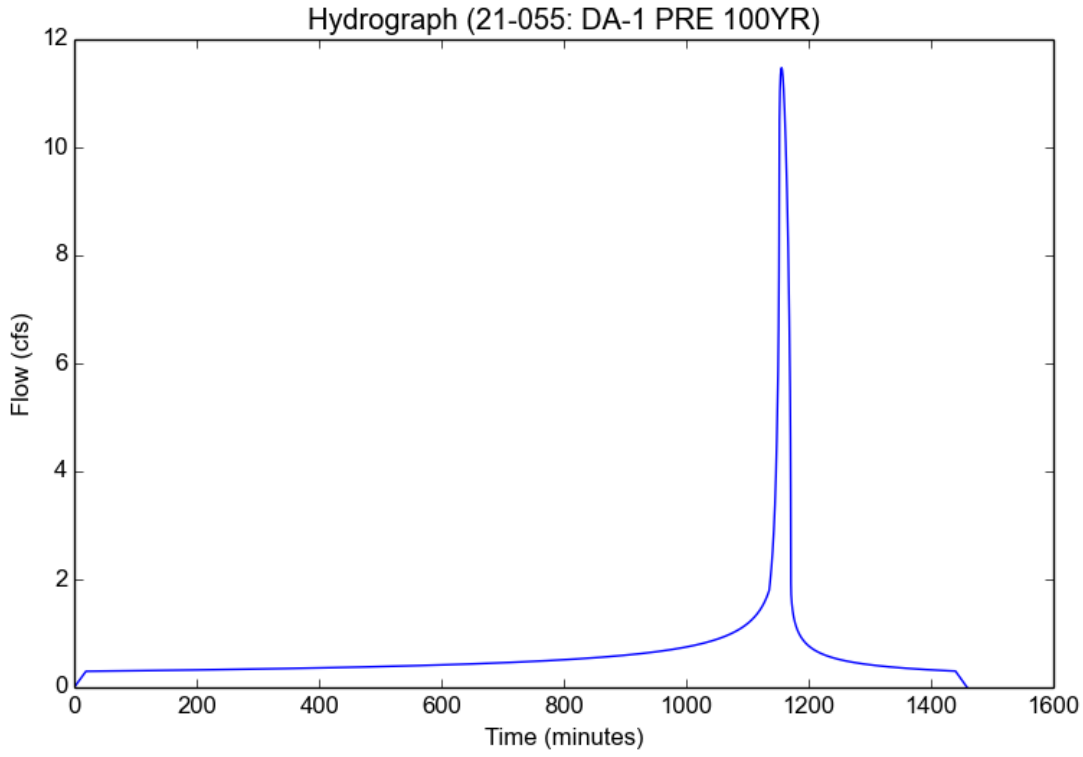
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-1 PRE 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-1 PRE 100YR
Area (ac)	12.82
Flow Path Length (ft)	1241.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.0468
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	2.4306
Undeveloped Runoff Coefficient (Cu)	0.3421
Developed Runoff Coefficient (Cd)	0.3682
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	11.4745
Burned Peak Flow Rate (cfs)	11.4745
24-Hr Clear Runoff Volume (ac-ft)	1.2889
24-Hr Clear Runoff Volume (cu-ft)	56146.0389



Peak Flow Hydrologic Analysis

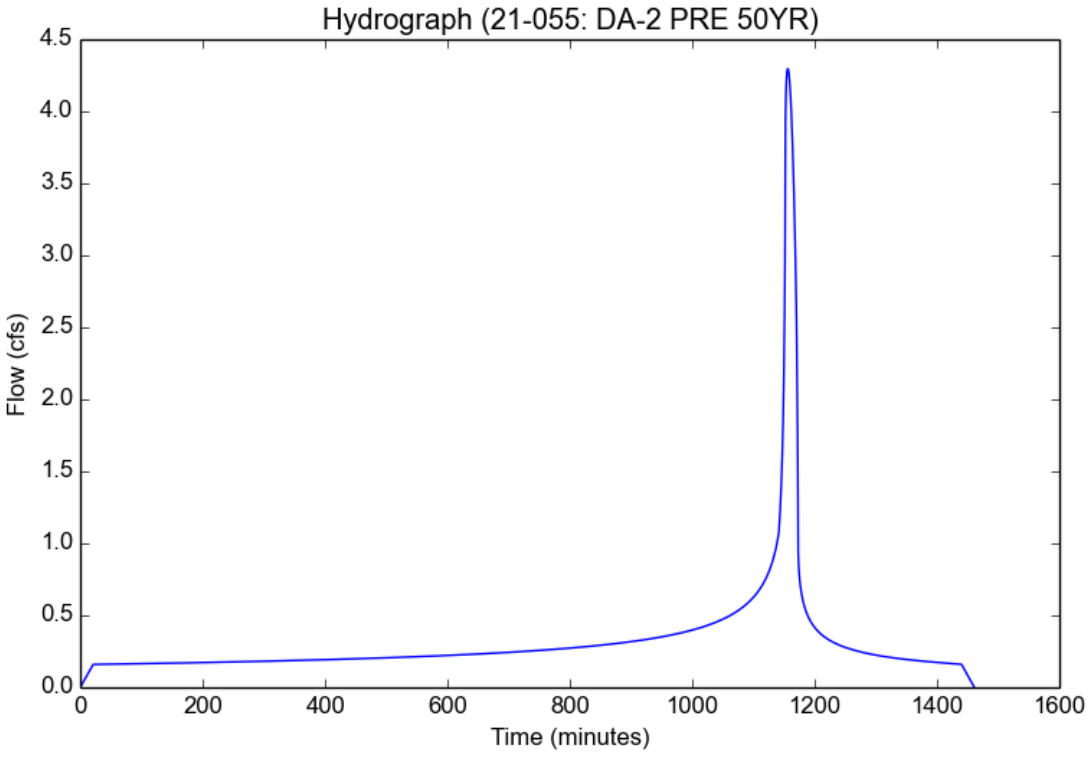
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-2 PRE 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-2 PRE 50YR
Area (ac)	5.76
Flow Path Length (ft)	1241.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.104
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	2.0667
Undeveloped Runoff Coefficient (Cu)	0.2984
Developed Runoff Coefficient (Cd)	0.361
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	4.297
Burned Peak Flow Rate (cfs)	4.297
24-Hr Clear Runoff Volume (ac-ft)	0.6463
24-Hr Clear Runoff Volume (cu-ft)	28152.2205



Peak Flow Hydrologic Analysis

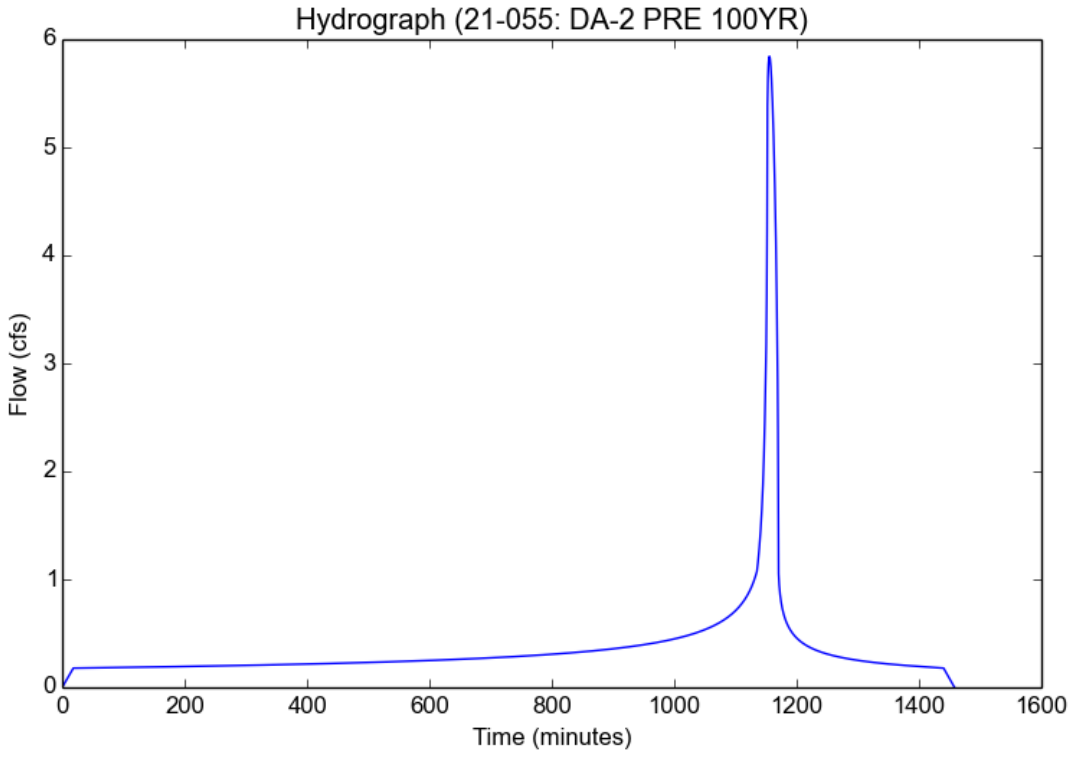
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-2 PRE 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-2 PRE 100YR
Area (ac)	5.76
Flow Path Length (ft)	1241.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.104
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	2.4931
Undeveloped Runoff Coefficient (Cu)	0.3497
Developed Runoff Coefficient (Cd)	0.4069
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	5.8432
Burned Peak Flow Rate (cfs)	5.8432
24-Hr Clear Runoff Volume (ac-ft)	0.7416
24-Hr Clear Runoff Volume (cu-ft)	32302.0554



Peak Flow Hydrologic Analysis

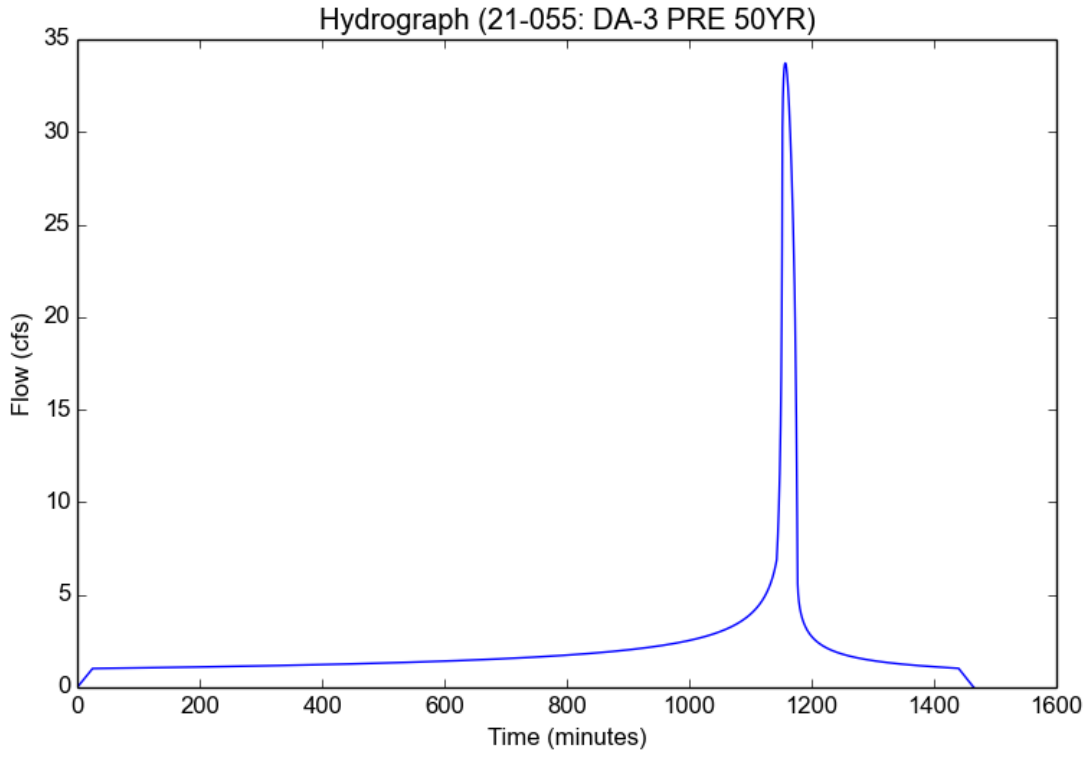
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-3 PRE 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-3 PRE 50YR
Area (ac)	62.56
Flow Path Length (ft)	2160.0
Flow Path Slope (vft/hft)	0.066
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.01
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	1.9041
Undeveloped Runoff Coefficient (Cu)	0.2769
Developed Runoff Coefficient (Cd)	0.2831
Time of Concentration (min)	25.0
Clear Peak Flow Rate (cfs)	33.7213
Burned Peak Flow Rate (cfs)	33.7213
24-Hr Clear Runoff Volume (ac-ft)	4.3933
24-Hr Clear Runoff Volume (cu-ft)	191373.0956



Peak Flow Hydrologic Analysis

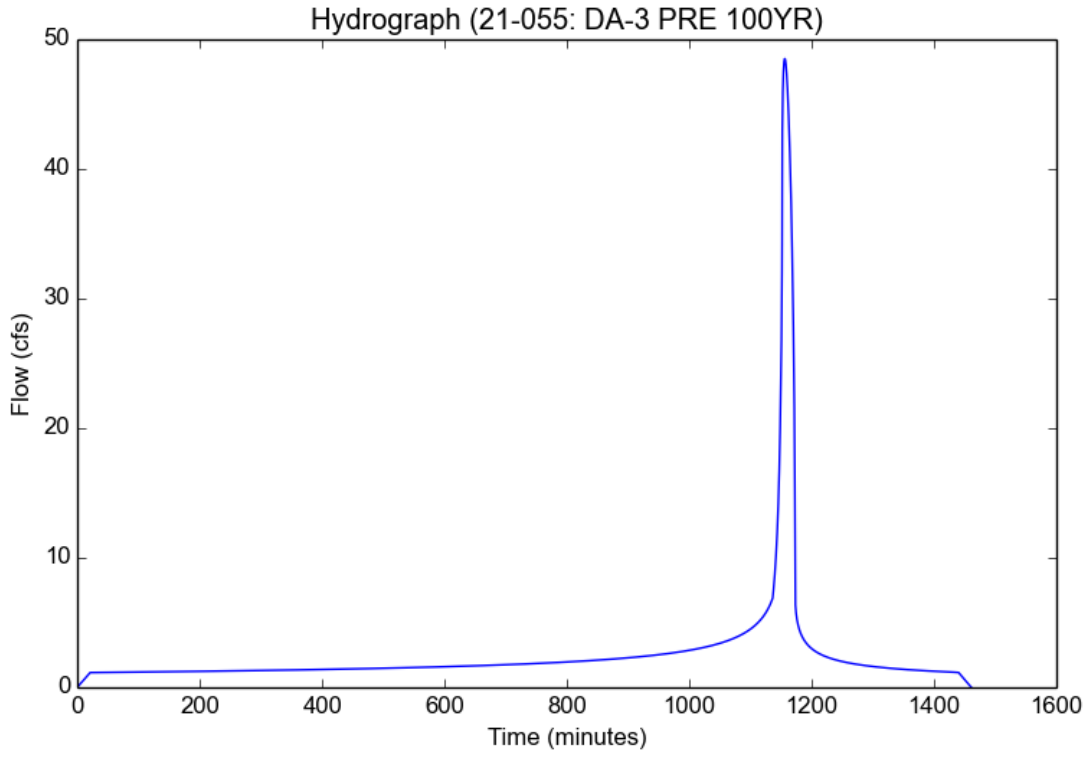
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-3 PRE 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-3 PRE 100YR
Area (ac)	62.56
Flow Path Length (ft)	2160.0
Flow Path Slope (vft/hft)	0.066
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.01
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	2.3189
Undeveloped Runoff Coefficient (Cu)	0.3287
Developed Runoff Coefficient (Cd)	0.3344
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	48.5141
Burned Peak Flow Rate (cfs)	48.5141
24-Hr Clear Runoff Volume (ac-ft)	5.1386
24-Hr Clear Runoff Volume (cu-ft)	223838.9512



Peak Flow Hydrologic Analysis

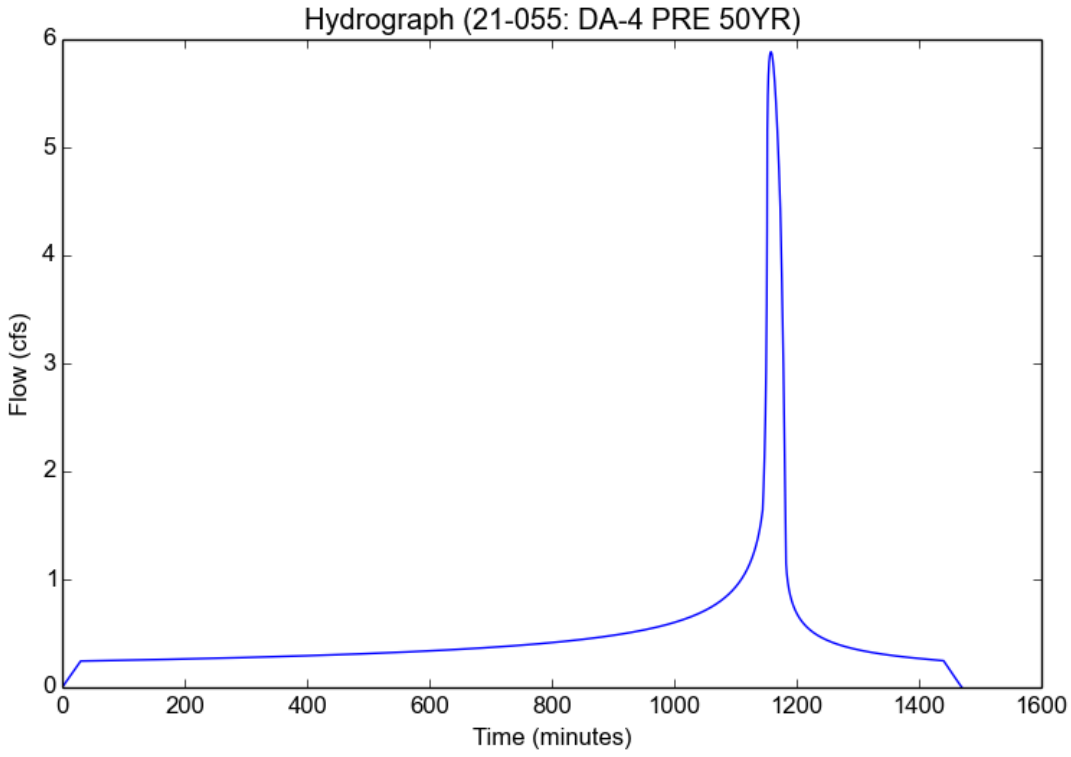
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-4 PRE 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-4 PRE 50YR
Area (ac)	11.86
Flow Path Length (ft)	2629.0
Flow Path Slope (vft/hft)	0.033
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.045
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	1.7478
Undeveloped Runoff Coefficient (Cu)	0.2548
Developed Runoff Coefficient (Cd)	0.2838
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	5.8836
Burned Peak Flow Rate (cfs)	5.8836
24-Hr Clear Runoff Volume (ac-ft)	1.0062
24-Hr Clear Runoff Volume (cu-ft)	43831.934



Peak Flow Hydrologic Analysis

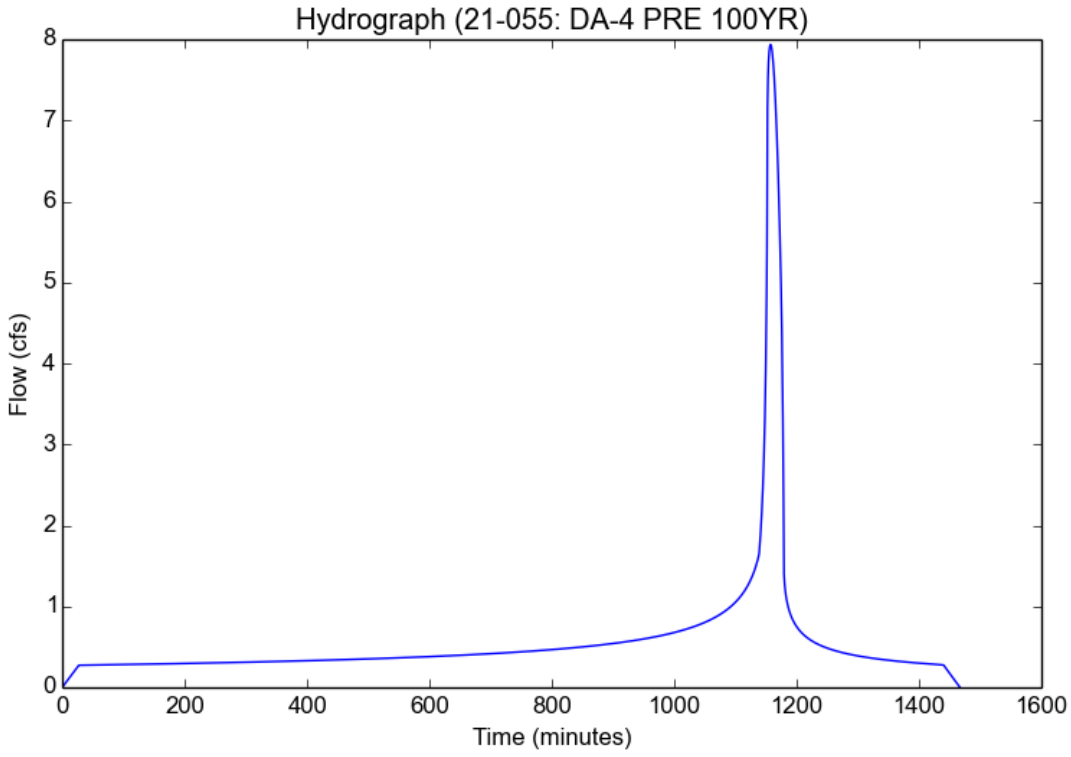
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-4 PRE 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-4 PRE 100YR
Area (ac)	11.86
Flow Path Length (ft)	2629.0
Flow Path Slope (vft/hft)	0.033
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.045
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	2.0605
Undeveloped Runoff Coefficient (Cu)	0.2976
Developed Runoff Coefficient (Cd)	0.3247
Time of Concentration (min)	27.0
Clear Peak Flow Rate (cfs)	7.9362
Burned Peak Flow Rate (cfs)	7.9362
24-Hr Clear Runoff Volume (ac-ft)	1.166
24-Hr Clear Runoff Volume (cu-ft)	50793.0824



POST DEVELOPEMENT CALCULATIONS

Peak Flow Hydrologic Analysis

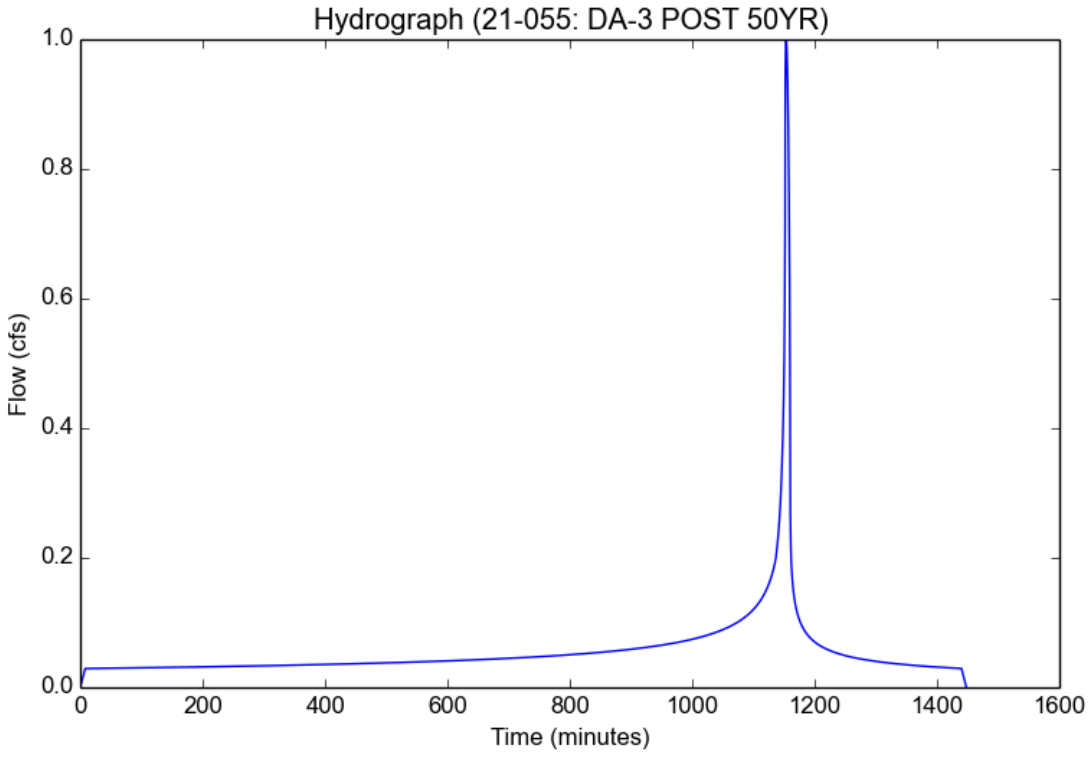
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-3 POST 50 YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-3 POST 50YR
Area (ac)	0.517
Flow Path Length (ft)	460.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.342
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.2529
Undeveloped Runoff Coefficient (Cu)	0.4348
Developed Runoff Coefficient (Cd)	0.5939
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.9988
Burned Peak Flow Rate (cfs)	0.9988
24-Hr Clear Runoff Volume (ac-ft)	0.113
24-Hr Clear Runoff Volume (cu-ft)	4922.4216



Peak Flow Hydrologic Analysis

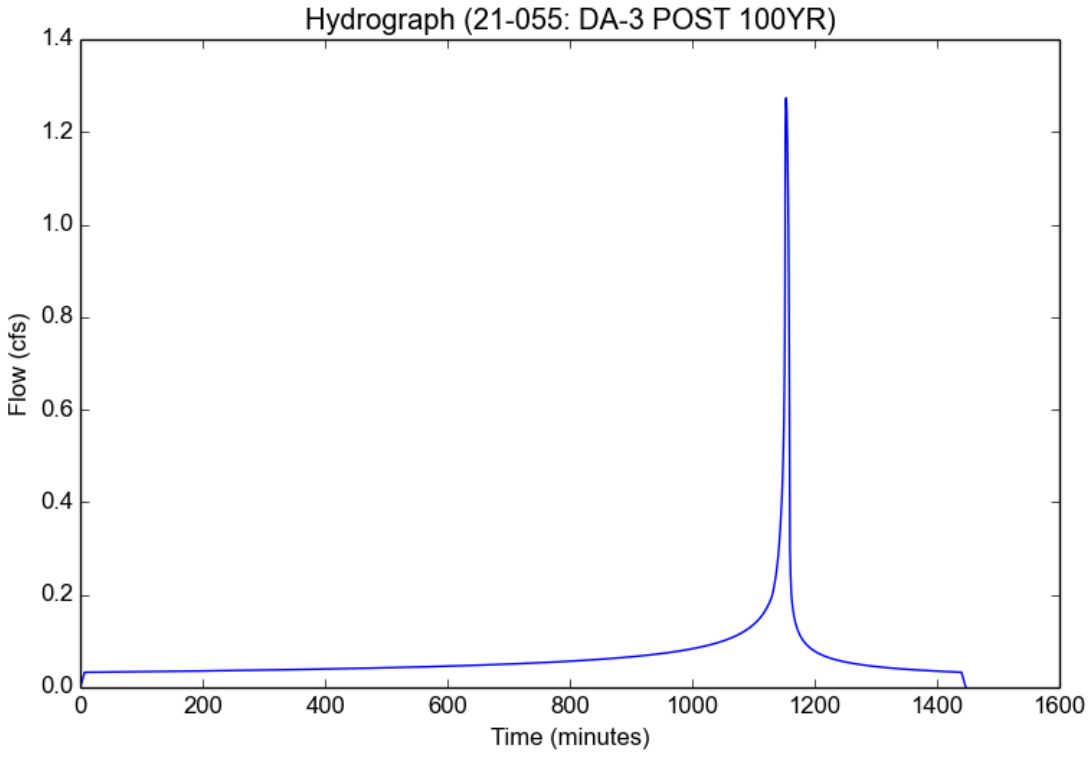
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-3 POST 100 YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-3 POST 100YR
Area (ac)	0.517
Flow Path Length (ft)	460.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.342
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	3.8862
Undeveloped Runoff Coefficient (Cu)	0.4954
Developed Runoff Coefficient (Cd)	0.6338
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	1.2733
Burned Peak Flow Rate (cfs)	1.2733
24-Hr Clear Runoff Volume (ac-ft)	0.1278
24-Hr Clear Runoff Volume (cu-ft)	5568.6477



Peak Flow Hydrologic Analysis

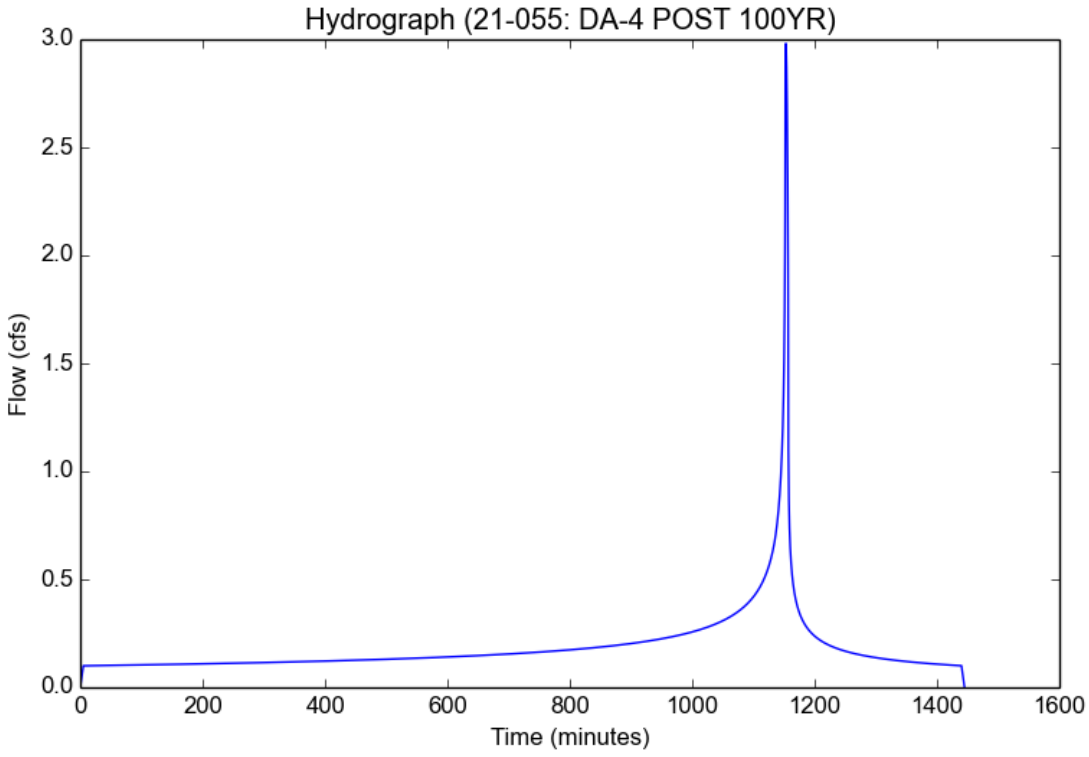
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-4 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-4 POST 100YR
Area (ac)	0.89
Flow Path Length (ft)	249.0
Flow Path Slope (vft/hft)	0.007
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.809
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8256
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.9812
Burned Peak Flow Rate (cfs)	2.9812
24-Hr Clear Runoff Volume (ac-ft)	0.3761
24-Hr Clear Runoff Volume (cu-ft)	16383.8829



Peak Flow Hydrologic Analysis

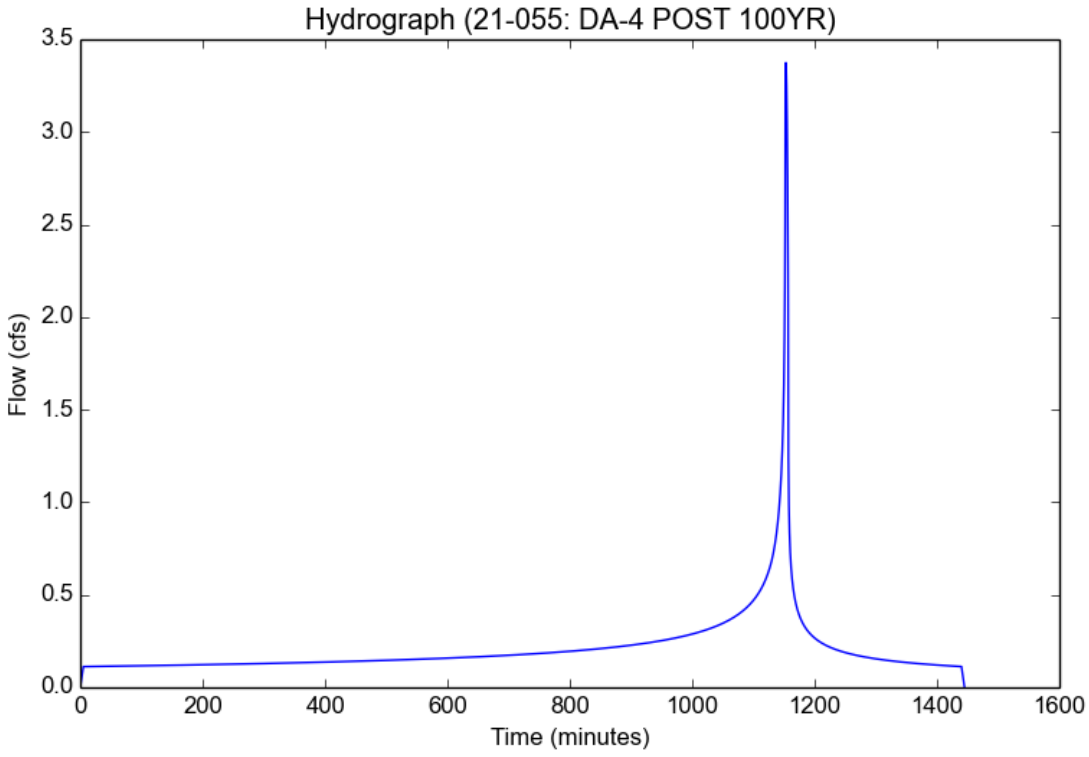
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-4 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-4 POST 100YR
Area (ac)	0.89
Flow Path Length (ft)	249.0
Flow Path Slope (vft/hft)	0.007
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.809
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.552
Undeveloped Runoff Coefficient (Cu)	0.5486
Developed Runoff Coefficient (Cd)	0.8329
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.3742
Burned Peak Flow Rate (cfs)	3.3742
24-Hr Clear Runoff Volume (ac-ft)	0.4225
24-Hr Clear Runoff Volume (cu-ft)	18402.925



Peak Flow Hydrologic Analysis

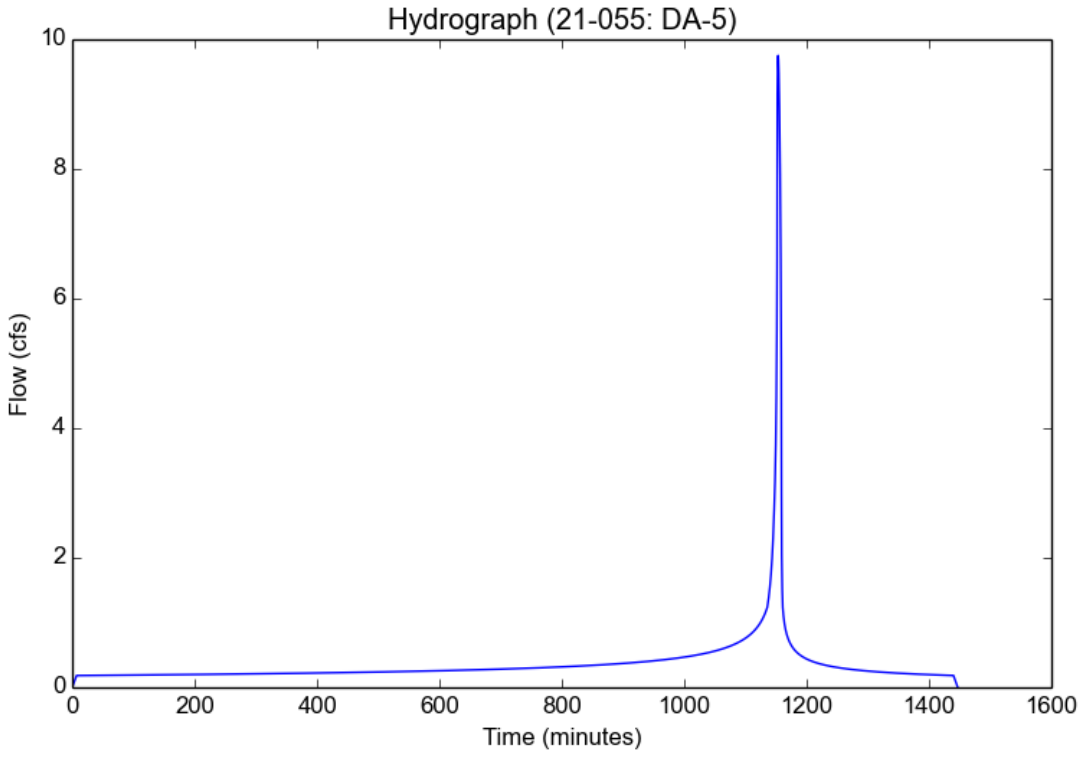
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-5 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-5
Area (ac)	5.36
Flow Path Length (ft)	676.0
Flow Path Slope (vft/hft)	0.097
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.158
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.4636
Undeveloped Runoff Coefficient (Cu)	0.455
Developed Runoff Coefficient (Cd)	0.5253
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	9.7518
Burned Peak Flow Rate (cfs)	9.7518
24-Hr Clear Runoff Volume (ac-ft)	0.7424
24-Hr Clear Runoff Volume (cu-ft)	32338.522



Peak Flow Hydrologic Analysis

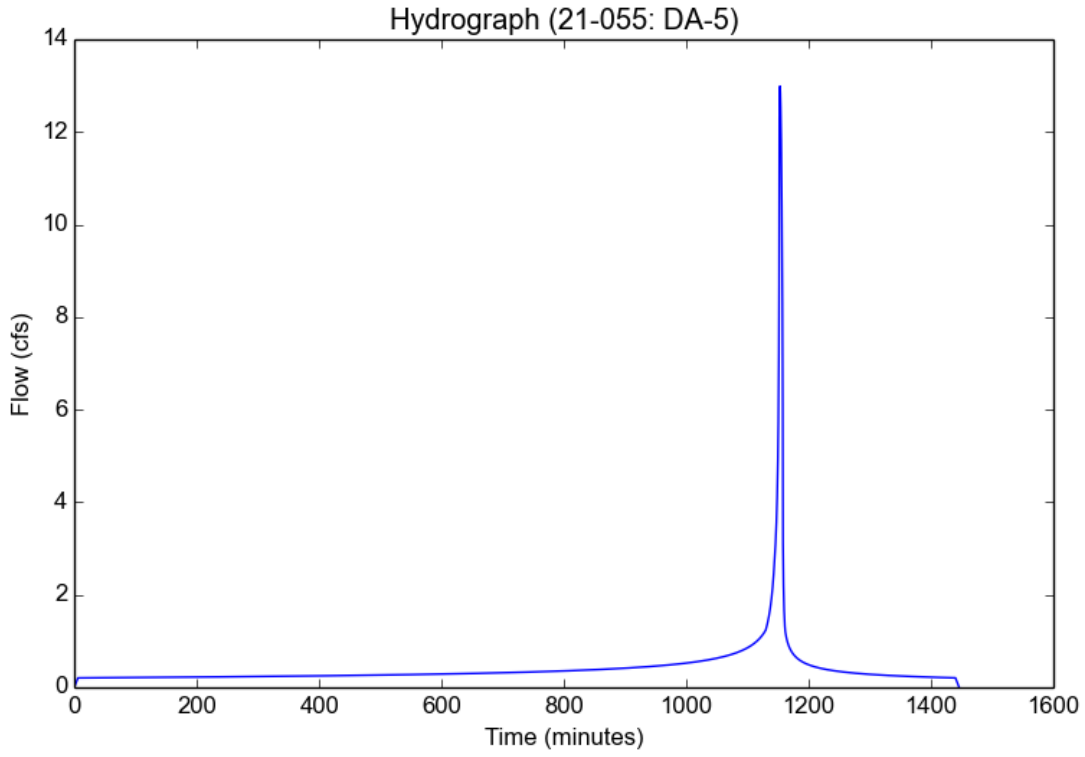
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-5 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-5
Area (ac)	5.36
Flow Path Length (ft)	676.0
Flow Path Slope (vft/hft)	0.097
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.158
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.1782
Undeveloped Runoff Coefficient (Cu)	0.5199
Developed Runoff Coefficient (Cd)	0.58
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	12.9885
Burned Peak Flow Rate (cfs)	12.9885
24-Hr Clear Runoff Volume (ac-ft)	0.8472
24-Hr Clear Runoff Volume (cu-ft)	36903.0075



Peak Flow Hydrologic Analysis

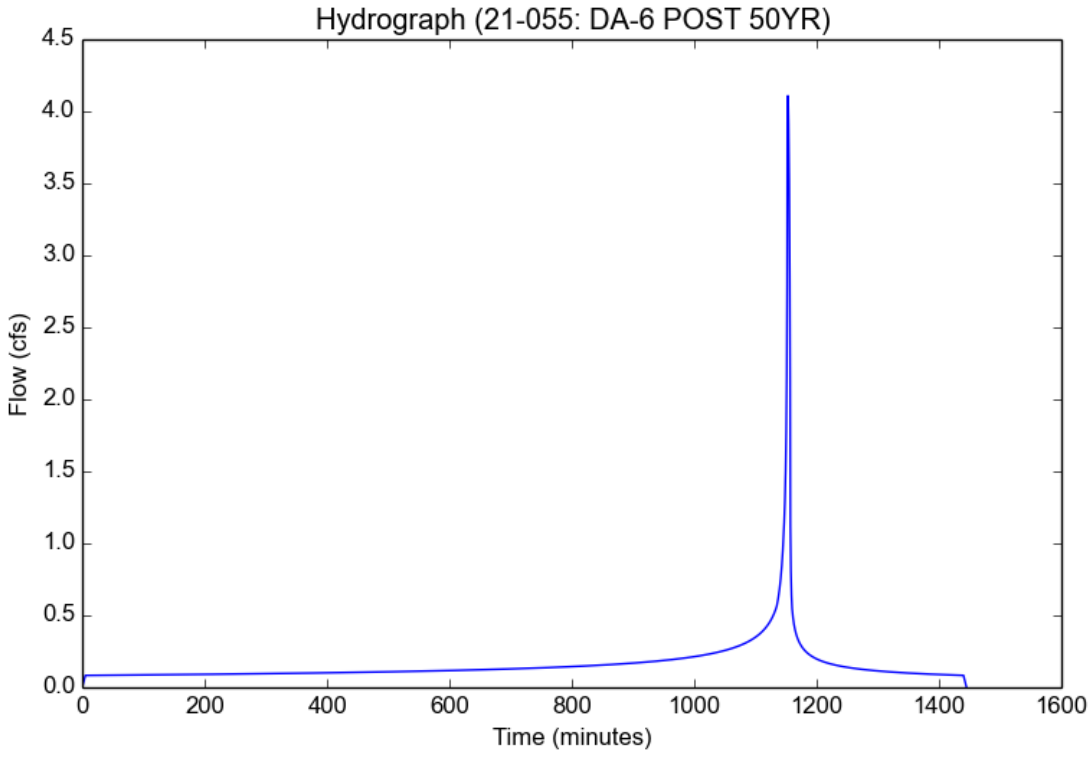
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-6 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-6 POST 50YR
Area (ac)	1.61
Flow Path Length (ft)	482.0
Flow Path Slope (vft/hft)	0.129
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.304
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.629
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.1086
Burned Peak Flow Rate (cfs)	4.1086
24-Hr Clear Runoff Volume (ac-ft)	0.3263
24-Hr Clear Runoff Volume (cu-ft)	14215.2137



Peak Flow Hydrologic Analysis

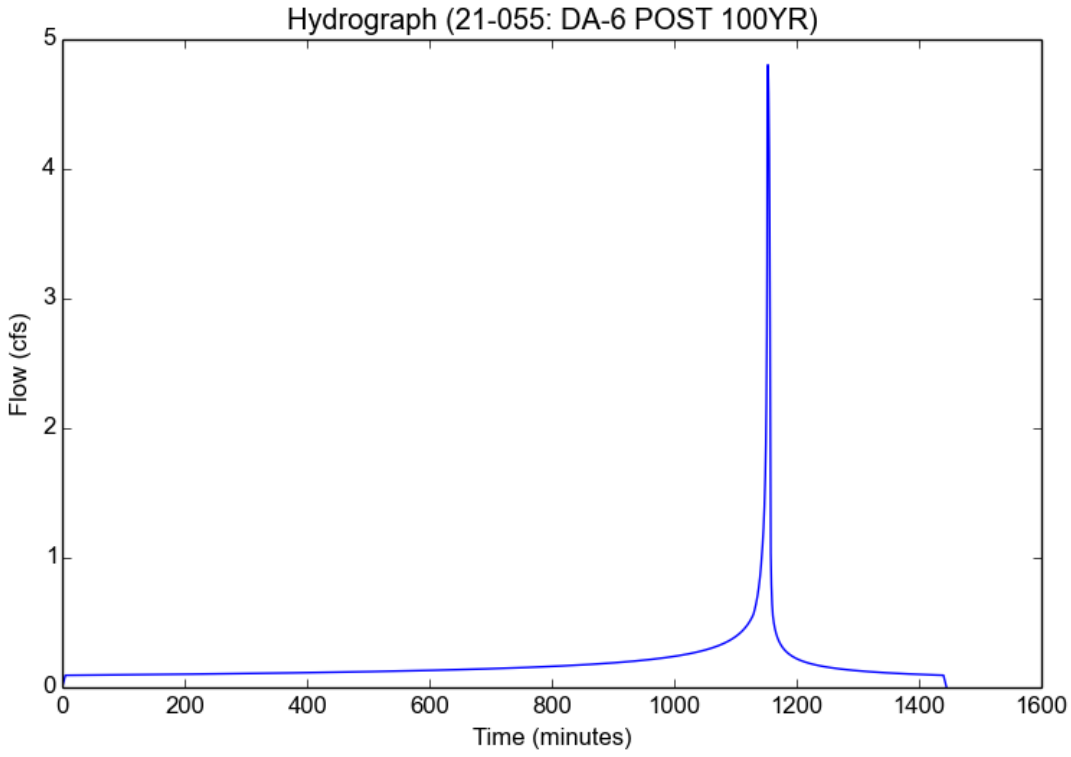
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-6 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-6 POST 100YR
Area (ac)	1.61
Flow Path Length (ft)	482.0
Flow Path Slope (vft/hft)	0.129
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.304
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.552
Undeveloped Runoff Coefficient (Cu)	0.5486
Developed Runoff Coefficient (Cd)	0.6554
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.8033
Burned Peak Flow Rate (cfs)	4.8033
24-Hr Clear Runoff Volume (ac-ft)	0.3692
24-Hr Clear Runoff Volume (cu-ft)	16082.6818



Peak Flow Hydrologic Analysis

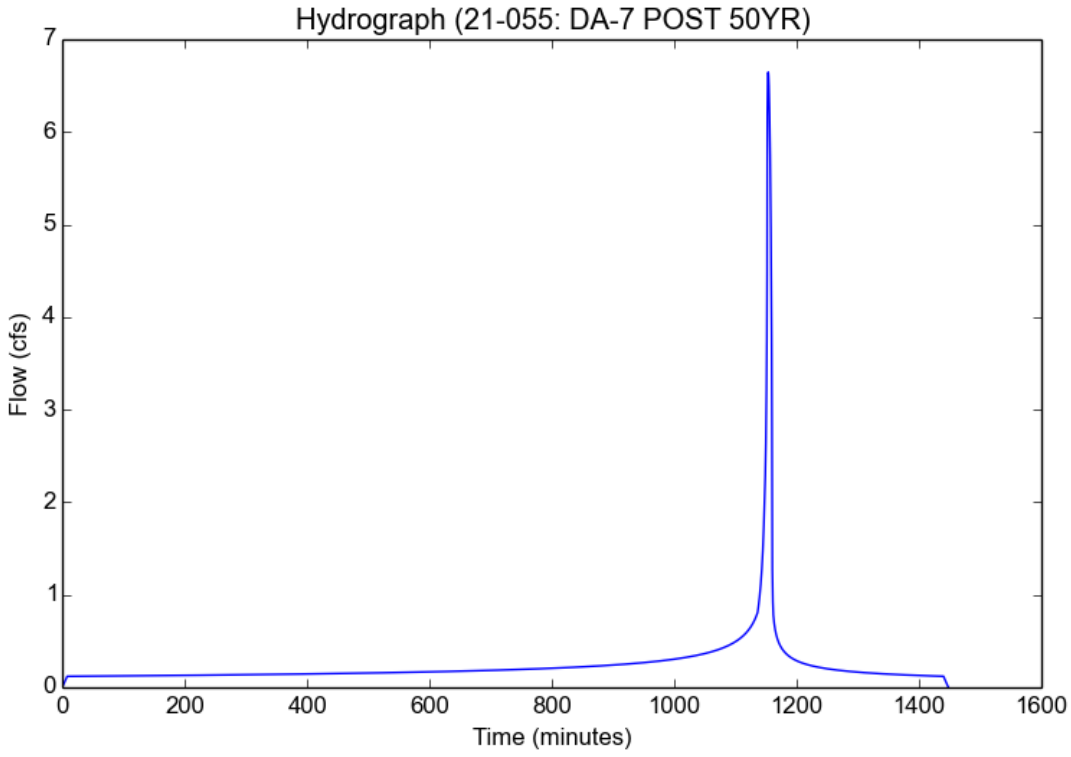
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-7 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-7 POST 50YR
Area (ac)	4.2
Flow Path Length (ft)	454.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.111
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.2529
Undeveloped Runoff Coefficient (Cu)	0.4348
Developed Runoff Coefficient (Cd)	0.4864
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	6.646
Burned Peak Flow Rate (cfs)	6.646
24-Hr Clear Runoff Volume (ac-ft)	0.4945
24-Hr Clear Runoff Volume (cu-ft)	21541.8131



Peak Flow Hydrologic Analysis

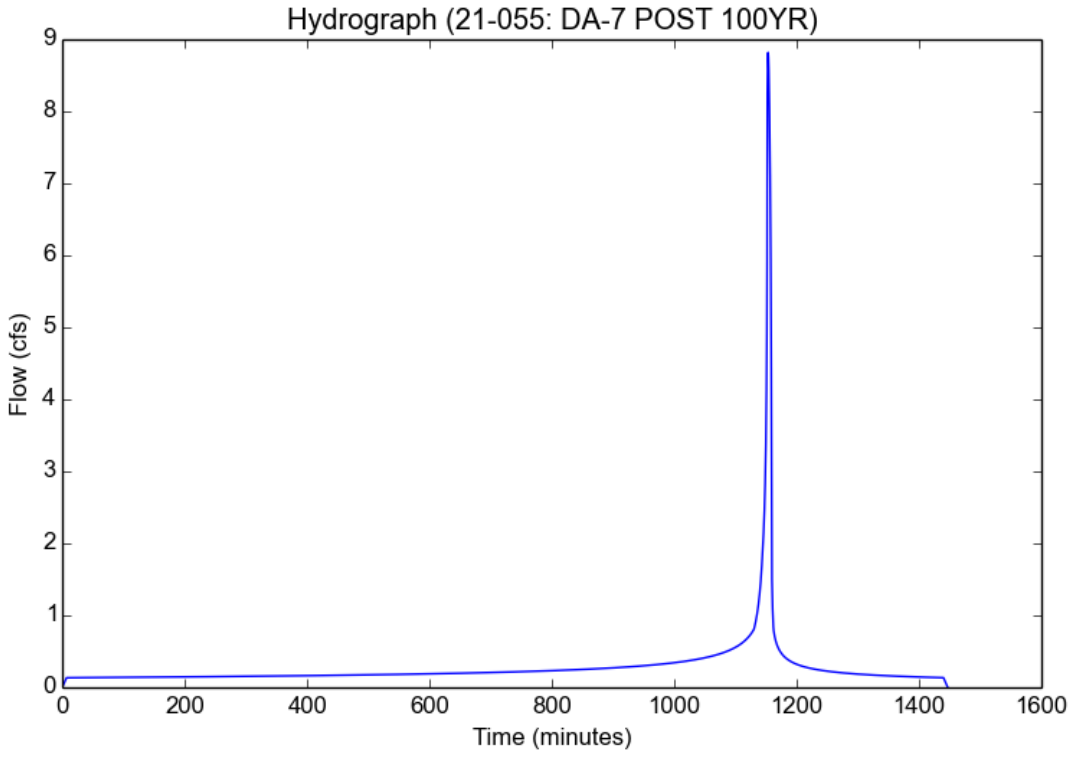
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-7 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-7 POST 100YR
Area (ac)	4.2
Flow Path Length (ft)	454.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.111
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	3.8862
Undeveloped Runoff Coefficient (Cu)	0.4954
Developed Runoff Coefficient (Cd)	0.5403
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	8.8186
Burned Peak Flow Rate (cfs)	8.8186
24-Hr Clear Runoff Volume (ac-ft)	0.5664
24-Hr Clear Runoff Volume (cu-ft)	24671.4103



Peak Flow Hydrologic Analysis

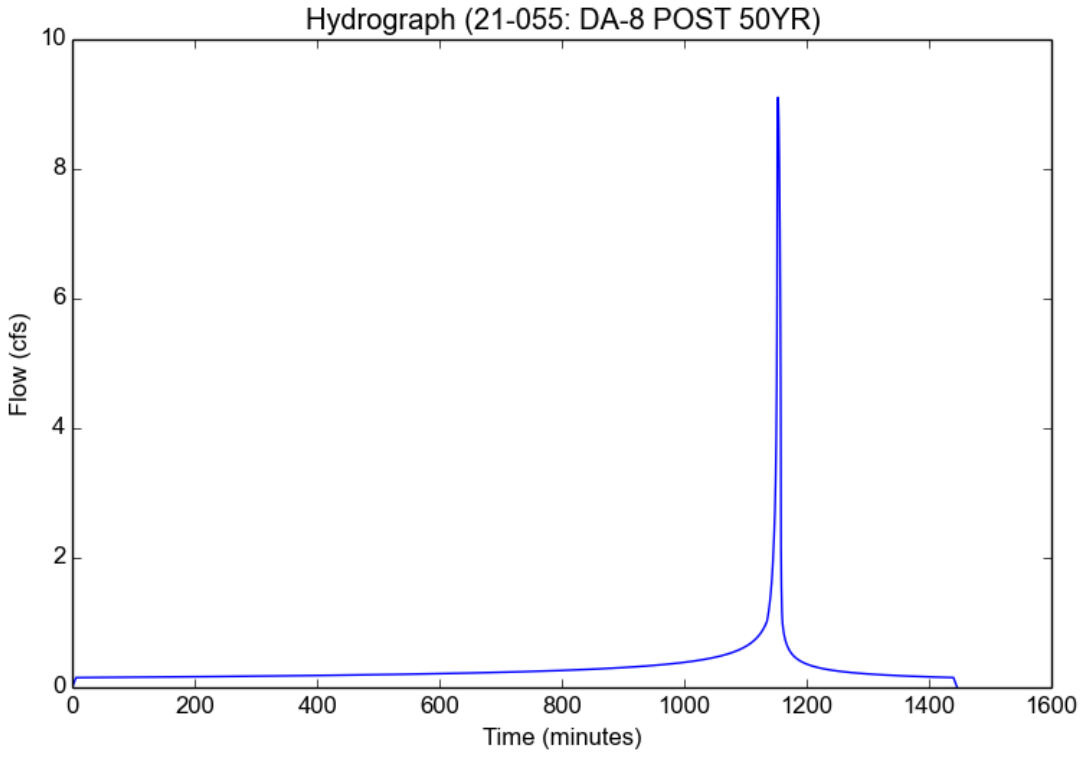
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-8 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-8 POST 50YR
Area (ac)	4.49
Flow Path Length (ft)	529.0
Flow Path Slope (vft/hft)	0.115
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.154
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.7239
Undeveloped Runoff Coefficient (Cu)	0.4799
Developed Runoff Coefficient (Cd)	0.5446
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	9.1051
Burned Peak Flow Rate (cfs)	9.1051
24-Hr Clear Runoff Volume (ac-ft)	0.6153
24-Hr Clear Runoff Volume (cu-ft)	26803.3439



Peak Flow Hydrologic Analysis

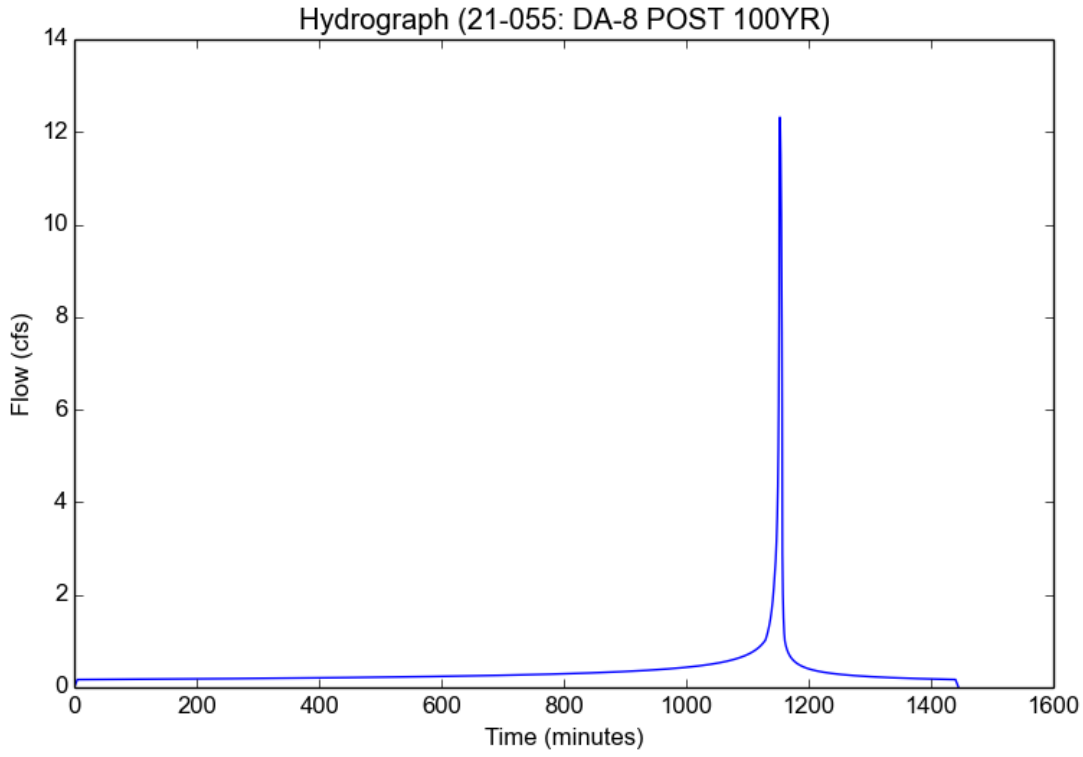
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-8 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-8 POST 100YR
Area (ac)	4.49
Flow Path Length (ft)	529.0
Flow Path Slope (vft/hft)	0.115
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.154
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.552
Undeveloped Runoff Coefficient (Cu)	0.5486
Developed Runoff Coefficient (Cd)	0.6027
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	12.318
Burned Peak Flow Rate (cfs)	12.318
24-Hr Clear Runoff Volume (ac-ft)	0.7024
24-Hr Clear Runoff Volume (cu-ft)	30597.2411



Peak Flow Hydrologic Analysis

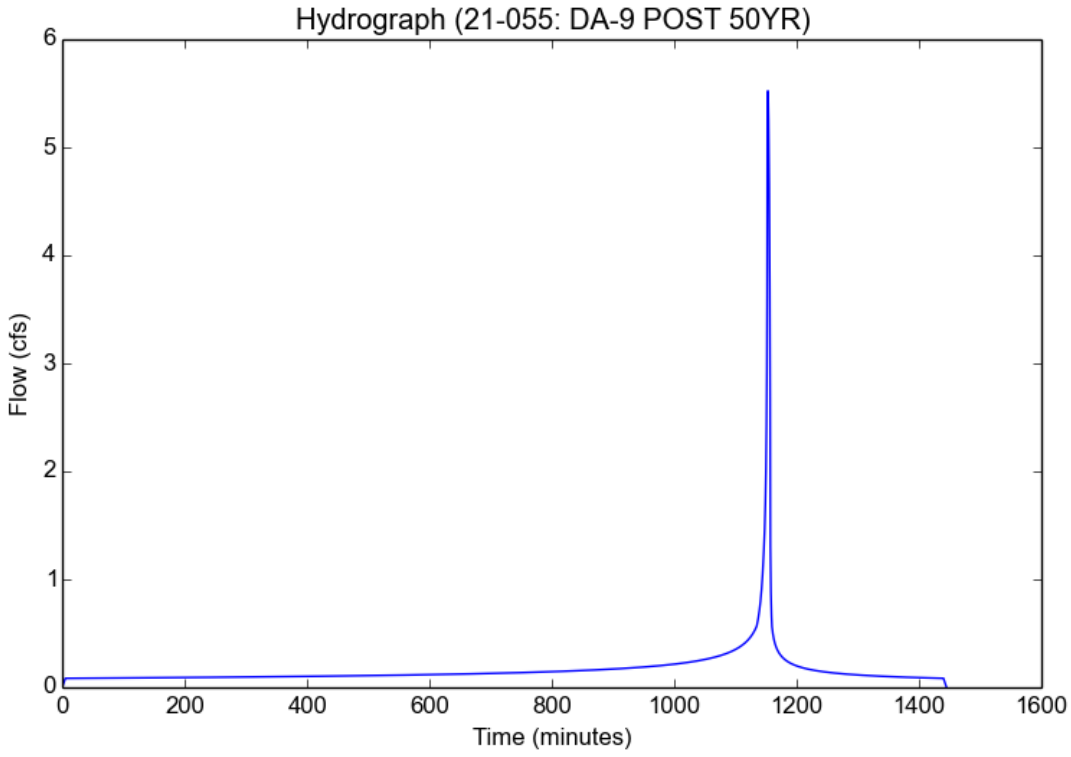
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-9 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-9 POST 50YR
Area (ac)	2.36
Flow Path Length (ft)	468.0
Flow Path Slope (vft/hft)	0.126
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.17
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.5768
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.5229
Burned Peak Flow Rate (cfs)	5.5229
24-Hr Clear Runoff Volume (ac-ft)	0.3406
24-Hr Clear Runoff Volume (cu-ft)	14838.3341



Peak Flow Hydrologic Analysis

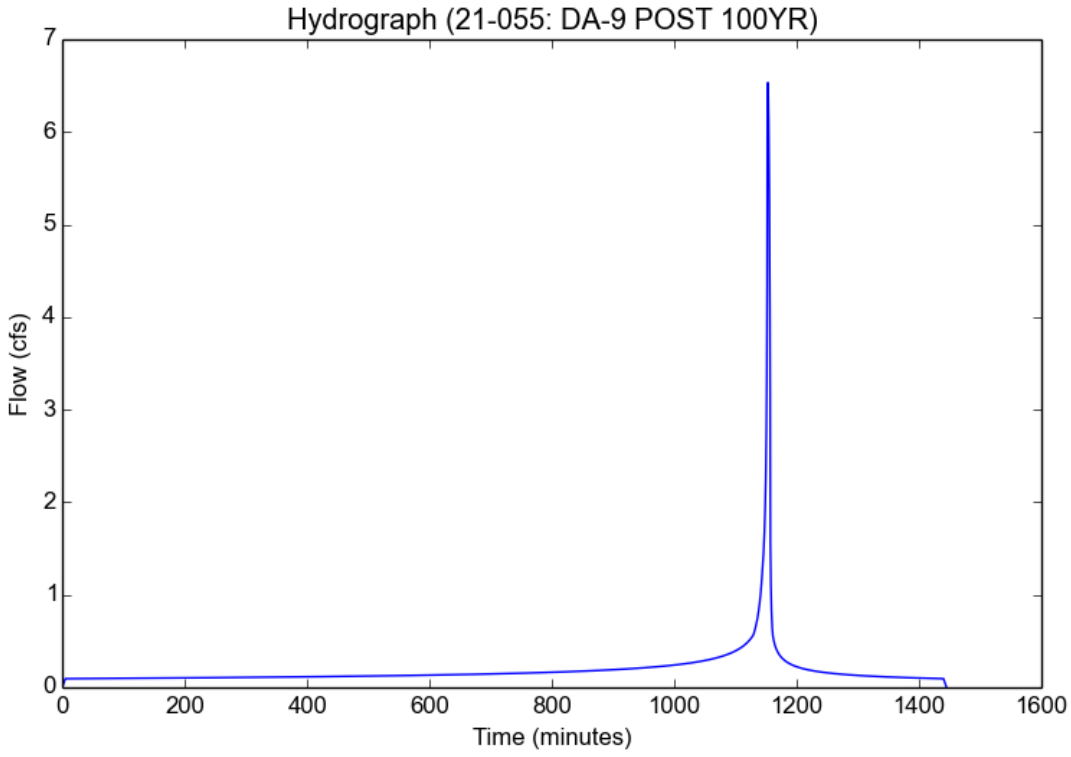
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-9 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-9 POST 100YR
Area (ac)	2.36
Flow Path Length (ft)	468.0
Flow Path Slope (vft/hft)	0.126
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.17
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.552
Undeveloped Runoff Coefficient (Cu)	0.5486
Developed Runoff Coefficient (Cd)	0.6083
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.5349
Burned Peak Flow Rate (cfs)	6.5349
24-Hr Clear Runoff Volume (ac-ft)	0.3875
24-Hr Clear Runoff Volume (cu-ft)	16881.4726



Peak Flow Hydrologic Analysis

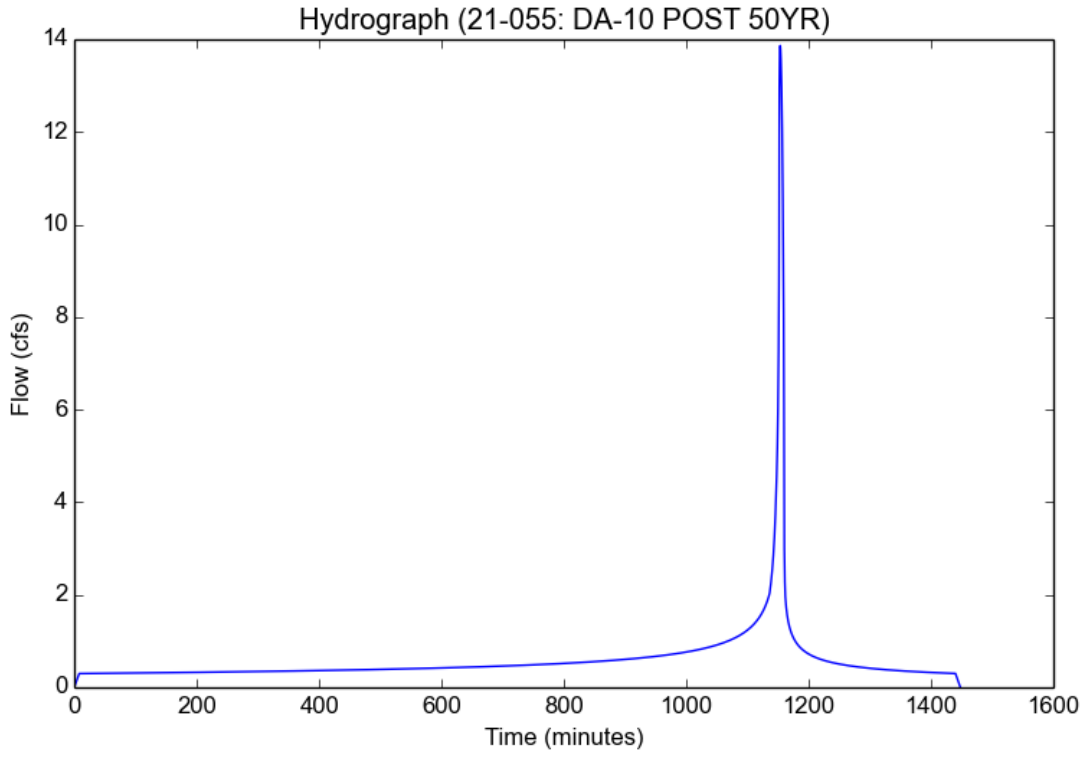
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-10 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-10 POST 50YR
Area (ac)	8.25
Flow Path Length (ft)	553.0
Flow Path Slope (vft/hft)	0.041
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.176
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.2529
Undeveloped Runoff Coefficient (Cu)	0.4348
Developed Runoff Coefficient (Cd)	0.5167
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	13.866
Burned Peak Flow Rate (cfs)	13.866
24-Hr Clear Runoff Volume (ac-ft)	1.2055
24-Hr Clear Runoff Volume (cu-ft)	52510.2729



Peak Flow Hydrologic Analysis

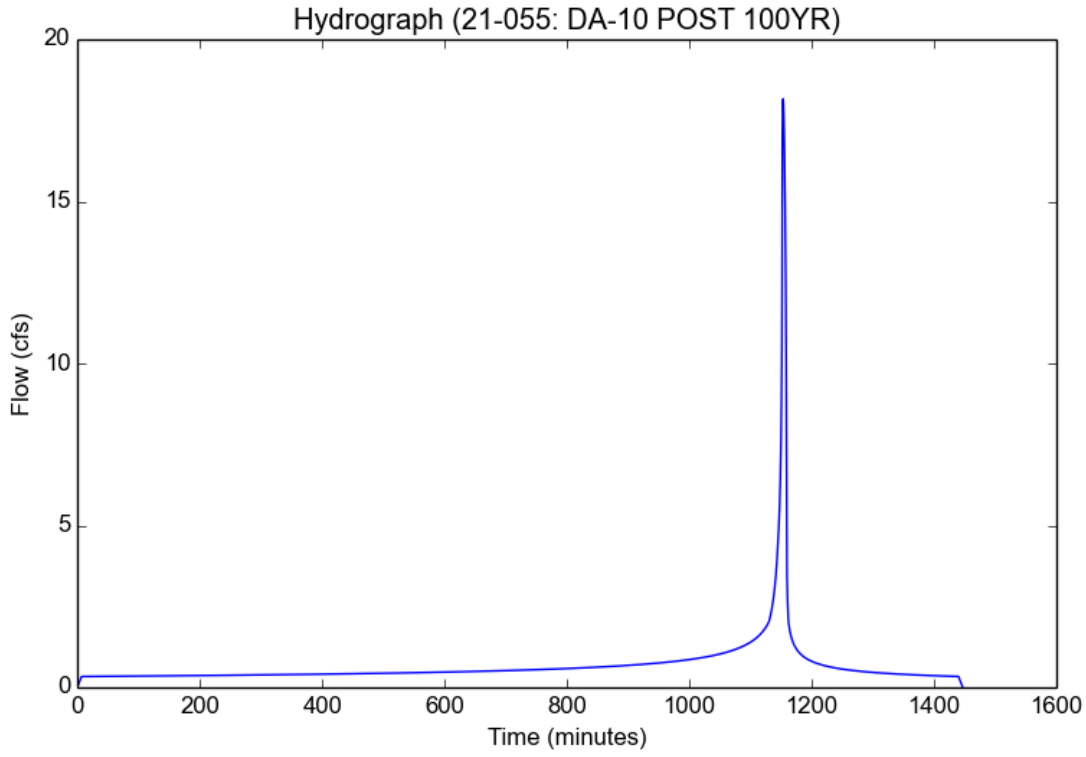
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-10 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-10 POST 100YR
Area (ac)	8.25
Flow Path Length (ft)	553.0
Flow Path Slope (vft/hft)	0.041
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.176
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	3.8862
Undeveloped Runoff Coefficient (Cu)	0.4954
Developed Runoff Coefficient (Cd)	0.5666
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	18.1655
Burned Peak Flow Rate (cfs)	18.1655
24-Hr Clear Runoff Volume (ac-ft)	1.3735
24-Hr Clear Runoff Volume (cu-ft)	59829.5798



Peak Flow Hydrologic Analysis

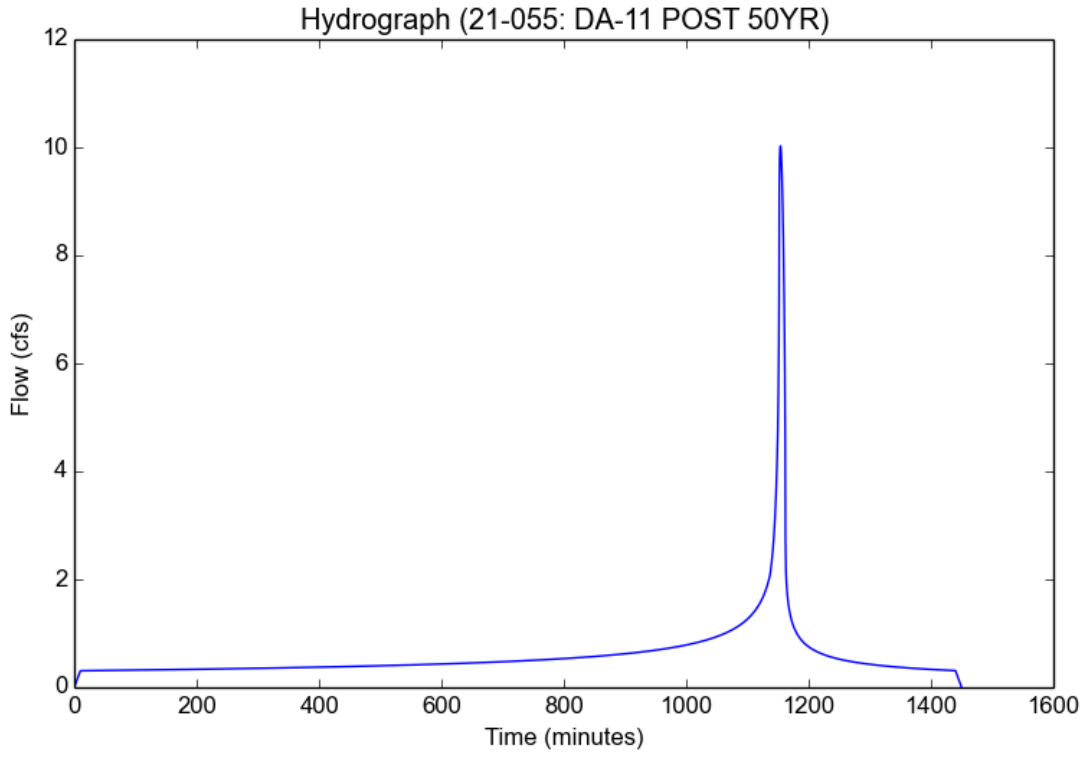
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-11 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-11 POST 50YR
Area (ac)	6.32
Flow Path Length (ft)	782.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.28
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	2.9291
Undeveloped Runoff Coefficient (Cu)	0.4021
Developed Runoff Coefficient (Cd)	0.5415
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	10.0241
Burned Peak Flow Rate (cfs)	10.0241
24-Hr Clear Runoff Volume (ac-ft)	1.2078
24-Hr Clear Runoff Volume (cu-ft)	52612.2833



Peak Flow Hydrologic Analysis

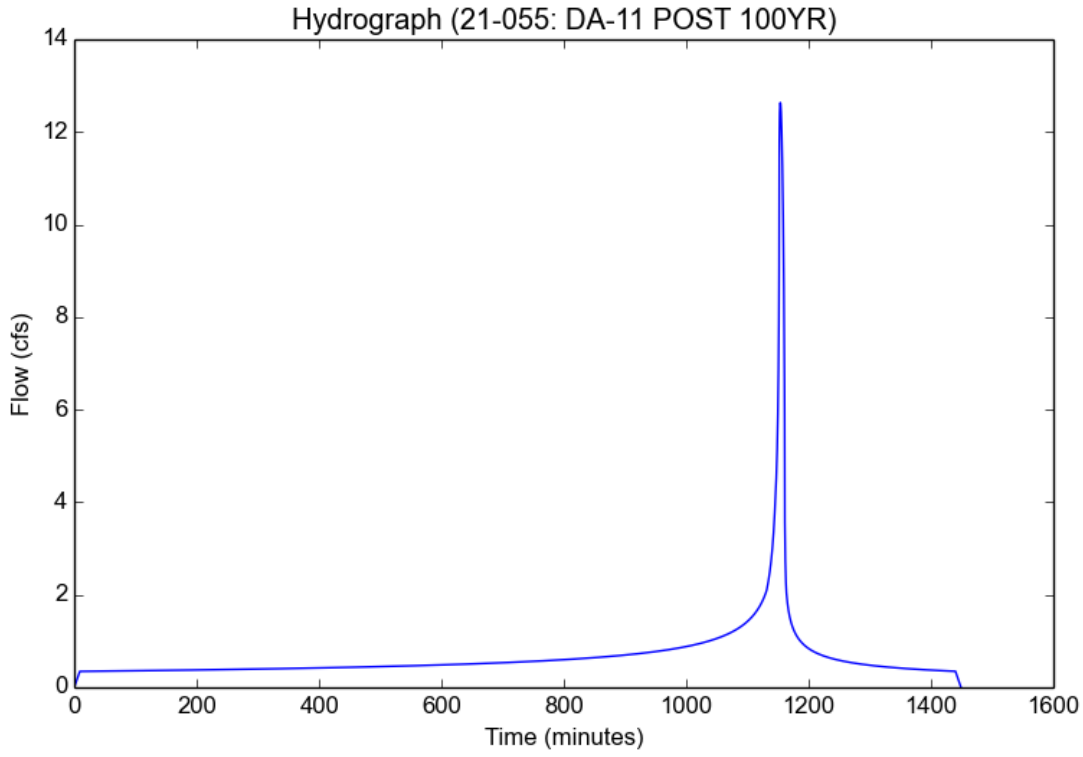
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-11 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-11 POST 100YR
Area (ac)	6.32
Flow Path Length (ft)	782.0
Flow Path Slope (vft/hft)	0.022
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.28
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	3.4532
Undeveloped Runoff Coefficient (Cu)	0.454
Developed Runoff Coefficient (Cd)	0.5789
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	12.6332
Burned Peak Flow Rate (cfs)	12.6332
24-Hr Clear Runoff Volume (ac-ft)	1.3689
24-Hr Clear Runoff Volume (cu-ft)	59629.2852



Peak Flow Hydrologic Analysis

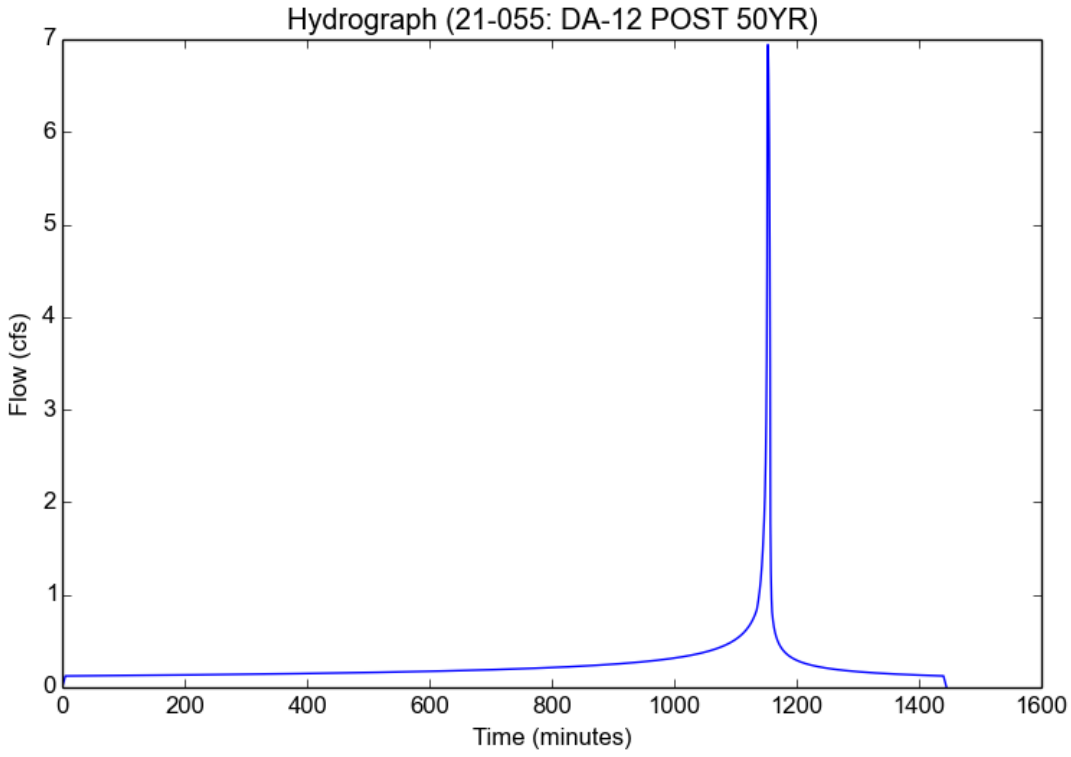
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-12 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-12 POST 50YR
Area (ac)	2.84
Flow Path Length (ft)	323.0
Flow Path Slope (vft/hft)	0.082
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.236
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.6025
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.9423
Burned Peak Flow Rate (cfs)	6.9423
24-Hr Clear Runoff Volume (ac-ft)	0.4916
24-Hr Clear Runoff Volume (cu-ft)	21411.9191



Peak Flow Hydrologic Analysis

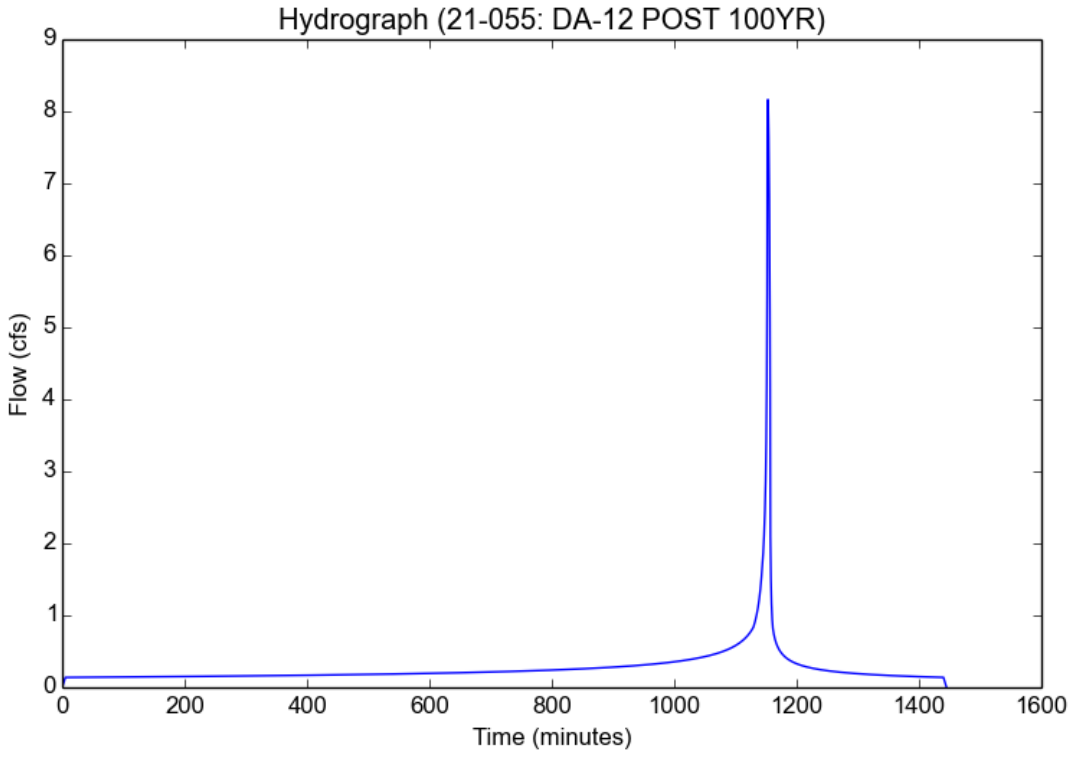
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-12 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-12 POST 100YR
Area (ac)	2.84
Flow Path Length (ft)	323.0
Flow Path Slope (vft/hft)	0.082
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.236
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.552
Undeveloped Runoff Coefficient (Cu)	0.5486
Developed Runoff Coefficient (Cd)	0.6315
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	8.1639
Burned Peak Flow Rate (cfs)	8.1639
24-Hr Clear Runoff Volume (ac-ft)	0.5574
24-Hr Clear Runoff Volume (cu-ft)	24282.1139



Peak Flow Hydrologic Analysis

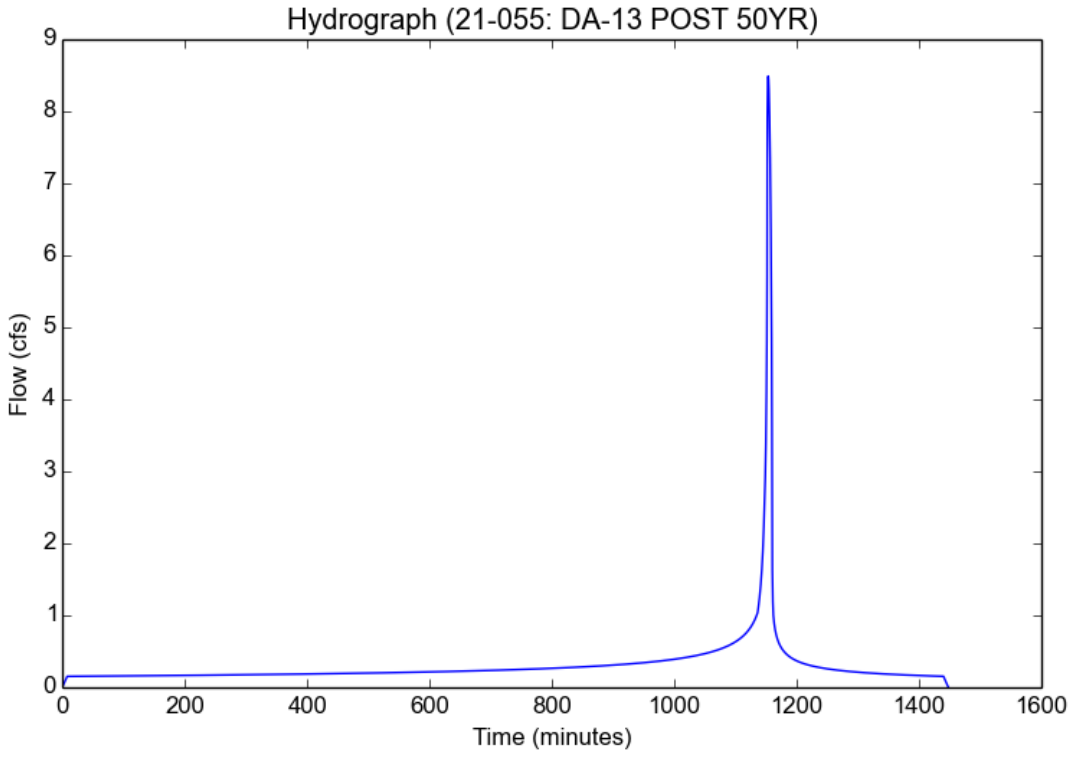
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-13 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-13 POST 50YR
Area (ac)	5.36
Flow Path Length (ft)	737.0
Flow Path Slope (vft/hft)	0.089
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.112
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.2529
Undeveloped Runoff Coefficient (Cu)	0.4348
Developed Runoff Coefficient (Cd)	0.4869
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	8.4896
Burned Peak Flow Rate (cfs)	8.4896
24-Hr Clear Runoff Volume (ac-ft)	0.6335
24-Hr Clear Runoff Volume (cu-ft)	27593.3691



Peak Flow Hydrologic Analysis

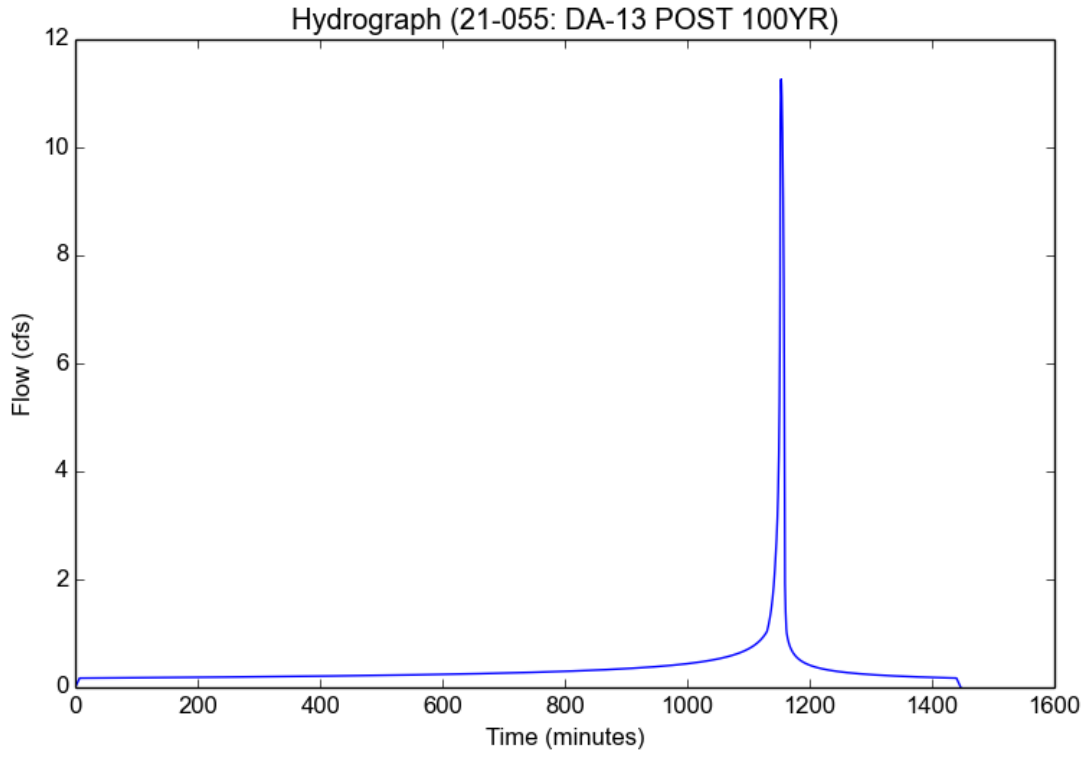
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-13 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-13 POST 100YR
Area (ac)	5.36
Flow Path Length (ft)	737.0
Flow Path Slope (vft/hft)	0.089
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.112
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	3.8862
Undeveloped Runoff Coefficient (Cu)	0.4954
Developed Runoff Coefficient (Cd)	0.5407
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	11.2627
Burned Peak Flow Rate (cfs)	11.2627
24-Hr Clear Runoff Volume (ac-ft)	0.7254
24-Hr Clear Runoff Volume (cu-ft)	31599.0447



Peak Flow Hydrologic Analysis

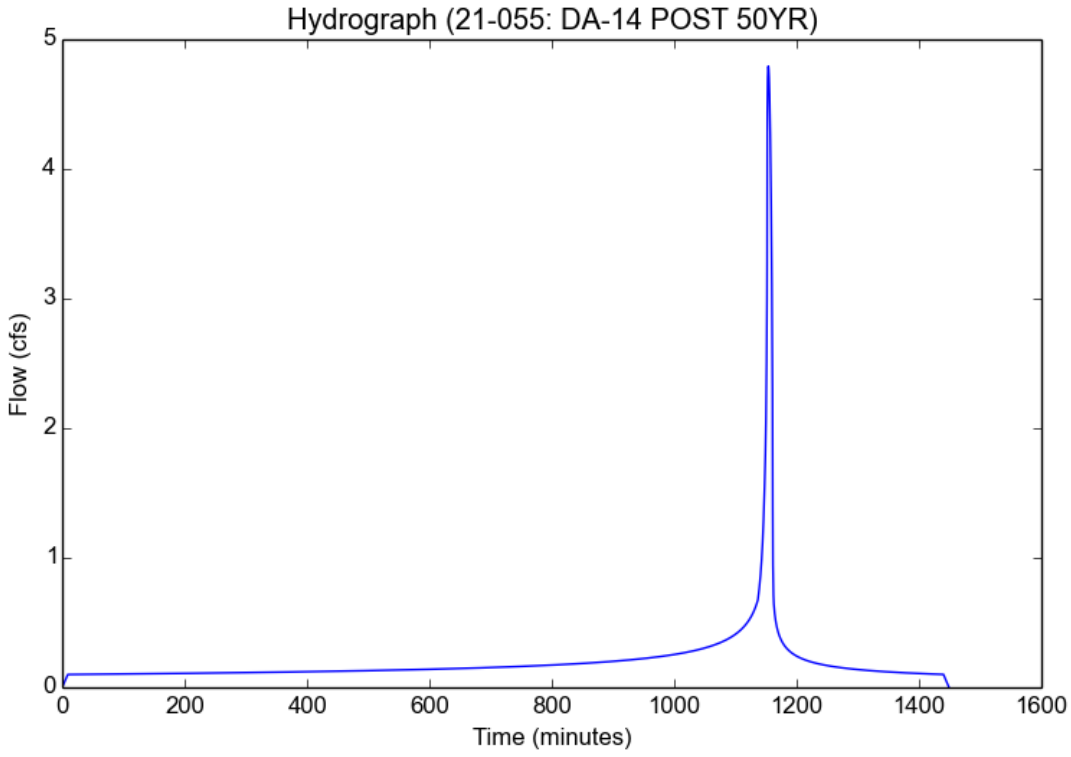
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-14 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-14 POST 50YR
Area (ac)	3.24
Flow Path Length (ft)	829.0
Flow Path Slope (vft/hft)	0.077
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.13
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.0778
Undeveloped Runoff Coefficient (Cu)	0.4181
Developed Runoff Coefficient (Cd)	0.4807
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	4.7936
Burned Peak Flow Rate (cfs)	4.7936
24-Hr Clear Runoff Volume (ac-ft)	0.4076
24-Hr Clear Runoff Volume (cu-ft)	17754.9492



Peak Flow Hydrologic Analysis

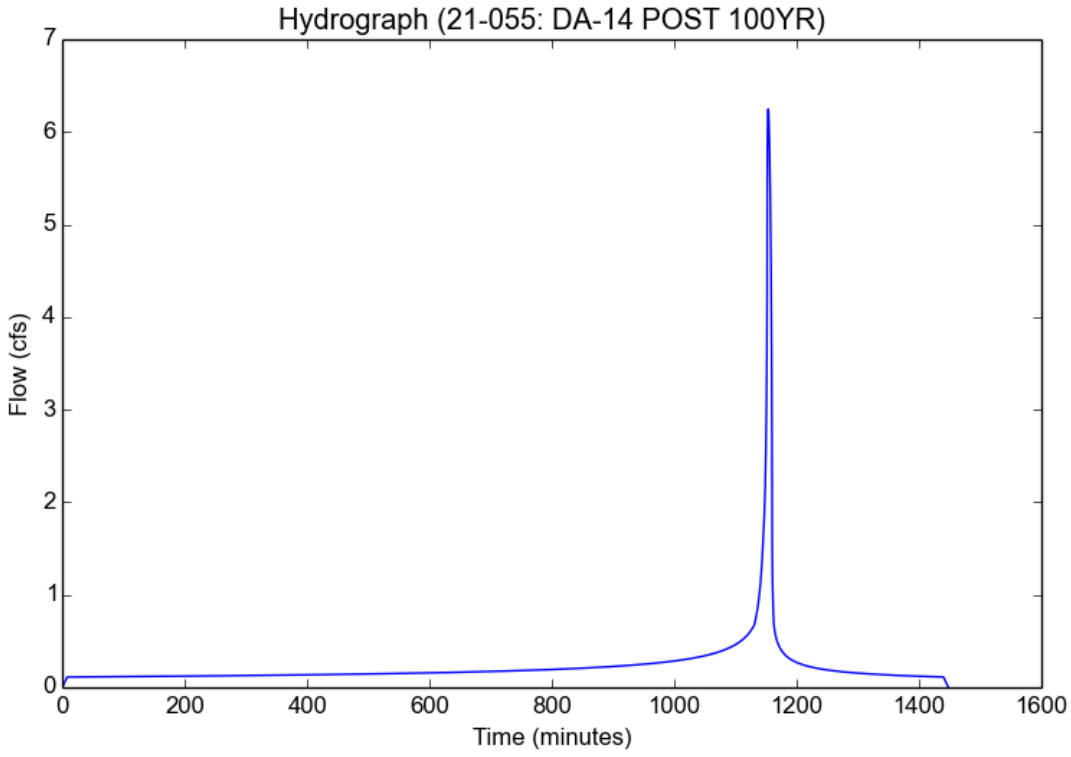
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-14 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-14 POST 100YR
Area (ac)	3.24
Flow Path Length (ft)	829.0
Flow Path Slope (vft/hft)	0.077
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.13
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	3.6498
Undeveloped Runoff Coefficient (Cu)	0.4728
Developed Runoff Coefficient (Cd)	0.5283
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	6.2474
Burned Peak Flow Rate (cfs)	6.2474
24-Hr Clear Runoff Volume (ac-ft)	0.4658
24-Hr Clear Runoff Volume (cu-ft)	20292.0033



Peak Flow Hydrologic Analysis

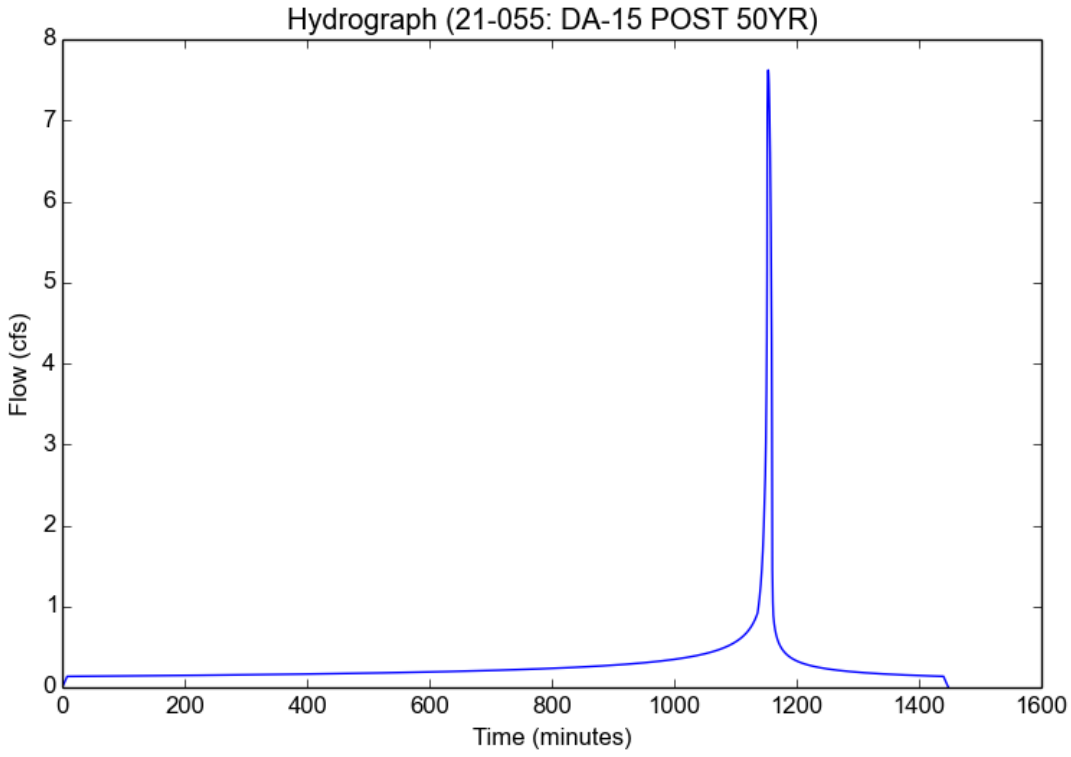
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-15 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-15 POST 50YR
Area (ac)	4.83
Flow Path Length (ft)	462.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.108
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.2529
Undeveloped Runoff Coefficient (Cu)	0.4348
Developed Runoff Coefficient (Cd)	0.485
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	7.6209
Burned Peak Flow Rate (cfs)	7.6209
24-Hr Clear Runoff Volume (ac-ft)	0.5624
24-Hr Clear Runoff Volume (cu-ft)	24497.5792



Peak Flow Hydrologic Analysis

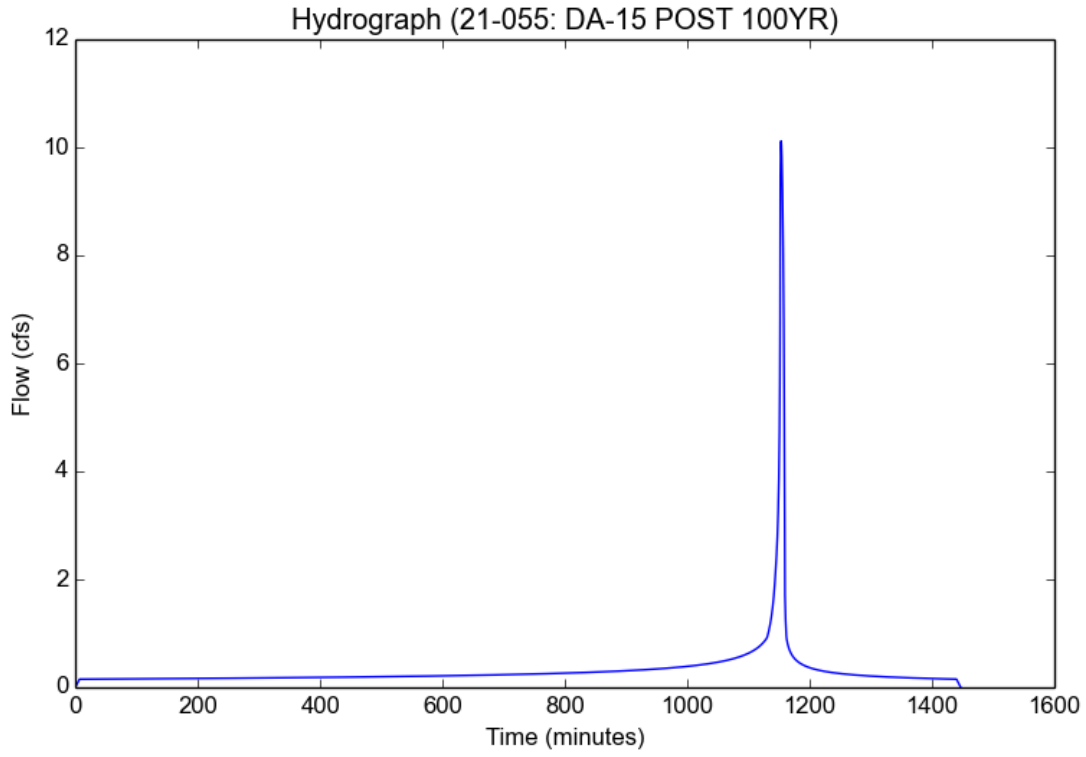
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-15 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-15 POST 100YR
Area (ac)	4.83
Flow Path Length (ft)	462.0
Flow Path Slope (vft/hft)	0.024
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.108
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	3.8862
Undeveloped Runoff Coefficient (Cu)	0.4954
Developed Runoff Coefficient (Cd)	0.5391
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	10.1186
Burned Peak Flow Rate (cfs)	10.1186
24-Hr Clear Runoff Volume (ac-ft)	0.6443
24-Hr Clear Runoff Volume (cu-ft)	28064.9506



Peak Flow Hydrologic Analysis

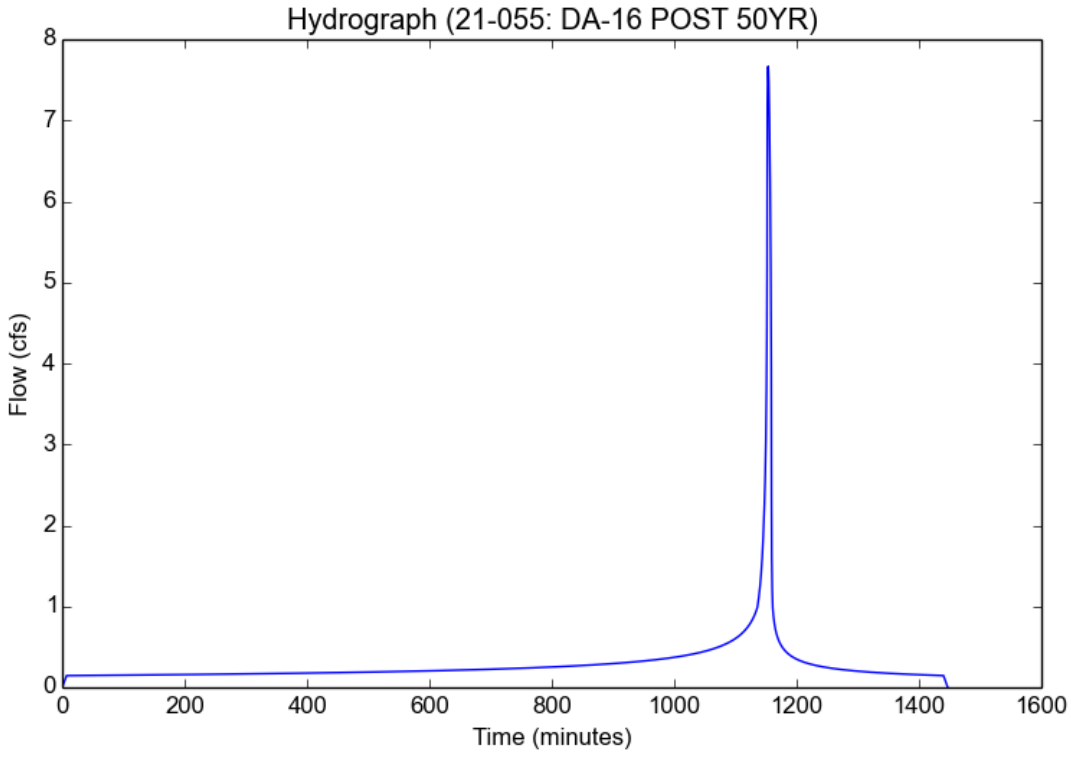
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-16 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-16 POST 50YR
Area (ac)	4.2
Flow Path Length (ft)	630.0
Flow Path Slope (vft/hft)	0.09
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.162
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.4636
Undeveloped Runoff Coefficient (Cu)	0.455
Developed Runoff Coefficient (Cd)	0.5271
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	7.6672
Burned Peak Flow Rate (cfs)	7.6672
24-Hr Clear Runoff Volume (ac-ft)	0.5891
24-Hr Clear Runoff Volume (cu-ft)	25659.1007



Peak Flow Hydrologic Analysis

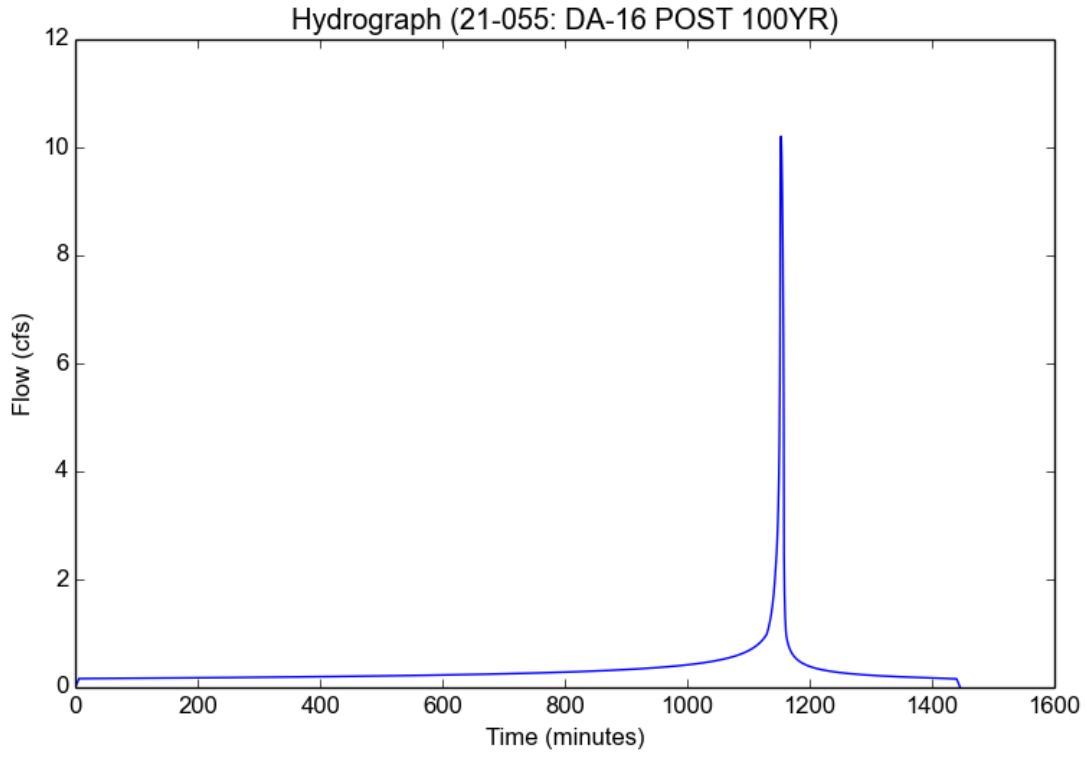
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-16 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-16 POST 100YR
Area (ac)	4.2
Flow Path Length (ft)	630.0
Flow Path Slope (vft/hft)	0.09
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.162
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.1782
Undeveloped Runoff Coefficient (Cu)	0.5199
Developed Runoff Coefficient (Cd)	0.5815
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	10.2043
Burned Peak Flow Rate (cfs)	10.2043
24-Hr Clear Runoff Volume (ac-ft)	0.672
24-Hr Clear Runoff Volume (cu-ft)	29272.389



Peak Flow Hydrologic Analysis

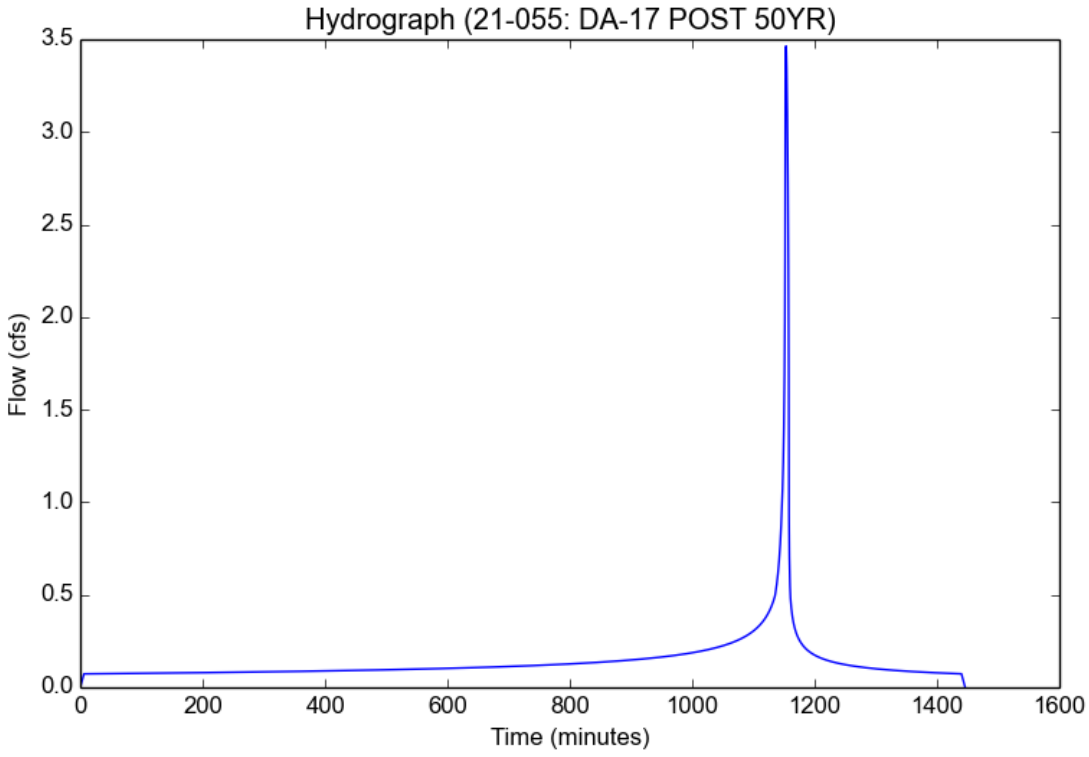
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-17 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-17 POST 50YR
Area (ac)	1.58
Flow Path Length (ft)	450.0
Flow Path Slope (vft/hft)	0.054
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.259
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	3.7239
Undeveloped Runoff Coefficient (Cu)	0.4799
Developed Runoff Coefficient (Cd)	0.5887
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	3.4636
Burned Peak Flow Rate (cfs)	3.4636
24-Hr Clear Runoff Volume (ac-ft)	0.2888
24-Hr Clear Runoff Volume (cu-ft)	12581.7458



Peak Flow Hydrologic Analysis

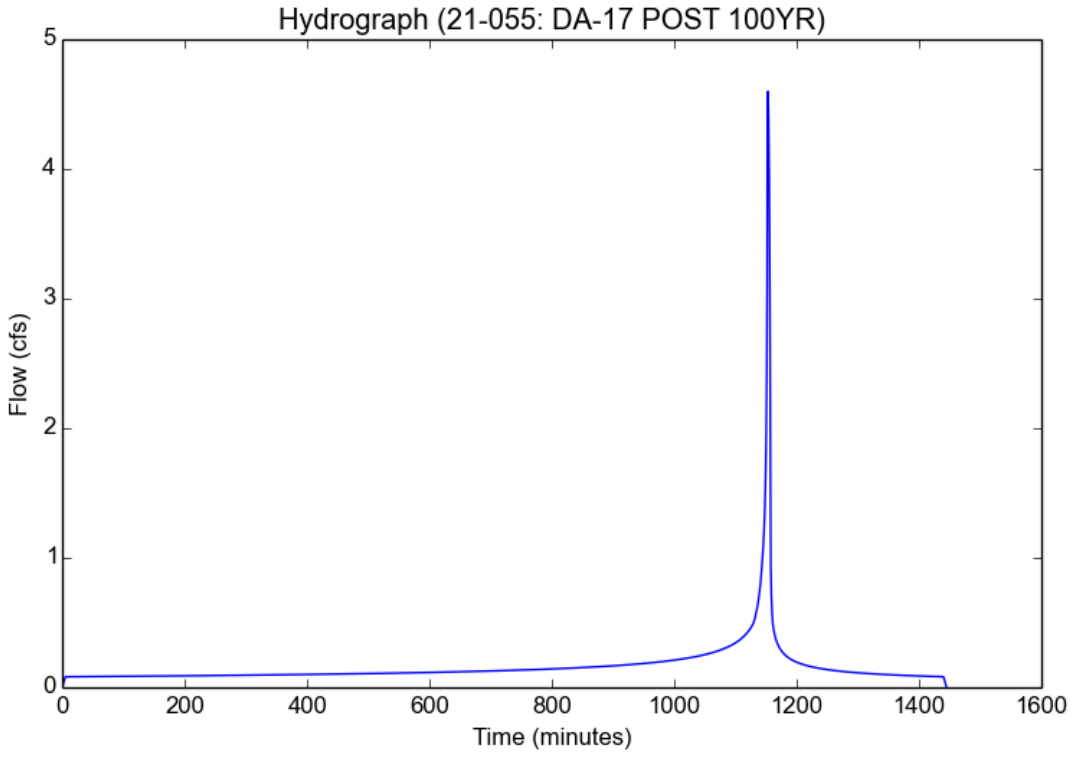
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-17 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-17 POST 100YR
Area (ac)	1.58
Flow Path Length (ft)	450.0
Flow Path Slope (vft/hft)	0.054
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.259
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.552
Undeveloped Runoff Coefficient (Cu)	0.5486
Developed Runoff Coefficient (Cd)	0.6396
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.6
Burned Peak Flow Rate (cfs)	4.6
24-Hr Clear Runoff Volume (ac-ft)	0.3278
24-Hr Clear Runoff Volume (cu-ft)	14278.1905



Peak Flow Hydrologic Analysis

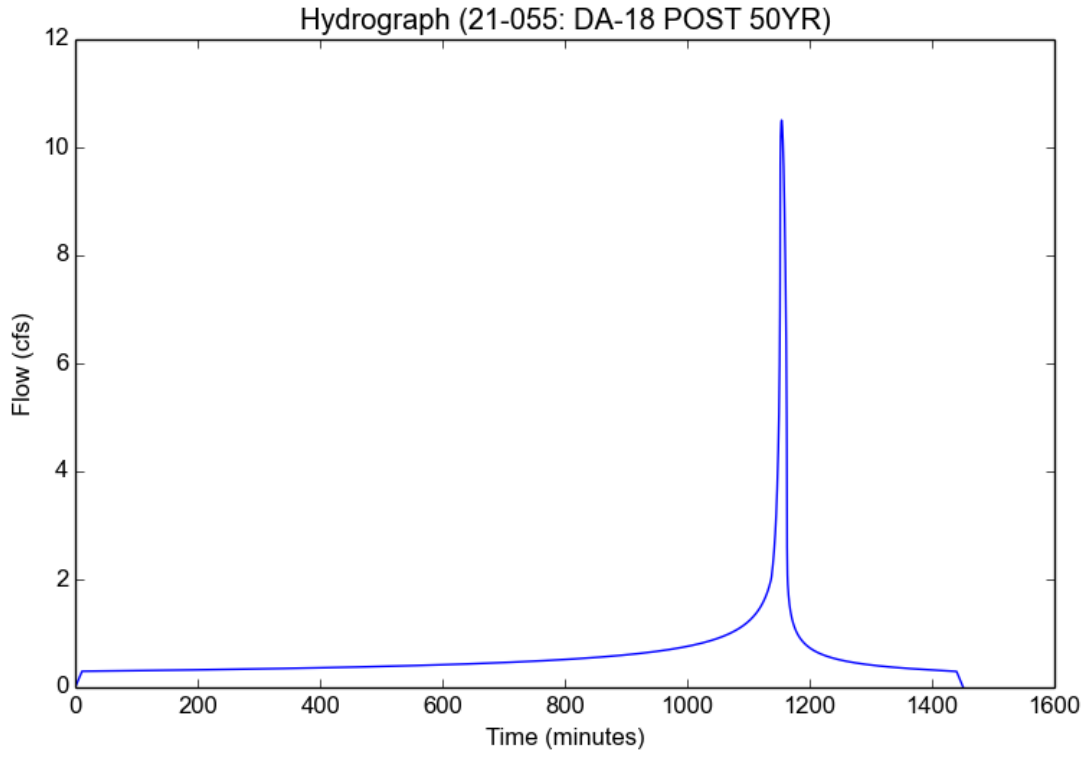
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-18 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-18 POST 50YR
Area (ac)	7.68
Flow Path Length (ft)	521.0
Flow Path Slope (vft/hft)	0.0046
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.198
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	2.8007
Undeveloped Runoff Coefficient (Cu)	0.3867
Developed Runoff Coefficient (Cd)	0.4883
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	10.5031
Burned Peak Flow Rate (cfs)	10.5031
24-Hr Clear Runoff Volume (ac-ft)	1.1908
24-Hr Clear Runoff Volume (cu-ft)	51871.2608



Peak Flow Hydrologic Analysis

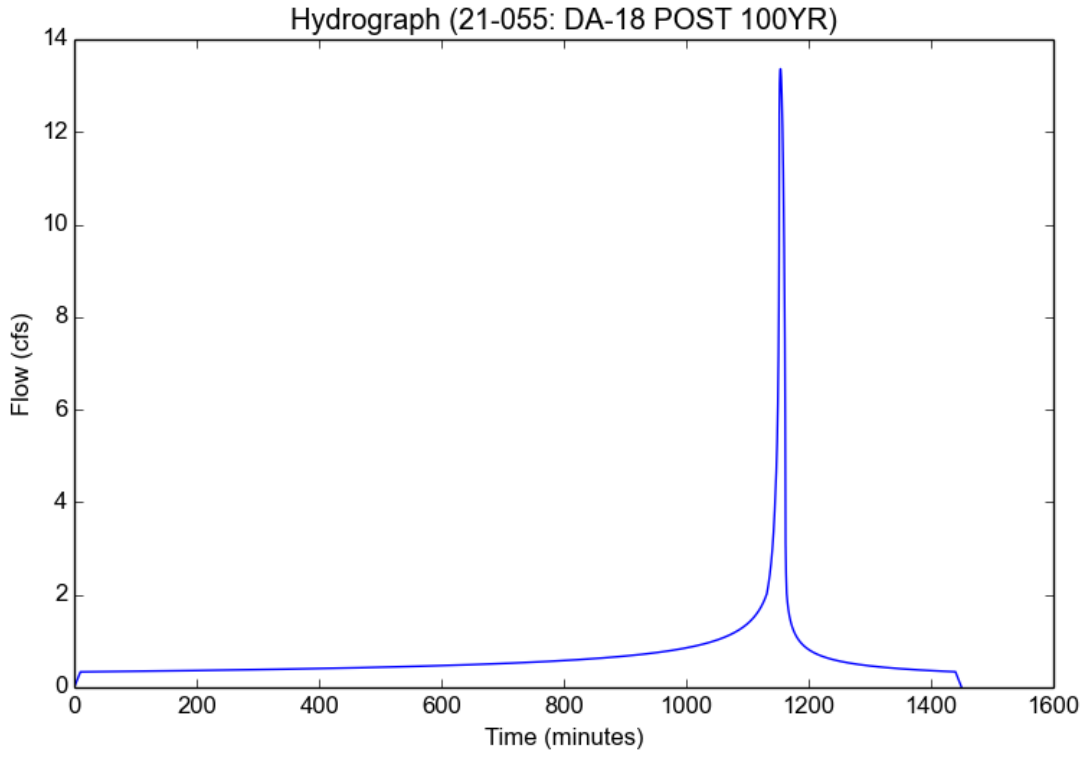
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-18 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-18 POST 100YR
Area (ac)	7.68
Flow Path Length (ft)	521.0
Flow Path Slope (vft/hft)	0.0046
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.198
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	3.2864
Undeveloped Runoff Coefficient (Cu)	0.438
Developed Runoff Coefficient (Cd)	0.5295
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	13.3639
Burned Peak Flow Rate (cfs)	13.3639
24-Hr Clear Runoff Volume (ac-ft)	1.3548
24-Hr Clear Runoff Volume (cu-ft)	59013.0341



Peak Flow Hydrologic Analysis

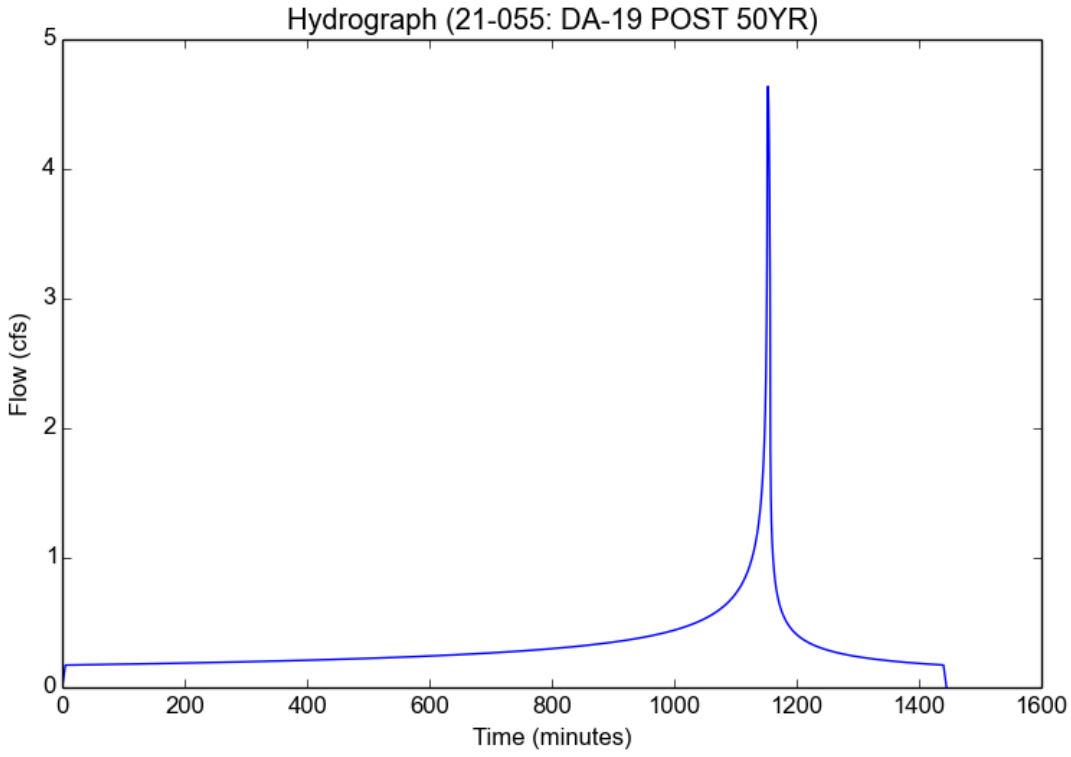
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-19 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-19 POST 50YR
Area (ac)	1.27
Flow Path Length (ft)	450.0
Flow Path Slope (vft/hft)	0.016
50-yr Rainfall Depth (in)	6.8
Percent Impervious	1.0
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.6372
Burned Peak Flow Rate (cfs)	4.6372
24-Hr Clear Runoff Volume (ac-ft)	0.6423
24-Hr Clear Runoff Volume (cu-ft)	27980.6488



Peak Flow Hydrologic Analysis

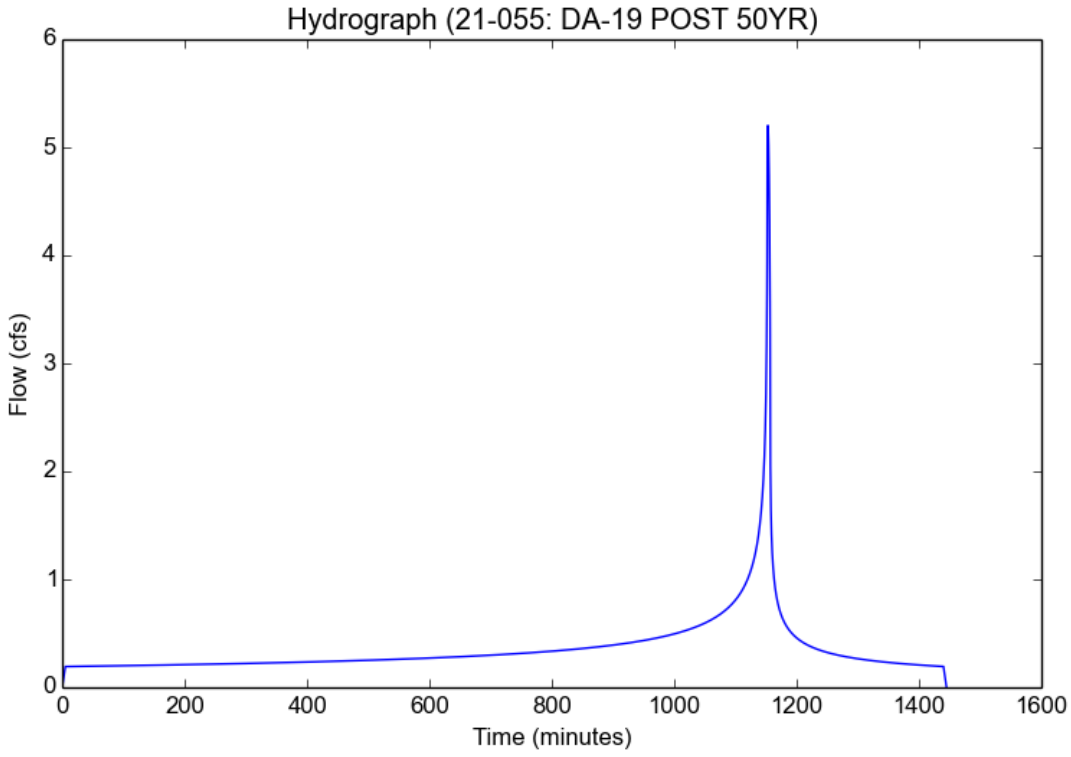
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-19 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-19 POST 50YR
Area (ac)	1.27
Flow Path Length (ft)	450.0
Flow Path Slope (vft/hft)	0.016
50-yr Rainfall Depth (in)	6.8
Percent Impervious	1.0
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.552
Undeveloped Runoff Coefficient (Cu)	0.5486
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.203
Burned Peak Flow Rate (cfs)	5.203
24-Hr Clear Runoff Volume (ac-ft)	0.7207
24-Hr Clear Runoff Volume (cu-ft)	31394.2879



Peak Flow Hydrologic Analysis

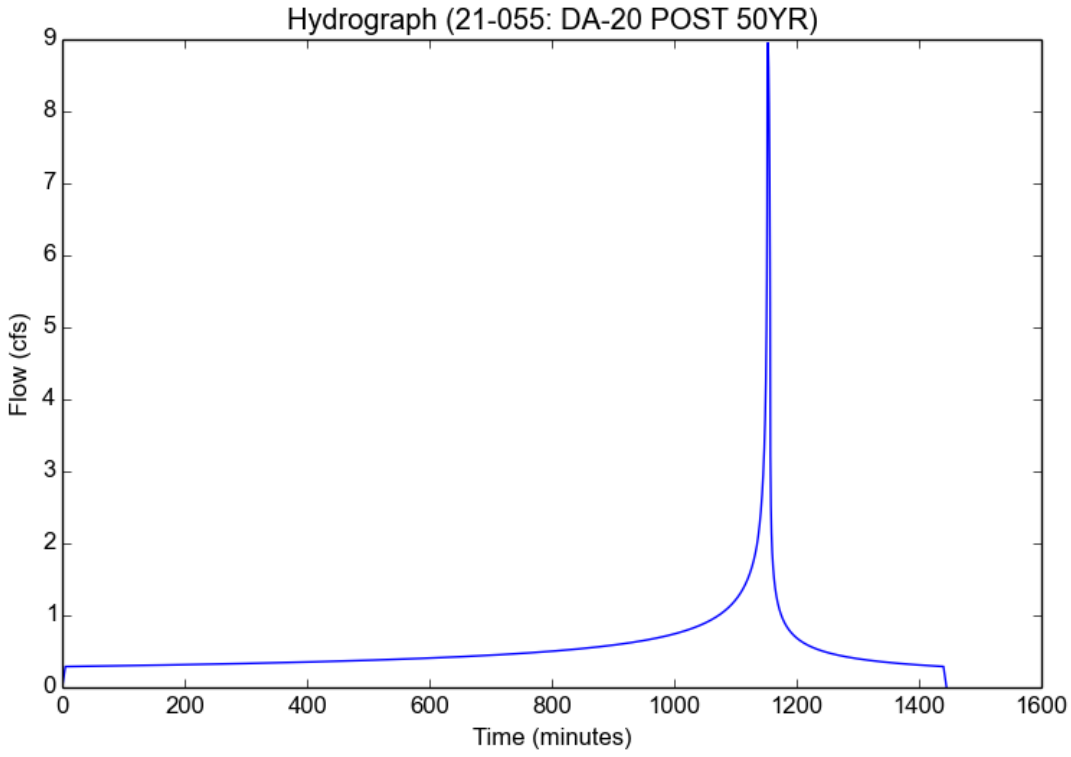
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-20 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-20 POST 50YR
Area (ac)	2.75
Flow Path Length (ft)	360.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.749
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.8023
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	8.9509
Burned Peak Flow Rate (cfs)	8.9509
24-Hr Clear Runoff Volume (ac-ft)	1.0903
24-Hr Clear Runoff Volume (cu-ft)	47494.4113



Peak Flow Hydrologic Analysis

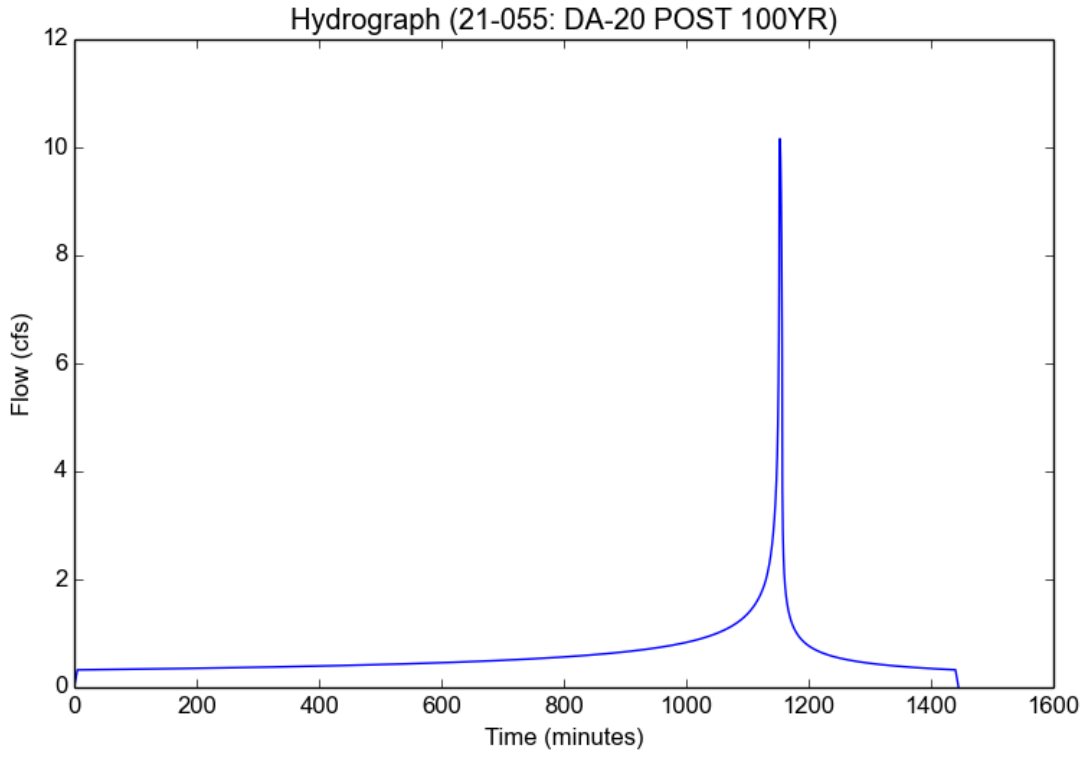
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-20 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-20 POST 100YR
Area (ac)	2.75
Flow Path Length (ft)	360.0
Flow Path Slope (vft/hft)	0.028
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.749
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.552
Undeveloped Runoff Coefficient (Cu)	0.5486
Developed Runoff Coefficient (Cd)	0.8118
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	10.162
Burned Peak Flow Rate (cfs)	10.162
24-Hr Clear Runoff Volume (ac-ft)	1.2252
24-Hr Clear Runoff Volume (cu-ft)	53370.7862



Peak Flow Hydrologic Analysis

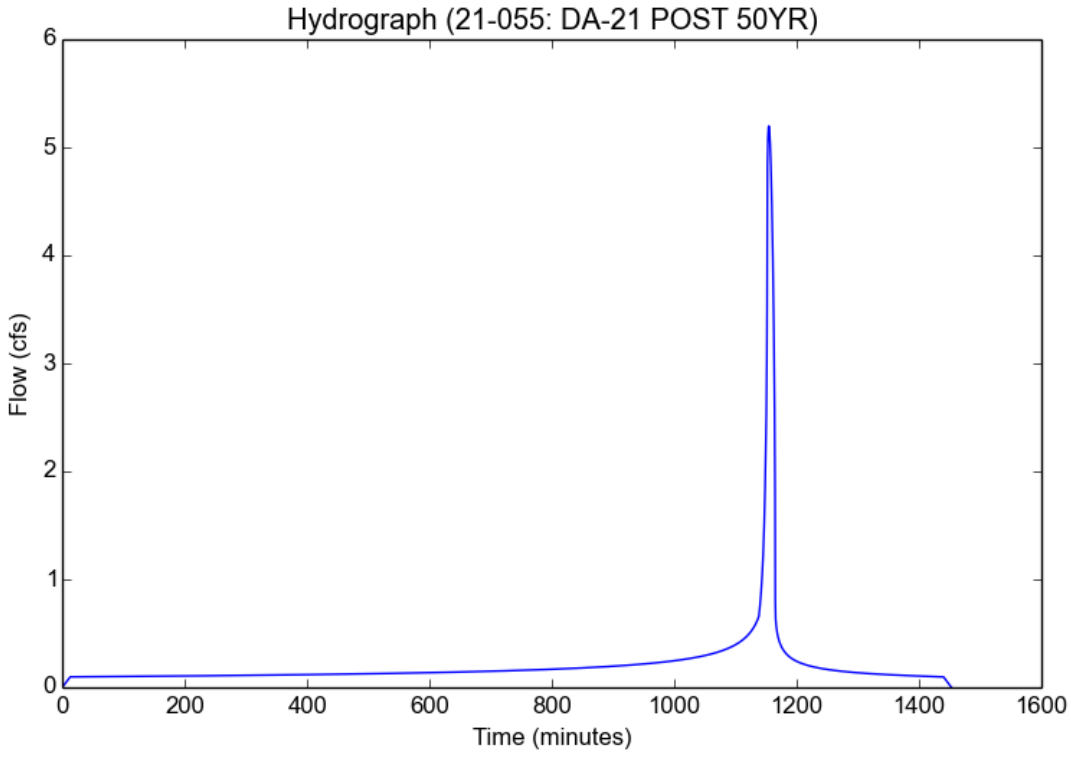
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-21 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-21 POST 50YR
Area (ac)	5.35
Flow Path Length (ft)	606.0
Flow Path Slope (vft/hft)	0.009
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.026
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	2.5893
Undeveloped Runoff Coefficient (Cu)	0.3612
Developed Runoff Coefficient (Cd)	0.3752
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	5.1979
Burned Peak Flow Rate (cfs)	5.1979
24-Hr Clear Runoff Volume (ac-ft)	0.4246
24-Hr Clear Runoff Volume (cu-ft)	18496.2541



Peak Flow Hydrologic Analysis

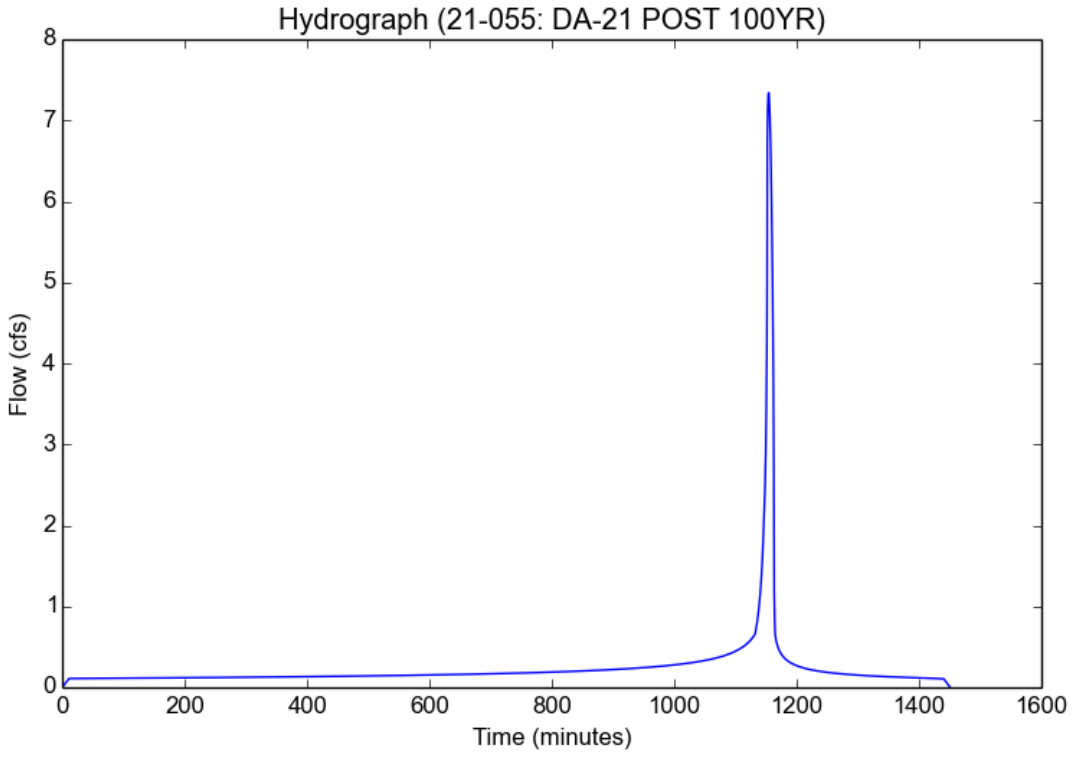
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-21 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-21 POST 100YR
Area (ac)	5.35
Flow Path Length (ft)	606.0
Flow Path Slope (vft/hft)	0.009
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.026
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	3.1424
Undeveloped Runoff Coefficient (Cu)	0.4242
Developed Runoff Coefficient (Cd)	0.4366
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	7.3403
Burned Peak Flow Rate (cfs)	7.3403
24-Hr Clear Runoff Volume (ac-ft)	0.4936
24-Hr Clear Runoff Volume (cu-ft)	21500.2456



Peak Flow Hydrologic Analysis

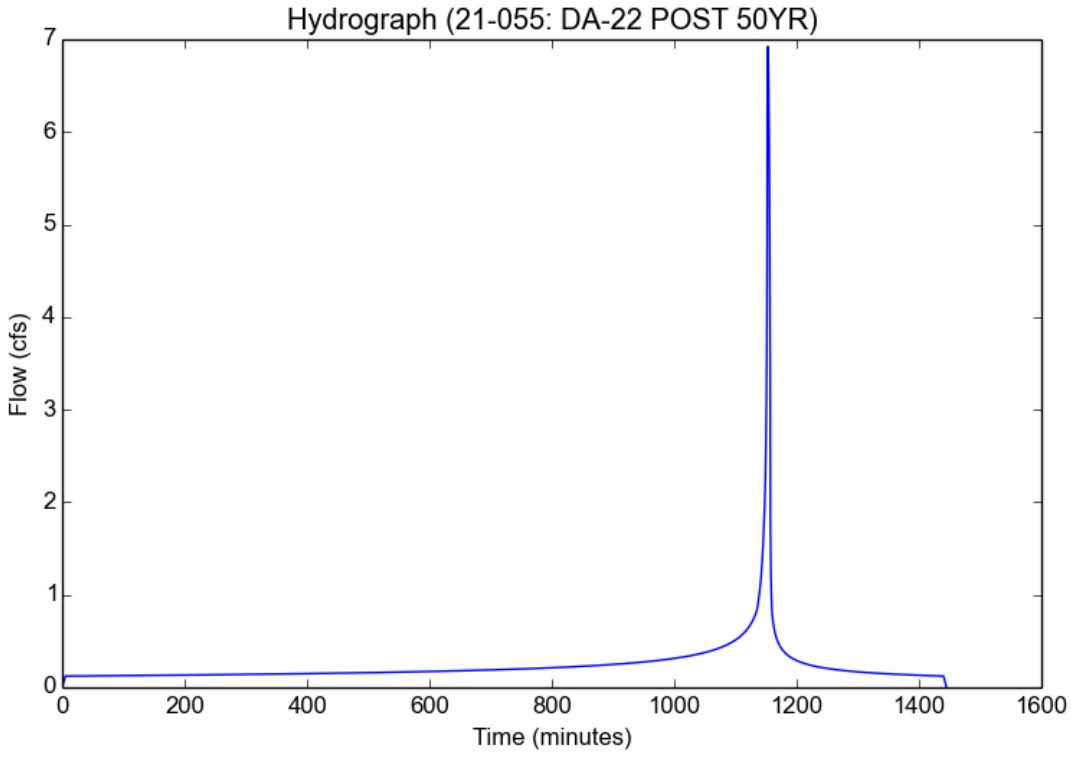
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-22 POST 50YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-22 POST 50YR
Area (ac)	2.84
Flow Path Length (ft)	322.0
Flow Path Slope (vft/hft)	0.082
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.232
Soil Type	15
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.8
Peak Intensity (in/hr)	4.0571
Undeveloped Runoff Coefficient (Cu)	0.5106
Developed Runoff Coefficient (Cd)	0.601
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.9244
Burned Peak Flow Rate (cfs)	6.9244
24-Hr Clear Runoff Volume (ac-ft)	0.4866
24-Hr Clear Runoff Volume (cu-ft)	21196.427



Peak Flow Hydrologic Analysis

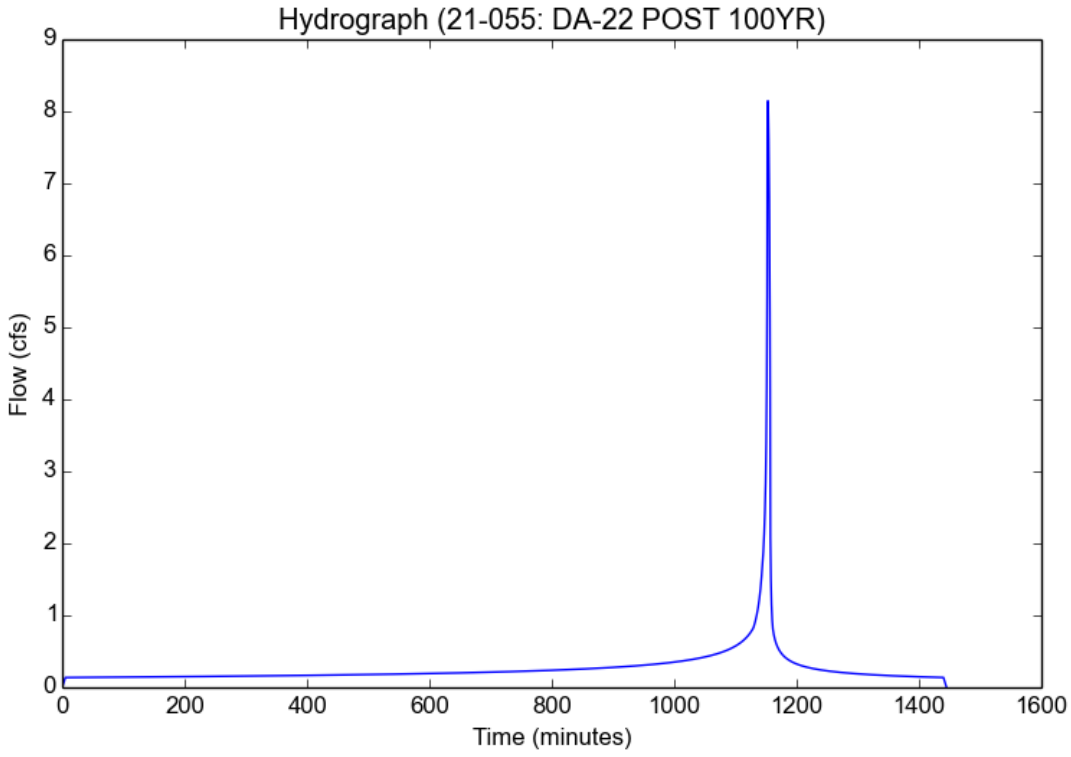
File location: C:/Local Cloud/Shared/2021/21-055 CMC East Campus/Civil/reports/Hydrology/Working/21-055 - DA-22 POST 100YR.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	21-055
Subarea ID	DA-22 POST 100YR
Area (ac)	2.84
Flow Path Length (ft)	322.0
Flow Path Slope (vft/hft)	0.082
50-yr Rainfall Depth (in)	6.8
Percent Impervious	0.232
Soil Type	15
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.6296
Peak Intensity (in/hr)	4.552
Undeveloped Runoff Coefficient (Cu)	0.5486
Developed Runoff Coefficient (Cd)	0.6301
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	8.1457
Burned Peak Flow Rate (cfs)	8.1457
24-Hr Clear Runoff Volume (ac-ft)	0.5519
24-Hr Clear Runoff Volume (cu-ft)	24041.6823



Attachment C

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Aug 9 2023

12IN PVC

Circular

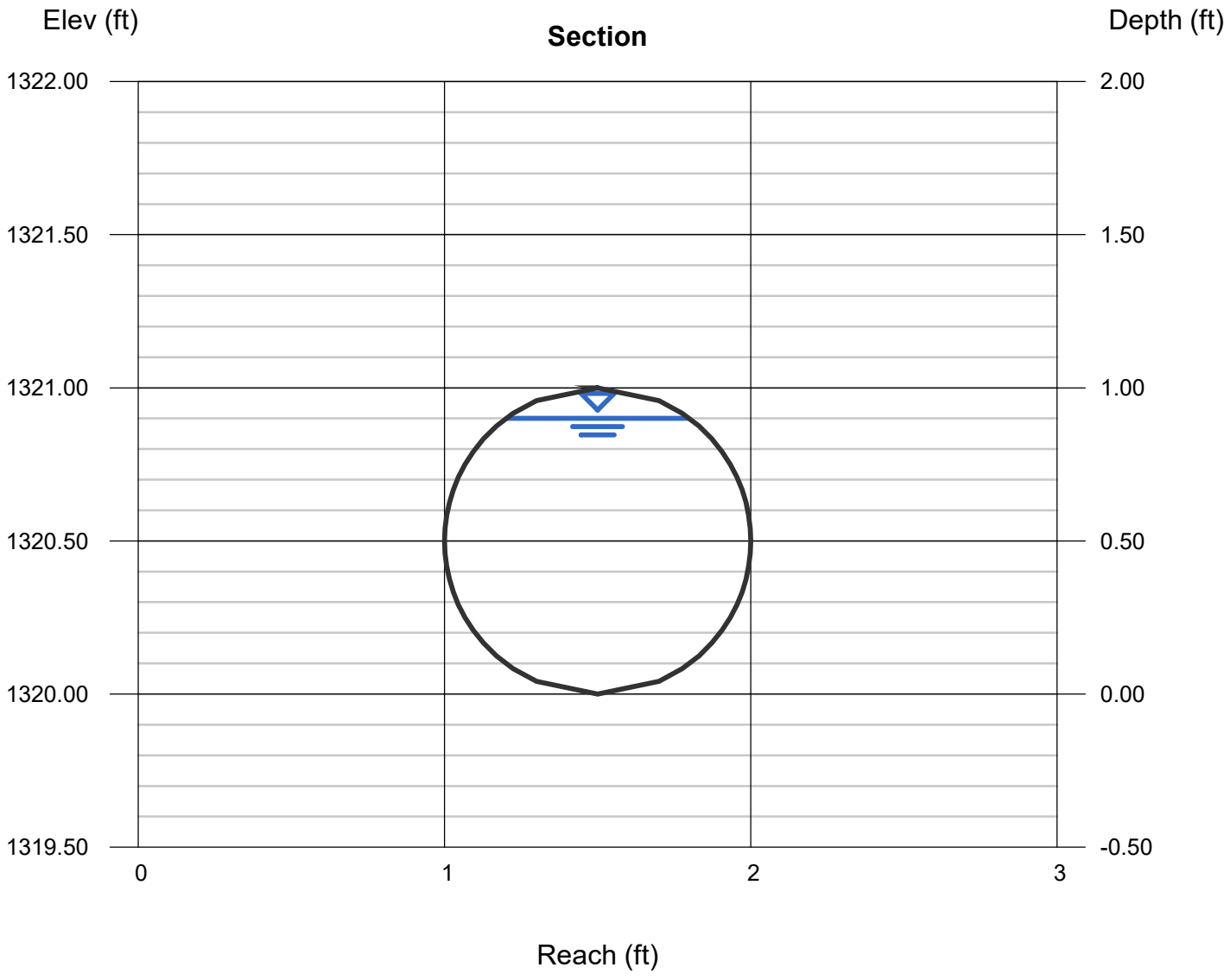
Diameter (ft)	= 1.00
Invert Elev (ft)	= 1320.00
Slope (%)	= 1.00
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 0.90
Q (cfs)	= 4.113
Area (sqft)	= 0.74
Velocity (ft/s)	= 5.52
Wetted Perim (ft)	= 2.50
Crit Depth, Yc (ft)	= 0.86
Top Width (ft)	= 0.60
EGL (ft)	= 1.37



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Aug 9 2023

36IN PVC

Circular

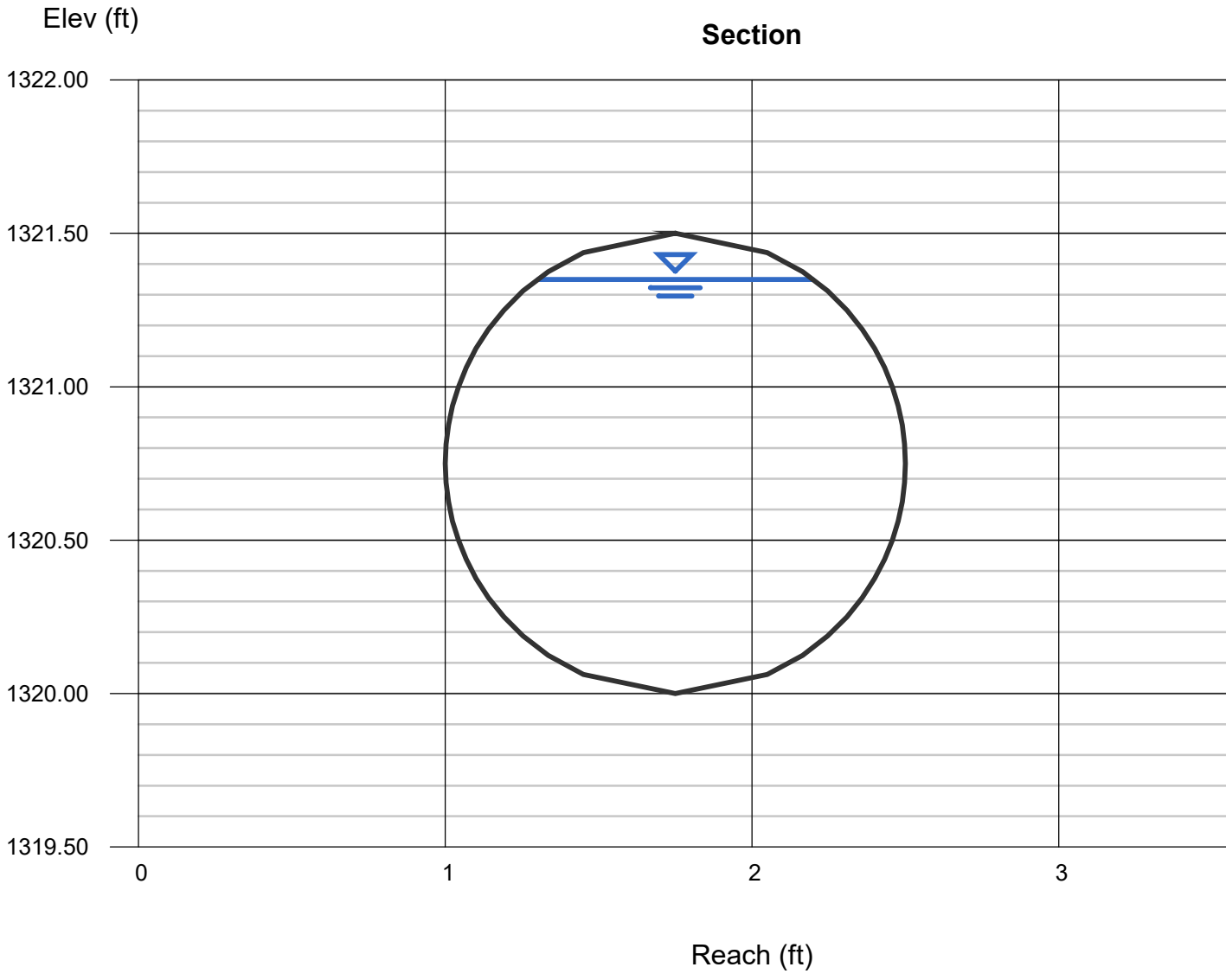
Diameter (ft)	= 1.50
Invert Elev (ft)	= 1320.00
Slope (%)	= 3.00
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 1.35
Q (cfs)	= 21.01
Area (sqft)	= 1.68
Velocity (ft/s)	= 12.53
Wetted Perim (ft)	= 3.75
Crit Depth, Yc (ft)	= 1.48
Top Width (ft)	= 0.90
EGL (ft)	= 3.79



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Aug 9 2023

36IN PVC

Circular

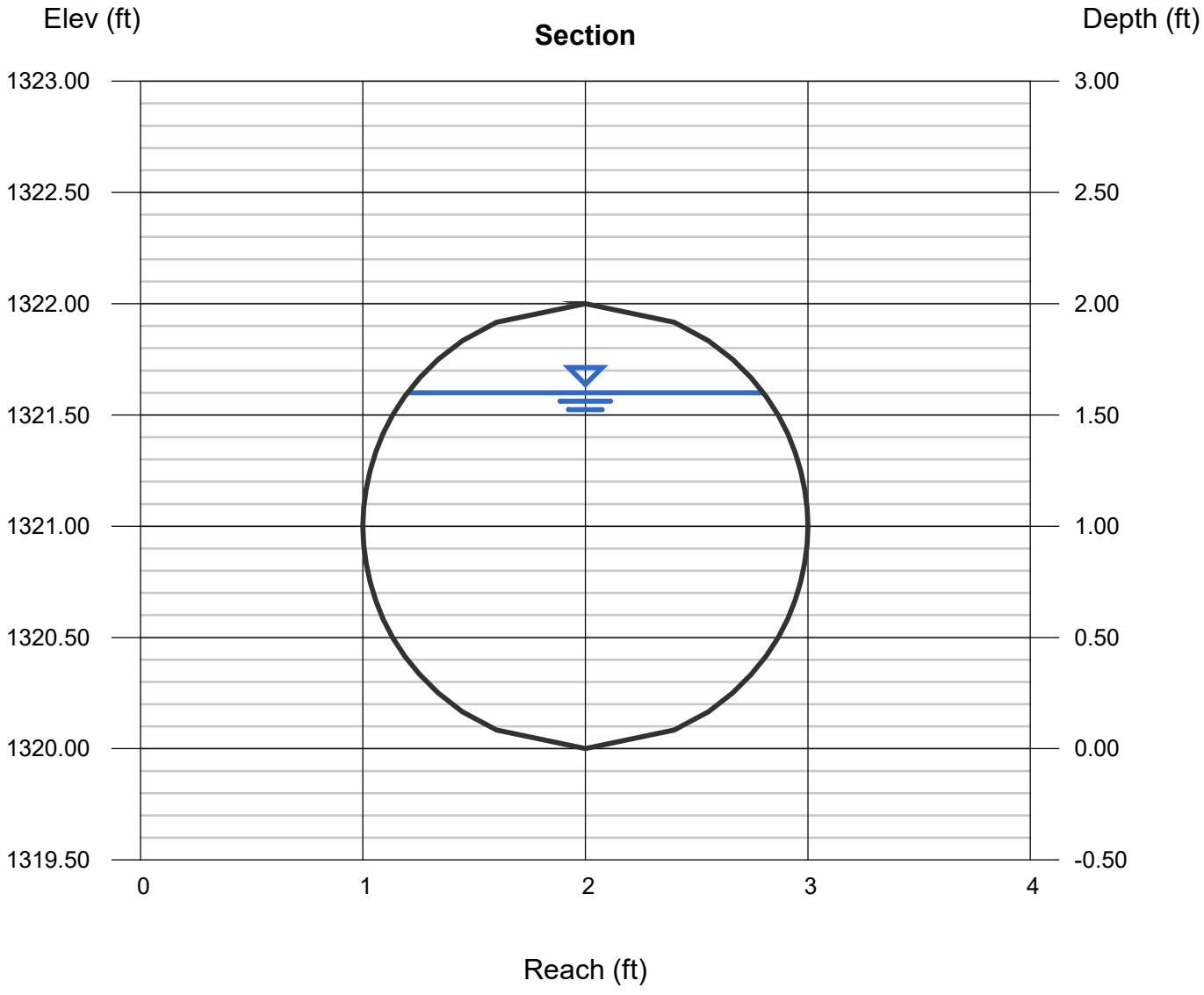
Diameter (ft)	= 2.00
Invert Elev (ft)	= 1320.00
Slope (%)	= 3.00
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 1.60
Q (cfs)	= 41.50
Area (sqft)	= 2.70
Velocity (ft/s)	= 15.40
Wetted Perim (ft)	= 4.43
Crit Depth, Yc (ft)	= 1.96
Top Width (ft)	= 1.60
EGL (ft)	= 5.29



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Aug 9 2023

36IN PVC

Circular

Diameter (ft)	= 3.00
Invert Elev (ft)	= 1320.00
Slope (%)	= 2.00
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 2.70
Q (cfs)	= 108.93
Area (sqft)	= 6.70
Velocity (ft/s)	= 16.25
Wetted Perim (ft)	= 7.50
Crit Depth, Yc (ft)	= 2.93
Top Width (ft)	= 1.80
EGL (ft)	= 6.81