



Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

**PRELIMINARY HYDROLOGY
CALCULATIONS**

FOR

**WHITTIER BOULEVARD BUSINESS PARK
12352 WHITTIER BLVD.
WHITTIER, CA 90602**

PREPARED FOR

**WESTERN REALCO
500 NEWPORT CENTER DR., #630
NEWPORT BEACH, CA 92660
PHONE: (949) 720-3787**

OCTOBER 25, 2021

JOB NO. 3868

PREPARED BY

**THIENES ENGINEERING
14349 FIRESTONE BLVD.
LA MIRADA, CALIFORNIA 90638
PHONE: (714) 521-4811
FAX: (714) 521-4173**

**PRELIMINARY HYDROLOGY
CALCULATIONS**

FOR

**WHITTIER BOULEVARD
BUSINESS PARK**

**PREPARED UNDER
THE SUPERVISION OF**

**REINHARD STENZEL
R.C.E. 56155
EXP. 12/31/2022**

DATE:

INTRODUCTION

A: PROJECT LOCATION

The project site is located along the west side of Whittier Blvd near the intersection of Whittier Blvd and Mar Vista St in the City of Whittier. See following page for vicinity map.

B: STUDY PURPOSE

The purpose of this study is to determine the proposed condition 50-year peak flow rate from the site that drains to existing onsite storm drains.

C: PROJECT STAFF:

Thienes Engineering staff involved in this study include:

Reinhard Stenzel
Kristie Ferronato

DISCUSSION

The proposed project site encompasses approximately 13.50 acres. There is one proposed warehouse type buildings ranging in size from approximately 288,300 square feet. A building will have an at grade truck yard along the south side of the building. There will be vehicle parking scatter throughout the site. A paved drive aisle will be located around the north, south, west, and through the proposed building.

Existing Condition

The existing condition of the site is fully developed with an industrial building. The site drains to existing gutters which connect to existing on-site storm drain. These existing storm drain connect to the existing open channel draining along the westerly property line.

Proposed Condition

The site is being developed with 1 warehouse type building. The northwestern portion of building, and approximately storm water from the north half of the site (including sub area 1A-1A1-1A2) will flow to proposed catch basins, then go through the proposed storm drain then will discharge the run off to ex. catch basin and existing storm drain of the project site. The 50-year peak flow rate for these subareas is approximately 15.90 cfs.

The south portion of building, and approximately storm water from the south half of the site (including sub area 1B-1B1-1B2) will flow to proposed catch basins, then go through the proposed storm drain then will discharge the run off to ex. catch basin and existing storm drain at the south west corner of the project site. The 50-year peak flow rate for these subareas is approximately 23.3 cfs.

The remaining portion of the southwestern truck yard (subarea 1C) will drain sheet flow southwesterly towards offsite of the project site. The 50-year peak flow rate for this subarea is approximately 0.5 cfs.

The western portion of the site that is not being improved (subarea 1d) will continue to drain southerly as in the existing condition. The 50-year peak flow rate for this subarea is approximately 1.40 cfs.

The following table summarizes the peak 50-year flow rate for each subarea.

The following table summarizes the peak 50-year flow rate for each subarea.

Subarea	Area ac.	Tc min.	Q cfs
1A	1.6	5	5.05
1A1	1.8	5	5.7
1A2	2.15	9	5.15
1B	1.75	5	5.55
1B1	1.7	5	5.40
1B2	3.90	5	12.35
1C	0.15	5	0.45
1E	0.45	5	1.40
TOTAL	13.50	-	41.05

Since the proposed storm drain connects to existing stubs on the property, it is not expected that the allowable Q from the county will be applied to the project. If this changes, additional ponding in the truck yards will be used for peak flow detention.

See Appendix "B" for the proposed condition hydrology calculations and Appendix "C" for the Proposed Condition Hydrology Map.

Methodology

Hydrology and hydrograph calculations were computed using Los Angeles County's Hydro-Cal Per the Los Angeles County Hydrology Manual (January 2006), the project site consists of Soil Types 017. The isohyet is 5.9 per the Los Angeles County Hydrology Manual. (Please Appendix "A" reference material (Isohyet map))

APPENDIX

DESCRIPTION

A

REFERENCE MATERIAL

B

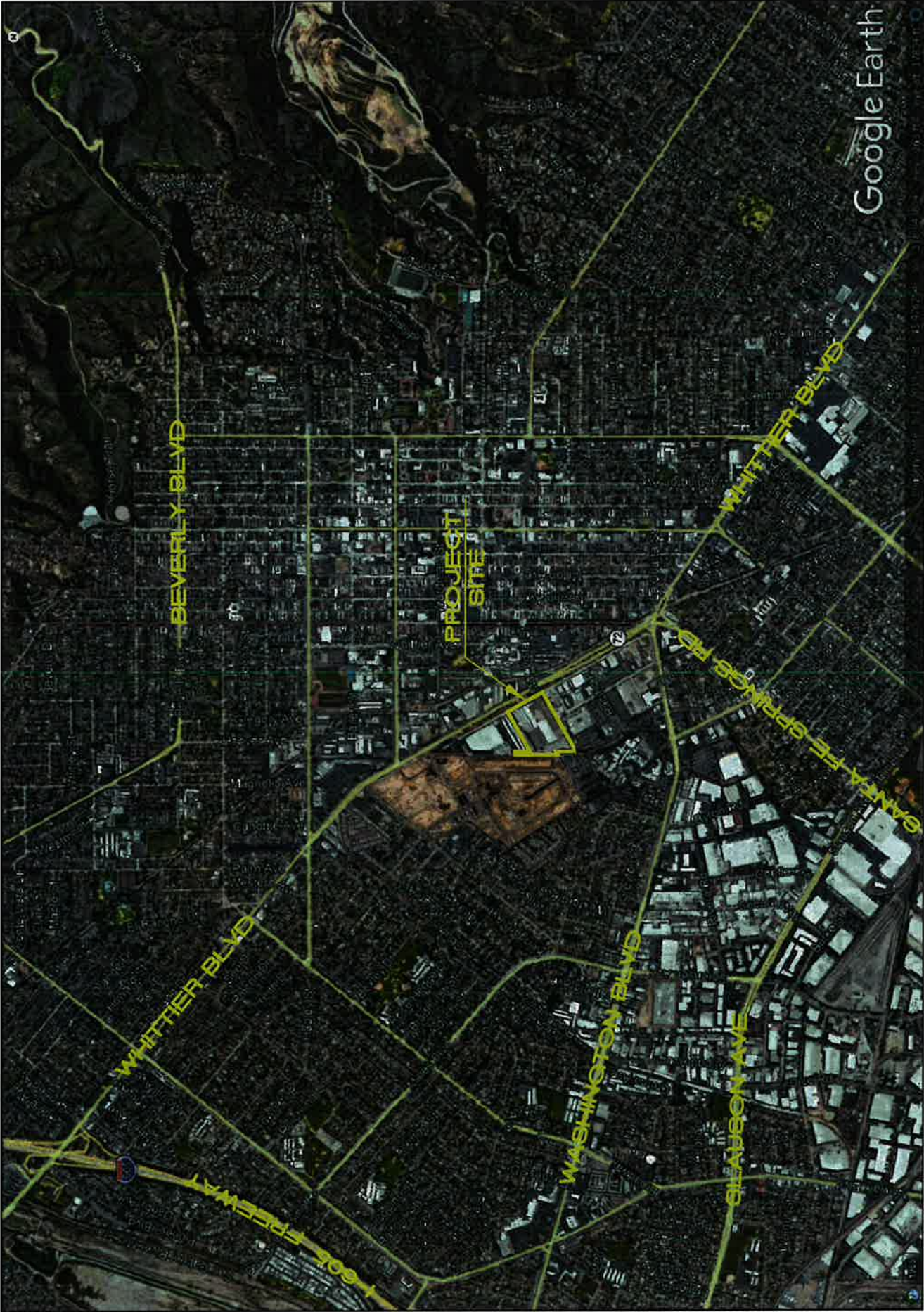
HYDROLOGY CALCULATIONS

C

HYDROLOGY MAPS

APPENDIX A

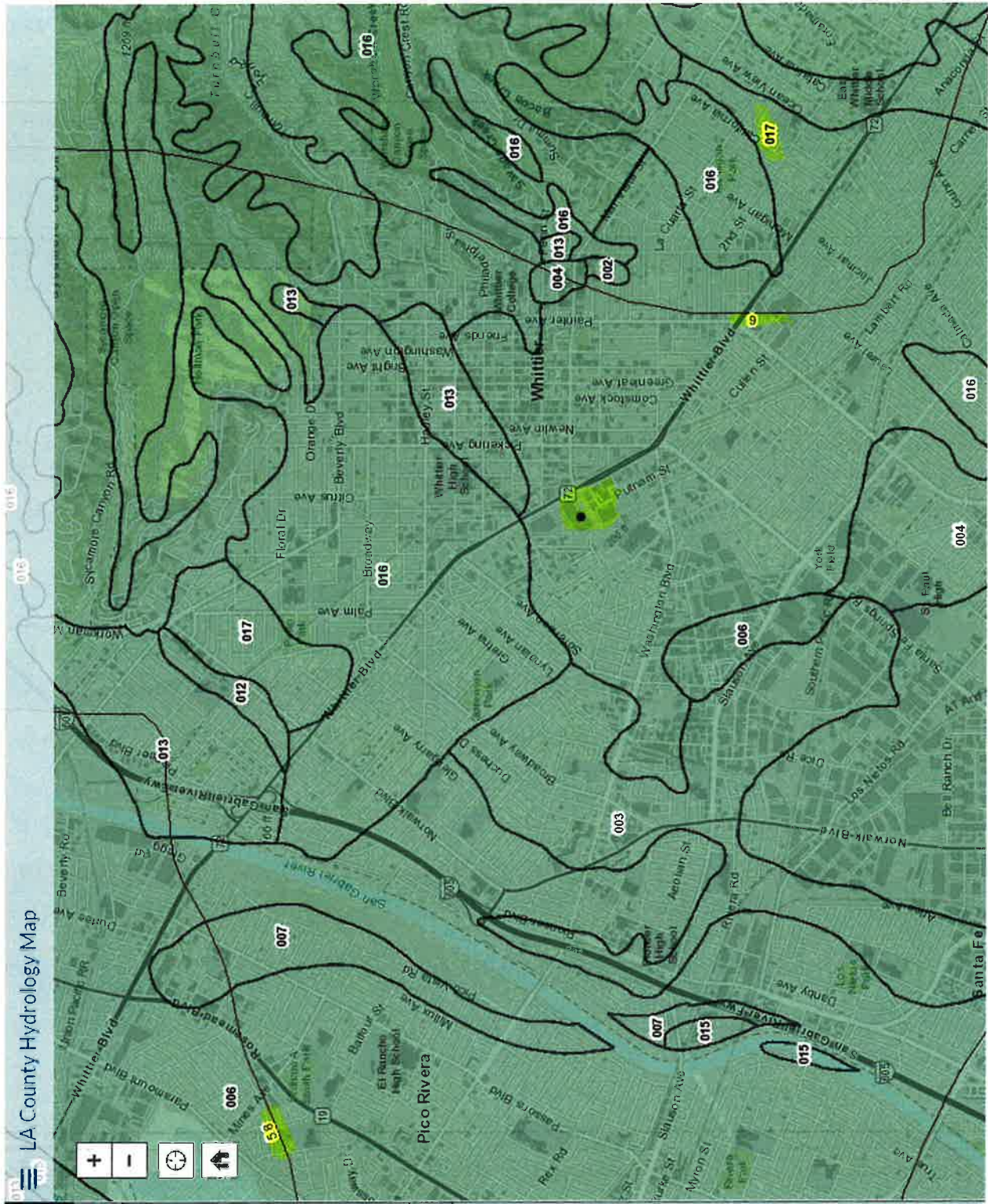
REFERENCE MATERIAL



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VICINITY MAP
FOR
**12352 WHITTIER BLVD.
WHITTIER, CA**



LA County Hydrology Map



Layers

- Hydrology GIS
- 50yr Two Tenths (Rainfall)
- DPA Zones
- Soils 2004
- Final 85th Percentile, 24-hr Rainfall
- 1-year, 1-hour Rainfall Intensity
- Final 95th Percentile, 24-hr Rainfall
- LA County Parcels

About
 Legend
 Layers

APPENDIX B

HYDROLOGY CALCULATIONS

Peak Flow Hydrologic Analysis

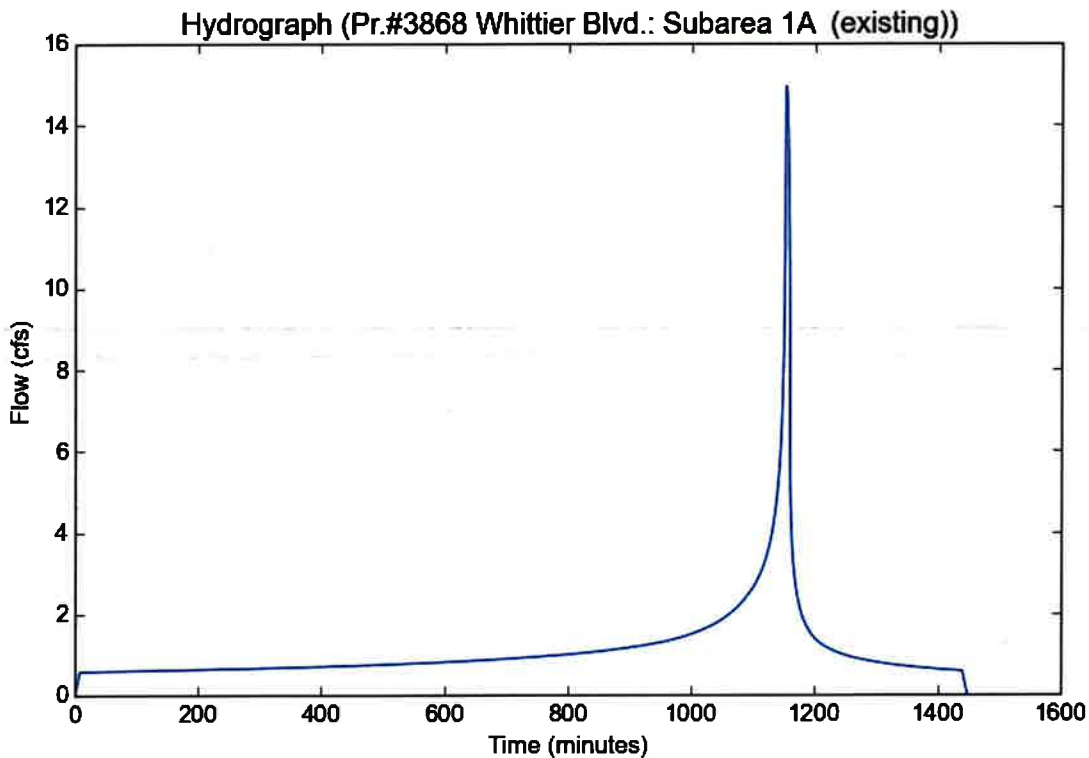
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1A (existing)
Area (ac)	5.9
Flow Path Length (ft)	870.0
Flow Path Slope (vft/hft)	0.03
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.8
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.8224
Undeveloped Runoff Coefficient (Cu)	0.8857
Developed Runoff Coefficient (Cd)	0.8971
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	14.9394
Burned Peak Flow Rate (cfs)	14.9394
24-Hr Clear Runoff Volume (ac-ft)	2.218
24-Hr Clear Runoff Volume (cu-ft)	96616.5716



Peak Flow Hydrologic Analysis

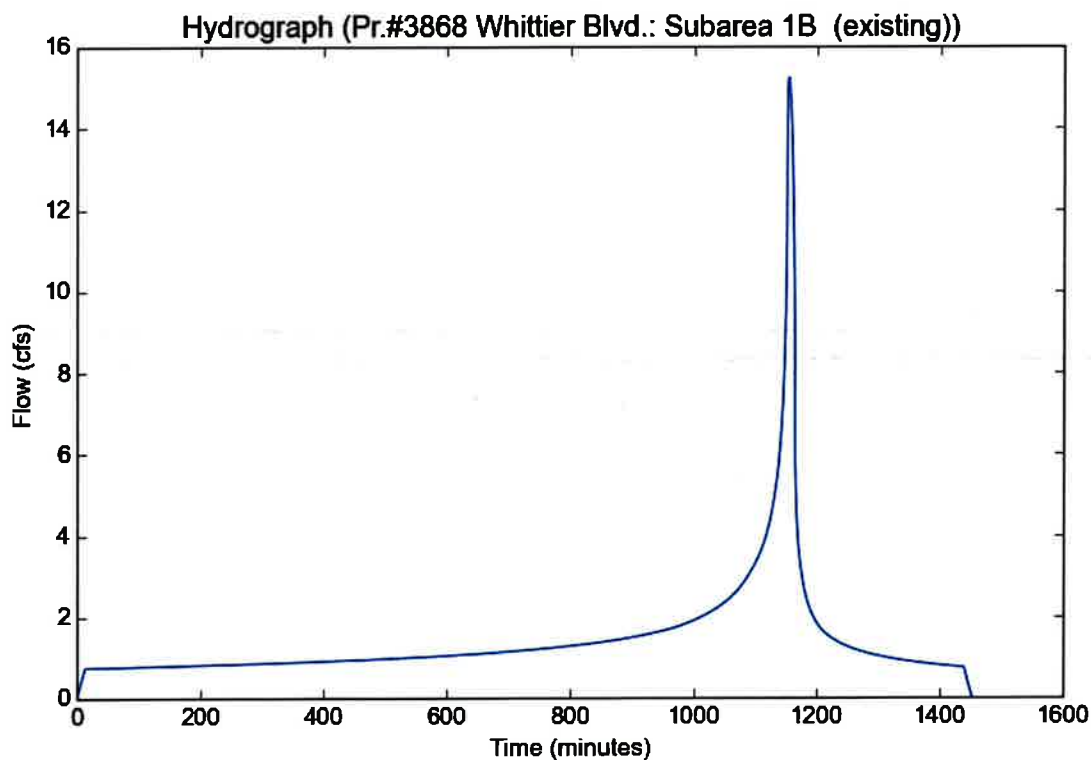
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Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1B (existing)
Area (ac)	7.6
Flow Path Length (ft)	1050.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.8
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.2466
Undeveloped Runoff Coefficient (Cu)	0.8572
Developed Runoff Coefficient (Cd)	0.8914
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	15.2203
Burned Peak Flow Rate (cfs)	15.2203
24-Hr Clear Runoff Volume (ac-ft)	2.8569
24-Hr Clear Runoff Volume (cu-ft)	124447.7135



Peak Flow Hydrologic Analysis

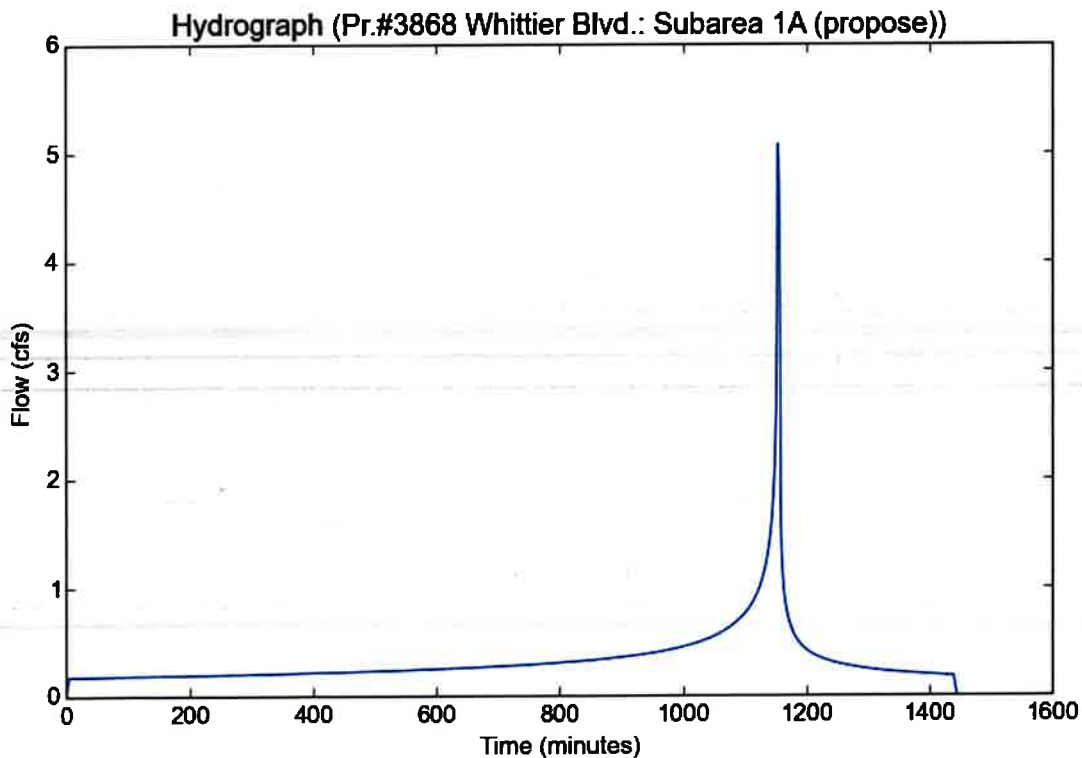
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Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1A (propose)
Area (ac)	1.6
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.9
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.5201
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.0689
Burned Peak Flow Rate (cfs)	5.0689
24-Hr Clear Runoff Volume (ac-ft)	0.6518
24-Hr Clear Runoff Volume (cu-ft)	28393.0774



Peak Flow Hydrologic Analysis

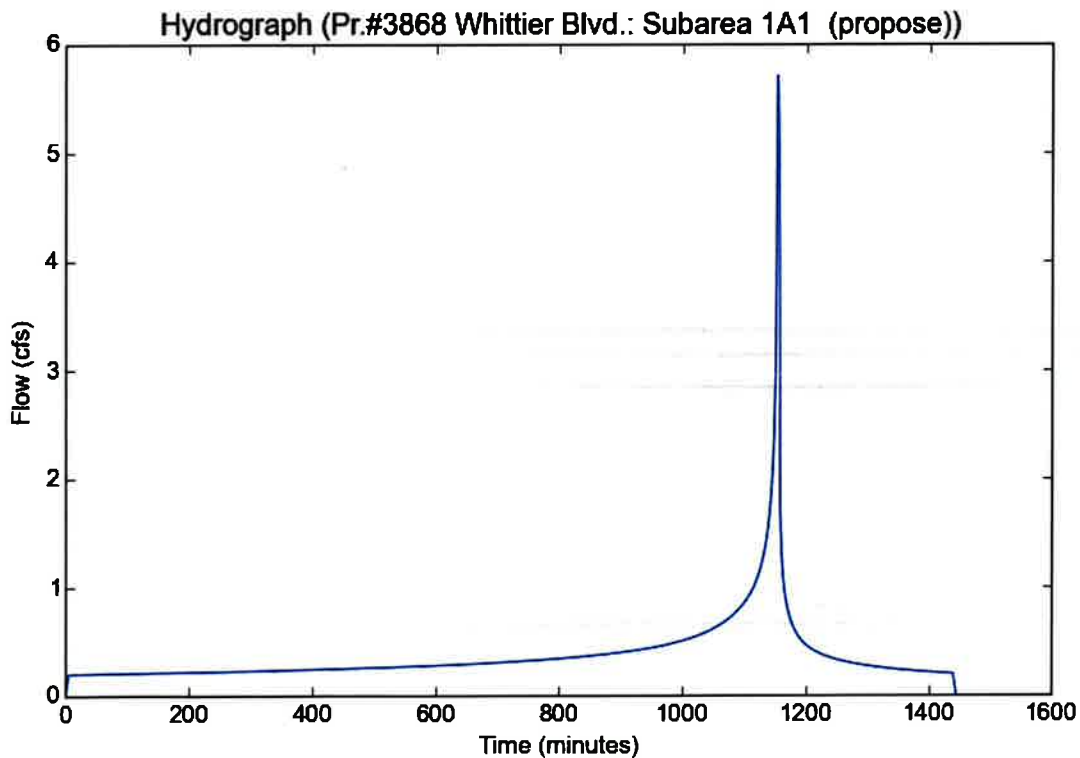
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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1A1 (propose)
Area (ac)	1.8
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.9
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.5201
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.7026
Burned Peak Flow Rate (cfs)	5.7026
24-Hr Clear Runoff Volume (ac-ft)	0.7333
24-Hr Clear Runoff Volume (cu-ft)	31942.212



Peak Flow Hydrologic Analysis

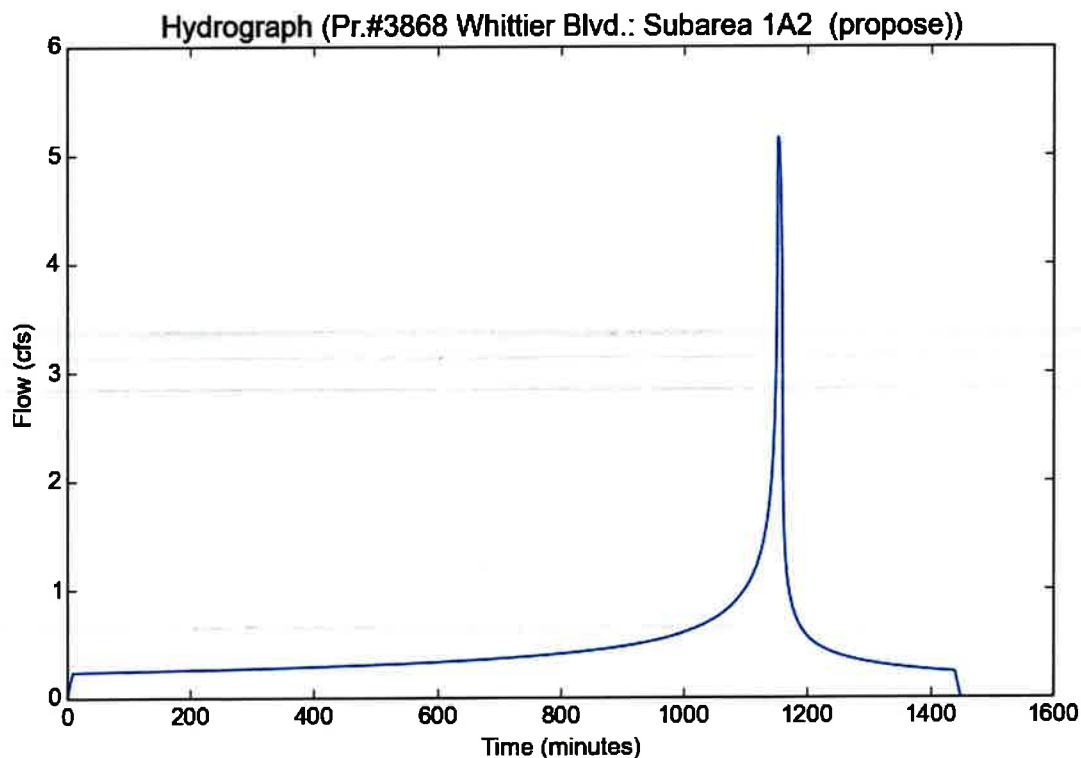
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Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1A2 (propose)
Area (ac)	2.15
Flow Path Length (ft)	743.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.9
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	2.6704
Undeveloped Runoff Coefficient (Cu)	0.8799
Developed Runoff Coefficient (Cd)	0.898
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	5.1557
Burned Peak Flow Rate (cfs)	5.1557
24-Hr Clear Runoff Volume (ac-ft)	0.8759
24-Hr Clear Runoff Volume (cu-ft)	38153.5235



Peak Flow Hydrologic Analysis

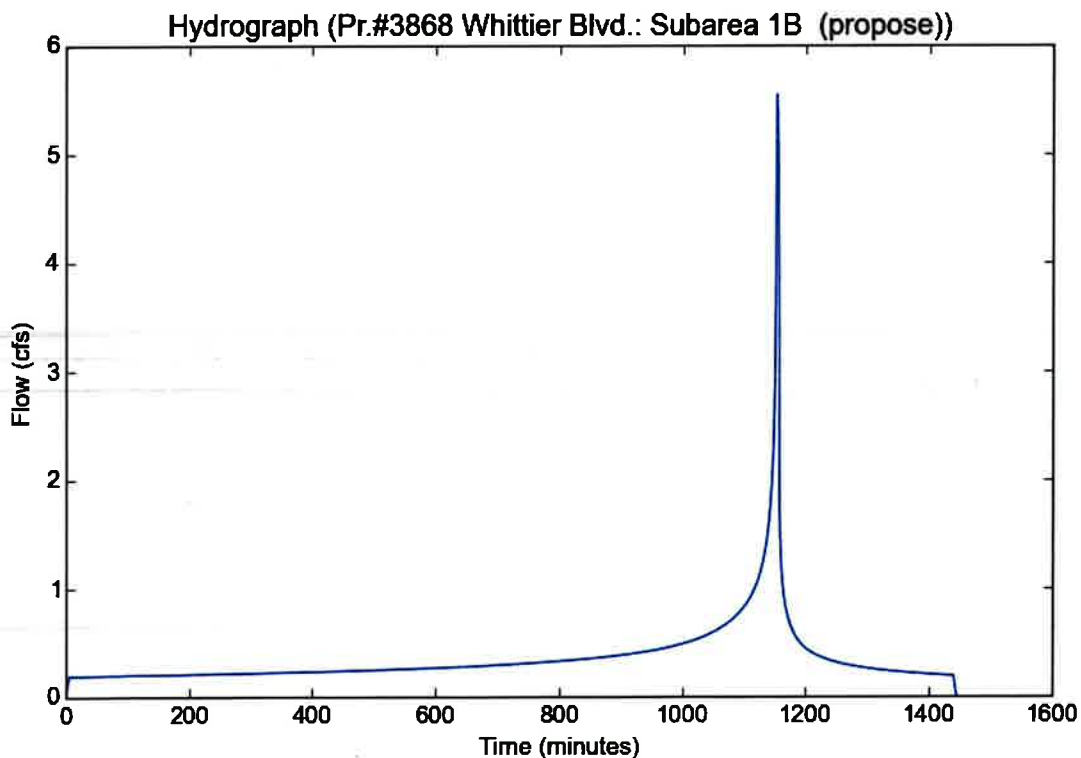
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Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1B (propose)
Area (ac)	1.75
Flow Path Length (ft)	170.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.9
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.5201
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.5442
Burned Peak Flow Rate (cfs)	5.5442
24-Hr Clear Runoff Volume (ac-ft)	0.7129
24-Hr Clear Runoff Volume (cu-ft)	31054.9284



Peak Flow Hydrologic Analysis

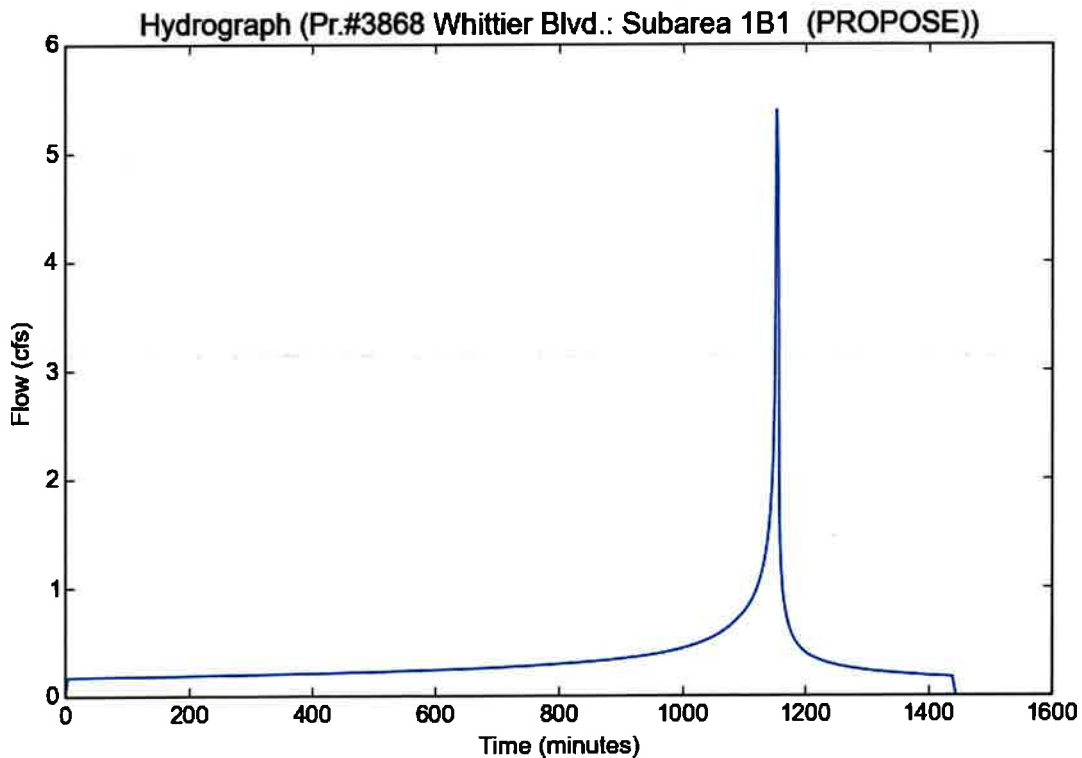
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Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1B1 (PROPOSE)
Area (ac)	1.7
Flow Path Length (ft)	210.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.8
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.5201
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.3858
Burned Peak Flow Rate (cfs)	5.3858
24-Hr Clear Runoff Volume (ac-ft)	0.6391
24-Hr Clear Runoff Volume (cu-ft)	27838.0792



Peak Flow Hydrologic Analysis

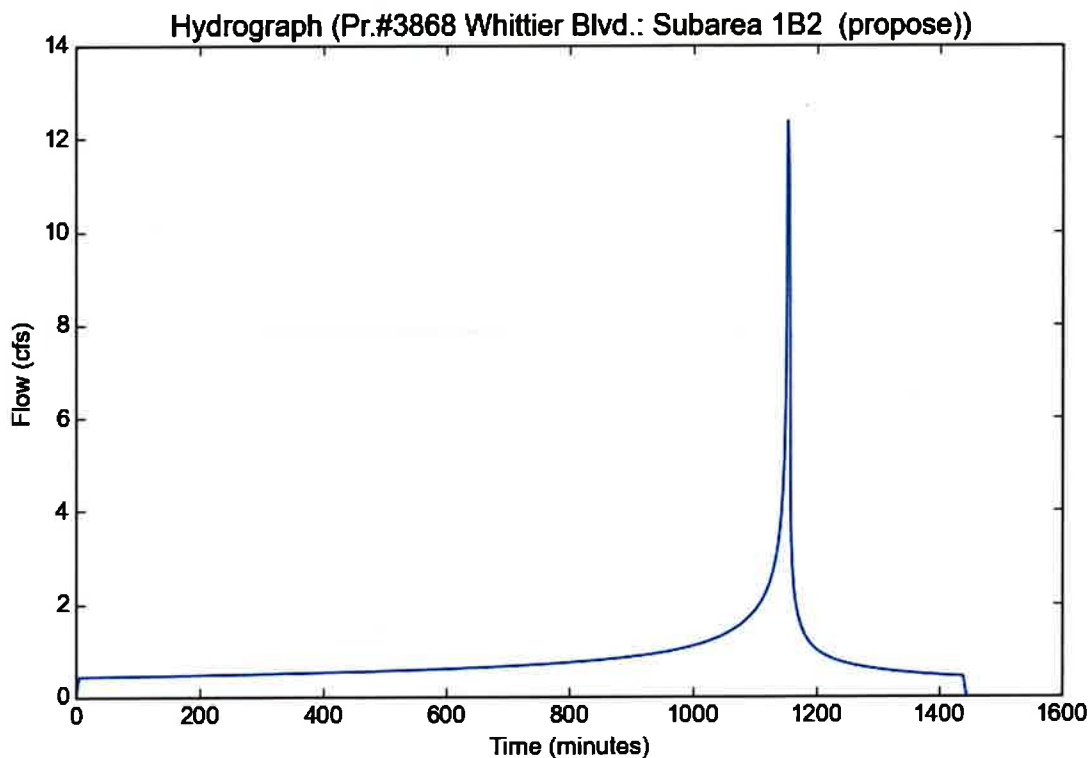
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Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1B2 (propose)
Area (ac)	3.9
Flow Path Length (ft)	75.0
Flow Path Slope (vft/hft)	0.007
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.9
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.5201
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	12.3556
Burned Peak Flow Rate (cfs)	12.3556
24-Hr Clear Runoff Volume (ac-ft)	1.5888
24-Hr Clear Runoff Volume (cu-ft)	69208.1261



Peak Flow Hydrologic Analysis

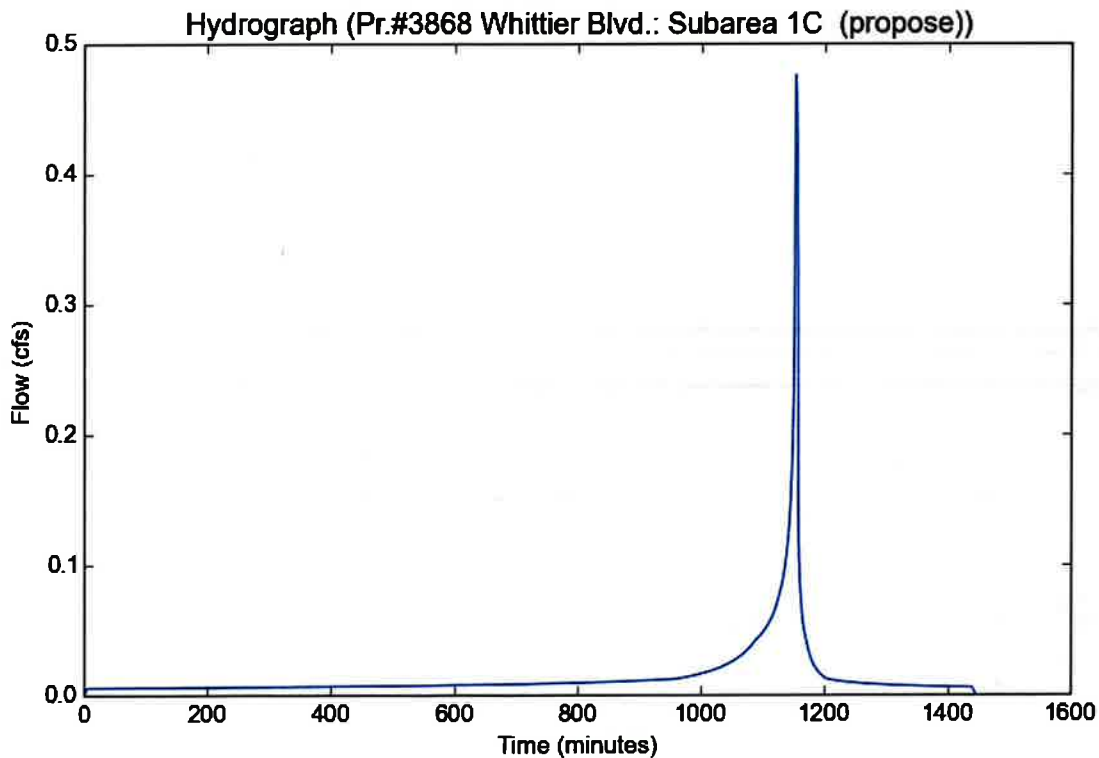
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Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1C (propose)
Area (ac)	0.15
Flow Path Length (ft)	15.0
Flow Path Slope (vft/hft)	0.33
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.2
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.5201
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.4752
Burned Peak Flow Rate (cfs)	0.4752
24-Hr Clear Runoff Volume (ac-ft)	0.0281
24-Hr Clear Runoff Volume (cu-ft)	1223.0017



Peak Flow Hydrologic Analysis

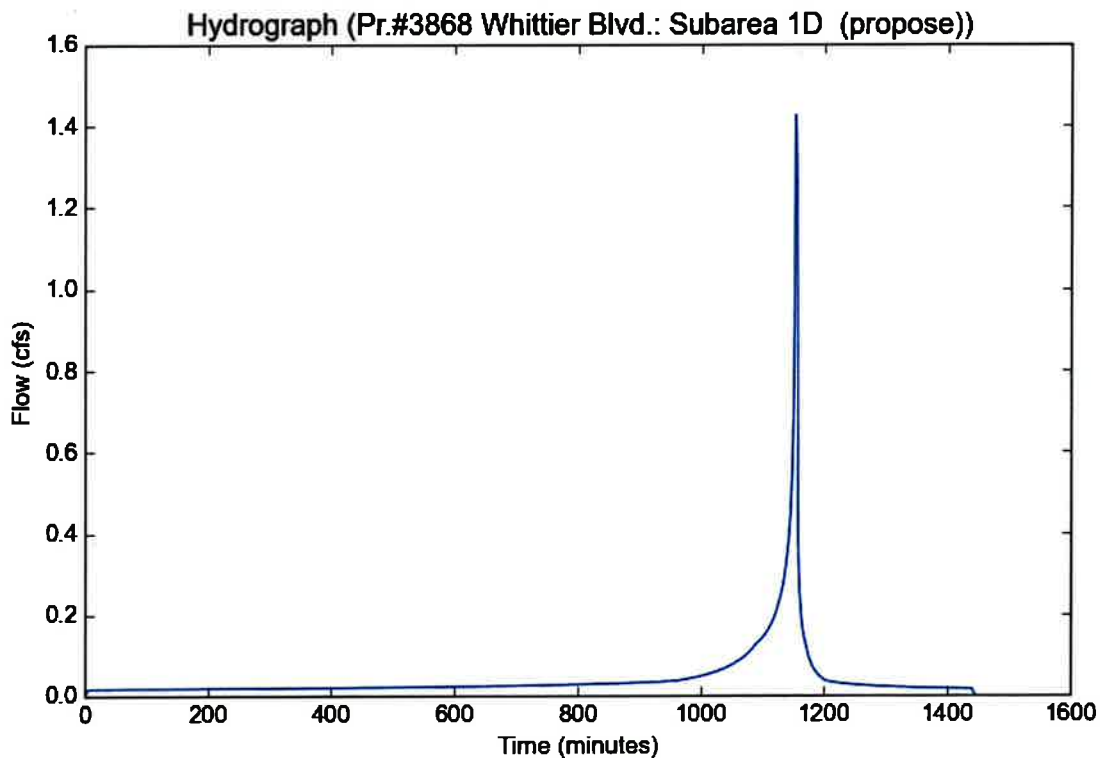
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Input Parameters

Project Name	Pr.#3868 Whittier Blvd.
Subarea ID	Subarea 1D (propose)
Area (ac)	0.45
Flow Path Length (ft)	370.0
Flow Path Slope (vft/hft)	0.33
50-yr Rainfall Depth (in)	5.9
Percent Impervious	0.2
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

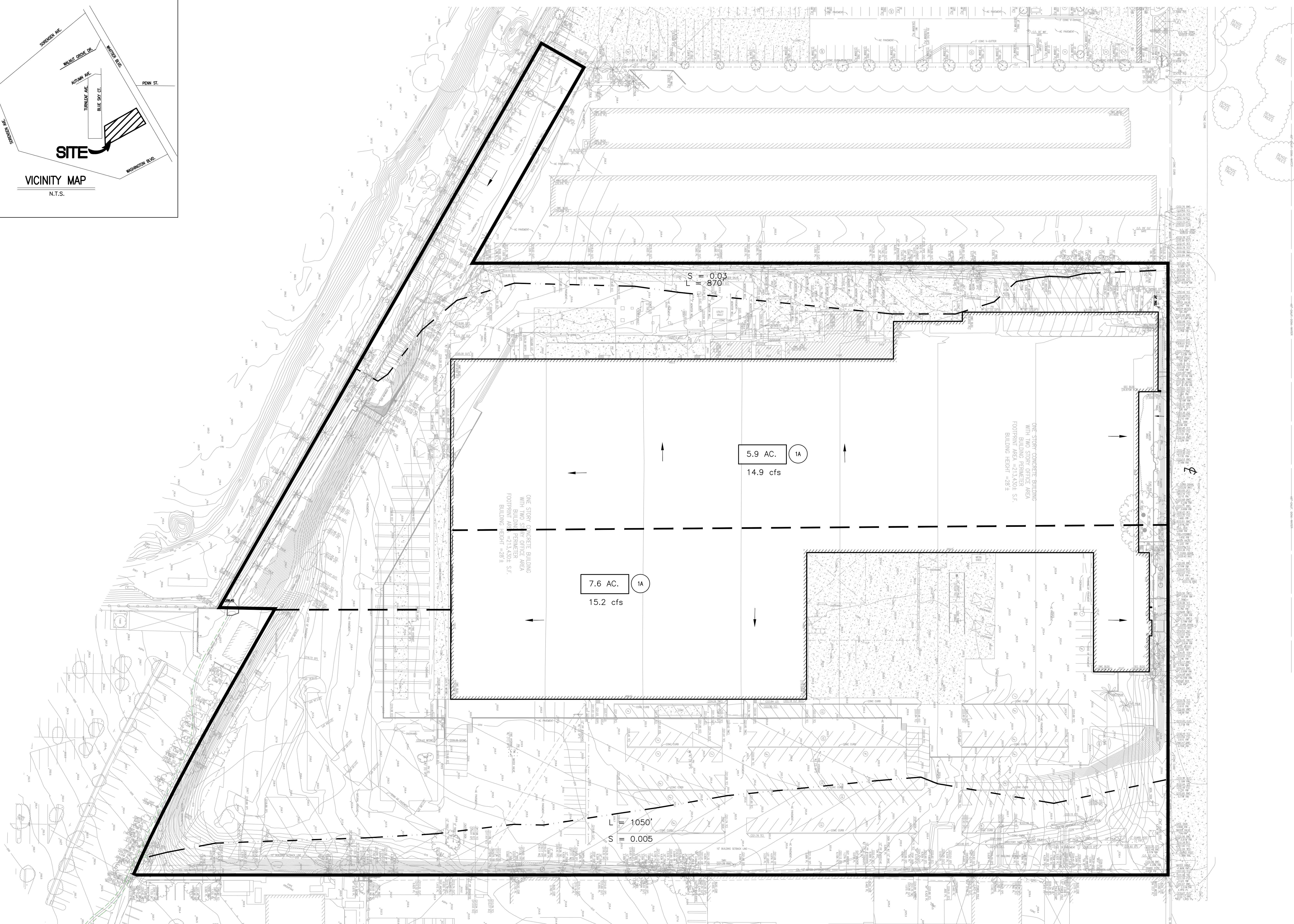
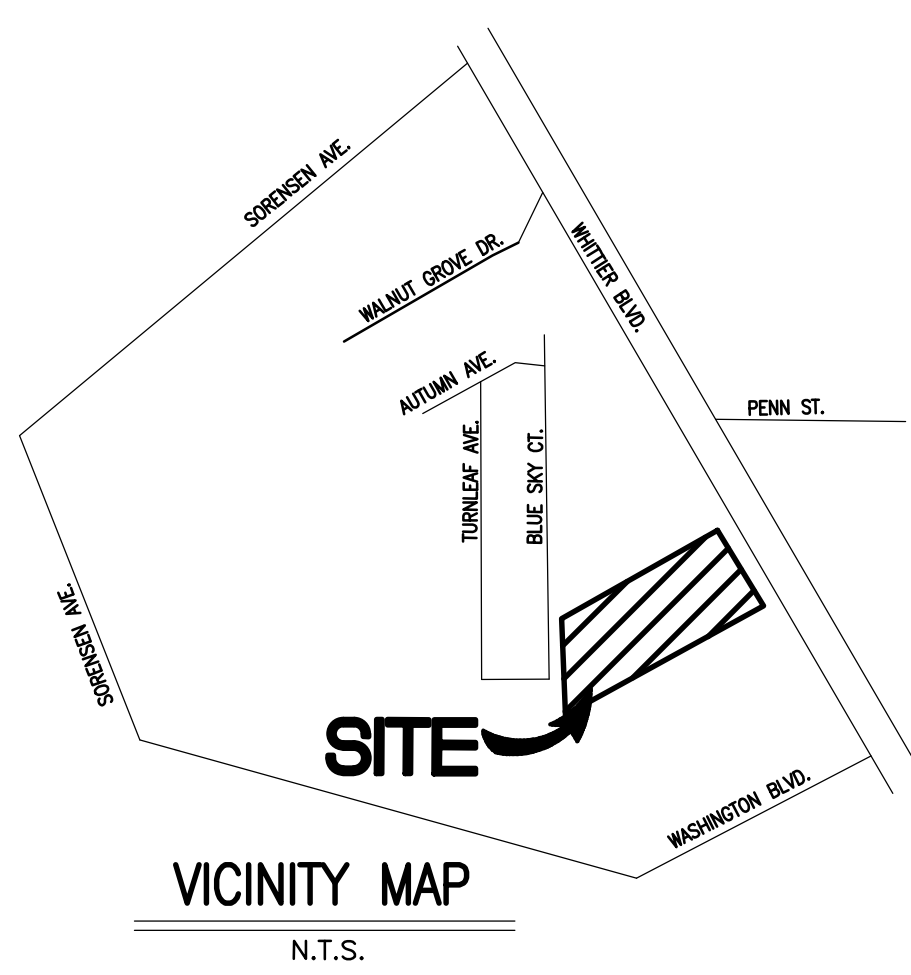
Output Results

Modeled (50-yr) Rainfall Depth (in)	5.9
Peak Intensity (in/hr)	3.5201
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.4256
Burned Peak Flow Rate (cfs)	1.4256
24-Hr Clear Runoff Volume (ac-ft)	0.0842
24-Hr Clear Runoff Volume (cu-ft)	3669.0052



APPENDIX C

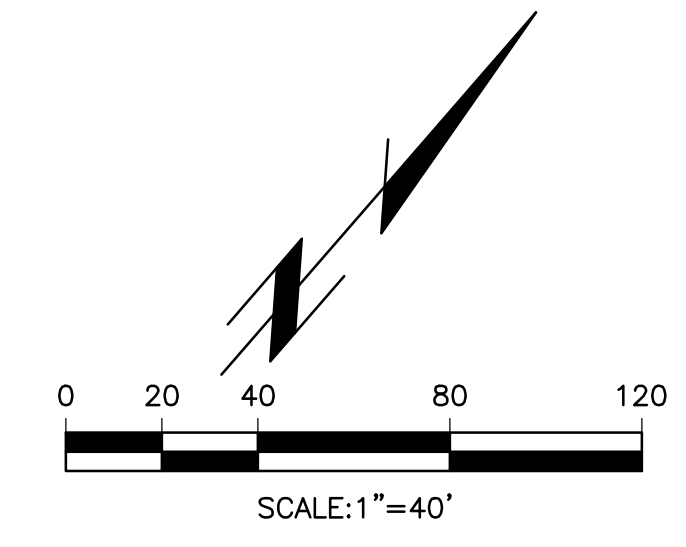
HYDROLOGY MAPS



WHITTIER BLVD.

LEGEND

	PROJECT BOUNDARY
	SUBAREA BOUNDARY
	FLOW PATH
	1.00 AC. SUBAREA AREA
	DRAINAGE AREA



PREPARED FOR:
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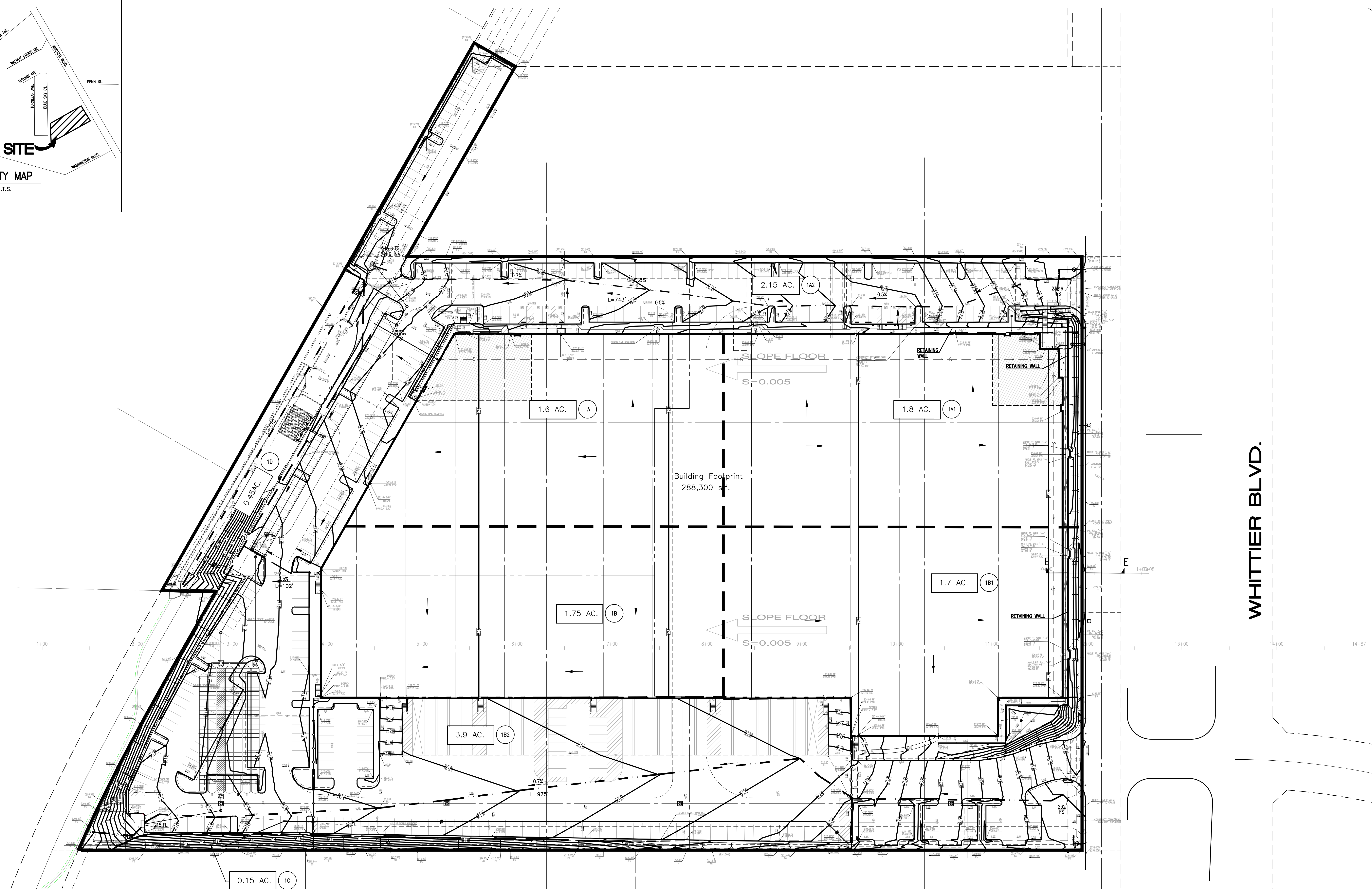
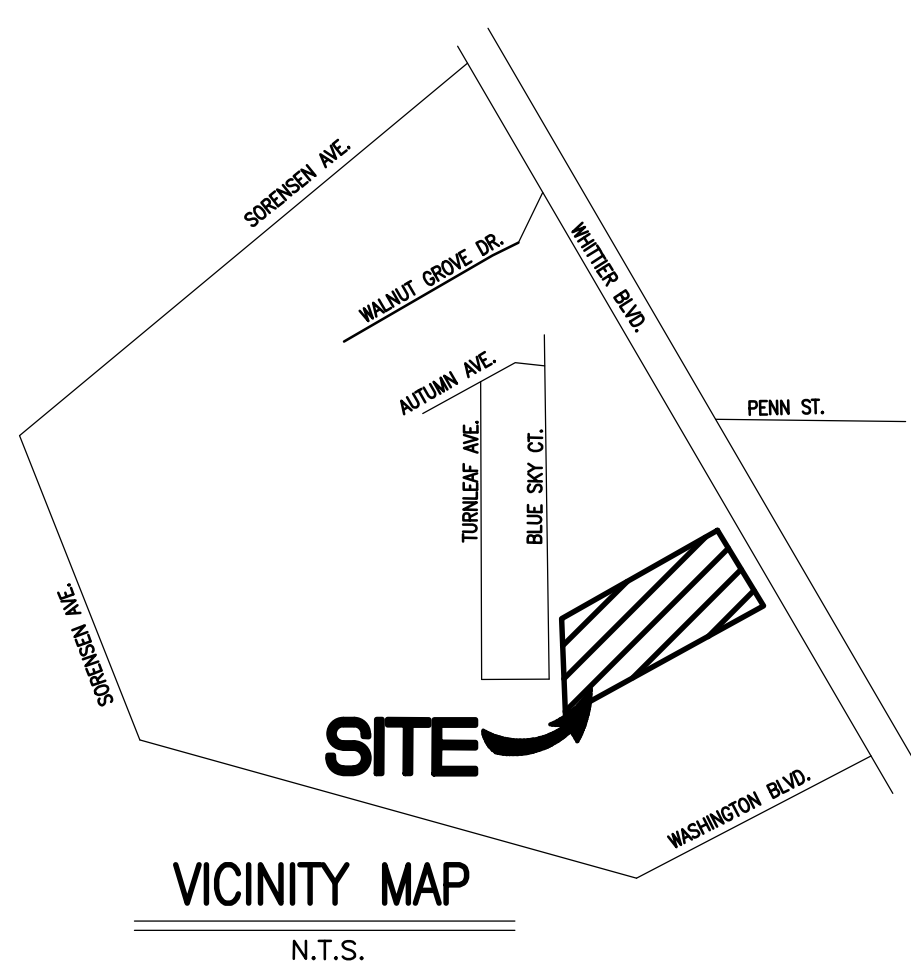
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CITY OF WHITTIER
PUBLIC WORKS DEPARTMENT

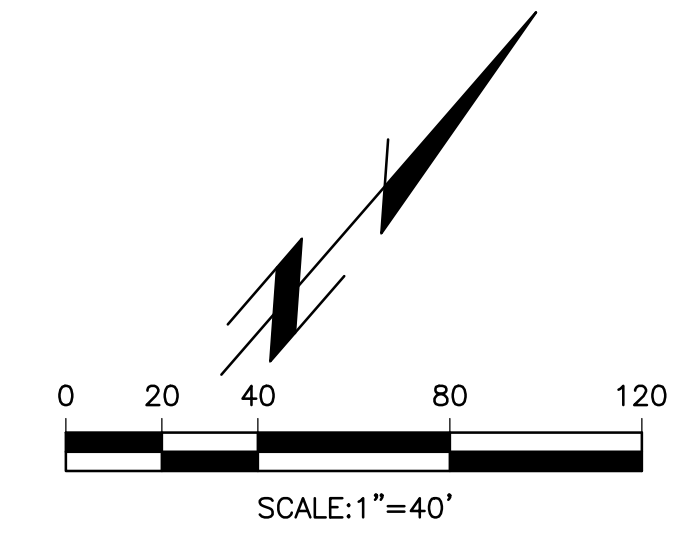
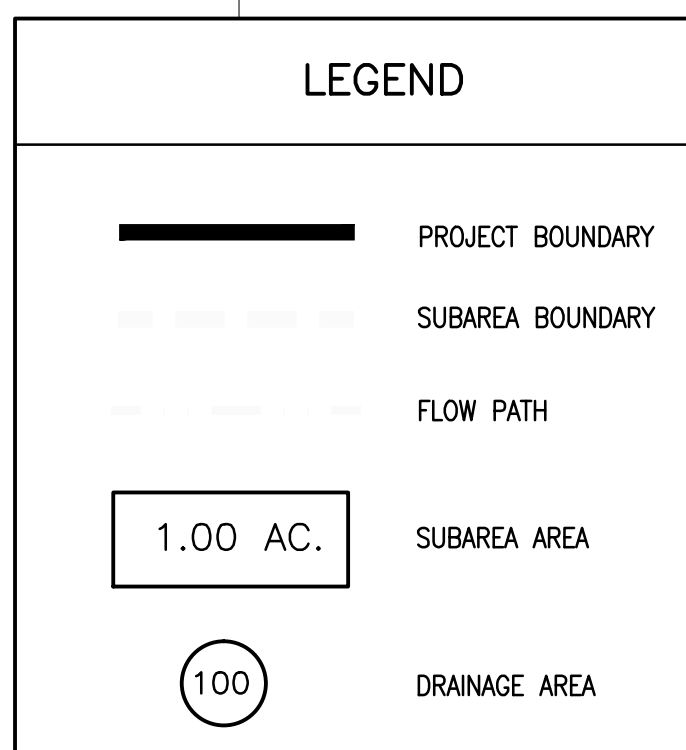
CONCEPTUAL HYDROLOGY MAP
EXISTING CONDITION
WHITTIER BOULEVARD
BUSINESS PARK
12352 WHITTIER BLVD.

Designed by _____	Approved by _____
Checked by _____	Date _____
Designed by _____	Public Works Director _____ R.C.E. XXXXX
Date _____	
Checked by _____	
Date _____	

Sheet **1** of **1** Sheets



WHITTIER BLVD.



PREPARED FOR:
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500 NEWPORT CENTER DRIVE, SUITE 630
NEWPORT BEACH, CA 92660
PHONE: (949) 720-3788

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CITY OF WHITTIER
PUBLIC WORKS DEPARTMENT
CONCEPTUAL HYDROLOGY MAP
WHITTIER BOULEVARD
BUSINESS PARK
12352 WHITTIER BLVD.

Designed by _____	Approved by _____	Date _____
Checked by _____	Public Works Director _____	R.C.E. XXXXX
Designed by _____		
Checked by _____		
Date _____		
Sheet 1 of 1		Sheets

Last Update: 6/14/21
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3888/1 OF 1 SHEET