TTM 78210
The Terraces at Walnut
Walnut, CA

PRELIMINARY HYDROLOGY ANALYSIS

September, 2017

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1 PROJECT DESCRIPTION

This report outlines the drainage facility design for The Terraces at Walnut Project, TTM 78210 in the City of Walnut. The project is located on the north side of East Valley Boulevard northeasterly of Grand Avenue. The site is approximately 49 acres and includes a combination of Small Lot Single Family and commercial development. Figure 1 shows the vicinity of the project and Figure 2 depicts the project location.

The project site is bounded by existing residential homes to the west and northwest and by commercial development to the south and east. San Jose Creek runs along East Valley Boulevard, just south of the project site.

The proposed development includes 240 small lot single family, and a commercial area with sub-level parking. This report serves as the preliminary engineering analysis for the existing drainage assessment and post-development watershed hydrologic conditions associated with the proposed development.

Refer to the project specific Standard Urban Mitigation Plan (SUSMP), found under separate cover, for information pertaining water quality mitigation measures.

1.1 Existing Drainage Systems

The project site consists of approximately 49 acres of undeveloped land. The existing project topography includes a hill. Due to topography of the area, flow is conveyed to three corners, via natural and concrete ditches, see Figure 2.

There are two existing drainage systems located along East Valley Boulevard. The County of Los Angeles owns two 24-inch reinforced concrete pipeline systems along north and south Valley Boulevard and are designed for a 10-yr storm event at about 24 cubic feet per second (cfs), refer to As-built plans in Appendix C. Under existing development conditions, storm water is conveyed by surface flow from the project site to the existing storm drain systems along Valley Boulevard and onto adjacent neighborhood property. There are four existing sub drainage areas, each with its own drainage path. Refer to Exhibit A for the Existing Condition Hydrologic Map in Appendix A.

Hydrology node 100.1 – In the existing condition sub-area A (1.5 acres) sheet flows to the northwestern corner of the site, enters a v-ditch, and drains into an inlet (Node 100) within the residential area along Roundup Dr.

Hydrology node 200.1 – Area C (20.3 acres) surface flow drains south and enters a catch basin onsite that is conveyed south onto Valley Blvd storm drain to Node 200.

Hydrology node 200.2 – Areas B (11.3 acres) surface flow drains southwest along a concrete v-ditch and enters the storm drain system between the residential property and Walnut City Parks and Recreation facility at Node 200.3. Flow at 200.3 eventually connects with the main line along East Valley Blvd. at Node 200.

Hydrology node 300.1- Area D (17.2 acres), located in the northeast corner of the project site flows east and enters the storm drain system at East Valley Blvd. The north storm drain system connects directly to San Jose Creek Channel, just south of Valley Blvd at Node 300.

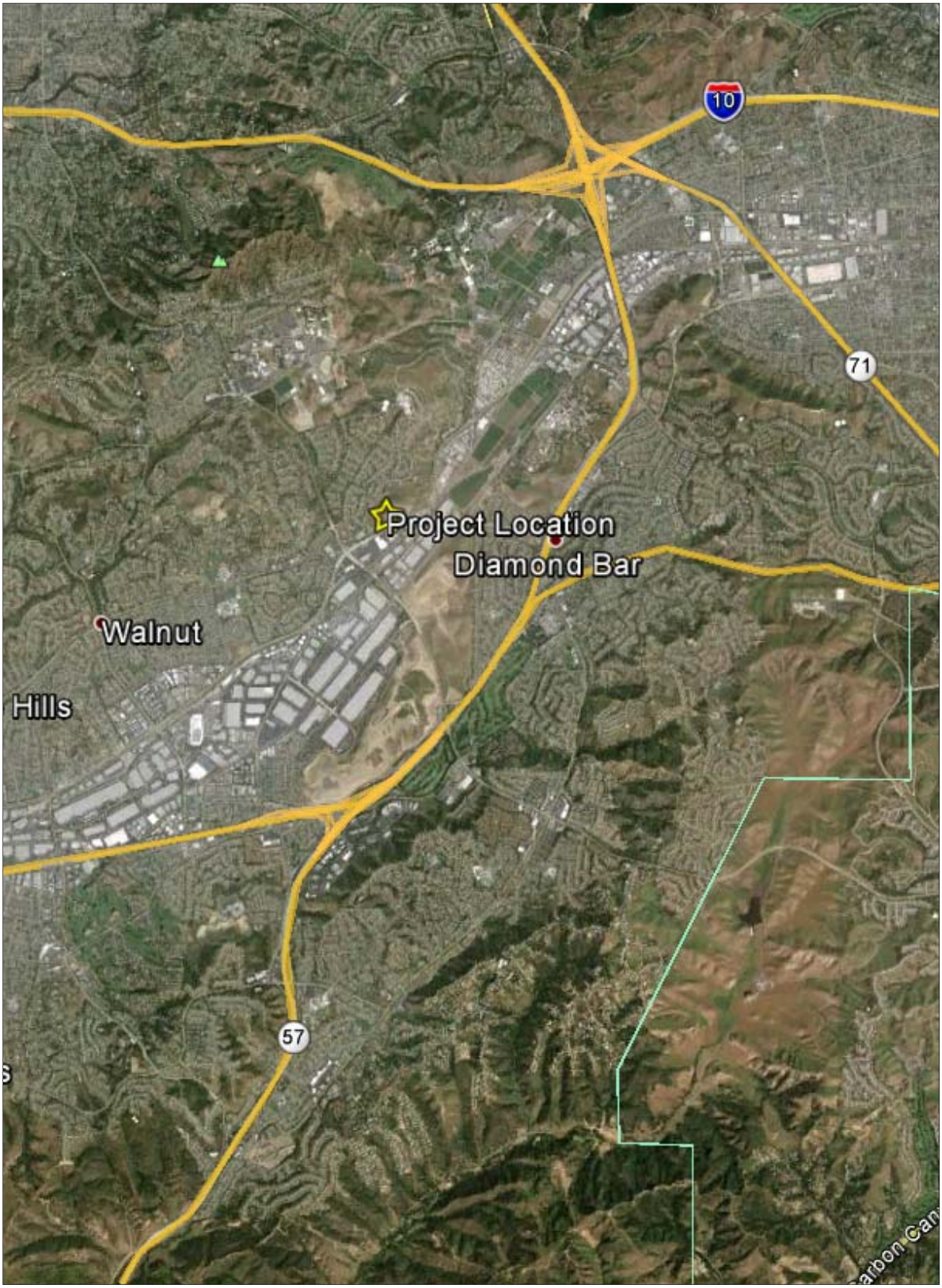


Figure 1: Vicinity Map

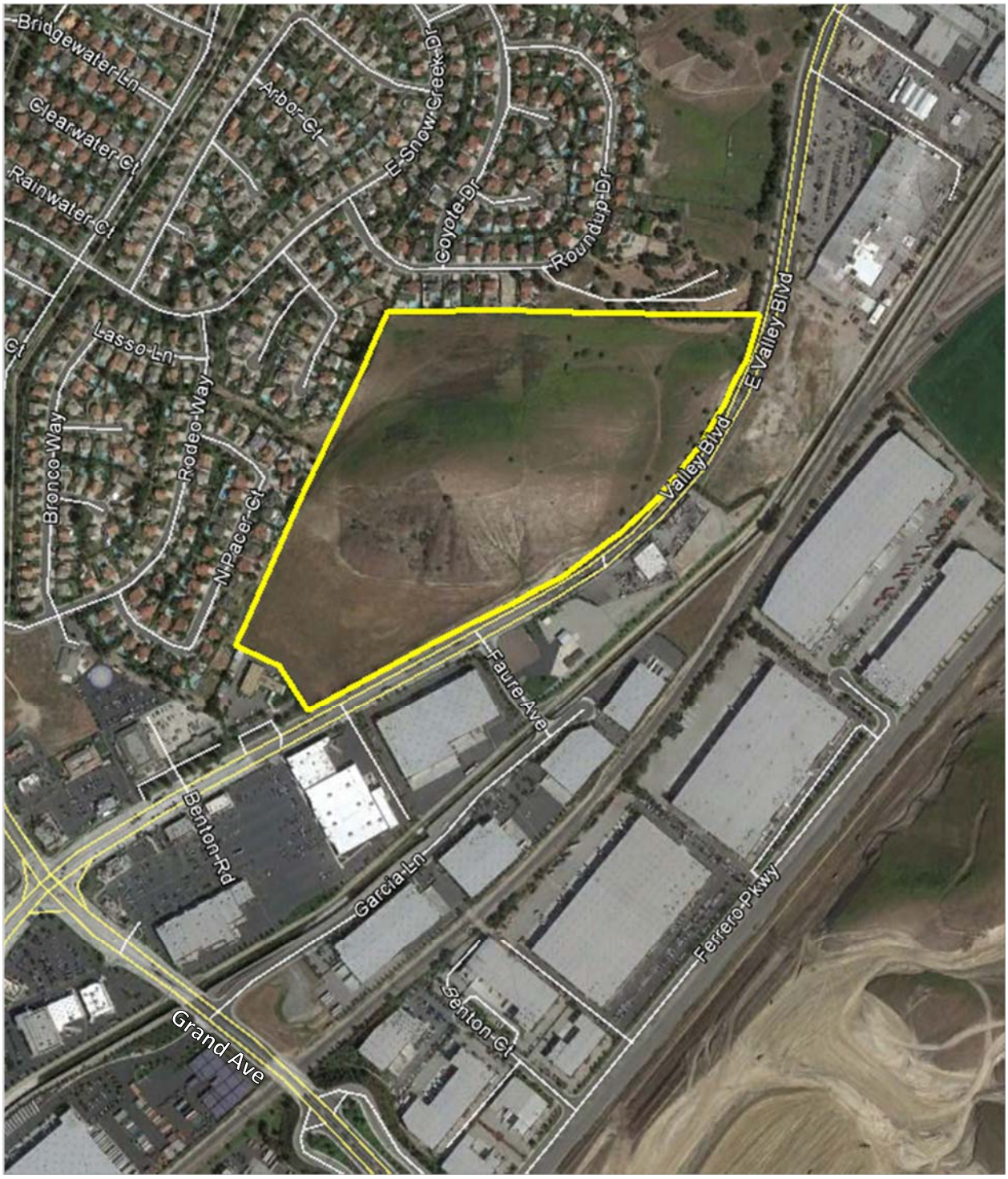


Figure 2: Project Location Map

1.2 Proposed Development Condition

The proposed development will direct flow to the existing East Valley Blvd. storm drain systems, see Los Angeles County As-built plans in Appendix C. The proposed development consists of a substantial amount of grading and development, thus modifying the area's flow paths and runoff coefficients. The discussion below outlines the drainage nodes and flow paths under the post development conditions. Refer to Exhibit B in Appendix A for the Proposed Condition Hydrologic Work Map

Hydrology node Node 100- only 0.4 acres of the 1.5 existing acreage remains flowing to the northwestern corner of the site and the other 1.1 acres drains towards the residential area. Due to the proposed grading, runoff to will be directed south towards Node 200 where it will be able to be mitigated for pollutants and flood.

Node 200.1 represents the initial area of the residential site that confluences with Node 200.2 downstream. Node 200.2 represents the connection to the flood basin that then will connect to Node 200.4. Node 200.4 represents the connection to the commercial area and the proposed underground flood control detention basin.

Node 200.3 represents the initial commercial area that will drain into the underground flood control detention basin at node 200.4.

Node 200.4 will then connect to the existing 24" RCP in East Valley Blvd at node 200.

Hydrology node Node 300- represents 8.1 acres of the project slope areas that are self-treating for stormwater pollution prevention and will be captured into drains and pipes, which will be tributary to the existing storm drain system along East Valley Blvd.

2 HYDROLOGY

Modified Rational Method (MODRAT) is based on the Rational Method, but uses a time of concentration and a design storm to determine intensities throughout the storm period. The intensities are used to determine the soil runoff coefficient. The rational formula then provides a flow rate for a specific time. Plotting the time specific flow rate provides a hydrograph and an associated flow volume. MODRAT is the standard method for hydrologic studies within Los Angeles County. Computer programs implement MODRAT to compute runoff data from input parameters.

The modified rational method (MODRAT) uses a design storm and a time of concentration to calculate runoff at different times throughout the storm. MODRAT calculates flows based on the rainfall distribution results in a runoff hydrograph. MODRAT allows hydrograph routing generated in each subarea through conveyances and combine hydrographs based on time. MODRAT produces peak flows equal to or lower than flows calculated using the rational method.

The drainage areas within the watershed were delineated using project specific contour topography, and the proposed site plan. The design discharges at intermediate points were computed by generating a hydrologic link-node model which divides the area into drainage sub-areas, each tributary to a concentration point or hydrologic nodes. The nodes are linked together by hydraulic conveyance processes which describe the physical watershed process. The site was divided into four main drainage areas: 1A, 3A, 1C and 1D. The Modified Rational Method analysis results for the 10 and 50-year storm events are provided in Appendix A. Hydrology maps are included as Exhibits A and B. The following assumptions/guidelines were applied for use of the Modified Rational Method:

An impervious coefficient was determined based upon land-use. Under existing conditions, the entire study is modeled as “Other Open Space” with 10% imperviousness due to the grading and incorporated ditches. Under the proposed development conditions, summery table below was used.

Table 1: Runoff Coefficient

Drainage Area Index	On-Site Tributary Area (Ac)	Land Use	Percent Impervious
1A	35.3	Small Lot Single Family	70%
3A	5.2	Commercial	90%
1C	0.4	Open Space	10%
1D	8.1	Open Space/Landscape	10%

The 2004 Los Angeles County Hydrology web based map was used to identify the predominant soil type, referenced from the Los Angeles Hydrology Manual. The predominant soil type for the proposed site is 002, see Figure 3.

Rainfall depth was determined for the 10-year and 50-year storm event using the isohyetal maps in the Los Angeles County Hydrology Manual. The 50-year 24-hour rainfall depth base on Figure 3 is 6.7 inches. The 10-year rainfall depth for the project site was calculated base on 0.714 reduction factor from the 50-year 24 hour and is calculated to be 4.78 inches.

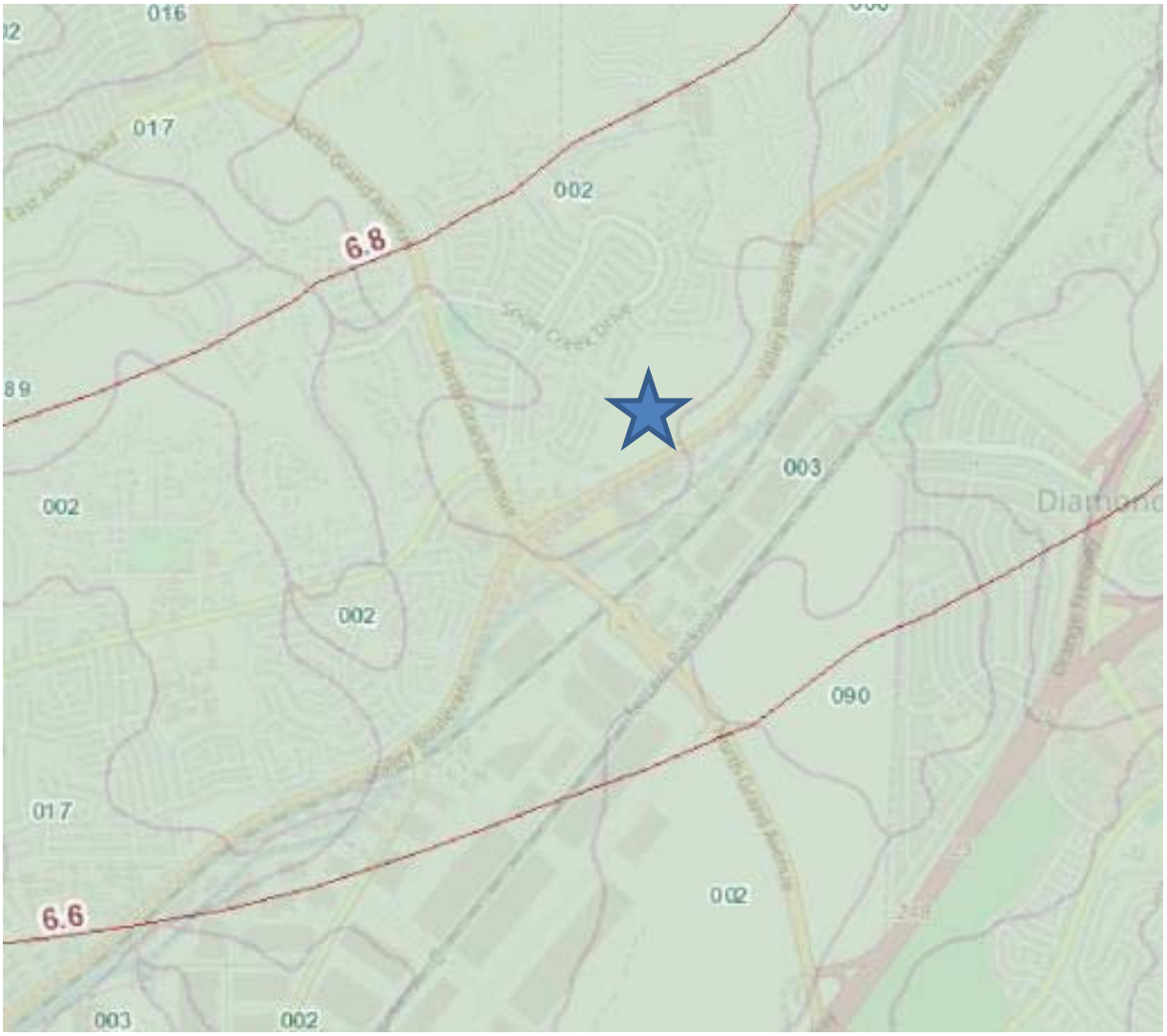


Figure 3: Soils Map

2.1 Hydrology Design Flows

In existing conditions, the site drains to three nodes, 100, 200, and 300. For comparison purposes, the proposed site will also have three discharge locations.

The two tables below summarize the hydrologic analyses for the onsite and offsite discharge locations under the existing and proposed conditions. Refer to Appendix A for all MODRAT input and output.

Table 2: Hydrologic Summary – Existing Condition

Existing Condition	10-YR HC (cfs)	50-YR HC (cfs)
Node 100	2.7	5.6
Node 200	26.7	77.1
Node 300	18.8	50.8

Table 3: Hydrologic Summary – Proposed Condition

Proposed Condition	10-YR HC (cfs)	50-YR HC (cfs)
Node 100	0.7	1.4
Node 200	34.3	88.9
Node 300	8.3	23.1

The proposed development produces a peak 50-year flow rate of 88.9 cfs at node 200. This approximately results in a 11.8 cfs increase from the existing condition which will be mitigated by a flood control detention basin. The flow produced by the proposed development outflows through the proposed storm drain at Node 200 to a storm drain line along East Valley Blvd. Peak flows to the adjacent neighborhood to the north have been reduced to 4.2 cfs and by 27.7 cfs at Node 300.

2.2 Flood Basin Design

Urbanization and development tends to increase the peak rate and storm water runoff. An underground flood basin is proposed in order to mitigate for the increase in peak flow. Flood basins with a restricted orifice opening allow reduce the peak flow rate to match or decrease the existing peak flow rate.

2.2.1 Orifice Analysis

The underground flood basin will have two orifice outlets, the lower outlet will be able to discharge flow from the 10-year storm event and the higher orifice will handle flow from the 50-year storm event in conjunction with the first orifice. Flowmaster was used to analyze the discharge rates from each orifice.

Flowmaster models weir and orifice discharge, considering headwater and tailwater elevations, type of orifice, Mannings roughness coefficient, and diameter. Orifice flow rates can be found on Table 4 below.

Table 4: Orifice Discharge Rates

Elevation	10-YR Diameter 24" (cfs)	50-YR Diameter 24" (cfs)	Cumulative Discharge (cfs)
1	0	0	0
2	15.88	0	15.88
3	22.45	0	22.45
4	27.5	0	27.5
5	31.75	15.88	47.63
6	35.5	22.45	57.95
7	38.89	27.50	66.39

FlowMaster results can be found in Appendix B.

2.2.2 Watershed Analysis

The flood basin proposed will be located in the south end of the site in the commercial area. The basin will mitigate flow from 35.3 acres of residential area (Area 1A) and 5.2 acres of commercial area (Area 3A). The basin footprint is about 0.3 acres with a 6 foot depth and 1 foot freeboard.. Watershed Modeling System (WMS) 9.1 software was used to analyze the hydrology.

WMS is a modeling system used for hydrology and hydraulics. WMS has multiple models incorporated. One of the models is MODRAT, a specialized method used by the County of Los Angeles to compute surface runoff. MODRAT models a data tree in WMS and allows for watershed input including parameters such as: area, flow length, slope, Tc, percent impervious, and rain depth. Hydraulic components such as basins can be incorporated into the model. HydroCalc outputs were used in WMS:MODRAT for analysis. Results for the watersheds with basin mitigation are listed below in Table 5 and 6.

Table 5: WMS 50-yr Surface Runoff Results

Location	Sub-Area (ac.)	Sub-Area Q (cfs)	Basin Outlet Q (cfs)
1A Residential	35.3	74.68	
3A Commercial Area	5.2	14.17	
2A Basin			64.17

Table 6: WMS 10-yr Surface Runoff Results

Location	Sub-Area (ac.)	Sub-Area Q (cfs)	Basin Outlet Q (cfs)
1A Residential	35.3	28.49	
3A Commercial Area	5.2	5.78	
2A Basin			24.54

Table 7: Basin Routing

Basin Elevation	Storage (a.f.)	Outflow (cfs)
1	0.00	0.00
2	0.30	15.88
3	0.60	22.45
4	0.90	27.50
5	1.20	47.63
6	1.50	57.95
7	1.80	66.39

WMS results for 50-YR can be found in Appendix B.

3 CONCLUSIONS

In the existing conditions the peak flow rate at node 200 was increased due to proposed grading and the proposed development residential units and commercial area.

The current hydrology resulted in a decrease to Node 100 and 300.

- At Node 100, peak flow will be reduced by 75%.
- At Node 300, peak flow rates will be reduced by 54%.

The increase in flow will be mitigated by a flood basin in the lower southern corner of the site. This 0.3 acre basin will be about 6 feet in depth and 1 foot as freeboard. Flow from the project area draining to Node 200 will be reduced from 88.9 cfs to 64.17 cfs, a 28% reduction.

4 REFERENCES

Reference 1
Los Angeles Hydrology Manual (January 2006)

Reference 2
Los Angeles LID Manual (January 2006)

Reference 3
City of Walnut Municipal Code (April 2015)

Reference 4
Los Angeles MS4 Permit Order No. R4-2012-0176 adopted November 8, 2012

5 APPENDIX

Appendix A: Hydrology Calculations

Appendix A-1: Existing Hydrology 10 & 50 Year Storm
Appendix A-2: Proposed Hydrology 10 & 50 Year Storm

Appendix B: Basin Routing Calculations

Appendix B-1: Proposed 50 Year Storm Routing
Appendix B-2: Proposed 10 Year Storm Routing

Appendix C: East Valley Boulevard Existing Storm Drain Plans

Appendix A:
Hydrology Calculations

Appendix A-1:

Existing Hydrology 10 & 50 Year Storm

Peak Flow Hydrologic Analysis

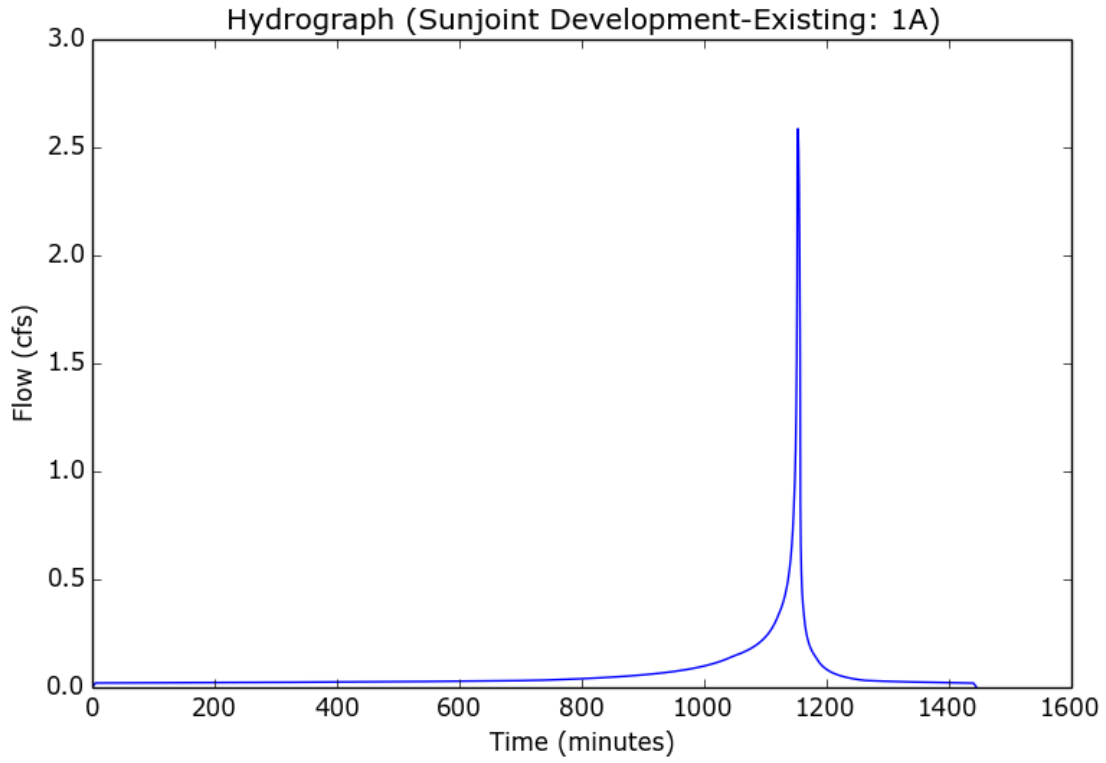
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/10-yr/10-YR- Existing Hydrology Analysis.pdf
Version: HydroCalc 0.3.1

Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1A
Area (ac)	1.5
Flow Path Length (ft)	230.0
Flow Path Slope (vft/hft)	0.135
50-yr Rainfall Depth (in)	4.78
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.4129
Peak Intensity (in/hr)	2.0362
Undeveloped Runoff Coefficient (Cu)	0.8411
Developed Runoff Coefficient (Cd)	0.8469
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.5869
Burned Peak Flow Rate (cfs)	2.7098
24-Hr Clear Runoff Volume (ac-ft)	0.1386
24-Hr Clear Runoff Volume (cu-ft)	6036.7696



Peak Flow Hydrologic Analysis

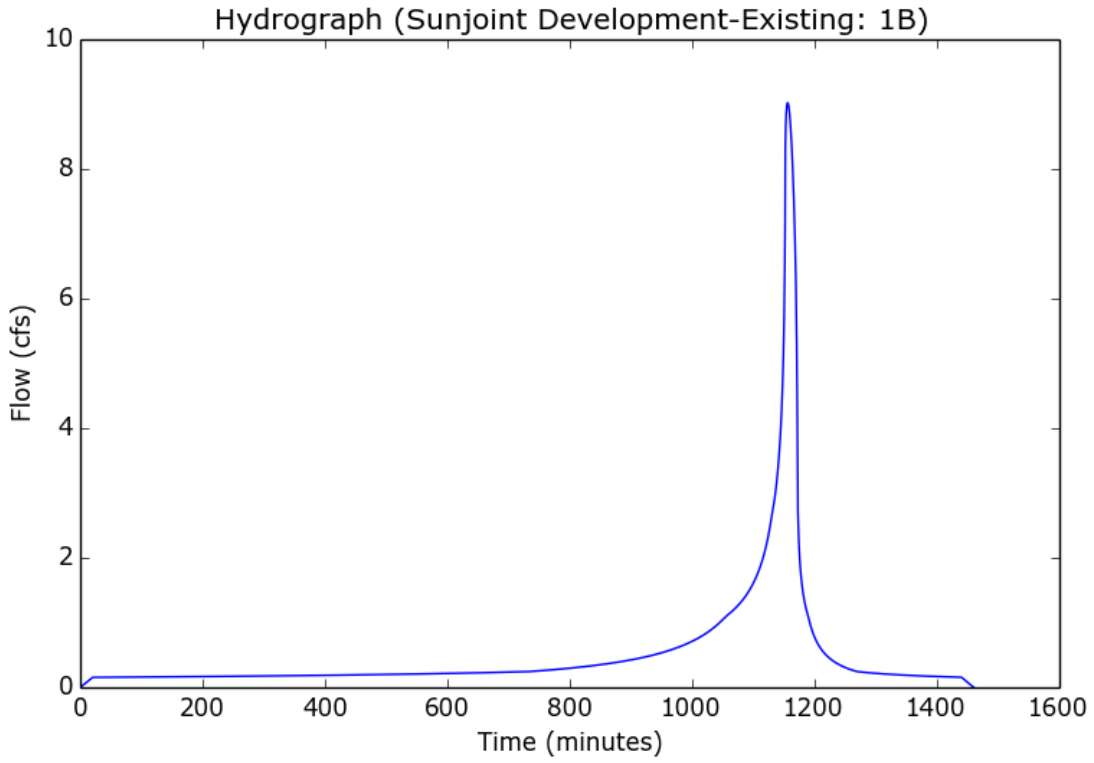
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/10-yr/10-YR- Existing Hydrology Analysis.pdf
Version: HydroCalc 0.3.1

Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1B
Area (ac)	11.32
Flow Path Length (ft)	2087.6
Flow Path Slope (vft/hft)	0.075
50-yr Rainfall Depth (in)	4.78
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.4129
Peak Intensity (in/hr)	1.0614
Undeveloped Runoff Coefficient (Cu)	0.7344
Developed Runoff Coefficient (Cd)	0.7509
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	9.022
Burned Peak Flow Rate (cfs)	9.717
24-Hr Clear Runoff Volume (ac-ft)	1.0399
24-Hr Clear Runoff Volume (cu-ft)	45299.2039



Peak Flow Hydrologic Analysis

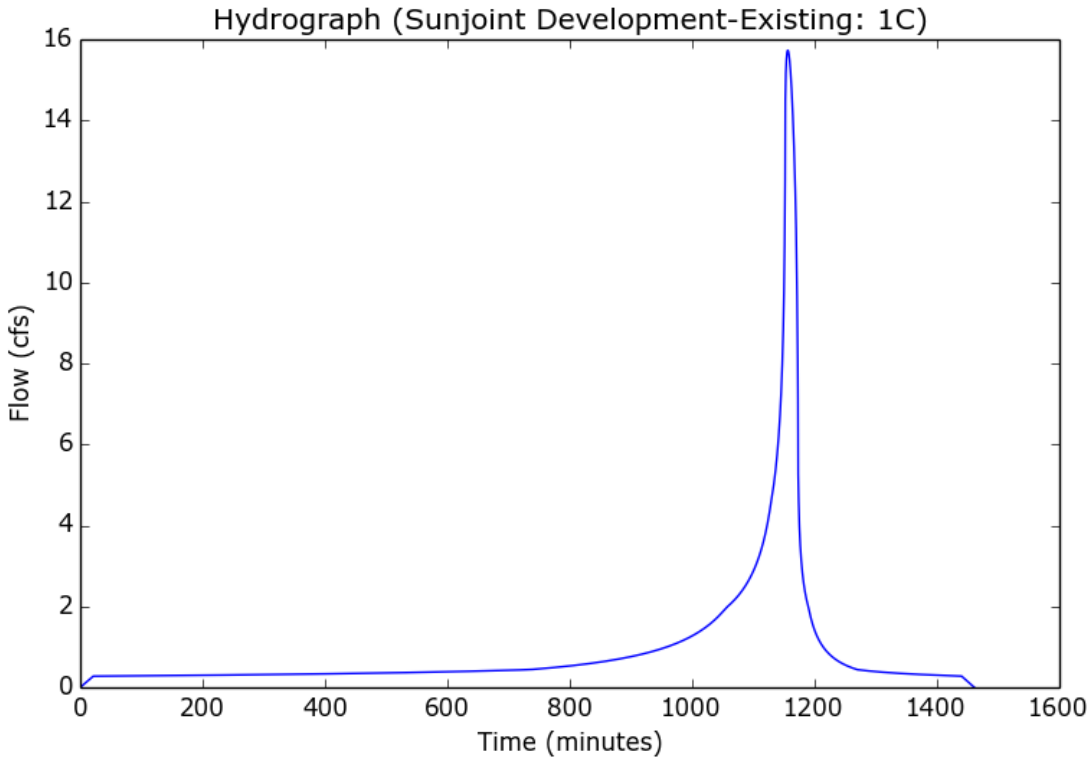
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/10-yr/10-YR- Existing Hydrology Analysis.pdf
Version: HydroCalc 0.3.1

Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1C
Area (ac)	20.3
Flow Path Length (ft)	2377.35
Flow Path Slope (vft/hft)	0.0954
50-yr Rainfall Depth (in)	4.78
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.4129
Peak Intensity (in/hr)	1.0373
Undeveloped Runoff Coefficient (Cu)	0.73
Developed Runoff Coefficient (Cd)	0.747
Time of Concentration (min)	21.0
Clear Peak Flow Rate (cfs)	15.7301
Burned Peak Flow Rate (cfs)	16.9612
24-Hr Clear Runoff Volume (ac-ft)	1.8643
24-Hr Clear Runoff Volume (cu-ft)	81209.1411



Peak Flow Hydrologic Analysis

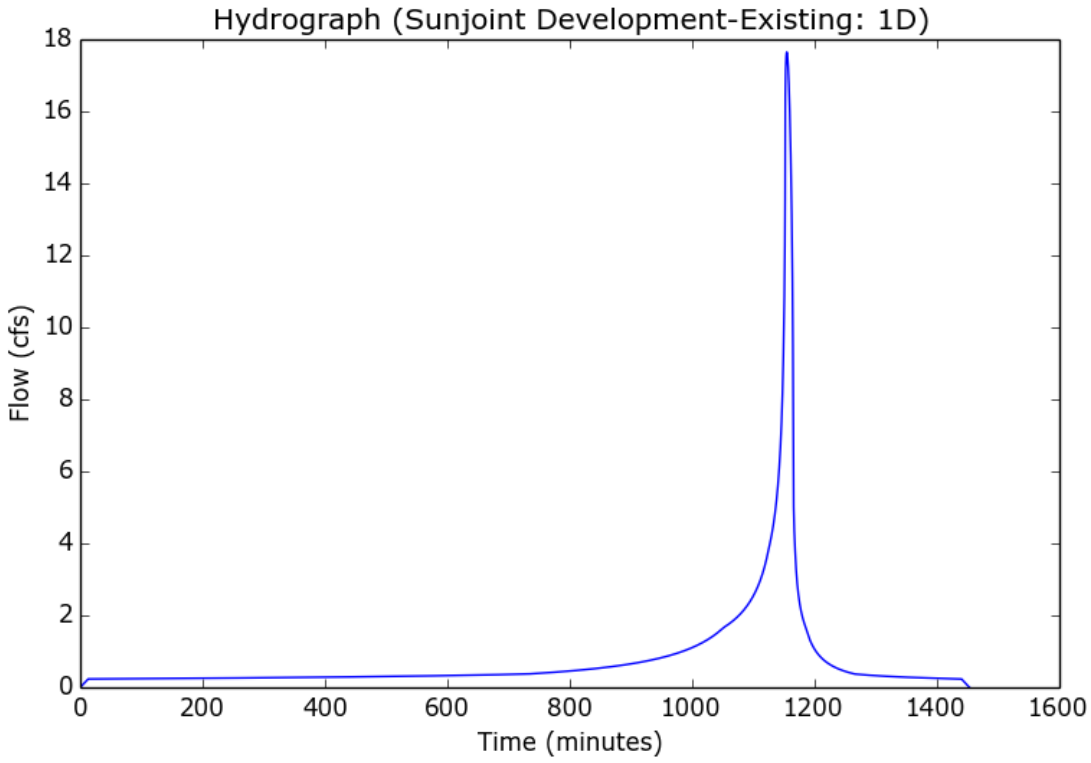
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/10-yr/10-YR- Existing Hydrology Analysis.pdf
Version: HydroCalc 0.3.1

Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1D
Area (ac)	17.2
Flow Path Length (ft)	1246.1
Flow Path Slope (vft/hft)	0.093
50-yr Rainfall Depth (in)	4.78
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.4129
Peak Intensity (in/hr)	1.2995
Undeveloped Runoff Coefficient (Cu)	0.7773
Developed Runoff Coefficient (Cd)	0.7896
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	17.6483
Burned Peak Flow Rate (cfs)	18.7867
24-Hr Clear Runoff Volume (ac-ft)	1.585
24-Hr Clear Runoff Volume (cu-ft)	69042.7779



Peak Flow Hydrologic Analysis

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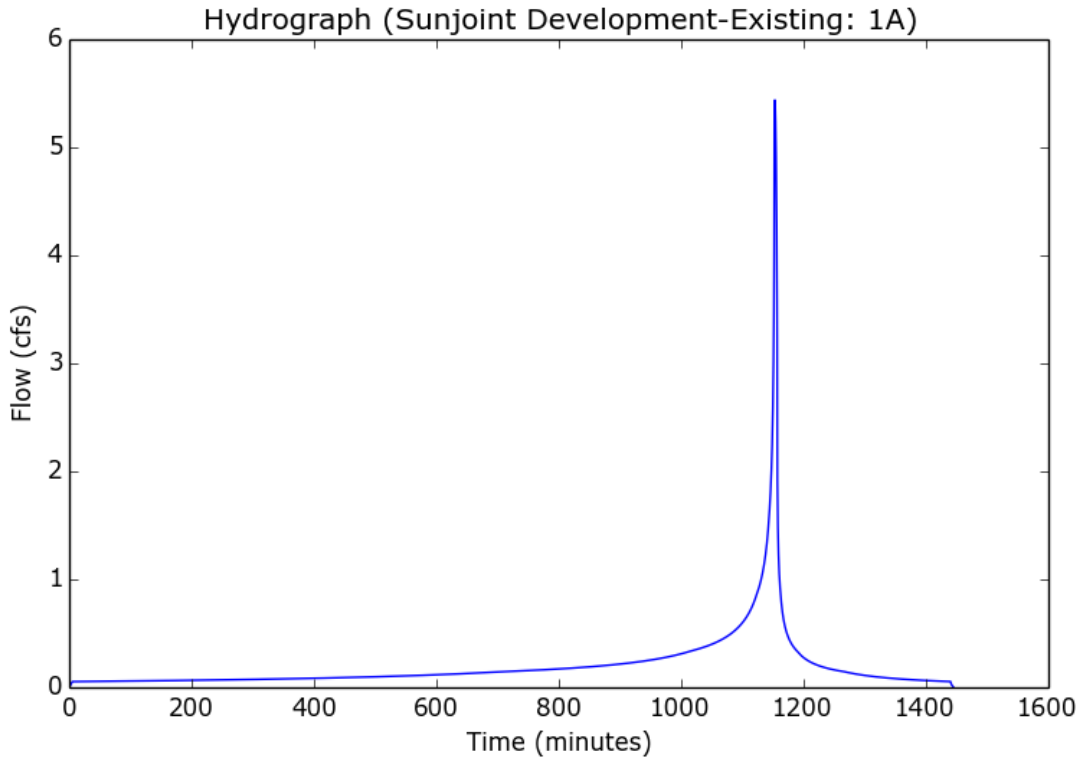
Version: HydroCalc 0.3.1

Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1A
Area (ac)	1.5
Flow Path Length (ft)	230.0
Flow Path Slope (vft/hft)	0.135
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.7
Peak Intensity (in/hr)	3.9974
Undeveloped Runoff Coefficient (Cu)	0.9078
Developed Runoff Coefficient (Cd)	0.907
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.4384
Burned Peak Flow Rate (cfs)	5.6016
24-Hr Clear Runoff Volume (ac-ft)	0.4061
24-Hr Clear Runoff Volume (cu-ft)	17691.498



Peak Flow Hydrologic Analysis

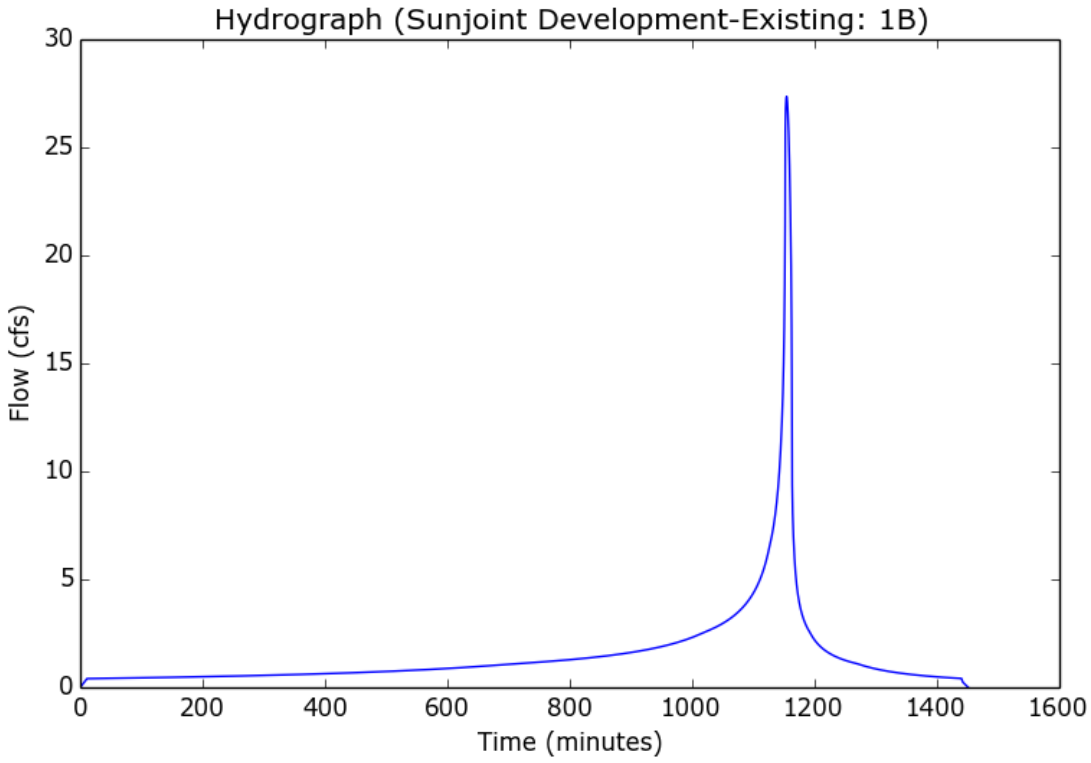
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/50-yr/Sunjoint Development-Existing Report.pdf
Version: HydroCalc 0.3.1

Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1B
Area (ac)	11.32
Flow Path Length (ft)	2087.6
Flow Path Slope (vft/hft)	0.075
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.7
Peak Intensity (in/hr)	2.7596
Undeveloped Runoff Coefficient (Cu)	0.873
Developed Runoff Coefficient (Cd)	0.8757
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	27.3563
Burned Peak Flow Rate (cfs)	28.4301
24-Hr Clear Runoff Volume (ac-ft)	3.0622
24-Hr Clear Runoff Volume (cu-ft)	133389.9832



Peak Flow Hydrologic Analysis

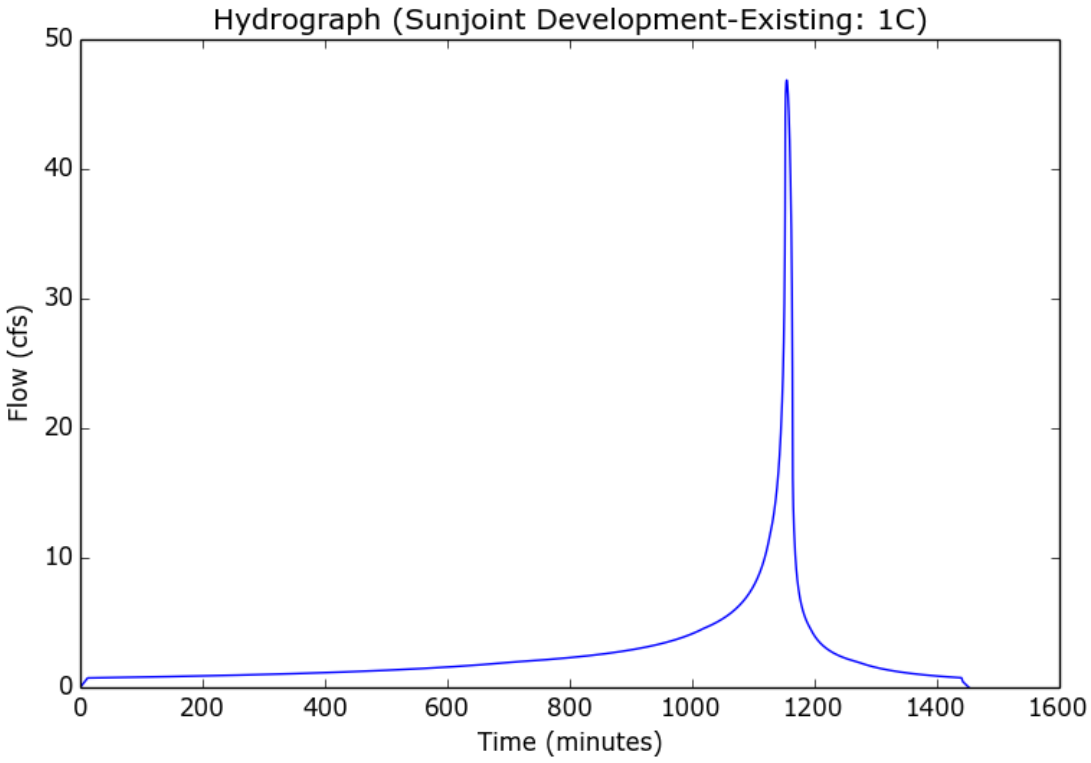
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/50-yr/Sunjoint Development-Existing Report.pdf
Version: HydroCalc 0.3.1

Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1C
Area (ac)	20.3
Flow Path Length (ft)	2377.35
Flow Path Slope (vft/hft)	0.0954
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.7
Peak Intensity (in/hr)	2.649
Undeveloped Runoff Coefficient (Cu)	0.8681
Developed Runoff Coefficient (Cd)	0.8713
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	46.8553
Burned Peak Flow Rate (cfs)	48.7566
24-Hr Clear Runoff Volume (ac-ft)	5.4905
24-Hr Clear Runoff Volume (cu-ft)	239167.0232



Peak Flow Hydrologic Analysis

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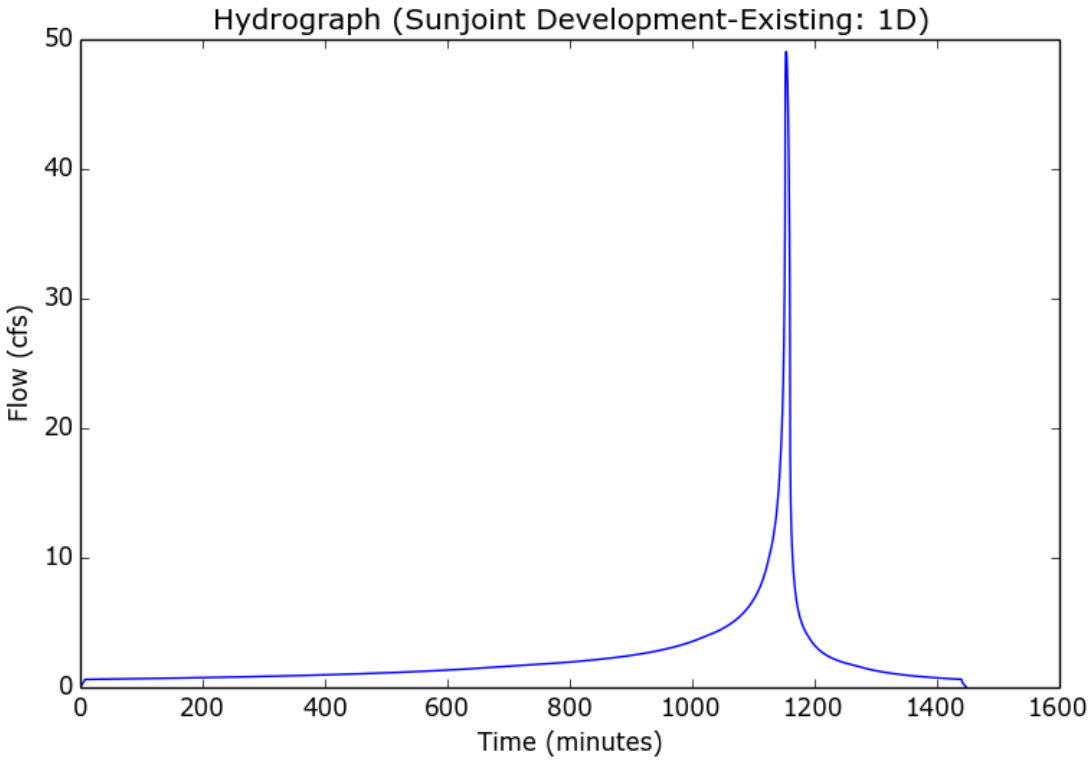
Version: HydroCalc 0.3.1

Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1D
Area (ac)	17.2
Flow Path Length (ft)	1246.1
Flow Path Slope (vft/hft)	0.093
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.7
Peak Intensity (in/hr)	3.2051
Undeveloped Runoff Coefficient (Cu)	0.8886
Developed Runoff Coefficient (Cd)	0.8898
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	49.0505
Burned Peak Flow Rate (cfs)	50.7714
24-Hr Clear Runoff Volume (ac-ft)	4.6553
24-Hr Clear Runoff Volume (cu-ft)	202786.2735



LEGEND

- DRAINAGE BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- 1B / 11.3 — SUBAREA DESIGNATION / AREA (ACRES)
- 100 — HYDROLOGY NODE
- EXISTING STORM DRAIN

250 125 0 250

SCALE: 1"=250'

Michael Baker
INTERNATIONAL
14725 Alton Parkway, Irvine CA 92618
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EXHIBIT A
EXISITING HYDROLOGY
TTM 78210
THE TERRACES AT WALNUT

H:\PDATA\145267\CADD\STRMWATER\EXHIBITS\EXISITING HYDROLOGY EXHIBIT A.DWG DWYER, JENNA 9/14/2017 2:57 PM

Appendix A-2:

Proposed Hydrology 10 & 50 Year Storm

Peak Flow Hydrologic Analysis

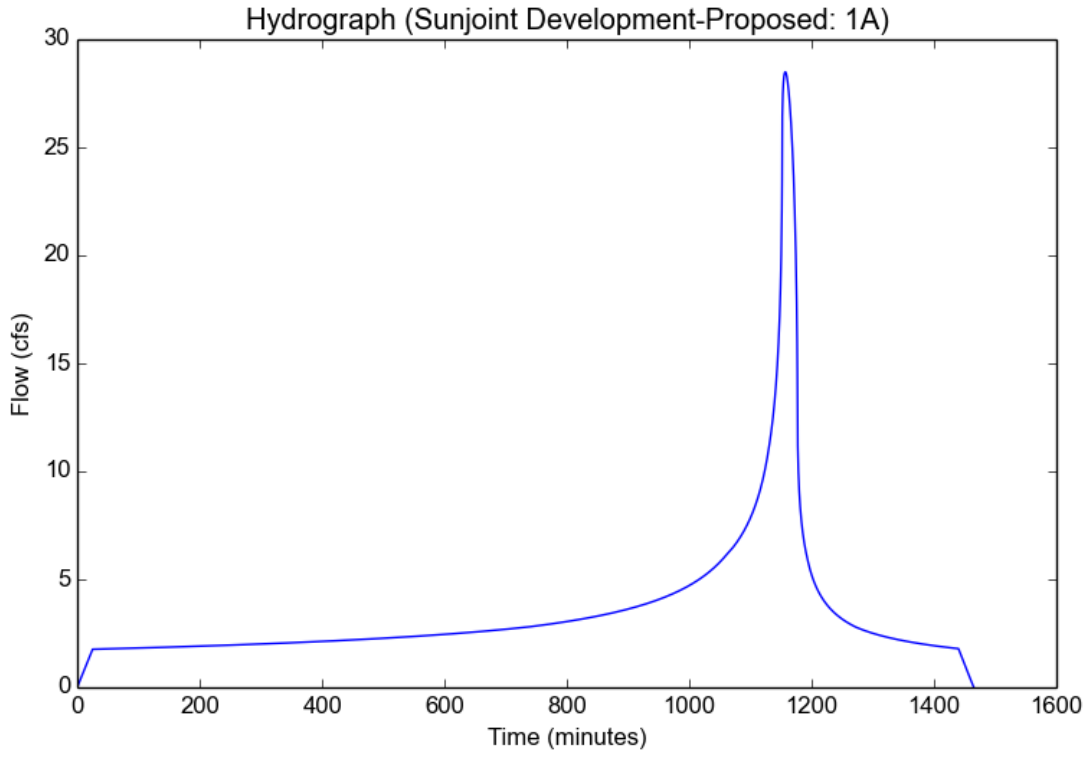
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/10-yr/10-YR- Proposed Hydrology Analysis.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1A
Area (ac)	35.3
Flow Path Length (ft)	3063.0
Flow Path Slope (vft/hft)	0.0493
50-yr Rainfall Depth (in)	4.78
Percent Impervious	0.7
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.4129
Peak Intensity (in/hr)	0.9557
Undeveloped Runoff Coefficient (Cu)	0.7153
Developed Runoff Coefficient (Cd)	0.8446
Time of Concentration (min)	25.0
Clear Peak Flow Rate (cfs)	28.4929
Burned Peak Flow Rate (cfs)	28.4929
24-Hr Clear Runoff Volume (ac-ft)	7.0535
24-Hr Clear Runoff Volume (cu-ft)	307251.5223



Peak Flow Hydrologic Analysis

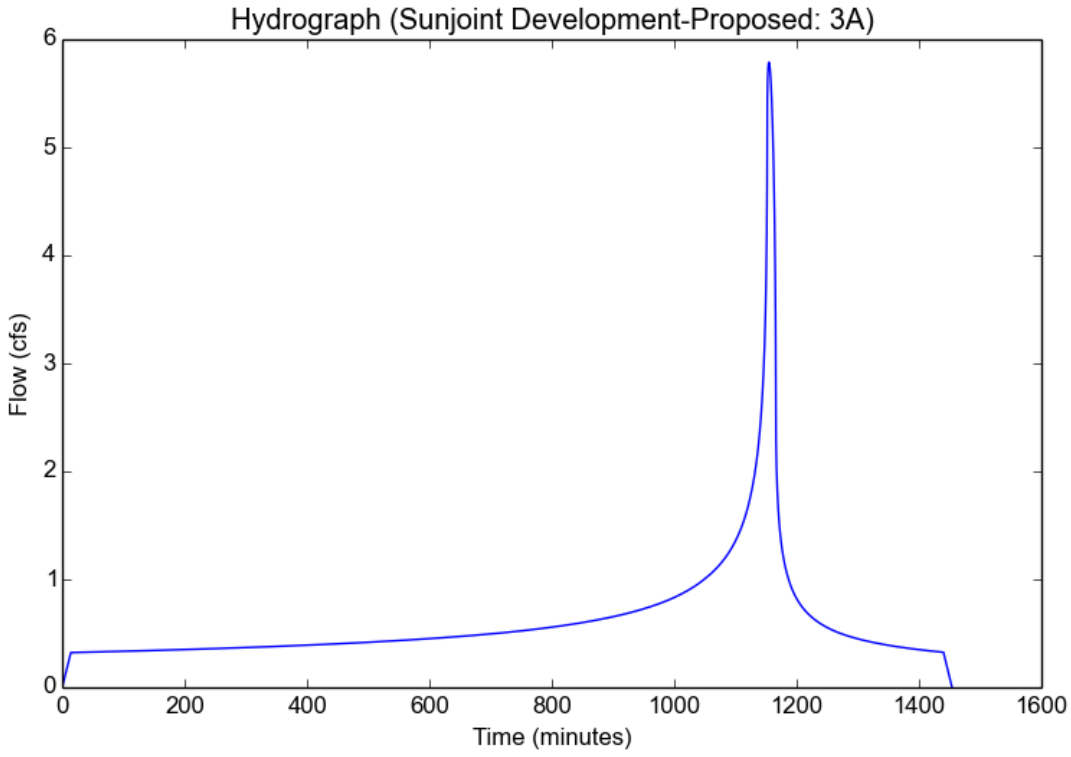
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/10-yr/10-YR- Proposed Hydrology Analysis.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	3A
Area (ac)	5.2
Flow Path Length (ft)	656.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	4.78
Percent Impervious	0.9
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.4129
Peak Intensity (in/hr)	1.2551
Undeveloped Runoff Coefficient (Cu)	0.7693
Developed Runoff Coefficient (Cd)	0.8869
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	5.7884
Burned Peak Flow Rate (cfs)	5.7884
24-Hr Clear Runoff Volume (ac-ft)	1.2266
24-Hr Clear Runoff Volume (cu-ft)	53429.93



Peak Flow Hydrologic Analysis

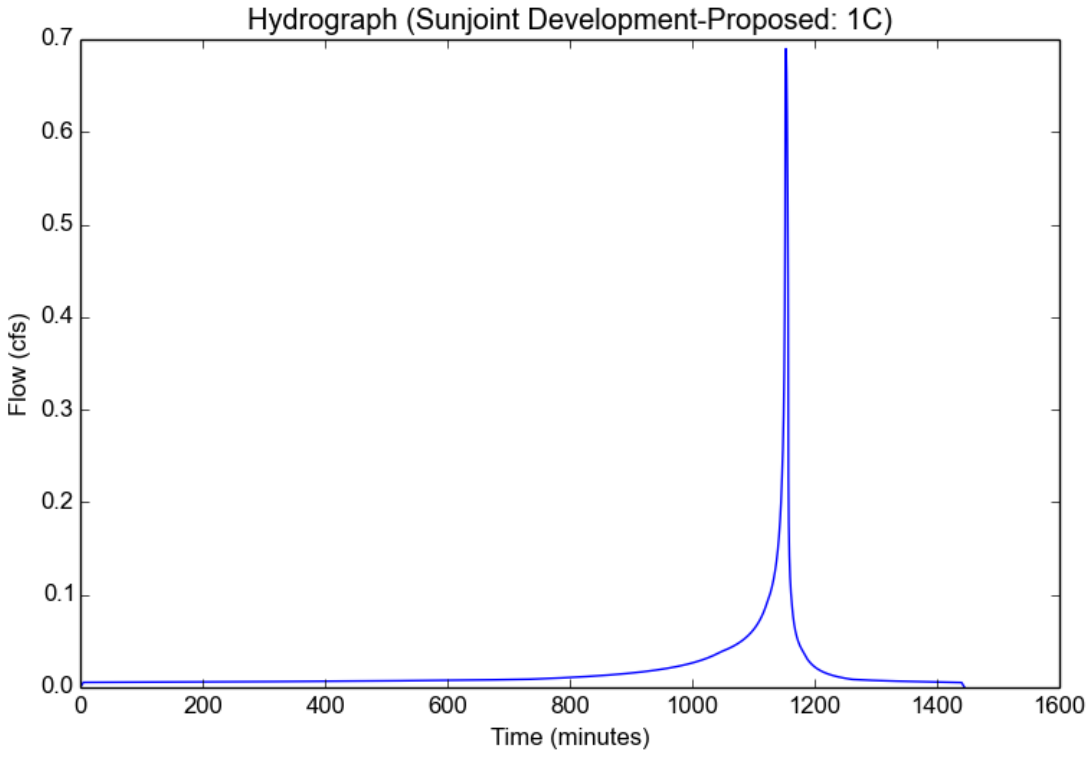
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/10-yr/10-YR- Proposed Hydrology Analysis.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1C
Area (ac)	0.4
Flow Path Length (ft)	50.0
Flow Path Slope (vft/hft)	0.3333
50-yr Rainfall Depth (in)	4.78
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.4129
Peak Intensity (in/hr)	2.0362
Undeveloped Runoff Coefficient (Cu)	0.8411
Developed Runoff Coefficient (Cd)	0.8469
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.6898
Burned Peak Flow Rate (cfs)	0.6898
24-Hr Clear Runoff Volume (ac-ft)	0.037
24-Hr Clear Runoff Volume (cu-ft)	1609.8052



Peak Flow Hydrologic Analysis

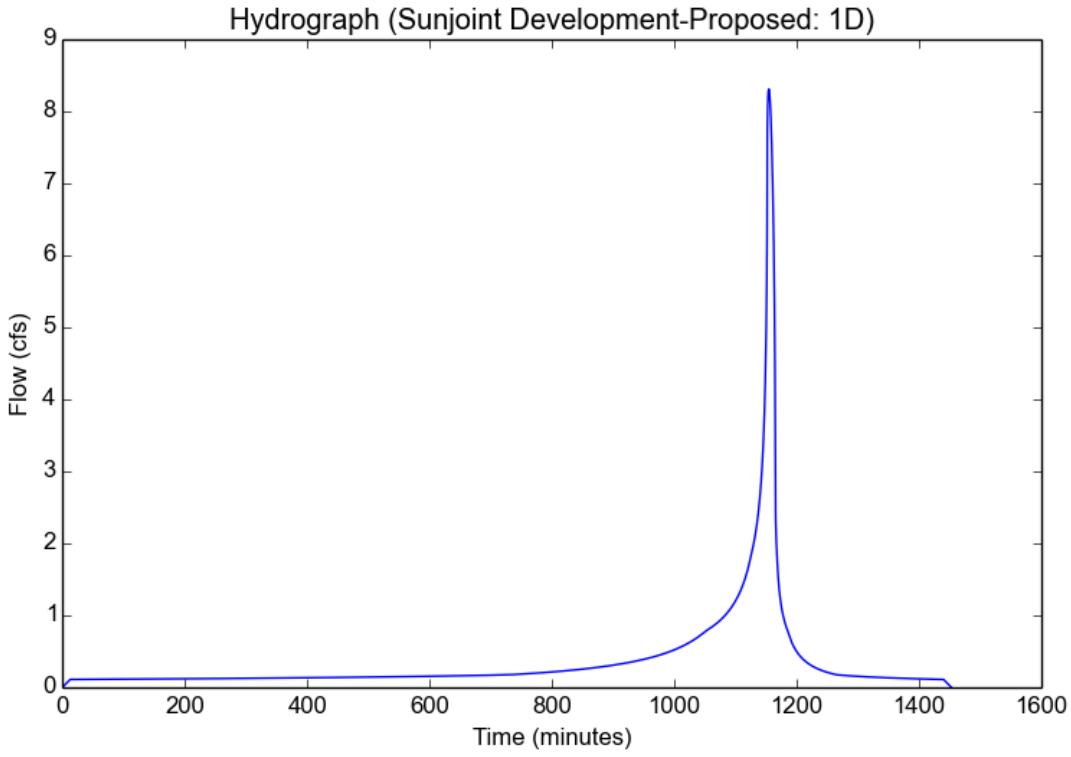
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/10-yr/10-YR- Proposed Hydrology Analysis.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1D
Area (ac)	8.1
Flow Path Length (ft)	1150.0
Flow Path Slope (vft/hft)	0.0783
50-yr Rainfall Depth (in)	4.78
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	3.4129
Peak Intensity (in/hr)	1.2995
Undeveloped Runoff Coefficient (Cu)	0.7773
Developed Runoff Coefficient (Cd)	0.7896
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	8.3111
Burned Peak Flow Rate (cfs)	8.3111
24-Hr Clear Runoff Volume (ac-ft)	0.7464
24-Hr Clear Runoff Volume (cu-ft)	32514.3315



Peak Flow Hydrologic Analysis

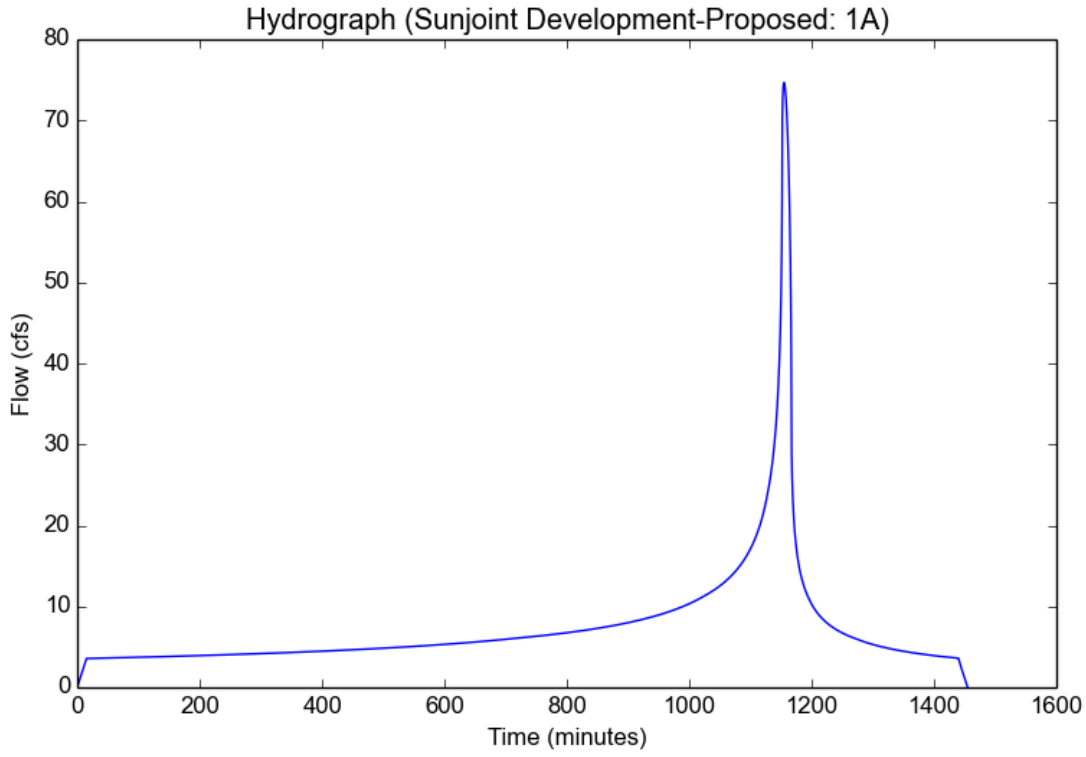
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/50-yr/50-YR-Proposed Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1A
Area (ac)	35.3
Flow Path Length (ft)	3063.0
Flow Path Slope (vft/hft)	0.0493
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.7
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.7
Peak Intensity (in/hr)	2.3852
Undeveloped Runoff Coefficient (Cu)	0.8565
Developed Runoff Coefficient (Cd)	0.8869
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	74.6797
Burned Peak Flow Rate (cfs)	74.6797
24-Hr Clear Runoff Volume (ac-ft)	14.9092
24-Hr Clear Runoff Volume (cu-ft)	649444.2603



Peak Flow Hydrologic Analysis

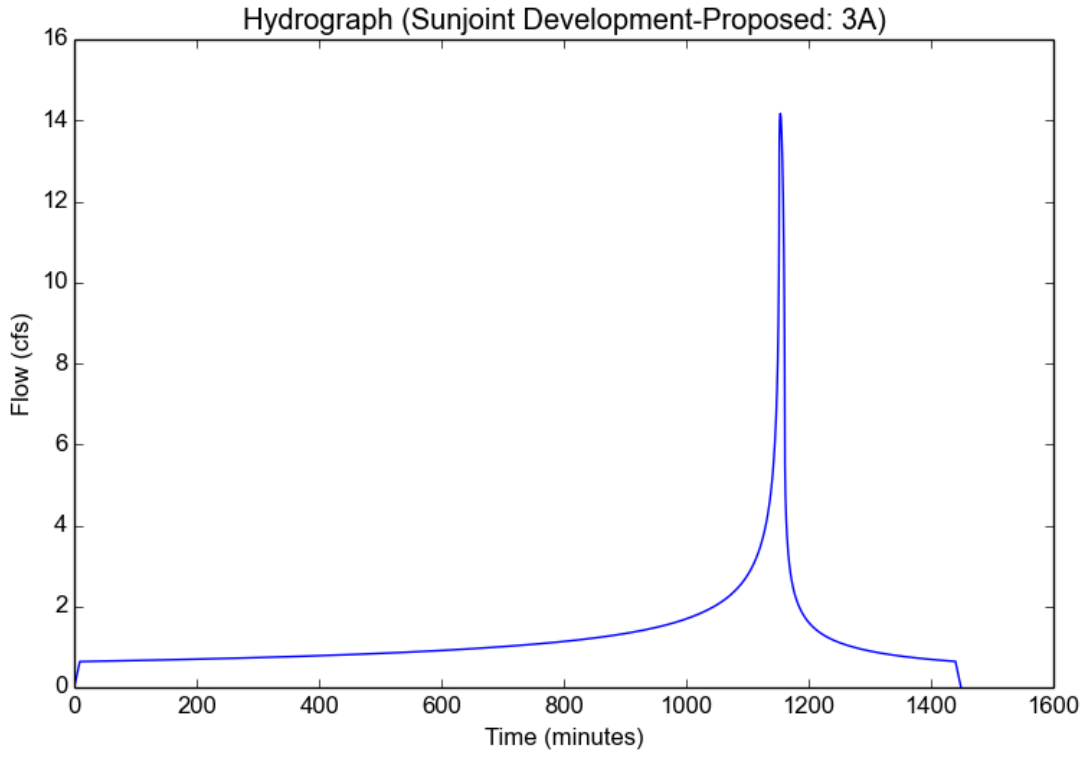
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/50-yr/50-YR-Proposed Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	3A
Area (ac)	5.2
Flow Path Length (ft)	656.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.9
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.7
Peak Intensity (in/hr)	3.0325
Undeveloped Runoff Coefficient (Cu)	0.8845
Developed Runoff Coefficient (Cd)	0.8984
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	14.1676
Burned Peak Flow Rate (cfs)	14.1676
24-Hr Clear Runoff Volume (ac-ft)	2.4598
24-Hr Clear Runoff Volume (cu-ft)	107150.3981



Peak Flow Hydrologic Analysis

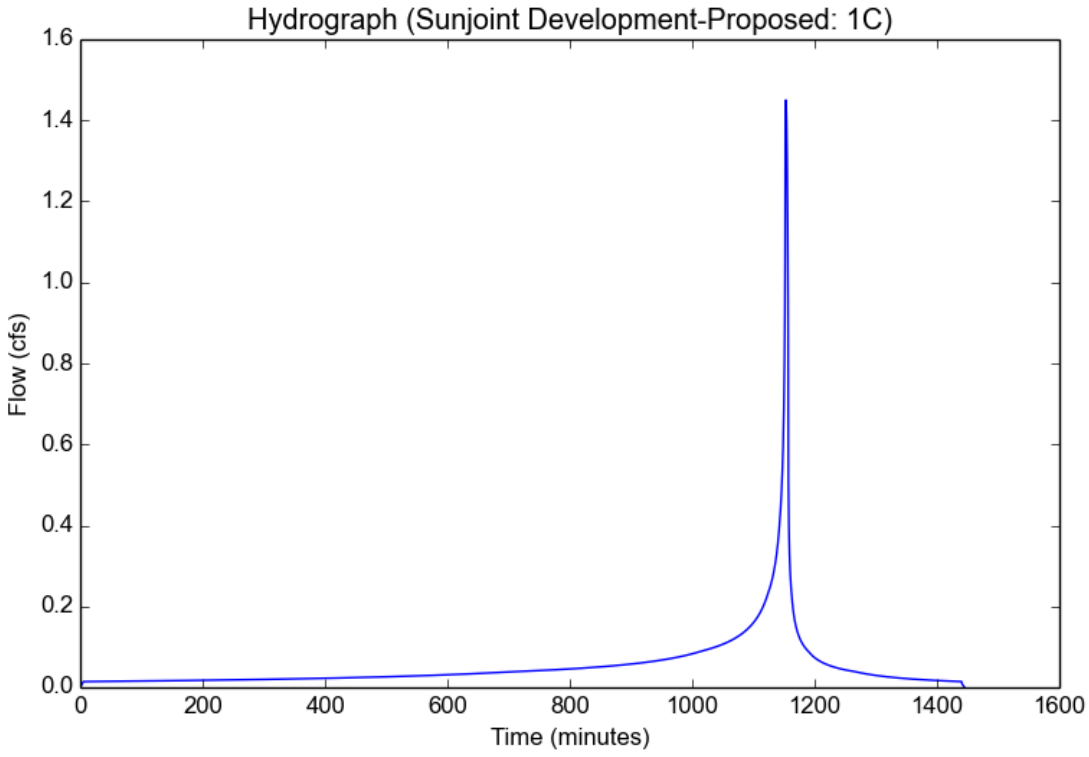
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/50-yr/50-YR-Proposed Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1C
Area (ac)	0.4
Flow Path Length (ft)	50.0
Flow Path Slope (vft/hft)	0.3333
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.7
Peak Intensity (in/hr)	3.9974
Undeveloped Runoff Coefficient (Cu)	0.9078
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.4391
Burned Peak Flow Rate (cfs)	1.4391
24-Hr Clear Runoff Volume (ac-ft)	0.1083
24-Hr Clear Runoff Volume (cu-ft)	4717.7328



Peak Flow Hydrologic Analysis

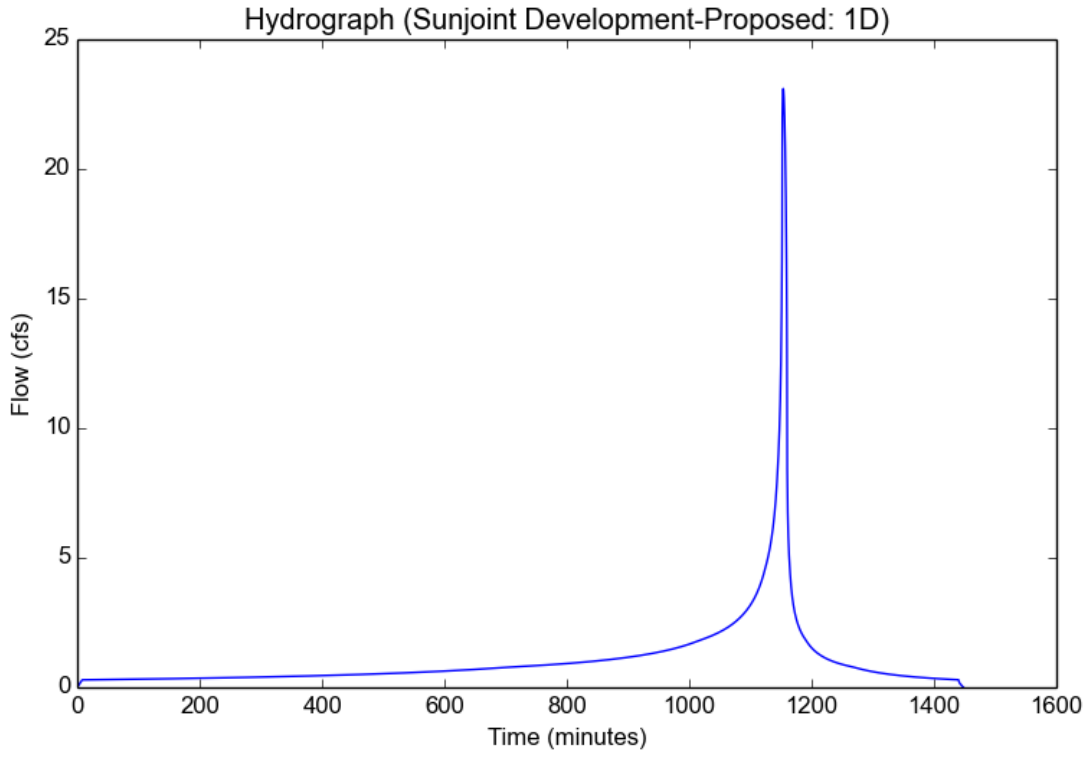
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/50-yr/50-YR-Proposed Report.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1D
Area (ac)	8.1
Flow Path Length (ft)	1150.0
Flow Path Slope (vft/hft)	0.0783
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.1
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.7
Peak Intensity (in/hr)	3.2051
Undeveloped Runoff Coefficient (Cu)	0.8886
Developed Runoff Coefficient (Cd)	0.8898
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	23.0993
Burned Peak Flow Rate (cfs)	23.0993
24-Hr Clear Runoff Volume (ac-ft)	2.1923
24-Hr Clear Runoff Volume (cu-ft)	95498.1869



SINGLE FAMILY
12 LOTS
60'X120'

100

1C
0.4

200.1

300

1D
8.1

1A
35.3

3A
5.2

200.3

200.2

200.4

200

NO HOSE BIBS OR WASHING AREAS IN SUBTERRANEAN PARKING STRUCTURE.

PROPOSED DETENTION BASIN

EAST VALLEY BOULEVARD
NORTH STORM DRAIN CONNECTION
TO SAN JOSE CREEK

EAST VALLEY BOULEVARD
SOUTH STORM DRAIN
CONNECTION TO SAN JOSE
CREEK

NORTH

LEGEND

- DRAINAGE BOUNDARY
- SUBAREA BOUNDARY
- FLOW PATH
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- 1B / 11.3 — SUBAREA DESIGNATION / AREA (ACRES)
- 100 — HYDROLOGY NODE

200 100 0 200

SCALE: 1"=200'

EXHIBIT B
PROPOSED HYDROLOGY MAP
TTM 78210
THE TERRACES AT WALNUT

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Santa Ana, CA 92707
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Appendix B:

Basin Routing Calculations

Rating Table for Circular Orifice - 2-for 50-yr

Project Description

Solve For	Discharge

Input Data

Headwater Elevation	617.00	ft
Centroid Elevation	615.00	ft
Tailwater Elevation	614.00	ft
Discharge Coefficient	0.63	
Diameter	2.00	ft

Headwater Elevation (ft)	Discharge (ft³/s)	Velocity (ft/s)
614.00		
615.00		
616.00	15.88	5.05
617.00	22.45	7.15
618.00	27.50	8.75

Rating Table for Circular Orifice - 1-for 10-yr

Project Description

Solve For	Discharge

Input Data

Headwater Elevation	613.00	ft
Centroid Elevation	612.00	ft
Tailwater Elevation	611.00	ft
Discharge Coefficient	0.63	
Diameter	2.00	ft

Headwater Elevation (ft)	Discharge (ft³/s)	Velocity (ft/s)
611.00		
612.00		
613.00	15.88	5.05
614.00	22.45	7.15
615.00	27.50	8.75
616.00	31.75	10.11
617.00	35.50	11.30
618.00	38.89	12.38

Appendix B-1:

Proposed 50 Year Storm Routing

** LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS **
** MODIFIED RATIONAL METHOD HYDROLOGY **
** RESERVOIR ROUTING OUTPUT **

********** RESERVOIR ROUTING STORM DAY 4 **********

RESERVOIR ROUTING at 5AB STORM DAY 4 STORM FREQ. 50
INITIAL WATER SURFACE ELEVATION: 1.00
RESERVOIR COMPOSITE ELEVATION-STORAGE-DISCHARGE DATA at 5AB

ELEVATION (ft.)	STORAGE (a.f.)	OUTFLOW (cfs)
1.00	0.00	0.00
4.33	0.21	15.88
7.67	0.41	22.45
11.00	0.62	27.50
14.33	0.83	47.63
17.67	1.03	57.95
21.00	1.24	66.39

RESERVOIR ROUTING TABLE at 5AB

TIME	INFLOW (cfs)	OUTFLOW (cfs)	W.S.ELEV (ft.)	STORAGE (a.f.)
0	0.00	0.00	1.00	0.00
100	4.38	4.36	1.92	0.06
200	4.62	4.60	1.97	0.06
300	4.91	4.88	2.02	0.06
400	5.25	5.21	2.09	0.07
500	5.67	5.63	2.18	0.07
600	6.21	6.16	2.29	0.08
700	6.94	6.86	2.44	0.09
800	7.87	7.77	2.63	0.10
900	9.30	9.14	2.92	0.12
1000	12.00	11.65	3.45	0.15
1050	14.52	13.97	3.93	0.18
1100	19.78	17.48	5.14	0.26
1110	21.73	18.65	5.74	0.29
1120	24.45	20.23	6.54	0.34
1130	28.47	22.44	7.66	0.41
1131	28.98	22.65	7.80	0.42
1132	29.51	22.87	7.94	0.43
1133	30.07	23.10	8.10	0.44
1134	30.67	23.34	8.25	0.45
1135	31.31	23.59	8.42	0.46
1136	31.99	23.86	8.60	0.47
1137	32.74	24.14	8.78	0.48
1138	33.53	24.44	8.98	0.49
1139	34.38	24.76	9.19	0.51
1140	35.31	25.09	9.41	0.52
1141	36.32	25.44	9.64	0.54
1142	37.44	25.82	9.89	0.55
1143	38.68	26.23	10.16	0.57
1144	40.06	26.66	10.45	0.59
1145	41.62	27.13	10.76	0.60
1146	43.40	28.04	11.09	0.63
1147	45.47	30.10	11.43	0.65
1148	47.86	32.18	11.78	0.67
1149	50.77	34.34	12.13	0.69
1150	54.54	36.64	12.51	0.71
1151	59.92	39.23	12.94	0.74
1152	73.89	42.71	13.52	0.78
1153	82.90	47.20	14.26	0.82
1154	86.07	49.88	15.06	0.87
1155	88.08	52.36	15.86	0.92
1156	88.35	54.74	16.63	0.97
1157	87.72	56.96	17.35	1.01
1158	86.48	58.78	18.00	1.05
1159	84.72	60.25	18.57	1.09
1160	82.44	61.53	19.08	1.12
1161	79.57	62.59	19.50	1.15
1162	75.59	63.41	19.82	1.17
1163	70.68	63.94	20.03	1.18
1164	65.58	64.17	20.12	1.19
1165	60.24	64.10	20.10	1.18
1166	53.77	63.72	19.94	1.17
1167	39.15	62.77	19.57	1.15
1168	30.33	61.24	18.97	1.11
1169	27.86	59.48	18.27	1.07
1170	25.39	57.62	17.56	1.03
1171	24.19	55.44	16.86	0.98
1172	22.61	53.31	16.17	0.94
1173	21.81	51.24	15.50	0.90
1174	20.68	49.24	14.85	0.86
1175	20.06	47.05	14.24	0.82
1176	19.22	43.61	13.67	0.79

1177	18.72	40.51	13.15	0.75
1178	18.05	37.72	12.69	0.72
1179	17.62	35.22	12.28	0.70
1180	17.08	32.98	11.91	0.68
1181	16.70	30.95	11.57	0.66
1182	16.26	29.13	11.27	0.64
1183	15.92	27.50	11.00	0.62
1184	15.54	27.11	10.74	0.60
1185	15.25	26.72	10.49	0.59
1186	14.92	26.34	10.23	0.57
1187	14.66	25.95	9.98	0.56
1188	14.37	25.57	9.73	0.54
1189	14.14	25.20	9.48	0.53
1190	13.89	24.83	9.24	0.51
1191	13.66	24.46	9.00	0.50
1192	13.44	24.10	8.76	0.48
1193	13.23	23.75	8.52	0.47
1194	13.04	23.39	8.29	0.45
1195	12.85	23.05	8.06	0.44
1196	12.66	22.71	7.84	0.42
1197	12.47	22.35	7.61	0.41
1198	12.30	21.92	7.40	0.40
1199	12.14	21.50	7.19	0.38
1200	11.97	21.10	6.98	0.37
1201	11.82	20.71	6.78	0.36
1202	11.66	20.32	6.59	0.35
1203	11.52	19.95	6.40	0.33
1204	11.38	19.58	6.21	0.32
1205	11.25	19.23	6.03	0.31
1206	11.12	18.88	5.86	0.30
1207	11.00	18.55	5.69	0.29
1208	10.87	18.22	5.52	0.28
1209	10.76	17.90	5.36	0.27
1210	10.65	17.60	5.20	0.26
1211	10.53	17.30	5.05	0.25
1212	10.43	17.00	4.90	0.24
1213	10.33	16.72	4.76	0.23
1214	10.22	16.44	4.62	0.22
1215	10.12	16.17	4.48	0.22
1216	10.03	15.91	4.35	0.21
1217	9.94	15.36	4.22	0.20
1218	9.85	14.81	4.11	0.19
1219	9.77	14.31	4.00	0.19
1220	9.68	13.85	3.91	0.18
1221	9.60	13.42	3.82	0.17
1222	9.51	13.03	3.74	0.17
1223	9.44	12.68	3.66	0.16
1224	9.36	12.35	3.59	0.16
1225	9.28	12.04	3.53	0.16
1226	9.21	11.76	3.47	0.15
1227	9.14	11.50	3.41	0.15
1228	9.08	11.26	3.36	0.15
1229	9.00	11.04	3.32	0.14
1230	8.94	10.83	3.27	0.14
1231	8.88	10.64	3.23	0.14
1232	8.82	10.46	3.20	0.14
1233	8.76	10.29	3.16	0.13
1234	8.69	10.13	3.13	0.13
1235	8.63	9.98	3.10	0.13
1236	8.57	9.84	3.07	0.13
1237	8.52	9.71	3.04	0.13
1238	8.46	9.59	3.01	0.12
1239	8.40	9.47	2.99	0.12
1240	8.35	9.36	2.97	0.12
1241	8.29	9.26	2.94	0.12
1242	8.25	9.16	2.92	0.12
1243	8.19	9.06	2.90	0.12
1244	8.14	8.97	2.88	0.12
1245	8.09	8.89	2.87	0.12
1246	8.05	8.80	2.85	0.11
1247	8.00	8.73	2.83	0.11
1248	7.95	8.65	2.82	0.11
1249	7.91	8.58	2.80	0.11
1250	7.86	8.51	2.79	0.11
1251	7.82	8.44	2.77	0.11
1252	7.77	8.38	2.76	0.11
1253	7.73	8.31	2.74	0.11
1254	7.68	8.25	2.73	0.11
1255	7.64	8.19	2.72	0.11
1256	7.61	8.14	2.71	0.11
1257	7.57	8.08	2.70	0.11
1258	7.53	8.03	2.68	0.10
1259	7.49	7.97	2.67	0.10
1260	7.45	7.92	2.66	0.10

1261	7.41	7.87	2.65	0.10
1262	7.38	7.83	2.64	0.10
1263	7.33	7.78	2.63	0.10
1264	7.30	7.73	2.62	0.10
1265	7.27	7.69	2.61	0.10
1266	7.23	7.64	2.60	0.10
1267	7.20	7.60	2.60	0.10
1268	7.16	7.56	2.59	0.10
1269	7.14	7.52	2.58	0.10
1270	7.10	7.48	2.57	0.10
1271	7.07	7.44	2.56	0.10
1272	7.03	7.40	2.55	0.10
1273	7.00	7.36	2.55	0.10
1274	6.97	7.32	2.54	0.10
1275	6.93	7.29	2.53	0.09
1276	6.90	7.25	2.52	0.09
1277	6.86	7.21	2.51	0.09
1278	6.84	7.17	2.51	0.09
1279	6.80	7.14	2.50	0.09
1280	6.77	7.10	2.49	0.09
1281	6.74	7.07	2.48	0.09
1282	6.70	7.03	2.48	0.09
1283	6.68	7.00	2.47	0.09
1284	6.64	6.96	2.46	0.09
1285	6.61	6.93	2.45	0.09
1286	6.58	6.90	2.45	0.09
1287	6.55	6.86	2.44	0.09
1288	6.53	6.83	2.43	0.09
1289	6.50	6.80	2.43	0.09
1290	6.47	6.77	2.42	0.09
1291	6.45	6.74	2.41	0.09
1292	6.43	6.71	2.41	0.09
1293	6.40	6.68	2.40	0.09
1294	6.38	6.65	2.40	0.09
1295	6.35	6.62	2.39	0.09
1296	6.33	6.59	2.38	0.09
1297	6.31	6.56	2.38	0.09
1298	6.26	6.54	2.37	0.09
1299	6.22	6.51	2.37	0.08
1300	6.21	6.48	2.36	0.08
1310	5.97	6.21	2.30	0.08
1320	5.76	5.97	2.25	0.08
1330	5.58	5.76	2.21	0.07
1340	5.39	5.57	2.17	0.07
1350	5.25	5.40	2.13	0.07
1360	5.10	5.24	2.10	0.07
1370	4.96	5.10	2.07	0.07
1380	4.84	4.96	2.04	0.06
1390	4.72	4.84	2.02	0.06
1400	4.62	4.72	1.99	0.06
1420	4.42	4.51	1.95	0.06
1440	4.25	4.33	1.91	0.06

Appendix B-2:

Proposed 10 Year Storm Routing

** LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS **
** MODIFIED RATIONAL METHOD HYDROLOGY **
** RESERVOIR ROUTING OUTPUT **

********** RESERVOIR ROUTING STORM DAY 4 **********

RESERVOIR ROUTING at 5AB STORM DAY 4 STORM FREQ. 10
INITIAL WATER SURFACE ELEVATION: 1.00
RESERVOIR COMPOSITE ELEVATION-STORAGE-DISCHARGE DATA at 5AB

ELEVATION (ft.)	STORAGE (a.f.)	OUTFLOW (cfs)
1.00	0.00	0.00
4.33	0.21	15.88
7.67	0.41	22.45
11.00	0.62	27.50
14.33	0.83	47.63
17.67	1.03	57.95
21.00	1.24	66.39

RESERVOIR ROUTING TABLE at 5AB

TIME	INFLOW (cfs)	OUTFLOW (cfs)	W.S.ELEV (ft.)	STORAGE (a.f.)
0	0.00	0.00	1.00	0.00
100	2.15	2.14	1.45	0.03
200	2.26	2.25	1.47	0.03
300	2.37	2.36	1.50	0.03
400	2.52	2.50	1.53	0.03
500	2.69	2.67	1.56	0.03
600	2.90	2.88	1.60	0.04
700	3.18	3.15	1.66	0.04
800	3.60	3.55	1.75	0.05
900	4.27	4.19	1.88	0.05
1000	5.53	5.37	2.13	0.07
1050	6.76	6.48	2.36	0.08
1100	9.13	8.55	2.79	0.11
1110	9.98	9.24	2.94	0.12
1120	11.13	10.14	3.13	0.13
1130	12.81	11.39	3.39	0.15
1131	13.02	11.55	3.42	0.15
1132	13.24	11.71	3.46	0.15
1133	13.46	11.87	3.49	0.15
1134	13.70	12.04	3.53	0.16
1135	13.95	12.22	3.57	0.16
1136	14.21	12.41	3.60	0.16
1137	14.50	12.61	3.65	0.16
1138	14.80	12.81	3.69	0.17
1139	15.13	13.03	3.73	0.17
1140	15.48	13.26	3.78	0.17
1141	15.86	13.50	3.83	0.18
1142	16.27	13.76	3.89	0.18
1143	16.72	14.03	3.95	0.18
1144	17.21	14.33	4.01	0.19
1145	17.76	14.64	4.07	0.19
1146	18.39	14.99	4.15	0.20
1147	19.21	15.37	4.23	0.20
1148	19.71	15.78	4.31	0.21
1149	20.78	16.03	4.41	0.21
1150	22.04	16.26	4.53	0.22
1151	23.68	16.54	4.67	0.23
1152	27.25	16.93	4.86	0.24
1153	30.82	17.45	5.13	0.26
1154	32.43	18.05	5.44	0.27
1155	33.41	18.69	5.76	0.29
1156	33.91	19.33	6.08	0.32
1157	34.13	19.96	6.40	0.33
1158	34.16	20.57	6.71	0.35
1159	34.06	21.15	7.01	0.37
1160	33.86	21.70	7.29	0.39
1161	33.57	22.21	7.55	0.41
1162	33.21	22.64	7.79	0.42
1163	32.78	22.98	8.02	0.43
1164	32.26	23.30	8.23	0.45
1165	31.66	23.58	8.41	0.46
1166	30.95	23.84	8.58	0.47
1167	30.02	24.06	8.73	0.48
1168	28.86	24.24	8.85	0.49
1169	27.67	24.37	8.93	0.49
1170	26.62	24.46	8.99	0.50
1171	25.64	24.52	9.03	0.50
1172	24.64	24.54	9.05	0.50
1173	23.56	24.52	9.04	0.50
1174	22.36	24.47	9.00	0.50
1175	20.99	24.38	8.94	0.49
1176	19.26	24.24	8.85	0.49

1177	15.68	24.01	8.70	0.48
1178	12.25	23.68	8.48	0.46
1179	11.21	23.29	8.22	0.45
1180	10.38	22.87	7.95	0.43
1181	9.92	22.45	7.67	0.41
1182	9.45	21.90	7.39	0.40
1183	9.10	21.36	7.12	0.38
1184	8.77	20.83	6.85	0.36
1185	8.49	20.31	6.58	0.35
1186	8.24	19.80	6.32	0.33
1187	8.01	19.30	6.07	0.31
1188	7.80	18.81	5.82	0.30
1189	7.61	18.33	5.58	0.28
1190	7.44	17.87	5.34	0.27
1191	7.28	17.42	5.11	0.25
1192	7.12	16.98	4.89	0.24
1193	6.97	16.55	4.68	0.23
1194	6.83	16.14	4.47	0.21
1195	6.71	15.55	4.26	0.20
1196	6.59	14.65	4.08	0.19
1197	6.48	13.84	3.90	0.18
1198	6.29	13.09	3.75	0.17
1199	6.19	12.40	3.60	0.16
1200	6.09	11.77	3.47	0.15
1201	6.00	11.19	3.35	0.15
1202	5.90	10.67	3.24	0.14
1203	5.81	10.18	3.14	0.13
1204	5.73	9.74	3.04	0.13
1205	5.64	9.33	2.96	0.12
1206	5.56	8.96	2.88	0.12
1207	5.49	8.61	2.81	0.11
1208	5.42	8.29	2.74	0.11
1209	5.35	8.00	2.68	0.10
1210	5.28	7.73	2.62	0.10
1211	5.22	7.48	2.57	0.10
1212	5.15	7.25	2.52	0.09
1213	5.09	7.04	2.48	0.09
1214	5.03	6.84	2.44	0.09
1215	4.98	6.65	2.40	0.09
1216	4.92	6.48	2.36	0.08
1217	4.87	6.32	2.33	0.08
1218	4.82	6.17	2.30	0.08
1219	4.77	6.04	2.27	0.08
1220	4.72	5.91	2.24	0.08
1221	4.68	5.78	2.21	0.08
1222	4.63	5.67	2.19	0.07
1223	4.59	5.56	2.17	0.07
1224	4.54	5.46	2.15	0.07
1225	4.50	5.37	2.13	0.07
1226	4.46	5.28	2.11	0.07
1227	4.42	5.20	2.09	0.07
1228	4.38	5.12	2.07	0.07
1229	4.35	5.04	2.06	0.07
1230	4.31	4.97	2.04	0.06
1231	4.27	4.90	2.03	0.06
1232	4.24	4.84	2.02	0.06
1233	4.21	4.77	2.00	0.06
1234	4.17	4.72	1.99	0.06
1235	4.14	4.66	1.98	0.06
1236	4.11	4.61	1.97	0.06
1237	4.08	4.55	1.96	0.06
1238	4.05	4.50	1.95	0.06
1239	4.02	4.46	1.94	0.06
1240	3.99	4.41	1.93	0.06
1241	3.96	4.37	1.92	0.06
1242	3.93	4.33	1.91	0.06
1243	3.91	4.29	1.90	0.06
1244	3.88	4.25	1.89	0.06
1245	3.85	4.21	1.88	0.05
1246	3.83	4.17	1.88	0.05
1247	3.80	4.14	1.87	0.05
1248	3.78	4.10	1.86	0.05
1249	3.75	4.07	1.85	0.05
1250	3.73	4.03	1.85	0.05
1251	3.71	4.00	1.84	0.05
1252	3.69	3.97	1.83	0.05
1253	3.66	3.94	1.83	0.05
1254	3.64	3.91	1.82	0.05
1255	3.62	3.88	1.82	0.05
1256	3.60	3.86	1.81	0.05
1257	3.58	3.83	1.80	0.05
1258	3.56	3.80	1.80	0.05
1259	3.54	3.78	1.79	0.05
1260	3.52	3.75	1.79	0.05

1261	3.50	3.73	1.78	0.05
1262	3.48	3.70	1.78	0.05
1263	3.46	3.68	1.77	0.05
1264	3.44	3.66	1.77	0.05
1265	3.42	3.63	1.76	0.05
1266	3.41	3.61	1.76	0.05
1267	3.39	3.59	1.75	0.05
1268	3.37	3.57	1.75	0.05
1269	3.35	3.55	1.74	0.05
1270	3.34	3.53	1.74	0.05
1271	3.32	3.51	1.74	0.05
1272	3.30	3.49	1.73	0.05
1273	3.29	3.47	1.73	0.05
1274	3.28	3.45	1.72	0.04
1275	3.26	3.43	1.72	0.04
1276	3.25	3.41	1.72	0.04
1277	3.23	3.40	1.71	0.04
1278	3.22	3.38	1.71	0.04
1279	3.21	3.36	1.71	0.04
1280	3.19	3.35	1.70	0.04
1281	3.18	3.33	1.70	0.04
1282	3.17	3.32	1.70	0.04
1283	3.16	3.30	1.69	0.04
1284	3.14	3.28	1.69	0.04
1285	3.13	3.27	1.69	0.04
1286	3.12	3.26	1.68	0.04
1287	3.11	3.24	1.68	0.04
1288	3.09	3.23	1.68	0.04
1289	3.08	3.21	1.67	0.04
1290	3.07	3.20	1.67	0.04
1291	3.06	3.19	1.67	0.04
1292	3.05	3.17	1.67	0.04
1293	3.04	3.16	1.66	0.04
1294	3.03	3.15	1.66	0.04
1295	3.01	3.13	1.66	0.04
1296	3.00	3.12	1.66	0.04
1297	2.99	3.11	1.65	0.04
1298	2.98	3.10	1.65	0.04
1299	2.97	3.08	1.65	0.04
1300	2.96	3.07	1.64	0.04
1310	2.86	2.96	1.62	0.04
1320	2.77	2.86	1.60	0.04
1330	2.70	2.77	1.58	0.04
1340	2.62	2.69	1.57	0.04
1350	2.55	2.62	1.55	0.03
1360	2.49	2.55	1.54	0.03
1370	2.43	2.49	1.52	0.03
1380	2.38	2.43	1.51	0.03
1390	2.33	2.38	1.50	0.03
1400	2.28	2.33	1.49	0.03
1420	2.20	2.24	1.47	0.03
1440	2.12	2.16	1.45	0.03

Appendix C:

East Valley Boulevard Existing Storm Drain Plans

HYDRAULIC DATA
10 YEAR STORM FREQUENCY

△ TO △		Q (cfs)
1	3	68
3	7	26
3	9	31

CURVE DATA

CURVE	RADIUS Ft.	CENTRAL ANGLE Deg.	Min.	Sec.	LENGTH Ft.	TANGENT Ft.
a	1950	53	04	15	1806.21	973.74
b	22.50	90	40	31	35.61	22.77
c	22.50	59	12	04	23.25	12.78
d	22.50	45	00	00	17.67	9.32

FOR GENERAL DRAINAGE NOTES SEE SHEET NO. 2

L.A.C.F.C.D. Dwg. # 34-F709.4

AS BUILT PLANS

R.D.D. 251

LOS ANGELES COUNTY ROAD DEPARTMENT

HIGHWAY DIVISION

JOB NAME VALLEY BOULEVARD

LIMITS GRAND AVE. TO POMONA BLVD.

DATE	BY	REVISIONS
3-3-75	II	As built

SCALE HORIZ. 1" = 40' VERT. 1" = 4'

JOB NO. 2113

SHEET 13 OF 18 SHTS.

DWG. NO. #43525

PROJECT ENGINEER: [signature] — C.E. No. 19914 — DESIGNER: G. GRIFFIN, G.Z.M. — CHECKER: S. Naiyer — REFERENCES: See Sht. 1

34-F709.4

HYDRAULIC DATA 10 YEAR STORM FREQUENCY

△ TO △		Q(cfs)
1	3	58.1
3	4	48.6
4	5	40.4
5	6	33.4
6	7	27.6
7	8	24.0

CURVE DATA

CURVE	RADIUS Ft.	CENTRAL ANGLE Deg.	Min.	Sec.	LENGTH Ft.	TANGENT Ft.
ⓐ	22.50	60	00	00	23.56	12.99
ⓑ	22.50	90	00	00	35.34	22.50

FOR GENERAL DRAINAGE NOTES SEE SHEET NO. 2

L.A.C.F.C.D. Dwg. # 34-F709.3

AS BUILT PLANS

R.D.D. 251

REVIEWED Albert E. Bean 8-3-73 DESIGN SECTION A DATE

LOS ANGELES COUNTY ROAD DEPARTMENT

HIGHWAY DIVISION

JOB NAME VALLEY BOULEVARD

LIMITS GRAND AVE. TO POMONA BLVD.

DATE	BY	REVISIONS
3-3-75	II	As built

SCALE HORIZ. 1" = 40' VERT. 1" = 4'

JOB NO. 2113

SHEET 12 OF 18 SHTS.

DWG. NO. # 43524

PROJECT ENGINEER | C.E. No. 19914 | DESIGNER Madarasz | CHECKER S. Naiyer | REFERENCES See Sht. 1

34-F709.3

PF556567