

TTM 78210
The Terraces at Walnut
Walnut, CA

PRELIMINARY HYDROLOGY ANALYSIS

August, 2018

Contact Persons:
Rebecca Kinney, PE
Bita Sadri, PE

Prepared for:

Sunjoint Development
280 Machlin Ct.
City of Industry, California 91789

Prepared by:

Michael Baker International
5 Hutton Centre, Suite 500
Santa Ana, CA 92707
949-472-3505

JN 145267

Michael Baker
I N T E R N A T I O N A L

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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.

In addition to the proposed development on-site, approximately 5 acres of the Tract 32158 to the north of the project site will be regarded as part of this project. 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 and 5 acres of offsite area. 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 1 for Vicinity Map and Figure 2 for Project Location Map.

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 Hydrology 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 (22.9 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.

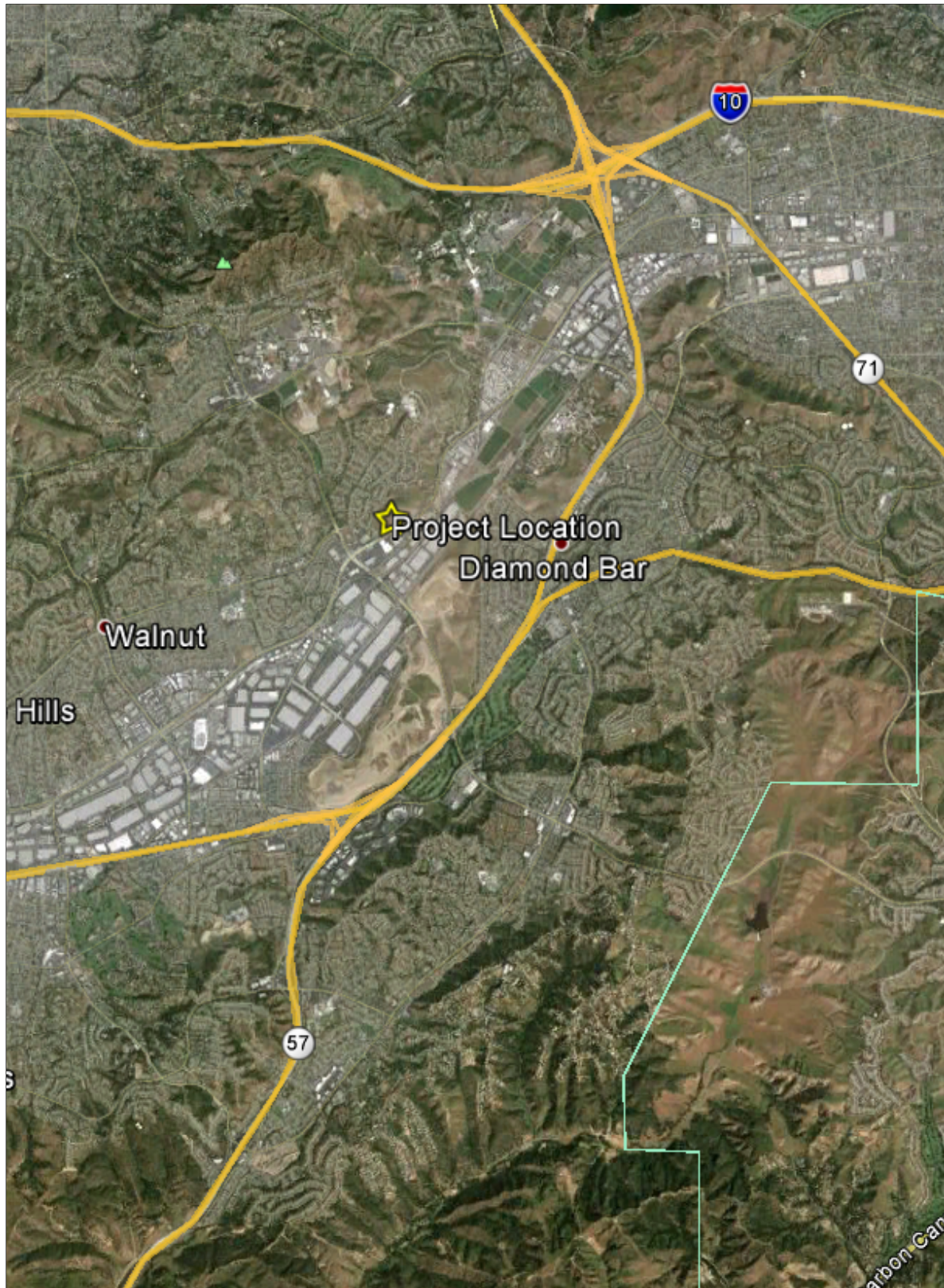


Figure 1: Vicinity Map



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 Routing Map.

Hydrology node Node 100- only 0.3 acres of the 1.5 existing acreage remains flowing to the northwestern corner of the site and the other 1.2 acres drains towards the residential area. Due to the proposed grading, runoff 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 200.4 represents the connection to the flood basin that then will connect to Node 200. Node 200.4 represents the connection to the commercial area also and 200.3 the landscape side slopes areas of the project.

Node 200.4 and 200.3 will then connect to the existing 24" RCP in East Valley Blvd at node 200.

Hydrology node Node 300- represents 10.4 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 five main drainage areas: 1A, 4A, 5A, 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, summary table below was used.

Table 1: Runoff Coefficient

Drainage Area Index	On-Site Tributary Area (Ac)	Land Use	Percent Impervious
1A	36.3	Small Lot Single Family	70%
3A	3.0	Commercial	90%
5A	2.7	Open Space	10%
6A	3.4	Commercial	90%
1C	0.3	Open Space	10%
1D	10.4	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 based on 0.714 reduction factor from the 50-year 24 hour and is calculated to be 4.78 inches.

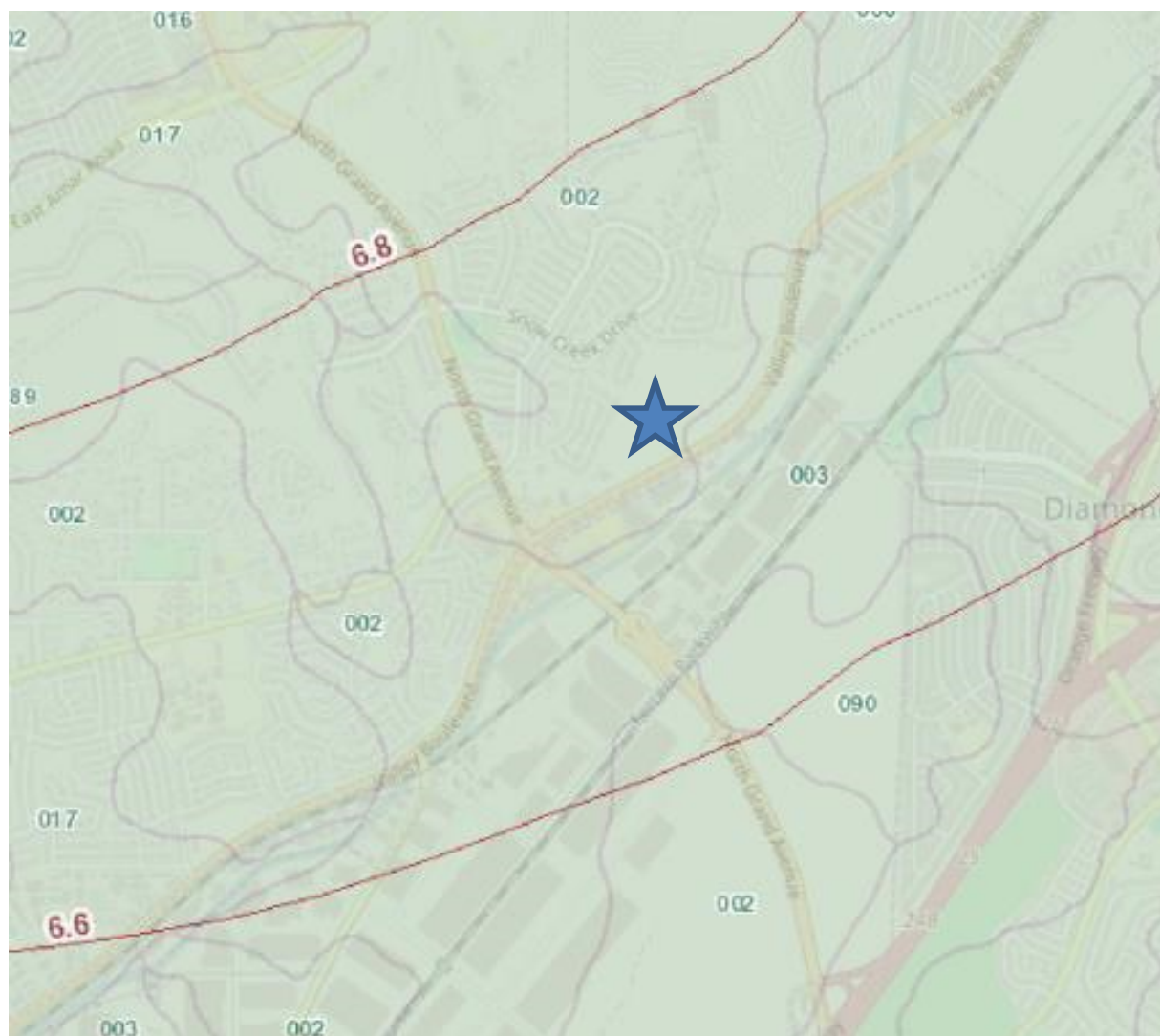


Figure 3: Soils Map

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	3.9	5.6
Node 200.3 + Node 200	16.7+30.0=46.7	28.4+48.8=77.2
Node 300	41.9	67.6

Table 3: Hydrologic Summary – Proposed Condition

Proposed Condition	10-YR HC (cfs)	50-YR HC (cfs)
Node 100	0.5	1.4
Node 200	38.3	96.7
Node 300	10.2	29.7

The proposed development produces a peak accumulative 50-year flow rate of 96.7 cfs at node 200.

The Allowable “Q” based on Los Angeles County Department of Public Works Design Division for the downstream system at node 200 is 1.35 cfs/acre, total of 61.2 cfs (see Appendix D for reference). To match the allowable flow a detention system has been proposed to mitigate the flow to match the requirement of Los Angeles County Public Works. 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.

The proposed developed flow for nodes 100 and 300 is reduced from the existing condition flows. Peak flows to the adjacent neighborhood to the north have been reduced to 1.4 cfs and by 37.9 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 reduce the peak flow rate to match or decrease the allowable Los Angeles County peak flow rate.

2.2.1 Orifice Analysis

The underground flood basin will have a 30" outlet, weir and orifice calculations were used to calculate the discharge base on stage storage. Discharge flow rates can be found on Table 4 below.

Table 4: Orifice Discharge Rates

Elevation	50-YR Diameter 30" (cfs)
0	0
0.5	9.25
1.0	23.64
1.5	28.95
2.0	33.43
2.5	37.37
3.0	40.94
3.5	44.22
4.0	47.27
4.5	50.14
5.0	52.85
5.5	55.43
6.0	57.89

2.2.2 Watershed Analysis

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.

The flood basin proposed will be located in the south end of the site in the commercial area. The basin will mitigate flow from 36.3 acres of residential area (Area 1A) and 3.0 acres of commercial area (Area 3A) the flow out of detention system confluence with the unmitigated 2.7 acres of side slope from the development (Area 5A) and 3.4 acres of street area (Area 6A). The basin footprint is based on ADS StormTech MC-4500 Chamber with 280 chambers and 12 end caps (see appendix for cumulative storage calculations). Watershed Modeling System (WMS) 9.1 software was used to analyze the hydrology.

Table 5: WMS 50-yr Surface Runoff Results

Location	Sub-Area (ac.)	Sub-Area Q (cfs)	Basin Outlet Q (cfs)
1A Residential	36.3	67.37	-
3A Commercial Area	3.0	10.79	50.97
5A Open Space	2.7	6.85	52.20
6A Street Area	3.4	8.63	57.92

Table 6: WMS 10-yr Surface Runoff Results

Location	Sub-Area (ac.)	Sub-Area Q (cfs)	Basin Outlet Q (cfs)
1A Residential	36.3	40.69	-
3A Commercial Area	3.0	4.49	34.93
5A Open Space	2.7	4.04	36.66
6A Street Area	3.4	5.33	40.27

Table 7: Basin Routing

Basin Elevation	280 x MC-4500 Storage (a.f.)	Diameter 30" Outflow (cfs)
0	0.00	0.00
0.5	0.1809	9.25
1.0	0.2870	23.64
1.5	0.3910	28.95
2.0	0.4924	33.43
2.5	0.5903	37.37
3.0	0.6839	40.94
3.5	0.7722	44.22
4.0	0.8534	47.27
4.5	0.9240	50.14
5.0	0.9776	52.85

WMS results 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 56%.

The increase in flow will be mitigated by a flood retention chamber in the lower southern corner of the site. Flow from the project area draining to Node 200 will be reduced to 57.92 cfs for the 50 Year Storm.

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)

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 B-3: StormTech System Storage

Appendix C: East Valley Boulevard Existing Storm Drain Plans

Appendix D: Los Angeles County Allowable Q

Appendix A:

Hydrology Calculations

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

Peak Flow Hydrologic Analysis

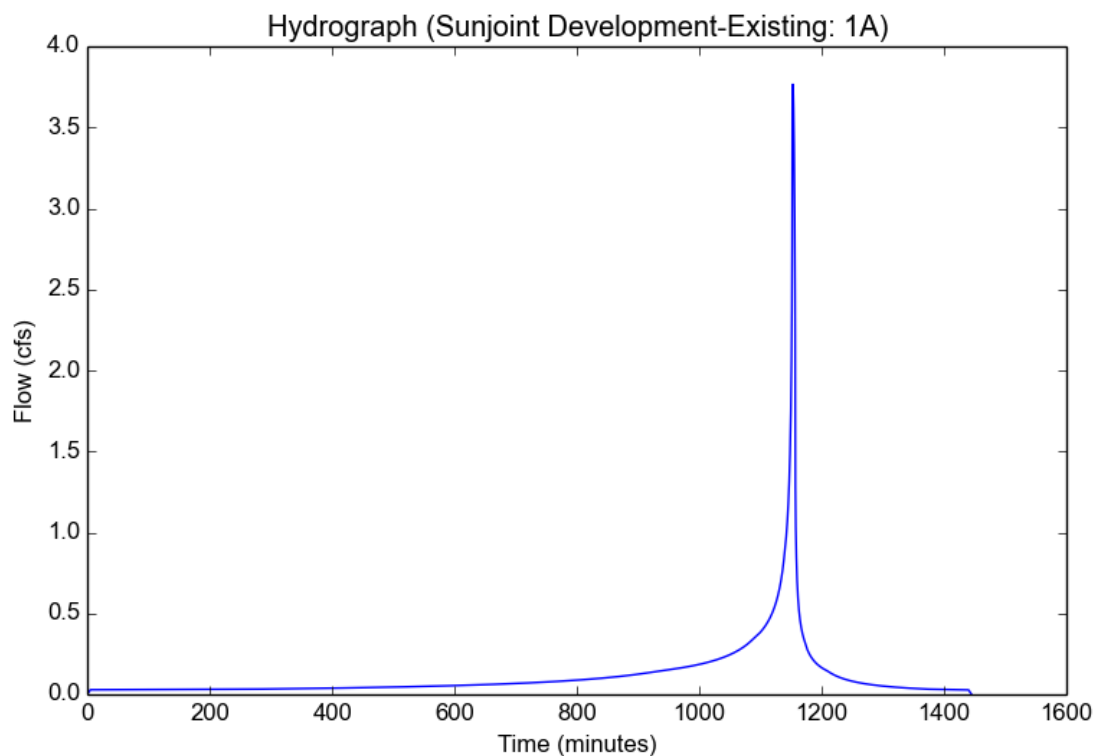
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Input Parameters

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	10-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.7838
Peak Intensity (in/hr)	2.8541
Undeveloped Runoff Coefficient (Cu)	0.8772
Developed Runoff Coefficient (Cd)	0.8795
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.7653
Burned Peak Flow Rate (cfs)	3.9088
24-Hr Clear Runoff Volume (ac-ft)	0.235
24-Hr Clear Runoff Volume (cu-ft)	10236.803



Peak Flow Hydrologic Analysis

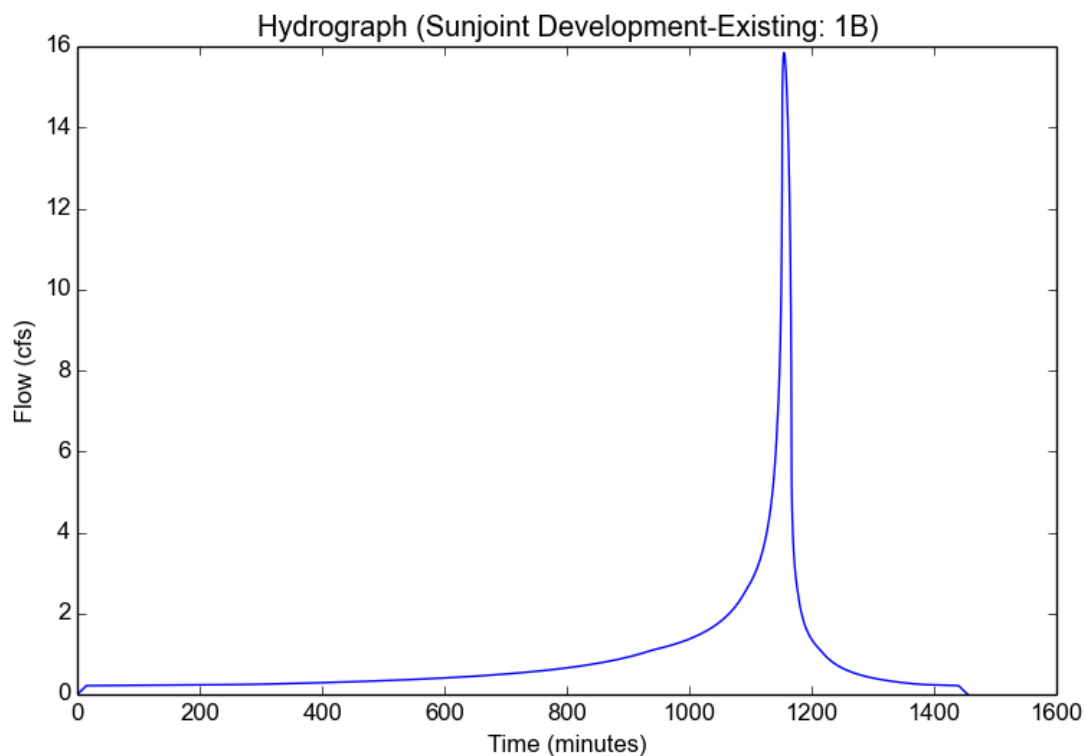
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Input Parameters

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	10-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.7838
Peak Intensity (in/hr)	1.7031
Undeveloped Runoff Coefficient (Cu)	0.8131
Developed Runoff Coefficient (Cd)	0.8218
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	15.8432
Burned Peak Flow Rate (cfs)	16.7183
24-Hr Clear Runoff Volume (ac-ft)	1.7696
24-Hr Clear Runoff Volume (cu-ft)	77084.9079



Peak Flow Hydrologic Analysis

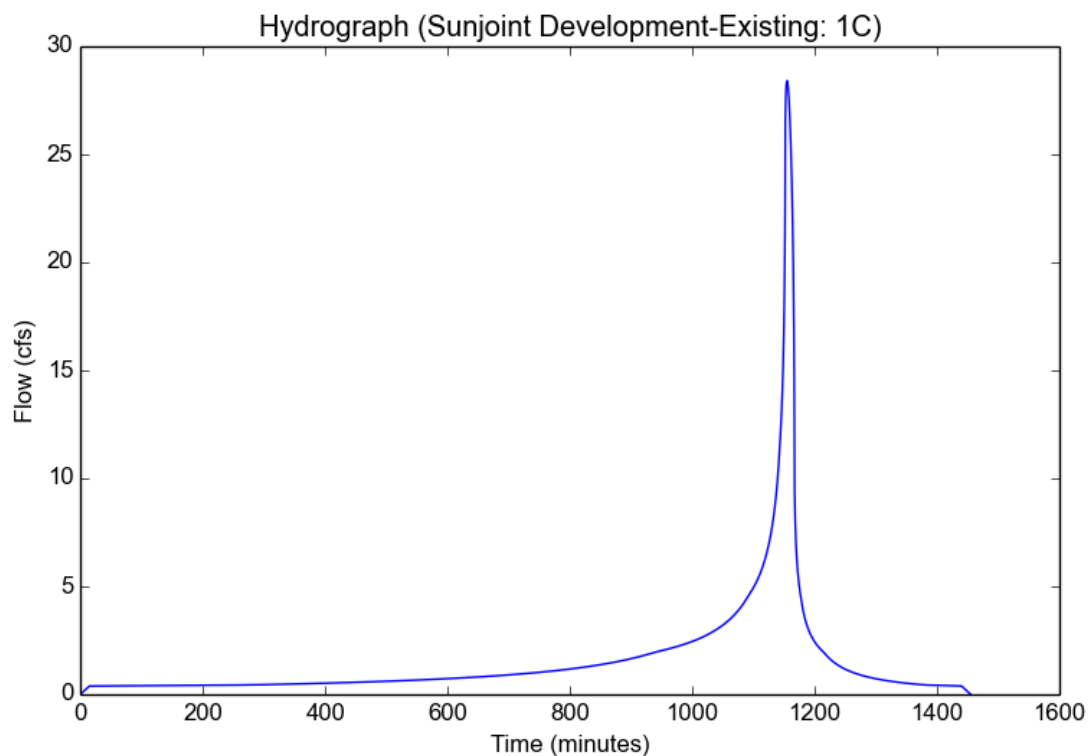
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Input Parameters

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	10-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.7838
Peak Intensity (in/hr)	1.7031
Undeveloped Runoff Coefficient (Cu)	0.8131
Developed Runoff Coefficient (Cd)	0.8218
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	28.4114
Burned Peak Flow Rate (cfs)	29.9808
24-Hr Clear Runoff Volume (ac-ft)	3.1734
24-Hr Clear Runoff Volume (cu-ft)	138235.303



Peak Flow Hydrologic Analysis

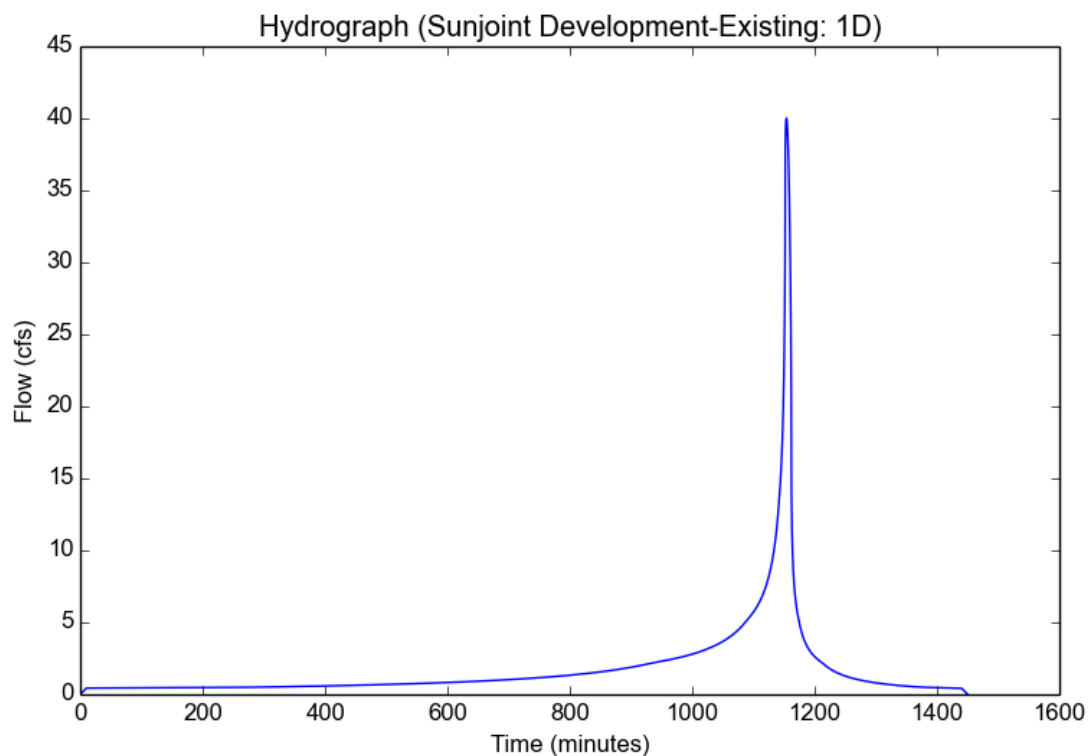
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Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1D
Area (ac)	22.9
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	10-yr
Fire Factor	0.71
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.7838
Peak Intensity (in/hr)	2.0606
Undeveloped Runoff Coefficient (Cu)	0.8421
Developed Runoff Coefficient (Cd)	0.8479
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	40.0111
Burned Peak Flow Rate (cfs)	41.9021
24-Hr Clear Runoff Volume (ac-ft)	3.5848
24-Hr Clear Runoff Volume (cu-ft)	156154.6678



Peak Flow Hydrologic Analysis

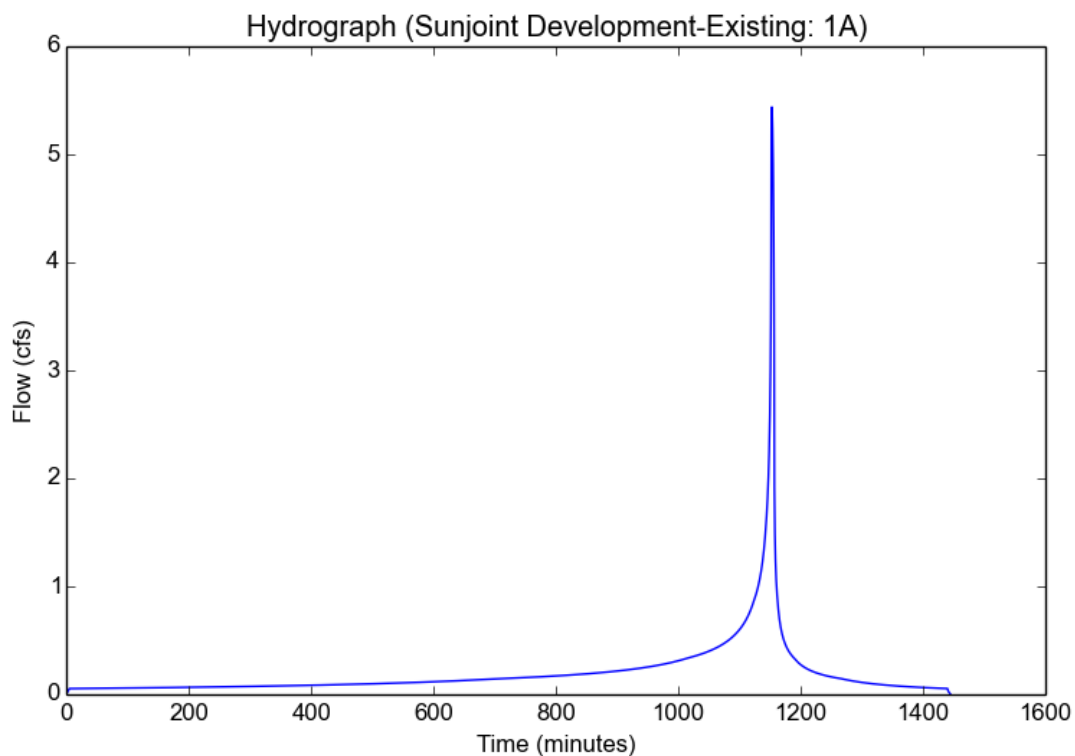
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Input Parameters

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)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.3965
Burned Peak Flow Rate (cfs)	5.572
24-Hr Clear Runoff Volume (ac-ft)	0.4061
24-Hr Clear Runoff Volume (cu-ft)	17691.498



Peak Flow Hydrologic Analysis

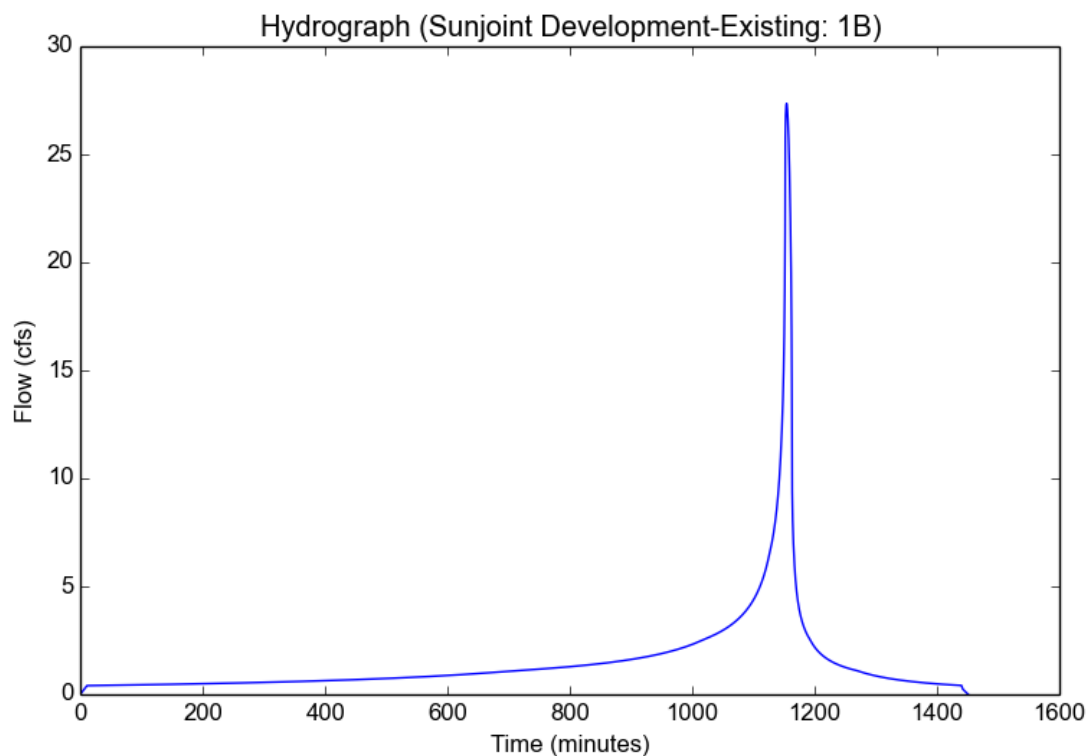
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Input Parameters

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

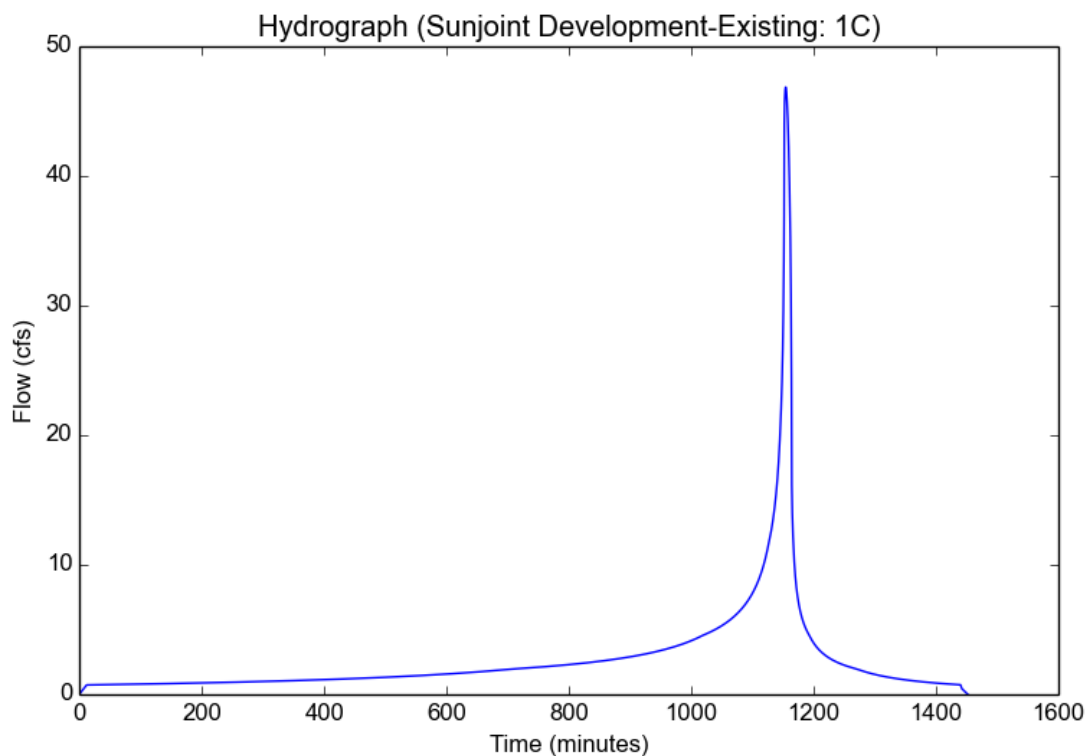
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Input Parameters

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

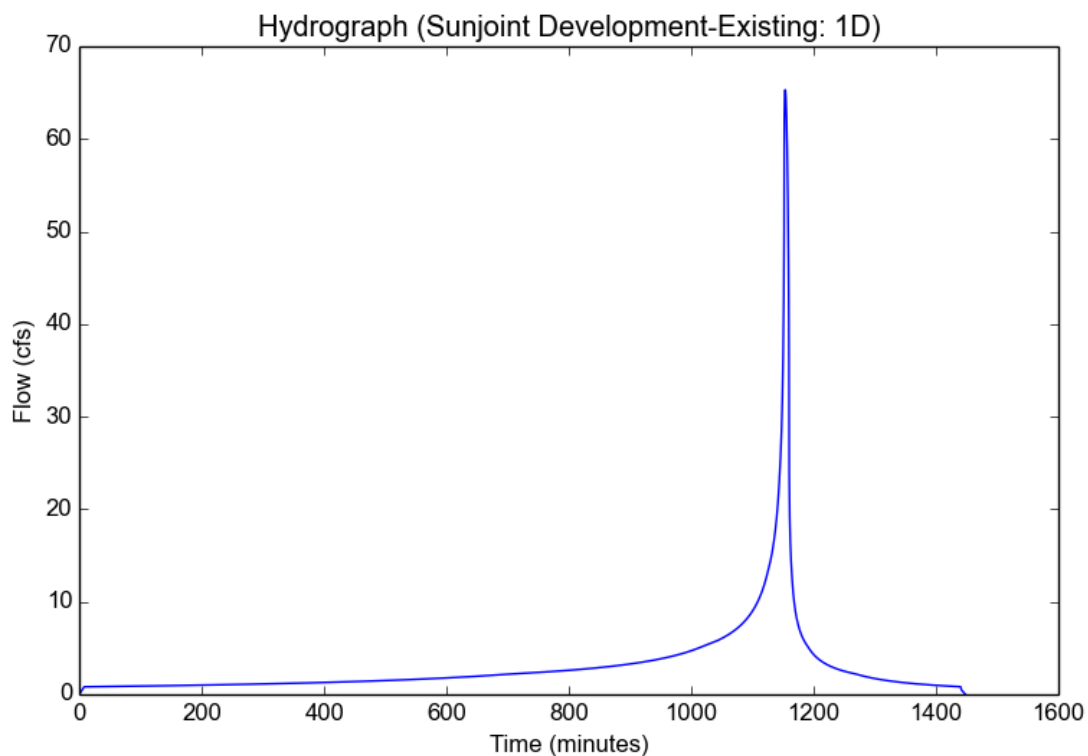
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Input Parameters

Project Name	Sunjoint Development-Existing
Subarea ID	1D
Area (ac)	22.9
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)	65.3055
Burned Peak Flow Rate (cfs)	67.5968
24-Hr Clear Runoff Volume (ac-ft)	6.1981
24-Hr Clear Runoff Volume (cu-ft)	269988.7013



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

Peak Flow Hydrologic Analysis

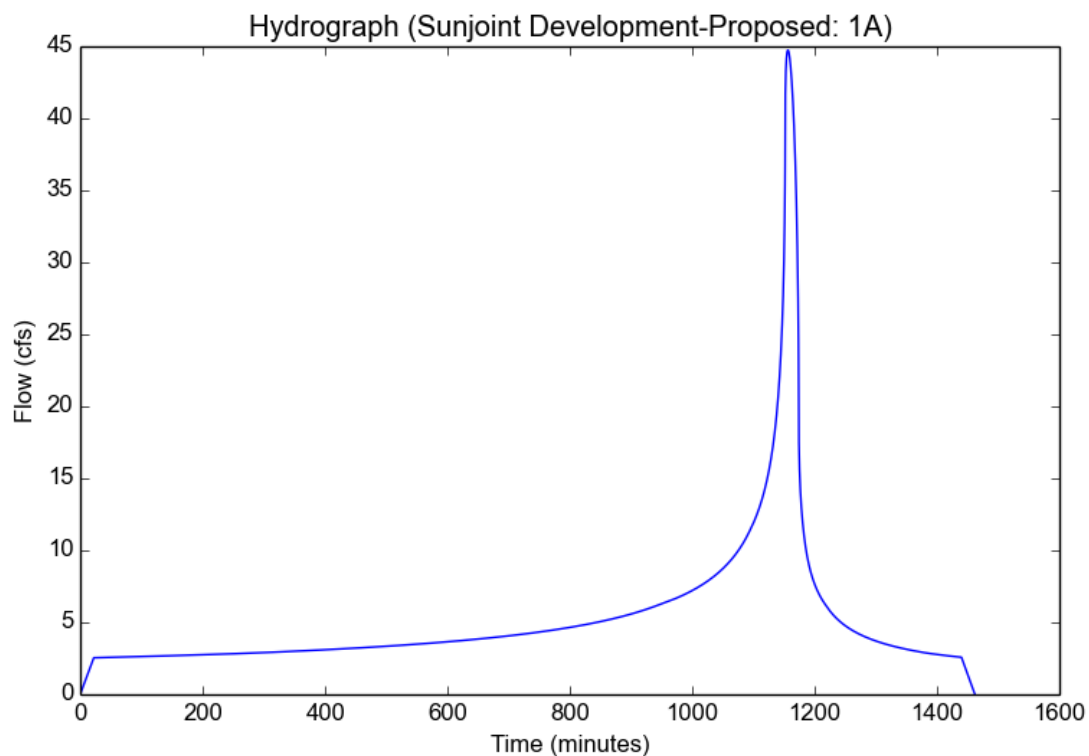
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Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1A
Area (ac)	36.3
Flow Path Length (ft)	3490.0
Flow Path Slope (vft/hft)	0.04298
50-yr Rainfall Depth (in)	6.7
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)	4.7838
Peak Intensity (in/hr)	1.4225
Undeveloped Runoff Coefficient (Cu)	0.7882
Developed Runoff Coefficient (Cd)	0.8665
Time of Concentration (min)	22.0
Clear Peak Flow Rate (cfs)	44.7418
Burned Peak Flow Rate (cfs)	44.7418
24-Hr Clear Runoff Volume (ac-ft)	10.5006
24-Hr Clear Runoff Volume (cu-ft)	457405.3837



Peak Flow Hydrologic Analysis

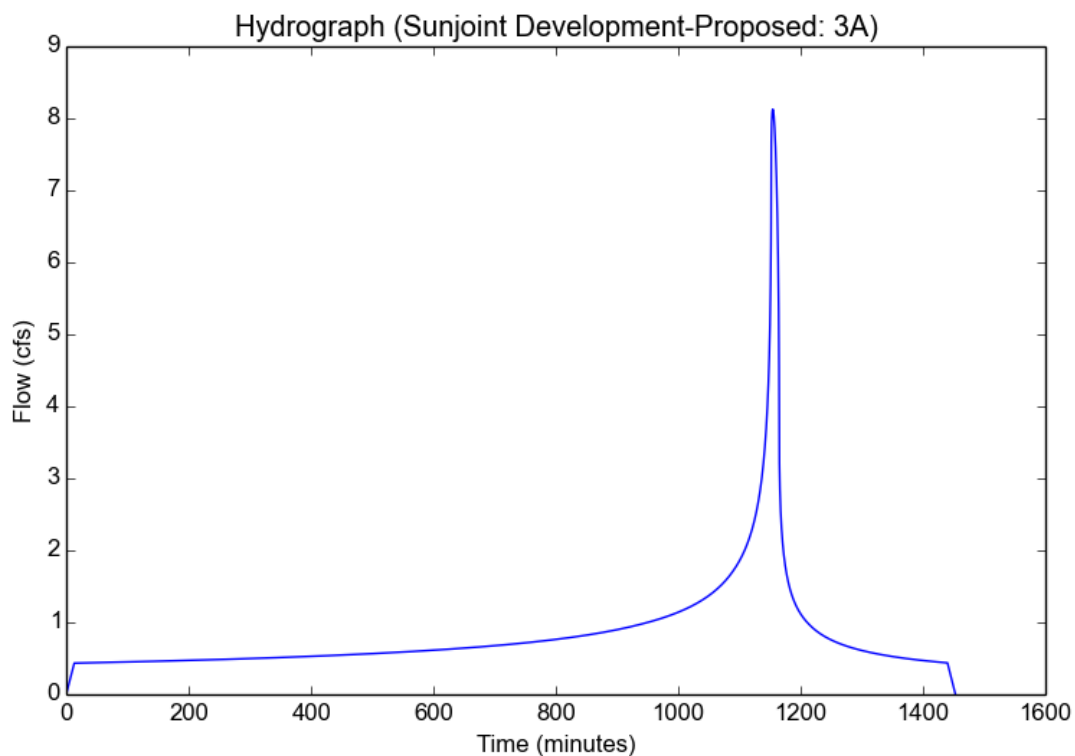
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Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	3A
Area (ac)	5.0
Flow Path Length (ft)	890.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.7
Percent Impervious	0.9
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.7838
Peak Intensity (in/hr)	1.8215
Undeveloped Runoff Coefficient (Cu)	0.8236
Developed Runoff Coefficient (Cd)	0.8924
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	8.1274
Burned Peak Flow Rate (cfs)	8.1274
24-Hr Clear Runoff Volume (ac-ft)	1.6683
24-Hr Clear Runoff Volume (cu-ft)	72671.7293



Peak Flow Hydrologic Analysis

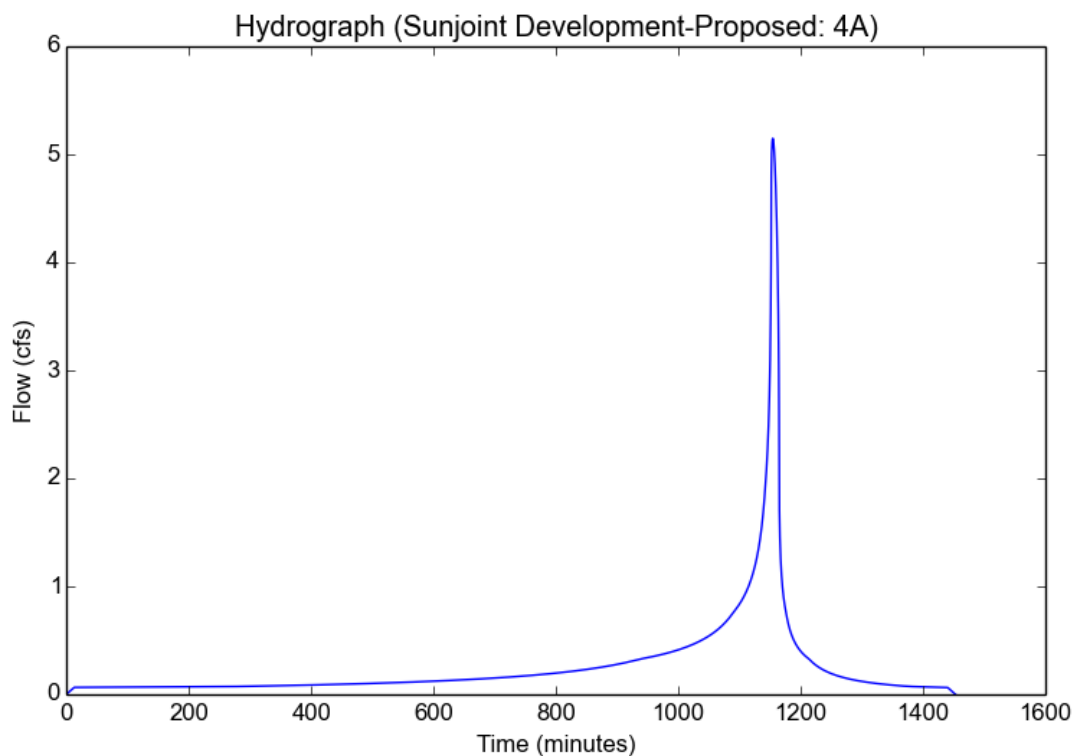
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/10-yr/10-Yr-rot-TTM.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	4A
Area (ac)	3.4
Flow Path Length (ft)	1650.0
Flow Path Slope (vft/hft)	0.0616
50-yr Rainfall Depth (in)	6.7
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)	4.7838
Peak Intensity (in/hr)	1.8215
Undeveloped Runoff Coefficient (Cu)	0.8236
Developed Runoff Coefficient (Cd)	0.8313
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	5.1482
Burned Peak Flow Rate (cfs)	5.1482
24-Hr Clear Runoff Volume (ac-ft)	0.5318
24-Hr Clear Runoff Volume (cu-ft)	23163.3581



Peak Flow Hydrologic Analysis

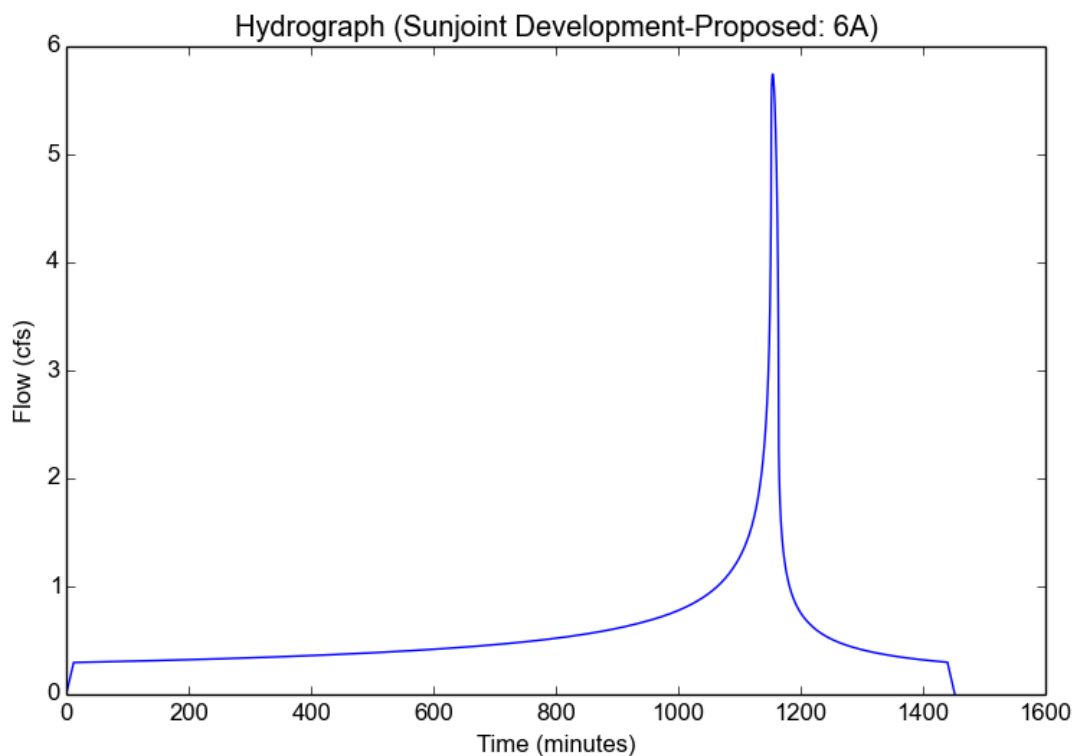
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/10-yr/10-Yr-rot-TTM.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	6A
Area (ac)	3.4
Flow Path Length (ft)	1300.0
Flow Path Slope (vft/hft)	0.0262
50-yr Rainfall Depth (in)	6.7
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)	4.7838
Peak Intensity (in/hr)	1.8914
Undeveloped Runoff Coefficient (Cu)	0.8298
Developed Runoff Coefficient (Cd)	0.893
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	5.7425
Burned Peak Flow Rate (cfs)	5.7425
24-Hr Clear Runoff Volume (ac-ft)	1.1345
24-Hr Clear Runoff Volume (cu-ft)	49417.5108



Peak Flow Hydrologic Analysis

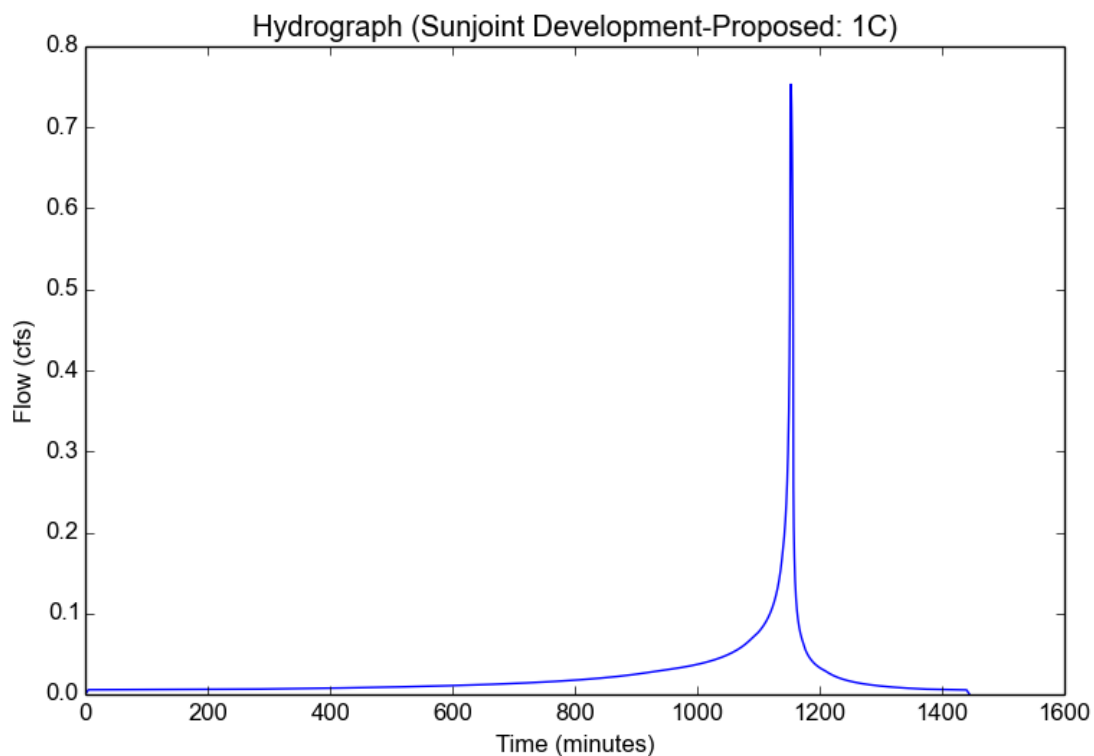
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/10-yr/10-Yr-rot-TTM.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1C
Area (ac)	0.3
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	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.7838
Peak Intensity (in/hr)	2.8541
Undeveloped Runoff Coefficient (Cu)	0.8772
Developed Runoff Coefficient (Cd)	0.8795
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.7531
Burned Peak Flow Rate (cfs)	0.7531
24-Hr Clear Runoff Volume (ac-ft)	0.047
24-Hr Clear Runoff Volume (cu-ft)	2047.3606



Peak Flow Hydrologic Analysis

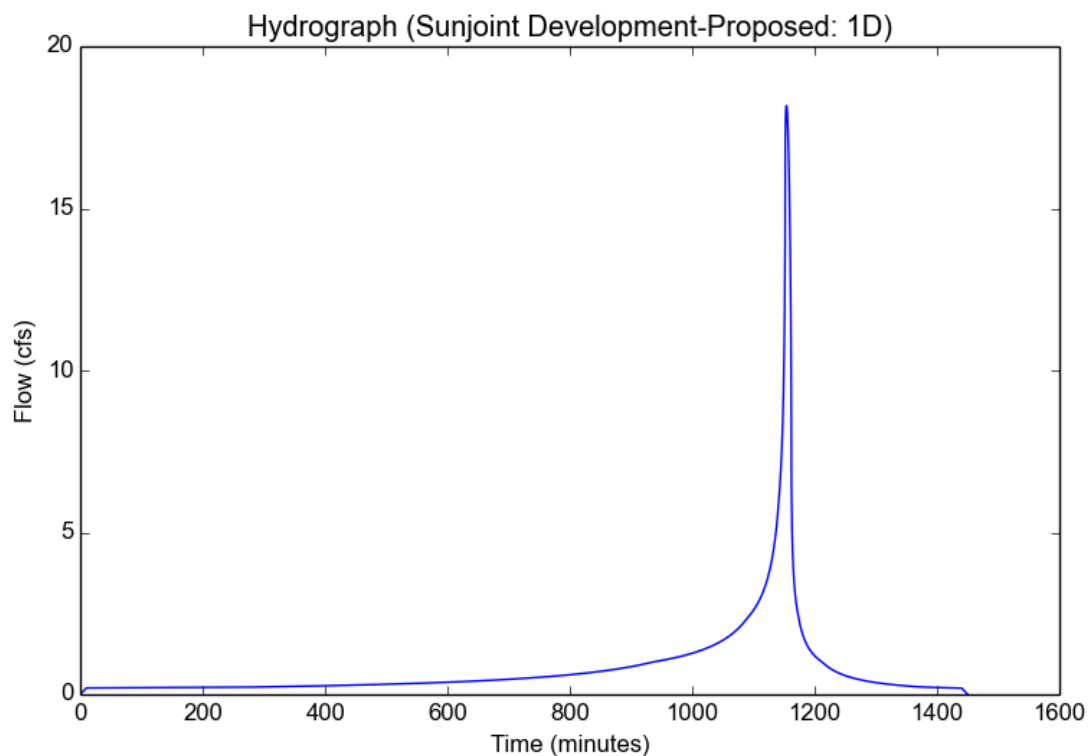
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/10-yr/10-Yr-rot-TTM.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1D
Area (ac)	10.4
Flow Path Length (ft)	1150.0
Flow Path Slope (vft/hft)	0.06
50-yr Rainfall Depth (in)	6.7
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)	4.7838
Peak Intensity (in/hr)	2.0606
Undeveloped Runoff Coefficient (Cu)	0.8421
Developed Runoff Coefficient (Cd)	0.8479
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	18.171
Burned Peak Flow Rate (cfs)	18.171
24-Hr Clear Runoff Volume (ac-ft)	1.628
24-Hr Clear Runoff Volume (cu-ft)	70917.4037



Peak Flow Hydrologic Analysis

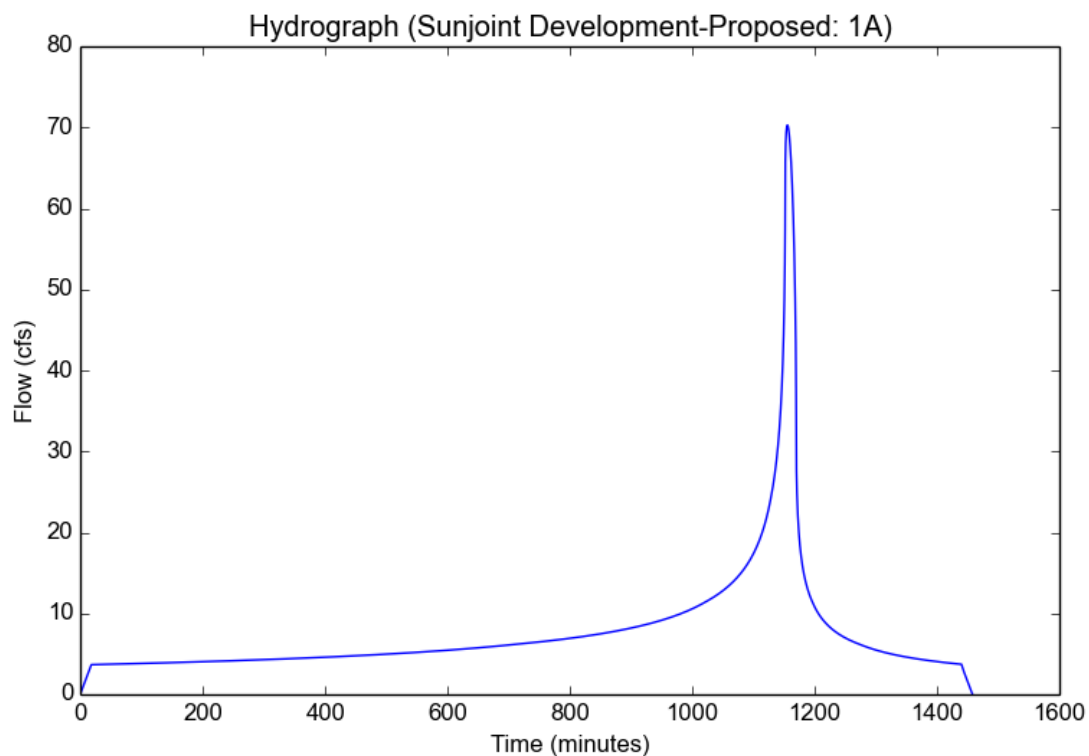
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/50-yr/50-Yr-rot.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1A
Area (ac)	36.3
Flow Path Length (ft)	3810.0
Flow Path Slope (vft/hft)	0.0402
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)	2.1894
Undeveloped Runoff Coefficient (Cu)	0.8478
Developed Runoff Coefficient (Cd)	0.8843
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	70.2822
Burned Peak Flow Rate (cfs)	70.2822
24-Hr Clear Runoff Volume (ac-ft)	15.3307
24-Hr Clear Runoff Volume (cu-ft)	667806.1692



Peak Flow Hydrologic Analysis

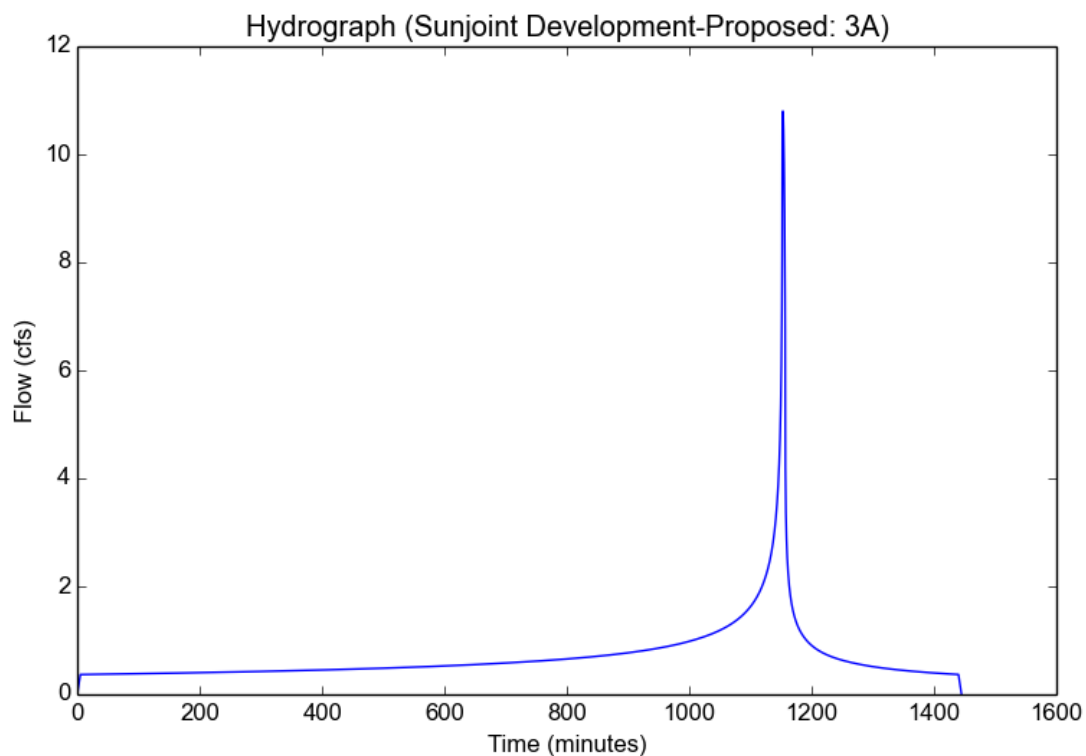
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/50-yr/50-Yr-rot.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	3A
Area (ac)	3.0
Flow Path Length (ft)	450.0
Flow Path Slope (vft/hft)	0.025
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)	3.9974
Undeveloped Runoff Coefficient (Cu)	0.9078
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	10.793
Burned Peak Flow Rate (cfs)	10.793
24-Hr Clear Runoff Volume (ac-ft)	1.4192
24-Hr Clear Runoff Volume (cu-ft)	61819.4621



Peak Flow Hydrologic Analysis

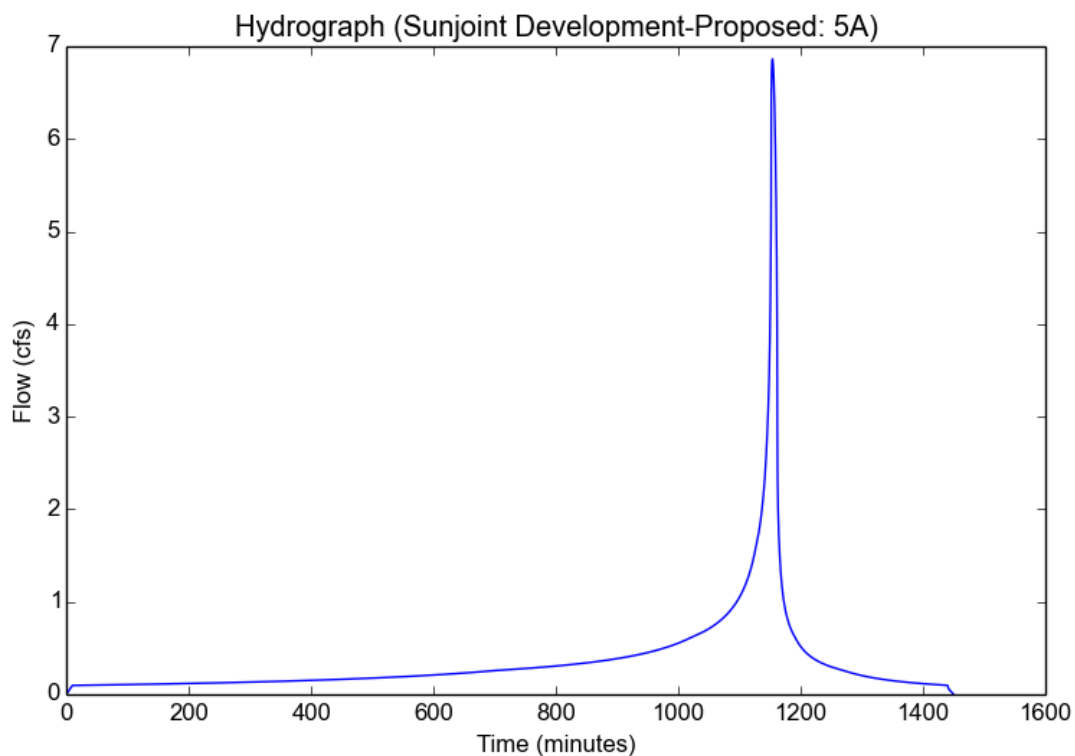
File location: H:/pdata/145267/Calcs/Strmwater/Hydrology/HydroCalc/Proposed/50-yr/50-Yr-rot.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	5A
Area (ac)	2.7
Flow Path Length (ft)	1650.0
Flow Path Slope (vft/hft)	0.0616
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)	2.886
Undeveloped Runoff Coefficient (Cu)	0.8786
Developed Runoff Coefficient (Cd)	0.8808
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	6.8631
Burned Peak Flow Rate (cfs)	6.8631
24-Hr Clear Runoff Volume (ac-ft)	0.7305
24-Hr Clear Runoff Volume (cu-ft)	31821.744



Peak Flow Hydrologic Analysis

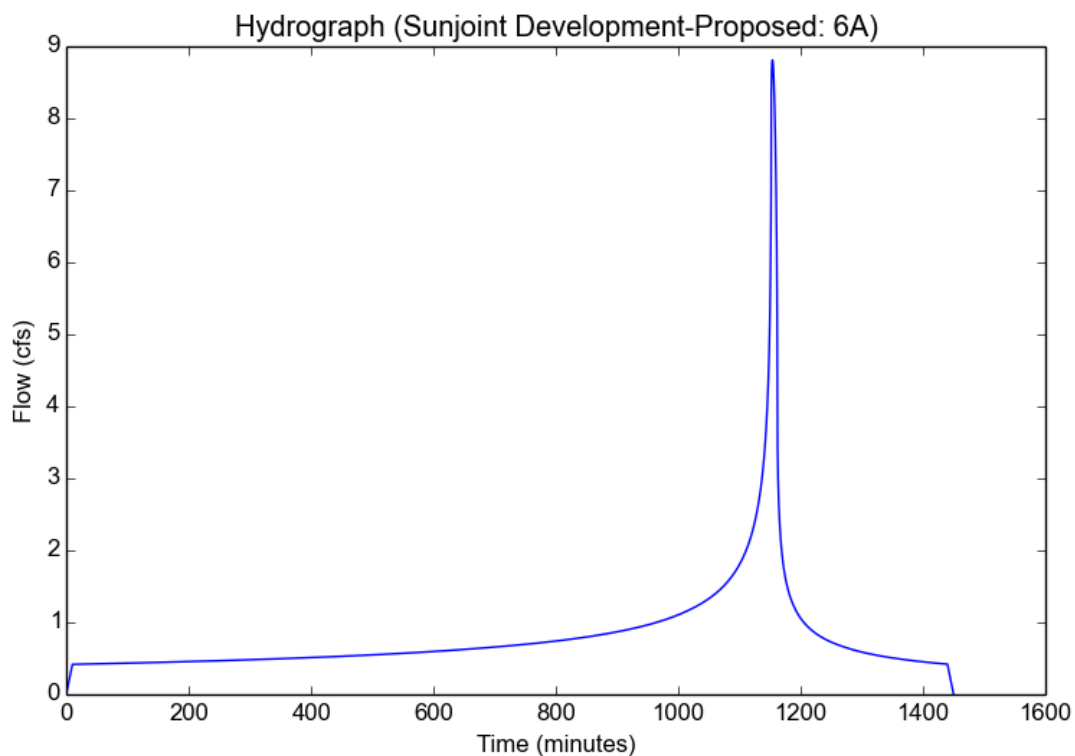
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Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	6A
Area (ac)	3.4
Flow Path Length (ft)	1300.0
Flow Path Slope (vft/hft)	0.0262
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)	2.886
Undeveloped Runoff Coefficient (Cu)	0.8786
Developed Runoff Coefficient (Cd)	0.8979
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	8.8101
Burned Peak Flow Rate (cfs)	8.8101
24-Hr Clear Runoff Volume (ac-ft)	1.6083
24-Hr Clear Runoff Volume (cu-ft)	70058.9077



Peak Flow Hydrologic Analysis

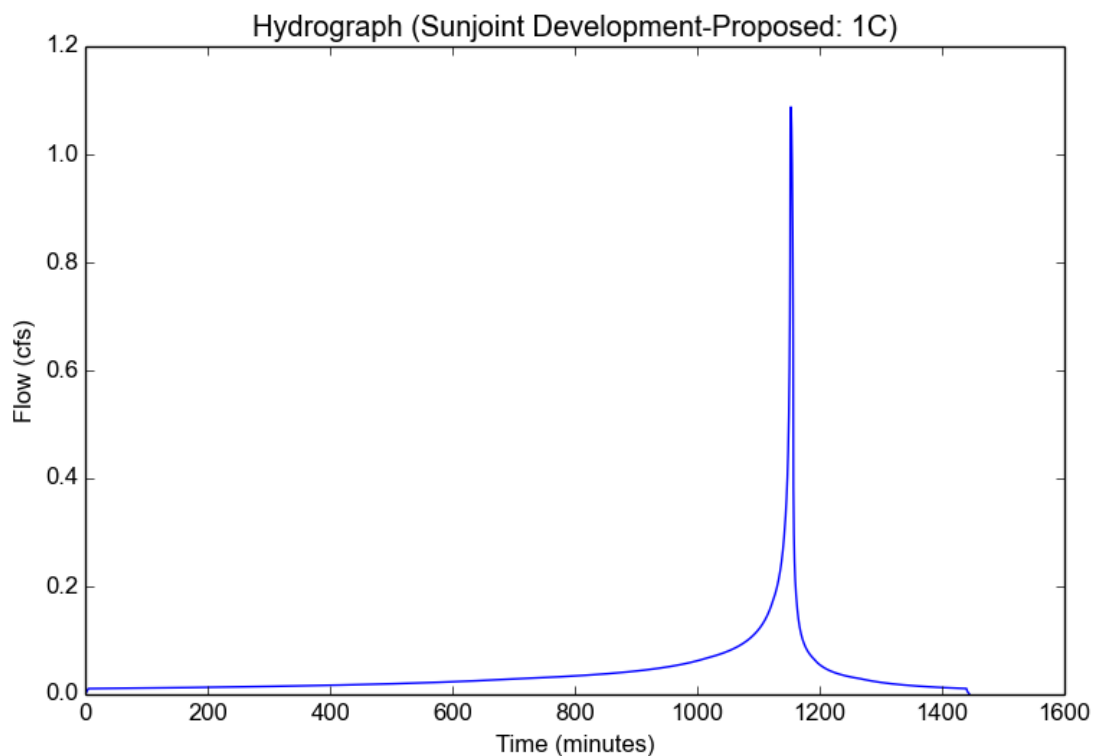
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Version: HydroCalc 1.0.2

Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1C
Area (ac)	0.3
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)	1.0793
Burned Peak Flow Rate (cfs)	1.0793
24-Hr Clear Runoff Volume (ac-ft)	0.0812
24-Hr Clear Runoff Volume (cu-ft)	3538.2996



Peak Flow Hydrologic Analysis

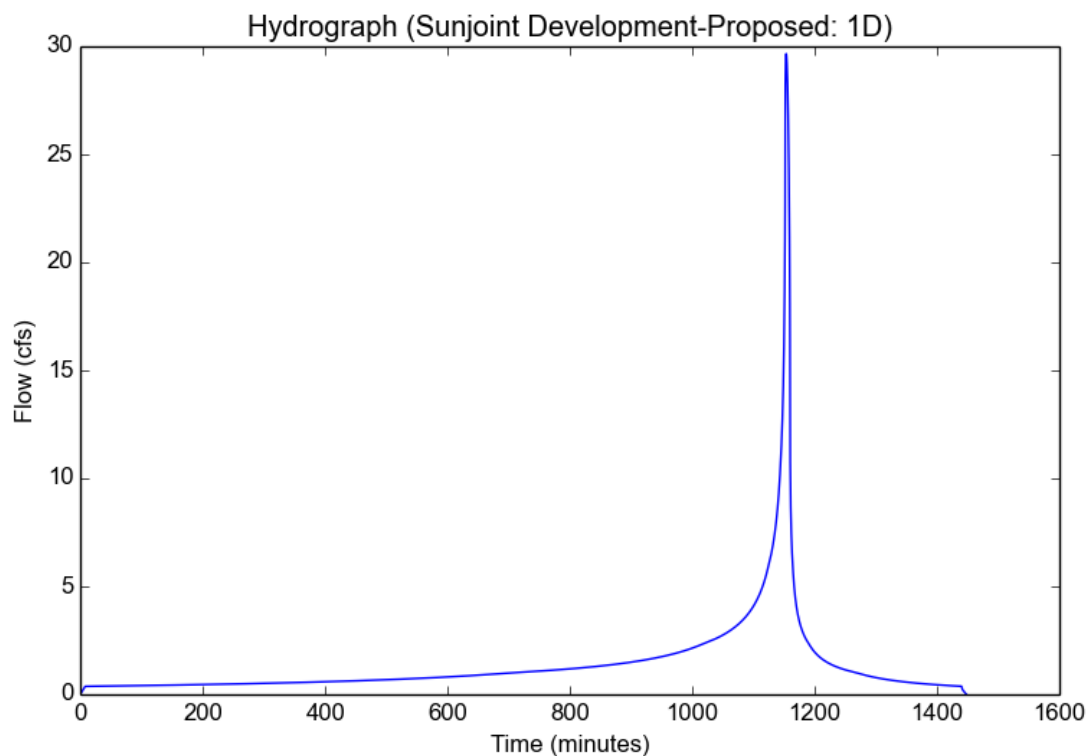
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Version: HydroCalc 1.0.2

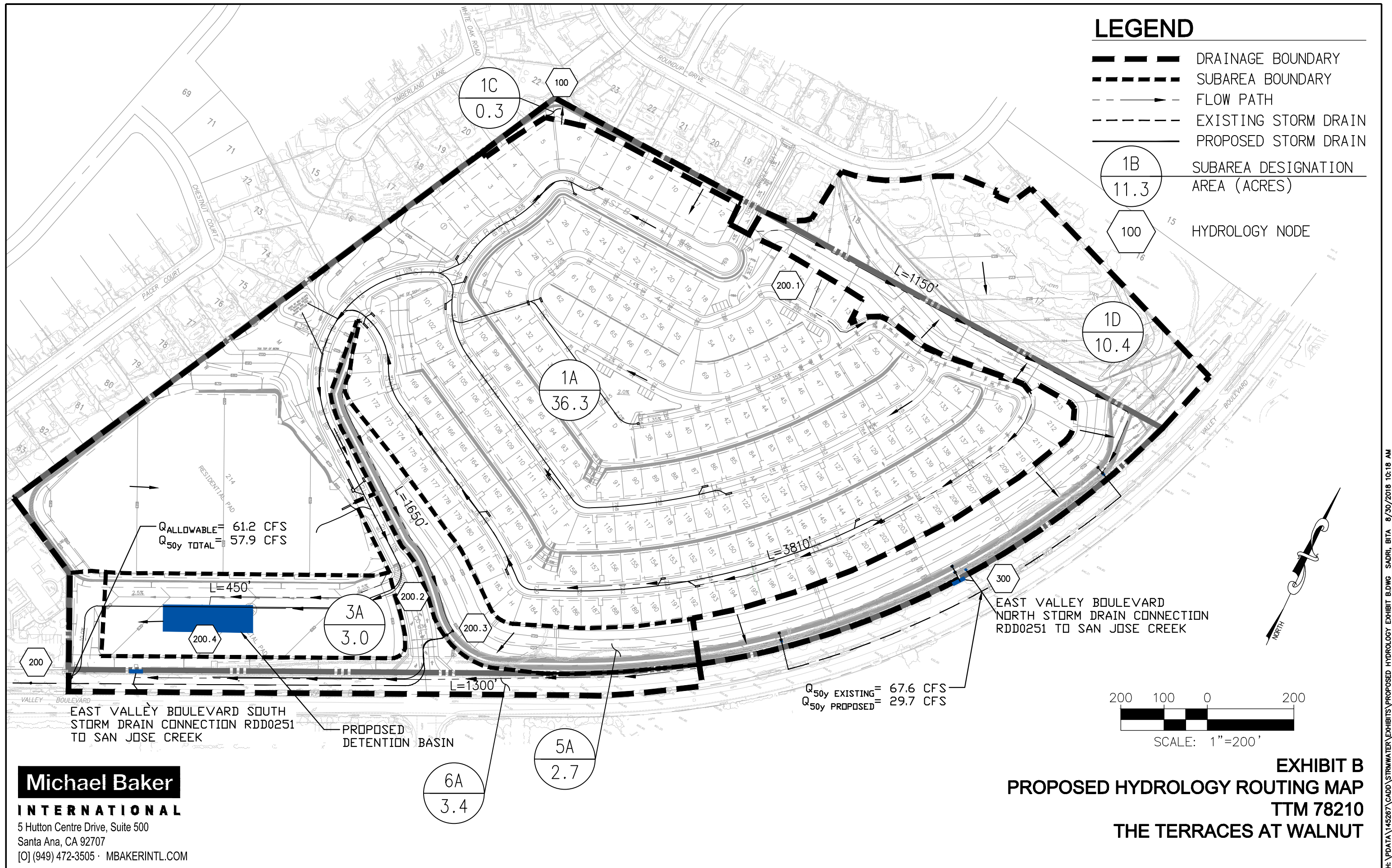
Input Parameters

Project Name	Sunjoint Development-Proposed
Subarea ID	1D
Area (ac)	10.4
Flow Path Length (ft)	1150.0
Flow Path Slope (vft/hft)	0.06
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)	29.6584
Burned Peak Flow Rate (cfs)	29.6584
24-Hr Clear Runoff Volume (ac-ft)	2.8149
24-Hr Clear Runoff Volume (cu-ft)	122614.9561





Michael Baker
INTERNATIONAL
5 Hutton Centre Drive, Suite 500
Santa Ana, CA 92707
[O] (949) 472-3505 · MBAKERINTL.COM

EXHIBIT B
PROPOSED HYDROLOGY ROUTING MAP
TTM 78210
THE TERRACES AT WALNUT

Appendix B:

Basin Routing Calculations

Appendix B-1:
Proposed 50 Year Storm Routing

File name: H:\pdata\145267\Calcs\Strmwater\Hydrology\WMS\TTM HYD WMS 2018-08-17\50-yr.lac

Run date: Fri Aug 17 11:37:36 2018

Los Angeles County Flood Control District
Modified Rational Method Hydrology

LOCATION	SUBAREA AREA	Storm Day 4		Storm Frequency 50		CONV TYPE	CONV LNPTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN	PCT IMPV
		SUBAREA Q	TOTAL AREA	TOTAL Q	TOTAL VOLUME										
1 1A	36.3	67.37	36.3	67.37	8.971	0	0	0.00000	0.00	0.00	0	2	18	6.70	0.01
1 2A	0.0	0.00	36.3	67.37	8.971	4	540	0.04000	2.00	0.00	0	2	0	6.70	0.00
1 3A	3.0	10.79	39.3	77.46	9.715	0	0	0.00000	0.00	0.00	0	2	5	6.70	0.01
1 4A	0.0	0.00	39.3	50.97	9.712	4	330	0.07000	1.00	0.00	0	2	0	6.70	0.00
1 5A	2.7	6.85	42.0	52.20	10.374	0	0	0.00000	0.00	0.00	0	2	10	6.70	0.00
1 6A	3.4	8.63	45.4	57.92	11.216	0	0	0.00000	0.00	0.00	0	2	10	6.70	0.01
1 7A	0.0	0.00	45.4	57.92	11.215	4	930	0.07000	2.00	0.00	0	2	0	6.70	0.00

Normal End of MODRAT

50-yr.rot
 ** LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS **
 ** MODIFIED RATIONAL METHOD HYDROLOGY **
 ** RESERVOIR ROUTING OUTPUT **

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

RESERVOIR ROUTING at 4A STORM DAY 4 STORM FREQ. 50
 INITIAL WATER SURFACE ELEVATION: 0.00
 RESERVOIR COMPOSITE ELEVATION-STORAGE-DISCHARGE DATA at 4A

ELEVATION (ft.)	STORAGE (a.f.)	OUTFLOW (cfs)
0.00	0.00	0.00
0.50	0.18	9.25
1.00	0.29	23.64
1.50	0.39	28.95
2.00	0.49	33.43
2.50	0.59	37.37
3.00	0.68	40.94
3.50	0.77	44.22
4.00	0.85	47.27
4.50	0.92	50.14
5.00	0.98	52.85
5.50	1.03	55.43
6.00	1.08	57.89

TIME	INFLOW (cfs)	OUTFLOW (cfs)	W.S.ELEV (ft.)	STORAGE (a.f.)
0	0.00	0.00	0.00	0.00
100	1.14	1.12	0.06	0.02
200	1.30	1.28	0.07	0.03
300	1.51	1.48	0.08	0.03
400	1.77	1.73	0.09	0.03
500	2.12	2.06	0.11	0.04
600	2.58	2.51	0.14	0.05
700	3.26	3.15	0.17	0.06
800	3.95	3.84	0.21	0.08
900	5.05	4.86	0.26	0.10
1000	7.36	6.91	0.37	0.14
1050	9.51	8.86	0.48	0.17
1100	13.96	13.25	0.64	0.21
1110	15.72	14.77	0.69	0.22
1120	18.24	16.88	0.77	0.24
1130	22.08	20.03	0.87	0.26
1131	22.53	20.42	0.89	0.26
1132	22.99	20.82	0.90	0.27
1133	23.48	21.23	0.92	0.27
1134	24.00	21.66	0.93	0.27
1135	24.55	22.10	0.95	0.28
1136	25.14	22.57	0.96	0.28
1137	25.78	23.07	0.98	0.28
1138	26.48	23.59	1.00	0.29
1139	27.22	23.84	1.02	0.29
1140	28.04	24.10	1.04	0.30
1141	28.94	24.40	1.07	0.30
1142	29.93	24.74	1.10	0.31
1143	31.03	25.13	1.14	0.32
1144	32.24	25.57	1.18	0.32
1145	33.60	26.07	1.23	0.33
1146	35.17	26.64	1.28	0.35
1147	37.00	27.28	1.34	0.36
1148	39.16	28.01	1.41	0.37
1149	41.72	28.86	1.49	0.39
1150	44.80	29.72	1.59	0.41
1151	48.86	30.73	1.70	0.43
1152	59.63	32.12	1.85	0.46
1153	72.91	34.07	2.08	0.51
1154	77.46	36.29	2.36	0.56
1155	76.30	38.43	2.65	0.62
1156	75.89	40.35	2.92	0.67
1157	71.87	42.04	3.17	0.71
1158	69.70	43.47	3.39	0.75
1159	68.50	44.76	3.59	0.79
1160	67.30	45.93	3.78	0.82
1161	65.98	46.97	3.95	0.85
1162	64.56	47.95	4.12	0.87
1163	63.12	48.81	4.27	0.89
1164	61.06	49.53	4.39	0.91
1165	58.89	50.10	4.49	0.92
1166	56.31	50.60	4.58	0.93
1167	53.63	50.89	4.64	0.94
1168	50.57	50.97	4.65	0.94
1169	46.06	50.79	4.62	0.94
1170	39.57	50.26	4.52	0.93
1171	29.40	49.38	4.37	0.91
1172	22.66	48.11	4.15	0.87
1173	19.79	46.69	3.90	0.84
1174	18.07	45.29	3.68	0.80
1175	16.76	43.88	3.45	0.76
1176	15.71	42.50	3.24	0.73
1177	14.86	41.15	3.03	0.69
1178	14.11	39.79	2.84	0.65
1179	13.49	38.46	2.65	0.62
1180	12.93	37.16	2.47	0.58
1181	12.43	35.83	2.31	0.55
1182	11.99	34.56	2.14	0.52

50-yr.rot

1183	11.58	33.32	1.99	0.49
1184	11.22	32.02	1.84	0.46
1185	10.89	30.79	1.71	0.43
1186	10.58	29.60	1.57	0.41
1187	10.29	28.40	1.45	0.38
1188	10.03	27.16	1.33	0.36
1189	9.79	25.99	1.22	0.33
1190	9.55	24.88	1.12	0.31
1191	9.34	23.83	1.02	0.29
1192	9.13	21.63	0.93	0.27
1193	8.94	19.48	0.86	0.26
1194	8.76	17.66	0.79	0.24
1195	8.59	16.13	0.74	0.23
1196	8.43	14.83	0.69	0.22
1197	8.27	13.72	0.66	0.21
1198	8.10	12.77	0.62	0.21
1199	7.93	11.96	0.59	0.20
1200	7.76	11.26	0.57	0.20
1201	7.60	10.65	0.55	0.19
1202	7.45	10.11	0.53	0.19
1203	7.30	9.64	0.51	0.18
1204	7.16	9.24	0.50	0.18
1205	7.02	9.09	0.49	0.18
1206	6.90	8.95	0.48	0.18
1207	6.77	8.81	0.48	0.17
1208	6.66	8.66	0.47	0.17
1209	6.55	8.52	0.46	0.17
1210	6.44	8.38	0.45	0.16
1211	6.34	8.25	0.45	0.16
1212	6.24	8.12	0.44	0.16
1213	6.14	7.98	0.43	0.16
1214	6.05	7.86	0.42	0.15
1215	5.96	7.73	0.42	0.15
1216	5.87	7.61	0.41	0.15
1217	5.79	7.49	0.40	0.15
1218	5.70	7.37	0.40	0.14
1219	5.62	7.25	0.39	0.14
1220	5.55	7.14	0.39	0.14
1221	5.48	7.03	0.38	0.14
1222	5.41	6.92	0.37	0.14
1223	5.34	6.81	0.37	0.13
1224	5.27	6.71	0.36	0.13
1225	5.21	6.61	0.36	0.13
1226	5.14	6.51	0.35	0.13
1227	5.09	6.42	0.35	0.13
1228	5.03	6.33	0.34	0.12
1229	4.97	6.24	0.34	0.12
1230	4.91	6.15	0.33	0.12
1231	4.86	6.06	0.33	0.12
1232	4.81	5.98	0.32	0.12
1233	4.75	5.90	0.32	0.12
1234	4.71	5.82	0.31	0.11
1235	4.66	5.74	0.31	0.11
1236	4.61	5.67	0.31	0.11
1237	4.56	5.59	0.30	0.11
1238	4.51	5.52	0.30	0.11
1239	4.47	5.45	0.29	0.11
1240	4.43	5.38	0.29	0.11
1241	4.38	5.32	0.29	0.10
1242	4.34	5.25	0.28	0.10
1243	4.30	5.19	0.28	0.10
1244	4.26	5.12	0.28	0.10
1245	4.22	5.06	0.27	0.10
1246	4.18	5.01	0.27	0.10
1247	4.15	4.95	0.27	0.10
1248	4.11	4.89	0.26	0.10
1249	4.08	4.84	0.26	0.09
1250	4.04	4.79	0.26	0.09
1251	4.00	4.73	0.26	0.09
1252	3.97	4.68	0.25	0.09
1253	3.93	4.63	0.25	0.09
1254	3.90	4.58	0.25	0.09
1255	3.87	4.54	0.25	0.09
1256	3.84	4.49	0.24	0.09
1257	3.81	4.45	0.24	0.09
1258	3.78	4.40	0.24	0.09
1259	3.75	4.36	0.24	0.09
1260	3.72	4.32	0.23	0.08
1261	3.70	4.27	0.23	0.08
1262	3.67	4.23	0.23	0.08
1263	3.64	4.20	0.23	0.08
1264	3.62	4.16	0.22	0.08
1265	3.59	4.12	0.22	0.08
1266	3.56	4.08	0.22	0.08
1267	3.54	4.05	0.22	0.08
1268	3.51	4.01	0.22	0.08
1269	3.49	3.98	0.21	0.08
1270	3.46	3.94	0.21	0.08
1271	3.44	3.91	0.21	0.08
1272	3.41	3.88	0.21	0.08
1273	3.39	3.84	0.21	0.08
1274	3.37	3.81	0.21	0.07
1275	3.34	3.78	0.20	0.07
1276	3.31	3.75	0.20	0.07
1277	3.28	3.72	0.20	0.07
1278	3.25	3.69	0.20	0.07

				50-yr.rot
1279	3.21	3.66	0.20	0.07
1280	3.18	3.63	0.20	0.07
1281	3.15	3.59	0.19	0.07
1282	3.12	3.56	0.19	0.07
1283	3.09	3.53	0.19	0.07
1284	3.06	3.50	0.19	0.07
1285	3.03	3.47	0.19	0.07
1286	3.01	3.44	0.19	0.07
1287	2.98	3.41	0.18	0.07
1288	2.95	3.38	0.18	0.07
1289	2.92	3.35	0.18	0.07
1290	2.89	3.32	0.18	0.06
1291	2.87	3.29	0.18	0.06
1292	2.84	3.26	0.18	0.06
1293	2.81	3.23	0.17	0.06
1294	2.79	3.20	0.17	0.06
1295	2.76	3.17	0.17	0.06
1296	2.74	3.14	0.17	0.06
1297	2.71	3.11	0.17	0.06
1298	2.69	3.09	0.17	0.06
1299	2.67	3.06	0.17	0.06
1300	2.64	3.03	0.16	0.06
1310	2.43	2.77	0.15	0.05
1320	2.24	2.55	0.14	0.05
1330	2.08	2.35	0.13	0.05
1340	1.93	2.17	0.12	0.04
1350	1.81	2.01	0.11	0.04
1360	1.70	1.88	0.10	0.04
1370	1.59	1.75	0.09	0.03
1380	1.49	1.64	0.09	0.03
1390	1.40	1.54	0.08	0.03
1400	1.33	1.45	0.08	0.03
1420	1.19	1.29	0.07	0.03
1440	1.07	1.16	0.06	0.02

Appendix B-2:
Proposed 10 Year Storm Routing

File name: H:\pdata\145267\Calcs\Strmwater\Hydrology\WMS\TTM HYD WMS 2018-08-17\10-yr\10-yr.lac

Run date: Fri Aug 17 12:07:11 2018

Los Angeles County Flood Control District
Modified Rational Method Hydrology

LOCATION	SUBAREA AREA	Storm Day 4		Storm Frequency 10		CONV TYPE	CONV LNGLTH	CONV SLOPE	CONV SIZE	CONV Z	CONTROL Q	SOIL NAME	TC	RAIN	PCT IMPV
		SUBAREA Q	TOTAL AREA	TOTAL Q	TOTAL VOLUME										
1 1A	36.3	40.69	36.3	40.69	4.930	0	0	0.00000	0.00	0.00	0	2	22	4.78	0.01
1 2A	0.0	0.00	36.3	40.69	4.930	4	540	0.04000	2.00	0.00	0	2	0	4.78	0.00
1 3A	3.0	4.49	39.3	45.04	5.338	0	0	0.00000	0.00	0.00	0	2	13	4.78	0.01
1 4A	0.0	0.00	39.3	34.93	5.336	4	330	0.07000	1.00	0.00	0	2	0	4.78	0.00
1 5A	2.7	4.04	42.0	36.66	5.698	0	0	0.00000	0.00	0.00	0	2	13	4.78	0.00
1 6A	3.4	5.33	45.4	40.27	6.161	0	0	0.00000	0.00	0.00	0	2	12	4.78	0.01
1 7A	0.0	0.00	45.4	40.27	6.159	4	930	0.07000	2.00	0.00	0	2	0	4.78	0.00

Normal End of MODRAT

10-yr.rot
 ** LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS **
 ** MODIFIED RATIONAL METHOD HYDROLOGY **
 ** RESERVOIR ROUTING OUTPUT **

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

RESERVOIR ROUTING at 4A STORM DAY 4 STORM FREQ. 10
 INITIAL WATER SURFACE ELEVATION: 0.00
 RESERVOIR COMPOSITE ELEVATION-STORAGE-DISCHARGE DATA at 4A

ELEVATION (ft.)	STORAGE (a.f.)	OUTFLOW (cfs)
0.00	0.00	0.00
0.50	0.18	9.25
1.00	0.29	23.64
1.50	0.39	28.95
2.00	0.49	33.43
2.50	0.59	37.37
3.00	0.68	40.94
3.50	0.77	44.22
4.00	0.85	47.27
4.50	0.92	50.14
5.00	0.98	52.85
5.50	1.03	55.43
6.00	1.08	57.89

TIME	INFLOW (cfs)	OUTFLOW (cfs)	W.S.ELEV (ft.)	STORAGE (a.f.)
0	0.00	0.00	0.00	0.00
100	0.46	0.46	0.02	0.01
200	0.49	0.48	0.03	0.01
300	0.52	0.51	0.03	0.01
400	0.64	0.62	0.03	0.01
500	0.79	0.77	0.04	0.02
600	1.01	0.97	0.05	0.02
700	1.32	1.27	0.07	0.02
800	1.82	1.73	0.09	0.03
900	2.70	2.54	0.14	0.05
1000	4.18	3.94	0.21	0.08
1050	5.52	5.08	0.27	0.10
1100	8.65	7.58	0.41	0.15
1110	9.64	8.38	0.45	0.16
1120	11.02	9.59	0.51	0.18
1130	13.13	11.88	0.59	0.20
1131	13.40	12.12	0.60	0.20
1132	13.70	12.36	0.61	0.20
1133	14.01	12.62	0.62	0.21
1134	14.34	12.88	0.63	0.21
1135	14.70	13.16	0.64	0.21
1136	15.08	13.46	0.65	0.21
1137	15.49	13.77	0.66	0.21
1138	15.93	14.10	0.67	0.22
1139	16.41	14.46	0.68	0.22
1140	16.94	14.84	0.69	0.22
1141	17.51	15.24	0.71	0.23
1142	18.14	15.68	0.72	0.23
1143	18.83	16.16	0.74	0.23
1144	19.59	16.68	0.76	0.24
1145	20.46	17.26	0.78	0.24
1146	21.43	17.89	0.80	0.24
1147	22.47	18.58	0.82	0.25
1148	23.62	19.34	0.85	0.26
1149	24.98	20.19	0.88	0.26
1150	26.70	21.16	0.91	0.27
1151	29.05	22.30	0.95	0.28
1152	33.94	23.73	1.01	0.29
1153	39.73	24.62	1.09	0.31
1154	43.34	25.77	1.20	0.33
1155	44.56	27.01	1.32	0.35
1156	44.94	28.21	1.43	0.38
1157	45.04	29.30	1.54	0.40
1158	44.93	30.22	1.64	0.42
1159	44.65	31.08	1.74	0.44
1160	44.23	31.87	1.83	0.46
1161	43.68	32.59	1.91	0.47
1162	42.99	33.22	1.98	0.49
1163	42.15	33.74	2.04	0.50
1164	41.09	34.17	2.09	0.51
1165	39.30	34.49	2.14	0.52
1166	37.94	34.72	2.16	0.52
1167	36.76	34.86	2.18	0.53
1168	35.49	34.93	2.19	0.53
1169	34.12	34.92	2.19	0.53
1170	32.59	34.84	2.18	0.53
1171	30.87	34.67	2.16	0.52
1172	28.87	34.41	2.12	0.52
1173	26.44	34.04	2.08	0.51
1174	22.36	33.52	2.01	0.49
1175	17.00	32.72	1.92	0.48
1176	13.18	31.68	1.80	0.45
1177	11.45	30.53	1.68	0.43
1178	10.54	29.38	1.55	0.40
1179	9.85	28.14	1.42	0.38
1180	9.30	26.88	1.31	0.35
1181	8.84	25.67	1.19	0.33
1182	8.46	24.51	1.08	0.30

10-yr.rot

1183	8.09	23.06	0.98	0.28
1184	7.72	20.47	0.89	0.26
1185	7.38	18.27	0.81	0.25
1186	7.07	16.38	0.75	0.23
1187	6.80	14.77	0.69	0.22
1188	6.55	13.38	0.64	0.21
1189	6.33	12.20	0.60	0.20
1190	6.13	11.18	0.57	0.20
1191	5.93	10.30	0.54	0.19
1192	5.75	9.54	0.51	0.18
1193	5.58	9.10	0.49	0.18
1194	5.43	8.85	0.48	0.17
1195	5.28	8.62	0.47	0.17
1196	5.15	8.39	0.45	0.16
1197	5.03	8.16	0.44	0.16
1198	4.91	7.94	0.43	0.16
1199	4.80	7.73	0.42	0.15
1200	4.69	7.53	0.41	0.15
1201	4.59	7.34	0.40	0.14
1202	4.50	7.15	0.39	0.14
1203	4.41	6.96	0.38	0.14
1204	4.32	6.79	0.37	0.13
1205	4.23	6.61	0.36	0.13
1206	4.16	6.45	0.35	0.13
1207	4.08	6.29	0.34	0.12
1208	4.01	6.14	0.33	0.12
1209	3.94	5.99	0.32	0.12
1210	3.87	5.85	0.32	0.11
1211	3.81	5.71	0.31	0.11
1212	3.75	5.58	0.30	0.11
1213	3.69	5.45	0.29	0.11
1214	3.63	5.33	0.29	0.10
1215	3.58	5.22	0.28	0.10
1216	3.52	5.10	0.28	0.10
1217	3.47	4.99	0.27	0.10
1218	3.42	4.89	0.26	0.10
1219	3.37	4.79	0.26	0.09
1220	3.31	4.69	0.25	0.09
1221	3.25	4.59	0.25	0.09
1222	3.18	4.50	0.24	0.09
1223	3.12	4.41	0.24	0.09
1224	3.06	4.32	0.23	0.08
1225	3.00	4.23	0.23	0.08
1226	2.95	4.14	0.22	0.08
1227	2.89	4.06	0.22	0.08
1228	2.84	3.98	0.22	0.08
1229	2.79	3.90	0.21	0.08
1230	2.73	3.82	0.21	0.07
1231	2.68	3.75	0.20	0.07
1232	2.64	3.67	0.20	0.07
1233	2.59	3.60	0.19	0.07
1234	2.55	3.53	0.19	0.07
1235	2.50	3.46	0.19	0.07
1236	2.46	3.40	0.18	0.07
1237	2.42	3.33	0.18	0.07
1238	2.38	3.27	0.18	0.06
1239	2.34	3.21	0.17	0.06
1240	2.30	3.14	0.17	0.06
1241	2.26	3.09	0.17	0.06
1242	2.23	3.03	0.16	0.06
1243	2.19	2.97	0.16	0.06
1244	2.16	2.92	0.16	0.06
1245	2.12	2.87	0.15	0.06
1246	2.09	2.81	0.15	0.06
1247	2.06	2.76	0.15	0.05
1248	2.03	2.72	0.15	0.05
1249	2.00	2.67	0.14	0.05
1250	1.98	2.62	0.14	0.05
1251	1.95	2.58	0.14	0.05
1252	1.92	2.53	0.14	0.05
1253	1.89	2.49	0.13	0.05
1254	1.86	2.45	0.13	0.05
1255	1.84	2.41	0.13	0.05
1256	1.81	2.37	0.13	0.05
1257	1.79	2.33	0.13	0.05
1258	1.76	2.29	0.12	0.04
1259	1.74	2.26	0.12	0.04
1260	1.72	2.22	0.12	0.04
1261	1.69	2.18	0.12	0.04
1262	1.67	2.15	0.12	0.04
1263	1.65	2.12	0.11	0.04
1264	1.63	2.08	0.11	0.04
1265	1.61	2.05	0.11	0.04
1266	1.59	2.02	0.11	0.04
1267	1.57	1.99	0.11	0.04
1268	1.55	1.96	0.11	0.04
1269	1.53	1.93	0.10	0.04
1270	1.51	1.90	0.10	0.04
1271	1.49	1.88	0.10	0.04
1272	1.47	1.85	0.10	0.04
1273	1.45	1.82	0.10	0.04
1274	1.44	1.80	0.10	0.04
1275	1.42	1.77	0.10	0.03
1276	1.40	1.75	0.09	0.03
1277	1.38	1.72	0.09	0.03
1278	1.37	1.70	0.09	0.03

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1279	1.35	1.68	0.09	0.03
1280	1.34	1.65	0.09	0.03
1281	1.32	1.63	0.09	0.03
1282	1.31	1.61	0.09	0.03
1283	1.29	1.59	0.09	0.03
1284	1.28	1.57	0.08	0.03
1285	1.26	1.55	0.08	0.03
1286	1.25	1.53	0.08	0.03
1287	1.23	1.51	0.08	0.03
1288	1.22	1.49	0.08	0.03
1289	1.21	1.47	0.08	0.03
1290	1.19	1.45	0.08	0.03
1291	1.18	1.43	0.08	0.03
1292	1.17	1.42	0.08	0.03
1293	1.15	1.40	0.08	0.03
1294	1.14	1.38	0.07	0.03
1295	1.13	1.36	0.07	0.03
1296	1.12	1.35	0.07	0.03
1297	1.11	1.33	0.07	0.03
1298	1.09	1.32	0.07	0.03
1299	1.08	1.30	0.07	0.03
1300	1.07	1.29	0.07	0.03
1310	0.97	1.15	0.06	0.02
1320	0.88	1.03	0.06	0.02
1330	0.80	0.94	0.05	0.02
1340	0.74	0.85	0.05	0.02
1350	0.67	0.77	0.04	0.02
1360	0.62	0.71	0.04	0.01
1370	0.57	0.65	0.04	0.01
1380	0.53	0.60	0.03	0.01
1390	0.50	0.55	0.03	0.01
1400	0.49	0.53	0.03	0.01
1420	0.47	0.49	0.03	0.01
1440	0.46	0.47	0.03	0.01

Appendix B-3:

StormTech System Storage

Project:

Chamber Model -
Units -
Number of Chambers -
Number of End Caps -
Voids in the stone (porosity) -
Base of STONE Elevation -
Amount of Stone Above Chambers -
Amount of Stone Below Chambers -

MC-4500
Imperial
280
12
40
-0.75
12
9

[Click Here for Metric](#)

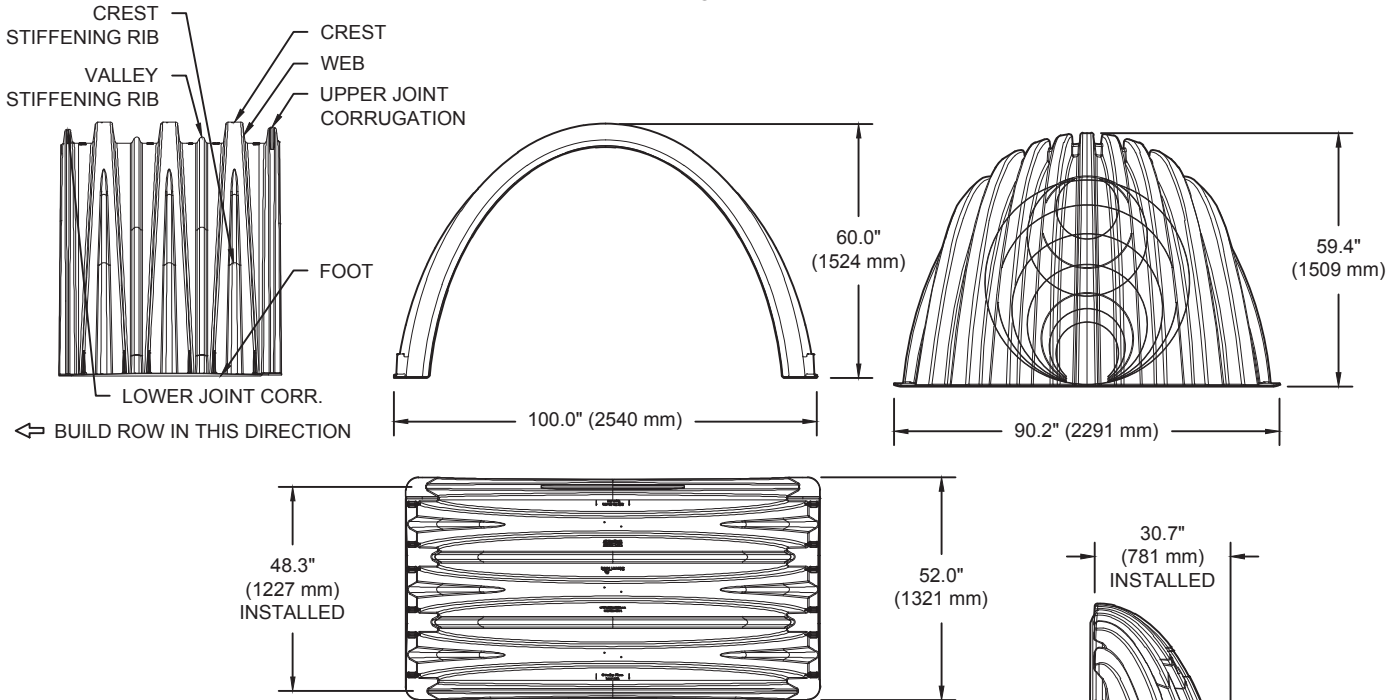


☐ Include Perimeter Stone in Calculations

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch. EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
81	0.00	0.00	0.00	0.00	354.15	354.15	46835.96	6.00
80	0.00	0.00	0.00	0.00	354.15	354.15	46481.81	5.92
79	0.00	0.00	0.00	0.00	354.15	354.15	46127.67	5.83
78	0.00	0.00	0.00	0.00	354.15	354.15	45773.52	5.75
77	0.00	0.00	0.00	0.00	354.15	354.15	45419.38	5.67
76	0.00	0.00	0.00	0.00	354.15	354.15	45065.23	5.58
75	0.00	0.00	0.00	0.00	354.15	354.15	44711.09	5.50
74	0.00	0.00	0.00	0.00	354.15	354.15	44356.94	5.42
73	0.00	0.00	0.00	0.00	354.15	354.15	44002.80	5.33
72	0.00	0.00	0.00	0.00	354.15	354.15	43648.65	5.25
71	0.00	0.00	0.00	0.00	354.15	354.15	43294.51	5.17
70	0.00	0.00	0.00	0.00	354.15	354.15	42940.36	5.08
69	0.04	0.00	11.47	0.00	349.56	361.03	42586.22	5.00
68	0.12	0.01	32.51	0.12	341.09	373.72	42232.19	4.92
67	0.16	0.03	46.13	0.32	335.57	382.01	41851.47	4.83
66	0.21	0.05	58.44	0.57	330.54	389.55	41469.46	4.75
65	0.27	0.07	75.14	0.81	323.77	399.71	41079.90	4.67
64	0.45	0.09	126.78	1.05	303.01	430.85	40680.19	4.58
63	0.67	0.11	186.27	1.36	279.09	466.72	40249.35	4.50
62	0.80	0.14	223.72	1.70	263.98	489.40	39782.62	4.42
61	0.91	0.17	254.28	2.01	251.63	507.92	39293.23	4.33
60	1.00	0.19	280.81	2.30	240.90	524.01	38785.31	4.25
59	1.09	0.22	304.45	2.58	231.33	538.37	38261.30	4.17
58	1.16	0.24	325.77	2.90	222.68	551.35	37722.93	4.08
57	1.23	0.27	345.52	3.24	214.64	563.40	37171.58	4.00
56	1.30	0.30	363.91	3.57	207.15	574.63	36608.18	3.92
55	1.36	0.32	381.09	3.88	200.16	585.13	36033.54	3.83
54	1.42	0.35	397.24	4.17	193.58	594.99	35448.42	3.75
53	1.47	0.37	412.53	4.45	187.35	604.34	34853.42	3.67
52	1.53	0.39	427.04	4.73	181.44	613.21	34249.09	3.58
51	1.57	0.42	440.86	5.01	175.80	621.66	33635.88	3.50
50	1.62	0.44	453.99	5.28	170.44	629.71	33014.22	3.42
49	1.67	0.46	466.54	5.55	165.31	637.40	32384.51	3.33
48	1.71	0.48	478.55	5.81	160.40	644.76	31747.11	3.25
47	1.75	0.50	490.02	6.06	155.71	651.80	31102.35	3.17
46	1.79	0.53	501.00	6.30	151.22	658.53	30450.55	3.08
45	1.83	0.55	511.61	6.54	146.88	665.04	29792.02	3.00
44	1.86	0.56	521.76	6.77	142.73	671.27	29126.98	2.92
43	1.90	0.58	531.53	7.00	138.73	677.26	28455.72	2.83
42	1.93	0.60	540.91	7.22	134.89	683.03	27778.45	2.75
41	1.96	0.62	549.94	7.44	131.19	688.57	27095.43	2.67
40	2.00	0.64	558.63	7.66	127.63	693.92	26406.85	2.58
39	2.03	0.66	567.00	7.87	124.20	699.07	25712.94	2.50
38	2.05	0.67	575.06	8.08	120.89	704.03	25013.87	2.42
37	2.08	0.69	582.82	8.28	117.70	708.81	24309.84	2.33
36	2.11	0.71	590.26	8.49	114.65	713.39	23601.03	2.25
35	2.13	0.72	597.48	8.69	111.68	717.84	22887.64	2.17
34	2.16	0.74	604.43	8.88	108.82	722.13	22169.80	2.08
33	2.18	0.76	611.11	9.07	106.07	726.25	21447.66	2.00
32	2.21	0.77	617.55	9.26	103.42	730.23	20721.41	1.92
31	2.23	0.79	623.74	9.44	100.87	734.06	19991.18	1.83
30	2.25	0.80	629.68	9.62	98.42	737.73	19257.12	1.75
29	2.27	0.82	635.42	9.85	96.04	741.30	18519.40	1.67
28	2.29	0.84	640.92	10.09	93.74	744.75	17778.09	1.58
27	2.31	0.85	646.20	10.15	91.61	747.95	17033.34	1.50
26	2.33	0.86	651.27	10.30	89.52	751.09	16285.39	1.42
25	2.34	0.87	656.12	10.46	87.51	754.10	15534.30	1.33
24	2.36	0.89	660.77	10.62	85.59	756.98	14780.20	1.25
23	2.38	0.90	665.22	10.78	83.75	759.74	14023.22	1.17
22	2.39	0.91	669.47	10.92	81.99	762.38	13263.48	1.08
21	2.41	0.92	673.53	11.07	80.31	764.90	12501.09	1.00
20	2.42	0.93	677.39	11.21	78.70	767.31	11736.19	0.92
19	2.43	0.95	681.07	11.35	77.18	769.59	10968.88	0.83
18	2.44	0.96	684.55	11.48	75.73	771.77	10199.29	0.75
17	2.46	0.97	687.86	11.61	74.36	773.83	9427.52	0.67
16	2.47	0.98	690.98	11.73	73.06	775.77	8653.70	0.58
15	2.48	0.99	693.92	11.85	71.84	777.61	7877.92	0.50
14	2.49	1.00	696.71	11.97	70.67	779.35	7100.32	0.42
13	2.50	1.01	699.35	12.08	69.57	781.01	6320.96	0.33
12	2.51	1.02	701.82	12.19	68.54	782.55	5539.95	0.25
11	2.51	1.02	704.12	12.29	67.58	783.99	4757.40	0.17
10	2.53	1.03	707.54	12.39	66.17	786.10	3973.41	0.08
9	0.00	0.00	0.00	0.00	354.15	354.15	3187.31	0.00
8	0.00	0.00	0.00	0.00	354.15	354.15	2833.16	-0.08
7	0.00	0.00	0.00	0.00	354.15	354.15	2479.02	-0.17
6	0.00	0.00	0.00	0.00	354.15	354.15	2124.87	-0.25
5	0.00	0.00	0.00	0.00	354.15	354.15	1770.73	-0.33
4	0.00	0.00	0.00	0.00	354.15	354.15	1416.58	-0.42
3	0.00	0.00	0.00	0.00	354.15	354.15	1062.44	-0.50
2	0.00	0.00	0.00	0.00	354.15	354.15	708.29	-0.58
1	0.00	0.00	0.00	0.00	354.15	354.15	354.15	-0.67

MC-4500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0\" X 60.0\" X 48.3\"	(2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET	(3.01 m³)
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET	(4.60 m³)
WEIGHT	130.0 lbs.	(59.0 kg)

NOMINAL END CAP SPECIFICATIONS

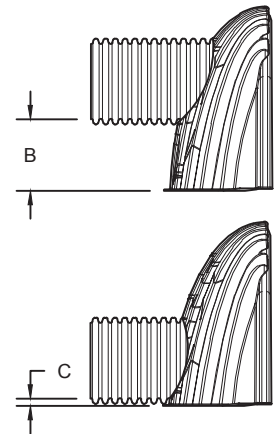
SIZE (W X H X INSTALLED LENGTH)	90.2\" X 59.4\" X 30.7\"	(2291 mm X 1509 mm X 781 mm)
END CAP STORAGE	35.7 CUBIC FEET	(1.01 m³)
MINIMUM INSTALLED STORAGE*	108.7 CUBIC FEET	(3.08 m³)
WEIGHT	135.0 lbs.	(61.2 kg)

*ASSUMES 12\" (305 mm) STONE ABOVE, 9\" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12\" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
 STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
 END CAPS WITH A WELDED CROWN PLATE END WITH "C"
 END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

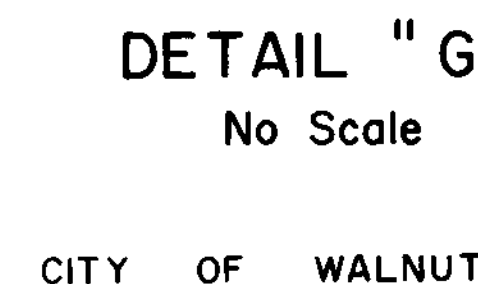
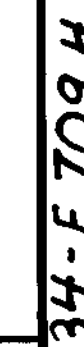
PART #	STUB	B	C
MC4500REPE06T	6\" (150 mm)	42.54\" (1.081 m)	---
MC4500REPE06B		---	0.86\" (22 mm)
MC4500REPE08T	8\" (200 mm)	40.50\" (1.029 m)	---
MC4500REPE08B		---	1.01\" (26 mm)
MC4500REPE10T	10\" (250 mm)	38.37\" (975 mm)	---
MC4500REPE10B		---	1.33\" (34 mm)
MC4500REPE12T	12\" (300 mm)	35.69\" (907 mm)	---
MC4500REPE12B		---	1.55\" (39 mm)
MC4500REPE15T	15\" (375 mm)	32.72\" (831 mm)	---
MC4500REPE15B		---	1.70\" (43 mm)
MC4500REPE18TC	18\" (450 mm)	29.36\" (746 mm)	---
MC4500REPE18TW		---	1.97\" (50 mm)
MC4500REPE18BC		---	---
MC4500REPE18BW	24\" (600 mm)	23.05\" (585 mm)	---
MC4500REPE24TC		---	2.26\" (57 mm)
MC4500REPE24TW		---	---
MC4500REPE24BC		---	---
MC4500REPE24BW	30\" (750 mm)	---	2.95\" (75 mm)
MC4500REPE30BC	36\" (900 mm)	---	3.25\" (83 mm)
MC4500REPE36BC	42\" (1050 mm)	---	3.55\" (90 mm)
MC4500REPE42BC			

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24\" (300-600 mm) SIZE ON SIZE AND 15-48\" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10\" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

Appendix C:
East Valley Boulevard Existing Storm
Drain Plans

HERCULENE® LA 4335
GRAFTING FILM

PF556568

AS BUILT PLANS R.D.D. 25

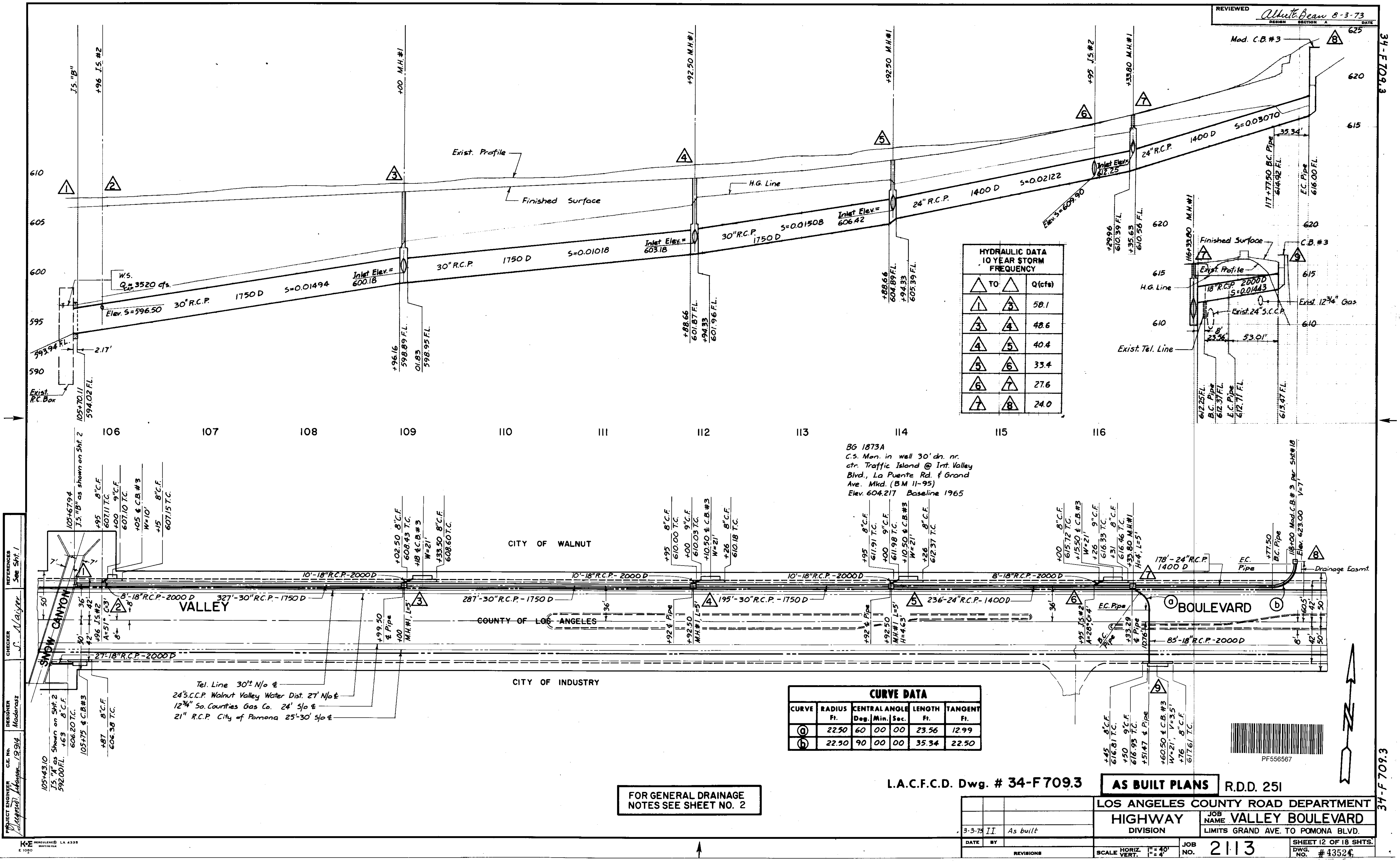
JOB NAME VALLEY BOULEVARD

LIMITS GRAND AVE. TO POMONA BLVD.

SHEET 13 OF 18 SH

DWG. 42525

NO. # 45540,



HYDRAULIC DATA 10 YEAR STORM FREQUENCY		
TO	Q (cfs)	
1	58.1	
3	48.6	
4	40.4	
5	33.4	
6	27.6	
7	24.0	

CURVE DATA				
CURVE	RADIUS Ft.	CENTRAL ANGLE Deg. Min. Sec.	LENGTH Ft.	TANGENT Ft.
(a)	22.50	60 00 00	23.56	12.99
(b)	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

LOS ANGELES COUNTY ROAD DEPARTMENT
HIGHWAY VALLEY BOULEVARD
DIVISION 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
DESIGNER
CHECKER
REFERENCES
See Sht. 1

LA 4335
10500

Appendix D:
Los Angeles County Allowable Q



**LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
DESIGN DIVISION – HYDRAULIC ANALYSIS UNIT**

Office Use Only	
☐ Sent	Initials: _____
☐ Fax ☐ Email ☐ Other:	_____
Date: _____	Time: _____

INFORMATION REQUEST SUMMARY

INFORMATION REQUESTED BY

*Requester's Name: Bitu Sadri
Company: Michael Baker International
*Phone Number: 949-330-4147 Fax Number: _____
*Email: bitu.sadri@mbakerintl.com

Method of Contact: ☐ Walk-in ☐ Phone ☐ Fax ☒ Email ☐ Prelim. Mtg. Date: 7/2/2018

Intended Use: Drainage Study

Proposed Project Type: Tentative Tract Map 78210 Acreage Involved: _____

*Will information be used in any litigation? ☐ YES ☒ NO
Case Info. Name: _____ No: _____ Location: _____

INFORMATION REQUESTED (Attach Assessor Map)

LACFCD Facility: Name: RDD 0251
Unit: _____ Line: _____ Station: 118+00
City: Walnut

*Street/Cross-street: Valley Blvd

*Thomas Guide: Page: 639 Grid: J5 & J6 ☐ Site Map/Plans Submitted

Info. Requested: Allowable "Q" per acre for Node 200 and 300
DWG #43524
34-F709.3

*Required Information. See Page 2 of 2 for Instructions.

BELOW SECTION TO BE COMPLETED BY THE HYDRAULIC ANALYSIS UNIT

INFORMATION PROVIDED:

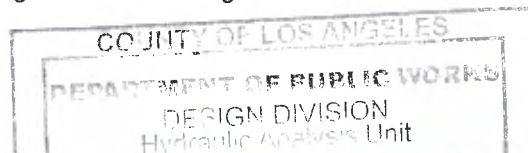
Allowable Discharge Flow into RDD 251

REFERENCES SEARCHED:

VALLEY BOULEVARD RDD251 Files 34-F709.3 & 34-F709.4, AND SAN JOSE CREEK

COMMENTS, ETC:

- 1- Allowable Discharge flow into existing RDD251 which is shown on DWG. NO. 43524 is 1.35cfs/acre.
- 2- Allowable Discharge flow into existing RDD251 which is shown on DWG. NO. 43525 is 1.12cfs/acre.



INFORMATION PROVIDED BY: George K. Smith

Date: 7/12/2018

INFORMATION REVIEWED BY: _____

Date: _____

Print

Save a Copy



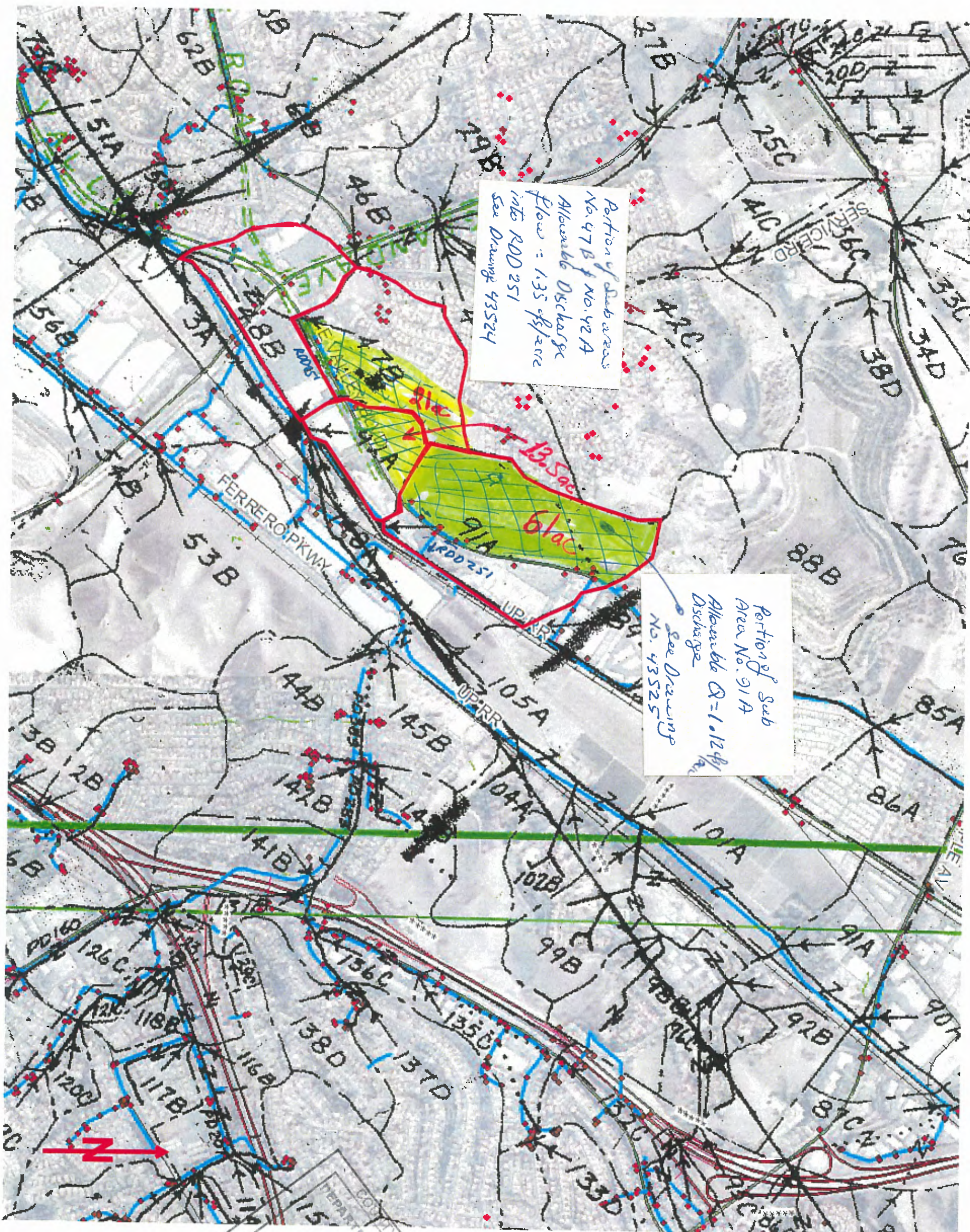
**LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
DESIGN DIVISION – HYDRAULIC ANALYSIS UNIT**

INFORMATION REQUEST INSTRUCTIONS

SUBMIT THE FOLLOWING WITH YOUR APPLICATION:

1. Please fill out the Information Request Form in Adobe Acrobat Reader. The fields marked with asterisk are required. At the bottom are buttons that you may use to Save and/or Print the form. Please save the form to your computer, and email it as an attachment with "Information Request" in the subject line along with any files pertaining to the request as describe in item 2 - 4 below. Address the email to Mr. Ambrose Ajaelo at aaajaelo@dpw.lacounty.gov. Please note that an incomplete form will cause a delay in processing.
2. Include an as-built drawing of the drain you plan to connect to, and indicate the station or catch basin you plan to connect to. This as-built drawing can be obtained from the following website: <http://dpw.lacounty.gov/des/plans/>. Please make sure that you select the drainage tab when you get on this site.
3. Shade the area you plan to develop, including any offsite water draining into this area, and attach it with your package. You can obtain the assessor's map from <http://assessor.lacounty.gov/>. Any other kind of map (e.g. google) is unacceptable.
4. In addition, submit any preliminary sketch or plan showing the work you propose in the areas you indicated on the assessors map.

If you have any questions, contact Mr. Ambrose Ajaelo via email aaajaelo@dpw.lacounty.gov or phone (626) 458-7860.



Portion of Sub areas
No. 47B & No. 42A
Allowable Discharge
Flow = 1.35 cfs/acre
into RPD 251
See Drawing 43524

Portion of Sub
Area No. 91A
Allowable Q = 1.12 cfs/acre
Discharge
See Drawing
No. 43525

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
DESIGN DIVISION
Hydraulic Analysis Unit
OFFICIAL
RECORD DOCUMENT
Issued By: *GokA*
Date: *7/12/2012*
Public Service That Works