PRELIMINARY HYDROLOGY STUDY
VTTM No. 82667
Rosecrans and Van Ness
2129 Rosecrans Avenue
Gardena , CA 90249

Project Address:

2129 Rosecrans Ave.
Gardena , CA 90249

Prepared For:

G3 Urban
Attn: Mitchell Gardner
15235 S Western Ave.
Gardena, CA 90249
(213) 400-5358

Prepared By:

C&V Consulting Inc.
6 Orchard, Suite 200
Lake Forest, CA 92630
Ryan J. Bittner, P.E.
Contact: Marco Midence,
Project Manager
(949) 916-3800

November 2019

TABLE OF CONTENTS

Preliminary Hydrology Study
for
Vesting Tentative Tract Map No. 82667
Gardena 40

ACKNOWLEDGEMENT AND SIGNATURE PAGE

This Preliminary Hydrology Study was prepared by C&V Consulting, Inc. under the supervision of Ryan J. Bittner, P.E.

_____ _____

Ryan J. Bittner, R.C.E. 68167 Date
CEO, C&V Consulting, Inc.

1.0 SITE DESCRIPTION:

The proposed development encompasses three parcels as shown on the Assessor's Parcel map, last updated in 2002, at approximately 5.466 acres. The project is bounded by U-Haul Moving & Storage of Gardena building to the West, Rosecrans Avenue to the South, Saf Keep Storage building to the East, and Real Soda in Real Bottles Ltd. building to the North. Additionally, there is an automotive repair shop along the southwestern corner of the site and a taxicab depot currently occupies the northern half of the site.

2.0 PURPOSE OF STUDY:

The preliminary hydrology study will determine the amount of stormwater runoff generated from the project site in the existing and proposed conditions. This study will anticipate whether detention or other peak flow mitigation methods will be required by comparing the proposed and existing condition peak flow rates for the 25, 50 and 100-year storm events.

3.0 EXISTING CONDITIONS:

In its current condition the site generally slopes from east to west and north to south towards Rosecrans Ave. The site ranges in elevations from 48 to 53 feet above sea level, based on the aerial flown on 1/21/2019.

The site is generally split into two different drainage areas. The southeastern quarter of the site is a vacant dirt lot. The existing drainage pattern of this portion of the site is sheet flow over the vacant land. In the northern portion that contains the existing taxicab depot, the existing drainage system appears to convey stormwater to the South via V-gutters. These V-gutters appear to drain to a grate drop inlet which drains into the street gutter through 3 curb cores at the southern end of the site near Rosecrans Ave.

Off-site flows from the east are mitigated by the existing Saf Keep storage building and screen wall along the site's eastern property line. There is also evidence on existing onsite stormwater mitigation controls on the Saf Keep storage facility in the from of v-gutters and grate inlet catch basins. Flows from the Real Soda in Real Bottle Ltd. site to the north are intercepted by a corrugated metal fence along the project site's northern property line. The northern property line represents a high point in that stormwater north of the property line will flow north into the existing v-gutter on the Real Soda in Real Bottles Ltd. site. The U-haul Moving & Storage to the west also has on-site stormwater mitigation controls in the form of v-gutters and grate inlet catch basins. Just as in the north, there is a corrugated metal fence that reaches to grade level to intercept any off-site seepage. Any nuisance water that flows towards our site is intercepted by the corrugated metal fence and sheet flows south, following the slope of the adjacent property. The southwestern portion of the site has an existing structure to prevent off-site flows from entering the site.

Flows from the site onto Rosecrans Ave. then proceed west into a County of Los Angeles owned and maintained catch basin located approximately 250 feet west of the project site along Rosecrans Ave. From this catch basin, the runoff then enters a Los Angeles County Flood Control District owned 9'-

6” x 7’-0” RCP storm system known as Project No. 11, per LACFCD As-Built No. 181-11-D1.4, which continues along Rosecrans Ave. This storm drain system ultimately outlets onto the Dominguez Channel a Los Angeles County Flood Control Facility. The Dominguez Channel then proceeds in a south westerly direction and eventually outlets into the Dominguez Channel Estuary and the Pacific Ocean.

The topographic survey was utilized to identify existing onsite high points and overall site conveyance of storm water runoff. Since all of the existing onsite stormwater runoff ultimately reaches the grate drain in the southern portion of the site, the entire site was used to approximately quantify the runoff based on the longest hydraulic path from the most remote high point to drain inlet low point.

Refer to the “Existing Conditions Hydrology Map” located within Appendix A of this study for more information.

4.0 PROPOSED CONDITIONS:

The proposed project consists of 50 residential townhome units, 41 single family dwellings, 14 live-work townhomes, and a retail building over approximately 5.47 acres. The proposed development includes drive aisles, parking, landscaping, walkways, patios, and common open space areas. The site will be graded to collect runoff at three low points to control the amount of imported fill during grading and reduce the need for retaining walls along the perimeter of the site while closely maintaining the entire site drainage area tributary to the existing Los Angeles County Flood Control District (LACFCD) maintained 9’-6” x 7’-0” RCB storm drain. The proposed grading will also be raising the site in the north, east, and west to ensure the neighboring sites are not tributary to our own. A screen will wall with a subdrain is proposed along the northern, eastern, and western property lines to mitigate any offsite seepage. The proposed development will utilize onsite catch basins, biofiltration systems, and detention pipes to capture and treat stormwater. Stormwater will ultimately be conveyed by a proposed onsite underground storm drain piping system to the LACFCD RCB storm drain located within Rosecrans Ave.

Stormwater runoff will be conveyed via proposed onsite gutter and directed to three sump areas, two equipped with curb inlet catch basins and the other with a grate inlet catch basin. The first curb inlet catch basin, located in area A2 of the post conditions hydrology map, will capture the stormwater from the commercial portion of the site while the other curb inlet catch basin, located in area A1 of the post conditions hydrology map will capture most of the onsite stormwater from the residential portion of the site. The grate inlet catch basin will capture the flow from the alley in area A3 running north-south in the southeastern residential portion of the site. An additional pass-by catch basin will be located near the northern drive aisle in area A1 to capture and treat low-flow stormwater and reduce flows into the residential curb inlet catch basin. All proposed onsite catch basins will be equipped with Modular Wetlands Dvert System to divert low flows to proposed Modular Wetlands System (MWS) Biofiltration Vaults for water quality treatment. These Biofiltration Vaults will be equipped with an internal bypass system to convey larger storm event overflow conditions to on-site detention pipes. During larger storm events, stormwater runoff will be conveyed to the underground detention system where it will be released at the flow rate allowed by LACFCD. The LACFCD has provided an allowable 2-year storm peak runoff rate for discharge to the Channel equal to 0.67 cfs per acre, or 3.66 cfs for the total site drainage area. Any flows in excess will be detained temporarily until they can be

released. Refer to separately prepared Preliminary Grading and Utility Plans for site design information.

In an event where the proposed onsite storm drain system is at its full capacity or clogged, stormwater will pond up at these proposed onsite sump areas and excess stormwater will top over grade break to continue to flow out towards Rosecrans Ave. where it will get intercepted by an offsite City maintained catch basin.

During final engineering, water surface elevation will be analyzed and provided to verify all habitable structures will have at least a 1 foot of freeboard during the 100-year storm event.

The "Proposed Conditions Preliminary Hydrology Map" is included in Appendix A for reference.

5.0 METHODOLOGY:

The site was analyzed using the Los Angeles County Department of Public Works Hydrology Manual 2006. The initial subarea was analyzed for acreage, land-use, soil type, peak flow rate and time of concentration according to the Rational Method described in the manual.

In this preliminary hydrology study, the impervious area percentage values were conservative estimation from the preliminary site design. During final engineering, impervious areas will be calculated in more detail to refine all peak flow rates.

In accordance with the Los Angeles County Department of Public Works Hydrology Manual all habitable structures must have a finished floor elevation to allow 1 ft of freeboard during the 100-year storm event and the drop inlet catch basin and onsite conveyance storm drain pipes will be sized to convey runoff from the 100-year storm event. Catch basin, pipe sizing and 100-year water surface elevation calculations will be provided during final engineering.

Confluence analysis and travel time considerations will be incorporated in the calculations during final engineering to reflect more accurate peak flow rate values.

6.0 RESULTS:

Hydrology Summary

Existing Conditions
Existing Conditions tributary to XA1:
25-year peak storm flow = **9.3527 cfs**
50-year peak storm flow = **11.3511 cfs**
100-year peak storm flow = **13.5784 cfs**
Time of Concertation (Tc) = 9 min

Proposed Conditions
Proposed Conditions tributary to A1:
25-year peak storm flow = **8.1892 cfs**

50-year peak storm flow = **10.0066 cfs**
100-year peak storm flow = **12.1310 cfs**
Tc = 5 min

Proposed Conditions tributary to A2:
25-year peak storm flow = **2.7144 cfs**
50-year peak storm flow = **3.0987 cfs**
100-year peak storm flow = **3.4793 cfs**
Tc = 6 min

Proposed Conditions tributary to A3:
25-year peak storm flow = **1.1112 cfs**
50-year peak storm flow = **1.2689 cfs**
100-year peak storm flow = **1.4249 cfs**
Tc = 5 min

Proposed Conditions Onsite Flow (Total):
Total 25-year peak storm flow = **12.01 cfs**
Total 50-year peak storm flow = **14.37 cfs**
Total 100-year peak storm flow = **17.04 cfs**

Percent Increase:
Δ25-year peak storm flow = 12.01/9.35 = +28.4%
Δ50-year peak storm flow = 14.37/11.35 = +26.7%
Δ100-year peak storm flow = 17.04/13.58 = +25.5%

Note: All time of concentrations indicated above refer to 100-year storm event

Detention Sizing
A Hydrograph was developed based on HydroCalc Program using the proposed conditions 25-year storm event flow rates.

For the purpose of this preliminary study detention volume calculation, post imposed flows for A1, A2, and A3 were added at each time increment (0.2 min) output by HydroCalc to get a total inflow hydrograph. These flows per increment of time were plotted to form a total flow hydrograph. Then, the area under the curve between the Allowable Q of 3.66 cfs and the total peak flows was calculated to determine the amount of detention required. Refer to the Detention Calculator located within Appendix E.

An orifice will be utilized at the downstream end of the proposed onsite private storm drain system to mitigate the increased peak flow rates and increase the overall time of concentration. Orifice calculations will be provided during final engineering.

$\Delta V_{25\text{-}YR}$ = 8,841 cf
BioClean Urbanpond System, Module Storage Capacity (5ft high model) = 298 cf per module;
8,841 cf ÷ 298 cf per module = 30 modules → 30 modules proposed
$V_{Urbanpond}$ = 298 cf per module x 30 Modules = 8,940 cf > $\Delta V_{25\text{-}YR}$ = 8,841 cf ✓

Catch Basin Sizing
Catch basin Sizing will be analyzed for the 100-year storm event peak flow rates and will be provided during final engineering.

Pipe Sizing
Pipe Sizing will be analyzed using WSPG software to verify hydraulic grade line (HGL) based on the 100-year storm event peak flow rates and will be provided during final engineering for proposed onsite conveyance pipe.

A preliminary pipe sizing for offsite runoff conveyance was done using AutoCAD Civil 3D – HydraFlow 2019 and provided in Appendix D of this report.

100-Year Water Surface Elevations
Water surface elevations for the 100-year storm event peak flow rates will verify that the proposed finish floor elevations are set at least 1' above the water surface elevation and will be calculated and provided during final engineering.

7.0 CONCLUSIONS:

The results from this preliminary hydrology study utilizing Los Angeles County Department of Public Works Hydrology Manual 2006 demonstrate that the proposed condition stormwater peak flow for different year storm event frequencies from the subject site will increase compared to the existing condition peak flow as indicated in the hydrology summary results in Section 6 of this report. This is mainly due to the increased change in impervious area based on the type of development is being proposed. This condition represents higher overall peak flow rates. During final engineering, impervious area for proposed conditions will be calculated in more detail based on the finalized landscape plan. The proposed peak flow rates will be re-evaluated to reflect the actual proposed conditions. However, the proposed development will still generate higher peak flows.

Since the development proposes onsite stormwater to be discharged to a LACFCD storm drain system, onsite detention will be required based on the results of this study and the proposed condition peak flow rate will need to be mitigated to match the allowable flow given by LACFCD by utilizing an orifice control plate at the downstream to reduce the peak outflow. This information will be provided during final engineering.

Stormwater generated from 85th percentile storm water depth will be treated onsite via proposed onsite MWS Biofiltration vaults prior to discharging to public onsite storm drain system. Refer to the separately prepared LID report for more details about water quality management.

8.0 DESIGN ASSUMPTIONS:

1. The property is located in the City of Gardena, Orange County rainfall region.

2. 100-year storm event flood level protection analysis required for habitable structures per the requirements of the Los Angeles County Department of Public Works Hydrology Manual

3. Detention and orifice control are required for the storm drain system to mitigate proposed conditions peak flow rate and time of concertation per the requirements required by the Los Angeles Department of Public Works to mitigate increased proposed peak flow rates. The allowable discharge rate (allowable Q) given by LADPW is 0.67 cfs/ac.

4. According to the Los Angeles County Department of Public Works Hydrology Manual 50-Year 24-Hour Isohyet Map 1-H1.8, the drainage area is located in Soil Group 009, the site receives 5.5 inches of rainfall over a 24-Hr storm (Q_{50}).

5. The LACDPW HydroCalc was utilized to determine the time of concentration, run-off flow rate and run-off volume for site.

6. The site was analyzed for a 25, 50 and 100-year storm events per the requirements of the January 2006 Los Angeles County Department of Public Works Hydrology Manual. The Rational Method Analysis was performed, and the appropriate calculations are provided herein.

9.0 REFERENCES:

1. Los Angeles County Department of Public Works, "Hydrology Manual", January 2006.

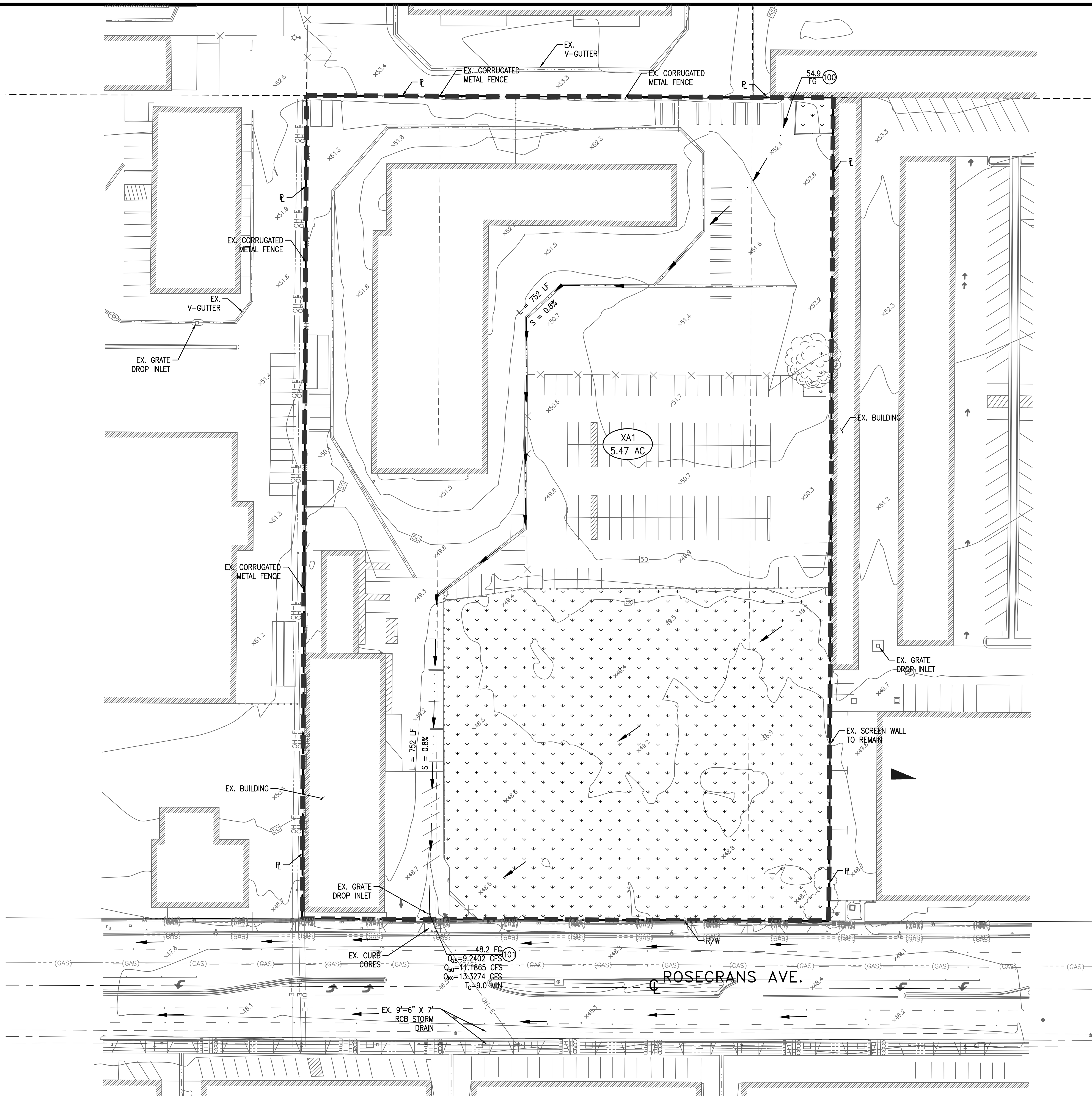
2. Los Angeles County Department of Public Works, "HydroCalc" Outputs and Data

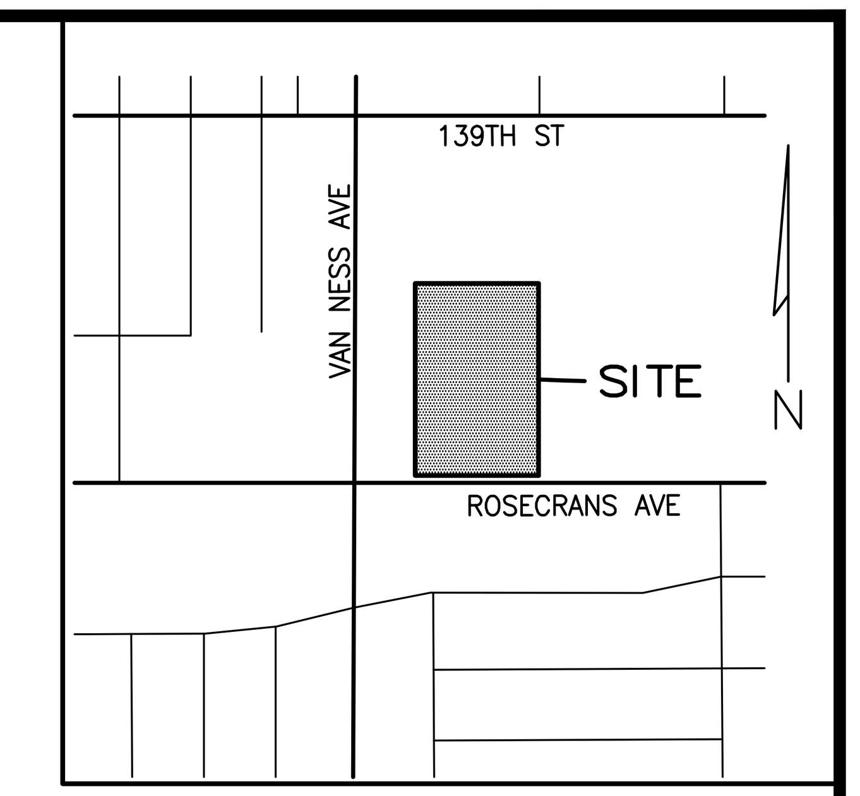
3. Hydraflow Express Extensions for Civil 3D 2013.

4. Preliminary Grading & Drainage Plan for this project by C&V Consulting, Inc. November 2019

APPENDIX A
HYDROLOGY MAPS

Existing Conditions Preliminary Hydrology Map





VICINITY MAP

N.T.S.

Pre-Developed Hydroligic Summary								
Area ID	Total Area (AC)	Pervious Area (AC)	Pervious (%)	Impervious Area (AC)	Impervious (%)	Q25 (CFS)	Q50 (CFS)	Q100 (CFS)
XA1	5.47	1.64	0.30	3.83	0.70	9.3527	11.3511	13.5784

LEGEND:

AREA X1	SUB-AREA NUMBER
X.XX Ac	ACREAGE
L=XXX'	FLOW PATH LENGTH
S=X.X'	CHANGE IN ELEVATION ALONG FLOW PATH
▬ ▬ ▬	SUB-AREA BOUNDARY
——·——	FLOW PATH
XXX.X	ELEVATION AT NODE
→	SURFACE FLOW DIRECTION
Q=X.XX CFS	STORM EVENT PEAK FLOW RATE
	PERVIOUS LANDSCAPE

SCALE: 1" = 40'

0 20 40 80

OWNER/DEVELOPER

G3 urban

G3 URBAN
15235 S WESTERN AVE.
GARDENA, CA 90249

PREPARED BY :

C&V CONSULTING, INC.
CIVIL ENGINEERING
LAND PLANNING & SURVEYING
6 ORCHARD, SUITE 200
LAKE FOREST, CALIFORNIA 92630
T. 949.916.3800
F. 949.916.3805
CVC-INC.NET

REGISTERED PROFESSIONAL ENGINEER
RYAN J. BITTNER
No. 68167
CIVIL
STATE OF CALIFORNIA

PRELIMINARY EXISTING CONDITIONS HYDROLOGY MAP
VTTM NO. 82667
2129 ROSECRANS AVENUE
GARDENA, CA 90249

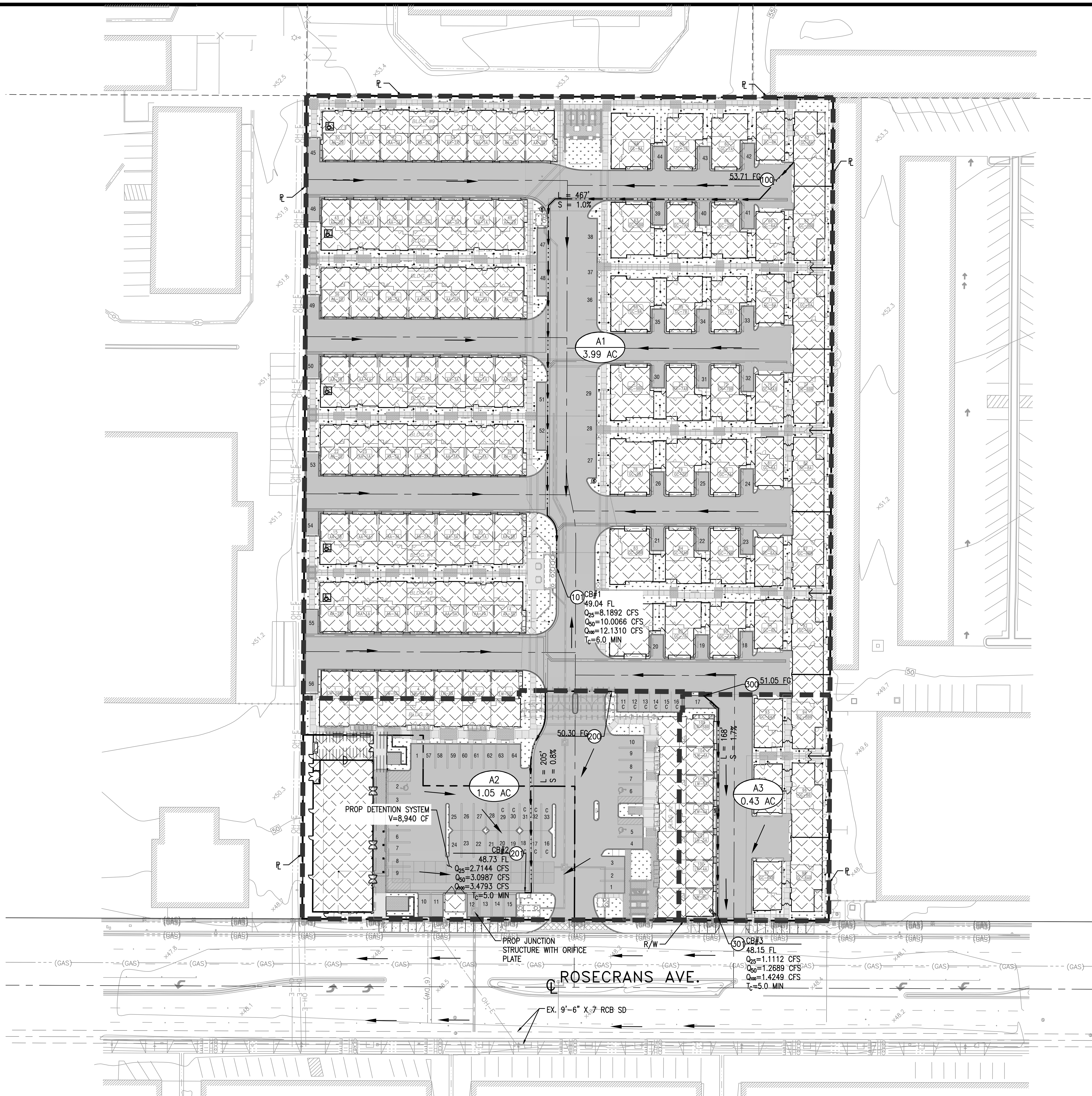
SHEET 1 OF 1

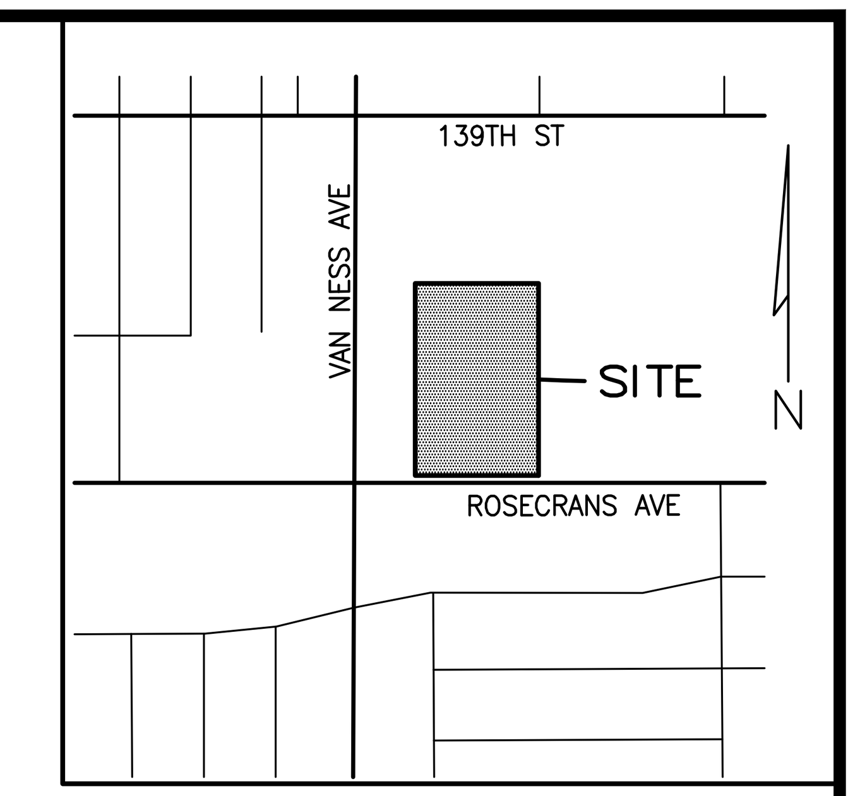
SCALE: AS SHOWN | DRAWN BY: EP | CHECKED BY: MM

CITY OF GARDENA

PLAN SET: PS02
DATE: 11/7/19

Proposed Conditions Preliminary Hydrology Map





VICINITY MAP

N.T.S.

Post-Developed Hydroligic Summary								
Area ID	**Total Area (AC)**	**Pervious Area (AC)**	**Pervious (%)**	**Impervious Area (AC)**	**Impervious (%)**	**Q25 (CFS)**	**Q50 (CFS)**	**Q100 (CFS)**
A1	3.99	0.51	0.13	3.49	0.87	8.1892	10.0066	12.1310
A2	1.05	0.10	0.09	0.95	0.91	2.7144	3.0987	3.4793
A3	0.43	0.04	0.10	0.38	0.90	1.1112	1.2689	1.4249
TOTAL	**5.47**	**0.64**	**0.12**	**4.82**	**0.88**	**12.01**	**14.37**	**17.04**

LEGEND:

AREA X1	SUB-AREA NUMBER
X.XX Ac	ACREAGE
L=XXX'	FLOW PATH LENGTH
S=X.X'	CHANGE IN ELEVATION ALONG FLOW PATH
(dashed heavy line)	SUB-AREA BOUNDARY
(arrow line)	FLOW PATH
XXX.X	ELEVATION AT NODE
(arrow)	SURFACE FLOW DIRECTION
Q=X.XX CFS	STORM EVENT PEAK FLOW RATE
(hatch)	SIDEWALK
(hatch)	STREET
(hatch)	BUILDING ROOF
(hatch)	PERVIOUS LANDSCAPE

SCALE: 1" = 40'

0 20 40 80

OWNER/DEVELOPER

G3 urban

G3 URBAN
15235 S WESTERN AVE.
GARDENA, CA 90249

PREPARED BY :

C&V CONSULTING, INC.
CIVIL ENGINEERING
LAND PLANNING & SURVEYING

6 ORCHARD, SUITE 200
LAKE FOREST, CALIFORNIA 92630
T. 949.916.3800
F. 949.916.3805
CVC-INC.NET

REGISTERED PROFESSIONAL ENGINEER
RYAN J. BITTNER
No. 68167
CIVIL
STATE OF CALIFORNIA

PRELIMINARY PROPOSED CONDITIONS HYDROLOGY MAP
VTTM NO. 82667
2129 ROSECRANS AVENUE
GARDENA, CA 90249

SHEET 1 OF 1

SCALE: AS SHOWN | DRAWN BY: EP | CHECKED BY: MM

CITY OF GARDENA

PLAN SET: PS02
DATE: 11/8/19

P:\G\GTHR-004\DWG\SHEETS_EH\EH-HYDRO-POST.DWG
BY: ERIC PEREZ 11/13/19 11:24 AM

APPENDIX B
HYDROLOGY CALCULATIONS

Existing & Proposed Conditions Hydrology Calculations (25-year Storm Event)

Peak Flow Hydrologic Analysis

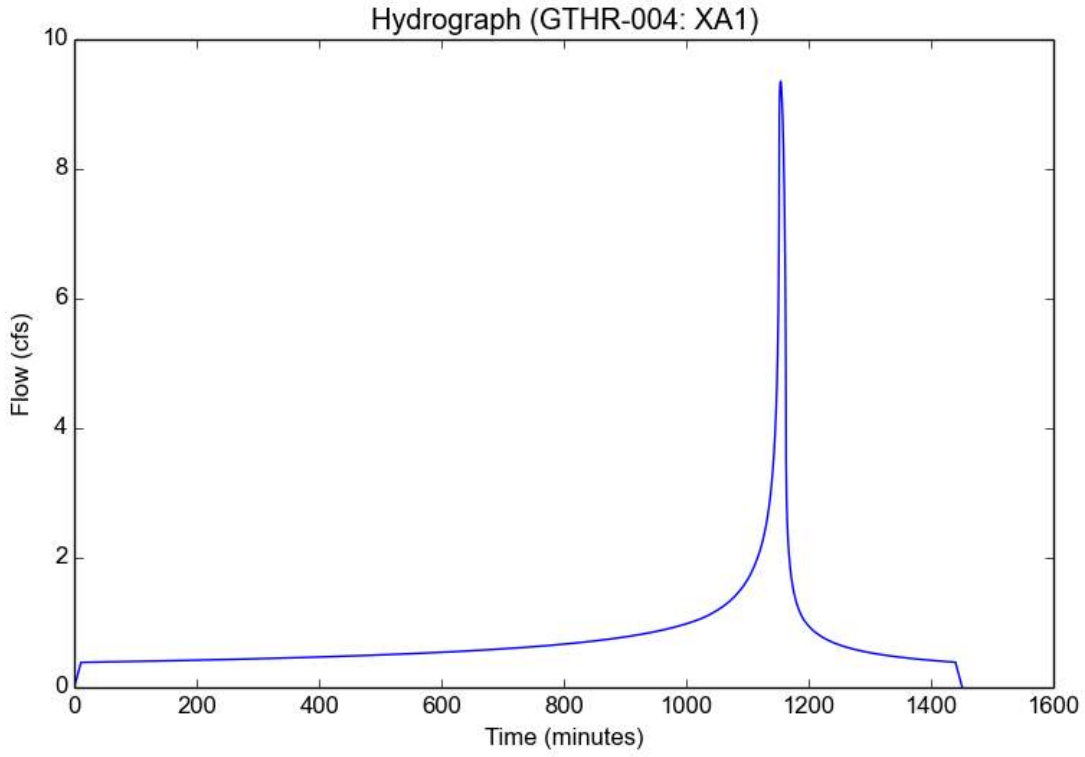
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - XA1, 25yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	XA1
Area (ac)	5.47
Flow Path Length (ft)	752.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.7
Soil Type	9
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	4.829
Peak Intensity (in/hr)	1.9889
Undeveloped Runoff Coefficient (Cu)	0.7655
Developed Runoff Coefficient (Cd)	0.8597
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	9.3527
Burned Peak Flow Rate (cfs)	9.3527
24-Hr Clear Runoff Volume (ac-ft)	1.4968
24-Hr Clear Runoff Volume (cu-ft)	65199.7022



Peak Flow Hydrologic Analysis

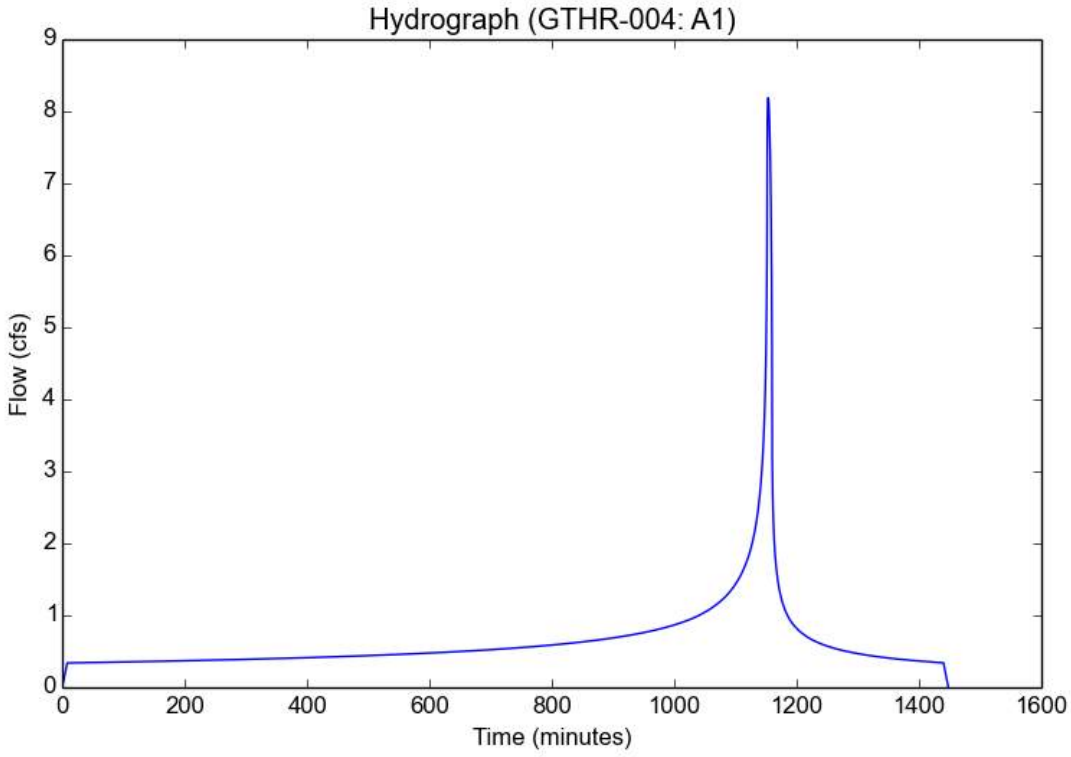
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/PRE-HYDRO/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - A1_25yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	A1
Area (ac)	3.99
Flow Path Length (ft)	467.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.87
Soil Type	9
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	4.829
Peak Intensity (in/hr)	2.3101
Undeveloped Runoff Coefficient (Cu)	0.8113
Developed Runoff Coefficient (Cd)	0.8885
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	8.1892
Burned Peak Flow Rate (cfs)	8.1892
24-Hr Clear Runoff Volume (ac-ft)	1.2854
24-Hr Clear Runoff Volume (cu-ft)	55992.3708



Peak Flow Hydrologic Analysis

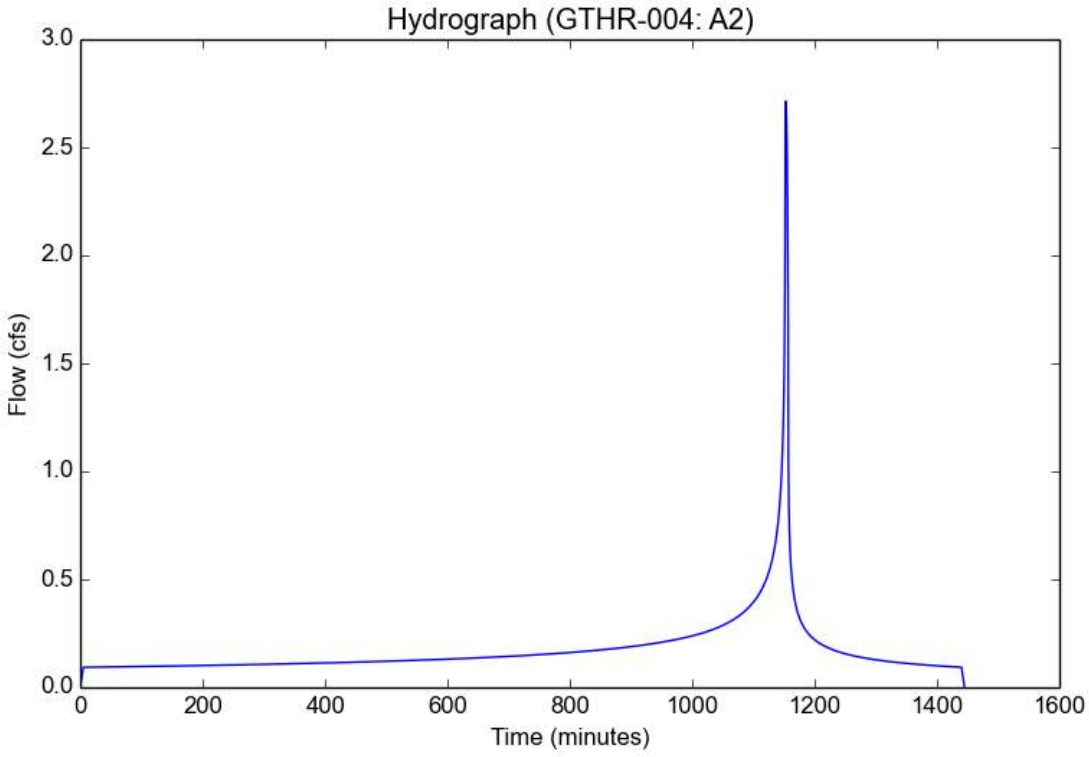
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/PRE-HYDRO/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - A2_25yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	A2
Area (ac)	1.05
Flow Path Length (ft)	205.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.91
Soil Type	9
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	4.829
Peak Intensity (in/hr)	2.8811
Undeveloped Runoff Coefficient (Cu)	0.8697
Developed Runoff Coefficient (Cd)	0.8973
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.7144
Burned Peak Flow Rate (cfs)	2.7144
24-Hr Clear Runoff Volume (ac-ft)	0.3503
24-Hr Clear Runoff Volume (cu-ft)	15257.4394



Peak Flow Hydrologic Analysis

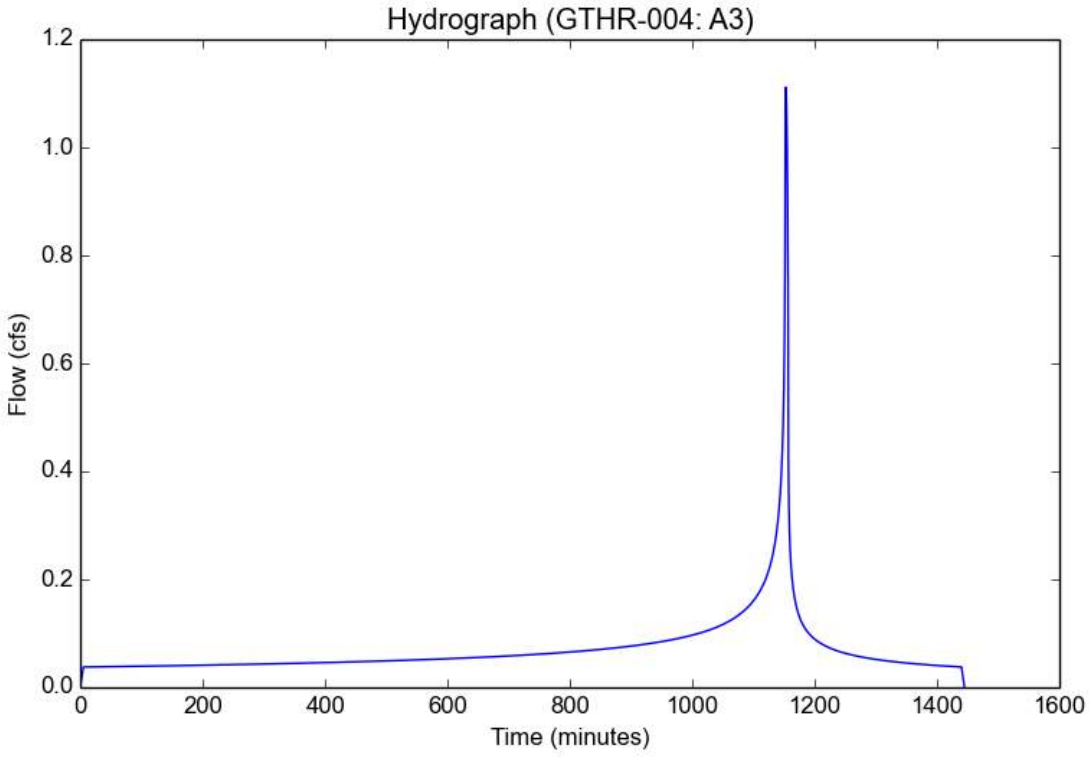
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/PRE-HYDRO/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - A3_25yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	A3
Area (ac)	0.43
Flow Path Length (ft)	168.0
Flow Path Slope (vft/hft)	0.017
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.9
Soil Type	9
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	4.829
Peak Intensity (in/hr)	2.8811
Undeveloped Runoff Coefficient (Cu)	0.8697
Developed Runoff Coefficient (Cd)	0.897
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.1112
Burned Peak Flow Rate (cfs)	1.1112
24-Hr Clear Runoff Volume (ac-ft)	0.1422
24-Hr Clear Runoff Volume (cu-ft)	6195.0091



Existing & Proposed Conditions Hydrology Calculations
(50-year Storm Event)

Peak Flow Hydrologic Analysis

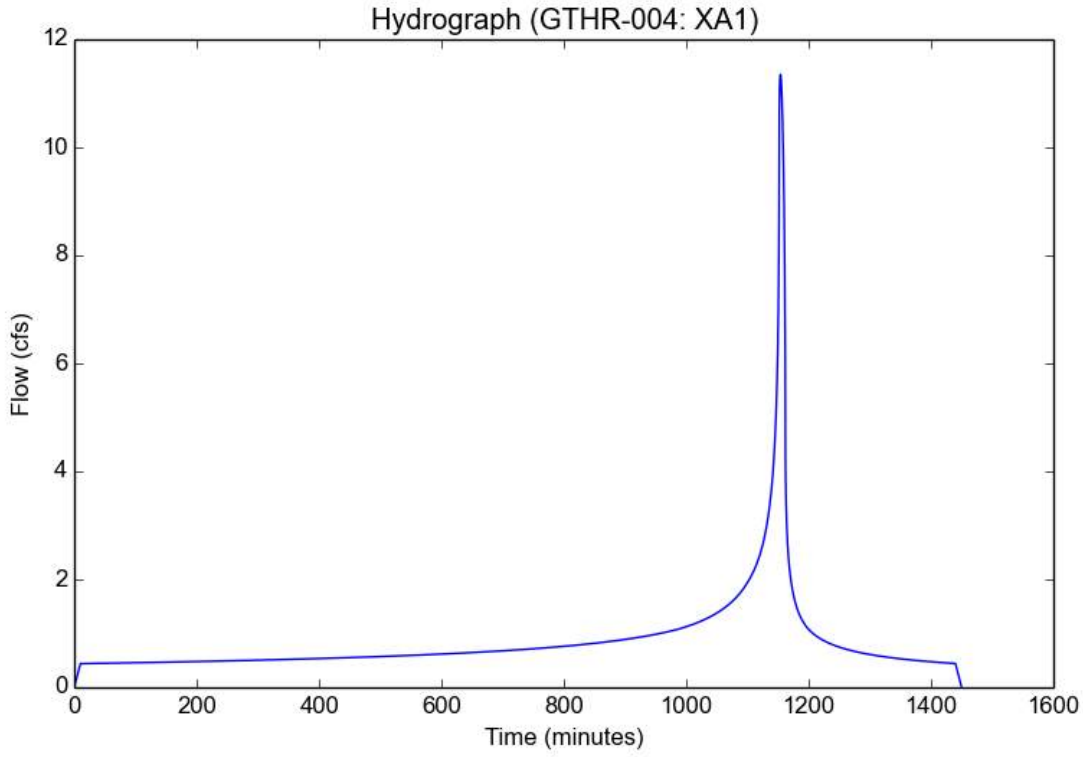
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - XA1, 50yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	XA1
Area (ac)	5.47
Flow Path Length (ft)	752.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.7
Soil Type	9
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.5
Peak Intensity (in/hr)	2.3691
Undeveloped Runoff Coefficient (Cu)	0.8198
Developed Runoff Coefficient (Cd)	0.8759
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	11.3511
Burned Peak Flow Rate (cfs)	11.3511
24-Hr Clear Runoff Volume (ac-ft)	1.7157
24-Hr Clear Runoff Volume (cu-ft)	74737.5586



Peak Flow Hydrologic Analysis

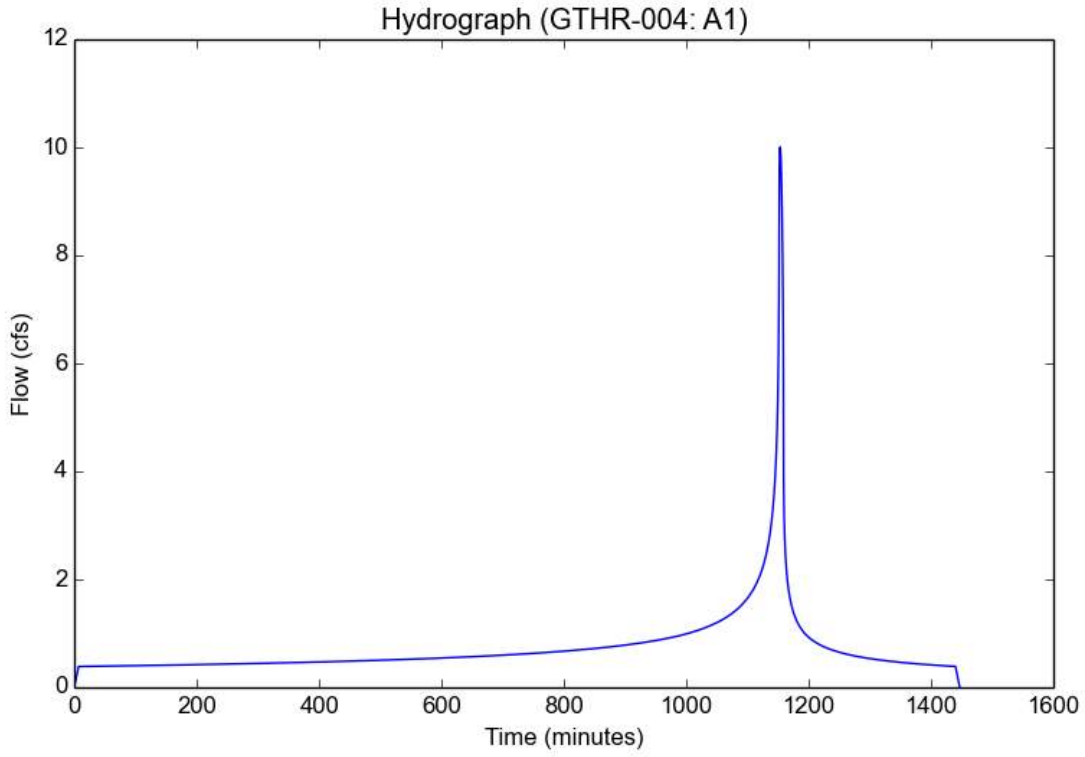
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/PRE-HYDRO/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - A1_50yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	A1
Area (ac)	3.99
Flow Path Length (ft)	467.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.87
Soil Type	9
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.5
Peak Intensity (in/hr)	2.8015
Undeveloped Runoff Coefficient (Cu)	0.8632
Developed Runoff Coefficient (Cd)	0.8952
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	10.0066
Burned Peak Flow Rate (cfs)	10.0066
24-Hr Clear Runoff Volume (ac-ft)	1.4675
24-Hr Clear Runoff Volume (cu-ft)	63923.2293



Peak Flow Hydrologic Analysis

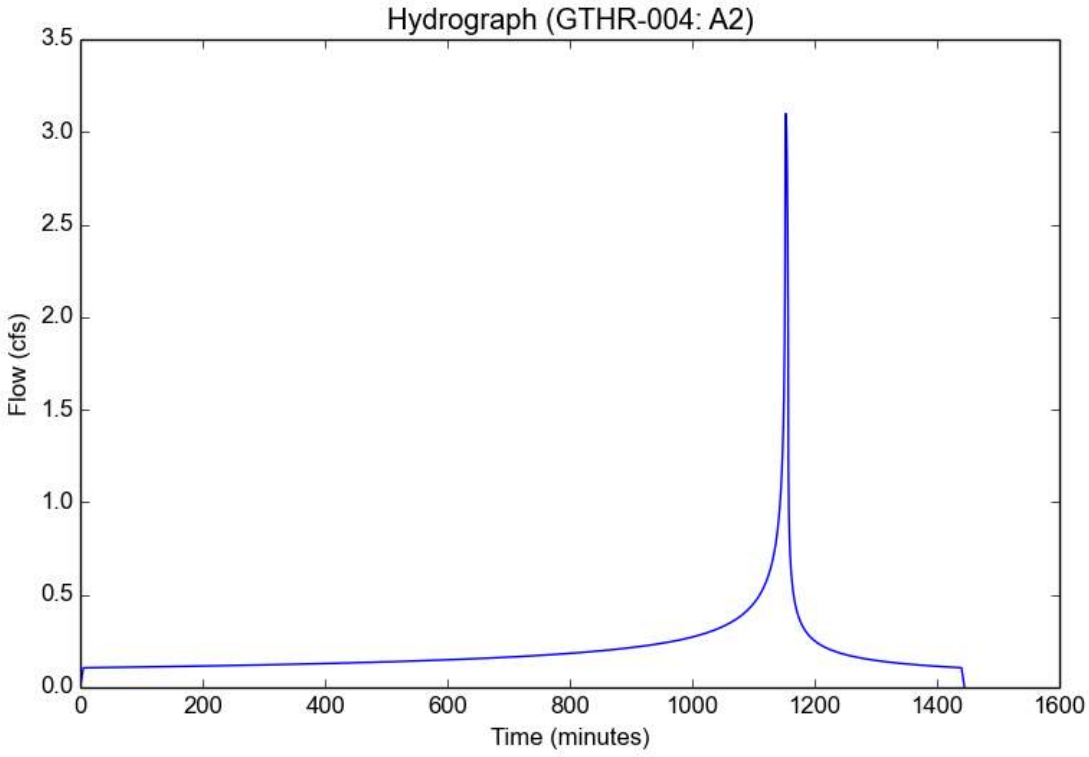
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/PRE-HYDRO/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - A2_50yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	A2
Area (ac)	1.05
Flow Path Length (ft)	205.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.91
Soil Type	9
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.5
Peak Intensity (in/hr)	3.2815
Undeveloped Runoff Coefficient (Cu)	0.8928
Developed Runoff Coefficient (Cd)	0.8994
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.0987
Burned Peak Flow Rate (cfs)	3.0987
24-Hr Clear Runoff Volume (ac-ft)	0.3995
24-Hr Clear Runoff Volume (cu-ft)	17403.6767



Peak Flow Hydrologic Analysis

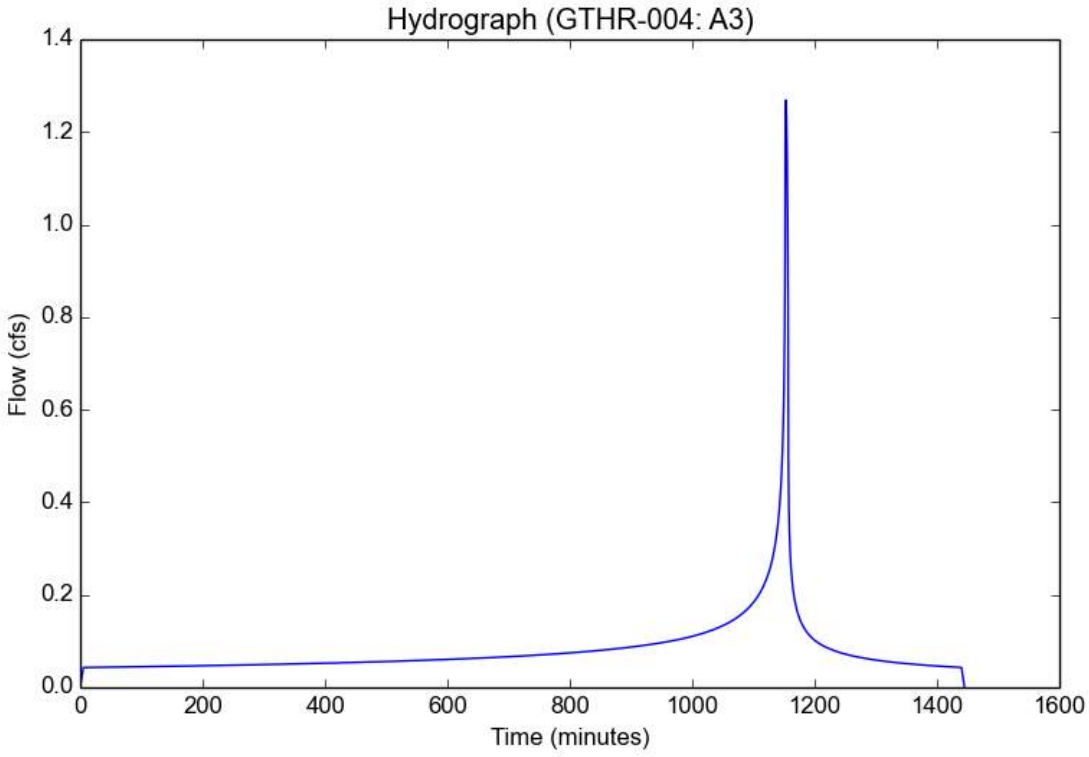
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/PRE-HYDRO/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - A3_50yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	A3
Area (ac)	0.43
Flow Path Length (ft)	168.0
Flow Path Slope (vft/hft)	0.017
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.9
Soil Type	9
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.5
Peak Intensity (in/hr)	3.2815
Undeveloped Runoff Coefficient (Cu)	0.8928
Developed Runoff Coefficient (Cd)	0.8993
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.2689
Burned Peak Flow Rate (cfs)	1.2689
24-Hr Clear Runoff Volume (ac-ft)	0.1623
24-Hr Clear Runoff Volume (cu-ft)	7067.733



Existing & Proposed Conditions Hydrology Calculations (100-year Storm Event)

Peak Flow Hydrologic Analysis

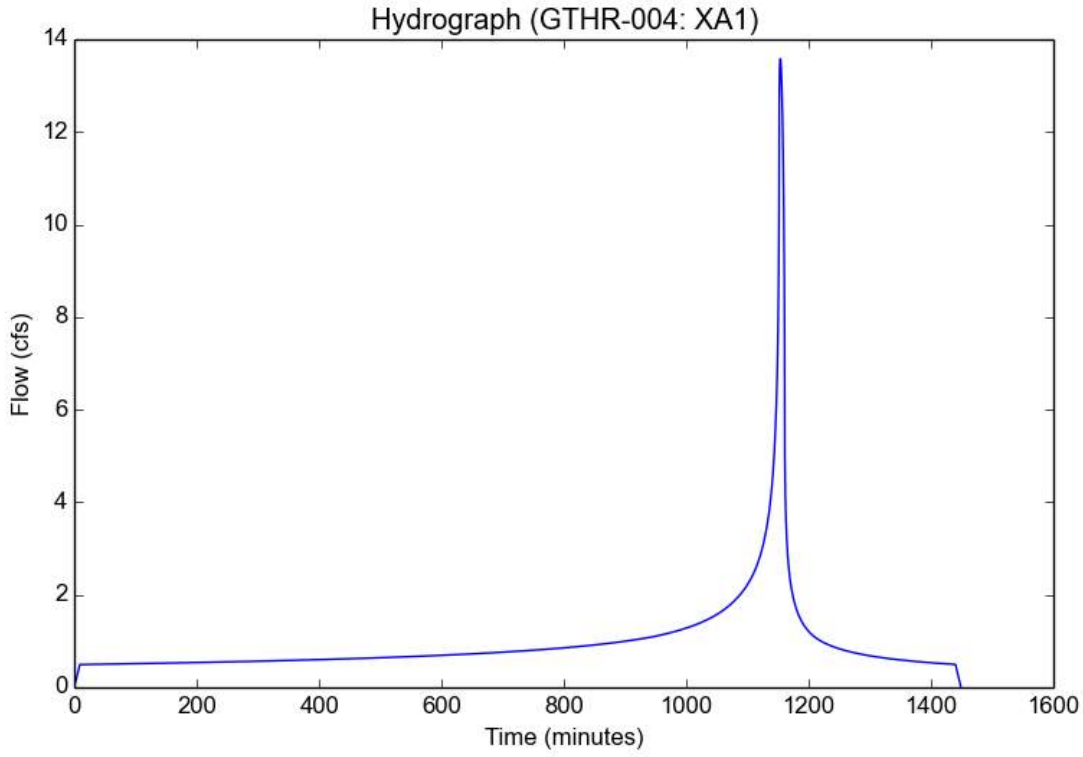
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - XA1, 100yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	XA1
Area (ac)	5.47
Flow Path Length (ft)	752.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.7
Soil Type	9
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.171
Peak Intensity (in/hr)	2.7931
Undeveloped Runoff Coefficient (Cu)	0.8625
Developed Runoff Coefficient (Cd)	0.8888
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	13.5784
Burned Peak Flow Rate (cfs)	13.5784
24-Hr Clear Runoff Volume (ac-ft)	1.9375
24-Hr Clear Runoff Volume (cu-ft)	84396.0716



Peak Flow Hydrologic Analysis

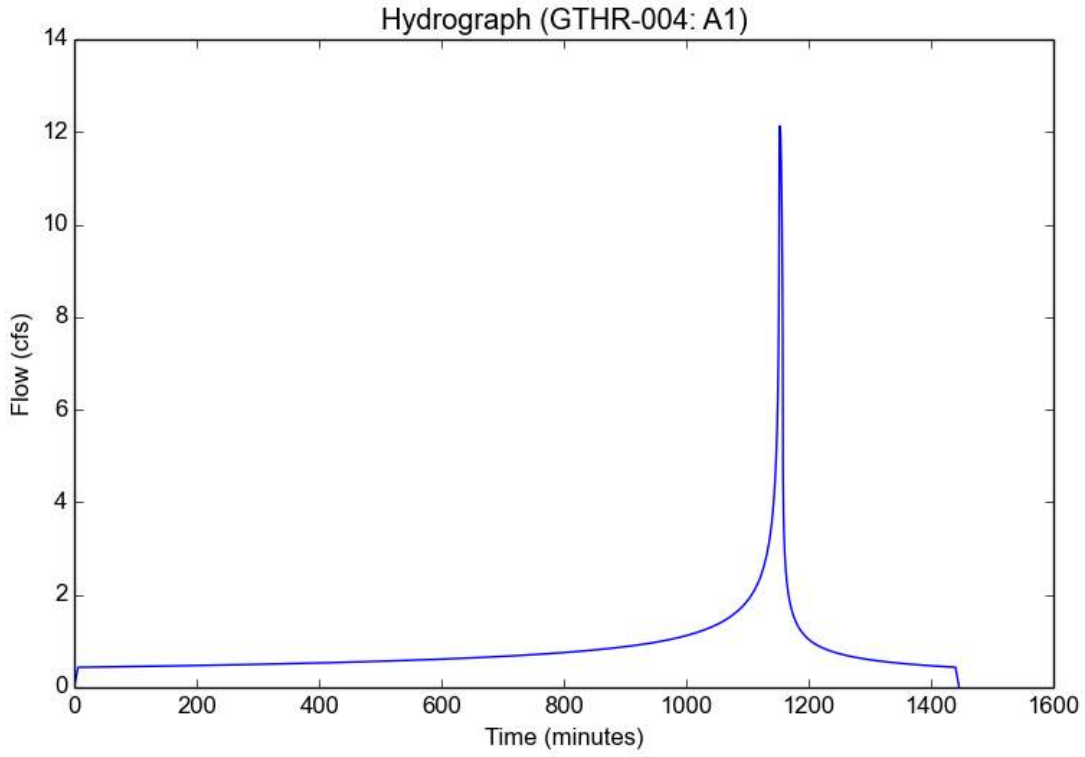
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/PRE-HYDRO/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - A1_100yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	A1
Area (ac)	3.99
Flow Path Length (ft)	467.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.87
Soil Type	9
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.171
Peak Intensity (in/hr)	3.3794
Undeveloped Runoff Coefficient (Cu)	0.8974
Developed Runoff Coefficient (Cd)	0.8997
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	12.131
Burned Peak Flow Rate (cfs)	12.131
24-Hr Clear Runoff Volume (ac-ft)	1.6503
24-Hr Clear Runoff Volume (cu-ft)	71886.9666



Peak Flow Hydrologic Analysis

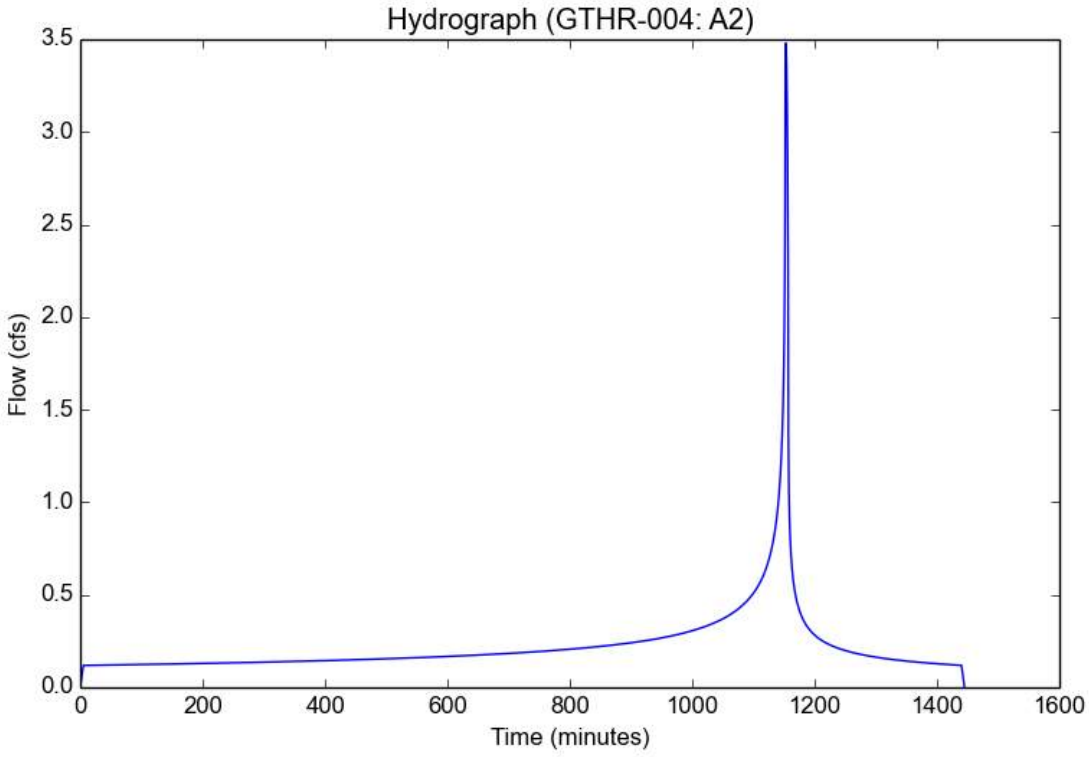
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/PRE-HYDRO/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - A2_100yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	GTHR-004
Subarea ID	A2
Area (ac)	1.05
Flow Path Length (ft)	205.0
Flow Path Slope (vft/hft)	0.008
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.91
Soil Type	9
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.171
Peak Intensity (in/hr)	3.6818
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.4793
Burned Peak Flow Rate (cfs)	3.4793
24-Hr Clear Runoff Volume (ac-ft)	0.4489
24-Hr Clear Runoff Volume (cu-ft)	19556.079



Peak Flow Hydrologic Analysis

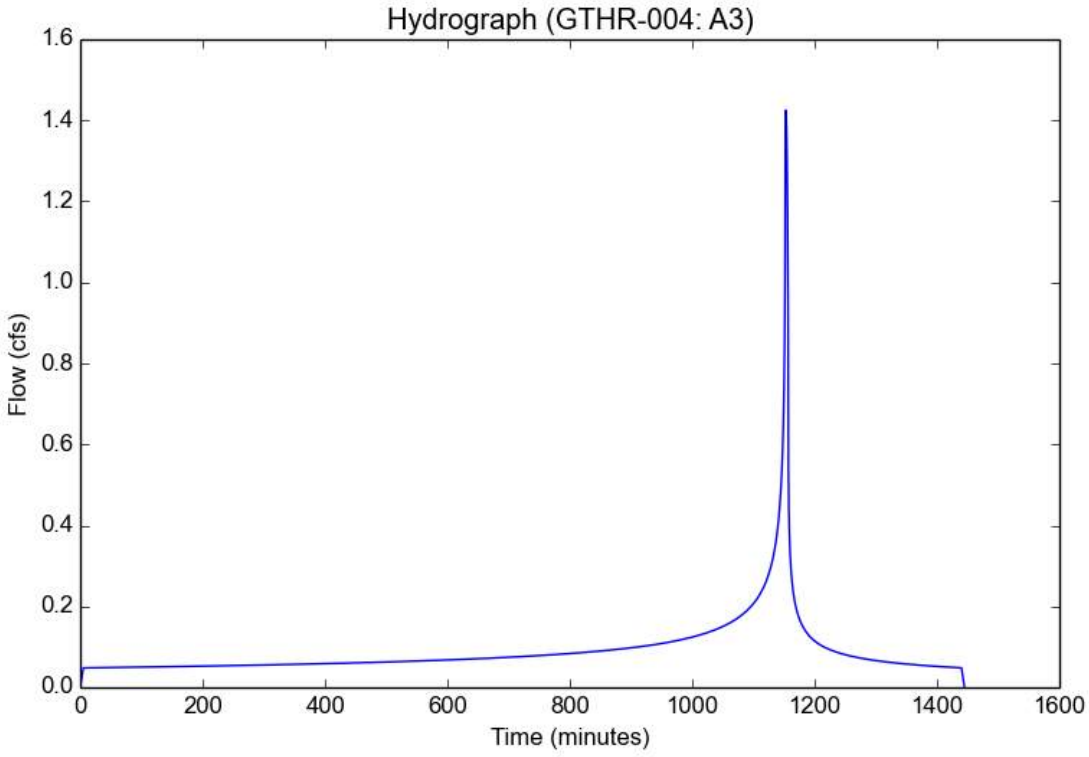
File location: P:/G/GTHR-004/Admin/Reports/Hydrology/PRE-HYDRO/Appendix B - Hydrology Calculations (Hydro Calc)/GTHR-004 - A3_100yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

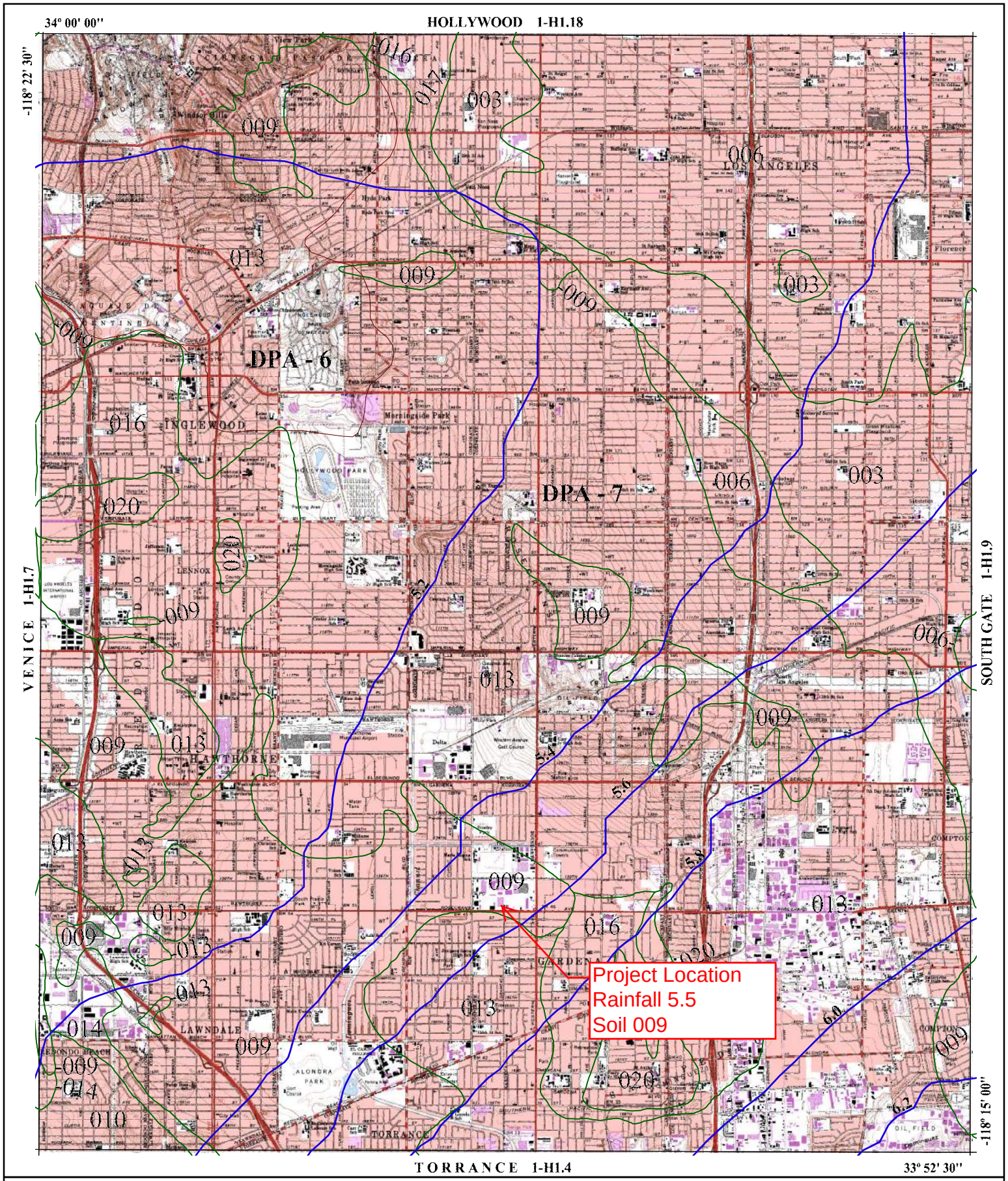
Project Name	GTHR-004
Subarea ID	A3
Area (ac)	0.43
Flow Path Length (ft)	168.0
Flow Path Slope (vft/hft)	0.017
50-yr Rainfall Depth (in)	5.5
Percent Impervious	0.9
Soil Type	9
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.171
Peak Intensity (in/hr)	3.6818
Undeveloped Runoff Coefficient (Cu)	0.9
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.4249
Burned Peak Flow Rate (cfs)	1.4249
24-Hr Clear Runoff Volume (ac-ft)	0.1824
24-Hr Clear Runoff Volume (cu-ft)	7943.2622



APPENDIX C
Isohyet



N
W E
S

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

INGLEWOOD
50-YEAR 24-HOUR ISOHYET

1-H1.8

LOS ANGELES COUNTY PUBLIC WORKS
Public Service That Works

APPENDIX D
Hydraulic Calculations

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Nov 13 2019

Offsite Flow Conveyance Pipe - 25 YR

Circular

Diameter (ft)	= 1.50
Invert Elev (ft)	= 100.00
Slope (%)	= 2.00
N-Value	= 0.013

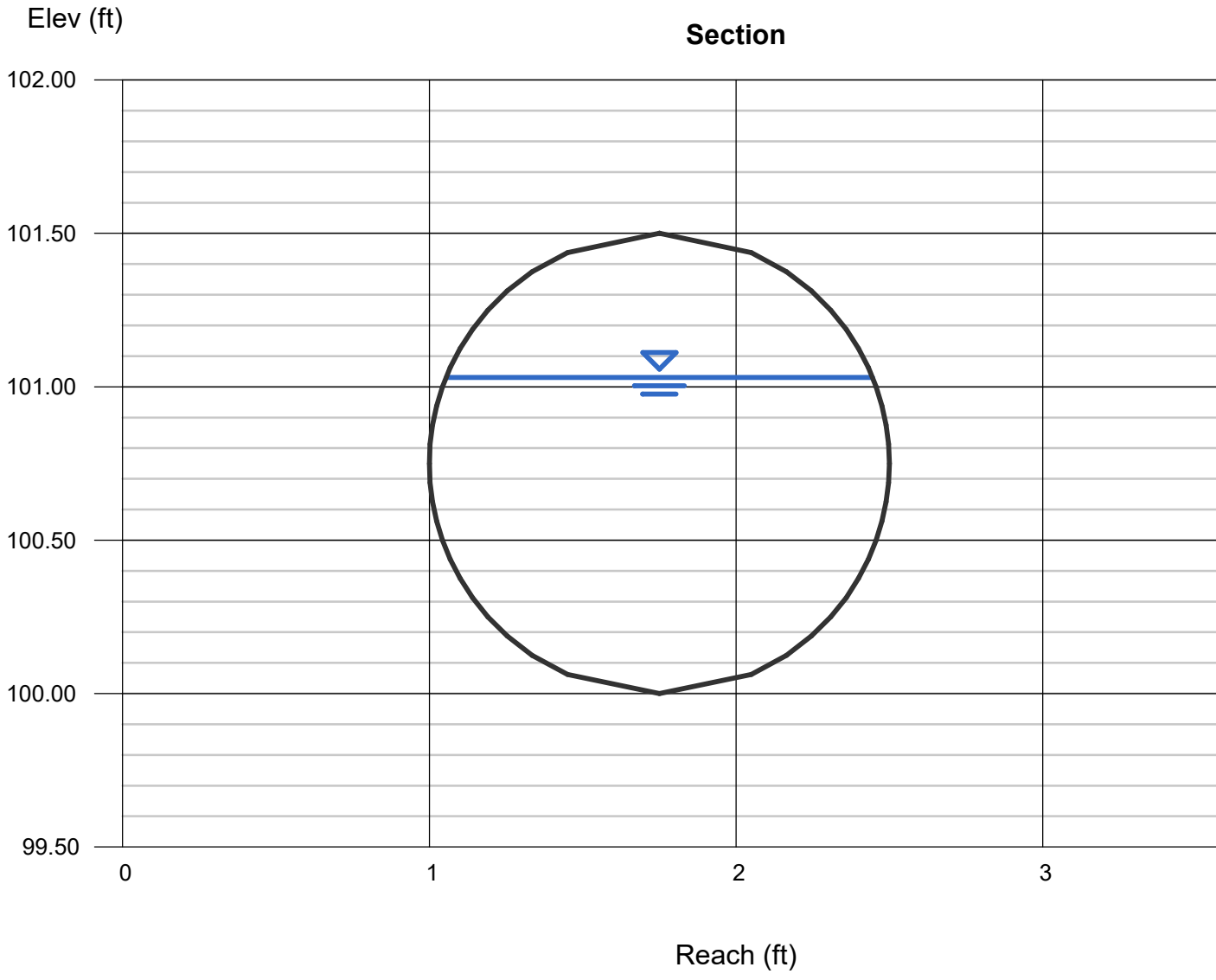
Calculations

Compute by:	Known Q
Known Q (cfs)	= 12.01

Highlighted

Depth (ft)	= 1.03
Q (cfs)	= 12.01
Area (sqft)	= 1.30
Velocity (ft/s)	= 9.27
Wetted Perim (ft)	= 2.93
Crit Depth, Yc (ft)	= 1.32
Top Width (ft)	= 1.39
EGL (ft)	= 2.37

Q was obtained by adding Q25's from A1, A2, and A3



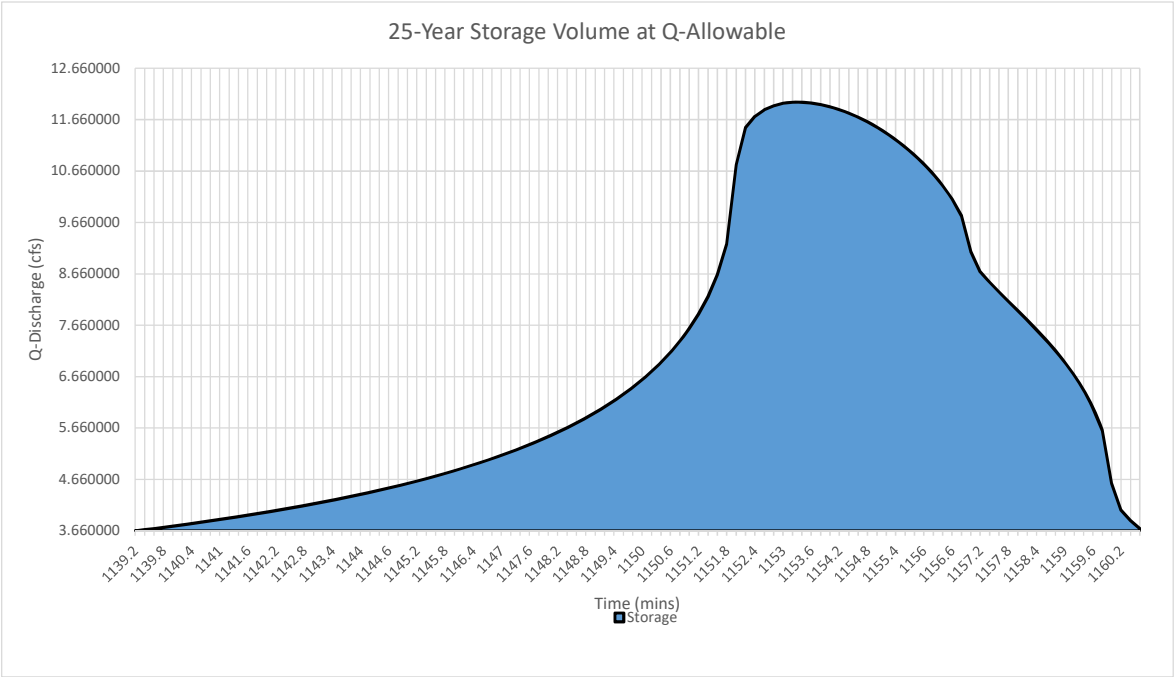
APPENDIX E
Detention Calculations

Q-25 HydroCalc Outputs based on LACDPW Qallowable = 3.66 cfs

Subarea

	A1	A2	A3		
Time (mins)	Q25 (CFS)	Q25 (CFS)	Q25 (CFS)	Total Q25 (cfs)	Area Under Curve
1139.2	2.610714207	0.745741823	0.300889722	3.657346	0.733764368
1139.4	2.626882664	0.750570081	0.302845181	3.680298	0.738400267
1139.6	2.643366652	0.755497287	0.304840806	3.703705	0.743128643
1139.8	2.66017676	0.760526916	0.306878011	3.727582	0.747941619
1140	2.677213617	0.765662614	0.308958277	3.751835	0.75282327
1140.2	2.694406811	0.770908217	0.311083166	3.776398	0.757787157
1140.4	2.711951297	0.776267757	0.313254317	3.801473	0.76285518
1140.6	2.729859486	0.781745483	0.315473458	3.827078	0.768031113
1140.8	2.748144424	0.787345866	0.317742409	3.853233	0.773318925
1141	2.766819836	0.793073626	0.320063088	3.879957	0.778722799
1141.2	2.785900174	0.79893374	0.322437521	3.907271	0.784247142
1141.4	2.805400666	0.804931469	0.324867849	3.935200	0.789896606
1141.6	2.825337373	0.811072371	0.327356333	3.963766	0.795676102
1141.8	2.84572725	0.817362331	0.329905367	3.992995	0.801590823
1142	2.866588214	0.823807582	0.332517489	4.022913	0.807646262
1142.2	2.887939212	0.830414734	0.335195388	4.053549	0.813848236
1142.4	2.909800305	0.837190802	0.337941921	4.084933	0.820202914
1142.6	2.932192753	0.844143241	0.340760121	4.117096	0.826716843
1142.8	2.955139114	0.851279983	0.343653218	4.150072	0.833396979
1143	2.978663347	0.858609476	0.346624651	4.183897	0.840250722
1143.2	3.00279093	0.86614073	0.349678089	4.218610	0.847285955
1143.4	3.02754899	0.873883364	0.352817448	4.254250	0.854511084
1143.6	3.052966448	0.881847665	0.35604692	4.290861	0.861935084
1143.8	3.079074175	0.890044647	0.359370988	4.328490	0.869567556
1144	3.105905173	0.898486119	0.362794464	4.367186	0.877418781
1144.2	3.133494773	0.907184765	0.366322514	4.407002	0.885499783
1144.4	3.161880855	0.916154228	0.369960697	4.447996	0.893822409
1144.6	3.191104102	0.925409206	0.373715003	4.490228	0.902399405
1144.8	3.221208275	0.934965566	0.377591896	4.533766	0.91124451
1145	3.252240535	0.944840462	0.381598368	4.578679	0.920372565
1145.2	3.284251801	0.955052483	0.385741996	4.625046	0.929799625
1145.4	3.317297157	0.965621808	0.390031007	4.672950	0.939543103
1145.6	3.351436316	0.976570394	0.394474351	4.722481	0.949621919
1145.8	3.386734157	0.987922183	0.399081791	4.773738	0.960056682
1146	3.423261335	0.99970335	0.403864003	4.826829	0.970869894
1146.2	3.461094987	1.01194258	0.408832685	4.881870	0.98208619
1146.4	3.50031955	1.024671399	0.414000697	4.938992	0.993732613
1146.6	3.54102772	1.037924552	0.419382215	4.998334	1.005838942
1146.8	3.583321561	1.051740459	0.424992915	5.060055	1.018438069
1147	3.627313827	1.066161735	0.43085019	5.124326	1.03156645
1147.2	3.673129513	1.081235829	0.436973404	5.191339	1.045264643
1147.4	3.720907714	1.097015767	0.443384207	5.261308	1.059577949
1147.6	3.770803847	1.113561064	0.450106896	5.334472	1.074557184
1147.8	3.822992344	1.130938815	0.457168872	5.411100	1.090259619
1148	3.87766993	1.149225038	0.464601184	5.491496	1.106734118
1148.2	3.935059654	1.168396352	0.472389018	5.575845	1.124024568
1148.4	3.995415893	1.188455757	0.480529003	5.664401	1.142227423
1148.6	4.059030636	1.209694392	0.489148548	5.757874	1.161465636
1148.8	4.126241463	1.232241165	0.498300153	5.856783	1.181851682
1149	4.197441808	1.256246954	0.508045276	5.961734	1.203517489
1149.2	4.273094372	1.281889963	0.518456516	6.073441	1.226454853
1149.4	4.352104316	1.309382843	0.529620518	6.191108	1.250796482
1149.6	4.436232878	1.338982349	0.541641918	6.316857	1.276909407
1149.8	4.526585405	1.371002723	0.554648798	6.452237	1.305098728
1150	4.624115173	1.405834721	0.568800459	6.598750	1.335704689
1150.2	4.730024287	1.44397347	0.584298785	6.758297	1.369162638
1150.4	4.845863586	1.486060741	0.601405507	6.933330	1.406044205
1150.6	4.973690744	1.532951928	0.620469548	7.127112	1.447124734
1150.8	5.116334341	1.585828033	0.64197275	7.344135	1.49349632
1151	5.277866379	1.646364425	0.666597272	7.590828	1.546626194
1151.2	5.464528793	1.716021889	0.694883185	7.875434	1.609128602
1151.4	5.686799397	1.800042665	0.729010094	8.215852	1.686001206
1151.6	5.965001969	1.906780598	0.772377341	8.644160	1.788009148
1151.8	6.344616057	2.057625389	0.833690128	9.235932	2.001765392
1152	7.320068398	2.463080235	0.99857371	10.781722	2.228534642
1152.2	7.783046037	2.647179612	1.073398429	11.503624	2.322676983
1152.4	7.931063532	2.698017146	1.094065078	11.723146	2.357486523

1152.6	8.022479012	2.724435113	1.104805352	11.851719	2.378267966
1152.8	8.083471332	2.737408827	1.110080028	11.930960	2.390805272
1153	8.124283922	2.741190899	1.111617715	11.977093	2.397550547
1153.2	8.150189854	2.737930824	1.110292257	11.998413	2.39982003
1153.4	8.164317542	2.728863892	1.106605931	11.999787	2.398409413
1153.6	8.168692176	2.714747725	1.100866867	11.984307	2.393833393
1153.8	8.164703011	2.696056255	1.093267895	11.954027	2.386437101
1154	8.153341648	2.67307637	1.08392583	11.910344	2.376454016
1154.2	8.135335029	2.645959027	1.072902256	11.854196	2.364038172
1154.4	8.111224809	2.614746138	1.060214458	11.786185	2.349282556
1154.6	8.081417172	2.579382644	1.045840342	11.706640	2.332229224
1154.8	8.046215308	2.539717808	1.02971897	11.615652	2.312873709
1155	8.005841149	2.495496721	1.011747132	11.513085	2.29116471
1155.2	7.96045014	2.446340598	0.991771358	11.398562	2.266998859
1155.4	7.910141269	2.391711577	0.969573651	11.271426	2.240130921
1155.6	7.854963719	2.330316537	0.944602457	11.129883	2.210262611
1155.8	7.794920964	2.261300073	0.916522355	10.972743	2.177086287
1156	7.729972823	2.183337156	0.884809497	10.798119	2.140057658
1156.2	7.660035723	2.093958741	0.848462639	10.602457	2.098221782
1156.4	7.584981266	1.988990482	0.805788972	10.379761	2.049819826
1156.6	7.504633041	1.860309867	0.753494629	10.118438	1.990749017
1156.8	7.418761438	1.687137793	0.683153402	9.789053	1.888454165
1157	7.32707607	1.259177806	0.509235145	9.095489	1.779922968
1157.2	7.2292151	1.050170321	0.424355241	8.703741	1.719350343
1157.4	7.124730435	0.972293686	0.392738651	8.489763	1.679051184
1157.6	7.013067148	0.917269017	0.370412897	8.300749	1.642115243
1157.8	6.893534549	0.874002901	0.352865918	8.120403	1.606217007
1158	6.765264739	0.83816511	0.33833685	7.941767	1.570236777
1158.2	6.627151685	0.80752897	0.32592042	7.760601	1.533421085
1158.4	6.477758635	0.780772049	0.315079091	7.573610	1.495127929
1158.6	6.315171406	0.757034624	0.30546348	7.377670	1.454697639
1158.8	6.13675327	0.735721761	0.296831853	7.169307	1.410847649
1159	5.933984319	0.716247074	0.288938209	6.939170	1.362421367
1159.2	5.704910048	0.698421513	0.28171251	6.685044	1.308243836
1159.4	5.440283261	0.682038156	0.275072871	6.397394	1.245432029
1159.6	5.121092088	0.666896298	0.268937615	6.056926	1.167183429
1159.8	4.698832636	0.652834564	0.263241086	5.614908	1.019453609
1160	3.681977019	0.639721128	0.257929659	4.579628	0.86427557
1160.2	3.182722134	0.627446825	0.252958934	4.063128	0.791843995
1160.4	2.991100138	0.615920192	0.248291722	3.855312	0.755716593
1160.6	2.852893535	0.605063801	0.243896541	3.701854	0.727880369
1160.8	2.742391796	0.594811511	0.239746507	3.576950	
				Total	**147.3548631**
				Volume (cf)	**8841**



Detention Vault Size Calcualtion			
Depth of Module (FT)	**Module Storage (CF/Module)**	**Total Required Storage (CF)**	**Required Number of Modules**
4	238	8841	37
5	298		30
6	357		25

APPENDIX F
As-builts & References

INDEX TO PLANS

STANDARD DRAWINGS ~ FLOOD CONTROL DISTRICT

	Local Depression No. 2	Drawing No. 2-D 88
	Standard Drop Step	" 2-D 96
(22)	Manhole No. 3	" 2-D 104
	Conc. Rings, Reducer and Pipe for M.H. Shaft	" 2-D 107
	Manhole Frame and Cover for Catch Basin	" 2-D 156
	Catch Basin Reinforcement for Round Manhole	" 2-D 157
	Detail of Bolt Support for Catch Basin	" 2-D 158
(15)	Catch Basin No. 1	" 2-D 160
	Detail of Angle and Anchor for Catch Basin	" 2-D 161
(16)	Catch Basin No. 2	" 2-D 162
	Catch Basin No. 3	" 2-D 163
	Standard A 305 Reinforcing	" 2-D 171
	Catch Basin Reinforcement	" 2-D 172
	Pipe Supports Across Trenches	" 2-D 173.1 to 3
	Removable Protection Bar for Catch Basin	" 2-D 175
	Pipe Bedding in Trenches	" 2-D 177
	Standard Non-rocking Manhole Frame & Cover	" 2-D 181
(21)	Manhole No. 2	" 2-D 184
(24)	Transition Structure No. 2	" 2-D 186
(18)	Junction Structure No. 1	" 2-D 189
	Junction Structure No. 3	" 2-D 191
	Junction Structure No. 4	" 2-D 193
(25)	Transition Structure No. 4	" 2-D 198
	Window Details for Multiple Box Section	" 2-D 205
	"D" Load Table for Design of Reinforced Concrete Pipe	" 2-D 213.1 & .2
	Detail of Catch Basin Opening	" 2-D 215
(23)	Manhole No. 4	2-D 113
	Reconstruction of Sanitary Sewers & House Connections	" 2-D 146

STANDARD PLANS ~ COUNTY ENGINEER

Reinforcing Steel Assembly - Single R.C. Box	Standard No. Dc - 70
Reinforcing Steel Assembly - Double R.C. Box	" Dc - 71
Standard Chimney Pipe	" S-a-9
Legend for Sanitary Sewer Plans & Profiles	" S-a-64
Brick Sewer Structures	" S-a-104
Standard Manhole Frame & Cover	" S-a-117
Concrete Reinforcement for Circular Pipes	" S-a-119
Trap Manhole Base	" S-a-138
Standard Manhole Step	" S-a-162

GENERAL NOTES

Elevations are in feet above U.S.C. & G.S. Sea Level Datum of 1929, based on the Los Angeles County Engineer's Precise Level Net, 1952 adjustment.

Stationing of Main Line Drawings is based on survey in C.S.F.B. 1969.

Stations shown on profile are along centerline of conduit or on a line normal to centerline of conduit.

Stations and invert elevations of pipe inlets, shown on the profiles, are at the inside face of the conduit wall unless otherwise shown.

Pipe connections shall conform to Standard Drawing 2-D191 or Standard Drawing 2-D193, unless otherwise shown on the project drawings.

Connector Pipes with cover less than two feet in roadway areas shall be backfilled with concrete according to General Note No. 3, Standard Drawing No. 2-D177. Concrete backfill indicated on Standard Drawing No. 2-D213.1 shall be used only in roadways, unless otherwise specified on the project drawings.

All storm drain pipe shall be bedded according to Std. Dwg. No. 2-D177, Case III, except bell and spigot pipe which shall have Case II bedding, unless otherwise shown on the project drawings.

All pipe not otherwise specified shall be Extra Strength Cement Concrete Pipe.

Existing public utilities shall be maintained in place by the Contractor unless otherwise specified on the project drawings. Interfering portions of abandoned utilities shall be removed by the Contractor.

All structures not otherwise specified are Standard Structures. For details, see appropriate Standard Drawing.

For structures marked "SEC ____", see structural details on Sheet No. 9.

At side opening catch basin locations where no curb exists, the catch basins shall be built with a curb face of 12 inches, unless otherwise specified on the project drawings. Where there is an existing curb with a height less than 8 inches the catch basin shall be built with a curb face sufficient to provide an 8 inch opening into the catch basin by increasing the depth of the depression below existing gutter grade. Where existing curb height is 8 inches or more, the curb face at the catch basin shall be that of the existing curb height plus 4 inches unless otherwise specified on the project drawings.

If an elevation is shown at a Catch Basin, it refers to the top of proposed curb at centerline of basin.

At locations where Local Depressions are specified and no curb exists, the curb specified on Standard Drawing No. 2-D88 shall conform to the detail shown on sheet No. 2, with the curb face varying from 12 inches at the basin to 8 inches at each end of the local depression.

The soils test borings for this project were made in June and July, 1955.

Resurface trenches within the cement concrete paved area of Rosecrans Avenue with 8 inches of cement concrete pavement and 6 inches of aggregate base material. Resurface trenches within all other paved areas of streets with 3 inches of premix pavement and 6 inches of aggregate base material, except as otherwise shown. Use Type 'A' base material.

Numbers in circles (6) indicate items under which payment will be made.

Where Premix Local Depressions are specified on the plans, substitute 6 inch Premix Apron for the 8 inch Cement Concrete Apron shown on Standard Drawing No. 2-D88.

STRUCTURAL NOTES

Dimensions for depth of reinforcing steel are from face of concrete to center of bars.

Longitudinal steel shall be continuous and extend through all R.C. Box Construction Joints and shall be lapped a minimum of 20 diameters at all splicies.

Transverse construction joints shall not be placed within 30 inches of manhole or junction structure openings.

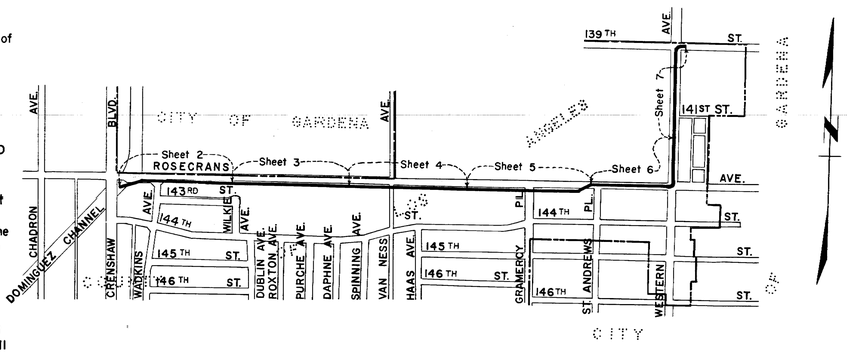
Unless otherwise shown on project drawings, transverse joint keyways, (in both slabs and walls), as detailed for longitudinal joint keyways, shall be placed at the end of each pour but the spacing thereof shall not exceed 50 feet or be less than 10 feet. All construction joints in bottom slab, top slab and side walls shall be in the same plane. No staggering of joints will be permitted.

The walls and top slab may be poured monolithic, but after walls have been poured, a time delay of two hours shall be made before pouring of the top slab is started.

Transverse reinforcement and transverse joints shall be placed at right angles (or radial) to conduit centerline, except as otherwise shown on project drawings.

Unless otherwise shown on the project drawings, transverse bars in curved reaches shall be placed radially. Straight transverse bars in top and bottom slabs shall be spaced as shown for the section, with the spacing to be applied at the centerline of construction and the bars placed radially from this spacing. Straight bars and angle bars in walls shall be spaced as shown for the section, spacing to be measured between vertical legs.

All bar bends and hooks shall conform to the American Concrete Institute "Manual of Standard Practice".



LOCATION MAP
SCALE 1" = 600'
600 300 0 600 1200 1800 2400
SCALE OF FEET

LEGEND
Proposed Storm Drain

"AS BUILT DRAWINGS"

Effective October 5, 1955, JOHN A. LAMBIE was appointed County Engineer. Wherever the name WILLIAM J. FOX appears on these plans it should be construed as meaning JOHN A. LAMBIE.

"PD024235"

COUNTY STORM DRAIN BOND ISSUE

APPROVED AS TO SANITARY SEWERS
A. M. RAWN
CHIEF ENGINEER OF COUNTY SANITATION DISTRICTS
BY L. Posthumus
OFFICE ENGINEER
DATE MAR. 30 1956

PREPARED BY
WILLIAM J. FOX
COUNTY ENGINEER
RECOMMENDED BY
C. V. Green
CONSTRUCTION AND STORM DRAIN ENGINEER
DRAWN BY B. Wheeler DESIGNED BY P.R. Pearl
TRACED BY B. Wheeler SUBMITTED BY A.W. Lyon
CHECKED BY G. W. Tatchell DATE 11-1-55

REVISIONS

MARK	DATE	DESCRIPTION
△	5-9-57	As Built

DRAWN BY County of L.A. DESIGNED BY County of L.A.
TRACED BY County of L.A. SUBMITTED BY
CHECKED BY W.H.E.D.
RECOMMENDED BY
DIVISION ENGINEER (DESIGN)

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
PROJECT NO. 11
ROSECRANS AVENUE
CONCRETE CONDUIT
LOCATION MAP & INDEX TO PLANS
APPROVED BY H.E. Nodyer 4/25/56
CHIEF ENGINEER

SCALE	DATE	NO. 481-11-D1.1
AS SHOWN	OCT. 1955	SHEET 1 OF 14

B.M. K.E. 83 Elev. 45.303 F.B. 1969 pg. 8. Rosecrans Ave. & Van Ness Ave. S.E. Corner Bt. Spk. in Curb 20' S. of N. end C.R.
B.M. 21-10 Elev. 44.574 F.B. 1391-15 & F.B. 1969 pg. 8 Rosecrans Ave. & Van Ness Ave. S.W. Corner 89.6' S. & Rosecrans Ave. 29.5' W. & Van Ness Ave. 1.5' Back of Curb in a well protected by a cast iron cover Marked C.S. Mon. a Std. C.S. Mon. stamped 21-10-1952 R.E. 63.
VAN NESS AVE.
Backfill to this line. See Typical Section on Sheet No 3
Exist ground line
Exist. 24" C.M.P.'s
Exist 24" CMP in trench
Backfill to this line see typical section at right
DOUBLE 7'-6" x 7'-3" R. C. BOX
9'-6" x 7'-0" R. C. BOX
S=.0004
Invert
6" H.L. Reconstruct per Std. Dwg. 2-D146
6" H.L.'s Reconstruct per Std. Dwg. 2-D146
Invert Exist. 12" San. Sewer
Invert Exist. 18" San. Sewer
PROFILE
HORI. SCALE: 1"=40'
VERT. SCALE: 1"=4'
SEC. No 3
SEC. No 4
SW¼ SEC. 14, T3S, R14W S.B.B.&M.
REPLAT OF BLOCK D AND E STRAWBERRY PARK TRACT
M.B. 8-138
Approximate site location
NOTE A Pipe Invert Elev. 39.70; Seal end with 8" brickwork or install 18" SPEC. INLET No. 4 with Inlet Elev. = 44.60 See Sh. No. 11 for details. See Sec. 3-08 of Specifications.
Curve Data for Future Storm Drain North in Van Ness Ave. Δ=44°49'40" R=45' T=18.56' L=35.21' B.C.=1+17.69, E.C.=1+52.90
Proposed Street Widening Line
GARDENA CITY BOUNDARY
ROSECRANS AVE.
8" Cement Conc. Pvm't. over 6" Agg Base
2" Premix Pvm't. over 6" Agg. Base
2" Premix Pvmt. Parking Area. Resurface trenches with 2" Premix Pvmt. (Omit Base)
See Sheet No 3
See Sheet No 5
Curve Data for Storm Drain South in Van Ness Ave. Δ=44°57'20" R=45' T=18.62' L=35.31' B.C.=1+17.50, E.C.=1+52.81
L.D. DETAIL 'E' No Scale
L.D. DETAIL 'F' No Scale
NW¼ SEC. 23, T3S, R14W, S.B.B.&M.
NE ¼ SEC. 23, T3S, R14W, S.B.B.&M.
NOTES: T.S.'s & T.S. Conduits interfering with construction of Storm Drain & C.B.'s to be relocated by L.A. Co. Road Dept. Δ Remove and Salvage for F.O.B. L.A. County Road Dept. truck.
TYPICAL SECTION FOR BACKFILL Sta 25+00 to Sta 45+00 Scale 1"=4'
DETAIL No 2 Scale ¼"=1'-0"
PLAN SCALE: 1"=40'
SCALE OF FEET
COUNTY STORM DRAIN BOND ISSUE
PREPARED BY WILLIAM J. FOX COUNTY ENGINEER
RECOMMENDED BY C.H. Green CONSTRUCTION AND STORM DRAIN ENGINEER
REVISIONS
5-9-57 As Built
9-14-65 Permit 64522 (181-11-F14.1 to .6)
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
PROJECT NO. 11 ROSECRANS AVE. CONCRETE CONDUIT STA. 23+00 TO STA. 34+00 PLAN AND PROFILE
SCALE AS SHOWN
DATE OCT. 1955
NO. 181-11-D1.4 SHEET 4 OF 14