December 2018

HYDROLOGY STUDY

"Glenelder"
Vesting Tentative Tract Map No. 82159
16234 Folger Street

City of Hacienda Heights | County of Los Angeles

Prepared For:

LENNAR

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Prepared By:

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WO#: 3916-28X HydroStdy-GlenelderTT82159

HYDROLOGY REPORT

FOR

"GLENELDER" -

VESTING TENTATIVE TRACT

MAP NO. 82159

16234 FOLGER STREET

CITY OF HACIENDA HEIGHTS

COUNTY OF LOS ANGELES

Prepared Date: 5/20/2019

PREPARED UNDER THE SUPERVISION OF:

5/20/2019

Jianhua "Gary" Guan, R.C.E. 64519, Exp. 06/30/19 Date:

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SECTION 1

INTRODUCTION & DISCUSSION

A. **INTRODUCTION**

The proposed residential developments for Glenelder – Vesting Tentative Tract Map (VTTM) No. 82159 is located at 16234 Folger Street, in the City of Hacienda Heights, County of Los Angeles. The property is located on the south side of Folger Street; east side of Hinnen Avenue; west side of Glenelder and north side of Denley. The general location can be found from the vicinity map.

The site is presently an Elementary School that consists of classroom buildings, surface parking, playground and open spaces areas. The overall property is 10 acres (net) in size and is a generally Trapezoid-shaped parcel. Surrounding land uses include primarily residential land uses on all sides, including Folger Street to the north, Glenelder Avenue to the east, Denley Street to the south and Hinnen Avenue to the west.

LENNAR proposes Vesting Tentative Tract Map No. 82159 for the development of 86 detached condominiums, common open space, parking, private drives, curb, gutter, sidewalk and storm drain improvements, retaining wall, wet and dry utilities and related infrastructure improvements. There will be improvements to Glenelder Avenue, Folger Street and Hinnen Avenue.

The subject property is zoned H9 Residential (0-9 du/ac).

B. DRAINAGE PATTERNS

The overall property is approximately 10 (net) acres in size and the site is currently an Elementary School that consists of classroom buildings, surface parking, playground and open spaces areas.

Stormwater and surface water onsite generally flow from south/southeast to north/northwest (i.e., from the Glenelder Avenue/Shadybend Drive intersection towards Folger Street/Hinnen Avenue intersection). Runoff from the site will be conveyed to an existing storm drain system (Hacienda Heights Project No. 1273 – Line “C”) in Folger Street. The existing storm drain plans can be found in Reference Section 6.

During the proposed condition, the site will be graded to follow the existing condition drainage pattern. The stormwater runoffs will be collected by the proposed storm drain systems and connect to an existing storm drain in Folger Street.

C. STUDY PURPOSE

The purpose of this study is to analyze pre-project and post-project hydrology of the project site to determine the peak flow rates of storm runoff and to compare with the allowable flows as well as to analyze the negative impacts, if any, due to the project developments.

D. HYDROLOGIC INFORMATION

2-year, 5-year, 10-year, 25-year and 50-year storms were analyzed for the project site. The project site encompasses the No.17 soil group. The 50-year 24-hour isohyet is approximately 6.4 inches. The project falls into DPA zone 7. The 85th Percentile, 24-hr Rainfall is approximately 1.1 inches. The reference Los Angeles County Hydrology Map GIS information can be found in Section I.

The area weighted average of 36% of impervious percentage was applied for the existing condition. The school site has 6.2 acres of vacant land with 1% of imperviousness and 3.7 acres with school site with 82% of imperviousness. There are 6.9 acres of off-site single family residential areas with 42% of imperviousness; refer to Land Use Exhibit 1 for details.

The area weighted average of 50% of impervious percentage was applied for the proposed condition. The project area (Vacant and school in the existing condition) has a 55% of imperviousness with Duplexes, Triplexes, etc residential land use. The off-site areas remain the same with the same acreage and 42% of imperviousness.

E. METHODOLOGY

The methodology described in the Los Angeles County Department of Public Works (LACDPW) Hydrology Manual dated January 2006, was used to compute storm run-off from the project site. The LACDPW HydroCalc computer program was used to compute subarea time of concentration (TC), Peak Flow Rates and Runoff Volume. The hydrology calculations are included in Section 2 and Section 3 of this report, for existing (pre-project) and proposed (post-project) conditions.

F. HYDROLOGY CALCULATION RESULTS

The overall studied area including the off-site areas is approximately 16.8 acres in size. The runoffs from the studied area are conveyed to an existing storm drain system (Hacienda Heights Project No. 1273 – Line “C”) in Folger Street.

The summary of the hydrology study results and the comparisons between the existing and proposed conditions can be found in the following tables.

As indicated from the summary table, the peak flow rates slightly increase due to the land use changes from school and vacant areas (36% imperviousness) to residential (55% imperviousness). Based on the allowable flow info referenced in Section 5, the allowable flow is about 1.70 cfs/acre for the existing storm drain system. The total allowable flow is about 28.56 cfs with 16.8 acres of the studied area while the total area produces the 25-year storm of 28.29 cfs which is less than the allowable flows.

The existing condition hydrology calculations and map can be found in Section 2 and the proposed condition can be found in Section 3.

Hydrology Summary Table
Glenelder - VTTM 82159
City of Hacienda Heights, County Of Los Angeles

Drainage Area	Existing Condition (1)						Proposed Condition (2)						Differences (3)=(2)-(1)					
	Area	2-yr Storm	5-yr Storm	10-yr Storm	25-yr Storm	50--yr Storm	Area	2-yr Storm	5-yr Storm	10-yr Storm	25-yr Storm	50--yr Storm	Area	2-yr Storm	5-yr Storm	10-yr Storm	25-yr Storm	50--yr Storm
	(acre)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(acre)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(acre)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Overall	16.8	7.21	14.30	20.18	28.00	33.45	16.8	7.74	15.12	20.58	28.29	33.67	0	0.53	0.82	0.40	0.29	0.22
Total	16.8	7.21	14.30	20.18	28.00	33.45	16.8	7.74	15.12	20.58	28.29	33.67	0	0.53	0.82	0.40	0.29	0.22

G. LID/WATER QUALITY

The project will be required to comply with the newly adopted MS4 Permit. This will require all filtration water quality devices to be sized to 1.5 times the design storm. The design storm is determined using the 0.75 inch storm or the 85th percentile storm, whichever is greater. The 85th Percentile, 24-hr Rainfall is approximately 1.1 inches per Los Angeles County Hydrology Map GIS information. The 0.75 inch storm and the 85th percentile storm calculations can be found in Section 4 by applying the LACDPW HydroCalc computer program and the 85th percentile storm (1.1 inches) was selected as the project design storm.

There are 5 Modular Wetland Systems (MWS) provided for the project. The water quality peak flows are interpolated based on the tributary areas. Along the public roadway frontier, the low flow lines are provided to collect the water quality flows from the project site and send to the proposed MWS for treatments. The water quality flows from the public roadways and off-site areas are not treated by the proposed private Modular Wetland Systems (MWS).

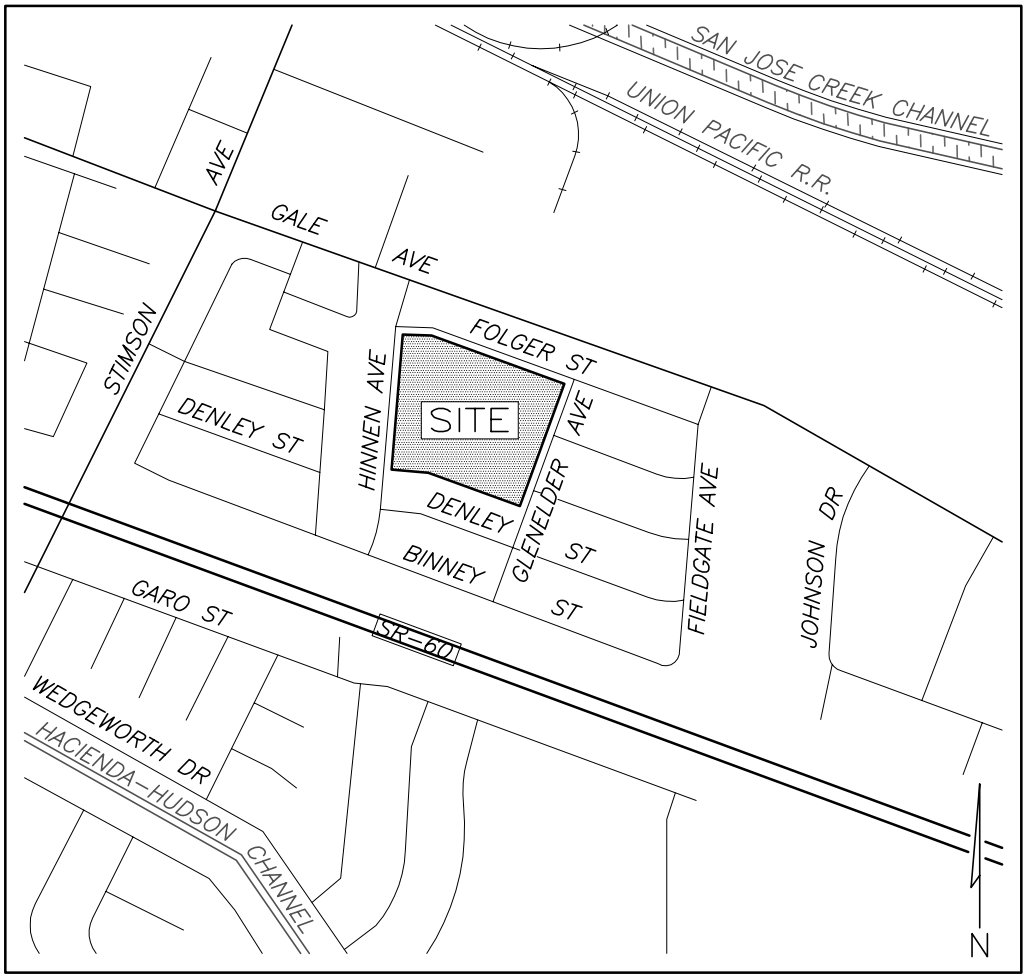
The detailed Low Impact Development (LID) can be found from the separate LID report and preliminary sizing for the MWS systems can be found in Section 4.

F. PRELIMINARY HYDRAULIC UPDATES FOR PROJECT 1273 – LINE "C" , CATCH BASIN AND STREET CAPACITY CALC'S

There are new connections to the existing storm drain systems (Project 1273 – Line "C") along Folger Street and there are hydraulic impacts to the existing storm drain systems. The preliminary hydraulic analysis were performed by applying the calculated flow rates and conceptual connections. Detailed hydraulic calculations can be found in Section 5. The hydraulic calculation results indicated that the proposed HGLs are still below the existing ground and meet the storm drain design requirements.

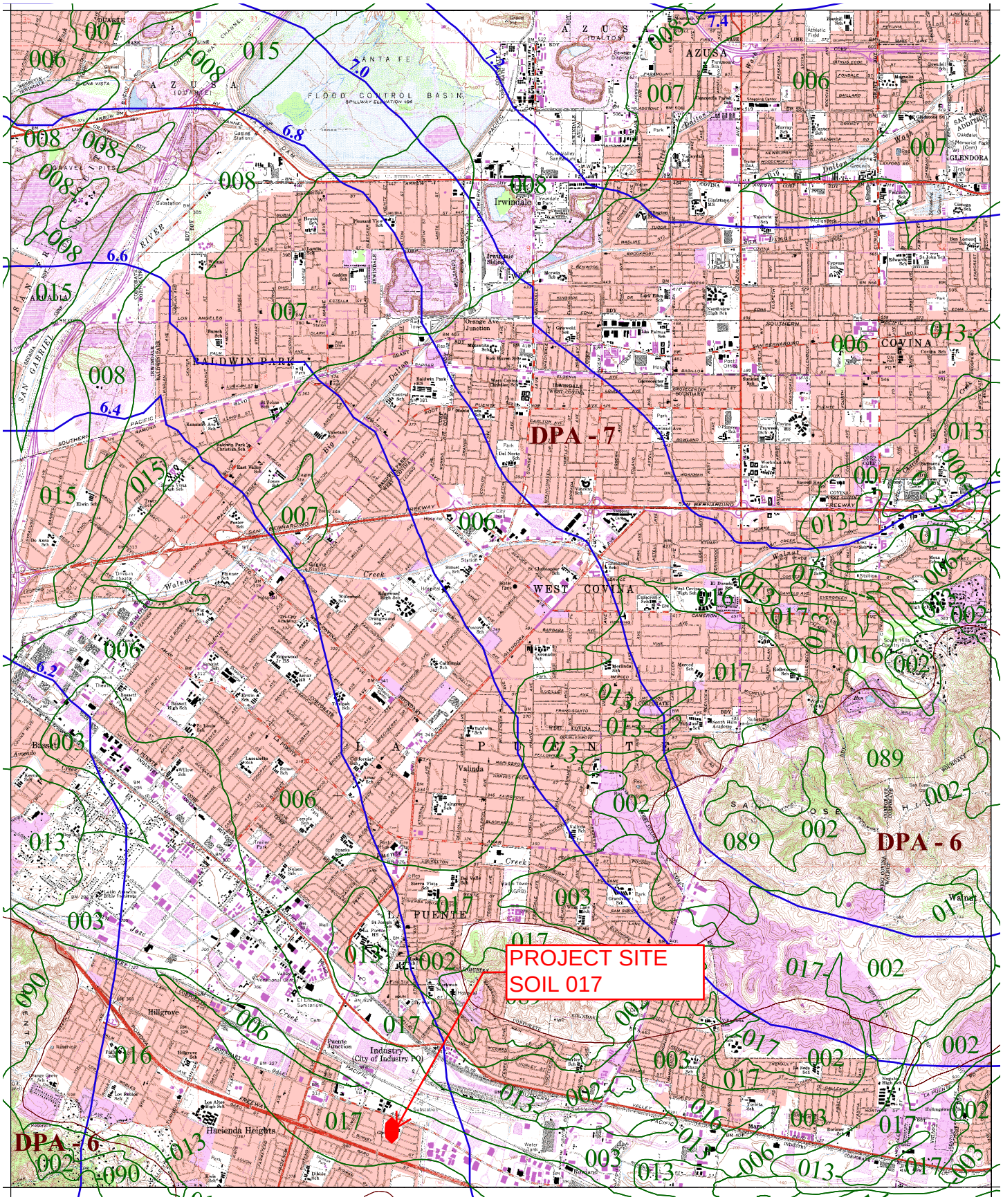
The street capacities along Hinnen Avenue and Glenelder Avenue were performed by applying the FlowMaster program due to the additional tributary areas from the project site. The catch basin sizing calculations were also performed for Catch Basin #4 (for Glenelder street flows) and Catch Basin #6 (for Hinnen street flows). The detailed calculations can be found in Section 5. The calculation results indicated that the street and catch basins have enough capacity to convey the proposed flows.

Overall, it is concluded that there will have no adverse impacts to the existing drainage systems due to the project developments.



VICINITY MAP

N.T.S.



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

N W E S

1 0 1 2 Miles

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

BALDWIN PARK
50-YEAR 24-HOUR ISOHYET

1-H1.21

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

Hydrology Map

A GIS viewer application to view the data for the hydrology manual.

LAYERS

- [x] 50yr Two Tenths (Rainfall)
- [ ] DPA Zones
- [ ] Soils 2004
- [x] Final 85th Percentile, 24-hr Rainfall
- [ ] Final 95th Percentile, 24-hr Rainfall
- [ ] 1-year, 1-hour Rainfall Intensity

SEARCH

Enter Address, Cross Street, or Parcel No.:
(ex: 900 S. Fremont Ave., Fremont@Valley, 5342005904)

16234 Folger St. hacienda heights

Search

Address Search Results:

16234 Folger St hacienda heights

Map Tips

Hold SHIFT to drag a zoom location box.
Hold SHIFT + CTRL to drag a zoom out location box.

SECTION 2

EXISTING CONDITION
HYDROLOGY CALCULATIONS AND MAP

Peak Flow Hydrologic Analysis

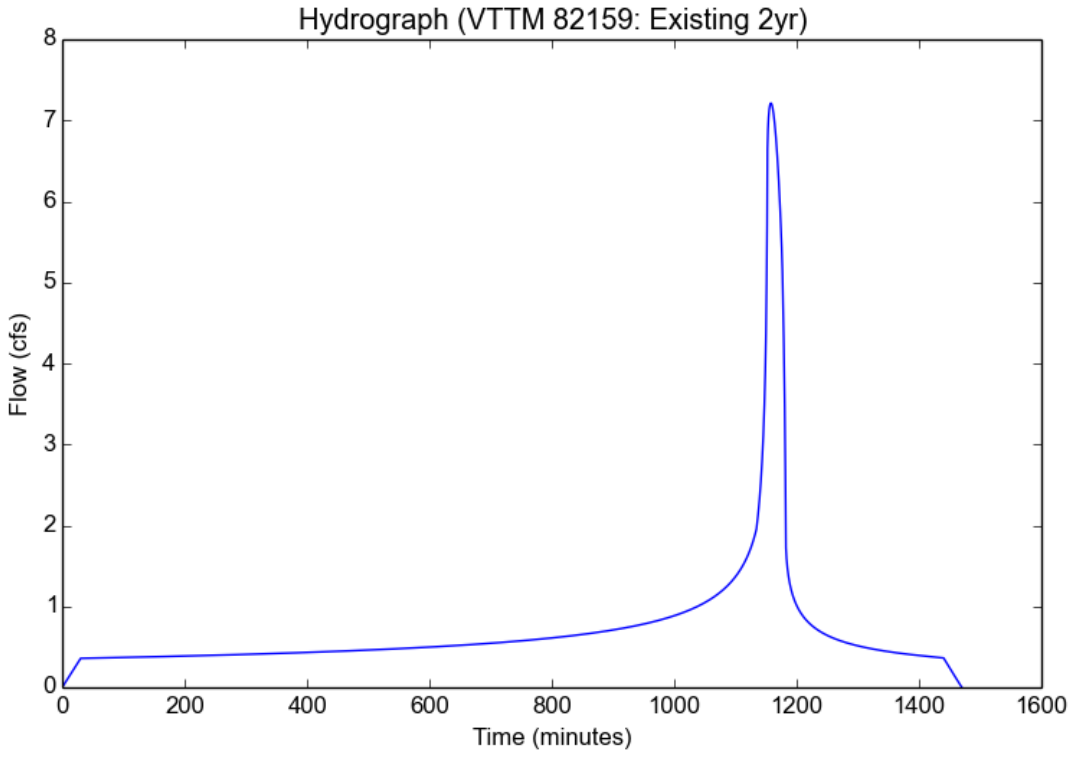
File location: C:/SD/VTTM 082159/Updated/VTTM 082159 - Existing 2-yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Existing 2yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.36
Soil Type	17
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.4768
Peak Intensity (in/hr)	0.6366
Undeveloped Runoff Coefficient (Cu)	0.5476
Developed Runoff Coefficient (Cd)	0.6744
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	7.213
Burned Peak Flow Rate (cfs)	7.213
24-Hr Clear Runoff Volume (ac-ft)	1.4508
24-Hr Clear Runoff Volume (cu-ft)	63198.1452



Peak Flow Hydrologic Analysis

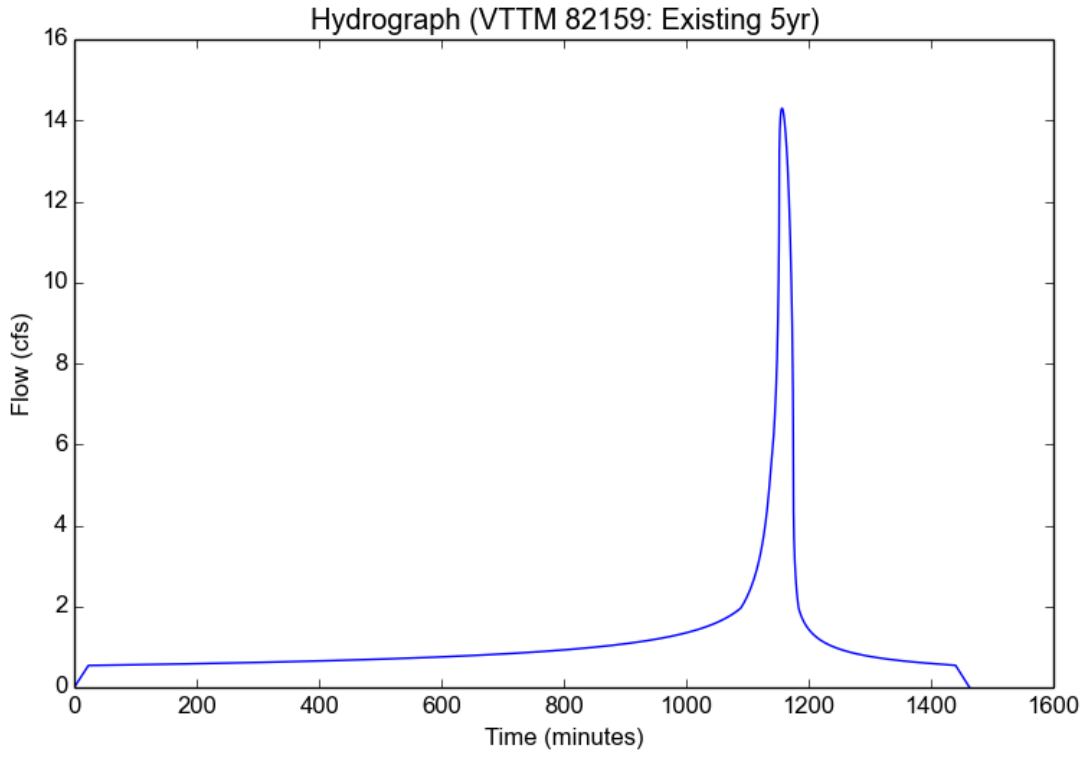
File location: C:/SD/VTTM 082159/Updated/VTTM 082159 - Existing 5-yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Existing 5yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.36
Soil Type	17
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	3.7376
Peak Intensity (in/hr)	1.0884
Undeveloped Runoff Coefficient (Cu)	0.7157
Developed Runoff Coefficient (Cd)	0.782
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	14.2999
Burned Peak Flow Rate (cfs)	14.2999
24-Hr Clear Runoff Volume (ac-ft)	2.3156
24-Hr Clear Runoff Volume (cu-ft)	100867.2544



Peak Flow Hydrologic Analysis

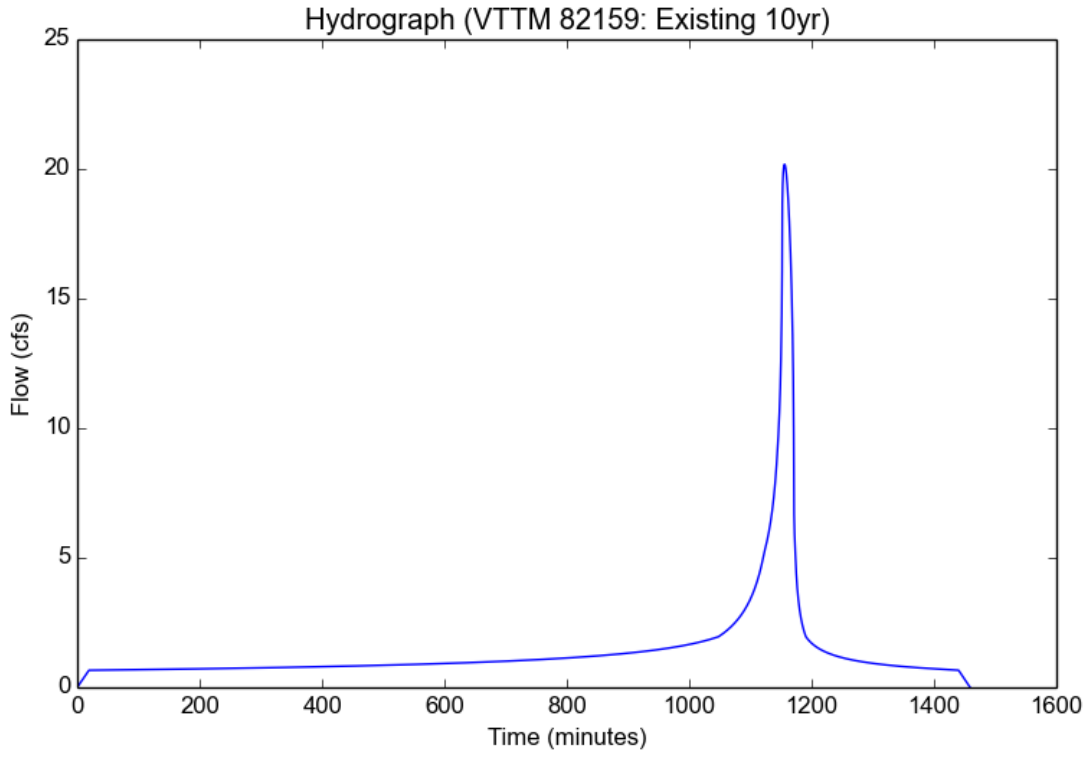
File location: C:/SD/VTTM 082159/Updated/VTTM 082159 - Existing 10-yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Existing 10yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.36
Soil Type	17
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.5696
Peak Intensity (in/hr)	1.4557
Undeveloped Runoff Coefficient (Cu)	0.7831
Developed Runoff Coefficient (Cd)	0.8252
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	20.1804
Burned Peak Flow Rate (cfs)	20.1804
24-Hr Clear Runoff Volume (ac-ft)	2.9287
24-Hr Clear Runoff Volume (cu-ft)	127572.4969



Peak Flow Hydrologic Analysis

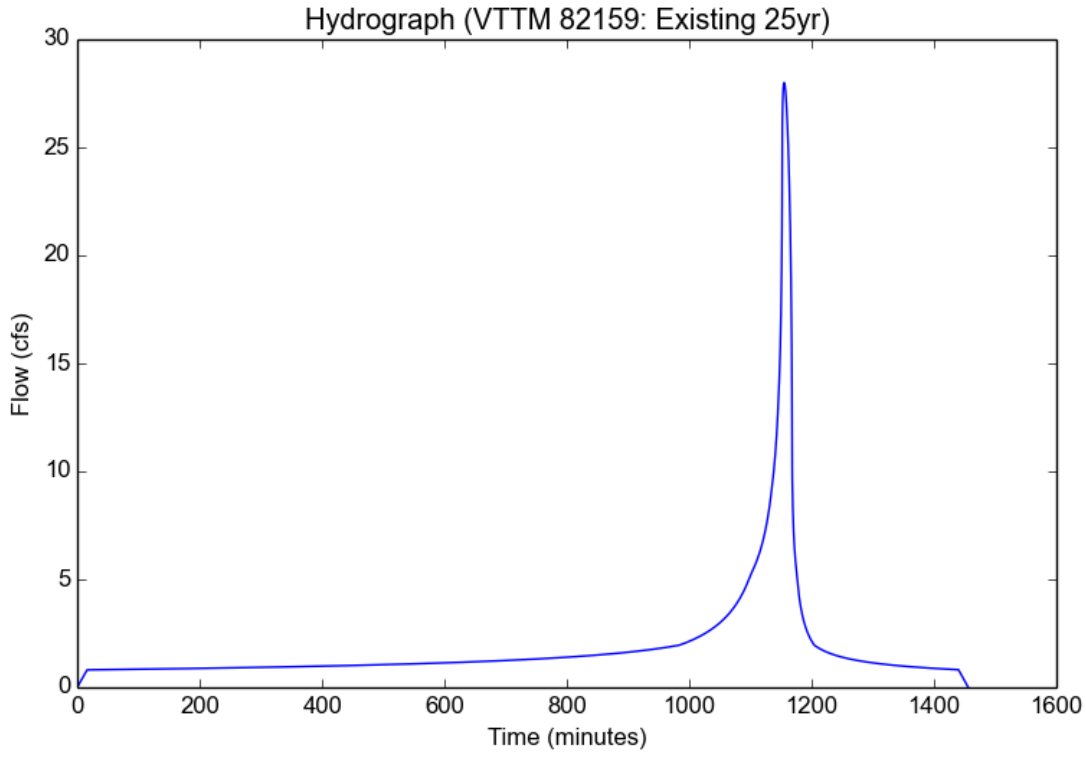
File location: C:/SD/VTTM 082159/Updated/VTTM 082159 - Existing 25-yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Existing 25yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.36
Soil Type	17
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.6192
Peak Intensity (in/hr)	1.9407
Undeveloped Runoff Coefficient (Cu)	0.8355
Developed Runoff Coefficient (Cd)	0.8587
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	27.9973
Burned Peak Flow Rate (cfs)	27.9973
24-Hr Clear Runoff Volume (ac-ft)	3.7567
24-Hr Clear Runoff Volume (cu-ft)	163642.5477



Peak Flow Hydrologic Analysis

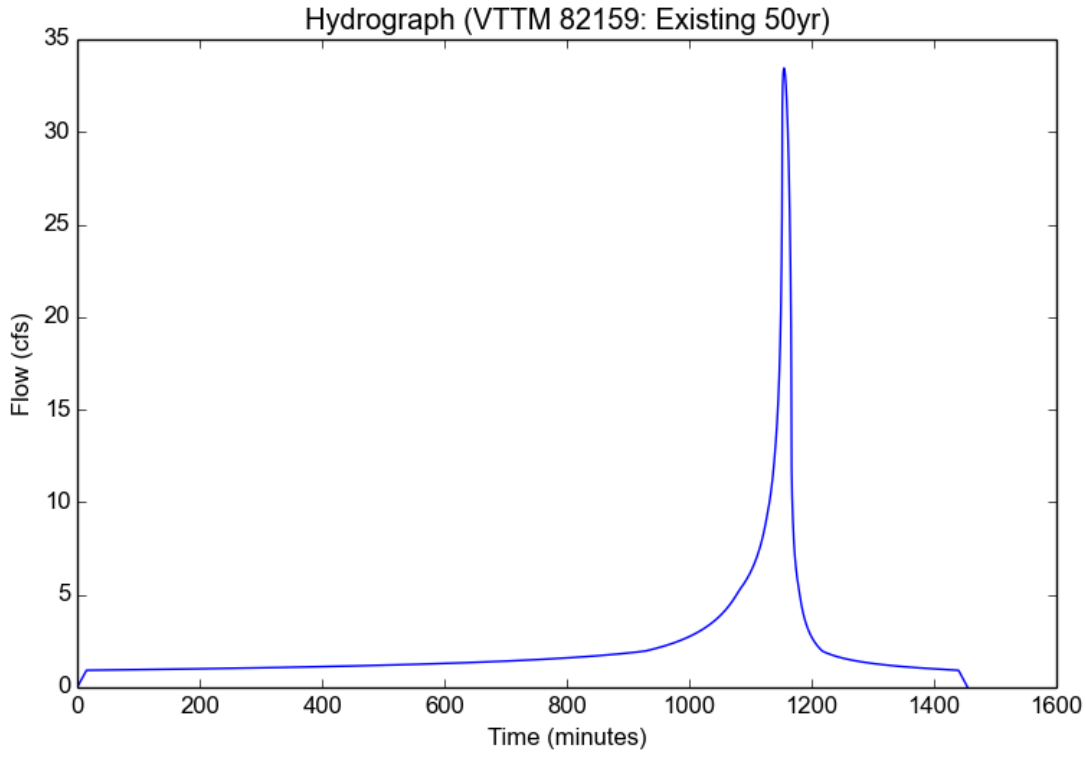
File location: C:/SD/VTTM 082159/Updated/VTTM 082159 - Existing 50-yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Existing 50yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.36
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.4
Peak Intensity (in/hr)	2.2784
Undeveloped Runoff Coefficient (Cu)	0.8592
Developed Runoff Coefficient (Cd)	0.8739
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	33.4511
Burned Peak Flow Rate (cfs)	33.4511
24-Hr Clear Runoff Volume (ac-ft)	4.412
24-Hr Clear Runoff Volume (cu-ft)	192188.1044



EX. STORM DRAIN SYSTEM (PUBLIC)

FOLGER ST (PUBLIC)

EX STORM DRAIN SYSTEM (PUBLIC)

PROJECT BOUNDARY

SCHOOL LAND USE = 3.7 ACRES

SCHOOL SITE

TOTAL AREA = 16.8 ACRES

SCHOOL LAND USE = 6.2 ACRES

HINNEN AVE (PUBLIC)

ROCHLEN ST (PUBLIC)

GLENELDER AVE (PUBLIC)

SHADYBEND DR (PUBLIC)

PROJECT BOUNDARY

PROJECT BOUNDARY

SFR LAND USE = 6.9 ACRES

DENLEY ST (PUBLIC)

BINNEY ST (PUBLIC)

SCALE: 1"=40'

0 20 40 80 120 160

SCALE: 1" = 40'

PREPARED FOR:

LENNAR

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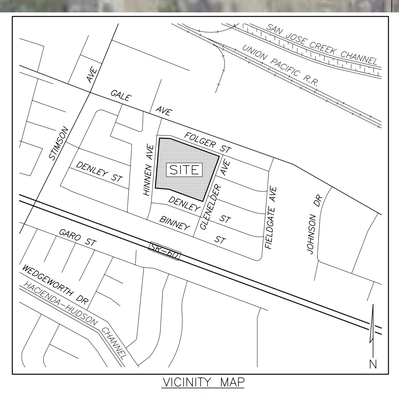
REGISTERED PROFESSIONAL ENGINEER No. 64515 Exp.06/30/19 CIVIL STATE OF CALIFORNIA



VICINITY MAP
N.T.S.

LEGEND

DRAINAGE BOUNDARY

VACANT (AREA=6.2 ACRES, 1% IMPERVIOUSNESS)

ELEMENTARY SCHOOL (AREA=3.7 ACRES, 82% IMPERVIOUSNESS)

THE REST OFF-SITE AREAS WITHIN THE STUDIED BOUNDARY (SFR , AREA=6.9 ACRES, 42% IMPERVIOUSNESS)
EXISTING CONDITION:
THE AREA WEIGHTED AVERAGE IMPERVIOUS PERCENTAGE=
(6.2X1+3.7X82+6.9X42)/16.8=36%

PROPOSED CONDITION:
THE PROJECT AREA (VACANT AND ELEMENTARY SCHOOL ABOVE) HAS A 55% IMPERVIOUSNESS WITH DUPLEXES RESIDENTIAL LAND USE
THE REST OFF-SITE AREAS WITHIN THE STUDIED BOUNDARY (SFR , AREA=6.9 ACRES, 42% IMPERVIOUSNESS)
THE AREA WEIGHTED AVERAGE IMPERVIOUS PERCENTAGE=
(6.2X55+3.7X55+6.9X42)/16.8=50%

THOMAS GUIDE PAGE: 678
GRID: D2

EXHIBIT 1
LAND USE EXHIBIT
VESTING TENTATIVE TRACT MAP 082159
16234 FOLGER STREET, HACIENDA HEIGHTS, CA 91745

W.O. 3916-28X GLENELDER EXISTING HYDROLOGY MAP

PLOTTED BY: Gary Guan DATE: May. 20, 2019 08:31:24 AM FILE: F:\1037\Engineering\SY_Hydrology\Land Use Map.dwg

EXISTING STORM DRAIN SYSTEM (PROJECT #1273) LINE "C" (PUBLIC)

FOLGER ST (PUBLIC)

EXISTING STORM DRAIN SYSTEM (PROJECT #1273) LINE "C" (PUBLIC)

PROJECT BOUNDARY

ΣQ_{25} =28.00cfs
ΣA=16.8ac

353.0 EL.

HINNEN AVE (PUBLIC)

ROCHLEN ST (PUBLIC)

SCHOOL SITE

1A
16.8

L=1,835', SLOPE=1.3%

GLENELDER AVE (PUBLIC)

SHADYBEND DR (PUBLIC)

PROJECT BOUNDARY

PROJECT BOUNDARY

DENLEY ST (PUBLIC)

BINNEY ST (PUBLIC)

379.0 EL.

SCALE: 1"=40'

0 20 40 80 120 160
SCALE: 1" = 40'

PREPARED FOR:
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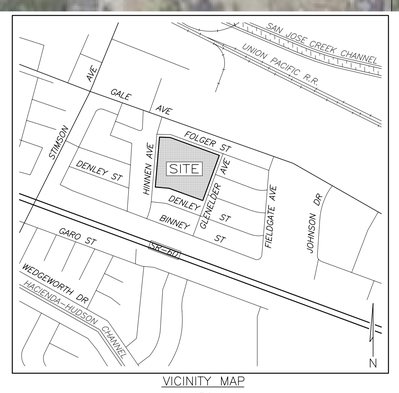


VICINITY MAP
N.T.S.

THOMAS GUIDE PAGE: 678
GRID: D2

HYDROLOGIC INFORMATION

7	DPA ZONE
017	SOIL GROUP
6.4"	50-YEAR 24-HOUR ISOHYET
36	AREA WEIGHTED AVERAGE % IMPERVIOUSNESS (SEE LAND USE EXHIBIT 1)
1	BURN FACTOR
1	BULKING FACTOR

LEGEND

	DRAINAGE BOUNDARY
1A / 1.0	AREA DESIGNATION FOR AREA "A" AREA ACREAGE (IN ACRES)
	FLOW LINE
ΣQ_{25} =30.0cfs / ΣA=10.0ac	SUMMATION 25-YR FLOW RATE TOTAL DRAINAGE AREA IN ACRES

NOTE:

- NOT WITHIN COUNTY ADOPTED FLOODWAY
- NOT WITHIN FEMA FLOOD ZONE A
- THE DRAINAGE FACILITIES TO BE MAINTAINED BY LACDPW UNLESS OTHERWISE NOTED.

EXHIBIT 2
EXISTING CONDITION HYDROLOGY MAP
VESTING TENTATIVE TRACT MAP 082159
16234 FOLGER STREET, HACIENDA HEIGHTS, CA 91745

W.O. 3916-28X GLENELDER EXISTING HYDROLOGY MAP

PLOTTED BY: Gary Guan DATE: May. 20, 2019 08:30:39 AM FILE: F:\1037\Engineering\SY_Hydrology\Ex Hydrology Map.dwg

SECTION 3

PROPOSED CONDITION
HYDROLOGY CALCULATIONS AND MAP

Peak Flow Hydrologic Analysis

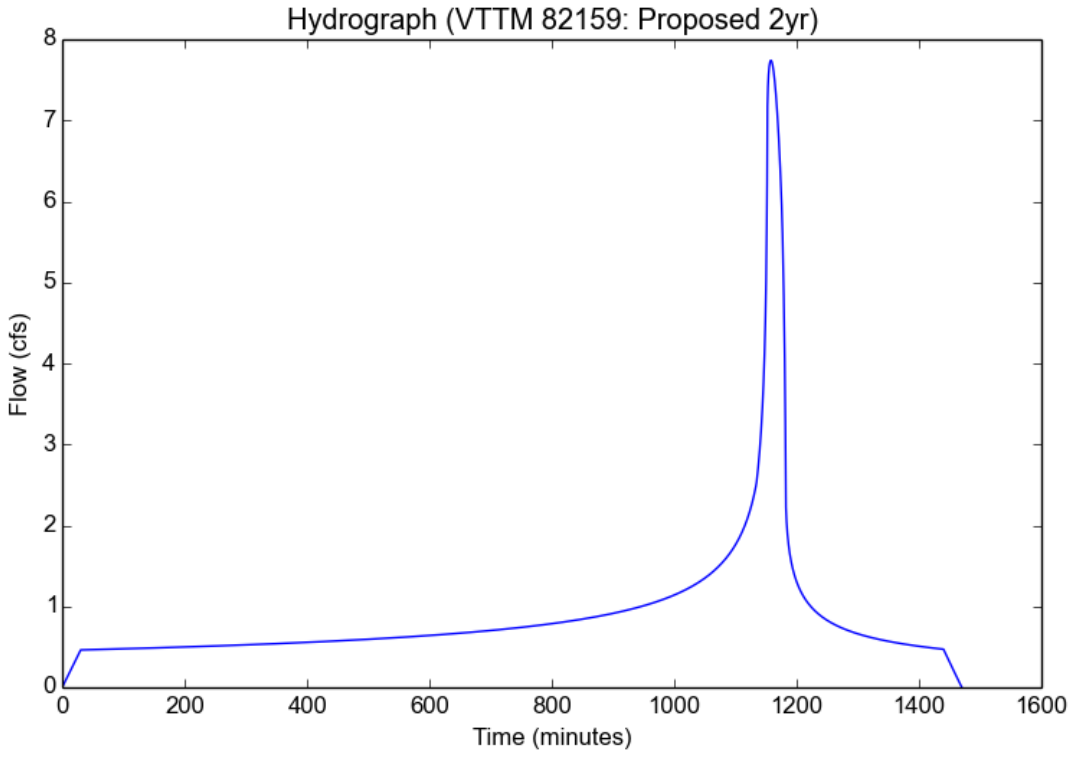
File location: C:/SD/VTTM 082159/Updated/VTTM 82159 - Proposed - 2yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Proposed 2yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.5
Soil Type	17
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.4768
Peak Intensity (in/hr)	0.6366
Undeveloped Runoff Coefficient (Cu)	0.5476
Developed Runoff Coefficient (Cd)	0.7238
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	7.7407
Burned Peak Flow Rate (cfs)	7.7407
24-Hr Clear Runoff Volume (ac-ft)	1.8105
24-Hr Clear Runoff Volume (cu-ft)	78865.1472



Peak Flow Hydrologic Analysis

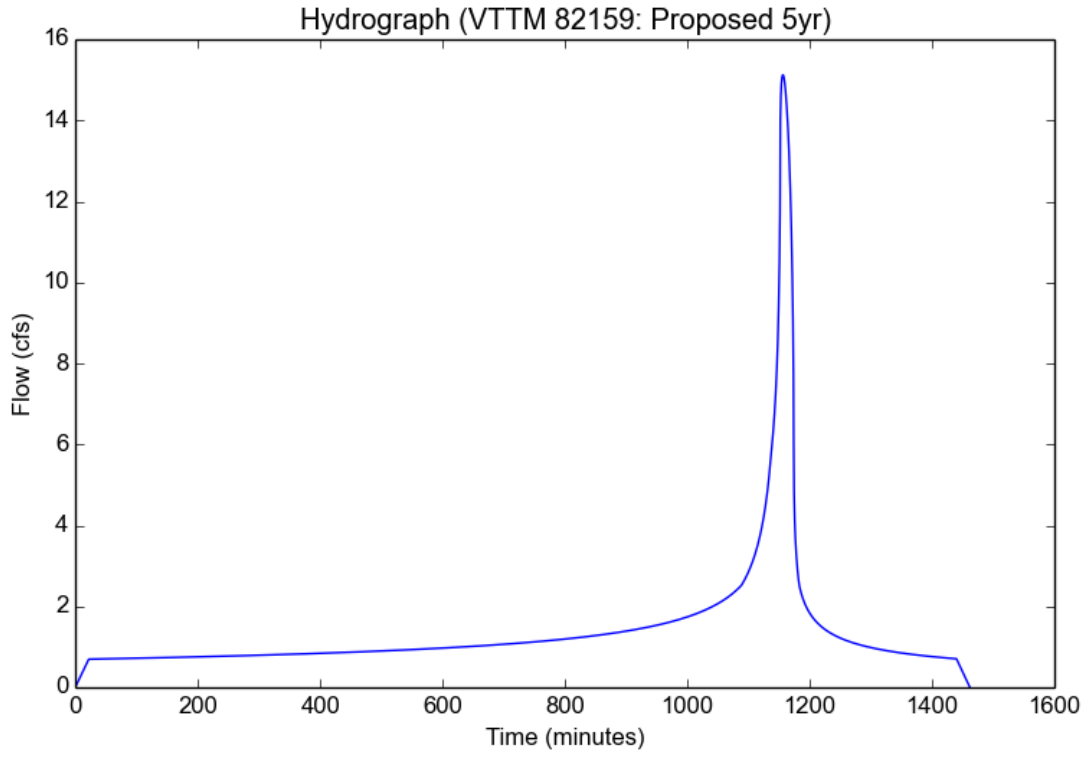
File location: C:/SD/VTTM 082159/Updated/VTTM 82159 - Proposed - 5yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Proposed 5yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.5
Soil Type	17
Design Storm Frequency	5-yr
Fire Factor	0
LID	False

Output Results

Modeled (5-yr) Rainfall Depth (in)	3.7376
Peak Intensity (in/hr)	1.1114
Undeveloped Runoff Coefficient (Cu)	0.7199
Developed Runoff Coefficient (Cd)	0.8099
Time of Concentration (min)	22.0
Clear Peak Flow Rate (cfs)	15.123
Burned Peak Flow Rate (cfs)	15.123
24-Hr Clear Runoff Volume (ac-ft)	2.8308
24-Hr Clear Runoff Volume (cu-ft)	123308.3227



Peak Flow Hydrologic Analysis

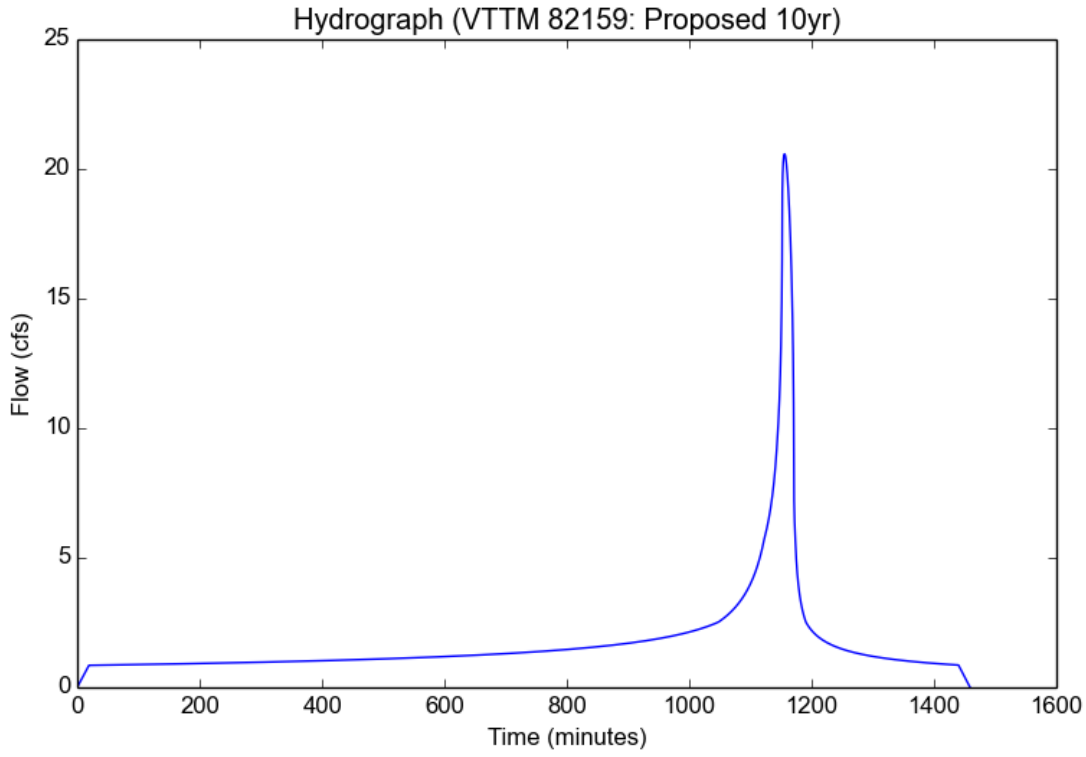
File location: C:/SD/VTTM 082159/Updated/VTTM 82159 - Proposed - 10yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Proposed 10yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.5
Soil Type	17
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.5696
Peak Intensity (in/hr)	1.4557
Undeveloped Runoff Coefficient (Cu)	0.7831
Developed Runoff Coefficient (Cd)	0.8415
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	20.5808
Burned Peak Flow Rate (cfs)	20.5808
24-Hr Clear Runoff Volume (ac-ft)	3.5371
24-Hr Clear Runoff Volume (cu-ft)	154076.4892



Peak Flow Hydrologic Analysis

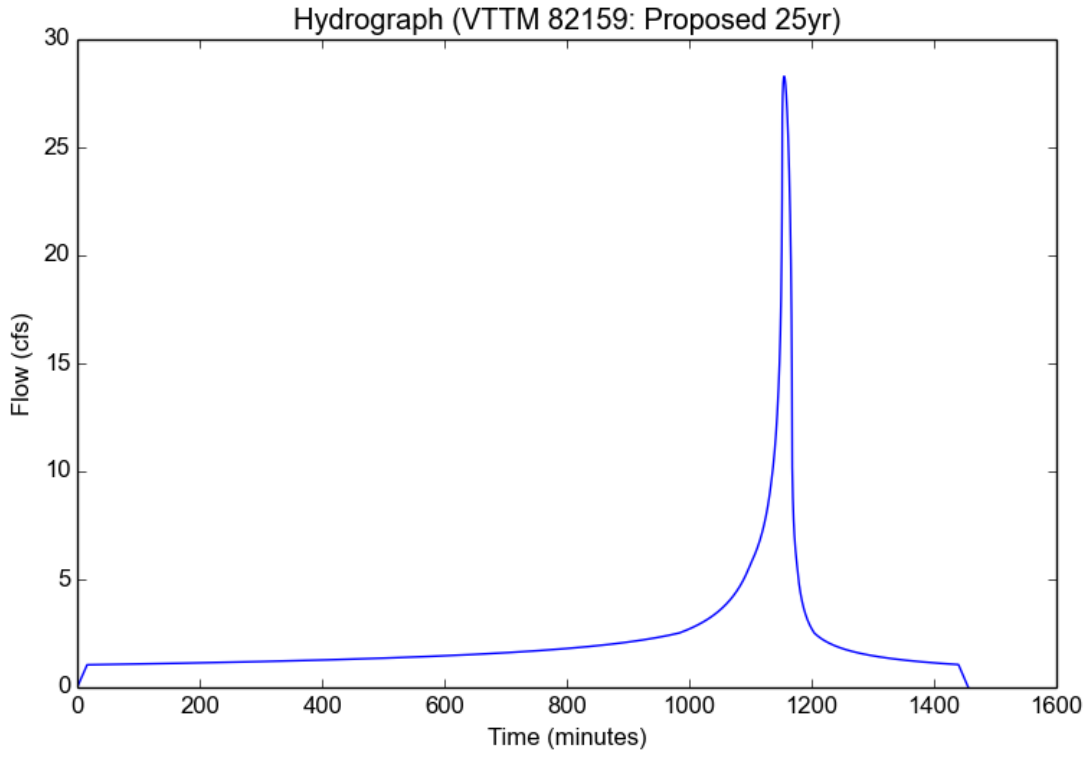
File location: C:/SD/VTTM 082159/Updated/VTTM 82159 - Proposed - 25yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Proposed 25yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.5
Soil Type	17
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.6192
Peak Intensity (in/hr)	1.9407
Undeveloped Runoff Coefficient (Cu)	0.8355
Developed Runoff Coefficient (Cd)	0.8677
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	28.2917
Burned Peak Flow Rate (cfs)	28.2917
24-Hr Clear Runoff Volume (ac-ft)	4.4709
24-Hr Clear Runoff Volume (cu-ft)	194753.7713



Peak Flow Hydrologic Analysis

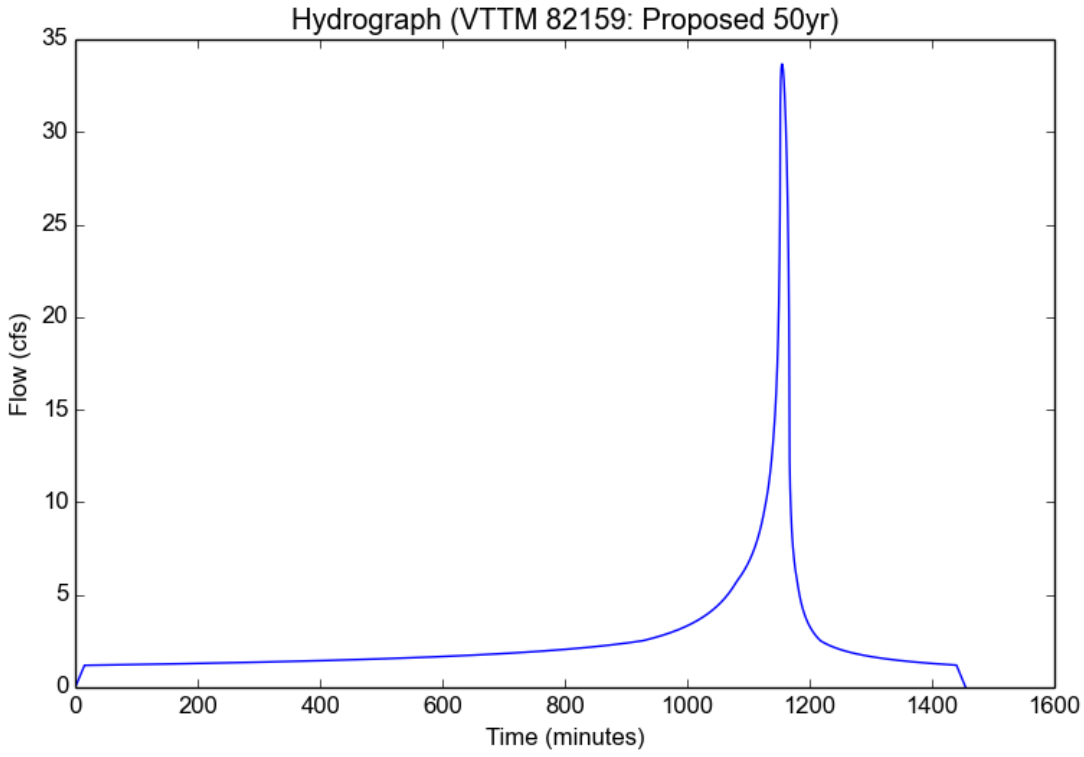
File location: C:/SD/VTTM 082159/Updated/VTTM 82159 - Proposed - 50yr.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Proposed 50yr
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
50-yr Rainfall Depth (in)	6.4
Percent Impervious	0.5
Soil Type	17
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.4
Peak Intensity (in/hr)	2.2784
Undeveloped Runoff Coefficient (Cu)	0.8592
Developed Runoff Coefficient (Cd)	0.8796
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	33.6696
Burned Peak Flow Rate (cfs)	33.6696
24-Hr Clear Runoff Volume (ac-ft)	5.1963
24-Hr Clear Runoff Volume (cu-ft)	226351.9731



EXISTING CONDITION
ΣQ_{25} =28.00cfs
ΣA=16.8ac

PROPOSED CONDITION
ΣQ_{25} =28.29cfs
ΣA=16.8ac

EXISTING STORM DRAIN SYSTEM (PROJECT #1273) LINE "C" (PUBLIC)

353.0 EL.

NEW CONNECTION
ΣQ_{25} =11.74cfs
ΣA=6.97ac

EX. CATCH BASIN (TO BE REMOVED)

TRACT# 2

EXISTING STORM DRAIN SYSTEM (PROJECT #1273) LINE "C" (PUBLIC)

CATCH BASIN #4 (10-FT) (PUBLIC)

MWS #4 (4'x13') (PRIVATE)

FOLGER ST (PUBLIC)

MWS #2 (8'x16') (PRIVATE)

CATCH BASIN #5 (PUBLIC) (EX.)

CATCH BASIN #6 (10-FT) (PUBLIC)

EX. CATCH BASIN (TO BE RELOCATED)

MWS #5 (4'x15') (PRIVATE)

CATCH BASIN #2 (PRIVATE)

PROJECT BOUNDARY

CATCH BASIN #3 (PRIVATE)

DVERT SYSTEM TO DIVERT LOW FLOWS (PRIVATE)

AREA DRAIN AND LOW FLOW PIPE (PRIVATE)

EX. CATCH BASIN (TO BE RELOCATED)

MWS#3 (8'x16') (PRIVATE)

PROPOSED STORM DRAIN (PRIVATE)

A-5 1.52

A-3 2.10

A-4 1.91

PRIVATE DRIVEWAY "A" AND FIRELANE

DVERT SYSTEM TO DIVERT LOW FLOWS (PRIVATE)

CATCH BASIN #1 (PRIVATE)

MWS #1 (8'x12') (PRIVATE)

A-1 2.15

1A 16.8

AREA DRAIN AND LOW FLOW PIPE (PRIVATE)

A-6 6.40

AREA DRAIN AND LOW FLOW PIPE (PRIVATE)

PROJECT BOUNDARY

A-2 2.72

PRIVATE DRIVEWAY "A" AND FIRELANE

L=1,835', SLOPE=1.3%

TRACT# 2 PROJECT BOUNDARY

DENLEY ST (PUBLIC)

BINNEY ST (PUBLIC)

379.0 EL.

TRACT# 21865

TRACT# 21616

HINNEN AVE (PUBLIC)

ROCHLEN ST (PUBLIC)

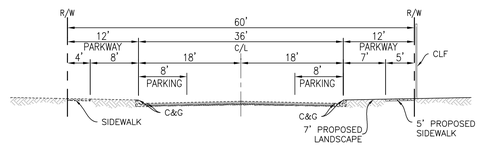
SHADYBEND DR (PUBLIC)

GLENELDER AVE (PUBLIC)

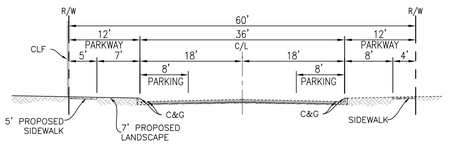
SCALE: 1"=40'

0 20 40 80 120 160

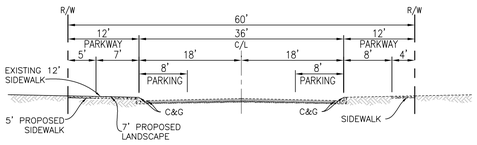
SCALE: 1" = 40'



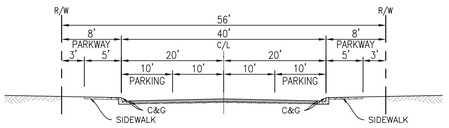
HINNEN AVENUE
EXISTING PUBLIC STREET
N.T.S.



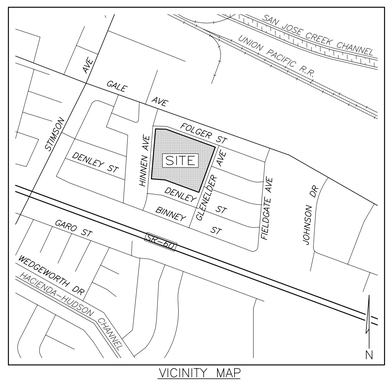
GLENELDER AVENUE
EXISTING PUBLIC STREET
N.T.S.



FOLGER STREET
EXISTING PUBLIC STREET
N.T.S.



PRIVATE DRIVEWAY "A" & FIRE LANE
PRIVATE STREET
N.T.S.



VICINITY MAP
N.T.S.

HYDROLOGIC INFORMATION

7	DPA ZONE
017	SOIL GROUP
6.4"	50-YEAR 24-HOUR ISOHYET
50	AREA WEIGHTED AVERAGE % IMPERVIOUSNESS
1	BURN FACTOR
1	BULKING FACTOR
1.1"	85TH PERCENTILE STORM
PROJECT DESIGN STORM	85TH PERCENTILE STORM
PERCENT OF DESIGN STORM RETAINED ON-SITE	0%

APPORTION OF POST-DEVELOPMENT FLOW RATES PER SUBAREA

SUBAREA	AREA (ACRES)	10-YR FLOW RATE (CFS)	25-YR FLOW RATE (CFS)	50-YR FLOW RATE (CFS)	CATCH BASIN NUMBER
A-1	2.15	2.63	3.62	4.31	#1
A-2	2.72	3.33	4.58	5.45	#2
A-3	2.10	2.57	3.54	4.21	#3
A-4	1.91	2.34	3.22	3.83	#4
A-5	1.52	1.86	2.56	3.05	#5
A-6	6.40	7.84	10.78	12.83	#6
OVERALL	16.80	20.58	28.29	33.67	

ALLOWABLE FLOW RATES

PER LA COUNTY DEPARTMENT OF PUBLIC WORKS DESIGN DIVISION - HYDRAULIC ANALYSIS UNIT, THE Q ALLOWABLE FOR PROJECT 1273 - LINE "C" IS 1.7 CFS/ACRE.
SUBAREA AREA: 16.8 AC
SUBAREA Q ALLOWABLE: 28.56 CFS
UPDATED Q25: 28.29 CFS
THE PROJECT DESIGN FLOWS ARE LESS THAN THE ALLOWABLE DISCHARGE.

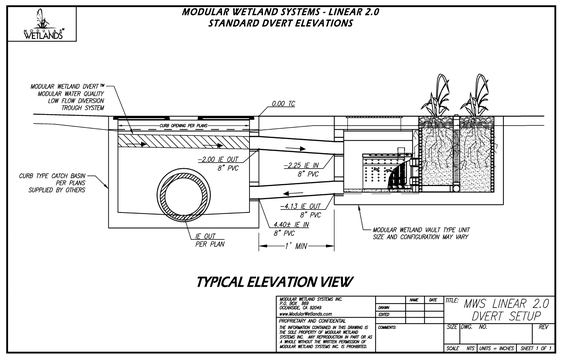
LEGEND

- DRAINAGE BOUNDARY
- SUB-AREA DRAINAGE BOUNDARY
- 1A / 1.0 — AREA DESIGNATION FOR AREA "A" / AREA ACREAGE (IN ACRES)
- A-1 / 1.0 — SUB-AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- FLOW LINE
- ΣQ_{25} =30.0cfs / ΣA=10.0ac — SUMMATION 25-YR FLOW RATE / TOTAL DRAINAGE AREA IN ACRES

PREPARED FOR:
LENNAR
15131 ALTON PARKWAY, SUITE 365
IRVINE, CA 92618
(949) 349-8000

PREPARED BY:
HUNSAKER & ASSOCIATES IRVINE, INC
PLANNING • ENGINEERING • SURVEYING
Three Hughes • Irvine, CA 92618 • PH: (949) 583-1010 • FX: (949) 583-0759

No. 64519 Exp.06/30/19 CIVIL REGISTERED PROFESSIONAL ENGINEER CALIFORNIA



DVERT SYSTEM TO DIVERT THE LOW FLOW
NTS

APPORTION OF POST-DEVELOPMENT WATER QUALITY RATES PER SUBAREA

SUBAREA	AREA (ACRES)	VOLUME (CF) PER CALC'S	VOLUME (CF) 1.5 TIMES	WQ FLOW RATE (CFS) PER CALC'S	WQ FLOW RATE (CFS) 1.5 TIMES	MWS UNITS NUMBER	MWS UNITS SIZE	NOTE
A-1	2.15	4,257	6,386	0.20	0.30	#1	MWS-8-12	
A-2	2.72	5,386	8,079	0.25	0.38	#2	MWS-8-16	
A-3	2.95**	5,841	8,079	0.28	0.41	#3	MWS-8-16**	LOW FLOW PIPE PROVIDED FOR PROJECT AREA ONLY, NO PUBLIC ROAD LOW FLOWS
A-4	0.92	1,822	2,733	0.09	0.13	#4	MWS-4-13	
A-5	–	–	–	–	–	–		
A-6	1.11	2,198	3,297	0.10	0.16	#5	MWS-4-15	
OVERALL	9.85	19,504	29,256	0.92	1.38			

NOTE:
MWS #3 INCLUDES AREA "A-3" AND PROJECT PORTIONS OF AREA "A-5"

NOTE:
- NOT WITHIN COUNTY ADOPTED FLOODWAY
- NOT WITHIN FEMA FLOOD ZONE A
- THE DRAINAGE FACILITIES TO BE MAINTAINED BY LACDPW UNLESS OTHERWISE NOTED.

THOMAS GUIDE PAGE: 678
GRID: D2

EXHIBIT 3
DRAINAGE CONCEPT/HYDROLOGY STUDY FOR
VESTING TENTATIVE TRACT MAP 082159
16234 FOLGER STREET, HACIENDA HEIGHTS, CA 91745

W.O. 3916-22X GLENELDER PROPOSED HYDROLOGY MAP

PLOTTED BY: Gary Guan DATE: May. 28, 2019 10:22:28 AM FILE: F:\1037\Engineering\SY_Hydrology\Prop Hydrology Map.dwg

SECTION 4

LID AND MWS SIZING CALCUALTIONS

Peak Flow Hydrologic Analysis

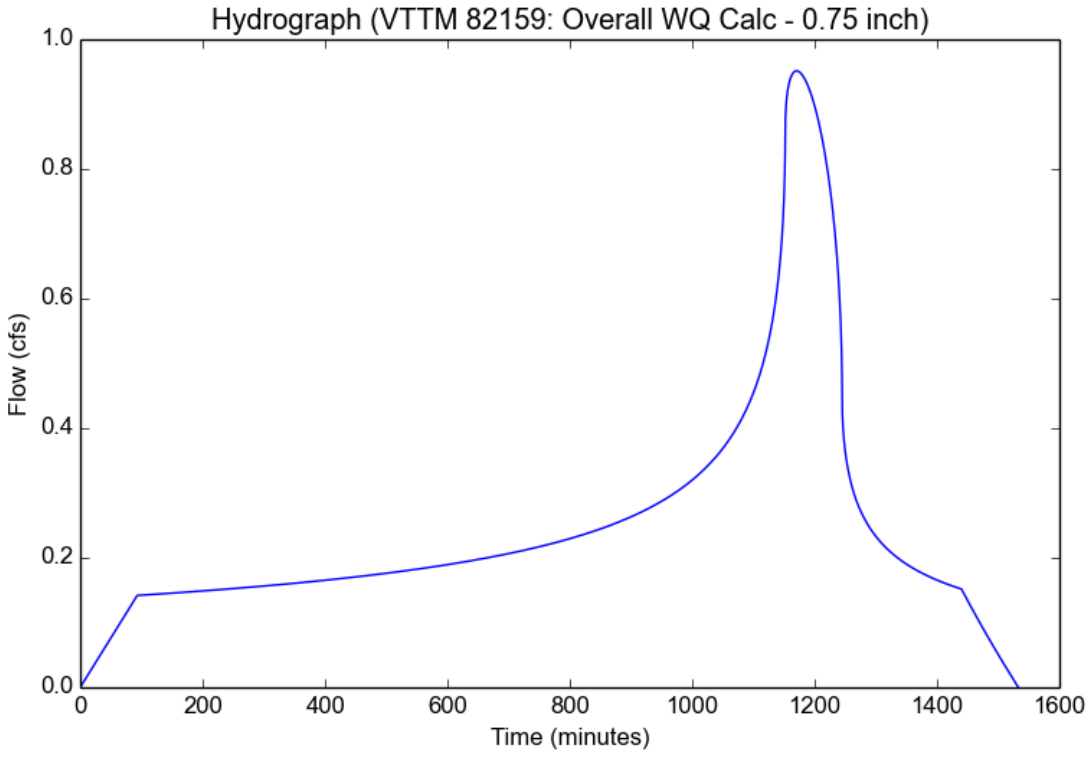
File location: C:/SD/VTTM 082159/Updated/VTTM 82159 - Overall WQ Calc - 0.75 inch.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Overall WQ Calc - 0.75 inch
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.5
Soil Type	17
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1133
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.5
Time of Concentration (min)	93.0
Clear Peak Flow Rate (cfs)	0.9514
Burned Peak Flow Rate (cfs)	0.9514
24-Hr Clear Runoff Volume (ac-ft)	0.5207
24-Hr Clear Runoff Volume (cu-ft)	22682.6096



Peak Flow Hydrologic Analysis

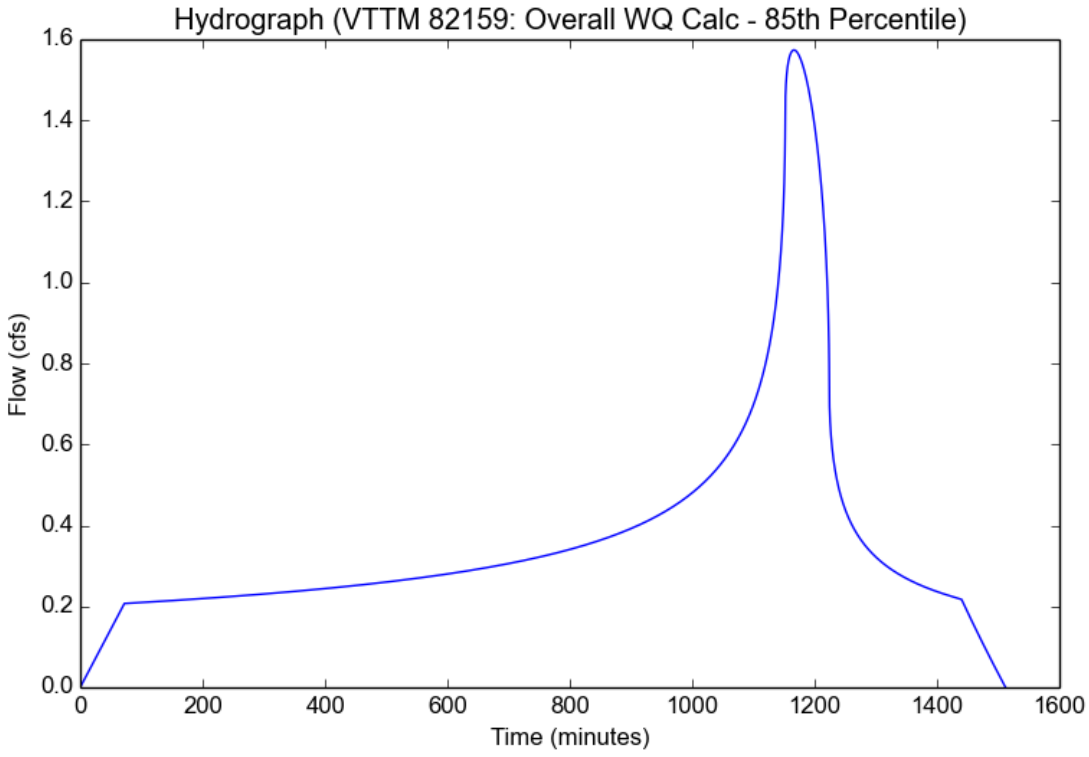
File location: C:/SD/VTTM 082159/Updated/VTTM 82159 - Overall WQ Calc - 85th Percentile.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	VTTM 82159
Subarea ID	Overall WQ Calc - 85th Percentile
Area (ac)	16.8
Flow Path Length (ft)	1835.0
Flow Path Slope (vft/hft)	0.013
85th Percentile Rainfall Depth (in)	1.1
Percent Impervious	0.5
Soil Type	17
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.1
Peak Intensity (in/hr)	0.1874
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.5
Time of Concentration (min)	72.0
Clear Peak Flow Rate (cfs)	1.5738
Burned Peak Flow Rate (cfs)	1.5738
24-Hr Clear Runoff Volume (ac-ft)	0.7637
24-Hr Clear Runoff Volume (cu-ft)	33266.2618



LEGEND

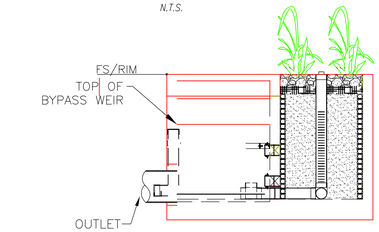
- PROJECT LIMITS
- NAP — NOT A PART
- DRAINAGE MANAGEMENT AREA (DMA) LIMITS
- DMA1 / 1.81 — DMA DESIGNATION AND ACREAGE
- EXISTING STORM DRAIN & FLOW
- PROJECT STORM DRAIN & FLOW
- FLOW DIRECTION (ONSITE)
- FLOW DIRECTION (OFFSITE)
- EXISTING CATCH BASIN
- PROJECT CATCH BASIN W/ BMPS
  STORM DRAIN STENCILING (SD-13)
  FULL TRASH CAPTURE INLET SCREEN
- PROJECT WALKWAYS, DRIVEWAYS AND PRIVATE DRIVEWAY
- COMMON OPEN SPACE AREAS
- PRIVATE OPEN SPACE AREAS
  (FRONT, SIDE, AND REAR WITHIN BOUNDARY AREA OF DWELLING.)
- PROJECT DISCHARGE POINT
- PROPRIETARY BIOFILTRATION
  MODULAR WETLAND SYSTEM (OR APPROVED EQUAL)
- AREA DRAIN AND LOW FLOW PIPE
- DWELLING AREA LIMITS

DMA TABLE

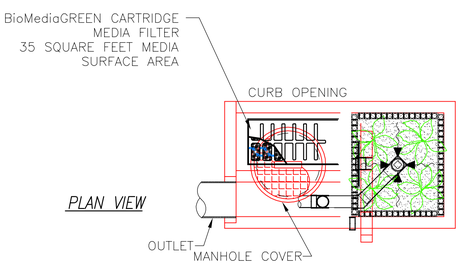
DMA	AREA (ACRES)	VOLUME (CF) PER CALC'S	VOLUME (CF) 1.5 TIMES	WQ FLOW RATE (CFS) PER CALC'S	WQ FLOW RATE (CFS) 1.5 TIMES	MWS UNITS NUMBER	MWS UNITS SIZE	NOTE
1	2.15	4,257	6,386	0.20	0.30	#1	MWS-8-12	LOW FLOW PIPE PROVIDED FOR PROJECT AREA ONLY, NO PUBLIC ROAD LOW FLOWS
2	2.72	5,386	8,079	0.25	0.38	#2	MWS-8-16	
3	2.95	5,841	8,079	0.28	0.41	#3	MWS-8-16	
4	0.92	1,822	2,733	0.09	0.13	#4	MWS-4-13	
5	1.11	2,198	3,297	0.10	0.16	#5	MWS-4-15	
OVERALL	9.85	19,504	29,256	0.92	1.38			

PROPRIETARY BIOFILTRATION (MWS) TYPICAL SECTION DETAIL

N.T.S.



ELEVATION VIEW



PLAN VIEW

GRAPHIC SCALE
0 20 40 80
(IN FEET)
1 INCH = 40 FT.

LOW IMPACT DEVELOPMENT (LID) PLAN - SITE PLAN

APPLICANT:
LENNAR
15131 ALTON PARKWAY, SUITE 365
IRVINE, CA 92618
(949) 349-8100

PREPARED BY:
HUNSAKER & ASSOCIATES IRVINE, INC.
PLANNING • ENGINEERING • SURVEYING
Three Hughes • Irvine, CA 92618 • PH: (949) 583-1010 • FX: (949) 583-0759

"VESTING TENTATIVE TRACT MAP NO. 082159"
16234 FOLGER STREET
CITY OF HACIENDA HEIGHTS
LOS ANGELES COUNTY, CA

DRAFTED BY:	DATE:	W.O. NO:	SHEET NO:
TIH	05/20/2018	3916-28X	1 OF 1

DATE: May. 29, 2019 09:25:04 AM FILE: F:\1037\Planning\SY_WQ\LID\Exhibits\LID_SP Glenelder.dwg

SECTION 5

PRELIMINARY HYDRAULIC UPDATES FOR PROJECT 1273 - LINE “C”, CATCH BASIN AND STREET CAPACITY CALC’S

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4	1		1.500														
CD	2	4	1		2.000														
CD	3	4	1		2.500														
CD	4	4	1		2.750														
CD	5	4	1		3.500														
CD	6	3	0	.000	5.000	2.000	.000	.000	.00										

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -
Hacienda Heights Project No. 1273
HEADING LINE NO 2 IS -
Updated Hydraulic Calculations for Line C
HEADING LINE NO 3 IS -

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1130.000	342.020	5	347.200

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1189.000	342.160	5	.013	.000	.000	.000	0

ELEMENT NO 3 IS A TRANSITION * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE
	1192.200	342.167	5	.013	.000	.000

WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1198.200	342.180	6	.014	.000	.000	.000	0

ELEMENT NO 5 IS A TRANSITION * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE
	1208.200	342.200	6	.014	.000	.000

ELEMENT NO 6 IS A JUNCTION * * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1210.000	342.210	6	2	0	.013	17.710	.000	342.300	.000	60.000	.000

RADIUS	ANGLE
.000	.000

WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1214.200	342.220	5	.013	22.500	10.695	.000	0

ELEMENT NO 8 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1230.370	342.740	5	.013	22.500	41.177	.000	0

ELEMENT NO 9 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H

```
                    1235.000  342.890    5              .013                                        .000      .000      .000     0
ELEMENT NO  10 IS A JUNCTION         *         *     *     *                *                   *               *
          U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                    1235.001  342.891    5     1     0   .013     2.550      .000   343.200      .000  60.000     .000
                                                                                      RADIUS    ANGLE
                                                                                        .000    .000
                                            W S P G W                                                    PAGE NO   3
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  11 IS A REACH            *         *     *
          U/S DATA   STATION    INVERT  SECT              N                                    RADIUS    ANGLE     ANG PT  MAN H
                    1241.870  343.190    5              .013                                        .000      .000      .000     0
ELEMENT NO  12 IS A JUNCTION         *         *     *     *                *                   *               *
          U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                    1246.530  343.940    4     1     0   .013      .001      .000   344.500      .000  90.000     .000
                                                                                      RADIUS    ANGLE
                                                                                        .000    .000
ELEMENT NO  13 IS A REACH            *         *     *
          U/S DATA   STATION    INVERT  SECT              N                                    RADIUS    ANGLE     ANG PT  MAN H
                    1261.380  344.440    4              .013                                        .000      .000      .000     0
ELEMENT NO  14 IS A REACH            *         *     *
          U/S DATA   STATION    INVERT  SECT              N                                    RADIUS    ANGLE     ANG PT  MAN H
                    1273.430  344.840    4              .013                                      44.990   15.346      .000     0
ELEMENT NO  15 IS A REACH            *         *     *
          U/S DATA   STATION    INVERT  SECT              N                                    RADIUS    ANGLE     ANG PT  MAN H
                    1285.000  345.230    4              .013                                        .000      .000      .000     0
ELEMENT NO  16 IS A REACH            *         *     *
          U/S DATA   STATION    INVERT  SECT              N                                    RADIUS    ANGLE     ANG PT  MAN H
                    1440.400  346.470    4              .013                                        .000      .000      .000     0
ELEMENT NO  17 IS A JUNCTION         *         *     *     *                *                   *               *
          U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                    1440.401  346.471    4     2     0   .013    11.740      .000   347.000      .000  90.000     .000
                                                                                      RADIUS    ANGLE
                                                                                        .000    .000
ELEMENT NO  18 IS A REACH            *         *     *
          U/S DATA   STATION    INVERT  SECT              N                                    RADIUS    ANGLE     ANG PT  MAN H
                    1657.070  348.210    4              .013                                        .000      .000      .000     0
ELEMENT NO  19 IS A JUNCTION         *         *     *     *                *                   *               *
          U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                    1661.731  348.250    4     0     0   .013      .000      .000      .000      .000    .000     .000
                                                                                      RADIUS    ANGLE
                                                                                        .000    .000
                                            W S P G W                                                    PAGE NO   4
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  20 IS A REACH            *         *     *
          U/S DATA   STATION    INVERT  SECT              N                                    RADIUS    ANGLE     ANG PT  MAN H
                    1770.000  349.110    4              .013                                        .000      .000      .000     0
ELEMENT NO  21 IS A REACH            *         *     *
          U/S DATA   STATION    INVERT  SECT              N                                    RADIUS    ANGLE     ANG PT  MAN H
                    1975.130  350.400    4              .013                                        .000      .000      .000     0
ELEMENT NO  22 IS A JUNCTION         *         *     *     *                *                   *               *
          U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
```

	1975.131	350.401	4	1	0	.013	3.220	.000	344.500	.000	80.000	.000
									RADIUS	ANGLE		
									.000	.000		

ELEMENT NO 23 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	2026.000	350.730	4	.013	.000	.000	.000	0

ELEMENT NO 24 IS A JUNCTION * * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	2033.000	350.770	4	3	0	.013	29.780	.000	350.800	.000	60.000	.000
									RADIUS	ANGLE		
									.000	.000		

ELEMENT NO 25 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	2068.200	351.000	4	.013	.000	.000	.000	0

ELEMENT NO 26 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	2068.200	351.000	4	351.000

Program Package Serial Number: 7181

WATER SURFACE PROFILE LISTING Date: 5-18-2019 Time: 6:31:53

Hacienda Heights Project No. 1273

Updated Hydraulic Calculations for Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1130.000	342.020	5.180	347.200	77.00	8.00	.99	348.19	.00	2.74	.00	3.500	.000	.00	1 .0
59.000	.0024					.0059	.35	5.18	.00	3.50	.013	.00	.00	PIPE
1189.000	342.160	5.386	347.546	77.00	8.00	.99	348.54	.00	2.74	.00	3.500	.000	.00	1 .0
TRANS STR	.0022					.0059	.02	5.39	.00		.013	.00	.00	PIPE
1192.200	342.167	5.397	347.564	77.00	7.70	.92	348.49	.00	3.58	2.00	5.000	2.000	.00	0 .0
6.000	.0022					.0082	.05	5.40	.61	5.00	.014	.00	.00	BOX
1198.200	342.180	5.434	347.614	77.00	7.70	.92	348.53	.00	3.58	2.00	5.000	2.000	.00	0 .0
TRANS STR	.0020					.0082	.08	5.43	.61		.014	.00	.00	BOX
1208.200	342.200	5.496	347.696	77.00	7.70	.92	348.62	.00	3.58	2.00	5.000	2.000	.00	0 .0
JUNCT STR	.0055					.0042	.01	.00	.61		.013	.00	.00	BOX
1210.000	342.210	6.091	348.301	59.29	6.16	.59	348.89	.00	2.41	.00	3.500	.000	.00	1 .0
4.200	.0024					.0035	.01	.00	.00	3.50	.013	.00	.00	PIPE
1214.200	342.220	6.136	348.356	59.29	6.16	.59	348.95	.00	2.41	.00	3.500	.000	.00	1 .0
16.170	.0322					.0035	.06	.00	.00	1.38	.013	.00	.00	PIPE
1230.370	342.740	5.752	348.492	59.29	6.16	.59	349.08	.00	2.41	.00	3.500	.000	.00	1 .0
4.630	.0324					.0035	.02	5.75	.00	1.38	.013	.00	.00	PIPE
1235.000	342.890	5.618	348.508	59.29	6.16	.59	349.10	.00	2.41	.00	3.500	.000	.00	1 .0
JUNCT STR	1.0000					.0033	.00	5.62	.00		.013	.00	.00	PIPE

Program Package Serial Number: 7181

WATER SURFACE PROFILE LISTING Date: 5-18-2019 Time: 6:31:53

Hacienda Heights Project No. 1273

Updated Hydraulic Calculations for Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1235.001	342.891	5.711	348.602	56.74	5.90	.54	349.14	.00	2.36	.00	3.500	.000	.00	1 .0
6.869	.0435					.0032	.02	5.71	.00	1.24	.013	.00	.00	PIPE
1241.870	343.190	5.433	348.623	56.74	5.90	.54	349.16	.00	2.36	.00	3.500	.000	.00	1 .0
JUNCT STR	.1609					.0073	.03	5.43	.00		.013	.00	.00	PIPE
1246.530	343.940	3.890	347.830	56.74	9.55	1.42	349.25	.00	2.44	.00	2.750	.000	.00	1 .0
14.850	.0337					.0115	.17	3.89	.00	1.51	.013	.00	.00	PIPE
1261.380	344.440	3.561	348.001	56.74	9.55	1.42	349.42	.00	2.44	.00	2.750	.000	.00	1 .0
12.050	.0332					.0115	.14	.00	.00	1.52	.013	.00	.00	PIPE
1273.430	344.840	3.416	348.256	56.74	9.55	1.42	349.67	.00	2.44	.00	2.750	.000	.00	1 .0
11.570	.0337					.0115	.13	3.42	.00	1.51	.013	.00	.00	PIPE
1285.000	345.230	3.160	348.390	56.74	9.55	1.42	349.81	.00	2.44	.00	2.750	.000	.00	1 .0
155.400	.0080					.0115	1.79	3.16	.00	2.75	.013	.00	.00	PIPE
1440.400	346.470	3.708	350.178	56.74	9.55	1.42	351.60	.00	2.44	.00	2.750	.000	.00	1 .0
JUNCT STR	1.0313					.0094	.00	3.71	.00		.013	.00	.00	PIPE
1440.401	346.471	4.759	351.230	45.00	7.58	.89	352.12	.00	2.22	.00	2.750	.000	.00	1 .0
216.669	.0080					.0072	1.57	4.76	.00	2.14	.013	.00	.00	PIPE
1657.070	348.210	4.588	352.798	45.00	7.58	.89	353.69	.00	2.22	.00	2.750	.000	.00	1 .0
JUNCT STR	.0086					.0072	.03	4.59	.00		.013	.00	.00	PIPE

Program Package Serial Number: 7181

WATER SURFACE PROFILE LISTING Date: 5-18-2019 Time: 6:31:53

Hacienda Heights Project No. 1273

Updated Hydraulic Calculations for Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1661.731	348.250	4.582	352.832	45.00	7.58	.89	353.72	.00	2.22	.00	2.750	.000	.00	1 .0
108.269	.0079					.0072	.78	4.58	.00	2.15	.013	.00	.00	PIPE
1770.000	349.110	4.506	353.616	45.00	7.58	.89	354.51	.00	2.22	.00	2.750	.000	.00	1 .0
205.130	.0063					.0072	1.49	4.51	.00	2.53	.013	.00	.00	PIPE
1975.130	350.400	4.701	355.101	45.00	7.58	.89	355.99	.00	2.22	.00	2.750	.000	.00	1 .0
JUNCT STR	1.0313					.0067	.00	4.70	.00		.013	.00	.00	PIPE
1975.131	350.401	4.941	355.342	41.78	7.03	.77	356.11	.00	2.15	.00	2.750	.000	.00	1 .0
50.869	.0065					.0062	.32	4.94	.00	2.21	.013	.00	.00	PIPE
2026.000	350.730	4.929	355.659	41.78	7.03	.77	356.43	.00	2.15	.00	2.750	.000	.00	1 .0
JUNCT STR	.0057					.0034	.02	4.93	.00		.013	.00	.00	PIPE
2033.000	350.770	5.851	356.621	12.00	2.02	.06	356.68	.00	1.13	.00	2.750	.000	.00	1 .0
35.200	.0065					.0005	.02	5.85	.00	1.00	.013	.00	.00	PIPE
2068.200	351.000	5.639	356.639	12.00	2.02	.06	356.70	.00	1.13	.00	2.750	.000	.00	1 .0

Q = 77 CFS. | Q = 45 cfs. | Q = 12 CFS.

PROFILE

SCALES: HORIZ. 1" = 40'
VERT. 1" = 4'

B.M.G.D. 1329, ELEV. = 350.002, F.B. 5374-20 HINNEN AVE. & CURB AT HSE. # 1106 ± Rt. P.K. SPK. IN CURB.

B.M.G.D. 1330, ELEV. = 359.624, F.B. 5374-20 FOLGER ST. N. CURB AT HSE. # 1625? ± Lt. P.K. SPK IN CURB.

B.M.G.D. 1331, ELEV. = 356.581, F.B. 5374-20 FOLGER ST. & GLENELDER AVE. SW. CORN. L.R. PK. SPK. 2' W. OF W. END G.R.

UPDATED Q=77.0CFS

UPDATED Q=59.33CFS

UPDATED Q=56.7CFS

UPDATED Q=45.0CFS

UPDATED Q=41.8CFS

UPDATED Q=12CFS

UPDATED HGL

UPDATED HGL

EXIST. GROUND LINE

H.G. LINE

H.G. LINE

PROPOSED NEW CONNECTION

PROPOSED NEW CONNECTION

42" R.C.P. 2 - 18" INLET (W) S=.0072

33" R.C.P. S=.0080

PIPE S=.0093

INV. 15" SEWER

BLANKET G.I.H.L. PER STD. DWG. No. 2-D251, CASE IV SEC. D-D

GRADE CHANGE

GRADE CHANGE

FOLGER AVE.

GLENELDER AVE.

HINNEN AVE.

ST.

STORM DRAIN - 10' E. ST. ℄

GLENELDER SCHOOL

CONST. C.B. NO. 3, W=21'

CONC. BACKFILL

TEST HOLE C-3 STA. 13+50

TEST HOLE C-4 STA. 18+35

STA. 16+05

M.H. #1 10+59.4

M.H. #2 12+44.2

M.H. #1 20+68.2

C.B. #3, W=21', D=5' L.D. #2 18" R.C.P. 1260-D

C.B. #3, W=10', D=3' L.D. #2 18" R.C.P. 1000-D

C.B. #3, W=21' L.D. #2 21" R.C.P. 1000-D

C.B. #3, V=4.5', V=5.75' L.D. #2, K=3' 40"-30" R.C.P. 1000-D

C.B. #2 L.D. #2, K=3' 12"-18" R.C.P. 1000-D

C.B. #1 L.D. #2 18"-18" R.C.P. 1260-D

C.B. #3, W=21' L.D. #2 21" R.C.P. 1000-D

C.B. #3, V=4.5, V=4.0 L.D. #2 24" R.C.P. 1230-D

C.B. #1 L.D. #2 15" R.C.P. 1260-D

65'-42" R.C.P. 1000-D

41'-42" R.C.P. 1000-D

412'-33" R.C.P. 1000-D

365'-33" R.C.P.-1250-D

35'-33" R.C.P.-1250-D

6" WATER EL. = 351.4

6" SEWER EL. = 348.16

6" WATER EL. = 351.75

6" SEWER EL. = 341.55

8" WATER EL. = 345.75

8" SEWER EL. = 345.65

8" WATER EL. = 345.75

8" SEWER EL. = 345.65

8" WATER - 24' W. ST. ℄ SUBURBAN

8" SEWER - 5' W. ST. ℄

8" WATER - 24' W. ST. ℄ SUBURBAN W.

2" GAS - 24' E. ST. ℄ SO. CALIF. GAS

2" GAS - 24' E. ST. ℄ SO. CALIF. GAS

8" SEWER - 5' E. ST. ℄

6" WATER - 24' W. ST. ℄ SUBURBAN

CURB DATA
Δ = 105° 20' 45"
R = 22.5'
T = 23.51'
L = 41.37'
P.C. = 11+28.02
E.C. = 12+50.37

CURVE DATA
Δ = 12° 20' 45"
R = 45'
T = 9.06'
L = 12.05'
P.C. = 12+61.38
E.C. = 12+73.43

PLAN
SCALE: 1" = 40'
25 0 50 100

CROSS SECTION - STA. 18+00
SCALE - HORIZ. - 1" = 10'
VERT. - 1" = 4'

EXHIBIT 4
UPDATED HYDRAULIC CALCULATION RESULTS
PROJECT NO. 1273 - LINE "C"

THIS SHEET APPLIES TO PROPOSALS 1, 2, 3 & 4

1970 STORM DRAIN BOND ISSUE

REVISIONS		
MK	DATE	DESCRIPTION
	5-25-76	AS BUILT

	INITIAL	DATE
DESIGNED BY	G.T.	6/73
DRAWN BY	H.T.	11/73
CHECKED BY		
SUPERVISED BY	G.T.	11/73
PROJECT ENGR.	H.T.	11/73

PREPARED BY
HARVEY T. BRANDT
COUNTY ENGINEER

RECOMMENDED BY
Carroll D. Smith
DIVISION ENGINEER - DESIGN DIVISION

DRAWN BY G. TAMANAHA DESIGNED BY S.I.T.
TRACED BY H. TOM SUBMITTED BY K. KAWAMA
CHECKED BY H. RAYNARD DATE

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

HACIENDA HEIGHTS
PROJECT NO. 1273
LINE C
PLAN AND PROFILE
STA. 11+30 TO STA. 20+70

RECOMMENDED BY
Dymilne
DIVISION ENGINEER (DESIGN)

DATE JUNE '74 SCALE AS SHOWN
NO. 470-1273-D26
SHEET 6 OF 15

"AS BUILT" DRAWING

Street Capacity Calc's for Hinnen Avenue

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01500	ft/ft
Discharge	3.22	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	100.67
0+00	100.00
0+02	100.13
0+18	100.43

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 100.67)	(0+18, 100.43)	0.015

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.29	ft
Elevation Range	100.00 to 100.67 ft	
Flow Area	1.18	ft²
Wetted Perimeter	10.99	ft
Hydraulic Radius	0.11	ft
Top Width	10.69	ft
Normal Depth	0.29	ft
Critical Depth	0.33	ft
Critical Slope	0.00676	ft/ft

Street Capacity Calc's for Hinnen Avenue

Results

Velocity		2.74	ft/s
Velocity Head		0.12	ft
Specific Energy		0.41	ft
Froude Number		1.45	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.29	ft
Critical Depth	0.33	ft
Channel Slope	0.01500	ft/ft
Critical Slope	0.00676	ft/ft

Cross Section for Hinnen Avenue

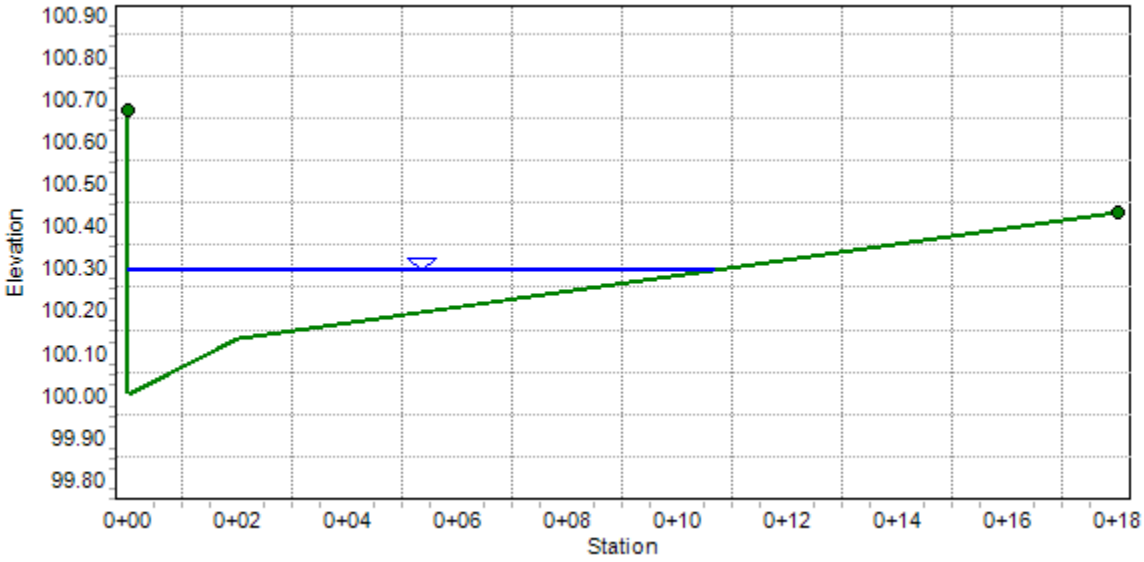
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01500	ft/ft
Normal Depth	0.29	ft
Discharge	3.22	ft^3/s

Cross Section Image



Worksheet for Glenelder Avenue Street Capacity Calc's

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01200	ft/ft
Discharge	10.78	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	100.67
0+00	100.00
0+02	100.13
0+18	100.43

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 100.67)	(0+18, 100.43)	0.015

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.43	ft
Elevation Range	100.00 to 100.67 ft	
Flow Area	3.20	ft²
Wetted Perimeter	18.44	ft
Hydraulic Radius	0.17	ft
Top Width	18.00	ft
Normal Depth	0.43	ft
Critical Depth	0.48	ft
Critical Slope	0.00562	ft/ft

Worksheet for Glenelder Avenue Street Capacity Calc's

Results

Velocity		3.37	ft/s
Velocity Head		0.18	ft
Specific Energy		0.61	ft
Froude Number		1.41	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.43	ft
Critical Depth	0.48	ft
Channel Slope	0.01200	ft/ft
Critical Slope	0.00562	ft/ft

Cross Section for Glenelder Avenue

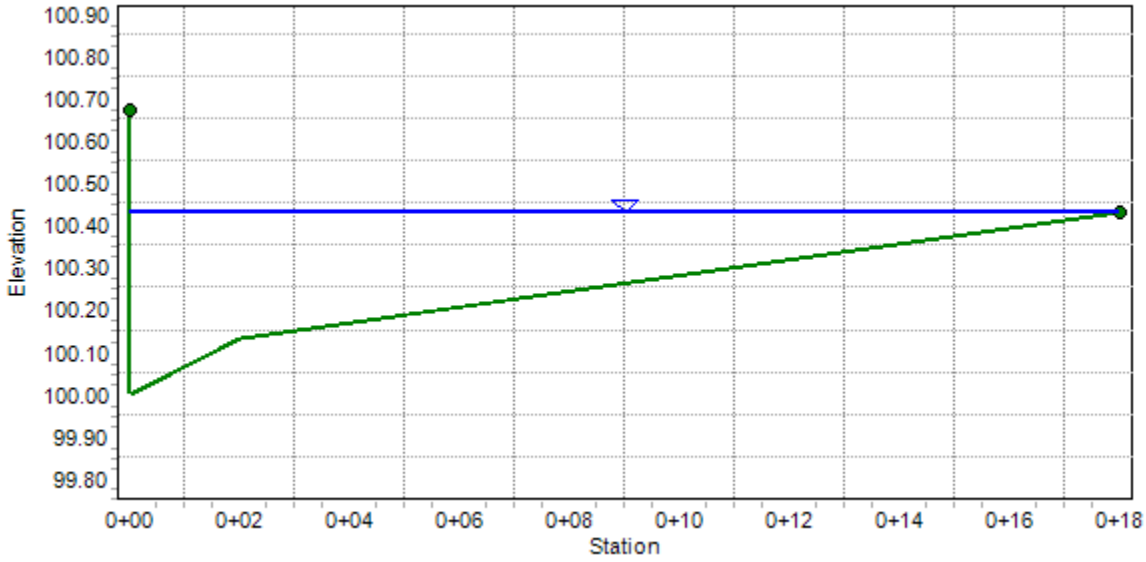
Project Description

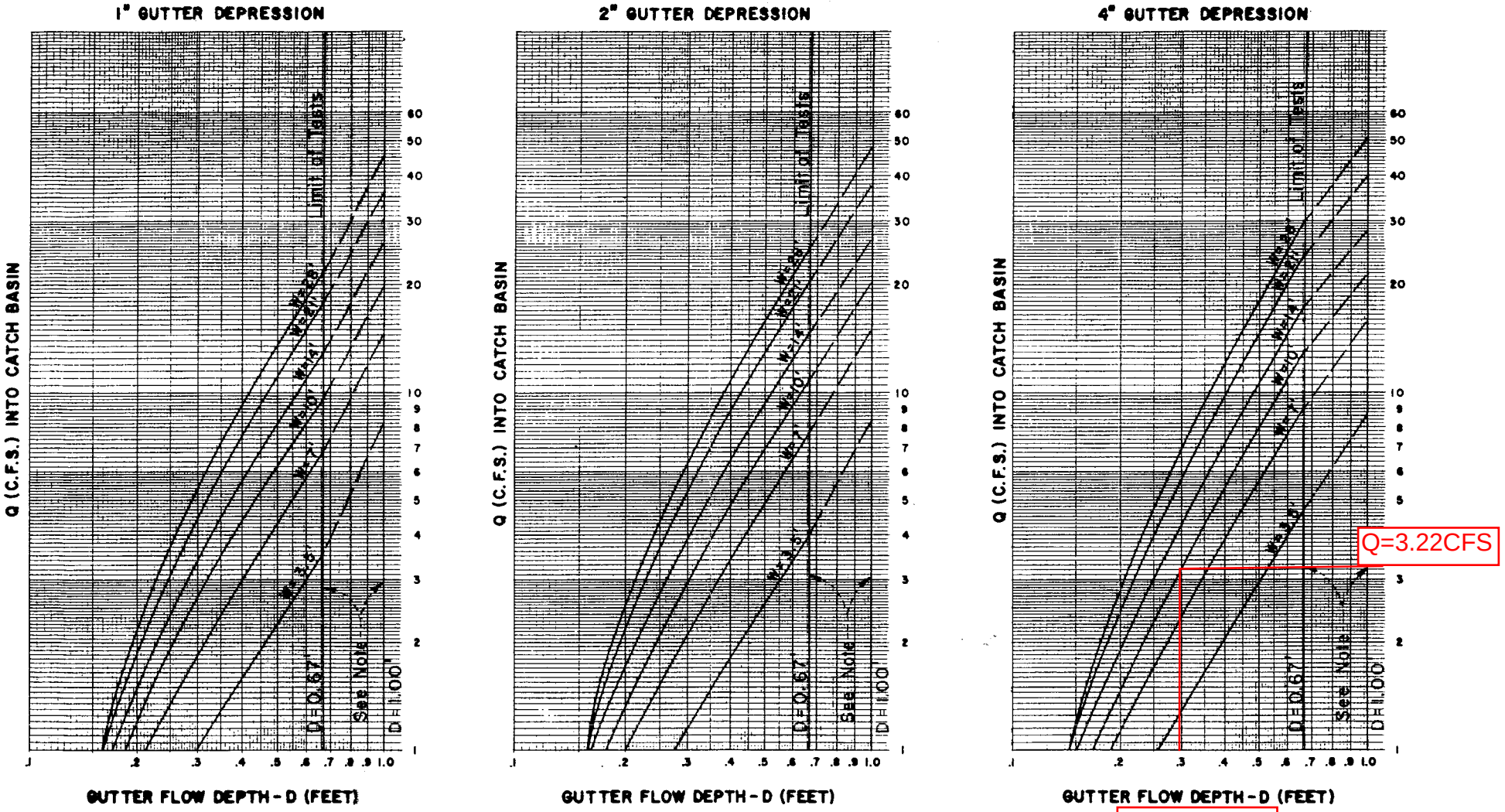
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01200	ft/ft
Normal Depth	0.43	ft
Discharge	10.78	ft³/s

Cross Section Image





NOTE: Curves between D=0.67' and 1.0' are not from model test data and will be revised in the future when additional model test data are available.

Los Angeles County Flood Control District

CURB OPENING CATCH BASIN CAPACITIES

STREET SLOPE = .01

D - 10B

Catch Basin #4 along Folger Street

Hunsaker & Associates Irvine, Inc.

DATE: 05/28/19
BY: G. Guan

C.B. #6 Along Hinnen Avenue
Curb Opening (Sump)

Given: (a) discharge Q = 10.8 c.f.s.

(b) 6" curb

Solution:

H (depth at opening) = 0.50 '

L = Q/3.087H^3/2 = 9.88 '

Use:

L= 10.00 '

Then:

H= 0.4959 '

SECTION 6

REFERENCES

- **ALLOWABLE FLOWS FROM LACDPW**

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

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

INFORMATION REQUEST SUMMARY

INFORMATION REQUESTED BY

*Requester's Name: Gary Guan
Company: Hunsaker & Associates
*Phone Number: 949-768-2591 Fax Number: _____
*Email: gguan@hunsaker.com

Method of Contact: ☐ Walk-in ☒ Phone ☐ Fax ☒ Email ☐ Prelim. Mtg. Date: _____

Intended Use: VTTM hydrology analysis

Proposed Project Type: Convert the school to detached condominiums Acreage Involved: 16.8 acres

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

INFORMATION REQUESTED (Attach Assessor Map)

LACFCD Facility: Name: Project No. 1273
Unit: DWG: 470-1273-D Line: C Station: 1200 to 21+00
City: Hacienda Heights
*Street/Cross-street: Hinnen Ave/Folger St
*Thomas Guide: Page: 678 Grid: D2 ☒ Site Map/Plans Submitted
Info. Requested:
Allowable Q
Hydrology Data, As Built Drwings
Hydraulic Grade Line

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

BELOW SECTION TO BE COMPLETED BY THE HYDRAULIC ANALYSIS UNIT

INFORMATION PROVIDED:
Project 1273 Line "C" Hydrology Data, Drainage Map, and allowable Discharge Flow, As Built Drawings.

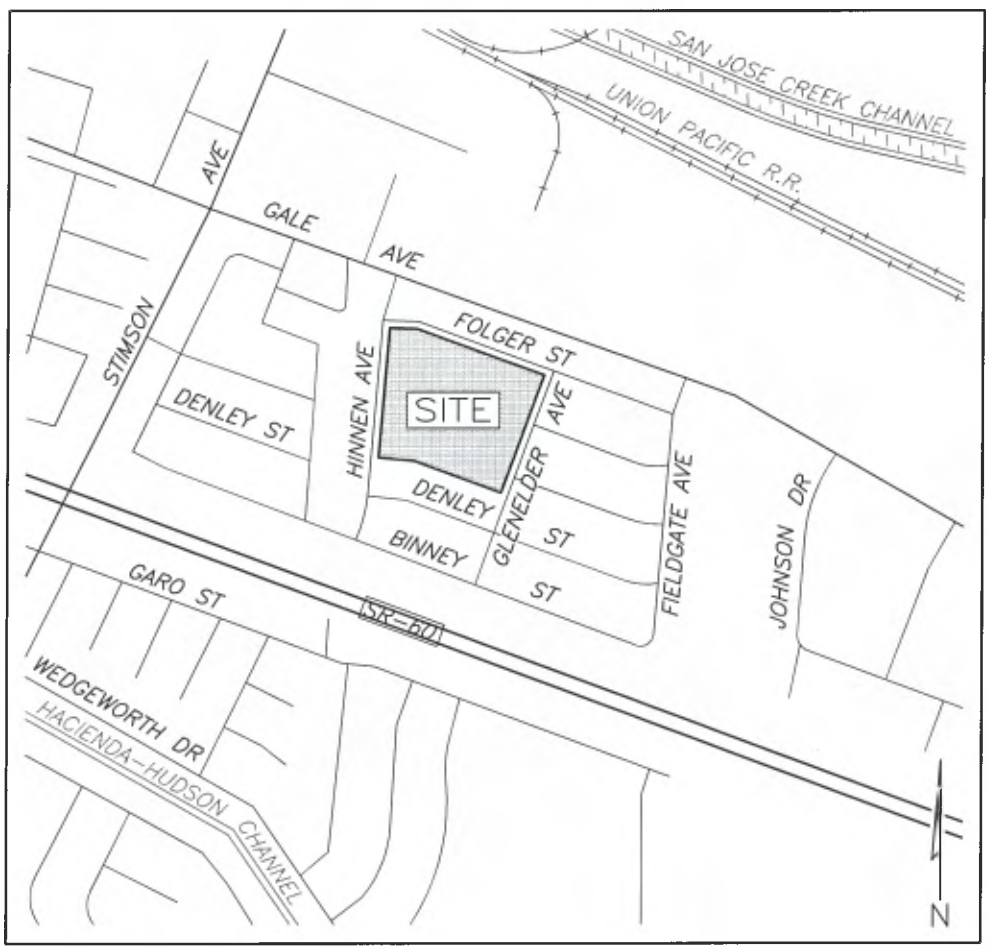
REFERENCES SEARCHED:
Project 1273 Files and As Built Drawing No. 470-1273-D2.1 to D2.15

COMMENTS, ETC:
1- Subarea No. 34C allowable discharge flow (Q= 51/21 x 112/160 = 1.70cfs/acre).
2- Hydraulic Grade Line shown on As Built Plan and Profile Sheet No. 470-1273-D2.6

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
DESIGN DIVISION
Hydraulic Analysis Unit
OFFICIAL RECORD DOCUMENT
Issued By: GAA
Date: 5/1/2019
Public Service That Works

INFORMATION PROVIDED BY: George K. Aintablian Date: 5/1/2019
INFORMATION REVIEWED BY: Date:

Print Save a Copy



VICINITY MAP

N.T.S.

REACH	Q (CFS)	
LINE A		
25A - 31A	740	
31A - P.D. 51	860	
LINE B		
28B - LN. A	140	
LINE C		
33C - 34C	~~45~~	45.0
34C - 35C	~~70~~	77.0
35C - PR. 527	~~100~~	112.0
LINE D		
36D - 37D	90	
37D - 38D	110	
38D - 39D	130	
39D - 40D	160	
40D - PR. 527	190	

COUNTY OF LOS ANGELES
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Public Service That Works

LEGEND

- WATERSHED BOUNDARY
- PROJECT DRAIN
- EXISTING DRAIN
- SUBAREA AND COLLECTION POINT
- PROPOSED DRAIN

LA HABRA & BALDWIN PARK QUADS

PREPARED D. A. L.	LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
DATE 11-24-71	1970 BOND ISSUE
SCALE 1"=2000'	PROJECT #1273
	~~10~~ YR. FREQUENCY Q's

GKA

SHEET NO.	INDEX TO DRAWINGS
1	LOCATION MAP AND INDEX TO DRAWINGS
2	STANDARD DRAWINGS, GENERAL NOTE AND ABBREVIATIONS
3	PLAN AND PROFILE — LINE "A"
4	PLAN AND PROFILE — LINE "B"
5 TO 6	PLAN AND PROFILE — LINE "C"
7 TO 9	PLAN AND PROFILE — LINE "D"
10	CROSS SECTIONS — LINE "A"
11	CROSS SECTIONS — LINE "B"
12 TO 13	STRUCTURAL DETAILS — LINE "A"
14	SINGLE BOXES; SCHEDULE AND DETAILS
15	RESURFACING MAP AND LOG OF BORINGS — LINES A, B, C, & D

LOCATION MAP
SCALE 1" = 1000'

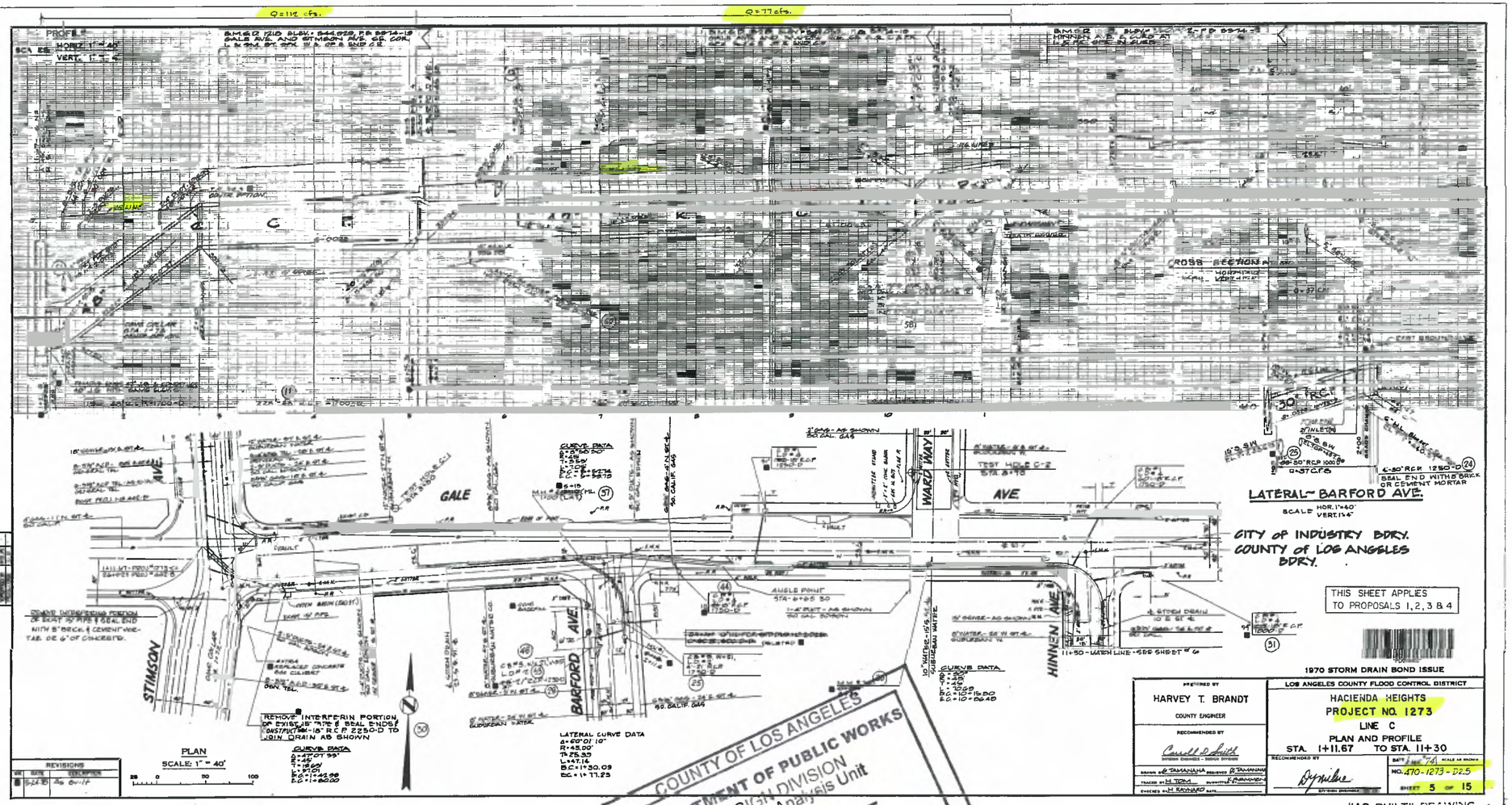
■ AS BUILT DRAWINGS

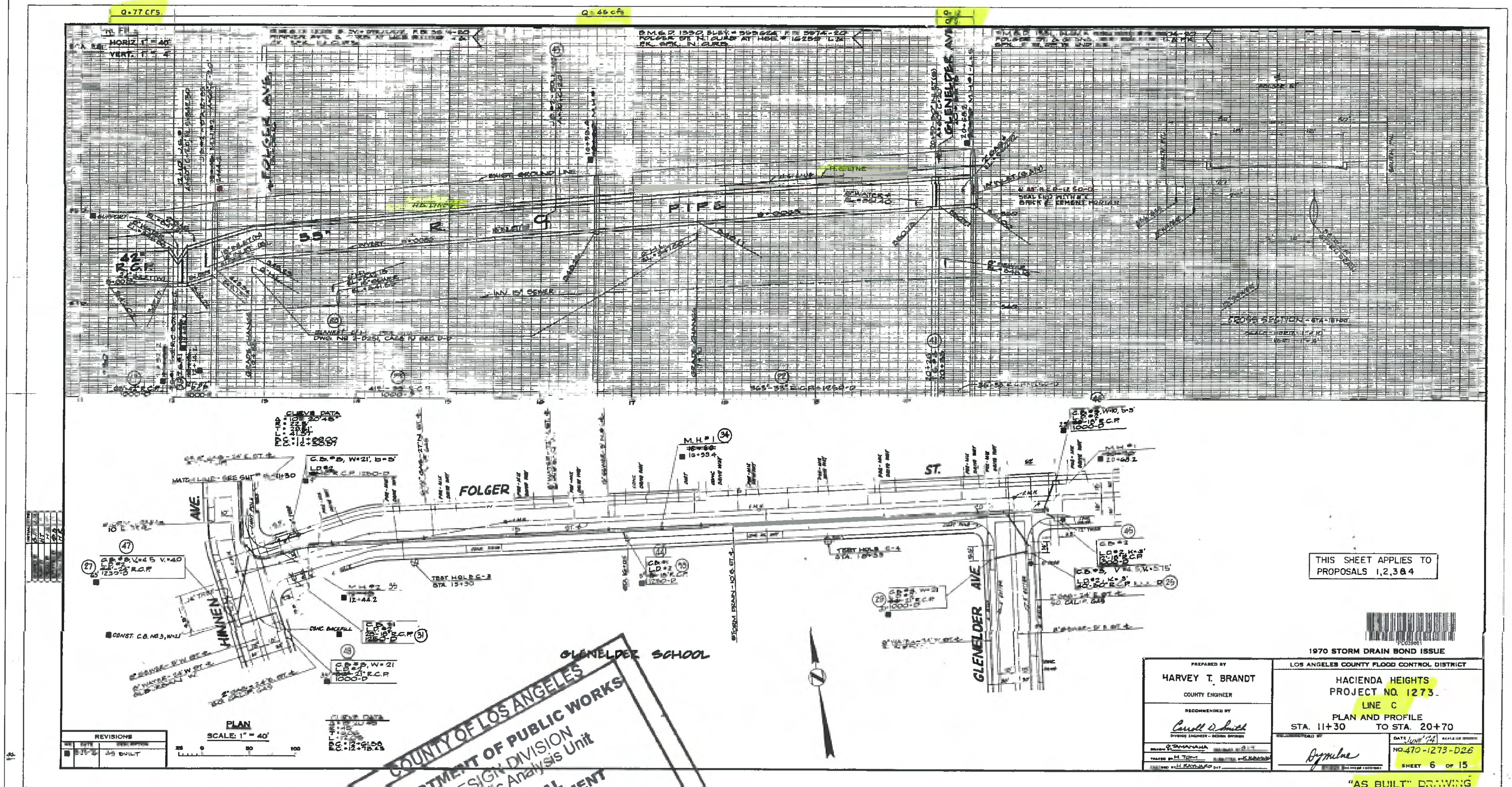
1970 STORM DRAIN BOND ISSUE

SANITATION DIVISION COUNTY OF LOS ANGELES	APPROVED AS TO CITY OF INDUSTRY	PREPARED BY HARVEY T. BRAND COUNTY ENGINEER	LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
4-17-73	CITY ENGINEER DEPUTY DATE 10/14/73	RECOMMENDED BY	HACIENDA HEIGHTS PROJECT NO. 1273 LINES A - D LOCATION MAP AND INDEX TO DRAWINGS
			NO. 110-1273-D2.1 SHEET 1 OF 15

REVISIONS

"AS BUILT" DRAWING




Q=77 CFS
Q=46 cfs
HORIZ 1" = 40'
VERT. 1" = 4'
FOLGER AVE.
GLENELDER AVE.
PIPE
42" R.C.P.
CROSS SECTION - STA. 19+00
FOLGER
ST.
HINNEN
AVE.
GLENELDER AVE.
GLENELDER SCHOOL
MATCH LINE - SEE SHT
TEST HOLE C-3 STA. 13+30
TEST HOLE C-4 STA. 18+55
PLAN
SCALE: 1" = 40'
REVISIONS
AS BUILT
THIS SHEET APPLIES TO PROPOSALS 1,2,3 & 4
1970 STORM DRAIN BOND ISSUE
PREPARED BY
HARVEY T. BRANDT
COUNTY ENGINEER
RECOMMENDED BY
Carroll O. Smith
DIVISION ENGINEER - DESIGN DIVISION
DRAWN BY G. TAMANAHA
TRACED BY H. TOM
CHECKED BY H. KAYAJARD
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
HACIENDA HEIGHTS
PROJECT NO. 1273
LINE C
PLAN AND PROFILE
STA. 11+30 TO STA. 20+70
DATE June '74
NO. 470-1273-D26
SHEET 6 OF 15
"AS BUILT" DRAWING

- **EXISTING STORM DRAIN PLANS**

SHEET NO.	INDEX TO DRAWINGS
1	LOCATION MAP AND INDEX TO DRAWINGS
2	STANDARD DRAWINGS, GENERAL NOTE AND ABBREVIATIONS
3	PLAN AND PROFILE — LINE "A"
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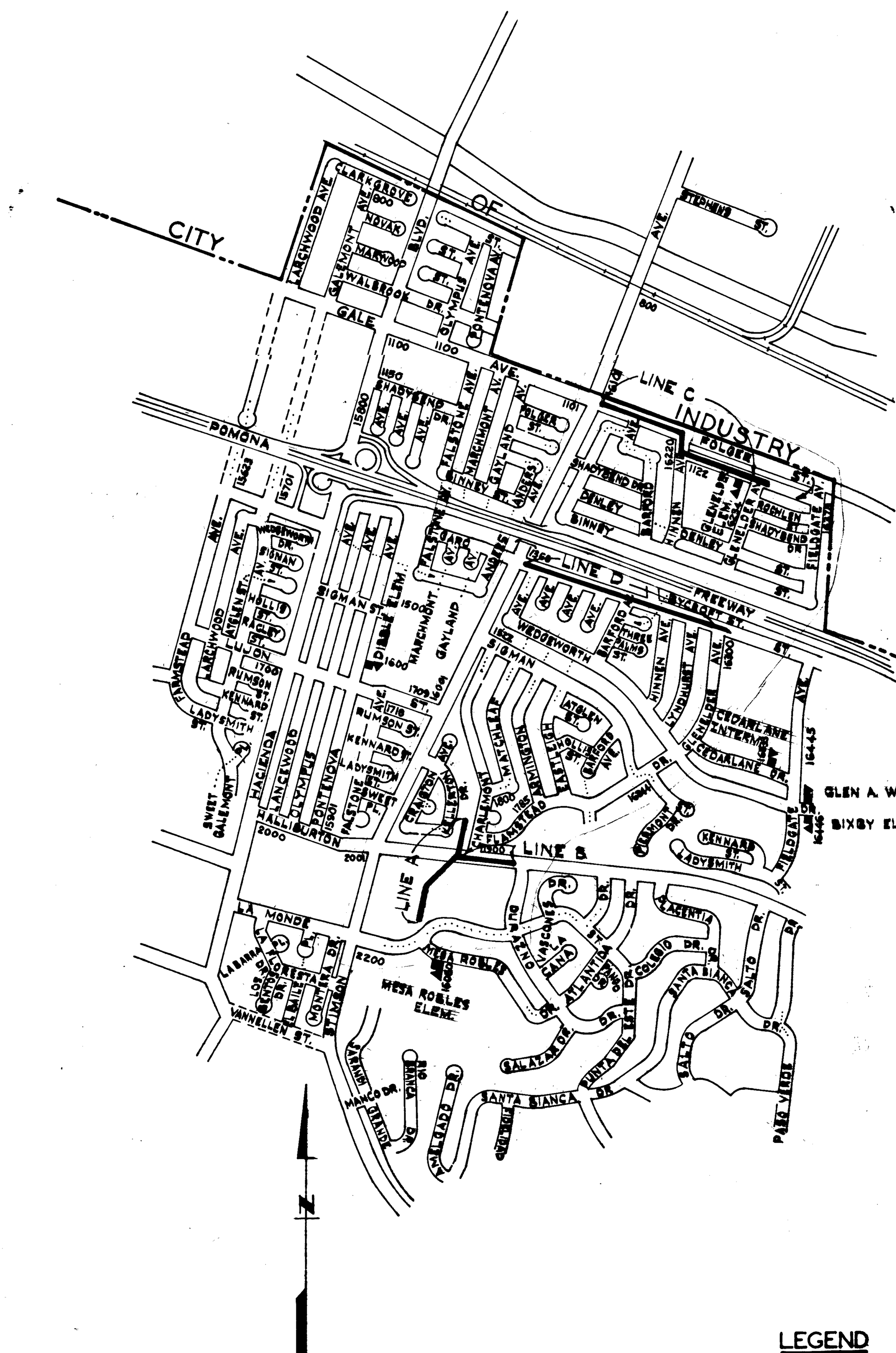


LOCATION MAP

SCALE 1" = 1000'

50 0 1000 2000

LEGEND

- Proposed Storm Drain
- Existing Storm Drain
- Proposed Storm Drain Other Drain
- City Boundary

PD039856

1970 STORM DRAIN BOND ISSUE

■ AS BUILT DRAWINGS

REVISIONS		
MK	DATE	DESCRIPTION

SANITATION DIVISION
COUNTY OF LOS ANGELES
Richard E. Kuhn 4-17-73

APPROVED AS TO CITY OF
INDUSTRY
George O. Aseke
CITY ENGINEER DEPUTY
DATE: 10/17/73

PREPARED BY
HARVEY T. BRAND
COUNTY ENGINEER

RECOMMENDED BY
Carroll D. Smith
DIVISION ENGINEER — DESIGN DIVISION

DRAWN BY B. Bravender DESIGNED BY G. TAMANAHA
TRACED BY E. MOORE SUBMITTED BY K. Kvammen
CHECKED BY H. RAYWARD DATE

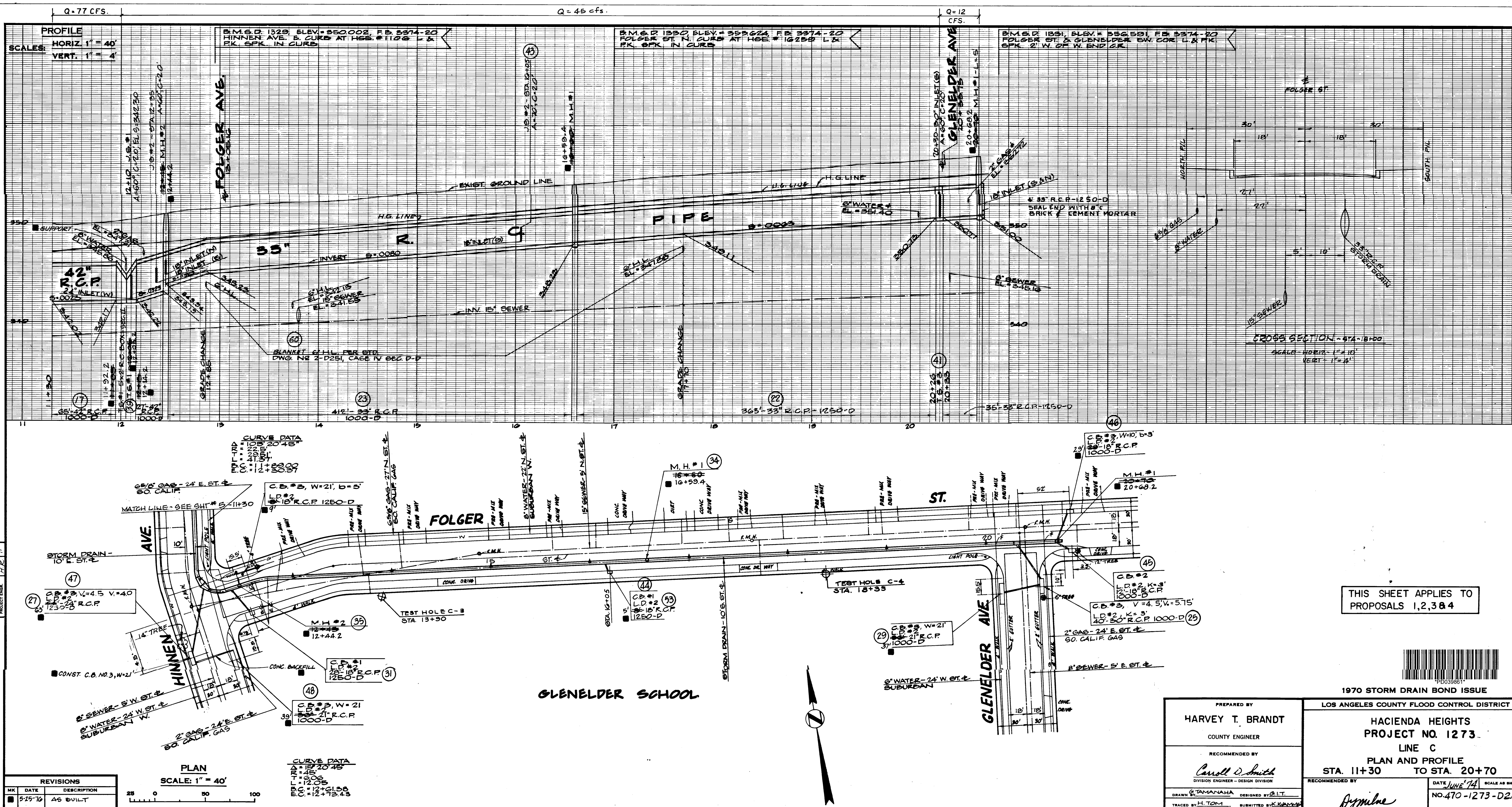
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

HACIENDA HEIGHTS
PROJECT NO. 1273
LINES A - D
LOCATION MAP AND INDEX TO DRAWINGS

RECOMMENDED BY [signature]
DIVISION ENGINEER (DESIGN)
6-10-74
A. E. Bruington
CHIEF ENGINEER — CIVIL ENGINEER

DATE [illegible] SCALE AS SHOWN
NO. 470-1273-D2.1
SHEET 1 OF 15

"AS BUILT" DRAWING



1970 STORM DRAIN BOND ISSUE

PREPARED BY HARVEY T. BRANDT, COUNTY ENGINEER

RECOMMENDED BY Carroll D. Smith, DIVISION ENGINEER – DESIGN DIVISION

DRAWN BY G. TAMANAHA DESIGNED BY G.I.T.
TRACED BY H. TOM SUBMITTED BY K. KVAMME
CHECKED BY H. RAYNARD DATE

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

HACIENDA HEIGHTS
PROJECT NO. 1273
LINE C
PLAN AND PROFILE
STA. 11+30 TO STA. 20+70

RECOMMENDED BY Dymilne, DIVISION ENGINEER (DESIGN)

DATE JUNE '74 SCALE AS SHOWN
NO. 470-1273-D26
SHEET 6 OF 15

"AS BUILT" DRAWING

December 2018

HYDROLOGY STUDY

"Glenelder"

Vesting Tentative Tract Map No. 82159

16234 Folger Street

City of Hacienda Heights | County of Los Angeles

HUNSAKER & ASSOCIATES IRVINE, INC.

HYDROLOGY STUDY

" Glenelder" | Vesting Tentative Tract Map No. 82159

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HUNSAKER & ASSOCIATES IRVINE, INC.

December 2018