COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION
SUBDIVISION PLAN CHECKING SECTION – HYDROLOGY UNIT

To: ENGLES SHEN AND ASSOCIATES

Attention: Engles Shen

REVIEW OF TR 060107 NORTH SAN GABRIEL AREA
TRANS DATE: 12-14-06

[ ] Provide a drainage concept prior to approval of the tentative map. Sufficient information must be submitted to the Department showing the extent of the drainage problem and proposed solution.

[X] The Drainage Concept/Hydrology Study has been approved for Area and Q only.

[ ] The drainage concept/SUSMP is unsatisfactory. Note the reasons stated herein or shown on returned map.

[ ] Prior to tentative map approval, comply with the Standard urban Stormwater Mitigation Plan (SUSMP) requirements. (www.888cleanla.com)

The first .75 inches of stormwater runoff volume from the site must be treated prior to discharging into stormwater conveyance systems.

[ ] Resubmit these sheets with check print, two (2) revised sets of the drainage concept, and the *MORA input/output file(s) on disk* (if applicable) for further consideration. Additional changes maybe required as determined by further review.

REVIEWED BY Jim Girardot **DATE 1-9-07**
Jim Girardot - (626) 458-4921

HYDROLOGY STUDY

APPROVED FOR AREA AND Q ONLY

APPROVED BY: J. Guardot FILE NO. 17019 DATE: 1-9-07

CHECKED BY: DATE: 1-9-07

DEVELOPMENT DIVISION

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

DRAINAGE CONCEPT/ SUSMP/ HYDROLOGY STUDY

For

TENTATIVE TRACT MAP #060107
8831-8845 FAIRVIEW AVENUE
SAN GABRIEL, CALIFORNIA 91775

REGISTERED PROFESSIONAL ENGINEER
ENGLES S. SHEN
C 018906
EXP. 6-30-2007
CIVIL
STATE OF CALIFORNIA

Prepared for:
David Mak
1363 Virginia Road
San Marino, California 91108

Prepared by:
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1111 Corporate Center Drive, Suite 302
Monterey Park, California 91754

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APPENDIX E..... STREET CAPACITY & REF. MAP

List of References:

1. Introduction

The project site is located in unincorporated Los Angeles County territory, north of Fairview Avenue approximately 200' west of Lotus Avenue

2. Existing Hydrology

On-site

The existing project site encompasses approximately 1.4 acres. The site currently drains to a drop inlet type Catch Basin located in the Fairview Ave, approximately 20' downstream of the site southeastern corner, see attached Storm Drain Plan No.9611. The site currently drains in a north to south pattern and has two contributing basins. The northern most area delivers 2.25 cfs at its point of discharge near the site western boundary. The remaining area the lower southeast region delivers 1.58cfs and discharges near the southeastern most boundary. For Time of Concentration and flow calculations see Appendix B, (see Appendix A, Exhibit-1, Existing Drainage Map for existing flow conditions).

Off-site

Off-site drainage pattern tributary to subject site consist of the existing housing north of the site. The acreage was determined to be 2.0 acres. See attached Appendix A, Exhibit-3 map. The homes at north of the site are primarily single family units. The off-site area produces 5.99cfs of runoff. A detailed study of the private street, upstream of Lot 9, would be required to determine if any of the 25 year storm flows would exceed the street capacities and flow westerly to the public street and be intercepted by PD 2003, permission would be required from private property owner to construct any damage facilities and connect to PD 2003.

Proposed Hydrology

On-site

The proposed site will consist of twelve condominiums, with a common private drive that slopes 1.7% in a southern direction. The site was divided into four drainage tributary areas each having a drop inlet in combination with a parkway drains which outlets onto Fairview Avenue.

The four drainage sub-areas will have three 2' X 2' catch basins and two 5'x5' Catch Basin to capture the flow at specified locations. The flow within the Catch Basin is conveyed to the Fairview Avenue thru parkway drains. The flows for the proposed areas A1, B1, C1 and D1 are 0.88, 2.14, 0.87 and 0.49, respectively. The site discharge is 4.38cfs exclude offsite runoff 5.99cfs. The total site discharge is 10.37cfs, which is slightly greater than the existing discharge of 9.80 cfs.

One proposed 8" pvc drain pipe will be installed along the driveway to pick up nuisance flow from the off-site area.

Pre-filter catch basins will be installed as necessary to comply with the SUSMP requirements.

For driveway capacity and street capacity see section cut A-A' & B-B' and Flow chart curves in Appendix D.

Off-site

See existing Off-site.

3. **Existing Hydraulics**

Appendix B, See Existing Hydrology.

4. **Proposed Hydraulics**

The proposed site is subdivided into four sub-areas. Each area has a 2' X 2' catch basin and one 5'x5' catch basin at specified locations. The flow within the driveway is conveyed by concrete swales to the catch basins. The flow within back yard landscape is conveyed by 2'w X 6"d conc. channel to the catch basins. The flow is then conveyed to Fairview Avenue by parkway drains. Fairview Avenue is an existing 50' Right of Way (ROW). The flow enters Fairview Avenue easterly along street gutter to an existing 7'w catch basin drop inlet east of subject site.

5. Conclusions and Recommendations

Conclusions:

The 4.4cfs of onsite runoff plus 5.99cfs or offsite runoff will produce a depth of flow that will not overtop the existing 6" curb along driveway, for big storm event, see section cut A-A'; B-B'. Offsite runoff will flow by surface flow to enter street thru parkway drain, driveway capacity is sufficient to handle and one 8"dia. pvc drain pipe can be used to drain nuisance and as store pipe. The total runoff of 10.37 cfs will be picked up thru exist catch basin in the east property corner. The allowable Q tributary to existing storm drain system is around 2.42 cfs/Acre, for 2 Acre offsite and 1.3 Acre onsite will have 8 cfs allowable runoff to enter public storm drain system. 8" curb capacity of half street can handle around 9.0 cfs runoff volumes. Therefore, the proposed project does not represent an adversely effect the local area.

Recommendations:

1. The proposed grading plan be followed as designed by the engineer
2. The location of the catch basin drop inlets is placed as recommended by the engineer.
3. The required filter is placed within the catch basin and the storm drain inlet if necessary to fulfill the SUSMP (water quality) requirements.
4. The parkway drains inverts are located as specified by the engineer.

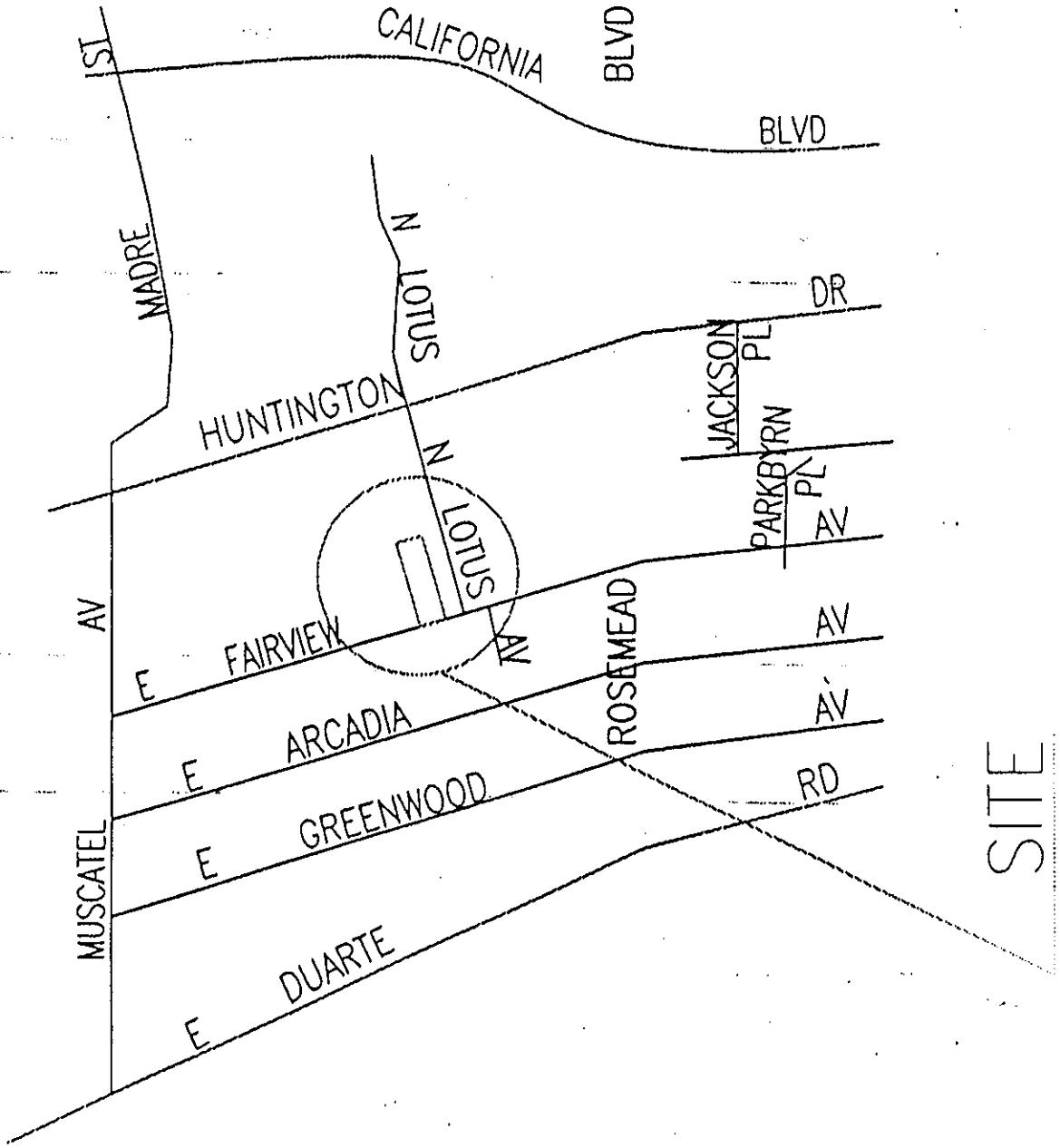
List of References:

1) *LACDPW Hydrology/Sedimentation Manual.*

2) *Urban Stormwater Management Tools, Larry Mays, Ph.d, PE, PH, dated 2004.*

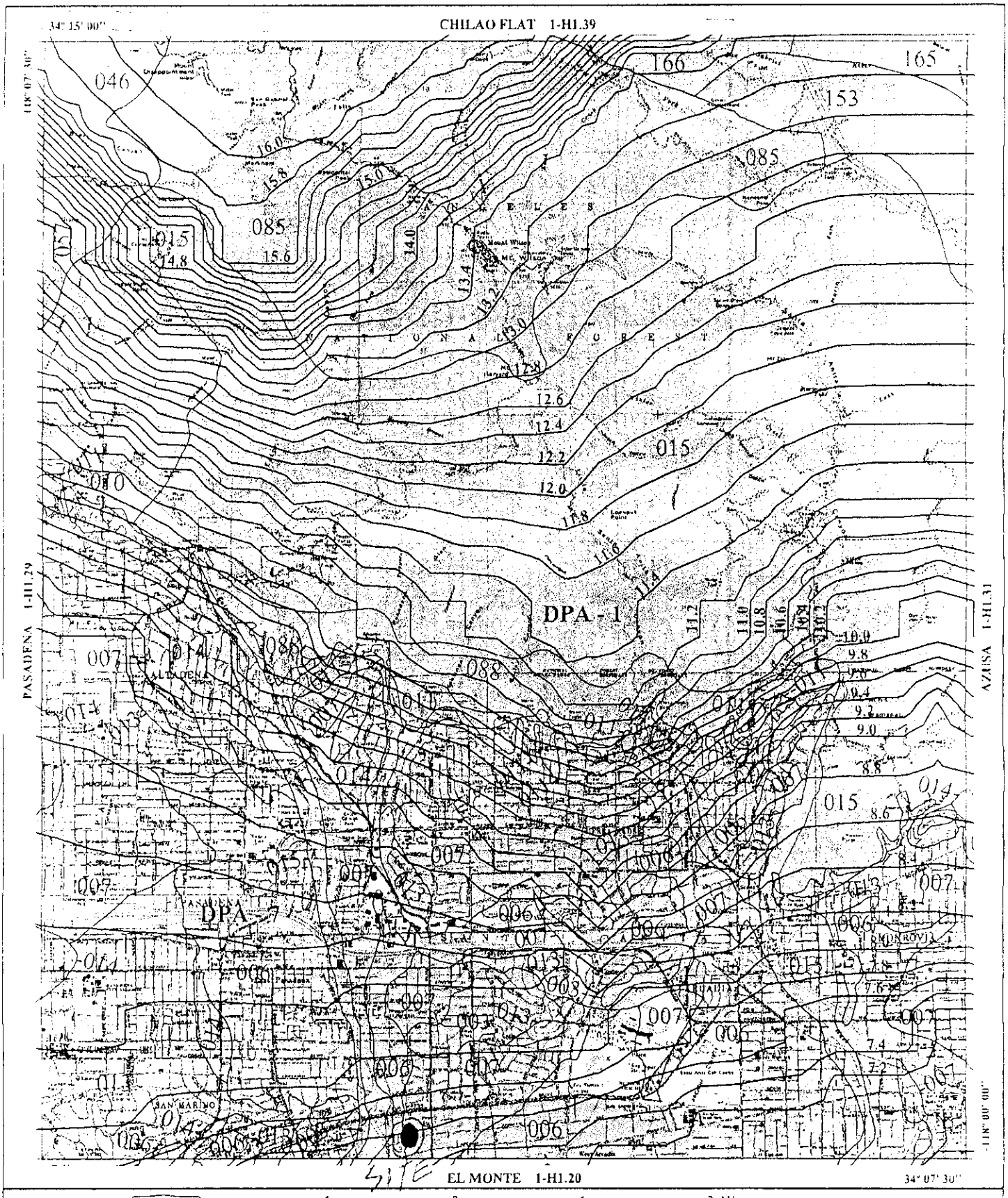
APPENDIX A

FIGURES



VICINITY MAP

NOT TO SCALE



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 x7.52=6.6

10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714 x7.52=5.37

MOUNT WILSON 1-H1.30

50-YEAR 24-HOUR ISOHYET

LOS ANGELES COUNTY PUBLIC WORKS

STANDARD VALUES TABLES

Overland Manning's N Values

Type of Development	N
Industrial-Commercial	0.014
Residential	0.040
Rural	0.060

Standard Lot Values

Type of Development	Lot Length	Lot Slope Range
Industrial-Commercial	200	0.005-0.02
Residential	100	0.01 -0.05
Rural	200	0.05 -1.00

STANDARD RANGE OF PROPORTION IMPERVIOUS

Type of Development	Proportion Impervious
Single-Family	0.21-0.45
Multi-Family	0.40-0.80
Commercial	0.48-0.92
Industrial	0.60-0.92
Institutional	0.70-0.90

Average Values for Metropolitan Los Angeles County are:
Single-Family=0.42 Multi-Family=0.68 Commercial=0.92
Industrial=0.91 Institutional=0.68
For more detail, see the separate Proportion Impervious Table.

Los Angeles County
Department of Public Works

STANDARD VALUES
TABLES

$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$

Where C_D = Developed Runoff Coefficient

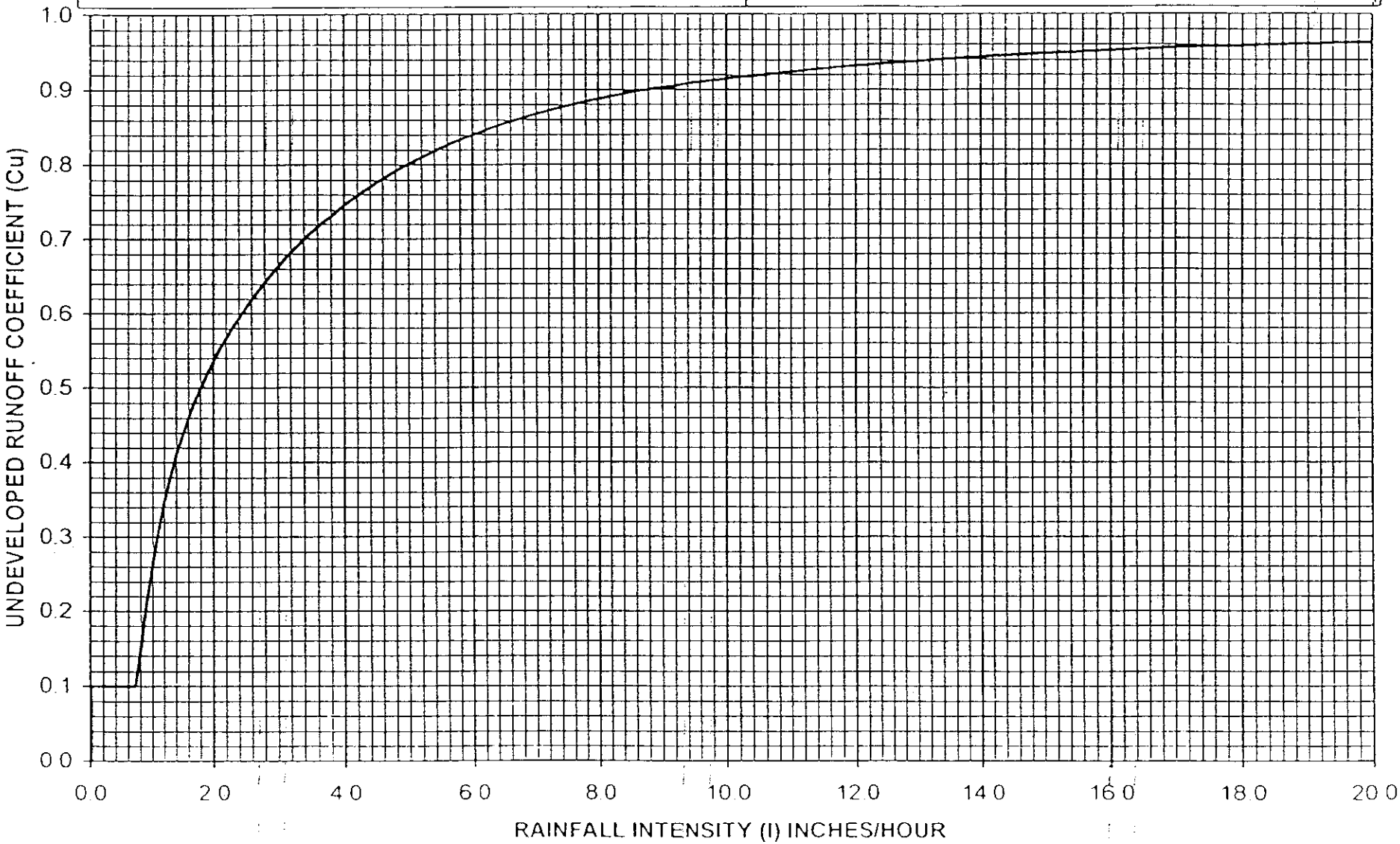
IMP = Proportion Impervious

C_U = Undeveloped runoff coefficient

Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE

SOIL TYPE NO. 007



TC=5 MINUTES

SOIL TYPE	% Impervious						
	40	50	60	70	80	90	100
	Qpm=ACRES x Value Shown						
002	0.308	0.325	0.341	0.357	0.373	0.389	0.406
003	0.189	0.225	0.261	0.297	0.334	0.370	0.406
004	0.197	0.232	0.267	0.302	0.336	0.371	0.406
005	0.189	0.225	0.261	0.297	0.334	0.370	0.406
006	0.243	0.270	0.297	0.325	0.352	0.379	0.406
007	0.189	0.225	0.261	0.297	0.334	0.370	0.406
008	0.330	0.343	0.355	0.368	0.380	0.393	0.406
009	0.235	0.264	0.292	0.320	0.349	0.377	0.406
010	0.189	0.225	0.261	0.297	0.334	0.370	0.406
011	0.246	0.273	0.299	0.326	0.352	0.379	0.406
012	0.357	0.365	0.373	0.381	0.389	0.398	0.406
013	0.189	0.225	0.261	0.297	0.334	0.370	0.406
014	0.189	0.225	0.261	0.297	0.334	0.370	0.406
015	0.189	0.225	0.261	0.297	0.334	0.370	0.406
016	0.206	0.239	0.272	0.306	0.339	0.372	0.406
017	0.268	0.291	0.314	0.337	0.360	0.383	0.406
018	0.189	0.225	0.261	0.297	0.334	0.370	0.406
019	0.189	0.225	0.261	0.297	0.334	0.370	0.406
020	0.189	0.225	0.261	0.297	0.334	0.370	0.406
021	0.189	0.225	0.261	0.297	0.334	0.370	0.406
022	0.199	0.233	0.268	0.302	0.337	0.371	0.406
023	0.198	0.232	0.267	0.302	0.336	0.371	0.406
024	0.189	0.225	0.261	0.297	0.334	0.370	0.406
025	0.320	0.335	0.349	0.363	0.377	0.391	0.406
026	0.189	0.225	0.261	0.297	0.334	0.370	0.406
027	0.189	0.225	0.261	0.297	0.334	0.370	0.406
028	0.189	0.225	0.261	0.297	0.334	0.370	0.406
029	0.303	0.320	0.338	0.355	0.372	0.389	0.406
030	0.189	0.225	0.261	0.297	0.334	0.370	0.406
031	0.189	0.225	0.261	0.297	0.334	0.370	0.406
032	0.234	0.262	0.291	0.320	0.348	0.377	0.406
033	0.189	0.225	0.261	0.297	0.334	0.370	0.406
034	0.265	0.288	0.312	0.335	0.359	0.382	0.406
035	0.189	0.225	0.261	0.297	0.334	0.370	0.406
036	0.280	0.301	0.322	0.343	0.364	0.385	0.406
037	0.189	0.225	0.261	0.297	0.334	0.370	0.406
038	0.189	0.225	0.261	0.297	0.334	0.370	0.406
039	0.259	0.283	0.308	0.332	0.357	0.381	0.406
040	0.268	0.291	0.314	0.337	0.360	0.383	0.406
041	0.189	0.225	0.261	0.297	0.334	0.370	0.406
042	0.247	0.274	0.300	0.327	0.353	0.379	0.406
043	0.189	0.225	0.261	0.297	0.334	0.370	0.406
044	0.304	0.321	0.338	0.355	0.372	0.389	0.406
045	0.189	0.225	0.261	0.297	0.334	0.370	0.406

APPENDIX B

EXISTING HYDROLOGY

EXIST

Tc Calculator

Subarea Parameters Manual Input

Subarea Number: A1

Area (Acres): .87

Proportion Impervious: .40

Soil Type: 7

Rainfall Isohyet (In.): 6.6

Flow Path Length (ft.): 530

Flow Path Slope: .018

Subarea Parameters Selected

Subarea Number:

Area (Acres): 0.87

Proportion Impervious: 0.4

Soil Type: 7

Rainfall Isohyet (In.): 6.6

Flow Path Length (ft.): 530

Flow Path Slope: 0.018

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	3.36	0.69	0.77

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.): 7

Flowrate (cfs): 2.25

Calculate Tc

Cancel

EXIST

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
B1	.50	.40	7	6.6	173.6	.016

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
	0.5	0.4	7	6.6	173.6	0.016

Input File

- [ ] Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

- ○ Calculate Single Tc From Subarea Parameters Provided In Input File
- ◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
B1	3.94	0.74	0.8

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Flowrate (cfs)
5	1.58

Calculate Tc

Cancel

EXISTING OFF SITE

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type
OFF1	2	0.65	7

Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
6.6	452	0.0197

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type
OFF1	2	0.65	7

Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
6.6	452	0.0197

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
OFF1	3.61	0.71	0.83

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Flowrate (cfs)
6	5.99

Calculate Tc

Cancel

APPENDIX C

PROPOSED HYDROLOGY

PROPOSE

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (In.)	Flow Path Length (ft.)	Flow Path Slope
A1	.28	.85	7	6.6	420	.013

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (In.)	Flow Path Length (ft.)	Flow Path Slope
	0.28	0.85	7	6.6	420	0.013

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
A1	3.61	0.71	0.87

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Flowrate (cfs)
6	0.88

Calculate Tc

Cancel

PROPOSE

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
B1	.68	.85	7	6.6	460	.019

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
	0.68	0.85	7	6.6	460	0.019

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
B1	3.61	0.71	0.87

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Flowrate (cfs)
6	2.14

Calculate Tc

Cancel

PROPOSE

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
C1	.25	.85	7	6.6	362	.016

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
	0.25	0.85	7	6.6	362	0.016

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
C1	3.94	0.74	0.88

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Calculate Tc

Cancel

Tc Value (min.)	Flowrate (cfs)
5	0.87

PROPOSE

Tc Calculator

Subarea Parameters Manual Input

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
D1	.14	.85	7	6.6	114	.01

Subarea Parameters Selected

Subarea Number	Area (Acres)	Proportion Impervious	Soil Type	Rainfall Isohyet (in.)	Flow Path Length (ft.)	Flow Path Slope
	0.14	0.85	7	6.6	114	0.01

Input File

☐ Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

○ Calculate Single Tc From Subarea Parameters Provided In Input File

◉ Calculate Tc's For Multiple Subareas And Create Tc Results File

Calculation Results

Subarea Number	Intensity	Undeveloped Runoff Coefficient (Cu)	Developed Runoff Coefficient (Cd)
D1	3.94	0.74	0.88

Tc Equation

Tc=(10)^-0.507*(Cd*I)^-0.519*(L)^0.483*(S)^-0.135

Tc Value (min.)	Flowrate (cfs)
5	0.49

Calculate Tc

Cancel

APPENDIX D

HYDRAULIC CALCULATIONS

HYDROLOGY STUDY BY MODIFIED METHOD TC_CALC_DEPTH													
				TC_RESULT									
Project	Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flowrate (cfs)
PM60107-EX	OFF1	2	0.65	25 yrs	7	452	0.0197	6.6	6	3.61	0.71	0.83	5.99
PM60107-EX	A1	0.87	0.4	25 yrs	7	530	0.018	6.6	7	3.36	0.69	0.77	2.25
PM60107-EX	B1	0.5	0.4	25 yrs	7	173.6	0.016	6.6	5	3.94	0.74	0.8	1.58
PM60107	AI	0.28	0.85	25 yrs	7	420	0.013	6.6	6	3.61	0.71	0.87	0.88
PM60107	BI	0.68	0.85	25 yrs	7	460	0.019	6.6	6	3.61	0.71	0.87	2.14
PM60107	CI	0.25	0.85	25 yrs	7	362	0.016	6.6	5	3.94	0.74	0.88	0.87
PM60107	DI	0.14	0.85	25 yrs	7	114	0.01	6.6	5	3.94	0.74	0.88	0.49
Qpm-OFF1	C	2	0.65	25 yrs	7	452	0.0197	0.75	30	0.19	0.1	0.62	0.24

HYDRAULIC CALCULATION

By: Cal Land Engineering		Using L.A. County Flood Control, modified method			
Project site:	8831-8845 Fairview Ave, San Gabriel	Calculated by	RY	date	12/7/2006
Subject	LA CO Public Work Hyd manual-Addumn	Soil Type # =	7	page	1

Hydrology Runoff by Modified Rational Method Calculation from TC calulator program

EXISTING CONDITION

Location	Q25 (SUM)		Q10 (SUM)	
Q @ offsite 1	5.99	cfs	4.44	cfs
Q @ area "A1"	2.25	cfs	1.63	cfs
Q @ area "B1"	1.58	cfs	1.23	cfs

PROPOSE CONDITION

Location	Q25 (SUM)		Q10 (SUM)		Location	Q25 (SUM)		Q10 (SUM)	
Q @ area "A1"	0.88	cfs	0.66	cfs	Q @ area "C1"	0.87	cfs	0.63	cfs
Q @ area "B1"	2.14	cfs	2.14	cfs	Q @ area "D1"	0.49	cfs	0.39	cfs

Drainage Device Selection

Pipe Dia (in)	3	4	6	8	Pipe Dia (in)	3	4	6	8
Cross Area A (ft^2)	0.05	0.09	0.20	0.35	Hydraulic, R_h=A/P	0.06	0.08	0.13	0.17
Pipe Dia (in)	12	16	18	24	Pipe Dia (in)	12	16	18	24
Cross Area A (ft^2)	0.79	1.40	1.77	3.14	Hydraulic, R_h=A/P	0.25	0.33	0.38	0.50

Drainage device Location			DATA for Max. flow in Drain pipe					Compare Q_{25} vs Q_{pipe}	
Sizing prop.pvc pipe	Q_{25} (SUM)		use pvc pipe	no of pipe	S (slope)	V (fps)	Q_{pipe} (cfs)		
PVC PIPE for OFF1 from pt"15"	5.99	cfs	1-8"	1	0.015	4.24	1.48	For nuisance flow ✓	
Catch Basin sizing	Length a in	Width b in	slot width W (in)	Perimeter P (ft)	Q/P =3.0 $h^{3/2}$ Bulking factor=1.5	Q/A=5.37 $h^{1/2}$	head h(ft)	vs.	head 0.4(ft)
Grate CB @sag, pt "35", Q_{25}=0.88	24.00	24.00	0.75	8.00	0.165		0.145	<	OK
Grate CB @sag, pt "38", Q_{25}=2.14	48.00	48.00	0.75	16.00	0.201		0.165	<	OK
Grate CB @sag, pt "45", Q_{25}=0.87	24.00	24.00	0.75	8.00	0.163		0.144	<	OK
Grate CB @sag, pt "48", Q_{25}=0.49	24.00	24.00	0.75	8.00	0.092		0.098	<	OK
Grate CB @sag, pt "15", Q_{25}=5.99	48.00	48.00	0.75	16.00	0.562		0.327	<	OK
Grate CB @sag, pt "38", Q_{25}=8.13	60.00	60.00	0.75	20.00	0.610		0.346	<	OK
** n for PVC pipe=0.013	* -use Parkway Drain				see plate 2.6 for chart of inlet capacity				
Parkway drain sizing	Depth D in	Width S in	Cross Area A (ft^2)	Slope, ft/100ft	Hydraulic R_h=A/P	V(fps)=1.49 6/n*$R_h^{2/3}$*$S^{1/2}$	capacity Q(cfs)	vs.	Q_{25} cfs
Parkway @pt"35"-A1	4.00	12.00	0.33	0.0200	0.125	4.04	1.347	>	0.880
Parkway @pt"38"-B1+Off site	4.00	66.00	1.83	0.0200	0.157	4.71	8.630	>	8.130 ✓
Parkway @pt"45"-C1	4.00	12.00	0.33	0.0200	0.125	4.04	1.347	>	0.870
Parkway @pt"48"-D1	4.00	12.00	0.33	0.0200	0.125	4.04	1.347	>	0.490

sizing velocity of flow	Depth D in	Width S in	Cross Area A (ft^2)	Slope, ft/100ft	Hydraulic R_h=A/P	Q_{25}(cfs)	V(fps)= Q_{25}/A	vs.	V(fps) max
Parkway @pt"35"	4.00	12.00	0.33	0.0200	0.125	0.880	2.64	>	2.000
Parkway @pt"38"-B1+Off site	4.00	66.00	1.83	0.0200	0.157	8.130	4.43	>	2.000
Parkway @pt"45"	4.00	12.00	0.33	0.0200	0.125	0.870	2.61	>	2.000
Parkway @pt"48"	4.00	12.00	0.33	0.0200	0.125	0.490	1.47	<	2.000
Check capacity of flow , see attach section cut									
PCC Gutter section sizing	Depth D see section	Width p ft	Cross Area A (ft^2)	Slope, ft/100ft	Hydraulic R_h=A/P	V(fps)=1.486/n*$R_h^{2/3}$*$S^{1/2}$=	capacity Q(cfs)	vs.	Q_{10} cfs
Gutter @SECT"A-A"'	0.096	26.00	2.23	0.0150	0.086	2.72	6.051	>	5.990
Gutter @SECT"B-B"'	0.115	26.00	2.67	0.0150	0.103	3.07	8.197	>	8.130

SECTION for BMP	A (ac)	Soil Type	Tc(min) Initial Time	% Imperv.	Q_{pm} (cfs)
Outlet point @ PT."35"-A1	0.28	7	5	85	0.10
Outlet point @ PT"38"-B1	0.68	7	5	85	0.24 .484
Outlet point @ PT"45"-C1	0.25	7	5	85	0.09
Outlet point @ PT"48"-D1	0.14	7	5	85	0.05

WSEL#1 @ SECTION A-A'

Channel Calculator

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	5.9900 cfs
Slope	0.0150 ft/ft
Manning's n	0.0130
Height	0.7000 ft
Bottom width	20.0000 ft
Left slope	0.0300 ft/ft (V/H)
Right slope	0.0300 ft/ft (V/H)

Computed Results:

Depth	0.0959 ft ← use 0.1'
Velocity	2.6916 fps
Full Flowrate	251.1642 cfs
Flow area	2.2254 ft2
Flow perimeter	26.3984 ft
Hydraulic radius	0.0843 ft
Top width	26.3955 ft
Area	30.3333 ft2
Perimeter	66.6877 ft
Percent full	13.7047 %

Critical Information

Critical depth	0.1304 ft
Critical slope	0.0051 ft/ft
Critical velocity	1.8868 fps
Critical area	3.1747 ft2
Critical perimeter	28.6971 ft
Critical hydraulic radius	0.1106 ft
Critical top width	28.6932 ft
Specific energy	0.2085 ft
Minimum energy	0.1956 ft
Froude number	1.6342
Flow condition	Supercritical

WSEL#2 @ SECTION B-B'

Channel Calculator

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	8.1300 cfs
Slope	0.0150 ft/ft
Manning's n	0.0130
Height	0.7000 ft
Bottom width	20.0000 ft
Left slope	0.0370 ft/ft (V/H)
Right slope	0.0370 ft/ft (V/H)

Computed Results:

Depth	0.1154 ft
Velocity	3.0488 fps
Full Flowrate	230.8243 cfs
Flow area	2.6666 ft2
Flow perimeter	26.2395 ft
Hydraulic radius	0.1016 ft
Top width	26.2352 ft
Area	27.2432 ft2
Perimeter	57.8637 ft
Percent full	16.4787 %

Critical Information

Critical depth	0.1599 ft
Critical slope	0.0048 ft/ft
Critical velocity	2.0902 fps
Critical area	3.8896 ft2
Critical perimeter	28.6502 ft
Critical hydraulic radius	0.1358 ft
Critical top width	28.6443 ft
Specific energy	0.2598 ft
Minimum energy	0.2399 ft
Froude number	1.6859
Flow condition	Supercritical

$Ap = 3.1416 \times D^2/4$, $R = D/4$

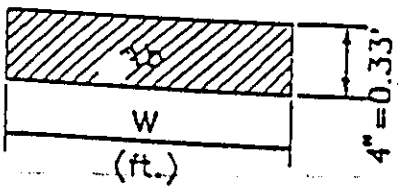
$V = (1.49/0.013) \times (R)^{2/3} \times (S)^{1/2}$ ft/sec

$(1.49/0.013 = 114.6)$

$Q = V \times Ap$ c.f.s.

D	S=0.5%		S=1%		S=1.5%		S=2%		Ap	R
	Q	V	Q	V	Q	V	Q	V		
4"	0.135	1.55	0.191	2.19	0.233	2.68	0.269	3.09	0.087	0.08
6"	0.398	2.03	0.563	2.87	0.688	3.51	0.794	4.05	0.196	0.12
8"	0.855	2.45	1.211	3.47	1.483	4.25	1.714	4.91	0.349	0.16
10"	1.553	2.85	2.196	4.03	2.687	4.93	3.107	5.70	0.545	0.20

BOX SIZE FOR PARKWAY DRAIN:



$n=0.013$, $Ab=0.333 \times W$ (sf.), $R=Ab/L$, $L=2 \times (W+0.333)$ (ft.

$V = (1.49/0.013) \times (R)^{2/3} \times (S)^{1/2}$ ft/sec

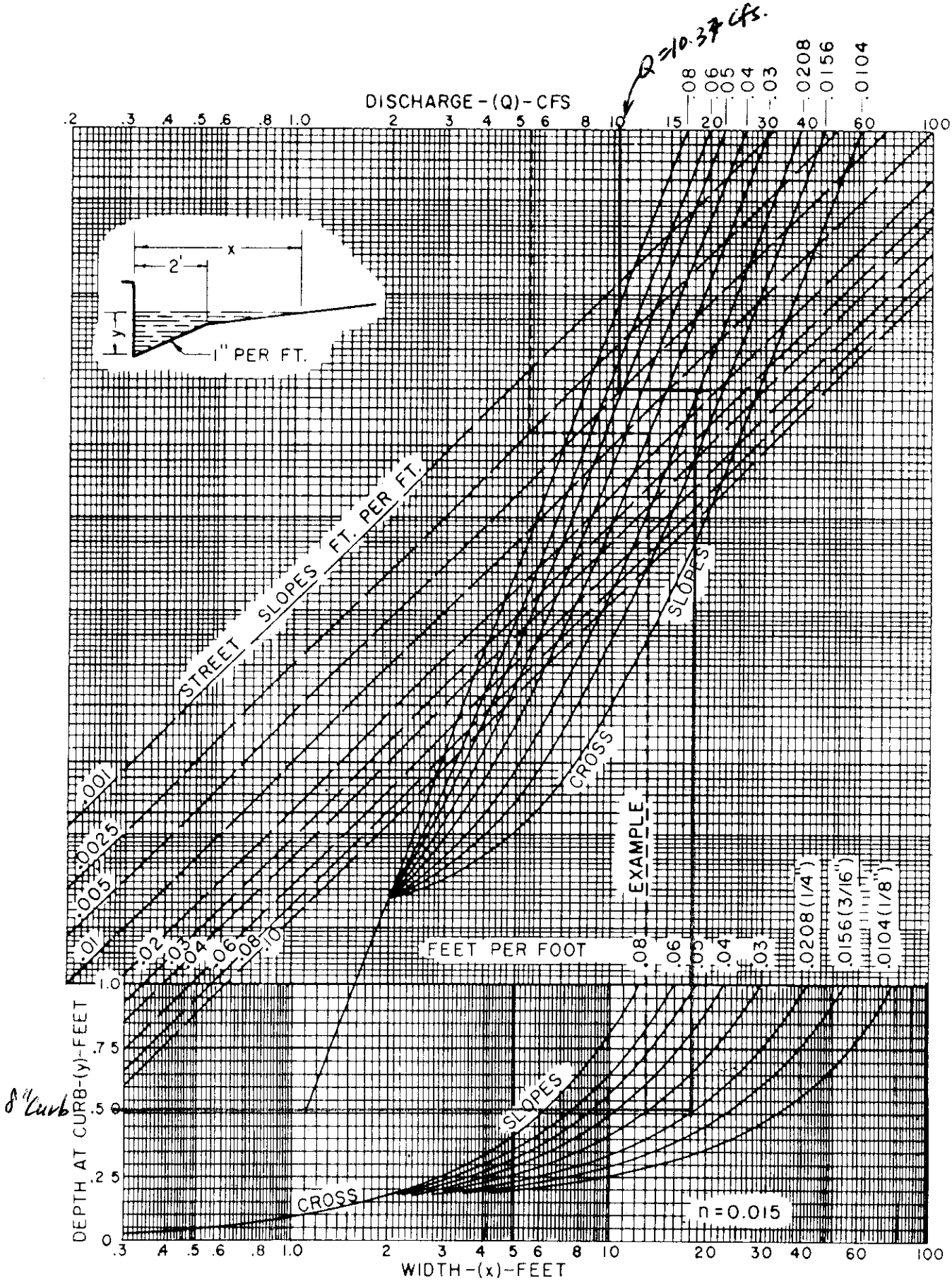
$(1.49/0.13 = 114.6)$

$Q = V \times Ab$ c.f.s.

W	Q (V=2ft/s)	S=1%		S=2%		Ab	R
		Q	V	Q	V		
1'-0"	0.667	0.956	2.87	1.349	4.05	0.333	0.125
1'-6"	1.000	1.520	3.04	2.145	4.29	0.500	0.136
2'-0"	1.334	2.088	3.13	2.955	4.43	0.667	0.143
2'-6"	1.666	2.657	3.19	3.765	4.52	0.833	0.147
3'-0"	2.000	3.240	3.24	4.580	4.58	1.000	0.150
3'-6"	2.334	3.804	3.26	5.392	4.62	1.167	0.152
4'-0"	2.666	4.386	3.29	6.212	4.66	1.333	0.154
4'-6"	3.000	4.965	3.31	7.020	4.68	1.500	0.155
5'-0"	3.334	5.534	3.32	7.835	4.70	1.667	0.156
5'-6"	3.666	6.122	3.34	8.652	4.72	1.833	0.157
6'-0"	4.000	6.700	3.35	9.480	4.74	2.000	0.158

APPENDIX E

STREET CAPACITY



FLOW CHARACTERISTIC CURVES

STRAIGHT CROSS SLOPES, CURB AND 2' GUTTER-1 IN./FT.

Plate 2.6-0681

☐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: Richard Yang 1-626-3776506 (cell)
Company: Engles Shen & Assoc.
Phone Number: 1-323-266-0866 Fax Number: 1-323-266-08617
Email: Englesshen@AOL.com

Method of Contact: ☐ Walk-in ☑ Phone ☑ Fax ☐ Email ☐ Prelim. Mtg. Date: 10/05/06

Intended Use: Install SD pipe to carry runoff from offsite to Fairview
Proposed Project Type: Res. Acreage Involved: _____
Will information be used in any litigation? ☐ YES ☐ NO
Case Info Name: _____ No: _____ Location: _____

Requester's Signature: _____

INFORMATION REQUESTED (Attach site map if available)
LACFCD Facility: Name: PD 470-9611-D36
Unit: _____ Line: _____ Station: _____
City: San Gabriel
Street/Cross-street: Fairview / Lotus St / Huntington Dr
Thomas Guide Page: 566 Grid: H-7 ☐ Site Map/Plans Submitted
Info. Requested:
request for allowable Q to PD 9611

BELOW SECTION TO BE COMPLETED BY THE HYDRAULIC ANALYSIS UNIT

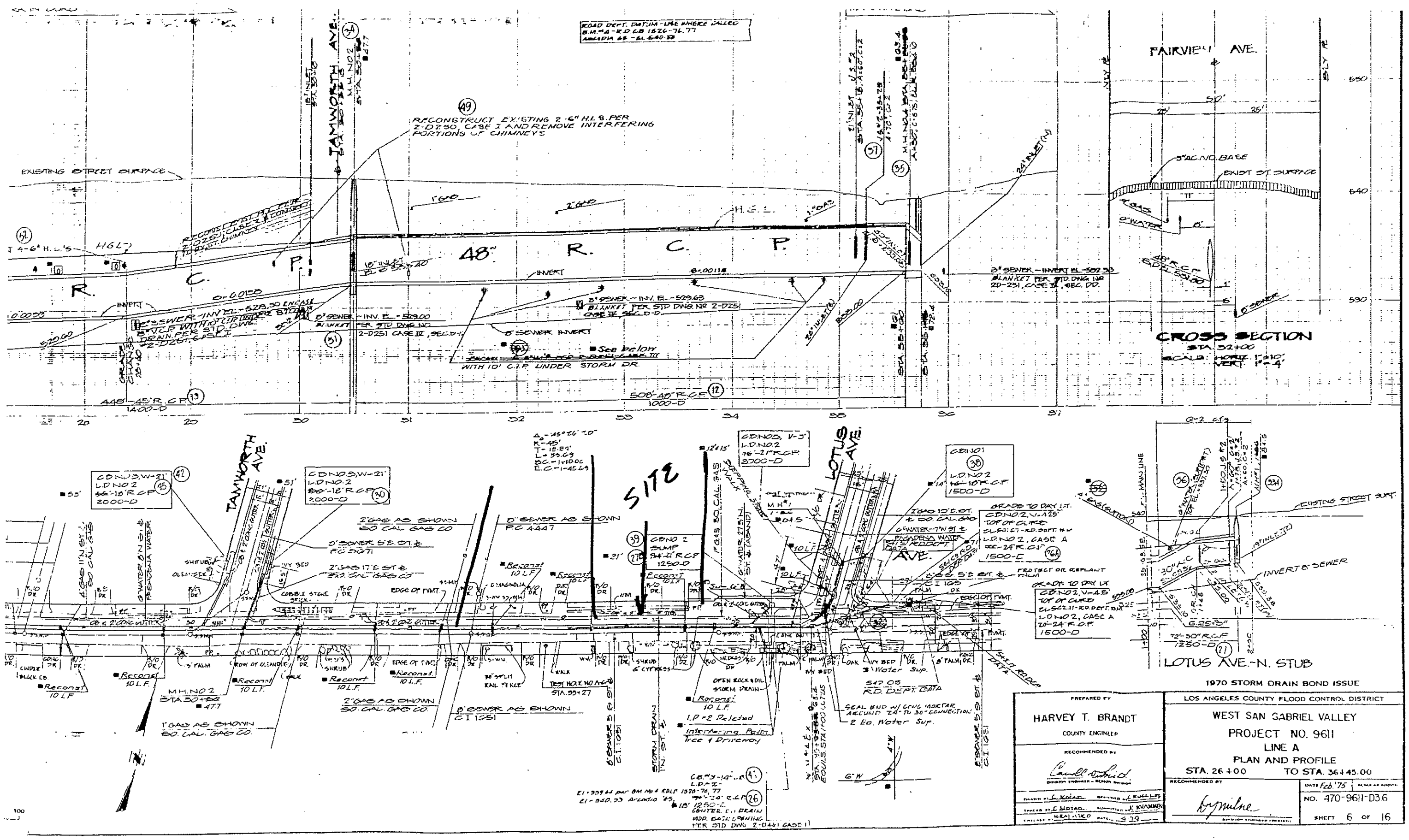
INFORMATION PROVIDED The allowable q for the proposed site tributary to Project 9611 is approximately 2.42 cfs/Ac.

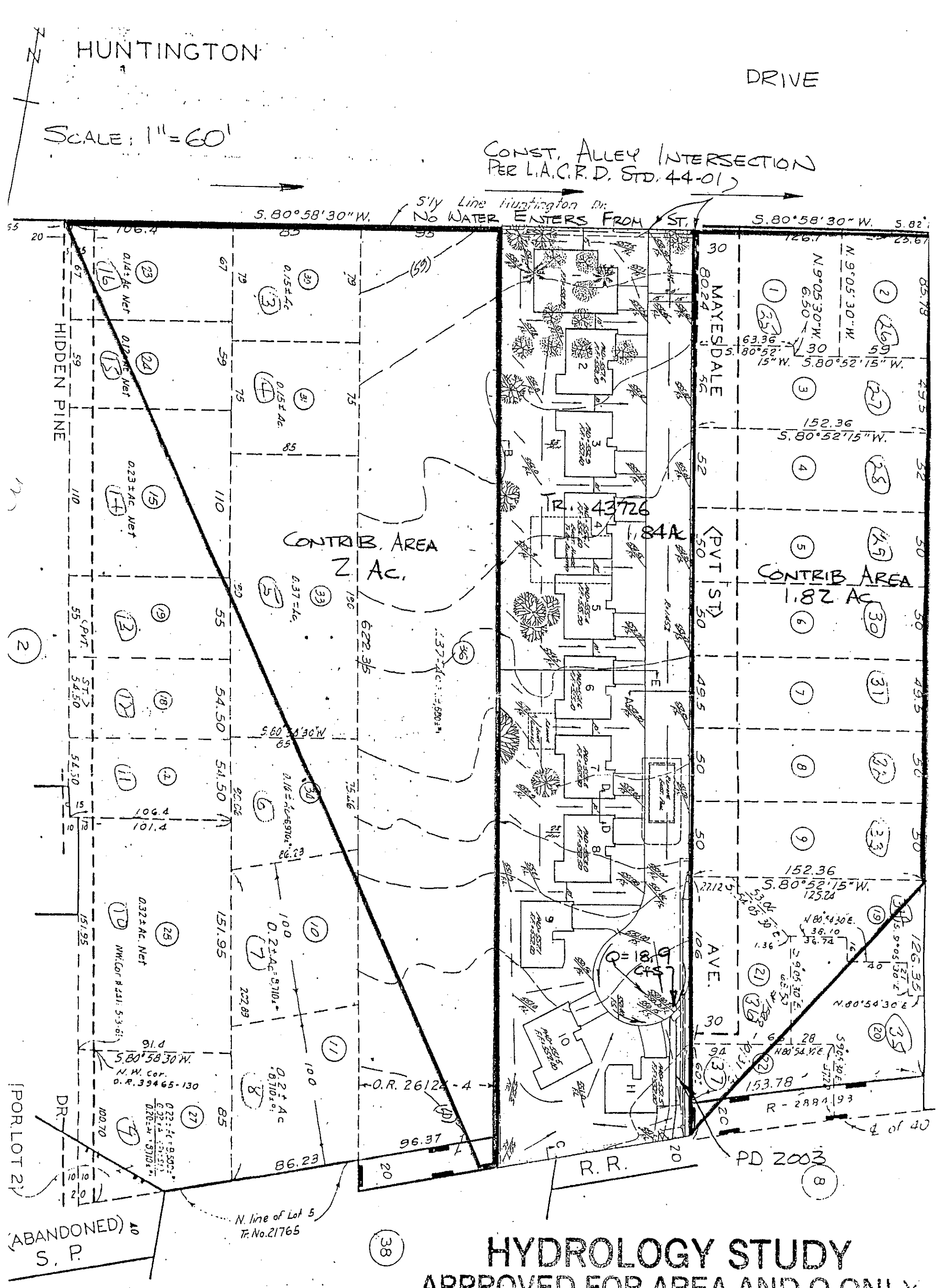
REFERENCES SEARCHED Water resources

COMMENTS, ETC. _____

FOLLOW-UP REQUIRED: _____

INFORMATION PROVIDED BY: Van Truong Date: 10/10/06
INFORMATION REVIEWED BY: _____ Date: __/__/__


TAMWORTH AVE.
FAIRVIEW AVE.
LOTUS AVE.
SITE
48" R. C. P.
RECONSTRUCT EXISTING 2-6" H.L.S. PER 2-D250, CASE I AND REMOVE INTERFERING PORTIONS OF CHIMNEYS
EXISTING STREET SURFACE
H.G.L.
INVERT
8" SEWER - INV. EL. - 529.63
BLANKET PER STD DWG. NO 2-D251 CASE IV, SEC. D-1
8" SEWER INVERT
See below
WITH 10' C.I.P. UNDER STORM DR.
500'-40" R.C.P.
1000-D
448'-45" R.C.P.
1400-D
CROSS SECTION
STA. 32+00
SCALE: HORIZ. 1"=10' VERT. 1"=4'
3" AC. NO. BASE
EXIST. ST. SURFACE
LOTUS AVE.-N. STUB
1970 STORM DRAIN BOND ISSUE
PREPARED BY
HARVEY T. BRANDT
COUNTY ENGINEER
RECOMMENDED BY
DIVISION ENGINEER - DESIGN DIVISION
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
WEST SAN GABRIEL VALLEY
PROJECT NO. 9611
LINE A
PLAN AND PROFILE
STA. 26+00 TO STA. 36+45.00
RECOMMENDED BY
DATE Feb '75
NO. 470-9611-D3.6
SHEET 6 OF 16



HUNTINGTON
DRIVE
SCALE: 1" = 60'
CONST. ALLEY INTERSECTION PER L.A.C.F.D. STD. 44-01
S'ly Line Huntington Dr.
NO WATER ENTERS FROM ST.
S.80°58'30"W.
HIDDEN PINE
DR.
(POR. LOT 2)
(ABANDONED) S. P.
N. line of Lot 5 Tr. No. 21765
CONTRIB. AREA 2 Ac.
TR. 43726 1.84 Ac.
CONTRIB. AREA 1.82 Ac.
MAYESDALE AVE.
(PVT. ST.)
Q = 18.9 CFS
O.R. 26124-4
N.W. Cor. O.R. 39465-130
R.R.
R-2884.93
PD 2003
4 of 40
622.35
151.95
152.36
153.78
126.35
106.4
101.4
86.23
96.37
S.80°52'15"W.
S.80°58'30"W.
N.80°54'30"E.
N.9°05'30"W.
0.14± Ac. Net
0.12± Ac. Net
0.23± Ac. Net
0.32± Ac. Net
0.15± Ac.
0.37± Ac.
0.2± Ac.
(2)
(8)
(38)

HYDROLOGY STUDY
APPROVED FOR AREA AND Q ONLY

By: Steve C. Gulick Date: APRIL 4, 1986

ENVIRONMENTAL DEVELOPMENT DIV.

REVISED
12-1A-55
1-5-56
1-23-56
1-30-56
1-22-57
1-30-58
10-7-60
9-28-61
11-6-61
2-21-62
4-15-64
4-2-66
66 07 27
6808 06210
6812 05112
6903 14

DRAINAGE AREA MAP
TR. NO. 43726

May 2003

EXHIBIT 4

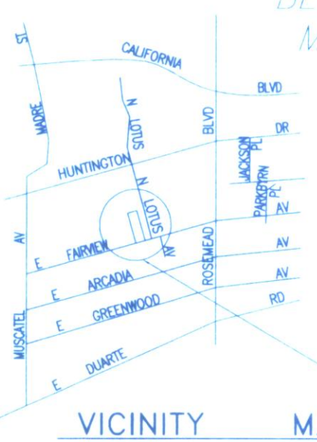
VESTING
TENTATIVE TRACT NO. 060107
DRAINAGE CONCEPT/SUSMP/HYDROLOGY STUDY

COUNTY OF LOS ANGELES, STATE OF CALIFORNIA

BEING A SUBDIVISION OF PORTIONS OF LOTS 84 AND 85 OF TRACT NO. 4850, AS PER MAP RECORDED IN BOOK 1 PAGES 97 AND 98 OF PATENTS RECORDS, BOTH IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

FOR CONDOMINIUM PURPOSES

SCALE: 1"=30'



VICINITY MAP
NOT TO SCALE

LEGENDS:

BW	BACK OF WALK
FF	FINISHED FLOOR
FG	FINISHED GRADE
FL	FLOW LINE
FS	FINISHED SURFACE
HP	HIGH POINT
INV	INVERT
TC	TOP OF CURB
TG	TOP OF GRATE
TS	TOP OF STEP
TW	TOP OF WALL
WV	WATER VALVE
	TOP OF CUT OR FILL

	FLOW BOUNDARY
D1	AREA DESIGNATION
Q50	CALCULATED FLOW
	FLOW DIRECTION
	DROP INLETS
	WATERSHED BOUNDARY
10	DRAINAGE NODE
B / 0.425AC	DRAINAGE SUBAREA NUMBER / DRAINAGE SUBAREA ACREAGE
	SUBAREA FOR EX. CONDITION

PROJECT ADDRESS:
8831, 8843/8845 FAIRVIEW AVENUE.
SAN GABRIEL, CA 91775

OWNER/SUBDIVIDER:
DAVID MAK
1363 VIRGINIA ROAD
SAN MARINO, CA 91108
TEL: (626) 405-8078; FAX-626-568-3367

PREPARED BY:
ENGLES SHEN & ASSOCIATES, INC.
1111 CORPORATE CENTER DRIVE, #302
MONTEREY PARK, CA 91754
TEL: (323) 266-0866

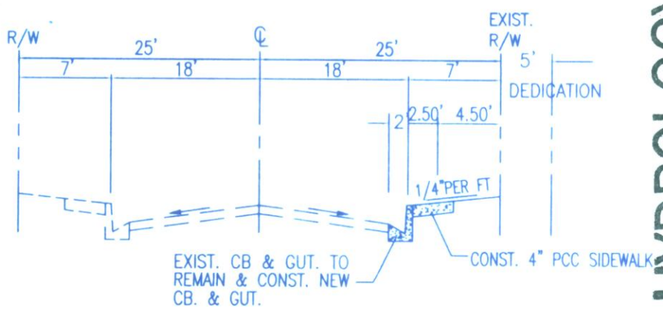
HYDROLOGY TABLE

SUB AREA	AREA (ACRES)	%IMP	FREQUENCY	SOIL TYPE	ISOHYET (IN)	TC (MIN.)	INTENSITY (IN./HR)	FLOWRATE (CFS)	**QPM (CFS)
OFFI	2.0	65%	25 YRS	7	6.6	6	3.61	5.99	0.24
AI	0.87	40%	25 YRS	7	6.6	7	3.36	2.25	0.16
BI	0.50	40%	25 YRS	7	6.6	5	3.94	1.58	0.09
AI	0.28	85%	25 YRS	7	6.6	6	3.61	0.88	0.1
BI	0.68	85%	25 YRS	7	6.6	6	3.61	2.14	0.24
CI	0.25	85%	25 YRS	7	6.6	5	3.94	0.87	0.09
DI	0.14	85%	25 YRS	7	6.6	5	3.94	0.49	0.05

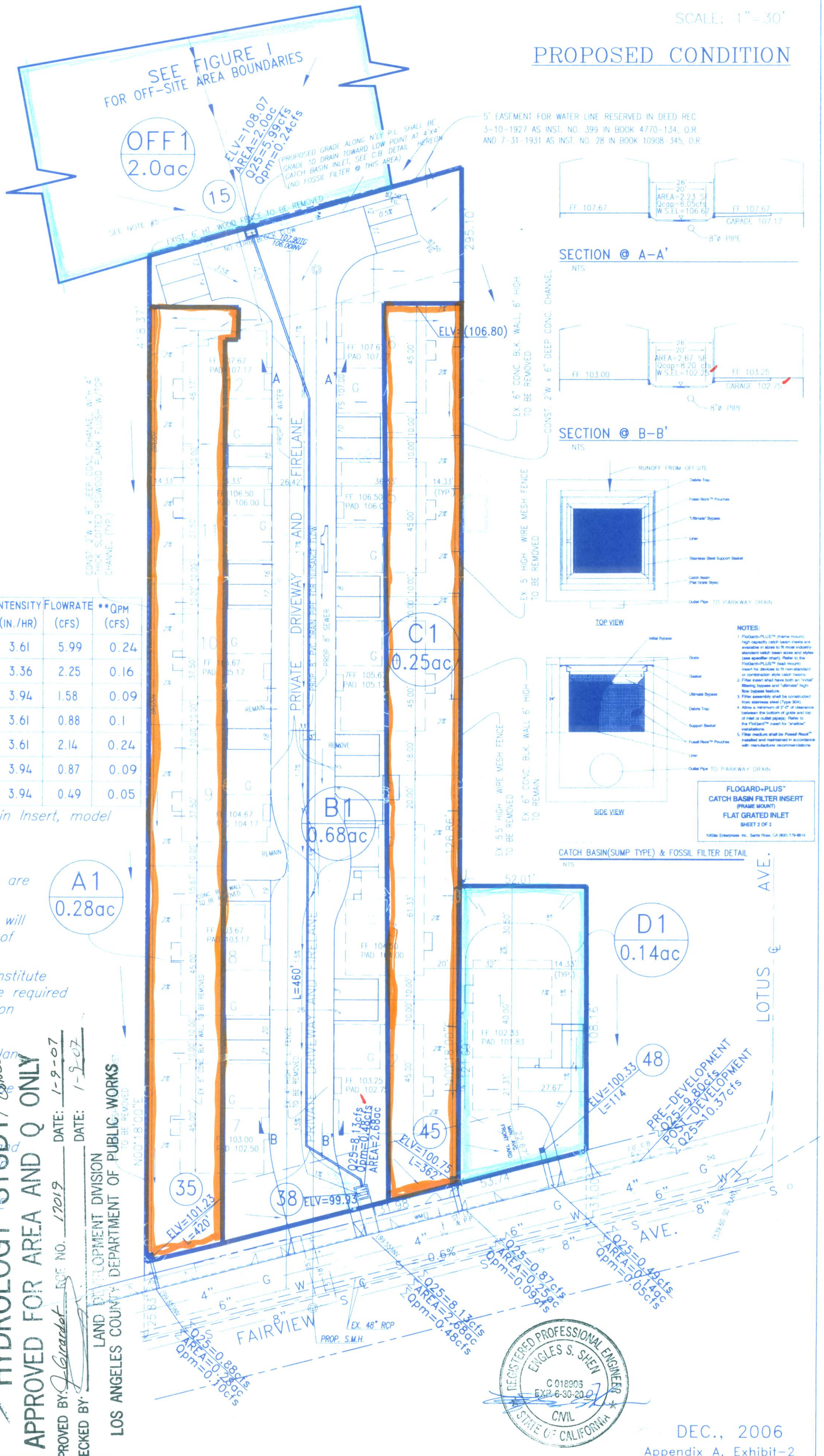
***Use Kristar Fossil Filter Flow-Gard Catch Basin Insert, model FF24D with Filter Flow Capacity=1.4cfs>Qpm*

DAINAGE CONCEPT NOTES

1. *Inlet details and storm drain alignments shown are not necessarily approved.*
2. *Compliance of all street drainage requirements will be met to the satisfaction of the Department of Public Works.*
3. *Approval of the drainage concept does not constitute determination that the offsite improvements are required within the meaning of Government Code Section 66462.5, (except as noted).*
4. *Comply with the urban Stormwater Mitigation Plan (SUSMP) requirements. The first .75 inches of stormwater runoff volume from the site must be treated prior to discharging into stormwater conveyance systems*
5. *The Basin will intercept off site nuisance flow and will be located on site as necessary to maintain the existing flow pattern*
6. *H.O.A. WILL BE RESPONSIBLE FOR SUSMP DEVICE MAINTENANCE*



TYPICAL SECTION @ FAIRVIEW AVE.
NO SCALE



SECTION @ A-A'
NTS

SECTION @ B-B'
NTS

CATCH BASIN(SUMP TYPE) & FOSSIL FILTER DETAIL
NTS

HYDROLOGY STUDY / DRAINAGE CONCEPT
APPROVED FOR AREA AND Q ONLY
APPROVED BY: [signature] RCE NO. 17019 DATE: 1-9-07
CHECKED BY: [signature] DATE: 1-9-07
LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

DEC., 2006

Appendix A, Exhibit-2

FIGURE 1