

F. Hydrology

PRELIMINARY HYDROLOGY AND SUSMP ANALYSIS

FOR

THE PLAZA AT THE GLEN

LOCATED AT

**NEC OF VICTORY BLVD AND ETHEL AVE
CITY OF NORTH HOLLYWOOD, CALIFORNIA**

Prepared for

DASHER LAWLESS, INC.

**6023 Hazeltine Ave
Los Angeles, CA 91401
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Prepared By:

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Anaheim Hills, CA 92808
(714) 685-6860
Brandon Willnecker P.E., Principal**

Project No. 08-720

Prepared: June 29, 2008

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SECTION 1.0

NARRATIVE

Introduction

Project Description

Hydrology Methodology/Analysis

SUSMP Compliance

Introduction

The proposed project is located on approximately 12.2 acres of developed land located at the northeast corner of Victory Boulevard and Ethel Avenue along the Tujunga Wash, in the City of North Hollywood, Los Angeles County, California. The existing shopping center located on this project area will be demolished and all existing surface improvements removed. The proposed project will include the construction of multi-story mixed use buildings, an underground parking structure, pavement, and landscape areas. Additional improvements will include underground sewer, water and storm drain facilities.

The purpose of this report is to support the position that on-site detention will not be required for runoff mitigation. The report will also identify off-site drainage concerns and stormwater treatment design requirements and for this project. The proposed peak on-site runoff will be shown to be lower than the existing peak on-site runoff. This reduction in the on-site runoff is the justification that on-site detention will not be required. In addition to the on-site requirements, this report will discuss the presence of off-site drainage concerns for neighboring properties and the proposed mitigation of these concerns. Lastly, in conformance with City of Los Angeles SUSMP requirements, this report will outline the Best Management Practices (BMPs) for stormwater treatment.

Hydrology Methodology

The hydrology calculations for the project are based on the LA County Department of Public Works (LADPW) Hydrology Manual (January 2006 edition). Location maps, precipitation values, and soil values have all been interpolated from the LADPW Manual and can be found in Section 2.0 of this report. The proposed project does not qualify for the Capital Flood Protection criteria and will therefore fall under the Urban Flood Protection level. The Urban Flood Protection level requires that the storm drain facilities be calculated for the 25-Year storm event. Existing and Proposed site conditions are analyzed using the LA County Time of Concentration (Tc) spreadsheet and LAR04 software to produce flow rates and to generate hydrographs for the 25-Year storm event. The soil type for the project is 015 and the 50-Year Isohyet is 7.25 inches. To determine the 25-Year Isohyet, the 50-Year Isohyet is multiplied by a scaling factor of 0.878 (Per LADPW Std.). The 25-Year Isohyet for this project is 6.366 inches.

Project Description

Existing Site Conditions: The existing site is a functioning commercial retail center. Currently, the on-site drainage pattern is the flow traveling east to west and ultimately into the Tujunga Wash. Stormwater runoff generated by the site sheet flows over asphalt pavement and concrete gutters to curb opening inlets located along the western property line. These inlets then convey the flow into the Tujunga Wash undetained and untreated. The connections to the Tujunga Wash are through three 12" pipes which outlet through the concrete wall of the channel. The Existing Hydrology Map in Section 3 illustrates the existing site development and flow pattern. The existing site is approximately 97% impervious with a hydraulic path 1500' in length. The resulting Time of Concentration (Tc) is 13 minutes with a 25-Year peak flow rate of 25.98 cfs. LA County Flood Control District has tabled the site to discharge a peak flow rate of 1 cfs per acre, or 12.2 cfs. The existing site exceeds the allowable discharge by approximately 213%.



As part of the existing shopping center improvements, a retaining/screen wall was constructed along the northern property line of the project. This retaining wall acts as a barrier for the runoff generated in the backyards of the adjacent residential parcels. Currently, there is no mitigation for this runoff and stormwater ponds in the yards until it percolates into the soil.

Observing the site and existing drainage devices, there are currently no stormwater treatment devices or attempts to utilize infiltration for mitigation of on-site stormwater runoff. On-site runoff is directed to impermeable surfaces, conveyed to catch basins by concrete channels, and discharged untreated into the Tujunga Wash Channel.

Proposed Site Development: The proposed site is a mixed use center consisting of several multi-story commercial/residential buildings, an underground parking structure, sidewalks, parking areas, and landscaping. The proposed site will convey the on-site flows to stormwater inlets, through City of LA required filtration/retention devices, and into the Tujunga Wash through the existing 12" lateral connections. The Proposed Hydrology Map in Section 4 illustrates the proposed site development and the proposed flow pattern. The proposed site is approximately 85% impervious area and the hydraulic path is 1940' with an average slope of 0.5%. The resulting Tc is 19 minutes with a 25-Year peak flow rate of 20.06 cfs. The proposed site will reduce the peak runoff by approximately 23%, which is a reduction from the existing condition and brings the site closer to conformance with the LACFCD tabled value.

The existing, proposed, and LACDPW tabled flow rate are summarized below:

PEAK SITE OUTFLOW SUMMARY TABLE

Storm Year	Existing Site Discharge	Proposed Site Discharge (Undetained)	Tabled Flow Rate (1 cfs/acre)
25	25.98 cfs	20.06 cfs	12.2 cfs

In order to mitigate the off-site drainage concern in the adjacent residential properties, the proposed project will construct storm drain infrastructure to collect the off-site runoff and convey the flow into the adjacent on-site retention swale. The storm drain system on the neighboring property will be designed to minimize impacts to the residential properties.

At least 95% of on-site storm water from will be treated for pollutants before being discharged into the Tujunga Wash. City of LA Standard Urban Stormwater Mitigation Plan (SUSMP) requirements are to pre-treat runoff from vehicular areas and infiltrate/retain the first 0.75-inch rain event for all impervious surfaces. This retention requirement results in a volume of water equivalent to 4% of the total impervious area for a depth of 30". In order to meet this requirement, the project has been divided into three drainage areas. See the Proposed Hydrology Map in Section 4 for illustration of these drainage areas. Stormwater runoff in Area A will be directed into a 10' swale located along the northern and eastern property lines. The swale will be designed to retain the necessary volume of site runoff in the soil and discharge overflow into the stormdrain network and into the Tujunga Wash. Prior to entering the swale, stormwater from vehicular areas will be pre-treated by City of LA approved stormwater inlet filter inserts. The retention swale will be approximately 13,700 square feet to provide the required retention capacity. Drainage Area B will be treated in underground retention boxes. These underground retention boxes will accept stormwater runoff, infiltrate the first 0.75-inch rainfall from the tributary impervious area, and overflow excess runoff into the storm drain network. The underground retention boxes will need to have a 30" deep retention depth for an area of



approximately 4,200 square feet. The retained runoff will infiltrate into perforated pipes and release into the storm drain system. Prior to entering the underground retention boxes, stormwater from vehicular areas will be pre-treated by City of LA approved stormwater inlet filter inserts. Drainage Area C will not be treated prior to entering the public right-of-way. Due to design constraints there are no practical mitigation measures to treat this stormwater runoff. Area C represents approximately 1.1% of the total site area, which is within the required 95% treatment of site runoff. See Section 5 for the BMP Site Plan and Preliminary Site Operations and Maintenance Plan.

SECTION 2.0

SITE INFORMATION

Location Map

Reference Documentation

LA County Design Division

Tabled Runoff Data

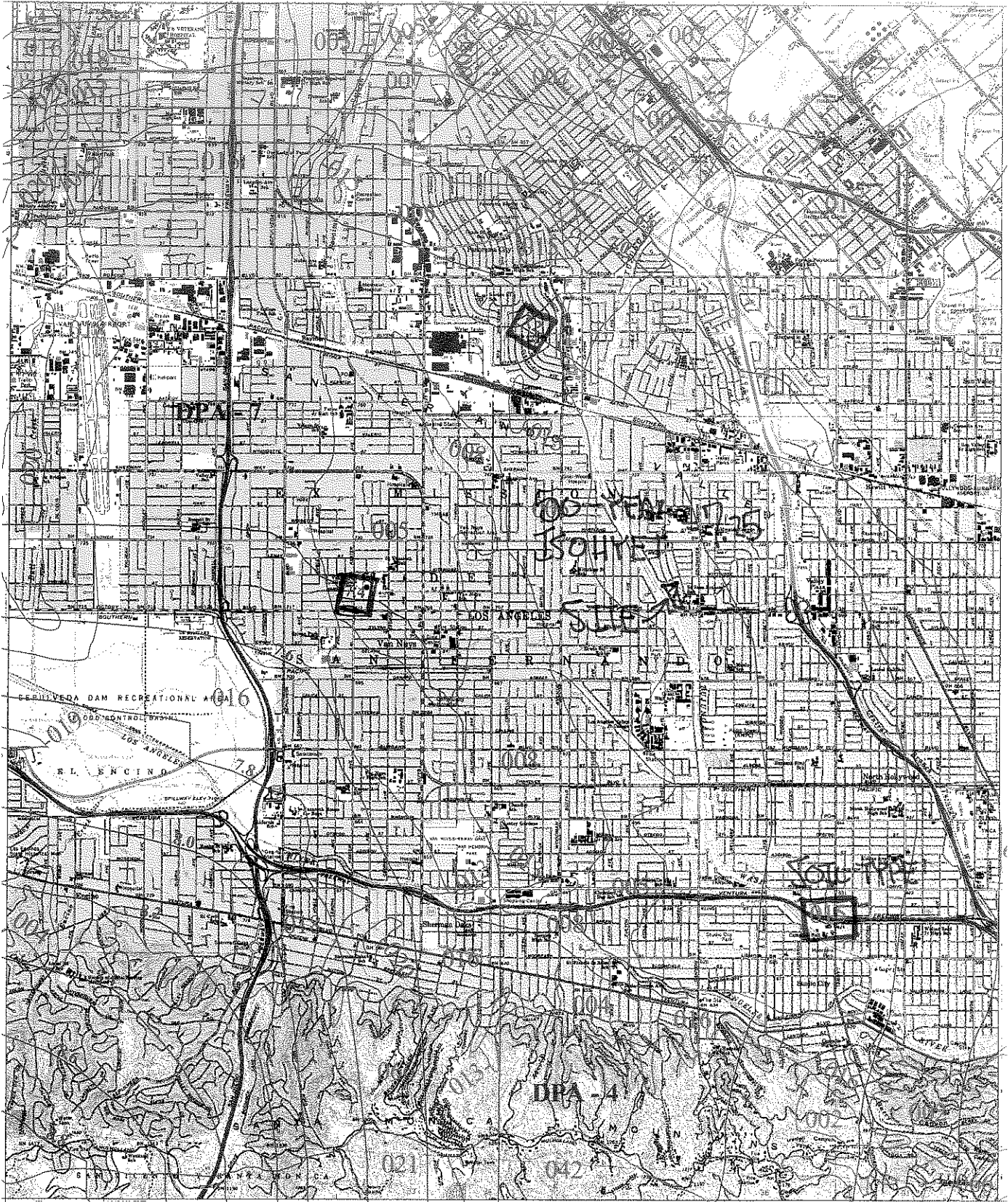
34° 15' 00"

SAN FERNANDO 1-HI.36

-118° 30' 00"

CANOGA PARK 1-HI.26

BURBANK 1-HI.28



-118° 22' 30"

BEVERLY HILLS 1-HI.17

34° 07' 30"



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

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

VAN NUYS
50-YEAR 24-HOUR ISOHYET

1-HI.27



DEPARTMENT OF PUBLIC WORKS
DESIGN DIVISION - HYDRAULIC ANALYSIS UNIT

INFORMATION REQUEST SUMMARY

INFORMATION REQUESTED BY

Requester's Name: Chris McKee

Company: DTC

Phone Number: (714) 685-6860

Method of Contact
Walk-in: _____

Telephone/Fax: _____

E-Mail: _____

Preliminary Meeting:

Intended use: Design/Analysis for future development

Date: 6/16/08

Will information be used in any Litigation? YES: _____ NO:

Requester's

Signature: [Signature]

INFORMATION REQUESTED (Attach site map if available)

Drain's Name: TUJUNGA WASH @ NE VICTORY BLVD

Location or TG page/grid: 352 D-6

Information Requested: HYDROLOGIC DATA, HYDRAULIC CALC. DESIGN CAPACITY & ALLOWABLE Q

INFORMATION PROVIDED

Hydrologic Data, Hydraulic Calculations Design Capacity & Allowable Q for Subarea NO. 9

REFERENCES SEARCHED

Design files

COMMENTS, ETC.

Project site = ± 12.5 acce.
Allowable Q = $172/115 \times 29000/44622 = 0.972 \approx 1.0$ g/s/acre

FOLLOW-UP REQUIRED:

AKS

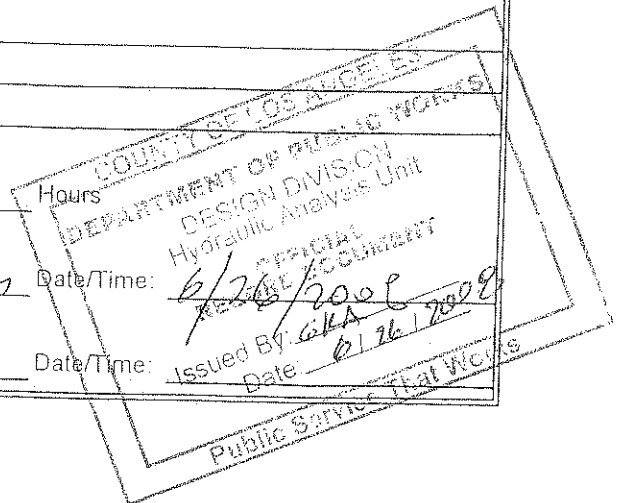
APPROXIMATE TIME INVOLVED IN SEARCH:

INFORMATION PROVIDED BY:

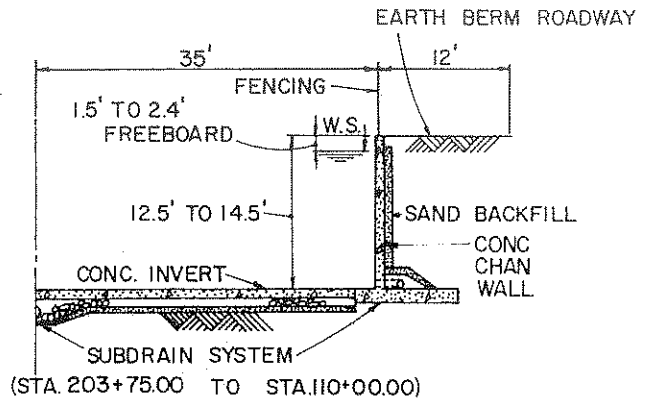
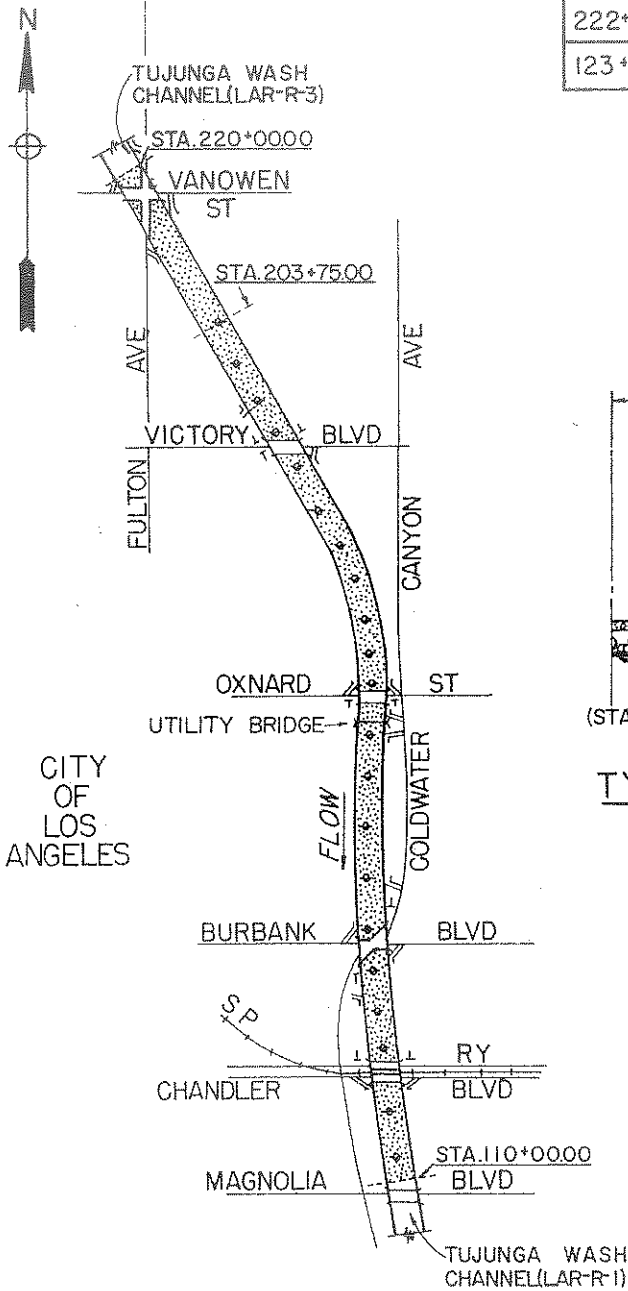
George Antablian

INFORMATION REVIEWED BY:

626-458-7959



DESIGN DATA				
STA.	TO STA.	SECT.	V	Q
222*0000	123*00.00	RECT.	34.2-38.7	29,000
123*0000	110*00.00	RECT.	33.5-34.2	30,000



TYPICAL OPEN SECTION
STA. 222*0000 TO STA. 110*0000

COUNTY OF LOS ANGELES
 DEPARTMENT OF PUBLIC WORKS
 DESIGN DIVISION
 Hydraulic Analysis Unit
 OFFICIAL
 RECORD DOCUMENT
 Issued By: *GLA*
 Date: *6/26/2008*
 Public Services Unit

LEGEND

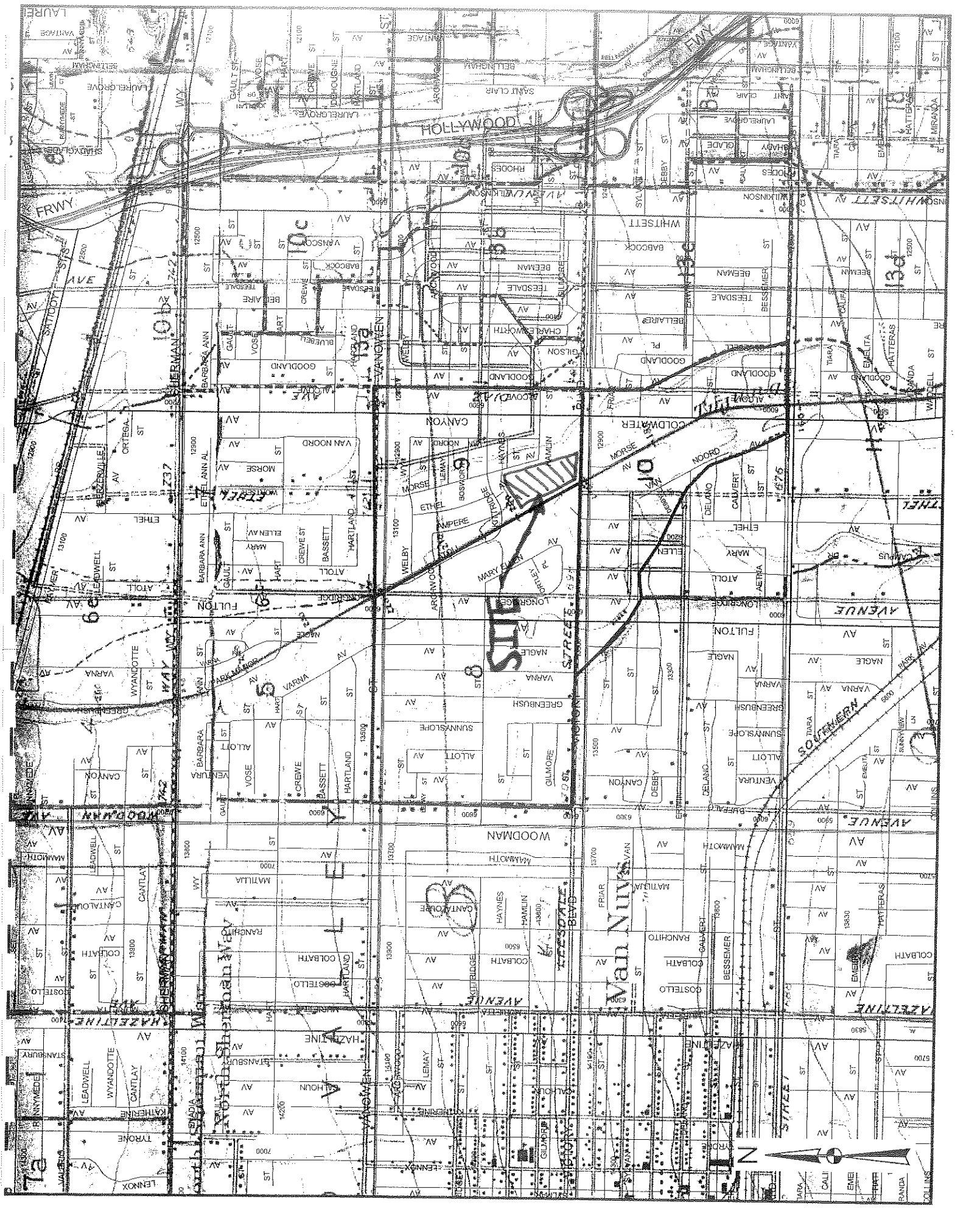
- OPEN SECTION
- STREET BRIDGE
- TYPICAL BERM-ACCESS RAMP
- TYPICAL BERM DEAD END
- SUBDRAIN MANHOLE
- CONST. PROJECT LIMIT

OPERATION AND MAINTENANCE MANUAL
 LOS ANGELES COUNTY DRAINAGE AREA,
 CALIFORNIA

TUJUNGA WASH CHANNEL
VANOWEN ST TO MAGNOLIA BLVD

SCALE IN FEET
 1000 0 1000 2000 3000 4000

OFFICE OF THE DISTRICT ENGINEER
 LOS ANGELES, CALIFORNIA LAR-R-2



HOLLYWOOD

STREET

Van Nuys

AZUSA



SPL Form 38

14 May 1968

Prev. edition is obsolete

Army C of E - Los Angeles

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
DESIGN DIVISION

Hydraulic DESIGN
SUMMARY OF PERTINENT DATA

Project Tajunga Wash Date 25 Oct. 1965
Locality Los Angeles River to Hansen Dam
Sheet 3 of 5
By E.G.C. Checked by

Station	Hydraulic elements	slope	D _n	D _s	Date	Invert Elev.	Wall ht.-ft.	S.E. ft.	F.B. ft.	REMARKS
271+06.78		.010464	9.8	10.5	39.4	732.41	13.00	1.10	2.50	5.7' Grade Change
268+31.78				10.4	39.3	734.53	13.00	1.10	2.60	C.S. R. 3125.26' Grade change
266+02.38		.008500	10.5	10.4	39.8	727.89	13.00	1.10	2.60	End of Panorma drain spillway
260+02.71		.006536	11.5	10.6	39.8	725.69	13.00	1.10	2.40	S.C. R. 2125.36' Grade change
257+27.71		.008500	10.5	10.6	39.1	723.97	13.00	1.10	2.40	Grade change
255+25.76		.010000	10.0	10.5	39.4	720.97	13.00	.90	2.50	C.S. R. 5819.75' Grade change
250+29.07		.008500	10.5	10.5	39.4	710.78	12.00	.90	1.50	4 Sherman Way
240+26.51		.007000	11.2	10.5	39.4	709.68	12.00	.90	1.50	S.C. R. 5819.75' Grade change
237+26.51		.008500	10.5	10.6	39.1	708.45	12.19		1.59	Grade Change
237+20				10.6	39.1	708.45	12.50		1.90	Grade Change
237+20	70'			10.7	39.7		12.50		1.80	
220+20.12		.007000	10.8	10.7	38.7	695.85	12.50		1.80	4 Intersection Van Owen St & Fulton Ave
204+00				10.8	38.4	688.78	12.50		1.70	Grade Change
192+50				11.5	36.0		13.00		1.50	
190+46.77		.005400	12.2	11.6	35.7		13.50		1.90	4 Victory Blvd
184+30				11.8	35.7		13.50		1.70	
177+00		.005000	11.8	12.0	34.5	668.20	13.50		1.50	Grade change
176+58.28		.008500	10.6	12.0	34.5	667.84	13.50		1.50	5.7' Grade change
173+64.28		.005000	11.8	11.7	35.4	665.58	13.50	1.28	1.80	C.S. 7' Grade change
165+57.05		.003778	13.8	11.7	35.4	660.74	13.50	1.28	1.80	S.C. R. 2122.12' Grade change
162+22.05				12.0	34.5	659.69	13.50		1.50	7.5' Grade change
161+56.67		.006000	11.8	12.0	34.5		13.50		1.50	4 Oxnard St
155+60				11.9	34.8		13.50		1.60	4 66" Pipe line crossing over ch.
151+45.14		.007120	11.1	11.9	34.8	652.87	13.50		1.60	5.7' Grade change
148+49.14		.005000	11.8	11.8	35.1	651.09	13.50	.58	1.70	C.S. 7' Grade change
146+29.67		.004800	12.6	11.8	35.1	649.50	13.50	.58	1.70	S.C. R. 4585.69' Grade change
143+79.67				11.9	34.8	648.28	13.50		1.60	7.5' Grade change
136+42.22		.006000	11.8	11.8	35.1	643.03	13.50		1.70	4 Calender Canyon Ave
135+02.89				11.8	35.1	643.03	13.50		1.70	4 Burbank Blvd
130+00				11.8	35.1	640.00	13.50		1.70	Grade Change
125+50				12.0	34.5		13.50		1.50	
123+00				12.1	34.2		13.50		1.40	
123+00	70' Rect.	.005000		12.7	33.7		13.50		1.80	1 EQUAL ENERGY
122+37.32	Q=50,000			12.7	33.7	636.19	14.50		1.80	4 Chandler Blvd. (North)
121+67.00	Q=17.9			12.7	33.7	635.84	14.50		1.80	4 S.P.R.R. Bridge

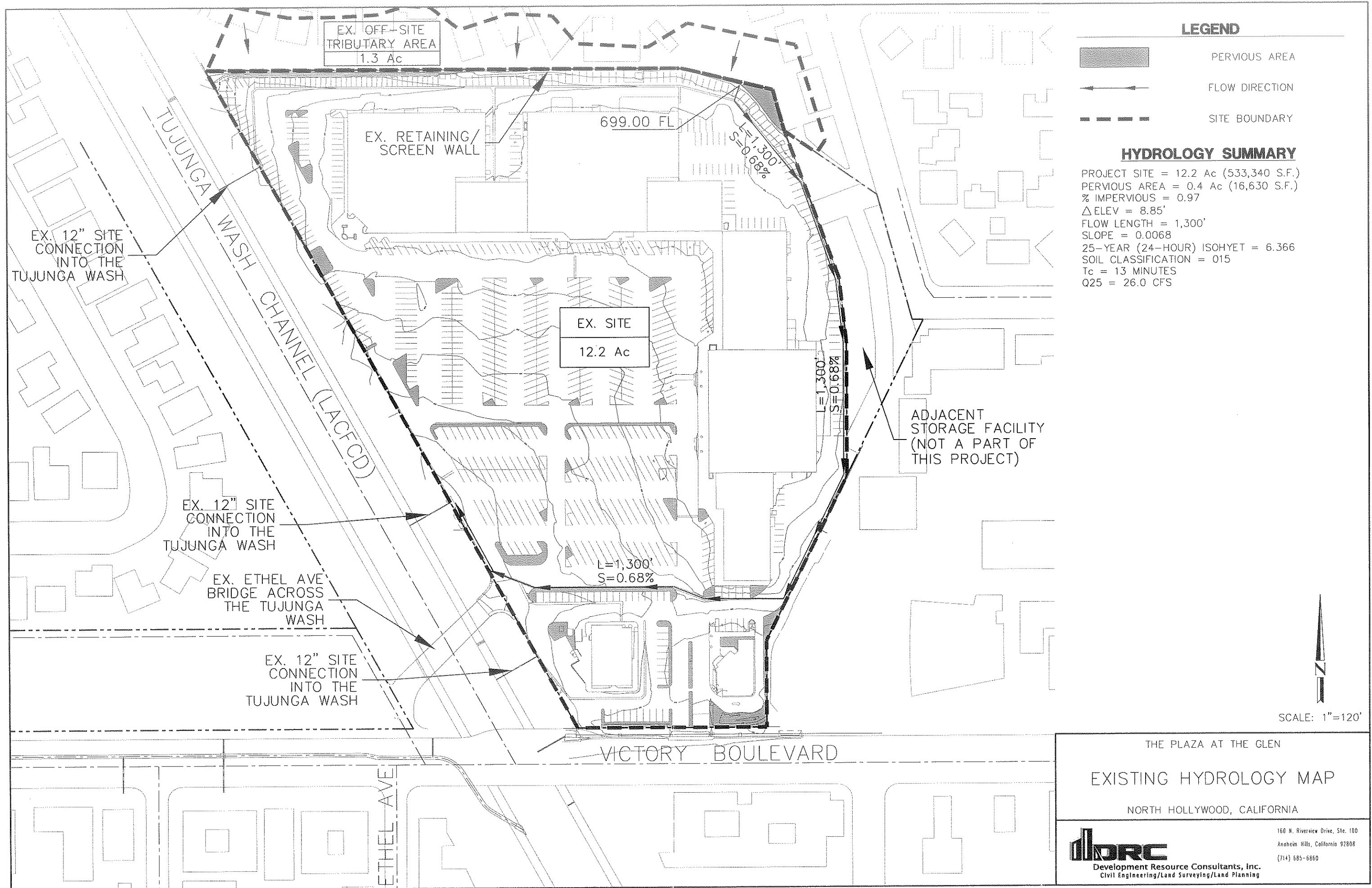
SECTION 3.0

EXISTING SITE CALCULATIONS

Existing On-Site Hydrology Map

LA County Tc Calculations

LA County LAR04 Existing Hydrograph



EX. OFF-SITE
TRIBUTARY AREA
1.3 Ac

EX. RETAINING/
SCREEN WALL

699.00 FL

L=1,300'
S=0.68%

EX. SITE
12.2 Ac

TUJUNGA
WASH CHANNEL (LACFCO)

EX. 12" SITE
CONNECTION
INTO THE
TUJUNGA WASH

EX. 12" SITE
CONNECTION
INTO THE
TUJUNGA WASH

EX. ETHEL AVE
BRIDGE ACROSS
THE TUJUNGA
WASH

EX. 12" SITE
CONNECTION
INTO THE
TUJUNGA WASH

L=1,300'
S=0.68%

L=1,300'
S=0.68%

ADJACENT
STORAGE FACILITY
(NOT A PART OF
THIS PROJECT)

VICTORY BOULEVARD

ETHEL AVE

LEGEND

-  PERVIOUS AREA
-  FLOW DIRECTION
-  SITE BOUNDARY

HYDROLOGY SUMMARY

PROJECT SITE = 12.2 Ac (533,340 S.F.)
 PERVIOUS AREA = 0.4 Ac (16,630 S.F.)
 % IMPERVIOUS = 0.97
 Δ ELEV = 8.85'
 FLOW LENGTH = 1,300'
 SLOPE = 0.0068
 25-YEAR (24-HOUR) ISOHYET = 6.366
 SOIL CLASSIFICATION = 015
 Tc = 13 MINUTES
 Q25 = 26.0 CFS

N
SCALE: 1"=120'

THE PLAZA AT THE GLEN
 EXISTING HYDROLOGY MAP
 NORTH HOLLYWOOD, CALIFORNIA



Development Resource Consultants, Inc.
 Civil Engineering/Land Surveying/Land Planning

160 N. Riverview Drive, Ste. 100
 Anaheim Hills, California 92808
 (714) 685-6860

08-720 The Plaza at The Glen
Existing Site Tc Calculation

Project	Subarea	Area	%imp	Frequency	Soil Type	Length	Slope	Isohyet
08-720	EX	12.20	0.97	25	15	1300	0.007	6.366

08-720 The Plaza at The Glen
Existing Site Tc Calculation

Project	Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Ischyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flowrate (cfs)	Actual Flowrate (Q=C/A)
08-720	EX	12.2	0.97	25	15	1300	0.0068	6.366	13	2.42	0.34	0.88	26	25.98

08-720 The Plaza at The Glen
Existing Site Hydrograph Calculations
LAR04 Title Data File

005 7610 1A 08-720 THE PLAZA AT THE GLEN - EXISTING PRELIMINARY
005 7610 2A Area A Hydrograph 25 Year

08-720 The Plaza at The Glen
Existing Site Hydrograph Calculations
LAR04 Runoff Data File

006	7610	1A	15	9712.213A364	1.0001000	2.00	0	
006	7610	2A	15	97 .099A364	1.0001000	2.00	02	2 0

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE:
 Area A Hydrograph 25 Year

HYDROGRAPH AT 7610 2A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	.00	100	1.53	200	1.59	300	1.67	400	1.77
500	1.89	600	2.03	700	2.21	800	2.45	900	2.81
1000	3.41	1050	4.22	1100	5.39	1110	6.40	1120	7.35
1130	8.50	1131	8.65	1132	8.81	1133	9.05	1134	9.16
1135	9.30	1136	9.45	1137	9.68	1138	9.92	1139	10.15
1140	10.38	1141	10.79	1142	11.20	1143	11.61	1144	11.92
1145	12.58	1146	13.15	1147	13.76	1148	14.33	1149	16.60
1150	18.85	1151	21.04	1152	23.29	1153	25.54	1154	25.81
1155	25.81	1156	25.64	1157	25.42	1158	24.76	1159	24.05
1160	23.30	1161	22.46	1162	19.97	1163	17.32	1164	14.74
1165	12.10	1166	9.46	1167	8.57	1168	7.93	1169	7.44
1170	7.07	1171	6.75	1172	6.46	1173	6.19	1174	6.03
1175	5.80	1176	5.68	1177	5.49	1178	5.38	1179	5.23
1180	5.12	1181	5.02	1182	4.90	1183	4.80	1184	4.68
1185	4.63	1186	4.55	1187	4.45	1188	4.38	1189	4.28
1190	4.25	1191	4.15	1192	4.12	1193	4.02	1194	3.99
1195	3.98	1196	3.90	1197	3.85	1198	3.82	1199	3.76
1200	3.73	1201	3.68	1202	3.64	1203	3.59	1204	3.56
1205	3.50	1206	3.51	1207	3.46	1208	3.43	1209	3.37
1210	3.38	1211	3.29	1212	3.30	1213	3.29	1214	3.25
1215	3.20	1216	3.21	1217	3.16	1218	3.17	1219	3.11
1220	3.08	1221	3.03	1222	3.04	1223	3.03	1224	3.04
1225	2.99	1226	2.95	1227	2.94	1228	2.95	1229	2.90
1230	2.90	1231	2.81	1232	2.82	1233	2.81	1234	2.82
1235	2.81	1236	2.73	1237	2.73	1238	2.73	1239	2.73
1240	2.69	1241	2.68	1242	2.65	1243	2.64	1244	2.64
1245	2.64	1246	2.64	1247	2.60	1248	2.56	1249	2.60
1250	2.56	1251	2.55	1252	2.52	1253	2.51	1254	2.52
1255	2.51	1256	2.47	1257	2.51	1258	2.47	1259	2.42
1260	2.43	1261	2.42	1262	2.43	1263	2.42	1264	2.39
1265	2.38	1266	2.39	1267	2.34	1268	2.34	1269	2.34
1270	2.30	1271	2.29	1272	2.30	1273	2.29	1274	2.30
1275	2.25	1276	2.26	1277	2.25	1278	2.26	1279	2.25
1280	2.25	1281	2.25	1282	2.25	1283	2.25	1284	2.21
1285	2.21	1286	2.21	1287	2.21	1288	2.21	1289	2.16
1290	2.17	1291	2.16	1292	2.12	1293	2.12	1294	2.12
1295	2.12	1296	2.08	1297	2.12	1298	2.13	1299	2.08
1300	2.08	1310	2.03	1320	1.94	1330	1.91	1340	1.87
1350	1.81	1360	1.76	1370	1.70	1380	1.69	1390	1.69
1400	1.61	1420	1.57	1440	1.53	1460	1.53	1500	1.53

Peak Flow →
 Rate

TOTAL VOLUME THIS HYDROGRAPH = 5.44 (Ac.Ft)

SECTION 4.0

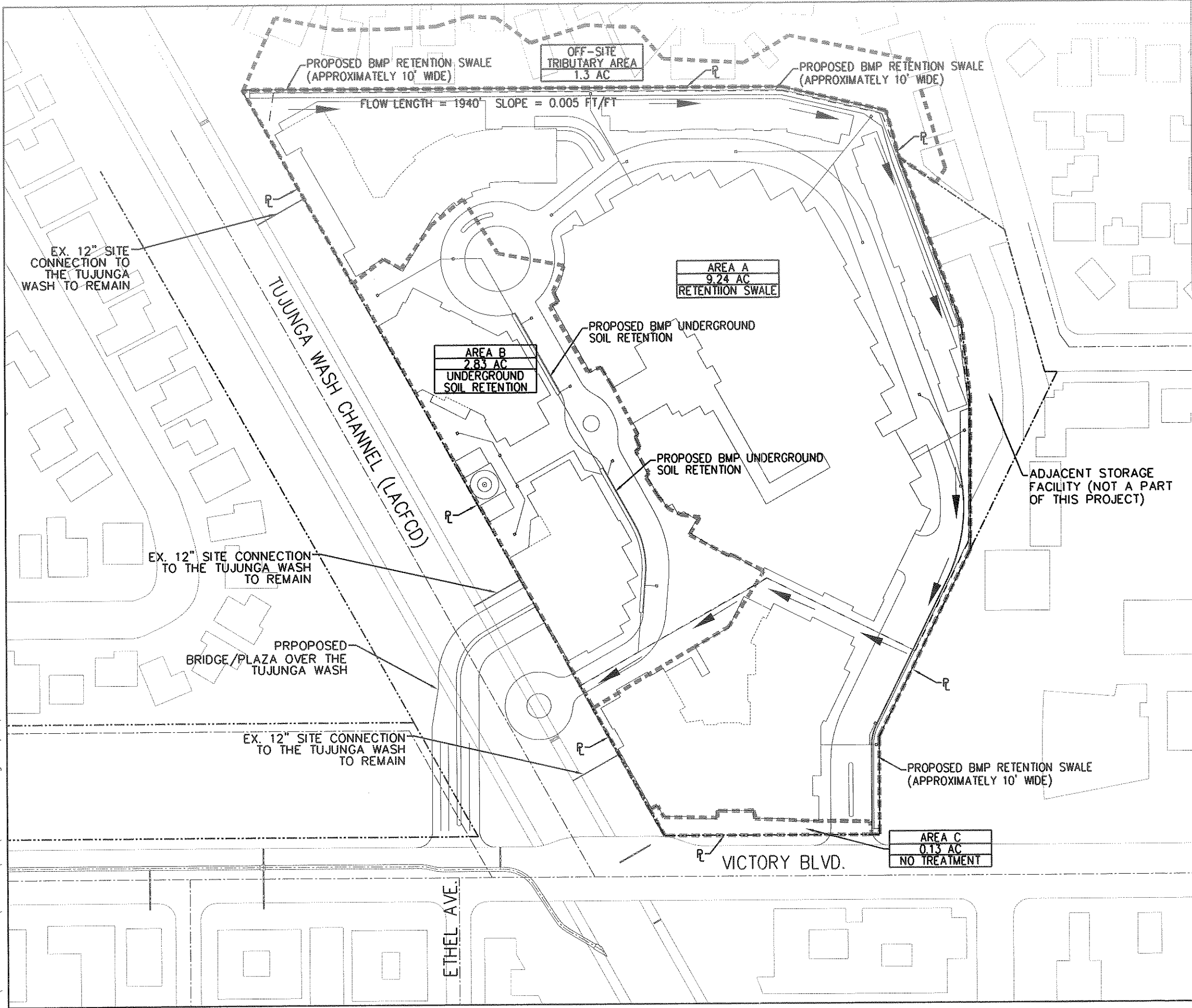
PROPOSED SITE CALCULATIONS

Proposed On-Site Hydrology Map

LA County Tc Calculations

LA County LAR04 Hydrograph Calculations

y:\usefulblocks\borders\drc\lb8-5x11.dwg 01/18/00 04:08:39 PM PST



LEGEND

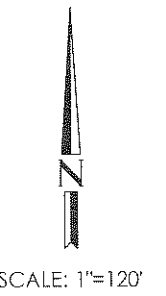
- DRAINAGE FLOW PATH
- DRAINAGE AREA BOUNDARY
- DRAINAGE FLOW PATH DIRECTION
- | |
|-----------------|
| AREA A |
| 9.24 AC |
| RETENTION SWALE |

 DRAINAGE AREA DESIGNATION
- | |
|-------------------------|
| 9.24 AC |
| DRAINAGE AREA (ACREAGE) |

 DRAINAGE AREA BMP RETENTION DEVICE

HYDROLOGY SUMMARY

PROJECT SITE = 12.2 Ac
 % IMPERVIOUS = 0.85
 FLOW LENGTH = 1,940'
 SLOPE = 0.005
 25-YEAR (24-HOUR) ISOHYET = 6.366
 SOIL CLASSIFICATION = 015
 Tc = 19 MINUTES
 Q25 = 20.0 CFS



THE PLAZA AT THE GLEN

PROPOSED HYDROLOGY MAP

NORTH HOLLYWOOD, CA 06-29-08

DRRC
Development Resource Consultants, Inc.
Civil Engineering/Land Surveying/Land Planning

160 N. Riverview Drive, Ste. 100
 Anaheim Hills, California 92808
 (714) 685-6860

08-720 The Plaza at The Glen
Proposed Site Tc Calculation

Project	Subarea	Area	%imp	Frequency	Soil Type	Length	Slope	Isohyet
08-720	Pr	12.20	0.85	25	15	1940	0.005	6.366

08-720 The Plaza at The Glen
Proposed Site Tc Calculation

Project	Subarea	Area (acres)	Pr	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flowrate (cfs)	Actual Flow Rate (Q=CIA)
08-720		12.2		0.85	25	15	1940	0.005	6.366	19	2.03	0.29	0.81	20	20.06

08-720 The Plaza at The Glen
Proposed Site Hydrograph Calculations
LAR04 Title Data File

005 7610 1A 08-720 THE PLAZA AT THE GLEN - PROPOSED PRELIMINARY
005 7610 2A Proposed Hydrograph 25 Year

08-720 The Plaza at The Glen
Proposed Site Hydrograph Calculations
LAR04 Runoff Data File

006	7610	1A	15	8512.219A364	1.0001000	2.00	0
006	7610	2A	15	85 .099A364	1.0001000	2.00	02 2 0

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE:

Proposed Hydrograph 25 Year

HYDROGRAPH AT 7610 2A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	.00	100	1.36	200	1.42	300	1.49	400	1.57
500	1.68	600	1.80	700	1.96	800	2.18	900	2.50
1000	3.03	1050	3.76	1100	4.80	1110	5.41	1120	6.36
1130	7.30	1131	7.39	1132	7.49	1133	7.64	1134	7.76
1135	7.90	1136	8.05	1137	8.25	1138	8.45	1139	8.65
1140	8.80	1141	9.04	1142	9.29	1143	9.54	1144	9.77
1145	10.23	1146	10.69	1147	11.16	1148	11.62	1149	13.18
1150	14.74	1151	16.27	1152	17.78	1153	19.31	1154	19.66
1155	19.83	1156	19.83	1157	19.78	1158	19.66	1159	19.52
1160	19.24	1161	18.89	1162	18.58	1163	18.24	1164	17.67
1165	17.11	1166	16.51	1167	15.91	1168	14.19	1169	12.43
1170	10.71	1171	9.00	1172	7.34	1173	6.75	1174	6.34
1175	6.01	1176	5.76	1177	5.51	1178	5.33	1179	5.14
1180	5.02	1181	4.85	1182	4.73	1183	4.61	1184	4.49
1185	4.40	1186	4.30	1187	4.22	1188	4.15	1189	4.06
1190	3.99	1191	3.93	1192	3.88	1193	3.80	1194	3.75
1195	3.69	1196	3.64	1197	3.56	1198	3.54	1199	3.48
1200	3.43	1201	3.40	1202	3.35	1203	3.32	1204	3.27
1205	3.24	1206	3.22	1207	3.19	1208	3.17	1209	3.11
1210	3.09	1211	3.03	1212	3.04	1213	3.01	1214	2.96
1215	2.93	1216	2.93	1217	2.87	1218	2.88	1219	2.85
1220	2.83	1221	2.79	1222	2.77	1223	2.77	1224	2.75
1225	2.72	1226	2.69	1227	2.66	1228	2.67	1229	2.64
1230	2.64	1231	2.58	1232	2.56	1233	2.56	1234	2.56
1235	2.53	1236	2.51	1237	2.48	1238	2.48	1239	2.48
1240	2.46	1241	2.45	1242	2.40	1243	2.40	1244	2.38
1245	2.37	1246	2.38	1247	2.35	1248	2.32	1249	2.32
1250	2.32	1251	2.32	1252	2.30	1253	2.27	1254	2.27
1255	2.27	1256	2.24	1257	2.24	1258	2.22	1259	2.21
1260	2.19	1261	2.19	1262	2.19	1263	2.19	1264	2.17
1265	2.14	1266	2.14	1267	2.14	1268	2.11	1269	2.11
1270	2.09	1271	2.08	1272	2.09	1273	2.06	1274	2.06
1275	2.06	1276	2.03	1277	2.03	1278	2.03	1279	2.03
1280	2.03	1281	2.00	1282	2.01	1283	2.00	1284	1.98
1285	1.98	1286	1.98	1287	1.98	1288	1.98	1289	1.95
1290	1.95	1291	1.95	1292	1.93	1293	1.92	1294	1.93
1295	1.92	1296	1.90	1297	1.90	1298	1.90	1299	1.87
1300	1.87	1310	1.82	1320	1.75	1330	1.70	1340	1.68
1350	1.63	1360	1.58	1370	1.53	1380	1.51	1390	1.50
1400	1.45	1420	1.40	1440	1.36	1460	1.36	1500	1.36

Peak Flow Rate →

1155 19.83

TOTAL VOLUME THIS HYDROGRAPH = 4.88 (Ac.Ft)

SECTION 5.0

SUSMP/BMP DOCUMENTATION

Operation and Maintenance Plan

BMP Site Plan

Retention Swale Detail

Underground Retention Box Detail

Stormwater Inlet Insert BMP Information

Operations and Maintenance Plan

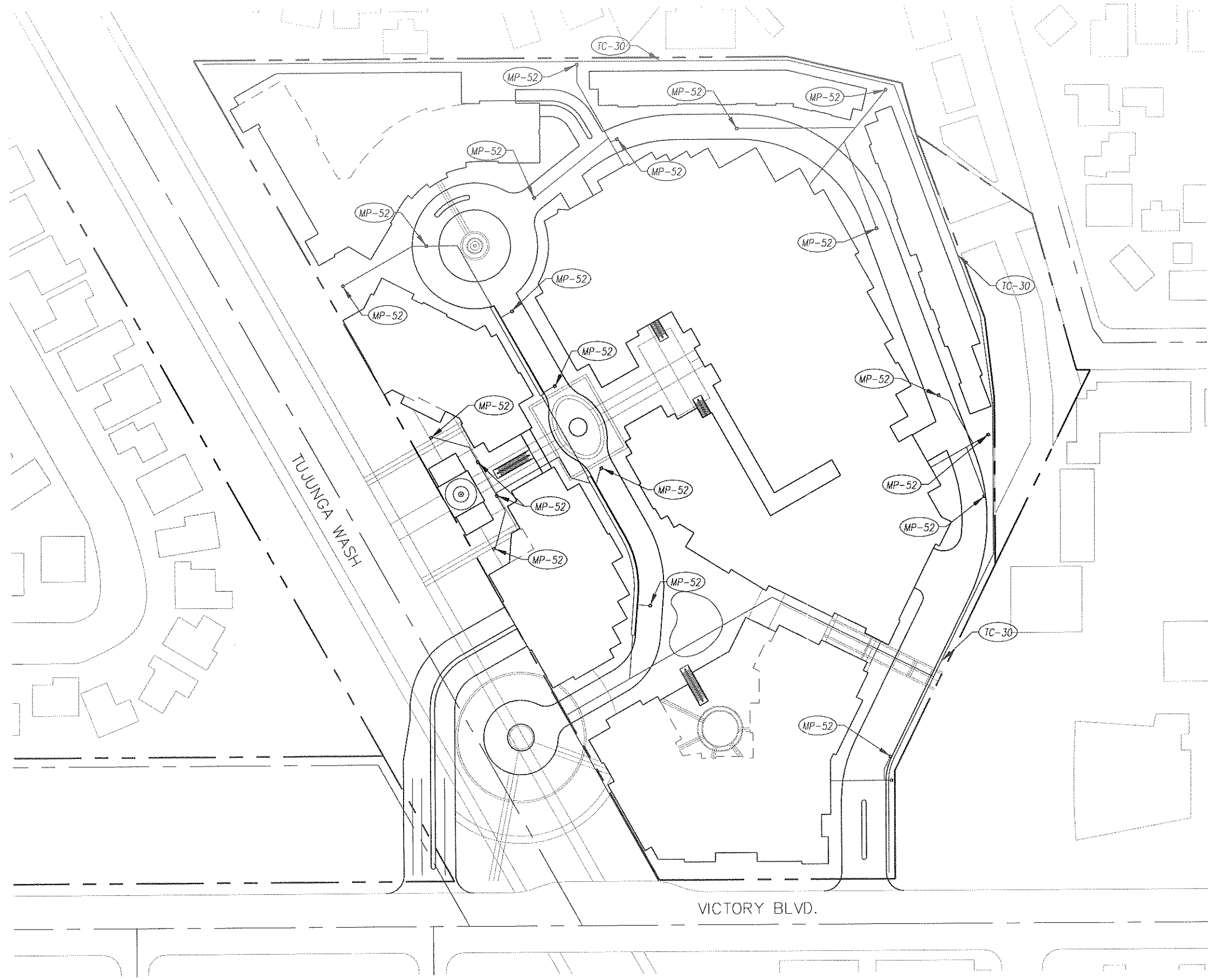
Dasher Lawless Plaza at Valley Glen Van Nuys, CA

No.	BMP DESCRIPTION	RESPONSIBLE PARTY	FREQUENCY / ACTIVITY
SC-10	Non-Storm Water Discharges	Owner & Operator: Dasher Lawless, Inc. 6023 Hazeltine Avenue Los Angeles, CA 91401 (818) 989-1282	Ongoing. Orientation shall be given to applicable employees within 30 days of start up and to each new applicable employee thereafter within 30 days of hire. Refreshing training shall be provided annually.
SC-11	Spill Prevention, Control, and Cleanup	Owner: Dasher Lawless, Inc.	Ongoing. The owner shall develop a spill response plan and maintain a spill response kit on site, which shall contain absorbent materials to adequately contain spills that may be anticipated. Applicable employees shall be trained to use the spill response kit. The kit shall be checked regularly to ensure there are sufficient materials.
SC-30	Outdoor Loading/Unloading	Owner: Dasher Lawless, Inc.	Inspect the loading areas on a daily basis for trash/debris, spills, and broken containers. Perform regular dry sweeping of the loading areas to remove trash/debris. Broken containers and spills shall be cleaned immediately upon occurrence.
SC-34	Waste Handling and Disposal	Owner: Dasher Lawless, Inc.	Ongoing Pick up any trash off the ground and place in appropriate containers. Trash storage pickup will be once per week.

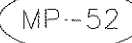



No.	BMP DESCRIPTION	RESPONSIBLE PARTY	FREQUENCY / ACTIVITY
SC-41	Building & Grounds Maintenance	Dasher Lawless, Inc., through landscape and grounds maintenance personnel	<p>Landscape and grounds maintenance will be performed on a weekly basis.</p> <p>Perform regular landscape maintenance that includes trimming and mowing, repair/replacement of damage or diseased vegetation, replanting of bare areas, etc.</p> <p>Perform regular grounds maintenance that includes trash and litter removal, etc.</p> <p>Additional repair activities will be performed as necessary.</p>
SC-42	Building Repair and Construction	Owner: Dasher Lawless, Inc.	When buildings are being repaired/maintained.
SC-44	Drainage System Maintenance	Owner: Dasher Lawless, Inc.	<p>Inspect catch basins a minimum of 3 times per year, including once prior to, during, and after the rainy season (October 1st through April 30th).</p> <p>Remove any trash, debris, or other obstructions. Make structural repairs as necessary.</p>
SD-11	Roof Runoff Controls	Owner: Dasher Lawless, Inc.	<p>Once per year prior to the start of the rainy season inspect roof drain inlets and outlets for obstructions and ensure roof drains continue to function properly.</p> <p>Remove obstructions in roof drain inlets and outlets and repair roof drain structures.</p>
SD-12	Efficient Irrigation	Dasher Lawless, Inc., through landscape and grounds maintenance personnel	<p>Inspect irrigation equipments on a monthly basis for proper operation.</p> <p>Check water sensors, irrigation heads, and timing.</p> <p>Adjust irrigation heads and timers as necessary.</p> <p>Repair or replace damaged irrigation equipment and make other repairs or adjustments as necessary.</p> <p>Landscape maintenance will be conducted on a weekly basis.</p>

No.	BMP DESCRIPTION	RESPONSIBLE PARTY	FREQUENCY / ACTIVITY
SD-13	Storm Drain Signage	Owner: Dasher Lawless, Inc.	<p>Inspect for legibility a minimum of once per year.</p> <p>Re-label/re-stencil as needed to clearly depict signage.</p>
SD-32	Trash Storage Areas	Owner: Dasher Lawless, Inc.	<p>Inspect trash storage areas daily to ensure all waste is inside the dumpster.</p> <p>Inspect trash containers and dumpsters for leaks and structural damage on a monthly basis. Repair or replace damaged trash containers and dumpsters.</p> <p>Dumpsters require functioning lids that will be closed during rain events.</p>
MP-52	Drain Inserts (FloGard Catch Basin Inserts)	Owner: Dasher Lawless, Inc.	<p>In accordance with manufacturer's specifications but not less than three times per year. Inspection and maintenance shall occur once prior to, during, and after the rainy season. (See Attached)</p>
TC-30	Vegetated Swales	Owner: Dasher Lawless, Inc.	<p>During weekly routine landscape maintenance include trimming, weeding, repair and replacement of damaged and diseased vegetation, and removal of trash and debris. Grass height shall not be cut lower than the design flow depth of the swale.</p> <p>Inspections shall take place twice per year, including once at the end of the rainy season (April 30th) to schedule summer maintenance and once prior to the onset of the rainy season (October 1st) to ensure the swale is ready for winter. Additional inspections shall take place after periods of heavy runoff. Sediment shall be removed when it builds up to 3 inches at any spot or covers vegetation.</p> <p>Check for erosion and accumulation of sediment and debris. Correct any erosion problems and remove accumulated sediment.</p>

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STRUCTURAL BMPS

-  DRAIN INSERTS
FLOGARD+PLUS CATCH BASIN INSERTS
-  RETENTION SWALES
-  STORM DRAIN SIGNAGE
-  TRASH STORAGE AREAS


LEGEND

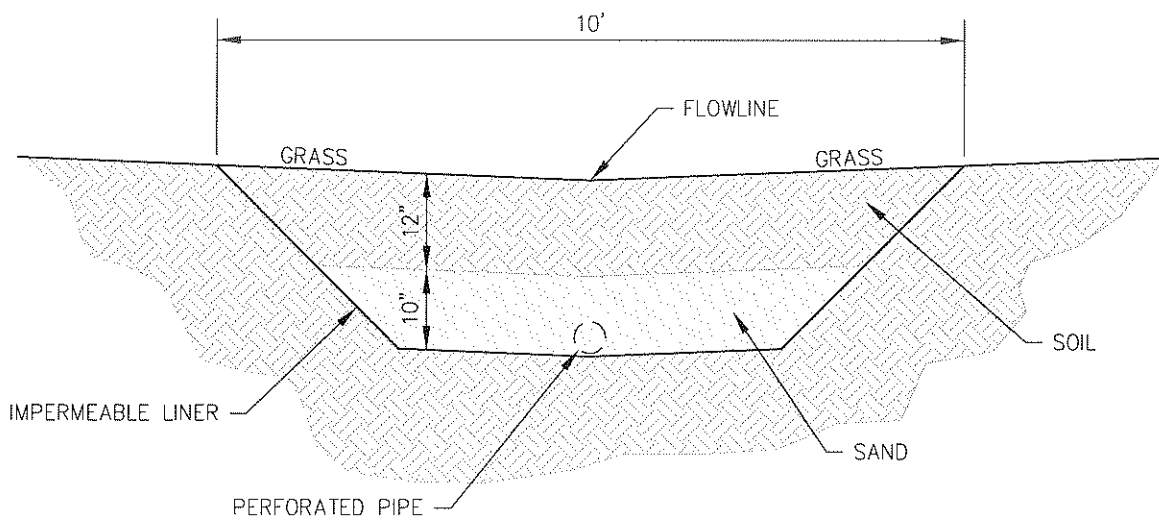
-  LANDSCAPED AREA
-  FLOW DIRECTION OF RUNOFF




SCALE: 1" = 120'

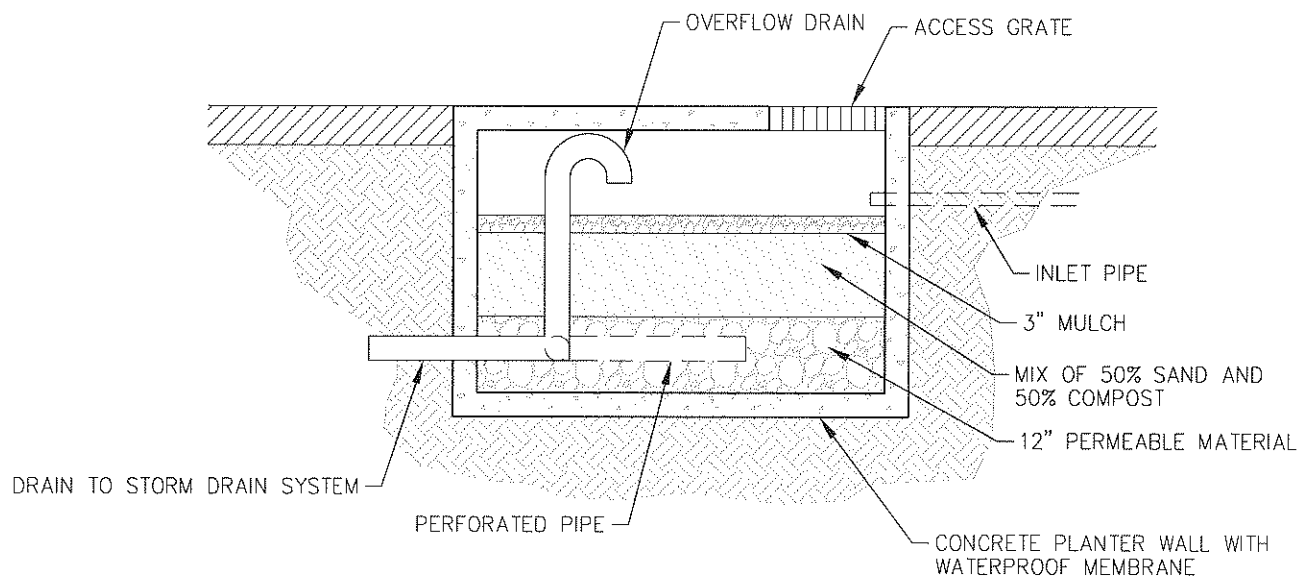
THE PLAZA AT THE GLEN
BMP SITE PLAN
NORTH HOLLYWOOD, CA

 Development Resource Consultants, Inc. Civil Engineering/Land Surveying/Land Planning	160 N. Riverview Drive, Ste. 100 Anaheim Hills, California 92808 (714) 685-6860
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NOTE:
100' MINIMUM LENGTH

<p>THE PLAZA AT THE GLEN RETENTION SWALE DETAIL TYPICAL SECTION NORTH HOLLYWOOD, CALIFORNIA</p>	
 <p>Development Resource Consultants, Inc. Civil Engineering/Land Surveying/Land Planning</p>	<p>160 N. Riverview Drive, Ste. 100 Anaheim Hills, California 92808 (714) 685-6860</p>



THE PLAZA AT THE GLEN
**UNDERGROUND RETENTION BOX
DETAIL**

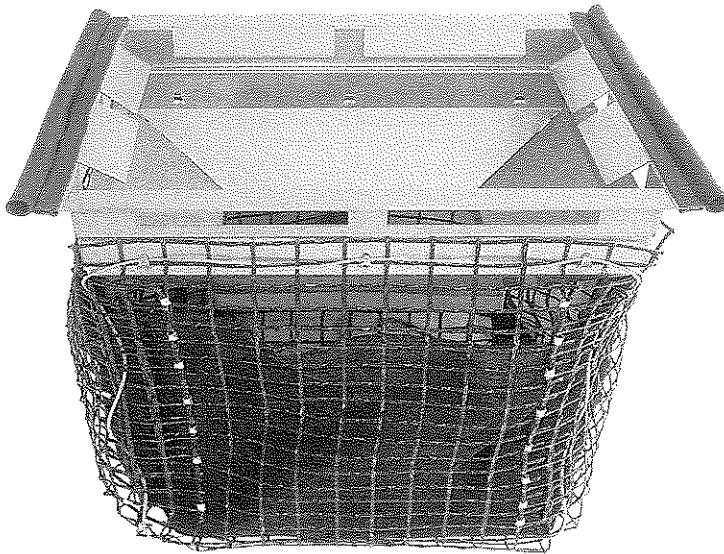
NORTH HOLLYWOOD, CALIFORNIA



Development Resource Consultants, Inc.
Civil Engineering/Land Surveying/Land Planning

160 N. Riverview Drive, Ste. 100
Anaheim Hills, California 92808
(714) 685-6860

Innovative stormwater management products



FloGard[®] +PLUS[®] Catch Basin Insert Filter

FloGard[®] +PLUS Catch Basin Insert Filter

GENERAL FILTER CONFIGURATION

FloGard[®]+PLUS catch basin insert filter shall provide solids filtration through a filter screen or filter liner, and hydrocarbon capture shall be effected using a non-leaching absorbent material contained in a pouch or similar removable restraint. Hydrocarbon absorbent shall not be placed at an exposed location at the entry to the filter that would allow blinding by debris and sediment without provision for self-cleaning in operation.

Filter shall conform to the dimensions of the inlet in which it is applied, allow removal and replacement of all internal components, and allow complete inspection and cleaning in the field.

FLOW CAPACITY

Filter shall provide two internal high-flow bypass locations that in total exceed the inlet peak flow capacity. Filter shall provide filtered flow capacity in excess of the required "first flush" treatment flow. Unit shall not impede flow into or through the catch basin when properly sized and installed.

MATERIALS

Filter support frame shall be constructed of type 304 stainless steel. Filter screen, when used in place of filter liner, shall be type 304 or 316 stainless steel, with an apparent opening size of not less than 4 U.S. mesh. Filter liner, when used in place of filter screen, shall be woven polypropylene geotextile fabric liner with an apparent opening size (AOS) of not less than 40 U.S. mesh as determined by ASTM D 4751. Filter liner shall include a support basket of polypropylene geogrid with stainless steel cable reinforcement.

Filter frame shall be rated at a minimum 25-year service life. All other materials, with the exception of the hydrocarbon absorbent, shall have a rated service life in excess of 2 years.

FloGard[®]+PLUS TEST RESULTS SUMMARY

Testing Agency	% TSS Removal	% Oil and Grease Removal	% PAH Removal
UCLA	80	70 to 80	
U of Auckland Tonking & Taylor Ltd. (for city of Auckland)	78 to 95		
U of Hawaii (for city of Honolulu)	80		20 to 40

FEATURES

- Easy to install, inspect and maintain
- Can be retrofitted to existing drain catch basins – or used in new projects
- Economical and efficient
- Catches pollutants where they are easiest to catch (at the inlet)
- No standing water – minimizes vector, bacteria and odor problems
- Can be incorporated as part of a "Treatment Train"

BENEFITS

- Lower installation, inspection and maintenance costs
- Versatile installation applications
- Higher return on investment
- Allows for installation on small and confined sites
- Minimizes vector, bacteria and odor problems
- Allows user to target specific pollutants

Innovative stormwater management products

FloGard® +PLUS Catch Basin Insert Filter



INSTALLATION AND MAINTENANCE

Filter shall be installed and maintained in accordance with manufacturer's general instructions and recommendations.

PERFORMANCE

Filter shall provide 80% removal of total suspended solids (TSS) from treated flow with a particle size distribution consistent with typical urban street deposited sediments. Filter shall capture at least 70% of oil and grease and 40% of total phosphorus (TP) associated with organic debris from treated flow. Unit shall provide for isolation of trapped pollutants, including debris, sediments, and floatable trash and hydrocarbons, from bypass flow such that re-suspension and loss of pollutants is minimized during peak flow events.

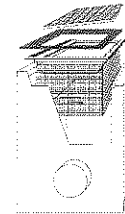
FloGard®+PLUS COMPETITIVE FEATURE COMPARISON

Evaluation of FloGard+PLUS Units (Based on flow-comparable units) (Scale 1-10, 10 being best)	FloGard+PLUS	Other Insert Filter Types**
Flow Rate	10	7
Removal Efficiency*	80%	45%
Capacity – Sludge and Oil	7	7
Service Life	10	3
Installation – Ease of Handling / Installation	8	6
Ease of Inspections & Maintenance	7	7
Value	10	2

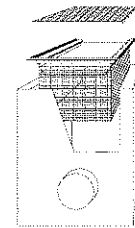
*approximate, based on field sediment removal testing in urban street application **average

Long-Term Cost Comparison (Scale 1-10, 10 being lowest cost, higher number being best)	FloGard+PLUS	Other Insert Filter Types
Unit cost — initial (\$/cfs treated)	10	4
Installation cost (\$/cfs treated)	9	6
Adsorbent replacement (annual avg \$/cfs treated)	10	2
Unit materials replacement (annual avg \$/cfs treated)	10	10
Maintenance cost (annual avg \$/cfs treated)	9	6
Total first yr (\$/cfs treated)	10	5
Total Annual Avg (\$/cfs treated, avg over 20 yrs)*	10	5

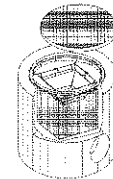
*assumes 3% annual inflation



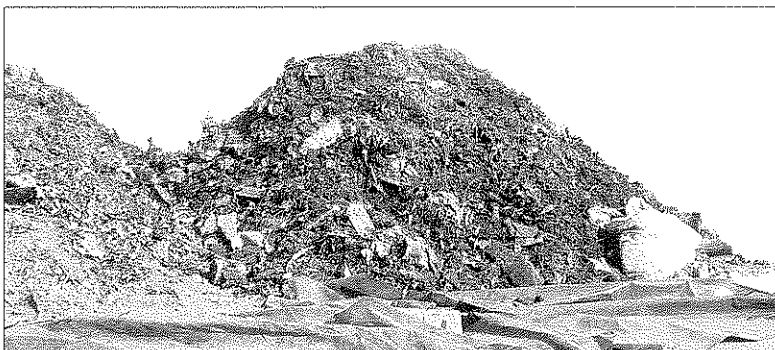
FloGard+PLUS
Combination Inlet



FloGard+PLUS
Flat Grate



FloGard+PLUS
Round Gated Inlet



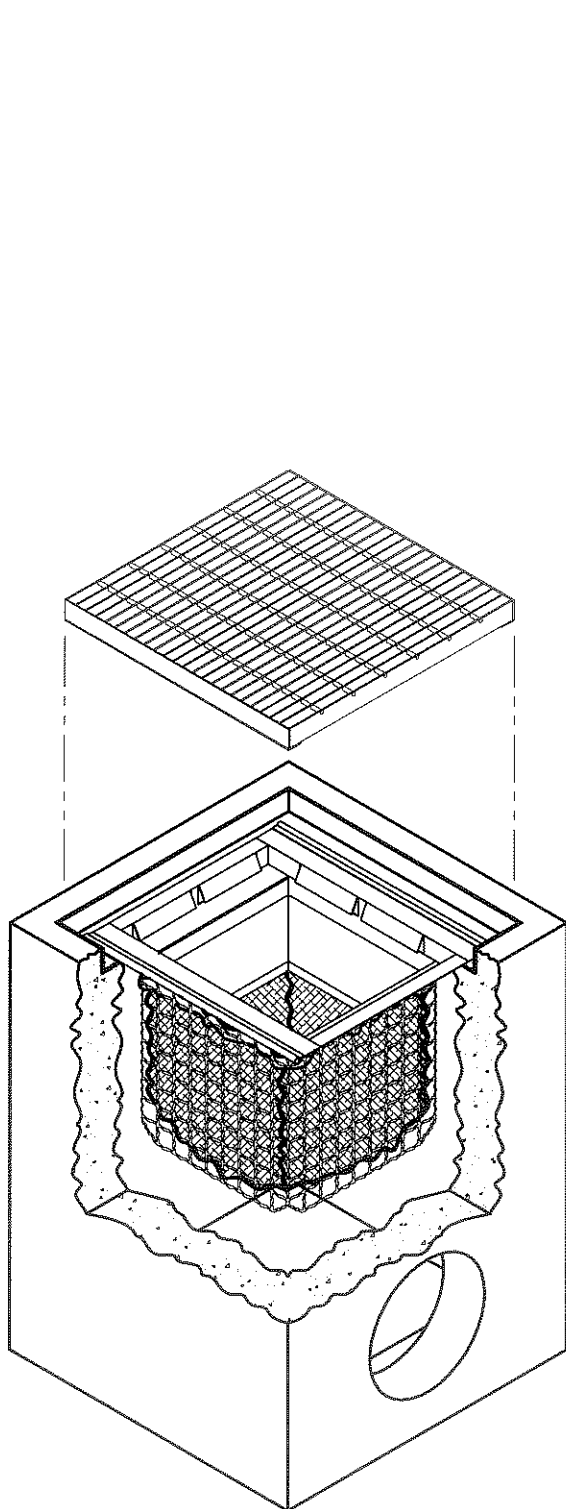
Captured debris from
FloGard+PLUS,
Dana Point, CA

KriStar Enterprises, Inc.
P.O. Box 6419
Santa Rosa, CA 95406-1419

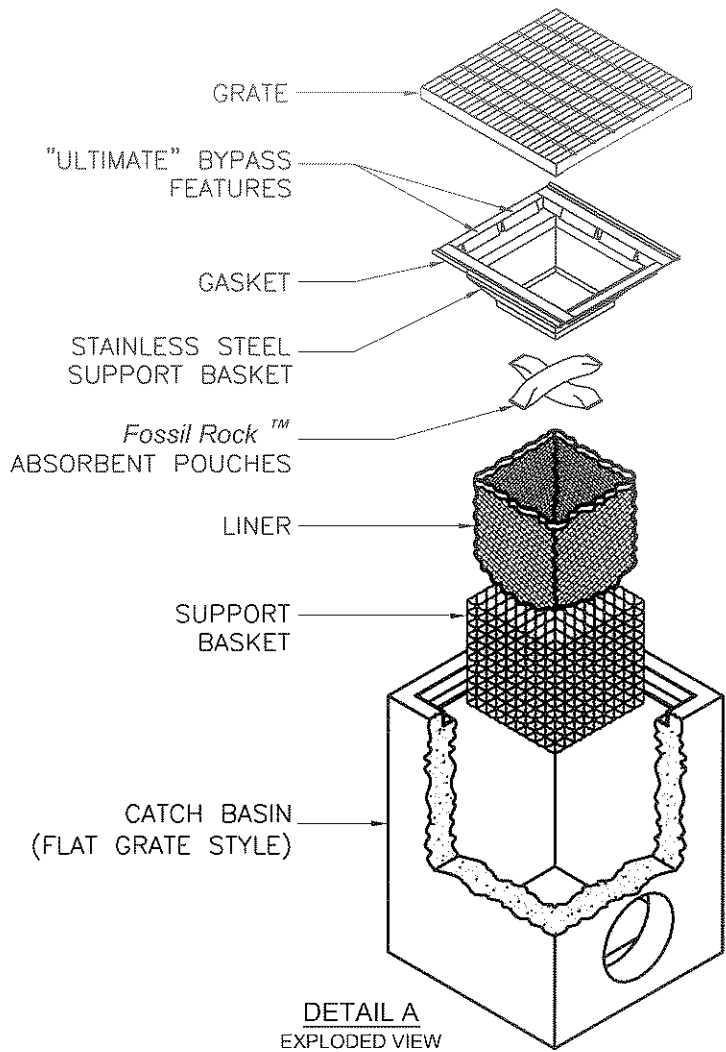
PH: 800-579-8819
FAX: 707-524-8186
www.kristar.com

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FGP-T 11.19.16.04.2M

FloGard® is a registered trademark of
KriStar Enterprises, Inc.



FLOGARD+PLUS® FILTER
-INSTALLED INTO CATCH BASIN-



DETAIL A
EXPLODED VIEW

NOTES:

1. FloGard®+Plus (frame mount) high capacity catch basin inserts are available in most sizes and styles (see specifier chart, sheet 2 of 2). Refer to the FloGard®+Plus (wall mount) insert for devices to fit non-standard, or combination style catch basins.
2. Filter insert shall have both an "initial" filtering bypass and "ultimate" high flow bypass feature.
3. Filter support frame shall be constructed from stainless steel Type 304.
4. Allow a minimum of 2.0 feet, of clearance between the bottom of the grate and top of outlet pipe(s), or refer to the FloGard® insert for "shallow" installations.
5. Filter medium shall be *Fossil Rock*™, installed and maintained in accordance with manufacturer specifications.
6. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
7. Filtered flow rate includes a safety factor of two.

U.S. PATENT # 6,00,023 & 6,877,029

TITLE

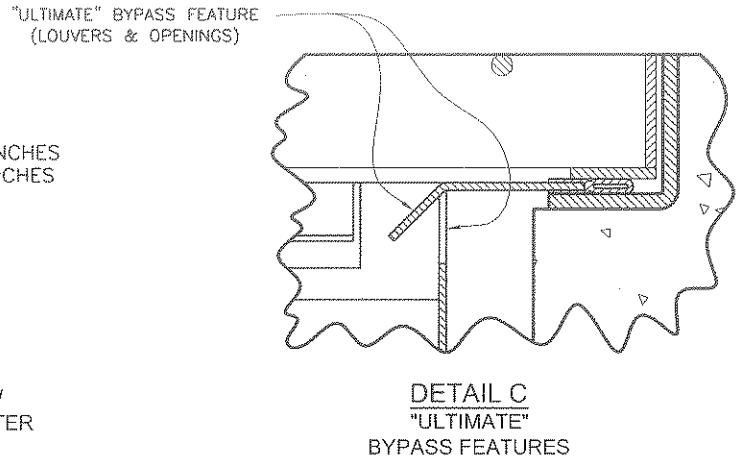
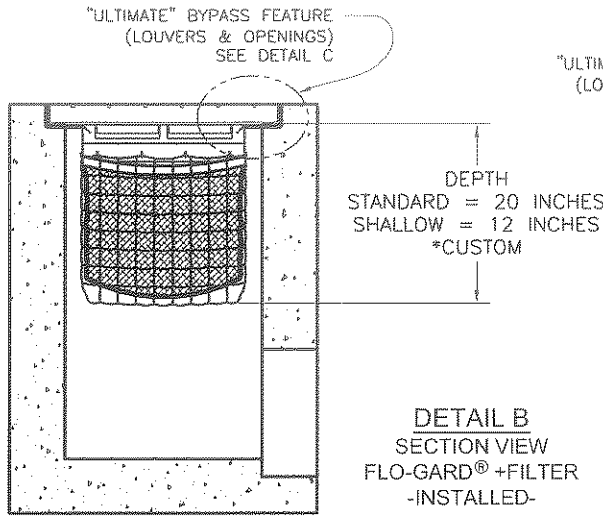
FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Frame Mount)
FLAT GRATED INLET



KriStar Enterprises, Inc.

P.O. Box 6419, Santa Rosa, CA 95406
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO. FGP-0001	REV A	ECD 0001	DATE JPR 09/01/06	SHEET 1 OF 2
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* MANY OTHER STANDARD & CUSTOM SIZES & DEPTHS AVAILABLE UPON REQUEST.

SPECIFIER CHART								
MODEL NO. STANDARD DEPTH	STANDARD & SHALLOW DEPTH <small>(Data in these columns is the same for both STANDARD & SHALLOW versions)</small>			STANDARD DEPTH -20 Inches-		MODEL NO. SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID <small>Inside Dimension (inch x inch)</small>	GRATE OD <small>Outside Dimension (inch x inch)</small>	TOTAL BYPASS CAPACITY <small>(cu. ft.)</small>	SOLIDS STORAGE CAPACITY <small>(cu. ft.)</small>	FILTERED FLOW <small>(cu. ft. / sec.)</small>		SOLIDS STORAGE CAPACITY <small>(cu. ft.)</small>	FILTERED FLOW <small>(cu. ft. / sec.)</small>
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-1530F	15 X 30	15 X 35	6.9	2.3	1.6	FGP-1530F8	1.3	.9
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-1624F	16 X 24	16 X 26	5.0	1.5	1.2	FGP-1624F8	.85	.7
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1820F	16 X 19	18 X 21	5.9	2.1	1.4	FGP-1820F8	1.2	.8
FGP-1824F	16 X 22	18 X 24	5.0	1.5	1.2	FGP-1824F8	.85	.7
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-2024F	18 X 22	20 X 24	5.9	1.2	1.0	FGP-2024F8	.7	.55
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-2142F	21 X 40	24 X 40	9.1	4.3	2.4	FGP-2142F8	2.45	1.35
FGP-2148F	19 X 46	22 X 48	9.8	4.7	2.6	FGP-2148F8	2.7	1.5
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2430F	24 X 30	26 X 30	7.0	2.8	1.8	FGP-2430F8	1.6	1.05
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	26 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-28F	28 X 28	32 X 32	6.3	2.2	1.5	FGP-28F8	1.25	.85
FGP-2440F	24 X 36	28 X 40	8.3	4.2	2.3	FGP-2440F8	2.4	1.3
FGP-30F	30 X 30	30 X 34	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.8	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.9	FGP-48F8	5.45	2.25
FGP-SD24F	24 X 24	28 X 28	6.1	2.2	1.5	FGP-SD24F8	1.25	.85
FGP-1836FGO	18 X 36	20 X 40	6.9	2.3	1.6	FGP-1836F8GO	1.3	.9
FGP-2436FGO	20 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8GO	1.95	1.15
FGP-48FGO	18 X 48	20 X 54	6.3	2.2	1.5	FGP-48F8GO	1.25	.85

TITLE

FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Frame Mount)
FLAT GRATED INLET



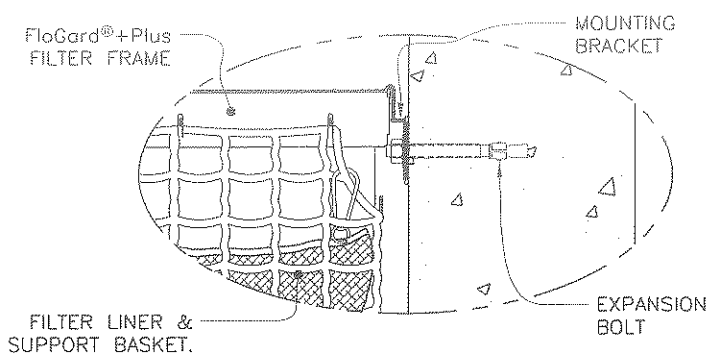
KriStar Enterprises, Inc.

P.O. Box 6419, Santa Rosa, CA 95406
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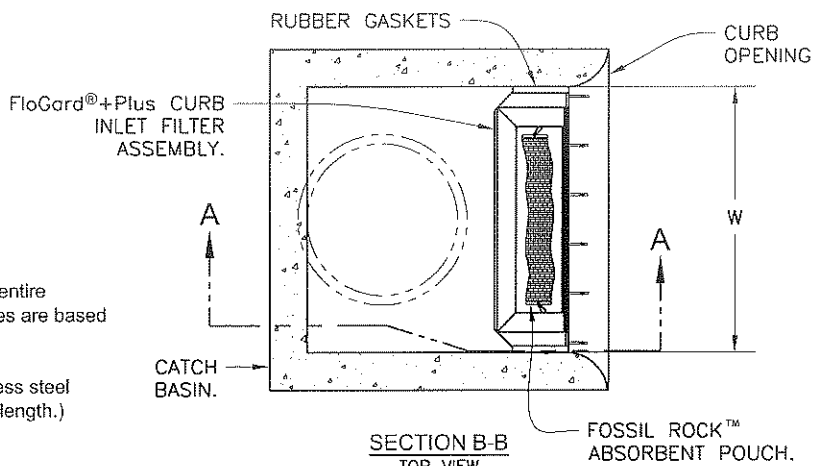
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SPECIFIER CHART

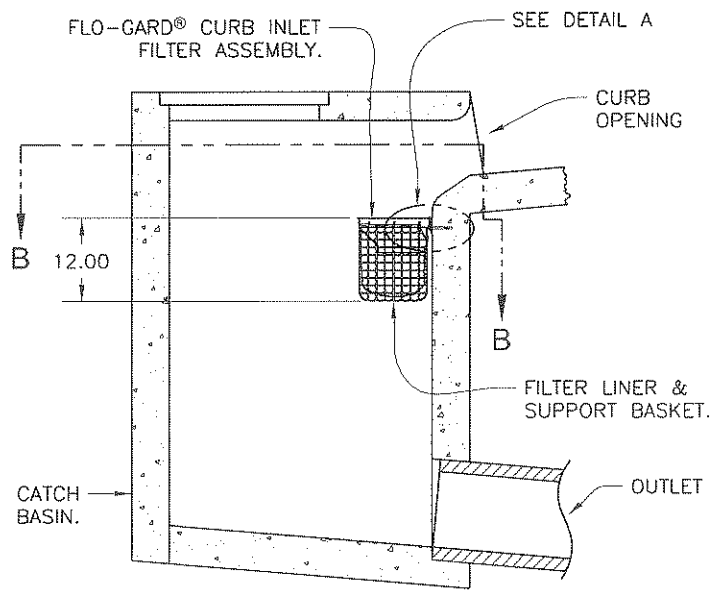
MODEL NO.	Curb Opening Width - W -	Storage Capacity - Cu. Ft. -	Clean Flow Rate - GPM/CFS -
FGP-24CI	2.0' (24")	.95	338 / .75
FGP-30CI	2.5' (30")	1.20	450 / 1.00
FGP-36CI	3.0' (36")	1.50	563 / 1.25
FGP-42CI	3.5' (42")	1.80	675 / 1.50
FGP-48CI	4.0' (48")	2.10	768 / 1.76
FGP-5.0CI	5.0' (60")	2.40	900 / 2.00
FGP-6.0CI	6.0' (72")	3.05	1,126 / 2.51
FGP-7.0CI	7.0' (84")	3.65	1,350 / 3.01
FGP-8.0CI	8.0' (96")	4.25	1,576 / 3.51
FGP-10.0CI	10.0' (120")	4.85	1,800 / 4.01
FGP-12.0CI	12.0' (144")	6.10	2,252 / 5.02
FGP-14.0CI	14.0' (168")	7.30	2,700 / 6.02
FGP-16.0CI	16.0' (192")	8.55	3,152 / 7.02
FGP-18.0CI	18.0' (216")	9.45	3,490 / 7.78
FGP-21.0CI	21.0' (252")	10.95	4,050 / 9.02
FGP-28.0CI	28.0' (336")	14.60	5,400 / 12.03



DETAIL A
MOUNTING BRACKET & EXPANSION BOLTS
SEE NOTE 2
SCALE 6/1



SECTION B-B
TOP VIEW
SCALE 1/1



SECTION A-A
SIDE VIEW
SCALE 1/1

NOTES:

1. FloGard®+PLUS filter inserts shall be installed across the entire width of curb opening. Storage capacity and clean flow rates are based on full width installation.
2. Filter insert shall be attached to the catch basin with stainless steel expansion anchor bolts & washers (3/8" x 2-1/2" minimum length.) See detail A.
3. FloGard®+PLUS filter inserts are designed with a debris trap/energy dissipator for the retention of floatables and collected sediments .
4. Filter support frame shall be constructed from stainless steel Type 304.
5. Filter liner shall be constructed from durable polypropylene, woven, monofilament, geotextile. Filter liner shall not allow the retention of water between storm events.
6. Filter inserts are supplied with "clip-in" filter pouches utilizing FOSSIL ROCK™ filter medium for the collection and retention of petroleum hydrocarbons (oils & greases).
7. FloGard®+PLUS filter inserts and FOSSIL ROCK™ filter medium pouches must be maintained in accordance with manufacturer recommendations.
8. FloGard +PLUS filter inserts are available in standard lengths of 24", 30",35", 42" & 48" and may be installed in various length combinations (end to end) to fit length of noted catch basin.
9. Clean flow rates are "calculated" based on liner flow rate of 140 gallons per minute per square foot of material, a factor of .50 has been applied to allow for anticipated sediment & debris loading. An additional safety factor of between .25 & .50 may be applied to allow for site specific sediment loading.
10. Storage capacity reflects maximum solids collection prior to impending "initial" filtering bypass. The "ultimate" high-flow bypass will not become impeded due to maximum solids loading.

TITLE

FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Curb Inlet Style)



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GENERAL SPECIFICATIONS FOR MAINTENANCE OF *FLO-GARD+PLUS*[®] CATCH BASIN INSERT FILTERS

SCOPE:

Federal, State and Local Clean Water Act regulations and those of insurance carriers require that stormwater filtration systems be maintained and serviced on a recurring basis. The intent of the regulations is to ensure that the systems, on a continuing basis, efficiently remove pollutants from stormwater runoff thereby preventing pollution of the nation's water resources. These specifications apply to the FloGard+Plus[®] Catch Basin Insert Filter.

RECOMMENDED FREQUENCY OF SERVICE:

Drainage Protection Systems (DPS) recommends that installed Flo-Gard+Plus[®] Catch Basin Insert Filters be serviced on a recurring basis. Ultimately, the frequency depends on the amount of runoff, pollutant loading and interference from debris (leaves, vegetation, cans, paper, etc.); however, it is recommended that each installation be serviced a minimum of three times per year, with a change of filter medium once per year. DPS technicians are available to do an on-site evaluation, upon request.

RECOMMENDED TIMING OF SERVICE:

DPS guidelines for the timing of service are as follows:

1. For areas with a definite rainy season: Prior to, during and following the rainy season.
2. For areas subject to year-round rainfall: On a recurring basis (at least three times per year).
3. For areas with winter snow and summer rain: Prior to and just after the snow season and during the summer rain season.
4. For installed devices not subject to the elements (washracks, parking garages, etc.): On a recurring basis (no less than three times per years).

SERVICE PROCEDURES:

1. The catch basin grate shall be removed and set to one side. The catch basin shall be visually inspected for defects and possible illegal dumping. If illegal dumping has occurred, the proper authorities and property owner representative shall be notified as soon as practicable.
2. Using an industrial vacuum, the collected materials shall be removed from the liner. (Note: DPS uses a truck-mounted vacuum for servicing Flo-Gard+Plus[®] catch basin inserts.)
3. When all of the collected materials have been removed, the filter medium pouches shall be removed by unsnapping the tether from the D-ring and set to one side. The filter liner, gaskets, stainless steel frame and mounting brackets, etc. shall be inspected for continued serviceability. Minor damage or defects found shall be corrected on-the-spot and a notation made on the Maintenance Record. More extensive deficiencies that affect the efficiency of the filter (torn liner, etc.), if approved by the customer representative, will be corrected and an invoice submitted to the representative along with the Maintenance Record.
4. The filter medium pouches shall be inspected for defects and continued serviceability and replaced as necessary and the pouch tethers re-attached to the liner's D-ring. See below.
5. The grate shall be replaced.

REPLACEMENT AND DISPOSAL OF EXPOSED FILTER MEDIUM AND COLLECTED DEBRIS

The frequency of filter medium pouch exchange will be in accordance with the existing DPS-Customer Maintenance Contract. DPS recommends that the medium be changed at least once per year. During the appropriate service, or if so determined by the service technician during a non-scheduled service, the filter medium pouches will be replaced with new pouches. Once the exposed pouches and debris have been removed, DPS has possession and must dispose of it in accordance with local, state and federal agency requirements.

Note: As the generator, the landowner is ultimately responsible for the proper disposal of the exposed filter medium and debris. Because the filter media likely contain petroleum hydrocarbons, heavy metals and other harmful pollutants, the materials must be treated as an EPA Class 2 Hazardous Waste and properly disposed of. DPS relieves the landowner of the actual disposal task, and provides certification of its completion in accordance with appropriate regulations.

DPS also has the capability of servicing all manner of catch basin inserts and catch basins without inserts, underground oil/water separators, stormwater interceptors and other such devices. All DPS personnel are highly qualified technicians and are confined space trained and certified. Call us at (888) 950-8826 for further information and assistance.

"PROVIDING SOLUTIONS TO STORMWATER POLLUTION"

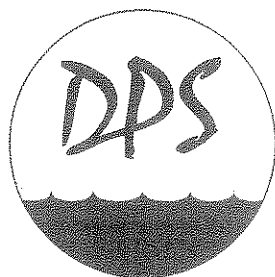
MAINTENANCE SERVICES

Drainage Protection Systems (DPS) is in the business of maintaining devices associated with stormwater drainage systems. Our confined-space certified technicians are qualified to perform maintenance on installed catch basin filtration systems, large underground precast concrete oil/water separators, stormwater interceptors and urban water runoff collection structures of all sorts. Our program will eliminate guesswork, record keeping, or billing on the part of our customers. Plus, DPS assumes all responsibility for the disposal, as per EPA standard, of all contaminants and exposed materials recovered during the maintenance process. In short, our knowledgeable staff and highly qualified technicians relieve the landowner of the worries of installation and maintenance of compliant systems.

If you have a stormwater system installed, you have to maintain it!

Federal, State and Local Regulations and insurance companies require that installed stormwater systems be maintained and serviced on a regular basis. This is to insure that the systems perform their task of removing harmful contaminants from urban runoff prior to their entry into our water resources. **DPS can help you keep your system operating efficiently and thereby keep you in compliance.**

Please contact us today to discuss a program that best suits your needs.



DRAINAGE PROTECTION SYSTEMS

a division of KriStar Enterprises, Inc.

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4020 Riverclub Drive • Cumming, GA 30041
770-889-4338 • FAX 678-609-1533

Service available throughout the United States.

Avoid unnecessary and costly fines.

Owners of properly installed filtration systems that meet the EPA Clean Water Act's criterion of BAT (Best Available Technology) for prevention of pollution from stormwater runoff **are not immune to fines!** The most sophisticated equipment is only as good as the associated maintenance program. DPS offers an all-inclusive Preventive Maintenance Program that will insure that the owner remains in compliance; but, more importantly, that the installed system is efficiently performing its function and doing its part to clean up the environment.

DPS Will Issue a Certificate of Compliance.

Upon completion of each maintenance service, **DPS** will issue a **Certificate of Compliance** to the landowner or manager for their records. This provides notice to the responsible person that the system is being maintained.

DPS Will Perform the Following Services:

- Provide a customized Preventive Maintenance Program to fit the particular system and needs and that complies with BAT and BMP criteria. As a minimum, the Program will include:
 1. A review of the installed system and recommendations for future systems.
 2. A mutually agreed to contract which will detail the frequency, the scope and the cost of the program.
- Perform periodic maintenance of the system by certified and highly qualified technicians, as per the agreement.
- Disposal of contaminated filter media and exposed material from the site in accordance with EPA Standards.
- At the conclusion of each maintenance service, furnish a Certificate of Compliance to the landowner or manager.
- Maintain records of each installation and each maintenance service.

DPS is Fully Insured

To protect its customers, DPS carries liability and pollution coverage.

Confined Space Certified Technicians

Entry into underground oil/water separators, interceptors, etc., requires properly equipped personnel that are trained and certified in confined space operations. All DPS Technicians are confined space certified.

Visit us on our website at:
www.drainageprotection.com