APPENDIX J:
HYDROLOGY REPORT AND USMP/LID REPORT

HYDROLOGY REPORT

City of Santa Clarita

MetroWalk

TR 83087

Prepared For:
New Urban West, INC.
2001 Wilshire Blvd., Suite 401
Santa Monica, CA 91405

Prepared By:
Alliance Land Planning & Engineering, Inc.
2248 Faraday Ave.
Carlsbad, CA 92008

OCTOBER 12, 2020

JN 1934

Table of Contents

List of Appendices

Project Description

The MetroWalk project is an approximately 20.4 ac residential development project located in the City of Santa Clarita. The proposed project includes 498 units with a mixture of senior apartments, townhomes, a private park, a recreation center, landscaping, and hardscape. The project site is currently undeveloped land. MetroWalk is bordered by Lost Canyon Road to the West, Harriman Drive/Vista Canyon Apartments to the North, and the Southern Pacific Railroad on the South.

Methodology

Methods currently outlined in the Los Angeles County Hydrology Manual have been used throughout this study. Time of concentration (TC) values were calculated using County of Los Angeles, HydroCalc software. To calculate TC's HydroCalc uses a subarea's acreage, flow path length/slope, imperviousness, and some of the info provided in Table 1 below. Refer to Appendix A for full TC calculations.

Flowrates were calculated using the Modified Rational Method and County of Los Angeles approved, LAR04 software. Even though HydroCalc does calculate flowrates those values are not approved for use. A summary of general hydrologic parameters is taken from the relevant 50-yr, 24-hr isohyetal map is provided in Table 1 below. The hydrologic parameters map is provided in Appendix A.

Table 1 - General Hydrologic Parameters

Parameter	Value
50-yr. 24-Hr Isohyetal Map	Mint Canyon
50-yr Inches of Rainfall (24 Hours)	6.10 in
Soil Classification Area	20
Debris Potential Area (DPA Zone)	9

Design Storm Event

The design storm event modeled for this project follows Los Angeles County criteria utilizing a 50-yr storm event for all subareas.

Existing Condition Drainage

The project site currently drains in a northwest direction and into an existing 42" RCP storm drain (MTD 1851) which was constructed with the Vista Canyon development and will be owned/maintained by the County of Los Angeles once it is turned over to them in the near future. The existing capacity of the 42" storm drain is 98.8 cfs. The MetroWalk project site and the upstream railroad property was included in the Vista Canyon hydrology report (Appendix D) for MTD 1851 (Appendix E), at Line 'A' from station 7+57.30 to station 3+48.14, which yielded this flowrate. A desilting basin exists at the inlet to the 42" storm drain to collect debris from the natural condition site. Once the MetroWalk project is constructed the desilting basin will be eliminated as it will no longer be needed.

Proposed Condition Drainage

In the proposed condition, all runoff from the project will be captured in area drains and routed through an underground storm drain system which will tie into the existing 42" storm drain per MTD 1851. Prior to discharge into MTD 1851 the first-flush runoff will be treated in an underground infiltration chamber located at the northwest corner of the site. Additionally, runoff from the MTA property will be conveyed through the project site via a storm drain line at the west end of the site that will also tie into the existing 42" storm drain in the northwest corner of the site. Runoff from both the MetroWalk and MTA properties was included in the hydrology report for MTD 1851 which has sufficient capacity to accept the proposed flowrates. See Appendix D for the Hydrology Report associated with MTD 1851 and Appendix E for the relevant MTD 1851 sheets.

Results

During the flood events the project will outlet flow to MTD 1851 and does not exceed the MTD's design capacity. The total flowrate generated by the project is 61.34 cfs. Table 2 shows a summary of the MTD max flowrate of 98.75 cfs and project flowrate of 61.34 cfs.

Table 2 – MTD 1851 Flowrates

PROJECT	FLOWRATE Q
	cfs
Q_allowable	98.75
Q_design plus upstream land	61.34

Hydromodification

This project discharges to MTD 1851 which is a County owned/maintained storm drain line and therefore per City/County stormwater policy the project is exempt from hydromodification.

Water Quality

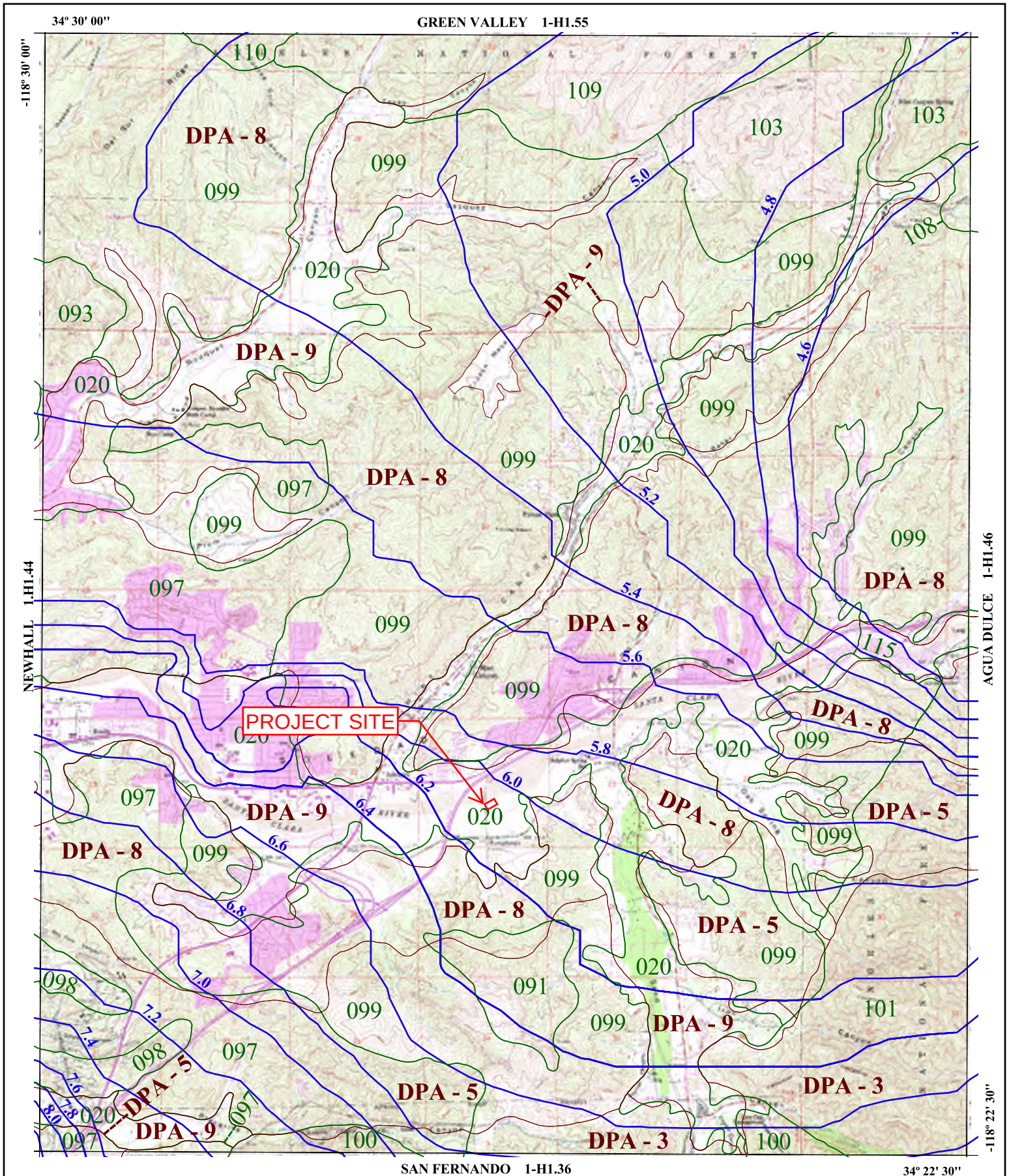
Water quality aspects of this project are covered separately in detail within the USMP/LID Report. Water quality treatment will be achieved through an onsite underground water quality chamber system at the northwest corner of the project. See the USMP report for additional info and details.

Conclusion

The proposed MetroWalk project is in compliance with the approved hydrology report for the MTD 1851 in which the project drains into. The proposed developed flowrate for the project of 61.34 cfs is less than the approved flowrate per MTD 1851 of the 98.75 cfs. Therefore, it is concluded that the project will have no negative impact on the existing downstream drainage system.

APPENDIX A

TIME OF CONCENTRATION (TC)



N
W E
S

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

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

MINT CANYON
50-YEAR 24-HOUR ISOHYET

1-H1.45

LOS ANGELES COUNTY PUBLIC WORKS

Peak Flow Hydrologic Analysis

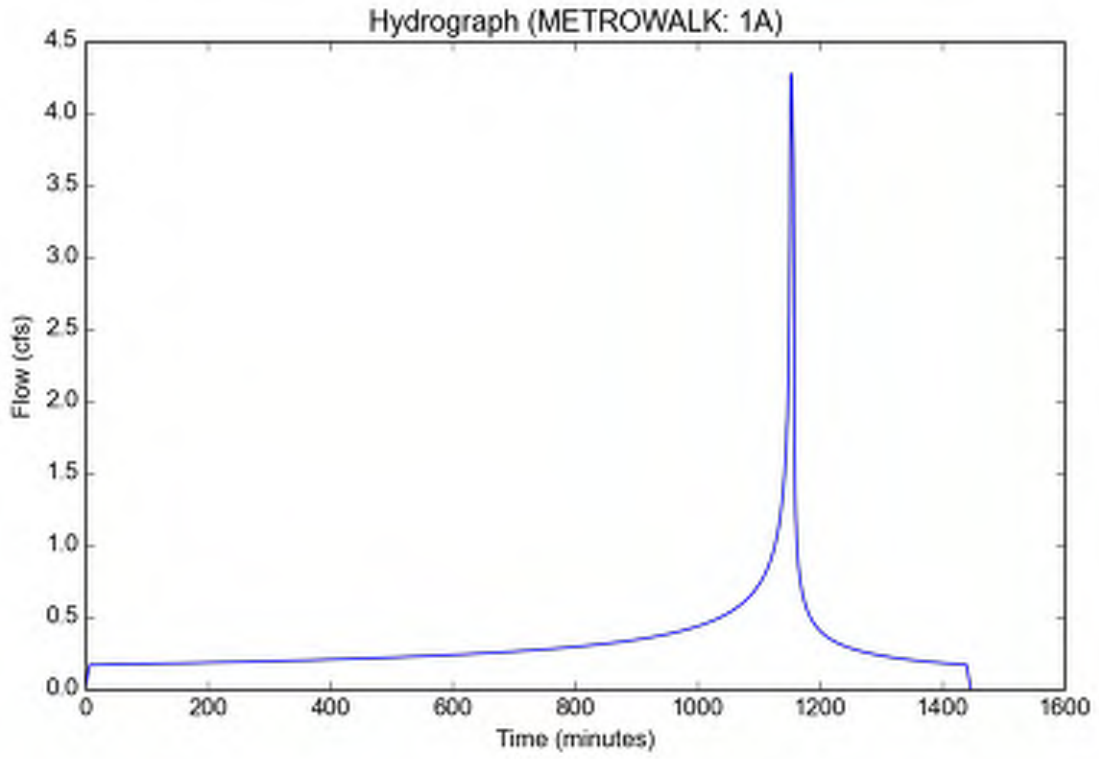
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	1A
Area (ac)	1.6
Flow Path Length (ft)	438.0
Flow Path Slope (vft/hft)	0.0091
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.86
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.1071
Undeveloped Runoff Coefficient (Cu)	0.6125
Developed Runoff Coefficient (Cd)	0.8597
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	4.2741
Burned Peak Flow Rate (cfs)	4.2741
24-Hr Clear Runoff Volume (ac-ft)	0.6434
24-Hr Clear Runoff Volume (cu-ft)	28024.7267



Peak Flow Hydrologic Analysis

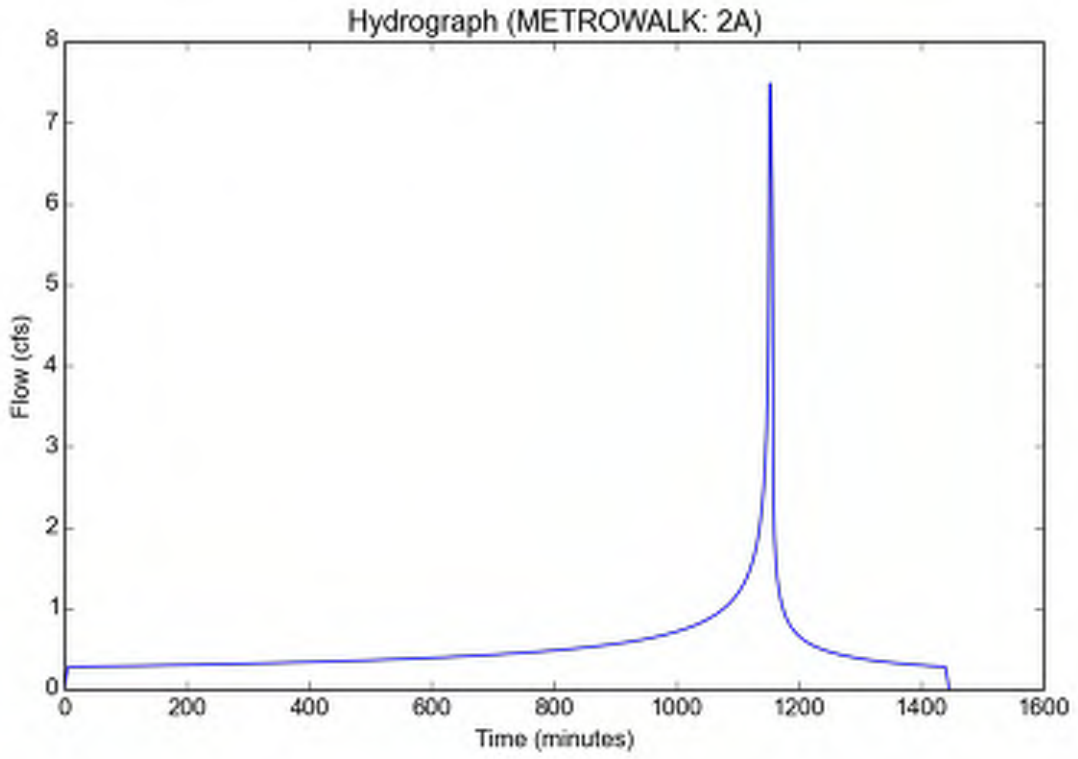
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	2A
Area (ac)	2.6
Flow Path Length (ft)	399.0
Flow Path Slope (vft/hft)	0.0125
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.86
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.3405
Undeveloped Runoff Coefficient (Cu)	0.6254
Developed Runoff Coefficient (Cd)	0.8616
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	7.483
Burned Peak Flow Rate (cfs)	7.483
24-Hr Clear Runoff Volume (ac-ft)	1.0455
24-Hr Clear Runoff Volume (cu-ft)	45542.0768



Peak Flow Hydrologic Analysis

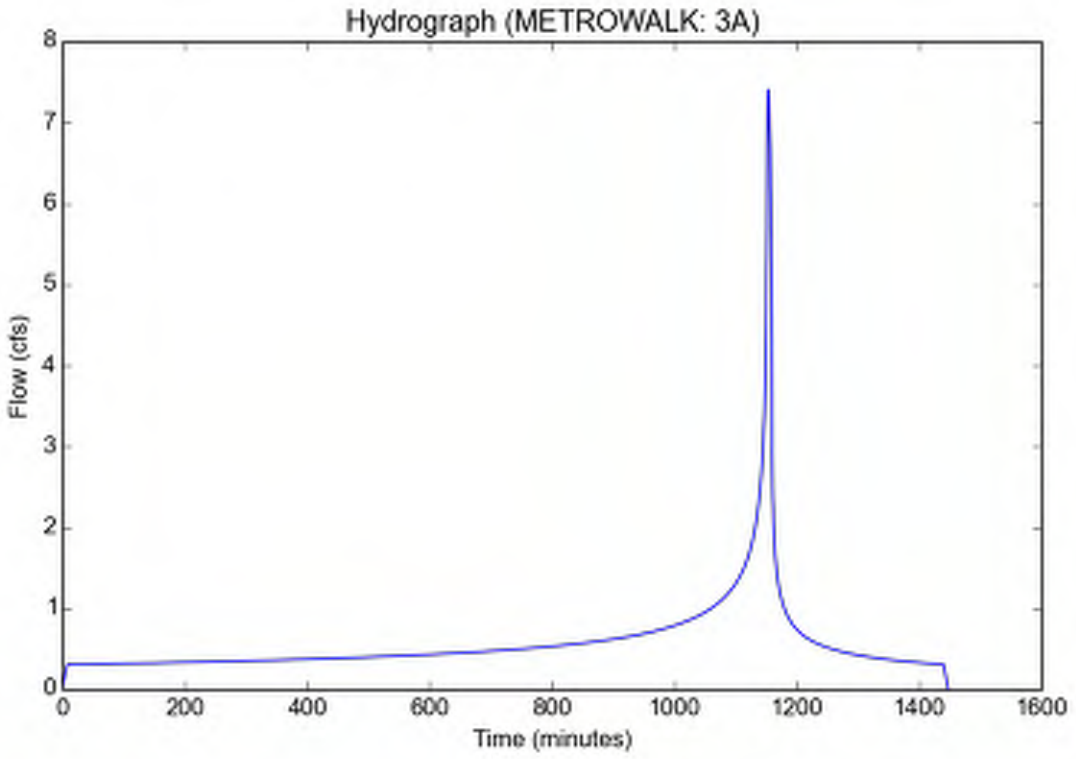
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	3A
Area (ac)	3.0
Flow Path Length (ft)	697.0
Flow Path Slope (vft/hft)	0.0144
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.82
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.9181
Undeveloped Runoff Coefficient (Cu)	0.5992
Developed Runoff Coefficient (Cd)	0.8458
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	7.4047
Burned Peak Flow Rate (cfs)	7.4047
24-Hr Clear Runoff Volume (ac-ft)	1.162
24-Hr Clear Runoff Volume (cu-ft)	50615.1944



Peak Flow Hydrologic Analysis

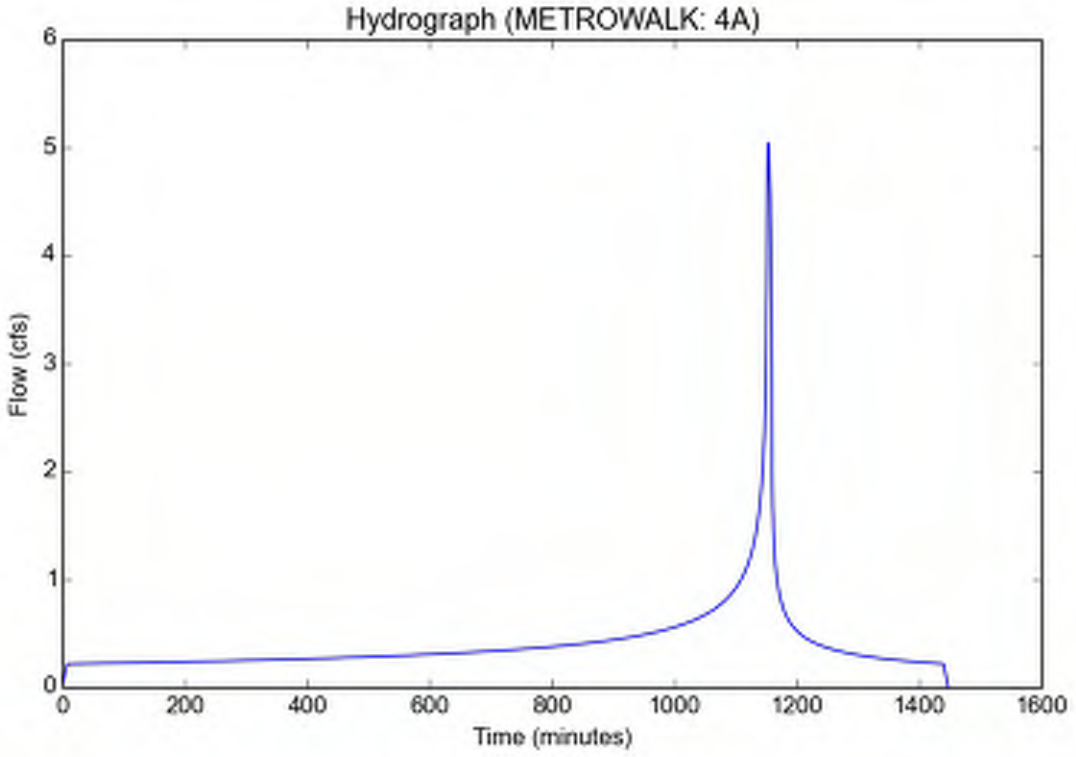
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	4A
Area (ac)	2.0
Flow Path Length (ft)	647.0
Flow Path Slope (vft/hft)	0.0093
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.88
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.9181
Undeveloped Runoff Coefficient (Cu)	0.5992
Developed Runoff Coefficient (Cd)	0.8639
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	5.0418
Burned Peak Flow Rate (cfs)	5.0418
24-Hr Clear Runoff Volume (ac-ft)	0.8189
24-Hr Clear Runoff Volume (cu-ft)	35671.6526



Peak Flow Hydrologic Analysis

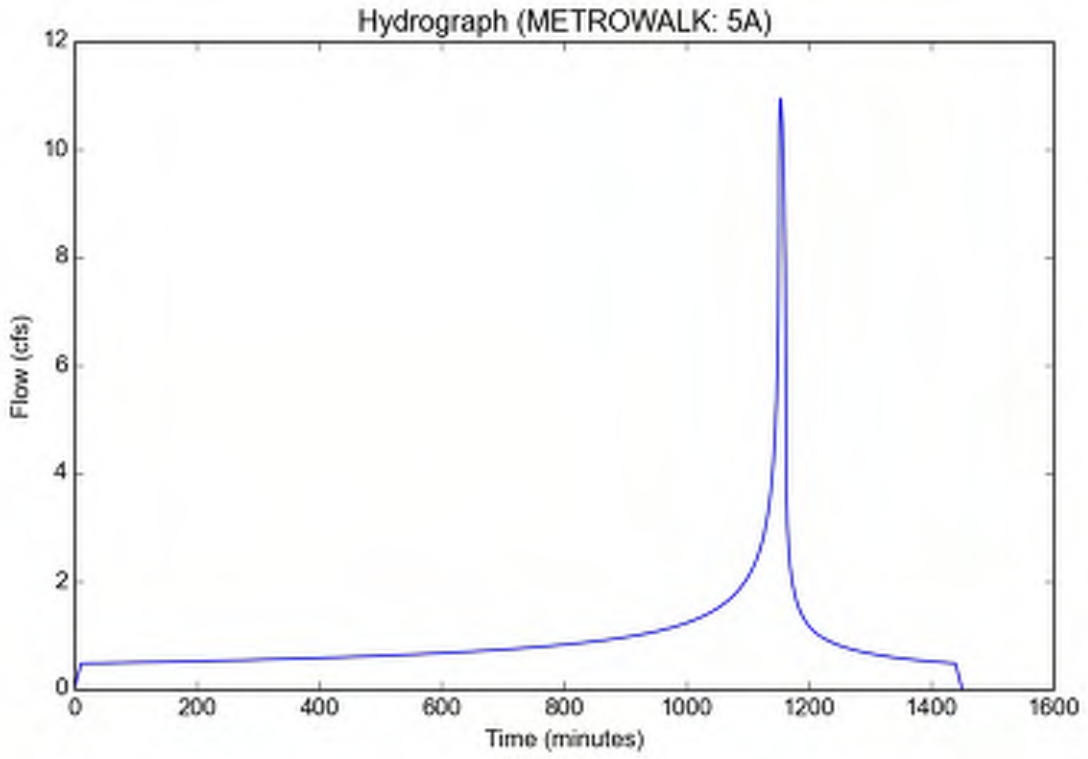
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	5A
Area (ac)	5.5
Flow Path Length (ft)	886.0
Flow Path Slope (vft/hft)	0.009
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.68
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.5124
Undeveloped Runoff Coefficient (Cu)	0.5625
Developed Runoff Coefficient (Cd)	0.792
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	10.944
Burned Peak Flow Rate (cfs)	10.944
24-Hr Clear Runoff Volume (ac-ft)	1.8455
24-Hr Clear Runoff Volume (cu-ft)	80389.0197



Peak Flow Hydrologic Analysis

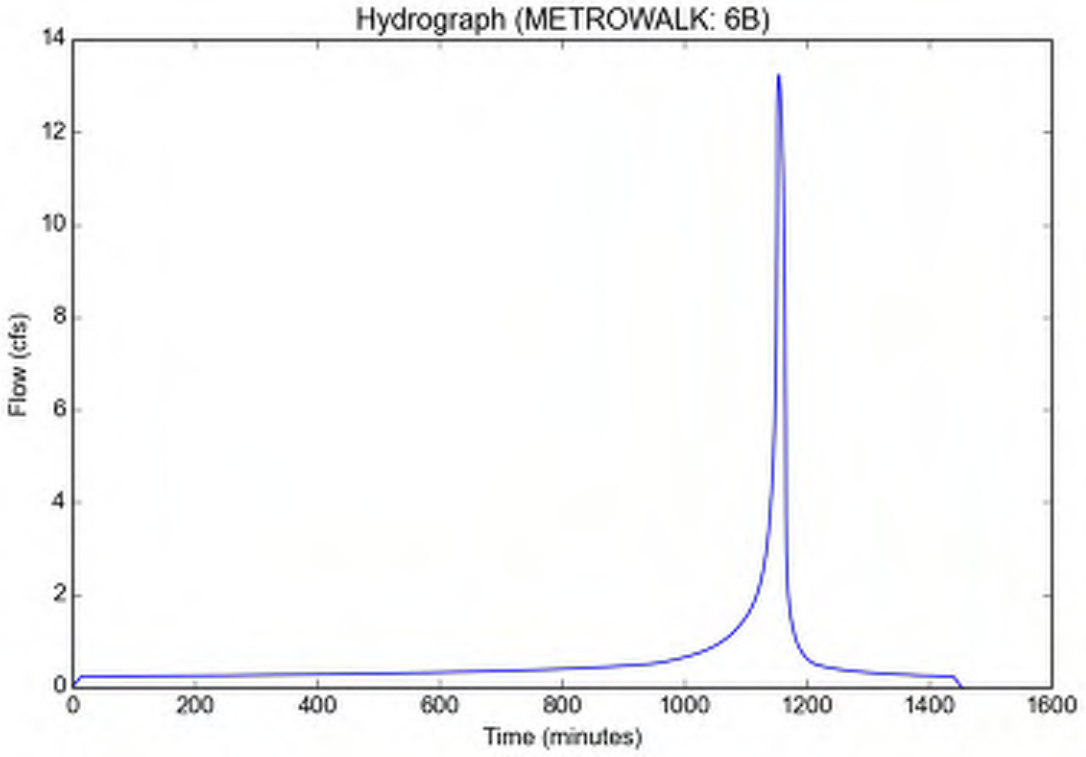
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	6B
Area (ac)	10.4
Flow Path Length (ft)	1096.0
Flow Path Slope (vft/hft)	0.0164
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.08
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.2432
Undeveloped Runoff Coefficient (Cu)	0.5381
Developed Runoff Coefficient (Cd)	0.567
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	13.2288
Burned Peak Flow Rate (cfs)	13.2288
24-Hr Clear Runoff Volume (ac-ft)	1.1822
24-Hr Clear Runoff Volume (cu-ft)	51495.9378



Peak Flow Hydrologic Analysis

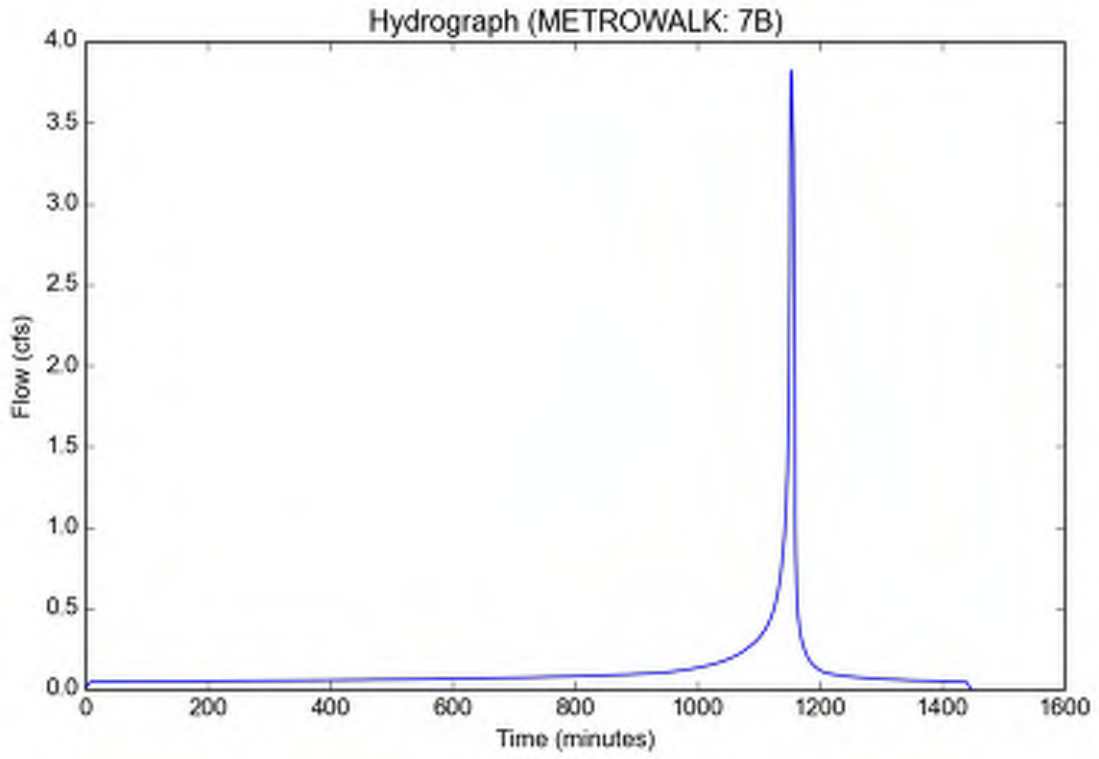
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	7B
Area (ac)	2.1
Flow Path Length (ft)	533.0
Flow Path Slope (vft/hft)	0.0188
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.08
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.9181
Undeveloped Runoff Coefficient (Cu)	0.5992
Developed Runoff Coefficient (Cd)	0.6232
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	3.8191
Burned Peak Flow Rate (cfs)	3.8191
24-Hr Clear Runoff Volume (ac-ft)	0.2401
24-Hr Clear Runoff Volume (cu-ft)	10460.5804



Peak Flow Hydrologic Analysis

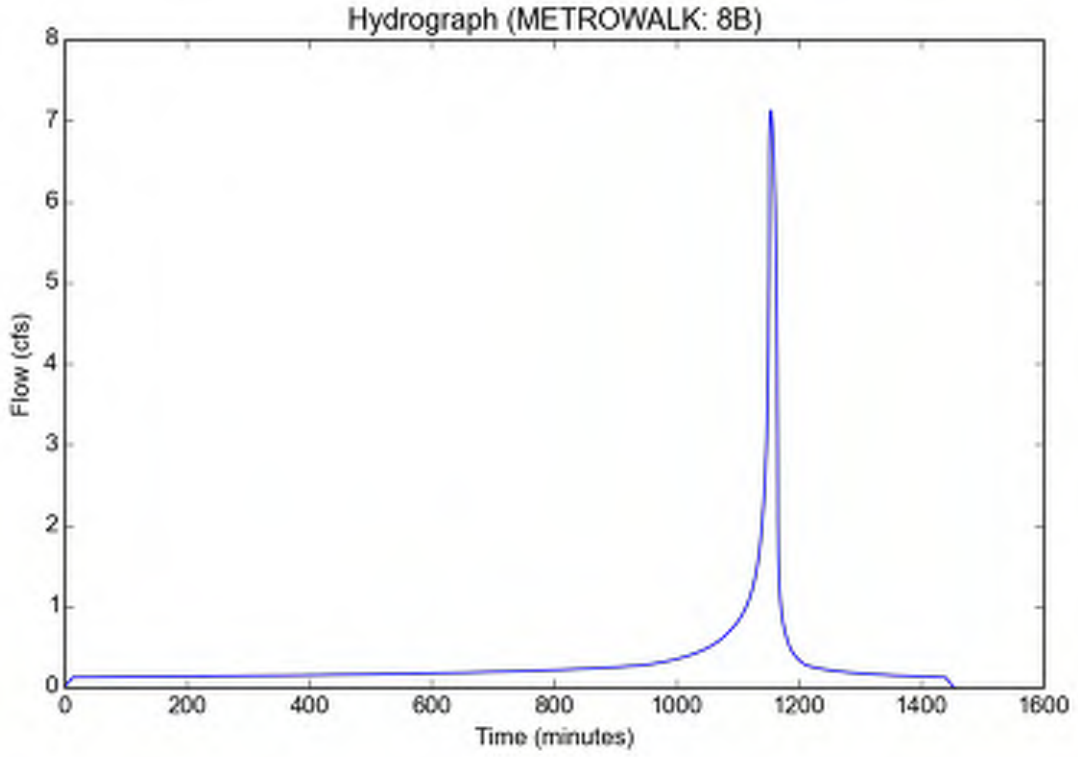
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	8B
Area (ac)	5.6
Flow Path Length (ft)	1109.0
Flow Path Slope (vft/hft)	0.0171
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.08
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.2432
Undeveloped Runoff Coefficient (Cu)	0.5381
Developed Runoff Coefficient (Cd)	0.567
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	7.1232
Burned Peak Flow Rate (cfs)	7.1232
24-Hr Clear Runoff Volume (ac-ft)	0.6366
24-Hr Clear Runoff Volume (cu-ft)	27728.5819



Peak Flow Hydrologic Analysis

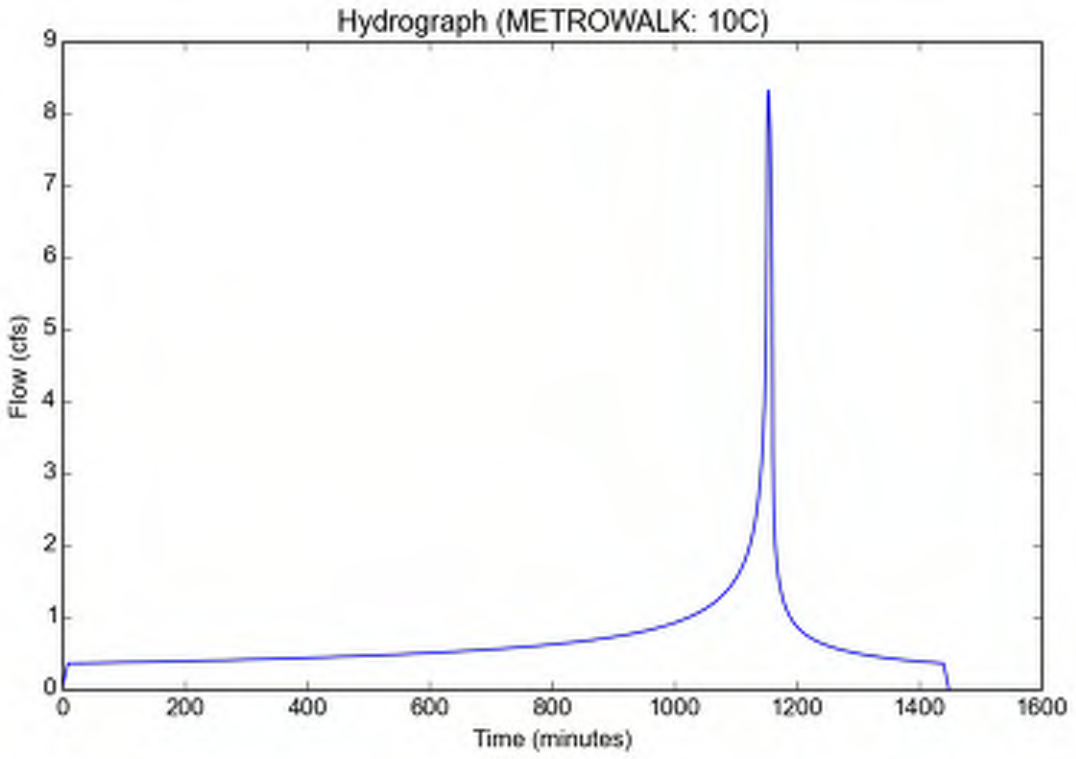
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	10C
Area (ac)	3.6
Flow Path Length (ft)	854.0
Flow Path Slope (vft/hft)	0.0187
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.8
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.7609
Undeveloped Runoff Coefficient (Cu)	0.5849
Developed Runoff Coefficient (Cd)	0.837
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	8.3191
Burned Peak Flow Rate (cfs)	8.3191
24-Hr Clear Runoff Volume (ac-ft)	1.3677
24-Hr Clear Runoff Volume (cu-ft)	59576.1834



Peak Flow Hydrologic Analysis

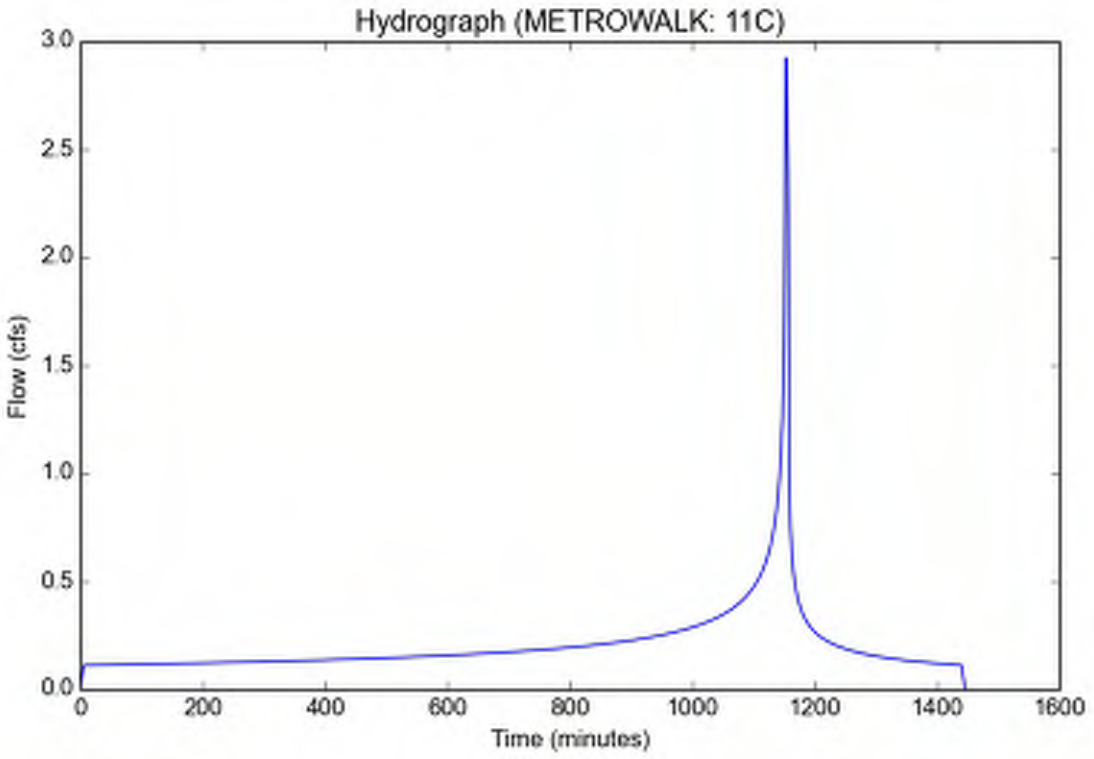
File location: I:/Project Files/1934 - METROWALK (CLOYD)/HYDROLOGY/HYDROCALCS/50-YR/METROWALK Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	METROWALK
Subarea ID	11C
Area (ac)	1.0
Flow Path Length (ft)	482.0
Flow Path Slope (vft/hft)	0.0145
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.91
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.3405
Undeveloped Runoff Coefficient (Cu)	0.6254
Developed Runoff Coefficient (Cd)	0.8753
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	2.9239
Burned Peak Flow Rate (cfs)	2.9239
24-Hr Clear Runoff Volume (ac-ft)	0.4205
24-Hr Clear Runoff Volume (cu-ft)	18318.9782



APPENDIX B

HYDROLOGIC MODELING OUTPUT

(LAR04 SOFTWARE)

```
006  1934    1A  20 86 1.6 7A304347.3001730                0  G1
006  1934    2A  20 86 2.6 6A304374.0001600                0
006  1934    3A  20 82 3.0 8A304122.1000820                0
006  1934    4A  20 88 2.0 8A304240.4000830                0
006  1934    5A  20 68 5.511A304 77.7010290                0
006  1934    6B 220  810.414A304  1.0001000                0
006  1934    7B 220  8 2.1 8A304 1465001000                0
006  1934    8B 220  8 5.614A304704.1000990                0
006  1934    9AB220  0  .0 0A304128.0001310                0 1
006  1934   10C  20 80 3.6 9A304662.1001810                0
006  1934   11C  20 91 1.0 6A304438.5002050                0
006  1934   12AC220  0  .0 0A304  1.0001000                021 2
```

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\civild\scr_soilx_34.dat
METROWALK (CLOYD) - DEV BASIN - 50YR BURN UNDEV/50YR DEVELOPED STORM DAY 4

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
1934	1A	1.6	4.15	1.6	4.15	4	347.	.01730	2.00	.00	0.	20	7	A30	.86
1934	2A	2.6	7.28	4.2	11.24	4	374.	.01600	2.00	.00	0.	20	6	A30	.86
1934	3A	3.0	7.19	7.2	18.03	4	122.	.00820	2.00	.00	0.	20	8	A30	.82
1934	4A	2.0	4.90	9.2	22.72	4	240.	.00830	2.25	.00	0.	20	8	A30	.88
1934	5A	5.5	10.76	14.7	33.02	4	78.	.10290	2.00	.00	0.	20	11	A30	.68
1934	6B	10.4	14.29	10.4	14.29	4	1.	.01000	2.00	.00	0.	220	14	A30	.08
1934	7B	2.1	3.99	12.5	18.25	4	1465.	.01000	2.00	.00	0.	220	8	A30	.08
1934	8B	5.6	7.70	18.1	23.98	4	704.	.00990	2.00	.00	0.	220	14	A30	.08

****

* CONFLUENCE Q'S *

* 1934 9A TA 1156 QA 33.02 QAB 50.67 QB 17.65 1934 9B TB 1162 QB 23.48 QBA 39.23 QA 15.74 *

* 1934 9AB TAB 1157 QAB 51.46 QA 32.19 QB 19.27 *

****

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
1934	9AB	18.1	23.48	32.8	51.46	4	128.	.01310	2.75	.00	0.	220	0	A30	.00
1934	10C	3.6	8.14	3.6	8.14	4	662.	.01810	2.00	.00	0.	20	9	A30	.80
1934	11C	1.0	2.84	4.6	10.34	4	439.	.02050	2.00	.00	0.	20	6	A30	.91

****

* CONFLUENCE Q'S *

* 1934 12A TA 1157 QA 51.25 QAC 61.34 QC 10.09 1934 12C TC 1156 QC 10.19 QCA 60.28 QA 50.09 *

* 1934 12AC TAC 1157 QAC 61.34 QA 51.25 QC 10.09 *

****

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
1934	12AC	4.6	10.19	37.4	61.34	4	1.	.01000	3.00	.00	0.	220	0	A30	.00

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

PROG F0601M

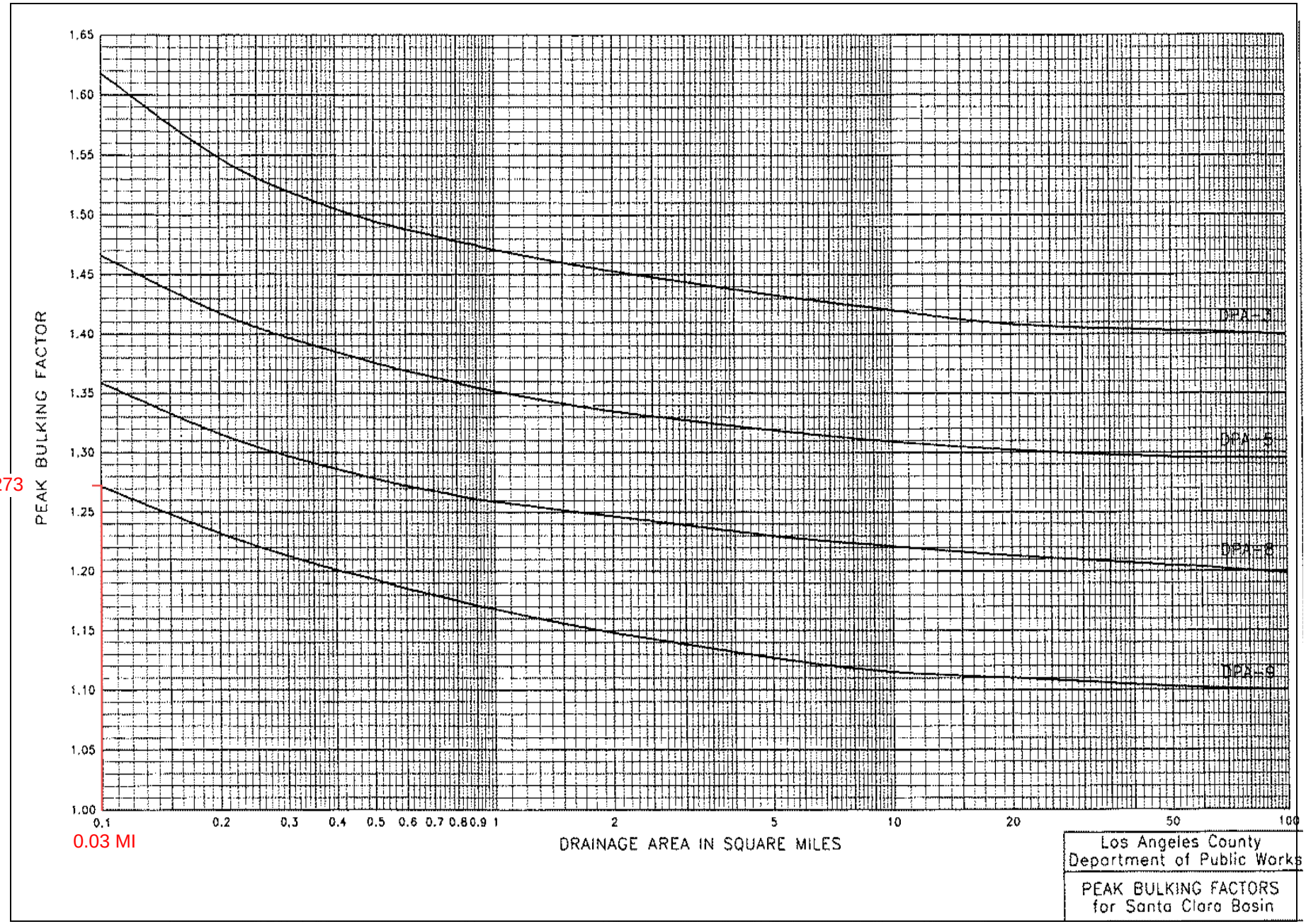
Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE:
METROWALK (CLOYD) - DEV BASIN - 50YR BURN UNDEV/50YR DEVELOPED
HYDROGRAPH AT 1934 12A STORM DAY 4 REDUCTION FACTOR = 1.000

TIME	Q	TIME	Q	TIME	Q	TIME	Q	TIME	Q
0	.00	100	2.49	200	2.58	300	2.72	400	2.87
500	3.06	600	3.29	700	3.59	800	3.97	900	4.55
1000	5.52	1050	7.05	1100	9.45	1110	11.15	1120	13.45
1130	15.93	1131	16.24	1132	16.52	1133	16.81	1134	17.13
1135	17.48	1136	17.86	1137	18.28	1138	18.79	1139	19.34
1140	19.92	1141	20.55	1142	21.25	1143	22.02	1144	22.81
1145	23.72	1146	24.82	1147	26.06	1148	27.42	1149	29.44
1150	32.65	1151	36.89	1152	42.08	1153	47.88	1154	53.29
1155	57.56	1156	60.28	1157	61.34	1158	60.74	1159	58.76
1160	55.46	1161	51.21	1162	46.94	1163	42.93	1164	39.24
1165	35.96	1166	33.07	1167	30.25	1168	27.55	1169	25.02
1170	22.76	1171	20.75	1172	18.95	1173	17.36	1174	15.97
1175	14.80	1176	13.80	1177	12.98	1178	12.26	1179	11.64
1180	11.12	1181	10.64	1182	10.23	1183	9.86	1184	9.52
1185	9.23	1186	8.98	1187	8.74	1188	8.52	1189	8.32
1190	8.13	1191	7.95	1192	7.79	1193	7.62	1194	7.47
1195	7.34	1196	7.19	1197	7.06	1198	6.94	1199	6.83
1200	6.72	1201	6.62	1202	6.50	1203	6.40	1204	6.29
1205	6.19	1206	6.11	1207	6.03	1208	5.96	1209	5.89
1210	5.84	1211	5.77	1212	5.72	1213	5.66	1214	5.60
1215	5.54	1216	5.47	1217	5.41	1218	5.35	1219	5.29
1220	5.23	1221	5.18	1222	5.13	1223	5.08	1224	5.04
1225	5.01	1226	4.97	1227	4.94	1228	4.89	1229	4.85
1230	4.82	1231	4.80	1232	4.77	1233	4.74	1234	4.72
1235	4.69	1236	4.66	1237	4.63	1238	4.60	1239	4.56
1240	4.53	1241	4.48	1242	4.44	1243	4.41	1244	4.39
1245	4.36	1246	4.34	1247	4.33	1248	4.32	1249	4.30
1250	4.28	1251	4.25	1252	4.22	1253	4.20	1254	4.18
1255	4.16	1256	4.14	1257	4.11	1258	4.09	1259	4.08
1260	4.07	1261	4.05	1262	4.03	1263	4.02	1264	3.99
1265	3.97	1266	3.95	1267	3.93	1268	3.91	1269	3.88
1270	3.85	1271	3.84	1272	3.82	1273	3.82	1274	3.80
1275	3.79	1276	3.78	1277	3.76	1278	3.75	1279	3.73
1280	3.73	1281	3.71	1282	3.69	1283	3.67	1284	3.65
1285	3.65	1286	3.64	1287	3.62	1288	3.60	1289	3.58
1290	3.57	1291	3.56	1292	3.55	1293	3.55	1294	3.54
1295	3.52	1296	3.50	1297	3.49	1298	3.48	1299	3.47
1300	3.45	1310	3.34	1320	3.27	1330	3.15	1340	3.05
1350	2.99	1360	2.93	1370	2.83	1380	2.77	1390	2.76
1400	2.70	1420	2.57	1440	2.50	1460	2.49	1500	2.49

TOTAL VOLUME THIS HYDROGRAPH = 9.54(Ac.Ft)

APPENDIX C

DEBRIS BULKING CALCULATIONS


PEAK BULKING FACTOR
1.65
1.60
1.55
1.50
1.45
1.40
1.35
1.30
1.25
1.20
1.15
1.10
1.05
1.00
1.273
DPA-3
DPA-5
DPA-8
DPA-6
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
2
5
10
20
50
100
0.03 MI
DRAINAGE AREA IN SQUARE MILES
Los Angeles County
Department of Public Works
PEAK BULKING FACTORS
for Santa Clara Basin

DEVELOPED CONDITION - 50-YR, BURNED AND BULKED FLOWRATE

BASIN A - SUBAREA 6B

DPA	Drainage Area		Developed Area	
	ac	sq mi	ac	sq mi
9	10.40	0.02	0.83	0.00
Total	10.40	0.02	0.83	0.00

Peak Bulking Factor

DPA Zone 9 Total	1.273	
DPA Zone 9 - Dev	1.273	

Qb =	14.29	cfs
BF1 TOT =	1.27	
BF1-DEV =	1.27	
A1 =	0.02	sq mi
Ad1 =	0.00	sq mi

LACDPW - Sedimentation Manual
Equation 3.4.3: For Partially Developed Watershed in Multiple DPA Zones

Term 1 =	15.40	cfs
Term 2 =	2.48	cfs
Term 3 =	0.00	cfs
Term 4 =	0.00	cfs

QBB = 17.88 cfs

DEVELOPED CONDITION - 50-YR, BURNED AND BULKED FLOWRATE

BASIN A - SUBAREA 7B

DPA	Drainage Area		Developed Area	
	ac	sq mi	ac	sq mi
9	2.10	0.00	0.57	0.00
Total	2.10	0.00	0.57	0.00

	Peak Bulking Factor
DPA Zone 9 Total	1.273
DPA Zone 9 - Dev	1.273

Qb =	3.99	cfs
BF1 TOT =	1.27	
BF1-DEV =	1.27	
A1 =	0.00	sq mi
Ad1 =	0.00	sq mi

LACDPW - Sedimentation Manual
Equation 3.4.3: For Partially Developed Watershed in Multiple DPA Zones

Term 1 =	2.70	cfs
Term 2 =	2.09	cfs
Term 3 =	0.00	cfs
Term 4 =	0.00	cfs

QBB = 4.78 cfs

DEVELOPED CONDITION - 50-YR, BURNED AND BULKED FLOWRATE

BASIN A - SUBAREA 8B

DPA	Drainage Area		Developed Area	
	ac	sq mi	ac	sq mi
9	5.60	0.01	0.76	0.00
Total	5.60	0.01	0.76	0.00

Peak Bulking Factor

DPA Zone 9 Total 1.273

DPA Zone 9 - Dev 1.273

Qb = 7.70 cfs

BF1 TOT = 1.27

BF1-DEV = 1.27

A1 = 0.01 sq mi

Ad1 = 0.00 sq mi

LACDPW - Sedimentation Manual

Equation 3.4.3: For Partially Developed Watershed in Multiple DPA Zones

Term 1 = 7.32 cfs

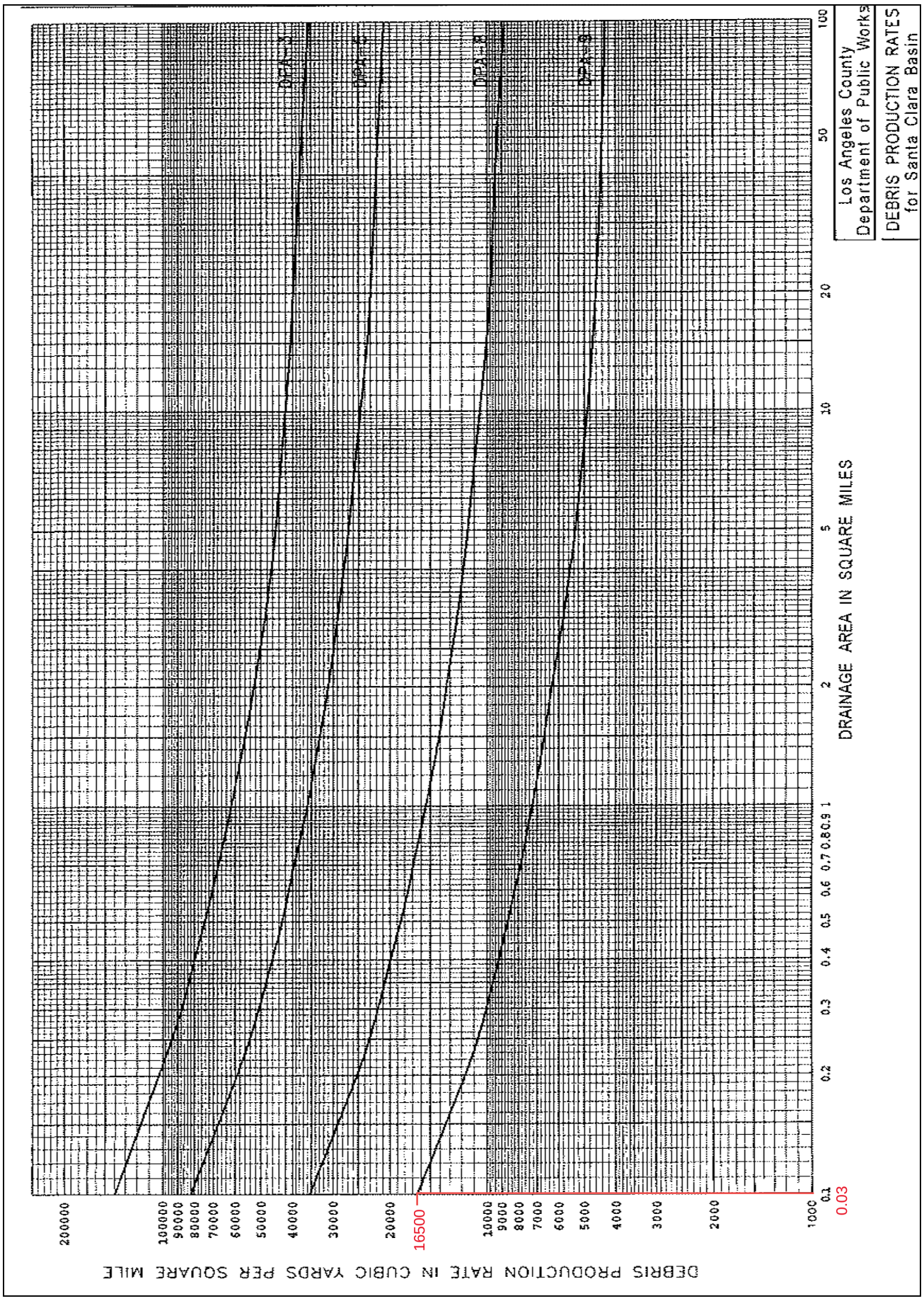
Term 2 = 2.19 cfs

Term 3 = 0.00 cfs

Term 4 = 0.00 cfs

QBB = 9.52 cfs

	SURFACE AREA		DEBRIS PRODUCTION RATE	DEBRIS PRODUCED (VOL_REQ)	DEBRIS BASIN SIZE (VOL_PROV)
	ac-ft	sq mi	cy / sq mi	cy	cy
DEBRIS BASIN 1	12.5	0.020	16500	330	355
DEBRIS BASIN 2	5.6	0.0088	16500	145	163
TOTAL		0.03	16500	495	518


DEBRIS PRODUCTION RATES
for Santa Clara Basin
Los Angeles County
Department of Public Works
DPA-3
DPA-4
DPA-5
DPA-6
DRAINAGE AREA IN SQUARE MILES
DEBRIS PRODUCTION RATE IN CUBIC YARDS PER SQUARE MILE
16500
0.03

APPENDIX D

VISTA CANYON HYDROLOGY REPORT

BULK HYDROLOGY REPORT

County of Los Angeles

VISTA CANYON
TR 069164

Job No. 0560

HYDROLOGY STUDY
APPROVED BY CITY OF Santa Clarita
APPROVED BY: _____ RCE NO 68252 DATE 11/6/15

HYDROLOGY STUDY
CITY OF Santa Clarita
RECOMMENDED FOR CITY APPROVAL
CHECKED BY: _____ RCE NO. 76882 DATE 10/8/2015
APPROVED BY: _____ DATE 10/8/2015
COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

Prepared For:
County of Los Angeles,
Department of Public Works

Prepared By:
Alliance Land Planning & Engineering, Inc.
2248 Faraday Ave.
Carlsbad, CA 92008

AUGUST 2015

Table of Contents

Appendices

Overview

This study is intended to summarize project flowrates during the rough grading or 'bulk grading' phase of the Vista Canyon Ranch Project (TM 69164) located in Santa Clarita, CA. Peak runoff flowrates for the 50- and 25-year events have been analyzed using methods prescribed in the LA County Hydrology Manual. The 'Bulk Condition Hydrology' Exhibit located in Appendix A of this report can be referenced to illustrate this analysis.

Bulk Condition Drainage

During the bulk grading phase, the project site will consist of 4 main drainage basins. Three basins are located behind the south bank and one basin is located behind the north bank. All basins outlet directly into the Santa Clara River. Soil cement bank protection along both north and south river banks will be constructed prior to any bulk grading sitework. Offsite tributary flows taken from the approved developed condition hydrology report have been included at appropriate locations at each of the four respective drainage basins.

To the south, Basin A will outlet via the proposed 48" RCP of Line 'A' per the stormdrain plans currently in process at LACDPW, Basin B will outlet via the 42" RCP of Line 'C', and Basin C will outlet via the 8'Wx4'H RCB of Line 'F'. To the north, Basin D will outlet via the proposed 24" RCP of Line 'G'.

All stormdrain lines are equipped with desilting basins upstream of the pipe inlet. Runoff must pond and flow into a standpipe system within each desilting basin before reaching the storm drain inlet for conveyance out to the River. Basin C will convey runoff only after the borrow pit completely fills and overflow reaches the inlet of the box culvert at Line 'F'. The peak flow attenuating effects of these desilting basins has not been considered in this anaylsis.

Only the proposed stormdrain inlets mentioned above will convey flow. Several laterals will be constructed with brick and mortar plugs until full site build-out occurs. The plugged laterals will not convey flow during this bulk grading phase.

Offsite flows have been taken directly from the approved Drainage Concept/Hydrology Report for TR 69164. The 50-yr burned only flowrate has been used as the onsite desilting basins will debulk flows prior to entering any stormdrain lines.

Methodology

Hydrologic modeling was performed to analyze a bulk (interim) condition runoff during the construction phase of the project. LAR04 and Flowmaster software have been used for this analysis.

The following hydrologic parameters and software have been used during the hydrologic step of this analysis:

- Storm Event = 50-yr, 25-yr
- 50-year, 24-hour Rainfall Depth = 5.8"
- Soil Classification Area = 020
- Time of concentration = HydroCalc software
- Flow rates and volumes = LAR04 software

The Table 1 below presents a summary of the hydrologic basin parameters for the 25- and 50-year events.

Hydrologic Parameter Summary

Basin	Component	Area		Flow Path	Slope	IMP	Soil Type	50-YR Rainfall	25YR Tc	50YR Tc
		SF	AC	FT	FT/FT	%		IN	MIN	MIN
A	2A	1,596,450	36.6	2,343	0.0201	10	20	5.8	29	24
B	1B	1,392,695	32.0	1,690	0.0077	10	20	5.8	27	23
	2B	602,438	13.8	335	0.0173	10	20	5.8	7	6
C	1C	1,048,853	24.1	890	0.0171	10	20	5.8	14	12
	2C	1,514,582	34.8	1,680	0.0315	10	20	5.8	20	17
D	1D	733,727	16.8	2,640	0.0212	25	20	5.8	28	24
	2D	216,309	5.0	1,274	0.017	25	20	5.8	17	15
TOTAL			163.1							

Results

The Table 2 below summarizes hydrologic results at the outlet of each major drainage basin:

SUMMARY OF FLOWS

Hydro Basin	Σ Area	ΣQ25	ΣQ50
	AC	CFS	CFS
A	58.0	68.04	76.43
B	45.8	38.47	49.69
C	211.9	295.79	311.71
D	21.8	16.83	21.81

Table 3 below summarizes flows at the outlet of each onsite sub-area and at each off-site point of run-on:

Detailed Summary of Flows

Hydro Basin	Sub-Area	Area	Q25	ΣQ25	Q50	ΣQ50
		AC	CFS	CFS	CFS	CFS
A	2A	36.6	22.74	22.74	31.13	31.13
	3A (OFFSITE 4A)	7.6	21.00		21.00	
	4A (OFFSITE 3A)	11.1	19.49		19.49	
	5A (OFFSITE 6B)	2.7	4.81		4.81	
	TOTAL A	**58.0**		**68.04**		**76.43**
B	1B	32.0	20.86		27.99	
	2B	13.8	21.47	38.47	27.95	49.69
	TOTAL B	**45.8**		**38.47**		**49.69**
C	1C	24.1	24.33		32.12	
	2C	34.8	27.80	49.37	37.06	65.29
	3C (OFFSITE 5A)	27.6	36.29		36.29	
	4C (OFFSITE 2A)	62.3	82.13		82.13	
	5C (OFFSITE 1A)	63.2	128.00		128.00	
	TOTAL C	**211.9**		**295.79**		**311.71**
D	1D	**16.8**	12.32		16.07	
	2D	**5.0**	4.98	**16.83**	6.38	**21.81**
	TOTAL D	**21.8**		**16.83**		**21.81**

Conclusion

Interim condition flowrates are summarized above. The greater of flowrates as taken from the developed condition hydrology and these interim flowrates should be used to size all storm drain lines for this project. This analysis does not consider attenuation of peak flows due to the desilting basin upstream of each inlet.

.

Appendix A

‘Bulk Condition Hydrology’ Exhibit

BULK CONDITION HYDROLOGY
FOR
VISTA CANYON RANCH
TENTATIVE TRACT 69164

SUMMARY OF FLOWS

Hydro Basin	Σ Area	ΣQ25	ΣQ50
	AC	CFS	CFS
A	58.0	68.04	76.43
B	45.8	38.47	49.69
C	211.9	295.79	311.71
D	21.8	16.83	21.81

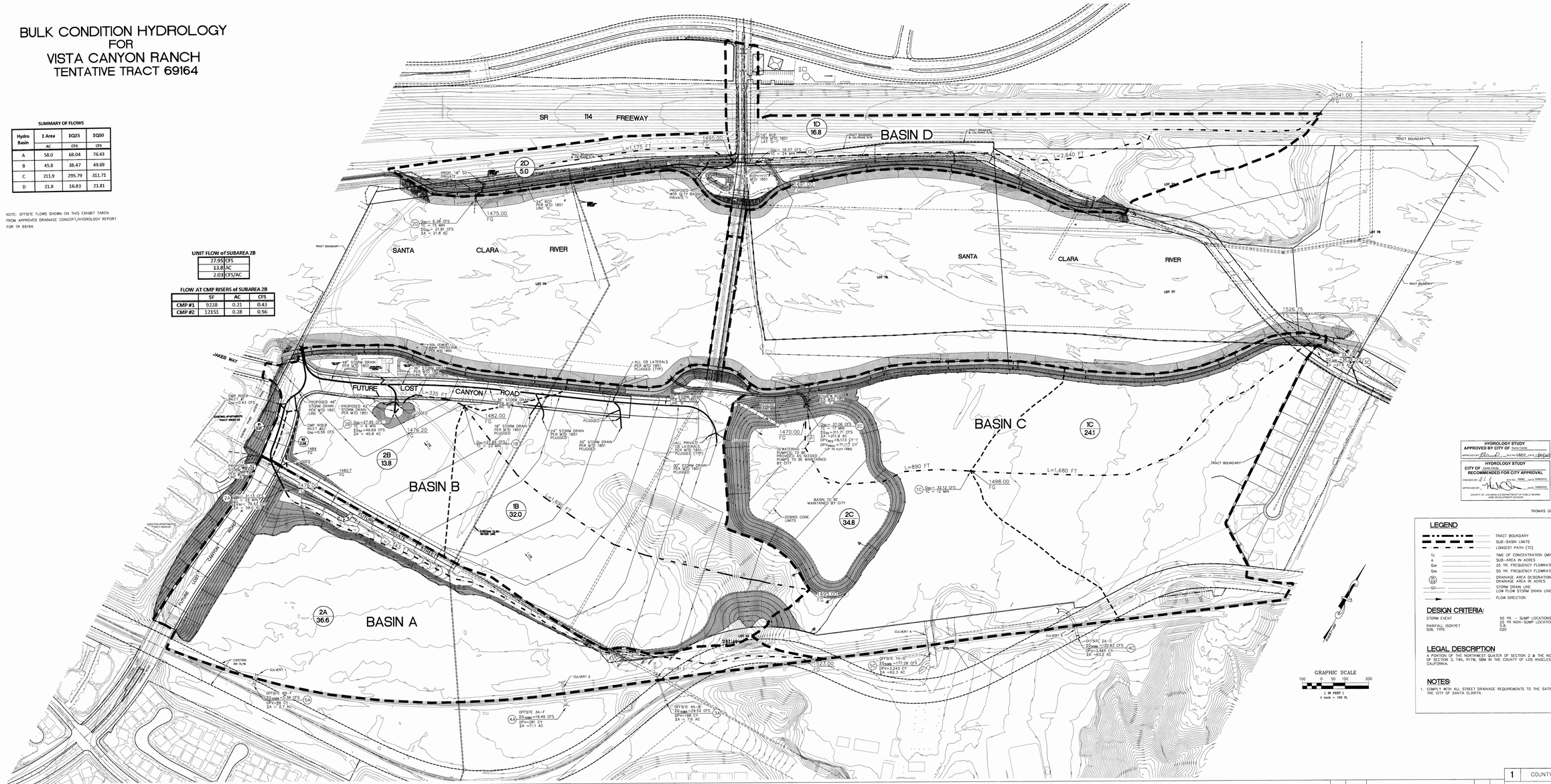
NOTE: OFFSITE FLOWS SHOWN ON THIS EXHIBIT TAKEN FROM APPROVED DRAINAGE CONCEPT/HYDROLOGY REPORT FOR TR 69164.

UNIT FLOW of SUBAREA 2B

27.95	CFS
13.8	AC
2.03	CFS/AC

FLOW AT CMP RISERS of SUBAREA 2B

	SF	AC	CFS
CMP #1	9228	0.21	0.43
CMP #2	12151	0.28	0.56



HYDROLOGY STUDY
APPROVED BY CITY OF Santa Clarita
APPROVED BY: _____ RCE NO: 52824 DATE: 09/28/15

HYDROLOGY STUDY
CITY OF Santa Clarita
RECOMMENDED FOR CITY APPROVAL
CHECKED BY: _____ RCE No. 78992 DATE: 10/8/2015
APPROVED BY: _____ DATE: 10/8/2015
COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

THOMAS GUIDE: 4551; B2, A3, B3

LEGEND

- TRACT BOUNDARY
- SUB-BASIN LIMITS
- LONGEST PATH (TC)
- Tc — TIME OF CONCENTRATION (MIN.)
- A — SUB-AREA IN ACRES
- Q25 — 25 YR. FREQUENCY FLOWRATE
- Q50 — 50 YR. FREQUENCY FLOWRATE
- 2D / 5.0 — DRAINAGE AREA DESIGNATION / DRAINAGE AREA IN ACRES
- 50 — STORM DRAIN LINE / LOW FLOW STORM DRAIN LINE
- FLOW DIRECTION

DESIGN CRITERIA:

STORM EVENT	50 YR. – SUMP LOCATIONS 25 YR NON–SUMP LOCATIONS
RAINFALL ISOHYET	5.8
SOIL TYPE	020

LEGAL DESCRIPTION

A PORTION OF THE NORTHWEST QUARTER OF SECTION 2, & THE NORTHEAST QUARTER OF SECTION 3, T4N, R17W, SBM IN THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA.

NOTES:

1. COMPLY WITH ALL STREET DRAINAGE REQUIREMENTS TO THE SATISFACTION OF THE CITY OF SANTA CLARITA.

GRAPHIC SCALE
100 0 50 100 200
(IN FEET)
1 inch = 100 ft.

ALLIANCE LAND PLANNING & ENGINEERING INC.
2248 FARADAY AVE
CARLSBAD, CA 92008
TEL: (760) 431-9896
FAX: (760) 431-9802
CIVIL ENGINEERING • LAND PLANNING • MUNICIPAL DESIGN • SURVEYING

PLANS PREPARED BY:
ALLIANCE LAND PLANNING & ENGINEERING INC.
2248 FARADAY AVE. CARLSBAD, CA. 92008
(760) 431-9896

PLANS PREPARED UNDER THE DIRECTION OF:
Craig Whitten 09/28/15
CRAIG M. WHITTEN RCE 51929 DATE

REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEN NO. 51929 EXP. 6-30-17 CIVIL STATE OF CALIFORNIA

PLAN PREPARED FOR:
JSB DEVELOPMENT
27451 Tourney Road, Suite 100
VALENCIA, CA 91355
Phone: 661-255-3275
Fax: 661-255-1132

NO.	DATE		BY	APPR

1 | COUNTY OF LOS ANGELES | 1 SHEETS

DRAINAGE CONCEPT STUDY
FOR VISTA CANYON RANCH
TENTATIVE TRACT 69164
DEVELOPED CONDITION

I:/CAD/0560/BULK HYDROLOGY/BULK HYDROLOGY-SH11.dwg

VISTA CANYON RANCH – TTM 69164 BULK CONDITION HYDROLOGY

Appendix B

Time of Concentration
(HydroCalc Output)

Time of Concentration

50-YEAR

Peak Flow Hydrologic Analysis

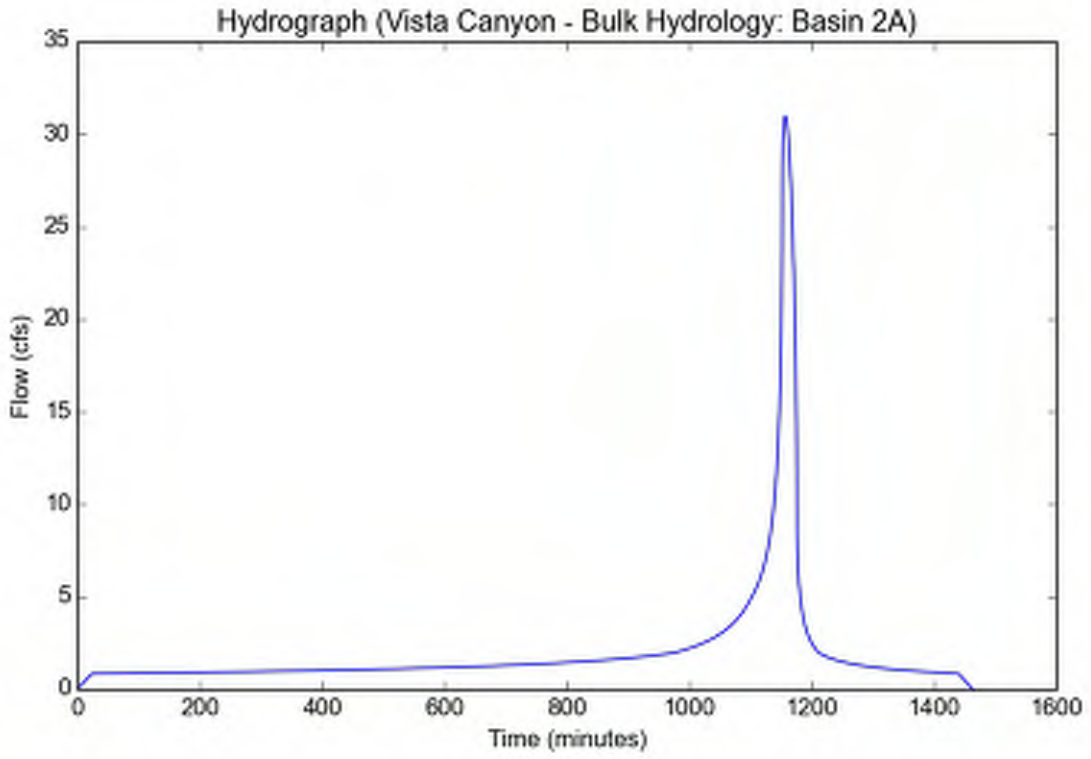
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/50YR/0560-BASIN 2A_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 2A
Area (ac)	36.6
Flow Path Length (ft)	2343.0
Flow Path Slope (vft/hft)	0.0201
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	1.6556
Undeveloped Runoff Coefficient (Cu)	0.4677
Developed Runoff Coefficient (Cd)	0.5109
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	30.9588
Burned Peak Flow Rate (cfs)	30.9588
24-Hr Clear Runoff Volume (ac-ft)	4.1142
24-Hr Clear Runoff Volume (cu-ft)	179216.603



Peak Flow Hydrologic Analysis

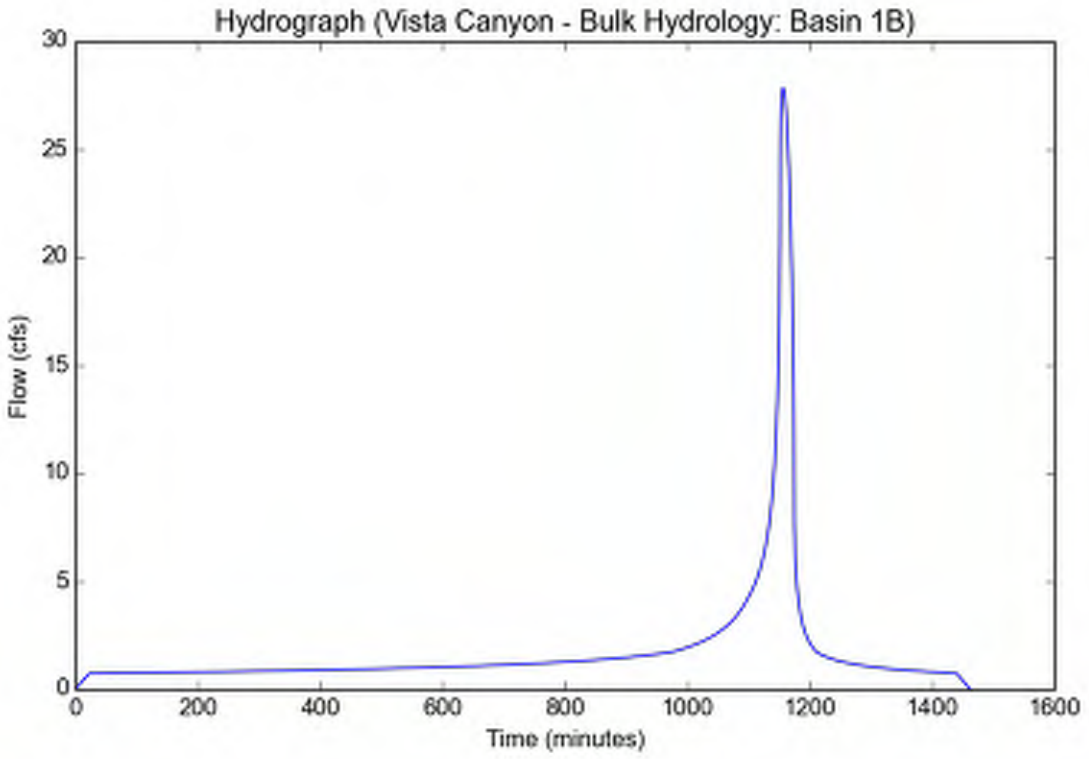
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/50YR/0560-BASIN 1B_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 1B
Area (ac)	32.0
Flow Path Length (ft)	1690.0
Flow Path Slope (vft/hft)	0.0077
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	1.689
Undeveloped Runoff Coefficient (Cu)	0.4724
Developed Runoff Coefficient (Cd)	0.5152
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	27.8433
Burned Peak Flow Rate (cfs)	27.8433
24-Hr Clear Runoff Volume (ac-ft)	3.5999
24-Hr Clear Runoff Volume (cu-ft)	156812.4921



Peak Flow Hydrologic Analysis

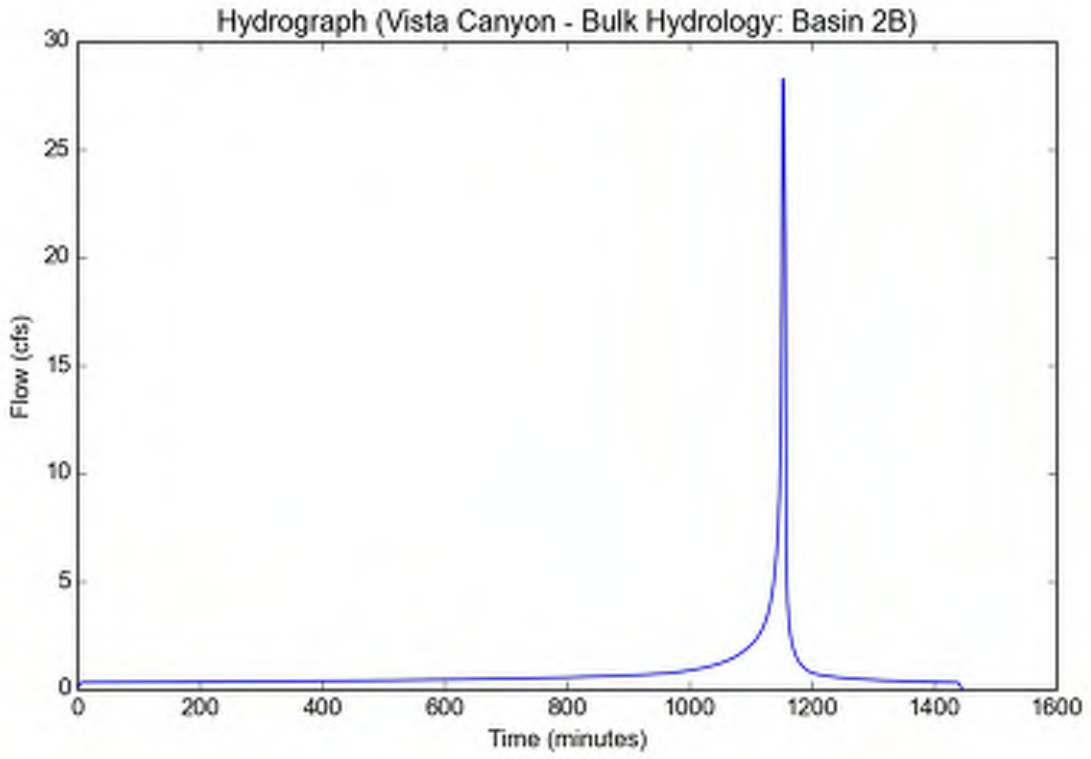
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/50YR/0560-BASIN 2B_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 2B
Area (ac)	13.8
Flow Path Length (ft)	335.0
Flow Path Slope (vft/hft)	0.0173
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	3.1763
Undeveloped Runoff Coefficient (Cu)	0.6163
Developed Runoff Coefficient (Cd)	0.6447
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	28.2587
Burned Peak Flow Rate (cfs)	28.2587
24-Hr Clear Runoff Volume (ac-ft)	1.5771
24-Hr Clear Runoff Volume (cu-ft)	68696.5082



Peak Flow Hydrologic Analysis

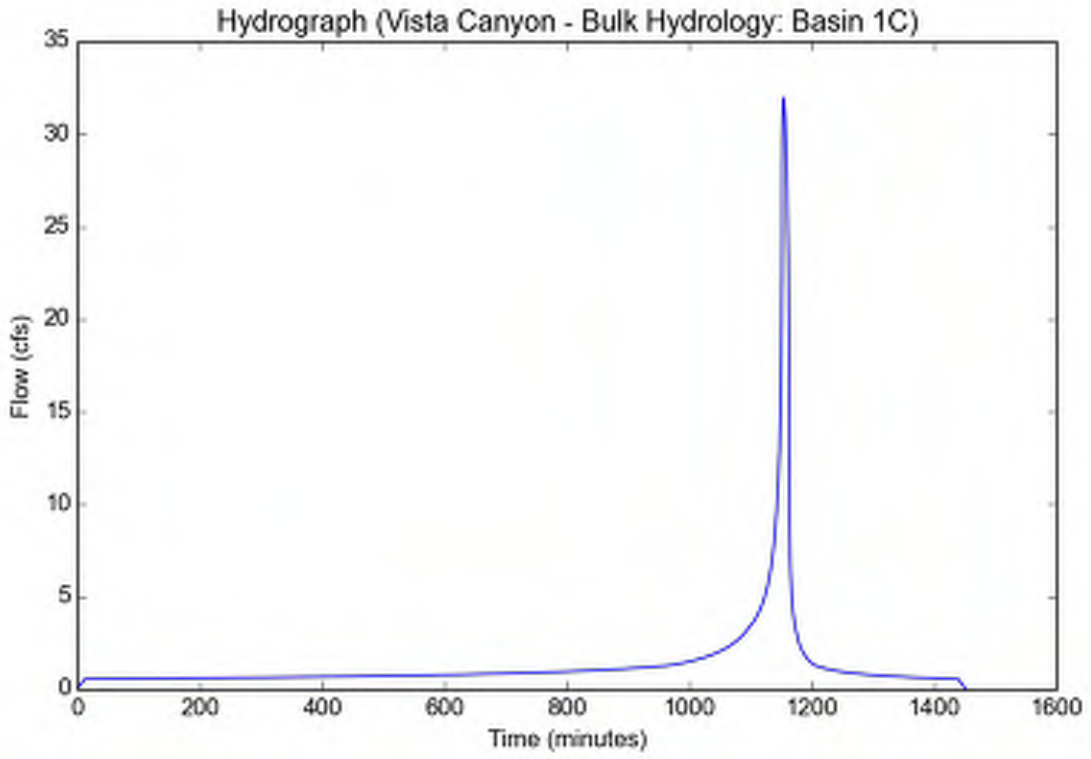
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/50YR/0560-BASIN 1C_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 1C
Area (ac)	24.1
Flow Path Length (ft)	890.0
Flow Path Slope (vft/hft)	0.0171
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	2.2931
Undeveloped Runoff Coefficient (Cu)	0.5426
Developed Runoff Coefficient (Cd)	0.5784
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	31.9626
Burned Peak Flow Rate (cfs)	31.9626
24-Hr Clear Runoff Volume (ac-ft)	2.7369
24-Hr Clear Runoff Volume (cu-ft)	119220.1944



Peak Flow Hydrologic Analysis

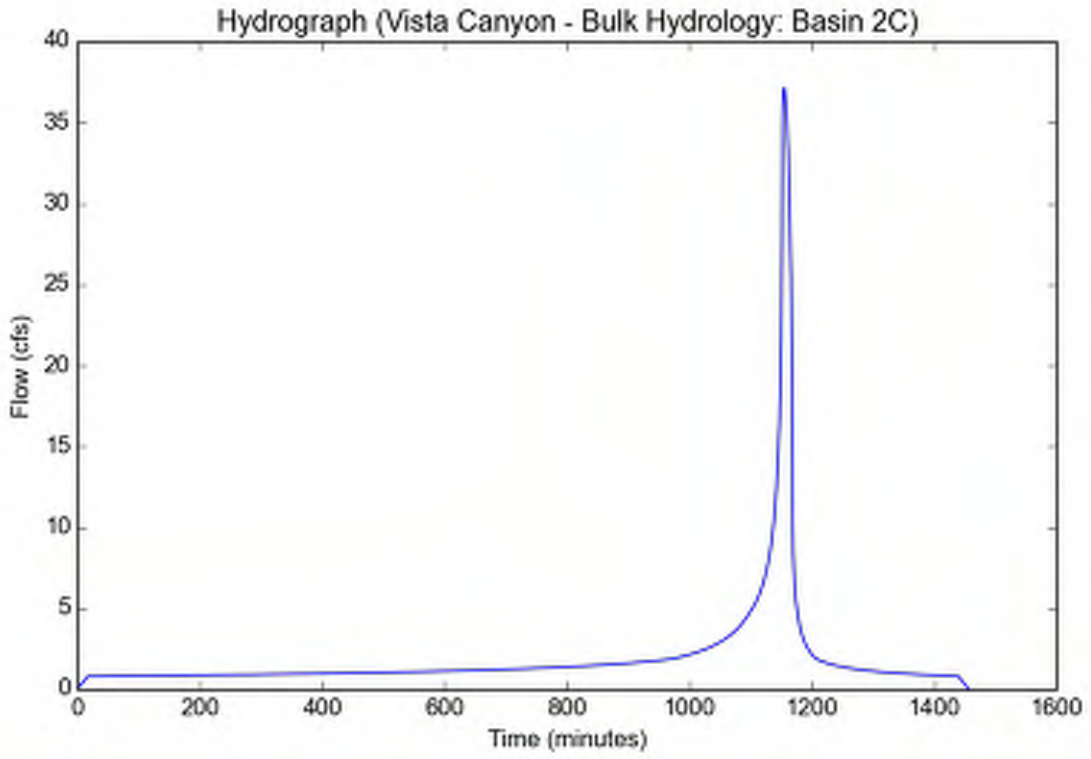
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/50YR/0560-BASIN 2C_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 2C
Area (ac)	34.8
Flow Path Length (ft)	1680.0
Flow Path Slope (vft/hft)	0.0315
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	1.9469
Undeveloped Runoff Coefficient (Cu)	0.5086
Developed Runoff Coefficient (Cd)	0.5478
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	37.1114
Burned Peak Flow Rate (cfs)	37.1114
24-Hr Clear Runoff Volume (ac-ft)	3.9357
24-Hr Clear Runoff Volume (cu-ft)	171439.4917



Peak Flow Hydrologic Analysis

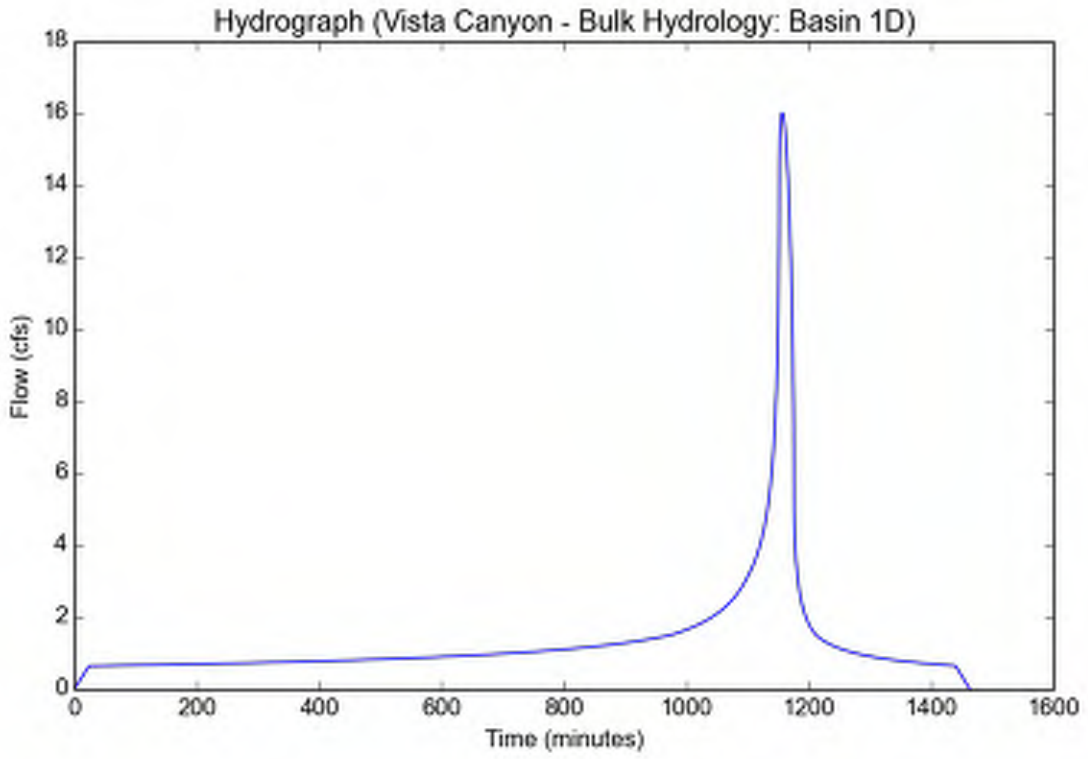
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/50YR/0560-BASIN 2D_081415.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 1D
Area (ac)	16.8
Flow Path Length (ft)	2640.0
Flow Path Slope (vft/hft)	0.0212
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.25
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	1.6556
Undeveloped Runoff Coefficient (Cu)	0.4677
Developed Runoff Coefficient (Cd)	0.5758
Time of Concentration (min)	24.0
Clear Peak Flow Rate (cfs)	16.0142
Burned Peak Flow Rate (cfs)	16.0142
24-Hr Clear Runoff Volume (ac-ft)	2.7817
24-Hr Clear Runoff Volume (cu-ft)	121170.7841



Peak Flow Hydrologic Analysis

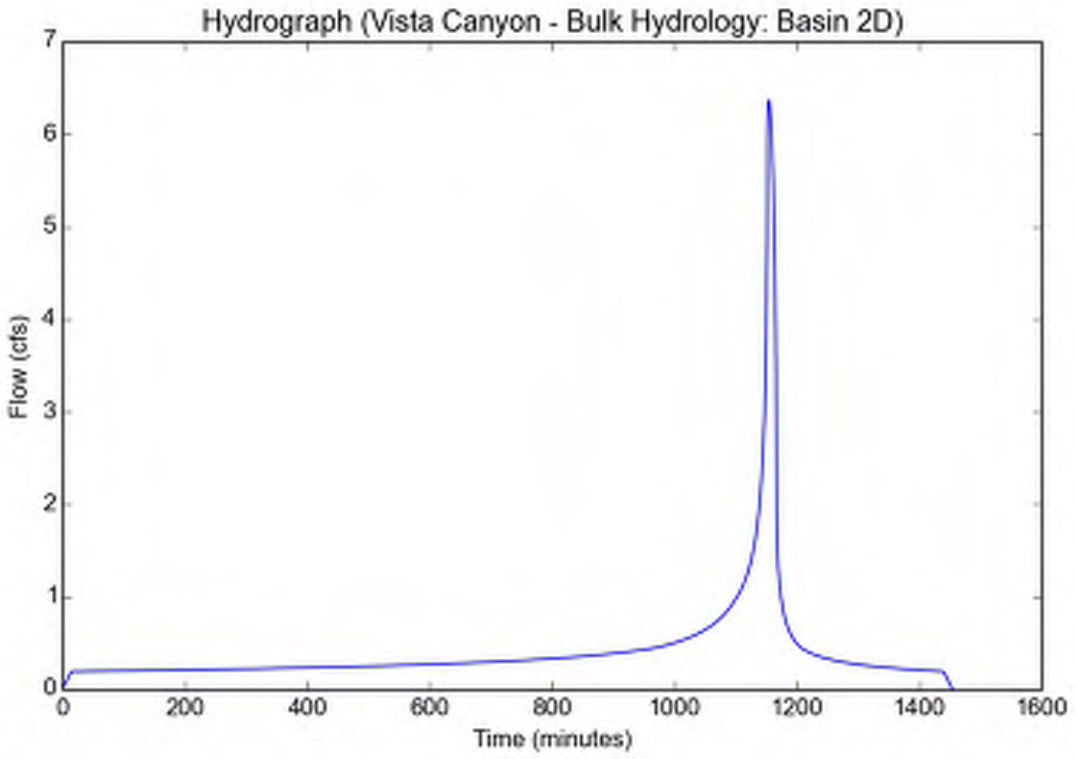
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/50YR/0560-BASIN 3D_081415.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 2D
Area (ac)	5.0
Flow Path Length (ft)	1274.0
Flow Path Slope (vft/hft)	0.017
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.25
Soil Type	20
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.8
Peak Intensity (in/hr)	2.0648
Undeveloped Runoff Coefficient (Cu)	0.522
Developed Runoff Coefficient (Cd)	0.6165
Time of Concentration (min)	15.0
Clear Peak Flow Rate (cfs)	6.3645
Burned Peak Flow Rate (cfs)	6.3645
24-Hr Clear Runoff Volume (ac-ft)	0.8316
24-Hr Clear Runoff Volume (cu-ft)	36226.4396



Time of Concentration

25-YEAR

Peak Flow Hydrologic Analysis

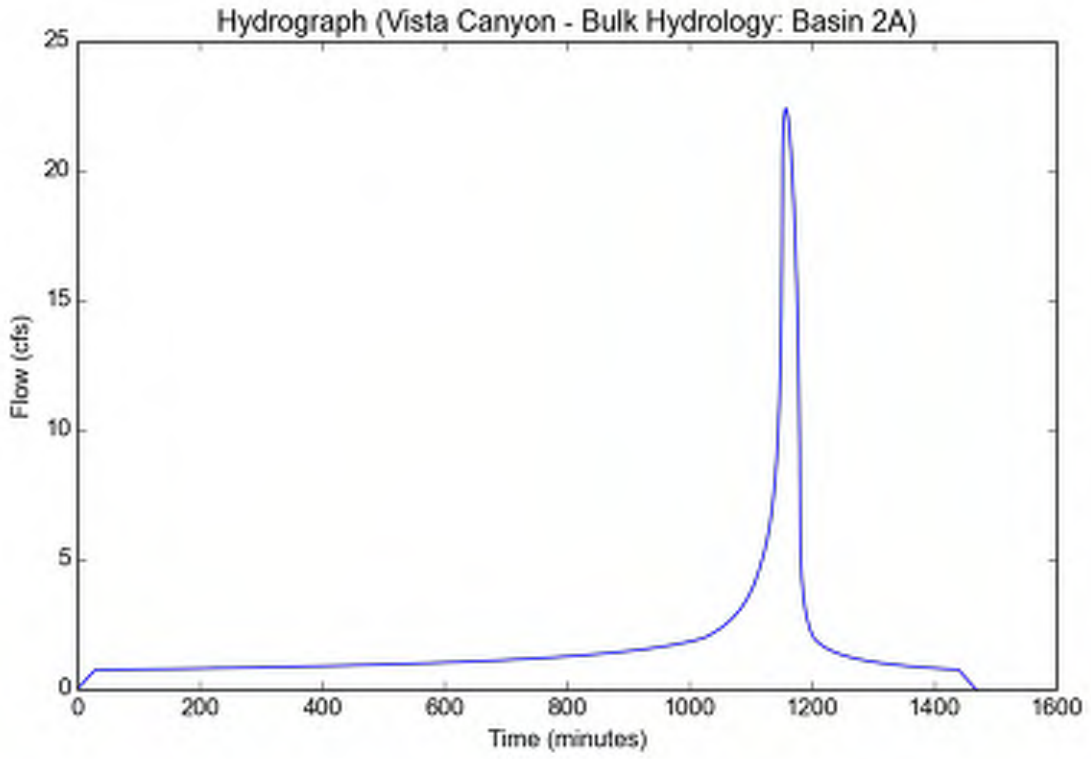
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/25YR/0560-BASIN 2A_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 2A
Area (ac)	36.6
Flow Path Length (ft)	2343.0
Flow Path Slope (vft/hft)	0.0201
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0924
Peak Intensity (in/hr)	1.3299
Undeveloped Runoff Coefficient (Cu)	0.4116
Developed Runoff Coefficient (Cd)	0.4604
Time of Concentration (min)	29.0
Clear Peak Flow Rate (cfs)	22.4094
Burned Peak Flow Rate (cfs)	22.4094
24-Hr Clear Runoff Volume (ac-ft)	3.4611
24-Hr Clear Runoff Volume (cu-ft)	150766.6638



Peak Flow Hydrologic Analysis

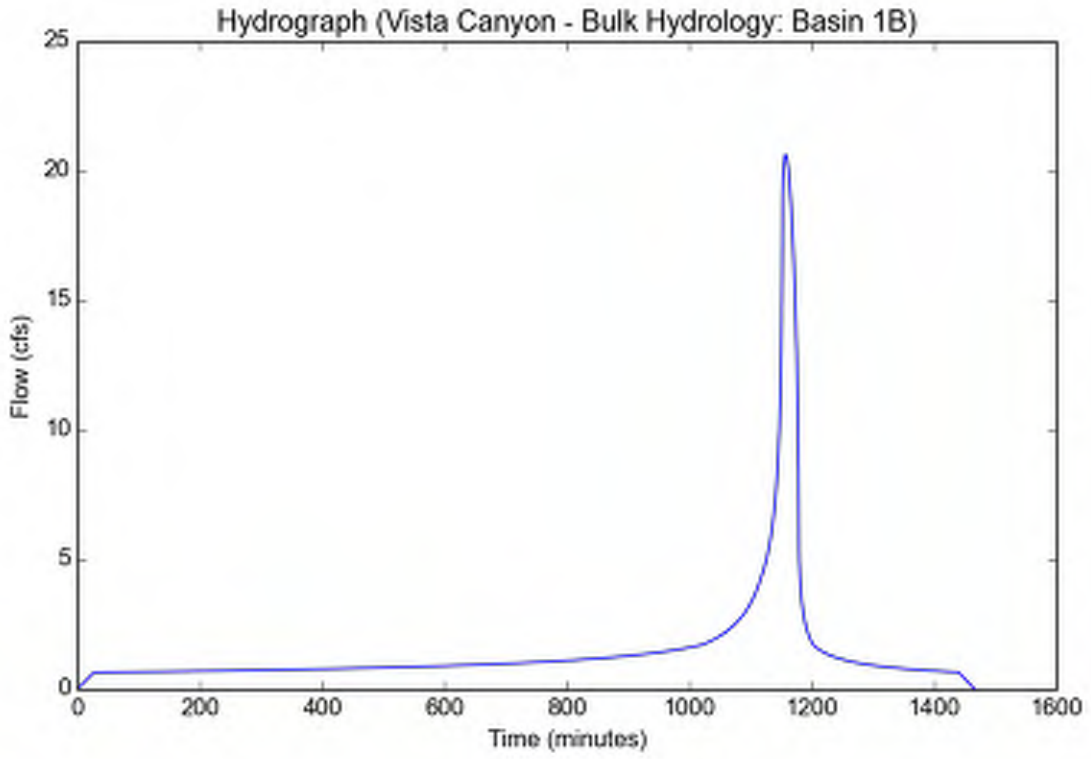
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/25YR/0560-BASIN 1B_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 1B
Area (ac)	32.0
Flow Path Length (ft)	1690.0
Flow Path Slope (vft/hft)	0.0077
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0924
Peak Intensity (in/hr)	1.3753
Undeveloped Runoff Coefficient (Cu)	0.4207
Developed Runoff Coefficient (Cd)	0.4686
Time of Concentration (min)	27.0
Clear Peak Flow Rate (cfs)	20.6246
Burned Peak Flow Rate (cfs)	20.6246
24-Hr Clear Runoff Volume (ac-ft)	3.0317
24-Hr Clear Runoff Volume (cu-ft)	132061.6345



Peak Flow Hydrologic Analysis

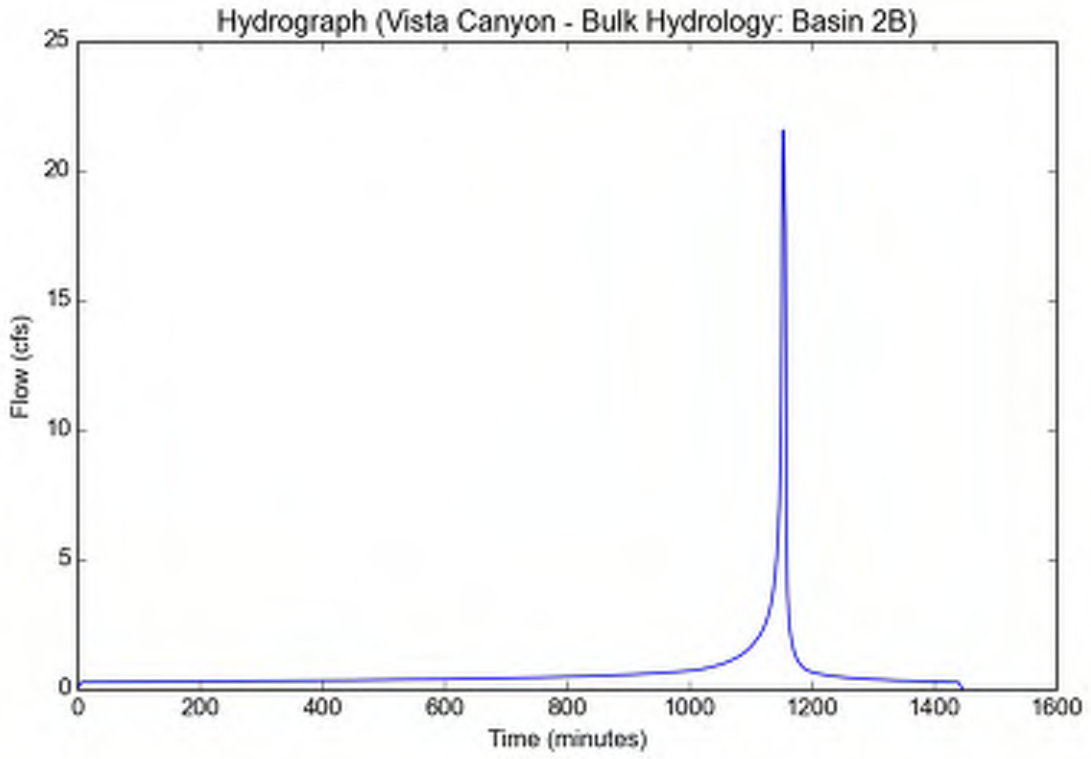
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/25YR/0560-BASIN 2B_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 2B
Area (ac)	13.8
Flow Path Length (ft)	335.0
Flow Path Slope (vft/hft)	0.0173
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0924
Peak Intensity (in/hr)	2.5939
Undeveloped Runoff Coefficient (Cu)	0.5698
Developed Runoff Coefficient (Cd)	0.6028
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	21.5787
Burned Peak Flow Rate (cfs)	21.5787
24-Hr Clear Runoff Volume (ac-ft)	1.3338
24-Hr Clear Runoff Volume (cu-ft)	58098.2699



Peak Flow Hydrologic Analysis

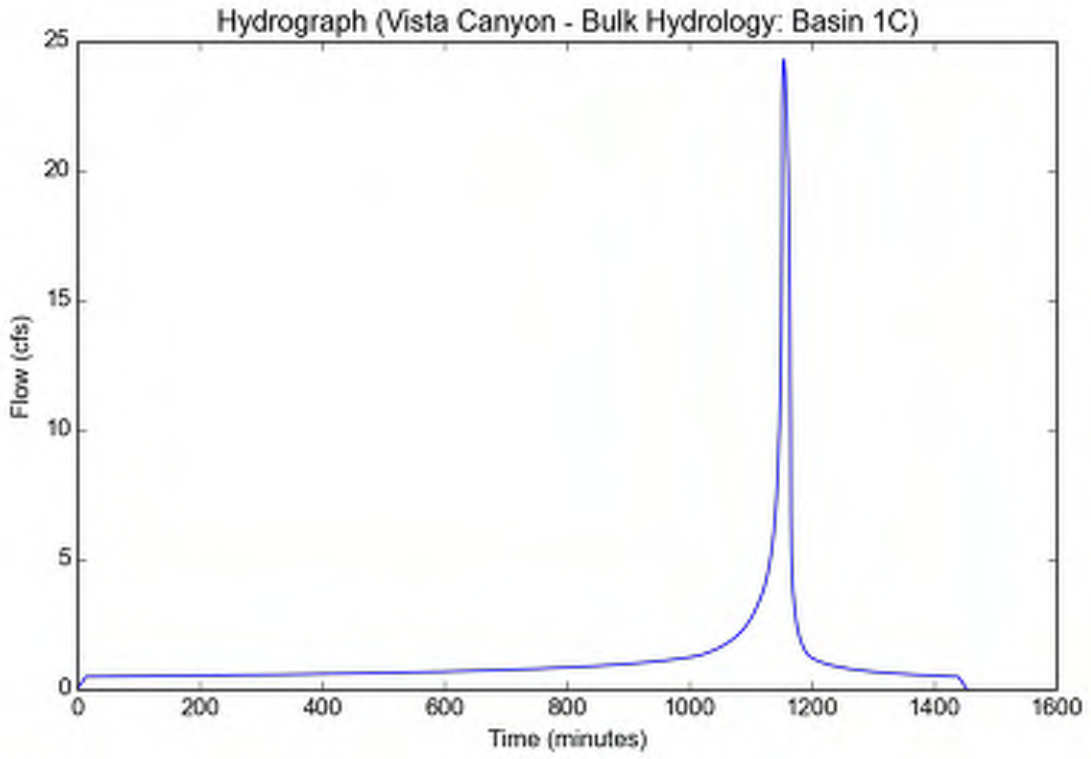
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/25YR/0560-BASIN 1C_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 1C
Area (ac)	24.1
Flow Path Length (ft)	890.0
Flow Path Slope (vft/hft)	0.0171
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0924
Peak Intensity (in/hr)	1.8727
Undeveloped Runoff Coefficient (Cu)	0.4982
Developed Runoff Coefficient (Cd)	0.5384
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	24.2978
Burned Peak Flow Rate (cfs)	24.2978
24-Hr Clear Runoff Volume (ac-ft)	2.3127
24-Hr Clear Runoff Volume (cu-ft)	100739.3193



Peak Flow Hydrologic Analysis

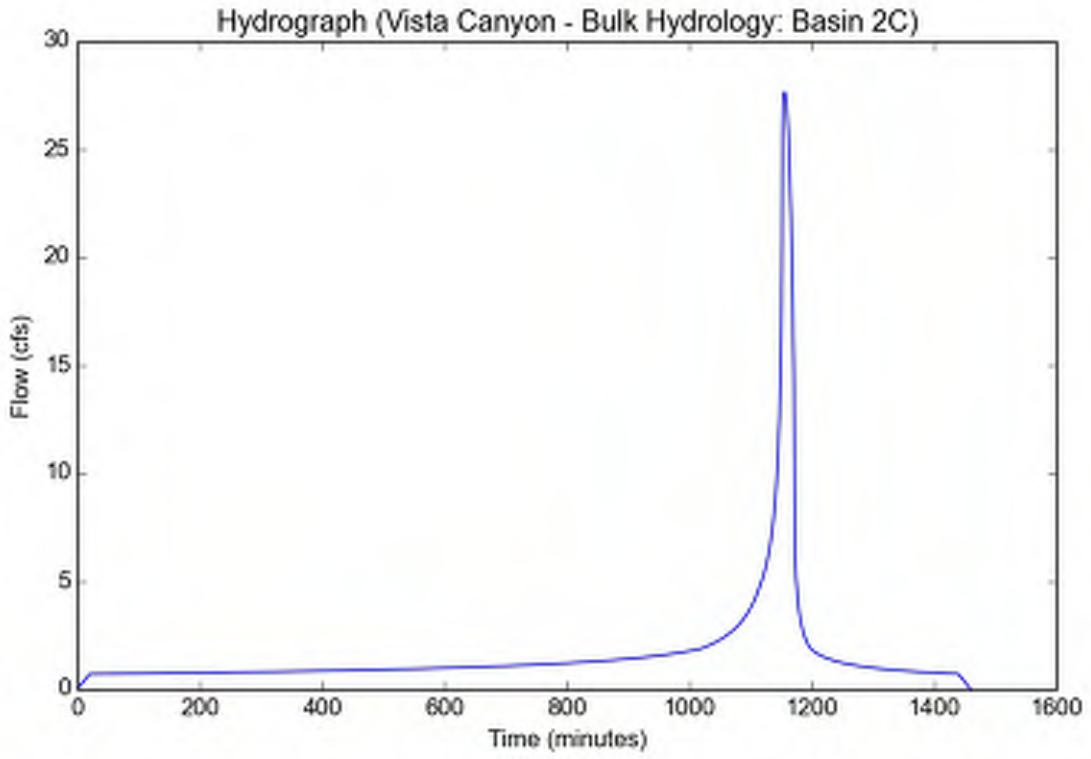
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/25YR/0560-BASIN 2C_081315.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 2C
Area (ac)	34.8
Flow Path Length (ft)	1680.0
Flow Path Slope (vft/hft)	0.0315
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.1
Soil Type	20
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0924
Peak Intensity (in/hr)	1.5836
Undeveloped Runoff Coefficient (Cu)	0.4576
Developed Runoff Coefficient (Cd)	0.5018
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	27.6561
Burned Peak Flow Rate (cfs)	27.6561
24-Hr Clear Runoff Volume (ac-ft)	3.3204
24-Hr Clear Runoff Volume (cu-ft)	144637.3788



Peak Flow Hydrologic Analysis

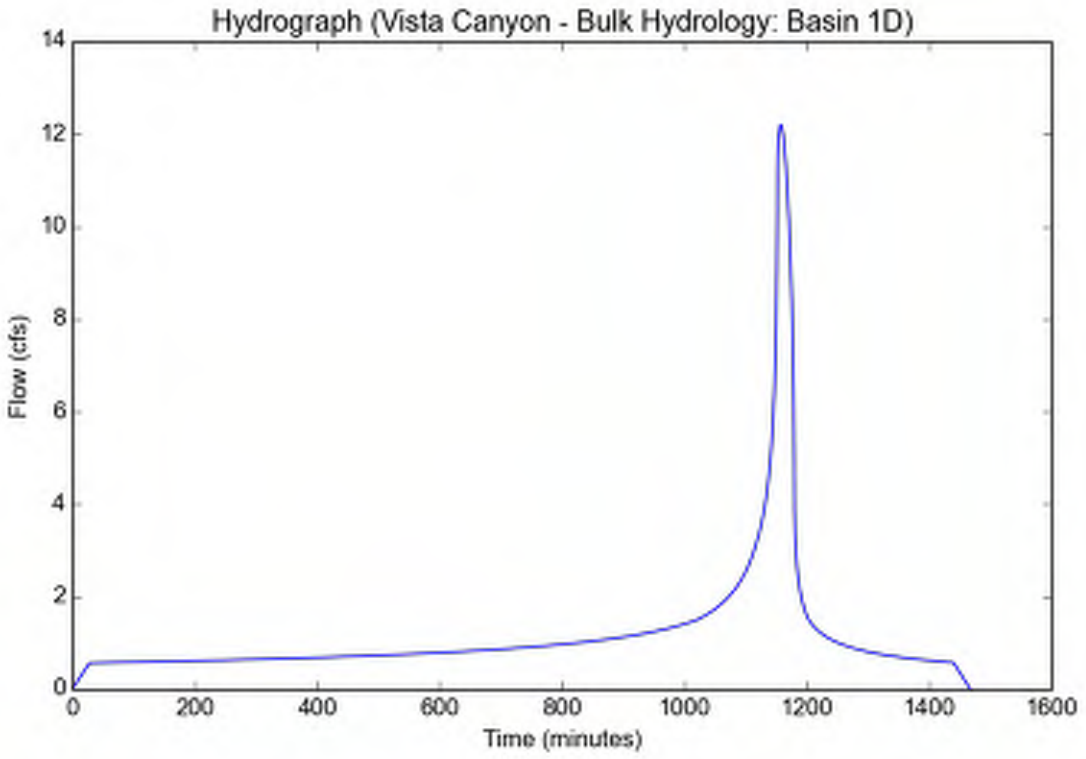
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/25YR/0560-BASIN 2D_081415.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 1D
Area (ac)	16.8
Flow Path Length (ft)	2640.0
Flow Path Slope (vft/hft)	0.0212
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.25
Soil Type	20
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0924
Peak Intensity (in/hr)	1.352
Undeveloped Runoff Coefficient (Cu)	0.416
Developed Runoff Coefficient (Cd)	0.537
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	12.1974
Burned Peak Flow Rate (cfs)	12.1974
24-Hr Clear Runoff Volume (ac-ft)	2.3857
24-Hr Clear Runoff Volume (cu-ft)	103921.4137



Peak Flow Hydrologic Analysis

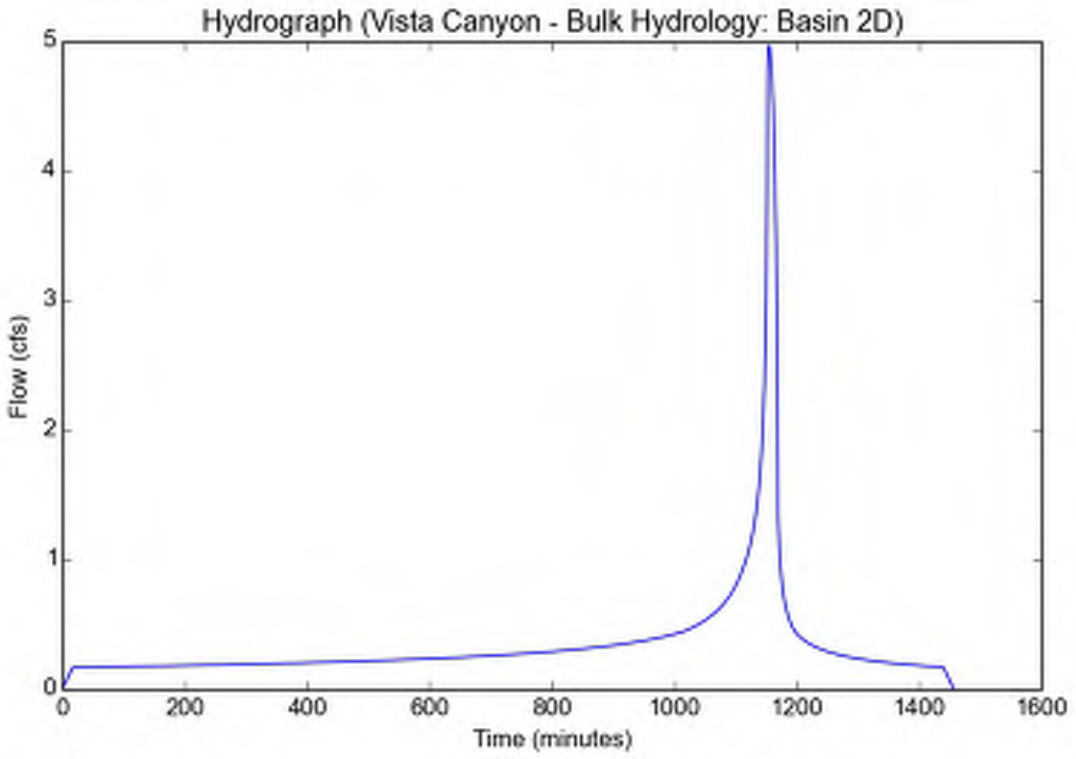
File location: I:/Project Files/0560 - VISTA CANYON/HYDROLOGY/BULK HYDROLOGY/HYDROCALC/25YR/0560-BASIN 3D_081415.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Vista Canyon - Bulk Hydrology
Subarea ID	Basin 2D
Area (ac)	5.0
Flow Path Length (ft)	1274.0
Flow Path Slope (vft/hft)	0.017
50-yr Rainfall Depth (in)	5.8
Percent Impervious	0.25
Soil Type	20
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.0924
Peak Intensity (in/hr)	1.7093
Undeveloped Runoff Coefficient (Cu)	0.4752
Developed Runoff Coefficient (Cd)	0.5814
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	4.9694
Burned Peak Flow Rate (cfs)	4.9694
24-Hr Clear Runoff Volume (ac-ft)	0.7143
24-Hr Clear Runoff Volume (cu-ft)	31113.7002



Appendix C

Hydrologic Modeling
(LAR04 Output)

LAR04

50-YEAR

INPUT FILE: Q50, INTERIM, BASIN A

```
006  0560    1A  20  0  .099A294  1.0001000              0  G1
006  0560    2A  20 1036.624A292  1.0001000              02  2
```

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\civild\lasoilx.dat

VISTA CANYON - BULK HYDRO ANALYSIS - BASIN A - Q50

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
560	1A	.0	.00	.0	.00	4	1.	.01000	.00	.00	0.	20	99	A29	.00
560	2A	36.6	31.13	36.6	31.13	2	1.	.01000	.00	.00	0.	20	24	A29	.10

INPUT FILE: Q50, INTERIM, BASIN B

```
006  0560    1B  20 1032.023A292335.0000770               0  G1
006  0560    2B  20 1013.8 6A294  1.0001000               02  2
```

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\civild\lasoilx.dat

VISTA CANYON - BULK HYDRO ANALYSIS - BASIN B - Q50

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM RAIN ZONE	DAY 4 PCT IMPV
560	1B	32.0	27.99	32.0	27.99	2	335.	.00770	.00	.00	0.	20	23	A29	.10
560	2B	13.8	27.95	45.8	49.69	4	1.	.01000	2.75	.00	0.	20	6	A29	.10

INPUT FILE: Q50, INTERIM, BASIN C

```
006  0560    1C  20 1024.112A292890.0001710               0  G1
006  0560    2C  20 1034.817A294  1.0001000               02  2
```

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\civild\lasoilx.dat

VISTA CANYON - BULK HYDRO ANALYSIS - BASIN C - Q50

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM RAIN ZONE	DAY 4 PCT IMPV
560	1C	24.1	32.12	24.1	32.12	2	890.	.01710	.00	.00	0.	20	12	A29	.10
560	2C	34.8	37.06	58.9	65.29	4	1.	.01000	3.00	.00	0.	20	17	A29	.10

INPUT FILE: Q50, INTERIM, BASIN D

```
006  0560    1D  20 2516.824A294 1274001700                0  G1
006  0560    2D  20 25 5.015A294  1.0001000                02  2
```

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\civild\lasoilx.dat

VISTA CANYON - BULK HYDRO ANALYSIS - BASIN D - Q50

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM RAIN ZONE	DAY 4 PCT IMPV
560	1D	16.8	16.07	16.8	16.07	4	1274.	.01700	2.00	.00	0.	20	24	A29	.25
560	2D	5.0	6.38	21.8	21.81	4	1.	.01000	2.00	.00	0.	20	15	A29	.25

LAR04

25-YEAR

INPUT FILE: Q25, INTERIM, BASIN A

```
006  0560    1A  20  0  .099A294  1.0001000              0  G1
006  0560    2A  20 1036.629A292  1.0001000              02  2
```

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE: C:\civild\lasoilx.dat

VISTA CANYON - BULK HYDRO ANALYSIS - BASIN A - Q25

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM DAY 4 RAIN ZONE	PCT IMPV
560	1A	.0	.00	.0	.00	4	1.	.01000	.00	.00	0.	20	99	A29	.00
560	2A	36.6	22.74	36.6	22.74	2	1.	.01000	.00	.00	0.	20	29	A29	.10

INPUT FILE: Q25, INTERIM, BASIN B

```
006  0560    1B  20 1032.027A292335.0000770               0  G1
006  0560    2B  20 1013.8 7A294  1.0001000               02  2
```

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE: C:\civild\lasoilx.dat

VISTA CANYON - BULK HYDRO ANALYSIS - BASIN B - Q25

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM RAIN ZONE	DAY 4 PCT IMPV
560	1B	32.0	20.86	32.0	20.86	2	335.	.00770	.00	.00	0.	20	27	A29	.10
560	2B	13.8	21.47	45.8	38.47	4	1.	.01000	2.50	.00	0.	20	7	A29	.10

INPUT FILE: Q25, INTERIM, BASIN C

```
006  0560    1C  20 1024.114A292890.0001710                0  G1
006  0560    2C  20 1034.820A294  1.0001000                02  2
```

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE: C:\civild\lasoilx.dat

VISTA CANYON - BULK HYDRO ANALYSIS - BASIN C - Q25

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM RAIN ZONE	DAY 4 PCT IMPV
560	1C	24.1	24.33	24.1	24.33	2	890.	.01710	.00	.00	0.	20	14	A29	.10
560	2C	34.8	27.80	58.9	49.37	4	1.	.01000	2.75	.00	0.	20	20	A29	.10

INPUT FILE: Q25, INTERIM, BASIN D

```
006  0560    1D  20  0  .099A294  1.0001000               0  G1
006  0560    2D  20 2516.828A294  1.0001000               02  2
```

Version 11.3, MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE: C:\civild\lasoilx.dat

VISTA CANYON - BULK HYDRO ANALYSIS - BASIN D - Q25

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	STORM RAIN ZONE	DAY 4 PCT IMPV
560	1D	.0	.00	.0	.00	4	1.	.01000	.00	.00	0.	20	99	A29	.00
560	2D	16.8	12.32	16.8	12.32	4	1.	.01000	2.00	.00	0.	20	28	A29	.25

APPENDIX E

STORM DRAIN PLANS FOR VISTA CANYON PHASE 1 (MTD 1851)

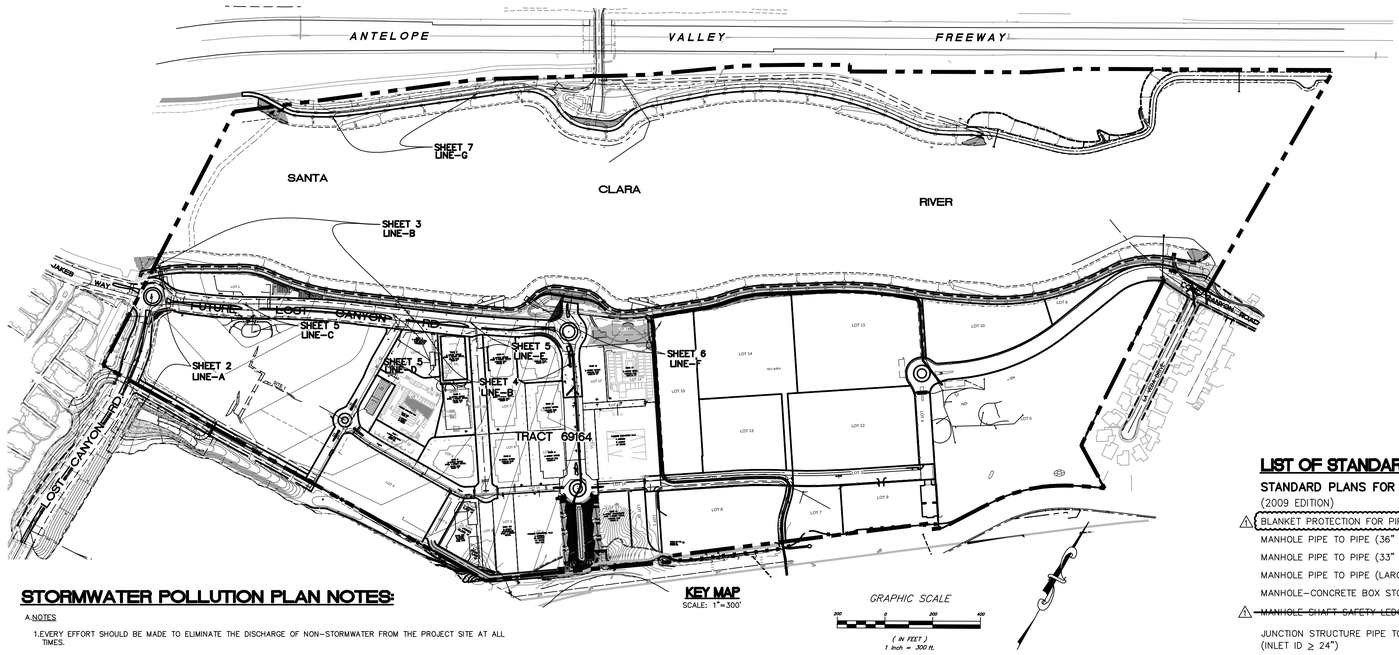
COUNTY OF LOS ANGELES
STORM DRAIN PLANS FOR VISTA CANYON (PHASE 1)

GENERAL NOTES

1. A PERMIT SHALL BE OBTAINED AND ALL FILES AND DEPOSITS FOR CONSTRUCTION INSPECTION SHALL BE PAID TO THE DEPARTMENT OF PUBLIC WORKS AT THE PERMIT COUNTER, 900 SOUTH FREMONT AVENUE, 8TH FLOOR, PRIOR TO STARTING WORK UNDER THIS CONTRACT. ALSO ALL OTHER REQUIRED PERMITS, SUCH AS ROAD EXCAVATION PERMITS, MUST BE OBTAINED PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL CONTACT THE DISTRICT OFFICE LISTED ON THE "APPLICATION FOR STORM DRAIN CONSTRUCTION INSPECTION FORM 1" TO ARRANGE FOR AN ACCEPTABLE CONSTRUCTION START DATE.
3. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION TO THE ACCURACY OF THE LOCATION, OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY, PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL SHEETS.
4. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" (INCLUDING SUPPLEMENTS), AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE DIRECTOR OF PUBLIC WORKS.
5. THE CONTRACTOR'S ATTENTION IS DIRECTED TO SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION IN REGARD TO SAFETY ORDERS AND SHALL CONFORM TO THE "MINIMUM PUBLIC SAFETY REQUIREMENTS" AS SHOWN ON THE LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD PLAN 6008.
6. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. MEAN SEA LEVEL DATUM OF 1929, UNLESS OTHERWISE INDICATED.
7. NO CONCRETE SHALL BE PLACED UNTIL THE FORMS AND REINFORCING STEEL HAVE BEEN PLACED, INSPECTED AND APPROVED.
8. ALL STRUCTURAL CONCRETE SHALL BE PORTLAND CEMENT CONCRETE WITH AN ULTIMATE 28 DAY COMPRESSIVE STRENGTH OF 4000 P.S.I. UNLESS OTHERWISE NOTED.
9. TRANSVERSE REINFORCEMENT AND TRANSVERSE JOINTS SHALL BE PLACED AT RIGHT ANGLES (OR RADIAL) TO THE CONDUIT CENTERLINE EXCEPT AS OTHERWISE SHOWN ON THE DRAWINGS.
10. ALL STEEL ADJACENT TO FACE OF CONCRETE SHALL HAVE 2.5" CLEARANCE UNLESS OTHERWISE SPECIFIED. STEEL CLEARANCE FOR RCB INVERT SHALL BE A MINIMUM OF 3 INCHES.
11. REINFORCEMENT SHALL BE DEFORMED BARS OF INTERMEDIATE GRADE STEEL PER A.S.T.M. A-615-GRADE 60.
12. ALL BAR BENDS AND HOOKS SHALL CONFORM TO THE AMERICAN CONCRETE INSTITUTE "MANUAL OF STANDARD PRACTICE."
13. DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO CENTERLINE OF STEEL UNLESS OTHERWISE NOTED.
14. ALL STEEL THAT IS TO BE CONTINUOUS SHALL HAVE A MINIMUM LAP OF 30 BAR DIAMETERS OR 18 INCHES, WHICHEVER IS GREATER.
15. ALL CONSTRUCTION JOINTS IN THE FOOTING OR SLABS AND WALLS SHALL BE IN THE SAME PLANE. NO STAGGERING OF JOINTS WILL BE PERMITTED.
16. ALL EXPOSED EDGES SHALL BE FINISHED WITH A 3/4" CHAMFER.
17. UNLESS OTHERWISE SHOWN, CONCRETE DIMENSIONS SHALL BE MEASURED VERTICALLY OR HORIZONTALLY AND PARALLEL OR AT RIGHT ANGLES (OR RADIAL) TO THE CENTERLINE OF CONSTRUCTION.
18. CONCRETE BACK FILL IS REQUIRED WHEN THE PIPE HAS LESS THAN ONE-FOOT OF COVER. THE CONCRETE BACK FILL SHALL BE 1-3-5 MIX. PORTLAND CEMENT CONCRETE POURED FROM WALL TO WALL OR TRENCH AND FROM BOTTOM OF TRENCH TO A MINIMUM OF 4 INCHES OVER THE TOP OF THE PIPE.
19. ALL PIPES SHALL BE PLACED IN TRENCH IN NATURAL GROUND AND/OR COMPACTED FILL. THE GROUND LEVEL BEFORE THE TRENCHING SHALL BE AT LEAST 3 FEET ABOVE THE TOP OF THE PIPE ELEVATION, OR AT FINISH SURFACE ELEVATION, WHICHEVER IS LESS.
20. ALL BACK FILL AND RELATIVE COMPACTION FILLS OUTSIDE OF STREET RIGHT OF WAY SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 90% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM SOIL TEST D1557-91 METHOD "A" UNLESS OTHERWISE SPECIFIED. THIS SHALL BE CERTIFIED BY A SOILS ENGINEER. THIS CERTIFICATION SHALL BE SUBMITTED TO THE DIRECTOR OF PUBLIC WORKS FOR ACCEPTANCE OF THE WORK BY THE COUNTY.
21. ALL BACK FILL AND FILLS WITHIN STREET RIGHT OF WAY SHALL BE COMPACTED IN ACCORDANCE WITH CITY REQUIREMENTS UNLESS OTHERWISE NOTED AND INSPECTED BY THE CITY. THE SOIL COMPACTION SHALL BE CERTIFIED BY A GEOTECHNICAL ENGINEER. ALL FILL MATERIALS SHOULD BE COMPACTED TO 90 PERCENT RELATIVE COMPACTION WITH ABOVE OPTIMUM MOISTURE CONTENT IN FILL DEPTHS OF 40' BELOW GRADE AND 93 PERCENT COMPACTION FOR ALL DEPTHS GREATER THAN 40 FEET BELOW GRADE.
22. PIPE BEDDING SHALL BE:
    IN ACCORDANCE WITH COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS STANDARD PLAN NO. 3092 UNLESS OTHERWISED NOTED.
    OR
    ACCORDING TO STANDARD PLAN NO. 3080, CASE III, EXCEPT BELL AND SPIGOT PIPE, WHICH SHALL BE CASE II BEDDING UNLESS OTHERWISE SHOWN. W VALVES SHALL BE AS SPECIFIED ON STANDARD PLAN NO. 3080 FOR CASE III BEDDING, NOTES 3(A), 3(B), AND 3(C). IF THE W VALUE AT THE TIP OF THE PIPE IS EXCEEDED, THE BEDDING SHALL BE MODIFIED AND/OR PIPE OF ADDITIONAL STRENGTH SHALL BE PROVIDED. THE PROPOSED MODIFICATION SHALL BE APPROVED BY PUBLIC WORKS.
23. PIPE SHALL BE EMBEDDED 5 INCHES INTO ALL STRUCTURES INCLUDING INLET AND HEADWALLS, UNLESS OTHERWISE SPECIFIED.
24. MINIMUM CONCRETE COVER FOR REINFORCEMENT IN PRECAST CONCRETE PIPE SHALL BE IN INCH IN PIPE HAVING A WALL THICKNESS OF 2-1/2 INCHES OR GREATER AND 3/4 INCH IN PIPE HAVING A WALL THICKNESS OF LESS THAN 2-1/2 INCHES.
25. ALL CATCH BASINS WITHIN THE DEDICATED STREET RIGHT-OF-WAY SHALL BE CONSTRUCTED PER THE STREET PLANS.
26. THE CONTRACTOR SHALL PROVIDE TO THE SATISFACTION OF THE DIRECTOR OF PUBLIC WORKS A SYSTEM FOR CONTRIBUTORY FLOWS TO BE OPERABLE AT ALL TIMES UNTIL STORM DRAIN SYSTEM IS ACCEPTED FOR MAINTENANCE. THE DESIGN OF THE DRAINAGE SYSTEM MUST BE PREPARED UNDER THE DIRECTION OF A CIVIL ENGINEER.
27. ALL REFERENCES ON THIS PLAN TO THE COUNTY ENGINEER, ROAD DEPARTMENT, OR FLOOD CONTROL DISTRICT SHALL APPLY TO THE APPROPRIATE ELEMENTS OF PUBLIC WORKS.
28. EXISTING UTILITIES SHALL BE MAINTAINED IN PLACE BY THE CONTRACTOR, UNLESS OTHERWISE NOTED.
29. WHERE THE UTILITIES ARE INDICATED ON THE DRAWINGS TO BE SUPPORTED, SAID SUPPORTS-SHALL BE IN ACCORDANCE WITH STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION NO. 224, UNLESS OTHERWISE INDICATED.
30. ALL OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES SHALL BE SEALED WITH 8 INCHES OF BRICK AND MORTAR OR 6 INCHES OF CONCRETE, UNLESS OTHERWISE SHOWN.
31. MANHOLES PER SHALL USE THE STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION 630 FOR THE "FRAME AND COVER" AND 635 FOR THE "STANDARD DROP STEP".
32. THIS STORM DRAIN WILL NOT BE FIELD ACCEPTED UNTIL THE STREETS HAVE BEEN PAVED, MANHOLES BROUGHT TO GRADE AND THE SYSTEM CLEANED TO THE SATISFACTION OF THE DIRECTOR OF PUBLIC WORKS.
33. A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FROM THE REGIONAL WATER QUALITY CONTROL BOARD IS REQUIRED BEFORE ANY DISCHARGE OF NON-STORMWATER INTO THE STORM DRAIN IS ALLOWED.
34. THE LATEST REVISED STANDARD PLAN OR DRAWING SHALL BE USED UNLESS OTHERWISE NOTED.
35. THE SOILS ENGINEER OF RECORD SHALL INSPECT AND APPROVE THE FOUNDATION EXCAVATIONS BEFORE STEEL OR CONCRETE IS PLACED.
36. STORM DRAIN MANHOLE COVERS CONSTRUCTED PER S.P.P.W.C. STANDARD PLANS 630, 631, 632, AND 633 SHALL BE CAST WITH THE LETTERS "L.A.C.F.C.D." THE LETTERS SHALL BE 1 INCH IN HEIGHT AND PLACED BELOW THE LETTER "D" IN THE CENTER OF THE COVER.
37. STORM DRAIN MANHOLE COVERS CONSTRUCTED PER S.P.P.W.C. STANDARD PLANS 312 SHALL BE CAST WITH THE LETTERS "L.A.C.F.C.D." THE LETTERS SHALL BE 1 INCH IN HEIGHT AND PLACED BELOW THE LETTER "D" IN THE CENTER OF THE COVER.
38. ALL THE ABOVE GROUND FACILITIES SHALL BE STAMPED WITH THE DRAIN AND LINE NAME. THE LETTERING SHOULD BE 4" BLACK TEXT ON A YELLOW BACKGROUND.
39. EVERY 100 FEET STATIONS SHALL BE LABELED ON THE INSIDE OF ALL STORM DRAINS AND WALL OF OPEN CHANNELS. THE LETTERING SHOULD BE 4" BLACK TEXT ON A YELLOW BACKGROUND AND SHALL BE PLACED IN THE SOFFIT OF PIPES AND THE TOP 2 FEET OF A CHANNEL WALL.
40. FOR ALL DEBRIS BASINS, THE 0%, 5%, AND 25% DEBRIS CONE ELEVATIONS SHALL BE LABELED ON THE CONCRETE FACING SLAB AND THE STAND PIPE.

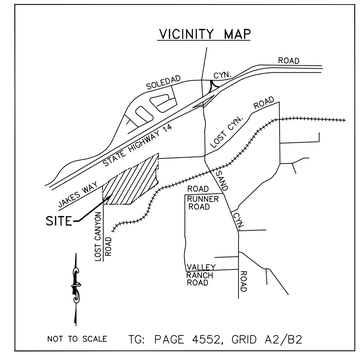
FILL NOTES

1. FILL SHALL BE COMPACTED THROUGHOUT IT'S FULL EXTENT TO A MINIMUM OF 90% OF MAXIMUM DRY DENSITY AS DETERMINED BY A.S.T.M.TEST METHOD STANDARD D1557 OR THE CURRENT EDITION, WHERE APPLICABLE; WHERE NOT APPLICABLE A TEST ACCEPTABLE TO THE CITY ENGINEER SHALL BE USED. -17.27.020(A)
2. TRENCH BACKFILLS UNDERLYING PAVEMENTS SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 90 PERCENT OF MAXIMUM DRY DENSITY, TO A DEPTH OF 24 INCHES BELOW THE PAVEMENT SECTION.
3. FIELD DENSITY SHALL BE DETERMINED BY A METHOD ACCEPTABLE TO THE CITY ENGINEER.
4. SUFFICIENT TESTS OF FILL SOILS SHALL BE MADE TO DETERMINE THE RELATIVE COMPACTION OF THE FILL IN ACCORDANCE WITH THE FOLLOWING GUIDELINES:
   (a) ONE TEST FOR EACH TWO FOOT VERTICAL LIFT.
   (b) ONE TEST FOR EACH 1000 CUBIC YARDS OF MATERIAL PLACED.
   (c) ONE TEST AT THE LOCATION OF THE FINAL FILL SLOPE FOR EACH BUILDING SITE (LOT) IN EACH FOUR FOOT VERTICAL LIFT OR PORTION THEREOF.
   (d) ONE TEST IN THE VICINITY OF EACH BUILDING PAD FOR EACH FOUR FOOT VERTICAL LIFT OR PORTION THEREOF.
5. SUFFICIENT TESTS OF FILL SOILS SHALL BE MADE TO VERIFY COMPLIANCE OF THE SOIL PROPERTIES COMPLY WITH THE DESIGN REQUIREMENTS, AS DETERMINED BY THE GEOTECHNICAL ENGINEER, INCLUDING SOIL TYPES AND SHEAR STRENGTHS. THE RESULTS OF SUCH TESTING SHALL BE INCLUDED IN THE REPORTS REQUIRED BY SECTION 17.29.020(C).
6. NO FILL SHALL BE PLACED UNTIL STRIPPING OF VEGETATION, REMOVAL OF UNSUITABLE METHOD FOR MOISTURE, ASH, ORGANIC MATTER, PEAT OR OTHER ORGANIC SOILS" ASTM SOILS HAS BEEN PERFORMED. THE CITY ENGINEER MAY REQUIRE A "STANDARD" TEST D-2974-87 ON ANY SUSPECT MATERIAL. ALL MATERIALS THAT HAVE A TEST VALUE OF 10 PERCENT OR GREATER WILL BE REJECTED AS UNSUITABLE FOR SUPPORT OF OR BEING STRUCTURAL FILL.
7. ROCK OR SIMILAR MATERIAL GREATER THAN 8 INCHES IN DIAMETER SHALL NOT BE PLACED IN THE TRENCH BACKFILL.
8. CONTINUOUS INSPECTION BY THE GEOTECHNICAL ENGINEER OR HIS RESPONSIBLE REPRESENTATIVE SHALL BE PROVIDED DURING ALL FILL PLACEMENT AND COMPACTION OPERATIONS.
9. THE GEOTECHNICAL ENGINEER SHALL PROVIDE SUFFICIENT INSPECTIONS DURING THE PREPERATION OF THE NATURAL GROUND AND THE PLACEMENT AND COMPACTION OF THE FILL TO BE SATISFIED THAT THE WORK IS BEING PERFORMED IN ACCORDANCE WITH THE PLAN AND APPLICABLE CODE REQUIREMENTS. -17.29.010(D)
10. ALL GRADING AND CONSTRUCTION SHALL CONFORM TO CHAPTERS 70 AND 71 OF THE LOS ANGELES BUILDING CODE UNLESS SPECIFICALLY NOTED ON THESE PLANS AND TO THE RECOMMENDATIONS PROVIDED IN THE SOILS REPORT, BULK GRADING PLAN REVIEW PREPARED BY FRANKLIN & ASSOCIATES DATED 11/9/15 (RTFA, 2015C)



KEY MAP
SCALE: 1"=300'

GRAPHIC SCALE
200 0 200 400
(IN FEET)
1 inch = 300 ft.



INDEX OF PROJECT DRAWINGS

LIST OF STANDARDS

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

(2009 EDITION)	SPPWC DWG.
⚠1 BLANKET PROTECTION FOR PIPES	225-2
MANHOLE PIPE TO PIPE (36" OR LARGER)	320-2
MANHOLE PIPE TO PIPE (33" OR SMALLER)	321-2
MANHOLE PIPE TO PIPE (LARGE SIDE INLET)	322-2
MANHOLE-CONCRETE BOX STORM DRAIN	323-2
⚠1 ~~MANHOLE SHAFT SAFETY LEDGE~~	~~330-2~~
JUNCTION STRUCTURE PIPE TO PIPE (INLET ID ≥ 24")	331-3
JUNCTION STRUCTURE PIPE TO PIPE (INLET ID ≤ 24")	332-2
JUNCTION STRUCTURE PIPE TO RCB	333-2
TRANSITION STRUCTURE PIPE TO PIPE	340-2
CONCRETE COLLAR FOR RCP (12" THRU 72")	380-4
MANHOLE FRAME AND COVER	630-3
PIPE BEDDING	3092-0 (L.A.C.D.P.W.)
SAFETY REQUIREMENTS	6008-1 (L.A.C.D.P.W.)

STORMWATER POLLUTION PLAN NOTES:

A. NOTES

1. EVERY EFFORT SHOULD BE MADE TO ELIMINATE THE DISCHARGE OF NON-STORMWATER FROM THE PROJECT SITE AT ALL TIMES.
2. ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ON-SITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEETFLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES OR WIND.
3. STOCKPILES OF EARTH AND OTHER CONSTRUCTION RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER.
4. FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOIL AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MUST BE CLEANED UP IMMEDIATELY AND DISPOSED OF IN A PROPER MANNER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM.
5. EXCESS OR WASTE CONCRETE MAY NOT BE WASHED INTO THE PUBLIC WAY OR ANY OTHER DRAINAGE SYSTEM. PROVISIONS SHALL BE MADE TO RETAIN CONCRETE WASTES ON-SITE UNTIL THEY CAN BE DISPOSED OF AS SOLID WASTE.
6. TRASH AND CONSTRUCTION RELATED SOLID WASTES MUST BE DEPOSITED INTO A COVERED RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND.
7. SEDIMENTS AND OTHER MATERIALS MAY NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS MUST BE STABILIZED SO AS TO INHIBIT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC WAY. ACCIDENTAL DEPOSITIONS MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS.
8. ANY SLOPES WITH DISTURBED SOILS OR DENUDED OF VEGETATION MUST BE STABILIZED SO AS TO INHIBIT EROSION BY WIND AND WATER.

B. THE FOLLOWING BMPs AS OUTLINED IN, BUT NOT LIMITED TO, THE LATEST EDITION OF THE CALIFORNIA BMP HANDBOOK (CONSTRUCTION) OR CALTRANS STORMWATER QUALITY HANDBOOKS (CONSTRUCTION SITE BMP MANUAL), MAY APPLY DURING THE CONSTRUCTION OF THIS PROJECT (ADDITIONAL MEASURES MAY BE REQUIRED IF DEEMED APPROPRIATE BY THE PROJECT ENGINEER OR THE BUILDING OFFICIAL):

EROSION CONTROL
EC1 – SCHEDULING
EC2 – PRESERVATION OF EXISTING VEGETATION
EC3 – HYDRAULIC MULCH
EC4 – HYDROSEEDING
EC5 – SOIL BINDERS
EC6 – STRAW MULCH
EC7 – GEOTEXTILE AND MATS
EC8 – WOOD MULCHING
EC9 – EARTH DIKES AND DRAINAGE SWALES
EC10 – VELOCITY DISSIPATION DEVICES
EC11 – SLOPE DRAINS
EC12 – STREAMBANK STABILIZATION
EC13 – RESERVED
EC14 – COMPOST BLANKETS
EC15 – SOIL PREPARATION/ROUGHENING
EC16 – NON-VEGETATED STABILIZATION

TEMPORARY SEDIMENT CONTROL
SE1 – SILT FENCE
SE2 – SEDIMENT BASIN
SE3 – SEDIMENT TRAP
SE4 – CHECK DAM
SE5 – FIBER ROLLS
SE6 – GRAVEL BAG BERM
SE7 – STREET SWEEPING AND VACUUMING
SE8 – SANDBAG BARRIER
SE9 – STRAW BALE BARRIER
SE10 – STORM DRAIN INLET PROTECTION
SE11 – ACTIVE TREATMENT SYSTEMS
SE12 – TEMPORARY SILT DIKE
SE13 – COMPOST SOCKS AND BERMS
SE14 – BIOFILTER BAGS

WIND EROSION CONTROL
WE1 – WIND EROSION CONTROL

EQUIPMENT TRACKING CONTROL
⚠1
TC1 – STABILIZED CONSTRUCTION ENTRANCE / EXIT
TC2 – STABILIZED CONSTRUCTION ROADWAY
TC3 – ENTRANCE / OUTLET TIRE WASH

NON-STORMWATER MANAGEMENT
NS1 – WATER CONSERVATION PRACTICES
NS2 – DEWATERING OPERATIONS
NS3 – PAVING AND GRINDING OPERATIONS
NS4 – TEMPORARY STREAM CROSSING
NS5 – CLEAR WATER DIVERSION
NS6 – ILLICIT CONNECTION / DISCHARGE
NS7 – POTABLE WATER / IRRIGATION
NS8 – VEHICLE AND EQUIPMENT CLEANING
NS9 – VEHICLE AND EQUIPMENT FUELING
NS10 – VEHICLE AND EQUIPMENT MAINTENANCE
NS11 – PILE DRIVING OPERATIONS
NS12 – CONCRETE CURING
NS13 – CONCRETE FINISHING
NS14 – MATERIAL AND EQUIPMENT USE
NS15 – DEMOLITION ADJACENT TO WATER
NS16 – TEMPORARY BATCH PLANTS

WASTE MANAGEMENT AND MATERIAL POLLUTION CONTROL
WM1 – MATERIAL DELIVERY AND STORAGE
WM2 – MATERIAL USE
WM3 – STOCK PILE MANAGEMENT
WM4 – SPILL PREVENTION AND CONTROL
WM5 – SOLID WASTE MANAGEMENT
WM6 – HAZARDOUS WASTE MANAGEMENT
WM7 – CONTAMINATION SOIL MANAGEMENT
WM8 – CONCRETE WASTE MANAGEMENT
WM9 – SANITARY / SEPTIC WASTE MANAGEMENT
WM10 – LIQUID WASTE MANAGEMENT

CATCH BASIN STENCIL DETAIL

ALL CATCH BASIN AND INLETS THAT DISCHARGE INTO AN EXISTING OR PROPOSED STORM DRAIN MUST BE STENCILED TO DISCOURAGE ILLEGAL DUMPING OF POLLUTANTS. THIS STENCIL SHALL HAVE A MINIMUM DIAMETER OF 30 INCHES.

HYDRAULIC ELEMENTS

LINE	STATION	Q50YR. C.F.S.	CONDUIT SIZE	S_F	PIPE SLOPE IN %	VELOCITY FT/SEC	DEPTH OF FLOW (FT)	REMARKS
LINE 'A'	1+00.00 TO 3+28.72	103.06	42" RCP	0.0105	1.31	10.71	FULL	DRAINS TO NATURAL CHANNEL
	3+28.72 TO 3+78.77	100.85	42" RCP	0.0100	1.31	10.48	FULL	
	3+78.77 TO 7+57.30	98.75	42" RCP	0.0096	1.31	10.27	FULL	
LAT 'A-1'	1+00.00 TO 1+60.59	2.42	18" RCP	0.0005	2.00	1.37	FULL	
LAT 'A-2'	1+00.00 TO 1+29.34	2.82	18" RCP	0.0007	2.01	1.60	FULL	
LAT 'A-3'	1+00.00 TO 1+52.00	98.75	42" RCP	0.0096	2.00	10.26	FULL	
LAT 'A-4'	1+00.00 TO 1+77.25	2.25	18" RCP	0.0005	1.22	1.27	FULL	
LINE 'B'	1+00.00 TO 5+50.72	89.10	48" RCP	0.0039	0.50	7.09	FULL	DRAINS TO NATURAL CHANNEL
LINE 'B'	5+50.72 TO 11+77.40	43.41	36" RCP	0.0064	0.80	7.55	FULL	
LINE 'B'	11+77.40 TO 15+02.93	34.43	36" RCP	0.0048	0.80	6.55	FULL	
LINE 'B'	15+02.93 TO 20+25.42	4.34	24" RCP	0.0066	1.00	5.83	FULL	
LINE 'C'	1+05.10 TO 2+36.87	42.13	42" RCP	0.0040	0.44	5.96	FULL	
LINE 'D'	1+04.10 TO 2+12.37	8.97	24" RCP	0.0016	2.00	2.86	FULL	
LINE 'E'	1+04.60 TO 2+23.53	29.21	30" RCP	0.0051	1.13	5.95	FULL	
LINE 'F'	1+00.00 TO 7+04.35	326.71	4'Hx8'W RCB	0.0054	0.40	10.21	FULL	DRAINS TO NATURAL CHANNEL
LINE 'G'	1+00.00 TO 1+20.69	22.31	24" RCP	0.0097	3.93	7.10	FULL	DRAINS TO NATURAL CHANNEL
LINE 'G'	1+20.69 TO 10+63.57	22.31	24" RCP	0.0097	0.50	7.10	FULL	
LINE 'G'	10+63.57 TO 11+90.33	21.01	24" RCP	0.0086	0.50	6.69	FULL	
LINE 'G'	11+90.33 TO 12+27.05	14.82	24" RCP	0.0043	0.50	4.72	FULL	

GEOLOGY AND SOILS NOTES

1. ALL RECOMMENDATIONS INCLUDED IN R.T. FRANKIAN AND ASSOCIATES STORM DRAIN REPORT "REPORT OF GEOTECHNICAL PLAN REVIEW, STORM DRAIN-PHASE 2" PREPARED BY RTFA DATED 1/27/17 AND ALL ADDENDUM'S MUST BE COMPLIED WITH AND ARE PART OF THE GRADING AND STORM DRAIN SPECIFICATIONS.
2. THE PROPOSED STORM DRAIN BOX STRUCTURE WILL BE SUPPORTED ON EITHER NATURAL SOILS COMPACTED TO A MINIMUM OF 95 PERCENT RELATIVE COMPACTION OR A MINIMUM OF 12 INCHES OF UNIFORM SIZE, CRUSHED, COMPACTED, 3/4-INCH GRAVEL SHOULD BE PLACED BELOW THE BOTTOM OF THE STORM DRAIN BOX STRUCTURE PROVIDED THE GRAVEL IS PLACED UPON RELATIVELY FIRM, NATURALLY DEPOSITED SOIL.
3. RUBBER GASKETS SHALL BE ADDED TO A MINIMUM OF THREE PIPE LENGTHS ON EACH SIDE OF SOILS TRANSITIONS.

PRIVATE ENGINEER NOTICE TO CONTRACTORS:

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THIS MAP. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THIS DRAWING. PRIOR TO EXCAVATION, THE CONTRACTOR SHALL CALL TOLL FREE (800) 422-4132 TO VERIFY THE UNDERGROUND LOCATION OF GAS AND TELEPHONE LINES.

NOTE: MTD 1851 MUST TRANSFER CONCURRENTLY WITH MTD 1850.

⚠1 LINES INDICATED AS "NOT TO BE MAINTAINED BY L.A.C.F.C.D." ARE ALSO "NOT TO BE MAINTAINED BY CITY OF SANTA CLARITA."

STORMDRAIN EASEMENT DEDICATION

LINE	LENGTH (FT)	AREA OF EASEMENT (SQ FT)
A	608	590
B	1,881	
B	1,881	4,905
F	573	12,485
G	1,110	6,845

SEE SHEET 8 FOR EASEMENT LAYOUTS

BENCHMARK: L 1668
DESCRIPTION: CS MON IN WELL 250MM DN @ PI 60MM EAST OF CENTERLINE
LOCATION: SAND CANYON ROAD AND 161M NORTH OF LIVE OAK SPRINGS CANYON ROAD 8.2M NORTHEAST OF POWER POLE #1155006E MKD (PI 24)
ELEVATION: 1586.011 DATUM: NAVD 88 (1995 ADJ.)

APPROVED
BY _____ CITY ENGINEER DATE

NO.	REVISION	REVISED BY	APPROVED BY	DATE
⚠1	REMOVED SAFETY LEDGE, ADDED LAT A-4 ADDED BLANKET PROTECTION SPPWC 225-2			03/25/16
⚠2	REPLACED SHEET 2 WITH SHEET 2A. REVISED SHEETS 3,4 & 5 ADDING CATCH BASINS TO LAT A-1,A-2,B-1,B-2,B-3 & E-1. REVISED LINE B. ADDED MAINTENANCE NOTE.			03/06/17
⚠3	REPLACED SHEET 2A WITH 2B, REVISED LATERAL A-1 PLAN AND PROFILE.			

REGISTERED PROFESSIONAL ENGINEER — CERTO M. WHITTEN — NO. 51929 — EXP 6-30-18 — CIVIL — STATE OF CALIFORNIA

PROJECT ENGINEER 09/02/16 DATE

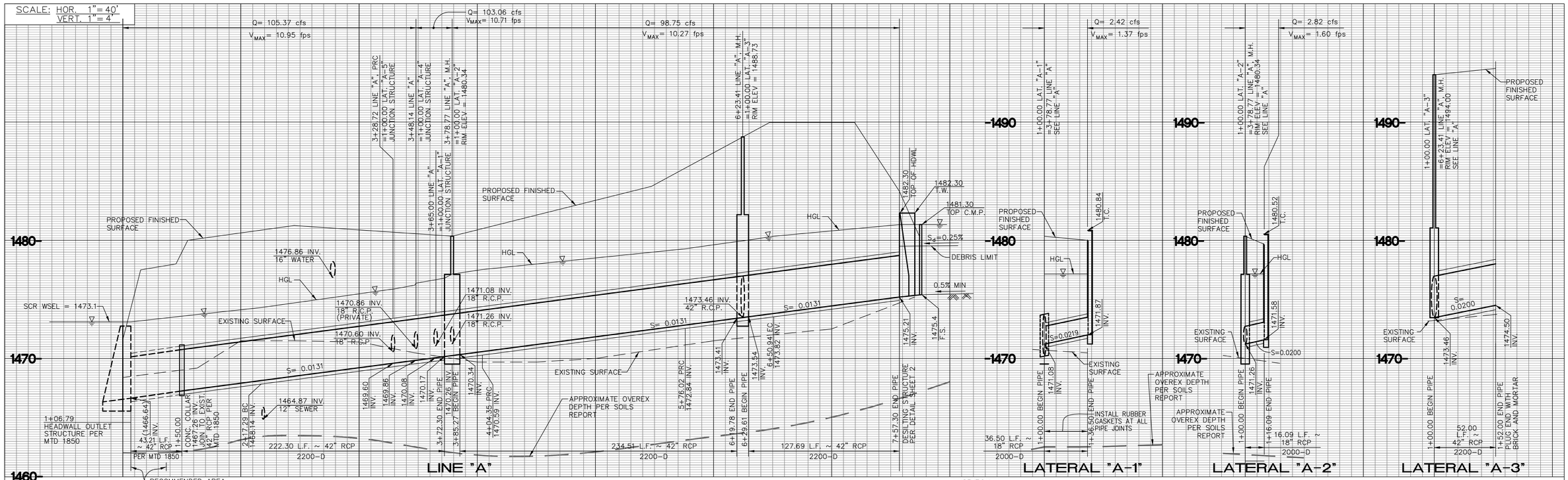
STORM DRAIN PLANS
TRACT No. 69164 M.T.D. No. 1851
CITY OF SANTA CLARITA

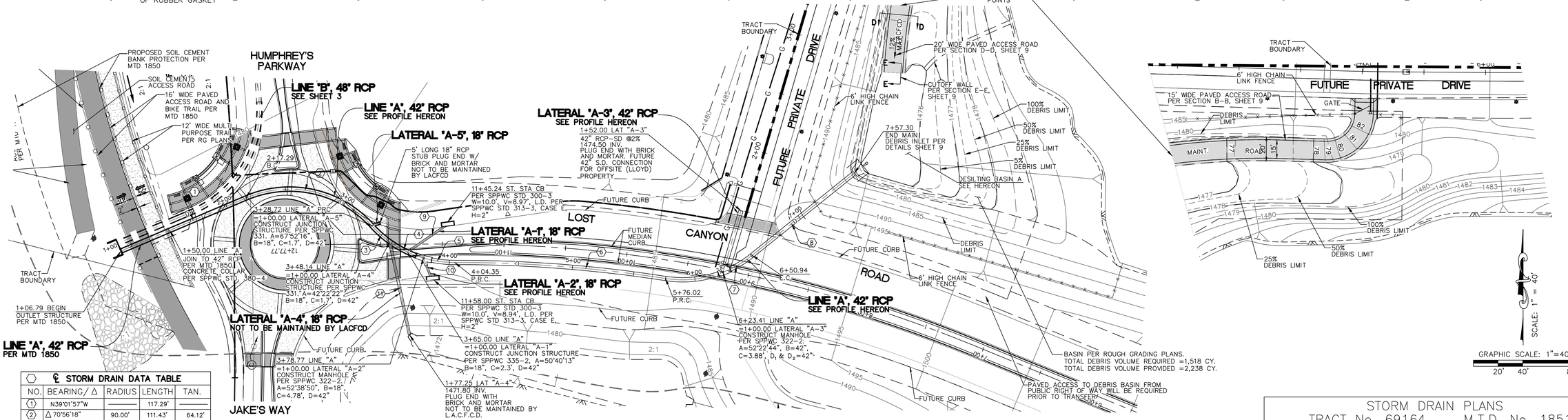
ALLIANCE LAND PLANNING & ENGINEERING INC.
2248 FARADAY AVE.
CARLSBAD, CA 92008
TEL: (760) 431-9896
FAX: (760) 431-8802
27433 TOURNEY ROAD
SUITE 250
VALENCIA, CA 91355
TEL: (661) 799-2760
FAX: (661) 254-1929
CIVIL ENGINEERING • LAND PLANNING • HILLSIDE DESIGN • SURVEYING

TRACT NO. 69164 SHEET 1 OF 10

I:\CAD\0560_ALT_C\STORM-DRAIN\0560-STORM-DRAIN-SHEET-01.dwg

SCALE: HOR. 1"=40'
VERT. 1"=4'





℄ STORM DRAIN DATA TABLE

NO.	BEARING/Δ	RADIUS	LENGTH	TAN.
①	N39°01'57"W	———	117.29'	———
②	Δ 70°56'18"	90.00'	111.43'	64.12'
③	Δ 12°21'37"	90.00'	19.42'	9.75'
④	Δ 19°30'05"	90.00'	30.63'	15.47'
⑤	Δ 16°17'00"	90.00'	25.58'	12.88'
⑥	Δ 9°03'55"	1085.00'	171.67'	86.01'
⑦	Δ 47°41'47"	90.00'	74.92'	39.79'
⑧	N54°52'13"W	———	106.36'	———
⑨	N50°40'13"W	———	36.50'	———
⑩	N52°41'29"E	———	16.09'	———
⑪	N61°55'06"E	———	77.25'	———

NOTE: PAVED ACCESS TO DEBRIS BASIN FROM PUBLIC RIGHT OF WAY WILL BE REQUIRED PRIOR TO TRANSFER

APPROVED

BY _____ CITY ENGINEER DATE

NO.	REVISION	REVISED BY	APPROVED BY	DATE
2	ADDED SHEET 2A TO REPLACE SHEET 2			03/06/17
1	REPLACED SHEET 2A WITH 2B, REVISED LATERAL A-1 PLAN AND PROFILE.			

REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTENBERG NO. 51929 EXP 6-30-18 CIVIL STATE OF CALIFORNIA

09/02/16
PROJECT ENGINEER DATE

STORM DRAIN PLANS
TRACT No. 69164 M.T.D. No. 1851
CITY OF SANTA CLARITA

ALLIANCE LAND PLANNING & ENGINEERING INC.
2248 FARADAY AVE. CARLSBAD, CA 92008 TEL: (760) 431-9896 FAX: (760) 431-8802
27433 TOURNEY ROAD SUITE 250 VALENCIA, CA 91355 TEL: (661) 799-2760 FAX: (661) 254-1929
CIVIL ENGINEERING • LAND PLANNING • HILLSIDE DESIGN • SURVEYING

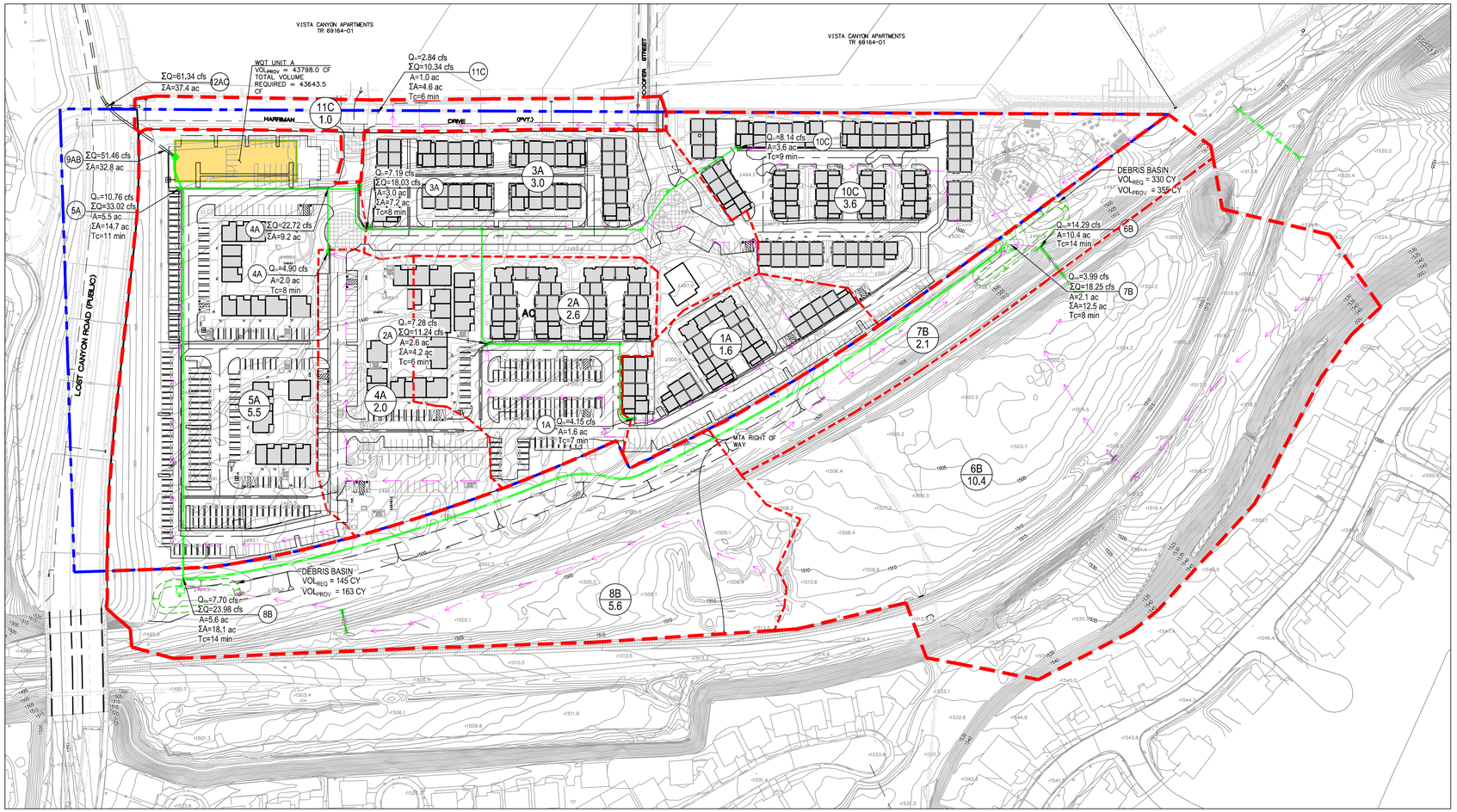
TRACT NO. 69164 SHEET 2B OF 10

I:\CAD\0560_ALT_C\STORM-DRAIN\0560-STORM-DRAIN-SHEET-02B.dwg

APPENDIX F

HYDROLOGY EXHIBIT

MetroWalk
HYDROLOGY EXHIBIT
7/24/20



SCALE: 1"=100'

GRAPHIC SCALE

100 50 0 100 200

(IN FEET)
1 inch = 100 ft.

LEGEND

- SURVEY BOUNDARY/PROPERTY LINE
- DRAINAGE BASIN
- DRAINAGE BASIN SUBAREA
- FLOW PATH
- PROPOSED STORM DRAIN
- WATER QUALITY TREATMENT (UNDERGROUND CHAMBERS)
- DEBRIS BASIN
- XX / XX.X — SUBAREA DESIGNATION / SUBAREA ACRES
- Q_{50} — 50YR CLEAR FLOWRATE
- Q_{50b} — 50YR BURNED FLOWRATE
- ΣQ — SUM OF THE CURRENT AND UPSTREAM FLOWRATES
- A — SUBAREA ACRES
- ΣA — SUM OF THE CURRENT AND UPSTREAM AREAS
- Tc — TIME OF CONCENTRATION
- VOL_{REQ} — DEBRIS VOLUME REQUIRED
- VOL_{PROV} — DEBRIS VOLUME PROVIDED

MTD 1851 FLOWRATES	
	FLOWRATES (Q)
	cfs
MAX ALLOWED	98.75
PROPOSED PROJECT	61.34

DEVELOPED CONDITION HYDROLOGIC PARAMETERS

SUBAREA	AREA	OVERLAND (Tc)				50-Yr RAIN	IMP	SOIL	DPA #	
		HI	LO	LENGTH	SLOPE					50-YR
	ac	ft	ft	ft	ft/ft	in/24 HR	%			min
1A	1.6	1501	1497	438	0.0091	6.10	86	20	9	7
2A	2.6	1498	1493	399	0.0125	6.10	86	20	9	6
3A	3.0	1497	1487	697	0.0144	6.10	82	20	9	8
4A	2.0	1495	1489	647	0.0093	6.10	88	20	9	8
5A	5.5	1493	1485	886	0.0090	6.10	68	20	9	11
6B	10.4	1515	1497	1096	0.0164	6.10	8	20	9	14
7B	2.1	1507	1497	533	0.0188	6.10	8	20	9	8
8B	5.6	1513	1494	1109	0.0171	6.10	8	20	9	14
10C	3.6	1510	1494	854	0.0187	6.10	80	20	9	9
11C	1.0	1490	1483	482	0.0145	6.10	91	20	9	6

ALLIANCE
LAND PLANNING & ENGINEERING INC.

2248 FARADAY AVE.
CARLSBAD, CA 92008
TEL: (760) 431-9896
FAX: (760) 431-8802

27451 TOURNEY RD.
SUITE 140
SANTA CLARITA, CA 91355
TEL: (661) 799-2760
FAX: (760) 431-8802

CIVIL ENGINEERING • LAND PLANNING • HILLSIDE DESIGN • SURVEYING

I: \CAD\1934\HYDROLOGY\1934-WQT-HYDRO.dwg

USMP/LID REPORT

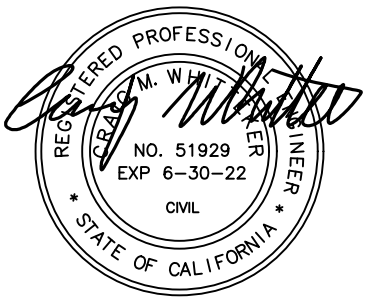
City of Santa Clarita

MetroWalk

TR 83087

Prepared For:
New Urban West, INC.
2001 Wilshire Blvd., Suite 401
Santa Monica, CCA 91405

Prepared By:
Alliance Land Planning & Engineering, Inc.
2248 Faraday Ave.
Carlsbad, CA 92008



OCTOBER 13, 2020
JN 1934

TABLE OF CONTENTS

APPENDICES

PROJECT DESCRIPTION

The proposed residential development project for the MetroWalk community is approximately 20.4 acres and includes senior apartments, townhomes, a private park, a recreation center, landscaping, and hardscape. The MetroWalk community is considered a Designated Project because it disturbs more than one acre of land and is adding more than 10,000 square feet of impervious surface area. The project site is currently undeveloped land. MetroWalk is bordered by Lost Canyon Road to the West, Harriman Drive/Vista Canyon Apartments to the North, and the MTA railroad on the South. The property is 20.4 acres in size, but 2.2 acres of the property is Lost Canyon Road and Harriman Drive which is already constructed and treated yielding 18.2 acres onsite development.

The projects private drainage system connects to the existing 42” storm drain MTD 1851 in the northwest corner of the site that ultimately outlets into the Santa Clara River. MTD 1851 is a City/County owned and maintained storm drain line.

METHODOLOGY

Storm Event	= 85th %
85th % rainfall depth	= 0.92"
Soil Classification Area	= 020

HydroCalc software approved by the City/County was used to calculate the required stormwater quality design volume (SWQDv) and stormwater quality design flowrate (SWQDf) as prescribed per the Low Impact Development (LID) Standards Manual of the County of Los Angeles, Department of Public Works (LACDPW). The 85th percentile design storm of 0.92 inches is determined from the LA County 85th Percentile Analysis Google Earth .KMZ file. The Soil Classification of 020 was acquired from the Mint Canyon 50-yr, 24-hr Isohyetal map. See appendix A for the full HydroCalc output.

EXISTING CONDITION

The project site currently drains in a northwest direction and into an existing 42” RCP storm drain (MTD 1851) which was constructed as part of the Vista Canyon development and will be owned/maintained by the County of Los Angeles once it is transferred by the City of Santa Clarita. The existing capacity of the 42” storm drain is 98.8 cfs. The MetroWalk project site was included in the original hydrology report for which MTD 1851 was designed.

A desilting basin exists at the inlet to the 42” storm drain to collect debris from the natural condition site and the undeveloped MTA property. Once the MetroWalk

project is constructed the desilting basin will be eliminated as debris will no longer be deposited to this location.

DEVELOPED CONDITION

In the developed condition, all runoff from the project will be captured in private storm drain lines and routed through an underground storm drain system. Before the system outlets into the existing 42" storm drain per MTD 1851, a diverter (splitter) box will route the required low flow volume to an underground water quality infiltration chamber while letting the high flow continue on to MTD 1851. The low flow pipe is sized to convey the water quality flow into the underground chamber.

UNDERGROUND INFILTRATION CHAMBERS

Infiltration will be the method for water quality treatment for this project. Per Infiltration report provided in appendix B, a raw percolation rate of 4 in/hr has been prescribed. The soils engineer has applied a safety factor to the infiltration rate of 4 in/hr for the natural soil at the project and reduced it to 0.6 in/hr for design purposes.

The design and performance data for the proposed infiltration basin are provided in the table below.

WQT Volume Required (SWQDv)	43,644	cf
Underground Chamber Volume Provided	43,798	cf
Required Low Flow (SWQDf)	2.29	cfs
10" Pipe @ 0.9%	2.30	cfs

DRAWDOWN

In the drawdown calculation below, to account for long-term performance, the factored infiltration rate of 0.6 in/hr has been used for this drawdown calculation.

DRAWDOWN TABLE - 96 HR DRAWDOWN CALCULATION

INFILTRATION BASIN	VOLUME REQUIRED (1)	SURFACE AREA AT BOTTOM (2)	MINIMUM FACTORED INFILTRATION RATE * (3)	FLOWRATE (4) = (2) x [(3) / 12"]	DRAWDOWN TIME (5) = (1) / (4)
	cf	sf	in/hr	cf/hr	hr
A	43,643.5	12,848	0.6	642.4	67.94

USMP SPECIFIC REQUIREMENTS

The following list discusses additional aspects of the project's SUSMP specific requirements:

HYDROMODIFICATION

This project discharges to MTD 1851 which is a County owned/maintained storm drain line and therefore per City/County stormwater policy the project is exempt from hydromodification.

NATURAL AREAS

The existing desilting basin was graded as part of the Vista Canyon Project and MTD 1851. The rest of the existing site consists of natural earth and vegetation (weeds).

STORMWATER POLLUTANTS OF CONCERN

The primary pollutants of concern anticipated for this project are associated with landscaped areas, private driveways, and residential buildings.

Pollutants of concern:

Pathogens; nutrients; pesticides; organic compounds; oxygen demanding substances; trash and debris; oils and grease; sediments; and metals. No legacy pollutants are present.

Pollutants shall be removed via the underground infiltration chamber described above.

POLLUTANT REMOVAL

The infiltration basin will remove pathogens, nutrients, pesticides, organic compounds, oxygen demanding substances, trash and debris, oils and grease, sediments, and metals by filtering the runoff though natural earth/soil prior to entering the underground aquifer.

SLOPES AND CHANNELS

There are no significant natural slopes or channels that exist on-site.

STORM DRAIN SYSTEM STENCILING

Multiple Catch Basins are proposed for this MetroWalk project. "NO DUMPING. DRAINS TO RIVER" stencils will be painted at the catch basin drain locations per the provided USMP Map.

OUTDOOR MATERIAL STORAGE AREAS

No outdoor material storage areas are proposed for this project.

PROPERLY DESIGN TRASH STORAGE AREAS

No outdoor trash storage areas are designed for this project.

LANDSCAPE IRRIGATION PRACTICES

Landscaped areas are designed to minimize/eliminate runoff and the need for fertilizer/pesticides. Landscaped areas are designed to include comprehensive irrigation systems that only water areas as needed to ensure healthy vegetation growth.

BMP MAINTENANCE (O&M)

An operation and maintenance manual for the proposed underground infiltration chamber is provided in Appendix C of this report.

CONCLUSION

This report concludes that the MetroWalk project is considered acceptable for development in terms of water quality design. All areas of development will be treated per methods outlined by the City of Santa Clarita and the County of LA. The proposed underground infiltration chamber will treat the project's required water quality runoff volume and hydromodification requirement are satisfied due to direct discharge into the existing storm drain system of MTD 1851.

APPENDIX A

HydroCalc & Low Flow Storm Drain (FlowMaster)

Peak Flow Hydrologic Analysis

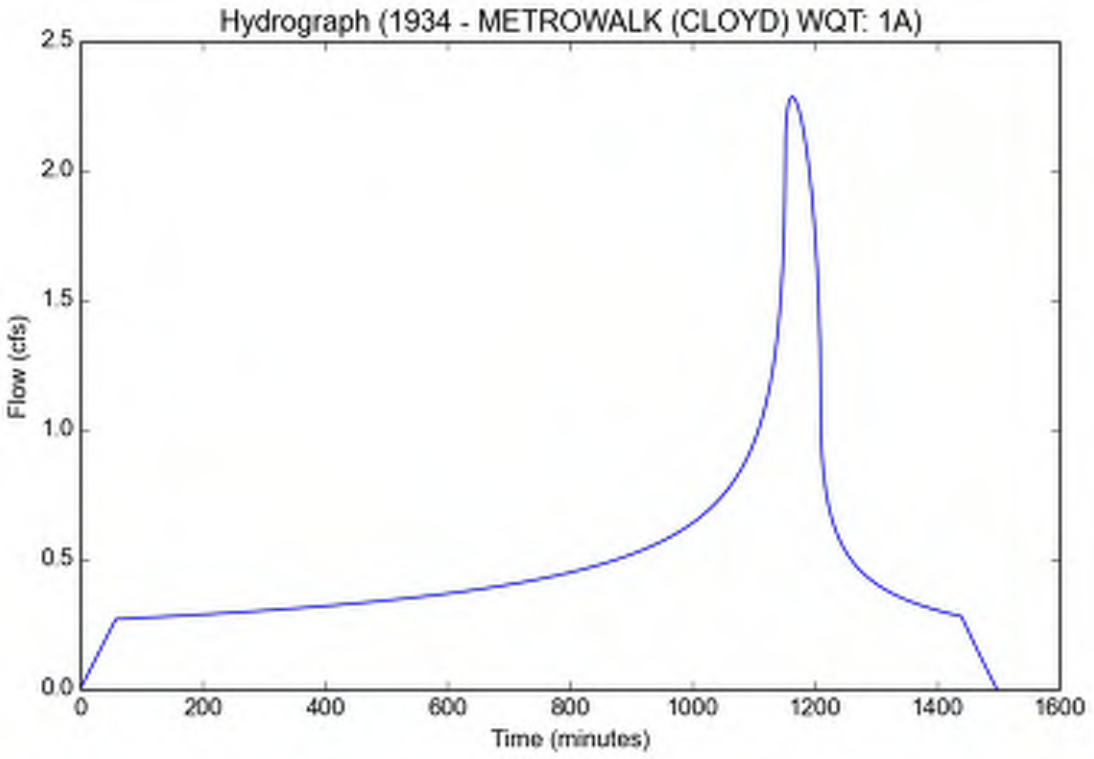
File location: I:/Project Files/1934 - METROWALK (CLOYD)/WQT/1934 - METROWALK (CLOYD) WQT - 1A.pdf
Version: HydroCalc 1.0.3

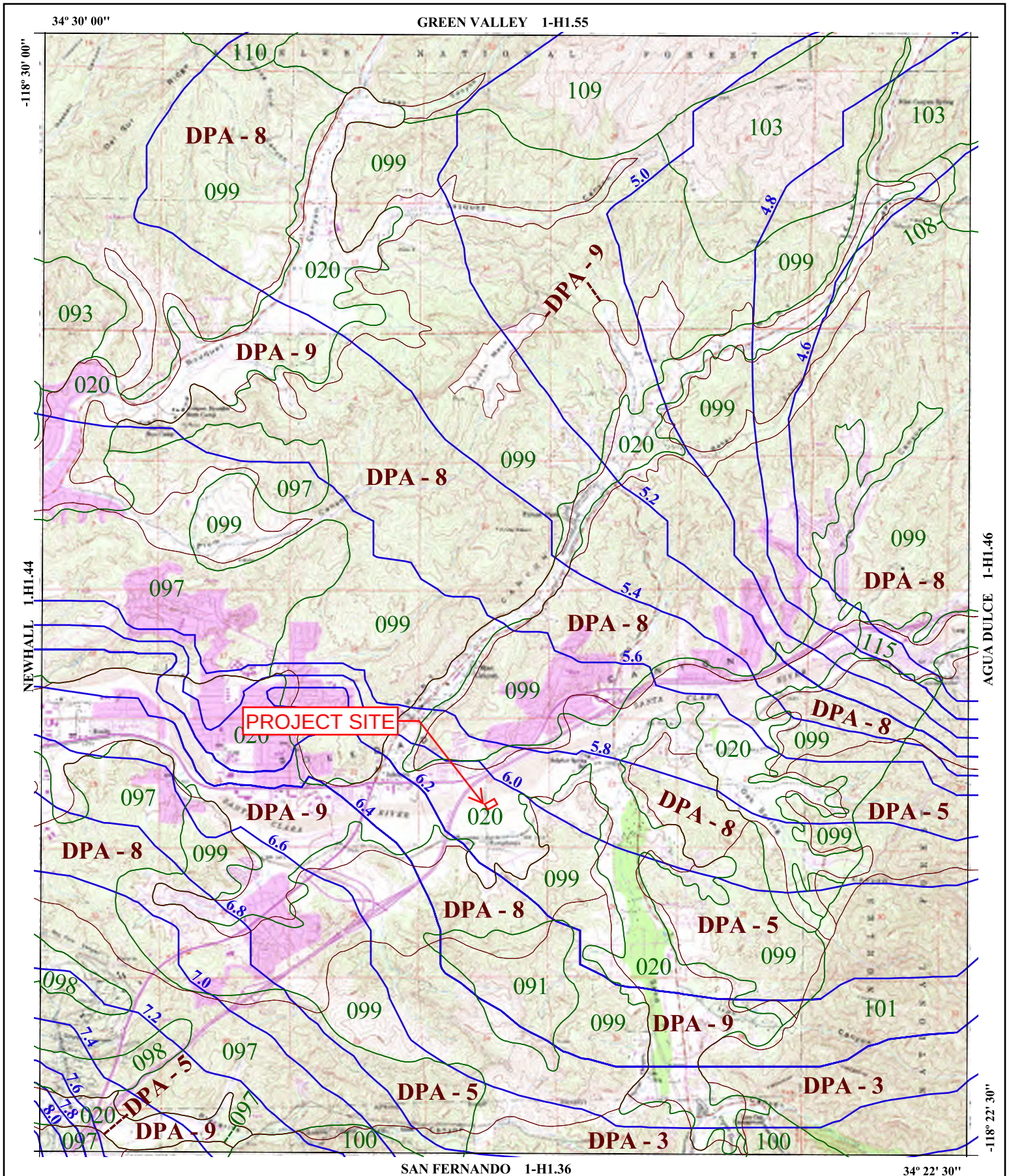
Input Parameters

Project Name	1934 - METROWALK (CLOYD) WQT
Subarea ID	1A
Area (ac)	18.2
Flow Path Length (ft)	1695.0
Flow Path Slope (vft/hft)	0.015
85th Percentile Rainfall Depth (in)	0.92
Percent Impervious	0.78
Soil Type	20
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.92
Peak Intensity (in/hr)	0.1735
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.724
Time of Concentration (min)	58.0
Clear Peak Flow Rate (cfs)	2.2856
Burned Peak Flow Rate (cfs)	2.2856
24-Hr Clear Runoff Volume (ac-ft)	1.0019
24-Hr Clear Runoff Volume (cu-ft)	43643.4693





N
W E
S

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

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

MINT CANYON
50-YEAR 24-HOUR ISOHYET

1-H1.45

LOS ANGELES COUNTY PUBLIC WORKS

METROWALK LOW FLOW SPLITTER

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.012	
Channel Slope	0.00900	ft/ft
Normal Depth	0.84	ft
Diameter	0.84	ft

Results

Discharge	2.30	ft³/s
Flow Area	0.55	ft²
Wetted Perimeter	2.64	ft
Hydraulic Radius	0.21	ft
Top Width	0.00	ft
Critical Depth	0.68	ft
Percent Full	100.0	%
Critical Slope	0.00930	ft/ft
Velocity	4.15	ft/s
Velocity Head	0.27	ft
Specific Energy	1.11	ft
Froude Number	0.00	
Maximum Discharge	2.47	ft³/s
Discharge Full	2.30	ft³/s
Slope Full	0.00900	ft/ft
Flow Type	SubCritical	

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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s

METROWALK LOW FLOW SPLITTER

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.84	ft
Critical Depth	0.68	ft
Channel Slope	0.00900	ft/ft
Critical Slope	0.00930	ft/ft

APPENDIX B

INFILTRATION REPORT

FEFFER
GEOLOGICAL CONSULTING

August 6, 2020 File No. 2445-04

Jonathan Frankel
New Urban West, Inc.
2001 Wilshire Blvd., Ste. 401
Santa Monica, CA 90403

Subject: **GEOTECHNICAL INVESTIGATION FOR SUSTAINABLE COMMUNITIES ENVIRONMENTAL ASSESSMENT ("SCEA")**
Proposed Multi Family Residential Development
Intersection Of Lost Canyon Road & Harriman Drive
Canyon Country - Santa Clarita, CA 91387
APN: 2840-004-009

Dear Mr. Frankel,

Feffer Geological Consulting is pleased to submit the following preliminary Geotechnical Investigation Report for the proposed development located in the City of Santa Clarita, California. This report is prepared to supplement the draft Sustainable Communities Environmental Assessment ("SCEA") for this project.

We appreciate the opportunity to be of service. Should you have any questions regarding the information contained in this report, please do not hesitate to contact us.

Sincerely,

FEFFER GEOLOGICAL CONSULTING, INC.

PROFESSIONAL GEOLOGIST JOSHUA FEFFER No. 2138 Certified Engineering Geologist STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER DAN DANESHFAR No. C 68377 Exp. 1-30-21 CIVIL STATE OF CALIFORNIA

Joshua R. Feffer
Principal Engineering Geologist
C.E.G. 2138

Dan Daneshfar
Principal Engineer
P.E. 68377

Distribution: Addressee– (1)

TABLE OF CONTENTS

Attached:

1.0 INTRODUCTION

1.1 PURPOSE

As requested, Feffer Geological Consulting has completed a preliminary Geotechnical Investigation for the proposed development. The purpose of this investigation is to evaluate the geotechnical conditions at the site in the areas of the proposed construction and provide geotechnical parameters and preliminary recommendations for future design and development. This report is prepared as a technical appendix for the project's draft SCEA.

Based on our investigation, it is our opinion that the proposed construction is feasible from a geotechnical standpoint. When final plans for the proposed construction become available, they should be reviewed by the project soils engineer and engineering geologist of record. A separate geotechnical report will be prepared to provide design level values for development once plans have been finalized.

1.2 SCOPE OF SERVICES

The scope of work performed during this investigation involved the following;

- Research and review of available pertinent geotechnical literature and previous reports for the project site;

- Field Exploration & Testing
  - Subsurface exploration consisting of the drilling of seven borings (B1, B2, B3, B4, B5, B6, B7) the advancement of six cone penetrometer test (CPT) soundings (CPT1, CPT2, CPT3, CPT4, CPT5, CPT6) and the excavation of four test pits (TP1, TP2, TP3, TP4);
  - Sampling and logging of the subsurface soils;
  - Laboratory testing of selected soil samples collected from the subsurface exploration to determine the engineering properties of the underlying earth materials;
  - Engineering and geologic analysis of the field and laboratory data;

- Compliance with *CEQA Appendix G* and an assessment of:
  - Rupture of a known earthquake
  - Strong seismic ground shaking
  - Seismic-related ground failure
  - Landslides
  - Soil erosion or loss of topsoil
  - Unstable geologic unit or soils
  - Expansive soils
  - Support of septic tanks or alternative waste systems

- Preparation of this report presenting our findings, conclusions, and preliminary recommendations for the proposed construction.

1.3 SITE DESCRIPTION

The subject site is located on the east side of Lost Canyon Road at its intersection with Harriman Drive in the Canyon Country area of the City of Santa Clarita, CA. The subject consists of an undeveloped approximately 20 acre irregularly shaped parcel of land. The site is bounded by Lost Canyon Road to the west, Harriman Drive to the north, and Metro Railway lines to the south and east.

The site has approximately twenty feet of overall elevation change and gently descends to the south and southeast with an approximate gradient of 12:1 (horizontal to vertical) or gentler. A graded 2:1 (horizontal to vertical) slope is present along the western portion of the site associated with the extension and construction of Lost Canyon Road and ranges in height from twenty to thirty feet. Figure 1 is a map illustrating the site location. Figure 2 is an aerial photograph with a topographic overlay of the site and vicinity.

1.4 PROPOSED CONSTRUCTION

It is our understanding that the proposed project will consist of the construction of 150 non-age restricted three-story townhomes, 179 non-age restricted apartments, 119 age-qualified apartments, and 50 deed restricted affordable senior apartments. The extent of development is illustrated on conceptual development plans included in Appendix C.

Final plans including structure heights, specific building footprints, and subterranean depths are still within the development phase and will be updated upon final project design. However, preliminary recommendations are based on the proposed maximum tower heights, subterranean depths, and loading factors. The findings and recommendations within this report are adequate to support the analysis of the project's potential geotechnical impacts.

1.5 DOCUMENT REVIEW

City files were researched and previous work on the project site and surrounding area was evaluated for use by this firm. Several reports are referenced but were not located within the city files. The following reports were used to supplement the findings of this investigation:

Reports for the Subject Site and Site to the North:

Assessor's Parcel Nos. 2840-004-009 and 2840-004-010
Geotechnical Constraints Investigation Cloyd Property Assessor's Parcel Nos. 2840-004-009 and 2840-004-010 Santa Clarita, California by RTF & A Geotechnical Engineering & Engineering Geology, dated June 29, 2007

Reports for the Property to the North:

Tentative Tract Map No. 69164 & 69164-01 Assessor's Parcel No. 2840-004-010

Geotechnical Report VOLUME I OF II For Tentative Tract Map No. 69164 Canyon Country, California Volume I Of II For Vista Canyon Ranch, Llc by RTF & A Geotechnical Engineering & Engineering Geology, dated November 14, 2008

Geotechnical Report VOLUME I OF II For Tentative Tract Map No. 69164 Canyon Country, California Volume II Of II For Vista Canyon Ranch, Llc by RTF & A Geotechnical Engineering & Engineering Geology, dated November 14, 2008 (referenced but not found in files)

Report of Rough Grading Plan Review Volume 1 Of 2 Vista Canyon Tract No. 69164 Santa Clarita, California by RTF & A Geotechnical Engineering & Engineering Geology, dated January 6, 2015

Report of Rough Grading Plan Review Volume 2 Of 2 Vista Canyon Tract No. 69164 Santa Clarita, California by RTF & A Geotechnical Engineering & Engineering Geology, dated January 6, 2015

Response to City of Santa Clarita Review Comments City Case # SOL12-00025 Vista Canyon, Tract No. 69164 Santa Clarita, California by RTF & A Geotechnical Engineering & Engineering Geology, dated March 30, 2015

Bulk Grading Plan Review Vista Canyon Phase 2 Santa Clarita, California For Vista Canyon Ranch, Llc by RTF & A Geotechnical Engineering & Engineering Geology, dated NOVEMBER 9, 2015

Geotechnical Report of Observation and Testing and As-Built Geologic Report Phase I Bulk Grading Proposed Vista Canyon Ranch Development Southwestern Portion of Tract Map No. 69164 Santa Clarita, California by RTF & A Geotechnical Engineering & Engineering Geology, dated April 28, 2016

Engineered Grading Consultant Certification Phase I Bulk Grading Proposed Vista Canyon Ranch Development Southwestern Portion of Tract Map No. 69164 Santa Clarita, California by RTF & A Geotechnical Engineering & Engineering Geology, dated July 11, 2016

Geotechnical Grading Plan Review SCRRA Right-of-Way Grading and Drainage Exhibit Vista Canyon Phase 2, Tract No. 69164-01 Santa Clarita, California by RTF & A Geotechnical Engineering & Engineering Geology, dated December 8, 2016

Geotechnical Report of Observation and Testing and As-Built Geologic Report Phase 2 I PA-3 Portion of Bulk Grading Lots 6, 8-14, 16, and 17 Proposed Vista Canyon Ranch Development Northeastern Portion of Tract Map No. 69164 Santa Clarita. California by RTF & A Geotechnical Engineering & Engineering Geology, dated March 18, 2019

Report Of Observation And Testing Services During Grading Of Building Pads 1 & 2 Vista Canyon Apartments 17270 Mitchel Drive, Santa Clarita, California Tract: 69164-01, Lot: 3-5 Rough Grading Permit No. Gra17-00056 Precise Grading Permit No. Gra17-00057 by Geocon West Inc. dated May 7, 2019

Report Of Observation And Testing Services During Grading Of Building Pads 2 Through 11 Vista Canyon Apartments 17350 Humphreys Parkway And 17270 Mitchel Drive Santa Clarita, California Tract: 69164-01, Lot: 3-5 Rough Grading Permit No. Gral 7-00056 Precise Grading Permit No. Gral 7-00057 by Geocon West Inc. dated April 18, 2019

Tract 45023 To West of the Subject Site:
Reports by Allan E. Seward Engineering Geology, Inc.: Geologic/Geotechnical Investigation Report, Proposed Lost Canyon Road Overpass Tr. 45023, dated December 10, 1998

Geologic/Geotechnical Report, Grading Plan for Tract 45023, Phases I and II, The Colony, dated September 21, 1999

Geotechnical Engineering Investigation, Proposed Residential Development, File No. 17520-S, dated January 7, 2000.

Geotechnical Engineering Investigation, Proposed Offsite Grading, File No. 17468-S, dated January 24, 2000.

County of Los Angeles Department of Public Works Correspondence:
Geologic Review Sheet dated February 17, 2000.

Soils Engineering Review Sheet dated February 25, 2000.

Response to County of Los Angeles Review Canyon Park Boulevard, Lost Canyon Road, Jakes Way, and Phase III Grading, Santa Clarita, California by Jerry Kovacs and Associates, Inc. dated April 21, 2000

Response to County of Los Angeles Review, Private Drain 2496, Tract 45023 Santa Clarita, California by Jerry Kovacs and Associates, Inc. dated May 1, 2000

Second Response to County of Los Angeles Review Canyon Park Boulevard, Lost Canyon Road, Jakes Way, and Phase III Grading, Santa Clarita, California, by Jerry Kovacs and Associates, Inc. dated June 6, 2000

Addendum to June 28, 2000, Response to County of Los Angeles Review Private Drain 2496, Tract 45023, MTA Railroad Right-of-Way Santa Clarita, California by Jerry Kovacs and Associates, Inc. dated July 20, 2000

**Our company name has been changed to Geotechnologies, Inc. We have been operating as Jerry Kovacs and Associates, Inc. since 1992 and Kovacs-Byer and Associates since 1971. Extension of Jakes Way and Lost Canyon Road Tract: 45023, Santa Clarita, California by Geotechnologies, Inc. Consulting Geotechnical Engineers dated April 16, 2001*

Revised Foundation Recommendations Proposed Residential Development Tract: 45023, Phase II, Lots: 1 - 9, Santa Clarita, California by Geotechnologies, Inc. Consulting Geotechnical Engineers dated January 14, 2002

2nd Response to County of Los Angeles Review Offsite Grading Plan for Tract No. 45023, Grading Permit No. 99-0811-0001 Area of Proposed Lost Canyon Road and Bridge Over Southern Pacific Railroad Tracks, Santa Clarita, California by Geotechnologies, Inc. Consulting Geotechnical Engineers dated March 14, 2002, Revised March 15, 2002

Updated Retaining Wall Recommendations Offsite Grading Plan for Tract No. 45023, Grading Permit No. 99-0811-0001 Area of Proposed Lost Canyon Road and Bridge Over Southern Pacific Railroad Tracks, Santa Clarita, California by Geotechnologies, Inc. Consulting Geotechnical Engineers dated March 22, 2002

3rd Response to County of Los Angeles Review Offsite Grading Plan for Tract No. 45023, Grading Permit No.99-0811-0001 Area of Proposed Lost Canyon Road and Bridge Over Southern Pacific Railroad Tracks, Santa Clarita, California by Geotechnologies, Inc. Consulting Geotechnical Engineers dated June 10, 2002

Update of Geotechnical Engineering Investigation Proposed Residential Development, Tract 45023, Phase III Santa Clarita, California by Geotechnologies, Inc. Consulting Geotechnical Engineers dated July 29, 2003

Statement Regarding Restricted Use Areas Proposed Residential Development, Tract 45023, Phase III Santa Clarita, California by Geotechnologies, Inc. Consulting Geotechnical Engineers dated April 23, 2004

Compaction Report Proposed Residential Development 27404 Lost Canyon Road, Santa Clarita, California, (Tract 45023, Phase III) by Geotechnologies, Inc. Consulting Geotechnical Engineers dated June 16, 2004

Final Compaction Report 27404 Lost Canyon Road, Santa Clarita, California, (Tract 45023, Phase III) by Geotechnologies, Inc. Consulting Geotechnical Engineers dated August 30, 2005

Final Compaction Report Proposed Fire Lane 27404 Lost Canyon Boulevard, Canyon Country, California (Tract: 45023, Phase I and II) by Geotechnologies, Inc. Consulting Geotechnical Engineers dated March 3, 2009

Jerry Kovacs and Associates, Inc.-Geotechnologies, Inc. produced several reports for the proposed tract development (Phase I-III), a bridge over the Southern Pacific Railroad Tracks and subsequent grading of the site. The collective subsurface investigations consisted of drilling fifty borings and excavating six test pits to depths of ten and fifteen feet below the existing ground surface. The subsurface exploration encountered up to five feet of fill overlying alluvium. Ground water was not encountered. The reports stated that the alluvium was dense and stable and that new foundations should be placed on a new compacted fill cap. The reports were approved by the governing municipality. The tract has been constructed.

2.0 INVESTIGATION

2.1 GENERAL

Our field investigation was performed from April 15, 16, and July 6 and 7, 2020 and consisted of a review of site conditions and subsurface exploration involving the drilling of seven geotechnical borings, advancing six cone penetrometer tests (CPT's), excavating four test pits and soil sampling. The investigation also includes laboratory testing of selected soil samples. A brief summary of these various tasks is provided below.

2.2 FIELD EXPLORATION

The subsurface investigation performed at the site consisted of drilling seven borings by use of a truck-mounted hollow-stem auger drill rig to a maximum depth of 51.5 feet below the existing ground surface, advancing six cone penetrometer tests to a maximum depth of 50 feet below the existing ground surface and excavating four test pits by hand labor to a maximum depth of 17 feet below the existing ground surface.

The purpose of the exploratory borings, cone penetrometer tests, and test pits was to determine the existing subsurface conditions and to collect subsurface samples in the areas of the proposed construction and throughout the site. Earth materials encountered in the borings, CPT and test pits consisted of artificial fill and alluvium.

The earth materials encountered in the borings and test pits consisted of up to four feet of fill over alluvium. Areas of deeper fill may be present at the site but were not encountered in the recent exploration.

A review of geological maps indicates that the material underlying the subject site is comprised of Alluvium-Flood Plain Deposits (Qa-Qfp) (Figure 3 and 4).

The borings were logged by our field geologist using both visual and tactile means. Both bulk and relatively undisturbed soil samples were obtained for testing. The approximate locations of the borings are shown on the attached site map. Detailed boring and test pit logs are presented in Appendix A.

2.3 LABORATORY TESTING

Laboratory testing was performed on representative samples obtained during our field exploration. Samples were tested for the purpose of estimating material properties for use in subsequent engineering evaluations. Testing included in-place moisture and density, hydro-response-swell/collapse, maximum density, and shear strength testing.

A summary of the laboratory test results is included in Appendix B. The physical properties of the soils were tested at Soil Labworks, LLC and Smith-Emery Laboratories. Chemical testing was performed at HDR Schiff. The undersigned geologist and engineer have reviewed the data, concur, and accept responsibility for utilizing the data therein.

3.0 SITE GEOLOGY, SEISMICITY, POTENTIAL HAZARDS

3.1 SITE GEOLOGY

The site is located at the western end of the Soledad basin, within the Transverse Ranges geomorphic province of California. The Soledad basin consists of an elongate, northeast trending basin, measuring approximately 30 miles long and 8 to 12 miles wide. The floor of the basin is irregular, with elevations ranging from 400 feet mean sea level (msl) at its western end to as much as 2,500 feet near the eastern end.

The basin is bounded on the north, east, and south by ridges and mountain masses of relatively old crystalline rocks that, along with ancestral highland masses, have contributed large quantities of Cenozoic age sediments to the basin (Jahns and Muehlberger, 1954). More than 20,000 feet of stratified rocks were deposited into the elongate lowland area of the basin, with an additional 4,500± feet of volcanic rocks accumulated locally (Jahns and Muehlberger, 1954).

Structurally, the Soledad basin is a westerly plunging open syncline with locally wrinkled flanks (Bailey and Jahns, 1954). The basin appears to have been defined as a trough of deposition mainly by faults, receiving its sedimentary fill in a manner that was very irregular in detail.

Repeated episodes of primarily early Tertiary deformation, both within and along the margins of the basin are indicated by numerous faults, folds, and unconformities, as well as by the distribution and lithology of the sedimentary rocks (Jahns and Muehlberger, 1954). The early Miocene and younger strata of the basin, although maintaining the broadly synclinal structure, have been considerably less deformed (Bailey and Jahns, 1954). These deposits blanket many of the older faults of the basin, but are themselves offset by other faults, such as the nearby San Gabriel fault zone.

Regional Geologic Maps (Figure 3) and the subsurface exploration indicated that the subject site is underlain by Alluvium-Flood Plain Deposits (Qa-Qfp) overlain by a veneer fill (Dibblee and Ehrenspeck, 1996). Descriptions of the materials encountered in the exploratory borings are summarized below.

3.1.1 Artificial Fill (Af)

Fill is material that has been placed or disturbed by construction activity. The fill consists of fine to medium grained silty sand and sandy silt with gravel. The color varies from brown, to gray brown and is moist and firm to medium dense. The fill encountered varies in thickness between three to four feet below the ground surface but may locally be deeper.

3.1.2 Alluvium-Flood Plain Deposits (Qa-Qfp)

The alluvium is a Holocene to youngest Pleistocene alluvial unit which consists of fine to coarse grained silty sand and sandy silt with fine to coarse gravels, and varies in color from brown to yellow brown, olive brown, and dark brown. The alluvium is typically moist and moderately dense to dense. The alluvium is generally weakly stratified, moderately-well to poorly sorted and

oxidized with no significant structural planes. The alluvium is typically found to contain multiple fining upward sequences from coarse grained basal deposits.

3.1.3 Groundwater

Groundwater was not observed to a depth of 51.5 feet in the recent exploration at the subject site. Historically, highest groundwater in this area is shown as being between 5 and 10 feet below the ground surface (Figure 5) (Department of Conservation, 1998).

It should be noted that groundwater was encountered north of the project site in a previous exploration conducted by RTF&A (2008) at depths of twelve to fifty-two feet below the ground surface. This data is summarized in Table 1 in section 5.3.4.

3.2 SEISMICITY

A risk common to all areas of Southern California that should not be overlooked is the potential for damage resulting from seismic events (earthquakes). The project site is located within a seismically active area, as is all of Southern California.

As required by the City of Santa Clarita a site-specific seismic design for the proposed construction will be performed and reviewed by the City of Santa Clarita Community Development Planning Division for the project site.

3.2.1 Seismic Hazards

The State of California enacted the Alquist-Priolo Special Studies Act of 1972 immediately following the destructive 1971 San Fernando earthquake (Department of Conservation, 2020a). The Alquist-Priolo Act is intended to prohibit the location of most structures for human occupancy across a known active fault that intersects the ground surface, thereby mitigating fault-rupture hazard. The Alquist-Priolo Act requires that the State Geologist delineate "Earthquake Fault Zones" along active surficial faults. Development within these Earthquake Fault Zones must include geologic investigation demonstrating the absence of Holocene-active faults.

The California State Legislature passed the Seismic Hazards Mapping Act of 1990 and was signed into law and became effective in 1991 (Department of Conservation, 2020b). The Seismic Hazards Mapping Act was prompted following the 1989 Loma Prieta earthquake, and is intended to reduce the threat to protect public safety and minimize the loss of life and property from the effects of strong ground shaking, liquefaction, landslides, and other earthquake-related hazards (Department of Conservation, 2020b).

The Seismic Hazards Mapping Act and Alquist Priolo Act require the State Geologist to delineate "Earthquake Zones of Required Investigation (EZRI)." The EZRI maps are released by the California Geological Survey (CGS). Zone delineations are based on a combination of factors, including but not limited to: surface distribution of soil deposits and bedrock, slope steepness, depth to groundwater, bedding orientation with respect to slopes, and distance to local earthquake faults (seismic source). Following a rigorous review process the EZRI Map delineates areas that

have been subject to or are potentially subject to earthquake induced fault surface rupture, liquefaction, and landsliding. A discussion of the potential for these earthquake hazards is presented below.

3.2.2 Earthquake Faults

The site is located within a tectonically active area, as is all Southern California. The closest known fault capable of producing strong earthquakes and ground shaking is the San Gabriel Fault located approximately 1 mile southeast of the site. The site is not mapped within an Alquist Priolo Fault Zone and no known Holocene-active faults cross the project site (Figure 6). While the potential for surface rupture is low to non-existent, the site could be impacted by strong ground shaking should an earthquake occur along a nearby fault. A discussion of each fault is provided below.

San Gabriel Fault Zone:

The active San Gabriel fault zone, located approximately 1.5 miles southwest of the site, consists of a northwest-trending zone of imbricate steeply north-dipping faults. The fault has strong geomorphic expression characterized by displaced geologic units, deflected drainages, strike valleys, notched ridges, subparallel faulting, fracturing, and folding (Oakeshott, 1958; Wentworth and Yerkes, 1971). According to Oakeshott (1958), the zone of faulting ranges in width from a single plane with no more than a few inches of gouge, to a half-mile wide area of several fault planes, zones of brecciation, and complex steep-limbed folds. No known active faults project into or cross the site. The site is not located in a State of California Alquist-Priolo Earthquake Fault Zone. Faults confined to the Mint Canyon formation are mapped adjacent to the site on the east and southeast. These faults are part of the informally named Sulphur Springs fault. The Sulphur Springs fault is not considered active.

3.2.3 Secondary Ground Effects

The site is located within an area mapped by the CGS (1999) as being potentially affected by seismic-induced liquefaction but not landsliding (Figure 6). A discussion of secondary ground effects is included below.

Liquefaction

Liquefaction is a process which occurs when saturated sediments are subjected to repeated strain reversals during a seismic event. The strain reversals cause an increase in pore water pressure such that the internal pore pressure approaches the overburden pressure and the shear strength approaches a low residual value. Liquefied soils are subject to flow, consolidation, or excessive strain. Liquefaction typically occurs in loose to medium dense sand and silty sandy soils below the groundwater table. Predominately fine-grained soils, such as silts, and clay, are less susceptible to liquefaction. The site is included within a zone of potentially liquefiable soil (Department of Conservation, 1998). Liquefaction is considered a potentially significant hazard at the site and liquefaction induced settlement may affect the subject site. A site-specific liquefaction analysis will be performed per Recommended Procedures of Implementation of CGS Special Publication

117A, Guidelines for Analyzing and Mitigating Liquefaction in California (Parrish, 2008). To reduce the risk of liquefaction induced settlement to a less than significant level the Guidelines for Mitigating Seismic Hazards (Chapter 7; Parrish, 2008) will be followed. As discussed in the guidelines, ground improvement (i.e., removal and recompaction of soil, vibrocompaction) and structural solutions (i.e., mat foundations, pile and grade beams) are acceptable methods of mitigation.

Prior to building permit issuance, the Project applicant shall prepare a project specific liquefaction settlement analysis that shall include design features to achieve performance standard pursuant to Recommended Procedures of Implementation of CGS Special Publication 117A, Guidelines for Analyzing and Mitigating Liquefaction in California (Parrish, 2008) and to the satisfaction of the City of Santa Clarita's Department of Building and Safety. These binding measures will reduce liquefaction induced settlement to a less than significant level.

Lateral Spreading Hazard

Saturated soils that have experienced liquefaction may be subject to lateral spreading where located adjacent to free faces, such as slopes, channels, and rivers. The site is remote to free-faces and the lateral spreading hazard at the site is insignificant.

Subsidence

According to the City of Santa Clarita Safety Element (2011), land subsidence is recognized as the gradual settling or sinking of the ground surface over a long period of time with little to no horizontal motion. Typically, subsidence is the result of excessive extraction of groundwater, oil, or gas but may occur due to strong ground shaking from earthquakes. Long term affects of subsidence can include structural impacts such as cracked pavement/landscaping, fractured building foundations, and dislocated pipe joints.

In order to mitigate potential localized land subsidence to an acceptable level, specific ground improvement systems should be implemented (i.e., removal and recompaction of soil, vibrocompaction) in combination with structural solutions (i.e., mat foundations, pile and grade beams).

Landsliding

According to mapping by the CGS (1999), the project site is not located within an area subject to potential seismic-induced slope instability (Figure 6). Since the site is not located within a mapped landslide zone, and no slopes exist on or within the immediate site vicinity, seismic induced lansliding is not a significant hazard to the future development.

Tsunamis/Seiches

The project site is located approximately twenty-five miles northeast of the Pacific Ocean and one-half mile south of the Santa Clarita river. Due to the sites distance from the coastline and other large bodies of water, the potential for tsunamis/seiches is considered low. Additionally, the

subject site is not downstream of any dams.

3.3 2019 CALIFORNIA BUILDING CODE CONSIDERATIONS

The proposed development may be designed in accordance with seismic considerations contained in the 2019 California Building Code, Section 1613. The following parameters may be considered for design of foundations within the alluvium or future compacted fill (ATC, 2020):

A ground motion hazard analysis is required (see Section 11.4.8 of ASCE /SEI 7-16) to be performed in accordance with Section 21.2 for structures on Site Class D with S1 greater than or equal to 0.2. However, as an alternative of performing the ground motion hazard analysis, a long period coefficient (Fv) of 1.7 may be utilized for calculation of Ts, provided that the value of the Seismic Response Coefficient (Cs) is determined by Equation 12.8-2 for values of the fundamental period of the building (T) less than or equal to 1.5 Ts, and taken as 1.5 times the value computed in accordance with either Equation 12.8-3 for T greater than 1.5 Ts and less than or equal to TL or Equation 12.8-4 for T greater than TL.

Mapped Spectral Response Acceleration Parameters:

	S_S	:	2.226g
	S_1	:	0.807g
Site Class:	D	:	Stiff Soil
Site Coefficients:	F_a	:	1.0
	F_v	:	1.7

Maximum Considered Earthquake Spectral Response Acceleration Parameters:

S_{MS}	:	2.226g
S_{M1}	:	1.372g

Design Spectral Response Acceleration Parameters:

S_{DS}	:	1.484g
S_{D1}	:	0.915g
PGA	:	0.941
PGA_M	:	1.035

4.0 GEOTECHNICAL CONSIDERATIONS

4.1 SUBSURFACE SOIL CONDITIONS

Subsurface materials at the project site consist of a layer of fill over alluvium. Based on laboratory testing the alluvium at the project site is competent and capable of supporting engineered structures and appurtenances. The following sections provide a general discussion about settlement and expansive soil activity.

4.2 SETTLEMENT

Settlement, or consolidation, occurs over time as a response to changes in pressure and soils stress. Our investigation indicates that the consolidation and hydrocollapse potential of the alluvium is low. The in-situ dry densities are high for the samples taken at the foundation level and it is our experience that these soils have a very low potential for consolidation.

4.3 EXPANSIVE SOIL

Typically, soils that contain a high clay content are susceptible to expansion/contraction. Clay minerals are capable of absorbing water, which causes an increase in volume and leads to expansion. The opposite effect occurs when clay rich soils dry out, thus decreasing in volume and contracting. The on-site soil was found to possess low to medium expansive characteristics based upon field soil classifications. Based on the recommended foundation systems and the underlying soil properties, expansion/contraction is unlikely to affect the proposed development.

4.4 SOIL EROSION & LOSS OF TOPSOIL

Only trace naturally occurring developed topsoil is exposed, and therefore is not at risk of substantially eroding due to proposed future development. During excavation soil will be exposed, however, engineered best management practices will be in place to mitigate and the potential hazard is considered low.

4.5 SLOPE STABILITY

The project site is not located within an area subject to potential seismic-induced slope instability. The site has approximately twenty feet of overall elevation change and gently descends to the south and southeast with an approximate gradient of 12:1 (horizontal to vertical) or gentler. A graded 2:1 (horizontal to vertical) slope is present along the western portion of the site associated with the extension and construction of Lost Canyon Road and ranges in height from twenty to thirty feet high. The 2:1 slope was graded as part of roadway construction and was compacted and inspected during development and approved. There are no significant slopes on the subject site and no potential for slope instability.

5.0 CONCLUSIONS AND PRELIMINARY DESIGN RECOMMENDATIONS

Conclusions and preliminary recommendations contained herein are based upon information provided, information gathered, laboratory testing, engineering, geologic evaluations, experience, and judgment.

Preliminary design values are provided within to meet requirements for the associated Environmental Impact Report and to assess the feasibility of development using conventional construction methods and best practices. The following preliminary values are for the assessment of construction feasibility and should not be used for final design. A separate geotechnical report will be prepared to provide design level values for development once plans have been finalized.

5.1 SITE SUITABILITY

The Geotechnical exploration, analyses, experience, and judgment result in the conclusion that the proposed development is suitable from a geotechnical standpoint.

It is our opinion that the project site can be developed as proposed without adverse geologic impact on adjoining properties. Safe project development will require strict adherence to good construction practices, agency and code requirements, and the recommendations in this report.

It should be realized that the purpose of the seismic design utilizing the above parameters is to safeguard against major structural failures and loss of life, but not to prevent damage altogether. Even if the structural engineer provides designs in accordance with the applicable codes for seismic design, the possibility of damage cannot be ruled out if moderate to strong shaking occurs as a result of a large earthquake. This is the case for essentially all structures in Southern California.

5.2 EARTHWORK

5.2.1 General

Grading should be done in accordance with good construction practice, minimum code requirements, and recommendations to follow. Grading criteria are included within Appendix D.

5.2.2 Site Preparation and Grading

Based on our understanding of the proposed development, laboratory testing, and experience, we recommend that foundations for the proposed development be founded in a future compacted fill cap.

Prior to the start of grading operations, utility lines within the project area, if any, should be located and marked in the field so they can be rerouted or protected during site development. All debris and perishable material should be removed from the project site. Although currently not anticipated, all permanent cut and fill slopes should not be constructed steeper than 2:1.

If fill is to be placed, the upper six to eight inches of surface exposed by the excavation should be scarified; moisture conditioned to two to four percent over optimum moisture content and compacted to 90 percent relative compaction[1]. If localized areas of relatively loose soils prevent proper compaction, over-excavation and re-compaction will be necessary.

5.2.3 Excavation Characteristics

The borings encountered competent earth material at the depth of the proposed construction and below. However, the soil at the site has considerable amounts of sand and gravel and caving may occur in some excavations. Based on the underlying geology, excavation can be completed using standard methods and best practices.

5.2.4 Use of Existing Soil

The existing soil can be used for the future compacted fill.

5.3 FOUNDATION SUPPORT

5.3.1 Foundation

A site-specific geotechnical investigation should be conducted to determine the appropriate type, or types, of foundation systems to use for the proposed development. Such systems may include the removal and recompaction of soil, mat foundations, pile foundations, grade beams or any combination thereof as determined by the appropriate geotechnical engineer.

The design level investigation should consider all relative potential geologic hazards to develop specific foundation recommendations. Based on a preliminary analysis, it is our opinion that site development can move forward if appropriate foundation recommendations and structural designs are implemented to mitigate all potential geologic hazards

5.3.2 Infiltration/SUSMP/LID

Percolation testing consisted of performing multiple in-situ falling head tests in the field, which is consistent with industry standard of practice for similar projects in the Southern California area (LADPW, 2014). The test pits were excavated on July 6, 2020 and infiltration testing was performed July 7, 2020.

All test pits were excavated by hand labor. Test pit one (TP-1) was excavated to a total depth of five feet. The bottom foot of the test pit consisted of a one-foot cube. Test pit two (TP-2) was excavated to a total depth of ten feet. Test pit three (TP-3) and four (TP-4) were excavated to a total depth of seventeen feet. Each test pit was filled with water to pre-soak on July 6, 2020. No

[1] Relative compaction refers to the ratio of the in-place dry density of soil to the maximum dry density of the same material as obtained by the "modified proctor" (ASTM D1557-14) test procedure.

water remained on the testing date of July 7, 2020. Multiple tests occurred until the measured rate stabilized within 10% of 3 successive tests.

The following table is a summary of the preliminary infiltration results. Allowable infiltration rates should be 15% of the values shown on the table below for each area tested. Additional testing may be required depending on the final proposed design.

Test Excavation	Total Depth (ft.)	Rate (in./hr)
TP-1	5'	4"
TP-2	10'	24"
TP-3	17'	22.5"
TP-4	17'	24"

5.3.3 Wastewater Disposal

The proposed development will not require the use of septic tanks or alternative wastewater disposal systems. Since sewers will be used for the disposal of wastewater, there will be no impact to the underlying supporting materials from the disposal of wastewater.

5.3.4 Groundwater and Associated Design

According to records, the highest historic groundwater level is located below the proposed foundations (Department of Conservation, 1998). Wet conditions and actual groundwater may be encountered due to seasonal fluctuations.

Groundwater was encountered in six borings north of the subject site in an earlier exploration conducted by RTF&A (2008). This data is summarized in Table 1. No surface water or seeps were observed.

Table 1.

Consultant	Boring	Depth to Groundwater	Date
RTF&A	HS-1	44	5/31/07
	B-1	17	12/7/05
	B-3	12	12/7/05
	B-4	15	12/7/05
	B-5	34	12/7/05
	B-6	52	12/12/05

5.4 RETAINING WALLS

5.4.1 Retaining Wall

Retaining walls up to six feet high that support fill, alluvium, and approved retaining wall backfill, may be designed for an equivalent fluid pressure of 30 pounds per cubic foot for level backslopes.

Retaining walls should be provided with a subdrain or weepholes covered with a minimum of 12 inches of ¾ inch crushed gravel.

It is recommended that retaining walls be waterproofed. Waterproofing design and inspection of its installation is not the responsibility of the geotechnical engineer. A qualified waterproofing consultant should be retained in order to recommend a product or method, which would provide protection to below grade walls.

5.4.2 Retaining Wall Backfill

Retaining wall backfill should be compacted to a minimum of 90 percent of the maximum density as determined by ASTM D 1557-14. It should be pointed out that the use of heavy compaction equipment in close proximity to retaining walls can result in excess wall movement and/or soil loadings exceeding design values. In this regard, care should be taken during backfilling operations.

5.4.3 Waterproofing

Moisture affecting retaining walls is one of the most common post-construction complaints. Poorly applied or omitted waterproofing can lead to efflorescence or standing water inside the building. Efflorescence is a process in which a powdery substance is produced on the surface of the concrete by the evaporation of water. The white powder usually consists of soluble salts such as gypsum, calcite, and/or halite (common salt). Efflorescence is common to retaining walls and generally does not affect their strength or integrity.

It is recommended that retaining walls be waterproofed. Waterproofing design and inspection of its installation is not the responsibility of the geotechnical engineer. A qualified waterproofing consultant should be retained in order to recommend a product or method, which would provide protection to below grade walls.

5.5 TEMPORARY EXCAVATIONS

All vertical cuts shall be inspected to verify geologic continuity. Un-shored vertical cuts to a height of five (5') may be made in earth materials at the site. Un-shored cuts in excess of five feet (5') shall be sloped at a gradient of no steeper than 1:1 (horizontal to vertical) for the portion of the excavation above the vertical cut.

A representative of the geotechnical engineer or geologist should be present during grading to see temporary slopes. All excavations, including caissons, footings, and utility trenches, shall be properly and adequately fenced, and/or covered to ensure the safety of all those working on the project. All temporary excavations shall be stabilized as soon as possible after the initial excavation.

5.5.1 Shoring

If required, shoring may consist of cast-in-place concrete piles with wood-lagging. Shoring piles should be a minimum of 18 inches in diameter and a minimum of 8 feet into alluvium below the base of the excavation. Piles may be assumed fixed 3 feet below the base of the excavation. For the vertical forces, piles may be designed for a skin friction of 400 to 600 pounds per square foot for that portion of pile in contact with the alluvium. Shoring piles should be spaced a maximum of 10 feet on center.

The friction value is for the total of dead and frequently applied live loads and may be increased by one third for short duration loading, which includes the effects of wind or seismic forces. Resistance to lateral loading may be provided by passive earth pressure within the alluvium below the base of the excavation.

Passive earth pressure may be computed as an equivalent fluid having a density of 400 pounds per cubic foot. The maximum allowable earth pressure is 4,000 to 6,000 pounds per square foot. For design of isolated piles, the allowable passive and maximum earth pressures may be increased by 100 percent. Piles spaced more than 2½ pile diameters on center may be considered isolated.

Rakers or other forms of internal bracing designed by the structural engineer may be used to support the shoring system where tieback anchors cannot be used.

5.5.3 Lagging

Lagging will be required between piles. Due to arching in the soils, the pressure on the lagging will be less that on the shoring piles. It is recommended that the lagging be designed for the full design pressure but be limited to a maximum of 400 pounds per square foot. The void between the lagging and the back-cut should be slurry-filled and observed by a representative of the geotechnical engineer.

A representative of the geotechnical engineer or geologist should be present during grading to see temporary slopes. All excavations, including caissons, footings, and utility trenches, shall be properly and adequately fenced, and/or covered to ensure the safety of all those working on the project.

All temporary excavations shall be stabilized as soon as possible after the initial excavation.

5.6 EXTERIOR FLATWORK AND AUXILIARY STRUCTURES

Whenever planned, exterior flatwork should be placed directly on a two-foot blanket of approved compacted fill. Five-inch net sections with #4 bars at 18 inches o.c.e.w. are also advised. Control joints should be planned at not more than twelve foot spacing for larger concrete areas. Narrower areas of flatwork such as walkways should have control joints planned at not greater than 1.5 times the width of the walkway. Recommendations provided above for interior slabs can also be used for exterior flatwork, but without a sand layer or Visqueen moisture barrier. Additionally, it is also recommended that at least 12-inch deepened footings be constructed along the edges of larger concrete areas.

Movement of slabs adjacent to structures can be mitigated by doweling slabs to perimeter footings. Doweling should consist of No. 4 bars bent around exterior footing reinforcement. Dowels should be extended at least two feet into planned exterior slabs. Doweling should be spaced consistent with the reinforcement schedule for the slab. With doweling, 3/8-inch minimum thickness expansion joint material should be provided. Where expansion joint material is provided, it should be held down about 3/8 inch below the surface. The expansion joints should be finished with a color matched, flowing, flexible sealer (e.g., pool deck compound) sanded to add mortar-like texture. As an option to doweling, an architectural separation could be provided between the main structures and abutting appurtenant improvements.
Auxiliary structures such as trash enclosures and garden walls can be placed directly on alluvium or on a two-foot blanket of compacted fill.

5.7 CONCRETE/SULFATE/CORROSIVITY

Testing of the sulfate content of the soil indicates that moderate levels of sulfate concentrations were encountered in the soil and therefore specialized concrete is not required for the project. We recommend that the low permeable concrete be utilized at the site to limit moisture transmission through slab and foundation. The structural engineer should specify appropriate compressive strength and water-cement ratio. Limited use (subject to approval of mix designs) of a water reducing agent may be included to increase workability. The concrete should be properly cured to minimize risk of shrinkage cracking. One-inch hard rock mixes should be provided. Pea gravel mixes are specifically not recommended but could be utilized for relatively non-critical improvements (e.g., flatwork) and other improvements provided the mix designs consider limiting shrinkage.

Contractors/other designers should take care in all aspects of designing mixes, detailing, placing, finishing, and curing concrete. The mix designers and contractor are advised to consider all available steps to reduce cracking. The use of shrinkage compensating cement or fiber reinforcing should be considered. Mix designs proposed by the contractor should be considered subject to review by the project engineer.

5.8 SOIL CORROSIVITY

According to testing of the site soils, the soils should be expected to be only mildly corrosive to ferrous metals. It is recommended that a consulting corrosion engineer be retained in order to determine the most appropriate protection measures for the project site.

Recommendations that the corrosion engineer may require include the following:

- All steel and wire concrete reinforcement should have at least 3 inches of concrete cover where cast against soil.

- Below-grade ferrous metals should be given a high-quality protective coating, such as plastic tape, extruded polyethylene, hot-applied coal tar enamel, or fusion-bonded epoxy.

- On any type of pipe, coat all bare metal appurtenances such as bolts, valves, joint harnesses, or flexible couplings with a coal tar or rubber-based mastic, coal tar epoxy, moldable sealant, wax tape, or equivalent, after assembly.

- Bond below-grade ferrous metals with non-conductive type joints for electrical continuity.

- Below-grade metals should be electrically insulated (isolated) from dissimilar metals, cement-mortar coated and concrete-encased metals, and above-grade metals, by means of insulated joints.

- Metal pipes penetrating concrete structures such as floors and walls should be provided with plastic sleeves, rubber seals, or other dielectric material to prevent pipe contact with the concrete and reinforcing steel.

- Bare copper tubing should be bedded and backfilled in clean sand at least 3 inches thick surrounding the tubing. The best corrosion control for hot water copper tubing is placement above-grade. Below-grade hot water copper tubing should be encased in impermeable, unstretched, non-shrink insulation with the joints and seams sealed.

5.9 PAVEMENT DESIGN

The following pavement sections are recommended as minimums:

Traffic Index	Asphalt Thickness	Base Thickness
Light Traffic (T.I.=5) for parking stalls and driveways	4 inches	6 inches
Heavy Traffic (T.I.= 6.5) for loading docs and large truck traffic	4 inches	12 inches

Concrete pavement sections should be a minimum of 6 inches thick and reinforced with #4 bars at 18" on center. A base of 6 inches is required below concrete pavement areas. Control joints should be planned at not more than twelve foot spacing.

All pavement should be placed on a minimum one-foot thick fill cap that is compacted to a minimum of 95% relative compaction.

5.10 DRAINAGE

Drainage should be directed away from structures via non-erodible conduits to suitable disposal areas. Two percent drainage is recommended directly away from structures. Building Code and Civil Engineer requirements and recommendations take precedence. All enclosed planters should be provided with a suitably located drain or drains and/or flooding protection in the form of weep holes or similar. Preferably, structures should have roof gutters and downspouts tied directly to the area drainage system.

5.11 PLAN REVIEW

When detailed grading and structural plans are developed, they should be reviewed by the project geotechnical consultant.

5.12 AGENCY REVIEW

All soil, geologic, and structural aspects of the proposed development are subject to the review and approval of the governing agency(s).

5.13 SUPPLEMENTAL CONSULTING

During construction, a number of reviews by the project geotechnical consultant are recommended to verify site geotechnical conditions and conformance with the intentions of the recommendations for construction. The following site reviews are advised, some of which are required by the governing agencies.

Preconstruction/pregrading meeting	Advised
Cut and/or shoring observation	Required
Periodic geotechnical observations and testing during grading	Required
Reinforcement for all foundations	Advised
Slab subgrade moisture barrier membrane	Advised
Slab subgrade rock placement	Advised
Presaturation checks for all slabs in primary structure areas	Required
Presaturation checks for all slabs for appurtenant structures	Advised
Slab steel placement, primary and appurtenant structures	Advised
Compaction of utility trench backfill	Advised

5.14 PROJECT SAFETY

The contractor is the party responsible for providing a safe site. This consultant will not direct the contractor's operations and cannot be responsible for the safety of personnel other than his own representatives on site. The contractor should notify the owner if he is aware of and/or anticipates unsafe conditions. If the geotechnical consultant at the time of construction considers conditions unsafe, the contractor, as well as the owner's representative, will be notified. Within this report the terminology safe or safely may have been utilized. The intent of such use is to imply low risk. Some risk will remain, however, as is always the case.

6.0 REFERENCES CITED

Applied Technology Council, 2020, ATC Hazards by location, https://hazards.atcouncil.org/, website accessed August 2020

Bailey, T. L., and Jahns, R. H., 1954, "Geology of the Transverse Range Province, Southern California," in Geology of Southern California, California Division of Mines Bull 170, Vol. 1, pp. 83-106.

Bing Maps, 2020, Bing Maps, https://www.bing.com/maps, Microsoft Corporation, website accessed August 2020

California Geological Survey (CGS), 1999, Earthquake Zones of Required Investigation Mint Canyon Quadrangle, California Geological Survey, map scale 1:24,000

City of Santa Clarita, 2011, City of Santa Clarita General Plan Safety Element June 2011, City of Santa Clarita, 48 p.

City of Santa Clarita, 2020, City of Santa Clarita Mapping Your City, City of Santa Clarita, http://gis.santa-clarita.com/html5/MasterPUB.html,website accessed August 2020.

County of Los Angeles Department of Public Works (LADPW), Geotechnical and Materials Engineering Division. June 30, 2014. *Low Impact Development Best Management Practice Guideline for Design, Investigation, and Reporting.* Pgs 7-8. http://dpw.lacounty.gov/gmed/permits/docs/policies/GS200.1.pdf

Department of Conservation, 1998, Seismic Hazard Zone Report for the Mint Canyon 7.5-Minute Quadrangle, Los Angeles County, California, Seismic Hazard Zone Report-018, Department of Conservation Division of Mines and Geology, 49 p.

Department of Conservation, 2020a, Alquist-Priolo Earthquake Fault Zones, https://www.conservation.ca.gov/cgs/alquist-priolo, website accessed August 2020

Department of Conservation, 2020b, Seismic Hazards Mapping Act, https://www.conservation.ca.gov/cgs/shma, website accessed August 2020

Dibblee, T.W., and Ehrenspeck, H.E., 1996, Geologic map of the Mint Canyon quadrangle, Los Angeles County, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-57, scale 1:24,000

Jahns, R. H., and Muehlberger, W. R., 1954, "Geology of the Soledad Basin, Los Angeles County," in Geology of Southern California, California Division of Mines Bull. 170, Map Sheet No. 6.

Oakeshott, G. B., 1958, "Geology and Mineral Deposits of San Fernando Quadrangle, Los Angeles County, California," California Division of Mines Bulletin 172, 147p.

Parrish. J. G., 2008, Special Publication 117A Guidelines for Evaluating and Mitigating Seismic Hazards in California, California Geological Survey, 108 p.

RTF&A Geotechnical Engineering & Engineering Geology, 2008, Geotechnical Report for Temtative Tract Map No. 69164 Canyon Country, California Volume I of II for Vista Canyon Ranch, LLC, Independent Consultant Report

Saul, R.B., and Wooten, T.M., 1983, Geology of the South Half of the Mint Canyon Quadrangle, Los Angeles County, California, CDMG Open File Report 83-24LA.

State of California, 1995, Mint Canyon Quadrangle Earthquake Fault Zones, Revised Official Map, June 1, 1995.

United States Geological Survey (USGS), 1999, Mint Canyon Quadrangle, California-Los Angeles Co. 7.5 Minute Series (Topographic): United States Department of the Interior Geological Survey, scale 1:24,000

Weber, F.H., Jr., 1982, Geology and Geomorphology Along the San Gabriel Fault Zone, Los Angeles and Ventura Counties, California, CDMG Open File Report 82-2.

Wentworth, C. M., and Yerkes, R. F., 1971, "Geologic Setting and Activity of Faults in the San Fernando Area, California," U.S. Geological Survey Professional Paper 733, pp. 6-16.

Winterer, E.L., and Durham, D.L., 1962, Geology of Southeastern Ventura Basin, Los Angeles County, California, USGS Professional Paper 334-H.

Figure 1. Location map of the subject site (Bing Maps, 2020).

Figure 2. Aerial photograph with topographic overlay from City of Santa Clarita (2020). Site outlined in yellow.

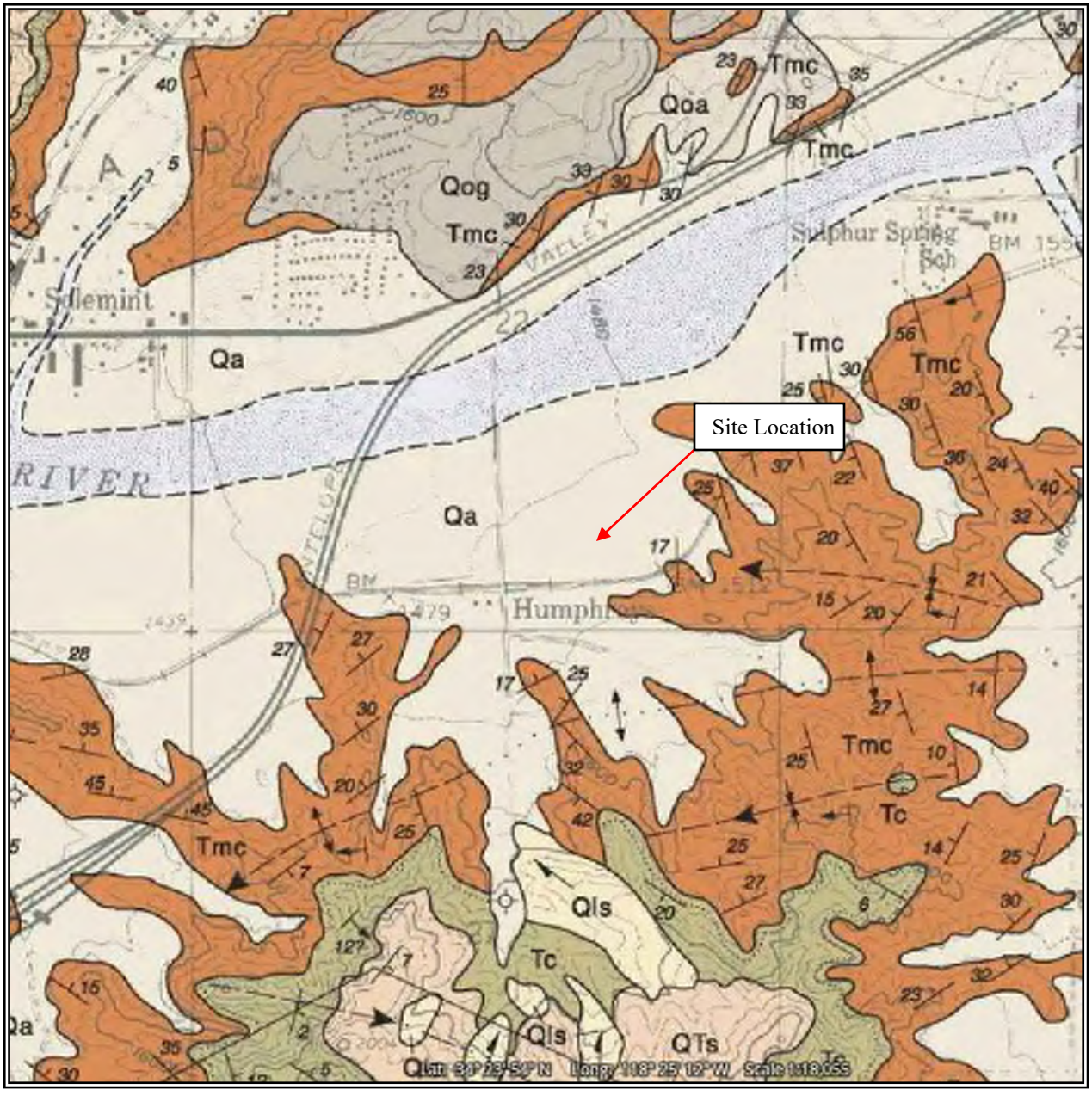


Figure 3. Portion of the geologic map of the mint canyon quadrangle by Dibblee and Ehrenspeck (1996).

Figure 4. Quaternary geologic map of the mint canyon quadrangle (Plate 1,1; Department of Conservation, 1998).

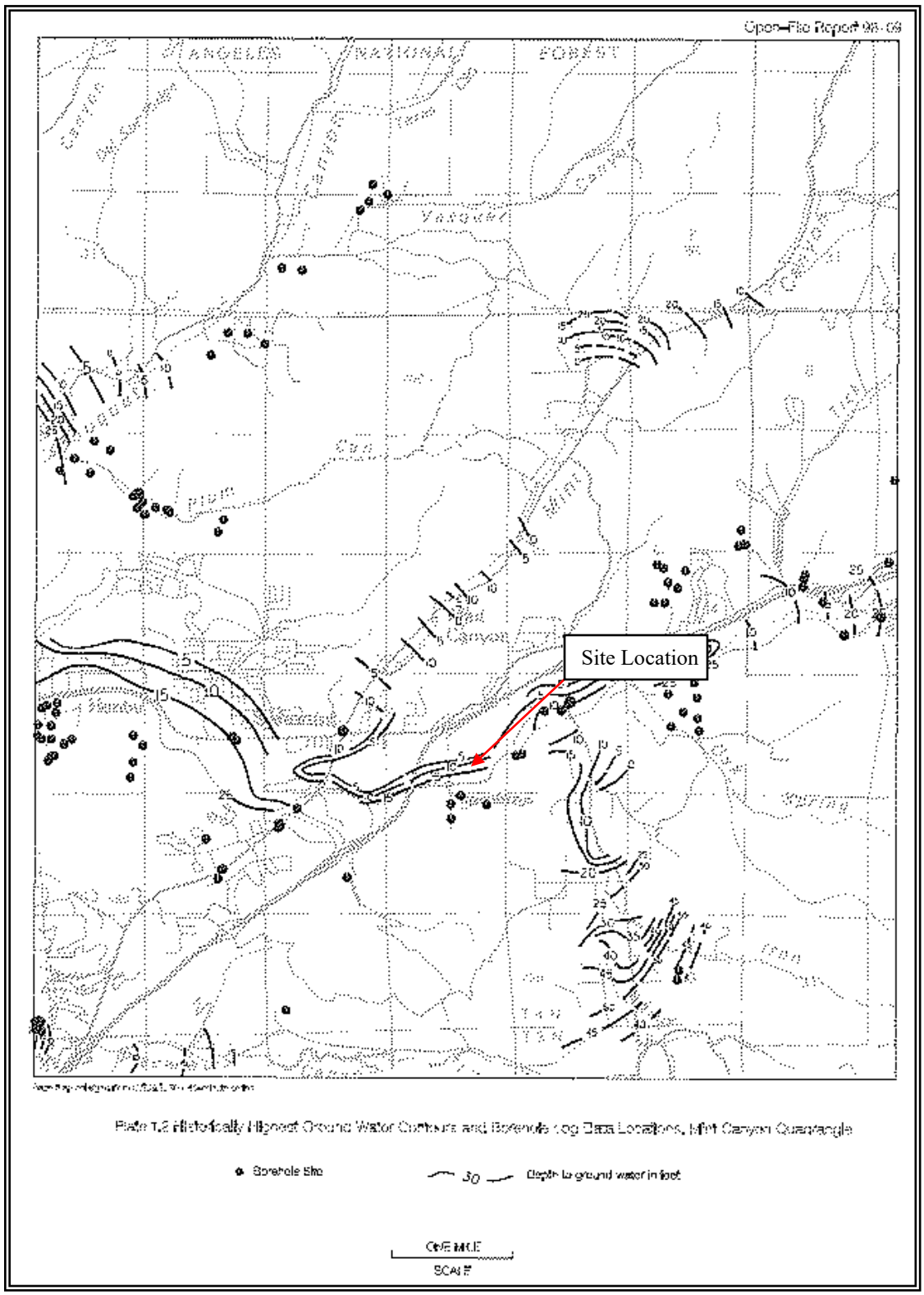


Figure 5. Historically highest groundwater contours in the site vicinity (Plate 1.2; Department of Conservation, 1998).

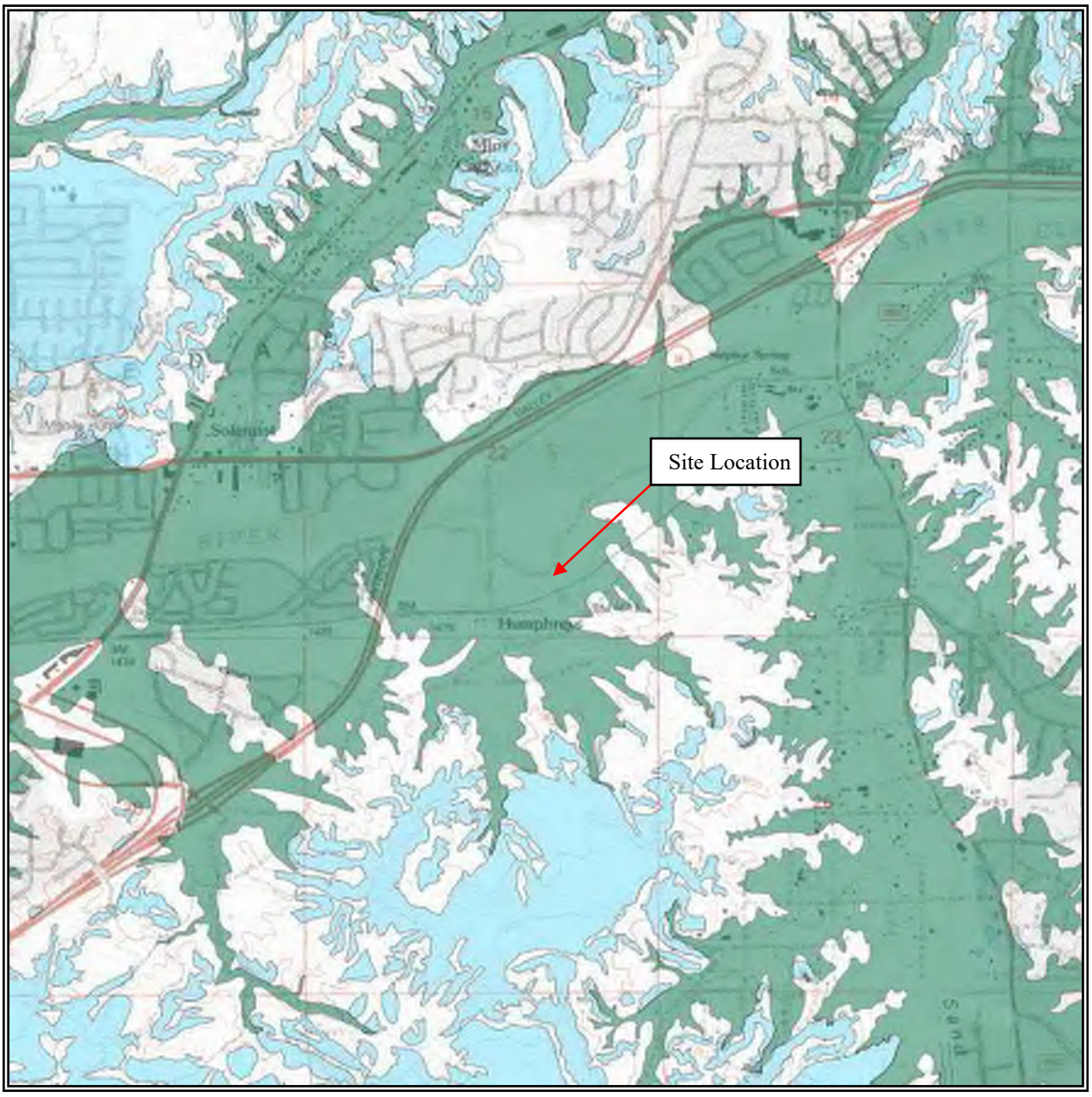
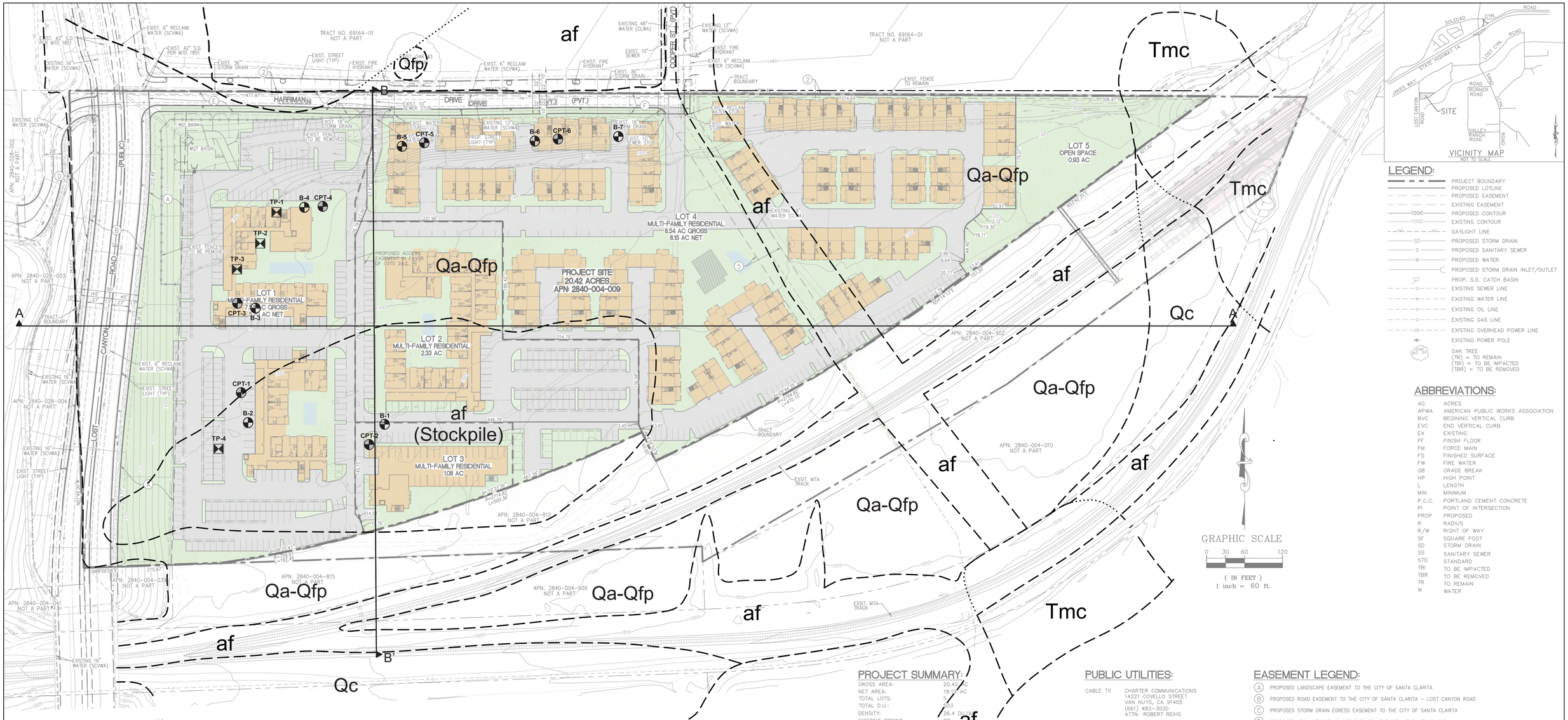


Figure 6. Portion of Earthquake Zones of Required Investigation Mint Canyon Quadrangle Seismic Hazard Zones (CGS, 1999).

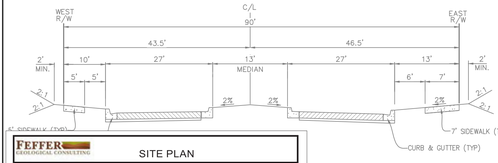


LEGEND:

- PROJECT BOUNDARY
- PROPOSED LOTLINE
- PROPOSED EASEMENT
- EXISTING EASEMENT
- PROPOSED CONTOUR
- EXISTING CONTOUR
- DAYLIGHT LINE
- PROPOSED STORM DRAIN
- PROPOSED SANITARY SEWER
- PROPOSED WATER
- PROPOSED STORM DRAIN INLET/OUTLET
- PROP. S.D. CATCH BASIN
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING OIL LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD POWER LINE
- EXISTING POWER POLE
- OAK TREE (TR) = TO REMAIN (TBI) = TO BE IMPACTED (TBR) = TO BE REMOVED

ABBREVIATIONS:

AC	ACRES
APWA	AMERICAN PUBLIC WORKS ASSOCIATION
BVC	BEGINING VERTICAL CURB
EVC	END VERTICAL CURB
EX	EXISTING
FF	FINISH FLOOR
FM	FORCE MAIN
FS	FINISHED SURFACE
FW	FIRE WATER
GB	GRADE BREAK
HP	HIGH POINT
L	LENGTH
MIN	MINIMUM
P.C.C.	PORTLAND CEMENT CONCRETE
PI	POINT OF INTERSECTION
PROP	PROPOSED
R	RADIUS
R/W	RIGHT OF WAY
SF	SQUARE FOOT
SD	STORM DRAIN
SS	SANITARY SEWER
STD	STANDARD
TBI	TO BE IMPACTED
TBR	TO BE REMOVED
TR	TO REMAIN
W	WATER



FEFFER GEOLOGICAL CONSULTING	SITE PLAN
NAME: NEW URBAN WEST INC.	
JB: 2445-04 METRO WALK	BY: AG
LOST CANYON RD	
DATE: 8/06/20 SCALE: 1"=60'	SITE: & HARRIMAN DR
REF:	BASE MAP FROM SURVEY

EXPLANATION

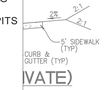
- B-7 LOCATION OF FEFFER GEOLOGICAL BORING
- TP-4 LOCATION OF FEFFER GEOLOGICAL TEST PITS
- CPT-6 LOCATION OF FEFFER GEOLOGICAL CPT
- A A' CROSS SECTION LINE
- Af ARTIFICIAL FILL
- Qc QUATERNARY COLLUVIUM
- Qa-Qfp ALLUVIUM-FLOOD PLAIN DEPOSITS
- Tmc MINT CANYON FORMATION

SYMBOLS

- GEOLOGIC CONTACT, dashed where approximate

ROAD (PUBLIC)

VATE)



LEGAL DESCRIPTION:

THAT PORTION OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 4 NORTH, RANGE 15 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SANTA CLARITA, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT OF SAID LAND FILED IN THE DISTRICT LAND OFFICE MARCH 29, 1877, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE NORTHERLY LINE OF SAID SOUTH HALF, DISTANT THEREON SOUTH 89 DEGREES 57 MINUTES 20 SECONDS EAST 124.57 FEET FROM THE WESTERLY LINE OF SAID SOUTHEAST QUARTER; THENCE ALONG SAID NORTHERLY LINE SOUTH 89 DEGREES 57 MINUTES 20 SECONDS EAST TO A POINT DISTANT THEREON NORTH 89 DEGREES 57 MINUTES 20 SECONDS WEST 150.99 FEET FROM THE INTERSECTION OF SAID NORTHERLY LINE WITH THE NORTHWESTERLY LINE OF THE 100 FOOT WIDE STRIP OF LAND DESCRIBED IN DEED DATED APRIL 22, 1890, FROM JOHN T. HUMPHREY'S TO SOUTHERN PACIFIC RAILROAD COMPANY; RECORDED APRIL 26, 1890, IN BOOK 650, PAGE 125 OF DEEDS, RECORDS OF SAID COUNTY; THENCE SOUTH 53 DEGREES 28 MINUTES 05 SECONDS WEST 421.92 FEET; THENCE SOUTH 53 DEGREES 59 MINUTES 43 SECONDS WEST 157.20 FEET TO A POINT; THENCE SOUTHWESTERLY ALONG A CURVE TO THE RIGHT, HAVING A RADIUS OF 2764.82 FEET, THROUGH A CENTRAL ANGLE OF 9 DEGREES 44 MINUTES 35 SECONDS (TANGENT TO SAID CURVE AT THE LAST MENTIONED POINT) BEARS SOUTH 56 DEGREES 04 MINUTES 05 SECONDS WEST AND NORTH OF SAID CURVE BEARS SOUTH 59 DEGREES 56 MINUTES 22 SECONDS WEST 469.59 FEET) AN ARC DISTANCE OF 470.15 FEET; THENCE NORTH 25 DEGREES 11 MINUTES 20 SECONDS WEST 50.00 FEET TO A POINT; THENCE SOUTHWESTERLY ALONG A COMPOUND CURVE TO THE RIGHT (TANGENT TO SAID CURVE AT THE LAST MENTIONED POINT BEARS SOUTH 64 DEGREES 48 MINUTES 40 SECONDS WEST) HAVING THE FOLLOWING RADII, CENTRAL ANGLES AND ARC LENGTHS; 2714.82 FEET, 10 DEGREES 53 MINUTES 36 SECONDS (CENTRAL ANGLES), 500.36 (ARC), 1759.91 FEET, 8 DEGREES 01 MINUTES 14 SECONDS (CENTRAL ANGLES), 246.36 (ARC), TO A POINT IN THE NORTHERLY LINE OF LAND DESCRIBED FIRST IN DEED DATED APRIL 26, 1890, FROM JOHN T. HUMPHREY'S TO SOUTHERN PACIFIC RAILROAD COMPANY RECORDED APRIL 26, 1890, IN BOOK 642, PAGE 277, OF DEEDS, RECORDS OF SAID COUNTY; THENCE ALONG SAID LAST MENTIONED NORTHERLY LINE TO A LINE HAVING A BEARING OF NORTH 2 DEGREES 00 MINUTES 00 SECONDS WEST THAT PASSED THROUGH THE POINT OF BEGINNING; THENCE ALONG SAID LINE NORTH 2 DEGREES 00 MINUTES 00 SECONDS WEST TO THE POINT OF BEGINNING.

APN: 2840-004-009

GENERAL NOTES

1. LOT LINES CAN BE ADJUSTED AND ADDITIONAL RESIDENTIAL OR COMMERCIAL LOTS MAY BE CREATED TO THE SATISFACTION OF THE CITY PLANNING DEPARTMENT AS LONG AS THE MAXIMUM NUMBER OF APPROVED RESIDENTIAL UNITS AND/OR THE MAXIMUM SQUARE FOOTAGE OF COMMERCIAL/OFFICE APPROVED IS NOT EXCEEDED.
2. ALIGNMENT AND GEOMETRICS OF STREETS ARE APPROXIMATE. ADJUSTMENTS TO STREETS CAN BE MADE WITH APPROVAL BY THE CITY OF SANTA CLARITA PLANNING DEPARTMENT AND THE ENGINEERING DEPARTMENTS.
3. GRADES SHOWN ON THIS TENTATIVE MAP ARE APPROXIMATE. GRADES MAY DEVIATE UP TO TEN FEET WITH APPROVAL OF CITY PLANNING AND ENGINEERING DEPARTMENTS.
4. PERMISSION IS REQUESTED FOR MULTIPLE (PHASED/UNIT) TRACT MAPS.
5. PERMISSION IS REQUESTED TO COMBINE LOTS.
6. PERMISSION IS REQUESTED TO CREATE ADDITIONAL LANDSCAPE/OPEN SPACE OR PUBLIC USE LOTS TO THE SATISFACTION OF THE CITY PLANNING DEPARTMENT.
7. PERMISSION IS REQUESTED TO RECORD ADDITIONAL UTILITY LOTS AND PROVIDE MAINTENANCE EASEMENTS TO THE SATISFACTION OF THE CITY OF SANTA CLARITA PLANNING AND ENGINEERING DEPARTMENTS.
8. THE LOCATIONS OF APPURTENANT STRUCTURES (E.G., PASEOS, TRANSIT SHELTERS, WATER QUALITY BASINS, ETC.) MAY BE RELOCATED TO THE SATISFACTION OF THE CITY OF SANTA CLARITA PLANNING AND ENGINEERING DEPARTMENTS.
9. PERMISSION IS REQUESTED TO MASS GRADE.
10. LOTS DESIGNATED FOR MULTI-FAMILY HOUSING MAY BE FURTHER SUBDIVIDED FOR CONDOMINIUM PURPOSES.
11. RESIDENTIAL UNITS MAY BE TRANSFERRED BETWEEN PLANNING AREAS SUBJECT TO THE APPROVAL OF THE CITY PLANNING DEPARTMENT.

PROJECT SUMMARY:

GROSS AREA:	20.42 AC
NET AREA:	18.15 AC
TOTAL LOTS:	5
TOTAL D.U.:	203
DENSITY:	26.4 DU/AC
EXISTING ZONING:	BP
PROPOSED ZONING:	UR5

EARTHWORK SUMMARY

CUT: 450,000 cy
FILL: 450,000 cy
IMPORT/EXPORT: 0 cy

OWNER:

BLUMAX SANTA CLARITA, LLC,
A DELAWARE LIMITED LIABILITY COMPANY
2001 WILSHIRE BLVD., SUITE 401
SANTA MONICA, CA 94303
PHONE: (310) 556-6390
ATTN: KEVIN HARBISON

FLOOD ZONE

FLOOD INSURANCE RATE MAPS COMMUNITY PANEL NUMBERS
NO. 06037C0840F AND 06037C0845F ZONE X

TOPOGRAPHY:

CONTOURS ARE BASED ON AN AERIAL PHOTOGRAMETRIC SURVEY PERFORMED BY VERTEX AND DON READ CORPORATION FLOWN ON MAY 2017.

BENCHMARK:

L 1668 DATUM NAVD 88(1995 ADJUSTMENT) ELEVATION 1586.011
SAND CANYON ROAD AND 161M NORTH OF LIVE OAK SPRINGS CANYON ROAD
8.2M NORTHEAST OF POWER POLE #115006E MKD (PI 24)
DESCRIPTION: CS MON IN WELL 250MM DN ⊕ PI 600MM EAST OF CENTERLINE

BASIS OF BEARINGS:

THE BEARINGS SHOWN HEREON ARE BASED ON THE BEARING NORTH 89°44'29" WEST OF THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 4 NORTH, RANGE 15 WEST, SAN BERNARDINO MERIDIAN, AS SHOWN ON MAP OF TRACT NO. 69164-01 FILED IN BOOK 1396 PAGES 40 THROUGH 48 INCLUSIVE, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF LOS ANGELES COUNTY.

ASSESSOR PARCEL NUMBER:

2840-004-009

CONDOMINIUM NOTE:

ALL RESIDENTIAL, COMMERCIAL AND OFFICE LOTS WITHIN THIS TENTATIVE MAP MAY BE FURTHER AIRSPACE SUBDIVIDED FOR CONDOMINIUM PURPOSES.

FOR CONDOMINIUM PURPOSES

PUBLIC UTILITIES:

CABLE TV	CHARTER COMMUNICATIONS 14221 COVELLO STREET VAN NUYS, CA 91405 (661) 483-3030 ATTN: ROBERT REIHS
ELECTRIC	SOUTHERN CALIFORNIA EDISION CO. 3589 FOOTHILL DRIVE THOUSAND OAKS, CA 91361 (661) 607-0512 ATTN: JOSHUA YANEZ
GAS	SOUTHERN CA. GAS COMPANY 9400 OAKDALE AVENUE CHATSWORTH, CA. 91313 (818) 701-7567 ATTN: JOHN CURRAN
SEWER	LOS ANGELES COUNTY SEWER MAINTENANCE DEPARTMENT 45712 NORTH DIVISION LANCASTER, CA. 93535 (626) 300-3370 ATTN: MARISA MORALES
TELEPHONE	AT&T 26971 N. FURNIVALL AVENUE SANTA CLARITA, CA 91351 (661) 251-8799 ATTN: BRYAN MONTGOMERY
WATER	SANTA CLARITA VALLEY WATER AGENCY 26521 SUMMIT CIRCLE SANTA CLARITA, CA 91350 (661) 259-2737 ATTN: BRENT PAYNE

EASEMENT LEGEND:

- (A) PROPOSED LANDSCAPE EASEMENT TO THE CITY OF SANTA CLARITA
- (B) PROPOSED ROAD EASEMENT TO THE CITY OF SANTA CLARITA – LOST CANYON ROAD
- (C) PROPOSED STORM DRAIN EGRESS EASEMENT TO THE CITY OF SANTA CLARITA
- (D) PROPOSED NEW LOT LINE ADJUSTMENT WITH THE CITY OF SANTA CLARITA
- (E) PROPOSED ROAD EASEMENT – HARRIMAN DRIVE

EASEMENTS

EASEMENTS BASED ON CHICAGO TITLE COMPANY PRELIMINARY REPORT
POLICY NO.: 00125823-994-LT2-KD

1. Water rights, claims or title to water, whether or not disclosed by the public records.

2. An easement affecting the portion of said land and for the purposes stated herein and incidental purposes
(No representation is made as to the present ownership of said easement)
In Favor of: Southern California Edison Company, Ltd
For: public utilities
Recorded: In Book 20996, Page 385, of Official Records
Affects: A portion of said land more particularly described therein
SHOWN HEREON AS (2)

5. Easement(s) for the purpose(s) shown below and rights incidental thereto as condemned by an instrument, Entitled: Amended Final Order of Condemnation
Court: Superior Court
Case No.: BC 317474
In favor of: Castaic Lake Water Agency, a California water agency
Purpose: water pipeline
Recording Date: May 5, 2006
Recording No: 06-0997584, Official Records
Affects: that portion of said land described therein
SHOWN HEREON AS (5)

6. Matters contained in that certain document
Entitled: Memorandum of Grading, Improvements, and Easement Agreement
Dated: November 13, 2009
Executed by: Rachel Jorgenson, Successor Trustee of the Marital Deduction Trust of The Cloyd Family Trust, dated November 3, 2003, Goldman Family Limited Partnership, a Delaware limited partnership, Vista Canyon Ranch, LLC, a California limited liability company and Vista Canyon Phase 1, LLC, a Delaware limited liability company
Recording Date: November 16, 2016
Recording No: 20161433058, Official Records
Reference is hereby made to said document for full particulars.

7. Any rights, claims or interests that may exist or arise by reason of the following facts disclosed by a map dated June 5, 2019 last revised July 9, 2019 of an ALTA/NSPS Land Title Survey completed June 4, 2019 prepared by or under the responsible charge of Michael A. Kennedo LS 5642, of/for Vertex Survey, Inc.
A. Curbs extend across the north, west and south lines of surveyed property.
B. There is vehicular access the west and south lines of surveyed property.
C. A V-ditch extends across the west line of surveyed property.
D. There are street lights and pull boxes on the north and west sides of surveyed property
E. There is a 36" stand pipe in the northwest corner of surveyed property,
F. There are water valves on the north side of the surveyed property.
G. A fire hydrant lies 1.3 feet east of the west line of surveyed property.

ALLIANCE LAND PLANNING & ENGINEERING INC.
2248 FARADAY AVE, CARLSBAD, CA 92008
TEL: (760) 431-9896 FAX: (760) 431-8802
27413 TOURNEY ROAD SUITE 120 VALENCIA, CA 91355 TEL: (661) 799-2760
CIVIL ENGINEERING • LAND PLANNING • HILLSIDE DESIGN • SURVEYING

PLAN PREPARED FOR:
NEW URBAN WEST, INC.
2001 WILSHIRE BLVD., SUITE 401
SANTA MONICA, CA 91405
TEL: (310) 556-6390
ATTN: KEVIN HARBISON

PLANS PREPARED BY:
ALLIANCE LAND PLANNING & ENGINEERING INC.
2248 FARADAY AVE.
CARLSBAD, CA 92008
(760) 431-9896
PLANS PREPARED UNDER THE DIRECTION OF:
CRAIG M. WHITTEKER R.C.E. 51929 3/19/20
CRAIG M. WHITTEKER NO. 51929 EXP 6-30-22 CIVIL STATE OF CALIFORNIA

NO.	DATE	REVISIONS	BY	APPR

SHEET 1 OF | CITY OF SANTA CLARITA | 1 SHEETS

METROWALK
TENTATIVE TRACT MAP 83087

E:\CAD\1934\TENTATIVE MAP\1934_TENTATIVE_MAP_PLAN.dwg

FEFFER GEOLOGICAL CONSULTING

CROSS SECTION A-A'

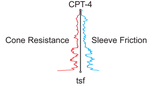
NAME: NEW URBAN WEST INC.

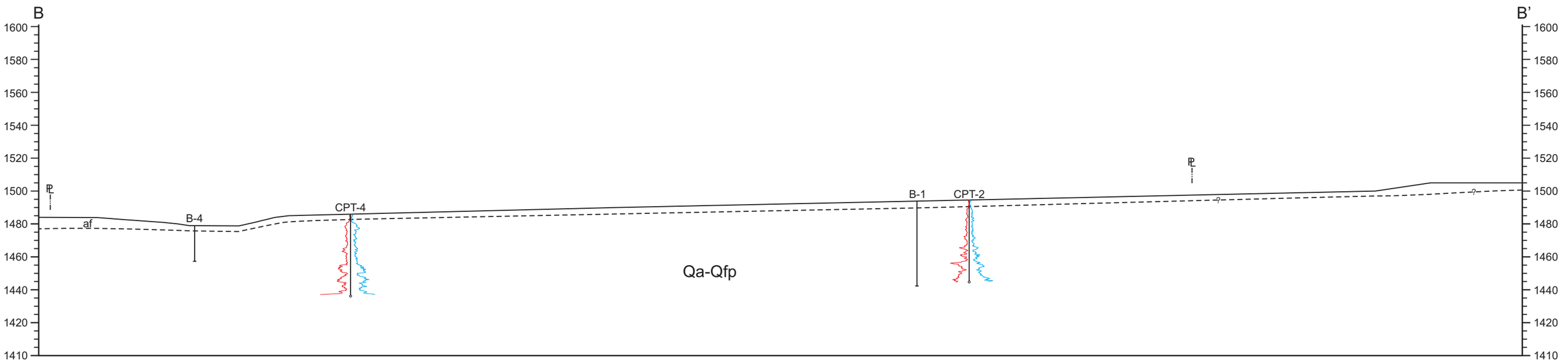
JB: 2445-04 METRO WALK BY: AG

LOST CANYON RD

DATE: 8/06/20 SCALE: 1"=60' SITE:& HARRIMAN DR

REF: ELEVATIONS FROM SURVEY





FEFFER GEOLOGICAL CONSULTING

CROSS SECTION B-B'

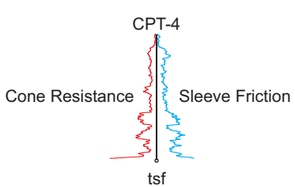
NAME: NEW URBAN WEST INC.

JB: 2445-04 METRO WALK BY: AG

LOST CANYON RD

DATE: 8/06/20 SCALE: 1"=60' SITE: & HARRIMAN DR

REF: ELEVATIONS FROM SURVEY



APPENDIX 'A'

Excavation Logs

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 1
Boring Location: Soil Covered Vacant Land

Date Performed: 4/15/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				Artificial Fill (Af)			
5	11	R		Alluvium-Flood Plain Deposits (Qa-Qfp): Sandy silt Gravel at 8’	Medium Brown Yellow Hue	Medium dense	Moist
10	11/12	R		Sandy gravel to gravelly sand, gravels up to 1/4” diameter	Medium Brown Yellow Hue	Medium Dense	Slightly Moist To Moist
15	7/8	R		Silt with gravel	Brown Yellow Brown	Medium Dense	Moist
20	8/9	R		Sandy silt, caliche	Medium Brown Slight Yellow Hue	Medium Dense	Moist
25	19/12	R		Cobbly sand interbeded with sandy silt to silty sand	Light Brown	Dense	Slightly Moist
30	13/15	R		Gravelly sand to sandy gravel, gravels 1/4” to 1” diameter	Brown Yellow Brown	Dense	Slightly Moist
35	28/15	R		Gravelly to cobbly sand	Light Brown Tan	Dense	Slightly Moist
40				End At 36.5’, Af to 4’, No Water, No Caving			

Feffer Geological Consulting

Figure

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 2
Boring Location: Soil Covered Vacant Land

Date Performed: 4/15/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				Artificial Fill (Af)			
2.5							
				Alluvium-Flood Plain Deposits (Qa-Qfp):			
5	8/8	R		Silty clay to clayey silt, trace gravels	Gray brown, Medium brown	Firm to stiff	Moist
7.5							
10	7/10	R		Sandy silt	Yellow brown	Firm to stiff	Moist
12.5	2/3/3		SPT	Silty sand to sandy silt, trace gravels, caliche	Light brown, tan	Medium dense	Moist
15	5/9	R		Sandy silt to silty sand, caliche	Light brown, Yellow brown	Firm	Slightly Moist
17.5	3/4/4		SPT	Sandy silt to silty sand, caliche	Light brown, Yellow brown	Firm	Slightly Moist
20	8/11	R		Silty sand, trace gravels, caliche	Light brown	Medium dense Firm	Slightly Moist
22.5	5/8		SPT	Sandy silt	Light yellow Brown	Firm	Moist
25	7/8	R		Sandy silt to silty sand	Light brown Yellow hue	Firm	Moist
27.5	5/7/10		SPT	Silty sand to sandy silt, trace clay & gravels	Light brown Yellow hue	Firm	Moist
30	9/11	R		Silty sand, trace gravels	Light brown Yellow hue		Moist
32.5	5/6/6		SPT	Sandy silt to silty sand	Light brown	Firm	Moist
35	11/17	R		Sandy silt to silty sand, increase in sands with depth	Light brown	Firm, Medium dense	Slightly Moist
37.5	6/8/9		SPT	Sandy silt to silty sand, increase in silt with depth	Light brown, Tan	Firm, Medium dense	Moist
40							

Feffer Geological Consulting

Figure

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 2
Boring Location: Soil Covered Vacant Land

Date Performed: 4/15/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
40	13/20	R		Sandy silt	Light brown, tan	Medium dense, Firm	Slightly Moist
42.5	7/8/8		SPT	Sandy silt, trace clay	Medium brown	Medium dense, Firm	Slightly Moist
45	16/24	R		Silty sand, trace clay	Medium brown	Dense	Slightly Moist
47.5	111/12/14		SPT	Silty sand	Light yellow brown	Dense	Slightly Moist
50	18/25	R		Sandy silt to silty sand	Light brown	Dense	Slightly Moist
				End At 51.5’, Af To 4’, No Water, No Caving			
55							
60							
65							
70							
75							
80							

Feffer Geological Consulting

Figure

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 3
Boring Location: Soil Covered Vacant Land

Date Performed: 4/15/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				Artificial Fill (Af)			
5	4/5	R		Alluvium-Flood Plain Deposits (Qa-Qfp): Silty sand to sandy silt	Medium brown	Medium dense	Slightly Moist
10	8/9	R		Silt, trace sand & gravel, caliche	Light yellow brown	Medium dense Firm	Slightly Moist
15	11/12	R		Silt, trace sand	Brown Yellow brown	Medium dense	Moist
20	7/10	R		Silty sand, trace gravel	Light yellow brown	Medium dense	Moist
25	8/11	R		Silty sand with common gravels, caliche	Brown	Medium dense	Slightly Moist
30	10/15	R		Sandy silt	Light Yellow brown	Medium dense Dense	Slightly Moist
35				End At 31.5’, Af to 4’, No Water, No Caving			
40							

Feffer Geological Consulting

Figure

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 4
Boring Location: Soil Covered Vacant Land

Date Performed: 4/15/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				Artificial Fill (Af)			
5	4/5	R		Alluvium-Flood Plain Deposits (Qa-Qfp): Clayey silt, caliche	Medium brown	Medium dense	Slightly Moist
10	7/10	R		Sandy silt to silty, trace gravels, caliche, carbon	Brown Yellow vrown	Medium dense Firm	Slightly Moist
15	9/13	R		Sandy silt to silty sand, trace common gravels	Light olive Yellow brown	Medium dense	Moist
20	8/12	R		Silty sand, trace gravel	Light yellow brown	Medium dense	Moist
				End At 21.5’, Af to 4’, No Water, No Caving			
25							
30							
35							
40							

Feffer Geological Consulting

Figure

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 5
Boring Location: Soil Covered Vacant Land

Date Performed: 4/16/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				Artificial Fill (Af)			
2.5							
				Alluvium-Flood Plain Deposits (Qa-Qfp):			
5	7/9	R		Sandy silt	Olive brown to brown	Firm	Moist
7.5							
10	7/9	R		Silt, trace clay, mica	Olive yellow Brown	Firm	Moist
12.5	4/6/6		SPT	Sandy silt to silty sand, trace gravels & rootlets	Olive yellow Brown	Firm	Moist
15	8/11	R		Sandy silt to silty sand, trace gravels & rootlets, calachie	Olive yellow Brown	Dense to stiff	Moist
17.5	5/5/5		SPT	Silty sand trace clay & gravel	Olive yellow Brown	Firm Medium dense	Moist
20	8/13	R		Silt grades into sandy silt to silt with trace sand	Olive brown	Medium dense Firm	Moist
22.5	5/6/6		SPT	Silty sand, trace gravels, calachie	Yellow olive Brown	Medium dense	Moist
25	11/19	R		Silty sand, trace gravels, calachie	Yellow olive Brown	Medium dense	Moist
27.5	5/6/8		SPT	Sandy silt, trace gravels, FeO2 staining	Olive yellow Brown	Firm	Moist
30	14/19	R		Gravelly sand, rounded, subrounded, angular gravels up to 1/2” diameter	Olive yellow Brown	Dense	Moist
32.5	6/8/10		SPT	Sandy silt, interbedded with silt and gravelly sands	Brown	Firm	Moist
35	11/19	R		Silty sand grades into gravelly sand, trace clay	Brown	Dense	Moist
37.5	9/10/11		SPT	Sand, trace silt, interbedded with sandy silt	Olive yellow Brown	Firm, Medium dense	Moist
40							

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 5
Boring Location: Soil Covered Vacant Land

Date Performed: 4/16/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
40	14/22	R		Fine grained sandy silt	Olive yellow Brown	Dense	Moist
42.5	9/9/9		SPT	Silty sand	Olive brown	Medium dense, Firm	Moist
45	13/21	R		Silty sand	Olive brown	Dense	Slightly Moist
47.5	6/9/13		SPT	Fine to medium grained sand, trace silt	Light olive yellow brown	Medium dense	Moist
50	27/32	R		Fine grained silty sand grades into gravelly sand, gravels up to 1/2” diameter	Light olive yellow brown	Dense	Moist
				End At 51.5’, Af To 4’, No Water, No Caving			
55							
60							
65							
70							
75							
80							

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 6
Boring Location: Soil Covered Vacant Land

Date Performed: 4/16/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				Artificial Fill (Af)			
5	13/14	R		Alluvium-Flood Plain Deposits (Qa-Qfp): Sandy silt to silt	Medium brown Yellow hue	Dense	Moist
10	6/8	R		Silt trace sand & gravel, caliche	Yellow brown	Medium dense Firm	Moist
15	6/9	R		Sandy silt, caliche	Brown Yellow hue	Medium dense Firm	Moist
20	9/11	R		Sand grades into gravelly sand, gravels up to 1/4” diameter	Light brown	Medium dense	Moist
25	7/10	R		Silt, trace clay, caliche, pores	Olive brown	Firm	Moist
30	13/18	R		Silty sand, trace gravel, caliche, carbon, mica	Olive Yellow brown	Dense, stiff	Moist
35	10/13	R		Silty sand grades into silt	Light brown	Dense	Moist
40				End At 36.5’, Af to 4’, No Water, No Caving			

Feffer Geological Consulting

Figure

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 7
Boring Location: Soil Covered Vacant Land

Date Performed: 4/16/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
0				Artificial Fill (Af)			
2.5							
				Alluvium-Flood Plain Deposits (Qa-Qfp):			
5	6/6	R		Silt, caliche	Olive brown to brown	Firm medium dense	Moist
7.5							
10	9/13	R		Sandy silt, caliche	Olive yellow Brown	Firm	Moist
12.5	6/7/11		SPT	Sandy silt	Olive yellow Brown	Firm	Moist
15	7/10	R		Sand trace silt, increase in grain size with depth	Light brown yellow hue	Medium dense	Moist
17.5	5/5/6		SPT	Silty sand grades into sandy silt, trace gravel, poorly laminated, caliche	Brown olive hue	Firm	Slightly moist
20	7/11	R		Sandy silt trace gravel, rootlets	Olive brown	Firm	Moist
22.5	6/12/19		SPT	Gravelly medium grained sand @24’ Gravels	Light to medium Brown	Dense	Moist
25	6/8	R		Silt trace sand, caliche	Brown olive hue	Dense	Moist
27.5	4/5/7		SPT	Silt trace sand, caliche, increase in sand with depth	Brown olive brown	Firm	Moist
30	9/11	R		Silt trace gravels, caliche	Olive brown	Firm	Moist
32.5	7/7/7		SPT	Fine grained sand with gravel	Brown slight olive yellow hue	Medium dense	Moist
35	10/15	R		Sandy silt trace gravels, caliche	Olive brown	Firm	Moist
37.5	6/6/7		SPT	Silt	Olive brown	Firm	Moist
40							

LOG OF EXPLORATORY BORING

Job Number: 2445-04
Project: New Urban West Inc.-Metro Walk

Boring No: 7
Boring Location: Soil Covered Vacant Land

Date Performed: 4/16/2020

Drill Type: 8” Hollow Stem CME Drill Rig

Depth in Feet	Blows per 6”	Sample Type: Undisturbed	Sample Type: Bulk	Bedrock/ Soil Description	Color	Density	Moisture
40	13/20	R		Silt	Light olive brown	Firm	Moist
42.5	7/8/8		SPT	Silt	Olive brown	Firm	Moist
45	16/24	R		Silty sand, trace gravel, caliche, grades into clayey silt	Light olive brown	Dense	Moist
47.5	111/12/14		SPT	Clayey silt, caliche	Brown olive brown	Firm to stiff	Moist
50	18/25	R		Sandy silt trace gravels, increase in gravels with depth	Brown olive brown	Dense	Moist
				End At 51.5’, Af To 4’, No Water, No Caving			
55							
60							
65							
70							
75							
80							

Feffer Geological Consulting

Figure

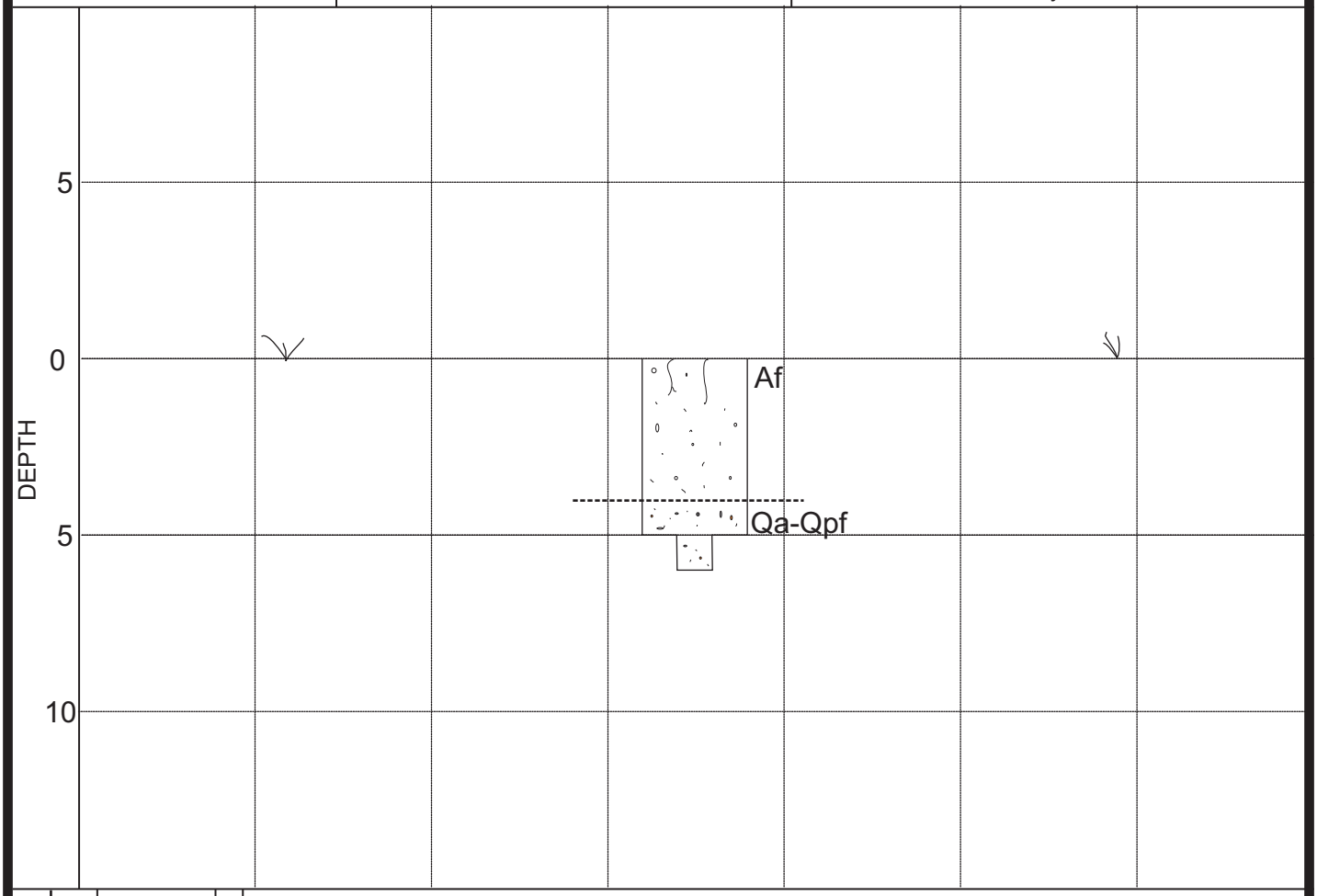
GRAPHIC LOG

APPROXIMATE SCALE : 1"=5'

DATE LOGGED : 7/6/20 BY : YMH

TEST EXCAVATION : 1

ADDRESS: Lost Canyon Rd. & Harriman Dr.



RING	BULK	SAMPLE DEPTH	Blows
		1	
		2	
		3	
		4	
		5	
		6	
		7	
		8	
		9	
		10	
		11	
		12	
		13	
		14	

LOCATION : See Site Map

DESCRIPTION: Classification (USCS), color, moisture, consistency etc.

0-4' Artificial Fill (Af):
Clayey silt, medium brown, slightly moist, medium dense

4-6' Alluvium-Flood Plain Deposits (Qa-Qfp):
Silty sand to sandy silt, medium brown, slightly moist to moist, medium dense to dense

End At 6', Artificial Fill To 4', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 2445-04	New Urban West Inc. Metro Walk	PLATE

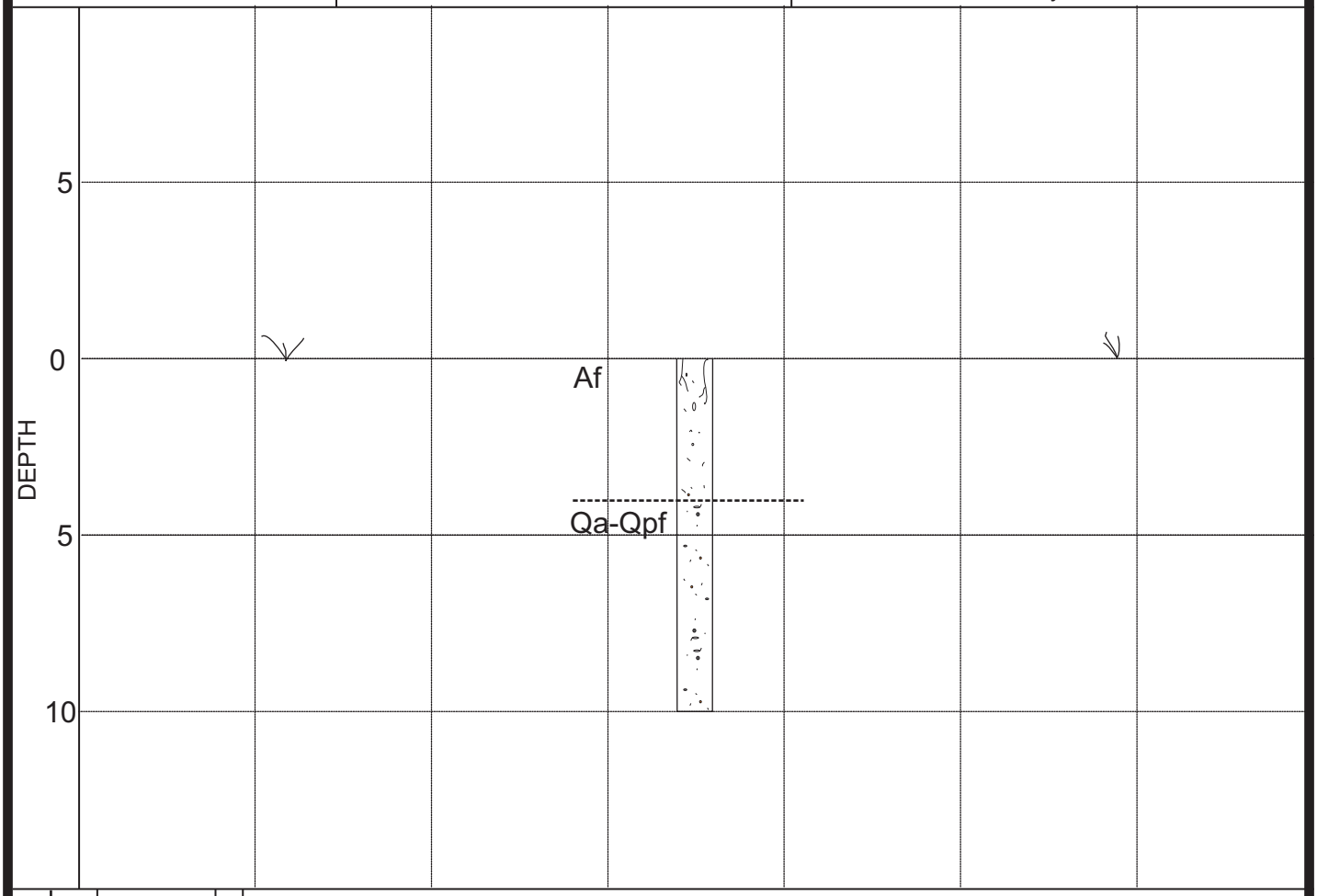
GRAPHIC LOG

APPROXIMATE SCALE : 1"=5'

TEST EXCAVATION : 2

DATE LOGGED : 7/6/20 BY : YMH

ADDRESS: Lost Canyon Rd. & Harriman Dr.



RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map DESCRIPTION: Classification (USCS), color, moisture, consistency etc.
		1 2 3 4 5 6 7 8 9 10 11 12 13 14		0-4' Artificial Fill (Af): Clayey silt, medium brown, slightly moist, medium dense to dense 4-10' Alluvium-Flood Plain Deposits (Qa-Qfp): Silty sand to sandy silt, medium brown, slightly moist, medium dense @ 10' Silt, trace sand & gravel, caliche light yellow, brown, slightly moist, medium dense to firm End At 10', Artificial Fill To 4', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 2445-04	New Urban West Inc. Metro Walk	PLATE

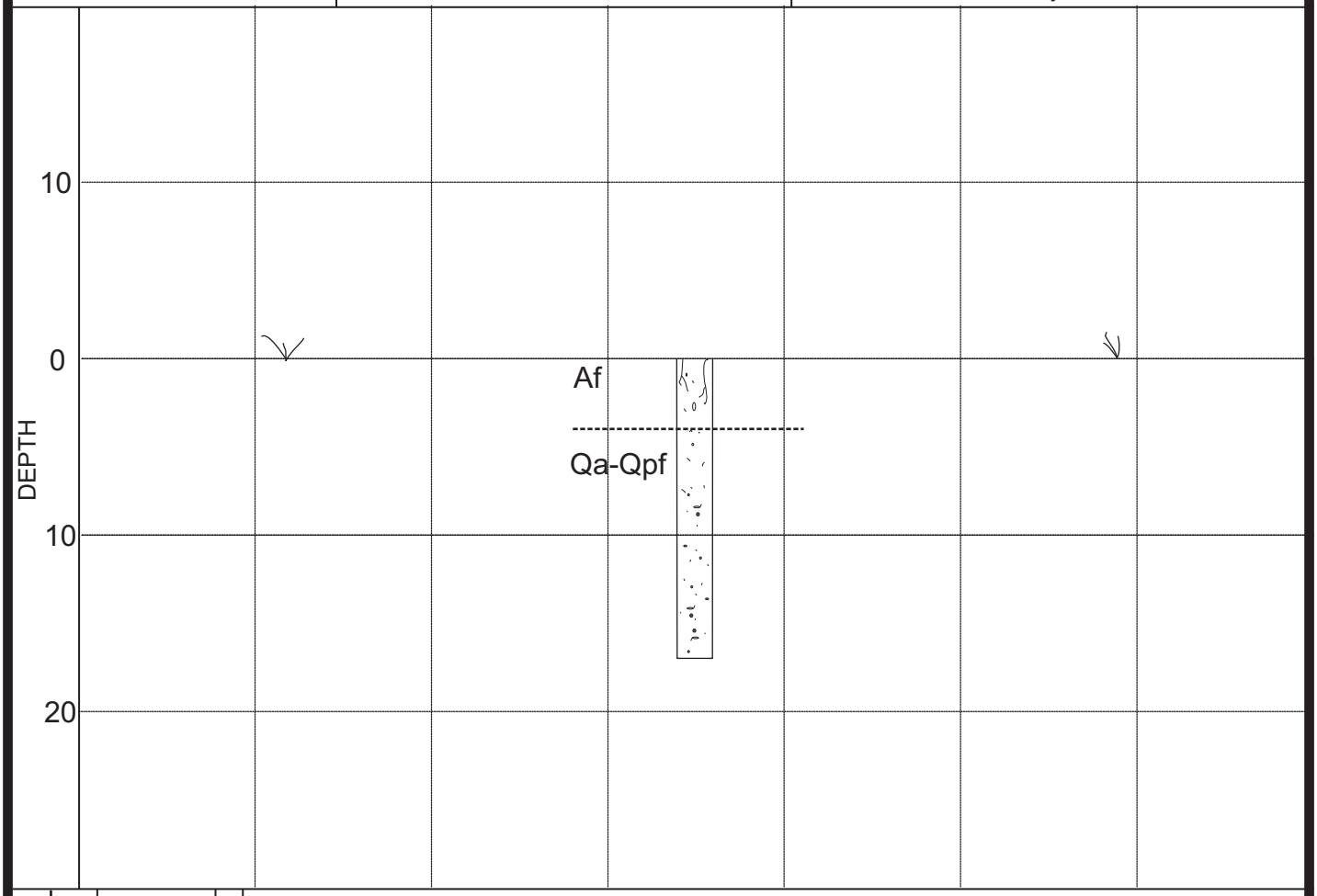
GRAPHIC LOG

APPROXIMATE SCALE : 1"=10'

TEST EXCAVATION : 3

DATE LOGGED : 7/6/20 BY : YMH

ADDRESS: Lost Canyon Rd. & Harriman Dr.



RING	BULK	SAMPLE DEPTH	Blows	LOCATION : See Site Map DESCRIPTION: Classification (USCS), color, moisture, consistency etc.
		2 4 6 8 10 12 14 16 18 20 22 24 26 28		0-4' Artificial Fill (Af): Clayey silt, medium brown, slightly moist, medium dense to dense 4-10' Alluvium-Flood Plain Deposits (Qa-Qfp): Silty sand to sandy silt, medium brown, slightly moist, medium dense @ 10' Silt, trace sand & gravel, caliche light yellow, brown, slightly moist, medium dense to firm @15' Sandy silt to silty sand, trace common gravels, light olive moist yellow brown, moist, medium dense End At 17', Artificial Fill To 4', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 2445-04	New Urban West Inc. Metro Walk	PLATE

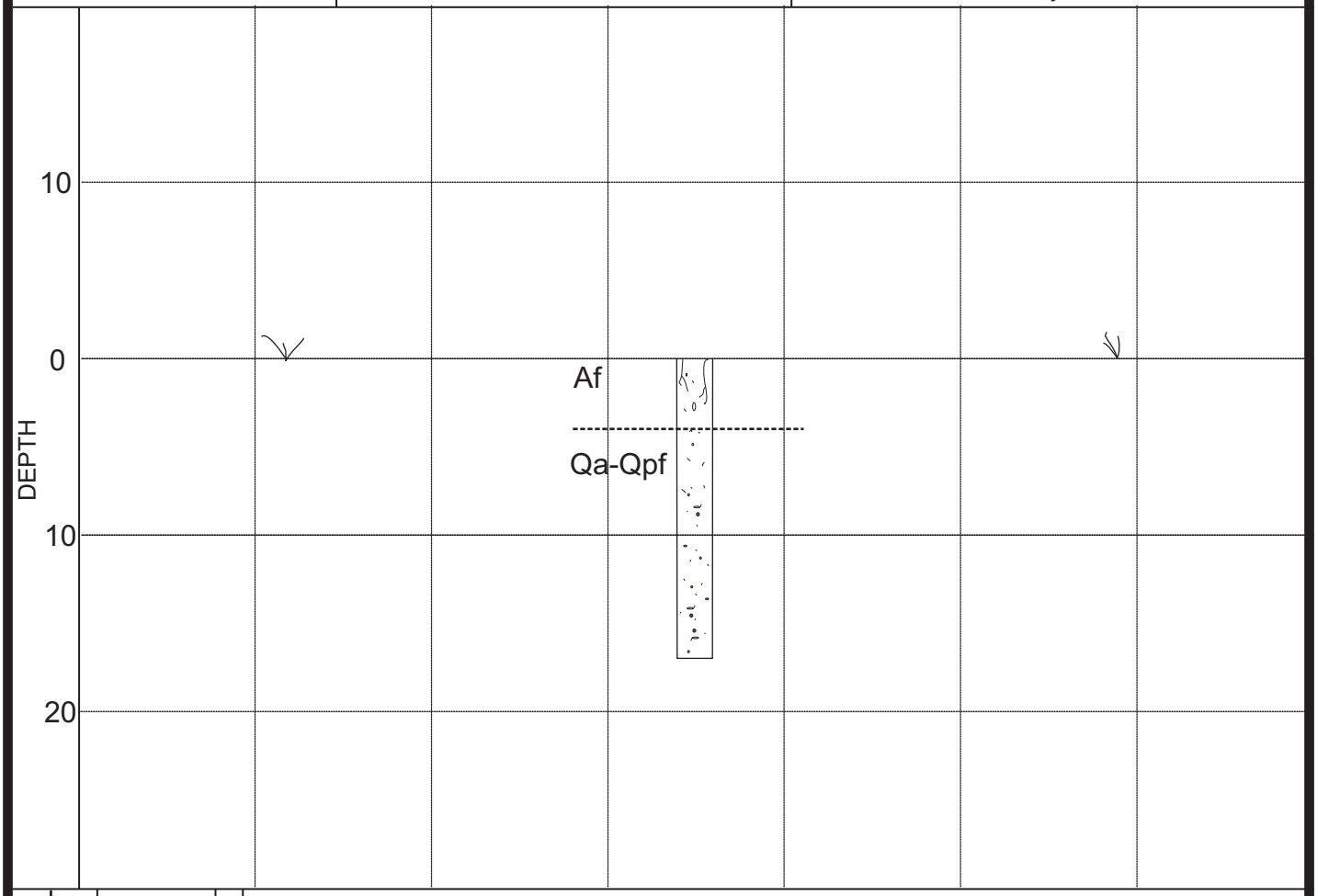
GRAPHIC LOG

APPROXIMATE SCALE : 1"=10'

DATE LOGGED : 7/6/20 BY : YMH

TEST EXCAVATION : 4

ADDRESS: Lost Canyon Rd. & Harriman Dr.



RING	BULK	SAMPLE DEPTH	Blows

LOCATION : See Site Map

DESCRIPTION: Classification (USCS), color, moisture, consistency etc.

2
4
6
8
10
12
14
16
18
20
22
24
26
28

0-4' Artificial Fill (Af):
Clayey silt, medium brown, slightly moist, medium dense to dense

4-10' Alluvium-Flood Plain Deposits (Qa-Qfp):
Silty clay to clayey silt, gray brown, medium brown, moist, firm to stiff

@ 10' Silty sand to sandy silt, trace gravels, caliche, light brown, tan, moist, medium dense

@15' Sandy silt to silty sand, caliche, light brown, yellow brown, slightly moist, firm

End At 17', Artificial Fill To 4', No Water, No Caving

FEFFER GEO CONSULTING	F.N. 2445-04	New Urban West Inc. Metro Walk	PLATE

SUMMARY

OF

CONE PENETRATION TEST DATA

Project:

New Urban West, Inc. – Metrowalk
27327 English Oak Court
Santa Clarita, CA
April 15, 2020

Prepared for:

Ms. Yvette Hays
Feffer Geological Consulting
1990 S. Bundy Drive, Ste 400
Los Angeles, CA 90025
Office (310) 207-5048 / Fax (310) 826-0182

Prepared by:

KEHOE TESTING & ENGINEERING
5415 Industrial Drive
Huntington Beach, CA 92649-1518
Office (714) 901-7270 / Fax (714) 901-7289
www.kehoetesting.com

TABLE OF CONTENTS

SUMMARY

OF

CONE PENETRATION TEST DATA

1. INTRODUCTION

This report presents the results of a Cone Penetration Test (CPT) program carried out for the New Urban West, Inc. - Metrowalk project located at 27327 English Oak Court in Santa Clarita, California. The work was performed by Kehoe Testing & Engineering (KTE) on April 15, 2020. The scope of work was performed as directed by Feffer Geological Consulting personnel.

2. SUMMARY OF FIELD WORK

The fieldwork consisted of performing CPT soundings at six locations to determine the soil lithology. A summary is provided in **TABLE 2.1**.

LOCATION	DEPTH OF CPT (ft)	COMMENTS/NOTES:
CPT-1	50	
CPT-2	50	
CPT-3	50	
CPT-4	50	
CPT-5	50	
CPT-6	49	

TABLE 2.1 - Summary of CPT Soundings

3. FIELD EQUIPMENT & PROCEDURES

The CPT soundings were carried out by **KTE** using an integrated electronic cone system manufactured by Vertek. The CPT soundings were performed in accordance with ASTM standards (D5778). The cone penetrometers were pushed using a 30-ton CPT rig. The cone used during the program was a 15 cm^2 cone and recorded the following parameters at approximately 2.5 cm depth intervals:

- Cone Resistance (qc)
- Sleeve Friction (fs)
- Dynamic Pore Pressure (u)
- Inclination
- Penetration Speed

The above parameters were recorded and viewed in real time using a laptop computer. Data is stored at the KTE office for up to 2 years for future analysis and reference. A complete set of baseline readings was taken prior to each sounding to determine temperature shifts and any zero load offsets. Monitoring base line readings ensures that the cone electronics are operating properly.

4. CONE PENETRATION TEST DATA & INTERPRETATION

The Cone Penetration Test data is presented in graphical form in the attached Appendix. These plots were generated using the CPeT-IT program. Penetration depths are referenced to ground surface. The soil behavior type on the CPT plots is derived from the attached CPT SBT plot (Robertson, "Interpretation of Cone Penetration Test…", 2009) and presents major soil lithologic changes. The stratigraphic interpretation is based on relationships between cone resistance (qc), sleeve friction (fs), and penetration pore pressure (u). The friction ratio (Rf), which is sleeve friction divided by cone resistance, is a calculated parameter that is used along with cone resistance to infer soil behavior type. Generally, cohesive soils (clays) have high friction ratios, low cone resistance and generate excess pore water pressures. Cohesionless soils (sands) have lower friction ratios, high cone bearing and generate little (or negative) excess pore water pressures.

The CPT data files have also been provided. These files can be imported in CPeT-IT (software by GeoLogismiki) and other programs to calculate various geotechnical parameters.

It should be noted that it is not always possible to clearly identify a soil type based on qc, fs and u. In these situations, experience, judgement and an assessment of the pore pressure data should be used to infer the soil behavior type.

If you have any questions regarding this information, please do not hesitate to call our office at (714) 901-7270.

Sincerely,

KEHOE TESTING & ENGINEERING

Steven P. Kehoe
President

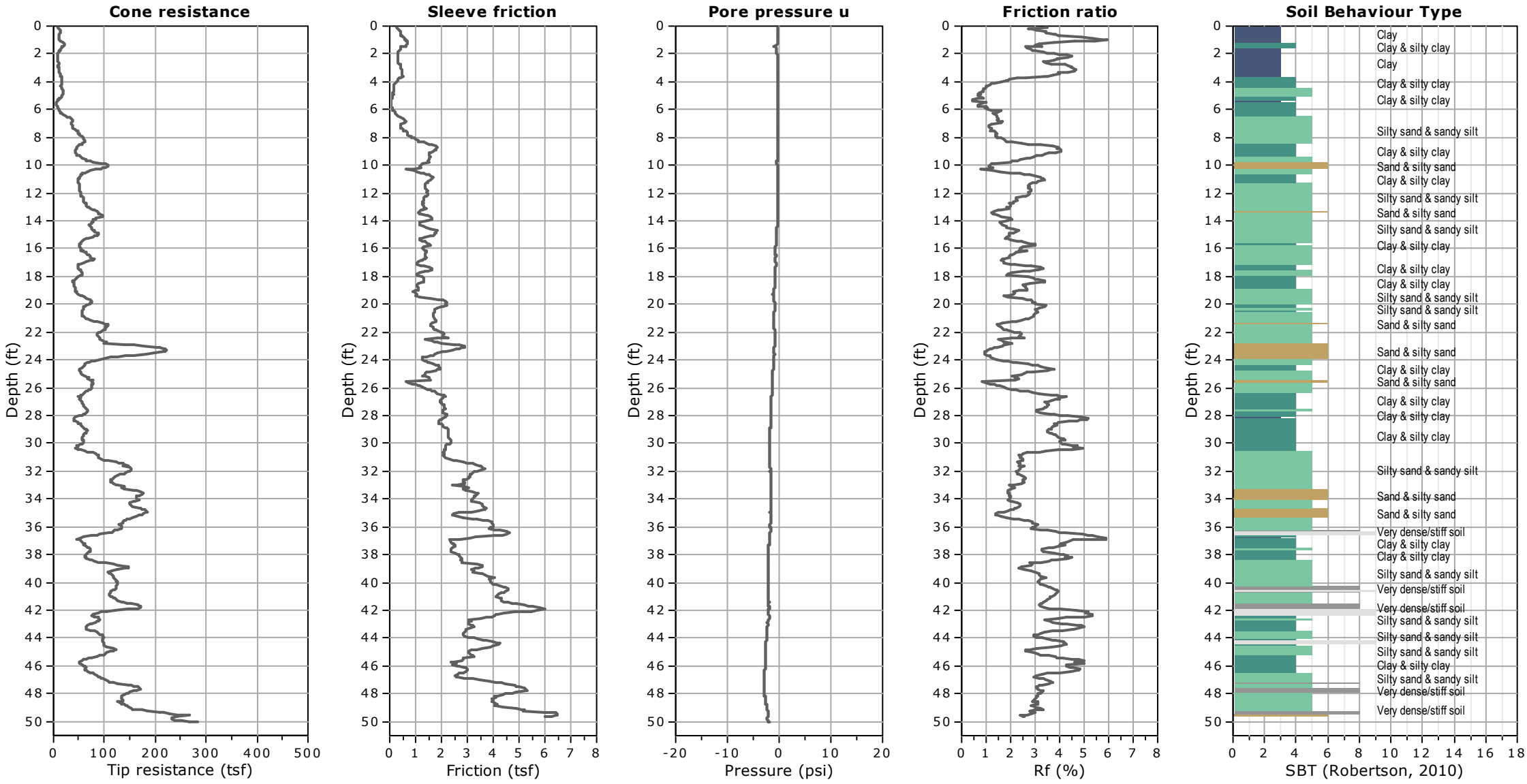
04/17/20-wt-1652

APPENDIX

Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Feffer Geological Consulting / New Urban-Metrowalk**
Location: **Santa Clarita, CA**

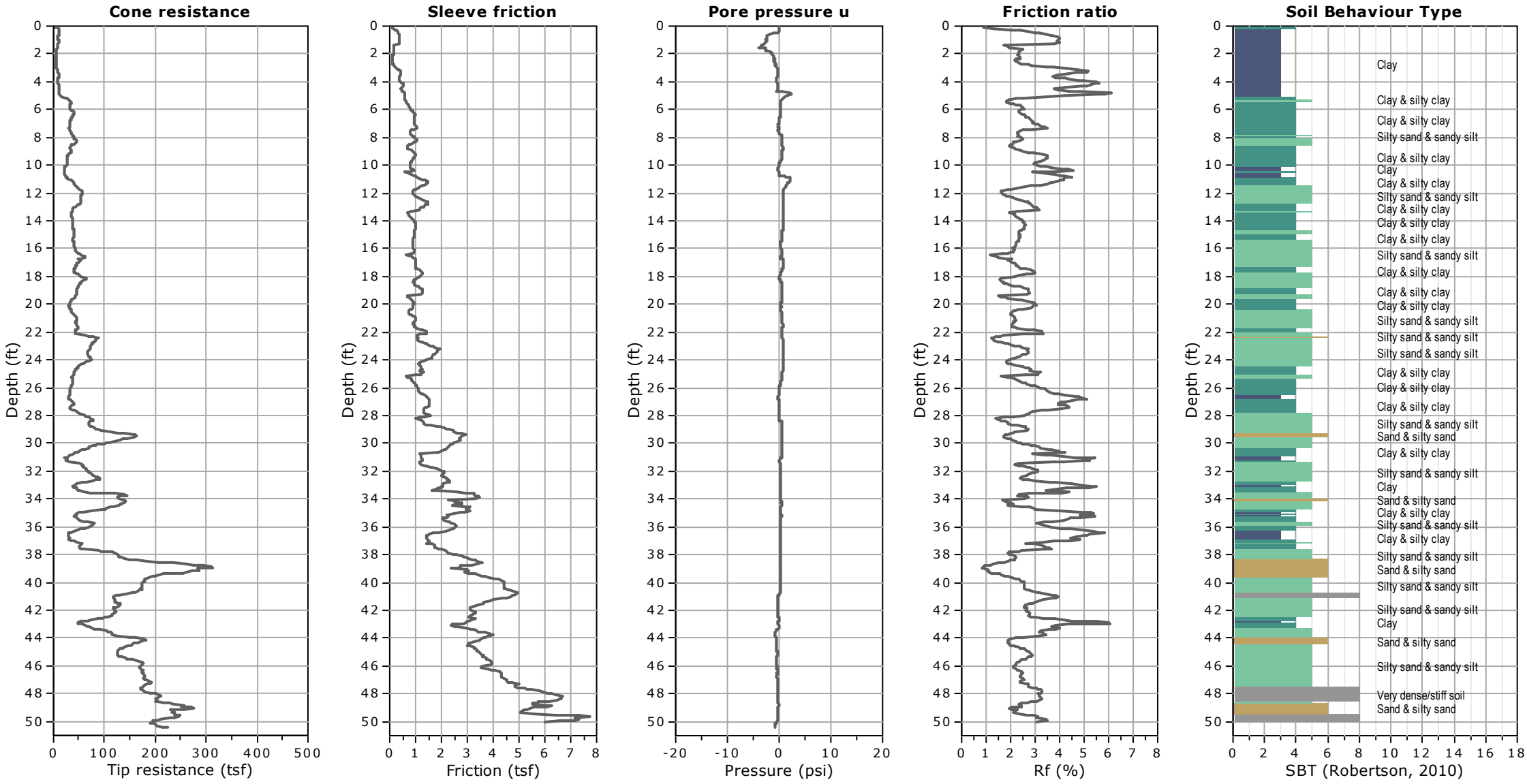
CPT-1
Total depth: 50.07 ft, Date: 4/15/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Feffer Geological Consulting / New Urban-Metrowalk**
Location: **Santa Clarita, CA**

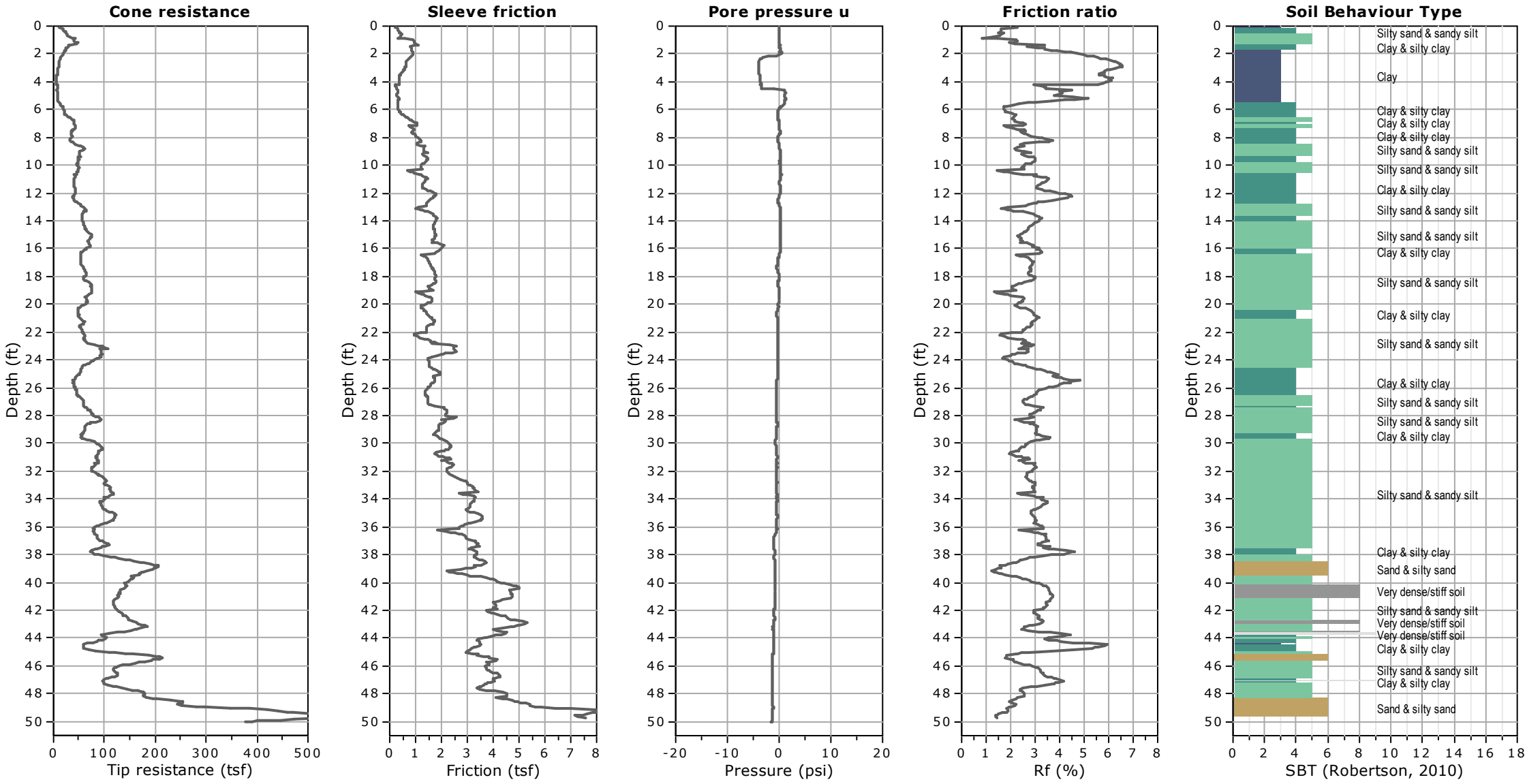
CPT-2
Total depth: 50.41 ft, Date: 4/15/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Feffer Geological Consulting / New Urban-Metrowalk**
Location: **Santa Clarita, CA**

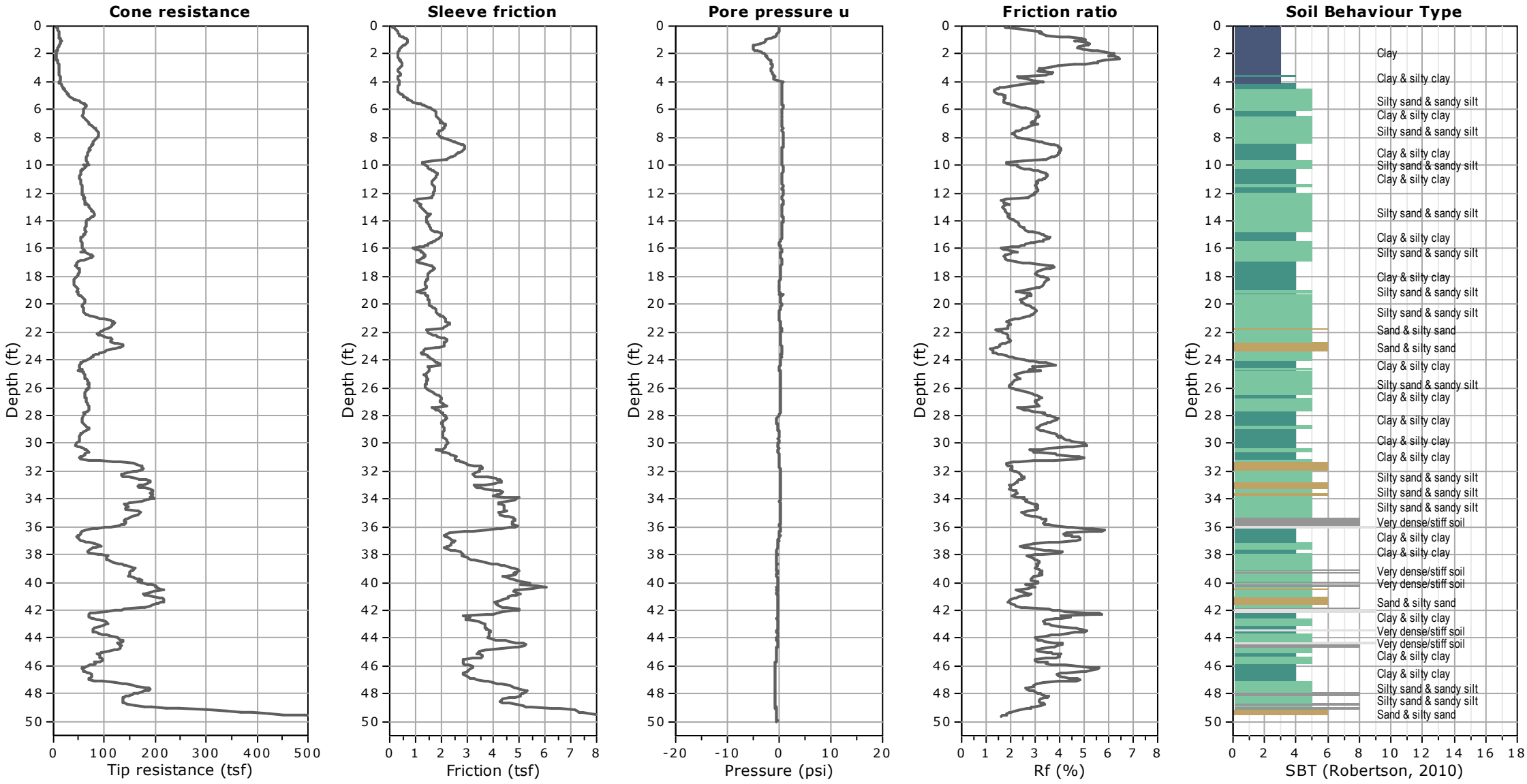
CPT-3
Total depth: 50.07 ft, Date: 4/15/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Feffer Geological Consulting / New Urban-Metrowalk**
Location: **Santa Clarita, CA**

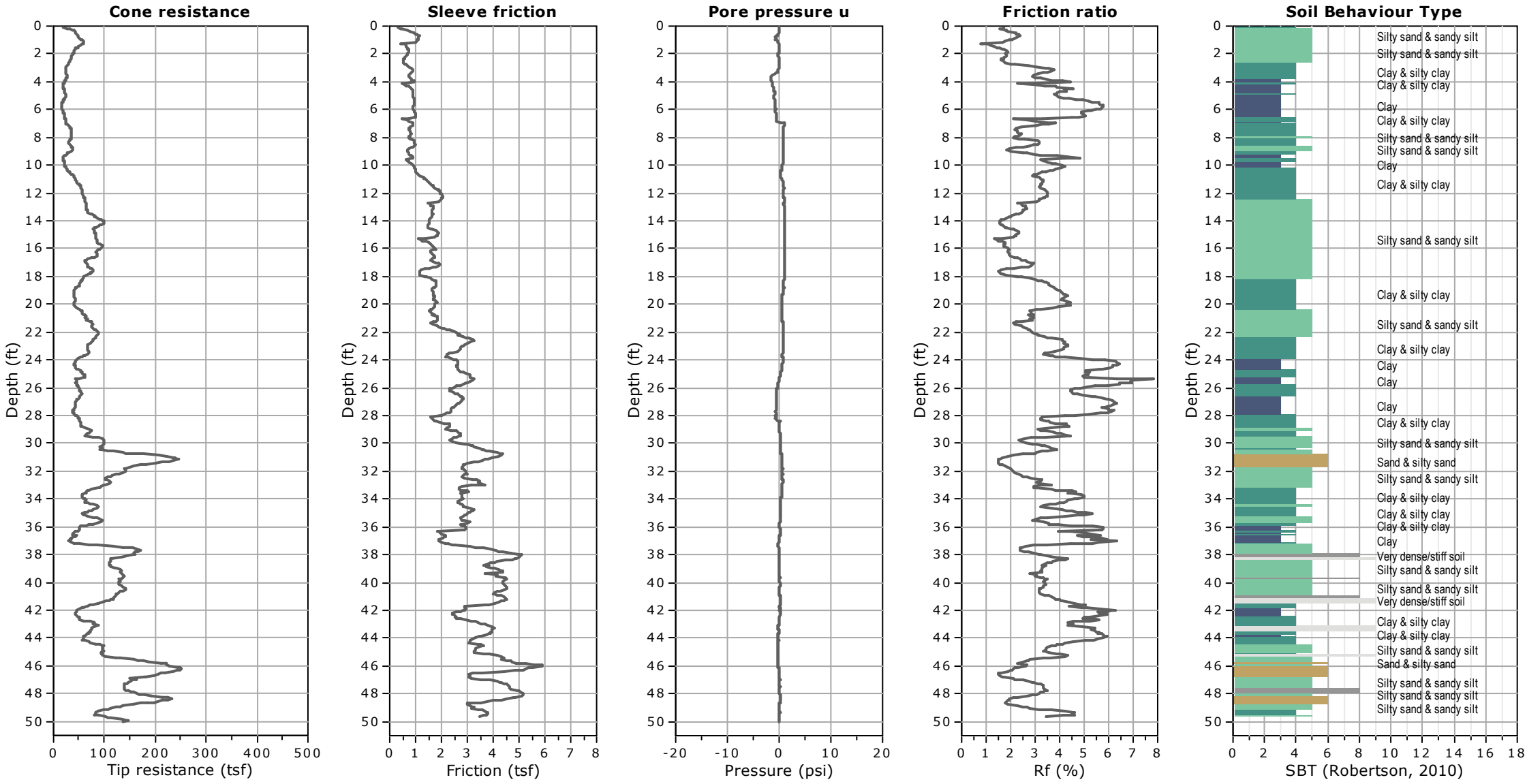
CPT-4
Total depth: 50.01 ft, Date: 4/15/2020



Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Feffer Geological Consulting / New Urban-Metrowalk**
Location: **Santa Clarita, CA**

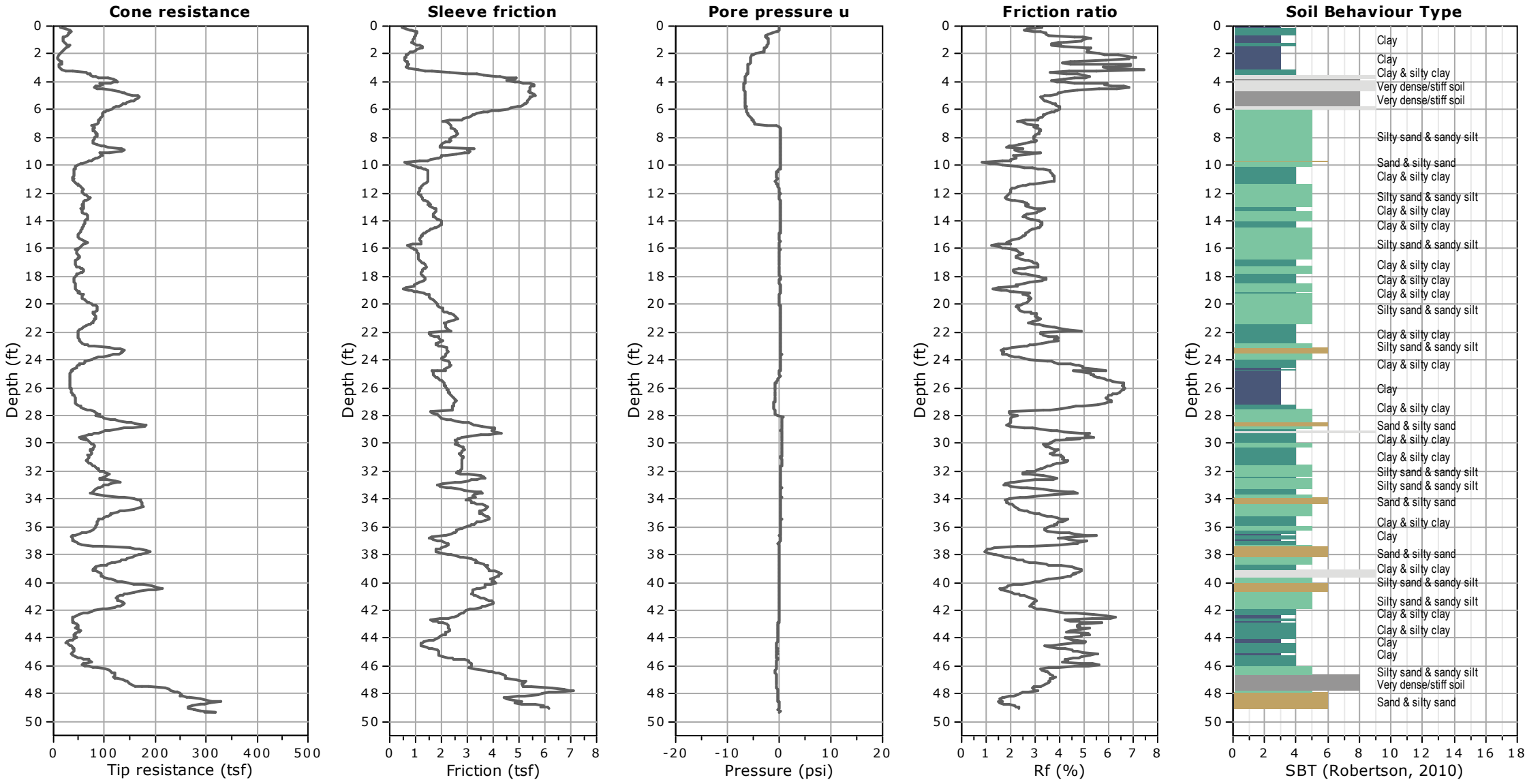
CPT-5
Total depth: 50.03 ft, Date: 4/15/2020



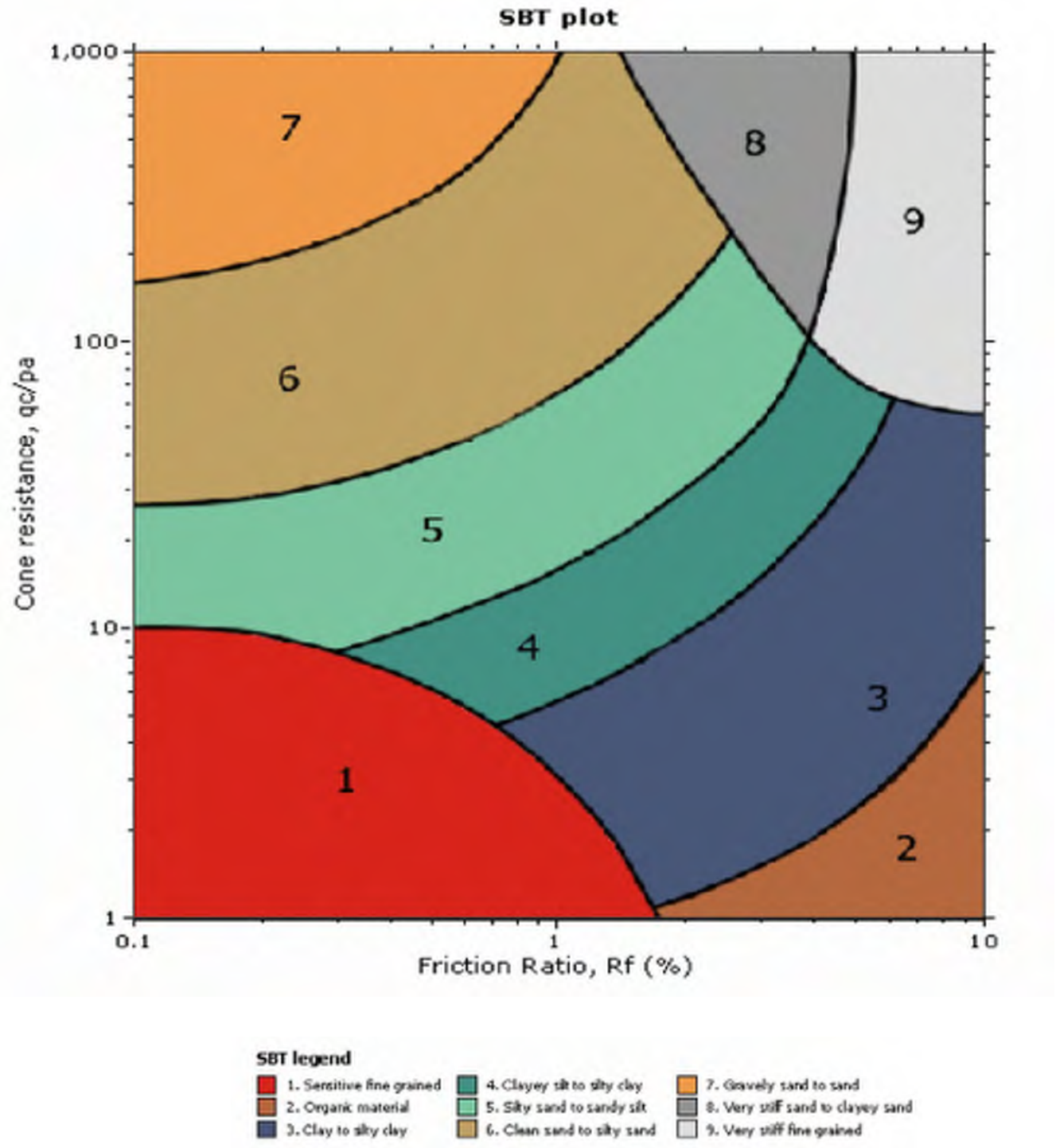
Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Feffer Geological Consulting / New Urban-Metrowalk**
Location: **Santa Clarita, CA**

CPT-6
Total depth: 49.38 ft, Date: 4/15/2020



Kehoe Testing & Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com



APPENDIX 'B'

Laboratory Testing & Engineering

SL20.3331
June 3, 2020

Feffer Geological Consulting
1990 S. Bundy Drive
4th Floor
Los Angeles, California 90025

Attn: Joshua R. Feffer

Subject: Laboratory Testing

Site: Terminus of Lost Canyon Road
Canyon Country, Santa Clarita, California

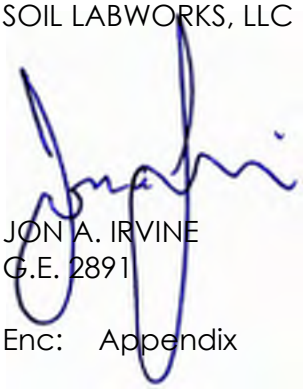
Job: FEFFER/NEW URBAN WEST, INC.-METRO WALK – 2445-04

Laboratory testing for the subject property was performed by Soil Labworks, LLC., under the supervision of the undersigned Engineer. Samples of the earth materials were obtained from the subject property by personnel of Feffer Geological and transported to the laboratory of Soil Labworks for testing and analysis. The laboratory tests performed are described and results are attached.

Services performed by this facility for the subject property were conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions.

Respectfully Submitted:

SOIL LABWORKS, LLC



JON A. IRVINE
G.E. 2891

Enc: Appendix

2500 Townsgate Road, Suite E, Westlake Village, California 91361
(805) 370-1338 FAX (805) 371-4693

APPENDIX

Laboratory Testing

Sample Retrieval - Drill Rig

Samples of earth materials were obtained at frequent intervals by driving a thick-walled steel sampler conforming to the most recent version of ASTM D 3550/D 3550M-17 with successive drops of a 140 pound hammer falling 30". The earth material was retained in brass rings of 2.416 inches inside diameter and 1.00 inch height. The central portion of the sample was stored in close-fitting, water-tight containers for transportation to the laboratory. Standard Penetration Tests (SPT) were performed at discrete intervals within the 8 inch diameter, hollow stem auger borings drilled on the site. The tests were performed using the 1-3/8 inch inside diameter, split-barrel sampler in accordance with ASTMD1586-11. Standard penetration test samples were retained in air-tight bags.

Moisture Density

The field moisture content and dry density were determined for each of the soil samples. The dry density was determined in pounds per cubic foot following ASTM 2937-17e2. The moisture content was determined as a percentage of the dry soil weight conforming to ASTM 2216-19. The results are presented below in the following table. The percent saturation was calculated on the basis of an estimated specific gravity. Description of earth materials used in this report and shown on the attached Plates were provided by the client.

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Dry Density (pcf)	Moisture Content (percent)	Percent Saturation (G_s=2.65)
B1	5	Alluvium	94.3	21.8	77
B1	10	Alluvium	113.5	1.9	11
B1	15	Alluvium	98.5	6.0	23
B1	20	Alluvium	101.3	8.8	37
B1	25	Alluvium	99.3	5.2	21
B1	30	Alluvium	109.0	4.9	25
B1	35	Alluvium	120.8	3.9	28
B2	5	Alluvium	106.7	18.2	88
B2	10	Alluvium	95.5	13.8	50
B2	15	Alluvium	105.2	10.0	46
B2	20	Alluvium	108.9	8.8	45
B2	25	Alluvium	102.8	13.1	57
B2	30	Alluvium	110.6	5.1	27
B2	35	Alluvium	105.8	7.5	36

Moisture Density (continued)

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Dry Density (pcf)	Moisture Content (percent)	Percent Saturation (G_s=2.65)
B2	40	Alluvium	109.1	7.4	38
B2	45	Alluvium	106.2	15.7	75
B2	50	Alluvium	111.4	8.0	44
B3	5	Alluvium	108.0	10.9	54
B3	10	Alluvium	108.6	4.5	23
B3	15	Alluvium	105.7	8.8	41
B3	20	Alluvium	104.0	8.6	39
B3	25	Alluvium	108.3	6.7	34
B3	30	Alluvium	102.3	11.3	49
B4	5	Alluvium	105.2	14.4	67
B4	10	Alluvium	97.0	7.3	27
B4	15	Alluvium	107.4	9.2	45
B4	20	Alluvium	100.8	11.0	45
B5	5	Alluvium	109.3	15.4	80
B5	10	Alluvium	96.9	23.2	87
B5	15	Alluvium	109.1	6.5	33
B5	20	Alluvium	103.9	11.8	53
B5	25	Alluvium	113.3	12.1	70
B5	30	Alluvium	115.8	3.9	24
B5	35	Alluvium	113.5	4.0	23
B5	40	Alluvium	108.4	5.3	27
B5	45	Alluvium	111.0	12.2	66
B5	50	Alluvium	116.8	4.4	28
B6	5	Alluvium	111.0	10.4	56
B6	10	Alluvium	99.4	7.7	31
B6	15	Alluvium	107.3	7.2	35
B6	20	Alluvium	115.1	3.5	21
B6	25	Alluvium	113.9	5.9	35
B6	30	Alluvium	109.8	9.9	52
B6	35	Alluvium	101.1	8.8	37
B7	5	Alluvium	103.8	10.4	47
B7	10	Alluvium	96.7	8.2	31
B7	15	Alluvium	98.5	7.8	30
B7	20	Alluvium	115.0	5.7	35
B7	25	Alluvium	99.4	12.5	50
B7	30	Alluvium	110.1	16.7	88
B7	35	Alluvium	103.8	13.1	56

Moisture Density (continued)

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Dry Density (pcf)	Moisture Content (percent)	Percent Saturation (G_s=2.65)
B7	40	Alluvium	102.1	12.6	56
B7	45	Alluvium	107.7	7.2	36
B7	50	Alluvium	105.0	11.5	53

Compaction Character

Compaction tests were performed on bulk samples of the earth materials in accordance with ASTM D1557-12ei. The results of the tests are provided on the table below and on the "Moisture-Density Relationship", A-Plates. The specific gravity of the fill/alluvium was estimated from the compaction curves.

Test Pit/Boring No.	Sample Depth (Feet)	Soil Type	Maximum Dry Density (pcf)	Optimum Moisture Content (Percent)
B5	0-10	Fill/Alluvium	128.9	9.4

Shear Strength

The peak and ultimate shear strengths of the alluvium and fill/alluvium were determined by performing consolidated and drained direct shear tests in conformance with ASTM D3080/D3080M-11. The tests were performed in a strain-controlled machine manufactured by GeoMatic. The rate of deformation was 0.01 inches per minute. Samples were sheared under varying confining pressures, as shown on the "Shear Test Diagrams," B-Plates. The moisture conditions during testing are shown on the following table and on the B-Plates. The samples indicated as saturated were artificially saturated in the laboratory. All saturated samples were sheared under submerged conditions.

Test Pit/ Boring No.	Sample Depth (Feet)	Dry Density (pcf)	As-Tested Moisture Content (percent)
B3	15	105.7	23.8
B1	20	101.3	23.8
B6	25	113.9	25.3
B2	30	110.6	23.6

Consolidation

One-dimensional consolidation tests were performed on samples of the alluvium in a consolidometer manufactured by GeoMatic in conformance with ASTM D2435/D2435M-11. The tests were performed on 1-inch high samples retained in brass rings. The samples were initially loaded to approximately ½ of the field over-burden pressure and then unloaded to compensate for the effects of possible disturbance during sampling. Loads were then applied in a geometric progression and resulting deformation recorded. Water was added at a specific load to determine the effect of saturation. The results are plotted on the "Consolidation Test," C-Plates.

Expansion Index

The expansive character of the fill/alluvium was determined by performing Expansion Index Tests in accordance with UBC 18.2 and ASTM 4829-11. A bulk sample of earth material was compacted at a specific moisture content using one fifth the compacted energy for the modified proctor test. The sample was then saturated and the expansion measured. The results of the tests are provided on the following table.

Test Pit No.	Sample Depth (Feet)	Soil Type	Expansion Index
B5	0-10	Fill/Alluvium	46

Atterberg Limits

Atterberg limits determinations were performed on samples of the soil/alluvium in accordance with ASTMD4318-17e1. The test results are presented on the table below.

Test Pit/Boring No.	Sample Depth (Ft)	Soil Type	Liquid Limit	Plastic Limit	Plasticity Index
B2	5	Alluvium	37	21	16
B2	22.5	Alluvium	23	23	0
B5	27.5	Alluvium	31	23	8

Grain Size Distribution

The amount of material in the soil finer than 1 No. 200 sieve was determined on selected samples in conformance with ASTM D1140-17. Wash sieving disperses clay and other fine material that are removed from the soil during the test. The percent of fine material in the soil sample is the calculated base on the loss of mass. The results are present in the table below.

Grain Size Distribution (continued)

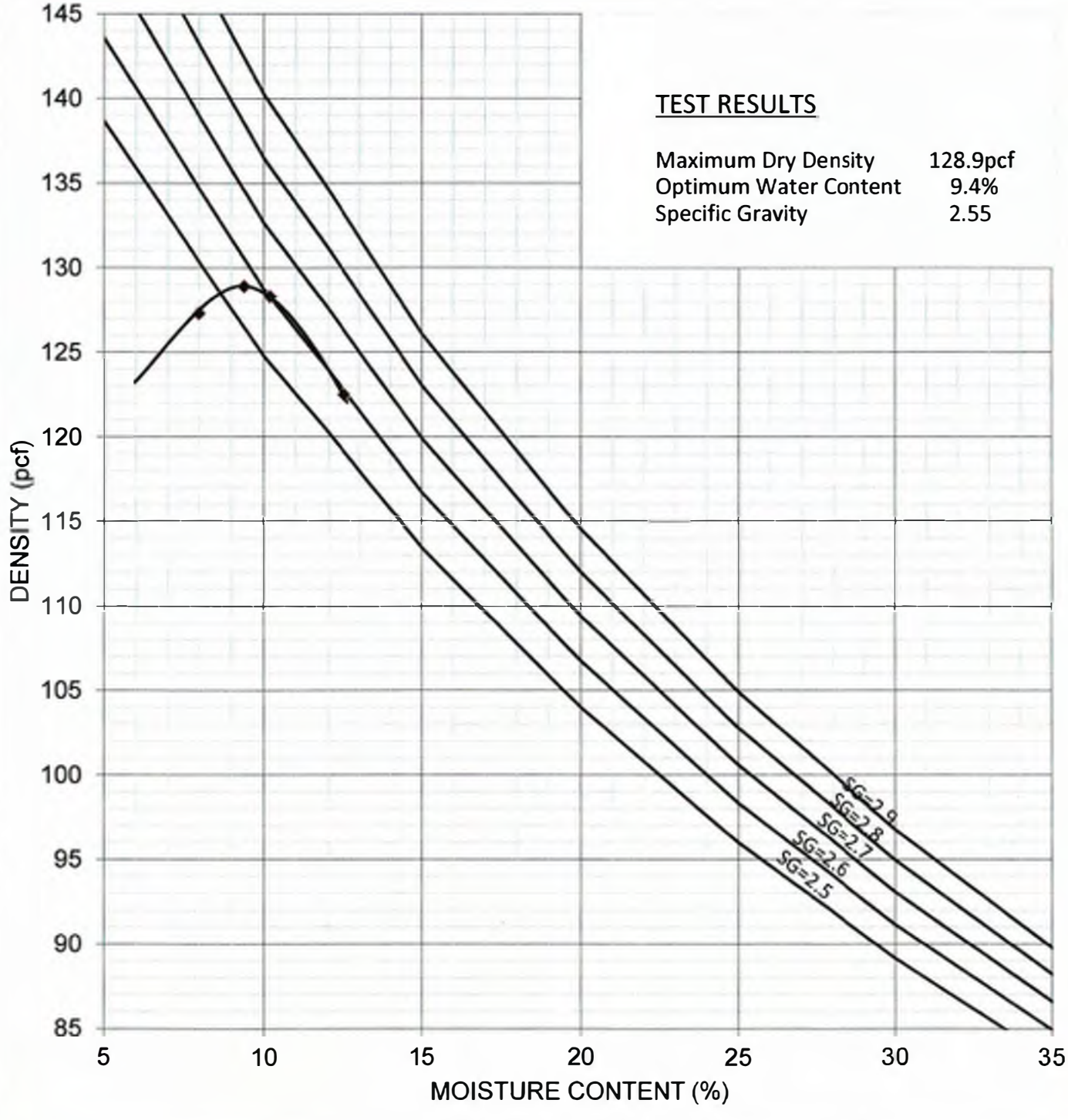
Boring No	Depth	Soil Type	(%) Passing 200 Sieve
B2	12.5	Alluvium	49.2
B5	17.5	Alluvium	52.0
B2	32.5	Alluvium	42.0
B5	47.5	Alluvium	75.7

SOIL LABWORKS LLC

MOISTURE-DENSITY RELATIONSHIP A-1

JN: **SL20.3331** CONSULTANT: **JAI**
CLIENT: **FEFFER/New Urban West, Inc.-Metro Walk**
B5 @ 0-10'
EARTH MATERIAL: **FILL/ALLUVIUM**

NOTE: ASTM Test Method D-1557-12



SOIL LABWORKS LLC

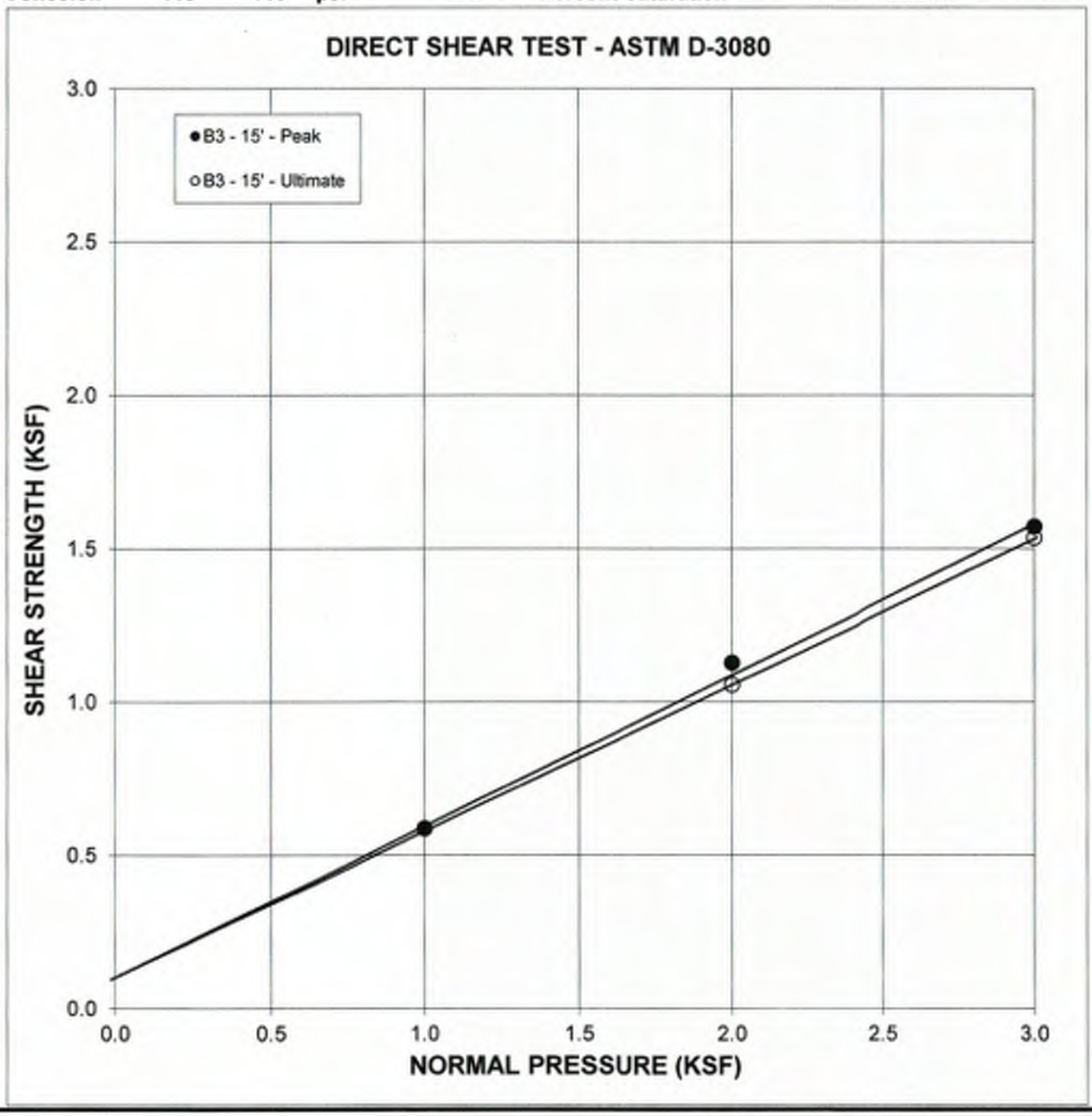
SHEAR DIAGRAM B-1

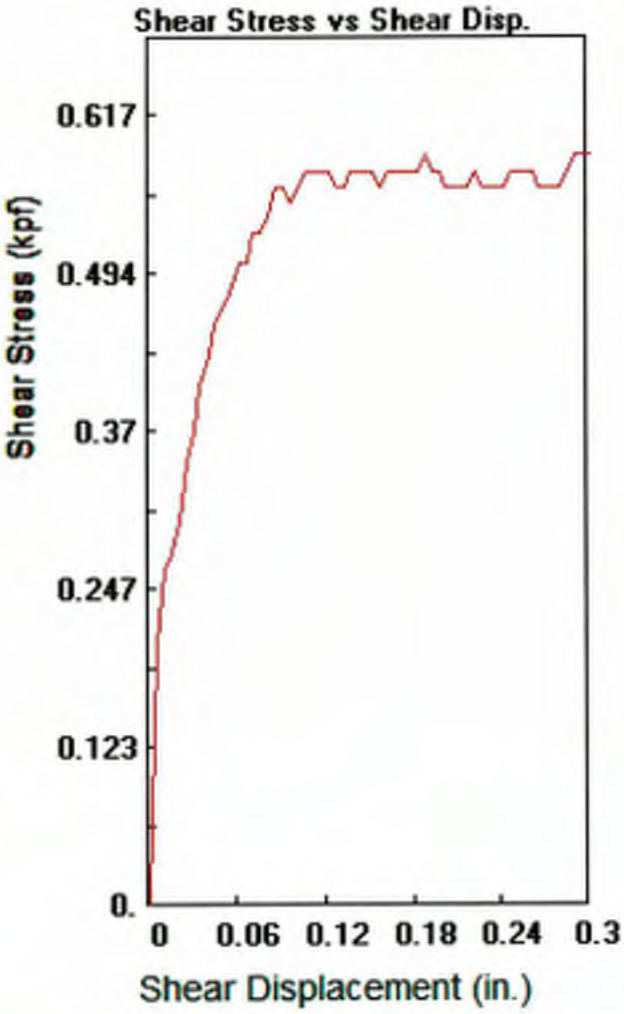
JN: SL20.3331 CONSULTANT JAI
CLIENT: Feffer/New Urban West-Metro Walk

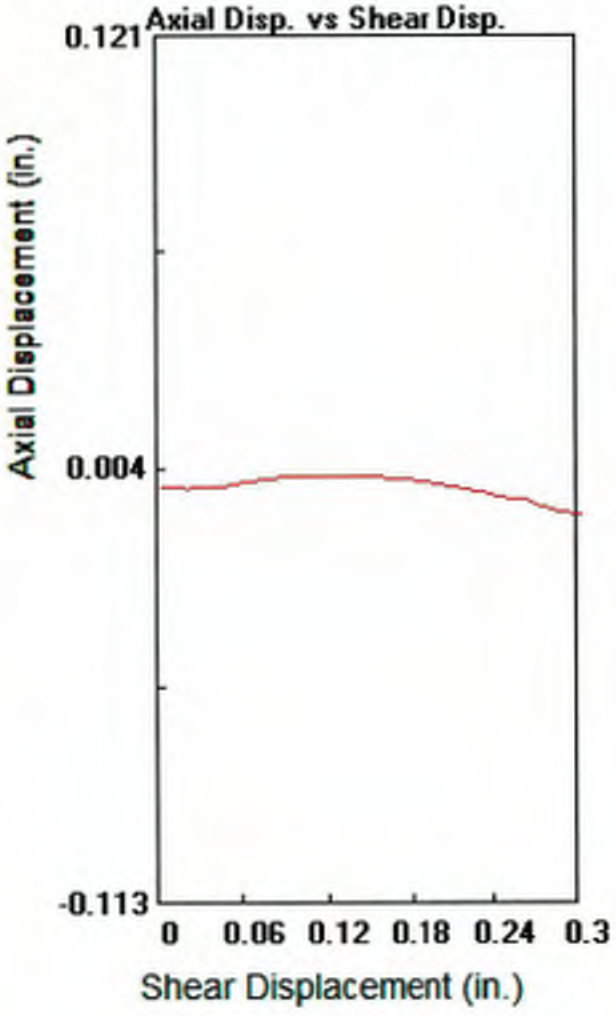
EARTH MATERIAL: ALLUVIUM

	PEAK	ULTIMATE	
Phi Angle	26	25	degrees
Cohesion	110	110	psf

Average Moisture Content	23.8%
Average Dry Density (pcf)	105.7
Percent Saturation	100.0%







Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 1

Technician: BF

Boring: B3

Axial Load: 1000 psf

Depth: 15 ft.

Shear Rate: 0.010 in./sec.

File: 3331B3151.dat

Distance: 0.30 in.

Stress at Max Def
588 0.186

Stress at Max Disp
0.296 588

Maximum Load

588 psf

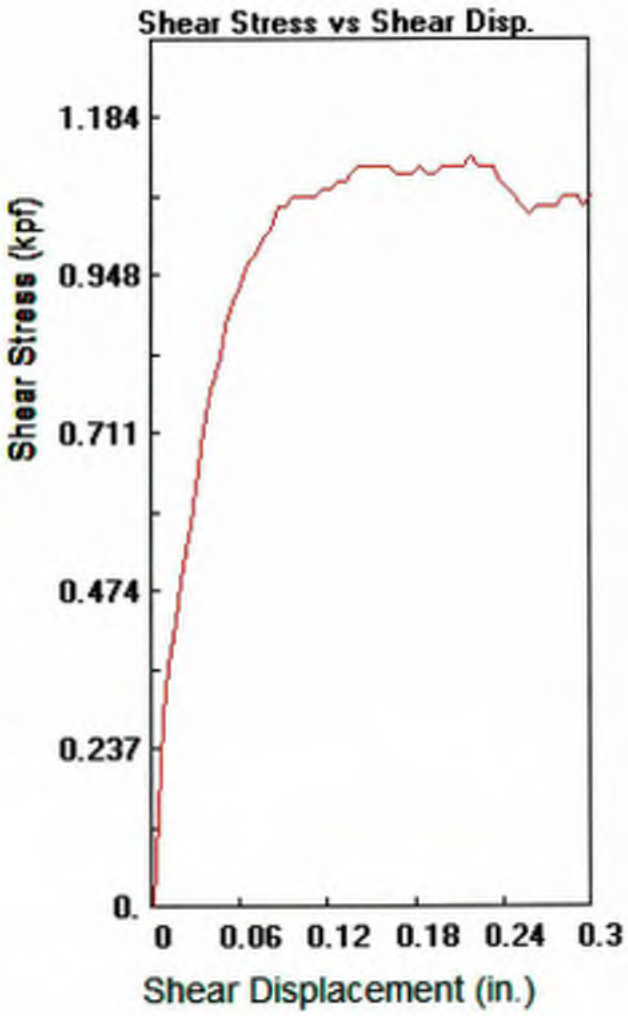
Shear Displacement at maximum Load

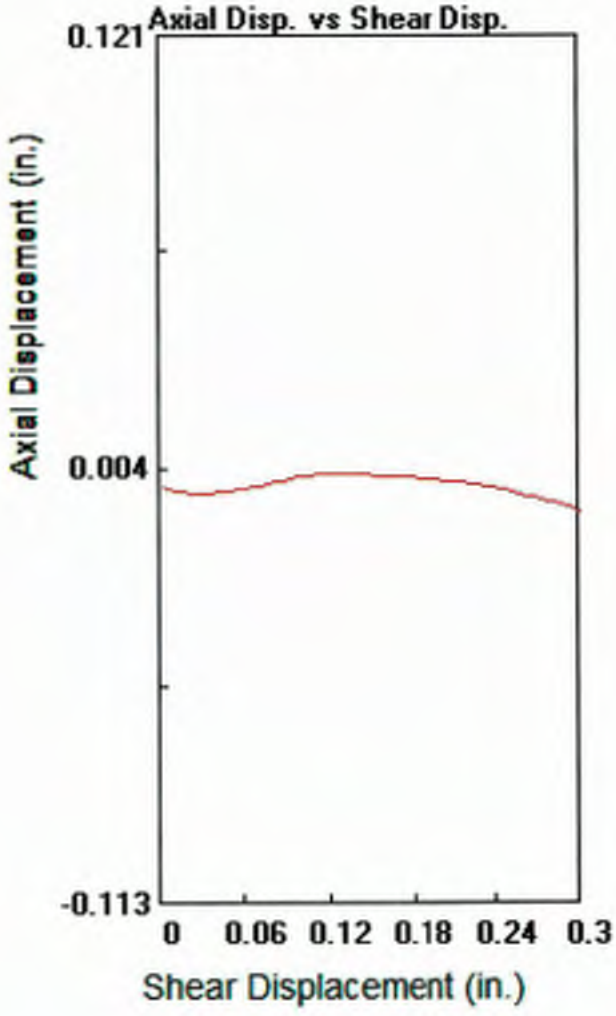
0.1856 in.

Date

5/15/2020

Soil Labworks





Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 2

Technician: BF

Boring: B3

Axial Load: 2000 psf

Depth: 15 ft.

Shear Rate: 0.010 in./sec.

File: 3331B3152.dat

Distance: 0.30 in.

Stress at Max Def
1128 0.216

Stress at Max Disp
0.295 1056

Maximum Load

1128 psf

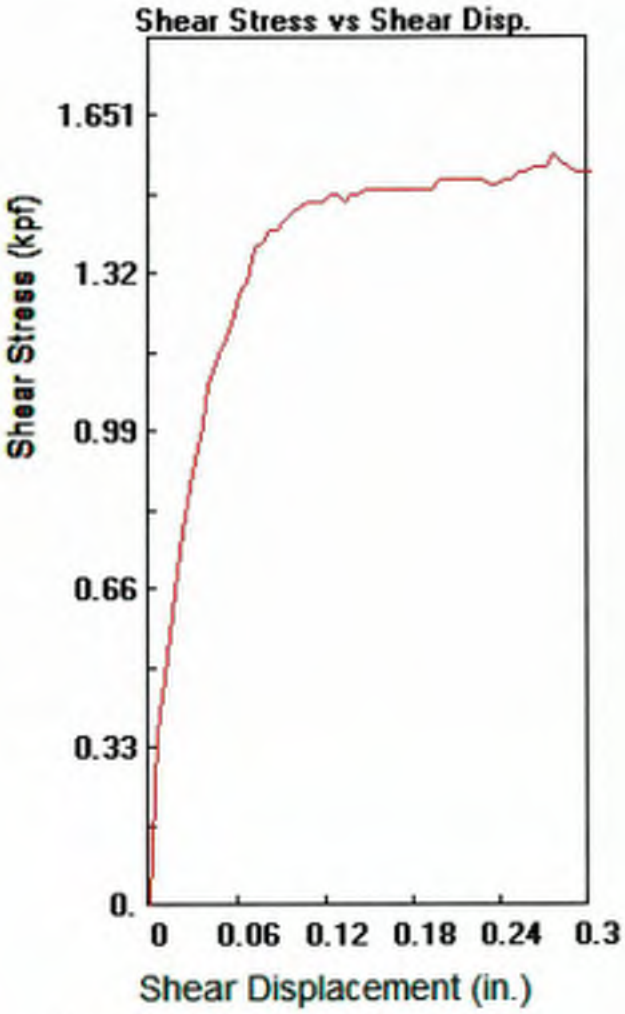
Shear Displacement at maximum Load

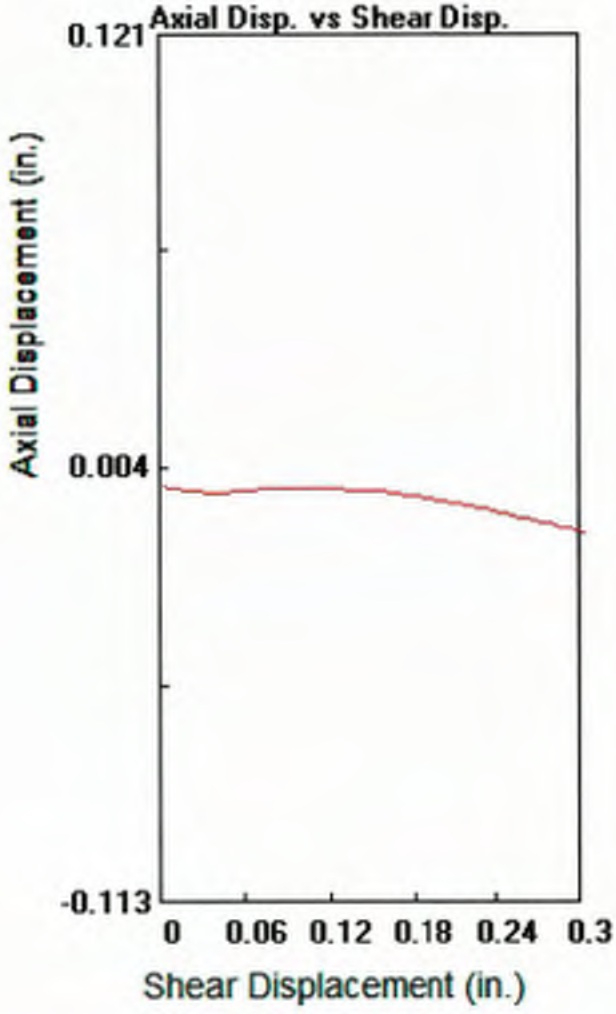
0.2156 in.

Date

5/15/2020

Soil Labworks





Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 3

Technician: BF

Boring: B3

Axial Load: 3000 psf

Depth: 15 ft.

Shear Rate: 0.010 in./sec.

File: 3331B3153.dat

Distance: 0.30 in.

Stress at Max Def
1572 0.276

Stress at Max Disp
0.296 1536

Maximum Load

1572 psf

Shear Displacement at maximum Load

0.2755 in.

Date

5/15/2020

Soil Labworks

SOIL LABWORKS LLC

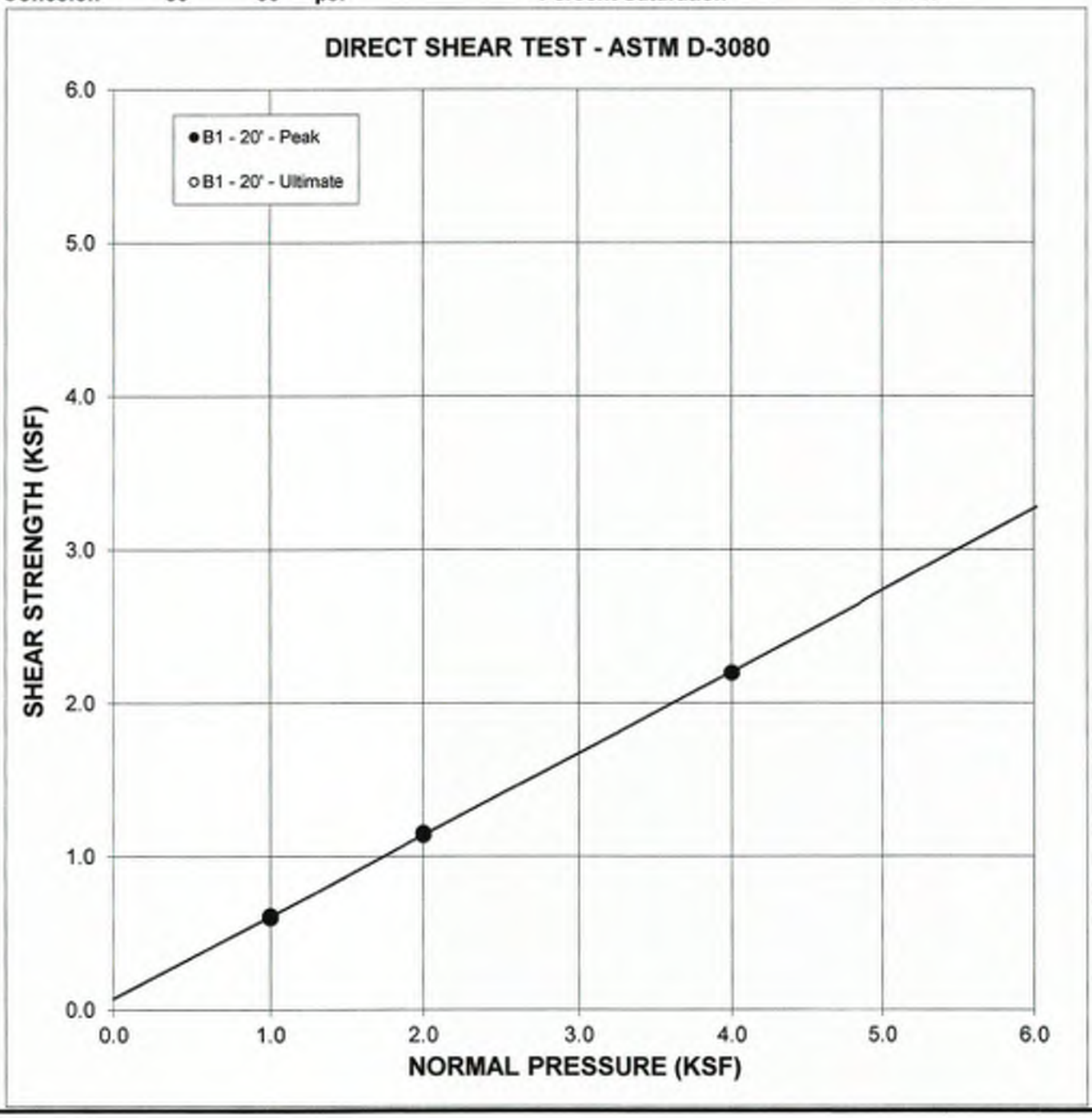
SHEAR DIAGRAM B-2

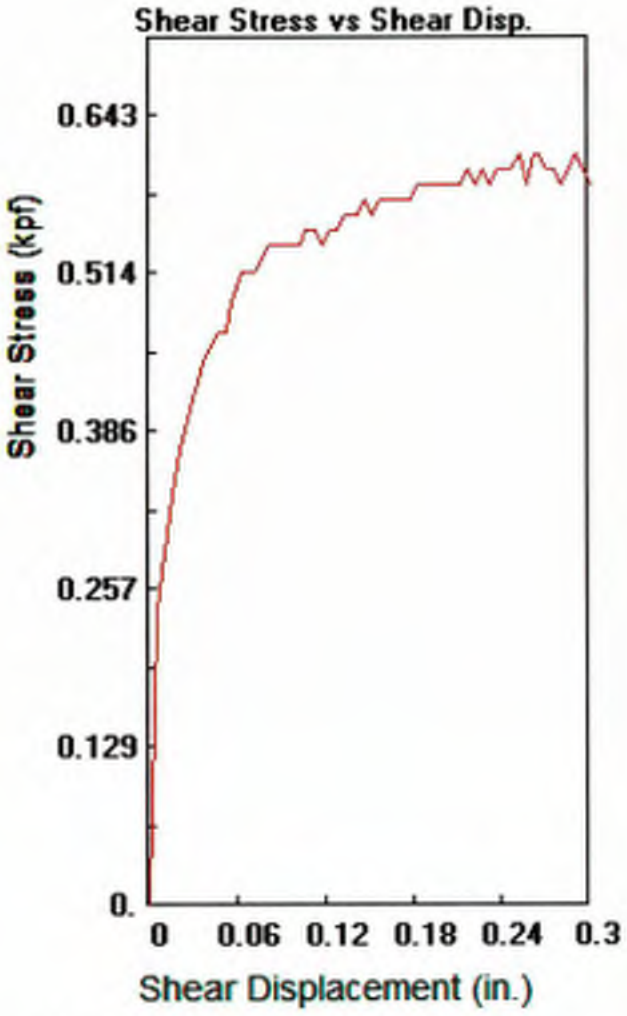
JN: SL20.3331 CONSULTANT JAI
CLIENT: Feffer/New Urban West-Metro Walk

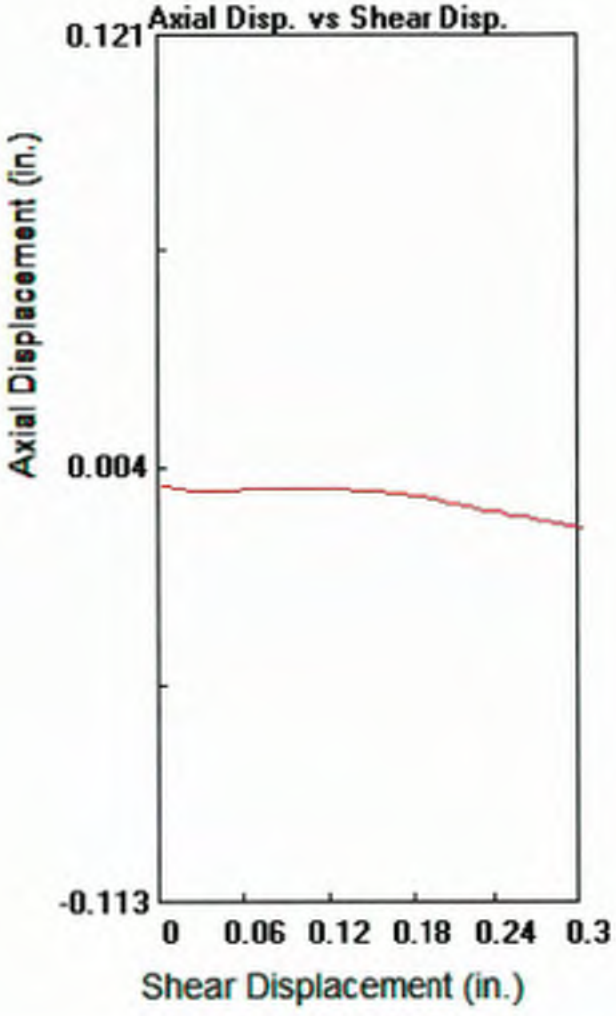
EARTH MATERIAL: ALLUVIUM

	PEAK	ULTIMATE	
Phi Angle	27.5	27.5	degrees
Cohesion	80	80	psf

Average Moisture Content	23.8%
Average Dry Density (pcf)	101.3
Percent Saturation	99.7%







Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 1

Technician: BF

Boring: B1

Axial Load: 1000 psf

Depth: 20 ft.

Shear Rate: 0.010 in./sec.

File: 3331B1201.dat

Distance: 0.30 in.

Stress at Max Def
612 0.251

Stress at Max Disp
0.296 600

Maximum Load

612 psf

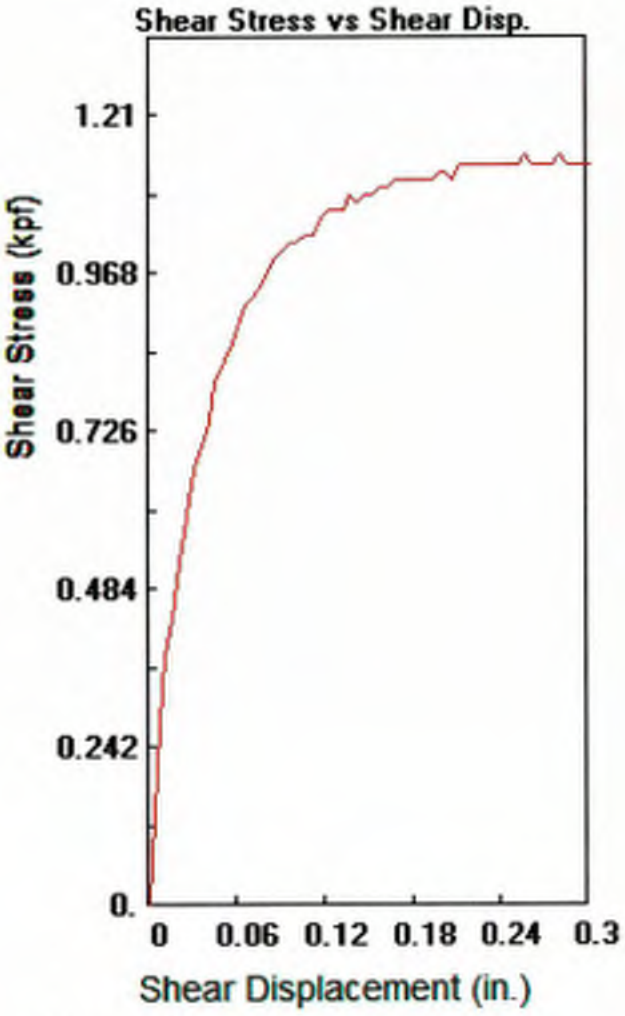
Shear Displacement at maximum Load

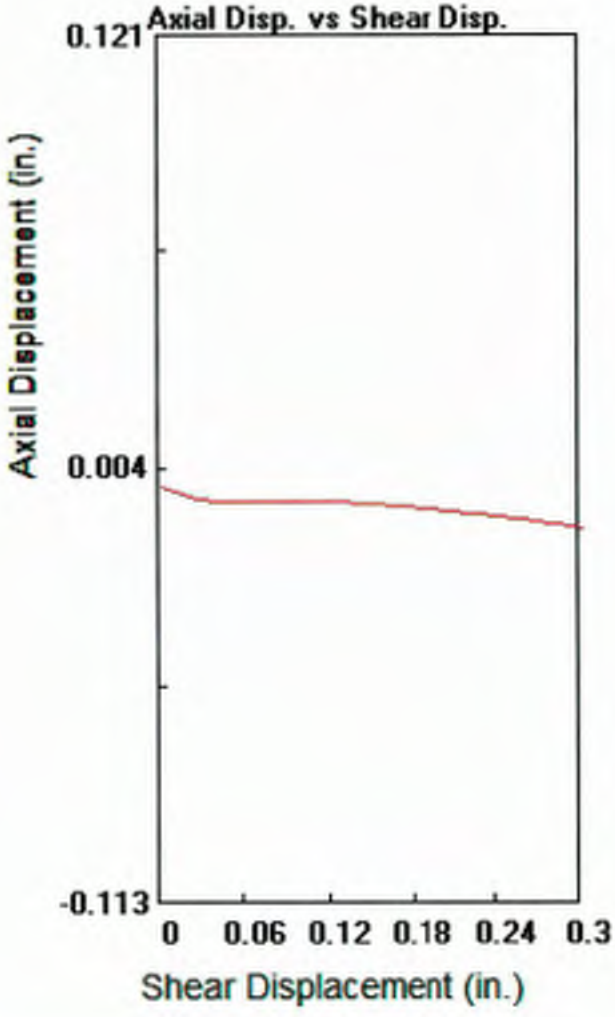
0.2506 in.

Date

5/19/2020

Soil Labworks





Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 2

Technician: BF

Boring: B1

Axial Load: 2000 psf

Depth: 20 ft.

Shear Rate: 0.010 in./sec.

File: 3331B1202.dat

Distance: 0.30 in.

Stress at Max Def
1152 0.256

Stress at Max Disp
0.296 1140

Maximum Load

1152 psf

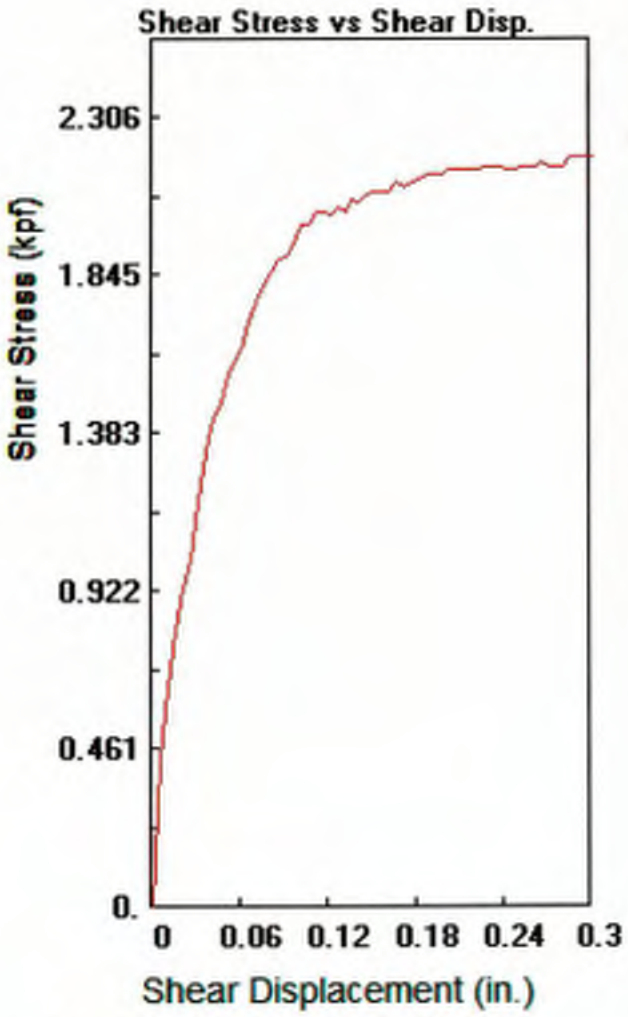
Shear Displacement at maximum Load

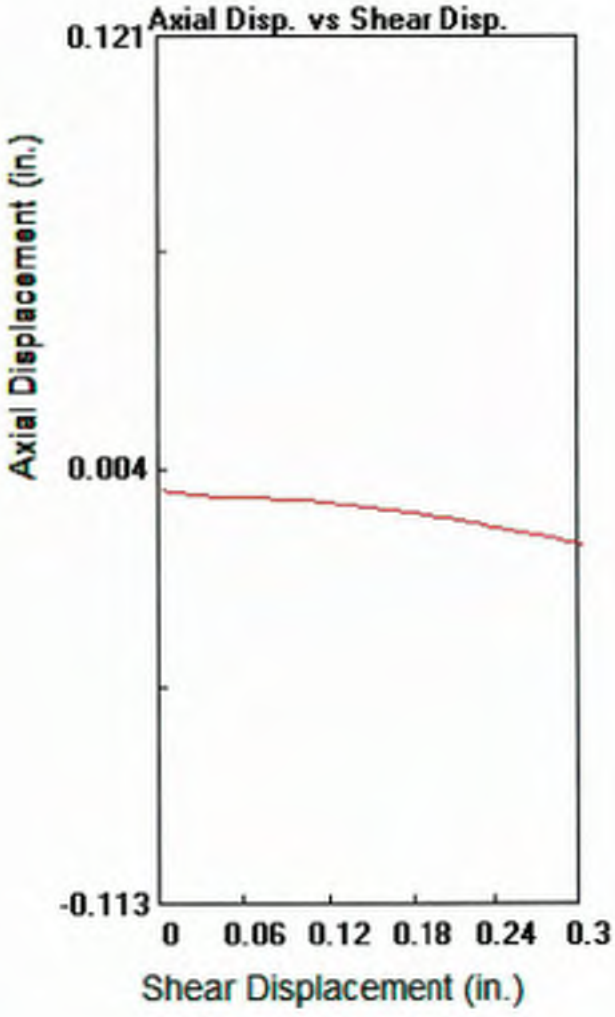
0.2557 in.

Date

5/19/2020

Soil Labworks





Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 3

Technician: BF

Boring: B1

Axial Load: 4000 psf

Depth: 20 ft.

Shear Rate: 0.010 in./sec.

File: 3331B1204.dat

Distance: 0.30 in.

Stress at Max Def
2196 0.286

Stress at Max Disp
0.296 2196

Maximum Load

2196 psf

Shear Displacement at maximum Load

0.2855 in.

Date

5/19/2020

Soil Labworks

SOIL LABWORKS LLC

SHEAR DIAGRAM B-3

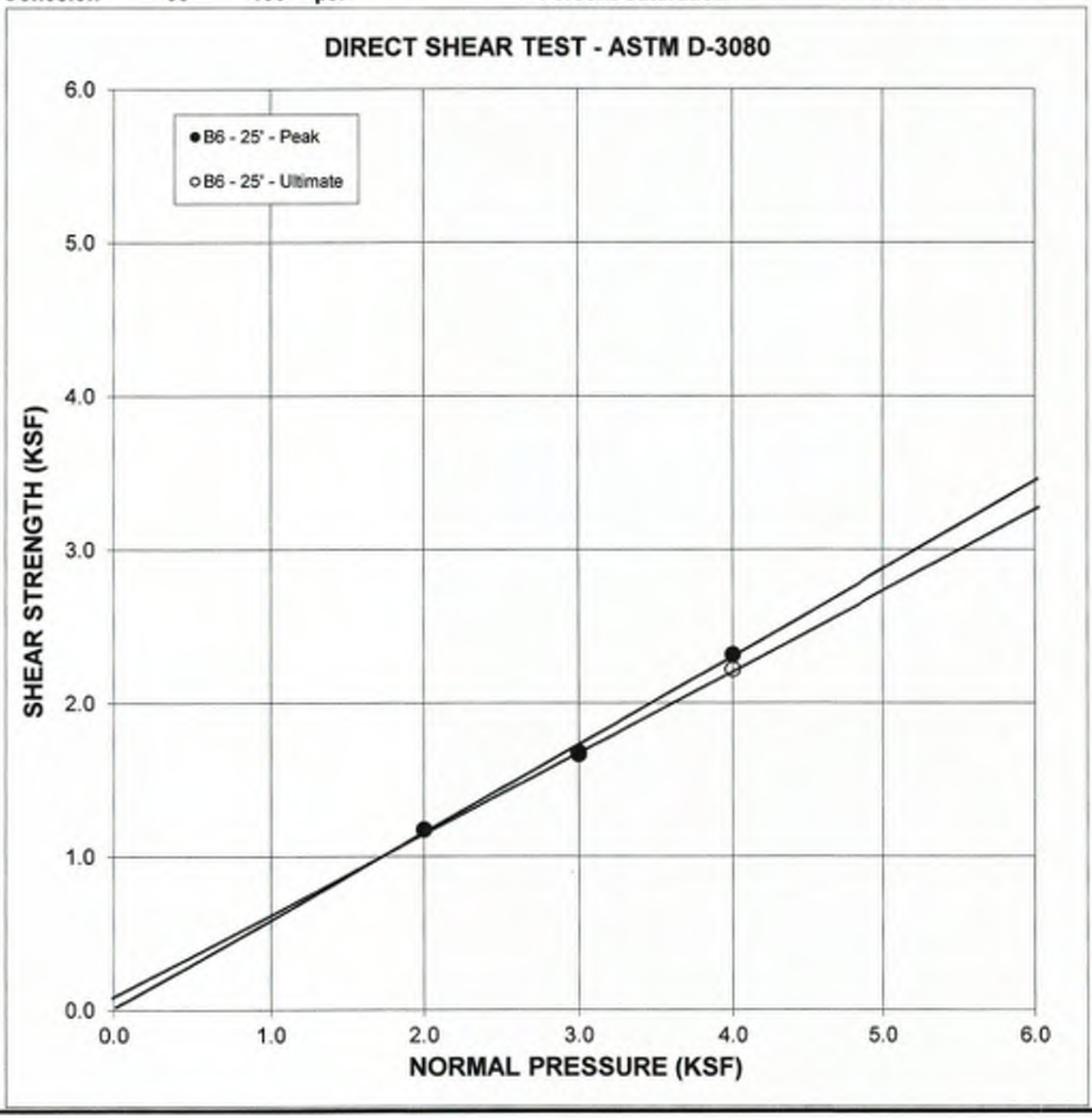
JN: SL20.3331 CONSULTANT JAI
CLIENT: Feffer/New Urban West-Metro Walk

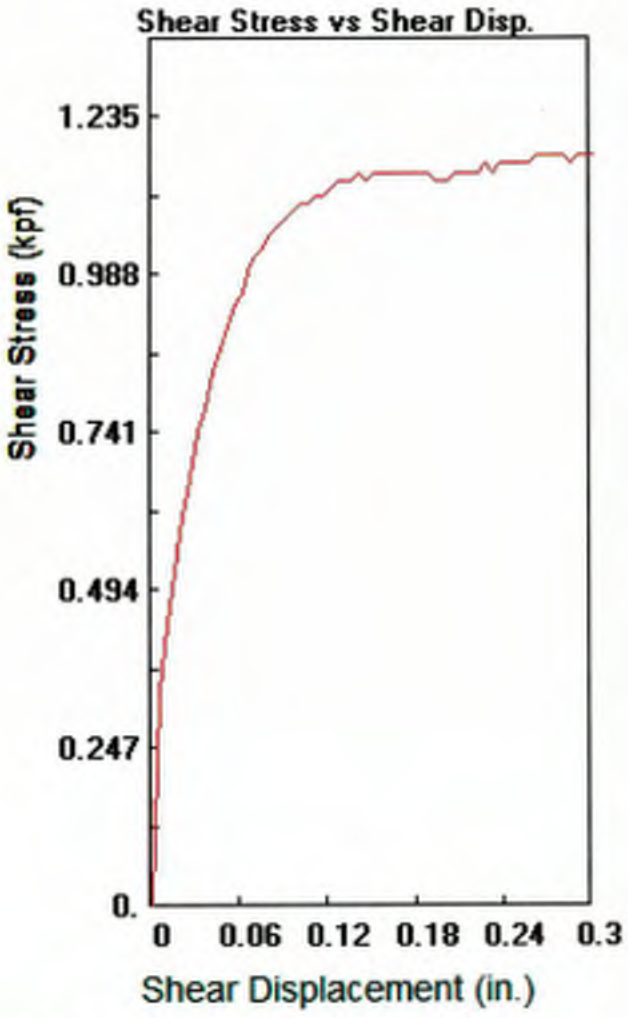
EARTH MATERIAL: ALLUVIUM

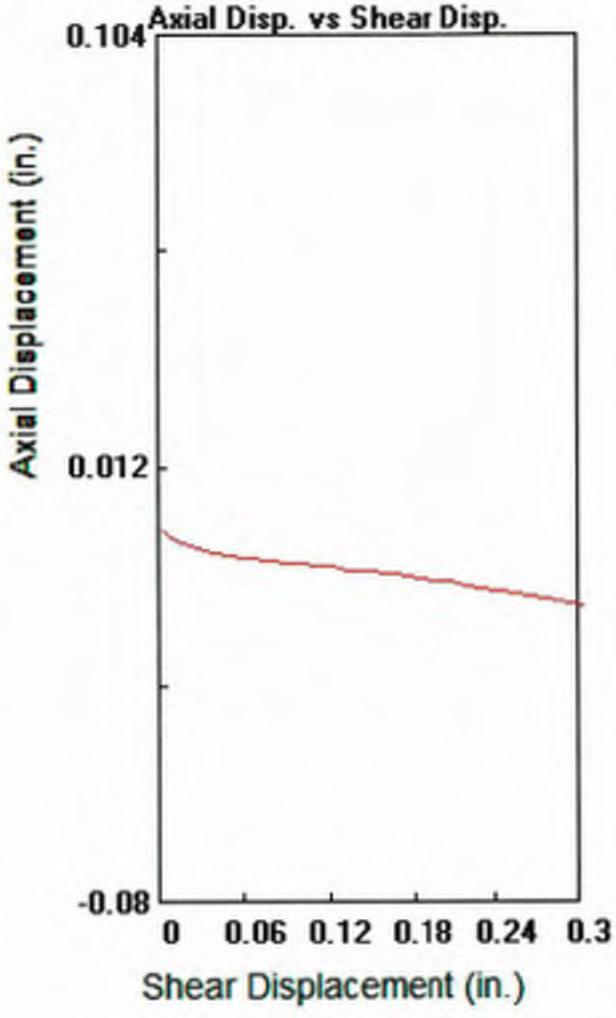
	PEAK	ULTIMATE	
Phi Angle	29	27	degrees
Cohesion	30	100	psf

Average Moisture Content	25.3%
Average Dry Density (pcf)	113.9
Percent Saturation	100.0%

DIRECT SHEAR TEST - ASTM D-3080







Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 1

Technician: BF

Boring: B6

Axial Load: 2000 psf

Depth: 25 ft.

Shear Rate: 0.010 in./sec.

File: 3331B6252.dat

Distance: 0.30 in.

Stress at Max Def
1176 0.261

Stress at Max Disp
0.296 1176

Maximum Load

1176 psf

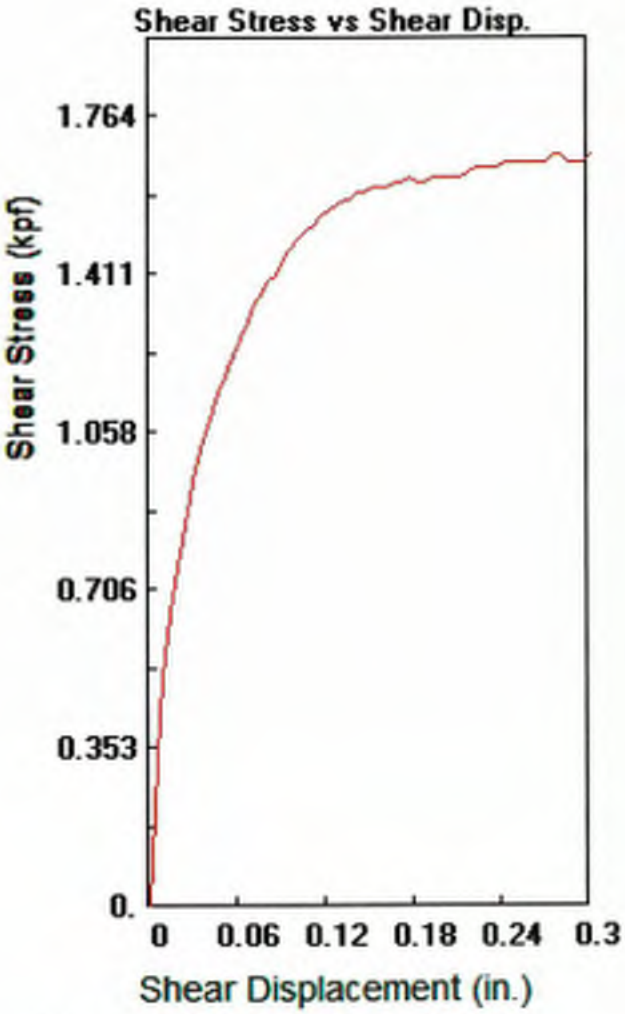
Shear Displacement at maximum Load

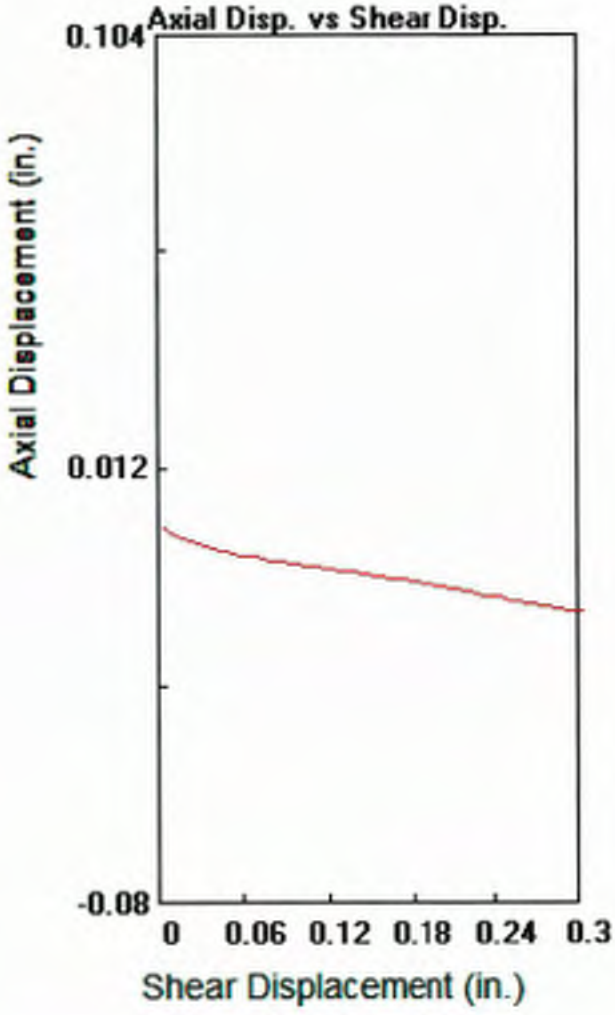
0.2606 in.

Date

5/15/2020

Soil Labworks





Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 2

Technician: BF

Boring: B6

Axial Load: 3000 psf

Depth: 25 ft.

Shear Rate: 0.010 in./sec.

File: 3331B6253.dat

Distance: 0.30 in.

Stress at Max Def
1680 0.276

Stress at Max Disp
0.296 1668

Maximum Load

1680 psf

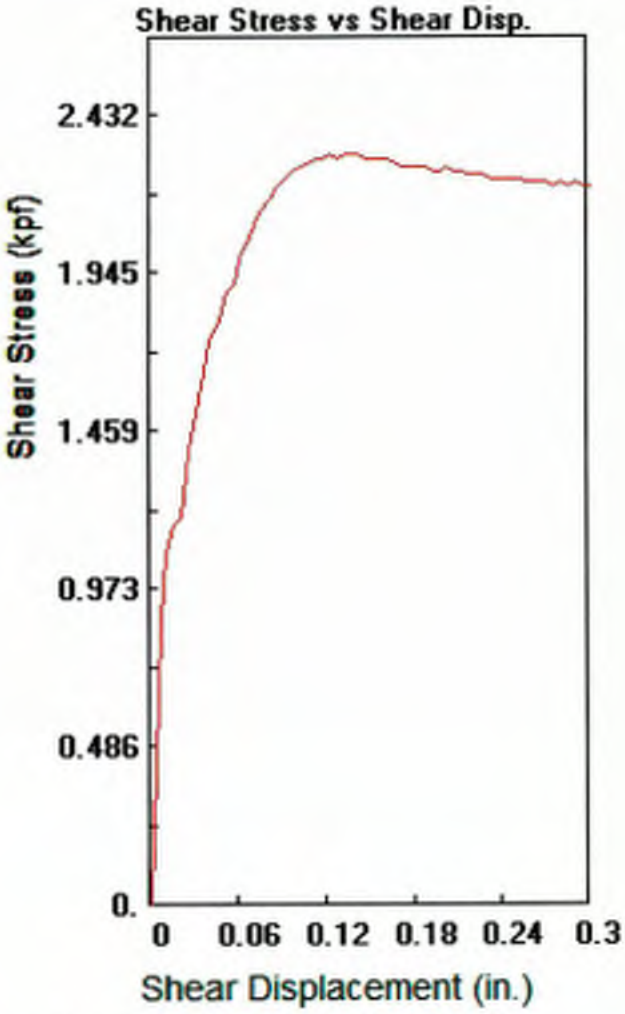
Shear Displacement at maximum Load

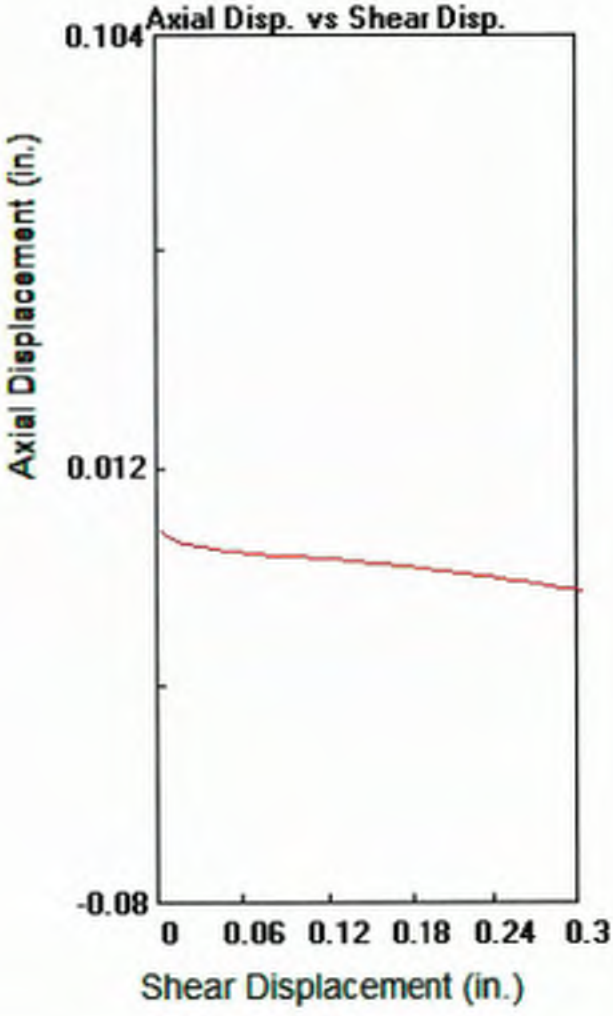
0.2755 in.

Date

5/15/2020

Soil Labworks





Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Sample: 3

Boring: B6

Depth: 25 ft.

File: 3331B6254.dat

Soil Type:QA

Technician: BF

Axial Load: 4000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Def
2316 0.121

Stress at Max Disp
0.296 2220

Maximum Load

2316 psf

Shear Displacement at maximum Load

0.1208 in.

Date

5/15/2020

Soil Labworks

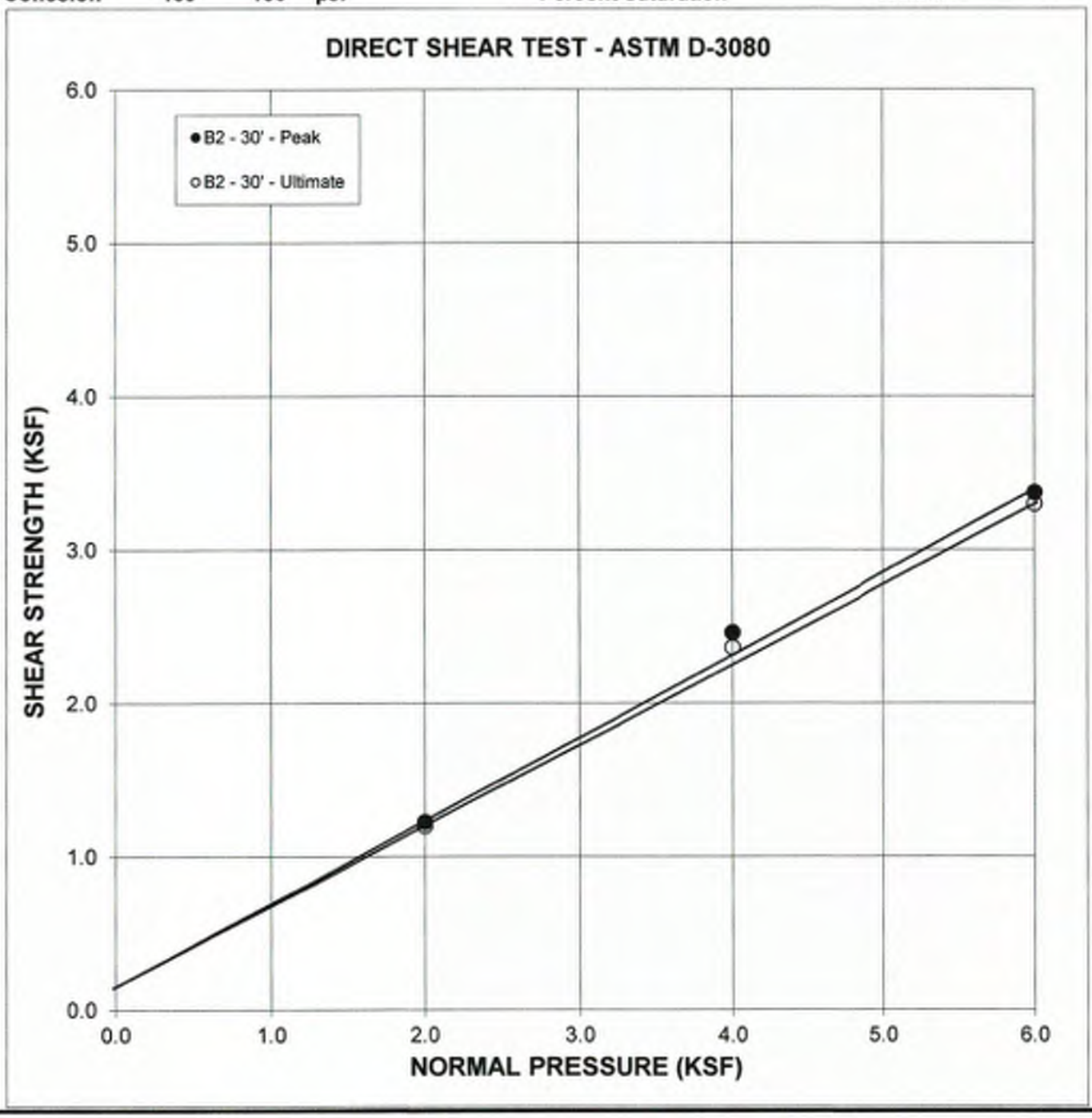
SHEAR DIAGRAM B-4

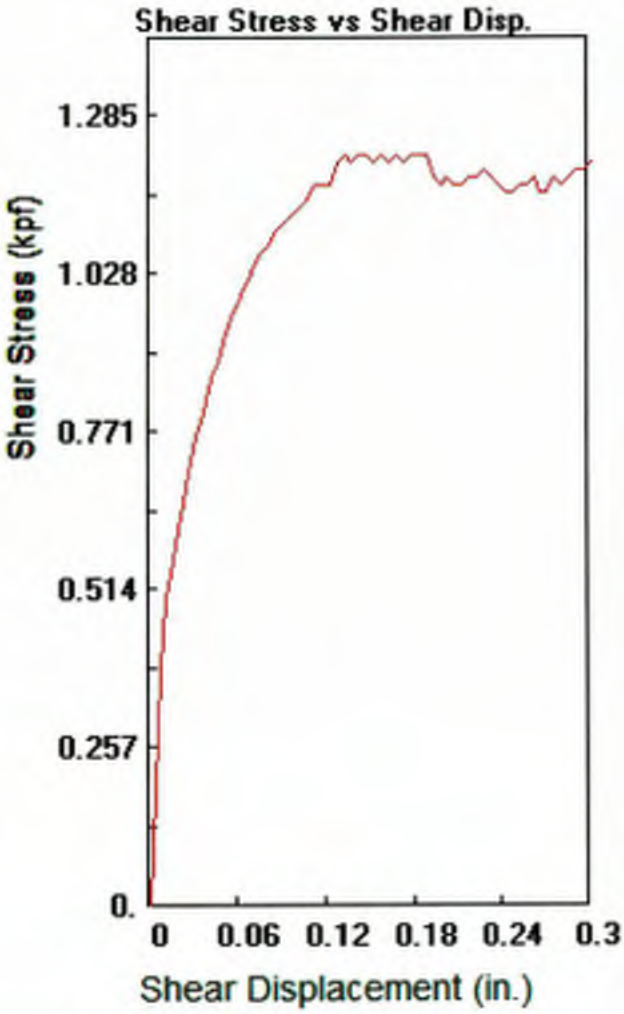
JN: SL20.3331 CONSULTANT JAI
CLIENT: Feffer/New Urban West-Metro Walk

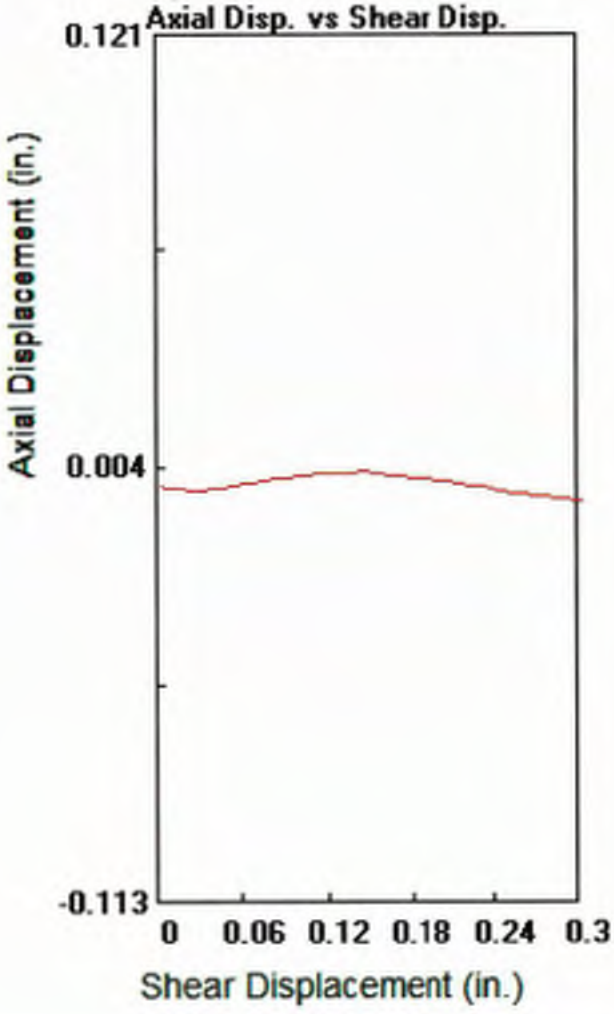
EARTH MATERIAL: ALLUVIUM

	PEAK	ULTIMATE	
Phi Angle	28	27	degrees
Cohesion	150	150	psf

Average Moisture Content	23.6%
Average Dry Density (pcf)	110.6
Percent Saturation	100.0%







Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 1

Technician: BF

Boring: B2

Axial Load: 2000 psf

Depth: 30 ft.

Shear Rate: 0.010 in./sec.

File: 3331B2302.dat

Distance: 0.30 in.

Stress at Max Def
1224 0.131

Stress at Max Disp
0.296 1200

Maximum Load

1224 psf

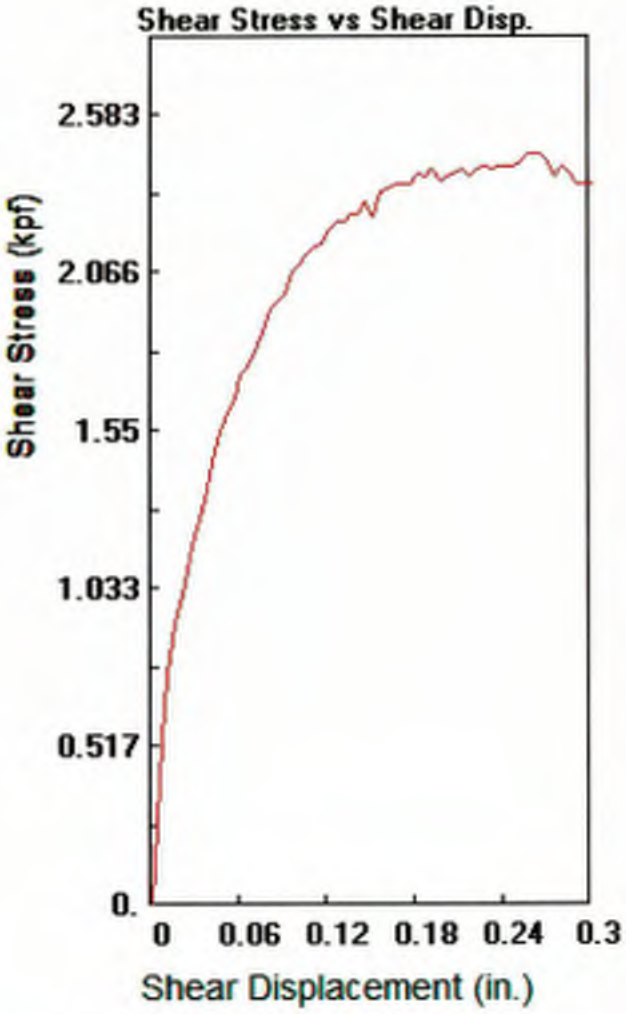
Shear Displacement at maximum Load

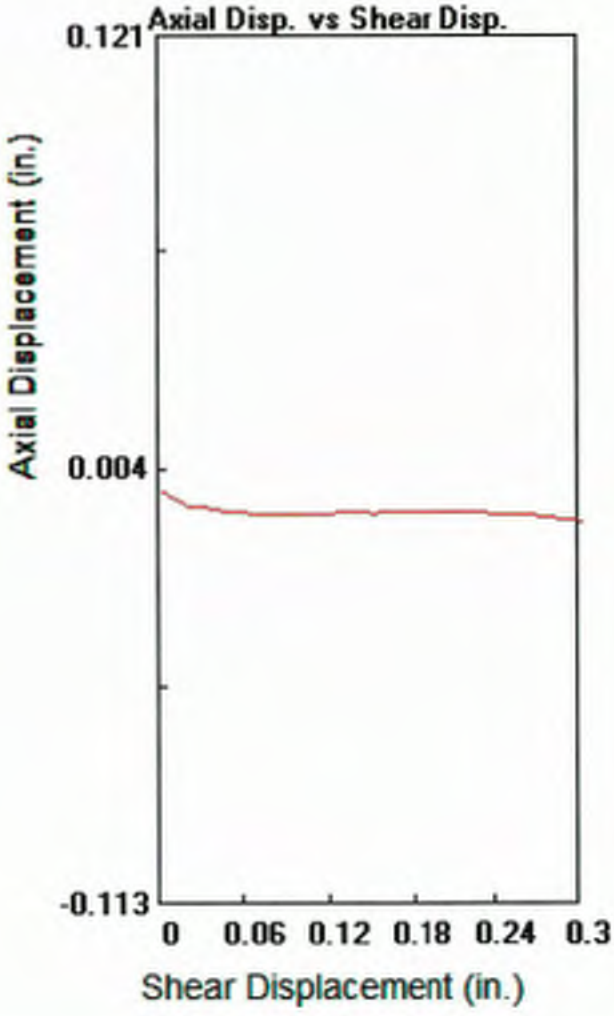
0.1307 in.

Date

5/19/2020

Soil Labworks





Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Sample: 2

Boring: B2

Depth: 30 ft.

File: 3331B2304.dat

Soil Type:QA

Technician: BF

Axial Load: 4000 psf

Shear Rate: 0.010 in./sec.

Distance: 0.30 in.

Stress at Max Def
2460 0.256

Stress at Max Disp
0.296 2364

Maximum Load

2460 psf

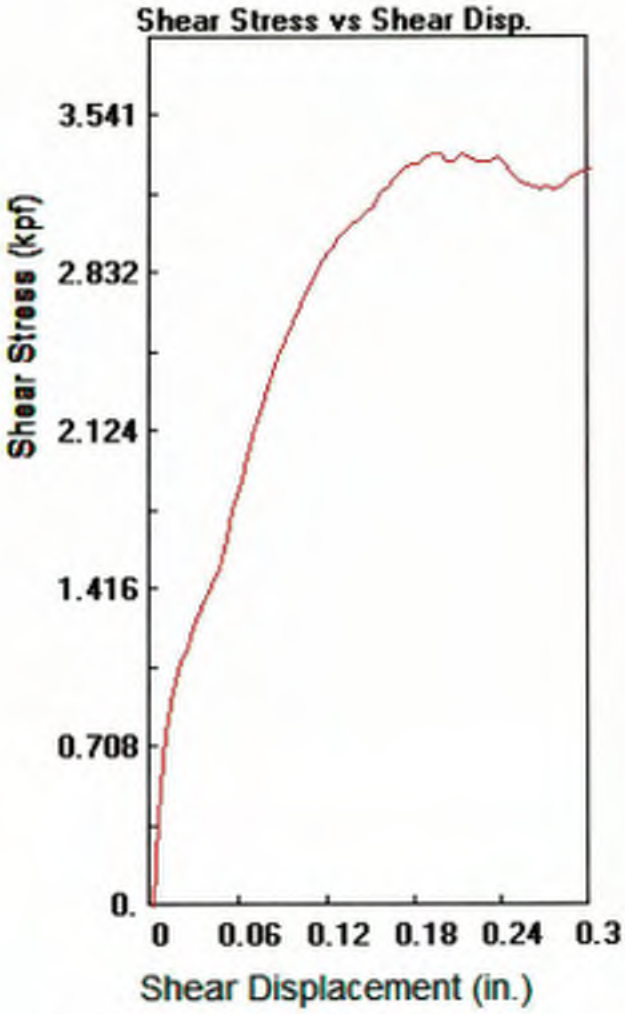
Shear Displacement at maximum Load

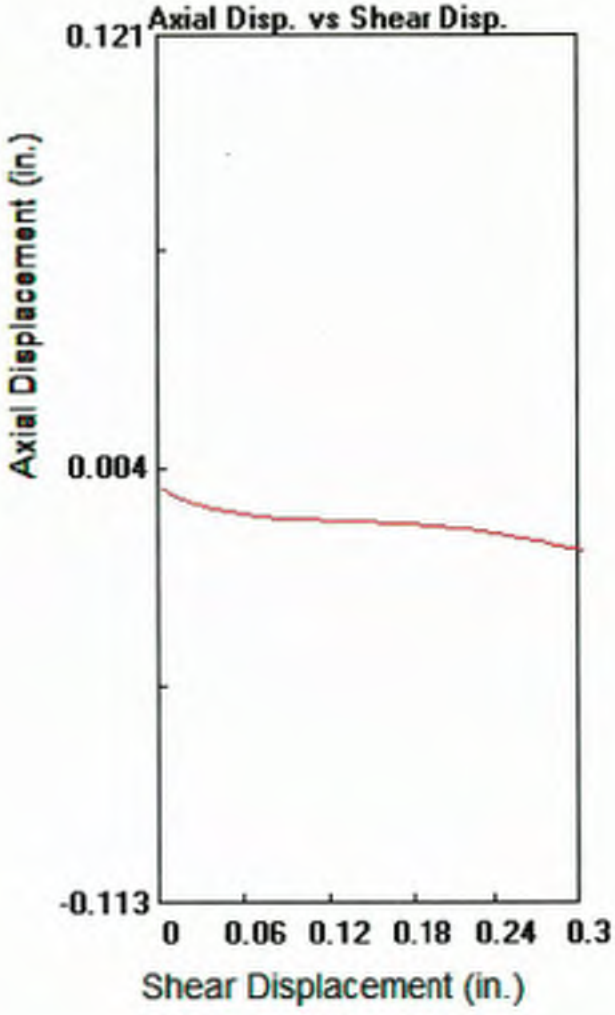
0.2556 in.

Date

5/19/2020

Soil Labworks





Parameters

Client: FEFFER/NEW URBAN WEST

Location: LOST CANYON RD

Job # 3331

Soil Type:QA

Sample: 3

Technician: BF

Boring: B2

Axial Load: 6000 psf

Depth: 30 ft.

Shear Rate: 0.010 in./sec.

File: 3331B2306.dat

Distance: 0.30 in.

Stress at Max Def
3372 0.191

Stress at Max Disp
0.296 3300

Maximum Load

3372 psf

Shear Displacement at maximum Load

0.1906 in.

Date

5/19/2020

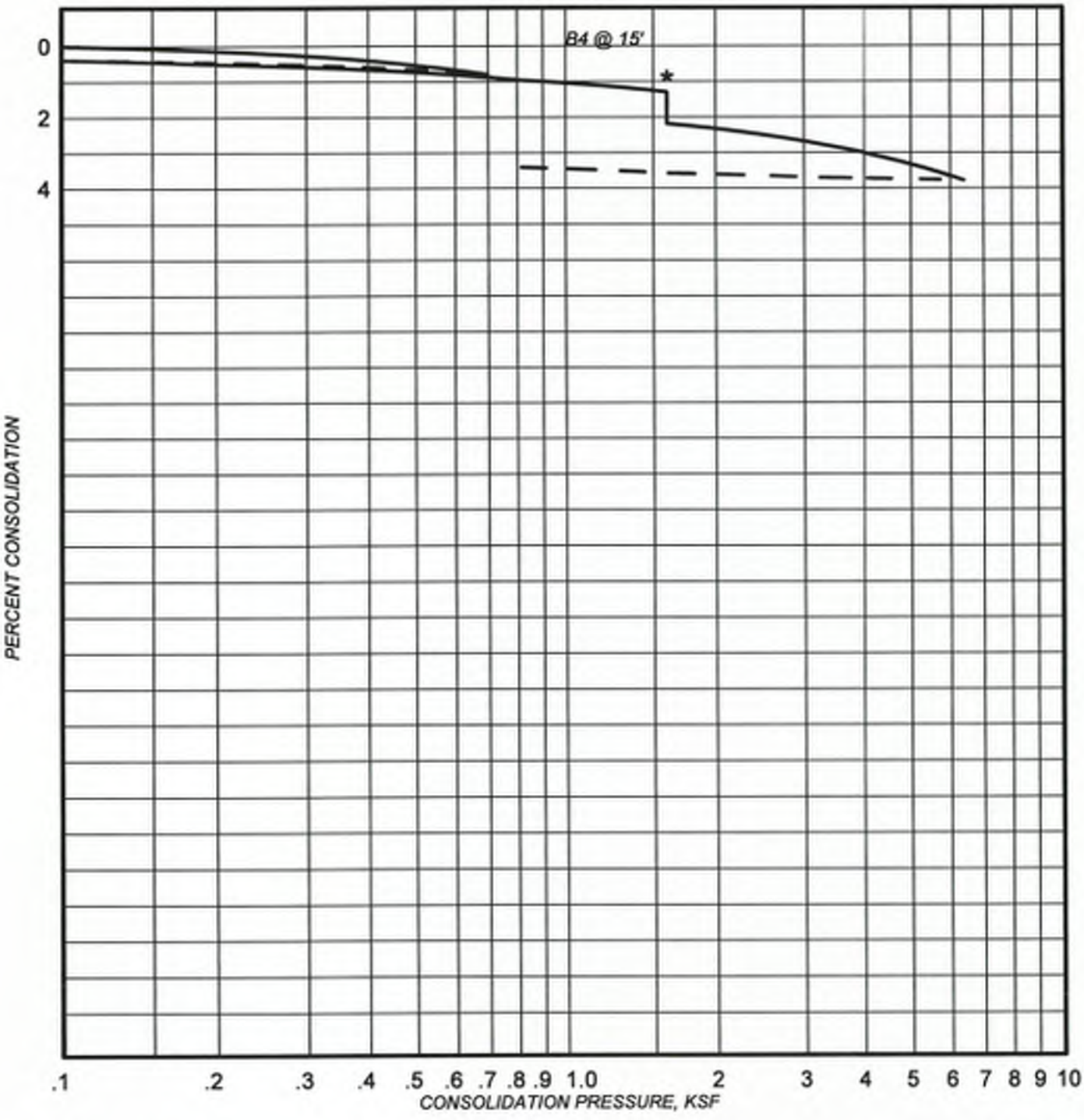
Soil Labworks

CONSOLIDATION TEST

PROJECT: 3331 FEFFER/NEW URBAN WEST-METRO WALK

SAMPLE: B4 @ 15'

ALLUVIUM



* Water Added

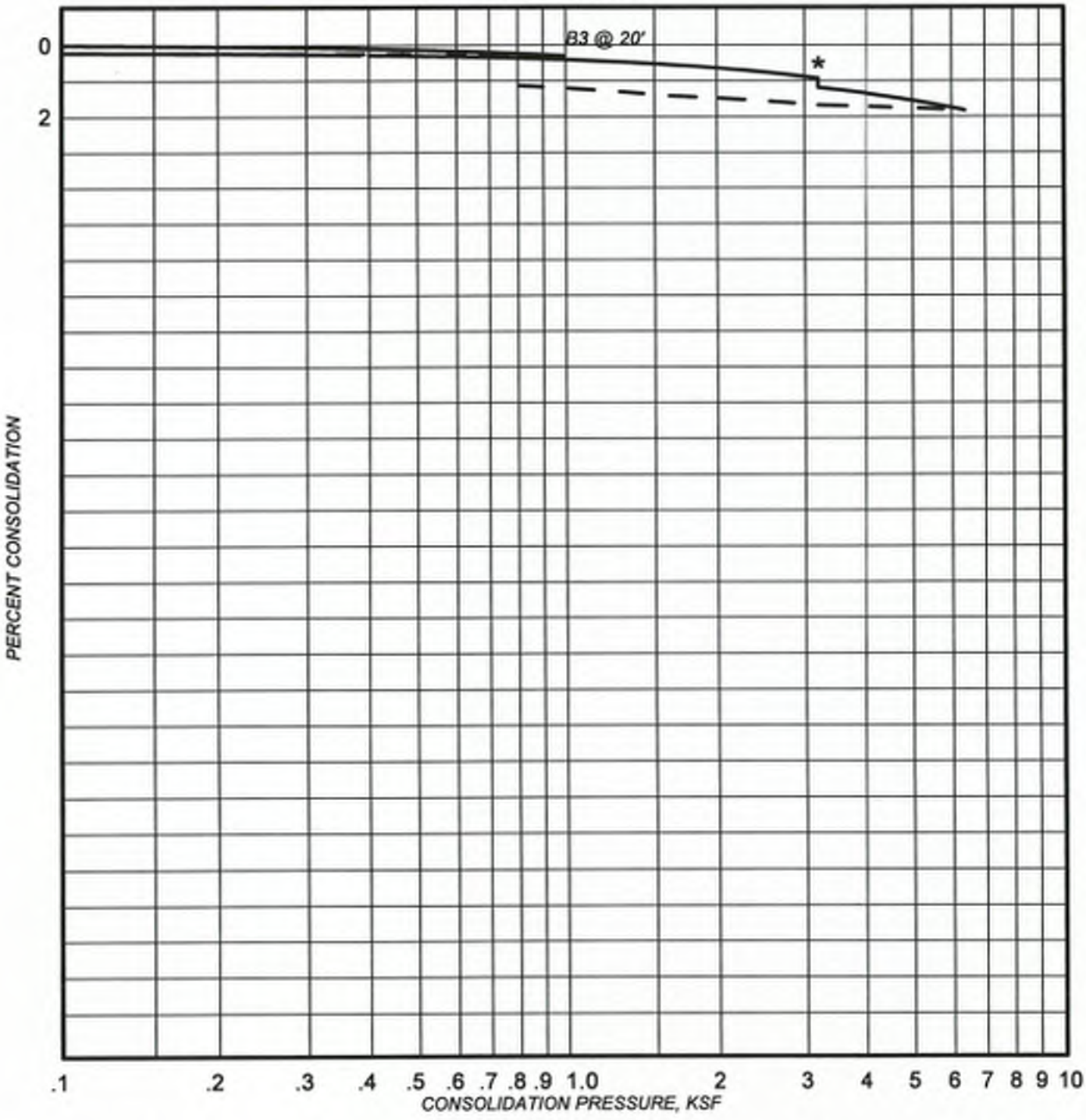
PLATE:

CONSOLIDATION TEST

PROJECT: 3331 FEFFER/NEW URBAN WEST-METRO WALK

SAMPLE: B3 @ 20'

ALLUVIUM



* Water Added

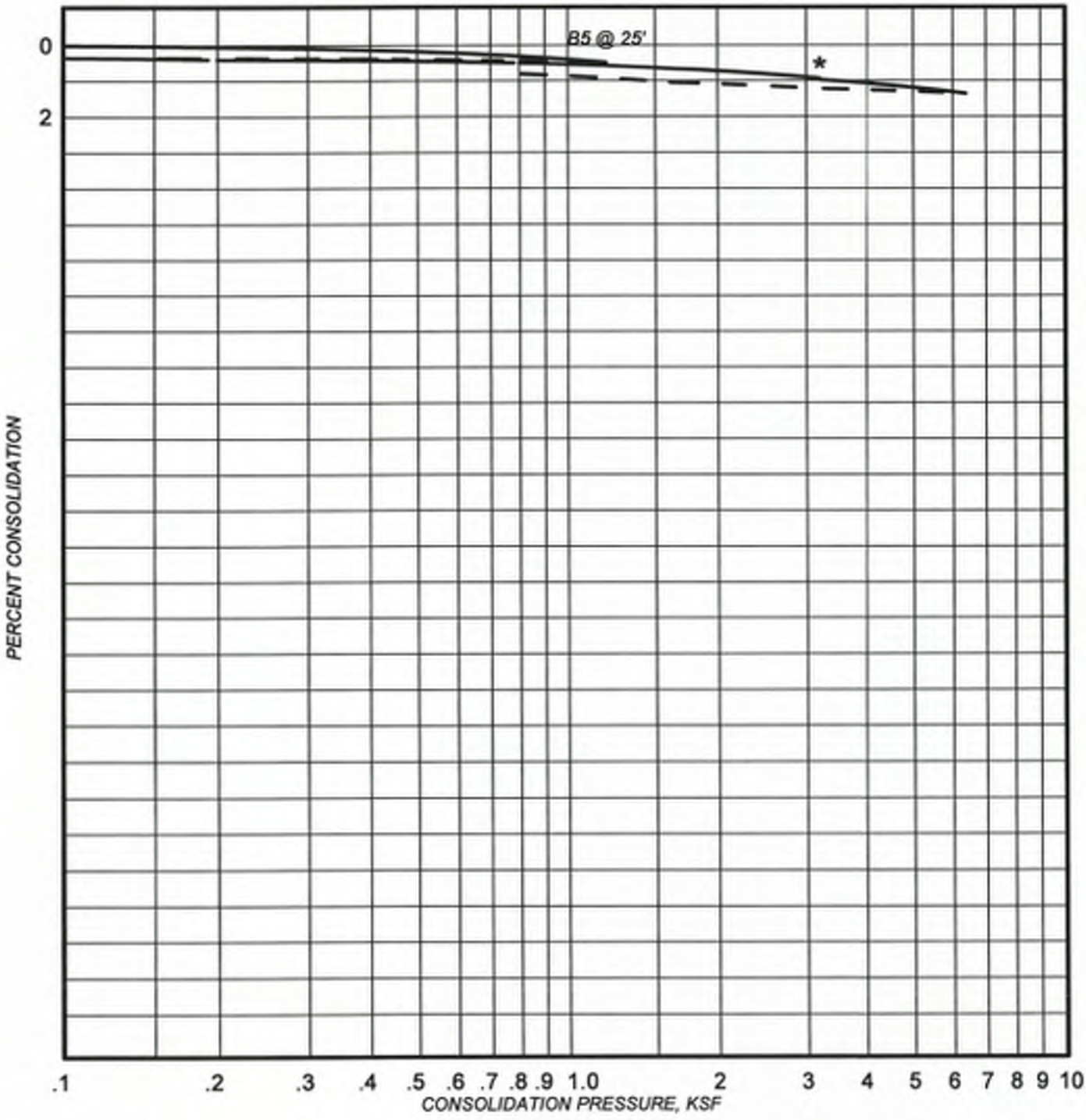
PLATE:

CONSOLIDATION TEST

PROJECT: FEFFER/NEW URBAN WEST, INC.-METRO WALK

SAMPLE: B5 @ 25'

ALLUVIUM



* Water Added

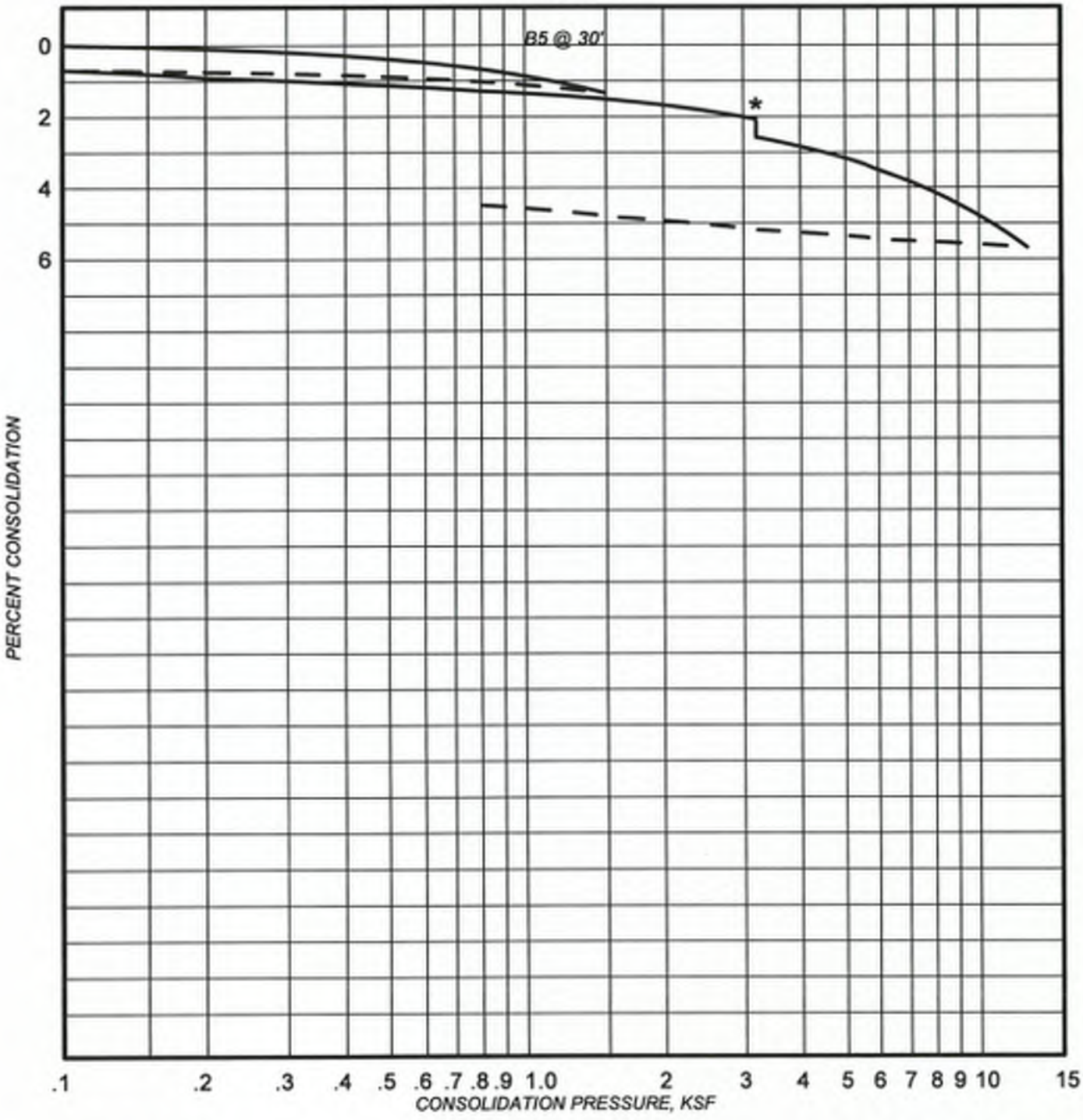
PLATE:

CONSOLIDATION TEST

PROJECT: FEFFER/NEW URBAN WEST, INC.-METRO WALK

SAMPLE: B5 @ 30'

ALLUVIUM



* Water Added

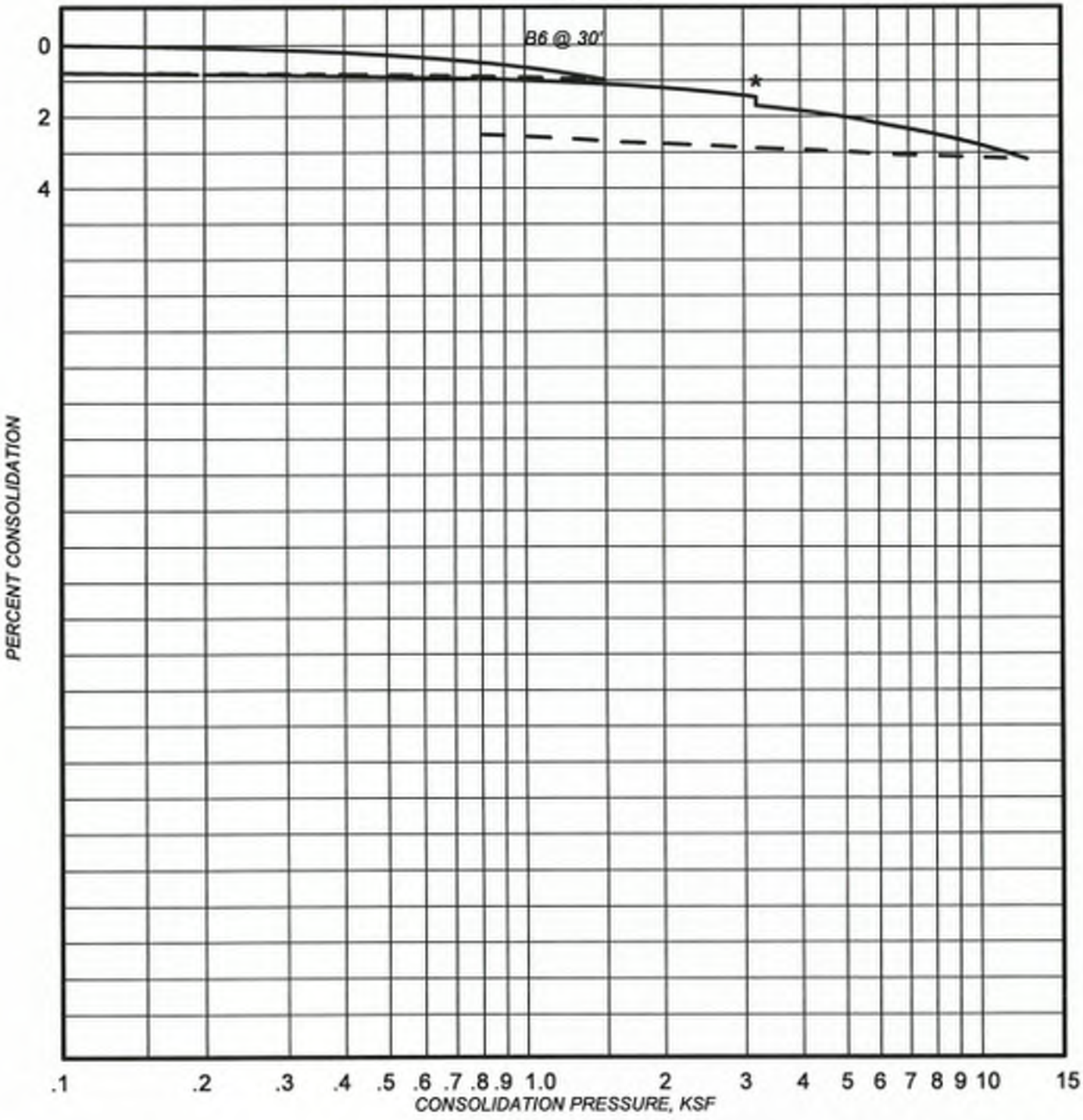
PLATE:

CONSOLIDATION TEST

PROJECT: 3331 FEFFER/NEW URBAN WEST, INC.-METRO WALK

SAMPLE: B6 @ 30'

ALLUVIUM



* Water Added

PLATE:

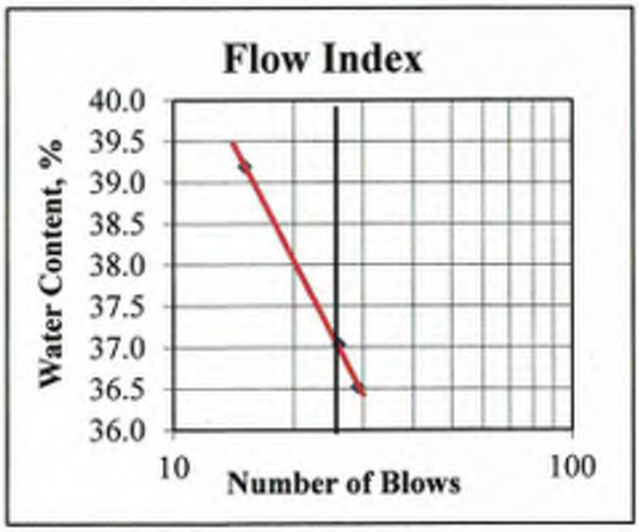
File No.: SL20.3331 June 3, 2020

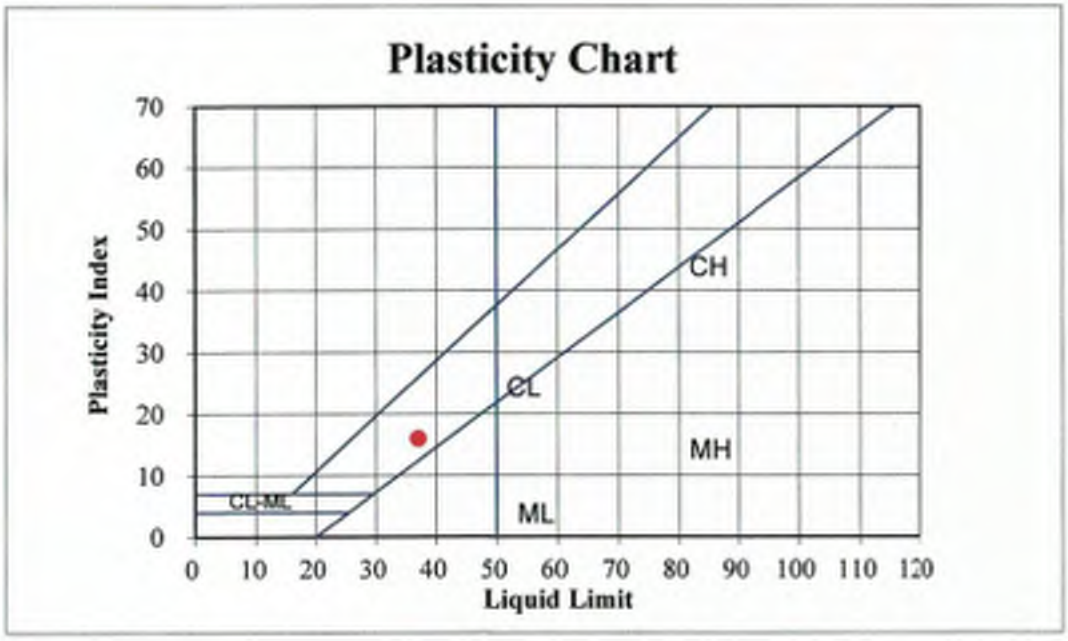
PLASTICITY INDEX

ASTM D-4318

Job Name: FEFFER/NEW URBAN WEST
Sample ID: B2 @ 5'
Soil Description: CL

DATA SUMMARY				TEST RESULTS	
Number of Blows:	15	26	29	**LIQUID LIMIT**	**37**
Water Content, %	39.2	37.0	36.5	**PLASTIC LIMIT**	**21**
Plastic Limit:	21.4	21.1		**PLASTICITY INDEX**	**16**





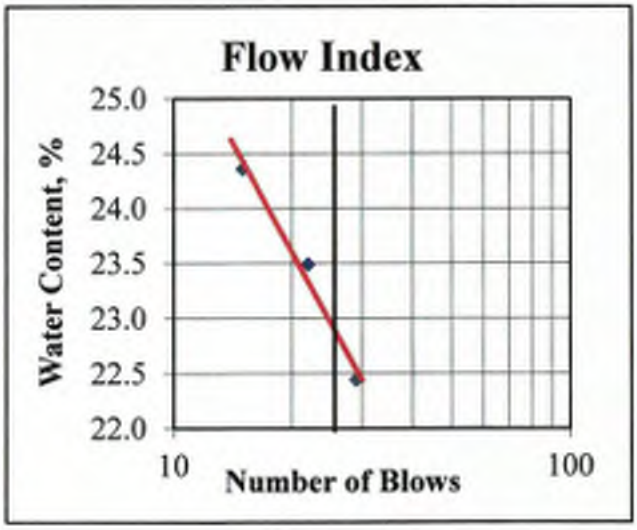
File No.: SL20.3331 June 3, 2020

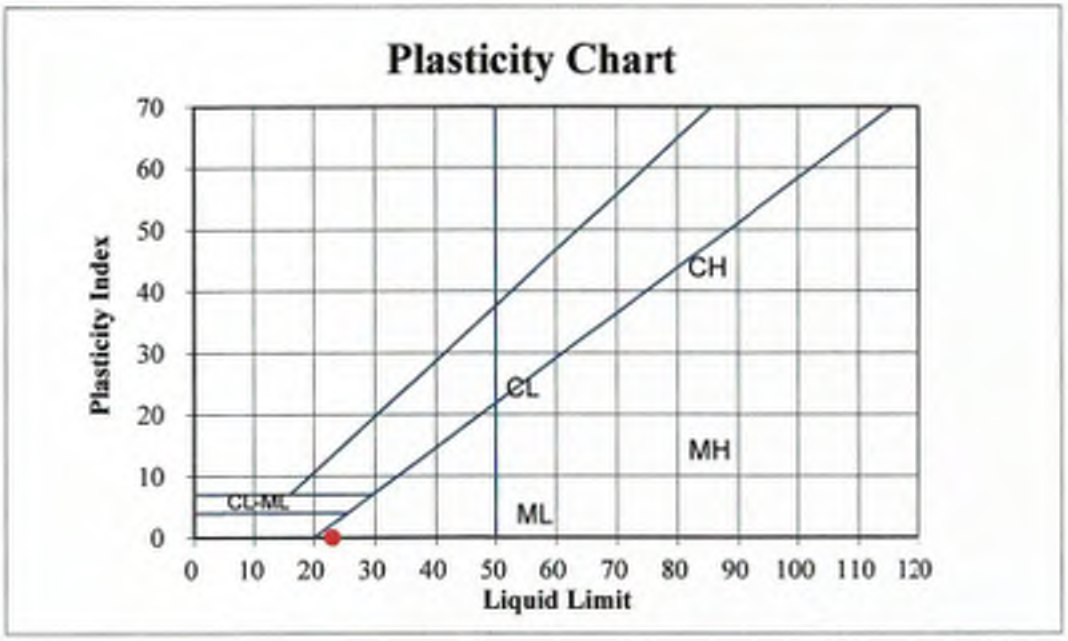
PLASTICITY INDEX

ASTM D-4318

Job Name: FEFFER/NEW URBAN WEST
Sample ID: B2 @ 22.5'
Soil Description: SM/Non Plastic

DATA SUMMARY				TEST RESULTS	
Number of Blows:	15	22	29	**LIQUID LIMIT**	**23**
Water Content, %	24.4	23.5	22.4	**PLASTIC LIMIT**	**23**
Plastic Limit:	23.4	23.5		**PLASTICITY INDEX**	**0**





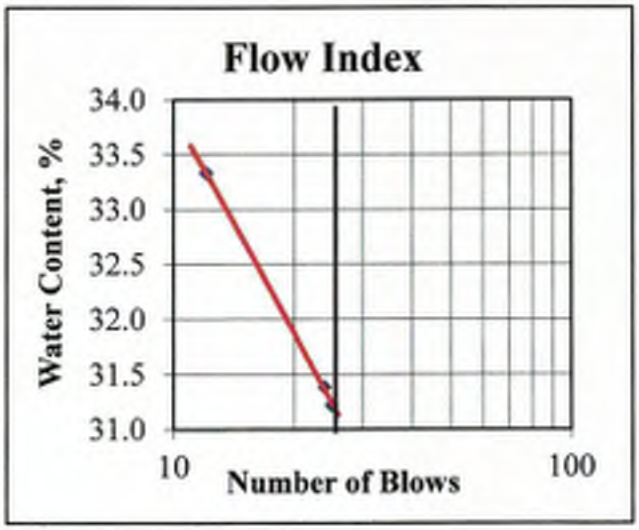
File No.: SL20.3331 June 3, 2020

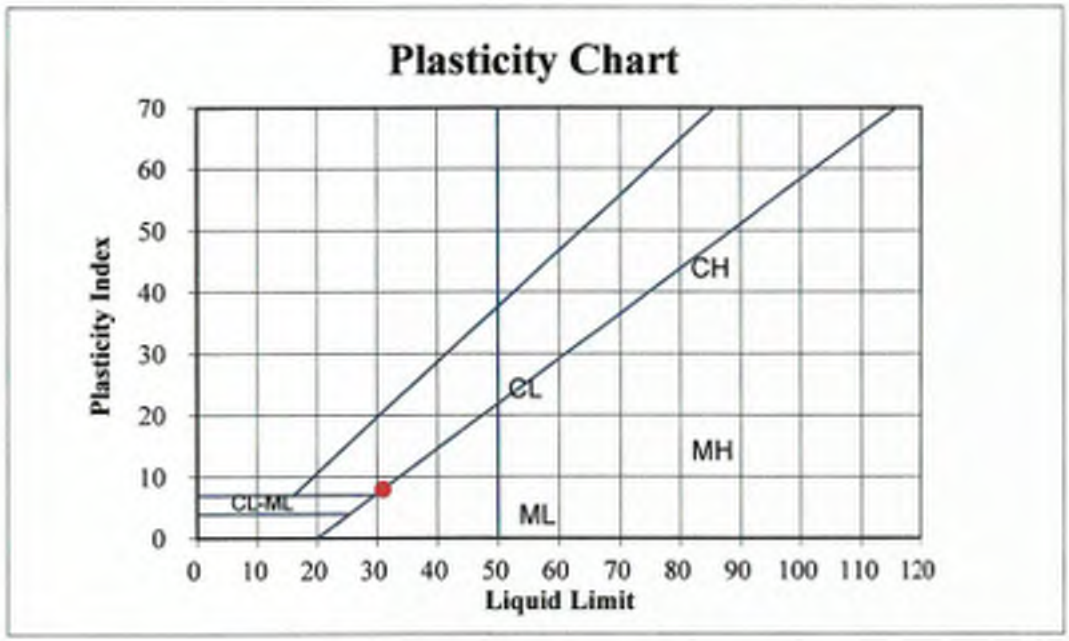
PLASTICITY INDEX

ASTM D-4318

Job Name: FEFFER/NEW URBAN WEST
Sample ID: B2 @ 27.5'
Soil Description: ML

DATA SUMMARY				TEST RESULTS	
Number of Blows:	12	24	25	**LIQUID LIMIT**	**31**
Water Content, %	33.3	31.4	31.2	**PLASTIC LIMIT**	**23**
Plastic Limit:	23.1	23.0		**PLASTICITY INDEX**	**8**





SMITH-EMERY LABORATORIES
An Independent Commercial Testing Laboratory
781 E. Washington Boulevard, Los Angeles, California 90021 ◆ (213) 745-5333 ◆ Fax (213) 741-8621

June 17, 2020

SEL File: 46769-1
SEL Report No.: G-20-2171

Feffer Geological Consulting
Attn.: Ms. Yvette Hays
1990 S. Bundy Drive, 4th floor
Los Angeles, CA 90025

RE: New Urban West Inc.-Metro Walk
2445-04, Terminus of Lost Canyon Rd.
Canyon Country-Santa Clarita, CA
APN: 2840-004-009

SUBJECT: R-Value

STANDARD: Cal Test Method 301

SAMPLE LOCATION: as above

Date Sampled: 6/5/20

Sampled by: E. Vasilon

REPORT OF TESTS

In compliance with the request of your authorized representative, we have conducted the subject test as per project requirements for the above-referenced project.

The bulk soil sample was delivered to our laboratory by your representative. Test result is as follow:

Boring Hole No.	Depth (ft)	Soil Type	R-Value at 300 psi Exudation Pressure		
			Uncorrected	Corrected	By Expansion
B-7	0-10	Olive Brown Silty SAND	**7**	**7**	**16**

Assumed Ti-5 G.F-2.5 W-2082.40

Should you have any questions regarding the contents of this report, please call.

Respectfully submitted,
SMITH-EMERY LABORATORIES

ANGELITO CABANILLA
Geotechnical Laboratory Manager

AC/ac
cc: Addressee

SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory, Established 1904

1195 N. Tustin Anahiem, California 92807 • Tel. (714) 238-6133 • Fax (714) 238-6144

(Cal Trans 301)

Report No.: A20-141

SEL JOB #: 46769-1
Date Sample: 6/5/2020
Project: New Urban West Inc.-Metro Walk
Depth: 0-10
SOIL TYPE: Olive Brown Silty Sand
Sample # 877
Location: 2445-04 Terminus of Los Canyon Rd.

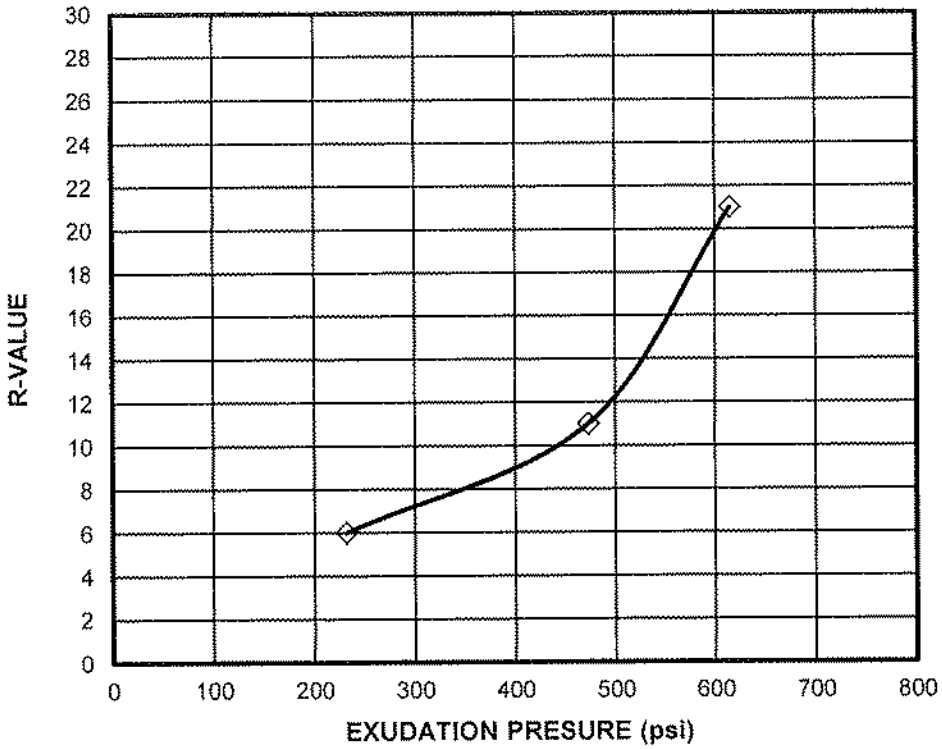
SPECIMEN	A	B	C
EXUDATION PRESSURE (psi)	615	473	232
PREPARED WEIGHT (g)	1100	1100	1100
FINAL WATER ADDED (g)	20	40	70
WEIGHT, SOIL & MOLD (g	3207	3240	3254
WEIGHT, MOLD (g)	2094	2100	2095
HEIGHT (in)	2.72	2.75	2.71
EXPANSION DIAL	0.0034	0.0011	0.0005
STABILOMETER @ 1000 lb	0	0	0
STABILOMETER @ 2000 lb	121	134	140
TURNS DISPLACEMENT	3.76	4.56	5.18
(2.5/d)*((Pv/Ph)-1)+1	1.21	1.11	1.07
100/Above	82	90	94
R-VALUE TEST UnCorr.	18	10	6
R-VALUE TEST Corr.	21	11	6

VALUE AT 300 PSI EXUDATION PRESSURE:

Rvalue uncorrected: 7

Rvalue Corrected: 7

Rvalue by expansion: 16



Moisture: n/a	R-VALUE TEST
Assumed Ti-5 G.F-2.5 W-2082.40	Smith-Emery Laboratory

Smith-Emery Laboratories

791/781 East Washington Blvd., Los Angeles, CA 90021; Tel (213) 745-5333; Fax (213) 749-8621

LABORATORY COMPACTION CHARACTERISTICS
ASTM D1557-12

Client: **Feffer Geological Consulting** | Lab. Ref No.: 877
Project: New Urban West, Inc.-Metro Walk; APN 2840-004-009 | SEL File No.: 46769-1
Location: 2445-04 Terminus of Lost Canyon Road, Canyon Country-Santa Clarita, CA | Date Sampled: 6/5/20
Soil Class: Olive Brown Silty SAND | Date Received: 6/8/20
Source: onsite | Date Tested: 6/9/20
Remarks: *:if 5-25%ret,rock correction reqr'd* | Sampled by: E. Vasilon

Equipment: Scale: B90416085/B846769478 **Drying:** Oven [X] Burner: [ ] Microwave [ ] *Method A* [X] (+)#4≤25% Calibrated Mold Vol. cc:
Rammer: **Mechnical** 10 lbs [X] **Manual** 10 lbs [ ] PREPARATION: *Method B* [ ] (+) 3/8"≤25%
Pie [ ] Round [X] 5.5 lbs [ ] [X] **Wet** [ ] **Dry** *Method C* [ ] (+) 3/4"≤30%

4" dia.	6" dia
943	2124

Rock Correction: OD Gs.: MC%: 2.0 % Ret'd #4 1.3
ZAV Assumed Gs.: 2.70 % Pass #4 98.7 Water density: 62.428 Calibrated Mold Vol. cc: 943
Soil Gs ass: 2.70 Boring No.: B-7 Sample No.: **1** Depth (ft): **0-10** Water Density: 62.23

Test no.	1	2	3	4	5
wt. of mold + wet soil (g)	4011.5	4154.0	4178.0	4103.0	
wt. of mold (g)	2011.0	2011.0	2011.0	2011.0	
wt. of wet soil (g)	2000.5	2143.0	2167.0	2092.0	
wet density of soil (g/cc)	2.121	2.273	2.298	2.218	
wt. wet soil + tare (g)	709.7	743.0	712.3	721.6	
wt.dry soil + tare (g)	675.4	695.8	658.7	658.1	
Wt of tare (g)	182.3	176.0	181.9	179.7	
moisture content %	7.0	9.1	11.2	13.3	
Density of soil (pcf)	123.8	130.1	129.0	122.3	
corrected moisture content %					
Density of soil (pcf)corrected					
Dry Density @ ZAV	119	124	129	134	
100 % Saturation @ ZAV	15.3	13.1	11.2	9.4	

sieve size	ret'd (g)	% ret'd
3/4"		
3/8"		
#4	147.0	1.3
Total	**11549.8**	

pass #4 %Moist content 7.0
wet pass #4 (g) 12201.0
dry pass #4 (g) 11402.8
ASTM D127
wt OD (g)
wt SSD
wt in water (g)
OD Gs
moist % 2.0

Max Dry Density (pcf) : 130.4 **OWC % 9.7** % Saturation: **90.8**
Max Dry Density (pcf) corrected : **OWC % Corr** % Saturation:

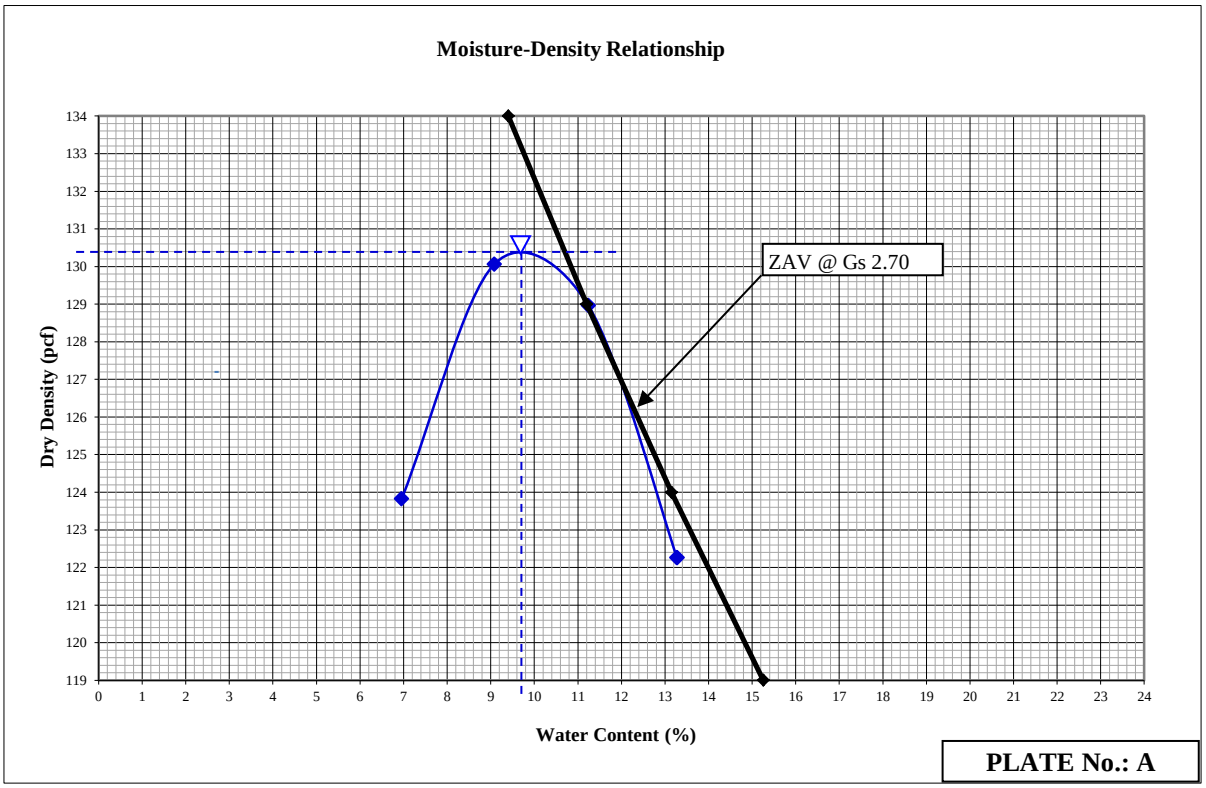


PLATE No.: A

Tested by: E.Saucedo Checked by: A. Cabanilla

PAVING DESIGN

IC: **2445-04** CONSULT: **YMH**
CLIENT **New Urban West-Metro Walk**

CALCULATION SHEET # **1**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	7	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	7	
Input Traffic Index (TI)	5	
Calculated Total Gravel Equivalent (GE)	1.488	feet
Calculated Total Gravel Equivalent (GE)	17.856	inches
Calculated Gravel Factor (Gf) for A/C paving	2.53	
Gravel Factor for Base Course (Gf)	1.2	
	Caltrans Class II Base	

TRIAL EQUIVALENT PAVEMENT SECTIONS:

A/C SECTION			BASE SECTION	
Section Thickness (inches)	Gravel Equivalent GE (feet)	GE (inches)	Delta (inches)	Minimum Base (inches)
3	0.63	7.60	10.25	8.54
4	0.84	10.14	7.72	6.43
5	1.06	12.67	5.18	4.32
6	1.27	15.21	2.65	2.21
7	1.48	17.74	0.11	0.09
8	1.69	20.28	-2.42	---
9	1.90	22.81	-4.96	---
10	2.11	25.35	-7.49	---
11	2.32	27.88	-10.03	---
12	2.53	30.42	-12.56	---

PAVING DESIGN

IC: **2445-04** CONSULT: **YMH**
CLIENT **New Urban West-Metro Walk**

CALCULATION SHEET # **1**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	7	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	7	
Input Traffic Index (TI)	6.5	
Calculated Total Gravel Equivalent (GE)	1.9344	feet
Calculated Total Gravel Equivalent (GE)	23.2128	inches
Calculated Gravel Factor (Gf) for A/C paving	2.22	
Gravel Factor for Base Course (Gf)	1.2	
	Caltrans Class II Base	

TRIAL EQUIVALENT PAVEMENT SECTIONS:

A/C SECTION			BASE SECTION	
Section Thickness (inches)	Gravel Equivalent GE (feet)	GE (inches)	Delta (inches)	Minimum Base (inches)
3	0.56	6.67	16.54	13.79
4	0.74	8.89	14.32	11.93
5	0.93	11.12	12.10	10.08
6	1.11	13.34	9.87	8.23
7	1.30	15.56	7.65	6.38
8	1.48	17.79	5.43	4.52
9	1.67	20.01	3.20	2.67
10	1.85	22.23	0.98	0.82
11	2.04	24.45	-1.24	---
12	2.22	26.68	-3.46	---

APPENDIX 'C'

Conceptual Plans

VISTA CANYON SPECIFIC PLAN AREA

PA 1

PA 2

PA 3

PA 4

HARRIMAN DRIVE (PVT.)

COOPER STREET

MITCHELL DRIVE

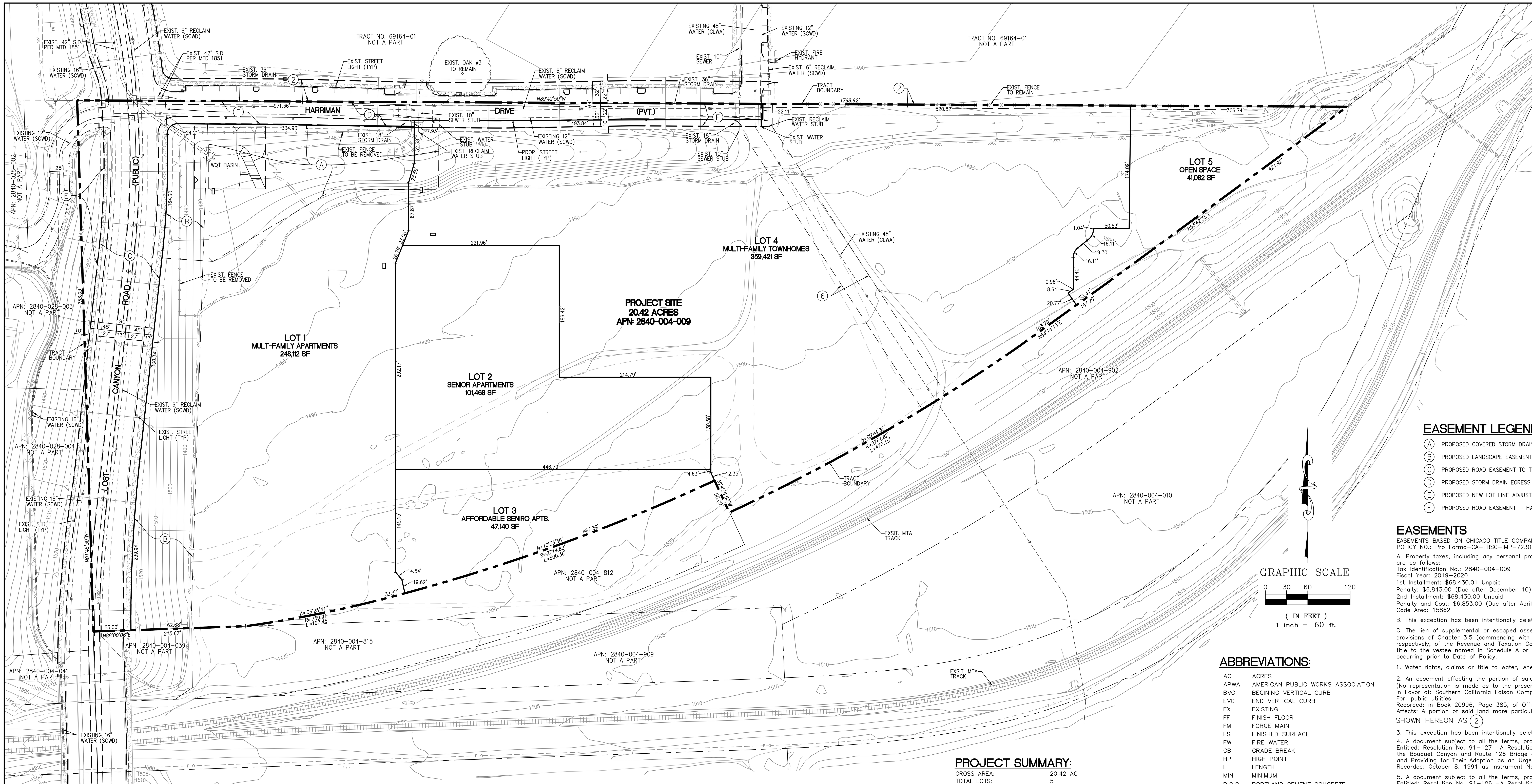
WQT. BASIN

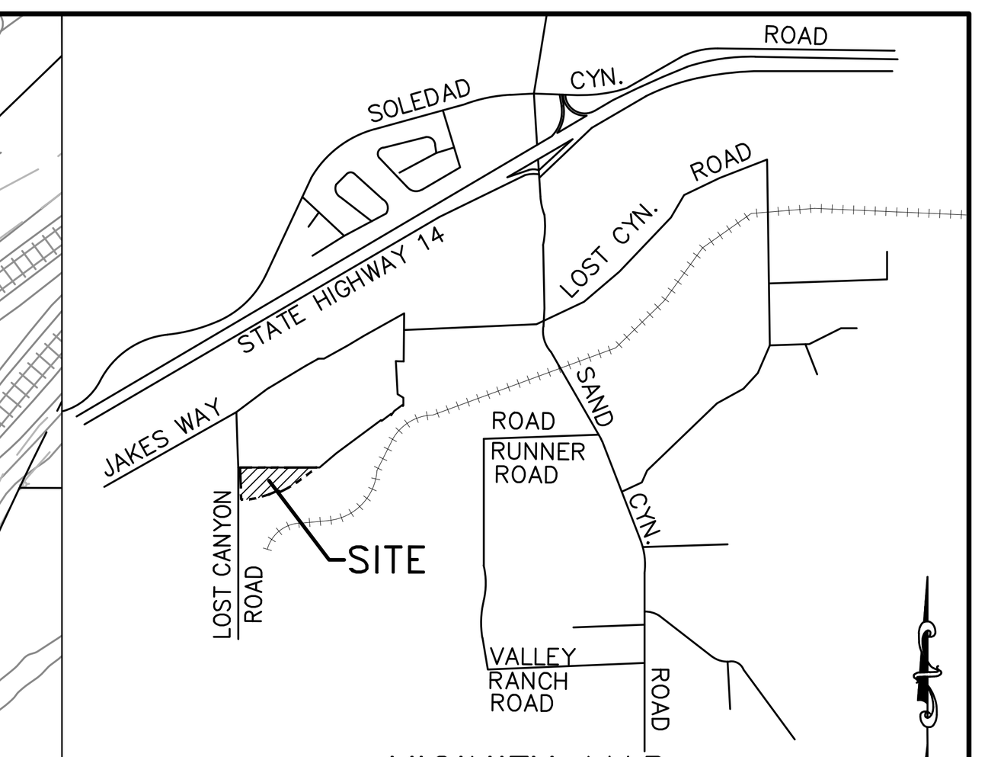
LEGEND

- Residential (R)
- Open Space (OS)
- Metrolink Station

North

0' 30' 60' 120'





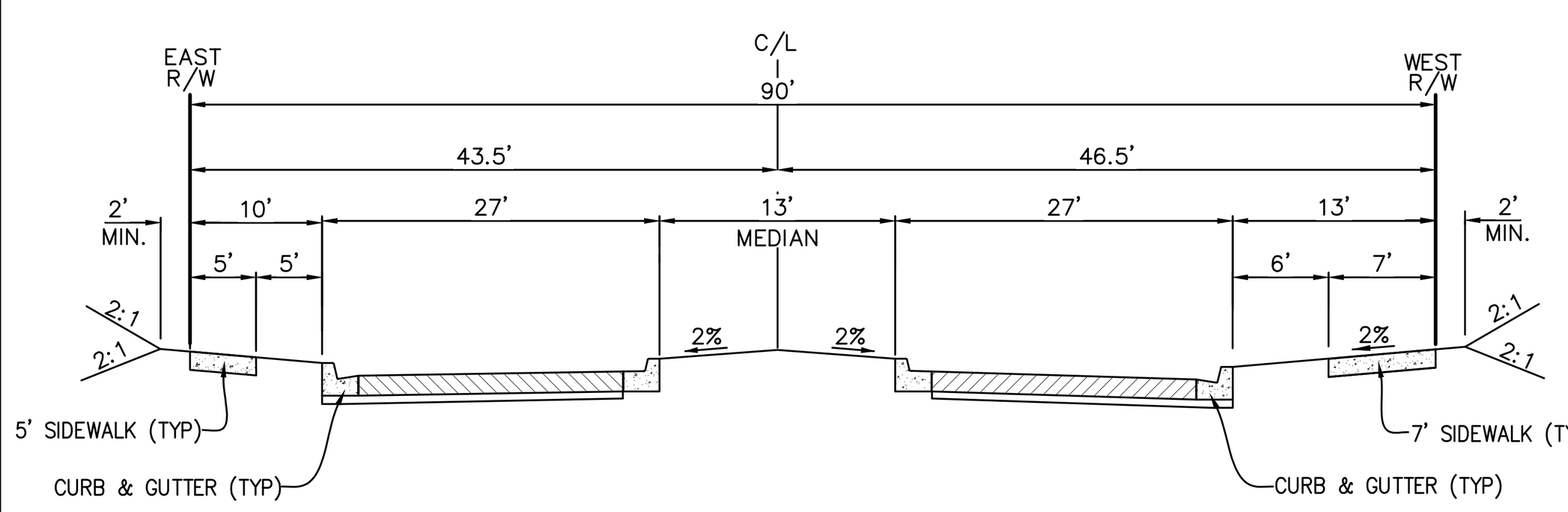
VICINITY MAP
NOT TO SCALE

LEGEND:

- PROJECT BOUNDARY
- PROPOSED ROAD RIGHT OF WAY
- PROPOSED EASEMENT
- EXISTING EASEMENT
- FUTURE RIGHT OF WAY
- PROPOSED CONTOUR
- EXISTING CONTOUR
- DAYLIGHT LINE
- PROP. STORM DRAIN
- PROP. SANITARY SEWER
- PROP. WATER
- PROP. STORM DRAIN INLET/OUTLET
- PROP. S.D. CATCH BASIN
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING OIL LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD POWER LINE
- EXISTING POWER POLE
- OAK TREE (TR) = TO REMAIN (TBI) = TO BE IMPACTED (TBR) = TO BE REMOVED

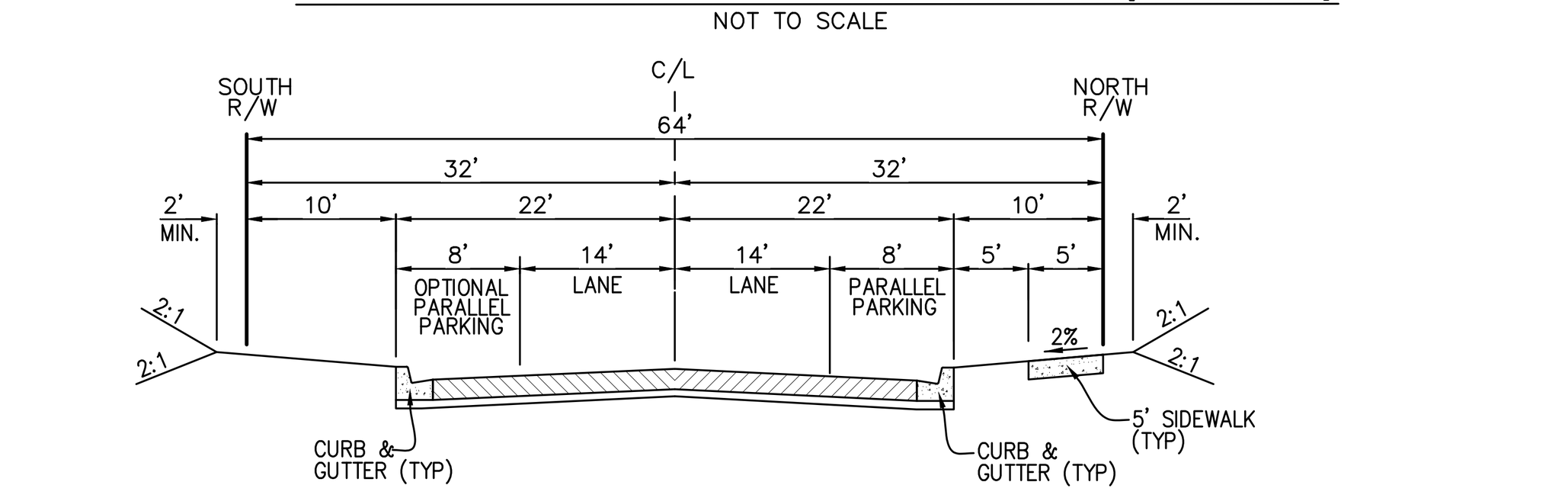
EASEMENT LEGEND:

- (A) PROPOSED COVERED STORM DRAIN EASEMENT TO THE CITY OF SANTA CLARITA
- (B) PROPOSED LANDSCAPE EASEMENT TO THE CITY OF SANTA CLARITA
- (C) PROPOSED ROAD EASEMENT TO THE CITY OF SANTA CLARITA – LOST CANYON ROAD
- (D) PROPOSED STORM DRAIN EGRESS EASEMENT TO THE CITY OF SANTA CLAIRTA
- (E) PROPOSED NEW LOT LINE ADJUSTMENT WITH THE CITY OF SANTA CLARITA
- (F) PROPOSED ROAD EASEMENT – HARRIMAN DRIVE



EXISTING LOST CANYON ROAD (PUBLIC)

NOT TO SCALE



EXISTING HARRIMAN DR. (PRIVATE)

NOT TO SCALE

LEGAL DESCRIPTION:

THAT PORTION OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 4 NORTH, RANGE 15 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SANTA CLARITA, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT OF SAID LAND FILED IN THE DISTRICT LAND OFFICE MARCH 29, 1877, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE NORTHERLY LINE OF SAID SOUTH HALF, DISTANT THEREON SOUTH 89 DEGREES 57 MINUTES 20 SECONDS EAST 124.57 FEET FROM THE WESTERLY LINE OF SAID SOUTHEAST QUARTER; THENCE ALONG SAID NORTHERLY LINE SOUTH 89 DEGREES 57 MINUTES 20 SECONDS EAST TO A POINT DISTANT THEREON NORTH 89 DEGREES 57 MINUTES 20 SECONDS WEST 150.99 FEET FROM THE INTERSECTION OF SAID NORTHERLY LINE WITH THE NORTHWESTERLY LINE OF THE 100 FOOT WIDE STRIP OF LAND DESCRIBED IN DEED DATED APRIL 22, 1890, FROM JOHN T. HUMPHREY'S TO SOUTHERN PACIFIC RAILROAD COMPANY; RECORDED APRIL 26, 1890, IN BOOK 650, PAGE 125 OF DEEDS, RECORDS OF SAID COUNTY; THENCE SOUTH 53 DEGREES 28 MINUTES 05 SECONDS WEST 421.92 FEET; THENCE SOUTH 53 DEGREES 59 MINUTES 43 SECONDS WEST 157.20 FEET TO A POINT; THENCE SOUTHWESTERLY ALONG A CURVE TO THE RIGHT, HAVING A RADIUS OF 2764.82 FEET, THROUGH A CENTRAL ANGLE OF 9 DEGREES 44 MINUTES 35 SECONDS (TANGENT TO SAID CURVE AT THE LAST MENTIONED POINT) BEARS SOUTH 56 DEGREES 04 MINUTES 05 SECONDS WEST AND NORTH OF SAID CURVE BEARS SOUTH 59 DEGREES 56 MINUTES 22 SECONDS WEST 469.59 FEET) AN ARC DISTANCE OF 470.15 FEET; THENCE NORTH 25 DEGREES 11 MINUTES 20 SECONDS WEST 50.00 FEET TO A POINT; THENCE SOUTHWESTERLY ALONG A COMPOUND CURVE TO THE RIGHT (TANGENT TO SAID CURVE A THE LAST MENTIONED POINT BEARS SOUTH 64 DEGREES 48 MINUTES 40 SECONDS WEST) HAVING THE FOLLOWING RADII, CENTRAL ANGLES AND ARC LENGTHS; 2714.82 FEET, 10 DEGREES 53 MINUTES 36 SECONDS (CENTRAL ANGLES), 500.36 (ARC), 1759.91 FEET, 8 DEGREES 01 MINUTES 14 SECONDS (CENTRAL ANGLES), 246.36 (ARC), TO A POINT IN THE NORTHERLY LINE OF LAND DESCRIBED FIRST IN DEED DATED APRIL 26, 1890, FROM JOHN T. HUMPHREY'S TO SOUTHERN PACIFIC RAILROAD COMPANY RECORDED APRIL 26, 1890, IN BOOK 642, PAGE 277, OF DEEDS, RECORDS OF SAID COUNTY' THENCE ALONG SAID LAST MENTIONED NORTHERLY LINE TO A LINE HAVING A BEARING OF NORTH 2 DEGREES 00 MINUTES 00 SECONDS WEST THAT PASSED THROUGH THE POINT OF BEGINNING; THENCE ALONG SAID LINE NORTH 2 DEGREES 00 MINUTES 00 SECONDS WEST TO THE POINT OF BEGINNING.

APN: 2840-004-009

GENERAL NOTES

1. LOT LINES CAN BE ADJUSTED AND ADDITIONAL RESIDENTIAL OR COMMERCIAL LOTS MAY BE CREATED TO THE SATISFACTION OF THE CITY PLANNING DEPARTMENT AS LONG AS THE MAXIMUM NUMBER OF APPROVED RESIDENTIAL LIMITS AND/OR THE MAXIMUM SQUARE FOOTAGE OF COMMERCIAL/OFFICE APPROVED IS NOT EXCEEDED.
2. ALIGNMENT AND GEOMETRICS OF STREETS ARE APPROXIMATE. ADJUSTMENTS TO STREETS CAN BE MADE WITH APPROVAL BY THE CITY OF SANTA CLARITA PLANNING DEPARTMENT AND THE ENGINEERING DEPARTMENTS.
3. BUILDING FOOTPRINTS THAT ARE SHOWN ON THIS TENTATIVE MAP FOR ILLUSTRATIVE PURPOSES. ACTUAL BUILDING LOCATIONS AND FOOTPRINTS MAY VARY. REVISIONS MAY BE ALLOWED DURING FUTURE SITE PLAN REVIEW, PROVIDED THE PROPOSED BUILDINGS SATISFY ALL EXISTING CODES AND ORDINANCES.
4. GRADES SHOWN ON THIS TENTATIVE MAP ARE APPROXIMATE. GRADES MAY DEVIATE UP TO TEN FEET WITH APPROVAL OF CITY PLANNING AND ENGINEERING DEPARTMENTS.
5. PERMISSION IS REQUESTED FOR MULTIPLE (PHASED/UNIT) TRACT MAPS.
6. PERMISSION IS REQUESTED TO COMBINE LOTS.
7. PERMISSION IS REQUESTED TO FILE ADDITIONAL LARGE LOT PARCEL MAPS AS LONG AS EACH PARCEL IS LARGER THAN 20 ACRES.
8. PERMISSION IS REQUESTED TO CREATE ADDITIONAL LANDSCAPE/OPEN SPACE OR PUBLIC USE LOTS TO THE SATISFACTION OF THE CITY PLANNING DEPARTMENT.
9. PERMISSION IS REQUESTED TO RECORD ADDITIONAL UTILITY LOTS AND PROVIDE MAINTENANCE EASEMENTS TO THE SATISFACTION OF THE CITY OF SANTA CLARITA PLANNING AND ENGINEERING DEPARTMENTS.
10. THE LOCATIONS OF APPURTENANT STRUCTURES (E.G., PASEOS, TRANSIT SHELTERS, WATER QUALITY BASINS, ETC.) MAY BE RELOCATED TO THE SATISFACTION OF THE CITY OF SANTA CLARITA PLANNING AND ENGINEERING DEPARTMENTS.
11. PERMISSION IS REQUESTED TO MASS GRADE.
12. LOTS DESIGNATED FOR MULTI-FAMILY HOUSING MAY BE FURTHER SUBDIVIDED FOR CONDOMINIUM PURPOSES.
13. OFFSITE GRADING OF THE CITY PARK SITE SHALL BE CONCURRENT WITH GRADING PER THIS TENTATIVE TRACT MAP.
14. RESIDENTIAL UNITS MAY BE TRANSFERRED BETWEEN PLANNING AREAS SUBJECT TO THE APPROVAL OF THE CITY PLANNING DEPARTMENT.

PROJECT SUMMARY:

GROSS AREA:	20.42 AC
TOTAL LOTS:	5
TOTAL D.U.:	503
EXISTING ZONING:	BP
PROPOSED ZONING:	UR5

EARTHWORK SUMARY

CUT: XX,XXX cy
FILL: XX,XXX cy
IMPORT/EXPORT:: 0 cy

OWNER:

BLUMAX SANTA CLARITA, LLC,
A DELAWARE LIMITED LIABILITY COMPANY
2001 WILSHIRE BLVD., SUITE 401
SANTA MONICA, CA 94303
PHONE: (310) 556-6390
ATTN: KEVIN HARBISON

FLOOD ZONE

FLOOD INSURANCE RATE MAPS COMMUNITY PANEL NUMBERS NO. 06037C0840F AND 06037C0845F ZONE X

TOPOGRAPHY:

CONTOURS ARE BASED ON AN AERIAL PHOTOGRAMETRIC SURVEY PERFORMED BY VERTEX AND DON READ CORPORATION FLOWN ON MAY 2017.

BENCHMARK:

L 1668 DATUM NAVD 88(1995 ADJUSTMENT) ELEVATION 1586.011
SAND CANYON ROAD AND 161M NORTH OF LIVE OAK SPRINGS CANYON ROAD
8.2M NORTHEAST OF POWER POLE #1155006E MKD (PI 24)
DESCRIPTION: CS MON IN WELL 250MM DN @ PI 600MM EAST OF CENTERLINE

BASIS OF BEARINGS:

THE BEARINGS SHOWN HEREON ARE BASED ON THE BEARING NORTH 89°44'29" WEST OF THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 4 NORTH, RANGE 15 WEST, SAN BERNARDINO MERIDIAN, AS SHOWN ON MAP OF TRACT NO. 69164-01 FILED IN BOOK 1396 PAGES 40 THROUGH 48 INCLUSIVE, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF LOS ANGELES COUNTY.

ASSESSOR PARCEL NUMBER:

2840-004-009

CONDOMINIUM NOTE:

ALL RESIDENTIAL, COMMERCIAL AND OFFICE LOTS WITHIN THIS TENTATIVE MAP MAY BE FURTHER AIRSPACE SUBDIVIDED FOR CONDOMINIUM PURPOSES.

ABBREVIATIONS:

AC	ACRES
APWA	AMERICAN PUBLIC WORKS ASSOCIATION
BVC	BEGINING VERTICAL CURB
EVC	END VERTICAL CURB
EX	EXISTING
FF	FINISH FLOOR
FM	FORCE MAIN
FS	FINISHED SURFACE
FW	FIRE WATER
GB	GRADE BREAK
HP	HIGH POINT
L	LENGTH
MIN	MINIMUM
P.C.C.	PORTLAND CEMENT CONCRETE
PI	POINT OF INTERSECTION
PROP	PROPOSED
R	RADIUS
R/W	RIGHT OF WAY
SF	SQUARE FOOT
SD	STORM DRAIN
SS	SANITARY SEWER
STD	STANDARD
TBI	TO BE IMPACTED
TBR	TO BE REMOVED
TR	TO REMAIN
W	WATER

PUBLIC UTILITIES:

CABLE TV	CHARTER COMMUNICATIONS 14221 COVELLO STREET VAN NUYS, CA 91405 (661) 483-3030 ATTN: ROBERT REIHS
ELECTRIC	SOUTHERN CALIFORNIA EDISION CO. 3589 FOOTHILL DRIVE THOUSAND OAKS, CA 91361 (661) 607-0512 ATTN: JOSHUA YANEZ
GAS	SOUTHERN CA. GAS COMPANY 9400 OAKDALE AVENUE CHATSWORTH, CA. 91313 (818) 701-7567 ATTN: JOHN CURRAN
SEWER	LOS ANGELES COUNTY SEWER MAINTENANCE DEPARTMENT 45712 NORTH DIVISION LANCASTER, CA. 93535 (626) 300-3370 ATTN: MARISA MORALES
TELEPHONE	AT&T 26971 N. FURNIVALL AVENUE SANTA CLARITA, CA 91351 (661) 251-8799 ATTN: BRYAN MONTGOMERY
WATER	SANTA CLARITA VALLEY WATER AGENCY 26521 SUMMIT CIRCLE SANTA CLARITA, CA 91350 (661) 259-2737 ATTN: BRENT PAYNE

EASEMENTS

EASEMENTS BASED ON CHICAGO TITLE COMPANY PRO FORMA REPORT
POLICY NO.: Pro Forma-CA-FBSC-IMP-72306-1-19-00098917.

A. Property taxes, including any personal property taxes and any assessments collected with taxes, are as follows:
Tax Identification No.: 2840-004-009
Fiscal Year: 2019-2020
1st Installment: $68,430.01 Unpaid
Penalty: $6,843.00 (Due after December 10)
2nd Installment: $68,430.00 Unpaid
Penalty and Cost: $6,853.00 (Due after April 10)
Code Area: 15862

B. This exception has been intentionally deleted

C. The lien of supplemental or escaped assessments of property taxes, if any, made pursuant to the provisions of Chapter 3.5 (commencing with Section 75) or Part 2, Chapter 3, Articles 3 and 4, respectively, of the Revenue and Taxation Code of the State of California as a result of the transfer of title to the vestee named in Schedule A or as a result of changes in ownership or new construction occurring prior to Date of Policy.

1. Water rights, claims or title to water, whether or not disclosed by the public records.

2. An easement affecting the portion of said land and for the purposes stated herein and incidental purposes (No representation is made as to the present ownership of said easement)
In Favor of: Southern California Edison Company, Ltd
For: public utilities
Recorded: in Book 20996, Page 385, of Official Records
Affects: A portion of said land more particularly described therein
SHOWN HEREON AS (2)

3. This exception has been intentionally deleted

4. A document subject to all the terms, provisions and conditions therein contained.
Entitled: Resolution No. 91-127 -A Resolution of the City Council of the City of Santa Clarita Confirming the Bouquet Canyon and Route 126 Bridge and Major Thoroughfare Construction Fee Districts Fee Revisions and Providing for Their Adoption as an Urgency Measure
Recorded: October 8, 1991 as Instrument No. 91-1581844, of Official Records

5. A document subject to all the terms, provisions and conditions therein contained.
Entitled: Resolution No. 91-106 -A Resolution of the City Council of the City of Santa Clarita Confirming the Bouquet Canyon and Route 126 Bridge and Major Thoroughfare Construction Fee Districts Fee Revisions
Recorded: October 8, 1991 as Instrument No. 91-1581845, of Official Records

6. Easement(s) for the purpose(s) shown below and rights incidental thereto as condemned by an instrument,
Entitled: Amended Final Order of Condemnation
Court: Superior Court
Case No.: BC 317474
In favor of: Castaic Lake Water Agency, a California water agency
Purpose: water pipeline
Recording Date: May 5, 2006
Recording No: 06-0997584, Official Records
Affects: that portion of said land described therein
SHOWN HEREON AS (6)

7. This exception has been intentionally deleted

8. This exception has been intentionally deleted

9. Matters contained in that certain document
Entitled: Memorandum of Grading, Improvements, and Easement Agreement
Dated: November 13, 2009
Executed by: Rachel Jorgenson, Successor Trustee of the Marital Deduction Trust of The Cloyd Family Trust, dated November 3, 2003, Goldman Family Limited Partnership, a Delaware limited partnership, Vista Canyon Ranch, LLC, a California limited liability company and Vista Canyon Phase 1, LLC, a Delaware limited liability company
Recording Date: November 16, 2016
Recording No: 20161433058, Official Records
Reference is hereby made to said document for full particulars.

10. This exception has been intentionally deleted
11. This exception has been intentionally deleted
12. This exception has been intentionally deleted
13. This exception has been intentionally deleted
14. This exception has been intentionally deleted
15. This exception has been intentionally deleted

16. Any rights, claims or interests that may exist or arise by reason of the following facts disclosed by a map dated June 5, 2019 last revised July 9, 2019 of an ALTA/NSPS Land Title Survey completed June 4, 2019 prepared by or under the responsible charge of Michael A. Kennada LS 5642, of/for Vertex Survey, Inc.
A. Curbs extend across the north, west and south lines of surveyed property.
B. There is vehicular access the west and south lines of surveyed property.
C. A V-ditch extends across the west line of surveyed property.
D. There are street lights and pull boxes on the north and west sides of surveyed property
E. There is a 36" stand pipe in the northwest corner of surveyed property,
F. There are water valves on the north side of the surveyed property.
G. A fire hydrant lies 1.3 feet east of the west line of surveyed property.

17. This exception has been intentionally deleted

18. This exception has been intentionally deleted

19. A deed of trust to secure an indebtedness in the amount shown below,
Amount: $4,500,000.00
Dated: November ___, 2019
Trustor/Grantor Blumax Santa Clarita, LLC, a Delaware limited liability company
Trustee: Chicago Title Company
Beneficiary: Goldman Family Limited Partnership
Recording Date: ____, 2019
Recording No: 2019 - ________, Official Records

DRAFT

ALLIANCE
LAND PLANNING & ENGINEERING INC.
2248 FARADAY AVE.
CARLSBAD, CA 92008
TEL: (760) 431-9896
FAX: (760) 431-8802
27413 TOURNEY ROAD
SUITE 120
VALENCIA, CA 91355
TEL: (661) 799-2760
CIVIL ENGINEERING • LAND PLANNING • HILLSIDE DESIGN • SURVEYING

PLAN PREPARED FOR:
NEW URBAN WEST, INC.
2001 WILSHIRE BLVD., SUITE 401
SANTA MONICA, CA 91405
TEL: (310) 556-6390
ATTN: KEVIN HARBISON

PLANS PREPARED BY:
ALLIANCE LAND PLANNING & ENGINEERING INC.
2248 FARADAY AVE.
CARLSBAD, CA 92008
(760) 431-9896
PLANS PREPARED UNDER THE DIRECTION OF:
CRAIG M. WHITTEKER R.C.E. 51929 — 3/13/20 DATE

REGISTERED PROFESSIONAL ENGINEER
CRAIG M. WHITTEKER
NO. 51929
EXP 6-30-22
CIVIL
STATE OF CALIFORNIA

NO.	DATE	REVISIONS	BY	APPR

SHEET 1 OF 1 SHEETS
CITY OF SANTA CLARITA

METROWALK
TENTATIVE TRACT MAP 83087
FOR CONDOMINIUM PURPOSES

I:\CAD\1934\TENTATIVE MAP\1934_TENTATIVE_MAP_PLAN.dwg

APPENDIX ‘D’

Grading Specifications

STANDARD GRADING SPECIFICATIONS

These specifications present the usual and minimum requirements for grading operations performed under our supervision.

GENERAL

1) The Geotechnical Engineer and Engineering Geologist are the developer's representative on the project.

2) All clearing, site preparation or earth work performed on the project shall be conducted by the contractor under the supervision of the Geotechnical Engineer.

3) It is the contractor's responsibility to prepare the ground surface to receive the fills to the satisfaction of the Geotechnical Engineer and to place, spread, mix, water, and compact the fill in accordance with the specifications of the Geotechnical Engineer. The contractor shall also remove all material considered unsatisfactory by the Geotechnical Engineer.

4) It is the contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment will be shut down to permit completion of compaction. Sufficient watering apparatus will also be provided by the contractor, with due consideration for the fill material, rate of placement and time of year.

5) A final report shall be issued by our firm outlining the contractor's conformance with these specifications.

SITE PREPARATION

1) All vegetation and deleterious materials such as rubbish shall be disposed of off-site. Soil, alluvium or rock materials determined by the Geotechnical Engineer as being unsuitable for placement in compacted fills shall be removed and wasted from the site. Any material incorporated as a part of a compacted fill must be approved by the Geotechnical Engineer.

2) The Engineer shall locate all houses, sheds, sewage disposal systems, large trees or structures on the site or on the grading plan to the best of his knowledge prior to preparing the ground surface.

Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipe lines, or others not located prior to grading are to be removed or treated in a manner prescribed by the Geotechnical Engineer.

3) After the ground surface to receive fill has been cleared, it shall be scarified, disced or bladed by the contractor until it is uniform and free from ruts, hollows, hummocks or other uneven features which may prevent uniform compaction.

The scarified ground surface shall then be brought to optimum moisture, mixed as required, and compacted as specified. If the scarified zone is greater than twelve inches (12") in depth, the excess shall be removed and placed in lifts restricted to six inches (6").

Prior to placing fill, the ground surface to receive fill shall be inspected, tested and approved by the Geotechnical Engineer.

PLACING, SPREADING AND COMPACTION OF FILL MATERIALS

1) The selected fill material shall be placed in layers which when compacted shall not exceed six inches (6") in thickness. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to insure uniformity of material and moisture of each layer.

2) Where the moisture content of the fill material is below the limits specified by the Geotechnical Engineer, water shall be added until the moisture content is as required to assure thorough bonding and thorough compaction.

3) Where the moisture content of the fill material is above the limits specified by the Geotechnical Engineer, the fill materials shall be aerated by blading or other satisfactory methods until the moisture content is adequate.

COMPACTED FILLS

1) Any material imported or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable by the Geotechnical Engineer. Roots, tree branches or other matter missed during clearing shall be removed from the fill as directed by the Geotechnical Engineer.

2) Rock fragments less than six inches (6") in diameter may be utilized in the fill, provided:

a) They are not placed in concentrated pockets.

b) There is a sufficient percentage of fine-grained material to surround the rocks.

c) The distribution of the rocks is supervised by the Geotechnical Engineer.

3) Rocks greater than six inches (6") in diameter shall be taken off-site, or placed in accordance with the recommendations of the Geotechnical Engineer in areas designated as suitable for rock disposal. Details for rock disposal such as location, moisture control, percentage of rock placed, will be referred to in the "Conclusions and Recommendations" section of the geotechnical report.

If the rocks greater than six inches (6") in diameter were not anticipated in the preliminary geotechnical and geology report, rock disposal recommendations may not have been made in the "Conclusions and Recommendations" section. In this case, the contractor shall notify the Geotechnical Engineer if rocks greater than six inches (6') in diameter are encountered. The Geotechnical Engineer will than prepare a rock disposal recommendation or request that such rocks be taken off-site.

4) Representative samples of materials to be utilized as compacted fill shall be analyzed in the laboratory by the Geotechnical Engineer to determine their physical properties. If any materials other than that previously tested is encountered during grading, the appropriate analysis of this material shall be conducted by the Geotechnical Engineer as soon as possible.

Material that is spongy, subject to decay or otherwise considered unsuitable shall not be used in the compacted fill.

5) Each layer shall be compacted to a minimum of ninety percent (90%) of the maximum density in compliance with the testing method specified by the controlling governmental agency (ASTM D-1557).

If compaction to a lesser percentage is authorized by the controlling governmental agency because of a specific land use or expansive soil conditions, the area to receive fill compacted to less than ninety percent (90%) shall either be delineated on the grading plan or appropriate reference made to the area in the geotechnical report.

6) Compaction shall be by sheeps foot roller, multi-wheeled pneumatic tire roller, or other types of acceptable rollers. Rollers shall be of such design that they will be able to compact the fill to the specified density. Rolling shall be accomplished while the fill material is at the specified moisture content. The final surface of the lot areas to receive slabs-on-grade should be rolled to a smooth, firm surface.

7) Field density tests shall be made by the Geotechnical Engineer of the compaction of each layer of fill. Density tests shall be made at intervals not to exceed two feet (2') of fill height provided all layers are tested. Where the sheeps foot rollers are used, the soil may be disturbed to a depth of several inches and density readings shall be taken in the compacted material below the disturbed surface. When these readings indicate the density of any layer of fill or portion thereof is below the required ninety percent (90%) density, the particular layer or portion shall be reworked until the required density has been obtained.

8) Buildings shall not span from cut to fill. Cut areas shall be over excavated and compacted to provide a fill mat of three feet (3').

FILL SLOPES

1) All fills shall be keyed and benched through all top soil, colluvium, alluvium, or creep material into sound bedrock or firm material where the slope receiving fill exceeds a ratio of five (5) horizontal to one (1) vertical, in accordance with the recommendations of the Geotechnical Engineer.

2) The key for side hill fills shall be a minimum of fifteen feet (15') within bedrock or firm materials, unless otherwise specified in the geotechnical report.

3) Drainage terraces and subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency, or with the recommendations of the Geotechnical Engineer.

4) The Contractor will be required to obtain a minimum relative compaction of ninety percent (90%) out to the finish slope face of fill slopes, buttresses, and stabilization fills. This may be achieved by either over-building

the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment, or by any other procedure which produces the required compaction.

5) All fill slopes should be planted or protected from erosion by methods specified in the geotechnical report and by the governing agency.

6) Fill-over-cut slopes shall be properly keyed through topsoil, colluvium, or creep material into rock or firm materials. The transition zone shall be stripped of all soil prior to placing fill.

CUT SLOPES

1) The Engineering Geologist shall inspect all cut slopes excavated in rock, lithified, or formation material at vertical intervals not exceeding ten feet (10').

2) If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints, or fault planes, are encountered during grading, these conditions shall be analyzed by the Engineering Geologist and Geotechnical Engineer; and recommendations shall be made to treat these problems.

3) Cut slope that face in the same direction as the prevailing drainage shall be protected from slope wash by a non-erosive interceptor swale placed at the top of the slope.

4) Unless otherwise specified in the geological and geotechnical report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of the controlling governmental agencies.

5) Drainage terraces shall be constructed in compliance with the ordinances of controlling governmental agencies, or with the recommendations of the Geotechnical Engineer or Engineering Geologist.

GRADING CONTROL

1) Inspection of the fill placement shall be provided by the Geotechnical Engineer during the progress of grading.

2) In general, density tests should be made at intervals not exceeding two feet (2') of fill height or every five hundred (500) cubic yards of fill placed. These criteria will vary depending on soil conditions and the size of the job. In any event, an adequate number of field density tests shall be made to verify that the required compaction is being achieved.

3) Density tests should also be made on the surface materials to receive fill as required by the Geotechnical Engineer.

4) All clean-out, processed ground to receive fill, key excavations, subdrains, and rock disposal must be inspected and approved by the Geotechnical Engineer prior to placing any fill. It shall be the Contractor's responsibility to notify the Geotechnical Engineer when such areas are ready for inspection.

CONSTRUCTION CONSIDERATIONS

1) Erosion control measures, when necessary, shall be provided by the Contractor during grading and prior to the completion and construction of permanent drainage controls.

2) Upon completion of grading and termination of inspections by the Geotechnical Engineer, no further filling or excavating, including that necessary for footings, foundations, large tree wells, retaining walls, or other features shall be performed without the approval of the Geotechnical Engineer or Engineering Geologist.

3) Care shall be taken by the contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of a permanent nature on or adjacent to the property.

APPENDIX C

O & M MANUAL
for
UNDERGROUND INFILTRATION CHAMBER

ADVANCED DRAINAGE SYSTEMS, INC.

SiteASSIST by StormTech
FOR STORMTECH INSTRUCTIONS, DOWNLOAD THE INSTALLATION APP

1934 - MetroWalk

LA County

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MADE FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING..
10. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

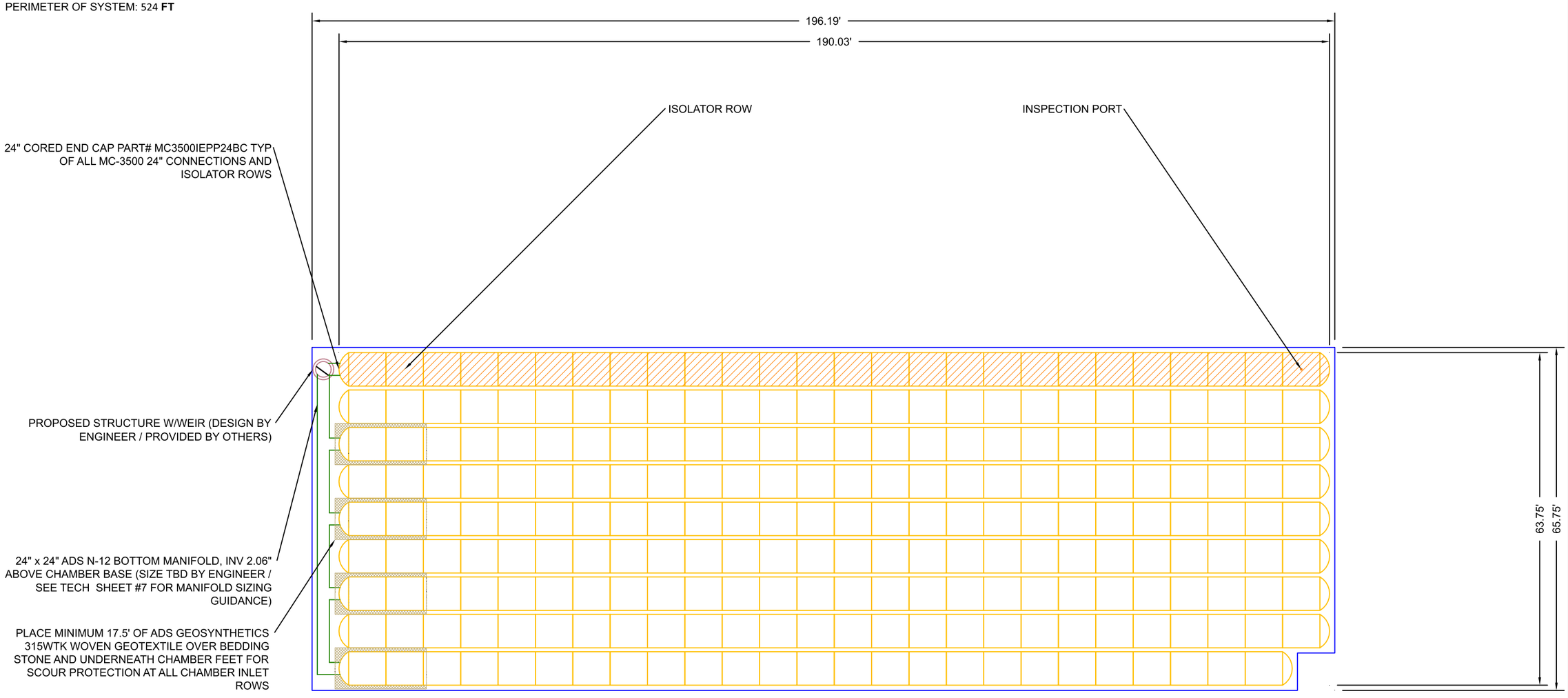
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

CONCEPTUAL LAYOUT

(233) STORMTECH MC-3500 CHAMBERS
(18) STORMTECH MC-3500 END CAPS
INSTALLED WITH 12 " COVER STONE, 9 " BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 43798 CF
AREA OF SYSTEM: 12848 **FT²**
PERIMETER OF SYSTEM: 524 **FT**

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION



1934 - MetroWalk
LA County

DATE: 05/07/2020 | DRAWN: SL | CHECKED: ---
PROJECT #: Tool

REV	DRW	CHK	DESCRIPTION

StormTech®
Detention · Retention · Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 |888-892-2694 | WWW.STORMTECH.COM

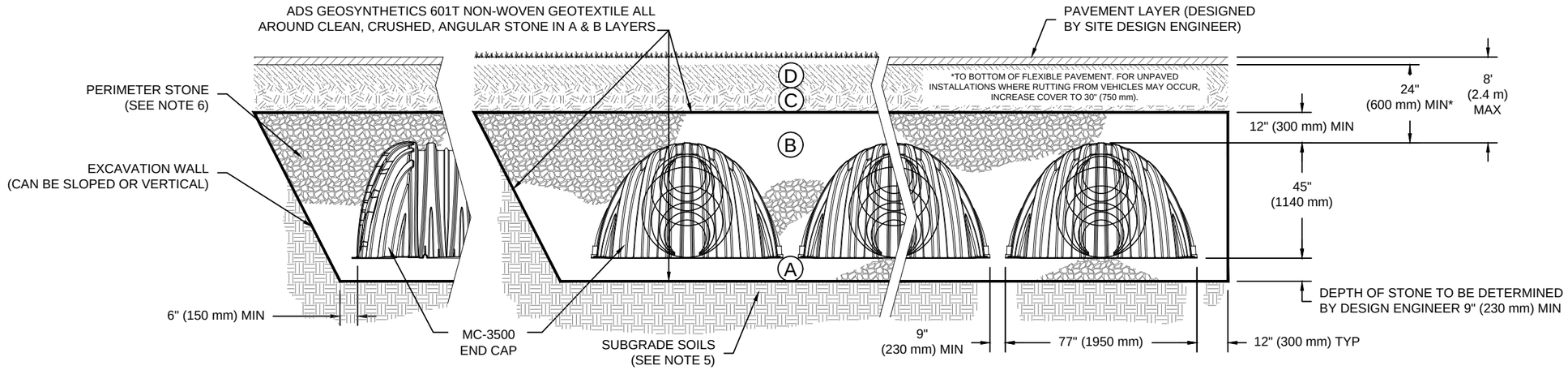
ADS.
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

NOT TO SCALE

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2] [3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
5. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
7. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

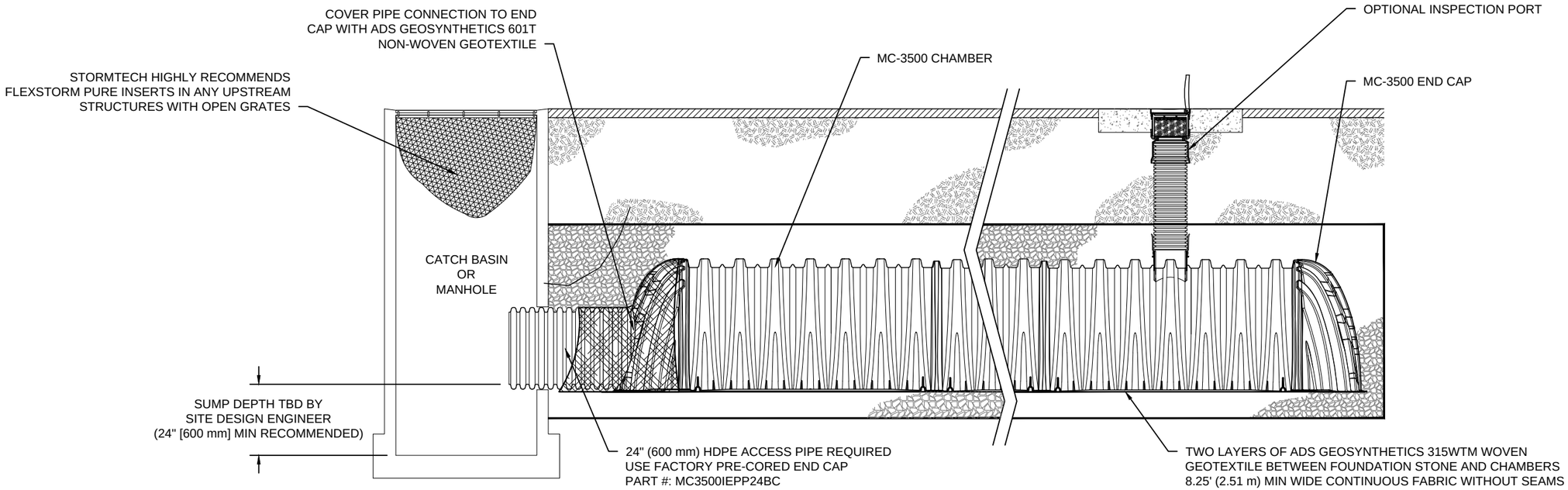
1934 - MetroWalk
LA County

DATE: 05/07/2020
DRAWN: SL
PROJECT #: Tool
CHECKED: ---

REV | DRW | CHK | DESCRIPTION

StormTech
Detention • Retention • Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473



MC-3500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

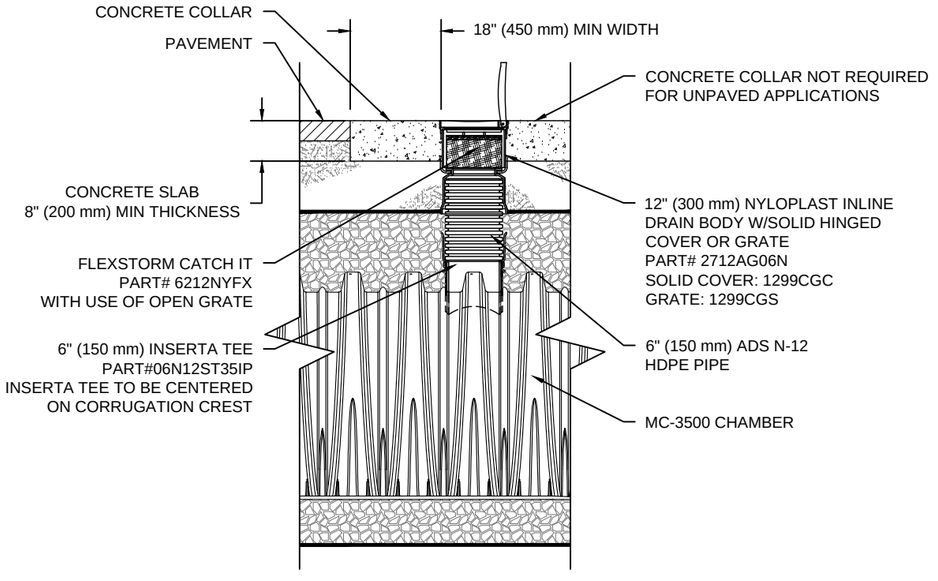
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



MC-3500 6" INSPECTION PORT DETAIL
NTS

1934 - MetroWalk
LA County

DATE: 05/07/2020 | DRAWN: SL | CHECKED: ---
PROJECT #: Tool

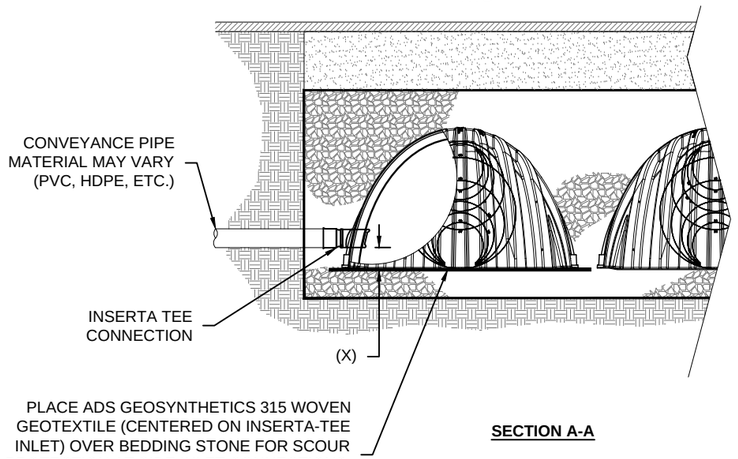
REV	DRW	CHK	DESCRIPTION

StormTech
Detention • Retention • Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

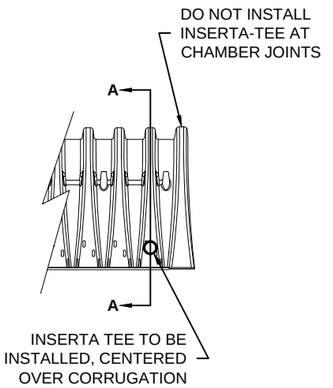
ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

INSERTA TEE DETAIL

NTS



SECTION A-A



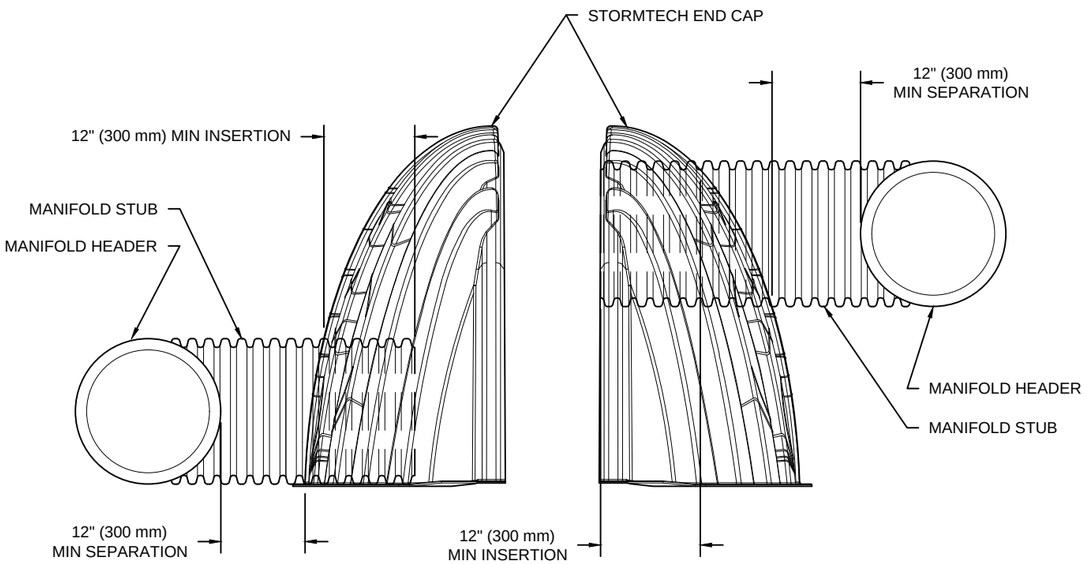
SIDE VIEW

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

NOTE:
PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS.
CONTACT STORMTECH FOR MORE INFORMATION.

MC-SERIES END CAP INSERTION DETAIL

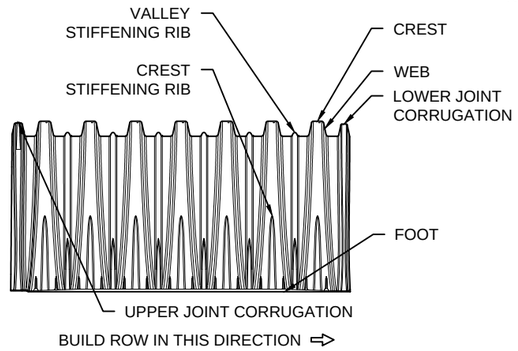
NTS

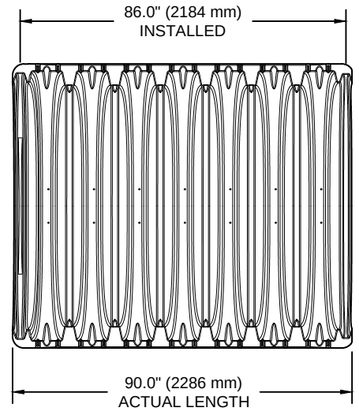


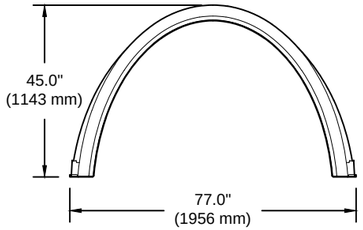
NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

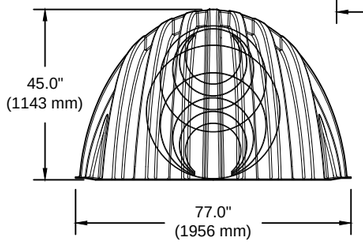
MC-3500 TECHNICAL SPECIFICATION

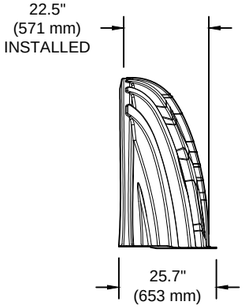
NTS











NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	178.9 CUBIC FEET	(5.06 m³)
WEIGHT	135.0 lbs.	(61.2 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 22.5"	(1956 mm X 1143 mm X 571 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	46.0 CUBIC FEET	(1.30 m³)
WEIGHT	50.0 lbs.	(22.7 kg)

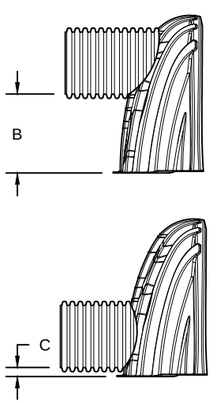
*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP30BC	30" (750 mm)	---	

NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS.
CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm)
THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHTEST POSSIBLE FOR THE PIPE SIZE.



1934 - MetroWalk
LA County

DATE: 05/07/2020 | DRAWN: SL | CHECKED: ---
PROJECT #: Tool

REV	DRW	CHK	DESCRIPTION

StormTech
Detention•Retention•Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

StormTech®
Detention • Retention • Water Quality
An ADS company

Isolator® Row O&M Manual


SC-740


MC-3500


MC-4500

THE MOST **ADVANCED** NAME IN WATER MANAGEMENT SOLUTIONS™

THE ISOLATOR® ROW

INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160LP, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the SC-160LP, DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

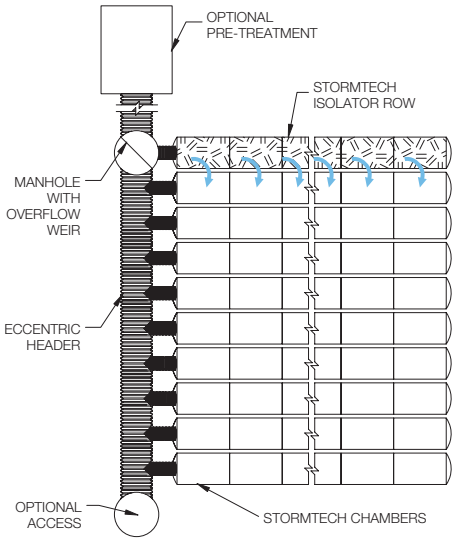
The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the over flow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

StormTech Isolator Row with Overflow Spillway (not to scale)



ISOLATOR ROW INSPECTION/MAINTENANCE

INSPECTION

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

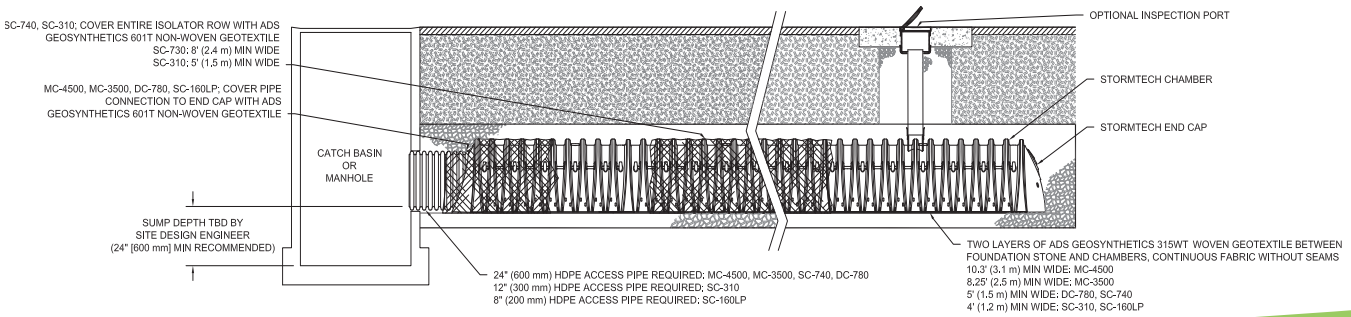
MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)

Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-4500 chamber models and is not required over the entire Isolator Row.



ISOLATOR ROW STEP BY STEP MAINTENANCE PROCEDURES

STEP 1

Inspect Isolator Row for sediment.

A) Inspection ports (if present)
   i. Remove lid from floor box frame
   ii. Remove cap from inspection riser
   iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
   iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Rows
   i. Remove cover from manhole at upstream end of Isolator Row
   ii. Using a flashlight, inspect down Isolator Row through outlet pipe
      1. Mirrors on poles or cameras may be used to avoid a confined space entry
      2. Follow OSHA regulations for confined space entry if entering manhole
   iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2. If not, proceed to Step 3.

STEP 2

Clean out Isolator Row using the JetVac process.

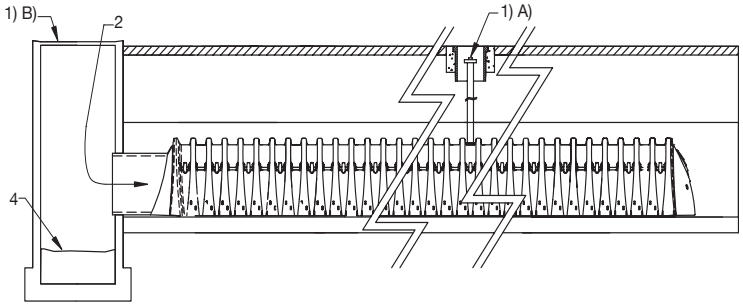
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

STEP 3

Replace all caps, lids and covers, record observations and actions.

STEP 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



SAMPLE MAINTENANCE LOG

Date	Stadia Rod Readings		Sediment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

StormTech® Detention • Retention • Water Quality
A division of ADS

Advanced Drainage Systems, Inc.
4640 Trueman Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

APPENDIX D

DEVELOPED CONDITION USMP/ LID EXHIBIT

MetroWalk
WATER QUALITY TREATMENT EXHIBIT
9/18/20

USMP NOTES

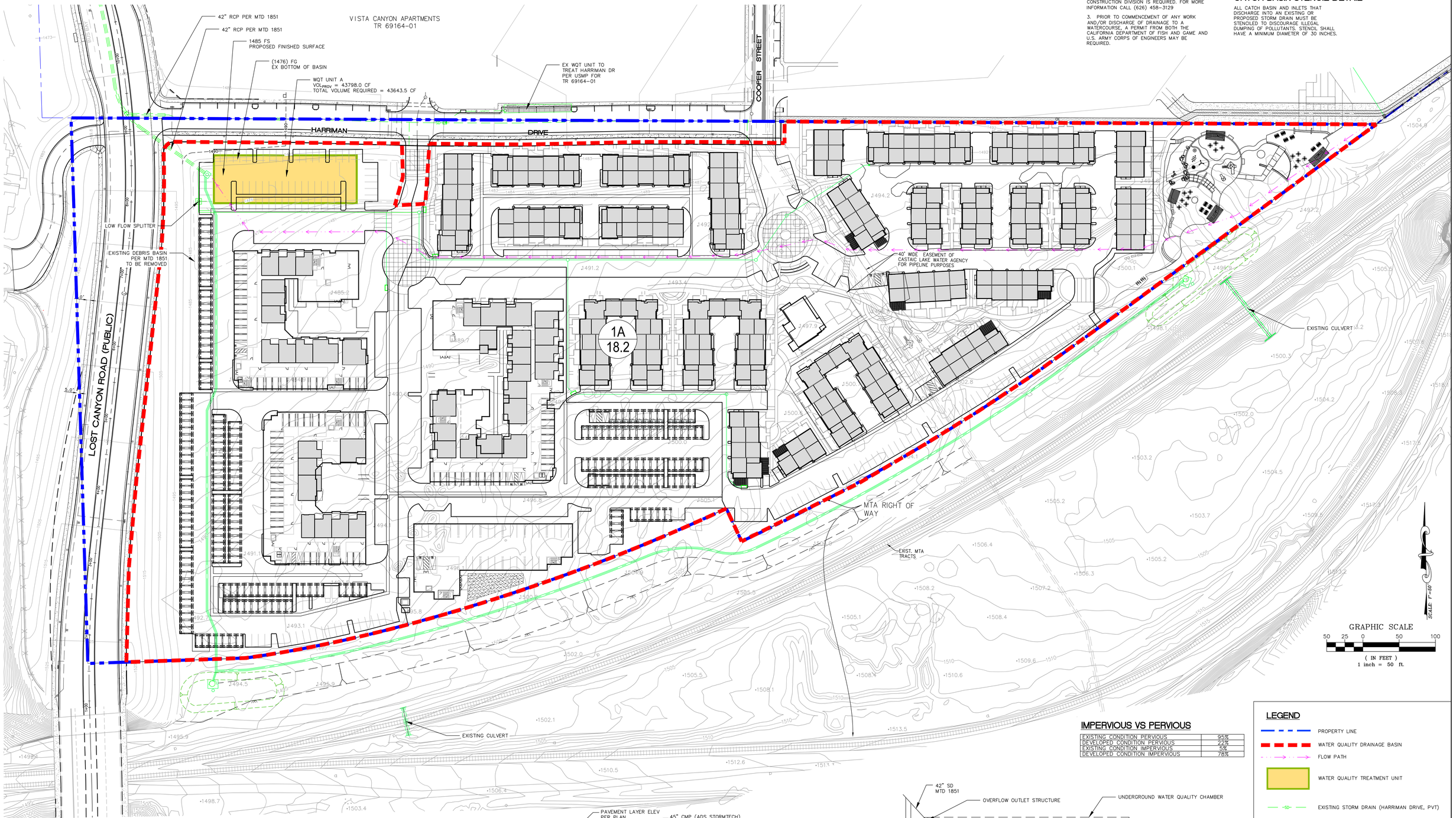
1. ALL STRUCTURAL BMP'S SHALL BE ACCESSIBLE FOR INSPECTION AND MAINTENANCE AND SHALL BEAR A "NO DUMPING – DRAINS TO OCEAN" SYMBOL IN TRAFFIC RATED PAINT PER DETAIL HEREIN. STENCIL IS AVAILABLE AT ANY OF THE BUILDING AND SAFETY'S DISTRICT OFFICES.

2. PRIOR TO COMMENCEMENT OF ANY WORK WITHIN THE ROAD RIGHT OF WAY AND/OR CONNECTION TO A COUNTY – MAINTAINED STORMDRAIN, AN ENCROACHMENT PERMIT FROM CONSTRUCTION DIVISION IS REQUIRED. FOR MORE INFORMATION CALL (626) 458-3129

3. PRIOR TO COMMENCEMENT OF ANY WORK AND/OR DISCHARGE OF DRAINAGE TO A WATERCOURSE, A PERMIT FROM BOTH THE CALIFORNIA DEPARTMENT OF FISH AND GAME AND U.S. ARMY CORPS OF ENGINEERS MAY BE REQUIRED.

CATCH BASIN STENCIL DETAIL

ALL CATCH BASIN AND INLETS THAT DISCHARGE INTO AN EXISTING OR PROPOSED STORM DRAIN MUST BE STENCILED TO DISCOURAGE ILLEGAL DUMPING OF POLLUTANTS. STENCIL SHALL HAVE A MINIMUM DIAMETER OF 30 INCHES.



IMPERVIOUS VS PERVIOUS

EXISTING CONDITION PERVIOUS	95%
DEVELOPED CONDITION PERVIOUS	22%
EXISTING CONDITION IMPERVIOUS	5%
DEVELOPED CONDITION IMPERVIOUS	78%

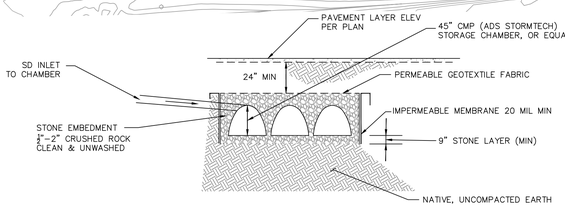
LEGEND

- PROPERTY LINE
- WATER QUALITY DRAINAGE BASIN
- FLOW PATH
- WATER QUALITY TREATMENT UNIT
- EXISTING STORM DRAIN (HARRIMAN DRIVE, PVT)
- EXISTING STORM DRAIN (MTD 1851)
- PROPOSED STORM DRAIN (ONSITE)
- PROPOSED STORM DRAIN (MTA LINE)
- PROPOSED CATCH BASIN
- PROPOSED GRATED INLET

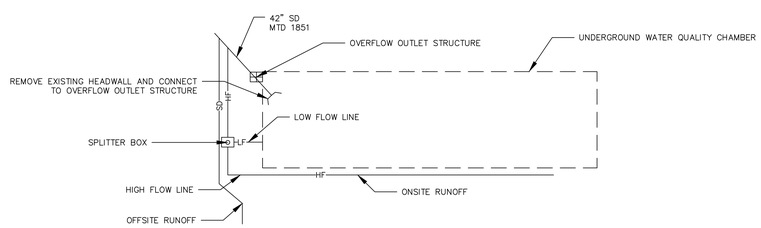
LID/WATER QUALITY

85th PERCENTILE STORM	0.92 IN
HYDROMOD DESIGN STORM	85th %
TOTAL DESIGN STORM VOLUME REQUIRED	43,644 CF
TOTAL STORAGE VOLUME PROVIDED	43,798 CF

Volume Required (SWQDv)	43,644	cf
U.G. Chamber Volume Provided	43,798	cf
Required Flowrate (SWQDf)	2.29	cfs
Design Flowrate (Low Flow)	2.30	cfs



TYPICAL UNDERGROUND INFILTRATION CHAMBER DETAIL
NO SCALE



UNDERGROUND WATER QUALITY CHAMBER
LOW FLOW DETAIL
NOT TO SCALE

ALLIANCE
LAND PLANNING & ENGINEERING INC.
CIVIL ENGINEERING • LAND PLANNING • HILLSIDE DESIGN • SURVEYING
2248 FARADAY AVE.
CARLSBAD, CA 92008
TEL: (760) 431-9896
FAX: (760) 431-8802
27451 TOURNEY RD.
SUITE 140
SANTA CLARITA, CA 91355
TEL: (661) 799-2760
FAX: (760) 431-8802

I:\CAD\1934\HYDROLOGY\1934-WQT-HYDRO.dwg