

LOS ANGELES INTERNATIONAL AIRPORT CONSOLIDATED RENTAL CAR FACILITY

WATER DESIGN REPORT

September 23, 2016
QTA 30% Submittal



Prepared for:



LAX

Los Angeles World Airports

Capital Programming, Planning and Engineering Group
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Contract Number DA-4881

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TranSystems has performed a 60% design level preliminary water system layout for the LAX Consolidated Rental Car Facility (ConRAC) referenced project. The proposed layout was verified to meet design requirements based on Los Angeles Fire Code Chapter 5, Section 507, Table 507.3.1. This table shows for Industrial and Commercial Land Development, 6,000 to 9,000 gpm (at 20 psi minimum) is the required Fire-Flow demand (from four to six fire hydrants flowing simultaneously). Table 507.3.2 shows a maximum distance of 300' between hydrants for placement.

There is an existing underground water distribution system that serves Manchester Square. Water mains exist beneath most of the existing streets. Since the majority of these systems will not be compatible with the new improvements, almost all will be removed. The main Los Angeles streets in the area typically consist of 12 inch water mains or larger, however Arbor Vitae Street and La Cienega Boulevard act as the northern and eastern City of Los Angeles boundary to City of Inglewood. Because of this, Arbor Vitae Street has an existing 6 inch water main and La Cienega Boulevard has an existing 8 inch water main. These water mains are not compatible with the new ConRAC fire water demands and portions of these mains need to be upsized.

Los Angeles Department of Water and Power (LADWP) have supplied 5 different Fire Service Pressure Flow Reports for the existing water distribution system. These reports give available flow and pressure information at various locations adjacent to the proposed site. These Flow Reports are included in the Appendix A. This information was used to aid in developing an accurate model of the existing system. This model was then used to determine if any existing pipes needed to be upsized in order to provide adequate flow to the project site.

Bentley WaterCAD V8i was used to perform the analysis. A representative model of the existing system was set up in WaterCAD based on the available pressure data supplied by LADWP. A static pressure of 98 psi was used for the model. A summary table with no demand present shows this static value in the Appendix B. All new piping was chosen to be PVC pipe with a Hazen-Williams design coefficient of 140. The exact condition of the existing pipes is unknown, but in order to get a best fit to the multiple points of pressure data a Hazen-Williams design coefficient of 110 was determined to best fit the data. As pipes get older, the coefficient decreases, so this is a reasonable assumption. No elevation difference was modeled across the system due to the flat topography of the area.

The buildings on the site will be surrounded by a series of fire hydrants placed no more than 300 feet apart. Therefore, the site will be served by a new water distribution system looped around all of the site buildings as shown in Appendix C. Water service can be provided from any location along the looped system. The proposed system has four connections on Arbor Vitae and one connection on La Cienega near 98th Street. Each connection point on Arbor Vitae or La Cienega has a backflow preventer installed to prevent contamination back into the water supply (See Plan Sheets I-CU-002 and I-CU-101-106 for more detailed layout – Appendix C). In addition, a post indicator valve and freestanding FDC located a minimum of 40 feet from the building, will be provided on each of the two fire service laterals of the QTA Buildings A and B.

The existing piping along Arbor Vitae is a 6" line. Unfortunately, this not adequate for the demands the development requires. As a result, it was determined that upsizing this line to a 12" size from its connection point near Aviation Boulevard east to our last proposed connection point just west of La Cienega. However, this alone still does not provide adequate flow and pressure to meet the requirements set forth in the Fire Code.



Next, we analyzed what would happen if we also upsized the line to 12" in La Cienega from Century Boulevard to our proposed connection at the southeast end of development. This combined with the improvements in Arbor Vitae provide enough to meet the demands set forth in the Fire Code. All of the proposed main lines are also 12" with the exception of the laterals going to the fire hydrants. This complies with LADWP minimum pipe size as specified with their pressure flow data.

The system was checked to verify it could handle six hydrants flowing simultaneously at 1,500 gpm. Various scenarios were run in the model to determine which six hydrants would be the worst case scenario for the system with respect to pressures at the flowing hydrant. It was found that six hydrants in line with each other between Buildings C and D showed the most dramatic decrease in pressure. A summary table is provided in the Appendix B displays this scenario.

To conclude, it was determined that making improvements to the existing lines along Arbor Vitae and La Cienega Boulevard will provide adequate water to the proposed facility.



APPENDIX A

LADWP FLOW REPORTS



City of Los Angeles

Los Angeles Department of Water and Power - Water System



SAR NUMBER 53973

Fire Service Pressure Flow ReportSERVICE NUMBER **619456**For: **5200 W 97TH ST** Approved Date: **3-23-2016**Proposed Service **8 INCH** off of the**8** inch main in **LA CIENEGA BLVD** on the **WEST** side approximately**90** feet **SOUTH** of **SOUTH** of **97TH ST** The System maximum pressure is**100** psi based on street curb elevation of **95** feet above sea level at this location.The distance from the DWP street main to the property line is **22** feet**System maximum pressure should be used only for determining class of piping and fittings.****Residual Flow/Pressure Table for water system street main at this location**

Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)
0	96	1930	78		
405	95	1990	77		
590	94	2045	76		
735	93	2100	75		
860	92	2155	74		
970	91	2205	73		
1070	90	2255	72		
1160	89	2305	71		
1245	88	2355	70		
1330	87	2405	69		
1405	86	2455	68		
1480	85	2500	67		
1550	84				
1620	83				
1685	82				
1750	81				
1815	80				
1875	79				

Meter Assembly Capacities**Domestic Meters**

1 inch = 56 gpm
 1-1/2 inch = 96 gpm
 2 inch = 160 gpm
 3 inch = 220 gpm
 4 inch = 400 gpm
 6 inch = 700 gpm
 8 inch = 1500 gpm
 10 inch = 2500 gpm

Fire Service

2 inch = 250 gpm
 4 inch = 600 gpm
 6 inch = 1400 gpm
 8 inch = 2500 gpm
 10 inch = 5000 gpm

FM Services

8 inch = 2500 gpm
 10 inch = 5000 gpm

These values are subject to change due to changes in system facilities or demands.

Notes: With 220 gpm simultaneous flow from 3" EQ domestic service

This information will be sent to the Department of Building and Safety for plan checking.

This SAR is valid for one year from 03-23-16. Once the SAR expires, the applicant needs to re-apply and pay applicable processing fee.

For additional information contact the Water Distribution Services Section **WESTERN (213) 367-1225**

ELIA SUN
Prepared by

ELIA SUN
Approved by

092-174
Water Service Map



City of Los Angeles

Los Angeles Department of Water and Power - Water System



SAR NUMBER 55250

Fire Service Pressure Flow ReportSERVICE NUMBER **620884**For: **5302 ARBOR VITAE ST**Approved Date: **8-12-2016**Proposed Service **10 INCH** off of the**6** inch main in **ARBOR VITAE ST** on the **SOUTH** side approximately**30** feet **WEST** of **WEST** of **HINDRY PL** The System maximum pressure is**98** psi based on street curb elevation of **100** feet above sea level at this location.The distance from the DWP street main to the property line is **19** feet**System maximum pressure should be used only for determining class of piping and fittings.****Residual Flow/Pressure Table for water system street main at this location**

Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)
0	79	825	61	1200	43
175	78	850	60	1215	42
250	77	870	59	1235	41
315	76	895	58	1250	40
365	75	920	57	1270	39
415	74	940	56	1285	38
455	73	960	55	1300	37
495	72	985	54	1320	36
530	71	1005	53	1335	35
565	70	1025	52	1350	34
600	69	1045	51	1365	33
630	68	1065	50	1385	32
660	67	1085	49	1400	31
690	66	1105	48	1415	30
720	65	1125	47	1430	29
745	64	1145	46	1445	28
775	63	1160	45	1460	27
800	62	1180	44	1475	26

Meter Assembly Capacities**Domestic Meters**

1 inch = 56 gpm
 1-1/2 inch = 96 gpm
 2 inch = 160 gpm
 3 inch = 220 gpm
 4 inch = 400 gpm
 6 inch = 700 gpm
 8 inch = 1500 gpm
 10 inch = 2500 gpm

Fire Service

2 inch = 250 gpm
 4 inch = 600 gpm
 6 inch = 1400 gpm
 8 inch = 2500 gpm
 10 inch = 5000 gpm

FM Services

8 inch = 2500 gpm
 10 inch = 5000 gpm

These values are subject to change due to changes in system facilities or demands.

Notes: DO NOT SELL SERVICE! MAXIMUM FLOW FROM EXISTING 6" WATER MAIN IS 1491 GPM AT 25 PSI. NEED TO UPSIZE 1840' OF PIPE TO 12" TO ACHIEVE 5000 GPM AT DESIRED LOCATION.

This information will be sent to the Department of Building and Safety for plan checking.

This SAR is valid for one year from 08-12-16. Once the SAR expires, the applicant needs to re-apply and pay applicable processing fee.

For additional information contact the Water Distribution Services Section **WESTERN (213) 367-1225****MARIA WELSH**

Prepared by

MARK PATTERSON

Approved by

094-174

Water Service Map



City of Los Angeles

Los Angeles Department of Water and Power - Water System



SAR NUMBER 55251

Fire Service Pressure Flow ReportSERVICE NUMBER **620885**For: **5514 W 93RD ST** Approved Date: **8-12-2016**Proposed Service **10 INCH** off of the**8** inch main in **093 ST** on the **SOUTH** side approximately**180** feet **EAST** of **EAST** of **AVIATION BLVD** The System maximum pressure is**98** psi based on street curb elevation of **100** feet above sea level at this location.The distance from the DWP street main to the property line is **19** feet**System maximum pressure should be used only for determining class of piping and fittings.****Residual Flow/Pressure Table for water system street main at this location**

Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)
0	79	2475	61	3595	43
520	78	2550	60	3650	42
755	77	2620	59	3705	41
940	76	2690	58	3755	40
1100	75	2755	57	3810	39
1240	74	2825	56	3860	38
1365	73	2890	55	3910	37
1485	72	2955	54	3960	36
1595	71	3020	53	4010	35
1700	70	3080	52	4060	34
1800	69	3140	51	4105	33
1895	68	3200	50	4155	32
1990	67	3260	49	4200	31
2075	66	3320	48	4250	30
2160	65	3375	47	4295	29
2240	64	3430	46	4340	28
2320	63	3490	45	4390	27
2400	62	3545	44	4435	26

Meter Assembly Capacities**Domestic Meters**

1 inch = 56 gpm
 1-1/2 inch = 96 gpm
 2 inch = 160 gpm
 3 inch = 220 gpm
 4 inch = 400 gpm
 6 inch = 700 gpm
 8 inch = 1500 gpm
 10 inch = 2500 gpm

Fire Service

2 inch = 250 gpm
 4 inch = 600 gpm
 6 inch = 1400 gpm
 8 inch = 2500 gpm
 10 inch = 5000 gpm

FM Services

8 inch = 2500 gpm
 10 inch = 5000 gpm

These values are subject to change due to changes in system facilities or demands.

Notes: UPGRADE 230'-8" WATER PIPE TO 12" PIPE TO GET 5000 GPM.**This information will be sent to the Department of Building and Safety for plan checking.**

This SAR is valid for one year from 08-12-16. Once the SAR expires, the applicant needs to re-apply and pay applicable processing fee.

For additional information contact the Water Distribution Services Section **WESTERN (213) 367-1225****MARK PATTERSON**

Prepared by

MARK PATTERSON

Approved by

094-174

Water Service Map



City of Los Angeles

Los Angeles Department of Water and Power - Water System



SAR NUMBER 55252

Fire Service Pressure Flow ReportSERVICE NUMBER **620886**For: **5524 W 98TH ST** Approved Date: **8-12-2016**Proposed Service **10 INCH** off of the**8** inch main in **098 ST** on the **SOUTH** side approximately**40** feet **EAST** of **EAST** of **AVIATION BLVD** The System maximum pressure is**100** psi based on street curb elevation of **95** feet above sea level at this location.The distance from the DWP street main to the property line is **19** feet**System maximum pressure should be used only for determining class of piping and fittings.****Residual Flow/Pressure Table for water system street main at this location**

Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)
0	88	3605	70		
755	87	3710	69		
1100	86	3815	68		
1370	85	3915	67		
1600	84	4015	66		
1805	83	4115	65		
1990	82	4210	64		
2165	81	4305	63		
2325	80	4395	62		
2480	79	4485	61		
2625	78	4575	60		
2765	77	4665	59		
2895	76	4750	58		
3025	75	4835	57		
3145	74	4920	56		
3265	73	5000	55		
3380	72				
3495	71				

Meter Assembly Capacities**Domestic Meters**

1 inch = 56 gpm
 1-1/2 inch = 96 gpm
 2 inch = 160 gpm
 3 inch = 220 gpm
 4 inch = 400 gpm
 6 inch = 700 gpm
 8 inch = 1500 gpm
 10 inch = 2500 gpm

Fire Service

2 inch = 250 gpm
 4 inch = 600 gpm
 6 inch = 1400 gpm
 8 inch = 2500 gpm
 10 inch = 5000 gpm

FM Services

8 inch = 2500 gpm
 10 inch = 5000 gpm

These values are subject to change due to changes in system facilities or demands.

Notes:**This information will be sent to the Department of Building and Safety for plan checking.**

This SAR is valid for one year from 08-12-16. Once the SAR expires, the applicant needs to re-apply and pay applicable processing fee.

For additional information contact the Water Distribution Services Section **WESTERN (213) 367-1225****MARK PATTERSON**

Prepared by

MARK PATTERSON

Approved by

092-171

Water Service Map



City of Los Angeles

Los Angeles Department of Water and Power - Water System



SAR NUMBER 55253

Fire Service Pressure Flow ReportSERVICE NUMBER **620887**For: **5201 CENTURY BLVD** Approved Date: **8-12-2016**Proposed Service **10 INCH** off of the**12** inch main in **CENTURY BL** on the **NORTH** side approximately**90** feet **WEST** of **WEST** of **LA CIENEGA BL** The System maximum pressure is**100** psi based on street curb elevation of **95** feet above sea level at this location.The distance from the DWP street main to the property line is **17** feet**System maximum pressure should be used only for determining class of piping and fittings.****Residual Flow/Pressure Table for water system street main at this location**

Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)	Flow (gpm)	Press. (psi)
0	96	4280	78		
900	95	4405	77		
1305	94	4530	76		
1625	93	4650	75		
1900	92	4770	74		
2145	91	4885	73		
2365	90	5000	72		
2570	89				
2765	88				
2945	87				
3115	86				
3280	85				
3440	84				
3590	83				
3735	82				
3880	81				
4015	80				
4150	79				

Meter Assembly Capacities**Domestic Meters**

1 inch = 56 gpm
 1-1/2 inch = 96 gpm
 2 inch = 160 gpm
 3 inch = 220 gpm
 4 inch = 400 gpm
 6 inch = 700 gpm
 8 inch = 1500 gpm
 10 inch = 2500 gpm

Fire Service

2 inch = 250 gpm
 4 inch = 600 gpm
 6 inch = 1400 gpm
 8 inch = 2500 gpm
 10 inch = 5000 gpm

FM Services

8 inch = 2500 gpm
 10 inch = 5000 gpm

These values are subject to change due to changes in system facilities or demands.

Notes:**This information will be sent to the Department of Building and Safety for plan checking.**

This SAR is valid for one year from 08-12-16. Once the SAR expires, the applicant needs to re-apply and pay applicable processing fee.

For additional information contact the Water Distribution Services Section **WESTERN (213) 367-1225****MARK PATTERSON**

Prepared by

MARK PATTERSON

Approved by

092-174

Water Service Map



APPENDIX B

WaterCAD RESULTS

SHEET OF

LAX-CONRAC Junction Summary Table with 0 Hydrant Flows Active

Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-1	100.00	0	98
J-2	100.00	0	98
J-3	100.00	0	98
J-4	100.00	0	98
J-5	100.00	0	98
J-6	100.00	0	98
J-7	100.00	0	98
J-8	100.00	0	98
J-9	100.00	0	98
J-10	100.00	0	98
J-11	100.00	0	98
J-12	100.00	0	98
J-13	100.00	0	98
J-14	100.00	0	98
J-16	100.00	0	98
J-17	100.00	0	98
J-19	100.00	0	98
J-20	100.00	0	98
J-21	100.00	0	98
J-22	100.00	0	98
J-23	100.00	0	98
J-24	100.00	0	98
J-25	100.00	0	98
J-26	100.00	0	98
J-27	100.00	0	98
J-28	100.00	0	98
J-29	100.00	0	98
J-31	100.00	0	98
J-33	100.00	0	98
J-34	100.00	0	98
J-35	100.00	0	98
J-36	100.00	0	98
J-37	100.00	0	98
J-38	100.00	0	98
J-39	100.00	0	98
J-40	100.00	0	98
J-41	100.00	0	98
J-42	100.00	0	98
J-43	100.00	0	98
J-44	100.00	0	98
J-45	100.00	0	98
J-46	100.00	0	98
J-47	100.00	0	98
J-48	100.00	0	98
J-49	100.00	0	98
J-52	100.00	0	98
J-53	100.00	0	98

LAX-CONRAC Junction Summary Table with 0 Hydrant Flows Active

Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-54	100.00	0	98
J-55	100.00	0	98
J-56	100.00	0	98
J-57	100.00	0	98
J-58	100.00	0	98
J-59	100.00	0	98
J-60	100.00	0	98
J-61	100.00	0	98
J-62	100.00	0	98
J-63	100.00	0	98
J-64	100.00	0	98
J-66	100.00	0	98
J-67	100.00	0	98
J-68	100.00	0	98
J-69	100.00	0	98
J-71	100.00	0	98
J-72	100.00	0	98
J-73	100.00	0	98
J-74	100.00	0	98
J-75	100.00	0	98
J-76	100.00	0	98
J-77	100.00	0	98
J-78	100.00	0	98
J-79	100.00	0	98
J-80	100.00	0	98

LAX-CONRAC - Pipe Summary Table

with 6 Hydrant Flows Active

Current Time: 0.000 hours

Label	Start Node	Stop Node	Dia. (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (Max) (ft/s)	Headloss (ft)
98-P1	J-42	J-33	12.0	PVC	140.0	-2,128	274	6.04	2.45
98-P2	J-43	J-42	12.0	PVC	140.0	-2,128	232	6.04	2.08
98-P3	J-55	J-43	12.0	PVC	140.0	2,399	36	6.81	0.40
98-P4	J-56	J-55	12.0	PVC	140.0	2,399	275	6.81	3.07
98-P5	J-53	J-56	12.0	PVC	140.0	2,399	244	6.81	2.73
98-P6	J-63	J-53	12.0	PVC	140.0	2,399	154	6.81	1.72
98-P7	J-63	J-66	12.0	PVC	140.0	-1,831	174	5.19	1.18
98-P8	J-67	J-66	12.0	PVC	140.0	1,831	224	5.19	1.52
98-P9	J-68	J-67	12.0	PVC	140.0	3,355	129	9.52	2.68
102-E1	J-22	J-23	8.0	Ductile Iron	110.0	-899	2,297	5.74	46.98
Avi-E1	R-3	J-29	16.0	Ductile Iron	110.0	6,100	50	9.73	1.21
Avi-E2	J-23	J-29	16.0	Ductile Iron	110.0	-6,100	614	9.73	16.75
Avi-E3	J-23	J-24	16.0	Ductile Iron	110.0	5,200	614	8.30	11.44
Avi-E4	J-24	J-25	12.0	Ductile Iron	110.0	2,522	129	7.15	2.75
Avi-E5	J-25	J-31	12.0	Ductile Iron	110.0	2,522	852	7.15	17.33
Avi-E6	J-31	J-26	12.0	Ductile Iron	110.0	2,522	1,417	7.15	28.17
Avi-E7	J-17	J-26	12.0	Ductile Iron	110.0	-2,522	43	7.15	1.84
Avi-E8	J-16	J-17	12.0	Ductile Iron	110.0	-2,522	369	7.15	8.08
BA-P1	J-79	J-67	12.0	PVC	140.0	-1,524	57	4.32	0.27
BA-P2	J-78	J-79	12.0	PVC	140.0	-1,524	239	4.32	1.15
BA-P3	J-76	J-78	12.0	PVC	140.0	-1,524	54	4.32	0.26
BA-P4	J-75	J-76	12.0	PVC	140.0	-623	236	1.77	0.22
BA-P5	J-74	J-75	12.0	PVC	140.0	-623	229	1.77	0.21
BA-P6	J-73	J-74	12.0	PVC	140.0	-623	213	1.77	0.20
BA-P7	J-72	J-73	12.0	PVC	140.0	-623	346	1.77	0.32
BA-P8	J-72	J-71	12.0	PVC	140.0	313	225	0.89	0.06
BA-P9	J-71	J-69	12.0	PVC	140.0	313	33	0.89	0.01
Bell-E1	J-12	J-13	12.0	Ductile Iron	110.0	-2,900	2,292	8.23	58.22
Bell-E2	R-2	J-13	12.0	Ductile Iron	110.0	2,900	50	8.23	1.24
CA-P1	J-61	J-62	12.0	PVC	140.0	-333	241	0.94	0.07
CA-P2	J-60	J-61	12.0	PVC	140.0	-333	267	0.94	0.08
CA-P3	J-59	J-60	12.0	PVC	140.0	-333	283	0.94	0.08
CA-P4	J-58	J-59	12.0	PVC	140.0	-333	234	0.94	0.07
CA-P5	J-57	J-58	12.0	PVC	140.0	-643	48	1.82	0.05
CA-P6	J-54	J-57	12.0	PVC	140.0	-643	190	1.82	0.19
CB-P1	J-64	J-63	12.0	PVC	140.0	569	51	1.61	0.04
CB-P2	J-62	J-64	12.0	PVC	140.0	569	296	1.61	0.23
CENT-E1	J-24	J-21	12.0	Ductile Iron	110.0	2,679	2,239	7.60	47.95
CENT-E2	J-20	J-21	12.0	Ductile Iron	110.0	-3,578	121	10.15	4.43
CENT-E3	J-11	J-20	12.0	Ductile Iron	110.0	-3,578	304	10.15	11.13
CENT-E4	J-20	J-19	6.0	Ductile Iron	110.0	0	38	0.00	0.00
CENT-E5	J-80	J-19	6.0	Ductile Iron	110.0	0	350	0.00	0.00
Cien-E1	J-28	J-68	8.0	Ductile Iron	110.0	-223	1,383	1.42	2.14
Cien-E2	J-8	J-28	6.0	Ductile Iron	110.0	-223	104	2.53	0.65
Cien-E3	J-7	J-8	6.0	Ductile Iron	110.0	-223	46	2.53	0.29
Cien-E4	J-6	J-7	6.0	Ductile Iron	110.0	-223	198	2.53	1.24

LAX-CONRAC - Pipe Summary Table

with 6 Hydrant Flows Active

Current Time: 0.000 hours

Label	Start Node	Stop Node	Dia. (in)	Material	Hazen-Williams C	Flow (gpm)	Length (ft)	Velocity (Max) (ft/s)	Headloss (ft)
Cien-P1	J-10	J-11	12.0	PVC	110.0	-3,578	382	10.15	13.99
Cien-P2	J-9	J-10	12.0	PVC	110.0	-3,578	28	10.15	1.03
Cien-P3	J-68	J-9	12.0	PVC	110.0	-3,578	471	10.15	17.23
Con-P1	J-33	J-41	12.0	PVC	140.0	-2,128	307	6.04	2.75
Con-P2	J-41	J-52	12.0	PVC	140.0	-2,128	44	6.04	0.39
Con-P3	J-52	J-40	12.0	PVC	140.0	-2,128	226	6.04	2.02
Con-P4	J-40	J-39	12.0	PVC	140.0	-2,128	270	6.04	2.42
Con-P5	J-39	J-38	12.0	PVC	140.0	-2,128	270	6.04	2.42
Con-P6	J-38	J-37	12.0	PVC	140.0	-2,128	270	6.04	2.42
Con-P7	J-37	J-36	12.0	PVC	140.0	-2,128	271	6.04	2.42
Con-P8	J-36	J-35	12.0	PVC	140.0	-2,128	295	6.04	2.64
Con-P9	J-35	J-1	12.0	PVC	140.0	-2,128	220	6.04	1.97
DC-P1	J-34	J-43	12.0	PVC	140.0	-4,527	225	12.84	8.15
DC-P2	J-44	J-34	12.0	PVC	140.0	-3,027	277	8.59	4.76
DC-P3	J-45	J-44	12.0	PVC	140.0	-1,527	241	4.33	1.17
DC-P4	J-46	J-45	12.0	PVC	140.0	-27	259	0.08	0.00
DC-P5	J-47	J-46	12.0	PVC	140.0	1,473	290	4.18	1.31
DC-P6	J-48	J-47	12.0	PVC	140.0	2,973	290	8.43	4.82
DC-P7	J-49	J-48	12.0	PVC	140.0	4,473	256	12.69	9.07
DC-P8	J-27	J-49	12.0	PVC	140.0	4,473	167	12.69	5.91
GLAS-E1	J-21	J-22	8.0	Ductile Iron	110.0	-899	607	5.74	12.41
P-120	J-58	J-72	12.0	PVC	140.0	-310	352	0.88	0.09
P-128	J-62	J-77	12.0	PVC	140.0	-901	194	2.56	0.35
P-129	J-77	J-76	12.0	PVC	140.0	-901	210	2.56	0.38
Vitae-E1	J-12	J-4	8.0	Ductile Iron	110.0	0	1,627	0.00	0.00
Vitae-E2	J-14	J-12	12.0	Ductile Iron	110.0	-2,900	184	8.23	5.91
Vitae-E3	J-16	J-14	12.0	Ductile Iron	110.0	-2,900	880	8.23	22.20
Vitae-E4	J-69	J-6	6.0	Ductile Iron	110.0	-223	169	2.53	1.06
Vitae-P1	J-3	J-16	12.0	PVC	140.0	-5,422	490	15.38	24.78
Vitae-P2	J-1	J-3	12.0	PVC	140.0	-5,422	42	15.38	2.12
Vitae-P3	J-1	J-27	12.0	PVC	140.0	3,294	843	9.34	16.93
Vitae-P4	J-27	J-54	12.0	PVC	140.0	-1,179	209	3.34	0.63
Vitae-P5	J-54	J-2	12.0	PVC	140.0	-536	254	1.52	0.18
Vitae-P6	J-2	J-5	12.0	PVC	140.0	-536	35	1.52	0.02
Vitae-P7	J-5	J-69	12.0	PVC	140.0	-536	77	1.52	0.05

LAX-CONRAC Junction Summary Table with 6 Hydrant Flows Active

Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-1	100.00	0	49
J-2	100.00	0	42
J-3	100.00	0	50
J-4	100.00	0	72
J-5	100.00	0	42
J-6	100.00	0	42
J-7	100.00	0	43
J-8	100.00	0	43
J-9	100.00	0	52
J-10	100.00	0	52
J-11	100.00	0	58
J-12	100.00	0	72
J-13	100.00	0	98
J-14	100.00	0	70
J-16	100.00	0	60
J-17	100.00	0	64
J-19	100.00	0	63
J-20	100.00	0	63
J-21	100.00	0	65
J-22	100.00	0	70
J-23	100.00	0	90
J-24	100.00	0	85
J-25	100.00	0	84
J-26	100.00	0	65
J-27	100.00	0	41
J-28	100.00	0	43
J-29	100.00	0	98
J-31	100.00	0	77
J-33	100.00	0	40
J-34	100.00	1,500	35
J-35	100.00	0	48
J-36	100.00	0	47
J-37	100.00	0	46
J-38	100.00	0	45
J-39	100.00	0	44
J-40	100.00	0	43
J-41	100.00	0	41
J-42	100.00	0	39
J-43	100.00	0	38
J-44	100.00	1,500	33
J-45	100.00	1,500	32
J-46	100.00	1,500	32
J-47	100.00	1,500	33
J-48	100.00	1,500	35
J-49	100.00	0	39
J-52	100.00	0	42
J-53	100.00	0	41

LAX-CONRAC Junction Summary Table with 6 Hydrant Flows Active

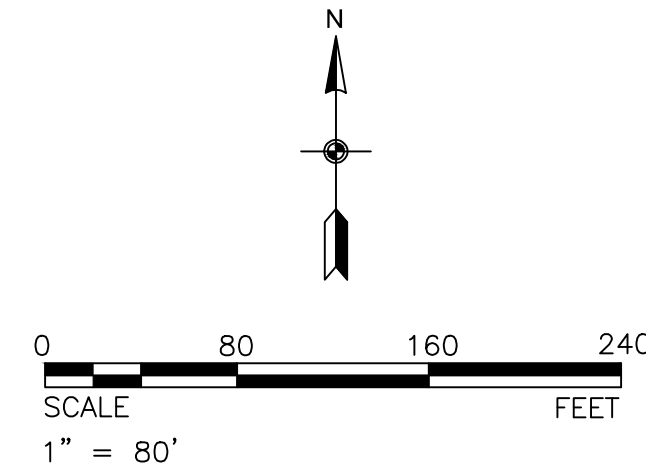
Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-54	100.00	0	42
J-55	100.00	0	38
J-56	100.00	0	40
J-57	100.00	0	42
J-58	100.00	0	42
J-59	100.00	0	42
J-60	100.00	0	42
J-61	100.00	0	42
J-62	100.00	0	42
J-63	100.00	0	42
J-64	100.00	0	42
J-66	100.00	0	42
J-67	100.00	0	43
J-68	100.00	0	44
J-69	100.00	0	42
J-71	100.00	0	42
J-72	100.00	0	42
J-73	100.00	0	42
J-74	100.00	0	42
J-75	100.00	0	42
J-76	100.00	0	42
J-77	100.00	0	42
J-78	100.00	0	42
J-79	100.00	0	43
J-80	100.00	0	63

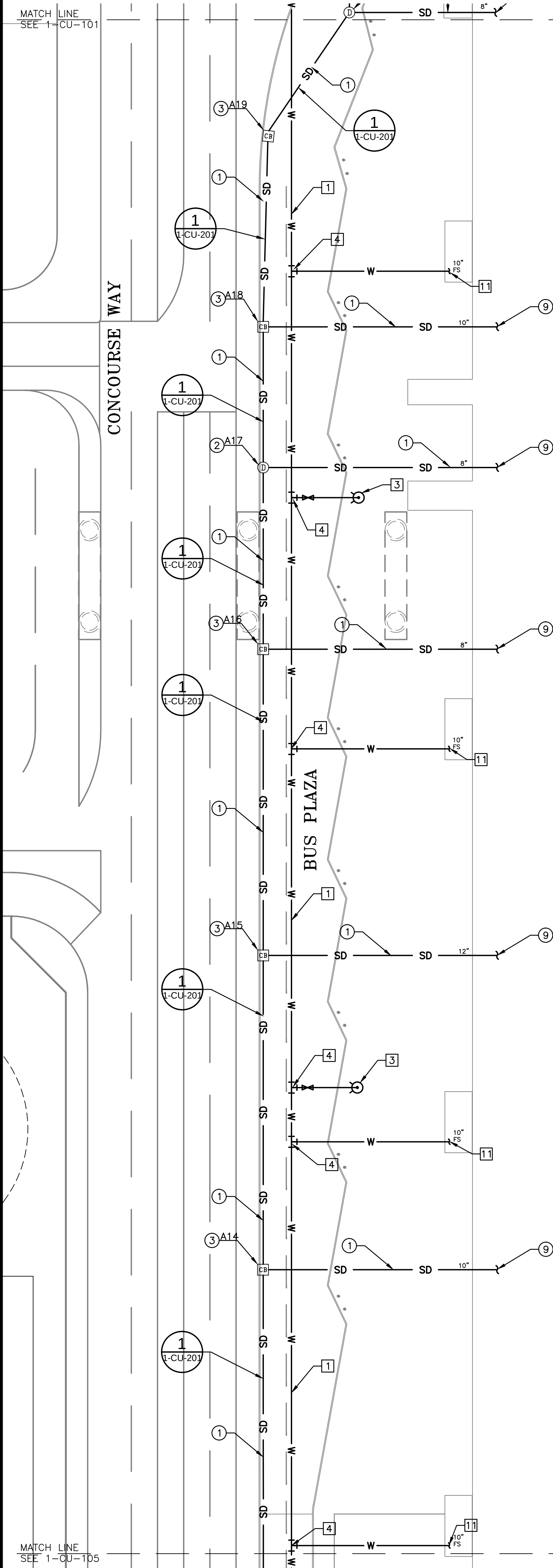


APPENDIX C

DESIGN SHEETS



SHEET _____ OF _____





CU-104

SHEET _____ OF _____

UTILITY PLAN