The Junipers Project
Environmental Impact Report

SCH No. 2018041032 - Project No. 586670

Appendix J3

Sewer System Analysis

February 2020

DEXTER WILSON ENGINEERING, INC.

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CONSULTING ENGINEERS

SEWER SYSTEM ANALYSIS FOR
THE JUNIPERS PROJECT
IN THE CITY OF SAN DIEGO
PROJECT NO. 586670

July 8, 2019

2234 FARADAY AVENUE • CARLSBAD, CA • (760) 438-4422

SEWER SYSTEM ANALYSIS FOR THE JUNIPERS PROJECT IN THE CITY OF SAN DIEGO PROJECT NO. 586670

July 8, 2019

Prepared by:
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Job No. 509-100

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July 8, 2019 509-100

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9707 Waples Street
San Diego, CA 92121

Attention: Troy Burns, Principal

Subject: Sewer System Analysis for The Junipers Project in the City of San Diego

Introduction

This report provides a sewer system analysis for The Junipers project. The project is located in Rancho Penasquitos in the north-central portion of the City of San Diego. It is situated west of Interstate 15 and north of Carmel Mountain Road. Figure 1 provides a vicinity map for the project.

The Junipers project encompasses a gross area of approximately 112.3 acres and proposes redevelopment of the Carmel Highlands Golf Course with 536 residential units. The site includes a recreation center.

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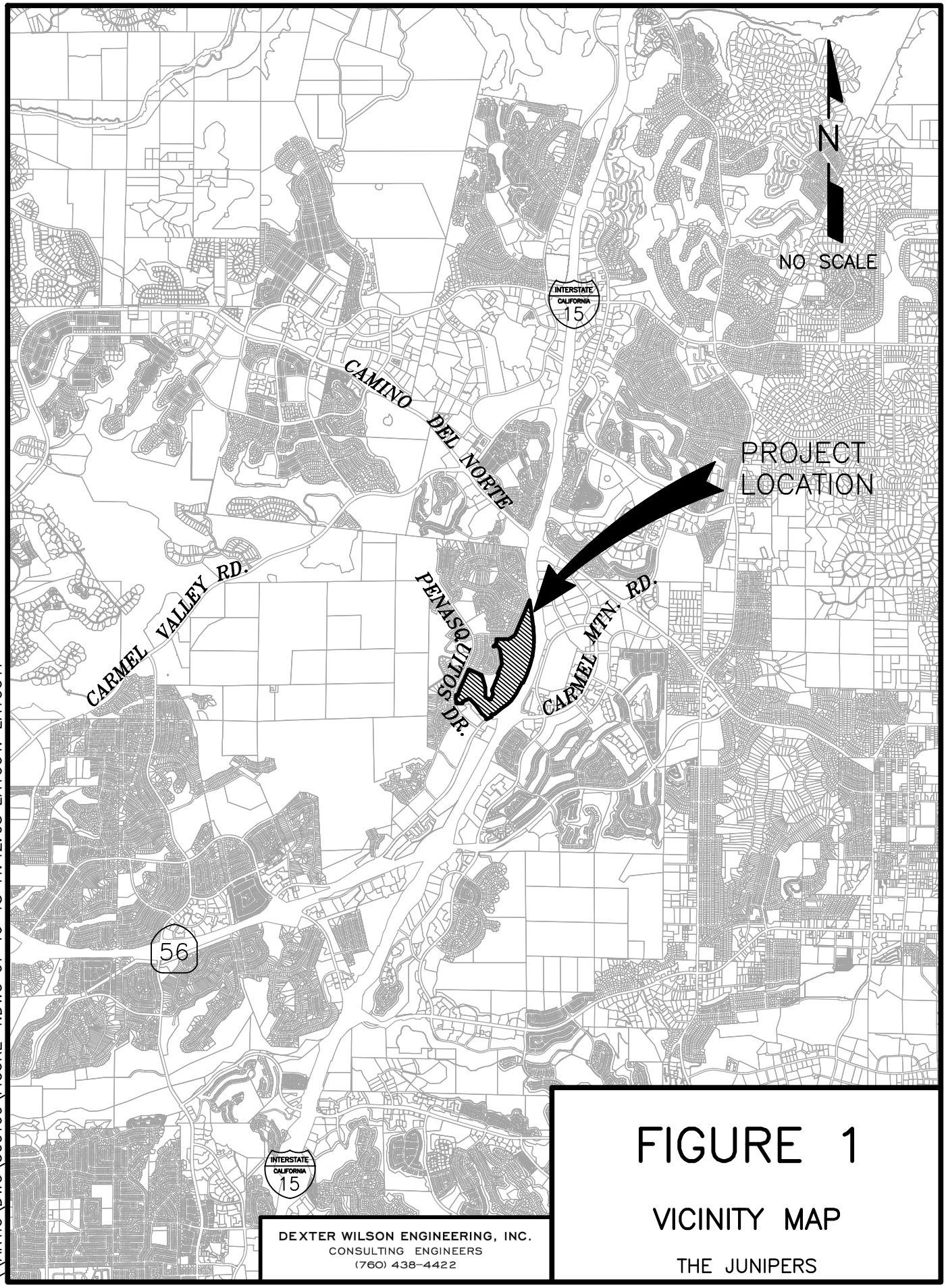


DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

FIGURE 1

VICINITY MAP

THE JUNIPERS

\\ARTIC\DWG\509100\FIGURE-1.DWG 01-16-18 11:42:08 LAYOUT: LAYOUT1

Purpose of Study

The purpose of this study is to provide a sewer system analysis for the proposed project. This report is intended to determine the impact that the project will have on the existing City of San Diego sewer system.

This sewer system analysis has been performed to determine the adequacy of the proposed and existing public sewer lines that will serve the project. All of the onsite, private facilities are not a part of this analysis.

Study Area

The study area for this report is the boundary of the project and the adjacent City of San Diego sewer lines and associated drainage area.

Design Criteria and Projected Flows

The design criteria utilized in the analysis of the project sewer system are in accordance with the current City of San Diego Sewer Design Guide (May 2015).

Table 1 summarizes the projected flows from the site during proposed development conditions. As shown, the projected sewage flow for the project is 141,504 gpd. Approximately 45 gross acres of the site are proposed to be developed as high density residential with the remaining acreage set aside for open space and slopes/landscaping.

TABLE 1
SEWER FLOW SUMMARY

Land Use	Area, Acres	Units	Density Du/Ac	Population Factor People/Unit	Equivalent Population	Unit flow gpd/person	Flow, gpd
Residential	45.11	536	11.9	3.3	1,768.8	80	141,504

Existing Sewer System

The existing sewer system in the vicinity of the project consists of 15-inch and 8-inch sewer lines that convey flow south. There is a 15-inch sewer line that conveys flow south and east along Penasquitos Drive to Carmel Mountain Road. This 15-inch sewer line continues south in Carmel Mountain Road for approximately 350 feet and then east to Interstate 15, where it continues south along the west side of Interstate 15. There are two 8-inch sewer lines that traverse the project: one on the west side of the project and the other on the east. Portions of the 8-inch sewer on the west side have been re-lined, reducing the effective inside diameter to 7-inches in two segments. This sewer line connects to the 15-inch sewer line in Penasquitos Drive, south of Janal Way. The 8-inch sewer on the east side of the project traverses the project area and runs in an easement parallel, generally, to Interstate 15. This sewer line also connects to the existing 15-inch sewer line just south and east of Carmel Mountain Road. Figure 2 provides the location of existing sewer facilities in the vicinity of the project.

Sewer System Analysis

The Junipers project proposes to reroute the two onsite public sewer lines to convey flow south through the project. One public sewer line will be constructed on the west side of the project and the other on the east. Two public sewer lines are proposed in order to allow the project to flow by gravity; thus, onsite portions of existing public sewer lines will be abandoned and removed. Existing flow from these sewer lines will be redirected through the proposed onsite public sewer system. All other onsite sewer lines that tie into the public backbone sewer line are proposed to be private. This analysis is only for the public sewer system. Figure 3 provides a map of the proposed sewer system.

The proposed 8-inch public sewer line in the west portion of the project will make one connection to existing sewer infrastructure. A connection will be made south of Del Diablo Street to an existing 8-inch sewer line and anew line will be re-routed to the proposed sewer line in Carmel Mountain Road.

\\ARTIC\DWG\509100\SEWER\TJP_SWR_FIGURE-2_EXSWR.DWG 11-29-18 08:36:13 LAYOUT: LAYOUT

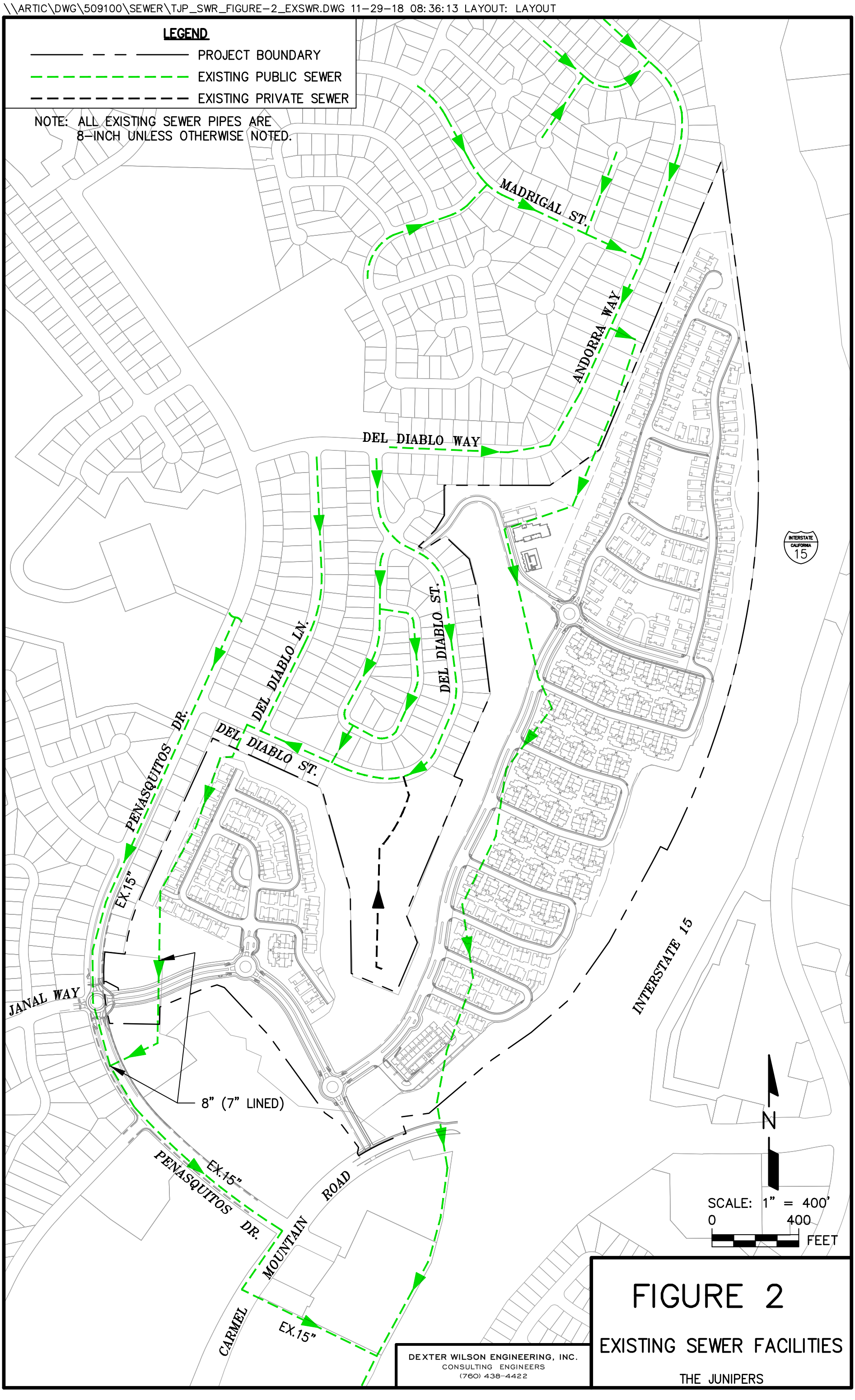
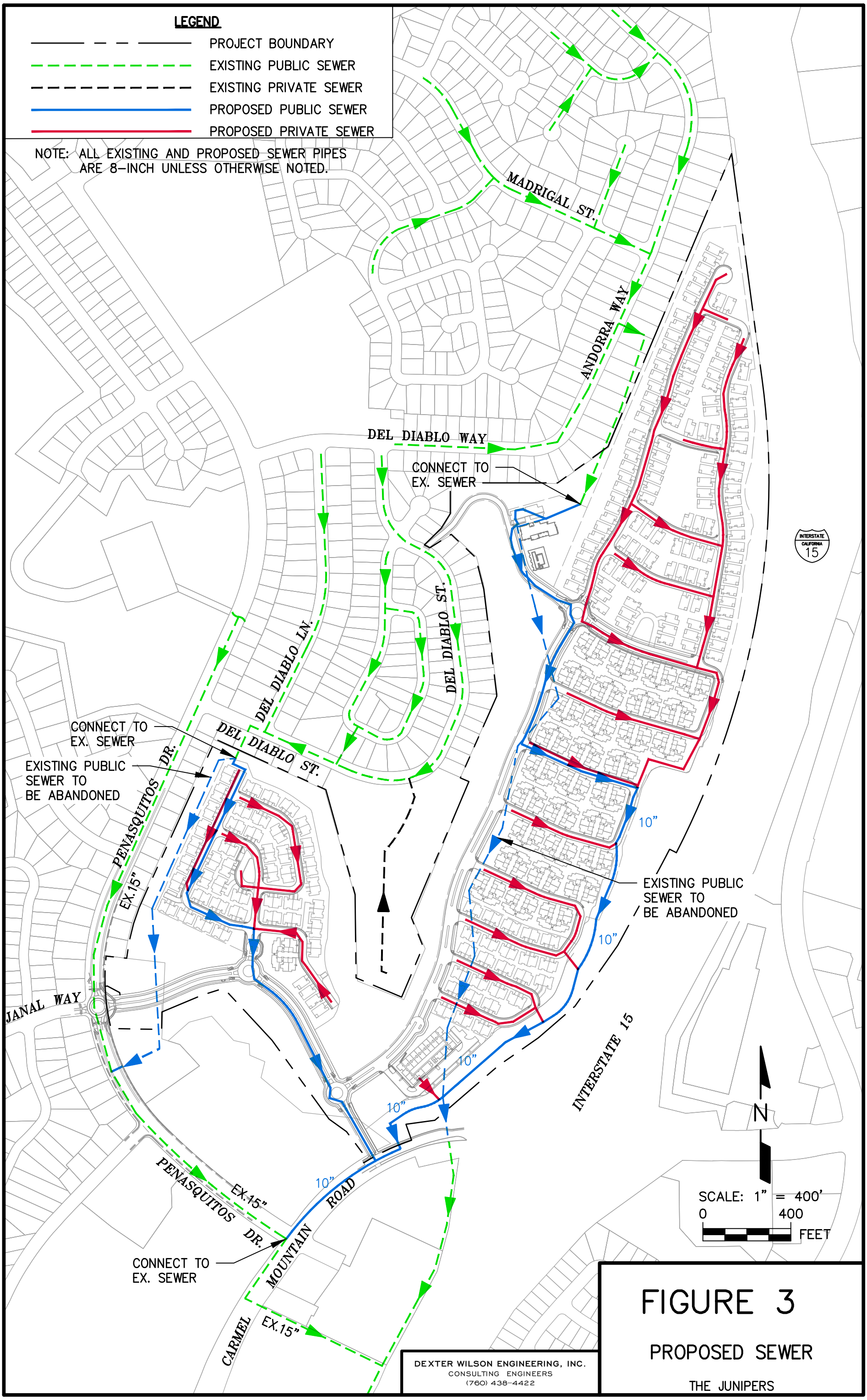


FIGURE 2

EXISTING SEWER FACILITIES

THE JUNIPERS

\\ARTIC\DWG\509100\SEWER\TJP_SWR_FIGURE-3_PROSWR.DWG 07-08-19 09:37:41 LAYOUT: LAYOUT



The proposed 8-inch sewer line in the east portion of the project will make two connections to existing sewer infrastructure. The most upstream connection will be made to an existing 8-inch sewer line near the northwest corner of the project boundary. Following this connection, the proposed sewer line continues south and get re-aligned within the project. The second and most downstream connection will be made to the existing 15-inch sewer line located in Carmel Mountain Road at Penasquitos Drive. Appendix A contains the sewer system analysis for the proposed public sewer system. Exhibit A provides the corresponding manhole diagram.

The proposed 8-inch sewer lines were modeled under existing and future flow conditions. The existing sewer on the east side of the project was modeled as an 8-inch sewer line as indicated on City mapping. Sewer slopes for the proposed sewer lines were estimated based on invert elevations provided on the project tentative map. City as-built data was used to determine the sewer slopes for the existing sewer lines. When sewer slopes for the proposed sewer lines are established during final engineering, the sizing of these lines should be confirmed. Flows from existing development were estimated based on land uses and using City planning criteria. The public sewer system was analyzed to the point of connection with the existing 15-inch trunk sewer. Exhibit A provides a map of the tributary area and Appendix A provides a summary of sewer flow projections for the area.

The results of the analysis indicate that the existing and proposed public sewer lines serving the project are within their design capacity. With the addition of project flows, the projected depth of flow in the pipe will still be within the design capacity of the existing pipe, but the downstream sections of the relocated sewer line are proposed to be increased to 10-inch.

The existing 15-inch/18-inch trunk sewer line downstream of the project was also analyzed to determine the existing capacity and projected impact of project flows. Flow data for the existing trunk sewer was provided by the City of San Diego and incorporated into Appendix A. The results of our analysis indicate that there is a section of existing 18-inch trunk line that has a d/D ratio of 0.47 under existing flow conditions. With the addition of flows from the Junipers project, the d/D in this section of line increases to 0.51.

Utility Locations

The placement of the public sewer line in relation to other utilities and street features is of importance to the City of San Diego to ensure proper separation and access for future maintenance. Appendix B provides an exhibit of the proposed public sewer line through the project with cross sections at several locations to show the location of the proposed public sewer line.

Alternative Sewer Alignment

At the request of the City, an alternate sewer alignment was studied in the southeast portion of the project to avoid having the public sewer line in an easement. The alternative alignment would continue the public sewer line south in Private Street "B" to Private Drive "E" and then south to Carmel Mountain Road. Appendix C provides the study that was conducted for this alignment. The alignment study reveals that this sewer line would need to be constructed to a maximum depth of over 38 feet in Private Street "B", adjacent to other private utilities. By comparison, the maximum depth of the sewer line in the easement to the east of proposed development is 17.8 feet. Based on this, the recommendation is to leave the proposed sewer line in an easement as shown on Exhibit A.

Conclusions

The following conclusions are summarized based on the sewer system analysis prepared for The Junipers project.

1. The project can receive sewer service by rerouting two public gravity sewers that traverse the site, and constructing private onsite sewer lines to connect to the public backbone sewer system.

2. Figure 3 provides a map of the existing and proposed sewer facilities that will serve the project. Appendix A summarizes the sewer system analysis performed for this study.

3. The existing 8-inch gravity sewer line near the southeast portion of the project boundary is within its design capacity during existing flow conditions. The impact of additional flows from the proposed project is a slight increase in the depth of flow in the pipe, and the proposed sewer line is proposed to be realigned as an 8-inch and 10-inch line.

4. The offsite 15-inch/18-inch trunk sewer downstream of the project has a maximum d/D of 0.47 under existing flow conditions and this will increase to a d/D of 0.51 with flows from the project.

5. All proposed private sewer facilities located within a single lot are to be designed to meet the requirements of the Uniform Plumbing Code and will be reviewed as part of the building permit plan check.

7. Sewer facilities shall be no closer than 10 feet edge to edge from any other utility, structure, or hardscape (curbs, medians, retaining walls, etc.). Any deviation from this requirement will require approval from the State of California Department of Public Health.

8. A separate plumbing permit will be required for construction and inspection of any on-site private system up to mains shown on a public improvement drawing. Plumbing outside the building shall be plan checked by a professional that is other than the designer engineer. All private mains shall be inspected under the self-certification program.

Please feel free to contact us if you have any questions regarding the information and recommendations presented in this report.

Dexter Wilson Engineering, Inc.

Stephen M. Nielsen, P.E.

REGISTERED PROFESSIONAL ENGINEER
STEPHEN M. NIELSEN
C 51070
EXP. 09/30/19
CIVIL
STATE OF CALIFORNIA

Attachments

SMN:FF:pjs

APPENDIX A

SEWER SYSTEM ANALYSIS SUMMARY

THE JUNIPERS THEORETICAL SEWER BASIN PROJECTIONS				
Tributary Area No.	Dwelling Units	Sewer Flow Factor	Average Sewer Flow, gpd	Description
1	178	280	49,840	Single Family Residential
2	126	280	35,280	Single Family Residential
3	59	280	16,520	49 Residential Units on 8.6 acres
4[1]	440	264	116,160	440 Residential Units
5[1]	96	264	25,344	96 Residential Units

[1] The Junipers proposes a total of 536 units on 45.1 acres. The project is made up of Sewer Basin Area 4 and Area 5.

FLOW SUMMARY BY NODE				
Node No.	Tributary Area	Dwelling Units	Existing Average[2] Flow, gpd	Proposed Average[3] Flow, gpd
11	2-3	185	51,800	51,800
5	5	96	0	25,344
40	1	178	49,840	49,840
23	4	237	0	62,568
22	4	36	0	9,504
19	4	56	0	14,784
18	4	30	0	7,920
15	4	81	0	21,384

[2] Not including flows from The Junipers (Area 4 and Area 5).

[3] Including portions of flow from The Junipers (Area 4 and Area 5).

CITY OF SAN DIEGO
HYDRAULIC MODEL RESULTS TABLE
TRUNK SEWER 89 - PEÑASQUITOS NORTH
2012 WWF AS-BUILT

FACILITY SEQUENCE NUMBER	PIPE ID	DOWNSTREAM MH ID	UPSTREAM MH INV. EL. (FT)	DOWNSTREAM MH INV. EL. (FT)	DOWNSTREAM MH RIM EL. (FT)	PIPE SLOPE (FT/FT)	PIPE DIAMETER (IN)	PIPE LENGTH (FT)	MAX. VELOCITY (FT/SEC)	MAX. DEPTH (IN)	MAX. d/D (%)	MAX. HGL. EL. (FT)	MAX. EGL. EL. (FT)	HGL. DEPTH BELOW RIM (FT)	AVG. FLOW (MGD)	MAX. FLOW (MGD)	FULL CAPACITY (MGD)	MAX. Q/CAP (%)
41536	J03N73.1	J03N78	594.65	589.25	599.30	0.020	15	269	4.99	5.84	39.0	589.74	590.12	9.56	0.74	1.427	5.92	24.1
41548	J03N78.1	J03N86	589.25	583.66	589.70	0.013	15	430	3.00	8.69	57.9	584.38	584.52	5.32	0.74	1.426	4.76	30.0
41547	J03N86.1	J03N91	583.66	582.75	588.80	0.002	18	435	2.58	8.76	48.7	583.48	583.58	5.32	0.74	1.423	3.11	45.7
41542	J03N91.1	J03N93	582.75	581.78	591.80	0.002	18	481	2.59	8.71	48.4	582.51	582.61	9.29	0.74	1.418	3.05	46.5
41237	J03N93.1	J02N193	581.78	580.80	592.80	0.002	18	481	3.63	6.74	37.5	581.36	581.57	11.44	0.74	1.415	3.06	46.2
41317	J02N193.1	J02N194	580.80	576.04	583.00	0.015	18	312	5.07	5.28	29.3	576.48	576.88	6.52	0.74	1.416	8.39	16.9
41242	J02N99.1	J02N98	576.01	575.13	580.10	0.003	15	350	0.00	0.79	5.3	575.20	575.20	4.90	0.00	0.000	2.09	0.0
41243	J02N98.1	J02N71	575.13	574.70	579.70	0.003	15	141	-0.01	4.16	27.8	575.05	575.05	4.65	0.00	-0.002	2.31	-0.1
41210	J02N71.1	J02N67	574.70	574.25	579.70	0.002	15	212	1.80	4.03	26.9	574.59	574.64	5.11	0.15	0.309	1.92	16.1
41178	J02N67.1	J02N65	574.25	573.97	589.00	0.002	15	116	1.83	4.00	26.6	574.30	574.35	14.70	0.15	0.309	2.05	15.1
41184	J02N65.1	J02N63	573.97	573.38	585.40	0.003	15	234	1.86	3.92	26.2	573.71	573.76	11.69	0.15	0.308	2.10	14.7
41185	J02N63.1	J02N53	573.38	573.03	595.00	0.003	15	130	1.69	4.20	28.0	573.38	573.42	21.62	0.15	0.308	2.17	14.2
41314	J02N53.1	J02N56	573.03	572.50	581.50	0.002	15	220	1.87	4.18	27.8	572.85	572.90	8.65	0.17	0.338	2.05	16.5
41204	J02N56.1	J02N111	572.50	571.63	586.60	0.002	15	350	1.88	4.16	27.8	571.98	572.03	14.62	0.17	0.337	2.08	16.2
41250	J02N111.1	J02N112	571.63	570.75	576.80	0.003	15	350	1.89	4.14	27.6	571.10	571.15	5.70	0.17	0.337	2.09	16.1
41251	J02N112.1	J02N113	570.75	570.35	597.59	0.003	15	155	1.76	4.36	29.0	570.71	570.76	26.88	0.17	0.337	2.12	15.9
41252	J02N113.1	J02N114	570.35	569.88	575.00	0.002	15	195	1.91	4.39	29.3	570.25	570.30	4.75	0.19	0.369	2.05	18.0
41253	J02N114.1	J02N171	569.88	569.00	581.00	0.003	15	350	2.57	3.66	24.4	569.31	569.41	11.70	0.20	0.384	2.09	18.4
41304	J02N171.1	J02N172	569.00	564.60	574.60	0.050	15	88	3.63	2.87	19.1	564.84	565.04	9.76	0.20	0.384	9.32	4.1
41311	J02N172.1	J02N179	564.60	564.22	573.00	0.032	15	12	3.79	3.00	20.0	564.47	564.69	8.53	0.22	0.428	7.49	5.7
41308	J02N179.1	J02N180	564.22	560.12	572.10	0.025	15	164	3.79	3.00	20.0	560.37	560.59	11.73	0.22	0.428	6.60	6.5
5473694	J02N194.1	J02N462	576.04	560.09	566.00	0.038	18	423	6.76	4.44	24.7	560.46	561.17	5.54	0.78	1.481	13.19	11.2
41323	J02N180.1	J02N200	560.12	557.02	571.00	0.025	15	124	3.80	3.00	20.0	557.27	557.49	13.73	0.22	0.428	6.60	6.5
41257	J02N200.1	J02N118	557.02	553.06	570.50	0.125	15	32	4.05	2.87	19.1	553.30	553.55	17.20	0.22	0.428	14.77	2.9
5473696	J02N462.1	J02N463	560.09	541.23	550.70	0.092	18	206	4.65	5.98	33.2	541.73	542.06	8.97	0.81	1.541	20.55	7.5
5473402	J02N463.1	J02N464	541.23	538.42	546.60	0.010	18	289	3.15	7.99	44.4	539.09	539.24	7.51	0.81	1.540	6.70	23.0
41325	J02N118.1	J02N201	553.06	530.78	548.80	0.050	15	450	4.99	2.87	19.1	531.02	531.41	17.78	0.27	0.530	9.29	5.7
41322	J02N201.1	J02N199	530.78	526.41	542.40	0.062	15	70	3.47	4.06	27.0	526.75	526.94	15.65	0.31	0.600	10.43	5.8
41259	J02N199.1	J02N121	526.41	519.32	530.30	0.015	15	477	4.01	4.04	27.0	519.66	519.91	10.64	0.38	0.692	5.09	13.6
41261	J02N121.1	J02N122	519.24	507.91	516.16	0.250	15	45	8.73	2.34	15.6	508.11	509.29	8.05	0.38	0.692	20.86	3.3

TOTAL LENGTH (MILES):	1.44	LENGTH OF PIPE - d/D < 50% (MILES):	1.36	LENGTH OF PIPE - Q/CAP < 50% (MILES):	1.44
LENGTH WEIGHTED Q/CAP:	20.0	LENGTH OF PIPE - d/D 50 - 75% (MILES):	0.08	LENGTH OF PIPE - Q/CAP 50 - 75% (MILES):	0.00
LENGTH WEIGHTED d/D:	31.4	LENGTH OF PIPE - d/D 75 - 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP 75 - 100% (MILES):	0.00
LENGTH WEIGHTED HGL BELOW RIM (FT):	9.76	LENGTH OF PIPE - d/D > 100% (MILES):	0.00	LENGTH OF PIPE - Q/CAP > 100% (MILES):	0.00

J03N73
41536
J03N78
41548
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41547
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J03N93
41237
J02N193
41317
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41325
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CARMEL MTN RD
TED WILLIAMS PY
SABRE SPRINGS PY
SANDAG Technical Services - GIS

DATE: 7/8/2019

SEWER STUDY SUMMARY

FOR: The Junipers Proposed Sewer - Existing Flow Conditions

BY: Dexter Wilson Engineering, Inc.

SHT: 1 OF 2

JOB NUMBER: 509-100

REFER TO PLAN SHEET:

FROM	TO	POP. PER D.U.	IN-LINE EDUs	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAKING FACTOR	PEAK FLOW (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)	REMARKS
				IN-LINE	TOTAL					M.G.D.	C.F.S.								
11	10	3.5	185.00	647.5	647.5	80	51,800	3.00	155,400	0.155	0.240	8	30.0	0.016827	0.08697	0.130	0.0603	8.97	Tributary Areas 2-3
10	9	0.00	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.0	0.092163	0.20165	0.302	0.2005	2.70	
9	8	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.7	0.070686	0.17601	0.264	0.1658	3.26	
8	7	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	2.0	0.065169	0.16893	0.253	0.1565	3.46	
7	6	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.0	0.092163	0.20165	0.302	0.2005	2.70	
6	5	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.0	0.092163	0.20165	0.302	0.2005	2.70	
5	4	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.0	0.092163	0.20165	0.302	0.2005	2.70	
4	3	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	0.8	0.105718	0.21658	0.325	0.2212	2.45	
3	2	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.3	0.080832	0.18849	0.283	0.1825	2.97	
2	1	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	0.6	0.121016	0.23253	0.349	0.2439	2.22	
1	1.1	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	0.6	0.117047	0.22846	0.343	0.2381	2.27	
1.1	1.2	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.1	0.087874	0.19675	0.295	0.1937	2.79	
1.2	1.3	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.0	0.092163	0.20165	0.302	0.2005	2.70	
1.3	1.4	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.8	0.068886	0.17370	0.261	0.1628	3.32	
1.4	1.5	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	8.5	0.031612	0.11798	0.177	0.0938	5.77	
40	39	3.5	178.00	623.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	Tributary Area 1
39	38	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
38	37	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
37	36	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
36	35	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
35	34	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
34	33	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
33	32	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.0886756	0.19767	0.30	0.1950	2.67	
32	31	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
31	30	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
30	29	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
29	28	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	6.0	0.036202	0.12599	0.189	0.1031	5.05	
28	27	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	4.0	0.044338	0.13927	0.209	0.1190	4.37	
27	26	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.7	0.109989	0.22113	0.332	0.2276	2.29	
26	25	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
25	24	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	2.0	0.062703	0.16572	0.249	0.1523	3.42	
24	23	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	2.0	0.062703	0.16572	0.249	0.1523	3.42	
23	22	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.6	0.117454	0.22888	0.343	0.2386	2.18	
22	21	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.6	0.111721	0.22294	0.334	0.2302	2.26	
21	20	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.6	0.111721	0.22294	0.334	0.2302	2.26	
20	19	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.7	0.105988	0.21687	0.325	0.2216	2.35	
19	18	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.8	0.099142	0.20945	0.314	0.2113	2.46	
18	17	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.8	0.099142	0.20945	0.314	0.2113	2.46	
17	16	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.8	0.099142	0.20945	0.314	0.2113	2.46	
16	15	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.8	0.099142	0.20945	0.314	0.2113	2.46	
15	14	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
14	1.5	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	2.4	0.057359	0.15842	0.238	0.1429	3.64	
1.5	13	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	2.4	0.057240	0.15825	0.237	0.1427	3.65	
13	EX2	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	7.0	0.033468	0.12131	0.182	0.0976	5.33	

[1] K' based on n = 0.013

[2] dn/D using K' in Brater King Table 7-14

[3] From Brater King Table 7-4 based on dn/D

FROM	TO	POP. PER D.U.	IN-LINE EDUs	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAKING FACTOR	PEAK FLOW (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)	REMARKS
				IN-LINE	TOTAL					M.G.D.	C.F.S.								
EX2	J03N73	0.0	0.00	0.0	0.0	80	740,000	3.00	2,220,000	2.220	3.435	15	1.5	0.201098	0.57597	0.461	0.3535	6.22	Average Flow from City Hydraulic Data
J03N73	J03N78	0.0	0.00	0.0	0.0	80	740,000	1.84	1,361,600	1.362	2.107	15	2.0	0.106816	0.40830	0.327	0.2229	6.05	Average Flow from City Hydraulic Data
J03N78	J03N86	0.0	0.00	0.0	0.0	80	740,000	1.84	1,361,600	1.362	2.107	15	1.3	0.132489	0.45752	0.366	0.2604	5.18	Average Flow from City Hydraulic Data
J03N86	J03N91	0.0	0.00	0.0	0.0	80	740,000	1.84	1,361,600	1.362	2.107	18	0.2	0.207724	0.70407	0.469	0.3621	2.59	Average Flow from City Hydraulic Data
J03N91	J03N93	0.0	0.00	0.0	0.0	80	740,000	1.84	1,361,600	1.362	2.107	18	0.2	0.207724	0.70407	0.469	0.3621	2.59	Average Flow from City Hydraulic Data
J03N93	J02N193	0.0	0.00	0.0	0.0	80	740,000	1.84	1,361,600	1.362	2.107	18	0.2	0.207724	0.70407	0.469	0.3621	2.59	Average Flow from City Hydraulic Data
J02N193	J02N99	0.0	0.00	0.0	0.0	80	740,000	1.84	1,361,600	1.362	2.107	18	1.5	0.075850	0.41059	0.274	0.1744	5.37	Average Flow from City Hydraulic Data
J02N99	J02N98	0.0	0.00	0.0	0.0	80	0	4.00	0	0.000	0.000	15	0.3	0.000000	0.00000	0.000	0.0000	0.26	Average Flow from City Hydraulic Data
J02N98	J02N71	0.0	0.00	0.0	0.0	80	0	4.00	0	0.000	0.000	15	0.3	0.000000	0.00000	0.000	0.0000	0.26	Average Flow from City Hydraulic Data
J02N71	J02N67	0.0	0.00	0.0	0.0	80	150,000	2.31	346,500	0.347	0.536	15	0.2	0.085959	0.36478	0.292	0.1907	1.80	Average Flow from City Hydraulic Data
J02N67	J02N65	0.0	0.00	0.0	0.0	80	150,000	2.31	346,500	0.347	0.536	15	0.2	0.085959	0.36478	0.292	0.1907	1.80	Average Flow from City Hydraulic Data
J02N65	J02N63	0.0	0.00	0.0	0.0	80	150,000	2.31	346,500	0.347	0.536	15	0.3	0.070185	0.32881	0.263	0.1650	2.08	Average Flow from City Hydraulic Data
J02N63	J02N53	0.0	0.00	0.0	0.0	80	150,000	2.31	346,500	0.347	0.536	15	0.3	0.070185	0.32881	0.263	0.1650	2.08	Average Flow from City Hydraulic Data
J02N53	J02N56	0.0	0.00	0.0	0.0	80	170,000	2.27	385,900	0.386	0.597	15	0.2	0.095733	0.38566	0.309	0.2060	1.85	Average Flow from City Hydraulic Data
J02N56	J02N111	0.0	0.00	0.0	0.0	80	170,000	2.27	385,900	0.386	0.597	15	0.2	0.095733	0.38566	0.309	0.2060	1.85	Average Flow from City Hydraulic Data
J02N111	J02N112	0.0	0.00	0.0	0.0	80	170,000	2.27	385,900	0.386	0.597	15	0.3	0.078166	0.34742	0.278	0.1782	2.14	Average Flow from City Hydraulic Data
J02N112	J02N113	0.0	0.00	0.0	0.0	80	170,000	2.27	385,900	0.386	0.597	15	0.3	0.078166	0.34742	0.278	0.1782	2.14	Average Flow from City Hydraulic Data
J02N113	J02N114	0.0	0.00	0.0	0.0	80	190,000	2.23	423,700	0.424	0.656	15	0.2	0.105110	0.40486	0.324	0.2203	1.90	Average Flow from City Hydraulic Data
J02N114	J02N171	0.0	0.00	0.0	0.0	80	200,000	2.21	442,000	0.442	0.684	15	0.3	0.089529	0.37248	0.298	0.1963	2.23	Average Flow from City Hydraulic Data
J02N171	J02N172	0.0	0.00	0.0	0.0	80	200,000	2.21	442,000	0.442	0.684	15	5.0	0.021930	0.18512	0.148	0.0726	6.03	Average Flow from City Hydraulic Data
J02N172	J02N179	0.0	0.00	0.0	0.0	80	220,000	2.17	477,400	0.477	0.739	15	3.2	0.029608	0.21426	0.171	0.0896	5.28	Average Flow from City Hydraulic Data
J02N179	J02N194	0.0	0.00	0.0	0.0	80	220,000	2.17	477,400	0.477	0.739	15	2.5	0.033498	0.22756	0.182	0.0977	4.84	Average Flow from City Hydraulic Data
J02N194	J02N180	0.0	0.00	0.0	0.0	80	780,000	1.83	1,427,400	1.427	2.209	18	3.8	0.049958	0.33253	0.222	0.1295	7.58	Average Flow from City Hydraulic Data
J02N180	J02N200	0.0	0.00	0.0	0.0	80	220,000	2.17	477,400	0.477	0.739	15	2.5	0.033498	0.22756	0.182	0.0977	4.84	Average Flow from City Hydraulic Data
J02N200	J02N462	0.0	0.00	0.0	0.0	80	220,000	2.17	477,400	0.477	0.739	15	12.5	0.014981	0.15390	0.123	0.0555	8.52	Average Flow from City Hydraulic Data
J02N462	J02N463	0.0	0.00	0.0	0.0	80	810,000	1.82	1,474,200	1.474	2.281	18	9.2	0.033160	0.27177	0.181	0.0970	10.45	Average Flow from City Hydraulic Data
J02N463	J02N118	0.0	0.00	0.0	0.0	80	810,000	1.82	1,474,200	1.474	2.281	18	1.0	0.100579	0.47478	0.317	0.2135	4.75	Average Flow from City Hydraulic Data
J02N118	J02N201	0.0	0.00	0.0	0.0	80	270,000	2.11	569,700	0.570	0.882	15	5.0	0.028266	0.20943	0.168	0.0867	6.51	Average Flow from City Hydraulic Data
J02N201	J02N199	0.0	0.00	0.0	0.0	80	310,000	2.06	638,600	0.639	0.988	15	6.2	0.028453	0.21012	0.168	0.0871	7.26	Average Flow from City Hydraulic Data
J02N199	J02N121	0.0	0.00	0.0	0.0	80	380,000	2.01	763,800	0.764	1.182	15	1.5	0.069189	0.32642	0.261	0.1633	4.63	Average Flow from City Hydraulic Data
J02N121	J02N122	0.0	0.00	0.0	0.0	80	380,000	2.01	763,800	0.764	1.182	15	25.0	0.016948	0.16361	0.131	0.0606	12.48	Average Flow from City Hydraulic Data
																Max dn/D			
																0.47			

[1] K' based on n = 0.013
[2] dn/D using K' in Brater King Table 7-14
[3] From Brater King Table 7-4 based on dn/D

DATE: 7/8/2019

JOB NUMBER: 509-100

SEWER STUDY SUMMARY

FOR: The Junipers Proposed Sewer - Future Flow Conditions

BY: Dexter Wilson Engineering, Inc.

SHT: 1 OF 2

REFER TO PLAN SHEET:

FROM	TO	POP. PER D.U.	IN-LINE EDUs	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAKING FACTOR	PEAK FLOW (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)	REMARKS
				IN-LINE	TOTAL					M.G.D.	C.F.S.								
11	10	3.5	185.00	647.5	647.5	80	51,800	3.00	155,400	0.155	0.240	8	30.0	0.016827	0.08697	0.130	0.0603	8.97	Tributary Areas 2-3
10	9	0.00	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.0	0.092163	0.20165	0.302	0.2005	2.70	
9	8	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.7	0.070686	0.17601	0.264	0.1658	3.26	
8	7	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	2.0	0.065169	0.16893	0.253	0.1565	3.46	
7	6	0.0	0.00	0.0	647.5	80	51,800	3.00	155,400	0.155	0.240	8	1.0	0.092163	0.20165	0.302	0.2005	2.70	
6	5	3.3	16.00	52.8	700.3	80	56,024	3.00	168,072	0.168	0.260	8	1.0	0.099678	0.21003	0.315	0.2121	2.76	Tributary Area 5 (The Junipers) 16 units
5	4	0.0	0.00	0.0	700.3	80	56,024	3.00	168,072	0.168	0.260	8	1.0	0.099678	0.21003	0.315	0.2121	2.76	
4	3	3.3	80.00	264.0	964.3	80	77,144	3.00	231,432	0.231	0.358	8	0.8	0.157442	0.26791	0.402	0.2952	2.73	Tributary Area 5 (The Junipers) 80 units
3	2	0.0	0.00	0.0	964.3	80	77,144	3.00	231,432	0.231	0.358	8	1.3	0.120381	0.23188	0.348	0.2429	3.32	
2	1	0.0	0.00	0.0	964.3	80	77,144	3.00	231,432	0.231	0.358	8	0.6	0.180225	0.28873	0.433	0.3260	2.47	
1	1.1	0.0	0.00	0.0	964.3	80	77,144	3.00	231,432	0.231	0.358	8	0.6	0.174314	0.28344	0.425	0.3181	2.53	
1.1	1.2	0.0	0.00	0.0	964.3	80	77,144	3.00	231,432	0.231	0.358	8	1.1	0.130867	0.24242	0.364	0.2581	3.12	
1.2	1.3	0.0	0.00	0.0	964.3	80	77,144	3.00	231,432	0.231	0.358	8	1.0	0.137255	0.24868	0.373	0.2671	3.02	
1.3	1.4	0.0	0.00	0.0	964.3	80	77,144	3.00	231,432	0.231	0.358	8	1.8	0.102304	0.21290	0.319	0.2161	3.73	
1.4	1.5	0.0	0.00	0.0	964.3	80	77,144	3.00	231,432	0.231	0.358	8	8.5	0.047078	0.14345	0.215	0.1241	6.49	
40	39	3.5	178.00	623.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	Tributary Area 1
39	38	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
38	37	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
37	36	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
36	35	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
35	34	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
34	33	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
33	32	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.0886756	0.19767	0.30	0.1950	2.67	
32	31	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
31	30	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
30	29	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
29	28	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	6.0	0.036202	0.12599	0.189	0.1031	5.05	
28	27	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	4.0	0.044338	0.13927	0.209	0.1190	4.37	
27	26	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	0.7	0.109989	0.22113	0.332	0.2276	2.29	
26	25	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	1.0	0.088676	0.19767	0.297	0.1950	2.67	
25	24	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	2.0	0.062703	0.16572	0.249	0.1523	3.42	
24	23	0.0	0.00	0.0	623.0	80	49,840	3.00	149,520	0.150	0.231	8	2.0	0.062703	0.16572	0.249	0.1523	3.42	
23	22	3.3	237.00	782.1	1405.1	80	112,408	2.40	269,779	0.270	0.417	10	0.57	0.116882	0.28536	0.342	0.2378	2.53	237 EDUs from Tributary Area 4 (The Junipers)
22	21	3.3	36.00	118.8	1523.9	80	121,912	2.38	290,151	0.290	0.449	10	0.63	0.119572	0.28881	0.347	0.2417	2.67	36 EDUs from Tributary Area 4 (The Junipers)
21	20	0.0	0.00	0.0	1523.9	80	121,912	2.38	290,151	0.290	0.449	10	0.63	0.119572	0.28881	0.347	0.2417	2.67	
20	19	0.0	0.00	0.0	1523.9	80	121,912	2.38	290,151	0.290	0.449	10	0.70	0.113436	0.28091	0.337	0.2327	2.78	
19	18	3.3	56.00	184.8	1708.7	80	136,696	2.34	319,869	0.320	0.495	10	0.80	0.116978	0.28548	0.343	0.2380	3.00	56 EDUs from Tributary Area 4 (The Junipers)
18	17	3.3	30.00	99.0	1807.7	80	144,616	2.32	335,509	0.336	0.519	10	0.80	0.122698	0.29280	0.351	0.2463	3.04	30 EDUs from Tributary Area 4 (The Junipers)
17	16	0.0	0.00	0.0	1807.7	80	144,616	2.32	335,509	0.336	0.519	10	0.80	0.122698	0.29280	0.351	0.2463	3.04	
16	15	0.0	0.00	0.0	1807.7	80	144,616	2.32	335,509	0.336	0.519	10	0.80	0.122698	0.29280	0.351	0.2463	3.04	
15	14	3.3	81.00	267.3	2075.0	80	166,000	2.29	380,140	0.380	0.588	10	1.0	0.124343	0.29488	0.354	0.2487	3.41	81 EDUs from Tributary Area 4 (The Junipers)
14	1.5	0.0	0.00	0.0	2075.0	80	166,000	2.29	380,140	0.380	0.588	10	2.39	0.080431	0.23502	0.282	0.1818	4.66	
1.5	13	0.0	0.00	0.0	2075.0	80	166,000	2.29	380,140	0.380	0.588	10	2.39	0.080431	0.23502	0.282	0.1818	4.66	
13	EX2	0.0	0.00	0.0	2075.0	80	166,000	2.29	380,140	0.380	0.588	10	7.02	0.046930	0.17903	0.215	0.1239	6.84	

[1] K' based on n = 0.013

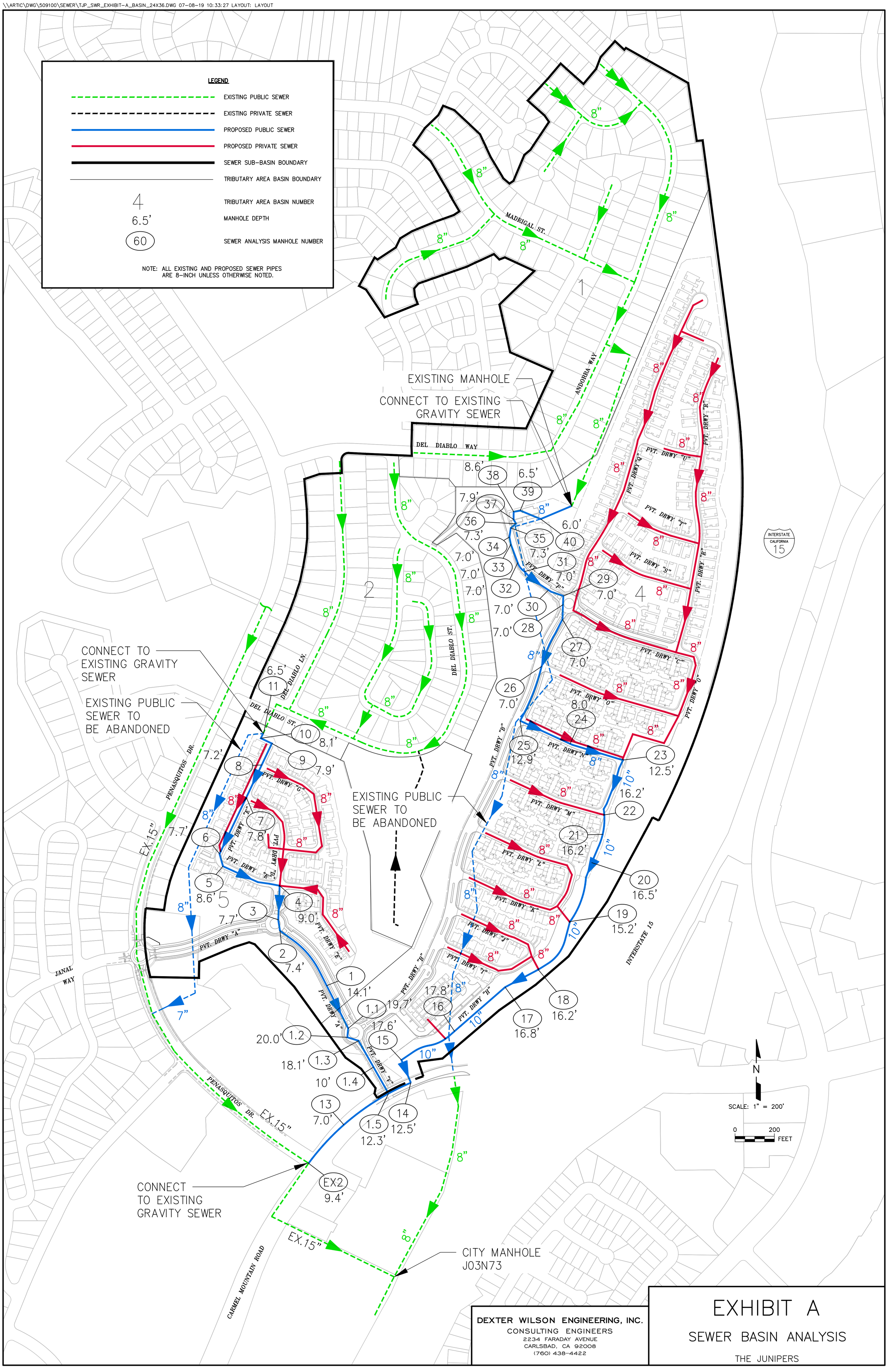
[2] dn/D using K' in Brater King Table 7-14

[3] From Brater King Table 7-4 based on dn/D

FROM	TO	POP. PER D.U.	IN-LINE EDUs	POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAKING FACTOR	PEAK FLOW (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)	REMARKS
				IN-LINE	TOTAL					M.G.D.	C.F.S.								
EX2	J03N73	0.0	0.00	0.0	0.0	80	881,504	2.29	2,018,644	2.019	3.124	15	1.5	0.182859	0.54576	0.437	0.3294	6.07	Average Flow from City Hydraulic Data
J03N73	J03N78	0.0	0.00	0.0	0.0	80	881,504	1.80	1,586,707	1.587	2.455	15	2.0	0.124475	0.44257	0.354	0.2489	6.31	Average Flow from City Hydraulic Data
J03N78	J03N86	0.0	0.00	0.0	0.0	80	881,504	1.80	1,586,707	1.587	2.455	15	1.3	0.154393	0.49699	0.398	0.2910	5.40	Average Flow from City Hydraulic Data
J03N86	J03N91	0.0	0.00	0.0	0.0	80	881,504	1.80	1,586,707	1.587	2.455	18	0.2	0.242066	0.77075	0.514	0.4068	2.68	Average Flow from City Hydraulic Data
J03N91	J03N93	0.0	0.00	0.0	0.0	80	881,504	1.80	1,586,707	1.587	2.455	18	0.2	0.242066	0.77075	0.514	0.4068	2.68	Average Flow from City Hydraulic Data
J03N93	J02N193	0.0	0.00	0.0	0.0	80	881,504	1.80	1,586,707	1.587	2.455	18	0.2	0.242066	0.77075	0.514	0.4068	2.68	Average Flow from City Hydraulic Data
J02N193	J02N99	0.0	0.00	0.0	0.0	80	881,504	1.80	1,586,707	1.587	2.455	18	1.5	0.088390	0.44403	0.296	0.1945	5.61	Average Flow from City Hydraulic Data
J02N99	J02N98	0.0	0.00	0.0	0.0	80	141,504	2.33	329,704	0.330	0.510	15	0.3	0.066783	0.32063	0.257	0.1592	2.05	Average Flow from City Hydraulic Data
J02N98	J02N71	0.0	0.00	0.0	0.0	80	141,504	2.33	329,704	0.330	0.510	15	0.3	0.066783	0.32063	0.257	0.1592	2.05	Average Flow from City Hydraulic Data
J02N71	J02N67	0.0	0.00	0.0	0.0	80	291,504	2.09	609,243	0.609	0.943	15	0.2	0.151139	0.49127	0.393	0.2866	2.11	Average Flow from City Hydraulic Data
J02N67	J02N65	0.0	0.00	0.0	0.0	80	291,504	2.09	609,243	0.609	0.943	15	0.2	0.151139	0.49127	0.393	0.2866	2.11	Average Flow from City Hydraulic Data
J02N65	J02N63	0.0	0.00	0.0	0.0	80	291,504	2.09	609,243	0.609	0.943	15	0.3	0.123405	0.44054	0.352	0.2473	2.44	Average Flow from City Hydraulic Data
J02N63	J02N53	0.0	0.00	0.0	0.0	80	291,504	2.09	609,243	0.609	0.943	15	0.3	0.123405	0.44054	0.352	0.2473	2.44	Average Flow from City Hydraulic Data
J02N53	J02N56	0.0	0.00	0.0	0.0	80	311,504	2.06	641,698	0.642	0.993	15	0.2	0.159191	0.50537	0.404	0.2976	2.14	Average Flow from City Hydraulic Data
J02N56	J02N111	0.0	0.00	0.0	0.0	80	311,504	2.06	641,698	0.642	0.993	15	0.2	0.159191	0.50537	0.404	0.2976	2.14	Average Flow from City Hydraulic Data
J02N111	J02N112	0.0	0.00	0.0	0.0	80	311,504	2.06	641,698	0.642	0.993	15	0.3	0.129979	0.45290	0.362	0.2568	2.47	Average Flow from City Hydraulic Data
J02N112	J02N113	0.0	0.00	0.0	0.0	80	311,504	2.06	641,698	0.642	0.993	15	0.3	0.129979	0.45290	0.362	0.2568	2.47	Average Flow from City Hydraulic Data
J02N113	J02N114	0.0	0.00	0.0	0.0	80	331,504	2.04	676,268	0.676	1.046	15	0.2	0.167767	0.52025	0.416	0.3093	2.17	Average Flow from City Hydraulic Data
J02N114	J02N171	0.0	0.00	0.0	0.0	80	341,504	2.04	696,668	0.697	1.078	15	0.3	0.141113	0.47337	0.379	0.2726	2.53	Average Flow from City Hydraulic Data
J02N171	J02N172	0.0	0.00	0.0	0.0	80	341,504	2.04	696,668	0.697	1.078	15	5.0	0.034565	0.23098	0.185	0.0998	6.91	Average Flow from City Hydraulic Data
J02N172	J02N179	0.0	0.00	0.0	0.0	80	361,504	2.02	730,238	0.730	1.130	15	3.2	0.045289	0.26389	0.211	0.1208	5.99	Average Flow from City Hydraulic Data
J02N179	J02N194	0.0	0.00	0.0	0.0	80	361,504	2.02	730,238	0.730	1.130	15	2.5	0.051238	0.28066	0.225	0.1319	5.48	Average Flow from City Hydraulic Data
J02N194	J02N180	0.0	0.00	0.0	0.0	80	921,504	1.80	1,658,707	1.659	2.567	18	3.8	0.058054	0.35861	0.239	0.1441	7.92	Average Flow from City Hydraulic Data
J02N180	J02N200	0.0	0.00	0.0	0.0	80	361,504	2.02	730,238	0.730	1.130	15	2.5	0.051238	0.28066	0.225	0.1319	5.48	Average Flow from City Hydraulic Data
J02N200	J02N462	0.0	0.00	0.0	0.0	80	361,504	2.02	730,238	0.730	1.130	15	12.5	0.022915	0.18912	0.151	0.0748	9.66	Average Flow from City Hydraulic Data
J02N462	J02N463	0.0	0.00	0.0	0.0	80	951,504	1.80	1,712,707	1.713	2.650	18	9.2	0.038525	0.29222	0.195	0.1077	10.94	Average Flow from City Hydraulic Data
J02N463	J02N118	0.0	0.00	0.0	0.0	80	951,504	1.80	1,712,707	1.713	2.650	18	1.0	0.116852	0.51358	0.342	0.2378	4.95	Average Flow from City Hydraulic Data
J02N118	J02N201	0.0	0.00	0.0	0.0	80	411,504	1.99	818,893	0.819	1.267	15	5.0	0.040630	0.25009	0.200	0.1119	7.25	Average Flow from City Hydraulic Data
J02N201	J02N199	0.0	0.00	0.0	0.0	80	451,504	1.97	889,463	0.889	1.376	15	6.2	0.039631	0.24697	0.198	0.1099	8.02	Average Flow from City Hydraulic Data
J02N199	J02N121	0.0	0.00	0.0	0.0	80	521,504	1.93	1,006,503	1.007	1.557	15	1.5	0.091174	0.37600	0.301	0.1989	5.01	Average Flow from City Hydraulic Data
J02N121	J02N122	0.0	0.00	0.0	0.0	80	521,504	1.93	1,006,503	1.007	1.557	15	25.0	0.022333	0.18680	0.149	0.0735	13.56	Average Flow from City Hydraulic Data
																Max dn/D			
																0.51			

[1] K' based on n = 0.013
[2] dn/D using K' in Brater King Table 7-14
[3] From Brater King Table 7-4 based on dn/D

\\ARTIC\DWG\509100\SEWER\TJP_SWR_EXHIBIT-A_BASIN_24X36.DWG 07-08-19 10:33:27 LAYOUT: LAYOUT



DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
2234 FARADAY AVENUE
CARLSBAD, CA 92008
(760) 438-4422

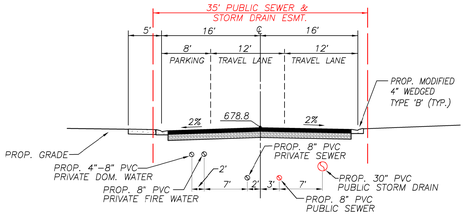
EXHIBIT A

SEWER BASIN ANALYSIS

THE JUNIPERS

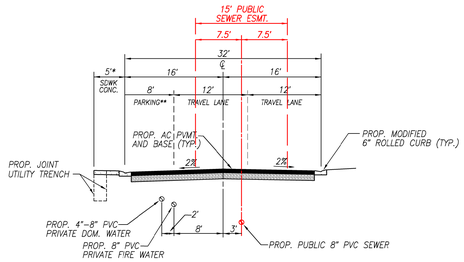
APPENDIX B

SEWER SYSTEM LAYOUT AND CROSS SECTIONS



SECTION "F"

NOT TO SCALE



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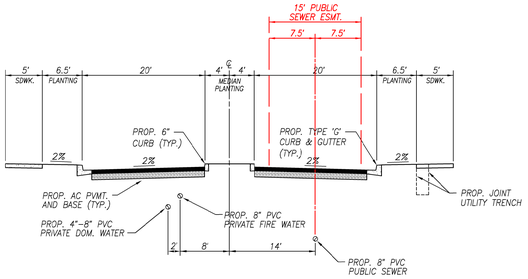

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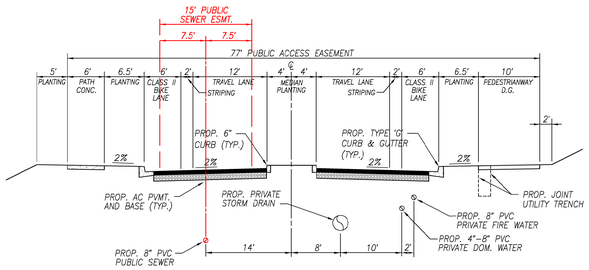

SECTION "I"

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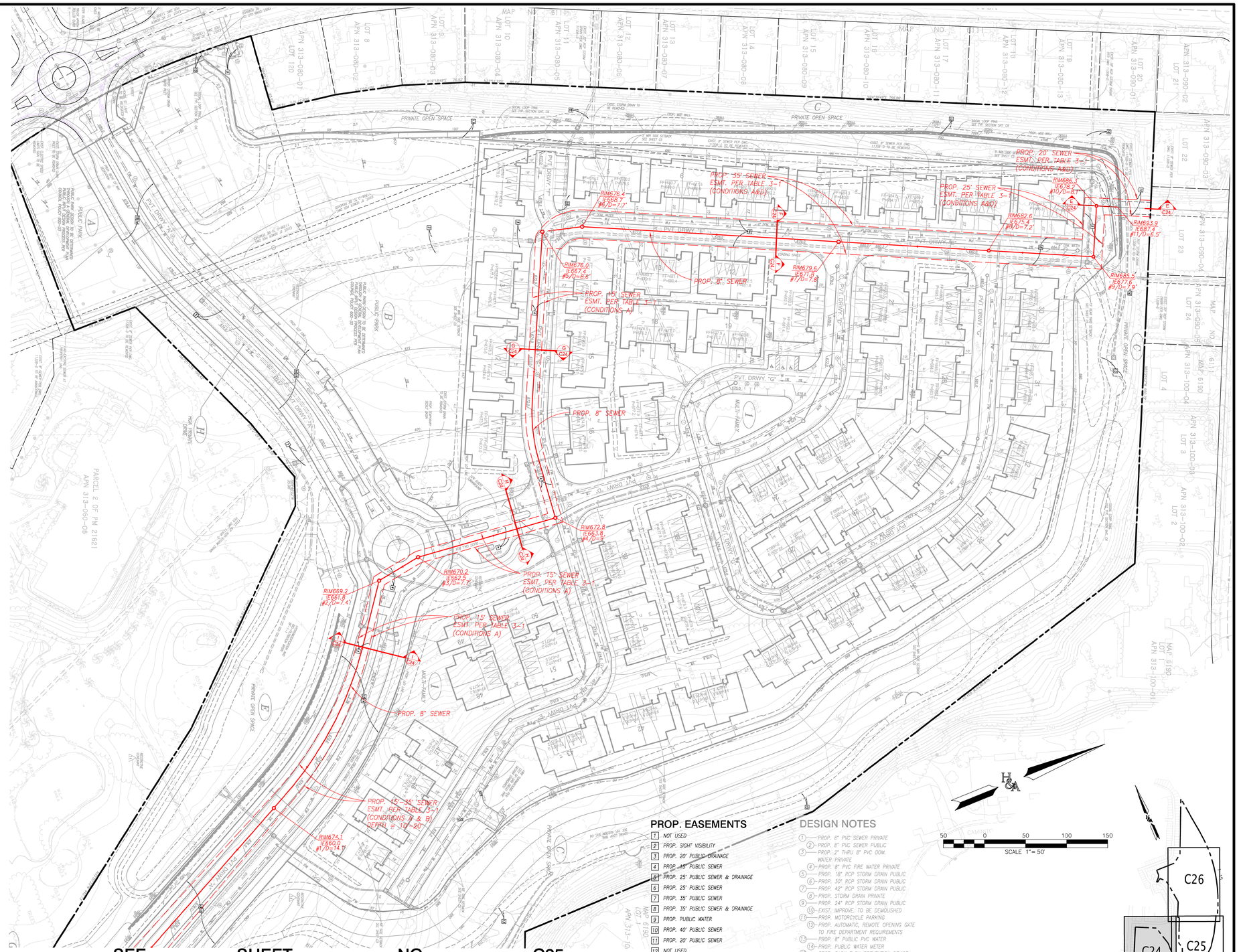


SEE SHEET NO. C25

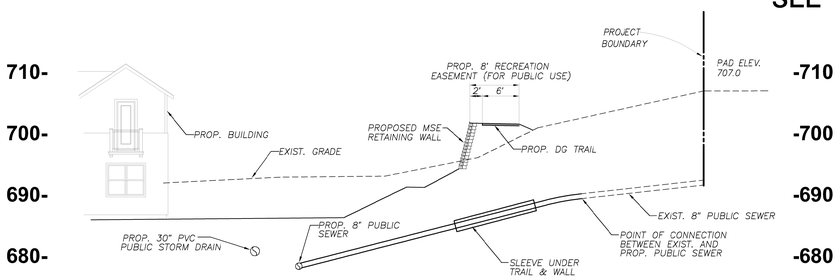
PROP. EASEMENTS

1. NOT USED
2. PROP. SIGHT VISIBILITY
3. PROP. 20' PUBLIC DRAINAGE
4. PROP. 15' PUBLIC SEWER
5. PROP. 25' PUBLIC SEWER & DRAINAGE
6. PROP. 25' PUBLIC SEWER
7. PROP. 35' PUBLIC SEWER
8. PROP. 35' PUBLIC SEWER & DRAINAGE
9. PROP. PUBLIC WATER
10. PROP. 40' PUBLIC SEWER
11. PROP. 20' PUBLIC SEWER
12. NOT USED
13. PROP. 8'/12' RECREATION EASEMENT (FOR PUBLIC USE)
14. PROP. ACCESS EASEMENT FOR WATER FACILITIES
15. PROP. PUBLIC INGRESS AND EGRESS OF MOTORIZED AND NON-MOTORIZED VEHICLES TOGETHER WITH PEDESTRIAN ACCESS
16. PROP. 15' PUBLIC DRAINAGE
17. NOT USED
18. PROP. RECREATION EASEMENT (FOR PUBLIC USE)

DESIGN NOTES

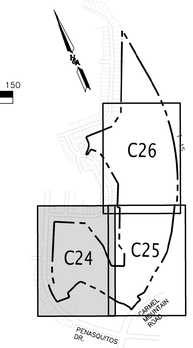
1. PROP. 6" PVC SEWER PRIVATE
2. PROP. 8" PVC SEWER PUBLIC
3. PROP. 2" THRU 8" PVC DOM. WATER PRIVATE
4. PROP. 8" PVC FIRE WATER PRIVATE
5. PROP. 18" RCP STORM DRAIN PUBLIC
6. PROP. 30" RCP STORM DRAIN PUBLIC
7. PROP. 42" RCP STORM DRAIN PUBLIC
8. PROP. STORM DRAIN PRIVATE
9. PROP. 24" RCP STORM DRAIN PUBLIC
10. EXIST. IMPROVE. TO BE DEMOLISHED
11. PROP. MOTORCYCLE PARKING
12. PROP. AUTOMATIC, REMOTE OPENING GATE TO FIRE DEPARTMENT REQUIREMENTS
13. PROP. 8" PUBLIC PVC WATER
14. PROP. PUBLIC WATER METER
15. PROP. BACK FLOW PREVENTION DEVICE
16. PROP. GATE FOR VEHICULAR ACCESS
17. PROP. GOLF CART PARKING
18. PROP. E.V. CHARGING STATION PER C.A.P.
19. PROP. 10" PUBLIC SEWER
20. EXIST. 6' MEDIAN
21. PROP. 6' MEDIAN
22. EXIST. CURB & GUTTER TO BE REMOVED
23. EXIST. DRWY TO BE REMOVED

50 0 50 100 150
SCALE 1"= 50'



SECTION "E"

SCALE: HORIZ/VERT 1"=10'



SHEET KEY MAP
NOT TO SCALE

REVISED	7/8/2019
REVISED	6/11/2019
REVISED	5/15/2019
REVISED	2/28/2019
ORIGINAL	12/17/2018

AGE RESTRICTED 55 AND OVER

PREPARED BY

HUNSAKER & ASSOCIATES SAN DIEGO, INC

PLANNING 9707 Waples Street
ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500 - FX(858)558-1414

PUBLIC SEWER

THE JUNIPERS

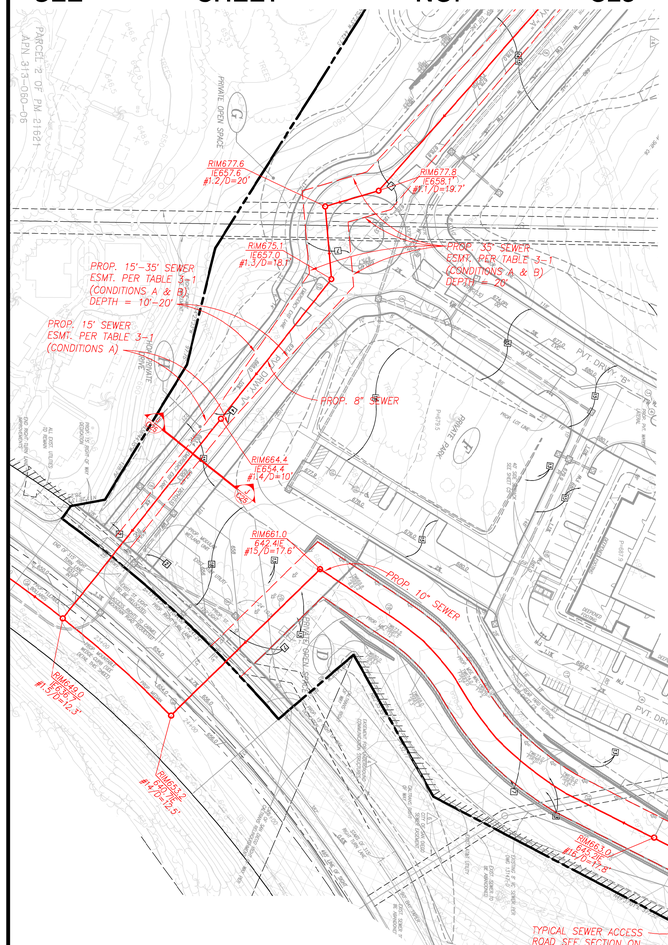
CITY OF SAN DIEGO, CALIFORNIA

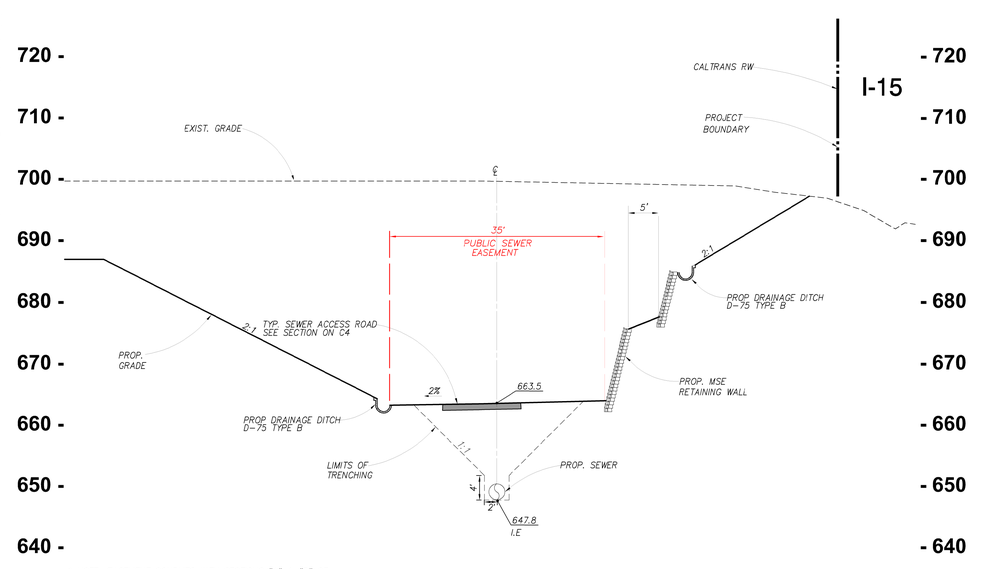
SHEET C24

W.O. 2167-0145

R:\1286\&Pln\SHT C24-26 PUBLIC SEWER.dwg[]Jul-08-2019:07:43

SEE SHEET NO. C23

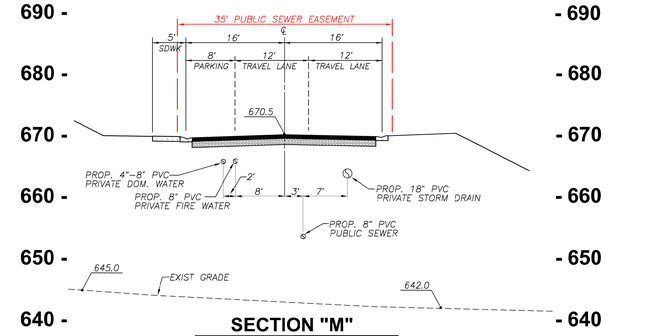




* NOTE: EASEMENT COMPLIES WITH SECTIONS "A" & "B" OF TABLE 3-1 IN THE SEWER DESIGN GUIDE. REQUESTS RELIEF FROM SECTION "E" DUE TO ACCESSIBILITY TO VEHICULAR AND ADDED WIDTH FOR FUTURE TRENCHING.

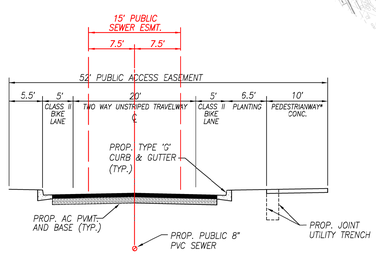
SECTION "K"

SCALE: HORIZ/VERT 1"=10'



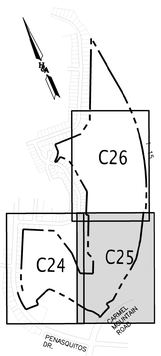
SECTION "M"

SCALE: HORIZ/VERT 1"=10'



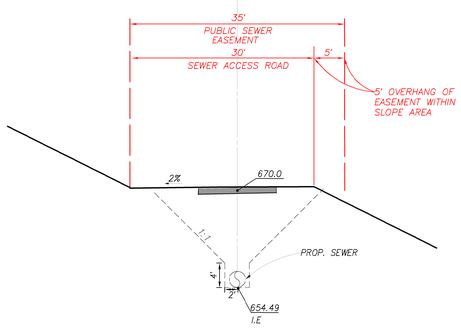
SECTION "J"

NOT TO SCALE



SHEET KEY MAP

NOT TO SCALE



SECTION "L"

SCALE: HORIZ/VERT 1"=10'

PROP. EASEMENTS

1. NOT USED
2. PROP. SIGHT VISIBILITY
3. PROP. 20' PUBLIC DRAINAGE
4. PROP. 15' PUBLIC SEWER
5. PROP. 25' PUBLIC SEWER & DRAINAGE
6. PROP. 25' PUBLIC SEWER
7. PROP. 35' PUBLIC SEWER
8. PROP. 35' PUBLIC SEWER & DRAINAGE
9. PROP. PUBLIC WATER
10. PROP. 40' PUBLIC SEWER
11. PROP. 20' PUBLIC SEWER
12. NOT USED
13. PROP. 8/12' RECREATION EASEMENT (FOR PUBLIC USE)
14. PROP. ACCESS EASEMENT FOR WATER FACILITIES
15. PROP. PUBLIC INGRESS AND EGRESS OF MOTORIZED AND NON-MOTORIZED VEHICLES TOGETHER WITH PEDESTRIAN ACCESS
16. PROP. 15' PUBLIC DRAINAGE
17. NOT USED
18. PROP. RECREATION EASEMENT (FOR PUBLIC USE)

DESIGN NOTES

1. PROP. 8" PVC SEWER PRIVATE
2. PROP. 8" PVC SEWER PUBLIC
3. PROP. 2" THRU 8" PVC DOM. WATER PRIVATE
4. PROP. 8" PVC FIRE WATER PRIVATE
5. PROP. 18" RCP STORM DRAIN PUBLIC
6. PROP. 30" RCP STORM DRAIN PUBLIC
7. PROP. 42" RCP STORM DRAIN PUBLIC
8. PROP. STORM DRAIN PRIVATE
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10. EXIST. IMPROVE. TO BE DEMOLISHED
11. PROP. MOTORCYCLE PARKING
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18. PROP. E.V. CHARGING STATION PER C.A.P.
19. PROP. 10" PUBLIC SEWER
20. EXIST. 6" MEDIAN
21. PROP. 6" MEDIAN
22. EXIST. CURB & GUTTER TO BE REMOVED
23. EXIST. DRWY TO BE REMOVED

H&A

50 0 50 100 150

SCALE 1"= 50'

SEE SHEET NO. C26

REVISED 7/8/2019
REVISED 6/11/2019
REVISED 5/15/2019
REVISED 2/28/2019
ORIGINAL 12/17/2018

AGE RESTRICTED 55 AND OVER

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SURVEYING PH(858)558-4500 · FX(858)558-1414

PUBLIC SEWER

THE JUNIPERS

CITY OF SAN DIEGO, CALIFORNIA

SHEET C25

W.O. 2167-0145

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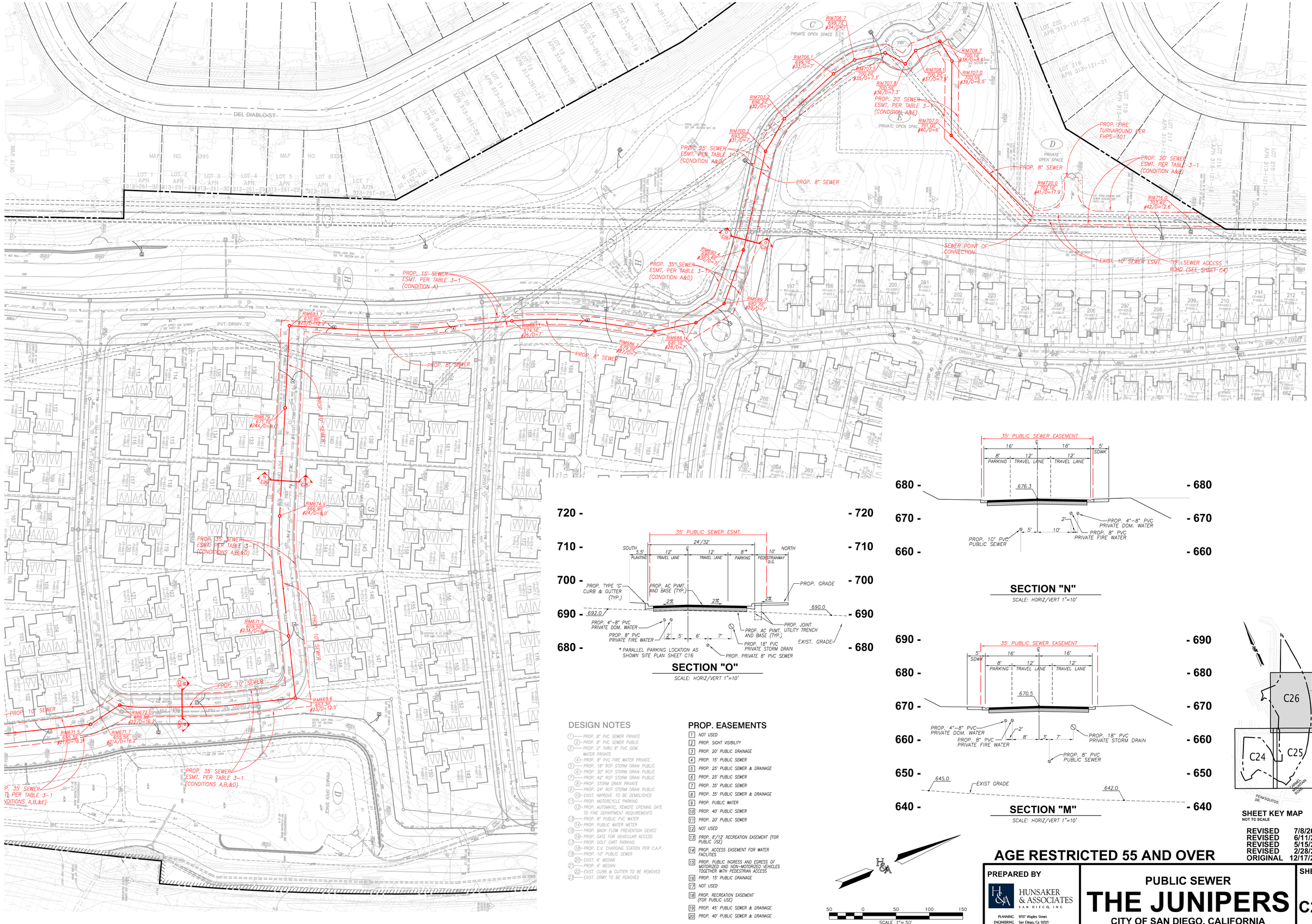
SEE SHEET NO. C25



SECTION "N"

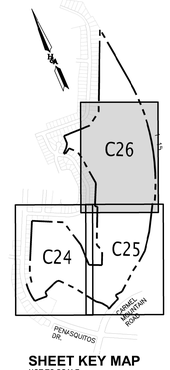
SCALE: HORIZ/VERT 1"=10'

SECTION "O"

SCALE: HORIZ/VERT 1"=10'

SECTION "M"

SCALE: HORIZ/VERT 1"=10'



SHEET KEY MAP

NOT TO SCALE

DESIGN NOTES

1. PROP. 8" PVC SEWER PRIVATE
2. PROP. 8" PVC SEWER PUBLIC
3. PROP. 2" THRU 8" PVC DOM. WATER PRIVATE
4. PROP. 8" PVC FIRE WATER PRIVATE
5. PROP. 18" RCP STORM DRAIN PUBLIC
6. PROP. 30" RCP STORM DRAIN PUBLIC
7. PROP. 42" RCP STORM DRAIN PUBLIC
8. PROP. STORM DRAIN PRIVATE
9. PROP. 24" RCP STORM DRAIN PUBLIC
10. EXIST. IMPROVE. TO BE DEMOLISHED
11. PROP. MOTORCYCLE PARKING
12. PROP. AUTOMATIC, REMOTE OPENING GATE TO FIRE DEPARTMENT REQUIREMENTS
13. PROP. 8" PUBLIC PVC WATER
14. PROP. PUBLIC WATER METER
15. PROP. BACK FLOW PREVENTION DEVICE
16. PROP. GATE FOR VEHICULAR ACCESS
17. PROP. GOLF CART PARKING
18. PROP. E.V. CHARGING STATION PER C.A.P.
19. PROP. 10" PUBLIC SEWER
20. EXIST. 6" MEDIAN
21. PROP. 6" MEDIAN
22. EXIST. CURB & GUTTER TO BE REMOVED
23. EXIST. DRWY TO BE REMOVED

PROP. EASEMENTS

1. NOT USED
2. PROP. SIGHT VISIBILITY
3. PROP. 20' PUBLIC DRAINAGE
4. PROP. 15' PUBLIC SEWER
5. PROP. 25' PUBLIC SEWER & DRAINAGE
6. PROP. 25' PUBLIC SEWER
7. PROP. 35' PUBLIC SEWER
8. PROP. 35' PUBLIC SEWER & DRAINAGE
9. PROP. PUBLIC WATER
10. PROP. 40' PUBLIC SEWER
11. PROP. 20' PUBLIC SEWER
12. NOT USED
13. PROP. E/12 RECREATION EASEMENT (FOR PUBLIC USE)
14. PROP. ACCESS EASEMENT FOR WATER FACILITIES
15. PROP. PUBLIC INGRESS AND EGRESS OF MOTORIZED AND NON-MOTORIZED VEHICLES TOGETHER WITH PEDESTRIAN ACCESS
16. PROP. 15' PUBLIC DRAINAGE
17. NOT USED
18. PROP. RECREATION EASEMENT (FOR PUBLIC USE)
19. PROP. 45' PUBLIC SEWER & DRAINAGE
20. PROP. 40' PUBLIC SEWER & DRAINAGE

SCALE 1"= 50'

AGE RESTRICTED 55 AND OVER

REVISED	7/8/2019
REVISED	6/11/2019
REVISED	5/15/2019
REVISED	2/28/2019
ORIGINAL	12/17/2018

PREPARED BY

HUNSAKER & ASSOCIATES SAN DIEGO, INC

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PUBLIC SEWER

THE JUNIPERS

CITY OF SAN DIEGO, CALIFORNIA

SHEET C26

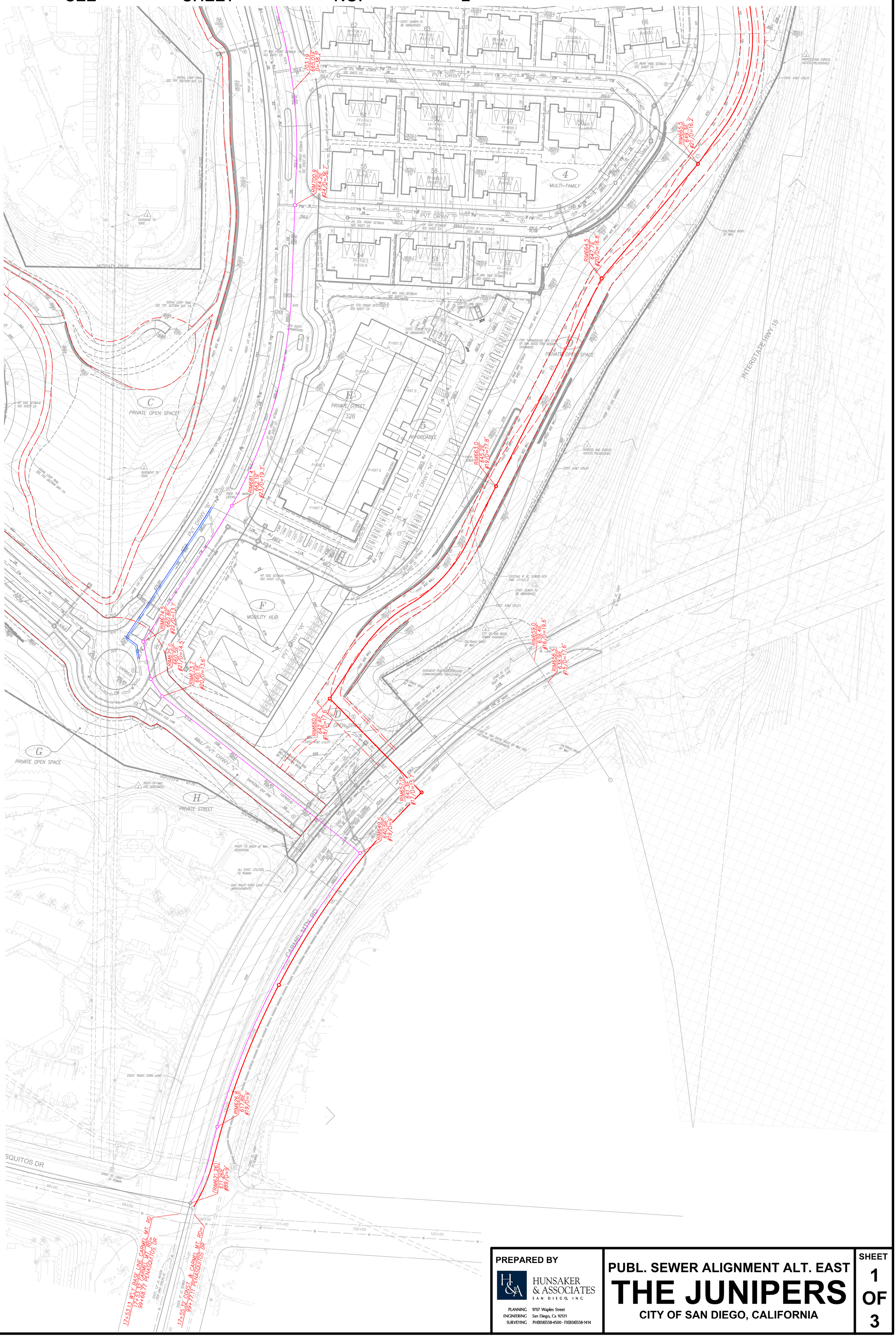
W.O. 2167-0145

R:\1286\&Fin\SHT C24-26 PUBLIC SEWER.dwg[]Jul-07-2019:08:08

APPENDIX C

ALTERNATIVE SEWER ALIGNMENT STUDY

SEE SHEET NO. 2



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PUBL. SEWER ALIGNMENT ALT. EAST

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SHEET 1 OF 3

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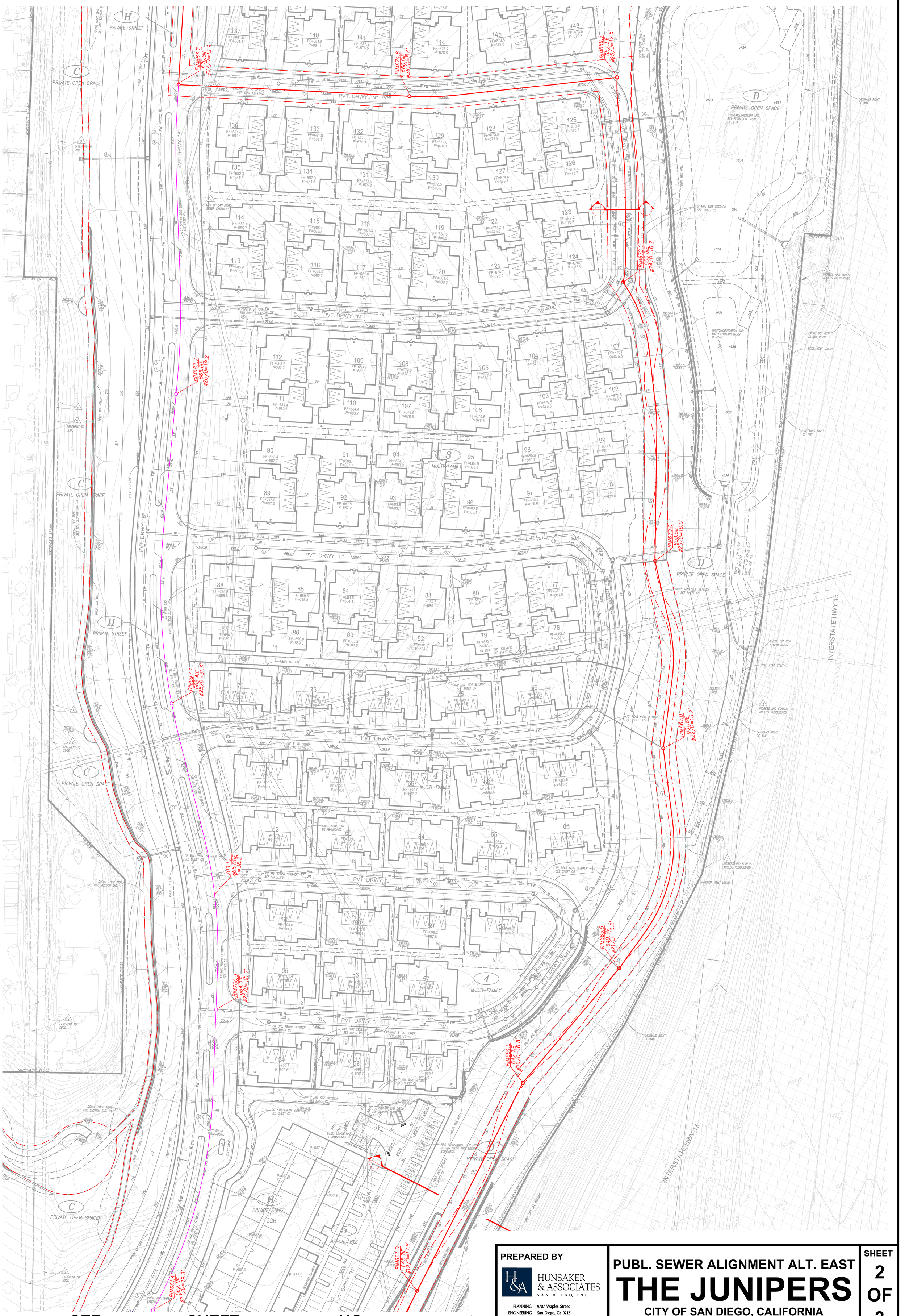
SEE SHEET NO. 3



SEE SHEET NO. 1

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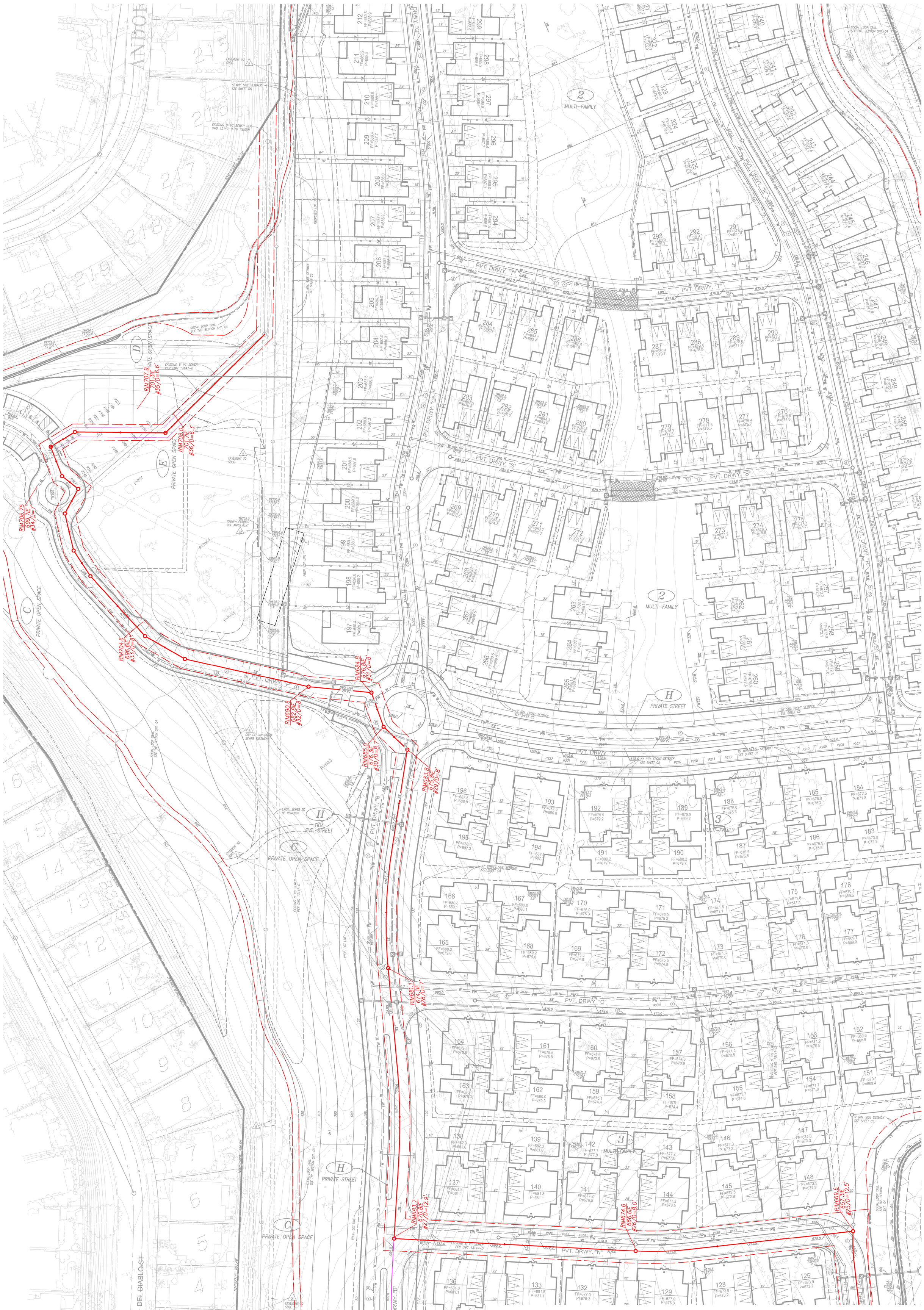

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