

May 26, 2020

To: City of Scottsdale

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Re: Sereno Canyon Phase 4 – Master Sewer Plan (Amendment #2)

This document is an amendment to the Sewer Basis of Design Report dated 02-20-18 approved by the City of Scottsdale. The sewer capacity analysis and exhibit attached herein is in support of the proposed development for Parcels E thru J of Sereno Canyon Phase 4 contributing to the Phase 4 Lift Station.

The proposed amendment is to delete the lift station and connect sewer outfall to 128th Street sewer line under construction by the Story Rock Development. The change will also result in the elimination of a portion of gravity sewer line in 124th Street at the end of the proposed sewer force main line which acted as an outfall for the force main from the lift station.

This amendment removes lift station discharge at Ranch Gate Road outfall by re-routing it to 128th Street. The herein presented analysis routes Sereno Canyon wastewater flows to a proposed 8 inch sewer line within 128th Street under design by Kimley-Horn Associates for Story Rock.

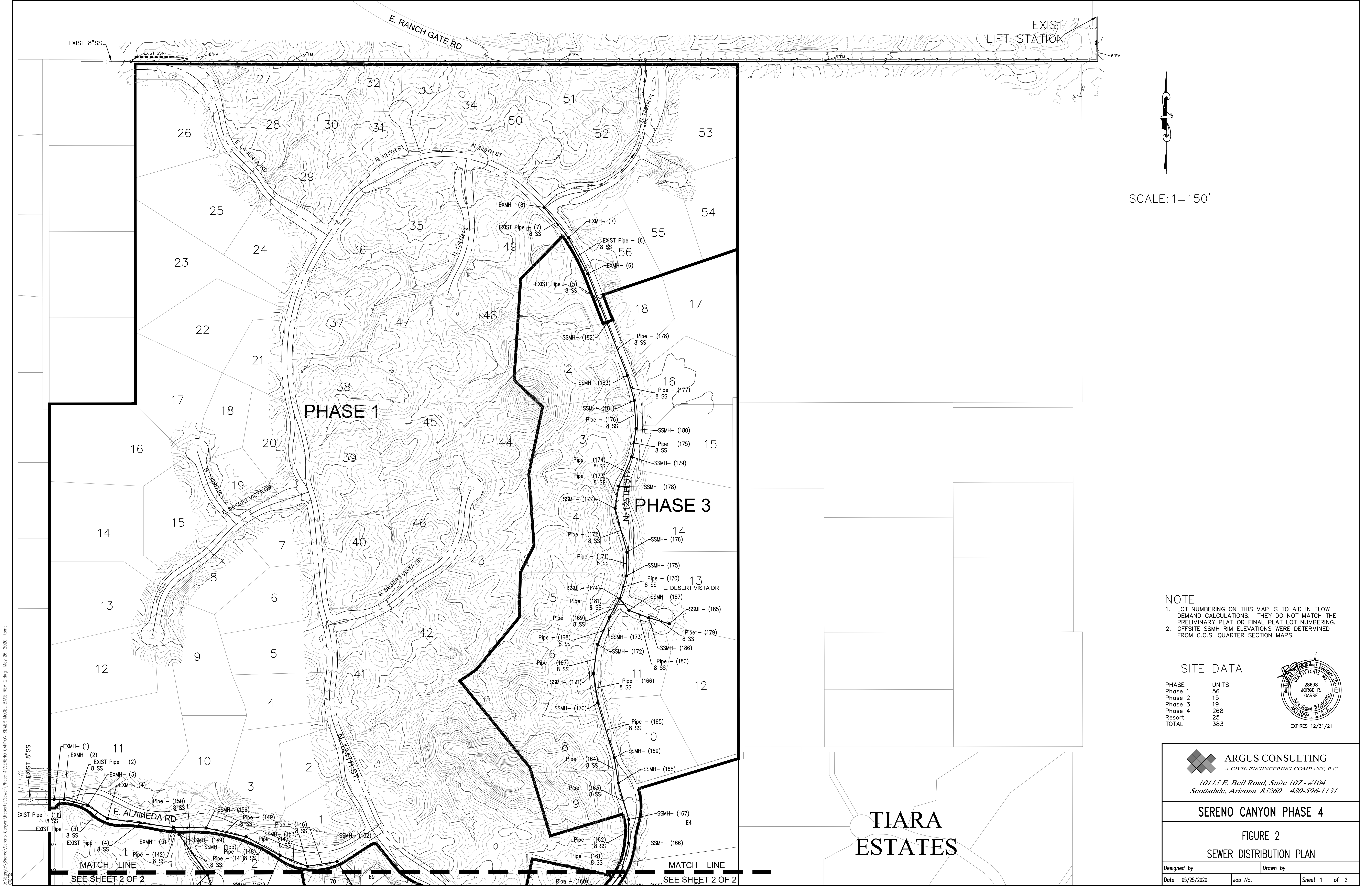
Basis of Sewer Design:

- The total number of units for Phase 4 = 268 dwelling units plus 25 Cottages
- Per City of Scottsdale design standard section 7-1.403 residential design flow will be 100 gallons per capita day with 2.5 persons per dwelling unit
- Cottages demand flows will be 380 gallons per unit
- Mountain House Lodge flows will be 1.2 gpd per square foot
- A peaking factor of 4 will be used for residential units
- A peaking factor of 4.5 will be used for the cottages
- A peaking factor of 6 will be used for the Mountain House Lodge

See attached calculations and sewer distribution map of the proposed system design and capacity.

The proposed sewer collection system is design to provided adequate capacity to meet City of Scottsdale regulations and code.

Figure 2: Sewer Distribution Map



Appendix A: Proposed System Design and Capacity

Sewer Model Node Demand Assignment

Project: Sereno Canyon Phase 4
Location: Scottsdale, AZ

SSMH	Phase	Rim Elevation	# of Units	Persons Per Unit (PPU)	Total Pop.	Daily Flow Factor (gal/cap-day)	Residential gallons/unit /day	Average Daily Flow (gpd)	Average Daily Flow (gpm)	Peaking Factor	Demand Flow with peaking factor (gpm)	Demand Flow with peaking factor (cfs)
1	4	2769.45	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
2	4	2761.99	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
3	4	2758.01	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
4	4	2762.73	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
5	4	2831.55	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
6	4	2832.98	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
7	4	2788.9	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
8	4	2785.33	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
9	4	2782.57	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
10	4	2779.75	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
11	4	2774.74	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
12	4	2770.74	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
13	4	2767.29	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
14	4	2765.21	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
15	4	2763.84	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
16	4	2838.32	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
17	4	2834.2	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
18	4	2826.45	5	2.5	12.5	100	250	1250	0.87	4.00	3.472	0.0077
19	4	2820.37	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
20	4	2818.1	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
21	4	2797.06	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
22	4	2830	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
23	4	2815.87	10	2.5	25.0	100	250	2500	1.74	4.00	6.944	0.0155
24	4	2799.18	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
25	4	2801.92	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
26	4	2776.29	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
27	4	2779.72	6	2.5	15.0	100	250	1500	1.04	4.00	4.167	0.0093
28	4	2788.07	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
29	4	2792.76	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
30	4	2797.11	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
31	4	2801.29	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
32	4	2804.34	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
33	4	2807.55	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
34	4	2812.29	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
35	4	2813.43	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
36	4	2804.59	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
37	4	2797.26	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
38	4	2797.86	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
39	4	2780.57	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
40	4	2779.22	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
41	4	2779.76	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
42	4	2792.05	7	2.5	17.5	100	250	1750	1.22	4.00	4.861	0.0108
43	4	2793.06	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
44	4	2795.26	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
45	4	2771.86	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
46	4	2773.99	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
47	4	2776.51	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
48	4	2780.97	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
49	4	2786.58	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
50	4	2786.99	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
57	4	2797	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
58	4	2798.5	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
59	4	2811	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
60	4	2809.64	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
61	4	2810.09	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
62	4	2814.06	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
63	4	2827.13	11	2.5	27.5	100	250	2750	1.91	4.00	7.639	0.0170
64	4	2830.21	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
65	4	2833.17	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
66	4	2836.28	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
67	4	2838.03	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
68	4	2838.62	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
69	Resort	2827.79	25	2.5	62.5	100	380	9500	6.60	4.50	29.688	0.0661
69	Spa	2827.79	14500	sf			1.2	17400	12.08	6.00	72.500	0.1615
70	4	2791.77	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
71	4	2784.42	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
72	4	2778.21	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
73	4	2775.32	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
74	4	2768.13	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
75	4	2761.66	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
76	4	2758.02	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
77	4	2756.62	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
78	4	2815.62	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
79	4	2810.92	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
80	4	2806.99	8	2.5	20.0	100	250	2000	1.39	4.00	5.556	0.0124
81	4	2793.72	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062

Sewer Model Node Demand Assignment

Project: Sereno Canyon Phase 4
Location: Scottsdale, AZ

SSMH	Phase	Rim Elevation	# of Units	Persons Per Unit (PPU)	Total Pop.	Daily Flow Factor (gal/cap-day)	Residential gallons/unit /day	Average Daily Flow (gpd)	Average Daily Flow (gpm)	Peaking Factor	Demand Flow with peaking factor (gpm)	Demand Flow with peaking factor (cfs)
82	4	2792.27	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
83	4	2790.23	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
84	4	2788.87	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
85	4	2786.14	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
86	4	2784.14	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
87	4	2802.83	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
88	4	2798.62	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
89	4	2792.17	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
90	4	2786.74	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
91	4	2781.38	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
92	4	2777.77	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
93	4	2772.93	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
94	4	2768.26	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
95	4	2763.13	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
96	4	2768.52	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
97	4	2766.99	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
98	4	2762.87	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
99	4	2758.75	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
100	4	2754.57	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
101	4	2752.31	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
102	4	2749.75	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
103	4	2744.71	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
104	4	2743.48	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
105	4	2745.14	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
106	4	2746.64	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
107	4	2754.54	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
108	4	2758.26	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
109	4	2760.57	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
110	4	2765.17	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
111	4	2770.98	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
112	4	2775.76	3	2.5	7.5	100	250	750	0.52	4.00	2.083	0.0046
113	4	2781.48	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
114	4	2785.93	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
115	4	2794.66	5	2.5	12.5	100	250	1250	0.87	4.00	3.472	0.0077
116	4	2797.09	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
117	4	2799.22	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
118	4	2811.43	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
119	4	2815.28	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
120	4	2821.44	4	2.5	10.0	100	250	1000	0.69	4.00	2.778	0.0062
121	4	2798.43	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
122	4	2797.44	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
123	4	2789.51	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
124	4	2782.75	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
125	4	2780.13	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
126	4	2777.9	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
127	4	2773.5	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
128	4	2770.5	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
129	4	2769.8	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
130	4	2748.07	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
131	4	2738.13	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
132	4	2750.84	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
133	4	2745.18	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
134	2	2815.98	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
135	2	2821.08	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
136	2	2820.48	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
137	2	2825	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
138	4	2821	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
139	4	2813.8	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
140	4	2809.75	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
141	2	2806	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
142	4	2798.19	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
143	4	2792.3	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
144	4	2785.01	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
145	4	2776	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
146	2	2773.5	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
147	2	2752	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
148	2	2748	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
149	2	2744	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
150	2	2743	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
151	2	2757	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
152	4	2765.8	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
153	4	2766.2	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
154	4	2765	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
155	4	2756.94	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
156	4	2749.7	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
157	3	2780.5	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000

Sewer Model Node Demand Assignment

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SSMH	Phase	Rim Elevation	# of Units	Persons Per Unit (PPU)	Total Pop.	Daily Flow Factor (gal/cap-day)	Residential gallons/unit /day	Average Daily Flow (gpd)	Average Daily Flow (gpm)	Peaking Factor	Demand Flow with peaking factor (gpm)	Demand Flow with peaking factor (cfs)
158	3	2778.6	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
159	3	2771.4	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
160	3	2764.01	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
161	4	2755.72	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
162	4	2754.72	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
163	4	2754.02	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
164	4	2753.32	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
165	4	2760.63	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
166	4	2756.73	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
167	3	2753.14	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
168	3	2747.84	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
169	3	2747.63	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
170	3	2743.3	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
171	3	2738.44	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
172	3	2736.68	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
173	3	2732.54	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
174	3	2729.38	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
175	3	2727.4	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
176	3	2726.07	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
177	3	2720.9	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
178	3	2717.97	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
179	3	2711.18	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
180	3	2707.55	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
181	3	2704.24	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
182	3	2700.7	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
183	3	2701.3	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
185	3	2733.2	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
186	3	2729.55	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
187	3	2728.63	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
188	4	2783.3	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
189	4	2778.7	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
190	4	2772.3	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
191	4	2773.4	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
192	4	2782.92	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
193	4	2779.07	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
194	4	2764.69	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
195	4	2758.3	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
196	4	2756.17	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
197	4	2756.3	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
198	4	2744.14	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
199	4	2726.9	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
EXMH-1	1	2721.98	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
EXMH-2	1	2725.04	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
EXMH-3	1	2730.33	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
EXMH-4	1	2731.01	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
EXMH-5	1	2739.72	1	2.5	2.5	100	250	250	0.17	4.00	0.694	0.0015
EXMH-6	1	2699.2	2	2.5	5.0	100	250	500	0.35	4.00	1.389	0.0031
EXMH-7	1	2701.79	0	2.5	0.0	100	250	0	0.00	4.00	0.000	0.0000
EXMH-8	1	2703.28	52	2.5	130.0	100	250	13000	9.03	4.00	36.111	0.0805
Total			383		958			116400	80.8333		350.799	0.7816

	E, Alameda RD.	E. Ranch Gate Rd.	128th St.	Total
Phase 1	2	54	0	56
Phase 2	15	0	0	15
Phase 3	0	19	0	19
Phase 4	123	14	130	267
Resort	25	0	0	25
	165	87	130	382

	Average Daily Flow (gpd)	Average Daily Flow (gpm)	Peaking Factor	Demand Flow with peaking factor (gpm)	Demand Flow with peaking factor (cfs)
Phase 1	14,000	9.7222	4.00	38.889	0.0866
Phase 2	3,250	2.2569	4.00	9.028	0.0201
Phase 3	4,500	3.1250	4.00	12.500	0.0279
Phase 4	67,750	47.0486	4.00	188.194	0.4193
Resort	9,500	6.5972	4.50	29.688	0.0661
Spa	17,400	12	6.00	72.500	0.1615
	116,400	80.8333		350.799	0.7816

Name	US Node	DS Node	US Invert (ft)	DS Invert (ft)	2D Length (ft) center-to-center edge-to-edge	% Slope	Size (in)	Tributary Pipes	Peak Cumulative Flow (cfs)	Depth to Diameter Ratio (d/D)	Peak Flow Velocity (ft/s)
E. Alameda Road Sewer outfall											
Pipe - (5)	SSMH- (7)	SSMH- (8)	2780.51	2777.03	70.03 66.03	4.96	8		0.0015	0.0298	0.4800
Pipe - (6)	SSMH- (8)	SSMH- (9)	2776.94	2774.28	46.29 42.29	5.74	8		0.0031	0.0440	0.9900
Pipe - (7)	SSMH- (9)	SSMH- (10)	2774.18	2771.46	47.17 43.17	5.77	8		0.0062	0.0440	1.7400
Pipe - (8)	SSMH- (10)	SSMH- (11)	2771.36	2766.45	81.44 77.44	6.02	8		0.0093	0.0440	1.6200
Pipe - (9)	SSMH- (11)	SSMH- (12)	2766.35	2762.45	49.61 45.61	7.87	8		0.0124	0.0440	2.1600
Pipe - (10)	SSMH- (12)	SSMH- (13)	2762.35	2759	48.38 44.38	6.92	8		0.0155	0.0597	1.7900
Pipe - (11)	SSMH- (13)	SSMH- (14)	2758.9	2757.85	48.19 44.19	2.18	8		0.0170	0.0746	1.4100
Pipe - (12)	SSMH- (14)	SSMH- (15)	2757.75	2756.69	48.1 44.1	2.21	8		0.0186	0.0746	1.5500
Pipe - (151)	SSMH- (15)	SSMH- (152)	2756.59	2755.66	168.48 164.48	0.55	8		0.0248	0.1190	1.0200
Pipe - (146)	SSMH- (152)	SSMH- (153)	2755.56	2755.28	47.65 43.65	0.6	8		0.0248	0.1040	1.0100
Pipe - (147)	SSMH- (153)	SSMH- (154)	2755.18	2754.69	81.96 77.96	0.6	8		0.0248	0.1040	1.0100
Pipe - (148)	SSMH- (154)	SSMH- (155)	2754.59	2748.94	194.84 190.84	2.9	8		0.0248	0.0746	1.6600
Pipe - (149)	SSMH- (155)	SSMH- (156)	2748.84	2741.7	134.42 130.42	5.31	8		0.0248	0.0746	2.0600
Pipe - (150)	SSMH- (156)	SSMH- (150)	2741.6	2735	135.93 131.93	4.86	8		0.0248	0.0746	2.0600
Pipe - (13)	SSMH- (16)	SSMH- (17)	2829.93	2825.81	53.97 49.97	7.62	8		0.0046	0.0298	1.4700
Pipe - (14)	SSMH- (17)	SSMH- (22)	2825.72	2821.91	57.3 53.3	6.64	8		0.0062	0.0447	1.0800
Pipe - (4)	SSMH- (6)	SSMH- (5)	2826.79	2825.36	108.09 104.09	1.32	8		0.0046	0.0299	0.4800
Pipe - (22)	SSMH- (5)	SSMH- (22)	2825.26	2821.93	107.38 103.38	3.11	8		0.0046	0.0448	1.0800
Pipe - (15)	SSMH- (22)	SSMH- (18)	2821.81	2818.16	58.18 54.18	6.27	8	PIPE 22	0.0108	0.0597	1.4400
Pipe - (16)	SSMH- (18)	SSMH- (19)	2817.96	2811.75	157 153	3.96	8		0.0186	0.0746	1.6700
Pipe - (17)	SSMH- (19)	SSMH- (20)	2811.65	2808.68	79.97 75.97	3.72	8		0.0217	0.0746	1.9300
Pipe - (18)	SSMH- (20)	SSMH- (23)	2808.58	2806.63	79.01 75.01	2.46	8		0.0248	0.0895	1.6700
Pipe - (19)	SSMH- (23)	SSMH- (25)	2806.53	2793.53	368.97 364.97	3.52	8		0.0402	0.1045	2.1200
Pipe - (23)	SSMH- (25)	SSMH- (24)	2793.43	2790.79	36.56 32.56	7.23	8		0.0402	0.0896	2.6500
Pipe - (20)	SSMH- (24)	SSMH- (21)	2790.69	2788.67	28.85 24.85	7	8		0.0402	0.0896	2.6500
Pipe - (21)	SSMH- (21)	SSMH- (142)	2788.57	2787.66	152.04 148.04	0.6	8		0.0433	0.1490	1.3600
Pipe - (127)	SSMH- (134)	SSMH- (135)	2809.9	2808.8	181.23 177.23	0.61	8		0.0031	0.0448	0.5400
Pipe - (129)	SSMH- (135)	SSMH- (136)	2808.7	2808.1	108.96 104.96	0.55	8		0.0046	0.0597	0.5300
Pipe - (130)	SSMH- (136)	SSMH- (137)	2808	2807	138.35 134.35	0.72	8		0.0062	0.0597	0.7200
Pipe - (131)	SSMH- (137)	SSMH- (138)	2806.9	2806.49	68.46 64.46	0.6	8		0.0062	0.0746	0.6400
Pipe - (132)	SSMH- (138)	SSMH- (139)	2806.4	2805.69	118.6 114.6	0.6	8		0.0093	0.0746	0.7700
Pipe - (133)	SSMH- (139)	SSMH- (140)	2805.6	2801.75	102.61 98.61	3.75	8		0.0108	0.0597	1.2500
Pipe - (134)	SSMH- (140)	SSMH- (141)	2801.65	2798	189.71 185.71	1.92	8		0.0124	0.0746	1.0300
Pipe - (135)	SSMH- (141)	SSMH- (142)	2797.9	2787.66	218.69 214.69	4.68	8		0.0155	0.0597	1.7900
Pipe - (136)	SSMH- (142)	SSMH- (143)	2787.56	2784.3	162.71 158.71	2	8	PIPE-21	0.0588	0.1340	2.1000
Pipe - (137)	SSMH- (143)	SSMH- (144)	2784.2	2777	135.57 131.57	5.31	8		0.0603	0.1045	3.1400
Pipe - (138)	SSMH- (144)	SSMH- (145)	2776.9	2768	158.87 154.87	5.6	8		0.0603	0.1045	3.1400
Pipe - (139)	SSMH- (145)	SSMH- (146)	2767.9	2765.5	116.08 112.08	2.07	8		0.0603	0.1343	2.1600
Pipe - (31)	SSMH- (34)	SSMH- (33)	2803.9	2799.26	118.69 114.69	3.91	8		0.0031	0.0299	0.9900
Pipe - (30)	SSMH- (33)	SSMH- (32)	2799.16	2796.05	102.82 98.82	3.02	8		0.0062	0.0448	1.0800
Pipe - (29)	SSMH- (32)	SSMH- (31)	2795.95	2793	97.61 93.61	3.02	8		0.0108	0.0597	1.2500
Pipe - (28)	SSMH- (31)	SSMH- (30)	2792.9	2788.82	127.35 123.35	3.2	8		0.0170	0.0746	1.4100
Pipe - (27)	SSMH- (30)	SSMH- (29)	2788.72	2784.47	78.84 74.84	5.4	8		0.0232	0.0746	1.9300
Pipe - (26)	SSMH- (29)	SSMH- (28)	2784.37	2779.78	74.72 70.72	6.15	8		0.0263	0.0746	2.1900
Pipe - (25)	SSMH- (28)	SSMH- (27)	2779.68	2771.43	144.3 140.3	5.72	8		0.0279	0.0746	2.3200
Pipe - (24)	SSMH- (27)	SSMH- (26)	2771.33	2768	61.43 57.43	5.42	8		0.0371	0.0896	2.3500
Pipe - (187)	SSMH- (26)	SSMH- (191)	2767.9	2766.07	149.44 145.44	1.22	8		0.0387	0.1194	1.6000

Name	US Node	DS Node	US Invert (ft)	DS Invert (ft)	2D Length (ft) center-to-center edge-to-edge	% Slope	Size (in)	Tributary Pipes	Peak Cumulative Flow (cfs)	Depth to Diameter Ratio (d/D)	Peak Flow Velocity (ft/s)
Pipe - (32)	SSMH- (35)	SSMH- (36)	2805.05	2796.3	160.74 156.74	5.45	8		0.0046	0.0299	1.4700
Pipe - (33)	SSMH- (36)	SSMH- (37)	2796.2	2788.77	182.64 178.64	4.07	8		0.0077	0.0448	1.3400
Pipe - (34)	SSMH- (38)	SSMH- (57)	2789.26	2788.77	95.04 91.04	0.52	8		0.0448	0.1537	1.3300
Pipe - (40)	SSMH- (37)	SSMH- (44)	2788.67	2786.87	48.53 44.53	3.7	8	Pipes 33, 34	0.0541	0.1077	2.7580
Pipe - (39)	SSMH- (44)	SSMH- (43)	2786.77	2784.67	134.41 130.41	1.57	8		0.0588	0.0896	1.1800
Pipe - (38)	SSMH- (43)	SSMH- (42)	2784.57	2783.66	148.31 144.31	0.61	8		0.0649	0.1194	1.0200
Pipe - (37)	SSMH- (42)	SSMH- (41)	2783.56	2771.37	340.28 336.28	2.35	8		0.0758	0.1045	1.8100
Pipe - (36)	SSMH- (41)	SSMH- (40)	2771.37	2771.07	56.69 52.69	0.52	8		0.0789	0.1490	1.1700
Pipe - (35)	SSMH- (40)	SSMH- (39)	2770.97	2770.67	58.8 54.8	0.52	8		0.0820	0.1490	1.2600
Pipe - (184)	SSMH- (39)	SSMH- (188)	2770.57	2770.28	55.45 51.45	0.52	8		0.0820	0.1490	1.2600
Pipe - (182)	SSMH- (188)	SSMH- (189)	2770.18	2769.53	125.12 121.12	0.52	8		0.0820	0.1490	1.2600
Pipe - (183)	SSMH- (189)	SSMH- (190)	2769.43	2767.05	237.68 233.68	1	8		0.0820	0.1343	1.4600
Pipe - (185)	SSMH- (190)	SSMH- (191)	2766.95	2766.07	54.83 50.83	1.6	8		0.0820	0.1194	1.7300
Pipe - (186)	SSMH- (191)	SSMH- (146)	2765.97	2765.5	32.32 28.32	1.45	8	Pipes 185,187	0.1206	0.1642	2.1300
Pipe - (143)	SSMH- (146)	SSMH- (151)	2765.4	2749	275.89 271.89	5.94	8	Pipes 139,186	0.1841	0.1642	3.8400
Pipe - (144)	SSMH- (151)	SSMH- (147)	2748.9	2744	275.89 271.89	1.78	8		0.1872	0.2089	2.7700
Pipe - (140)	SSMH- (147)	SSMH- (148)	2743.9	2740	92.54 88.54	4.21	8		0.1903	0.1791	3.5300
Pipe - (141)	SSMH- (148)	SSMH- (149)	2739.9	2736	87.07 83.07	4.48	8		0.1903	0.1642	4.0000
Pipe - (142)	SSMH- (149)	SSMH- (150)	2735.9	2735	73.51 69.51	1.22	8		0.1903	0.2388	2.3200
Pipe - (145)	SSMH- (150)	EXIST SSMH- (5)	2735.8	2730	54.08 50.08	10.72	8	Pipes 142, 150	0.2166	0.1493	5.3700
Pipe - (56)	SSMH- (38)	SSMH- (57)	2789.26	2788.78	61.83 57.83	0.78	8		0.0046	0.0478	0.7590
Pipe - (53)	SSMH- (58)	SSMH- (57)	2793.03	2788.78	140.25 136.25	3.03	8		0.0402	0.0955	2.3520
Pipe - (54)	SSMH- (59)	SSMH- (58)	2795.6	2793.13	66.7 62.7	3.7	8		0.0402	0.0910	2.5520
Pipe - (55)	SSMH- (61)	SSMH- (59)	2800.81	2795.7	127.7 123.7	4	8		0.0402	0.0896	2.5910
Pipe - (57)	SSMH- (61)	SSMH- (60)	2801.5	2800.91	99 95	0.6	8		0.0031	0.0418	0.6150
Pipe - (58)	SSMH- (62)	SSMH- (61)	2805.67	2800.81	148.27 144.27	3.28	8		0.0371	0.0896	2.3600
Pipe - (59)	SSMH- (63)	SSMH- (62)	2818.64	2805.77	334.99 330.99	3.84	8		0.0309	0.0791	2.3600
Pipe - (60)	SSMH- (64)	SSMH- (63)	2821.72	2818.74	45.92 41.92	6.51	8		0.0139	0.0478	2.2250
Pipe - (61)	SSMH- (65)	SSMH- (64)	2824.68	2821.82	43.93 39.93	6.5	8		0.0108	0.0433	2.0580
Pipe - (62)	SSMH- (66)	SSMH- (65)	2827.79	2824.78	46.16 42.16	6.53	8		0.0093	0.0403	1.9690
Pipe - (63)	SSMH- (67)	SSMH- (66)	2829.54	2827.89	44.25 40.25	3.72	8		0.0077	0.0418	1.5290
Pipe - (64)	SSMH- (68)	SSMH- (67)	2830.23	2829.64	47.52 43.52	1.25	8		0.0062	0.0493	0.9800
Pipe - (65)	SSMH- (69)	SSMH- (62)	2806.86	2805.77	209.87 205.87	0.52	8		0.2277	0.1134	1.0850
EXIST Pipe - (4)	EXIST SSMH- (5)	EXIST SSMH- (4)	2730	2722.5	257.01 253.01	2.92	8		0.2181	0.2089	3.3500
EXIST Pipe - (3)	EXIST SSMH- (4)	EXIST SSMH- (3)	2722.4	2721.8	91.26 87.26	0.66	8		0.2181	0.2985	2.0100
EXIST Pipe - (2)	EXIST SSMH- (3)	EXIST SSMH- (2)	2721.7	2715.9	92.83 88.83	6.25	8		0.2181	0.1642	4.7400
EXIST Pipe - (1)	EXIST SSMH- (2)	EXIST SSMH- (1)	2715.8	2713.5	38.00 34.00	6.05	8		0.2197	0.1791	4.2100
128th Street Sewer Outfall											
Pipe - (118)	SSMH- (123)	SSMH- (124)	2781.12	2774.36	95.81 91.81	7.06%	8		0.0031	0.0299	0.4800
Pipe - (119)	SSMH- (124)	SSMH- (125)	2774.26	2771.74	46.88 42.88	5.38%	8		0.0062	0.0299	1.4700
Pipe - (120)	SSMH- (125)	SSMH- (126)	2771.64	2769.51	46.88 42.88	4.54%	8		0.0093	0.0448	1.3400
Pipe - (121)	SSMH- (126)	SSMH- (127)	2769.41	2765.11	96.50 92.50	4.46%	8		0.0124	0.0597	1.2500
Pipe - (122)	SSMH- (127)	SSMH- (128)	2765.02	2762.11	81.93 77.93	3.55%	8		0.0155	0.0597	1.6100
Pipe - (123)	SSMH- (128)	SSMH- (129)	2762.01	2761.14	167.03 163.03	0.52%	8		0.0186	0.1045	0.8600
Pipe - (124)	SSMH- (129)	SSMH- (130)	2761.04	2739.68	500.00 496.00	4.27%	8		0.0186	0.0597	1.9700
Pipe - (125)	SSMH- (130)	SSMH- (131)	2739.58	2729.74	240.78 236.78	4.09%	8		0.0186	0.0597	1.9700
Pipe - (73)	SSMH- (78)	SSMH- (79)	2808.90	2803.06	116.72 112.72	5.00%	8		0.0046	0.0313	1.4480
Pipe - (74)	SSMH- (79)	SSMH- (80)	2802.96	2797.12	116.94 112.94	4.99%	8		0.0093	0.0418	1.7950

Name	US Node	DS Node	US Invert (ft)	DS Invert (ft)	2D Length (ft)	% Slope	Size (in)	Tributary Pipes	Peak Cumulative Flow (cfs)	Depth to Diameter Ratio (d/D)	Peak Flow Velocity (ft/s)
					center-to-center edge-to-edge						
Pipe - (75)	SSMH- (80)	SSMH- (81)	2797.02	2785.82	221.99	5.05%	8		0.0217	0.0627	2.3230
					217.99						
					98.54						
Pipe - (76)	SSMH- (81)	SSMH- (82)	2785.72	2783.61	94.54	2.14%	8		0.0279	0.0716	2.5080
					245.00						
					241.00						
Pipe - (77)	SSMH- (82)	SSMH- (83)	2783.51	2782.29	110.00	0.50%	8		0.0279	0.1224	1.1220
					106.00						
					68.27						
Pipe - (78)	SSMH- (83)	SSMH- (84)	2782.19	2780.47	106.00	1.56%	8		0.0031	0.0552	1.1980
					64.27						
					64.27						
Pipe - (81)	SSMH- (87)	SSMH- (88)	2794.44	2790.23	131.74	6.17%	8		0.0031	0.0298	0.9900
					127.74						
					127.74						
Pipe - (82)	SSMH- (88)	SSMH- (89)	2790.13	2783.78	128.71	4.82%	8		0.0031	0.0448	1.6200
					127.74						
					128.71						
Pipe - (83)	SSMH- (89)	SSMH- (84)	2783.68	2780.47	124.71	2.49%	8		0.0093	0.0896	0.9800
					68.00						
					68.00						
Pipe - (80)	SSMH- (84)	SSMH- (85)	2780.37	2778.72	64.00	2.43%	8	Pipes 78, 83	0.0124	0.0507	1.3970
					89.00						
					89.00						
Pipe - (79)	SSMH- (85)	SSMH- (86)	2778.62	2775.65	85.00	3.34%	8		0.0124	0.0537	1.7030
					89.00						
					89.00						
Pipe - (192)	SSMH- (86)	SSMH- (192)	2775.55	2774.78	85.00	0.87%	8		0.0124	0.0731	1.0670
					82.00						
					82.00						
Pipe - (193)	SSMH- (192)	SSMH- (193)	2774.68	2771.17	78.00	4.28%	8		0.0124	0.0507	1.8570
					293.00						
					289.00						
Pipe - (194)	SSMH- (193)	SSMH- (194)	2771.07	2756.79	120.00	4.87%	8		0.0124	0.0493	1.9420
					116.00						
					116.00						
Pipe - (195)	SSMH- (194)	SSMH- (195)	2756.69	2748.90	104.00	6.49%	8		0.0124	0.0463	2.1450
					104.00						
					100.00						
Pipe - (196)	SSMH- (195)	SSMH- (196)	2748.80	2748.01	100.00	0.76%	8		0.0124	0.0761	1.0170
					92.98						
					92.98						
Pipe - (85)	SSMH- (90)	SSMH- (91)	2778.35	2773.09	88.98	5.66%	8		0.0046	0.0896	3.0500
					66.42						
					66.42						
Pipe - (86)	SSMH- (91)	SSMH- (92)	2772.99	2769.48	62.42	5.28%	8		0.0077	0.1045	2.5900
					92.14						
					92.14						
Pipe - (87)	SSMH- (92)	SSMH- (93)	2769.38	2764.64	88.14	5.14%	8		0.0124	0.1044	2.8300
					89.06						
					89.06						
Pipe - (88)	SSMH- (93)	SSMH- (94)	2764.54	2759.97	85.06	5.13%	8		0.0170	0.1045	3.0600
					102.83						
					102.83						
Pipe - (89)	SSMH- (94)	SSMH- (95)	2759.87	2754.84	98.83	4.89%	8		0.0217	0.1194	2.6900
					98.83						
					69.49						
Pipe - (90)	SSMH- (95)	SSMH- (75)	2754.74	2753.27	65.49	2.12%	8		0.0248	0.1343	2.3200
					108.07						
					108.07						
Pipe - (66)	SSMH- (70)	SSMH- (71)	2783.38	2776.03	104.07	6.80%	8		0.0031	0.0045	1.4270
					109.55						
					109.55						
Pipe - (67)	SSMH- (71)	SSMH- (72)	2776.03	2769.82	105.55	5.67%	8		0.0062	0.0343	1.6570
					84.71						
					84.71						
Pipe - (68)	SSMH- (72)	SSMH- (73)	2769.82	2766.93	80.71	3.41%	8		0.0062	0.3880	1.3890
					243.97						
					243.97						
Pipe - (69)	SSMH- (73)	SSMH- (74)	2766.83	2759.74	239.97	2.91%	8		0.0124	0.0552	1.6240
					133.03						
					133.03						
Pipe - (70)	SSMH- (74)	SSMH- (75)	2759.64	2753.27	129.03	4.79%	8		0.0124	0.4980	1.9310
					135.51						
					135.51						
Pipe - (71)	SSMH- (75)	SSMH- (76)	2753.17	2749.63	131.51	2.61%	8	Pipes70,90	0.0387	0.0970	2.2070
					297.52						
					297.52						
Pipe - (72)	SSMH- (76)	SSMH- (77)	2749.53	2747.98	293.52	0.52%	8		0.0387	0.1433	1.2550
					47.67						
					47.67						
Pipe - (91)	SSMH- (96)	SSMH- (97)	2760.13	2758.60	43.67	3.21%	8		0.0031	0.0299	0.9900
					119.36						
					119.36						
Pipe - (92)	SSMH- (97)	SSMH- (98)	2758.50	2754.48	115.36	3.37%	8		0.0062	0.0448	1.0800
					89.23						
					89.23						
Pipe - (93)	SSMH- (98)	SSMH- (99)	2754.38	2750.36	85.23	4.51%	8		0.0108	0.0597	1.2500
					43.89						
					43.89						
Pipe - (94)	SSMH- (99)	SSMH- (77)	2750.26	2747.98	39.89	5.19%	8		0.0139	0.0597	1.6100
					43.33						
					43.33						
Pipe - (95)	SSMH- (77)	SSMH- (100)	2747.88	2746.00	39.33	4.34%	8	Pipes 72,94	0.0526	0.1000	2.8920
					47.39						
					47.39						
Pipe - (96)	SSMH- (100)	SSMH- (101)	2745.90	2743.84	43.39	4.35%	8		0.0572	0.1030	2.9680
					53.40						
					53.40						
Pipe - (97)	SSMH- (101)	SSMH- (102)	2743.74	2741.36	49.40	4.46%	8		0.0588	0.1045	3.0190
					129.04						
					129.04						
Pipe - (98)	SSMH- (102)	SSMH- (103)	2741.26	2736.32	125.04	3.83%	8		0.0619	0.1104	2.9070
					46.22						
					46.22						
Pipe - (99)	SSMH- (103)	SSMH- (104)	2736.23	2735.58	42.22	1.41%	8		0.0634	0.1418	2.0630
					35.00						
					35.00						
Pipe - (197)	SSMH- (196)	SSMH- (197)	2747.91	2747.63	31.00	0.80%	8	Pipes 103,196	0.0789	0.1179	1.8040
					80.00						
					80.00						
Pipe - (198)	SSMH- (197)	SSMH- (107)	2747.53	2745.53	76.00	2.50%	8		0.0805	0.1388	2.7090
					109.00						
					109.00						
Pipe - (102)	SSMH- (107)	SSMH- (106)	2746.43	2738.74	105.00	7.06%	8		0.0820	0.1075	4.8200
					30.00						
					30.00						
Pipe - (101)	SSMH- (106)	SSMH- (105)	2738.64	2737.23	26.00	4.70%	8		0.0836	0.1224	3.4100
					75.00						
					75.00						
Pipe - (100)	SSMH- (105)	SSMH- (104)	2737.13	2735.58	71.00	2.07%	8		0.0851	0.1493	2.5780
					38.00						
					38.00						
Pipe - (199)	SSMH- (104)	SSMH- (198)	2735.48	2733.01	34.00	6.50%	8		0.0851	0.1478	4.5470
					260.00						
					260.00						
Pipe - (128)	SSMH- (198)	SSMH- (131)	2729.65	2727.05	256.00	1.00%	8		0.0851	0.2358	2.3490
					232.00						
					232.00						
Pipe - (200)	SSMH- (131)	SSMH- (199)	2726.95	2722.77	228.00	1.80%	8	Pipe 125,128 128th Outfall	0.0851	0.2149	2.9940
					124.06						
					124.06						
Pipe - (115)	SSMH- (120)	SSMH- (119)	2813.05	2806.89	120.06	4.97%	8		0.0062	0.0448	1.0800
					78.17						
					78.17						
Pipe - (114)	SSMH- (119)	SSMH- (118)	2806.79	2803.04	74.17	4.80%	8		0.0093	0.0448	1.6200
					284.06						
					284.06						
Pipe - (113)	SSMH- (118)	SSMH- (117)	2802.94	2790.83	280.06	4.26%	8		0.0124	0.0597	1.6100
					46.18						
					46.18						
Pipe - (112)	SSMH- (117)	SSMH- (116)	2790.73	2788.70	42.18	4.40%	8		0.0186	0.0746	1.5500

Name	US Node	DS Node	US Invert (ft)	DS Invert (ft)	2D Length (ft) center-to-center edge-to-edge	% Slope	Size (in)	Tributary Pipes	Peak Cumulative Flow (cfs)	Depth to Diameter Ratio (d/D)	Peak Flow Velocity (ft/s)
Pipe - (111)	SSMH- (116)	SSMH- (115)	2788.60	2786.27	50.08 46.08	4.65%	8		0.0217	0.0746	1.8000
Pipe - (110)	SSMH- (115)	SSMH- (114)	2786.17	2777.54	176.43 172.43	4.89%	8		0.0294	0.0746	2.3200
Pipe - (116)	SSMH- (121)	SSMH- (122)	2790.04	2789.05	53.67 49.67	1.84%	8		0.0015	0.0299	0.4800
Pipe - (117)	SSMH- (122)	SSMH- (114)	2788.95	2777.54	164.71 160.71	6.93%	8		0.0031	0.0299	0.9900
Pipe - (109)	SSMH- (114)	SSMH- (113)	2777.44	2773.09	85.24 81.24	5.10%	8	Pipes 110,117	0.0340	0.0896	2.1600
Pipe - (108)	SSMH- (113)	SSMH- (112)	2772.99	2767.37	108.08 104.08	5.20%	8		0.0402	0.0896	2.5600
Pipe - (107)	SSMH- (112)	SSMH- (111)	2767.27	2762.59	89.68 85.68	5.22%	8		0.0449	0.0896	2.7500
Pipe - (106)	SSMH- (111)	SSMH- (110)	2762.49	2756.78	110.34 106.34	5.17%	8		0.0495	0.1045	2.4400
Pipe - (105)	SSMH- (110)	SSMH- (109)	2756.68	2752.18	88.08 84.08	5.11%	8		0.0557	0.1045	2.5900
Pipe - (104)	SSMH- (109)	SSMH- (108)	2752.08	2748.93	81.99 77.99	3.84%	8		0.0588	0.1194	2.3000
Pipe - (103)	SSMH- (108)	SSMH- (196)	2748.83	2736.75	305.06 301.06	3.96%	8		0.0603	0.1194	2.4900
E. Ranch Gate Road (Happy Valley Rd) Sewer outfall											
Pipe - (46)	SSMH- (50)	SSMH- (49)	2772.74	2772.31	82.86 78.86	0.52%	8		0.0031	0.0433	0.5850
Pipe - (45)	SSMH- (49)	SSMH- (48)	2772.21	2771.64	108.41 104.41	0.53%	8		0.0062	0.0597	0.7220
Pipe - (44)	SSMH- (48)	SSMH- (47)	2771.55	2766.06	76.41 72.41	7.18%	8		0.0062	0.0328	1.7980
Pipe - (43)	SSMH- (47)	SSMH- (46)	2765.96	2762.48	50.83 46.83	6.85%	8		0.0062	0.0328	1.7700
Pipe - (42)	SSMH- (46)	SSMH- (45)	2762.38	2758.85	51.40 47.40	6.87%	8		0.0062	0.0328	1.7700
Pipe - (41)	SSMH- (45)	SSMH- (1)	2758.75	2755.09	52.66 48.66	6.95%	8		0.0108	0.0418	2.1080
Pipe - (1)	SSMH- (1)	SSMH- (2)	2754.99	2754.31	135.90 131.90	0.50%	8		0.0155	0.0925	0.9400
Pipe - (2)	SSMH- (2)	SSMH- (3)	2754.21	2753.61	115.13 111.13	0.52%	8		0.0155	0.0925	0.9530
Pipe - (3)	SSMH- (3)	SSMH- (4)	2753.51	2752.8	137.13 133.13	0.52%	8		0.0155	0.0925	0.9530
Pipe - (155)	SSMH- (4)	SSMH- (161)	2752.7	2752.2	72.61 68.61	0.69%	8		0.0155	0.0829	1.0520
Pipe - (156)	SSMH- (161)	SSMH- (162)	2752.1	2751.2	96.39 92.39	0.93%	8		0.0155	0.0851	1.0730
Pipe - (157)	SSMH- (162)	SSMH- (163)	2751.1	2750.5	149.91 145.91	0.40%	8		0.0155	0.0910	0.9600
Pipe - (158)	SSMH- (163)	SSMH- (164)	2750.4	2749.8	99.44 95.44	0.60%	8		0.0186	0.0970	1.0590
Pipe - (159)	SSMH- (164)	SSMH- (160)	2749.7	2749.3	60.16 56.16	0.66%	8		0.0186	0.0955	1.0950
Pipe - (152)	SSMH- (157)	SSMH- (158)	2771.4	2770	89.98 85.98	1.56%	8		0.0000	0.0000	0.0000
Pipe - (153)	SSMH- (158)	SSMH- (159)	2769.9	2761.7	121.47 117.47	6.75%	8		0.0015	0.2985	0.4800
Pipe - (154)	SSMH- (159)	SSMH- (160)	2761.6	2749.3	209.77 205.77	5.86%	8		0.0015	0.2985	0.4800
Pipe - (160)	SSMH- (160)	SSMH- (165)	2749.2	2745.1	143.68 139.68	2.85%	8	Pipes 154,159	0.0217	0.0716	1.9100
Pipe - (161)	SSMH- (165)	SSMH- (166)	2745	2744.2	128.80 124.80	0.62%	8		0.0217	0.1030	1.1220
Pipe - (162)	SSMH- (166)	SSMH- (167)	2744.1	2743.5	90.22 86.22	0.67%	8		0.0248	0.1045	1.1770
Pipe - (163)	SSMH- (167)	SSMH- (168)	2743.4	2739	145.50 141.50	3.02%	8		0.0248	0.0731	1.9900
Pipe - (164)	SSMH- (168)	SSMH- (169)	2738.9	2738.2	98.27 94.27	0.71%	8		0.0263	0.1075	1.2250
Pipe - (165)	SSMH- (169)	SSMH- (170)	2738.1	2735	219.28 215.28	1.41%	8		0.0294	0.0955	1.6130
Pipe - (166)	SSMH- (170)	SSMH- (171)	2734.9	2729.5	113.56 109.56	4.76%	8		0.0309	0.0731	2.5050
Pipe - (167)	SSMH- (171)	SSMH- (172)	2729.4	2728	113.56 109.56	1.23%	8		0.0309	0.1015	1.5620
Pipe - (168)	SSMH- (172)	SSMH- (173)	2727.9	2723.5	113.71 109.71	3.87%	8		0.0325	0.0791	2.3600
Pipe - (169)	SSMH- (173)	SSMH- (174)	2723.4	2719.6	81.32 77.32	4.67%	8		0.0340	0.0776	2.5650
Pipe - (179)	SSMH- (185)	SSMH- (186)	2725.9	2720.7	82.07 78.07	6.34%	8		0.0031	0.0299	0.9900
Pipe - (180)	SSMH- (186)	SSMH- (187)	2720.6	2720.1	81.55 77.55	0.61%	8		0.0046	0.0597	0.5300
Pipe - (181)	SSMH- (187)	SSMH- (174)	2720	2719.6	56.96 52.96	0.70%	8		0.0046	0.0597	0.5300
Pipe - (170)	SSMH- (174)	SSMH- (175)	2719.5	2718	90.80 86.80	1.65%	8	Pipes 169,181	0.0387	0.1060	1.8570
Pipe - (171)	SSMH- (175)	SSMH- (176)	2717.9	2717	90.69 86.69	0.99%	8		0.0387	0.1194	1.5530
Pipe - (172)	SSMH- (176)	SSMH- (177)	2716.9	2711.1	173.48 169.48	3.34%	8		0.0402	0.0910	2.4060
Pipe - (173)	SSMH- (177)	SSMH- (178)	2711	2709	86.17 82.17	2.32%	8		0.0433	0.1030	2.1630
Pipe - (174)	SSMH- (178)	SSMH- (179)	2708.9	2701	123.31 119.31	6.41%	8		0.0433	0.0806	3.0910
Pipe - (175)	SSMH- (179)	SSMH- (180)	2700.9	2698	108.83 104.83	2.66%	8		0.0433	0.1000	2.2740

[illegible]