



**SEWER STUDY FOR
SCRIPPS MERCY HOSPITAL CAMPUS PROJECT
(PTS #658548)**

SAN DIEGO, CALIFORNIA

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1. Project Description, Location, and Scope

1.1 Project Description

The Scripps Mercy Hospital CUP Amendment project involves demolition of existing buildings and construction of new medical offices and hospital buildings at the Scripps Mercy Hospital Campus in the Uptown community of the City of San Diego. The project site is located on approximately 21.07 acres, generally at 4077 Fifth Avenue, and is currently developed with the Scripps Mercy Hospital campus buildings, surface and structured parking, internal streets and driveways, and landscaping. The project site is situated north of Washington Street, east of Fourth Avenue, east and west of Sixth Avenue, and south of existing development that is located along Arbor Drive. Regional access to the site is provided by State Route 163 (SR 163), immediately east of the project site. Local access to the site is via Washington Street, Fifth Avenue, Lewis Street, and Fourth Avenue.

The project involves a Conditional Use Permit (CUP) to amend existing CUP No. 304755, Site Development Permit (SDP) to amend existing SDP No. 531932, and a Planned Development Permit. Demolition would include the Facility Building, Generator Building and Cooling Tower, Behavioral Health Clinic, Hospital Building, 550 Washington Building, 550 Washington Parking Structure, Mercy Manor, Parking Lot 4.1, and Emergency Department. The Cancer Center and associated parking structure, currently under construction, would remain, as well as the College Building, Mercy Gardens, the Chapel, Central Energy Plant, and Parking Lot 12. A new parking structure (6th Avenue Parking Structure and Bridge) has been approved and will be constructed at the surface parking located on the east side of Sixth Avenue separately and in advance of major construction efforts of the project. While this parking structure is part of the existing CUP for the hospital campus, its construction has been previously approved under SCR No. 531932. Construction for the project would include Hospital I (15 stories, 630,000 square feet), Hospital II (15 stories, 380,000 square feet); Hospital Support Building (three stories with three levels of parking below ground, 65,000 square feet); Medical Office Building (seven stories above-grade, 200,000 square feet) and associated parking (three levels above-grade and two levels below-grade); and a Central Energy Plant Expansion (2,400 square feet), and two Utility Yards.

The project would also involve vacation of public utility easements and vacation of a public street rights-of-way. Storm water easements would be vacated where storm water facilities have been/will be moved and/or new storm water facilities constructed. Four street easements would be vacated at the new parking structure site on the east side of Sixth Avenue. Additionally, existing San Diego Gas and Electric (SDG&E) facilities (including electricity and natural gas lines) would be relocated and easements quit claimed.

The project site is zoned CC-3-8, CC-3-9, OR-1-1, RM-3-9, OC-1-1, Transit Overlay Zone, and Community Plan Implementation Overlay Zone. The project site is located in the Medical Complex Neighborhood of the Uptown Community Plan and is designated Institutional, Community Commercial: 0-109 Du/Ac, and Open Space. The site is designated Institutional & Public and Semi-Public Facilities, Multiple Use, and Parks, Recreation, and Open Space in the San Diego General Plan.

Discretionary actions associated with the project include: an amendment to Conditional Use Permit (CUP) No. 304755, a Site Development Permit (SDP) to amend existing SDP No. 531932, a Planned Development Permit (PDP) to deviate from height and floor area ratios, a Neighborhood Use Permit (NDP) to address a comprehensive sign plan, Tentative Map to adjust property lines, Public Utility Easement Vacation, and Public Street Vacation.

1.2 Project Location

The 17.7-acres Scripps Mercy Memorial Campus is located at the northeasterly corner of Washington Street and Fifth Ave, in the City of San Diego, California. The CUP project site is bound by Montecito Way to the north, Washington Street to the south, Fourth Avenue to the west, and Sixth Avenue to the east. Access to the project site is provided off Lewis Street, Fifth Avenue, Washington Street, and Sixth Avenue. A site vicinity map is shown in Figure 1-1 below. The Scripps Mercy Memorial Campus also includes the Sixth Avenue parking structure between Sixth Avenue and Eighth Avenue.

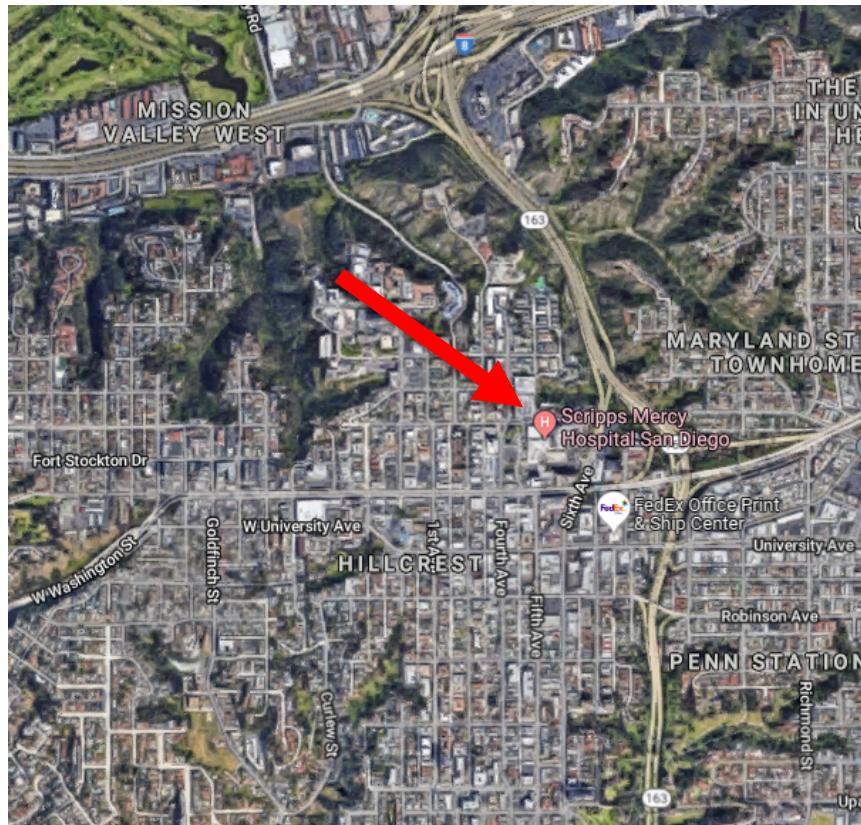


Figure 1-1: Site Vicinity Map

1.3 Scope of Report

This report will identify the impact of the proposed developments on existing sanitary sewer system, analyze the capacity of existing sewer infrastructure based on additional demands, and provide recommendations to mitigate the proposed impact.

2. Study Objectives

The specific objectives of this sewer study are:

- Calculate the project proposed sewer demand based on the City of San Diego Sewer Design Manual.

- Determine the capacity of the existing sanitary sewer system under the proposed condition.
- Identify any mitigation measures.

3. Methodology

The anticipated sewer demand of the existing and proposed conditions on the Scripps Mercy campus were calculated using the City of San Diego Sewer Design Manual. The density conversion (Table 1-1) from the City of San Diego Sewer Design Manual (See Appendix C for reference) was used to estimate the equivalent population, then a per-capita sewage generation rate of 80 gallons per day (gpd) was applied to calculate the average sewage demands (See Table 4-1 for calculations). The City of San Diego Sewer Design manual did not specify if any sewage generated from parking structures should be considered, so the sewer generation from the existing and proposed parking structures was assumed to be negligible.

All existing upstream and offsite sewage flows were calculated using the City of San Diego density conversion (Table 1-1), and the city of San Diego Zoning Map: Grid 19 (refer to Appendix C) to identify the existing zone and upstream tributary site area in acres. According to Table 1-1 of the City of San Diego Sewer Design Manual, offices, commercial/hotel, industrial, and hospital zones density conversations represent equivalent populations per floor of the building. As such, for upstream tributary area calculations containing these zones, an analysis was completed to quantify how many floors each building has in order to obtain the net area and associated population. Google street view was used to understand how many floors each building in these zones exist to complete this analysis. For all other zones, the City of San Diego Sewer Design Manual does not specify floor area to be included in the calculations, therefore the site area was used to calculate the population and no multi-floor analysis was completed. See table A-1 and Exhibit 5 for tributary area calculations with multi-floor analysis.

See Exhibit 5, Table A-1, Table 5-1, and Table 5-2 for upstream tributary area flow calculations.

4. Project Sewer Description

4.1 Pre-Development Sewer Conditions

The existing Scripps Mercy Hospital campus includes a college building, parking structures, surface parking lots, medical office building (MOB), emergency department, Chapel, various utility facilities, and the main hospital building. The existing sewer connections to the public mains on Washington St., Fifth Ave., Fourth Ave., and Sixth Ave are shown on Exhibit 1 in Appendix A. The anticipated sewer demand for the pre-development condition is 200,316 gallons per day. Please refer to Table 4-1 for the detailed breakdown of the existing demands. An analysis of the existing sewer demands on the infrastructure was performed as shown on Table 5-1 to compare the impacts of the proposed condition. The existing 8-inch vitrified clay pipe (VCP) listed as "Line 23" in Appendix B on Sixth Avenue between MH#99 and MH#93 with a slope of 4.20% is at 51.9% full under existing conditions,

which exceeds the capacity of 50% maximum. The proposed development reduces the flow rate in Pipe 23 by 1,639 cubic feet per second, which is 0.19% of the existing condition. Refer to Table 5-1 & Table 5-2 for existing & proposed flow rates.

The analysis for the existing condition assumes that the Buchanan Canyon Sewer Capital Improvement Project (B00429) has already been completed as we understand its construction is anticipated to begin in 2022.

4.2 Post-Development Sewer Conditions

The post-development conditions of the Scripps Mercy Hospital Campus Project include the demolition of the main hospital building, emergency department, behavioral health unit, 550 Washington medical office building, and parking structure north of Washington Boulevard between Fifth and Sixth Street. New construction includes Replacement Hospital 1, and Hospital Building (HB), Medical Office Building (MOB), and Replacement Hospital 2. The anticipated sewer demands for the proposed condition is 353,609 gallons per day. Refer to Table 4-1 for the projected sewer demands and Table 5-2 for the proposed condition sewer analysis.

Table 4-1 Projected Water and Sewer Demands

Building	Building Use	SQFT/Quantity	Table 1-1 Density Conversion (Pop/NetAC)	Net Ac	Sewage Capita/Day (GPD)	Average Demand (City of SD)	Notes	City Sewer Connection
<i>Existing Buildings To Be Demolished</i>								
Facility Building	Utilities	12,984	38.2	0.30	80	911		6th Ave
Generator Building	Utilities	555	38.2	0.01	80	39		6th Ave
Behavioral Health Unit	Hospital	64,341	150.0	1.48	80	17,725		6th Ave
Hospital Building	Hospital	507,580	150.0	11.65	80	139,829	507,580 sqft x 150 population/net acre.	6th Ave
550 Washington	Hospital	75,420	150.0	1.73	80	20,777		Washington St
550 Parking	Parking Structure	30,364	-	0.70	80	-		Washington St
Mercy Manor	"Office"	16,668	38.2	0.38	80	1,169	Assumed as an office space.	Caltrans
Lot 4 Parking Structure	Parking Structure	161,939	-	3.72	80	-		4th Ave
ED Building	Hospital	13,796	150.0	0.32	80	3,804	13,796 sqft x 150 population/net acre.	5th Ave
184,254 GPD								
<i>Existing Building to Remain</i>								
College Building	Office	40,700	38.2	0.93	80	2,855		Caltrans
Mercy Gardens	Office	26,790	38.2	0.62	80	1,879		Caltrans
Chapel		5,920	38.2	0.14	80	415		Caltrans
Central Energy Plant		18,869	38.2	0.43	80	1,324		6th Ave
Lot 12 Parking Structure	Parking Structure	223,842	-	5.14	80	-		4th Ave
Cancer Center & Parking Structure	Hospital	34,817	150.0	0.80	80	9,591		5th Ave
	Parking Structure	69,770	-	1.60	80	-		5th Ave
Parking Structure 6th Ave	Parking Structure	481,728	-	11.06	80	-		6th Ave
16,065 GPD								
<i>Proposed Additions</i>								
Hospital Building	Hospital	67,000	150.0	1.5	80	18,457		Washington St
Hospital I	Hospital	631,000	150.0	14.5	80	173,829	631,000 sqft x 150 population/net acre.	6th Ave
Hospital II	Hospital	380,000	150.0	8.7	80	104,683	380,000 sqft x 150 population/net acre.	6th Ave
MOB	Hospital	200,000	150.0	4.59	80	55,096		4th Ave
Utility Yard	Utilities	8,078	38.2	0.19	80	567		Caltrans
Utility Yard	Utilities	11,521	38.2	0.26	80	808		6th Ave
CEP Expansion	Utilities	2,400	38.2	0.06	80	168		6th Ave

353,609 GPD

5. Project Impacts

5.1 Sewer Infrastructure – Final Condition

The capacity of the existing sewer was determined using information from The City of San Diego GIS reference file. Sewer analysis of the existing, and proposed conditions can be found in Table 5-1 and Table 5-2. In the initial study, it was assumed in the proposed condition that the proposed MOB would discharge into 4th avenue; however, the study created capacity issues in numerous existing sewer lines downstream. Therefore, MOB will use on-site sewer routing to connect to the 8-inch line in Mercy Canyon.

The existing 8-inch vitrified clay pipe (VCP) listed as “Line 23” in Appendix B on Sixth Avenue between MH#99 and MH#93 with a slope of 4.20% is at 51.9% full under existing conditions, which exceeds the capacity of 50% maximum.

With the proposed Scripps Mercy Hospital Campus Project development, the condition in the existing 8-inch VCP pipe is improved from the existing flow rate of 882,117 cubic feet per second to 880,478 cubic feet per second as shown on Table 5-1 and Table 5-2, highlighted in yellow. The proposed development reduces the flow rate in Pipe 23 by 1,639 cubic feet per second, which is 0.19% of the existing condition.

All other existing lines for both existing condition and proposed condition fall below 50% full. Therefore, impacts to the existing sewer system due to the project would be less than significant considering the existing sewer main “Line 23” is undersized in the existing condition.

In addition, the Project will not adversely affect the Buchanan Canyon Sewer Capital Improvement Project (B00429). All pipes analyzed with these improvements are all below 50% full when our project discharge is applied to the system (See Table 5-2 and Exhibit 4).

Table 5-1 - Pipe Capacity Breakdown (Existing Condition)

Project Number 658548

For Scripps Mercy Hospital SD
By KPFF Consulting Engineers

Sheet 1 of 1
Date:: 9/30/2021
Refer to Plan Sheet EX 3.0 and 3.1

Line	From MH	To DS MH	Zone	Net Acre	(Pop/Net Acre)	Population Served	Sewage Per Capita/Day gpd	Cumulative Avg. Dry Weather Flow (gpd)	Dry Weather Peaking Factor	Cumulative Peak Dry Weather Flow (gpd)	Wet Weather Peaking Factor	Cumulative Peak Wet Weather Flow (Design Flow)	Line Size D (in)	Slope (%)	Normal Depth dn	dn/D	Velocity fps	Remarks	
						In-Line Cumulative Total													
Upstream			RM3-9 (Upstream Trib Area 1)	14.34	160.6	2303.004	2303.00	80	184240.32									Inlet from Tributary Area 1. Refer to Exhibit 6 and Table A-1 for Tributary Area calcualtions.	
			CC-3-8 (Upstream Trib Area 1)	1.066	43.7	46.5842	2349.59	80	187967.06	2.24	421046.21	1	421046.21	0.63				structures	
1	97	94	Ex. Lot 12 Parking Lot	5.14	0	0	2349.59	80	187967.06	2.24	421046.21	1	421046.21	0.63	12	0.25	4.93	0.410833	2.07
2	94	93	Ex. Lot 4 Parking Lot	3.72	0	0	2349.59	80	187967.06	2.24	421046.21	1	421046.21	0.63	12	0.26	4.88	0.406667	2.1
3	93	62					2349.59	80	187967.06	2.24	421046.21	1	421046.21	0.63	12	0.24	4.98	0.415	2.04
4	62	63					2349.59	80	187967.06	2.24	421046.21	1	421046.21	0.63	12	0.25	4.93	0.410833	2.07
5	63	916					2349.59	80	187967.06	2.24	421046.21	1	421046.21	0.63	12	0.40	4.34	0.361667	2.46
6	916	917					2349.59	80	187967.06	2.24	421046.21	1	421046.21	0.63	12	0.53	4.03	0.335833	2.72
7	917	60	Ex. Cancer center and parking	0.8	150	120	2469.59	80	197567.06	2.22	438598.86	1	438598.86	0.66	12	0.74	3.78	0.315	3.11 Existing On-Site Structure
8	60	59					2469.59	80	197567.06	2.22	438598.86	1	438598.86	0.66	12	0.29	4.86	0.405	2.22
9	59		Ex. 550 Washington	1.73	150	259.5												Building has 2 existing laterals. One on line 9 and one on line 20. To be conservative line 9 is assumed to have the full flow as it is further	
			Ex. Parking	0.7		0	2729.09	80	218327.06	2.18	475952.98	1	475952.98	0.71	12	0.24	5.33	0.444167	2.11
10	3	71	CC-3-9 (Upstream Trib Area 2)	8.85	43.7	386.745	3115.83	80	249266.66	2.13	530937.98	1	530937.98	0.80	12	0.24	5.7	0.475	2.17 Tributary Area 2. Refer to Exhibit 6 and Table A-1 for Tributary Area calcualtions.
11	71	72					3115.83	80	249266.66	2.13	530937.98	1	530937.98	0.80	12	0.54	4.55	0.379167	2.93
12	72	78					3115.83	80	249266.66	2.13	530937.98	1	530937.98	0.80	12	0.54	4.55	0.379167	2.93
13	78	112					3115.83	80	249266.66	2.13	530937.98	1	530937.98	0.80	12	0.50	4.65	0.3875	2.85
14	112	113					3115.83	80	249266.66	2.13	530937.98	1	530937.98	0.80	12	0.40	4.94	0.411667	2.62
15			CC-3-8 (Upstream Trib Area 3)	11.36	43.7	496.432												Inlet from Tributary Area 3. Refer to Exhibit 6 and Table A-1 for Tributary	
			CC-3-9 (Upstream Trib Area 3)	24.98	43.7	1091.626												Area calcualtions.	
			RM3-9 (Upstream Trib Area 3)	2.18	160.6	350.108	5054.00	80	404319.94	2.00	808639.87	1	808639.872	1.21	12	3.9	3.37	0.280833	6.7
16	110	109	CC-3-9 (In-line Trib Area 4A)	4.61	43.7	201.457	5255.46	80	420436.496	1.99	836668.63	1	836668.627	1.26	12	1.97	4.11	0.3425	5.3 Tributary Area calcualtions.
17	109	102	CC-3-9 (In-line Trib Area 4B)	7.82	43.7	341.734	5597.19	80	447775.216	1.97	882117.18	1	882117.1755	1.32	12	7.06	3.03	0.2525	8.49 Tributary Area calcualtions.
18	102	100					5597.19	80	447775.216	1.97	882117.18	1	882117.1755	1.32	12	8.7	2.87	0.239167	9.13
19	100	99					5597.19	80	447775.216	1.97	882117.18	1	882117.1755	1.32	12	8.66	2.88	0.24	9.12
20							0.00	80	0.00	4	0.00	1	0	0.00	6	2.1	0	0	Building has 2 existing laterals. One on line 9 and one on line 20. To be conservative line 9 is assumed to have the full flow as it is further upstream.
21	87	88					0.00	80	0.00	4	0.00	1	0	0	6	19.1	0	0	
22	88	99					0.00	80	0.00	4	0.00	1	0	0	6	19.1	0	0	
23	99	93					5597.19	80	447775.22	1.97	882117.1755	1	882117.1755	1.32	8	4.2	4.15	0.51875	7.21 Inlet from line 22 nd line 19
24	94		Ex. Hospital	11.65	150	1747.50													
			Ex. Emergency Department	0.32	150	48.00													
			Ex. Behavioral Health Unit	1.48	150	222.00													
			Ex. Central Energy Plant	0.43	38.2	16.43	2033.93	80	162714.08	2.29	372615.2432	1	372615.2432	0.56	8	2.57	2.94	0.3675	4.81 Existing On-Site Structures
25	93	92					7631.12	80	610489.30	1.89	1153824.769	1	1153824.769	1.73	10	5.2	4.06	0.406	8.32 Inlet from line 23 and 24
26	92	107					7631.12	80	610489.30	1.89	1153824.769	1	1153824.769	1.73	10	5.87	3.93	0.393	8.69
27	105	107	Ex. Chapel	0.34	38.2	12.988													
			Ex. Facility Bldg	0.3	38.2	11.46													
			Ex. Generator Building	0.45	0		24.45	80	1955.84	4	7823.36	1	7823.36	0.01	8	3.97	0.38	0.0475	1.69 Existing On-Site Structures
28	107	106	Ex. 6th Ave Parking Structure	11.05	0		7655.56	80	612445.14	1.89	1157521.307	1	1157521.307	1.74	10	6.44	3.84	0.384	9.02 has no rate for parking structures
29	106	337					7655.56	80	612445.14	1.89	1157521.307	1	1157521.307	1.74	10	14.37	3.11	0.311	12.05
30			Ex. Mercy Gardens	0.62	38.2	23.684													
			Ex. College Building	0.93	38.2	35.526													
			Ex. Mercy Manor	0.38	38.2	14.516	73.73	80	5898.08	4.00	23592.32	1	23592.32	1.76	8	52.31	2.44	0.305	19.58 Existing On-Site Structures
31	102																		

Table 5-2 - Pipe Capacity Breakdown (Proposed Condition)

Project Number 658548

For
By
Scripps Mercy Hospital SD
KPFF Consulting Engineers

Sheet 1 of 1
Date: 05/11/2022
Refer to Plan Sheet EX 5.0 and 5.1

Line	From MH	To DS MH	Zone	Net Acre	(Pop/Net Acre)	Population Served	Sewage Per Capita/Day	Cumulative Avg. Dry Weather Flow (gpd)	Dry Weather Peaking Factor	Cumulative Peak Dry Weather	Wet Weather Peaking Factor	Cumulative Peak Wet Weather Flow (Design)	Line Size D (in)	Slope (%)	Normal Depth dn	dn/D	Velocity fps	Remarks	
Upstream			RM3-9 (Upstream Trib Area 1)	14.34	160.6	2303.004	2303.00	80	184240.32			1	417499.43	0.63				Inlet from Tributary Area 1. Refer to Exhibit 6 and Table A-1 for Tributary Area calcualtions.	
			CC-3-8 (Upstream Trib Area 1)	1.066	43.7	46.5842	2349.59	80	187967.06	2.22	417499.43	1	417499.43	0.63				No generated flow. Sewer Design Manual has no rate for parking structures	
1	97	94	Ex. Lot 12 Parking Lot	5.14	0	0	2349.59	80	187967.06	2.22	417499.43	1	417499.43	0.63	12	0.25	4.63	0.385833	2.07
2	94	93					2349.59	80	187967.06	2.22	417499.43	1	417499.43	0.63	12	0.26	4.88	0.406667	2.1
3	93	62					2349.59	80	187967.06	2.22	417499.43	1	417499.43	0.63	12	0.24	4.98	0.415	2.04
4	62	63					2349.59	80	187967.06	2.22	417499.43	1	417499.43	0.63	12	0.25	4.93	0.410833	2.07
5	63	916					2349.59	80	187967.06	2.22	417499.43	1	417499.43	0.63	12	0.40	4.34	0.361667	2.59
6	916	917					2349.59	80	187967.06	2.22	417499.43	1	417499.43	0.63	12	0.53	4.03	0.335833	2.87
7	917	60	Ex. Cancer center and parking	0.8	150	120	2469.59	80	197567.06	2.21	435898.68	1	435898.68	0.65	12	0.74	3.75	0.3125	3.27
8	60	59					2469.59	80	197567.06	2.21	435898.68	1	435898.68	0.65	12	0.29	4.82	0.401667	2.32
9	59	3					2469.59	80	197567.06	2.21	435898.68	1	435898.68	0.65	12	0.24	5.07	0.4225	2.17
10	3	71	CC-3-9 (Upstream Trib Area 2)	8.85	43.7	386.745	2856.33	80	228506.66	2.16	494413.75	1	494413.75	0.74	12	0.24	5.45	0.454167	2.22
11	71	72					2856.33	80	228506.66	2.16	494413.75	1	494413.75	0.74	12	0.54	4.37	0.364167	2.99
12	72	78					2856.33	80	228506.66	2.16	494413.75	1	494413.75	0.74	12	0.54	4.37	0.364167	2.99
13	78	112					2856.33	80	228506.66	2.16	494413.75	1	494413.75	0.74	12	0.50	4.45	0.370833	2.91
14	112	113					2856.33	80	228506.66	2.16	494413.75	1	494413.75	0.74	12	0.40	4.73	0.394167	2.69
15			CC-3-8 (Upstream Trib Area 3)	11.36	43.7	496.432													
			CC-3-9 (Upstream Trib Area 3)	24.98	43.7	1091.626													
			RM3-9 (Upstream Trib Area 3)	2.18	160.6	350.108	4794.50	80	383559.94	2.02	774174.27	1	774174.2662	1.16	12	3.9	3.3	0.275	6.8
16	110	109	CC-3-9 (In-line Trib Area 4A)	4.61	43.7	201.457	4995.96	80	399676.496	2.01	802260.16	1	802260.164	1.20	12	1.97	4	0.333333	5.37
17	109	102	CC-3-9 (In-line Trib Area 4B)	7.82	43.7	341.734	5337.69	80	427015.216	1.99	849559.43	1	849559.4345	1.27	12	7.06	2.97	0.2475	8.62
18	102	100					5337.69	80	427015.216	1.99	849559.43	1	849559.4345	1.27	12	8.66	2.82	0.235	9.28
19	100	99					5337.69	80	427015.216	1.99	849559.43	1	849559.4345	1.27	12				
20		87	Hospital Support Building (Proposed)	1.50	150	225.00	225.00	80	18000.00	4	72000.00	1	72000	0.11	6	2.1	1.49	0.248333	2.89
21	87	88					225.00	80	18000.00	4	72000.00	1	72000	0.108	6	19.1	0.86	0.143333	6.29
22	88	99					225.00	80	18000.00	4	72000.00	1	72000	0.108	6	19.1	0.86	0.143333	6.29
23	99	93					5562.69	80	445015.22	1.98	880478.7289	1	880478.7289	1.32	8	4.2	4.15	0.51875	7.36
24			Hospital 1 (proposed)	14.5	150	2175.00													
			Hospital 2 (proposed)	8.7	150	1305.00													
			Central Electrical Plant (Proposed)	0.06	0	0.00	3480.00	80	278400.00	2.11	586611.4481	1	586611.4481	0.88	8	2.57	3.78	0.4725	5.42
25	93	92					9042.69	80	723415.22	1.85	1340953.543	1	1340953.543	2.01	10	5.2	4.41	0.441	9.51
26	92	107					9042.69	80	723415.22	1.85	1340953.543	1	1340953.543	2.01	10	5.87	4.26	0.426	9.19
27	105	107	Ex. Chapel	0.14	38.2	5.348													
			Utility Yard (Proposed)	0.19	38.2	7.258	12.61	80	1008.48	4	4033.92	1	4033.92	0.01	8	3.97	0.38	0.0475	1.69
28	107	106	Ex. 6th Ave Parking Structure	11.06	0		9055.30	80	724423.70	1.85	1342571.886	1	1342571.886	2.01	10	6.44	4.16	0.416	9.02
29	106	337					9055.30	80	724423.70	1.85	1342571.886	1	1342571.886	2.01	10	14.37	3.35	0.335	12.73
30			Ex. Mercy Gardens	0.62	38.2	23.684													
			Ex. College Building	0.93	38.2	35.526													
			MOB (Proposed)	4.59	150	688.5													
			Utility Yard (Proposed)	0.26	0	0	747.71	80	59816.80	2.59	154927.8236	1	154927.8236	0.23	8	52.31	0.89	0.11125	11.9
31	102	104					747.71	80	59816.80	2.59	154927.8236	1	154927.8236	0.23	8	7.06	1.45	0.18125	5.88
32	104	337	RM 3-9 (Upstream Trib Area 5)	3.43	160.6	550.858	1298.57	80	103885.44	2.41	249855.526	1	249855.526	0.37	8	7.56	1.8	0.225	6.02
33			RS																

6. References

City of San Diego Sewer Design Guidelines 2004 - Density Conversion (Table 1-1, Figure 1-1, pages 1-15, 1-16, 1-17, 1-18)

City of San Diego Sewer Zoning Map – Grid 19 (Refer to Appendix C)

City of San Diego Sewer GIS Sewer Data – (Refer to Exhibit 3 and 5)

Appendix A Campus Sewer Maps

Exhibit 1 - Existing Campus Sewer Map

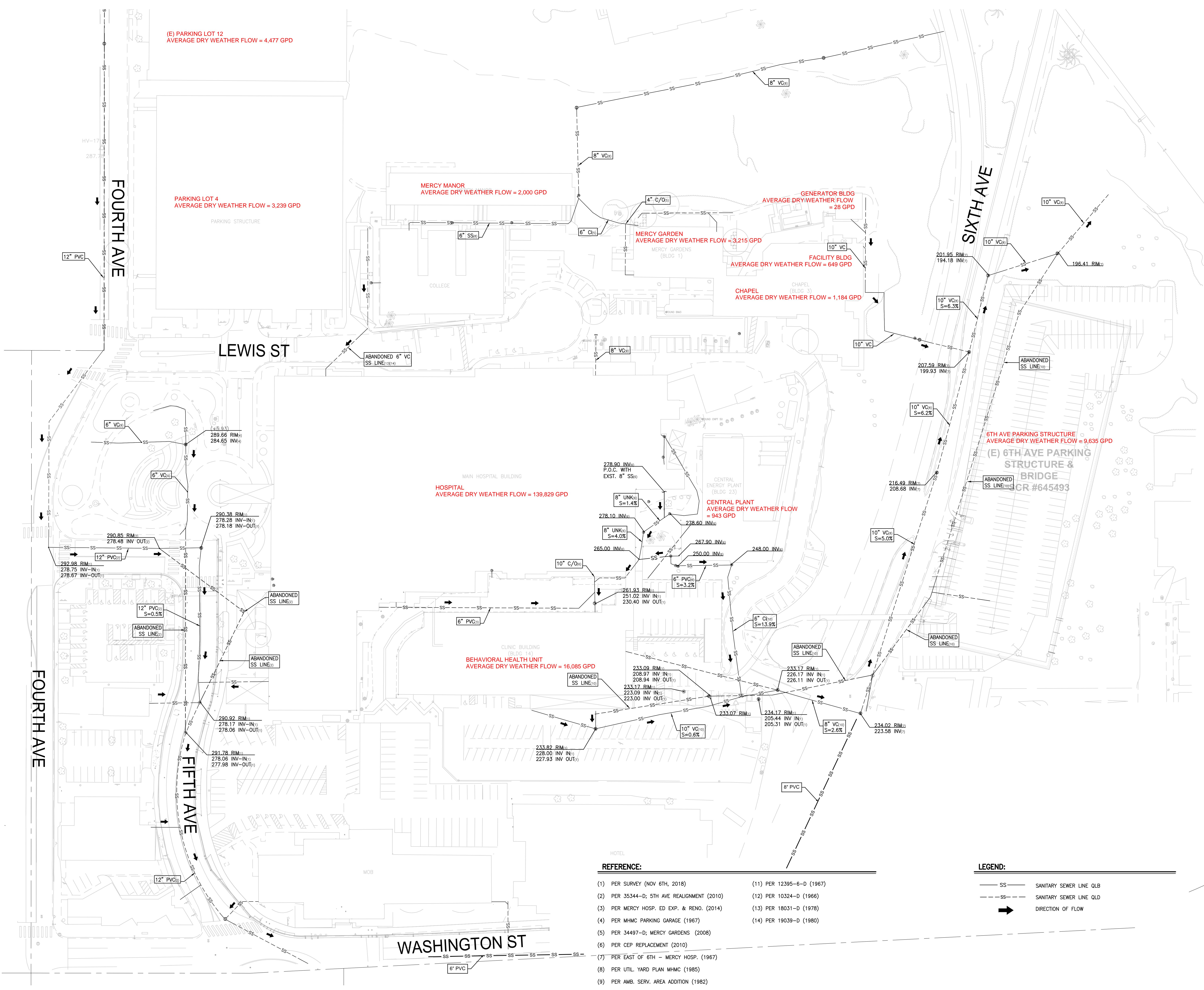
Exhibit 2 - Existing Sewer Study

Exhibit 3 – Proposed Utility Plan

Exhibit 4 – Proposed Phase 2 Sewer Study

Table A-1 -Existing Tributary Area Analysis

Exhibit 5 – Existing Tributary Area Analysis



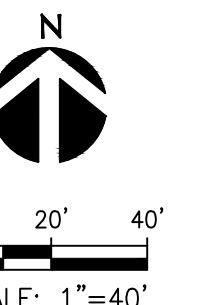
SCRIPPS MERCY
HOSPITAL

77 FIFTH AVENUE
SAN DIEGO, CA 92103

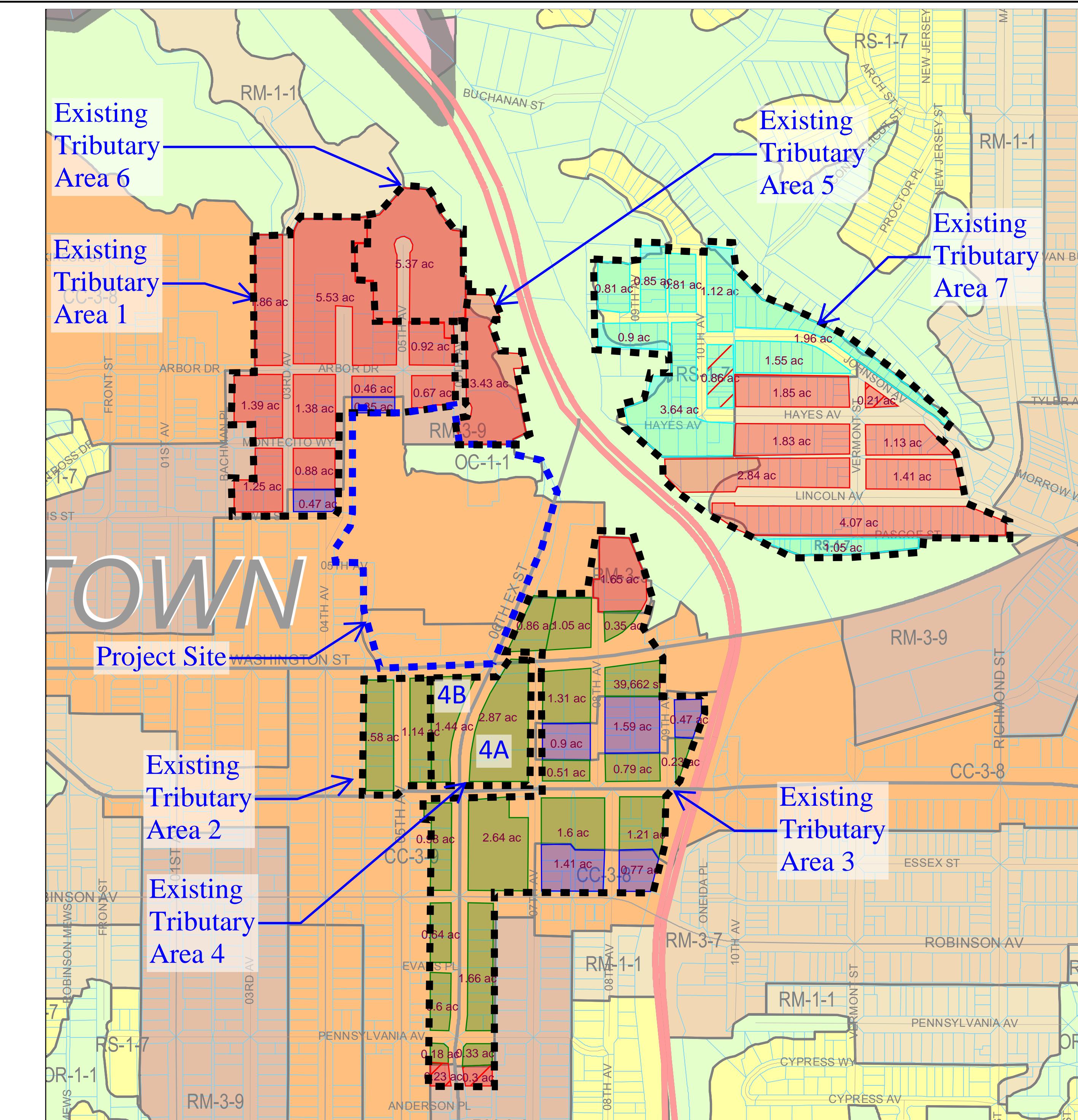
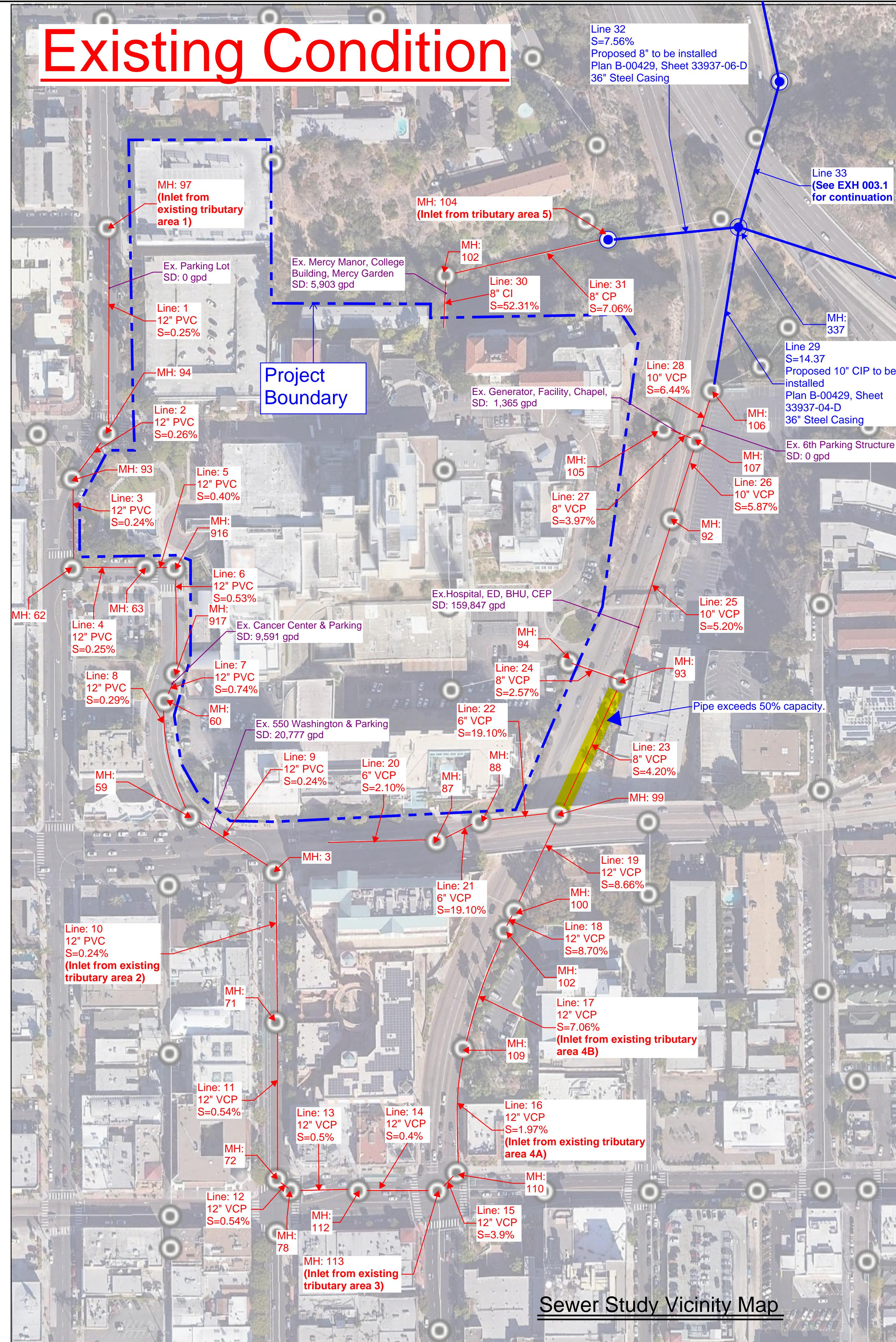
EXISTING CAMPUS SEWER MAP

EET NUMBER (EXHIBIT NUMBER)

EXH-001



Existing Condition



City of San Diego Zoning Map Grid 19

Legend

- Existing City of SD Sewer MH
 - Existing City of SD Sewer line
 - Proposed City of SD Sewer MH as part of Buchanan Canyon Sewer Capital Improvement Project (B00429)
 - Proposed City of SD Sewer Line as part of Buchanan Canyon Sewer Capital Improvement Project (B00429)

PROJECT DESCRIPTION

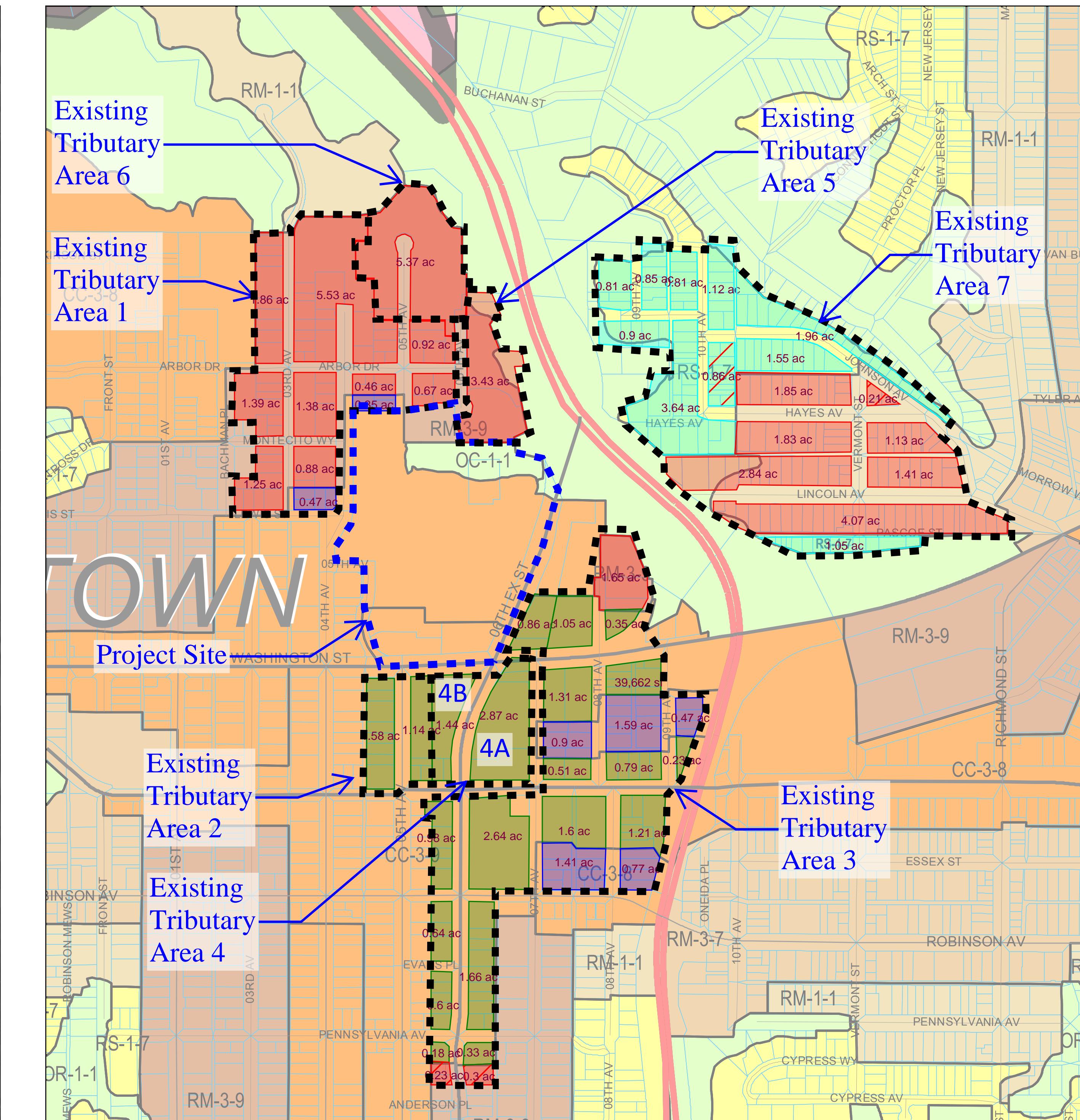
SCRIPPS MERCY HOSPITAL

EXISTING

[View Details](#) | [Edit](#) | [Delete](#)

EXH-002

Existing Condition



City of San Diego Zoning Map Grid 19

Legend

Existing City of SD Sewer MH

Existing City of SD Sewer line

Proposed City of SD Sewer MH as part of Buchanan Canyon Sewer Capital Improvement Project (B00429)

Proposed City of SD Sewer Line as part of Buchanan Canyon Sewer Capital Improvement Project (B00429)

PROJECT DESCRIPTION

SCRIPPS MERCY

HOSPITAL

4077 FIFTH AVENUE
SAN DIEGO, CA 92103

EXISTING SEWER STUDY

EXH-002.1

NOTES:

- THE PROPOSED PROJECT WILL COMPLY WITH ALL THE REQUIREMENTS OF THE CURRENT CITY OF SAN DIEGO STORM WATER STANDARDS MANUAL BEFORE A GRADING OR BUILDING PERMIT IS ISSUED. IT IS THE RESPONSIBILITY OF THE OWNER/DESIGNER/APPLICANT TO ENSURE THAT THE CURRENT STORM WATER PERMANENT BMP DESIGN STANDARDS ARE INCORPORATED INTO THE PROJECT.
- IF A 3" OR LARGER WATER METER IS REQUIRED FOR THIS PROJECT, THE OWNER/PERMITTEE SHALL CONSTRUCT THE NEW METER AND PRIVATE BACKFLOW DEVICE ON SITE, ABOVE GROUND, WITHIN AN ADEQUATELY SIZED WATER EASEMENT, IN A MANNER SATISFACTORY TO THE PUBLIC UTILITIES DIRECTOR AND THE CITY ENGINEER.

UTILITY CONSTRUCTION NOTES:

SANITARY SEWER
 (SS1) PROPOSED PRIVATE SEWER MAIN
 (SS2) PROPOSED SEWER LATERAL
 (SS3) PROPOSED PRIVATE SEWER MANHOLE
 (SS4) CONNECTION TO EXISTING PUBLIC SEWER
 (SS5) PROPOSED POINT OF CONNECTION TO ONSITE PRIVATE SEWER OR BUILDING PLUMBING.
 (SS6) PROPOSED PUBLIC SEWER MANHOLE

IRRIGATION WATER
 (I1) PROPOSED WATER SERVICE FOR IRRIGATION.
 (I2) PROPOSED POINT OF CONNECTION TO ONSITE PRIVATE IRRIGATION.
 (I3) PROPOSED BACKFLOW PREVENTION DEVICE, WITH CONCRETE PAD PER CITY OF SAN DIEGO STANDARD PLANS.
 (I4) PROPOSED WATER METER FOR IRRIGATION.
 (I5) CONNECTION TO EXISTING PUBLIC WATER MAIN.

FIRE WATER
 (F1) PROPOSED FIRE SERVICE
 (F2) PROPOSED FIRE WATER METER/BACKFLOW PREVENTER
 (F3) CONNECTION TO EXISTING PUBLIC WATER MAIN
 (F4) PROPOSED FIRE HYDRANT
 (F5) PROPOSED POINT OF CONNECTION TO ONSITE PRIVATE FIRE WATER SERVICE.
 (F6) PROPOSED STANDPIPE

DOMESTIC WATER
 (W1) PROPOSED WATER SERVICE
 (W2) PROPOSED BACKFLOW PREVENTER
 (W3) CONNECTION TO EXISTING PUBLIC WATER MAIN
 (W4) PROPOSED WATER METER
 (W5) PROPOSED POINT OF CONNECTION TO ONSITE PRIVATE WATER OR BUILDING PLUMBING.
 (W6) DUAL METER AND BACKFLOW PREVENTION ASSEMBLY WITH CONCRETE PAD PER CITY OF SAN DIEGO STANDARD PLANS.

LEGEND:

	LIMIT OF WORK
	PROPERTY LINE
	SANITARY SEWER
	WATER
	IRRIGATION WATER
	FIRE WATER
	STORM DRAIN
	GAS
	ELECTRIC
	TELEPHONE
	PERFORATED PIPE
	FIRE HYDRANT
	POINT OF CONNECTION
	COORDINATION POINT
	CAP OR PLUG

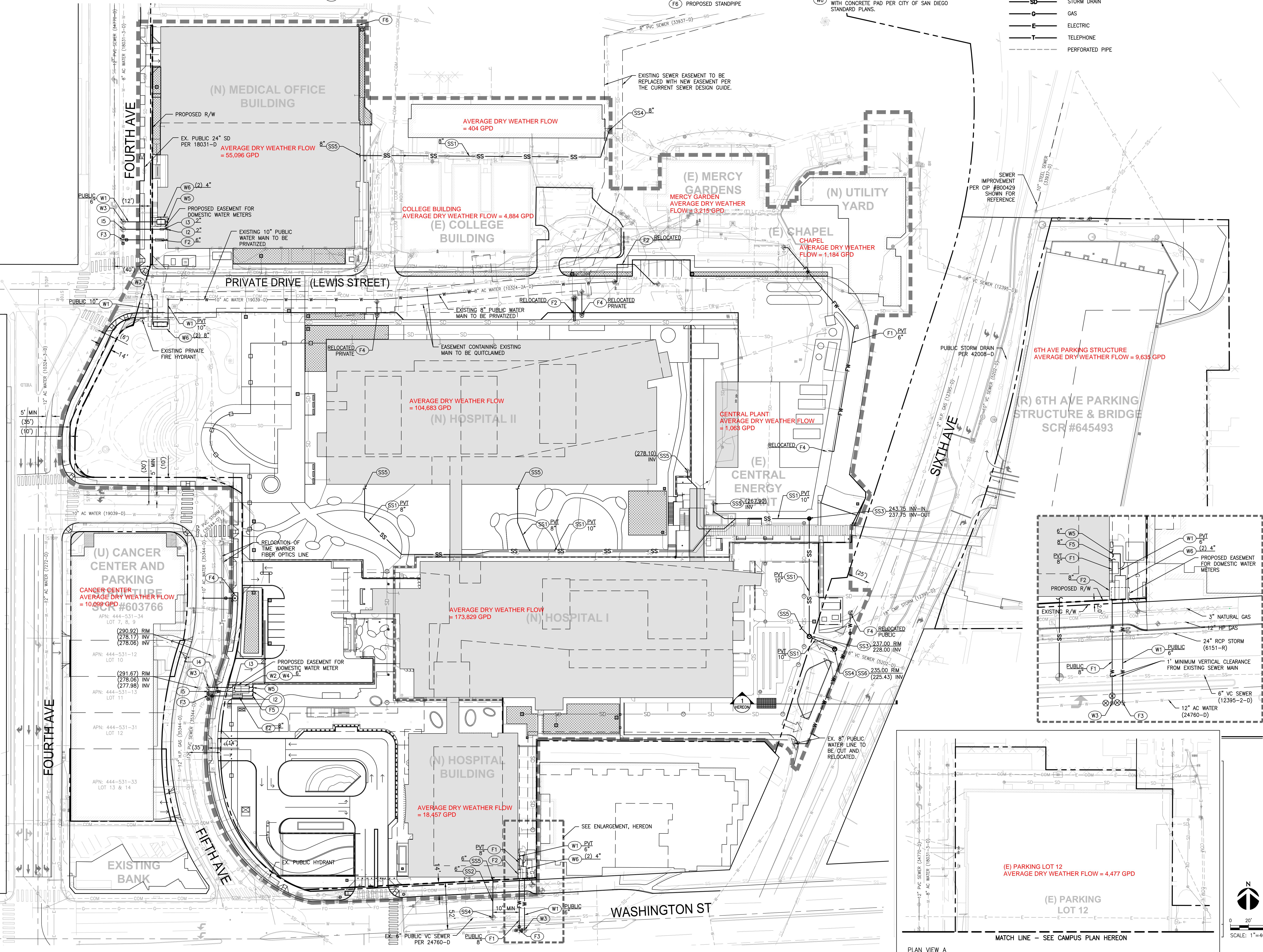
CO ARCHITECTS

5055 Wilshire Boulevard, 9th Floor
Los Angeles, California 90017
323.525.0500 phone, 323.525.0955 fax

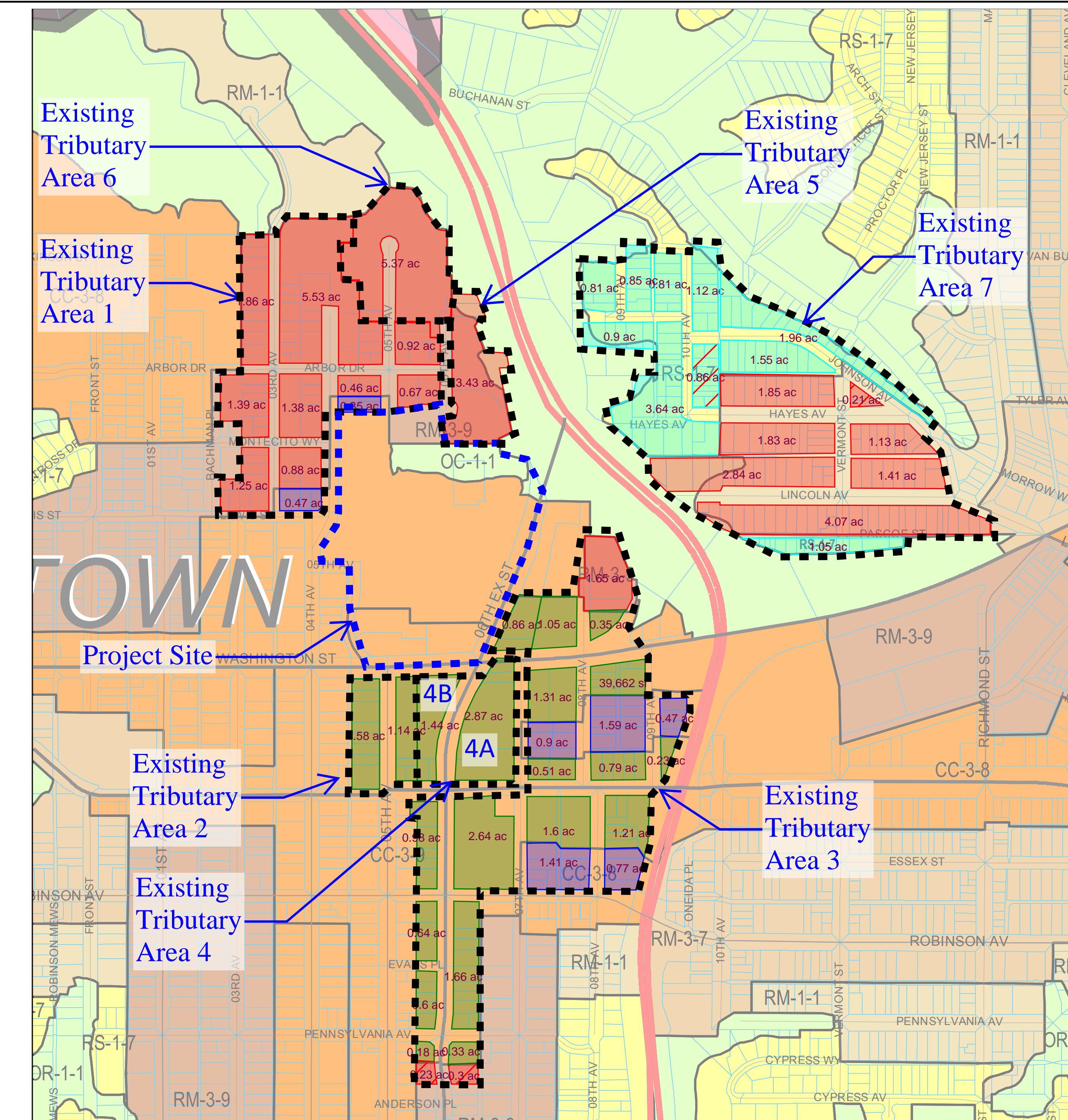
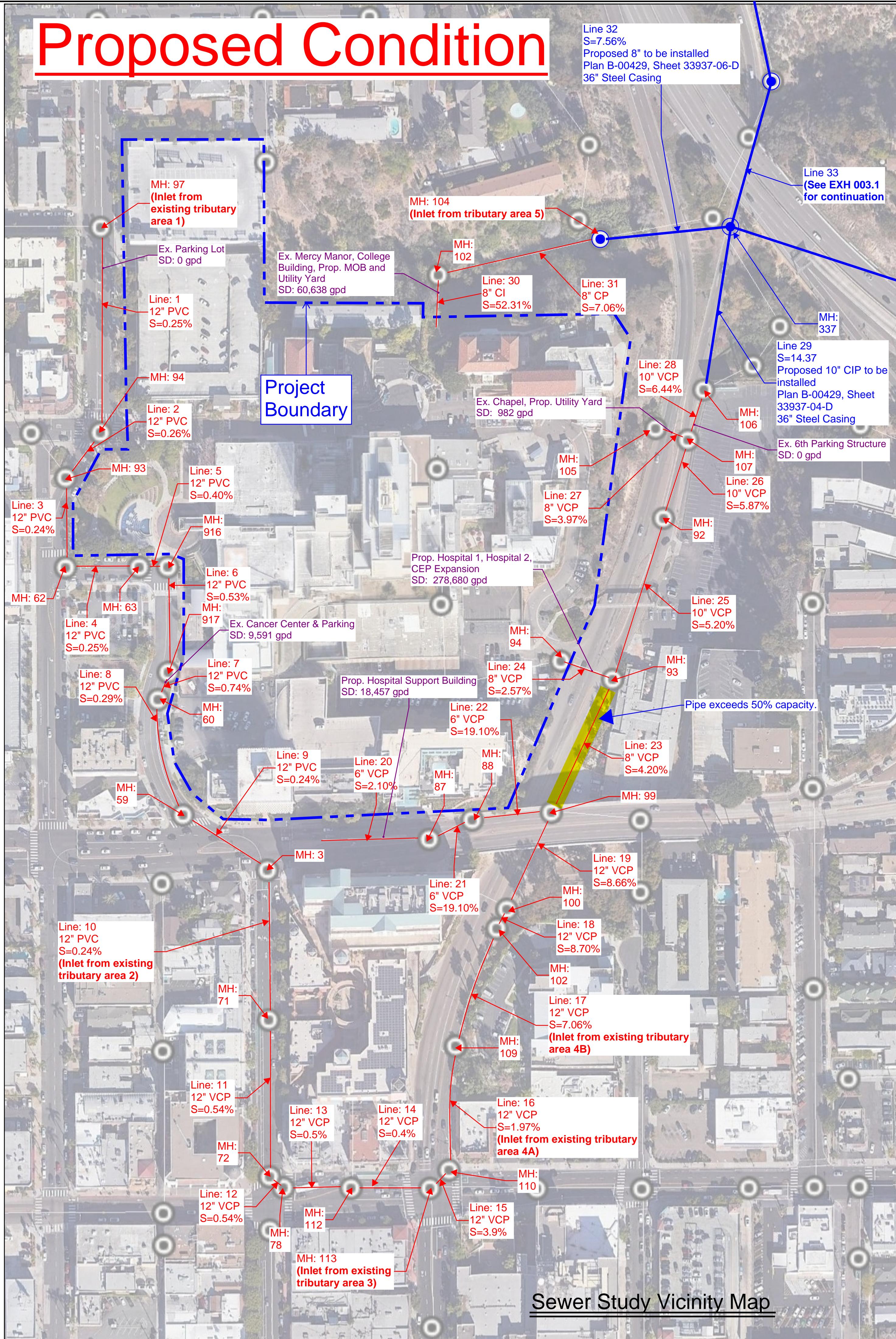
PROFESSIONAL STAMP

AGENCY STAMP

kpf 700 South Flower Street
Suite 2100
Los Angeles, CA 90017
O: 213.418.0201
F: 213.266.5294
www.kpf.com



Proposed Condition



City of San Diego Zoning Map Grid 19

Legend

- Existing City of SD Sewer MH
 - Existing City of SD Sewer line
 - Proposed City of SD Sewer MH as part of Buchanan Canyon Sewer Capital Improvement Project (B00429)
 - Proposed City of SD Sewer Line as part of Buchanan Canyon Sewer Capital Improvement Project (B00429)

PROJECT DESCRIPTION

SCRIPPS MERCY HOSPITAL

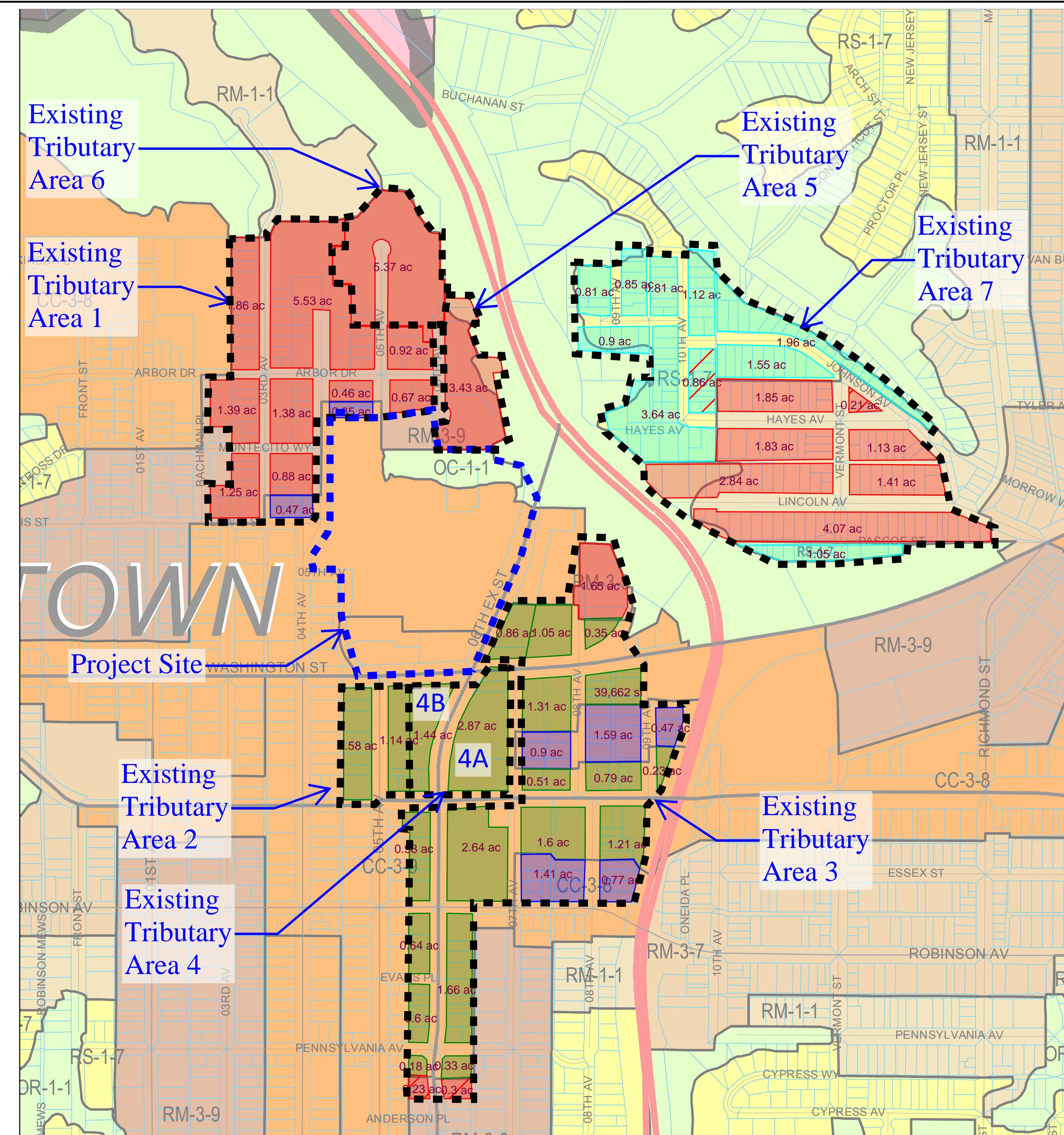
PROPOSE

PROPOSED SEWER STUDY

Page 1 of 1

EXH-004

Proposed Condition



City of San Diego Zoning Map Grid 19

Legend

Existing City of SD Sewer MH

Existing City of SD Sewer line

Proposed City of SD Sewer MH as part of Buchanan Canyon Sewer Capital Improvement Project (B00429)

Proposed City of SD Sewer Line as part of Buchanan Canyon Sewer Capital Improvement Project (B00429)

PROJECT DESCRIPTION

SCRIPPS MERCY HOSPITAL

4077 FIFTH AVENUE
SAN DIEGO, CA 92103

PROPOSED SEWER STUDY

SHEET NUMBER (EXHIBIT NUMBER)

EXH-004.1

Table A-1 Existing Tributary Area Analysis*

TA	Parcel ID	Lot Area (Acre)	# of Floors	City of SD Zone	Area x Floor (Acre)
1	6-1	0.13	2	CC-3-9	0.26
	6-2	0.11	1	CC-3-9	0.11
	6-3	0.12	1	CC-3-9	0.12
	6-4	0.12	1	CC-3-9	0.12
	6-5	0.06	1	CC-3-9	0.06
	6-6	0.12	1	CC-3-9	0.12
	6-7	0.12	1	CC-3-9	0.12
	6-8	0.06	1	CC-3-9	0.06
Net Floor Area Tributary Area 1 CC-3-9					0.97
Net Site Area Tributary Area 1 RM-3-9					14.34
2	1-1	0.16	1	CC-3-9	0.16
	1-2	0.15	2	CC-3-9	0.3
	1-3	0.3	2	CC-3-9	0.6
	1-4	0.16	2	CC-3-9	0.32
	1-5	0.15	2	CC-3-9	0.3
	1-6	0.16	1	CC-3-9	0.16
	1-7	0.15	1	CC-3-9	0.15
	1-8	0.35	3	CC-3-9	1.05
	1-9	0.9	6	CC-3-9	5.4
	1-10	0.08	1	CC-3-9	0.08
	1-11	0.08	3	CC-3-9	0.24
	1-12	0.09	1	CC-3-9	0.09
Net Floor Area Tributary Area 2 CC-3-9					8.85
3	2-1	0.63	1	CC-3-9	0.63
	2-2	0.22	1	CC-3-9	0.22
	2-3	1.06	2	CC-3-9	2.12
	2-4	0.57	2	CC-3-9	1.14
	2-5	0.13	2	CC-3-8	0.26
	2-6	0.2	2	CC-3-8	0.4
	2-7	0.11	1	CC-3-8	0.11
	2-8	0.24	1	CC-3-9	0.24
	2-9	0.75	3	CC-3-9	2.25
	2-10	0.13	3	CC-3-8	0.39
	2-11	0.19	2	CC-3-8	0.38
	2-12	0.14	2	CC-3-8	0.28
	2-13	0.3	2	CC-3-9	0.6
	2-14	0.1	2	CC-3-9	0.2
	2-15	0.09	2	CC-3-9	0.18
	2-16	0.1	1	CC-3-9	0.1
	2-17	0.1	2	CC-3-9	0.2
	2-18	0.14	2	CC-3-8	0.28
	2-19	0.14	2	CC-3-8	0.28

continued on next column

* Refer to Exhibit 6 for additional details on parcel ID, lot area, and number of floors

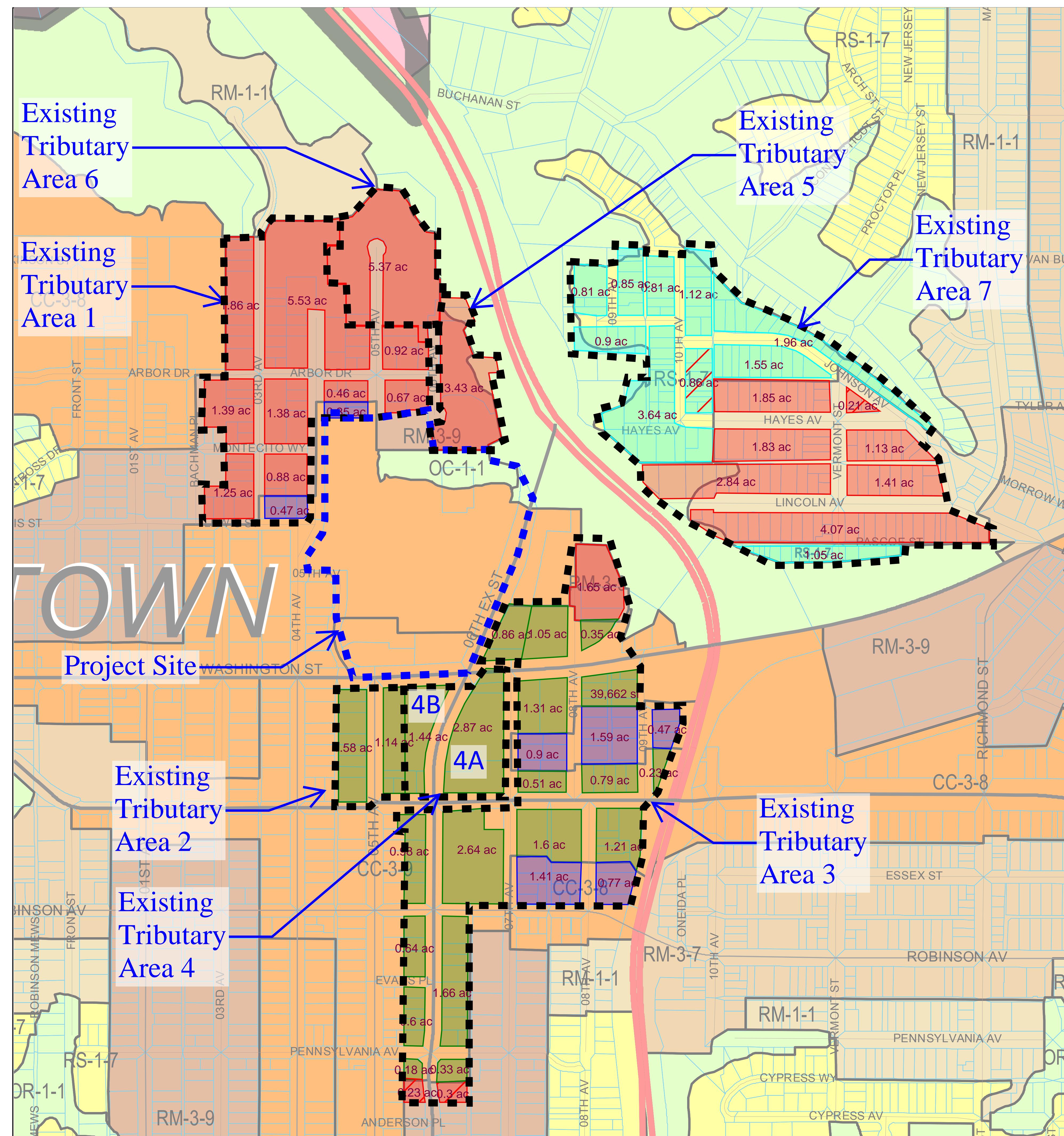
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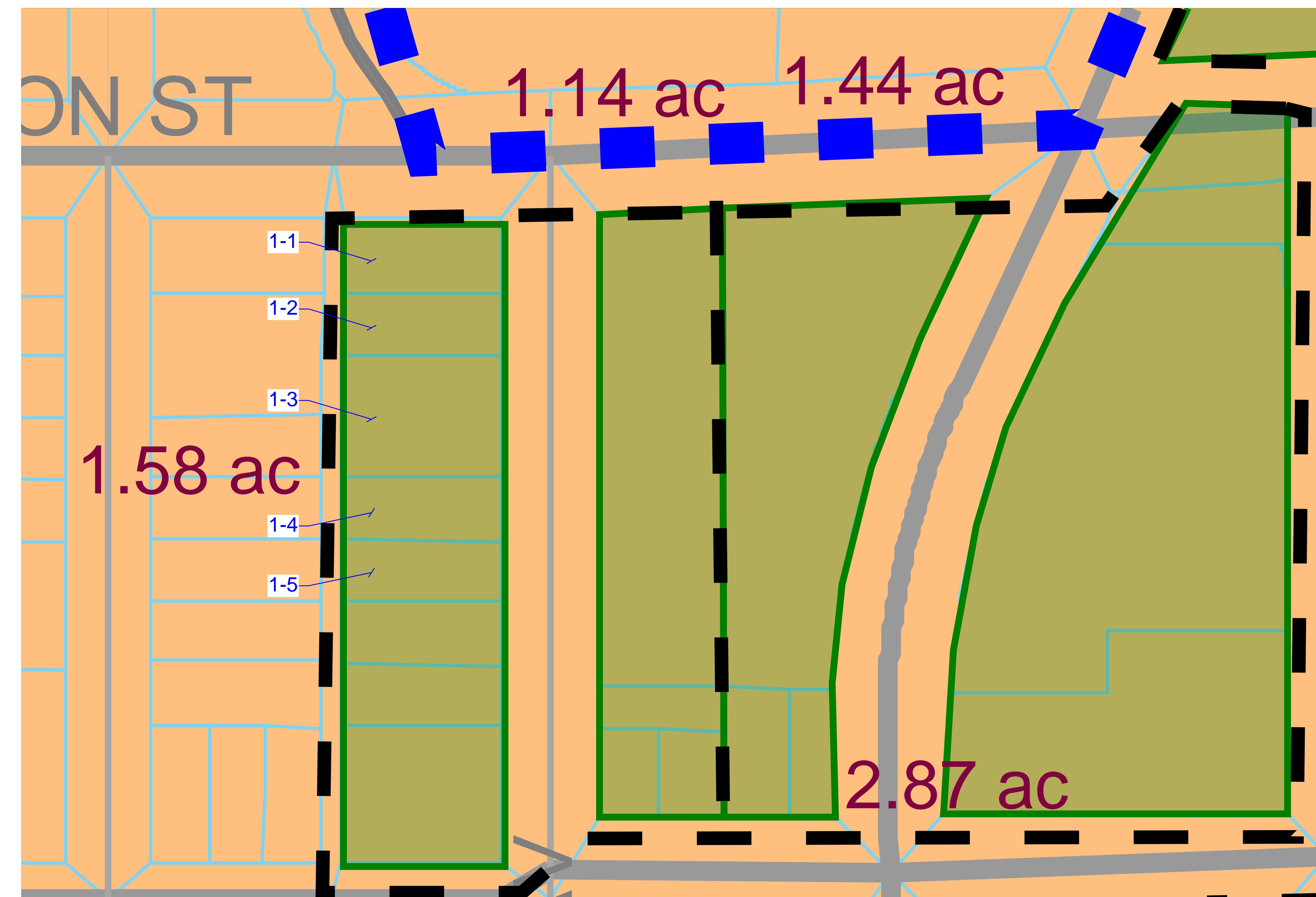
TA	Parcel ID	Lot Area (Acre)	# of Floors	City of SD Zone	Area x Floor (Acre)
3	2-20	0.14	2	CC-3-8	0.28
	2-21	0.09	2	CC-3-8	0.18
	2-22	0.19	2	CC-3-8	0.38
	2-23	0.29	1	CC-3-8	0.29
	2-24	0.17	1	CC-3-9	0.17
	2-25	0.15	1	CC-3-9	0.15
	2-26	0.15	1	CC-3-9	0.15
	2-27	0.15	1	CC-3-9	0.15
	2-28	0.16	2	CC-3-9	0.32
	2-29	0.27	2	CC-3-8	0.54
	2-30	0.13	2	CC-3-8	0.26
	2-31	0.13	2	CC-3-8	0.26
	2-32	0.14	2	CC-3-8	0.28
	2-33	0.1	1	CC-3-9	0.1
	2-34	0.24	4	CC-3-9	0.96
	2-35	0.07	1	CC-3-9	0.07
	2-36	0.03	2	CC-3-9	0.06
	2-37	0.35	5	CC-3-8	1.75
	2-38	0.23	1	RM-3-9	0.23
	2-39	0.45	1	RM-3-9	0.45
	2-40	0.82	1	RM-3-9	0.82
	2-41	0.15	1	RM-3-9	0.15
	2-42	0.16	1	CC-3-8	0.16
	2-43	0.14	1	CC-3-8	0.14
	2-44	0.09	2	CC-3-8	0.18
	2-45	0.08	1	CC-3-8	0.08
	2-46	0.22	1	CC-3-9	0.22
	3-1	0.32	1	CC-3-9	0.32
	3-2	0.23	1	CC-3-9	0.23
	3-3	0.1	1	CC-3-9	0.1
	3-4	0.11	1	CC-3-9	0.11
	3-5	0.22	1	CC-3-9	0.22
	3-6	2.64	1	CC-3-9	2.64
	4-1	0.23	1	CC-3-9	0.23
	4-2	0.14	1	CC-3-9	0.14
	4-3	0.27	1	CC-3-9	0.27
	4-4	0.11	3	CC-3-9	0.33
	4-5	0.11	2	CC-3-9	0.22
	4-6	0.1	1	CC-3-9	0.1
	4-7	0.12	1	CC-3-9	0.12
	4-8	0.16	1	CC-3-9	0.16
	4-9	0.18	2	CC-3-9	0.36
	4-10	0.33	1	CC-3-9	0.33

continued on next column

Table A-1 (Continued)

TA	Parcel ID	Lot Area (Acre)	# of Floors	City of SD Zone	Area x Floor (Acre)
3	4-11	0.08	2	CC-3-9	0.16
	4-12	0.14	2	CC-3-9	0.28
	4-13	0.17	2	CC-3-9	0.34
	4-14	0.11	1	CC-3-9	0.11
	4-15	0.11	2	CC-3-9	0.22
	4-16	0.2	1	CC-3-9	0.2
	4-17	0.21	2	CC-3-9	0.42
	4-18	0.15	1	CC-3-9	0.15
	4-19	0.13	2	CC-3-9	0.26
	4-20	0.35	1	CC-3-9	0.35
	4-21	0.3	1	RM-3-9	0.3
	4-22	0.12	1	RM-3-9	0.12
	4-23	0.11	1	RM-3-9	0.11
	5-1	0.72	2	CC-3-9	1.44
	5-2	0.1	1	CC-3-9	0.1
	5-3	0.79	1	CC-3-9	0.79
	5-4	0.24	1	CC-3-8	0.24
	5-5	0.1	1	CC-3-8	0.1
	5-6	0.15	3	CC-3-8	0.45
	5-7	0.16	1	CC-3-8	0.16
	5-8	0.16	2	CC-3-8	0.32
	5-9	0.11	1	CC-3-8	0.11
	5-10	0.13	1	CC-3-8	0.13
	5-11	0.1	2	CC-3-8	0.2
	5-12	0.09	1	CC-3-8	0.09
	5-13	0.05	1	CC-3-8	0.05
	5-14	0.06	2	CC-3-8	0.12
	5-15	0.05	1	CC-3-8	0.05
	5-16	0.13	2	CC-3-9	0.26
	5-17	0.12	2	CC-3-9	0.24
	5-18	0.49	6	CC-3-9	2.94
	5-19	0.08	1	CC-3-9	0.08





PROJECT DESCRIPTION
SCRIPPS MERCY
HOSPITAL

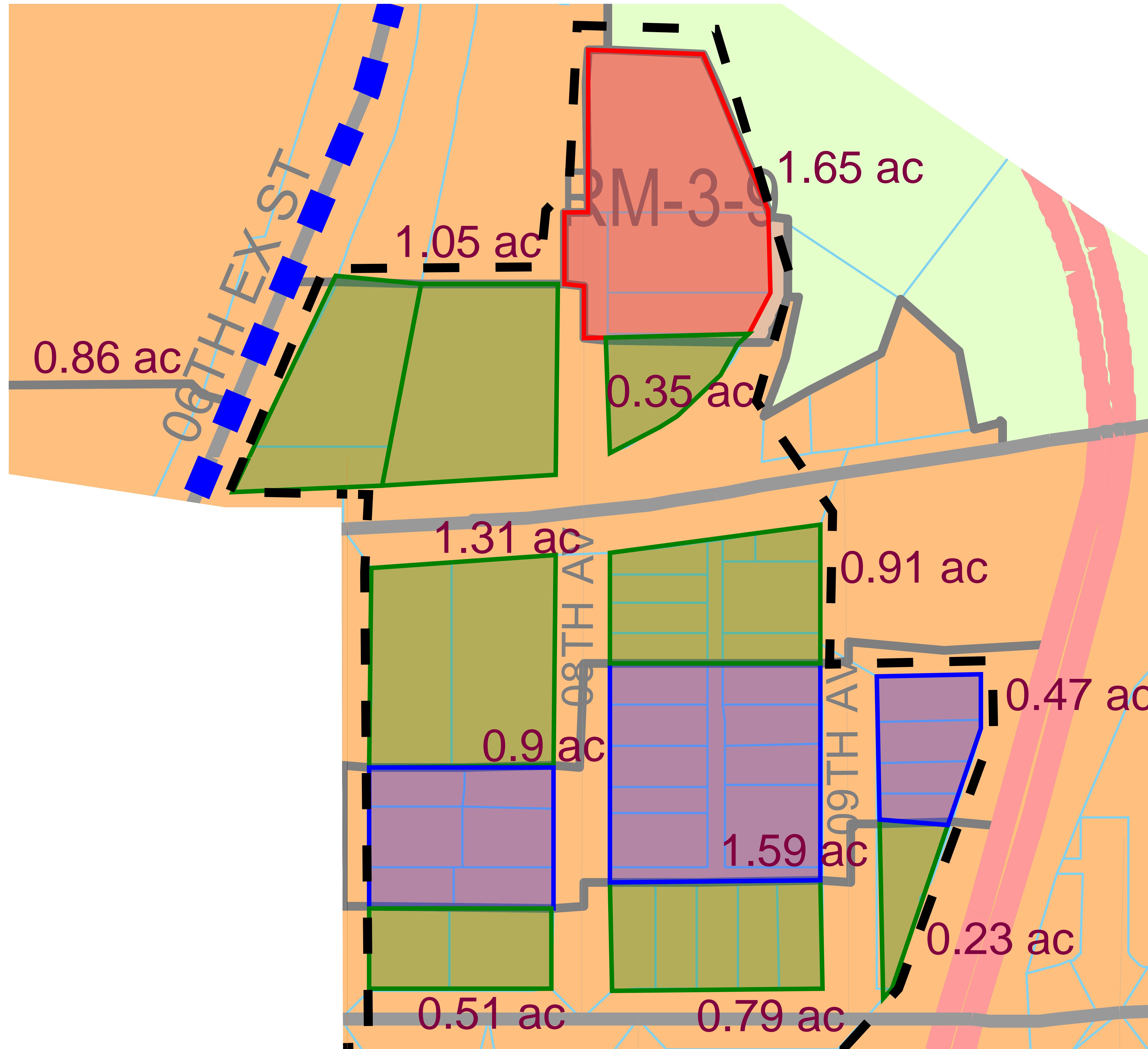
4077 FIFTH AVENUE
SAN DIEGO, CA 92103

DRAWING TITLE

EXISTING
TRIBUTARY AREA
ANALYSIS

SHEET NUMBER (EXHIBIT NUMBER)

EXH-005.1



0 25' 50'
SCALE: 1' = 50'

EXH-005.2

4077 FIFTH AVENUE
SAN DIEGO, CA 92103

DRAWING TITLE
EXISTING
TRIBUTARY AREA
ANALYSIS

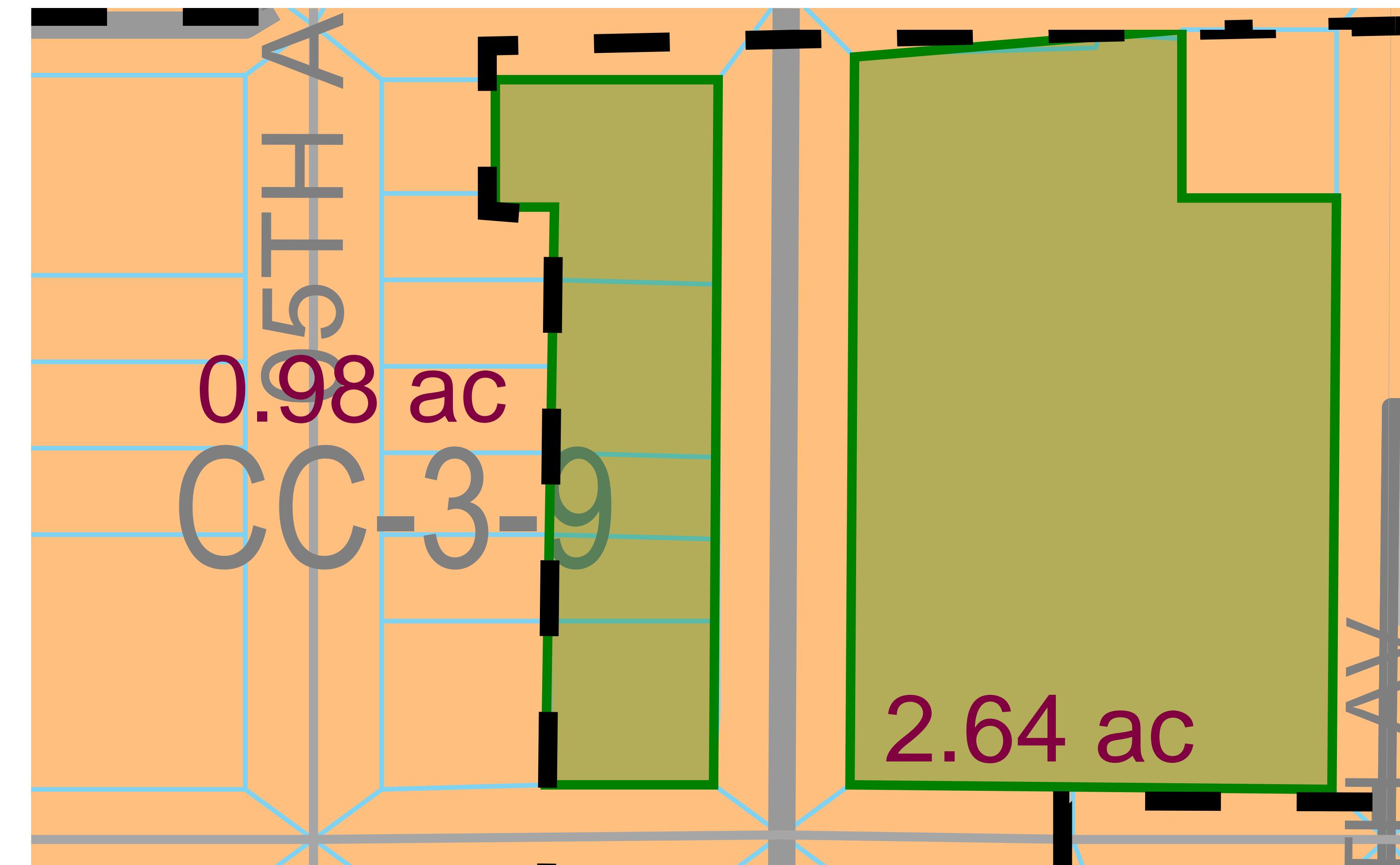
SHEET NUMBER (EXHIBIT NUMBER)

N

REVISIONS
DATE ISSUED FOR
PROJECT NUMBER
DESIGNED BY
DRAWN BY
CHECKED BY
SCALE AS SPECIFIED
KEY MAP

DATE
PROJECT NUMBER
DESIGNED BY
DRAWN BY
CHECKED BY
SCALE AS SPECIFIED
KEY MAP

PROJECT DESCRIPTION
SCRIPPS MERCY
HOSPITAL



N
0 25' 50'
SCALE: 1" = 50'

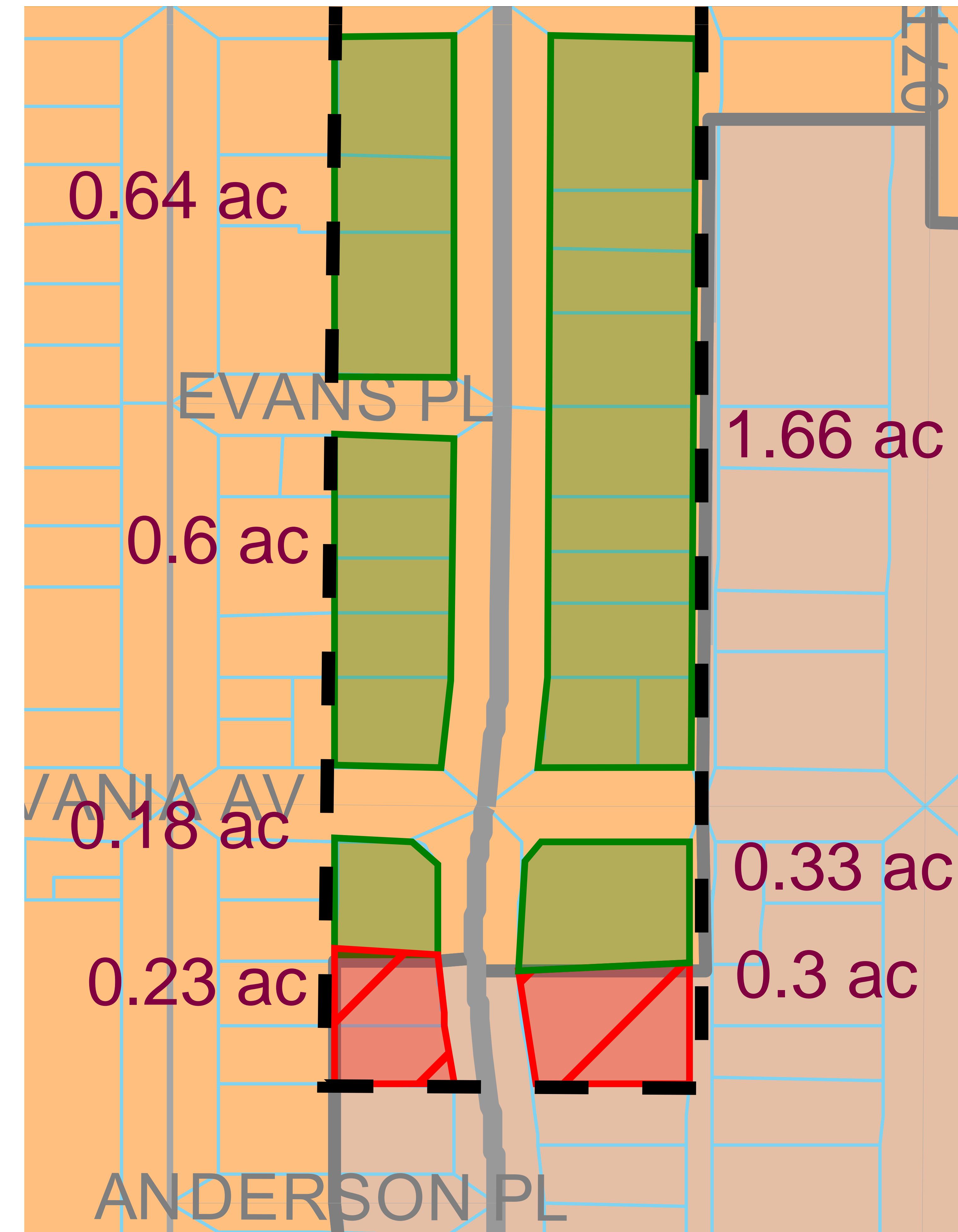
EXH-005.3

PROJECT DESCRIPTION
SCRIPPS MERCY
HOSPITAL

4077 FIFTH AVENUE
SAN DIEGO, CA 92103

DRAWING TITLE
EXISTING
TRIBUTARY AREA
ANALYSIS

SHEET NUMBER (EXHIBIT NUMBER)



0 25' 50'

SCALE: 1" = 50'

EXH-005.4

4077 FIFTH AVENUE
SAN DIEGO, CA 92103

PROJECT DESCRIPTION
SCRIPPS MERCY
HOSPITAL

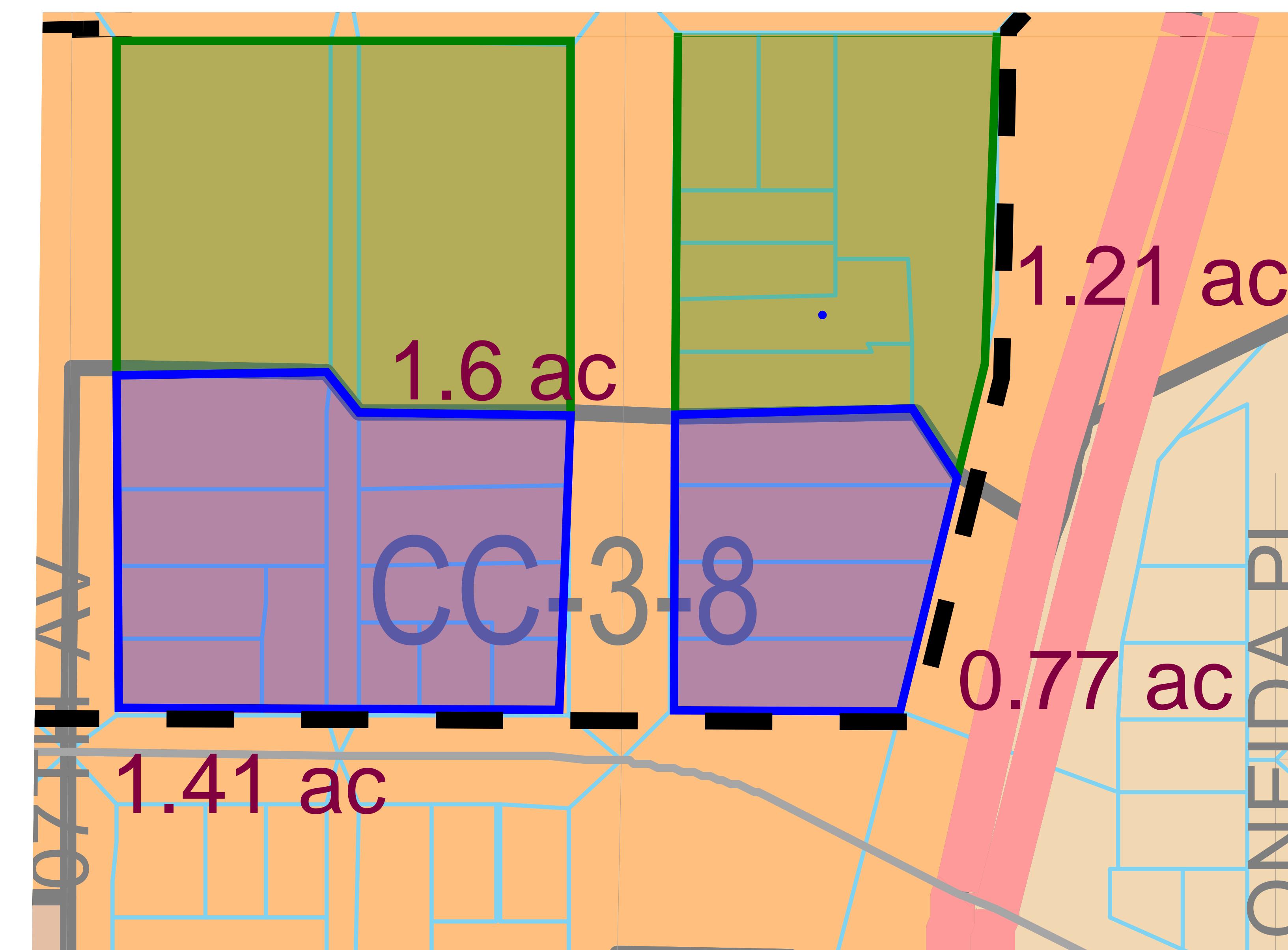
DRAWING TITLE
CAMPUS
SEWER
MAP

SHEET NUMBER (EXHIBIT NUMBER)

N

0 25' 50'

SCALE: 1" = 50'

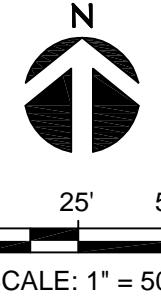


PROJECT DESCRIPTION
SCRIPPS MERCY
HOSPITAL

4077 FIFTH AVENUE
SAN DIEGO, CA 92103

DRAWING TITLE
EXISTING
TRIBUTARY AREA
ANALYSIS

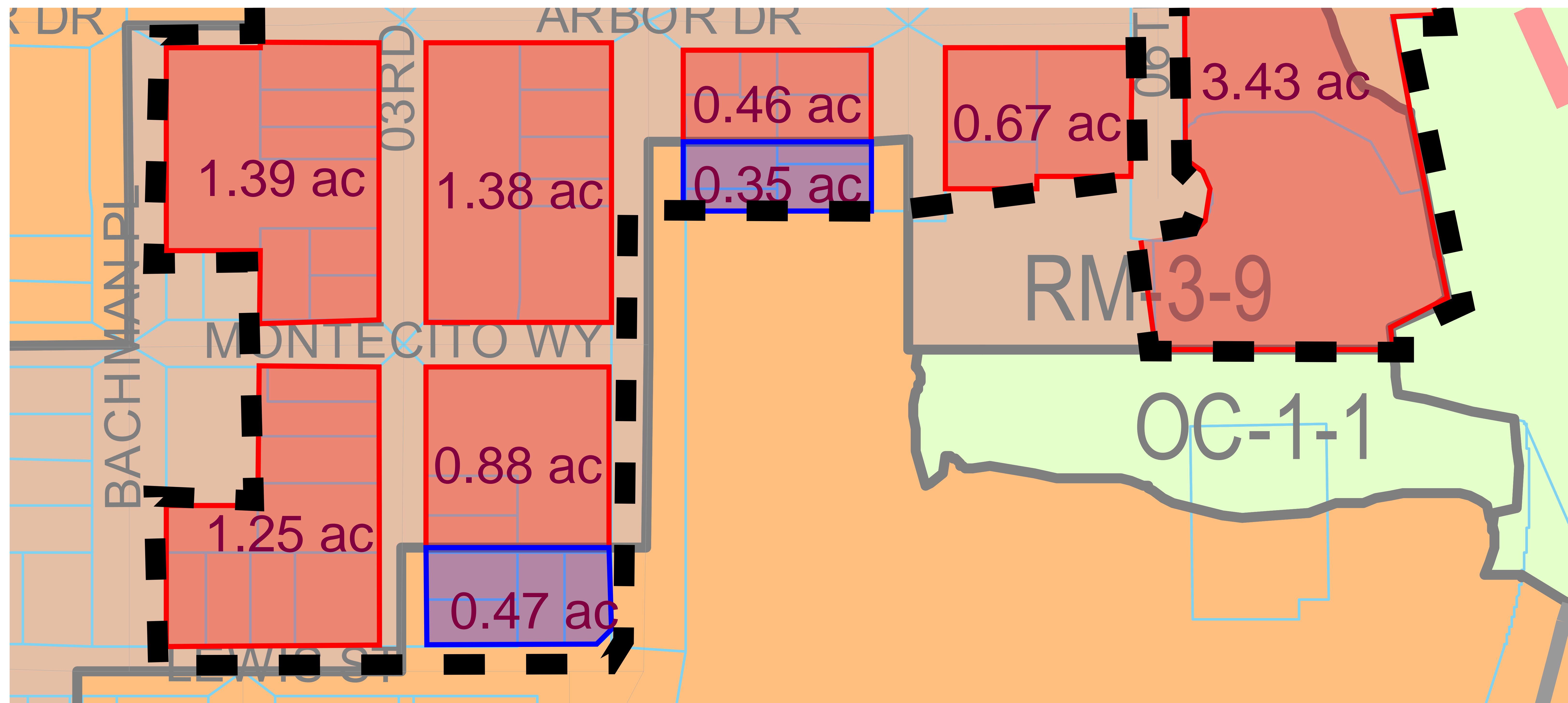
SHEET NUMBER (EXHIBIT NUMBER)



0 25' 50'

SCALE: 1" = 50'

EXH-005.5



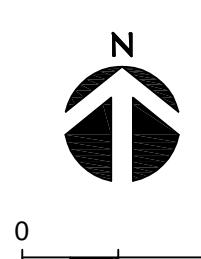
4077 FIFTH AVENUE
SAN DIEGO, CA 92103

DRAWING TITLE

EXISTING
TRIBUTARY AREA
ANALYSIS

SHEET NUMBER (EXHIBIT NUMBER)

EXH-005.6



Appendix B Flowmaster V8i Calculations

Table B-1 – Flowmaster Calculations Existing Condition

Table B-2 – Flowmaster Calculations Proposed Condition

Exhibit 6 – Flowmaster Existing Condition

Exhibit 7 – Flowmaster Proposed Condition

Table B-1 - FlowMaster Calculations - Existing Condition

Circular Pipe (SS Flow Phase 2 Existing.fm8) Report								
Label	Solve For	Channel Slope (%)	Normal Depth (in)	Diameter (in)	Discharge (cfs)	Percent Full (%)	Velocity (ft/s)	
Pipe - 1	Normal Depth	0.25000	4.93	12.00	0.63	41.1	2.07	
Pipe - 2	Normal Depth	0.26000	4.88	12.00	0.63	40.6	2.10	
Pipe - 3	Normal Depth	0.24000	4.98	12.00	0.63	41.5	2.04	
Pipe - 4	Normal Depth	0.25000	4.93	12.00	0.63	41.1	2.07	
Pipe - 5	Normal Depth	0.40000	4.34	12.00	0.63	36.2	2.46	
Pipe - 6	Normal Depth	0.53000	4.03	12.00	0.63	33.6	2.72	
Pipe - 7	Normal Depth	0.74000	3.78	12.00	0.66	31.5	3.11	
Pipe - 8	Normal Depth	0.29000	4.86	12.00	0.66	40.5	2.22	
Pipe - 9	Normal Depth	0.24000	5.33	12.00	0.71	44.4	2.11	
Pipe - 10	Normal Depth	0.24000	5.70	12.00	0.80	47.5	2.17	
Pipe - 11	Normal Depth	0.54000	4.55	12.00	0.80	37.9	2.93	
Pipe - 12	Normal Depth	0.54000	4.55	12.00	0.80	37.9	2.93	
Pipe - 13	Normal Depth	0.50000	4.65	12.00	0.80	38.7	2.85	
Pipe - 14	Normal Depth	0.40000	4.94	12.00	0.80	41.2	2.62	
Pipe - 15	Normal Depth	3.90000	3.37	12.00	1.21	28.1	6.70	
Pipe - 16	Normal Depth	1.97000	4.11	12.00	1.26	34.2	5.30	
Pipe - 17	Normal Depth	7.06000	3.03	12.00	1.32	25.2	8.49	
Pipe - 18	Normal Depth	8.70000	2.87	12.00	1.32	23.9	9.13	
Pipe - 19	Normal Depth	8.66000	2.88	12.00	1.32	24.0	9.12	
Pipe - 20	Normal Depth	2.10000	0.46	6.00	0.01	7.7	1.43	
Pipe - 21	Normal Depth	19.10000	0.28	6.00	0.01	4.7	3.00	
Pipe - 22	Normal Depth	19.10000	0.28	6.00	0.01	4.7	3.00	
Pipe - 23	Normal Depth	4.20000	4.15	8.00	1.32	51.9	7.21	
Pipe - 24	Normal Depth	2.57000	2.94	8.00	0.56	36.8	4.81	
Pipe - 25	Normal Depth	5.20000	4.06	10.00	1.73	40.6	8.32	
Pipe - 26	Normal Depth	5.87000	3.93	10.00	1.73	39.3	8.69	
Pipe - 27	Normal Depth	3.97000	0.38	8.00	0.01	4.7	1.69	
Pipe - 28	Normal Depth	6.44000	3.84	10.00	1.74	38.4	9.02	
Pipe - 29	Normal Depth	14.37000	3.11	10.00	1.74	31.1	12.05	

Table B-1 - FlowMaster Calculations - Existing Condition

Circular Pipe (SS Flow Phase 2 Existing.fm8) Report								
Label	Solve For	Channel Slope (%)	Normal Depth (in)	Diameter (in)	Discharge (cfs)	Percent Full (%)	Velocity (ft/s)	
Pipe - 30	Normal Depth	52.31000	2.44	8.00	1.76	30.4	19.58	
Pipe - 31	Normal Depth	7.06000	0.63	8.00	0.04	7.9	3.13	
Pipe - 32	Normal Depth	7.56000	1.16	8.00	0.15	14.5	4.80	
Pipe - 33	Normal Depth	2.81000	4.35	16.00	2.08	27.2	6.77	
Pipe - 34	Normal Depth	2.40000	4.53	16.00	2.08	28.3	6.40	
Pipe - 35	Normal Depth	7.64000	3.38	16.00	2.08	21.2	9.66	
Pipe - 36	Normal Depth	5.34000	3.70	16.00	2.08	23.1	8.50	
Pipe - 37	Normal Depth	3.32000	4.34	16.00	2.25	27.1	7.35	
Pipe - 38	Normal Depth	3.32000	4.34	16.00	2.25	27.1	7.35	

Table B-2 - FlowMaster Calculations - Proposed Condition

SS Flow Phase 2 Downstream v2 Report								
Label	Solve For	Channel Slope (%)	Normal Depth (in)	Diameter (in)	Discharge (cfs)	Percent Full (%)	Velocity (ft/s)	
Pipe - 1	Normal Depth	0.25000	4.93	12.00	0.63	41.1	2.07	
Pipe - 2	Normal Depth	0.26000	4.88	12.00	0.63	40.6	2.10	
Pipe - 3	Normal Depth	0.24000	4.98	12.00	0.63	41.5	2.04	
Pipe - 4	Normal Depth	0.25000	4.93	12.00	0.63	41.1	2.07	
Pipe - 5	Normal Depth	0.40000	4.34	12.00	0.63	36.2	2.46	
Pipe - 6	Normal Depth	0.53000	4.03	12.00	0.63	33.6	2.72	
Pipe - 7	Normal Depth	0.74000	3.75	12.00	0.65	31.3	3.10	
Pipe - 8	Normal Depth	0.29000	4.82	12.00	0.65	40.1	2.21	
Pipe - 9	Normal Depth	0.24000	5.07	12.00	0.65	42.3	2.06	
Pipe - 10	Normal Depth	0.24000	5.45	12.00	0.74	45.4	2.13	
Pipe - 11	Normal Depth	0.54000	4.37	12.00	0.74	36.4	2.87	
Pipe - 12	Normal Depth	0.54000	4.37	12.00	0.74	36.4	2.87	
Pipe - 13	Normal Depth	0.50000	4.45	12.00	0.74	37.1	2.79	
Pipe - 14	Normal Depth	0.40000	4.73	12.00	0.74	39.5	2.57	
Pipe - 15	Normal Depth	3.90000	3.30	12.00	1.16	27.5	6.62	
Pipe - 16	Normal Depth	1.97000	4.00	12.00	1.20	33.3	5.24	
Pipe - 17	Normal Depth	7.06000	2.97	12.00	1.27	24.7	8.39	
Pipe - 18	Normal Depth	8.70000	2.81	12.00	1.27	23.5	9.05	
Pipe - 19	Normal Depth	8.66000	2.82	12.00	1.27	23.5	9.03	
Pipe - 20	Normal Depth	2.10000	1.49	6.00	0.11	24.9	2.89	
Pipe - 21	Normal Depth	19.10000	0.86	6.00	0.11	14.3	6.29	
Pipe - 22	Normal Depth	19.10000	0.86	6.00	0.11	14.3	6.29	
Pipe - 23	Normal Depth	4.20000	4.15	8.00	1.32	51.9	7.21	
Pipe - 24	Normal Depth	2.57000	3.78	8.00	0.88	47.3	5.42	
Pipe - 25	Normal Depth	5.20000	4.41	10.00	2.01	44.1	8.67	
Pipe - 26	Normal Depth	5.87000	4.26	10.00	2.01	42.6	9.06	
Pipe - 27	Normal Depth	3.97000	0.38	8.00	0.01	4.7	1.69	
Pipe - 28	Normal Depth	6.44000	4.16	10.00	2.01	41.6	9.38	
Pipe - 29	Normal Depth	14.37000	3.35	10.00	2.01	33.5	12.56	

Table B-2 - FlowMaster Calculations - Proposed Condition

SS Flow Phase 2 Downstream v2 Report								
Label	Solve For	Channel Slope (%)	Normal Depth (in)	Diameter (in)	Discharge (cfs)	Percent Full (%)	Velocity (ft/s)	
Pipe - 30	Normal Depth	52.31000	0.89	8.00	0.23	11.2	10.76	
Pipe - 31	Normal Depth	7.06000	1.45	8.00	0.23	18.1	5.33	
Pipe - 32	Normal Depth	7.56000	1.80	8.00	0.37	22.5	6.28	
Pipe - 33	Normal Depth	2.81000	4.76	16.00	2.48	29.8	7.12	
Pipe - 34	Normal Depth	2.40000	4.96	16.00	2.48	31.0	6.73	
Pipe - 35	Normal Depth	7.64000	3.70	16.00	2.48	23.1	10.16	
Pipe - 36	Normal Depth	5.34000	4.04	16.00	2.48	25.3	8.95	
Pipe - 37	Normal Depth	3.32000	4.71	16.00	2.64	29.4	7.69	
Pipe - 38	Normal Depth	3.32000	4.71	16.00	2.64	29.4	7.69	

Exhibit 6 - Flowmaster Existing Condition

Worksheet for Pipe - 23

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	4.20000 %
Diameter	8.00 in
Discharge	1.32 cfs

Results

Normal Depth	4.15	in
Flow Area	0.18	ft ²
Wetted Perimeter	1.07	ft
Hydraulic Radius	2.05	in
Top Width	0.67	ft
Critical Depth	0.54	ft
Percent Full	51.9	%
Critical Slope	0.01210	ft/ft
Velocity	7.21	ft/s
Velocity Head	0.81	ft
Specific Energy	1.15	ft
Froude Number	2.42	
Maximum Discharge	2.66	ft ³ /s
Discharge Full	2.48	ft ³ /s
Slope Full	0.01193	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth 0.00 in
Length 0.00 ft
Number Of Steps 0

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	51.94	%
Downstream Velocity	Infinity	ft/s

Exhibit 6 - Flowmaster Existing Condition

Worksheet for Pipe - 23

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	4.15	in
Critical Depth	0.54	ft
Channel Slope	4.20000	%
Critical Slope	0.01210	ft/ft

Exhibit 7 - Flowmaster Proposed Condition

Worksheet for Pipe - 23

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013
Channel Slope	4.20000 %
Diameter	8.00 in
Discharge	1.32 cfs

Results

Normal Depth	4.15	in
Flow Area	0.18	ft ²
Wetted Perimeter	1.07	ft
Hydraulic Radius	2.05	in
Top Width	0.67	ft
Critical Depth	0.54	ft
Percent Full	51.9	%
Critical Slope	0.01210	ft/ft
Velocity	7.21	ft/s
Velocity Head	0.81	ft
Specific Energy	1.15	ft
Froude Number	2.42	
Maximum Discharge	2.66	ft ³ /s
Discharge Full	2.48	ft ³ /s
Slope Full	0.01193	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth 0.00 in
Length 0.00 ft
Number Of Steps 0

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	51.94	%
Downstream Velocity	Infinity	ft/s

Exhibit 7 - Flowmaster Proposed Condition

Worksheet for Pipe - 23

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	4.15	in
Critical Depth	0.54	ft
Channel Slope	4.20000	%
Critical Slope	0.01210	ft/ft

Appendix C Reference Documents

City of San Diego Sewer Design Manual

City of San Diego Zoning Map: Grid 19

TABLE 1-1

**CITY OF SAN DIEGO
DENSITY CONVERSIONS**

Zone	Maximum Density (DU/Net Ac)	Population/(DU)	Equivalent Population (Pop/Net Ac)
AR-1-1, RE-1-1	0.1	3.5	0.4
RE-1-2	0.2	3.5	0.7
AR-1-2, RE-1-3	1	3.5	3.5
RS-1-1, RS-1-8	1	3.5	3.5
RS-1-2, RS-1-9	2	3.5	7.0
RS-1-3, RS-1-10	3	3.5	10.5
RS-1-4, RS-1-11	4	3.5	14.0
RS-1-5, RS-1-12	5	3.5	17.5
RS-1-6, RS-1-13	7	3.5	24.5
RS-1-7, RS-1-14	9	3.5	31.5
RX-1-1	11	3.4	37.4
RT-1-1	12	3.3	39.6
RX-1-2, RT-1-2, RU-1-1	14	3.2	44.8
RT-1-3, RM-1-2	17	3.1	52.7
RT-1-4	20	3.0	60.0
RM-1-3	22	3.0	66.0
RM-2-4	25	3.0	75.0
RM-2-5	29	3.0	87.0
RM-2-6	35	2.8	98.0
RM-3-7, RM-5-12	43	2.6	111.8
RM-3-8	54	2.4	129.6

TABLE 1-1

**CITY OF SAN DIEGO
DENSITY CONVERSIONS
(Continued)**

Zone	Maximum Density (DU/Net Ac)	Population/(DU)	Equivalent Population (Pop/Net Ac)
RM-3-9	73	2.2	160.6
RM-4-10	109	1.8	196.2
RM-4-11	218	1.5	327.0
Schools/Public	8.9	3.5	31.2
Offices	10.9	3.5	38.2*
Commercial/Hotels	12.5	3.5	43.7*
Industrial	17.9	3.5	62.5*
Hospital	42.9	3.5	150.0*

Definitions:

DU = Dwelling Units

Ac = Acreage

Pop = Population

Net Acreage is the developable lot areas excluding areas that are dedicated as public streets in acres. Gross Area is the entire area in acres of the drainage basin, including lots, streets, etc.

For undeveloped areas, assume Net Acreage = 0.8 x Gross Area in Acres

For developed areas, calculate actual net acreage.

Tabulated figures are for general case. The tabulated figures shall not be used if more accurate figures are available.

Population is based on actual equivalent dwelling units (EDU) or the maximum estimate obtained from zoning.

Figures with asterisk (*) represent equivalent population per floor of the building.

**CITY OF SAN DIEGO
METROPOLITAN WASTEWATER DEPARTMENT**

**PEAKING FACTOR FOR SEWER FLOWS
(Dry Weather)**

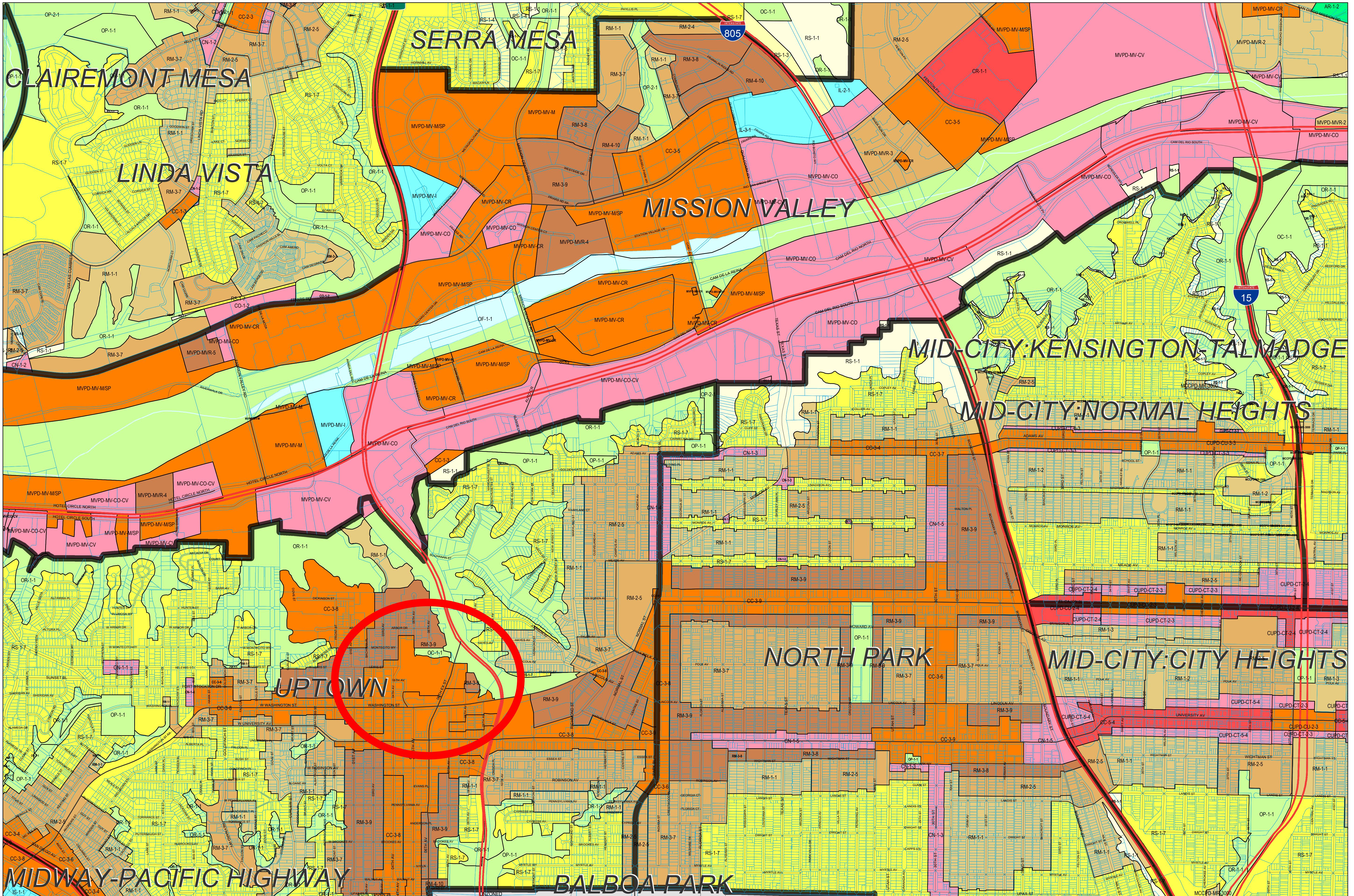
**Ratio of Peak to Average Flow*
Versus Tributary Population**

<u>Population</u>	<u>Ratio of Peak to Average Flow</u>	<u>Population</u>	<u>Ratio of Peak to Average Flow</u>
200	4.00	4,800	2.01
500	3.00	5,000	2.00
800	2.75	5,200	1.99
900	2.60	5,500	1.97
1,000	2.50	6,000	1.95
1,100	2.47	6,200	1.94
1,200	2.45	6,400	1.93
1,300	2.43	6,900	1.91
1,400	2.40	7,300	1.90
1,500	2.38	7,500	1.89
1,600	2.36	8,100	1.87
1,700	2.34	8,400	1.86
1,750	2.33	9,100	1.84
1,800	2.32	9,600	1.83
1,850	2.31	10,000	1.82
1,900	2.30	11,500	1.80
2,000	2.29	13,000	1.78
2,150	2.27	14,500	1.76
2,225	2.25	15,000	1.75
2,300	2.24	16,000	1.74
2,375	2.23	16,700	1.73
2,425	2.22	17,400	1.72
2,500	2.21	18,000	1.71
2,600	2.20	18,900	1.70
2,625	2.19	19,800	1.69
2,675	2.18	21,500	1.68
2,775	2.17	22,600	1.67
2,850	2.16	25,000	1.65
3,000	2.14	26,500	1.64
3,100	2.13	28,000	1.63
3,200	2.12	32,000	1.61
3,500	2.10	36,000	1.59
3,600	2.09	38,000	1.58
3,700	2.08	42,000	1.57
3,800	2.07	49,000	1.55
3,900	2.06	54,000	1.54
4,000	2.05	60,000	1.53
4,200	2.04	70,000	1.52
4,400	2.03	90,000	1.51
4,600	2.02	100,000+	1.50

*Based on formula: Peak Factor = $6.2945 \times (\text{pop})^{-0.1342}$
(Holmes & Narver, 1960)

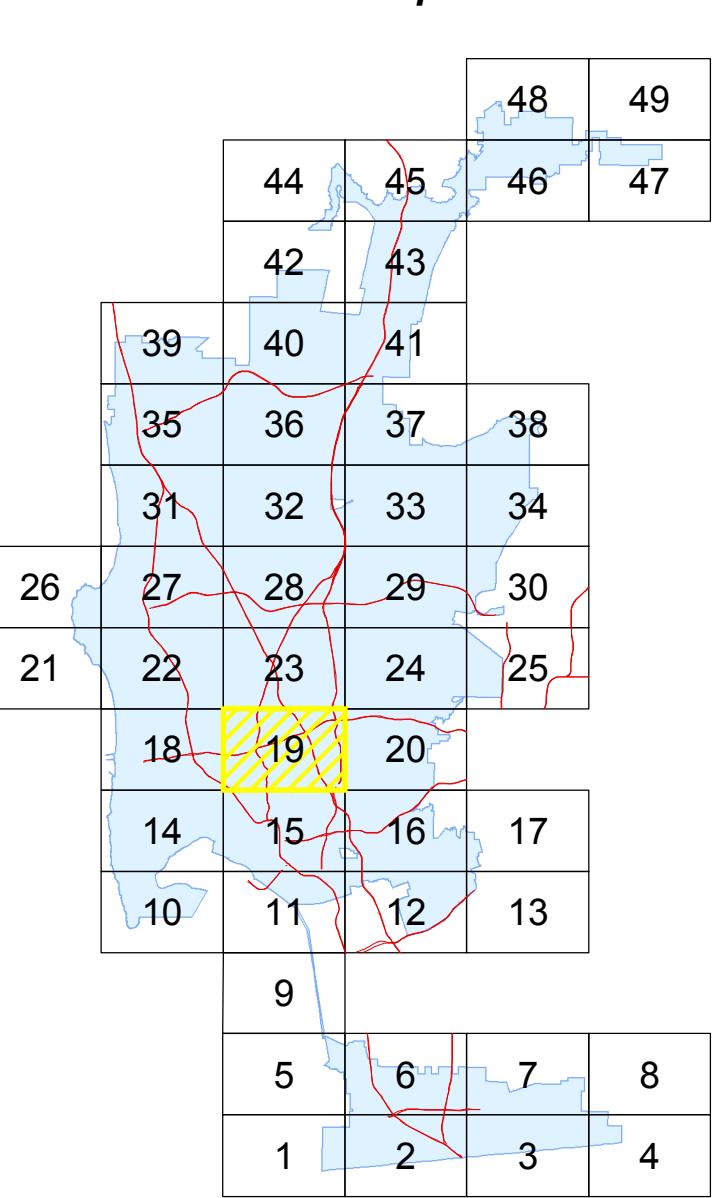
FIGURE 1-1

Official Zoning Map



Legend	
City of San Diego Boundary	
Community Plan Areas	
Parcels	
Zoning	
ZONE_NAME	
AR-1-2	
CC-1-3	
CC-2-3	
CC-3-4	
CC-3-5	
CC-3-6	
CC-3-7	
CC-3-8	
CC-3-9	
CC-5-4	
CN-1-1	
CN-1-2	
CN-1-3	
CN-1-4	
CN-1-5	
CO-1-2	
CR-1-1	
CUPD-CT-2-3	
CUPD-CT-2-4	
CUPD-CT-5-4	
CUPD-CU-2-3	
CUPD-CU-2-4	
CUPD-CU-3-3	
CV-1-1	
IL-2-1	
IL-3-1	
IS-1-1	
MCCPD-MR-1500B	
MCCPD-MR-2500	
MCCPD-MR-3000	
MVPD-MV-CO	
MVPD-MV-CV	
MVPD-MV-I	
MVPD-MV-M	
MVPD-MV-MSP	
MVPD-MV-R	
MVPD-MV-R2	
MVPD-MV-R3	
MVPD-MV-R4	
MVPD-MV-CO-CV	
MVPD-MV-CR	
MVPD-MV-CV	
MVPD-MV-MP	
MVPD-MV-MSP	
MVPD-MV-R	
MVPD-MV-R2	
MVPD-MV-R3	
MVPD-MV-R4	
MVPD-MV-R5	
OP-1-1	
OP-2-1	
OR-1-1	
RM-1-1	
RM-1-2	
RM-1-3	
RM-2-4	
RM-2-5	
RM-3-7	
RM-3-8	
RM-3-9	
RM-4-10	
RS-1-1	
RS-1-3	
RS-1-4	
RS-1-7	
UNZONED	

Index Map



City of San Diego
Development Services Department

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