SEWER STUDY

FOR

ONE ALEXANDRIA NORTH

(CDP NO. 2570682/NDP NO. 2570684/ SDP NO. 2570685/TPM NO. 2570686)

Job Number 19366-AC

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Introduction

The purpose of this report is to evaluate the proposed sewer main connections that will service the One Alexandria North Campus and determine the existing system capacity as well as the additional flow resulting from the proposed campus development. The project site is located east of North Torrey Pines Road, north of Callan Road in San Diego, California.

Existing Conditions

The existing campus includes Buildings 11255, 11355, a recreational center, and a locker room shown on Exhibit B. All of the existing buildings tie into the existing sewer main running through the site. Refer to the Table 1 below and the attached Existing Conditions Exhibit B.

Table 1: Net Acreage Tabulation for Existing Condition

Building No.	Total Area (SF)	Total Area (Ac)
11255	76,993	1.77
11355	91,183	2.09
Rec Center	3,607	0.08
Locker Room	1,382	0.03
Upstream Maintenance Facility	5,940	0.14
Total:	179,105	4.11 (1)

(1) 179,105 SF ÷ 43,560 SF/Ac = 4.11 Acres

Proposed Condition

The campus buildout proposes the addition of Buildings 1, 2, 3, and 4. All the proposed buildings will be serviced via an existing 10" public sewer main, which begins from a maintenance facility at the Torrey Pines Golf Course and continues down Torreyana Road past the project site. The section of the sewer main running through the campus would be modified to accommodate the proposed buildings, removing and replacing the sewer line between Manhole-1 and Manhole-7. Refer to Table 2 below and attached Proposed Conditions Exhibit C.

Table 2: Net Acreage Tabulation for Proposed Conditions

Building No.	Total Area (SF)	Total Area (Ac)
B1	127,008	2.92
B2	115,501	2.65
B3	3,358	0.08
B4	10,632	0.24
Upstream Maintenance Facility (Existing)	5,940	0.14
Total:	262,440	6.03[(2)]

[(2)] 262,440 SF ÷ 43,560 SF/Ac = 6.03 acres

The change to the sewer system comes from the removal of the existing buildings on site and the addition of buildings B1-B4. The difference in flow rate to the system is calculated below:

Equation 1 (Existing Flow to Sewer Main):

Acreage of existing buildings: 4.11 ac (from Table 1)

Equivalent Population = $4.11\ ac * 62.5 \frac{pop}{ac} = 256.875 \sim 257$

Peaking Factor = $6.2945 * 257^{-0.1342} = 2.989$

$257 * 2.989 * 80\ gcpcd = \mathbf{61453.84\ GPD}\ (\mathbf{42.68\ GPM})$

Equation 2 (Proposed Flow to Sewer Main):

Total Acreage of B1-B4 + Maintenance Facility: 6.03 ac (from Table 2)

Equivalent Population = $6.03\ ac * 62.5\ pop = 376.88 \sim 377$

Peaking Factor = $6.2945 * 377^{-0.1342} = 2.839$

$377 * 2.839 * 80\ gcpcd = \mathbf{85624.24\ GPD}\ (\mathbf{59.46\ GPM})$

Design Methodology

The only load to the sewer main before the One Alexandria North campus is the maintenance facility in the Torrey Pines Golf Course. The load to the 10" sewer main from this facility was calculated. Then, a flow rate from the proposed new developments tying into the existing 10" sewer main was calculated using the San Diego Sewer Design Guide and compared with the existing conditions. Pursuant to the City of San Diego Sewer Design Guide (2015 version), the approach used to evaluate the flow rate of the proposed conditions was to evaluate the density of the site by summating the square footage of each building to determine total developed acreage

and convert to a population using the City of San Diego Sewer Design Guide Density Conversions, Table 1-1 for an industrial zone. Peak hour factors were applied to the populations of each building (based on Peaking Factor for Sewer Flows, Figure 1-1 of Sewer Design Manual). Each value was multiplied by 80 gallons per capita per day (gpcpd) to calculate an equivalent flow rate. The cumulative flow rate of the proposed buildings totaled to 59.46 gallons per minute, an increase of 16.78 GPM to the system.

Next, the flow depth was calculated throughout the proposed sewer system to ensure the depth to pipe diameter ratio is less than 0.5 in accordance with the San Diego Sewer Design Guide, Section 1.3.3.3. The highest depth of flow to pipe diameter ratio in the sewer main exiting the campus was determined to be 0.18, well below 0.5. The increase in depth of flow to pipe diameter ratio from existing conditions is 0.05. These calculations are shown in the Sewer Study Summary in Exhibit A, and manhole locations are shown in the attached Exhibit C: Proposed Conditions.

Conclusion

The proposed conditions on One Alexandria North campus, which would construct 4 new structures and remove the 4 existing buildings, has a gross floor area of 256,500 ft^2. The sewer system affected in the proposed development is the 10" sewer main that runs through the campus and continues on Torreyana Road. The only structure that this sewer main services upstream of the campus is a Torrey Pines Golf Course maintenance facility, with a gross floor area of 5,940 ft^2. The existing flow rate in the 10" main is 42.68 GPM, while the proposed flow rate is 59.46 GPM. The depth of flow to pipe diameter ratio of the proposed flow exiting the site is 0.18. The existing depth of flow to pipe diameter ratio is 0.13, an increase of 0.05. This study shows that the existing sewer lateral has enough capacity to serve the proposed campus development without any negative impacts to the public sewer system.

EXHIBIT A

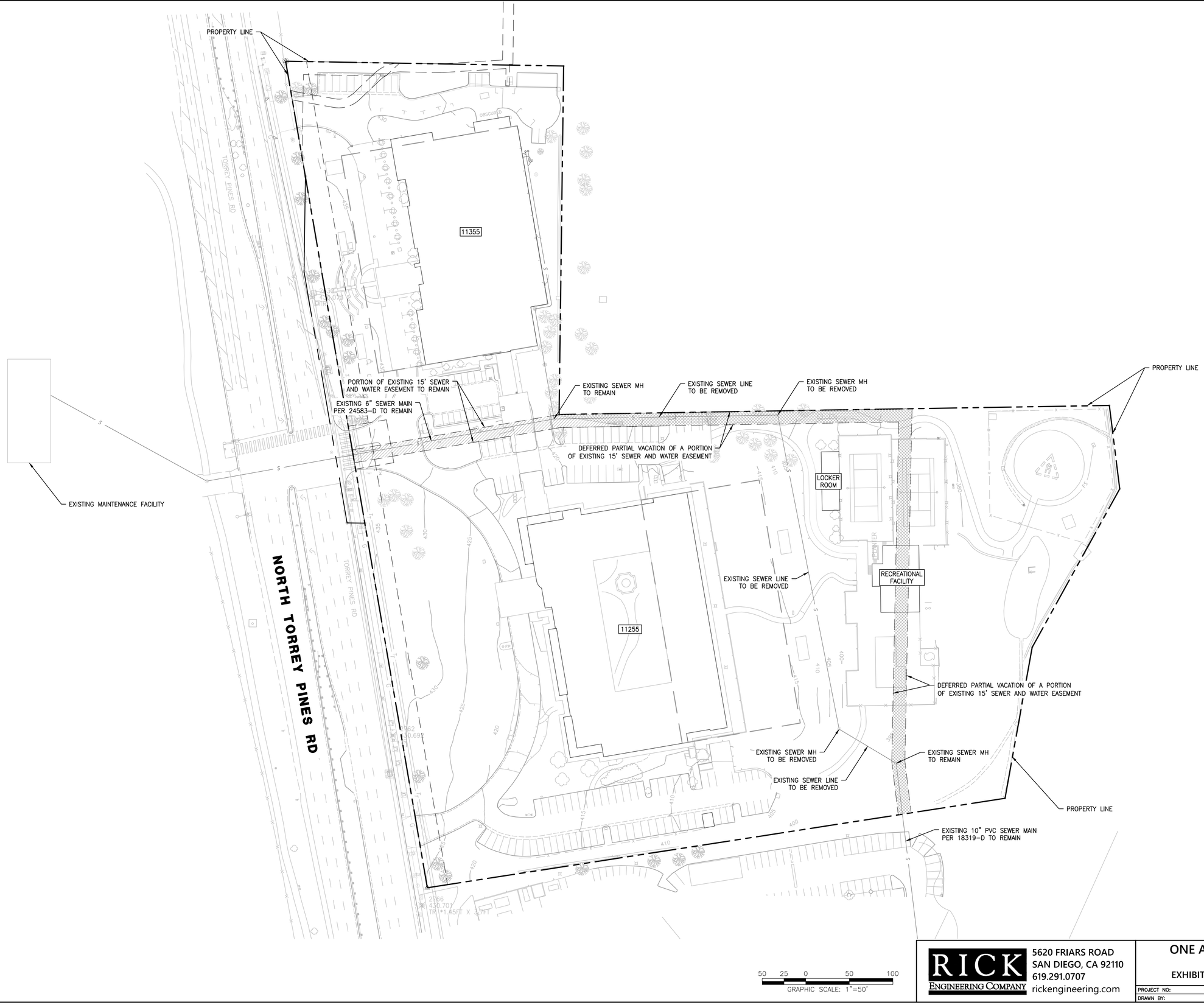
SEWER STUDY SUMMARY

Medium Density (MDR)	
Pop./EDU =	**3.5**
GPD/Capita =	**80**

FROM MANHOLE	TO MANHOLE	CUMM. EDU UPSTREAM MANHOLE	IN LINE D.U.'S	CUMM D.U.'S	CUMM. POP SERVED	PEAK DESIGN FLOW			LINE SIZE (INCHES)	DESIGN SLOPE (%)	dn(FT) n= 0.013	dn/D	Rh (ft)	VELOCITY (fps)
						PEAK/AVG RATIO	M.G.D.	CFS						
1	2	2	4	6	22.3	4.15	0.007	0.011	10	7.1	0.03	0.030	0.02	1.97
2	3	6	0	6	22.3	4.15	0.007	0.011	10	6.8	0.03	0.030	0.02	1.93
3	4	6	0	6	22.3	4.15	0.007	0.011	10	1.0	0.04	0.050	0.03	1.03
4	5	6	0	6	22.3	4.15	0.007	0.011	10	1.0	0.04	0.050	0.03	1.03
5	6	6	47	54	188.4	3.12	0.047	0.073	10	2.1	0.08	0.100	0.05	2.34
6	7	54	0	54	188.4	3.12	0.047	0.073	10	21.4	0.05	0.060	0.03	5.37
11	10	0	54	54	187.5	3.12	0.047	0.072	8	1.0	0.11	0.16	0.07	1.86
10	9	54	0	54	187.5	3.12	0.047	0.072	8	2.0	0.09	0.14	0.06	2.42
9	8	54	47	101	353.6	2.86	0.081	0.125	8	8.2	0.09	0.13	0.05	4.69
8	7	101	0	101	353.6	2.86	0.081	0.125	8	13.0	0.07	0.11	0.05	5.32
7	**-**	**0**	**155**	**155**	**542.0**	**2.70**	**0.117**	**0.182**	**10**	**1.3**	**0.15**	**0.18**	**0.09**	**2.59**

Note 1: See Exhibit C for Manhole Locations

Note 2: Manholes 1-7 are public. Manholes 8-11 are private.



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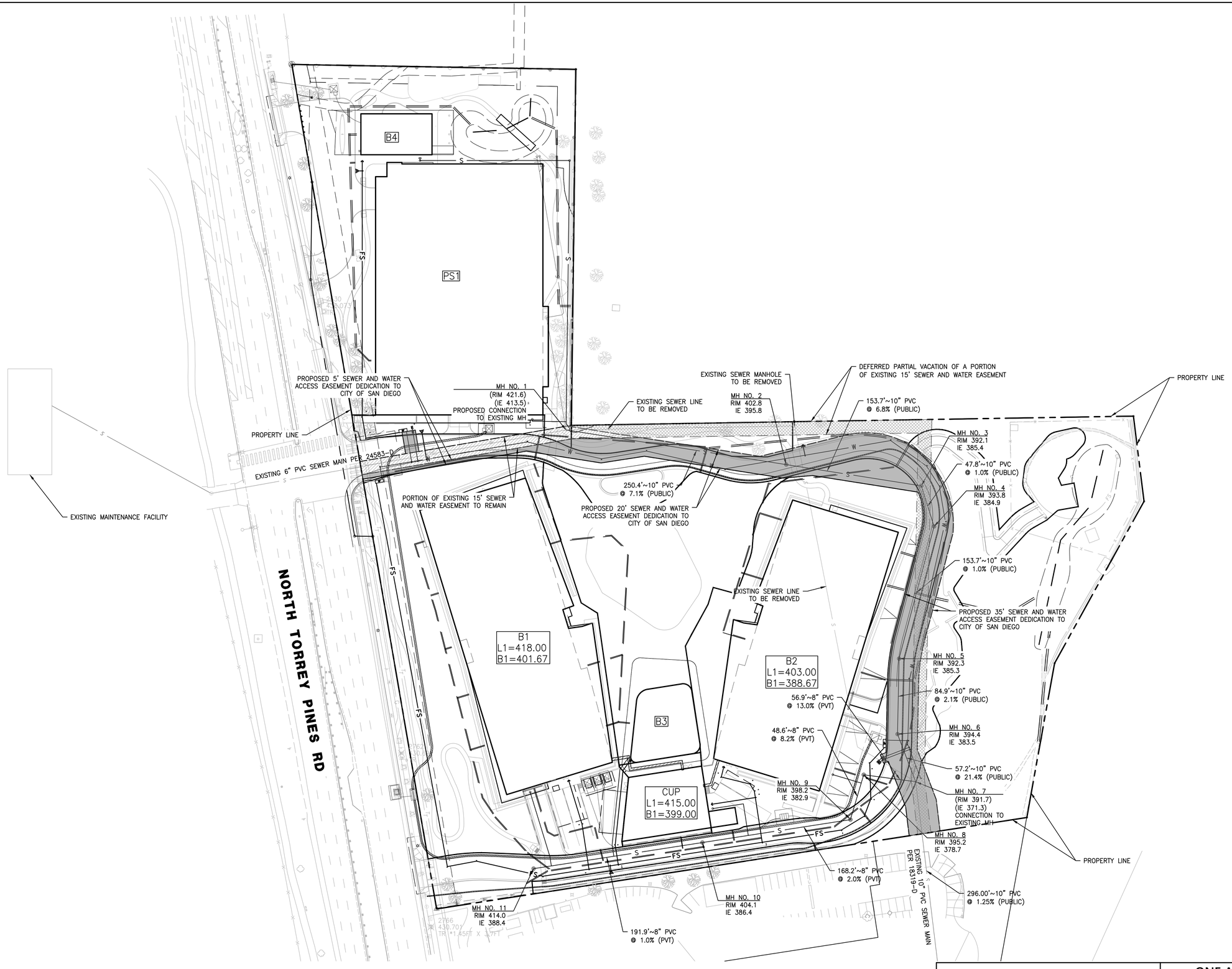
ONE ALEXANDRIA NORTH
SEWER STUDY
EXHIBIT B: EXISTING CONDITIONS

PROJECT NO:	19366	SCALE:	1"=50'
DRAWN BY:	WW	DATE:	11/4/2021



50 25 0 50 100

GRAPHIC SCALE: 1"=50'

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ONE ALEXANDRIA NORTH

SEWER STUDY

EXHIBIT C: PROPOSED CONDITIONS

PROJECT NO:	19366	SCALE:	1"=50'
DRAWN BY:	WW	DATE:	9/27/2022

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