

# APN 3022-001-026 Sanitary Sewer Analysis

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## Introduction

The following sanitary sewer hydraulic analysis was completed using the LA County Sanitation District's 2020 Loading Rates found in Appendix A along with the Sewer Area Study for Tract No. 47936 found in Appendix C. The Sewer Area Study was referenced for the existing flow rates of the neighboring properties.

## Sanitary Sewer Hydraulic Analysis

The proposed building/parcel will have two sewer laterals connecting to a proposed 10" sewer main on 8<sup>th</sup> Street East. Those connections will be at Nodes A and B, see Appendix B for the Sewer Node Exhibit. At Node C the proposed main will connect to the existing 10" sewer main to the north roughly 430' south of E Avenue P. No additional connections/laterals were found between Nodes C and E. At Node E the proposed flow meets with the existing flow from the properties to the west and travels downstream towards the east.

Utilizing the LACSD 2020 Loading Rates categorizes the building into Warehousing greater than 300,000 sqft. Table 1 shows the anticipated Average Daily Flow (ADF) and Peak Daily Flow (PDF) based on the parcel area and unit flow factor. Table 2 shows the cumulative flows at significant nodes. Table 3 breaks down the capacity of the existing 10" and 15" sewer lines. From the two tables Node A's ADF of 0.0040 mgd and PDF of 0.0099 mgd satisfies the proposed capacity of Reach A to B of 0.2840 mgd. At Node B, the cumulative ADF of 0.0079 mgd and PDF of 0.0198 mgd satisfies the proposed capacity of Reach B to C of 0.2840 mgd. Continuing downstream the flows remain constant while the capacity of the existing sewer jumps to 0.4490 mgd between Nodes C and D and 1.0720 mgd between Nodes D and E. From the Sewer Area Study for Tract No. 47936 the existing flow at Node E from the west is 0.2475 mgd. That combined with our proposed flow from the south produces a cumulative ADF of 0.2554 mgd and PDF of 0.2673 mgd. This satisfies the existing capacity of Reach E and East of 2.2904 mgd.

| Table 1: Proposed Flow Rates |                             |                                   |                          |                       |                          |                       |
|------------------------------|-----------------------------|-----------------------------------|--------------------------|-----------------------|--------------------------|-----------------------|
| Parcel Area (sqft)           | Land Use                    | Unit Flow Factor (gpd/1,000 sqft) | Average Daily Flow (gpd) | Peak Daily Flow (gpd) | Average Daily Flow (mgd) | Peak Daily Flow (mgd) |
| 793,104                      | Warehousing > 300,000 sq ft | 10                                | 7,931                    | 19,828                | 0.0079                   | 0.0198                |

| Table 2: Cumulative Flow Rates |                 |                 |
|--------------------------------|-----------------|-----------------|
|                                | Total ADF (mgd) | Total PDF (mgd) |
| Node A to Node B               | 0.0040          | 0.0099          |
| Node B to Node C               | 0.0079          | 0.0198          |
| Node C to Node D               | 0.0079          | 0.0198          |
| Node D to Node E               | 0.0079          | 0.0198          |
| Node E and East                | 0.2554          | 0.2673          |

Note:

Flows into Node A and B from proposed project assumed to be 50% of total flow to each Node.

Flows into Node E from the west, refer to Sewer Area Study for Tract No. 47936 (89-102) August 1991, 0.383 cfs (0.2475 mgd)

| Table 3: Capacity of Sewer Lines |                        |                        |                 |                              |                |          |                 |   |                            |   |  |                   |  |                         |
|----------------------------------|------------------------|------------------------|-----------------|------------------------------|----------------|----------|-----------------|---|----------------------------|---|--|-------------------|--|-------------------------|
|                                  |                        |                        |                 | Hydraulic Radius Calculation |                |          |                 |   |                            |   | Flow Calculation   |                   |  |                         |
| Reach                            | Pipe Diameter [D] (in) | Pipe Diameter [D] (ft) | Radius [r] (ft) | depth/Diameter @ PDF [d/D]   | depth [d] (ft) | [h] (ft) | Theta [Θ] (rad) | Cross Sectional Area of Flow More than Half Full [A] (ft <sup>2</sup> ) | Wetted Perimeter [WP] (ft) | Hydraulic Radius [R <sub>h</sub> ] (ft) | Roughness Coefficient Vitrified Clay Full [n <sub>full</sub> ] | Slope [S] (ft/ft) | Flow Capacity [Q] [ft <sup>3</sup> /s] | Flow Capacity [Q] [mgd] |
| Node A to Node B                 | 10                     | 0.83                   | 0.42            | 0.5                          | 0.417          | 0.417    | 3.142           | 0.273   | 1.309                      | 0.208                                   | 0.013  | 0.0016            | 0.4394                                 | 0.2840                  |
| Node B to Node C                 | 10                     | 0.83                   | 0.417           | 0.5                          | 0.417          | 0.416667 | 3.142           | 0.273   | 1.309                      | 0.208                                   | 0.013  | 0.0016            | 0.4394                                 | 0.2840                  |
| Node C to Node D                 | 10                     | 0.83                   | 0.417           | 0.5                          | 0.417          | 0.416667 | 3.142           | 0.273   | 1.309                      | 0.208                                   | 0.013  | 0.004             | 0.6947                                 | 0.4490                  |
| Node D to Node E                 | 10                     | 0.83                   | 0.417           | 0.5                          | 0.417          | 0.416667 | 3.142           | 0.273   | 1.309                      | 0.208                                   | 0.013  | 0.0228            | 1.6586                                 | 1.0720                  |
| Node E and East                  | 15                     | 1.25                   | 0.625           | 0.75                         | 0.938          | 0.3125   | 2.094           | 0.987   | 2.618                      | 0.377                                   | 0.013  | 0.0036            | 3.5438                                 | 2.2904                  |

Note: Slopes of existing sewer mains referenced from Sanitary Sewer Plans for Tract No. 47936, PC 90-21

## Appendix A

### LACSD Loading Rate Table (Dated 2020)

SANITATION DISTRICT NO. 20  
 CONNECTION FEE LOADINGS, CAPACITY UNITS, AND UNIT RATES  
 EFFECTIVE JULY 1, 2020

| CATEGORY                           | UNIT OF USAGE | LOADINGS   |           |          | CAPACITY UNITS | CHARGE    |
|------------------------------------|---------------|------------|-----------|----------|----------------|-----------|
|                                    |               | FLOW (GPD) | COD (PPD) | SS (PPD) |                |           |
| Single Family Home                 | Parcel        | 260        | 1.22      | 0.59     | 1.00           | 2,073.76  |
| Condominium                        | No. of Units  | 195        | 0.92      | 0.44     | 0.75           | 1,555.32  |
| Multi-Unit Residential             | No. of Units  | 156        | 0.73      | 0.35     | 0.60           | 1,244.26  |
| Mobile Home Park                   | Spaces        | 156        | 0.73      | 0.35     | 0.60           | 1,244.26  |
| Hotel/Motel/Rooming House          | Rooms         | 125        | 0.54      | 0.28     | 0.48           | 995.40    |
| Store                              | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Supermarket                        | 1000 Sq.Ft.   | 150        | 2.00      | 1.00     | 0.88           | 1,824.91  |
| Shopping Center                    | 1000 Sq.Ft.   | 325        | 3.00      | 1.17     | 1.51           | 3,131.38  |
| Regional Mall                      | 1000 Sq.Ft.   | 150        | 2.10      | 0.77     | 0.82           | 1,700.48  |
| Office Building                    | 1000 Sq.Ft.   | 200        | 0.86      | 0.45     | 0.76           | 1,576.06  |
| Medical, Dental, Veterinary Clinic | 1000 Sq.Ft.   | 300        | 1.29      | 0.68     | 1.14           | 2,364.09  |
| Restaurant                         | 1000 Sq.Ft.   | 1,000      | 16.68     | 5.00     | 5.71           | 11,841.17 |
| Indoor Theatre                     | 1000 Sq.Ft.   | 125        | 0.54      | 0.28     | 0.48           | 995.40    |
| Car Wash - Tunnel, No Recycling    | 1000 Sq.Ft.   | 3,700      | 15.86     | 8.33     | 14.07          | 29,177.80 |
| Car Wash - Tunnel, Recycling       | 1000 Sq.Ft.   | 2,700      | 11.74     | 6.16     | 10.31          | 21,380.47 |
| Car Wash - Wand                    | 1000 Sq.Ft.   | 700        | 3.00      | 1.58     | 2.66           | 5,516.20  |
| Bank, Credit Union                 | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Service Shop, Auto Maint/Repair    | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Animal Kennel                      | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Gas Station                        | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Auto Sales                         | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Wholesale Outlet                   | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Nursery/Greenery                   | 1000 Sq.Ft.   | 25         | 0.11      | 0.06     | 0.10           | 207.38    |
| Lt Manufacturing =< 300,000 sq.ft. | 1000 Sq.Ft.   | 25         | 0.23      | 0.09     | 0.12           | 248.85    |
| Lt manufacturing > 300,000 sq.ft.  | 1000 Sq.Ft.   | 10         | 0.09      | 0.05     | 0.05           | 103.69    |
| Lumber Yard =< 300,000 sq.ft.      | 1000 Sq.Ft.   | 25         | 0.23      | 0.09     | 0.12           | 248.85    |
| Lumber Yard > 300,000 sq.ft.       | 1000 Sq.Ft.   | 10         | 0.09      | 0.05     | 0.05           | 103.69    |
| Warehousing =< 300,000 sq.ft.      | 1000 Sq.Ft.   | 25         | 0.23      | 0.09     | 0.12           | 248.85    |
| Warehousing > 300,000 sq.ft.       | 1000 Sq.Ft.   | 10         | 0.09      | 0.05     | 0.05           | 103.69    |
| Open Storage =< 300,000 sq.ft.     | 1000 Sq.Ft.   | 25         | 0.23      | 0.09     | 0.12           | 248.85    |
| Open Storage > 300,000 sq.ft.      | 1000 Sq.Ft.   | 10         | 0.09      | 0.05     | 0.05           | 103.69    |
| Drive-In Theatre                   | 1000 Sq.Ft.   | 20         | 0.09      | 0.05     | 0.08           | 165.90    |
| Night Club                         | 1000 Sq.Ft.   | 350        | 1.50      | 0.79     | 1.33           | 2,758.10  |
| Bowling/Skating                    | 1000 Sq.Ft.   | 150        | 1.76      | 0.55     | 0.73           | 1,513.84  |
| Club & Lodge Halls                 | 1000 Sq.Ft.   | 125        | 0.54      | 0.27     | 0.47           | 974.67    |
| Auditorium/Amusement               | 1000 Sq.Ft.   | 350        | 1.50      | 0.79     | 1.33           | 2,758.10  |
| Golf Course & Park                 | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Campground, Marina, RV Park        | Spaces        | 55         | 0.34      | 0.14     | 0.22           | 456.23    |
| Convalescent Home                  | Beds          | 125        | 0.54      | 0.28     | 0.48           | 995.40    |
| Laundromat                         | 1000 Sq.Ft.   | 3,825      | 16.40     | 8.61     | 14.55          | 30,173.21 |
| Mortuary/Funeral Home              | 1000 Sq.Ft.   | 100        | 1.33      | 0.67     | 0.59           | 1,223.52  |
| Health Spa without Showers         | 1000 Sq.Ft.   | 300        | 1.29      | 0.68     | 1.14           | 2,364.09  |
| Health Spa with Showers            | 1000 Sq.Ft.   | 600        | 2.58      | 1.35     | 2.28           | 4,728.17  |
| Special Event Center*              | Attendance    | 10         | 0.04      | 0.02     | 0.04           | 82.95     |
| College/University                 | Students      | 20         | 0.09      | 0.05     | 0.08           | 165.90    |
| Private School                     | 1000 Sq.Ft.   | 200        | 0.86      | 0.45     | 0.76           | 1,576.06  |
| Library/Museum                     | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Post Office (Local)                | 1000 Sq.Ft.   | 100        | 0.43      | 0.23     | 0.38           | 788.03    |
| Post Office (Regional)             | 1000 Sq.Ft.   | 25         | 0.23      | 0.09     | 0.12           | 248.85    |
| Church                             | 1000 Sq.Ft.   | 50         | 0.21      | 0.11     | 0.19           | 394.01    |

X = 0.7242    Y = 0.1128    Z = 0.1630

Connection Fee Rate = \$2,073.76

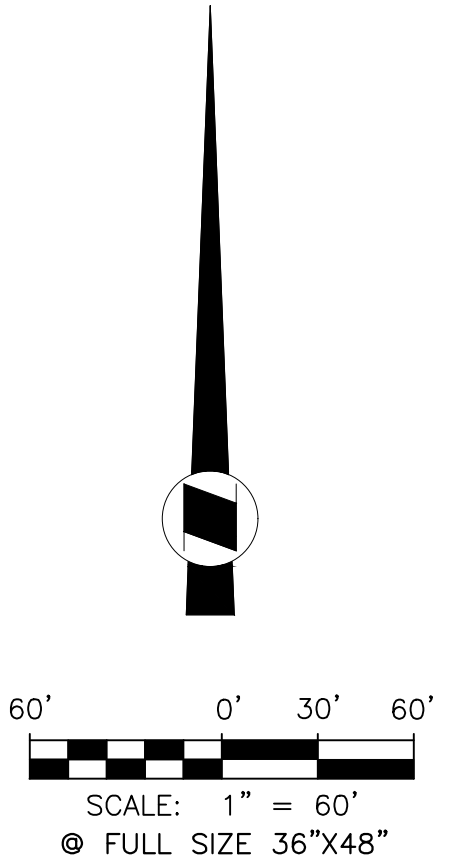
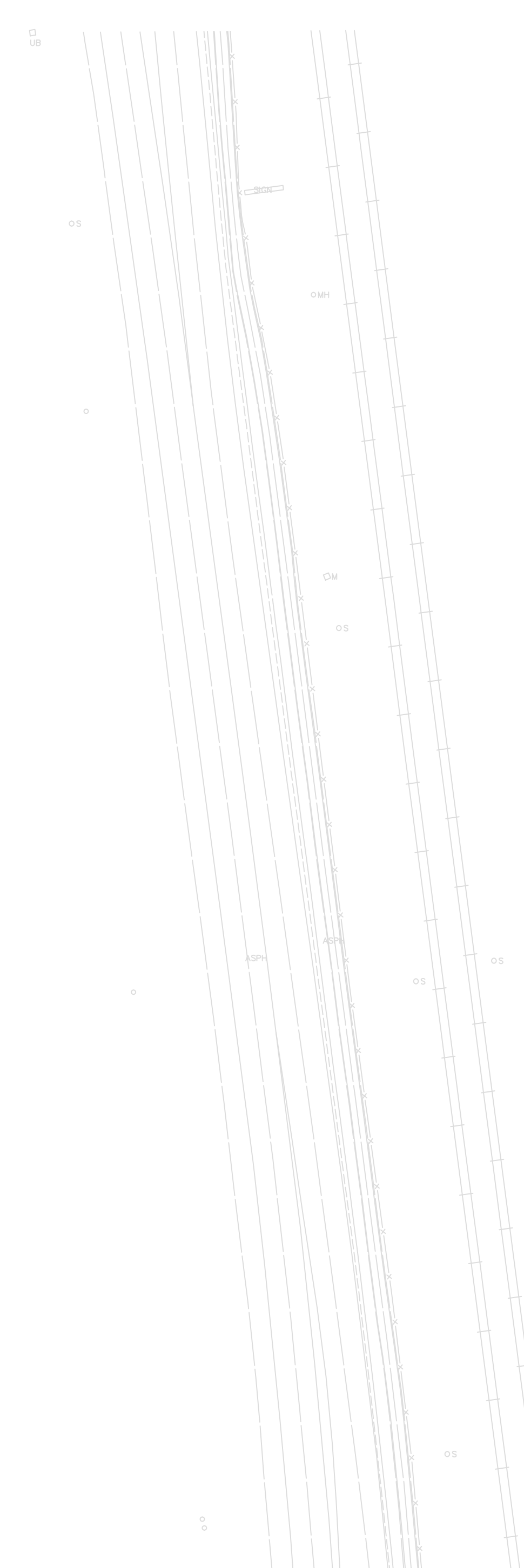
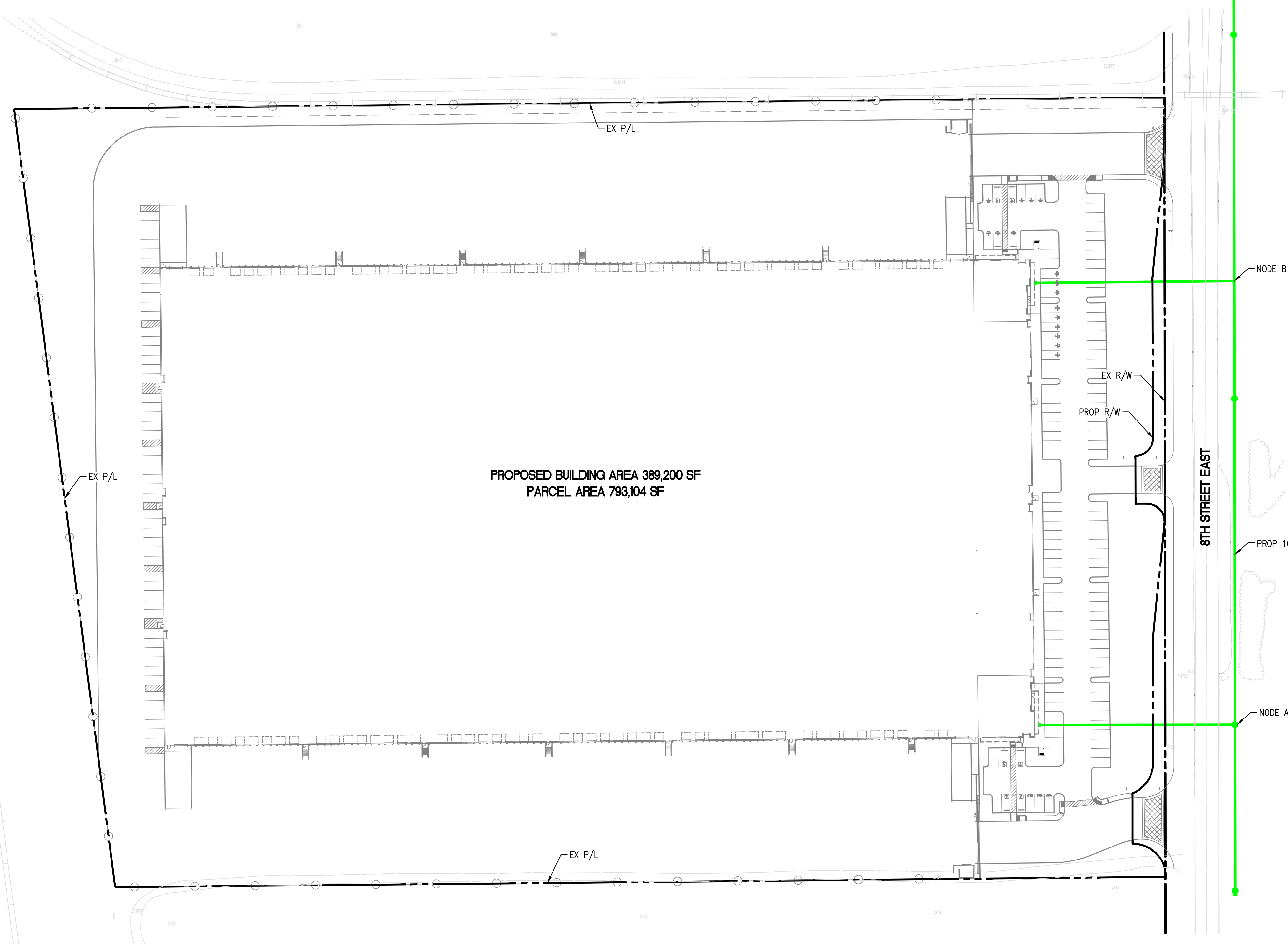
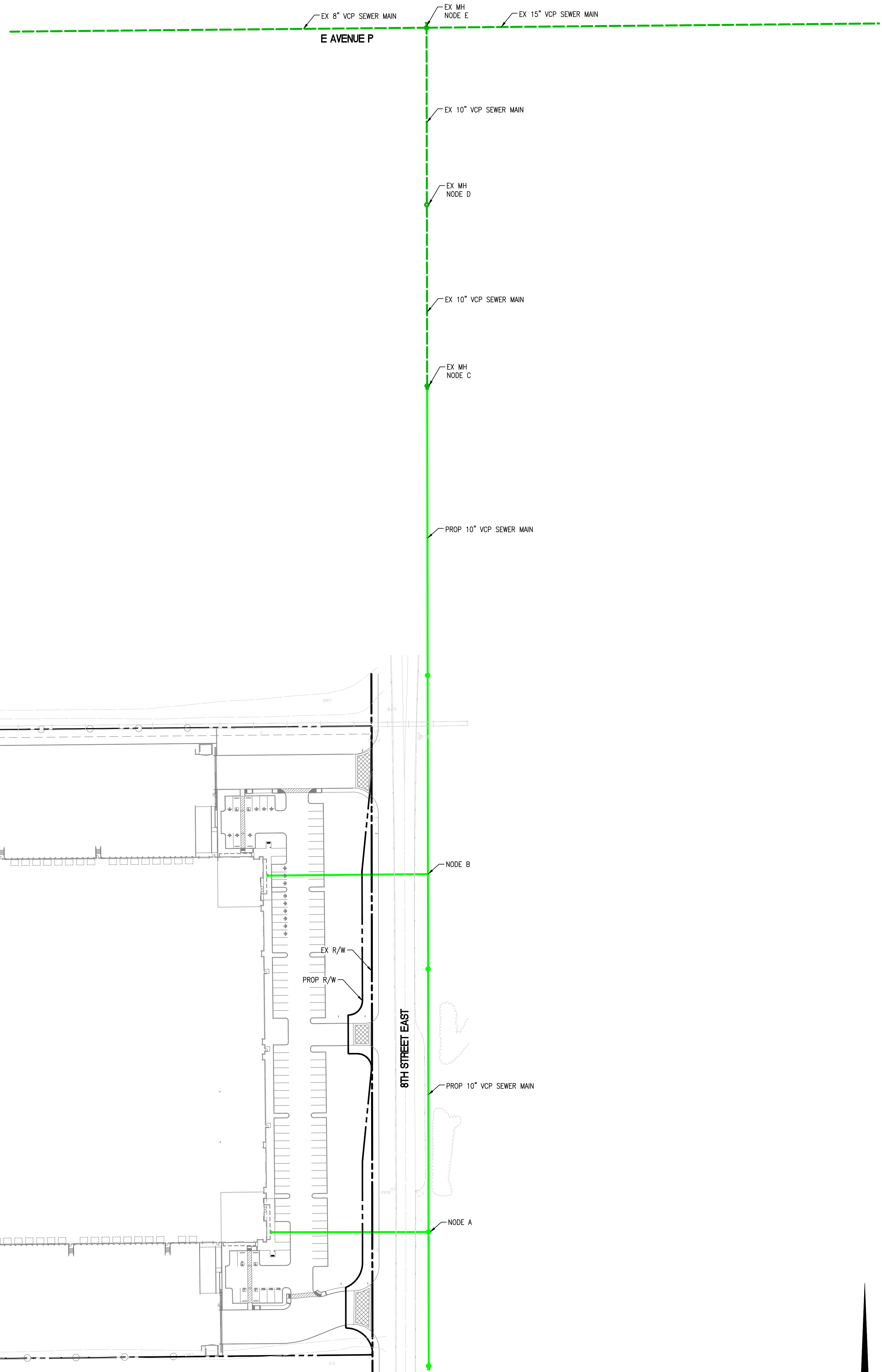
Doc 5705732

\* Including, but not limited to, Convention Center, Fairground, Racetrack, Sports Stadium/Arena

## Appendix B

### Sewer Node Exhibit





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GLENN CHUNG, P.E. R.C.E. 62794 DATE \_\_\_\_\_

PALMDALE 8TH STREET INDUSTRIAL SITE  
 SEWER ANALYSIS  
 PROPOSED SEWER EXHIBIT  
 DATE: 6/1/2022

## Appendix C

### Sewer Area Study for Tract No. 47936 (89-102) (Dated August 1991)

**SEWER AREA STUDY**

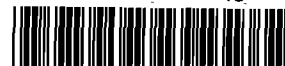
**FOR**

**TRACT NO. 47936**

**(89-102)**

**August 1991**

Prepared by : Cushman and Associates  
43434 Sahuayo Street  
Lancaster CA 93535  
(805) 945-5979



71218PC

The sewer area study for this tract, tract no. 47936, is included in the sewer area study that was done for tract no. 47856, prepared by The Keith Counties on June 22, 1990.

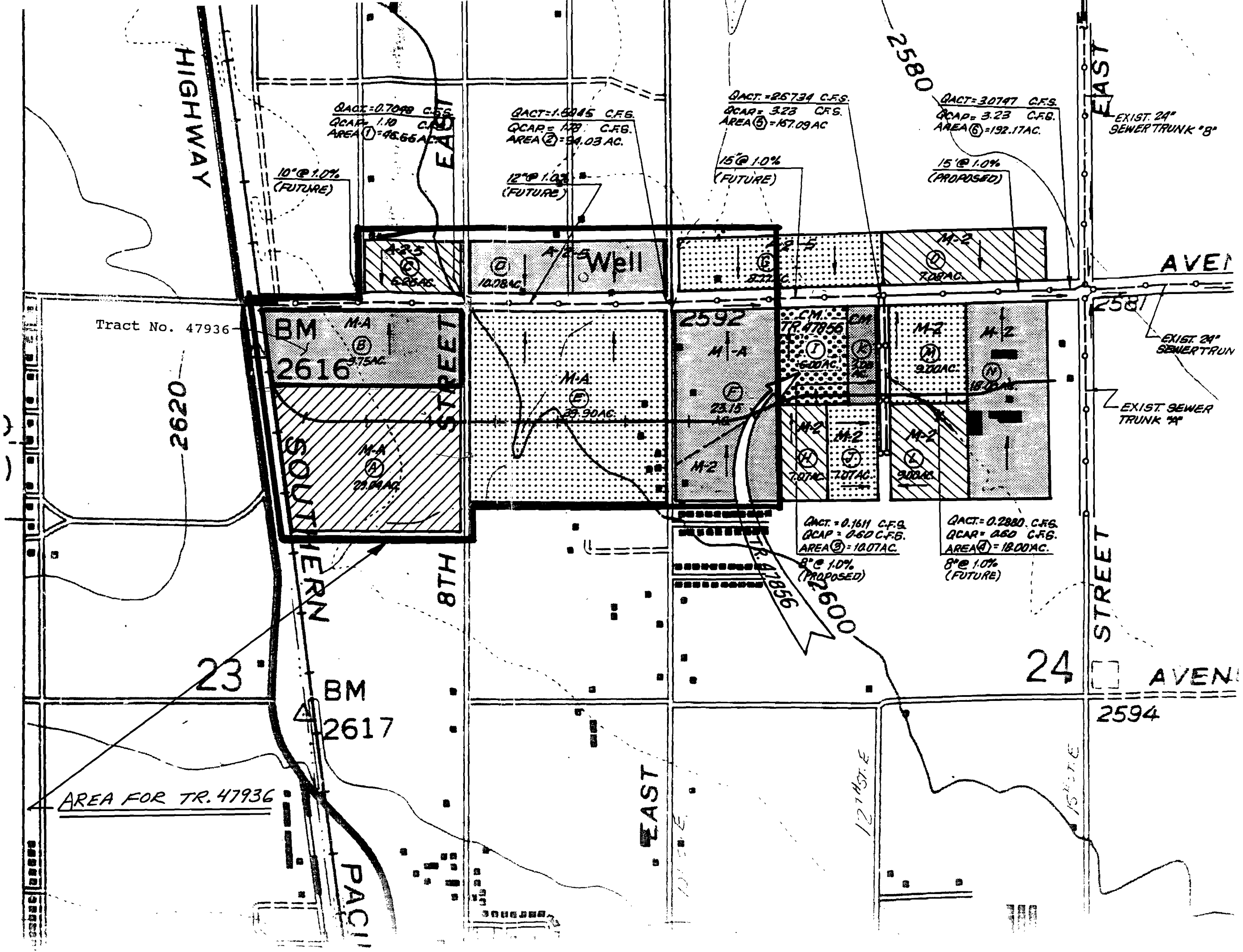
Tract 47936 lies within the area of the approved sewer area study for tract no. 47856. The noted study is attached and should be used as reference for the area and quantity calculations. The attached map (ref. tract no 47856 sewer area study) outlines the tributary area for tract no. 47936.

Refer to attached map & tract no. 47856 sewer area study

| Area   | Acres | Flow<br>(cfs/ac) | Q<br>(actual cfs) | Land use |
|--------|-------|------------------|-------------------|----------|
| A      | 29.04 | .016             | 0.4646            | M-A      |
| B      | 9.75  | .016             | 0.1560            | M-A      |
| C      | 5.26  | .016             | 0.0842            | A-2-5    |
| D      | 10.08 | .016             | 0.1613            | A-2-5    |
| E      | 39.90 | .016             | 0.6384            | M-A      |
| F      | 23.15 | .016             | 0.3704            | M-A/M-2  |
| (1/2)G | 4.38  | .016             | 0.0701            | A-2-5    |

Sewer Flow Calculations:

| Area    | Acres  | Q<br>(actual cfs) | Pipe | Slope | Q cap.<br>(cfs) | Criteria |
|---------|--------|-------------------|------|-------|-----------------|----------|
| 1=B+C   | 44.05  | 0.2402            | 8"   | 0.40% | 0.383           | 1/2 full |
| 2=1+A-E | 94.03  | 1.5045            | 15"  | 0.36% | 1.943           | 1/2 full |
| 3=2+F-G | 121.56 | 1.9450            | 15"  | 0.36% | 1.943           | 1/2 full |



Tract No. 47936

2620

BM 2616

M-A 21.84 AC

8TH

23

BM 2617

AREA FOR TR. 47936

PACIFIC

EAST

2592

QACT = 0.1611 C.F.S.  
QCAP = 0.60 C.F.S.  
AREA 3 = 10.07 AC  
8' @ 1.0% (PROPOSED)

QACT = 0.2880 C.F.S.  
QCAP = 0.60 C.F.S.  
AREA 4 = 18.00 AC  
8' @ 1.0% (FUTURE)

2600

24

AVENUE

2594

15' @ 1.0%

AVENUE

EXIST. 24" SEWER TRUNK

EXIST. SEWER TRUNK 18"

STREET

EAST

EXIST. 24" SEWER TRUNK "8"

2580

QACT = 0.7098 C.F.S.  
QCAP = 1.10 C.F.S.  
AREA 1 = 45.66 AC  
10' @ 1.0% (FUTURE)

QACT = 1.5045 C.F.S.  
QCAP = 1.23 C.F.S.  
AREA 2 = 54.03 AC  
12' @ 1.0% (FUTURE)

QACT = 26734 C.F.S.  
QCAP = 3.23 C.F.S.  
AREA 5 = 167.09 AC  
15' @ 1.0% (FUTURE)

QACT = 30747 C.F.S.  
QCAP = 3.23 C.F.S.  
AREA 6 = 192.17 AC  
15' @ 1.0% (PROPOSED)

22.5  
6.25 AC

10.78 AC

Well

8.72 AC

7.08 AC

CM TR. 47856  
6.00 AC

CM TR. 47856  
3.00 AC

M-2 3.00 AC

M-2 15.00 AC

M-2 7.07 AC

M-2 7.07 AC

M-2 3.00 AC

QACT = 0.1611 C.F.S.  
QCAP = 0.60 C.F.S.  
AREA 3 = 10.07 AC  
8' @ 1.0% (PROPOSED)

QACT = 0.2880 C.F.S.  
QCAP = 0.60 C.F.S.  
AREA 4 = 18.00 AC  
8' @ 1.0% (FUTURE)

12' @ 1.0% E

15' @ 1.0% E