Appendix K
Sewer Service Analysis

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER

CONSULTING ENGINEERS

SEWER SERVICE ANALYSIS
FOR THE
OLIVE PARK APARTMENTS PROJECT
IN THE CITY OF OCEANSIDE

August 8, 2024

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

SEWER SERVICE ANALYSIS
FOR THE
OLIVE PARK APARTMENTS PROJECT
IN THE CITY OF OCEANSIDE

August 8, 2024

8-8-2024

Prepared by:
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2234 Faraday Avenue
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760-438-4422

Job No. 1161-001

DEXTER WILSON ENGINEERING, INC.

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August 8, 2024 1161-001

Capstone Equities
5455 Wilshire Blvd., Suite #1012
Los Angeles, CA 90036

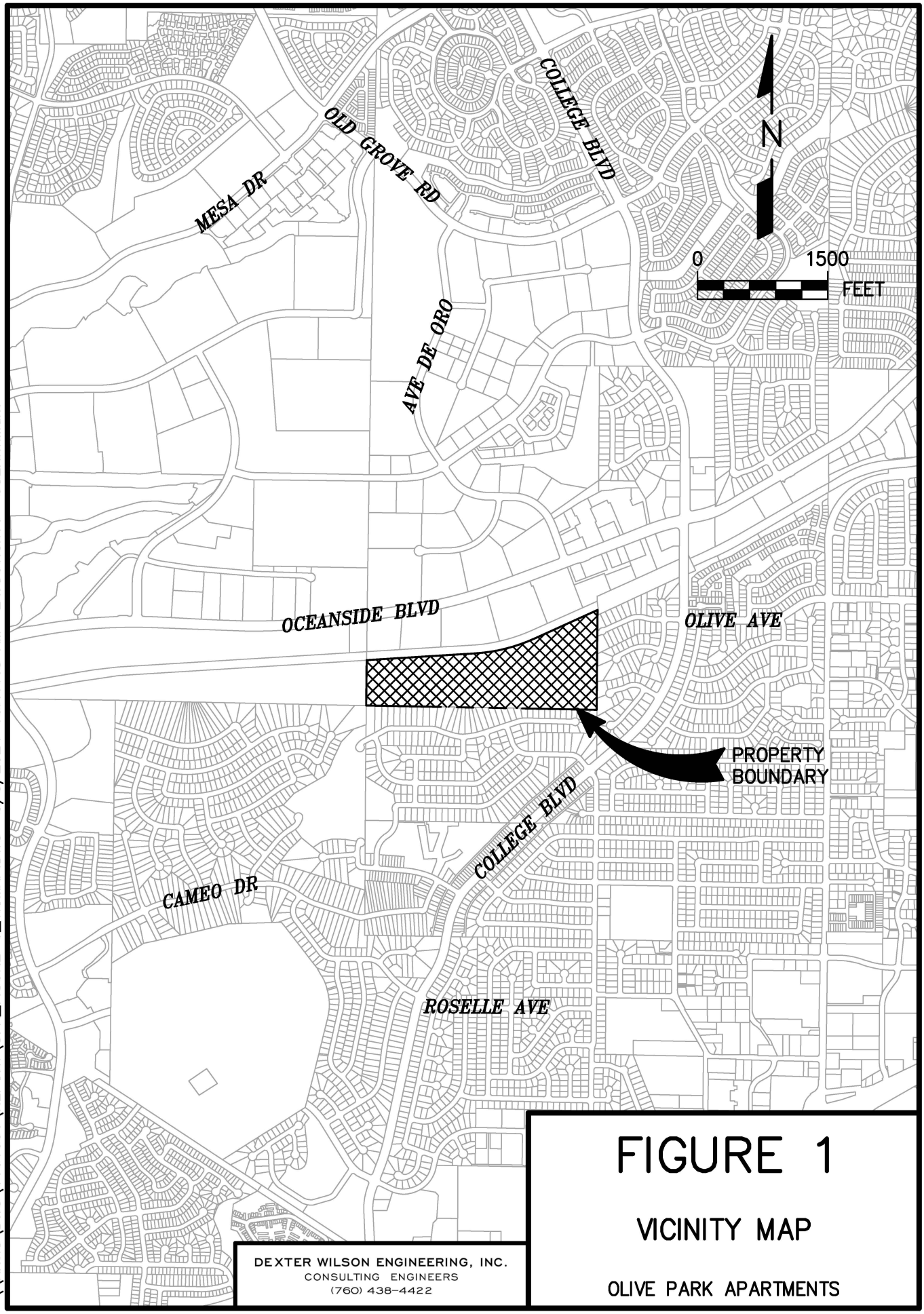
Attention: Brian Mikail, Principal

Subject: Sewer Service Analysis for the Olive Park Apartments Project in the City of Oceanside

Introduction

This report provides an analysis of sewer service to the Olive Park Apartments project in the City of Oceanside. The project is located west of Olive Drive and south of Oceanside Boulevard. Figure 1 provides a vicinity map for the project. A preliminary site plan is included in Appendix A.

The parcel on which the project is located encompasses approximately 43.5 acres and the existing site is presently undeveloped. The project proposes to develop 10.49 acres of the parcel with 282 multi-family dwelling units. The project will connect to the existing City of Oceanside gravity sewer at one location in Olive Drive.



\\ARTIC\DWG\1161001\REPORT\OPA_FIGURE-1_VICMAP.DWG 3/8/2024 10:17:48 AM LAYOUT:8x11 USER:William

FIGURE 1

VICINITY MAP

OLIVE PARK APARTMENTS

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

Sewer System Design Criteria

The design criteria used for the evaluation of the sewerage system impacts by the Olive Park Apartments project are based on the City of Oceanside Water Utilities Department, Water, Sewer, and Reclaimed Water Design & Construction Manual, August 2017, Section 3, Sewer Systems Design Guidelines (Design & Construction Manual). Based on the design manual, average daily sewer generation rates are determined using land use and number of units, the rates are presented in Table 1.

TABLE 1
SEWER GENERATION RATES

Land Use	Generation Rate
Low Density Residential	170 gpd/DU
Mid Density Residential	140 gpd/DU
Industrial	1,000 gpd/acre
Commercial	1,000 gpd/acre
Hotels	100 gpd/room

Peaking Factors

The peaking factor for residential development is identified in the City of Oceanside Design & Construction Manual. To convert average dry weather flows to peak wet weather flows, the peaking factors in Table 2 were used. In addition, in previous sewer studies done in the City of Oceanside the City identified residential dwelling units on lots less than one acre to have an average occupancy of 2.5 persons per dwelling unit. The average occupancy of 2.5 persons per dwelling unit will be assumed for the Olive Park Apartments project as well.

TABLE 2 PEAKING FACTORS	
Population	**Peak Factor**
< 500	3.5
500-1000	2.75
1000-5000	2.50
> 5000	2.00

The peaking factor for non-residential flow (i.e. industrial, commercial, hotels, etc.) is given as a formula in the Manual. The formula is stated: $Q_p = 1.84 \times Q_a^{0.92}$, where Q_p equals peak flow in cubic feet per second (cfs) and Q_a equals average flow in cfs. A copy of the page in the City's Manual where the peaking factors are located is attached as Appendix B.

Manning's "n"

The gravity sewer analyses are made using a computer spreadsheet model which uses the Manning Equation for all its calculations. The Manning's "n" used for the computer spreadsheet model is held as a constant for all depths in a circular conduit. The value of Manning's "n" used for this study is 0.013 which corresponds with the recommended value in the City's design manual.

Depth and Velocity of Flow in Gravity Sewers

Gravity sewer lines are designed to convey peak wet weather flow. Pipes that are 10-inches in diameter and smaller are designed to convey this flow with a maximum depth-to-diameter (d/D) ratio of 0.50. Pipes that are 12-inches and larger in diameter are designed for a maximum d/D ratio of 0.67. Gravity sewer lines are designed to maintain a minimum velocity of 2.0 feet per second at peak flow to prevent the deposition of solids.

Estimated Sewer Flows

Based on the sewage generation factors presented in Table 1, the estimated average sewer flow and peak sewer flow for the Olive Park Apartments project are calculated in Tables 3 and 4.

TABLE 3
ESTIMATED AVERAGE SEWER FLOW FROM OLIVE PARK APARTMENTS

Land Use	Quantity	Sewer Generation	Total (Average) Flow
Mid Density Residential	282	140 gpd	39,480 gpd

TABLE 4
ESTIMATED PEAK SEWER FLOW FROM OLIVE PARK APARTMENTS

Land Use	Average Flow	Peaking Factor[1]	Peak Flow
Mid Density Residential	39,480 gpd	2.75	108,570 gpd

[1] Referencing Table 2, the peaking factors are based on population.

Existing and Proposed Sewer System

The existing and proposed sewer system in the vicinity of the Olive Park project is shown in Exhibit A at the back of this report. Wastewater generated by the Olive Park Apartments project will flow to the existing 8-inch gravity sewer in Olive Drive. This sewer line in Olive Drive currently flows east to Bradley Street and then turns north in Bradley Street connecting to the existing 8" sewer in College Boulevard through an easement.

The Olive Park Apartments project proposes to extend the Olive Drive sewer from the Bradley Street intersection east to College Boulevard. The existing manhole at the intersection of Olive Drive and Bradley Street will be re-channelized so that flow from the development project and from Olive Drive will flow directly toward College Boulevard bypassing Bradley Street. In College Boulevard the new 8" gravity sewer will connect to the existing 8-inch gravity sewer line in College Boulevard at a new manhole. These offsite sewer improvements consisting of the proposed 8-inch public sewer line in Olive Drive between Bradley Street and College Boulevard will be approximately 272 feet in length.

In College Boulevard the existing 8-inch sewer extends north across the NCTD railroad tracks and connects to the existing 12-inch Loma Alta Trunk Sewer. See Exhibit A at the back of this report.

A new sewer manhole will be constructed on the 8" sewer line in Bradley Street just north of the intersection with Olive Drive to provide access to the 8" sewer in Bradley Street. The existing 8-inch public sewer line between the re-channelized manhole and the new manhole in Bradley Street will be abandoned or removed at an approximate length of 15 feet.

Onsite Gravity Sewer System

The onsite gravity sewer system is proposed to be public. The design of the onsite sewer is based on a minimum pipe slope of one (1) percent for minimum 8" diameter sewer pipe. The onsite sewer system will connect into the existing manhole in Olive Drive. The approximate length for the proposed 8-inch onsite public sewer is 625 feet.

Sewer System Analysis

To determine the impact of the Olive Park Apartments project on the existing and proposed sewer system, a sewer system analysis was conducted. The system was analyzed under existing flow conditions and under existing flows plus proposed project flows. The As-Builts included in Appendix C were utilized to determine the sizes and slopes of the sewer lines analyzed in this study. A value of 2.32 feet was added to the As-Built elevations to bring the sewer inverts to the NAVD88 Datum.

The analysis of the sewer system under existing flows is provided in Appendix D and the analysis for existing plus proposed flows is presented in Appendix E. Exhibit A presents the manhole diagram, sub-basin boundaries, public sewer system downstream of the project within the analyzed area, and the proposed onsite public sewer. Appendix F presents a table that shows the existing contributing residential units for each manhole sub-basin shown on Exhibit A.

The sewer capacity analysis includes the proposed Olive Park Apartments project as well as the existing development downstream of the project. The existing plus proposed project flows analysis begins with the aforementioned proposed onsite public sewer collection system beginning at Manhole 9 and extending east to the existing manhole at the west end of Olive Drive (Manhole 7) and continuing east and north to the existing 12" public sewer at the intersection College Boulevard just south of Oceanside Boulevard (MH 100).

The wastewater is then conveyed to the west through the existing 12" public Loma Alta Trunk Sewer south of and parallel to Oceanside Boulevard and north of an parallel to the NCTD railroad tracks. The 12" and larger sewer mains are not included in this analysis.

Sewer System Analysis Results

The results of the sewer flow analysis indicate that with the proposed 282 Olive Park Apartments development project the sewer lines between the property boundary and the connection to the existing 12" public sewer line have a maximum depth-to-diameter (d/D) ratio of 0.26 d/D under existing peak flow and 0.31 d/D under existing plus proposed project peak flow.

The minimum velocity achieved under existing peak flow is 0.60 fps at the west end of Olive Drive where there are few dwelling units contributing flow into the 8" sewer line which is at 0.60 percent slope. Under existing plus proposed project peak flow the flow velocity in this segment of existing sewer is increased to 2.04 fps. Thus, the velocities within the existing sewer system are improved with the addition of the proposed Olive Park Apartments project.

Depth of flow in the proposed onsite 8" public gravity sewer at 1 percent slope will be 0.25 d/D with a velocity of 2.26 fps. These results are shown in the top two rows of the spreadsheet calculations in Appendix E.

Conclusions

The following conclusions relate to providing sewer service to the Olive Park Apartments project.

1. The development of the project is projected to result in an average sewage flow of 39,480 gpd.

2. The property can receive sewer service by connecting to the existing public 8" sewer line at the west end of Olive Drive and building a sewer extension to College Boulevard.

3. The proposed offsite sewer improvements needed to provide sewer service to the proposed project include construction of an 8-inch public sewer line and manholes between Bradley Street and College Boulevard, re-channelization of the existing manhole at the intersection of Olive Drive and Bradley Street, abandonment or removal of a short section of the existing 8-inch sewer line north of the re-channelized manhole, and construction of a new manhole in Bradley Street.

4. The public sewer system analysis conducted indicates that the existing and proposed sewer lines downstream of the project site can accommodate the wastewater flows from the proposed Olive Park Apartments project.

5. The existing sewer lines are calculated to flow at a maximum depth of 0.26 d/D under existing peak flow and 0.31 d/D under existing plus proposed project peak flow.

6. The onsite gravity sewer system is proposed to be a public 8-inch sewer line at a minimum slope of one percent.

Thank you for the opportunity to provide assistance on this project. If you have any questions about the analysis or conclusions of this study, please let us know.

Dexter Wilson Engineering, Inc.

Andrew Oven, P.E.

AO:WT:ah

Attachments

APPENDIX A

PRELIMINARY SITE PLAN


APN 162-241-05
APN 162-111-03
COLLEGE BLVD.
BRADLEY ST.
APN 162-381-10
LOT 172
APN 162-381-11
LOT 173
APN 162-381-20
LOT 174
APN 162-381-30
LOT 175
APN 162-381-40
LOT 176
APN 162-381-50
LOT 177
APN 162-381-60
LOT 178
APN 162-381-70
LOT 179
APN 162-381-90
LOT 180
APN 162-381-19
LOT 181
APN 162-381-20
LOT 182
APN 162-382-42
LOT 183
APN 162-382-20
LOT 205
APN 162-382-19
LOT 206
OLIVE DR.
OLIVE DRIVE
CRYSTAL ST.
BLDG. 1
BLDG. 2

Olive Park Apartments

Capstone Equities, LLC

PHASE 1 + PHASE 2 UNIT MIX

PHASE 1	Unit Type	Count	Mix/Unit Type	Mix %	Unit Type %
A1	1x1	56	78	32.6%	45.3%
A2	1x1	11		6.4%	
A3	1x1	11		6.4%	
B1	2x1	51	51	29.7%	29.7%
C1	3x2	43	43	25.0%	25.0%
TOTAL		**172**	**172**	**100.0%**	**100.0%**

PHASE 2	Unit Type	Count	Mix/Unit Type	Mix %	Unit Type %
A1	1x1	58	86	52.7%	78.2%
A2	1x1	16		14.5%	
A3	1x1	12		10.9%	
B1	2x1	24	24	21.8%	21.8%
C1	3x2	0	0	0.0%	0.0%
TOTAL		**110**	**110**	**100.0%**	**100.0%**

PHASES 1 + 2	Unit Type	Count	Mix/Unit Type	Mix %	Unit Type %
A1	1x1	114	164	40.4%	58.2%
A2	1x1	27		9.6%	
A3	1x1	23		8.2%	
B1	2x1	75	75	26.6%	26.6%
C1	3x2	43	43	15.2%	15.2%
TOTAL		**282**	**282**	**100%**	**100%**

APPENDIX B

PEAKING FACTORS FROM THE CITY OF OCEANSIDE WATER UTILITIES DEPARTMENT, WATER, SEWER AND RECLAIMED WATER DESIGN & CONSTRUCTION MANUAL

Low Density Residential	EA-R, EB-R, SDF-R	170 gpd/EDU
Mid Density Residential	MDA-R, MDB-R, MDC-R, HD-R, UHD-R	140 gpd/EDU
Industrial	LI	1,000 gpd/acre
Commercial	CC, NC, GC, SC, PC, GI, RP-I, CI, PI	1,000 gpd/acre
Hotels		100 gpd/room

Peak daily flows for residential developments, shall be based on a ratio of peak to average flow as shown below:

Population	Ratio of Peak to Average Flow
Less than 500	3.5
500 to 1,000	2.75
1,000 to 5,000	2.50
Greater than 5,000	2.00

3. Peak daily flows for all other uses shall be based on the following formula:

$$Qp = 1.84\ Qa^{.92}$$

Where Qp = Peak Flow in CFS
Qa = Average Flow in CFS

I. Residential area easements shall be constructed by the developer. They shall be fenced on both sides parallel to the easement with a gate at the entrance and the exit. Easements shall be dedicated to the City and maintained by Property Owner with a lock feature.

J. All sewer mains not located within the public right-of-way shall be provided with a minimum 20-foot wide sewer easement. In some special cases, a wider easement may be required; the Water Utilities Director shall determine size. All easements shall be easily accessible to City maintenance equipment with all weather roadways. An access road will be built for trucks and as approved by the Water Utilities Department.

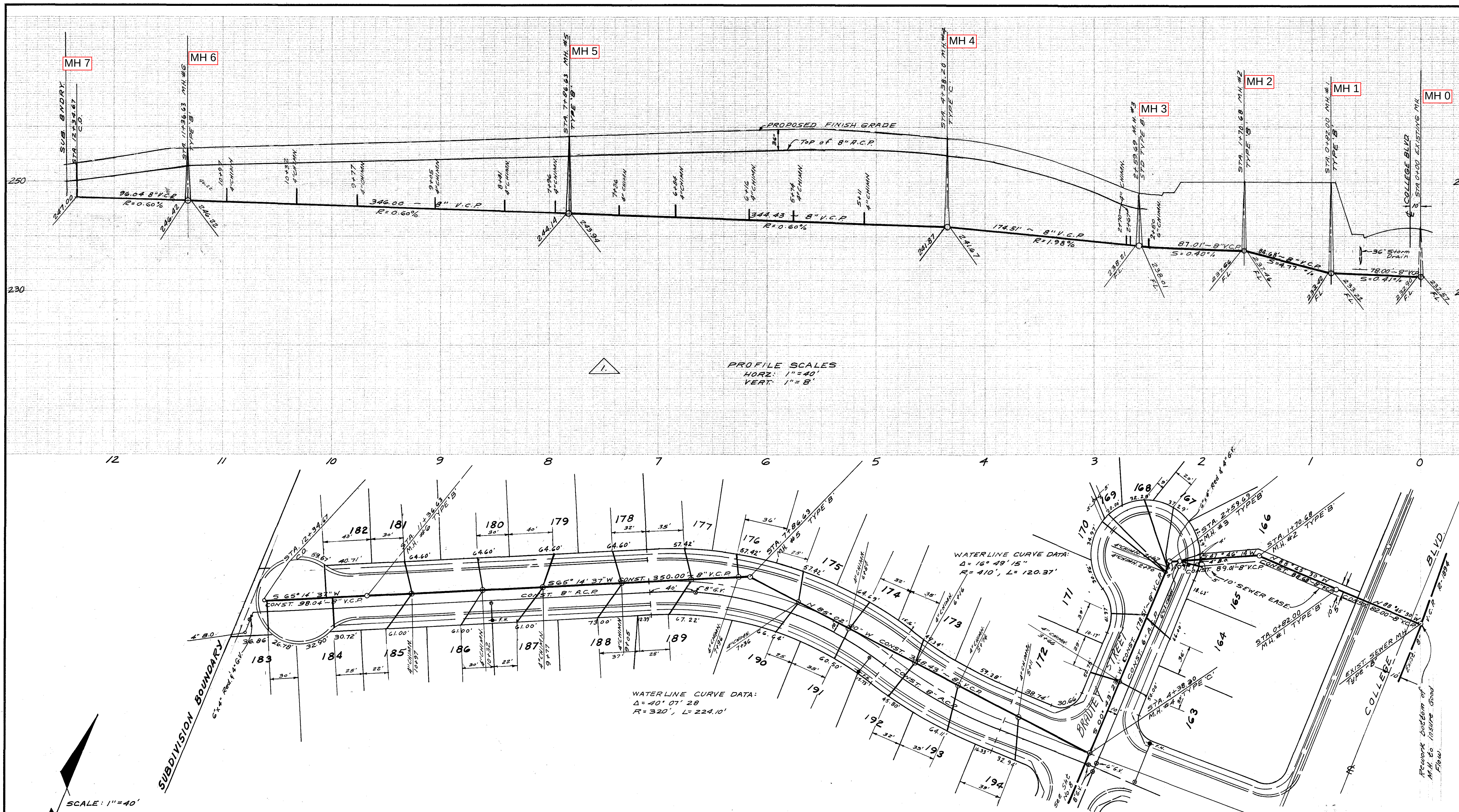
K. All utility easements that contain sewer mains, which will be publicly maintained, shall demonstrate that the largest vehicle within the Sewer Collections Fleet can transverse the streets without damage to both public and private property. The turning radius of this vehicle will be made available upon request.

L. Where water and sewer mains are located within the same easement, the minimum easement size shall be 30 feet wide. All easements shall be easily accessible to the City's maintenance equipment with all-weather access roadways. No trees or structures or building overhang are allowed within the City easements. When easements are located on private properties, the property owner shall keep the easement free and clear of weeds and debris.

M. 3-inch minimum width color coded detector tape marked "SEWER" in 1-½ inch black letters shall be placed on the compacted and graded bedding material one foot above and centered over the sewer main prior to backfilling the trench.

APPENDIX C

SEWER AS-BUILTS



'AS BUILT'

E. BRIAN SMITH, R.C.E. 13,817

PREPARED BY:
BRIAN SMITH ENGINEERS INC.
2656 STATE STREET
CARLSBAD, CALIFORNIA

REG. CIVIL ENGINEER NO. 13817

DATE: 1-29-76

SHEET 7	CITY OF OCEANSIDE	8 SHEETS

PLAN & PROFILE SEWER & WATER
IMPROVEMENTS IN COLLEGE PARK UNIT No. 8
OCEANSIDE CALIFORNIA

APPROVED: 2-2-76 CITY ENGINEER

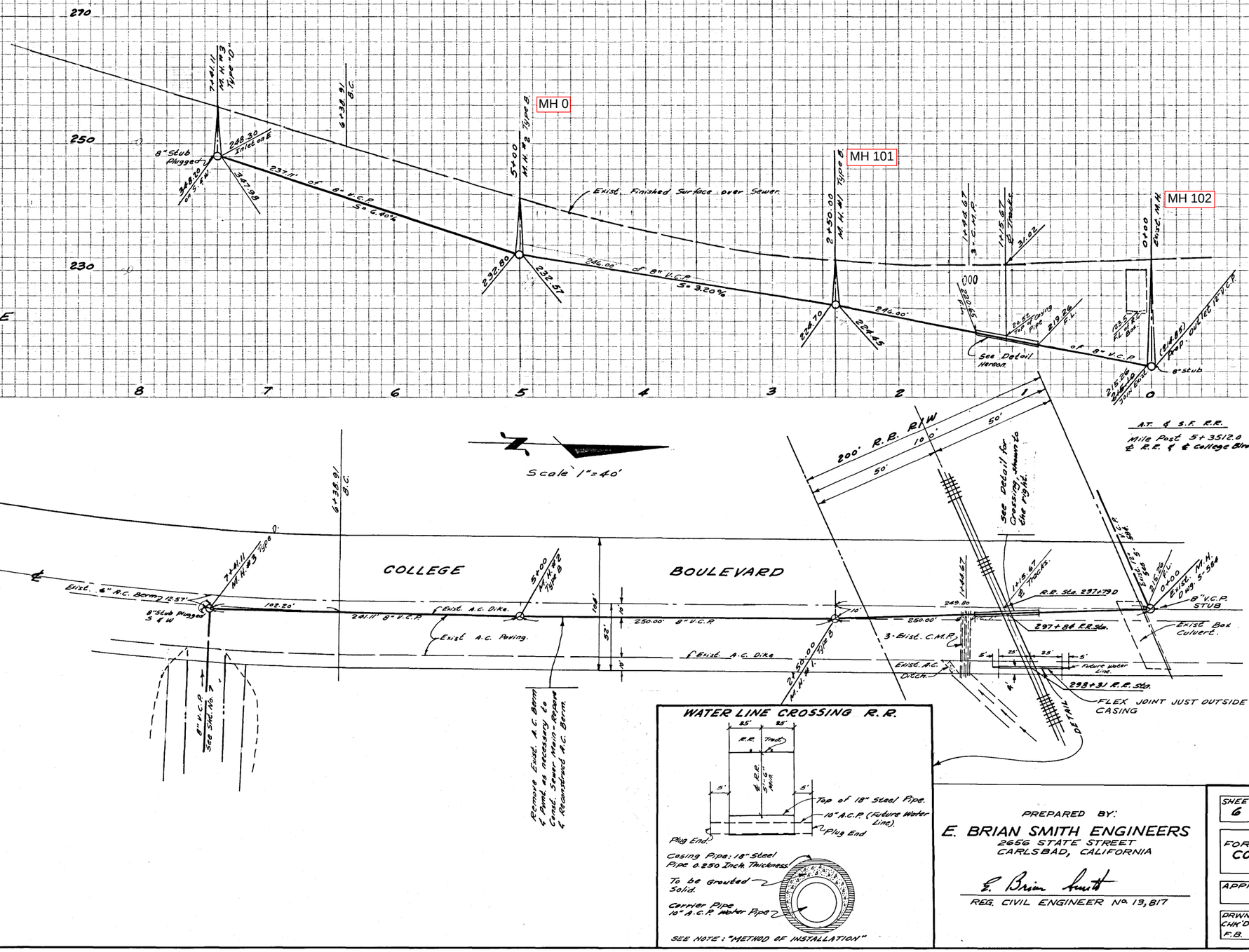
DRAWN BY:
CHK'D BY:
F.B. L.B.

REVISED	DATE	O.K.
Sewer & Grade	6/12-76	

DATE:
SCALE
HORIZ. 1" = 40'
VERT. 1" = 8'

R-2490

FILE NO. 3613-8



NOTES FOR CROSSING R.R.

METHOD OF INSTALLATION: (S.2.5.1)

(b) Bored or jacked installation shall have a bored hole diameter essentially the same as the outside diameter of the pipe plus the thickness of the protective coating. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe (incl coating) by more than approx. 1 in removal measures as approved by the chief engineer of the railway comp. shall be taken. Boring operation shall not be stopped if such stoppage would be detrimental to the railway.

(c) Tunnelling operation shall be conducted as approved by the engineer. If voids are caused by the tunnelling operations, they shall be filled by pressure grouting or by other approved methods which will provide proper support.

NO WORK IS TO BE DONE WITHIN RAILROAD RIGHT OF WAY UNTIL ENCHROACHMENT PERMIT HAS BEEN ISSUED BY A.T. & S.F. R.R.

"AS BUILT"

PREPARED BY:
E. BRIAN SMITH ENGINEERS
2656 STATE STREET
CARLSBAD, CALIFORNIA
E. Brian Smith
REG. CIVIL ENGINEER No 13,817

SHEET 6 | CITY OF OCEANSIDE ENGINEERING DEPARTMENT | 12 SHEETS

PLANS & PROFILES FOR SEWER & WATER IMPROVEMENTS IN COLLEGE PARK ESTATES UNIT No. 5

APPROVED: Howard A. Ritter CITY ENGINEER — DATE: 2-15-73

SCALES: HORIZ: AS SHOWN VERT: AS SHOWN

DRAWN BY: — CHK'D. BY: — F.B. L.B.

REVISED	DATE	O.K.

DRAWING No. E 1894

2-3613

APPENDIX D

SEWER SYSTEM COMPUTER MODELING RESULTS
EXISTING FLOW

DATE: 8/7/2024

JOB NUMBER: 1161-001

SEWER STUDY SUMMARY

FOR: Olive Park Apartments - Existing

BY: Dexter Wilson Engineering, Inc.

FROM	IE	TO	IE	Δ ELEVATION (ft)	POP. PER D.U.	EDUs		POPULATION SERVED		SEWAGE PER EDU/DAY (gpd/EDU)	AVG. DRY WEATHER FLOW (gpd)	PEAKING FACTOR	PEAK FLOW (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' [1]	dn (feet)	dn/D[2]	C_a for Velocity[3]	VELOCITY (fps)
						IN-LINE	TOTAL	IN-LINE	TOTAL					M.G.D.	C.F.S.							
7	249.32	6	248.54	0.78	2.5	3.0	3.0	7.5	7.5	170	510	3.500	1,785	0.002	0.003	8	0.60	0.001367	0.02653	0.040	0.0104	0.60
6	248.54	5	246.26	2.28	2.5	11.0	14.0	27.5	35.0	170	2,380	3.500	8,330	0.008	0.013	8	0.60	0.006378	0.05465	0.082	0.0305	0.95
5	246.26	4	243.99	2.27	2.5	8.0	22.0	20.0	55.0	170	3,740	3.500	13,090	0.013	0.020	8	0.60	0.010018	0.06776	0.102	0.0419	1.09
4	243.99	3	242.44	1.55	2.5	66.0	88.0	165.0	220.0	170	14,960	3.500	52,360	0.052	0.081	8	1.00	0.031053	0.11695	0.175	0.0926	1.97
3	242.24	2	241.01	1.23	2.5	0.0	88.0	0.0	220.0	170	14,960	3.500	52,360	0.052	0.081	8	1.00	0.031053	0.11695	0.175	0.0926	1.97
2	241.01	1	237.94	3.07	2.5	278.0	366.0	695.0	915.0	170	62,220	2.750	171,105	0.171	0.265	8	6.40	0.040125	0.13254	0.199	0.1109	5.37
1	237.94	0	234.89	3.05	2.5	21.0	387.0	52.5	967.5	170	65,790	2.750	180,923	0.181	0.280	8	6.40	0.042415	0.13622	0.204	0.1153	5.46
0	234.89	101	226.77	8.12	2.5	10.0	397.0	25.0	992.5	170	67,490	2.750	185,598	0.186	0.287	8	3.20	0.061562	0.16417	0.246	0.1503	4.30
101	226.77	100	217.57	9.20	2.5	116.0	513.0	290.0	1,282.5	170	87,210	2.500	218,025	0.218	0.337	8	3.74	0.066863	0.17111	0.257	0.1594	4.76

Total EDUS
513.0

Total Pop.
1,283

Min Slope
0.60

Max dn/D
0.26

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

APPENDIX E

SEWER SYSTEM COMPUTER MODELING RESULTS
EXISTING PLUS THE PROPOSED PROJECT FLOW

DATE: 8/7/2024

JOB NUMBER: 1161-001

SEWER STUDY SUMMARY

FOR: Olive Park Apartments - Existing plus Proposed Project Flows

BY: Dexter Wilson Engineering, Inc.

FROM	IE	TO	IE	Δ ELEVATION (ft)	POP. PER D.U.	EDUs		POPULATION SERVED		SEWAGE PER CAPITA/DAY (gpd/person)	AVG. DRY WEATHER FLOW (gpd)	PEAKING FACTOR	PEAK FLOW (gpd)	PEAK FLOW (DESIGN FLOW)		LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (fps)
						IN-LINE	TOTAL	IN-LINE	TOTAL					M.G.D.	C.F.S.							
9	255.60	8	252.50	3.10	2.5	172.0	172.0	430.0	430.0	140	24,080	3.500	84,280	0.084	0.130	8	1.00	0.049984	0.14783	0.222	0.1296	2.26
8	252.50	7	249.32	3.18	2.5	110.0	282.0	275.0	705.0	140	39,480	2.750	108,570	0.109	0.168	8	1.00	0.064389	0.16794	0.252	0.1552	2.44
7	249.32	6	248.54	0.78	2.5	3.0	285.0	7.5	712.5	170	39,990	2.750	109,973	0.110	0.170	8	0.60	0.084200	0.19250	0.289	0.1879	2.04
6	248.54	5	246.26	2.28	2.5	11.0	296.0	27.5	740.0	170	41,860	2.750	115,115	0.115	0.178	8	0.60	0.088138	0.19705	0.296	0.1941	2.06
5	246.26	4	243.99	2.27	2.5	8.0	304.0	20.0	760.0	170	43,220	2.750	118,855	0.119	0.184	8	0.60	0.090961	0.20029	0.300	0.1986	2.08
4	243.99	3	242.44	1.55	2.5	66.0	370.0	165.0	925.0	170	54,440	2.750	149,710	0.150	0.232	8	1.00	0.088788	0.19780	0.297	0.1952	2.67
3	242.24	2	241.01	1.23	2.5	0.0	370.0	0.0	925.0	170	54,440	2.750	149,710	0.150	0.232	8	1.00	0.088788	0.19780	0.297	0.1952	2.67
2	241.01	1	237.94	3.07	2.5	278.0	648.0	695.0	1,620.0	170	101,700	2.500	254,250	0.254	0.393	8	6.40	0.059623	0.16153	0.242	0.1469	6.03
1	237.94	0	234.89	3.05	2.5	21.0	669.0	52.5	1,672.5	170	105,270	2.500	263,175	0.263	0.407	8	6.40	0.061699	0.16435	0.247	0.1505	6.09
0	234.89	101	226.77	8.12	2.5	10.0	679.0	25.0	1,697.5	170	106,970	2.500	267,425	0.267	0.414	8	3.20	0.088704	0.19771	0.297	0.1950	4.77
101	226.77	100	217.57	9.20	2.5	116.0	795.0	290.0	1,987.5	170	126,690	2.500	316,725	0.317	0.490	8	3.74	0.097132	0.20725	0.311	0.2082	5.30

Total EDUS	Total Pop.	Min Slope	Max dn/D
795.0	1,988	0.60	0.31

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

APPENDIX F

SUB-BASIN INFORMATION IN THE MODELED AREA

Olive Park Apartments Sub-Basin Information

SUB-BASIN[1]	EXISTING LOW DENSITY RESIDENTIAL EDUs IN SUB-BASIN
MH 7	3
MH 6	11
MH 5	8
MH 4	66
MH 3	0
MH 2	278
MH 1	21
MH 0	10
MH 101	116

Note: [1] Reference Exhibit A for the Sub-Basin locations and boundaries.

EXHIBIT A

MANHOLE AND SUB-BASIN DIAGRAM

LEGEND

PROPERTY BOUNDARY

EXISTING PUBLIC GRAVITY SEWER LINE

EXISTING PUBLIC GRAVITY SEWER LINE TO BE ABANDONED OR REMOVED

PROPOSED PUBLIC GRAVITY SEWER LINE

(103) MANHOLE NUMBER

MANHOLE SUB-BASIN BOUNDARY

MH 103 MANHOLE SUB-BASIN LABEL

PROJECT IMPACT LIMITS

PROPERTY BOUNDARY

OCEANSIDE BLVD

ESPERANZA WAY

NORTH AVE

OLIVE DR

JOANN DR

BRADLEY ST

COLLEGE BLVD

KIMBERLY LN

RAVINE RD

MH 0 MH 1 MH 2 MH 4 MH 5 MH 6 MH 7 MH 101

EX.8" EX.12" EX.15"

N

0 300 FEET

EXHIBIT A

MANHOLE AND SUB-BASIN DIAGRAM

OLIVE PARK APARTMENTS

DEXTER WILSON ENGINEERING, INC.
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