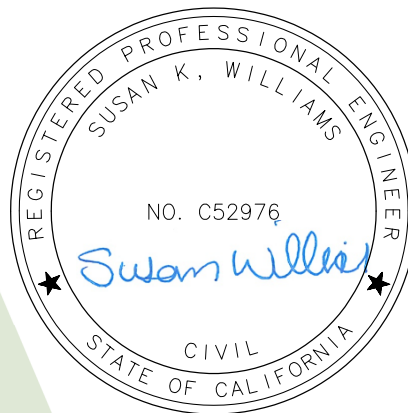




SEWER ANALYSIS REPORT

THE RITZ-CARLTON RESIDENCES NEWPORT BEACH

NEWPORT BEACH, CA



PREPARED FOR:
NEWPORT CENTER HOTEL, LLC
4901 BIRCH ST
NEWPORT BEACH, CA 92660
949.463.0085

PREPARED BY:
FUSCOE ENGINEERING, INC.
16795 VON KARMAN, SUITE 100
IRVINE, CA 92606
(949) 474-1960

PROJECT MANAGER:
ORIANA SLASOR, P.E.

DATE PREPARED: DECEMBER 2021

JOB NUMBER 1112-008-02

full circle thinking®



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December 2021

1112-008-02



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1.0 INTRODUCTION

1.1 PURPOSE OF STUDY

The purpose of this study is to analyze the City of Newport Beach public sanitary sewer systems for the existing and proposed conditions for the proposed Ritz-Carlton Residences project. In addition, this report includes recommendations for sewer upgrades, if any, that would be required to accommodate wastewater flows associated with the proposed project development.

1.2 SITE DESCRIPTION

The project site is the Marriott Resort Hotel & Spa and it encompasses a total area of approximately 9.53 acres in the City of Newport Beach. The existing site consists of the hotel & spa with 532 hotel rooms, along with associated parking. The Ritz-Carlton Residences project is in the southerly portion of the property and will encompass 3.95 acres of the total area. Adjacent land uses include other commercial development to the east, a golf course (Newport Beach Country Club) to the west, and residential property to the north and south.

The site is located westerly of the intersection of Newport Center Drive and Santa Barbara Drive. A Vicinity Map is shown below.

Project information along with the Vesting Tentative Tract Map are included as Appendix 1 of this report.



Vicinity Map

1.3 EXISTING SEWER FACILITIES

Wastewater from the site currently discharges to the City's public sewer system through two 8" sewer laterals on the east side of the project site. The laterals connect to the existing 10" sewer main in Newport Center Drive.

The location of this sewer system is shown on the Public Sewer Exhibit, included in this report as Appendix 2. As-Built Plans of the existing sewer system is included in Appendix 3.

1.4 PROPOSED DEVELOPMENT

The proposed project development will consist of demolition of one of the existing hotel buildings and construction of a new building. The proposed building will be in the southerly portion of the project site and will consist of 159 hotel-branded residences and 5 levels of subterranean parking. Construction of 35,000 square feet of amenity space is included in the proposed development. A Project Description, prepared by CAA Planning, and an email correspondence from MVE Architects (Appendix 1) describe the type and quantity of proposed hotel-branded residences, the number of existing hotel rooms that will remain, and the square footage of proposed amenity space.

The proposed unit count and type will be as follows:

Unit Type	Qty.
1 Bed	26
2 Bed	112
3 Bed	18
4 Bed	2
5 Bed	1
Hotel Room (Remaining from Existing Conditions)	373
Total	532

2.0 METHODOLOGY AND EXISTING SEWER FLOWS

The City of Newport Beach has published design criteria for public sewer systems. A copy of this criteria, along with City of Los Angeles flow coefficients for commercial areas, are included in this report as Appendix 4. The design criteria includes the following parameters:

- Design flow shall not exceed half-full;
- Manning's roughness coefficient (Manning's "n") shall not be less than 0.013;
- Wastewater calculations shall be 265 gpd for development size between 151 to 250 units;
- Peaking factor for development size between 151 and 250 units shall be 3.40 times average flow.

The investigation included obtaining the current wastewater flows in the existing sewer system that will be accepting the project flows. This was achieved by a flow test of two weeks, conducted from September 29 – October 15, 2021, by USCubed. The manhole (#K19_046) location is shown on the Public Sewer Exhibit (Appendix 2). The Sewer Monitoring Report is included as Appendix 5.

The manhole was monitored using Hach Flo-Dar Flow Meters, and included the following analyses:

- Assessed permitting and traffic control at the site on Newport Center Dr in Newport Beach, CA.
- Obtained a City Encroachment Permit, which required a formal traffic control plan.
- Installed and removed traffic control in accord with approved traffic control plan per site-specific California Temporary Traffic Control Handbook (CATTCH) requirements for both the installation and removal of equipment.
- Validated the site for suitability for sewer flow monitoring for the Newport Marriott Residences Project.
 - MHK 19_046 had flows entering the manhole from the east and the north.
 - The site had moderate open channel hydraulics with minor turbulence from inflow from the eastern line.
- Installed and calibrated the flow monitoring equipment at the site per manufacturer recommendations on 9/29/2021.
 - Follow-up on the installation confirmed equipment was reading properly.
 - Collected 15-minute interval depth and velocity data points over the entire monitoring period.
- Removed the equipment on 10/15/2021 and validated the data.
 - All of the equipment went through diagnostic testing before and after the study with less than a 1% deviation between manual and meter level readings and less than a 5% deviation between manual and meter velocity readings.
 - Equipment calibration was verified in accordance with manufacturer specifications.

The Flo-Dar methodology used by USCubed consists of transmission of a digital Doppler radar beam that interacts with the fluid and reflects signals at a different frequency than that which was transmitted. The flow-depths were detected by ultrasonic pulse echo. Flowrate was then calculated based on the continuity equation, as follows:

$$Q = V \times A, \text{ Where } Q = \text{Flow}, V = \text{Average Velocity and } A = \text{Area.}$$

Table 1 presents the results of the peak wastewater flows that were obtained from the flow monitoring operations, along with the calculated flow-depths and percent-full for the 10" sewer main at the location of manhole K19_046. The sewer monitoring report is included as Appendix 5. The Kutter Flow-Depth calculations are included in Appendix 7. The results in show the sewer main is 29% full for the existing condition.

Table 1 – Existing Condition Peak Wastewater Flows

MH #	Street	Pipe Size/ Slope	Peak Flow (gpm)	Peak Flow (cfs)	Flow Depth (inches)	%-Full
K19_046	Newport Center Drive	10" S=0.88%	151.08 (outflow)	0.337 (outflow)	2.9" (Calibrated)	29%

3.0 PROPOSED SEWER FLOWS

The proposed project wastewater peak flows were calculated for this project using the following information, from the Project Information (See Appendix 1):

- 159 Proposed hotel-branded residences
- 373 Existing hotel rooms to remain
- 35,000 Square feet of proposed amenities

The sewer generation calculations and tables are included in Appendix 6 of this report. The proposed development is anticipated to generate net new flows of 0.161 cfs, which would result in a proposed condition flow rate of 0.498 cfs in the existing 10" City sewer system. There are two existing 8" sewer laterals that are available to service the project site. The project wastewater will discharge through 1 or both existing 8" laterals, which connect to the existing 10" sewer main in Newport Center Dr.

The Kutter Flow-Depth calculations for the proposed condition are summarized in Table 2. The results show the existing 10" sewer main will be 35.2%-full considering the proposed conditions. Therefore, the existing sewer main will have capacity to accept the anticipated flows from the proposed project.

Table 2 – Existing Sewer with Proposed Condition Flows

MH #	Street	Pipe Size/Slope	Existing Peak Flow (cfs)	Project Peak Flow (cfs)	Proposed Flow in Pipe (cfs)	Proposed Flow Depth (in)	Proposed % Full
K19_046	Newport Center Drive	10" S=0.88%	0.337	0.161	0.498	3.52"	35.2%

4.0 RESULTS AND CONCLUSIONS

The calculations and results presented in this report demonstrate that the existing sewer system will not be adversely impacted by the wastewater flows associated with the proposed project.

The sewer monitoring report shows that the existing 10" sewer main in Newport Center Drive is currently at 29%-full for the existing peak wastewater flows. The proposed development will connect to the existing 8" laterals and discharge into the 10" sewer main. The flow depth of the existing public sewer system with the proposed conditions will be at 35.2%-full and will be in compliance with City of Newport Beach Design Criteria. Therefore, no sewer upgrades will be required to accommodate the proposed project development.

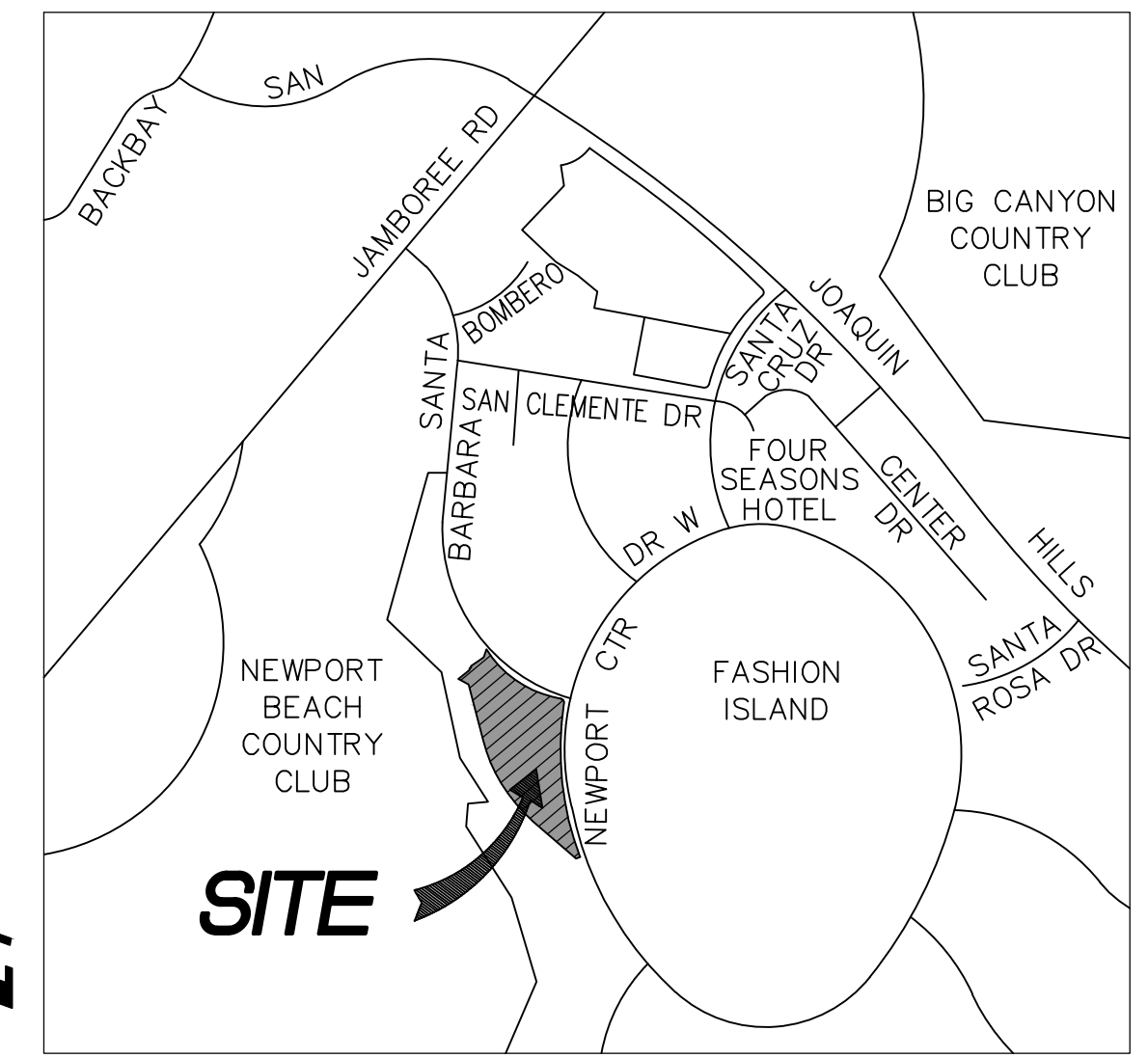
5.0 APPENDICES

Appendix 1	Project Information
Appendix 2	Public Sewer Exhibit
Appendix 3	Sewer As-Built Plans
Appendix 4	Design Criteria
Appendix 5	Sewer Monitoring Report
Appendix 6	Sewer Generation Calculations
Appendix 7	Kutter Flow Depth Calculations

Appendix 1

Project Information

VESTING TENTATIVE TRACT MAP NO. 19222
IN THE CITY OF NEWPORT BEACH, COUNTY OF ORANGE, STATE OF CALIFORNIA
FOR CONDOMINIUM PURPOSES



LOCATION MAP

NTS

GENERAL NOTES

1. EXISTING LAND USE: HOTEL
2. PROPOSED LAND USE: HOTEL & HOTEL BRANDED RESIDENCES
3. NO PUBLIC UTILITIES ARE PROPOSED FOR THIS PROJECT
4. SEWAGE DISPOSAL SERVICE IS PROVIDED BY CITY OF NEWPORT BEACH
5. WATER SERVICE IS PROVIDED BY CITY OF NEWPORT BEACH
6. NO PUBLIC AREAS ARE PROPOSED
7. SEE LANDSCAPE PLANS FOR TREE PLANTING
8. SEE CONCEPTUAL GRADING PLAN FOR DIRECTION OF FLOW OF WATER COURSES
9. NO EASEMENT IS PROPOSED

AREAS

GROSS AREA = 415,004 SF (9.527 AC)

LOT 1 = 294,137 SF (6.752 AC)
LOT 2 = 120,868 SF (2.775 AC)

FLOOD ZONE

THE AREA OF LAND SHOWN HEREON LIES ENTIRELY WITHIN FLOOD ZONE "AE", AS
DEFINED ON INFORMATION PUBLISHED BY U.S. DEPARTMENT OF HOUSING AND URBAN
DEVELOPMENT AS REFLECTED BY FLOOD INSURANCE RATE MAP PANEL NO.
06059C0382K, EFFECTIVE 3/21/2019

OWNER

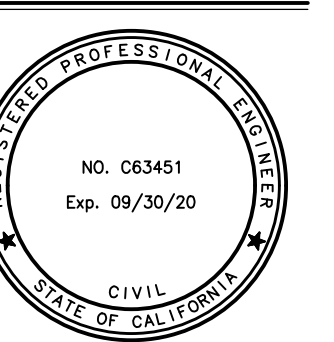
NEWPORT CENTER HOTEL, LLC
4901 BIRCH ST
NEWPORT BEACH, CA 92660
CONTACT: KEVIN MARTIN
PHONE: (949) 838-1274

SITE ADDRESS

900 NEWPORT CENTER DRIVE
NEWPORT BEACH, CA 92660

CIVIL ENGINEER

ORIANA SLASOR, P.E.
FUSCOE ENGINEERING, INC.
16795 VON KARMAN, SUITE 100
IRVINE, CA 92606
PHONE: (949) 474-1960
FAX: (949) 474-5315



LEGAL DESCRIPTION

PARCEL 2, IN THE CITY OF NEWPORT BEACH, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS PER MAP 2004-225 FILED IN BOOK 361, PAGES 1, 2, AND 3 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, AS MODIFIED BY THE PARCEL MAP CERTIFICATE OF CORRECTION RECORDED APRIL 23, 2008 AS INSTRUMENT NO. 2008-190230 OF OFFICIAL RECORDS.





















BASIS OF BEARINGS

BEARINGS HEREON ARE IN TERMS OF THE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS-83) ZONE VI, 2017.50 EPOCH, AS DERIVED LOCALLY BY ORANGE COUNTY HORIZONTAL GPS CONTROL STATIONS TRAK AND SACY, BEING N30°42'07"W AS PUBLISHED BY THE ORANGE COUNTY SURVEYOR. ALL DISTANCES WERE SCALED TO GROUND BY APPLYING THE COMPUTED COMBINATION FACTOR (CF) 0.99996333.

BENCH MARK

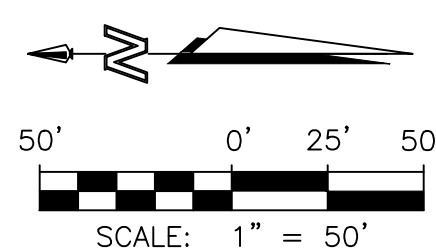
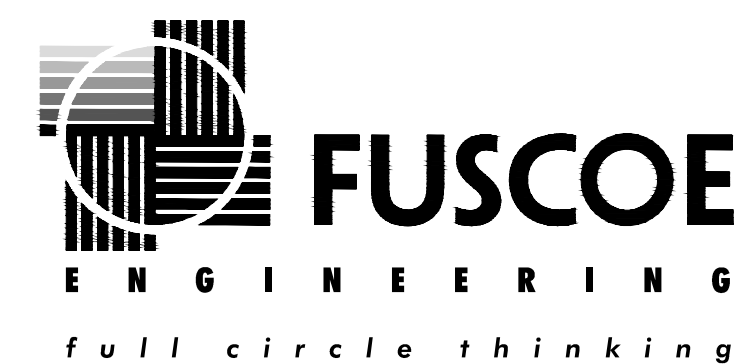
ELEVATIONS HEREON ARE IN TERMS OF THE NATIONAL VERTICAL DATUM (NAVD88),
BASED LOCALLY ON THE COUNTY OF ORANGE BENCHMARK:
3K-46-91 = 95.484 FEET (1991 LEVELED)

LEGEND

	RIGHT OF WAY/PROPERTY LINE		EXISTING CABLE TV LINE	BF	BACKFLOW
	CENTER LINE		EXISTING ELECTRIC LINE	BLDG	BUILDING
	EX. EASEMENT		EXISTING TRAFFIC SIGNAL CONDUIT	CB	CATCH BASIN
	PROPOSED LOT LINE		EXISTING STREET LIGHT CONDUIT	CL	CENTER LINE
	PROPOSED RETAINING WALL		EXISTING GAS LINE	DW	DOMESTIC WATER
	EXISTING RETAINING WALL		EXISTING TELEPHONE LINE	ESMT	EASEMENT
	EXISTING CONTOUR		EXISTING TELEPHONE LIGHT	EX.	EXISTING
	EXISTING DOMESTIC WATER		PRIVATE STORM DRAIN LINE	FH	FIRE HYDRANT
	EXISTING FIRE WATER		LINE OF SIGHT	FW	FIRE WATER
	EXISTING SEWER MAIN			L	LENGTH
	EXISTING STORM DRAIN			R	RADIUS
				P/L	PROPERTY LINE
				R	RADIUS
				R/W	RIGHT OF WAY
				SD	STORM DRAIN

EXISTING EASEMENTS

- ① PUBLIC UTILITY EASEMENT, BOOK 11301, PAGE 1203 (TO REMAIN)
- ② WATERLINE EASEMENT, BOOK 11318, PAGE 1747 (TO REMAIN)
- ③ 15' UTILITY EASEMENT 93-3805 (TO REMAIN)
- ④ SOUTHERN CALIFORNIA EDISON COMPANY PUBLIC UTILITIES EASEMENT
INST. 85-149874

[illegible]

VESTING TENTATIVE TRACT
MAP NO. 19222
FOR CONDOMINIUM PURPOSES
CITY OF NEWPORT BEACH

DATE:	12/07/2021
SCALE:	AS SHOWN
JOB NO.:	1112-008
DRAWN:	MI
CHECKED:	OS
SHEET 1 OF 1	

Susan Williams

From: Pieter Berger <pberger@mve-architects.com>
Sent: Wednesday, September 15, 2021 3:26 PM
To: Susan Williams; Oriana Slasor
Cc: 01112-008@fuscoe.tonicdm.com
Subject: RE: Newport Beach View Analysis

Categories: 01112-008 NB Marriot, Filed in TonicDM

The construction is all going to be Type IA.

The mix is still very much being debated however it currently stands as follows:

1BR	26DU
2BR	112 DU
3BR	18 DU
4BR	2
5BR	1
TOTAL	159 DU

There is no commercial program for the project. However the amenity program is substantial and is roughly 35,000 SF. Still all conceptual but this will include: Club Rooms, Fitness, Spa, Lockers, Private Meeting Rooms, Kitchen Area, Viewing Terrace, Etc.

I am not sure how many keys are being demolished. Kevin Martin from Lyon should be able to provide that information.

Hope this helps.
Thank you.

Pieter Berger
Senior Associate Partner

MVE+PARTNERS
www.mve-architects.com

From: Susan Williams <SWilliams@fuscoe.com>
Sent: Wednesday, September 15, 2021 3:13 PM
To: Pieter Berger <pberger@mve-architects.com>; Oriana Slasor <oslasor@fuscoe.com>
Cc: 01112-008@fuscoe.tonicdm.com
Subject: RE: Newport Beach View Analysis

Hello Pieter,
Thank you for sending. We are preparing sewer capacity and water demand studies, the calculations of which include construction building types, residential unit mix, along with commercial square footages. Do you have this information at this time? Also if the number of hotel rooms that will be demolished is known, would you please also send that information?
Thank you,
Sue
(714) 642-7510

The Ritz-Carlton Residences, Newport Beach Project Description

Proposed Ritz-Carlton Residences

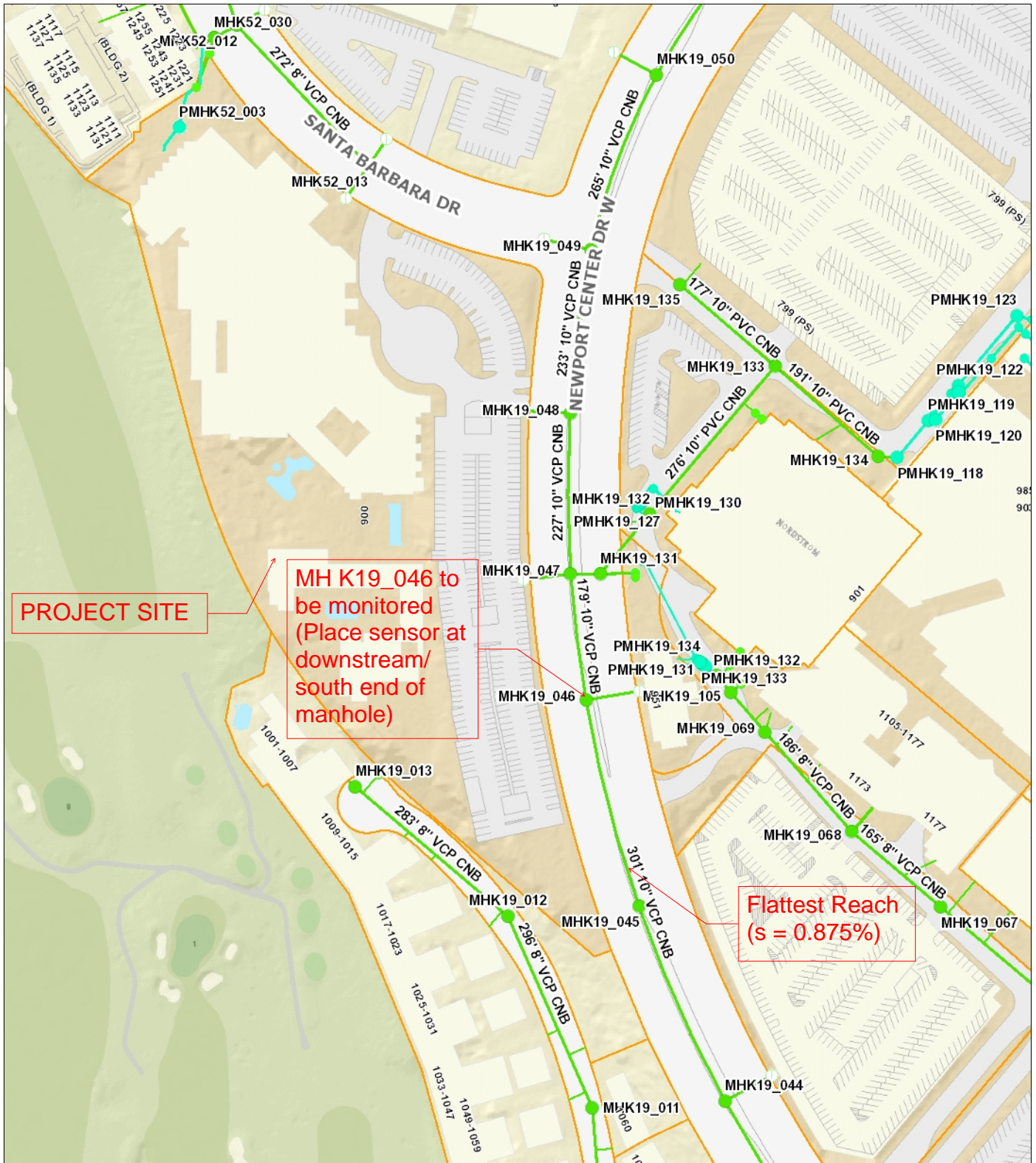
...

The new 21-story structure will accommodate up to 159 hotel-branded residences, representing 30% of the total units at the Newport Beach Marriott Resort Hotel. The total units at the Newport Beach Marriott Resort Hotel will remain unchanged at 532, with 373 traditional hotel rooms and up to 159 hotel-branded residences.

...

Appendix 2

Public Sewer Exhibit



NBGiS
NEWPORT BEACH



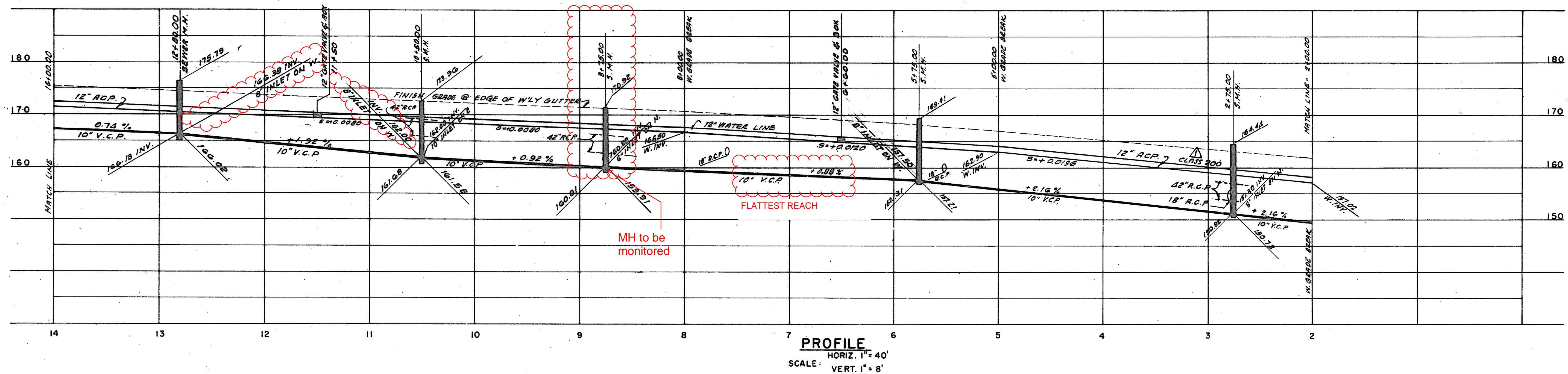
0 200 400
Feet

Disclaimer:

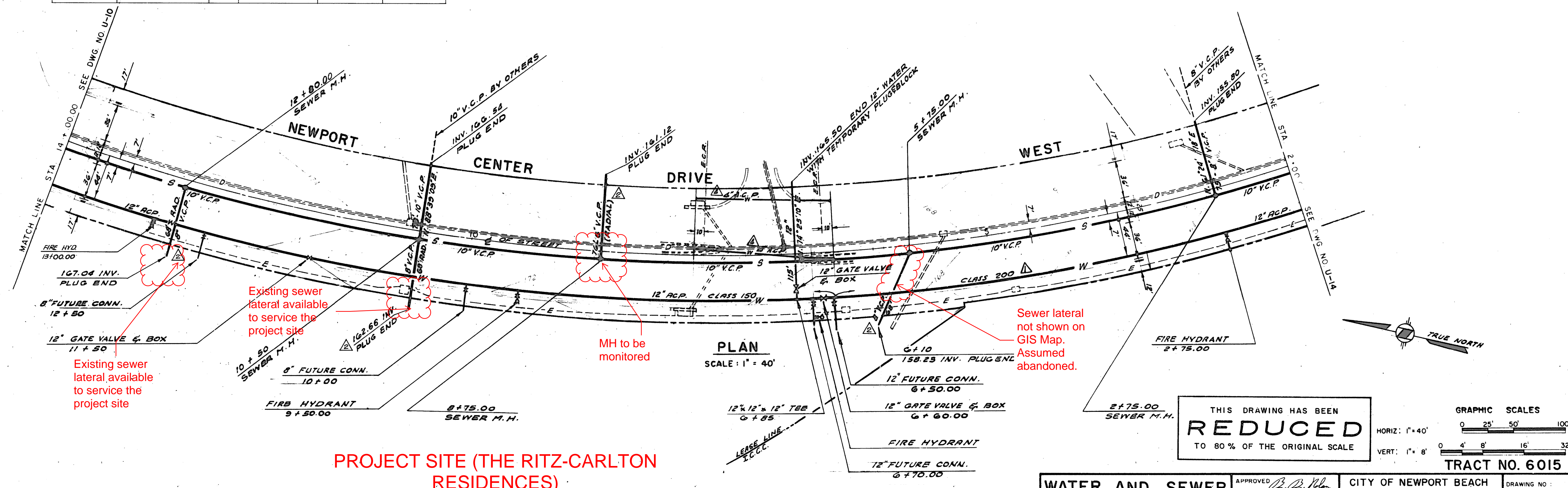
Every reasonable effort has been made to assure the accuracy of the data provided, however, The City of Newport Beach and its employees and agents disclaim any and all responsibility from or relating to any results obtained in its use.

Appendix 3




Sewer As-Built Plans



TYPE OF LINE	STATION FROM	TO	SIZE	WALL THICKNESS CLASS / D-LOAD (AS APPLICABLE)	TRUE LENGTH	TRUE SLOPE
WATER	2+00	5+00	12"		307.3'	+0.0191
	5+00	8+00	12"		307.3'	+0.0117
	8+00	14+00	12"		614.53'	+0.0078
SEWER	2+00	2+75	10"		75.29'	+0.0215
	2+75	5+75	10"		301.16'	+0.0213
	5+75	8+75	10"		301.16'	+0.00875
	8+75	10+50	10"		175.68'	+0.00914
	10+50	12+80	10"		230.89'	+0.131
	12+80	14+00	10"		120.47'	+0.00742



PROJECT SITE (THE RITZ-CARLTON RESIDENCES)

A.I.M.	G.W.	AS BUILT	9-23-03	
	D.I.	RS BUILT	9-7-03	
	N.W.	ADDED 4" A.C.P. FOR SPRINKLER SYSTEM	3-28-07	
BY CWD	LDI	REV. CLASS OF PIPE STA 2+00 TO 6+00	10-28-04	
	BT	REVISIONS*	DATE	REV. NO.

812 WEST EIGHTH STREET, LOS ANGELES, CALIFORNIA

QUINTON ENGINEERS, LTD.

PLANNING • ENGINEERING • ARCHITECTURE

NEWPORT CENTER

THE IRVINE COMPANY

WATER AND SEWER		APPROVED: <i>[Signature]</i> ASST. PUBLIC WORKS DIRECTOR R.E. NO. 12804 DATE 10-12-04		CITY OF NEWPORT BEACH PUBLIC WORKS DEPARTMENT		DRAWING NO. 65852	
DESIGNED: C. JOHNSON		APPROVED: <i>[Signature]</i>		JOB NO. U-9		DWC NO. U-9	
DRAWN: C.A. & H.W.		DATE: OCT 14 1995		REV. NO.		SHEET NO. 9 OF 20	
CHECKED: J.G. PURDY							

Appendix 4

Design Criteria

DESIGN CRITERIA

GENERAL

For more information on Design Criteria look in The City of Newport Beach Engineering Standards Manual. It provides consultants with authorized Newport Beach project requirements pertaining to production of construction drawings, project deliverables, related quality assurance, submitting final hard copies and digital plans. This information is intended for all engineering disciplines.

Consultants shall adhere to the CAD requirements for delivering plans. The guidelines shall be enforced during both the project design period and construction services period.

This Manual is not intended to replace codes or accepted industry standards and practices.

1. Submitting hard copy drawings

- a. All submitters should contact the project engineer to get a project number. The project engineer shall contact the Public Works Department to get the last project number assigned for their type of project. The project number shall be reflected on the right bottom corner of all drawing pages. E.g. W-3567-S, TRM_15634, T_5678_S, etc.
- b. Drawings shall exactly 24"x36" cut sheet. Drawing border should be only 1" on the left side of the sheet and 1/2" on other three sides. Refer to 2-e for more detail.
- c. All sheets shall be issued a **SEQUENTIAL NUMERIC SHEET NUMBER**.
Alphanumeric numbers shall not be assigned in lieu of numeric numbers. Duplicate numbering such as sheet 6 and 6A shall not be used. In the case of revisions and additions of additional sheets all sheets may have to be re-numbered so they remain sequential or added to the end of the set.
- d. Title sheets shall have an index and/or key map clearly indicating the sheet numbers issued. Provide a Vicinity map, a legend of abbreviations, symbols and, line types used.
- e. Scales for profile shall not be smaller than 1" = 40' horizontal and 1" = 10' vertical.
The vertical scale should be changed to appropriate scale when grades are steep or very flat. Scales for plan views shall not be smaller than 1" = 40'. For complex intersections or similar plans, the scale shall be 1" = 10' or as approved by City's Project Engineer.
- f. Large tracts shall have separate small-scale maps showing the overall layout of water, sewer, storm drain, and street lighting systems.

- b. There are more than one fire service connection to the same parcel or site.
- c. The building being serviced by the connection is 3-stories in height or greater.
- d. There are hazardous chemicals or materials either stored or used on the site being served by the connection.
- e. There is a private storage or fire protection reservoir on the site being served by the connection.
- f. The connection serves a marina or boat dock slip.

K. Pressure Booster Pump Stations (Private Domestic & Private Fire)

- 1. Pressure boosting stations shall be permitted only as a temporary installation by special permission from the Public Works Department.
 - a. Where such installations are allowed, they shall be served by metered service connections having both RPP type backflow prevention assembly and pressure sustaining valve equipment.
- (1.) These installations require special design and review by the Utilities Department and the Public Works Department.
- b. Backflow device shall be reduced pressure principle (RPP) type in accord with the applicable City standards.

IV. SEWER SYSTEM

A. Mains

- 1. General
 - a. Substantiating engineering calculations for sizing pipe and structural designs shall accompany all plan submittals.
 - b. Minimum size shall be 8 inches inside diameter.
 - c. Design flow shall not exceed H of full depth.
 - d. Pipe joints shall be elastomeric compression type unless otherwise specified.
 - e. Pipe material shall be SDR-35 PVC or standard strength VCP.
 - f. HDPE, ductile iron, RPM or filament bonded PVC flexible pipe materials can only be used upon special approval by the Utilities Department.

- g. Structural design shall be per water system requirements listed in Section III D. "Structural Pipe Design", except that:
 - (1). Minimum test pressure shall be per the *Standard Specifications*.
 - (2). Minimum factor of safety for VCP shall be 1.5.
- h. PVC fittings shall be prefabricated (molded) full-body fittings.
- i. Backfill shall be in conformance with the *Standard Specifications* Section 306-1.3, except that relative compaction shall be 90% minimum.
- j. Pipe Bedding
 - (1.) VCP shall be bedded in conformance with section 306-1.2.1 of the *Standard Specifications*. PVC shall be bedded in I inch crushed rock.
 - (2.) Pipe bedding and backfill shall be done in accord with the applicable portions of City STD-105-L and STD-106-L.
- 2. Locations
 - a. Alleys - Mains shall be offset 3.0 feet minimum from centerline to clear gutter. The offset shall be to the opposite side of the alley from any existing or proposed water main.
 - (1.) Clearance between sewer and water mains shall be in strict accord with the California DOHS requirements for "water and sewer separation."
 - (a). Horizontal clearance shall be at least 10 ft. wall to wall.
 - (b). Horizontal clearances less than 10 ft., but greater than 4 ft. may be allowed with special material construction. Utilities Department and State DOHS written permission is mandatory.
 - (2.) Clearance between sewer and utility conduits other than water shall be at least 2 ft. horizontal and 1 ft. vertical.
 - b. Streets - Main locations shall be in accord with STD-101-L.
 - c. Sewers in streets with more than 84 feet of right-of-way width require special design.
 - d. Extend and cap all dead ends beyond pavement limits. Refer to STD-401-L.

3. Minimum Gravity Sewer Slopes expressed in units of feet per foot:

Pipe Size (in.)		Minimum Slope (ft./ft.)	Preferred Slope (ft./ft.)
8"	0.0032	0.0040	
10"	0.0026	0.0032	
12"	0.0020	0.0032	

4. Gravity Sewer Hydraulic Criteria

- a. Hydraulic analysis shall be performed using Manning's Equation in the US Customary Unit System. Long-hand, manual calculations may be requested for City review on all sewer designs.

- (1.) Manning's Roughness coefficient shall not be less than 0.013 for any sewer main. ($n \geq 0.013$)

- (2.) Flows shall be first analyzed as "steady, uniform, non-turbulent" flow.

- b. Velocity Criteria

- (1.) Minimum design velocity shall be 2.0 ft./sec.

- (2.) Maximum velocity shall be 6.0 ft./sec. Analysis shall be performed to determine whether flow regime is "sub-critical" or "super-critical".

- (a.) Initial critical flow analysis shall be via Froude Number (f).

- (b.) Depth of flow limit requirement shall be for "sub-critical" flow depth.

- (3.) Froude Number (f) shall be determined from the following equation:

$$f = \frac{v}{\sqrt{gd}} \quad \text{where the variables in the equation are:}$$

fis the Froude Number

vis the velocity of the waste stream

gis the gravitational constant (32.2 ft/sec²)

dis the depth of flow (subcritical depth)

5. Sewer Hydraulic Loading Design

- a. Wastewater hydraulic calculations shall be performed utilizing the quantities of wastewater from the table below; (these should be considered design minimums, they are based on actual field flow monitoring tests):

Development Size (dwelling units)	Average flow (gallons per day)	Peaking Factor (dimensionless)	Peak flow (gallons per day)
--------------------------------------	-----------------------------------	-----------------------------------	--------------------------------

0 to 75 315	3.80	1,200
76 to 150 285	3.65	1,040
151to 250 265	3.40	900
250& up 245	3.15	770

- b. Certain developments with special circumstances may require design to consider flows higher than those in the table above. In no case shall the design flows be less than the amounts determined by the table above.

B. Manholes

Manholes shall be designed in accord with City of Newport Beach Standards, Standard Drawings, Standard Special Provisions and these Design Criteria. Manholes are required:

1. At all changes in slope.
2. At all changes in direction.
 - a. Horizontal curves for radii in excess of 150 feet may be used in areas without services only by the special approval of both the Utilities Department and the Public Works Department and only where straight sewer main runs are infeasible because of interference with other underground utilities.
3. At all intersections of mains. Match crown lines. Use 0.20 foot drop through manhole per City STD-401-L.
4. At all intersections between mains and laterals sized 8 inches and larger.
5. Minimum spacing is 300 feet; maximum spacing is 400 feet.
6. At the ends of dead end mains greater than 200 feet in length.
7. To have a special lining (either fiberglass or T-Lock) installed wherever:
 - a. Any sewer main connecting to the manhole has a slope greater than 7%.
 - b. Any change in slope of 5% or greater occurs between the upstream and the downstream manhole.

C. Terminal Cleanouts

1. Are required at ends of all mains where it is impractical or impossible to construct a sewer manhole.
2. May be used at other locations only by special permission of the Public Works Department.

D. Laterals

Each residential dwelling unit, residence, condominium, or rental unit (for buildings with four or less units) shall have an individual lateral, unless otherwise approved by the Public Works Department.

1. Size

- a. Single family, apartment or condominium units shall be 4 inches minimum diameter per City STD-406-L unless slope is less than 1/8 inch per foot. (In which case the lateral shall be upsized to 6 inches diameter.)
- b. All other laterals shall be a minimum of 6 inches in diameter.

2. Location

- a. At right angles or radial to street right-of-way.
 - b. Center of lot frontage or 5 feet toward the center of the lot from the downstream lot line. All lateral locations shall be shown and dimensioned or stationed on the construction plans.
 - c. In commercial developments, laterals shall connect the main line at manholes wherever possible.
 - d. All lateral connections 8 inches and larger shall connect to the sewer main at manholes.
 - e. All connections to existing manholes shall be mechanically saw cored and the joints made shall be sealed closed around the installed pipe using a non-shrink concrete grout or epoxy material.
3. Minimum depth of lateral pipe cover shall be 4 feet below finished grade at property line for level lots or lots sloping toward street. Special design is required for lots sloping away from street.
4. Cleanout shall be provided at property line in accord with STD-406-L on all lateral connections 6 inches in diameter and smaller. 8-inch diameter laterals and larger require manholes as cleanouts at or near the property line.

E. Wastewater Pump Stations

1. Special Design Required

- a. In all cases where a wastewater lift station is required, special design and review by City is required.

2. General Design Requirements

**SEWAGE FACILITIES CHARGE
SEWAGE GENERATION FACTOR FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES**

EFFECTIVE DATE: April 6, 2012

Line No.	FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
1	Acupuncture Office/Clinic	120/1,000 Gr SF	265	275
2	Arcade - Video Games	50/1,000 Gr SF	265	275
3	Auditorium (a)	3/Seat	265	275
4	Auto Parking (a)	20/1,000 Gr SF	265	275
5	Auto Mfg., Service Maintenance (b)	Actual	1,260	1,165
6	Bakery	280/1,000 Gr SF	3,020	2,540
7	Bank: Headquarters	120/1,000 Gr SF	265	275
8	Bank: Branch	50/1,000 Gr SF	265	275
9	Ballroom	350/1,000 Gr SF	265	275
10	Banquet Room	350/1,000 Gr SF	265	275
11	Bar: Cocktail, Fixed Set (a) (c)	15/Seat	265	275
12	Bar: Juice, No Baking Facilities (d)	720/1,000 Gr SF	265	275
13	Bar: Juice, with Baking Facilities (d)	720/1,000 Gr SF	265	275
14	Bar: Cocktail, Public Table Area (c)	720/1,000 Gr SF	265	275
15	Barber Shop	120/1,000 Gr SF	265	275
16	Barber Shop (s)	15/Stall	265	275
17	Beauty Parlor	425/1,000 Gr SF	265	275
18	Beauty Parlor (s)	50/Stall	265	275
19	Bldg. Const/Field Office (e)	120/Office	265	275
20	Bowling Alley: Alley, Lanes & Lobby Area	50/1,000 Gr SF	265	275
21	Bowling Facility: Arcade/Bar/Restaurant/Dancing	Total	Average	Average
22	Cafeteria: Fixed Seat	30/Seat	1,000	600
23	Car Wash: Automatic (b)	Actual	265	285
24	Car Wash: Coin Operated Bays (b)	Actual	265	285
25	Car Wash: Hand Wash (b)	Actual	265	285
26	Car Wash: Counter & Sales Area	50/1,000 Gr SF	265	275
27	Chapel: Fixed Seat	3/Seat	265	275
28	Chiropractic Office	120/1,000 Gr SF	265	275
29	Church: Fixed Seat	3/Seat	265	275
30	Church School: Day Care/Elem	9/Occupant	265	275
31	Church School: One Day Use (s)	9/Occupant	265	275
32	Cocktail Lounge: Fixed Seat (f)	15/Seat	265	275
33	Coffee House: No Food Preparation (d)	720/1,000 Gr SF	265	275
34	Coffee House: Pastry Baking Only (d)	720/1,000 Gr SF	265	275
35	Coffee House: Serves Prepared Food (d)	25/Seat	1,000	600
36	Cold Storage: No Sales (g)	30/1,000 Gr SF	265	275
37	Cold Storage: Retail Sales (g)	50/1,000 Gr SF	265	275
38	Comfort Station: Public	80/Fixture	265	275
39	Commercial Use (a)	50/1,000 Gr SF	265	275
40	Community Center	3/Occupant	265	275
41	Conference Room of Office Bldg.	120/1,000 Gr SF	265	275
42	Counseling Center (h)	120/1,000 Gr SF	265	275
43	Credit Union	120/1,000 Gr SF	265	275
44	Dairy	Average Flow	1,510	325
45	Dairy: Barn	Average Flow	1,510	325
46	Dairy: Retail Area	50/1,000 Gr SF	265	275
47	Dancing Area (of Bars or Nightclub) (c)	350/1,000 Gr SF	265	275
48	Dance Studio (i)	50/1,000 Gr SF	265	275
49	Dental Office/Clinic	250/1,000 Gr SF	265	275

**SEWAGE FACILITIES CHARGE
SEWAGE GENERATION FACTOR FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES**

EFFECTIVE DATE: April 6, 2012

Line No.	FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
50	Doughnut Shop	280/1,000 Gr SF	1,000	600
51	Drug Rehabilitation Center (h)	120/1,000 Gr SF	265	275
52	Equipment Booth	30/1,000 Gr SF	265	275
53	Film Processing (Retail)	50/1,000 Gr SF	265	275
54	Film Processing (Industrial)	Actual	265	275
55	Food Processing Plant (b)	Actual	2,210	1,450
56	Gas Station: Self Service	100/W.C.	265	275
57	Gas Station: Four Bays Max	430/Station	1,950	1,175
58	Golf Course Facility: Lobby/Office/Restaurant/Bar	Total	700	450
59	Gymnasium: Basketball, Volleyball (k)	200/1,000 Gr SF	265	275
60	Hanger (Aircraft)	50/1,000 Gr SF	265	275
61	Health Club/Spa (k)	650/1,000 Gr SF	265	275
62	Homeless Shelter	70/Bed	265	275
63	Hospital	70/Bed	820	1,230
64	Hospital: Convalescent (a)	70/Bed	265	275
65	Hospital: Animal	300/1,000 Gr SF	820	1,230
66	Hospital: Psychiatric	70/Bed	265	275
67	Hospital: Surgical (a)	360/Bed	265	275
68	Hotel: Use Guest Rooms Only (a)	120/Room	265	275
69	Jail	85/Inmate	265	275
70	Kennel: Dog Kennel/Open	100/1,000 Gr SF	265	275
71	Laboratory: Commercial	250/1,000 Gr SF	265	275
72	Laboratory: Industrial	Actual	265	275
73	Laundromat	185/Machine	550	370
74	Library: Public Area	50/1,000 Gr SF	265	275
75	Library: Stacks, Storage	30/1,000 Gr SF	265	275
76	Lobby of Retail Area (l)	50/1,000 Gr SF	265	275
77	Lodge Hall	3/Seat	265	275
78	Lounge (l)	50/1,000 Gr SF	265	275
79	Machine Shop (No Industrial Waste Permit Required) (b)	50/1,000 Gr SF	265	275
80	Machine Shop (Industrial)	Actual	265	275
81	Mfg or Industrial Facility (No IW Permit Required) (b)	50/1,000 Gr SF	265	275
82	Mfg or Industrial Facility (Industrial)	Actual	265	275
83	Massage Parlor	250/1,000 Gr SF	265	275
84	Medical Building (a)	225/1,000 Gr SF	265	275
85	Medical: Lab in Hospital	250/1,000 Gr SF	340	275
86	Medical Office/Clinic	250/1,000 Gr SF	265	275
87	Mini-Mall (No Food)	50/1,000 Gr SF	265	275
88	Mortuary: Chapel	3/Seat	265	275
89	Mortuary: Embalming	300/1,000 Gr SF	800	800
90	Mortuary: Living Area	50/1,000 Gr SF	265	275
91	Motel: Use Guest Room Only (a)	120/Room	265	275
92	Museum: All Area	30/1,000 Gr SF	265	275
93	Museum: Office Over 15%	120/1,000 Gr SF	265	275
94	Museum: Sales Area	50/1,000 Gr SF	265	275
95	Office Building (a)	120/1,000 Gr SF	265	275
96	Office Bldg w/Cooling Tower	170/1,000 Gr SF	265	275
97	Plating Plant (No IW Permit Required) (b)	50/1,000 Gr SF	265	275
98	Plating Plant (Industrial) (b)	Actual	265	275

**SEWAGE FACILITIES CHARGE
SEWAGE GENERATION FACTOR FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES**

EFFECTIVE DATE: April 6, 2012

Line No.	FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
99	Pool Hall (No Alcohol)	50/1,000 Gr SF	265	275
100	Post Office: Full Service (m)	120/1,000 Gr SF	265	275
101	Post Office: Private Mail Box Rental	50/1,000 Gr SF	265	275
102	Prisons	175/Inmate	265	275
103	Residential Dorm: College or Residential (n)	70/Student	265	275
104	Residential: Boarding House	70/Bed	265	275
105	Residential: Apt - Bachelor (a)	75/DU	265	275
106	Residential: Apt - 1 BDR (a) (o)	110/DU	265	275
107	Residential: Apt - 2 BDR (a) (o)	150/DU	265	275
108	Residential: Apt - 3 BDR (a) (o)	190/DU	265	275
109	Residential: Apt - >3 BDR (o)	40/BDR	265	275
110	Residential: Condo - 1 BDR (o)	110/DU	265	275
111	Residential: Condo - 2 BDR (o)	150/DU	265	275
112	Residential: Condo - 3 BDR (o)	190/DU	265	275
113	Residential: Condo - >3 BDR (o)	40/BDR	265	275
114	Residential: Duplex/Towhhouse - 1 BR (o)	110/DU	265	275
115	Residential: Duplex/Towhhouse - 2 BR (o)	150/DU	265	275
116	Residential: Duplex/Towhhouse - 3 BR (o)	190/DU	265	275
117	Residential: Duplex/Towhhouse - >3 BR (o)	40/BDR	265	275
118	Residential: SFD - 1 BR (o)	140/DU	265	275
119	Residential: SFD - 2 BR (o)	185/DU	265	275
120	Residential: SFD - 3 BR (o)	230/DU	265	275
121	Residential: SFD - >3 BR (o)	45/BDR	265	275
122	Residential Room Addition: Bedroom (o)	45/BDR	265	275
123	Residential Room Conversion: Into a Bedroom (o)	45/BDR	265	275
124	Residential: Mobile Home	Same as Apt	265	275
125	Residential: Artist (2/3 Area)	75/DU	265	275
126	Residential: Artist Residence	75/DU	265	275
127	Residential: Guest Home w/ Kitchen	Same as Apt	265	275
128	Residential: Guest Home w/o Kitchen	45/BDR	265	275
129	Rest Home	70/Bed	555	490
130	Restaurant: Drive-In	50/Stall	1000	600
131	Restaurant: Drive-In Seating Area	25/Seat	1000	600
132	Restaurant: Fast Food Indoor Seat	25/Seat	1000	600
133	Restaurant: Fast Food Outdoor Seat	25/Seat	1000	600
134	Restaurant: Full Service Indoor Seat (a)	30/Seat	1000	600
135	Restaurant: Full Service Outdoor Seat	30/Seat	1000	600
136	Restaurant: Take Out	300/1,000 Gr SF	1000	600
137	Retail Area (greater than 100,000 SF)	50/1,000 Gr SF	265	275
138	Retail Area (less than 100,000 SF)	25/1,000 Gr SF	265	275
139	Rifle Range: Shooting Stalls/Lanes, Lobby	50/1,000 Gr SF	265	275
140	Rifle Range Facility: Bar/Restaurant	Total	Average	Average
141	School: Arts/Dancing/Music (i)	11/Student	265	275
142	School: Elementary/Jr. High (a) (p)	9/Student	265	275
143	School: High School (a) (p)	11/Student	265	275
144	School: Kindergarten (s)	9/Student	265	275
145	School: Martial Arts (i)	9/Student	265	275
146	School: Nursery-Day Care (p)	9/Child	265	275
147	School: Special Class (p)	9/Student	265	275

**SEWAGE FACILITIES CHARGE
SEWAGE GENERATION FACTOR FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES**

EFFECTIVE DATE: April 6, 2012

<i>Line No.</i>	FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
148	School: Trade or Vocational (p)	11/Student	265	275
149	School: Training (p)	11/Student	265	275
150	School: University/College (a) (p)	16/Student	265	275
151	School: Dormitory (a) (n)	70/Student	265	275
152	School: Stadium, Pavilion	3/Seat	265	275
153	Spa/Jacuzzi (Commercial with backwash filters)	Total	265	275
154	Storage: Building/Warehouse	30/1,000 Gr SF	265	275
155	Storage: Self-Storage Bldg	30/1,000 Gr SF	265	275
156	Store: Ice Cream/Yogurt	25/1,000 Gr SF	1000	600
157	Store: Retail (l)	50/1,000 Gr SF	265	275
158	Studio: Film/TV - Audience Viewing Room (q)	3/Seat	265	275
159	Studio: Film/TV - Regular Use Indoor Filming Area (q)	50/1,000 Gr SF	265	275
160	Studio: Film/TV - Ind. Use Film Process/Machine Shop (q)	50/1,000 Gr SF	265	275
161	Studio: Film/TV - Ind. Use Film Process/Machine Shop	Total	265	275
162	Studio: Recording	50/1,000 Gr SF	265	275
163	Swimming Pool (Commercial with backwash filters)	Total	265	275
164	Tanning Salon: Independent, No Shower (r)	50/1,000 Gr SF	265	275
165	Tanning Salon: Within a Health Spa/Club	640/1,000 Gr SF	265	275
166	Theater: Drive-In	6/Vehicle	265	275
167	Theater: Live/Music/Opera	3/Seat	265	275
168	Theater: Cinema	3/Seat	265	275
169	Tract: Commercial/Residential	1/Acre	265	275
170	Trailer: Const/Field Office (e)	120/Office	265	275
171	Veterinary Clinic/Office	250/1,000 Gr SF	265	275
172	Warehouse	30/1,000 Gr SF	265	275
173	Warehouse w/ Office	Total	265	275
174	Waste Dump: Recreational	400/Station	2650	2750
175	Wine Tasting Room: Kitchen	200/1,000 Gr SF	265	275
176	Wine Tasting Room: All Area	50/1,000 Gr SF	265	275

FOOTNOTES TO SGFs TABLE

- (a) SFC rates for these facilities have historically been published in SFC ordinances.
- (b) Bureau of Sanitation will determine the flow based on the information given by applicants for facilities with industrial discharge. The flow will be redetermined by Sanitation inspectors annually based on water bills. If the actual flow exceeds the previous year's determined flow, the applicants will be charged for the difference. If this type of facility is exempt from an industrial discharge permit, only the domestic SFC will be assessed.
- (c) The SFC for a bar shall be the sum of SFC's for all areas based on the SGF for each area (ex. fixed seat area, public table area, dancing area).
- (d) The determination of SGF for juice bars and coffee houses previously depended on the extent of the actual food preparation in house, not by the types of food provided. Food is assumed to be prepared offsite and as such, the three prior subcategories have been consolidated.
 - 1) SGF for no pastry baking and no food preparation is 720 gpd/1000 gr.sq.ft.
 - 2) SGF for pastry baking only and no food preparation is 720 gpd/1000 gr.sq.ft.
 - 3) SGF for complete food preparation is 25 gpd/seat, the same as a fast food restaurant.Juice bars and coffee houses do not serve any alcoholic drinks.
- (e) Building construction includes trailers, field offices, etc.
- (f) Cocktail lounge usually does not serve prepared food.
- (g) Cold storage facilities are categorized as follow:
 - 1) No Sales - the cold storage facility is used only for temporary storage, no selling is involved. For example, cold storage facilities at the harbor temporarily store seafood until it is distributed.
 - 2) Cold storage w/ retail sales - the primary function of this facility is to support the wholesale/retail operation of a store, such as supermarket freezers, refrigerators, etc.
- (h) Counseling centers include marriage counseling centers, alcohol/drug rehabilitation /dependency centers, nutrition centers, diet centers, etc.

- (i) Part-time basis schools or dance studios should be charged as retail area - 50 gpd /1000 gr.sq.ft. Full-time basis schools should be charged by the number of students.
- (j) Domestic waste is estimated at 50 gpd/1,000 square feet in addition to total process flow.
- (k) Bureau of Sanitation will determine if an industrial permit is needed for health spas. The first year flow is based on 650 gpd/1000 gr.sq.ft., and the Sanitation inspectors will redetermine the flow annually based on water bill from the previous year. The applicants are responsible for paying the difference of SFC.

Health club/spa includes lobby area, workout floors, aerobic rooms, swimming pools, Jacuzzi, sauna, locker rooms, showers, and restrooms. If a health club/spa has a gymnasium type of facility, this portion should be charged separately at the gymnasium SFC rate.

Gymnasiums include basketball court, volleyball court, and any other large open space with low occupancy density.
- (l) Lobby of retail includes lounges, holding rooms, or waiting area, etc.
- (m) Full service post offices include U.S. Postal Service, UPS, Federal Express, DHL, and etc.
- (n) The SGF for a college dormitory based on student capacity also includes the SGF for the dormitory cafeterias.
- (o) A bedroom is defined as an enclosed subdivision with 50 sq.ft. or more floor area in a residential building commonly used for sleeping purpose, and is partitioned off to form a habitable room.
- (p) The SGF for schools based on the student capacity, covers the following facilities:
 - 1) classrooms and lecture halls
 - 2) professors' offices
 - 3) administration offices
 - 4) laboratories for classes or research
 - 5) libraries
 - 6) bookstores
 - 7) student/professor lounges
 - 8) school cafeterias
 - 9) warehouses and storage areas
 - 10) auditoriums
 - 11) gymnasiums
 - 12) restrooms

It does not include water used by schools for swimming pools. When a school files an application for addition of any of the foregoing facilities, the student population will be reassessed and the total gpd for the new facility will be based on the number of students increased since the last SFC was paid or when the City implemented the SFC for the first time. The SFC for any school facility (ex. stadium, dormitory, etc.) not listed above, will be based on the designated SGF for that category.

- (q) The SFC for a TV or motion picture studio shall be the sum of SFC's for different facilities in the studio, based on the SGF for each facility. A studio may include one or more of the following facilities: audience viewing room, filming room, film processing, storage area, etc.
- (r) No independent tanning salons with shower were encountered during 1996 survey.
- (s) Alternative basis of charge for City's consideration. The prior square footage basis is also presented should the City decide to continue charging on that basis.

Appendix 5

Sewer Monitoring Report



Utility Systems Science and Software

Report Date: 10/18/2021

Customer: Fuscoe

Group: Newport Beach

Site: 2021.10 Newport Center MH

Statistics for 2021.10 Newport Center MH: 09/29/2021 thru 10/15/2021

	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)				
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total Gal	Rain
9/29/21	62.24	90.77	31.86	0.09	0.13	0.05	2.17	2.71	1.65	1.71	2.00	1.33	89,627	
9/30/21	54.96	96.01	24.06	0.08	0.14	0.03	2.09	2.68	1.34	1.59	2.04	1.26	79,145	
10/1/21	55.51	95.45	25.70	0.08	0.14	0.04	2.09	2.75	1.48	1.61	2.08	1.23	79,930	
10/2/21	52.96	87.33	25.39	0.08	0.13	0.04	2.06	2.70	1.40	1.58	2.03	1.26	76,267	
10/3/21	47.93	76.76	24.51	0.07	0.11	0.04	2.02	2.64	1.41	1.50	1.80	1.22	69,021	
Week:	54.72	96.01	24.06	0.08	0.14	0.03	2.09	2.75	1.34	1.60	2.08	1.22	393,991	
10/4/21	60.14	151.08	23.54	0.09	0.22	0.03	2.12	2.93	1.30	1.67	2.64	1.25	86,602	
10/5/21	67.17	113.66	34.30	0.10	0.16	0.05	2.24	2.81	1.71	1.75	2.22	1.33	96,721	
10/6/21	61.28	102.83	27.64	0.09	0.15	0.04	2.04	2.63	1.43	1.75	2.23	1.32	88,247	
10/7/21	58.64	103.40	24.44	0.08	0.15	0.04	2.07	2.55	1.32	1.68	2.29	1.29	84,447	
10/8/21	59.72	97.67	28.88	0.09	0.14	0.04	2.12	2.57	1.52	1.68	2.16	1.32	85,991	
10/9/21	50.85	89.50	23.28	0.07	0.13	0.03	2.02	2.52	1.28	1.56	2.07	1.23	73,219	
10/10/21	52.69	102.76	22.77	0.08	0.15	0.03	2.08	2.71	1.41	1.55	2.12	1.18	75,876	
Week:	58.64	151.08	22.77	0.08	0.22	0.03	2.10	2.93	1.28	1.66	2.64	1.18	591,104	

	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)				
Date	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Total Gal	Rain
10/11/21	54.82	87.51	29.50	0.08	0.13	0.04	2.18	2.64	1.65	1.56	1.96	1.26	78,940	
10/12/21	55.22	89.38	26.92	0.08	0.13	0.04	2.13	2.67	1.58	1.58	1.96	1.22	79,513	
10/13/21	57.68	94.10	26.90	0.08	0.14	0.04	2.15	2.67	1.54	1.62	2.04	1.21	83,059	
10/14/21	57.72	99.22	28.05	0.08	0.14	0.04	2.08	2.59	1.50	1.66	2.14	1.23	83,115	
10/15/21	44.13	92.92	27.54	0.06	0.13	0.04	1.89	2.57	1.49	1.47	2.05	1.26	63,549	
Week:	53.91	99.22	26.90	0.08	0.14	0.04	2.09	2.67	1.49	1.58	2.14	1.21	388,175	
Totals:	56.10	151.08	22.77	0.08	0.22	0.03	2.09	2.93	1.28	1.62	2.64	1.18	1,373,271	

0.337 cfs



Site Report

10/18/2021

Confidential Proprietary Information

Fusco

MH at ~951 Newport Center Dr

Newport Beach, CA 92660

2021.10 Newport Center MH

MH # K 19_046

Access:

MH in SB left turn lane, west of address

System Type:

Sanitary ☒

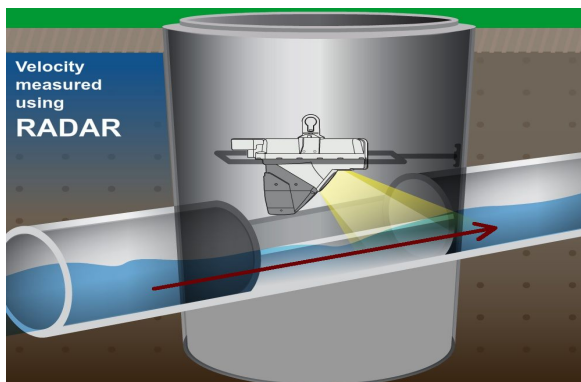
Storm ☐

Install Date: 9/29/2021

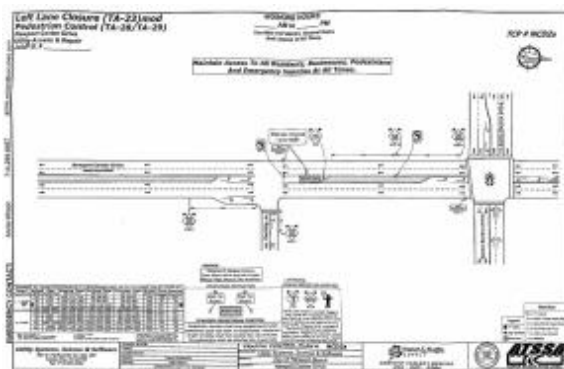
Map



Technology



Traffic Plan



Flow Meter

Meter Depth: 128"

MH Coordinates: 33.615437, -117.878581

Moderate open channel hydraulics with some turbulence due to inflow from lateral

Avg Velocity	Avg Measured Level	Multiplier
2.1 fps	1.6"	1.0

Gas

O2	H2S	CO	LEL
20.9	0	0	0

Notes

Two inlets from east & north; monitored downstream line as directed.

Traffic Safety

Used cones & signs in accord w/approved TCP per site-specific CATTCH requirements.

Land Use

Residential	Commercial	Industrial	Trunk
	X		

Manhole Depth	146"
Monitored Pipe Size	10"
Inner Pipe Size (In/Out)	10"/10"
Pipe Shape	Round
Pipe Condition	Good
Manhole Material	Lined
Silt	None observed
Velocity Profile Data	Passed
Velocity Profile Taken	0.4 2-D
Sensor Offset	18"
Sensor Dist. to Crown	8"
Sensor Direction	Downstream
Flow Heading	South



Meter Site Document

2021.10 Newport Center MH

MH at ~951 Newport Center Dr

Newport Beach, CA 92660

Site



Manhole Before Install



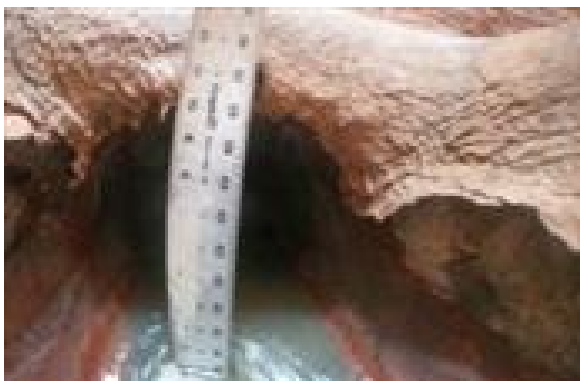
Installation Process



Installed



Upstream



Downstream



Temporary Flow Study

Fusco

2021.10 Newport Center MH

Meter Start Date		From	9/29/2021
Meter Stop Date		To	10/15/2021
Velocity (fps)		Level (in)	Flow (mgd)
Average	2.102	1.625	0.082
Maximum	2.930	2.640	0.218
Minimum	1.280	1.180	0.033
Pipe Size		10.000	
Estimated Capacity (mgd)		Not Calculated	
Capacity Used		Not Calculated	
Sensor Type		Hach - Flodar	

Utility Systems, Science and Software

9314 Bond Av, Suite A
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Santa Ana, CA 92705



Methods & Procedures & Equipment

Methods and Procedures

Utility Systems Science & Software provided Fuscoe with an off the shelf, non-proprietary flow monitoring solution that included one state of the art Hach Flo-Dar® AV Sensor system. The project course of action is listed below. The US³ team:

- Assessed permitting and traffic control at the site on Newport Center Dr in Newport Beach, CA.
- Obtained a City Encroachment Permit, which required a formal traffic control plan.
- Installed and removed traffic control in accord with approved traffic control plan per site-specific California Temporary Traffic Control Handbook (CATTCH) requirements for both the installation and removal of equipment.
- Validated the site for suitability for sewer flow monitoring for the Newport Marriott Residences Project.
 - MHK 19_046 had flows entering the manhole from the east and the north.
 - The site had moderate open channel hydraulics with minor turbulence from inflow from the eastern line.
- Installed and calibrated the flow monitoring equipment at the site per manufacturer recommendations on 9/29/2021.
 - Follow-up on the installation confirmed equipment was reading properly.
 - Collected 15-minute interval depth and velocity data points over the entire monitoring period.
- Removed the equipment on 10/15/2021 and validated the data.
 - All of the equipment went through diagnostic testing before and after the study with less than a 1% deviation between manual and meter level readings and less than a 5% deviation between manual and meter velocity readings.
 - Equipment calibration was verified in accordance with manufacturer specifications.
- Prepared the data reports.
 - The table below contains a summary of the average (Avg) and maximum (Max) velocities (Vel) and levels (Lev) collected during this study as well as the calculated flow rates (Flow) and depth versus diameter ratios (d/D).

Pipe Size (in)	Avg Vel (fps)	Max Vel (fps)	Avg Lev (in)	Max Lev (in)	Avg Flow (gpm)	Max Flow (gpm)	Avg d/D	Max d/D
10	2.10	2.93	1.62	2.64	56.32	151.08	0.16	0.26

Equipment

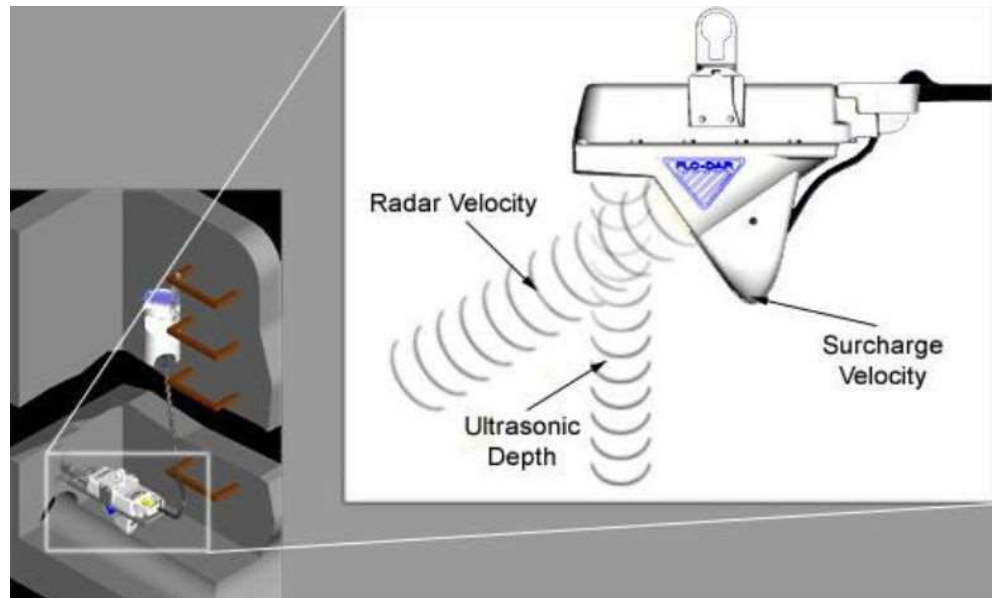


Figure above: Equipment installed for the Sewer Flow Monitoring Study



Figure above: Web-Enabled Flo-Dar® AV Sensor, Radar-Based Velocity/Area Flow Meter

FloDar® AV Sensor Specifications:

- **Enclosure**
 - IP68 Waterproof rating, Polystyrene
- **Dimensions**
 - 160.5 W x 432.2 L x 297 D mm (6.32 x 16.66 x 11.7 in.),
 - With SVS, D = 387 mm (15.2 in.)
- **Weight**
 - 4.8 kg (10.5 lbs.)
- **Operating Temperature**
 - -10 to 50°C (14 to 122°F)
- **Storage Temperature**
 - -40 to 60°C (-40 to 140°F)
- **Power Requirements**
 - Supplied by FL900 Flow Logger, Flo-Logger, or Flo-Station
- **Interconnecting Cable**
 - Disconnect available at both sensor and logger or Flo-Station
 - Polyurethane, 0.400 (±0.015) in. diameter; IP68
 - Standard length 9 m (30 ft), maximum 305 m (1000 ft)
- **Cables – available in two styles:**
 - connectors at both ends
 - connector from sensor with open leads to desiccant hub, desiccant hub with connector to logger. A potting/sealant kit will be included. This can be used to run the cable through conduit.
- **Certification**
 - Certified to: FCC Part 15.245: FCC ID: VIC-FLODAR24
 - Industry Canada Spec. RSS210. v7: IC No.: 6149A-FLODAR24

SURCHARGE DEPTH MEASUREMENT

- Auto zero function maintains zero error below 0.5 cm (0.2 in.)
- **Method**
 - Piezo-resistive pressure transducer with stainless steel diaphragm
- **Range**
 - 3.5 m (138 in.), overpressure rating 2.5 x full scale

VELOCITY MEASUREMENT

- **Method**
 - Radar
- **Range**
 - 0.23 to 6.10 m/s (0.75 to 20 ft/s)

- **Frequency Range**
 - 24.075 to 24.175 GHz, 15.2 mW (max.)
- **Accuracy**
 - $\pm 0.5\%$; ± 0.03 m/s (± 0.1 ft/s)

DEPTH MEASUREMENT

- **Method**
 - Ultrasonic
- **Standard Operating Range from Flo-Dar® Housing to Liquid**
 - 0 to 152.4 cm (0 to 60 in.)
- **Optional Extended Level Operating Range from Transducer Face to Liquid**
 - 0 to 6.1 m (0 to 20 ft.) with 43.18 cm (17 in.) dead band, temperature compensated.
- **Accuracy**
 - $\pm 1\%$; ± 0.25 cm (± 0.1 in.)

FLOW MEASUREMENT

- **Method**
 - Based on Continuity Equation
- **Accuracy**
 - $\pm 5\%$ of reading typical where flow is in a channel with uniform flow conditions and is not surcharged, $\pm 1\%$ full scale max.

SURCHARGE CONDITIONS DEPTH/VELOCITY DEPTH (Std with Flo-Dar® Sensor)

- **Surcharge depth supplied by Flo-Dar® sensor.**

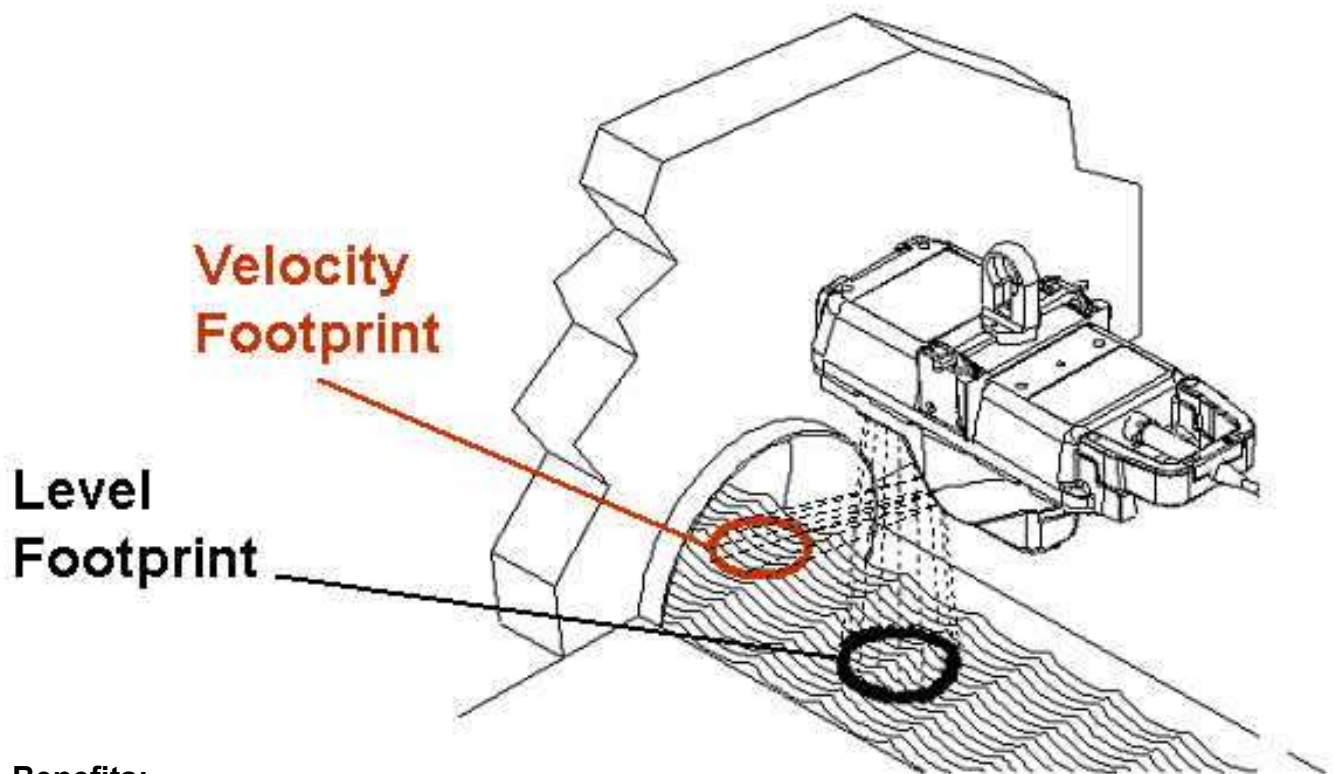
VELOCITY (Optional Surcharge Velocity Sensor)

- **Method**
 - Electromagnetic
- **Range**
 - ± 4.8 m/s (± 16 ft/s)
- **Accuracy**
 - ± 0.15 ft/s or 4% of reading, whichever is greater.
- **Zero Stability**
 - ± 0.05 ft/s

The Flo-Dar® Open Channel Flow Meters provide an innovative approach to open channel flow monitoring. Combining digital Doppler radar velocity sensing with ultrasonic pulse echo level sensing Flo-Dar® provides accurate open channel flow monitoring without the fouling problems associated with submerged sensors.

Perfect Solution for Difficult Flow Conditions:

- Flows with High Solids Content
- High Temperature Flows
- Caustic Flows
- Large Man-Made Channel
- High Velocities
- Shallow Flows

**Benefits:**

1. Personnel have no contact with the flow during installation.
2. Maintenance caused by sensor fouling is eliminated
3. Field Replaceable/Interchangeable Sensors and Monitors

How It Works

Flo-Dar® transmits a digital Doppler radar beam that interacts with the fluid and reflects back signals at a different frequency than that which was transmitted. These reflected signals are compared with the transmitted frequency. The resulting frequency shift provides an accurate measure of the velocity and the direction of the flow. Level is detected by ultrasonic pulse echo. Flow is then calculated based on the Continuity Equation:

$$Q = V \times A, \text{ Where } Q = \text{Flow}, V = \text{Average Velocity and } A = \text{Area}$$

Accurate Flow Measurements

Flo-Dar® provides the user with highly accurate flow measurements under a wide range of flows and site conditions. By measuring the velocity of the fluid from above, Flo-Dar® eliminates accuracy problems inherent with submerged sensors including sensor disturbances, high solids content and distribution of reflectors.

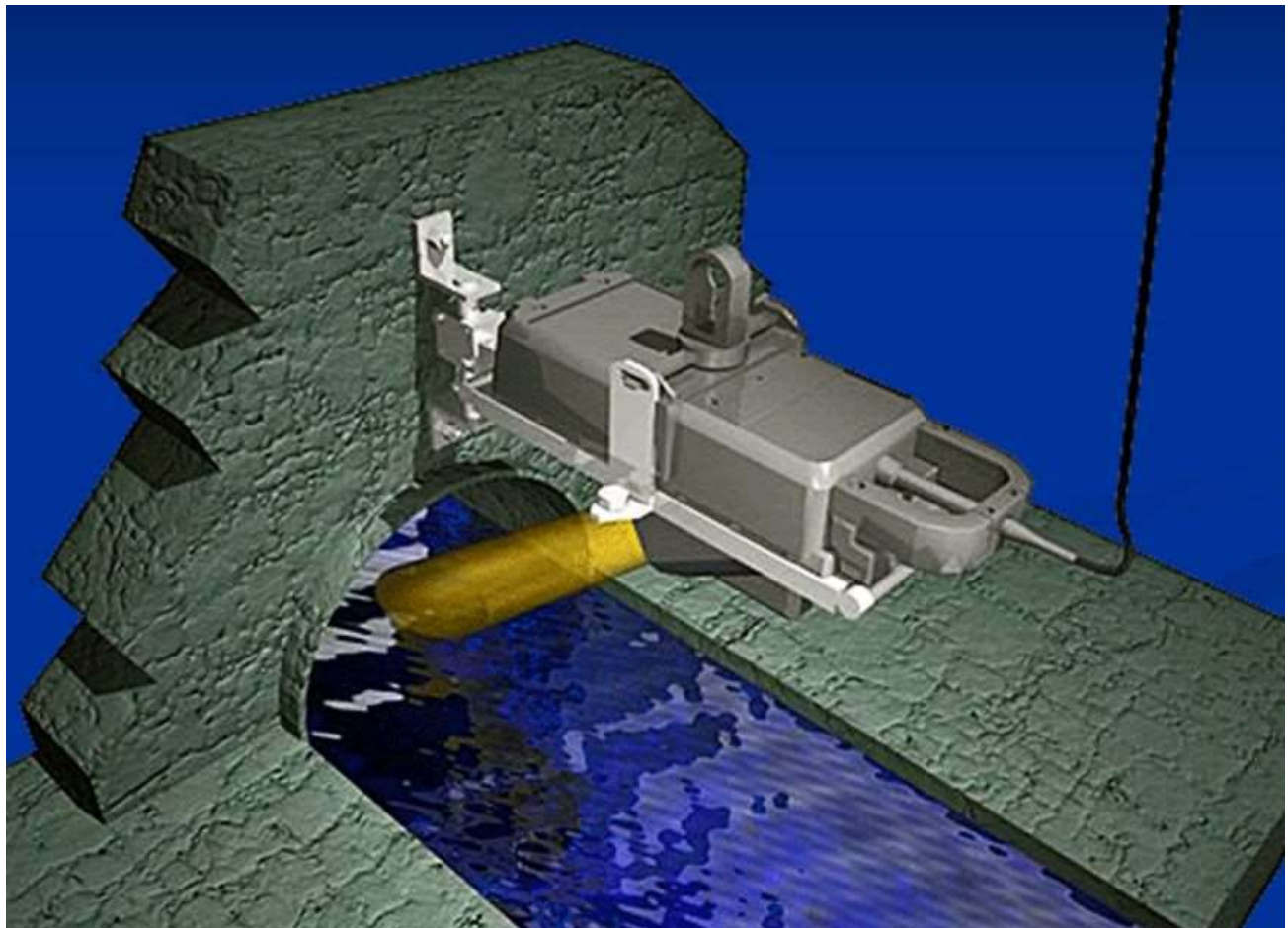


Figure above: US³ utilizes exclusively Hach March-McBirney Flo-Dar® Meters

US³ Company Information

US³ is a California Corporation **Federal ID No. 33-0729605** and qualifies as a Minority Business Enterprise. US³ has certified as an MBE with the California Public Utility Commission's authorized clearinghouse, **Verification Number: 97ES0008**.

US³ is a specialty service company for the Water & Waste Water industry, providing monitoring and control for Utilities since 1996. US³ is in the forefront of this industry by taking the proven technological approaches developed in other high-tech industries and applying them to protect one of our most precious natural resources - our water.

US³ engineers and technical personnel have applied advanced instrumentation system technology to water/wastewater open channel flow monitoring, pipeline evaluation, engineering, and data analysis, all coupled to the power of the Internet. This unique integrated systems approach allows the company to bring greater insight and intelligence to gathering information about water/wastewater system performance of our clients, and in turn, to support the fulfillment of their commitments to manage and cost effectively design, operate, and maintain these systems.

Moreover, **US³** supports Municipalities, Consulting Engineering firms and other water/waste water systems integrators by providing temporary technical services for engineering, software programming and technical site maintenance and calibration site support work, primarily in the Water and Waste Water industries.

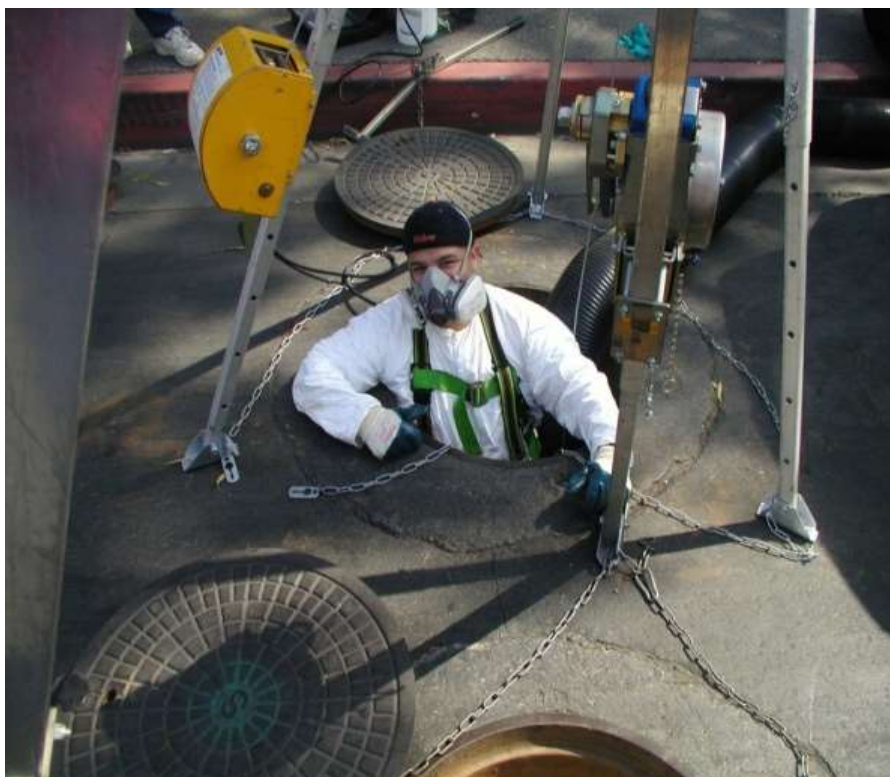


Figure at right: All US³ technicians are certified for Confined Space Entry.

Key Personnel Assigned

US³ provided the necessary resources to fully implement this project. Primary in support of this effort were the following personnel:

Mr. Mark Serres: Mr. Serres is a degreed electrical engineer with over 25 years of experience with fresh/wastewater systems, project management, and systems integration in relation to complex industrial systems. This includes experience in industrial automation and water/wastewater industries. Mr. Serres is responsible for assuring client satisfaction and marshalling the required resources to meet the project requirements.

Mr. Thomas Williams: Mr. Williams is an Engineering Manager with over 20 years of experience in complex systems development for wastewater monitoring. This experience includes hydraulic compatibility, instrumentation, communications and analysis. Mr. Williams is responsible for assuring that the required equipment is designed and calibrated to meet the project requirements.

Darlene Szczublewski, PE: Mrs. Szczublewski is a licensed Civil Engineer in multiple states. She has over 15 years of engineering experience with stormwater/wastewater related projects. She assisted in the completion of several Sanitary Sewer Evaluation Surveys and Capacity Analysis projects to meet Consent Decrees as well as completing numerous Infiltration and Inflow (I&I) studies for other clients. Mrs. Szczublewski has developed numerous flow data analysis techniques to present a clear informative picture of flow in a monitored system. Her work also includes the development of training programs for clients describing I&I and capacity analysis methodologies. Mrs. Szczublewski is responsible for analyzing the data as well as the data collection process and assuring that the reports meet the project requirements.

Name, title, address and telephone number of persons to contact regarding this US³ project.

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Appendix 6

Sewer Generation Calculations

The Ritz-Carlton Residences (12/2021)

Sewer Flow Generation to City sewer in Newport Center Drive

Proposed Condition						
	Number of Units or SF of Amenities	Avg Flow (gpd/du) or (gpd/SF)	Peaking Factor	Peak Flow (gpd/DU) or (gpd/SF)	Total Peak Flow (gpd)	Total (proposed) Peak Flow (cfs)
Hotel- Branded Residences	159	265	3.4	901	143,259	0.222
Hotel Rooms	373	120	2.5	300	111,900	0.173
Amenities	35000	0.10	2.5	0.250	8,750	0.014
					Total	0.408

Note: Generation Factors Per City of Newport Beach Design Criteria (See Appendix)

Existing Condition - Harbor Landing Building Hotel Rooms					
Number of Hotel Rooms	Avg Flow (gpd/du)	Peaking Factor	Peak Flow (gpd/du)	Total Peak Flow (gpd)	Total Existing Condition Hotel Rooms Peak Flow (cfs)
532	120	2.5	300	159,600	0.247
Note: Generation Factors Per City of LA Design Criteria (See Appendix)					

Total Net (Proposed - Existing) Peak Flow	0.161 cfs
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Appendix 7

Kutter Flow Depth Calculations

Existing Condition Sewer Depth (10" Sewer in Newport Center Drive)

***Cells that are highlighted can be changed**

GIVEN:

Q _{given} =	0.337	cfs	<== Discharge
n=	0.013		<== Roughness coefficient
S=	0.0088		<== Slope V:H
r=	0.417	ft	<== Radius

TRIAL DEPTH:

29% full

h=	2.900	in	<== Vary this depth to get Q _{assume} = Q _{given}
		0.242 ft	

CALCULATIONS:

beta= 65.16 degree

R= 0.139 ft

C= 73.512

V= 2.567 ft/sec

A= 0.131 sq. ft.

Q_{assume} = 0.337 cfs

Q _{half full} =	0.96 cfs	Q _{3/4 full} =		1.79 cfs
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RESULT:

(Q_{given}-Q_{assume}) / Q_{given} % = 0% <===== **OK**

Flow Depth (in) = 2.900

Capacity d/r = 58.00%

Q_{capacity} = 0.963 cfs

Capacity Q_{given}/Q_{capacity} = 34.99%

(Q _{half full} =	0.96 cfs	(Q _{3/4 full} =		1.79 cfs
beta _{half full} =	90.000 degree	beta _{3/4 full} =		120.00 degree
R _{half full} =	0.208 ft	R _{3/4 full} =		0.251 ft
C _{half full} =	82.537 ft	C _{3/4 full} =		86.814 ft
A _{half full} =	0.273 sq. ft.	A _{3/4 full} =		0.439 sq. ft.
V _{half full} =	3.531 ft/sec)	V _{3/4 full} =		4.084 ft/sec)

Proposed Condition Sewer Depth (10" Sewer in Newport Center Drive)

***Cells that are highlighted can be changed**

GIVEN:

Q_{given}= **0.498** cfs
 n= **0.013**
 S= **0.0088**
 r= **0.417** ft

<== Discharge

<== Roughness coefficient

<== Slope V:H

<== Radius

0.337+0.161
 =0.498 cfs

TRIAL DEPTH:

35.2% full

h= **3.520** in
 0.293 ft

<== Vary this depth to get Q_{assume} = Q_{given}

CALCULATIONS:

beta= 72.78 degree

R= 0.162 ft

C= 76.953

V= 2.905 ft/sec

A= 0.171 sq. ft.

Q_{assume} = 0.498 cfs

Q_{half}full = 0.96 cfs

Q_{3/4}full = 1.79 cfs

RESULT:

(Q_{given}-Q_{assume}) / Q_{given} % =

0% <===== **OK**

Flow Depth (in) = 3.520

Capacity d/r = 70.39%

Q_{capacity} = 0.963 cfs

Capacity Q_{given}/Q_{capacity} = 51.71%

(Q_{half}full = 0.96 cfs
beta_{half}full = 90.000 degree
R_{half}full = 0.208 ft
C_{half}full = 82.537 ft
A_{half}full = 0.273 sq. ft.
V_{half}full = 3.531 ft/sec)

(Q_{3/4}full = 1.79 cfs
beta_{3/4}full = 120.00 degree
R_{3/4}full = 0.251 ft
C_{3/4}full = 86.814 ft
A_{3/4}full = 0.439 sq. ft.
V_{3/4}full = 4.084 ft/sec)