SEWER AREA STUDY

FOR

TORRANCE WAREHOUSE

LOCATED AT

2555 W. 190th Street

Torrance, CA 90504

Prepared for

St. Paul Fire and Marine Insurance Co.,

A Connecticut Corporation

Prepared By:

DRC Engineering Inc.

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Project No. 19-040

August 6, 2020

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INTRODUCTION

The purpose of this report is to verify the capacity of the existing public sewer main serving the proposed project and to determine the average and peak flows with the addition of the sewage generated by the proposed project into the existing public system. This report will show that the existing public sewer mains will have the capacity to convey the sewage generated from the proposed site and existing tributary areas to the public sewer system as it flows from the 10" VCP sewer in 190TH Street East to Van Ness Ave.

The project is located on approximately 13.30 acres of land located at the 2555 W. 190th Street. Currently the proposed project includes the demolition of an existing school (vacant) and construction of one warehouse building with pavement, curbs, gutters, sidewalks, and landscaping. Additional improvements will include on-site water, sewer and storm drain facilities.

Sewage generated on-site will be conveyed to existing public facilities by a proposed 6" private sewer lateral. The proposed private main will connect to the existing 10" public sewer main located in 190th Street (constructed per SS-363). The 8" sewer line will collect sewerage from the proposed project and continue east in the 10" VCP located in 190th street. From 190th street, the sewer flows east continuing to Van Ness Ave. The 10" 190th Street. line confluences with a 48" line (SS-1002) and is conveyed to the existing 48" RCP sewer main running south near the intersection of Van Ness Ave and 190th Street.

1. PROPOSED SEWER DEMAND OF PROJECT

In order to determine the proposed site discharge, the Los Angeles County Sanitation District Will Serve Table 1 (included in Appendix B) Loadings for each class of land use was used. The proposed site is a commercial (warehouse) center and prospective tenants have not been identified. From Table 1 the loading was based on warehouse occupancies.

From the Sewer Generation Factor:

Warehouse = 25 GPD per 1,0000 SF building

The following guidelines from the City of Torrance were used:

1. Manning's coefficient, "n" = 0.013
2. Maximum allowable capacity for all sewer pipes 12" diameter and under = 50%
3. Maximum allowable capacity for all sewer pipes over 12" diameter = 75%
4. Recommended minimum design velocity = 2 ft/sec

Building	Use	SF	SWR Flow gpd (1)	SWR Flow cfs	SWR Flow Peaked (2) (cfs)	SWR Flow Peaked (MGD)
One	W	291,000	7275	0.011	0.029	0.019

1. Sewer Flow generation 25 gpd per 1,000 SF from LA Co. Sanitation District Will Serve Table 1
2. 2.65 Peak factor

The proposed project discharge peak flow is expected to add 0.029 cfs to the system.

2. EXISTING FLOW IN THE PUBLIC SYSTEM

The proposed development site is at the upstream terminus of the 10" VCP sewer line and the interim tributary areas to the 190th street sewer appear to be fully developed. Existing sewer flows are based on Monitoring Data conducted by USCubed (see Appendix C.) Flow monitoring was conducted over the course of two weeks (July 20th – August 4th, 2020) at three manhole locations provided by the City of Torrance. Data was recorded at 15-minute intervals during monitoring. In the current condition the proposed site is vacant and assumed to contribute no flows to the monitoring data. Therefore, the below table does not reflect any flow in the approximately 1640 LF of 10" sewer from 190th Street to the monitored manhole near the intersection of Van Ness Ave & 190th Street. The monitoring data maximum flow (mgd) was utilized for conversion to cubic feet per second for further evaluation:

MH	Size	Flow Depth Max. (in)	D/d	SWR Flow Max. (mgd)	SWR Flow Max (cfs)
#1	8	1.90	23.6%	0.009	0.010
#4	10	0.79	7.90%	0.009	0.010
#5	10	2.39	24.10%	0.046	0.120

The software used in determining pipe capacity and velocity in the sewer mains is Bentley Flowmaster, v8i. Output from the program is included in Appendix D Calculations. Available record drawings are included in Appendix E.

3. RESULTS AND CONCLUSIONS

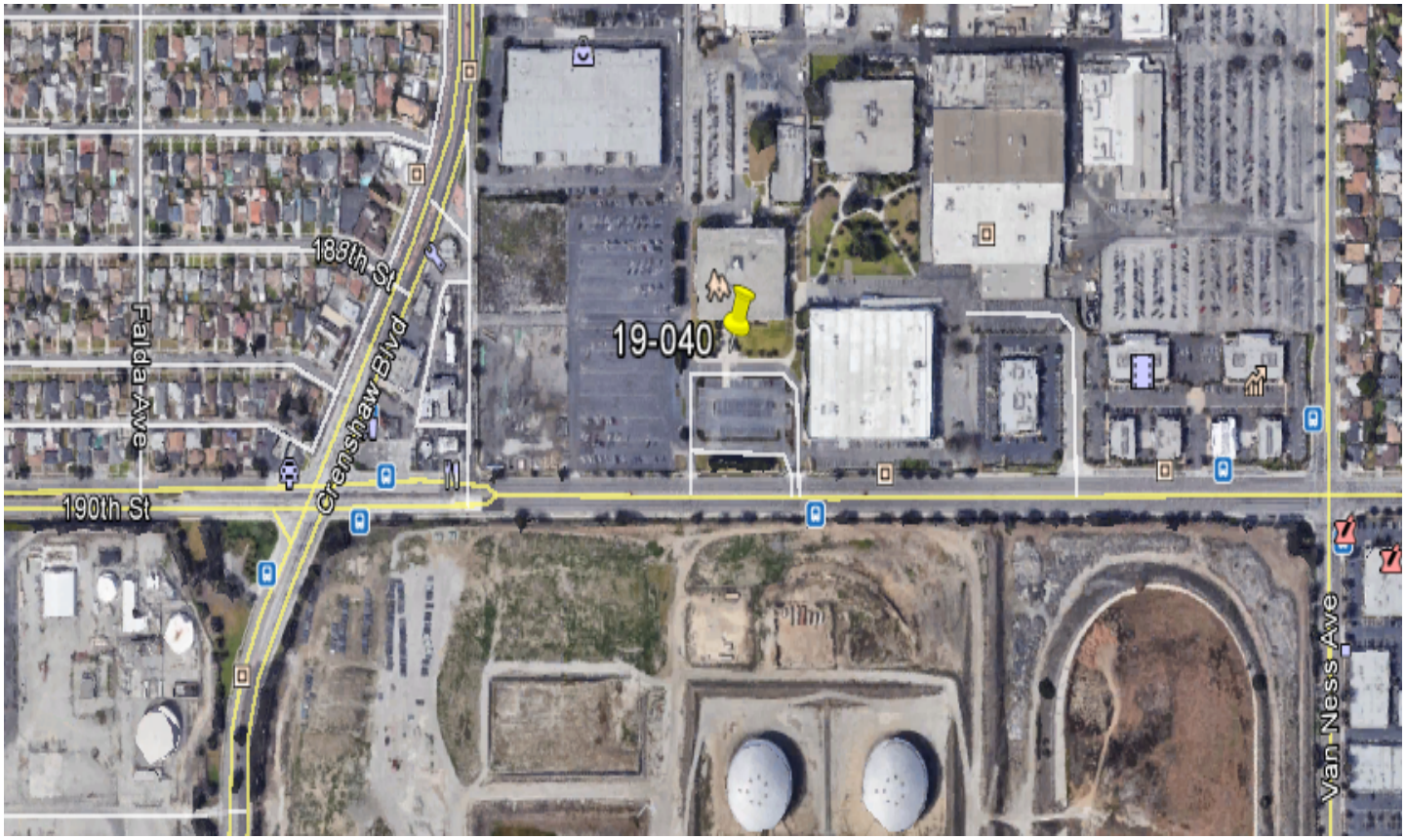
The results of the existing sewer flows were combined with the expected site peak flows and modeled to determine the new expected flow depth for calculation of D/d ratio:

MH	Size	Ex. SWR Flow Max. (cfs)	Pr. SWR Flow Max (cfs)	SWR Flow Peaked (MGD)	Flow Depth Max. (in)	D/d
#1	8	0.010	0. 039	0.028	1.00	18.50%
#4	10	0.010	0.039	0.028	1.00	14.10%
#5	10	0.120	0.149	0.065	2.76	27.20%

Based on the projected peak flow combined with known existing flows the existing public sewer main has been shown to have sufficient capacity to convey the additional project sewer flows within the design guideline not to exceed D/d ratio of 0.5. Therefore, the proposed project will not require any mitigation measures.

APPENDIX A

VICINTY MAP



APPENDIX B

Table 1 Sewer Generation Loading

TABLE 1

LOADINGS FOR EACH CLASS OF LAND USE

DESCRIPTION	UNIT OF MEASURE	FLOW (Gallons Per Day)	COD (Pounds Per Day)	SUSPENDED SOLIDS (Pounds Per Day)
R E S I D E N T I A L				
Single Family Home	Parcel	260	1.22	0.59
Duplex	Parcel	312	1.46	0.70
Triplex	Parcel	468	2.19	1.05
Fourplex	Parcel	624	2.92	1.40
Condominiums	Parcel	195	0.92	0.44
Single Family Home (reduced rate)	Parcel	156	0.73	0.35
Five Units or More	No. of Dwlg. Units	156	0.73	0.35
Mobile Home Parks	No. of Spaces	156	0.73	0.35
C O M M E R C I A L				
Hotel/Motel/Rooming House	Room	125	0.54	0.28
Store	1000 ft^2	100	0.43	0.23
Supermarket	1000 ft^2	150	2.00	1.00
Shopping Center	1000 ft^2	325	3.00	1.17
Regional Mall	1000 ft^2	150	2.10	0.77
Office Building	1000 ft^2	200	0.86	0.45
Professional Building	1000 ft^2	300	1.29	0.68
Restaurant	1000 ft^2	1,000	16.68	5.00
Indoor Theatre	1000 ft^2	125	0.54	0.28
Car Wash				
Tunnel - No Recycling	1000 ft^2	3,700	15.86	8.33
Tunnel - Recycling	1000 ft^2	2,700	11.74	6.16
Wand	1000 ft^2	700	3.00	1.58
Financial Institution	1000 ft^2	100	0.43	0.23
Service Shop	1000 ft^2	100	0.43	0.23
Animal Kennels	1000 ft^2	100	0.43	0.23
Service Station	1000 ft^2	100	0.43	0.23
Auto Sales/Repair	1000 ft^2	100	0.43	0.23
Wholesale Outlet	1000 ft^2	100	0.43	0.23
Nursery/Greenhouse	1000 ft^2	25	0.11	0.06
Manufacturing	1000 ft^2	200	1.86	0.70
Dry Manufacturing	1000 ft^2	25	0.23	0.09
Lumber Yard	1000 ft^2	25	0.23	0.09
Warehousing	1000 ft^2	25	0.23	0.09
Open Storage	1000 ft^2	25	0.23	0.09
Drive-in Theatre	1000 ft^2	20	0.09	0.05

TABLE 1
(continued)
LOADINGS FOR EACH CLASS OF LAND USE

DESCRIPTION	UNIT OF MEASURE	FLOW (Gallons Per Day)	COD (Pounds Per Day)	SUSPENDED SOLIDS (Pounds Per Day)
C O M M E R C I A L				
Night Club	1000 ft^2	350	1.50	0.79
Bowling/Skating	1000 ft^2	150	1.76	0.55
Club	1000 ft^2	125	0.54	0.27
Auditorium, Amusement	1000 ft^2	350	1.50	0.79
Golf Course, Camp, and Park (Structures and Improvements	1000 ft^2	100	0.43	0.23
Recreational Vehicle Park	No. of Spaces	55	0.34	0.14
Convalescent Home	Bed	125	0.54	0.28
Laundry	1000 ft^2	3,825	16.40	8.61
Mortuary/Cemetery	1000 ft^2	100	1.33	0.67
Health Spa, Gymnasium				
With Showers	1000 ft^2	600	2.58	1.35
Without Showers	1000 ft^2	300	1.29	0.68
Convention Center, Fairground, Racetrack, Sports Stadium/Arena	Average Daily Attendance	10	0.04	0.02
I N S T I T U T I O N A L				
College/University	Student	20	0.09	0.05
Private School	1000 ft^2	200	0.86	0.45
Church	1000 ft^2	50	0.21	0.11

APPENDIX C

Sewer monitoring data by USCubed

Collected November to December 2019

Methods & Procedures & Equipment

Methods and Procedures

Utility Systems Science & Software provided DRC Engineering with an off the shelf, non-proprietary flow monitoring solution that included three state of the art Hach Flo-Dar® AV Sensor systems. The project course of action is listed below. The US^3 team:

- Assessed traffic control at the sites on 190th St in Torrance, CA.
- Validated the sites for suitability for sewer flow monitoring for the Comstock Development Torrance Warehouse Project.
- Installed and removed traffic control in accord with site-specific CA MUTCD requirements for both the installation and removal of equipment.
- Installed and calibrated the flow monitoring equipment per manufacturer recommendations.
- Removed the equipment, validated the data and prepared the data reports.
    - The data supports the conclusion that there is capacity available in the monitored sewer lines since the depth for the peak flows observed during this study did not exceed the d/D limit of 0.50 at any of the sites at any time.
    - The maximum d/D observed during this study was ~0.24 at both US MH 01 and DS MH 05.

Equipment

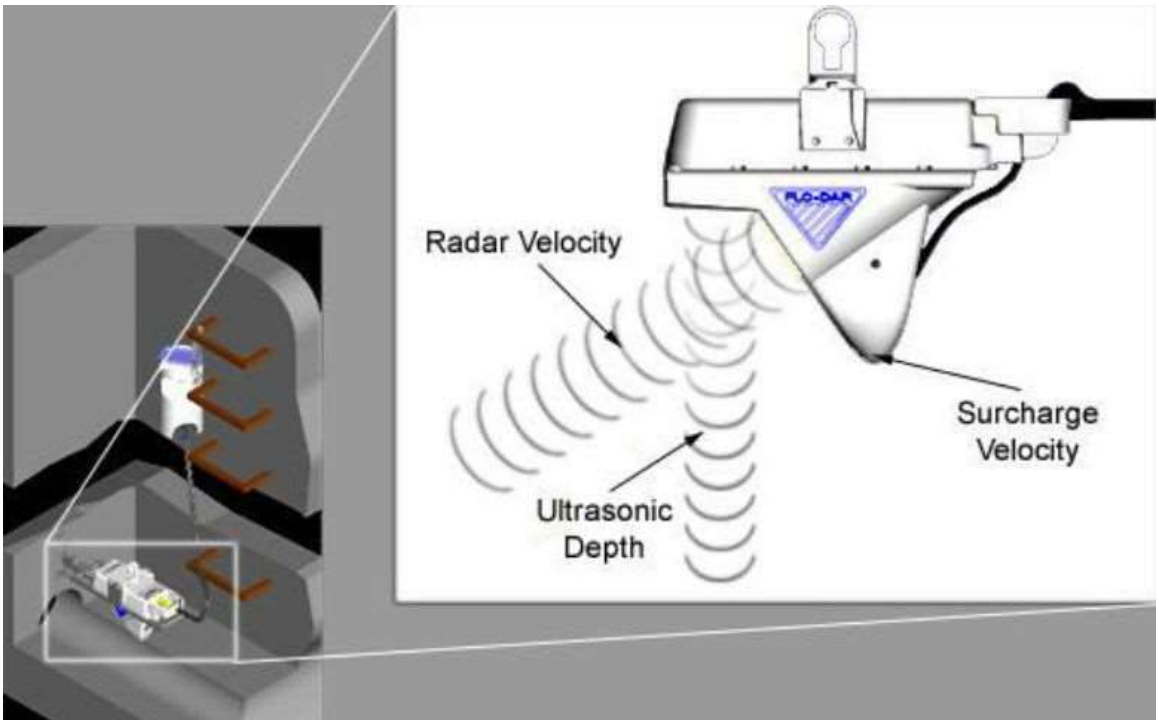


Figure: Equipment installed for the Sewer Flow Monitoring Study



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

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**
  - ±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**
  - ±1%; ±0.25 cm (±0.1 in.)

FLOW MEASUREMENT

- **Method**
  - Based on Continuity Equation
- **Accuracy**
  - ±5% of reading typical where flow is in a channel with uniform flow conditions and is not surcharged, ±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)

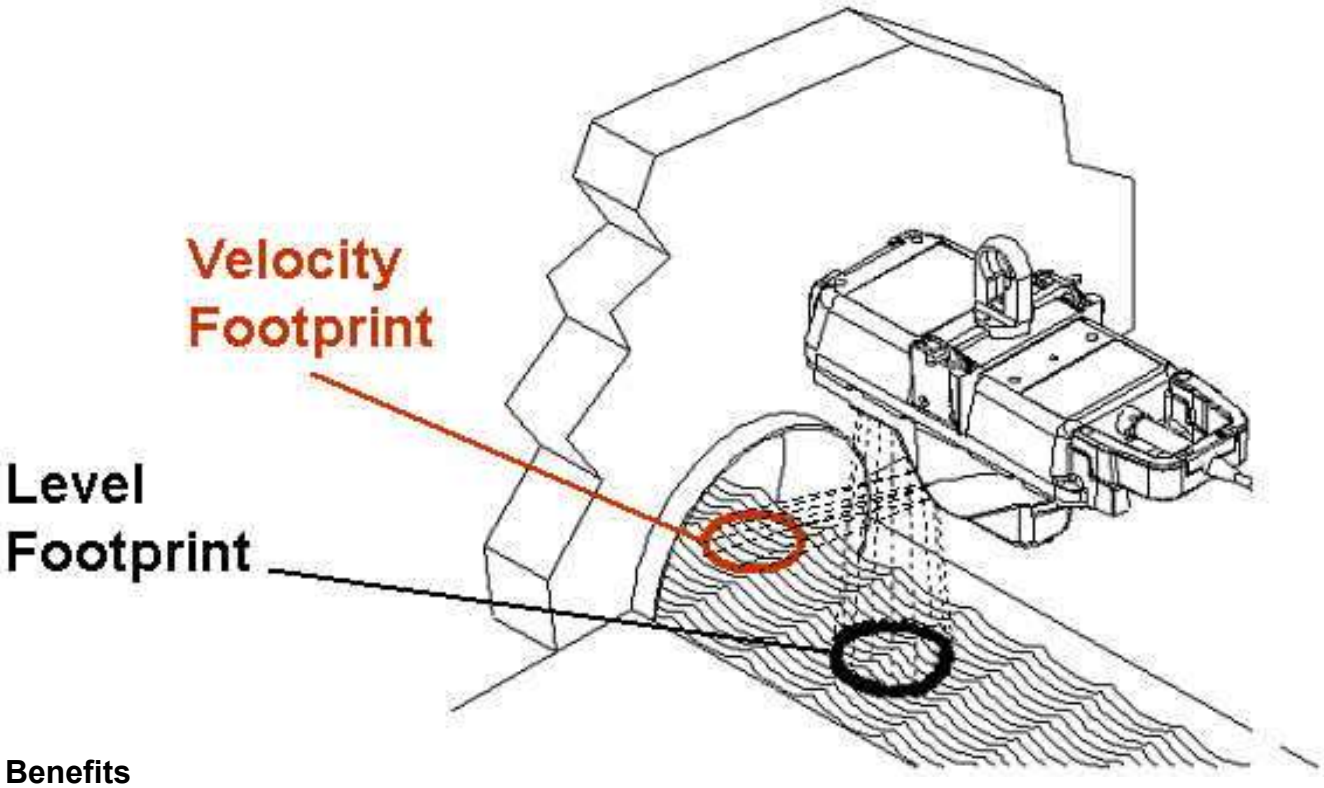
- **Method**
  - Electromagnetic
- **Range**
  - ±4.8 m/s (±16 ft/s)
- **Accuracy**
  - ±0.15 ft/s or 4% of reading, whichever is greater.
- **Zero Stability**
  - ±0.05 ft/s

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 x A, Where Q = Flow, V = Average Velocity and A = 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.

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.

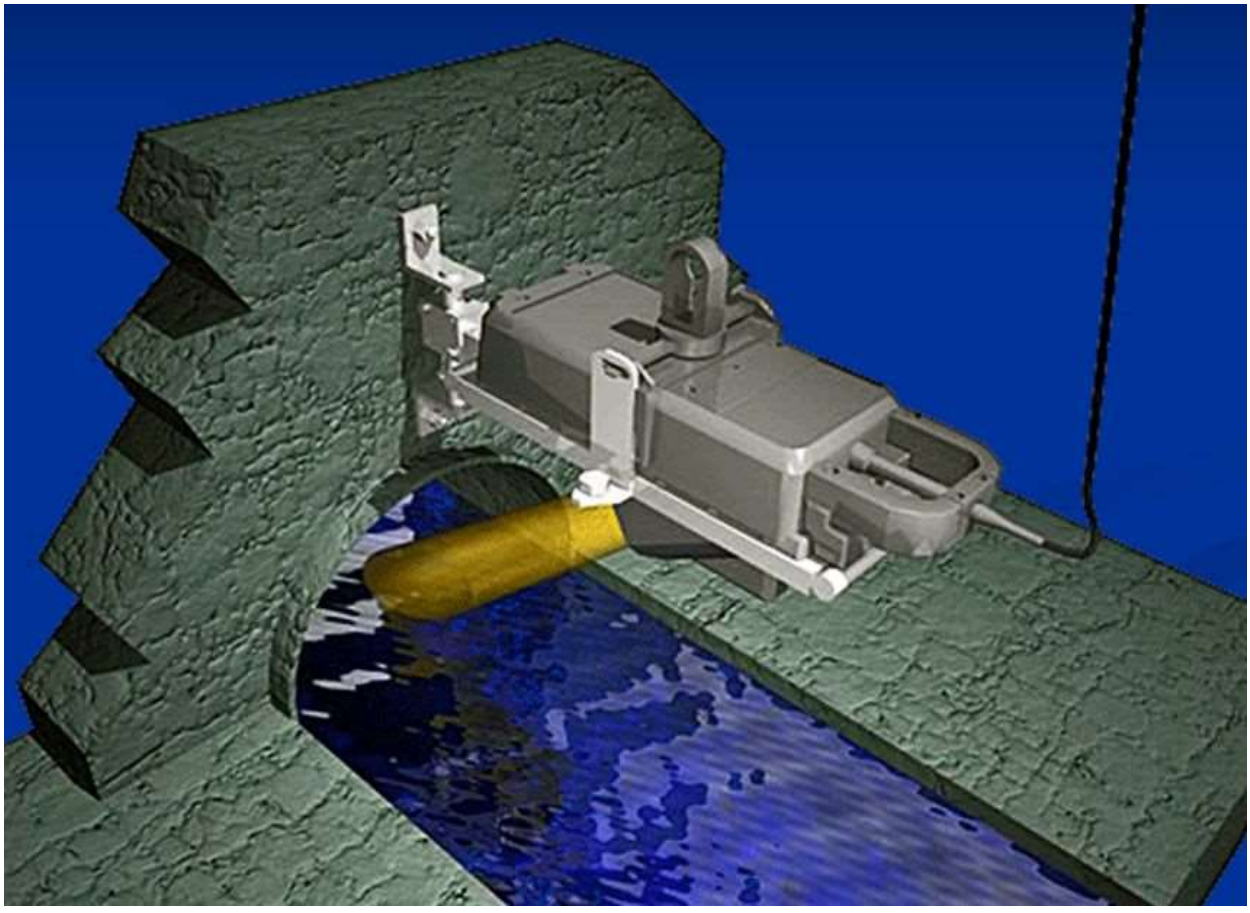


Figure: US³ utilizes exclusively Hach March-McBirney Flo-Dar® Meters

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: All technicians are certified for Confined Space Entry.

Name, Title, Address and Telephone numbers of persons to contact concerning this report.

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Site Report 8/05/2020

Confidential Proprietary Information

DRC Engineering

2020.07 US MH 01

MH at ~2754 W. 190th St
Torrance, CA 90504
MH # 01

Access:
MH in drive aisle at Honeywell entrance

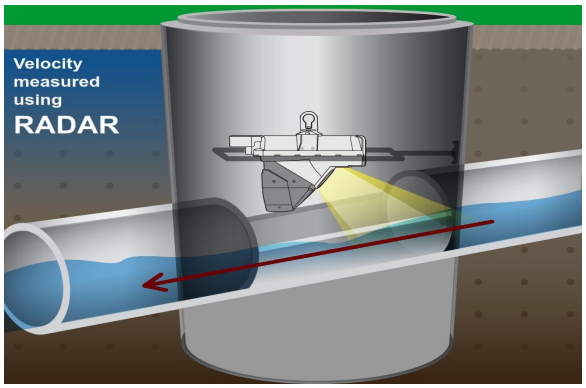
System Type:
Sanitary [X] Storm [ ]

Install Date: 7/20/2020

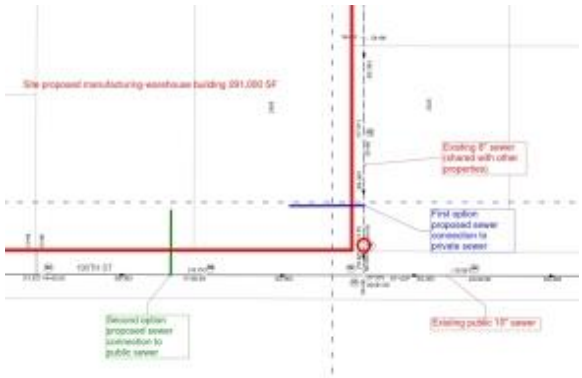
Map



Technology



Sewer Plan



Flow Meter			
Meter Depth: 188"			
MH Coordinates: 33.858505, -118.323124			
Laminar open channel hydraulics			
Avg Velocity	Avg Measured Level		Multiplier
0.25 fps	1.25"		1.0
Gas			
O2	H2S	CO	LEL
20.9	0	0	0
Notes			
One inlet & two outlets (W partially blocked); monitored the upstream line as it provided the best hydraulics.			
Traffic Safety			
No formal TCP required; used cones & signs per site-specific CA MUTCD TC requirements.			
Land Use			
Residential	Commercial	Industrial	Trunk
	X		

Manhole Depth	203"
Monitored Pipe Size	8"
Inner Pipe Size (In/Out)	8"/8"
Pipe Shape	Round
Pipe Condition	Good
Manhole Material	Concrete
Silt	W DS line partially filled
Velocity Profile Data	*
Velocity Profile Taken	0.4 2-D
Sensor Offset	14.78"
Sensor Dist. to Crown	6.78"
Sensor Direction	Upstream
Flow Heading	South

Meter Site Document

2020.07 US MH 01

MH at ~2754 W. 190th St

Torrance, CA 90504

Site



Manhole Before Install



Installation Process



Installed



Upstream



West Downstream Line



Temporary Flow Study

DRC Engineering

2020.07 US MH 01

Meter Start Date		From	7/20/2020
Meter Stop Date		To	8/4/2020
Velocity (fps)		Level (in)	Flow (mgd)
Average	0.236	1.257	0.004
Maximum	0.630	1.900	0.009
Minimum	0.100	0.890	0.001
Pipe Size		8.000	
Estimated Capacity (mgd)		Not Calculated	
Capacity Used		Not Calculated	
Sensor Type		Hach - Flodar	

Utility Systems, Science and Software

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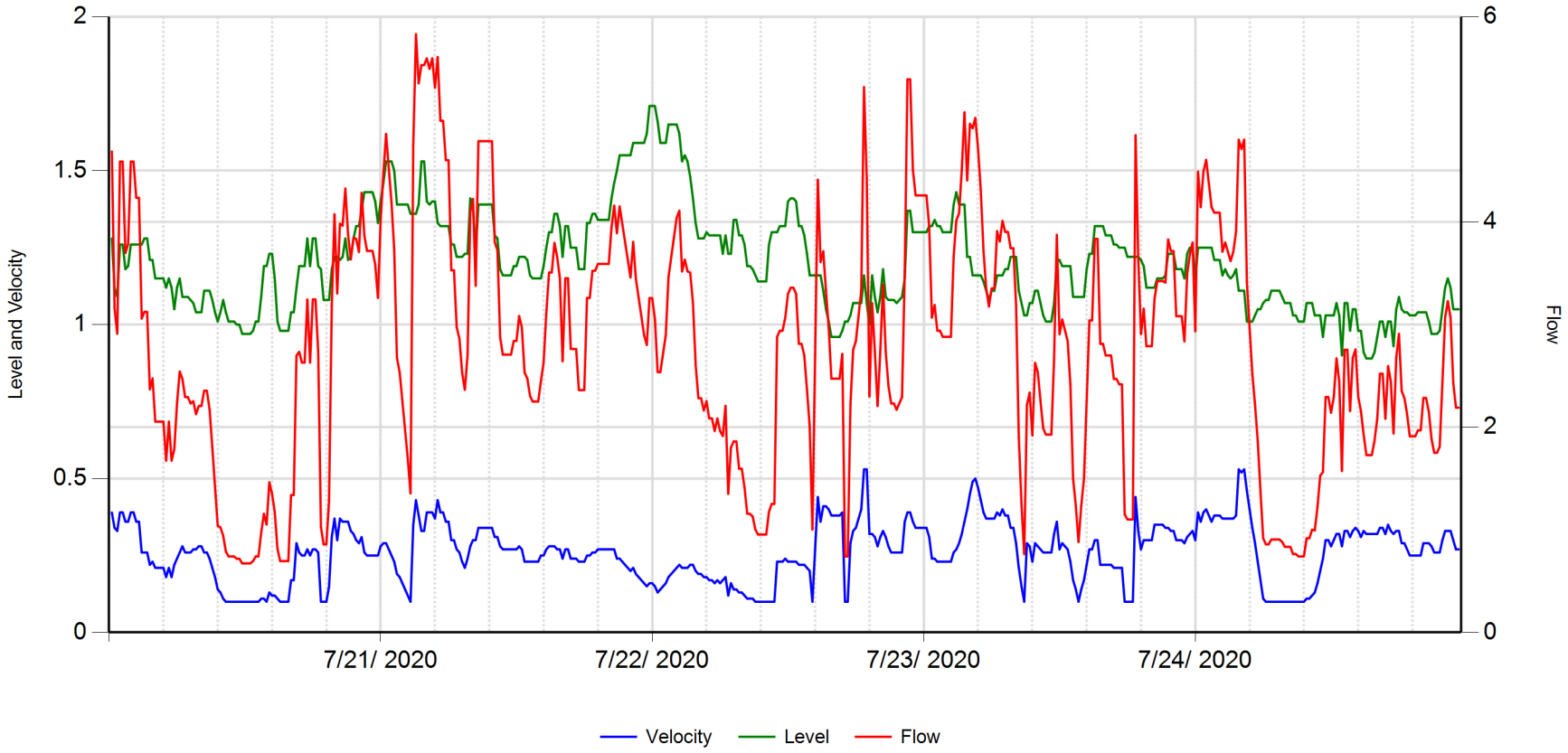
601 N. Parkcenter Dr, Suite 209
Santa Ana, CA 92705

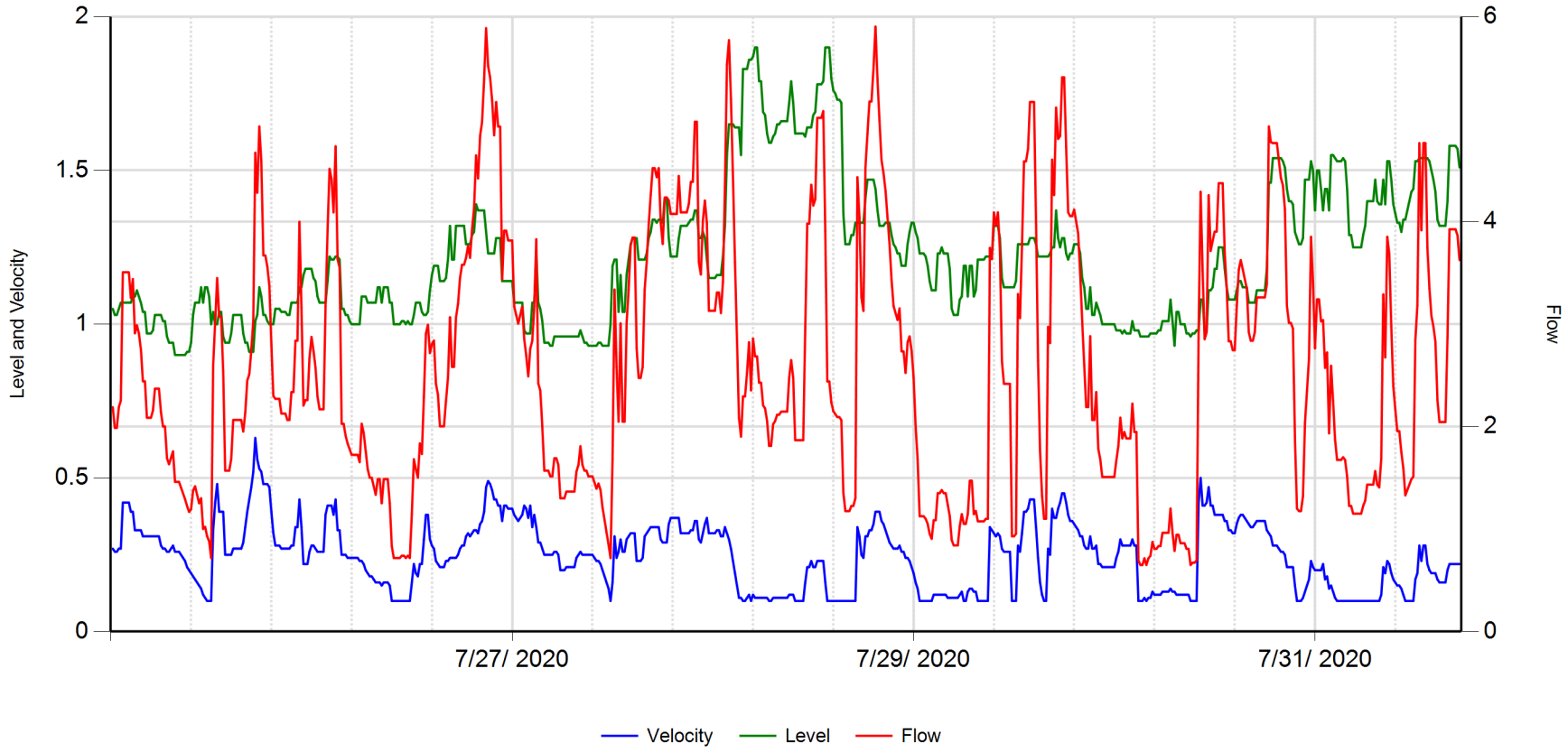
2020.07 US MH 01



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	0.259	1.203	2.783	**RainFall**	Inches
Maximum	0.530	1.710	5.831		
Minimum	0.100	0.890	0.673		

8/05/2020

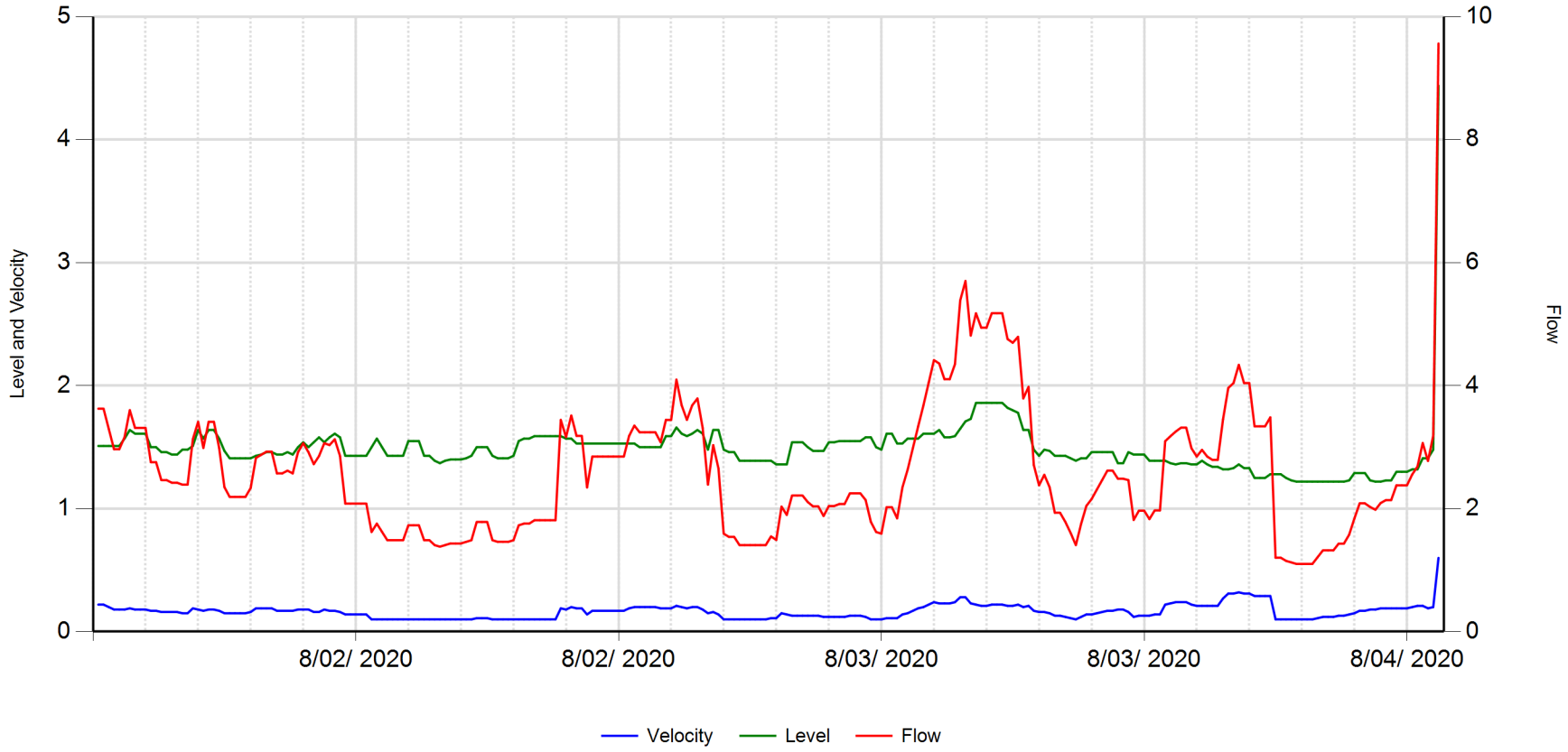
2020.07 US MH 01



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	0.244	1.216	2.592	**RainFall**	Inches
Maximum	0.630	1.900	5.904		
Minimum	0.100	0.900	0.651		

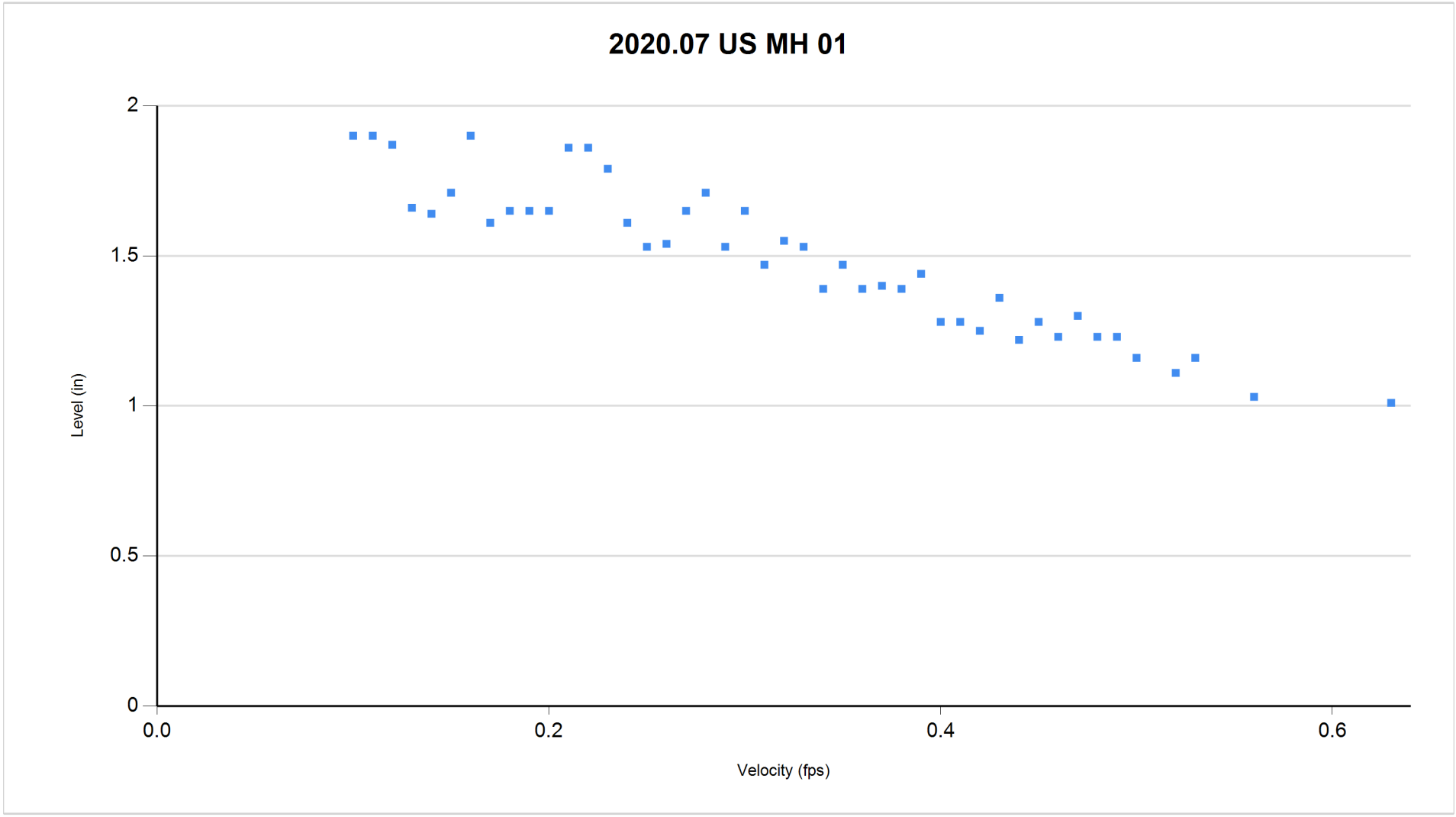
8/05/2020

2020.07 US MH 01



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	0.162	1.473	2.570	**RainFall**	Inches
Maximum	0.320	1.860	5.702		
Minimum	0.100	1.220	1.101		

8/05/2020



7/20/2020 thru 8/04/2020

8/5/2020 9:23:14 AM

Site Report 8/05/2020

Confidential Proprietary Information

DRC Engineering

2020.07 Mid MH 04

MH at ~2549 W. 190th St
Torrance, CA 90504
MH # 04 DS

Access:
MH in flush median, south of address

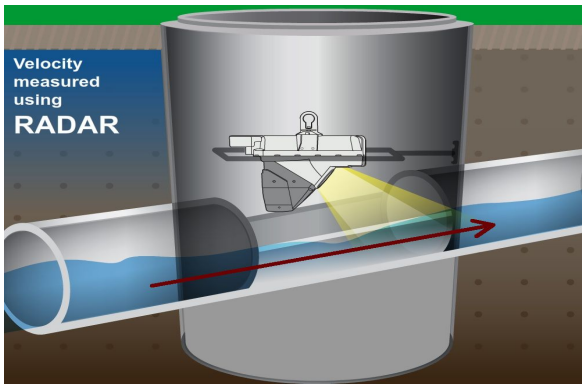
System Type:
Sanitary [X] Storm [ ]

Install Date: 7/20/2020

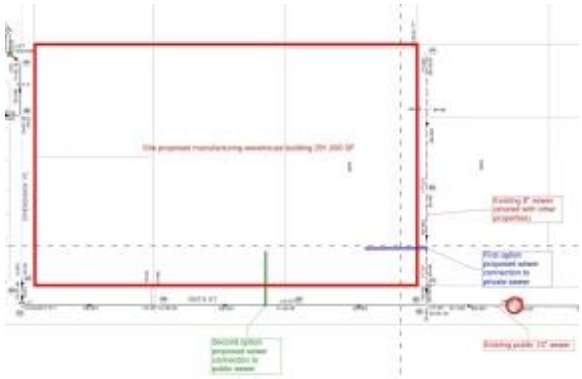
Map



Technology



Sewer Plan



Flow Meter			
Meter Depth: 187"			
MH Coordinates: 33.858345, -118.322394			
Low to moderate open channel hydraulics			
Avg Velocity	Avg Measured Level		Multiplier
0.5 fps	0.66"		1.0
Gas			
O2	H2S	CO	LEL
20.9	0	0	0
Notes			
No laterals; monitored the downstream line as it provided the best hydraulics.			
Traffic Safety			
No formal TCP required; used cones & signs per site-specific CA MUTCD TC requirements.			
Land Use			
Residential	Commercial	Industrial	Trunk
	X		

Manhole Depth	203"
Monitored Pipe Size	10"
Inner Pipe Size (In/Out)	10"/10"
Pipe Shape	Round
Pipe Condition	Good
Manhole Material	Concrete
Silt	Minor, intermittent
Velocity Profile Data	*
Velocity Profile Taken	0.4 2-D
Sensor Offset	15.85"
Sensor Dist. to Crown	5.85"
Sensor Direction	Downstream
Flow Heading	East

Meter Site Document

2020.07 Mid MH 04

MH at ~2549 W. 190th St

Torrance, CA 90504

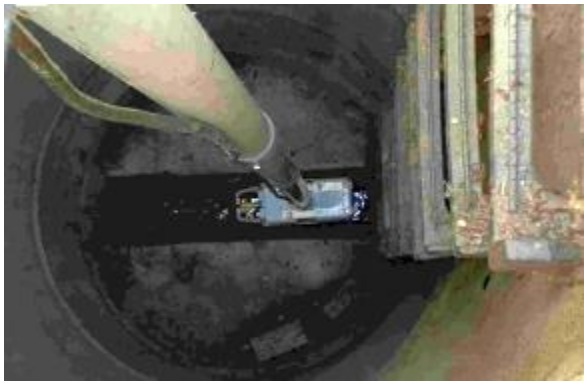
Site



Manhole Before Install



Installation Process



Installed



Upstream



Downstream



Temporary Flow Study

DRC Engineering

2020.07 Mid MH 04

Meter Start Date		From	7/20/2020
Meter Stop Date		To	8/4/2020
Velocity (fps)		Level (in)	Flow (mgd)
Average	0.485	0.606	0.004
Maximum	0.710	0.790	0.009
Minimum	0.260	0.460	0.002
Pipe Size		10.000	
Estimated Capacity (mgd)		Not Calculated	
Capacity Used		Not Calculated	
Sensor Type		Hach - Flodar	

Utility Systems, Science and Software

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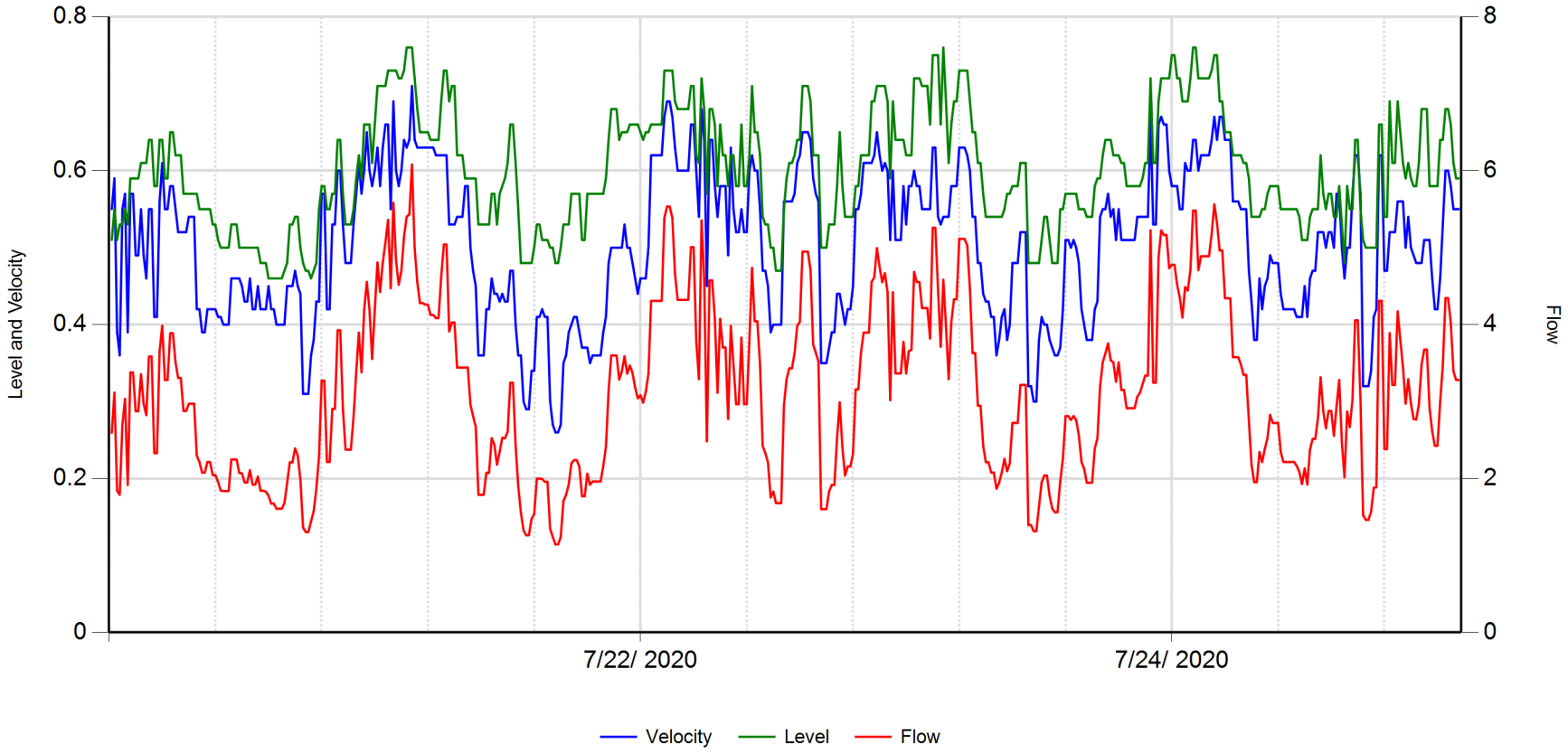
Santa Ana, CA 92705

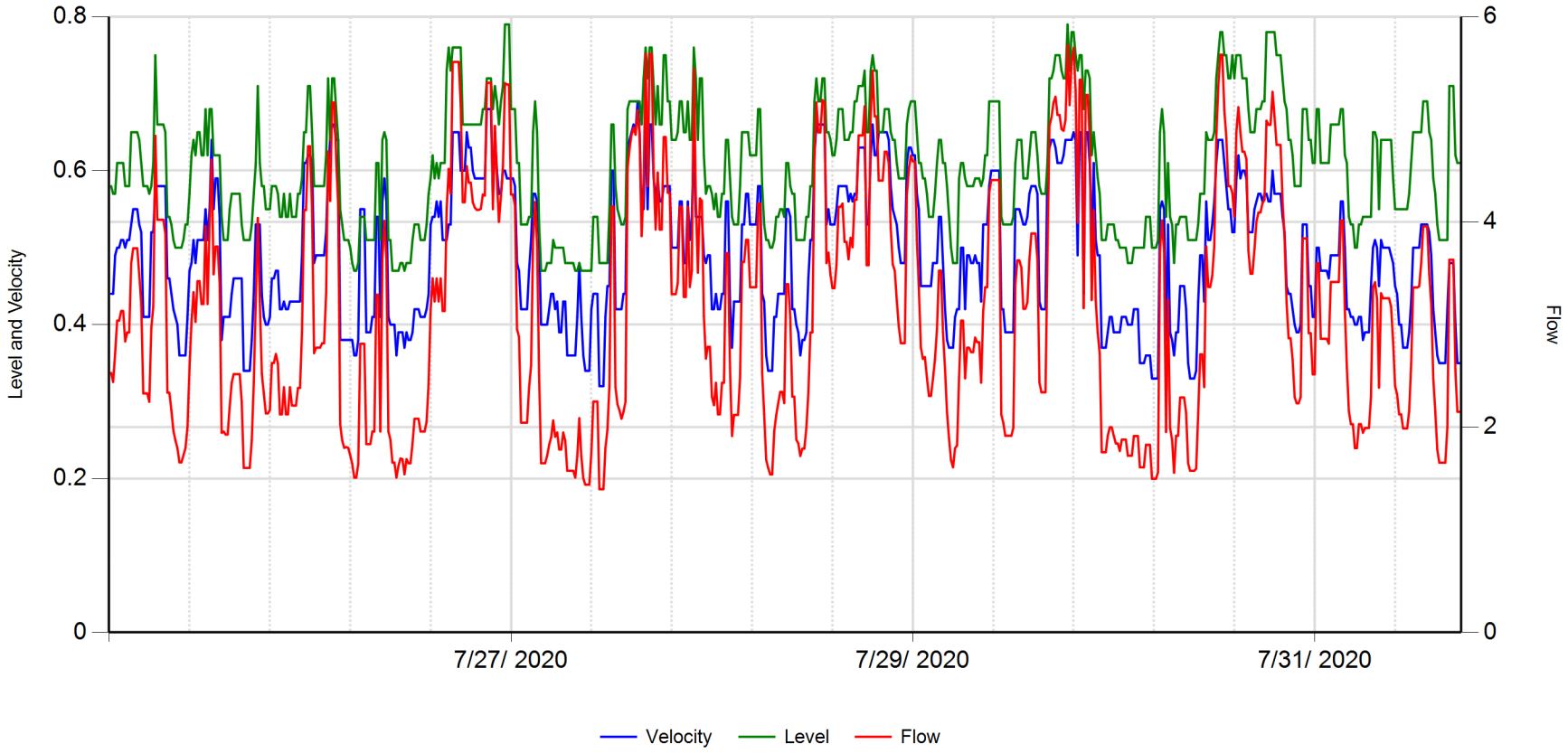
2020.07 Mid MH 04



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	0.504	0.600	3.132	**RainFall**	Inches
Maximum	0.710	0.760	6.080		
Minimum	0.260	0.460	1.144		

8/05/2020

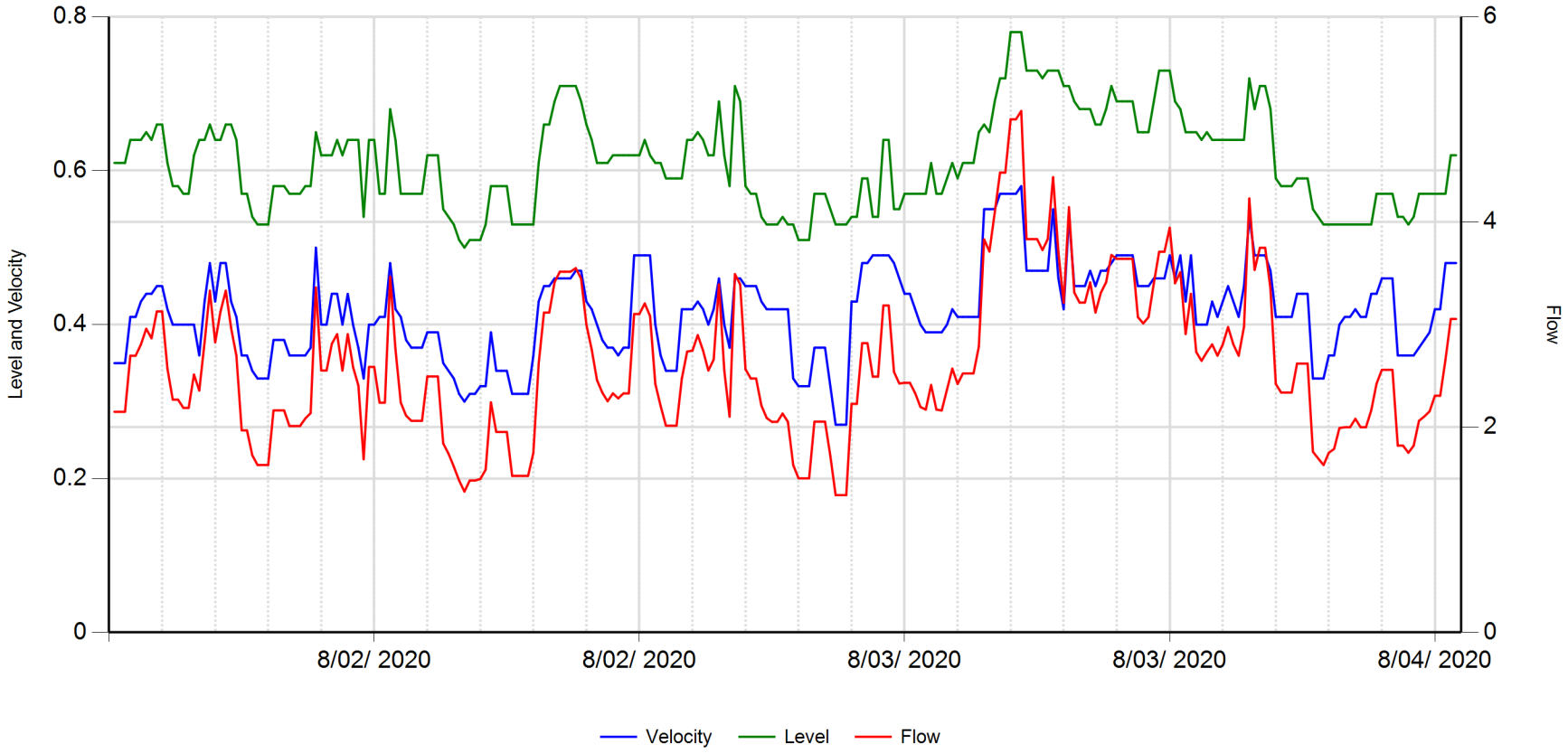
2020.07 Mid MH 04



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	0.492	0.606	3.109	**RainFall**	Inches
Maximum	0.690	0.790	5.724		
Minimum	0.320	0.470	1.397		

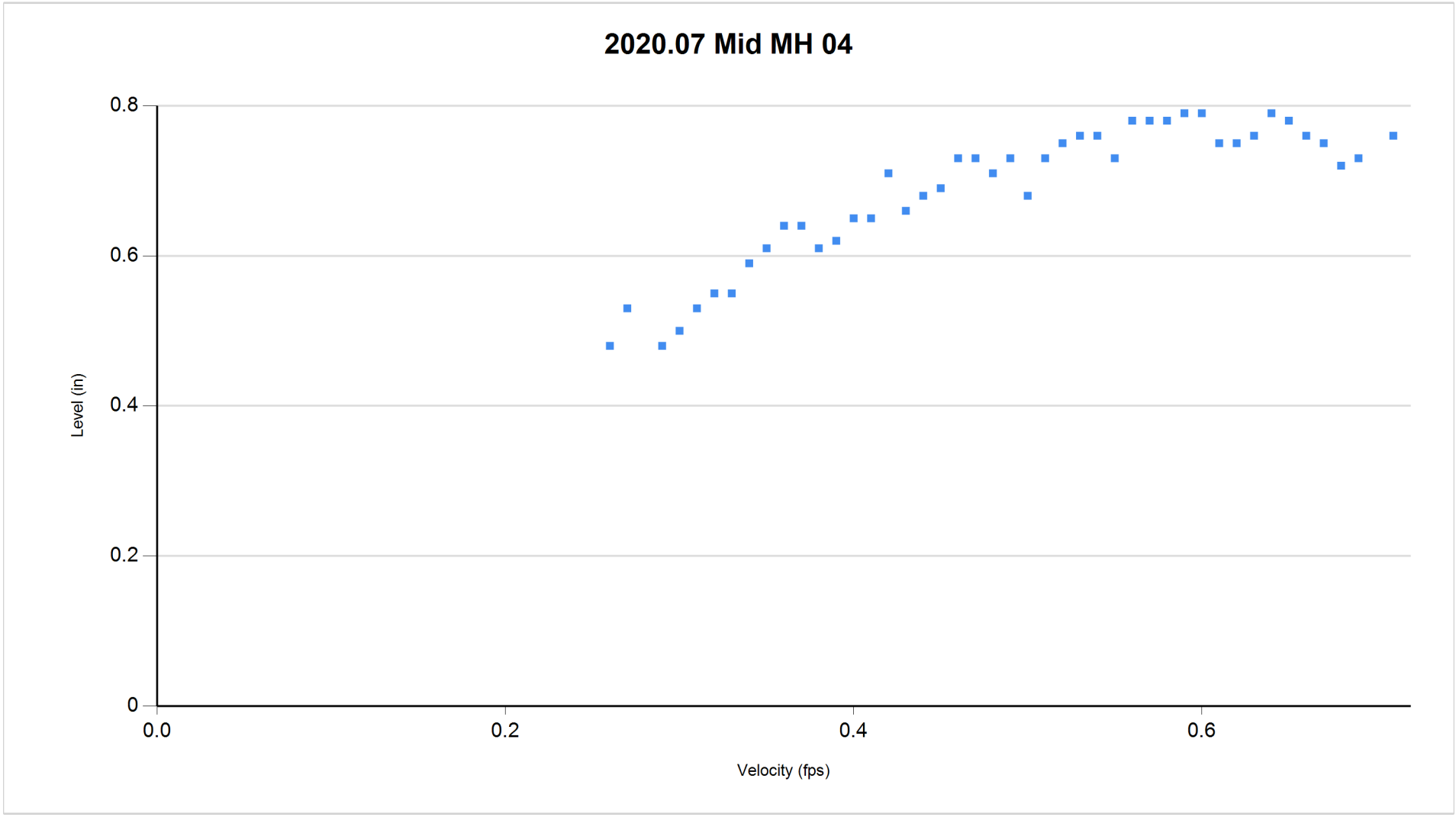
8/05/2020

2020.07 Mid MH 04



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	0.416	0.611	2.612	**RainFall**	Inches
Maximum	0.580	0.780	5.081		
Minimum	0.270	0.500	1.338		

8/05/2020



7/20/2020 thru 8/04/2020

8/5/2020 9:24:44 AM

Site Report 8/05/2020

Confidential Proprietary Information

DRC Engineering

2020.07 DS MH 05

MH at ~2239 W. 190th St
Torrance, CA 90504
MH # 05 DS

Access:
MH in median, south of address

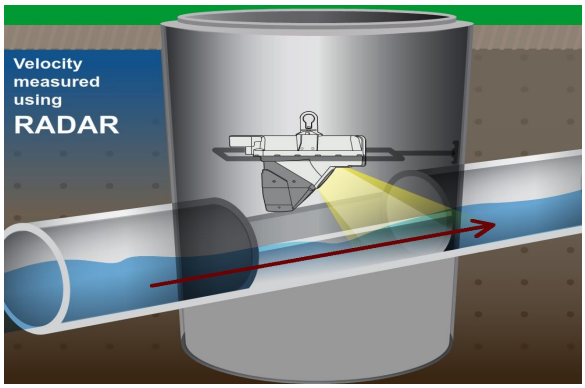
System Type:
Sanitary [X] Storm [ ]

Install Date: 7/20/2020

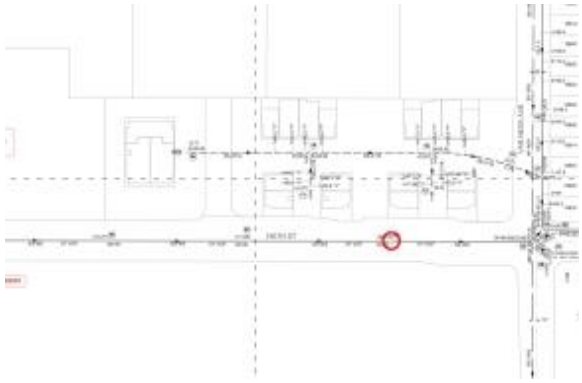
Map



Technology



Sewer Plan



Flow Meter
Meter Depth: 235"
MH Coordinates: 33.858348, -118.318939
Low to moderate open channel hydraulics

Avg Velocity	Avg Measured Level	Multiplier
0.33 fps	1.25"	1.0

Gas			
O2	H2S	CO	LEL
20.9	0	0	0

Notes
Inlets from west & south (S partially blocked); monitored the downstream line as it provided the best hydraulics.

Traffic Safety
No formal TCP required; used cones & signs per site-specific CA MUTCD TC requirements.

Land Use			
Residential	Commercial	Industrial	Trunk
	X		

Manhole Depth	251"
Monitored Pipe Size	10"
Inner Pipe Size (In/Out)	10"/10"
Pipe Shape	Round
Pipe Condition	Good
Manhole Material	Concrete
Silt	S US line partially filled
Velocity Profile Data	*
Velocity Profile Taken	0.4 2-D
Sensor Offset	16.33"
Sensor Dist. to Crown	6.33"
Sensor Direction	Downstream
Flow Heading	East

Meter Site Document

2020.07 DS MH 05

MH at ~2239 W. 190th St

Torrance, CA 90504

Site



Manhole Before Install



Installation Process



Installed



Upstream South Lateral



Downstream



Temporary Flow Study

DRC Engineering

2020.07 DS MH 05

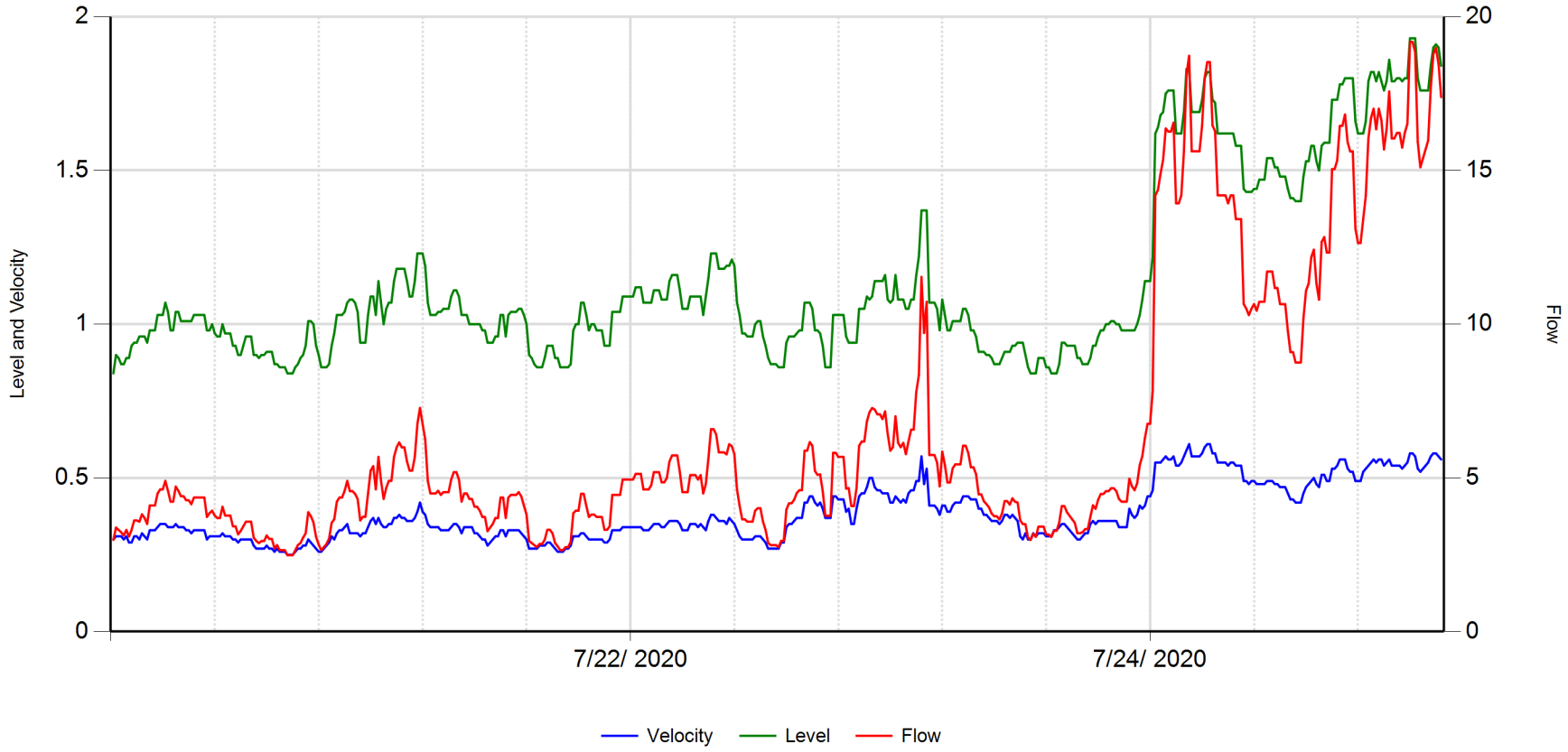
Meter Start Date		From	7/20/2020
Meter Stop Date		To	8/4/2020
Velocity (fps)		Level (in)	Flow (mgd)
Average	0.409	1.281	0.013
Maximum	0.720	2.390	0.046
Minimum	0.250	0.840	0.004
Pipe Size		10.000	
Estimated Capacity (mgd)		Not Calculated	
Capacity Used		Not Calculated	
Sensor Type		Hach - Flodar	

Utility Systems, Science and Software

9314 Bond Av, Suite A
El Cajon, CA 92021

601 N. Parkcenter Dr, Suite 209
Santa Ana, CA 92705

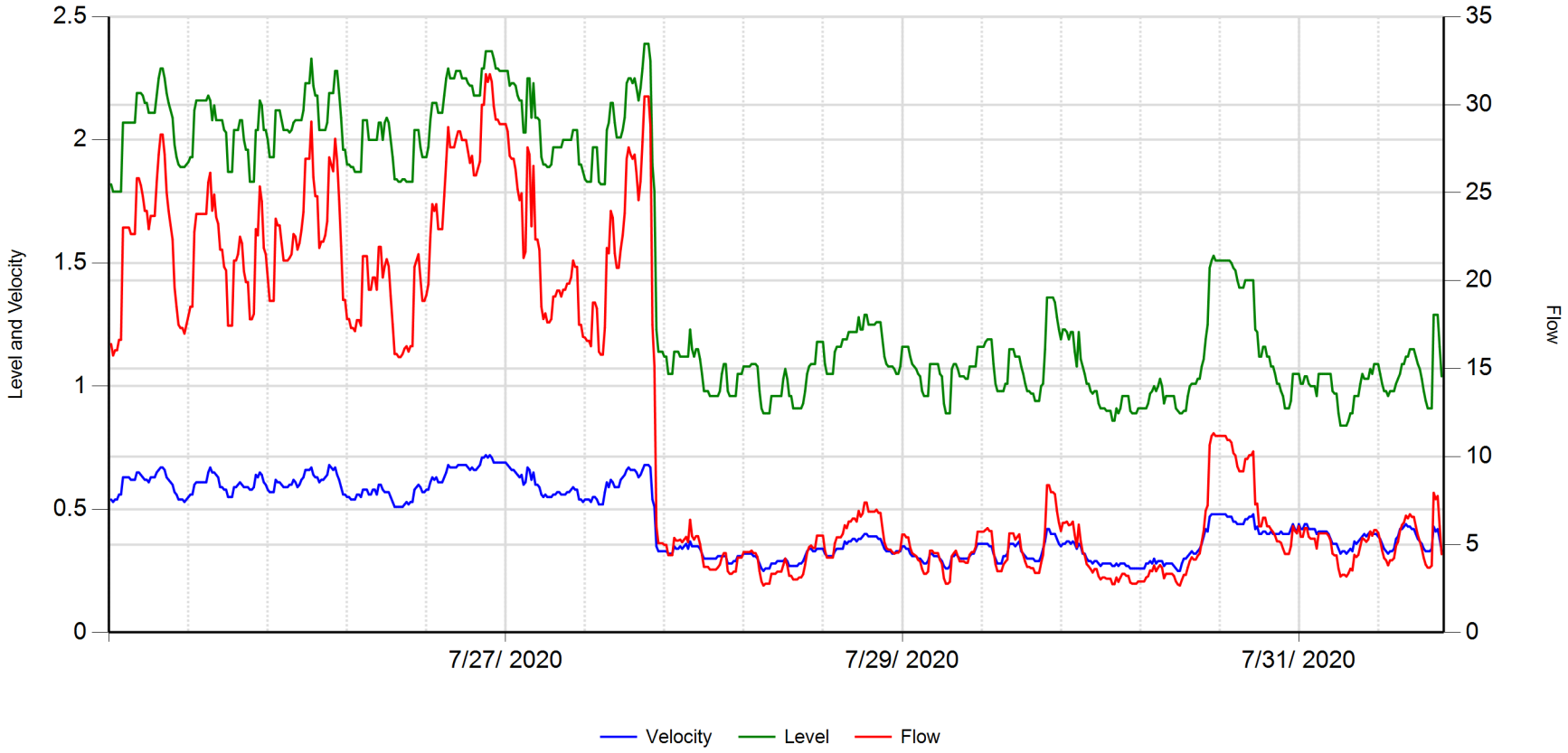
2020.07 DS MH 05



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	0.383	1.145	6.594	**RainFall**	Inches
Maximum	0.610	1.930	19.181		
Minimum	0.250	0.840	2.486		

8/05/2020

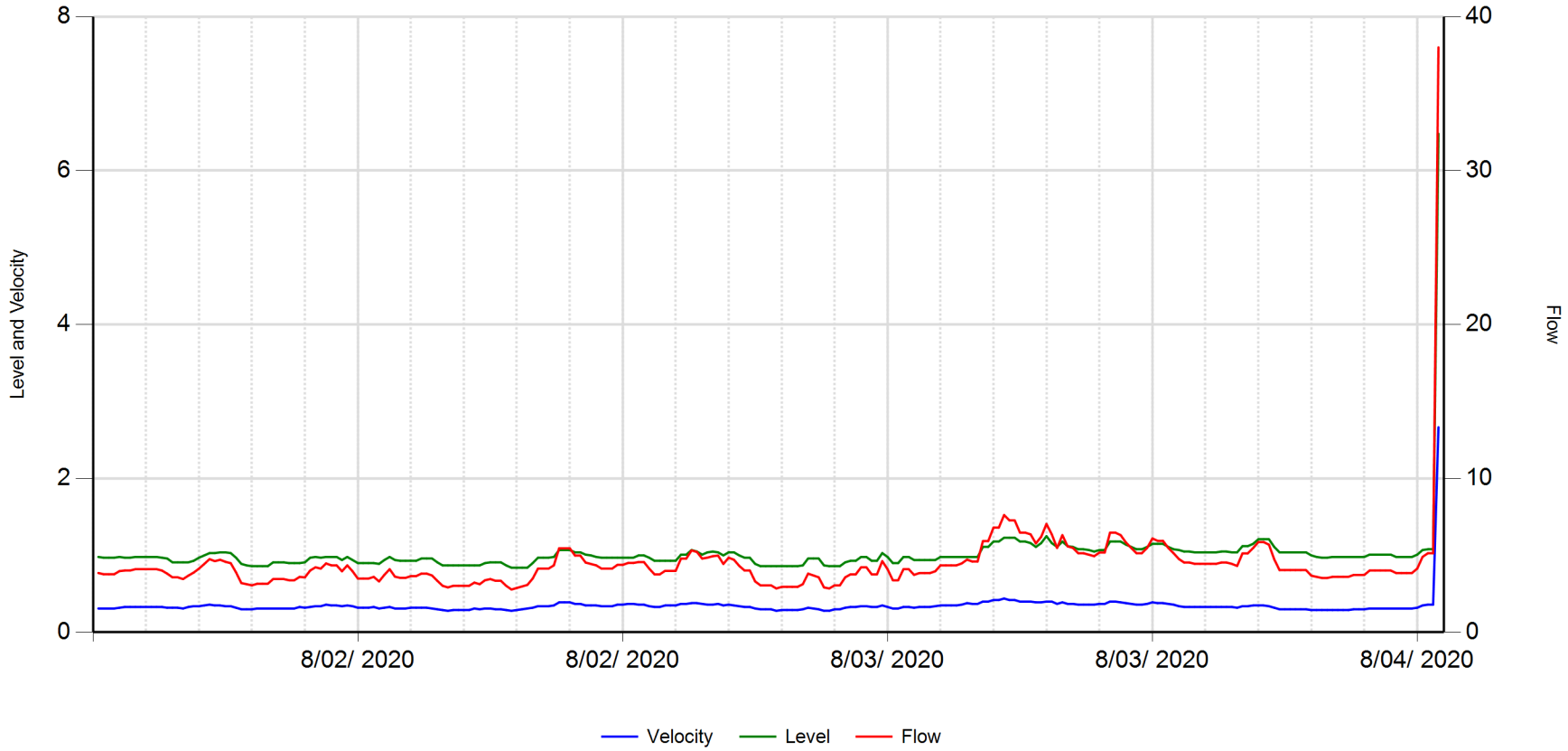
2020.07 DS MH 05



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	0.451	1.482	12.118	**RainFall**	Inches
Maximum	0.720	2.390	31.734		
Minimum	0.250	0.840	2.668		

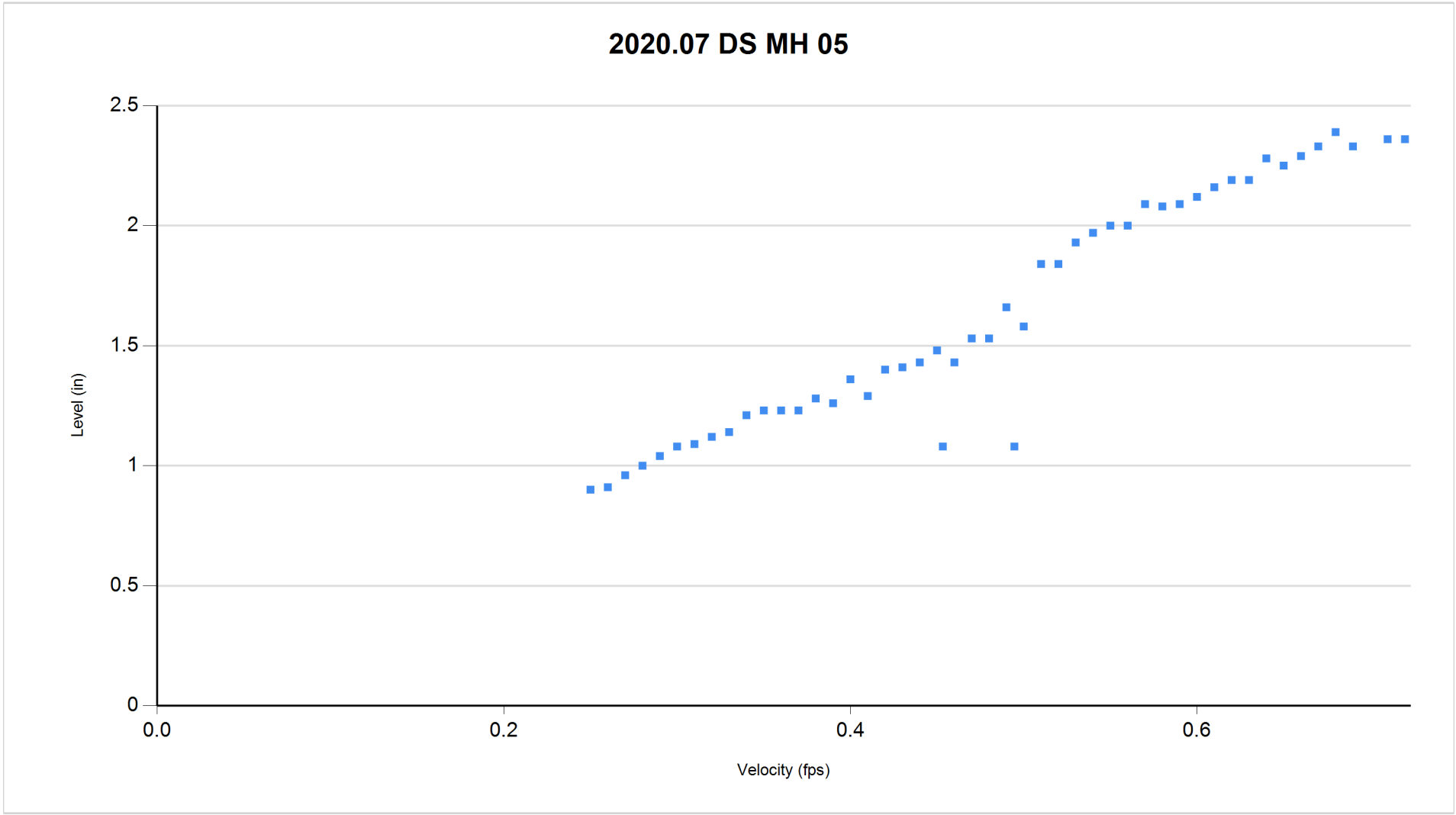
8/05/2020

2020.07 DS MH 05



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	0.337	0.994	4.321	**RainFall**	Inches
Maximum	0.495	1.250	7.624		
Minimum	0.280	0.840	2.784		

8/05/2020



7/20/2020 thru 8/04/2020

8/5/2020 9:25:30 AM

APPENDIX D

Calculations

Worksheet for 8" MH#1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00440	ft/ft
Diameter	0.67	ft
Discharge	0.04	ft^3/s

Results

Normal Depth	0.10	ft
Flow Area	0.03	ft^2
Wetted Perimeter	0.53	ft
Hydraulic Radius	0.06	ft
Top Width	0.48	ft
Critical Depth	0.09	ft
Percent Full	14.9	%
Critical Slope	0.00701	ft/ft
Velocity	1.19	ft/s
Velocity Head	0.02	ft
Specific Energy	0.12	ft
Froude Number	0.80	
Maximum Discharge	0.87	ft^3/s
Discharge Full	0.81	ft^3/s
Slope Full	0.00001	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	14.91	%
Downstream Velocity	Infinity	ft/s

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Worksheet for 8" MH#1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.10	ft
Critical Depth	0.09	ft
Channel Slope	0.00440	ft/ft
Critical Slope	0.00701	ft/ft

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Worksheet for 10" MH#4

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00180	ft/ft
Diameter	0.83	ft
Discharge	0.04	ft³/s

Results

Normal Depth	0.12	ft
Flow Area	0.05	ft²
Wetted Perimeter	0.64	ft
Hydraulic Radius	0.07	ft
Top Width	0.58	ft
Critical Depth	0.08	ft
Percent Full	14.1	%
Critical Slope	0.00700	ft/ft
Velocity	0.84	ft/s
Velocity Head	0.01	ft
Specific Energy	0.13	ft
Froude Number	0.52	
Maximum Discharge	0.99	ft³/s
Discharge Full	0.92	ft³/s
Slope Full	0.00000	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	14.07	%
Downstream Velocity	Infinity	ft/s

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Worksheet for 10" MH#4

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.12	ft
Critical Depth	0.08	ft
Channel Slope	0.00180	ft/ft
Critical Slope	0.00700	ft/ft

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Worksheet for 10" MH#5

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00180	ft/ft
Diameter	0.83	ft
Discharge	0.15	ft^3/s

Results

Normal Depth	0.23	ft
Flow Area	0.12	ft^2
Wetted Perimeter	0.91	ft
Hydraulic Radius	0.13	ft
Top Width	0.74	ft
Critical Depth	0.17	ft
Percent Full	27.2	%
Critical Slope	0.00616	ft/ft
Velocity	1.25	ft/s
Velocity Head	0.02	ft
Specific Energy	0.25	ft
Froude Number	0.55	
Maximum Discharge	0.99	ft^3/s
Discharge Full	0.92	ft^3/s
Slope Full	0.00005	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	27.22	%
Downstream Velocity	Infinity	ft/s

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Worksheet for 10" MH#5

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.23	ft
Critical Depth	0.17	ft
Channel Slope	0.00180	ft/ft
Critical Slope	0.00616	ft/ft

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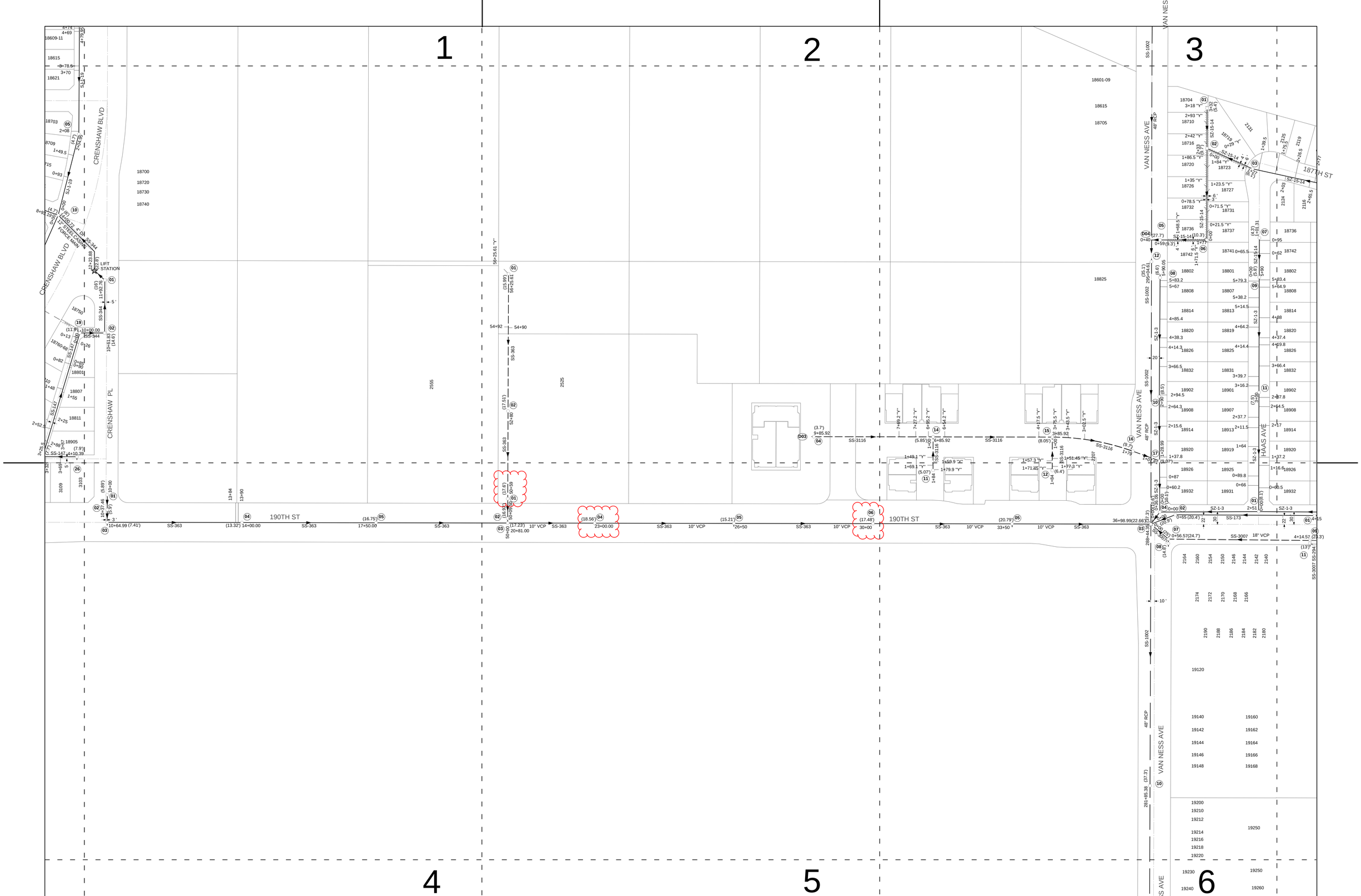
APPENDIX E

Record Drawings:

City of Torrance Atlas Map SS-28

As-Built Drawings SS-363



CITY OF TORRANCE

SANITARY SEWERS

DRAWN: TT DATE: April 25, 2013

CHECKED: NA, SY REV:

LEGEND

8" SEWER UNLESS INDICATED

1 + 00 H.C. TO PL

0 + 90

0 + 75 "Y" C.O.

0 + 50 "C" H.C. TO CURB

CHIMNEY

STA. DEPTH

0 + 00 (6.6')

LIFT STATION M.H.

SS - 100 PLAN NO.

COUNTY SEWER

PRIVATE SEWER

ABAND. SEWER & MH

STREET CENTER LINE

SEWER EASEMENT

100 0 100 200

20	21	22
27	28	29
35	36	37

SHEET NO. 28

PLAN AND PROFILE OF SANITARY SEWER

190th STREET FROM CRENSHAW PLACE TO VAN NESS AVENUE

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, (SSPWC) LATEST EDITION AND SUPPLEMENTS THERETO, AS WRITTEN AND PROMULGATED BY PUBLIC WORKS STANDARDS INC., HEREINAFTER REFERRED TO AS THE STANDARD SPECIFICATIONS, TORRANCE STANDARD T600, AND TO THE SATISFACTION OF THE ENGINEERING DIRECTOR.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE, VERIFY DEPTH AND PROTECT ALL STRUCTURES, INCLUDING SUBSTRUCTURES, SHOWN ON THE PLAN. THE CONTRACTOR SHALL BEAR THE ENTIRE COST OF REPAIRING OR REPLACING ANY OF SAID STRUCTURES DAMAGED BY HIM/HER DURING PROSECUTION OF THE WORK. ALL REPAIRS AND REPAIRS REPLACEMENTS SHALL BE DONE IN THE PRESENCE OF THE INSPECTOR. ALL LOCATIONS SHOWN ON THE PLAN FOR UTILITY LINES HAVE BEEN TAKEN FROM AVAILABLE RECORDS AND THEIR COMPLETENESS AND CORRECTNESS ARE IN NO WAY GUARANTEED.
3. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (USA) AT 1-800-227-2600 AND ALL PUBLIC UTILITY COMPANIES AND OWNERS OF PRIVATE FACILITIES WITHIN THE AREA OF CONSTRUCTION AT LEAST 2 WORKING DAYS IN ADVANCE OF PERFORMING ANY WORK WITHIN SAID AREA.
4. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM THE ENGINEERING DIRECTOR BEFORE COMMENCING WORK. TRAFFIC CONTROL WITHIN PUBLIC STREET RIGHTS OF WAY SHALL BE IN CONFORMANCE WITH THE "WORK AREA TRAFFIC CONTROL HANDBOOK," LATEST EDITION AND AN APPROVED TRAFFIC CONTROL PLAN, IF REQUIRED. THE CONTRACTOR SHALL PROVIDE A 24-HOUR TELEPHONE NUMBER FOR EMERGENCY REPAIRS TO TRAFFIC CONTROL AND PAVEMENT MARKINGS.
5. CAUTION: REVIEW APPROVED CONSTRUCTION PLAN. IF CONSTRUCTION REQUIRES WORKERS AND/OR EQUIPMENT TO BE WITHIN 6 FEET OR CRANES OR HOISTING DEVICES TO BE WITHIN 10 FEET OF OVERHEAD ELECTRIC LINES, CALL SOUTHERN CALIFORNIA EDISON CO. AT (310) 783-9339 FOR PROJECTS IN RESIDENTIAL AREAS OR (310) 783-9331 FOR PROJECTS IN COMMERCIAL AREAS.
6. PRIOR TO COMMENCEMENT OF WORK, ALL SURVEY MONUMENTS IN THE PROJECT AREA SHALL BE LOCATED AND TIED OUT. ALL CENTERLINE MONUMENTS OR TIES LOST OR DESTROYED BY THIS WORK SHALL BE REPLACED EITHER BY A LICENSED SURVEYOR OR A CIVIL ENGINEER REGISTERED PRIOR TO JANUARY 1, 1982 AND NEW TIE SHEETS PROVIDED. METHOD OF ESTABLISHMENT SHALL BE STATED ON THE TIE SHEET.
7. GRADE SHEETS PREPARED AND STAMPED BY A LICENSED ENGINEER OR SURVEYOR SHALL BE DELIVERED TO THE INSPECTOR PRIOR TO COMMENCEMENT OF WORK.
8. THE CONTRACTOR SHALL NOTIFY THE CITY STREET DEPARTMENT AT (310) 781-6900 PRIOR TO TRIMMING, REMOVING OR RELOCATING ANY EXISTING TREES.
9. UNLESS OTHERWISE SHOWN, ALL TRAFFIC SIGNS SHALL BE RELOCATED OR REMOVED BY THE CITY. THE CONTRACTOR SHALL NOTIFY STREET DEPARTMENT AT (310) 781-6900 AT LEAST 2 WORKING DAYS IN ADVANCE TO ARRANGE THE WORK. THE CONTRACTOR SHALL PROVIDE A 24-HOUR TELEPHONE NUMBER FOR EMERGENCY REPAIRS TO TRAFFIC CONTROL AND PAVEMENT MARKINGS.
10. BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, COUNTY SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE AT (310) 638-1161 SO THAT REQUIRED INSPECTION CAN BE MADE.
11. EXISTING DOWNSTREAM MANHOLES SHALL BE BULK HEADED WITH BRICK AND MORTAR OR PLUGS APPROVED BY THE INSPECTOR AT NEW INLET DURING CONSTRUCTION OF NEW UPSTREAM LINES. BRICK AND MORTAR OR PLUG SHALL BE REMOVED IN THE PRESENCE OF THE INSPECTOR(S) DURING CLEANING OF THE FIRST UPSTREAM SECTION OF THE NEW
12. NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE PLANS UNTIL A PERMIT FOR INDUSTRIAL WASTEWATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICT FOR SAID CONNECTION.
13. TRENCHES LESS THAN 2' WIDE CUT INTO AN EXISTING ROADWAY WITHIN THE PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH CLASS 60-E-0.7 (100-E-100) CONCRETE SLURRY (SECTION 201 OF STANDARD SPECIFICATIONS) TO 1" BELOW EXISTING PAVEMENT THICKNESS (DELETE BASE PER TORRANCE STANDARD T116). THE NEW PAVEMENT SHALL BE EQUAL TO EXISTING PAVEMENT THICKNESS PLUS 1", BUT IN NO CASE SHALL BE LESS THAN 4" THICK.
14. TRENCHES 2' OR MORE IN WIDTH OR OUTSIDE AN EXISTING ROADWAY SHALL BE BACKFILLED WITH MATERIAL APPROVED BY THE ENGINEERING DIRECTOR TRENCH BACKFILL SHALL BE COMPACTED TO A RELATIVE DENSITY OF 95% IN THE UPPER 3 FEET AND 90 % BELOW A DEPTH OF THE UPPER 3 FEET (PER TORRANCE STANDARD T116).
15. TRENCH RESURFACING SHALL BE OF THE SAME TYPE AS THE EXISTING PAVEMENT, EXCEPT IF EXISTING PAVEMENT IS A.C. OVER P.C.C. RESURFACING MAY BE FULL-DEPTH A.C.
16. FOR ASPHALT CONCRETE SECTION 4" THICK OR GREATER, UNLESS OTHERWISE SHOWN, THE CONTRACTOR SHALL CONSTRUCT A MINIMUM 2" THICK FINISH COURSE USING CLASS C2-AR-4000 OVER A BASE COURSE OF CLASS B-AR-4000 PER SECTION 203-6 OF THE STANDARD SPECIFICATIONS. CLASS D2-AR-4000 ASPHALT CONCRETE SHALL BE USED IF FINISH COURSE IS LESS THAN 2" THICK. FOR SECTION LESS THAN 4" THICK, ASPHALT CONCRETE SHALL BE CLASS C2-AR-4000 UNLESS OTHERWISE SPECIFIED. THE MAXIMUM THICKNESS OF EACH LIFT SHALL BE 4".
17. MANHOLE COVER SHALL BE CAST WITH THE WORDS "TORRANCE SEWER" FOR CITY MAINTAINED LINES AND "PRIVATE SEWER" FOR PRIVATELY MAINTAINED LINES.
18. ALL SEWER LINES CONSTRUCTED TO PUBLIC STANDARDS SHALL BE VITRIFIED CLAY PIPE (VCP). DUCTILE IRON PIPE MAY BE USED SUBJECT TO PRIOR WRITTEN APPROVAL FROM THE ENGINEERING DIRECTOR. ALL HOUSE CONNECTION LATERALS SHALL BE MINIMUM 6 INCH DIAMETER.
19. CONTRACTOR SHALL SET ALL MANHOLE FRAMES AND COVERS TO FINISHED GRADE.
20. CONCRETE ENCASEMENT SHALL BE REQUIRED FOR SEWER MAIN LINE AND HOUSE LATERAL WITH LESS THAN 3 FEET OF COVER.
21. DURING NON-CONSTRUCTION HOURS, ALL EXCAVATIONS MUST BE PLATED OR BACKFILLED EXCEPT BORE PITS WHICH SHALL BE SECURED WITH K-RAIL AND 6' HIGH CHAIN LINK FENCE PANELS SECURED IN PLACE TO THE SATISFACTION OF THE ENGINEERING DIRECTOR. PLATES SHALL BE TACK WELDED, PINNED AND/OR SECURED IN PLACE BY ANOTHER METHOD APPROVED BY THE INSPECTOR.
22. THE CONTRACTOR SHALL MAKE AVAILABLE FOR THE INSPECTOR'S REVIEW, ON A DAILY BASIS, AS-BUILT DRAWINGS FOR WORK PERFORMED UP TO AND INCLUDING THE PREVIOUS DAY'S ACTIVITIES. WORK SHALL NOT BE CONSIDERED AS COMPLETE UNTIL AS-BUILT DRAWINGS ARE SUBMITTED TO AND ACCEPTED BY THE ENGINEERING DIRECTOR.
23. THE CONTRACTOR SHALL REPAIR AND REPLACE DAMAGED EXISTING IMPROVEMENTS AND FACILITIES PER SECTION 7-9 OF THE SSPWC.
24. UNLESS NOTED OR SHOWN OTHERWISE ON PLANS OR IN SPECIFICATIONS, EXTRA STRENGTH V.C.P. IS TO BE USED.
25. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
26. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF HONEYWELL OR THE ENGINEERING DIRECTOR.
27. NO REPRESENTATIVE OF THE CITY OF TORRANCE WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
28. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT AND PAY FEES TO EXCAVATE IN CITY STREETS FROM THE CITY OF TORRANCE ENGINEERING DEPARTMENT.
29. APPROVAL OF THIS PLAN BY THE CITY OF TORRANCE DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT.
30. PRIOR TO ISSUANCE OF THE REQUIRED SEWER CONSTRUCTION PERMIT, THE CONTRACTOR SHALL OBTAIN AND FILE WITH THE CITY OF TORRANCE, COPIES OF A PERMIT TO EXCAVATE IN CITY STREETS AND A PERMIT FOR EXCAVATION AND TRENCHES FROM THE STATE OF CALIFORNIA DIVISION OF INDUSTRIAL SAFETY AND A CERTIFICATE OF WORKER'S COMPENSATION INSURANCE WITH THE CITY OF TORRANCE NAMED AS THE CERTIFICATE HOLDER TO BE NOTIFIED 30 DAYS PRIOR TO CANCELLATION OF THE POLICY.
31. BEDDING FOR VCP PIPE CONSTRUCTED IN TRENCH DEPTHS 20 FEET OR LESS IN DEPTH SHALL CONFORM TO CITY OF TORRANCE STD DWG T204-1. BEDDING SHALL BE MINIMUM 4" BELOW PIPE HAUNCH . BEDDING FOR VCP PIPE CONSTRUCTION IN TRENCHES GREATER THAN 20 FEET DEEP SHALL CONSIST OF CONTROLLED LOW STRENGTH MATERIAL (CLSM) AS SHOWN IN DETAIL 1 ON SHEET 4 OF THESE PLANS. WHERE EXPANSIVE SOIL IS ENCOUNTERED DETAIL 2 ON SHEET 4 SHALL APPLY. IN ALL CASES, FOR VCP PIPE CONSTRUCTION TRENCH WIDTHS SHALL BE 36 INCHES OR LESS IN WIDTH AS MEASURED AT THE TOP OF PIPE.

MATERIAL QUANTITIES

NO	DESCRIPTION	QUANTITY	UNIT
1	8" DIA. PIPE (3) 1593	~~1650~~	LF
2	48" SEWER MANHOLE	10	EA
3	10" DIA. PIPE	1591	LF
4	6" DIA. PIPE LATERALS	310	LF
5	~~18" DIAMETER 5/16" THICK STEEL CASING~~ (2)	~~20~~	~~LF~~
6	8"x 6" WYE	1	EA
7	48" DROP SEWER MANHOLE PER APWA STD DWG 202-0	1	EA
8	~~10"x 10" WYE~~ (2)	~~1~~	~~EA~~
9	NOT USED	–	–
10	PROTECT RCB (2 LOCATIONS)	1	LS
11	48" SHALLOW MANHOLE PER CITY OF TORRANCE STD T205-1	–	–
12	V.C.P. BEDDING FOR DEPTHS GREATER THAN 20 FEET PER DETAILS ON SHEET 4	691	LF
13	45° D.I.P. BEND	–	–
14	15" DIAMETER 1/4" THICK STEEL CASING (3)	40 ~~20~~	LF
15	10" DIA. STUB	20	LF
16	8" DIA. STUB	20	LF

(2)

~~17~~	~~10" D.I.P.~~	~~345~~	~~LF~~
18	60" DROP SEWER MANHOLE PER APWA STD. DWG. 202-0	1	EA
19	15" DIAMETER STEEL CASING	48	LF

(3)

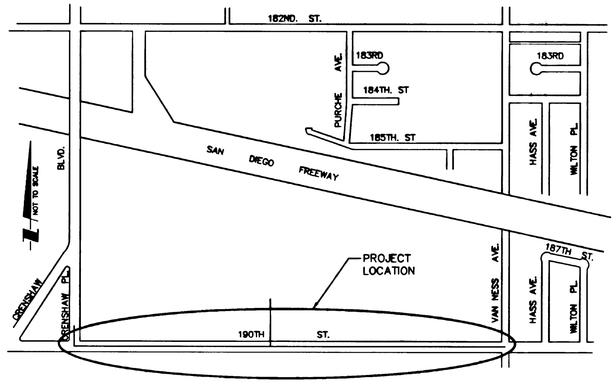
20	6" DIA. PIPE	206	LF
21	CONCRETE ENCASEMENT	103	LF
22	48" SIPHON MANHOLE PER LACDPW STD. DWG. 2005-2	2	EA
23	6" 22.5° V.C.P. BEND	4	EA
24	4" PVC. PIPE	46	LF

CONSTRUCTION NOTES

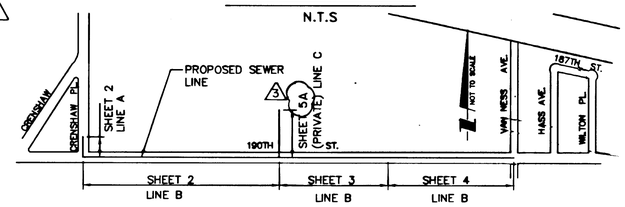
1. INSTALL 8" EXTRA STRENGTH V.C.P. TRENCH AND BEDDING PER CITY OF TORRANCE STD DWGS T116-0 & T204-1. BEDDING SHALL BE MIN 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED.
2. INSTALL 48" PRECAST CONCRETE MANHOLE PER APWA STD DWG 202-2.
3. INSTALL 10" EXTRA STRENGTH V.C.P. TRENCH AND BEDDING PER CITY OF TORRANCE STD DWGS T116-0 & T204-1. BEDDING SHALL BE MIN 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED.
4. INSTALL 6" V.C.P.
5. ~~INSTALL 18" DIAMETER 5/16" THICK STEEL CASING~~ (2)
6. INSTALL 8" x 6" V.C.P. WYE
7. INSTALL 48" DROP SEWER MANHOLE PER APWA STD DWG. 202-0.
8. ~~INSTALL 10" x 10" V.C.P. WYE~~ (2)
9. NOT USED
10. PROTECT RCB DURING CONSTRUCTION PER DIRECTION OF LA COUNTY FLOOD CONTROL.
11. INSTALL 48" PRECAST CONCRETE SHALLOW MANHOLE PER CITY OF TORRANCE STD T205-1.
12. INSTALL 10" EXTRA STRENGTH V.C.P. BEDDING FOR DEPTHS GREATER THAN 20 FEET PER DETAILS ON SHEET 4. TRENCH PER STD DWG T-116-0. TYPE "G" JOINTS REQUIRED.
13. INSTALL 12" - 45° D.I.P. BEND
14. ~~INSTALL~~ 15" DIAMETER 1/4" THICK STEEL CASING (3)
15. INSTALL 10" EXTRA STRENGTH V.C.P. 5' STUB ON SOUTH SIDE OF MANHOLE PLUG END WITH BRICK AND MORTAR.
16. INSTALL 8" EXTRA STRENGTH V.C.P. 5' STUB ON SOUTH SIDE OF MANHOLE PLUG END WITH BRICK AND MORTAR.

(2)
17. ~~INSTALL 10" D.I.P. WITH MECHANICAL JOINTS~~
18. INSTALL 60" DROP SEWER MANHOLE PER APWA STD. DWG. 202-0
19. INSTALL 15" MIN. DIAMETER STEEL CASING.

(3)
20. INSTALL 6" EXTRA STRENGTH V.C.P. DOUBLE BARREL SIPHON. TRENCH AND BEDDING PER CITY OF TORRANCE STD. DWGS. T116-0 & T204-1. BEDDING SHALL BE MIN. 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED.
21. INSTALL CONCRETE ENCASEMENT PER CITY OF TORRANCE STD. DWG. T716-1.
22. INSTALL 48" PRECAST CONCRETE SIPHON MANHOLE PER STD. DWG. 2005-2.
23. INSTALL 6" 22.5° EXTRA STRENGTH V.C.P. BEND.
24. INSTALL 4" PVC PIPE.



VICINITY MAP



KEY MAP

N.T.S

STANDARD DRAWINGS

CITY OF TORRANCE

DWG. NO	TITLE
T116-0	TYPICAL TRENCH SECTION
T204-1	BEDDING FOR SEWER PIPE
T205-1	SHALLOW MANHOLE FOR 8" TO 36" PIPE
T206-0	SEWER AND WATER SEPARATION REQUIREMENTS
T603-1	STREET CLOSURE POLICY
T701-1	BEDDING FOR WATER PIPE
T716-1	SEWER/CONCRETE ENCASEMENT

(3) LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

2005-2	SIPHON MANHOLE

APWA

DWG. NO	TITLE
200-1	PRECAST CONCRETE SEWER MANHOLE
207-0	PRECAST REINFORCED CONRETE MANHOLE BASE
210-1	24" MANHOLE FRAME AND COVER LOCKING TYPE (W/ TORRANCE SEWER CAST ON TOP)
224-0	SUPPORTS FOR CONDUIT ACROSS TRENCHES
202-0	DROP SEWER MANHOLE

JOB SITE SAFETY

BY ACCEPTING THIS CONTRACT, CONTRACTOR HEREBY RELEASES AND AGREES TO INDEMNIFYING, DEFEND, HOLD HARMLESS THE CITY OF TORRANCE, PSOMAS (HEREINAFTER ENGINEERS), THEIR PARENT AND SUBSIDIARY COMPANIES, AGENTS, EMPLOYEES, CONSULTANTS AND REPRESENTATIVES FOR ANY AND ALL DAMAGE TO PERSONS OR PROPERTY OR WRONGFUL DEATH REGARDLESS OF WHETHER OR NOT SUCH A CLAIM, DAMAGE, LOSS OR EXPENSE IS CAUSED IN WHOLE OR IN PART BY THE NEGLIGENCE, ACTIVE OR PASSIVE, OF THE CITY OF TORRANCE, ENGINEERS, THEIR PARENT AND SUBSIDIARY COMPANIES, AS WELL AS THEIR AGENTS AND EMPLOYEES, EXCEPTING ONLY THE SOLE NEGLIGENCE OF THE CITY OF TORRANCE, ENGINEERS, THEIR PARENT AND SUBSIDIARY COMPANIES AND THEIR AGENTS AND EMPLOYEES TO THE FULLEST INTENT PERMITTED BY LAW, SUCH INDEMNIFICATION SHALL EXTEND TO ALL CLAIMS, DEMANDS, ACTIONS, OR LIABILITY FOR INJURIES, DEATH OR DAMAGES OCCURRING AFTER COMPLETION OF THE PROJECT, AS WELL AS DURING THE WORK'S PROGRESS. CONTRACTOR FURTHER AGREES THAT IT SHALL ACCOMPLISH THE ABOVE AT ITS OWN COST, EXPENSE AND RISK EXCLUSIVE OF AND REGARDLESS OF ANY APPLICABLE INSURANCE POLICY OR POSITION TAKEN BY ANY INSURANCE COMPANY REGARDING COVERAGE.

DOCUMENT REUSE

THESE DOCUMENTS HAVE BEEN PREPARED FOR A SPECIFIC PROJECT AND SHALL NEITHER BE ALTERED NOR REUSED FOR ANY OTHER PURPOSE. ALSO, THESE DOCUMENTS DO NOT REPRESENT AS-BUILT CONDITIONS. IF REUSED WITHOUT THE DESIGN ENGINEER'S WRITTEN APPROVAL, IT WILL BE AT THE SOLE RISK AND RESPONSIBILITY OF THE USER. THE ACT OF ALTERING OR REUSING IS CONSTRUED AS INDEMNIFYING AND HOLDING THE DESIGN ENGINEERING FIRM AND ITS EMPLOYEES HARMLESS FROM ALL CLAIMS, DAMAGES, AND EXPENSES, INCLUDING ATTORNEY FEES, ARISING OUT OF SUCH ACT.

PRIVATE ENGINEER'S NOTICE TO CONTRACTOR

CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE CITY OF TORRANCE AND PSOMAS, ITS EMPLOYEES, OFFICERS, AND AGENTS, HARMLESS AGAINST ANY AND ALL CLAIMS BY ANY PARTIES ARISING FROM, OR RELATED TO, ANY AND ALL DAMAGES, INCLUDING LEGAL COSTS AND ATTORNEY'S FEES, RESULTING FROM INTERFERENCE WITH, INTERRUPTION OF, DAMAGE TO, OR ANY AND ALL INJURIES WHICH RESULT FROM DAMAGE CAUSED TO SUBSURFACE INSTALLATIONS AS DEFINED IN GOVERNMENT CODE 4216.1(J), WHICH IS UNFORESEEN AND DESPITE ENGINEER'S EFFORT DURING THE DESIGN PROCESS WAS NOT LOCATED, EXCEPTING ONLY THE GROSS NEGLIGENCE OR WILLFUL MISCONDUCT OF ENGINEERING IN PROVIDING ITS SERVICES.

LEGEND

E	ELECTRICAL LINE	T	TELEPHONE LINE
G	GAS LINE	O	OIL LINE
SD	STORM DRAIN	HP	HIGH PRESSURE GAS LINE
W	WATER LINE	SS	SANITARY SEWER
⊗	VALVE	IRR	IRRIGATION LINE
○	MANHOLE	FPS	FIRE PROTECTION WATER LINE

(1/7) DETAIL NUMBER / SHEET ON WHICH DETAIL APPEARS

"AS BUILT" Per Insp. J. Carlson 02-14-02 Permit No. 01-168

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES. (562)699-7411 Ext. 2727

APPROVED: COUNTY SANITATION DISTRICT NO.5 OF LOS ANGELES COUNTY, CA
JAMES F. STAHL - CHIEF ENGINEER & GENERAL MANAGER
BY: _____ for OFFICE ENGINEER DATE: 4-12-2001

Underground Service Alert of Southern California
Call: TOLL FREE 1-800 227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK

LA COUNTY PUBLIC WORKS BM NUMBER Y 8486
ELEV. 62.445' NGVD 29 1994 ADJUSTMENT
LACS BM MON IN WELL ● NE COR 190TH ST & VAN NESS AVE 53 FT N & 43 FT E/O C/L
INT MKD (TOR 5.1)

DATUM STATEMENT

HORIZONTAL CONTROL SHOWN HEREON IS BASED ON A LOCAL GROUND BASED SYSTEM.

BASIS OF BEARINGS

THE BEARINGS SHOWN HEREON ARE BASED UPON THE BEARING OF N 89° 54' 54" E OF THE CENTERLINE OF 190TH STREET AS SHOWN ON THE STATE OF CALIFORNIA DIVISION OF HIGHWAYS SURVEY CONTROL MAP LA-405D-4.

REGISTERED PROFESSIONAL ENGINEER — RICHARD W. BURTT — No. 32862 — Exp. 6/30/02 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — No. 24251 — Exp. 12-31-01 — CIVIL — STATE OF CALIFORNIA — 4/3/01

PLANS PREPARED BY:
PSOMAS
3187 Red Hill Avenue
Suite 250
Costa Mesa, CA 92626
(714) 751-7373 Fax(714) 545-8883

DATE	DESCRIPTION	BY	CHECKED
7/25/01	(1) LINE "A" NOT FOR CONSTRUCTION. NOT PART OF CONTRACT	CR	TS
7/25/01	(2) REVISED MATERIAL QUANTITIES & CONST. NOTES	CR	TS
10-9-01	(3) REVISED SHTS 1, 5 & ADDED SHT 5A	CR	TS

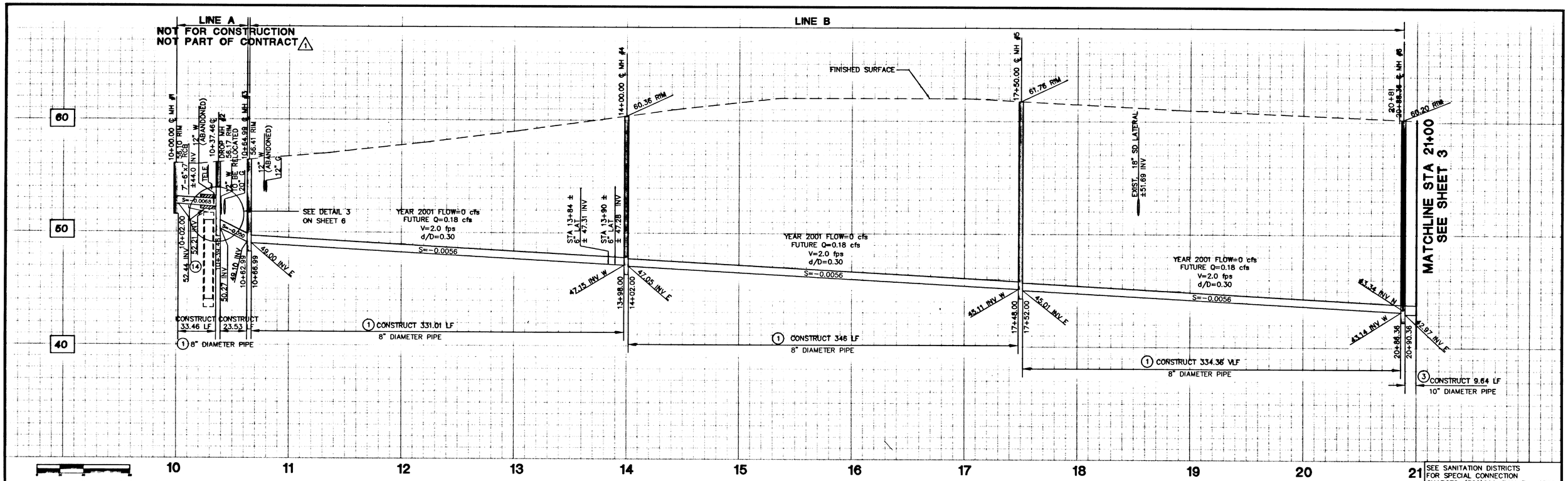
CITY OF TORRANCE
ENGINEERING DEPARTMENT

DRAWN: CR
DESIGNED: CR
PROJECT ENGINEER: LW Ted Symons
DIVISION ENGINEER: R. Perkins 4/10/02

APPROVED: Richard W. Burtt 3-12-01
RICHARD W. BURTT — DATE
ENGINEERING DIRECTOR
R.C.E. NO. 32862 EXP. 6/30/02
R.T.E. NO. 1538 EXP. 9/30/02

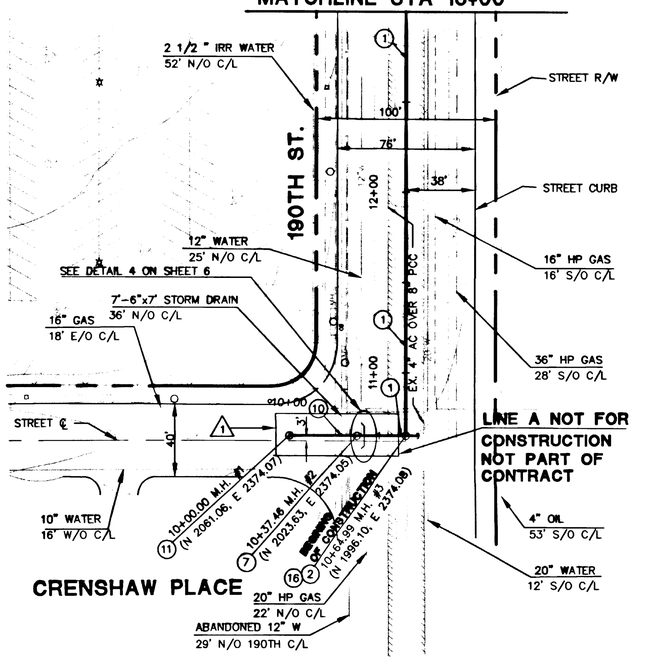
SCALE: AS SHOWN | SHEET 1 OF 6
PLAN NO. SS-363

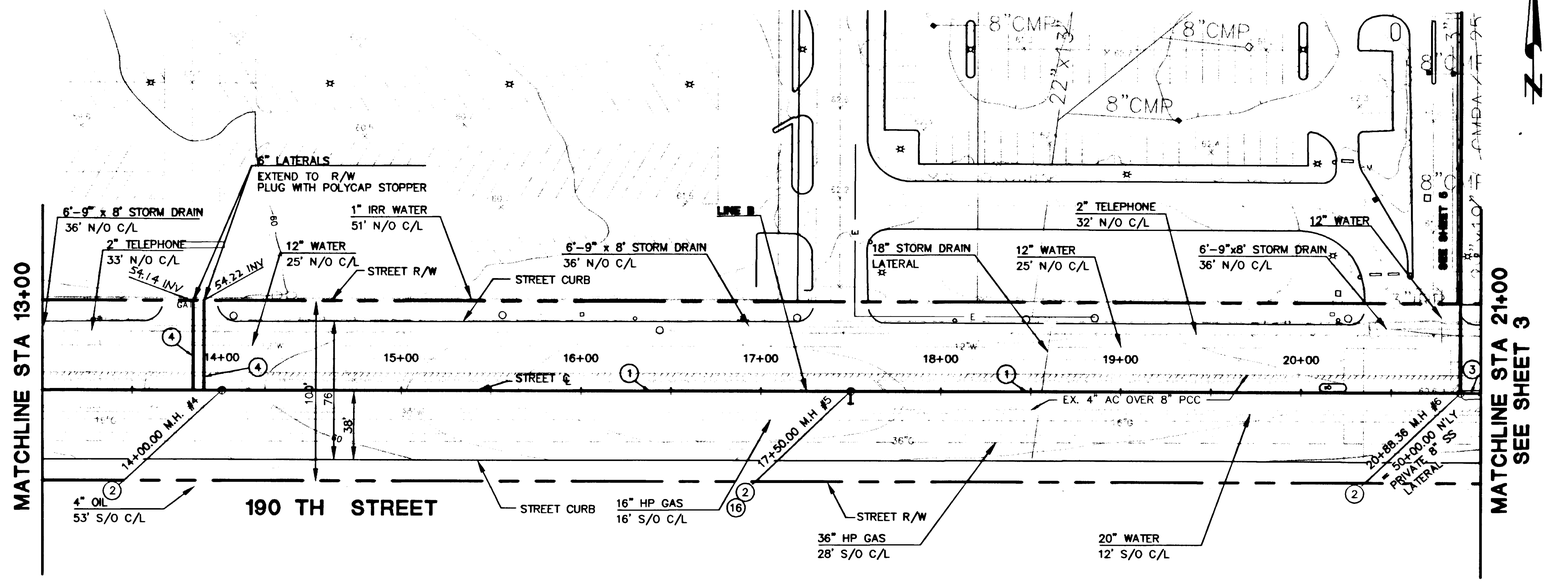
Plotted: 04/02/01 16:19:41 W:\HONEYWELL\SITE_A\1HON0201\sstrns\sewer lines\sheets\031401\SN01.dwg Ottomirez



SCALE : 1" = 40' (HOR.)
1" = 4' (VER.)

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES. (562)699-7411 Ext. 2727





CONSTRUCTION NOTES

1. INSTALL 8" EXTRA STRENGTH V.C.P. TRENCH AND BEDDING PER CITY OF TORRANCE STD DWGS T116-0 & T204-1. BEDDING SHALL BE MIN 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED
2. INSTALL 48" PRECAST CONCRETE MANHOLE PER APWA STD DWG 200-2.
3. INSTALL 10" EXTRA STRENGTH V.C.P. TRENCH AND BEDDING PER CITY OF TORRANCE STD DWGS T116-0 & T204-1. BEDDING SHALL BE MIN 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED
4. INSTALL 6" V.C.P.
7. INSTALL 48" DROP SEWER MANHOLE PER APWA STD DWG. 202-0.
10. PROTECT RCB DURING CONSTRUCTION PER DIRECTION OF LA COUNTY FLOOD CONTROL.
11. INSTALL 48" PRECAST CONCRETE SHALLOW MANHOLE PER CITY OF TORRANCE STD T205-1.
14. INSTALL 15" DIAMETER 1/4" THICK STEEL CASING
16. INSTALL 8" EXTRA STRENGTH V.C.P. 5' STUB ON SOUTH SIDE OF MANHOLE PLUG END WITH BRICK AND MORTAR. AND ON NORTH SIDE

REGISTERED PROFESSIONAL ENGINEER — RICHARD L. TED SYMONS — No. 24251 — Exp. 12-31-01 — CIVIL — STATE OF CALIFORNIA

4/3/01

PLANS PREPARED BY:
PSOMAS
3187 Red Hill Avenue
Suite 250
Costa Mesa, CA 92626
(714) 751-7373 Fax (714) 545-8883

REV.	DATE	DESCRIPTION	BY	CHECKED
1	7/25/01	LINE A NOT FOR CONSTRUCTION.	CR	TS
		NOT PART OF CONTRACT.		

CITY OF TORRANCE
ENGINEERING DEPARTMENT

DRAWN: CR
DESIGNED: CR
PROJECT ENGINEER: LW Ted Symons
DIVISION ENGINEER: R. Perkins 4/10/01

APPROVED: Richard W. Burtt 3/12/01
RICHARD W. BURTT — DATE
ENGINEERING DIRECTOR
R.C.E. NO. 32862 EXP. 6/30/02
R.T.E. NO. 1538 EXP. 9/30/02

SCALE: AS SHOWN | SHEET 2 OF 6

PLAN NO. SS-363

Plotted: 04/02/01 15:47:37 W:\HOME\WEL_SITE_A\THOND201\retired sewer line sheets\033-401\Sh102.dwg ©Psomas

LINE B

SEE SHEET 2
MATCHLINE STA 21+00

MATCHLINE STA 32+00
SEE SHEET 4

605
595
485

23+00.00 ℄ MH #7
59.06 RIM

EXIST. 12" W.
±50.7 INV

EXIST. 10" W.
±51.57 INV
(ABANDONED)

26+50.00 ℄ MH #8
57.00 RIM

EXIST. 18" SD
±47.04 INV

30+00.00 ℄ MH #9
58.53 RIM

Year 2001 flow=0.25 cfs
V=~~1.7 fps~~ 1.5 fPS
d/D=~~0.31~~ 0.30 (2)

future Q=0.43 cfs
V=~~2.0 fps~~ 1.7 fPS (2)
d/D=~~0.42~~ 0.48 (2)

Year 2001 flow=0.25 cfs
V=~~1.6 fps~~ 1.5 fPS
d/D=~~0.33~~ 0.30 (2)

future Q=0.54 cfs
V=~~2.0 fps~~ 1.8 fPS (2)
d/D=~~0.50~~ 0.55 (2)

Year 2001 flow = 0.25 cfs
V=~~1.6 fps~~ 1.5 fPS
d/D=~~0.33~~ 0.30 (2)

future Q=0.54 cfs
V=~~2.0 fps~~ 1.8 fPS
d/D=~~0.50~~ 0.55 (2)

Year 2001 flow=0.25 cfs
V=~~1.6 fps~~ 1.5 fPS
d/D=~~0.33~~ 0.30 (2)

future Q=0.54 cfs
V=~~2.0 fps~~ 1.8 fPS
d/D=~~0.50~~ 0.55 (2)

S=~~0.0028~~ S=0.0018 (2)
S=~~0.0024~~ S=0.0018
S=~~0.0024~~ S=0.0018
S=~~0.0024~~ S=0.0018

~~42.30~~ INV W (2)
42.60 INV W
~~42.28~~ INV E (2)
42.50
41.89 (2)
~~41.45~~ INV W
41.79 (2)
~~41.35~~ INV E
41.17 (2)
~~40.98~~ INV W
~~40.48~~ INV E (2)
40.68 INV E

22+98.00
23+02.00
26+48.00
26+52.00
29+98.00
30+02.00

(3) CONSTRUCT 198 LF
10" DIAMETER PIPE

(3) CONSTRUCT 346 LF
10" DIAMETER PIPE

(3) CONSTRUCT 346 LF
10" DIAMETER PIPE

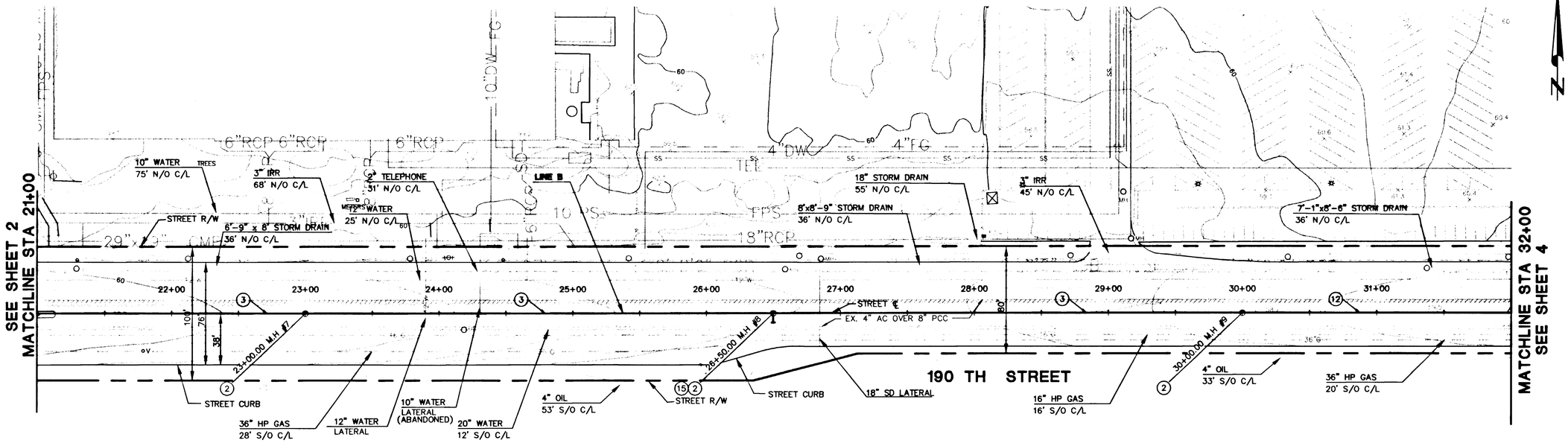
(12) CONSTRUCT 198 LF
10" DIAMETER PIPE

21 22 23 24 25 26 27 28 29 30 31 32

(2) NOTE:
PROFILE WAS NOT GRAPHICALLY ADJUSTED

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES. (562)699-7411 Ext. 2727

SCALE : 1" = 40' (HOR.)
1" = 4' (VER.)



CONSTRUCTION NOTES

(2) INSTALL 48" PRECAST CONCRETE MANHOLE PER APWA STD DWG 200-2.

(3) INSTALL 10" EXTRA STRENGTH V.C.P. TRENCH AND BEDDING PER CITY OF TORRANCE STD DWGS T116-0 & T204-1. BEDDING SHALL BE MIN 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED

(12) INSTALL 10" EXTRA STRENGTH V.C.P. BEDDING FOR DEPTHS GREATER THAN 20 FEET PER DETAILS ON SHEET 4. TRENCH PER STD DWG T-116-0. TYPE "G" JOINTS REQUIRED.

(15) INSTALL 10" EXTRA STRENGTH V.C.P. 5' STUB ON SOUTH SIDE OF MANHOLE PLUG END WITH BRICK AND MORTAR.

REGISTERED PROFESSIONAL ENGINEER
No. 24251
Exp. 12-31-01
CIVIL
STATE OF CALIFORNIA
4/3/01

PLANS PREPARED BY:
PSOMAS
3187 Red Hill Avenue
Suite 250
Costa Mesa, CA 92626
(714) 751-7373 Fax (714) 545-8883

REV.	DATE	DESCRIPTION	BY	CHECKED
(2)	7/25/01	ADJUSTED PROFILE FROM MH NO. 6 TO MH NO. 11	CR	TS/RP

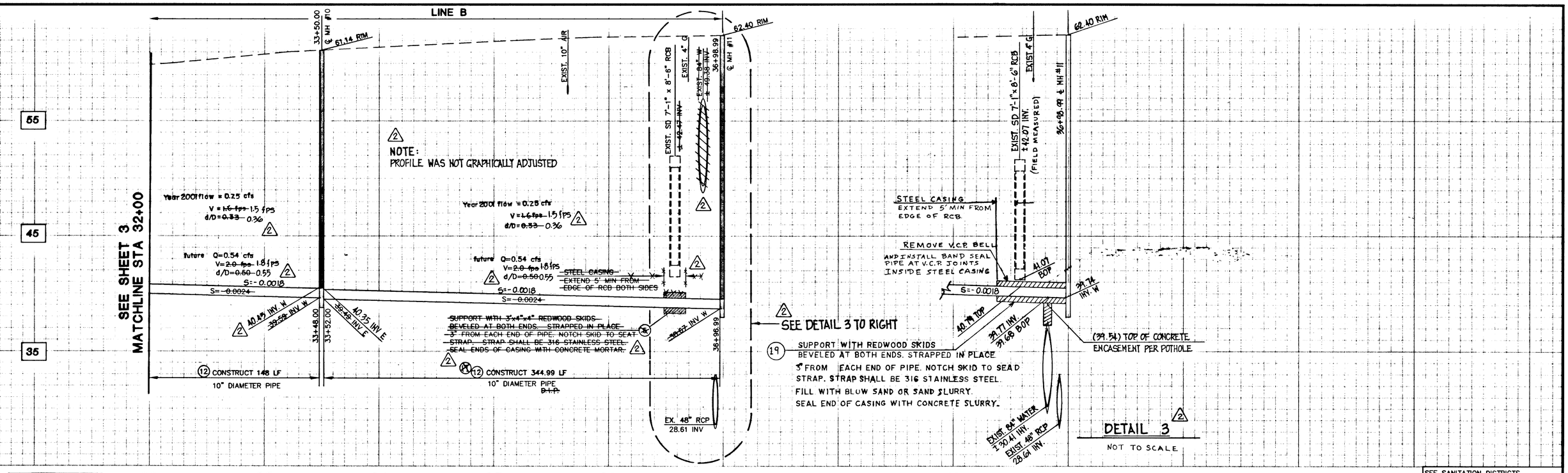
CITY OF TORRANCE
ENGINEERING DEPARTMENT

DRAWN: CR
DESIGNED: CR
PROJECT ENGINEER: LW Ted Symons
DIVISION ENGINEER: R. Perkins 4/11/01

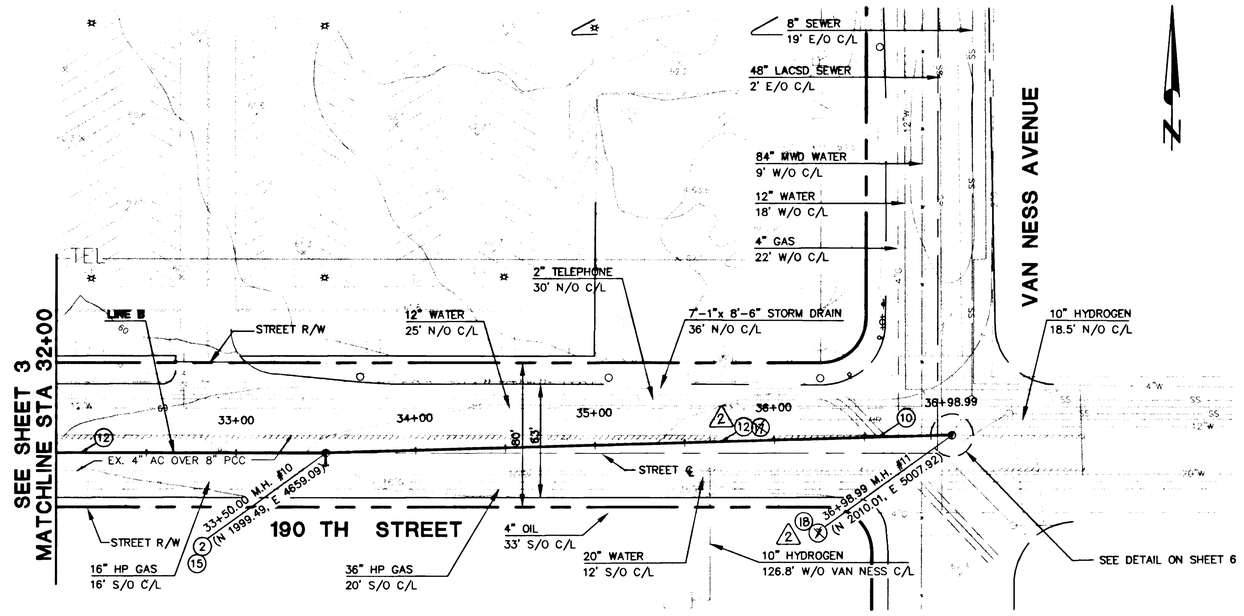
APPROVED: 7-12-01
RICHARD W. BURTT, ENGINEERING DIRECTOR, DATE
R.C.E. NO. 32862 EXP. 6/30/02
R.T.E. NO. 1538 EXP. 9/30/02

SCALE: AS SHOWN
SHEET 8 OF 6
PLAN NO. SS-363

Plotted: 04/02/01 15:49:45 W:\HONEYWELL\SITE_A\HON0201\wdrwes\sewer line\sheets\031401\Sh103.dwg CRamirez



SEE SANITATION DISTRICTS
FOR SPECIAL CONNECTION
CHARGES. (562)699-7411 Ext. 2727



NOTE: THIS TYPE OF CONSTRUCTION REQUIRES THE CLSM FILL TO EXTEND FROM THE PIPE TO THE TRENCH WALL.

CONTROLLED LOW STRENGTH MATERIAL (CLSM) DETAIL 1

NOT TO SCALE

CLASS A-1 CONCRETE CRADLE DETAIL 2

(TO BE USED WHEN EXPANSIVE SOILS ARE ENCOUNTERED)

NOT TO SCALE

CONSTRUCTION NOTES

(2) INSTALL 48" PRECAST CONCRETE MANHOLE PER APWA STD DWG 200-2.

2 ~~(5) INSTALL 18" DIAMETER 5/16" THICK STEEL CASING.~~

(7) INSTALL 48" DROP SEWER MANHOLE PER APWA STD DWG 202-0

(10) PROTECT RCB DURING CONSTRUCTION PER DIRECTION OF LA COUNTY FLOOD CONTROL.

(12) INSTALL 10" EXTRA STRENGTH V.C.P. BEDDING FOR DEPTHS GREATER THAN 20 FEET PER DETAILS ON SHEET 4. TRENCH PER STD DWG T-116-0. TYPE "G" JOINTS REQUIRED.

(15) INSTALL 10" EXTRA STRENGTH V.C.P. 5' STUB ON SOUTH SIDE OF MAHOLE PLUG END WITH BRICK AND MORTAR.

2 (17) ~~INSTALL 16" DIP WITH MECHANICAL JOINTS.~~

(18) INSTALL 60" DROP SEWER MANHOLE PER APWA STD. DWG. 202-0.

(19) INSTALL 15" DIAMETER MIN. STEEL CASING.

REGISTERED PROFESSIONAL ENGINEER
RICHARD W. BURTT
No. 24251
Exp. 12-31-01
CIVIL
STATE OF CALIFORNIA
4/3/01

PLANS PREPARED BY:

PSOMAS

3187 Red Hill Avenue
Suite 250
Costa Mesa, CA 92626
(714) 751-7373 Fax (714) 545-8883

REV.	DATE	DESCRIPTION	BY	CHECKED
2	7/25/01	ADJUSTED PROFILE FROM MH #6 TO MH #11 ADDED DETAIL 3 ADJUSTED LOCATION OF MWD WATER LINE AND EXTENDED SLEEVE.	CR	TS

CITY OF TORRANCE
ENGINEERING DEPARTMENT

DRAWN: CR
DESIGNED: CR
PROJECT ENGINEER: Ted Symons
DIVISION ENGINEER: R. Burtt 4/30/01

APPROVED: Richard W. Burtt 3/22/01
RICHARD W. BURTT DATE
ENGINEERING DIRECTOR
R.C.E. NO. 32862 EXP. 6/30/02
R.T.E. NO. 1538 EXP. 9/30/02

SCALE: AS SHOWN SHEET 4 OF 6
PLAN NO. SS-363

Plotted: 04/02/01 17:36:56 W:\HOME FWEL\SITE_A \THON2001\waltres\sewer line\sheets\03401\SH104.dwg CRamirez

PRIVATE SEWER NOT TO BE MAINTAINED BY CITY OF TORRANCE

LINE C

DELETED - SEE PROFILE SHEET 5A (3)

ST R/W

FINISHED SURFACE

50+00.00 ℄ MH #6

52+80.00 ℄ MH #12 PRIVATE

56+25.61 ℄ MH #13 PRIVATE

61.90 RIM

62.39 RIM

63.21 RIM

56+48.28

EXIST. 12" W ± 54.23 INV

EXIST. TEL ± 57.01 INV

EXIST. 3" IRR ± 58.35 INV

EXIST. 3" IRR ± 58.35 INV

EXIST. 8" CMP ± 52.40 INV

EXIST. 8" CMP ± 52.40 INV

EXIST. WATER ± 56.56 INV

EXIST. IRR ± 60.65 INV

EXIST. WATER ± 57.61 INV

EXIST. 8" SD ± 59.77 INV

65

55

45

43.14 INV W 8" SS
42.97 INV E 10" SS

18" x 6'-9" RCB
± 45.94 INV

Q=0.25cfs
V=2.1 fps
d/D=0.37
S=0.0052

STA 54 + 40 ± 6" LAT FROM BLDG 1/5
± 45.90 INV

Q=0.24cfs
V=2.1 fps
d/D=0.36
S=0.0066

STA 54 + 92 ± 6" LAT FROM BLDG 38
± 46.15 INV

(47.46±) CONNECT TO EX. 6" PVC SEWER

FLOW FROM GP JOHNSON

47.12 INV S

56+23.61

56+27.61

47.22 INV N

±47.36 INV S

SUPPORT WITH 3'x4"x4" REDWOOD SKIDS BEVELED AT BOTH ENDS. STRAPPED IN PLACE 3" FROM EACH END OF PIPE. NOTCH SKID TO SEAT STRAP. STRAP SHALL BE 316 STAINLESS STEEL. SEAL ENDS OF CASING WITH CONCRETE MORTAR. (14)

50+02.00

43.34 INV W

44.78 INV S

52+78.00

44.98 INV N

52+82.00

(1) CONSTRUCT 276 LF 8" DIAMETER PIPE

(1) CONSTRUCT 341.61 LF 8" DIAMETER PIPE

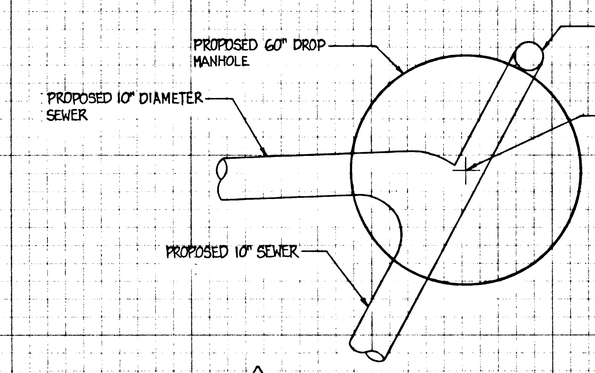
(1) CONSTRUCT 20.67 LF 8" DIAMETER PIPE

STEEL CASING EXTEND 5' MIN FROM EDGE OF RCB BOTH SIDES

FILL WITH BLOWN SAND OR SAND SLURRY. (2)

50 51 52 53 54 55 56 57

SCALE : 1" = 40' (HOR.)
1" = 4' (VER.)

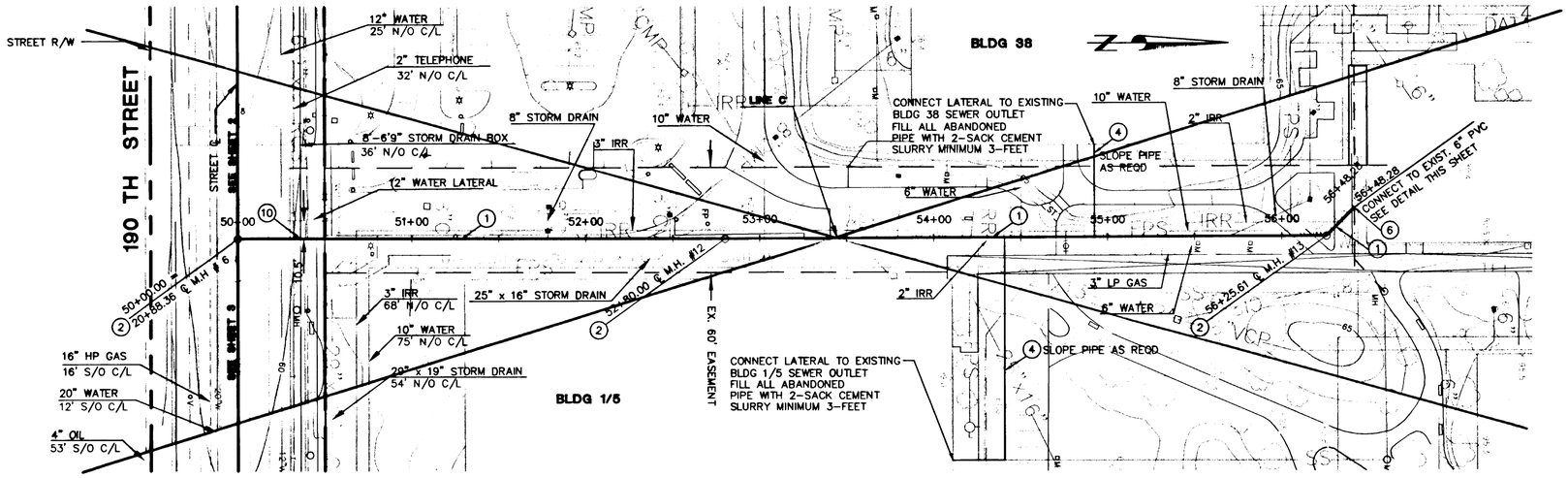


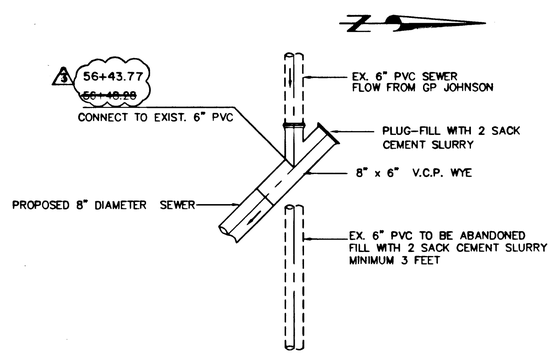
(2)

REVISED DETAIL 1
N.T.S.

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES. (562)699-7411 Ext. 2727

DELETED - SEE PLAN SHEET 5A (3)





DETAIL
SCALE: 1" = 2'

CONSTRUCTION NOTES

(1) INSTALL 8" EXTRA STRENGTH V.C.P. TRENCH AND BEDDING PER CITY OF TORRANCE STD DWGS T116-0 & T204-1. BEDDING SHALL BE MIN 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED

(2) INSTALL 48" PRECAST CONCRETE MANHOLE PER APWA STD DWG 200-2.

(4) INSTALL 6" V.C.P.

(6) INSTALL 8" x 6" V.C.P. WYE

(10) PROTECT RCB DURING CONSTRUCTION PER DIRECTION OF LA COUNTY FLOOD CONTROL.

(14) INSTALL 15" DIAMETER 1/4" THICK STEEL CASING.

REGISTERED PROFESSIONAL ENGINEER — RICHARD L. RAE — No. 24251 — Exp. 12-31-01 — CIVIL — STATE OF CALIFORNIA

4/3/01

PLANS PREPARED BY:

PSOMAS

3187 Red Hill Avenue
Suite 250
Costa Mesa, CA 92626
(714) 751-7373 Fax(714)545-8883

REV.	DATE	DESCRIPTION	BY	CHECKED
(2)	7/25/01	REVISED DETAIL 1	CR	TS
(3)	10-9-01	DELETED PLAN & PROF. VIEWS; REVISED DETAIL	CR	TS

CITY OF TORRANCE
ENGINEERING DEPARTMENT

DRAWN: CR
DESIGNED: CR
PROJECT ENGINEER: Ted Symons
DIVISION ENGINEER: R. Burtt 4/20/01

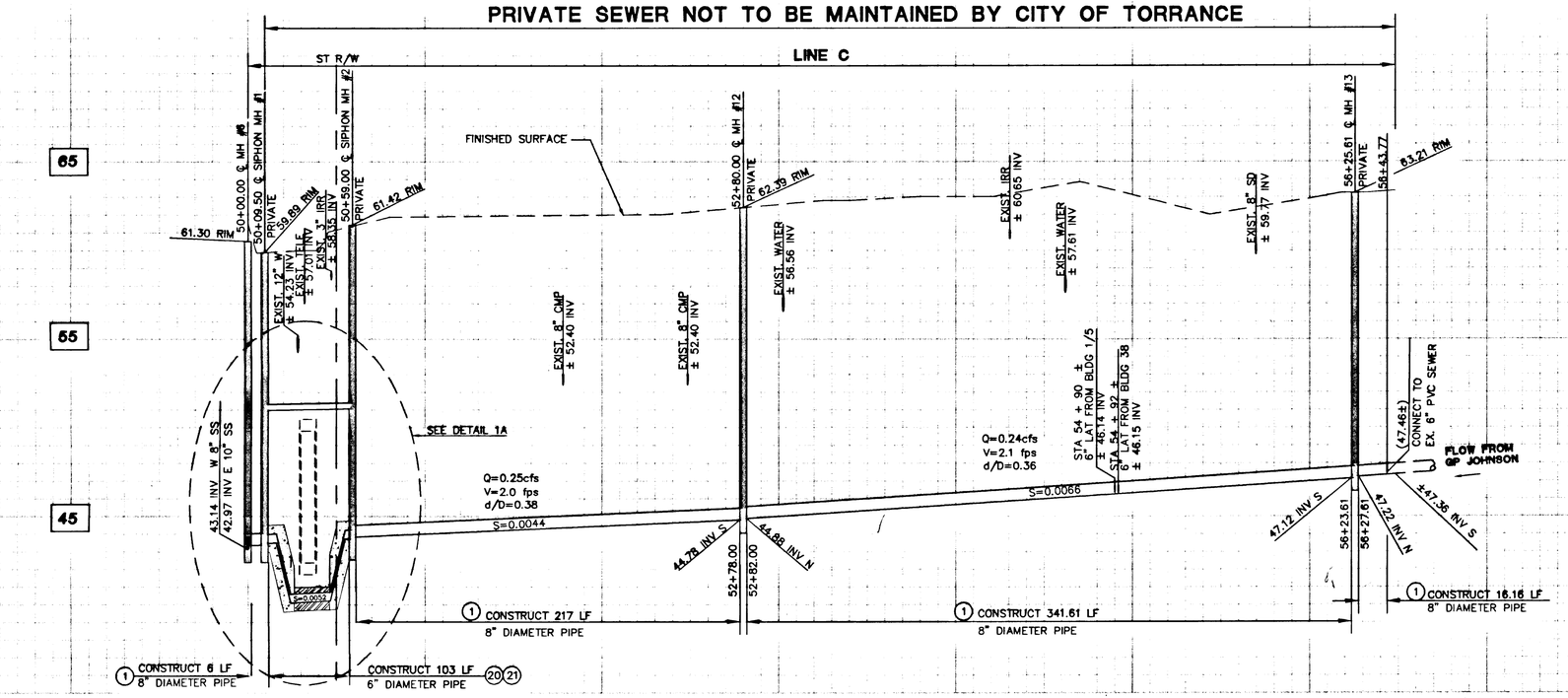
APPROVED: Richard W. Burtt 3/30/01
RICHARD W. BURTT DATE
ENGINEERING DIRECTOR
R.C.E. NO. 32862 EXP. 6/30/02
R.T.E. NO. 1538 EXP. 9/30/02

SCALE: AS SHOWN | SHEET 6 OF 6

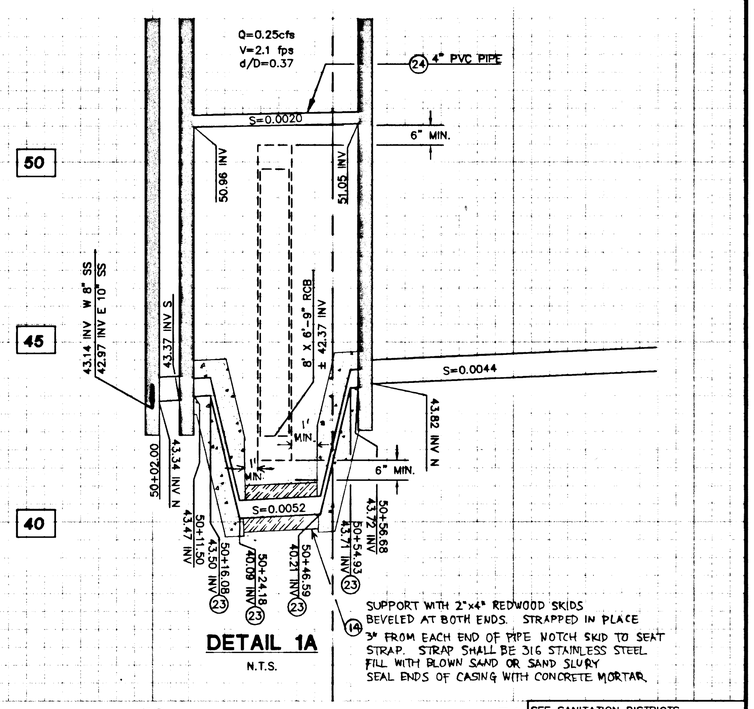
PLAN NO. SS-363

Plotted: 04/02/01 17:33:40 W:\HONEYWELL\SITE_A\HON0201\vstrea\sewer line\sheets\03140\SH105.dwg Dominez

PRIVATE SEWER NOT TO BE MAINTAINED BY CITY OF TORRANCE



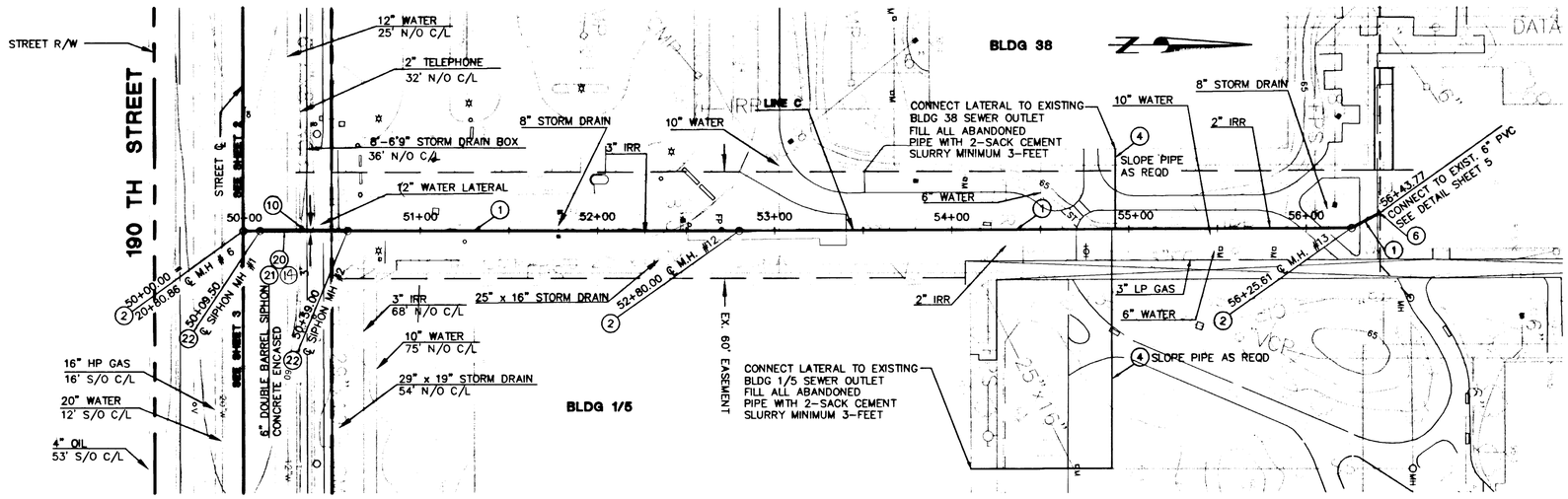
SCALE : 1" = 40' (HOR.)
1" = 4' (VER.)



DETAIL 1A
N.T.S.

SUPPORT WITH 2"x4" REDWOOD SKIDS BEVELED AT BOTH ENDS. STRAPPED IN PLACE 3" FROM EACH END OF PIPE NOTCH SKID TO SEAT STRAP. STRAP SHALL BE 316 STAINLESS STEEL FILL WITH BLOWN SAND OR SAND SLURRY SEAL ENDS OF CASING WITH CONCRETE MORTAR.

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES. (562)699-7411 Ext. 2727



CONSTRUCTION NOTES

(1) INSTALL 8" EXTRA STRENGTH V.C.P. TRENCH AND BEDDING PER CITY OF TORRANCE STD DWGS T116-0 & T204-1. BEDDING SHALL BE MIN 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED

(2) INSTALL 48" PRECAST CONCRETE MANHOLE PER APWA STD DWG 200-2.

(4) INSTALL 6" V.C.P.

(6) INSTALL 8" x 6" V.C.P. WYE

(10) PROTECT RCB DURING CONSTRUCTION PER DIRECTION OF LA COUNTY FLOOD CONTROL.

(14) INSTALL 15" DIAMETER 1/4" THICK STEEL CASING.

(20) INSTALL 6" EXTRA STRENGTH V.C.P. DOUBLE BARREL SIPHON. TRENCH AND BEDDING PER CITY OF TORRANCE STD. DWGS. T116-0 & T204-1. BEDDING SHALL BE MIN 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED.

(21) INSTALL CONCRETE ENCASEMENT PER CITY OF TORRANCE STD. DWG. T716-1.

(22) INSTALL 48" PRECAST CONCRETE SIPHON MANHOLE PER LACDPW STD. DWG. 2005-2.

(23) INSTALL 6" 22.5° EXTRA STRENGTH V.C.P. BEND.

(24) INSTALL 4" PVC PIPE.

REGISTERED PROFESSIONAL ENGINEER No. 24251 Exp. 12-31-01 STATE OF CALIFORNIA
10/10/01

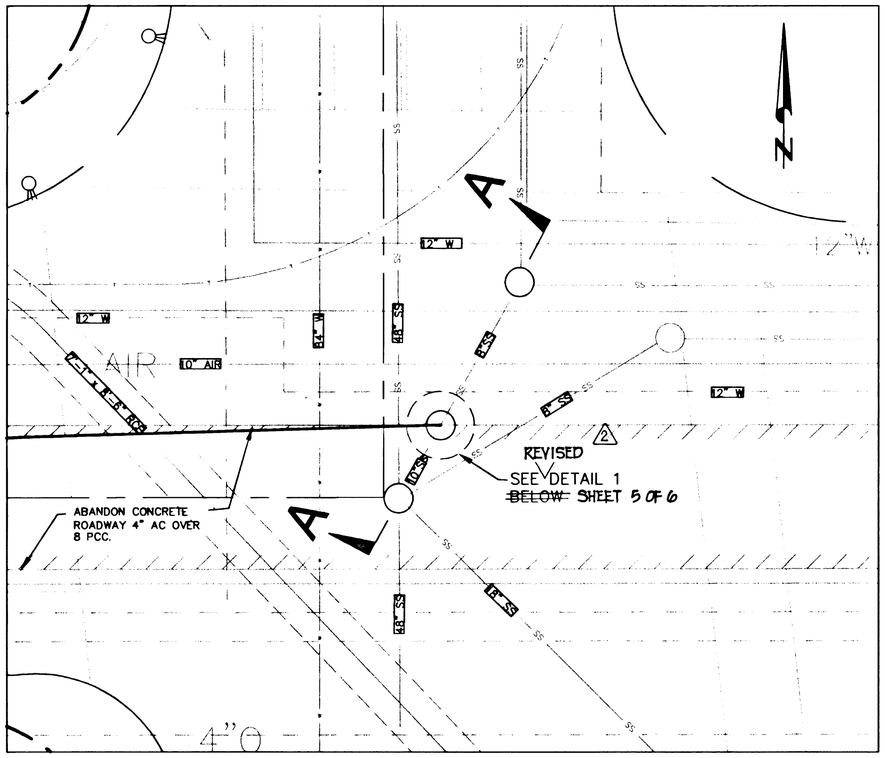
PLANS PREPARED BY:
PSOMAS
3187 Red Hill Avenue
Suite 250
Costa Mesa, CA 92626
(714) 751-7373 Fax (714) 545-8883

REV.	DATE	DESCRIPTION	BY	CHECKED
3	10/9/01	ADDED 6" DOUBLE BARREL SIPHON, DETAIL 1A,	RV EMS	CW RPP
		ADJUSTED GRADE SOUTH OF MANHOLE #12, AND		
		HORIZONTAL ALIGNMENT SHIFTED 7.5' WEST		

CITY OF TORRANCE
ENGINEERING DEPARTMENT

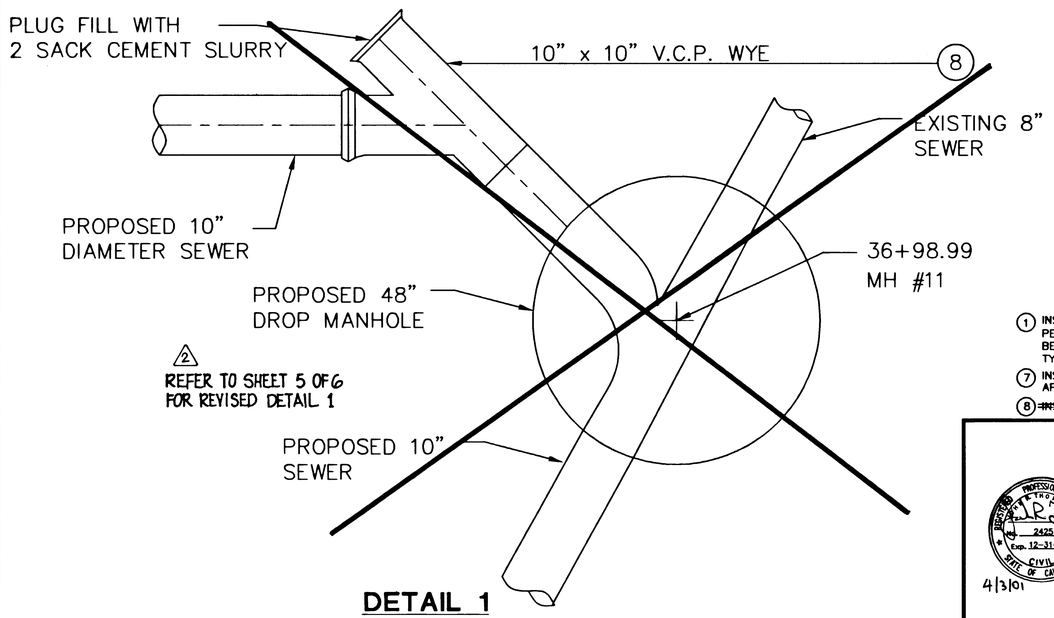
DRAWN: CR
DESIGNED: CR
PROJECT ENGINEER: L. Vivas RV 10/9/01
APPROVED: Richard W. Burtt 10-10-01
RICHARD W. BURTT DATE
ENGINEERING DIRECTOR
R.C.E. NO. 32862 EXP. 6/30/02
R.T.E. NO. 1538 EXP. 9/30/02
DIVISION ENGINEER: R. Perkins 10/10/01
SCALE: AS SHOWN
SHEET 8A OF 6
PLAN NO. SS-363

Plotted: 10/10/01 14:03:29 P:\HONEYWELL\SITE_A\1HON0201\waters\sewer line sheets\0314-01\SH105a.dwg CRamirez



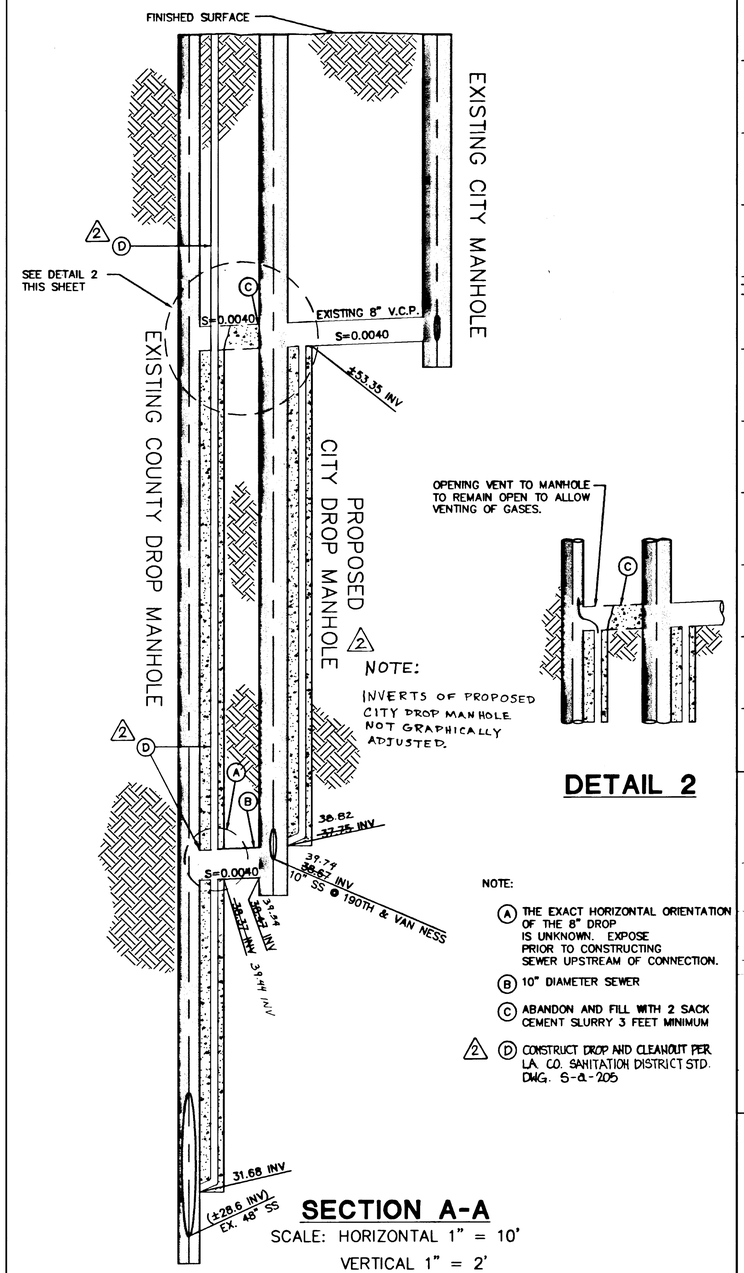
PLAN VIEW

SCALE: 1" = 10'



DETAIL 1

N.T.S.



SECTION A-A

SCALE: HORIZONTAL 1" = 10'
VERTICAL 1" = 2'

DETAIL 2

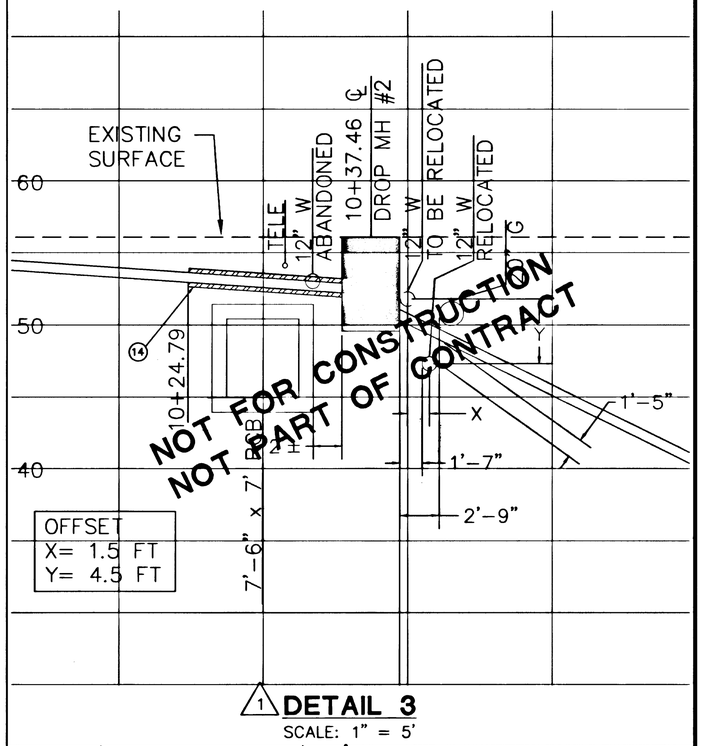
NOTE:

(A) THE EXACT HORIZONTAL ORIENTATION OF THE 8" DROP IS UNKNOWN. EXPOSE PRIOR TO CONSTRUCTING SEWER UPSTREAM OF CONNECTION.

(B) 10" DIAMETER SEWER

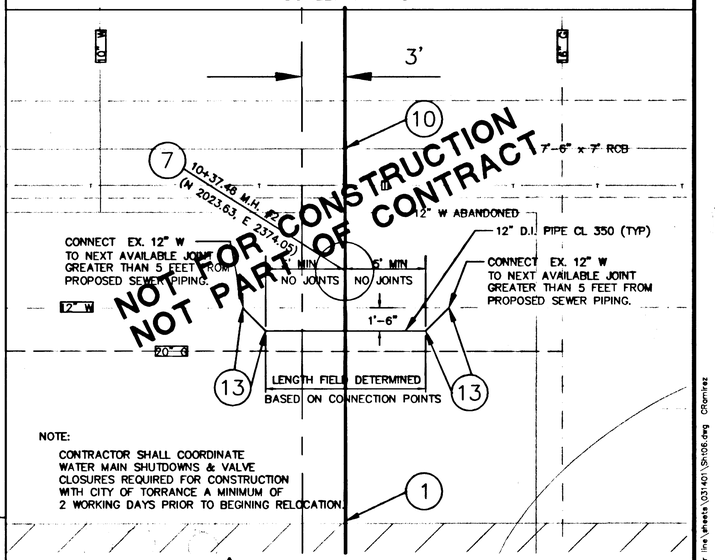
(C) ABANDON AND FILL WITH 2 SACK CEMENT SLURRY 3 FEET MINIMUM

2 (D) CONSTRUCT DROP AND CLEANOUT PER LA CO. SANITATION DISTRICT STD. DWG. S-4-205



1 DETAIL 3

SCALE: 1" = 5'



NOTE:

CONTRACTOR SHALL COORDINATE WATER MAIN SHUTDOWNS & VALVE CLOSURES REQUIRED FOR CONSTRUCTION WITH CITY OF TORRANCE A MINIMUM OF 2 WORKING DAYS PRIOR TO BEGINING RELOCATION.

1 DETAIL 4

12" WATER RELOCATION
SCALE: 1" = 5'

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES. (562)699-7411 Ext. 2727

CONSTRUCTION NOTES

1. INSTALL 8" EXTRA STERNGTH V.C.P. TRENCH AND BEDDING PER CITY OF TORRANCE STD DWGS T116-0 & T204-1. BEDDING SHALL BE MIN. 4" BELOW PIPE HAUNCH. TYPE "G" JOINTS REQUIRED.
7. INSTALL 48" DROP SEWER MANHOLE PER APWA STD DWG. 202-0.
8. ~~INSTALL 10" x 10" V.C.P. WYE~~ 2
10. PROTECT RCB DURING CONSTRUCTION PER DIRECTION OF LA COUNTY FLOOD CONTROL.
13. INSTALL 12" D.I.P. 45° BEND
14. INSTALL 15" DIAMETER 1/4" THICK STEEL CASING

PLANS PREPARED BY:

PSOMAS

3187 Red Hill Avenue
Suite 250
Costa Mesa, CA 92626
(714) 751-7373 Fax (714) 545-8883

REGISTERED PROFESSIONAL ENGINEER — TED SYMORA — No. 24251 — Exp. 12-31-01 — CIVIL — STATE OF CALIFORNIA

4/3/01

REV.	DATE	DESCRIPTION	BY	CHECKED
1	7/25/01	LINE "A" NOT FOR CONSTRUCTION. NOT PART OF CONTRACT.	CR	TS APP
2	7/25/01	REVISED DETAIL 1 AND SECTION A-A	CR	TS APP

CITY OF TORRANCE
ENGINEERING DEPARTMENT

DRAWN: CR
DESIGNED: CR
PROJECT ENGINEER: EW Ted Symora
DIVISION ENGINEER: R.Burkett 4/10/01

APPROVED: Richard W. Burtt 3/2/01
RICHARD W. BURTT — DATE
ENGINEERING DIRECTOR
R.C.E. NO. 32862 EXP. 6/30/02
R.T.E. NO. 1538 EXP. 9/30/02

SCALE: AS SHOWN | SHEET 6 OF 6

PLAN NO. SS-363

Plotted: 04/02/01 16:09:37 W:\HOME\EL_SITE_A\HONO201\Vectra sewer improvements\031401\SH06.dwg CRamirez