Appendix A (Continued)

Initial Study, Notice of Preparation (NOP), and NOP Comment Letters

Appendix IS-5

Drainage Study

Preliminary Drainage Study

100 E. Ocean

City of Long Beach
Los Angeles County, California

Prepared for:

American Life, Incorporated
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Prepared by:

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May 2018

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100 E. Ocean

1.0 Introduction

The purpose of this study is to assess the hydrological effects from the proposed mixed-use development. The analysis will compare the existing hydrological requirements, conditions, and constraints to the proposed development, in accordance with the County of Los Angeles Public Works Hydrology Manual, 2006 Edition Los Angeles County Standard Urban Stormwater Mitigation Plan (SUSMP) and the existing agreements between the owner and the City of Long Beach.

The proposed mixed-use project is located east of Pine Avenue and south of E Ocean Boulevard in the City of Long Beach in the County of Los Angeles (**See Figure 1**). The proposed project consists of an approximate 1.35 acre multistory mixed-use hotel development project.

Figure 1 Project Location
NTS

2.0 Hydrological Characteristics

2.1 Rainfall

Based on plate 1-H1.5 of the rainfall Isohyet maps prepared by the Los Angeles County Public Works (See Appendix 3), the 50-Year 24-Hour Isohyet project area falls within the 5.3 inches of rainfall. According to the LA County Hydrology Manual the Multiplication Factor for the10-Year Storm event is 0.714. Using the rainfall depth for the 50-Year Storm Event along with the Multiplication Factors, the rainfall depths for the other storm events were determined. A summary of storm water runoff for 2-yr, 5-yr, 10-yr, 25-yr, 50-yr and 100-yr events are shown in Appendices 1 and 2 for existing and proposed conditions. These summary tables are shown for reference only.

2.2 Soil Properties

Based on plate 1-H1.5 of the rainfall isohyets maps, the proposed project area falls within the soil type 003. (See Appendix 3)

2.3 Land Use

The existing condition of the project area is an asphalt pavement parking lot occupying mostly the southern half of the lot with the northern portion currently serving as an interactive art exhibit. The areas immediately adjacent to the project are developed areas consisting of roadway, and existing commercial buildings. The proposed project will occupy the entire site with a multistory mixed-use hotel.

3.0 Methodology and Analysis

This drainage study is based on the Los Angeles County Hydrology Manual. Due to the small size of the project area, the Los Angeles County HydroCalc program, developed by Los Angeles County Public Works, was utilized for this analysis. Below is a summary of the factors utilized in the hydrologic analysis of the project area.

- Project Area = 1.35 acres
- Soil Type is 003
- 50-Yr 24-Hr Isohyet = 5.3 inches
- Existing and Proposed Impervious Percentages (calculated using actual impervious cover ratios)
    - Existing: 75%
    - Proposed: 93%
- Multiplication Factor for the 10-Year storm event is, 0.714.

3.1 Existing Conditions

The existing project area is divided into northern and southern portions, separated by natural ground and a vertical separation of 15 to 20 feet. The northern portion of the site is an interactive art exhibit known as “The Loop.” The southern portion is an asphalt pavement parking lot. The proposed project will occupy the entire site with a multistory, mixed-use hotel building.

See Table 1 below for a summary of the existing peak 10-year values, using LA County HydroCalc (reference Appendix 3 for Maps):

SUBAREA	AREA	% IMP	FLOWRATE (cfs)	VOLUME (ac-ft)
E-1	0.85	0.88	1.60	0.214
E-2	0.42	0.43	0.42	0.059
E-3	0.05	1.0	0.10	0.014
E-4	0.03	1.0	0.06	0.008
Total	1.35		2.19	0.296

Table 1: Existing 10-year Hydrology

3.2 Proposed Conditions

The development will consist of one level of subterranean parking with a multistory mixed-use hotel, landscaping, and miscellaneous concrete walks. Stormwater will be conveyed via multiple roof drains and drive aisle trench drains that lead to two 10 foot diameter underground steel reinforced polyethylene (SRPE) detention tanks and will be retained until it reaches the detention system outlet pipe (reference Contech DuroMaxx brochure in Appendix 4). The stormwater will then be conveyed via an 18 inch reinforced concrete pipe (RCP) that connects to a new manhole, joining the existing 27 inch RCP storm drain system located within Pine Avenue. The stormwater detention system will capture 3,102 cubic-feet of underground storage. During storm events beyond the 10-year event, the detention system will overflow via the drive aisle trench drains and sheet flow to the existing curb and gutters that lead to an existing catch basin, entering the existing storm drain system.

See Table 3 below for a summary of the proposed peak 10-year values, using LA County HydroCalc (reference Appendix 3 for Maps):

SUBAREA	AREA	% IMP	FLOWRATE (cfs)	VOLUME (ac-ft)
P-1	0.85	0.99	1.72	0.237
P-2	0.42	0.79	0.71	0.104
P-3	0.05	0.98	0.10	0.014
P-4	0.03	1.0	0.06	0.008
Total	1.35		2.59	0.363

Table 2: Proposed 10-year Hydrology

3.3 SUSMP & LID Analysis

According to the City of Long Beach Low Impact Development (LID) Best Management Practice (BMP) Design Manual, this project falls under the “All Other Developments” category discussed in section 3.1.3. Due to the project size, this project will also implement BMPs required by the Los Angeles County Standard Urban Stormwater Mitigation Plan (SUSMP) Manual.

Below is a summary of the factors utilized in the SUSMP analysis of the project area.

- Project Area = 1.35 acres
- Soil Type is 003
- Percent Impervious = 93%
- Longest Flow Path = 321 feet

Based on these factors and the SUSMP calculations under Appendix 4, the proposed site is required to mitigate a runoff volume of 3,102 cubic feet or a runoff flow of 0.28 cfs (reference calculations in Appendix 4). Since infiltration is infeasible this project will mitigate the SUSMP volume by using underground SRPE detention system with an irrigation re-use pump. The detention system will retain stormwater until it reaches the overflow pipe that connects to the existing storm drain system. Storm events beyond the 10-year event will overflow via the drive aisle trench drains and sheet flow to the existing curb and gutters that eventually lead to an existing catch basin that connects to the existing storm drain system within Pine Avenue. See Proposed Hydrology map under Appendix 3 and SUSMP map under Appendix 4.

The storm water detention system will capture 3,102 cubic feet of runoff volume from the roof and surface features (reference calculation in Appendix 3). This volume meets the 3,102 cubic feet of mitigated volume required by the SUSMP calculation (reference calculation in Appendix 4).

4.0 Summary and Conclusions

The hydrological analysis shows an increase in stormwater runoff between the existing and the proposed condition, and an increase in volume between the existing and proposed condition. The difference in volume between the existing and proposed 10 year storm is 2,936CF (P_{10} = 15,815CF – E_{10} = 12,883CF). The SUSMP volume (3,102 CF, see Appendix 4) exceeds the difference between the existing and proposed 10 year storm, therefore the SUSMP volume will be mitigated by the proposed stormwater detention system, as described under Section 3.3. The detention system overflows via an 18 RCP storm drain pipe that connects to a new manhole, joining an existing 27 inch RCP storm drain line. During events beyond the 10-year event, the detention system will overflow via the drive aisle trench drains and sheet flow to the curb and gutter and enter the existing downstream catch basin. See proposed Hydrology Map under Appendix 3.

5.0 References

1. *Los Angeles County Hydrology Manual*, Los Angeles County Public Works, January 2006.

2. *HydroCalc*, Los Angeles County Public Works.

3. *City of Long Beach LID BMP Design Manual,* February 2013.

4. *Development Planning for Storm Water management: A Manual for the Standard Urban Storm Water Mitigation Plan (SUSMP)*, Los Angeles County Department of Public Works, September 2002.

APPENDIX 1
Existing Condition Hydrology Calculations

100 E Ocean Hydrology - 10 Year Storm

Existing

SUBAREA	AREA	% IMP	FLOWRATE (cfs)	VOLUME (ac-ft)	VOLUME (cu-ft)
E-1	0.85	0.88	1.60	0.214	9327
E-2	0.42	0.43	0.42	0.059	2575
E-3	0.05	1.0	0.10	0.014	613
E-4	0.03	1.0	0.06	0.008	368
Total	1.35		2.19	0.296	12,883

100 E OCEAN
Existing Hydrology

Project	Subarea	Area (ac)	Length (ft)	Slope	Depth	% imp	Soil Type	Frequency	Tc-calculated (min.)	Intensity (in.hr)	Cu	Cd	Flow Rate (cfs)	Volume (ac-ft)
100 E OCEAN	E-1	0.85	183	0.068	5.3	0.88	3	2-yr	6	1.12	0.16	0.81	0.77	0.116
100 E OCEAN	E-2	0.42	321	0.043	5.3	0.43	3	2-yr	13	0.78	0.10	0.44	0.15	0.032
100 E OCEAN	E-3	0.05	97	0.047	5.3	1.00	3	2-yr	5	1.22	0.18	0.90	0.06	0.008
100 E OCEAN	E-4	0.03	65	0.001	5.3	1.00	3	2-yr	6	1.12	0.16	0.90	0.03	0.005
Totals		1.35											1.01	0.160
100 E OCEAN	E-1	0.85	183	0.068	5.3	0.88	3	5-yr	5	1.85	0.30	0.83	1.30	0.175
100 E OCEAN	E-2	0.42	321	0.043	5.3	0.43	3	5-yr	9	1.40	0.22	0.51	0.30	0.048
100 E OCEAN	E-3	0.05	97	0.047	5.3	1.00	3	5-yr	5	1.85	0.30	0.90	0.08	0.012
100 E OCEAN	E-4	0.03	65	0.001	5.3	1.00	3	5-yr	5	1.85	0.30	0.90	0.05	0.007
Totals		1.35											1.73	0.242
100 E OCEAN	E-1	0.85	183	0.068	5.3	0.88	3	10-yr	5	2.26	0.36	0.84	1.60	0.214
100 E OCEAN	E-2	0.42	321	0.043	5.3	0.43	3	10-yr	8	1.81	0.29	0.55	0.42	0.059
100 E OCEAN	E-3	0.05	97	0.047	5.3	1.00	3	10-yr	5	2.26	0.36	0.90	0.10	0.014
100 E OCEAN	E-4	0.03	65	0.001	5.3	1.00	3	10-yr	5	2.26	0.36	0.90	0.06	0.008
Totals		1.35											2.19	0.296
100 E OCEAN	E-1	0.85	183	0.068	5.3	0.88	3	25-yr	5	2.78	0.43	0.84	1.99	0.264
100 E OCEAN	E-2	0.42	321	0.043	5.3	0.43	3	25-yr	6	2.55	0.40	0.62	0.66	0.073
100 E OCEAN	E-3	0.05	97	0.047	5.3	1.00	3	25-yr	5	2.78	0.43	0.90	0.12	0.017
100 E OCEAN	E-4	0.03	65	0.001	5.3	1.00	3	25-yr	5	2.78	0.43	0.90	0.08	0.010
Totals		1.35											2.85	0.365
100 E OCEAN	E-1	0.85	183	0.068	5.3	0.88	3	50-yr	5	3.16	0.47	0.85	2.28	0.300
100 E OCEAN	E-2	0.42	321	0.043	5.3	0.43	3	50-yr	5	3.16	0.47	0.65	0.87	0.084
100 E OCEAN	E-3	0.05	97	0.047	5.3	1.00	3	50-yr	5	3.16	0.47	0.90	0.14	0.020
100 E OCEAN	E-4	0.03	65	0.001	5.3	1.00	3	50-yr	5	3.16	0.47	0.90	0.09	0.012
Totals		1.35											3.37	0.416
100 E OCEAN	E-1	0.85	183	0.068	5.3	0.88	3	100-yr	5	3.55	0.51	0.85	2.57	0.337
100 E OCEAN	E-2	0.42	321	0.043	5.3	0.43	3	100-yr	5	3.55	0.51	0.68	1.01	0.095
100 E OCEAN	E-3	0.05	97	0.047	5.3	1.00	3	100-yr	5	3.55	0.51	0.90	0.16	0.022
100 E OCEAN	E-4	0.03	65	0.001	5.3	1.00	3	100-yr	5	3.55	0.51	0.90	0.10	0.013
Totals		1.35											3.83	0.467

APPENDIX 2
Proposed Condition Hydrology Calculations

100 E Ocean Hydrology - 10 Year Storm

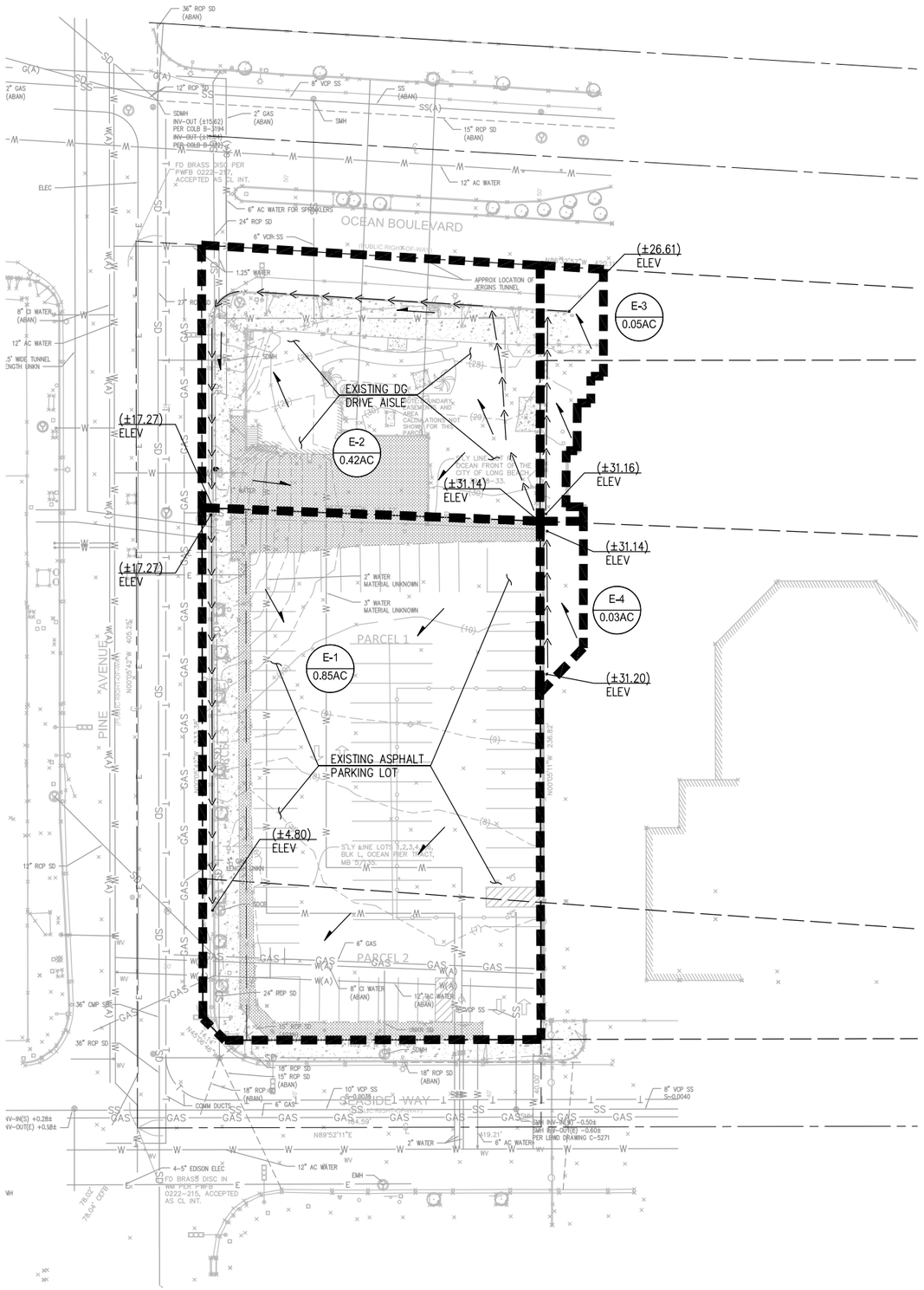
Proposed

SUBAREA	AREA	% IMP	FLOWRATE (cfs)	VOLUME (ac-ft)	Volume (cu-ft)
P-1	0.85	0.99	1.72	0.237	10330
P-2	0.42	0.79	0.71	0.104	4518
P-3	0.05	0.98	0.10	0.014	602
P-4	0.03	1.0	0.06	0.008	368
Total	1.35		2.59	0.363	15,819

100 E OCEAN
Proposed Hydrology

Project	Subarea	Area (ac)	Length (ft)	Slope	Depth	% imp	Soil Type	Frequency	Tc-calculated (min.)	Intensity (in.hr)	Cu	Cd	Flow Rate (cfs)	Volume (ac-ft)
100 E OCEAN	P-1	0.85	183	0.068	5.3	0.99	3	2-yr	5	1.22	0.18	0.89	0.93	0.129
100 E OCEAN	P-2	0.42	321	0.043	5.3	0.79	3	2-yr	9	0.93	0.12	0.79	0.31	0.056
100 E OCEAN	P-3	0.05	97	0.047	5.3	0.98	3	2-yr	5	1.22	0.18	0.89	0.05	0.008
100 E OCEAN	P-4	0.03	65	0.001	5.3	1.00	3	2-yr	6	1.12	0.16	0.90	0.03	0.005
Totals		1.35											1.32	0.197
100 E OCEAN	P-1	0.85	183	0.068	5.3	0.99	3	5-yr	5	1.85	0.30	0.89	1.40	0.194
100 E OCEAN	P-2	0.42	321	0.043	5.3	0.79	3	5-yr	7	1.58	0.25	0.81	0.54	0.085
100 E OCEAN	P-3	0.05	97	0.047	5.3	0.98	3	5-yr	5	1.85	0.30	0.89	0.08	0.011
100 E OCEAN	P-4	0.03	65	0.001	5.3	1.00	3	5-yr	5	1.85	0.30	0.90	0.05	0.007
Totals		1.35											2.07	0.297
100 E OCEAN	P-1	0.85	183	0.068	5.3	0.99	3	10-yr	5	2.26	0.36	0.89	1.72	0.237
100 E OCEAN	P-2	0.42	321	0.043	5.3	0.79	3	10-yr	6	2.07	0.33	0.82	0.71	0.104
100 E OCEAN	P-3	0.05	97	0.047	5.3	0.98	3	10-yr	5	2.26	0.36	0.89	0.10	0.014
100 E OCEAN	P-4	0.03	65	0.001	5.3	1.00	3	10-yr	5	2.26	0.36	0.90	0.06	0.008
Totals		1.35											2.59	0.363
100 E OCEAN	P-1	0.85	183	0.068	5.3	0.99	3	25-yr	5	2.78	0.43	0.90	2.11	0.292
100 E OCEAN	P-2	0.42	321	0.043	5.3	0.79	3	25-yr	5	2.78	0.43	0.83	0.97	0.128
100 E OCEAN	P-3	0.05	97	0.047	5.3	0.98	3	25-yr	5	2.78	0.43	0.89	0.12	0.017
100 E OCEAN	P-4	0.03	65	0.001	5.3	1.00	3	25-yr	5	2.78	0.43	0.90	0.08	0.010
Totals		1.35											3.28	0.447
100 E OCEAN	P-1	0.85	183	0.068	5.3	0.99	3	50-yr	5	3.16	0.47	0.90	2.41	0.332
100 E OCEAN	P-2	0.42	321	0.043	5.3	0.79	3	50-yr	5	3.16	0.47	0.84	1.11	0.146
100 E OCEAN	P-3	0.05	97	0.047	5.3	0.98	3	50-yr	5	3.16	0.47	0.89	0.14	0.019
100 E OCEAN	P-4	0.03	65	0.001	5.3	1.00	3	50-yr	5	3.16	0.47	0.90	0.09	0.012
Totals		1.35											3.75	0.509
100 E OCEAN	P-1	0.85	183	0.068	5.3	0.99	3	100-yr	5	3.55	0.51	0.90	2.70	0.373
100 E OCEAN	P-2	0.42	321	0.043	5.3	0.79	3	100-yr	5	3.55	0.51	0.84	1.26	0.163
100 E OCEAN	P-3	0.05	97	0.047	5.3	0.98	3	100-yr	5	3.55	0.51	0.89	0.16	0.022
100 E OCEAN	P-4	0.03	65	0.001	5.3	1.00	3	100-yr	5	3.55	0.21	0.10	0.10	0.013
Totals		1.35											4.22	0.571

APPENDIX 3
Hydrology Maps & Supporting Information



LEGEND:

- SUBAREA LIMIT
- 19 / 2.86 AC — SUBAREA NAME / AREA
- FLOW DIRECTION
- WATER COURSE
- (±11.00) ELEV — WATER COURSE ELEVATION
- EXISTING LANDSCAPING OR NATURAL GROUND

HYDROLOGY DATA:

	E-1	E-2	E-3	E-4	TOTAL
10-YEAR STORM (CFS)	1.60	0.42	0.10	0.06	2.19

N

30' 0 30' 60'
15' 45'
SCALE: 1"=30'

kpff

400 Oceangate, Suite 500
Long Beach, California 90802
(562) 437-9100 Fax (562) 437-9200

100 E OCEAN HOTEL
LONG BEACH, CA
PRELIMINARY EXISTING
STORM WATER SITE PLAN

DATE: MAY 2018 | SCALE: AS SHOWN
DRAWN BY: MH | SHT 01 OF 01

Plotted: May 25, 2018 – 2:30pm mhilsabeck Layout: Layout1
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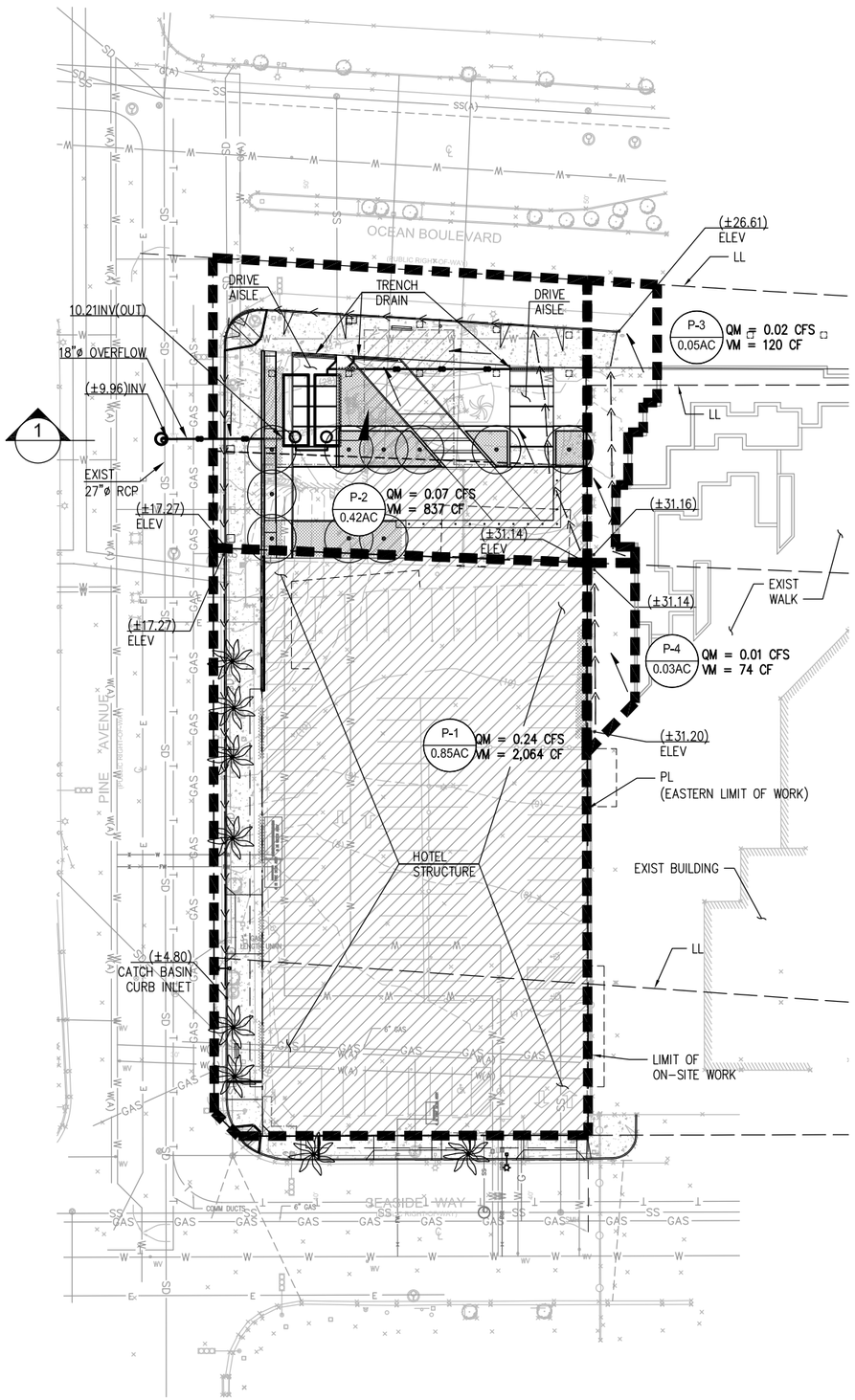


LEGEND:

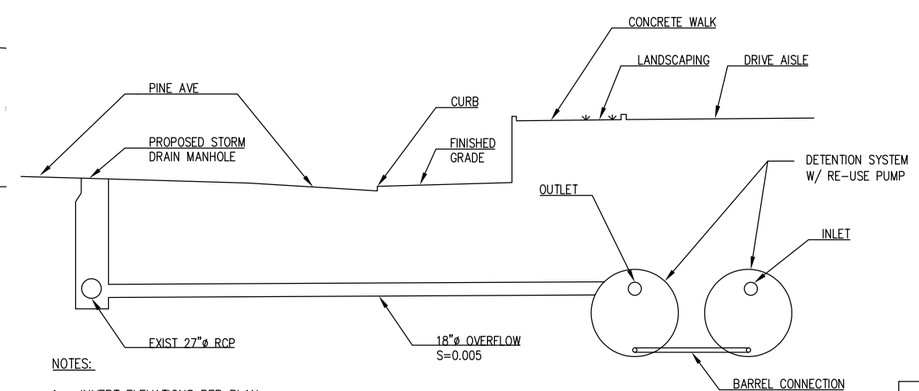
- SUBAREA LIMIT
- 19 / 2.86 AC — SUBAREA NAME / AREA
- QM = XXX CFS — MITIGATED FLOW RATE
- VM = XXX CF — MITIGATED VOLUME
- FLOW DIRECTION
- WATER COURSE
- (±11.00) ELEV — WATER COURSE ELEVATION
- PROPOSED LANDSCAPING
- PROPOSED HOTEL STRUCTURE

HYDROLOGY DATA:

	P-1	P-2	P-3	P-4	TOTAL
10-YEAR STORM (CFS)	1.72	0.71	0.10	0.06	2.59
SUSMP (Q-CFS)	0.24	0.07	0.02	0.01	0.28
SUSMP (V-CF)	2,064	837	120	74	3,102

DIFFERENCE BETWEEN EXISTING & PROPOSED 10-YEAR HYDROLOGY

= 2.59 CFS – 2.19 CFS = 0.41 CFS



NOTES:

1. INVERT ELEVATIONS PER PLAN.
2. REFER TO APPENDIX 4 FOR CONTECH DUROMAXX UNDERGROUND DETENTION SYSTEM.

1 **DETENTION SYSTEM**
SCALE: NTS

N

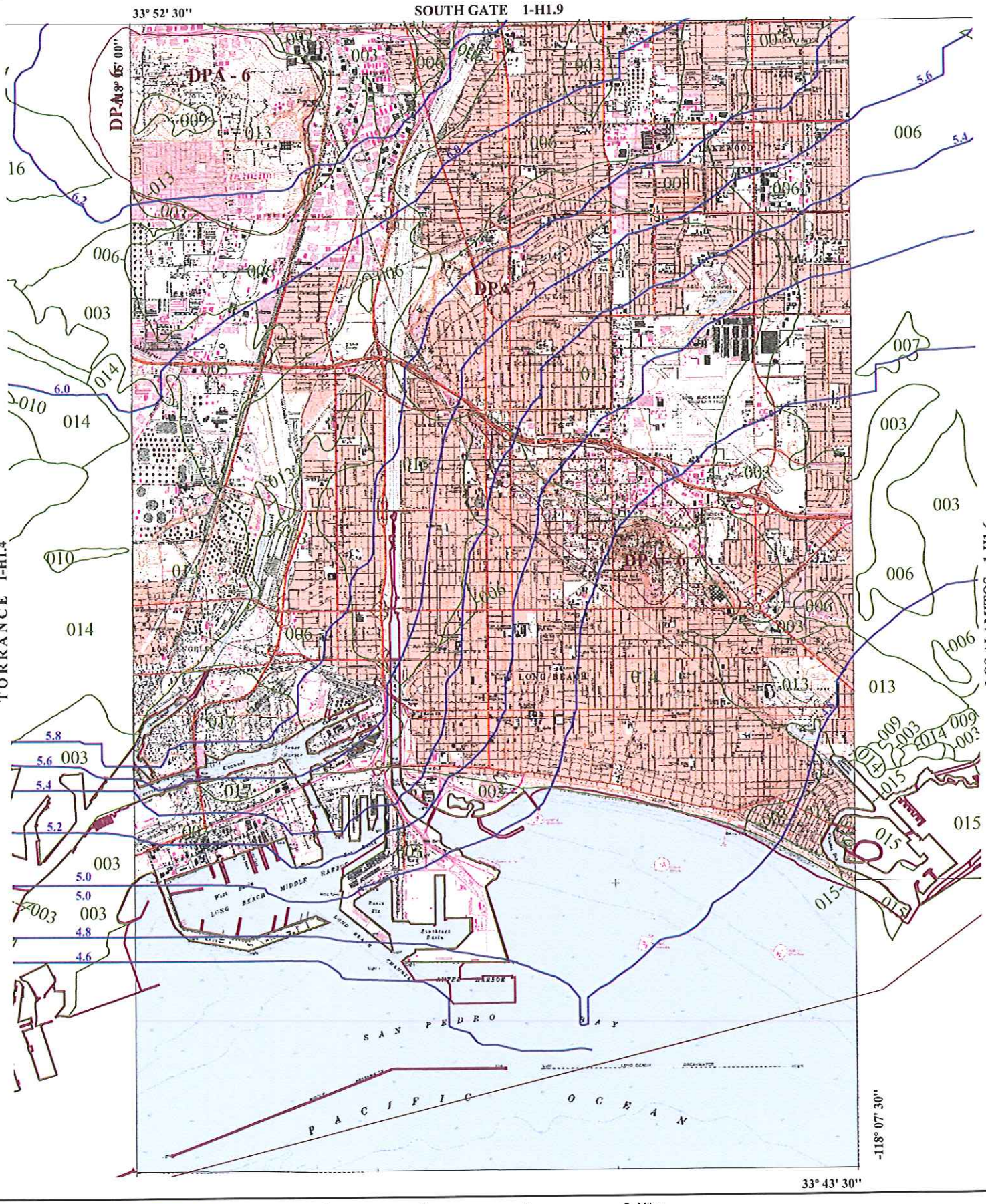
30' 0 30' 60'
15' 45'
SCALE: 1"=30'

kpff
400 Oceangate, Suite 500
Long Beach, California 90802
(562) 437-9100 Fax (562) 437-9200

100 E OCEAN HOTEL
LONG BEACH, CA
PRELIMINARY PROPOSED
STORM WATER SITE PLAN

DATE: MAY 2018 | SCALE: AS SHOWN
DRAWN BY: MH | SHT 01 OF 01

Plotted: Jun 01, 2018 – 10:33am mhilsabeck Layout: Layout1
L:\2017\1700261 – 100 E Ocean_The Beacon Hotel\Drawings\Exhibit\Hydrology\PR Hydrology.dwg



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

LONG BEACH
50-YEAR 24-HOUR ISOHYET

1-H1.5

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

Table 5.3.1
Rainfall Frequency Multiplication Factors

Frequency	Multiplication Factor
2-yr	0.387
5-yr	0.584
10-yr	0.714
25-yr	0.878
50-yr	1.000
100-yr	1.122
500-yr	1.402

Appendix B contains isohyetal maps for the 50-year, 24-hour rainfall depth. The isohyetal contour lines are spaced at intervals of two-tenths of an inch. The spatial rainfall distributions for the county design storms were converted to grid data for use with Geographic Information System (GIS) compatible hydrologic models.

5.4 DESIGN STORM

The three components of the design storm include the IDF equation, the unit hyetograph curve, and the isohyets. These components are used to define the design storm for a particular location and frequency. As an example, consider the 25-year design storm for the Palmer Canyon watershed in Figure 5.4.1. Subarea 1A of this watershed, shown in Figure 5.4.2, will be used for the sample calculations.

1. Compute the area between successive isohyetal lines and multiply by the average of the isohyet values. Table 5.4.1 shows the areas between isohyets for Subarea 1A.

2. The sum of these precipitation-area values divided by the total subarea area provides the area weighted average rainfall depth. The average rainfall should be calculated to the nearest two-tenths of an inch. Table 5.4.1 contains the calculations for the isohyetal values in this subarea.

It may be noted that for small subareas, the isohyet nearest the centroid of the subarea usually equals the design depth. Selecting the isohyets nearest the subarea centroid is an acceptable method for determining the design rainfall for subareas of approximately 40 acres.

APPENDIX 4
Standard Urban Stormwater Mitigation Plan and Supporting Information

SUSMP Peak mitigated stormwater flow calculation

Job: 100 E Ocean
By: MH
Date: 5/24/2018

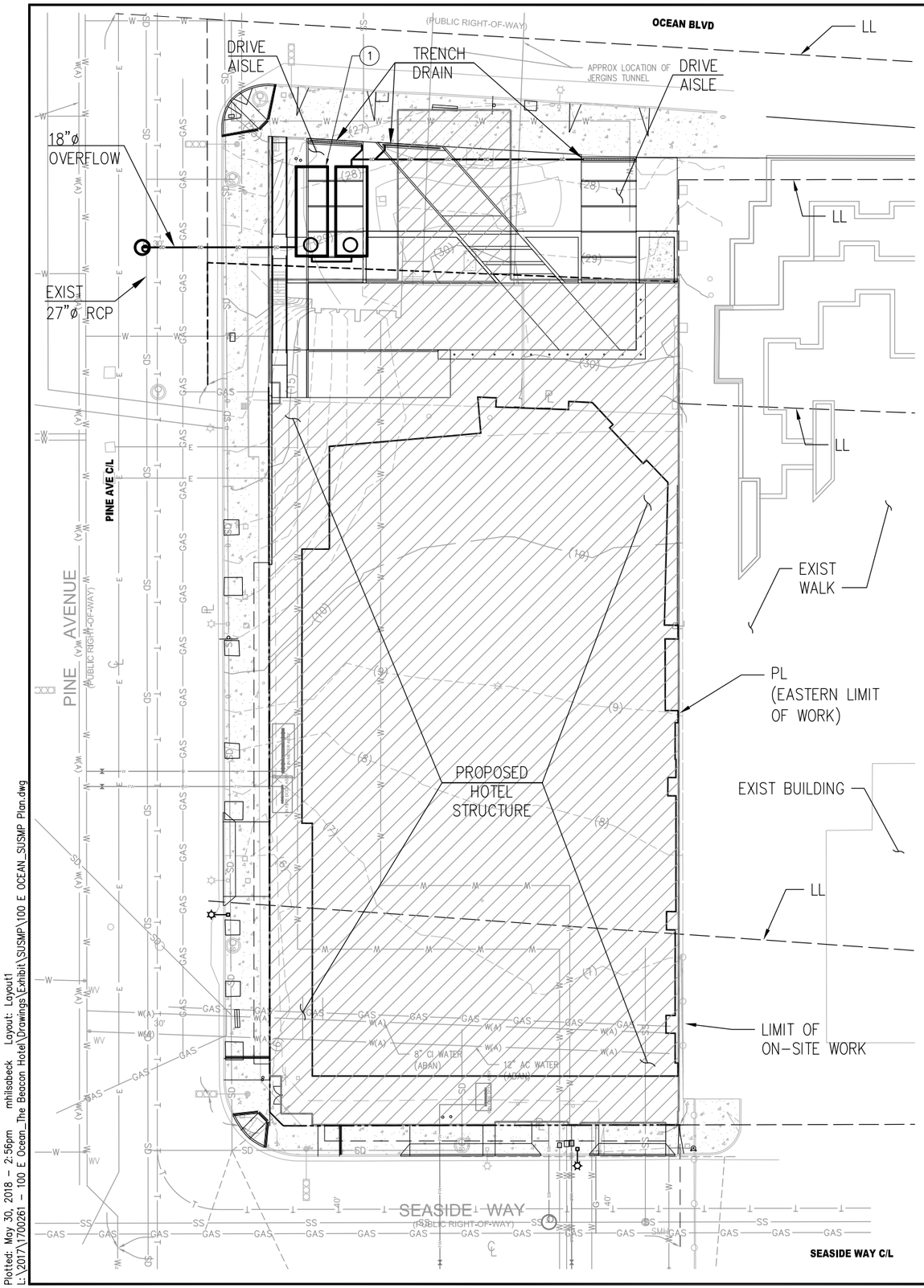
Total Development

Inputs:										
Area (ac)	Soil type #	% Impervious	% Pervious	% Undev area	A(I)	A(P)	A(U)	Length	Slope (ft/ft)	Initial Tc
1.35	3	93	7	0	1.2555	0.0945	0	183	0.068	30

Outputs:										
Iteration No.	Initial T_C (min)	I_X (in/hr)	C_U	C_D	C_D*I_X	Calc. T_C (min)	Diff (min)	Q_{PM} (cfs)	V_M (ft^3)	OK?
1	30	0.193	0.1	0.844	0.163	14.204	-15.796	0.222	3102.0	OK!
2	14.00	0.276	0.1	0.844	0.233	11.797	-2.203	0.317	3102.0	OK!
3	12.00	0.297	0.1	0.844	0.251	11.356	-0.644	0.341	3102.0	OK!
4	11.00	0.309	0.1	0.844	0.261	11.125	0.125	0.355	3102.0	OK!
5	11.00	0.309	0.1	0.844	0.261	11.125	0.125	0.355	3102.0	OK!

					% Impervious			Q_{PM} (cfs)	V_M (ft^3)	
TOTAL					**93.00%**			**0.36**	**3,102**	

T_C - Assume initial value between 5 and 30 mins
I_X - Use Table 1 to correspond value from T_C to get I_X
C_U - Use Runoff Coefficient Curve to correspond from I_X to get C_U
C_D = (0.9 * Imp.) + ((1.0 - Imp.) * C_U)
Calc. T_C = (10 ^ -0.507) * ((C_D * I_X) ^ -0.519) * (Length ^ 0.483) * (Slope ^ -0.135)
Q_{PM} - Peak Mitigation Flow Rate = C_D * I_X * A_{Total} * (1.008333 ft^3-hour / acre-inches-seconds)
V_M - Volume of Stormwater Runoff = (2722.5 ft^3/acres) * ((A_I) * (0.9) + (A_P + A_U) * (C_U))



GENERAL NOTES:

1. THIS DRAWING IS A REPRESENTATION OF COMPLIANCE WITH SUSMP AND CITY OF LONG BEACH LOW IMPACT DEVELOPMENT REQUIREMENTS. NOT FOR CONSTRUCTION.

SUSMP/LID NOTES:

(1) UNDERGROUND DETENTION SYSTEM W/ STORMWATER RE-USE PUMP PER SUSMP BMP B.6

BMP OPERATION AND NOTES:

UNDERGROUND DETENTION SYSTEM: QUARTERLY INSPECTIONS. CLEAN TRASH AND DEBRIS FROM DETENTION SYSTEM, INLET ORIFICE AND OUTLET BEFORE AND AFTER EACH RAIN EVENT.

SUSMP CALCULATIONS:

PROPOSED DEVELOPMENT AREA:	1.35 AC
PERCENT IMPERVIOUS:	93% (SITE BOUNDARY)
AVERAGE SLOPE:	0.03 FT/FT
LONGEST FLOW PATH:	321 FT
PEAK MITIGATED FLOW:	0.28 CFS
PEAK MITIGATED VOLUME:	3,102 CF
PROPOSED IMPERVIOUS PERCENTAGE:	93% (TOTAL TRIBUTARY AREA)

LEGEND

	PROJECT BOUNDARY
	PROPERTY LINE
	LOT LINE
	CENTER LINE
	EASEMENT
W	EXIST WATER LINE
W(A)	ABANDONED WATER LINE
E	ELECTRICAL
T	TELECOMM
GAS	GAS
G(A)	ABANDONED GAS
SS	SANITARY SEWER
S(A)	ABANDONED SANITARY SEWER
SD	STORM DRAIN
	CURB
	PROPOSED HOTEL STRUCTURE

N

20' 0 20' 40'
10' 30'
SCALE: 1"=20'

kpff
400 Oceangate, Suite 500
Long Beach, California 90802
(562) 437-9100 Fax (562) 437-9200

100 E OCEAN HOTEL
LONG BEACH, CA
PRELIMINARY PROPOSED
SUSMP PLAN

DATE: MAY 2018	SCALE: AS SHOWN
DRAWN BY: MH	SHT 01 OF 01

Plotted: May 30, 2018 – 2:56pm mhilsabeck Layout: Layout1
L:\2017\1700261 – 100 E Ocean_The Beacon Hotel\Drawings\Exhibit\SUSMP\100 E OCEAN_SUSMP Plan.dwg

CONTECH®
ENGINEERED SOLUTIONS

DuroMaxx® Steel Reinforced Polyethylene Technology

LEED with Contech®

Sanitary & Storm Sewer | Reline | Irrigation | Detention | Wastewater

DuroMaxx®
STEEL REINFORCED PE TECHNOLOGY

CONTECH®
PIPE SOLUTIONS

Key Performance Advantages

» Manufactured in accordance with ASTM F2562 and AASHTO MP-20.

The Strength of Steel. The Durability of Plastic.

It's the ideal combination of materials that makes DuroMaxx an exceptional pipe. 80 ksi steel reinforcing ribs provide the strength, and pressure rated Polyethylene Resin (PE) provides the durability. This combination of materials results in an extraordinarily strong and durable pipe. DuroMaxx is designed with a smooth inner wall for outstanding hydraulic capacity and provides the properties you can count on for long-term service and performance in the most demanding environments.

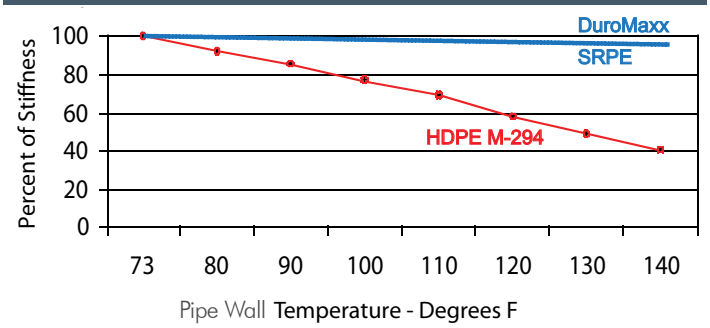
Lifelong Performance

DuroMaxx steel reinforced ribbed profile wall construction will not creep or buckle. The built-in capacity of the high strength steel eliminates concerns that have long plagued profile wall HDPE pipe. Today, it is possible to design with confidence to meet the long-term structural demands of the most difficult **sanitary & storm sewer, reline, irrigation, detention,** and **wastewater** projects.

Temperature Effects on Strength

All flexible pipes must be designed to have adequate pipe stiffness to resist handling, installation and construction loads and to minimize deflection, ensuring a successful installation. Published pipe stiffness levels are measured at 73°F in a laboratory. The actual or apparent field pipe stiffness due to the effects of sunlight and a modest 80° temperature can produce results that are very different in the field – where it counts. A pipe wall temperature in excess of 110°results in a loss of pipe stiffness greater than 30% for a non-reinforced profile wall polyethylene pipe. Steel reinforced DuroMaxx pipe loses less than 1% of its stiffness under the same conditions because the steel provides the pipe stiffness, not the PE plastic. As a result, DuroMaxx can be twice as stiff as non-steel reinforced HDPE pipe.

Effective Pipe Stiffness vs. Temperature*



*The information in this graph is an average stiffness loss observed over several diameters of one AASHTO M-294 HDPE profile wall product.

High Strength Steel & High Performance Pressure Rated Resins

Predictable service life demands predictable material properties. DuroMaxx uses only high quality pressure rated PE resin that provides predictable engineering properties including crack resistance, tensile strength and modulus of elasticity. Hydrostatic Design Basis (HDB) testing verifies and documents important 50 and 100 year design properties that aid the professional engineer when designing piping systems.

Unlike unreinforced plastic pipes which rely fully on time/strain sensitive materials for their structural performance, DuroMaxx's steel reinforcement provides 100% of the load carrying capacity. DuroMaxx resin contains 3% carbon black which long-standing research has shown will inhibit the affects of UV degradation (strength loss and brittleness) in excess of 50 years of direct exposure to sunlight. Therefore, the strength of DuroMaxx does not diminish over time, nor is it significantly impacted by elevated summertime temperatures.

Multiple Joint Options

DuroMaxx's steel reinforced bell and spigot achieves a level of watertight joint performance that sets it apart from conventional pipe products. The DuroMaxx steel reinforced high performance (HP) joint is designed to meet, exceed, and maintain the highest standards of performance when tested in accordance with ASTM D3212. Additional options include: soil tight (ST), welded coupler (WC), and electrofusion (EF) joints.

Savings

High flow rates are achieved with a smooth polyethylene waterway wall for optimal savings. Target flow rates can be assured with DuroMaxx by contacting your local Contech sales engineer for the appropriate information. Manning's "n" values will range between 0.011 to 0.013, depending on velocity and flow rate.

DuroMaxx pipe is lightweight and can be easily handled and quickly installed, often eliminating the need to use heavy construction equipment. The outside diameter (OD) of DuroMaxx is smaller than other conventional pipe materials, resulting in less trench excavation. As the two main cost drivers to install water conveyance products are manpower and machinery, DuroMaxx provides the opportunity to save in both, resulting in less overall spending. The longer lengths and easy joint assembly are just some of the DuroMaxx installation advantages. DuroMaxx should be installed in accordance with nationally accepted ASTM D2321 installation practices. Contact your local Contech representative for the DuroMaxx Installation Guide.

Fittings & Fabricated Manholes

DuroMaxx pipe is available with a full range of fabricated fittings such as elbows, tees, wyes, slope junctions and reducers. Both standard and custom fittings can be readily fabricated, which can result in fewer concrete structures and lower project costs. Manhole structures fabricated with DuroMaxx and HDPE pipe can be an excellent alternative to precast or cast-in-place concrete manholes and structures by providing greater durability and better hydraulic flow through the structure. This solution is both efficient and cost effective.

Sizes

Available in diameters from 30 to 120 inches and manufactured in standard lengths of 14 or 24 feet with bell and spigot joints, DuroMaxx has fewer joints to assemble on site, resulting in faster installation rates for the contractor. If your project requires custom lengths, contact your Contech representative for details and availability.

Pipe Dimensions & Handling Weights

Nom. Pipe Dia.(in)	Pipe OD (in)	Pipe ID (in)	Bell OD (in)	Min. Cover (ft)	Max. Cover (ft)**	Approx. Weight (lbs/ft)
30	30.9	29.5	34.0	1.0	50	18.8
36	37.1	35.4	39.9	1.0	50	23.6
42	43.2	41.3	45.8	1.0	50	27.0
48	49.5	47.2	52.3	1.0	30	30.8
54	55.5	53.2	58.2	1.0	30	36.1
60	61.4	59.1	64.1	1.0	30	42.9
66	67.8	65.0	71.6	1.5	30	56.9
72	73.7	70.9	77.6	1.5	30	65.6
84	85.9	82.7	88.9	2.0	30	76.3
96	97.8	94.5	NA*	2.0	30	87.0
108	111.3	108	NA*	2.5	25	99.7
120	121.9	118.1	NA*	3.0	25	109.0

* Currently available with welded coupler (WC) and electrofusion (EF) joints or plain ended with or without soil tight (ST) joints.

** The maximum cover limits shown in the table above are conservative and greater burial depths are possible. Contact your local Sales Engineer for project specific information.

Environmental Benefits

Contech is an environmentally conscious company committed to shaping the future of green building and design. Contech offers a wide range of site solutions that respond to green building and construction needs and can contribute towards LEED® and NAHB green credits. DuroMaxx has the potential to contribute to a variety of LEED credits in the categories for sustainable sites, water efficiency, materials and resources, innovation in design and regional priority. DuroMaxx consumes 35% less of the natural resources required to produce AASHTO M-294 pipe. The steel reinforcing ribs in the profile wall that provide the structural integrity for the pipe are made out of steel with recycled content levels ranging from 55-80%.

About LEED

A third party certification program, U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) Green Building Rating System™ is based on points and evaluates the overall performance of a green building project by assessing each of the materials and systems used in aggregate.

Sanitary Sewer & Yard Piping

Large diameter sanitary sewer projects can be tough to deal with for many agencies. These long interceptors or trunk lines can run for miles, from manhole to manhole, eating away at an already constrained budget. Much of the costs can be contributed to installation realities for large quantities of very large diameters. These costs can include:

- Freight and number of trucks needed.
- Number of picks and weight of those picks.
- Number of joints and procedure to meet watertight standard.
- Other material costs.

DuroMaxx provides real answers that help make the agency's and engineer's job easier. Outstanding performance and value are clearly evident when comparing DuroMaxx to a wide variety of other products such as RCP, HDPE, Polypropylene, PVC and fiberglass pipe.

Benefits

- Large diameters up to 120 inches.
- Predictable, high strength for deep covers, shape and deflection control.
- Joint tightness that meets initial testing requirements and long-term infiltration/exfiltration needs.
- Resistant to corrosive effluent.
- Smooth inner walls allow for minimum slope designs and longer runs.
- Lightweight for installation efficiency.

Shelley, Idaho
14 miles installed up to 48" diameter

DuroMaxx
Sanitary System

Barker Ranch,
Washington
3 miles
54″ & 60″ diameter

DuroMaxx
Irrigation System

Irrigation Applications

Agriculture and irrigation agencies are in need of more dependable and cost effective solutions to conserve their most valuable resource, water. Many are enclosing ditches and canals with pipe conveyance systems in remote areas of the country. These projects can be challenging to any engineer or project manager, especially when hydraulic parameters require larger diameter pipe sizes. DuroMaxx has proven solutions to these problems.

Benefits

- HDB pressure rated PE resins provide superior corrosion resistance.
- A variety of joint configurations and joint tightness levels are available to meet your specific project needs.
- Installation cost advantages important for remote locations.
- Versatile fabrication supports unique fittings and components.
- Excels in short and long-term cost analysis for irrigation applications.

100-Year Gravity Flow Capabilities 50-Year Pressurized Service Period		
Diameters (in)	9 Months	Continuous (50 years)
30-42	9.5 psi	6.75 psi
48-60	12.0 psi	8.5 psi
66-120	15.0 psi*	15.0 psi

* Stated pressure capabilities based on assumed burial depth. Higher pressure may be possible. Please consult your Contech sales representative.

Direct Bury & Reline Applications

DuroMaxx drainage pipe is ideally suited for the collection and removal of stormwater from highway, urban, industrial and residential projects. Its unique combination of steel reinforcement and pressure rated PE resin allows it to perform like no other drainage pipe on the market.

Benefits

- 80 ksi high strength steel provides maximum load carrying capabilities with allowable cover limits ranging from 30 to 50 feet.
- High strength steel provides exceptional shape and deflection control even on warm, sunny days where typical corrugated HDPE drainage pipes fall short.
- Pressure rated PE resin provides unmatched durability.
- Abrasion and chemical resistance is unaffected by water pH levels unlike reinforced concrete pipe, where abrasion resistance varies with water pH levels.
- Available with soil tight, steel reinforced high performance, and welded coupler joint options. If your project requires extreme joint tightness for the life of the system, rely on the DuroMaxx steel reinforced high performance or welded coupler joints.
- While DuroMaxx may not be the least expensive storm sewer pipe on the market, it outperforms when other products fall short. Long-term, DuroMaxx's outstanding performance and durability generate value.
- The efficient wall profile makes DuroMaxx ideally suited for reline of deteriorating culverts.

Colorado Springs, Colorado

1,296 lf

96" diameter

DuroMaxx
Storm Sewer System

Monticello, Indiana
395,000 gal. storage
96″, 84″ & 72″ diameters

DuroMaxx
CSO System

Tank Applications

Sanitary Sewer Overflow/Combined Sewer Overflow/ Pump Station Equalization Tanks/Detention

Storage tank systems are used to regulate stormwater and wastewater flow through main pipelines by acting as a buffer during peak loads. DuroMaxx systems are designed to contain the water and slowly release it into the main system over a period of time. These systems are often custom made to watertight specifications in order to suit the project requirements.

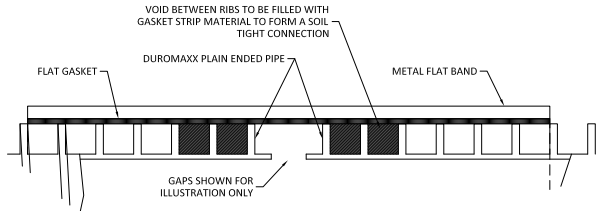
DuroMaxx tank systems can incorporate a wide range of fittings such as bends, risers, bulk headed ends, and inlet/outlet pipes. The systems can be custom manufactured to individual lengths in sizes and configurations that can be economically transported and assembled on site.

Benefits

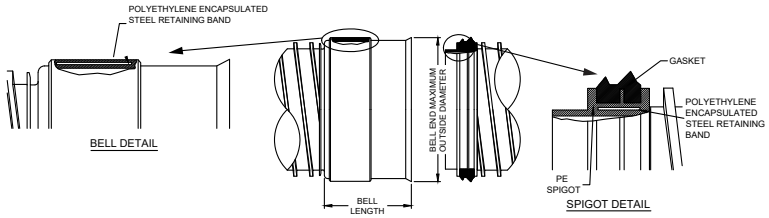
- Utilizing larger diameters whenever possible reduces storage cost per gallon. DuroMaxx is available up to 120 inches.
- Steel reinforcing results in smaller outside diameter dimensions when compared to corrugated HDPE pipe or reinforced concrete pipe. When maximum diameter selection is limited by minimal cover, DuroMaxx can typically be upsized by 6 inches or more, resulting in reduced overall water storage cost.
- A variety of joint configurations and joint tightness levels available to meet specific project needs.
- Offers a corrosion resistant system alternative to concrete in wastewater management without need for protective coatings.
- Fast, efficient installation.

THE DESIGN BEHIND THE PERFORMANCE

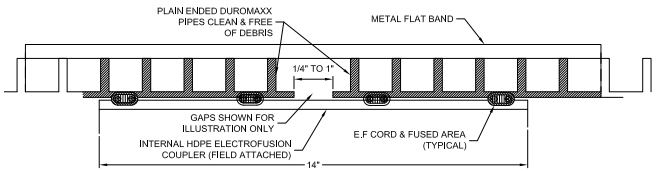
Soil Tight (ST) Joint Detail



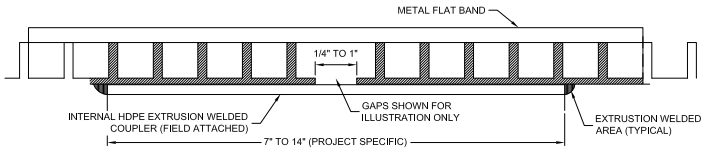
High Performance (HP) Joint Details



Electrofusion (EF) Joint Detail



Welded Coupler (WC) Joint Detail



Contech Engineered Solutions provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, retaining walls, sanitary sewer, erosion control and stormwater management solutions.

For more information, call one of Contech's Regional Offices located in the following cities:

Ohio (Corporate Office)	**513-645-7000**
California (Roseville)	800-548-4667
Colorado (Denver)	720-587-2700
Florida (Orlando)	321-348-3520
Maine (Scarborough)	207-885-9830
Maryland (Baltimore)	410-740-8490
Oregon (Portland)	503-258-3180
Texas (Dallas)	972-590-2000

www.ContechES.com | 800.338.1122

CONTECH® ENGINEERED SOLUTIONS

COMPLETE SITE SOLUTIONS

STORMWATER SOLUTIONS

Helping to satisfy stormwater management requirements on land development projects

- Stormwater Treatment
- Detention/Infiltration
- Rainwater Harvesting
- Biofiltration/Bioretention

PIPE SOLUTIONS

Meeting project needs for durability, hydraulics, corrosion resistance, and stiffness

- Corrugated Metal Pipe (CMP)
- Steel Reinforced Polyethylene (SRPE)
- High Density Polyethylene (HDPE)
- Polyvinyl Chloride (PVC)

STRUCTURES SOLUTIONS

Providing innovative options and support for crossings, culverts, and bridges

- Plate, Precast & Truss bridges
- Hard Armor
- Retaining Walls
- Tunnel Liner Plate

CONTECH® ENGINEERED SOLUTIONS

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DuroMaxx Bro 8/16 MC 5M

STEEL

We print our brochures entirely on Forest Stewardship Council certified paper. FSC certification ensures that the paper in our brochures contain fiber from well-managed and responsibly harvested forests that meet strict environmental and socioeconomic standards.

FSC

Appendix IS-6

Long Beach Police Department Service Letter

CITY OF LONG BEACH

POLICE DEPARTMENT

400 WEST BROADWAY LONG BEACH CALIFORNIA 90802

Robert G. Luna
Chief of Police

Ref 1.0

June 22, 2018

Stephanie Eyestone-Jones
Eyestone Environmental
2121 Rosecrans Avenue, Suite 3355
El Segundo, CA 90245

Dear Stephanie Eyestone-Jones,

This letter is in response to your request for information from the Long Beach Police Department to complete an Environmental Impact Report (EIR) for the 100 East Ocean Boulevard Project as required by the City of Long Beach Development Services Department.

The project location of 100 East Ocean Boulevard is in the City of Long Beach and is located within South Patrol Division. The Reporting District (RD) 152 is in South Division. The South Patrol Division is housed in the Public Safety Building (PSB) located at 400 West Broadway, Long Beach, California 90802 and is approximately 0.5 miles from the project site.

The South Patrol Division consists of 105 sworn officers, three full-time civilian employees and one part-time civilian employee. There are 38 patrol vehicles and six supervisor vehicles assigned and available for use in the division. On any given day and time, the number of officers working the South Patrol Division ranges from 10 to 30 officers, sergeants and lieutenants.

The Long Beach Police Department has many specialized service units to fulfill a variety of public safety functions and responsibilities. These specialized teams include, but are not limited to, the Special Weapons and Tactics (SWAT) team, Police Service Dog Unit, Motor Patrol Officers, Mental Evaluation Team (MET), Hostage Negotiators, Air Support Unit, and Detectives. Each of these teams are available to respond and assist in the South Patrol Division.

According to the most recent census information, the population of the South Patrol Division is 73,823. South Division's northern boundary is Anaheim Street. The southern boundary is the Harbor Scenic Drive. The west boundary borders the 710 Freeway and the east boundary is Cherry Avenue.

The current officer to resident ratio for the City of Long Beach is 1.58. The officer-to-resident ratio for the South Division is 1.4, which includes Reporting District 152. These ratios meet the service standards set forth by the Long Beach Police Department.

The City of Long Beach operates an Emergency Operations and Communications Center, which is responsible for answering both incoming 911 and non-emergency phone calls. These calls are categorized into the following three priorities:

- Priority 1 – The life or property of a citizen is in imminent danger
- Priority 2 – Disturbance of the peace or general well-being
- Priority 3 – All other calls, which include reports and parking problems

The average citywide response time for "Priority 1" calls in 2017 was 3:34 minutes. The average "Priority 1" call response time for South Patrol Division was 3:10 minutes.

South Patrol Division crime statistics can be obtained by accessing the City of Long Beach website. Please refer to our website at http://www.longbeach.gov/police/crime-info/crime-statistics/ crime statistics for RD 152, the division and within the city. The website will provide monthly statistics for the last two years, in addition to a five-year summary.

If you have any questions or require additional information, please contact me or my Chief of Staff, Commander W. Paul Lebaron, at (562) 570-7301.

Sincerely,

R. Luna

Robert G. Luna
Chief of Police

RGL:OM:om
EIR – 100 E. Ocean Blvd

LONG BEACH POLICE DEPARTMENT
400 West Broadway
Long Beach, California 90802-4817

U.S. POSTAGE PITNEY BOWES
ZIP 90802 $ 000.47⁰
02 4W
0000357462 JUL 10 2018

Stephanie Eyestone-Jones
Eyestone Environmental
2121 Rosecrans Avenue, Suite 3355
El Segundo, CA 90245

3024584744 C022

Appendix IS-7

Tribal Consultation Letters

CITY OF LONG BEACH

LONG BEACH DEVELOPMENT SERVICES

333 West Ocean Blvd., 5th Floor, Long Beach, CA 90802 Phone: 570-6194 Fax: 570-6068

PLANNING BUREAU

June 20, 2018

Andrew Salas
Gabrieleno Band of Mission Indians – Kizh Nation
P. O. Box 393
Covina, CA 91723

Re: AB-52 Consultation with the Gabrieleno Band of Mission Indians – Kizh Nation for the 100 East Ocean Boulevard Project

Dear Mr. Salas:

The City of Long Beach is conducting its consultation process for the 100 East Ocean Boulevard Project. Please consider this letter and preliminary project information as the initiation of the California Environmental Quality Act (CEQA) process, specifically Public Resources Code (PRC) Section 21080.3.1 and Chapter 532 Statutes of 2014 (AB-52). Please respond within 30 days, pursuant to PRC Section 21080.3.1(d), if you would like to initiate consultation on this project.

PROJECT TITLE: 100 East Ocean Boulevard Project

PROJECT LOCATION: 100 East Ocean Boulevard, Long Beach, California (Assessor's Parcel Number 7278-007-928)

PROJECT DESCRIPTION: The Project Applicant, 100 East Ocean Blvd, LP, proposes a new hotel on a 59,501-square-foot (1.36-acre) site located at 100 East Ocean Boulevard (Project Site) in the City of Long Beach. The Project Site, which is the former site of the Jergins Trust Building, is bounded by Ocean Boulevard to the north, the Convention Center Walkway and an office building to the east, Seaside Way to the south, and Pine Avenue to the west. The Project Applicant proposes a 30-story, 530,828-square-foot building of up to 375.5 feet in height that would include 429 hotel rooms, 15,000 square feet of restaurant space, and 16,500 square feet of meeting and ballroom space (collectively, the Project). In addition, hotel amenities would include a pool deck and bar, fitness center, executive lounge, guest laundry, and a main floor lounge. Project parking would be valet-only and would be provided on-site in one subterranean level and one partially at-grade level, with access from Seaside Way and Pine Avenue, as well as off-site in existing nearby parking facilities. The proposed building would replace an existing surface parking lot on the Project Site, and pedestrian walkways and new landscaping would be provided. The Project also includes improvements to the portion of Victory Park located within the Project Site boundaries, including new landscaping and relocation of "The Loop," an existing public art project. Project grading would require an estimated 23,500 cubic yards of soil removal and export, with a maximum excavation depth of 22 feet. Project construction would occur over approximately 30 months, with completion anticipated in 2021. A Mitigated Negative Declaration will be prepared in accordance with CEQA for this project.

Your comments and concerns are important to the City of Long Beach in moving forward with this project. If you have any questions or concerns with the project, please contact me at:

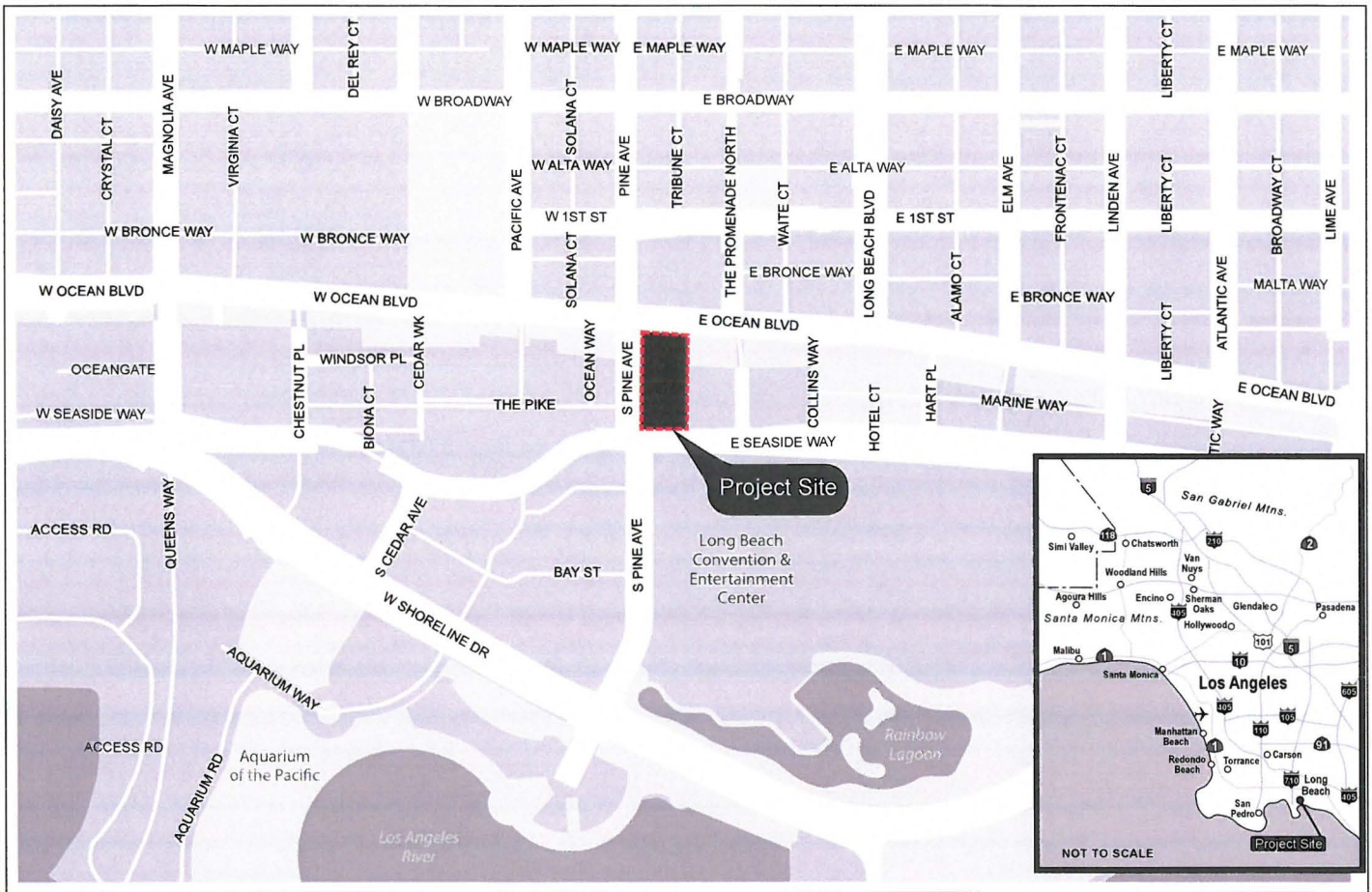
Craig Chalfant
Senior Planner | City of Long Beach
333 West Ocean Boulevard, 5th floor | Long Beach, CA 90802
craig.chalfant@longbeach.gov | 562.570.6368

Please be advised that the Gabrieleno Band of Mission Indians – Kizh Nation has 30 days upon receipt of this letter to provide input regarding this project.

Sincerely,

Craig Chalfant
City of Long Beach

Attachment: Project Location Map



eyestone ENVIRONMENTAL

Figure 1
Project Location Map

Source: City of Long Beach Technology & Innovation Department GIS, 2018; Eyestone Environmental, 2018.

CITY OF LONG BEACH

LONG BEACH DEVELOPMENT SERVICES

333 West Ocean Blvd., 5th Floor, Long Beach, CA 90802 Phone: 570-6194 Fax: 570-6068

PLANNING BUREAU

June 20, 2018

Anthony Morales
Gabrieleno/Tongva San Gabriel Band of Mission Indians
P. O. Box 693
San Gabriel, CA 91778

Re: AB-52 Consultation with the Gabrieleno/Tongva San Gabriel Band of Mission Indians for the 100 East Ocean Boulevard Project

Dear Mr. Morales:

The City of Long Beach is conducting its consultation process for the 100 East Ocean Boulevard Project. Please consider this letter and preliminary project information as the initiation of the California Environmental Quality Act (CEQA) process, specifically Public Resources Code (PRC) Section 21080.3.1 and Chapter 532 Statutes of 2014 (AB-52). Please respond within 30 days, pursuant to PRC Section 21080.3.1(d), if you would like to initiate consultation on this project.

PROJECT TITLE: 100 East Ocean Boulevard Project

PROJECT LOCATION: 100 East Ocean Boulevard, Long Beach, California (Assessor's Parcel Number 7278-007-928)

PROJECT DESCRIPTION: The Project Applicant, 100 East Ocean Blvd, LP, proposes a new hotel on a 59,501-square-foot (1.36-acre) site located at 100 East Ocean Boulevard (Project Site) in the City of Long Beach. The Project Site, which is the former site of the Jergins Trust Building, is bounded by Ocean Boulevard to the north, the Convention Center Walkway and an office building to the east, Seaside Way to the south, and Pine Avenue to the west. The Project Applicant proposes a 30-story, 530,828-square-foot building of up to 375.5 feet in height that would include 429 hotel rooms, 15,000 square feet of restaurant space, and 16,500 square feet of meeting and ballroom space (collectively, the Project). In addition, hotel amenities would include a pool deck and bar, fitness center, executive lounge, guest laundry, and a main floor lounge. Project parking would be valet-only and would be provided on-site in one subterranean level and one partially at-grade level, with access from Seaside Way and Pine Avenue, as well as off-site in existing nearby parking facilities. The proposed building would replace an existing surface parking lot on the Project Site, and pedestrian walkways and new landscaping would be provided. The Project also includes improvements to the portion of Victory Park located within the Project Site boundaries, including new landscaping and relocation of "The Loop," an existing public art project. Project grading would require an estimated 23,500 cubic yards of soil removal and export, with a maximum excavation depth of 22 feet. Project construction would occur over approximately 30 months, with completion anticipated in 2021. A Mitigated Negative Declaration will be prepared in accordance with CEQA for this project.

Your comments and concerns are important to the City of Long Beach in moving forward with this project. If you have any questions or concerns with the project, please contact me at:

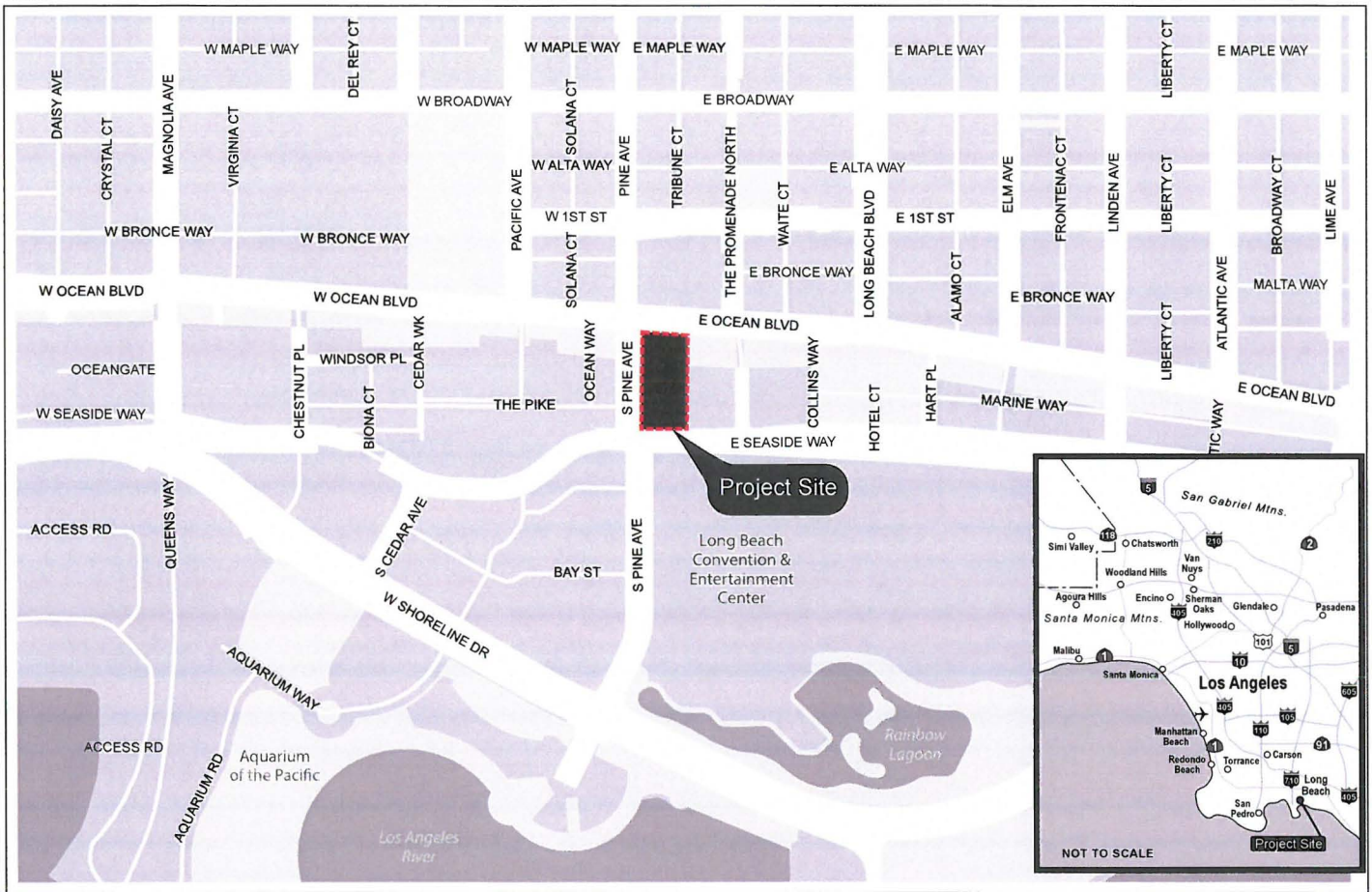
Craig Chalfant
Senior Planner | City of Long Beach
333 West Ocean Boulevard, 5th floor | Long Beach, CA 90802
craig.chalfant@longbeach.gov | 562.570.6368

Please be advised that the Gabrieleno/Tongva San Gabriel Band of Mission Indians has 30 days upon receipt of this letter to provide input regarding this project.

Sincerely,

Craig Chalfant
City of Long Beach

Attachment: Project Location Map



eyestone ENVIRONMENTAL

Figure 1
Project Location Map

Source: City of Long Beach Technology & Innovation Department GIS, 2018; Eyestone Environmental, 2018.

CITY OF LONG BEACH

LONG BEACH DEVELOPMENT SERVICES

333 West Ocean Blvd., 5th Floor, Long Beach, CA 90802 Phone: 570-6194 Fax: 570-6068

PLANNING BUREAU

June 20, 2018

Robert Dorame
Gabrieleno Tongva Indians of California Tribal Council
P. O. Box 490
Bellflower, CA 90707

Re: AB-52 Consultation with the Gabrieleno Tongva Indians of California Tribal Council for the 100 East Ocean Boulevard Project

Dear Mr. Dorame:

The City of Long Beach is conducting its consultation process for the 100 East Ocean Boulevard Project. Please consider this letter and preliminary project information as the initiation of the California Environmental Quality Act (CEQA) process, specifically Public Resources Code (PRC) Section 21080.3.1 and Chapter 532 Statutes of 2014 (AB-52). Please respond within 30 days, pursuant to PRC Section 21080.3.1(d), if you would like to initiate consultation on this project.

PROJECT TITLE: 100 East Ocean Boulevard Project

PROJECT LOCATION: 100 East Ocean Boulevard, Long Beach, California (Assessor's Parcel Number 7278-007-928)

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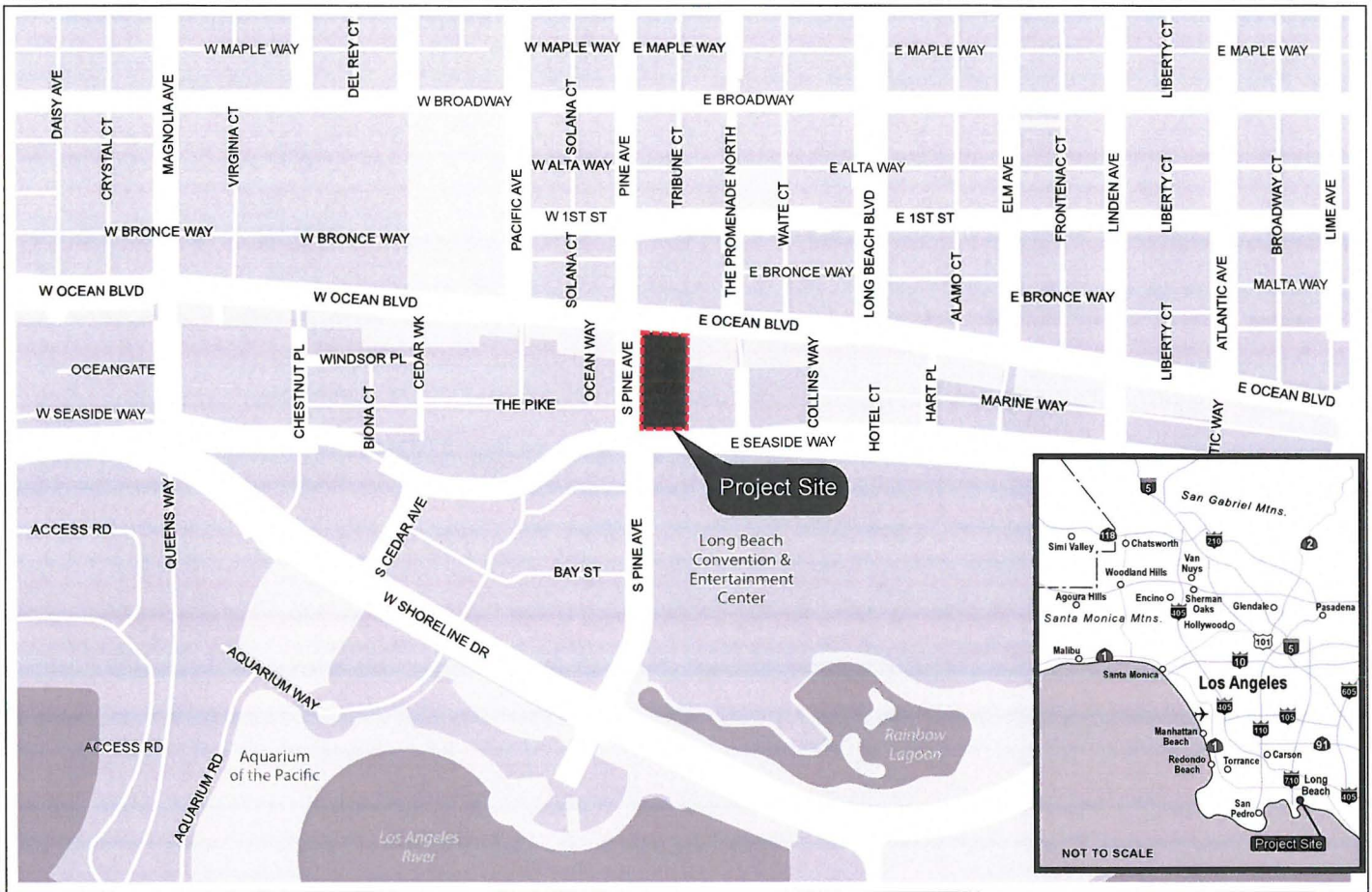
Craig Chalfant
Senior Planner | City of Long Beach
333 West Ocean Boulevard, 5th floor | Long Beach, CA 90802
craig.chalfant@longbeach.gov | 562.570.6368

Please be advised that the Gabrieleno Tongva Indians of California Tribal Council has 30 days upon receipt of this letter to provide input regarding this project.

Sincerely,

Craig Chalfant
City of Long Beach

Attachment: Project Location Map



eyestone ENVIRONMENTAL

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Source: City of Long Beach Technology & Innovation Department GIS, 2018; Eyestone Environmental, 2018.

CITY OF LONG BEACH

LONG BEACH DEVELOPMENT SERVICES

333 West Ocean Blvd., 5th Floor, Long Beach, CA 90802 Phone: 570-6194 Fax: 570-6068

PLANNING BUREAU

June 20, 2018

Sandonne Goad
Gabrielino/Tongva Nation
106 ½ Judge John Aiso Street, #231
Los Angeles, CA 90012

Re: AB-52 Consultation with the Gabrielino/Tongva Nation for the 100 East Ocean Boulevard Project

Dear Ms. Goad:

The City of Long Beach is conducting its consultation process for the 100 East Ocean Boulevard Project. Please consider this letter and preliminary project information as the initiation of the California Environmental Quality Act (CEQA) process, specifically Public Resources Code (PRC) Section 21080.3.1 and Chapter 532 Statutes of 2014 (AB-52). Please respond within 30 days, pursuant to PRC Section 21080.3.1(d), if you would like to initiate consultation on this project.

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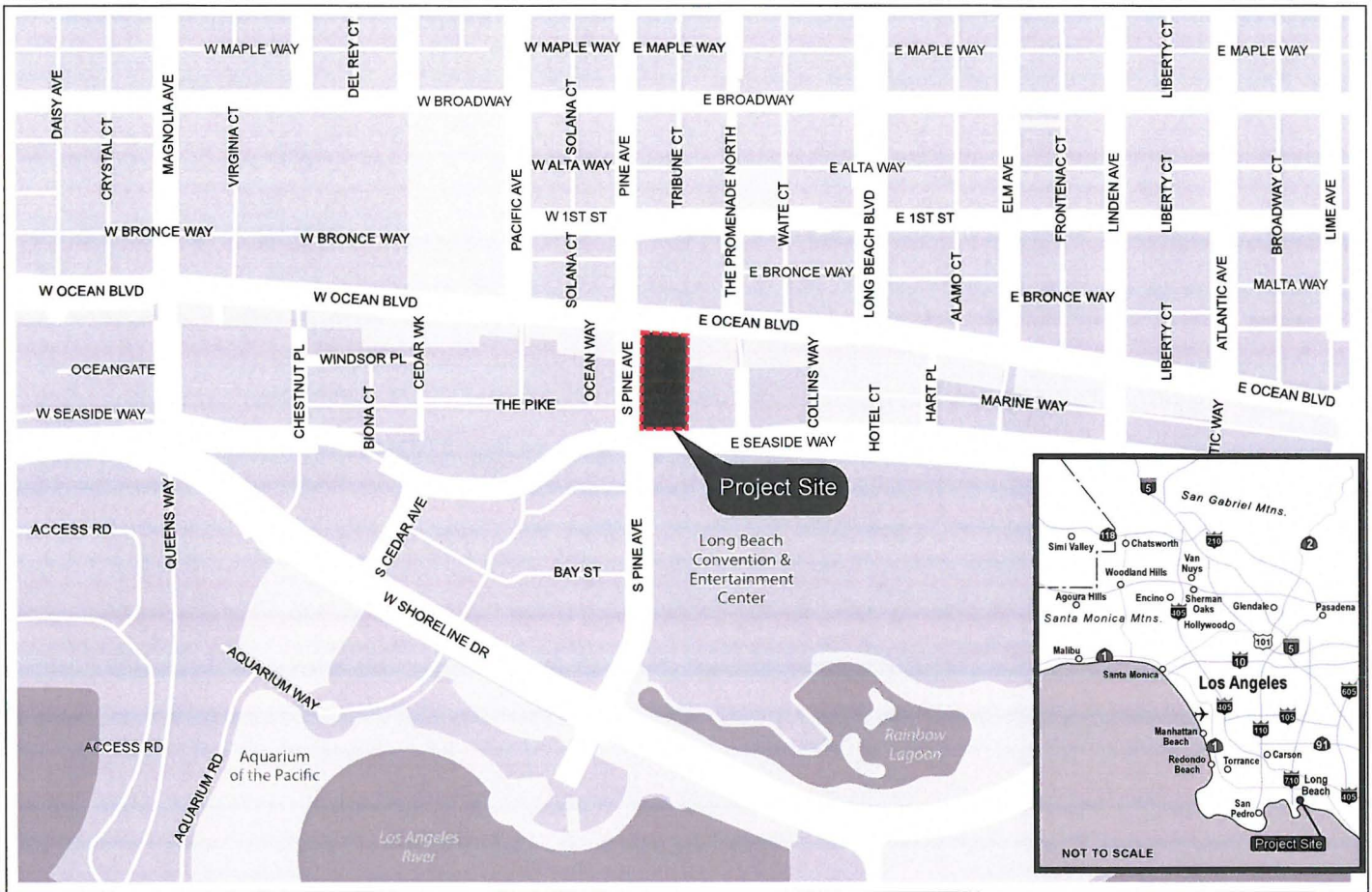
Craig Chalfant
Senior Planner | City of Long Beach
333 West Ocean Boulevard, 5th floor | Long Beach, CA 90802
craig.chalfant@longbeach.gov | 562.570.6368

Please be advised that the Gabrielino/Tongva Nation has 30 days upon receipt of this letter to provide input regarding this project.

Sincerely,

Craig Chalfant
City of Long Beach

Attachment: Project Location Map



eyestone ENVIRONMENTAL

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Source: City of Long Beach Technology & Innovation Department GIS, 2018; Eyestone Environmental, 2018.

CITY OF LONG BEACH

LONG BEACH DEVELOPMENT SERVICES

333 West Ocean Blvd., 5th Floor, Long Beach, CA 90802 Phone: 570-6194 Fax: 570-6068

PLANNING BUREAU

June 20, 2018

Charles Alvarez
Gabrielino-Tongva Tribe
23454 Vanowen Street
West Hills, CA 91307

Re: AB-52 Consultation with the Gabrielino-Tongva Tribe for the 100 East Ocean Boulevard Project

Dear Mr. Alvarez:

The City of Long Beach is conducting its consultation process for the 100 East Ocean Boulevard Project. Please consider this letter and preliminary project information as the initiation of the California Environmental Quality Act (CEQA) process, specifically Public Resources Code (PRC) Section 21080.3.1 and Chapter 532 Statutes of 2014 (AB-52). Please respond within 30 days, pursuant to PRC Section 21080.3.1(d), if you would like to initiate consultation on this project.

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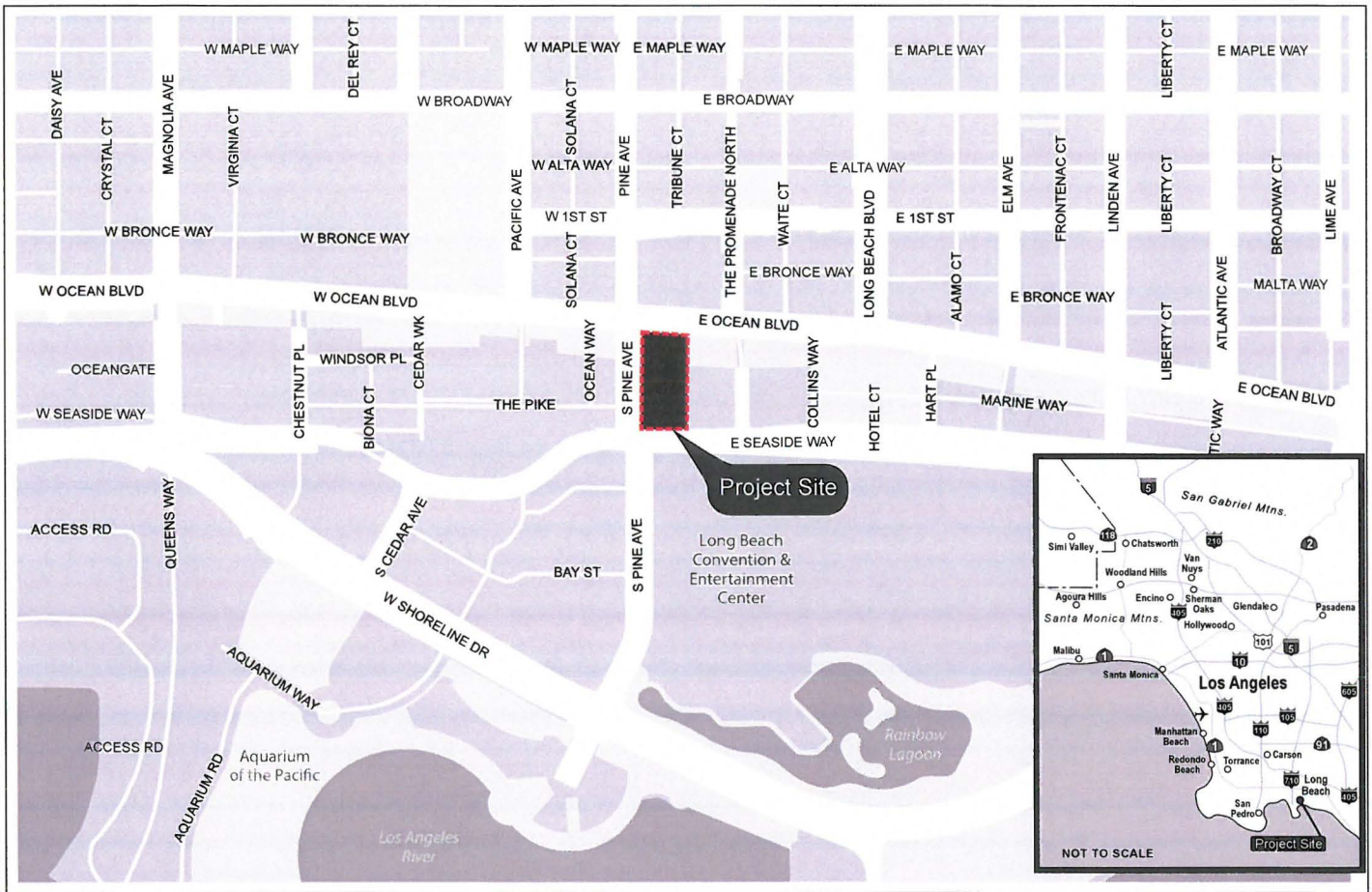
Craig Chalfant
Senior Planner | City of Long Beach
333 West Ocean Boulevard, 5th floor | Long Beach, CA 90802
craig.chalfant@longbeach.gov | 562.570.6368

Please be advised that the Gabrielino-Tongva Tribe has 30 days upon receipt of this letter to provide input regarding this project.

Sincerely,

Craig Chalfant
City of Long Beach

Attachment: Project Location Map



eyestone ENVIRONMENTAL

Figure 1
Project Location Map

Source: City of Long Beach Technology & Innovation Department GIS, 2018; Eyestone Environmental, 2018.

Appendix IS-8

Water and Sewer Memorandum

Technical Memo

Water Service. Water services for the City of Long Beach are provided by the Long Beach Water Department (LBWD) through an underground water distribution pipe network. The LBWD water distribution network totaled 912 miles of water mains with approximately 90,000 service connections[1].

Long Beach Water Department (LBWD) receives its domestic water supply from three sources: Groundwater, Imported, and Recycled. The following table identifies existing and projected water supply projections[2]:

TABLE 1: EXISTING AND PROJECTED WATER SUPPLIES (IN ACRE-FEET)[2]

Water Supply	2020	2025	2030	2035	2040
Groundwater	33,001	33,501	34,001	34,501	35,001
Imported	35,100	35,100	35,100	35,100	35,100
Recycled	9,190	9,190	9,190	9,190	9,190
Total	**77,291**	**77,791**	**78,291**	**78,791**	**79,291**

As illustrated in Table 1, the major source of water for the LBWD includes imported water purchased from the Metropolitan Water District of Southern California (MWDSC), pumped groundwater treated by the LBWD, and recycled water and. The LBWD is performing research into other possible measures to increase or maintain water supplies, including seawater desalinization and water conservation measures to reduce water demand.

According to the 2015 Urban Water Management Plan, LBWD projects that water supplies will be sufficient to meet all demands through the year 2040. The following table illustrates the projected water supplies vs the projected demands for LBWD.

TABLE 2: WATER SUPPLIES EXCEED DEMANDS*

	2020	2025	2030	2035	2040
Total Supplies	77,291	77,791	78,291	78,791	79,291
Total Demands	63,643	63,410	63,454	63,609	64,137
Surplus	13,648	14,381	14,836	15,182	15,154

**Includes both potable and recycled water supplies/demands*

Existing Water Service: The project area is bounded by Ocean Boulevard to the north, Pine Avenue to the West, Seaside Way to the South, and existing improvements to the east, including a pedestrian bridge, a promenade and a building. Records indicate that there are existing water mains within Ocean Boulevard, Pine Avenue, and Seaside Way and several laterals within the project site. The water mains consist of a 12-inch pipe in Ocean Boulevard, running east-west, a 12-inch pipe running north-south within Pine Avenue, and a 12-inch pipe running east-west within Seaside Way. The existing laterals for the project range from 6-inch pipes to 2-inch pipes; however it is anticipated that new points of connections will be required for the proposed development.

Proposed Water Service: It is anticipated that the proposed development will utilize approximately 4065 fixture units and require 650 gpm. The proposed laterals for the development will range from 1-inch to 8-inch pipes. The proposed laterals for the project will provide service for the domestic, fire, and irrigation systems. There are other existing utilities within the surrounding streets; however

it is not anticipated that the water connections will pose a significant challenge considering the lines are pressurized. Upon connection to the new development booster pumps will be utilized to achieve the required pressures for the building since the existing street pressure for the surrounding area of 65 psi.

Fire Flow: The City Fire Code utilized the 2016 California Fire Code (CFC), with some amendments and modifications, as part of the City's Municipal Code. The purpose of the CFC is to prescribe minimum fire safety requirements for new and existing buildings, facilities, storage and processes. The regulations address fire prevention, fire protection, and life safety among other requirements.

The proposed project will comply with the City of Long Beach Fire Code and satisfy the flow requirements set forth in the code. Moreover the project will install a sprinkler system and fire hydrants in accordance with the CFC.

Sewer Service: The LBWD is responsible for Operation and Maintenance on 712 miles of gravity sewer, 26 pump stations, 7.6 miles of force main, 115,116 lateral connections and 16,158 sewer maintenance holes (generally manholes). The system generates roughly 45 million gallons per day (mgd) of wastewater. Most of the wastewater is delivered to the LACSD's Joint Water Pollution Control Plant (JWPCP), 24501 South Figueros Street, Carson, California. Some of the wastewater is delivered to the LACSD's Long Beach Reclamation Plant, 7400 East Willow Street, Long Beach, California. The Long Beach Reclamation Plant produces reclaimed water for irrigation purposes at the City's parks, golf courses, cemeteries and numerous garden nurseries. Other users include California State University Long Beach, Long Beach City College, the Long Beach Unified School District and Caltrans sites on the 405 and 605 Freeways and THUMS (a collaboration of oil producers operating four off-shore oil islands).[3]

Existing Sewer Service: According to LBWD records there are existing sewer mains within Ocean Boulevard and Seaside Way. The sewer main within Seaside Way is a 10-inch Vitrified Clay Pipe (vcp) and will service the proposed development. There is an existing 8-inch sewer lateral that is currently cut and capped at the southeastern edge of the property. This existing lateral, most likely, served as the main connection point for the previous Jergins Trust Building that was demolished around 1989. The proposed development will either utilize the existing lateral or install a new lateral at a new point of connection near the existing lateral.

The proposed development will connect to the existing 10-inch vcp line within Seaside Way; however from the existing manhole located at the southeastern corner of the project site, the sewer line constricts to a 8-inch vcp line for the segment of pipe that stretches all the way to Locus Avenue. There is no record as to why the smaller (8-inch) sewer line was allowed to remain in place while the 10-inch line was installed; however this will result in a bottleneck for the project and will require replacement.

Proposed Sewer Service: It is anticipated that the proposed development will discharge approximately 69,509 gpd (0.11cfs) of average daily flow and 139,018 gpd (0.22 cfs) of peak flow into the existing system through a 8-inch vcp lateral. With the introduction of the new flow from the proposed development, the downstream 8-inch main line will need to be upsized to match the upstream 10-inch line. The replacement line will have the same alignment (horizontal and vertical) of the existing line and utilize the same connection points.

There are a significant number of utilities within Seaside Way, therefore should the sewer lateral move significantly from the current location of the existing sewer lateral, utility conflicts may present a challenge; however if the sewer lateral remains in the near vicinity of the existing lateral, there should not be utility conflict challenges.

[1] Long Beach Water Department (LBWD). Fiscal Year 2016 Comprehensive Annual Financial Report.
[2] Long Beach Water Department, 2015 Draft Urban Water Management Plan, Table 12-Existing and Projected Water Supplies (af/yr). af/yr = acre-feet per year.
[3] Long Beach Sewer System Management Plan (SSMP) Final Report, April 2014

Appendix IS-9

Sanitary Sewer Study

PRELIMINARY SANITARY SEWER STUDY

FOR

PROPOSED HOTEL DEVELOPMENT

THE BEACON HOTEL

100 E OCEAN BLVD
LONG BEACH, CALIFORNIA
90802

FOR

LONG BEACH WATER DEPARTMENT

1800 E. WARDLOW ROAD

LONG BEACH, CALIFORNIA

90807

By

KPFF Consulting Engineers
400 Oceangate, Suite 500
Long Beach, CA 90802

October 2, 2018

Proposed Development:

The proposed development is located in Downtown Long Beach and will occupy approximately 1 acre at the southeast corner of Ocean Blvd and Pine Ave in the City of Long Beach (Please see Figure 1 below).The proposed development will consist of a new high-rise hotel, 29-story, 2-level parking garage, 429-rooms, with restaurant, meeting room, parking, and roof top amenities.

Figure 1 – Vicinity Map

The proposed project is anticipated to contain 429 hotel rooms and 23,512 square feet of restaurant space, which translates to approximately 15,274 gallons per day (0.24 cfs), using the LA Sanitation District Number 3 loading rates. This is the maximum peak discharge flow rate possible for the proposed development.

Flow Monitoring Analysis:

Utility Systems Science and Software personnel performed a sewer flow monitoring study on the existing sewer manhole located at the intersection of Locust Ave and Seaside Way during the period spanning March 07, 2018 through March 14, 2018. The site report for the sewer manhole is included as Attachment A. The site report identifies the location of the manhole that was monitored as well as information relating to the condition of the sewer manhole and the connecting pipes. The manhole is identified as H08-SMH-004 per the Long Beach Water Department (LBWD) Sewer Atlas (Please see Attachment B). The contact information for the firm performing the sewer monitoring is shown below:

Darlene Szczublewski, P E
Senior Civil Engineer
darlene.szczublewski@uscubed.com
1250 Pioneer Way, Suite F
El Cajon, CA 92020
619-546-4281 (work)
619-246-5304 (cell)

The location of the sewer monitoring survey is subject to mild traffic during typical days; however the manhole is located in the path of the Long Beach Grand Prix, therefore the pavement shows signs of minor fatigue and wear.

Additional information relative to the sewer monitoring survey is included in Attachment C. This additional information includes:

- Instrumentation used for the sewer monitoring survey.
- Information showing the average and maximum velocity, level, and flow of the existing system for the duration of the survey:
    - Graphs of the results of the sewer monitoring survey
    - Statistics of the results of the sewer monitoring survey
    - Raw data of the sewer monitoring survey

Proposed Flow Contribution:

According to the sewer monitoring survey, the average flow for the system was 36.95 gpm (0.082cfs) and a maximum flow of 102.22 gpm (0.228cfs) for the duration of the survey.

The proposed hotel development will add an estimated peak of 154,274 gallons per day (0.24 cfs) to the existing system for a total of 0.322 cfs of average flow and a maximum flow of 0.468 cfs during a peak surge. These flows were estimated using LA County Sanitation's recommended flow rates and Long Beach Water Department's peaking factor. The total peak rate is summarized in the table below.

The Beacon Hotel at 100 E Ocean Blvd

Estimated Sewage Flow Rates

Description	Unit	Rate[1]	Unit	Value	Unit	Flow Result	Unit
Hotel Room	per room	125	gpd	429	rooms	**53,625**	**gpd**
Restaurant	per 1,000 sf	1,000	gpd	23,512	sf	**23,512**	**gpd**
					Total	77,137	gpd
					Peak Factor	2.0	
					Total Peak	**154,274**	**gpd**
					Total Peak	**0.24**	**cfs**

Notes

1. Proposed flow rates are per "LA County Sanitation District No. 3 Service Charge Report for Fiscal year 2015-16."

2. Peak rate is per long Beach Water Department sewer design guidelines

3. One cubic foot per second = 646,358 gallons per day

Analysis:

The proposed development was evaluated to determine the impact that the additional peak flow will have on the existing downstream system.

Performing a flow analysis calculation on the 10-inch sewer main downstream from the intersection of Locust Ave and Seaside Way, based on parameters from King's Hydraulic Hand Book, a Manning's friction factor of n=0.013, and an existing pipe slope of 0.004 ft/ft (Attachment D), resulted in the following:

- Average Flow 0.322 cfs: d/D = 0.33, V = 2.077 ft/s
- Peak Flow 0.468 cfs: d/D = 0.41, V = 2.318 ft/s

The hydraulic analysis of the existing 10-inch downstream pipe can be found in Attachment E.

Findings and Conclusions:

The effluent flow from the proposed project will add approximately 154,274 gallons per day (0.24 cfs) to the existing system. To assess the impact the additional flow will have on the system we used both the average flow and the maximum (peak) flow results from the sewer monitoring study and added the projected flow from the proposed development. The resulting d/D for the average flow was 0.33 and for maximum peak flow the d/D was 0.41. Therefore it is our opinion that the downstream sewer line can convey the increased flow from this development.

Summary Table					
	Existing (cfs)	*Prop. (cfs)*	*Total (cfs)*	*d/D*	*V (ft/s)*
Average	0.082	0.135	0.322	0.33	2.077
Peak	0.228	0.24	0.468	0.41	2.318

Note: *It should be noted that the downstream system will also require improvement for the system to operate within acceptable d/D limits. The improvement consists of upsizing an 8" pipe to a 10" pipe to obtain system continuity of a 10" line. The existing system immediately downstream of the proposed development is a 10" line; however this line spills into a manhole, which is connected to an 8" downstream line. This 8" line is connected to a downstream manhole, which is connected to a 10" downstream line. The 8" line in-between the two 10" lines will require upsizing to a 10" line.*

This provides the results of the sewer monitoring analysis requested. Please call if you have any questions or need additional information.

José Hernández, PE

Attachments:
A) Sewer Monitoring Survey Site Report
B) Long Beach Water Department Sewer Atlas
C) Sewer Flow Monitoring Data
D) Existing 10-inch Sewer Pipe Record Dwg
E) Sewer Flow Calculation Results

Attachment A

Site Report

03-15-2018

Confidential Proprietary Information

KPFF

~40 S. Locust Av

2018.03 Locust Av FM MH H08-SMH-004

Sewer Flow Monitoring for the Beacon Hotel Project

Access:

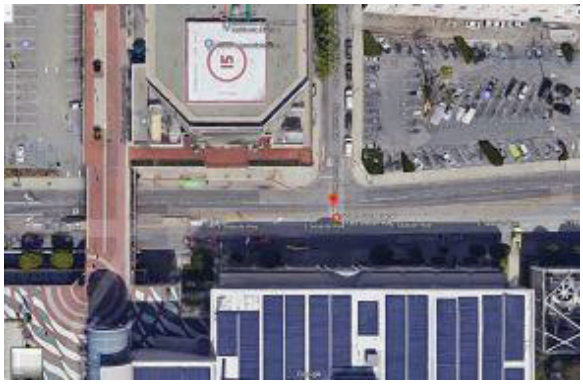
MH in center westbound lane of Seaside Way at Locust Av

System Type:

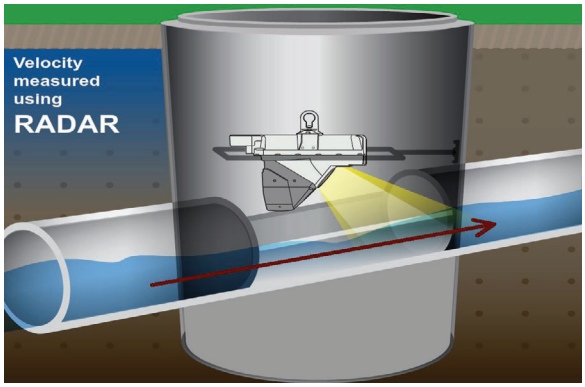
Sanitary [X] Storm [ ]

Install Date: 3/07/2018

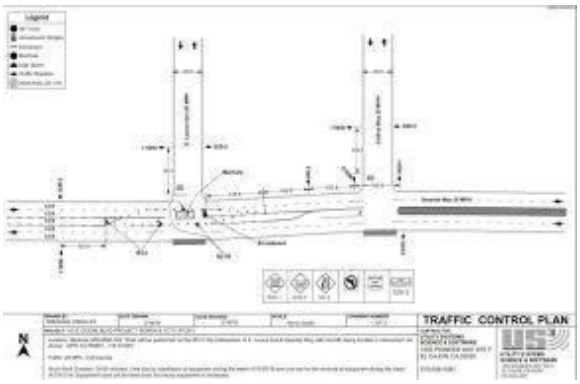
Map



Technology



Traffic Plan



Flow Meter			
Meter Depth: 86"			
Map Coordinates: 33.765860, -118.191000			
Slightly turbulent open channel hydraulics due to minor drop in western trough.			
Avg Velocity	Avg Measured Level		Multiplier
2.0 fps	1.5"		1
Gas			
O2	H2S	CO	LEL
20.9	0	0	0
Notes			
Undocumented lateral entering MH from north; monitored downstream line to get total flow.			
Traffic Safety			
Used cones, signs & arrow board in accord with approved traffic control plan.			
Land Use			
Residential	Commercial	Industrial	Trunk
	X		

Manhole Depth	103"
Monitored Pipe Size	10"
Inner Pipe Size (In/Out)	10"/10"
Pipe Shape	Round
Pipe Condition	Good
Manhole Material	Lined
Silt	0
Velocity Profile Data	*
Velocity Profile Taken	0.4 2-D
Sensor Offset	16.81"
Sensor Dist. to Crown	6.81"
Sensor Direction	Downstream
Flow Heading	East

Meter Site Document

KPFF

2018.03 Locust Av FM MH

~40 S. Locust Av

Site

Manhole Before Install

Installation Process

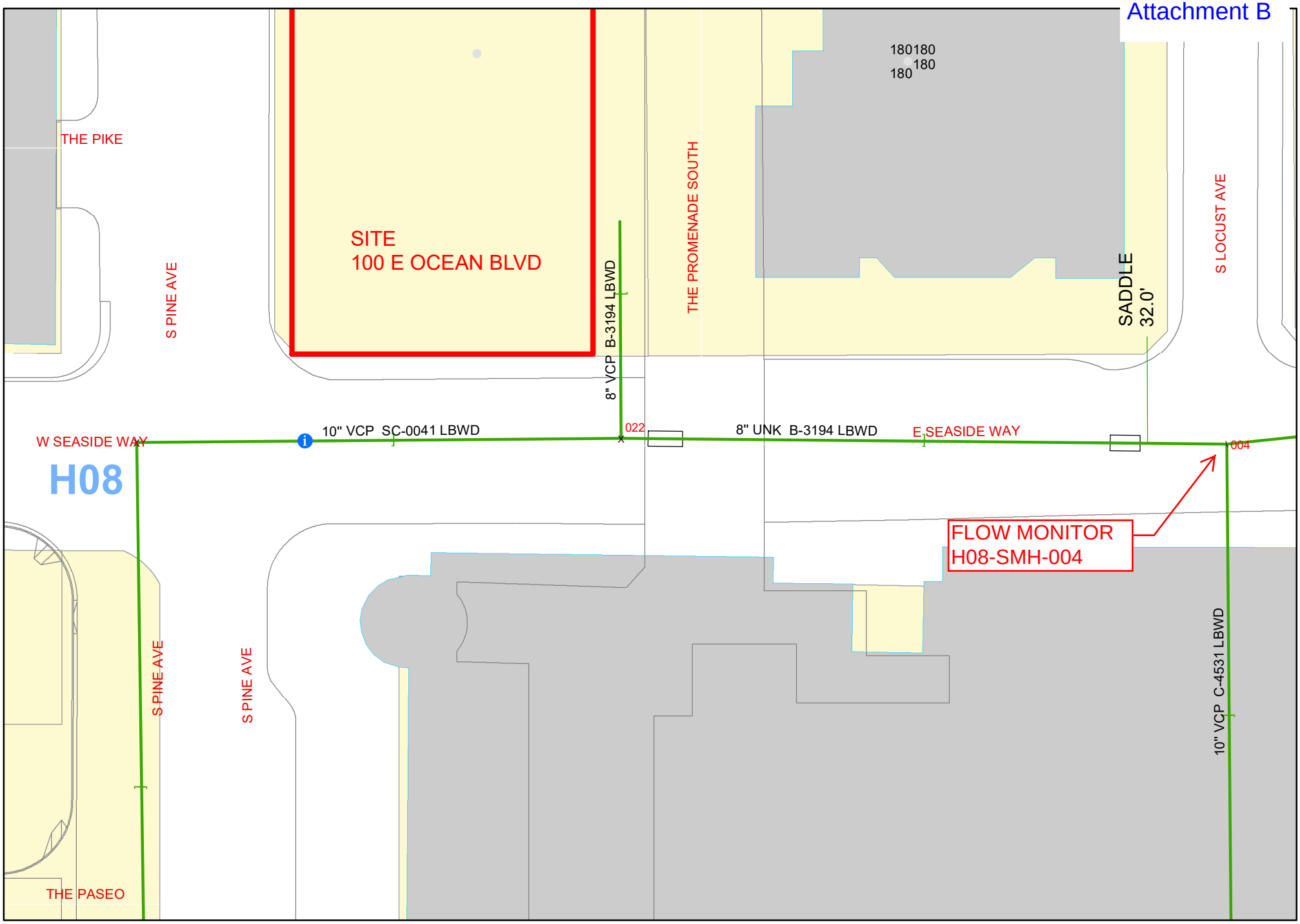
Installed

MH Condition

Downstream

Attachment B

Attachment B



Disclaimer: This map and/or data are not an official record LBWD. It is compiled from data furnished by private contractors and other sources. Locations, sizes of geographic feature and facilities shown are based on these sources. This information is furnished strictly as a convenience. LBWD does not assume any responsibility for its accuracy or completeness.

N

1 inch = 50 feet

0 20 40 80 120 Feet

Attachment C

Methods & Procedures & Equipment

Methods and Procedures

Utility Systems Science & Software provided KPFF Consulting Engineers with an off the shelf, non-proprietary flow monitoring solution that included one state of the art Hach Flo-Dar® AV Sensor system and one CCTV inspection. The project course of action is listed below. The US^3 team:

- Assessed permitting and traffic control at the sites on Seaside Way in Long Beach.
- Validated MH 4 for suitability for sewer flow monitoring for the Beacon Hotel Project.
- Prepared the traffic control plans and obtained a City Encroachment Permit.
- Coordinated with the LBWD Inspector for installation of equipment and the CCTV inspection.
- Installed and calibrated the flow monitoring equipment per manufacturer recommendations.
- Inspected the northern lateral at MH 22, removed the flow monitoring equipment at MH 4, validated the data, and prepared the data reports.

Equipment

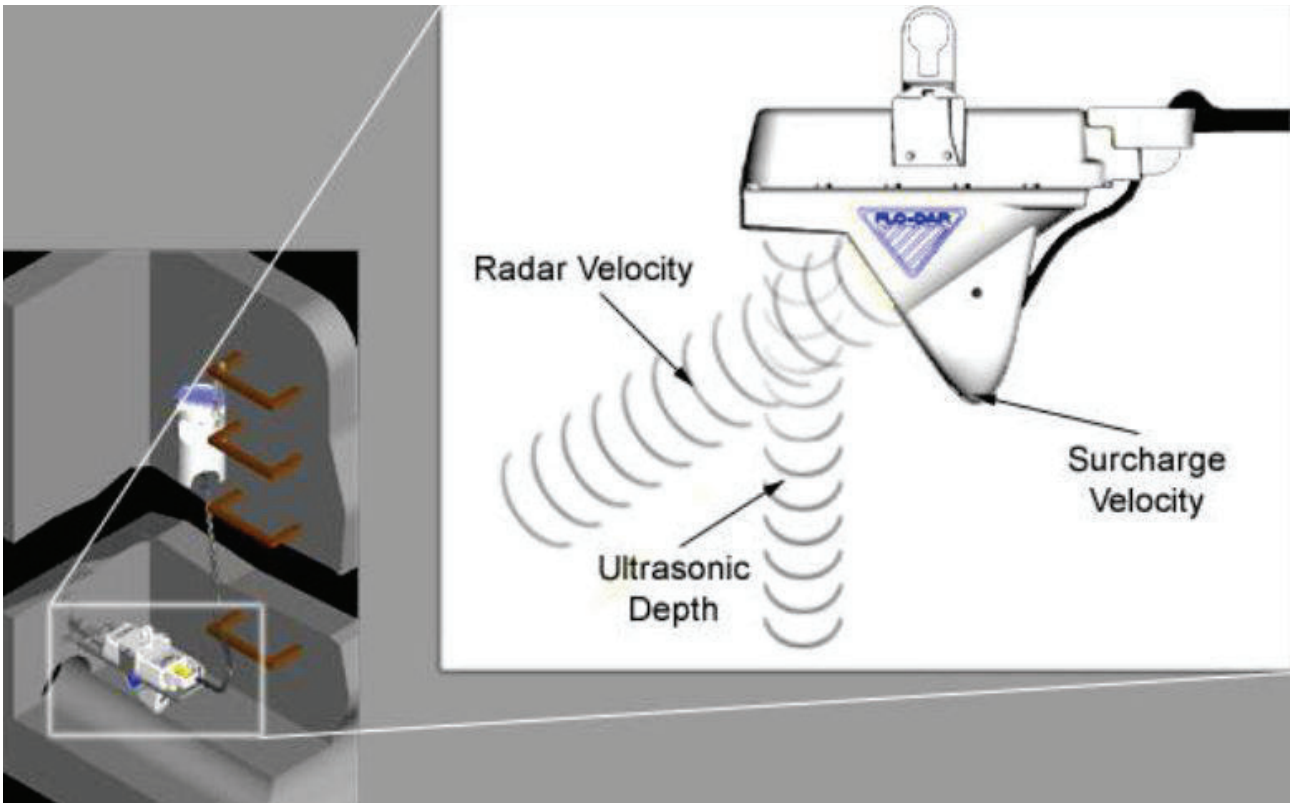


Figure: Equipment installed as part of the Sewer Flow Monitoring Study

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.**

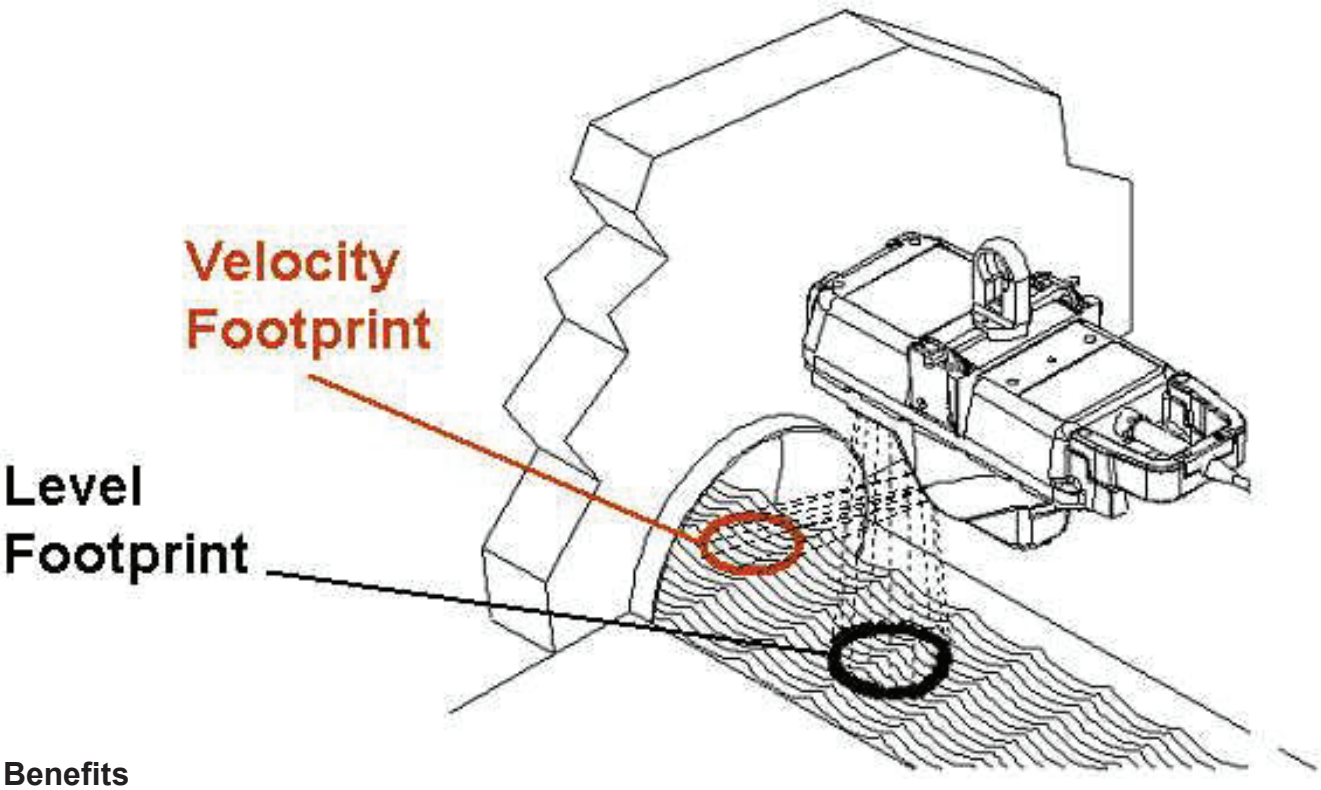
VELOCITY (Optional Surcharge Velocity Sensor)

- **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.

US^3 Company Information

US^3 is a California Corporation **Federal ID No. 33-0729605** and qualifies as a Minority Business Enterprise. US^3 has certified as an MBE with the California Public Utility Commission's authorized clearinghouse, **Verification Number: 97ES0008.**

US^3 is a specialty service company for the Water & Waste Water industry, providing monitoring and control for Utilities since 1996. US^3 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.

US^3 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.

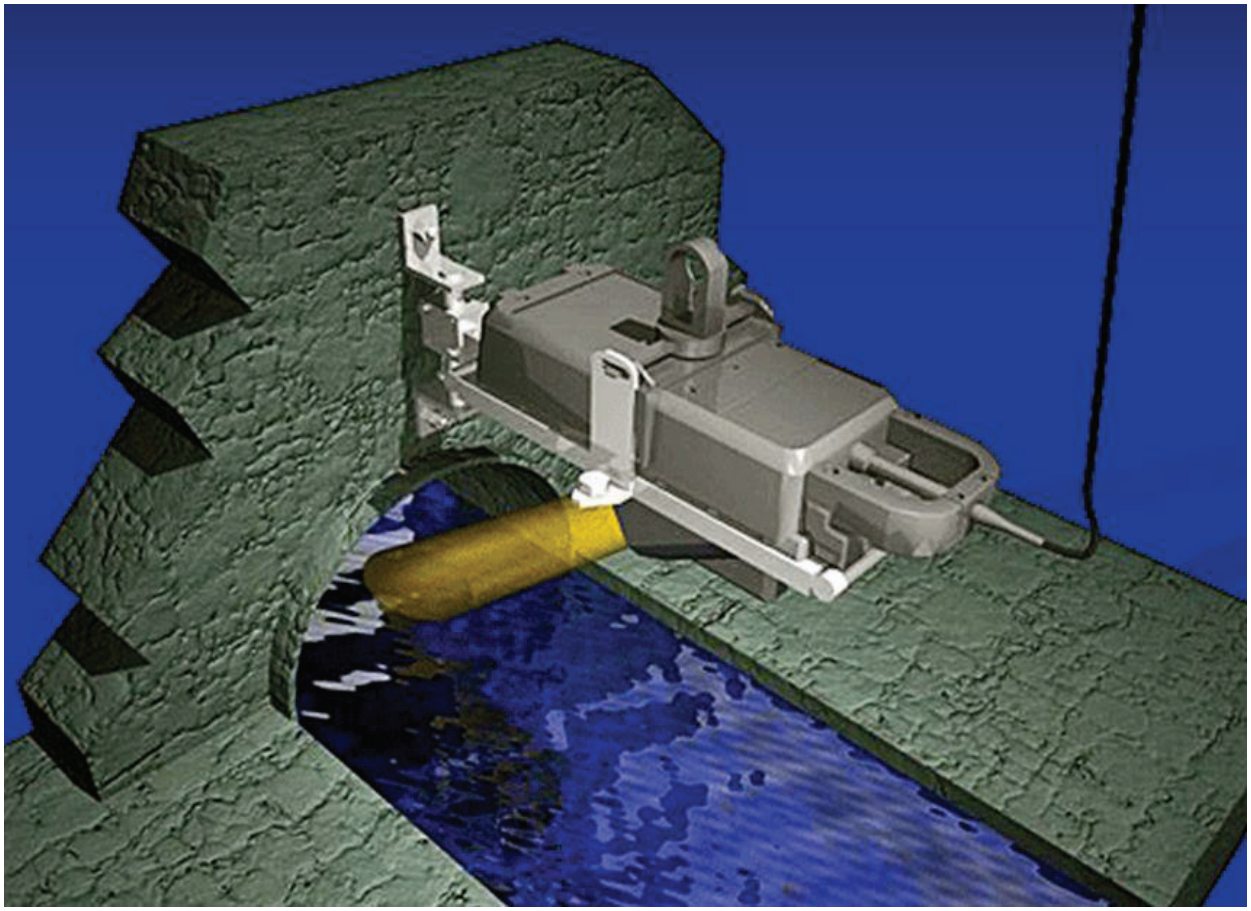


Figure: US^3 utilizes exclusively Hach March-McBirney Flo-Dar® Meters

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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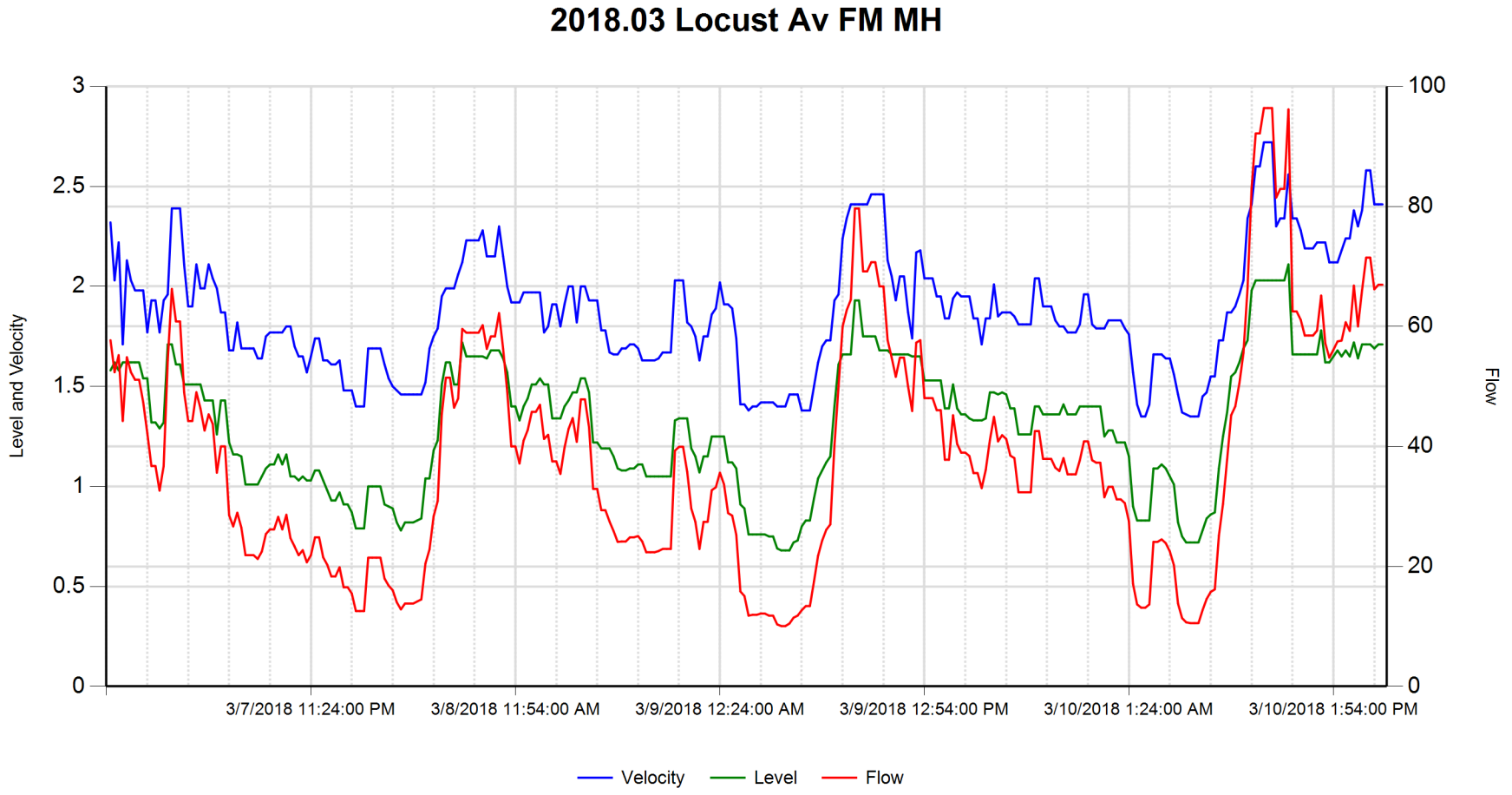
Utility Systems Science and Software

Report Date: 03/15/2018
Customer: US3
Group: Long Beach
SiteID: 3013

Statistics for 2018.03 Locust Av FM MH: 03/07/2018 thru 03/14/2018

	Flow (GPM)			Flow (MGD)			Velocity (FPS)			Level (inches)				
Date	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Total Gal**	**Rain**
3/7/18	37.30	66.25	20.69	0.05	0.10	0.03	1.89	2.39	1.57	1.32	1.71	1.01	53,711	
3/8/18	32.60	62.22	12.57	0.05	0.09	0.02	1.80	2.30	1.40	1.23	1.72	0.78	46,950	
3/9/18	37.53	79.65	10.07	0.05	0.11	0.01	1.86	2.46	1.38	1.31	1.93	0.68	54,043	
3/10/18	45.97	96.39	10.56	0.07	0.14	0.02	1.98	2.72	1.35	1.43	2.11	0.72	66,190	
3/11/18	40.61	93.89	10.69	0.06	0.14	0.02	1.86	2.50	1.33	1.36	2.11	0.73	58,481	
Week:	**38.80**	**96.39**	**10.07**	**0.06**	**0.14**	**0.01**	**1.87**	**2.72**	**1.33**	**1.33**	**2.11**	**0.68**	**279,375**	
3/12/18	35.80	70.69	8.26	0.05	0.10	0.01	1.65	2.14	1.28	1.38	2.04	0.61	51,554	
3/13/18	41.45	102.22	8.96	0.06	0.15	0.01	1.67	2.34	1.07	1.48	2.34	0.66	59,683	
3/14/18	24.37	80.21	12.36	0.04	0.12	0.02	1.31	2.06	0.98	1.22	2.16	0.91	35,092	
Week:	**33.87**	**102.22**	**8.26**	**0.05**	**0.15**	**0.01**	**1.55**	**2.34**	**0.98**	**1.36**	**2.34**	**0.61**	**146,330**	
Totals:	**36.95**	**102.22**	**8.26**	**0.05**	**0.15**	**0.01**	**1.75**	**2.72**	**0.98**	**1.34**	**2.34**	**0.61**	**425,705**	



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	1.872	1.311	38.073	**RainFall**	Inches
Maximum	2.720	2.110	96.389		
Minimum	1.350	0.680	10.069		

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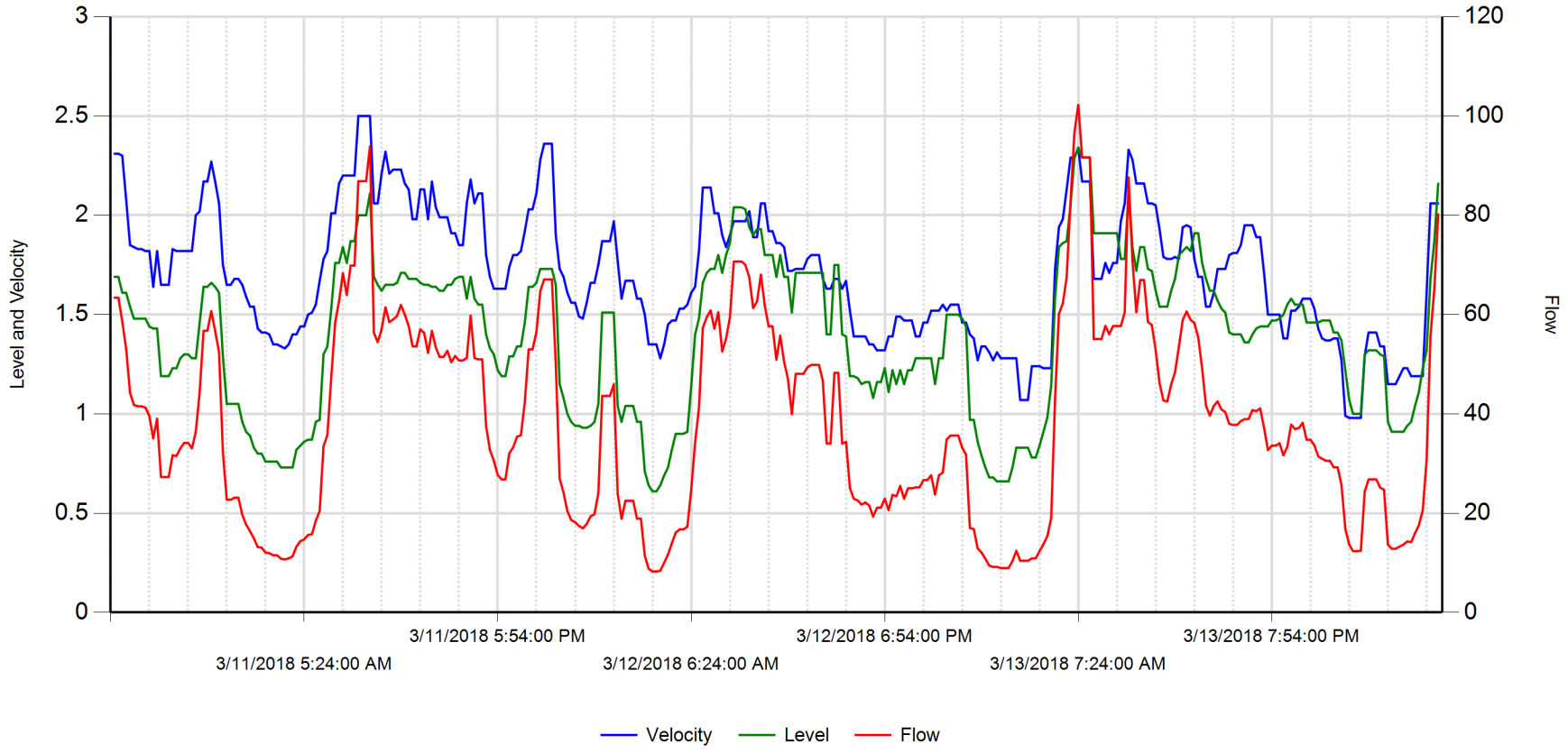
2018.03 Locust Av FM MH



	Velocity (fps)	Level (in)	Flow (gpm)		
Average	1.713	1.395	38.422	**RainFall**	Inches
Maximum	2.500	2.340	102.222		
Minimum	0.980	0.610	8.264		

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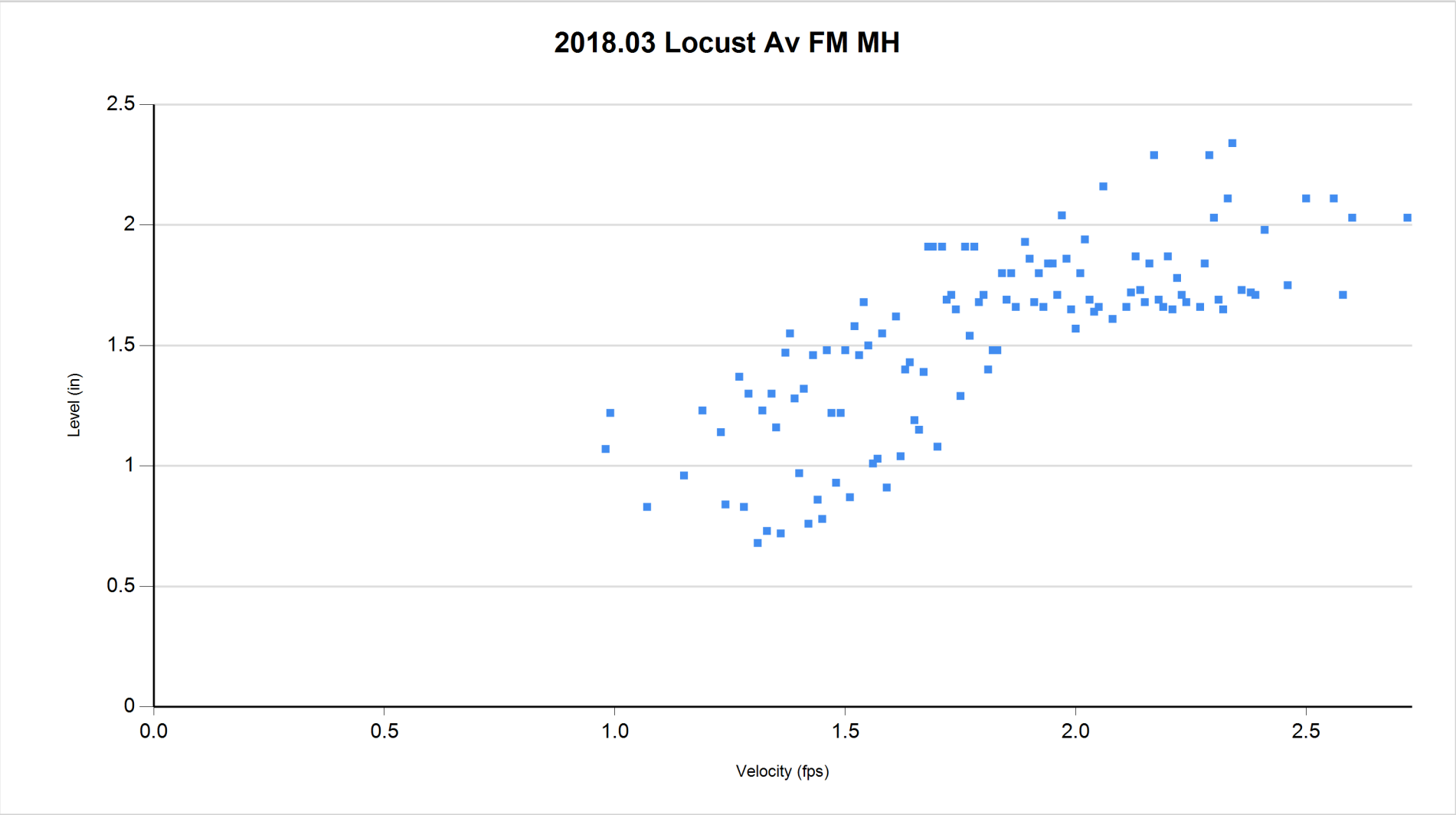

3/07/2018 thru 3/14/2018

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Utility Systems Science and Software

Report Date: 03/15/2018
Customer: US3
Group: Long Beach
SiteID: 3013

Data for 2018.03 Locust Av FM MH: 3/07/2018 thru 3/14/2018

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/07 11:09	1.58	57.71	2.32
2018/03/07 11:24	1.62	52.36	2.03
2018/03/07 11:39	1.58	55.21	2.22
2018/03/07 11:54	1.62	44.24	1.71
2018/03/07 12:09	1.62	54.86	2.13
2018/03/07 12:24	1.62	52.36	2.03
2018/03/07 12:39	1.62	51.11	1.98
2018/03/07 12:54	1.62	51.11	1.98
2018/03/07 13:09	1.54	47.36	1.98
2018/03/07 13:24	1.54	42.22	1.77
2018/03/07 13:39	1.32	36.74	1.93
2018/03/07 13:54	1.32	36.74	1.93
2018/03/07 14:09	1.29	32.64	1.77
2018/03/07 14:24	1.32	36.74	1.93
2018/03/07 14:39	1.71	54.31	1.96
2018/03/07 14:54	1.71	66.25	2.39
2018/03/07 15:09	1.61	60.83	2.39
2018/03/07 15:24	1.61	60.83	2.39
2018/03/07 15:39	1.51	49.03	2.11
2018/03/07 15:54	1.51	44.24	1.90
2018/03/07 16:09	1.51	44.24	1.90
2018/03/07 16:24	1.51	49.03	2.11
2018/03/07 16:39	1.51	46.32	1.99
2018/03/07 16:54	1.43	42.64	1.99
2018/03/07 17:09	1.43	45.35	2.11
2018/03/07 17:24	1.43	43.75	2.04
2018/03/07 17:39	1.26	35.62	1.99
2018/03/07 17:54	1.43	40.00	1.87
2018/03/07 18:09	1.43	40.00	1.87
2018/03/07 18:24	1.22	28.54	1.68
2018/03/07 18:39	1.16	26.67	1.68
2018/03/07 18:54	1.16	28.96	1.82
2018/03/07 19:09	1.15	26.46	1.69
2018/03/07 19:24	1.01	21.87	1.69
2018/03/07 19:39	1.01	21.87	1.69
2018/03/07 19:54	1.01	21.87	1.69
2018/03/07 20:09	1.01	21.25	1.64
2018/03/07 20:24	1.05	22.50	1.64
2018/03/07 20:39	1.09	25.42	1.75

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/07 20:54	1.11	26.18	1.77
2018/03/07 21:09	1.11	26.18	1.77
2018/03/07 21:24	1.16	28.26	1.77
2018/03/07 21:39	1.11	26.18	1.77
2018/03/07 21:54	1.16	28.61	1.80
2018/03/07 22:09	1.05	24.72	1.80
2018/03/07 22:24	1.05	23.33	1.70
2018/03/07 22:39	1.03	21.87	1.65
2018/03/07 22:54	1.05	22.71	1.65
2018/03/07 23:09	1.03	20.69	1.57
2018/03/07 23:24	1.03	21.87	1.65
2018/03/07 23:39	1.08	24.86	1.74
2018/03/07 23:54	1.08	24.86	1.74
2018/03/08 00:09	1.03	21.53	1.63
2018/03/08 00:24	0.98	20.28	1.63
2018/03/08 00:39	0.93	18.33	1.61
2018/03/08 00:54	0.93	18.33	1.61
2018/03/08 01:09	0.97	19.86	1.63
2018/03/08 01:24	0.91	16.53	1.48
2018/03/08 01:39	0.91	16.53	1.48
2018/03/08 01:54	0.87	15.49	1.48
2018/03/08 02:09	0.79	12.57	1.40
2018/03/08 02:24	0.79	12.57	1.40
2018/03/08 02:39	0.79	12.57	1.40
2018/03/08 02:54	1.00	21.46	1.69
2018/03/08 03:09	1.00	21.46	1.69
2018/03/08 03:24	1.00	21.46	1.69
2018/03/08 03:39	1.00	21.46	1.69
2018/03/08 03:54	0.91	17.99	1.61
2018/03/08 04:09	0.90	16.81	1.54
2018/03/08 04:24	0.89	16.04	1.50
2018/03/08 04:39	0.82	14.03	1.48
2018/03/08 04:54	0.78	12.85	1.46
2018/03/08 05:09	0.82	13.82	1.46
2018/03/08 05:24	0.82	13.82	1.46
2018/03/08 05:39	0.82	13.82	1.46
2018/03/08 05:54	0.83	14.17	1.46
2018/03/08 06:09	0.84	14.51	1.46
2018/03/08 06:24	1.04	20.49	1.52
2018/03/08 06:39	1.04	22.85	1.69
2018/03/08 06:54	1.18	28.33	1.75
2018/03/08 07:09	1.23	30.90	1.79
2018/03/08 07:24	1.51	45.42	1.95
2018/03/08 07:39	1.62	51.46	1.99
2018/03/08 07:54	1.62	51.46	1.99

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/08 08:09	1.51	46.46	1.99
2018/03/08 08:24	1.51	47.99	2.06
2018/03/08 08:39	1.72	59.58	2.12
2018/03/08 08:54	1.65	58.96	2.23
2018/03/08 09:09	1.65	58.96	2.23
2018/03/08 09:24	1.65	58.96	2.23
2018/03/08 09:39	1.65	58.96	2.23
2018/03/08 09:54	1.65	60.21	2.28
2018/03/08 10:09	1.64	56.25	2.15
2018/03/08 10:24	1.68	58.33	2.15
2018/03/08 10:39	1.68	58.33	2.15
2018/03/08 10:54	1.68	62.22	2.30
2018/03/08 11:09	1.64	56.25	2.15
2018/03/08 11:24	1.57	49.10	2.00
2018/03/08 11:39	1.40	40.00	1.92
2018/03/08 11:54	1.40	40.00	1.92
2018/03/08 12:09	1.33	37.15	1.92
2018/03/08 12:24	1.40	40.97	1.97
2018/03/08 12:39	1.44	42.71	1.97
2018/03/08 12:54	1.51	45.76	1.97
2018/03/08 13:09	1.51	45.76	1.97
2018/03/08 13:24	1.54	46.94	1.97
2018/03/08 13:39	1.51	41.25	1.77
2018/03/08 13:54	1.51	41.94	1.80
2018/03/08 14:09	1.34	37.50	1.91
2018/03/08 14:24	1.34	37.50	1.91
2018/03/08 14:39	1.34	35.42	1.80
2018/03/08 14:54	1.40	39.79	1.91
2018/03/08 15:09	1.43	42.92	2.00
2018/03/08 15:24	1.47	44.72	2.00
2018/03/08 15:39	1.47	40.76	1.82
2018/03/08 15:54	1.54	47.85	2.00
2018/03/08 16:09	1.54	47.85	2.00
2018/03/08 16:24	1.47	43.19	1.93
2018/03/08 16:39	1.22	32.92	1.93
2018/03/08 16:54	1.22	32.92	1.93
2018/03/08 17:09	1.19	29.37	1.78
2018/03/08 17:24	1.19	29.37	1.78
2018/03/08 17:39	1.19	27.50	1.67
2018/03/08 17:54	1.15	25.90	1.66
2018/03/08 18:09	1.09	24.10	1.66
2018/03/08 18:24	1.08	24.17	1.69
2018/03/08 18:39	1.08	24.17	1.69
2018/03/08 18:54	1.09	24.86	1.71
2018/03/08 19:09	1.09	24.86	1.71

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/08 19:24	1.11	25.07	1.69
2018/03/08 19:39	1.11	24.17	1.63
2018/03/08 19:54	1.05	22.36	1.63
2018/03/08 20:09	1.05	22.36	1.63
2018/03/08 20:24	1.05	22.36	1.63
2018/03/08 20:39	1.05	22.57	1.64
2018/03/08 20:54	1.05	22.92	1.67
2018/03/08 21:09	1.05	22.92	1.67
2018/03/08 21:24	1.05	22.92	1.67
2018/03/08 21:39	1.33	39.31	2.03
2018/03/08 21:54	1.34	39.93	2.03
2018/03/08 22:09	1.34	39.93	2.03
2018/03/08 22:24	1.34	35.76	1.82
2018/03/08 22:39	1.19	29.65	1.80
2018/03/08 22:54	1.15	27.43	1.75
2018/03/08 23:09	1.07	22.92	1.63
2018/03/08 23:24	1.15	27.43	1.75
2018/03/08 23:39	1.15	27.43	1.75
2018/03/08 23:54	1.25	32.71	1.86
2018/03/09 00:09	1.25	33.19	1.89
2018/03/09 00:24	1.25	35.62	2.02
2018/03/09 00:39	1.25	33.68	1.91
2018/03/09 00:54	1.12	28.89	1.91
2018/03/09 01:09	1.12	28.47	1.89
2018/03/09 01:24	1.09	25.28	1.74
2018/03/09 01:39	0.91	15.83	1.41
2018/03/09 01:54	0.89	15.07	1.41
2018/03/09 02:09	0.76	11.81	1.38
2018/03/09 02:24	0.76	11.94	1.40
2018/03/09 02:39	0.76	11.94	1.40
2018/03/09 02:54	0.76	12.15	1.42
2018/03/09 03:09	0.76	12.15	1.42
2018/03/09 03:24	0.75	11.81	1.42
2018/03/09 03:39	0.75	11.81	1.42
2018/03/09 03:54	0.69	10.35	1.40
2018/03/09 04:09	0.68	10.07	1.40
2018/03/09 04:24	0.68	10.07	1.40
2018/03/09 04:39	0.68	10.49	1.46
2018/03/09 04:54	0.72	11.46	1.46
2018/03/09 05:09	0.73	11.81	1.46
2018/03/09 05:24	0.80	12.71	1.38
2018/03/09 05:39	0.83	13.40	1.38
2018/03/09 05:54	0.83	13.40	1.38
2018/03/09 06:09	0.94	17.50	1.50
2018/03/09 06:24	1.04	21.81	1.62

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/09 06:39	1.08	24.31	1.70
2018/03/09 06:54	1.12	26.11	1.73
2018/03/09 07:09	1.15	27.01	1.73
2018/03/09 07:24	1.40	40.14	1.93
2018/03/09 07:39	1.61	50.00	1.96
2018/03/09 07:54	1.66	60.00	2.24
2018/03/09 08:09	1.66	62.71	2.34
2018/03/09 08:24	1.66	64.44	2.41
2018/03/09 08:39	1.93	79.65	2.41
2018/03/09 08:54	1.93	79.65	2.41
2018/03/09 09:09	1.75	69.17	2.41
2018/03/09 09:24	1.75	69.17	2.41
2018/03/09 09:39	1.75	70.69	2.46
2018/03/09 09:54	1.75	70.69	2.46
2018/03/09 10:09	1.68	66.67	2.46
2018/03/09 10:24	1.68	66.67	2.46
2018/03/09 10:39	1.68	57.71	2.13
2018/03/09 10:54	1.66	54.79	2.05
2018/03/09 11:09	1.66	51.60	1.93
2018/03/09 11:24	1.66	54.79	2.05
2018/03/09 11:39	1.66	54.79	2.05
2018/03/09 11:54	1.66	50.00	1.87
2018/03/09 12:09	1.65	45.90	1.74
2018/03/09 12:24	1.65	57.29	2.17
2018/03/09 12:39	1.65	57.71	2.18
2018/03/09 12:54	1.53	48.06	2.04
2018/03/09 13:09	1.53	48.06	2.04
2018/03/09 13:24	1.53	48.06	2.04
2018/03/09 13:39	1.53	46.04	1.95
2018/03/09 13:54	1.53	46.04	1.95
2018/03/09 14:09	1.39	37.78	1.84
2018/03/09 14:24	1.39	37.78	1.84
2018/03/09 14:39	1.51	45.21	1.94
2018/03/09 14:54	1.39	40.42	1.97
2018/03/09 15:09	1.36	38.96	1.95
2018/03/09 15:24	1.36	38.96	1.95
2018/03/09 15:39	1.34	38.40	1.95
2018/03/09 15:54	1.33	35.56	1.84
2018/03/09 16:09	1.33	35.56	1.84
2018/03/09 16:24	1.33	33.06	1.71
2018/03/09 16:39	1.34	36.11	1.84
2018/03/09 16:54	1.47	41.04	1.84
2018/03/09 17:09	1.47	44.93	2.01
2018/03/09 17:24	1.46	40.83	1.85
2018/03/09 17:39	1.47	41.87	1.87

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/09 17:54	1.46	41.25	1.87
2018/03/09 18:09	1.39	38.47	1.87
2018/03/09 18:24	1.39	38.06	1.85
2018/03/09 18:39	1.26	32.36	1.81
2018/03/09 18:54	1.26	32.36	1.81
2018/03/09 19:09	1.26	32.36	1.81
2018/03/09 19:24	1.26	32.36	1.81
2018/03/09 19:39	1.40	42.57	2.04
2018/03/09 19:54	1.40	42.57	2.04
2018/03/09 20:09	1.36	37.92	1.90
2018/03/09 20:24	1.36	37.92	1.90
2018/03/09 20:39	1.36	37.92	1.90
2018/03/09 20:54	1.36	36.46	1.83
2018/03/09 21:09	1.36	35.90	1.80
2018/03/09 21:24	1.41	38.06	1.80
2018/03/09 21:39	1.36	35.35	1.77
2018/03/09 21:54	1.36	35.35	1.77
2018/03/09 22:09	1.36	35.35	1.77
2018/03/09 22:24	1.40	37.71	1.81
2018/03/09 22:39	1.40	40.83	1.96
2018/03/09 22:54	1.40	40.83	1.96
2018/03/09 23:09	1.40	37.71	1.81
2018/03/09 23:24	1.40	37.29	1.79
2018/03/09 23:39	1.40	37.29	1.79
2018/03/09 23:54	1.25	31.53	1.79
2018/03/10 00:09	1.28	33.26	1.83
2018/03/10 00:24	1.28	33.26	1.83
2018/03/10 00:39	1.22	31.18	1.83
2018/03/10 00:54	1.22	31.18	1.83
2018/03/10 01:09	1.22	30.56	1.79
2018/03/10 01:24	1.15	27.50	1.76
2018/03/10 01:39	0.90	17.08	1.57
2018/03/10 01:54	0.83	13.68	1.41
2018/03/10 02:09	0.83	13.12	1.35
2018/03/10 02:24	0.83	13.12	1.35
2018/03/10 02:39	0.83	13.68	1.41
2018/03/10 02:54	1.09	24.10	1.66
2018/03/10 03:09	1.09	24.10	1.66
2018/03/10 03:24	1.11	24.51	1.66
2018/03/10 03:39	1.09	23.89	1.64
2018/03/10 03:54	1.05	22.50	1.64
2018/03/10 04:09	1.01	20.21	1.56
2018/03/10 04:24	0.82	13.82	1.46
2018/03/10 04:39	0.75	11.39	1.37
2018/03/10 04:54	0.72	10.69	1.36

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/10 05:09	0.72	10.56	1.35
2018/03/10 05:24	0.72	10.56	1.35
2018/03/10 05:39	0.72	10.56	1.35
2018/03/10 05:54	0.78	12.71	1.45
2018/03/10 06:09	0.84	14.58	1.47
2018/03/10 06:24	0.86	15.76	1.55
2018/03/10 06:39	0.87	16.18	1.55
2018/03/10 06:54	1.09	25.14	1.73
2018/03/10 07:09	1.25	30.42	1.73
2018/03/10 07:24	1.37	37.78	1.87
2018/03/10 07:39	1.55	45.21	1.87
2018/03/10 07:54	1.57	46.67	1.90
2018/03/10 08:09	1.62	50.49	1.96
2018/03/10 08:24	1.69	55.56	2.03
2018/03/10 08:39	1.73	66.39	2.34
2018/03/10 08:54	1.98	83.06	2.41
2018/03/10 09:09	2.03	92.15	2.60
2018/03/10 09:24	2.03	92.15	2.60
2018/03/10 09:39	2.03	96.39	2.72
2018/03/10 09:54	2.03	96.39	2.72
2018/03/10 10:09	2.03	96.39	2.72
2018/03/10 10:24	2.03	81.46	2.30
2018/03/10 10:39	2.03	82.92	2.34
2018/03/10 10:54	2.03	82.92	2.34
2018/03/10 11:09	2.11	96.18	2.56
2018/03/10 11:24	1.66	62.50	2.34
2018/03/10 11:39	1.66	62.50	2.34
2018/03/10 11:54	1.66	61.11	2.28
2018/03/10 12:09	1.66	58.47	2.19
2018/03/10 12:24	1.66	58.47	2.19
2018/03/10 12:39	1.66	58.47	2.19
2018/03/10 12:54	1.66	59.31	2.22
2018/03/10 13:09	1.78	65.14	2.22
2018/03/10 13:24	1.62	57.22	2.22
2018/03/10 13:39	1.62	54.79	2.12
2018/03/10 13:54	1.65	56.11	2.12
2018/03/10 14:09	1.68	57.50	2.12
2018/03/10 14:24	1.65	57.64	2.18
2018/03/10 14:39	1.68	60.69	2.24
2018/03/10 14:54	1.65	59.24	2.24
2018/03/10 15:09	1.72	66.81	2.38
2018/03/10 15:24	1.64	60.00	2.30
2018/03/10 15:39	1.71	66.04	2.38
2018/03/10 15:54	1.71	71.46	2.58
2018/03/10 16:09	1.71	71.46	2.58

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/10 16:24	1.69	66.18	2.41
2018/03/10 16:39	1.71	66.94	2.41
2018/03/10 16:54	1.71	66.94	2.41
2018/03/10 17:09	1.69	63.40	2.31
2018/03/10 17:24	1.69	63.40	2.31
2018/03/10 17:39	1.61	58.61	2.30
2018/03/10 17:54	1.61	53.12	2.08
2018/03/10 18:09	1.54	44.31	1.85
2018/03/10 18:24	1.48	41.81	1.84
2018/03/10 18:39	1.48	41.53	1.83
2018/03/10 18:54	1.48	41.53	1.83
2018/03/10 19:09	1.48	41.25	1.82
2018/03/10 19:24	1.44	39.58	1.82
2018/03/10 19:39	1.43	35.07	1.64
2018/03/10 19:54	1.43	39.03	1.82
2018/03/10 20:09	1.19	27.29	1.65
2018/03/10 20:24	1.19	27.29	1.65
2018/03/10 20:39	1.19	27.29	1.65
2018/03/10 20:54	1.23	31.67	1.83
2018/03/10 21:09	1.23	31.53	1.82
2018/03/10 21:24	1.28	33.06	1.82
2018/03/10 21:39	1.30	34.17	1.82
2018/03/10 21:54	1.30	34.17	1.82
2018/03/10 22:09	1.28	33.06	1.82
2018/03/10 22:24	1.28	36.39	2.00
2018/03/10 22:39	1.46	44.44	2.02
2018/03/10 22:54	1.64	56.74	2.17
2018/03/10 23:09	1.64	56.74	2.17
2018/03/10 23:24	1.66	60.69	2.27
2018/03/10 23:39	1.64	56.74	2.17
2018/03/10 23:54	1.61	52.43	2.06
2018/03/11 00:09	1.29	32.29	1.75
2018/03/11 00:24	1.05	22.71	1.65
2018/03/11 00:39	1.05	22.71	1.65
2018/03/11 00:54	1.05	23.12	1.68
2018/03/11 01:09	1.05	23.12	1.68
2018/03/11 01:24	0.96	19.72	1.65
2018/03/11 01:39	0.91	17.71	1.59
2018/03/11 01:54	0.89	16.39	1.54
2018/03/11 02:09	0.83	14.93	1.54
2018/03/11 02:24	0.80	13.19	1.43
2018/03/11 02:39	0.80	13.06	1.41
2018/03/11 02:54	0.76	12.08	1.41
2018/03/11 03:09	0.76	11.94	1.40
2018/03/11 03:24	0.76	11.53	1.35

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/11 03:39	0.76	11.53	1.35
2018/03/11 03:54	0.73	10.83	1.34
2018/03/11 04:09	0.73	10.69	1.33
2018/03/11 04:24	0.73	10.90	1.35
2018/03/11 04:39	0.73	11.32	1.40
2018/03/11 04:54	0.82	13.26	1.40
2018/03/11 05:09	0.84	14.37	1.44
2018/03/11 05:24	0.86	14.72	1.44
2018/03/11 05:39	0.87	15.62	1.50
2018/03/11 05:54	0.87	15.76	1.51
2018/03/11 06:09	0.96	18.47	1.55
2018/03/11 06:24	0.97	20.42	1.67
2018/03/11 06:39	1.30	33.47	1.78
2018/03/11 06:54	1.34	35.76	1.82
2018/03/11 07:09	1.53	47.43	2.01
2018/03/11 07:24	1.76	58.40	2.01
2018/03/11 07:39	1.76	62.64	2.16
2018/03/11 07:54	1.84	68.33	2.20
2018/03/11 08:09	1.76	63.96	2.20
2018/03/11 08:24	1.87	69.86	2.20
2018/03/11 08:39	1.87	69.86	2.20
2018/03/11 08:54	2.00	86.87	2.50
2018/03/11 09:09	2.00	86.87	2.50
2018/03/11 09:24	2.00	86.87	2.50
2018/03/11 09:39	2.11	93.89	2.50
2018/03/11 09:54	1.69	56.39	2.06
2018/03/11 10:09	1.65	54.44	2.06
2018/03/11 10:24	1.62	57.01	2.21
2018/03/11 10:39	1.65	61.46	2.32
2018/03/11 10:54	1.65	58.47	2.21
2018/03/11 11:09	1.65	59.03	2.23
2018/03/11 11:24	1.66	59.72	2.23
2018/03/11 11:39	1.71	61.94	2.23
2018/03/11 11:54	1.71	60.00	2.16
2018/03/11 12:09	1.68	57.71	2.13
2018/03/11 12:24	1.68	53.61	1.98
2018/03/11 12:39	1.68	53.61	1.98
2018/03/11 12:54	1.66	57.01	2.13
2018/03/11 13:09	1.65	56.32	2.13
2018/03/11 13:24	1.65	52.29	1.98
2018/03/11 13:39	1.64	56.74	2.17
2018/03/11 13:54	1.64	53.40	2.04
2018/03/11 14:09	1.62	51.46	1.99
2018/03/11 14:24	1.62	51.46	1.99
2018/03/11 14:39	1.65	52.71	1.99

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/11 14:54	1.65	50.42	1.91
2018/03/11 15:09	1.68	51.67	1.91
2018/03/11 15:24	1.69	50.76	1.85
2018/03/11 15:39	1.69	50.76	1.85
2018/03/11 15:54	1.58	51.25	2.06
2018/03/11 16:09	1.69	59.79	2.18
2018/03/11 16:24	1.58	51.25	2.06
2018/03/11 16:39	1.55	50.97	2.11
2018/03/11 16:54	1.55	50.97	2.11
2018/03/11 17:09	1.40	37.50	1.80
2018/03/11 17:24	1.33	32.71	1.69
2018/03/11 17:39	1.30	30.56	1.63
2018/03/11 17:54	1.22	27.71	1.63
2018/03/11 18:09	1.19	26.81	1.63
2018/03/11 18:24	1.19	26.81	1.63
2018/03/11 18:39	1.29	32.08	1.74
2018/03/11 18:54	1.29	33.26	1.80
2018/03/11 19:09	1.34	35.42	1.80
2018/03/11 19:24	1.34	35.69	1.82
2018/03/11 19:39	1.46	42.36	1.92
2018/03/11 19:54	1.64	52.99	2.03
2018/03/11 20:09	1.64	52.99	2.03
2018/03/11 20:24	1.66	56.46	2.11
2018/03/11 20:39	1.73	64.72	2.28
2018/03/11 20:54	1.73	67.08	2.36
2018/03/11 21:09	1.73	67.08	2.36
2018/03/11 21:24	1.73	67.08	2.36
2018/03/11 21:39	1.65	50.14	1.90
2018/03/11 21:54	1.15	27.01	1.73
2018/03/11 22:09	1.08	24.17	1.69
2018/03/11 22:24	1.00	20.42	1.61
2018/03/11 22:39	0.96	18.61	1.56
2018/03/11 22:54	0.94	18.19	1.56
2018/03/11 23:09	0.94	17.43	1.49
2018/03/11 23:24	0.93	16.94	1.48
2018/03/11 23:39	0.93	17.85	1.56
2018/03/11 23:54	0.94	19.37	1.66
2018/03/12 00:09	0.96	19.79	1.66
2018/03/12 00:24	1.05	24.03	1.75
2018/03/12 00:39	1.51	43.61	1.87
2018/03/12 00:54	1.51	43.61	1.87
2018/03/12 01:09	1.51	43.61	1.87
2018/03/12 01:24	1.51	45.97	1.97
2018/03/12 01:39	1.04	23.89	1.77
2018/03/12 01:54	0.96	18.89	1.58

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/12 02:09	1.04	22.50	1.67
2018/03/12 02:24	1.04	22.50	1.67
2018/03/12 02:39	1.04	22.50	1.67
2018/03/12 02:54	0.96	18.89	1.58
2018/03/12 03:09	0.96	18.89	1.58
2018/03/12 03:24	0.71	11.46	1.50
2018/03/12 03:39	0.64	8.82	1.35
2018/03/12 03:54	0.61	8.26	1.35
2018/03/12 04:09	0.61	8.26	1.35
2018/03/12 04:24	0.64	8.40	1.28
2018/03/12 04:39	0.69	10.00	1.35
2018/03/12 04:54	0.73	11.67	1.45
2018/03/12 05:09	0.82	13.96	1.47
2018/03/12 05:24	0.90	16.11	1.47
2018/03/12 05:39	0.90	16.74	1.53
2018/03/12 05:54	0.90	16.74	1.53
2018/03/12 06:09	0.91	17.29	1.55
2018/03/12 06:24	1.14	24.72	1.61
2018/03/12 06:39	1.40	34.24	1.64
2018/03/12 06:54	1.48	41.18	1.82
2018/03/12 07:09	1.66	57.36	2.14
2018/03/12 07:24	1.71	59.44	2.14
2018/03/12 07:39	1.73	60.83	2.14
2018/03/12 07:54	1.73	57.15	2.01
2018/03/12 08:09	1.80	60.49	2.01
2018/03/12 08:24	1.71	52.57	1.90
2018/03/12 08:39	1.80	55.14	1.84
2018/03/12 08:54	1.86	59.44	1.90
2018/03/12 09:09	2.04	70.69	1.97
2018/03/12 09:24	2.04	70.69	1.97
2018/03/12 09:39	2.04	70.69	1.97
2018/03/12 09:54	2.03	70.00	1.97
2018/03/12 10:09	1.94	67.50	2.02
2018/03/12 10:24	1.90	61.32	1.89
2018/03/12 10:39	1.93	62.64	1.89
2018/03/12 10:54	1.93	68.06	2.06
2018/03/12 11:09	1.80	61.81	2.06
2018/03/12 11:24	1.80	57.64	1.92
2018/03/12 11:39	1.80	57.64	1.92
2018/03/12 11:54	1.69	50.90	1.86
2018/03/12 12:09	1.80	55.76	1.86
2018/03/12 12:24	1.69	50.49	1.84
2018/03/12 12:39	1.69	47.01	1.72
2018/03/12 12:54	1.51	39.93	1.72
2018/03/12 13:09	1.71	48.06	1.73

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/12 13:24	1.71	48.06	1.73
2018/03/12 13:39	1.71	48.06	1.73
2018/03/12 13:54	1.71	49.37	1.78
2018/03/12 14:09	1.71	49.86	1.80
2018/03/12 14:24	1.71	49.86	1.80
2018/03/12 14:39	1.71	49.86	1.80
2018/03/12 14:54	1.71	46.67	1.68
2018/03/12 15:09	1.40	34.03	1.63
2018/03/12 15:24	1.40	34.03	1.63
2018/03/12 15:39	1.75	48.26	1.68
2018/03/12 15:54	1.75	48.26	1.68
2018/03/12 16:09	1.40	34.03	1.63
2018/03/12 16:24	1.39	34.37	1.67
2018/03/12 16:39	1.19	25.07	1.52
2018/03/12 16:54	1.19	22.92	1.39
2018/03/12 17:09	1.18	22.57	1.39
2018/03/12 17:24	1.15	21.74	1.39
2018/03/12 17:39	1.16	22.15	1.39
2018/03/12 17:54	1.16	21.53	1.35
2018/03/12 18:09	1.08	19.31	1.35
2018/03/12 18:24	1.16	21.11	1.32
2018/03/12 18:39	1.16	21.11	1.32
2018/03/12 18:54	1.23	22.92	1.32
2018/03/12 19:09	1.11	20.62	1.39
2018/03/12 19:24	1.22	23.68	1.39
2018/03/12 19:39	1.15	23.40	1.49
2018/03/12 19:54	1.22	25.49	1.49
2018/03/12 20:09	1.15	22.92	1.47
2018/03/12 20:24	1.22	25.00	1.47
2018/03/12 20:39	1.22	25.00	1.47
2018/03/12 20:54	1.28	25.21	1.39
2018/03/12 21:09	1.28	25.21	1.39
2018/03/12 21:24	1.28	26.67	1.46
2018/03/12 21:39	1.28	26.67	1.46
2018/03/12 21:54	1.28	27.64	1.52
2018/03/12 22:09	1.15	23.75	1.52
2018/03/12 22:24	1.28	27.64	1.52
2018/03/12 22:39	1.28	28.19	1.55
2018/03/12 22:54	1.50	34.86	1.52
2018/03/12 23:09	1.50	35.62	1.55
2018/03/12 23:24	1.50	35.62	1.55
2018/03/12 23:39	1.50	35.62	1.55
2018/03/12 23:54	1.48	33.19	1.46
2018/03/13 00:09	1.44	31.81	1.46
2018/03/13 00:24	0.97	17.01	1.40

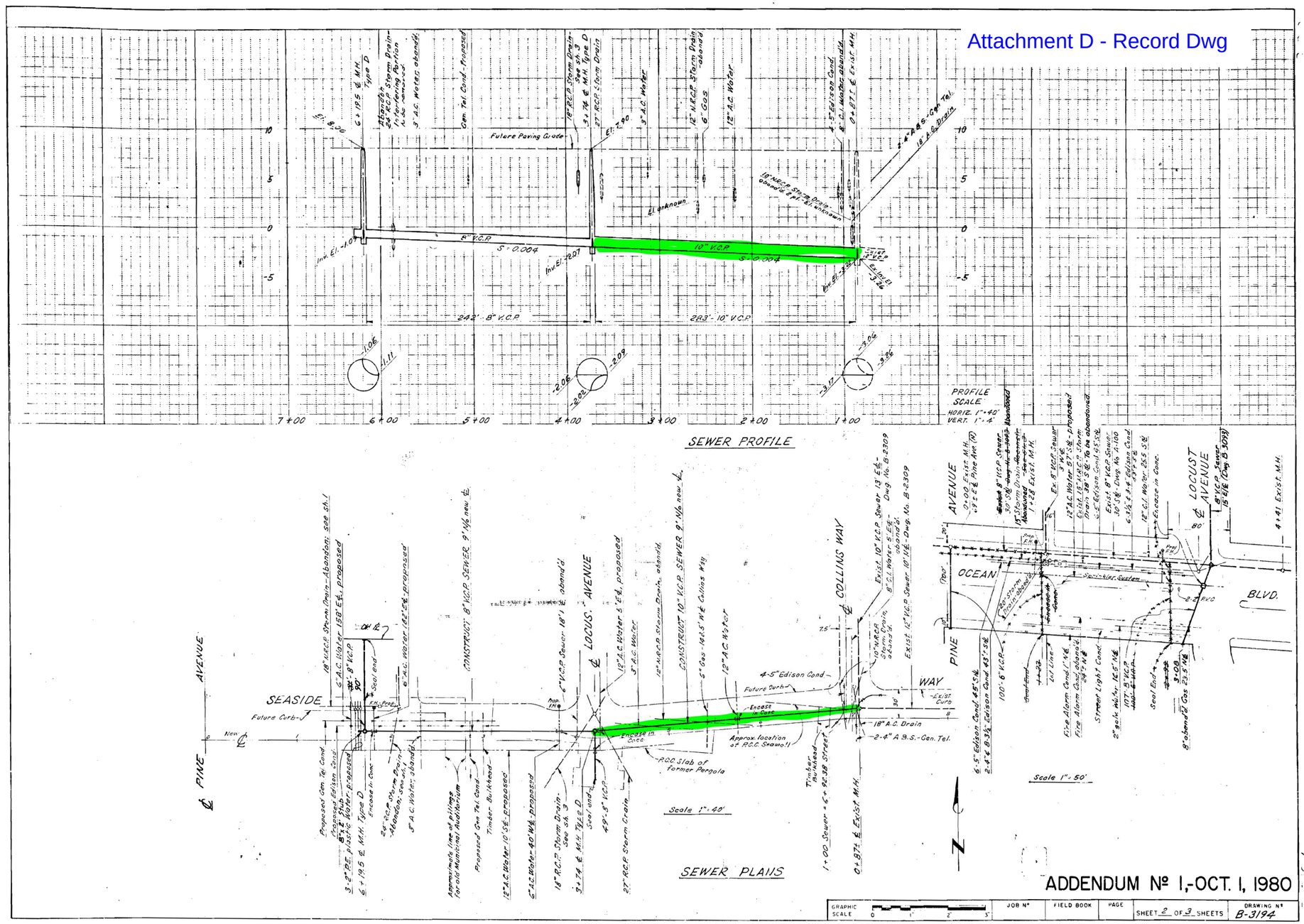
TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/13 00:39	0.97	16.81	1.38
2018/03/13 00:54	0.86	12.92	1.27
2018/03/13 01:09	0.79	12.08	1.34
2018/03/13 01:24	0.73	10.83	1.34
2018/03/13 01:39	0.68	9.44	1.31
2018/03/13 01:54	0.68	9.17	1.27
2018/03/13 02:09	0.66	9.17	1.31
2018/03/13 02:24	0.66	8.96	1.28
2018/03/13 02:39	0.66	8.96	1.28
2018/03/13 02:54	0.66	8.96	1.28
2018/03/13 03:09	0.73	10.35	1.28
2018/03/13 03:24	0.83	12.43	1.28
2018/03/13 03:39	0.83	10.42	1.07
2018/03/13 03:54	0.83	10.42	1.07
2018/03/13 04:09	0.83	10.42	1.07
2018/03/13 04:24	0.78	10.90	1.24
2018/03/13 04:39	0.78	10.90	1.24
2018/03/13 04:54	0.84	12.36	1.24
2018/03/13 05:09	0.91	13.75	1.23
2018/03/13 05:24	0.98	15.35	1.23
2018/03/13 05:39	1.14	18.96	1.23
2018/03/13 05:54	1.58	42.99	1.73
2018/03/13 06:09	1.84	60.14	1.94
2018/03/13 06:24	1.86	62.22	1.98
2018/03/13 06:39	1.87	67.50	2.13
2018/03/13 06:54	2.05	82.78	2.29
2018/03/13 07:09	2.29	96.67	2.29
2018/03/13 07:24	2.34	102.22	2.34
2018/03/13 07:39	2.29	91.67	2.17
2018/03/13 07:54	2.29	91.67	2.17
2018/03/13 08:09	2.29	91.67	2.17
2018/03/13 08:24	1.91	55.07	1.68
2018/03/13 08:39	1.91	55.07	1.68
2018/03/13 08:54	1.91	55.07	1.68
2018/03/13 09:09	1.91	57.71	1.76
2018/03/13 09:24	1.91	56.04	1.71
2018/03/13 09:39	1.91	57.71	1.76
2018/03/13 09:54	1.91	57.71	1.76
2018/03/13 10:09	1.78	57.71	1.97
2018/03/13 10:24	1.78	60.49	2.06
2018/03/13 10:39	2.11	87.64	2.33
2018/03/13 10:54	1.84	70.90	2.28
2018/03/13 11:09	1.72	60.49	2.16
2018/03/13 11:24	1.84	66.94	2.16
2018/03/13 11:39	1.84	66.94	2.16

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/13 11:54	1.73	58.54	2.06
2018/03/13 12:09	1.72	57.92	2.06
2018/03/13 12:24	1.62	52.85	2.05
2018/03/13 12:39	1.54	46.18	1.93
2018/03/13 12:54	1.54	42.71	1.79
2018/03/13 13:09	1.54	42.50	1.78
2018/03/13 13:24	1.62	45.90	1.78
2018/03/13 13:39	1.68	48.40	1.79
2018/03/13 13:54	1.80	53.54	1.78
2018/03/13 14:09	1.82	58.96	1.94
2018/03/13 14:24	1.84	60.62	1.95
2018/03/13 14:39	1.82	58.96	1.94
2018/03/13 14:54	1.91	58.33	1.78
2018/03/13 15:09	1.91	55.42	1.69
2018/03/13 15:24	1.76	49.17	1.69
2018/03/13 15:39	1.68	41.67	1.54
2018/03/13 15:54	1.62	39.65	1.54
2018/03/13 16:09	1.62	41.60	1.61
2018/03/13 16:24	1.57	42.50	1.73
2018/03/13 16:39	1.53	40.90	1.73
2018/03/13 16:54	1.51	40.35	1.73
2018/03/13 17:09	1.41	37.99	1.80
2018/03/13 17:24	1.40	37.78	1.81
2018/03/13 17:39	1.40	37.78	1.81
2018/03/13 17:54	1.40	38.54	1.85
2018/03/13 18:09	1.36	38.96	1.95
2018/03/13 18:24	1.36	38.96	1.95
2018/03/13 18:39	1.40	40.76	1.95
2018/03/13 18:54	1.43	40.56	1.89
2018/03/13 19:09	1.44	41.11	1.89
2018/03/13 19:24	1.44	37.22	1.71
2018/03/13 19:39	1.44	32.71	1.50
2018/03/13 19:54	1.47	33.61	1.50
2018/03/13 20:09	1.47	33.61	1.50
2018/03/13 20:24	1.48	34.10	1.50
2018/03/13 20:39	1.50	31.67	1.38
2018/03/13 20:54	1.55	33.33	1.38
2018/03/13 21:09	1.58	37.85	1.52
2018/03/13 21:24	1.55	36.94	1.52
2018/03/13 21:39	1.55	37.15	1.54
2018/03/13 21:54	1.55	38.19	1.58
2018/03/13 22:09	1.46	34.79	1.58
2018/03/13 22:24	1.46	34.79	1.58
2018/03/13 22:39	1.46	33.68	1.53
2018/03/13 22:54	1.46	31.46	1.43

TimeStamp	Level (in)	Flow (gpm)	Velocity (fps)
2018/03/13 23:09	1.47	30.97	1.38
2018/03/13 23:24	1.47	30.56	1.37
2018/03/13 23:39	1.47	30.56	1.37
2018/03/13 23:54	1.41	29.24	1.38
2018/03/14 00:09	1.41	29.24	1.38
2018/03/14 00:24	1.37	25.76	1.27
2018/03/14 00:39	1.22	16.81	0.99
2018/03/14 00:54	1.07	13.68	0.98
2018/03/14 01:09	1.00	12.36	0.98
2018/03/14 01:24	1.00	12.36	0.98
2018/03/14 01:39	1.00	12.43	0.98
2018/03/14 01:54	1.30	24.31	1.29
2018/03/14 02:09	1.32	26.81	1.41
2018/03/14 02:24	1.32	26.81	1.41
2018/03/14 02:39	1.32	26.81	1.41
2018/03/14 02:54	1.30	25.14	1.34
2018/03/14 03:09	1.29	24.72	1.34
2018/03/14 03:24	0.96	13.68	1.15
2018/03/14 03:39	0.91	12.85	1.15
2018/03/14 03:54	0.91	12.85	1.15
2018/03/14 04:09	0.91	13.26	1.19
2018/03/14 04:24	0.91	13.68	1.23
2018/03/14 04:39	0.94	14.31	1.23
2018/03/14 04:54	0.96	14.17	1.19
2018/03/14 05:09	1.04	15.97	1.19
2018/03/14 05:24	1.11	17.57	1.19
2018/03/14 05:39	1.23	20.56	1.19
2018/03/14 05:54	1.32	30.76	1.61
2018/03/14 06:09	1.68	55.69	2.06
2018/03/14 06:24	1.87	65.21	2.06
2018/03/14 06:39	2.16	80.21	2.06

Attachment D

Attachment D - Record Dwg



ADDENDUM Nº 1,-OCT. 1, 1980

GRAPHIC SCALE 0 1 2 3	JOB Nº	FIELD BOOK	PAGE	SHEET 2 OF 3 SHEETS	DRAWING Nº B-3194

GRAPHIC SCALE
Scale 1"=40' 0 40 80 120 85

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B/3194 2A/3

Attachment E

FLOW ANALYSIS USING d/D RATIO PARAMETERS FROM KING'S HYDRAULICS HAND BOOK

D= Diameter of pipe in inches ; d = depth of flow; Slope =S

Diameter pipe D =		**10**		Slope S =	**0.004**		Manning's n =		**0.013**					
d/D	Ca	Cr	**Q**	**V**	d/D	Ca	Cr	**Q**	**V**	d/D	Ca	Cr	**Q**	**V**
0.01	0.0013	0.007	0.0002	0.234	0.31	0.2074	0.176	0.289	2.009	0.61	0.502	0.280	0.955	2.739
0.02	0.0037	0.013	0.0009	0.353	0.32	0.2167	0.18	0.307	2.040	0.62	0.512	0.282	0.978	2.752
0.03	0.0069	0.020	0.0023	0.471	0.33	0.2260	0.185	0.326	2.077	0.63	0.521	0.284	1.000	2.765
0.04	0.0105	0.026	0.0041	0.561	0.34	0.2355	0.189	0.345	2.107	0.64	0.531	0.286	1.024	2.778
0.05	0.0147	0.033	0.0067	0.658	0.35	0.2450	0.193	0.364	2.137	0.65	0.540	0.288	1.046	2.791
0.06	0.0192	0.039	0.0098	0.735	0.36	0.2546	0.198	0.384	2.174	0.66	0.550	0.290	1.071	2.804
0.07	0.0242	0.045	0.0136	0.809	0.37	0.2642	0.202	0.404	2.203	0.67	0.559	0.292	1.093	2.816
0.08	0.0294	0.051	0.0180	0.880	0.38	0.2739	0.206	0.424	2.232	0.68	0.569	0.293	1.115	2.823
0.09	0.0350	0.057	0.0230	0.947	0.39	0.2836	0.21	0.445	2.261	0.69	0.578	0.295	1.138	2.836
0.10	0.0409	0.063	0.0288	1.013	0.4	0.2934	0.214	0.466	2.289	0.70	0.587	0.296	1.159	2.842
0.11	0.0470	0.070	0.0355	1.086	0.41	0.3032	0.218	0.488	2.318	0.71	0.596	0.298	1.182	2.855
0.12	0.0534	0.075	0.0422	1.138	0.42	0.3130	0.222	0.510	2.346	0.72	0.605	0.299	1.202	2.861
0.13	0.0600	0.081	0.0499	1.197	0.43	0.3239	0.226	0.534	2.374	0.73	0.614	0.300	1.223	2.868
0.14	0.0668	0.087	0.0583	1.256	0.44	0.3328	0.229	0.554	2.395	0.74	0.623	0.301	1.243	2.874
0.15	0.0739	0.093	0.0674	1.313	0.45	0.3428	0.233	0.577	2.423	0.75	0.632	0.302	1.264	2.880
0.16	0.0811	0.099	0.0771	1.369	0.46	0.3527	0.236	0.599	2.444	0.76	0.640	0.302	1.280	2.880
0.17	0.0885	0.104	0.0869	1.415	0.47	0.3627	0.240	0.622	2.471	0.77	0.649	0.303	1.301	2.887
0.18	0.0961	0.110	0.0980	1.469	0.48	0.3727	0.243	0.645	2.492	0.78	0.657	0.304	1.320	2.893
0.19	0.1039	0.115	0.1092	1.513	0.49	0.3827	0.247	0.669	2.519	0.79	0.666	0.304	1.338	2.893
0.20	0.1118	0.121	0.1215	1.565	0.50	0.3930	0.250	0.693	2.539	0.80	0.674	0.304	1.354	2.893
0.21	0.1199	0.126	0.1339	1.608	0.51	0.4030	0.253	0.716	2.560	0.81	0.681	0.304	1.368	2.893
0.22	0.1281	0.131	0.1468	1.650	0.52	0.4130	0.256	0.740	2.580	0.82	0.689	0.304	1.384	2.893
0.23	0.1365	0.136	0.1604	1.692	0.53	0.4230	0.259	0.764	2.600	0.83	0.697	0.304	1.400	2.893
0.24	0.1449	0.142	0.1752	1.741	0.54	0.4330	0.262	0.788	2.620	0.84	0.704	0.304	1.414	2.893
0.25	0.1535	0.147	0.1899	1.782	0.55	0.4430	0.265	0.812	2.640	0.85	0.712	0.303	1.427	2.887
0.26	0.1623	0.152	0.2054	1.822	0.56	0.4530	0.268	0.837	2.660	0.86	0.719	0.303	1.441	2.887
0.27	0.1711	0.157	0.2212	1.862	0.57	0.4620	0.270	0.858	2.673	0.87	0.725	0.302	1.450	2.880
0.28	0.1800	0.161	0.2367	1.893	0.58	0.4720	0.273	0.883	2.693	0.88	0.732	0.301	1.461	2.874
0.29	0.1890	0.166	0.2536	1.932	0.59	0.4820	0.275	0.906	2.706	0.89	0.738	0.299	1.466	2.861
0.30	0.1982	0.171	0.2713	1.971	0.60	0.4920	0.278	0.934	2.733	0.90	0.745	0.298	1.477	2.855

Where: $Q = VA$

$$Q = \frac{(1.486)(r^{2/3})(s^{1/2})(A)}{n}$$

$$Q = \frac{(1.486)(Cr*D)(s^{1/2})(Ca*D^2)}{n}$$

V = Velocity

A = Area

r = Hydraulic Radius

Ca = Area Coefficient (King's)

Cr = Circ. Pipe Hydraulic Radius Coefficient (King's)

Avg Flow

Peak Flow

Appendix IS-10

Energy Calculations

100 E. Ocean
Energy Analysis Spreadsheets

- Appendix : Energy Analysis
    - Energy Consumption Summary
    - Construction Energy Usage
        - Off-Road Equipment
        - Electricity Usage
        - On-Road Fuel Usage Rates
        - On-Road Vehicles
        - Construction Water Usage
    - Operational Energy Usage
        - On-Road Fuel Usage Rates
        - Future Operations without Project Design Features
        - Future Operations
        - Peak Electricity Demand Calculations

100 East Ocean - Energy Calculations

Summary of Energy Use During Construction

	Project	
Electricty		
Water Consumption	1,284	kWh
Temporary Power (lighting, tools)	66,730	kWh
Total:	**68,013**	kWh
Gasoline		
On Road	66,778	Gallons
Off Road	0	
Total:	**66,778**	Gallons
Diesel		
On Road	47,319	Gallons
Off Road	28,865	Gallons
Total:	**76,184**	Gallons

Summary of Energy Use During Operations

	Baseline (Buildout)	Project Buildout no PDFs	Project with PDFs and Project Characteristics		Percent Reduction from Project Buildout no PDFs
Electricity					
Electricity (building)	0	4,813,637	4,490,141	kWh/year	-7%
Electricity (water)	0	243,506	199,937	kWh/year	-18%
Electricity Total	0	5,057,143	4,690,078	kWh/year	-7%
Natural Gas	0	15,818,630	15,818,630	cu ft/year	0%
Mobile					
Gasoline	0	656,570	218,310	Gallons/year	-67%
Diesel	0	41,800	13,899	Gallons/year	-67%

Calculation of Diesel Usage During Cosnstruciton (Offroad Equipment):

Phase Name	Off Road Equipment Type	Units	Hours	HP	Load Factor	Avg. Daily Factor	Number of Days	Diesel Fuel Usage
Demolition	Concrete/Industrial Saws	1	8	81	0.73	0.6	25	354.78
Demolition	Crushing/Proc. Equipment	1	8	85	0.78	0.6	25	397.8
Demolition	Excavators	0	8	158	0.38	0.6	25	0
Demolition	Rubber Tired Dozers	1	8	247	0.4	0.6	25	592.8
Demolition	Tractors/Loaders/Backhoes	1	8	97	0.37	0.6	25	215.34
Grading	Bore/Drill Rigs	1	8	221	0.5	0.6	20	530.4
Grading	Cranes	1	8	231	0.29	0.6	20	321.552
Grading	Excavators	1	8	158	0.38	0.6	20	288.192
Grading	Graders	0	8	187	0.41	0.6	20	0
Grading	Rubber Tired Dozers	0	8	247	0.4	0.6	20	0
Grading	Rubber Tired Loaders	2	8	203	0.36	0.6	20	701.568
Grading	Tractors/Loaders/Backhoes	0	8	97	0.37	0.6	20	0
Grading	Welders	1	8	46	0.45	0.6	20	99.36
Mat Foundation	Cement and Mortar Mixers	4	8	9	0.56	0.6	3	14.5152
Mat Foundation	Cranes	0	7	231	0.29	0.6	3	0
Mat Foundation	Forklifts	0	8	89	0.2	0.6	3	0
Mat Foundation	Generator Sets	0	8	84	0.74	0.6	3	0
Mat Foundation	Pumps	4	8	84	0.74	0.6	3	179.0208
Mat Foundation	Tractors/Loaders/Backhoes	0	7	97	0.37	0.6	3	0
Mat Foundation	Welders	0	8	46	0.45	0.6	3	0
Mat Foundation	Welders	1	8	46	0.45	0.6	3	14.904
Parking and Podium	Aerial Lifts	1	8	63	0.31	0.6	46	215.6112
Parking and Podium	Cranes	0	7	231	0.29	0.6	46	0
Parking and Podium	Forklifts	0	8	89	0.2	0.6	46	0
Parking and Podium	Generator Sets	0	8	84	0.74	0.6	46	0
Parking and Podium	Pumps	2	8	84	0.74	0.6	46	1372.4928
Parking and Podium	Tractors/Loaders/Backhoes	1	8	97	0.37	0.6	46	396.2256
Parking and Podium	Welders	1	8	46	0.45	0.6	46	228.528
Building Construction (She	Aerial Lifts	2	8	63	0.31	0.6	451	4227.8544
Building Construction (She	Cranes	0	7	231	0.29	0.6	451	0
Building Construction (She	Forklifts	2	8	89	0.2	0.6	451	3853.344
Building Construction (She	Generator Sets	0	8	84	0.74	0.6	451	0
Building Construction (She	Tractors/Loaders/Backhoes	1	8	97	0.37	0.6	451	3884.7336
Building Construction (She	Welders	2	8	46	0.45	0.6	451	4481.136
Building Construction (Fini	Aerial Lifts	1	8	63	0.31	0.6	211	988.9992
Building Construction (Fini	Air Compressors	1	8	78	0.48	0.6	211	1895.9616
Building Construction (Fini	Cranes	0	7	231	0.29	0.6	211	0
Building Construction (Fini	Forklifts	1	8	89	0.2	0.6	211	901.392
Building Construction (Fini	Generator Sets	0	8	84	0.74	0.6	211	0
Building Construction (Fini	Tractors/Loaders/Backhoes	0	7	97	0.37	0.6	211	0
Building Construction (Fini	Welders	1	8	46	0.45	0.6	211	1048.248
Architectural Coating	Air Compressors	1	6	78	0.48	0.6	109	734.5728
Paving	Cement and Mortar Mixers	0	6	9	0.56	0.6	66	0
Paving	Pavers	0	8	130	0.42	0.6	66	0
Paving	Paving Equipment	1	6	132	0.36	0.6	66	564.5376
Paving	Rollers	1	6	80	0.38	0.6	66	361.152
Paving	Tractors/Loaders/Backhoes	0	8	97	0.37	0.6	66	0
					Total Diesel Usage for Construction (Offroad Equipment):			**28,865 gallons of diesel fuel**

gallons of diesel fuel per horsepower-hour= 0.05

Notes: Equipment assumptions are provide in the CalEEMod output files and fuel usage estimate of 0.05 gallons of diesel fuel per horsepower-hour is from the SCAQMD CEQA Air Quality Handbook, Table A9-3E.

Construction Electricity Usage

Caterpillar 40-C4.4 Generator[a]

Peak Power Rating - Prime (kW)	36
Typical Load	70%
Average Output (kW)	25.2
Hours per Day	4
Average Daily Output (kWh)	100.8
Building Construction Phase Duration (days)	662
Total Construction (kWh)	66,730
Total Construction (MWh)	66.7

[a]https://www.albancat.com/content/uploads/2014/06/40-C4.4-Spec-Sheet.pdf

EMFAC2014 Emissions Inventory
Region Type: Air Basin
Region: South Coast
Calendar Year: 2019
Season: Annual
Vehicle Classification: EMFAC2011 Categories

Region	Veh_Class	Fuel	Speed (miles/hr)	Population (vehicles)	VMT (miles/day)	Trips (trips/day)	Fuel_Gas (1000 gallons/day)	Fuel_DSL (1000 gallons/day)	Miles per Gallon
South Coast	LDA	GAS	Aggregate	5980840.2	208813623	37720472.98	7773.185747	0	26.9
South Coast	LDT1	GAS	Aggregate	511602.26	17332147.22	3105638.035	765.2237958	0	22.6
South Coast	LDT2	GAS	Aggregate	2084013.16	78122888.55	13175061.38	3885.932485	0	20.1
							Construction Worker Trip (Composite LDA/LDT1/LDT2):		**24.1**
South Coast	T7 tractor cnstruction	DSL	Aggregate	3252.62213	288234.1261	0	47.91762982	49.06718655	**5.9**

Notes: Consistent with CalEEMod, a construction worker trip is assumed to be a composite of 50% LDA , 25% for LDT1, and 25% for LDT2. Used EMFAC 2011 Categories for construciton as EMFAC2011 has specific categories for vehicle class T7.

Calculation of Gasoline and Diesel Usage During Construction (Onroad Vehicles):

Phase Name	Daily Woker Trips	Daily Vendor Trips	Days	Total Worker Trips	Total Vendor Trips	Total Haul Trips	Trip Length (miles)			Total Length (miles)			Avg. Daily Factor	Gallons of Fuel	
							Worker	Vendor	Haul	Worker	Vendor	Haul	(worker and vendor)	Gasoline	Diesel
Demolition	10	0	25	250	0	1250	14.7	6.9	70	3675	0	87500	0.6	91.41748	14895.46
Grading	13	0	20	260	0	2000	14.7	6.9	70	3822	0	140000	0.6	95.07418	23832.73
Mat Foundation	248	290	3	744	870	0	14.7	13.8	20	10936.8	12006	0	0.6	272.0584	1226.296
Parking and Podium	248	50	46	11408	2300	0	14.7	6.9	20	167697.6	15870	0	0.6	4171.562	1620.966
Building Construction (Shell)	248	15	451	111848	6765	0	14.7	6.9	20	1644166	46678.5	0	0.6	40899.45	4767.755
Building Construction (Finishing)	248	5	211	52328	1055	0	14.7	6.9	20	769221.6	7279.5	0	0.6	19134.78	743.5301
Architectural Coating	50	0	109	5450	0	0	14.7	6.9	20	80115	0	0	0.6	1992.901	0
Paving	5	5	66	330	330	0	14.7	6.9	20	4851	2277	0	0.6	120.6711	232.5734
													Total:	**66,778**	**47,319**

Worker Miles per gallon=	24.12	gasoline
Vedor/Haul miles per gallon=	5.87	diesel

Notes: Consistent with CalEEMod worker vehicles are assumed to be gasoline and 50% LDA, 25%LDT1, and 25% LDT2. Vendor and haul trips are assumed to be 100% diesel Heavy Duty Trucks (T7)

Water Usage for Control of Fugitive Dust during Construction:

Phase	Days	Average Daily Acerage Distrubed	Gallons Per Year	Electricity (kWhr)
Demolition	25	0	0	0
Grading	20	1.36	82,144	799
Mat Foundation	3	0	0	0
Parking and Podium	46	0	0	0
Building Construction (Shell)	451	0	0	0
Building Construction (Finishing)	211	0	0	0
Architectural Coating	109	0	0	0
Paving	66	0.3	49,830	485
		Total:	**131,974**	**1,284**

Water application rate=	3020	gal/acre/day
kWhr equivalent=	0.01	kWhr

Notes: 1) Gallons per year of water usage for dust control is calculated based on a minimum control efficiency of 66% (three times daily) with an application rate of 3,020 gal/acre/day (Air & Waste Management Association Air Pollution Engineering Manual (1992 Edition)) and average of 26 construction days per month.
2) CalEEMod Default: Each gallon of delivered potable water in Southern California is associated with 0.009727 kWhr of electricity).

EMFAC2014 Emissions Inventory
Region Type: Air Basin
Region: South Coast
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC2007 Categories

Region	CalYr	Season	Veh_Class	Fuel	MdYr	Speed (miles/hr)	Population (vehicles)	VMT (miles/day)	Trips (trips/day)	Fuel_Gas (1000 gallons/day)	Fuel_DSL (1000 gallons/day)
South Coast	0	Annual	LDA	GAS	Aggregated	Aggregated	5983324.08	203406334.5	37758498	8962.552247	0
South Coast	0	Annual	LDA	DSL	Aggregated	Aggregated	20560.2331	653396.714	126492.48	0	21.01725148
South Coast	0	Annual	LDT1	GAS	Aggregated	Aggregated	704120.722	23959701.08	4257214.1	1219.237627	0
South Coast	0	Annual	LDT1	DSL	Aggregated	Aggregated	1020.64914	34758.83358	5902.6782	0	1.140927592
South Coast	0	Annual	LDT2	GAS	Aggregated	Aggregated	1998564.65	72973317.94	12574608	4353.005354	0
South Coast	0	Annual	LDT2	DSL	Aggregated	Aggregated	954.606624	33837.39521	5897.1354	0	1.098922828
South Coast	0	Annual	LHD1	GAS	Aggregated	Aggregated	306736.83	13172356.63	4569921.4	984.8986766	0
South Coast	0	Annual	LHD1	DSL	Aggregated	Aggregated	98644.7586	4084184.142	1240826.9	0	212.3005495
South Coast	0	Annual	LHD2	GAS	Aggregated	Aggregated	31916.6357	1380051.408	475510.3	103.4048579	0
South Coast	0	Annual	LHD2	DSL	Aggregated	Aggregated	32633.9088	1332547.957	410493.49	0	69.35604242
South Coast	0	Annual	MCY	GAS	Aggregated	Aggregated	238796.046	1746303.041	477544.32	44.04302905	0
South Coast	0	Annual	MDV	GAS	Aggregated	Aggregated	1666722.55	56233095.91	10285786	4277.205001	0
South Coast	0	Annual	MDV	DSL	Aggregated	Aggregated	1685.6707	57417.81391	10215.064	0	1.856437771
South Coast	0	Annual	MH	GAS	Aggregated	Aggregated	66982.0158	758744.7362	6700.8808	53.05277536	0
South Coast	0	Annual	MH	DSL	Aggregated	Aggregated	11760.4939	128008.6648	1176.0494	0	14.2877918
South Coast	0	Annual	OBUS	GAS	Aggregated	Aggregated	7310.31532	274984.626	333849.4	21.94764195	0
South Coast	0	Annual	OBUS	DSL	Aggregated	Aggregated	6316.4082	510924.915	0	0	74.24454754
South Coast	0	Annual	SBUS	GAS	Aggregated	Aggregated	1639.46389	58906.75244	6557.8553	5.38281272	0
South Coast	0	Annual	SBUS	DSL	Aggregated	Aggregated	4756.29946	171589.1691	0	0	23.78263689
South Coast	0	Annual	T6	GAS	Aggregated	Aggregated	25351.7693	1213525.712	507238.2	91.68377716	0
South Coast	0	Annual	T6	DSL	Aggregated	Aggregated	88850.1522	5323590.354	0	0	592.7846956
South Coast	0	Annual	T7	GAS	Aggregated	Aggregated	1715.48341	230951.3207	34323.394	18.14702494	0
South Coast	0	Annual	T7	DSL	Aggregated	Aggregated	87795.947	13172387.8	0	0	2357.794852
South Coast	0	Annual	UBUS	GAS	Aggregated	Aggregated	1912.83348	205370.7536	7651.3339	18.70519393	0
South Coast	0	Annual	UBUS	DSL	Aggregated	Aggregated	7466.92761	800350.4525	29867.709	0	196.6841245

					MPG	Gallons Per Mile
Totals	401,916,638.60		20,153.27	3,566.35	**16.9**	0.06
Total (GAS)	375,613,644.40	0.93			**18.6**	0.05
Total (DSL)	26,302,994.21	0.07			**7.375**	0.14

100 East Ocean - Project Buildout with no PDFs
Los Angeles-South Coast County, Annual

Land Use Details

Land Uses	*Size*	*Metric*	*Lot Acreage*	*Floor Surface Area*	*Population*
Enclosed Parking with Elevator	151.00	Space	0.85	40,593.00	0
Hotel	429.00	Room	14.30	446,123.00	0
Quality Restaurant	23.51	1000sqft	0.54	23,152.00	0
Racquet Club	26.85	1000sqft	0.62	26,847.00	0

Trip Summary Information

Land Uses	*Average Daily Trip Rate*			*Unmitigated*
	Weekday	*Saturday*	*Sunday*	
Enclosed Parking with Elevator	0.00	0.00	0.00	0
Hotel	3,586.44	3,595.02	2,612.61	8,228,823
Quality Restaurant	2,637.82	2,767.13	2,116.14	3,675,485
Racquet Club	0.00	0.00	0.00	0
Total	6,224.26	6,362.15	4,728.75	11,904,308

Unmitigated Gasoline and Diesel Usage

	Gasoline	*Diesel*
Miles/Gallon	16.9	18.6
% Fleet Mix	93.5%	6.5%
Total (Gallons):	**656,570**	**41,800**

Energy by Land Use - Natural Gas (Unmitigated)

Land Uses	*kBTU/yr*	cu ft/year
Enclosed Parking with Elevator	0	0
Hotel	10,698,000	10,188,571
Quality Restaurant	5,425,630	5,167,267
Racquet Club	485,931	462,791
Total	16,609,561	**15,818,630**

Energy by Land Use - Electricity (Unmitigated)

Land Uses	*kWH/yr*
Enclosed Parking with Elevator	96,205
Hotel	3,381,610
Quality Restaurant	1,037,820
Racquet Club	298,002
Total	**4,813,637**

Water Detail (Unmitigated)

Land Uses	*Indoor Use (Mgal)*	*Outdoor Use (Mgal)*	*Electricity Use (kWh/yr)*
Enclosed Parking with Elevator	0.00	0.00	0
Hotel	10.88	1.21	132,675
Quality Restaurant	7.14	0.46	83,720
Racquet Club	1.59	0.97	27,111
Total	19.61	2.64	243,506

Notes: Indoor water results in 0.0111 kWhr of electricity usage per gallon from delivery, treatment, and distribution of water within Southern California (CalEEMod). Outdoor water results in 0.009727 kWhr of electricity usage per gallon from delivery and distribution of water within Southern California (CalEEMod).

100 East Ocean - Project Operations
Los Angeles-South Coast County, Annual

Land Use Details

Land Uses	*Size*	*Metric*	*Lot Acreage*	*Floor Surface Area*	*Population*
Enclosed Parking with Elevator	151	Space	0.85	40,593.00	0
Hotel	429	Room	14.3	446,123.00	0
Quality Restaurant	23.51	1000sqft	0.54	23,152.00	0
Racquet Club	26.85	1000sqft	0.62	26,847.00	0

Trip Summary Information

Land Uses	*Average Daily Trip Rate*			*Mitigated*
	Weekday	*Saturday*	*Sunday*	
Enclosed Parking with Elevator	0.00	0.00	0.00	0
Hotel	3,586.44	3,595.02	2,612.61	0
Quality Restaurant	2,637.82	2,767.13	2,116.14	2,736,084
Racquet Club	0.00	0.00	0.00	1,222,099
Total	6,224.26	6,362.15	4,728.75	3,958,183

Mitigated Gasoline and Diesel Usage

	Gasoline	*Diesel*
Miles/Gallon	16.9	18.6
% Fleet Mix	93.5%	6.5%
Total (Gallons):	**218,310**	**13,899**

Energy by Land Use - Natural Gas (Mitigated)

Land Uses	*kBTU/yr*	cu ft/year
Enclosed Parking with Elevator	0	0
Hotel	10,698,000	10,188,571
Quality Restaurant	5,425,630	5,167,267
Racquet Club	485,931	462,791
Total	16,609,561	**15,818,630**

Energy by Land Use - Electricity (Mitigated)

Land Uses	*kWH/yr*
Enclosed Parking with Elevator	78,446
Hotel	3,142,940
Quality Restaurant	991,560
Racquet Club	277,195
Total	**4,490,141**

Water Detail (Unmitigated)

Land Uses	*Indoor Use (Mgal)*	*Outdoor Use (Mgal)*	*Electricity Use (kWh/yr)*
Enclosed Parking with Elevator	0.00	0.00	0
Hotel	8.71	1.21	108,492
Quality Restaurant	5.71	0.46	67,862
Racquet Club	1.27	0.97	23,582
Total	15.69	0.97	**199,937**

Notes: Indoor water results in 0.0111 kWhr of electricity usage per gallon from delivery, treatment, and distribution of water within Southern California (CalEEMod). Outdoor water results in 0.009727 kWhr of electricity usage per gallon from delivery and distribution of water within Southern California (CalEEMod).

Peak Electricity Demand Calculations

Electrical Load Factor Equation	
Load Factor (%)[1]	52%

Project Electricity Demand (Operational)	
Annual Demand	
Building (MWh)	4,490
Water (MWh)	200
Total (MWh)	4,690
Average Daily Demand	
Building (kWh)	12,302
Water (kWh)	548
Total (kWh)	12,850
Average Load	
Building (kW)	513
Water (kW)	23
Total (kW)	535

Peak Load Calculation	
Peak Load (kW)	1,009
Systemwide Peak Load (MWh)	5,854
Percent of Peak	0.017%

[1]2017 Report: System Efficiency of California's Electric Grid. California Public Utilities Commission. 2017. Page 11, Figure 6. Visual estimate.

Appendix IS-11

Utility Memoranda

ROSENDIN ELECTRIC

CA License: 142881

1730 South Anaheim Way
Anaheim, CA 92805
T: 657.276.0600
F: 657.276.0781
www.rosendin.com
LEAD. INSPIRE. BUILD.

Date: June 1, 2018
To: Ashley Rogers, Principal Planner
From: Mark Allen, Rosendin Electric

Subject: Electrical Service for 100 E. Ocean, Long Beach, CA 90802

Technical Memo

Electrical Service:

Electrical service for the area surrounding the project area is provided by Southern California Edison (SCE). Records indicate that there are existing electrical duct banks within Pine Avenue and Seaside Way. It is anticipated that the proposed development will require 6,000 KVA. The proposed electrical service will provided from a connection to the existing manhole in Pine Avenue or Seaside Way. There are other existing utilities within the surrounding streets; however electrical service can go over or under existing utilities; therefore utility conflicts are not anticipated. A will serve letter from SCE was received for the project which would indicate that capacity issues are not anticipated for this project. Please find the will serve letter in Attachment A.

Date: May 30, 2018
To: Ashley Rogers, Principal Planner
From: Jose Hernandez

Subject: Natural Gas Service for 100 E. Ocean, Long Beach, CA 90802

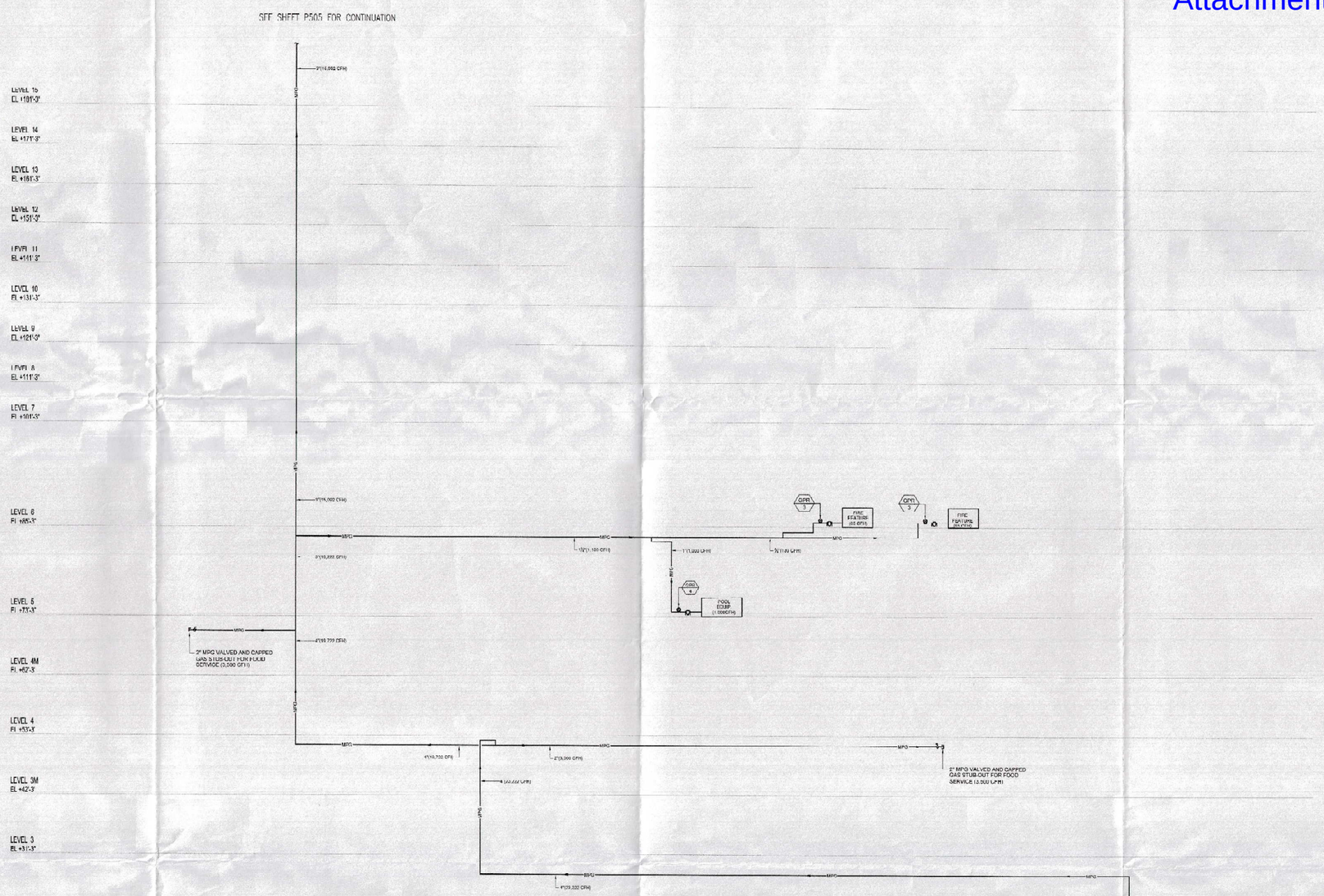
Technical Memo

The following information was compiled in coordination and communication with Pan-Pacific Mechanical:

Natural Gas Service:

Natural gas is provided throughout the City of Long Beach by the Long Beach Department of Gas & Oil. Records indicate that there are existing gas mains within Pine Avenue and Seaside Way. The gas line in Pine Avenue is a 3-inch line and the gas line in Seaside Way is 6-inch. It is anticipated that the proposed development will require 23,222,000 btu. The proposed gas lateral for the development will be connected to the existing gas main in Seaside Way. There are other existing utilities within the surrounding streets; however the gas line is pressurized and utility conflicts are not anticipated. Capacity issues are not anticipated for this project. The proposed project has been presented and received preliminary approval from LBG&O. Please find the LBG&O approved plan in Attachment A. The project will serve letter has been requested and it is anticipated to be received in the next few weeks from the date shown hereon.

Attachment A



GAS METER & SERVICE LINE PROVIDED BY LONG BEACH GAS AND OIL. GAS LOAD AT FIVE PSI PRESSURE & TOTAL DEVELOPED LENGTH 1000 FEET

SPACE HEATING	=	5,997 CFH
WATER HEATING	=	5,400 CFH
COOKING	=	10,500 CFH
AMENITY SPACE	=	325 CFH
POOL HEATING	=	1,000 CFH
TOTAL	=	23,222 CFH

Approved for medium pressure gas supply at 5 psig (minimum)
Medium pressure house line(s) must be of all welded construction.
Long Beach Energy.
Date 5/25/12

GBD

GBD Architects, Incorporated
1120 NW Couch St.
Ste. 300
Portland, OR 97209
Tel (503) 224-0668
gbd@gbdarch.com
GBD 10

STAMP

PROJECT
100 E. OCEAN
100 E. OCEAN BOULEVARD
LONG BEACH, CA 90802

CLIENT
American Life, Inc.
100 E. OCEAN BOULEVARD
LONG BEACH, CA 90802

Notice of Extended Payment Provision: The contractor will allow the owner to make payment within 30 days after the date a billing or estimate is delivered. Notice of Alternate Billing Cycle: The contract will allow the owner to require the submission of billings or estimates in billing cycles other than 30-day cycles. Billings or estimates for the contract shall be submitted as follows: Each calendar month starting on the last day of the applicable month.

REVISIONS

DATE
Issue Date

PROJECT NUMBER
Project Number

SCALE
NONE

SHEET TITLE
NATURAL GAS RISER DIAGRAM

P504

10/04 LEED GN DEVELOPMENT

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10/26/2012 1:16:17 PM

FP/1 448

Appendix IS-12

Will Serve Letters

Will Serve Letter Only

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

05/10/2018

ROSENDIN ELECTRIC

100 E OCEAN BLVD

Your project is located in Southern California Edison (SCE) service territory. SCE will serve the above subject project's electrical requirements per the California Public Utilities Commission and Federal Energy Regulatory Commission tariffs.

SCE may need to conduct utility studies, where applicable, to assess whether additions or modifications to the existing electric infrastructure are required to serve this project. Where applicable, SCE has attached Appendix (B) which not only describes the study, and permitting, but includes a Project Information Sheet that will need to be completed by you and submitted to SCE if your project is at a point where SCE has to determine the required electrical utility work. This Will-Serve letter does not imply that either: (i) these studies have been completed, or (ii) that any required California Environmental Quality Act (CEQA) analysis of project-related electric utility impacts has been conducted.

I am the SCE Design Representative currently assigned to this project. SCE or Applicant will design and construct all required electrical infrastructure to serve this project provided you enter into the applicable contractual agreements with SCE identify scope of electrical utility work required, and supply the following information:

- Site plans as required
- Required contracts and agreements (fully executed)
- Applicable fees
- Local permits
- Required easement documents

Your project will be scheduled for construction once SCE has all the necessary information for your project and you have submitted or agreed to the applicable requirements as stated above, and paid any necessary fees.

If your project will not require SCE services, please notify us so that we can update our records.

SCE appreciates your business. If you have any questions, please feel free to call me at (562) 981-8245.

Sincerely,

TYLER TREFFRY

SCE Design Representative

Enclosure: Appendix B, where applicable

CITY OF
LONG BEACH
ENERGY RESOURCES

2400 EAST SPRING STREET • LONG BEACH, CA 90806
(562) 570-2000 • www.longbeach.gov

June 6, 2018

Mr. Steve Foley
SODO Builders LLC
270 South Hanford St, Suite 100
Seattle, WA 98134

Subject: Will Serve Letter for The Beacon Hotel at 100 E. Ocean Boulevard

Dear Mr. Foley:

This letter confirms that, upon completion of construction, natural gas hook up and services will be provided to the Beacon Hotel development site located in the vicinity of OCEAN BLVD & PINE AVE in Long Beach, California.

Since the City of Long Beach is the sole provider of natural gas within its city limits, gas service to this parcel is available, subject to the utility and development regulations in the City of Long Beach Municipal Code.

Please refer to the City of Long Beach, Gas & Oil Department website, http://www.longbeach.gov/lbgo/, for information on existing/new gas service standards and to access current gas rates and fee schedule.

Please feel free to contact me if you have any questions or concerns.

Sincerely,

Jane Hermsen, P.E.
Mechanical Engineer
jane.hermsen@longbeach.gov
(562) 570-2059