30% DRAINAGE STUDY
FOR
EAST HARBOR ISLAND PUBLIC INFRASTRUCTURE DEVELOPMENT

Job Number 19538-F

July 24, 2024

RICK

30% DRAINAGE STUDY

FOR

EAST HARBOR ISLAND PUBLIC INFRASTRUCTURE DEVELOPMENT

Job Number 19538-F

Venkat Gummadi, P.E.
R.C.E. #81958
Exp. 3/26

Prepared For:

Port of San Diego
3165 Pacific Highway
San Diego, California 92101
(619) 686-6200

Prepared By:

RICK – Water Resources Division
5620 Friars Road
San Diego, California 92110-2596
(619) 291-0707

July 24, 2024

TABLE OF CONTENTS

1.0 Introduction 1
2.0 Hydrology 4
3.0 Hydraulics 8
4.0 Conclusion 10

FIGURES:

Figure 1: Vicinity Map.....3

FIGURES:

Table 2.3-1: Summary of Hydrologic Results 5

Appendices:

Appendix A: Rational Methods Analyses (100-year, 6-hour)
Appendix B: WSPGW Hydraulic Analyses [Post-Development]
Appendix C: Project FEMA FIRMette

Map Pockets:

Map Pocket 1: Drainage Study Map for East Harbor Island [Post-Project]

1.0 INTRODUCTION

1.1 Project Description

This drainage report presents hydrologic and hydraulic analyses for the East Harbor Island Public Infrastructure project, herein referred to as “the project”. The project proponent is the Port of San Diego, and it is located in the City of San Diego, north of the East Basin of the San Diego Bay, at the intersection of North Harbor Drive and Harbor Island Drive. See Figure 1, Vicinity Map located at the end of Section 1.0.

The project site consists of approximately 23 acres, currently existing as of rental car facilities and the San Diego Harbor Police Department. The project area is within the Pueblo San Diego Watershed. Development for this project includes proposed roadway and infrastructure improvements for the proposed re-alignment of Liberator Way. North of Liberator Way, which will be superelevated to the south, there are three proposed pads. The project proposes the demolition of existing development and mass grading of these pads. The graded pads will be developed by others in the future. This 30% Drainage Study is intended to support the 30% improvement plans, titled “East Harbor Island Public Infrastructure Development” for the realignment of the existing Liberator Way, and the mass-grading of building pads for development.

1.2 Hydrology and Hydraulics

Hydrology and hydraulics are discussed in detail in Section 2.0 and 3.0 of this report.

1.3 Sea Level Rise Impacts

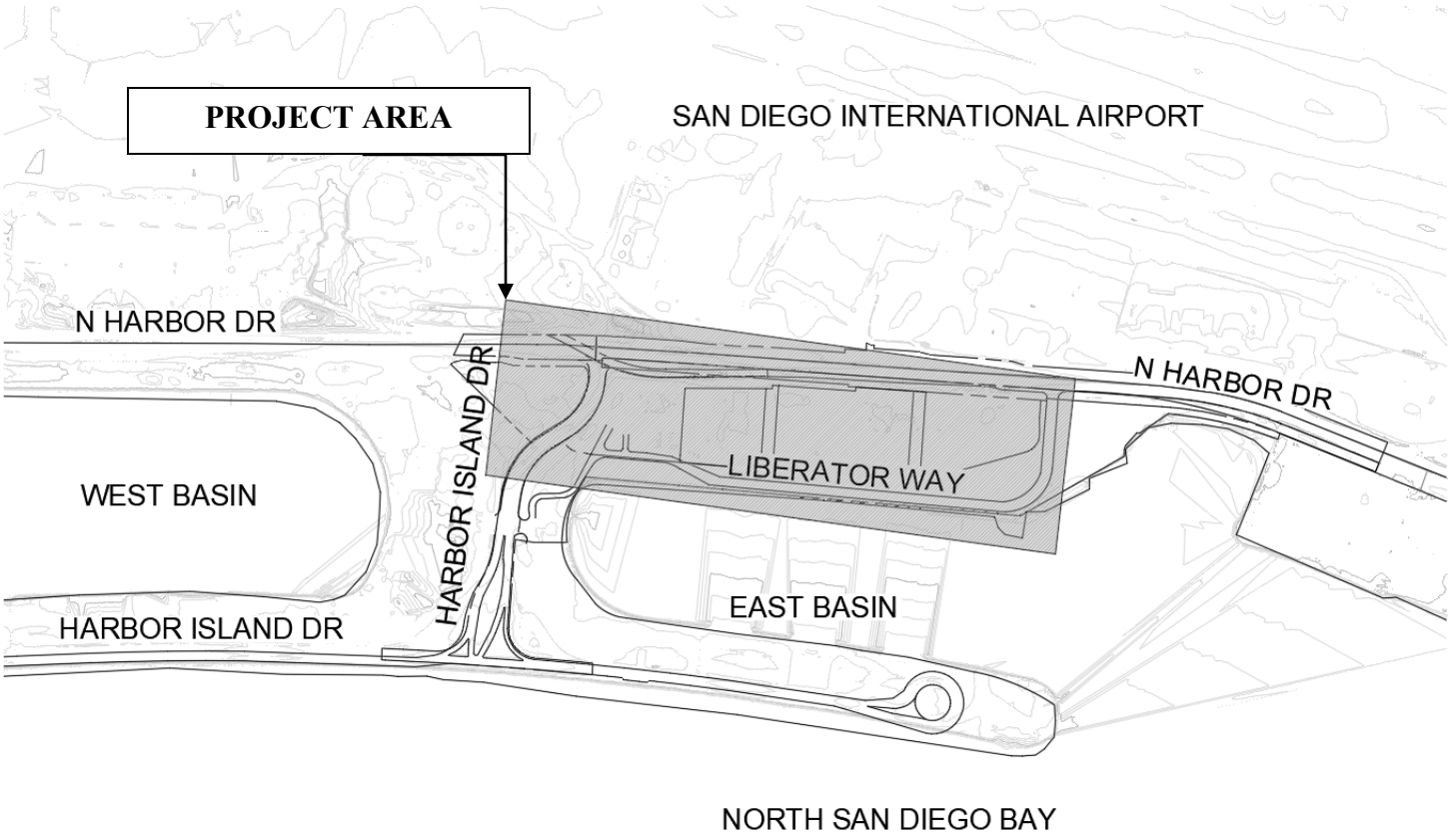
To determine the starting HGL for pipe flow analysis Table 3 of the document titled, “Sea-Level Rise Technical Memorandum”, dated May 31, 2024, was referenced. The projected sea level elevation rise by the year 2100 with a 5% probability of exceedance of 4.9 feet was utilized for design purposes. This is discussed in detail in Section 3.2 of this report.

1.4 Water Quality

Post-project storm water runoff will be treated per the Storm Water Standards Manual and will be discussed in the document titled, “Port of San Diego Stormwater Quality Management Plan for Priority Development Project (PDP) East Harbor Island Public Infrastructure Development”, dated July 24, 2024, or subsequent versions there-of, prepared by RICK (Job No. 19538-F). The post-project condition proposes Green Street Elements to provide water quality treatment for the proposed realignment of Liberator Way in accordance with the requirements of the Port of San Diego BMP Design Manual (2024). The project proposes biofiltration facilities along the south side of Liberator Way. The conceptual size of the biofiltration swales was determined by multiplying the effective drainage area by a 3% sizing factor.

Four sediment collection areas are proposed for the rough graded conditions of the pads and are anticipated to remain in place until further construction on the project site begins. Future development will be responsible for the design of permanent post-construction BMPs for the proposed pads. The project directly discharges to the San Diego Bay, therefore, the hydromodification management requirements are not applicable to this project and a Hydromodification Management Plan (HMP) analysis should not be required. Please refer to the previously mentioned PDP SWQMP for more detailed discussion about water quality.

Figure 1: Vicinity Map



NOT TO SCALE

NORTH

2.0 HYDROLOGY

Hydrologic conditions for the project area have been analyzed for post-development conditions (anticipating ultimate development by others of the graded pads within the project).

2.1 Methodology

Hydrologic methodology and criteria were utilized in accordance with the City of San Diego Drainage Design Manual, dated January 2017. The 100-year, 6-hour post-project condition flow rates have been computed using the Rational Method, Q=CIA. Runoff coefficients were determined using assumed future development land uses from the East Harbor Island Public Realm Design Manual (2021) and the Civitas East Harbor Island Conceptual Layout (2020).

2.2 Criteria

The hydrologic conditions were analyzed in accordance with the City of San Diego Drainage Design Manual, dated January 2017. The hydrologic criterion that has been utilized is summarized below:

Design Storm:	100-year, 6-hour
Runoff Coefficients*:	
0% Impervious	C = 0.35
100% Impervious	C = 0.95
Soil Type:	C
Rainfall Data:	4.4 inch/hour intensity from an assumed 5-minute time of concentration

* Weighted runoff coefficients were used where appropriate based on a percentage of 0.95 and 0.35. A runoff coefficient of 0.85 was used for the future pads, assuming the developed watershed will be up to 85% impervious.

2.3 Hydrologic Results

For the purpose of this report, the hydrology to each outfall location was determined for the post-development condition. The overall tributary acreage to the existing and proposed outfalls in the post-project condition is 24.5 acres, which includes approximately 1.5 acres of offsite run-on. Calculations are provided in Appendix A of this report. Refer to the post-project condition maps located in Map Pocket 1.

The hydrologic results are shown below in Table 2.3-1, followed by a description of the drainage conditions.

Table 2.3-1: Summary of Hydrologic Results

	Outfall	C	I (in/hr)	Area (acres)	Peak Flow Rate, Q_{100} (cfs[1])
Post-Project	Southwest	.47	4.4	8.4	17.4
	Northwest	.47	4.4	1.9	3.9
	Southeast	.47	4.4	12.8	26.5
	Northeast	.47	4.4	1.4	2.9
	Total			**24.5**	**50.7**
Post-Development [Ultimate Condition]	Southwest	.85	4.4	8.4	31.4
	Northwest	.85	4.4	1.9	7.1
	Southeast	.85	4.4	12.8	47.9
	Northeast	.85	4.4	1.4	5.2
	Total			**24.5**	**91.6**

Notes: 1. cfs = cubic feet per second

Pre-Project Condition

The proposed project is a re-development of the existing site and the analysis within the report focuses on the post-project condition. The existing land use consists of impervious industrial and commercial areas, including rental car facilities, the San Diego Harbor Police Department, and roadways. The existing urban drainage system consists of various storm drains conveying flows from north to south. There is a small portion of liberator way that does not drain south in the pre-project condition. Approximately 0.7 acres drain northeast to North Harbor Drive, and approximately 1.1 acres drain west to Harbor Island Drive (northwest outfall). There are approximately 1.5 acres of offsite run-on that sheet flow through the project. As depicted by the project demolition plans, the existing outfalls draining the pre-project condition are to be demolished and will not be utilized for the post-development condition.

Post-Project and Ultimate Condition

The following summarizes the hydrologic conditions for the post-project condition. The drainage characteristics in the post-project condition remain similar to the pre-project. It is anticipated that the offsite drainage will be similar in both the pre- and post-project condition and therefore will not impact the project site. There is a berm proposed around the graded pads, which will result in additional 0.7 acres (1.4 acres total) sheet flowing to North Harbor Drive and an additional 0.8 (1.9 acres total) acres sheet flowing to Harbor Island Drive. For the interim condition depicted by the 30% development plans, the northern development will be demolished and therefore, the pads will be fully pervious. The graded pads, which consist of approximately 15 acres, will be mass graded so that runoff will sheet flow towards four sediment collection areas for this interim condition. In this interim condition, the site will be approximately 20% impervious, with the only impervious features being Liberator Way.

This report analyzes the ultimate condition of the project for the design of the mainline storm drains and outfalls. The land use in the ultimate condition will include developed visitor-serving attraction areas consisting of impervious and pervious areas. In the ultimate condition, the entire site is assumed to be 85% impervious. The storm drain systems for the graded pads will be designed by others with future development. For this report, two major outfalls are proposed, in similar locations to several existing outfalls, which discharge to the East Basin of the San Diego Bay. There is a small portion of liberator way that does not drain south in the post-project

condition. Approximately 1.4 acres drain northeast to North Harbor Drive, and approximately 1.9 acres drain west to Harbor Island Drive (northwest outfall). These areas ultimately discharge to the East Basin of the San Diego Bay. When the pads are developed, storm drains will be designed to tie into these outfall pipes, thus the pipes are designed to convey flows for the whole developed site. The westerly portion of the site will sheet flow to a 30-inch reinforced concrete pipes (RCP) and a 24-inch RCP, which confluence in a 42-inch RCP outfall pipe to the southwest of the project. The easterly portion of the site will sheet flow to two 36-inch RCPs, which confluence in a 48-inch RCP outfall pipe to the southeast of the project.

3.0 HYDRAULICS

3.1 Hydraulic Methodology and Criteria

The hydraulic methodology and criteria for the project will utilize the City of San Diego Drainage Design Manual (January 2017) (DDM) for supplemental information.

In accordance with the DDM, the 100-year, 6-hour storm will be the typical design storm used for hydraulic design of the project. The hydraulics must also consider the tail water effects from the San Diego Bay; specifically including the starting hydraulic grade line (HGL) that should be used in the storm drain analyses. The following summarizes the methodology, criteria, and preliminary results specific to the starting HGL, pipe sizing, inlet sizing, and dry lane requirements for the project.

3.2 Initial Water Surface Elevation (WSEL) at San Diego Bay

To determine the starting HGL for pipe flow analysis on the vertical datum for the project, which is Mean Lower Low Water (MLLW), several different data sources are considered. The 100-year, base flood elevation (BFE) per the FEMA Flood Insurance Study (FIS) for San Diego County, revised May 16, 2012, is equal to 8' on the NAV88 datum for East Harbor Island. See Appendix C for reference. This BFE values converts to 8.71' on the MLLW datum. According to Table 3 of the document titled, "Sea-Level Rise Technical Memorandum", dated May 31, 2024, prepared for the Port of San Diego by Harris and Associates, the projected sea level elevation rise by the year 2100 with a 5% probability of exceedance is 4.9 feet. This value was selected for design purposes. The cumulative tailwater for the project is therefore 13.61' on the MLLW datum, calculated as the sum of the BFE and the projected SLR.

3.3 Pipe Sizing

The proposed peak flow rates determined using the Rational Method were used to determine the hydraulic grade lines (HGLs) for the proposed storm drain systems that will serve the project in the post-project condition. The post-development conditions were analyzed to ensure the HGLs are below the finished grade in the streets and pads for the 100-year, 6-hour storm event. In order to determine the required size of each outfall, the Water Surface Pressure Gradient for Windows (WSPGW) modeling software was used. The following addresses the design and results.

Pipe Flow Design

The storm drain system will be constructed of Reinforced Concrete (RCP) or equivalent. The Manning's roughness coefficient “n” used for the hydraulic calculations for RCP is 0.013.

Pipe Flow Results

The WSPGW computer outputs for post-development conditions are provided in Appendix B of this report. The WSPGW results were used to determine the storm drain sizes required to convey the 100-year, 6-hour peak flow rates. The resulting pipe sizes from these analyses are shown on the Improvement Plans for the project.

The proposed storm drain systems will flow under pressure and watertight joints will be used along each section of pipe where the HGL is more than 1-foot above the inside top of pipe elevation. The HGL is contained below the finished grade at the proposed inlet locations.

3.4 Inlet Sizing

The preliminary layout of inlets is reflected on the Improvement Plans and on the drainage study map provided in this report. The sizing of each inlet will be prepared during future final engineering of each street section, and locations of each inlet will also be adjusted based on revised vertical alignments (if necessary), and dry lane requirements will also be verified to confirm additional inlets are not required.

4.0 CONCLUSION

This 30% drainage study is intended to support the Improvement Plan, titled “East Harbor Island Public Infrastructure Development,” for the realignment of Liberator Way and the mass grading of surrounding development pads. The pads will be developed by others in the future. Therefore, hydrologic and hydraulic analyses have been prepared and presented herein to define overall drainage patterns and preliminary pipe sizes for the project in its ultimate, post-development condition. The post-development condition peak discharge rates were determined using the Rational Method based on the hydrologic methodology and criteria described in the City of San Diego Drainage Design Manual, dated January 2017.

The hydraulic design criteria for the project will follow the City of San Diego Drainage Design Manual, dated January 2017. The tail water effects of the San Diego Bay have been considered in the preliminary sizing of existing and proposed storm drain systems, including the 100-year water surface elevation for San Diego, and a sea level rise of 4.9-ft (Sea Level Rise Vulnerability Assessment & Coastal Resiliency Report). The 100-year, 6-hour post-project peak flow rates were determined to calculate the hydraulic grade lines (HGLs) for the proposed storm drain systems. The storm drain system is designed to convey flow while maintaining HGLs below the finished grade throughout the proposed streets and pads.

The results of the hydrologic and hydraulic analyses are included as appendices to this report and reflect the overall project. The drainage study map corresponding with the hydrologic and hydraulic results are also included as Map Pocket within this report.

APPENDIX A

Rational Method Analyses (100-year, 6-hour)

Pre-Project					
		C	I (in/hr)	A (ac)	Q (cfs)
South West		0.9	4.4	10.1	40.0
North West		0.9	4.4	1.1	4.4
South East		0.9	4.4	12.6	49.9
North East		0.9	4.4	0.7	2.8
SUM				**24.5**	**97.0**

Post-Project					
		C	I (in/hr)	A (ac)	Q (cfs)
South West		0.47	4.4	8.4	17.4
North West		0.47	4.4	1.9	3.9
South East		0.47	4.4	12.8	26.5
North East		0.47	4.4	1.4	2.9
SUM				**24.5**	**50.7**

Post-Development (Ultimate Condition)					
		C	I (in/hr)	A (ac)	Q (cfs)
South West		0.85	4.4	8.4	31.4
North West		0.85	4.4	1.9	7.1
South East		0.85	4.4	12.8	47.9
North East		0.85	4.4	1.4	5.2
SUM				**24.5**	**91.6**

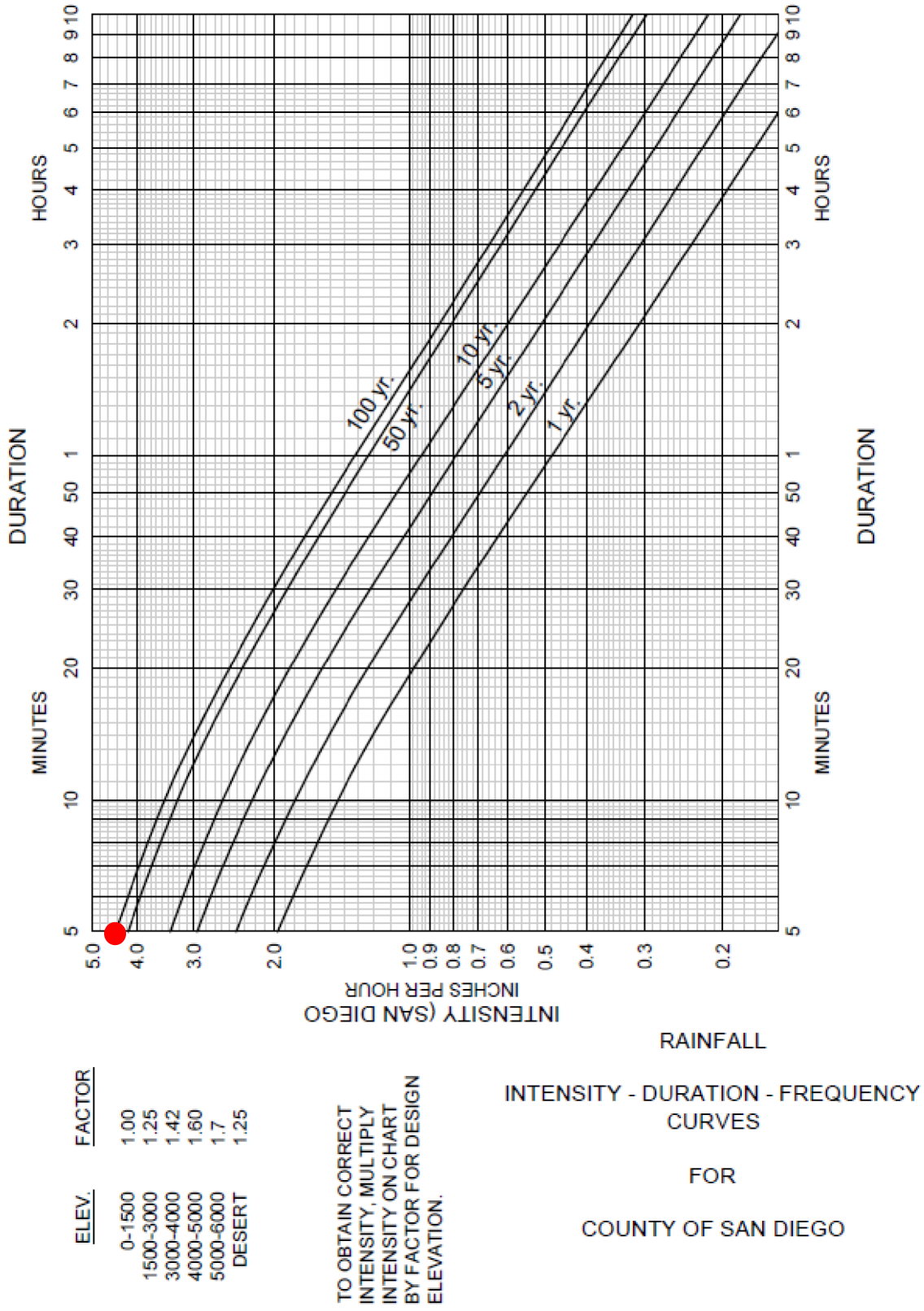


Figure A-1. Intensity-Duration-Frequency Design Chart

APPENDIX B

WSPGW Hydraulic Analyses
[Post-Development]

```
T1 J-19538-F, EAST HARBOR ISLAND
T2 100 YEAR, ULTIMATE CONDITION CAPACITY RUN
T3 WEST BASIN OUTFALL MAINLINE
SO   1000.      2.000  1                            13.61
R    1032.17    2.320  1      .013                                  0.000

JX   1036.17    2.320  1  4   .013    4.114             2.320        -90            0.000
R    1042.9     2.390  1      .013                                  0.000
JX   1046.9     2.390  1  2   .013   18.700             2.390        -24            0.000
R    1128.61    3.210  3      .013                                 24.000
SH   1128.61    3.210  3                             3.210
CD   1  4   0    .000   4.000     .000  .000  .000   .00
CD   2  4   0    .000   2.500     .000  .000  .000   .00
CD   3  4   0    .000   2.000     .000  .000  .000   .00
CD   4  4   0    .000   1.500     .000  .000  .000   .00
Q             8.602
```

Program Package Serial Number: 7077

WATER SURFACE PROFILE LISTING Date: 7-22-2024 Time: 2: 9: 7

J-19538-F, EAST HARBOR ISLAND
100 YEAR, ULTIMATE CONDITION CAPACITY RUN
WEST BASIN OUTFALL MAINLINE

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2.000	11.610	13.610	31.42	2.50	.10	13.71	.00	1.66	.00	4.000	.000	.00	0 .0
32.170	.0099					.0005	.02	11.61	.00	1.27	.013	.00	.00	PIPE
1032.170	2.320	11.305	13.625	31.42	2.50	.10	13.72	.00	1.66	.00	4.000	.000	.00	0 .0
JUNCT STR	.0000					.0004	.00	11.31	.00		.013	.00	.00	PIPE
1036.170	2.320	11.331	13.651	27.30	2.17	.07	13.72	.00	1.55	.00	4.000	.000	.00	0 .0
6.730	.0104					.0004	.00	11.33	.00	1.17	.013	.00	.00	PIPE
1042.900	2.390	11.264	13.654	27.30	2.17	.07	13.73	.00	1.55	.00	4.000	.000	.00	0 .0
JUNCT STR	.0000					.0002	.00	.00	.00		.013	.00	.00	PIPE
1046.900	2.390	11.330	13.720	8.60	2.74	.12	13.84	.00	1.05	.00	2.000	.000	.00	0 .0
81.710	.0100					.0014	.12	.00	.00	.85	.013	.00	.00	PIPE
1128.610	3.210	10.641	13.851	8.60	2.74	.12	13.97	.00	1.05	.00	2.000	.000	.00	0 .0

```
T1 J-19538-F, EAST HARBOR ISLAND
T2 100 YEAR, ULTIMATE CONDITION CAPACITY RUN
T3 WEST BASIN OUTFALL LATERAL
SO   1000.      2.390  1                            13.654
R    1075.95    3.150  1      .013                                  0.000

SH   1075.95    3.150  1                             3.150
CD   1  4   0    .000   2.500     .000  .000  .000   .00
Q            13.09   .0
```

Program Package Serial Number: 7077

WATER SURFACE PROFILE LISTING Date: 7-22-2024 Time: 2:29: 0

J-19538-F, EAST HARBOR ISLAND
100 YEAR, ULTIMATE CONDITION CAPACITY RUN
WEST BASIN OUTFALL LATERAL

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2.390	11.264	13.654	13.09	2.67	.11	13.76	.00	1.22	.00	2.500	.000	.00	0 .0
75.950	.0100					.0010	.08	11.26	.00	.97	.013	.00	.00	PIPE
1075.950	3.150	10.581	13.731	13.09	2.67	.11	13.84	.00	1.22	.00	2.500	.000	.00	0 .0

```
T1 J-19538-F, EAST HARBOR ISLAND
T2 100 YEAR, ULTIMATE CONDITION CAPACITY RUN
T3 EAST BASIN OUTFALL MAINLINE
SO   1000.      2.000  1                           13.61
R    1030.98    2.310  1      .013                                  0.000

JX   1034.98    2.310  1  4   .013    9.724            2.310        -90            0.000
R    1057.32    2.550  1      .013                                  0.000
JX   1061.32    2.550  1  2   .013   21.320            2.550        -41            0.000
R    1147.24    3.410  2      .013                                 14.000
SH   1147.24    3.410  2                             3.410
CD   1  4   0    .000   4.000     .000  .000  .000   .00
CD   2  4   0    .000   3.000     .000  .000  .000   .00
CD   3  4   0    .000   2.500     .000  .000  .000   .00
CD   4  4   0    .000   1.500     .000  .000  .000   .00
Q            16.830
```

Program Package Serial Number: 7077

WATER SURFACE PROFILE LISTING Date: 7-22-2024 Time: 2:45:10

J-19538-F, EAST HARBOR ISLAND
100 YEAR, ULTIMATE CONDITION CAPACITY RUN
EAST BASIN OUTFALL MAINLINE

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2.000	11.610	13.610	47.87	3.81	.23	13.84	.00	2.07	.00	4.000	.000	.00	0 .0
30.980	.0100					.0011	.03	11.61	.00	1.59	.013	.00	.00	PIPE
1030.980	2.310	11.334	13.644	47.87	3.81	.23	13.87	.00	2.07	.00	4.000	.000	.00	0 .0
JUNCT STR	.0000					.0009	.00	11.33	.00		.013	.00	.00	PIPE
1034.980	2.310	11.372	13.682	38.15	3.04	.14	13.83	.00	1.84	.00	4.000	.000	.00	0 .0
22.340	.0107					.0007	.02	11.37	.00	1.38	.013	.00	.00	PIPE
1057.320	2.550	11.148	13.698	38.15	3.04	.14	13.84	.00	1.84	.00	4.000	.000	.00	0 .0
JUNCT STR	.0000					.0004	.00	.00	.00		.013	.00	.00	PIPE
1061.320	2.550	11.221	13.771	16.83	2.38	.09	13.86	.00	1.31	.00	3.000	.000	.00	0 .0
85.920	.0100					.0006	.05	.00	.00	1.03	.013	.00	.00	PIPE
1147.240	3.410	10.423	13.833	16.83	2.38	.09	13.92	.00	1.31	.00	3.000	.000	.00	0 .0

```
T1 J-19538-F, EAST HARBOR ISLAND
T2 100 YEAR, ULTIMATE CONDITION CAPACITY RUN
T3 EAST BASIN OUTFALL LATERAL
SO   1000.      2.550  1                            13.698
R    1087.95    3.430  1      .013                                  0.000

SH   1087.95    3.430  1                             3.430
CD   1  4   0    .000   3.000     .000  .000  .000   .00
Q            17.58   .0
```

Program Package Serial Number: 7077

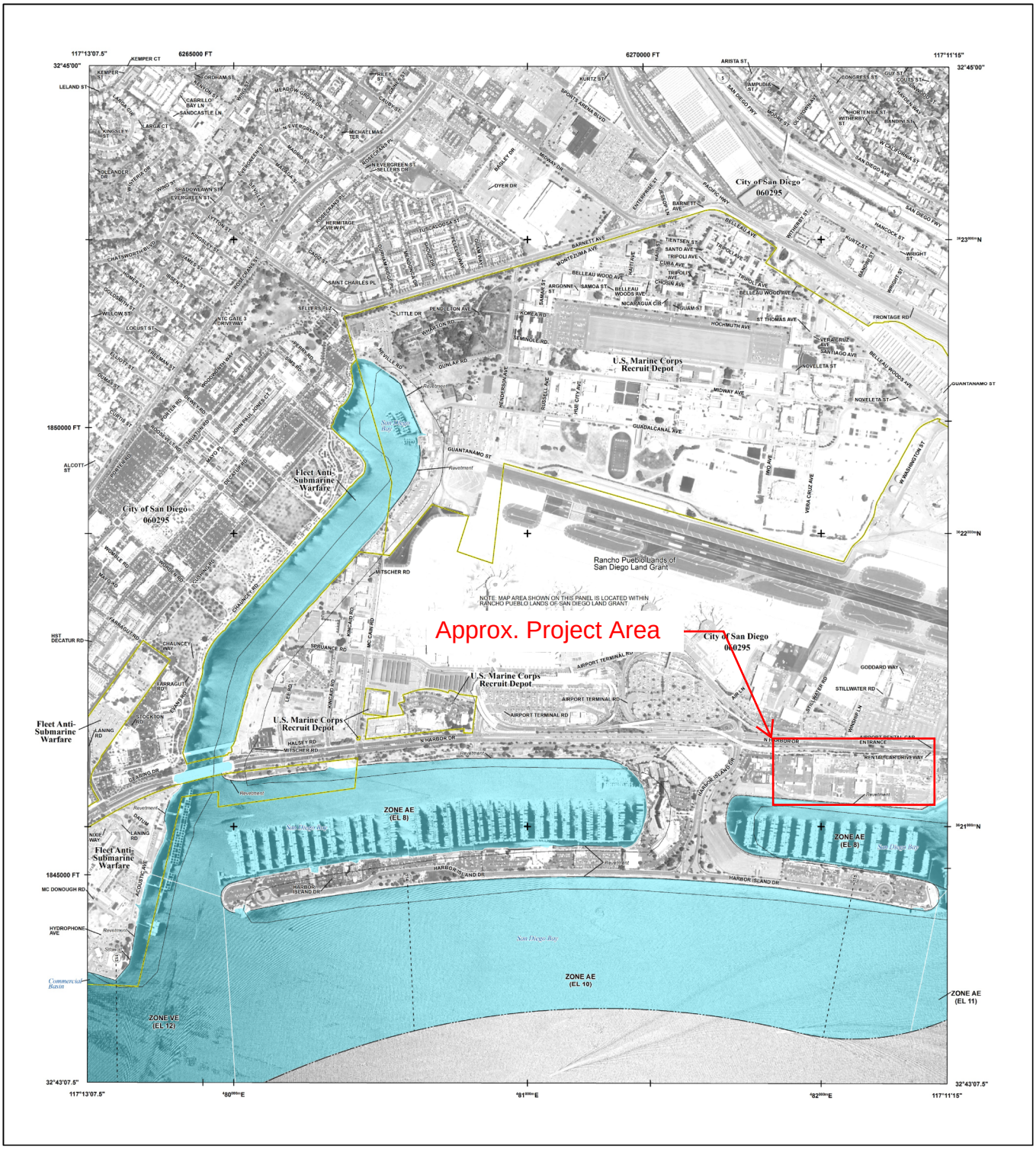
WATER SURFACE PROFILE LISTING Date: 7-22-2024 Time: 2:47: 5

J-19538-F, EAST HARBOR ISLAND
100 YEAR, ULTIMATE CONDITION CAPACITY RUN
EAST BASIN OUTFALL LATERAL

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2.550	11.148	13.698	17.58	2.49	.10	13.79	.00	1.34	.00	3.000	.000	.00	0 .0
87.950	.0100					.0007	.06	11.15	.00	1.05	.013	.00	.00	PIPE
1087.950	3.430	10.329	13.759	17.58	2.49	.10	13.86	.00	1.34	.00	3.000	.000	.00	0 .0

APPENDIX C

Project FEMA FIRMette



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99* With BFE or Depth *Zone AE, AO, AH, VE, AR* Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X* Future Conditions 1% Annual Chance Flood Hazard *Zone X* Area with Reduced Flood Risk due to Levee See Notes. *Zone X* Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard *Zone X* Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer Levee, Dike, or Floodwall
OTHER FEATURES	18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation 8 Coastal Transect Coastal Transect Baseline Profile Baseline Hydrographic Feature 513 Base Flood Elevation Line (BFE) Limit of Study Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was derived from digital orthophotography collected by the U.S. Department of Agriculture Farm Service Agency. Department of Agriculture imagery was flown in 2016 and was produced with a 1-meter ground sample distance.

Coastal Base Flood Elevations shown on the map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Coastal flood elevations are also provided in the Coastal Transect Parameters table in the FIS Report for this jurisdiction. Elevations shown in the Coastal Transect Parameters table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on the FIRM.

SCALE

N

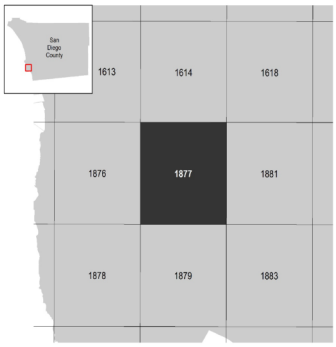
Map Projection:
Universal Transverse Mercator Zone 11N; North American Datum 1983;
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

SAN DIEGO COUNTY, CALIFORNIA and Incorporated Areas

PANEL 1877 OF 2375

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
SAN DIEGO, CITY OF	060295	1877	H

VERSION NUMBER
2.3.3.3

MAP NUMBER
06073C1877H

MAP REVISED
DECEMBER 20, 2019

MAP POCKET 1

Drainage Study Map

For

East Harbor Island Public Infrastructure Development

[Post-Project]

© 2024 Rick Engineering Company

C:\RICK\Projects\C19500\19538F_East Harbor Island\WaterRes\19538F_drn_proposed_718.dwg – plotted by: bhawksworth ON 2024-07-23 @ 14:11 – ctb:acad.ctb



LEGEND

- PRE- PROEJCT DRAINAGE BOUNDARY
- DRAINAGE SUB-BOUNDARY
- DRAINAGE BOUNDARY
- (1.25 AC) DRAINAGE AREA
- 950 EXIST. MAJOR ELEV. CONTOUR
- 948 EXIST. MINOR ELEV. CONTOUR
- PROPOSED ELEV. CONTOUR
- EXIST. STORM DRAIN
- FUTURE STORM DRAIN TIE-IN LOCATION
- FLOW DIRECTION
- PROPOSED STORM DRAIN

EAST HARBOR ISLAND PLAN VIEW

SCALE: 1" = 100'

100 50 0 100 200

GRAPHIC SCALE: 1"=100'

NOTES:
1. VERTICAL DATUM: MEAN LOWER LOW WATER (MLLW)
2. ONSITE TOPOGRAPHY FROM SURVEY PERFORMED BY RICK ENGINEERING 2023.
3. OFFSITE TOPOGRAPHY GENERATED FROM CITY OF SAN DIEGO LIDAR DATA (2021).
4. AERIAL IMAGERY FROM AUTOCAD HYBRID IMAGERY.
5. THIS EXHIBIT IS NOT TO BE USED FOR CONSTRUCTION.

RICK
5620 FRIARS ROAD
SAN DIEGO, CA 92110
619-291-0707
rickengineering.com

DRAINAGE EXHIBIT

EAST HARBOR ISLAND

PROJECT NO:	19538-F	SCALE:	1"=100'
DRAWN BY:	BJH	DATE:	7/24/24