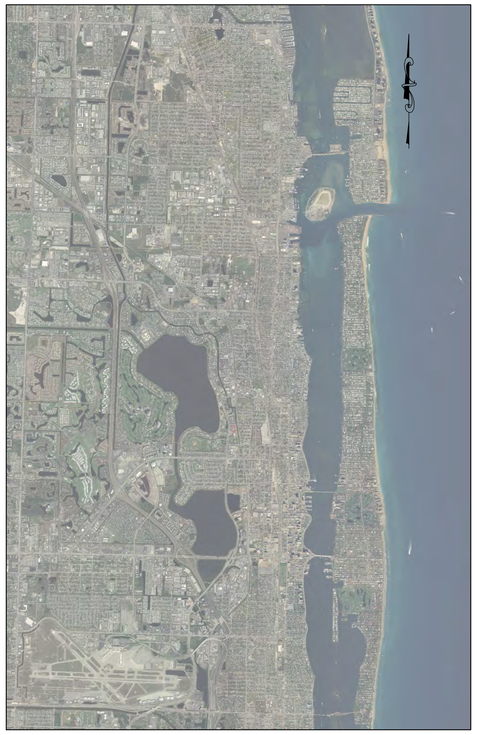
DIVER INVESTIGATION SURVEY OF POTENTIAL BURIED UTILITIES
INTRACOASTAL WATERWAY, CUT PB-36 THROUGH CUT PB-41
PALM BEACH COUNTY, FLORIDA

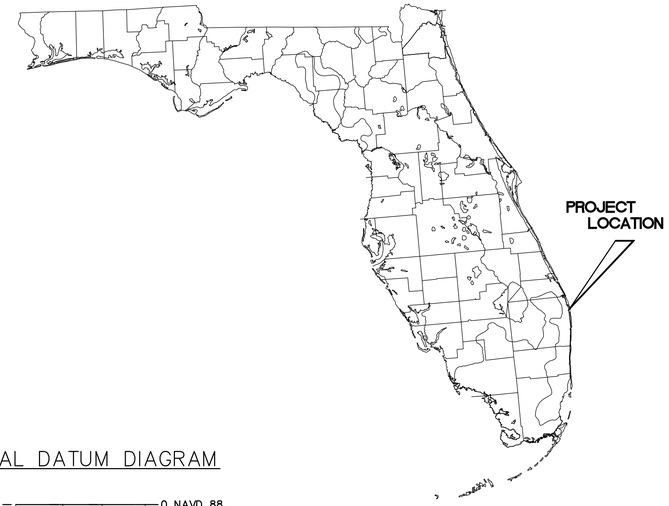
-FOR-

TAYLOR ENGINEERING, INC.

DATE: FEBRUARY 15, 2018
COMMISSION NUMBER: 5303.16



LOCATION MAP
1" INCH = 5,000 FEET



SURVEY NOTES:

1. COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE REFERENCED TO THE FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, NORTH AMERICAN DATUM OF 1983, ADJUSTMENT OF 2011 (NAD 83/2011).
2. ELEVATIONS ARE REFERENCED TO **MEAN LOWER LOW WATER** (SEE VERTICAL DATUM DIAGRAM).
3. ELEVATIONS SHOWN ARE IN FEET AND ARE REFERENCED TO **MEAN LOWER LOW WATER**. ELEVATION DATA WAS COLLECTED IN FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) AND CONVERTED TO MLLW USING THE LATEST VERSION OF VDATUM (VERTICAL DATUM TRANSFORMATION) PROVIDED BY NOAA, NATIONAL OCEAN SERVICE (NOS).
4. **CAUTION:** THE DIFFERENCE BETWEEN NAVD 88 AND MEAN LOWER LOW WATER VARIES AND MAY NOT BE THE SAME AS THE DIFFERENCE USED FOR PREVIOUS ACOE SURVEYS. TO MAKE A DIRECT COMPARISON BETWEEN SURVEYS, THE USER NEEDS TO BE CAREFUL TO VERIFY THE VERTICAL DATUM TRANSFORMATION PARAMETERS FOR EACH PROJECT AREA.
5. COORDINATES AND ELEVATIONS ARE BASED UPON THE MONUMENTS SHOWN IN THE CONTROL TABLE.
6. ELEVATION DATA POINTS SHOWN HEREON WERE INTERPOLATED ALONG A GRIDDED SURFACE DERIVED FROM SOUNDING DATA AND ARE FOR DISPLAY PURPOSES ONLY
7. BATHYMETRIC, MAGNETOMETER, SEISMIC RESULTS AND SIDE-SCAN SONAR INFORMATION DEPICTED ON THIS SURVEY REPRESENT THE EXISTING CONDITIONS ON THE DATE OF THE FIELD SURVEY. DATA WAS COLLECTED ON DEC 14-17 AND 21-23, 2015, JANUARY 6, 7, & 27, AND FEBRUARY 4, 2016.
8. AERIAL IMAGERY WAS TAKEN IN 2013 AND WAS PROVIDED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION.
9. AERIAL IMAGERY IS DISPLAYED HEREON FOR INFORMATION PURPOSES ONLY, NO PHOTOGRAPHIC ACCURACY IS IMPLIED BY THIS MAP.
10. NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.
11. HORIZONTAL POSITIONING UTILIZED A TRIMBLE SPS 852 REAL TIME REAL TIME KINEMATIC GPS RECEIVER WITH REAL TIME CORRECTIONS APPLIED FROM POINT 235.
12. SOUNDINGS WERE OBTAINED USING AN ODOM MB1 MULTI BEAM ECHO SOUNDER OPERATING AT 219KHZ.
11. WATER SURFACE ELEVATIONS WERE OBTAINED USING A TRIMBLE SPS 852 REAL TIME KINEMATIC (RTK) DUAL FREQUENCY GPS RECEIVER WITH REAL TIME CORRECTIONS APPLIED FROM A TRIMBLE 5700 DUAL FREQUENCY BASE STATION OCCUPYING POINTS SHOWN IN THE CONTROL TABLE AND WERE VERIFIED TO A TIDE STAFF ELEVATED FROM CONTROL POINT 234.
12. THE SIDE-SCAN SONAR DATA WAS COLLECTED USING THE EDGETECH DUAL FREQUENCY (600 KHZ AND 1600 KHZ) CHIRP SIDE-SCAN SONAR. THE MODEL USED WAS THE 4125. THE SIDE-SCAN SONAR IS CAPABLE OF PRODUCING SONIC IMAGES OF THE BOTTOM WITH THE RESOLUTION TO DISPLAY SMALL OBJECTS IF THEY ARE EXPOSED AND NOT COMPLETELY BURIED. THE LIMITATIONS OF THE SIDE-SCAN SONAR ARE THAT IT CANNOT PENETRATE THE BOTTOM AND DETECT A BURIED OBJECT.
13. MAGNETOMETER DATA WAS COLLECTED USING THE GEOMETRICS G-882 DIGITAL CESIUM MAGNETOMETER WITH ALTIMETER AND DEPTH SENSOR. THE MAGNETOMETER READS THE EARTH'S MAGNETIC FIELD AND MEASURES THE EFFECTS OF FERROUS OBJECTS UPON IT.
14. THE SUB-BOTTOM (SEISMIC) DATA WAS COLLECTED USING AN EDGETECH X-STAR CHIRP SUB-BOTTOM PROFILER.
15. ADDITIONS OR DELETIONS TO THIS SURVEY MAP ARE PROHIBITED WITHOUT WRITTEN CONSENT.
16. DIVER INVESTIGATION WAS PERFORMED BY INDUSTRIAL DIVERS CORPORATION. ON JANUARY 22-26 AND 29-31, FEBRUARY 1-2, 5-9, AND 12-15, 2018.

PREPARED BY:

Morgan & Eklund Inc.

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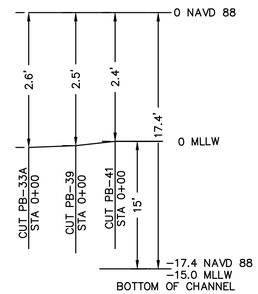
VERTICAL DATUM DIAGRAM



RELATIONSHIP BETWEEN NAVD88 AND MLLW

(BASED UPON NOAA VDATUM CONVERSION)

LEGEND

APM	ALUMINUM PIPE MONUMENT
CGS	COAST & GEODETIC SURVEY
CM	CONCRETE MONUMENT
DM ID	FDEP DOCUMENT IDENTIFICATION NUMBER
DRM	DEEP ROD MONUMENT
FDEP	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
ICWW	INTRACOASTAL WATERWAY
LT	LEFT
M&E	MORGAN & EKLUND, INC.
MLLW	MEAN LOWER LOW WATER
NGS	NATIONAL GEODETIC SURVEY
NOAA	NATIONAL OCEANIC AND ATMOSPHERIC ASSOCIATION
ORB	OFFICIAL RECORD BOOK
RT	RIGHT
USACE	UNITED STATES ARMY CORPS OF ENGINEERS
℄	CENTERLINE
△	RED CHANNEL MARKER
□	GREEN CHANNEL MARKER

CONTROL TABULATION

	NAD 83/11 SPCS 0901		NAVD 88*		
DESIGNATION	NORTHING	EASTING	ELEVATION	STAMPING	DESCRIPTION
282	892034.55	968102.57	5.11	LB 4298	5/8" IRC
225	891643.02	968059.34	4.76	LB 4298	5/8" IRC
W 309	891639.96	968062.79	8.88	W 309	FLORIDA SRD DISK
IWP 26			2.49	IWP 26 1957 JACKSONVILLE	USACE DISK
234	870009.90	966430.83	3.35	LB 4298	5/8" IRC
235	869923.48	966453.56	3.15	LB 4298	5/8" IRC
236	852476.42	969017.25	4.46	LB 4298	5/8" IRC
237	852483.15	969075.62	4.58	LB 4298	5/8" IRC
ZEIS	852327.16	967513.56		ZEIS	CGS DISK

* ALL ELEVATION DATA SHOWN ON THE FOLLOWING PAGES HAVE BEEN CONVERTED TO MEAN LOWER LOW WATER USING THE LATEST VERSION OF VDATUM (VERTICAL DATUM TRANSFORMATION) PROVIDED BY NOAA, NATIONAL OCEAN SERVICE (NOS).

CAUTION

THERE MAY BE OTHER UTILITY CROSSINGS THAT WERE NOT DETECTED DURING THIS SURVEY. CONTRACTOR IS TO VERIFY UTILITY LOCATIONS PRIOR TO DREDGING.

SHEET INDEX

FIELD BOOK: PALM BEACH 64A, PAGES 1-24

REVISED 3/6/18: ADD DIVER DATA AND NOTES

UTILITY CROSSINGS

Station	Designation	Identified Utility	Elevation Datum	Attachment Number	Comments	Sheet Number	Status
PB-36 STA 32+51	Crossing 1	Florida Power and Light	-16 MLLW*	ORB 6657, PAGE 287	No mag hits	3, 11	PWC
PB-36 STA 34+07	Crossing 2	Florida Power and Light	n/a	ORB 24343, PAGE 1515	Strong Mag Anomaly String 1	3, 11	PWC
PB-36 STA 50+54	Crossing 2A	Nautical Chart "Cable"	n/a	n/a	Mag string 1A	4,12	PWC
PB-36 STA 74+75	Crossing 3	Possible Florida Public Utilities Co. Gas Main	-17.3 MLLW	n/a	Mag hits string 2	4, 12	PWC
PB-36 STA 75+49	Crossing 4	Possible Florida Public Utilities Co. Gas Main	n/a	n/a	Mag hits string 3	4, 12	PWC
PB-36 STA 77+45	Crossing 5	Florida Power and Light	-18.7 MLLW	ORB 16498, PAGE 1501	Mag hits string 4	4, 12	PWC
PB-36 STA 104+58	Crossing 6	Unknown	-12.2 MLLW	n/a	Possible Utility Crossing - Mag hits string 5	5, 13	Not cleared
PB-37 STA 34+11	Crossing 7	Unknown	-16.7 MLLW	n/a	Possible Utility Crossing - Mag hits string 6	6, 14	PWC
PB-37 STA 68+14	Crossing 8	Comcast	Approximately -35 MLLW*	ORB 7188, PAGE 1845	Mag hits string 7 north of easement	8, 16	PWC
PB-38 STA 4+02	Crossing 9	Florida Power and Light	Approximately -70 MLLW*	DM ID 372578	No mag hits	8, 16	PWC
PB-38 STA 5+66	Crossing 10	Florida Power and Light	varies -12.5 to -15.4 MLLW	ORB 16498, PAGE 1524	SEE AS-BUILT BY AVIROM & ASSOCIATES - Side-scan feature 00	8, 16	PWC
PB-38 STA 9+75	Crossing 11	City if West Palm Beach	-32 MLLW*	ORB 23947, PAGE 1889	No mag hits	8, 16	PWC
PB-38 STA 9+99	Crossing 12	Town of Palm Beach	-40 MLLW*	ORB 24196, PAGE 1729	No mag hits	8, 16	PWC
PB-38 STA 17+36	Crossing 13	Possible Florida Public Utilities Co. Gas Main	-15.8 MLLW	n/a	No mag hits	8, 16	PWC
PB-38 STA 18+67	Crossing 14	Unknown	-22.3 MLLW	n/a	Side-scan feature 01	8, 16	PWC
PB-38 STA 18+70	Crossing 15	Unknown	-20.8 MLLW	n/a	Side-scan feature 02	8, 16	PWC
PB-38 STA 18+73	Crossing 16	Unknown	-15.8 MLLW	n/a	Side-scan feature 03	8, 16	PWC
PB-38 sta 19+23	Crossing 17	Unknown	n/a	n/a	Side-scan feature 04	8, 16	PWC
PB-38 STA 22+22	Crossing 17A	FDOT cable	n/a	DEP PERMIT SAJ-1993-31700 (IP-GGL)	No mag hits	8, 16	PWC
PB-38 STA 21+16	Crossing 18	Possible City of West Palm Beach	-18.5 MLLW to -22.3 MLLW	ORB 21355, PAGE 1661	Side-scan features 06	8, 16	PWC
PB-38 STA 20-90	Crossing 18A	Unknown	n/a	n/a	side-scan feature 05	8, 16	PWC
PB-38 STA 21+43	Crossing 19	Possible City of West Palm Beach or Florida Power and Light	-18.5 MLLW to -22.3 MLLW	ORB 21355, PAGE 1661 or ORB 16580, PAGE 1490	Side-scan features 07	8, 16	PWC
PB-38 STA 21+58	Crossing 20	Florida Power and Light	-18.5 MLLW to -22.3 MLLW	ORB 16580, PAGE 1490	Side-scan feature 08	8, 16	PWC
PB-38 STA 22+00	Crossing 20A	Unknown	n/a	n/a	Side-scan feature 09	8, 16	PWC
PB-38 STA 21+90	Crossing 21	Florida Power and Light	n/a	ORB 23921, PAGE 469	Side-scan feature 9?	8, 16	PWC
PB-39 STA 10+03	Crossing 22	Florida Power and Light	-16.2 MLLW	ORB 16498, PAGE 1513	Mag hits string 8	9, 17	PWC
PB-39 STA 16+38	Crossing 23	Unknown	n/a	n/a	Side-scan features 11 & 12	9, 17	PWC
PB-39 STA 18+33	Crossing 24	American Telephone and Telegraph	-16.5 MLLW & -18.6 MLLW	ORB 6645, PAGE 369 AND DM ID 141839	Mag hits string 9	9, 17	PWC
PB-40 STA 9+56	Crossing 25	Possible Florida Public Utilities Co. Gas Main	Approximately -50 MLLW*	n/a		10, 18	PWC
PB-40 STA 10+88	Crossing 26	American Telephone and Telegraph	-17.4 MLLW TO -19.2 MLLW	DM ID 141240	Side-scan feature 13	10, 18	PWC
PB-40 STA 11+01	Crossing 27	American Telephone and Telegraph	-17.4 MLLW TO -19.2 MLLW	DM ID 141240	Side-scan feature 14	10, 18	PWC
PB-40 STA 11+21	Crossing 28	American Telephone and Telegraph	-17.4 MLLW TO -19.2 MLLW	DM ID 141240	Side-scan feature 15	10, 18	PWC
PB-40 STA 11+54	Crossing 29	American Telephone and Telegraph	-17.4 MLLW TO -19.2 MLLW	DM ID 141240	Side-scan feature 16	10, 18	PWC
PB-40 STA 14+02	Crossing 30	Unknown	n/a	n/a	Side-scan feature 17	10, 18	PWC
PB-40 STA 14+39	Crossing 31	Unknown	n/a	n/a	Side-scan feature 18	10, 18	PWC
PB-40 STA 15+20	Crossing 32	Florida Power and Light	n/a	ORB 12316, PAGE 1115	Side-scan feature 19	10, 18	PWC
PB-40 STA 14+15	Crossing 32A	Florida Power and Light	n/a	DEP PERMIT SAJ-2017-00022(GP-CGK)	No mag hits	10,18	PWC

0 800' 1600'
HORIZONTAL SCALE 1" = 800'
INTENDED DISPLAY SCALE

LEGEND

- TRENCHED TO −17.5 MLLW NO UTILITIES ENCOUNTERED
- FOUND UTILITY LINE
- NOT INVESTIGATED
- PWC–PROCEED WITH CAUTION
- * ELEVATION CITED ON AS-BUILT DRAWINGS BY OTHERS

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LB #4298
JOHN R. MORGAN II, PSM
FLORIDA CERTIFICATION #3520

CERTIFICATE OF SURVEYOR – I HEREBY CERTIFY THAT THE INFORMATION SHOWN HEREON IS IN ACCORDANCE WITH A RECENT FIELD SURVEY MADE UNDER MY DIRECTION, AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE STANDARDS OF PRACTICE AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS IN CHAPTER 5J–17, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027, FLORIDA STATUTES.

JOHN R. MORGAN, II, PLS
PROFESSIONAL LAND SURVEYOR #3520
STATE OF FLORIDA

KEY MAP

DIVER INVESTIGATION SURVEY OF POTENTIAL BURIED UTILITIES
INTRACOASTAL WATERWAY, CUT PB–36 THROUGH PB–41
PALM BEACH COUNTY, FLORIDA
FOR TAYLOR ENGINEERING, INC.

COMMISSION NO. 5303.16
SCALE AS SHOWN
DATE 3/6/18

DRAWN BY	CHECKED BY	FIELD BOOK / PAGE NO.	DATE OF SURVEY	SHEET
LFP	JRM	SEE COVER	2/15/18	2 OF 22

HORIZONTAL SCALE 1" = 50'
INTENDED DISPLAY SCALE
0 50' 100'

LEGEND

- TRENCHED TO -17.5 MLLW NO UTILITIES ENCOUNTERED
- FOUND UTILITY LINE
- NOT INVESTIGATED
- PWC-PROCEED WITH CAUTION

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ELEVATION DATA (MLLW -10' PROJECT)
DIVER INVESTIGATION SURVEY OF POTENTIAL BURIED UTILITIES
INTRACOASTAL WATERWAY, CUT PB-36 THROUGH PB-41
PALM BEACH COUNTY, FLORIDA
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GREEN MARKER–3
WOOD POST

FOUND CABLE
–10'± MLLW

TRENCHED 7' DEEP 10' NORTH & SOUTH
NO UTILITIES FOUND

TRENCHED 7' DEEP 10' NORTH & SOUTH
NO UTILITIES FOUND

POSSIBLE CROSSING 2A (NAVIGATION CHART)

48+00 49+00 50+00 51+00 52+00 53+00 54+00 55+00 56+00 57+00 58+00 59+00 60+00 61+00 62+00 63+00 64+00

RGE. 125

℄ INTRACOASTAL WATERWAY

RGE. 62.5

125' ICWW CHANNEL

RGE. 0

CUT PB–36

GREEN MARKER–3A
WOOD POST

64+00 65+00 66+00 67+00 68+00 69+00 70+00 71+00 72+00 73+00 74+00 75+00 76+00 77+00 78+00 79+00 80+00

RGE. 125

℄ INTRACOASTAL WATERWAY

RGE. 62.5

125' ICWW CHANNEL

RGE. 0

CUT PB–36

RED MARKER–4
METAL POST

–17.3' MLLW
8" GAS MAIN

TRENCHED 20' SOUTH TO –17'± MLLW DEPTH HITTING ROCK
TRENCHED 15' NORTH HITTING ROCK AT –18'± MLLW

CROSSING #3 FLORIDA PUBLIC
UTILITIES COMPANY GAS MAIN

POSSIBLE CROSSING #4
FLORIDA PUBLIC
UTILITIES CO. EASEMENT
LOCATION NOT KNOWN

FLORIDA POWER AND LIGHT
CROSSING #5
ORB 16498, P 1501

TRENCHED 10' NORTH AND SOUTH
TO –17.5' MLLW NO UTILITIES

TRENCHED 10' NORTH AND 7' SOUTH
TO –18'± MLLW NO UTILITIES

–18.7' MLLW
CABLE AND PIPE

POSSIBLE FPL CABLE

BE

0 50' 100'
HORIZONTAL SCALE 1" = 50'
INTENDED DISPLAY SCALE

LEGEND

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LFP	JRM	SEE COVER	2/15/18	4 OF 22

H:\Drawings\5303–16\DWG\5303–16.dwg, by: Mon, 11 Jun 2018 – 2:24pm

0 50' 100'

HORIZONTAL SCALE 1" = 50'
INTENDED DISPLAY SCALE

LEGEND

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3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00

RGE. 125

℄ INTRACOASTAL WATERWAY

RGE. 62.5

RGE. 0

CUT PB-37

125' ICWW CHANNEL

19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00

RGE. 125

℄ INTRACOASTAL WATERWAY

RGE. 62.5

RGE. 0

CUT PB-37

125' ICWW CHANNEL

GREEN MARKER-7
METAL POST

-16.7' MLLW
30" POSSIBLE SEWER PIPE

UTILITY CROSSING #7
TOWN OF PALM BEACH SANITARY SEWER

FM

0 50' 100'
HORIZONTAL SCALE 1" = 50'
INTENDED DISPLAY SCALE

LEGEND

TRENCHED TO -17.5 MLLW
NO UTILITIES ENCOUNTERED

FOUND UTILITY LINE

NOT INVESTIGATED

PWC-PROCEED WITH CAUTION

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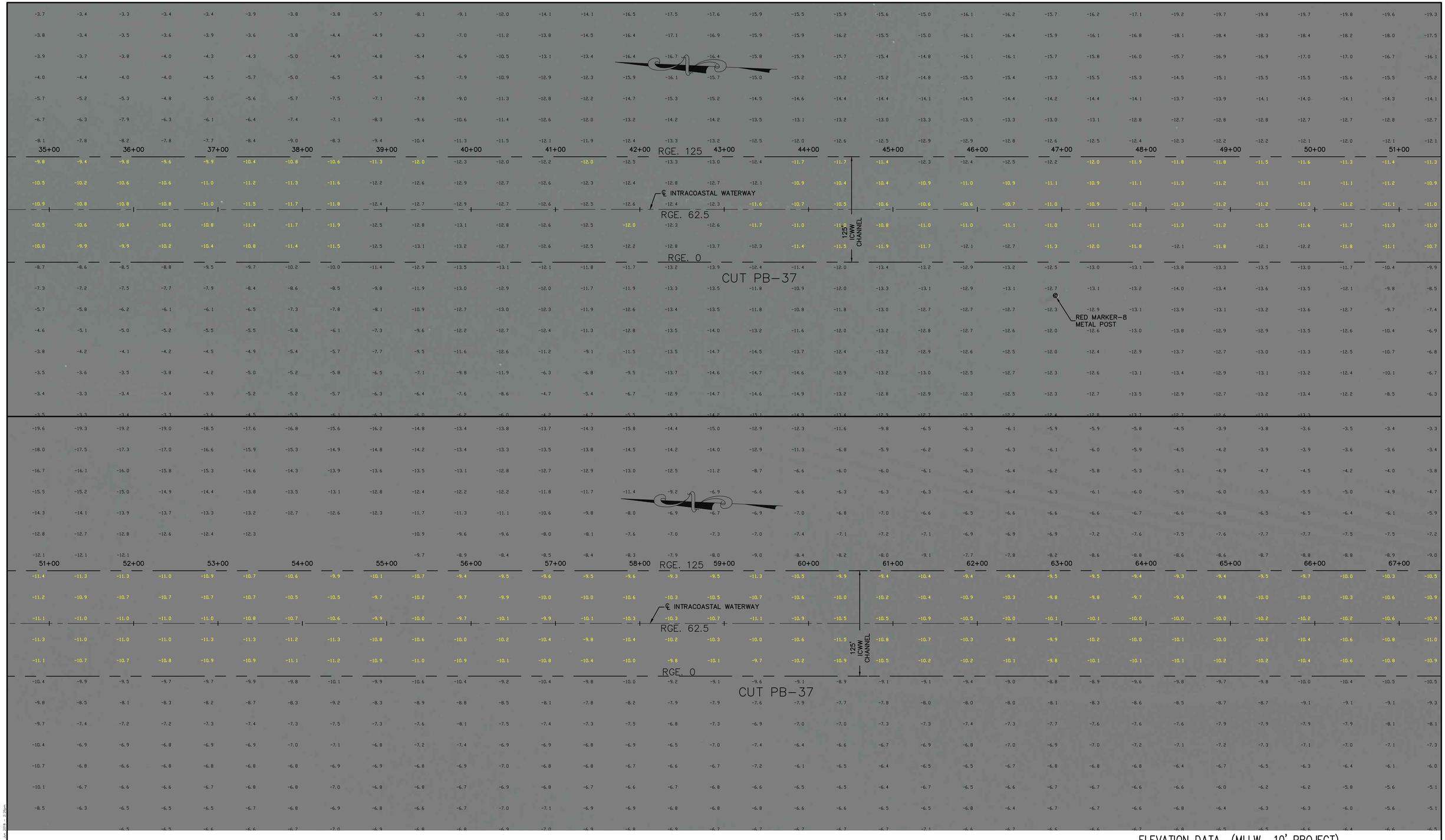

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HORIZONTAL SCALE 1" = 50'
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LB #4298
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FLORIDA CERTIFICATION #3520

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STATE OF FLORIDA

ELEVATION DATA (MLLW -10' PROJECT)

DIVER INVESTIGATION SURVEY OF POTENTIAL BURIED UTILITIES
INTRACOASTAL WATERWAY, CUT PB-36 THROUGH PB-41
PALM BEACH COUNTY, FLORIDA
FOR TAYLOR ENGINEERING, INC.

DRAWN BY	CHECKED BY	FIELD BOOK	DATE OF SURVEY
LFP	JRM	PAGE NO. SEE COVER	2/15/18

COMMISSION NO. 5303.16
SCALE AS SHOWN
DATE 3/6/18
SHEET 7 OF 22

COMCAST CROSSING #8 ORB 7188, PAGE 1845
GREEN MARKER-9 METAL POST
POSSIBLE UTILITY 00
FLORIDA POWER AND LIGHT CROSSING #10 ORB 16498, PAGE 1524
67+00
68+00
69+00
70+00
71+00
0+00
1+00
RGE. 125
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00
11+00
12+00
ELEV =-15.4 MLLW
℄ INTRACOASTAL WATERWAY
TRENCHED 10' NORTH AND SOUTH NO UTILITIES AT -17.0' MLLW
RGE. 62.5
TRENCHED 10' NORTH AND 18' SOUTH -18'± MLLW NO UTILITIES
ELEV =-13.9 MLLW
125' ICWW CHANNEL
RGE. 0
CUT PB-38
ELEV =-12.5 MLLW
CUT PB-38 STA 0+00 = CUT PB-37 STA 71+31.94
CUT PB-37
RED MARKER-10 WOOD POST
TOWN OF PALM BEACH FORCE MAIN CROSSING #12 ORB 24196, PAGE 1729
CABLE REMNANTS
POSSIBLE COMCAST CABLE
FLORIDA POWER AND LIGHT CROSSING #9 DM ID 372578
FPL CABLE PER AVIROM & ASSOCIATES, INC. AS-BUILT "TOPOGRAPHIC SURVEY SEMIOLE AVENUE AT THE INTRACOASTAL WATERWAY DATED 6/15/13
CITY OF WEST PALM BEACH CROSSING#11 ORB 23947, PAGE 1889
POSSIBLE CROSSSING #16
HDPE N=867736.40 NAD 83/09 E=967437.15
CITY OF WEST PALM BEACH CROSSINGS #18 & 19 ORB 21355, PAGE 1661
FLORIDA POWER AND LIGHT CROSSING #21 ORB 23921, PAGE 469
FLORIDA POWER AND LIGHT CROSSINGS #19 & 20 ORB 16580, PAGE 1490
-21.50' MLLW 2-6" PIPES
-22.3' MLLW 6" DIAMETER PIPE
-15.8' MLLW UNKNOWN DOUBLE CABLE
POSSIBLE CROSSING #17
12+00
13+00
14+00
15+00
RGE. 125
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+00
28+00
-20.8' MLLW UNKNOWN CABLE
-20.0' MLLW BUNDLE 7 CABLES VARIOUS SIZES
-23.1' MLLW 4" PIPE
℄ INTRACOASTAL WATERWAY
-18.5' MLLW 4" PIPE
3-8" HDPE PIPES 80+ FEET BELOW ICWW CHANNEL
-22.3' MLLW UNKNOWN CABLE
RGE. 62.5
125' ICWW CHANNEL
POSSIBLE CITY OF FLORIDA POWER AND LIGHT
POSSIBLE CROSSING #20
RGE. 0 CUT PB-38
POSSIBLE CROSSING #18A APPROXIMATE LOCATION CROSSING #17A BELIEVED TO BE AT LEAST 14' BELOW THE CHANNEL BOTTOM PER DEP Permit SAJ-1993-31700 (IP-GGL)
POSSIBLE CROSSING #20A
FLAGLER MEMORIAL BRIDGE
POSSIBLE CROSSING #18
POSSIBLE CROSSING #19
POSSIBLE CROSSING #14
POSSIBLE CROSSING #15
FLORIDA PUBLIC UTILITIES CO. CROSSING #13 ORB 24176, PAGE 546

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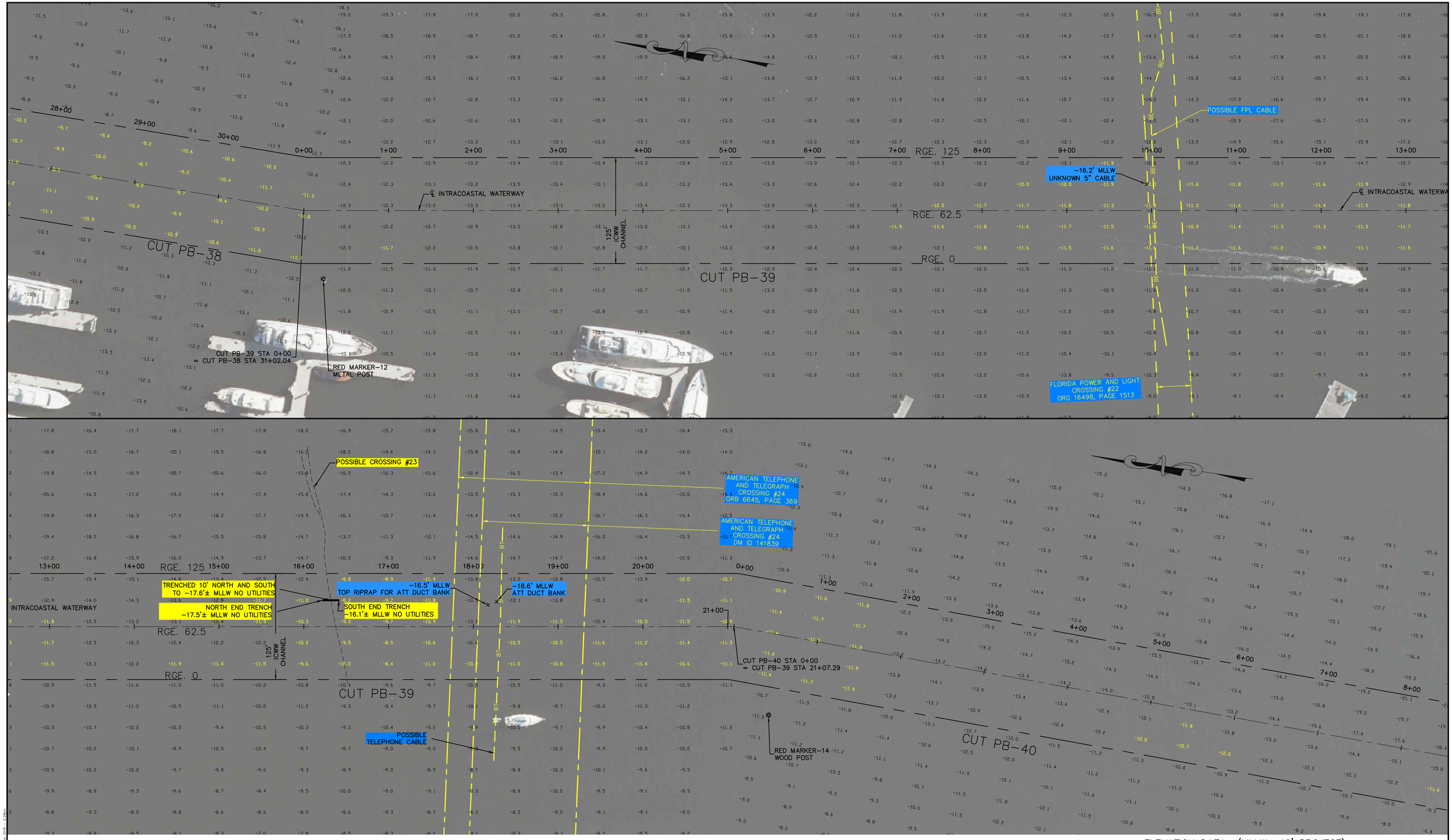

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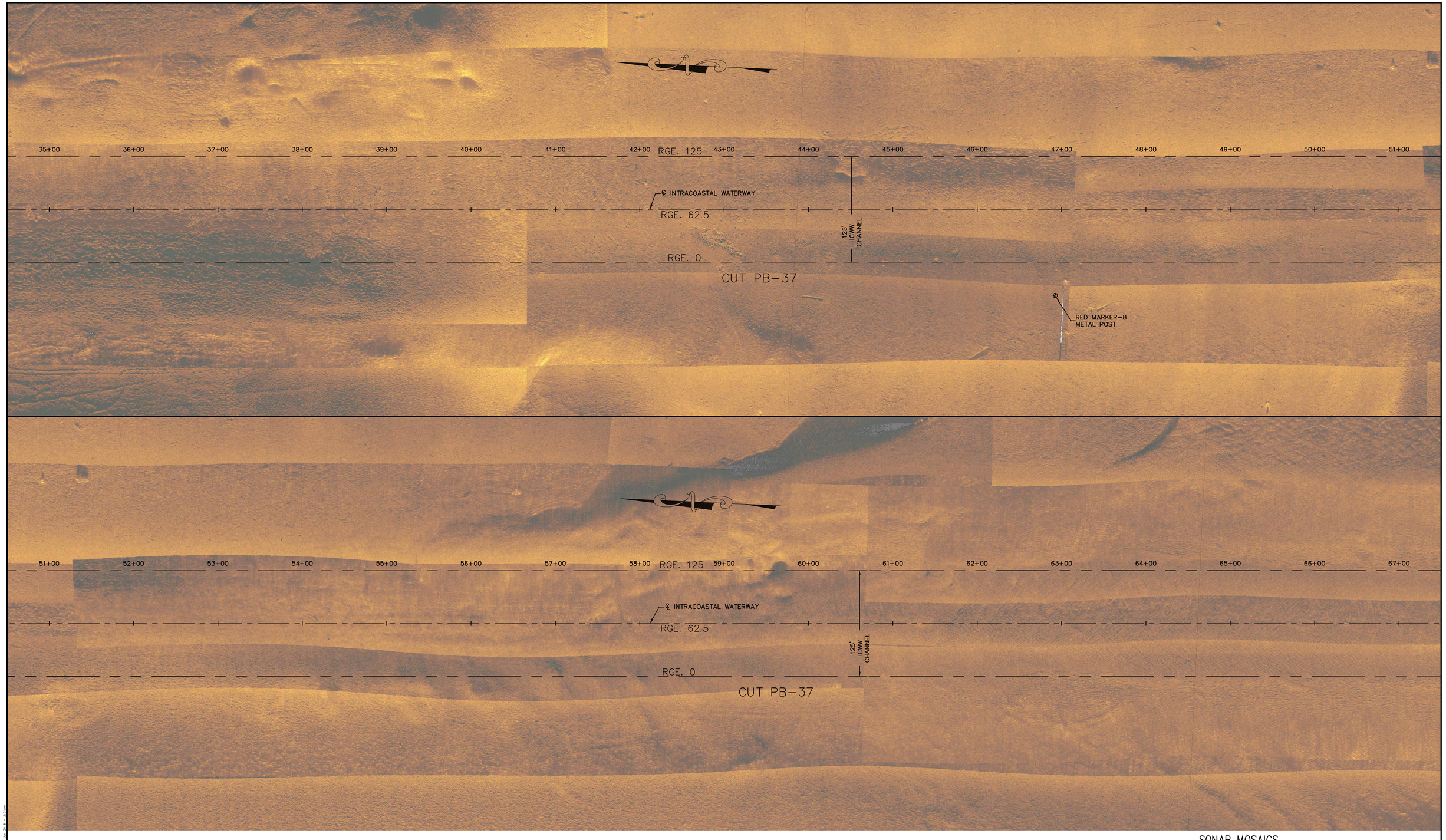

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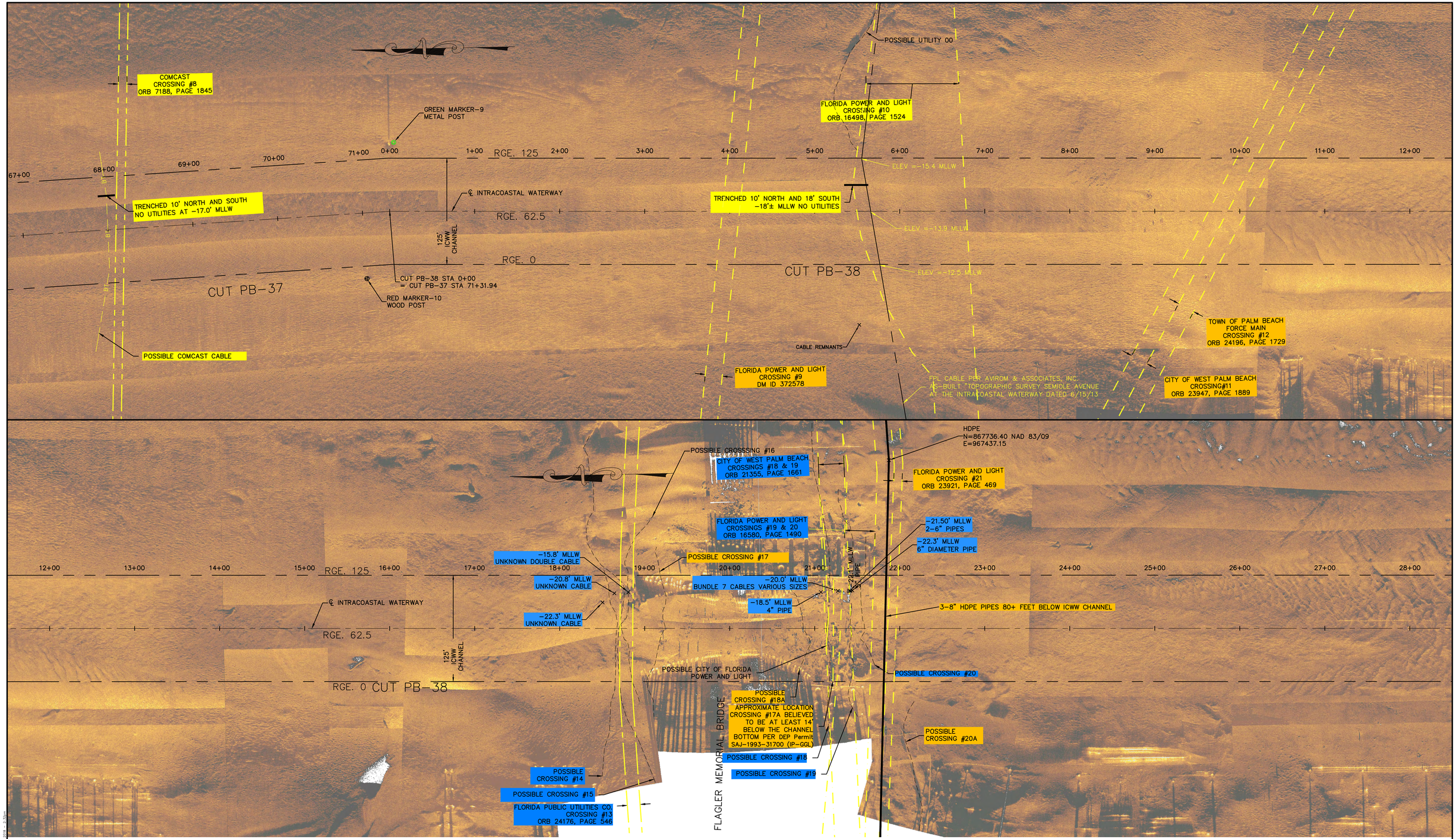

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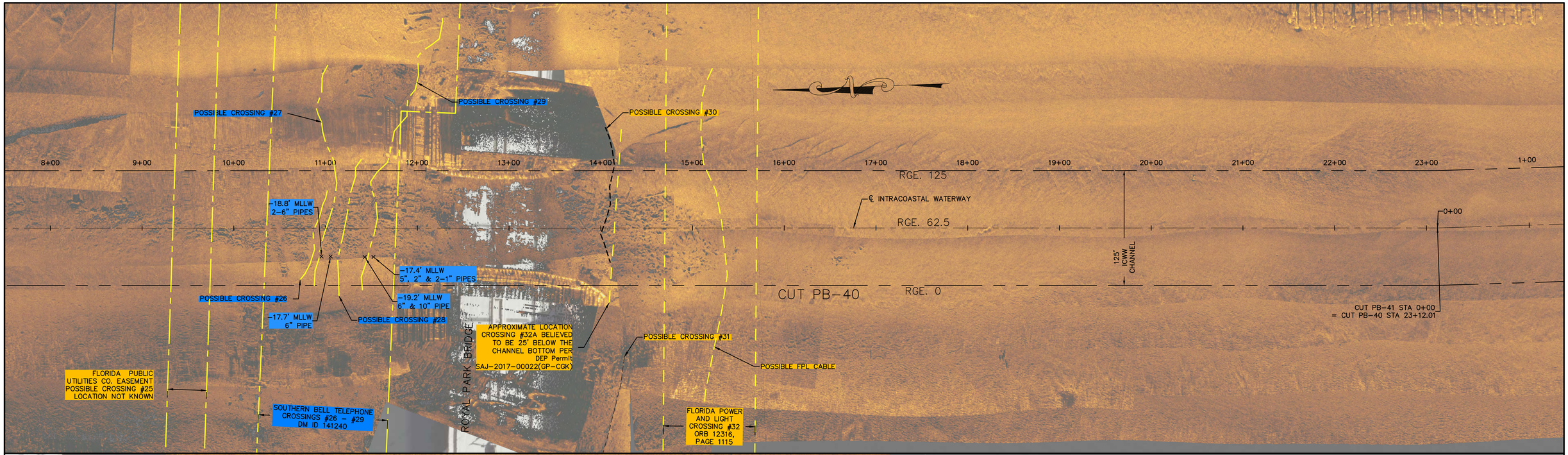

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Morgan & Eklund Inc.

PROFESSIONAL SURVEY CONSULTANTS

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JOHN R. MORGAN II, PSM
FLORIDA CERTIFICATION #3520

CERTIFICATE OF SURVEYOR - I HEREBY CERTIFY THAT THE INFORMATION SHOWN HEREON IS IN ACCORDANCE WITH A RECENT FIELD SURVEY MADE UNDER MY DIRECTION, AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE STANDARDS OF PRACTICE AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027, FLORIDA STATUTES.

JOHN R. MORGAN, II, PLS
PROFESSIONAL LAND SURVEYOR #3520
STATE OF FLORIDA

SONAR MOSAICS

DIVER INVESTIGATION SURVEY OF POTENTIAL BURIED UTILITIES
INTRACOASTAL WATERWAY, CUT PB-36 THROUGH PB-41
PALM BEACH COUNTY, FLORIDA
FOR TAYLOR ENGINEERING, INC.

COMMISSION NO.	SCALE	DATE
5303.16	AS SHOWN	3/6/18

DRAWN BY	CHECKED BY	FIELD BOOK / PAGE NO.	DATE OF SURVEY	SHEET
LFP	JRM	SEE COVER	2/15/18	18 OF 22

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Palm Beach ICWW Utility Search

Introduction

SONOGRAPHICS, INC. and MORGAN & EKLUND, INC. (M&E) have completed an underwater survey of the Intracoastal Waterway in Palm Beach County, Florida to detect the possible presence of utilities crossing. This report describes the equipment used, the methods implemented and the results obtained.

A. Equipment Used to Detect Submerged Utilities

A-1 MAGNETOMETER:

To locate utilities such as pipelines and cables under a waterway, several devices were employed. One device was the Geometrics Model G-882 marine magnetometer. It is a highly sensitive cesium pumped digital unit capable of sampling at 10 times per second. It is capable of locating ferrous objects because they interrupt the earth's magnetic field. It is a very common tool for locating pipelines and cables that have ferrous iron in their construction. The limitations of a magnetometer are:

1. If the cable or pipeline is not made with ferrous iron they will not be detected by the magnetometer.
2. If a utility is detected the depth of burial can only be determined through calculations that are imprecise and therefore are not very accurate or reliable.
3. If there are other ferrous items in the vicinity they must be separated from the potential utility contacts usually by comparing positions and analyzing signatures.
4. Selecting the exact position of an anomaly can be difficult due to the context in which the anomaly is situated relative to the earth's field and other ferrous objects. Some positions are straightforward and accurate while others are subject to interpretation.

A-2 SIDE-SCAN SONAR:

The second device employed was an EdgeTech dual frequency (600 kHz and 1600 kHz) chirp side-scan sonar. The model used was the 4125. The side-scan sonar is capable of producing sonic images of the bottom with the resolution to display the utility if it is exposed and not completely buried. It is capable of covering the entire bottom of the waterway from one side to the other. The limitation of the side-scan sonar is that it cannot penetrate the bottom and detect a buried utility.

A-3 SUB-BOTTOM PROFILER:

The third device employed was an EdgeTech X-Star Chirp Sub-bottom Profiler (SBP). The tow-fish used was the model SB-216S which can sweep sonic pulses from 2 kHz to 16 kHz. The sub-bottom profiler is capable of penetrating the sediment and getting reflections from the utility if it is significantly different in density from the surrounding sediment. The beam pattern of the sub-bottom profiler is wide enough fore and aft to detect the utility before and after it is directly under the tow-fish resulting in a classic hyperbolic pattern. If such a pattern is detected, then the actual depth of burial can be measured accurately relative to the surrounding bottom. The limitations of the sub-bottom profiler are:

1. The sediment may not be conducive to penetration if it contains gaseous organic material.
2. If the utility was purposely buried in the sediment, it may have been backfilled with material that is impenetrable. In this instance the backfill may be detected but the depth of burial would be un-measurable.
3. The construction of the utility may be of a material that is not of sufficient difference in density from the sediment or it may be physically too small. Typically, utilities with a diameter smaller than 6 inches will not be detected.

A. SURVEY METHODS

On January 6th, 7th and 27th, 2016 the survey vessel provided by Morgan Eklund, Inc. was mobilized with the Side-Scan Sonar, Magnetometer, Sub-bottom Profiler and Trimble DGPS Navigation Systems. The Navigation computer with Hypack Navigation Software was installed to interface the DGPS and output towfish coordinates to the Side-scan computer topside. The Navigation computer was loaded with preplanned survey lines spaced at 50 and 100 foot intervals through the length of the survey area and parallel to potential utilities for the side-scan survey. It provided visual guidance to the helmsman for navigation of each line. The RTK- was able to provide WGS 84 differential positions to the Navigation computer. The published accuracy of the DGPS system is less than 1 meter.

The Side-Scan and Sub-bottom tow-fish were deployed from the side of the vessel with minimal amount of cable out. The distance from the DGPS antenna to the center of the transducers was also measured. The layback and offset was calculated by the Navigation software, enabling towfish coordinates to be sent to both the Sub-bottom and Sonar computers in real time.

The magnetometer was installed and tests were done to insure that it was interfaced and working properly. The navigation computer recorded the data from the magnetometer and combined it with the NAD83, Florida State Plane East Zone, U.S. Survey Foot tow-fish coordinates. The magnetometer sensor was towed near the water surface from 50 to 70 feet aft of the vessel. The layback and offset was calculated by the Navigation software, enabling tow-fish coordinates to be merged with the incoming magnetometer readings in real time. The sampling rate was set to 10 samples per second. The magnetometer signal strength was monitored as the vessel was operated at 8 points of the compass to ensure that the sensor would not be affected by an improper angle to the earth's magnetic field. Test passes close to a metal navigation aid produced a significant anomaly with no degradation in signal strength. The background noise level was normal throughout the test and it was deemed that the magnetometer was ready for survey operations.

A. DATA PROCESSING

C-1 SIDE-SCAN SONAR DATA:

The Side-scan data was recorded in the native EdgeTech JSF format on the hard drive in the Sonar Computer by the EdgeTech Discover program. The JSF files were read by the Chesapeake SonarWizMap program and after adjustments and navigation smoothing, image files were created for the construction of a sonar mosaic. The sonar mosaic was exported as a Geo-Tif file. Each individual sonar line was examined for possible utility targets.

C-2 MAGNETOMETER DATA:

The magnetometer data was recorded in the Hypack (RAW) files. The RAW files were imported to an editor where anomalies were analyzed in profile and recorded as targets. The targets were plotted and analyzed for continuous patterns consistent with the presence of utilities.

C-3 SUB-BOTTOM PROFILER DATA:

The Sub-bottom data was recorded in the native EdgeTech (JSF) format on the hard drive in the Sub-bottom Computer. The JSF files were read by the Chesapeake SonarWizMap program and after adjustments and navigation smoothing profiles were produced for each survey line. The data was analyzed for patterns consistent with pipeline or cable signatures. Particular attention was paid to utility easement areas and where magnetic anomalies were detected.

B. RESULTS

D-1 SIDE-SCAN SONAR RESULTS:

20 possible utility detections were observed on the side-scan imagery.

Possible Utility_00 is a possible cable or pipeline meandering from the as-built plot of an FPL cable at the north edge of FPL Crossing #10 easement. The contact image starts at the northern easement boundary and moves north 30 feet from the

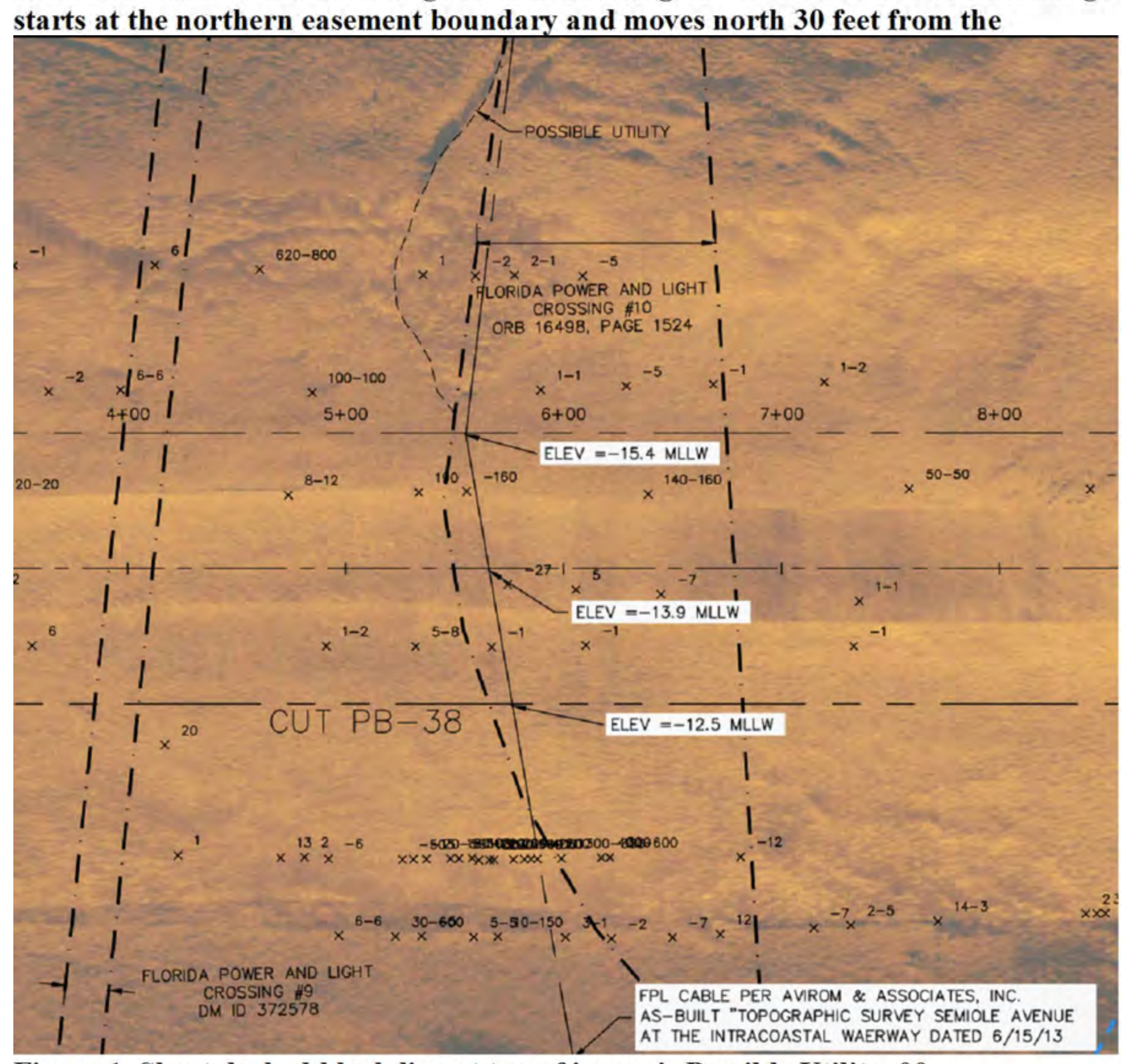

Figure 1. Short dashed black line at top of image is Possible Utility_00

boundary then bends back and meets the plotted cable just inside the boundary on the east end for a total length of about 120 feet (See Figure 1).

Possible Utility_01 crosses the waterway about 20 – 30 feet north of the north fender piles of the Flagler Memorial Bridge. It is adjacent to Possible Utilities _02 and _03. It is not within or close to any utility easements known to us at this time (See Figure 2). We are designating it as Crossing #14.

Possible Utility_02 is adjacent and south of Possible Utility_01 and runs across the entire waterway survey area (See Figure 2). We are designating it as Crossing #15.

Possible Utility_03 is adjacent and south of Possible Utility_02 (See Figure 2). We are designating it as Crossing #16.

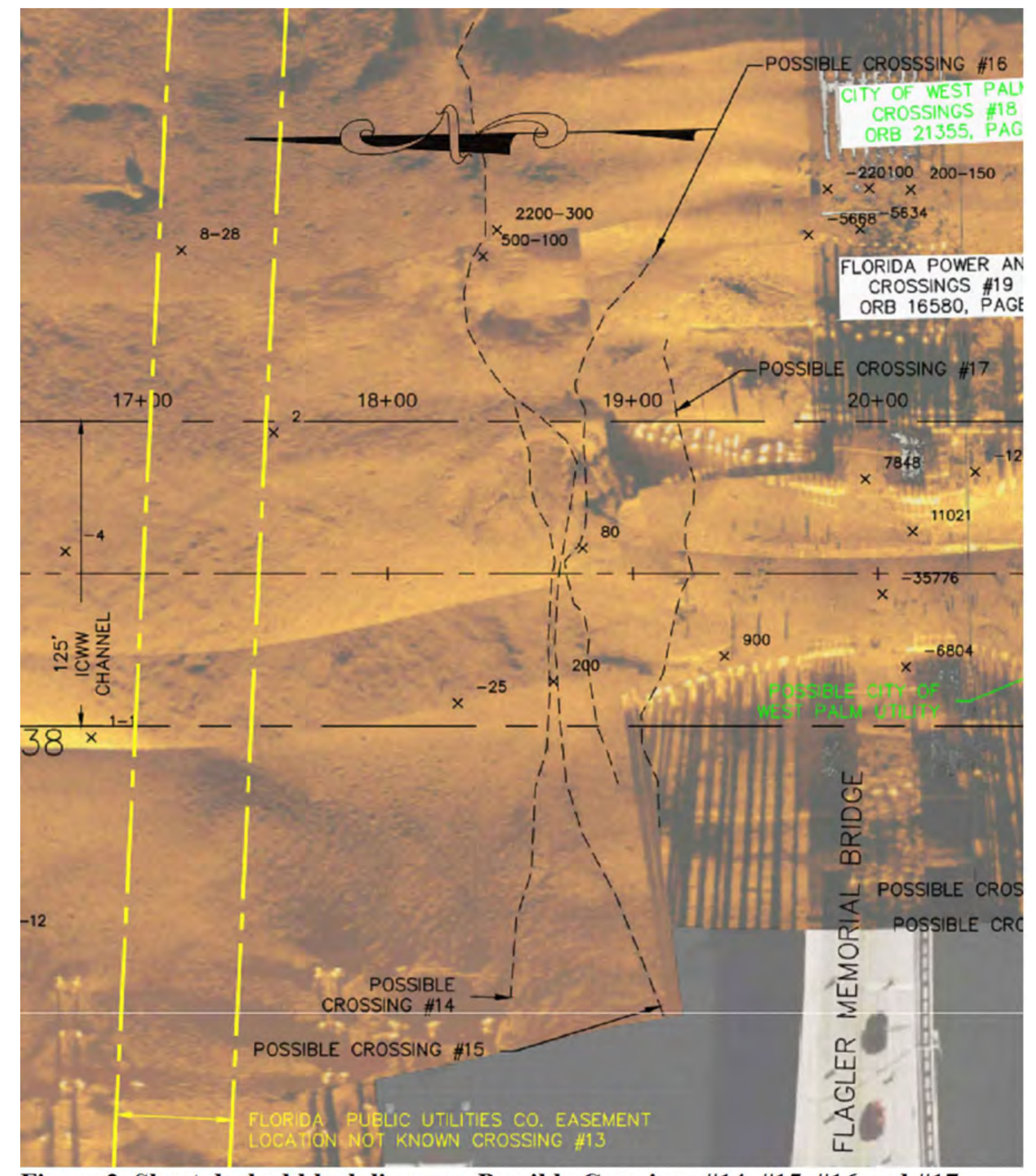

Figure 2. Short dashed black lines are Possible Crossings #14, #15, #16 and #17.

Possible Utility_04 runs through the north fender piles of the Flagler Memorial Bridge (See Figure 2). We are designating it as Crossing #17.

Possible Utility_05 runs between the south fender piles of the Flagler Memorial Bridge about 15 to 30 feet north of the City of West Palm Beach Crossing #18 easement boundary (See Figure 3).

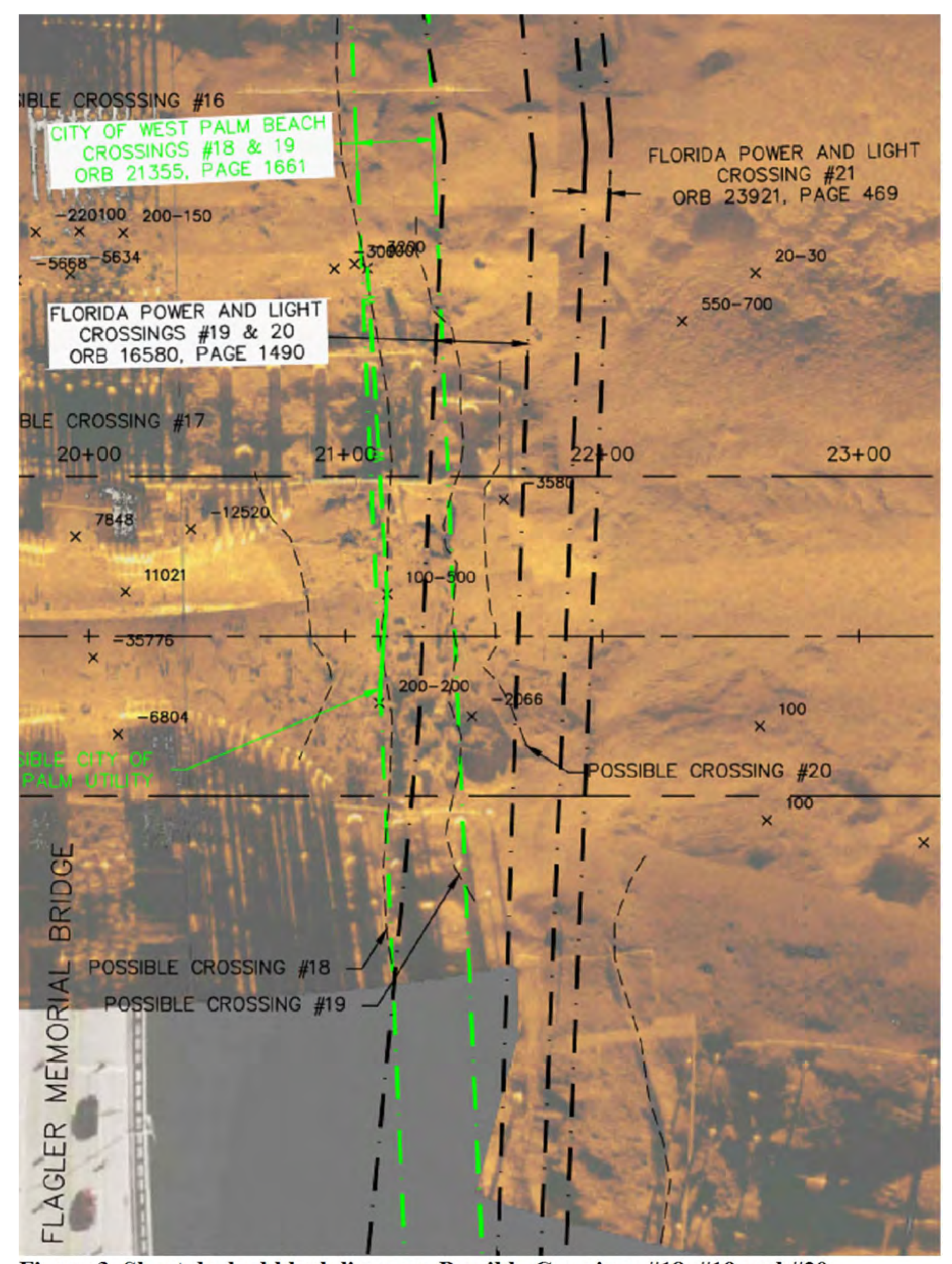

Figure 3. Short dashed black lines are Possible Crossings #18, #19 and #20. Possible Crossing 18A (leftmost) and 20A (rightmost) are unlabeled.

runs across the entire waterway survey area, through the south fender piles and along the northern boundary of the City of West Palm Beach easement (See Figure 3). We are designating it as Crossing #18.

Possible Utility_07 runs across the entire waterway survey area, through the south fender piles and along the southern boundary of the City of West Palm Beach easement (See Figure 3). We are designating it as Crossing #19.

Possible Utility_08 runs from just inside the east fender piles on the south side of the bridge within the FPL easement to the west side of the channel (See Figure 3). We are designating it as Crossing #20.

Possible Utility_09 runs from the west extent of the sonar coverage to the west edge of the channel (See Figure 3). It varies from 13 to 37 feet south of the Florida Power & Light Crossing #21 easement.

Possible Utility_10 runs for less than 100 feet on the eastern edge of the sonar coverage within the FP&L Crossing #22 easement (See Figure 4). Magnetometer string 8 was detected west of this feature and within the northern half of the easement. These two features were joined to form "Possible FPL Cable" in Figure 4a.

Possible Utility_11 merges with Possible Utility_12 east of the channel after a run of less than 100 feet and is not near a known easement (See Figure 5).

Possible Utility_12 runs from the west edge of the channel to approximately 150 feet west of the channel and is not near a known easement (See Figure 5). We have designated Possible Utility 12 as crossing #23.

Possible Utility_13 runs from the west edge of the channel and most of the way across toward the east edge (See Figure 6). Possible Utility_13 has been designated as Crossing #26.

Possible Utility_14 runs from the west edge of the channel to 125 feet beyond the east edge (see Figure 6). Possible Utility_14 has been designated as Crossing #27.

Possible Utility_15 runs from just outside the west edge of the channel to just outside the east edge (See Figure 6). Possible Utility_15 has been designated as Crossing #28.

Possible Utilty_16 runs from the west edge of the channel to just inside the last fender pile on the northeast side of the Royal Park Bridge and continues almost to the extent of the sonar coverage to the east (See Figure 6). Possible Utility_16 has been designated as Crossing #29. Possible Utilities_13, _14, _15 and _16 are all within the Southern Bell Telephone easement (See Figure 6).

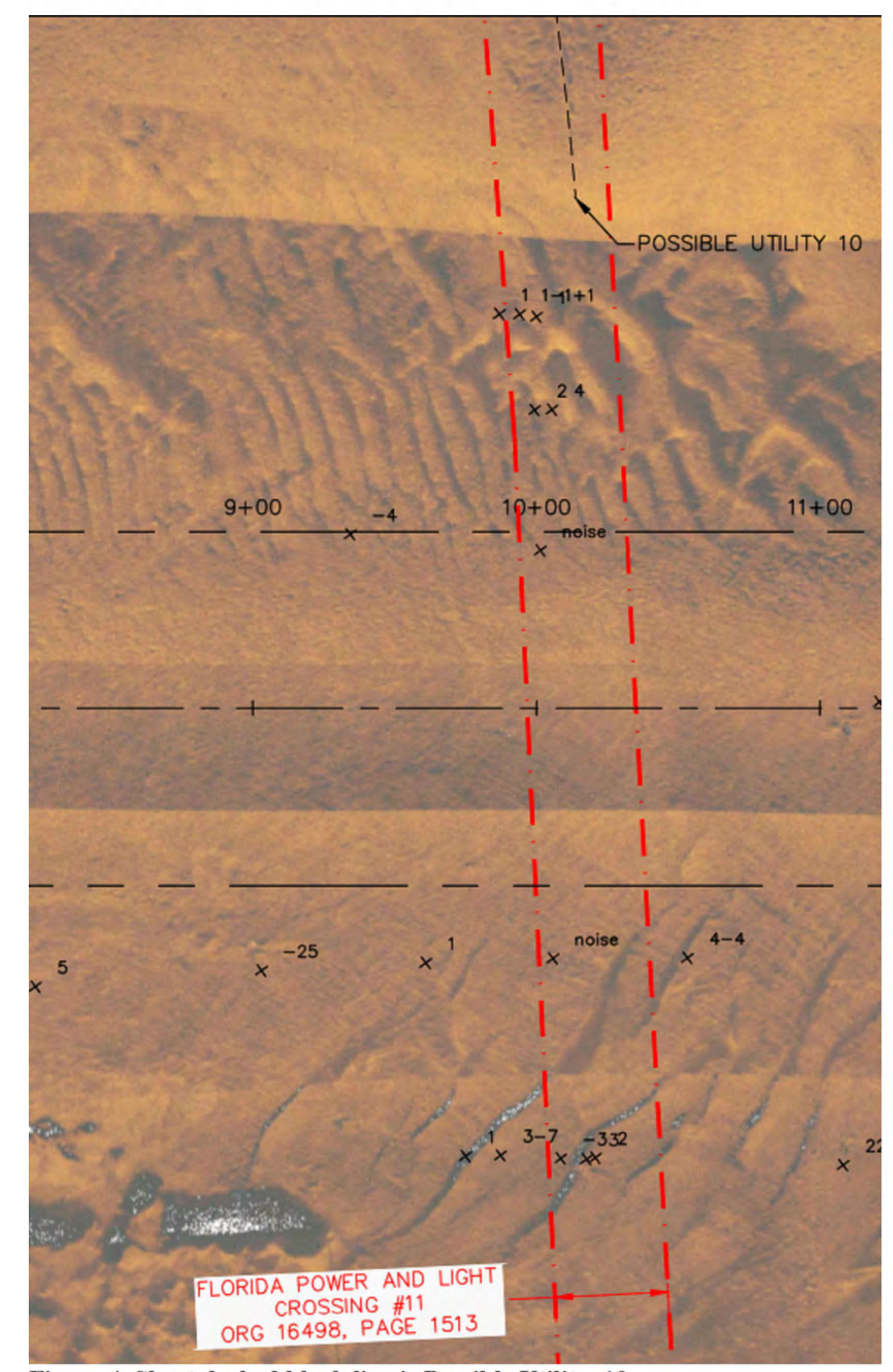

Figure 4. Short dashed black line is Possible Utility_10.

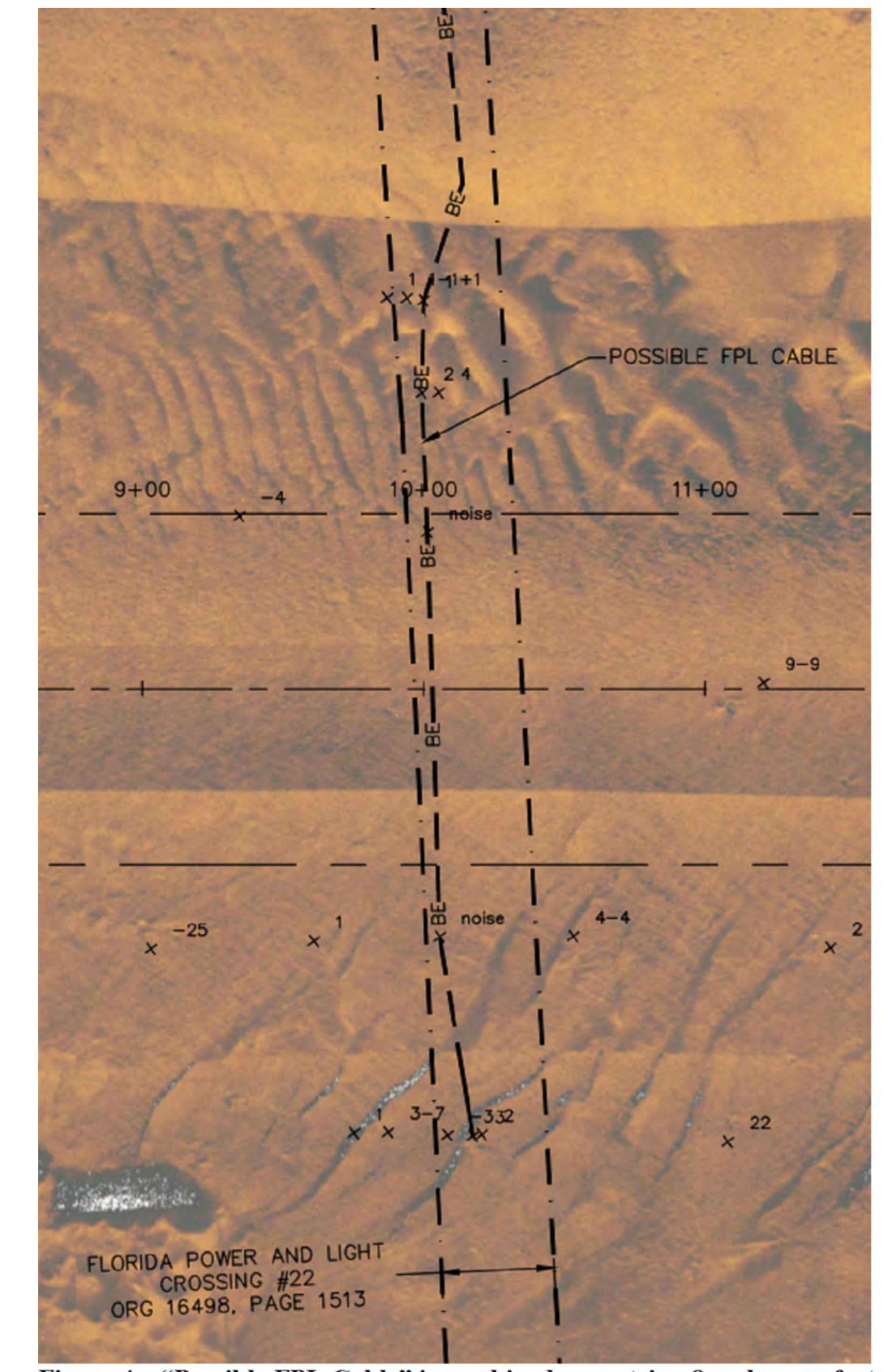

Figure 4a. "Possible FPL Cable" is combined mag string 8 and sonar feature "Possible Utility_10"

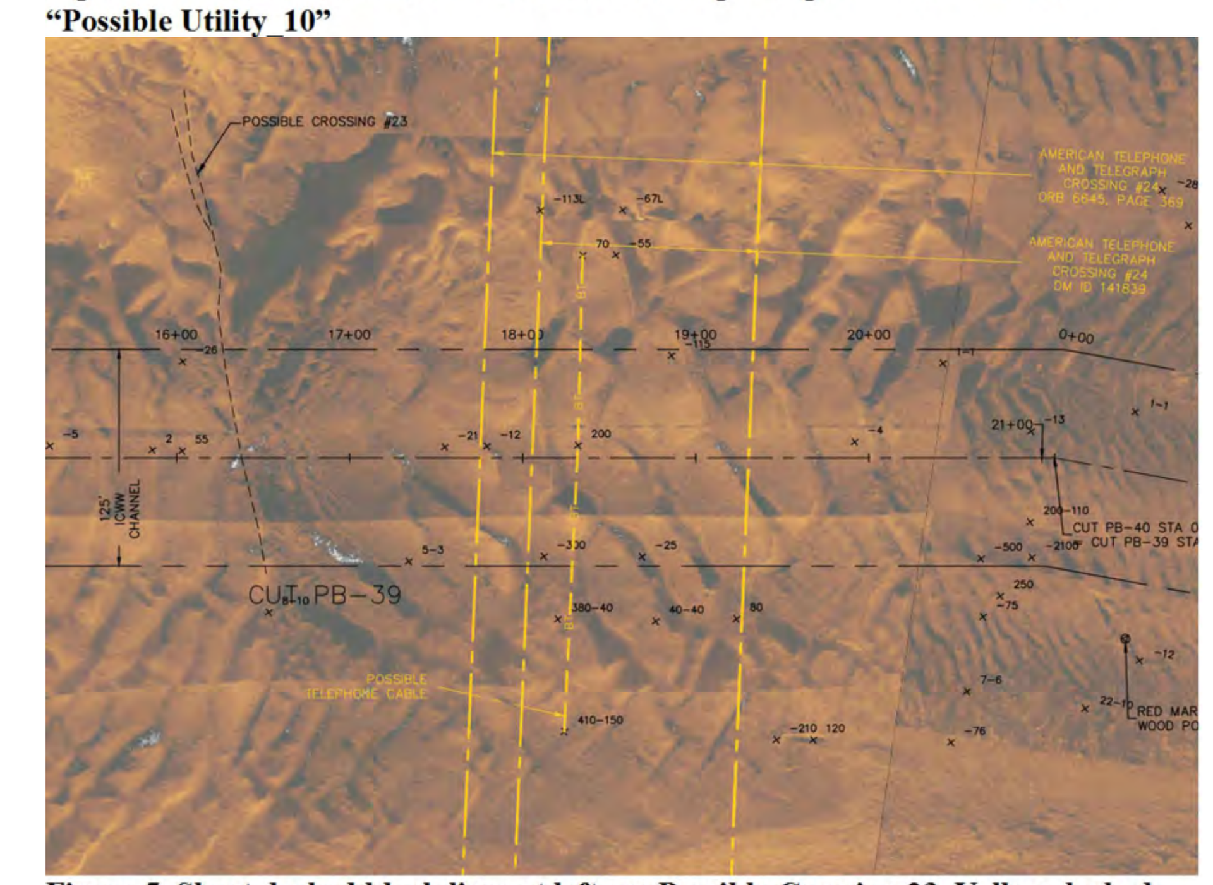

Figure 5. Short dashed black lines at left are Possible Crossing 23. Yellow dashed line is mag string 9 labeled as Possible Telephone Cable.

Possible Utility_17 starts within the channel on the west side and runs about 70 feet past the east edge of the channel south of the fender pilings on the south side of the Royal Park Bridge (See Figure 7). Possible Utility_17 has been designated as Crossing #30.

Possible Utility_18 starts about 75 feet west of the west channel edge and runs west to the extent of the sonar coverage. It may be another segment of Possible Utility_17 and both are outside of any known easements (See Figure 7). Possible Utility_18 has been designated as Crossing #31 .

Possible Utility_19 runs most of the way across the waterway for 400 feet and is within the Florida Power & Light easement (Crossing #32) just south of the Royal Park Bridge (See Figure 7).

The Sonar mosaic is available as several geo-tif files.

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SURVEY REPORT

DIVER INVESTIGATION SURVEY OF POTENTIAL BURIED UTILITIES
INTRACOASTAL WATERWAY, CUT PB-36 THROUGH PB-41
PALM BEACH COUNTY, FLORIDA
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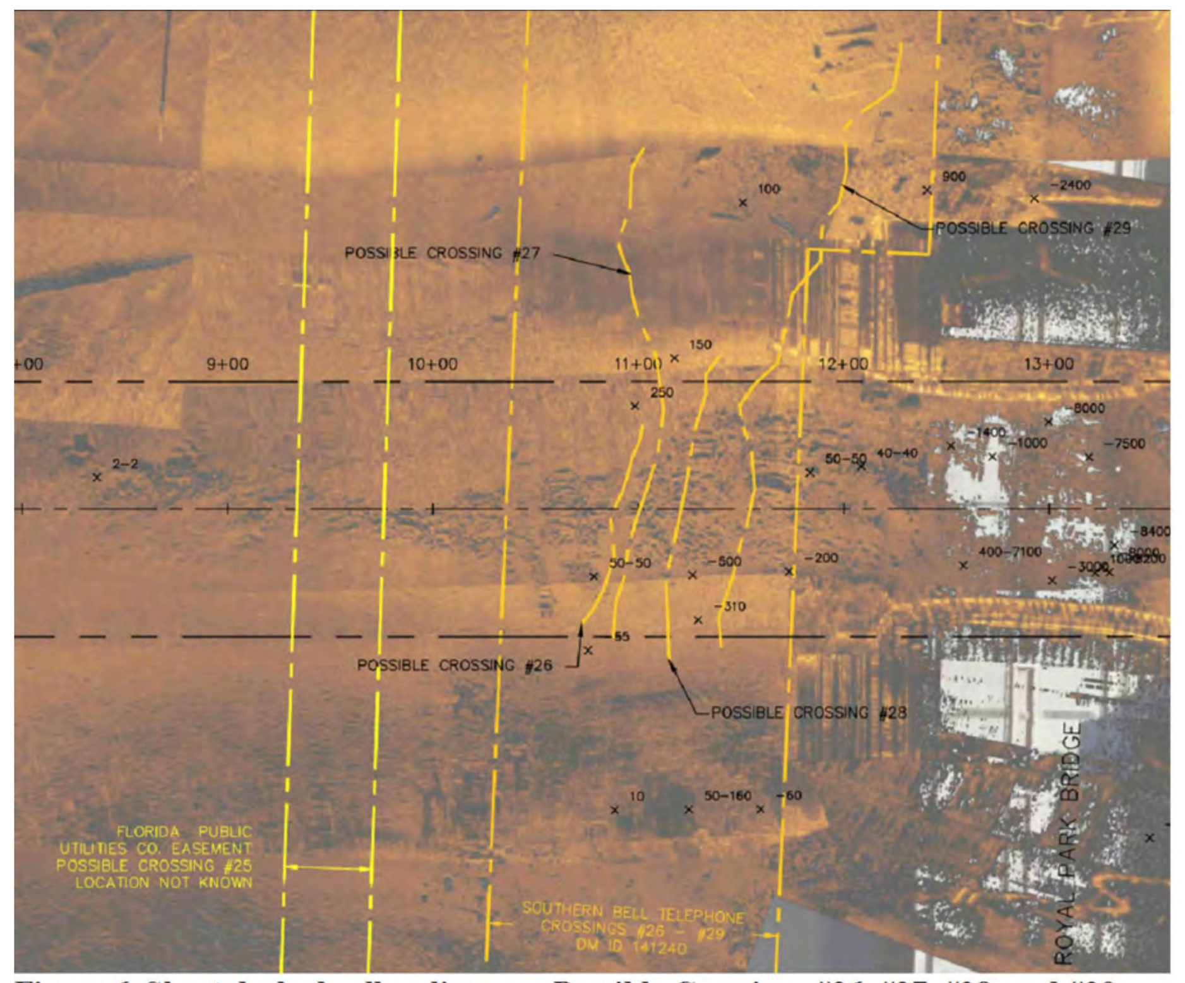

Figure 6. Short dashed yellow lines are Possible Crossings #26, #27, #28, and #29.

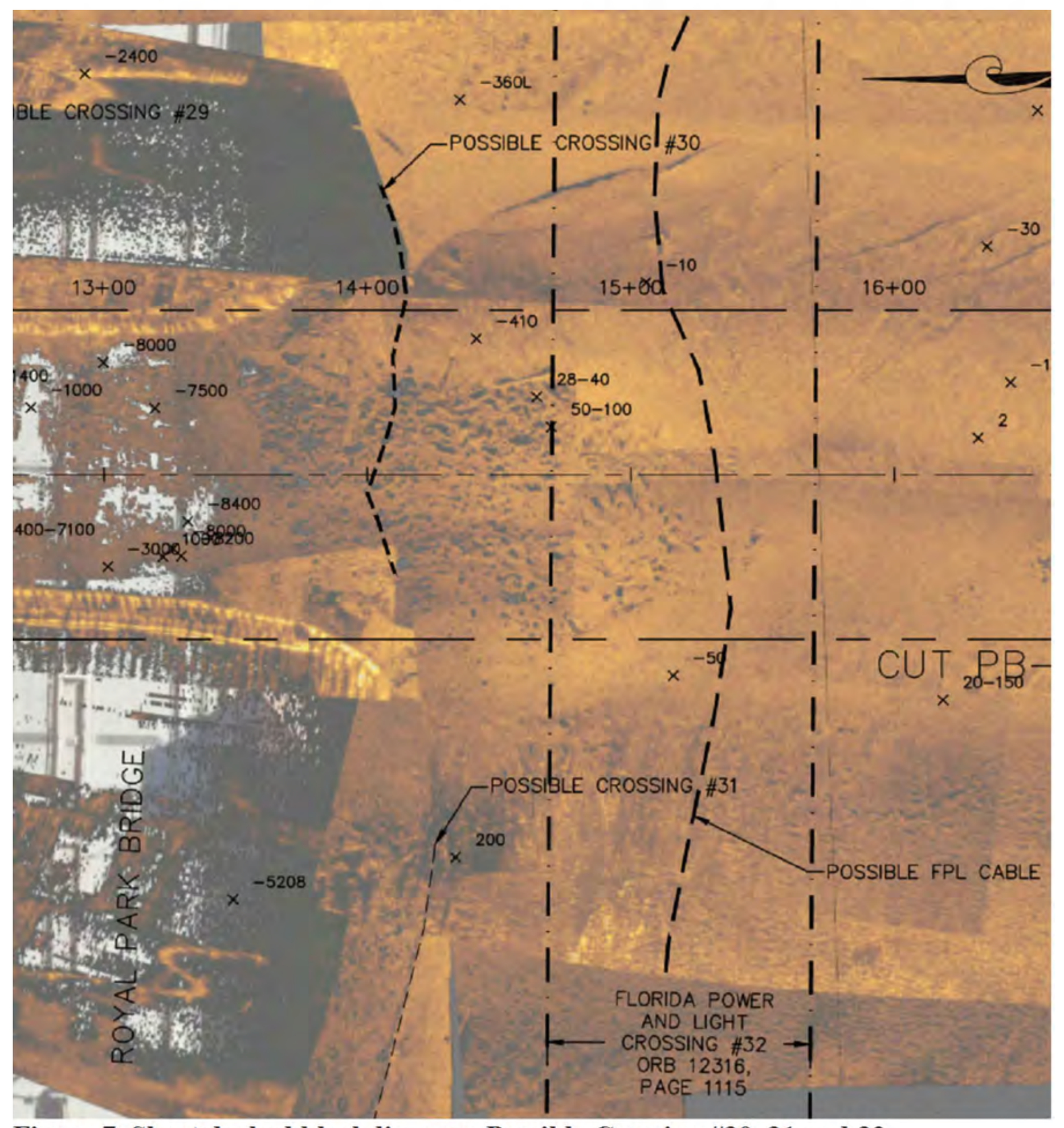

Figure 7. Short dashed black lines are Possible Crossing #30, 31 and 32.

D-2 MAGNETOMETER RESULTS:

A total of 1656 anomalies were detected throughout the area. Steel channel markers presented significant signatures along with moored yachts, docks and the bridges. Anomalies were plotted and analyzed for indications of a series of hits that would be aligned similar to the path of a utility. Utilities with ferrous iron in their construction will typically plot a continuous string of targets across the waterway. Those targets would normally have similar signatures such as a dipole vs. monopole and have similar intensity. There were no sidescan sonar, magnetometer, or seismic targets within the area show as crossing #1 FPL easement. The dive team trenched from the center of the easement, 10' north and 10' south to -16' MLLW.

The first anomaly string occurred in the center of the Florida Power & Light Crossing #2 easement. All the anomalies in this string are very strong indicating a steel conduit.

FP&L CROSSING #2 MAGNETOMETER ANOMALY STRING #1

INTENSITY gammas	Easting feet	Northing feet	Line Name
7200-2000	966554.6	884552	001_0953
1700-1500	966497.5	884545	002_1231
1700-800	966453.5	884545	003_1350
8000-4000	966303.5	884526	004_1020
1950-2150	966336.5	884526	005_1148
900-700	966392.5	884532	006_1309
2200-800	966405.6	884535	007_1140

The second anomaly string occurred where a "Cable" (Crossing 2A) is marked on a navigation chart. This string is questionable as it has strong intensities mixed with weaker intensities. A dive team trenched 12' north and south of the magnetometer anomaly string down to -17.5' MLLW and no utilities were found.

String #1A Within Nautical Chart Crossing 2A

INTENSITY gammas	Easting feet	Northing feet	Line Name
150-210	966676	882903	001_
1300-150	966619	882891	002_
35-63	966579	882895	003_
70-8	966528	882896	007_
25	966512	882900	006_
100-1200	966450	882906	005_
10	966411	882906	004_

The third anomaly string occurred at the Florida Public Utilities Co. Crossing #3 easement and diverges away from the easement as it progresses east. On the east side of the ICWW the dive team trenched 10' north and 10' south of the anomaly string and found an 8" gas pipe at elevation -17.3' MLLW. On the west side of the ICWW the dive team encountered rock at elevation -18 MLLW.

String #2

INTENSITY gammas	Easting feet	Northing feet	Line Name
-55	966854.6	880479	001_0953
160	966805.5	880481	002_1231
95	966753.5	880482	003_1350
-50	966708.6	880471	007_
250	966616.5	880465	005_
215	966579.5	880451	004_

The fourth anomaly string occurred about 12 feet north of the Florida Public Utilities Co. Crossing #4 easement and diverges away from the easement as it progresses east. The dive team trenched 10' north and 10' south of anomaly string #3 (shown below) to -17.5' MLLW and no utility lines were observed.

String #3 Florida Public Utilities Crossing #4

INTENSITY gammas	Easting feet	Northing feet	Line Name
-185	966858.6	880405	001_
270-60	966807.5	880403	002_
120-30	966759.5	880403	003_
-310	966717.6	880407	007_
680-100	966687.5	880401	006_
420-22	966627.5	880403	005_
50-60	966582.5	880409	004_

The fifth anomaly string occurred within the Florida Power and Light Crossing #5 easement. The dive team trenched 10' north and south of the magnetomer anomaly string #4 and located a cable and pipe on the west side of the ICWW at -18.7' MLLW.

String #4 Florida Power & Light Crossing #5

INTENSITY gammas	Easting feet	Northing feet	Line Name
-1000	966863.6	880195	001_
-70	966818.5	880212	002_
3-55	966778.5	880216	003_
175-10	966733.6	880211	007_
-60	966706.5	880210	006_
20-20	966652.5	880201	005_
500-2700	966597.5	880202	004_

The sixth anomaly string occurred where an easement has not been found to date. We are designating it as Crossing #6. At anomaly string #6 a 5" rusty pipe was found at elevation -12.2 MLLW.

String #5 Unknown Utility Crossing #6

INTENSITY gammas	Easting feet	Northing feet	Line Name
-1200	967071.6	877521	001_1433
2100-500	967016.5	877512	002_1231
1100-20	966970.5	877510	003_1350
870-20	966925.6	877505	007_1355
100-1600	966892.5	877496	006_1309
-1000	966850.5	877488	005_1148
1800	966816.5	877480	004_1412

The seventh anomaly string occurred where an easement has not been found to date. We are designating it as Crossing #7. At anomaly string #6 (crossing #7) a 30" sewer line was observed at elevation -16.7' MLLW.

String #6 Unknown Utility Crossing #7

INTENSITY gammas	Easting feet	Northing feet	Line Name
270-120	967252.7	873626	001_1433
290-210	967197.5	873624	002_1231
320-90	967164.5	873631	003_1350
310-200	967100.2	873649	007_1355
580-210	967076.5	873652	006_1309
550-250	967032.5	873663	005_1148
270-260	966972.7	873678	004_1412

The eighth anomaly string occurred just north of the Comcast Crossing #8 easement. At anomaly string #7 the dive team trenched north and south down to -17' MLLW on the east side of the ICWW and no utilities were observed.

String #7 Near Comcast Crossing #8

INTENSITY gammas	Easting feet	Northing feet	Line Name
220-15	967404.7	870284	001_
385-10	967361.5	870267	002_
350-1100+900	967309.5	870260	003_
none			007_
310	967223.5	870258	006_
7	967176.5	870257	005_
-80	967126.7	870276	004_

The ninth anomaly string occurred within the Florida Power and Light Crossing #22 easement. This string has two anomalies that are noise patterns consistent with a power cable interfering with the magnetometer. At crossing #22 (FPL), anomaly string #9, the dive team found a 5" cable on the east side of the ICWW at elevation -16.2' MLLW.

String #8 Within FP&L Crossing #22

INTENSITY gammas	Easting feet	Northing feet	Line Name
1-1+1	967501.3	865862.1	001_
2	967468.5	865852	002_
noise	967419.7	865842.9	003_
none			007_
none			006_
noise	967277.6	865817.9	005_
3-7	967205.9	865826	004_

The tenth anomaly string occurred within the AT&T easements at Crossing #24. This string is questionable as it has strong intensities on the west side and weaker or missing intensities on the east side. At crossing #24 (AT&T), anomaly string #9, the dive team found 2 AT&T duct banks. The top of the southerly duct bank was at elevation -18.6' MLLW. The top of the northerly duct bank was located at elevation -16.5' MLLW.

String #9 Within FP&L Crossing #24

INTENSITY gammas	Easting feet	Northing feet	Line Name	
none				1
70	967599.5	865027	002_	
none			003_	
200	967490.6	865013.9	007_	
-300	967424.3	865024.1	006_	
380-40	967389.6	865010.9	005_	
410-150	967325.9	864998	004_	

The lists of positions are displayed with the positive and negative intensities in nano-teslas (gammas), the easting and northing in feet (NAD83, Florida State Plane East Zone, U.S. Survey Foot) and line names.

With so many anomalies in the area there are anomaly strings observed that may be a random occurrence and not necessarily associated with a utility. The following locations are noted as possible but unlikely utility strings:

Centered at X=966517, Y=883604 (Cut PB-36 Range 43+42) a string of 6 anomalies runs diagonally about 098T– 278T with anomaly intensity labels of 18-6, 750-1450, 4-3, -5, 10-50, and 700-5000.

Centered at X=967100, Y=873138 (Cut PB-37 Range 39+20) a string of 5 anomalies runs east-west across the waterway with anomaly intensity labels of 1-2, 25-2, 4-4, 1020-80 and -6.

D-3 SUB-BOTTOM PROFILER RESULTS

Numerous sub-bottom reflections were observed and geologic layers were observed as deep as 12 feet but none of the reflections displayed the classic hyperbolic signature patterns consistent with utilities. There was one half hyperbolic signature at Crossing #10 on Sub-bottom Line 7N.001 (See Figure 8). All the other sub-bottom lines were checked for similar signatures at Crossing #10 and while some suggest a generally disturbed sub-bottom area, only line 6S had a possible contact (See Figure 9) but not similar to the one on 7N.001. These contacts are marked on the HTML annotated profiles as "FP10". A small dark partially hyperbolic feature was marked (See Figure 10) as "C8"at Crossing #8 on Sub-bottom line 3N but none of the other lines had any contacts at Crossing #8. Two features resembling fat commas were marked "FP2" at Crossing #2 (See Figure 11) on Sub-bottom line 4S.002 but none of the other lines confirmed this with similar signatures.

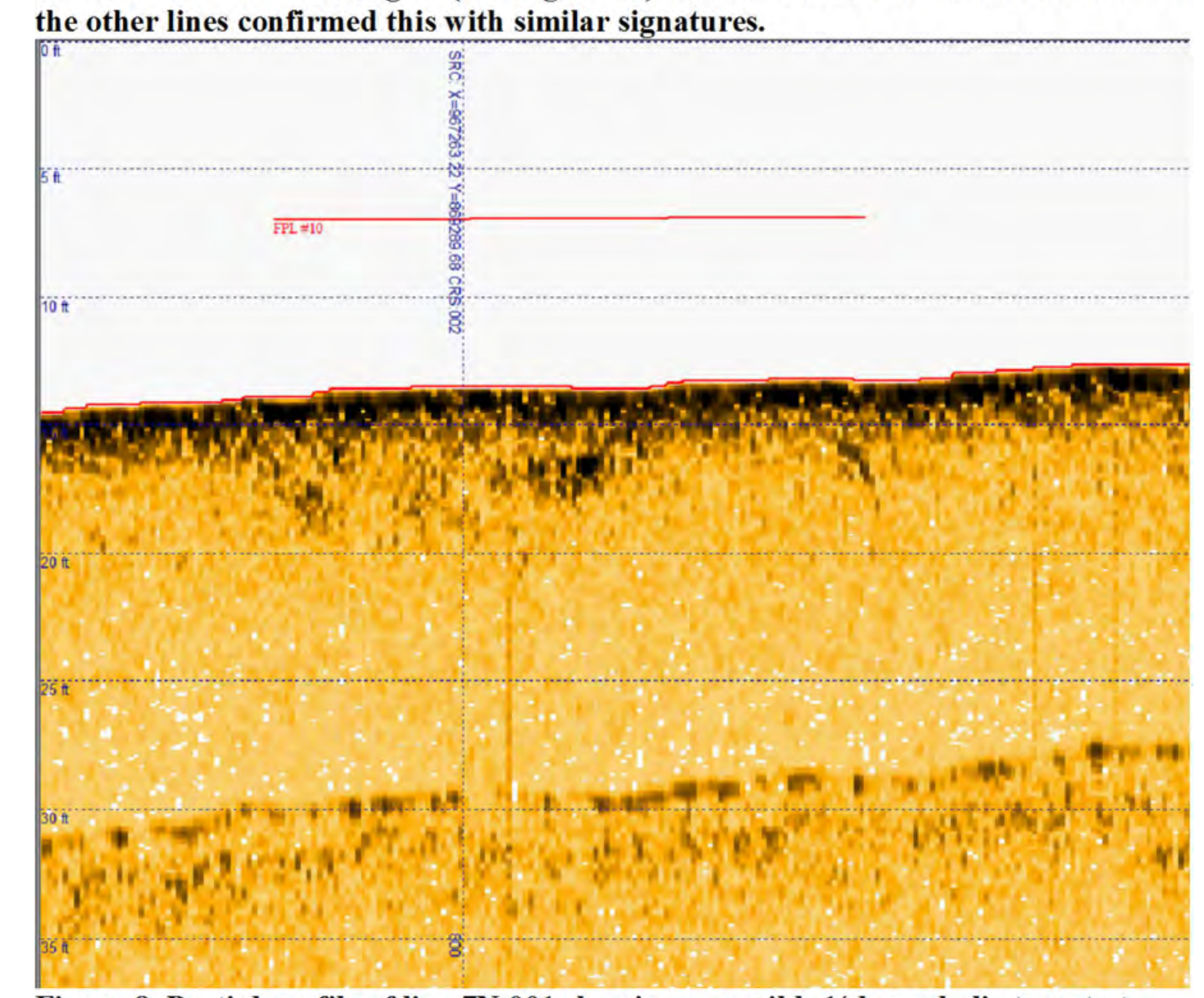

Figure 8. Partial profile of line 7N.001 showing a possible ½ hyperbolic target at right. Top of target is approximately 2.4' below surrounding bottom. The red line above marks the width of the FP&L easement from south (left) to north (right).

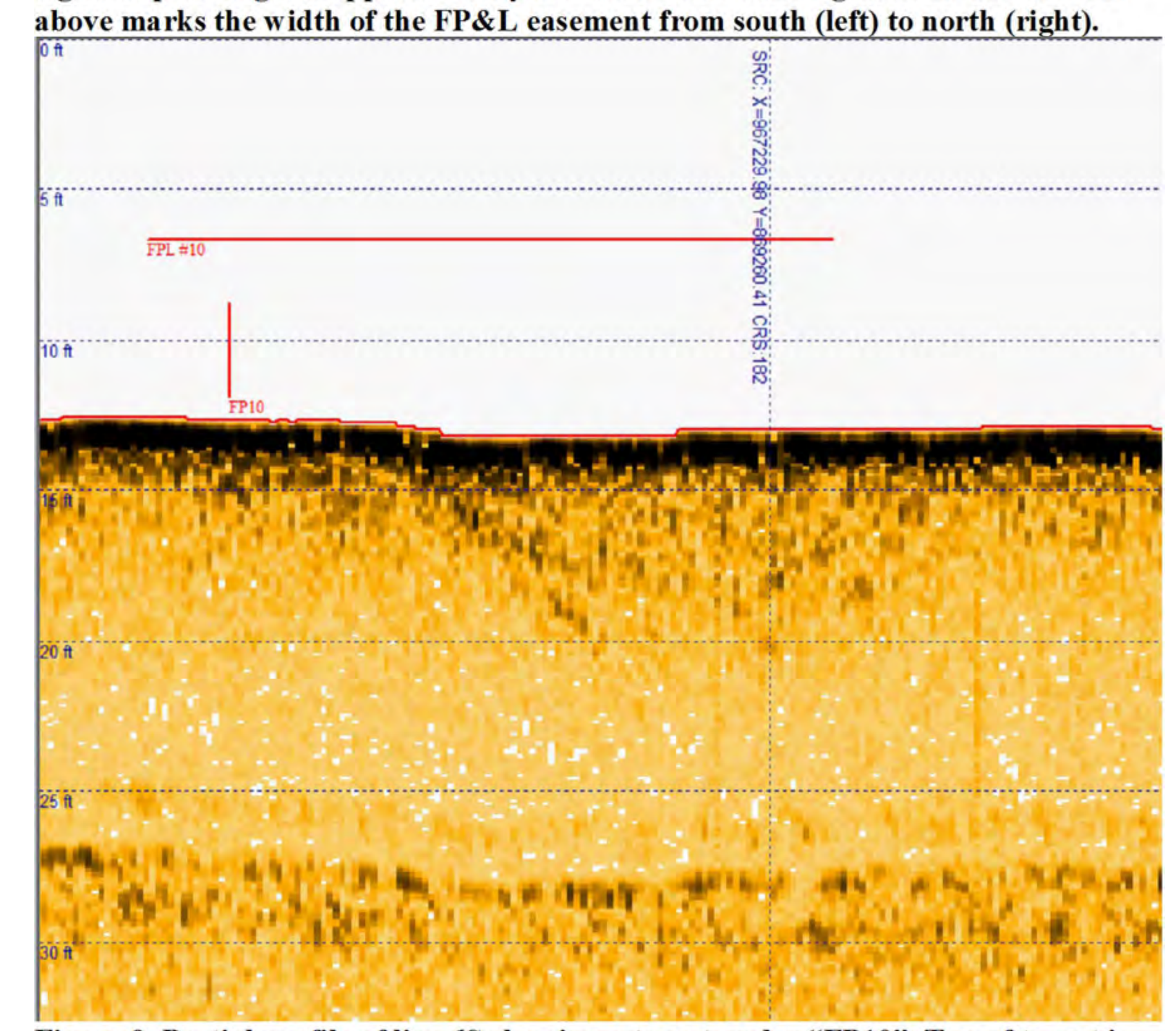

Figure 9. Partial profile of line 6S showing a target under "FP10". Top of target is approximately 1.8' below surrounding bottom. The red line above marks the width of the FP&L easement from north (left) to south (right).

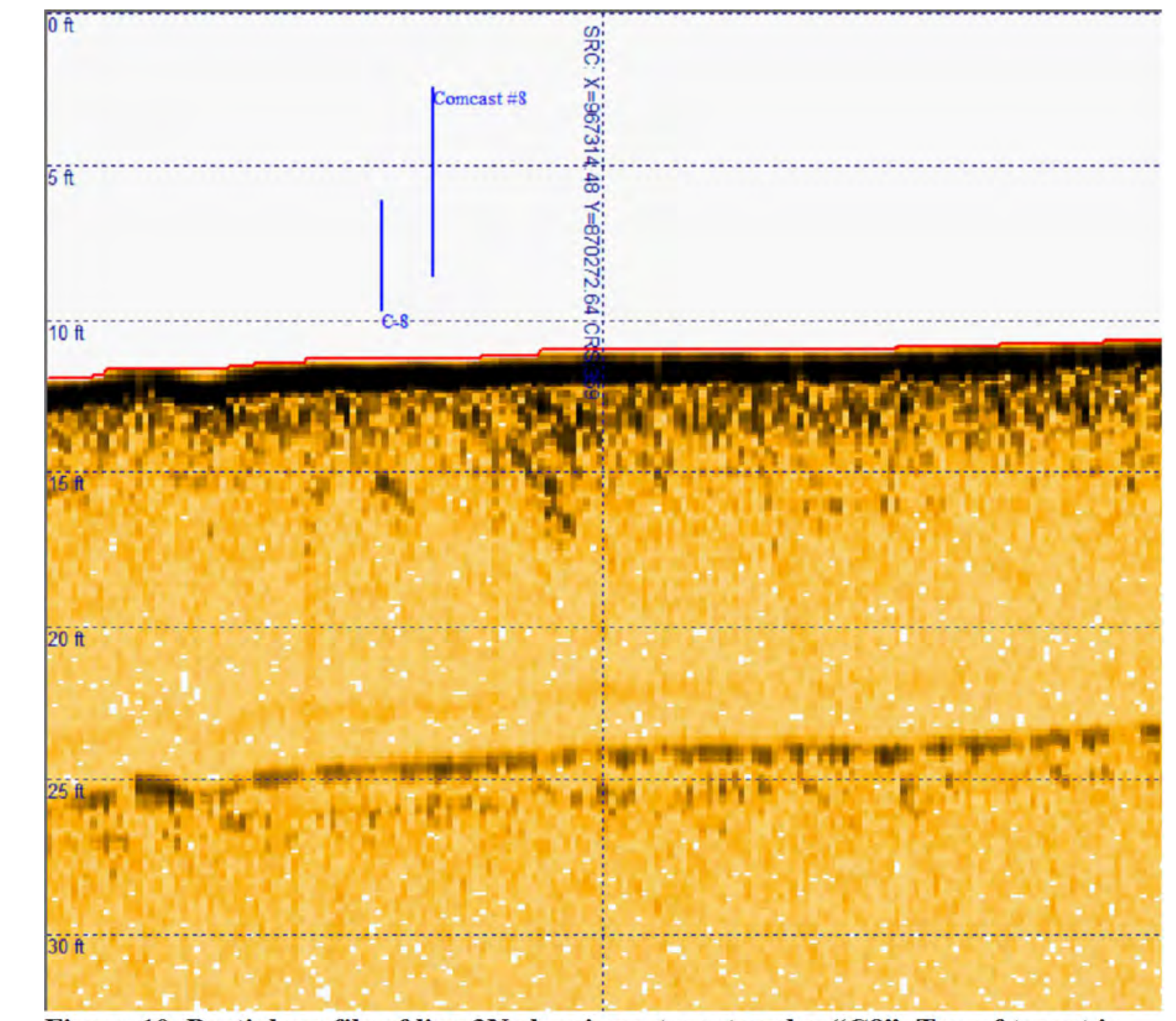

Figure 10. Partial profile of line 3N showing a target under "C8". Top of target is approximately 2.5' below surrounding bottom.

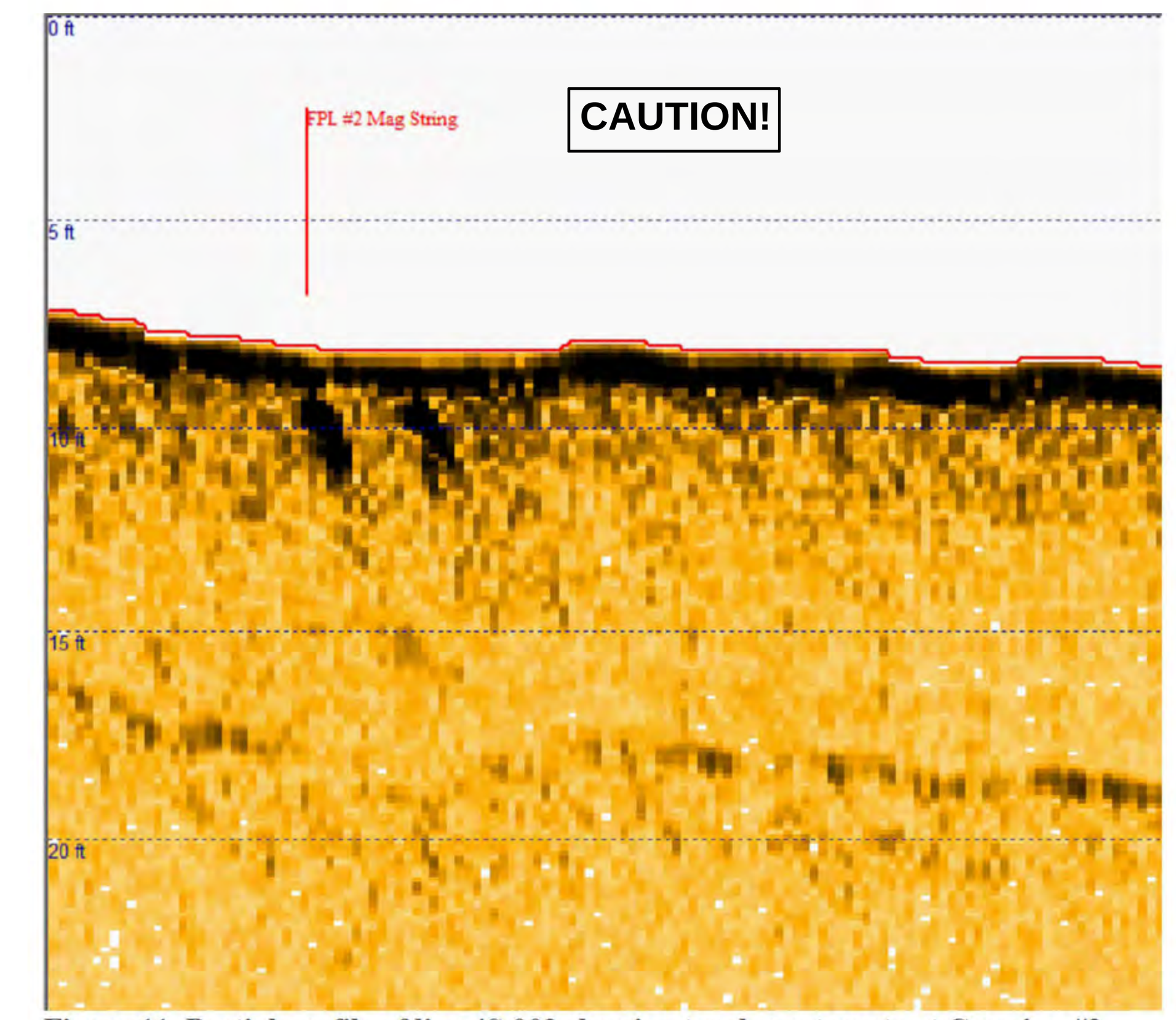

Figure 11. Partial profile of line 4S.002 showing two large targets at Crossing #2. Top of targets are approximately 1.3' below surrounding bottom.

Sub-bottom Target	Easting	Northing	Line#	Crossing#	DOB
FP10-1	967267	869371	7N.001	FPL #10	2.4'
FP10-2	967233	869361	6S	FPL #10	1.8'
C8	967315	870233	3N	Comcast #8	2.5'
FP2-1	966302	884527	4S.002	FPL #2	1.3'
FP2-2	966303	884513	4S.002	FPL #2	1.3'

A. CONCLUSIONS

Nineteen sonar features resembling cables were detected. Sixteen of those have been designated with crossing numbers. Nine magnetometer anomaly strings were detected and designated or correlated with crossing numbers. The five sub-bottom targets are inconclusive. No other utilities were detected on this survey.

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LB #4298

CERTIFICATE OF SURVEYOR – I HEREBY CERTIFY THAT THE INFORMATION SHOWN HEREON IS IN ACCORDANCE WITH A RECENT FIELD SURVEY MADE UNDER MY DIRECTION, AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE STANDARDS OF PRACTICE AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027, FLORIDA STATUTES.

JOHN R. MORGAN, II, PLS
PROFESSIONAL LAND SURVEYOR #3520
STATE OF FLORIDA

SURVEY REPORT
DIVER INVESTIGATION SURVEY OF POTENTIAL BURIED UTILITIES
INTRACOASTAL WATERWAY, CUT PB-36 THROUGH PB-41
PALM BEACH COUNTY, FLORIDA
FOR TAYLOR ENGINEERING, INC.

DRAWN BY	CHECKED BY	FIELD BOOK / PAGE NO.	DATE OF SURVEY	COMMISSION NO.	SCALE	DATE
LFP	JRM	SEE COVER	2/15/18	5303.16	AS SHOWN	3/6/18

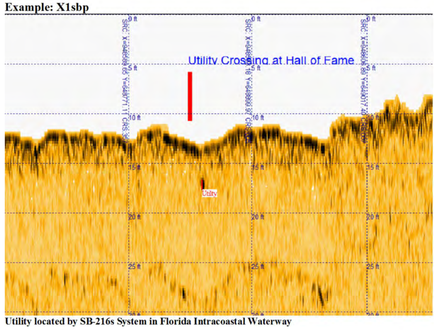
A spreadsheet (M-E summary.xlsx) has been constructed to help illustrate the results of this survey.

The power and telephone cables do not typically have significant ferrous iron in their construction that would allow them to be detected by the magnetometer. Occasionally the magnetometer will detect a large amount of current flowing through a power cable but that is a variable factor and did occur on two occasions during this survey.

It should be understood that the results of this survey are an interpretation of remote sensing data and as such cannot be relied upon as positive confirmation of the existence or nonexistence of submerged or buried utilities.

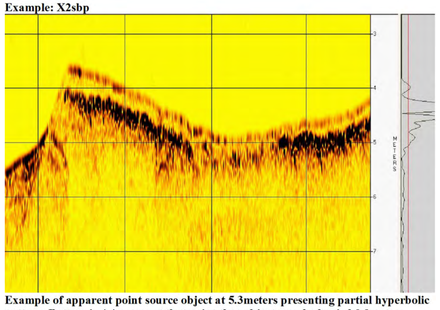
Some examples of sub-bottom targets from other project areas are shown below:

Example: X1sbp



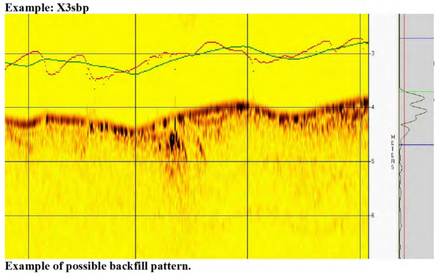
Utility located by SB-216s System in Florida Intracoastal Waterway

Example: X2sbp



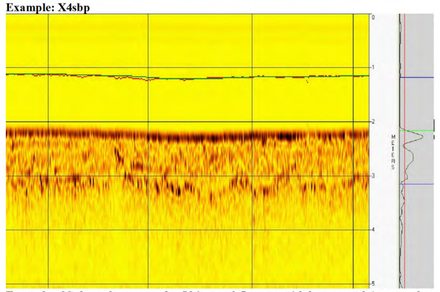
Example of apparent point source object at 5.3meters presenting partial hyperbolic pattern. Bottom is 4.4meters at that point thus object may be buried 0.9meters.

Example: X3sbp



Example of possible backfill pattern.

Example: X4sbp



Example of Sub-surface anomaly. Object at 2.5meters with bottom at 2.1meters thus top of object may be buried 0.4meters. Note masking of sub-bottom reflector by object.

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PALM BEACH COUNTY, FLORIDA
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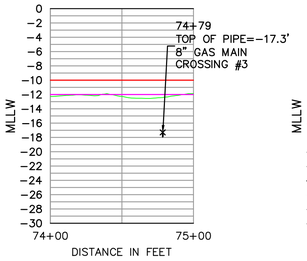
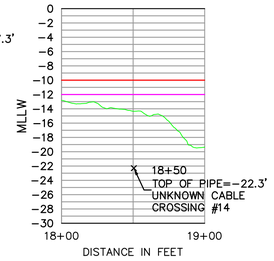
COMMISSION NO. 5303.16
SCALE AS SHOWN
DATE 3/6/18
SHEET 21 OF 22

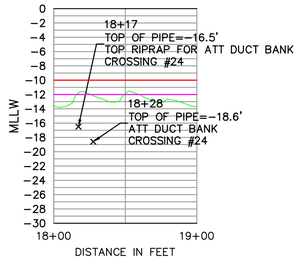
CUT 36 31' LT (EAST)



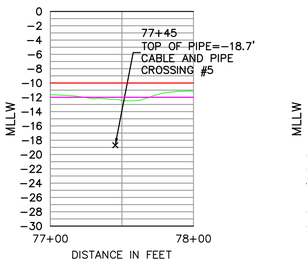
CUT 38 31' LT (EAST)



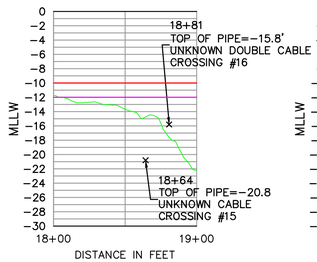
CUT 39 27' LT (EAST)



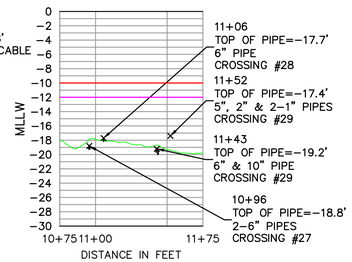
CUT 36 33' RT (WEST)



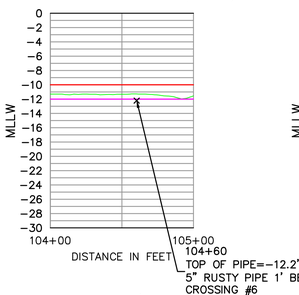
CUT 38 42' LT (EAST)



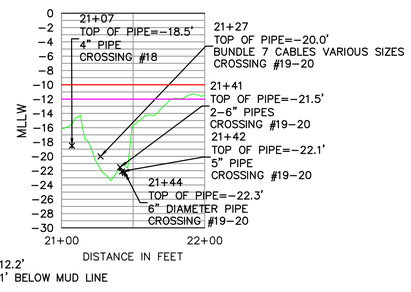
CUT 40 31' RT (WEST)



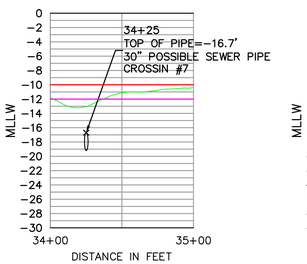
CUT 36 24' LT (EAST)



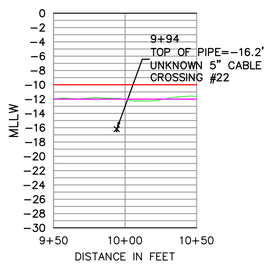
CUT 38 45' LT (EAST)



CUT 37 31' LT (EAST)



CUT 39 31' LT (EAST)



NOTE: ALL PROFILE VIEWS FACE EAST

0 50' 100'
HORIZONTAL SCALE 1" = 50'
INTENDED DISPLAY SCALE

0 10' 20'
VERTICAL SCALE 1" = 10'
INTENDED DISPLAY SCALE

LEGEND

DECEMBER 2015
DESIGN SURFACE (−10' MLLW)
DESIGN +2 (−12' MLLW)

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STATE OF FLORIDA

PROFILES (MLLW −10' PROJECT)
DIVER INVESTIGATION SURVEY OF POTENTIAL BURIED UTILITIES
INTRACOASTAL WATERWAY, CUT PB−36 THROUGH PB−41
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SCALE AS SHOWN
DATE 3/6/18
SHEET 22 OF 22

H:\Projects\5303-16\DWG\5303-16.dwg Thu, Mar. 11, 2021 - 2:34pm