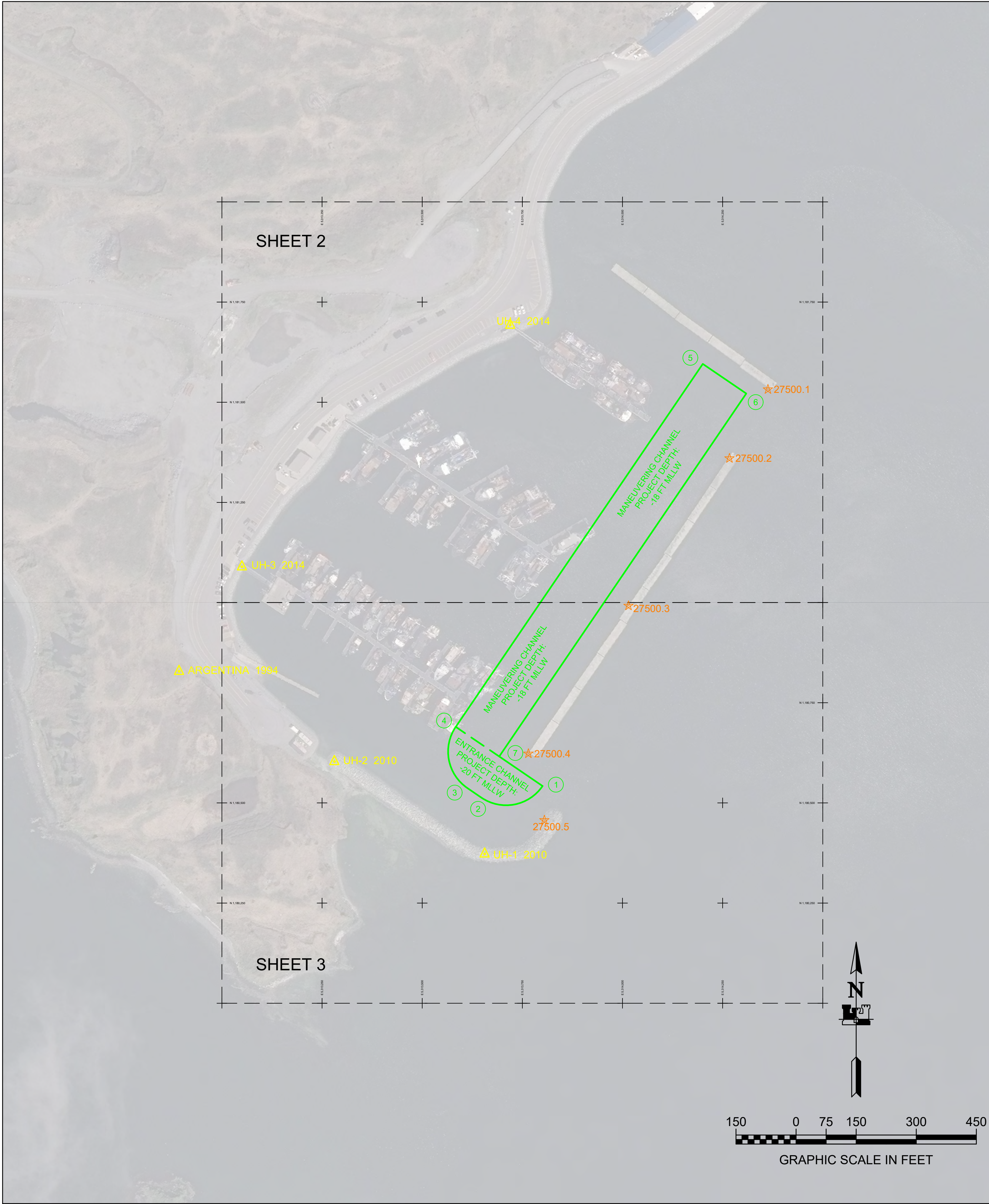




NAVIGATION AIDS			
NO.	NORTHING	EASTING	DESCRIPTION
27500.1	1,181,532	5,314,363	CARL E MOSES HARBOR LIGHT A FI W 4S
27500.2	1,181,360	5,314,267	CARL E MOSES HARBOR LIGHT B FI W 2.5S
27500.3	1,180,992	5,314,015	CARL E MOSES HARBOR LIGHT C FI W 4S
27500.4	1,180,623	5,313,765	CARL E MOSES HARBOR LIGHT D Q W
27500.5	1,180,457	5,313,805	CARL E MOSES HARBOR LIGHT 1 FI G 2.5S

PROJECT LIMITS			PROJECT LIMITS		
CORNER#	NORTHING	EASTING	CORNER#	NORTHING	EASTING
1	1,180,542.22	5,313,800.45	5	1,181,595.52	5,314,200.49
2	1,180,513.22	5,313,647.74	6	1,181,521.67	5,314,308.97
3	1,180,537.04	5,313,612.77	7	1,180,615.89	5,313,692.25
4	1,180,689.75	5,313,583.77			

VOLUME COMPUTATIONS		
AREA A: ENTRANCE CHANNEL	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-20.0	0
AVAILABLE TO MAX PAY DEPTH (MP)	-21.0	0
AREA B: MANEUVERING CHANNEL		
AVAILABLE TO PD	-18.0	0
AVAILABLE TO MP	-19.0	0
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		0

OBJECT/OBSTRUCTION DATA				
ID	NORTHING	EASTING	DEPTH	APPROX SIZE (FEET)
OBJ-001	1,180,805.2	5,313,693.7	-66.7	15X15X 3
OBJ-002	1,180,954.6	5,313,578.3	-69.0	12X14X4
OBJ-003	1,181,361.3	5,313,986.7	-73.1	10X10X2
OBJ-004	1,181,309.0	5,313,861.9	-72.8	16X6X2

LEGEND

MANHOLE	□
CATCH BASIN	⊠
CULVERT	<
VALVE	⊠
SIGN	○
GUARD POST	●
ELECTRICAL JUNCTION BOX	⊠
ELECTRICAL PEDESTAL	⊠
ELECTRICAL SWITCH BOX	⊠
TRANSFORMER WITH PAD	⊠
TRANSFORMER	▲
COMMUNICATION JUNCTION BOX	⊠
LIGHT POLE	○
FIRE HYDRANT	⊠
BUILDING	⊠
FENCE LINE	— x —



THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN NSPS/THSOA CERTIFIED HYDROGRAPHER

Gregory W. Gibson (317)

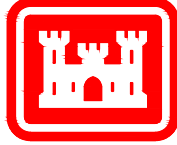


NOTES

- PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 10, NAD83 (CORS), IN US SURVEY FEET BASED ON A STATIC GPS NETWORK HOLDING NGS EPOCH 2003.00 CORS L1 PHASE CENTER VALUES FOR "PLATINUM_AK 2007 CORS ARP" (NGS PID DL6672), "PORT HEIDEN AK 2007 CORS ARP" (NGS PID DL6447) AND "SAND POINT_AK 2004 CORS ARP" (NGS PID DL7635).
- LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 10, NAD83, IN US SURVEY FEET HOLDING DOMED BC "NO 19 1973" AS N 1,183,685.10", E 5,317,889.65" AND DOMED BC "UH-4, 2014" AS N 1,181,692.30", E 5,313,719.62".
- VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0'), BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST: "946 2620, UNALASKA, DUTCH HARBOR, ALASKA" PUBLISHED 10/24/2011. THIS TIDAL DATUM IS BASED ON THE 1983-2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOAA/USCGS TIDAL BENCHMARK "NO. 19 1973" (VM#11816) AS 16.43'.
- VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 12B) ELEVATIONS HOLDING NOAA/USCGS TIDAL BENCHMARK "NO. 19 1973" (PID BBBB51/VM#11816) AS 16.72'.
- SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
- BATHYMETRY WAS COLLECTED MAY 9 & 10, 2019. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2020 MULTIBEAM ECHOSOUNDER OPERATING AT 400 KHZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH A AML BASE X SOUND VELOCITY PROBE. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV WAVEMASTER V5 SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE R8 MODEL 3 GPS RECEIVER SET AT CONTROL STATION "NO 19 1973". DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 AND QIMERA 1.6 SOFTWARE. HORIZONTAL CONTROL WAS VERIFIED USING RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHNIQUES.
- TERRESTRIAL LASER SCANNING DATA WAS COLLECTED MAY 9 & 10, 2019. DATA WAS COLLECTED USING A RIEGL VZ400 LASER SCANNER AND PROCESSED USING QINSY 8.1 AND QIMERA 1.6 SOFTWARE. POSITION AND VESEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV WAVEMASTER V5 SYSTEM
- THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
- MAP SOUNDINGS ARE BINNED AT 24 FEET AND ARE SHOAL-BIASED. CONTOURS ARE BASED ON 12 FEET BINNED SHOAL-BIASED SOUNDINGS. VOLUME SOUNDINGS ARE BINNED AT 3 FEET AND ARE MEAN VALUE SOUNDINGS.

SURVEY CONTROL DATA				
STATION	NORTHING	EASTING	MLLW	DESCRIPTION
2620 M 1982	1,184,130.08	5,317,058.63	10.97	NOS SBC
2620 P 1990	1,184,292.6	5,316,731.6	11.73	NOS SBC
ARGENTINA 1994	1,180,828.37	5,312,893.00	33.58	2 INCH AL CAP
GRAVE 1901-35	1,183,502.41	5,320,202.41	59.72	USCGS SBC (TRI STA)
NO. 19 1973	1,183,685.10	5,317,889.85	16.43	USCGS SBC (BENCH MARK)
UH-1 2010	1,180,372.71	5,313,655.82	10.92	3 INCH DOMED BC
UH-2 2010	1,180,603.19	5,313,280.70	11.04	3 INCH DOMED BC
UH-3 2014	1,181,089.15	5,313,050.09	13.00	3.5 INCH DOMED BC
UH-4 2014	1,181,692.30	5,313,719.62	12.31	3.5 INCH DOMED BC

*Bench marks with coordinate precision of 0.1' were measured by RTK GNSS.



US ARMY CORPS OF ENGINEERS®
ALASKA DISTRICT

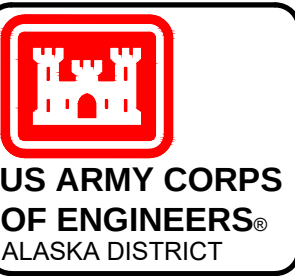
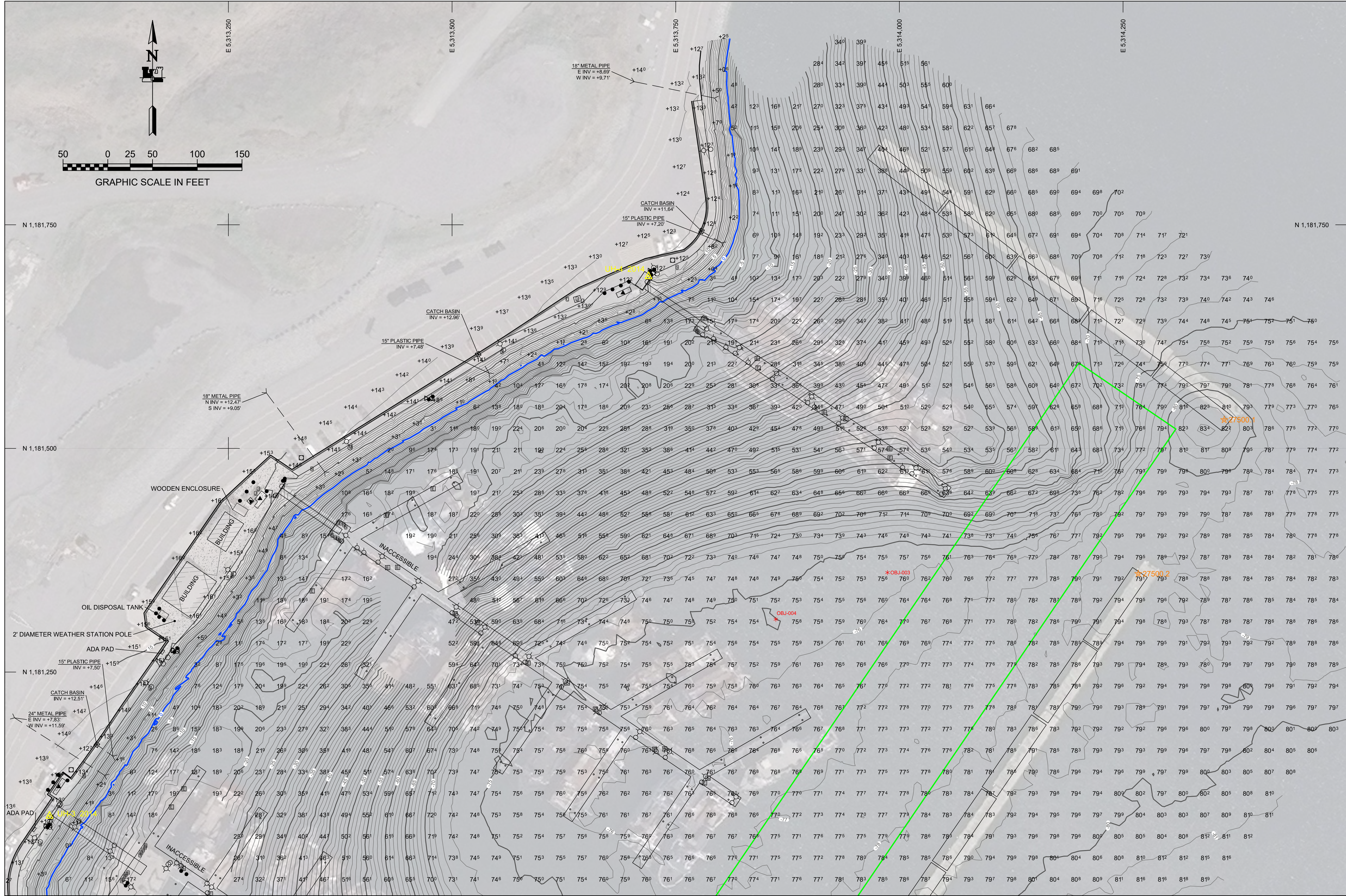
REV.	DATE	BY	APPR.	DESCRIPTION

CONTRACT NO.: WB11K16-16-D-0014	TASK ORDER NO.: 19P0061	JOB NO.: 0219	SCALE: 1" = 150'	CONTRACTOR: EFC INC.	STATE: ALASKA
SURVEYED BY: GREGORY W. GIBSON	PLOT DATE: 17 JULY 2019	SIZE: ANSI D	CHIEF GEOMATICS SECTION	CITY: WASILLA	
U.S. ARMY CORPS OF ENGINEERS ALASKA DISTRICT 2204 3RD STREET DIER, ALASKA 99506-0888	DRAWN BY: ROBERT GOUGHNOUR	CHECKED BY: TASJBG/GWG	APPROVED BY: TASJBG/GWG	FILE:	

UNALASKA, ALASKA
013597 - UNALASKA HARBOR
PROJECT CONDITION SURVEY
MAY 6 - MAY 10, 2019

REFERENCE
NUMBER:

5-UAK-92-07-14

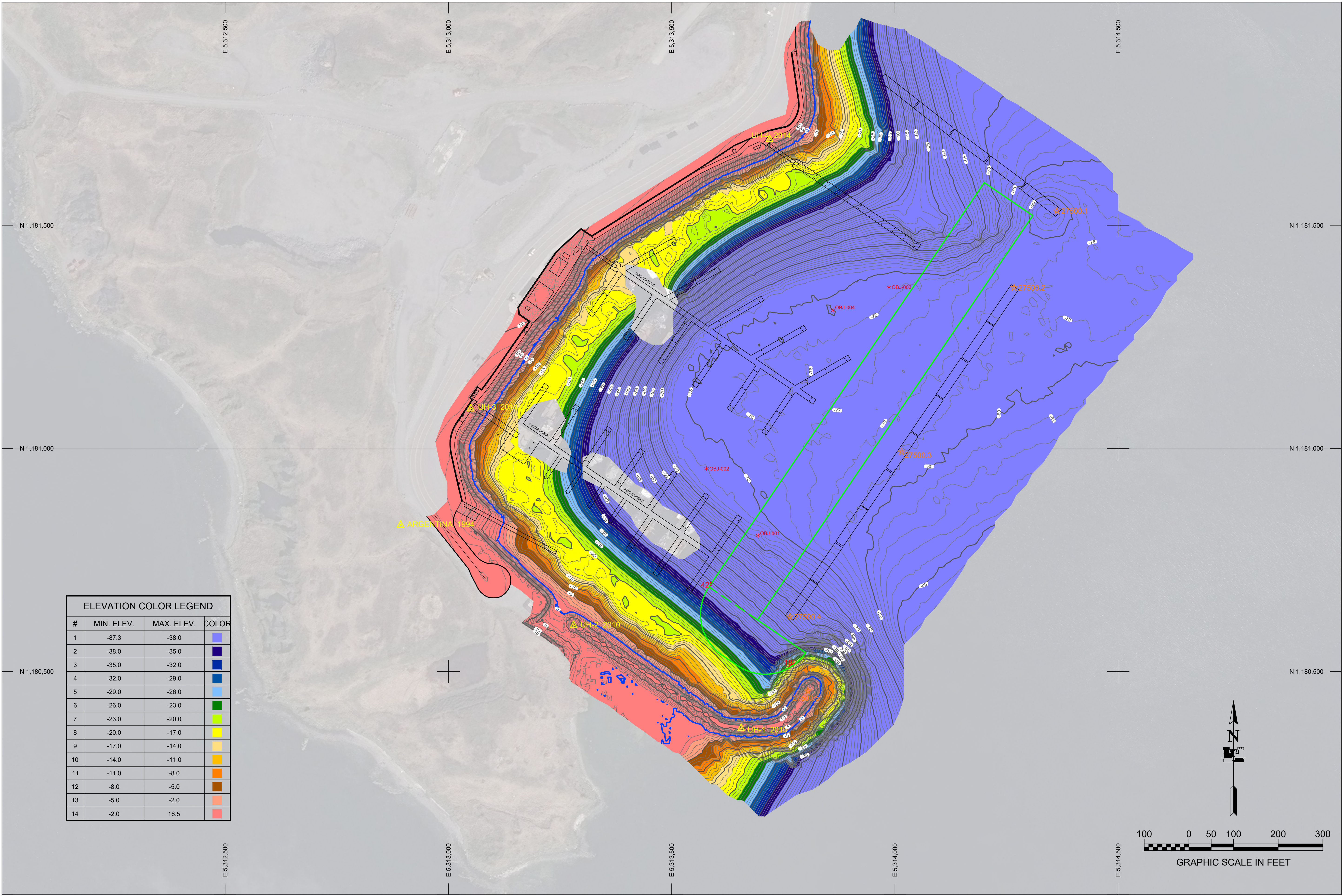


REV.	DATE	BY	APPR.	DESCRIPTION

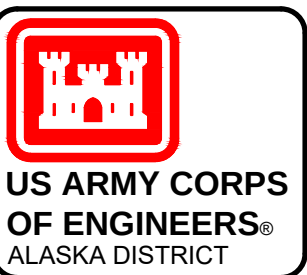
	SURVEYED BY:	UPC:	CONTRACT NO.:
	DRAWN BY:	013597	W811K8-16-D-0014
	CHECKED BY:	ROBERT GOUGHNOUR	TASK ORDER NO.:
	APPROVED BY:	TAJUGING	17 JULY 2019
FILE:	013597 VH02 DWG	SCALE:	1" = 50'
STATE:	ALASKA	CITY:	WASILLA

UNALASKA, ALASKA
013597 - UNALASKA HARBOR
PROJECT CONDITION SURVEY
MAY 6 - MAY 10, 2019

REFERENCE
NUMBER:
5-UAK-92-07-14
SHEET 2 OF 5



ELEVATION COLOR LEGEND			
#	MIN. ELEV.	MAX. ELEV.	COLOR
1	-87.3	-38.0	
2	-38.0	-35.0	
3	-35.0	-32.0	
4	-32.0	-29.0	
5	-29.0	-26.0	
6	-26.0	-23.0	
7	-23.0	-20.0	
8	-20.0	-17.0	
9	-17.0	-14.0	
10	-14.0	-11.0	
11	-11.0	-8.0	
12	-8.0	-5.0	
13	-5.0	-2.0	
14	-2.0	16.5	



REV.	DATE	BY	APPR.	DESCRIPTION

 U.S. ARMY CORPS OF ENGINEERS ALASKA DISTRICT 2204 3RD STREET BER, ALASKA 99506-0888	SURVEYED BY: GREGORY W. GIBSON	UPC: 013597	CONTRACT NO.: W811K8-16-D-0014
	DRAWN BY: ROBERT GOUGHNOUR	PLOT DATE: 17 JULY 2019	TASK ORDER NO.: 19P0061
	CHECKED BY: TASJBG/GWG	SIZE: ANSI D	JOB NO.: 0219
	APPROVED BY: TASJBG/GWG	SCALE: 1" = 100'	CONTRACTOR: LETRAC INC.
FILE: 013597_VH02.DWG		CHIEF GEOMATICS SECTION	CITY: WASILLA
		STATE: ALASKA	

UNALASKA, ALASKA
013597 - UNALASKA HARBOR
PROJECT CONDITION SURVEY
MAY 6 - MAY 10, 2019

REFERENCE
NUMBER:
5-UAK-92-07-14
SHEET 4 OF 5

FLOATING BREAKWATER ANCHORS			
NAME	NORTHING	EASTING	TOP ELEV.
ANCHOR-1	1,181,239.23	5,314,188.20	-76.54
ANCHOR-2	1,181,308.31	5,314,108.40	-76.08
ANCHOR-3	1,181,253.73	5,314,299.97	-77.61
ANCHOR-4	1,181,361.60	5,314,145.92	-74.75
ANCHOR-5	1,181,405.48	5,314,187.95	-73.04
ANCHOR-6	1,181,308.56	5,314,335.09	-77.61
ANCHOR-7	1,181,463.56	5,314,314.59	-77.75
ANCHOR-8	1,181,598.55	5,314,416.12	-74.85
ANCHOR-9	1,181,498.46	5,314,267.08	-72.32
ANCHOR-10	1,181,633.70	5,314,365.28	-73.69
ANCHOR-11	1,181,618.60	5,314,252.02	-68.87
ANCHOR-12	1,181,658.75	5,314,301.52	-71.79
ANCHOR-13	1,181,698.40	5,314,244.82	-68.92
ANCHOR-14	1,181,588.36	5,314,164.93	-59.54
ANCHOR-15	1,181,626.70	5,314,113.05	-55.13
ANCHOR-16	1,181,734.80	5,314,195.49	-66.26
ANCHOR-17	1,181,676.25	5,314,063.84	-48.94
ANCHOR-18	1,181,759.84	5,314,125.19	-60.65
ANCHOR-19	1,181,743.72	5,314,089.15	-54.96
ANCHOR-20	1,181,717.98	5,313,999.31	-34.38
ANCHOR-21	1,181,766.96	5,313,966.49	-28.03
ANCHOR-22	1,181,850.06	5,314,022.67	-46.83
ANCHOR-23	1,181,826.56	5,314,092.87	-58.64
ANCHOR-24	1,180,620.79	5,313,837.45	-60.07
ANCHOR-25	1,180,650.83	5,313,889.72	-68.15
ANCHOR-26	1,180,694.27	5,313,710.67	-55.12
ANCHOR-27	1,180,796.86	5,313,696.52	-69.14
ANCHOR-28	1,180,780.47	5,313,749.14	-68.85
ANCHOR-29	1,180,704.15	5,313,925.11	-74.19
ANCHOR-30	1,180,762.72	5,313,866.16	-72.95

FLOATING BREAKWATER ANCHORS			
NAME	NORTHING	EASTING	TOP ELEV.
ANCHOR-31	1,180,818.13	5,313,773.74	-73.02
ANCHOR-32	1,180,866.99	5,313,808.92	-75.32
ANCHOR-33	1,180,759.45	5,313,974.36	-77.75
ANCHOR-34	1,180,922.33	5,313,843.95	-76.07
ANCHOR-35	1,180,813.45	5,314,001.97	-79.31
ANCHOR-36	1,180,978.62	5,313,881.48	-76.11
ANCHOR-37	1,180,869.01	5,314,039.98	-79.38
ANCHOR-38	1,181,033.95	5,313,919.32	-76.48
ANCHOR-39	1,180,925.34	5,314,077.19	-78.95
ANCHOR-40	1,180,982.93	5,314,114.35	-78.60
ANCHOR-41	1,181,086.56	5,313,955.31	-76.56
ANCHOR-42	1,181,034.45	5,314,150.67	-78.10
ANCHOR-43	1,181,142.44	5,313,996.56	-75.96
ANCHOR-44	1,181,091.83	5,314,189.16	-77.63
ANCHOR-45	1,181,199.35	5,314,031.86	-76.21
ANCHOR-46	1,181,254.96	5,314,070.01	-75.77
ANCHOR-47	1,181,147.11	5,314,227.00	-77.24
ANCHOR-48	1,181,203.06	5,314,263.44	-77.31
ANCHOR-50	1,181,040.50	5,314,093.86	-75.86
ANCHOR-51	1,181,561.74	5,314,223.67	-62.53
ANCHOR-52	1,181,248.38	5,314,263.18	-75.17

△ ARGENTINA 1854

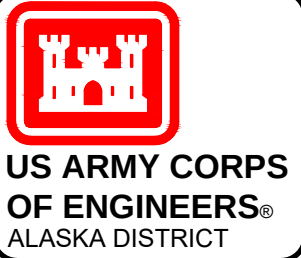
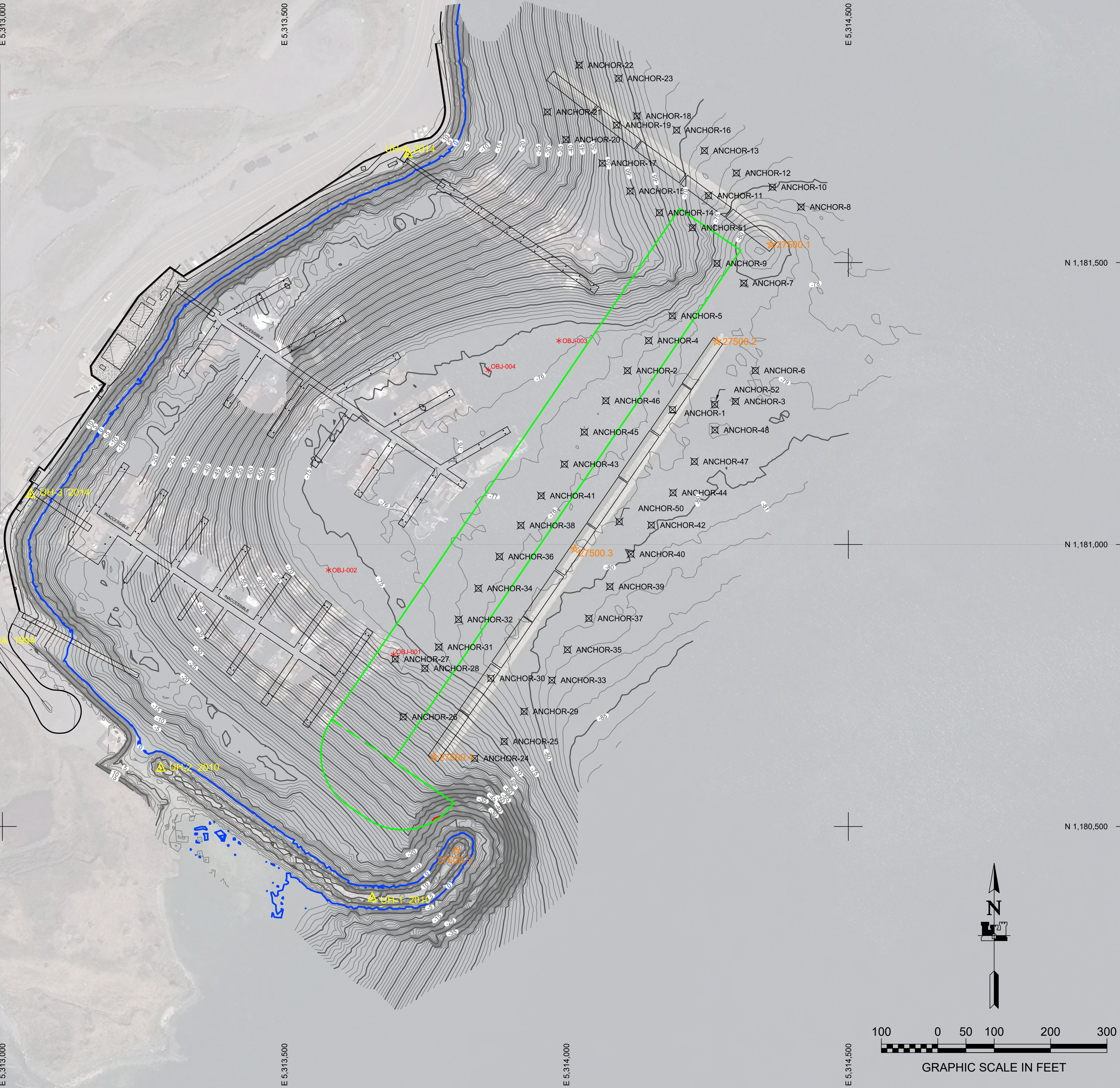
△ CHL 2010

△ OBJ-001

*OBJ-002

*OBJ-003

*OBJ-004



REV.	DATE	BY	APPR.	DESCRIPTION

	SURVEYED BY: GREGORY W. GIBSON		UPC: 013597	CONTRACT NO.: W911KG-16-D-0014		
	DRAWN BY: ROBERT GOUGHNOUR		PLOT DATE: 17 JULY 2019	TASK ORDER NO.: 19P0061		
	CHECKED BY:		SIZE: ANSI D	SCALE: 1" = 100'		
	APPROVED BY:		CONTRACTOR: TASJGGG INC.			
FILE:		CITY:				STATE:
013597_VH02.DWG		WASILLA				ALASKA

UNALASKA, ALASKA
013597 - UNALASKA HARBOR
PROJECT CONDITION SURVEY
MAY 6 - MAY 10, 2019

REFERENCE NUMBER:
5-UAK-92-07-14
SHEET 5 OF 5