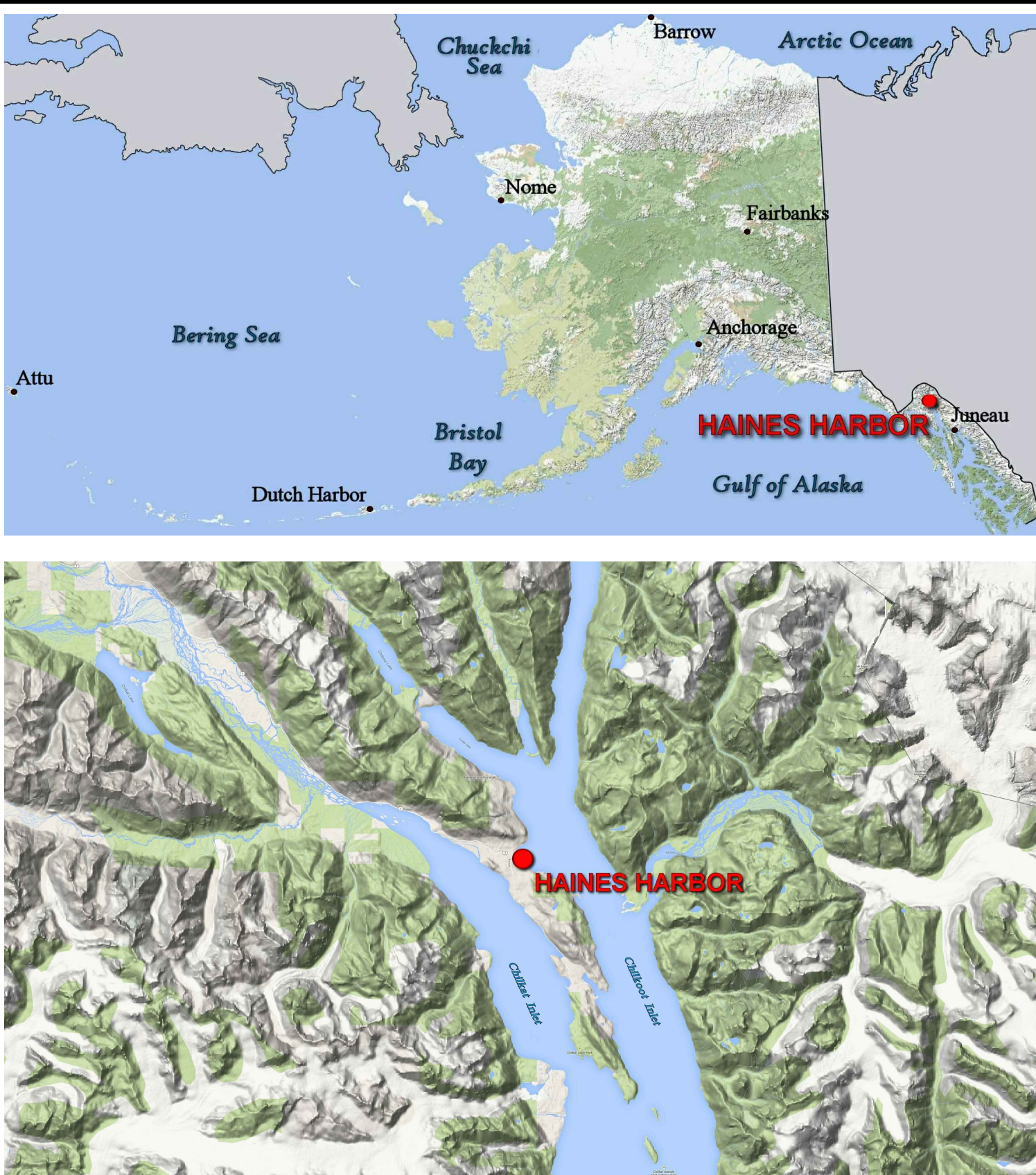




VOLUME COMPUTATIONS		
AREA A: ENTRANCE CHANNEL	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-15.0	460
AVAILABLE TO MAX PAY DEPTH (MP)	-16.0	662
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	1,045
AREA B: BASIN (EASTERN) AREA		
AVAILABLE TO PD	-14.0	2,460
AVAILABLE TO MP	-15.0	5,071
AVAILABLE SS AT 3:1 (H:V) & 25' WIDE	VARIES	838
AREA C: BASIN (WESTERN) AREA		
AVAILABLE TO PD	-12.0	1,883
AVAILABLE TO MP	-13.0	3,951
AVAILABLE SS AT 3:1 (H:V) & 25' WIDE	VARIES	1,261
AREA D: BASIN (NORTHERN) AREA		
AVAILABLE TO PD	-11.0	221
AVAILABLE TO MP	-12.0	361
AVAILABLE SS AT 3:1 (H:V) & 25' WIDE	VARIES	1,217
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		14,406



NOTES

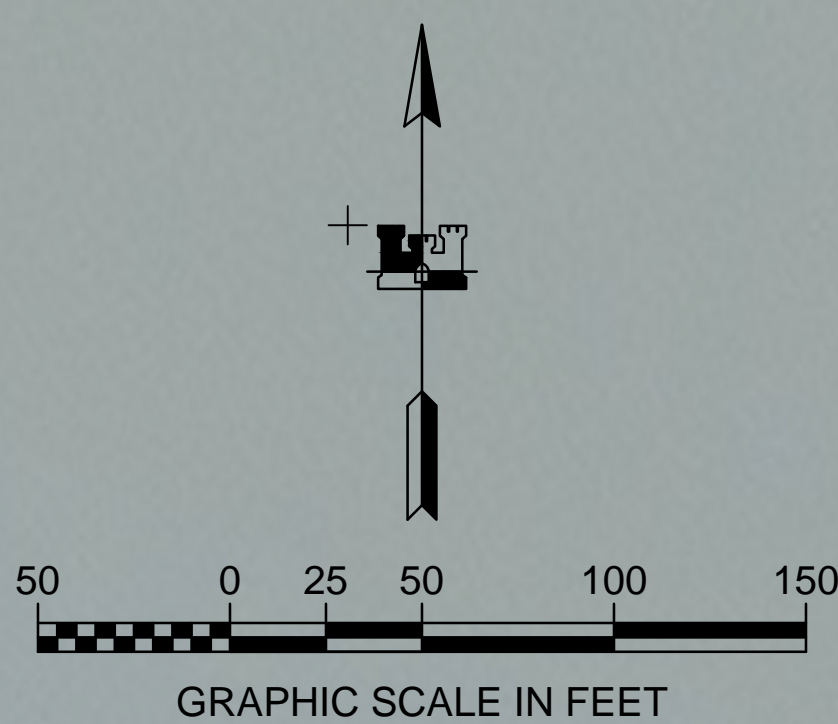
1. PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83 (CORS86), IN U.S. SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83(CORS86) 2002.00 EPOCH VALUES OF NGS CORS STATIONS: "GUSTAVUS 6 CORS ARP" (GUS6 - PID D06231), "SKAGWAYUSACKA2005 CORS ARP" (AB44 - PID D07448) AND "CAPEPENCKA2007 CORS ARP" (AB43 - PID D07445).
2. LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83, IN U.S. SURVEY FEET HOLDING DOMED BC "HNS-7 GPS 1995" AS N 2,706,656.27, E 2,353,376.15.
3. VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0), BASED ON THE NOAA'S TIDAL BENCH MARK LIST: "945 2421, CHILKAT INLET, ALASKA" PUBLISHED 06/05/2014. THIS TIDAL DATUM IS BASED ON THE 2007-2011 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOAA'S TIDAL BENCH MARK "2421 C 1998" (VMH14041) AS 20.84' AND NOAA'S TIDAL BENCH MARK "2421 D 1998" (VMH14042/PID BBDX55) AS 20.44'.
4. VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 ELEVATIONS HOLDING USACE SBC "HNS-7" (PID B8BC52) AS 31.95' AND NOAA'S TIDAL BENCH MARK "2421 D 1998" (VMH14042/PID BBDX55) AS 16.19'.
5. SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
6. BATHYMETRY WAS COLLECTED JUNE 27, 2015. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2022 MULTIBeam ECHOSOUNDER OPERATING AT 200 KHZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN AML BASE X SOUND VELOCITY PROBE. POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLANIX POSMV 320 V4 SYSTEM. DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHNIQUES.
7. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.
8. 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
HH-1	2,707,596.84	2,353,756.32	26.02	USACE 3.5" DOMED SBC
HH-6	2,706,922.52	2,354,071.75	26.21	USACE 3.5" DOMED SBC
HH-7	2,707,206.44	2,354,151.36	26.59	USACE 3.5" DOMED SBC
HH-8	2,707,421.75	2,354,139.73	25.19	USACE 3.5" DOMED SBC
HH-9	2,707,492.29	2,354,105.04	25.98	USACE 3.5" DOMED SBC
HH-20 1997	2,707,554.58	2,353,405.42	32.69	3.25" DOMED SBC
HH-21 1997	2,707,160.36	2,353,378.82	34.00	3.25" DOMED SBC
HH-22 2000	2,707,107.68	2,353,549.09	27.14	3.25" DOMED SBC
HNS-7 GPS 1995	2,706,656.27	2,353,376.15	36.10	AKDOT 3.25" DOMED SBC

NAVIGATION AIDS			
USCG NO.	NORTHING	EASTING	DESCRIPTION
23910	2,706,931	2,354,069	HAINES SMALL BOAT HARBOR LIGHT 2

PROJECT LIMITS			PROJECT LIMITS		
CORNER#	NORTHING	EASTING	CORNER#	NORTHING	EASTING
1	2,706,923.77	2,353,871.15	12	2,707,441.74	2,354,057.16
2	2,707,060.76	2,353,830.15	13	2,707,420.74	2,354,070.16
3	2,707,104.76	2,353,724.15	14	2,707,224.75	2,354,080.15
4	2,707,184.76	2,353,529.16	15	2,707,209.75	2,354,076.15
5	2,707,493.75	2,353,509.16	16	2,707,230.75	2,354,004.15
6	2,707,495.75	2,353,549.16	17	2,707,057.76	2,354,034.15
7	2,707,503.75	2,353,699.16	18	2,707,042.76	2,354,013.15
8	2,707,478.75	2,353,700.16	19	2,706,915.76	2,353,978.15
9	2,707,463.74	2,353,839.16	20	2,706,718.77	2,354,050.15
10	2,707,489.74	2,353,841.16	21	2,706,670.78	2,353,948.14
11	2,707,476.74	2,353,969.16			

OBSTRUCTION DATA				
ID	NORTHING	EASTING	DEPTH	APPROX SIZE (FEET)
OBST-1	2,706,847.6	2,353,994.0	-14.5	6X8X2.4
OBST-2	2,706,929.0	2,353,946.2	-13.3	31X6X3.8



THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THOSOA CERTIFIED HYDROGRAPHER

David R. Neff

David R. Neff C.H. (275)

US Army Corps of Engineers
ALASKA DISTRICT

CONTRACT NO. W01H814-0011.0025

CONTRACTOR: ETIEME INC.

CITY: SAN RAFAEL

STATE: CALIFORNIA

APPROVED: MICHAEL E. NEFF

DATE: 08/27/2015

NO.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	08/27/2015

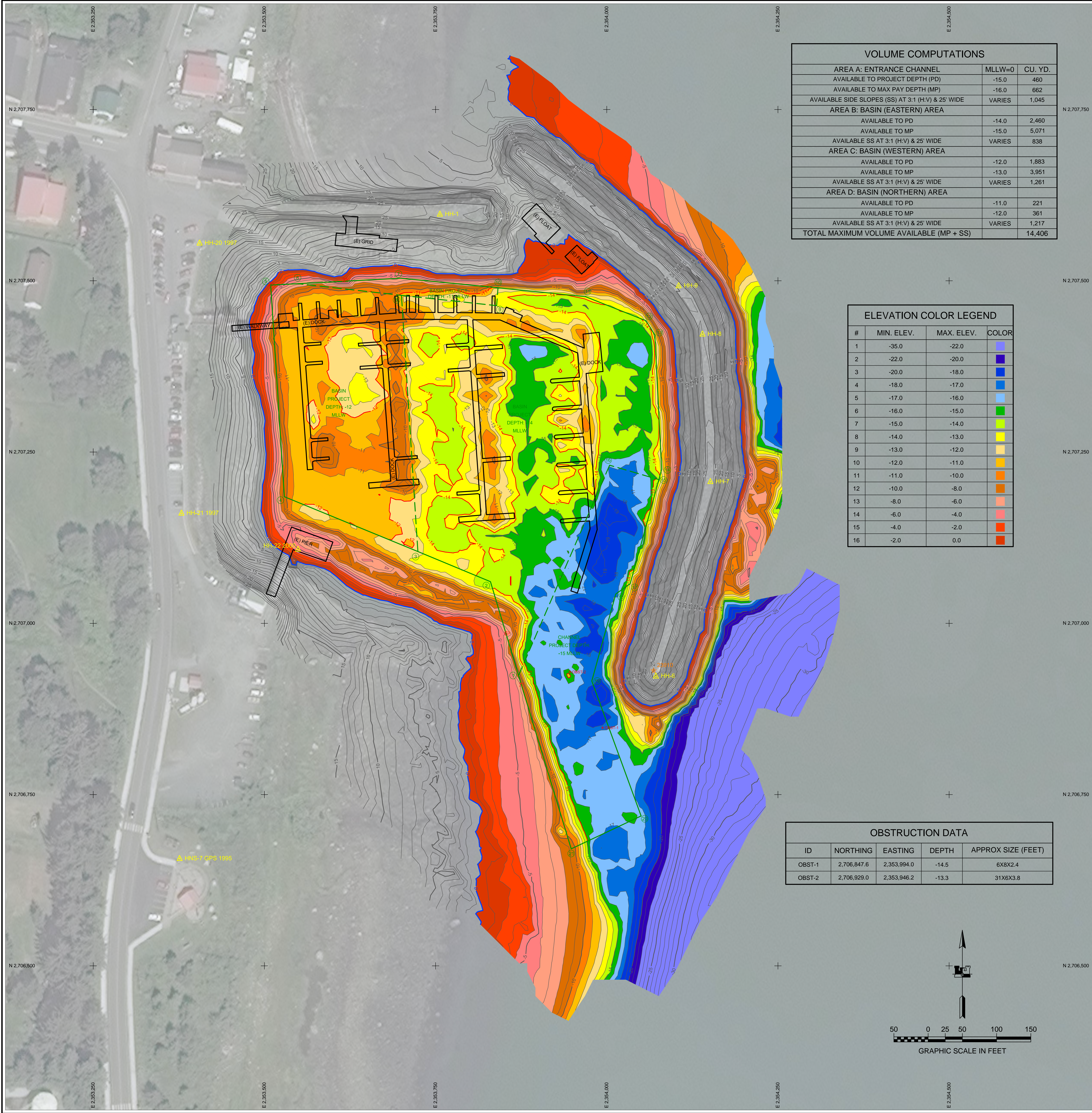
U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
JBER, ALASKA 99505-0988

637 E. Third St., Ste 100
San Rafael, CA 94901

HAINES, ALASKA
HAINES HARBOR
PROJECT CHARTER SURVEY
JUNE 24 - 29, 2015

SHEET IDENTIFICATION
1-HAI-92-07-12

Sheet 1 of 2



VOLUME COMPUTATIONS		
AREA A: ENTRANCE CHANNEL	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-15.0	460
AVAILABLE TO MAX PAY DEPTH (MP)	-16.0	662
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	1,045
AREA B: BASIN (EASTERN) AREA		
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AVAILABLE SS AT 3:1 (H:V) & 25' WIDE	VARIES	1,217
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		14,406

ELEVATION COLOR LEGEND			
#	MIN. ELEV.	MAX. ELEV.	COLOR
1	-35.0	-22.0	
2	-22.0	-20.0	
3	-20.0	-18.0	
4	-18.0	-17.0	
5	-17.0	-16.0	
6	-16.0	-15.0	
7	-15.0	-14.0	
8	-14.0	-13.0	
9	-13.0	-12.0	
10	-12.0	-11.0	
11	-11.0	-10.0	
12	-10.0	-8.0	
13	-8.0	-6.0	
14	-6.0	-4.0	
15	-4.0	-2.0	
16	-2.0	0.0	

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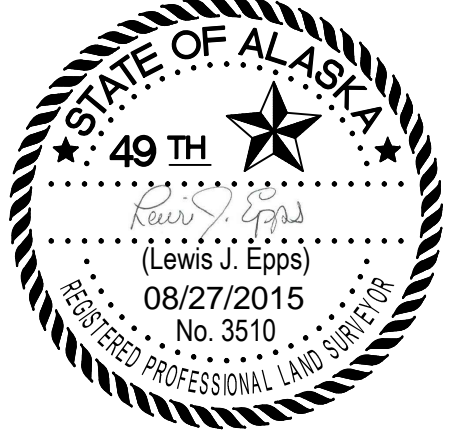


- NOTES**
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David R. Neff

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CONTRACT NO. W11HB14-0013.0025
CONTRACTOR: ETIEME INC.
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U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
JBER, ALASKA 99505-0988

637 1/2 Road, Ste. 100
San Rafael, CA 94901

HAINES, ALASKA
HAINES HARBOR
PROJECT CONDITION SURVEY
JUNE 24 - 29, 2015

SHEET IDENTIFICATION
1-HAI-92-07-12
Sheet 2 of 2