

NAVIGATION AIDS			
USCG NO.	NORTHING	EASTING	DESCRIPTION
26610	1,388,238	1,955,185	CYANE ROCK LIGHTED BELL BUOY 15
26615-1	1,386,779	1,952,082	KODIAK FERRY DOCK LIGHT (SOUTH)
26615-2	1,386,943	1,952,200	KODIAK FERRY DOCK LIGHT (NORTH)
26620	1,386,160	1,950,982	KODIAK BOAT HARBOR DAYBEACON 2
26630	1,386,047	1,950,710	KODIAK BOAT HARBOR LIGHT 1
26635	1,385,224	1,951,001	(ST HERMAN) NORTH ENTRANCE LIGHT 1
26640	1,385,148	1,950,797	(ST HERMAN) NORTH ENTRANCE LIGHT 2
26760	1,385,664	1,950,417	(ST PAUL) ENTRANCE CHANNEL BUOY 11
NAVAID1	1,387,487	1,953,157	NEAR ISLAND BRIDGE KODIAK SIDE NORTH LIGHT
NAVAID2	1,387,395	1,953,198	NEAR ISLAND BRIDGE NORTH CENTER LIGHT
NAVAID3	1,387,302	1,953,239	NEAR ISLAND BRIDGE NEAR ISLAND SIDE NORTH LIGHT
NAVAID4	1,387,463	1,953,118	NEAR ISLAND BRIDGE KODIAK SIDE SOUTH LIGHT
NAVAID5	1,387,371	1,953,159	NEAR ISLAND BRIDGE SOUTH CENTER LIGHT
NAVAID6	1,387,278	1,953,200	NEAR ISLAND BRIDGE NEAR ISLAND SIDE SOUTH LIGHT



### NOTES

- PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83 (CORS96), IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE 2000 EPOCH VALUES OF OPUS DB DERIVED STATIONS: "NIC-4 2006" (PID BBBK44) AS NORTHING 1,388,817.55; EASTING 1,954,333.76; "SHH-3 2009" (PID BBBK45) AS NORTHING 1,382,702.24; EASTING 1,950,183.98; "TDB 125" (PID BBBK43) AS NORTHING 1,386,072.95; EASTING 1,950,690.54.
- LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83, IN US SURVEY FEET HOLDING DOMED SBC "SHH-2 2006" AS N 1,383,833.76; E 1,950,858.32.
- VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0) BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST: "945 7282 KODIAK ISLAND WOMEN'S BAY, ALASKA" PUBLISHED 08/02/2014. THIS TIDAL DATUM IS BASED ON THE 2007-2011 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOAA/NOS TIDAL BENCH MARK "7292 B 1984" (VM1613) AS 21.05.
- VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD88 (GEOID 12A) ELEVATIONS HOLDING BRASS DISC "NIC-4 2006" (PID BBBK44) AS 15.61.
- SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
- BATHYMETRY WAS COLLECTED MARCH 24, 26-29, AND APRIL 4, 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 APPLINK POSMV 320 V4 SYSTEM. DATA WAS COLLECTED AND PROCESSED USING QINSY 8.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING STATIC AND RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHNIQUES.
- THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.

### SURVEY CONTROL DATA

STATION	NORTHING	EASTING	MLLW	DESCRIPTION
HARBOR MASTER	1,387,193.26	1,951,081.54	20.46	2" FLAT SBC
NIC-1 1997	1,385,942.73	1,951,555.54	28.36	3-1/4" DOMED SBC
NIC-2 1997	1,387,453.51	1,952,435.26	48.03	3-1/4" DOMED SBC
NIC-3 2006	1,387,617.77	1,953,239.60	17.29	3" DOMED SBC
NIC-4 2006	1,388,617.55	1,954,333.77	16.56	3" DOMED SBC
SHH-3 2009	1,382,702.24	1,950,183.98	19.73	3-1/4" DOMED SBC
SPH-1 2009	1,387,252.33	1,950,663.43	20.37	3-1/4" DOMED SBC
SPH-2 2009	1,386,685.52	1,951,150.86	17.71	3-1/4" DOMED SBC
TDB 105	1,384,382.86	1,950,977.49	16.23	3-1/2" DOMED USACE BC
TDB 111	1,386,622.19	1,952,584.12	21.3	3-1/2" DOMED USACE BC
TDB 112	1,387,280.27	1,953,330.09	55.0	3-1/2" DOMED USACE BC
TDB 113	1,387,658.87	1,954,073.23	21.6	3-1/2" DOMED USACE BC
TDB 125	1,386,072.95	1,950,690.54	19.77	3-1/2" DOMED USACE BC

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

### PROJECT LIMITS

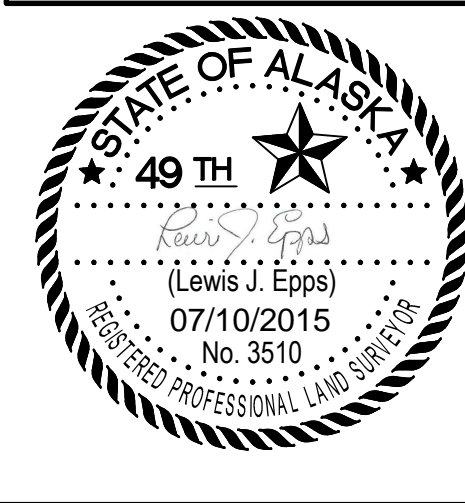
CORNER#	NORTHING	EASTING
1	1,387,916.76	1,954,346.96
2	1,387,736.78	1,953,897.42
3	1,387,210.18	1,953,091.71
4	1,386,596.40	1,952,206.05
5	1,385,798.98	1,950,988.16
6	1,388,102.43	1,954,272.62
7	1,387,915.07	1,953,804.64
8	1,387,376.11	1,952,980.02

### PROJECT LIMITS

CORNER#	NORTHING	EASTING
9	1,386,762.29	1,952,094.29
10	1,385,966.31	1,950,878.60
11	1,388,009.60	1,954,309.79
12	1,387,825.92	1,953,851.03
13	1,387,293.14	1,953,035.86
14	1,386,679.35	1,952,150.17
15	1,385,882.65	1,950,933.38

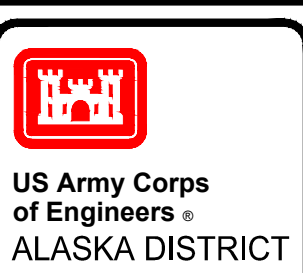
### VOLUME COMPUTATIONS

AREA A: CHANNEL	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-22.0	127
AVAILABLE TO MAX PAY DEPTH (MP)	-23.0	220
AVAILABLE SIDE SLOPES (SS) AT 3:1 (H:V) & 25' WIDE	VARIES	2,128
TOTAL MAXIMUM VOLUME AVAILABLE (MP + SS)		2,348



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

David R. Neff C.H. (275)



CONTRACT NO. W01HB14-0-011.0/019  
 CONTRACTOR ETIEME INC.  
 CITY SAN RAFAEL STATE CALIFORNIA  
 PROJECT NEAR ISLAND CHANNEL  
 SHEET 1 OF 6  
 DATE 07/10/2015  
 DRAWN BY MICHAEL E. NEFF  
 CHECKED BY THOMAS A. BLON  
 APPROVED BY

NO.	DESCRIPTION	DATE	BY	APP'D
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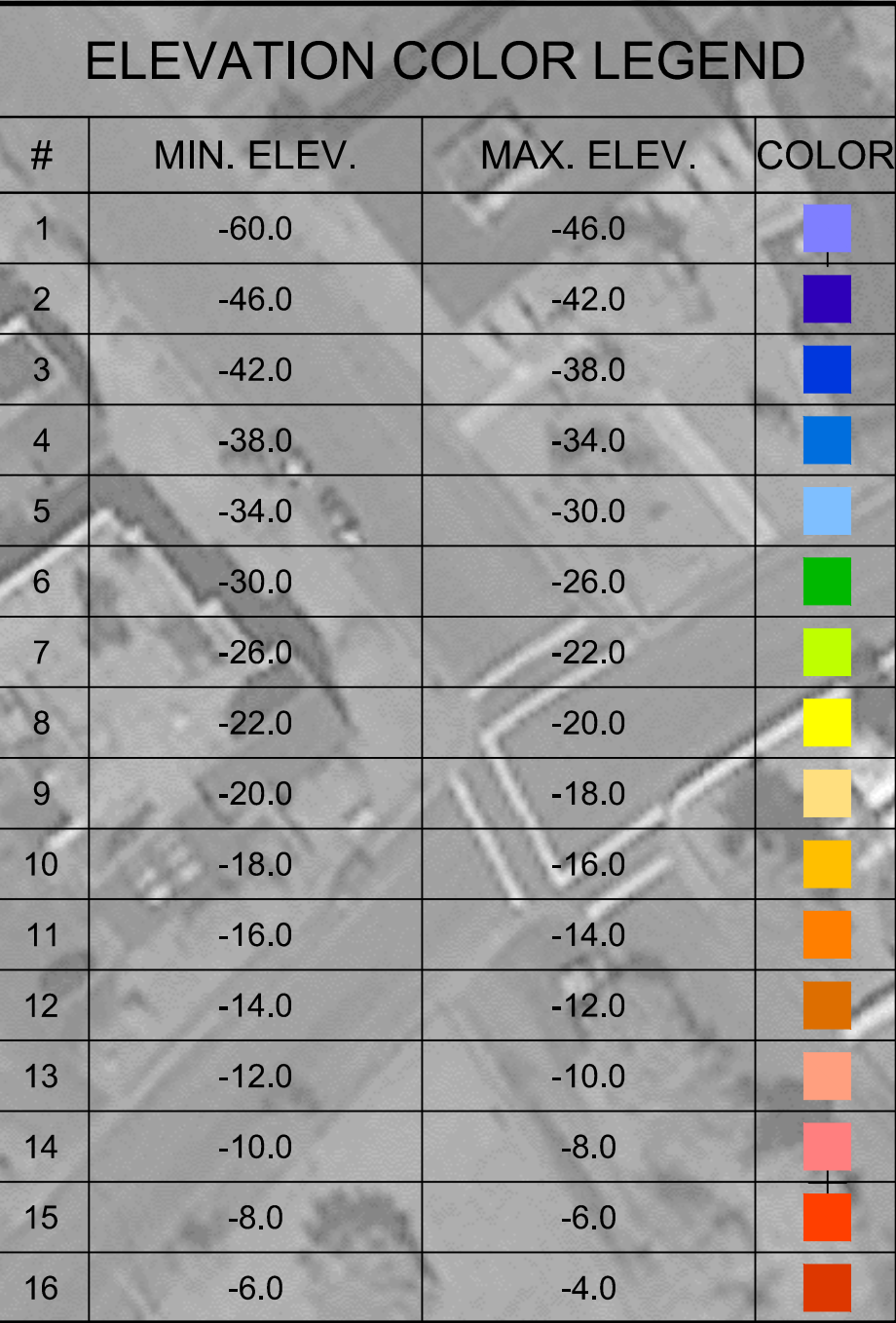
NO.	DESCRIPTION	DATE	BY	APP'D
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KODIAK, ALASKA  
 NEAR ISLAND CHANNEL  
 PROJECT CONDITION SURVEY  
 MARCH 24 - APRIL 04, 2015  
 SHEET IDENTIFICATION  
 5-KOD-92-07-23  
 Sheet 1 of 6









PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83 (CORS98). IN SUEY SURVEY FEET BASED ON A FULLY CONstrained STATIC GPS NETWORK HOLDING THE 2003 EPOCH VALUES AT THE CORNER STATION POINTS. SH-22 HAS AN EPOCH OF 2007.00, EASTING 1,364,333.76; NORTH 1,386,671.57; UTM ZONE 18Q UTM COORDINATES ARE SH-13C 2008" (PDB BBBBXX) AS NORTHING 1,386,702.24; EASTING 1,950,183.98"; "TDB 125" (PDB BBBBXX) AS NORTHING 1,386,072.95; EASTING 1,950,183.74.

LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83, IN SUEY SURVEY FEET. LOCAL PROJECT HORIZONTAL DATUM IS N 1,386,671.57; E 1,950,183.76.

VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW+0.0), BASED ON THE NOAA/NDS TIDAL BENCH MARK LIST: "945 7202 KODIAK ISLAND, WOMEN'S Bay, ALASKA," PUBLISHED 05/02/2014. THIS TIDAL DATUM IS BASED ON THE 2007-2011 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOAA/NDS TIDAL BENCH MARK "7222 B" 1984" (VMM1616). AS LST 0.05.

VERTICAL TIE TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (GEOD 2011) SOUNDINGS HOLDING BRASS IDEAL "NIG 2000" (PDB BBBBXX) AS LST 0.00.

SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICED:

BATHYMETRY WAS COLLECTED MARCH 24, 26-29, AND APRIL 4, 2015. SOUNDINGS WERE COLLECTED USING A SONAR SYSTEM WITH A 120° FAN BEAM. SOUNDINGS WERE COLLECTED AT A 1-METER VERTICAL VELOCITY THOUGH THE WATER COLUMN WAS DETERMINED WITH AN AMEL BASE X-SIDE VELOCITY PROFILE, POSITION AND VESSEL ORIENTATION WERE MEASURED USING AN APPLIXX POSMV 320 V-Axis SYSTEM. DATA WAS COLLECTED AND PLOTTED USING THE HYPERMARTIN SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING STATIC AND RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHNIQUES.

THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF THE SURVEY.

MAP SOUNDINGS ARE BINNED AT 24 FEET AND ARE SHOAL-BASED. CONTOURS ARE BASED ON 12 FEET BINNED SHOAL-BASED SOUNDINGS. VOLUME SOUNDINGS ARE BINNED AT 3 FEET AND ARE MEAN VALUE

SURVEY CONTROL DATA				
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NIC-3 2006	1,387,617.77	1,953,239.60	17.29	3' DOMED SBC
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\*Bench marks with elevation precision of 0.1' were measured by RTK GNSS

PROJECT LIMITS		
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2	1,387,736.78	1,953,897.42
3	1,387,210.18	1,953,091.71
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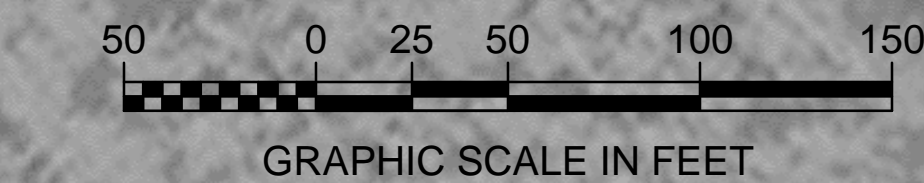
PROJECT LIMITS		
CORNER#	NORTHING	EASTING
9	1,386,762.29	1,952,094.29
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14	1,386,679.35	1,952,150.17
15	1,385,882.65	1,950,933.38

















VOLUME COMPUTATIONS		
AREA A = CHANNEL	MLLW=0	CU. YD.
AVAILABLE TO PROJECT DEPTH (PD)	-22.0	127
AVAILABLE TO MAX PAY DEPTH (MP)	-23.0	220
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THIS HYDROGRAPHIC SURVEY WAS COMPLETED  
UNDER THE OVERSIGHT OF AN ACSM/THOSOA  
CERTIFIED HYDROGRAPHER



David R. Neff C.H. (275)



ELEVATION COLOR LEGEND			
#	MIN. ELEV.	MAX. ELEV.	COLOR
1	-60.0	-46.0	
2	-46.0	-42.0	
3	-42.0	-38.0	
4	-38.0	-34.0	
5	-34.0	-30.0	
6	-30.0	-26.0	
7	-26.0	-22.0	
8	-22.0	-20.0	
9	-20.0	-18.0	
10	-18.0	-16.0	
11	-16.0	-14.0	
12	-14.0	-12.0	
13	-12.0	-10.0	
14	-10.0	-8.0	
15	-8.0	-6.0	
16	-6.0	-4.0	



PRIMARY PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83 (CORSNGE), IN SURVEY FETTER, 1985.0725, S. 59142.2006# AS NORTHING 1,385,617.983, EASTING 1,364,334.37# "59143.2006# (TDB BBNK4#) AS NORTHING 1,382,702.24, EASTING 1,360,183.98; "TDB 121# (TDB BBNK4#) AS NORTHING 1,385,072.95, EASTING 1,360,680.54

LOCAL PROJECT HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83, IN SURVEY FETTER, 1985.0725, S. 59142.2006# AS N.T. 383,633.76; E. 1,550,859.32

VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0) BASED ON THE NOAA'S DITL BENCH MARK LIST: "45 92232 KODIAK ISLAND, WOMEN'S BA, ALASKA " PUBLISHED 05/02/2014. THIS DITL DATA IS BASED ON THE 2007-2011 DITL EPOCH AND IS REFERENCED BY HOLDING NOAA'S DITL BENCH MARK "WOMEN'S BA" (UMR1610) AS 0.0

VERTICAL TIES TO THE NATIONAL SPATIAL REFERENCE SYSTEM ARE BASED ON PUBLISHED NAVD83 (GEOID 124) ELEVATIONS HOLDING BRASS DISC "N4-C 2006# (TDB BBNK4#) AS 16.1"

SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.

BATHYMETRY WAS COLLECTED MARCH 24, 26-29, AND APRIL 4, 2016. SOUNDINGS WERE COLLECTED USING AN ECHOSOUND 2002 MULTIBeam ECHOSOUNDER OPERATING AT 300 KHZ. SOUND VELOCITY THROUGH THE WATER COLUMN WAS DETERMINED WITH AN IMB BASE X-SOUND VELOCITY PROBE. POSITION AND VESSEL TRACKING WAS DETERMINED USING A REAL TIME POSITIONING SYSTEM DATA COLLECTED DATA. DATA WAS PROCESSED USING QINSY 8.1 SOFTWARE. HORIZONTAL CONTROL WAS SURVEYED USING STATIC AND RTK GNSS EQUIPMENT AND TECHNIQUES. VERTICAL CONTROL WAS SURVEYED USING DIFFERENTIAL LEVELING TECHNIQUES.


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PROJECT LIMITS		
CORNER#	NORTHING	EASTING
9	1,386,762.29	1,952,094.29
10	1,385,966.31	1,950,878.60
11	1,388,009.60	1,954,309.79
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13	1,387,293.14	1,953,035.86
14	1,386,679.35	1,952,150.17
15	1,385,882.65	1,950,933.38

STATE OF ALASKA  
49<sup>TH</sup>  
*Lewis J. Epps*  
(Lewis J. Epps)  
07/10/2015  
No. 3510  
REGISTERED PROFESSIONAL LAND SURVEYOR

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



\_\_\_\_\_  
David R. Neff C.H. (275)