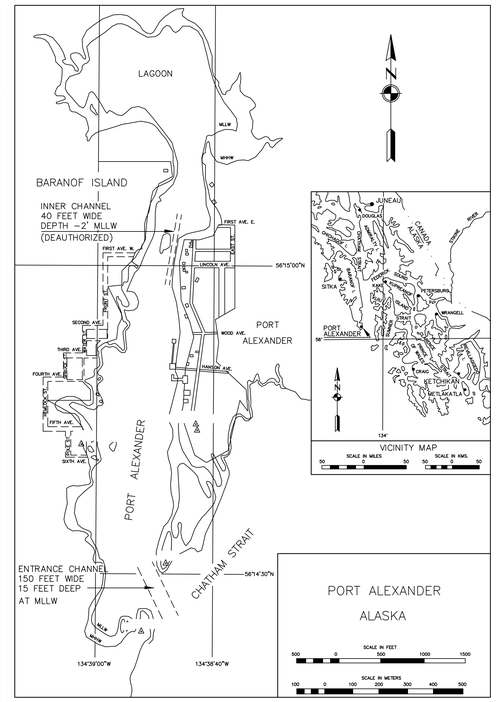
CORPS OF ENGINEERS



NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83, IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83 (CORS) 2002.00 EPOCH VALUES OF NGS CORS STATIONS: "BIORKA ISLAND 6 CORS ARP" (BIS6 – PID DK6554) AS N 1838719.91, E 2311128.31 (ALASKA STATE PLANE, ZONE 1, NAD 83) AND "LEVEL ISLAND 5 CORS ARP" (LEV5 – PID DJ3033) AS N 1692097.79, E 2801993.45 (ALASKA STATE PLANE, ZONE 1, NAD 83) AND "PETERSBURGAK2005 CORS ARP" (AB51 – PID DM7457) N 1813698.79, E 2836899.55 (ALASKA STATE PLANE, ZONE 1, NAD 83). CORS STATIONS STATE PLANE COORDINATES ARE CONVERTED FROM LAT/LONG USING NGS PROGRAM SPCS83(V2.1). RESULTANT COORDINATES AT PRIMARY HARBOR CONTROL HOLD USC&GS SBC "BM-1 1924" AS N 1612497.63, E 2486478.86 AND DOMED BC "PAH-1 1999" AS N 1610524.72, E 2485989.52.

2. VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0'), BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST: "9451054, PORT ALEXANDER, BARANOF ISLAND, ALASKA", PUBLISHED 10/21/2010. THIS TIDAL DATUM IS BASED ON THE 1983–2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOS TIDAL BENCHMARK "945 1054 F" AS 13.87' AND NOS TIDAL BENCHMARK "945 1054 G" AS 14.51'. ALSO PROVIDED ARE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) EQUIVALENTS, HOLDING BM-1 1924 AS 15.22', BASED ON GPS OBSERVATIONS FROM JULY 11 & 12, 2011.

3. THE SURVEY WAS CONDUCTED ON JULY 10–12, 2010. HYDROGRAPHIC SOUNDING DATA WAS COLLECTED USING AN ODOM ES3 MULTI-BEAM ECHOSOUNDER (200KHZ, 120-DEGREE SWATH-WIDTH WITH 120, 0.75 DEGREE BEAMS). POSITIONING AND VESSEL ATTITUDE WERE PROVIDED IN REAL TIME USING A TRIMBLE 461 RTK GPS RECEIVER OPERATING ON KINEMATIC CORRECTORS BROADCAST FROM A TRIMBLE 5700 RTK BASE RECEIVER SET AT CONTROL STATION, "BM-1 1924". SOUND VELOCITY PROFILE WAS PROVIDED USING AN ODOM DIGI-BAR PRO, AND WAS PROVIDED IN REAL TIME AT THE SOUNDER HEAD USING AN ODOM DIGI-BAR V. DATA COLLECTION AND NAVIGATION WERE PERFORMED USING HYPACK HYSWEEP (2010) SOFTWARE. MULTI-BEAM SURVEY DATA WAS POST-PROCESSED USING HYPACK HYSWEEP (2010) SOFTWARE.

4. MLLW ELEVATIONS FOR MONUMENTS PAH-1, PAH-2, PAH-3, PAH-5 WERE NOT UPDATED THIS SURVEY.

5. SOUNDING VALUES SHOWN ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.

6. THIS DRAWING IS INDICATIVE OF GENERAL SEAFLOOR CONDITIONS ON THE DATES OF SURVEY.

7. THIS SURVEY WAS CONDUCTED BY HUGHES AND ASSOCIATES, WASILLA, AK.

CONTROL DATA					
STATION	NORTHING	EASTING	ELEV. (MLLW)	ELEV. (NAVD88)	DESCRIPTION
PT. 303	1,611,175.12	2,486,213.52	14.58	13.31	DRILL HOLE IN TOP OF MOUND
ALEX 1924	1,611,431.65	2,488,241.46	--	61.16 *	USC&GS SBC
BM-1 1924	1,612,497.63	2,486,478.86	16.49	15.22	USC&GS SBC
BM-2 1924	1,612,394.62	2,486,513.52	14.58	13.31	USC&GS SBC
PAH-1 1999	1,610,524.72	2,485,989.52	42.95	41.05 *	DOMED BC
PAH-2 1999	1,612,308.10	2,485,463.14	12.62	10.95 *	DOMED BC
PAH-4 2005	1,611,303.71	2,485,528.30	17.52	15.65 *	3.5" DOMED BC IN ROCK
PAH-5 2005	1,611,172.08	2,486,204.96	17.94	16.67	3.5" DOMED BC IN ROCK
* ELEVATION DETERMINED BY STATIC GPS OBSERVATION					
SEE NOTES 2 AND 4 FOR CONTROL DATA DETAILS					

PROJECT LIMITS					
CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	1,610,507	2,486,245	3	1,611,126	2,485,939
2	1,610,573	2,486,380	4	1,611,192	2,486,074

☆ NAVIGATION AIDS ☆			
USCG No.	DESCRIPTION	NORTHING	EASTING
23465	PORT ALEXANDER LIGHT	1,610,509.7	2,485,990.4
23470	ENTRANCE BUOY 2	1,610,759.0	2,486,266.2

VOLUME COMPUTATIONS	
PROJECT DEPTH -15.0'	
AVAILABLE TO PROJECT DEPTH (-15.0')	220 cy
AVAILABLE BETWEEN PROJECT DEPTH (-15.0') AND MAX PAY DEPTH (-16.0')	49 cy
AVAILABLE ALONG SIDE SLOPES	183 cy
TOTAL MATERIAL AVAILABLE	452 cy

STATE OF ALASKA 49TH
JACK S. HUGHES
LS-4915
REGISTERED PROFESSIONAL LAND SURVEYOR

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB-10-D-0005-0005
CONTRACTOR HUGHES AND ASSOCIATES STATE AK
CITY WASILLA
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

No.	Description	Date Approved

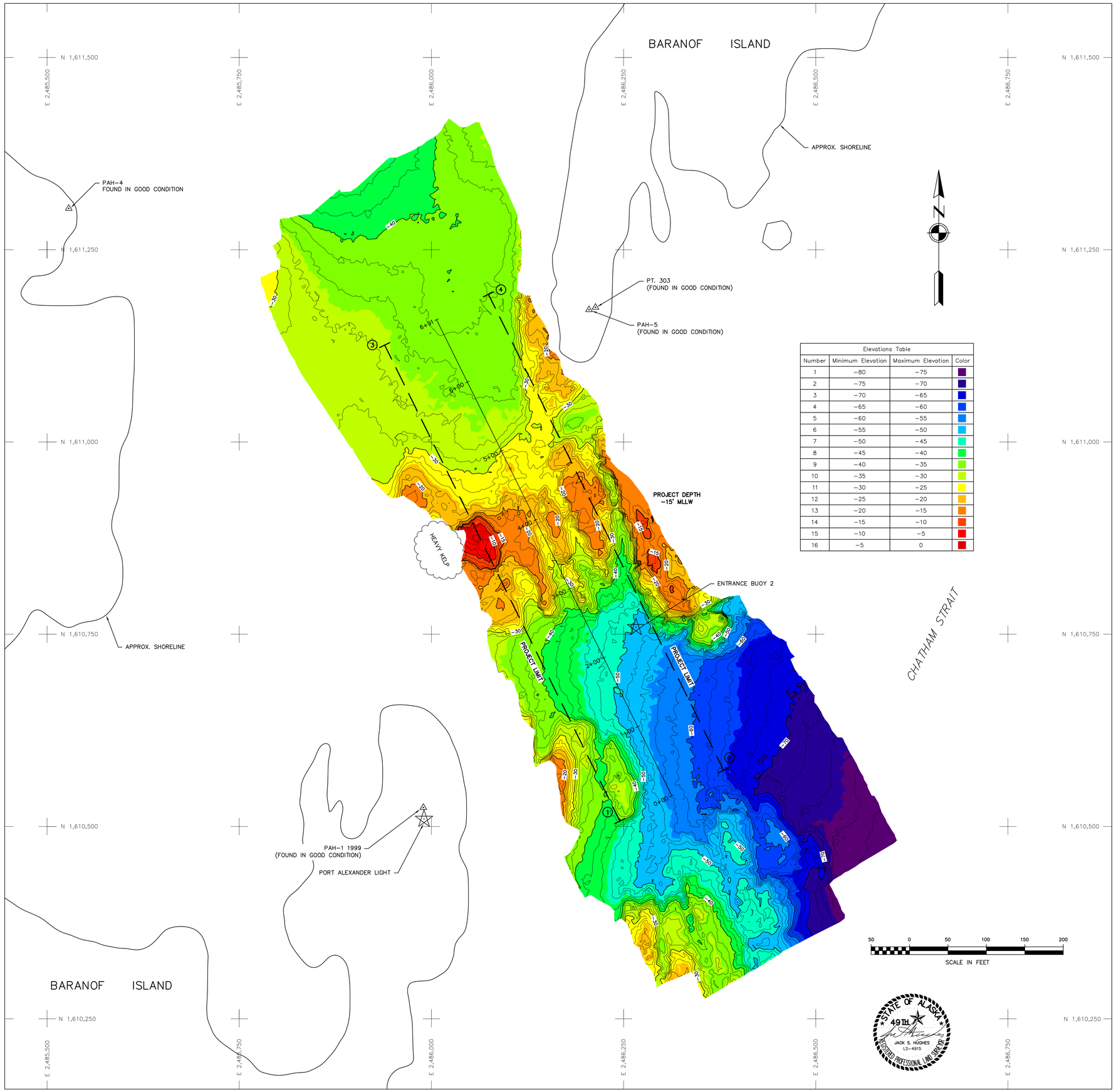
Date: 11/17/11
Dwg Scale: 1" = 50'
Plot Scale:
File:
Drawing #: 2937-11
Section
Branch
Designed:
Drawn: TNL
Reviewed: CSH
Chief
Submitted:
Chief

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

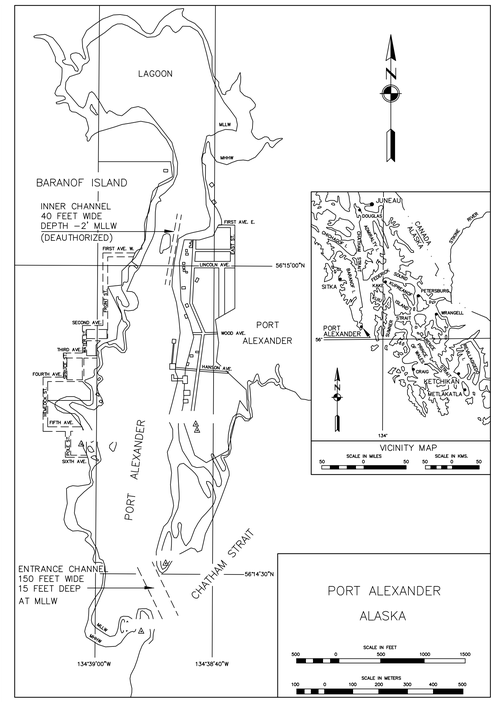
PORT ALEXANDER, ALASKA ENTRANCE CHANNEL CONDITION SURVEY JULY 10–12, 2011

Reference number:
V-101
Sheet 1 of 2

CORPS OF ENGINEERS



Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	−80	−75	
2	−75	−70	
3	−70	−65	
4	−65	−60	
5	−60	−55	
6	−55	−50	
7	−50	−45	
8	−45	−40	
9	−40	−35	
10	−35	−30	
11	−30	−25	
12	−25	−20	
13	−20	−15	
14	−15	−10	
15	−10	−5	
16	−5	0	



NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83, IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83 (CORS) 2002.00 EPOCH VALUES OF NGS CORS STATIONS: "BIORKA ISLAND 6 CORS ARP" (BIS6 – PID DK6554) AS N 1838719.91, E 2311128.31 (ALASKA STATE PLANE, ZONE 1, NAD 83) AND "LEVEL ISLAND 5 CORS ARP" (LEV5 – PID DJ3033) AS N 1692097.79, E 2801993.45 (ALASKA STATE PLANE, ZONE 1, NAD 83) AND "PETERSBURGAK2005 CORS ARP" (AB51 – PID DM7457) N 1813698.79, E 2836899.55 (ALASKA STATE PLANE, ZONE 1, NAD 83). CORS STATIONS STATE PLANE COORDINATES ARE CONVERTED FROM LAT/LONG USING NGS PROGRAM SPCS83(V2.1). RESULTANT COORDINATES AT PRIMARY HARBOR CONTROL HOLD USC&GS SBC "BM−1 1924" AS N 1612497.63, E 2486478.86 AND DOMED BC "PAH−1 1999" AS N 1610524.72, E 2485989.52.

2. VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW=0.0'), BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST: "9451054, PORT ALEXANDER, BARANOF ISLAND, ALASKA", PUBLISHED 10/21/2010. THIS TIDAL DATUM IS BASED ON THE 1983−2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOS TIDAL BENCHMARK "945 1054 F" AS 13.87' AND NOS TIDAL BENCHMARK "945 1054 G" AS 14.51'. ALSO PROVIDED ARE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) EQUIVALENTS, HOLDING BM−1 1924 AS 15.22', BASED ON GPS OBSERVATIONS FROM JULY 11 & 12, 2011.

3. THE SURVEY WAS CONDUCTED ON JULY 10−12, 2010. HYDROGRAPHIC SOUNDING DATA WAS COLLECTED USING AN ODOM ES3 MULTI−BEAM ECHOSOUNDER (200KHZ, 120−DEGREE SWATH−WIDTH WITH 120, 0.75 DEGREE BEAMS). POSITIONING AND VESSEL ATTITUDE WERE PROVIDED IN REAL TIME USING A TRIMBLE 461 RTK GPS RECEIVER OPERATING ON KINEMATIC CORRECTORS BROADCAST FROM A TRIMBLE 5700 RTK BASE RECEIVER SET AT CONTROL STATION, "BM−1 1924". SOUND VELOCITY PROFILE WAS PROVIDED USING AN ODOM DIGI−BAR PRO, AND WAS PROVIDED IN REAL TIME AT THE SOUNDER HEAD USING AN ODOM DIGI−BAR V. DATA COLLECTION AND NAVIGATION WERE PERFORMED USING HYPACK HYSWEEP (2010) SOFTWARE. MULTI−BEAM SURVEY DATA WAS POST−PROCESSED USING HYPACK HYSWEEP (2010) SOFTWARE.

4. MLLW ELEVATIONS FOR MONUMENTS PAH−1, PAH−2, PAH−3, PAH−5 WERE NOT UPDATED THIS SURVEY.

5. SOUNDING VALUES SHOWN ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.

6. THIS DRAWING IS INDICATIVE OF GENERAL SEAFLOOR CONDITIONS ON THE DATES OF SURVEY.

7. THIS SURVEY WAS CONDUCTED BY HUGHES AND ASSOCIATES, WASILLA, AK.

CONTROL DATA					
STATION	NORTHING	EASTING	ELEV. (MLLW)	ELEV. (NAVD88)	DESCRIPTION
PT. 303	1,611,175.12	2,486,213.52	14.58	13.31	DRILL HOLE IN TOP OF MOUND
ALEX 1924	1,611,431.65	2,488,241.46	−−	61.16 *	USC&GS SBC
BM−1 1924	1,612,497.63	2,486,478.86	16.49	15.22	USC&GS SBC
BM−2 1924	1,612,394.62	2,486,513.52	14.58	13.31	USC&GS SBC
PAH−1 1999	1,610,524.72	2,485,989.52	42.95	41.05 *	DOMED BC
PAH−2 1999	1,612,308.10	2,485,463.14	12.62	10.95 *	DOMED BC
PAH−4 2005	1,611,303.71	2,485,528.30	17.52	15.65 *	3.5" DOMED BC IN ROCK
PAH−5 2005	1,611,172.08	2,486,204.96	17.94	16.67	3.5" DOMED BC IN ROCK
* ELEVATION DETERMINED BY STATIC GPS OBSERVATION					
SEE NOTES 2 AND 4 FOR CONTROL DATA DETAILS					

PROJECT LIMITS					
CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	1,610,507	2,486,245	3	1,611,126	2,485,939
2	1,610,573	2,486,380	4	1,611,192	2,486,074

NAVIGATION AIDS			
USCG No.	DESCRIPTION	NORTHING	EASTING
23465	PORT ALEXANDER LIGHT	1,610,509.7	2,485,990.4
23470	ENTRANCE BUOY 2	1,610,759.0	2,486,266.2

VOLUME COMPUTATIONS	
PROJECT DEPTH −15.0'	
AVAILABLE TO PROJECT DEPTH (−15.0')	220 cy
AVAILABLE BETWEEN PROJECT DEPTH (−15.0') AND MAX PAY DEPTH (−16.0')	49 cy
AVAILABLE ALONG SIDE SLOPES	183 cy
TOTAL MATERIAL AVAILABLE	452 cy

STATE OF ALASKA 49TH
JACK S. HUGHES
LS−4915
REGISTERED PROFESSIONAL LAND SURVEYOR

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB−10−D−0005−0005
CONTRACTOR HUGHES AND ASSOCIATES STATE AK
CITY WASILLA
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

No.	Description	Date	Appvd

Date: 11/17/11
Dwg Scale: 1" = 50'
Plot Scale:
File:
Drawing #: 2937−11
Designed:
Drawn: TNL
Reviewed: CSH
Chief
Section
Submitted:
Chief
Branch

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

PORT ALEXANDER, ALASKA
ENTRANCE CHANNEL
CONDITION SURVEY
JULY 10−12, 2011

Reference number:
V−102
Sheet 2 of 2