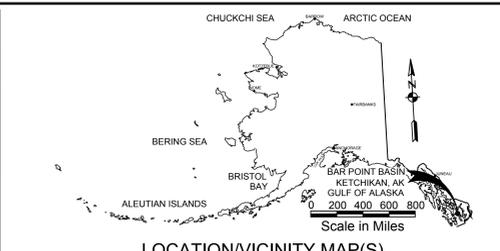


### Elevations Table

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-152.07	-50.00	1279212.90	Red
2	-50.00	-25.00	847431.09	Orange
3	-25.00	-20.00	212967.12	Yellow
4	-20.00	-18.00	121037.81	Light Green
5	-18.00	-17.00	137094.07	Green
6	-17.00	-16.00	187454.68	Light Blue
7	-16.00	-14.00	184014.58	Blue
8	-14.00	-13.00	45248.89	Dark Blue
9	-13.00	-12.00	49382.00	Very Dark Blue
10	-12.00	-11.00	72639.18	Black
11	-11.00	-10.00	79925.97	Dark Purple
12	-10.00	-9.00	39491.20	Medium Purple
13	-9.00	-8.00	33607.88	Light Purple
14	-8.00	-5.00	96416.43	Very Light Purple
15	-5.00	0.00	153004.40	White
16	0.00	24.61	212087.72	Light Blue



- ### NOTES
- HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83, IN U.S. SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83 (CORS) 2010 EPOCH VALUES OF NGS CORS STATIONS: "ANNETTE ISLAND 5 CORS ARP" (AIS5 - PID DK6482) AS N 1,188,024.64, E 3,119,193.51 (ALASKA STATE PLANE, ZONE 1, NAD 83) AND "PORTAL EXANAK 2005" (AB48 - PID DL6995) AS N 1,612,437.44, E 2,495,550.66 (ALASKA STATE PLANE, ZONE 1, NAD 83) AND "LEVEL ISLAND 6 CORS ARP" (LEV6 - PID DJ3035) N 1,692,090.98, E 2,802,073.47 (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 USACE SBC "BPP-5-2001" AS N 1,289,759.16, E 3,099,834.79 AND SBC "BPP-6-2012" AS N 1,291,023.25, E 3,097,826.80.
  - VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLW+0'), BASED ON THE NOAA'S TIDAL BENCH MARK LIST "84640, KETCHIKAN, TONGASS NARROWS, ALASKA" PUBLISHED 09/27/2011. THIS TIDAL DATUM IS BASED ON THE 1983-2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOS TIDAL BENCHMARK "0460 E 2001" AS 53.12' AND NOS TIDAL BENCHMARK "0460 F 2004" AS 53.11'. ALSO PROVIDED ARE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) EQUIVALENTS, HOLDING "BPP-6-2012" AS 18.63', BASED ON GPS OBSERVATIONS FROM JULY 6 & 13 2012.
  - THE SURVEY WAS CONDUCTED ON JULY 6-15, 2012. HYDROGRAPHIC SOUNDING DATA WAS COLLECTED USING AN ODOM 553 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 "BPP-5-2001". 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 (2012) SOFTWARE. MULTI-BEAM SURVEY DATA WAS POST-PROCESSED USING HYPACK HYSWEEP (2012) SOFTWARE.
  - PLAN VIEW SOUNDING SELECTION IS THE POINT NEAREST CENTER IN A 12 FOOT BINNED MATRIX. CONTOUR AND VOLUME SOUNDING SELECTION IS THE AVERAGE VALUE IN A 3 FOOT BINNED MATRIX.
  - CONTROL MONUMENT "BPP-4-2001" WAS NOT UPDATED DUE TO INACCESSIBILITY.
  - SOUNDING VALUES SHOWN ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
  - THIS DRAWING INDICATES THE GENERAL CONDITIONS AT THE TIME OF THE SURVEY.

### SURVEY CONTROL DATA

STATION	NORTHING	EASTING	ELEV	DESCRIPTION
BAR-2 1972	1,289,295.61	3,099,769.18	21.04	USACE SBC, FOUND IN GOOD COND
BAR-4 1972	1,289,552.31	3,098,796.18	21.14	USACE SBC, FOUND IN GOOD COND
BAR-6 1976	1,290,671.95	3,098,651.22	21.42	SEARCHED FOR NOT FOUND
BPP-1 1998	1,290,101.69	3,099,574.62	22.22	USACE SBC, FOUND IN GOOD COND
BPP-2 1998	1,289,530.10	3,099,011.94	19.41	USACE SBC, FOUND IN GOOD COND
BPP-3 2001	1,289,759.16	3,099,834.79	22.90	USACE SBC, FOUND IN GOOD COND
BPP-4 2001	1,290,602.71	3,098,428.97	23.08	INACCESSIBLE NOT UPDATED
BPP-5 2012	1,290,782.60	3,098,218.46	23.41	SBC SET THIS SURVEY
BPP-6 2012	1,291,023.25	3,097,826.80	22.58	SBC SET THIS SURVEY

### NAVIGATION AIDS

USCG NO.	NORTHING	EASTING	DESCRIPTION
22200	1,289,303.00	3,099,772.00	SOUTH ENTRANCE LIGHT 2S FL. RED
22205	1,289,473.00	3,099,593.00	SOUTH ENTRANCE DAYBEACON 3S GRN
22210	1,289,717.00	3,098,322.00	ENTRANCE LIGHT 2 FL. RED
22215	1,290,085.00	3,098,274.00	ENTRANCE DAYBEACON 3 GRN
22220	1,290,548.00	3,097,433.00	NORTH ENTRANCE LIGHT 2N FL. RED

### PROJECT LIMITS

CORNER#	NORTHING	EASTING	CORNER#	NORTHING	EASTING
1	1,289,357.00	3,099,723.00	8	1,290,015.00	3,099,150.00
2	1,289,447.00	3,099,837.00	9	1,290,433.00	3,098,597.00
3	1,289,732.00	3,099,690.00	10	1,289,880.00	3,098,566.00
4	1,290,027.00	3,099,688.00	11	1,289,622.00	3,098,832.00
5	1,290,565.00	3,098,666.00	12	1,289,532.00	3,099,667.00
6	1,290,481.00	3,098,622.00	13	1,289,427.00	3,099,668.00
7	1,290,203.00	3,099,152.00			

### SURVEY LIMITS

CORNER#	NORTHING	EASTING	CORNER#	NORTHING	EASTING
21	1,290,662.03	3,098,680.60	26	1,289,253.50	3,099,243.12
22	1,290,281.94	3,098,507.67	27	1,288,709.60	3,099,243.12
23	1,290,936.92	3,097,241.41	28	1,288,709.60	3,099,767.58
24	1,290,315.54	3,096,898.08	29	1,289,334.30	3,100,556.02
25	1,289,311.52	3,098,715.20			

### VOLUME COMPUTATIONS

PROJECT DEPTH -10.0'		
AVAILABLE TO PROJECT DEPTH (-10.0')		3,137 cy
AVAILABLE BETWEEN PROJECT DEPTH (-10.0') AND MAX PAY DEPTH (-11.0')		1,787 cy
TOTAL MATERIAL AVAILABLE		4,924 cy
PROJECT DEPTH -15.0'		
AVAILABLE TO PROJECT DEPTH (-15.0')		1,564 cy
AVAILABLE BETWEEN PROJECT DEPTH (-15.0') AND MAX PAY DEPTH (-16.0')		1,805 cy
TOTAL MATERIAL AVAILABLE		3,369 cy
AVAILABLE ALONG SIDE SLOPES (3:1)		15,341 cy

**U.S. Army Corps of Engineers**  
ALASKA DISTRICT

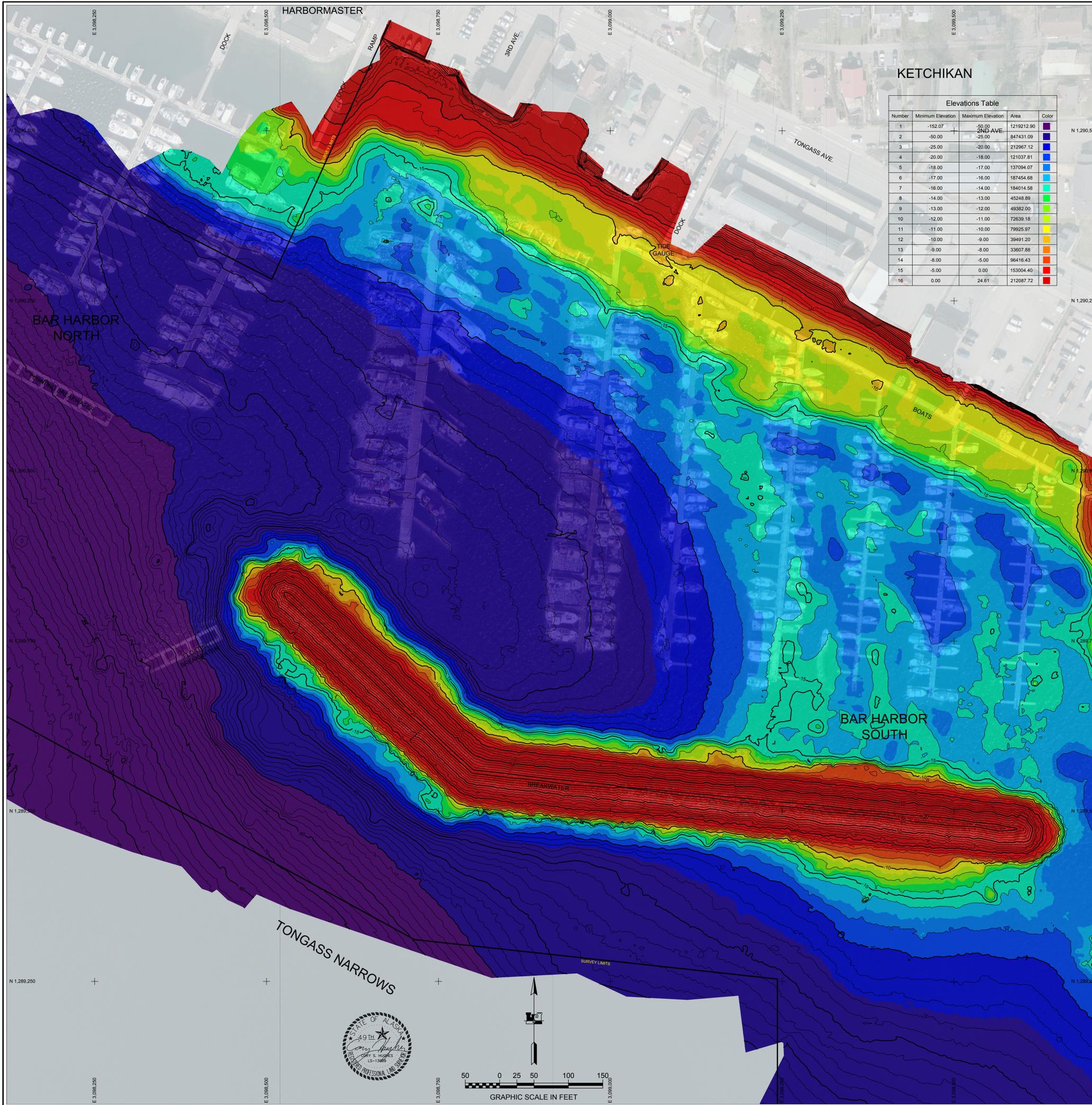
CONTRACT NO. \_\_\_\_\_  
DRAWING NO. \_\_\_\_\_  
JOB NO. \_\_\_\_\_  
DATE: \_\_\_\_\_

STATE: \_\_\_\_\_  
CITY: \_\_\_\_\_  
APPROVED BY: \_\_\_\_\_  
DESIGNED BY: \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_  
DATE: \_\_\_\_\_

SCALE: \_\_\_\_\_  
FILE NAME: \_\_\_\_\_  
SIZE: \_\_\_\_\_

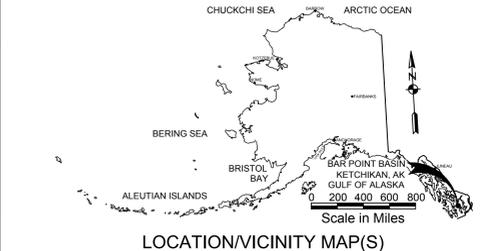
**KETCHIKAN, ALASKA**  
**BAR POINT BASIN**  
**COLOR RELIEF**  
**JULY 6-15, 2012**

**SHEET IDENTIFICATION**  
**V-105**  
Sheet 5 of 7



**KETCHIKAN**

Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-152.07	-50.00	1219212.90
2	-50.00	-25.00	847431.09
3	-25.00	-20.00	212967.12
4	-20.00	-18.00	121037.81
5	-18.00	-17.00	137094.07
6	-17.00	-16.00	187454.68
7	-16.00	-14.00	184014.58
8	-14.00	-13.00	45248.89
9	-13.00	-12.00	49382.00
10	-12.00	-11.00	72639.18
11	-11.00	-10.00	79925.97
12	-10.00	-9.00	39491.20
13	-9.00	-8.00	33607.88
14	-8.00	-5.00	96416.43
15	-5.00	0.00	153004.40
16	0.00	24.61	212087.72



- HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83, IN U.S. SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE PUBLISHED NAD83 (GCRS) 2010 EPOCH VALUES OF NGS CORS STATIONS: "ANNETTE ISLAND 5 CORS ARP" (AIS5 - PID D6482) AS N 1,188,024.64, E 3,119,193.51 (ALASKA STATE PLANE, ZONE 1, NAD 83) AND "PORTALEXANAK2005" (AB48 - PID D16995) AS N 1,612,437.44, E 2,485,565.65 (ALASKA STATE PLANE, ZONE 1, NAD 83) AND "LEVEL ISLAND 6 CORS ARP" (LEV6 - PID D20355) N 1,892,090.98, E 2,802,073.47 (ALASKA STATE PLANE, ZONE 1, NAD 83). CORS STATIONS STATE PLANE COORDINATES ARE CONVERTED FROM LAT/LONG USING NGS PROGRAM SPCS83V2.1. RESULTANT COORDINATES AT PRIMARY HARBOR CONTROL HOLD USACE SBC "BPB-3 2001" AS N 1,289,759.16, E 3,099,834.73 AND SBC "BPB-6 2012" AS N 1,291,023.25, E 3,097,626.80.
- VERTICAL CONTROL IS MEAN LOWER LOW WATER (MLLWW) OF, BASED ON THE NOAA'S TIDAL BENCH MARK LIST "945490, KETCHIKAN, TONGASS NARROWS, ALASKA" PUBLISHED 09/27/2011. THIS TIDAL DATUM IS BASED ON THE 1985-2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOS TIDAL BENCHMARK "0460 E 2001" AS 53.12' AND NOS TIDAL BENCHMARK "0460 F 2004" AS 53.11'. ALSO PROVIDED ARE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) EQUIVALENTS, HOLDING "BPB-6 2012" AS 16.63', BASED ON GPS OBSERVATIONS FROM JULY 8 & 13 2012.
- THE SURVEY WAS CONDUCTED ON JULY 6-15, 2012. HYDROGRAPHIC SOUNDING DATA WAS COLLECTED USING AN ODOM E53 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 "BPB-3 2001". SOUND VELOCITY PROFILE WAS PROVIDED USING AN ODOM DICH-BAR PRO, AND WAS PROVIDED IN REAL TIME AT THE SOUND HEAD USING AN ODOM DIGI-BAR V. DATA COLLECTION AND NAVIGATION WERE PERFORMED USING HYPACK HYSWEEP (2012) SOFTWARE. MULTI-BEAM SURVEY DATA WAS POST-PROCESSED USING HYPACK HYSWEEP (2012) SOFTWARE.
- PLAN VIEW SOUNDING SELECTION IS THE POINT NEAREST CENTER IN A 12 FOOT BINNED MATRIX. CONTOUR AND VOLUME SOUNDING SELECTION IS THE AVERAGE VALUE IN A 3 FOOT BINNED MATRIX.
- CONTROL MONUMENT "BPB - 4 2001" WAS NOT UPDATED DUE TO INACCESSIBILITY.
- SOUNDING VALUES SHOWN ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
- THIS DRAWING INDICATES THE GENERAL CONDITIONS AT THE TIME OF THE SURVEY.

SURVEY CONTROL DATA				
STATION	NORTHING	EASTING	ELEV	DESCRIPTION
BAR-2 1972	1,289,295.61	3,099,769.18	21.04	USACE SBC, FOUND IN GOOD COND
BAR-4 1972	1,289,552.31	3,098,796.18	21.14	USACE SBC, FOUND IN GOOD COND
BAR-6 1976	1,290,671.95	3,098,651.22	21.42	SEARCHED FOR NOT FOUND
BPB-1 1998	1,290,101.69	3,099,574.62	22.22	USACE SBC, FOUND IN GOOD COND
BPB-2 1998	1,289,530.10	3,099,011.94	19.41	USACE SBC, FOUND IN GOOD COND
BPB-3 2001	1,289,759.16	3,099,834.79	22.90	USACE SBC, FOUND IN GOOD COND
BPB-4 2001	1,290,602.71	3,098,428.97	23.08	INACCESSIBLE NOT UPDATED
BPB-5 2012	1,290,782.60	3,098,218.46	23.41	SBC SET THIS SURVEY
BPB-6 2012	1,291,023.25	3,097,826.80	22.58	SBC SET THIS SURVEY

NAVIGATION AIDS				
USCG NO.	NORTHING	EASTING	DESCRIPTION	
22200	1,289,303.00	3,099,772.00	SOUTH ENTRANCE LIGHT 2S FL. RED	
22205	1,289,473.00	3,099,593.00	SOUTH ENTRANCE DAYBEACON 3S GRN	
22210	1,289,717.00	3,098,322.00	ENTRANCE LIGHT 2 FL. RED	
22215	1,290,085.00	3,098,274.00	ENTRANCE DAYBEACON 3 GRN	
22220	1,290,548.00	3,097,433.00	NORTH ENTRANCE LIGHT 2N FL. RED	

PROJECT LIMITS			PROJECT LIMITS		
CORNER#	NORTHING	EASTING	CORNER#	NORTHING	EASTING
1	1,289,357.00	3,099,723.00	8	1,290,015.00	3,099,150.00
2	1,289,447.00	3,099,837.00	9	1,290,433.00	3,098,597.00
3	1,289,732.00	3,099,690.00	10	1,289,880.00	3,098,566.00
4	1,290,027.00	3,099,688.00	11	1,289,622.00	3,098,832.00
5	1,290,565.00	3,098,666.00	12	1,289,532.00	3,099,667.00
6	1,290,481.00	3,098,622.00	13	1,289,427.00	3,099,668.00
7	1,290,203.00	3,099,152.00			

SURVEY LIMITS			SURVEY LIMITS		
CORNER#	NORTHING	EASTING	CORNER#	NORTHING	EASTING
21	1,290,662.03	3,098,680.60	26	1,289,253.50	3,099,243.12
22	1,290,281.94	3,096,507.67	27	1,288,709.60	3,099,243.12
23	1,290,936.92	3,097,241.41	28	1,288,709.60	3,099,767.58
24	1,290,315.54	3,096,898.08	29	1,289,334.30	3,100,556.02
25	1,289,311.52	3,098,715.20			

VOLUME COMPUTATIONS			
PROJECT DEPTH -10.0'			
AVAILABLE TO PROJECT DEPTH (-10.0')			3,137 cy
AVAILABLE BETWEEN PROJECT DEPTH (-10.0') AND MAX PAY DEPTH (-11.0')			1,787 cy
TOTAL MATERIAL AVAILABLE			4,924 cy
PROJECT DEPTH -15.0'			
AVAILABLE TO PROJECT DEPTH (-15.0')			1,564 cy
AVAILABLE BETWEEN PROJECT DEPTH (-15.0') AND MAX PAY DEPTH (-16.0')			1,805 cy
TOTAL MATERIAL AVAILABLE			3,369 cy
AVAILABLE ALONG SIDE SLOPES (3:1)			15,341 cy

**US Army Corps of Engineers - ALASKA DISTRICT**

CONTRACT NO. \_\_\_\_\_ CONTRACTOR \_\_\_\_\_ DATE \_\_\_\_\_

DRAWING NO. \_\_\_\_\_ CITY \_\_\_\_\_ STATE \_\_\_\_\_

SCALE \_\_\_\_\_ SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

**KETCHIKAN, ALASKA**  
**BAR POINT BASIN**  
**COLOR RELIEF**  
**JULY 6-15, 2012**

**SHEET IDENTIFICATION**  
**V-106**  
 Sheet 6 of 7