

- NOTES**
- HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, (5001) NAD83, IN U.S. SURVEY FEET, BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE 2005 EPOCH VALUES PUBLISHED NAD83 (COR96) OF NGS CORS STATIONS "PORT ALEXAN AK CORS ARP" (PID D6698), "LINE OF WALKS-1 CORS ARP" (PID D4367), "ANNETTE ISLAND CORS ARP" (PID D6482).
 - VERTICAL CONTROL IS IN U.S. SURVEY FEET AND REFERS TO MEAN-LOWER-LOW-WATER (MLLW) OF THE MLLW VALUES SHOWN ON THIS PLAN ARE BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST FOR STATION 9450314, METLAKATLA, ALASKA, HOLDING THE NOAA STANDARD BENCH MARK BRASS CAP, "MNH-1, 1999 VW R1955, 7.199 METERS AS ELEVATION, THIS VALUE IS FROM TIDAL EPOCH 1983 - 2001, PUBLISHED 6 NOV 2007 FOR THIS STATION.
 - VERTICAL CONTROL WAS ALSO TIED INTO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) EQUIVALENTS BASED ON HOLDING THE OPUS DB PUBLISHED VALUE OF NOAA BENCH MARK BRASS CAP, "NOS NOAA 0460 BM IN 1985, 382 METERS APPLYING THE AVERAGE DELTA TO THE REMAINING PRIMARY CONTROL.
 - VERTICAL AND HORIZONTAL CONTROL WAS SURVEYED 1/3 SEPTEMBER 2010 USING RTK AND DIFFERENTIAL LEVELING TECHNIQUES ALONG WITH LONG PERIOD STATIC GPS OBSERVATIONS USING A TRIMBLE 5700 AND FOR A JAVAD SIGMA WHICH WAS THEN PROCESSED THROUGH THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (OPUS). THE DIFFERENTIAL LEVELING EQUIPMENT USING A LEICA NI-2 SELF LEVELING LEVEL AND LEVEL ROD, REAL TIME KINEMATIC SURVEYING WAS DONE WITH A RTK BASE STATION SET UP AT "MNH-1" MONUMENTS WERE CHECKED AGAINST THEIR PUBLISHED VALUES AS A QUALITY CONTROL PROCEDURE USING A JAVAD ROVER AND BASE STATION.
 - HYDROGRAPHIC SOUNDING DATA WAS COLLECTED 1/3 SEPTEMBER 2010 USING AN ODOM ES-3 MULTIBeam ECHOSONAR, (240 MHz, 90 DEGREE SWATH-WIDTH WITH 1.5 BEAMS). POSITIONING AND VESSEL ALTITUDE WERE MEASURED JAVAD SIGMA AND A "CORR-FIBS" INTERNAL NAVIGATION SYSTEM OPERATING ON RTK CORRECTORS BROADCAST FROM A JAVAD SIGMA BASE STATION SET AT THE NOS BENCH MARK "MNH-1 1999". SOUND VELOCITY WAS MEASURED AT NUMEROUS LOCATIONS AND THE PHASES USING AN ODOM DIGI-BAR FROD SOUND VELOCITY PROFILER. DATA COLLECTION, NAVIGATION AND POST-PROCESSING WERE PERFORMED USING HYPAACK HYWHELP (2010) SOFTWARE.
 - SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS OTHERWISE NOTED.
 - THIS DRAWING IS INDICATIVE OF CONDITIONS ON THE DATES OF SURVEY.
 - THIS SURVEY WAS PERFORMED BY SEATTLE DISTRICT, US ARMY CORPS OF ENGINEERS, PUGET SOUND SURVEY CREW.

NAVIGATION AIDS

USCG No.	DESCRIPTION	NORTHING	EASTING
22065	METLAKATLA BOAT HARBOR LIGHT 2	1,210,761.11	3,121,453.98
22070	METLAKATLA INNER HARBOR DAYBEACON 3	1,210,624.80	3,121,577.89
22075	METLAKATLA INNER HARBOR DAYBEACON 5	1,210,510.38	3,121,357.65
22080	METLAKATLA INNER HARBOR DAYBEACON 7	1,210,349.90	3,121,414.65

PROJECT LIMITS

CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	1,209,774.73	3,121,434.37	5C	1,210,669.71	3,121,662.47
2	1,210,087.67	3,122,057.41	6	1,210,536.76	3,121,185.46
3	1,210,512.69	3,121,845.45	7	1,210,141.75	3,121,315.41
4A	1,210,353.72	3,121,528.44	8	1,210,427.89	3,121,888.44
4B	1,210,339.74	3,121,355.43	9	1,210,396.68	3,121,903.44
5A	1,210,439.75	3,121,322.45	10	1,210,293.71	3,121,697.43
5B	1,210,507.74	3,121,353.45	11	1,209,986.69	3,121,852.40
PT 2	1,210,698.73	3,121,494.47	12	1,210,792.72	3,121,524.48

CONTROL DATA

STATION	NORTHING	EASTING	MLLW ELEV/NAVD88 ELEV	DESCRIPTION
S END E BW 1981	1,210,069.71	3,122,251.80	23.43	USACE SBC
PC E BW 1981	1,210,521.00	3,121,992.61	23.92	USACE SBC
S END W BW 1981	1,210,018.59	3,121,198.43	24.11	USACE SBC
MNH-1 1999	1,209,901.43	3,121,956.23	21.86	USACE DOMED BC
MNH-2 1999	1,209,729.74	3,121,614.82	21.90	USACE DOMED BC
MNH-3 2003	1,209,775.86	3,121,797.78	23.19	USACE DOMED BC

VOLUME COMPUTATIONS

Project Depth -15' MLLW	
VOLUME AVAILABLE TO PROJECT DEPTH (-15 MLLW)	13,283.4 (CU YDS)
VOLUME AVAILABLE BETWEEN PROJECT DEPTH AND MAXIMUM PAV LINE (-16' MLLW)	6738.8 (CU YDS)
VOLUME AVAILABLE ALONG SIDE SLOPE (3:1, H:V)	430.2 (CU YDS)
TOTAL	20,452.4 (CU YDS)

US ARMY CORPS OF ENGINEERS ALASKA DISTRICT

CONTRACT NO. **SEATTLE DISTRICT**

CITY: **SEATTLE** STATE: **WA** DATE: **2010**

RECOMMENDED BY: **J. ADAIR** APPROVED BY: **J. ADAIR**

DESIGNED BY: **G. KING** CHECKED BY: **L. TOKUNAGA**

DATE: **23 SEP 2010** DRAWING NO.: **2851-10**

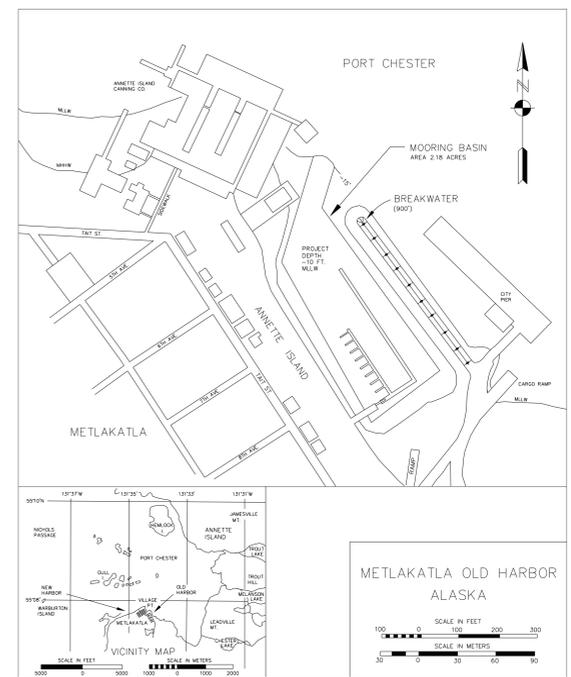
PROJECT: **METLAKATLA, ALASKA**

DESCRIPTION: **METLAKATLA NEW HARBOR PROJECT CONDITION SURVEY SEPTEMBER 1 & 3, 2010**

REFERENCE NUMBER: **V-005**

SHEET 1 OF 1

SURVEY



- NOTES**
- HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83 (5000), IN U.S. SURVEY FEET, BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING 2003 EPOCH VALUES PUBLISHED NAD83 (CORS) OF NGCS STATIONS: "PORT ALEXANDER AK CORS ARP" (PID: DL6095); "JUNEAU WAAS 1 CORS ARP" (PID: DF4367); "ANNETTE ISLAND CORS ARP" (PID: DG4823).
 - VERTICAL CONTROL IS IN U.S. SURVEY FEET AND REFERS TO MEAN-LOWER-LOW-WATER (MLLW+0.0'). THE MLLW VALUES SHOWN ON THIS PLAT ARE BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST FOR STATION 9450314, METLAKATLA, ALASKA, HOLDING THE NOAA STANDARD BENCH MARK BRASS CAP, "NOS NOAA 945 0314 A 2009 VM #19553" AS ELEVATION 7.186 METERS. THIS VALUE IS FROM TIDAL EPOCH 1983 - 2001, PUBLISHED 6 NOVEMBER 2007 FOR THIS STATION.
 - VERTICAL CONTROL WAS ALSO TIED INTO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) HOLDING THE OPUS DB PUBLISHED VALUES OF NOAA BENCH MARK BRASS CAP, "NOS NOAA 0314 B 2009 S.366 METERS APPLYING THE AVERAGE DELTA TO THE REMAINING PRIMARY CONTROL.
 - VERTICAL AND HORIZONTAL CONTROL SURVEY WAS CONDUCTED 3, 4 SEPTEMBER 2010 USING RTK AND DIFFERENTIAL LEVELING TECHNIQUES ALONG WITH LONG PERIOD STATIC GPS OBSERVATIONS USING A TRIMBLE 5700 AND/OR A JAVAD SIGMA WHICH WAS THEN PROCESSED THROUGH THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (OPUS) BY THE DIFFERENTIAL LEVELING EQUIPMENT WAS A LEICA IN-2 SELF LEVELING LEVEL AND LEVEL ROD. ALL PRIMARY CONTROL WAS DOUBLE-TIED USING REAL-TIME KINEMATIC CONTROL METHODS AND INDEPENDENT BASELINES SOLUTIONS. MONUMENTS WERE CHECKED AGAINST THEIR PUBLISHED VALUES AS A QUALITY CONTROL PROCEDURE. USING A JAVAD ROVER UNIT AND BASE STATION.
 - HYDROGRAPHIC SOUNDING DATA WAS COLLECTED 3, 4 SEPTEMBER 2010 USING AN ODOM ES-3 MULTIBEAM ECHOSONAR, (240 KHZ, 90 DEGREE SWATH-WIDTH WITH 1.5' BEAMS). POSITIONING AND VESSEL ALTITUDE WERE MEASURED USING A JAVAD SIGMA AND A CODA FIBS+ INTERNAL NAVIGATION SYSTEM OPERATING ON RTK CORRECTORS BROADCAST FROM A JAVAD SIGMA BASE STATION, SET AT THE NOS BENCH MARK "314 B 2009". SOUND VELOCITY WAS MEASURED AT NUMEROUS LOCATIONS AND TIDE PHASES USING AN ODOM DIGI-BAR PRO SOUND VELOCITY PROFILER. DATA COLLECTION, NAVIGATION AND POST-PROCESSING WERE PERFORMED USING HYPACK HYSWEEP (2010) SOFTWARE.
 - SOUNDINGS ARE IN US SURVEY FEET AND ARE MINUS UNLESS OTHERWISE NOTED.
 - THIS DRAWING IS INDICATIVE OF CONDITIONS ON THE DATES OF SURVEY.
 - THIS SURVEY WAS PERFORMED BY: SEATTLE DISTRICT, US ARMY CORPS OF ENGINEERS, PUGET SOUND SURVEY CREW.

CONTROL DATA					
STATION	NORTHING	EASTING	MLLW ELEV	NAV88 ELEV	DESCRIPTION
MET 3 1972	1,209,604.57	3,124,917.22	23.62	28.32	USACE SBC
MET 3 1972	1,209,954.47	3,124,641.64	21.55	26.25	USACE SBC
BM 11 1969	1,209,598.63	3,124,922.54	24.06	28.76	USCGS BENCH MARK BC
BM 13 1969	1,209,318.11	3,124,709.01	20.08	24.78	USCGS BENCH MARK BC
MOH-1 1999	1,209,256.01	3,124,769.64	23.57	28.27	USACE DOMED BC
MOH-2 1999	1,209,938.19	3,124,373.78	22.45	27.15	USACE DOMED BC
MOH-3 2003	1,209,395.29	3,124,903.51	23.71	28.41	USACE DOMED BC
MOH-4 2003	1,209,598.86	3,124,500.42	20.46	25.16	USACE DOMED BC
BM 14 1972	1,210,036.81	3,124,346.36	22.21	26.91	USCGS BENCH MARK BC
0314A 2009	1,209,532.95	3,125,009.99	23.58	28.28	USCGS BENCH MARK BC
0314B 2009	1,209,498.89	3,124,579.64	17.60	22.30	USCGS BENCH MARK BC
0314C 2009	1,209,679.10	3,124,464.82	20.23	24.93	USCGS BENCH MARK BC

PROJECT LIMITS					
CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	1,210,130.72	3,124,606.88	4	1,209,423.69	3,124,687.61
2	1,209,950.73	3,124,564.81	5	1,209,813.41	3,124,465.96
3	1,209,554.62	3,124,865.66	6	1,210,114.85	3,124,536.42

NAVIGATION AIDS			
USCG No	DESCRIPTION	NORTHING	EASTING
22090	METLAKATLA BREAKWATER LIGHT 1	1,209,968.16	3,124,629.8

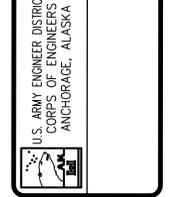
VOLUME COMPUTATIONS		
Project Depth -10' MLLW		
VOLUME AVAILABLE TO PROJECT DEPTH (-10' MLLW)	160.2	CUBIC YARDS
VOLUME AVAILABLE BETWEEN PROJECT DEPTH AND MAXIMUM FAY LINE (-5' MLLW)	445.5	CUBIC YARDS
VOLUME AVAILABLE ALONG SIDE SLOPE (3:1, H:V)	115.6	CUBIC YARDS
TOTAL	721.3	CUBIC YARDS



CONTRACT NO. US ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
 CONTRACTOR
 CITY STATE DATE
 Recommended: APPROVE: LICENSED ENGINEER
 ISSUE CONTRACTOR

SM ACTION	DESCRIPTION	DATE	APPROVE

DATE: 23 SEP 2010
 DRAWN BY: G. KING
 CHECKED BY: L. TOKUNAGA
 DESIGNED BY: J. ADAIR
 SUBMITTED BY: A. CHURCHILL
 U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ANCHORAGE, ALASKA
 Drawing #: 2854-10



METLAKATLA, ALASKA
 METLAKATLA OLD HARBOR
 PROJECT CONDITION SURVEY
 SEPTEMBER 3 & 4, 2010

Reference number:
V-006
 Sheet 1 of 1

SURVEY