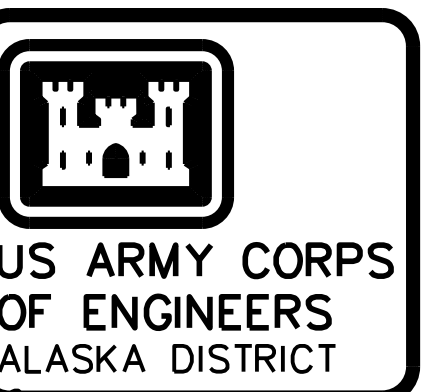


NOTES

- 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 PUBLISHED NAD83 (COR96) 2003 EPOCH VALUES OF NCS CORP STATIONS: "WHITEHORSE CORP ARP" (PID DE6615); "JUNEAU WAAS 1 CORP ARP" (PID DF4367); "ANNETTE ISLAND CORP ARP" (PID DK6482)
- 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 9451528, KAKE, ALASKA. HOLDING THE NOAA STANDARD BENCH MARK BRASS CAP. "NOS NOAA 1528 A 2009 VM #19560" 7.325 METERS AS ELEVATION. THIS VALUE IS FROM TIDAL EPOCH 1983 - 2001, PUBLISHED 6 NOV 2007.
- VERTICAL CONTROL WAS ALSO TIED INTO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV88) HOLDING OPUS DB PUBLISHED VALUES FOR NOAA BENCH MARK BRASS CAP. "NOS NOAA 1528 E 2009 VM #19564" AS ELEVATION 6.162 METERS APPLYING THE AVERAGE DELTA TO THE REMAINING PRIMARY CONTROL.
- VERTICAL AND HORIZONTAL CONTROL SURVEY WAS CONDUCTED 26/27 AUGUST 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 USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (OPUS) THE DIFFERENTIAL LEVELING EQUIPMENT USING A LECIA NI-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 26/27 AUGUST 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+ INTERVAL NAVIGATION SYSTEM OPERATING ON RTK CORRECTORS BROADCAST FROM A JAVAD SIGMA BASE STATION, SET AT THE NOS BENCHMARK "1528 E 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 SURVEY 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 NAVD88 ELEV	DESCRIPTION
945-1528-A 2009	1,866,357.40	2,640,050.98	24.03	28.73 USACE SBC
945-1528-B 2009	1,868,279.97	2,640,145.55	25.91	30.61 USACE SBC
945-1528-C 2009	1,868,312.86	2,640,322.56	26.30	31.00 USACE SBC
945-1528-D 2009	1,868,292.83	2,640,547.08	31.91	36.61 USACE SBC
945-1528-E 2009	1,868,212.06	2,640,422.04	20.22	24.92 USACE SBC

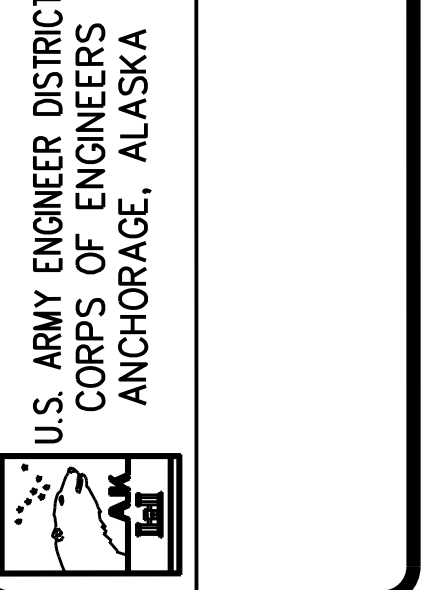
NAVIGATION AIDS			
DESCRIPTION	NORTHING	EASTING	
FLASHING GREEN LIGHT #13 DAY MARK	1,867,230.54	2,639,589.26	



CONTRACT NO. _____
 CONTRACTOR _____
 CITY _____ STATE _____
 Recommended: _____
 Approved: _____
 Date: _____

Symbol	Description	Date	Appr.

Date: 23 SEP 2010
 Drawn: L. TOKUNAGA
 Revised: J. ADAIR
 Designer: A. CHURCHILL
 Checker: _____
 Drafter: _____



KAKE, ALASKA
 KAKE SMALL BOAT HARBOR
 PROJECT CONDITION SURVEY
 AUGUST 26 & 27, 2010

SURVEY