

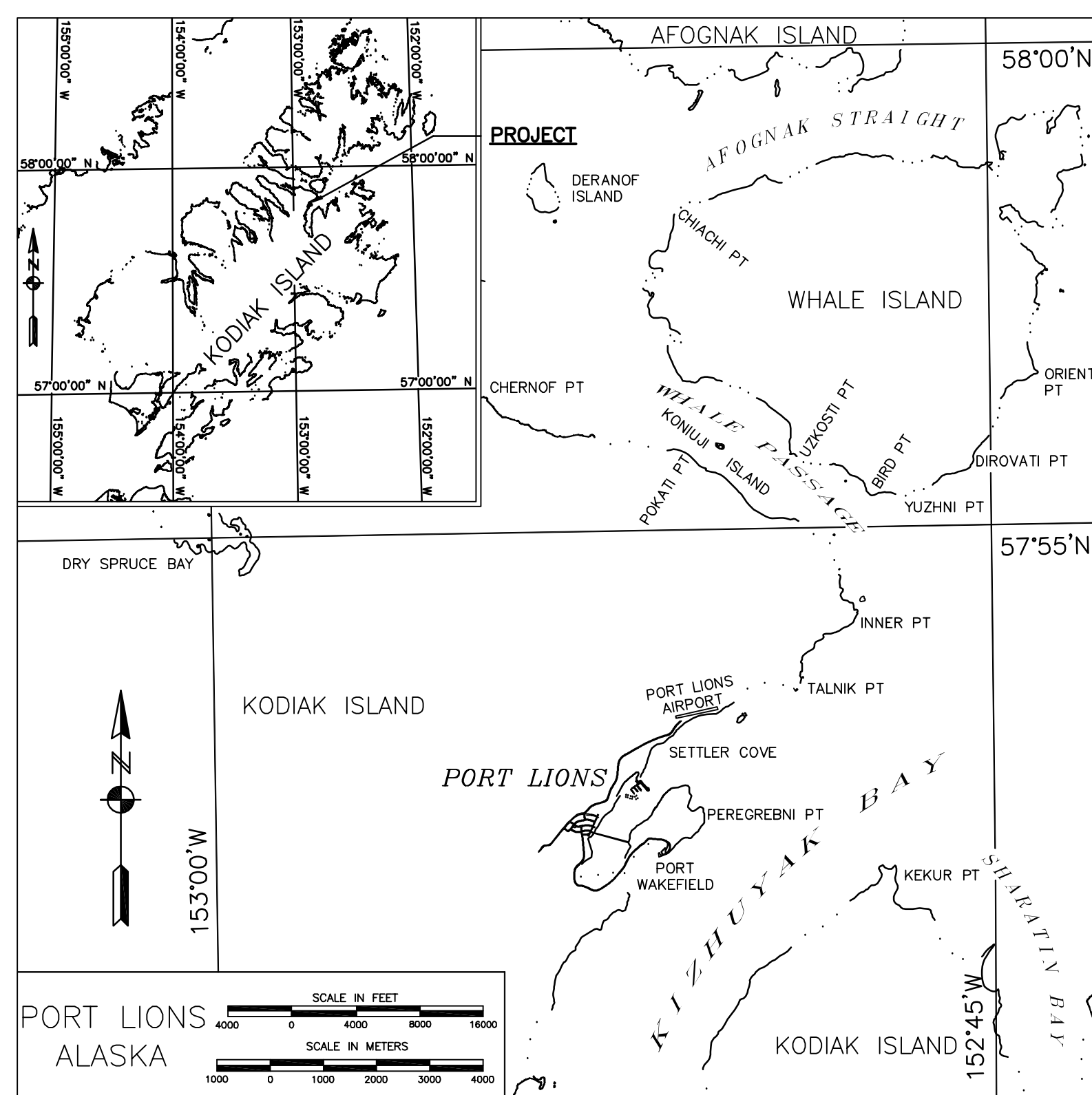
## SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT I AM PROPERLY REGISTERED AND LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF ALASKA AND THAT THIS PLAT REPRESENTS A HYDROGRAPHIC SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION. THE ELEVATIONS SHOWN HEREON DEPICT THE DEPTHS AS SURVEYED AUGUST 5-8, 2009, TO THE BEST OF MY KNOWLEDGE AND BELIEF.

KARL D. WOODS, P.L.S.  
REGISTRATION NO. LS 10950

AUGUST 16, 2010  
DATE

100 0 100 200 300  
SCALE IN FEET



## NOTES

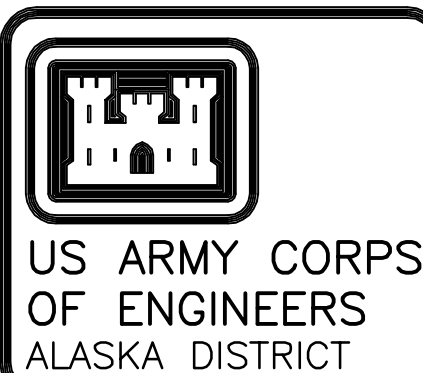
- HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 5, NAD83 (CORR96) IN U.S. SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE 2003 EPOCH VALUES OF OPUS DB DERIVED STATIONS: "PLH-5 2005" (PID BBBL10) AS N 1,416,517.22; E 1,860,997.72; "1240-EE 1983" (PID BBBL10) AS N 1,416,211.66; E 1,861,730.35
- VERTICAL CONTROL IS IN U.S. SURVEY FEET AND REFERS TO MEAN-LOWER-LOW-WATER DATUM (MLLW=0.0'). THE MLLW VALUES SHOWN ON THIS PLAT ARE BASED ON NOAA/NOS TIDAL STATION 945 7391, PORT LIONS, KODIAK ISLAND, ALASKA, HOLDING USCGS BENCH MARK DOME BC 7391 C 2009 AS 10.70 FEET. THIS VALUE IS FROM TIDAL EPOCH 1983-2001, PUBLISHED 6/04/2010 FOR THIS STATION.
- VERTICAL CONTROL WAS ALSO TIED INTO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) HOLDING THE OPUS DB PUBLISHED VALUES OF "PLH-5 2005" (PID BBBL10) AS 22.85 FEET AND "1240-EE 1983" (PID BBBL10) AS 22.50 FEET AND APPLYING THE AVERAGE DELTA TO THE REMAINING PRIMARY CONTROL.
- THE HORIZONTAL CONTROL SURVEY WAS CONDUCTED AUGUST 5 THROUGH 8, 2009 USING THREE (3) TRIMBLE R8 GPS RECEIVERS AND A COMBINATION OF STATIC GPS AND RTK SURVEY TECHNIQUES. GPS DATA POST-PROCESSING WAS ACCOMPLISHED USING TRIMBLE GEOMATICS OFFICE V1.6. ALL PRIMARY CONTROL WAS DOUBLE-TIED USING REAL-TIME-KINEMATIC CONTROL METHODS AND INDEPENDENT BASELINE SOLUTIONS.
- THE TOPOGRAPHIC AND PLANNETRIC SURVEYS WERE CONDUCTED AUGUST 5 THROUGH 8, 2009 USING TRIMBLE R8 GPS RECEIVERS, REAL-TIME-KINEMATIC PROCEDURES, AND CONVENTIONAL METHODS. FIXED AIDS-TO-NAVIGATION WERE SURVEYED AT THE LIGHT GLOBE. BUOY POSITIONS WERE DETERMINED BY AVERAGING THE FLOOD AND EBB SURVEYED LOCATIONS TO ESTABLISH AN APPROXIMATE BUOY ANCHOR POSITION.
- HYDROGRAPHIC DATA ACQUISITION WAS CONDUCTED AUGUST 5 THROUGH 7, 2009 USING A RESON SEABAT 7125 MULTIBEAM ECHOSOUNDER (200KHZ WITH 511 BEAMS AT 128 DEGREES SWATH WIDTH). VESSEL POSITIONING, HEADING AND ATTITUDE WERE MEASURED USING A CODA-OCTOPUS F185 INERTIAL MOTION UNIT OPERATING WITH RTK CORRECTORS FROM THE BASE STATION SET AT "PLH-5 2005". SOUND VELOCITY CASTS WERE MEASURED AND COLLECTED USING AN ODOM DIGIBAR PRO SOUND VELOCITY PROFILER. SURFACE SOUND VELOCITY WAS MEASURED USING AN APPLIED MICRO-SYSTEMS SMART PROBE. VESSEL NAVIGATION AND DATA COLLECTION WAS PERFORMED USING GPS OINSY INTEGRATED SOFTWARE (OINSY v8). DATA PROCESSING AND FINAL DATA ANALYSIS WERE PERFORMED USING CARIS HIPS SOFTWARE (V6.1).
- SOUNDINGS ARE SHOWN IN U.S. SURVEY FEET AND ARE MINUS UNLESS NOTED OTHERWISE.
- THIS SURVEY IS INDICATIVE OF CONDITIONS ON THE DATES OF SURVEY.
- THE PORT LIONS ENTRANCE CHANNEL COORDINATES AND DIMENSIONS DEFINE AND CONTROL THE SOUTH-EASTERN EDGE OF THE 150' WIDE CHANNEL. THE COORDINATES FOR THE PROJECT LIMITS ARE LISTED FOR COMPUTATIONAL PURPOSES ONLY.

CONTROL DATA				DESCRIPTION
STATION	NORTHING	EASTING	ELEV. (MLLW)	
A-5 1973	1,416,048.67	1,862,912.79	---	UNMARKED DOME BC IN BOULDER
B-1 1973	1,417,839	1,861,559	---	PK NAIL IN ROCK, NOT SEARCHED FOR
B-2 1973	1,417,372.85	1,861,416.87	3.64 4.59	UNMARKED DOME BC IN BOULDER
7391 C 2009	1,416,645.58	1,860,946.03	10.70 11.65	NOS DOME BC IN ROCK OUTCROP
7391 D 2009	1,416,644.36	1,861,101.85	7.73 8.68	NOS DOME BC IN BOULDER
1240-83-WE	1,416,623.51	1,861,130.22	21.82 22.77	USACE DOME BC IN BOULDER
1240-83-EE	1,416,211.66	1,861,730.35	21.55 22.50	USACE DOME BC IN BOULDER
PLH-1 1998	1,415,445.50	1,861,141.89	19.91 20.86	DOME BC IN CONCRETE DOCK
PLH-2 1998	1,416,625.67	1,861,043.18	35.49 36.44	DOME BC IN BEDROCK
PLH-3 2002	1,416,410.03	1,861,442.43	22.70 23.65	DOME BC IN BOULDER
PLH-4 2002	1,415,555.85	1,862,524.49	---	DOME BC IN BOULDER
PLH-5 2005	1,416,517.22	1,860,997.72	21.90 22.85	DOME BC IN BOULDER
PLH-6 2005	1,416,774.59	1,861,046.45	20.52 21.47	DOME BC IN BOULDER

NAVIGATION AIDS			
USCG No.	DESCRIPTION	NORTHING	EASTING
26530	SETTLER COVE DAYBEACON 1	1,416,169	1,862,075
26535	SETTLER COVE BREAKWATER LIGHT 2	1,416,217	1,861,726

VOLUME COMPUTATIONS			
PROJECT DEPTH -14' MLLW			CUBIC YARDS
MINIMUM PAY LINE (-14' MLLW)*			3
BETWEEN MINIMUM PAY LINE and MAXIMUM PAY LINE (-15' MLLW)*			726
VOLUME AVAILABLE ALONG SIDESLOPES (3:1, HV)*			0
TOTAL			729
* VOLUMES ARE WITHIN PROJECT LIMITS AND DO NOT INCLUDE SIDE SLOPES.			

PROJECT LIMITS					
CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	1,416,500	1,862,138	3	1,415,860	1,861,631
2	1,416,065	1,861,960	4	1,415,810	1,861,164



CONTRACT NO. W911KB-08-D-0002-0009  
CONTRACTOR TERRASOIL LIMITED  
CITY PALMER  
STATE ALASKA  
Date: \_\_\_\_\_  
Approved: \_\_\_\_\_  
Resident Engineer: \_\_\_\_\_  
Prime Contractor: \_\_\_\_\_

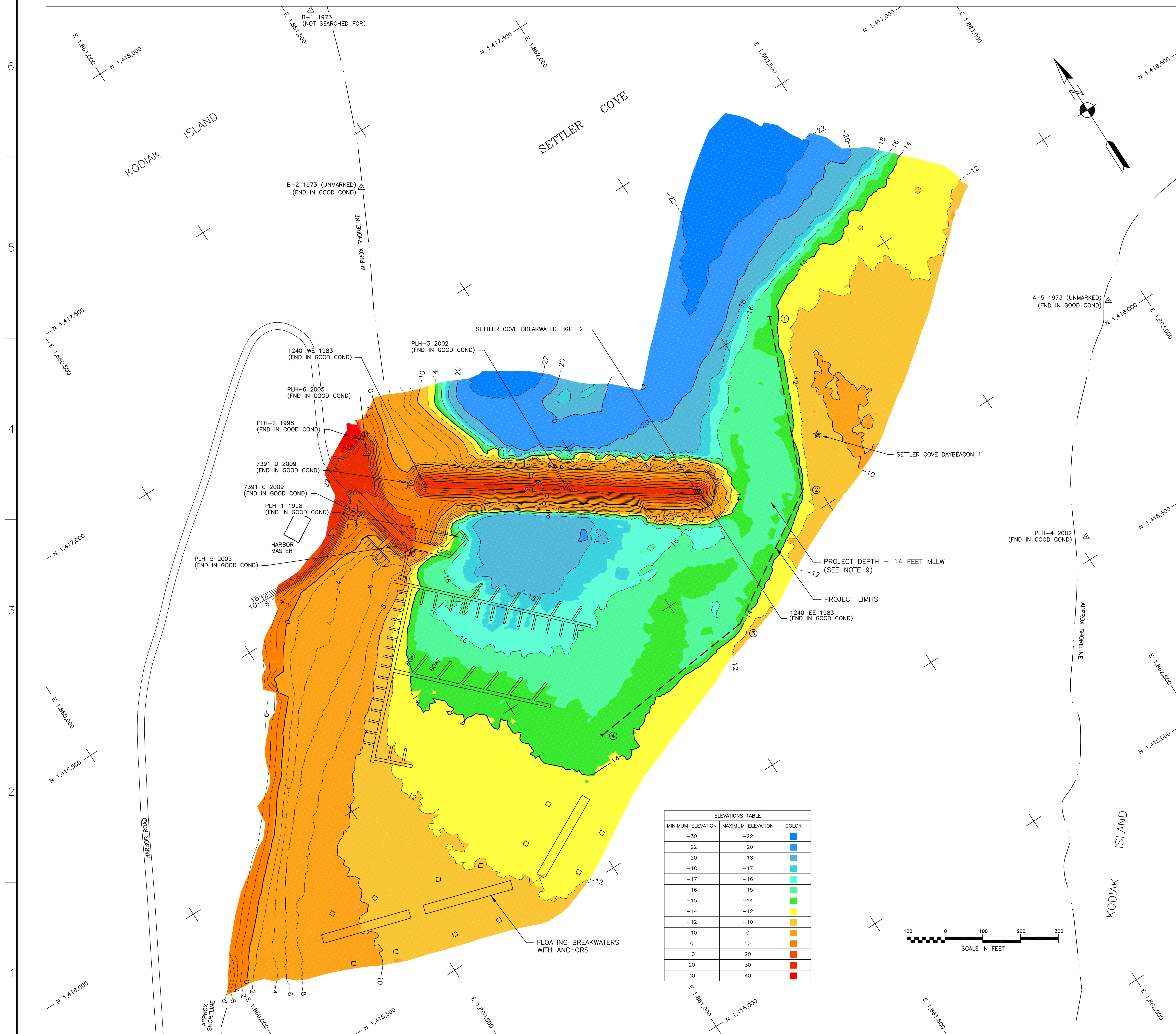
Item	Description	Date	Approved
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Date: 8/16/2010  
Drawn: JEA  
Checked: KDW  
Reviewed: KDW  
Scale: 1"=100'  
Sheet: 1 of 2  
Drawing #: 2769-10  
US ARMY DISTRICT OF ALASKA  
PORT LIONS, ALASKA  
PORT LIONS HARBOR  
PROJECT CONDITION SURVEY  
AUGUST 5-8, 2009

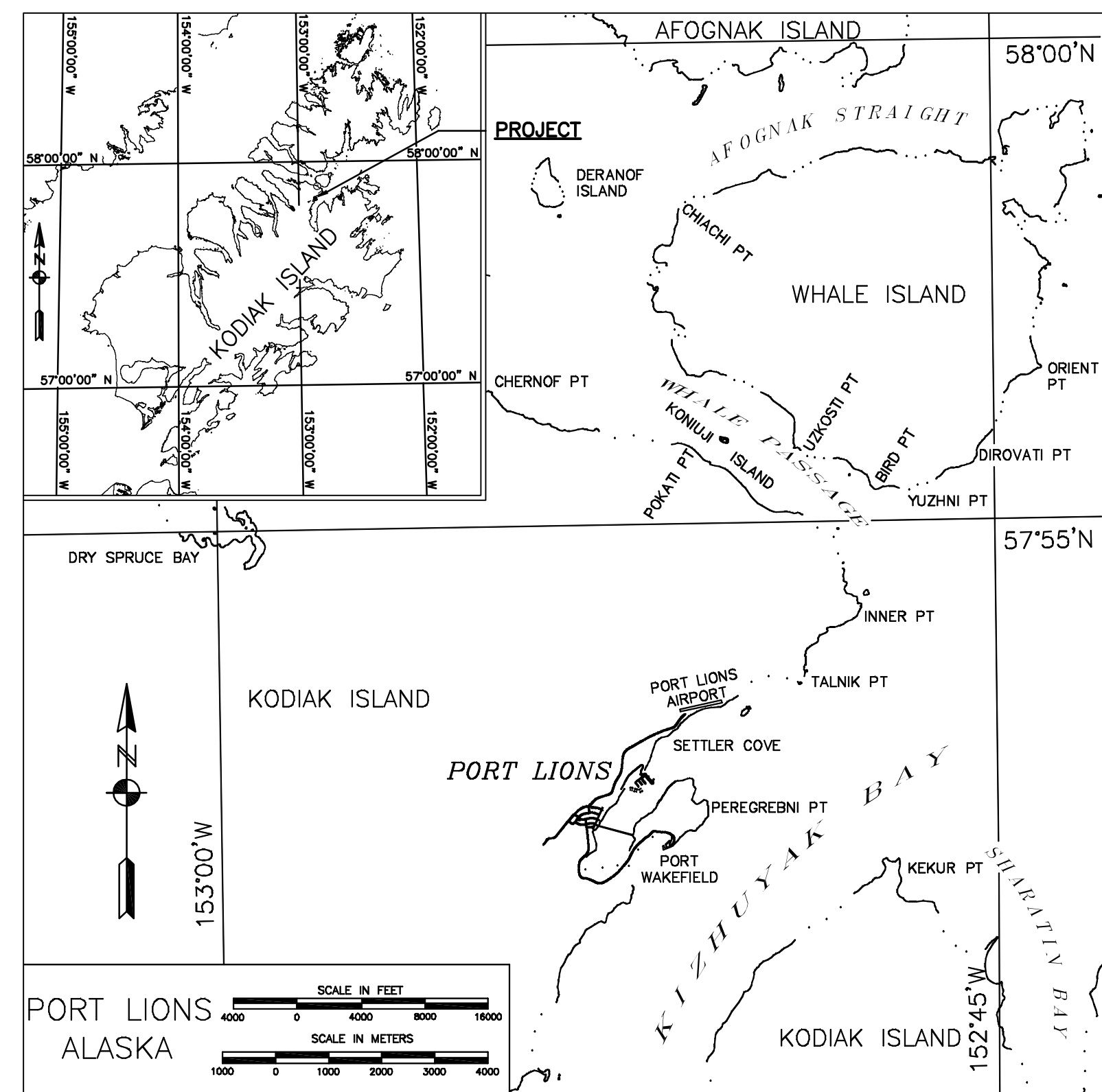
Reference number:  
V-101  
Sheet 1 of 2

SURVEY





ELEVATIONS TABLE		
MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
-30	-22	Blue
-22	-20	Dark Blue
-20	-18	Light Blue
-18	-17	Teal
-17	-16	Green
-16	-15	Light Green
-15	-14	Yellow
-14	-12	Orange
-12	-10	Light Orange
-10	0	Yellow
0	10	Orange
10	20	Dark Orange
20	30	Red
30	40	Dark Red



## NOTES

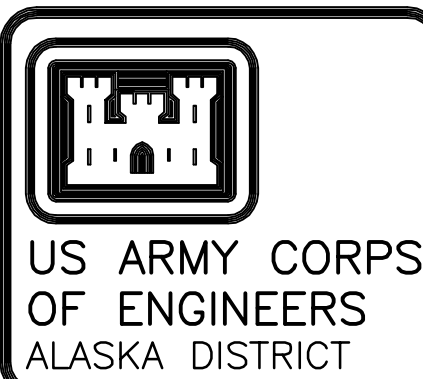
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CONTRACT NO. W911KB-08-D-0002-0009	CONTRACTOR TERRASOIL LIMITED	DATE
CITY PALMER	STATE ALASKA	APPROVED
RECOMMENDED	PRIME CONTRACTOR	RESIDENT ENGINEER

Rev	Action	Description	Date	By
1				

DESIGNED: JEA	DATE: 8/16/2010
DRAWN: LEP/CEA/JWW	DRAWN SCALE: 1"=100'
CHECKED: KOW	CHECKED SCALE: 1"=100'
IN CHARGE: JEA	IN CHARGE SCALE: 1"=100'
PROJECT: PORT LIONS HARBOR PROJECT CONDITION SURVEY	PROJECT: PORT LIONS HARBOR PROJECT CONDITION SURVEY
ANCHORAGE, ALASKA	ANCHORAGE, ALASKA

PORT LIONS, ALASKA
PORT LIONS HARBOR
PROJECT CONDITION SURVEY
AUGUST 5-8, 2009

Reference number:
V-102
Sheet 2 of 2

SURVEY