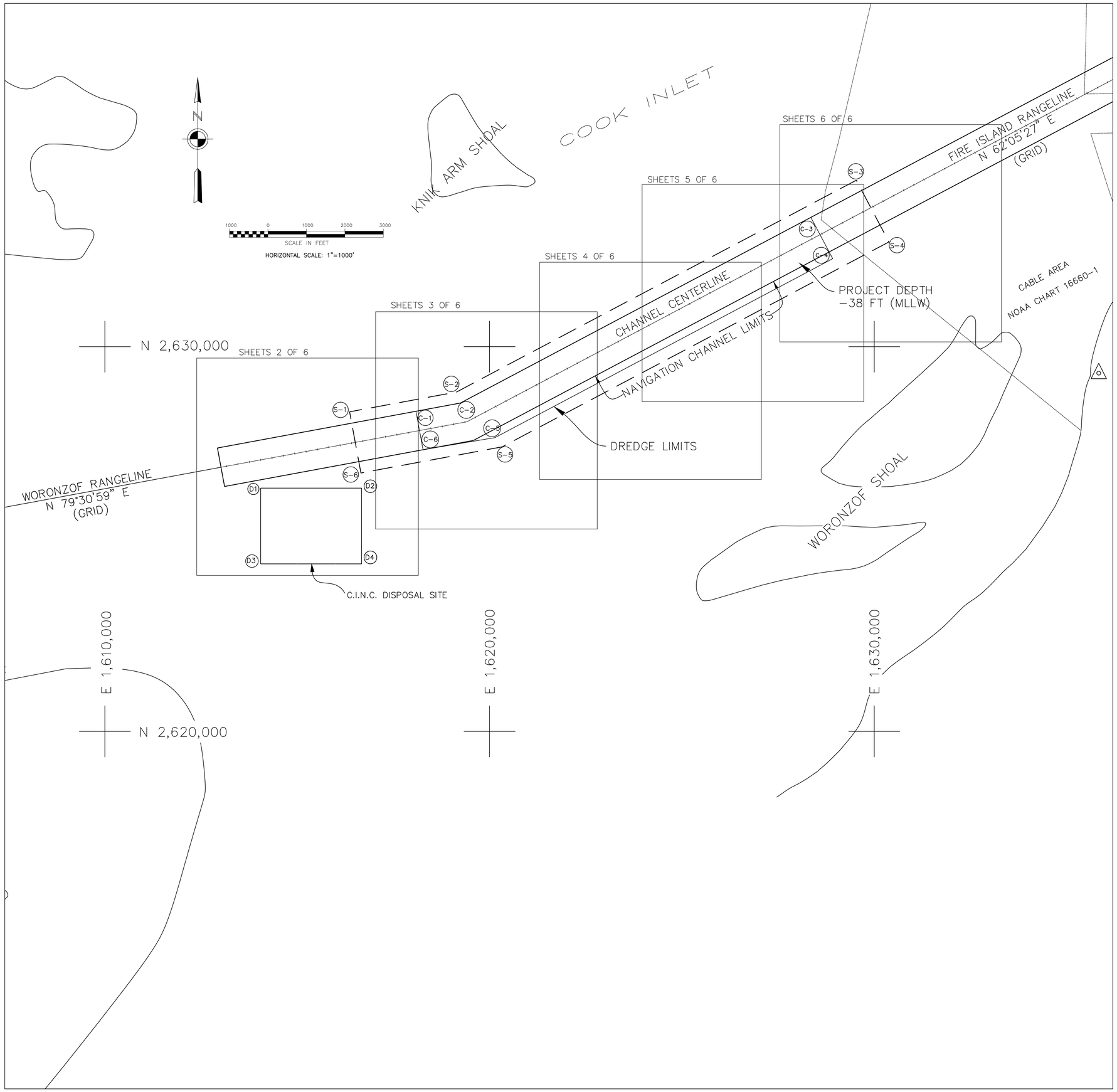
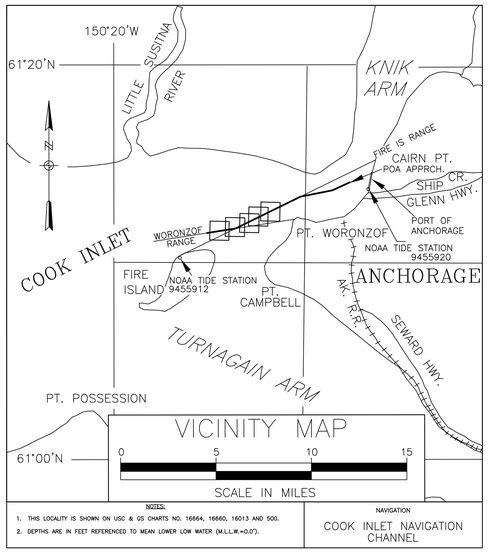
CORPS OF ENGINEERS





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TERRA 11	2,644,969.84	1,660,159.24	80.48	Antennae Reference Point
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2013 DREDGE LIMIT

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STATE OF ALASKA 49TH
(Lewis J. Epps)
07/31/13
No. 3510
REGISTERED PROFESSIONAL LAND SURVEYOR

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THOSOA CERTIFIED HYDROGRAPHER

David R. Neff C.H.(275)

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB-10-0005
CONTRACTOR ETRAC ENGINEERING, INC
CITY SAN RAFAEL STATE CA
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Approd

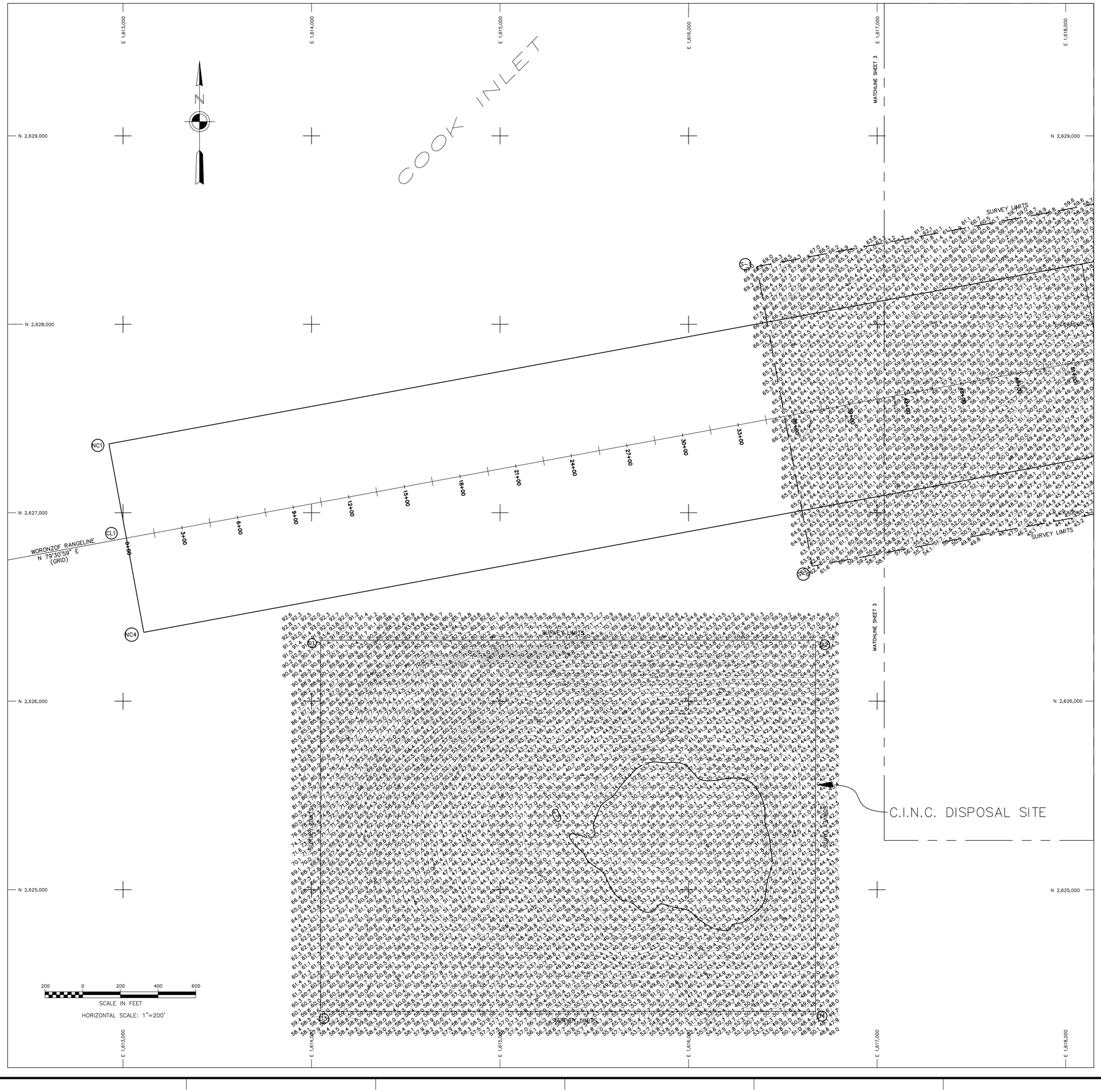
Date: 07/31/13
Dwg Scale: 1" = 1000'
Plot Scale: 1:1
File: POST_20130716_FINAL.dwg
Designed: S. OLSON
Drawn: S. OLSON
Reviewed: J. ANDERSON
Chief Section
Submitted: A. CHURCHILL
Chief Branch
USACE Survey No: 3109-13

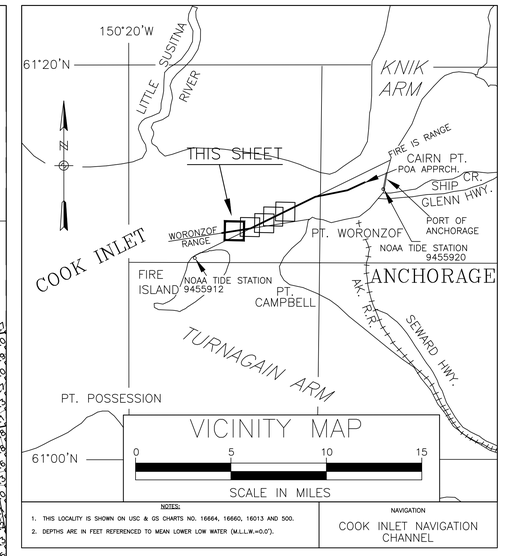
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
POSTDREDGE SURVEY
JULY 16, 2013

Reference number:
V-101
Sheet 1 of 6

CORPS OF ENGINEERS





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STATE OF ALASKA 49TH (Lewis J. Epps) 07/31/13 No. 3510 REGISTERED PROFESSIONAL LAND SURVEYOR

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

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CITY SAN RAFAEL STATE CA
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Approd

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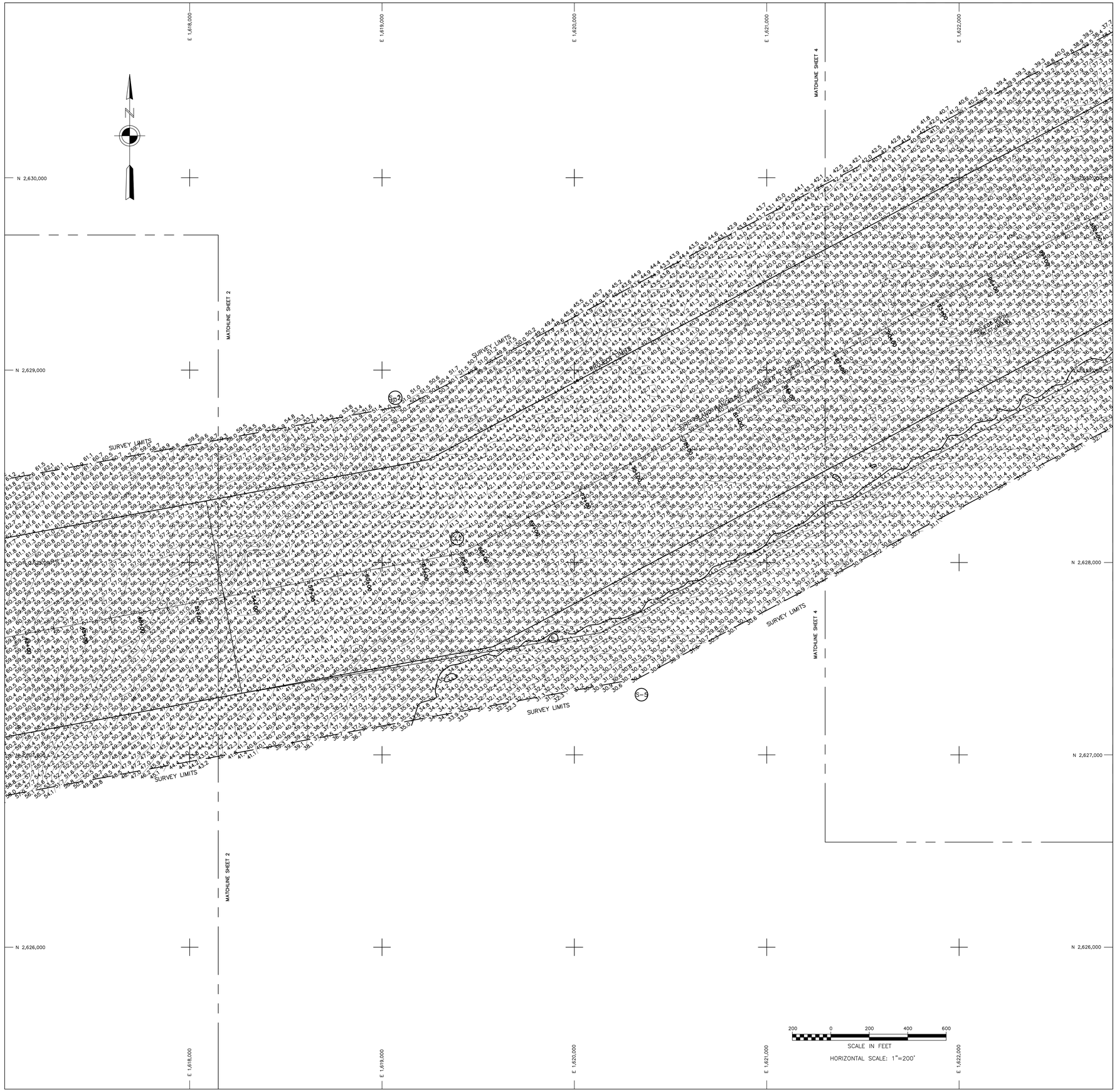
Dwg Scale: 1" = 200'
Plot Scale: 1:1
File: POST_20130716_FINAL.dwg
Designed: S. OLSON
Drawn: S. OLSON
Reviewed: J. ANDERSON
Chief: SecCon
Submitted: A. CHURCHILL
Chief: Branch
USACE Survey No: 3109–13

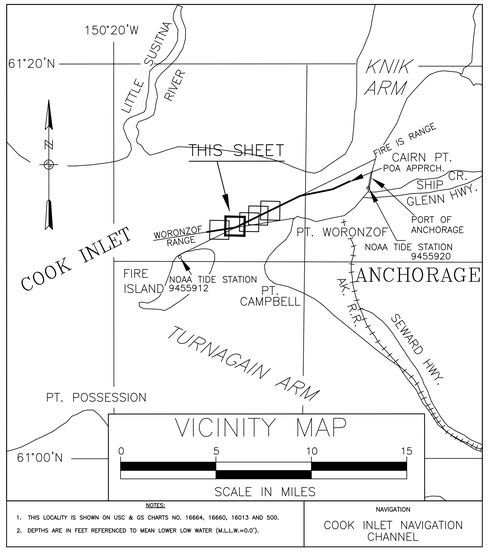
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
POSTDREDGE SURVEY
JULY 16, 2013

Reference number:
V–102
Sheet 2 of 6

CORPS OF ENGINEERS





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200 0 200 400 600
SCALE IN FEET
HORIZONTAL SCALE: 1"=200'

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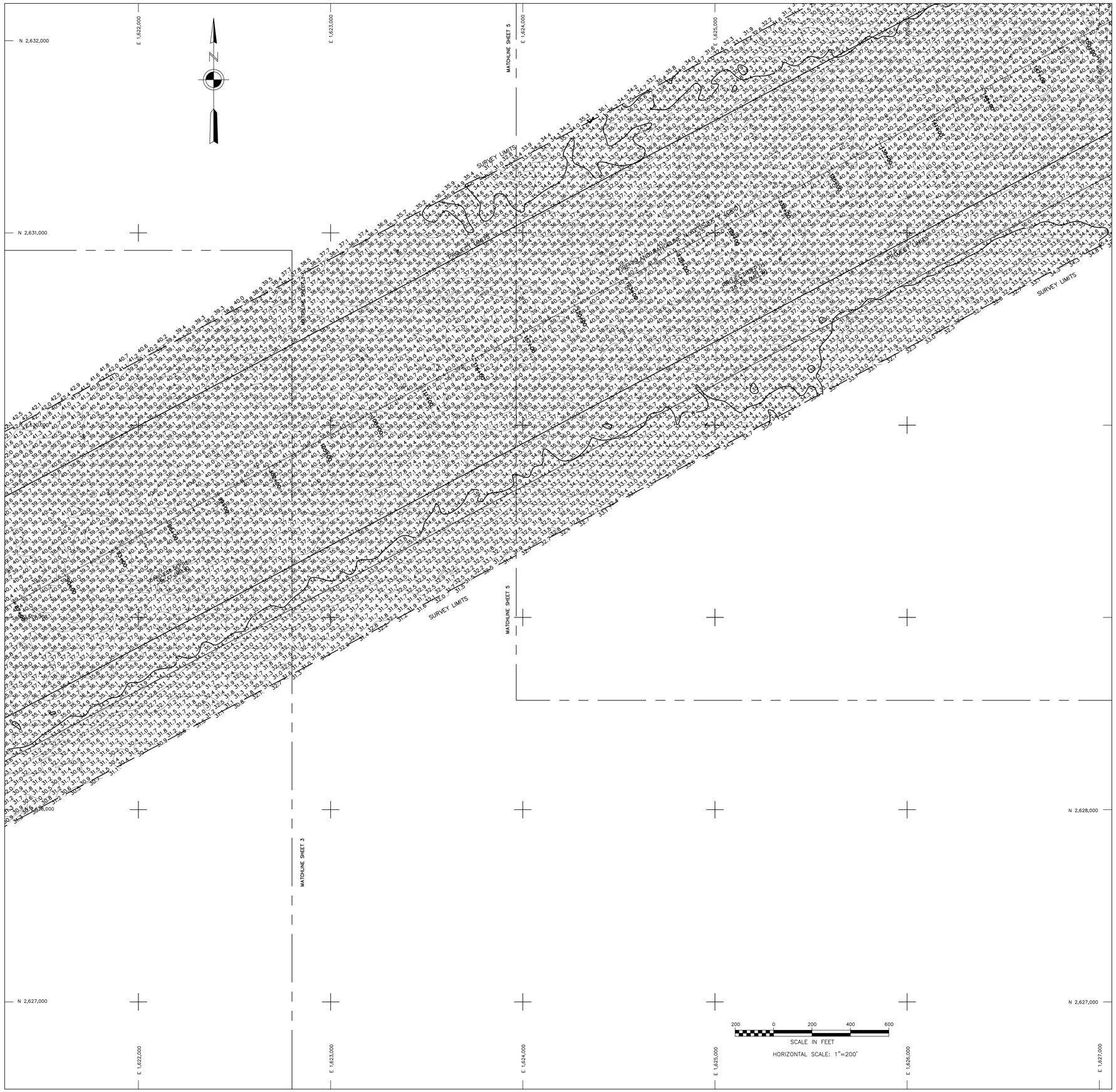
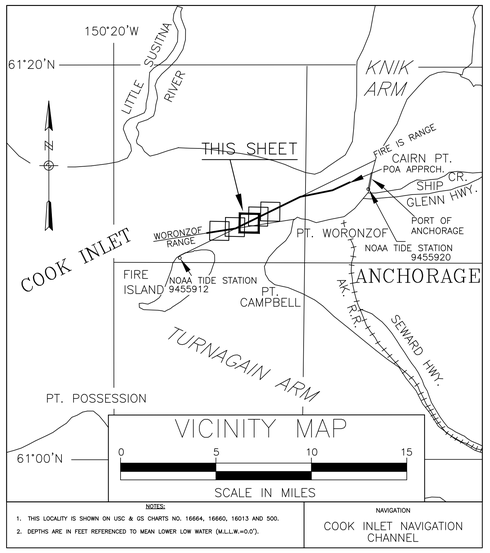
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
POSTDREDGE SURVEY
JULY 16, 2013

Reference number:
V–103
Sheet 3 of 6

CORPS OF ENGINEERS





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COOK INLET, ALASKA
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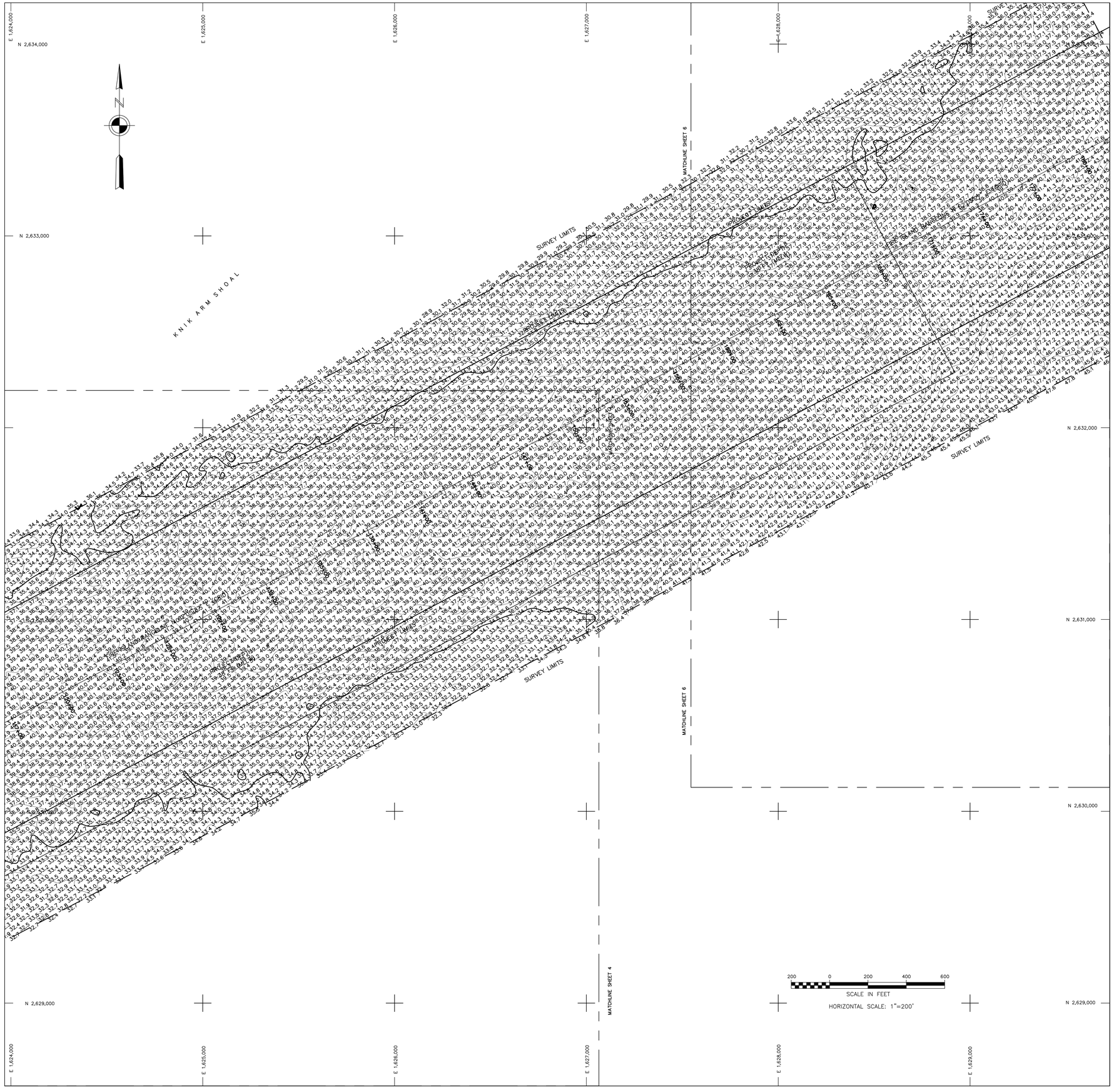
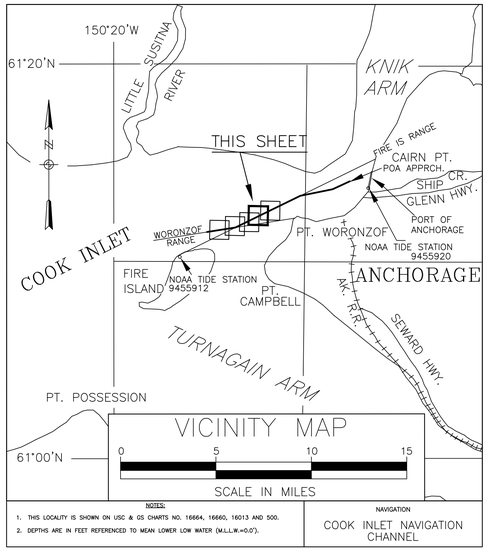
JULY 16, 2013

Reference number:
V–104
Sheet 4 of 6

CORPS OF ENGINEERS





NOTES:

1. THIS LOCALITY IS SHOWN ON USC & GS CHARTS NO. 16664, 16660, 16013 AND 500.
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CONTRACTOR ETRAC ENGINEERING, INC
CITY SAN RAFAEL STATE CA
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Approd

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

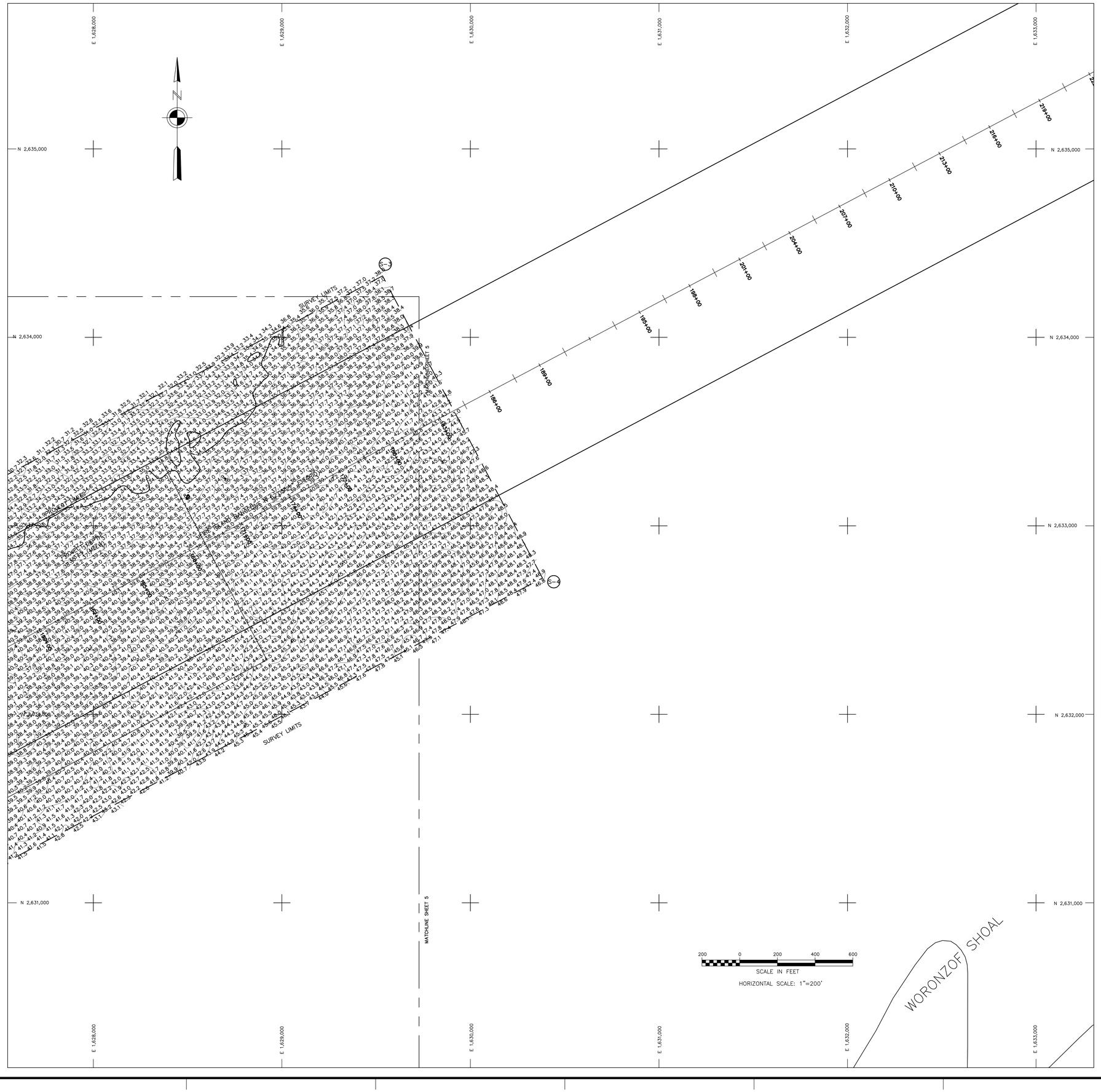
Designed: S. OLSON
Drawn: S. OLSON
Reviewed: J. ANDERSON
Chief Section
Submitted: A. CHURCHILL
Chief Branch
USACE Survey No: 3109–13

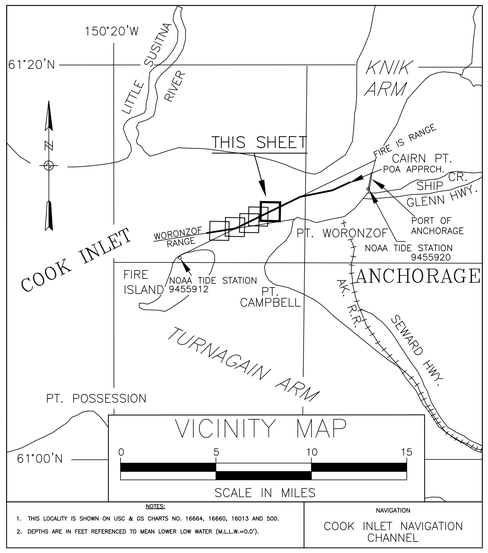
Date: 07/31/13
Dwg Scale: 1" = 200'
Plot Scale: 1:1
File: POST_20130716_FINAL.dwg

COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
POSTDREDGE SURVEY
JULY 16, 2013

Reference number:
V–105
Sheet 5 of 6

CORPS OF ENGINEERS





NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 4, NAD83 IN U.S. SURVEY FEET HOLDING USACE "TERRA 11" AS N 2,644,969.84, E 1,660,159.24.
2. VERTICAL CONTROL: ELEVATIONS ARE MEAN LOWER LOW WATER (MLLW) TIDAL DATUM EPOCH 1983–2001, EXPRESSED IN US SURVEY FEET. 3109–13 ELEVATIONS WERE ACQUIRED IN REFERENCE TO A SINGLE BENCHMARK HOLDING USACE "TERRA 11" AS 80.48 FEET MLLW. FINAL DATA WERE ADJUSTED BASED ON THE C.I.N.C. CUSTOM MLLW PLANE DETERMINED FROM THE DOWL C.I.N.C. CONTROL SURVEY CONDUCTED IN FEBRUARY, 2013.
3. SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
4. THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF SURVEY.
5. SURVEY WAS CONDUCTED ON JULY 16, 2013 BY ETRAC ENGINEERING, INC. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2024 MULTIBEAM DEPTH SOUNDER (200KHZ, 120–DEGREE SWATH–WIDTH WITH 256, 1 DEGREE BEAMS). SOUND VELOCITY PROFILES WERE MEASURED USING AN ODOM DIGI–BAR PRO. SOUND VELOCITY WAS MEASURED IN REAL TIME AT THE SOUNDER HEAD USING A VALEPORT MINISVS.
6. VESSEL POSITIONING, HEADING, ATTITUDE, AND RTK TIDES WERE PROVIDED IN REAL TIME USING AN APPLANIX POSMV WAVEMASTER GPS/INERTIAL POSITIONING SYSTEM RECEIVING RTK CORRECTIONS FROM A TRIMBLE SPS855 RECIEVER SET AT CONTROL STATION "TERRA 11" LOCATED ATOP THE PORT OFFICE BUILDING. POST–PROCESS KINEMATIC CORRECTIONS USING POSPAC MMS 5.4 SOFTWARE WERE APPLIED TO DATA FOLLOWING ACQUISITION. VESSEL NAVIGATION, DATA ACQUISITION AND PROCESSING WERE PERFORMED USING QPS INTEGRATED SOFTWARE.

CONTROL DATA

POINT ID	NORTHING	EASTING	ELEV. (MLLW)	DESCRIPTION
PORT 1989	2,639,934.29	1,656,925.43	39.55	Almon
5920 THERMO 1 1988	2,642,784.70	1,660,183.87	37.32	Almon
S. END	2,644,296.27	1,659,728.03	40.50	USACE SBC 1978 (APPROX. STA 63+67.98)
ETRAC-2	2,644,443.04	1,660,120.66	38.38	Brass Cap
TERRA 11	2,644,969.84	1,660,159.24	80.48	Antennae Reference Point
TERRA 12	2,644,990.65	1,660,166.56	81.21	Antennae Reference Point
ETRAC-1	2,646,395.57	1,660,814.72	38.34	Brass Cap
N. END	2,646,649.84	1,660,584.80	41.56	USACE SBC 1978 (APPROX. STA 88+73.09)

2013 DREDGE LIMIT

NAME	NORTHING	EASTING
C-1	2,628,320.37	1,618,085.73
C-2	2,628,534.04	1,619,240.43
C-3	2,633,360.88	1,628,352.82
C-4	2,632,288.21	1,628,921.02
C-5	2,627,635.82	1,620,141.11
C-6	2,627,320.35	1,618,270.78

STATE OF ALASKA 49TH
(Lewis J. Epps)
07/31/13
No. 3510
REGISTERED PROFESSIONAL LAND SURVEYOR

THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THOSOA CERTIFIED HYDROGRAPHER

David R. Neff C.H.(275)

BATHYMETRY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB–10–0005
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COOK INLET, ALASKA
COOK INLET NAVIGATION CHANNEL
POSTDREDGE SURVEY
JULY 16, 2013

Reference number:
V–106
Sheet 6 of 6