

- NOTES**
1. THIS LOCALITY IS SHOWN ON USC & GS CHARTS NO. 16664, 16660, 16613 AND 500.
 2. DEPTHS ARE IN FEET REFERENCED TO MEAN LOWER LOW WATER (MLLW=0.0').
 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 APRIL 16, 2015 BY ETRAC INC. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2024 MULTIBEAM DEPTH SOUNDER (200KHZ, 120-DEGREE SWATH-WIDTH WITH 296, 0.5 DEGREE BEAMS). SOUND VELOCITY PROFILES WERE MEASURED USING AN AML BASE X SVP. SOUND VELOCITY WAS MEASURED IN REAL TIME AT THE SOUNDER HEADING 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 RECEIVER SET AT CONTROL STATION "TERRA 11" LOCATED ATOP THE PORT OFFICE BUILDING. POST-PROCESS KINEMATIC CORRECTIONS USING POSPAC MMS 7.1 SOFTWARE WERE APPLIED TO DATA FOLLOWING ACQUISITION. VESSEL NAVIGATION, DATA ACQUISITION AND PROCESSING WERE PERFORMED USING OPS INTEGRATED SOFTWARE.

DREDGE LIMITS - AREA C			
Corner #	Northing	Easting	
DL-24	2628708.65	1619570.25	
DL-25	2627809.70	1620045.97	
DL-28	2632462.12	1628828.90	
DL-29	2633360.88	1628352.82	

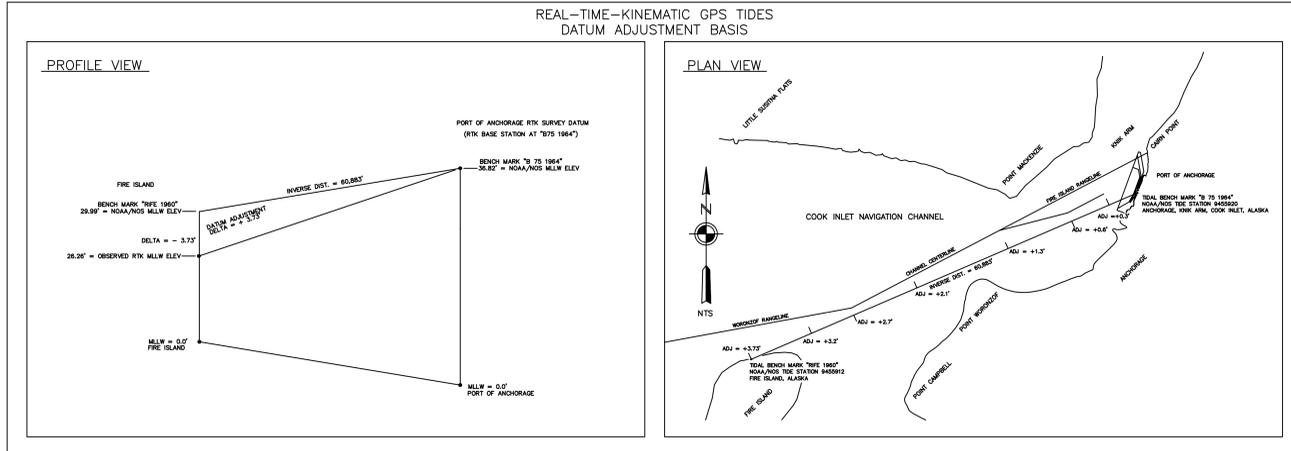
CINC DISPOSAL SITE			
Corner #	Northing	Easting	
DS-5	2626323.49	1614048.61	
DS-6	2626323.49	1616673.28	
DS-7	2624354.99	1616673.28	
DS-8	2624354.99	1614619.08	
DS-9	2624587.68	1614048.61	

DREDGE LIMITS - AREA D			
Corner #	Northing	Easting	
DL-25	2627809.70	1620045.97	
DL-26	2627635.79	1620138.09	
DL-27	2632288.21	1628921.02	
DL-28	2632462.12	1628828.90	

CINC SURVEY LIMITS			
Corner #	Northing	Easting	
SL-16	2628562.99	1619081.63	
SL-17	2627313.36	1619743.03	
SL-18	2632433.89	1629409.67	
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SL-21	2624254.99	1613948.61	
SL-22	2624254.99	1616773.28	
SL-23	2626423.49	1616773.28	

CONTROL DATA				
POINT ID	NORTHING	EASTING	ELEV. (MLLW)	DESCRIPTION
BM 12 1974	2,620,563.82	1,604,566.35	27.63	Brass Cap
BM 5934 F	2,655,203.73	1,655,049.51	36.48	Brass Cap
CRAIG	2,642,635.95	1,661,029.47	44.95	Brass Cap
ETRAC-1	2,646,395.57	1,660,814.72	38.34	Brass Cap
ETRAC-2	2,644,443.04	1,660,120.66	36.38	Brass Cap
MIKE	2,645,987.73	1,661,875.48	48.67	Brass Cap
NORTH END	2,646,649.84	1,660,584.80	41.56	USACE SBC 1978
PORT 1969	2,639,934.29	1,656,925.43	39.55	Almon
PORT MAC	2,655,563.46	1,654,968.22	41.51	Brass Cap
RIFE 1960	2,620,502.19	1,604,162.70	29.99	Brass Cap
SOUTH END	2,644,296.27	1,659,728.03	40.58	USACE SBC 1978
TERRA 11 ARP	2,644,969.84	1,660,159.24	80.48	Antennae Reference Point
TERRA 12 ARP	2,644,990.65	1,660,166.56	81.21	Antennae Reference Point
5920 THERMO 1 1988	2,642,784.70	1,660,183.87	37.32	Almon

VOLUME COMPUTATIONS	
DREDGE AREA C	CUBIC YARDS
VOLUME AVAILABLE ABOVE -38' MLLW	0
VOLUME AVAILABLE ABOVE -40' MLLW	289
VOLUME AVAILABLE ABOVE -43' MLLW	146,423
DREDGE AREA D	CUBIC YARDS
VOLUME AVAILABLE ABOVE -38' MLLW	0
VOLUME AVAILABLE ABOVE -40' MLLW	470
VOLUME AVAILABLE ABOVE -43' MLLW	60,515
DISPOSAL AREA	CUBIC YARDS
FILL VOLUME AVAILABLE BELOW -45' MLLW	1,595,788



CONTRACT NO. W911KB-15-C-0006
 CONTRACTOR: MANSON CONSTRUCTION CO.
 CITY: SEATTLE STATE: WA
 Recommended: _____ Approved: _____
 PRIME CONTRACTOR RESIDENT ENGINEER

Symbol	Action	Description	Date	App'd

Date: 04/27/15
 Draw Scale: 1" = 1000'
 Plot Scale: 1:1
 File: FILE_20150416_PML.dwg
 Designer: M. TENCZA
 Drawn: M. TENCZA
 Reviewed: J. ANDERSON
 Checked: _____
 Submitted: A. CHURCHILL
 Checked: _____
 U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 ANCHORAGE, ALASKA
 USACE Survey No: 3258-15

COOK INLET, ALASKA
 COOK INLET NAVIGATION CHANNEL
 PRE-DREDGE SURVEY
 APRIL 16, 2015

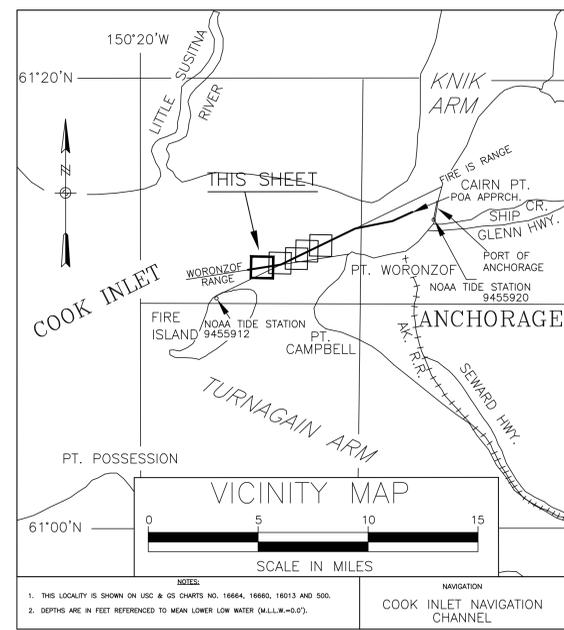
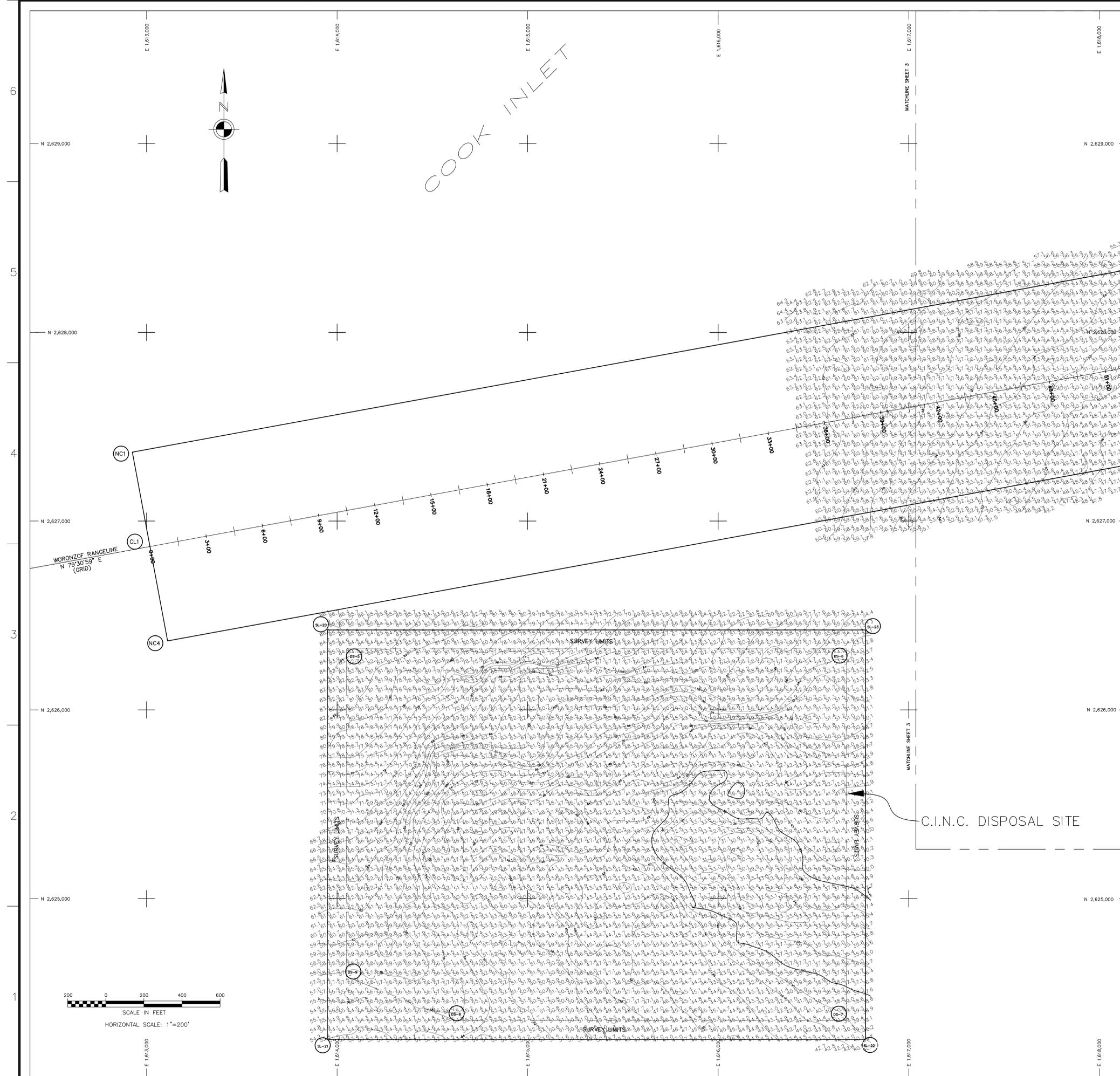


THIS HYDROGRAPHIC SURVEY WAS COMPLETED UNDER THE OVERSIGHT OF AN ACSM/THSOA CERTIFIED HYDROGRAPHER

David R. Neff CH(275)

BATHYMETRY

Reference number:
V-101
 Sheet 1 of 11



- NOTES**
- 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.
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DL-28	2624262.12	1628828.90
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CINC DISPOSAL SITE

Corner #	Northing	Easting
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Corner #	Northing	Easting
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VOLUME COMPUTATIONS

DREDGE AREA C	CUBIC YARDS
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VOLUME AVAILABLE ABOVE -40' MLLW	289
VOLUME AVAILABLE ABOVE -43' MLLW	146,423
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David R. Neff CH(275)

BATHYMETRY



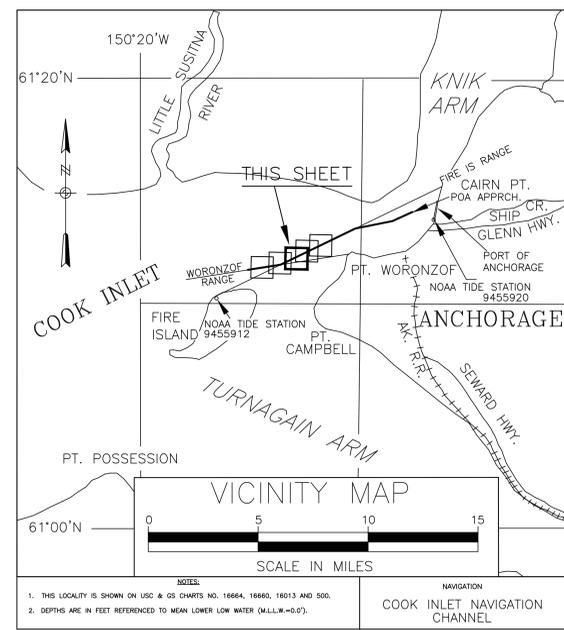
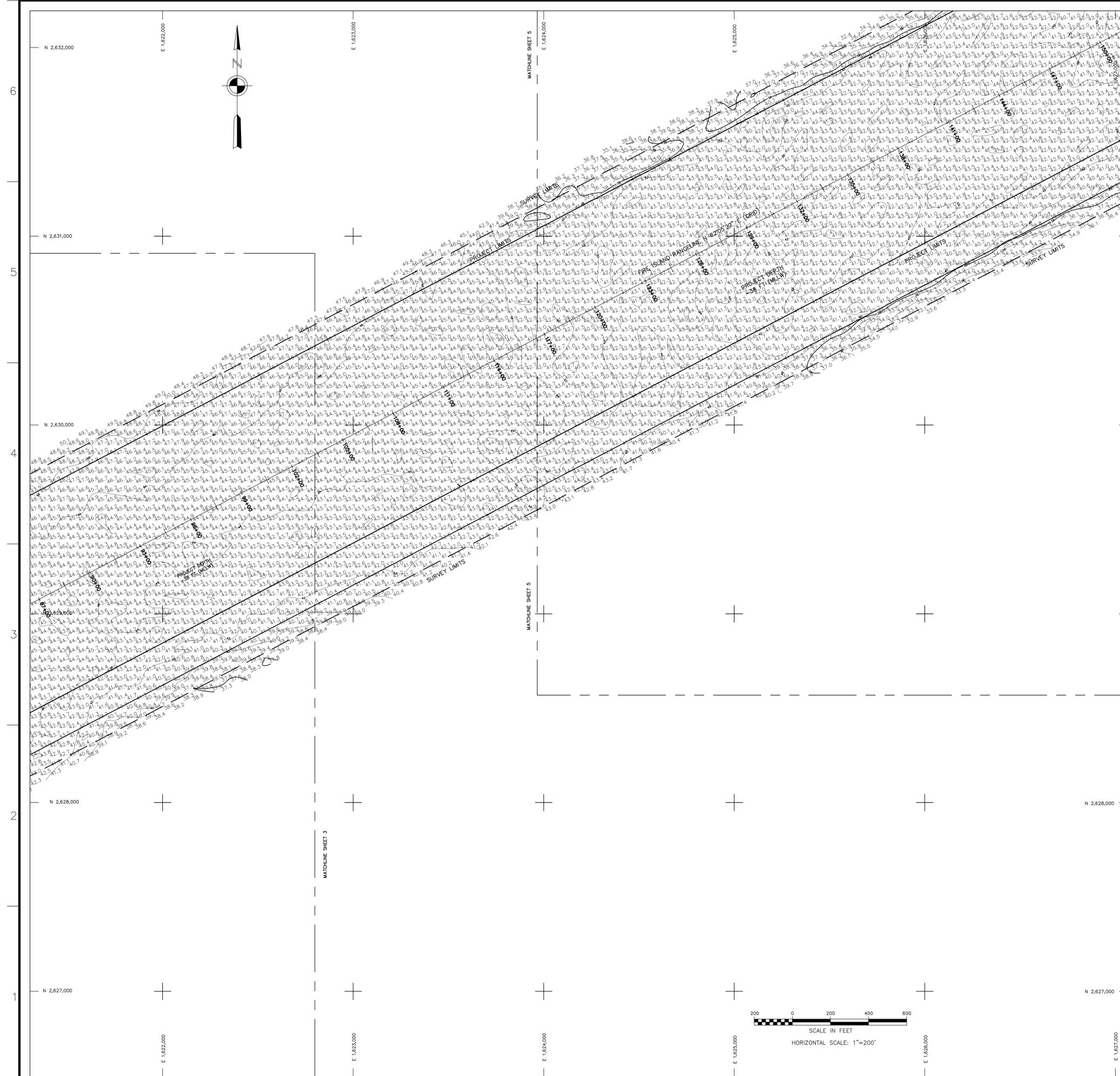
CONTRACT NO. W911KB-15-C-0006
 CONTRACTOR: MANSON CONSTRUCTION CO.
 CITY: SEATTLE STATE: WA
 Recommended: Approved: Date:
 PRIME CONTRACTOR RESIDENT ENGINEER

Sheet	Action	Description	Date	App'd

Date: 04/27/15
 Dwg Scale: 1" = 200'
 Plot Scale: 1:1
 File: ME2010414.dwg
 Branch:
 Designer: M. TENCZA
 Drawn: M. TENCZA
 Reviewed: J. ANDERSON
 Checked: A. CHURCHILL
 Submitted: A. CHURCHILL
 USACE Survey No: 3258-15

COOK INLET, ALASKA
 COOK INLET NAVIGATION CHANNEL
 PRE-DREDGE SURVEY
 APRIL 16, 2015

Reference number:
V-102
 Sheet 2 of 11



- NOTES**
- 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.
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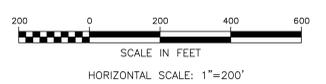
CINC DISPOSAL SITE		
Corner #	Northing	Easting
DS-5	2626323.49	1614048.61
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VOLUME COMPUTATIONS	
DREDGE AREA C	CUBIC YARDS
VOLUME AVAILABLE ABOVE -38' MLLW	0
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David R. Neff CH(275)

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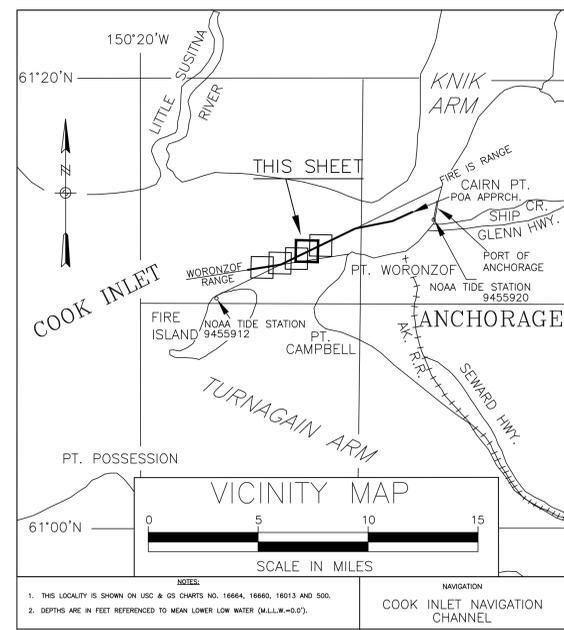
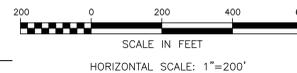
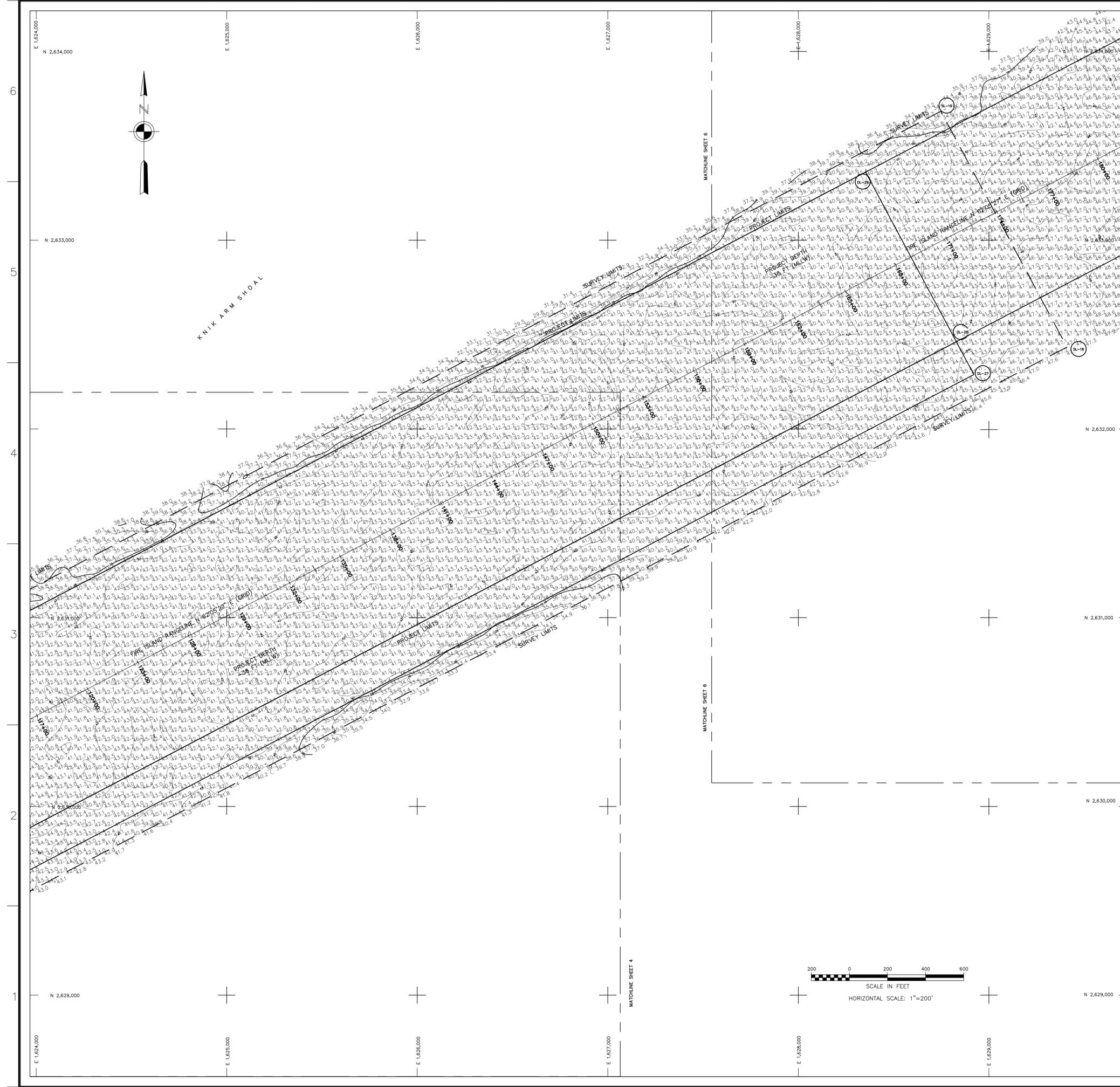
CONTRACT NO. W911KB-15-C-0006
 CONTRACTOR: MANSON CONSTRUCTION CO.
 CITY: SEATTLE STATE: WA
 Recommended: _____ Date: _____
 Approved: _____ Date: _____
 PRIME CONTRACTOR: _____ RESIDENT ENGINEER: _____

Serial	Action	Description	Date	App'd

Date: 04/27/15
 Dwg Scale: 1" = 200'
 Plot Scale: 1:1
 File: P:\2014\MLLW.dwg
 Branch: _____
 Designer: M. TENCZA
 Drawn: M. TENCZA
 Reviewed: J. ANDERSON
 Checked: _____
 Submitted: A. CHURCHILL
 U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ANCHORAGE, ALASKA
 USACE Survey No: **3258-15**

COOK INLET, ALASKA
 COOK INLET NAVIGATION CHANNEL
 PRE-DREDGE SURVEY
 APRIL 16, 2015

Reference number:
V-104
 Sheet 4 of 11



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DISPOSAL AREA	CUBIC YARDS
FILL VOLUME AVAILABLE BELOW -45' MLLW	1,595,788



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

David R. Neff CH(275)

BATHYMETRY



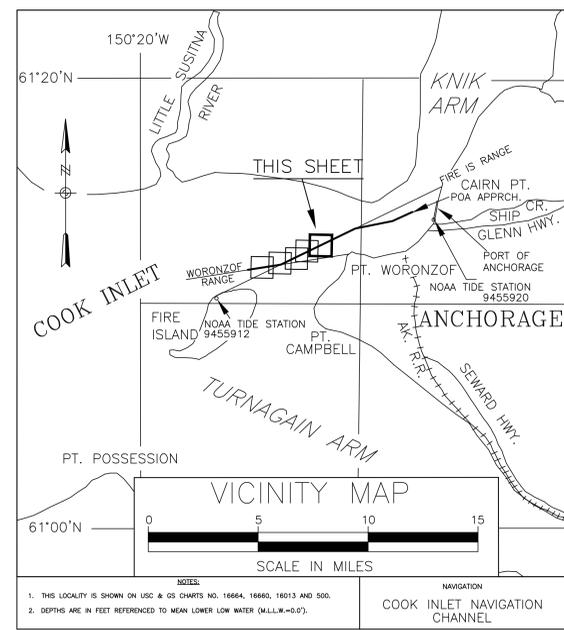
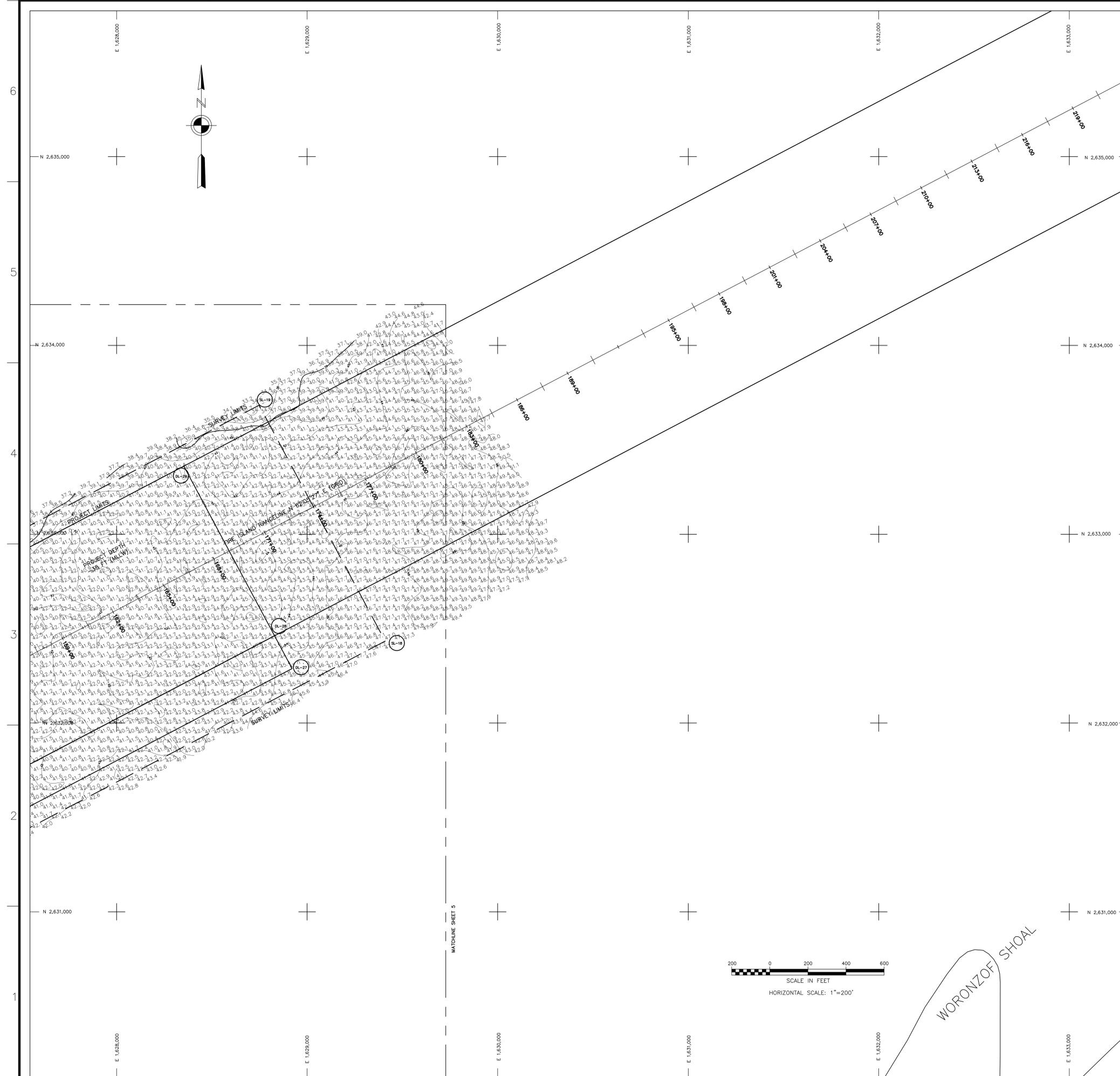
CONTRACT NO. W911KB-15-C-0006
 CONTRACTOR: MANSON CONSTRUCTION CO.
 CITY: SEATTLE STATE: WA
 Recommended: [Signature] Date: [Blank]
 Approved: [Signature] Date: [Blank]
 RESIDENT ENGINEER

Serial	Action	Description	Date	App'd

Date: 04/27/15
 Draw Scale: 1" = 200'
 Plot Scale: 1:1
 File: P:\2014\MLW.dwg
 Branch: [Blank]
 Designer: M. TENCZA
 Drawn: M. TENCZA
 Reviewed: J. ANDERSON
 Section: [Blank]
 Submitted: A. CHURCHILL
 Chief: [Blank]
 USACE Survey No: 3258-15

COOK INLET, ALASKA
 COOK INLET NAVIGATION CHANNEL
 PRE-DREDGE SURVEY
 APRIL 16, 2015

Reference number:
V-105
 Sheet 5 of 11



- NOTES**
1. THIS LOCALITY IS SHOWN ON USC & GS CHARTS NO. 16664, 16660, 16013 AND 500.
 2. DEPTHS ARE IN FEET REFERENCED TO MEAN LOWER LOW WATER (MLLW=0.0).
 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 APRIL 16, 2015 BY ETRAC INC. SOUNDINGS WERE COLLECTED USING AN R2SONIC 2024 MULTIBEAM DEPTH SOUNDER (200kHz, 120-DEGREE SWATH-WIDTH WITH 256, 0.5 DEGREE BEAMS). SOUND VELOCITY PROFILES WERE MEASURED USING AN AML BASE X SVP. 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 SP5855 RECEIVER SET AT CONTROL STATION "TERRA 11" LOCATED ATOP THE PORT OFFICE BUILDING. POST-PROCESS KINEMATIC CORRECTIONS USING POSPAC MMS 7.1 SOFTWARE WERE APPLIED TO DATA FOLLOWING ACQUISITION. VESSEL NAVIGATION, DATA ACQUISITION AND PROCESSING WERE PERFORMED USING OPS INTEGRATED SOFTWARE.

DREDGE LIMITS - AREA C

Corner #	Northing	Easting
DL-24	2628708.65	1619570.25
DL-25	2627809.70	1620045.97
DL-28	2632462.12	1628828.90
DL-29	2633360.88	1628352.82

CINC DISPOSAL SITE

Corner #	Northing	Easting
DS-5	2626323.49	1614048.61
DS-6	2626323.49	1616673.28
DS-7	2624354.99	1616673.28
DS-8	2624354.99	1614619.08
DS-9	2624587.68	1614048.61

DREDGE LIMITS - AREA D

Corner #	Northing	Easting
DL-25	2627809.70	1620045.97
DL-26	2627635.79	1620138.09
DL-27	2632288.21	1628921.02
DL-28	2632462.12	1628828.90

CINC SURVEY LIMITS

Corner #	Northing	Easting
SL-16	2628562.99	1619081.63
SL-17	2627313.36	1619743.03
SL-18	2632433.89	1629409.67
SL-19	2633683.29	1628747.85
SL-20	2626423.49	1613948.61
SL-21	2624254.99	1613948.61
SL-22	2624254.99	1616773.28
SL-23	2626423.49	1616773.28

CONTROL DATA

POINT ID	NORTHING	EASTING	ELEV. (MLLW)	DESCRIPTION
BM 12 1974	2,620,563.82	1,604,566.35	27.63	Brass Cap
BM 5934 F	2,655,203.73	1,655,049.51	36.48	Brass Cap
CRAIG	2,642,635.95	1,661,029.47	44.95	Brass Cap
ETRAC-1	2,646,395.57	1,660,814.72	38.34	Brass Cap
ETRAC-2	2,644,443.04	1,660,120.66	36.38	Brass Cap
MIKE	2,645,987.73	1,661,875.48	48.67	Brass Cap
NORTH END	2,646,649.84	1,660,584.80	41.56	USACE SBC 1978
PORT 1969	2,639,934.29	1,656,925.43	39.55	Almon
PORT MAC	2,655,563.46	1,654,968.22	41.51	Brass Cap
RIFE 1960	2,620,502.19	1,604,162.70	29.99	Brass Cap
SOUTH END	2,644,296.27	1,659,728.03	40.58	USACE SBC 1978
TERRA 11 ARP	2,644,969.84	1,660,159.24	80.48	Antennae Reference Point
TERRA 12 ARP	2,644,990.65	1,660,166.56	81.21	Antennae Reference Point
5920 THERMO 1 1988	2,642,784.70	1,660,183.87	37.32	Almon

VOLUME COMPUTATIONS

DREDGE AREA	CUBIC YARDS
DREDGE AREA C	
VOLUME AVAILABLE ABOVE -38' MLLW	0
VOLUME AVAILABLE ABOVE -40' MLLW	289
VOLUME AVAILABLE ABOVE -43' MLLW	146,423
DREDGE AREA D	
VOLUME AVAILABLE ABOVE -38' MLLW	0
VOLUME AVAILABLE ABOVE -40' MLLW	470
VOLUME AVAILABLE ABOVE -43' MLLW	60,515
DISPOSAL AREA	
FILL VOLUME AVAILABLE BELOW -45' MLLW	1,595,788



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BATHYMETRY



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 CONTRACTOR MANSON CONSTRUCTION CO.
 CITY SEATTLE STATE WA
 Recommended: Approved: Date:
 PRIME CONTRACTOR RESIDENT ENGINEER

Serial	Action	Description	Date	App'd

Date: 04/27/15
 Dwg. Scale: 1" = 200'
 Plot. Scale: 1:1
 File: ME2010414.dwg
 Designer: M. TENCZA
 Drafter: M. TENCZA
 Reviewer: J. ANDERSON
 Checker: J. ANDERSON
 Submitter: A. CHURCHILL
 Branch: ANCHORAGE, ALASKA
 USACE Survey No.: 3258-15

COOK INLET, ALASKA
 COOK INLET NAVIGATION CHANNEL
 PRE-DREDGE SURVEY
 APRIL 16, 2015

Reference number:
V-106
 Sheet 6 of 11