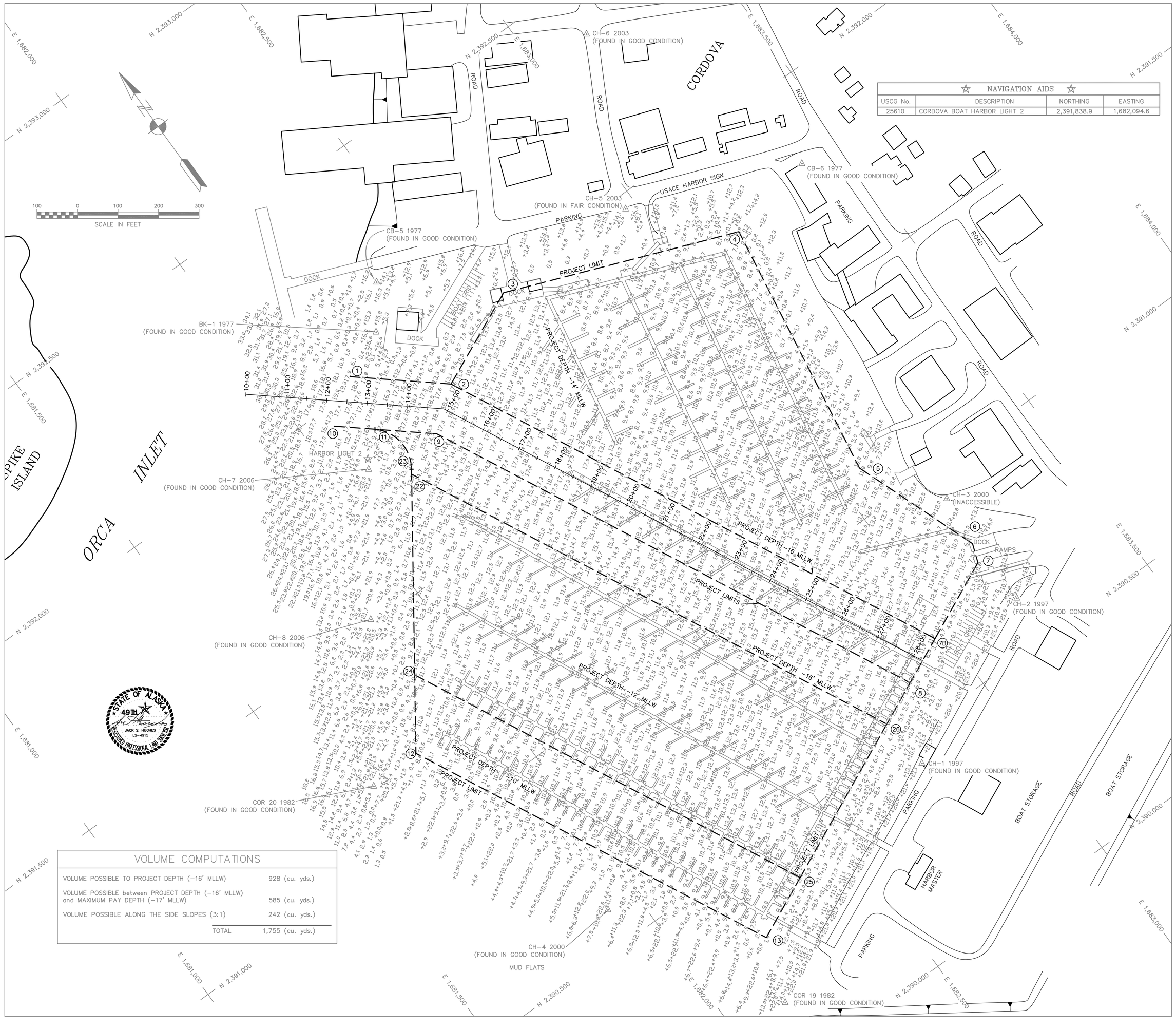
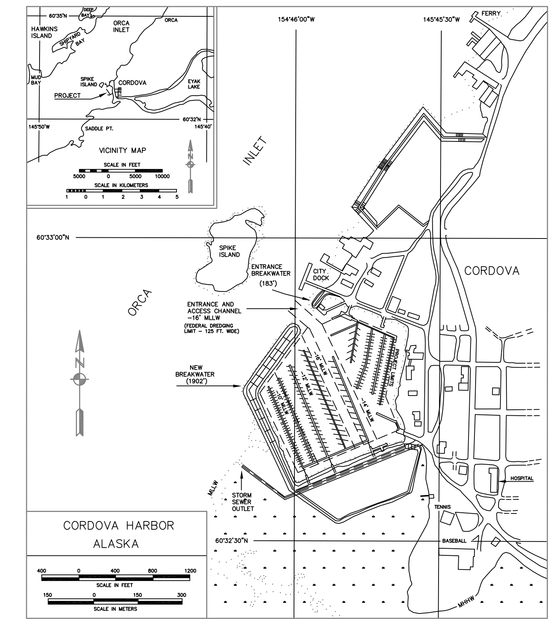
CORPS OF ENGINEERS



☆ NAVIGATION AIDS ☆			
USCG No.	DESCRIPTION	NORTHING	EASTING
25610	CORDOVA BOAT HARBOR LIGHT 2	2,391,838.9	1,682,094.6



NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 3, NAD83, IN US SURVEY FEET, HOLDING USACE SBC "CB-5 1977" AS N 2,392,179.77, E 1,682,368.00 AND DOMED BC "CH-2 1997" AS N 2,390,621.55, E 1,683,190.94.
2. VERTICAL CONTROL IS MEAN LOWER LOW WATER DATUM, IN US SURVEY FEET (MLLW=0.0') HOLDING USCGS TIDAL BENCH MARK "37 + 56.95" AS 45.28'. TIDAL DATUM IS BASED ON THE 1983–2001 TIDAL EPOCH FROM NOAA/NOS TIDAL BENCH MARK LIST: "9454050 CORDOVA, ORCA INLET, PRINCE WILLIAM SOUND, ALASKA", PUBLISHED 05/16/2003.
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 JUNE 8–12, 2010 BY HUGHES AND ASSOCIATES. SOUNDINGS WERE COLLECTED USING AN ODOM ES3 MULTI–BEAM DEPTH SOUNDER (200KHZ, 120–DEGREE SWATH–WIDTH WITH 240, .75 DEGREE BEAMS). SOUND VELOCITY PROFILE WAS PROVIDED USING AN ODEM DIGI–BAR PRO, AND WAS PROVIDED IN REAL TIME AT THE SOUNDER HEAD USING AN ODEM DIGI–BAR V. POSITIONING AND TIDES WERE PROVIDED IN REAL TIME USING A TRIMBLE 461 RTK GPS RECIEVER OPERATING ON KINEMATIC CORRECTORS BROADCAST FROM A TRIMBLE 5700 RTK BASE RECEIVER SET AT CONTROL STATION, "CB–5 1977". VESSEL NAVIGATION, DATA COLLECTION AND PROCESSING WERE PERFORMED USING HYPACK 2010 INTEGRATED SOFTWARE.
6. HORIZONTAL CONTROL WAS UPDATED THROUGH A STATIC GPS NETWORK AND A LEAST SQUARES ADJUSTMENT.
7. VERTICAL CONTROL WAS UPDATED THROUGH DIFFERENTIAL LEVELING USING A DIGITAL LEVEL AND HOLDING NOAA BENCHMARK "37 + 56.95" AS 45.28' AND "35 + 60.98" AS 37.67'.

CONTROL DATA				
STATION	NORTHING	EASTING	ELEV.	DESCRIPTION
BK–1 1977	2,392,081.04	1,682,294.36	16.79	USACE SBC
CB–6 1977	2,391,801.78	1,683,389.60	39.91	USACE SBC
CB–5 1977	2,392,180.25	1,682,367.85	17.35	USACE SBC
CH–1 1997	2,390,429.31	1,682,761.96	21.13	USACE DOMED BC
CH–2 1997	2,390,622.10	1,683,190.80	21.84	USACE DOMED BC
CH–3 2000	2,390,921.64	1,683,194.88	18.70	INACCESSABLE
CH–4 2000	2,390,590.51	1,681,922.53	22.39	USACE DOMED BC
COR 19 1982	2,390,148.64	1,682,142.51	22.25	USACE SBC
COR 20 1982	2,391,176.61	1,681,632.70	21.94	USACE SBC
CH–5 2003	2,391,965.51	1,682,971.62	20.07	USACE SBC
CH–6 2003	2,392,372.16	1,683,146.31	22.64	USACE SBC
CH–7 2006	2,391,817.33	1,682,081.05	21.40	3 1/4" DOMED BC IN ROCK
CH–8 2006	2,391,514.01	1,681,868.02	22.01	3 1/4" DOMED BC IN ROCK

PROJECT LIMITS					
CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	2,392,029.55	1,682,177.94	10	2,391,953.36	1,682,074.36
2	2,391,868.49	1,682,369.08	11	2,391,888.20	1,682,151.69
3	2,391,974.87	1,682,606.33	12	2,391,181.09	1,681,764.63
4	2,391,756.67	1,683,165.11	13	2,390,305.77	1,682,198.61
5	2,391,109.58	1,683,064.29	22	2,391,745.51	1,682,159.89
6	2,390,794.87	1,683,180.93	23	2,391,755.46	1,682,166.86
7	2,390,748.96	1,683,164.19	24	2,391,339.69	1,681,875.70
7B	2,390,659.20	1,682,988.63	25	2,390,376.70	1,682,353.14
8	2,390,607.03	1,682,854.98	26	2,390,558.19	1,682,748.55
9	2,391,789.67	1,682,268.64			

VOLUME COMPUTATIONS	
VOLUME POSSIBLE TO PROJECT DEPTH (–16' MLLW)	928 (cu. yds.)
VOLUME POSSIBLE between PROJECT DEPTH (–16' MLLW) and MAXIMUM PAY DEPTH (–17' MLLW)	585 (cu. yds.)
VOLUME POSSIBLE ALONG THE SIDE SLOPES (3:1)	242 (cu. yds.)
TOTAL	1,755 (cu. yds.)

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB–10–D–0005
CONTRACTOR HUGHES AND ASSOCIATES
CITY WASILLA STATE AK
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Appvd

Date: 6/12/10
Dwg Scale: 1" = 100'
Plot Scale:
File:
Drawing #:
2759–10

Surveyed: HUGHES AND ASSOCIATES
Drawn: REH
Reviewed: CSH
Submitted:

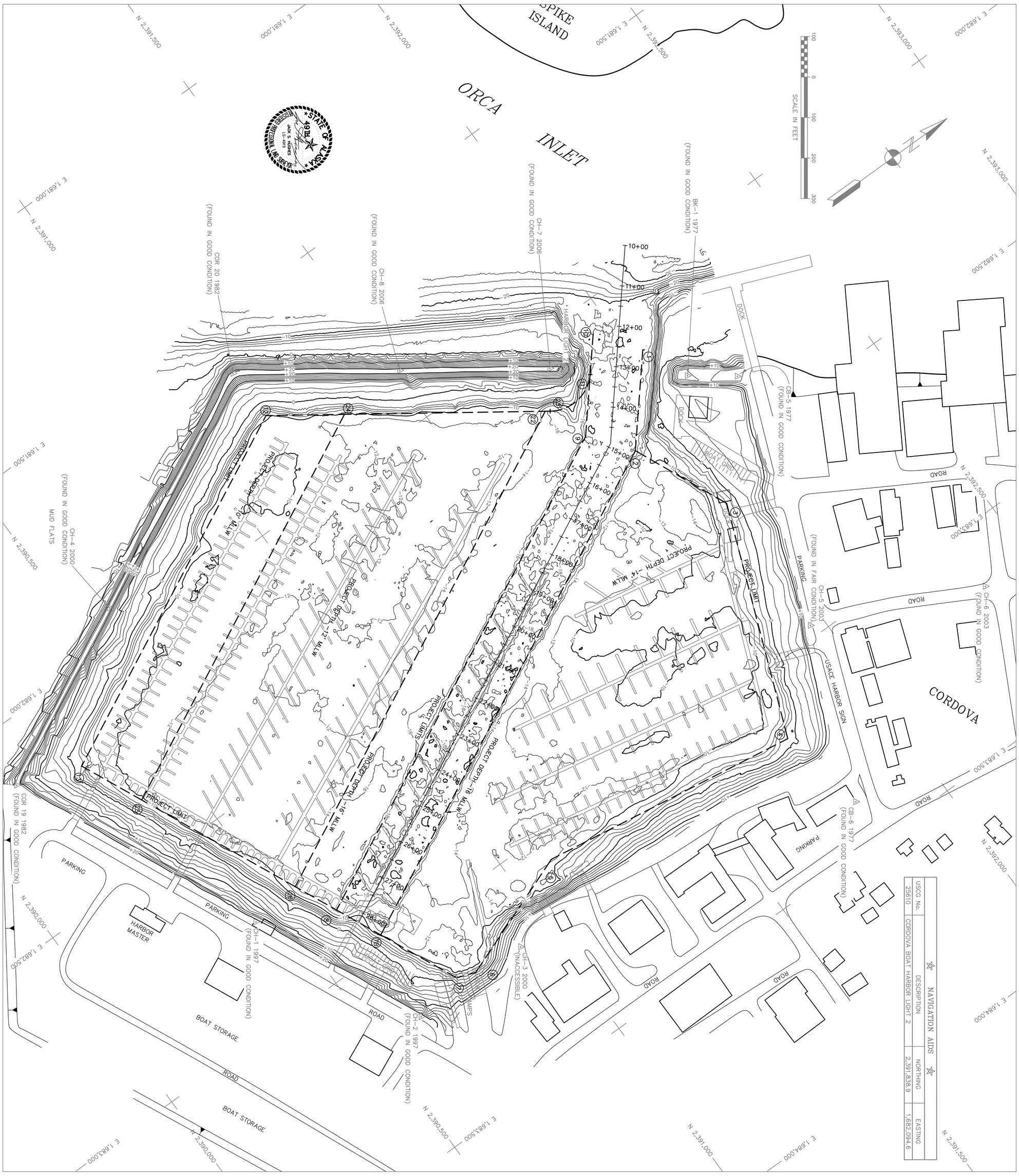
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

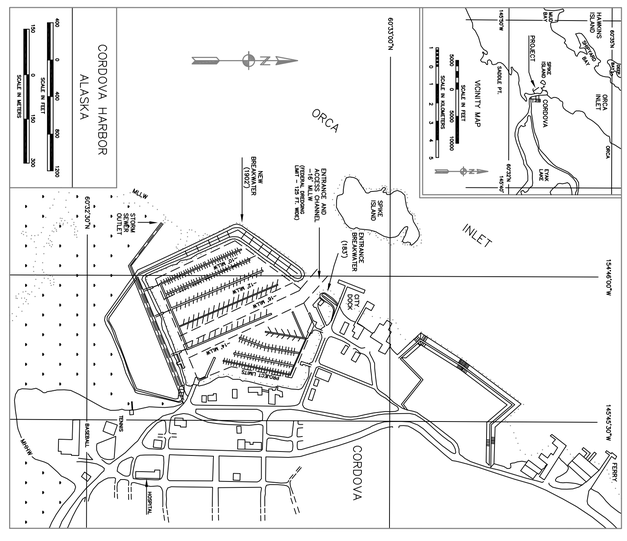
SURVEY NO:

CORDOVA, ALASKA
CORDOVA HARBOR
CONDITION SURVEY
JUNE 8–12, 2010

Reference number:
V–101

Sheet 1 of 4





NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 3, NAD83, IN US SURVEY FEET, HOLDING USACE SBC "CB-5 1977" AS N 2,392,179.77, E 1,682,368.00 AND DOMED BC "CH-2 1997" AS N 2,390,621.55, E 1,683,190.94.
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5. SURVEY WAS CONDUCTED ON JUNE 8–12, 2010 BY HUGHES AND ASSOCIATES. SOUNDINGS WERE COLLECTED USING AN ODOM ES3 MULTI–BEAM DEPTH SOUNDER (200KHZ, 120–DEGREE SWATH–WIDTH WITH 240, 75 DEGREE BEAMS). SOUND VELOCITY PROFILE WAS PROVIDED USING AN ODEM DIGI–BAR PRO, AND WAS PROVIDED IN REAL TIME AT THE SOUNDER HEAD USING AN ODEM DIGI–BAR V. POSITIONING AND TIDES WERE PROVIDED IN REAL TIME USING A TRIMBLE 461 RTK GPS RECEIVER OPERATING ON KINEMATIC CORRECTORS BROADCAST FROM A TRIMBLE 5700 RTK BASE RECEIVER SET AT CONTROL STATION, "CB–5 1977". VESSEL NAVIGATION, DATA COLLECTION AND PROCESSING WERE PERFORMED USING HYPACK 2010 INTEGRATED SOFTWARE.
6. HORIZONTAL CONTROL WAS UPDATED THROUGH A STATIC GPS NETWORK AND A LEAST SQUARES ADJUSTMENT.
7. VERTICAL CONTROL WAS UPDATED THROUGH DIFFERENTIAL LEVELING USING A DIGITAL LEVEL AND HOLDING NOAA BENCHMARK "37 + 56.95" AS 45.28' AND "35 + 60.98" AS 37.67'.

CONTROL DATA

STATION	NORTHING	EASTING	ELEV.	DESCRIPTION
BK-1 1977	2,392,081.04	1,682,294.36	16.79	USACE SBC
CB-6 1977	2,391,801.78	1,683,389.60	39.91	USACE SBC
CB-5 1977	2,392,180.25	1,682,367.85	17.35	USACE SBC
CH-1 1997	2,390,429.31	1,682,761.96	21.13	USACE DOMED BC
CH-2 1997	2,390,622.10	1,683,190.80	21.84	USACE DOMED BC
CH-3 2000	2,390,921.64	1,683,194.88	18.70	INACCESSABLE
CH-4 2000	2,390,590.51	1,681,922.53	22.39	USACE DOMED BC
COR 19 1982	2,390,148.64	1,682,142.51	22.25	USACE SBC
COR 20 1982	2,391,176.61	1,681,632.70	21.94	USACE SBC
CH-5 2003	2,391,965.51	1,682,971.62	20.07	USACE SBC
CH-6 2003	2,392,372.16	1,683,146.31	22.64	USACE SBC
CH-7 2006	2,391,817.33	1,682,081.05	21.40	3 1/4" DOMED BC IN ROCK
CH-8 2006	2,391,514.01	1,681,868.02	22.01	3 1/4" DOMED BC IN ROCK

PROJECT LIMITS

CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	2,392,029.55	1,682,177.94	10	2,391,953.36	1,682,074.36
2	2,391,868.49	1,682,369.08	11	2,391,888.20	1,682,151.69
3	2,391,974.87	1,682,606.33	12	2,391,181.09	1,681,764.63
4	2,391,756.67	1,683,165.11	13	2,390,305.77	1,682,198.81
5	2,391,109.58	1,683,064.29	22	2,391,745.51	1,682,159.89
6	2,390,794.87	1,683,180.93	23	2,391,755.46	1,682,166.86
7	2,390,748.96	1,683,164.19	24	2,391,339.69	1,681,875.70
7B	2,390,659.20	1,682,968.63	25	2,390,376.70	1,682,353.14
8	2,390,607.03	1,682,854.98	26	2,390,558.19	1,682,748.55
9	2,391,789.67	1,682,268.64			

CORPS OF ENGINEERS

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB-10-D-0005
CONTRACTOR HUGHES AND ASSOCIATES
CITY WASILLA STATE AK

Recommended:	Approved:	Date:
PRIME CONTRACTOR	RESIDENT ENGINEER	

Sym.	Action	Description	Date	Appvd

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

Surveyed: HUGHES AND ASSOCIATES
Drawn: REH
Reviewed: CSH
Submitted:
Date: 6/12/10
Dwg Scale: 1" = 100'
Plot Scale:
File:
Drawing #:

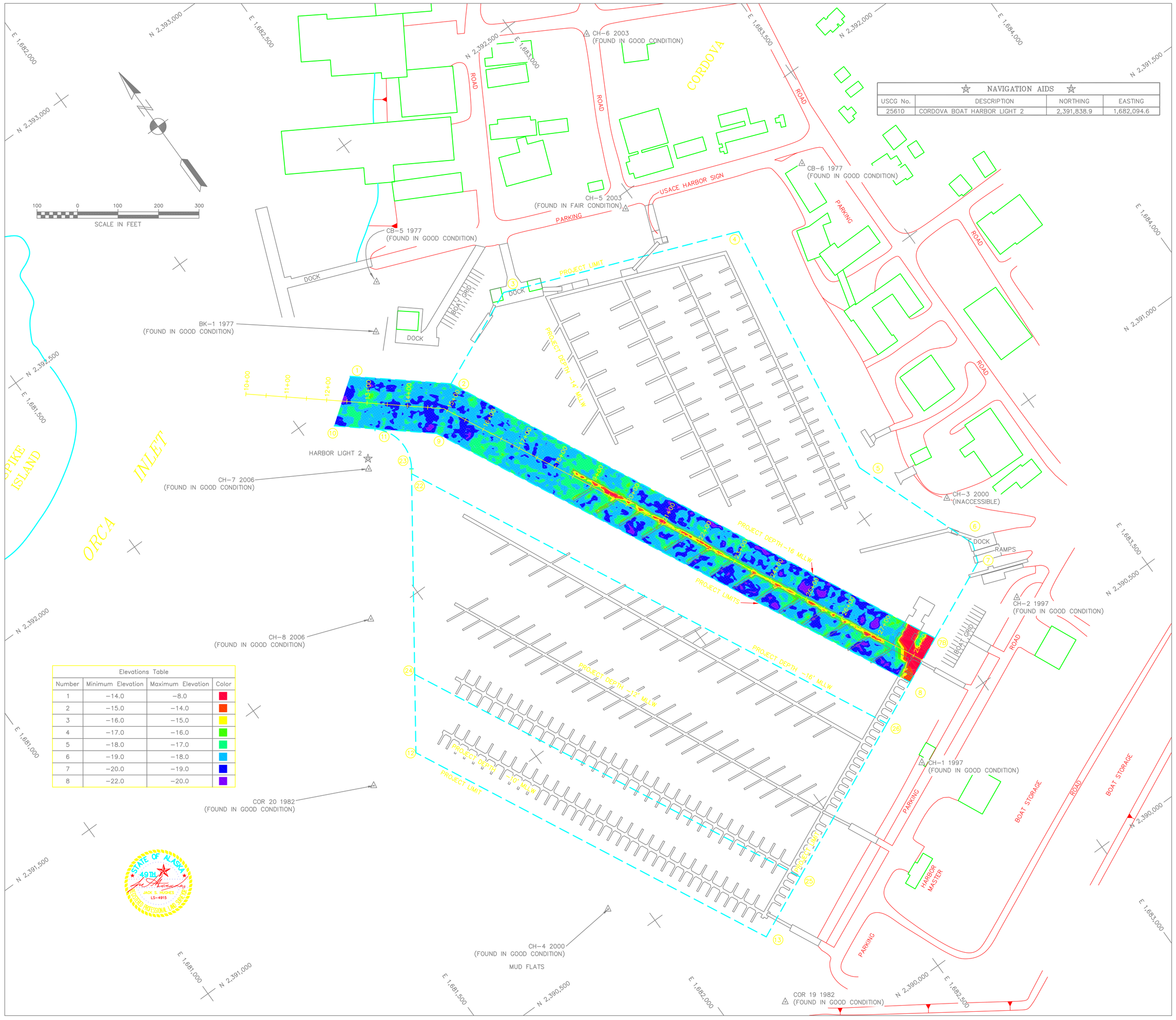
SURVEY NO: 2759-10

CORDOVA, ALASKA
CORDOVA HARBOR
CONDITION SURVEY
JUNE 8–12, 2010

Reference number: V-102

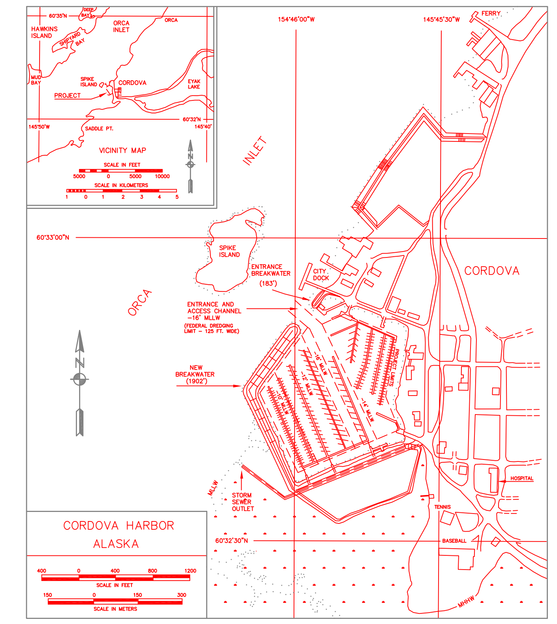
Sheet 2 of 4

CORPS OF ENGINEERS



NAVIGATION AIDS			
USCG No.	DESCRIPTION	NORTHING	EASTING
25610	CORDOVA BOAT HARBOR LIGHT 2	2,391,838.9	1,682,094.6

Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	−14.0	−8.0	
2	−15.0	−14.0	
3	−16.0	−15.0	
4	−17.0	−16.0	
5	−18.0	−17.0	
6	−19.0	−18.0	
7	−20.0	−19.0	
8	−22.0	−20.0	



NOTES

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6. HORIZONTAL CONTROL WAS UPDATED THROUGH A STATIC GPS NETWORK AND A LEAST SQUARES ADJUSTMENT.
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PROJECT LIMITS					
CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	2,392,029.55	1,682,177.94	10	2,391,953.36	1,682,074.36
2	2,391,868.49	1,682,369.08	11	2,391,888.20	1,682,151.69
3	2,391,974.87	1,682,606.33	12	2,391,181.09	1,681,764.63
4	2,391,756.67	1,683,165.11	13	2,390,305.77	1,682,198.61
5	2,391,109.58	1,683,064.29	22	2,391,745.51	1,682,159.89
6	2,390,794.87	1,683,180.93	23	2,391,755.46	1,682,166.86
7	2,390,748.96	1,683,164.19	24	2,391,339.69	1,681,875.70
7B	2,390,659.20	1,682,968.63	25	2,390,376.70	1,682,353.14
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9	2,391,789.67	1,682,268.64			

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. W911KB–10–D–0005
CONTRACTOR HUGHES AND ASSOCIATES
CITY WASILLA STATE AK
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Appvd

Surveyed: HUGHES AND ASSOCIATES
Drawn: REH
Reviewed: CSH
Submitted:
Date: 6/12/10
Dwg Scale: 1" = 100'
Plot Scale:
File:
Drawing #:
SURVEY NO: 2759–10

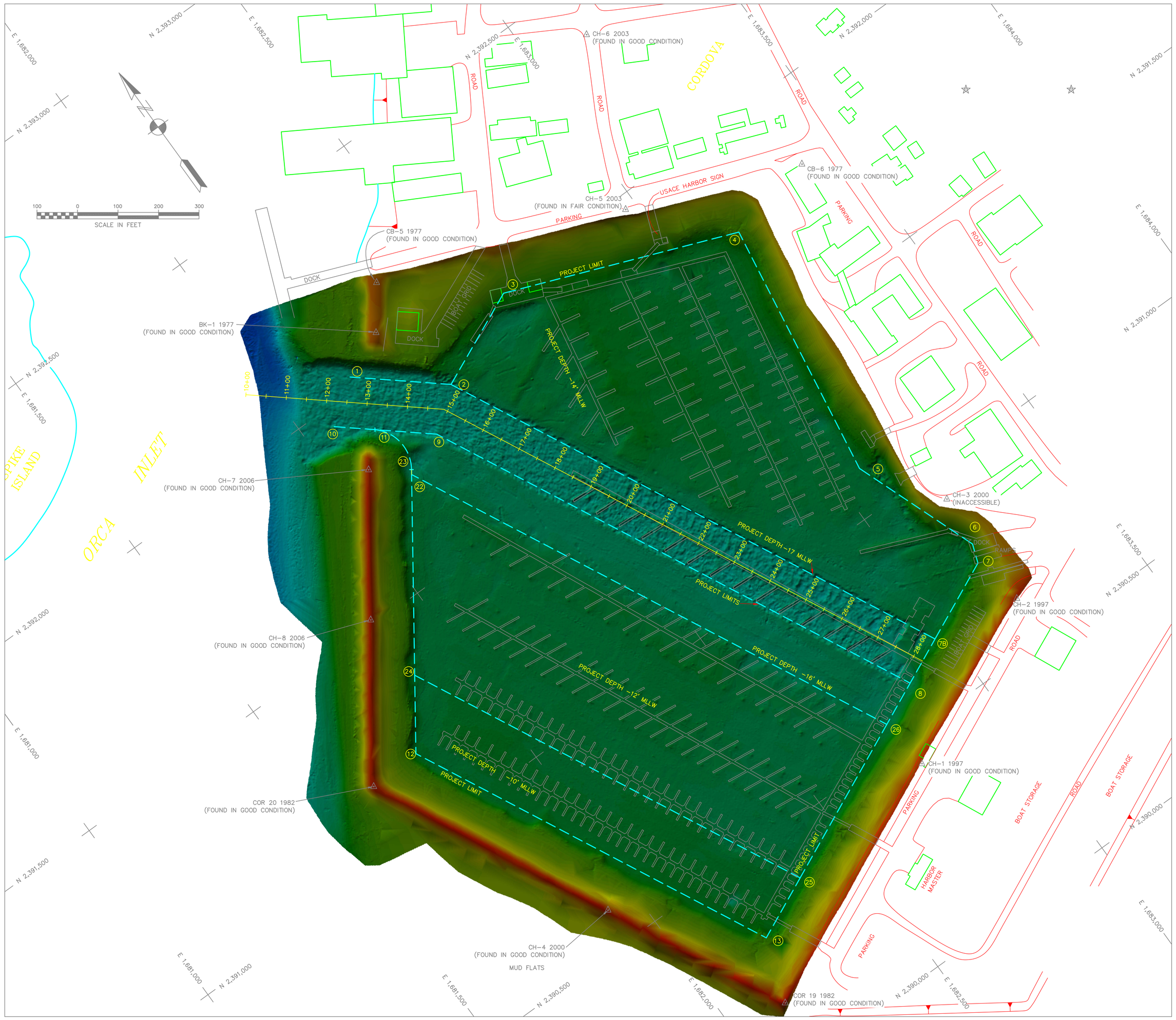
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

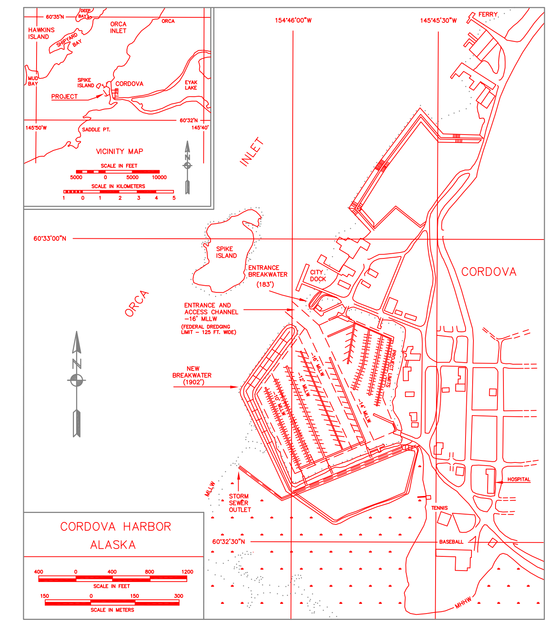
CORDOVA, ALASKA
CORDOVA HARBOR
CONDITION SURVEY
JUNE 8–12, 2010

Reference number:
V–103

Sheet 3 of 4

CORPS OF ENGINEERS





NOTES

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8. COORDINATES AND ELEVATION FOR MONUMENT CH–3 2000 WERE NOT UPDATED TO THE CURRENT EPOCH BECAUSE THE MONUMENT WAS INACCESSIBLE AT THE TIME OF THE SURVEY. COORDINATES AND ELEVATION FOR MONUMENT CH–5 2003 WERE NOT UPDATED TO THE CURRENT EPOCH BECAUSE THE MONUMENT HAS BEEN DISTURBED.

CONTROL DATA

STATION	NORTHING	EASTING	ELEV.	DESCRIPTION
BK–1 1977	2,392,081.04	1,682,294.36	16.79	USACE SBC
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* – SEE NOTE 8 ABOVE.

PROJECT LIMITS

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US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

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CONTRACTOR HUGHES AND ASSOCIATES
CITY WASILLA STATE AK
Recommended: Approved: Date:
"PRIME CONTRACTOR" "RESIDENT ENGINEER"

Sym	Action	Description	Date	Appvd

Surveyed: HUGHES AND ASSOCIATES
Drawn: REH
Reviewed: CSH
Submitted:
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ANCHORAGE, ALASKA

Date: 6/12/10
Dwg Scale: 1" = 100'
Plot Scale:
File:
Drawing #:

SURVEY NO: 2759–10

CORDOVA, ALASKA
CORDOVA HARBOR
CONDITION SURVEY
JUNE 8–12, 2010

Reference number:
V–104

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