

CONTROL DATA			
STATION	NORTHING	EASTING	ELEV.
BK-1 1977	2,592,003.104	1,662,294.36	16.79 USACE SBC
CH-6 1977	2,591,601.78	1,663,488.60	39.91 USACE SBC
CH-6 1977	2,591,601.78	1,663,488.60	39.91 USACE SBC
CH-1 1987	2,590,429.31	1,662,765.13	21.93 USACE DOWD BC
CH-1 1987	2,590,622.10	1,663,190.80	21.84 USACE DOWD BC
CH-3 2000	2,590,927.64	1,663,194.88	18.70 INACE/SAS/SABLE
CH-4 2000	2,590,590.51	1,661,922.51	22.39 USACE DOWD BC
CH-9 1982	2,590,148.64	1,662,142.51	22.25 USACE SBC
CH-9 1982	2,591,172.61	1,663,531.50	21.94 USACE SBC
CH-9 2000	2,591,172.61	1,663,531.50	21.94 USACE SBC
CH-6 2003	2,592,372.16	1,663,146.31	22.64 USACE SBC
CH-7 2006	2,591,871.33	1,661,081.05	21.40 USACE SBC
CH-8 2006	2,591,951.01	1,661,066.02	22.01 3 1/4" DOWD BC IN ROCK

[illegible]

1. HORIZONTAL TOTAL IS MENI LOWER LOW WRITE A PLUM IN US SUREY FEET (BASED ON 0.7)
HOLDING USSCS TOTAL BECHEN MARK 37° 56.96' N; 158° 45.28' W. TOTAL DATA IS BLANKED ON THE
1983-2001 TIDAL EPOCH FROM NOAA/NOS TOTAL BECHEN MARK LIST: 945-0450 CORVOVA, ORCA
INLET, PRINCE WILLIAM SOUND, ALASKA, PUBLISHED 05/16/2003.

3. SOUNDINGS ARE IN FEET AND ARE ALWAYS UNLESS OTHERWISE INDICATED.

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 MULT-BEAM DEPTH SOUNDER (200KHZ, 120-DEGREE SWATH-WIDTH WITH 240 75 DEGREE BEAMS) SOUND VELOCITY PROFILE WAS PROVIDED USING

ON THE MIDDLE WITH TWO 170 DEGREE BEAMS; SOUND TELETYPE PORTAL WHO PROVIDED OCEAN 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 "CR-5 1927". VESSEL NAVIGATION DATA

6. HORIZONTAL CONTROL WAS UPDATED THROUGH A STATIC GPS NETWORK AND A LEAST SQUARES ADJUSTMENT.

VERTICAL CONTROL WAS UPDATED THROUGH DIFFERENTIAL LEVELING USING A DIGITAL LEVEL AND 7. 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
CR-6 1977	2,391,801.78	1,683,389.60	39.91	USACE SBC

Case	Year	Age (years)	Gender	Site	Pathologic	Survival (months)
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 DOWED BC	
CH-2	1997	2,390,622.10	1,683,190.80	21.84	USACE DOWED 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 DOWED 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 SSC
CH-5 2003	2,391,965.51	1,682,971.62	20.07	USACE SSC
CH-6 2003	2,392,372.16	1,683,146.31	22.64	USACE SSC
CH-7 2006	2,392,812.72	1,683,081.05	21.40	USACE SSC

CH-7	2006	2,391,817.33	1,062,061.03	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

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	2,390,748.06	1,683,164.10	24	2,391,730.60	1,681,875.70

7	2,390,480.90	1,003,104.15	24	2,391,035.05	1,001,013.70
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			

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

[illegible]

US ARMY CORPS
OF ENGINEERS



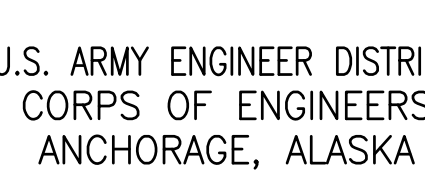
1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 3, NAD83, IN US SURVEY FEET, HOLDING
USACE SBC "CB-5 1977" AS N 2,392,179.77, E 1,682,368.00 AND DOMED BC "CH-2 1997" AS
N 2,390,621.55, E 1,683,190.94.

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 3, MAGNETIC IN USE SURVEY FEET (MAGNETIC) 1983-2020, EPOCH FROM ALASKA'S TIDAL BENCH MARK US1: 34545050 CORROD'A, ORCA INLET, PRINCE WILLIAM SOUND, ALASKA, PUBLISHED 05/16/2003.
2. VERTICAL CONTROL IS MEAN LOWE LOW WATER DATUM, IN US SURVEY FEET (MILLW=0.0) THE 1983-2020 EPOCH FROM ALASKA'S TIDAL BENCH MARK US1: 34545050 CORROD'A, 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 HIGHERS AND ASSOCIATES. SOUNDINGS WERE COLLECTED USING AN ODOM 653 MULTI-BEAM DEPTH SOUNDER (200MHz, 120-Degree SWATH-MOD WITH 240, 75 DEGREE BEAMS), SOUND VELOCITY PROFILE WAS PROVIDED USING ODOM DIG-W/4, POSITIONING AND TIDES WERE PROVIDED IN REAL TIME USING A TRIMBLE 4610 RTK GPS RECEIVER OPERATING ON KNEARFIELD CORRECTOR BROADCAST FROM A TRIMBLE 5700 RTK BASE RECEIVER SET AT CONTROL STATION, ODS 51776. VESSEL NAVIGATION, DATA COLLECTION AND PROCESSING WERE PERFORMED USING HYPERACK 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 SOUNDED NOAA BENCHMARK "37" + 56.95' AS 45.22' AND "35" + 60.88' AS 57.67'.
8. HOLDING NOAA BENCHMARK "37" + 56.95' AS 45.22' AND "35" + 60.88' AS 57.67'.

CONTROL DATA			
STATION	NORTHING	EASTING	ELEV.
BC-1 1977	2,192,020.04	1,682,294.36	16.79 USACE SBC
CG-6 1972	2,191,601.76	1,683,485.60	39.91 USACE SBC
CG-1 1987	2,192,429.51	1,682,761.98	21.13 USACE DOWD BC
CG-1 1997	2,190,622.10	1,683,190.80	21.84 USACE DOWD BC
CG-2 1997	2,190,622.10	1,683,190.80	INACCESIBLE
CH-3 2000	2,192,921.64	1,683,194.88	22.39 USACE DOWD BC
CH-4 2000	2,190,590.51	1,681,922.53	USACE SBC
COR 19 1982	2,190,146.64	1,682,142.51	USACE SBC
COR 20 1982	2,191,176.61	1,683,521.50	21.94 USACE SBC
CG-6 2003	2,192,429.51	1,682,761.98	21.13 USACE SBC
CG-1 2003	2,192,429.51	1,683,146.31	22.64 USACE SBC
CG-2 2006	2,191,617.33	1,682,081.05	21.40 USACE SBC
CH-8 2006	2,191,515.01	1,681,866.02	22.01 3 1/4" DOWD BC IN ROCK

	PROJECT LIMITS			
	CORNER	EASTING	NORTHING	EASTING
CORNER				
1	2,392,009.55	1,682,717.64	2,391,953.36	1,682,675.69
2	2,391,868.49	1,682,369.68	2,391,888.20	1,682,015.16
3	2,391,974.87	1,682,650.33	2,391,819.70	1,681,764.93
4	2,391,766.67	1,682,165.11	2,390,505.77	1,682,198.61
5	2,391,724.87	1,682,165.11	2,391,724.87	1,682,165.66
6	2,390,748.86	1,683,164.19	2,391,339.69	1,681,875.70
7B	2,390,659.20	1,682,988.62	2,390,586.19	1,682,746.55
8	2,391,058.67	1,682,988.62		
9	2,390,659.20	1,682,988.62		
10	2,391,058.67	1,682,988.62		

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



Surveyed:	HUGHES AND ASSOCIATES
Drawn:	REH
Reviewed:	CSH

Surveyed:	HUGHES AND ASSOCIATES
Drawn:	REH
Reviewed:	CSH

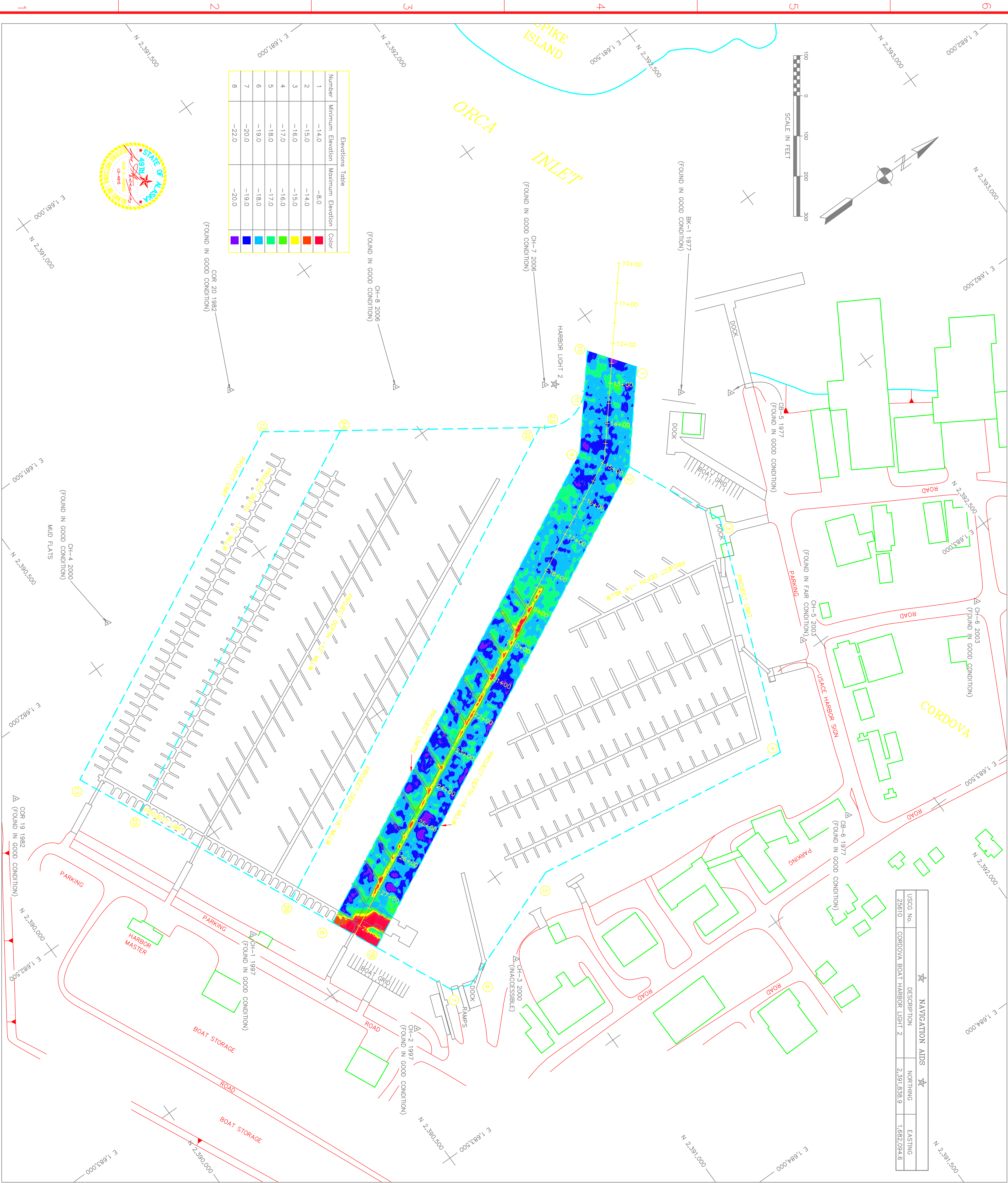
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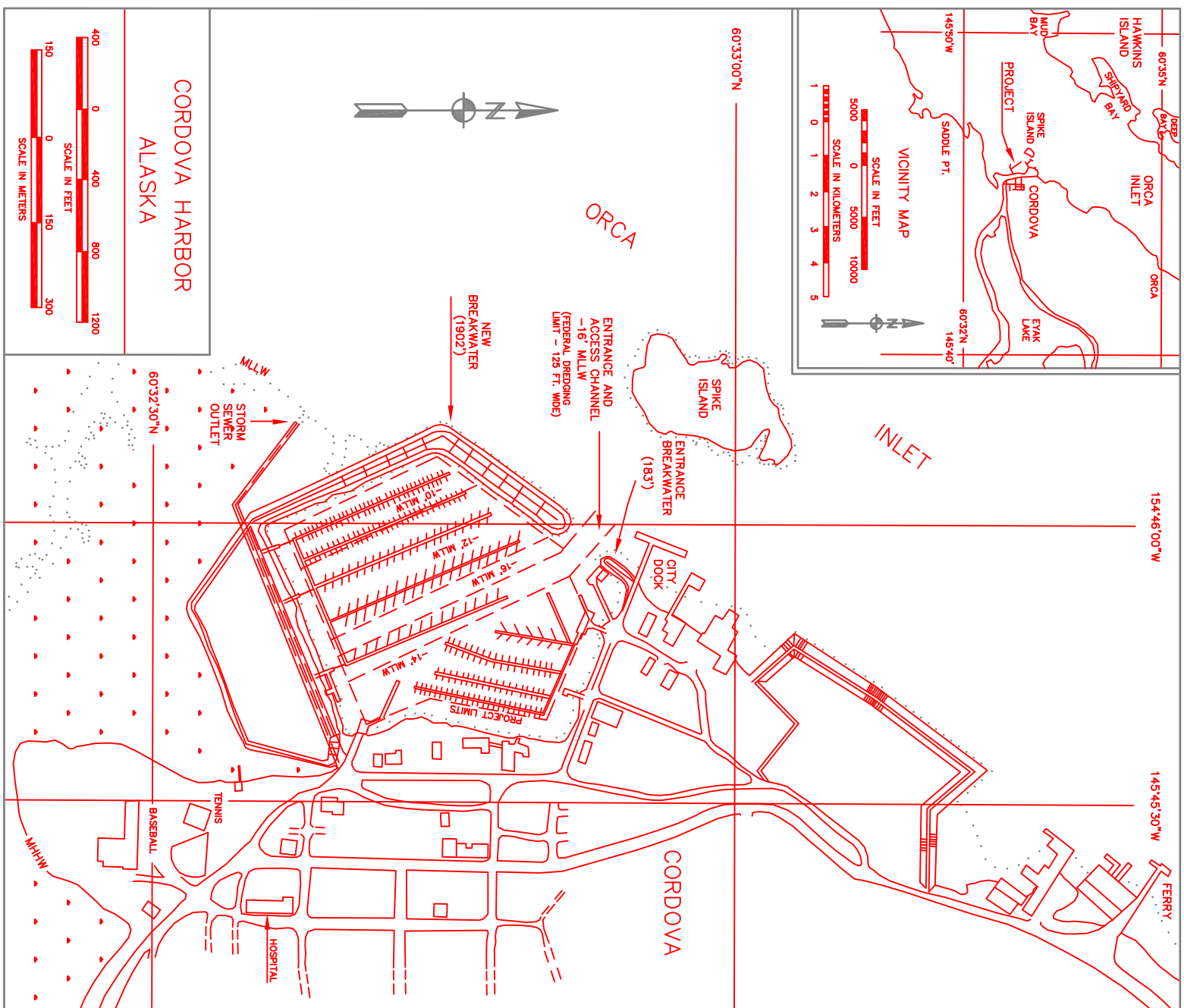
CONTRACT NO. <u>W911KB-10-D-0005</u>		
CONTRACTOR <u>HUGHES AND ASSOCIATES</u>		
CITY <u>WASILLA</u>		STATE <u>AK</u>
Recommended:	Approved:	Date:
<u>PRIME CONTRACTOR</u>	<u>RESIDENT ENGINEER</u>	



US ARMY CORPS
OF ENGINEERS
ALASKA DISTRICT



USC No.	DESCRIPTION	NORTHING	EASTING
25810	CORDOVA BOAT HARBOR LIGHT 2	2,391,935.9	1,682,094.6



NOTES

- HORIZONTAL CONTROL IS ALASKA STATE PLANE ZONE 3, MARS, IN US SURVEY FEET. HOLDING USACE SBC CB-5-1977 AS N 2,392,179.77; E 1,682,564.00 AND DOWMED BC CH-2-1997 AS N 2,390,621.55; E 1,683,190.94.
- VERTICAL CONTROL IS MEAN LOWER LOW WATER DATUM IN US SURVEY FEET (MLLW=0.0). HOLDING USACE TIDAL BENCH MARK 57 + 56.95 AS 45.28. TIDAL DATUM IS BASED ON THE INLET PRINCE WILLIAM SOUND, ALASKA. PUBLISHED 05/16/2003.
- SOUNDINGS ARE IN FEET AND ARE MINUS UNLESS OTHERWISE INDICATED.
- THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF SURVEY.
- SURVEY WAS CONDUCTED ON JUNE 8-12, 2010 BY HUGHES AND ASSOCIATES. SOUNDINGS WERE COLLECTED USING AN ODOM E53 MULTI-BEAM DEPTH SOUNDER (200KHz, 120-DEGREE SWATH-WIDTH WITH 240, 75 DEGREE BEAMS). SOUND VELOCITY PROFILE WAS PROVIDED USING ODOM RIG-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 COLLECTION AND PROCESSING WERE PERFORMED USING HYPERACK 2010 INTEGRATED SOFTWARE.
- HORIZONTAL CONTROL WAS UPDATED THROUGH A STATIC GPS NETWORK AND A LEAST SQUARES ADJUSTMENT.
- VERTICAL CONTROL WAS UPDATED THROUGH DIFFERENTIAL LEVELING USING A DIGITAL LEVEL AND 7. HOLDING NOAA BENCHMARK 57 + 56.95 AS 45.28 AND 55 + 60.98 AS 57.07.

CONTROL DATA

STATION	NORTHING	EASTING	ELEV.	DESCRIPTION
BK-1-1977	2,392,081.04	1,682,284.36	16.79	USACE SBC
CB-6-1977	2,391,901.78	1,683,369.60	39.91	USACE SBC
CB-6-1977	2,392,180.25	1,682,367.85	17.35	USACE SBC
CH-2-1997	2,390,921.64	1,683,190.80	21.84	USACE DOWMED BC
CH-3-2000	2,390,921.64	1,683,194.89	18.70	INACCESSIBLE
CH-4-2000	2,390,950.51	1,681,922.53	22.39	USACE DOWMED BC
CH-19-1992	2,391,746.61	1,682,142.51	22.25	USACE SBC
CH-20-1992	2,391,746.61	1,682,142.51	21.84	USACE SBC
CH-19-1992	2,391,746.61	1,682,142.51	22.25	USACE SBC
CH-6-2003	2,392,272.16	1,683,146.31	22.64	USACE SBC
CH-7-2006	2,391,817.33	1,682,081.02	22.01	3 1/4" DOWMED BC IN ROCK
CH-8-2006	2,391,514.01	1,681,868.02	22.01	3 1/4" DOWMED 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	1,682,006.33	12	2,391,191.09	1,681,748.63
4	2,391,974.87	1,682,006.33	13	2,391,191.09	1,681,748.63
5	2,391,109.56	1,683,064.29	22	2,391,745.51	1,682,156.89
6	2,390,794.87	1,683,160.93	23	2,391,735.46	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	1,682,986.63	25	2,390,376.70	1,682,353.14
8	2,390,607.03	1,682,984.99	26	2,390,598.19	1,682,748.55
9	2,391,059.07	1,682,285.64			



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 Date: 6/12/10

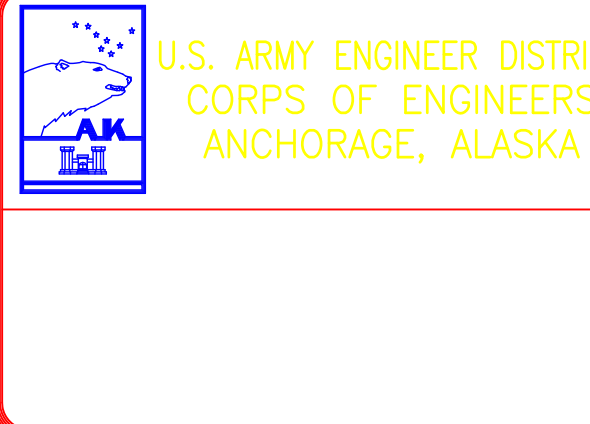
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Reviewed: CSH Plot Scale: _____

Submitted: _____ File: _____

Drawing #: _____

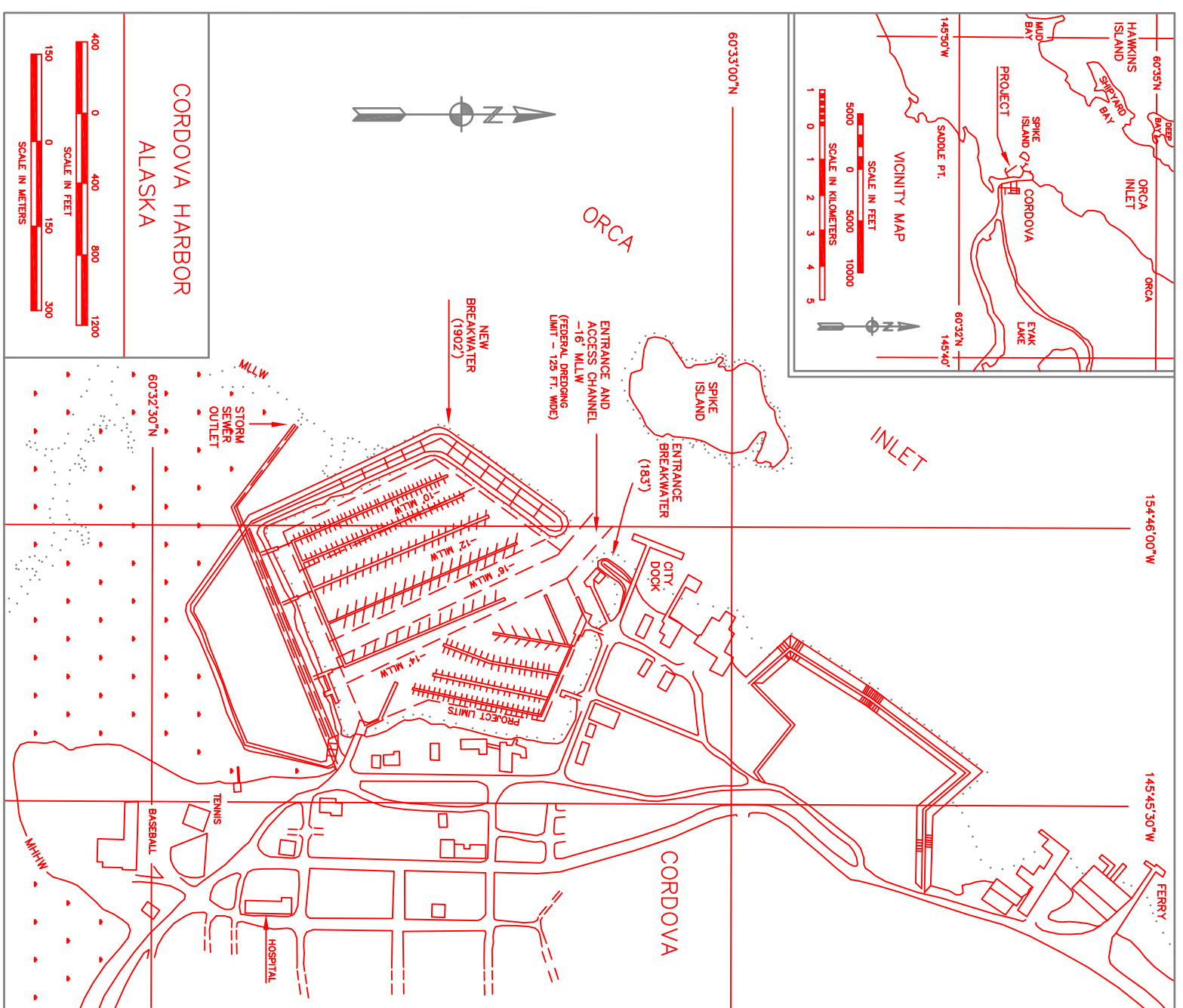
SURVEY NO: 2759-10



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

Reference number: V-103

Sheet 3 of 4

[illegible]

STATION	CONTROL DATA		
	NORTHING	EASTING	ELEV.
BSM-1-2006	1,862,922.64	1,682,948.88	6.59
BSM-6-1997	2,351,801.76	1,682,980.66	35.39
BSM-6-1997	2,350,186.25	1,682,967.96	11.35
CH-1-1997	2,350,429.31	1,682,761.96	17.13
CH-2-1997	2,350,622.64	1,683,190.00	21.84
CH-3-2000*	2,350,622.64	1,683,194.88	16.70
CH-3-2000*	2,350,622.64	1,683,194.88	16.70
COR 19 1982	2,391,146.64	1,682,144.51	22.25
COR 20 1982	2,391,176.60	1,681,432.69	21.94
CH-5-2003*	2,391,936.51	1,682,971.62	22.04
CH-6-2003	2,392,937.16	1,683,146.31	22.04
CH-6-2006	2,392,937.16	1,683,146.31	22.04
CH-6-2006	2,391,514.01	1,681,666.02	22.01
* SEE NOTE 8 ABOVE.			

	PROJECT LIMITS			
	CORNER	NORTHING	EASTING	CORNER
1	2,392,029.55	1,682,717.54	10	
2	2,391,868.49	1,682,359.08	11	2,391,983.36
3	2,391,947.87	1,682,006.93	12	2,391,888.20
4	2,391,947.87	1,682,006.93	13	2,391,868.20
5	2,391,109.58	1,682,006.93	14	2,391,745.51
6	2,390,794.87	1,683,184.93	15	2,391,755.45
7	2,390,748.86	1,683,184.93	16	2,391,339.69
8	2,390,748.86	1,683,184.93	17	1,681,971.87
9	2,390,607.03	1,682,205.48	18	1,682,748.55
10	2,391,789.87	1,682,205.48	19	2,390,558.19

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



Surveyed: **HUGHES AND ASSOCIATES**

Drawn: REH

Reviewed: CSH

Submitted:

SURVEY NO:

Date: 6/12/10

Dwg Scale: 1" = 100'

File:

Drawing #:

2759-10

Sym.	Action	Description	Date	Appvd.

CONTRACT NO. W911KB-10-D-0005

CONTRACTOR HUGHES AND ASSOCIATES

CITY WASILLA STATE AK

Recommended:	Approved:	Date:
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PRIME CONTRACTOR RESIDENT ENGINEER _____



US ARMY CORPS
OF ENGINEERS
ALASKA DISTRICT