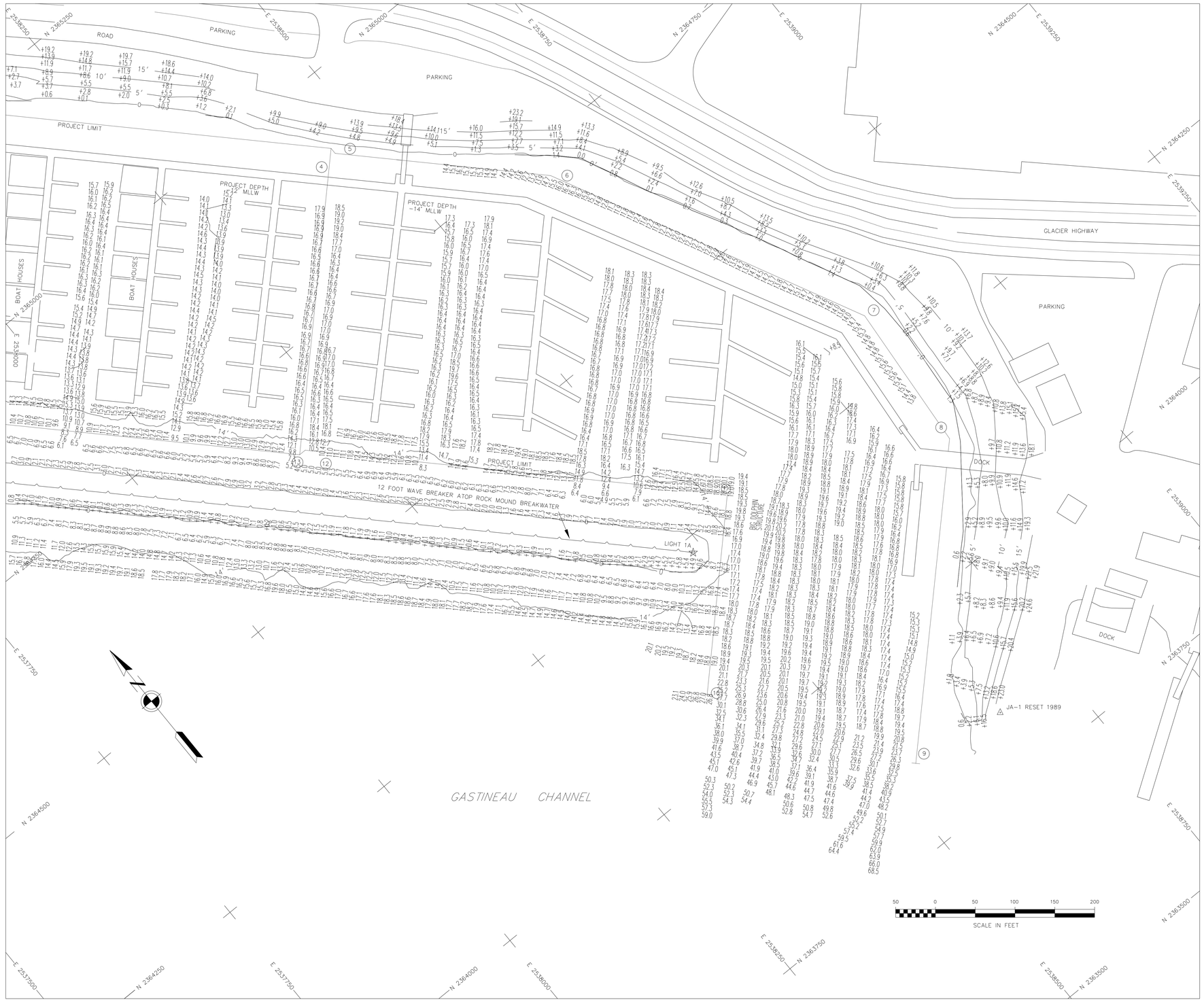
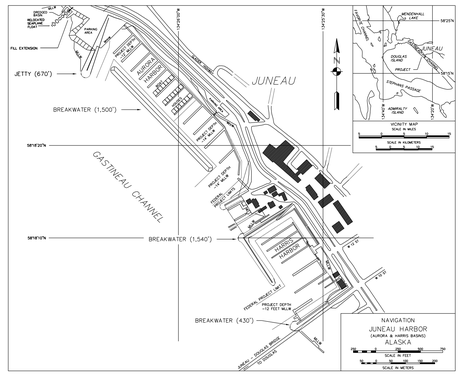
CORPS OF ENGINEERS





NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83 (5001) IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE 2003 EPOCH VALUES PUBLISHED NAD83 (CORS) OF NGS CORS STATIONS: "WHITEHORSE CORS ARP" (PID DE6615); "JUNEAU WAAS 1 CORS ARP" (PID DF4367); "A155 ANNETTE ISLAND 5 CORS ARP" (PID DK6482).
2. 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 9452210, JUNEAU, GASTINEAU CHANNEL, STEPHENS PASS, ALASKA, HOLDING NOAA TIDAL BENCH MARK DOMED BC "JNU TIDAL GPS 1999" (PID AI4908, VM#16187) AS ELEVATION. THIS VALUE IS FROM TIDAL EPOCH 1983 – 2001, PUBLISHED 11/6/2007 FOR THIS STATION.
3. VERTICAL CONTROL WAS ALSO TIED INTO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV88) HOLDING THE OPUS DB PUBLISHED VALUES OF "JNU TIDAL GPS 1999" (PID AI4908, VM#16187) AS 20.30 APPLYING THE AVERAGE DELTA TO THE REMAINING PRIMARY CONTROL.
4. THE VERTICAL AND HORIZONTAL CONTROL SURVEY WAS CONDUCTED 7 AUGUST 2009 USING RTK AND DIFFERENTIAL LEVELING TECHNIQUES ALONG WITH LONG PERIOD STATIC GPS OBSERVATIONS USING A TRIMBLE 5700 WHICH WAS THEN PROCESSED USING NATIONAL GEODETIC SURVEY ON LINE POSITIONING USER SERVICE (OPUS). THE DIFFERENTIAL LEVELING EQUIPMENT WAS A LECIA N1-2 SELF LEVELING LEVEL AND A LEVEL ROD. ALL PRIMARY CONTROL WAS DOUBLE-TIED USING REAL-TIME-KINEMATIC CONTROL METHODS AND INDEPENDENT BASELINES SOLUTIONS. MONUMENTS WERE CHECKED AGAINST THEIR PUBLISHED VALUES AS A QUALITY CONTROL PROCEDURE USING A TRIMBLE ROVER AND BASE STATION.
5. HYDROGRAPHIC SOUNDING DATA ACQUISTION WAS COLLECTED ON 7 AUG 2009. SOUNDINGS WERE COLLECTED USING A ROSS 835 SINGLE 3 DEGREE BEAM, 200 kHZ TRANSDUCER, POSITIONING AND VESSEL ALTITUDE WERE MEASURED USING A CODA F185+ INTERNAL NAVIGATION SYSTEM OPERATING ON RTK CORRECTORS BROADCAST FROM A TRIMBLE 750 BASE STATION. SOUND VELOCITY WAS MEASURED AT NUMEROUS LOCATIONS AND TIDE PHASES USING AN ODOM DIGI-BAR PRO SOUND VELOCITY PROFILER. POSITIONING AND VESSEL ATTITUDE WERE MEASURED USING A TRIMBLE MS860 AND TSS DSM-05. RTK CORRECTIONS WERE BROADCAST FROM LOCAL BASE STATION OCCUPYING DH-C. DATA WAS COLLECTED AND FIELD PROCESSED USING HYPACK 2008. TIDAL ELEVATIONS WERE MEASURED USING RTK GPS OFF THE 2006 ALASKA GEOID MODEL G2006A04 WITH A LOCAL ADJUSTMENT OF 4.7 FOOT SEPARATION VALUE BETWEEN NAVD88 AND M.L.L.W. AND VERIFIED THROUGH DATA COLLECTED AT NOAA TIDE STATION JUNEAU.
6. SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS NOTED OTHERWISE.
7. THIS SURVEY IS INDICATIVE OF CONDITIONS ON THE DATE OF SURVEY.
8. THIS SURVEY WAS CONDUCTED/SURVEYED BY: PUGET SOUND SURVEY CREW, SEATTLE DISTRICT, U.S. CORPS OF ENGINEERS.

VOLUME COMPUTATIONS

Project Depth -12' MLLW	
VOLUME AVAILABLE TO PROJECT DEPTH (-12' MLLW)	1765.2 (cubic yards)
VOLUME AVAILABLE BETWEEN PROJECT DEPTH AND MAXIMUM PAY LINE (-13' MLLW)	2281.8 (cubic yards)
VOLUME AVAILABLE ALONG THE SIDE SLOPE (3:1; H:V)	1285.2 (cubic yards)
TOTAL	5532.2 (cubic yards)
Project Depth -14' MLLW	
VOLUME AVAILABLE TO PROJECT DEPTH (-14' MLLW)	4582.4 (cubic yards)
VOLUME AVAILABLE BETWEEN PROJECT DEPTH AND MAXIMUM PAY LINE (-15' MLLW)	5372.5 (cubic yards)
VOLUME AVAILABLE ALONG THE SIDE SLOPE (3:1; H:V)	4252.7 (cubic yards)
TOTAL	8835.1 (cubic yards)

CONTROL DATA

STATION	NORTHING	EASTING	ELEV.	NAVD88 ELEV.	DESCRIPTION
JA-1 RESET 1989	2,363,832.49	2,538,655.23	23.88	28.58	USACE SBC
LENA PT	2,365,509.00	2,537,211.03	24.84	29.54	4" DOMED BC
AH-D 1999	2,365,793.41	2,537,503.02	23.17	27.87	3 1/4" DOMED BC IN CONC.
AH-E 1999	2,365,616.69	2,537,228.50	24.87	29.57	3 1/4" DOMED BC
AH-2 2005	2,365,309.64	2,537,131.21	25.97	30.67	SET 2.5" ALM CAP ON ALM ROD
JUNEAU TIDAL GPS	2,362,230.50	2,541,118.12	28.09	32.79	3 1/4" NOS DOMED BC

NAVIGATION AIDS

DESCRIPTION	USCG No.	NORTHING	EASTING
AURORA BASIN LIGHT 1A	23710	2,364,231.8	2,538,486.6
AURORA BASIN LIGHT 1B	23720	2,365,295.8	2,537,126.6

☆ PROJECT LIMITS ☆

CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	2,365,201.8	2,537,241.6	9	2,363,849.8	2,538,535.6
2	2,365,473.8	2,537,350.6	10	2,364,082.8	2,538,387.6
3	2,365,730.8	2,537,640.6	11	2,364,261.8	2,538,566.6
4	2,364,912.8	2,538,455.6	12	2,364,639.8	2,538,190.6
5	2,364,904.8	2,538,455.6	13	2,364,639.8	2,538,181.6
6	2,364,711.8	2,538,647.6	14	2,365,396.8	2,537,427.6
7	2,364,325.8	2,538,841.6	15	2,365,164.8	2,537,334.6
8	2,364,138.8	2,538,826.6			

SURVEY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. REP # XXXXXX-XX-X-XXXX
CONTRACTOR
CITY STATE
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym.	Action	Description	Date	Appvd

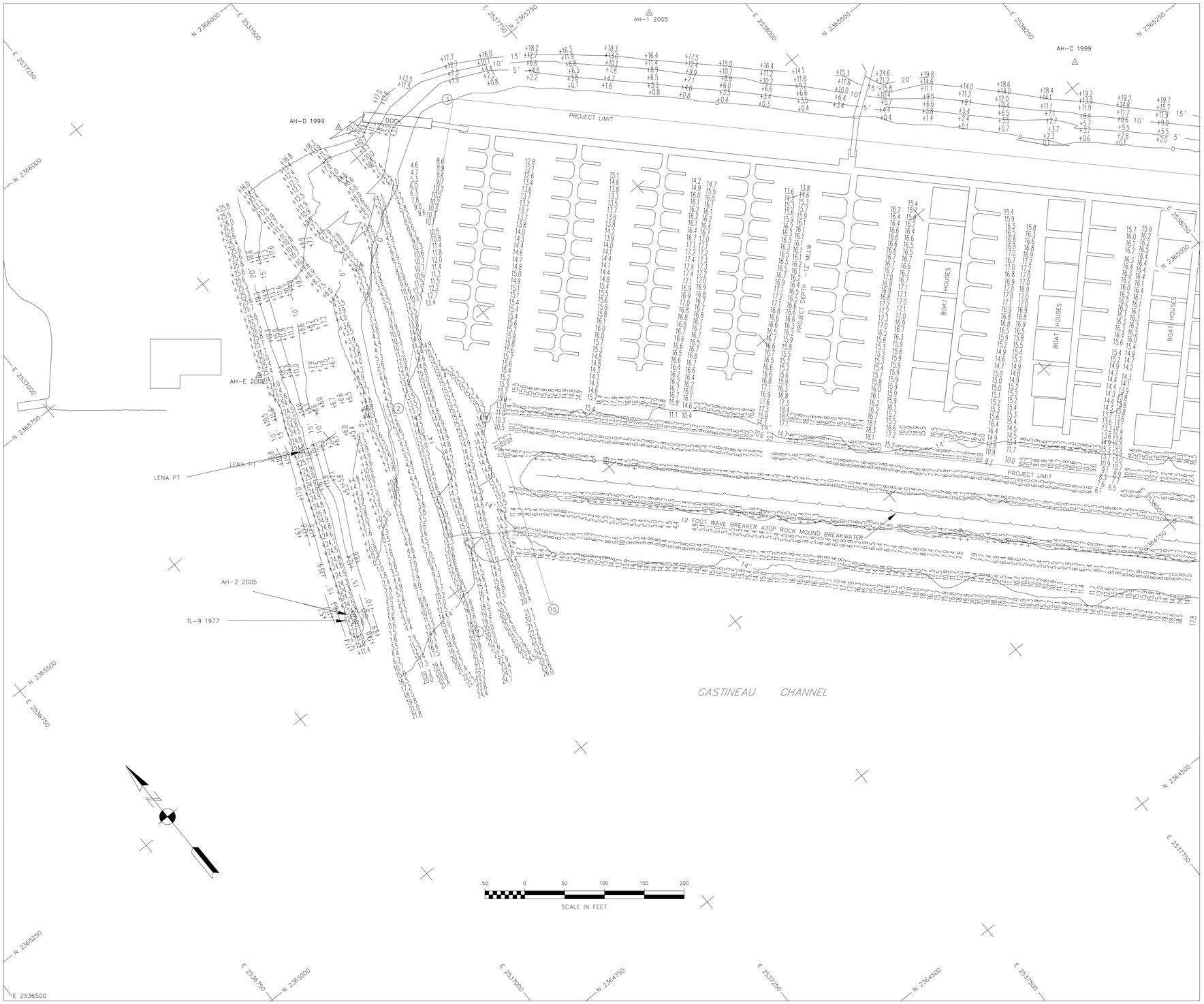
Designed: G. KING
Drawn: F. GILBERT/L. TOKUNAGA
Reviewed: A. CHURCHILL
Chief
Submitted
Chief
Date: 9 DEC 09
Dwg Scale: AS NOTED
Plot Scale:
File:
Section
Branch
Drawing # DWG#

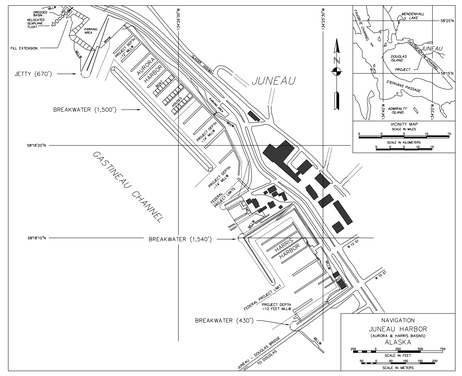
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

JUNEAU, ALASKA
AURORA SMALL BOAT HARBOR
EASTERN HALF
7 AUGUST 2009

Reference number:
V-002
Sheet 2 of 2

CORPS OF ENGINEERS





NOTES

1. HORIZONTAL CONTROL IS ALASKA STATE PLANE, ZONE 1, NAD83 (5001) IN US SURVEY FEET BASED ON A FULLY CONSTRAINED STATIC GPS NETWORK HOLDING THE 2003 EPOCH VALUES PUBLISHED NAD83 (CORS) OF NGS CORS STATIONS: "WHITEHORSE CORS ARP" (PID DE6615); "JUNEAU WAAS 1 CORS ARP" (PID DF4367); "A135 ANNETTE ISLAND 5 CORS ARP" (PID DK6482).

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5. HYDROGRAPHIC SOUNDING DATA ACQUISITION WAS COLLECTED ON 7 AUG 2009. SOUNDINGS WERE COLLECTED USING A ROSS 835 SINGLE 3 DEGREE BEAM, 200 kHZ TRANSDUCER, POSITIONING AND VESSEL ALTITUDE WERE MEASURED USING A CODA F185+ INTERNAL NAVIGATION SYSTEM OPERATING ON RTK CORRECTORS BROADCAST FROM A TRIMBLE 750 BASE STATION. SOUND VELOCITY WAS MEASURED AT NUMEROUS LOCATIONS AND TIDE PHASES USING AN ODOM DIGI-BAR PRO SOUND VELOCITY PROFILER. POSITIONING AND VESSEL ATTITUDE WERE MEASURED USING A TRIMBLE MS860 AND TSS DSM-05. RTK CORRECTIONS WERE BROADCAST FROM LOCAL BASE STATION OCCUPYING DH-C. DATA WAS COLLECTED AND FIELD PROCESSED USING HYPACK 2008. TIDAL ELEVATIONS WERE MEASURED USING RTK GPS OFF THE 2006 ALASKA GEOID MODEL G2006A04 WITH A LOCAL ADJUSTMENT OF 4.7 FOOT SEPARATION VALUE BETWEEN NAVD88 AND M.L.L.W. AND VERIFIED THROUGH DATA COLLECTED AT NOAA TIDE STATION JUNEAU.

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8. THIS SURVEY WAS CONDUCTED/SURVEYED BY: PUGET SOUND SURVEY CREW, SEATTLE DISTRICT, U.S. CORPS OF ENGINEERS.

VOLUME COMPUTATIONS

Project Depth -12' MLLW		
VOLUME AVAILABLE TO PROJECT DEPTH (-12' MLLW)	1765.2	(cubic yards)
VOLUME AVAILABLE BETWEEN PROJECT DEPTH AND MAXIMUM PAY LINE (-13' MLLW)	2281.8	(cubic yards)
VOLUME AVAILABLE ALONG THE SIDE SLOPE (3:1; H:V)	1285.2	(cubic yards)
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AH-E 1999	2,365,616.69	2,537,228.50	24.87	29.57	3 1/4" DOMED BC
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NAVIGATION AIDS

DESCRIPTION	USCG No.	NORTHING	EASTING
AURORA BASIN LIGHT 1A	23710	2,364,231.8	2,538,486.6
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8	2,364,138.8	2,538,826.6			

SURVEY

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. REP # XXXXXX-XX-X-XXXX
CONTRACTOR
CITY STATE
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym.	Action	Description	Date	Appvd

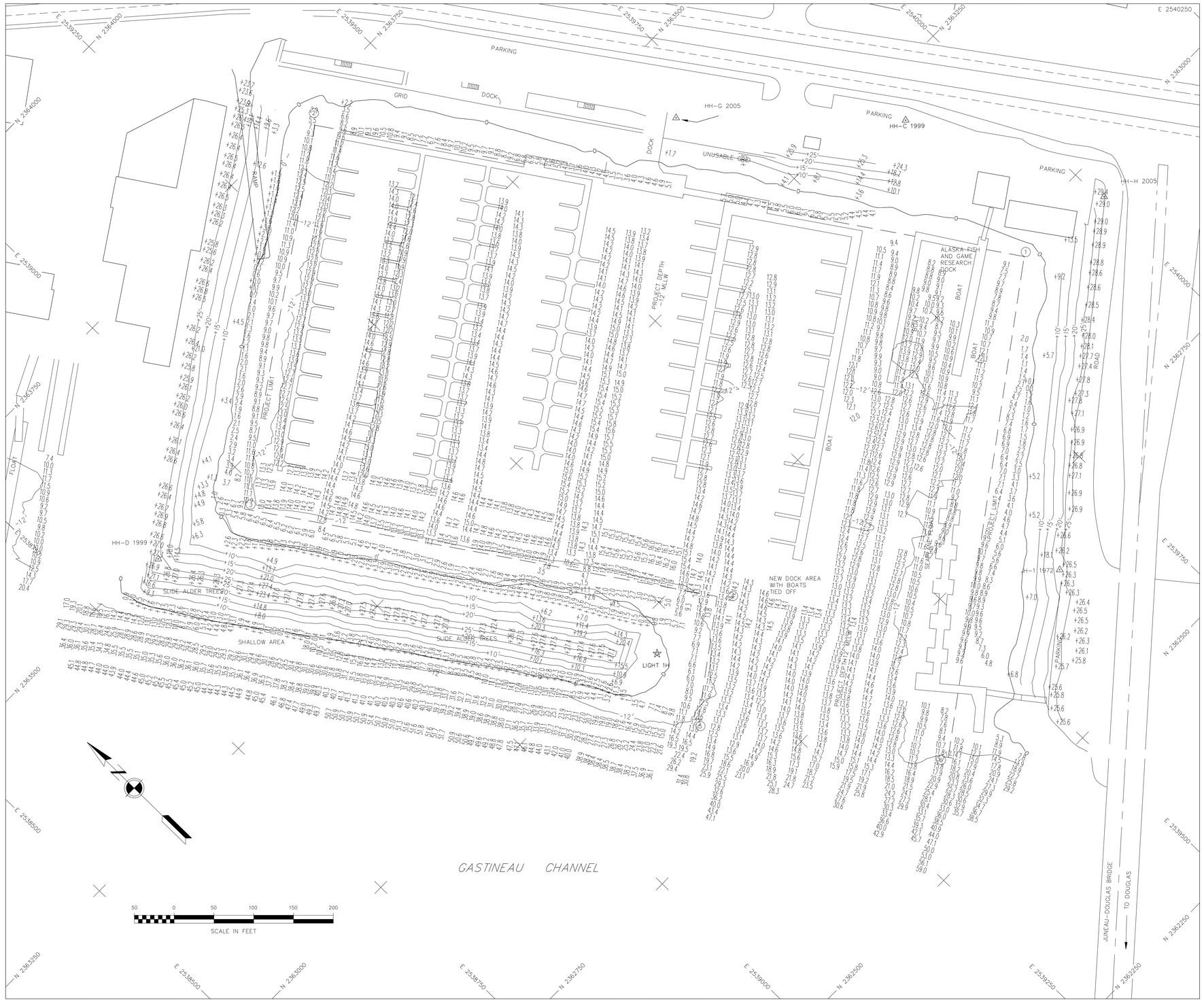
Designed: G KING
Drawn: F GILBERT/L TOKUNAGA
Reviewed: A. CHURCHILL
Chief Section
Submitted
Chief Branch
Date: 9 DEC 09
Dwg Scale: AS NOTED
Plot Scale:
File:
Drawing # DWG#

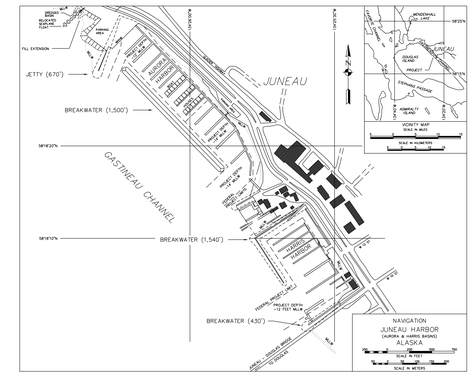
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

JUNEAU, ALASKA
AURORA SMALL BOAT HARBOR
WESTERN HALF
7 AUGUST 2009

Reference number:
V-001
Sheet1 of 2

CORPS OF ENGINEERS





NOTES

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3. VERTICAL CONTROL WAS ALSO TIED INTO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) HOLDING THE OPUS DB PUBLISHED VALUES OF "JNU TIDAL GPS 1999" (PID AI4908/VM#16187) AS 20.30 APPLYING THE AVERAGE DELTA TO THE REMAINING PRIMARY CONTROL.

4. THE VERTICAL AND HORIZONTAL CONTROL SURVEY WAS CONDUCTED 10 AUGUST 2009, USING RTK AND DIFFERENTIAL LEVELING TECHNIQUES ALONG WITH LONG PERIOD STATIC GPS OBSERVATIONS USING A TRIMBLE 5700 INTERNAL NAVIGATION SYSTEMS WHICH WAS THEN PROCESSED USING NATIONAL GEODETIC SURVEY ON LINE POSITIONING USER SERVICE (OPUS). THE DIFFERENTIAL LEVELING EQUIPMENT WAS A LECIA N1-2 SELF LEVELING LEVEL AND A LEVEL ROD. ALL PRIMARY CONTROL WAS DOUBLE-TIED USING REAL-TIME-KINEMATIC CONTROL METHODS AND INDEPENDENT BASELINES SOLUTIONS. MONUMENTS WERE CHECKED AGAINST THEIR PUBLISHED VALUES AS A QUALITY CONTROL PROCEDURE USING A TRIMBLE ROVER AND BASE STATION.

5. HYDROGRAPHIC SOUNDING DATA ACQUISITION WAS CONDUCTED ON 10 AUG 2009. SOUNDINGS WERE COLLECTED USING A ROSS 835 (SINGLE 3 DEGREE BEAM, 200kHZ TRANSDUCER). POSITIONING AND VESSEL ALTITUDE WERE MEASURED USING A TRIMBLE MS860 AND TSS DSM-05 INTERNAL NAVIGATION SYSTEMS OPERATING ON RTK CORRECTORS BROADCAST FROM A LOCAL BASE STATION LOCATED AT "DH-C". SOUND VELOCITY WAS MEASURED AT NUMEROUS LOCATIONS AND TIDE PHASES USING AN ODOM DIGI-BAR PRO AND VERIFIED WITH A BAR CHECK AT 5-FOOT INCREMENTS TO PROJECT DEPTH. DATA WAS COLLECTED, FIELD PROCESSED AND POST-PROCESSED USING HYPACK 2008. TIDE ELEVATIONS WERE MEASURED USING RTK GPS OFF THE 2006 ALASKA GEOID MODEL G2006A04 WITH A LOCAL ADJUSTMENT OF 4.7 FOOT SEPERATION VALUE BETWEEN NAVD88 AND M.L.L.W. AND VERIFIED THROUGH DATA COLLECTED AT NOAA TIDE STATION JUNEAU.

6. SOUNDINGS ARE IN U.S. SURVEY FEET AND ARE MINUS UNLESS NOTED OTHERWISE.

7. THIS SURVEY IS INDICATIVE OF CONDITIONS ON THE DATES OF SURVEY.

8. THIS SURVEY WAS CONDUCTED/SURVEYED BY: PUGET SOUND SURVEY CREW, SEATTLE DISTRICT, U.S. ARMY CORPS OF ENGINEERS.

VOLUME COMPUTATIONS	
Project Depth -12' MLLW	
VOLUME AVAILABLE TO PROJECT DEPTH (-12' MLLW)	3025.6 (cubic yards)
VOLUME AVAILABLE BETWEEN PROJECT DEPTH AND MAXIMUM PAY LINE (-13' MLLW)	4185.1 (cubic yards)
VOLUME AVAILABLE ALONG THE SIDE SLOPE (3:1; H:V)	2679.3 (cubic yards)
TOTAL	9890.0 (cubic yards)

CONTROL DATA

STATION	NORTHING	EASTING	MLLW ELEV.	NAVD88 ELEV.	DESCRIPTION
JA-1 RESET 1989	2,363,832.49	2,538,655.23	23.88	28.58	USACE SBC
JH-1 1972	2,362,667.25	2,539,903.18	26.00	30.70	USACE SBC
HH-C 1999	2,363,201.83	2,539,897.30	25.31	30.01	3 1/4" DOMED BC
HH-D 1999	2,363,200.08	2,539,900.22	26.36	31.06	3 1/4" DOMED BC
HH-G 2005	2,363,408.72	2,539,700.93	25.19	29.89	SET 3.5" FLAT BC IN CONCRETE
HH-H 2005	2,362,954.54	2,540,005.51	28.44	33.14	SET 3.5" DBC IN CONCRETE
JUNEAU TIDAL GPS	2,362,230.50	2,541,118.12	28.09	32.79	3 1/4" NOS DOMED BC

PROJECT LIMITS

CORNER	NORTHING	EASTING	CORNER	NORTHING	EASTING
1	2,362,974.7	2,539,881.6	4	2,362,952.7	2,539,306.6
2	2,363,727.7	2,539,377.6	5	2,362,861.7	2,539,179.6
3	2,363,454.7	2,538,970.6	6	2,362,603.7	2,539,364.6

NAVIGATION AIDS

DESCRIPTION	USCG NO.	NORTHING	EASTING
HARRIS HARBOR LIGHT 1H	23705	2,362,956.7	2,539,202.6

US ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

CONTRACT NO. RFP # XXXXXX-XX-X-XXXX
CONTRACTOR
CITY STATE
Recommended: Approved: Date:
PRIME CONTRACTOR RESIDENT ENGINEER

Sym	Action	Description	Date	Appvd

Designed: G. KING
Drawn: F. GILBERT/L. TOKUNAGA
Reviewed: A. CHURCHILL
Chief A. CHURCHILL
Submitted:
Chief:
Date: 9 DEC 2009
Dwg Scale: AS NOTED
Plot Scale:
File:
Drawing # DWG #

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

JUNEAU, ALASKA
HARRIS SMALL BOAT HARBOR
PROJECT CONDITION SURVEY
10 AUGUST 2009

Reference number:
V-001
Sheet1 of 1

SURVEY