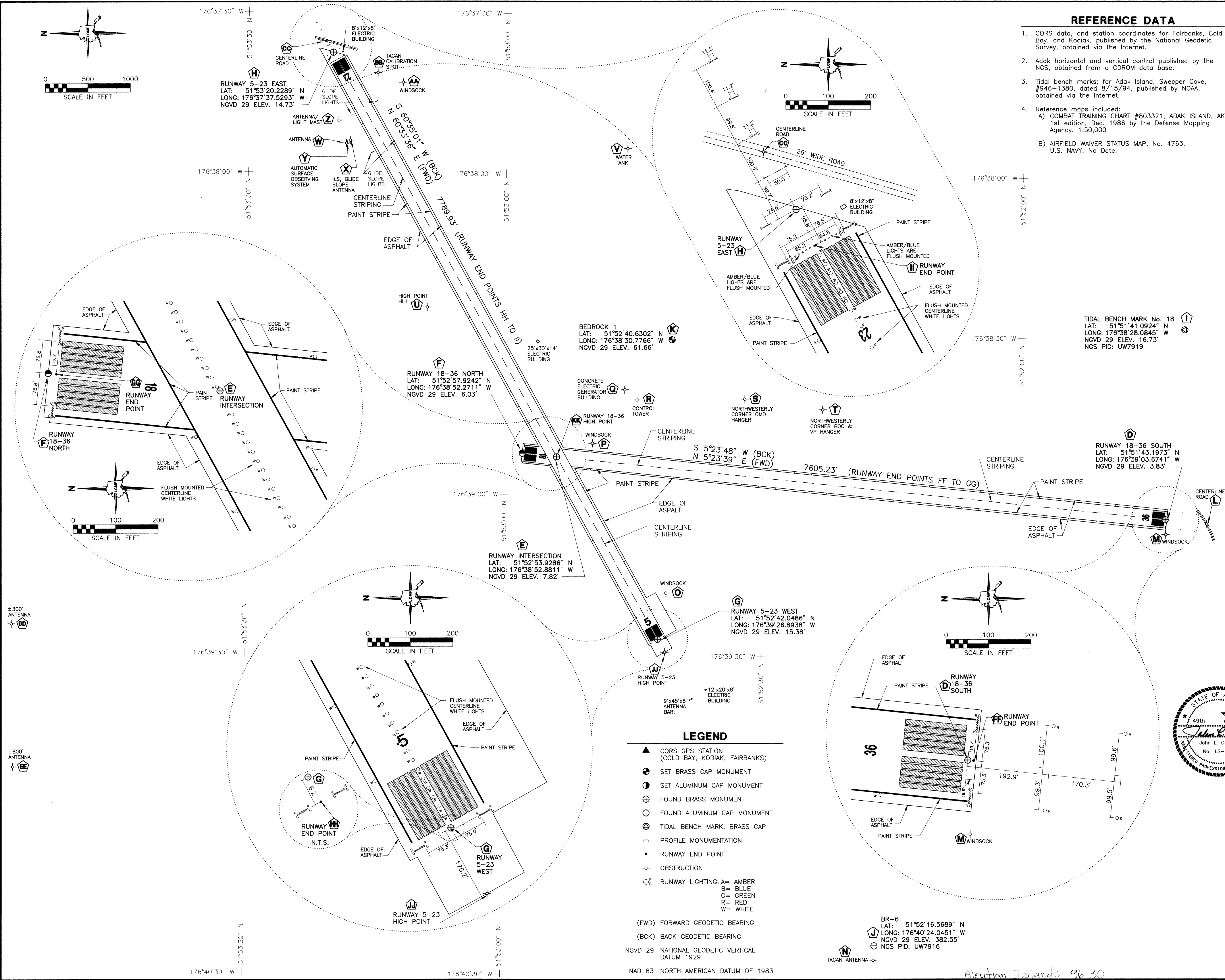
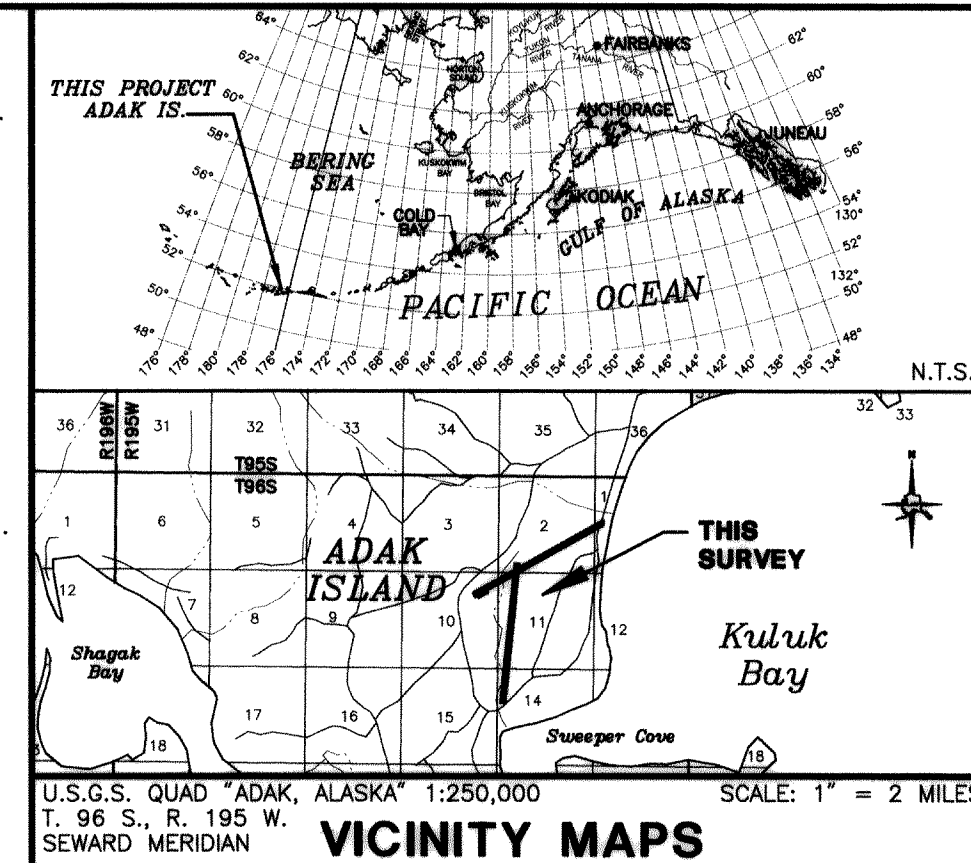


DRAWN BY: CEZ
PLOT DATE: 12/17/96 (15:16)
FIELD BOOK(S): LCMF-1050
AUTOCAD DRAWING NAME: 96236RS.DWG



REFERENCE DATA

- CORS data, and station coordinates for Fairbanks, Cold Bay, and Kodiak, published by the National Geodetic Survey, obtained via the Internet.
- Adak horizontal and vertical control published by the NGS, obtained from a CDROM data base.
- Tidal bench marks; for Adak Island, Sweeper Cove, #946-1380, dated 8/15/94, published by NOAA, obtained via the Internet.
- Reference maps included:
A) COMBAT TRAINING CHART #803321, ADAK ISLAND, AK. 1st edition, Dec. 1986 by the Defense Mapping Agency. 1:50,000
B) AIRFIELD WAIVER STATUS MAP, No. 4763, U.S. NAVY. No Date.



NOTES:

- The purpose of this survey is to provide reliable NAD 1983 coordinates and NGVD 1929 elevations on runway features and certain local obstructions at the Adak Airport. The Federal Aviation Administration plans to design a GPS approach into this airport based on this data.
- The coordinates of the airport are based on a static GPS control survey using three dual frequency Ashtech GPS receivers, model Z-XII. Observations were made over a seven day period from October 30 through November 5, 1996.
- All GPS phase data was postprocessed with Ashtech GPPS, version 5.2.0 using option 3 (L1C) for the CORS ties and option 1 for local Adak vectors. The broadcast ephemeris was utilized. All vectors were adjusted and geodetic coordinates derived using least squares techniques with Filenet version 3.0 software.
- An NAD 1983 (epoch 1996.0) coordinate and ellipsoidal height was established on monument BEDROCK 1, based on ties to the Continuously Operating Reference Stations (CORS) at Fairbanks, Kodiak, and Cold Bay. Five hour observations were made between this monument and the CORS on October 31, November 1, and November 5, 1996. The CORS phase data, in RINEX2 format, and coordinates were downloaded from the National Geodetic Survey (NGS) Internet site. All double difference float, repeat vectors were adjusted in fully constrained adjustment holding all three CORS sites in three dimensions. This adjustment was: C5.out.
- The final local horizontal positions on Adak, were derived by holding station BEDROCK 1 in three dimensions (relative to CORS network). This was adjustment: A3.OUT. New horizontal positions were determined for TIDAL 18 and BR6 based on this adjustment.
- Elevations are expressed in orthometric height in feet in the NGVD 1929 system unless otherwise noted. No NAVD 1988 published bench marks exist in the vicinity of Adak Island. NGVD 29 elevations were determined by adjusting the local Adak GPS vectors, holding TIDAL 18, BR6, and R/W 18-36 N, in elevation. TIDAL 18 (PID: UW7919) and BR6 (PID: UW7916) are published NGS control points. The elevation of R/W 18-36 N was established by differential leveling based on TIDAL 18 and TIDAL 20. The final elevations were produced in adjustment: A7.OUT.
- All bearings and distances are geodetic. All distances and elevations are in feet.
- Positions and elevations to all obstructions and runway features were determined by conventional techniques using a Topcon GTS 3B total station, and a Topcon Automatic Level.
- The profile elevations of each runway were determined by differential leveling and stadia by running between the end point monumentation.
- This survey does not constitute a subdivision as defined by AS 40.15.190 (2).

SURVEYOR'S CERTIFICATE

I, JOHN OSWALD, DO HEREBY CERTIFY THAT I AM PROPERLY REGISTERED AND LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF ALASKA, THAT THIS PLAN REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION, THAT THE MONUMENTS SHOWN ACTUALLY EXIST AS DESCRIBED, AND ALL DIMENSIONS AND DETAILS ARE CORRECT.

DATE: Dec. 17, 1996 REGISTRATION NUMBER: LS-8297

John L. Oswald
REGISTERED LAND SURVEYOR

FEDERAL AVIATION ADMINISTRATION

RECORD OF SURVEY

of

ADAK AIRPORT

FOR

F.A.A. CERTIFICATION

Located in Sections 1, 2, 3, 10, 11, 14 and 15, Township 96 South, Range 195 West, Seward Meridian, Alaska

ADAK, ALASKA ALEUTIAN ISLAND RECORDING DISTRICT

LCMF Incorporated
A subsidiary of Ukpeagvik Ilipiat Corporation

Anchorage, Alaska (907) 562-1830
Barrow, Alaska (907) 852-8212

SURVEY DATE: Nov. 5, 1996 SHEET: 1 of 2
SCALE: AS SHOWN W.O. No: 96-236

LEGEND

- ▲ CORS GPS STATION (COLD BAY, KODIAK, FAIRBANKS)
- SET BRASS CAP MONUMENT
- SET ALUMINUM CAP MONUMENT
- ⊕ FOUND BRASS MONUMENT
- ⊖ FOUND ALUMINUM CAP MONUMENT
- ⊙ TIDAL BENCH MARK, BRASS CAP
- PROFILE MONUMENTATION
- RUNWAY END POINT
- ✦ OBSTRUCTION
- RUNWAY LIGHTING: A= AMBER
B= BLUE
G= GREEN
R= RED
W= WHITE

(FWD) FORWARD GEODETIC BEARING

(BCK) BACK GEODETIC BEARING

NGVD 29 NATIONAL GEODETIC VERTICAL DATUM 1929

NAD 83 NORTH AMERICAN DATUM OF 1983

BR-6
LAT: 51°52'16.5689" N
LONG: 176°40'24.0451" W
NGVD 29 ELEV. 382.55'
NGS PID: UW7916

TACAN ANTENNA

Aleutian Islands 96-30

POINT DATA LIST

POINT	NAD 83 LATITUDE (NORTH) LONGITUDE (WEST)	NGVD 29 ELEVATION (IN FEET)	DESCRIPTION
A	64° 58' 40.7979"	147° 29' 57.1649"	FAIRBANKS (CORS)
B	57° 37' 03.6858"	152° 11' 36.2613"	KODIAK (CORS)
C	55° 11' 24.9827"	162° 42' 25.6992"	COLD BAY (CORS)
D	51° 51' 43.1973"	176° 39' 03.6741"	FOUND RUNWAY 18-36 SOUTH MONUMENT
E	51° 52' 53.9286"	176° 38' 52.8811"	FOUND RUNWAY INTERSECTION MONUMENT
F	51° 52' 57.9242"	176° 38' 52.2711"	SET RUNWAY 18-36 NORTH MONUMENT
G	51° 52' 42.0486"	176° 39' 26.8938"	FOUND RUNWAY 5-23 WEST MONUMENT
H	51° 53' 20.2289"	176° 37' 37.5293"	FOUND RUNWAY 5-23 EAST MONUMENT
I	51° 51' 41.0924"	176° 38' 28.0845"	FOUND TIDAL BENCH MARK No. 18
J	51° 52' 16.5689"	176° 40' 24.0451"	FOUND BR-6 MONUMENT
K	51° 52' 40.6302"	176° 38' 30.7766"	SET BEDROCK 1 MONUMENT
L	51° 51' 38.3722"	176° 39' 04.4097"	CENTERLINE ROAD
M	51° 51' 43.1275"	176° 39' 06.4488"	WIND SOCK
N	51° 52' 16.6480"	176° 40' 26.7426"	TACAN ANTENNA
O	51° 52' 41.1005"	176° 39' 18.2435"	WIND SOCK
P	51° 52' 49.7641"	176° 38' 50.2947"	WIND SOCK
Q	51° 52' 46.0711"	176° 38' 40.1758"	ELECTRIC GENERATOR BUILDING
R	51° 52' 44.6355"	176° 38' 42.0848"	CONTROL TOWER
S	51° 52' 32.1348"	176° 38' 41.7624"	OMD HANGER
T	51° 52' 23.0835"	176° 38' 43.5980"	BOQ & VP HANGER
U	51° 53' 09.0762"	176° 38' 25.0341"	HILL HIGH POINT
V	51° 52' 45.9377"	176° 37' 55.0668"	NORTHERLY OF TWO WATER TANKS
W	51° 53' 18.6223"	176° 37' 54.4651"	ANTENNA
X	51° 53' 18.1824"	176° 37' 53.9251"	ILS, GLIDE SLOPE ANTENNA
Y	51° 53' 18.5236"	176° 37' 54.5052"	AUTOMATIC SURFACE OBSERVATION SYSTEM
Z	51° 53' 19.5279"	176° 37' 50.2024"	OLD ANTENNA / LIGHT MAST
AA	51° 53' 12.0822"	176° 37' 43.0415"	WIND SOCK
BB	51° 53' 15.0242"	176° 37' 41.2601"	TACAN CALIBRATION SPOT
CC	51° 53' 20.9954"	176° 37' 35.3824"	CENTERLINE ROAD
DD	51° 53' 57.0912"	176° 39' 24.9760"	TOP OF 300' ANTENNA
EE	51° 53' 56.7860"	176° 39' 51.8143"	TOP OF 800' ANTENNA
FF	51° 51' 43.0628"	176° 39' 03.6937"	RUNWAY END POINT, RUNWAY 18-36 SOUTH
GG	51° 52' 57.7324"	176° 38' 52.3004"	RUNWAY END POINT, RUNWAY 18-36 NORTH
HH	51° 52' 42.0192"	176° 39' 26.9811"	RUNWAY END POINT, RUNWAY 5-23 WEST
II	51° 53' 19.7650"	176° 37' 38.8591"	RUNWAY END POINT, RUNWAY 5-23 EAST
JJ	51° 52' 41.1944"	176° 39' 29.3391"	RUNWAY 5-23 HIGH POINT
KK	51° 52' 53.9286"	176° 38' 52.8811"	RUNWAY 18-36 HIGH POINT

LEGEND

- ▲ CORS GPS STATION
(COLD BAY, KODIAK, FAIRBANKS)
- ⊙ SET BRASS CAP MONUMENT
- ⊙ SET ALUMINUM CAP MONUMENT
- ⊕ FOUND BRASS MONUMENT
- ⊙ FOUND ALUMINUM CAP MONUMENT
- ⊙ TIDAL BENCH MARK, BRASS CAP
- ▭ PROFILE MONUMENTATION
- RUNWAY END POINT
- ⊕ OBSTRUCTION
- ⊙ RUNWAY LIGHTING: A= AMBER
B= BLUE
G= GREEN
R= RED
W= WHITE

(FWD) FORWARD GEODETIC BEARING

(BCK) BACK GEODETIC BEARING

NGVD 29 NATIONAL GEODETIC VERTICAL
DATUM 1929

NAD 83 NORTH AMERICAN DATUM OF 1983

FAIRBANKS CORS SITE
LAT: 64°58'40.7979" N
LONG: 147°29'57.1649" W
ELLIPSOID HEIGHT 1045.98'KODIAK CORS SITE
LAT: 57°37'03.6858" N
LONG: 152°11'36.2613" W
ELLIPSOID HEIGHT 87.38'COLD BAY CORS SITE
LAT: 55°11'24.9827" N
LONG: 162°42'25.6992" W
ELLIPSOID HEIGHT 163.86'RUNWAY 18-36 NORTH
LAT: 51°52'57.9242" N
LONG: 176°38'52.2711" W
NGVD 29 ELEV. 6.03'BEDROCK 1
LAT: 51°52'40.6302" N
LONG: 176°38'30.7766" W
ELLIPSOID HEIGHT 82.58'
NGVD 29 ELEV. 61.66'RUNWAY 5-23 WEST
LAT: 51°52'42.0486" N
LONG: 176°39'26.8938" W
NGVD 29 ELEV. 15.38'BR-6
LAT: 51°52'16.5689" N
LONG: 176°40'24.0451" W
NGVD 29 ELEV. 382.55'RUNWAY 18-36 SOUTH
LAT: 51°51'43.1973" N
LONG: 176°39'03.6741" W
NGVD 29 ELEV. 3.83'TIDAL BENCH No. 18
LAT: 51°51'41.0924" N
LONG: 176°38'28.0845" W
NGVD 29 ELEV. 16.73'

GPS VECTOR DIAGRAM

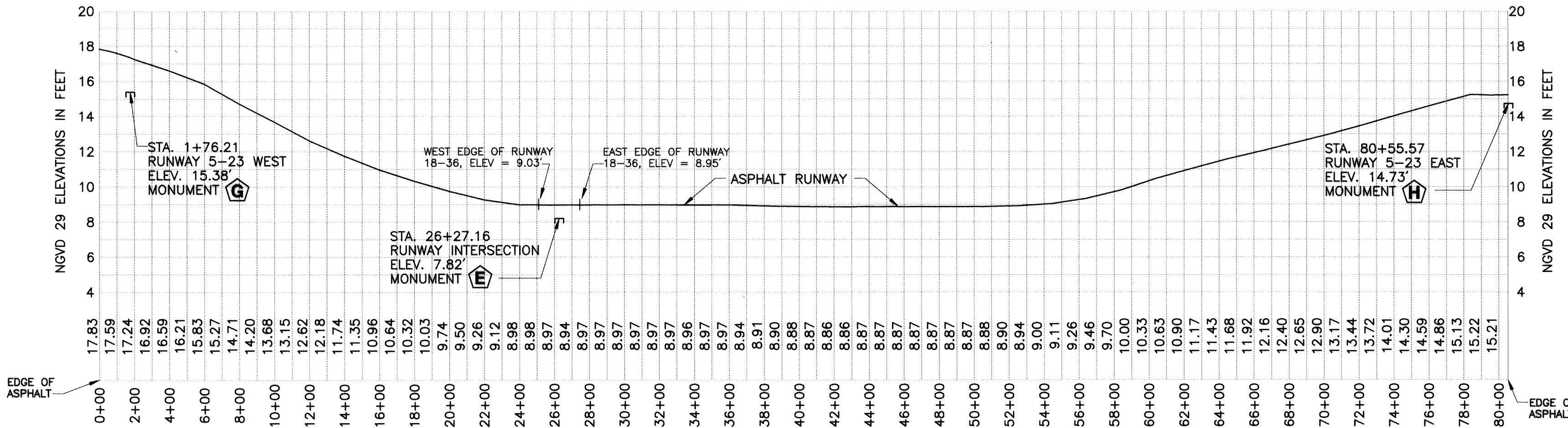
SCALE: 1" = 1000'

GPS SESSIONS FOR CORS TIES - 5 Hr. OCCUPATIONS

Oct. 31, Session 305 B:	COLD BAY	FAIRBANKS	KODIAK	BEDROCK 1
Nov. 1, Session 306 A:	COLD BAY	FAIRBANKS	KODIAK	BEDROCK 1
Nov. 5, Session 310 A:	COLD BAY	FAIRBANKS	KODIAK	BEDROCK 1

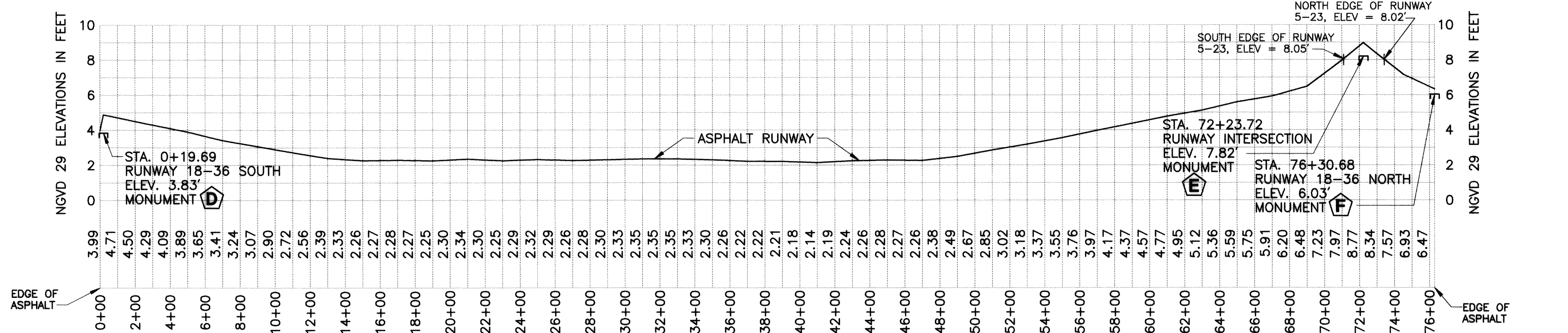
GPS SESSIONS FOR LOCAL CONTROL - 1 3/4 Hr. OCCUPATIONS

Oct. 30, Session 305 A:	BR-6	TIDAL BENCH No. 18
Oct. 31, Session 305 B:	BEDROCK 1	BR-6
Nov. 1, Session 306 A:	RUNWAY 18-36 SOUTH	TIDAL BENCH MARK No. 18
Nov. 2, Session 307 A:	RUNWAY 18-36 SOUTH	RUNWAY 18-36 NORTH
Nov. 2, Session 307 B:	RUNWAY 18-36 SOUTH	RUNWAY 5-23 WEST
Nov. 3, Session 308 A:	RUNWAY 18-36 SOUTH	RUNWAY 18-36 NORTH
Nov. 3, Session 308 B:	RUNWAY 18-36 SOUTH	RUNWAY 5-23 WEST
Nov. 4, Session 309 A:	RUNWAY 18-36 SOUTH	RUNWAY 5-23 EAST
Nov. 5, Session 310 A:	RUNWAY 5-23 EAST	TIDAL BENCH MARK No. 18
		BEDROCK 1



RUNWAY 5-23 CENTERLINE PROFILE (West to East)

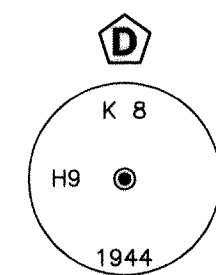
HORIZ. SCALE: 1" = 500' VERT. SCALE: 1" = 5'



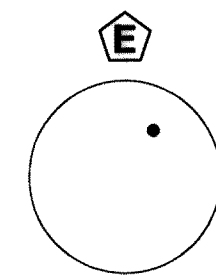
RUNWAY 18-36 CENTERLINE PROFILE (South to North)

HORIZ. SCALE: 1" = 500' VERT. SCALE: 1" = 5'

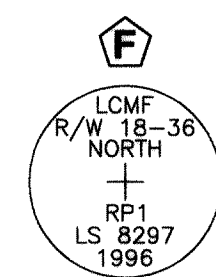
CAP MARKINGS



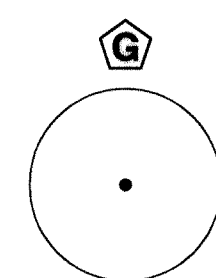
MONUMENT: RUNWAY 18-36 SOUTH
FOUND 2 1/8" BRASS SHELL CASING
MONUMENT, 1.0' BELOW RIM OF IRON
MONUMENT CASING, SET FLUSH IN 1.6'
SQUARE CONCRETE PAD, FLUSH WITH
ASPHALT AT SOUTHERLY END OF
RUNWAY 18-36.



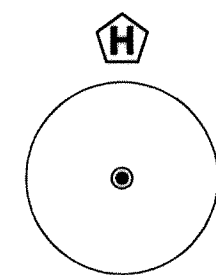
MONUMENT: RUNWAY INTERSECTION
FOUND 2 3/8" BRASS MONUMENT WITH
PUNCH MARK, NO VISIBLE STAMPING, 1.1'
BELOW RIM OF IRON MONUMENT CASING,
SET FLUSH IN ASPHALT AT INTERSECTION
OF RUNWAYS 5-23 AND 18-36.



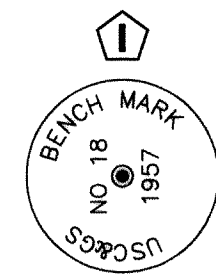
MONUMENT: RUNWAY 18-36 NORTH
SET 2" ALUMINUM CAP MONUMENT,
0.2' BELOW GROUND IN GRAVEL, 0.3'
NORTHERLY OF NORTHERLY EDGE OF
ASPHALT RUNWAY, 0.4' BELOW TOP
OF ASPHALT AT NORTH END RUNWAY
18-36.



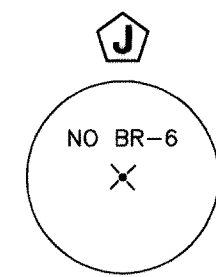
MONUMENT: RUNWAY 5-23 WEST
FOUND 2 3/8" BRASS MONUMENT WITH
PUNCH MARK, NO VISIBLE STAMPING,
2.0' BELOW RIM OF IRON MONUMENT
CASING, SET FLUSH IN 1.6' SQUARE
CONCRETE PAD, FLUSH WITH ASPHALT.



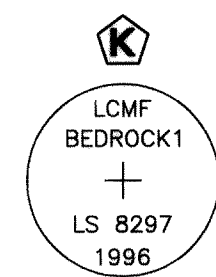
MONUMENT: RUNWAY 5-23 EAST
FOUND 2 1/8" BRASS SHELL CASING
MONUMENT, NO VISIBLE STAMPING, 0.6'
BELOW RIM OF IRON MONUMENT CASING,
SET FLUSH IN 1.6' SQUARE CONCRETE
PAD, FLUSH IN ASPHALT AT EASTERLY
END OF RUNWAY 5-23.



MONUMENT: TIDAL BENCH MARK No. 18
FOUND 3 1/2" BRASS CAP MONUMENT,
FLUSH IN SOUTHWEST CORNER OF
CONCRETE PAD THAT WAS A BASE FOR
A FIRE HYDRANT, WHICH HAS BEEN
REMOVED, MANHOLE EXISTS AS STATED.
REFERENCE NGS DATABASE MONUMENT,
PID UW7919 AND NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION, NATIONAL
OCEAN SERVICE TIDAL BENCH MARK SHEET
946-1380 DATED 8/15/94.



MONUMENT: BR-6
FOUND 3 1/4" ALUMINUM CAP MONUMENT,
FLUSH IN 7 1/4" CONCRETE POST,
WHICH PROJECTS 0.4' ABOVE GROUND.
REFERENCE NGS DATABASE MONUMENT
PID UW7916. NOTE: THIS STATION REFERED
TO AS "B S 6" IN NGS DATA BASE.



MONUMENT: BEDROCK 1
SET 3 1/2" BRASS CAP MONUMENT,
FLUSH IN BEDROCK ON HIGHEST
POINT OF 50' HIGH GRAFFITI COVERED
ROCK HILL, ±250' EAST OF AIRPORT
FIRE STATION BUILDING 800'
SOUTHEASTERLY OF AIRPORT TOWER.

FEDERAL AVIATION ADMINISTRATION

RECORD OF SURVEY
of
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F.A.A. CERTIFICATIONLocated in Sections 1, 2, 3, 10, 11, 14 and 15, Township
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SURVEY DATE: Nov. 5, 1996 SHEET: 2 of 2

SCALE: AS SHOWN W.O. No: 96-236