
APPENDIX C

FACILITY REQUIREMENTS

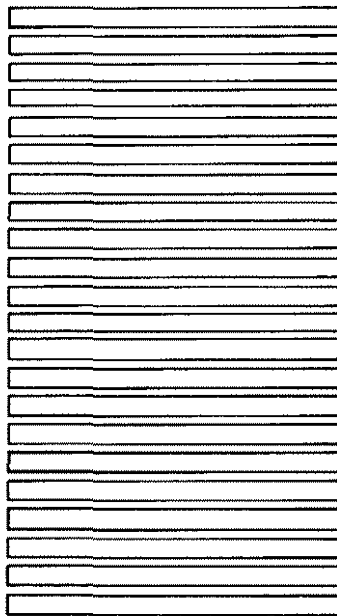
Airplane Characteristics

Airport Layout Plan (1999)

FAA Aeronautical Study #01-AAL-226-NRA

Airplane Characteristics

727
AIRPLANE
CHARACTERISTICS
AIRPORT PLANNING



BOEING
COMMERCIAL AIRPLANE COMPANY
(A DIVISION OF THE BOEING COMPANY)

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727 AIRPLANE CHARACTERISTICS

REVISIONS					
Page	Date	Page	Date	Page	Date
Original 1 to 108	February 1969	41	June 1978	88	December 1972
Rev. 1 1 to 144	December 1972	42	June 1978	89	February 1969
Rev. 2 1 to 108	June 1978	43	June 1978	90	June 1978
Rev. C	April 1985	44	June 1978	91	June 1978
1	February 1969	45	June 1978	92	June 1978
2	June 1978	46	June 1978	93	June 1978
3	June 1978	47	June 1978	94	June 1978
4	June 1978	48	June 1978	95	June 1978
5	June 1978	49	June 1978	96	June 1978
6	Blank	50	June 1978	97	June 1978
7	February 1969	51	June 1978	98	June 1978
8	December 1972	52	June 1978	99	April 1985
9	June 1978	53	June 1978	100	April 1985
10	June 1978	54	Blank	101	April 1985
11	June 1978	55	June 1978	102	April 1985
12	June 1978	56	June 1978	103	April 1985
13	June 1978	57	February 1969	104	April 1985
14	June 1978	58	February 1969	105	April 1985
15	June 1978	59	June 1978	106	April 1985
16	June 1978	60	June 1978	107	April 1985
17	June 1978	61	June 1978	108	April 1985
18	June 1978	62	June 1978	109	April 1985
19	December 1972	63	June 1978	110	April 1985
20	June 1978	64	June 1978	111	April 1985
21	June 1978	65	June 1978	112	April 1985
22	June 1978	66	June 1978	113	April 1985
23	June 1978	67	February 1969	114	April 1985
24	June 1978	68	February 1969	115	April 1985
25	June 1978	69	February 1969	116	April 1985
26	June 1978	70	June 1978	117	April 1985
27	February 1969	71	June 1978	118	April 1985
28	February 1969	72	June 1978	119	April 1985
29	June 1978	73	June 1978	120	April 1985
30	June 1978	74	December 1972	121	April 1985
31	June 1978	75	June 1978	122	April 1985
32	June 1978	76	June 1978	123	April 1985
33	June 1978	77	June 1978	124	April 1985
34	June 1978	78	June 1978	125	April 1985
35	June 1978	79	June 1978	126	April 1985
36	June 1978	80	June 1978	127	April 1985
37	June 1978	81	June 1978	128	April 1985
38	June 1978	82	June 1978	129	April 1985
39	June 1978	83	June 1978	130	April 1985
40	June 1978	84	June 1978	131	April 1985
		85	June 1978	132	April 1985
		86	December 1972	133	December 1972
		87	December 1972	134	June 1978

727 AIRPLANE CHARACTERISTICS

REVISIONS					
Page	Date	Page	Date	Page	Date
135	December 1972				
136	Blank				
137	June 1978				
138	Blank				
139	June 1978				
140	Blank				
141	June 1978				
142	Blank				
143	June 1978				
144	Blank				
145	June 1978				
146	Blank				
147	June 1978				
148	Blank				
149	June 1978				
150	Blank				
151	June 1978				
152	Blank				
153	June 1978				
154	Blank				
155	June 1978				

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		727-100C*		
CHARACTERISTIC		PRIMARY**	ALT. I**	ALT. II**
MAXIMUM RAMP WEIGHT	LB	161,000	161,000	170,000
	KG	73,100	73,100	77,200
MAXIMUM FLIGHT WEIGHT	LB	160,000	160,000	169,000
	KG	72,600	72,600	76,700
MAXIMUM LANDING WEIGHT	LB	137,500	140,000	142,500
	KG	62,400	63,600	64,700
ZERO FUEL WEIGHT	LB	123,500	123,500	132,000
	KG	56,100	56,100	59,900
OPERATING EMPTY WEIGHT (SPEC.)	LB	91,100	91,100	91,100
	KG	41,400	41,400	41,400
MAXIMUM STRUCTURAL PAYLOAD***	LB	32,400	32,400	40,900
	KG	14,700	14,700	18,600
SEATING CAPACITY SEE PAGE 15	TYPICAL MIXED		106 (16 FIRST CLASS, 90 TOURIST)	
	TYPICAL TOURIST		125 (ALL TOURIST)	
	CERTIFICATED FOR 131 (EXIT LIMIT 131)			
CARGO VOLUME-- UPPER DECK SEE PAGES 16 & 17	CU FT (CU M)	725 (20.53) 70 PASSENGERS, 2 PALLETS		
		1091 (30.90) 56 PASSENGERS, 3 PALLETS		
		1457 (41.26) 52 PASSENGERS, 4 PALLETS		
		2921 (82.7) EIGHT 108-IN. PALLETS		
		3,278 (92.8) EIGHT 125-IN. PALLETS		
CARGO VOLUME-- LOWER DECK SEE PAGE 22	CU FT	890		
	CU M	25		
MAXIMUM TOTAL CARGO VOLUME	CU FT	4,168		
	CU M	118		
USABLE FUEL CAPACITY-- BASIC	U.S. GAL	7,680		
	L	29,069		
	LB	51,460		
	KG	23,360		
USABLE FUEL CAPACITY-- OPTIONAL	U.S. GAL	-		
	L	-		
	LB	-		
	KG	-		

* REFERENCE DATA; NO LONGER IN PRODUCTION

** OPERATIONAL MODES WITH DIFFERENT CG RANGES

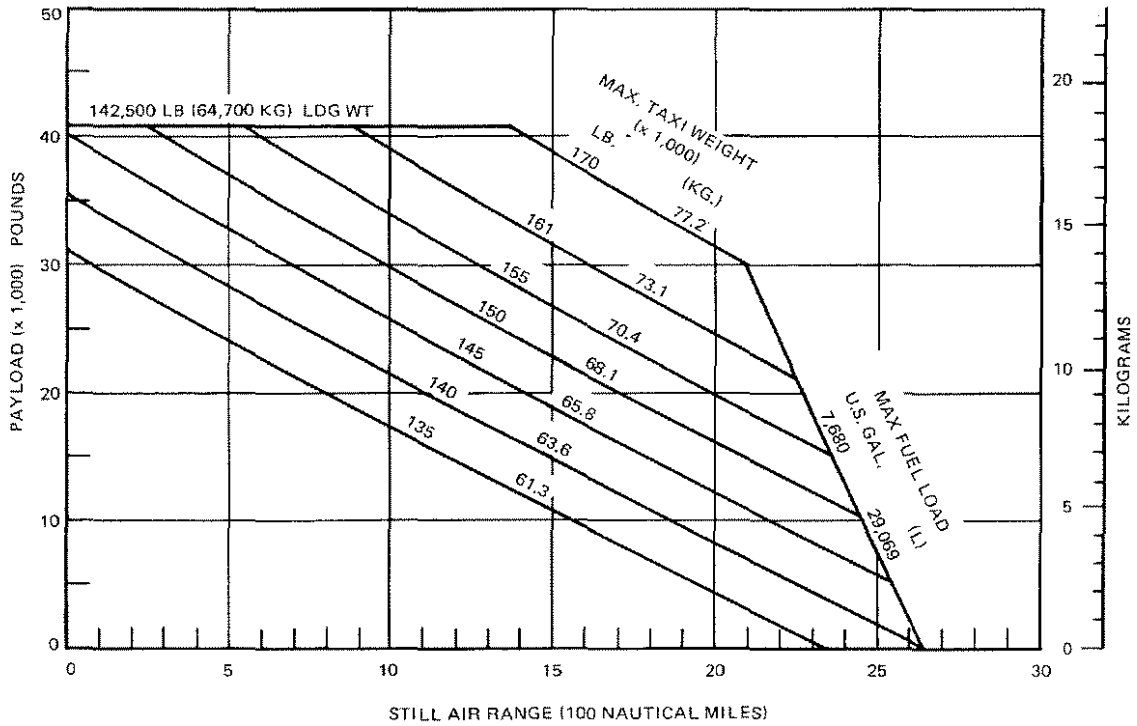
*** MAY BE LESS IF MAXIMUM LANDING WEIGHT LIMITATIONS OCCUR DUE TO FUEL RESERVES

NOTE: CONSULT USING AIRLINE FOR SPECIFIC DATA.

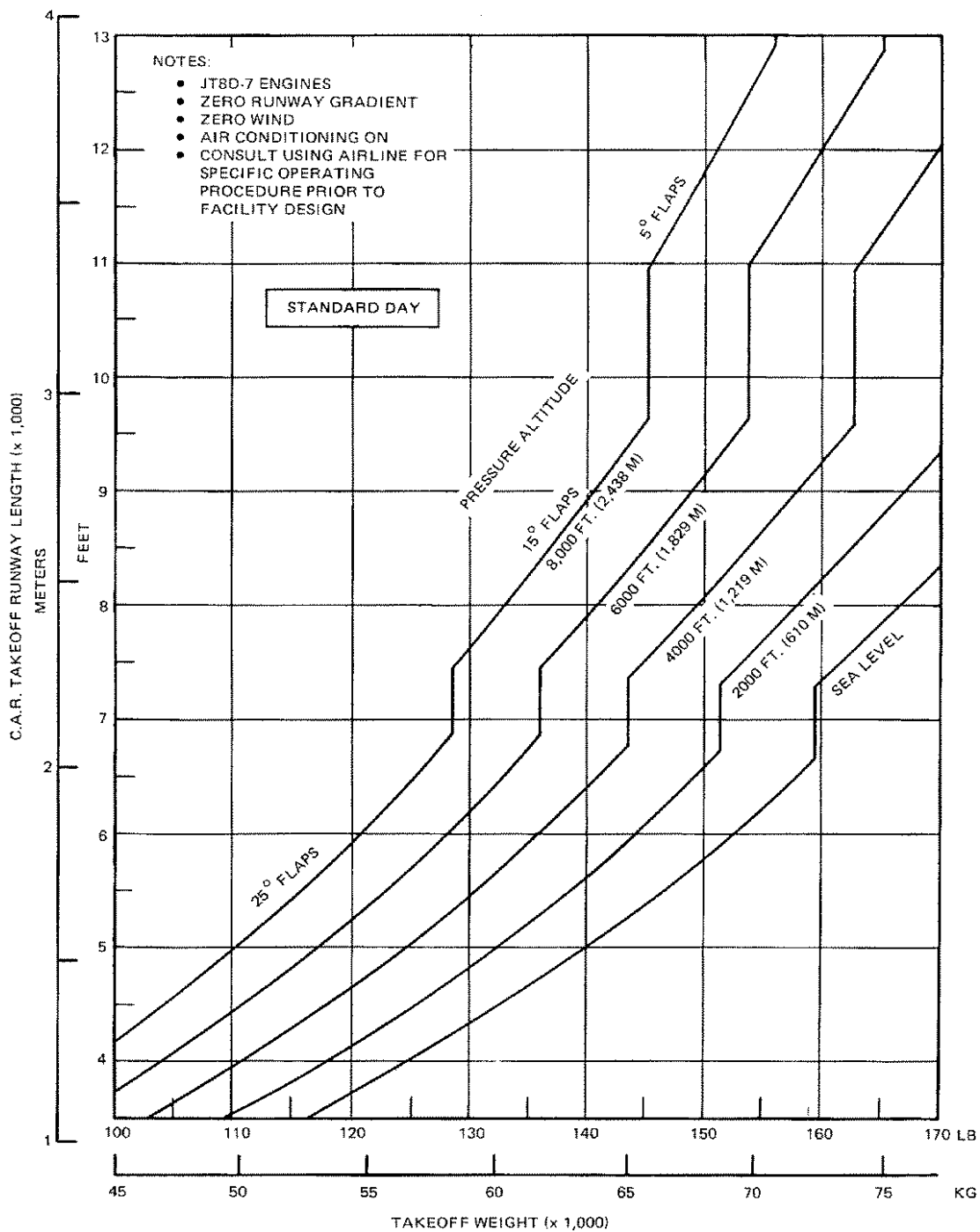
GENERAL CHARACTERISTICS
MODEL 727-100C (CONVERTIBLE)

NOTES

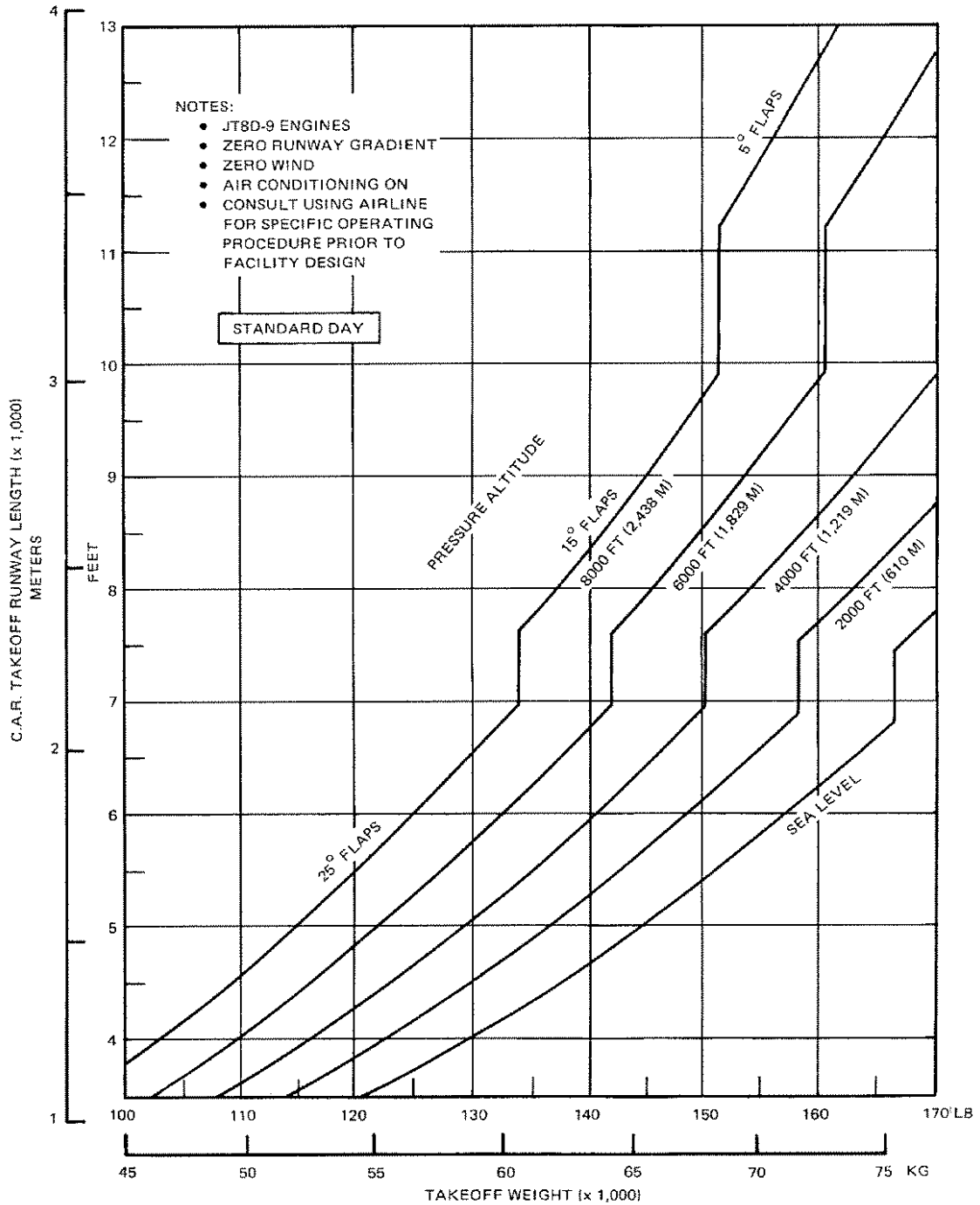
- CARGO CONFIGURATION
- TYPICAL AIRLINE OEW 88,500 LB (40,180 KG)
- LRC AT 30,000 AND 35,000 FT (9,140 AND 10,670 M)
- ATA DOMESTIC RESERVES
- JT8D-7 OR -9 ENGINES
- STANDARD DAY
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN



PAYLOAD/RANGE FOR LONG-RANGE CRUISE—(JT8D-7 OR -9 ENGINES)
MODEL 727-100C CARGO CONFIGURATION



**3.2 C.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS—(JT8D-7 ENGINES)—STANDARD DAY
 MODELS 727-100, -100C**

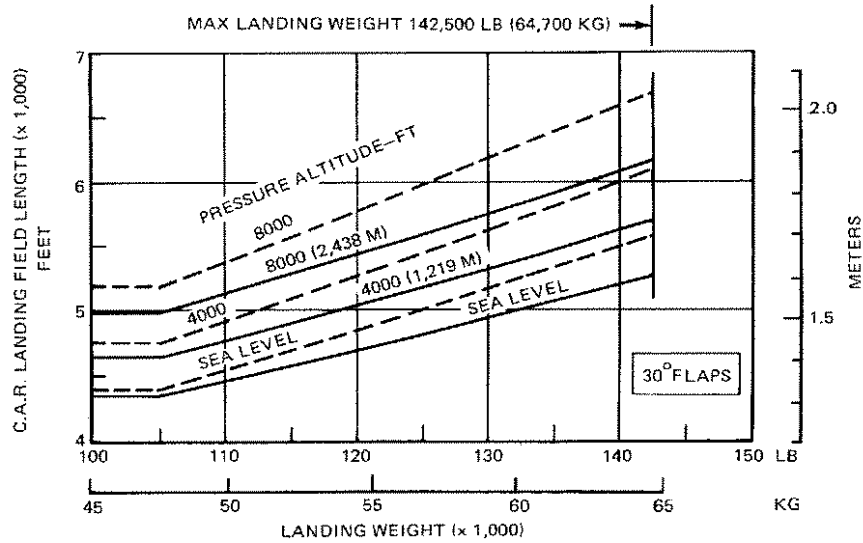
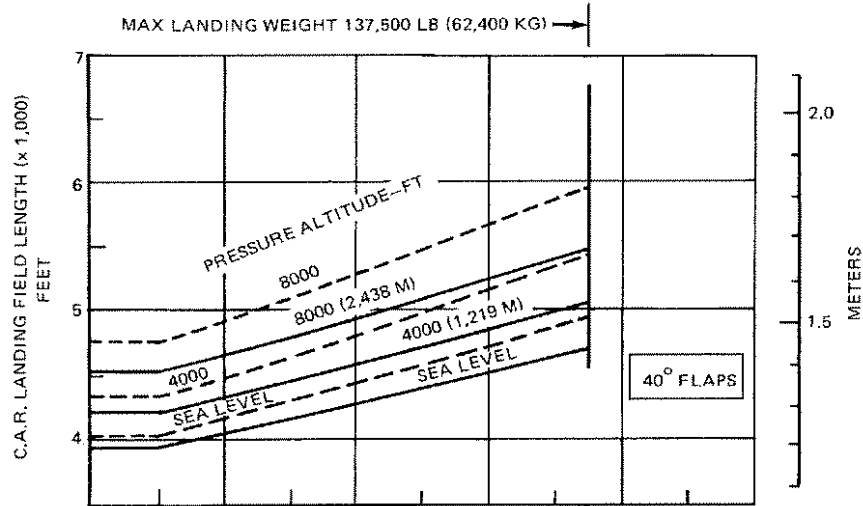


**C.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS—(JT8D-9 ENGINES)—STANDARD DAY
MODELS 727-100, -100C**

NOTES:

- NOSE BRAKES ON
- MK II ANTI-SKID
- MANUAL SPOILERS
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN
- ZERO WIND
- ZERO SLOPE

— DRY RUNWAY
 - - - WET RUNWAY



3.3 C.A.R. LANDING RUNWAY REQUIREMENTS—30° AND 40° FLAPS
 MODEL 727-100, -100C



737

Airplane Characteristics for Airport Planning



Boeing Commercial Airplanes

**737 AIRPLANE CHARACTERISTICS
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CHARACTERISTICS	UNITS	MODEL ADVANCED 737-200C, -200QC				
MAX DESIGN TAXI WEIGHT	POUNDS	116,000	117,500	120,000	125,000	128,600
	KILOGRAMS	52,617	53,298	54,432	56,700	58,333
MAX DESIGN TAKEOFF WEIGHT	POUNDS	115,500	117,000	119,500	124,500	128,100
	KILOGRAMS	52,390	53,071	54,205	56,473	58,106
MAX DESIGN LANDING WEIGHT	POUNDS	103,000	105,000	105,000	107,000	107,000
	KILOGRAMS	46,720	47,628	47,628	48,535	48,535
MAX DESIGN ZERO FUEL WEIGHT	POUNDS	95,000	96,500	95,000	99,000	99,000
	KILOGRAMS	43,092	43,772	43,092	44,906	44,906
OPERATING EMPTY WEIGHT (1)	POUNDS	65,700	69,800	66,500	67,000	65,700
	KILOGRAMS	29,801	31,661	30,164	30,391	29,801
MAX STRUCTURAL PAYLOAD	POUNDS	29,300	26,700	28,500	32,000	33,300
	KILOGRAMS	13,290	12,111	12,928	14,515	15,105
SEATING CAPACITY (2)	TWO-CLASS	102: 14 FIRST CLASS AND 88 ECONOMY				
	ALL-ECONOMY	93 AT FIVE ABREAST, OR 130 AT SIX ABREAST; FAA EXIT LIMIT: 136				
MAX CARGO VOLUME - MAIN DECK (3)	CUBIC FEET	2,760	2,760	2,760	2,760	2,760
	CUBIC METERS	78.2	78.2	78.2	78.2	78.2
MAX CARGO VOLUME - LOWER DECK	CUBIC FEET	875	875	875	875	875
	CUBIC METERS	24.8	24.8	24.8	24.8	24.8
USABLE FUEL	US GALLONS	5,160	5,160	5,160	5,160	5,160
	LITERS	19,531	19,531	19,531	19,531	19,531
	POUNDS	34,572	34,572	34,572	34,572	34,572
	KILOGRAMS	15,682	15,682	15,682	15,682	15,682

- NOTES: (1) OPERATING EMPTY WEIGHT FOR BASELINE MIXED CLASS CONFIGURATION. CONSULT WITH AIRLINE FOR SPECIFIC WEIGHTS AND CONFIGURATIONS.
(2) AIRPLANE IN ALL-PASSENGER CONFIGURATION
(3) AIRPLANE IN ALL-CARGO CONFIGURATION, SEVEN PALLETS 88 x 125 IN (2.24 x 3.18 M) EACH

2.1.5 GENERAL CHARACTERISTICS
MODEL ADVANCED 737-200C, -200QC

CHARACTERISTICS	UNITS	MODEL 737-400					
		CFM56-3B2 ENGINES (22,000 LB SLST)			CFM56-3C ENGINES (23,500 LB SLST)		
MAX DESIGN	POUNDS	139,000	143,000	150,500	143,000	144,000	150,500
TAXI WEIGHT	KILOGRAMS	63,049	64,864	68,266	64,864	65,317	68,266
MAX DESIGN	POUNDS	138,500	142,500	150,000	142,500	143,500	150,000
TAKEOFF WEIGHT	KILOGRAMS	62,823	64,637	68,039	64,637	65,091	68,039
MAX DESIGN	POUNDS	121,000	121,000	124,000	124,000	124,000	124,000
LANDING WEIGHT	KILOGRAMS	54,885	54,885	56,246	56,246	56,246	56,246
MAX DESIGN	POUNDS	113,000	113,000	117,000	117,000	117,000	117,000
ZERO FUEL WEIGHT	KILOGRAMS	51,256	51,256	53,070	53,070	53,070	53,070
OPERATING	POUNDS	73,170	73,170	73,170	74,170	74,170	74,170
EMPTY WEIGHT (1)	KILOGRAMS	33,189	33,189	33,189	33,643	33,643	33,643
MAX STRUCTURAL	POUNDS	39,830	39,830	43,830	42,830	42,830	42,830
PAYLOAD	KILOGRAMS	18,067	18,067	19,881	19,427	19,427	19,427
SEATING CAPACITY	TWO-CLASS	146: 8 FIRST CLASS AND 138 ECONOMY					
	ALL-ECONOMY	159 AT SIX ABREAST; FAA EXIT LIMIT: 189					
MAX CARGO VOLUME	CUBIC FEET	1,373	1,234 (2)	1,146 (3)	1,222 (4)	1,097 (5)	1,097 (5)
- LOWER DECK	CUBIC METERS	38.9	34.9 (2)	32.5 (3)	34.6 (4)	31.1 (5)	31.1 (5)
USABLE FUEL	US GALLONS	5,311	5,701 (2)	6,121 (3)	5,803 (4)	6,295 (5)	6,295 (5)
	LITERS	20,102	21,578 (2)	23,168 (3)	21,964 (4)	23,827 (5)	23,827 (5)
	POUNDS	35,584	38,197 (2)	41,011 (3)	38,880 (4)	42,177 (5)	42,177 (5)
	KILOGRAMS	16,141	17,326 (2)	18,602 (3)	17,636 (4)	19,131 (5)	19,131 (5)

- NOTES: (1) OPERATING EMPTY WEIGHT FOR BASELINE MIXED CLASS CONFIGURATION. CONSULT WITH AIRLINE FOR SPECIFIC WEIGHTS AND CONFIGURATIONS.
- (2) AIRPLANE WITH 390 GAL (1,475 L) AUXILIARY FUEL TANK IN AFT CARGO COMPARTMENT
- (3) AIRPLANE WITH 810 GAL (3,065 L) AUXILIARY FUEL TANK IN AFT CARGO COMPARTMENT
- (4) AIRPLANE WITH 500 GAL (1,893 L) AUXILIARY FUEL TANK IN AFT CARGO COMPARTMENT
- (5) AIRPLANE WITH 1,000 GAL (3,785 L) AUXILIARY FUEL TANK IN AFT CARGO COMPARTMENT

2.1.7 GENERAL CHARACTERISTICS
MODEL 737-400

CHARACTERISTICS	UNITS	MODEL 737-700, -700 WITH WINGLETS -700C		
MAX DESIGN TAXI WEIGHT	POUNDS	133,500	153,500	155,000
	KILOGRAMS	60,554	69,627	70,307
MAX DESIGN TAKEOFF WEIGHT	POUNDS	133,000	153,000	154,500
	KILOGRAMS	60,328	69,400	70,080
MAX DESIGN LANDING WEIGHT	POUNDS	128,000	128,000	129,200
	KILOGRAMS	58,060	58,060	58,604
MAX DESIGN ZERO FUEL WEIGHT	POUNDS	120,500	120,500	121,700
	KILOGRAMS	54,658	54,658	55,202
OPERATING EMPTY WEIGHT (1)	POUNDS	83,000	83,000	83,000
	KILOGRAMS	37,648	37,648	37,648
MAX STRUCTURAL PAYLOAD	POUNDS	37,500	37,500	38,700
	KILOGRAMS	17,010	17,010	17,554
SEATING CAPACITY (1)	TWO-CLASS	128	128	128
	ALL-ECONOMY	148	148	148
MAX CARGO - LOWER DECK	CUBIC FEET	1002	1002	1002
	CUBIC METERS	28.4	28.4	28.4
USABLE FUEL	US GALLONS	6875	6875	6875
	LITERS	26,022	26,022	26,022
	POUNDS	46,063	46,063	46,063
	KILOGRAMS	20,894	20,894	20,894

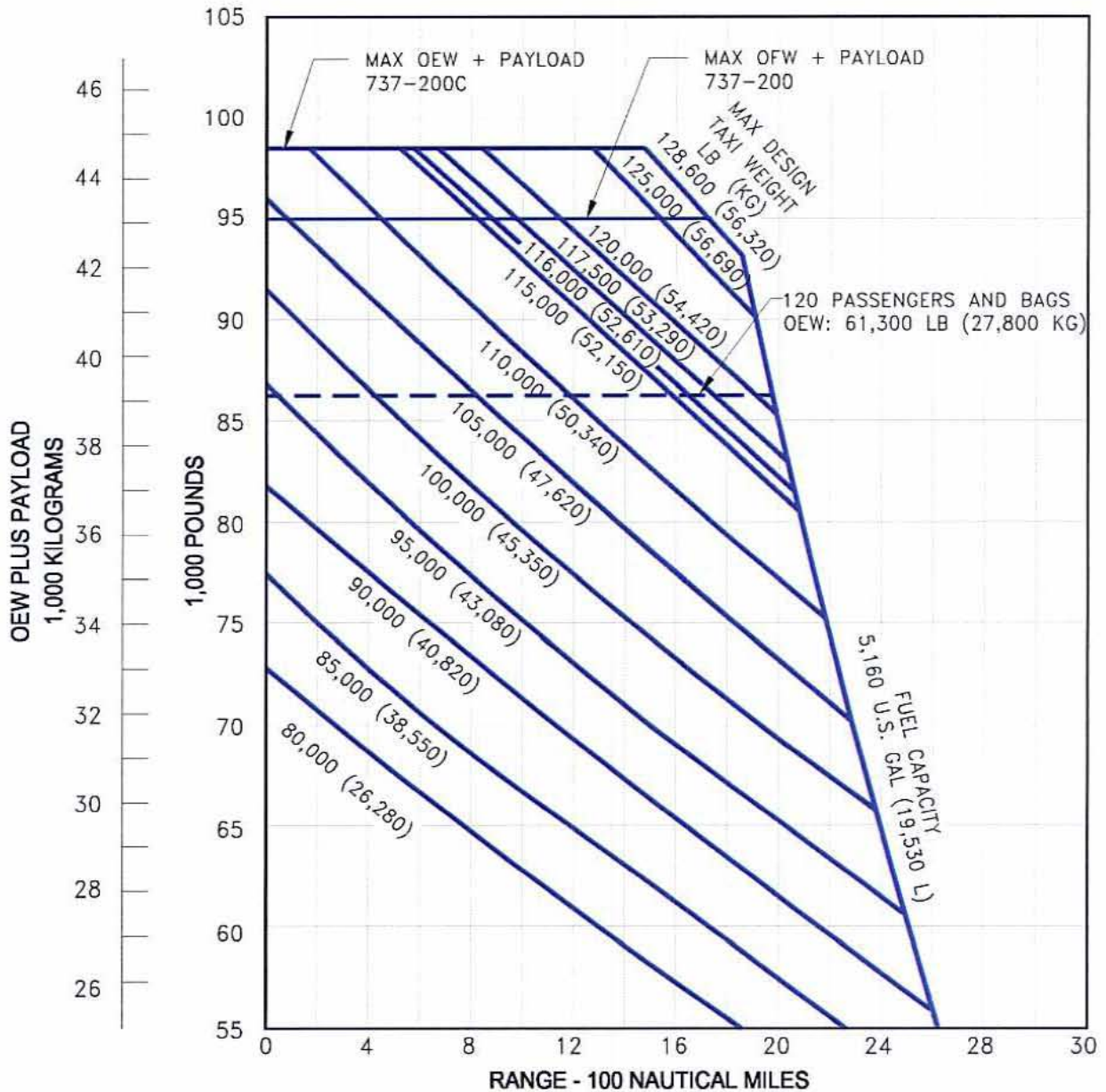
NOTE: (1) OPERATING EMPTY WEIGHT FOR BASELINE MIXED CLASS CONFIGURATION.
CONSULT WITH AIRLINE FOR SPECIFIC WEIGHTS AND CONFIGURATIONS.

2.1.10 GENERAL CHARACTERISTICS
MODEL 737-700, -700 WITH WINGLETS, -700C

D6-58325-6

NOTES:

- * DOMESTIC RESERVES
- * JT9D-15/15A ENGINES
- * STANDARD DAY, ZERO WIND
- * LRC AT 30,000 FEET (9,150 METERS)
- * CONSULT WITH USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN

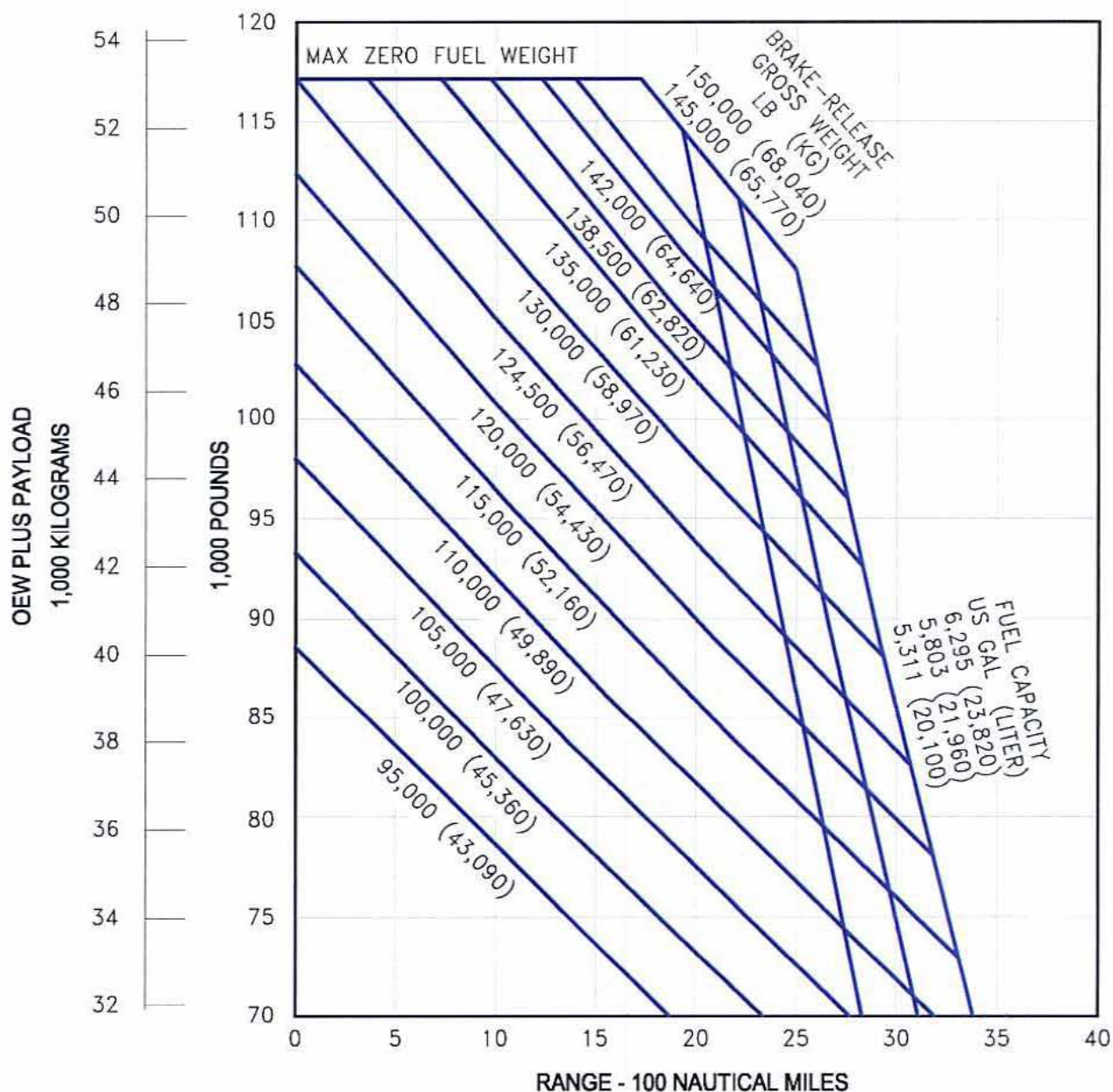


* FOR TAKEOFF WEIGHT, SUBTRACT 500 LB (227 KG) FROM TAXI WEIGHT

3.2.3 PAYLOAD/RANGE FOR LONG-RANGE CRUISE
 MODEL ADVANCED 737-200 (JT8D-15/15A ENGINES)

NOTES:

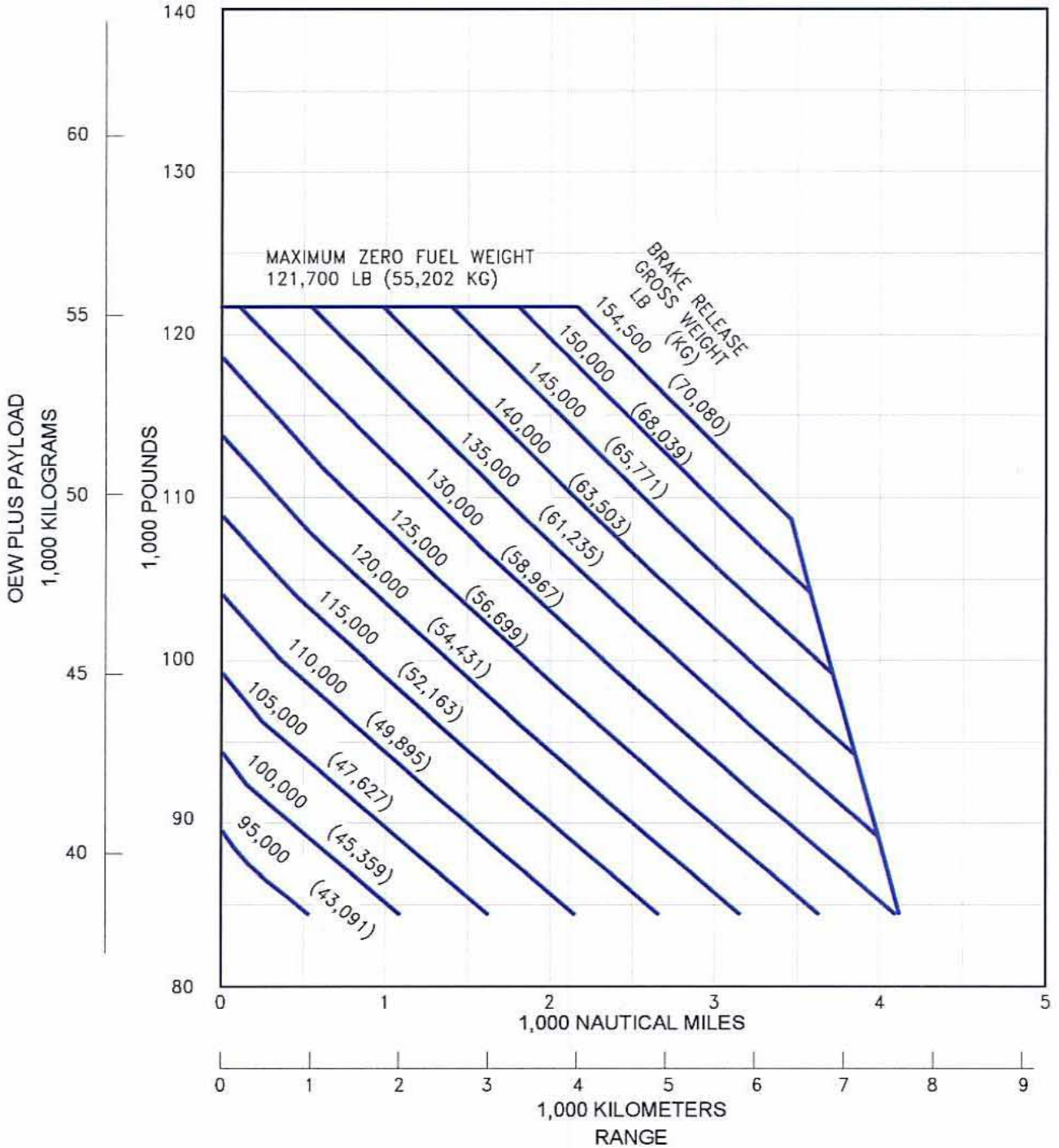
- * DOMESTIC RESERVES
- * CFM56-3B-2 OR CFM56-3C-1 ENGINES
- * STANDARD DAY, ZERO WIND
- * LRC AT 31,000/35,000 FEET
- * CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN



3.2.7 PAYLOAD/RANGE FOR LONG-RANGE CRUISE
MODEL 737-400

NOTES:

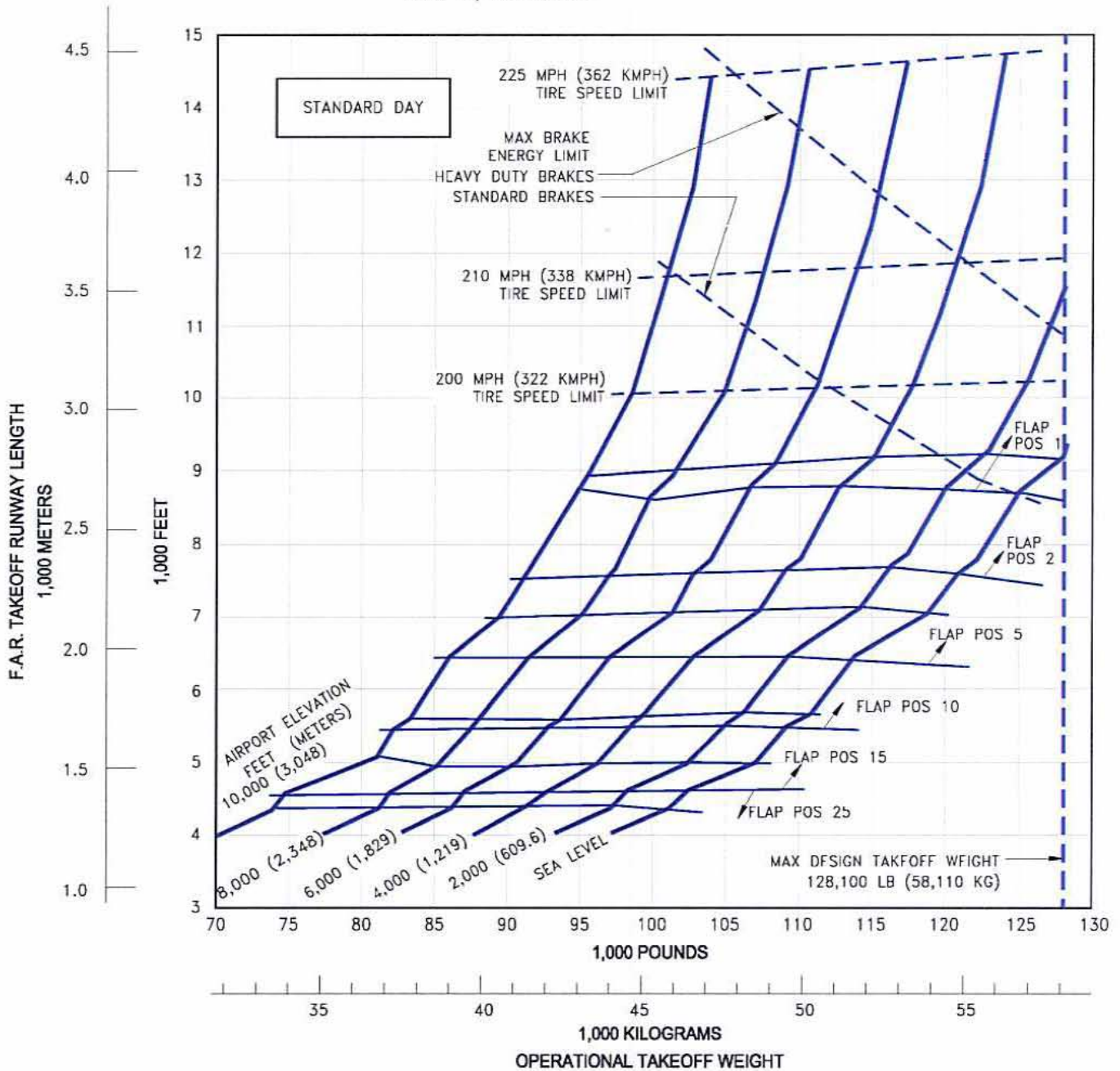
- 31-35-39,000 FT STEP CRUISE
- CRUISE MACH = LRC
- STANDARD DAY, ZERO WIND
- 200 NMI ALTERNATIVE
- TYPICAL MISSION RESERVES
- NOMINAL PERFORMANCE
- CONSULT WITH USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN



3.2.11 PAYLOAD/RANGE FOR LONG-RANGE CRUISE
 MODEL 737-700 WITH WINGLETS

NOTES:

- * NO ENGINE AIRBLEED FOR AIR CONDITIONING
- * ZERO WIND, ZERO RUNWAY GRADIENT
- * CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN
- * JT8D-15/15A ENGINFS

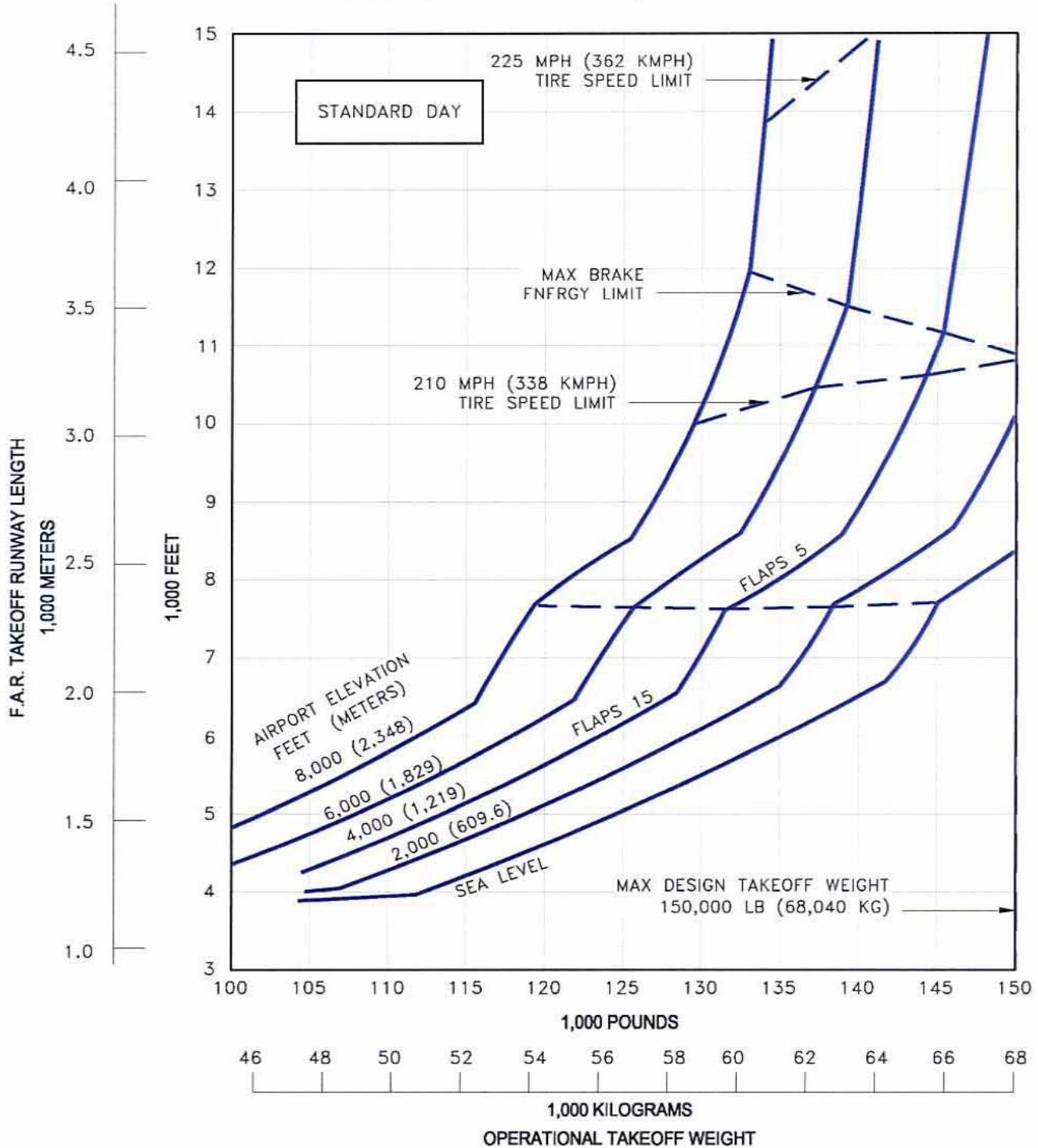


3.3.5 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS
STANDARD DAY
 MODEL ADVANCED 737-200 (JT8D-15/15A ENGINES)

D6-58325-6

NOTES:

- * NO ENGINE AIRBLEED FOR AIR CONDITIONING
- * ZERO WIND, ZERO RUNWAY GRADIENT
- * CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN
- * CFM 56-3C1 ENGINES RATED AT 23,500 LB SLST



3.3.17 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS

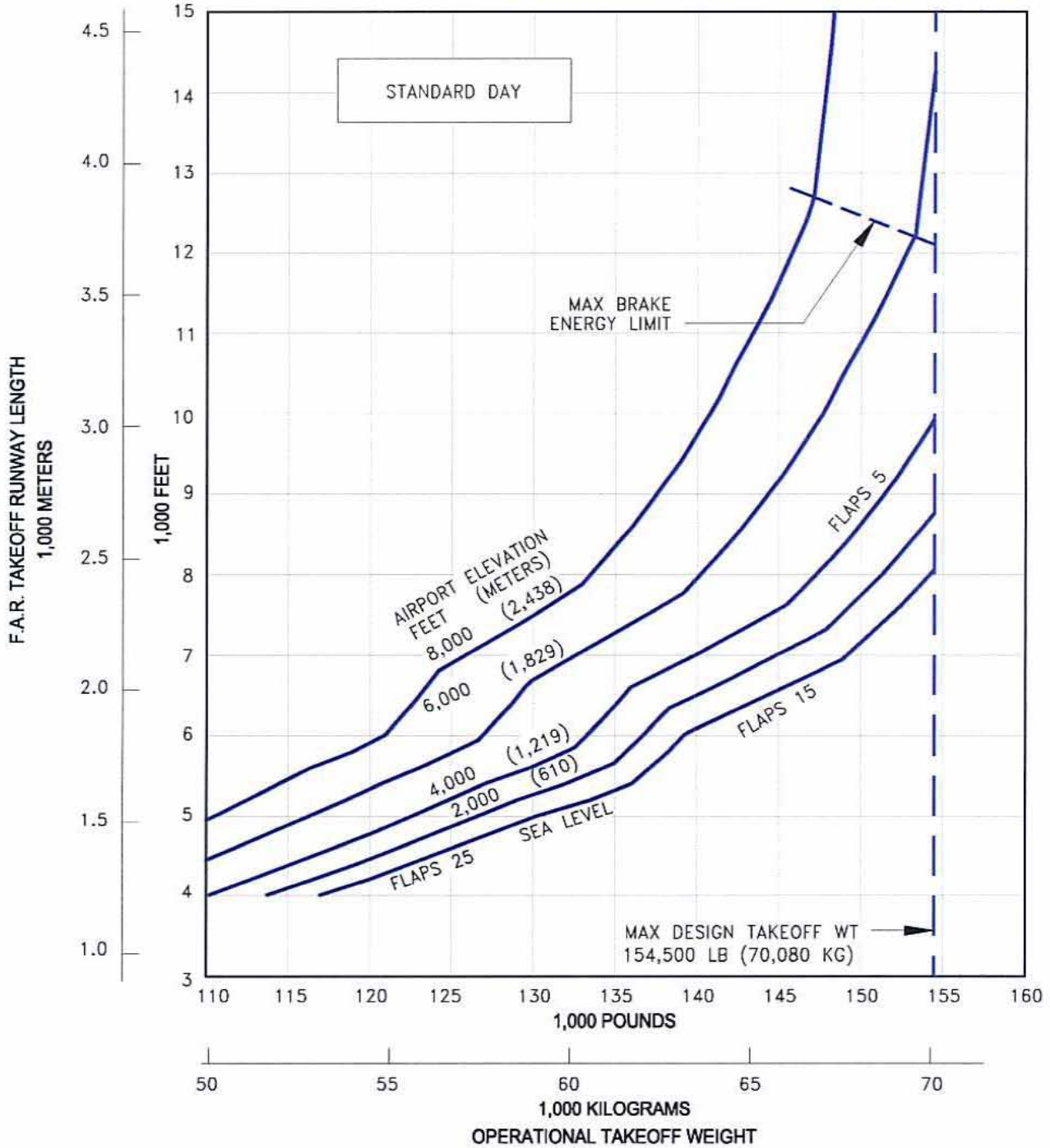
STANDARD DAY

MODEL 737-400 (CFM56-3C1 ENGINES AT 23,500 LB SLST)

D6-58325-6

NOTES:

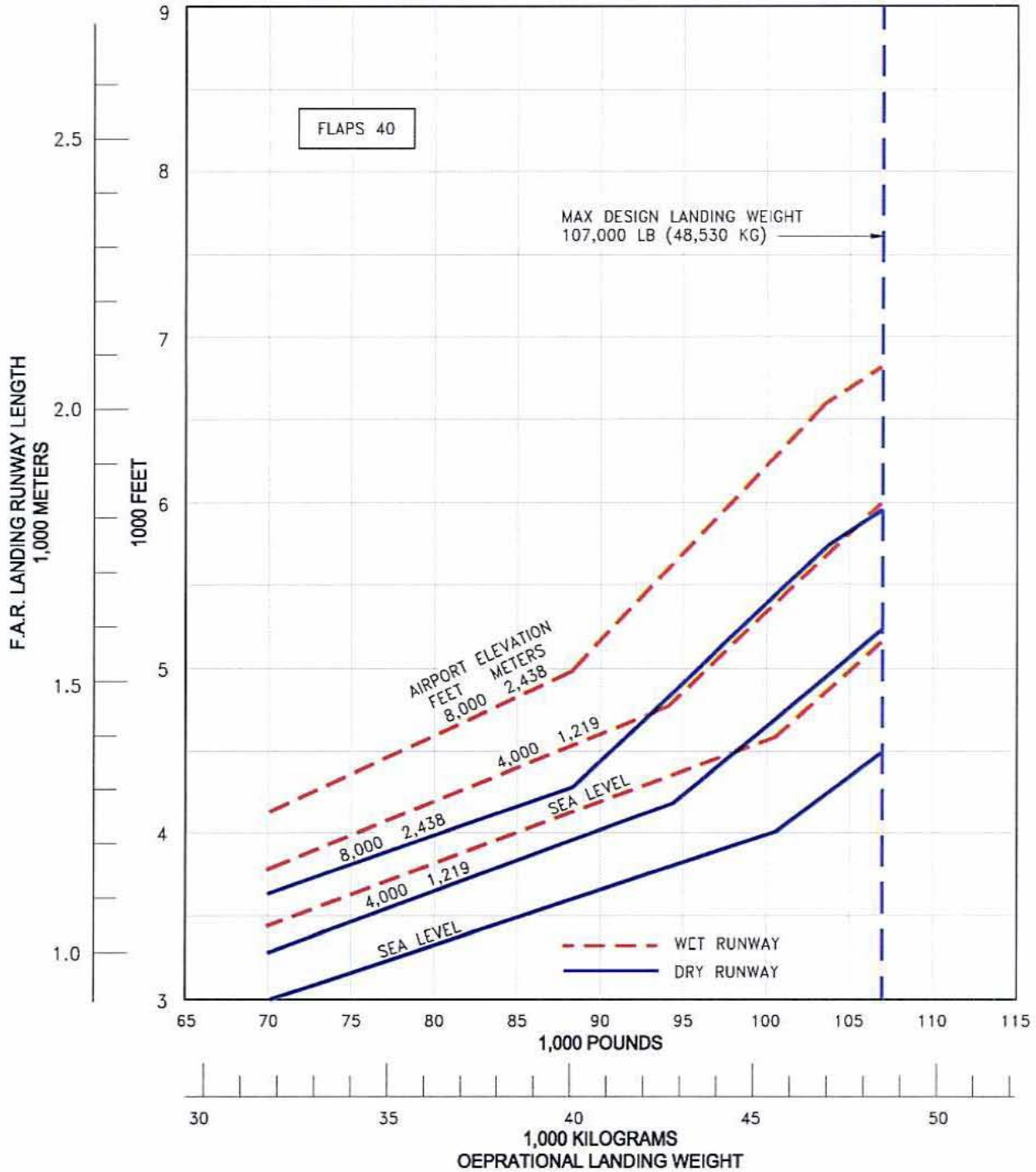
- CFM56-7B20 ENGINES RATED AT 20,600 LB SLST
- NO ENGINE AIR BLEED FOR AIR CONDITIONING
- ZERO WIND, ZERO RUNWAY GRADIENT
- DRY RUNWAY SURFACE
- CONSULT WITH USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN



3.3.39 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS
STANDARD DAY, DRY RUNWAY
MODEL 737-700 WITH WINGLETS, (CFM56-7B20 ENGINES AT 20,600 LB SLST)

NOTES:

- * $V_{APP} = 1.3V_S$
- * ZERO WIND
- * FLAP POSITION 40
- * AUTOMATIC SPEED BRAKES
- * CONSULT WITH USING AIRLINE FOR SPECIFIC PROCEDURE PRIOR TO FACILITY DESIGN



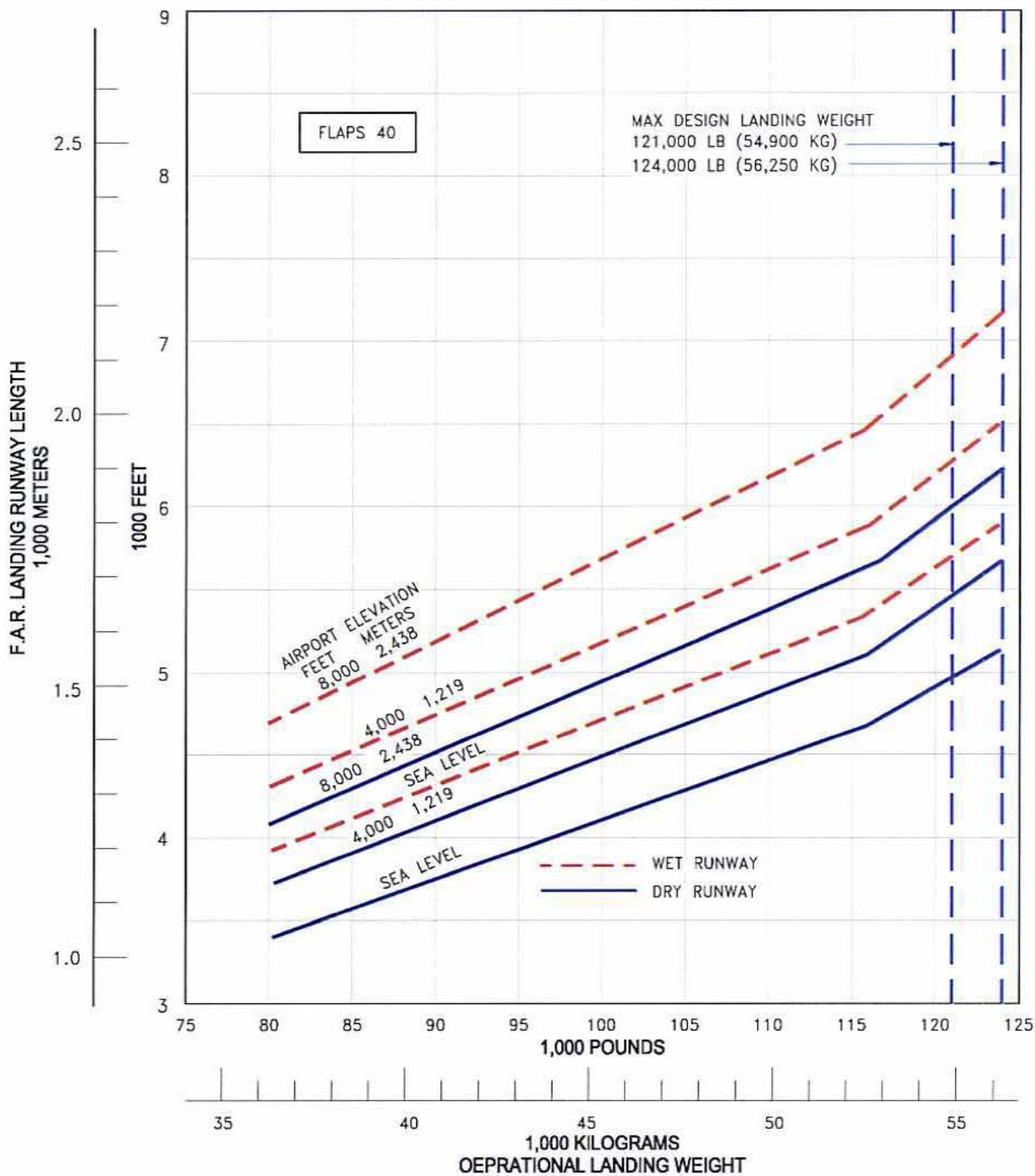
3.4.7 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 40

MODEL ADVANCED 737-200, -200C

D6-58325-6

NOTES:

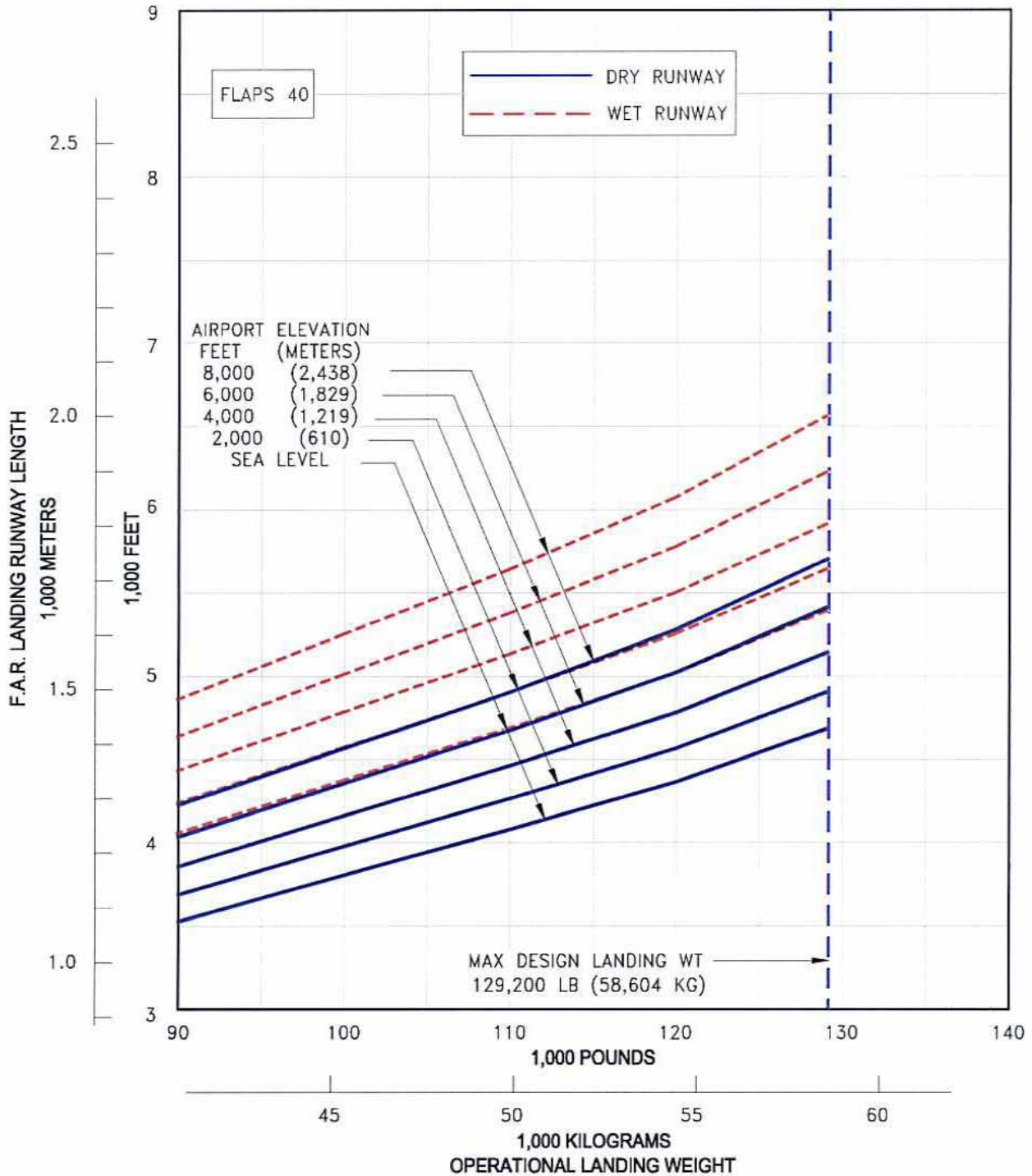
- * $V_{APP} = 1.3V_S$
- * ZERO WIND, ZERO RUNWAY GRADIENT
- * FLAP POSITION 40
- * AUTOMATIC SPEED BRAKES
- * CONSULT WITH USING AIRLINE FOR SPECIFIC PROCEDURE PRIOR TO FACILITY DESIGN



3.4.13 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 40
 MODEL 737-400

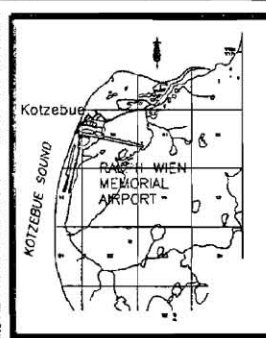
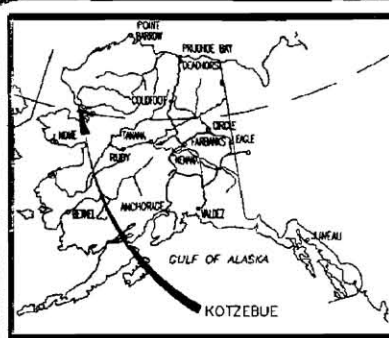
NOTES:

- STANDARD DAY
- AUTO SPOILERS OPERATIVE
- ANTI-SKID OPERATIVE
- ZERO WIND
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN



3.4.25 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 40
 MODEL 737-700 WITH WINGLETS

Airport Layout Plan (1999)



LOCATION MAP

NO SCALE

VICINITY MAP

SEC. 9, 10, 15, 16, T17N, R18W,
K.R.M., USGS KOTZEBUE (D-2) 1951

AIRPORT DATA		
	EXISTING	ULTIMATE
AIRPORT ELEVATION (MSL)	11.4'	SAME
AIRPORT REFERENCE CODE	CII/BI	CII/BI/N
MEAN HIGH TEMP. HOTTEST MONTH (JULY)	59°F	SAME
TAXIWAY LIGHTING	MITL/NONE	MITL/MITL
RAMP LIGHTING	FLOODLIGHTS	SAME
NAVIGATION AIDS	LS/DME, DF VOR, NDB, RVR	LS/DME, DF VOR, NDB, RVR, GPS
COMMUNICATION AIDS	CTAF, UNICOM, FSS	
* AIRPORT REFERENCE POINT (ARP)	LAT. 66°53'04.8"N	
R/W STA. 19+83.46, 134E.94' RT.	LONG. 162°35'53.7"W	
THRESHOLD 8: STA. 1+00	LAT. 66°53'21.6"N	SAME
	LONG. 162°36'33.3"W	SAME
THRESHOLD 26: STA. 60+00	LAT. 66°53'09.7"N	SAME
	LONG. 162°34'08.6"W	SAME
THRESHOLD 17: STA. 2+40	LAT. 66°53'06.2"N	SAME
	LONG. 162°36'33.4"W	SAME
THRESHOLD 35: STA. 40+40	LAT. 66°52'29.8"N	SAME
	LONG. 162°36'55.8"W	SAME
WATERLANE THRESHOLD 18: STA. 0+00	LAT. NONE	66°53'09.1"N
	LONG. NONE	162°36'41.9"W
WATERLANE THRESHOLD 36: STA. 25+00	LAT. NONE	66°52'45.6"N
	LONG. NONE	162°37'00.3"W

* ARP CALCULATION DOES NOT INCLUDE ULTIMATE WATERLANE.

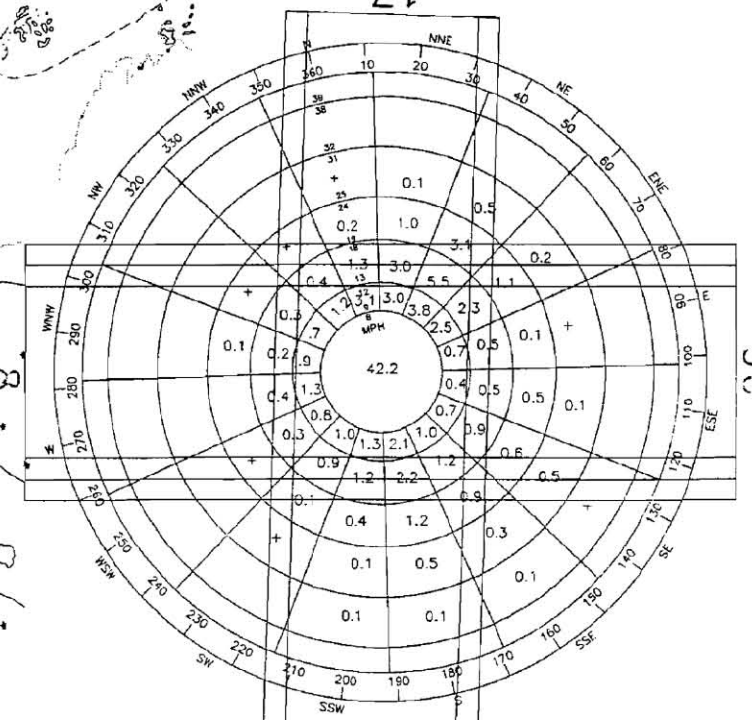
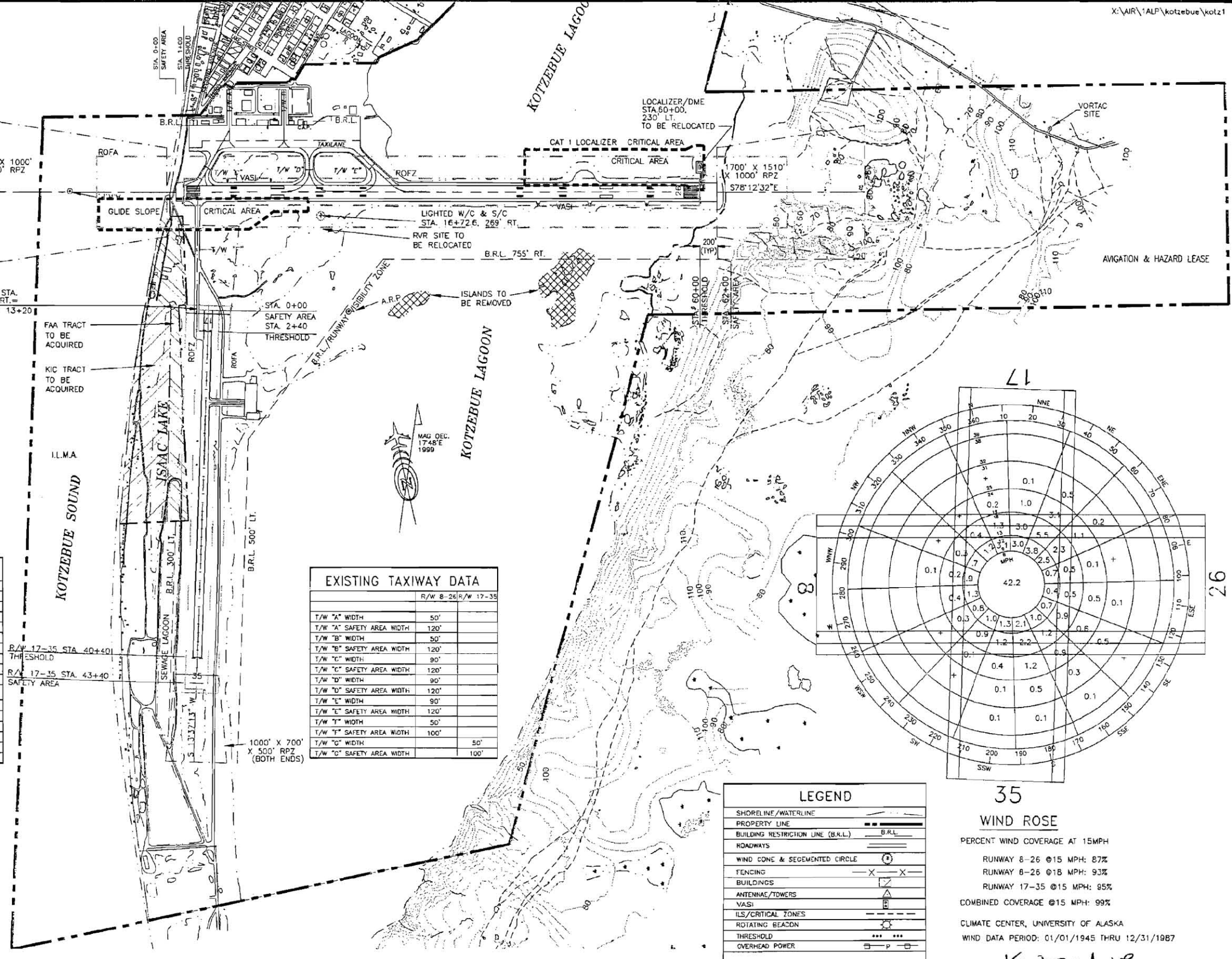
DATA BASE CONTROL YEAR: NAD 83

THE ALASKA STATE PLANE GRID BEARING FOR R/W 8-26 IS S 77°40'01" E.
THE GEODETIC COORDINATES WERE CALCULATED FROM GPS READINGS ON R/W 8-26 CENTERLINE MONUMENT AT STA. 0+00.

	RUNWAY 8-26		RUNWAY 17-35		WATERLANE 18-36	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE	EXISTING	ULTIMATE
% WIND COVERAGE	93% @ 18 MPH	SAME	95% @ 15 MPH	SAME		94% @ 12 MPH
INSTRUMENT RUNWAY	ILS	SAME	N/A	SAME		N/A
RUNWAY SURFACE TYPE	ASPHALT	SAME	GRAVEL	SAME		WATER
APPROACH VISIBILITY MINIMUM	<3/4mi & ≥1mi	<3/4mi & ≥1/2mi	≥1mi	SAME		≥1mi
PAVEMENT STRENGTH	128,000#	SAME	N/A	SAME		N/A
RUNWAY LIGHTING	HIRL	SAME	HIRL	SAME		NONE
RUNWAY MARKING	PRECISION	SAME	NONE	SAME		NONE
VISUAL APPROACH AIDS	VASI, REILS,	MALS	NONE	SAME		NONE
R/W DIMENSIONS	5000' x 150'	SAME	3800' x 90'	3800' x 75'		2500' x 100'
R/W SAFETY AREA	6300' x 212'	6300' x 500'	4340' x 100'	4400' x 150'		2500' x 200'
R/W OBJECT FREE AREA (ROFA)	7900' x 800'	SAME	4400' x 500'	SAME		2980' x 250'
R/W OBSTACLE FREE ZONE (ROFZ)	6300' x 463'	SAME	4200' x 400'	SAME		2900' x 120'
T/W WIDTH	SEE CHART	SEE CHART	SEE CHART	SEE CHART		NONE
T/W SAFETY AREA WIDTH	SEE CHART	SEE CHART	SEE CHART	SEE CHART		NONE

NONSTANDARD CONDITIONS			
ITEM	STANDARD	EXISTING	ULTIMATE
R/W 8-26			
S.A. WIDTH	500'	212'	500'
S.A. LENGTH BEYOND THRESHOLD	1000'	100'/200'	SAME
ACCESS RD. IN SAFETY AREA	NONE	YES	SAME
R/W 17-35			
S.A. LENGTH BEYOND THRESHOLD	300'	300'/240'	300'/300'
T/W S.A. WIDTHS	80'	50'/50'/80'	SEE SHEET 2
WATERLANE ACCESS ROAD	300' RT.	225' RT.	SAME
OFFSET FROM R/W 17/35 C/L			
SEWAGE LAGOON SEPARATION FROM R/W C/L	10,000'	250'	250'
ROFA	500'	150'	500'

EXISTING TAXIWAY DATA	
	R/W 8-26/R/W 17-35
T/W "A" WIDTH	50'
T/W "A" SAFETY AREA WIDTH	120'
T/W "B" WIDTH	50'
T/W "B" SAFETY AREA WIDTH	120'
T/W "C" WIDTH	90'
T/W "C" SAFETY AREA WIDTH	120'
T/W "D" WIDTH	90'
T/W "D" SAFETY AREA WIDTH	120'
T/W "E" WIDTH	90'
T/W "E" SAFETY AREA WIDTH	120'
T/W "F" WIDTH	50'
T/W "F" SAFETY AREA WIDTH	100'
T/W "G" WIDTH	50'
T/W "G" SAFETY AREA WIDTH	100'



LEGEND	
SHORELINE/WATERLINE	---
PROPERTY LINE	---
BUILDING RESTRICTION LINE (B.R.L.)	---
ROADWAYS	---
WIND CONE & SEGMENTED CIRCLE	⊙
FENCING	-X-X-
BUILDINGS	⊠
ANTENNAE/TOWERS	⊠
VASI	⊠
ILS/CRITICAL ZONES	---
ROTATING BEACON	⊙
THRESHOLD	---
OVERHEAD POWER	⊠

35
WIND ROSE
PERCENT WIND COVERAGE AT 15MPH
RUNWAY 8-26 @ 15 MPH: 87%
RUNWAY 8-26 @ 18 MPH: 93%
RUNWAY 17-35 @ 15 MPH: 95%
COMBINED COVERAGE @ 15 MPH: 99%
CLIMATE CENTER, UNIVERSITY OF ALASKA
WIND DATA PERIOD: 01/01/1945 THRU 12/31/1987

DESIGN: NP
DRAWN: CAT
CHECKED: PDM

BY	DATE	REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION - DESIGN AND ENGINEERING SERVICES
APPROVED: S/ PATRICIA D. MILLER DATE 12/3/99
PATRICIA D. MILLER, P.E. DESIGN GROUP CHIEF

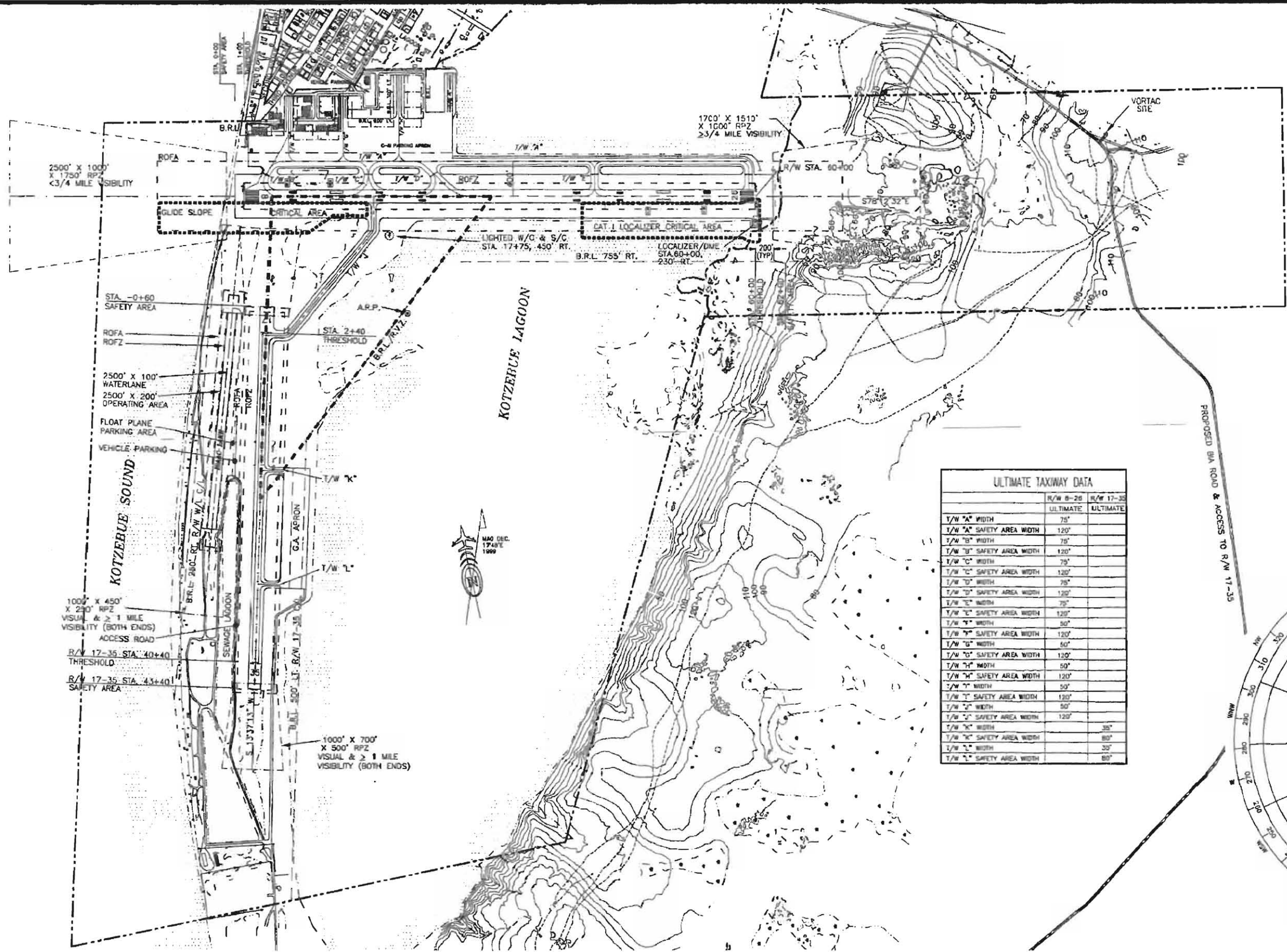
AIRPORT LAYOUT PLAN APPROVED
BY LETTER DATED: 12/15/99
Barbara J. Johnson
AIRPORTS DIVISION,
ALASKAN REGION, AAL-610
AIRSPACE REVIEW #99AAL-123NRA

NOTES
NO OFZ OBJECT PENETRATIONS.
NO THRESHOLD SITING SURFACE
OBJECT PENETRATIONS, EXCEPT FOR
RUNWAY 26, WHICH HAS PENETRATIONS
SHOWN ON SHEETS 8 AND 11.

RALPH WIEN MEMORIAL AIRPORT
KOTZEBUE, ALASKA
EXISTING
AIRPORT LAYOUT PLAN

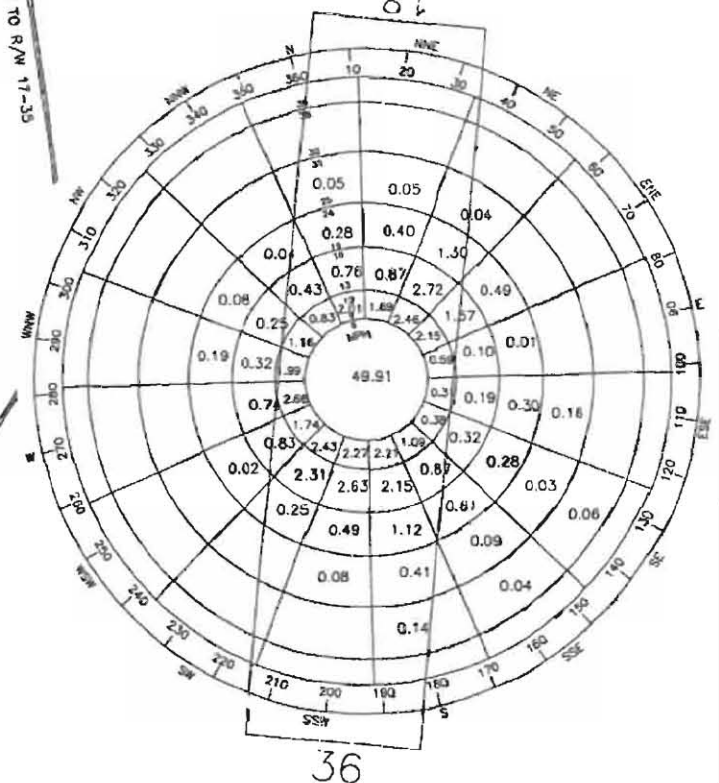
SHEET
1 OF
12

LEGEND	
SHORELINE/WATERLINE	---
PROPERTY LINE	---
BUILDING RESTRICTION LINE (B.R.L.)	---
ROADWAYS	---
WIND CONE & SEGMENTED CIRCLE	⊙
FENCING	---x---x---
BUILDINGS	⊠
ANTENNAE/TOWERS	⊙
VASI	⊙
LS/CRITICAL ZONES	---
ROTATING BEACON	⊙
THRESHOLD	---
OVERHEAD POWER	---



ULTIMATE TAXIWAY DATA		
	R/W 8-28	R/W 17-35
	ULTIMATE	ULTIMATE
T/W "A" WIDTH	75'	
T/W "A" SAFETY AREA WIDTH	120'	
T/W "B" WIDTH	75'	
T/W "B" SAFETY AREA WIDTH	120'	
T/W "C" WIDTH	75'	
T/W "C" SAFETY AREA WIDTH	120'	
T/W "D" WIDTH	75'	
T/W "D" SAFETY AREA WIDTH	120'	
T/W "E" WIDTH	75'	
T/W "E" SAFETY AREA WIDTH	120'	
T/W "F" WIDTH	50'	
T/W "F" SAFETY AREA WIDTH	120'	
T/W "G" WIDTH	50'	
T/W "G" SAFETY AREA WIDTH	120'	
T/W "H" WIDTH	50'	
T/W "H" SAFETY AREA WIDTH	120'	
T/W "I" WIDTH	50'	
T/W "I" SAFETY AREA WIDTH	120'	
T/W "J" WIDTH	50'	
T/W "J" SAFETY AREA WIDTH	120'	
T/W "K" WIDTH	35'	
T/W "K" SAFETY AREA WIDTH	80'	
T/W "L" WIDTH	35'	
T/W "L" SAFETY AREA WIDTH	80'	

WIND ROSE
 PERCENT WIND COVERAGE AT 12MPH
 RUNWAY 18-36: 94%
 CLIMATE CENTER, UNIVERSITY OF ALASKA
 WIND DATA PERIOD: 01/01/1945 THRU 12/31/1987
 JUNE THROUGH SEPTEMBER ONLY



DESIGN_MDH	
DRAWN_EJM	
CHECKED_RFA	
EJM	3/25/05
BY	DATE
ADDED SAND STORAGE BLDG.	
REVISIONS	

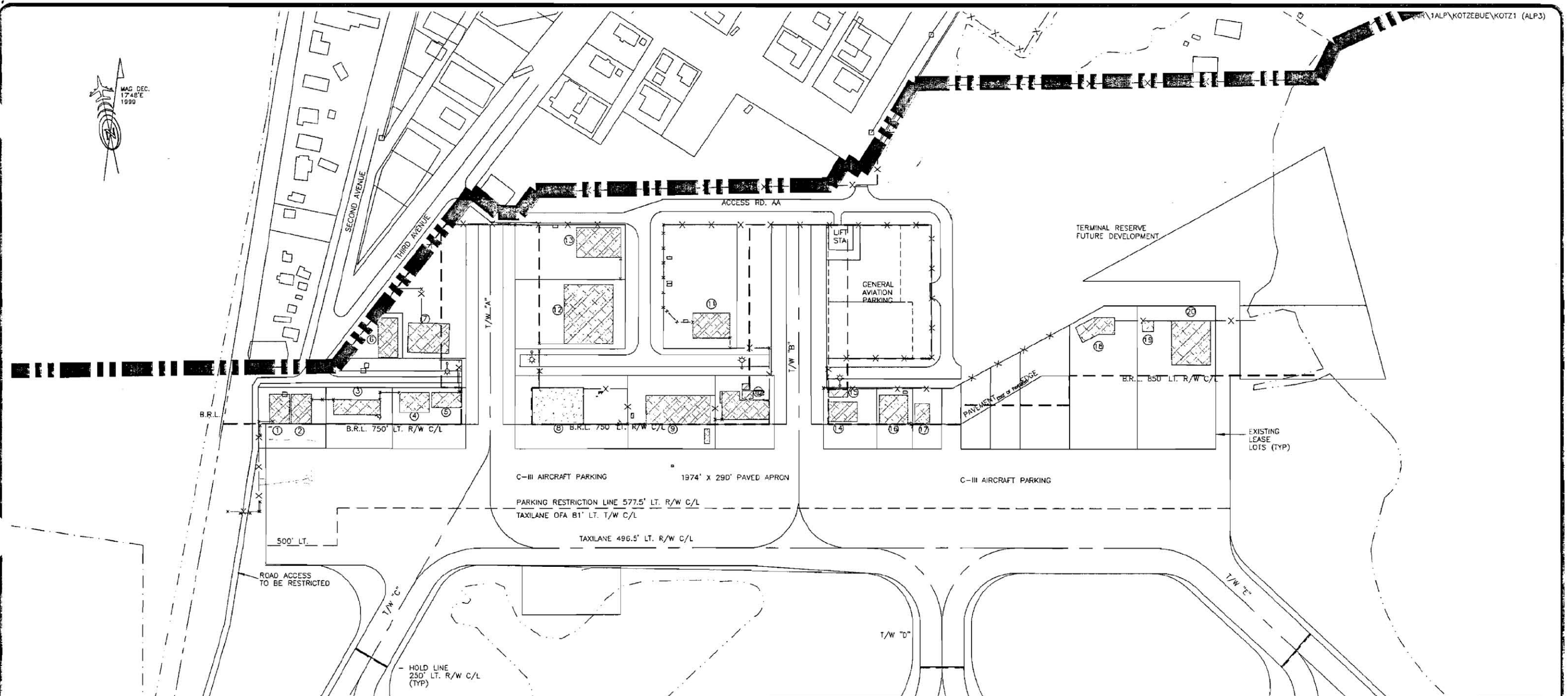
STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
 NORTHERN REGION - DESIGN AND ENGINEERING SERVICES
 APPROVED *Patricia D. Miller* DATE 4/1/05
 PATRICIA D. MILLER, P.F. DESIGN GROUP CHIEF

AIRPORT LAYOUT PLAN APPROVED
 BY LETTER DATED: 4/1/05
Patricia D. Miller
 AIRPORTS DIVISION,
 ALASKAN REGION, AAL-610
 AIRSPACE REVIEW #99AAI-123NRA

NOTES
 NO OFZ OBJECT PENETRATIONS.
 NO THRESHOLD SITING SURFACE
 OBJECT PENETRATIONS.

RALPH WIEN MEMORIAL AIRPORT
 KOTZEBUE, ALASKA
 ULTIMATE
 AIRPORT LAYOUT PLAN

SHEET
 2 OF
 12



BUILDING DATA TABLE					
#	STRUCTURE NAME	HEIGHT (AGL)	OBSTRUCTION MARKING (Y/N)		REMARKS
			EXISTING	ULTIMATE	
1	DOT SHOP	21.5'	N	N	
2	DOT SHOP/ARFF	18'	N	N	
3	TERMINAL	16'	N	N	
4	HANGAR	17'	N	N	
5	OFFICE	22'	N	N	
6	SAND SHED	17.5'	N	N	
7	HANGAR/TERMINAL	29.5'	N	N	
8	HANGAR/TERMINAL	28'	N	N	
9	TERMINAL	25'	N	N	
10	HANGAR/TERMINAL	18'	N	N	
11	HANGAR/TERMINAL	23.5'	N	N	
12	HANGAR/TERMINAL	35'	N	N	
13	HANGAR/TERMINAL	26'	N	N	
14	OFFICE/TERMINAL	16'	N	N	
15	STORAGE	8'	N	N	
16	OFFICE/HANGAR	21'	N	N	

BUILDING DATA TABLE					
#	STRUCTURE NAME	HEIGHT (AGL)	OBSTRUCTION MARKING (Y/N)		REMARKS
			EXISTING	ULTIMATE	
17	OFFICE	19'	N	N	
18	OFFICE/WAREHOUSE	25.5'	N	N	
19	OFFICE	22'	N	N	
20	HANGAR	31'	N	N	

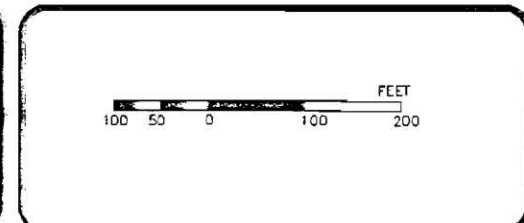
DESIGN__NP	
DRAWN__CAT	
CHECKED__CAT	
BY	DATE
	REVISIONS

STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
 NORTHERN REGION - DESIGN AND ENGINEERING SERVICES

APPROVED S/ **PATRICIA D. MILLER** DATE **12/3/99**
 PATRICIA D. MILLER, P.E. DESIGN GROUP CHIEF

AIRPORT LAYOUT PLAN APPROVED
 BY LETTER DATED: **12/15/99**

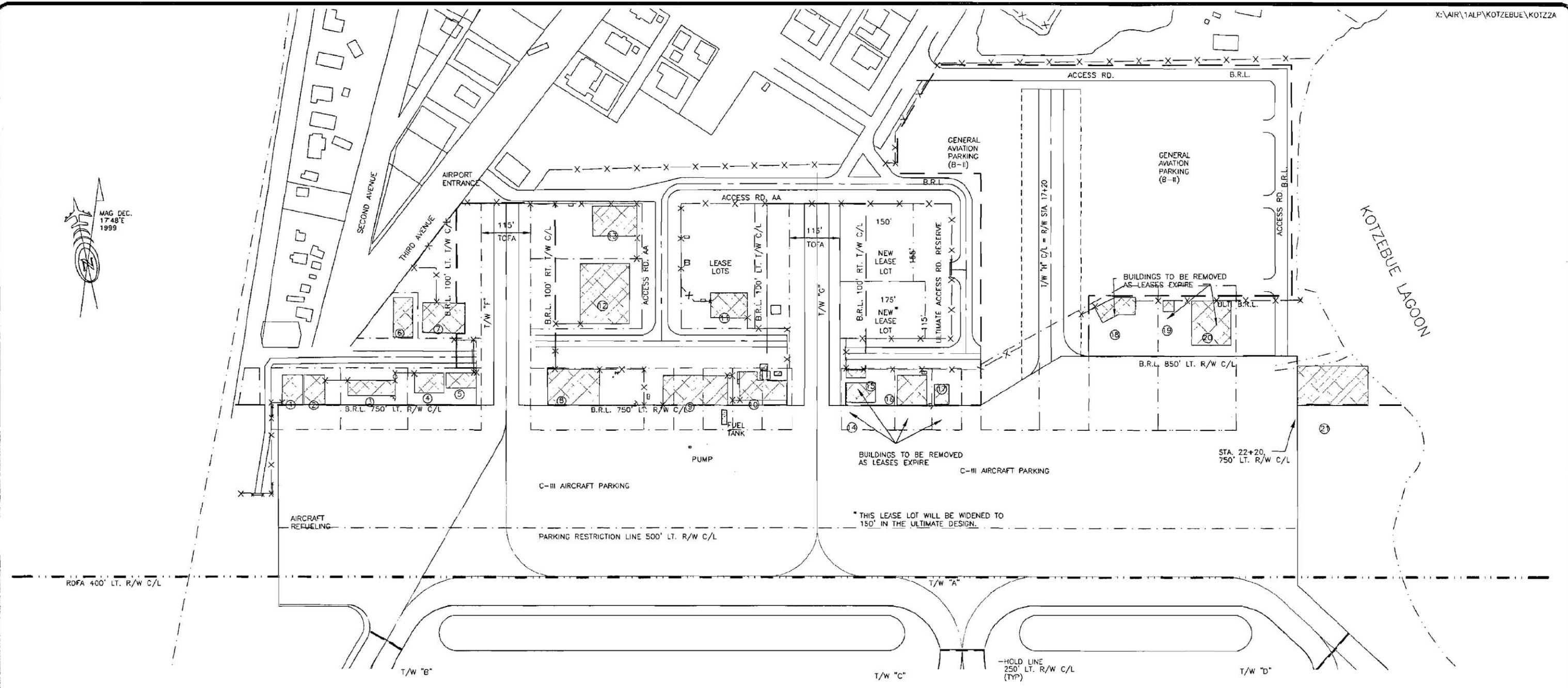
Barbara J. Johnson
 AIRPORTS DIVISION,
 ALASKAN REGION, AAL-610
 AIRSPACE REVIEW #99AAL-123NRA



RALPH WIEN MEMORIAL AIRPORT
 KOTZEBUE, ALASKA

R/W 8-26 TERMINAL PLAN
 EXISTING TERMINAL LAYOUT

SHEET
 3 OF
 12



NOTE:
TAXWAY DESIGNATIONS REFLECT ULTIMATE.

BUILDING DATA TABLE

#	STRUCTURE NAME	HEIGHT (AGL)	OBSTRUCTION MARKING (Y/N)	REMARKS
			EXISTING ULTIMATE	
1	DOT SHOP	21.5'	N N	
2	DOT SHOP/ARFF	18'	N N	
3	TERMINAL	16'	N N	
4	HANGAR	17'	N N	
5	OFFICE	22'	N N	
6	SAND SHED	17.5'	N N	
7	HANGAR/TERMINAL	28.5'	N N	
8	HANGAR/TERMINAL	26'	N N	
9	TERMINAL	25'	N N	
10	HANGAR/TERMINAL	18'	N N	
11	HANGAR/TERMINAL	23.5'	N N	
12	HANGAR/TERMINAL	35'	N N	
13	HANGAR/TERMINAL	26'	N N	
14	OFFICE/TERMINAL	16'	N N	
15	STORAGE	8'	N N	
16	OFFICE HANGAR	21'	N N	

BUILDING DATA TABLE

#	STRUCTURE NAME	HEIGHT (AGL)	OBSTRUCTION MARKING (Y/N)	REMARKS
			EXISTING ULTIMATE	
17	OFFICE	19'	N N	
18	OFFICE/WAREHOUSE	25.5'	N N	
19	OFFICE	22'	N N	
20	HANGAR	31'	N N	
21	SREB/ARFF/FSS	31'	N N	

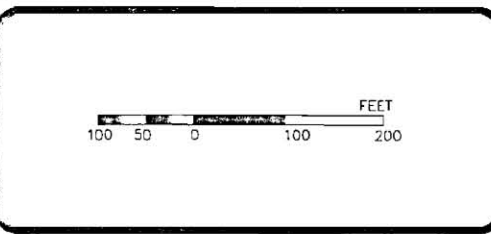
BUILDINGS DO NOT PENETRATE TRANSITIONAL SURFACE

BUILDINGS DO NOT PENETRATE TRANSITIONAL SURFACE

DESIGN_MP	
DRAWN_CAT	
CHECKED_PDM	
BY DATE	REVISIONS

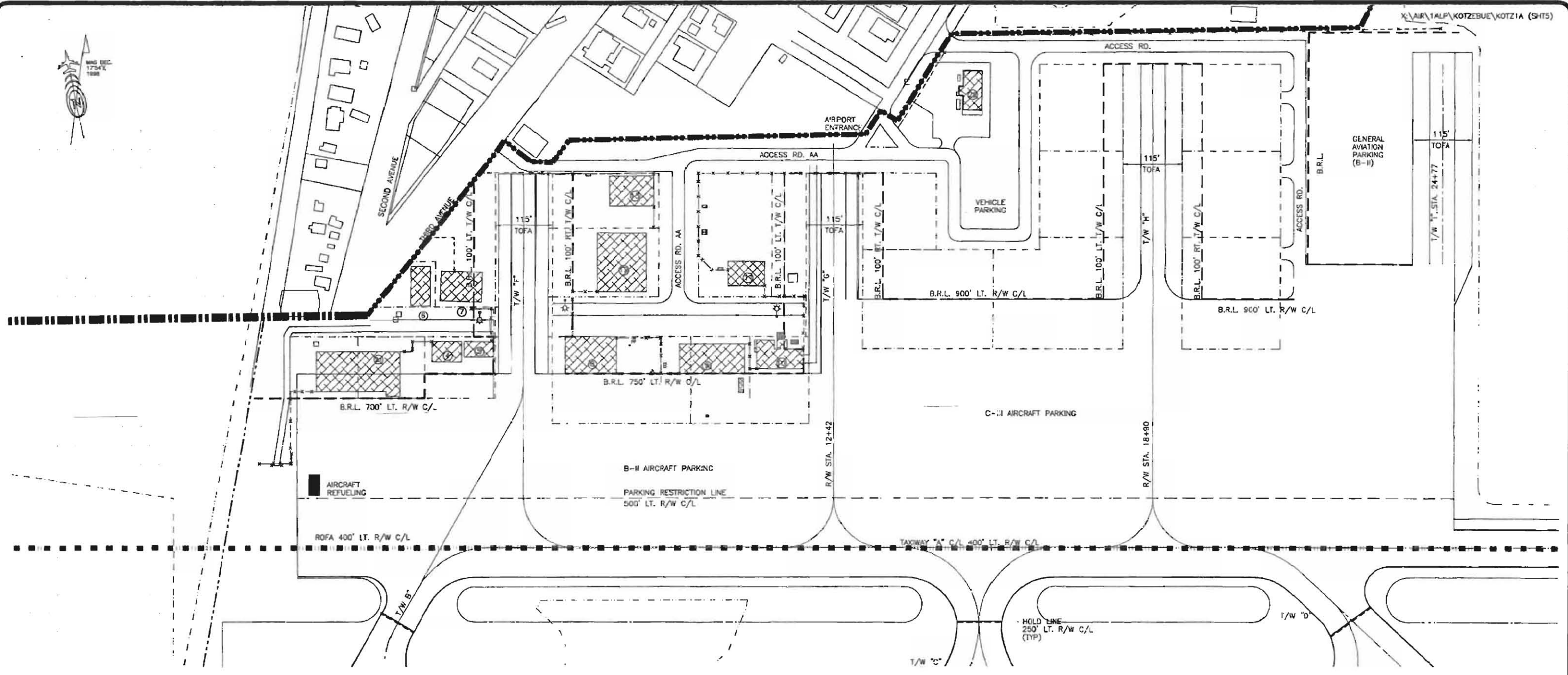
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION - DESIGN AND ENGINEERING SERVICES
APPROVED
S/ PATRICIA D. MILLER DATE 12/3/99
PATRICIA D. MILLER, P.E. DESIGN GROUP CHIEF

AIRPORT LAYOUT PLAN APPROVED
BY LETTER DATED: 12/15/99
Barbara J. Johnson
AIRPORTS DIVISION,
ALASKAN REGION, AAL-610
AIRSPACE REVIEW #99AAL-123NRA



RALPH WIEN MEMORIAL AIRPORT
KOTZEBUE, ALASKA
R/W 8-26 TERMINAL PLAN
INTERIM TERMINAL LAYOUT

SHEET
4 OF
12



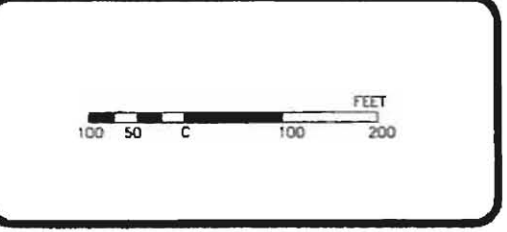
BUILDINGS DO NOT PENETRATE TRANSFERING SURFACE

DESIGN_MDH	
DRAWN_EJM	
CHECKED_RFA	
EJM	3/25/05 ADDED SAND STORAGE BDLG.
RA	7/28/03 UPDATE AIRT/SREB LOCATION
BY	DATE
	REVISIONS

STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
 NORTHERN REGION

APPROVED *Patricia D. Miller* DATE *4/6/05*
 PATRICIA D. MILLER, P.E. DESIGN GROUP CHIEF

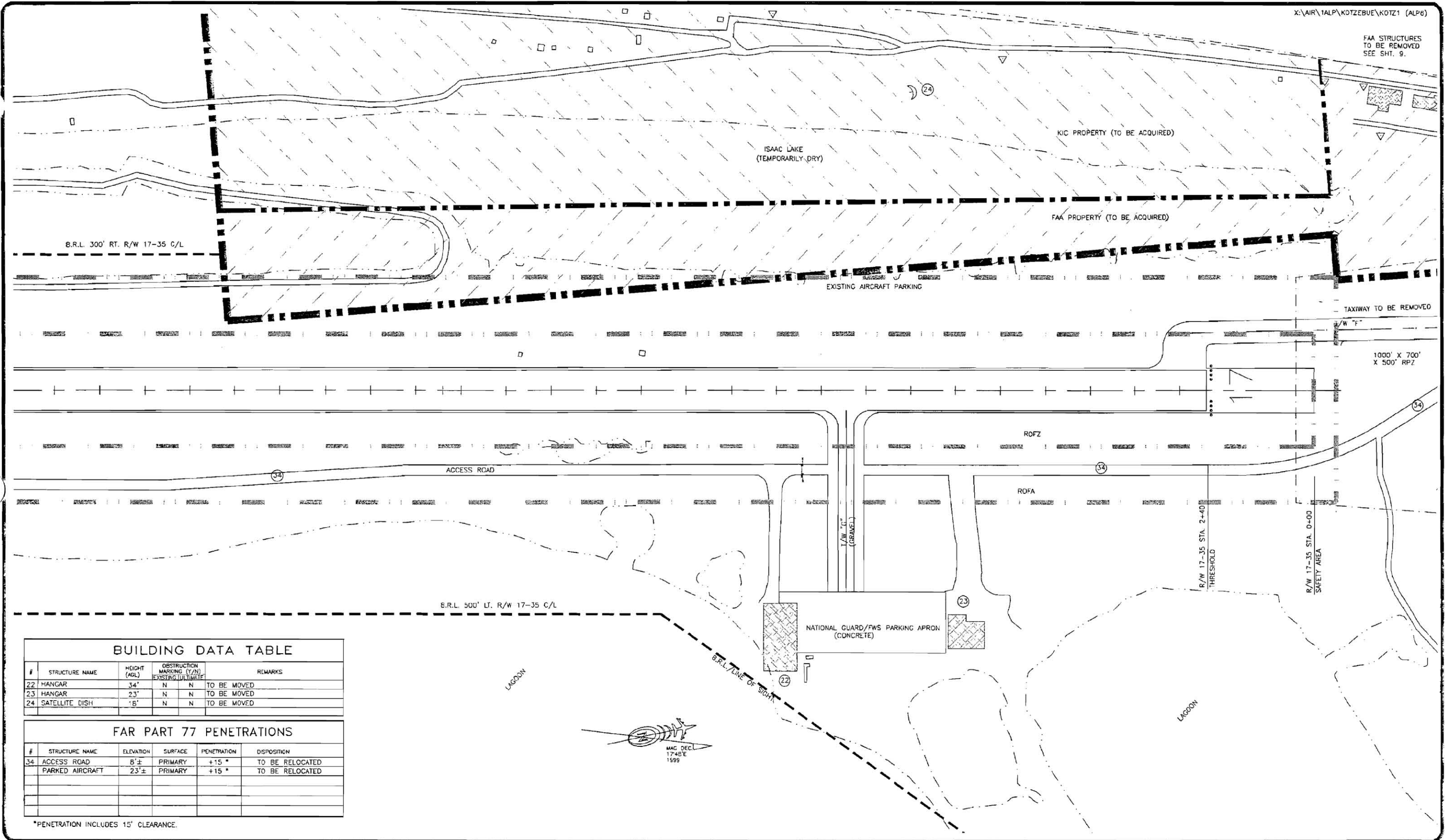
AIRPORT LAYOUT PLAN APPROVED
 BY LETTER DATED: *4/14/05*
R. Wien
 AIRPORTS DIVISION,
 ALASKAN REGION, AAL-610
 AIRSPACE REVIEW #99AAL-123NRA



RALPH WIEN MEMORIAL AIRPORT
 KOTZEBUE, ALASKA
 R/W 8-26 TERMINAL PLAN
 ULTIMATE TERMINAL LAYOUT

SHEET
 5 OF
 12

FAA STRUCTURES TO BE REMOVED SEE SHT. 9.



BUILDING DATA TABLE

#	STRUCTURE NAME	HEIGHT (AGL)	OBSTRUCTION MARKING (Y/N)		REMARKS
			EXISTING	ULTIMATE	
22	HANGAR	34'	N	N	TO BE MOVED
23	HANGAR	23'	N	N	TO BE MOVED
24	SATELLITE DISH	6'	N	N	TO BE MOVED

FAR PART 77 PENETRATIONS

#	STRUCTURE NAME	ELEVATION	SURFACE	PENETRATION	DISPOSITION
34	ACCESS ROAD	8'±	PRIMARY	+15 *	TO BE RELOCATED
	PARKED AIRCRAFT	23'±	PRIMARY	+15 *	TO BE RELOCATED

*PENETRATION INCLUDES 15' CLEARANCE.

DESIGN NP

DRAWN CAT

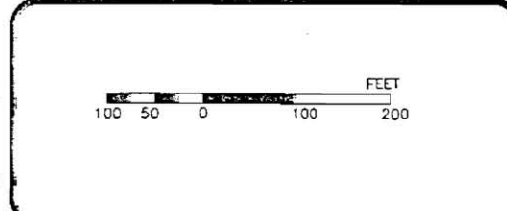
CHECKED CAT

BY	DATE	REVISIONS

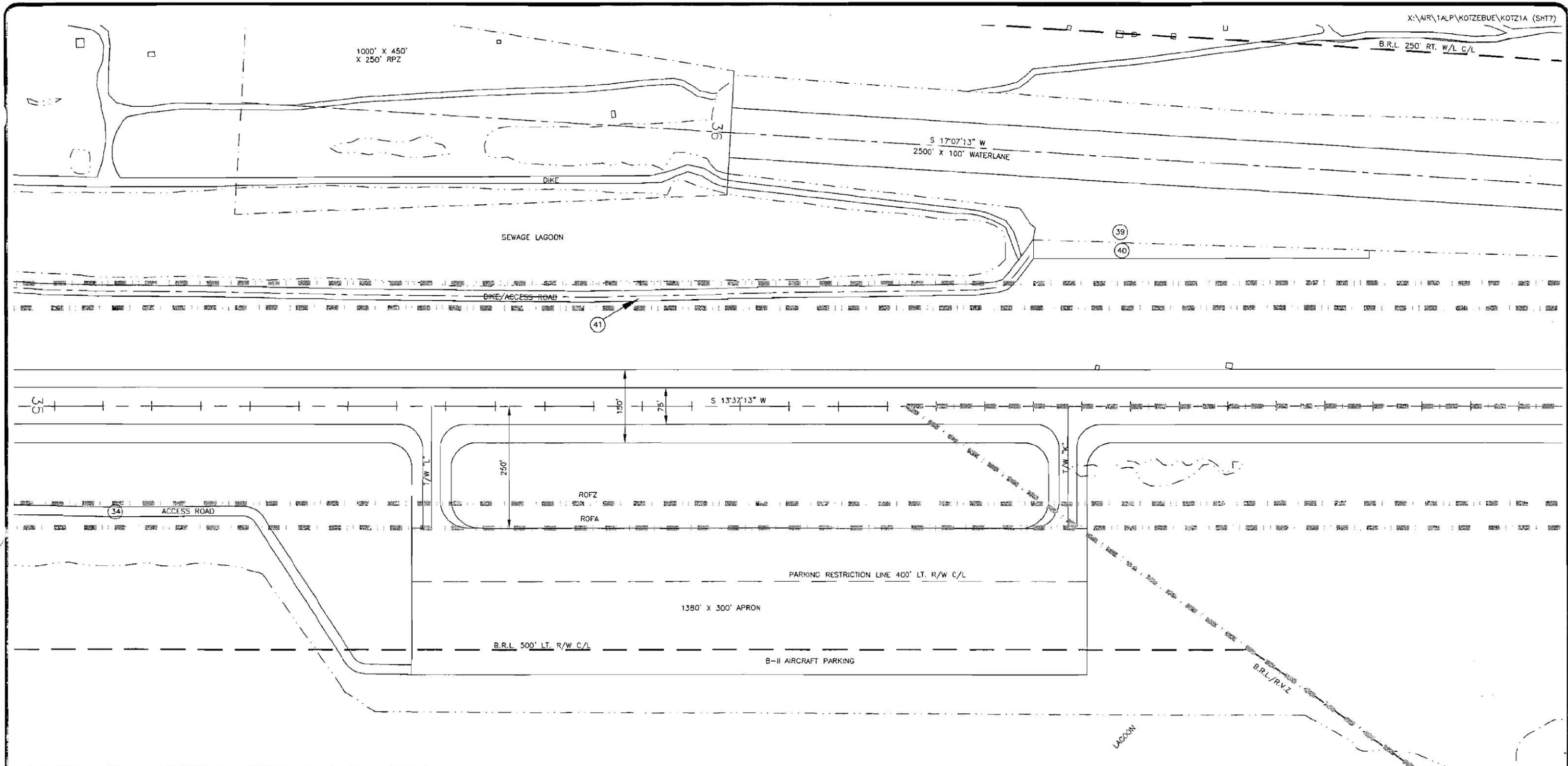
STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
 NORTHERN REGION - DESIGN AND ENGINEERING SERVICES

APPROVED S/ PATRICIA D. MILLER DATE 12/3/99
 PATRICIA D. MILLER, P.E. DESIGN GROUP CHIEF

AIRPORT LAYOUT PLAN APPROVED
 BY LETTER DATED: 12/15/99
 Barbara J. Johnson
 AIRPORTS DIVISION,
 ALASKAN REGION, AAL-610
 AIRSPACE REVIEW #99AAL-123NRA



RALPH WIEN MEMORIAL AIRPORT
 KOTZEBUE, ALASKA
 R/W 17-35 TERMINAL PLAN
 EXISTING TERMINAL LAYOUT



FAR PART 77 PENETRATIONS

#	STRUCTURE NAME	TOP (MSL) ELEVATION	SURFACE	PENETRATION	DISPOSITION/REMARKS
34	ACCESS ROAD	8'±	PRIMARY	+15*	NONE
39	PARKED AIRCRAFT	16'±	TRANSITIONAL	NONE	AS PER AIRCRAFT PARKING SEPARATIONS FOR A1 RUNWAY.
40	PARKED VEHICLES	15'±	TRANSITIONAL R/W 17-35	NONE	NONE
41	ACCESS ROAD	8'±	PRIMARY	+15*	BEST SOLUTION FOR ACCESS

	RUNWAY 6-26		RUNWAY 17-35	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE
T/W "K" WIDTH			NONE	35'
T/W "K" SAFETY AREA WIDTH			NONE	80'
T/W "L" WIDTH			NONE	35'
T/W "L" SAFETY AREA WIDTH			NONE	80'



NOTES
NO OFZ OBJECT PENETRATIONS.
NO THRESHOLD SITING SURFACE OBJECT PENETRATIONS.

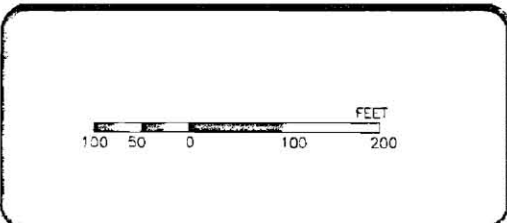
* 15' CLEARANCE INCLUDED IN CALCULATION.

DESIGN NP
DRAWN CAT
CHECKED PDM

BY	DATE	REVISIONS

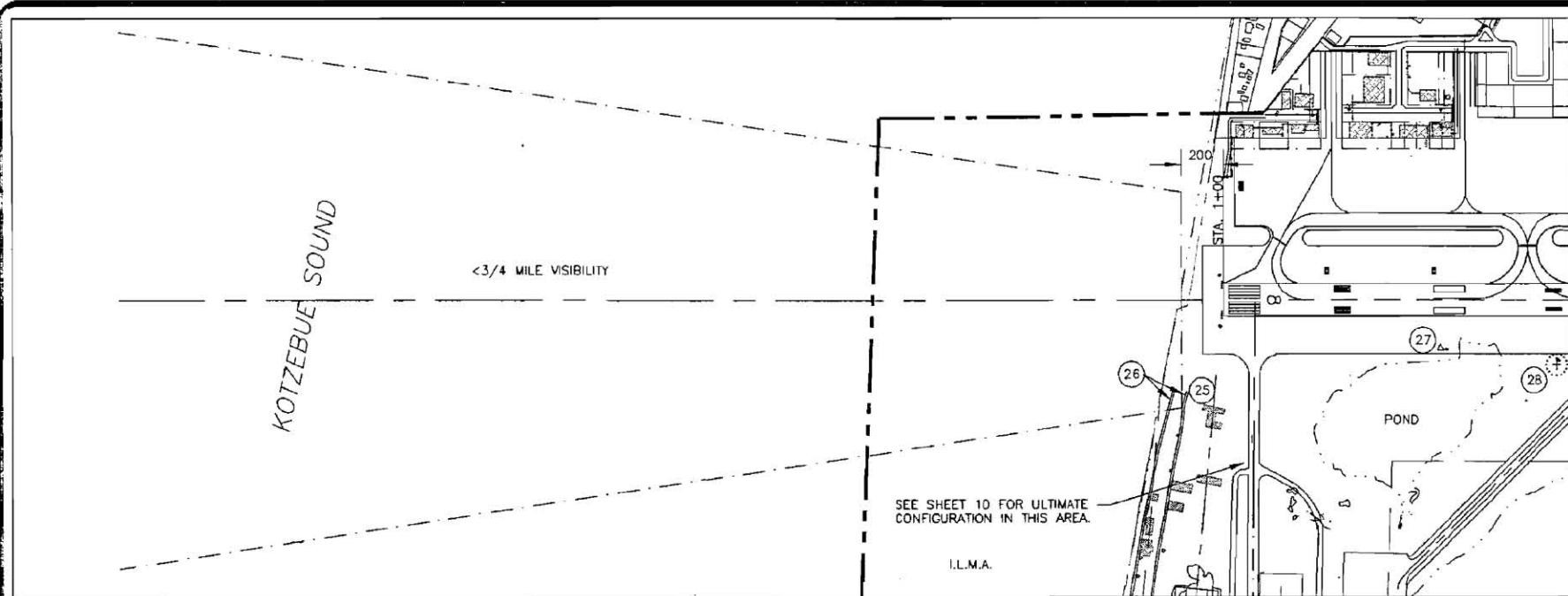
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION-DESIGN AND ENGINEERING SERVICES
APPROVED S/ PATRICIA D. MILLER DATE 12/3/99
PATRICIA D. MILLER, P.E. DESIGN GROUP CHIEF

AIRPORT LAYOUT PLAN APPROVED
BY LETTER DATED: 12/15/99
Barbara J. Johnson
AIRPORTS DIVISION,
ALASKAN REGION, AAL-610
AIRSPACE REVIEW #99AAL-123NRA

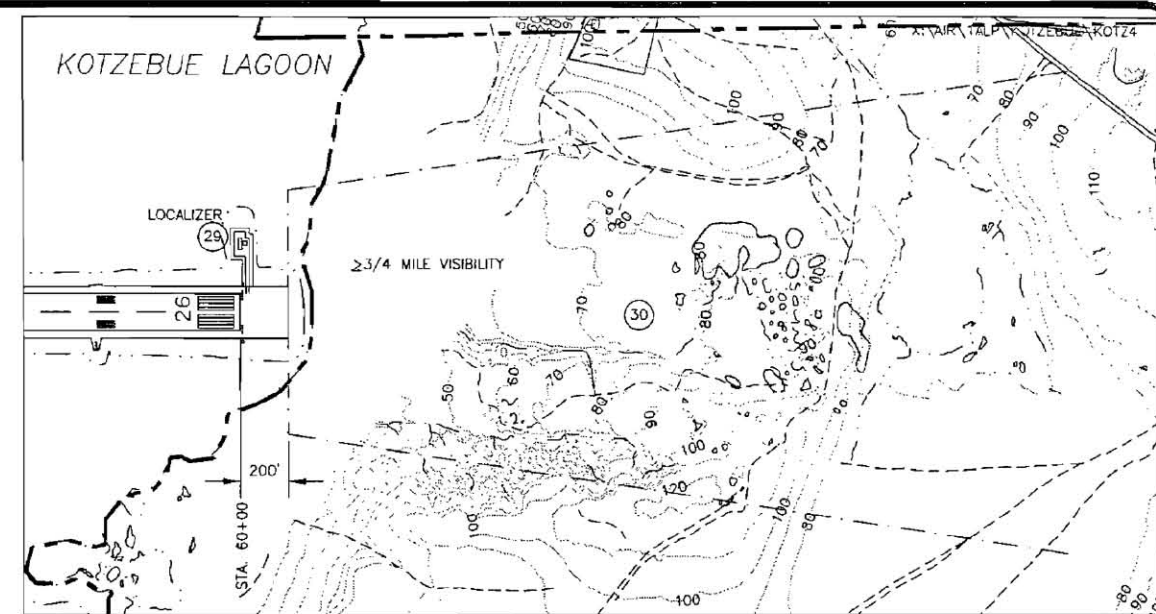


RALPH WIEN MEMORIAL AIRPORT
KOTZEBUE, ALASKA
R/W 17-35 TERMINAL PLAN
ULTIMATE TERMINAL LAYOUT

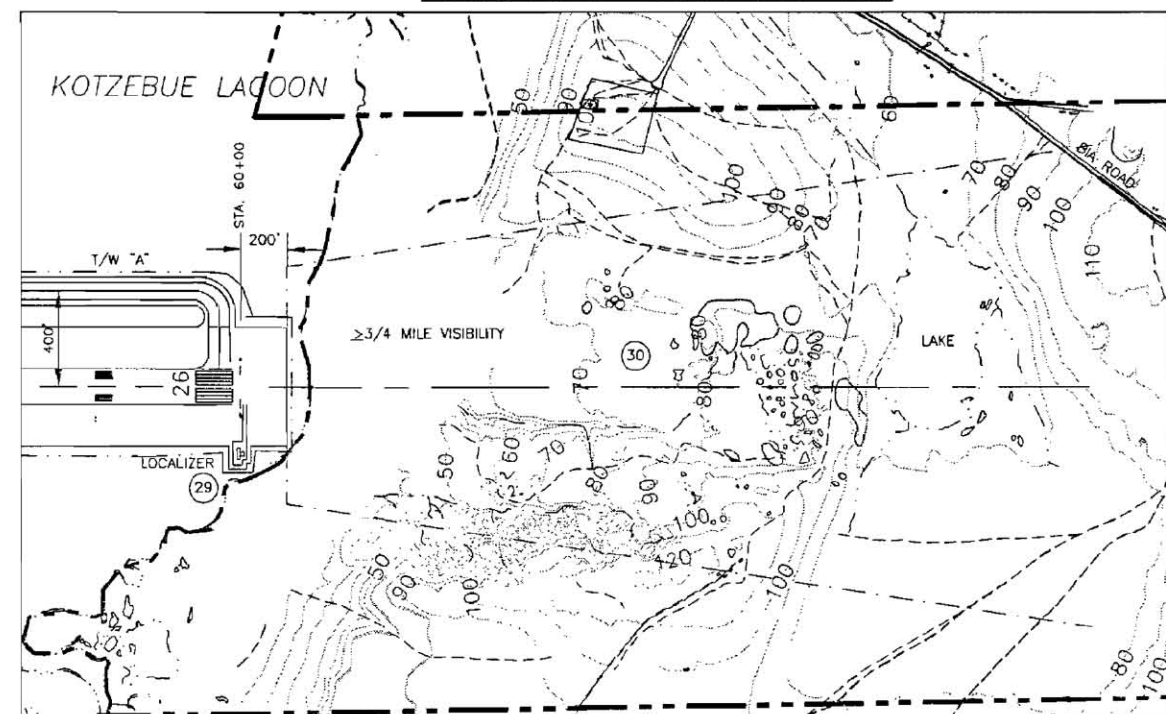
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12



EXISTING & ULTIMATE RUNWAY 8

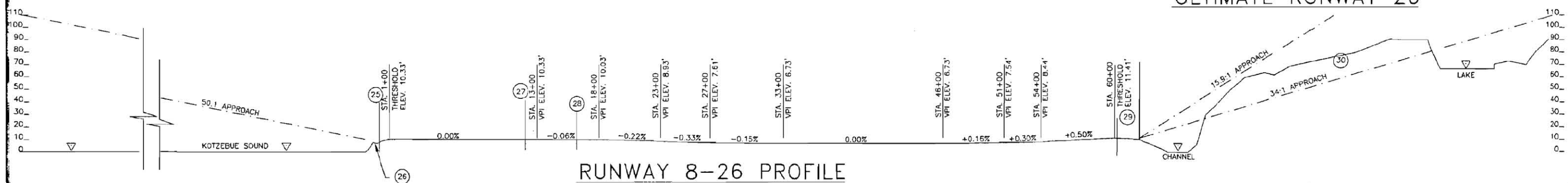
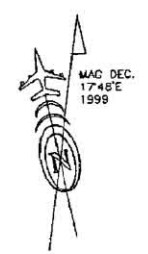


EXISTING RUNWAY 26



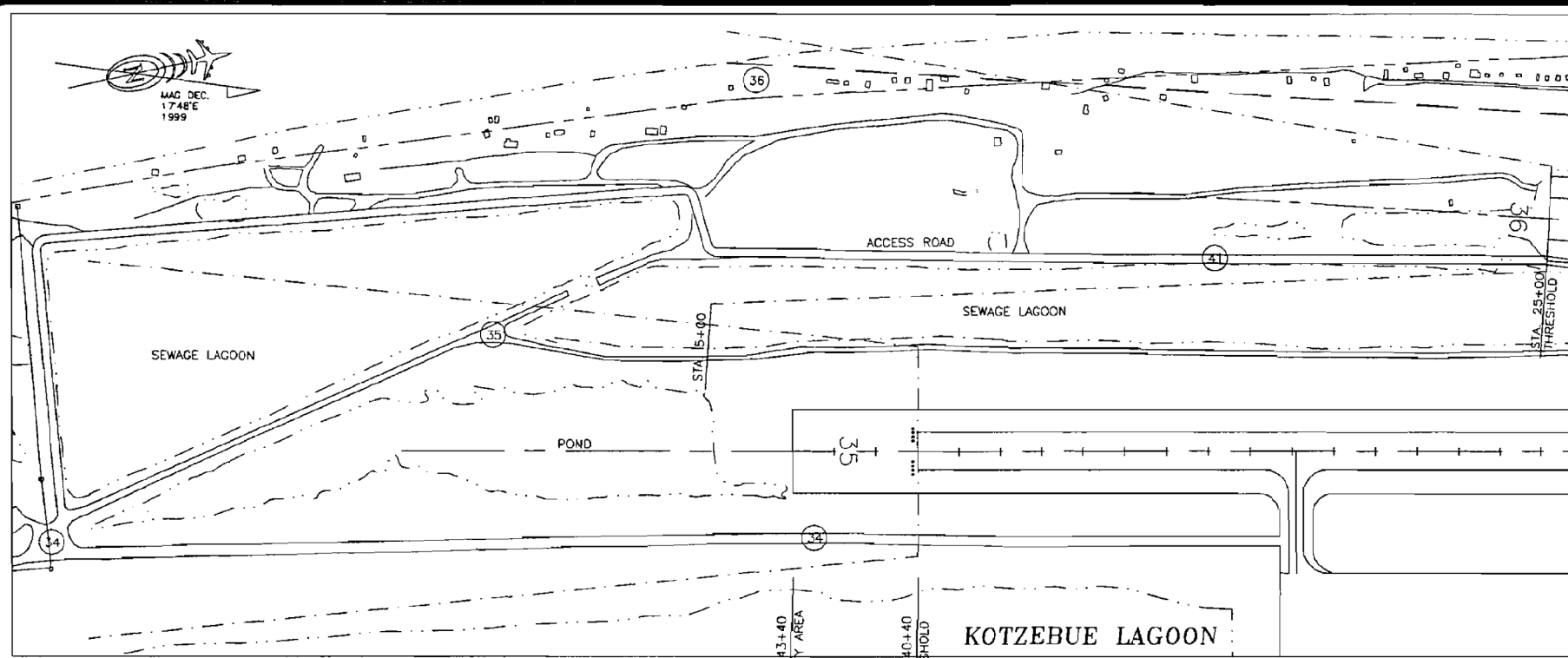
ULTIMATE RUNWAY 26

OBSTRUCTION TABLE				
#	STRUCTURE NAME	TOP ELEV. (MSL)	PART 77 SURFACE PENETRATION	PROPOSED DISPOSITION OF OBSTRUCTION
25	VENT ON BUILDING	45'	+35'	OBSTRUCTION LIGHT OR BUILDING REMOVAL
26	ROADS	10'	+15'	REMOVAL
27	GLIDE SLOPE ANTENNA	40'	+30'	FIXED BY FUNCTION
28	WIND CONE	31'	+21'	NONE: OBSTRUCTION LIGHT EXISTS
29	LOCALIZER ANTENNA	30'	+19'	NONE: OBSTRUCTION LIGHT EXISTS
30	TERRAIN	<100'	<20'	TO BE REMOVED FOR 34:1/7:1 SURFACES



RUNWAY 8-26 PROFILE

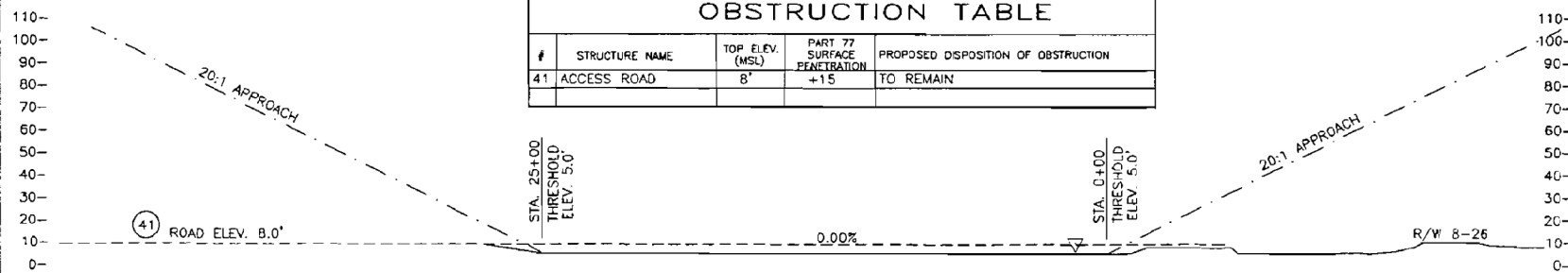
DESIGN _____ DRAWN CAT _____ CHECKED NP _____	<table border="1"> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>										STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES NORTHERN REGION - DESIGN AND ENGINEERING SERVICES APPROVED S/ PATRICIA D. MILLER DATE 12/3/99 PATRICIA D. MILLER, P.E. DESIGN GROUP CHIEF	AIRPORT LAYOUT PLAN APPROVED BY LETTER DATED 12/15/99 Barbara J. Johnson AIRPORTS DIVISION, ALASKAN REGION, AAL-610 AIRSPACE REVIEW #99AAL-123NRA		RALPH WIEN MEMORIAL AIRPORT KOTZEBUE, ALASKA R/W 8-26: INNER PORTION OF APPROACH SURFACE PLAN & PROFILE	SHEET 8 OF 12
BY DATE REVISIONS	APPROVED S/ PATRICIA D. MILLER DATE 12/3/99 PATRICIA D. MILLER, P.E. DESIGN GROUP CHIEF	AIRPORT LAYOUT PLAN APPROVED BY LETTER DATED 12/15/99 Barbara J. Johnson AIRPORTS DIVISION, ALASKAN REGION, AAL-610 AIRSPACE REVIEW #99AAL-123NRA		RALPH WIEN MEMORIAL AIRPORT KOTZEBUE, ALASKA R/W 8-26: INNER PORTION OF APPROACH SURFACE PLAN & PROFILE	SHEET 8 OF 12										



ULTIMATE RUNWAY 35 & WATERLANE SOUTH APPROACH

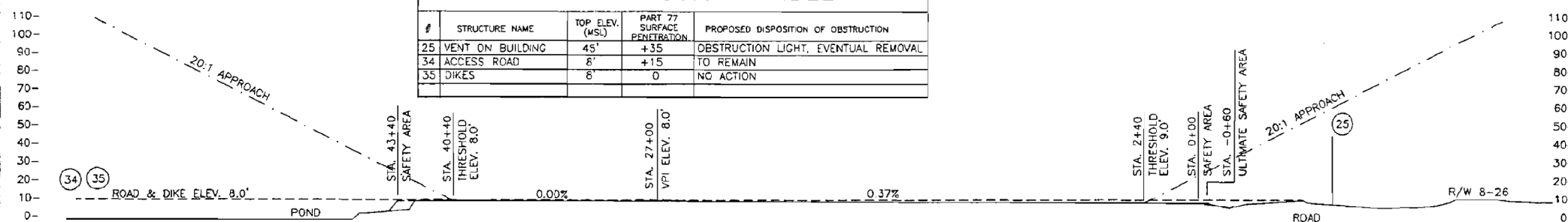


OBSTRUCTION TABLE			
#	STRUCTURE NAME	TOP ELEV. (MSL)	PROPOSED DISPOSITION OF OBSTRUCTION
41	ACCESS ROAD	8'	TO REMAIN

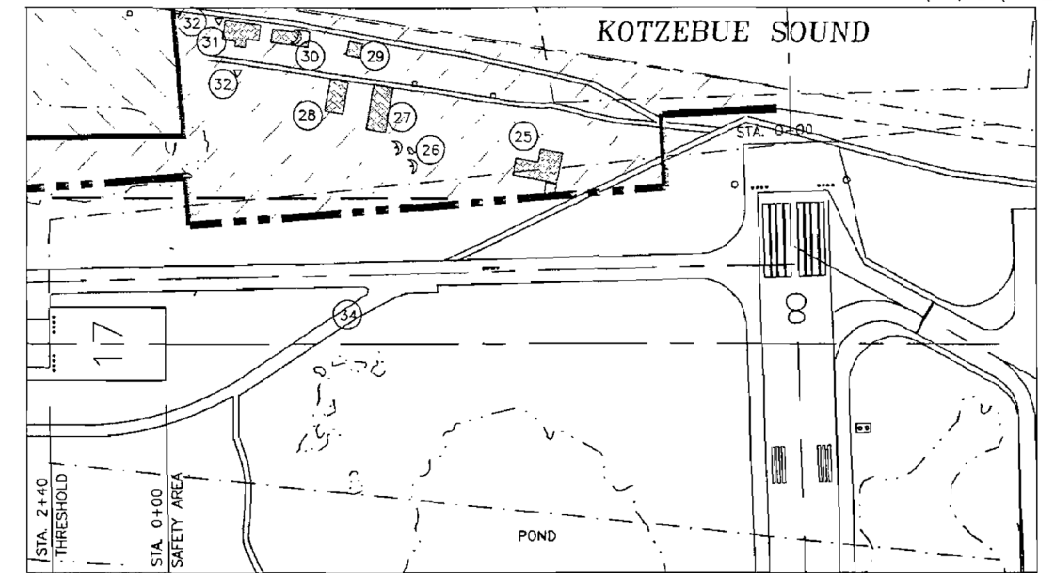


ULTIMATE WATERLANE PROFILE

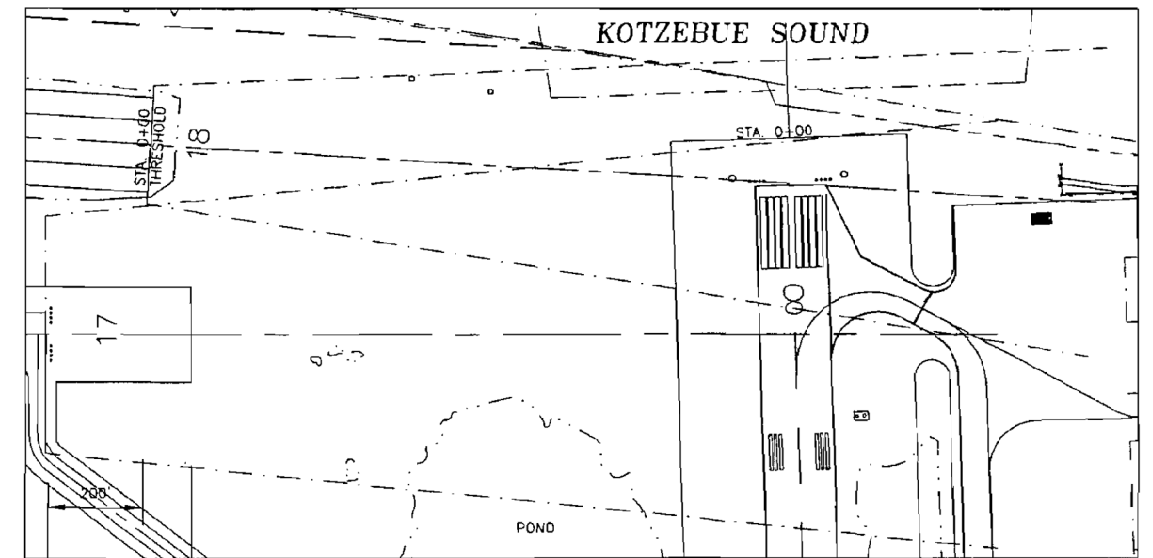
OBSTRUCTION TABLE			
#	STRUCTURE NAME	TOP ELEV. (MSL)	PROPOSED DISPOSITION OF OBSTRUCTION
25	VENT ON BUILDING	45'	OBSTRUCTION LIGHT, EVENTUAL REMOVAL
34	ACCESS ROAD	8'	TO REMAIN
35	DIKES	8'	NO ACTION



EXISTING & ULTIMATE RUNWAY 17-35 PROFILE



EXISTING RUNWAY 17 APPROACH



ULTIMATE RUNWAY 17 & WATERLANE NORTH APPROACH

OBSTRUCTION TABLE			
#	STRUCTURE NAME	TOP ELEV. (MSL)	PROPOSED DISPOSITION OF OBSTRUCTION
25	VENT ON BUILDING	45'	OBSTRUCTION LIGHT, EVENTUAL REMOVAL
26	FAA SAT DISH ARRAY	18'	TO BE RELOCATED
27	FAA MAINT OFFICE	15'	REMOVAL
28	FAA SHOP	17.5'	TO BE REMOVED
29	SHACK	8'	TO BE REMOVED
30	IWS & ANTENNA	32'	TO BE RELOCATED
31	FSS	18'	TO BE RELOCATED
32	FAA TOWERS	60'	TO BE RELOCATED
36	SHACKS	8'	NO ACTION

* PENETRATES 8-26 PRIMARY SURFACE

DESIGN: NP

DRAWN: CAT

CHECKED: PDM

BY	DATE	REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION - DESIGN AND ENGINEERING SERVICES

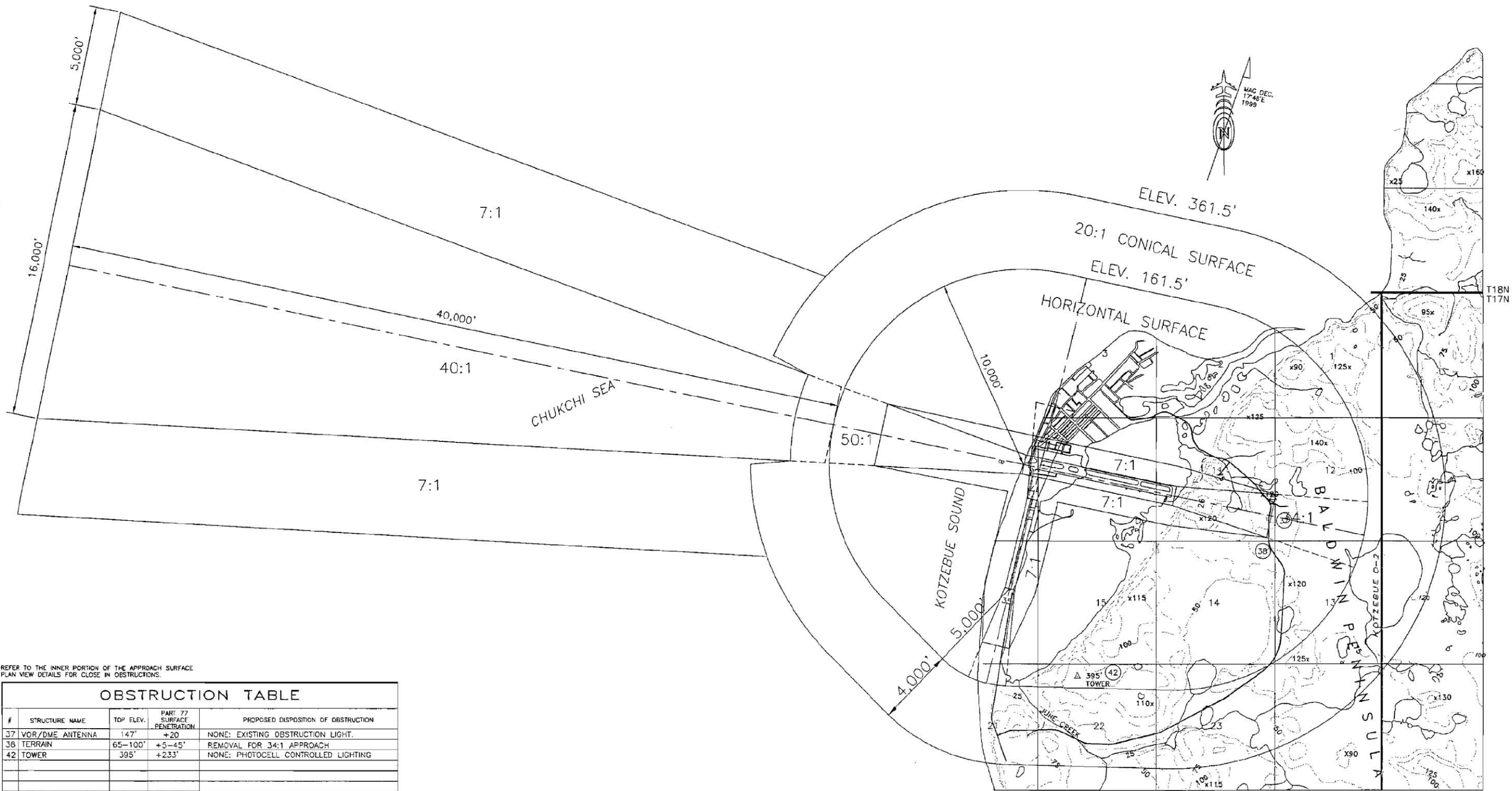
APPROVED: S/ PATRICIA D. MILLER DATE 12/3/99
PATRICIA D. MILLER, P.E. DESIGN GROUP CHIEF

AIRPORT LAYOUT PLAN APPROVED
BY LETTER DATED: _____

AIRPORTS DIVISION,
ALASKAN REGION, AAL-610
AIRSPACE REVIEW #99AAL-123NRA

RALPH WIEN MEMORIAL AIRPORT
KOTZEBUE, ALASKA
R/W 17-35: INNER PORTION OF
APPROACH SURFACE
PLAN & PROFILE

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REFER TO THE INNER PORTION OF THE APPROACH SURFACE PLAN VIEW DETAILS FOR CLOSE IN OBSTRUCTIONS.

OBSTRUCTION TABLE			
#	STRUCTURE NAME	TOP ELEV.	PROPOSED DISPOSITION OF OBSTRUCTION
37	VOR/DME ANTENNA	147'	NONE: EXISTING OBSTRUCTION LIGHT.
38	TERRAIN	65-100'	+5-45' REMOVAL FOR 34:1 APPROACH
42	TOWER	395'	+233' NONE: PHOTOCCELL CONTROLLED LIGHTING

VICINITY MAP

SEC. 9, 10, 15, 16, T17N, R18W,
K.R.M., USGS KOTZEBUE (D-2) 1951

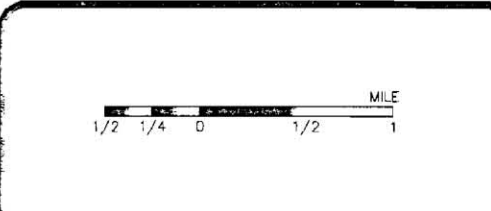
DESIGN NP
DRAWN CAT
CHECKED PDM

BY	DATE	REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION - DESIGN AND ENGINEERING SERVICES

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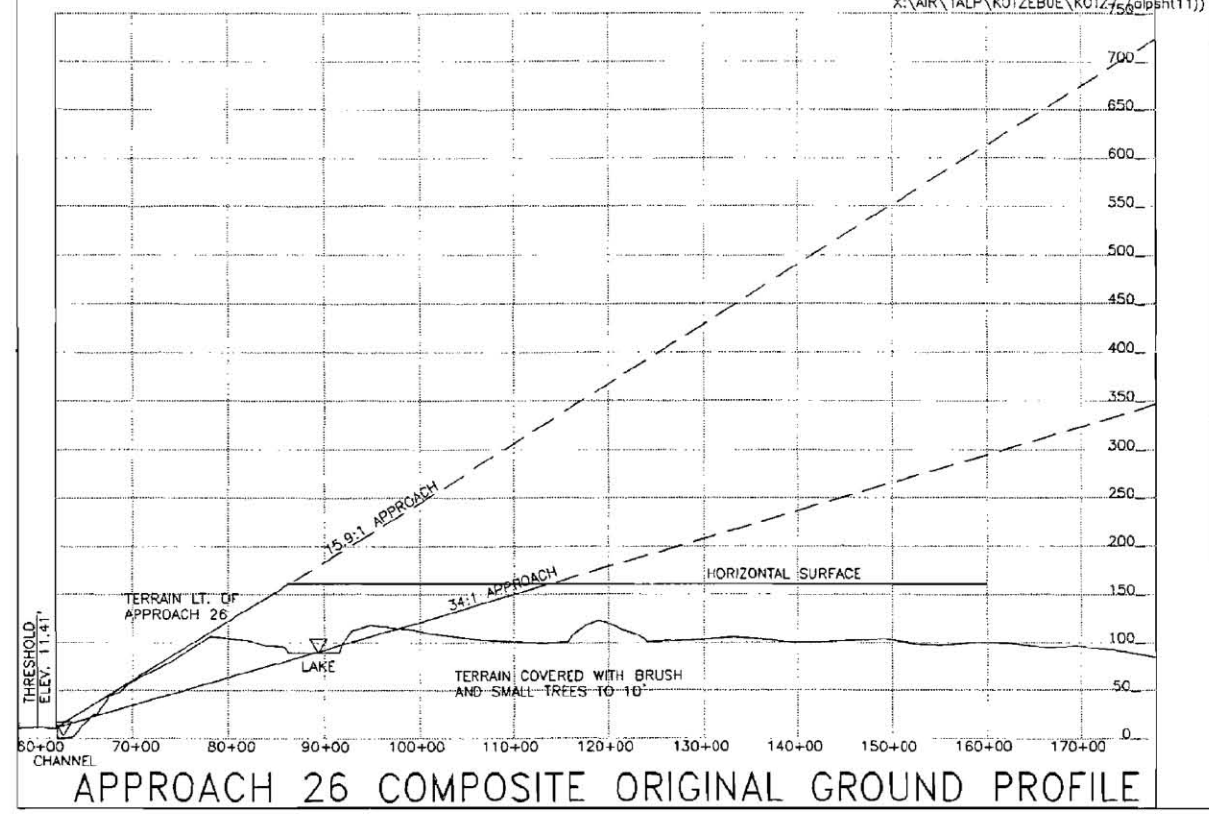
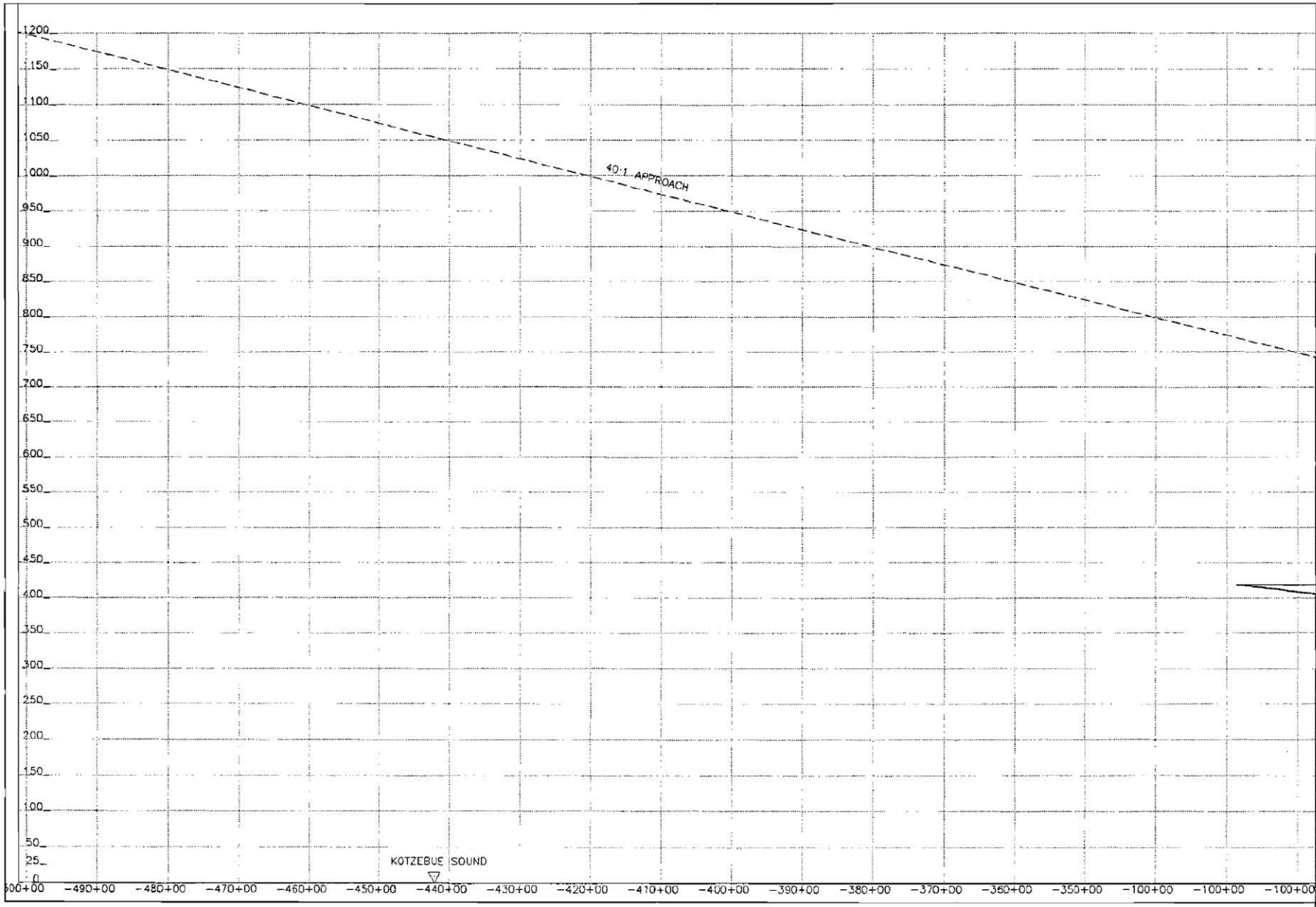
AIRPORT LAYOUT PLAN APPROVED
BY LETTER DATED: 12/15/99
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ALASKAN REGION, AAL-610
AIRSPACE REVIEW #99AAL-123NRA



RALPH WIEN MEMORIAL AIRPORT
KOTZEBUE, ALASKA

AIRSPACE

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12



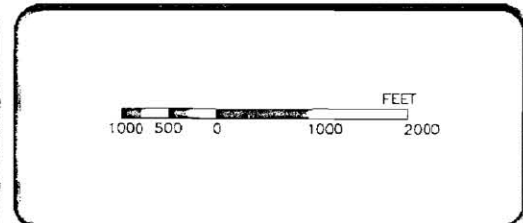
APPROACH 8 COMPOSITE ORIGINAL GROUND PROFILE

DESIGN NP
DRAWN CAT
CHECKED PDM

BY	DATE	REVISIONS

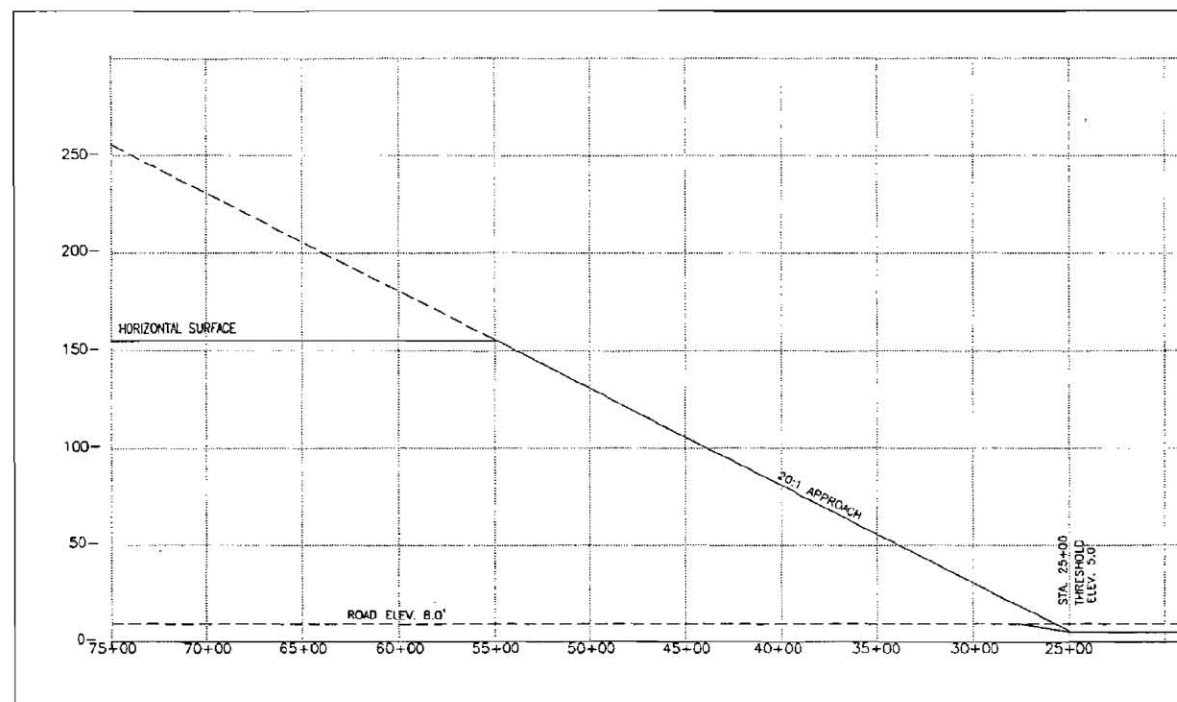
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION - DESIGN AND ENGINEERING SERVICES
APPROVED S/ PATRICIA D. MILLER DATE 12/3/99
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Barbara J. Johnson
AIRPORTS DIVISION,
ALASKAN REGION, AAL-610
AIRSPACE REVIEW #99AAL-123NRA

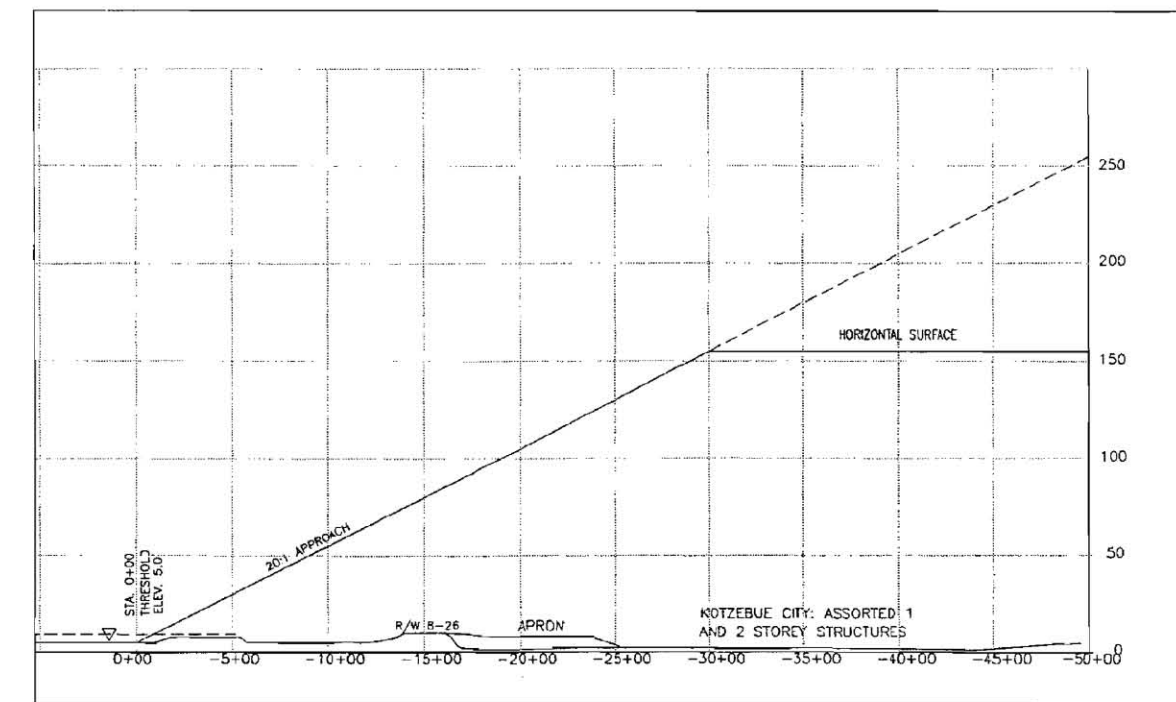


RALPH WIEN MEMORIAL AIRPORT
KOTZEBUE, ALASKA
R/W 8-26 APPROACH PROFILES

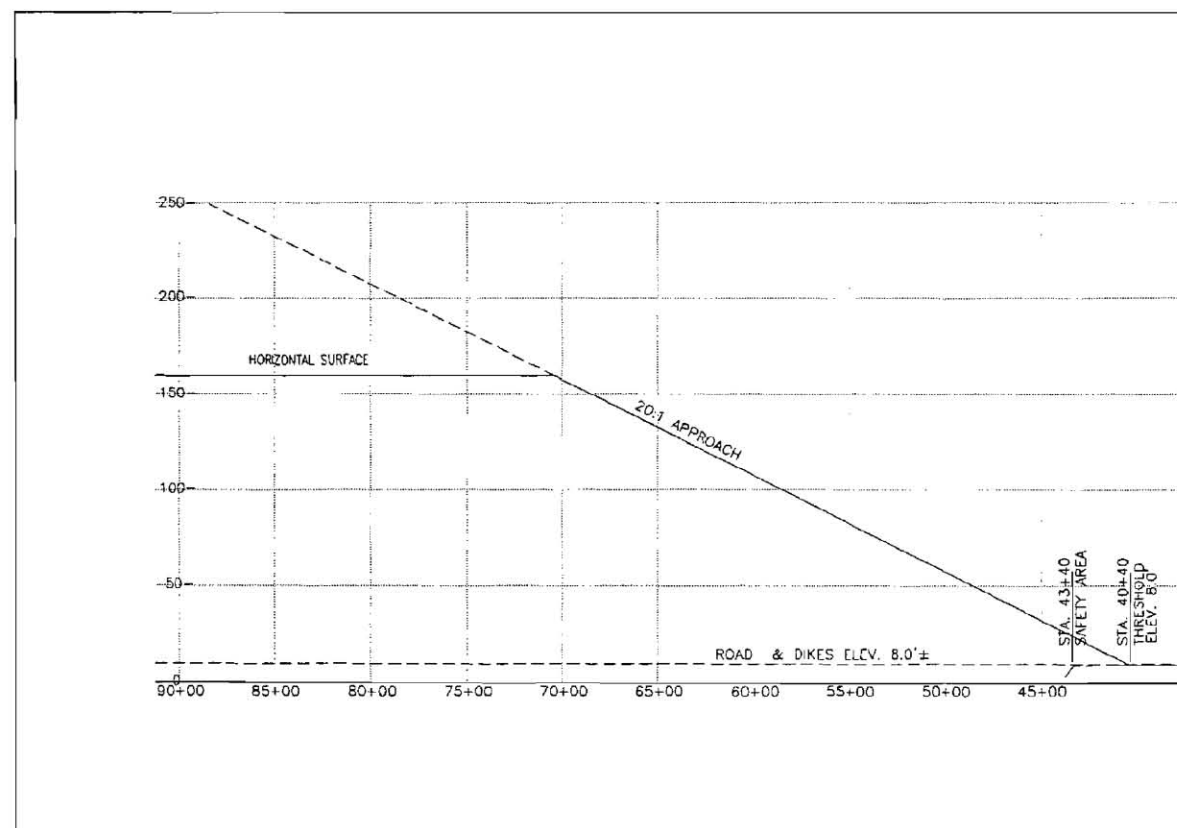
SHEET 11 OF 12



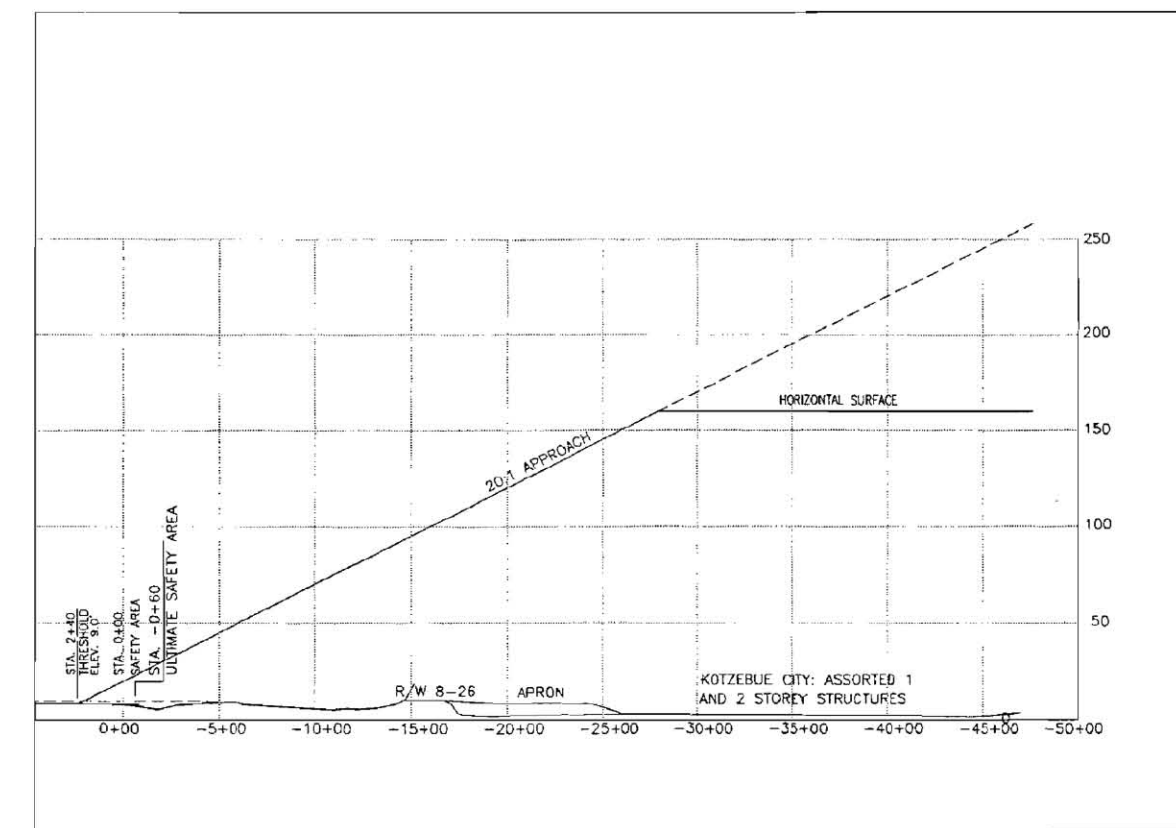
WATERLANE APPROACH 36 COMPOSITE ORIGINAL GROUND PROFILE



WATERLANE APPROACH 18 COMPOSITE ORIGINAL GROUND PROFILE



APPROACH 35 COMPOSITE ORIGINAL GROUND PROFILE

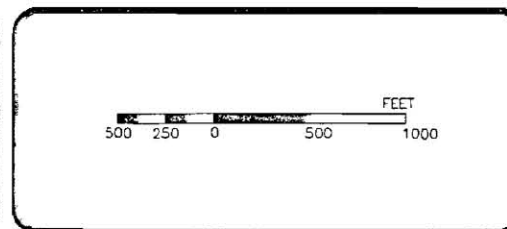


APPROACH 17 COMPOSITE ORIGINAL GROUND PROFILE

DESIGN	NP
DRAWN	CAT
CHECKED	PDM
BY	DATE
REVISIONS	

STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
 NORTHERN REGION - DESIGN AND ENGINEERING SERVICES
 APPROVED S/ PATRICIA D. MILLER DATE 12/3/99
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 ALASKAN REGION, AAL-610
 AIRSPACE REVIEW #99AAL-123NRA



RALPH WIEN MEMORIAL AIRPORT
 KOTZEBUE, ALASKA
 WATERLANE APPROACH PROFILES
 R/W 35-17 APPROACH PROFILES

**FAA Aeronautical Study
#01-AAL-226-NRA**

01-AAL-226-NRA
RALPH WIEN MEMORIAL AIRPORT (KOTZEBUE)
PROPOSAL TO CLEAR HILL OBSTRUCTION OFF RUNWAY 26

To: Pat Oien, Airports Division, AAL-622B
From: Dennis Stoner, Anchorage Flight Procedures Office

12/5/01

Background:

On November 8, 2001 a meeting was conducted between Airports Division, Alaska DOT, RM Consultants, Flight Standards, and the Anchorage Flight Procedures Office (FPO). The purpose of the meeting was to discuss what improvements could be made to lower minimums on the current and future instrument approach procedures to Kotzebue Runway 26 if the hill to the east of the runway was removed. The hill penetrates both the 34:1 Terminal Approach Procedures (TERPS) and the 20:1 Visual Approach surfaces. The group also discussed what additional improvements could be made if an approach lighting system was installed.

The Alaska DOT group has conducted public meetings at Kotzebue and it was determined that the community does not want any disruption to the town cemetery, located approximately 1500 feet northeast of the Runway 26 threshold.

The Anchorage Flight Procedures Office (FPO) was asked to conduct a feasibility study to determine (a) what amount of excavation would be necessary to improve the approach surfaces and not disrupt the cemetery and (b) what improvements could be made with the addition of an approach lighting system.

It must be stated that due to the limitation of *not disturbing the cemetery*, the **only** approach procedure, which can be improved by this project, is the GPS RWY 26 approach. This is because all of the other approaches to Runway 26 are offset and would require excavation at the cemetery location to improve the underlying approach surfaces. If this project is completed it could possibly allow for the development of a precision LNAV/VNAV approach to Runway 26 at sometime in the future.

This is a preliminary study and subject to further scrutiny when and if the excavation is completed and the approach procedures are developed or amended.

Analysis/Evaluation:

References used for this analysis were FAA Order 8260.3, change 18, para 251a(2) Straight-in 34:1 Visual Portion of the Final Approach Segment. FAA Order 8260.36A para 22, AC 150/5300-13 para 306a,b,c., OC 2118 dtd August 1995/1996. Excavation Plan Project Drawing Sheet 2 of 3.

The purpose of this analysis is to determine the dimensions of the "Visual Portion" trapezoid used to conduct an obstacle evaluation and identify any penetrations to the 34:1 Approach surface and 20:1 Visual surface. The surface is aligned with the runway centerline and begins 200 feet from the threshold at threshold elevation and extends to the Visual Descent Point (VDP) for non-precision approaches. The beginning width is 800 feet (400 feet either side of runway centerline). The sides splay outward relative to the runway centerline. For ease of computation

30,380.58 feet (5NM) was used as the length of the trapezoid. The width of the trapezoid at any given distance "d" from its origin can be calculated using the following formula: $1/2W = (0.138 \times d) + 400$ Where $1/2W =$ Perpendicular distance in feet from the centerline to the edge of the area. This area is outlined in *red* on the attached Excavation Plan drawing.

Once the dimensions of the "Visual Portion" trapezoid were calculated we conducted an analysis of obstacles penetrating the 34:1 and 20:1 Obstacle Identification Surfaces (OIS) surfaces. (see para 251b Obstacle Clearance) The surface height above the threshold of the approach and visual slopes is calculated for any distance "d" from the origin line using the formula:

34:1 surface height = $d/34$

20:1 surface height = $d/20$

Effects of penetrations to the Obstacle Identification Surfaces (OIS) which overlie the visual area.

If the 34:1 surface is penetrated, one of the following actions must be taken:

1. Adjust the obstacle height below the surface or remove the penetrating obstacle.
2. Limit minimum visibility to $3/4$ mile.

In addition to the 34:1 evaluation, if the 20:1 surface is penetrated, take one of the following actions:

1. Adjust the obstacle height below the surface or remove the penetrating obstacle.
2. Do not publish a VDP, **limit minimum visibility to 1 mile, and take action to have the penetrating obstacles marked and lighted.**
3. Do not publish a VDP, limit minimum visibility to 1 mile, and **do not authorize night IFR operations to this runway.**

The actual approach surface to Runway 26 is currently 16:1. **There are penetrations of both the 34:1 and the 20:1 OIS.**

The other evaluation that must be considered is that of the Runway and Inner Approach Obstacle Free Zones (OFZ) described in FAA Order 8260.36A para 22 and AC 150/5300-13 para 306a,b,c. This evaluation is conducted if Approach Lights are going to be installed and a precision approach was to be developed.

The Runway OFZ parallels the length of the runway and extends 200 feet beyond the runway threshold. The Inner OFZ overlies the approach light system from a point 200 feet from the threshold to a point 200 feet beyond the last approach light. The height of the Inner Approach OFZ starts at threshold elevation and slopes at 50:1 to the end of the OFZ. If approach lights are not installed or planned, the Inner approach OFZ does not apply. When obstacles penetrate the specified OFZ, the lowest landing minimums that can be authorized are changed as follows, visibility credit for lights is not authorized, and paragraph 332 of TERPS does not apply:

1. For glidepath angles through 4.2 degrees: 300-3/4
2. For glidepath angles above 4.2 degrees: 400-1

The importance of the Obstacle Free Zones (OFZ) is that if an approach light system is installed more excavation will be necessary to prepare the area. If a light system is installed and there are penetrations of the OFZ's they **will not be beneficial in reducing minimums on a precision approach procedure.** Without penetrations it may be possible to have precision minimums as low as 200-1/2.

Conclusions:

If nothing is done to improve the approach and visual surfaces to Runway 26 it will only be a matter of time until night IFR operations will no longer be authorized to that runway.

Approach minimums can not be reduced as long as there are penetrations to the surfaces. If all penetrations to the 34:1 approach surface are eliminated it would **not change** the visibility minimums on the GPS RWY 26 approach.

If a MALS approach light system were installed visibility minimums for could be reduced by $\frac{1}{4}$ mile to $\frac{3}{4}$ mile for Category A,B,C and to 1 mile for Category D.

If a MALSR approach light system were installed visibility minimums could be reduced by $\frac{1}{2}$ mile to $\frac{1}{2}$ mile for Category A,B,C and to $\frac{3}{4}$ mile for Category D for a non-precision approach. If a precision approach were developed minimums could be as low as $\frac{1}{2}$ mile for all categories, if there are no penetrations of the OFZ's. Penetrations of the OFZ's would eliminate any visibility reduction normally given for approach lights and raise the minimums of a precision approach.

Answers to NRA Questions:

1. If the TERPS surface is cleared as planned for 34:1, will the remaining FAR Part 77 approach surface penetrations be a hazard to air transportation?

No, However...If an approach light system is installed, then ideally we would need to have the Inner Approach OFZ cleared to 200 feet beyond the last light on a 50:1 slope for a **precision** approach to receive any light credit reduction to minimums. A **non-precision** approach would not be effected by penetrations of the OFZ.

2. What improvements to minimums could clearing for a 34:1 TERPS approach surface as planned have on approaches to runway 26 (precision and non-precision and with/without approach lights?)

If the 34:1 surface is cleared it will not impact minimums on the **non-precision** approach without lights. If a MALS/F is installed visibility could be reduced by $\frac{1}{4}$ mile resulting in $\frac{3}{4}$ mile for Category A, B, C and 1 mile for Category D aircraft. If a MALSR is installed visibility could be reduced to $\frac{1}{2}$ mile for all Categories.

A clear 34:1 surface for a **precision** approach, visibility could be reduced to $\frac{3}{4}$ mile all categories without lights or with a MALS/F. If a MALSR is installed and a clear Inner Approach OFZ (50:1), **precision** approach visibility could be reduced to $\frac{1}{2}$ mile for all categories.

What improvements to minimums could clearing for a 20:1 TERPS approach surface have on runway 26 (precision and non-precision and with/without lights)?

If there are no penetrations to the 20:1 surface and approach lights are installed, visibility minimums could possibly be reduced to $\frac{3}{4}$ mile for Category A, B, C, and 1 mile for Category D aircraft. Clearing the 20:1 surface will allow night IFR operations to runway 26. If this surface has penetrations, night IFR operations could be prohibited.