

4 FACILITY REQUIREMENTS

4.1 Airfield Requirements

4.1.1 Design Aircraft

The design aircraft is based on the most demanding aircraft operating at the facility that meets FAA's substantial use threshold, which specifies a minimum of 500 annual itinerant operations (AC 150/5325-4B). Table 4-1 shows the large jet aircraft expected to operate at Kotzebue during the next 20 years, which are candidates for the design aircraft designation. The jets are divided into three categories: jets being phased out of service, jets that will operate throughout the next 20 years, and jets that will begin operating at Kotzebue during the next 20 years.

Table 4-1 – Large Jet Aircraft Operating at Kotzebue Airport

Aircraft	Air Carrier	ARC	Frequency (round trip flights per week)	Notes
<i>Being phased out</i>				
B727-100	Northern Air Cargo	C-III	—	Phase out between 2013-2016
B737-200	Alaska Airlines	C-III	—	Phase out in 2007
<i>Continue operating through 2026</i>				
B737-200	Northern Air Cargo	C-III	5	
B737-400	Alaska Airlines	C-III	24	
L-382	Lynden Air Cargo	C-IV	3	
<i>Begin operating by 2026</i>				
B737-700	Alaska Airlines	C-III	—	

Both Northern Air Cargo and Alaska Airlines will be phasing out the smallest members of their respective fleets, Northern Air Cargo's Boeing 727-100 within 10 years and Alaska's Boeing 737-200 in 2007. Alaska Airlines predicts that within 20 years they may be flying the Boeing 737-700 aircraft to Kotzebue. Lynden Air Cargo predicts that their fleet servicing Kotzebue will not change over the next 20 years.

The aircraft with the most demanding ARC (C-IV) is the Lockheed L-382 Hercules. However, with only 3 scheduled flights per week and 12 chartered flights per year in 2005 (336 annual itinerant operations), this aircraft does not meet FAA's substantial use threshold. The three remaining aircraft that are expected to be operating in 2026 have an ARC of C-III: the Boeing 737-200, 737-400, and 737-700. The B737-200 was selected as the design aircraft for the primary runway because it requires the longest runway (see Runway Length section below).



Photo 4-1: A Northern Air Cargo jet waits for clearance to take off from Runway 8-26

The crosswind runway at Kotzebue should be designed to meet an ARC of B-II, since this is the most demanding aircraft category that requires a crosswind runway (see Runway Requirements below). Table 4-2 summarizes the B-II aircraft operating at Kotzebue Airport.



Photo 4-2: A Beech 1900 used for Maniilaq medevac flights at Kotzebue Airport

Table 4-2 – B-II Aircraft at Kotzebue Airport

Aircraft	ARC	Passengers	MTOW* (lbs.)
Cessna 208B Caravan	B-II	9	8,750
Reims/Cessna F406	B-II	9	9,850
Beech King Air 200	B-II	7	12,500
Raytheon Beech 1900D	B-II	19	17,120

*MTOW: Maximum certificated takeoff weight

The Raytheon Beech 1900 was not chosen as the design aircraft for the crosswind runway because under most circumstances the Beech 1900 operators use the main runway. They prefer to land on paved runways whenever possible, and because the Beech 1900's approach speed is close to that of Category C aircraft it has a greater tolerance to crosswinds than many other B-II aircraft. The operators also prefer the main runway for its greater width (allowing further operational tolerance). The occasional use of the crosswind runway by the Beech 1900 would not be likely to exceed the substantial use threshold.

Of the remaining B-II aircraft, the Beech King Air 200 has the most demanding runway length requirement, so it was selected as the design aircraft for the crosswind runway.

4.1.2 Runway Requirements

Demand-Capacity Analysis

The approximate airport annual service volume was determined from the Airport Capacity and Delay Advisory Circular (150/5060-5) and compared with the predicted annual operations (see Section 3). The existing and predicted operations at Kotzebue are well below the capacity of the airport, with the 2006 and 2026 annual operations utilizing 21 percent and 26 percent of the

airport’s capacity, respectively. Hourly capacity will also not be reached during the planning period, but some delay will continue to be experienced during peak hour operations. The conclusion of this analysis is that improvements at Kotzebue will continue to be driven by aircraft requirements and FAA standards, rather than by demand.

Dimensional Criteria

The runway dimensions are based on the airport reference code (ARC). The ARC is determined based on the operational and physical characteristics of an airport’s current and predicted fleet mix. The airport reference code consists of two parts: the aircraft approach category (A to E), which relates to the approach speed of the aircraft, and the airplane design group (I to VI), which relates to the wingspan or tail height of an airplane. Table 4-3 defines the characteristics associated with each approach category and design group.

Table 4-3 – Aircraft Reference Code Components

Aircraft Approach Category		Airplane Design Group	
	1.3x Stall Speed*	Tail Height (ft)	Wingspan (ft)
A	<91 kt	I	<20
B	91-<121 kt	II	20 - <30
C	121-<141 kt	III	30 - <45
D	141-<166 kt	IV	45 - <60
E	≥166 kt	V	60 - <66
		VI	66 - <80
			214 - <262

* Aircraft grouping based on 1.3 times the stall speed in the landing configuration at maximum certificated landing weight.

The primary runway design aircraft, the Boeing 737-200, has an ARC of C-III. Consequently, C-III will continue to be the Kotzebue Airport ARC. The crosswind runway can have a lower ARC because it is used by smaller aircraft. The crosswind runway at the Kotzebue Airport will continue to have an ARC of B-II, because this is the most demanding type of aircraft that needs a crosswind runway (see next section for further details).

Orientation

A wind data analysis was performed as part of this study and can be found in the *Interim Resource Documents* Binder. The optimum runway alignment was found to be between 101 and 107 degrees. Runway 8-26 falls within this optimum range with an orientation of 102 degrees.

The wind coverage on Runway 8-26 was calculated using both the DOT&PF 16-point analysis and the FAA 36-point analysis. The results from the 36-point analysis are shown in Table 4-4.

Table 4-4 – Kotzebue Primary Runway Wind Coverage

ARC	Crosswind Component	Wind Coverage*		Crosswind Runway Necessary
		Standard	Existing	
A-I, B-I	10.5 kt (12 mph)	95 percent	90 percent	Yes
A-II, B-II	13 kt (15 mph)	95 percent	94 percent	Yes
A-III, B-III, C-I to D-III	16 kt (18.5 mph)	95 percent	98 percent	No
A-IV to D-VI	20 kt (23 mph)	95 percent	99 percent	No

*Percent wind coverage was calculated using the FAA 36-point analysis.

The wind coverage analysis determined that a crosswind runway is necessary for aircraft with an ARC of A-I to B-II. However, the need for a crosswind runway for A-II and B-II aircraft is disputable. According to the DOT&PF 16-point analysis, the existing wind coverage at 13 knots (15 mph) is acceptable with a value of 95.3 percent, while the FAA method calculates less than 95 percent coverage with a value of 94.1 percent.

The existing combination of primary (Runway 8-26) and crosswind (Runway 17-35) runways at Kotzebue Airport provides sufficient wind coverage for category A-I to B-II aircraft, as well as some separation of the general aviation activity from the jet traffic.

Runway Length

Summary: The recommended runway lengths for the Kotzebue Airport are a 7,500-foot primary runway with an ARC of C-III and a 3,650-foot crosswind runway with an ARC of B-II. The 7,500-foot primary runway length corresponds to the runway length requirements of the design aircraft, the Boeing 737-200. An interim development length for the primary runway is 6,700 feet, which corresponds to the runway length required for the Boeing 737-400. Figure 4-1 shows two possible airport layouts with the recommended runway lengths and Figure 4-2 shows the corresponding airspace requirements.

The length of the primary runway is controlled by the most demanding C-III aircraft operating at Kotzebue and the recommendations of the “Landing Performance Assessments at Time of Arrival (Turbojets)” Safety Alert for Operators released in August 2006 (SAFO 06012). The C-III aircraft operating at Kotzebue include Boeing 727s and 737s; see the Aviation Forecast in Section 3 for further discussion of the fleet mix. The aircraft analyzed to determine the primary runway length are the B727-100 and the B737-200, B737-400, and B737-700. SAFO 06012 recommends that operators assess runway braking action and runway contaminants (e.g., snow, slush, and ice) prior to landing to ensure that sufficient runway length is available for a “full stop landing, with at least a 15 percent safety margin beyond the actual landing distance.” In order for operators to comply with this FAA recommendation, the recommended 15 percent safety margin should be included when designing the Kotzebue Airport runway. Although this SAFO is currently a recommendation, FAA is in the process of developing it into a regulation. This process is expected to be completed within 1 to 2 years.

Methodology: The minimum runway length was determined using Boeing’s Airport Planning Manuals (APM) for 727 and 737 aircraft in conjunction with FAA AC 150/5325-4B, Runway Length Requirements for Airport Design. The design inputs for determining the runway length according to the FAA advisory circular are the critical design airplanes under evaluation and

their manufacturer’s APM, the maximum certificated takeoff weight or takeoff operating weight for short-haul routes, maximum certificated landing weight, airport elevation above mean sea level (11 MSL), effective runway gradient (assumed to be zero), and the mean daily maximum temperature of the hottest month at the airport (60°F). Portions of Boeing 727 and 737 APMs are available in Appendix C, including landing length, payload-range, and takeoff length charts. Using these inputs, both the takeoff and landing length requirements can be determined for each aircraft.

A summary of the method for determining runway length outlined in AC 150/5325-4B follows. The landing length requirement is calculated using the APM landing length chart with the highest landing flap setting. The wet runway charts are used in response to the Code of Federal Regulations requirement (14 CFR 121.195(d), 135.385(d), and 91.1037(e)) that turbo-jet powered aircraft landing length determinations use wet runway data (or the dry landing length be increased by 15 percent). The takeoff length is based on a takeoff weight corresponding to the length of haul that is flown by the airplanes on a substantial use basis. The length of haul for the aircraft under consideration is from Anchorage to Kotzebue, a distance of 478 nautical miles. The maximum takeoff weight is determined from the Payload-Range Chart and appropriate haul length. The takeoff length required is determined from the takeoff length chart and maximum takeoff weight. The runway length is the longer of the required landing and takeoff lengths.

However, these runway lengths do not take into consideration fair or poor braking conditions. Thus, they are only a starting point for designing a runway that allows operators to comply with SAFO 06012 recommendations. In discussions with FAA, their recommendation was to calculate an appropriate runway length with Boeing’s contaminated runway data and then increase this length by 15 percent in order to allow for a safety margin. A “contaminated runway” has snow, slush, or ice on its surface.

Contaminated runway data was not readily available from Boeing. However, a safety margin increase of 15 percent was added to the runway length calculated using AC 150/5325-4B. Table 4-5 shows the preliminary runway lengths calculated for each aircraft type using the AC method and the final runway lengths after applying the 15 percent safety margin. The recommended runway length corresponding to the design aircraft, the Boeing 737-200, is shown in bold. The runway length corresponding to the Boeing 737-400 aircraft is also shown in bold; this length can be used as an interim runway development length.

Table 4-5 – Kotzebue Airport Primary Runway Length

Aircraft	Landing Length	Takeoff Length	Runway Length	1.15*Runway Length
B727-100	5,500'	6,200'	6,200'	7,100'
B737-200	5,200'	6,500'	6,500'	7,500'
B737-400	5,800'	5,600'	5,800'	6,700'
B737-700	5,400'	5,300'	5,400'	6,200'

To confirm the runway length calculations, the two Boeing 727 and 737 operators, Northern Air Cargo and Alaska Airlines, were contacted for their assessment of the current runway length and the optimal runway length for their operations over the next 20 years. FAA had suggested that Alaska Airlines’ estimate of the necessary runway length would probably be accurate, because

they have been involved in the process of developing appropriate safety margins for contaminated runways. Mike Moore, the Director of Operations for Northern Air Cargo, stated that the current Kotzebue runway length of 5,900 feet was adequate but a runway length of 6,500 feet would provide a better safety margin. Lynae Jacobson, the Manager of Air Traffic and Airfield Operations for Alaska Airlines, stated that they would prefer a runway between 6,500 and 7,500 feet. She stated that the minimum runway length necessary for a full B737-400 to land in poor braking conditions is 6,500 feet.

The responses from the operators generally confirm the calculated runway lengths. Table 4-6 shows both the calculated runway lengths and those recommended by the operators. The runway length for the Boeing 737-400 is used as the interim or minimum runway length because the Boeing 737-200 currently has fewer operations than FAA’s substantial use threshold (500 annual itinerant operations), although it is predicted to have operations above the thresholds within the next 20 years. The Boeing 737-400 currently operates at a level far exceeding the substantial use threshold and will continue to operate at that level through the next 20 years.

Table 4-6 – Runway Length Summary

	Calculated	Northern Air Cargo 737-200	Alaska Airlines 737-400
Minimum Runway Length	6,700'	5,900'	6,500'
Optimum Runway Length	7,500'	6,500'	7,500'

Beyond lengthening the runway, the SAFO guidance can also be met by increased runway maintenance and by reduction of aircraft payloads. Runway surface preparation is the primary variable in aircraft braking distance. Application of heated sand, snow plowing, and other surface preparation methods are instrumental in reducing an aircraft’s required landing length. Limiting payloads can also reduce the required runway length.

Further cost analysis may be necessary to determine the most cost-effective method of meeting the SAFO guidance. The recommendation of this report is to plan for a 7,500-foot runway. An interim development length of 6,700 feet is acceptable. Some operational techniques can be combined with the 6,700-foot runway to ensure that the runway length is sufficient, such as keeping the runway surface in the fair-to-good braking range and flying aircraft with less than a full load.

Crosswind Runway: A crosswind runway meeting B-II standards is required at Kotzebue. The Beech King Air 200 is the design aircraft for the crosswind runway because it requires the longest runway. Table 4-2 above lists the B-II aircraft operating at Kotzebue and their characteristics. These aircraft, excluding the Beech 1900 which is more likely to use the primary runway, were used to determine the necessary crosswind runway length.

The number of passengers listed in Table 4-2 above is the number that the operators at Kotzebue advertise for these aircraft. The aircraft are capable of carrying more passengers, but the operators have chosen to limit their passengers to nine so that they will be regulated by the less stringent FAA Part 135 rather than FAA Part 121, which applies to operators carrying ten or more passengers.

The crosswind runway length was designed to provide the length required if in the future any of the operators of these planes decide to begin utilizing the planes' full capacity. Consequently the method outlined in AC 150/5325-4B for determining runway lengths for small aircraft with maximum certificated takeoff weight of 12,500 pounds or less and 10 or more passenger seats was used. The required crosswind runway length was determined to be 3,650 feet.

Runway Standards and Deficiencies

Runway and safety area width standards are based on the ARC designation. Table 4-7 summarizes runway standards, including runway and safety area widths, for B-II and C-III runways. Table 4-8 summarizes the FAA runway standards for C-III and B-II facilities, the existing Kotzebue Airport conditions, and the deficiencies.

Table 4-7 – Runway Standards

	Primary Runway (C-III) (ft)	Crosswind Runway (B-II) (ft)
Runway Width	150	75
Runway Shoulder Width	25	10
Runway Blast Pad Width	200	95
Runway Blast Pad Length	200	150
Runway Safety Area Width	500	150
Runway Safety Area Length Prior to Landing Threshold	600	300
Runway Safety area Length Beyond RW End	1,000	300
Runway Object Free Area Width	800	500
Runway Object Free Area Length Beyond Runway End	1,000	300

Table 4-8 – Runway Characteristics

	Existing (ft)	Standard (ft)	Deficiency (ft)
<i>Primary Runway</i>			
Length	5,900	7,500	1,600
Width	150	150	—
Safety Area Width	340	500	160
Safety Area Length Beyond Runway End	100 / 200	1,000	900 / 800
Object Free Area Width	800	800	—
Object Free Area Length Beyond Runway End	1,000	1,000	—
<i>Crosswind Runway</i>			
Length	3,800	3,650	—
Width	90	75	—
Safety Area Width	100	150	50
Safety Area Length Beyond Threshold	300 / 240	300	0 / 60
Object Free Area Width	150	500	350
Object Free Area Length Beyond Runway End	300	300	—

The development of the existing Runways 8-26 and 17-35 are hindered by several non-standard issues. The first is an access road that crosses the Runway 8-26 safety area off of the west end of the runway. The width of the Runway 8-26 safety area is also constrained because a portion of the runway is located on fill in the lagoon. The safety area length beyond the runway ends is constrained on the west end by the Kotzebue Sound and on the east end by the Kotzebue Lagoon.

Runway 17-35's safety area is 60 feet less than the standard of 300 feet on the north side of the runway because of an existing airport access road. A wastewater lagoon is located within 250 feet of the runway centerline, which does not meet the minimum separation distance of 10,000 feet. A waterlane access road is located 225 feet right of the runway centerline, which does not meet the minimum separation requirement of 300 feet. Currently, there is general aviation aircraft parking to the west of Runway 17-35 within the runway object free area.

4.1.3 Taxiway Requirements

A full parallel taxiway is advised for Runway 8-26 because it has a precision instrument approach (AC 150/5300-13). There is an existing apron taxilane approximately 1,200 feet long, leaving a deficiency of 6,300 feet of taxiway. A parallel taxiway is not justified for Runway 17-35, because it does not have a precision approach and activity levels are much lower than for Runway 8-26.

The dimensions of the taxiway are controlled by the aircraft design group (II and III). In Alaska, the taxiway widths are typically increased to that of the next larger design group to allow for the difficulty experienced maneuvering aircraft in cold weather conditions and to allow for snow removal. In Kotzebue, this increase will also allow for larger aircraft that occasionally use the runway, such as the Lockheed L-382 Hercules. The applicable taxiway dimension standards, existing condition, and deficiencies are shown in Table 4-9.

Table 4-9 – Taxiway Dimension Standards

Taxiway Characteristics	Existing (ft)	Standard (ft)	Deficiency (ft)
<i>Design Group III</i>			
Taxiway Width (Group IV)	50* / 90	75	25 / 0
Taxiway Safety Area Width	100** / 120	118	18 / 0
<i>Design Group II</i>			
Taxiway Width (Group III)	50	50	—
Taxiway Safety Area Width	100	79	—

* Taxiways A, B, & F

** Taxiway F

The existing taxiway and taxiway safety area widths at Kotzebue are primarily up to standard. Widening Taxiways A and B that connect the lease lots to the apron, widening the safety area of Taxiway F that connects Runway 8-26 to Runway 17-35, and extending the existing apron taxilane into a full parallel taxiway are the recommended taxiway improvements. It should be noted that Taxiways A and B actually meet the FAA Group III width standards but are narrower than the other Runway 8-26 taxiways, which are designed to greater than Group IV standards.

4.1.4 Float Plane and Ski Facilities

Float plane operation at Kotzebue is limited but does occur. If the airport remains at the existing site, development of the float plane facilities specified in the current Airport Layout Plan (Appendix C) is recommended. If the airport is relocated to higher ground, development of a waterlane at the new site would be imprudent.

Planes on skis are currently accommodated on the crosswind runway by maintenance staff leaving a thin layer of snow on the gravel runway. This method satisfactorily meets the demand at the existing airport and would also be used at the relocated site.

4.2 Landside Facilities

Landside facilities consist of the terminal area facilities, terminal area aircraft parking apron, vehicle parking, road access, general aviation (GA) facilities and aviation support facilities.

The current aviation forecast (Section 3) predicts enplanements and based aircraft for 2026 to be generally the same as, and operations much lower than, those predicted for 2008 in the 1998 AMP. Enplanements, operations, and based aircraft in 2026 are all currently forecast to be well below the 2018 forecast in the 1998 AMP. See Table 4-10.

Table 4-10 – Current Forecast Compared to 1998 Airport Master Plan

Current Forecast – Year 2026 (see Section 3)		1998 Kotzebue Airport Master Plan	
		2008	2018
Enplanements	72,432	74,200	92,200
Operations	52,837	80,640	94,405
Based A/C	101	107	130

The 1998 AMP identified six key landside capacity/facility requirement needs:

1. Replace the existing snow removal equipment building (SREB) and aircraft rescue and firefighting (ARFF) facilities.
2. Find a new site for FAA’s Flight Service Station (FSS) and National Weather Service (NWS) station.
3. Relocate fueling facilities.
4. Eliminate penetration of the Part 77 airspace by jets parked on the apron.
5. Add lease lot area and add/relocate aircraft parking areas.

Progress has been made on resolving these issues. A new combined DOT&PF/FAA facility, now under construction, will resolve Items 1 and 2. The refueling station (Item 3) was removed in 1998; refueling is now done by fuel trucks which are housed in a building on the apron. Items 4 and 5 continue to be issues, as is access to Runway 17-35 and the private properties to the west.

In general the existing facilities, newly constructed facilities, or landside facilities planned for ultimate development on the existing ALP meet or exceed the anticipated needs for the Kotzebue Airport, (see Appendix C, ALP Sheets 5 and 7). If the airport is relocated, landside facilities equivalent in size should be planned for, except lease lots for air carriers should be larger. Layout of a new airport facility should be configured to separate air taxi, air carrier, cargo, and GA operations.

4.2.1 Terminal Area Facilities

In the mid-1980’s, about 12 leaseholders had apron access and demand for lots with apron access was approaching capacity. By the mid 1990’s, 15 lease holds with apron access were available and leased (ASCG, 1998). Recently two lots were combined to provide area for construction of the

new SREB/ARFF/FSS (see Appendix A, land occupancy drawings, Lot AAA). This eliminated an apron frontage lot.

Cargo and Certified Passenger Handling

FBX provides cargo handling service for Northern Air Cargo, Everts Air Cargo, Lynden Air Cargo, and Frontier Flying Service. The FBX facility burned and was rebuilt with a larger building within the same lot. This lot is extremely congested, and multiple aircraft (including 727 and DC-6 jets) utilizing this leaseholder's facility end up parked outside the leaseholder's lot. The large aircraft parked at this facility create an obstruction of the Part 77 airspace.

Alaska Airlines' lease area for passenger terminal and cargo handling is also very congested. On the air side of their facility, luggage carts and service equipment spill out onto the apron and parked aircraft create an obstruction to the Part 77 airspace. The existing lease lot is 150 feet by 180 feet, with a 60- by 135-foot terminal building. The building includes office space, luggage, cargo and mail handling, passenger ticketing, and check-in spaces, as well as waiting areas on both sides of security.

Changes in security since 9-11 have put pressure on Alaska Airlines to reconfigure the passenger service area of the terminal. However, as predicted in the 1998 AMP, over the last 10 years enplanements have shifted from large certified air carriers to smaller commuter/air taxi operators. This has helped to offset terminal congestion that would have been created by making room for the increase in security equipment and personnel. Therefore, based on the recent trend toward passengers' use of commuter airlines, the fact that the terminal is functioning marginally adequately, and a flat-to-slight increase in enplanements over the next 20 years, the existing building size appears adequate.

Expansion to handle the congestion and to resolve the parked aircraft airspace penetrations is impractical at the FBX and Alaska Airlines locations. However, the area identified on the existing ALP for future terminal area and C-III aircraft parking would meet the needs. It provides for larger lease lots and a greater setback from the runway centerline.

4.2.2 Terminal Area Aircraft Parking Apron

Three to four large itinerant aircraft (727, 737, or DC-6 type) on the main apron at any one time is not unusual in Kotzebue. In addition to these itinerant aircraft, the fixed base operators such as Frontier, Baker, Bering, ATS and Hageland have aircraft on the apron. (Bering, located adjacent to FBX, has the largest based-aircraft fleet.) The mix of large and small aircraft causes some congestion, but appears to be manageable. The previous AMP predicted growth in air taxi aircraft on the terminal area apron from 28 in 1995 to 40 by 2018. This growth has not been realized; the aircraft on the terminal apron is currently estimated at 15 air taxis and 4 air carriers.



Photo 4-3 FBX Terminal at Kotzebue

Existing and Ultimate Demand

2006: Air Carrier = 4 aircraft x 1.1 = 5 parking spaces at 600 sq. yd. = **3,000 sq. yd.**
Air Taxi = 15 x 1.1 = 17 x 360 sq. yd. = **6,120 sq. yd.**

2026: Air Carrier = 5 aircraft x 1.1 = 6 parking spaces at 600 sq. yd. = **3,600 sq. yd.**
Air Taxi = 19 x 1.1 = 21 x 360 sq. yd. = **7,560 sq. yd.**

The existing terminal apron area is adequate for current and future demand but requires reconfiguration to separate the large and small aircraft operations. This was considered and accounted for in the 1998 AMP. The ultimate terminal area plan identifies adequate space and offset to meet this need through 2026.

4.2.3 General Aviation Facilities

Table 4-11 shows the existing and projected GA aircraft capacity and demand. The number of based aircraft for the GA parking areas is derived from the number of current rental tiedown spaces, which is substantially lower than the based aircraft number listed in the forecast section. The based aircraft listed in Section 3 include 69 registered planes with Kotzebue addresses and 13 air taxi aircraft registered through the air taxi’s main office address. For example, Bering Air planes are registered at Nome, but at any one time 3-4 aircraft may be stationed at Kotzebue. This resulted in 82 based aircraft. Of these, 15 are estimated to be on lease lots, leaving 66 “private” aircraft that presumably require tiedown space at Kotzebue. However, the current number of rental tiedowns is only 29, leaving a discrepancy of 38. Some of these are likely to be aircraft on floats, while others may be registered planes that have been sold and are no longer in Kotzebue or that have been moved off the airport to wait for repairs or for flying to get cheaper.

Table 4-11 – GA Aircraft Capacity and Demand

	Private Based Aircraft	Required Space	Available Tiedown/Apron Space	Deficiency
2006 (existing)	29	9,570 sq. yd.	14,200 sq. yd. along Runway 17-35	Existing is adequate
2026 (forecast)	36	11,880 sq. yd.	6,600 sq. yd. along Taxiway B	
			Total Available = 20,800 sq.yd.	

The two existing GA parking areas are described in Section 2.2.2. The existing apron along Runway 17-35, although large enough, does not meet FAA separation requirements. Relocation of this apron/tiedown area to offset meeting FAA requirements is necessary.

4.2.4 Vehicle Parking

No designated public parking areas exist. Patrons park on leaseholder lots or within the airport access road ROW. The shift of passenger enplanements from Alaska to smaller commuter airlines has relieved the demand in front of the Alaska Airlines terminal. Although no specific demand data is available, discussions and observations indicate that parking is generally adequate except at times during the winter when snow accumulates. Ultimate development of Block 2, Parcels O and L, shows a vehicle parking area (Appendix C, ALP Sheet 5).

4.2.5 Airport Access

Existing surface access to the airport is discussed in Section 2.2.3. Access to the airport is adequate except for the road to access Runway 17-35. Although construction of the BIA Hillside Road has reduced traffic crossing the end of the runway safety area, it is still a concern. Attempts by FAA and DOT&PF to close this road have proved unsuccessful with the community due to long-standing traditional uses. Continued use of this road poses security and safety concerns. Additional coordination to develop access alternatives acceptable to the FAA, the Transportation Security Administration (TSA), and the community is required.

4.2.6 Aviation Support Facilities

Maintenance and Operations

The new DOT&PF/FAA ARFF/SREB/FSS facility currently under construction will provide improved facilities for airport maintenance and operations, firefighting and rescue, and flight services. A new DOT&PF sand/deicing chemical storage facility is also being constructed. No other support facilities are anticipated in the next 20 years.

Utilities

Section 2.1.5 describes the existing utilities. Utility extension to Block 2, Parcels O and L, will be necessary when the apron is expanded as shown on the existing ALP.

Fuel Services

Crowley Marine Services is the only fuel vendor at the airport. Refueling trucks have to travel through town to reach Crowley's bulk fuel storage facilities. Until 1999 Crowley had two 12,000-gallon tanks at the airport, but these were removed because they were airspace obstructions. Reportedly Crowley would prefer to re-install two 12,000-gallon tanks at the airport. This would expedite their refueling operations.

4.2.7 Airport Layout

Figure 4-1 shows an ideal layout and a topographically constrained layout. Both layouts meet the airfield and landside facility requirements set forth in this chapter.

The ideal layout provides a compact facility that minimizes taxiing distances and land purchase while maintaining separation of main apron and GA apron traffic. This layout would be affected by whether or not the crosswind runway is paved, since it crosses the paved main runway and parallel taxiway.

The second layout shows a potential airport layout for a topographically constrained site. Topographic constraints that affect the airport layout are present at the existing airport and in Areas 1 and 2.

4.3 Facility Requirements for Alternative Development

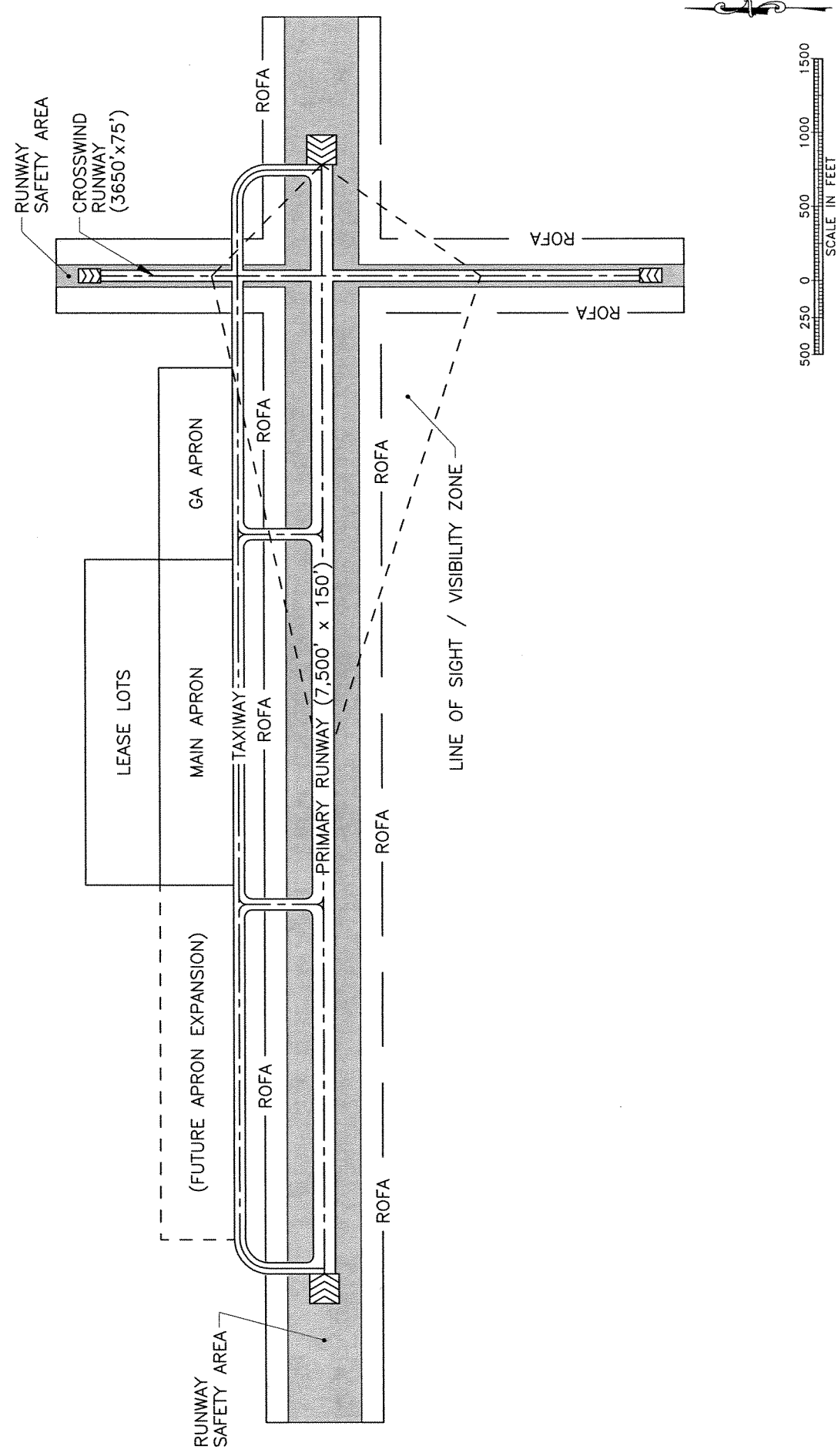
So as not to overly complicate the analysis, the initial alternative development and analysis only considered primary elements of the airport facility. The facility requirements for the alternatives were generally designed to meet the ALP ultimate layout and FAA standards, with a few differences between the facility requirements for relocating versus improving the airport. The primary elements used as the basis for developing the alternatives are outlined below.

Table 4-12 – Primary Elements Used to Develop Alternatives

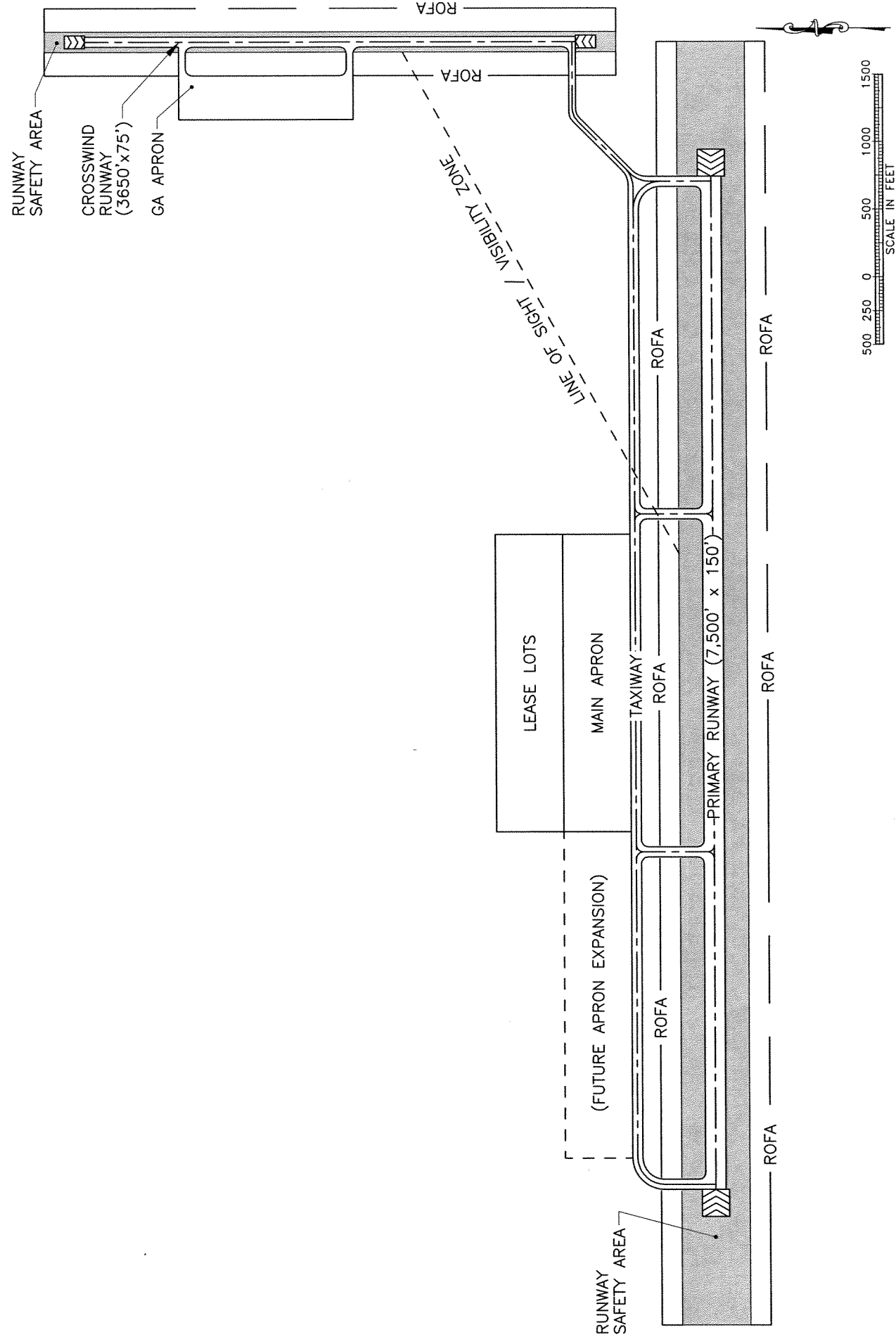
Element	Dimensions	Reason
Primary Runway		
Runway Length	7,500' and 6,700'	Ultimate and interim lengths based on FAA standards
Runway Width	150'	FAA standards
Safety Area	9,500' x 500' and 8,700' x 500'	FAA standards, based on ultimate and interim runway lengths
Crosswind Runway		
Runway Length	3,800'	Existing crosswind runway length
Runway Width	75'	FAA standards
Safety Area	4,400' x 150'	FAA standards
Other Features		
Apron & Lease Lot Sizes	As shown on Figure 5-1	Same as ALP ultimate layout
Parallel Taxiway	Partial	Existing airport layout

The alternatives were designed to meet or exceed FAA recommendations, except in the case of the parallel taxiway. Although FAA recommends a full parallel taxiway for runways with precision instrument approaches, this would add considerable expense to the airport development at the existing site and might skew the analysis in favor of relocation. Consequently, all alternatives were developed with a partial parallel taxiway.

In addition, there are two significant differences between the relocation alternatives and the expansion alternative. Both of the differences came about so that the alternative costs could be compared fairly, with the understanding that the expansion alternative would be more constrained than the relocation alternatives. First, the relocation alternatives included a land purchase large enough for the primary runway to be expanded up to 10,000 feet long, while the expansion alternative provided for minimal land purchase. Second, the relocation alternatives were designed to comply with full Part 77 airspace requirements, but the improvements at the existing airport only include removal of obstructions to meet the Terminal Instrument Procedures (TERPS) requirements as outlined in FAA aeronautical study #01-AAL-226-NRA dated 12/5/01 (Appendix C).



IDEAL AIRPORT LAYOUT



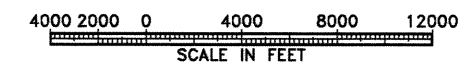
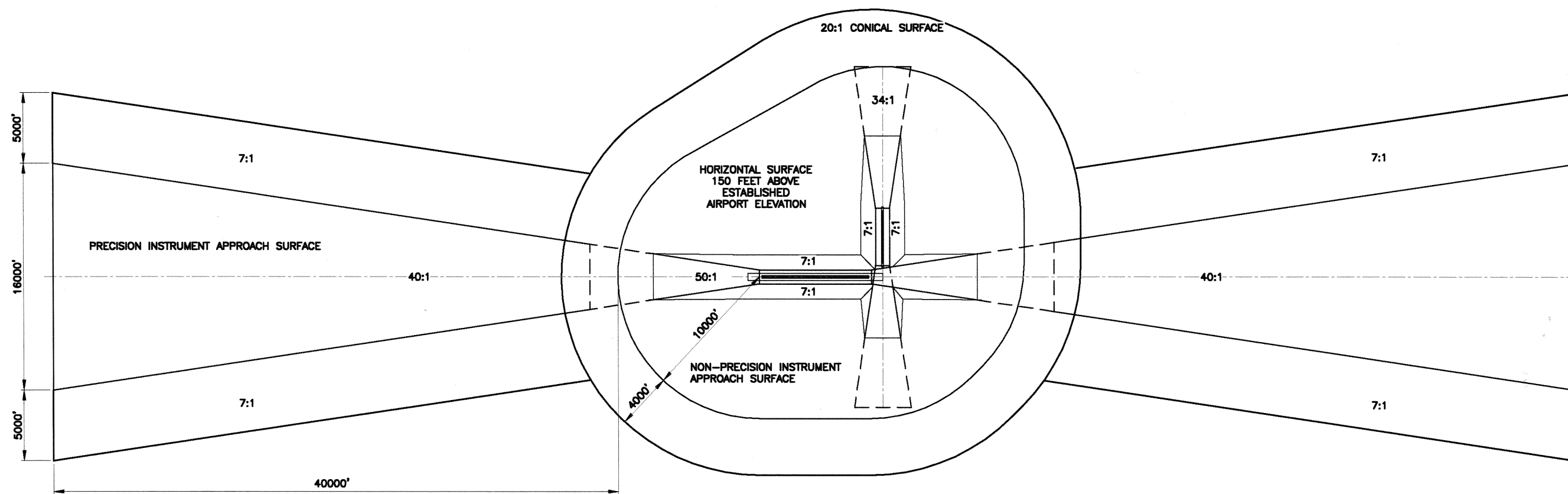
TOPOGRAPHICALLY CONSTRAINED AIRPORT LAYOUT

DESIGN:	RAA
DRAWN:	GDS
CHECK:	RLC
DEC 2007	
PROJ. No.	F05077
FIGURE	4-1

KOTZEBUE AIRPORT RELOCATION FEASIBILITY STUDY
 PROPOSED AIRPORT LAYOUTS

KOTZEBUE, ALASKA

PREPARED BY:
 PDC, INC.



CONSULTANT :

PREPARED BY:
PDC, INC.

PROJECT :
**KOTZEBUE AIRPORT
RELOCATION FEASIBILITY STUDY**

KOTZEBUE, ALASKA

SHEET TITLE :
**RELOCATED AIRPORT
PART 77 AIRSPACE**

DESIGN	RAA
DRAWN	RAA
CHECKED	RLC
DATE	SEPT 2007

PROJECT No.
F05077

FIGURE

4-2