

8.0 AIRPORT FACILITY REQUIREMENTS AND STANDARDS

The general location of the various types of airport facilities and requirements for runways, taxiways, aprons, servicing facilities, roadways, and parking were developed from an analysis of the demand and capacity requirements and from airport design standards. Airside and landside needs and deficiencies were determined based on the findings of the projected aviation demand forecast, approved by the FAA on April 1, 2019, to allow Big Lake Airport to accommodate projected demand through 2036. This resulted in a first approximation of the overall size and shape of airport improvements and helps assess potential impacts on land use, the environment, infrastructure, and airspace.

8.1 Airfield

The FAA prescribes standards to which runways, taxiways, aprons, and other features should be developed. These standards are based upon the dimensions and performance characteristics of the airport's critical aircraft. A critical aircraft is defined as the most demanding aircraft anticipated to operate (land or take off) at the airport at least 500 times annually within the 20-year planning horizon.

8.1.1 Airport Reference Code and Critical Aircraft

The Cessna 185 is expected to be the most demanding aircraft to use the airport, with estimated usage roughly 500 times per year by 2036. Additional larger aircraft will operate at the airport, but on a less frequent basis. *The Runway Design Code (RDC) for Runway 07-25 should continue to be A-I Small Aircraft, visibility not less than 1 mile.*

8.1.2 Runway Alignment

The airport currently has one runway, 07-25, aligned generally east-west. A standard wind analysis using wind data for Wasilla Airport (15 miles away by air) from 2009 to 2019, indicates that the runway has 98.24 percent crosswind coverage at 10.5 knots.

According to FAA AC 150-5300, if an airports primary runway provides less than 95 percent for aircraft forecasted to use the airport on a regular basis, it should be realigned or augmented by a crosswind runway. Crosswind coverage for Runway 07-25 appears adequate based on off-site wind data. The 5010 report for this airport indicates that a small hill east of Runway 25 may cause turbulence on approach to the runway. The hill is about 40 feet high and 1,500 feet east of the Runway 25 threshold. *On-site wind data should be collected to confirm the runway alignment prior to shifting the runway.*

8.1.3 Runway Design

Runway 07-25 is currently 2,450 feet long and 70 feet wide. The runway is classified as A-1 Small Aircraft which is appropriate for the critical aircraft (C-185). According to FAA AC 150/5325-4B, given conditions at BGQ, the dimensional standard for runway width is 60 feet. *The 70-foot runway width exceeds the FAA A-1 small standard width of 60 feet and the runway should be reduced to 60 feet in width.*

According to FAA AC 150/5325-4B, given conditions at BGQ, the dimensional standard for runway length for small airplanes with fewer than ten passenger seats is approximately 2,900 feet. Comments received from pilots indicate that the present runway length is adequate for most aircraft for most of the year, but some aircraft (the Piper PA-31 Navajo was cited) would benefit from a longer runway in the summer months. *The runway should be resurfaced and ultimately extended by approximately 450 feet to 2,900 feet.*

The runway shoulders are variable in width and there are no blast pads at either end of the runway. *The runway shoulders should be constructed to a ten-foot width and blast pads are not necessary.*

Nearly all of the many private airports surrounding BGQ have gravel runways. Aircraft based at these private airports are often flown to BGQ for maintenance services. These aircraft and the aircraft based at BGQ may be equipped with tundra tires or skis, depending on the season. For these aircraft, operating on paved runways can be difficult, dangerous, or even impossible depending on surface conditions. Therefore, *the runway should remain gravel surfaced.*

The RSA for Runway 07-25 is currently 100 feet wide. It extends 217.5 feet west of the threshold for Runway 07 and 147.5 feet east of the threshold for Runway 25. To comply with FAA design standards, the RSA should be 120 feet wide and extend 240 feet beyond each threshold. *The RSA should be graded and widened 20 feet and extended an additional 22.5 feet beyond the Runway 07 threshold and an additional 92.5 feet beyond the Runway 25 threshold.*

The ROFAs and ROFZs meet FAA design standards for length and width. The RPZs for Runway 07-25 are appropriately sized to serve aircraft with approach visibility minimums of 1.0 mile. However, a substantial portion of the RPZ for Runway 07 is outside the airport boundary and is obstructed by roads, structures, and trees. *The portion of the Runway 07 RPZ that is outside the airport boundary should be acquired and cleared or the runway shifted so that the*

entire RPZ is within the airport property boundary. Perimeter fencing should be extended to include the RPZs to the extent practicable.

Aircraft parking areas are currently at least 280 feet from the runway centerline, exceeding the standard of 155'.

8.1.4 Runway Capacity

Airfield capacity is an estimate of the number of aircraft operations a runway can handle without an unacceptable level of delay. When demand begins to approach capacity, unacceptable delays can occur. Runway capacity depends on many factors. At BGQ, the most important of these are the number of aircraft operations and runways and the mix of aircraft types.

BGQ has a single runway. FAA Advisory Circular 150/5060-5 *Airport Capacity and Delay* contains capacity estimates for various airfield layouts and fleet mixes. This Advisory Circular estimates an annual capacity of 230,000 operations and an hourly capacity of 98 visual operations for an airfield similar to the BGQ. According to the forecast information in Table 16, air traffic is expected to reach 21,545 operations by 2036. By this measure, airfield capacity should be adequate through the forecast period. It should be noted that the AC 150/5060-5 has less accuracy for smaller general aviation airports, as it gives consideration to layout/runway use, meteorological conditions, navigational aids, fleet mix and touch-and-go operations. All of which can differ from small to larger airports and the types of operations being conducted in comparison.

8.1.5 Taxiways

All taxiways should meet Taxiway Design Group (TDG) 1A Small Aircraft standards. Taxiways used by TDG 1A aircraft must be 25 feet wide with a taxiway safety area (TSA) width of 49 feet and a TOFA width of 89 feet. Taxiways must intersect at 90 degrees whenever practicable and be designed to prevent direct (straight-line) access between aprons and the runway.

Taxiways A, B, C, and D are currently 50 feet wide, which exceeds the TDG 1A standard of 25 feet. Taxiway E meets the standard 25-foot width. Taxiway B is partially obstructed by "No Parking" signs and aircraft parked in the itinerant tiedown lot. Taxiway C is intersected by a vehicle road providing access to lease lots on the East Apron. *Taxiways A, B, C, and D should be reconstructed to meet the 25-foot standard width. Taxiways B and D should be realigned at least 225 feet from the runway centerline so they function as a single parallel taxiway. 225' would allow the TW to meet standards if the airport eventually becomes A1, instead of A1 (small). Any required signage should be located in accordance with 150/5345-44K Specification for Runway and*

Taxiway Signs. The itinerant parking tiedown lot should be relocated. Alternate access should be established for the eastern-most portion of the East Apron to reduce the vehicle crossing of Taxiway C. Ten-foot shoulders as well as compliant TSA and TOFA should be provided for all taxiways, present and future.

8.1.6 Aprons and Aircraft Parking

There is currently approximately 120,000 square feet of public tiedown apron space, consisting of 37 parking spaces, available to accommodate based aircraft that do not park on airport lease lots. Currently, 22 aircraft (or 34 percent) of a total of 65 based aircraft currently park in the public tiedown area. There are 15 vacant or surplus parking spaces. Tiedown availability does fluctuate with the yearly seasons, with more rentals in the summer and less in the winter. According to the forecast, there will be 129 based aircraft at BGQ in 2036. Assuming the ratio between based aircraft parking in the public tiedown area verses those parking on lease lots remains the same, there will be a demand for 41 parking spaces (31 percent of 129) in the public tiedown area in 2036. If 37 parking spaces requires 120,000 square feet in the current apron/taxiway configuration, 41 parking spaces equates to 110 percent of the same area or 133,200 square feet – an increase of 13,200 square feet.

To calculate the number of transient aircraft parking positions necessary to meet future demand at Big Lake Airport, the number of peak (summer) daily transient operations was estimated to be 2.5 times the number of annual daily transient operations (9137/365). Further, it was estimated that apron parking positions would be required to accommodate only half of these aircraft. For 2036, the forecast estimated that peak (summer) daily transient operations at the Airport would be 63 (9137/365 x 2.5), requiring 32 transient aircraft parking positions. At 4,000 square feet per position, this equates to 128,000 square feet of apron space.

Total based aircraft and itinerant apron space not associated with lease lots required to meet need during the forecast period is estimated to be 261,200 square feet or approximately 141,200 square feet more than currently exists at the airport. Itinerant aircraft parking should be moved to a location that meets taxiway and runway setback standards.

8.1.7 Lighting, Markings, and Signage

Medium intensity lighting systems are present on both the runway and taxiways. The MIRL and MITL systems been in operation since 1981. *Given the system's age (35+ years), consideration should be given to replacing it in the near term. According to FAA A/C 150-5340-30J, Design and*

Installation Details of Airport Visual Aids, a MIRL is recommended for visual or non-precision instrument runways. The electrical building should also be replaced.

Runway markings and other airfield signage are not required on this non-certificated airport. *It is recommended that an itinerant aircraft parking area be clearly designated with appropriate signage.*

8.2 Airspace and Air Traffic Control

8.2.1 Air Traffic Patterns

No change required.

8.2.2 Approach and Departure Procedures

No change required.

8.2.3 Part 77 Surfaces and Obstructions

As a critical portion of the master plan, topographical and aeronautical survey information for the airport was gathered as a part of the Part 77 and ALP development. From this survey data, it was concluded that South Big Lake Road, Hughes Homestead Road, trees, and a utility pole penetrate the Runway 7 Approach Surface and structures (hangars) on the East Apron penetrate the Transitional Surface as defined for a Non-Precision Instrument approach. *As these structures are penetrations, they should be evaluated and marked/lighted or removed in accordance with AC 70/7460-1L - Obstruction Marking and Lighting. Alternately, consideration could be given to shifting the runway east and/or south to remove the penetrations from the Part 77 surfaces and whether the future Primary Surface should start at the end of the runway or 200 feet beyond the end of the runway (prepared hard surface).*

8.2.4 Air Traffic Control

Air traffic at the airport is not controlled by an air traffic control tower. Pilots voluntarily report their position on a common traffic advisory frequency of 122.8 megahertz (MHz). Fixed wing aircraft use a rectangular pattern with standard turns to the left for all runways. The normal pattern altitude for fixed-wing aircraft is 800 to 1,000 feet above the estimated airport elevation of 157.5 feet. *At uncontrolled airports, Federal Aviation Regulations (FARs) recommend that helicopters avoid the flow of fixed-wing aircraft because of the helicopter's slower speed. Helicopters may use a direct path to or from the airport, or a mirror image of the fixed wing pattern on the opposite side the*

runway with turns to the right to avoid the flow of fixed-wing traffic. The normal helicopter pattern altitude is 500 feet above ground level. No changes required.

8.2.5 Navigation Aids

Airport users identified the need for improved on-site weather information, noting that weather conditions can be significantly different, in terms of cloud cover and wind speed/direction, from that at other local airports such as Wasilla and Willow. *A weather station should be installed at the airport. A siting study will be required before installation.*

8.3 **Landside**

8.3.1 Lease Lots and Buildings

Interviews with DOT&PF Statewide Airport Leasing indicate that there are no vacant lease lots and there is demand for additional space. Leasing staff turns away several potential applicants each year because there are no vacant lease lots with taxiway and road access. Leasing staff predicts that if five lease lots were available, they could lease all of the lots within five years. *Space for at least ten additional lease lots should be identified and developed in phases as actual demand requires. New lease lots should be located outside of Part 77 surfaces.*

It was also noted during interviews with lease holders that the leaseholder performing a large majority of the helicopter operations is not optimally located with respect to adjacent fixed wing operators. The lease holder has plans to expand their operation leading to some concern about potential conflicts between helicopters and parked fixed wing aircraft. Unlike surrounding airports, BGQ has remaining undeveloped space in the northeast quadrant of the airport, which has the potential to attract additional helicopter operators in the future. *Space on the airport should be reserved for the development of a helicopter area.*

8.3.2 Terminal, Fixed Base Operations, and Fuel Facilities

Airport users did not identify the need for a passenger terminal during the forecast period. Fixed Base Operations may develop in response to market forces, but the available infrastructure together with space for new lease lots should be adequate to accommodate the likely demand. On-airport fuel sales were requested by many airport users.

8.3.3 Surface Access and Parking

Surface access should be restricted to a few controlled points. The access road to the east apron intersects with TTF traffic entering the airport on Taxiway A. *At a minimum, perimeter fencing*

should be installed around the developed areas of the airport to limit access and provide security. Consideration should be given to extending fencing around the entire airport to restrict entry by ATVs and wildlife. TTF aircraft entering via Taxiway A should be controlled through the use of a gate and appropriate signing and illumination. Additional planned TTF access points along the southern airport boundary are recommended. Conflicts at Taxiway A with vehicle traffic accessing the East Apron should be reduced or eliminated by constructing a new access road to the eastern portion of the East Apron from a point further east on Aero Lane where the airport property is adjacent to the road.

A gated service road should be constructed for the purpose of trailering floatplanes between Hughes Homestead Road to the apron areas. This road should be located on airport property as close to Big Lake Road as possible to minimize passage through the RPZ and preclude incursions into the RSA. DOT&PF should encourage MSB to widen access to the floatplane ramp within Fish Creek Park.

Hughes Homestead Road is located on airport property between the intersection with Big Lake Road to a point approximately one mile east. Although the road provides access to the undeveloped land on the south side of the airport, it also provides the only developed access to private property north of Fish Creek. Hughes Homestead Road is not eligible to be improved with AIP funding since it serves private property. *DOT&PF should coordinate with the MSB to establish alternate access to private property south of the airport, possibly to re-develop Oscar Anderson Road, which at one time provided access to this area. Once this has been accomplished, Hughes Homestead Road should be closed to non-airport traffic and dead-ended at its eastern-most point before leaving airport property.*

Numerous property easements exist directly to the runway surface and are depicted on the ALP. DOT&PF should work to revise existing and future easements to end at a taxiway entrance, instead of the runway.

8.3.4 Utilities

8.3.4.1 *Electricity*

Electricity is available to all lease lots and common use areas. Emergency power is not available for runway lights and nav aids. *The existing electric distribution system should be extended by Matanuska Electrical Association to serve new lease areas and the proposed new Snow Removal Equipment Building (SREB) to be built during the planning period.*

8.3.4.2 *Water and Wastewater*

There is no municipal water and wastewater service on the airport. Private wells and septic systems have been installed on some of the lease lots. If piped municipal water and wastewater service is extended to the proposed SREB, leaseholders may be able to connect to the water and wastewater lines, at their own expense.

8.3.4.3 *Telephone*

Landline and cell telephone service will be available to all lease lots when construction is completed. *The telephone system should be extended by Matanuska Telephone Association to all new lease areas built during the planning period.*

8.3.5 Fencing and Security

BGQ currently has no existing perimeter fence. *To help prevent theft and vandalism on apron areas, fencing and gates should be constructed to prevent direct vehicle and pedestrian access from Big Lake Road and along the perimeter of the lease lots. Consideration should also be given to extending the fencing along Hughes Homestead Road and around the end of Runway 25 to prevent large mammals from entering the runways as well as deterring vehicle and pedestrian deviations and incursions.*

8.3.6 Maintenance

Maintenance equipment used at BGQ on a regular basis has to be ferried to the airport from the Palmer station, slowing maintenance response to weather events and resulting in unproductive transit time for equipment and staff. *A two-bay snow removal equipment building and office should be constructed on the airport, and a grader and loader should be purchased and stationed there.*

8.4 Facility Requirements Summary

Table 18 summarizes facility requirements for BGQ.

Table 18. Facility Requirements (Critical Aircraft - Cessna 185)

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
Runway 07-25 - ADG A-I (Small Aircraft), Visibility Minimum Not Lower Than 1 Mile			
RUNWAY DESIGN			
Length	Approximately 2,900'	2450'	Extend approx. 450'
Width	60'	70'	Reduce to 60'
Surfacing	Gravel	Gravel	None
Alignment	95% crosswind coverage at 10.5kts	98.24% crosswind coverage at 10.5kts (@Wasilla Airport 2009-2019)	Consider on-site weather station to confirm future needs
RUNWAY PROTECTION			
Runway Safety Area (RSA) Width	120'	100'	Widen 20'
RSA Length Before Runway End	240' (RW 07)	217.5' (RW 07)	Extend 22.5' (RW 07)
	240' (RW 25)	147.5' (RW 25)	Extend 92.5' (RW 25)
Runway Object Free Area (ROFA) Width	250'	250'	None
ROFA Beyond Runway End	240'	240'	None
Runway Obstacle Free Zone (ROFZ) Width	250'	250'	None
ROFZ Beyond Runway End	200'	200'	None
Runway Protection Zone (RPZ) Length	1,000'	1,000' Incompatible land use	Shift runway to remove incompatible land use
RPZ Inner Width	250'	250'	None
RPZ Outer Width	450'	450'	None
RUNWAY SEPARATION			
Parallel Taxiway/Taxilane Centerline	150'	Variable	Align parallel taxiways B and D as one taxiway ≥ 150' from RW centerline
Aircraft Parking Area	155'	300'	None
Helicopter Touchdown Pad	Refer to AC 150-5390-2C	None	None

Table 18. Facility Requirements (Continued)

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
TAXIWAY DESIGN			
Taxiway Width	25'	Varies	Reduce all TWsto 25'
TAXIWAY PROTECTION			
Taxiway Safety Area	49'	49'	None
Taxiway Object Free Area	89'	89'	None
TAXIWAY SEPARATION			
Taxiway CL To Fixed Or Movable Object	44.5'	Varies	Provide clear TOFA for all new taxiways
Other Taxiway Needs	No taxiways in middle 1/3 of runway. Limit or eliminate vehicle crossings. Control taxiway access from off-airport. All taxiway/runway intersections 90 degrees	Taxiway C in middle third of runway, but no connection to Runway 07 end; multiple vehicle crossings of taxiways; uncontrolled off airport taxiway access; jog from "Taxiway B" to "Taxiway D"	Provide taxiway connector to Runway 07 and eliminate Taxiway C connector in middle 1/3 of runway; reduce or eliminate vehicle crossings; realign taxiway intersection; determine location of boundary crossing, if suitable; eliminate jog and construct parallel taxiway
Miscellaneous			
General Aviation (Apron Space (sq. ft.))	261,200 sq. ft.	120,000 sq. ft.	Develop ~ 141,200 sq. ft. of additional public tiedown apron space
Surfacing	Gravel	Gravel	None
On-Airport Nav aids/Weather Reporting	Various	None	Install weather station and weather camera
Runway Edge Lighting	Medium Intensity Runway Lighting (MIRL)	MIRL	Replace MIRL at end of useful life; replace electrical building
Airfield Signage	None	None	Install frangible location and hold signage
Heliport	Heliport	None	Set aside area for helicopter operations
Airspace			

Table 18. Facility Requirements (Continued)

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
PART 77			
RW END 07: NPI ¹⁰ , 1 SM ¹¹ , UTILITY			
Length of Primary Surface	200' beyond each runway end	2,450	None
Width of Primary Surface	500'	500'	None
Radius of Horizontal Surface	5,000'	5,000'	None
Approach Surface Outer Width	2,000'	2,000'	None
Approach Slope	20:01	Approach Surface for Runway 07 obstructed by Hughes Homestead Road, Big Lake Road, a utility pole, and trees.	Shift runway threshold east
RW END 25: NPI, 1 SM, UTILITY			
Length of Primary Surface	200' beyond each runway end	2,450	None
Width of Primary Surface	500'	500'	None
Radius of Horizontal Surface	5,000'	5,000'	None
Approach Surface	5,000	5,000	None
Approach Slope	20:01	20:01	None
BRL ¹² (Transitional Surface)	35' transitional surface clearance at BRL	Approximately 21.4' transitional surface clearance at BRL	Install obstruction lighting for transitional surface penetrations and identify penetrations on ALP
Landside			
Lease Lots	Increase # of lots	No vacant lots	Provide approximately 10 new lease lots
Terminal Building	None	None	None
On-Airport Fuel Sales	On-airport fuel sales	None	None
Vehicle Parking	Parking on leaseholds	Parking on leaseholds; small itinerant lot	Move itinerant parking out of TOFA
Access Roads	Safe, efficient, secure access	Uncontrolled access; multiple access points; 1 vehicle/aircraft crossing	Reduce access points; restrict on-airport roads to airport traffic only; provide controlled TTF access with a gate, appropriate signing, and illumination

¹⁰ NPI: Non-Precision Instrument

¹¹ SM: Statute Miles

¹² BRL: Building Restriction Line

Table 18. Facility Requirements (Continued)

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
DOT&PF Facilities & Equipment	Adequate facilities and equipment	No on-airport facilities and equipment	Construct on-airport SREB, purchase SRE ¹³
Snow Storage	Adequate space	Adequate space	None
Utilities - Water	Potable water, as needed	Wells provide potable water to some lease lots	Leaseholders provide potable water, as needed
Utilities - Wastewater	Sewer systems, as needed	Some septic and flush-haul systems	Leaseholders provide septic or flush-haul systems, as needed; DOT&PF work with leaseholders to provide Porta Potty in near term
Utilities - Telephone	Available at all lease lots	Available at all lease lots	Telephone utility extend to any new lease lots
Utilities - Electric	Available at all lease lots & airport facilities; standby generator to power MIRL	Available at all lease lots; no standby generator for MIRL	Electric company extend to any new lease lots; DOT&PF acquire standby generator for MIRL
Fencing and Security	Secure perimeter fencing; adequate lighting	No fence or public area lighting	Construct perimeter fencing, light public areas
Floatplane Access	Clear RSA	Floatplane access crosses RSA; floatplane access at MSB park too narrow	Provide on-airport service road outside of RSA; MSB widen floatplane access at park

¹³ **SRE:** Snow Removal Equipment