

6.3.5.1 *Design Aircraft*

The majority of the aircraft based at BGQ are fixed-wing, single-engine aircraft such as the Cessna 185. The current design aircraft designated in the AASP for the BGQ is the Cessna 185, which has an Airport Reference Code of A-I. Because of the short length of the existing runway, the gravel surface, and no commercial scheduled fixed wing aviation activity anticipated here over the time period of this forecast, the design aircraft will remain the Cessna 185 by 2036.

7.0 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 May 2, 2017, to allow Big Lake Airport to accommodate projected demand through 2031. 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.

7.1 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 design aircraft. A design 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.

7.1.1 Airport Reference Code and Design Aircraft

The Cessna 185 is expected to be the most demanding aircraft to use the airport at least 500 times per year through 2036, although other large aircraft will also operate there 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.*

7.1.2 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 the period March 3,

1998, to May 31, 2000, indicates that the runway has 97.5% crosswind coverage at 10.5 knots.

According to FAA AC 150-5300, if an airports primary runway provides less than 95% 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 to exceed this criterion 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.*

7.1.3 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 design aircraft (C-185). 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. The 70 foot runway width exceeds the FAA A-I standard width of 60 feet and the runway should be reduced to 60 feet in width.

Comments received from pilots indicate that the present runway length is adequate for a majority of 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. *It is recommended that the runway be resurfaced and ultimately extended by approximately 465 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 80 feet wide and 100 feet in length should be constructed at each runway end.*

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 Runway Safety Area (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. *It is recommended that the RSA 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.*

All aircraft parking areas are currently at least 300 feet from the runway centerline which exceed standards by 100 feet.

7.1.4 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.

7.1.5 Taxiways

All taxiways should meet Taxiway Design Group (TDG) A-1 Small Aircraft standards. Taxiways used by TDG A-1 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, and D are currently 50 feet wide, which exceeds the TDG A-1 standard of 25 feet. Taxiways C and E meet 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, 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. 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 eliminate the vehicle crossing of Taxiway C. Taxiway E is no longer needed and should be removed. Ten foot shoulders as well as compliant Taxiway Safety Areas and Taxiway Object Free Areas should be provided for all taxiways.*

7.1.6 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 31%) of a total of 72 based aircraft currently park in the public tiedown area. There are 15 vacant or surplus parking spaces. According to the moderate forecast, there will be 132 based aircraft at BGQ in 2031. 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% of 132) in the public tiedown area in 2031. If 37 parking spaces requires 120,000 square feet in the current apron/taxiway configuration, 41 parking spaces equates to 110% of the same area or 133,200 square feet – an increase of 13,200 square feet. *To accommodate demand through the planning period, an additional 13,200 square feet of public tiedown apron space should be provided. Itinerant aircraft parking should be moved to a location that meets taxiway and runway setback standards.*

7.1.7 Lighting, Markings, and Signage

The runway has a Medium Intensity Runway Lighting (MIRL) system that has been in operation since 1981. *Given the system’s age (35+ years), consideration should be given to replacing it in the near term. The roof on 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.*

7.2 Airspace and Air Traffic Control

7.2.1 Air Traffic Patterns

No change required.

7.2.2 Approach and Departure Procedures

No change required.

7.2.3 Part 77 Surfaces and Obstructions

Topographical survey information for the airport is limited. However, it appears 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. *Accurate survey information should be acquired and an accurate Part 77 analysis should be completed. If the structures are in fact 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. The Part 77 analysis should investigate 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).*

BGQ currently does not have a Wildlife Hazard Assessment. The FAA requires that federally obligated general aviation airports located near wildlife attractants comply with AC 150/5200-33B (Hazardous Wildlife Attractants On or Near Airports) by preparing Wildlife Hazard Assessments. For general aviation airports like BGQ that do not sell Jet-A fuel and normally serve piston-powered aircraft, the AC recommends a separation distance of 5,000 feet from hazardous wildlife attractants such as landfills. All known wildlife attractants are more than 5,000 feet from the airport.

7.2.4 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.

7.2.5 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. *It is recommended that an AWOS be installed at the airport.*

7.3 **Landside**

7.3.1 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. Further, there is reason to believe, given land use and space availability concerns at nearby airports and the availability of undeveloped space in the northeast quadrant of BGQ, that BGQ will attract additional helicopter operators in the future. *Space on the airport should be reserved for the development of a heliport.*

7.3.2 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. *Space should be identified and reserved for the development of an automated (“key card”) fuel dispensing location.*

7.3.3 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 C. *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 C should be controlled through the use of a gate and appropriate signing and illumination. Conflicts at Taxiway C with vehicle traffic accessing the East Apron should be 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 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.*

7.3.4 Utilities

7.3.4.1 *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*

SREB built during the planning period. An emergency generator should be provided to power the runway lighting system in the event of a power outage.

7.3.4.2 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.

7.3.4.3 Telephone

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

7.3.5 Fencing and Security

To help prevent theft, vandalism and incursions in the apron area, fencing and gates should be constructed to prevent direct vehicle and pedestrian access from Big Lake Road and the along the perimeter of the West and East Aprons. Consideration should also be given to extending the fencing along Hughes Homestead Road and around the end of Runway 25 to prevent incursions by ATVs, snowmachines, and wildlife.

7.3.6 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.*

7.4 Facility Requirements Summary

Table 17 summarizes facility requirements for BGQ.

It should also be noted that the airport lacks a current survey. The locations and elevations of surfaces and structures on the airport should be verified before moving forward.

Table 17. Facility Requirements (Design 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' –stated in ALP data table 2450'- estimated based on RW ends LAT and LONG provided in ALP data table 2435' –based on the stationing for RW ends (25' shorter than stated) and CAD drawings provided RW 25: STA 36+52.50 RW 07: STA 12+17.50	Extend approx. 465'. Update RW ends data to reflect existing conditions Runway length reported on ALP data table and by FAA does not match ALP drawings. Drawing has to be adjusted to reflect length of 2450' OR if existing runway length is 2435'- RW ends data has to be updated
Width	60'	70'	Reduce to 60'
Surfacing	Gravel	Gravel	NONE
Alignment	95% crosswind coverage at 10.5kts	97.5% crosswind coverage at 10.5kts (@Wasilla Airport 1998-2000)	NONE
RUNWAY PROTECTION			
Runway Safety Area (RSA) Width	120'	100'	Widen 20'
RSA Length Beyond 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

Table 17. Facility Requirements (Continued)

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
ROFZ Beyond Runway End	200'	200'	NONE
Runway Protection Zone (RPZ) Length	1,000'	1,000' Incompatible land use	Address incompatible land use
RPZ Inner Width	250'	500'	Reduce to 250'
RPZ Outer Width	450'	700'	Reduce to 450'
RUNWAY SEPARATION			
Parallel Taxiway/Taxilane Centerline	150'	Variable	Align parallel taxiways B and D as one taxiway > = 225' from RW centerline
Aircraft Parking Area	125'	300'	NONE
Helicopter Touchdown Pad	Refer to AC 150-5390-2C	NONE	NONE
Taxiways - TDG 1A			
TAXIWAY DESIGN			
Taxiway Width	25'	VARIABLES	NONE
TAXIWAY PROTECTION			
Taxiway Safety Area	49'	NONE	Establish Taxiway Safety Areas
Taxiway Object Free Area	89'	100' for Taxiways A, B, C, D, E.	NONE
TAXIWAY SEPARATION			
Taxiway CL To Fixed Or Movable Object	44.5'	Unknown	Verify separation
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 connecting 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			
APRON SPACE (sq. ft.)			
General Aviation	133,200	120,000	Develop additional public tiedown apron space
Surfacing	Gravel	Gravel	NONE
On-Airport Navaids/Weather Reporting	Various	NONE	Install AWOS and weather cam
Runway Edge Lighting	Medium Intensity Runway Lighting (MIRL)	MIRL	Replace MIRL at end of useful life; replace roof on electrical building

Table 17. Facility Requirements (Continued)

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
Airfield Signage	NONE	NONE	Install frangible location and hold signage
Heliport	Heliport	NONE	Provide heliport
Airspace			
PART 77			
RW END 07: NPI, 1 SM, UTILITY			
Length of Primary Service	Extends 200' beyond each end of the runway for prepared hard surface	200' beyond each runway end	Confirm if runway should be considered a prepared hard surface with primary surface 200 feet from end of runway
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.	Clear or mark obstructions or move runway threshold
RW END 25: NPI, 1 SM, UTILITY			
Length of Primary Service	Extends 200' beyond each end of the runway for prepared hard surface	200' beyond each runway end	Confirm if runway should be considered a prepared hard surface with primary surface 200 feet from end of runway
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 (Transitional Surface)	35' transitional surface clearance at BRL	Approximately 19' transitional surface clearance at BRL	Shift runway south to obtain BRL 35' transitional surface clearance or light transitional surface penetrations and identify penetrations on ALP
Landside			
Lease Lots	Increase # of lots	No vacant lots	Provide approximately 10 new apron/lease lots

Table 17. Facility Requirements (Continued)

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
Terminal Building	NONE	NONE	NONE
On-Airport Fuel Sales	On-airport fuel sales	NONE	Reserve space for automated fuel dispenser
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
DOT&PF Facilities & Equipment	Adequate facilities and equipment	No on-airport facilities and equipment	Construct on-airport SREB, purchase SRE
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