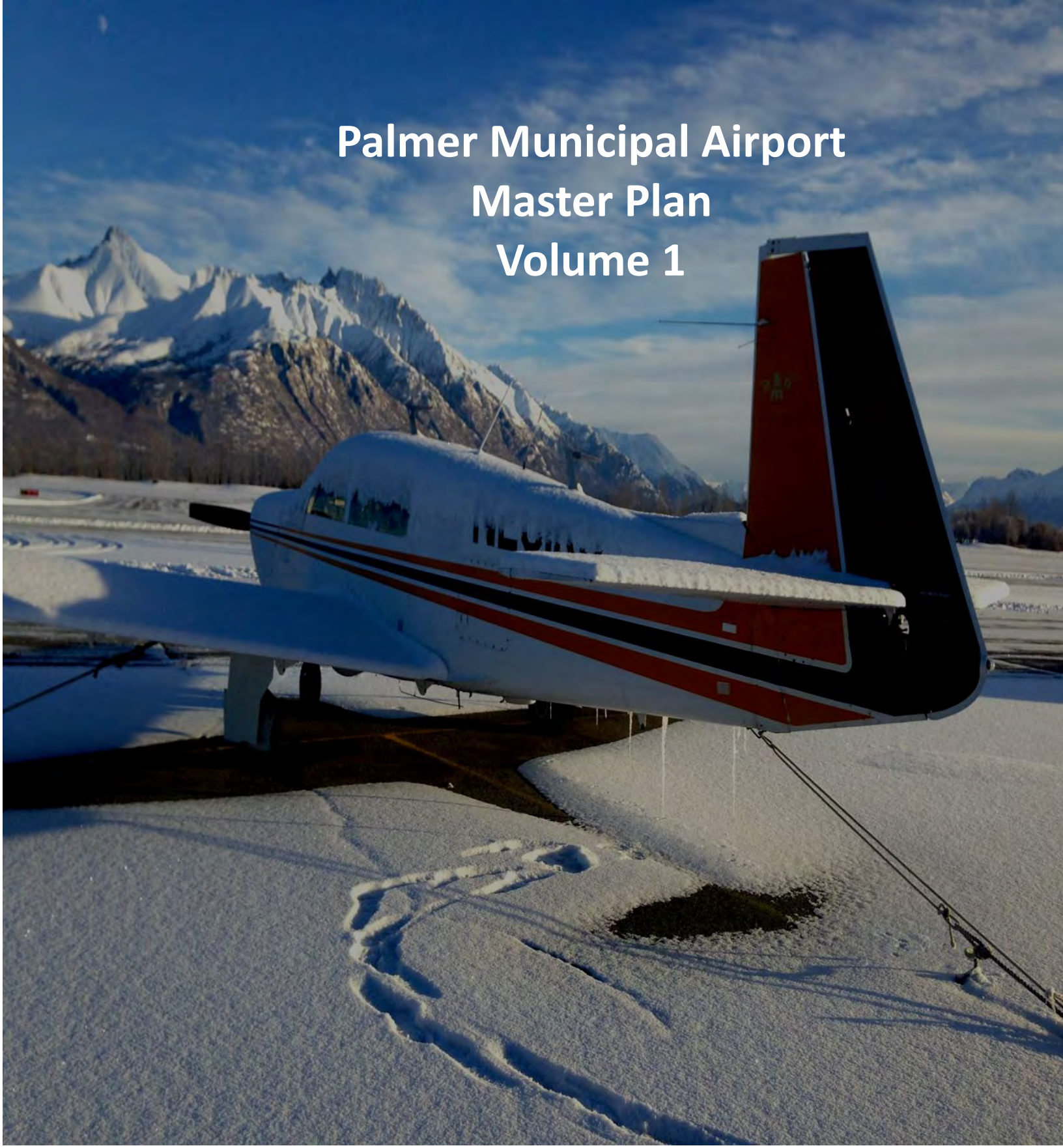

Palmer Municipal Airport
Master Plan
Volume 1

City of Palmer
231 West Evergreen Avenue
Palmer, Alaska 99645

HDL ENGINEERING Consultants
Palmer and Anchorage, Alaska

August, 2016

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AA	Airport Advisories
AAAS	Airport Airspace Analysis Survey
AAC	Alaska Administrative Code
AC	Air Carrier, or FAA Advisory Circular
ACMP	Alaska Coastal Management Plan
ACT	Airport Contacts
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
AFM	Aircraft Flight Manual
AGL	Above Ground Level
AKEPIC	Alaska Exotic Plans Information Clearinghouse
ALP	Airport Layout Plan
ALS	Approach Lighting System
ANHP	Alaska Natural Heritage Program
APDES	Alaska Pollutant Discharge Elimination System
APO	Aviation Policy and Planning Office
ARC	Airport Reference Code
ASDA	Accelerate Stop Distance Available
ASOS	Automated Surface Observing System
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
CGP	Construction General Permit
City	City of Palmer
dB	Decibels
DNL	Average Day-Night A-Weighted Sound Levels
DOD	Department of Defense
DOT&PF	Department of Transportation and Public Facilities
DWPA	Drinking Water Protection Area
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency

ESA	Endangered Species Act
GASB	Government Accounting Standards Board
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FEMA	Federal Emergency Management Agency
FSS	Flight Service Station
GA	General Aviation
GPS	Global Positioning System
IMC	Instrument Meteorological Conditions
INM	Integrated Noise Model
IPAC	Information, Planning and Conservation System
ISER	Institute of Social and Economic Research
LDA	Landing Distance Available
LED	Light Emitting Diode
LWCA	Land and Water Conservation Act
MHz	Megahertz
MIRL	Medium Intensity Runway Lighting
MSB	Matanuska-Susitna Borough
MSL	Mean Sea Level
MTOW	Maximum Takeoff Weight
NAS	National Airspace System
NEM	Noise Exposure Maps
NEPA	National Environmental Policy Act
NHPA	National Historical Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPIAS	National Plan of Integrated Airport Systems
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NWS	National Weather Service
OAP	Obstacle Action Plan
OE/AAA	Obstruction Evaluation/Airport Airspace Analysis
OFZ	Object Free Zone

PAPI	Precision Approach Path Indicator
PAQ	Palmer Municipal Airport
PCI	Pavement Condition Index
PLA	Parachute Landing Area
PM	Particulate Matter
PMC	Palmer Municipal Code
PWS	Public Water System
REIL	Runway End Identifier Lights
ROFA	Runway Object Free Area
ROFZ	Runway Object Free Zone
RPZ	Runway Protection Zone
RSA	Runway Safety Area
SOP	Standard Operating Procedures
STOL	Short Takeoff and Landing
SWPPP	Storm Water Pollution Prevention Plan
TAF	Terminal Area Forecast
TDG	Taxiway Design Group
TERPS	Terminal Instrument Procedures
THRE	Threshold Elevation
TODA	Takeoff Distance Available
TORA	Takeoff Runway Available
UND	University of North Dakota
USACE	United States Army Corp of Engineers
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
Valley	Matanuska-Susitna Valley
VFR	Visual Flight Rules

1.0 INTRODUCTION

1.1 Background and History

The Palmer Municipal Airport (PAQ), Federal Aviation Administration (FAA) identifier: PAQ is owned and operated by the City of Palmer (City) and is located near the confluence of the Knik and Matanuska River valleys, at the base of the Chugach and Talkeetna Mountains. The 524-acre airport property is bounded on the east by the Matanuska River, west by the City, north by the Old Glenn Highway, and south by farms and housing (Figure 1-1).

The original airport's construction began in 1946 and was completed using the Territorial Board of Road Commissioner's equipment and labor donated by Boy Scout Troop No. 54. In 1950, the airport was upgraded and additional land acquired. In 1963, the City obtained title to the airport from the State of Alaska. In 1966, the FAA established a manned Flight Service Station that was later moved to make way for the new north-south runway. In 1977, the main north-south runway was constructed to 5,000 feet, and in 1987 it was extended to its current length of 6,009 feet.

The airport currently has a 6,009-foot paved primary Runway 16-34, a 3,617-foot paved crosswind Runway 9-27, and a 1,560-foot gravel Runway 16S-34S. Runway 16-34 was originally designed to support Boeing C-130 aircraft. In 2007, Runway 9-27 was structurally strengthened, repaved, and its lighting system rehabilitated. The airport is unique in that it contains an 18-hole municipal golf course, and it has the only 6,009-foot, paved, lighted runway in the Matanuska-Susitna Valley (valley) and can handle heavy aircraft.

Aviation activity in the Palmer area as represented by the Palmer Flight Service Station's aircraft contacts have increased from 10,486 in 2008 to 13,853 in 2013. Recently, two air cargo companies have moved to PAQ and are negotiating long-term leases with the City. The fleet mix appears to be changing and both the general aviation (GA) and air cargo activity appears to be increasing. The City and FAA wish to update the airport master plan following Advisory Circular (AC) 150/5070-6B and implement an updated plan that meets the needs of the public and assures a viable, revenue-generating future for the City.

1.2 Airport Classification

PAQ is classified in the State of Alaska's 2013 Aviation System Plan as an On-Road Community Class airport. PAQ is classified by the FAA as General Aviation because it has less than 2,500 passenger boardings per year and no scheduled passenger service. The airport is a part of the National Airspace System (NAS), the National Plan of Integrated Airport Systems (NPIAS), and is a federally-obligated airport. All airport development at federally-obligated airports must conform to an FAA-approved Airport Layout Plan (ALP).

1.3 Role in the Community

The airport supports a mixture of GA and air cargo needs. The airport serves as a base for general aviation activities, Hageland Aviation's aircraft maintenance facility, the Alaska Department of Natural Resources Division of Forestry's (Forestry) Fire Fighting and Fire Retardant Loading Facility,

aircraft fueling, charter services, air parts sales, engine rebuilding, flight training, parachute jumping, and cargo operators transporting fuel and freight to remote Alaska locations. The airport is a short distance from downtown Palmer, where food, hotels, and other services are available.

Although the airport does not have scheduled passenger airline service, the aircraft and facilities at the airport are essential components to local business and the local economy. In the 2007 airport master plan, DOWL HKM and its consultants performed an economic impact analysis of the airport's activity on the local economy. The results of that study indicated that the activity at the airport provided direct, indirect, and secondary economic impacts of $19M per year, that directly and indirectly created 216 total jobs including 139 jobs related to the airport. In 2014, HDL Engineering Consultants (HDL) estimated the direct employment at the airport at 140 to 145.

1.4 Airport Management

The airport is owned and operated by the City of Palmer and managed full-time by the Airport Superintendent. An Alaska Job Corps intern is used occasionally to assist the Airport Superintendent with administrative duties. The Airport Superintendent reports directly to the City Manager. The City Manager reports to the Mayor and City Council.

1.5 Airport Maintenance and Operations

The City has no full time staff at the airport for maintenance and operations. Airport snow removal equipment is housed in the City's Airport Maintenance building located on Lease Lot 22A on the airport. Snow removal and other airport routine maintenance work like mowing and Precision Approach Path Indicators (PAPI), Runway End Identifier Lights (REIL), and other airport lighting system inspection and lamp replacements are accomplished with City Public Works Department staff on an as-needed basis. System repairs are contracted out if needed. Equipment repairs are done at the City shop by Public Works staff. Public Works staff completes water main flow tests for hydrants and sewer main jet rod cleaning of manholes and main line. Building maintenance is completed by Public Works staff or contracted out for larger projects.

Figure 1-1. Palmer Airport Plan View

2.0 INVENTORY AND DESCRIPTION OF EXISTING FACILITIES

2.1 Airspace

The airspace at Palmer is Class G uncontrolled and Class E controlled airspace. The airspace from the ground surface to 700 feet above ground level (AGL) is Class G uncontrolled airspace. The Class E controlled airspace extends from 700 feet AGL up to, but not including, the overlying Class A airspace at 18,000 feet above mean sea level (MSL). Palmer's Class E airspace extends horizontally approximately 6.5 nautical miles from the center of the airport complex. The purpose of the Class E airspace is to protect the airspace and provide traffic separation during instrument approaches being made under instrument meteorological conditions (IMC) (Figure 2-1).

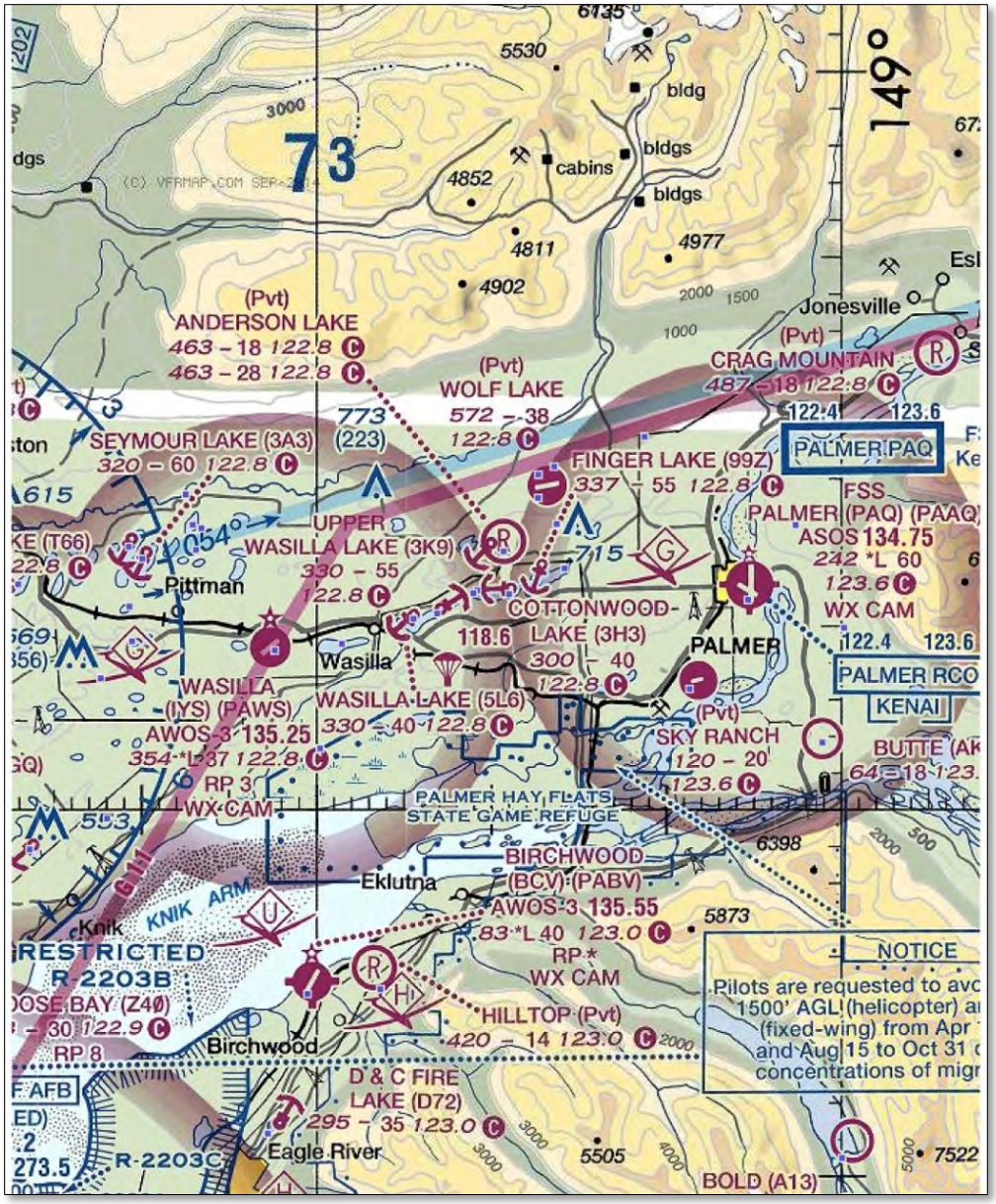

Figure 2-1. Palmer Airspace (from the Anchorage Sectional Map)

2.2 Traffic Pattern

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 123.60 megahertz (MHz). Fixed wing aircraft use a rectangular pattern with standard turns to the left for all runways. Runway 16S-34S uses the same traffic pattern as Runway 16-34. The location of the traffic pattern depends on the speed of the aircraft and can be immediately adjacent to the runway for slower, light aircraft or can extend as far as 3 miles away for higher speed aircraft. The normal pattern altitude for fixed-wing aircraft is 800 to 1,000 feet above the airport elevation of 242 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 AGL.

2.3 Instrument Approach and Departure Procedures

The airport has two published instrument approach procedures. The first is a straight-in Global Positioning System (GPS) instrument approach to Runway 9 titled "RNAV (GPS) RUNWAY 9". The final approach course is over the city and the approach procedure has ceiling and visibility minimums of 820 feet MSL and 1 statute mile, respectively. The ceiling minimum is 595 feet above the Runway 9 threshold elevation (THRE) of 225 feet MSL. The missed approach is a climbing right turn to 3,400 MSL then back to waypoint INICE located between Big Lake and Wasilla (Figure 2-2).

The second GPS approach is a circling approach titled "RNAV (GPS)-A". Because the final approach course is aligned with the runway centerline by an angle greater than 30 degrees, the circling approach leads the pilot to the airport complex, but to no particular runway. This approach is from the southwest, generally following the Knik and Matanuska Rivers, and is skewed approximately 45˚ west of the Runway 34 centerline. The instrument approach procedure has ceiling and visibility minimums of 860 feet MSL and 1 statute mile. The ceiling minimum is 618 feet above the airport elevation of 242 feet MSL. The missed approach procedure is a climbing left turn to 4,500 MSL back to waypoint OWGAT located near the west end of the Palmer Hay Flats (Figure 2-3).

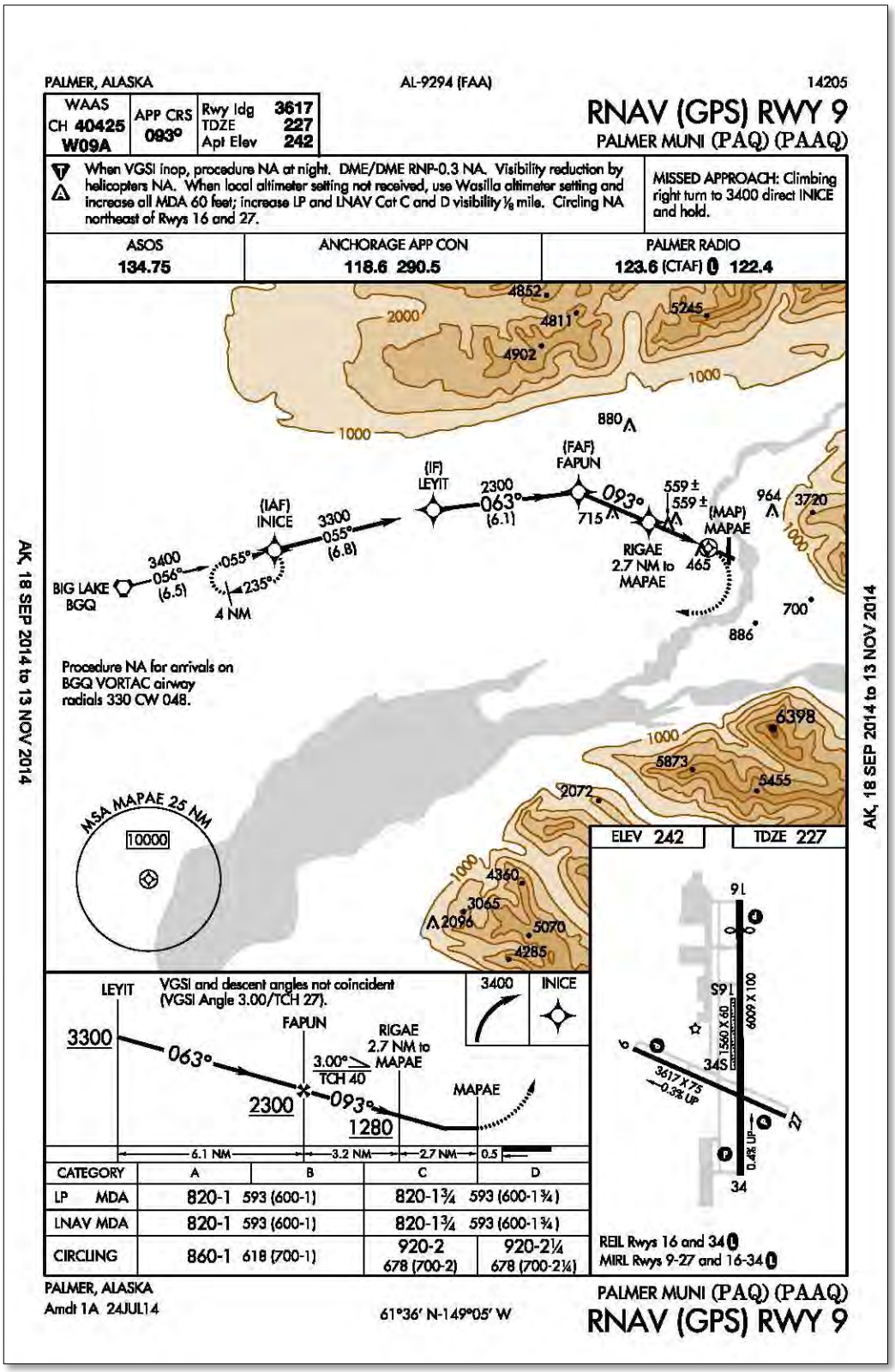

Figure 2-2. Instrument Approach Procedure RNAV (GPS) RUNWAY 9

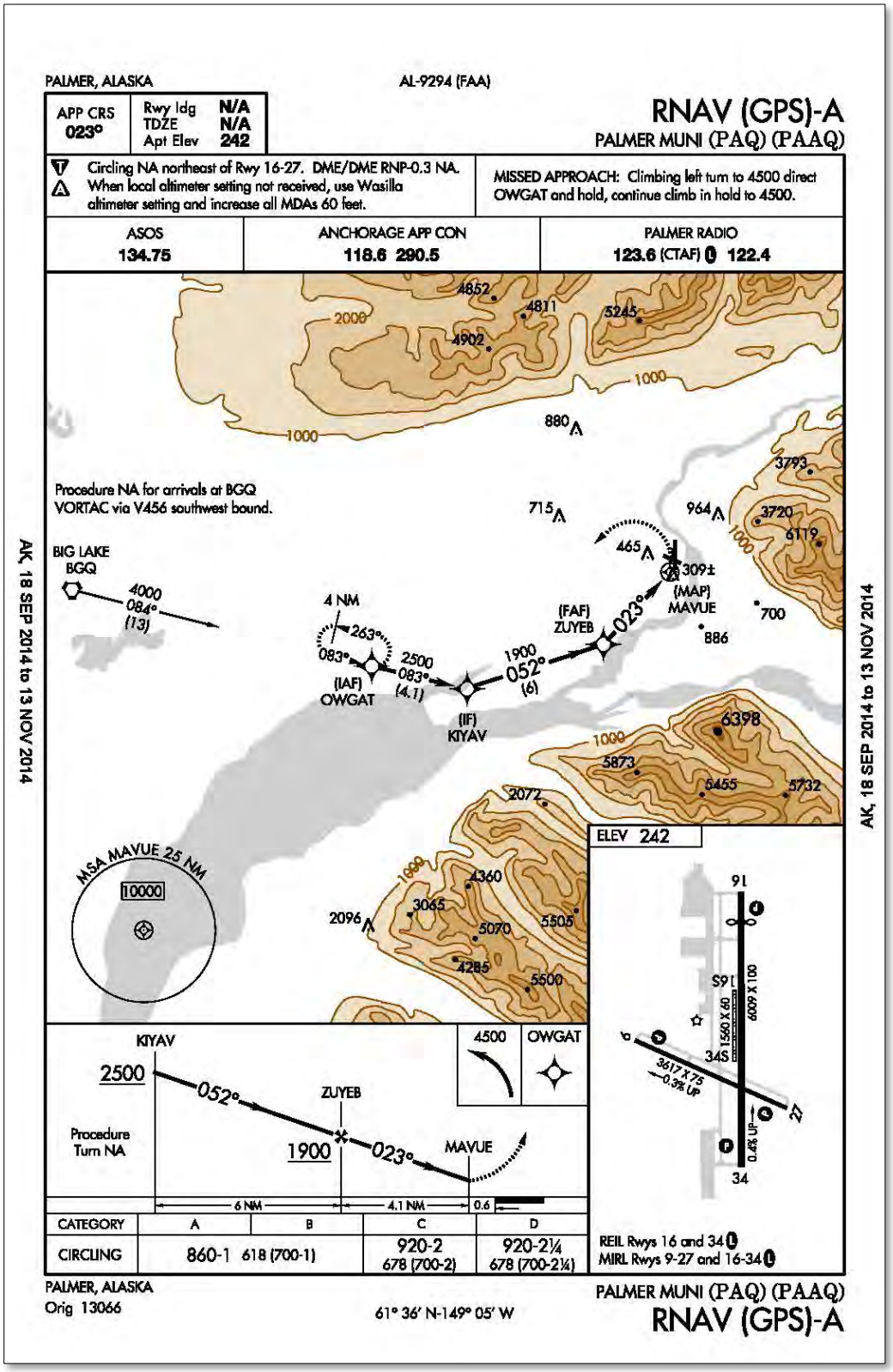

Figure 2-3. Instrument Approach Procedure RNAV (GPS)-A

2.4 Airspace Surfaces

FAR Part 77 (Part 77); Federal Order 8260.3, the *United States Standard for Terminal Instrument Procedures* (TERPS); and runway end siting requirements in FAA AC 150/5300-13A establish imaginary airspace surfaces and standards for determining obstructions to air navigation. The geometry and slopes of imaginary airspace surfaces are governed by the airport category (utility or visual), the type of instrument approach procedures planned, and visibility minimums. Utility runways are intended for use by aircraft with gross weight less than 12,500 pounds. Runway 9 is currently a non-precision instrument utility runway. Runways 27, 16 and 34 are visual runways. Runway 27 is also a utility runway. See Table 2-1 for a summary of the existing airspace surfaces for the airport.

Table 2-1. Existing Part 77 and Threshold Siting Surfaces

	RUNWAY 9 (Non-Precision Instrument, 1-mile Visibility, Utility*)	RUNWAY 27 (Visual, Utility*)	RUNWAY 16 (Visual)	RUNWAY 34 (Visual)
Primary Surface	500' wide centered on runway to 200' off runway end	250' wide centered on runway to 200' off runway end	500' wide centered on runway to 200' off runway end	500' wide centered on runway to 200' off runway end
Approach Surface	10,000‘ at 34:1 from Primary Surface, width: 500 - 2,000’	5,000‘ at 20:1 from Primary Surface, width: 250 - 1,250’	5,000‘ at 20:1 from Primary Surface, width: 500 - 1,500’	5,000‘ at 20:1 from Primary Surface, width: 500 - 1,500’
Transitional Surface	7:1 from Primary and Approach Surfaces	7:1 from Primary and Approach Surfaces	7:1 from Primary and Approach Surfaces	7:1 from Primary and Approach Surfaces
Horizontal Surface	5,000' arc, 150' above airport elevation	5,000' arc, 150' above airport elevation	5,000' arc, 150' above airport elevation	5,000' arc, 150’ above airport elevation
Conical Surface	4,000’ at 20:1 outward from horizontal	4,000’ at 20:1 outward from horizontal	4,000’ at 20:1 outward from horizontal	4,000’ at 20:1 outward from horizontal
Departure Surface	N/A**	10,200’ at 40:1 from runway end	10,200’ at 40:1 from runway end	10,200’ at 40:1 from runway end

* Utility runways are intended for use by aircraft less than 12,500 pounds gross weight.

** Runway 9 instrument departure procedure not authorized – obstacles.

2.5 Airside Facilities

2.5.1 Runways

The existing airfield configuration consists of three runways: 1) a primary paved, lighted runway (16-34); 2) a paved, lighted crosswind runway (9-27); and 3) an unlit gravel short takeoff and landing (STOL) runway (16S-34S). Runway 16-34 measures 6,009 feet by 100 feet and is currently classified as a B-III, visual runway. Obstructions (trees in Matanuska River Park) on the north end have caused the Runway 16 threshold to be displaced southward 500 feet. The displaced threshold has markings and lighting. The published Takeoff Runway Available (TORA), Takeoff Distance Available (TODA), Accelerate Stop Distance Available (ASDA) and Landing Distance Available (LDA) are shown in Table 2-2.

Table 2-2. Declared Distances

	TORA	TODA	ASDA	LDA
Runway 16	6,009’	6,009’	6,009’	5,509’
Runway 34	6,009’	6,009’	6,009’	6,009’
Runway 9	3,617’	3,617’	3,617’	3,617’
Runway 27	3,617’	3,617’	3,617’	3,617’

Runway 16-34 was constructed to 5,000 feet in 1977 (Hunter, 2014). The original 5,000 feet was designed with a thick gravel structural section and 3 inches of asphalt concrete pavement for heavy aircraft. Anecdotal information indicates the silt overburden was removed to underlying gravels and was replaced with clean, imported Matanuska River gravel. However, record drawings indicate a design for 48 inches of gravel under the pavement. This appears consistent with the observed lack of frost movement and 40-year pavement age for the original south 5,000 feet of runway (Figures 2-4 and 2-5). The runway is used occasionally by heavier C-130 and C-17 military aircraft with no signs of pavement or subgrade distress. The south 5,000 feet of pavement has performed well, but has reached the end of its service life. The runway was extended 1,000 feet to the north in 1987. Record drawings indicate the same 51-inch structural section with 3 inches of pavement. The north 1,000 feet has extensive deep, wide, cracking suggesting a different structural section was actually installed, a different pavement design, or both. Crack sealing of Runway 16-34 was last completed in September of 2014 and is discussed later in *Section 2.5.7 Pavement Condition*.

Figure 2-4. North 500 feet of Runway 16-34 (Displaced Threshold Area)

Figure 2-5. South Section of Runway 16-34

Runway 9-27, the crosswind runway, is paved, lighted, and measures 3,617 feet by 75 feet (Figures 2-6 and 2-7). Runway 9-27 was rehabilitated in 2007. The runway is classified as B-II and is an instrument runway. In 2007, the structural section depth was increased to 54 inches and pavement depth increased to 3 inches to support B-II aircraft. The 12,500-pound weight restriction (small aircraft) has not been removed. The adjoining Taxiway B will be discussed in *Section 2.5.3 Taxiways*. Taxiway B will not support heavy aircraft.

Figure 2-6. View West on Runway 27

Figure 2-7. View East on Runway 9

Runway 16S-34S, the STOL runway, has a gravel surface and is located adjacent to Runway 16-34. Runway 16S-34S pilots use the same traffic pattern as Runway 16-34 with no simultaneous operations. The runway measures 1,560 feet by 60 feet. This gravel strip is unlit and is used regularly by tundra-tired aircraft and occasionally by ski-equipped aircraft. The threshold is marked with reflectors. Some of the two-color threshold reflectors at the thresholds are reversed and facing the wrong direction (red toward the runway rather than red away from the runway). A gravel berm has been pushed out to the edges of Runway 16S-34S by maintenance operations and exceeds the 3-inch FAA runway safety area surface gradient standard (Figures 2-8 and 2-9).

Figure 2-8. Runway 16S-34S Threshold Markers

Figure 2-9. Runway 16S-34S Gravel Berm

Runway Object Free Areas (ROFAs) for Runways 16-34 and 9-27 appear to be clear of non-frangible objects with the following two notable exceptions: 1) the golf course fence east of Runway 16-34 and east and north of Runway 27; and 2) trees east of the Runway 16 threshold. A more detailed evaluation during the aeronautical survey will identify all critical penetrating objects.

Existing Runway Safety Areas (RSAs) and **Runway Obstacle Free Zones** (OFZs) are summarized in Table 2-3. RSAs are specifically graded to allow a deviation from runway pavement without catastrophic consequence. Both longitudinal and transverse grades are defined by FAA. The RSA for Runway 16-34 does not meet RSA longitudinal grading criteria for more than 300 feet beyond the runway ends. The RSAs for Runway 9-27 and Runway 16S-34S meet RSA grading criteria. OFZs need to be clear of all aircraft and other object penetrations during operations, except that objects necessary by function, such as navigational aids, are allowed in the OFZ on frangible couplings. The OFZs at the airport meet the FAA dimensional standards.

Existing Runway Protection Zones (RPZs) are summarized in Table 2-3. The purpose of RPZs is to protect people and property on the ground. The City controls aviation activity within the existing RPZs as follows:

- Runway 34 Departure RPZ. Land in the departure RPZ for Runway 34 is the Matanuska River Park, which is owned and maintained by the Matanuska-Susitna Borough (MSB). The RPZ is bisected by a section line. Land west of the section line is controlled by an avigation easement; land to the east of the section line is not under City control and the airport's ability to control tree heights is severely restricted. The City should take acquire an avigation easement to cover the complete RPZ.
- Runway 16 Departure RPZ. Land in the departure RPZ for Runway 16 is owned and controlled by the airport.
- Runway 9 Departure RPZ. Land in the departure RPZ for Runway 9 is a mixture of City-owned land leased to the Palmer Municipal Golf Course and the Matanuska River floodplain, which is state property.

- Runway 27 Departure RPZ. Land in the departure RPZ for Runway 27 is a mixture of airport lands and private lands controlled by avigation easement, with the exception of minor slivers of private property on the north and south sides.

Runway 9-27 runway is currently weight restricted to aircraft 12,500 pounds or lighter. When this restriction is removed, the necessary RPZ will change to 500x700x1,000 feet, which has been protected historically.

Existing land use in the RPZs is typically grandfathered, but the current interim guidance from FAA is to work with sponsors to remove or mitigate the risk of incompatible land uses over time in existing RPZs. New or modified RPZs resulting from a runway extension or centerline shift, a change in the design aircraft that increases the RPZ dimensions, a new instrument approach procedure that increases the RPZ dimensions, or planned new development in the RPZ will require the sponsor to perform a detailed alternatives analysis that shows how the sponsor has avoided, minimized, or mitigated risks to people and property on the ground. RPZ changes would need to be shown on the ALP and submitted to the FAA for review and approval.

Runway Capacity. The paved runways have a combined capacity of 230,000 aircraft operations per year.

Table 2-3. Runway Existing Conditions

	RUNWAY				
	16	**34**	**9**	**27**	**16S-34S**
Visibility Minimum (Statute Miles)	N/A	N/A	1	N/A	N/A
Type	Visual	Visual	Instrument	Visual	Visual
Category			Utility	Utility	Utility
Runway Design Group	B-III-VIS	B-III-VIS	B-II-I	B-II-VIS	A-1-VIS
Runway Length	6,009	6,009	3,617	3,617	1,560
Runway Width	100	100	75	75	60
Runway Shoulder Width	20	20	10	10	10
Runway Surface	P	P	P	P	G
Allowable Crosswind Component	16 Knots	16 Knots	13 Knots	13 Knots	10.5 Knots
Runway Safety Area (**RSA**)					
- Length Beyond Departure End	300	300	300	300	240
- Length Prior to Threshold	600	300	300	300	240
- Width	300	300	150	150	120
Runway Object Free Area (**ROFA**)					
- Length Beyond Departure End	600	600	300	300	240
- Length Prior to Threshold	1,100	600	300	300	240
- Width	680	680	500	500	70
Runway Object Free Zone (**ROFZ**)					
- Length Prior to Threshold	600	600	300	300	200
- Width	400	400	360	360	250
Approach **RPZ**					
- Length	1,000	1,000	1,000	1,000	1,000
- Inner Width	500	500	250	250	250
- Outer Width	700	700	450	450	450
- Acres	13.77	13.77	8.03	8.03	8.03
Departure **RPZ**					
- Length	1,000	1,000	1,000	1,000	1,000
- Inner Width	500	500	250	250	250
- Outer Width	700	700	450	450	450
- Acres	13.77	13.77	8.03	8.03	8.03
Runway Separation to:					
- Hold Position	100	100	125	125	N/A
- Parallel Taxiway	425	425	200	200	N/A
- Aircraft Parking	650	650	250	250	200

Note: All dimensions in feet, except RPZ acreage, P = Paved, G = Gravel,

2.5.2 Helicopter Facilities

The airport has a designated helicopter landing area immediately northeast of the Forestry apron. The area is approximately 140 feet by 320 feet. There are five 20-foot by 20-foot concrete landing pads located within the landing area. The pads have either no markings or well-worn markings. This area primarily serves Forestry helicopters during the firefighting season.

2.5.3 Taxiways

Both paved runways have full-length parallel taxiways. Taxiway A, the parallel taxiway for Runway 16-34, is 50 feet wide and Taxiway B, the parallel taxiway for Runway 9-27, is 40 feet wide. There are four additional 60-foot wide interlink taxiways (Taxiways C, D, E, and G) that connect Runway 16-34 to Taxiway A and the aprons. Taxiway F connects Taxiway A to the Large Aircraft Apron and is 60 feet wide. There are 35-foot wide taxiways providing access to hangar lease lots north of Runway 9-27. The taxiway adjacent to the lease lots is Taxiway J and the remainder is Taxiway L. Taxiway L also continues as a short interlink between Runway 9-27 and the parallel Taxiway B. Taxiways H and M are also short interlink taxiways that connect Taxiway B and Runway 9-27 at the runway thresholds. Taxiway T is a 60-foot wide paved taxiway that runs adjacent to Aprons A, B, C, and D. All taxiways are paved and feature medium-intensity edge lighting and signage where they intersect runways. Taxiway A is designed for heavy aircraft; Taxiway B has a thin structural section with 2 inches of pavement and is not suitable for aircraft greater than 12,500 pounds.

2.5.4 Aprons

The airport has 1.29 million square feet of paved apron designated as Aprons A, B, C, and D and the Large Aircraft Apron (Figure 1-1). Forestry has a private 302,600 square feet (SF) apron located on their lease lot (Figure 2-10). The airport has 150 total tie-down spaces available consisting of 142 leasable spaces plus 8 transient parking spaces. Of the 142 leasable spaces, 61 are currently leased and occupied and 89 are vacant (Table 2-4).

Figure 2-10. Forestry Apron Compass Rose and Facilities

Figure 2-11. Large Aircraft Apron and Compass Rose

The Large Aircraft Apron measures approximately 1,500 feet long by 300 feet wide. Eight of the 12 available tie-down spaces are leased. There are currently two DC-4s, two C-119s, three DC-3s, and a Cessna 401 that utilize the apron. A compass calibration pad is located on the Large Aircraft Apron (Figure 2-11). The Large Aircraft Apron compass calibration pad was last calibrated in the early 1990s.

Table 2-4. Public Use Aprons and Tie Down Spaces

	Size	Total Available	Leased	Vacant
Transient	*	8	0	8
Apron A	233,300	27	16	11
Apron B	156,400	39	14	25
Apron C	303,300	45	17	28
Apron D	144,250	19	6	13
Large Aircraft	450,000	12	8	4
- Total	1,287,250	150	61	89

* Area included with Apron A

2.5.5 Markings

Pavement markings on all runways, taxiways, and aprons are standard, with the following exceptions: Runway 9 is an instrument runway, but is marked as a visual runway; Runway 16-34 is a visual runway but is marked as an instrument runway. FAA standards allow runways to be over-marked with FAA approval. The Runway 16 displaced threshold is properly marked. Existing airport markings are worn and faded due to their age (Figure 2-12).

Figure 2-12. Runway 16 Displaced Threshold Markings

2.5.6 Signage

Signage is present at runway-runway and runway-taxiway intersections in both directions. Runway distance remaining signs are installed in both directions for Runway 16-34. Mandatory, location, and informational signs are located throughout the airport to provide pilot guidance. Taxiway-taxiway and taxiway-apron intersections are not signed (Figure 2-13).

Figure 2-13. Taxiway-Runway Intersection and Informational Signs

2.5.7 Pavement Condition

The 2013 Pavement Condition Report from the State of Alaska Department of Transportation and Public Facilities (DOT&PF) indicates that various pavements on the airport are in need of rehabilitation.

A Pavement Condition Index (PCI) of less than 70 indicates a need for corrective maintenance or pavement rehabilitation such as patching and crack sealing. Runway 16-34 has an average PCI of 54 and Runway 9-27 has an average PCI of 95. The PCI for the taxiways ranges from 62 to 92. Runway 16-34 is in the poorest condition, particularly in the first 1,000 feet of Runway 16 which has block cracking, raveling, corrugation, and longitudinal and transverse cracking (Figures 2-14 and 2-15). The taxiways and aprons are all in fair to good condition, with some needing corrective or preventative maintenance in order to maximize their useful life. See the Palmer Municipal Airport Pavement Management Plan (HDL, 2013) included in Appendix G for more detailed information.

Figure 2-14. Pavement Cracks (Magnitude)

Figure 2-15. Pavement Cracks (Severity)

2.5.8 Visual Aids

Runway 16-34 has standard pilot-controlled MIRL and no approach lighting. Runway edge lighting is white, except on the last 500 feet (north of the Runway 16 displaced threshold) which is amber/red lenses (Figure 2-16).

Runway 9-27 has standard pilot-controlled MIRL (Figure 2-17). All edge lighting is white signifying a visual approach runway; however, Runway 9 is an instrument runway.

Figure 2-16. Red/Amber Runway Edge Light

Runway 16-34 is equipped with 4-box PAPI and REILs at each threshold. Runway 9-27 is equipped with a 2-box PAPI at each threshold, but no REIL. PAPIs are located on the left side of the runway per standards (Figures 2-18 and 2-19).

Neither runway has approach lighting. The airport has a rotating beacon and segmented circle located northwest of the intersection of the two runways (Figure 2-20). The primary lighted wind cone is located at the center of the segmented circle. Four secondary lighted wind cones are located east of Runway 16-34 near Taxiway D, west of Runway 16-34 near the Runway 34 PAPIs, southwest of the Runway 27 PAPIs and northeast of the Runway 9 PAPIs.

Figure 2-17. Threshold Lights (Runway 9 end)

Figure 2-18. 4-Box PAPI (Runway 34)

Figure 2-19. Primary Lighted Wind Cone in Segmented Circle

Figure 2-20. REIL Fixture

2.5.9 Weather Equipment

The airport is equipped with an Automated Surface Observing System (ASOS) located south of the Flight Service Station (FSS) near the center of the airport. The ASOS has a 500-foot buffer around the facility so airport structures do not affect observations. The ASOS program is a joint effort of the National Weather Service (NWS), the FAA, and the Department of Defense (DOD). The ASOS system provides automated weather information to the FSS, pilots via radio frequency and telephone, and the nation's primary surface weather observing network. The ASOS site is leased by the FAA (Figures 2-21 and 2-22).

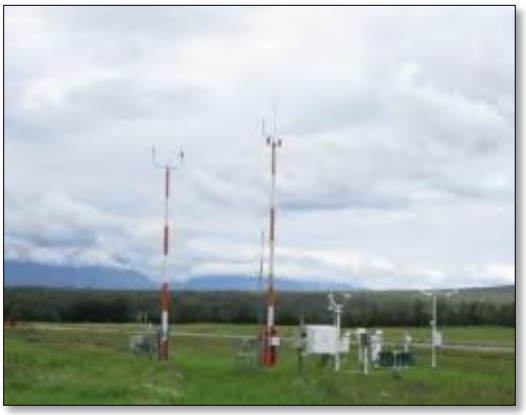

Figure 2-21. ASOS Equipment

Figure 2-22. ASOS Equipment

2.5.10 Aircraft Fueling

The airport has two aircraft fueling stations. "NA Holdings" is located at Colville Inc.'s lease lot north of Apron C and dispenses 100LL and Jet A aviation fuel using a self-serve credit card system. At the Large Aircraft Apron, Hinchinbrook Aero Fuels also dispenses 100LL and Jet A aviation fuel using a self-serve credit card system.

2.5.11 Hangars

The airport has 13 hangar structures with an estimated total capacity of 39 aircraft. The Forestry hangar is state-owned and the "Old Woods" hangar is City-owned. The other 11 are privately-owned. All existing hangar space is being utilized.

Table 2-5. Existing Hangar Inventory

Description	Capacity	Description	Capacity
Artics Air Academy	1	Forestry	4
Gallagher	1	Hageland	3
Helmricks (brown)	8	New Horizons	4
Colville	3	CIG	2
Custom Aircraft (BJ's)	1	Palmer Hangar Association	9
Fish Creek (grey west)	1	Old Woods	1
Denier (grey east)	1	TOTAL	39

The City is currently considering developing low-cost shelters on Apron B to protect aircraft from the wind and snow. The shelters would be light-weight unheated steel structures with hangar doors constructed directly on the paved surface. To keep the shelters economical, in the $300 to $500 per month range, the shelters would have no water or sewer utilities, plumbing, heating, or concrete floors.

2.5.12 Flight Service Station

The Palmer FSS is located in a two-story City building south of Apron A. The FSS opened in 1966 and was relocated to its present position in 1977 to make room for the new north-south runway. The FSS is one of 14 satellite FSSs in Alaska and is staffed by FAA from 8:00 am to 6:00 pm, 7 days per week, 365 days per year. The FSS provides traffic advisories, preflight weather briefings, notices to airmen, files, opens and closes flight plans, relays instructions and clearances from air traffic control, monitors airfield navaids, collects and disseminates pilot reports and traffic advisories, and provides weather observations for arriving and departing traffic.

2.6 Landside Facilities

2.6.1 Access Roads

The Palmer Airport has three primary access points. South Airport Road provides access from the Old Glenn Highway. Access from the downtown area is via Evergreen Street. The third main access point is from Cope Industrial Way, which provides access to the Large Aircraft Apron at the southwest side of the airport. Cope Industrial Way connects to Outer Springer Loop Road and west into the downtown area via South Chugach Street.

Airport Road and Cope Industrial Way provide paved access to all aprons and lease lot areas. There is no direct connection between the north and south apron areas because of the crosswind runway and private lands.

2.6.2 Lease Lots

The current ALP's Land Occupancy Plan shows 49 lease lots occupying 264 acres of airport land (Figure 2-23). Thirty of the 49 parcels are leased and 19 are vacant. The lease lots are used for a variety of aviation and non-aviation uses including the municipal golf course, agriculture lands, the State Forestry facilities, hangars, flight schools, businesses, RPZ protection, federal navaids, the FSS, and the City airport equipment storage building.

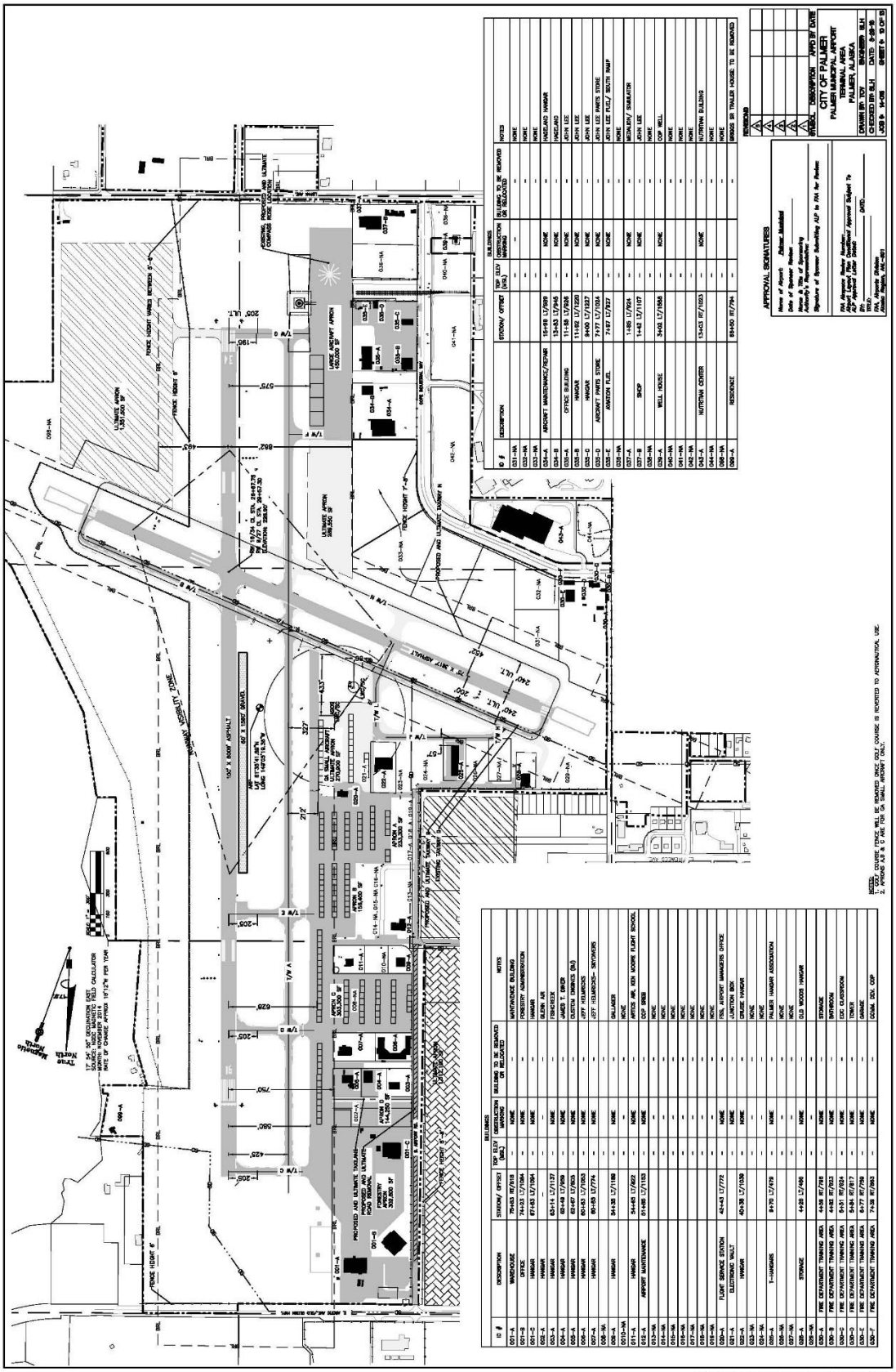

Figure 2-23. Land Occupancy Drawing

2.6.3 Security Fencing and Gates

The airport has approximately 23,500 feet of perimeter chain link fence and 22 vehicle gates (Figure 2-24). Of the 22 vehicle gates, eight are normally closed and locked, three are open only during normal business hours, ten are always open, and one is open only in the winter for snow storage area access. A 6-foot high chain link fence separates the airport from the golf course. The remaining fencing consists of 5, 6, and 8-foot high chain link fence, some with barbed wire. Fencing is in fair to good condition and in places is overgrown and deformed from vegetation. The golf course fence is non-frangible and limits the OFA of Runway 16-34. The fence was constructed as part of the FAA-approved golf course development without FAA funding. When the golf course area is needed for aeronautical use, the fence is to be relocated to meet standards.

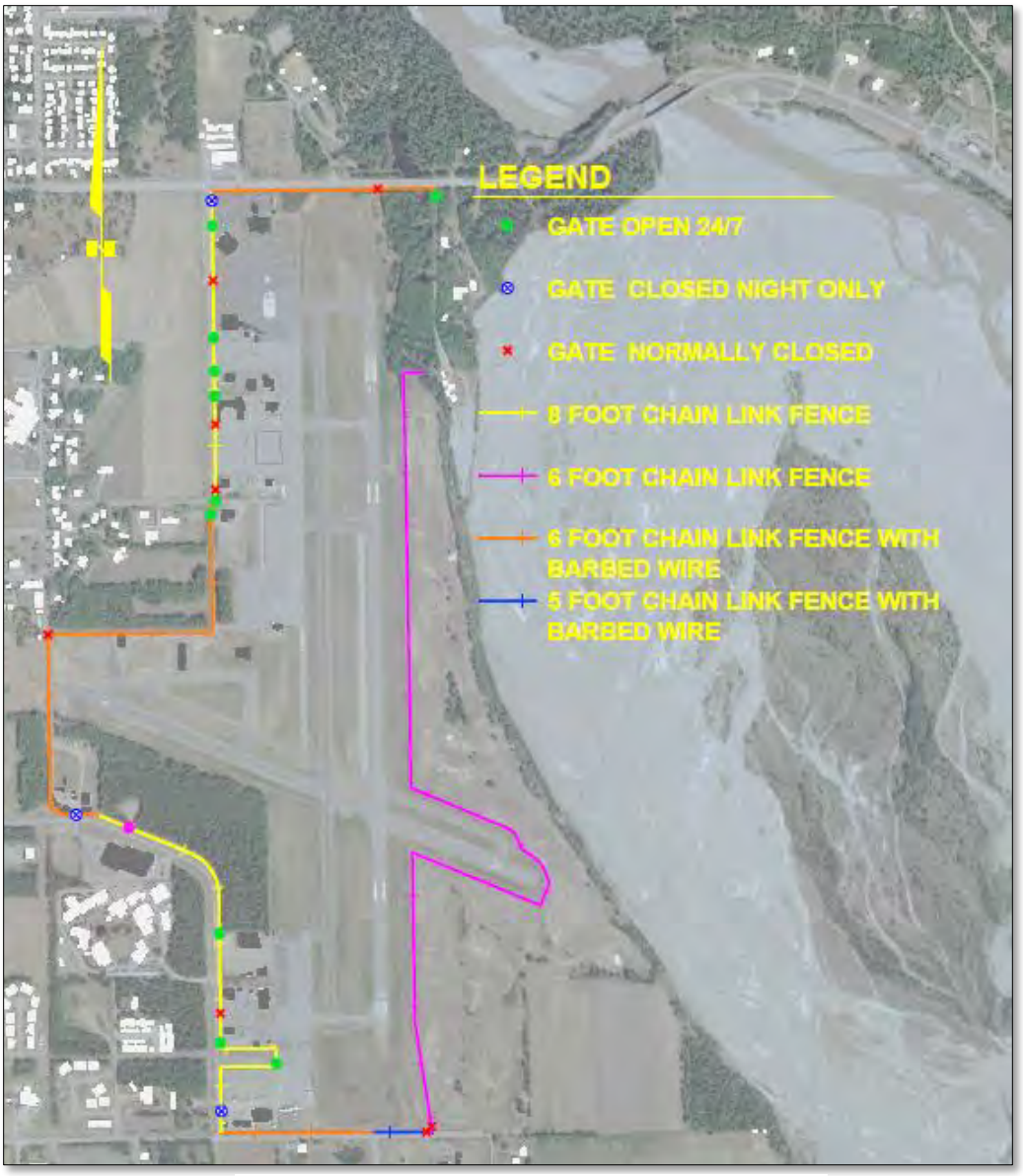

Figure 2-24. Airport Fencing

2.6.4 Airport Equipment

Table 2.6 represents the equipment currently being utilized at the airport for snow removal, vegetation control, and general airport facilities maintenance.

Table 2-6. Airport Equipment

Acquisition Date	Description	Purchase Price ($)	FAA Funded
1/1/1995	1995 Case 821B Loader	Unknown	No
1/1/1996	1996 S&S 158HC Snowblower	Unknown	No
4/22/2003	2003 John Deere 4210 Tractor Mower	15,250	Yes
7/12/2003	2000 John Deere 47 Backhoe Attachment	6,108	Yes
7/12/2003	59” John Deere Snowblower Attachment	3,258	Yes
7/12/2003	57” John Deere Broom Attachment	3,925	Yes
7/12/2003	John Deere Balast Box	165	Yes
4/6/2004	2004 International Dump Truck	134,385	Yes
6/16/2006	2006 Caterpillar 140 Grader	247,010	Yes

2.6.5 Other Facilities

There are several facilities located on the airport property that are non-aviation related. The Palmer Municipal Golf Course is located between Runway 16-34 and the Matanuska River on lease lots LL1 and LL2 consisting of 135 acres of airport land. Revenue from the golf course goes into the Palmer Airport Enterprise Fund.

Other non-aviation related facilities on the airport include fire department and community development buildings, MSB School District Nutrition Facility, baseball fields, and the New Horizons Telecom office along Cope Industrial Way. Two City municipal water supply wells (Wells 4 and 5) are located on airport property near the south end of Cope Industrial Way. Revenue from the non-aviation related leases goes into the Palmer Airport Enterprise Fund. The airport also has a lease with a local farmer who cuts, bales, and removes hay on the airport grounds during summer months.

2.7 Environmental

2.7.1 Introduction

This section describes the existing environmental resources at, and in the vicinity of, the airport. FAA Order 5050.4, *FAA Airports Guidance for Complying with NEPA*, was used as a guide to assist in the identification of potential environmental impacts specific to PAQ. This information will be used to identify key environmental issues that will be involved in analyzing airport development alternatives. Only those environmental resource categories that were identified within or in the immediate vicinity of the airport are discussed in detail. Environmental resource categories that were not identified within airport property or in close proximity to the airport and are not evaluated in this document are:

- Coastal Barrier Resources. Review of the United States Fish and Wildlife Service (USFWS) website indicated that there are no lands included in the Coastal Barrier Resources System located within Alaska (USFWS, 2014a).
- Prime and Unique Farmland. Prime and/or unique farmlands have not been designated in Alaska (U.S. Department of Agriculture [USDA], 2014a). The local area surrounding the City of Palmer is known to be a productive agricultural area. The primary soil type surrounding the airport is Bodenburg silt loam. This soil type consists of very deep and well drained soils usually found on terraces, hillslopes, and outwash plains. According to the USDA Web Soil Survey, farmland of this soil type is of local importance.
- Wild and Scenic Rivers. There is no designated state or federal wild or scenic rivers in the vicinity of the project (National Wild and Scenic Rivers System, 2014).
- Coastal Zone. The Alaska Coastal Management Plan (ACMP) was repealed June 30, 2011, after the Alaska State Legislature failed to pass legislation to extend the program.

2.7.2 Air Quality

The airport is located within the Cook Inlet Intrastate Air Quality Control Region, which includes the Greater Anchorage Area Borough, Kenai Peninsula Borough, and the MSB as defined in the Code of Federal Regulations (CFR) Title 40 CFR 81.54. According to the Alaska Administrative Code (AAC) Title 18 AAC 50, these areas are considered Class II areas with maximum allowable increases for particulate matter 10 micrometers or less in size (PM-10), particulate matter at 2.5 micrometers or less in size (PM-2.5), nitrogen dioxide, and sulfur dioxide (Alaska Department of Environmental Conservation [ADEC], 2014a). Activities in these areas must operate in such a way that they do not exceed listed air quality controls for these compounds.

2.7.3 Compatible Land Use

FAA grant assurances require that airport sponsors work to ensure compatible land use in the area surrounding an airport. Per FAA's *Environmental Desk Reference for Airport Actions* and FAA's *Airport Compliance Manual* (Order 5190.6B, Part VI: Land Use), compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts, potential for airspace conflicts from tall structures in the vicinity of the airport, electronic interference with navaids, or potential interactions between aircraft and wildlife attractants. Activities that may alter aviation-related noise impacts and affect land uses subjected to those impacts typically involve:

1. airport development actions to accommodate fleet mix changes or the number of aircraft operations;
2. air traffic changes; or
3. new approaches to the airport made possible by new navigational aids.

Other land use compatibility issues can result from activities in the vicinity of the airport that could cause adverse impacts to safe aircraft operations, such as cell towers or other tall structures that

obstruct navigable airspace, municipal landfills, wetlands, agricultural areas, and parks/golf courses or other land uses that attract wildlife species that are hazardous to aviation activity. The surrounding farm fields and the Palmer Municipal Golf Course, located adjacent to airport property attract large numbers of migratory bird species (mainly cranes and geese) in the spring and fall.

2.7.4 Section 4(f) Resources

Section 4(f) of the Department of Transportation Act states that FAA cannot approve the use of publicly-owned wildlife refuges, parks and recreation areas, or historic sites eligible for the National Register of Historic Places (NRHP) unless there is no feasible and prudent alternative to using the land and the project includes all possible measures to minimize harm to the property.

There are no identified state or federal recreation areas, wildlife refuges, critical habitat areas or parks in the vicinity of the airport. Publicly owned land adjacent to the airport that may qualify as Section 4(f) includes:

- The Matanuska River Park, owned and maintained by the MSB. The park is located north of the airport, at mile 17 of the Old Glenn Highway. The park provides 86 campsites and 20 caravan sites and provides a central comfort station equipped with flush toilets and hot showers. The park features an open area with four park pavilions that host picnic tables and grills, playground equipment, horseshoe pit, sand volleyball court, and trails and river access. The park is closed at freeze-up in the fall until approximately the beginning of May. The Matanuska River Park received a grant from the Land and Water Conservation Fund Act (LWCA) in 1981 and is therefore also subject to Section 6(f) stipulations. Section 6(f) of the LWCA prohibits the conversion of property acquired or developed using LWCA funds to a non-recreational purpose without the approval of the Department of the Interior's National Park Service.
- The Sherrod Complex, located north of the airport and west of the Matanuska River Park is owned by the MSB. The complex hosts multiple school facilities and provides sport fields for local organizations such as the Matanuska Youth Soccer Association.
- The Palmer Municipal Golf Course is located on the east side of the airport. The golf course is a public course, owned by the City and operated by a private concessionaire, which has maintained a good working relationship with the City. Built in 1990, the 18-hole course is 144.85 acres in size.
- The Babb Arboretum is a wooded open space with 109 shrubs and 47 trees and encompasses an area of 0.30 acre located at the corner of Gulkana Street and Fireweed Avenue. According to Sandra Garley, Director of Community Development for the City of Palmer, a portion of the Arboretum land is owned by the City but the remainder, as well as surrounding cottages and buildings are privately owned. The arboretum is currently not maintained by City staff and is on and adjacent to airport property. The arboretum is publically funded, open to the public, and requires no entrance fee.

- The City of Palmer owns teeball fields located within the airport property boundary located off of Cope Industrial Way.
- Historic properties that are eligible for or listed on the NRHP are considered significant resources worthy of preservation and protection under Section 4(f). A review of known and present historic properties will be necessary prior to any new development at the airport. In addition, depending on the proposed development, a cultural resource survey may be necessary.

2.7.5 Biotic Resources

The Alaska Natural Heritage Program (ANHP) collects, synthesizes, and validates information on Alaska's animal and plant species of concern and their habitats, ecosystems of concern, and invasive species. The ANHP collaborates with Alaska Department of Fish and Game (ADF&G), Bureau of Land Management (BLM), USFWS and the federal government to collectively monitor species that are threatened, endangered, or rare within the state of Alaska. The ANHP rates species on both a global (G) and state (S) level. Tables 2-7 and 2-8 below outline the global and state rankings as well as a list of ANHP species in the vicinity of the airport (ANHP, 2014).

Table 2-7. Alaska Natural Heritage Program Global & State Ranking Scale

Ranking	Definition
G1/S1	Critically Imperiled
G2/S2	Imperiled
G3/S3	Vulnerable
G4/S4	Apparently Secure
G5/S5	Secure
GU/SU	Unrankable
GX/SX	Presumed extinct
GH/SH	Possibly extinct
GNR/SNR	Unranked
GNA/SNA	Not Applicable

Table 2-8. Alaska Natural Heritage Program Species

Common Name	Scientific Name	Ranking
Starry Solomon-plume	*Maianthemum stellatum*	G5/S2
Red Clubrush	*Blysmopsis rufa*	G5/S1
Rusty Blackbird	*Euphagus carolinus*	G4/S4

Starry Solomon-plume. Starry Solomon-plume is a perennial plant found throughout Canada and the US. This species is listed as secure on the global scale (G5). However, in the State of Alaska, this species is ranked as imperiled (S2) (USDA, 2014b).

Red Clubrush. Red Clubrush is a perennial plant found throughout Alaska and within all the Canadian provinces except British Columbia. This species is listed as secure on the global scale (G5). However, in the State of Alaska, this species is ranked as critically imperiled (S1) (USDA, 2014C).

Rusty Blackbird. The rusty blackbird migrates between its summer breeding range in Alaska and Canada to its winter range in the southeastern US. While this species currently rates as apparently secure (G4) on the global level and apparently secure/vulnerable (S4B/S3N) at the state level the Rusty Blackbird is one of North America's most rapidly declining species. According to the Cornell Lab of Ornithology (2014) the species population has declined by 85-99 percent over the past forty years without any identified cause.

Migratory Bird Species

The Migratory Bird Treaty Act of 1918, as amended (16 USC 703-711) as well as the Bald and Golden Eagle Protection Acts (16 USC 668-668d) and Executive Order 13186 require all federal agencies avoid to the extent possible, the "take" of migratory birds and bald and golden eagle, eggs, feathers, or nests.

A review of the USFWS Information, Planning, and Conservation System (IPaC) decision support tool listed the Rusty Blackbird (*Euphagus carolinus*) as a migratory bird of conservation concern that may be found in the vicinity of the airport (USFWS, 2014b). Cranes (*Gruidae sp.*) and geese (*Anser sp., Branta sp. and Chen sp.*) are also known to use the agricultural field that lies west of and adjacent to the airport. Use of the field by the birds in such close proximity to the airport is considered incompatible with airport activities according to FAA AC 150/5200-33.

Suitable eagle nesting habitat exists in areas adjacent to the airport property. According to the ADF&G, eagles in the area prefer nesting sites in cottonwood trees near water bodies (ADF&G, 2014a). Eagles have been known to nest along the Matanuska River. Prior to development at the airport an eagle nest survey may be required.

Anadromous or Resident Fish and Essential Fish Habitat

The Magnuson Stevens Fishery and Conservation and Management Act directs federal agencies to consult with the National Marine Fisheries Service (NMFS) when any of their activities may have an adverse effect on Essential Fish Habitat (EFH). An adverse effect is defined as “any impact which reduces quality and/or quantity of EFH." Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, or reduction in species’ fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (National Oceanic and Atmospheric Administration [NOAA], 2014). All waters that support anadromous fish species are considered EFH by NMFS.

The Anadromous Fish Act (Alaska Statute 16.05.871- .901) gives ADF&G authority to regulate all activities within or across water bodies bearing anadromous fish species. The act requires individuals and government agencies proposing to alter or affect “the natural flow or bed” of a specified water body or fish stream to obtain permit approval from ADF&G. Regulated activities include construction; road crossings; gravel removal; mining; water withdrawals; the use of vehicles

or equipment in a waterway; stream realignment or diversion; bank stabilization; blasting; and the placement, excavation, deposition, or removal of any material.

According to the ADF&G's *Atlas to the Catalog of Waters Important of the Spawning, Rearing, or Migration of Anadromous Fishes*, the Matanuska River (AWC #247-50-10220) is the only anadromous stream in the vicinity of the airport, supporting all five species of Pacific salmon (ADF&G, 2014b) and considered EFH by NMFS. The Matanuska River is a braided river located east of the airport property. There is ongoing local concern regarding erosion of the river bank toward the golf course and ultimately the airport.

Non-Native/Invasive Species

Several state and federal organizations and regional community groups are working to identify, control, and prevent the spread of invasive and noxious weeds in Alaska in accordance with Executive Order 13112, Invasive Species. The ANHP maintains the Alaska Exotic Plans Information Clearinghouse (AKEPIC) database which contains information on over 330 non-native plant species tracked in the state. The State of Alaska regulates and manages the spread of invasive and noxious weed species that could pose a public health risk or harm the agricultural industry.

A total of four non-native species were identified in the vicinity of the airport and listed in Table 2-9. Consultation with the necessary agencies will be completed to prevent any spread of non-native/invasive species near the airport (ANHP, 2014).

Table 2-9. Alaska Natural Heritage Program Invasive Species

Common Name	Scientific Name
Bird Vetch	*Vicia cracca*
Reed Canarygrass	*Phalaris arundinacea*
Quackgrass	*Elymus repens*
Yellow Sweetclover	*Melilotus officinalis*

2.7.6 Historic and Archaeological Sites

Consultation in accordance with Section 106 of the National Historical Preservation Act (NHPA) will be conducted under any federal undertaking sponsored by FAA to determine whether any historic properties are likely to be affected. At present, no known historic properties exist within the airport boundary.

2.7.7 Federally Listed Threatened or Endangered Species

Threatened and Endangered Species

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure their actions do not jeopardize the existence of species listed by USFWS and the NMFS as threatened or endangered or adversely affect their designated critical habitat. According to USFWS IPaC decision support tool there are no listed threatened or endangered species or designated critical habitat within the MSB (USFWS, 2014b).

Bald and Golden Eagles

Bald Eagles are protected by the Bald Eagle Protection Act. Due to the proximity of the Matanuska River, the area surrounding the airport is considered ideal eagle nesting and foraging habitat. Bald Eagle nests have previously been identified within a 2-mile radius of the airport, however, further investigation regarding the site and status of the nests is required.

2.7.8 Environmental Justice

Environmental justice ensures that low-income or minority populations do not bear a disproportional burden of effects from federal action. According to the United States Census Bureau (USCB), the majority of people living in Palmer are Caucasian (79.1%) and live above the poverty line (88.5%) (USCB, 2014) and therefore are not low income or minority.

2.7.9 Floodplains

The City participates in the National Flood Insurance Program. According to the Federal Emergency Management Agency (FEMA) Map Service Center, the airport property is generally enclosed within Zone X of the Matanuska River floodplain (Map Panel 02170C8155E). The area is determined to be outside the 0.2% annual chance floodplain (FEMA, 2014).

2.7.10 Hazardous Materials, Pollution Prevention, and Solid Waste

The Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Database indicates there are no known active contaminated sites within the airport property boundary (ADEC, 2014b). Previous contaminated areas at the airport have been closed and are currently listed as "Cleanup Complete" by ADEC. Airport operations that could contribute to the presence of hazardous materials include aircraft maintenance operations, leaking aircraft, aircraft anti/de-icing, or airfield anti/de-icing. The airport does not apply de-icing or anti-icing agents to the airfield.

2.7.11 Induced Socioeconomic Impacts

Induced socioeconomic impacts resulting from improvements to the airport will be assessed when airport projects are identified, prioritized, and funded. Socioeconomic impact analysis will take into consideration impacts to population movement and growth, public service demands, or changes in business and economic activities.

2.7.12 Light Emissions and Visual Effects

The airport is located east of downtown Palmer. The airport is visible from Palmer Junior Middle School (west) and the Palmer Pioneer Cemetery across the Old Glenn Highway (north). It is also visible from adjacent farmlands, the golf course, residences along Outer Springer Loop, and residences on the Lazy Mountain hillside. Changes or improvements to the airport would not significantly alter light emissions or the appearance of the airport.

2.7.13 Noise

Aircraft noise can be a nuisance to noise sensitive land uses surrounding airports. Noise sensitive land uses can include residences, hotels, schools, hospitals, health care, and nursing homes. Noise can be detrimental to the relationship between the airport and community.

Since 1978, the Integrated Noise Model (INM) has been the FAA's accepted standard for evaluating existing and future aircraft noise impacts in the vicinity of airports. Noise Exposure Maps (NEMs) were prepared in accordance with Subpart B - Development of Noise Exposure Maps and Noise Compatibility Programs, and Appendix A - Noise Exposure Maps of 14 CFR Part 150. INM computer modeling generates noise contours based on the types of aircraft (fleet mix), time of day (day or night), runway used, and the typical flight paths. Average day-night A-weighted sound levels (DNL) greater than 65 decibels (dB) are considered by FAA to be incompatible with certain land uses. A-weighted noise levels emphasize frequency ranges where most human speech resides and is used extensively in measuring and predicting community and transportation noise. The FAA uses Table 1, of Part 150, Appendix A, as guidance for noise levels and land use compatibility. Table 1 of Part 150, Appendix A, can be found in Appendix I of this master plan update. The NEMs are located in Appendix E.

2.7.14 Solid Waste

Two existing solid waste facilities and one proposed facility were identified within the general area. These facilities include:

- MSB Central Landfill - Is an active waste facility located approximately 3.5 miles west of the airport.
- Alaska Demolition Palmer Inert Waste – Is an active waste facility located within 2 miles of the airport to the southwest.
- Central Monofill Services Inc. – The proposed Inert Waste Monofill would be located within 5 miles to the southwest of the airport. The proposed Monofill would be owned and managed by Central Monofill Services Incorporated. The facility would be used for disposal of demolition and construction debris and other inert waste.

The Solid Waste Recycling, Reuse, and Waste Reduction analysis is located in Appendix H.

2.7.15 Water Quality

A review of the ADEC Drinking Water Program's Map of Public Drinking Water Protection Areas (DWPAs) and Public Water System (PWS) sources and of the Environmental Protection Agency (EPA) Sole Source Aquifer Program's website identified the City of Palmer Municipal Wells No. 4 and 5, located on airport property (ADEC, 2014c).

Storm water within the Palmer Airport sheet flows off the pavement and infiltrates into the adjacent ground. The receiving water body is the Matanuska River. A Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Alaska Pollutant Discharge Elimination System (APDES) Construction

General Permit (CGP) and use of Best Management Practices will be observed should any airport development take place.

The 2010 Alaska's Impaired Waters list identifies a half-mile stretch of the Matanuska River as a Section 303(d) Impaired Water body due to residues and debris from a nearby illegal waste site. The illegal waste site is located on and in the Matanuska River just north of Eagle Drive in Palmer (ADEC, 2014d). According to ADEC, the illegal waste site poses an immediate threat to the surface water quality of the Matanuska River and is within the Drinking Water Protection Area for a minimum of three public water systems.

2.7.16 Wetlands

Executive Order 11990 requires federal agencies to "minimize the destruction, loss[,] or degradation of wetlands" for federally funded transportation projects. Wetlands are defined by the U.S. Army Corps of Engineers (USACE) as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE, 1987).

The USFWS National Wetland Inventory (NWI) identified wetlands on the airport, in the northeast corner and southeast area that is currently the golf course (USFWS, 2014c & MSB, 2014). In addition, NWI identified two wetland areas adjacent to airport property which include:

- Matanuska River Park located north of the airport
- Agricultural Wetlands located northwest of the airport

2.7.17 Cumulative Impacts

A thorough review of cumulative impact of airport improvement projects will be assessed during the future NEPA document. These impacts include items that by themselves are fairly minor, yet, when combined with other minor impacts from other projects on the airport, become more important.

The categories in the *Desk Reference* are used in anticipation that an Environmental Assessment of environmental impacts of various projects in this plan will be prepared in the future.

2.7.18 National Environmental Policy Act Documentation

The following excerpt from FAA Order 5050.4B *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* (2006) lists items that are considered federal actions and would invoke the NEPA process. Some projects included in this plan that meet the definition of "federal action" will be eligible for a categorical exclusion and will not require the preparation of an Environmental Assessment (EA) or Environmental Impact Statement (EIS).

From FAA Order 5050.4B, Section 9.g:

> **Federal Action.** For FAA Office of Airports, a federal action may include one or more of the following:

1. Conditional, unconditional, or mixed approval of federal funding for airport planning and development projects, including separate funding of plans and specification for those projects.
2. Conditional, unconditional, or mixed approval of a location for a new, public use airport.
3. Conditional, unconditional, or mixed approval of a first-time or changed ALP.
4. Authorizing an airport sponsor to impose and use passenger facility charges.
5. Conditional, unconditional, or mixed approval of an airport sponsor's request under 49 USC, section 47125, to use or transfer Federally-owned land to carry out an action under 49 USC Chapter 471, Subchapter I, at a public-use airport or to support the airport's operations.
6. Conditional, unconditional, or mixed approval of an airports sponsor's request to release land from a Federally-obligated, public-use airport when the land would be used for non-aeronautical purposes.
7. Conditional, unconditional, or mixed approval of the use of a facility as public-use airport when the facility becomes available under the Surplus Property Act.
8. Approving noise compatibility programs under Code of Federal Regulations 14 CFR, Part 150.
9. Approving an airport sponsor to restrict the use of Stage 3 aircraft at public-use airports under 14 CFR Part 161.
10. Issuing a Part 139 certification.
11. Conditional, unconditional, or mixed approval of funding for measures in an FAA-approved Wildlife Hazard Management Plan or approving ALP changes to accommodate those measures.

The information in Table 2-10 is based on FAA Order 5050.4B and summarizes the type of project normally eligible for a categorical exclusion and those that normally require an EA or EIS.

Table 2-10. Type of Environmental Analysis Required

Type of Environmental Document	Examples of Projects
Categorical Exclusion (always)	• Grants for planning or environmental work • ALP approval • Preparation of noise exposure maps • Safety equipment for airport certification (snow removal) • Purchase of security equipment
Categorical Exclusion (if no extraordinary circumstances)	• Airfield improvements • Fill deposits into previously excavated non-aquatic areas • Heliport at an existing airport • On-airport measuring devices, segmented circles, and landing aids • Vegetation, berms, or sound walls to reduce noise • On-airport obstruction treatment (land grading or tree trimming activities for Part 77 requirements) • Small aircraft parking ramps, vehicular parking areas, and garages • Build or maintain fencing • Wildlife Hazard Management Plan implementation
Environmental Assessment	• Helicopter facilities that cause a DNL1.5dB increase over noise sensitive areas within the 65 DNL contour • Land acquisition that is highly controversial • Project that would convert land protected under the Farmland Protection Act to non-agricultural use • Dredging or filling of any waterway or wetland that require a USACE permit
Environmental Impact Statement	• An environmental assessment signaling significant impact • A new commercial service airport in a metropolitan statistical area • A new runway in a metropolitan statistical area

2.8 Land Management Regulations

2.8.1 Palmer Comprehensive Plan

The *City of Palmer Comprehensive Plan* is the City's statement of its vision, and identifies the goals and objectives needed to guide the community's physical, social, and economic development and thus achieve its vision. The only mention of the airport in the 2006 *Palmer Comprehensive Plan* Introduction, Economic Vitality, or Transportation chapters is to note that the City has a regional

airport and that this is an attribute that adds to the community's quality of life. When the Comprehensive Plan is next updated, these chapters should address the airport's role in regional movement of people and freight, its role in supporting statewide fire-fighting, its support of a diversity of aircraft repair and maintenance enterprises and activities, its role as a developing base for skydiving and related training and sports, and the economic engine to the community this activity and commerce provides.

Objective B in the Comprehensive Plan Land Use chapter is to: Support continued industrial use, consistent with other plan goals. In this section the Comprehensive Plan does note that,

> "The proximity of Palmer's airport is an important resource for potential industrial developers. Lands surrounding the Palmer Airport offer one of the most promising areas for expansion of industrial activities. Ideally, growth in this area would take advantage of the air access, for example businesses that might distribute or assemble value-added products for use around Alaska. The primary role for the City in encouraging industrial expansion is to zone land for this use, and ensure compatibility between industrial and adjoining uses."

This section of the Comprehensive Plan should include a paragraph about three primary land use concerns linked to airports: 1) noise from aircraft operations, 2) protection of airspace from obstacles, and 3) uses that have the potential to attract hazardous wildlife on or near the airport. These topics are not covered in the Comprehensive Plan, however communities with airports will often mention them. As the Comprehensive Plan is the policy and legal basis for zoning, including statements on these aviation-related land use concerns in the Comprehensive Plan opens the door for discussion and promoting compatibility during development permit reviews.

Regarding noise, Palmer Municipal Code (PMC) Title 7 - Airport Regulations contains one relevant section, which restricts engine testing to between the hours of 7 am and 10 pm. This is similar to the Nuisance section of PMC at §8.36.025, which prohibits certain equipment from operating between 10 pm and 6 am unless a permit is obtained from the Palmer Police.

City staff reports that during fire-fighting season, residents generally tolerate aircraft operations and noise at all hours as there is broad support for the state's aviation fire-fighting actions. However, during the off-season, residents do at times complain when there is exceptionally noisy or off-hour aircraft activity. Often times those impacted are beyond the City boundary. This causes an ambiguous jurisdictional situation because the activity is not the responsibility of nor is governed by the City outside of City limits; this area is in the MSB.

2.8.2 Palmer Airport Zoning

Until recently the airport was primarily in the Public Use (P) zoning district, which does not give priority to aviation or related use and instead favors public buildings and uses, especially for recreational purposes. The City remedied this with a series of mid-2014 rezoning actions. The airport runways, aprons, and most of the surrounding lease lots are now zoned either Airport Commercial (A-C) or Airport Industrial (A-I) (Figure 2-25). As a result, local land use regulations now

support airport operations and work to minimize future land use conflict on airport property and with aviation activities (Figure 2-26).

PMC §17.44.010 Intent. The **Airport Commercial Zoning District** is intended to provide for the safe and orderly use of lands where the best use is for airport-related commercial and retail purposes. The specific intent in establishing this district is:

A. To provide land for commercial and retail operations that are dependent upon the use of aircraft or are involved in the maintenance of aircraft or aircraft parts and equipment;
B. To locate aircraft-related uses in an area where their activities will have minimal effect on residential areas;
C. To prohibit uses that are not commercial- or retail-oriented and dependent upon or related to aircraft and their use;
D. To prohibit residential use of land;
E. To be consistent with the airport layout plan prepared by HDL Engineering Consultants, July 2004; and
F. To give preference to aeronautical uses. (Ord. 05-010 § 3, 2005; Ord. 455 § 3, 1993)

PMC §17.48.010 Intent. The **Airport Industrial Zoning District** is intended to provide for the safe and orderly use of lands where the best use is for airport-related industrial purposes. The specific intent in establishing this district is:

A. To provide land for industrial operations that are dependent upon the use of aircraft or are involved in the manufacturing or maintenance of aircraft or aircraft parts and equipment;

B. To locate industrial uses in an area where their activities will have minimal effect on residential areas;
C. To prohibit uses that are not industrial- or manufacturing-oriented and dependent upon or related to aircraft and their use;
D. To prohibit residential use of land;
E. To be consistent with the airport layout plan prepared by HDL Engineering Consultants, July 2004; and
F. To give preference to aeronautical uses. (Ord. 05-011 § 3, 2005; Ord. 455 § 3, 1993)

Figure 2-25. City Zoning in Effect at the Palmer Municipal Airport

2.8.3 Surrounding Land Uses and Concerns

Land surrounding and adjacent to the airport is:

1. North - the Matanuska River Park, Palmer Pioneer Cemetery, Academy Charter School, and Sherrod and Swanson Elementary schools and recreation areas are all zoned for Public Use (P). There is also a large parcel of undeveloped land, zoned for Public Use, and the Cranberry Meadows subdivision, which is zoned Single Family Residential (R-1).
2. East - between the airport and the Matanuska River, three parcels of privately owned land zoned for Commercial-General (CG) use, and the Palmer Municipal golf course on airport property that is zoned Public Use. There is a single family dwelling unit on one of the GC zoned parcels whose owner objects to the airport's noise, activity and proximity.

3. South - Public Use zoned land with hayfields and golf course. There is concern over bird attraction at times. There are several subdivisions further south of the airport located outside of City limits. The City should work with the MSB to ensure that land use is compatible with the aviation activities on the airport.

4. West - a mixture of zoning and land uses, including a 40+ acre parcel now used for agricultural purposes and zoned for Single Family Residential (R-1) that could support many future dwelling units; an underutilized parcel zoned as a Business Park (BP); additional underutilized parcels zoned for Single Family Residential (R-1); a commercial district zoned as Commercial Limited (CL); Willow Pointe zoned as High Density Residential (R-4); Palmer Junior Middle School; and lease lots within the airport boundary that are home to the MSB School District Nutrition Facility, teeball fields, and Alaska Job Corps that are all zoned Public Use; and areas south of that zoned for Commercial-Limited (CL), Mountain Rose Estates and Eagle Ridge zoned for Single Family Residential Estate (R-1 E), and Agricultural uses.

5. Immediately west of the Runway 9-27, crossing the avigation easement - a well-used walking path off of South Gulkana Street that cuts across the easement and connects to a bicycle path along Cope Industrial Way. The bicycle path continues east to Outer Springer Loop Road. Together this makes about a 4,200-foot long shared use path separated from roads.

6. Immediately west of Runway 9-27 and in the avigation easement - the Babb Arboretum, a 0.3 acre wooded open space with 47 trees and 109 shrubs. South of the Arboretum the City has proposed a Willow Pointe/Arboretum Trails Plan with community gardens.

2.8.4 Corrective Actions Underway

Based on a settlement of a disputed claim with the US Department of Justice, the City entered into a Corrective Action Plan with the FAA to remedy airport land use and revenue compliance discrepancies. The City is currently working closely and cooperatively with the FAA Airports Division to resolve the discrepancies which include fair market rents for non-aviation uses, transitioning non-aviation land use to aviation-related land uses, and removal of the MSB School District Warehouse (Nutrition Center) and Municipal Well 4 and 5 parcels from the airport property.

The City has resolved the non-frangible golf course fence issue with the FAA through the ALP review and approval process. There currently are no FAA-approved frangible fence systems in the US. Palmer's approved ALP reflects a non-standard OFA for Runway 16-34 and 9-27 because of the non-frangible fence. The City and FAA have agreed that the golf course fence needs to remain in place as long as the golf course is being used. At such a time that the golf course reverts to an aeronautical use the fence will be relocated outside the OFA or removed. If an FAA-approved frangible fence system becomes available, the parties agreed that the City would request FAA funding for a frangible fence project. The non-frangible golf course fence is constructed below runway centerline and does not penetrate the transitional surface.

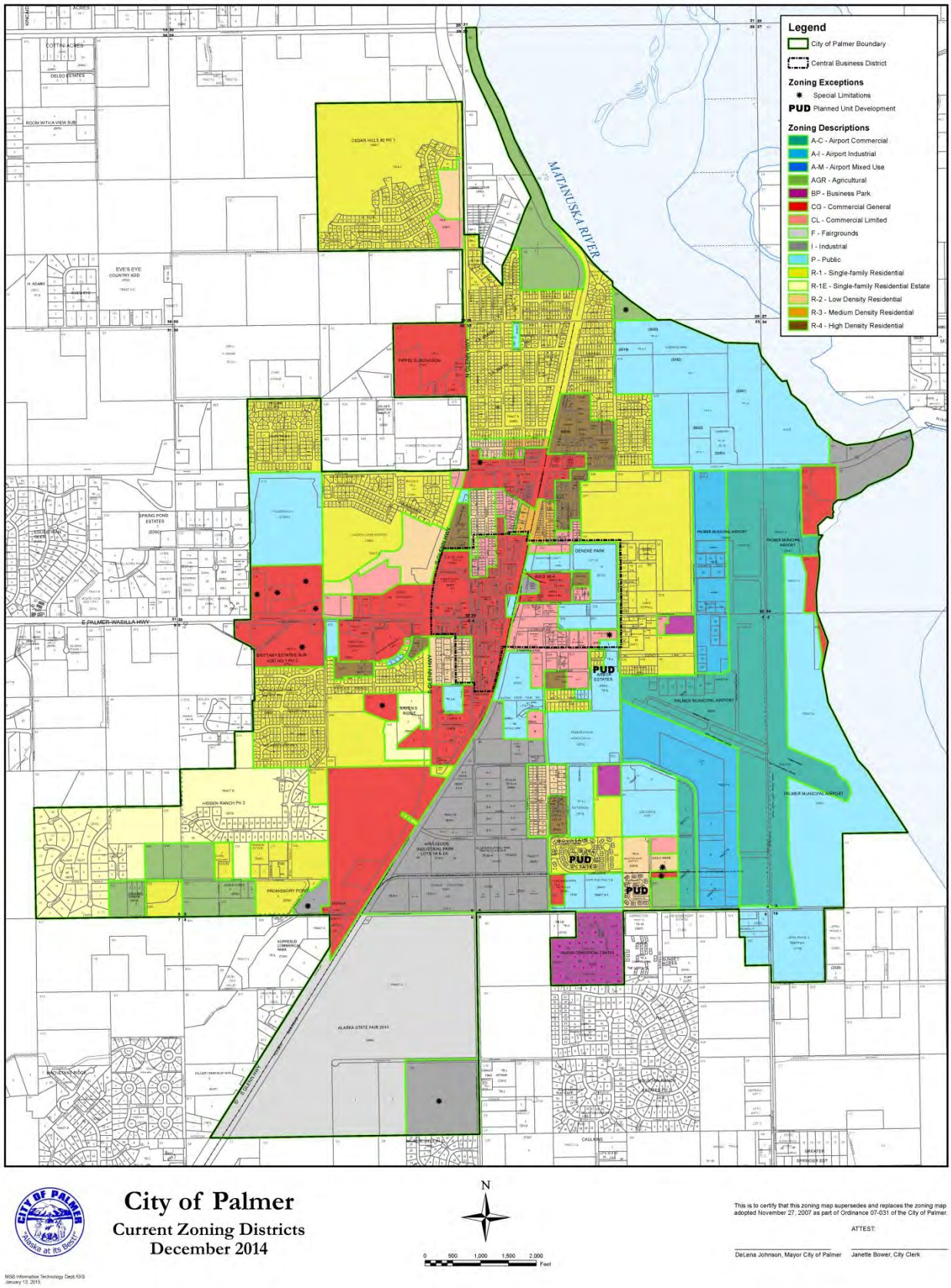

Figure 2-26. Palmer Zoning Map, December 2014

2.8.5 Airspace Protection

The City is responsible for maintaining clear approach and departure surfaces under its federal grant assurances. In a memo dated August 18, 2015, (Appendix J) the directors of the FAA offices of Airport Safety and Standards, Airport Planning and Programming, and Airport Compliance remind FAA personnel and airport sponsors of this responsibility and suggest that airport sponsors prepare an Obstacle Action Plan (OAP). The City is currently developing an OAP, which will address all known obstacles at and around the airport that penetrate the 20:1 approach and departure surfaces for all runways. An OAP outlines how the sponsor plans to mitigate all obstacles, such as lighting of obstacles, tree monitoring, clearing plans, and reoccurring brush mitigation. For land not owned or controlled by the City, FAA expects that the City will take action to achieve land use compatibility.

Palmer

There is nothing in the PMC protecting navigable airspace surrounding the airport from obstructions. On the airport, the new airport zoning districts restrict building heights to 35 feet for A-C zoning, and 55 feet for A-I zoning. Many zoning codes in areas with airports have a section on tall structures (like cell towers) that protects navigable airspace, thereby alerting planning commissioners, planning staff, developers, pilots, and others of these matters. One option would be to simply refer to federal regulations that are discussed below.

Matanuska-Susitna Borough

The MSB code §17.60.145 (C)(10) states that, "The proposed development shall not interfere with the approaches to any existing airport or airfield, including water bodies supporting aircraft use." This MSB code section does not apply within the City limits since the MSB has delegated planning powers within the City. Airspace just south of the Palmer airport is actually in the MSB, so arguably the MSB clause does protect south of the runway, but this is jurisdictionally awkward. PMC §17.60.090 - Rules for Tall Structures, should be amended to add a clause similar to MSB's cited above. This would provide uniformity and better protections. It could also include a reference that objects of natural growth must also support airport use, as this has been an issue in Palmer. Some municipalities also prepare a map depicting the navigable airspace (per federal rules) and incorporate this into their code to provide clarity.

FAA

CFR Title 14 Part 77 Obstructions to Air Navigation establishes standards and imaginary surfaces for determining obstructions to air navigation (Table 2-1). Part 77 establishes notification requirements for objects affecting navigable airspace. This notification serves as the basis for:

- Evaluating the effect of the construction or alteration on operating procedures,
- Determining the potential hazardous effect of the proposed construction on air navigation,
- Identifying mitigating measures to enhance safe air navigation, and
- Charting of new objects.

Notification allows the FAA to identify potential aeronautical hazards in advance, thus preventing or minimizing the adverse impacts to the safe and efficient use of navigable airspace. 14 CFR Part 77.9 states that any person/organization who intends to sponsor any of the following construction or alterations must notify the Administrator of the FAA:

- any construction or alteration exceeding 200 feet above ground level,
- any construction or alteration,
    - within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet, or
    - within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet, or
    - within 5,000 feet of a public use heliport which exceeds a 25:1 surface.
- any highway, railroad or other traverse way whose prescribed adjusted height would exceed the above noted standards
- when requested by the FAA
- any construction or alteration located on a public use airport or heliport regardless of height or location.

Notification is provided by submitting *FAA Form 7460-1, Notice of Proposed Construction or Alteration* online using the FAA's Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) website 45 days prior to construction. The FAA conducts an extensive aeronautical study and makes a determination detailing the study's findings.

3.0 FORECAST

Aviation activity is closely tied to the economy and population growth. The City of Palmer and the MSB has been experiencing steady growth since the 1980s. The area's growth rate is driven by the ongoing shortage of land in the Anchorage bowl, availability of developable land in the valley, lower real estate prices, lower property taxes, the ability to live in the valley and commute to Anchorage, and the area's excellent outdoor recreational opportunities.

3.1 Historical Population Trends

From 2000 to 2013, Palmer's population increased from 4,533 to 6,461, a growth rate of 2.76% per year. During the same period, the MSB population, considered the fastest growing region in Alaska, grew from 59,322 to 95,195, a growth rate of 6.09% per year. During the 45-year period between 1960 and 2005, the City of Palmer and the MSB populations grew at a rate of 3.43% and 6.09% per year, respectively. For the past 45 years, the area has grown faster than the state. (Table 3-1)

Table 3-1. Population Growth Rates

Period		Population	Average Annual Growth Rate
2000 to 2013 (recent 13 years)	Palmer	4,533 to 6,461 [3]	2.76%
	MSB	59,322 to 95,195 [3]	3.71%
	State of Alaska	627,963 to 736,399 [2]	1.23%
1960 to 2005 (45 years)	Palmer	1,181 to 5,382 [1]	3.43%
	MSB	5,188 to 74,041 [1]	6.09%
	State of Alaska	226,167 to 666,946 [2]	2.43%

3.2 Population Growth Projections

In December of 2009, the University of Alaska's Institute of Social and Economic Research (ISER), projected that between 2010 and 2035 population in the MSB would grow on average between 5.03% and 0.93% depending on a wide range of economic factors (Table 3-2). The BASE CASE of 3.06% average population growth in the MSB is based on oil development in the outer continental shelf in 2021, a natural gas pipeline in 2019, development of Livengood, Donlin Creek, and Pebble mines, US inflation at 2.5%, modest US economic recovery, and a Knik Arm Bridge.

Table 3-2. Average Growth Rate Projections 2010-2035

	Wage and Salary Jobs	Population	Households
	HIGH CASE		
State	1.98 %	1.99 %	2.10 %
Anchorage	1.46 %	1.23 %	1.33 %
Mat-Su	5.65 %	5.03 %	5.15 %
	BASE CASE		
State	1.06 %	1.11 %	1.24 %
Anchorage	.74 %	.78 %	.90 %
Mat-Su	3.69 %	3.06 %	3.19 %
	LOW CASE		
State	.28 %	.30 %	.44 %
Anchorage	.26 %	.26 %	.40 %
Mat-Su	.89 %	.93 %	1.07 %

The State of Alaska Department of Labor and Workforce Development produces resident population projections for Alaska (Table 3-3). The trend for the MSB is for consistent growth in population due to natural increases and in-migration.

Table 3-3. Population Projections

	2012	2017	2022	2027	2032	2037
			Population			
State of Alaska	732,298	770,417	806,479	839,191	868,902	897,034
Anchorage Borough	298,842	313,348	326,612	338,059	347,870	356,584
MSB	93,801	105,617	117,845	130,254	142,615	154,692
			Annual Growth Rate			
State of Alaska		1.02%	0.92%	0.80%	0.70%	0.64%
Anchorage Borough		0.95%	0.83%	0.69%	0.57%	0.50%
MSB		2.40%	2.22%	2.02%	1.83%	1.64%

3.3 Aviation Activity Growth

Operations and enplanement data are not recorded at the airport because there is no tower. The Palmer FSS is staffed 10 hours per day, 365 days per year and records the number of aircraft contacts (ACT) and airport advisories (AA), which is useful in analyzing trends. From 2008 to 2013, ACTs increased from 10,486 to 13,853 in 2013, an annual growth rate of 5.73%, and for the same period AAs grew at an annual growth rate of 4.94% (Table 3-4).

Table 3-4. Palmer FSS Aircraft Contact and Airport Advisories (FAA)

Palmer FSS	Air Carrier (AC)	Air Taxi (AT)	General Aviation (GA)	Military	Aircraft Contacts Total (ACT)	Airport Advisory (AA)
2008	11	1,637	8,755	83	10,486	7,619
2009	9	303	9,215	107	9,634	8,317
2010	14	345	13,832	144	14,335	10,509
2011	10	258	12,557	107	12,932	9,202
2012	13	278	11,729	200	12,220	8,445
2013	21	487	13,105	240	13,853	9,697
	78	3,308	69,193	881	73,460	53,789
as % of GA	0.1%	4.8%	100.0%	1.3%		

Aviation activity is growing and the fleet mix is changing. The last forecast was completed in 2007 as a part of the 2009 airport master plan. Since then, two air cargo companies (Bush Air Cargo and Alaska Air Fuel) have moved their operations to Palmer and are negotiating long-term leases with the City. In 2013, the Alaska Skydiving Center was established at the airport. The City is also currently working with a potential leaseholder that wishes to relocate its cargo aircraft to the airport.

The airport has two active flight schools (Artic Air Academy and Wingnuts Aviation) that provide year-round pilot training. Kingdom Air Corps (KAC) in nearby Chickaloon has a fleet of 15 light aircraft that use the airport to train missionary pilots and provide ratings, endorsements, and bush flying skills. Hageland Aviation operates its aviation maintenance facility at the airport. The University of Alaska's Aviation Technology Division uses the airport to train pilots outside Anchorage's Class C controlled airspace. Forestry continues to operate a wide range of larger aircraft and load tankers from its Fire Retardant Loading Facility.

3.4 Based Aircraft

An accurate accounting of based aircraft is important because it is the basis for forecasting general aviation operations and is located in Section 3.5. Based aircraft were determined from City tie-down lease records (September 2014), discussions with leaseholders, and visual inspection. This count does not include aircraft that are rotated in and out of the airport seasonally, such as Forestry's fire-fighting fleet and transient aircraft (Table 3-5). Three rotor wing aircraft are based at the airport.

Table 3-5. Fixed Wing Based Aircraft

		Leased or Occupied
APRONS	Transient	0
	Apron A	16
	Apron B	14
	Apron C	17
	Apron D	6
	Large Aircraft Apron	8
LEASE LOTS	Artics Air Academy	19
	Gallagher	1
	Helmericks (brown)	9
	Helmericks Main	12
	Custom Aircraft (BJ's)	4
	Fish Creek (grey west)	7
	Denier (grey east)	1
	Forestry	4
	Hageland	4
	New Horizons	4
	CIG	2
	Palmer Hangars Assn	9
	Old Woods	0
	TOTAL	137

3.5 Operations

Forecasting was accomplished by reviewing US Department of Transportation (USDOT), FAA, US Census data, Palmer FSS information; and by mailed surveys, personal interviews and the GRA model. Forecasting GA operations for 2015 (base year) was accomplished using Equation 13 from the "Model for Estimating General Aviation Operations at Non-Towered Airports Using Towered and Non-Towered Airport Data" (GRA, Inc., July 2001) as follows:

OPS = -571 + 355*BA - 0.46*BA2 + 40,510*%in100mi + 3,795*VITFSnum + 0.001*POP100 - 8,587*WACAORAK + 24,102*POP25/100 + 13,674*TOWDUM

- BA = based aircraft at the airport
- BA2 = the square of based aircraft at the airport
- %in100mi = based aircraft as a percentage of total based aircraft at GA airports within a 100-mile radius
- VITFSnum = number of 14 CFR Part 141 certified flight schools at the airport
- POP100 = population within a 100-mile radius of the airport
- WACAORAK = adjustment factor if state is WA, CA, OR, or AK (=1 if so)
- POP25/100 = ratio of population within 25 miles over population within 100 miles of the airport
- TOWDUM = adjustment factor if a control tower is present (=1 if so)

Based aircraft for GA model was calculated by subtracting the non GA aircraft (8 aircraft on the large aircraft apron plus 4 at Forestry and 4 at Hageland Aviation) from the 137 total based aircraft = 121. The %in100mi was determined by finding the based aircraft (from the FAA Form 5010 – Airport Master Record) at airports within 100 miles of Palmer, then summing those values and comparing the based aircraft at PAQ to the total. The VITFSnum for PAQ is 0, since there are no Part 141 flight schools at the airport. POP100 was determined using the Missouri Census Data Center website, which allows the user to find the 2010 Census population within a specified radius of any point in the United States. POP100 was increased by the 3.5% total annual population growth between 2010 and 2013 for Alaska. POP25 was determined using the same method. The WACAORAK variable is 1, since Alaska is included in this list of states. Finally, the TOWDUM value was 0 since there is no control tower at the airport. Using these values, the equation yielded an estimated 30,650 GA operations for PAQ in 2015. The calculation sheet is shown in Appendix 2A.

GA operations were split 70%-30% local-itinerant and military operations were split 60% Blackhawks, 10% King Airs, and 30% Shorts 330s based on feedback from the FSS specialist who has 30 years of experience at PAQ. Air carriers and air taxis were assumed to be captured in the cargo operator's surveys. Military operations were assumed to be 1.3% of GA operations based on the 6 years of FAA data in Table 3-4.

Using the above analysis, the 2015 (base year) total fixed-wing operations are estimated to be 33,310, helicopter operations are estimated to be 821, and total operations are estimated to be 34,131 (Table 3-6).

An average annual growth rate of 3.0% was applied to the base year data to project aviation activity for the 20-year planning period. The 3.0% growth rate for this forecast is slightly higher than the City's recent population growth rate of 2.76% for the past 13 years, lower than the MSB's recent growth rate of 3.71%, about the same as ISERs BASE CASE scenario of 3.06% and above the Alaska Department of Labor's projected growth rate of 2.4% for the MSB.

Table 3-6. Aviation Activity Forecast Summary

	APPCH CAT	ADG	Base Year: 2015			Growth Rate: 3%	
			2015	2020	2025	2030	2035
BASED AIRCRAFT							
Fixed-Wing			137	159	184	213	247
Helicopter			3	3	4	5	5
TOTAL BASED AIRCRAFT			**140**	**162**	**188**	**218**	**252**
PASSENGER ENPLANEMENTS			**75**	**87**	**101**	**117**	**135**
FIXED WING OPERATIONS							
ITINERANT	-	-					
Douglas DC-4	B	III	720	835	968	1,122	1,300
Convair 580	B	III	47	54	63	73	85
Douglas DC-3	A	III	202	234	272	315	365
Canadair CL-215T	A	III	45	52	60	70	81
Citation SII	B	II	50	58	67	78	90
Dehavilland Dash 8	A	III	2	2	3	3	4
Beechcraft 1900	B	II	5	6	7	8	9
Shorts 330 (C-23)	B	II	136	158	183	211	245
Beechcraft King Air	B	II	40	46	54	62	72
Lockheed Hercules C130	C	IV	24	28	32	37	43
Aerocommander 500S	B	II	27	31	36	42	49
Aerocommander 840	B	II	21	24	28	33	38
Aerocommander 1000	B	II	17	20	23	26	31
Cessna 208 Caravan	A	II	392	455	527	610	708
Dehavilland DHC-3	A	II	40	46	54	62	72
Dehavilland DHC-6	A	II	4	5	5	6	7
Casa 212	A	II	0	0	0	0	0
Cessna 401	B	I	208	241	280	324	376
Cessna 402	B	I	50	58	67	78	90
Cessna 207	B	I	50	58	67	78	90
Aerocommander 690	B	I	0	0	0	0	0
Cessna 185	A	I	125	145	168	195	225
Pilatus PC-12	A	II	200	232	269	312	361
Piper PA-18	A	I	115	133	154	179	207
Piper PA 27-250	A	I	50	58	67	78	90
Embraer Navajo PA-31	A	I	24	28	32	37	43
Dehavilland DHC-2	A	I	37	43	50	58	67
Cessna 180	A	I	30	35	40	47	54
GA Itinerant "as" C172	A	I	6,988	8,101	9,391	10,887	12,621
GA Itinerant "as" C185	B	I	2,207	2,559	2,966	3,438	3,986

TOTAL ITINERANT OPS			**11,855**	**13,745**	**15,933**	**18,469**	**21,409**
LOCAL	-	-					
GA Local "as" C172	A	I	16,306	18,903	21,914	25,404	29,450
GA Local "as" C185	B	I	5,149	5,969	6,920	8,022	9,300
TOTAL LOCAL OPS			**21,455**	**24,872**	**28,834**	**33,426**	**38,750**
TOTAL FIXED WING OPS			**33,310**	**38,617**	**44,767**	**51,895**	**60,159**
HELICOPTER OPERATIONS							
Bell 206 B111	-	-	90	104	121	140	163
Bell 212	-	-	44	51	59	69	79
Bell UH-1D	-	-	4	5	5	6	7
Bell UH-1H	-	-	10	12	13	16	18
Blackhawk UH-60	-	-	255	296	343	397	461
A-Star AS-350 (Includes Medevac)	-	-	418	485	562	651	754
TOTAL HELICOPTER OPS			**821**	**953**	**1,103**	**1,279**	**1,482**
TOTAL OPERATIONS			**34,131**	**39,570**	**45,870**	**53,174**	**61,641**
INSTRUMENT OPERATIONS			**200**	**232**	**269**	**312**	**361**

3.6 Enplanements

PAQ has no scheduled air service because of its proximity to nearby Ted Stevens Anchorage International Airport located 42 miles away. Reported chartered passenger services to and from PAQ by certified air carriers between 2009 and 2013 is shown in Table 3-7. The zero enplanements for 2011 were disregarded and the average (75) of the years 2012 and 2013 was used for the base year enplanements. Should scheduled air service be established, the forecast enplanements would be significantly under estimated.

Table 3-7. Palmer Enplanements (FAA Air Carrier Activity Information System Database)

Year	Enplanements
2009	161
2010	374
2011	0
2012	90
2013	61

3.7 Comparison with Other Forecasts

The 2009 Palmer Airport Master Plan estimated 31,016 operations for 2015 using their moderate growth rate of 1% and 36,028 for their high growth rate of 3%, versus this forecast of 34,131 operations for the base year 2015. The 2012 Wasilla Airport Master Plan estimated 58,588

operations for 2015 and 143 based aircraft. The 2014 Birchwood Airport FAA Terminal Area Forecast estimated 70,188 and 308 based aircraft.

3.8 Comparison with the APO TAF

FAA Office of Aviation Policy and Planning (APO) provides forecasts of aviation activity at public airports. The APO terminal area forecast (TAF) for Palmer Municipal Airport was obtained through their website and Table 3-8 shows the comparison between the current airport forecast and the TAF published by APO.

The difference between this forecast and the APO TAF is likely due to the differences in the accuracy of the source data. This forecast is based on site visits, research, interviews, and a deeper study of the specific activity at PAQ. The source of the APO TAF data is not known.

Table 3-8. Comparison of Airport Forecast and Terminal Airport Forecast

	Airport Forecast (AF)	Terminal Airport Forecast (TAF)	AF vs. TAF (Percent Difference)
Passenger Enplanements			
2015	75	22	241%
(Base +5 yrs) 2020	87	22	295%
(Base +10 yrs) 2025	101	22	359%
(Base +15 yrs) 2030	117	22	432%
Air Taxi & Commercial Operations			
2015	2,477	0	No Value
(Base +5 yrs) 2020	2,872	0	No Value
(Base +10 yrs) 2025	3,329	0	No Value
(Base +15 yrs) 2030	3,859	0	No Value
Total Operations			
2015	34,131	0	No Value
(Base +5 yrs) 2020	39,570	0	No Value
(Base +10 yrs) 2025	45,870	0	No Value
(Base +15 yrs) 2030	53,174	0	No Value

3.9 Conclusions

Based on the estimated 767 operations for B-III and 249 operations for A-III aircraft for the base year (2015) and the expected growth, we recommend that Runway 16-34 improvements continue to be designed to B-III standards, and Runway 9-27 improvements continue to be designed to B-II standards. The total annual aircraft operations are estimated to be 61,641 during the 20-year planning period which falls well below the airport capacity of 230,000 annual operations.

4.0 FACILITY REQUIREMENTS

4.1 Design Aircraft

Based on the approved aviation activity forecast, the design aircraft for Runway 16-34 is the Douglas DC-4 and Convair 580, both Airport Reference Code (ARC) B-III aircraft. In the forecast base year 2015, the airport received an estimated 767 B-III operations and 249 A-III operations. By 2035, annual B-III and A-III operations are expected to grow to 1,385 and 450 respectively.

Runway 9-27 and related taxiway improvements should continue to be designed to B-II standards. Runway 9-27 is structurally limited to 25,000-pound aircraft because of the pavement thickness of 3 inches. Runway 9-27 could accommodate heavier aircraft with a thicker pavement section. However, the performance of heavier B-III aircraft requires a longer runway than the length of Runway 9-27, which is 3,617 feet.

4.2 Traffic Pattern

All runways use a standard left traffic pattern. During the first public meeting, residents suggested using a non-standard right traffic pattern for Runway 34 to move all pattern traffic for the main runway over the Matanuska River. The rationale was to reduce aircraft flying over the City and noise over residential areas. The results of the noise analysis discussed in Section 2.7.13 and Appendix E indicate that noise levels generated by the existing traffic pattern are generally compatible with noise sensitive land uses. Switching to a non-standard traffic pattern may reduce safety by adding confusion to unfamiliar pilots and would put more night traffic over unlit terrain on Lazy Mountain, which is located east of the airport. Continued use of the standard left traffic pattern for all runways is recommended.

Helicopter traffic patterns described in the Inventory (Chapter 2) provide safe and efficient helicopter movement to and from the helicopter landing areas. Helicopter traffic is less structured than the fixed wing traffic patterns, avoids the fixed wing traffic pattern, and tends to fly direct to and from landing areas in an uncontrolled environment. There were concerns raised for low-flying helicopter aircraft by one resident northeast of the airport. To minimize noise impacts, we suggest the City work with the aviation community to develop fly friendly practices that avoid residential areas, and follow noisy road corridors and the Matanuska River to the extent practical.

4.3 Instrument Approach and Departure Procedures

Improvements most requested by pilots were approach lighting, instrument approaches with vertical guidance, and lower ceiling and visibility minima. The straight-in RNAV (GPS) RUNWAY 9 approach provides lateral guidance with minima as low as 820 MSL (593 AGL) ceilings and 1 statute mile visibility. Lower minima would help pilots access the airport in poor weather conditions. An Approach Lighting System (ALS) typically lowers visibility requirements. An ALS system would extend 1,400 to 2,400 feet off extended runway centerline at the approach end. The ALS is a series of sequenced flashing lights that guide the pilot to the threshold. In the case of Runway 9, an ALS would extend westward into residential and the Palmer Senior Center areas. However, discussions

with FAA indicate that adding an ALS or providing vertical guidance to Runway 9 would not improve the approach, because minima are governed by the controlling obstructions (terrain) in the missed approach segment, not by navigational aids or the approach type.

Pilots also requested a straight-in instrument approach procedure to Runway 34, approach lighting for Runway 34, and vertical guidance to improve access. The RNAV (GPS)-A approach is a circling approach that provides lateral guidance to the general airport environment, but cannot align with a specific runway because of terrain. The RNAV (GPS)-A approach has minima down to 860 MSL (618 AGL) and 1 statute mile. Discussions with FAA indicate that a straight-in approach to Runway 34 is not possible because of terrain (Bodenburg Butte and Pioneer Peak) in the intermediate and final approach course segments. In order to qualify for a straight-in approach, the final approach course would need to align within 15° of runway centerline, which is not possible.

Providing an ALS for a circling approach would not lower minima because the minima are governed by obstructions and not navigational aids. An ALS for a circling approach would not be funded by the FAA, although the City could install and maintain an ALS for Runway 34 with its own funding. Land would need to be acquired and Outer Springer Loop would need to be relocated to avoid conflicts with the ALS. The FAA does not typically design approaches with vertical guidance for circling approaches. Vertical guidance would not lower minima due to controlling terrain.

4.4 Airside Facilities

4.4.1 Runways

Alignment: 88,934 hourly wind speed and direction observations were obtained from the Palmer ASOS for a 10.6-year period from January 1, 2004 to August 31, 2014 and analyzed with the FAA wind analysis program. The results indicate Runway 16-34 provides greater than 95% crosswind coverage for aircraft with a crosswind capability of 16 knots and 13 knots, but not 10.5 knots. The crosswind runway (Runway 9-27) provides adequate coverage for aircraft with a crosswind capability of 16 knots and 13 knots, but not 10.5 knots. The STOL runway has the same alignment as Runway 16-34, so was not analyzed separately for crosswind coverage. Overall crosswind coverage of the two paved runways is approximately 98 to 99%. No additional runways or changes to runway alignment are required. A summary of the crosswind coverage is shown in the following tables and runway wind analysis and data is provided in Appendix F.

Table 4-1. FAA Design Standards

Runway Design Code (RDC)	Allowable Crosswind Component (knots)
A-I and B-I	10.5
A-II and B-II	13
A-III, B-III, C-I through D-III, D-I through D-III	16

Table 4-2. Crosswind Coverage, 2004 to 2014

Wind Speed (knots)	Runway 16-34 (%)	Runway 9-27 (%)	Combined (%)
10.5	93.29	93.07	97.74
13	95.96	95.83	98.63
16	97.98	97.98	99.24

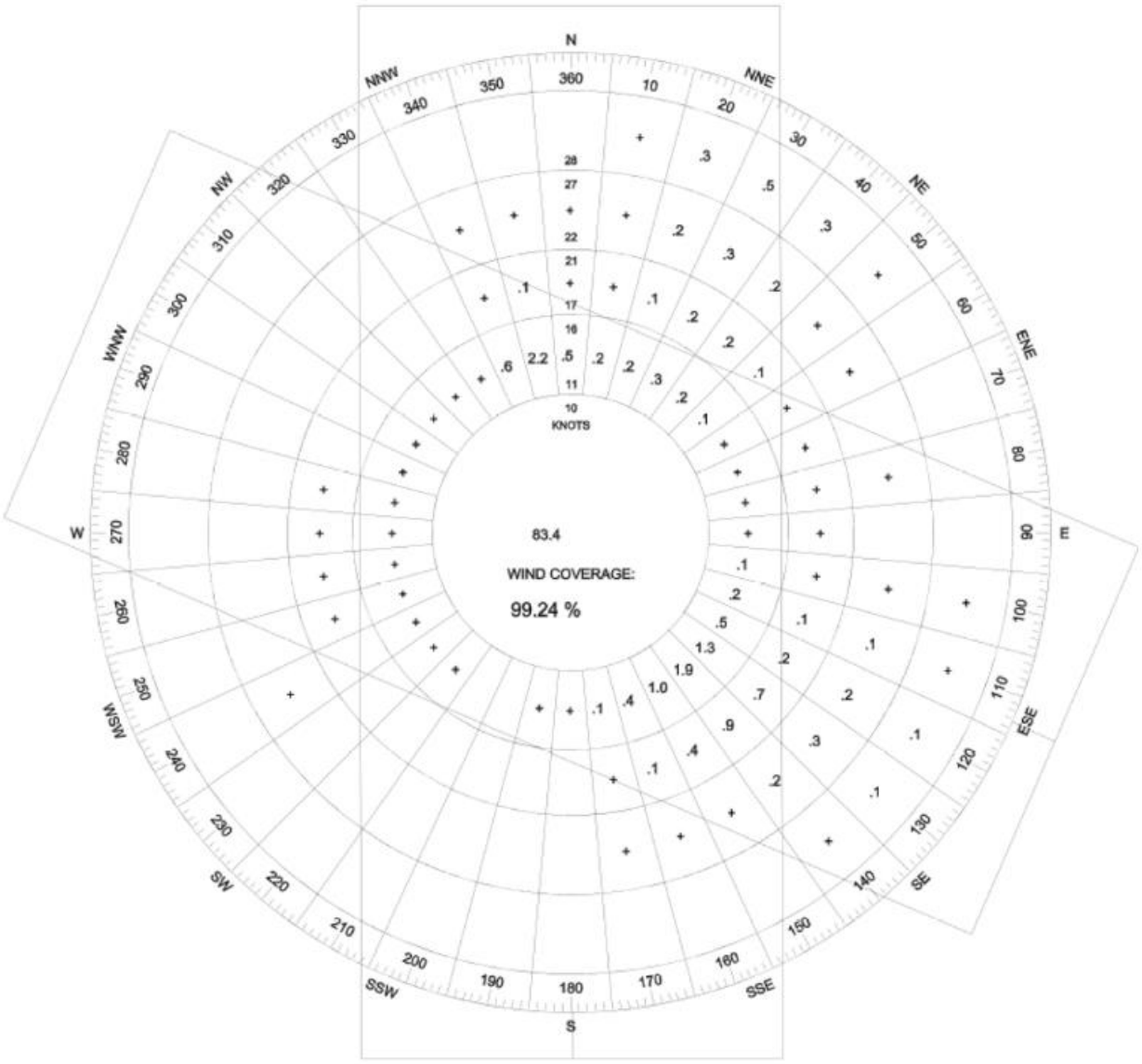

Figure 4-1. Wind Rose, 2004 to 2014

Length: FAA *AC 150/5325-4B Runway Length Requirements for Airport Design* provides guidance for determining runway length requirements for various categories of aircraft. The largest aircraft that routinely use the airport are the DC-4 with a Maximum Takeoff Weight (MTOW) of 73,000 pounds and Convair 580 with MTOW of 58,156 pounds (per American Museum of Aviation website). For aircraft over 60,000 pounds gross weight, the AC directs one to use the manufacturer's airport planning manual. The critical aircraft were designed prior to the development of airport planning manuals, so performance data in the aircraft flight manual (AFM) were used. Using the airport elevation of 242 feet MSL, mean daily maximum temperature of 65° F, no wind, and aircraft at MTOW, the runway length required for takeoff for the DC-4 and CV580 is 5,500 feet and 5,000 feet respectively. Runway 16-34 provide 6,009 feet of takeoff runway available which is sufficient for the critical aircraft and for occasional other aircraft such as C-130s, military aircraft, and business jets.

The crosswind Runway 9-27 is 3,617 feet in length and is primarily used by small general aviation and light twin engine aircraft. Figure 2-1 of FAA AC 150/5325-4B recommends a runway length of 3,400 feet to accommodate 100% of small aircraft with less than 10 seats. The existing crosswind runway provides sufficient length and no runway extension is needed.

The existing gravel runway is approximately 1,560 feet long and is used primarily by STOL aircraft and small aircraft with skis and tundra tires. The length of this runway is adequate for the aircraft that use the runway.

Width: FAA AC 150/5300-13A *Airport Design* requires that runways intended for B-III aircraft have a minimum width of 100 feet with 20-foot shoulders. Runway 16-34 is currently 100 feet wide with 20-foot wide unpaved shoulders and meets standard requirements (Table 4-3).

Runway 9-27 is 75 feet wide and is designed for B-II aircraft up to 25,000 pounds and requires a minimum width of 75 feet with 10-foot shoulders to comply with FAA standards. The runway currently meets standards.

The STOL Runway 16S-34S is designed to serve A-I small aircraft and should have a minimum width of 60 feet with 10-foot shoulders. The width of the gravel runway is 60 feet wide with 10-foot shoulders and meets standards. No concerns with length were reported by pilots and its length is considered adequate.

Runway Object Free Area: The ROFA for Runway 16-34 should be 800 feet wide and extend 600 feet beyond the runway ends to serve B-III aircraft. On the east side of Runway 16-34, the existing ROFA is limited by the non-frangible golf course perimeter fence to 280 feet east of the runway centerline. See the discussion under Section 2.8.4 - Corrective Action Underway. The non-frangible golf course fence is constructed below runway centerline and does not penetrate the transitional surface. There is terrain on the west side of Runway 16-34 at the north end between the runway and Taxiway A that penetrates the transverse grade limitations of FAA AC 150/5300-13A *Airport Design*.

The ROFA for Runway 9-27 should have a width of 500 feet and extend 300 feet beyond the runway ends to serve B-II aircraft and an instrument approach procedure with visibility minima of not less than 1 mile. The ROFA for Runway 9-27 is limited by a section of non-frangible golf course fence located 180 feet south of the runway centerline, resulting in a non-standard ROFA having a width of 430 feet. See also Section 2.8.4 - Corrective Action Underway.

Runway 16S-34S has minor mounds of gravel on the runway shoulders that should be removed or re-graded to comply with standards.

Runway Safety Area: The RSA currently extends only 300 feet beyond the departure end of Runway 16 and 300 feet beyond the departure end of Runway 34 due to longitudinal slopes that exceed the maximum allowed. The RSA should be extended to 600 feet beyond the runway ends to meet the requirements for a B-III runway. The RSA is 300 feet wide and meets the width standard for B-III.

The RSA currently extends 300 feet beyond both ends of Runway 9-27 and is 150 feet wide which meets standards for a B-II runway.

The RSA for Runway 16S-34S extends 240 feet beyond both runway ends and has a width of 120 feet. This RSA meets standards for an A-I runway.

Runway Obstacle Free Zone: The ROFZ for B-III large aircraft runways should be 400 feet wide and extend 200 feet beyond both ends of the runway. Runway 16-34 has an ROFZ of these dimensions that is free of obstructions.

The ROFZ for B-II aircraft runways should be 400 feet wide and extend 200 feet beyond both ends of the runway. The golf course fence is within 180 feet of the Runway 9-27 centerline and should be addressed.

The ROFZ for A-I small aircraft runways should be 250 feet wide and extend 200 feet beyond both ends of the runway. Runway 16S-34S meets the standard requirements.

Runway Protection Zone: The RPZ for runways serving B-III aircraft should be 1,000 feet long with an inner width of 500 feet and an outer width of 700 feet. The RPZs for Runway 16-34 meet the standards. The RPZ for runways serving B-II aircraft should be 1,000 feet long with an inner width of 500 feet and an outer width of 700 feet. Due to the weight restriction on Runway 9-27, the existing RPZs have an inner width of 250 feet and an outer width of 450 feet, which meets the standard for small aircraft. The weight restriction is not necessary and once lifted the RPZ will change to 500x700x1,000 feet, which has been protected historically and meets the required dimensions. The Approach RPZ for Runway 34 is a combination of agricultural, airport, and golf course lands, owned and controlled by the airport. The departure RPZ for Runway 34 is owned by the MSB (Matanuska River Park), with areas west of the section line bisecting the RPZ controlled by avigation easement. The Approach RPZ for Runway 9 is controlled by the combination of fee simple land owned by the City and avigation easements on private properties. In the Approach RPZ for Runway 9, there is a sliver of land on the northwest corner of the RPZ that is privately owned and needs to be controlled by purchase or avigation easement.

Table 4-3. Runway Design Requirements

Non Standard	Existing		Standard	Existing	Standard	Existing	Standard
	Runway 16	**Runway 34**	**Runway 16-34**	**Runway 9-27**	**Runway 9-27**	**Runway 16S-34S**	**Runway 16S-34S**
	Visual 1 mile	Visual 1 mile	Visual 1 mile	Instrument 1 mile	Instrument 1 mile	Visual NA	Visual NA
Orientation	179.83	359.83		113.31/ 293.33			
Runway Length	6,009	6,009		3,617		1,560	
Runway Width	100	100	100	75	75	60	60
Runway Shoulder Width	20	20	20	10	10	10	10
Runway Design Group	B-III-VIS	B-III-VIS		B-II-I SM		A-I-VIS	
Runway Surface	P	P		P		G	
Allowable Crosswind Component	16 Knots	16 Knots		13 Knots		10.5 Knots	
Runway Safety Area (**RSA**)							
Length Beyond Departure End	300	300	600	300	300	240	240
Length Prior to Threshold	800	300	600	300	300	240	240
Width	300	300	300	150	150	120	120
Runway Object Free Area (**ROFA**)							
Length Beyond Departure End	600	600	600	300	300	240	240
Length Prior to Threshold	1,100	600	600	300	300	240	240
Width	680	680	800	430	500	400	400
Runway Object Free Zone (**ROFZ**)							
Length Prior to Threshold	600	600	200	300	200	200	200
Width	400	400	400	380	400	250	250
Approach **RPZ**							
Length	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Inner Width	500	500	500	250	500	250	250
Outer Width	700	700	700	450	700	450	450
Acres	13.77	13.77	13.77	8.03	13.77	8.03	8.03
Departure **RPZ**							
Length	1,000	1000	1,000	1,000	1,000	1,000	1,000
Inner Width	500	500	500	250	500	250	500
Outer Width	700	700	700	450	700	450	700
Acres	13.77	13.77	13.77	8.03	13.77	8.03	13.77
Runway Separation to:							
Hold Position	200	200	200	125	200	N/A	200
Parallel Taxiway	425	425	300	200	240	N/A	225
Aircraft Parking	650	650	400	250	250	200	200
Helicopter Touchdown Pad			500		500		500

Note: All dimensions in feet, except RPZ acreage, P = Paved, G = Gravel, SM = Statute Mile, VIS = Visibility.
RPZ = Approach Runway Protection Zone

Runway Capacity: Airfield capacity was estimated using the long-range planning method found in AC 150/5060-5 *Airport Capacity and Delay*. Based on this method, the airport is estimated to have an annual service volume capacity of approximately 230,000 operations per year. The airport is estimated to have a peak operations capacity of 98 VFR operations per hour and 59 IFR operations per hour. The airfield's capacity exceeds the forecast demand of 61,641 operations per year and 7 VFR operations per hour.

4.4.2 Heliport

A public heliport should be established on the airport to accommodate the existing and future helicopter traffic. The heliport landing area near Forestry was constructed by Forestry for their specific fire-fighting use. The City is currently negotiating a lease with Forestry to make the Forestry heliport non-public and revenue-generating. A new lighted public heliport is recommended. FAA AC 150/5390-2C *Heliport Design* recommends a minimum of 500-foot separation between the centerline of a runway accommodating aircraft between 12,500 pounds and 300,000 pounds and the center of a heliport accommodating medium helicopters between 7,001 pounds and 12,500 pounds. The proposed new heliport site is located near the existing large aircraft apron and complies with runway separation distance, is clear of the ASOS protection area, is away from small GA aprons, is out of Runway 16-34 ROFA, and is in general alignment with the final approach course with Runway 34 to allow helicopters to use the published RNAV instrument approach procedure. The proposed heliport location provides a noise buffer to residential areas.

4.4.3 Parachute Landing Areas (PLAs)

FAA AC 105-2D requires approval from airport management prior to any skydiving onto the airport. Parachutists may drift over an airport with an open parachute without airport management approval as long as the parachutist remains 1,000 to 1,500 feet above ground level (AGL). The airport may designate suitable PLAs. The FAA recommends the airport manager and parachute users develop standard operating procedures (SOPs) for activities conducted by parachutists.

DOT/FAA/AR-11/30 *Development of Criteria for Parachute Landing Areas on Airports* recommends PLAs be hazard free. Hazards include: telephone and power lines, towers, buildings, open bodies of water, clusters of trees covering more than 9,480 feet, fencing, paved surfaces, aircraft tie-down areas, and equipment necessary for aircraft operations or navigation (NAVAIDS, airfield lighting, and signage), excluding equipment necessary for skydiving operations. It is recommended the PLA be a minimum distance of 40 feet from any hazard for safety reasons. Table 4-4 shows the recommended minimum size of Parachute Landing Area sizes and distance from hazards.

Table 4-4. Minimum PLA Size and Distance from Hazards

Parachute Activity	Minimum PLA Size Using Ram-Air Canopies (square feet)	Minimum PLA Size Using Round Canopies (square feet)	Minimum Radial Distances From Hazards (feet)
Student/Training	338,000	3,041,900	40
Tandem	84,500	N/A	40
All other activity	5,000	338,000	40

As an example, an area measuring of 338,000 square feet or 582 feet by 582 feet or a circle 656 feet in diameter would need to be available and marked if used for student/training at an on-airport PLA. Standard markings of PLAs on airports require perimeter boundaries to be marked by one of the following methods: dashed lines (minimum of 3 inches wide in white or orange chalk, paint, or engineering tape), traffic-style cones, flags, streamers, landscaping, or mowing. Different types of markers are recommended to differentiate the areas within the PLA and the perimeter of the PLA. The Airport Facility Directory should list parachute activity when parachuting to the airport. The City would need to work out mutually acceptable standards and practices with the skydiving entities using the airport so as to not conflict with fixed and rotor wing aircraft activity.

4.4.4 Taxiways

FAA AC 150/5300-13A *Airport Design* provides standards for taxiway geometrics and design. The design aircraft for taxiways serving Runway 16-34 is Taxiway Design Group (TDG) 3. TDG-3 requires taxiways to be 50 feet wide with 20-foot shoulders. Taxiway A has a paved width of 50 feet and 20-foot shoulders. Interlink taxiways C, D, E, F and G are paved 60 feet wide with 20-foot shoulders. Currently all associated taxiways associated with Runway 16-34 meet the standard shoulder width requirements. Taxiway A is 425 feet from parallel Runway 16-34 which meets the minimum separation distance of 300 feet.

Taxiways associated with B-II Runway 9-27 generally match TDG 2 design standards with the exception of Taxiway B. Taxiway B centerline is located 200 feet from Runway 9-27 centerline which does not meet standards for a B-II instrument runway with 1-mile visibility minimums. The centerline of Taxiway B should be relocated 240 feet from the centerline of Runway 9-27 to meet FAA standards. Taxiway B width is 40 feet and the FAA standard is 35 feet. Taxiways H, J and L are paved, 35 feet wide, and have shoulders that vary in width from 19 to 22 feet. Standards for TDG 2 taxiways require a 35-foot width with 15-foot shoulders.

Table 4-5. Taxiway Design Requirements

Runway 16-34 TAXIWAY DATA								
Taxiway	Taxiway Width		Shoulder		TSA		OFA	
	Existing	Standard	Existing	Standard	Existing	Standard	Existing	Standard
A	50	50	20	20	118	118	186	186
C	60	50	20	20	118	118	186	186
D	60	50	20	20	118	118	186	186
E	60	50	20	20	118	118	186	186
F	60	50	20	20	118	118	186	186
G	60	50	20	20	118	118	186	186

Runway 9-27 TAXIWAY DATA								
Taxiway	Taxiway Width		Shoulder		TSA		OFA	
	Existing	Standard	Existing	Standard	Existing	Standard	Existing	Standard
B	40	35	19	15	79	79	131	131
H	35	35	15	15	79	79	131	131
L	35	35	22	15	79	79	131	131
M	35	35	22	15	79	79	131	131

4.4.5 Aprons

There are 139 tie-down spaces currently available at the airport for small aircraft, nine of which are transient. Of the 130 leasable tie-downs, 53 are currently leased and 77 are vacant. Using a growth rate of 3% per year for the 20-year planning horizon, a total of 99 tie-down spaces will be leased 2035. The City is in the process of consolidating aircraft tie-downs to reduce apron maintenance and is considering making Apron C and/or D available for aircraft shelters or other leased development. If the City converts Apron D to aircraft shelters or a lease lot, 16 tie-down spaces will be removed from the inventory. The City is also reconfiguring Apron C to consist of 24 electrical outlet tie-downs and converting the remaining apron space to a lease lot which removes 26 spaces from the inventory. Table 4.6 summarizes the number of tie-downs available should one or both of these alternatives be developed. (Transient tie-downs are not included.)

Table 4-6 Tie-down spaces available

Tie down spaces with current apron configuration	130
Tie-down spaces with Apron D converted to lease lots	114
Tie-down spaces with Portion of Apron C converted to lease lot	104
Tie-down spaces with both Apron C and D converted to lease lots	88

If both Apron D and portions of Apron C are converted to lease areas, the City could consider providing additional tie-downs adjacent to Aprons C and D, as shown on the Ultimate Airport Layout Plan located in Appendix B, this could add as many as 18 tie-downs without construction of additional GA apron. This will provide sufficient GA apron space for the planning period. Should

demand for tie-down spaces exceed the 20-year forecast, a new apron should be constructed south of the FSS, which will add an additional 23 tie-downs.

The large aircraft apron has 12 available tie-down spaces of which 8 are currently leased. The City is currently working with a prospective tenant to base a DC-3 and a Learjet at Palmer, and with Alaska Air Fuel for a permanent lease located north of Hageland's facility on the north end of the existing Large Aircraft Apron. The Large Aircraft Apron should be lengthened to the north to add additional parking space for future growth and to provide access to new commercial lease lots.

4.4.6 Markings

There are several non-standard pavement markings that should be corrected. Runway 9 has an instrument approach but is not marked as an instrument runway. Since it is less than 4,200 feet in length, aiming point markings are not required, but instrument threshold markings should be added in accordance with AC 150/5340-1L *Standards for Airport Markings*.

Runway 9-27 designation numbers are beyond the standard "plus or minus five degrees" rule due to magnetic drift. The magnetic azimuth of Runway 9 is currently 95.78˚ and is drifting to the west (increasing the magnetic azimuth) at about 0.35˚ per year which will widen the discrepancy. Runway 9-27 should be re-designated as Runway 10-28.

Runway 16-34 has standard non-precision instrument markings, but Runway 16-34 is classified as a visual runway because there are no published instrument approaches to Runway 16 or 34. Over-marking is acceptable per AC 150/5340-1L. It is recommended to keep markings as-is because of the large aircraft use.

Runway 16 currently has a magnetic azimuth of 162.30˚. Runway 16-34 is currently compliant with the standard "plus or minus five degrees" rule for runway designations. However, Runway 16-34 will need to be renumbered to "Runway 17-35" in about eight years (2023), if the magnetic drift continues at its current rate.

Appendix 6 of AC 150/5300-13A requires that compass calibration pads be resurveyed every 5 years or when any buildings, utilities, or structures have been built within 600 feet of the center of the pad. The compass calibration pads at the Large Aircraft Apron and Forestry apron have not been resurveyed in the last 5 years. They should be noted as out of service in the Airport Facility Directory until they can be resurveyed and remarked. Resurvey of the compass calibration pads will require a new magnetic survey and recertification by the United States Geological Survey, or other qualified entity in accordance with the standard.

Several of the STOL runway threshold markers are facing the wrong direction (i.e. green reflectors at the runway end and red reflectors indicating the beginning of the runway). The markers should be corrected.

4.4.7 Signage

All runway-runway and runway-taxiway intersections are properly marked with lighted intersection signs as described in the inventory. However, the hold position sign on taxiway G is located at 193

feet from the centerline of runway 16-34 and should be relocated to the hold position at 200 feet. Most taxiway-taxiway intersections and all of the taxiway-apron intersections are not signed. New Light Emitting Diode (LED) lighted signs should be installed per standard AC 150/5340-18F *Standards for Airport Sign Systems*.

4.4.8 Pavement Condition

The airport should budget approximately $30,000 annually for preventative maintenance projects such as crack sealing, shallow patching, and pavement sealing. This investment will extend the life of the pavement and prevent the need for premature full rehabilitation projects.

One user suggested that runway pavement be grooved to assist with drainage and prevent hydroplaning. If standing water on the runways is a significant concern, an analysis should be conducted to determine the source and solution for the problem.

4.4.9 Visual Aids

Runway 16-34 has pilot-controlled MIRL, PAPIs, and REILs that were all installed in 2006 and are in good condition. Runway edge lighting is white, except on the last 500 feet (north of the Runway 16 displaced threshold) which has amber/red split lenses. Although Runways 16 and 34 are visual runways, the pavement markings are for non-precision instrument runways. It is recommended to modify the runway edge lighting in the Caution Zone (the last 2,000 feet or one-half the runway length, whichever is less) to amber lights facing the aircraft, in accordance with FAA AC 150/5340-30H *Design and Installation Details for Airport Visual Aids.* Therefore, lenses in the 1,500 feet south of the displaced threshold and lenses in the southern 2,000 feet of the runway should be replaced with amber/white lenses.

Runway 9-27 has pilot-controlled MIRL and PAPIs that were installed in 2007 and are in good condition. Edge lighting is white signifying a visual approach runway; however, Runway 9 is an instrument runway. According to FAA AC 150/5340-30H, amber lighting should be present in the Caution Zone. Since the total length of Runway 9 is less than 4,000 feet, the white edge light lenses along the last half of Runway 9 should be replaced with white/amber lenses, with the amber facing the Runway 9 approach.

The airport manager is evaluating the use of LED style lamps for longevity, brightness, and to lower operational and maintenance costs. There is currently one test LED taxiway light on Taxiway G. There are two LED lights on Taxiway C; one is heated and the other is not. The heated light is set to turn off at 40 degrees but can be operated manually. The City should consider updating to LED runway and taxiway lighting. At some point, incandescent light fixtures may no longer be manufactured. The remainder of airport visual aids are adequate and in satisfactory condition.

4.4.10 Weather Equipment

The ASOS weather station on the airport meets all airport requirements. No improvements or replacement of the ASOS are required.

4.4.11 Aircraft Fueling

Both aircraft fueling stations on the airport are privately owned and operated. Bulk storage of fuel may be needed by operators to reduce costs. Bulk storage and dispensing systems should be designed and constructed to current codes and standards and located away from City Well 4 and 5 to protect the City's drinking water supply.

4.4.12 Other Aircraft Facilities

Floatplane Facilities: A desire for floatplane facilities was mentioned in the previous Airport Master Plan, however the project team has not received similar requests. The demand for floatplane facilities in Palmer is not defined. Therefore, it is recommended that the airport defer any further planning for a floatplane facility until a clear purpose and need can be demonstrated.

Ski Plane Facilities: There are several small aircraft on the airport that convert to ski operations during the winter. Currently these aircraft operate on the STOL runway (which is not plowed to remove snow during the winter). However, there is no snow-covered access between the parking aprons and the gravel strip. The City could consider operational changes to their snow removal to accommodate ski plane access to the STOL runway.

4.5 Landside Facilities

4.5.1 Flight Service Station

The FSS is in good condition; however, the City-side of the FSS does not have an indoor restroom and is currently served by a portable toilet. The facility should be equipped with a restroom for airport employees. The entire FSS currently runs on electric heat. Conversion to natural gas heating system would lower energy costs over the life of the building.

4.5.2 Lease Lots

Based on the forecast, the airport will likely need additional lease lots to meet anticipated demand for large lots in the area of the Large Aircraft Apron.

The airport has four large commercial lease lots that are currently occupied. If the activity at the airport increases at the projected rate over the next twenty years, then four to five additional large commercial lease lots will be needed.

The airport currently has 24 general aviation lease lots, of which 11 are leased. If the ratio of based aircraft to leased lots holds true in the future and based aircraft increase from 140 to 252, then the airport will need a total of 20 lease lots. General aviation lease lot capacity should be adequate for the foreseeable future.

4.5.3 Access Roads

The City has considered extending Gulkana Street between Fireweed Avenue and Cope Industrial Way. This new section of roadway would cross the approach to Runway 9 approximately 400 feet from the Runway 9 threshold. Such a project would require relocating the storm water main as well

as depressing the roadway 10 to 15 feet below the existing ground surface to avoid becoming an obstruction to the approach.

Parking is adequate and is allowed on lease lots when parking is related to lease lot business. There is a small demand for public and apron parking, which is currently met by parking on City or FAA areas of the airport near the FSS. This current parking scenario is likely sufficient given the limited demand for this type of parking.

4.5.4 Security Fencing and Gates

The airport has approximately 23,500 feet of perimeter chain link fence and 21 vehicle gates as shown in the Inventory. The east side golf course fence should be replaced with a new frangible fence when FAA standards are developed, or removed when the golf course is returned to aeronautical use. See the discussion in Section 2.8.4 - Corrective Action Underway. The perimeter fencing gap at the northeast corner of the airport property should be enclosed with approximately 1,600 feet of new security fencing. Vegetation growth attaching to the fence should be removed annually.

4.5.5 Utilities

As the airport expands into new property or adds buildings on existing airport property, utilities will need to be extended. Particularly, additional utility extensions may be needed along the west side of the airport as new parcels are leased and hangars are added.

The City recently completed a storm water system model that shows the need to upsize the 36-inch diameter storm water outfall pipeline that crosses the airport property, or to provide a temporary storage system to handle peak flows. One concept is to provide subsurface storm water storage in the approach RPZ to Runway 9 to avoid reconstructing this major outfall across the airport. The storm water outfall pipeline is located on the north side of and parallel to Runway 9-27, between Runway 9-27 and Taxiway B.

4.5.6 Snow Removal

Airport users requested that better snow removal practices be implemented, specifically in icy conditions which make run-ups for large aircraft difficult. The City is currently consolidating tie-downs to reduce snow removal and apron maintenance. The City has a snow blower and loader that are approximately 20 years old and are nearing the end of their useful life. The snow blower and loader should be replaced.

The City has two snow storage sites. One site is located on the airport east of the Fire Training Center on Cope Industrial Way. The site is satisfactory but is inconveniently located. The snow storage site is surrounded by heavy vegetation and poses no environmental impacts to other lease lots or property owners. The second snow storage site is located on Lease Lot 22B near the City equipment storage building. The site is satisfactory and conveniently located near airport snow removal equipment.

4.5.7 Other Facilities

The most common request received during the planning process called for increased business utilization and economic impact from the airport. Suggestions included setting up restaurants, camping sites, rental cars, and developing professional pilot training on or near the airport. Suggestions to meet this desire included better access between the aprons and the golf course, establishment of business-friendly long-term leases, and increased marketing for the airport.

Several other items were requested by airport users during the planning process, including:

- Maintain tree buffers for new development and establish new tree buffers for properties near the airport
- Install electrical outlets on Apron C
- Construct affordable, non-heated T-hangars for wind and snow protection

4.5.8 Airport Maintenance

Airport maintenance equipment is based out of a City equipment storage building on the west side of the airport. This facility is currently adequate to house all of the airport maintenance equipment. However, if additional lease lots and apron area are constructed, additional maintenance equipment may be required. An expansion to the existing maintenance building would likely be required to accommodate the additional equipment.

4.5.9 Land Use

The RPZs for each runway are either owned by the airport, protected by avigation easements, or exist over undevelopable terrain (i.e. the Matanuska River), except for a portion of the Runway 34 departure RPZ and small portions of the Runway 9 approach and departure RPZs. For Runway 34, an avigation easement needs to be acquired from the MSB for the portion of the Matanuska River Park east of the section line. For the west end of Runway 9, a small portion of private property needs to be acquired or an avigation easement over the property acquired, and at the east end, an avigation easement from the State of Alaska for the portion of the RPZ located above Matanuska River is needed.

Plans to develop existing and new lease lots are all within existing airport property and no runway extensions are necessary. Therefore, land acquisition for airport capacity is not anticipated for the foreseeable future.

Future land acquisition to the west of airport road is highly recommended to assure long term compatibility with the airport and community residents. A buffer as shown in the Alternatives chapter would avoid residential housing development immediately adjacent to the airport and mitigate future land use conflicts. The land is currently zoned residential. The proposed buffer area is now primarily agricultural and is also prime habitat for migratory birds. This wildlife attractant poses a potential hazard to aircraft. A wildlife attractant study should be conducted per AC 150/5200-33B *Hazardous Wildlife Attractants on or Near Airports* to evaluate level of risk and to

establish measures the City and land owners can take to reduce hazards to aircraft. If the buffer is planned properly, airport related uses could be encouraged such as a business park, residential air park subdivisions, hangar homes, landscaped parkways or other land uses designed to be compatible with residential uses to the west and airport uses to the east. The buffer should be revenue-generating to the extent practical.

Several noise complaints have been received from residents living south of the airport. The City only has zoning authority within the city limits, but most lands to the south are outside city limits. The MSB currently has few if any land use controls over this property. Therefore, the only way that the airport can achieve any degree of control over the area south of the airport has been to purchase and annex the property. It is recommended that the airport work with the MSB to implement land with regulations that protect the airport's right to flight. The potential for incompatible land use in this area has greatly increased in recent years and large parcels southwest of the airport have been developed into residential subdivisions. That trend is likely to continue.

4.5.10 Through the Fence Operations

With FAA approval, the airport can authorize "through the fence" operations by adjacent property owners (Public Law 112-95). In general, a through the fence agreement between an airport and an adjacent property owner (or an association representing property owners) is required to be a written agreement that prescribes the rights, responsibilities, charges, duration, and other terms the airport determines are necessary to establish and manage the airport's relationship with the property owner. The agreement is required at a minimum to 1) pay airport access charges that, as determined by the airport, are comparable to those charged to tenants and operators on- airport making similar use of the airport; 2) bear the cost of building and maintaining the infrastructure that, as determined by the airport, is necessary to provide aircraft access to the airfield; 3) maintain the property for residential, noncommercial use for the duration of the agreement; 4) prohibit access to the airport from other properties through the property of the property owner; and 5) prohibit all aircraft fueling on the property.

5.0 ALTERNATIVES

5.1 Introduction

Alternatives were developed to address safety, standards, and the needs of the airport for the 20-year planning horizon. Based on discussions with airport users, the public, City officials, and City staff, three alternatives were brought forward for consideration. The alternatives and their overall goals are as follows:

- Alternative A – Safety and Standardization Improvements
- Alternative B – Mix of GA & Commercial Development
- Alternative C – GA & Commercial Development with Expansion into the Golf Course

Alternative A addresses solely safety and non-standard conditions at the airport with no real projection for new facilities or growth. Alternative A includes ongoing maintenance of existing pavements, correcting non-standard lighting and markings, and removing airspace obstructions like the golf course fence and trees that penetrate navigable airspace.

Alternative B addresses the same safety and non-standard conditions as Alternative A, and additionally looks at a modest growth rate in GA and commercial aviation activity and facilities. It includes maintaining existing facilities and pavements, expanding the Large Aircraft Apron, further developing existing GA parking and lease lots, developing unheated low cost shelters, constructing a new heliport, and acquiring, developing or controlling non-airport lands as a buffer between the airport and community.

Alternative C addresses the same safety and non-standard conditions as Alternative A, plus looks at 100% build-out of existing GA and commercial aviation facilities, lease lots, and tie-downs. This alternative includes maintaining existing facilities and pavements, expanding the commercial apron, fully developing existing GA parking and lease lots, developing more unheated low cost shelters, constructing a new heliport - all to 100% of capacity of land available at the airport. It also includes acquiring, developing or controlling non-airport lands as a buffer between the airport and community, and considers the use of the golf course for further development.

Each of the alternatives is described in detail below.

5.2 Alternative A - Safety and Standardization Improvements

Alternative A addresses safety and non-standard items and includes the following (Figure 5-1):

Taxiway B Repairs. Poor soils and frost jacking at four utility crossings has created differential pavement movement that could be hazardous to certain aircraft. This project is a localized, dig-out repair project on Taxiway B that need to be addressed in 2017.

Aeronautical Survey. This project is underway and includes an aeronautical survey of the airport and surrounding areas in accordance with AC 150/5300 16A, 17B, and 18B and 49 CFR Part 77. The aeronautical survey will provide the FAA with more accurate obstruction charting in the vicinity of the airport which may slightly lower approach minimums, will provide the City with new aerial

mapping and photography, and will allow the City to begin the transition to a GIS-based ALP which will become the standard for future ALPs.

Wildlife Hazard Assessment. Significant migratory waterfowl activity occurs in agricultural and wetland areas surrounding the airport during spring and fall migrations. A wildlife hazard assessment is needed to evaluate the level of hazard and to make recommendations to mitigate hazardous bird activity in the vicinity of the airport. The study will take approximately 12 months to complete and will require observing and documenting bird flight patterns during both the spring and fall migrations.

Runway 16-34 Safety Area Grading. This project extends the safety area from 300 feet to 600 feet on each end of Runway 16-34, removes high non-standard terrain on the north end of Runway 16-34, and removes non-standard high terrain between Taxiway A and Runway 16-34 that does not meet FAA design standards for grading.

Runway 16-34 and Runway 9-27 Obstruction Removal. There are a number of obstructions (trees) that penetrate navigable airspace and are not compliant with FAA standards. This project removes trees west of Runway 9 threshold and north of Runway 34 that penetrate Part 77 approach and transitional surfaces. The results of the aeronautical survey, or a separate conventional survey, should be used to define which trees are obstructions and must be trimmed or removed.

The golf course fence does not meet ROFA frangibility requirements of AC 150/5220-23 which reduces the width of the ROFAs for both Runways 16-34 and 9-27. The fence needs to be frangible per FAA standards, or relocated. Relocating the fence would significantly and adversely affect the golf course which generates revenue for the airport. After close collaboration between the City and FAA, it was determined that the fence will remain in place until there is a FAA-approved frangible fence system or removed when the area used for golf course is needed for aeronautical use. See also Section 2.8.4 - Corrective Action Underway.

Rehabilitate Runway 16-34 Pavement. The pavement on Runway 16-34 has reached the end of its useful life. The pavement is nearly 40 years old and shows extensive cracking, distress, and degradation that will be a hazard to aircraft if not rehabilitated. This project removes existing pavement for the entire 6,009-foot length and 100-foot width and replaces it with new pavement and markings. Incidental work would include correcting the Carsonite threshold markers for gravel Runway 16S-34S to standard red/green orientation, and repainting hold position markings.

Rehabilitate Runway 9-27 Markings. Runway 9-27 is an instrument runway but is marked as a visual runway. Non-precision instrument approach runways are required to have standard designation markings, centerline markings, threshold markings, and aiming point markings. Since the runway is less than 4,200 feet in length, aiming point markings are not required, but instrument threshold markings need to be added in accordance with AC 150/5340-1L *Standards for Airport Markings*. Runway 9-27 should be re-designated as Runway 10-28 due to magnetic drift. Work needs to include repainting hold position markings and signage as necessary to meet standards. After removing existing markings, the entire runway should be fog-sealed for a uniform pavement color, as well as to rejuvenate the pavement surface, prior to installing new markings.

Runway 16-34 and 9-27 Lighting Upgrades, Phase I. This project includes minor changes to the colors of runway edge lighting to meet standards. Runway 16-34 edge lighting on the last 500 feet north of the Runway 16 displaced threshold is amber/red; the remainder is white. The edge lights for the 1,500 feet south of the displaced threshold and the southern 2,000 feet of the runway should be amber/white. Runway 9-27 edge lighting is non-standard for an instrument approach runway. Runway edge lighting lenses should be changed from all white to amber/white for the last half of Runway 9.

Recalibrate Compass Calibration Pad. The compass calibration pad is out of calibration. Magnetic north is currently drifting at about 0.35˚ per year making the facility provide erroneous magnetic compass information to pilots. The compass calibration pad should be noted as out of service in the Airport Facility Directory and resurveyed and recertified by the United States Geological Survey. The old compass calibration markings and monuments should be removed. The magnetic heading radials need to be restriped and re-monumented at 30 degree intervals, per the FAA standard.

Relocate Taxiway B and Interlinks. A greater separation distance is required between the runway and parallel taxiway since Runway 9 is designated as a B-II instrument runway with greater than 1-mile visibility. Taxiway B centerline is 200 feet from Runway 9 centerline and should be relocated 40 feet further north to 240 feet from Runway 9-27 centerline to meet the FAA standard. Interlink Taxiways H, L, A, and M should be reconstructed to meet current geometric standards. All taxiway tapers and radii should meet current FAA standards for Taxiway Design Group II aircraft. Similar to Runway 9-27, the structural section should be improved to support heavier aircraft. Work would also include remarking pavement and relocating taxiway signage to meet standards.

Airport Boundary Change. This project includes the removal of the Nutrition Center, ball fields, and City Well 4 and 5 parcels from the airport property in accordance with the City's settlement agreement with the FAA. The work would include conveying the subject properties from the airport (which is City) to the City. The Exhibit A – Airport Property Plan would be updated to reflect the airport boundary change.

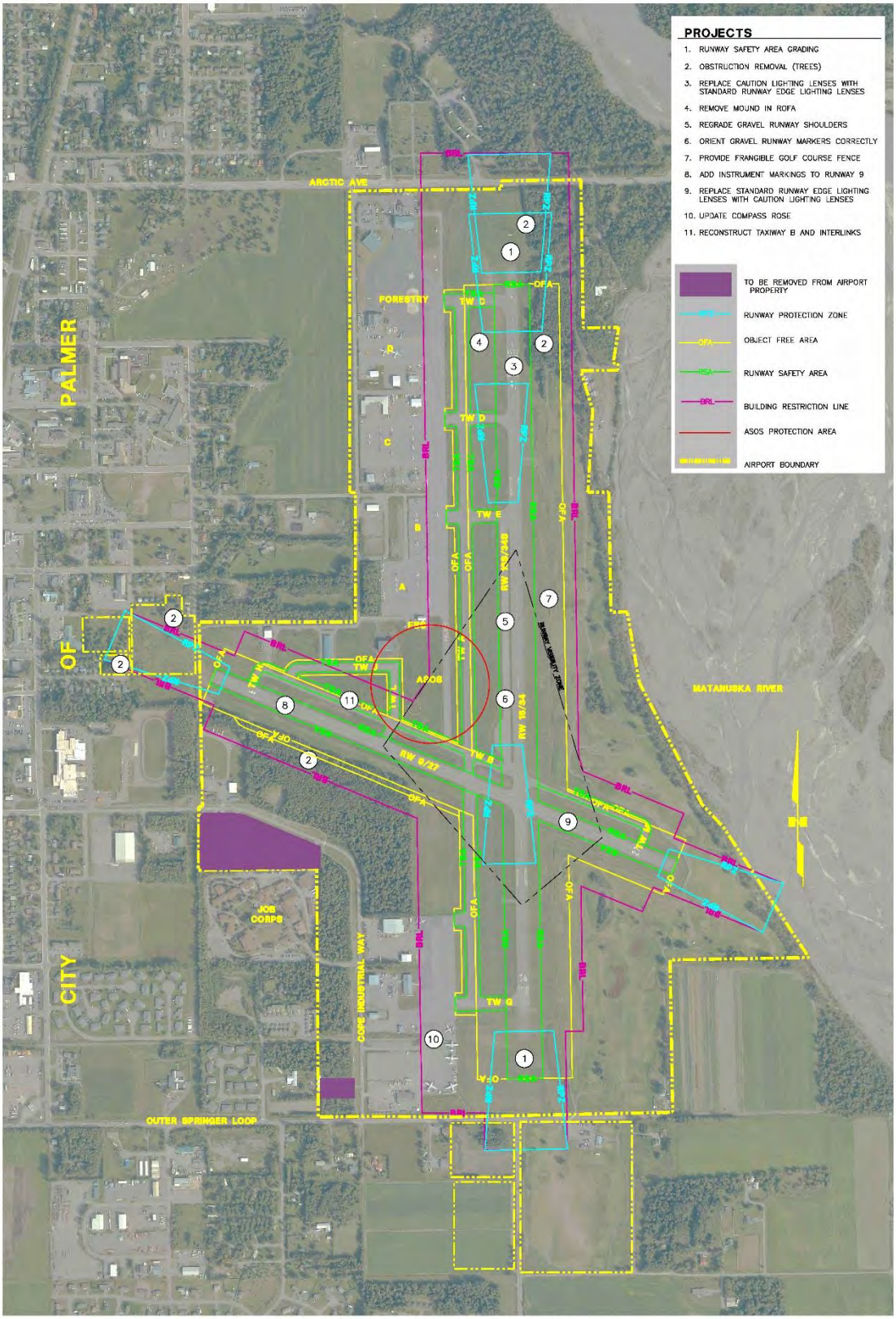

Figure 5-1. Alternative A – Safety and Standardization Improvements

5.3 Alternative B - Mix of GA & Commercial Development

Alternative B includes the safety and standardization improvements of Alternative A, plus assumes moderate growth for GA and commercial development (Figure 5-2).

Low Cost Shelters. This project would develop City-owned and operated low cost, fully enclosed, T-hangar type shelters on Apron B. The shelters would be pre-engineered steel, uninsulated, unheated structures built over existing paved aprons with pile supports and no concrete floors. The shelters would have a hangar door and basic electrical outlets and lights. The goal is to provide aircraft basic shelter from wind and snow in the $300 to $500 per month range, which is currently unavailable at any other area airports. The City would be the owner and manager of the facility to take advantage of property tax exemptions and ability to accept lower investment rates of returns than a private developer. The City should pre-lease the shelters before ordering and installing them.

Runway 16-34 and 9-27 Lighting Upgrades, Phase II. This project includes changing the runway edge lighting from incandescent to LED lighting to improve reliability, visibility, and to lower maintenance costs.

Electrical Outlets, Phase I-III. This project includes a total of 24 new electrical outlets at GA tie-downs on Apron C to accommodate winter flyers and the need for aircraft pre-heating. Eight new electrical outlets will be installed per phase, providing a total of 24 new electrical tie-down spaces upon completion of all three phases.

Large Aircraft Apron Expansion. This project expands the existing Large Aircraft Apron northward to provide access to undeveloped and heavily wooded lease lots. Initially, runway access will be accommodated by a new taxiway that connects the next available lease lot to Taxiway A, then the apron would be expanded as the demand for space increases. The project would accommodate growing commercial activity at the airport and allow lessors to develop long term facilities.

Construct Heliport. The City of Palmer is currently developing a lease with Forestry for the heliport constructed by Forestry. A new public heliport is needed to accommodate helicopter activity. The candidate site for a new heliport is on the large aircraft apron, south of Taxiway G. The optimum location is near the final approach course segment to the RNAV Runway 34 approach, has readily available access, and is located near fuel services.

Northeast Perimeter Security Fencing. This project would include the installation of approximately 2,000 feet of new 8-foot security fencing on the northeast corner of the airfield, and would complete the final gap in perimeter fencing.

Reconstruct Storm Water Outfall (Non-FAA). The City recently completed a storm water system study that determined that the existing 5,800 feet of 36-inch diameter storm water outfall line that crosses the airport is undersized for anticipated flows. The storm water outfall line is located on the north side of Runway 9-27 and crosses the airport from west airport boundary to the Matanuska River. The project would upsize the existing pipeline, add an additional storm water pipeline to add capacity, add subsurface storage in the approach RPZ to Runway 9, or some combination of the

three solutions. The project would cross Taxiways H, L, A and M and Runway 16-34. The project would be funded with non-FAA funds.

Aviation Campground. This project would include acquiring private land and developing an aviation campground north of Runway 9. The project would include developing taxiways and taxilanes that connect camping spots to existing Taxiway B and Taxiway H. The facility would help promote airport activity and provide a service not currently available at airports in the valley. The income produced from an aviation campground would be minor compared to the high infrastructure investment in taxiways, taxilanes, fencing, landscaping and other minor improvements. The City does not plan to develop an aviation campground as described, but is open to its development by others, and have identified a possible location.

Acquire Buffer Lands. Due to the potential for high-density residential development immediately adjacent to the airport, the City should consider acquiring or controlling lands west of the airport to create transition buffer between the airport and residential areas (Figure 5-2). The land is mostly zoned R-1, Single Family Residential, leaving it open to single-family housing with 8,400 square foot lots. This land would buffer against future land use conflicts. The City could control this area's development through outright purchase, land use controls, or through-the-fence agreements with private developers. Due to the long-term significance of this property, the City should consider working with the land owners to develop a plan for compatible land use.

Trail Systems. Trail connections between the airport, downtown business district, and the golf course are an important part of creating a viable community trail network. This project would provide trail connections on the perimeter of the airport connecting the Mountain Rose Estates subdivision to the golf course, and the airport and golf course to the downtown business district. Trail signage would help channel pedestrians and bicyclists away from aircraft movement areas.

Non-aviation revenue. The wooded area west of Cope Industrial Way should be considered for development to accommodate non-aviation revenue. This area could be developed for public fee parking for the trail system and overflow parking for Palmer Job Corp.

Conversion of Apron D. The City is currently negotiating with a potential lessee to convert Apron D, which consists of GA tie-downs, to a lease lot. The conversion of Apron D from a GA apron to a lease lot will generate revenue at market rate.

Construct Taxiway N, Phase I. Taxiway N will be a parallel taxiway on the south side of Runway 9. The taxiway will provide facility access to the expanded Large Aircraft Apron and commercial lease lots. Phase I includes construction beginning at the Runway 9 threshold to Taxiway A.

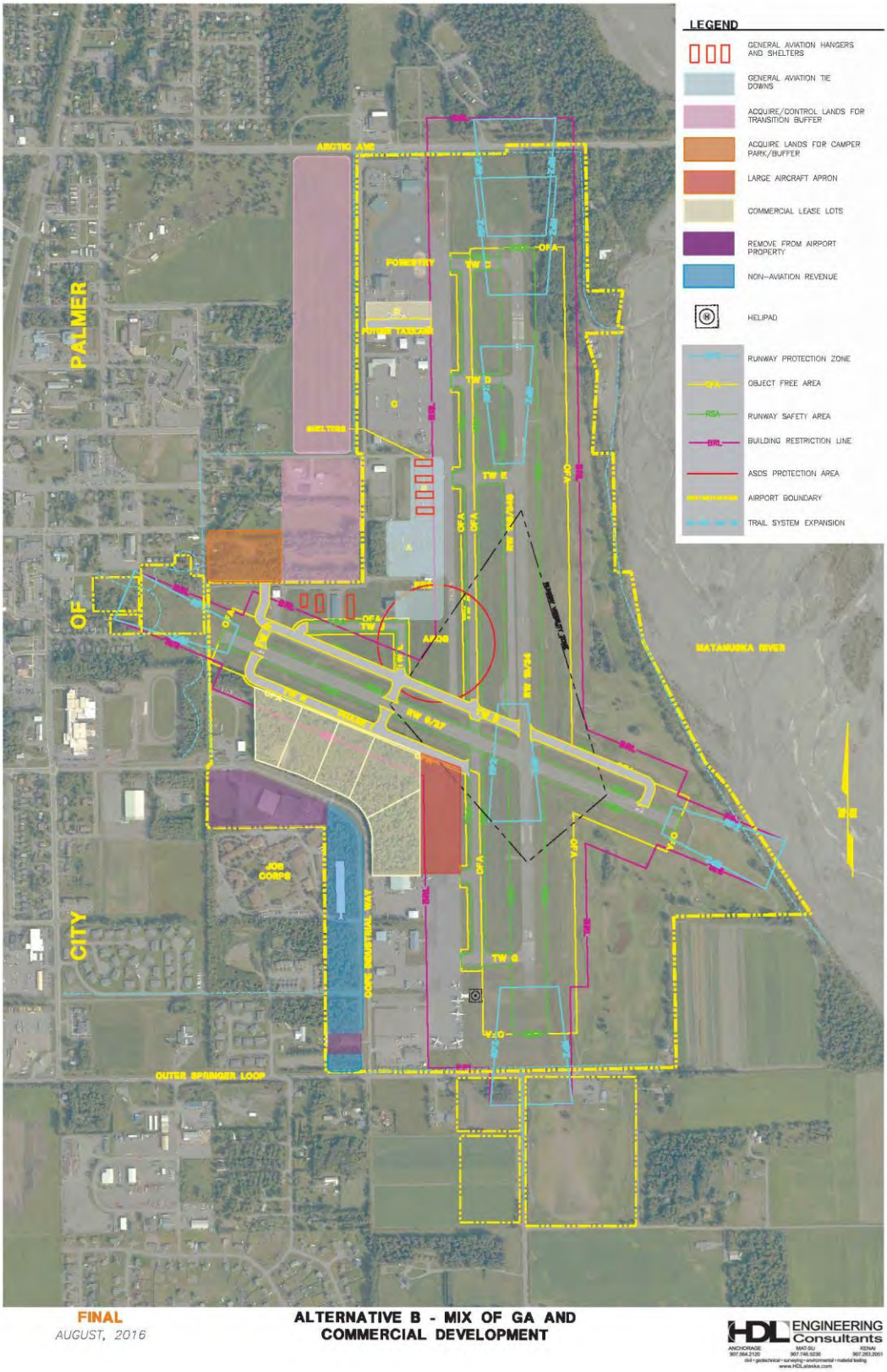

Figure 5-2. Alternative B – Mix of GA & Commercial Development

5.4 Alternative C - GA & Commercial Development with Expansion into the Golf Course

Alternative C assumes a high-growth scenario where existing GA and commercial development areas are at capacity and that portions of the existing golf course would be needed to further support airport activity and growth. Alternative C includes all components of Alternative A and B with the addition of airport improvements onto the golf course property as needed (Figure 5-3).

Expand GA and Commercial Facilities. If needed, airport facilities would be expanded into the golf course area south of Runway 9-27 and east of Runway 16-34. A taxiway or taxiways would be constructed to connect to Runway 16-34 at Taxiway G and to Runway 9-27 at Taxiway M. Road access would be provided at Outer Springer Loop Road. New land would be acquired by the City to relocate the golf course south of Outer Springer Loop Road or to another site. Lease lots, aprons, taxiways, taxilanes, utilities, and facilities would be planned and developed based on the airport's long-term needs.

Construct Taxiway N, Phase II. Phase II of Taxiway N will continue the parallel taxiway from Taxiway A to the Runway 27 threshold. The project will provide facility access to general aviation aircraft that expand onto the existing golf course.

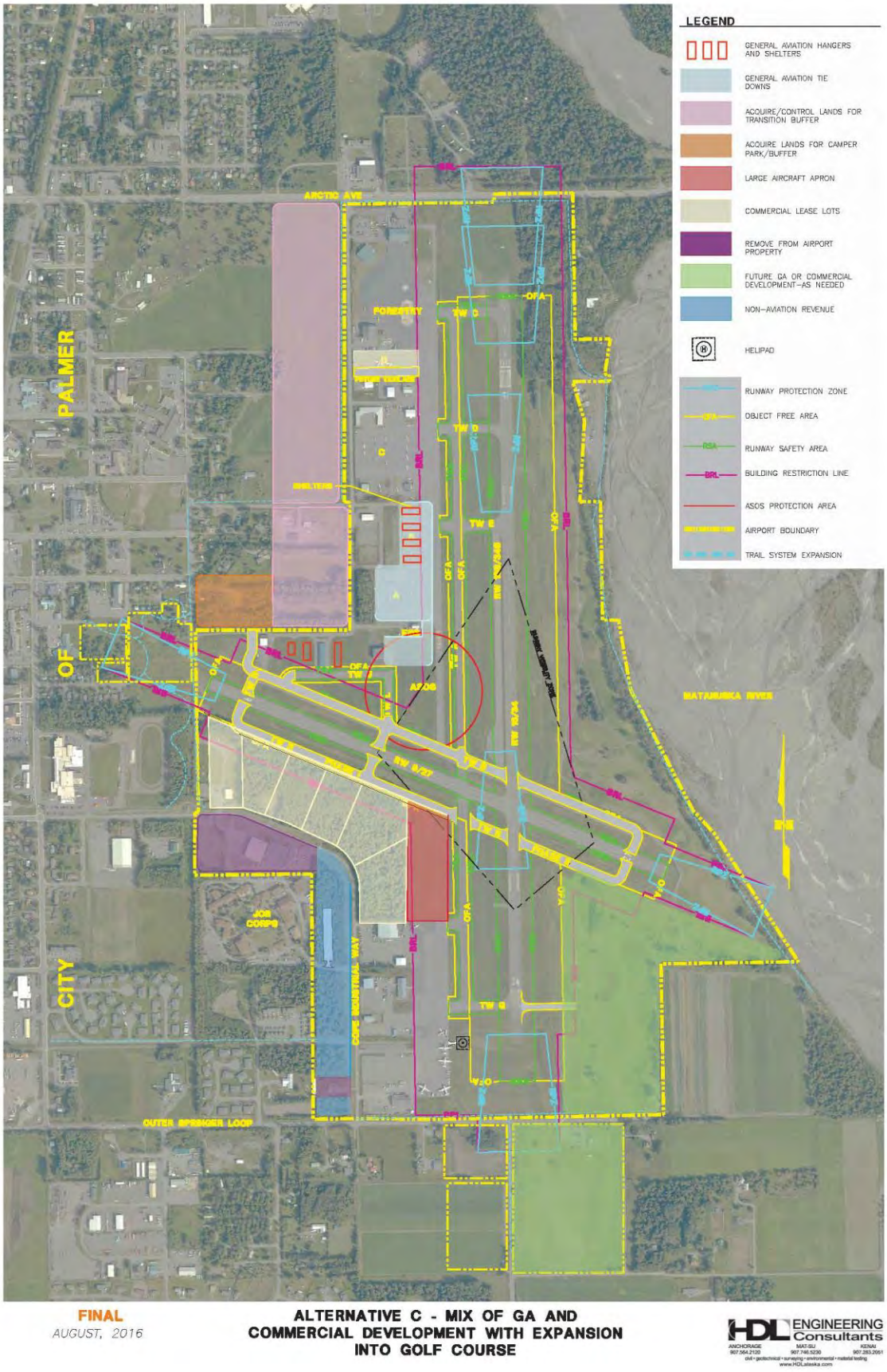

Figure 5-3. Alternative C – GA & Commercial Development with Expansion into Golf course

6.0 FINANCIAL ANALYSIS

6.1 Introduction

The City of Palmer received title to the airport in 1963, under terms of a transfer from the State of Alaska. Its financial operations are consolidated within the City's records as an Enterprise Fund, since it is a business-like entity within the municipality.

Northern Economics collected financial reports for the airport from 2005 to 2014, along with the airport's 2015 budget. Annual operating revenues averaged approximately $190,000 (rounded) for the 10 years, while annual operating expenses (excluding depreciation) averaged approximately $255,000 (rounded), generating an average annual loss of $65,000. Depreciation expense averaged $500,000 (also rounded) per year, for a full-cost average annual loss of approximately $565,000.

Primary operating revenues are generated from land leases, at 80 percent of total revenue, while aircraft tie-down fees generated about 12 percent of average annual revenues.

The three largest expense components were salaries and benefits, and administrative services, at 68 percent of total expenses. Legal fees averaged 25 percent of total expenses over the same 10 years.

Palmer's municipal airport has reported higher relative revenues than the nearest comparable facility, located at Wasilla. At both airports and other major public facilities, a major cost item is depreciation, a non-cash expense, but one that must be reported under terms and conditions of Government Accounting Standards Board (GASB) Statement 34. The full Financial Analysis is located in Appendix L.

6.2 Forecast

Northern Economics prepared a 10-year forecast for the years 2016 to 2025, based on the prior 10 years, the adopted 2015 budget, and certain assumptions related to salaries (i.e., a full time airport manager), legal fees (decreasing due to settlements with the FAA), and consolidation of accounts, such as services.

The operating forecast, under base assumptions, indicated an increasing loss before depreciation, estimated at $178,000 (rounded) in 2016 and widening to a loss of $260,000 (rounded) in 2025.

HDL asked Northern Economics to suggest ways to improve the airport's financial condition. These are discussed in the following section.

6.3 Possible Actions

As discussed in greater detail within Section 3.1 of their financial analysis, the financial health of the airport is dependent on the overall strength of the local and state economy, the market conditions for lease rates, the availability of ready, willing and able tenants, and the City's ability to secure leases, generate other revenue, and control expenses.

Northern Economics developed three cases, from low to full build-out, based on current operations and the three cases (low, medium, high):

- Low case. This is the current financial situation.
- Medium case. Lease prices and leased square footage are increased along with tie-downs.
- High case. Lease prices and leased square footage are increased beyond the medium case.

Summary operating results are shown below in Table 6-1.

Table 6-1. Model Net Income Summary, All Cases

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Model Case	**Net Income ($ Thousands)**									
Low Case	(170)	(174)	(180)	(184)	(190)	(194)	(201)	(205)	(210)	(217)
Medium Case	(129)	(91)	(85)	(79)	(73)	(65)	(58)	(48)	(40)	(31)
High Case	(86)	(37)	18	38	59	83	105	133	159	186

Source: Northern Economics, Inc., 2015. Appendix L

6.4 Recommendations

In order to generate a positive net income, the City should explore the following (in the general order of preference):

- Review Administrative Services costs to assure there are no overlapping service billings.
- Implement a fuel flowage fee in lieu of the existing three percent fuel tax
- Consider an FAA-approved “through-the-fence” agreement with development of the 40-acre parcel west of the airport
- Revise the leasing structure to become more attractive to prospective lessees.
- Include escalation clauses in future leases to account for inflation and increases in costs to operate the airport.

7.0 CAPITAL IMPROVEMENT PLAN

This Capital Improvement Project Plan includes projects anticipated during the 20-year planning period of 2015 to 2035. This plan should be re-evaluated by the City annually as the City's needs and priorities change with time. Federally-funded projects are required to comply with the NEPA. Projects that require an EA will need an FAA-approved EA by October 1 of the year prior to the project. Projects that are anticipated to be categorically excluded from the NEPA process will require approximately 90 days to document agency coordination. The Total Project Cost Estimates include an inflation factor of 3% per year.

Table 7-1. Capital Improvement Plan Summary

Project	Title	Total Project Estimate ($)	Year	EA Status
0	Aeronautical Survey	262,500	2015	CE
1	Rehabilitate Runway 16-34 Design	566,400	2017	N/A
2	Rehabilitate Runway 16-34 Pavement and Extend Safety Area	6,235,200	2017	EA
3	Runway 16-34 Obstruction Removal (Trees)	238,600	2017	CE
4	Large Apron Expansion	5,149,600	2017	EA
5	Taxiway B Spot Repairs	141,800	2017	CE
6	Construct Security Fencing	98,000	2017	CE
7	Update Airport Layout Plan	112,000	2017	N/A
8	Acquire Airport Equipment - Blower and Box Blade	272,900	2018	CE
9	Remark Runway 9-27, Lighting Improvements, and Recalibrate Compass Rose	993,200	2019	CE
10	Construct Heliport	355,200	2019	EA
11	Wildlife Hazard Assessment	89,600	2019	CE
12	Acquire Snow Removal Equipment	574,000	2020	N/A
13	Taxiway N and Interlinks Design	661,800	2020	N/A
14	Acquire Avigation Easement	343,900	2020	CE
15	Construct Taxiway N and Interlinks, Phase 1	4,313,600	2021	EA
16	Construct Sand Storage Building	826,000	2022	CE
17	Construct Aircraft Electrical Outlets (Non-FAA)	239,500	2022	N/A
18	Reconstruct Storm Water Outfall (Non-FAA, Non-Airport)	7,378,000	2024	EA
19	Construct General Aviation Apron	5,635,400	2026	EA
20	Construct Shelters (Non-FAA)	857,000	2026	N/A
21	Relocate Taxiway B and Interlinks Phase 2	7,032,700	2030	EA
22	Relocate Water Utilities	545,000	2030	EA
23	Acquire Buffer Lands	3,525,300	2030	EA
24	Aviation Campground	1,081,600	2030	EA
25	Construct Taxiway N and Interlink, Phase 2	5,059,600	2040	N/A
26	Replace Golf Course Fence with Frangible	4,861,400	2040	CE

7.1 Projects

PAQ-00 **Aeronautical Survey.** The project includes performing an aeronautical survey of the airport to accurately identify obstructions. Work includes providing geodetic control, aerial photography, mapping, and obstruction identification to AC 150/5300-16A, 150/5300-17C, 150/5300-18B standards.

Rationale: An accurate Airport Airspace Analysis Survey (AAAS) is needed to accurately identify obstructions and to support instrument approach and departure procedures.

Budget Level Cost*: 262,500*

PAQ-01 **Rehabilitate Runway 16-34 Design.** The project includes surveying, geotechnical, environmental, and civil engineering, permits, and construction and NEPA documents for the rehabilitation of Runway 16-34, including paving and striping.

Rationale: Runway 16-34 was constructed in 1977 and extended 1,000 feet in 1987, the original pavement is 38 years old. The 2013 DOT&PF pavement condition survey reports corrugations, longitudinal and transverse cracking, block cracking, and raveling and a PCI ranging from 49 to 57 supporting the need for rehabilitation.

Budget Level Cost*: 566,400*

PAQ-02 **Rehabilitate Runway 16-34 Pavement and Extend Safety Area.** This project will rehabilitate the 6,009-foot x 100-foot Runway 16-34 pavement, and pavement transitions to interlink taxiways. The project will include new runway pavement and will remove terrain penetrations on the west side of Runway 16-34 and extend the runway safety area from 300 feet to the 600 feet at each end.

Rationale: The improvements are needed to replace 40-year old pavement that has reached the end of its useful life, to comply with FAA design standards for airport grading, and to provide standard safety area length.

Budget Level Cost*: 6,235,200*

PAQ-03 **Runway 16-34 Obstruction Removal (Trees).** This project will remove obstructions (trees) that currently penetrate the approach surfaces to Runways 16, 34, 9, and 27.

Rationale: The improvements are needed for safety and to comply with FAA standards. Obstructions (trees) limit instrument approaches to daytime only operations and need to be removed.

Budget Level Cost: 238,600

PAQ-04 **Large Aircraft Apron Expansion.** This project includes expanding the existing 300-foot wide Large Aircraft (commercial) Apron northward approximately 950 feet to accommodate commercial lease lots and additional large aircraft parking.

Rationale: The project is needed to provide to accommodate large commercial aircraft.

Budget Level Cost: 5,149,600

PAQ-05 **Taxiway B Spot Repairs.** The project includes improving four utility crossing areas on existing Taxiway B that are experience frost jacking and pavement failures. The work includes removal of pavement, excavation and removal of frost susceptible soils, and installation of non-frost susceptible classified fill, leveling course and new AC pavement.

Rationale: Frost jacking and pavement undulations and failures are a safety concern and potential hazard to aircraft.

Budget Level Cost*: 141,800*

PAQ-06 **Construct Security Fencing.** This project will construct approximately 2,000 feet of new perimeter fencing located on the northeast side of the airport where none exists.

Rationale: The construction is needed to complete the airport's perimeter fencing.

Budget Level Cost*: 98,000*

PAQ-07 **Update Airport Layout Plan.** This project will update the ALP and disclose obstructions discovered by the Aeronautical Survey that will be concluded in the Fall of 2016.

Rationale: The ALP should be updated to reflect the Aeronautical Survey.

Budget Level Cost*: 112,000*

PAQ-08 **Acquire Airport Equipment – Blower and Box Blade.** This project would acquire a new snow blower and box blade to remove snow on runway, taxiway, and apron surfaces.

Rationale: Snow build-up on runways, taxiways and aprons impairs aircraft control. The equipment is needed to replace the existing snow blower and improve aircraft control and safety after winter snowfalls.

Budget Level *Cost: 272,900*

PAQ-09 **Remark Runway 9-27, Lighting Improvements, and Recalibrate Compass Rose.** This project will obliterate existing Runway 9-27 pavement markings and remark with new non-

precision instrument markings and renumber the runway to Runway 10-28. This project would make changes to runway edge lighting edge lighting colors, and replace existing incandescent runway and taxiway edge lighting fixtures throughout the airport. This project would resurvey and remark the compass calibration pads located on the large aircraft apron and Forestry Apron. The work would include a new magnetic survey and recertification by the United States Geological Survey, or other qualified entity in accordance with standards.

Rationale: The improvements are needed to meet standards. Runway 9-27 numbering and the compass calibration pad do not meet standards due to magnetic drift. Magnetic north is drifting west at about 0.35˚ per year and the compass calibration pads have not been calibrated since the 1990s. AC 150/5300-13A, Appendix 6 requires that compass calibration pads be resurveyed every 5 years.

Budget Level Cost: 993,200

PAQ-10 **Construct Heliport.** This project constructs a new public lighted heliport to be located adjacent to the existing commercial apron.

Rationale: This project is needed to accommodate forecasted demand for helicopter activity.

Budget Level Cost: 355,200

PAQ-11 **Wildlife Hazard Assessment.** The Wildlife Hazard Assessment would evaluate the potential for certain land uses attracting hazardous wildlife on or near the airport, and the risks posed to aircraft by wildlife, particularly birds, in accordance with AC 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*. The work may also include development of a Wildlife Hazard Management Plan to mitigate the risks to aviation safety.

Rationale: Large flocks of migratory birds including cranes and geese are known to frequent farm fields adjacent to the airport during the spring and fall migratory season. Ravens are known to frequent the airport when hay is harvested from airport lands. These large birds pose a potential hazard to aviation safety.

Budget *Level Cost: 89,600*

PAQ-12 **Acquire Snow Removal Equipment.** This project includes acquiring a large front end loader with quick disconnect.

Rationale: The project will replace the current equipment that has reached the end of its useful life.

Budget Level *Cost: 574,000*

PAQ-13 **Taxiway N and Interlinks, Design.** This project includes surveying, geotechnical, environmental, and civil engineering, permits, plans, specifications and environmental analysis documents for the construction of approximately 2,550 feet of new taxiway on the south side of Runway 9-27, interlinks to Runway 9-27, and related taxiway edge lighting, markings, signage, and tree removal from the transitional surface on the south side of Runway 9-27.

Rationale: The project is needed to improve capacity and provide needed commercial lease lot access to the taxiways and runways.

Budget Level Cost: 661,800

PAQ-14 **Acquire Avigation Easement.** This project includes acquiring an avigation easement for approximately 10 acres of land located off the north end of Runway 16-34, east of extended runway centerline and within the RPZ. The parcel is owned by the MSB and located in the Matanuska River Park.

Rationale: The easement needs to be acquired to protect the runway's RPZ from future activity and airspace obstructions that could be detrimental to public safety and the airport users.

Budget Level Cost: 343,900

PAQ-15 **Construct Taxiway N and Interlinks, Phase 1.** This project includes construction of approximately 2,550 feet of new taxiway on the south side of Runway 9-27, interlinks to Runway 9-27, and related taxiway edge lighting, markings, signage, and tree removal from the transitional surface on the south side of Runway 9-27.

Rationale: The project is needed to improve capacity and provide needed commercial lease lot access to the taxiways and runways.

Budget Level Cost: 4,313,600

PAQ-16 **Construct Sand Storage Building.** This project would construct a new 60 foot by 80-foot sand storage building adjacent to the existing airport snow removal equipment building.

Rationale: The airport experiences extended periods of cold temperatures and freezing rain that requires sand be applied to airport surfaces for aircraft control. A sand storage building is needed to protect sand from saturation and freezing making it difficult to load into equipment.

Budget Level Cost: 826,000

PAQ-17 **Construct Aircraft Electrical Outlets (Non-FAA).** This project includes construction of approximately 21 electrical power outlets at the general aviation apron. Work would include additional electrical services from Matanuska Electric Association, installation of electrical panels and meters, underground conduits and cables, and outlets. The project would not be eligible for FAA-funding.

Rationale: The project would provide needed electrical power for preheating airplanes in the winter and would provide additional revenue to the airport.

Budget Level Cost: 239,500

PAQ-18 **Reconstruct Storm Water Outfall (Non-Fed, Non-Airport).** An existing storm water outfall line is located on the north side of Runway 9-27 and crosses the airport from west airport boundary to the Matanuska River. The project would upsize the existing pipeline, add an additional storm water pipeline to add capacity, add subsurface storage in the approach RPZ to Runway 9, or some combination of the three solutions. The project would cross Taxiway H, L, A and M and Runway 16-34. The project would be funded with other than FAA or airport funds.

Rationale: The City recently completed a storm water system study that determined that the existing 5,800 feet of 36-inch diameter storm water outfall line that crosses the airport is undersized for current and anticipated flows. The system must be upgraded to avoid back-ups and localized flooding.

Budget Level Cost: 7,378,000

PAQ-19 **Construct General Aviation Apron.** This project includes the construction of approximately 6.7 acres (450 foot by 650 foot) of new general aviation apron to be located south of the Flight Service Station. Work would include construction of connecting taxiway, 12 electrical outlets, markings, and tie-downs.

Rationale: The project will be needed to accommodate growth in demand for aircraft tie-downs.

Budget Level Cost: 5,635,400

PAQ-20 **Construct Shelters (Non-FAA).** This project would construct low-cost City-owned and operated aircraft shelters on Apron B to protect aircraft from the wind, snow, and sun. The shelters would be light-weight unheated steel structures with hangar doors and would be constructed directly on the apron surface. To keep the shelters economical, in the $300 to $500 per month range, the shelters would have no water or sewer utilities, plumbing, heating, or concrete floors.

Rationale: Palmer routinely experiences 60 to 80 mile per hour winds during winter storms that can be a hazard to aircraft. The low-cost, no-frills shelters would provide affordable aircraft protection not currently available in the Anchorage bowl or Matanuska Valley. The City would be the best entity to develop the shelters because of their ability to accept a lower rate of return on the investment and property tax advantages.

Budget Level Cost*: 857,000*

PAQ-21 **Relocate Taxiway B and Interlinks Phase 2.** This project includes relocation of approximately 3,800 feet of Taxiway B, reconstruction of interlink Taxiways H, L, A, and M, and related taxiway edge lighting, markings, and signage.

Rationale: The project is needed to provide the standard runway-taxiway separation distance of 240 feet, now that Runway 9 is designated as a B-II runway.

Budget Level Cost*: 7,032,700*

PAQ-22 **Relocate Water Utilities.** This project will relocate water utilities located through lease lots LL23, LL24, and LL25 to the west side of LL23, LL24, and LL25.

Rationale: The water line currently runs through the lease lots making the lots undevelopable to lessees.

Budget *Level Cost: 545,000*

PAQ-23 **Acquire Buffer Lands.** This project includes the purchase of approximately 35 acres of private land to the west of the airport to ensure compatible land use and to preserve space for long-term growth.

Rationale: The project is needed to provide a buffer residential development from airport noise and to avoid incompatible residential development immediately adjacent to the airport.

Budget Level Cost*: 3,525,300*

PAQ-24 **Aviation Campground.** This project includes purchase of approximately 7 acres of private lands, construction of approximately 1,200 feet of new taxiways and taxilanes, and twelve 20 by 20-foot paved aircraft parking pads and related improvements for an aviation campground located north of Runway 9-27.

Rationale: The project is needed to accommodate the summertime transient flying public that frequent the area.

Budget Level Cost: 1,081,600

PAQ-25 **Construct Taxiway N and Interlink, Phase 2.** This project includes construction of approximately 1,490 feet of new taxiway on the south side of Runway 9-27 east of Taxiway A and related taxiway edge lighting, markings, and signage.

Rationale: The project will provide commercial lease lot access to the taxiways and runways when the golf course is converted to aviation related uses.

Budget Level Cost: 5,059,600

PAQ-26 **Replace Golf Course Fence with Frangible.** This project will replace approximately 8,100 feet of existing golf course fence currently limits the Runway 16-34 and Runway 9-27 OFA's with an FAA-approved frangible fence system.

Rationale: The improvements are needed to meet FAA OFA standards. Fencing will reduce the potential for conflicts with people and wildlife inadvertently entering aircraft movement areas.

Budget Level Cost: 4,861,400

References

ADEC. 2014a. Alaska Division of Air Quality: Air Non-point Mobile Source. Last Accessed September 26, 2014. http://dec.alaska.gov/air/anpms/comm/matsu1_pm.htm.

ADEC. 2014b. Alaska Map of Contaminated Sites. Last accessed on September 26, 2014. http://www.arcgis.com/home/item.html?id=315240bfbaf84aa0b8272ad1cef3cad3.

ADEC. 2014c. ADEC Drinking Water Protection Map. Last Accessed September 26, 2014 http://dec.alaska.gov/eh/dw/DWP/protection_areas_map.html

ADEC. 2014d. Division of Water. Last accessed on September 26, 2014. http://dec.alaska.gov/water/wqsar/Docs/2010impairedwaters.pdf

ADF&G. 2014a. Bald Eagle (Haliaeetus leucocephalus) Species Profile. Last Accessed September 26, 2014. http://www.adfg.alaska.gov/index.cfm?adfg=baldeagle.main.

ADF&G. 2014b. ADF&G Atlas to the Catalog of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes. Last accessed on September 26, 2014. http://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=maps.interactive.

Agnew Beck Consulting. 2006. Palmer Comprehensive Plan.

ANHP. 2014. Animal Data Portal. Last Accessed September 26, 2014. http://aknhp.uaa.alaska.edu/maps/biotics/#.

Combs, J. 2014. Personal communication between Jeffery Combs, City of Palmer, and Heather Campfield, HDL, on December 2, 2014.

Cornell Lab of Ornithology. n.d. All About Birds. Last accessed September 26, 2014. http://www.allaboutbirds.org/guide/Gray-cheeked_Thrush/lifehistory

Federal Aviation Administration. Air Carrier Activity Information System Database. http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger

Federal Aviation Administration. Office of Aviation Policy and Planning (APO) terminal area forecast (TAF). Palmer and Birchwood Airports. https://aspm.faa.gov/main/taf.asp

FEMA. 2014. FEMA Map Service Center. Last accessed on September 26, 2014. https://msc.fema.gov/portal/search

Goldsmith, Scott., HDR Alaska, Inc., and Northern Economics. Economic and Demographic Projections for Alaska and Greater Anchorage 2010–2035. December 2009.

GRA, Inc., July 2001. Model for Estimating General Aviation Operations at Non-Towered Airports Using Towered and Non-Towered Airport Data”

www.faa.gov/data_research/aviation_data_statistics/general_aviation/media/gamodel3f.doc

HDL, 2013. Howell, David. Alaska Population Trends 2012 to 2042, June 2014.

Hunter, J. 2014. From FAA Flight Service Station historical records provided by Jennifer Hunter on December 29, 2014.

IUCN. 2014a. The IUCN Red List of Threatened Species Anodonta beringiana. Last accessed September 26, 2014. http://www.iucnredlist.org/details/188974/0

IUCN. 2014b. The IUCN Red List of Threatened Species Lithobates sylvaticus. Last accessed September 26, 2014. http://www.iucnredlist.org/details/58728/0

IUCN. 2014c. The IUCN Red List of Threatened Species Contopus cooperi. Last accessed September 26, 2014.http://www.iucnredlist.org/details/22699787/0

IUCN. 2014d. The IUCN Red List of Threatened Species Catharus minimus. Last accessed September 26, 2014. http://www.iucnredlist.org/details/22708658/0

IUCN. 2013e. The IUCN Red List of Threatened Species Myotis lucifugus. Last accessed September 26, 2014. http://www.iucnredlist.org/details/14176/0

MSB. 2014. MAT-SU Wetland Mapping Project (2007-present). Last Accessed September 26, 2014. http://www.matsugov.us/wetlands/wetlands-map-viewer.

National Wild and Scenic Rivers System. 2014. National Wild and Scenic Rivers System. Last Accessed September 26, 2014. http://www.rivers.gov/map.php.

NOAA. 2014. Essentail Fish Habitat Consultations. Last Accessed September 26, 2014. http://www.habitat.noaa.gov/protection/efh/consultations.html

State of Alaska. Department of Labor and Workforce Development, Research and Analysis Section.

USCB. 2014. State & County Quick Facts. Last Accessed September 26, 2014. http://quickfacts.census.gov/qfd/states/02/0258660.html

USDA. 2014a. Natural Resources Conservation Service: Prime and Important Farmlands. Last Accessed September 26, 2014. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ak/soils/surveys/?cid=nrcs142p2_035988.

USDA. 2014b. Plants Profile. Last accessed November 27, 2013. http://plants.usda.gov/java/county?state_name=Alaska&statefips=02&symbol=CAHE4

USFWS. 2014a. Coastal Barrier Resources Act. Last Accessed September 26, 2914 http://www.fws.gov/cbra/Maps/Mapper.html.

USFWS. 2014b IPaC - Information, Planning, and Conservation System. Last Accessed September 26, 2014. http://ecos.fws.gov/ipac/wizard/chooseLocation!prepare.action.

USFWS. 2014c. National Wetlands Inventory. Last Accessed September 26, 2014. http://www.fws.gov/wetlands/.

USACE. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army, Waterways Experiment Station. Vicksburg, MS. Tech. Rep. Y-87-1.

Wickam, G. 2014. Personal communication between Jeffery Combs, City of Palmer, and Heather Campfield, HDL, on December 2, 2014.Federal Aviation Administration. Air Carrier Activity Information System Database. http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger

APPENDIX A
DEVELOPMENT ALTERNATIVE DRAWINGS

PROJECTS

1. RUNWAY SAFETY AREA GRADING
2. OBSTRUCTION REMOVAL (TREES)
3. REPLACE CAUTION LIGHTING LENSES WITH STANDARD RUNWAY EDGE LIGHTING LENSES
4. REMOVE MOUND IN ROFA
5. REGRADE GRAVEL RUNWAY SHOULDERS
6. ORIENT GRAVEL RUNWAY MARKERS CORRECTLY
7. PROVIDE FRANGIBLE GOLF COURSE FENCE
8. ADD INSTRUMENT MARKINGS TO RUNWAY 9
9. REPLACE STANDARD RUNWAY EDGE LIGHTING LENSES WITH CAUTION LIGHTING LENSES
10. UPDATE COMPASS ROSE
11. RECONSTRUCT TAXIWAY B AND INTERLINKS

TO BE REMOVED FROM AIRPORT PROPERTY

RPZ RUNWAY PROTECTION ZONE

OFA OBJECT FREE AREA

RSA RUNWAY SAFETY AREA

BRL BUILDING RESTRICTION LINE

ASOS PROTECTION AREA

AIRPORT BOUNDARY

ARCTIC AVE

PALMER

FORESTRY

JOB CORPS

CITY

OUTER SPRINGER LOOP

COPE INDUSTRIAL WAY

MATANUSKA RIVER

RW 9/27

RW 16/34

RW 18/34S

RUNWAY VISIBILITY ZONE

TW A

TW B

TW C

TW D

TW E

TW G

FINAL

AUGUST, 2016

ALTERNATIVE A - SAFETY AND STANDARDIZATION IMPROVEMENTS

HDL ENGINEERING Consultants
ANCHORAGE 907.564.2120
MAT-SU 907.746.5230
KENAI 907.283.2051
civil • geotechnical • surveying • environmental • material testing
www.HDLalaska.com

LEGEND

- GENERAL AVIATION HANGERS AND SHELTERS
- GENERAL AVIATION TIE DOWNS
- ACQUIRE/CONTROL LANDS FOR TRANSITION BUFFER
- ACQUIRE LANDS FOR CAMPER PARK/BUFFER
- LARGE AIRCRAFT APRON
- COMMERCIAL LEASE LOTS
- REMOVE FROM AIRPORT PROPERTY
- NON–AVIATION REVENUE
- HELIPAD
- RPZ — RUNWAY PROTECTION ZONE
- OFA — OBJECT FREE AREA
- RSA — RUNWAY SAFETY AREA
- BRL — BUILDING RESTRICTION LINE
- ASOS PROTECTION AREA
- AIRPORT BOUNDARY
- TRAIL SYSTEM EXPANSION

ARCTIC AVE
PALMER
FORESTRY
FUTURE TAXILANE
SHELTERS
ASOS
MATANUSKA RIVER
RUNWAY VISIBILITY ZONE
RW 16/34
RW 9/27
RW 18/36
PHASE I
JOB CORPS
COPE INDUSTRIAL WAY
OUTER SPRINGER LOOP
CITY OF
TW A
TW B
TW C
TW D
TW E
TW G
TW J
TW L
TW N

FINAL
AUGUST, 2016

ALTERNATIVE B - MIX OF GA AND COMMERCIAL DEVELOPMENT

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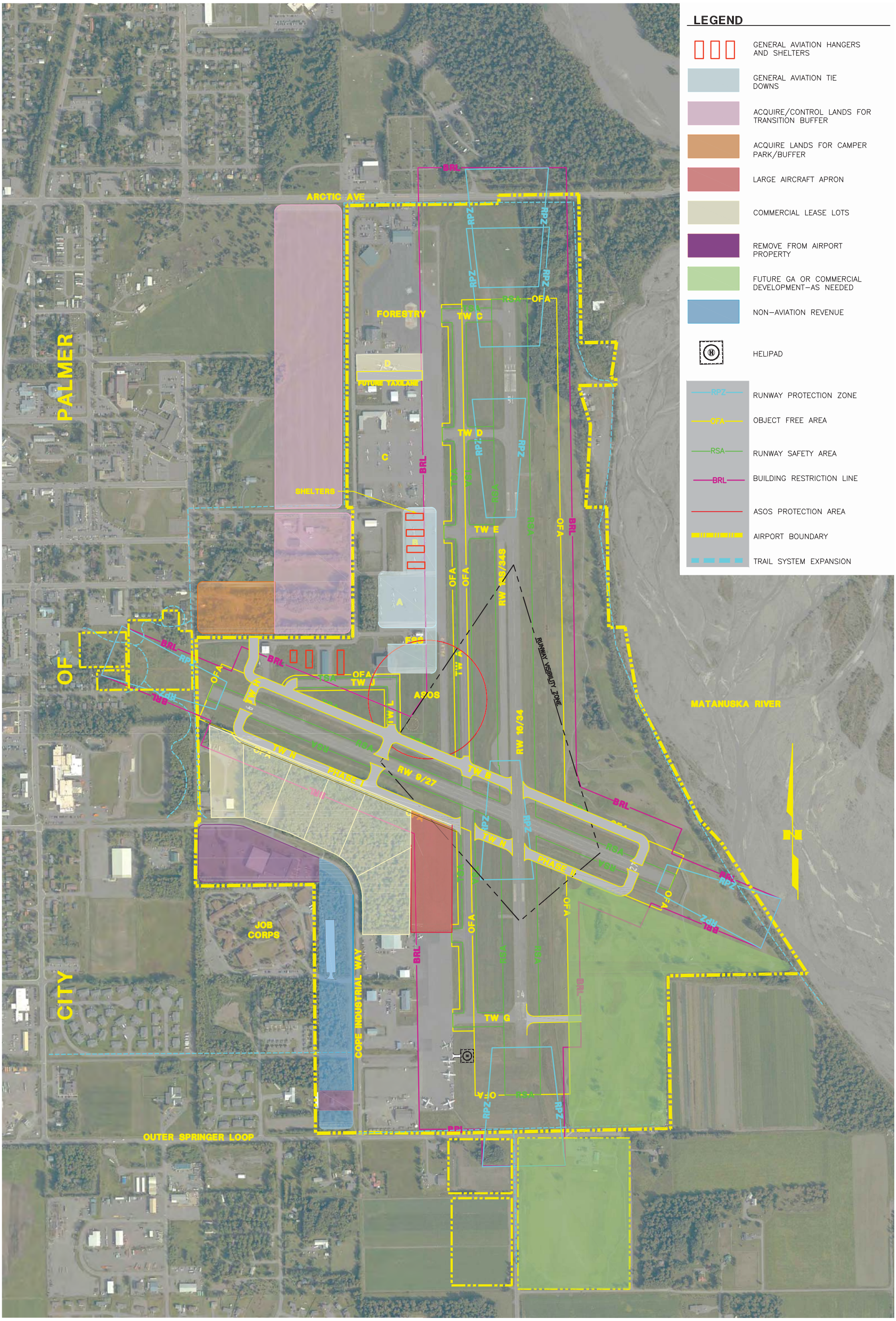

FINAL

AUGUST, 2016

ALTERNATIVE C - MIX OF GA AND COMMERCIAL DEVELOPMENT WITH EXPANSION INTO GOLF COURSE

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ANCHORAGE 907.564.2120
MAT-SU 907.746.5230
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APPENDIX B
AIRPORT LAYOUT PLAN

U.S. Department
of Transportation
**Federal Aviation
Administration**

August 22, 2016

Mr. Nathan E. Wallace
City Manager, City of Palmer
231 W. Evergreen Ave.
Palmer, AK 99654

Dear Manager Wallace:

The Palmer Municipal Airport, Palmer AK, Airport Layout Plan (ALP), prepared by Hattenburg, Dilley, & Linnell, and bearing your signature, is approved. A signed copy of the approved ALP is enclosed.

An aeronautical study (no. 2016-AAL-103-NRA) was conducted on the proposed development. This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

The FAA has only limited means to prevent the construction of structures near an airport. The airport sponsor has the primary responsibility to protect the airport environs through such means as local zoning ordinances, property acquisition, avigation easements, letters of agreement or other means.

This ALP approval is conditioned on acknowledgement that any development on airport property requiring Federal environmental approval must receive such written approval from FAA prior to commencement of the subject development. This ALP approval is also conditioned on acceptance of the plan under local land use laws. We encourage appropriate agencies to adopt land use and height restrictive zoning based on the plan.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. AIP funding requires evidence of eligibility and justification at the time a funding request is ripe for consideration. When construction of any proposed structure or development indicated on the plan is undertaken, such construction requires normal 45-day advance notification to FAA for review in accordance with applicable Federal Aviation Regulations (i.e., Parts 77, 157, 152, etc.). More notice is generally

beneficial to ensure that all statutory, regulatory, technical and operational issues can be addressed in a timely manner.

Please attach this letter to the Airport Layout Plan and retain it in the airport. We wish you great success in your plans for the development of the airport.

Sincerely;

Patricia Oien,
Lead Capacity Planner
Alaskan Region Airports Division

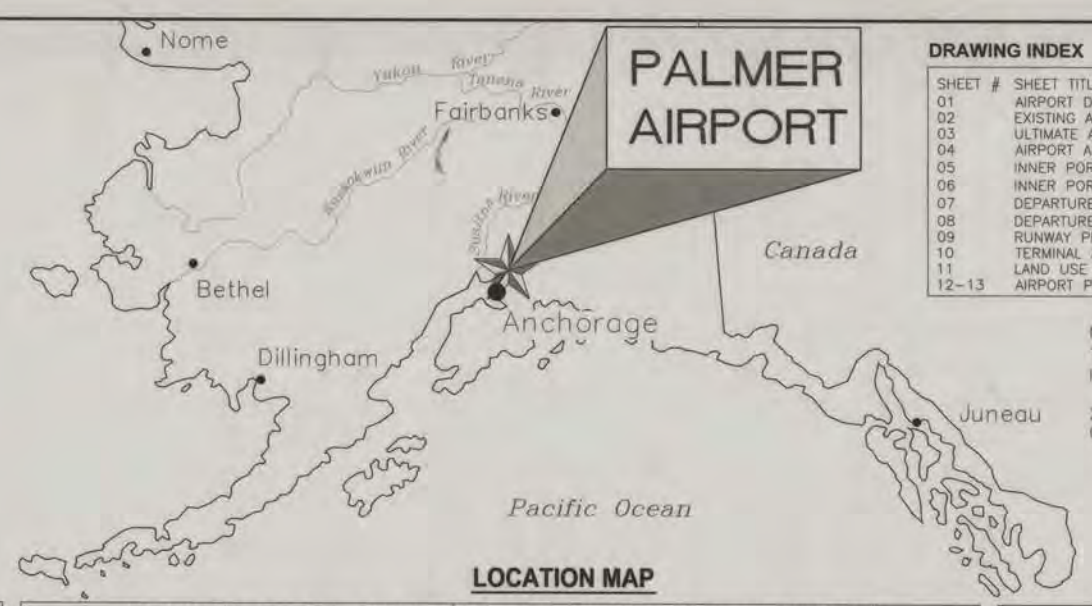
Enclosure:
Signed copy of Airport Layout Plan

cc:
Frank Kelly, Airport Superintendent, Palmer Municipal Airport

PALMER AIRPORT

VICINITY MAP

SCALE: 1" = 1 MILE
ANCHORAGE C-6 QUADRANGLE
ALASKA-MATANUSKA SUSITNA BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)



LOCATION MAP

DRAWING INDEX

SHEET #	SHEET TITLE	REVISION DATE
01	AIRPORT DATA SHEET	8/2/2016
02	EXISTING AIRPORT LAYOUT PLAN	
03	ULTIMATE AIRPORT LAYOUT PLAN	
04	AIRPORT AIRSPACE	
05	INNER PORTION OF THE APPROACH SURFACE – RW 16/34	
06	INNER PORTION OF THE APPROACH SURFACE – RW 9/27	
07	DEPARTURE SURFACE – RW 16/34	
08	DEPARTURE SURFACE – RW 9/27	
09	RUNWAY PROFILES	
10	TERMINAL AREA	
11	LAND USE DRAWING	
12-13	AIRPORT PROPERTY MAP AND TABLE	

NOTES:
1. ALL LATITUDE/LONGITUDE COORDINATES ARE GIVEN IN NORTH AMERICAN DATUM OF 1983 (2011).
2. ALL ELEVATIONS GIVEN IN NAVD88 VERTICAL CONTROL DATUM.

LEGEND

	EXISTING	PROPOSED
AIRPORT REFERENCE POINT (ARP)		SAME
CONTOURS		SAME
WIND CONE AND SEGMENTED CIRCLE		SAME
FENCE		
BUILDING RESTRICTION LINE (BRL)	BRL	SAME
RUNWAY PROTECTION ZONE (RPZ)		RPZ
RUNWAY OBSTACLE FREE ZONE (OFZ)		OFZ
RUNWAY OBJECT FREE AREA (OFA)		OFA
RUNWAY SAFETY AREA (RSA)		RSA
TAXIWAY OBJECT FREE AREA (TOFA)		OFA
TAXIWAY SAFETY AREA (TSA)		TSA
POWERPOLE		SAME
DISTANCE TO GO SIGN		SAME
RUNWAY MARKING SIGN		SAME
RUNWAY THRESHOLD LIGHTS		SAME
REIL		REIL□
VASI	VASI 8	SAME
PAPI	PAPI	SAME
RAIL ROAD		SAME
ROTATING BEACON		SAME
ROTATING BEAM CEILOMETER	RBC	SAME
ANEMOMETER	ANEM	SAME
AIRFIELD PAVEMENT		
GRAVEL RUNWAY		SAME
PROPOSED PROPERTY AQUISITION	NA	
PROPERTY LINE		
STORM DRAIN	SD	SAME
PROPOSED AVIGATION EASEMENT	NA	
LAND USE CHANGE	NA	

RUNWAY 16-34 DATA

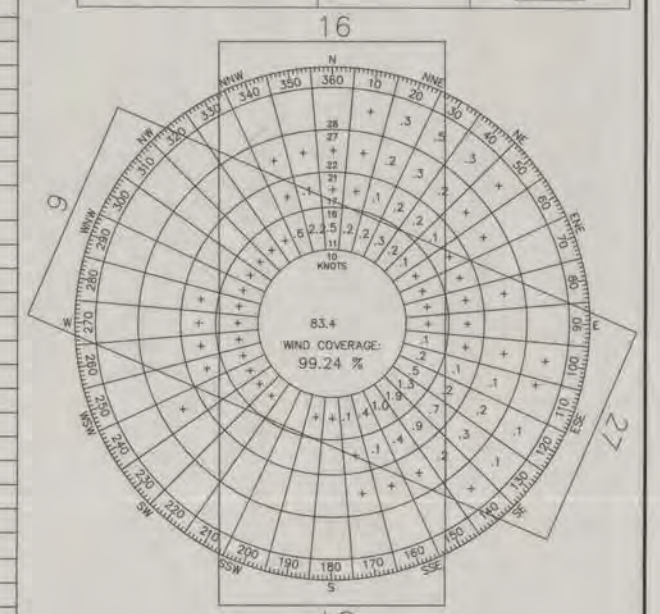
PARAMETER	EXISTING	NEAR TERM	ULTIMATE
UTILITY	NO	SAME	SAME
RUNWAY DESIGN CODE (RDC)	B-III-VIS	SAME	SAME
APPROACH REFERENCE CODE (APRC)	D-IV-VIS, D-V-VIS	SAME	SAME
DEPARTURE REFERENCE CODE (DPRC)	D-IV, D-V	SAME	SAME
% WIND COVERAGE	SEE WIND ROSE	SAME	SAME
RUNWAY MATERIAL	FLEXIBLE PAVEMENT	SAME	SAME
PAVEMENT STRENGTH	>75,000 LBS	SAME	SAME
PCN STRENGTH	18/F/B/Y/U	SAME	SAME
SURFACE TREATMENT	NO	SAME	SAME
MAXIMUM LONGITUDINAL GRADE	1.98%	SAME	SAME
DIMENSIONS	100'X6,009'	SAME	SAME
RUNWAY TOUCHDOWN ZONE ELEVATION	246.00-234.15	SAME	SAME
RUNWAY HIGH AND LOW ELEVATIONS	246.00-220.02	SAME	SAME
DISPLACED THRESHOLD ELEVATION	246.0000	SAME	SAME
RUNWAY END COORDINATES	16: N61°36'14.36"W, N149°05'14.99"W 34: N61°35'15.19"W, N149°05'14.62"W		
RUNWAY MARKINGS	VISUAL	SAME	SAME
RUNWAY LIGHTING	MIRL	SAME	SAME
PART 77 APPROACH CATEGORY	20:1	SAME	SAME
APPROACH TYPE	NPI	SAME	SAME
VISIBILITY MINIMUM	1 MILE	SAME	SAME
AERONAUTICAL SURVEY REQUIRED	VERTICALLY GUIDED	SAME	SAME
RUNWAY DEPARTURE SURFACE	1,000'X6,466'X10,200' @40:1	SAME	SAME
RUNWAY SAFETY AREA	300'X6,709'	300'X7,209'	SAME
RUNWAY OBJECT FREE AREA	680'X7,209'	SAME	800'X7,209'
RUNWAY OBSTACLE FREE ZONE	400'X7,209'	SAME	SAME
RUNWAY PROTECTION ZONE	500'X700'X1,000'	SAME	SAME
THRESHOLD SITING SURFACE	VISUAL	SAME	SAME
VISUAL AND INSTRUMENT NAVAIDS	PAPI	SAME	SAME
TAXIWAY/TAXILANE WIDTH	50'-55'	SAME	SAME
TAXILANE OFA	162'	SAME	SAME
TAXIWAY SAFETY AREA (TSA) WIDTH	118'	SAME	SAME
TAXIWAY OBJECT FREE AREA (TOFA) WIDTH	186'	SAME	SAME
TAXIWAY SEPARATION	-	-	300
TAXIWAY LIGHTING	MITL	SAME	SAME

RUNWAY 9-27 DATA (10-28 NEAR AND ULTIMATE)

PARAMETER	EXISTING	NEAR TERM	ULTIMATE
UTILITY	YES	SAME	SAME
RUNWAY DESIGN CODE (RDC)	B-II(S)-5000	SAME	SAME
APPROACH REFERENCE CODE (APRC)	B-I(S)-5000	SAME	SAME
DEPARTURE REFERENCE CODE (DPRC)	B-I(S)	SAME	SAME
% WIND COVERAGE	SEE WIND ROSE	SAME	SAME
RUNWAY MATERIAL	FLEXIBLE PAVEMENT	SAME	SAME
PAVEMENT STRENGH	>25,000 LBS	SAME	SAME
PCN STRENGTH	2/F/B/Z/U	SAME	SAME
SURFACE TREATMENT	NO	SAME	SAME
MAXIMUM LONGITUDINAL GRADE	2.13%	SAME	SAME
DIMENSIONS	75'X3,617'	SAME	SAME
RUNWAY TOUCHDOWN ZONE ELEVATION	232.01-230.00	SAME	SAME
RUNWAY HIGH AND LOW ELEVATIONS	232.01-226.00	SAME	SAME
DISPLACED THRESHOLD ELEVATION	N/A	SAME	SAME
RUNWAY END COORDINATES	9: N61°35'41.96"W, N149°06'02.32"W 27: N61°35'27.86"W, N149°04'53.67"W		
RUNWAY MARKINGS	VISUAL	SAME	NON-PRECISION/VISUAL
RUNWAY LIGHTING	MIRL	SAME	SAME
PART 77 APPROACH CATEGORY	RW9 34:1/ RW27 20:1	SAME	SAME
APPROACH TYPE	NON-PRECISION/ VISUAL	SAME	SAME
VISIBILITY MINIMUM	1 MILE	SAME	SAME
AERONAUTICAL SURVEY REQUIRED	VERTICALLY GUIDED	SAME	SAME
RUNWAY DEPARTURE SURFACE	RW9 N/A OBSTACLES TO BE CONSISTENT WITH TERMINAL PROCEDURES RW27 1,000'X6,466'X10,200 @40:1	SAME	SAME
RUNWAY SAFETY AREA	150'X4,217'	SAME	SAME
RUNWAY OBJECT FREE AREA	360'X4,217'	500'X4,217'	SAME
RUNWAY OBSTACLE FREE ZONE	250'X4,217'	400'X4,217'	SAME
RUNWAY PROTECTION ZONE	250'X450'X1,000'	500'X700'X1,000'	SAME
THRESHOLD SITING SURFACE	NON-PRECISION/ VISUAL	SAME	SAME
VISUAL AND INSTRUMENT NAVAIDS	PAPI	SAME	SAME
TAXIWAY/TAXILANE WIDTH	35'-40'	SAME	SAME
TAXILANE OFA	115'	SAME	SAME
TAXIWAY SAFETY AREA (TSA) WIDTH	79'	SAME	SAME
TAXIWAY OBJECT FREE AREA (TOFA) WIDTH	131'	SAME	SAME
TAXIWAY SEPARATION	200'	SAME	240'
TAXIWAY LIGHTING	MITL	SAME	SAME

RUNWAY 16S-34S DATA

PARAMETER	EXISTING	NEAR TERM	ULTIMATE
UTILITY	YES	SAME	SAME
RUNWAY DESIGN CODE (RDC)	A-I(S)-VIS	SAME	SAME
APPROACH REFERENCE CODE (APRC)	B-III-VIS, D-II-VIS	SAME	SAME
DEPARTURE REFERENCE CODE (DPRC)	B-III, D-II	SAME	SAME
% WIND COVERAGE	SEE WIND ROSE	SAME	SAME
RUNWAY MATERIAL	GRAVEL	SAME	SAME
PAVEMENT STRENGTH	N/A	SAME	SAME
PCN STRENGTH	N/A	SAME	SAME
SURFACE TREATMENT	N/A	SAME	SAME
MAXIMUM LONGITUDINAL GRADE	1.22%	SAME	SAME
DIMENSIONS	60'X1,560'	SAME	SAME
RUNWAY TOUCHDOWN ZONE ELEVATION	238.05-230.98	SAME	SAME
RUNWAY HIGH AND LOW ELEVATIONS	238.05-230.98	SAME	SAME
DISPLACED THRESHOLD ELEVATION	N/A	SAME	SAME
RUNWAY END COORDINATES	16S: N61°35'53.20"W, N149°05'16.96"W 34S: N61°35'37.83"W, N149°05'16.83"W		
RUNWAY MARKINGS	N/A	SAME	SAME
RUNWAY LIGHTING	NONE	SAME	SAME
PART 77 APPROACH CATEGORY	20:1	SAME	SAME
APPROACH TYPE	VISUAL	SAME	SAME
VISIBILITY MINIMUM	1 MILE	SAME	SAME
AERONAUTICAL SURVEY REQUIRED	NON-VERTICALLY GUIDED	SAME	SAME
RUNWAY DEPARTURE SURFACE	1,000'X6,466'X10,200' @40:1	SAME	SAME
RUNWAY SAFETY AREA	120'X2,040'	SAME	SAME
RUNWAY OBJECT FREE AREA	250'X2,040'	SAME	SAME
RUNWAY OBSTACLE FREE ZONE	70'X2,040'	SAME	SAME
RUNWAY PROTECTION ZONE	250'X450'X1,000'	SAME	SAME
THRESHOLD SITING SURFACE	VISUAL	SAME	SAME
VISUAL AND INSTRUMENT NAVAIDS	N/A	SAME	SAME
TAXIWAY/TAXILANE WIDTH	N/A	SAME	SAME
TAXILANE OFA	N/A	SAME	SAME
TAXIWAY SAFETY AREA (TSA) WIDTH	N/A	SAME	SAME
TAXIWAY OBJECT FREE AREA (TOFA) WIDTH	N/A	SAME	SAME
TAXIWAY SEPARATION	N/A	SAME	SAME
TAXIWAY LIGHTING	N/A	SAME	SAME



RUNWAY 09/27
10.5 KNOT CROSSWIND COMPONENT = 93.07%
13 KNOT CROSSWIND COMPONENT = 95.83%
16 KNOT CROSSWIND COMPONENT = 97.31%
RUNWAY 16/34
10.5 KNOT CROSSWIND COMPONENT = 93.29%
13 KNOT CROSSWIND COMPONENT = 95.96%
16 KNOT CROSSWIND COMPONENT = 97.98%
RUNWAYS 09/27 & 16/34
COMBINED CROSSWIND COVERAGE = 99.24%
RUNWAY 09/27 @ 16 Knots
RUNWAY 16/34 @ 16 Knots
SOURCE: NEVADA DESERT RESEARCH CENTER WIND DATABASE
WIND COLLECTED FROM 2004 TO 2014

AIRPORT DATA TABLE

ITEM	EXISTING	ULTIMATE
AIRPORT REFERENCE CODE (ARC)	B-III	B-III
CRITICAL AIRCRAFT	DOUGLAS DC-4	DOUGLAS DC-4
MEAN MAXIMUM TEMP. HOTTEST MONTH	67.2°F, JULY	67.2°F, JULY
AIRPORT ELEVATION (AMSL)	247.9'	247.9'
AIRPORT NAVIGATIONAL AIDS	BEACON	BEACON
AIRPORT REFERENCE POINT COORDINATES	LAT 61°35'41.69"N LONG 149°05'19.36"W	LAT 61°35'41.69"N LONG 149°05'19.36"W
MAGNETIC DECLINATION, DATE, RATE OF CHANGE	17°54'55"E, NOVEMBER 2014	0°19'12"W/YEAR
NPIAS SERVICE LEVEL	GA	GA
TAXIWAY LIGHTING	MITL	MITL
MISCELLANEOUS FACILITIES	LIGHTED WIND CONE, ASOS, PAPIS, REILS	LIGHTED WIND CONE, ASOS, PAPIS, REILS
NAVAIDS FED	ASOS	ASOS
NAVAIDS CITY	PAPIS, REILS, BEACON, WIND CONE, RW LIGHTING	PAPIS, REILS, BEACON, WIND CONE, RW LIGHTING

DECLARED DISTANCES TABLE

PARAMETER	RUNWAY 16	RUNWAY 34
TAKE OFF RUN AVAILABLE (TORA)	6,009'	6,009'
TAKE OFF DISTANCE AVAILABLE (TODA)	6,009'	6,009'
ACCELERATE STOP DISTANCE AVAILABLE (ASDA)	6,009'	6,009'
LANDING DISTANCE AVAILABLE (LDA)	5,509'	6,009'

MODIFICATION TO STANDARDS APPROVAL TABLE

APPROVAL DATE	AIRSPACE CASE NO.	STANDARD TO BE MODIFIED	DESCRIPTION
NONE			

17° 54' 55" DECLINATION EAST
SOURCE: NGDC MAGNETIC FIELD CALCULATOR MONTH: NOVEMBER 2014
RATE OF CHANGE APPROX 19'12"W PER YEAR

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal
Date of Sponsor Review: 8-2-16
Name & Title of Sponsoring Authority's Representative: Nathan E. Wallace, City Manager
Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number: 2016-AAL-103-NRA
Airport Layout Plan Conditional Approval Subject To
ALP Approval Letter Dated: 8-22-16
BY: DATE: 8-22-16
TITLE: LEAD PLANNER AAL-611.2
FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

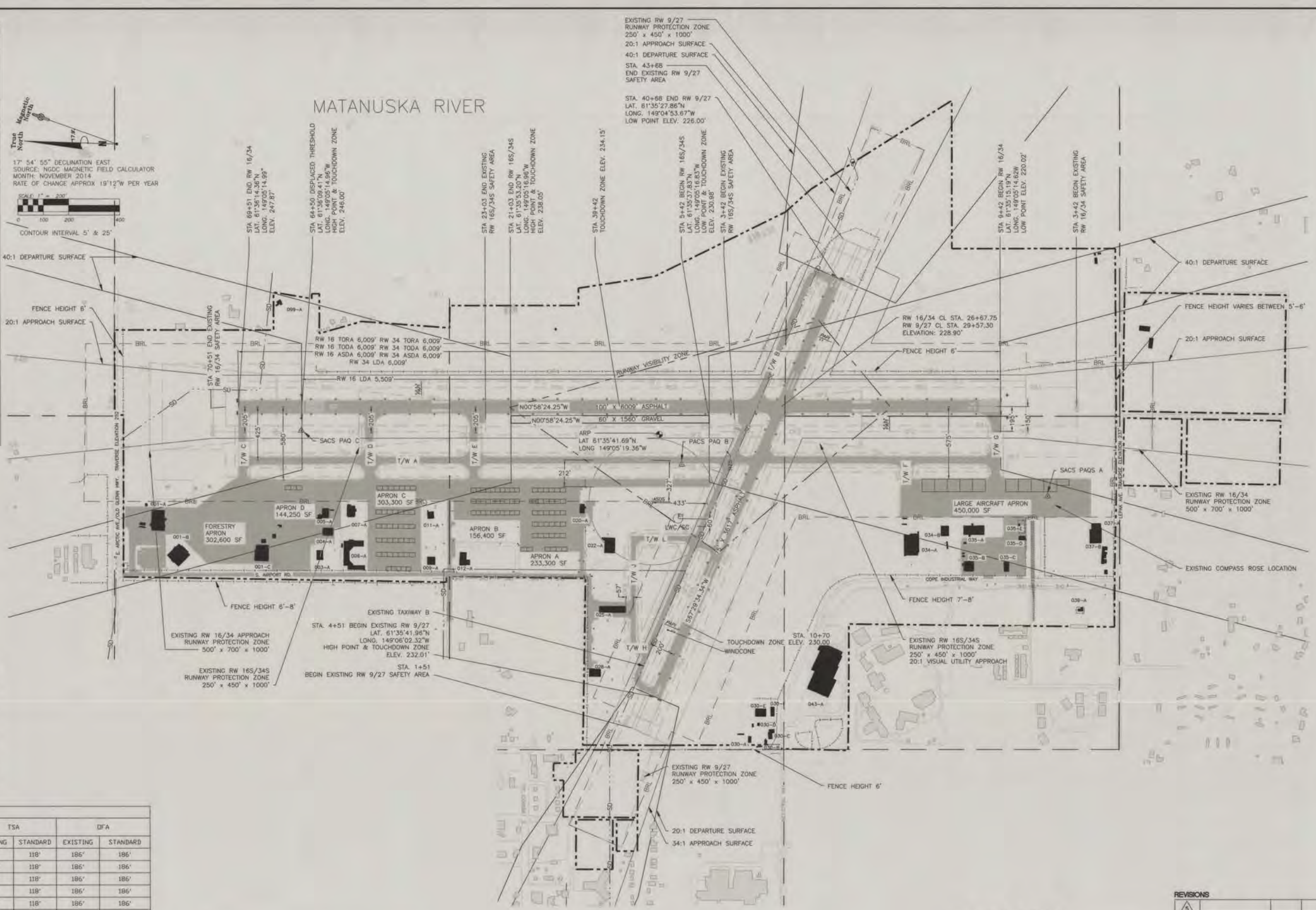
SYMBOL	DESCRIPTION	APPD BY	DATE
5			
4			
3			
2			
1			

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
AIRPORT DATA SHEET
PALMER, ALASKA

DRAWN BY: TCV	ENGINEER: SLH
CHECKED BY: SLH	DATE: 3-29-16
JOB #: 14-015	SHEET #: 1 OF 13

H:\jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_1-AIRPORT_DATA_SHEET, 1=1, 08-02-16 at 10:01 by tlc
LAYOUT: Data Sheet
XREF: 14015_09_ALP_B01

LEGEND	EXISTING	PROPOSED
AIRPORT REFERENCE POINT (ARP)		SAME
CONTOURS		SAME
WIND CONE AND SEGMENTED CIRCLE		SAME
FENCE		SAME
BUILDING RESTRICTION LINE (BRL)	BRL	SAME
RUNWAY PROTECTION ZONE (RPZ)		RPZ
RUNWAY OBSTACLE FREE ZONE (OFZ)		OFZ
RUNWAY OBJECT FREE AREA (OFA)		OFA
RUNWAY SAFETY AREA (RSA)		RSA
TAXIWAY OBJECT FREE AREA (TOFA)		OFA
TAXIWAY SAFETY AREA (TSA)		TSA
POWERPOLE		SAME
DISTANCE TO GO SIGN		SAME
RUNWAY MARKING SIGN		SAME
RUNWAY THRESHOLD LIGHTS		SAME
REIL		REILs
VASI	VASI 8	SAME
PAPI	PAPI	SAME
RAIL ROAD		SAME
ROTATING BEACON		SAME
ROTATING BEAM CEILOMETER	RBC	SAME
ANEMOMETER	ANEM	SAME
AIRFIELD PAVEMENT		SAME
GRAVEL RUNWAY		SAME
PROPOSED PROPERTY AQUISITION	NA	
PROPERTY LINE		SAME
STORM DRAIN	SD	SAME
PROPOSED AVIGATION EASEMENT	NA	
LAND USE CHANGE	NA	



NON-STANDARD CONDITIONS	EXISTING	STANDARD	ULTIMATE
RW 16 SAFETY AREA BEYOND RW END	300	600	600
RW 16/34 OFA WIDTH	680	800	800
RW 9/27 OFA WIDTH	360	500	500
RW 9/27 OFZ WIDTH	250	400	400
RW 16/34 OFZ LENGTH PRIOR TO THRESHOLD	700	200	200
RW 16/34 SEPARATION TO HOLD POS.	100	200	200
RW 9/27 SEPARATION TO HOLD POS.	125	200	200
RW 9/27 SEPARATION TO PARALLEL TW	200	240	240

RUNWAY 16-34 TAXIWAY DATA	WIDTH		TAXIWAY EDGE SAFETY MARGIN	SHOULDER WIDTH		TSA		OFA	
ITEM	EXISTING	STANDARD		EXISTING	STANDARD	EXISTING	STANDARD	EXISTING	STANDARD
T/W A	50'	50'	7.5'	20'	20'	118'	118'	186'	186'
T/W C	60'	50'	7.5'	20'	20'	118'	118'	186'	186'
T/W D	60'	50'	7.5'	20'	20'	118'	118'	186'	186'
T/W E	60'	50'	7.5'	20'	20'	118'	118'	186'	186'
T/W F	60'	50'	7.5'	20'	20'	118'	118'	186'	186'
T/W G	60'	50'	7.5'	20'	20'	118'	118'	186'	186'

RUNWAY 9-27 TAXIWAY DATA	WIDTH		TAXIWAY EDGE SAFETY MARGIN	SHOULDER WIDTH		TSA		OFA	
ITEM	EXISTING	STANDARD		EXISTING	STANDARD	EXISTING	STANDARD	EXISTING	STANDARD
T/W B	40'	35'	7.5'	19'	15'	79'	79'	131'	131'
T/W H	35'	35'	N/A	15'	15'	79'	79'	131'	131'
T/W J	35'	35'	N/A	22'	15'	79'	79'	131'	131'
T/W L	35'	35'	N/A	22'	15'	79'	79'	131'	131'

AIRPORT SURVEY CONTROL				
TYPE	DESIGNATION	NORTHING	EASTING	ELEV.
PACS	PAQ B	2772926.165	1798694.697	-
SACS	PAQ A	2775815.289	1798897.761	-
SACS	PAQ C	2778816.913	1799116.455	-

NAD83 (2011) NAVD88 AKSP2 4F

NOTES:
1. THERE ARE NO ROFZ PENETRATIONS.
2. SEE SHEET 1 FOR RUNWAY DATA TABLE.
3. CROSS WIND COMPONENT IS ON THE TITLE SHEET.
4. RW 16S/34S PART 77 SURFACES ARE WHOLLY CONTAINED WITHIN THE RW 16/34 SURFACES AND ARE NOT SHOWN.
5. NON-STANDARD OFA FOR RUNWAY 16/34 WILL BECOME STANDARD ONCE GOLF COURSE IS RETURNED TO AERONAUTICAL USE, AT WHICH TIME THE FENCE WILL BE RELOCATED.

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal
Date of Sponsor Review: 8-2-16
Name & Title of Sponsoring Authority's Representative: Nathan E Wallace City Manager
Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number: _____
Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated: _____
BY: _____ DATE: _____
TITLE: _____
FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

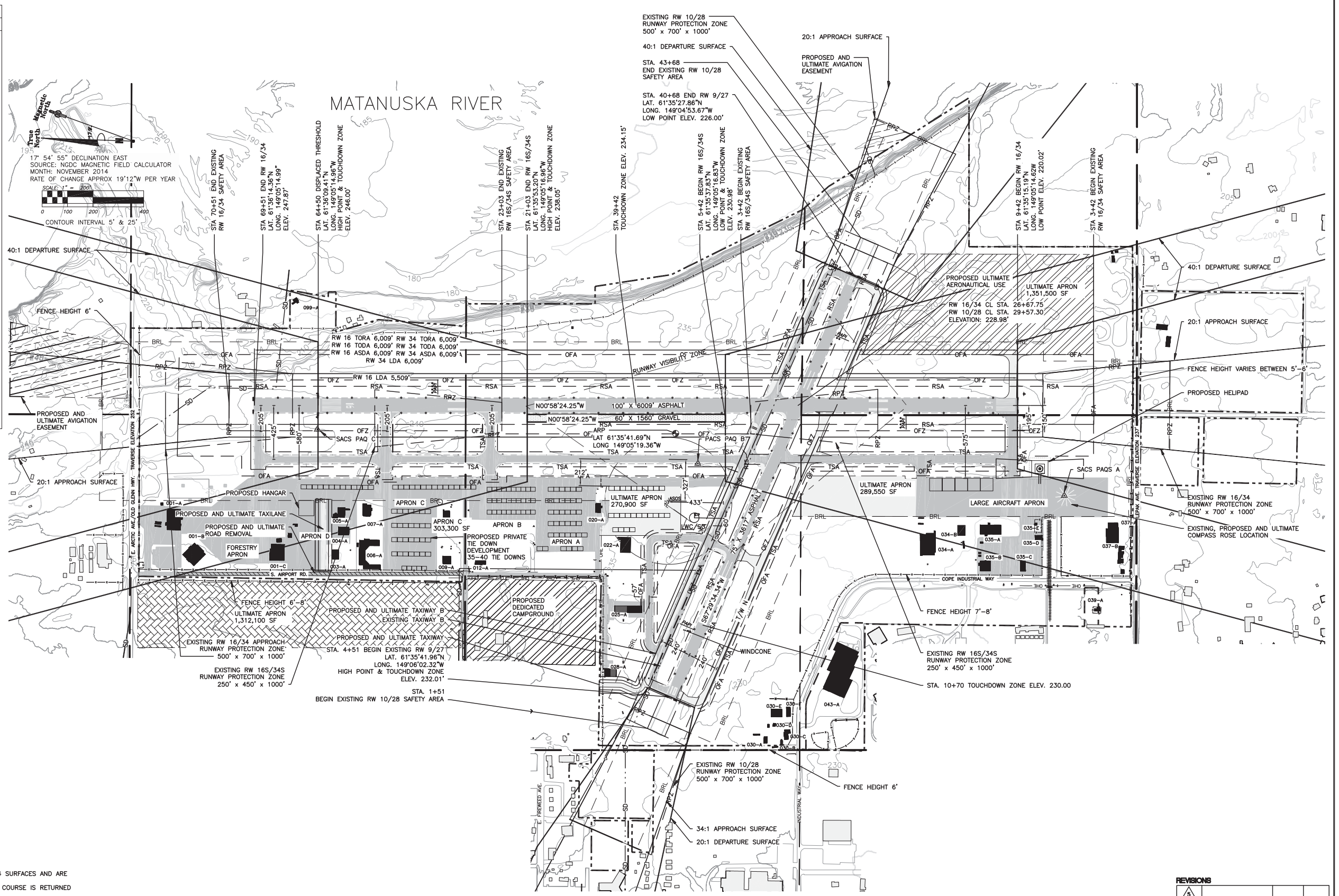
SYMBOL	DESCRIPTION	APPD BY	DATE
5			
4			
3			
2			
1			

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
EXISTING AIRPORT LAYOUT PLAN
PALMER, ALASKA

DRAWN BY: TCV ENGINEER: SLH
CHECKED BY: SLH DATE: 3-29-16
JOB #: 14-015 SHEET #: 2 OF 13

H:\Jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_2-3-AIRPORT_LAYOUT_PLAN, 1=1, 08-02-16 at 10:34 by tlc
LAYOUT: ALP EXST
XREF: 14015_00-X-BUILDINGS, 14015_00-X-PARCEL, 14015_00-XBASE, 14015_00-XBASE-WORKING, 14

LEGEND		
	EXISTING	PROPOSED
AIRPORT REFERENCE POINT (ARP)		SAME
CONTOURS	200	SAME
WIND CONE AND SEGMENTED CIRCLE	P	SAME
FENCE		
BUILDING RESTRICTION LINE (BRL)	BRL	SAME
RUNWAY PROTECTION ZONE (RPZ)	RPZ	RPZ
RUNWAY OBSTACLE FREE ZONE (OFZ)	OFZ	OFZ
RUNWAY OBJECT FREE AREA (OFA)	OFA	OFA
RUNWAY SAFETY AREA (RSA)	RSA	RSA
TAXIWAY OBJECT FREE AREA (TOFA)	OFA	OFA
TAXIWAY SAFETY AREA (TSA)	TSA	TSA
POWERPOLE		SAME
DISTANCE TO GO SIGN		SAME
RUNWAY MARKING SIGN		SAME
RUNWAY THRESHOLD LIGHTS		SAME
REIL		REIL
VASI	VASI 8	SAME
PAPI	PAPI	SAME
RAIL ROAD		SAME
ROTATING BEACON		SAME
ROTATING BEAM CEILOMETER	RBC	SAME
ANEMOMETER	ANEM	SAME
AIRFIELD PAVEMENT		
GRAVEL RUNWAY		SAME
PROPOSED PROPERTY AQUISITION	NA	
PROPERTY LINE		
STORM DRAIN	SD	SAME
PROPOSED AVIGATION EASEMENT	NA	
LAND USE CHANGE	NA	



NON-STANDARD CONDITIONS			
	EXISTING	STANDARD	ULTIMATE
RW 16 SAFETY AREA BEYOND RW END	300	600	600
RW 16/34 OFA WIDTH	680	800	800
RW 9/27 OFA WIDTH	360	500	500
RW 9/27 OFZ WIDTH	250	400	400
RW 16/34 OFZ LENGTH PRIOR TO THRESHOLD	700	200	200
RW 16/34 SEPARATION TO HOLD POS.	100	200	200
RW 9/27 SEPARATION TO HOLD POS.	125	200	200
RW 9/27 SEPARATION TO PARALLEL TW	200	240	240

NOTES:
1. THERE ARE NO ROFZ PENETRATIONS.
2. SEE SHEET 1 FOR RUNWAY DATA TABLE.
3. CROSSWIND COMPONENT IS ON THE TITLE SHEET.
4. RW 16S/34S PART 77 SURFACES ARE WHOLLY CONTAINED WITHIN THE RW 16/34 SURFACES AND ARE NOT SHOWN.
5. NON-STANDARD OFA FOR RUNWAY 16/34 WILL BECOME STANDARD ONCE GOLF COURSE IS RETURNED TO AERONAUTICAL USE, AT WHICH TIME THE FENCE WILL BE RELOCATED.

APPROVAL SIGNATURES

Name of Airport: *Palmer Municipal*

Date of Sponsor Review: _____

Name & Title of Sponsoring Authority's Representative: _____

Signature of Sponsor Submitting ALP to FAA for Review: _____

FAA Airspace Review Number: _____
Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated: _____
BY: _____ *DATE:* _____
TITLE: _____
FAA, Airports Division
Alaska Region, AAL-601

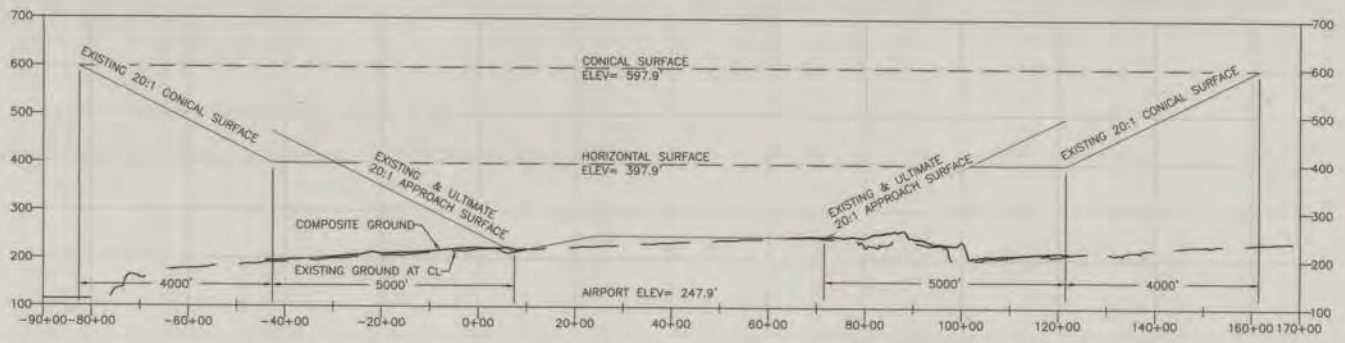
REVISIONS

SYMBOL	DESCRIPTION	APPD BY	DATE
5			
4			
3			
2			
1			

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
ULTIMATE AIRPORT LAYOUT PLAN
PALMER, ALASKA

DRAWN BY: TCV	ENGINEER: SLH
CHECKED BY: SLH	DATE: 3-29-16
JOB #: 14-015	SHEET #: 3 OF 13

H:\Jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_2-3-AIRPORT_LAYOUT_PLAN, 1=1, 08-02-16 at 14:48 by tlc
LAYOUT: ALP ULT
XREF: 14015_00-X-BUILDINGS, 14015_00-X-PARCEL, 14015_00-XBASE, 14015_00-XBASE-WORKING, 14015_09_ALP_B01, PALMER AIRPORT

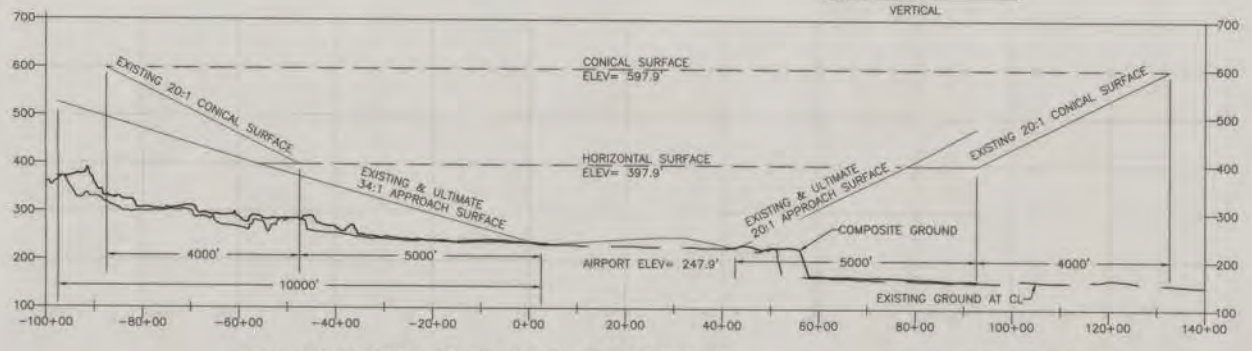


1/3 RUNWAY 16/34 PROFILE

SCALE: 1"=2000'

0 2000 4000
HORIZONTAL

0 100 200
VERTICAL



2/3 RUNWAY 9/27 PROFILE

SCALE: 1"=2000'

0 2000 4000
HORIZONTAL

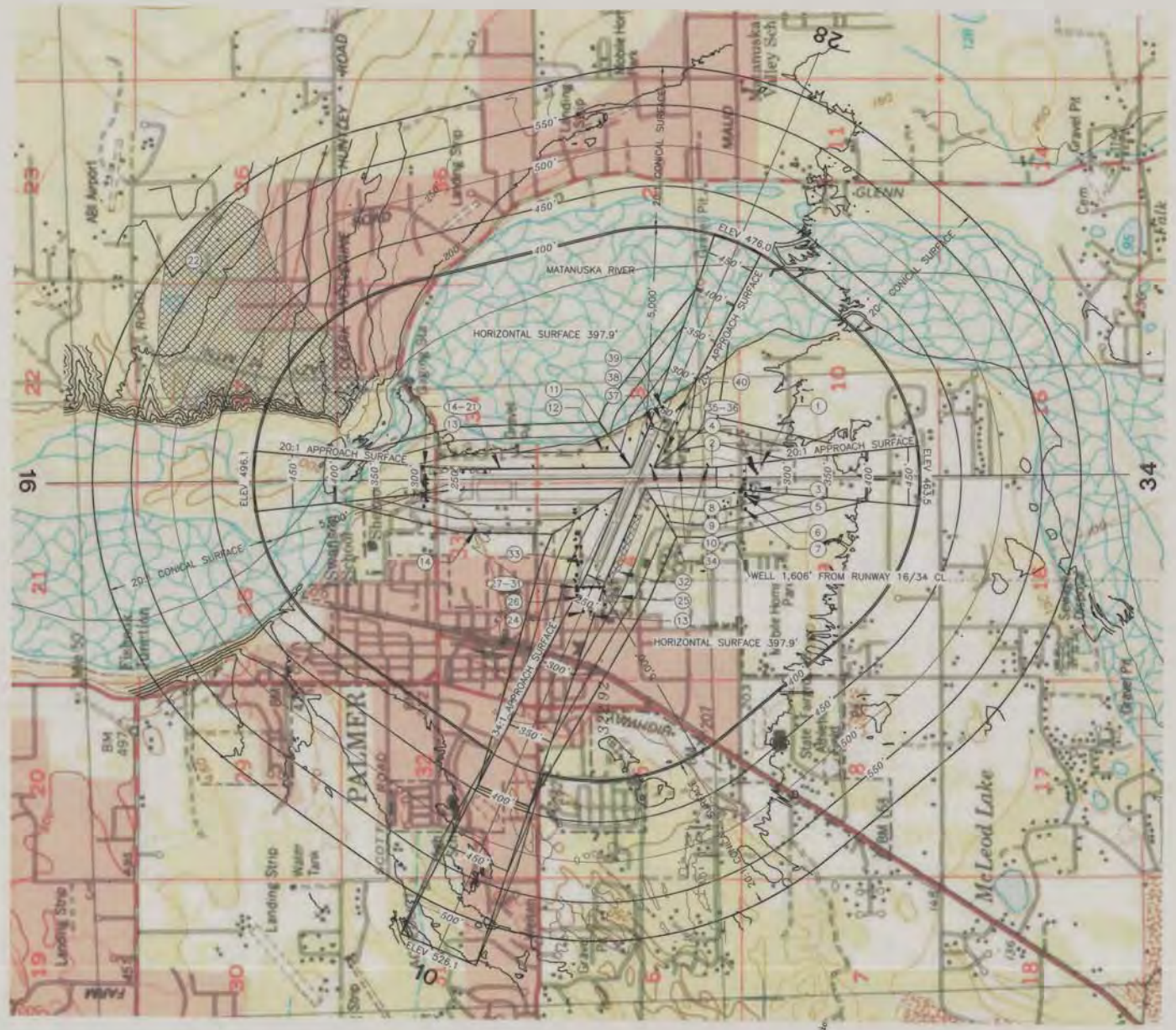
0 100 200
VERTICAL

PART 77 SURFACE TABLE

ID #	DESCRIPTION	STATION OFFSET	ELEVATION	SURFACE PENETRATED	SURFACE ELEVATION	AMOUNT PENETRATION	DISPOSITION	STAGE TO CORRECT
1	TREES	-4+01 TO -3+56 RT/295	278.76'	APPROACH SURFACE	270.00'	8.76'	REMOVE	NEAR TERM
2	TREES	-2+72 TO -2+50 RT/70	245.20'	APPROACH SURFACE	263.59'	-18.39'	REMAIN	-
3	TREES	-2+44 TO -0+86 LT/153	268.38'	APPROACH SURFACE	258.45'	9.93'	REMOVE	NEAR TERM
4	TREES	-2+27 TO -1+81 RT/137	261.35'	APPROACH SURFACE	260.01'	1.34'	REMOVE	NEAR TERM
5	POWER POLE	0+38 LT	258.24'	TRANSITIONAL SURFACE	263.47'	-5.23'	REMAIN	-
6	POWER POLE	0+39 LT	259.30'	TRANSITIONAL SURFACE	268.21'	-8.91'	REMAIN	-
7	POWER POLE	0+40 LT	257.35'	TRANSITIONAL SURFACE	319.47'	-62.12'	REMAIN	-
8	FENCE	0+46 LT	229.98'	APPROACH SURFACE	248.24'	-18.26'	REMAIN	-
9	FENCE	9+39 RT/279	219.90'	TRANSITIONAL SURFACE	222.28'	-2.38'	REMAIN	-
10	FENCE	16+39 RT/279	226.10'	TRANSITIONAL SURFACE	237.93'	-11.83'	REMAIN	-
11	FENCE	28+85 RT/279	233.83'	TRANSITIONAL SURFACE	251.74'	-17.91'	REMAIN	-
12	TREES	34+11 TO 36+41 RT/564	323.96'	TRANSITIONAL SURFACE	300.93'	23.13'	REMOVE	NEAR TERM
13	TREES	60+86 TO 78+30 RT/126	294.53'	APPROACH SURFACE	280.49'	14.04'	REMOVE	NEAR TERM
14	TOWER	67+18 LT/1247	359.52'	TRANSITIONAL SURFACE	388.36'	-28.84'	REMAIN	-
15	FENCE	78+57	243.37'	APPROACH SURFACE	281.82'	-38.45'	REMAIN	-
16	TREES	79+70 LT/129	294.85'	APPROACH SURFACE	287.52'	7.33'	REMOVE	NEAR TERM
17	UTILITY POLE	79+93 LT/385	282.32'	TRANSITIONAL SURFACE	296.03'	-13.71'	REMAIN	-
18	UTILITY POLE	80+01 LT/55	269.51'	APPROACH SURFACE	289.09'	-19.58'	REMAIN	-
19	UTILITY POLE	80+05 RT/268	264.50'	APPROACH SURFACE	289.30'	-24.80'	REMAIN	-
20	TREES	79+46 TO 80+34 RT/37	274.13'	APPROACH SURFACE	288.58'	-14.45'	REMAIN	-
21	TREES	80+50 LT/ 323	324.10'	APPROACH SURFACE	291.73'	32.37'	REMOVE	NEAR TERM
22	LAZY MOUNTAIN	94+27 TO 144+76 RT/1532	623.04'	CONICAL SURFACE	595.45'	-27.59'	REMAIN	-
23	TREES	-7+39 TO -4+51 RT/114	288.22'	APPROACH SURFACE	253.49'	34.73'	REMOVE	NEAR TERM
24	TREES	-6+26 RT/ 34	279.20'	APPROACH SURFACE	256.83'	22.37'	REMOVE	NEAR TERM
25	TREES	-3+77 TO 2+37 RT/282	313.26'	TRANSITIONAL SURFACE	239.84'	73.42'	REMOVE	NEAR TERM
26	TREES	-3+61 TO -2+78 LT/138	293.75'	APPROACH SURFACE	248.25'	45.50'	REMOVE	NEAR TERM
27	TREES	-2+46 TO -1+75 LT/254	292.66'	APPROACH SURFACE	245.46'	47.20'	REMOVE	NEAR TERM
28	UTILITY POLE	-1+82 LT/332	273.12'	TRANSITIONAL SURFACE	251.34'	21.78'	REMAIN	-
29	UTILITY POLE	-1+20 LT/354	272.68'	TRANSITIONAL SURFACE	253.34'	19.34'	REMAIN	-
30	FENCE	-1+02 TO 0+94	242.81'	APPROACH SURFACE	239.19'	3.62'	REMAIN	-
31	TREES	-0+06 LT/442	315.50'	TRANSITIONAL SURFACE	263.98'	51.52'	REMOVE	NEAR TERM
32	TREES	1+21 TO 21+44 RT/223	329.37'	APPROACH SURFACE	234.26'	95.11'	REMOVE	NEAR TERM
33	TREES	4+87 LT/484	255.62'	TRANSITIONAL SURFACE	266.12'	-10.50'	REMAIN	-
34	FENCE	33+41 RT/180	230.26'	PRIMARY SURFACE	247.29'	-17.03'	REMAIN	-
35	TREES	37+42 TO 38+67 RT/312	267.75'	TRANSITIONAL SURFACE	250.29'	17.46'	REMOVE	NEAR TERM
36	FENCE	38+60 RT/180	227.92'	PRIMARY SURFACE	250.29'	-22.37'	REMAIN	-
37	FENCE	43+09 LT/165	228.14'	APPROACH SURFACE	227.96'	0.18'	REMAIN	-
38	FENCE	44+91	224.88'	APPROACH SURFACE	236.76'	-11.88'	REMAIN	-
39	TREES	47+74 TO 48+16 LT/115	268.38'	APPROACH SURFACE	251.00'	17.38'	REMOVE	NEAR TERM
40	TREES	48+13 TO 48+30 RT/242	258.96'	TRANSITIONAL SURFACE	251.15'	7.81'	REMOVE	NEAR TERM

* GREATEST PENETRATION IN A LARGE AREA OF TERRAIN. REFER TO HATCHED AREA ON MAP.

NOTES:
1. 9-27 NUMBERING IS PROPOSED TO BE UPDATED TO 10-28.
2. OBSTRUCTION AREAS IDENTIFIED FROM MATANUSKA SUSITNA BOROUGH LIDAR DATA COLLECTED IN 2009.
3. RW 16S/34S PART 77 SURFACES ARE WHOLLY CONTAINED WITHIN THE RW 16/34 SURFACES AND ARE NOT SHOWN.



3/3 PART 77 AIRSPACE PLAN

SCALE: 1"=2000'

Magnetic North
True North
17.9°

17° 54' 55" DECLINATION EAST
SOURCE: NGDC MAGNETIC FIELD CALCULATOR
MONTH: NOVEMBER 2014
RATE OF CHANGE APPROX 19'12"W PER YEAR

0 2000 4000

CONTOUR INTERVAL 50' & 250'

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal
Date of Sponsor Review: 8-2-16
Name & Title of Sponsoring Authority's Representative: Nathan E. Wallace, City Manager
Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number:
Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated:
BY: DATE:
TITLE:
FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

5			
4			
3			
2			
1			

SYMBOL DESCRIPTION APPD BY DATE

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
AIRPORT AIRSPACE DRAWING
PALMER, ALASKA

DRAWN BY: TCV	ENGINEER: SLH
CHECKED BY: SLH	DATE: 3-29-16
JOB #: 14-015	SHEET #: 4 OF 13

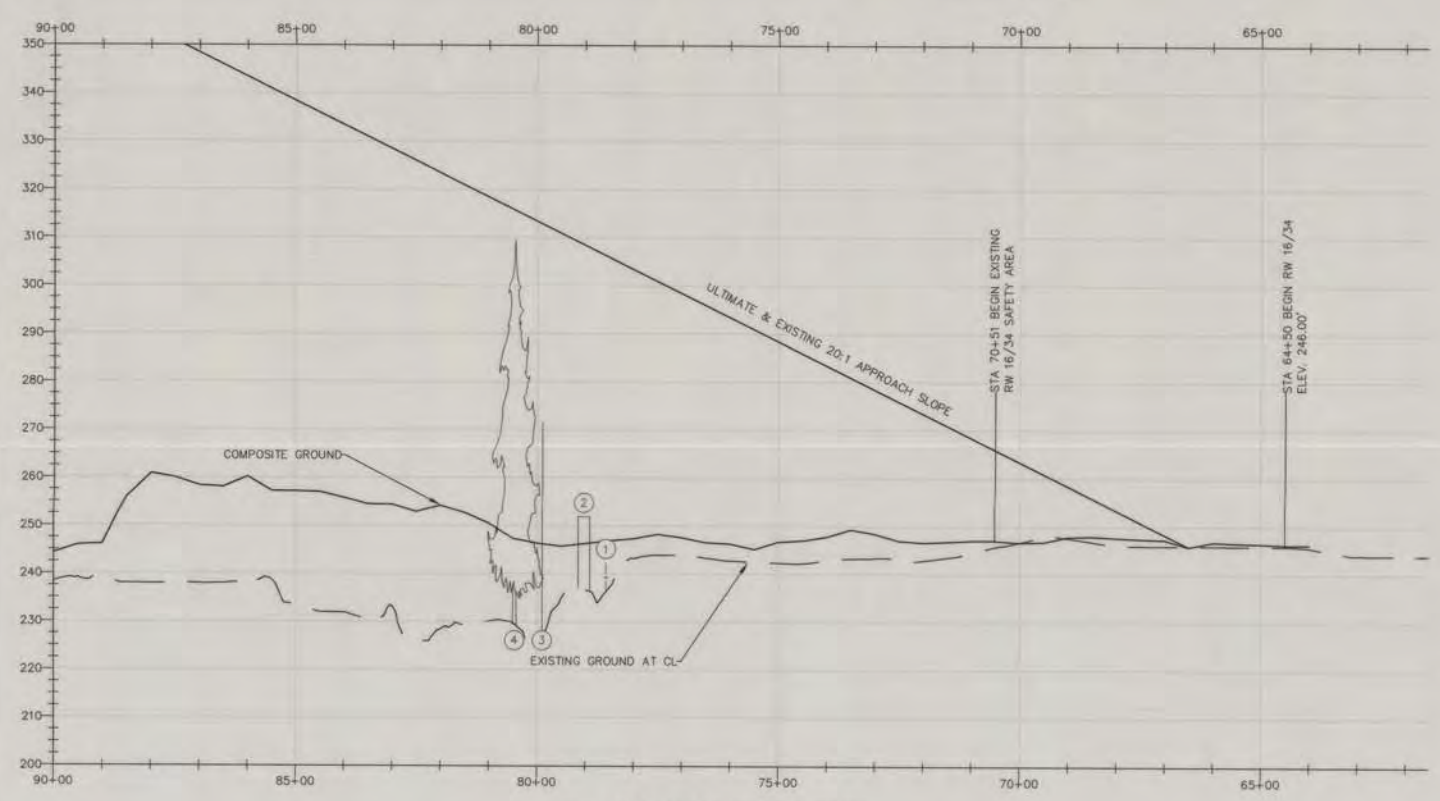
H:\jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_4-AIRPORT_AIRSPACE, 1:1, 08-02-16 at 10:46 by tlc
LAYOUT: AIRSPACE
XREF: 14015_00-XBASE, 14015_09_ALP_B01

1/4 RUNWAY 16 PLAN
SCALE: HORZ: 1"=200'

SCALE 1" = 200'
0 100 200 400
CONTOUR INTERVAL 5' & 25'

2/4 RUNWAY 34 PLAN
SCALE: HORZ: 1"=200'

SCALE 1" = 200'
0 100 200 400
CONTOUR INTERVAL 5' & 25'

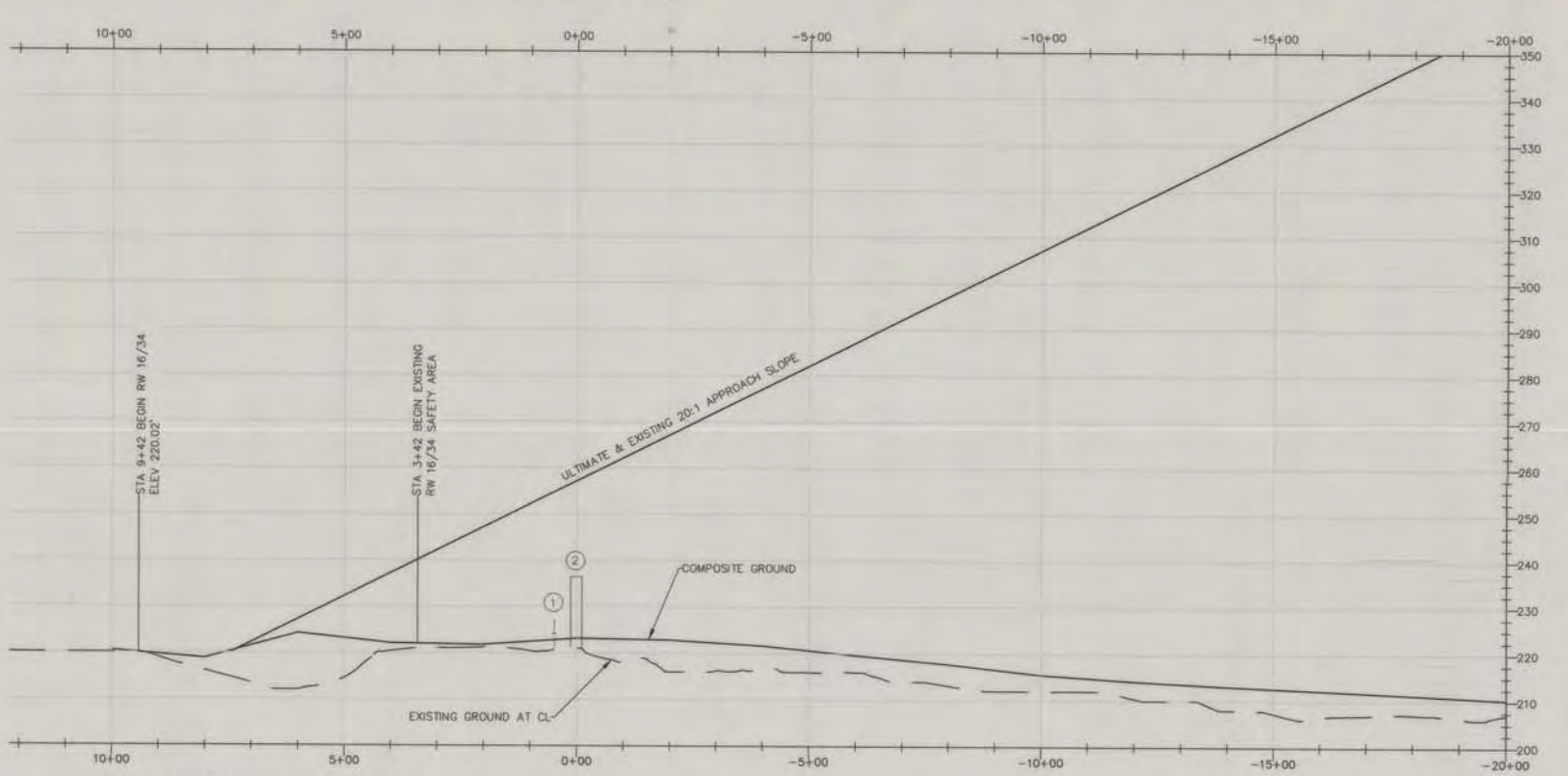


3/4 RUNWAY 16 PROFILE
SCALE: HORZ: 1"=200'

PART 77 SURFACE TABLE (INNER PORTION RW 16)

ID #	DESCRIPTION	STATION/ OFFSET	ELEVATION	SURFACE PENETRATED	SURFACE ELEVATION	AMOUNT PENETRATION	DISPOSITION	STAGE TO CORRECT
1	FENCE	78+57/0	242.30	-	306.25	-63.95	REMAIN	-
2	PUBLIC ROAD	79+02/0	251.95	-	308.53	-56.58	REMAIN	-
3	POWER POLE	79+89/0	271.39	-	312.86	-41.47	REMAIN	-
4	TREES	80+47/0	309.52	-	315.75	-6.23	REMAIN	-

NO OBSTRUCTION SURVEY EXISTS. NEW OBSTRUCTION SURVEY FORTHCOMING IN 2016.



4/4 RUNWAY 34 PROFILE
SCALE: HORZ: 1"=200'

PART 77 SURFACE TABLE (INNER PORTION RW 34)

ID #	DESCRIPTION	STATION/ OFFSET	ELEVATION	SURFACE PENETRATED	SURFACE ELEVATION	AMOUNT PENETRATION	DISPOSITION	STAGE TO CORRECT
1	FENCE	0+48/0	227.22	-	254.84	-27.62	REMAIN	-
2	PUBLIC ROAD	0+01/0	236.47	-	257.19	-20.72	REMAIN	-

NO OBSTRUCTION SURVEY EXISTS. NEW OBSTRUCTION SURVEY FORTHCOMING IN 2016.

NOTES:
1. GOLF COURSE FENCE WILL BE REMOVED ONCE GOLF COURSE IS REVERTED TO AERONAUTICAL USE.
2. OBSTRUCTION AREAS IDENTIFIED FROM MATANUSKA SUSITNA BOROUGH LIDAR DATA COLLECTED IN 2009.

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal
Date of Sponsor Review: 8-2-16
Name & Title of Sponsoring Authority's Representative: Nathan E Wallace, City Manager
Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number:
Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated:
BY: DATE:
TITLE:
FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

SYMBOL	DESCRIPTION	APPD BY	DATE
5			
4			
3			
2			
1			

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
INNER PORTION OF APPROACH SURFACE - RW 16/34
PALMER, ALASKA

DRAWN BY: TCV	ENGINEER: SLH
CHECKED BY: SLH	DATE: 3-29-16
JOB #: 14-015	SHEET #: 5 OF 13

H:\Jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_5&6-INNER_PORTION_OF_APPROACH, 1=200, 08-02-16 at 11:25 by tlc
LAYOUT: INNER PORTION-RW 16
XREF: 14015_00-XBASE, 14015_09_ALP_B01

1/4 RUNWAY 9 PLAN

SCALE: HORZ: 1"=200'

SCALE: 1" = 200'
0 100 200 400

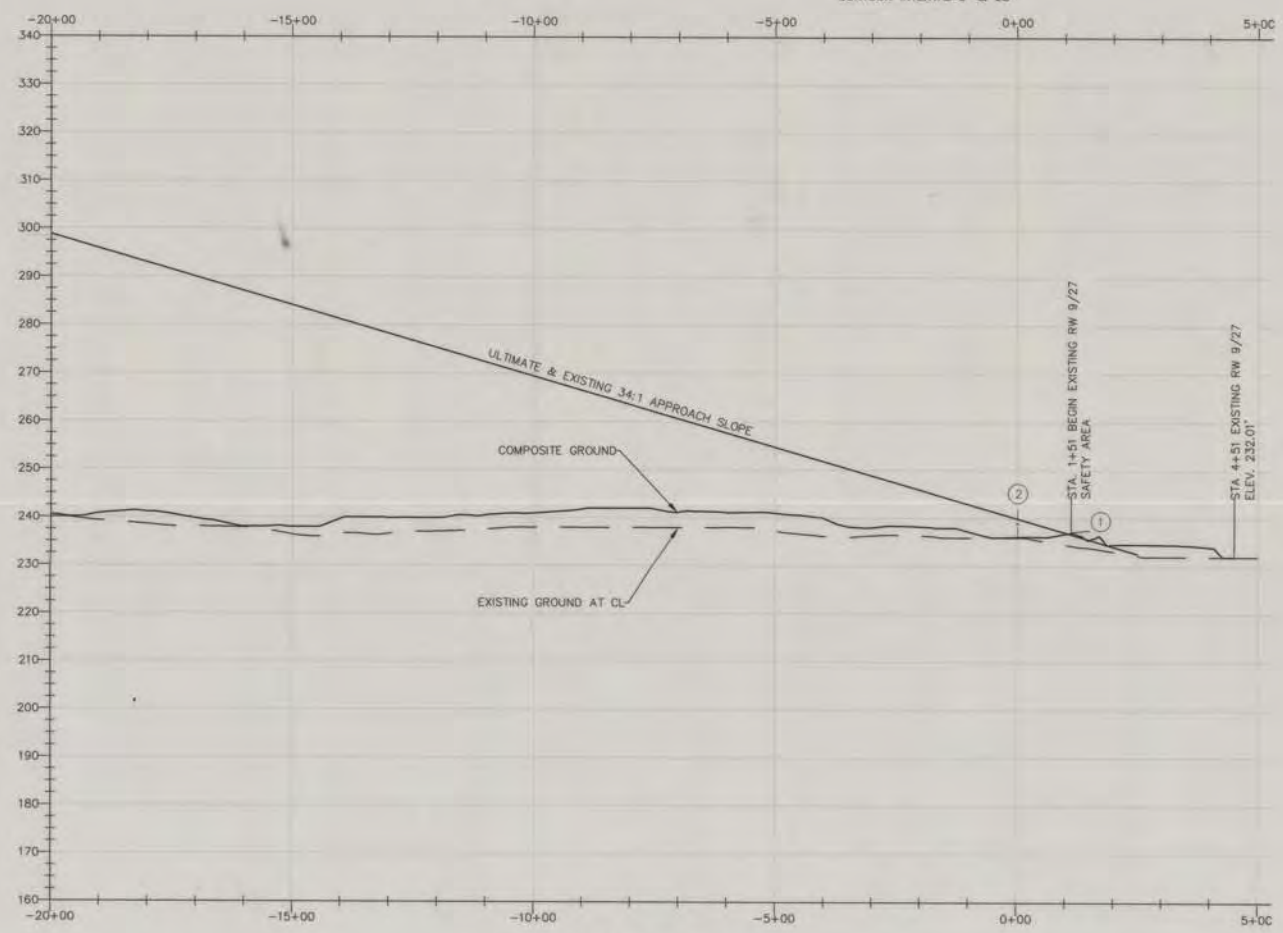
CONTOUR INTERVAL 5' & 25'

2/4 RUNWAY 27 PLAN

SCALE: HORZ: 1"=200'

SCALE: 1" = 200'
0 100 200 400

CONTOUR INTERVAL 5' & 25'



3/4 RUNWAY 9 PROFILE

SCALE: HORZ: 1"=200'

PART 77 SURFACE TABLE (INNER PORTION RW 9)								
ID #	DESCRIPTION	STATION/ OFFSET	ELEVATION	SURFACE PENETRATED	SURFACE ELEVATION	AMOUNT PENETRATION	DISPOSITION	STAGE TO CORRECT
1	HILL	1+05 TO 2+51 LT/175	237.10	APPROACH SURFACE	232.66-236.94	2.00	REMOVE	NEAR TERM
2	FENCE	0+02/0	242.01	-	239.98	2.03	REMAIN	-

NO OBSTRUCTION SURVEY EXISTS. NEW OBSTRUCTION SURVEY FORTHCOMING IN 2016.

4/4 RUNWAY 27 PROFILE

SCALE: HORZ: 1"=200'

PART 77 SURFACE TABLE (INNER PORTION RW 27)								
ID #	DESCRIPTION	STATION/ OFFSET	ELEVATION	SURFACE PENETRATED	SURFACE ELEVATION	AMOUNT PENETRATION	DISPOSITION	STAGE TO CORRECT
1	HILL	42+68 TO 43+52 LT/232	228.99	APPROACH SURFACE	227.07	1.92	REMOVE	NEAR TERM
2	FENCE	44+90/0	225.99	-	238.17	-12.18	REPLACE WITH A FRANGIBLE FENCE	-
3	RIVER	52+34/0	166.33	-	275.4	-109.07	REMAIN	-

NO OBSTRUCTION SURVEY EXISTS. NEW OBSTRUCTION SURVEY FORTHCOMING IN 2016.

NOTES:
1. GOLF COURSE FENCE WILL BE REMOVED ONCE GOLF COURSE IS REVERTED TO AERONAUTICAL USE.
2. OBSTRUCTION AREAS IDENTIFIED FROM MATANUSKA SUSITNA BOROUGH LIDAR DATA COLLECTED IN 2009.

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal
Date of Sponsor Review: 8-2-16
Name & Title of Sponsoring Authority's Representative: William E. Wilcox, City Manager
Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number:
Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated:
BY: DATE:
TITLE:
FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

5			
4			
3			
2			
1			

SYMBOL DESCRIPTION APPD BY DATE

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
INNER PORTION OF APPROACH SURFACE - RW 16/34
PALMER, ALASKA

DRAWN BY: TCV ENGINEER: SLH
CHECKED BY: SLH DATE: 3-29-16
JOB #: 14-015 SHEET #: 6 OF 13

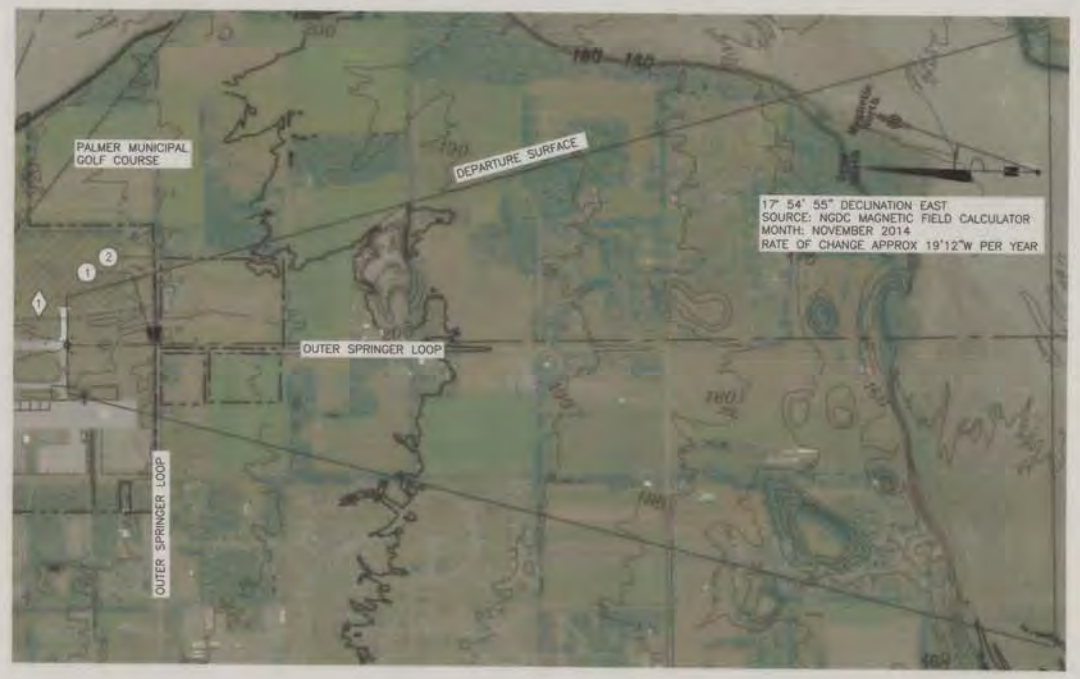
H:\Jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_5&6-INNER_PORTION_OF_APPROACH, 1=200, 08-02-16 at 11:25 by tlc
LAYOUT: INNER PORTION-RW 9
XREF: 14015_00-XBASE, 14015_09_ALP_B01

1/4 RUNWAY 34 PLAN

SCALE: HORZ: 1"=1,000'

SCALE: 1" = 1,000'
0 500 1,000 2,000

CONTOUR INTERVAL 10' & 50'

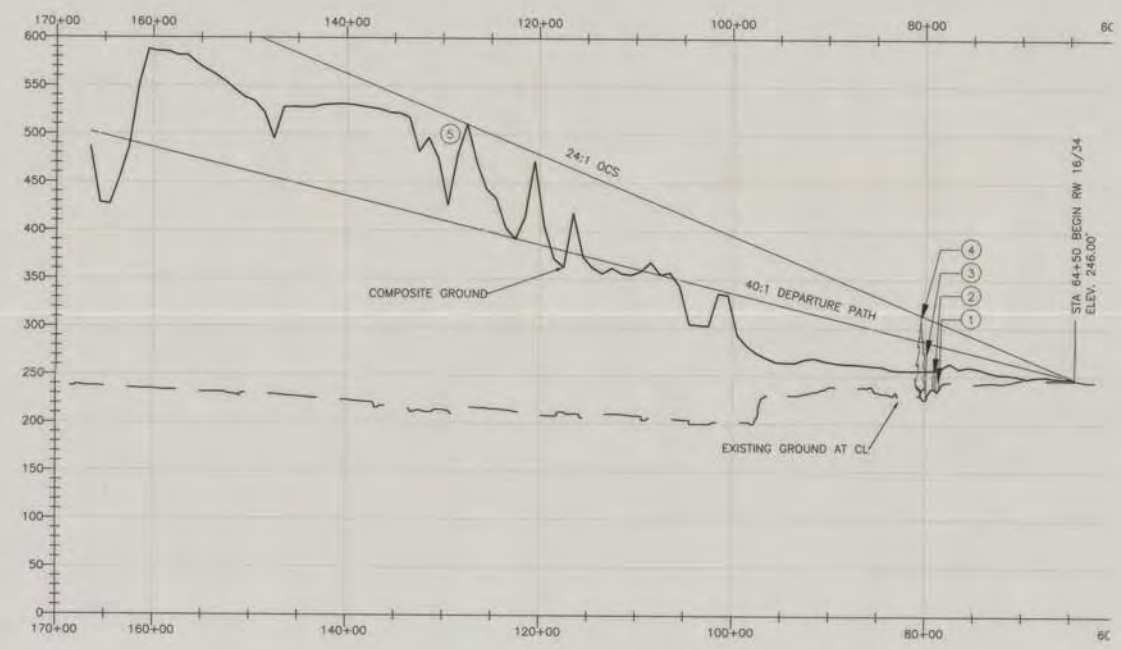


2/4 RUNWAY 16 PLAN

SCALE: HORZ: 1"=1,000'

SCALE: 1" = 1,000'
0 500 1,000 2,000

CONTOUR INTERVAL 10' & 50'



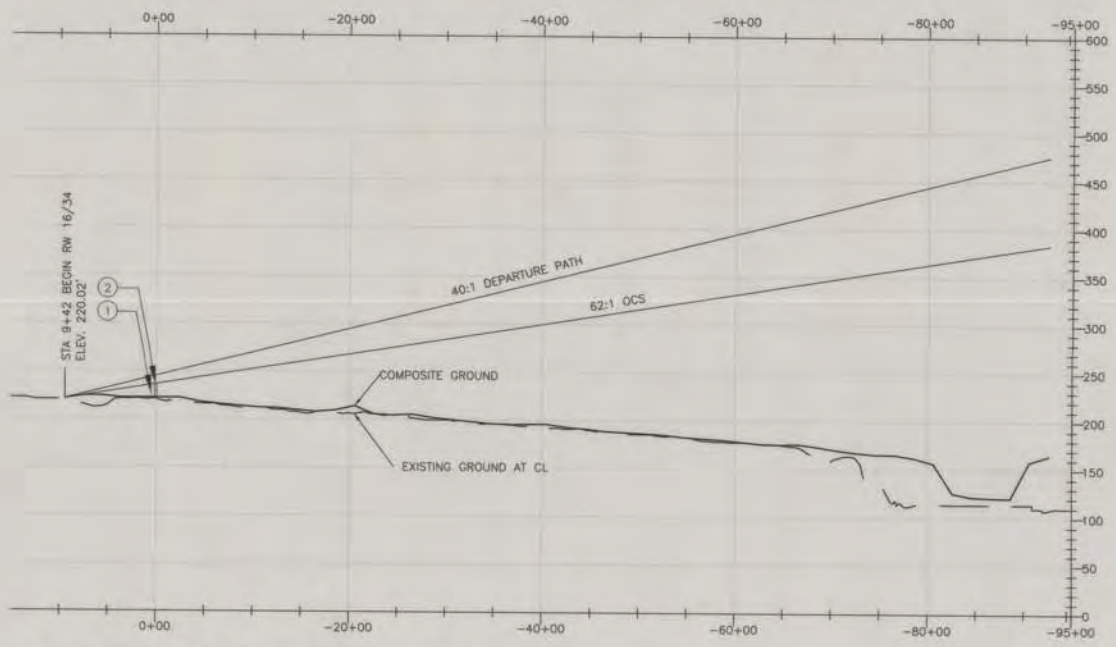
3/4 RUNWAY 34 DEPARTURE PROFILE

SCALE: HORZ: 1"=1000' VERT: 1"= 100'

RUNWAY 34 DEPARTURE CLEARANCES

ID #	DESCRIPTION	STATION/ OFFSET	ELEVATION	SURFACE PENETRATED	SURFACE ELEVATION	AMOUNT PENETRATION	DISPOSITION	STAGE TO CORRECT
1	FENCE	78+57/0	242.3	-	282.62	-40.32	REMAIN	-
2	PUBLIC ROAD	79+02/0	251.95	-	283.76	-31.81	REMAIN	-
3	POWER POLE	79+89/0	271.39	DEPARTURE SURFACE	285.93	-14.54	MOVE POLE OUT OF PART 77 SURFACE	-
4	TREES	80+47/0	309.53	DEPARTURE SURFACE	287.37	22.16	TRIM TREES OUT OF PART 77 SURFACE	-
5	LAZY MOUNTAIN	106+10 TO 162+41 RT/1300	510.88	DEPARTURE SURFACE	351.48-492.23	105.93	REMAIN	-

NO OBSTRUCTION SURVEY EXISTS. NEW OBSTRUCTION SURVEY FORTHCOMING IN 2016.



4/4 RUNWAY 16 DEPARTURE PROFILE

SCALE: HORZ: 1"=1000' VERT: 1"= 100'

RUNWAY 16 DEPARTURE CLEARANCES

ID #	DESCRIPTION	STATION/ OFFSET	ELEVATION	SURFACE PENETRATED	SURFACE ELEVATION	AMOUNT PENETRATION	DISPOSITION	STAGE TO CORRECT
1	FENCE	0+48/0	227.22	-	243.55	-16.33	REMAIN	-
2	PUBLIC ROAD	0+01/0	236.47	-	244.73	-8.26	REMAIN	-

NO OBSTRUCTION SURVEY EXISTS. NEW OBSTRUCTION SURVEY FORTHCOMING IN 2016.

NOTES:
1. GOLF COURSE FENCE WILL BE REMOVED ONCE GOLF COURSE IS REVERTED TO AERONAUTICAL USE.
2. OBSTRUCTION AREAS IDENTIFIED FROM MATANUSKA SUSITNA BOROUGH LIDAR DATA COLLECTED IN 2009.

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal

Date of Sponsor Review: 8-2-16

Name & Title of Sponsoring Authority's Representative: City Manager, Nathan E. Wilson

Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number: _____

Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated: _____

BY: _____ *DATE:* _____

TITLE: _____

FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

5			
4			
3			
2			
1			

SYMBOL DESCRIPTION APPD BY DATE

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
DEPARTURE SURFACE RW 16/34
PALMER, ALASKA

DRAWN BY: TCV ENGINEER: SLH
CHECKED BY: SLH DATE: 3-29-16
JOB #: 14-015 SHEET #: 7 OF 13

H:\jobs\14-015 Palmer Airport Master Plan (CCP)\CAD\DRAWINGS\14015_09_ALP_7_DEPARTURE 16-34, 1=1, 08-02-16 at 12:49 by tlc
LAYOUT: 1634
XREF: AIRPORT, BD01

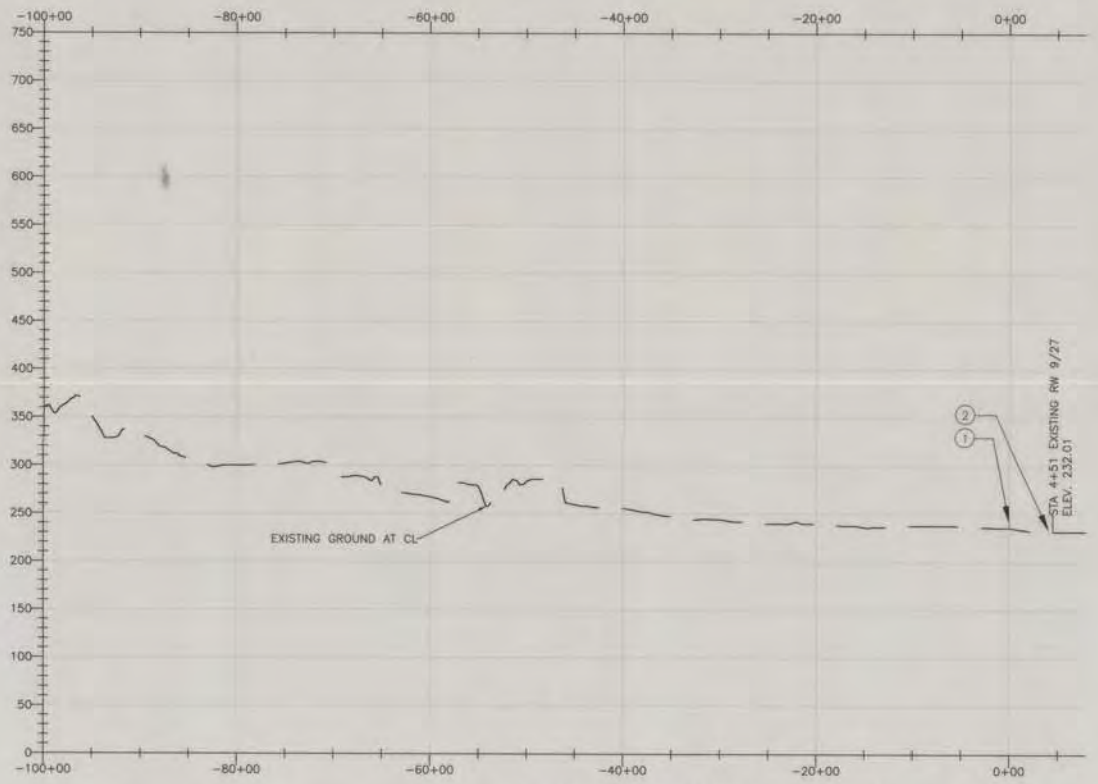
NOTES:
RUNWAY 27 DEPARTURE SURFACE NOT AVAILABLE FOR THIS RUNWAY.

1/4 RUNWAY 27 PLAN

SCALE: HORZ: 1"=1,000'

SCALE: 1" = 1,000'
0 500 1,000 2,000

CONTOUR INTERVAL 10' & 50'



3/4 RUNWAY 27 DEPARTURE PROFILE

SCALE: HORZ: 1"=1000' VERT: 1"= 100'

RUNWAY 27 DEPARTURE CLEARANCES

ID #	DESCRIPTION	STATION/ OFFSET	ELEVATION	SURFACE PENETRATED	SURFACE ELEVATION	AMOUNT PENETRATION	DISPOSITION	STAGE TO CORRECT
1	FENCE	0+02/0	242.01	-	254.46	-	REMAIN	-
2	HILL	4+09 LT/208	234.00	-	234.11	-	REMAIN	-

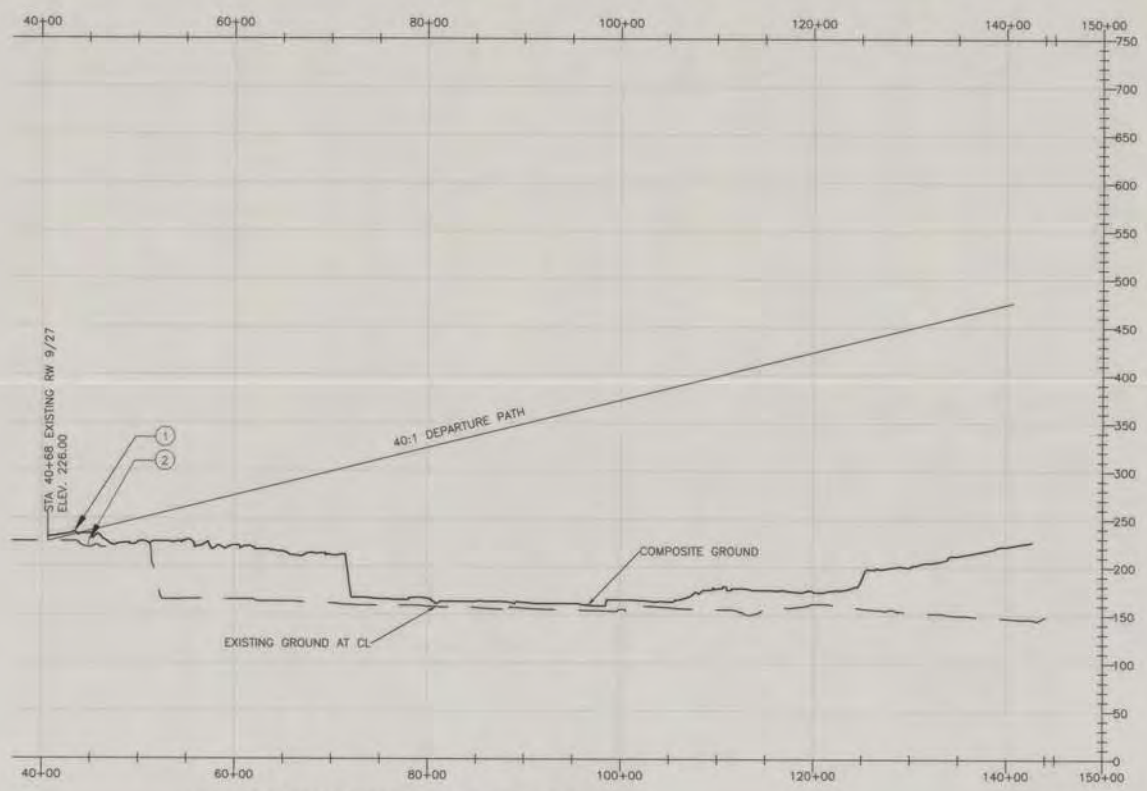
NO OBSTRUCTION SURVEY EXISTS. NEW OBSTRUCTION SURVEY FORTHCOMING IN 2016.

2/4 RUNWAY 9 PLAN

SCALE: HORZ: 1"=1,000'

SCALE: 1" = 1,000'
0 500 1,000 2,000

CONTOUR INTERVAL 10' & 50'



4/4 RUNWAY 9 DEPARTURE PROFILE

SCALE: HORZ: 1"=1000' VERT: 1"= 100'

RUNWAY 9 DEPARTURE CLEARANCES

ID #	DESCRIPTION	STATION/ OFFSET	ELEVATION	SURFACE PENETRATED	SURFACE ELEVATION	AMOUNT PENETRATION	DISPOSITION	STAGE TO CORRECT
1	HILL	40+68 TO 43+77 LT/491	231.02	DEPARTURE SURFACE	226.00-233.70	5.02	REMOVE	NEAR TERM
2	FENCE	44+90/0	225.99	-	236.55	-10.56	REPLACE WITH A FRANGIBLE FENCE	-

NO OBSTRUCTION SURVEY EXISTS. NEW OBSTRUCTION SURVEY FORTHCOMING IN 2016.

NOTES:
1. GOLF COURSE FENCE WILL BE REMOVED ONCE GOLF COURSE IS REVERTED TO AERONAUTICAL USE.
2. OBSTRUCTION AREAS IDENTIFIED FROM MATANUSKA SUSITNA BOROUGH LIDAR DATA COLLECTED IN 2009.

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal

Date of Sponsor Review: 8-2-16

Name & Title of Sponsoring Authority's Representative: Nathan E. Wallace, City Manager

Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number:
Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated:
BY: DATE:
TITLE:
FAA, Airports Division
Alaska Region, AAL-601

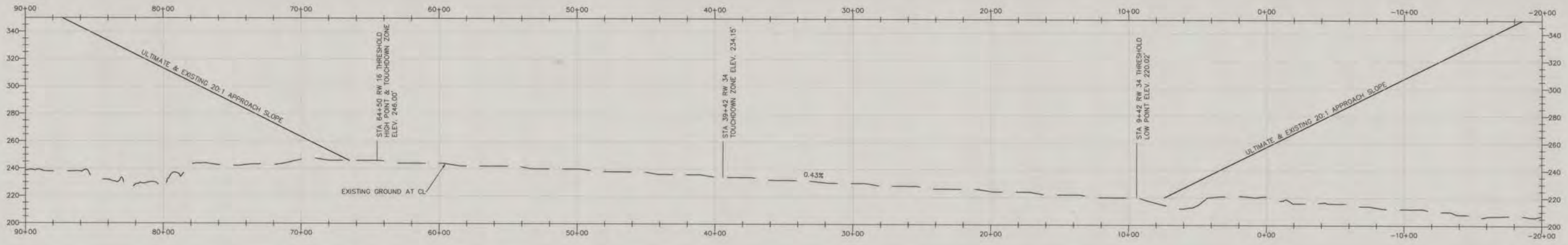
REVISIONS

SYMBOL	DESCRIPTION	APPD BY	DATE
5			
4			
3			
2			
1			

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
DEPARTURE SURFACE RW 9/27
PALMER, ALASKA

DRAWN BY: TCV	ENGINEER: SLH
CHECKED BY: SLH	DATE: 3-29-16
JOB #: 14-015	SHEET #: 8 OF 13

H:\Jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_8_DEPARTURE 9-27, 1=1, 08-02-16 at 13:02 by tlc
LAYOUT: 0927
XREF: AIRPORT, BDO1

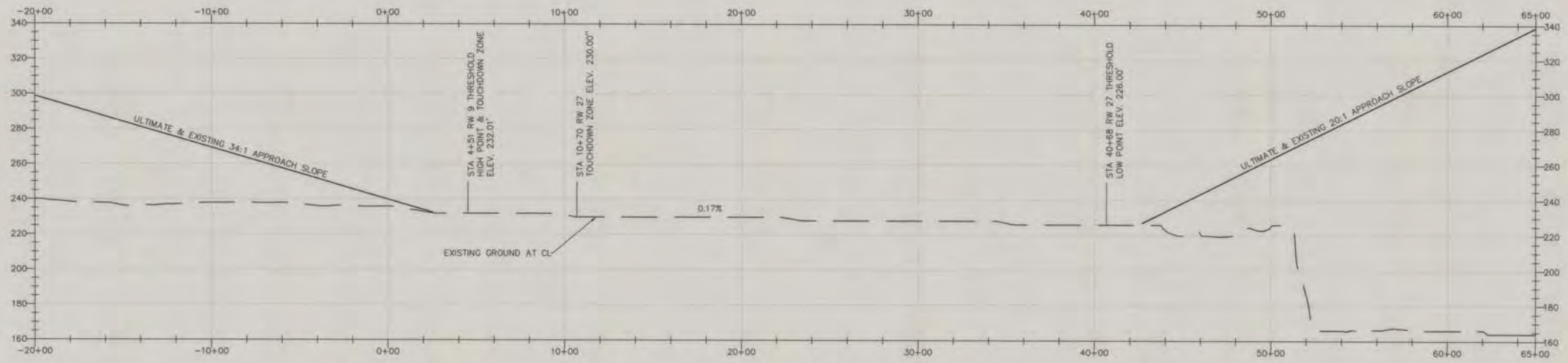


1/3 RUNWAY 16/34 PROFILE

SCALE: 1"=400'

NOTES:
RW 16 TOUCHDOWN ZONE EFFECTIVE GRADE: 0.47%
RW 34 TOUCHDOWN ZONE EFFECTIVE GRADE: 0.47%
RW 16/34 HAS CLEAR LINE OF SIGHT

0 400 800
HORIZONTAL
0 100 200
VERTICAL

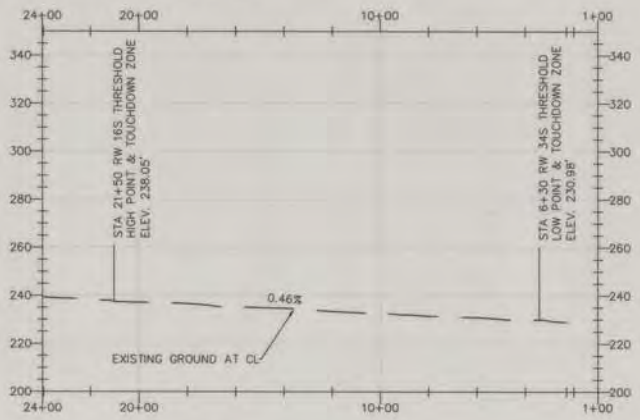


2/3 RUNWAY 9/27 PROFILE

SCALE: 1"=400'

NOTES:
RW 09 TOUCHDOWN ZONE EFFECTIVE GRADE: 0.14%
RW 27 TOUCHDOWN ZONE EFFECTIVE GRADE: 0.13%
RW 09/27 HAS CLEAR LINE OF SIGHT

0 400 800
HORIZONTAL
0 100 200
VERTICAL



3/3 RUNWAY 16S/34S PROFILE

SCALE: 1"=400'

NOTES:
RW 16S TOUCHDOWN ZONE EFFECTIVE GRADE: 0.46%
RW 34S TOUCHDOWN ZONE EFFECTIVE GRADE: 0.46%
RW 16S/34S HAS CLEAR LINE OF SIGHT

0 400 800
HORIZONTAL
0 100 200
VERTICAL

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal
Date of Sponsor Review: 8-2-16
Name & Title of Sponsoring Authority's Representative: Mitch E Walker City Manager
Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number:
Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated:
BY: DATE:
TITLE:
FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

5			
4			
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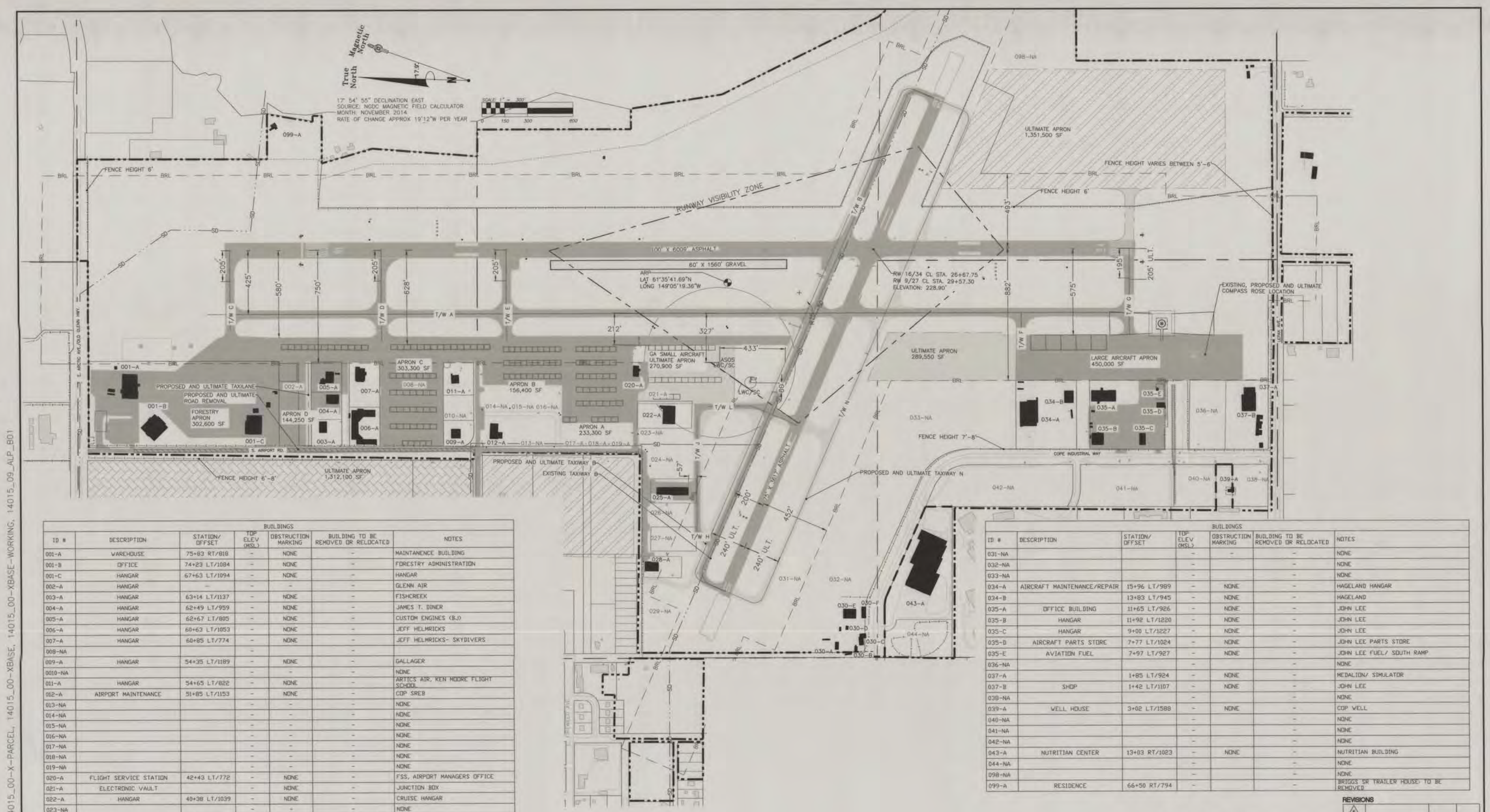
SYMBOL DESCRIPTION APPD BY DATE

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
RUNWAY PROFILES
PALMER, ALASKA

DRAWN BY: TCV	ENGINEER: SLH
CHECKED BY: SLH	DATE: 3-29-16
JOB #: 14-015	SHEET #: 9 OF 13

H:\Jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_9-RUNWAY PROFILES, 1=200, 08-02-16 at 13:14 by tlc
LAYOUT: PROFILES
XREF: 14015_00-XBASE, 14015_09_ALP_B01



BUILDINGS

ID #	DESCRIPTION	STATION/ OFFSET	TOP ELEV (MSL)	OBSTRUCTION MARKING	BUILDING TO BE REMOVED OR RELOCATED	NOTES
001-A	WAREHOUSE	75+83 RT/818	-	NONE	-	MAINTANENCE BUILDING
001-B	OFFICE	74+23 LT/1084	-	NONE	-	FORESTRY ADMINISTRATION
001-C	HANGAR	67+63 LT/1094	-	NONE	-	HANGAR
002-A	HANGAR	-	-	-	-	GLENN AIR
003-A	HANGAR	63+14 LT/1137	-	NONE	-	FISHCREEK
004-A	HANGAR	62+49 LT/959	-	NONE	-	JAMES T. DINER
005-A	HANGAR	62+67 LT/805	-	NONE	-	CUSTOM ENGINES (BJ)
006-A	HANGAR	60+63 LT/1053	-	NONE	-	JEFF HELMRICKS
007-A	HANGAR	60+85 LT/774	-	NONE	-	JEFF HELMRICKS- SKYDIVERS
008-NA			-		-	
009-A	HANGAR	54+35 LT/1189	-	NONE	-	GALLAGER
0010-NA			-	-	-	NONE
011-A	HANGAR	54+65 LT/822	-	NONE	-	ARTICS AIR, KEN MOORE FLIGHT SCHOOL
012-A	AIRPORT MAINTENANCE	51+85 LT/1153	-	NONE	-	COP SREB
013-NA			-	-	-	NONE
014-NA			-	-	-	NONE
015-NA			-	-	-	NONE
016-NA			-	-	-	NONE
017-NA			-	-	-	NONE
018-NA			-	-	-	NONE
019-NA			-	-	-	NONE
020-A	FLIGHT SERVICE STATION	42+43 LT/772	-	NONE	-	FSS, AIRPORT MANAGERS OFFICE
021-A	ELECTRONIC VAULT		-	NONE	-	JUNCTION BOX
022-A	HANGAR	40+38 LT/1039	-	NONE	-	CRUISE HANGAR
023-NA			-	-	-	NONE
024-NA			-	-	-	NONE
025-A	T-HANGARS	9+70 LT/479	-	NONE	-	PALMER HANGAR ASSOCIATION
026-NA			-	-	-	NONE
027-NA			-	-	-	NONE
028-A	STORAGE	4+26 LT/466	-	NONE	-	OLD WOODS HANGAR
029-NA			-	-	-	
030-A	FIRE DEPARTMENT TRAINING AREA	4+59 RT/796	-	NONE	-	STORAGE
030-B	FIRE DEPARTMENT TRAINING AREA	4+82 RT/923	-	NONE	-	BATHROOM
030-C	FIRE DEPARTMENT TRAINING AREA	5+51 RT/924	-	NONE	-	EOC CLASSROOM
030-D	FIRE DEPARTMENT TRAINING AREA	5+84 RT/817	-	NONE	-	TOWER
030-E	FIRE DEPARTMENT TRAINING AREA	6+77 RT/759	-	NONE	-	GARAGE
030-F	FIRE DEPARTMENT TRAINING AREA	7+39 RT/863	-	NONE	-	COMM. DEV. COP

BUILDINGS

ID #	DESCRIPTION	STATION/ OFFSET	TOP ELEV (MSL)	OBSTRUCTION MARKING	BUILDING TO BE REMOVED OR RELOCATED	NOTES
031-NA			-	-	-	NONE
032-NA			-		-	NONE
033-NA			-		-	NONE
034-A	AIRCRAFT MAINTENANCE/REPAIR	15+96 LT/989	-	NONE	-	HAGELAND HANGAR
034-B		13+83 LT/945	-	NONE	-	HAGELAND
035-A	OFFICE BUILDING	11+65 LT/926	-	NONE	-	JOHN LEE
035-B	HANGAR	11+92 LT/1220	-	NONE	-	JOHN LEE
035-C	HANGAR	9+00 LT/1227	-	NONE	-	JOHN LEE
035-D	AIRCRAFT PARTS STORE	7+77 LT/1024	-	NONE	-	JOHN LEE PARTS STORE
035-E	AVIATION FUEL	7+97 LT/927	-	NONE	-	JOHN LEE FUEL/ SOUTH RAMP
036-NA			-		-	NONE
037-A		1+85 LT/924	-	NONE	-	MEDALION/ SIMULATOR
037-B	SHOP	1+42 LT/1107	-	NONE	-	JOHN LEE
038-NA			-		-	NONE
039-A	WELL HOUSE	3+02 LT/1588	-	NONE	-	COP WELL
040-NA			-		-	NONE
041-NA			-		-	NONE
042-NA			-		-	NONE
043-A	NUTRITIAN CENTER	13+03 RT/1023	-	NONE	-	NUTRITIAN BUILDING
044-NA			-		-	NONE
098-NA			-		-	NONE
099-A	RESIDENCE	66+50 RT/794	-		-	BRIGGS SR TRAILER HOUSE- TO BE REMOVED

NOTES:
1. GOLF COURSE FENCE WILL BE REMOVED ONCE GOLF COURSE IS REVERTED TO AERONAUTICAL USE.
2. APRONS A,B & C ARE FOR GA SMALL AIRCRAFT ONLY.

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal
Date of Sponsor Review: 8-2-16
Name & Title of Sponsoring Authority's Representative: Nathan E Welden, City Manager
Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number:
Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated:
BY: DATE:
TITLE:
FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

SYMBOL	DESCRIPTION	APPD BY	DATE
5			
4			
3			
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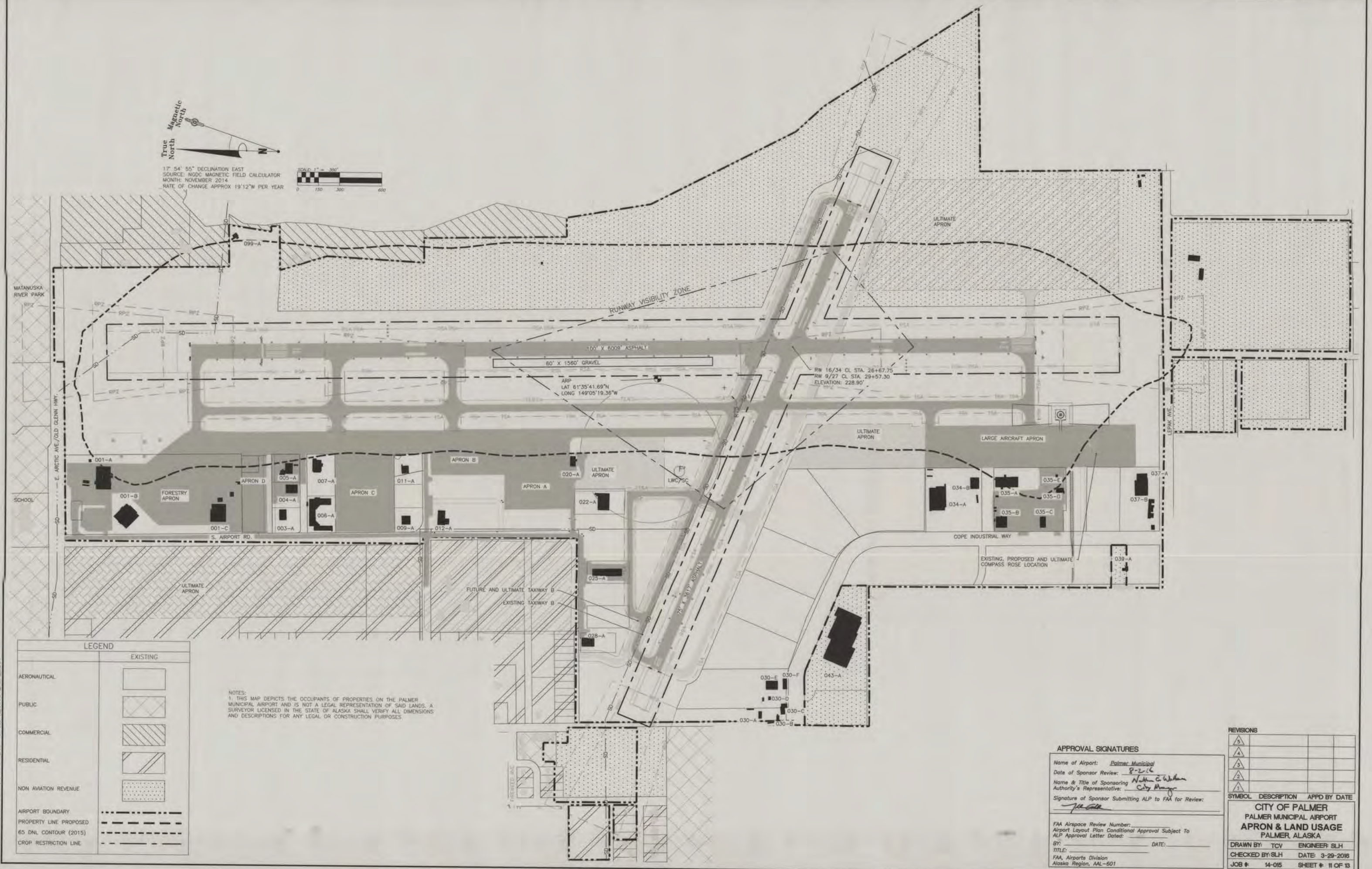
CITY OF PALMER
PALMER MUNICIPAL AIRPORT
TERMINAL AREA
PALMER, ALASKA

DRAWN BY: TCV	ENGINEER: SLH
CHECKED BY: SLH	DATE: 3-29-16
JOB #: 14-015	SHEET #: 10 OF 13

H:\Jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_10_Terminal Area, 1=1
LAYOUT: terminal 1
XREF: 14015_00-X-BUILDINGS, 14015_00-X-PARCEL, 14015_00-XBASE, 14015_00-XBASE-WORKING, 14015_00-X-BUILDINGS, 14015_09_ALP_B01



LEGEND	EXISTING
AERONAUTICAL	
PUBLIC	
COMMERCIAL	
RESIDENTIAL	
NON AVIATION REVENUE	
AIRPORT BOUNDARY	
PROPERTY LINE PROPOSED	
65 DNL CONTOUR (2015)	
CROP RESTRICTION LINE	

NOTES:
1. THIS MAP DEPICTS THE OCCUPANTS OF PROPERTIES ON THE PALMER MUNICIPAL AIRPORT AND IS NOT A LEGAL REPRESENTATION OF SAID LANDS. A SURVEYOR LICENSED IN THE STATE OF ALASKA SHALL VERIFY ALL DIMENSIONS AND DESCRIPTIONS FOR ANY LEGAL OR CONSTRUCTION PURPOSES.

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal
Date of Sponsor Review: 8-2-16
Name & Title of Sponsoring Authority's Representative: Nathan C. Wallace, City Manager
Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number:
Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated:
BY: DATE:
TITLE:
FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

SYMBOL	DESCRIPTION	APPD BY	DATE
5			
4			
3			
2			
1			

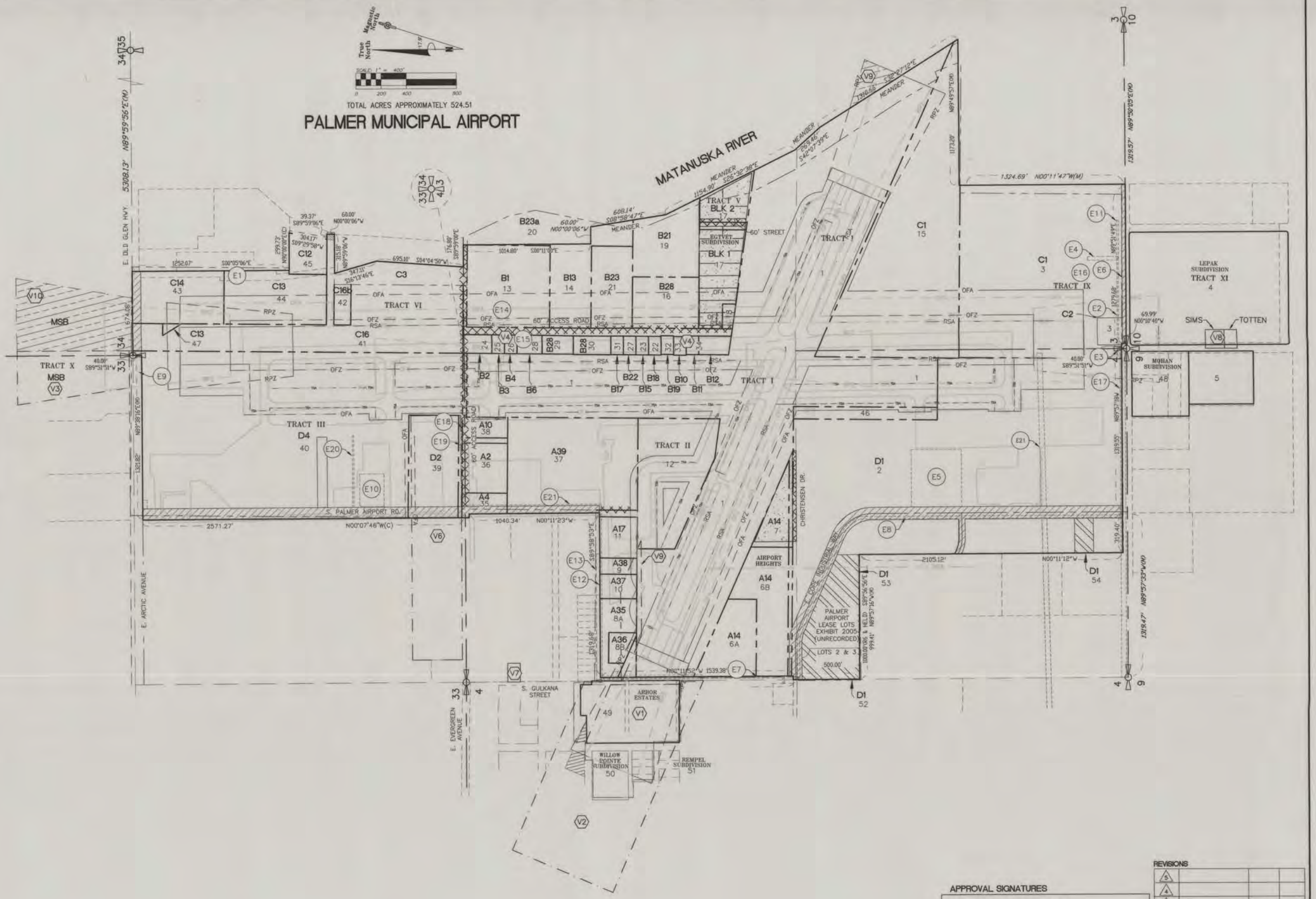
CITY OF PALMER
PALMER MUNICIPAL AIRPORT
APRON & LAND USAGE
PALMER, ALASKA

DRAWN BY:	TCV	ENGINEER:	SLH
CHECKED BY:	SLH	DATE:	3-29-2016
JOB #:	14-015	SHEET #:	11 OF 13

H:\Jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_11-LandUse.tx1, 1:1, 08-02-16 at 13:20 by tlc
LAYOUT: Land use
VIEW: 14015_09-F_01-L.PDF, 01-L_X7700
XREF: 14015_00-XTPARCEL 14015_00-XBASE, Z_05021_ALP_B001

LEGEND	
	EXISTING
PARCEL TO BE REMOVED	
VACATED RIGHT-OF-WAY, PLAT 2006-15	
ELIMINATED, PLAT 2006-15	
DEDICATED RIGHT-OF-WAY	
PROPOSED EASEMENT, 1986	
SECTION CORNER	33 / 34 / 4 / 3
1/4 SECTION CORNER	
EASEMENT INDEX NUMBER	E9
AVIGATION EASEMENT NUMBER	V3
ORIGINAL AIRPORT PARCEL	B11
PARCEL INDEX NUMBER	15
SECTION LINE	
1/4 SECTION LINE	
1/16 SECTION LINE	
AIRPORT EXTERIOR BOUNDARY	
AIRPORT PREVIOUS EXTERIOR	
ORIGINAL PARCELS	
EASEMENT	
AVIGATION EASEMENT	

BOUNDARY DIMENSIONS ARE FROM PLAT 2006-15.



APPROVAL SIGNATURES

Name of Airport: Palmer Municipal

Date of Sponsor Review: 5-2-16

Name & Title of Sponsoring Authority's Representative: Nathan E. Wallace, City Manager

Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number:

Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated:

BY: DATE:

TITLE:

FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

SYMBOL	DESCRIPTION	APPD BY	DATE
5			
4			
3			
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CITY OF PALMER
PALMER MUNICIPAL AIRPORT
AIRPORT PROPERTY MAP EXHIBIT A
PALMER, ALASKA

DRAWN BY: TCV	ENGINEER: SLH
CHECKED BY: SLH	DATE: 3-29-16
JOB #: 14-015	SHEET #: 12 OF 13

H:\Jobs\14-015 Palmer Airport Master Plan (COP)\CAD\DRAWINGS\14015_09_ALP_12&13-10_PALMER-AIRPORT-EXHIBIT A, 1=1, 08-02-16 at 14:20 by tlc
LAYOUT: 1-400
XREF: 14015_00-X-BUILDINGS, 14015_00-X-PARCEL, 14015_00-XBASE, 14015_00-XBASE-WORKING, 14015_09_ALP

INDEX NO.	1980 TRACT	PARCEL	DATE ACQUIRED	GRANT No.	ACREAGE	BOOK/PAGE	LAST NAME	DEED TYPE	PURPOSE OF ACQUISITION
1	I	–	5/10/63	9-50-005-001	112.4	46/108	STATE OF ALASKA	QC DEED	AIRPORT USE
1	I	–	4/15/50	9-50-005-001	127.9	Vol. 9/133	THUMA	QC DEED	AIRPORT USE
2	VIII	D1	7/14/77	5-002-0211-04	–	144/286	LEWIS	W. DEED	AIRPORT USE
3	IX	C2	12/30/75	7-032-0211-02	1.0	93/109	KOCKRITZ	W. DEED	AIRPORT USE
3	VIII	C1	7/13/77	5-002-0211-04	–	211/658	LEWIS	W. DEED	AIRPORT USE
4	XII	Tract A-2	5/2/86	3-02-0211-01	–	465/456	DELAND	W. DEED	AIRPORT USE
5	XII	–	11/24/86	3-02-0211-01	–	498/306	HARRINGTON	W. DEED	AIRPORT USE
6	VIII	(a)A14	8/19/77	UNKNOWN	–	146/567	KIRCHER	W. DEED	AIRPORT USE
6	VIII	(b)A14	8/20/77	UNKNOWN	–	146/567	KIRCHER	W. DEED	AIRPORT USE
7	VIII	LOT 2	3/11/77	UNKNOWN	2.0	136/221	CHRISTENSEN	CONDEMNATION	AIRPORT USE
7	VIII	LOT 1	9/26/75	7-032-0211-02	–	104/716	MCKECHNIE	QC DEED	AIRPORT USE
9	VII	A38	2/11/76	7-032-0211-02	1.0	112/129	SANDVIK	CONDEMNATION	AIRPORT USE
8A	VII	A35	2/6/80	5-002-0211-04	3.3	118/235	WOODS	CONDEMNATION	AIRPORT USE
8B	VII	A36	2/7/80	NOT 04	1.0	118/235	WOODS	CONDEMNATION	AIRPORT USE
10	VII	A37	10/30/74	7-032-0211-02	1.5	90/892	KING	W. DEED	AIRPORT USE
11	VII	A17	4/18/75	7-032-0211-02	2.5	91/867	SAMPSON	W. DEED	AIRPORT USE
12	II	–	5/10/63	9-50-005-001	0.7	930/913	STATE OF ALASKA	W. DEED	AIRPORT USE
13	IV	B1	1/24/75	7-032-0211-02	10.0	94/810	CRIPPEN	W. DEED	AIRPORT USE
14	IV	B13	2/17/75	7-032-0211-02	5.0	111/773	BUZBY	W. DEED	AIRPORT USE
15	VIII	C1	7/13/77	5-002-0211-04	–	144/286	LEWIS	W. DEED	AIRPORT USE
16	IV	B28	8/26/77	5-002-0211-04	–	147/147	LOYER	W. DEED	AIRPORT USE
17	V	LT 1, BLK 2, EGTVET	5/10/75	7-032-0211-02	0.8	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 1, BLK 1, EGTVET	4/30/75	7-032-0211-02	–	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 2, BLK 1, EGTVET	5/1/75	7-032-0211-02	–	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 3, BLK 1, EGTVET	5/2/75	7-032-0211-02	–	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 4, BLK 1, EGTVET	5/3/75	7-032-0211-02	0.6	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 5, BLK 1, EGTVET	5/4/75	7-032-0211-02	0.7	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 6, BLK 1, EGTVET	5/5/75	7-032-0211-02	0.7	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 7, BLK 1,EGTVET	5/6/75	7-032-0211-02	0.8	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 8, BLK 1, EGTVET	5/7/75	7-032-0211-02	0.8	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 9, BLK 1, EGTVET	5/8/75	7-032-0211-02	0.4	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 10, BLK 1, EGTVET	5/9/75	7-032-0211-02	0.4	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 2, BLK 2, EGTVET	5/11/75	7-032-0211-02	0.4	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
17	V	LT 3, BLK 2, EGTVET	5/12/75	7-032-0211-02	0.9	97/260	WEIDEKEHR	W. DEED	AIRPORT USE
18	V	LT 2, BLK 1, EGTVET	3/29/77	5-002-0211-04	0.4	172/824	WIRSCHING	W. DEED	AIRPORT USE
18	V	LT 3, BLK 1, EGTVET	3/29/77	5-002-0211-04	0.4	172/824	WIRSCHING	W. DEED	AIRPORT USE
19	IV	B21	12/10/74	7-032-0211-02	5.8	92/385	HAWKINS	W. DEED	AIRPORT USE
20*	IV	B23a	10/30/78	UNKNOWN	1.0	180/408	WEIDEKEHR	W. DEED	AIRPORT USE
21	IV	B23	8/14/75	7-032-0211-02	6.2	100/549	BRANTON	W. DEED	AIRPORT USE
22	IV	B18	8/26/77	5-002-0211-04	–	147/147	BENSON	W. DEED	AIRPORT USE
23	IV	B15	8/27/77	5-002-0211-04	–	147/147	LOYER	W. DEED	AIRPORT USE
24	IV	B2	2/20/75	7-032-0211-02	0.8	95/132	WIEDEKEHR	W. DEED	AIRPORT USE
25	IV	B5	5/14/75	7-032-0211-02	0.3	97/865	KOSLOSKY	W. DEED	AIRPORT USE
26	IV	B4	3/7/75	7-032-0211-02	0.3	97/134	HERMON	W. DEED	AIRPORT USE
27	IV	B22	5/2/75	7-032-0211-02	0.3	97/868	SEIFERT	W. DEED	AIRPORT USE
28	IV	B6	3/11/77	5-002-0211-04	0.7	138/45	HAMILTON	CONDEMNATION	AIRPORT USE
29	IV	B8	3/11/77	7-032-0211-02	0.9	136/226	LAZY	CONDEMNATION	AIRPORT USE
30	IV	B20	12/29/74	7-032-0211-02	1.0	94/809	ROBERTS	W. DEED	AIRPORT USE
31	IV	B17	3/24/77	5-002-0211-04	0.3	136/231	MCALLISTER	W. DEED	AIRPORT USE
32	IV	B19	4/5/77	5-002-0211-04	0.3	142/22	ELLIOTT	CONDEMNATION	AIRPORT USE
33	IV	B10	7/16/75	7-032-0211-02	0.3	100/547	MAYO	W. DEED	AIRPORT USE
34	IV	B11	3/11/77	UNKNOWN	1.2	136/236	MATANUSKA	CONDEMNATION	AIRPORT USE
34	IV	B12	3/11/77	UNKNOWN	1.2	136/236	MATANUSKA	CONDEMNATION	AIRPORT USE
35	III	A4	10/21/74	7-032-0211-02	1.0	93/114	STACY	W. DEED	AIRPORT USE
36	III	A2	4/23/75	7-032-0211-02	3.0	97/236	ERICKSON	W. DEED	AIRPORT USE
36	III	A2	5/7/75	7-032-0211-02	3.0	98/191	LECKWOLD	QC DEED	AIRPORT USE
37	III	A39	7/17/75	7-032-0211-02	17.7	100/413	WIEDERKEHR	CONDEMNATION	AIRPORT USE
38	III	A10	3/24/75	7-032-0211-02	1.3	95/135	ROOK	W. DEED	AIRPORT USE
39	III	D2	7/11/75	7-032-0211-02	6.8	105/688	SNODGRASS	CONDEMNATION	AIRPORT USE
40	III	D4	7/11/75	7-032-0211-02	72.6	100/418	SNODGRASS	CONDEMNATION	AIRPORT USE
41	X	C3	–	UNKNOWN	4.2	UNKNOWN	HERMON	UNKNOWN	AIRPORT USE
41	VI	C16	10/9/75	7-032-0211-02	20.9	100/418	SNODGRASS	CONDEMNATION	AIRPORT USE
42	VI	C16(b)	10/10/75	7-032-0211-02	1.0	100/418	SNODGRASS	CONDEMNATION	AIRPORT USE
43	VI	C14	1/30/75	7-032-0211-02	7.7	93/580	AKLESTAD	W. DEED	AIRPORT USE
44	VI	C13	12/17/74	7-032-0211-02	8.2	93/110	HERMON	W. DEED	AIRPORT USE
44	VI	C15	12/19/74	7-032-0211-02	–	93/110	HERMON	W. DEED	AIRPORT USE
45	VI	C12	12/19/74	7-032-0211-02	2.2	93/108	ZIMOWSKI	W. DEED	AIRPORT USE
46	I	Tract III	3/10/63	UNKOWN	2.6	46/108	STATE OF ALASKA	QC DEED	AIRPORT USE
47	VI	C16(a)	12/20/74	7-032-0211-02	0.2	93/113	HERMON	W. DEED	AIRPORT USE
48	XIII	LT 5, MOHAN	1/25/94	3-02-0211-01	–	755/107	COWART	W. DEED	AIRPORT USE
48	XIII	LT 1, MOHAN	8/12/94	3-02-0211-01	–	778/346	FRITZ	W. DEED	AIRPORT USE
48	XIII	LT 3, MOHAN	8/17/94	3-02-0211-01	–	778/253	TYSVER	GRANT DEED	AIRPORT USE
48	XIII	LT 4, MOHAN	8/17/94	3-02-0211-01	–	778/253	TYSVER	GRANT DEED	AIRPORT USE
49	XIII	TRACT B, ARBOR	5/26/09	AIP-3-02-0211-014-2009	–	2009-011705-0	UNIV. OF ALASKA	QC DEED	AIRPORT USE
50	XIII	LT 2, WILLOW PT.	7/15/04		–	2004-019118-0	UNIV. OF ALASKA	QC DEED	AIRPORT USE
51	XIII	LT 9, BLK 2, REMPEL	8/11/04		–	2004-023332-0	CONTL VENTURES	W. DEED	AIRPORT USE
51	XIII	LT 10, BLK 2, REMPEL	8/12/04		–	2004-023332-1	CONTL VENTURES	W. DEED	AIRPORT USE
51	XIII	LT 11, BLK 2, REMPEL	8/13/04		–	2004-023332-2	CONTL VENTURES	W. DEED	AIRPORT USE
51	XIII	LT 12, BLK 2, REMPEL	8/14/04		–	2004-023332-3	CONTL VENTURES	W. DEED	AIRPORT USE

* OUTSIDE AIRPORT BOUNDARY

INDEX	PARCEL INDEX	FAA PARCEL	INTEREST	BOOK/PAGE	DATE ACQUIRED	CONVEYANCE	GRANTOR	GRANTEE	PURPOSE OF ACQUISITION
E1	–	–	ROW EASEMENT	204/789	11/9/79	EASEMENT	HERMON	PUBLIC	PUBLIC ACCESS
E2	3	C1	ELECTRIC EASEMENT	211/656	4/9/80	EASEMENT	C.O.P.	M.E.A.	UTILITY SERVICES
E3	2	D1	ELECTRIC EASEMENT	211/658	4/9/80	EASEMENT	C.O.P.	M.E.A.	UTILITY SERVICES
E4	3	C1	ELECTRIC EASEMENT	211/669	4/9/80	EASEMENT	C.O.P.	M.E.A.	UTILITY SERVICES
E5	2	D1	ELECTRIC EASEMENT	254/721	5/12/81	BLANKET EASEMENT	WOODS AIR	M.E.A.	UTILITY SERVICES
E5	2	D1	ELECTRIC EASEMENT	254/722	6/10/81	BLANKET EASEMENT	C.O.P.	M.E.A.	UTILITY SERVICES
E6	3	C1	PUBLIC USE EASEMENT	267/408	6/11/82	QUITCLAIM	LEWIS	PUBLIC	PUBLIC USE
E7	2	D1	ELECTRIC EASEMENT	414/808	4/2/85	EASEMENT	C.O.P.	M.E.A.	UTILITY SERVICES
E8	2	D1	ELECTRIC EASEMENT	448/942	10/18/85	EASEMENT	C.O.P.	M.E.A.	UTILITY SERVICES
E9	40	D4	PUBLIC USE EASEMENT	480/169	7/30/86	EASEMENT	C.O.P.	M.S.B.	PUBLIC ACCESS
E10	40	D4	ELECTRIC EASEMENT	710/698	6/30/92	EASEMENT	HERMON	M.E.A.	UTILITY SERVICES
E11	3	C1	ELECTRIC EASEMENT	825/827	10/19/95	EASEMENT	C.O.P.	M.E.A.	UTILITY SERVICES
E12	–	–	PUBLIC ROW EASEMENT	16 Misc./292	3/25/71	EASEMENT	KING	M.S.B.	PUBLIC ACCESS
E13	–	–	ELECTRIC EASEMENT	38/301	9/13/56	BLANKET EASEMENT	PIPPEL	M.E.A.	UTILITY SERVICES
E14	–	–	ELECTRIC EASEMENT	39/198	10/6/61	BLANKET EASEMENT	STACY	M.E.A.	UTILITY SERVICES
E15	28	B5	ELECTRIC EASEMENT	39/171	6/6/49	BLANKET EASEMENT	GREEN	M.E.A.	UTILITY SERVICES
E15	28	B6	ELECTRIC EASEMENT	142/19	6/23/77	BLANKET EASEMENT	M.E.A.	C.O.P.	UTILITY SERVICES
E16	3	–	ELECTRIC EASEMENT	39/200	5/22/88	BLANKET EASEMENT	KOCKRITZ	M.E.A.	UTILITY SERVICES
E17	2	D1	ELECTRIC EASEMENT	39/201	12/28/55	EASEMENT	THUMA	M.E.A.	UTILITY SERVICES
E18	35	A4	PUBLIC ROW EASEMENT	44/316	12/29/45	EASEMENT	EGTVET	U.S.A.	PUBLIC ACCESS
E18	–	–	EASEMENT VACATION	PLAT2 006-015	2/13/06	VACATION RESOLUTION	–	–	UTILITY SERVICES
E19	39	D2	NAT. GAS EASEMENT	PLAT2 006-015	–	–	–	–	UTILITY SERVICES
E20	40	D4	NAT. GAS EASEMENT	PLAT2 006-016	–	–	–	–	UTILITY SERVICES
E21	2	D1	RAILWAY EASEMENT	466/913	5/12/86	QUITCLAIM DEED	DODDS	C.O.P.	RAILROAD

ID NO.	INTEREST	BOOK/PAGE	DATE ACQUIRED	GRANTOR	GRANTEE	PURPOSE OF ACQUISITION
V1	AVIGATION EASEMENT	44/318	6/23/55	U.S.A	TERR. OF ALASKA	AIRPORT USE
V1	AVIGATION EASEMENT	17 Misc./191	9/16/71	U.A.A.	C.O.P.	AIRPORT USE
V1	AVIGATION EASEMENT	17 Misc./576	9/16/71	U.A.A.	C.O.P.	AIRPORT USE
V2	AVIGATION EASEMENT	44/334	9/22/52	GRANGE NO. 1	TERR. OF ALASKA	AIRPORT USE
V2	AVIGATION EASEMENT	44/341	9/23/52	MVFC. ASSN.	TERR. OF ALASKA	AIRPORT USE
V2	AVIGATION EASEMENT	44/344	10/13/52	ARR CORP.	TERR. OF ALASKA	AIRPORT USE
V3	AVIGATION EASEMENT	480/166	8/7/86	MAT-SU BOROUGH	C.O.P.	AIRPORT USE
V4	AVIGATION EASEMENT	44/339	9/22/52	MCKECHNIE	TERR. OF ALASKA	AIRPORT USE
V4	AVIGATION EASEMENT	44/347	11/14/52	ANTHONEY	TERR. OF ALASKA	AIRPORT USE
V4	AVIGATION EASEMENT	44/350	1/20/53	DYE	TERR. OF ALASKA	AIRPORT USE
V4	AVIGATION EASEMENT	44/356	1/9/63	KOSLOSKY	TERR. OF ALASKA	AIRPORT USE
V4	AVIGATION EASEMENT	44/353	6/21/53	LOSSING	TERR. OF ALASKA	AIRPORT USE
V5	AVIGATION EASEMENT	44/328	6/9/50	EGTVET	TERR. OF ALASKA	AIRPORT USE
V5	AVIGATION EASEMENT	44/330	8/8/51	NEWCOMB	TERR. OF ALASKA	AIRPORT USE
V5	AVIGATION EASEMENT	44/332	9/8/52	THUMA	TERR. OF ALASKA	AIRPORT USE
V5	AVIGATION EASEMENT	44/322	6/9/50	EGTVET	TERR. OF ALASKA	AIRPORT USE
V6	AVIGATION EASEMENT	44/326	2/10/51	SNODGRASS	TERR. OF ALASKA	AIRPORT USE
V7	AVIGATION EASEMENT	44/337	9/22/52	HERMON	TERR. OF ALASKA	AIRPORT USE
V8	AVIGATION EASEMENT	NOT LEGIBLE	1950	SIMS	TERR. OF ALASKA	AIRPORT USE
V8	AVIGATION EASEMENT	NOT LEGIBLE	1950	TOTTEN	TERR. OF ALASKA	AIRPORT USE
V8	AVIGATION EASEMENT	NOT LEGIBLE	1950	HILL	TERR. OF ALASKA	AIRPORT USE
V9	AVIGATION EASEMENT	–	TO BE ACQUIRED	STATE OF ALASKA	–	AIRPORT USE
V10	AVIGATION EASEMENT	–	TO BE ACQUIRED	MAT-SU BOROUGH	–	AIRPORT USE

INDEX NO.	1980 TRACT	PARCEL	DATE ACQUIRED	GRANT No.	ACREAGE	BOOK/PAGE	LAST NAME	DEED TYPE	SELL TO	USE
52	VIII	D1	7/14/77	5-002-0211-04	2.5	144/286	LEWIS	W. DEED	CITY OF PALMER	BALL FIELD
53	VIII	D1	7/14/77	5-002-0211-04	5.9	144/286	LEWIS	W. DEED	CITY OF PALMER	MSB SCHOOL DISTRICT NUTRITION CENTER
54	VIII	D1	7/14/77	5-002-0211-04	1.0	144/286	LEWIS	W. DEED	CITY OF PALMER	CITY OG PALMER WATER WELL

APPROVAL SIGNATURES

Name of Airport: Palmer Municipal

Date of Sponsor Review: 8-2-16

Name & Title of Sponsoring Authority's Representative: Nathan E. Wallace City Manager

Signature of Sponsor Submitting ALP to FAA for Review:

FAA Airspace Review Number:

Airport Layout Plan Conditional Approval Subject To ALP Approval Letter Dated:

BY: DATE:

TITLE:

FAA, Airports Division
Alaska Region, AAL-601

REVISIONS

5			
4			
3			
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1			

SYMBOL DESCRIPTION APPD BY DATE

CITY OF PALMER
PALMER MUNICIPAL AIRPORT
AIRPORT PROPERTY TABLE EXHIBIT A
PALMER, ALASKA

DRAWN BY: TCV ENGINEER: SLH
CHECKED BY: SLH DATE: 3-29-16
JOB #: 14-015 SHEET #: 13 OF 13

H:\Jobs\14-015 Palmer Airport Master Plan (COPY)\CAD\DRAWINGS\14015_09_ALP_12&13-10_PALMER-AIRPORT-EXHIBIT A, 1=1, 08-02-16 at 14:20 by tlc
LAYOUT: 1-400 table
XREF: 14015_00-X-BUILDINGS, 14015_00-X-PARCEL, 14015_00-XBASE, 14015_00-XBASE-WORKING, 14015_09_ALP_B01, PALMER AIRPORT

APPENDIX C
CAPITAL IMPROVEMENT PLAN PROJECT COST ESTIMATES

Project	Title	Total Project Estimate ($)	Year	EA Status	Non-federal share
0	Aeronautical Survey	262,500	2015	CE	16,400
1	Rehabilitate Runway 16-34 Design	566,400	2017	N/A	35,400
2	Rehabilitate Runway 16-34 Pavement and Extend Safety Area	6,235,200	2017	EA	389,700
3	Runway 16-34 Obstruction Removal (Trees)	238,600	2017	CE	15,000
4	Large Apron Expansion	5,149,600	2017	EA	321,800
5	Taxiway B Spot Repairs	141,800	2017	CE	8,800
6	Construct Security Fencing	98,000	2017	CE	6,100
7	Update Airport Layout Plan	112,000	2017	N/A	7,000
8	Acquire Airport Equipment - Blower and Box Blade	272,900	2018	CE	17,100
9	Remark Runway 9-27, Lighting Improvements, and Recalibrate Compass Rose	993,200	2019	CE	62,000
10	Construct Heliport	355,200	2019	EA	22,200
11	Wildlife Hazard Assessment	89,600	2019	CE	5,600
12	Acquire Snow Removal Equipment	574,000	2020	N/A	35,900
13	Taxiway N and Interlinks Design	661,800	2020	N/A	41,400
14	Acquire Avigation Easement	343,900	2020	CE	21,500
15	Construct Taxiway N and Interlinks, Phase 1	4,313,600	2021	EA	269,600
16	Construct Sand Storage Building	826,000	2022	CE	51,700
17	Construct Aircraft Electrical Outlets (Non-FAA)	239,500	2022	N/A	15,000
18	Reconstruct Storm Water Outfall (Non-FAA, Non-Airport)	7,378,000	2024	EA	7,378,000
19	Construct General Aviation Apron	5,635,400	2026	EA	352,200
20	Construct Shelters (Non-FAA)	857,000	2026	N/A	857,000
21	Relocate Taxiway B and Interlinks Phase 2	7,032,700	2030	EA	439,600
22	Relocate Water Utilities	545,000	2030	EA	34,100
23	Acquire Buffer Lands	3,525,300	2030	EA	220,400
24	Aviation Campground	1,081,600	2030	EA	67,600
25	Construct Taxiway N and Interlink, Phase 2	5,059,600	2040	N/A	316,200
26	Replace Golf Course Fence with Frangible	4,861,400	2040	CE	303,800

Aeronautical Survey PAQ-00

August 2016

2015

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Aeronautical Survey	250,000	250,000

Subtotal Construction		$250,000
Land Acquisition		0
City Administration	@ 5%	12,500
Design	@ 0%	0
Construction Management	@ 0%	0
Project Contingency	@ 0%	0
0 Years Inflation	@ 0%	0
Subtotal		$262,500
Source of Funds		
Local Share	@ 3.125%	8,200
State Share	@ 3.125%	8,200
Federal Share	@ 93.75%	246,100
Total		$262,500

Rehabilitate Runway 16-34 Design PAQ-01

August 2016

2017

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Survey	85,000	80,000
2	1 L.S.	Geotech	150,000	150,000
3	1 L.S.	Environmental	50,000	40,000
4	1 L.S.	Design	200,000	200,000
5	1 L.S.	Bid Assistance	10,000	10,000

Subtotal Construction		$480,000
Land Acquisition		0
City Administration	@ 5%	24,000
Design	@ 0%	0
Construction Management	@ 0%	0
Project Contingency	@ 10%	48,000
1 Years Inflation	@ 3%	14,400
Subtotal		$566,400
Source of Funds		
Local Share	@ 3.125%	17,700
State Share	@ 3.125%	17,700
Federal Share	@ 93.75%	531,000
Total		$566,400

Rehabilitate Runway 16-34 Pavement and Extend Safety Area PAQ-02

August 2016

2017

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	250,000	250,000
2	1 L.S.	Engineers Field Office and Lab	20,000	20,000
3	1 L.S.	Airport Safety Requirements (3%)	150,000	150,000
4	1 L.S.	Temp Erosion & Pollution Control (3%)	40,000	40,000
5	1 L.S.	Construction Surveying (2.5%)	50,000	50,000
6	30,000 C.Y.	Usable Excavation	10	300,000
7	2,000 TON	Classified Fill, Type IIA	14	28,000
8	9,400 TON	Leveling Course	25	235,000
9	73,300 S.Y.	Remove Existing Pavement	3.00	219,900
10	16,300 TON	Recycled Asphalt Material	12	195,600
11	22,000 TON	Asphalt Concrete Pavement, 4"	125	2,750,000
12	250 L.F.	36" Culvert	300	75,000
13	200 TON	Asphalt Prime Coat	650	130,000
14	1 L.S.	Temporary Markings	100,000	100,000
15	1 L.S.	Airport Marking	100,000	100,000
16	1 L.S.	Pavement Grooving	100,000	100,000
17	440 KSF	Seeding (Schedule A Mix)	120	52,800
		Subtotal Construction		$4,796,300

Land Acquisition		0
City Administration	@ 5%	239,800
Design	@ 0%	0
Construction Management	@ 12%	575,600
Project Contingency	@ 10%	479,600
1 Years Inflation	@ 3%	143,900
Subtotal		$6,235,200
Source of Funds		
Local Share	@ 3.125%	194,900
State Share	@ 3.125%	194,800
Federal Share	@ 93.75%	5,845,500
Total		$6,235,200

Runway 16-34 Obstruction Removal (Trees) PAQ-03

August 2016

2017

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization (10%)	25,000	25,000
2	1 L.S.	Construction Survey By Contractor	20,000	20,000
3	20 ACRES	Clearing and Grubbing	6,000	120,000
4	30 EACH	Selected Tree Removal	1,200	36,000
5	1 L.S.	Seeding	10,000	10,000

Subtotal Construction		$211,000
Land Acquisition		0
City Administration	@ 5%	10,600
Design	@ 0%	0
Construction Management	@ 0%	0
Project Contingency	@ 5%	10,600
1 Years Inflation	@ 3%	6,300
Subtotal		$238,500
Source of Funds		
Local Share	@ 3.125%	7,500
State Share	@ 3.125%	7,500
Federal Share	@ 93.75%	223,600
Total		$238,600

Large Apron Expansion PAQ-04

August 2016

2017

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	200,000	200,000
2	1 L.S.	Engineers Field Office and Lab	20,000	20,000
3	1 L.S.	Construction Survey By Contractor	75,000	75,000
4	1 L.S.	Airport Safety Requirements (3%)	50,000	50,000
5	1 L.S.	Temp Erosion & Pollution Control (3%)	75,000	75,000
6	1 L.S.	Construction Surveying (2.5%)	79,000	79,000
7	40,000 C.Y.	Unusable Excavation	12	480,000
8	82,800 TON	Classified Fill, Type IIA	14	1,159,200
9	13,200 TON	Leveling Course	25	330,000
10	41,000 S.Y.	Geotextile (Separation)	1.25	51,250
11	8,800 TON	Asphalt Concrete Pavement, 3"	125	1,100,000
12	80 TON	Asphalt Prime Coat	650	52,000
13	1,000 L.F.	Airport Pavement Striping	0.75	750
14	10 KSF	4" Topsoil (from Usable Excavation)	500	5,000
15	10 KSF	Seeding (Schedule A Mix)	120	1,200

Subtotal Construction		$3,678,400
Land Acquisition		0
City Administration	@ 5%	183,900
Design	@ 10%	367,800
Construction Management	@ 12%	441,400
Project Contingency	@ 10%	367,800
1 Years Inflation	@ 3%	110,400
Subtotal		$5,149,700
Source of Funds		
Local Share	@ 3.125%	160,900
State Share	@ 3.125%	160,900
Federal Share	@ 93.75%	4,827,800
Total		$5,149,600

Taxiway B Spot Repairs PAQ-05

August 2016

2017

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	9,000	9,000
2	1 L.S.	Airport Safety Requirements (3%)	9,000	9,000
3	1 L.S.	Temp Erosion & Pollution Control (3%)	10,000	10,000
4	1 L.S.	Construction Surveying (2.5%)	5,000	5,000
5	530 C.Y.	Unusable Excavation	20	10,600
6	845 TON	Classified Fill, Type IIA	20	16,900
7	156 TON	Leveling Course	50	7,800
8	1,060 S.Y.	Remove Existing Pavement	6.00	6,400
9	35 TON	Install RAM	70	2,500
10	815 S.Y.	Geotextile (Separation)	1.25	1,000
11	87 TON	Asphalt Concrete Pavement	150	13,100
12	5 TON	Asphalt Prime Coat	650	3,300
		Subtotal Construction		$94,600

Land Acquisition		0
City Administration	@ 5%	4,700
Design	@ 12%	11,400
Construction Management	@ 15%	14,200
Project Contingency	@ 15%	14,200
1 Years Inflation	@ 3%	2,800
Subtotal		$141,900
Source of Funds		
Local Share	@ 3.125%	4,400
State Share	@ 3.125%	4,400
Federal Share	@ 93.75%	133,000
Total		$141,800

Construct Security Fencing PAQ-006

August 2016

2017

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	2,000 L.S.	New 8-foot perimeter Security Fencing	35	70,000
		Subtotal Construction		$70,000

Land Acquisition		0
City Administration	@ 5%	3,500
Design	@ 10%	7,000
Construction Management	@ 12%	8,400
Project Contingency	@ 10%	7,000
1 Years Inflation	@ 3%	2,100
Subtotal		$98,000
<u>Source of Funds</u>		
Local Share	@ 3.125%	3,000
State Share	@ 3.125%	3,100
Federal Share	@ 93.75%	91,900
Total		$98,000

Update Airport Layout Plan PAQ-07

August 2016

2017

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Update ALP Based On Aeronautical Survey	80,000	80,000
2	1 L.S.	Create Obstruction Action Plan (OAP)	0	0

Subtotal Construction		$80,000
Land Acquisition		0
City Administration	@ 5%	4,000
Design	@ 10%	8,000
Construction Management	@ 12%	9,600
Project Contingency	@ 10%	8,000
1 Years Inflation	@ 3%	2,400
Subtotal		$112,000
Source of Funds		
Local Share	@ 3.125%	3,500
State Share	@ 3.125%	3,500
Federal Share	@ 93.75%	105,000
Total		$112,000

Acquire Airport Equipment - Blower and Box Blade PAQ-08

August 2016

2018

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Acquire Snow Blower	210,000	210,000
1	1 L.S.	Acquire Box Blade	25,000	25,000

Subtotal Construction		$235,000
Land Acquisition		0
City Administration	@ 5%	11,800
Design	@ 0%	0
Construction Management	@ 0%	0
Project Contingency	@ 5%	11,800
2 Years Inflation	@ 3%	14,300
Subtotal		$272,900
Source of Funds		
Local Share	@ 3.125%	8,600
State Share	@ 3.125%	8,500
Federal Share	@ 93.75%	255,800
Total		$272,900

Remark Runway 9-27, Lighting Improvements, and Recalibrate Compass Rose PAQ-09

August 2016

2019

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization (10%)	40,000	40,000
2	1 L.S.	Construction Survey By Contractor	50,000	50,000
4	1 L.S.	Replace Select Miscolored Lamp Lenses	10,000	10,000
3	1 L.S.	Remark Runway 9-27 to Runway 10-28	175,000	175,000
5	1 L.S.	Magnetic Survey	40,000	40,000
6	1 L.S.	Remark Compass Rose	10,000	10,000
7	240 EACH	LED Lighting (All Runways and Taxiways)	1,200.00	288,000
8	33,000 S.Y.	Fogseal Runway 10-28	2.00	66,000
		Subtotal Construction		$679,000

Land Acquisition		0
City Administration	@ 5%	34,000
Design	@ 10%	67,900
Construction Management	@ 12%	81,500
Project Contingency	@ 10%	67,900
3 Years Inflation	@ 3%	63,000
Subtotal		$993,300
Source of Funds		
Local Share	@ 3.125%	31,000
State Share	@ 3.125%	31,000
Federal Share	@ 93.75%	931,200
Total		$993,200

Construct Heliport PAQ-10

August 2016

2019

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	10,000	10,000
2	1 L.S.	Airport Safety Requirements (3%)	10,000	10,000
3	1 L.S.	Temp Erosion & Pollution Control (3%)	15,000	15,000
4	1 L.S.	Construction Surveying (2.5%)	15,000	15,000
5	1,500 C.Y.	Unusable Excavation	12	18,000
6	3,000 TON	Classified Fill, Type IIA	14	42,000
7	600 TON	Leveling Course	25	15,000
8	2,100 S.Y.	Geotextile (Separation)	1.25	2,625
9	150 TON	Asphalt Concrete Pavement, 3"	125	18,750
10	2 TON	Asphalt Prime Coat	650	1,300
11	1 L.S.	Markings	10,000	10,000
12	10 KSF	4" Topsoil (from Usable Excavation)	500	5,000
13	10 KSF	Seeding (Schedule A Mix)	120	1,200
14	16 Each	Edge Lights, L861T	1,500	24,000
15	5 Each	Handhole, L-867, Size B	750	3,750
16	1 Each	Airport Signs Non-Illuminated	3,000	3,000
17	1,000 L.F.	#6 Bare Copper Grounding Conductor	3.00	3,000
18	1,000 L.F.	Underground Cable #6 AWG, 600V, FAA Ty	4.00	4,000
19	6 Each	Ground Rod	200	1,200
20	4 L.F.	14-2 Underground Cable SOOW	2.50	10
21	0 L.F.	2-inch Rigid Steel Conduit	20	0
22	1,000 L.F.	2-inch HDPE Conduit	17	17,000
23	1 L.S.	Lighting Controls Allowance	15,000	15,000
		Subtotal Construction		$234,800
		Land Acquisition		0
		City Administration	@ 5%	11,700
		Design	@ 12%	28,200
		Construction Management	@ 15%	35,200
		Project Contingency	@ 10%	23,500
		3 Years Inflation	@ 3%	21,800
		Subtotal		$355,200
		Source of Funds		
		Local Share	@ 3.125%	11,100
		State Share	@ 3.125%	11,100
		Federal Share	@ 93.75%	333,000
		Total		$355,200

Wildlife Hazard Assessment PAQ-11

August 2016

2019

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Hazard Assessment	75,000	75,000

Subtotal Construction		$75,000
Land Acquisition		0
City Administration	@ 5%	3,800
Design	@ 0%	0
Construction Management	@ 0%	0
Project Contingency	@ 5%	3,800
3 Years Inflation	@ 3%	7,000
Subtotal		$89,600
Source of Funds		
Local Share	@ 3.125%	2,800
State Share	@ 3.125%	2,800
Federal Share	@ 93.75%	84,000
Total		$89,600

Acquire Snow Removal Equipment PAQ-12

August 2016

2020

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 Each	Large Front End Loader	450,000	450,000

Subtotal Construction		$450,000
Land Acquisition		0
City Administration	@ 5%	22,500
Design	@ 0%	0
Construction Management	@ 0%	0
Project Contingency	@ 10%	45,000
4 Years Inflation	@ 3%	56,500
Subtotal		$574,000
Source of Funds		
Local Share	@ 3.125%	18,000
State Share	@ 3.125%	17,900
Federal Share	@ 93.75%	538,100
Total		$574,000

Taxiway N and Interlinks Design PAQ-13

August 2016

2020

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Survey	80,000	80,000
2	1 L.S.	Geotech	75,000	75,000
3	1 L.S.	Environmental	40,000	40,000
4	1 L.S.	Electrical - Airport Lighting	145,000	145,000
5	1 L.S.	Design	185,000	185,000
6	1 L.S.	Bid Assistance	15,000	15,000

Subtotal Construction		$540,000
Land Acquisition		0
City Administration	@ 5%	27,000
Design	@ 0%	0
Construction Management	@ 0%	0
Project Contingency	@ 5%	27,000
4 Years Inflation	@ 3%	67,800
Subtotal		$661,800
Source of Funds		
Local Share	@ 3.125%	20,700
State Share	@ 3.125%	20,700
Federal Share	@ 93.75%	620,400
Total		$661,800

Acquire Avigation Easement PAQ-14

August 2016

2020

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	10 Acres	Acquire Avigation Easement	25,000	250,000

Subtotal Construction		$250,000
Land Acquisition		0
City Administration	@ 5%	12,500
Acquisition Services & Appraisal	@ 10%	25,000
Construction Management	@ 0%	0
Project Contingency	@ 10%	25,000
4 Years Inflation	@ 3%	31,400
Subtotal		$343,900
Source of Funds		
Local Share	@ 3.125%	10,800
State Share	@ 3.125%	10,700
Federal Share	@ 93.75%	322,400
Total		$343,900

Construct Taxiway N and Interlinks, Phase 1 PAQ-15

August 2016

2021

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	150,000	150,000
2	1 L.S.	Airport Safety Requirements	75,000	75,000
3	1 L.S.	Temp Erosion & Pollution Control	50,000	50,000
4	1 L.S.	Construction Surveying	85,000	85,000
5	28,000 C.Y.	Unusable Excavation	12.00	336,000
6	80,000 TON	Classified Fill, Type IIA	14.00	1,120,000
7	8,100 TON	Leveling Course	25.00	202,500
8	46,700 S.Y.	Geotextile (Separation)	1.25	58,375
9	3,000 TON	Asphalt Concrete Pavement, 3"	125.00	375,000
10	30 TON	Asphalt Prime Coat	650.00	19,500
11	8,000 L.F.	Airport Pavement Striping	0.75	6,000
12	25 KSF	Seeding (Schedule A Mix)	120.00	3,000
13	43 Each	Taxiway Edge Lights, L861T	1,500.00	64,500
14	12 Each	Handhole, L-867, Size B	750.00	9,000
15	2 Each	Airport Signs Illuminated	6,000.00	12,000
16	6 Each	Airport Signs Non-Illuminated	3,000.00	18,000
17	8,000 L.F.	#6 Bare Copper Grounding Conductor	3.00	24,000
18	8,000 L.F.	Underground Cable #6 AWG, 600V, FAA Ty	4.00	32,000
19	16 Each	Ground Rod	200.00	3,200
20	2,000 L.F.	14-2 Underground Cable SOOW	2.50	5,000
21	300 L.F.	2-inch Rigid Steel Conduit	20.00	6,000
22	10,000 L.F.	2-inch HDPE Conduit	17.00	170,000
23	1 L.S.	Lighting Control Upgrades	50,000	50,000
24	24 ACRES	Clearing and Grubbing	6,000	144,000
25	0 EACH	Selected Tree Removal	1,200	0
		Subtotal Construction		$3,018,100
		Land Acquisition		0
		City Administration	@ 5%	150,900
		Design	@ 0%	
		Construction Management	@ 12%	362,200
		Project Contingency	@ 10%	301,800
		5 Years Inflation	@ 3%	480,700
		Subtotal		$4,313,700
		Source of Funds		
		Local Share	@ 3.125%	134,800
		State Share	@ 3.125%	134,800
		Federal Share	@ 93.75%	4,044,000
		Total		$4,313,600

Construct Sand Storage Building PAQ-16

August 2016

2022

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	4,800 S.F.	Construct Unheated Sand Storage Shelter	110	528,000
		Subtotal Construction		$528,000

Land Acquisition		0
City Administration	@ 5%	26,400
Design	@ 10%	52,800
Construction Management	@ 12%	63,400
Project Contingency	@ 10%	52,800
6 Years Inflation	@ 3%	102,500
Subtotal		$825,900
<u>Source of Funds</u>		
Local Share	@ 3.125%	25,900
State Share	@ 3.125%	25,800
Federal Share	@ 93.75%	774,300
Total		$826,000

Construct Aircraft Electrical Outlets (Non-FAA) PAQ-17

August 2016

2022

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	20,000	20,000
2	1 L.S.	Airport Safety Requirements (3%)	5,000	5,000
3	1 L.S.	Construction Surveying (2.5%)	2,000	2,000
4	2,400 S.Y.	Remove Existing Pavement	2.50	6,000
5	10 TON	Asphalt Concrete Pavement, 3"	125.00	1,250
6	2 KSF	4" Topsoil (from Usable Excavation)	500.00	1,000
7	2 KSF	Seeding (Schedule A Mix)	120.00	240
8	21 Each	Electrical Outlets	2,500.00	52,500
9	5 Each	Junction Boxes	750.00	3,750
10	1,200 L.F.	#6 Bare Copper Grounding Conductor	3.00	3,600
11	1,200 L.F.	Underground Cable #6 AWG, 600V	4.00	4,800
12	12 Each	Ground Rod	200.00	2,400
13	50 L.F.	2-inch Rigid Steel Conduit	20.00	1,000
14	1,200 L.F.	2-inch HDPE Conduit	17.00	20,400
15	1 L.S.	Load Center	20,000	20,000
		Subtotal Construction		$143,900

Land Acquisition		0
City Administration	@ 5%	7,200
Design	@ 12%	17,300
Construction Management	@ 15%	21,600
Project Contingency	@ 15%	21,600
6 Years Inflation	@ 3%	27,900
Subtotal		$239,500
<u>Source of Funds</u>		
Local Share	@ 3.125%	7,500
State Share	@ 3.125%	7,500
Federal Share	@ 93.75%	224,500
Total		$239,500

Reconstruct Storm Water Outfall (Non-FAA, Non-Airport) PAQ-18

August 2016

2024

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	200,000	200,000
2	1 L.S.	Engineers Field Office and Lab	0	0
3	1 L.S.	Airport Safety Requirements	100,000	100,000
4	1 L.S.	Temp Erosion & Pollution Control	75,000	75,000
5	1 L.S.	Construction Surveying	101,000	101,000
6	5,800 L.F.	New 48" CPEP	400	2,320,000
7	5 Each	Taxiway and Runway Borings	300,000	1,500,000
8	12 Each	Replace Manholes	4,000	48,000
9	1 L.S.	Replace Outfall Structure	120,000	120,000
10	363 KSF	Seeding	120.00	43,560
		Subtotal Construction		$4,507,600

Land Acquisition		0
City Administration	@ 5%	225,400
Design	@ 10%	450,800
Construction Management	@ 12%	540,900
Project Contingency	@ 10%	450,800
8 Years Inflation	@ 3%	1,202,500
Subtotal		$7,378,000

Source of Funds		
Local Share	@ 100.000%	7,378,000
State Share	@ 0.000%	0
Federal Share	@ 0.00%	0
Total		$7,378,000

Construct General Aviation Apron PAQ-19

August 2016

2026

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	200,000	200,000
2	1 L.S.	Construction Survey By Contractor	75,000	75,000
3	1 L.S.	Airport Safety Requirements	50,000	50,000
4	1 L.S.	Temp Erosion & Pollution Control	75,000	75,000
5	1 L.S.	Construction Surveying	50,000	50,000
6	40,100 C.Y.	Unusable Excavation	12.00	481,200
7	96,900 TON	Classified Fill, Type IIA	14.00	1,356,600
8	9,100 TON	Leveling Course	25.00	227,500
9	46,300 S.Y.	Geotextile (Separation)	1.25	57,875
10	4,300 TON	Asphalt Concrete Pavement, 2"	125.00	537,500
11	40 TON	Asphalt Prime Coat	650.00	26,000
12	1 L.S.	Airport Pavement Striping	7,500.00	7,500
13	10 KSF	4" Topsoil (from Usable Excavation)	500.00	5,000
14	10 KSF	Seeding (Schedule A Mix)	120.00	1,200
15	120 Anchors	Tiedown Anchors (3 Per Plane x 40 Spaces)	800.00	96,000
16	6 Each	Electrical Outlets	2,500.00	15,000
17	3 Each	Junction Boxes	750.00	2,250
18	800 L.F.	#6 Bare Copper Grounding Conductor	3.00	2,400
19	800 L.F.	Underground Cable #6 AWG, 600V	4.00	3,200
20	12 Each	Ground Rod	200.00	2,400
21	800 L.F.	2-inch HDPE Conduit	17.00	13,600
22	1 L.S.	Load Center	2,500	2,500
		Subtotal Construction		$3,288,000
		Land Acquisition		0
		City Administration	@ 5%	164,400
		Design	@ 10%	328,800
		Construction Management	@ 12%	394,600
		Project Contingency	@ 10%	328,800
		10 Years Inflation	@ 3%	1,130,800
		Subtotal		$5,635,400
		Source of Funds		
		Local Share	@ 3.125%	176,100
		State Share	@ 3.125%	176,100
		Federal Share	@ 93.75%	5,283,200
		Total		$5,635,400

Construct Shelters (Non-FAA) PAQ-20

August 2016

2026

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	10,000 S.F.	Construct Unheated Uninsulated T-Hangar style shelter	50.00	500,000
		Subtotal Construction		$500,000

Land Acquisition		0
City Administration	@ 5%	25,000
Design	@ 10%	50,000
Construction Management	@ 12%	60,000
Project Contingency	@ 10%	50,000
10 Years Inflation	@ 3%	172,000
Subtotal		$857,000
<u>Source of Funds</u>		
Local Share	@ 100.000%	857,000
State Share	@ 0.000%	0
Federal Share	@ 0.00%	0
Total		$857,000

Relocate Taxiway B and Interlinks Phase 2 PAQ-21

August 2016

2030

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	100,000	100,000
2	1 L.S.	Engineers Field Office and Lab	0	0
3	1 L.S.	Airport Safety Requirements (3%)	50,000	50,000
4	1 L.S.	Temp Erosion & Pollution Control (3%)	75,000	75,000
5	1 L.S.	Construction Surveying (2.5%)	84,000	84,000
6	5,000 C.Y.	Usable Excavation	10.50	52,500
7	40,300 C.Y.	Unusable Excavation	12.00	483,600
8	85,200 TON	Classified Fill, Type IIA	14.00	1,192,800
9	11,800 TON	Leveling Course	25.00	295,000
10	2,300 TON	Recycled Asphalt Material	25.00	57,500
11	20,100 S.Y.	Remove Existing Pavement	2.50	50,250
12	42,700 S.Y.	Geotextile (Separation)	1.25	53,375
13	4,100 TON	Asphalt Concrete Pavement, 3"	125.00	512,500
14	41 TON	Asphalt Prime Coat	650.00	26,650
15	20,000 L.F.	Airport Pavement Striping	0.75	15,000
16	25 KSF	4" Topsoil (from Usable Excavation)	500.00	12,500
17	25 KSF	Seeding (Schedule A Mix)	120.00	3,000
18	110 Each	Taxiway Edge Lights, L861T	1,500.00	165,000
19	20 Each	Handhole, L-867, Size B	750.00	15,000
20	110 Each	Remove Existing Taxiway Lights	250.00	27,500
21	6 Each	Airport Signs Illuminated	6,000.00	36,000
22	12 Each	Airport Signs Non-Illuminated	3,000.00	36,000
23	15,000 L.F.	#6 Bare Copper Grounding Conductor	3.00	45,000
24	15,000 L.F.	Underground Cable #6 AWG, 600V, FAA Ty	4.00	60,000
25	25 Each	Ground Rod	200.00	5,000
26	500 L.F.	14-2 Underground Cable SOOW	2.50	1,250
27	700 L.F.	2-inch Rigid Steel Conduit	20.00	14,000
28	11,300 L.F.	2-inch HDPE Conduit	17.00	192,100
29	1 L.S.	Lighting Controls	75,000	75,000
		Subtotal Construction		$3,735,525

Land Acquisition		0
City Administration	@ 5%	186,800
Design	@ 10%	373,600
Construction Management	@ 12%	448,300
Project Contingency	@ 10%	373,600

14 Years Inflation	@ 3%	1,914,800
Subtotal		$7,032,625
Source of Funds		
Local Share	@ 3.125%	219,800
State Share	@ 3.125%	219,800
Federal Share	@ 93.75%	6,593,100
Total		$7,032,700

Relocate Water Utilities PAQ-22

August 2016

2030

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	30,000	30,000
2	1 L.S.	Engineers Field Office and Lab	0	0
3	1 L.S.	Airport Safety Requirements	10,000	10,000
4	1 L.S.	Temp Erosion & Pollution Control	15,000	15,000
5	1 L.S.	Construction Surveying	20,000	20,000
6	560 L.F.	New 8" DI Water Line	250	140,000
7	3 Each	Sewer Crossing Encasements	15,000	45,000
8	1 Each	Hydrant	4,000	4,000
9	2 L.S.	Connect to Existing Water Line	15,000	30,000
10	28 KSF	Seeding	120	3,400

Subtotal Construction		$297,400
Land Acquisition		0
City Administration	@ 5%	14,900
Design	@ 10%	29,700
Construction Management	@ 12%	35,700
Project Contingency	@ 5%	14,900
14 Years Inflation	@ 3%	152,400
Subtotal		$545,000
Source of Funds		
Local Share	@ 3.125%	17,100
State Share	@ 3.125%	17,000
Federal Share	@ 93.75%	510,900
Total		$545,000

Acquire Buffer Lands PAQ-23

August 2016

2030

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	40 Acres	Acquire Buffer Land	50,000	2,000,000

Subtotal Construction		$2,000,000
Land Acquisition		0
City Administration	@ 5%	100,000
Acquisition Services & Appraisal	@ 10%	200,000
Construction Management	@ 0%	0
Project Contingency	@ 10%	200,000
14 Years Inflation	@ 3%	1,025,200
Subtotal		$3,525,200
Source of Funds		
Local Share	@ 3.125%	110,200
State Share	@ 3.125%	110,200
Federal Share	@ 93.75%	3,304,900
Total		$3,525,300

Aviation Campground PAQ-24

August 2016

2030

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	10,000	10,000
2	1 L.S.	Airport Safety Requirements	10,000	10,000
3	1 L.S.	Temp Erosion & Pollution Control	15,000	15,000
4	1 L.S.	Construction Surveying	15,000	15,000
5	4,000 C.Y.	Unusable Excavation	12.00	48,000
6	1 L.S.	Site Grading	40,000	40,000
7	6,100 TON	Classified Fill, Type IIA	14.00	85,400
8	900 TON	Leveling Course	25.00	22,500
9	7,600 S.Y.	Geotextile (Separation)	1.25	9,500
10	900 TON	Asphalt Concrete Pavement, 2"	125	112,500
11	9 TON	Asphalt Prime Coat	650	5,850
12	1 L.S.	Markings	10,000	10,000
13	40 KSF	Seeding (Schedule A Mix)	120	4,800

Subtotal Construction		$388,600
Land Acquisition	7 acres at 50,000	350,000
City Administration	@ 5%	19,400
Design	@ 10%	38,900
Construction Management	@ 12%	46,600
Project Contingency	@ 10%	38,900
14 Years Inflation	@ 3%	199,200
Subtotal		$1,081,600
Source of Funds		
Local Share	@ 3.125%	33,800
State Share	@ 3.125%	33,800
Federal Share	@ 93.75%	1,014,000
Total		$1,081,600

Construct Taxiway N and Interlink, Phase 2 PAQ-25

August 2016

2040

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	1 L.S.	Mobilization/Demobilization	150,000	150,000
2	1 L.S.	Airport Safety Requirements	75,000	75,000
3	1 L.S.	Temp Erosion & Pollution Control	50,000	50,000
4	1 L.S.	Construction Surveying	85,000	85,000
5	20,000 C.Y.	Unusable Excavation	12.00	240,000
6	50,000 TON	Classified Fill, Type IIA	14.00	700,000
7	7,000 TON	Leveling Course	25.00	175,000
8	46,700 S.Y.	Geotextile (Separation)	1.25	58,375
9	2,000 TON	Asphalt Concrete Pavement, 3"	125.00	250,000
10	20 TON	Asphalt Prime Coat	650.00	13,000
11	5,000 L.F.	Airport Pavement Striping	0.75	3,750
12	20 KSF	Seeding (Schedule A Mix)	120.00	2,400
13	36 Each	Taxiway Edge Lights, L861T	1,500.00	54,000
14	8 Each	Handhole, L-867, Size B	750.00	6,000
15	3 Each	Airport Signs Illuminated	6,000.00	18,000
16	5 Each	Airport Signs Non-Illuminated	3,000.00	15,000
17	6,000 L.F.	#6 Bare Copper Grounding Conductor	3.00	18,000
18	6,000 L.F.	Underground Cable #6 AWG, 600V, FAA Ty	4.00	24,000
19	12 Each	Ground Rod	200.00	2,400
20	2,000 L.F.	14-2 Underground Cable SOOW	2.50	5,000
21	400 L.F.	2-inch Rigid Steel Conduit	20.00	8,000
22	8,400 L.F.	2-inch HDPE Conduit	17.00	142,800
23	1 L.S.	Lighting Control Upgrades	10,000	10,000
		Subtotal Construction		$2,105,700
		Land Acquisition		0
		City Administration	@ 5%	105,300
		Design	@ 10%	210,600
		Construction Management	@ 12%	252,700
		Project Contingency	@ 10%	210,600
		24 Years Inflation	@ 3%	2,174,800
		Subtotal		$5,059,700
		Source of Funds		
		Local Share	@ 3.125%	158,100
		State Share	@ 3.125%	158,100
		Federal Share	@ 93.75%	4,743,400
		Total		$5,059,600

Replace Golf Course Fence with Frangible PAQ-26

August 2016

2040

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	8,100 L.F.	Frangible Fence Material	180.00	1,458,000
2	1 L.S.	Freight	200,000	200,000
3	8,100 L.F.	Fence Installation	40.00	324,000
		Subtotal Construction		$1,982,000
		Land Acquisition		0
		City Administration	@ 5%	99,100
		Design	@ 10%	198,200
		Construction Management	@ 12%	237,800
		Project Contingency	@ 15%	297,300
		24 Years Inflation	@ 3%	2,047,000
		Subtotal		$4,861,400
		Source of Funds		
		Local Share	@ 3.125%	151,900
		State Share	@ 3.125%	151,900
		Federal Share	@ 93.75%	4,557,600
		Total		$4,861,400

APPENDIX D
AVIATION FORECAST SUPPORT

HDL HATTENBURG DILLEY & LINNELL
Engineering Consultants

April 30, 2015 File: 14-015

Mr. Mike Edelmann, Project Manager
FAA Alaskan Region Airports Division
701 C Street Box 14 AAL-618
Anchorage, AK 99513

RE: Aviation Activity Forecast (Updated)
Palmer Municipal Airport

Dear Mr. Edelmann:

On behalf of the City of Palmer we have prepared and submit for your review and acceptance the attached updated Aviation Activity Forecast for the Palmer Municipal Airport.

The updates to the approved February 4, 2015 forecast include: adding 24 annual operations for the Hercules C130, 24 annual operations for the PA-31 Navajo, and changing the base year from 2014 to 2015. Commercial carries were re-interviewed and we found that the 2014 commercial operations were not expected to change in 2015, and the based aircraft and general aviation operations were unchanged from 2014.

This updated forecast continues to support the airport's current aircraft design group (ADG) III designation. We recommend Runway 16-34 improvements continue to be designed to B-III standards and Runway 9-27 designed to B-II standards. The total annual operations (fixed-wing and helicopter) are estimated to be 34,131 for the base year 2015 and are forecast to be 61,641 in 2035 which falls below the airport's capacity of 230,000 annual operations.

If you have any questions please contact me at 564-2111 or shattenburg@hdlalaska.com.

Sincerely,

HATTENBURG DILLEY & LINNELL

Scott Hattenburg, PE/Principal

Attachment: Aviation Activity Forecast (9 pages)
Appendix 3A (1 page)
Appendix 3B (2 pages)

3335 Arctic Boulevard Suite 100 • Anchorage Alaska 99503 • Phone: 907.564.2120 • Fax: 907.564.2122
202 W. Elmwood Avenue Suite 1 • Palmer Alaska 99645 • Phone: 907.746.5230 • Fax: 907.746.5231

3.0 FORECAST

Aviation activity is closely tied to the economy and population growth. The City of Palmer and the Mat-Su Borough has been experiencing steady growth since the 1980s. The area's growth rate is driven by the ongoing shortage of land in the Anchorage bowl, availability of developable land in the valley, lower real estate prices, lower property taxes, the ability to live in the valley and commute to Anchorage, and the area's excellent outdoor recreational opportunities.

3.1 Historical Population Trends

From 2000 to 2013, Palmer's population increased from 4,533 to 6,461 in 2013, a growth rate of 2.76% per year. During the same period, the Mat-Su Borough population, considered the fastest growing region in Alaska, grew from 59,322 to 95,195, a growth rate of 6.09% per year. During the 45 year period between 1960 and 2005, Palmer and the Mat-Su Borough populations grew at a rate of 3.43% and 6.09% per year, respectively. For the past 45 years, the area has grown faster than the state. See Table 3-1.

Table 3-1. Population Growth Rates

Period		Population	Average Annual Growth Rate
2000 to 2013 (recent 13 years)	Palmer	4,533 to 6,461 [3]	2.76%
	Mat-Su Borough	59,322 to 95,195 [3]	3.71%
	State of Alaska	627,963 to 736,399 [2]	1.23%
1960 to 2005 (45 years)	Palmer	1,181 to 5,382 [1]	3.43%
	Mat-Su Borough	5,188 to 74,041 [1]	6.09%
	State of Alaska	226,167 to 666,946 [2]	2.43%

Source:
1. Palmer Comprehensive Plan, September 2006, Agnew Beck Consulting.
2. State of Alaska Department of Labor and Workforce Development, Research and Analysis, http://laborstats.alaska.gov/pop/popest.htm
3. United States Census Bureau, http://quickfacts.census.gov/qfd/states/02000.html.

3.2 Population Growth Projections

In December of 2009, the University of Alaska's Institute of Social and Economic Research (ISER), projected that between 2010 and 2035 population in the Mat-Su Borough would grow on average between 5.03% and 0.93% depending on a wide range of economic factors. See Table 3-2. The BASE CASE of 3.06% average population growth in the Mat-Su Borough is based on oil development in the outer continental shelf in 2021, a natural gas pipeline in 2019, development of Livengood, Donlin Creek and Pebble mines, US inflation at 2.5%, modest US economic recovery, and a Knik Arm Bridge.

Table 3-2. Average Growth Rate Projections 2010-2035 (ISER, 2009)

	Wage and Salary Jobs	Population	Households
	HIGH CASE		
State	1.98 %	1.99 %	2.10 %
Anchorage	1.46 %	1.23 %	1.33 %
Mat-Su	5.65 %	5.03 %	5.15 %
	BASE CASE		
State	1.06 %	1.11 %	1.24 %
Anchorage	.74 %	.78 %	.90 %
Mat-Su	3.69 %	3.06 %	3.19 %
	LOW CASE		
State	.28 %	.30 %	.44 %
Anchorage	.26 %	.26 %	.40 %
Mat-Su	.89 %	.93 %	1.07 %

The State of Alaska Department of Labor and Workforce Development produces resident population projections for Alaska. See Table 3-3. The trend for the Mat-Su Borough is for consistent growth in population due to natural increases and in-migration.

Table 3-3. Population Projections (Alaska DOL)

	2012	2017	2022	2027	2032	2037
			Population			
State of Alaska	732,298	770,417	806,479	839,191	868,902	897,034
Anchorage Borough	298,842	313,348	326,612	338,059	347,870	356,584
Matanuska-Susitna Borough	93,801	105,617	117,845	130,254	142,615	154,692
			Annual Growth Rate			
State of Alaska		1.02%	0.92%	0.80%	0.70%	0.64%
Anchorage Borough		0.95%	0.83%	0.69%	0.57%	0.50%
Matanuska-Susitna Borough		2.40%	2.22%	2.02%	1.83%	1.64%

3.3 Aviation Activity Growth

Operations and enplanement data are not recorded at this airport because there is no tower. Palmer Flight Service Station (FSS) however is staffed 10 hours per day, 365 days per year and

records the number of aircraft contacts (ACT) and airport advisories (AA) which is useful in analyzing trends. From 2008 to 2013, ACTs increased from 10,486 to 13,853 in 2013, an annual growth rate of 5.73%, and for the same period AAs grew at an annual growth rate of 4.94%. See Table 3-4.

Table 3-4. Palmer FSS Aircraft Contact and Airport Advisories (FAA)

Palmer FSS	Air Carrier (AC)	Air Taxi (AT)	General Aviation (GA)	Military	Aircraft Contacts Total (ACT)	Airport Advisory (AA)
2008	11	1,637	8,755	83	10,486	7,619
2009	9	303	9,215	107	9,634	8,317
2010	14	345	13,832	144	14,335	10,509
2011	10	258	12,557	107	12,932	9,202
2012	13	278	11,729	200	12,220	8,445
2013	21	487	13,105	240	13,853	9,697
	78	3,308	69,193	881	73,460	53,789
as % of GA	0.1%	4.8%	100.0%	1.3%		

Aviation activity is growing and the fleet mix is changing. The last forecast was completed in 2007 as a part of the 2009 airport master plan. Since then, two air cargo companies (Bush Air Cargo and Alaska Fuel Haulers) have moved their operations to Palmer and are negotiating long-term leases with the City. In 2013, the Alaska Skydiving Center was established at the airport. The City is currently working with a potential leaseholder that wishes to relocate its cargo aircraft to Palmer.

Currently, the airport has two active flight schools (Artic's Air Academy and Wingnuts Aviation) which are providing year-round pilot training. Kingdom Air Corps (KAC) in nearby Chickaloon has a fleet of 15 light aircraft that use Palmer to train missionary pilots and provide ratings, endorsements, and bush flying skills. Hageland Aviation operates its aviation maintenance facility at Palmer. The University of Alaska's Aviation Technology Division uses Palmer to train pilots outside Anchorage's Class C controlled airspace. The State Department of Forestry continues to operate a wide range of larger aircraft and load tankers from its Fire Retardant Loading Facility.

3.4 Based Aircraft

An accurate accounting of based aircraft is important because it is the basis for forecasting general aviation operations in Section 3.5. Based aircraft were determined from City tie-down lease records (September 2014), discussions with leaseholders, and by visual inspection. This count does not include aircraft that are rotated in and out of Palmer seasonally such as Forestry's fire-fighting fleet

and transient aircraft. See Table 3-5 for a summary of based fixed wing aircraft. In addition, three rotor wing aircraft are based at Palmer.

Table 3-5. Fixed Wing Based Aircraft

		Leased or Occupied
APRONS	Transient	0
	Apron A	16
	Apron B	14
	Apron C	17
	Apron D	6
	Large Aircraft Apron	8
LEASE LOTS	Artics Air Academy	19
	Gallagher	1
	Helmericks Brown	9
	Helmericks Main	12
	Custom Aircraft (BJ's)	4
	Fish Creek (Grey West)	7
	Denier (Grey East)	1
	Forestry	4
	Hageland	4
	New Horizons	4
	CIG	2
	Palmer Hangars Assn	9
	Old Woods	0
	TOTAL	137

3.5 Operations

Forecasting was accomplished by reviewing US Department of Transportation (USDOT), FAA, US Census data, Palmer FSS information; and by mailed surveys, personal interviews and the GRA model. Forecasting GA operations for 2015 (base year) was accomplished using Equation 13 from the "Model for Estimating General Aviation Operations at Non-Towered Airports Using Towered and Non-Towered Airport Data" (GRA, Inc., July 2001) as follows:

OPS = -571 + 355*BA - 0.46*BA2 + 40,510*%in100mi + 3,795*VITFSnum + 0.001*POP100 - 8,587*WACAORAK + 24,102*POP25/100 + 13,674*TOWDUM

- BA = based aircraft at the airport
- BA2 = the square of based aircraft at the airport
- %in100mi = based aircraft as a percentage of total based aircraft at GA airports within a 100 mile radius

- VITFSnum = number of 14 CFR Part 141 certified flight schools at the airport
- POP100 = population within a 100 mile radius of the airport
- WACAORAK = adjustment factor if state is WA, CA, OR, or AK (=1 if so)
- POP25/100 = ratio of population within 25 miles over population within 100 miles of the airport
- TOWDUM = adjustment factor if a control tower is present (=1 if so)

Based aircraft for GA model was calculated by subtracting the non GA aircraft (8 aircraft on the large aircraft apron plus 4 at Forestry and 4 at Hageland Aviation) from the 137 total based aircraft = 121. %in100mi was determined by finding the based aircraft (from the 5010) at airports within 100 miles of Palmer, then summing those values and comparing the based aircraft at Palmer to the total. The VITFSnum for Palmer is 0, since there are no Part 141 flight schools at Palmer. POP100 was determined using the Missouri Census Data Center website, which allows you to find the 2010 Census population within a specified radius of any point in the United States. POP100 was increased by the 3.5% total annual population growth between 2010 and 2013 for Alaska. POP25 was determined using the same method. The WACAORAK variable is 1, since Alaska is included in this list of states. Finally, the TOWDUM value was 0 since there is no control tower at the airport. Using these values, the equation yielded an estimated 30,650 GA operations for the Palmer Municipal Airport in 2014. The calculation sheet is shown in Appendix 2A.

GA operations were split 70%-30% local-itinerant and military operations were split 60% Blackhawks, 10% King Airs, and 30% Shorts 330s based on feedback from the FSS specialist who has 30 years of experience at Palmer. Air carriers and air taxis were assumed to be captured in the cargo operator's surveys. Military operations were assumed to be 1.3% of GA operations based on the 6 years of FAA data in Table 3-4.

Using the above analysis, the 2015 (base year) total fixed-wing operations are estimated to be 33,310, helicopter operations are estimated to be 821, and total operations are estimated to be 34,131. See Table 3-6.

An average annual growth rate of 3.0% was applied to the base year data to project aviation activity for the 20-year planning period. The 3.0% growth rate for this forecast is slightly higher than the City of Palmer's recent population growth rate of 2.76% for the past 13 years, lower than the MSB's recent growth rate of 3.71%, about the same as ISERs BASE CASE scenario of 3.06% and above the Alaska Department of Labor's projected growth rate of 2.4% for the Mat-Su Borough.

Table 3-6. Aviation Activity Forecast Summary

	APPCH CAT	ADG	Base Year: 2015			Growth Rate: 3%	
			2015	2020	2025	2030	2035
BASED AIRCRAFT							
Fixed-Wing			137	159	184	213	247
Helicopter			3	3	4	5	5
TOTAL BASED AIRCRAFT			**140**	**162**	**188**	**218**	**252**
PASSENGER ENPLANEMENTS			**75**	**87**	**101**	**117**	**135**
FIXED WING OPERATIONS							
ITINERANT	-	-					
Douglas DC-4	B	III	720	835	968	1,122	1,300
Convair 580	B	III	47	54	63	73	85
Douglas DC-3	A	III	202	234	272	315	365
Canadair CL-215T	A	III	45	52	60	70	81
Citation SII	B	II	50	58	67	78	90
Dehavilland Dash 8	A	III	2	2	3	3	4
Beechcraft 1900	B	II	5	6	7	8	9
Shorts 330 (C-23)	B	II	136	158	183	211	245
Beechcraft King Air	B	II	40	46	54	62	72
Lockheed Hercules C130	C	IV	24	28	32	37	43
Aerocommander 500S	B	II	27	31	36	42	49
Aerocommander 840	B	II	21	24	28	33	38
Aerocommander 1000	B	II	17	20	23	26	31
Cessna 208 Caravan	A	II	392	455	527	610	708
Dehavilland DHC-3	A	II	40	46	54	62	72
Dehavilland DHC-6	A	II	4	5	5	6	7
Casa 212	A	II	0	0	0	0	0
Cessna 401	B	I	208	241	280	324	376
Cessna 402	B	I	50	58	67	78	90
Cessna 207	B	I	50	58	67	78	90
Aerocommander 690	B	I	0	0	0	0	0
Cessna 185	A	I	125	145	168	195	225
Pilatus PC-12	A	II	200	232	269	312	361
Piper PA-18	A	I	115	133	154	179	207
Piper PA 27-250	A	I	50	58	67	78	90
Embraer Navajo PA-31	A	I	24	28	32	37	43
Dehavilland DHC-2	A	I	37	43	50	58	67
Cessna 180	A	I	30	35	40	47	54
GA Itinerant "as" C172	A	I	6,988	8,101	9,391	10,887	12,621
GA Itinerant "as" C185	B	I	2,207	2,559	2,966	3,438	3,986
TOTAL ITINERANT OPS			**11,855**	**13,745**	**15,933**	**18,469**	**21,409**
LOCAL	-	-					
GA Local "as" C172	A	I	16,306	18,903	21,914	25,404	29,450
GA Local "as" C185	B	I	5,149	5,969	6,920	8,022	9,300
TOTAL LOCAL OPS			**21,455**	**24,872**	**28,834**	**33,426**	**38,750**
TOTAL FIXED WING OPS			**33,310**	**38,617**	**44,767**	**51,895**	**60,159**
HELICOPTER OPERATIONS							
Bell 206 B111	-	-	90	104	121	140	163
Bell 212	-	-	44	51	59	69	79
Bell UH-1D	-	-	4	5	5	6	7
Bell UH-1H	-	-	10	12	13	16	18
Blackhawk UH-60	-	-	255	296	343	397	461
A-Star AS-350 (Includes Medevac)	-	-	418	485	562	651	754
TOTAL HELICOPTER OPS			**821**	**953**	**1,103**	**1,279**	**1,482**
TOTAL OPERATIONS			**34,131**	**39,570**	**45,870**	**53,174**	**61,641**
INSTRUMENT OPERATIONS[2]			**200**	**232**	**269**	**312**	**361**

3.6 Enplanements

Palmer Municipal Airport has no scheduled air service because of its proximity to nearby Ted Stevens Anchorage International Airport located 42 miles away. Reported chartered passenger services to and from Palmer by certified air carriers between 2009 and 2013 is shown in Table 3-7. The zero enplanements for 2011 was disregarded and the average (75) of the years 2012 and 2013 was used for the base year enplanements. Should scheduled air service be established, the forecast enplanements would be significantly under estimated.

Table 3-7. Palmer Enplanements (FAA Air Carrier Activity Information System Database)

Year	Enplanements
2009	161
2010	374
2011	0
2012	90
2013	61

3.7 Comparison with Other Forecasts

The 2007 Palmer Airport master plan estimated 30,700 operations for 2014 using their moderate growth rate of 1% and 34,866 for their high growth rate of 3%, versus this forecast of 34,131 operations for the base year 2015. The 2012 Wasilla Airport master plan estimated 57,400 operations for 2014 and 140 based aircraft. The 2014 Birchwood Airport FAA terminal area forecast estimated 70,188 and 465 based aircraft.

3.8 Comparison with the APO TAF

FAA Office of Aviation Policy and Planning (APO) provides forecasts of aviation activity at public airports. The APO terminal area forecast (TAF) for Palmer Municipal Airport was obtained through their website and Table 3-8 shows the comparison between the current airport forecast and the TAF published by APO.

The difference between this forecast and the APO TAF is likely due to the differences in the accuracy of the source data. This forecast is based on site visits, research, interviews, and a deeper study of the specific activity at the Palmer Airport. The source of the APO TAF data is not known.

Table 3-8. Comparison of Airport Forecast and Terminal Airport Forecast

	Airport Forecast (AF)	Terminal Airport Forecast (TAF)	AF vs. TAF (Percent Difference)
Passenger Enplanements			
2015	75	22	241%
(Base +5 yrs) 2020	87	22	295%
(Base +10 yrs) 2025	101	22	359%
(Base +15 yrs) 2030	117	22	432%
Air Taxi & Commercial Operations			
2015	2,477	0	No Value
(Base +5 yrs) 2020	2,872	0	No Value
(Base +10 yrs) 2025	3,329	0	No Value
(Base +15 yrs) 2030	3,859	0	No Value
Total Operations			
2015	34,131	0	No Value
(Base +5 yrs) 2020	39,570	0	No Value
(Base +10 yrs) 2025	45,870	0	No Value
(Base +15 yrs) 2030	53,174	0	No Value

3.9 Conclusions

Based on the estimated 767 operations for B-III and 249 operations for A-III aircraft for the base year 2015 and the expected growth, we recommend that Runway 16-34 improvements continue to be designed to B-III standards, and Runway 9-27 improvements continue to be designed to B-II standards. The total annual aircraft operations are estimated to be 61,641 during the 20-year planning period which falls well below the airport capacity of 230,000 annual operations.

References

Federal Aviation Administration. Air Carrier Activity Information System Database. http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger

Federal Aviation Administration. Office of Aviation Policy and Planning (APO) terminal area forecast (TAF). Palmer and Birchwood Airports. https://aspm.faa.gov/main/taf.asp

Goldsmith, Scott., HDR Alaska, Inc., and Northern Economics. Economic and Demographic Projections for Alaska and Greater Anchorage 2010–2035. December 2009.

Howell, David. Alaska Population Trends 2012 to 2042, June 2014.

State of Alaska. Department of Labor and Workforce Development, Research and Analysis Section.

GA Operations Regression Equation, Equation 13, All 232 Airports, Dummy Variable for Towered, (GRA, Inc., July 2001)

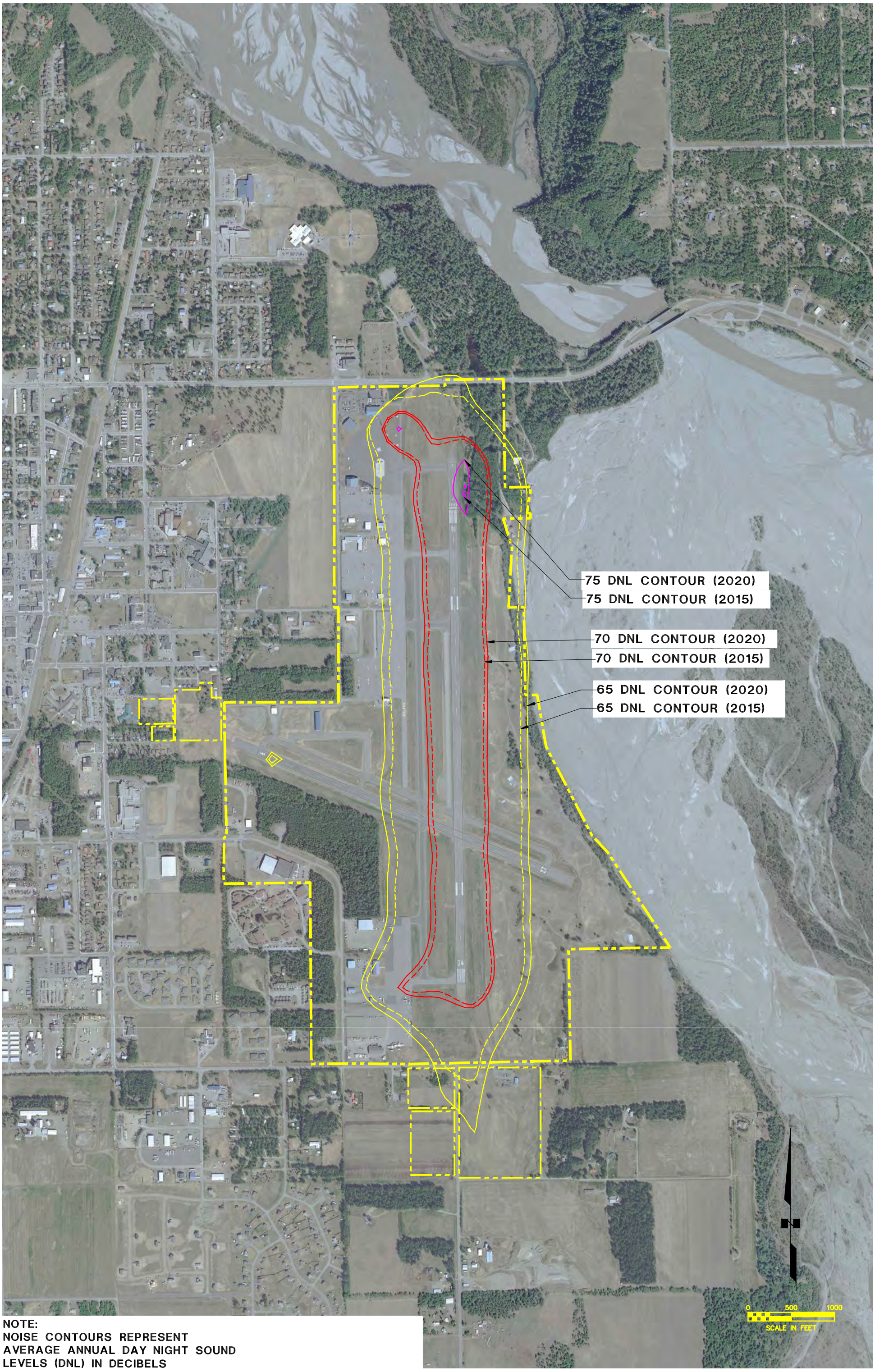
Factor		Variable	Variable for Palmer	Result
-571	x	1		-571
355	x	BA	121	42,955
-0.46	x	BA2	14,641	-6,735
-40,510	x	%in100mi	0.079	-3,200
3,795	x	VITFSnum	0	0
0.001	x	Pop100	411,953	412
-8,587	x	WACAORAK	1	-8,587
24,102	x	Pop25/100	0.26454	6,376
13,674	x	TOWDUM	0	0
				30,650 *Total OPS*

	Variable Definition
OPS	Annual GA Operations at an airport
OPSBA	Annual GA Operations per Based Aircraft (BA) at an airport
BA	Total Based Aircraft at an airport
BA2	Based Aircraft squared, which is included since airport operations tend to increase as the number of
PCI	Per Capita Income in the county in which the airport is located
EMP	Non-agricultural Employment in the airport's county
FAR139	Categorical variable, 1 if airport is certificated for commercial air carrier service, 0 otherwise
WST	Categorical variable, 1 if airport is located in FAA Western Region (excluding Alaska), 0 otherwise
AAL	Categorical variable, 1 if airport is located in Alaska, 0 otherwise
R12	Categorical variable, 1 if airport is located in FAA New England Region or FAA Eastern Region, 0
BAE100	Categorical variable, 1 if airport based aircraft is 100 or greater, 0 otherwise
Pop25	Population within 25 miles, by U.S. Census
Pop50	Population within 50 miles, by U.S. Census
Pop100	Population within 100 miles, by U.S. Census
Pop25/100	Ratio of Pop25 to Pop100, proportion, between 0 and 1, by census tract, U.S. Census
Se BA/BA	Single engine based aircraft/all based aircraft, proportion, between 0 and 1, from Terminal Area
TOWDUM	1 if towered airport, 0 otherwise, from TAF
%in50mi	Percentage of based aircraft among based aircraft at GA airports within 50 miles, Proportion,
%in100mi	Percentage of based aircraft among based aircraft at GA airports within 100 miles, Proportion,
VITFS	Presence or absence of FAR141 certificated pilot school, FAA Flight Standards VITALS database
VITFSnum	Number of FAR141 certificated pilot schools on airport, 1 if FAR141 certificated pilot school present,
VITFSemp	Number of Employees of FAR141 certificated pilot schools at airport, FAA Flight Standards VITALS
WACAORAK	1 if state is CA, OR, WA, or AK, 0 otherwise

	APCH SPD (KTS)	WING SPAN (FT)	TAIL HT (FT)	MTOW (lbs)	APPCH CAT	ADG	Base Year 2015	2020	2025	Growth 3% 2030	2035
PASSENGER ENPLANEMENTS											
Commuter/Air Taxi											
From FAA ACAIS	-	-	-	-		-	75	87	101	117	135
							75	87	101	117	135
FIXED WING OPERATIONS											
ITINERANT											
Commuter/Air Taxi											
Alaska Fuel Haulers											
Douglas DC-4	95	117.5	27.9	73,000	B	III	720	835	968	1,122	1,300
Cessna 401	95	44.2	11.5	6,300	B	I	208	241	280	324	376
Bush Air Cargo											
Douglas DC-3C	72	95.0	23.5	25,200	A	III	0	0	0	0	0
NHTI/HEI											
Piper PA-27-250	61	37.3	10.3	5,200	A	I	50	58	67	78	90
Piper PA-18	49	35.3	10.3	1,750	A	I	50	58	67	78	90
Cessna 185	64	35.8	12.0	3,350	A	I	75	87	101	117	135
Hageland											
Cessna 208 Caravan	79	52.1	12.0	8,807	A	II	300	348	403	467	542
Cessna 207	92	36.0	9.3	3,800	B	I	50	58	67	78	90
Cessna 402	95	44.2	11.5	6,300	B	I	50	58	67	78	90
Beechcraft 1900	113	58.0	15.5	17,120	B	II	5	6	7	8	9
Ultima Thule, Inc.											
Piper PA-18	49	35.3	10.3	1,750	A	I	65	75	87	101	117
Cessna 185	64	35.8	12.0	3,350	A	I	50	58	67	78	90
Dehavilland DHC-3	50	58.0	12.0	8,000	A	II	40	46	54	62	72
Cessna 180	64	36.0	12.0	2,550	A	I	30	35	40	47	54
DNR Forestry											
Casa 212	81	62.3	20.7	16,976	A	II	0	0	0	0	0
Cessna 208 Caravan	79	52.1	12.0	8,807	A	II	92	107	124	143	166
Convair 580	107	105.3	29.2	54,600	B	III	47	54	63	73	85
Dehavilland Dash 8	90	90.0	24.1	41,100	A	III	2	2	3	3	4
Douglas DC-3	72	95.0	23.5	25,200	A	III	2	2	3	3	4
Shorts 330 (C-23)	96	74.7	16.2	32,100	B	II	16	19	22	25	29
Canadair CL-215T	79	94.0	29.5	43,500	A	III	45	52	60	70	81
Aero Commander 1000	100	52.1	15.0	11,200	B	II	17	20	23	26	31
Aero Commander 500S	97	49.1	15.0	6,750	B	II	27	31	36	42	49
Aero Commander 690	98	46.7	15.0	10,250	B	I	0	0	0	0	0
Aero Commander 840	98	52.1	15.0	10,325	B	II	21	24	28	33	38
Dehavilland DHC-6	75	65.0	19.5	12,500	A	II	4	5	5	6	7
Dehavilland DHC-2	50	48.0	9.0	5,100	A	I	37	43	50	58	67
Anonymous / Miscellaneous											
DC-3	72	95.0	23.5	25,200	A	III	200	232	269	312	361
Pilatus PC-12	87	53.3	14.0	10,450	A	II	200	232	269	312	361
Navajo PA 31	74	40.6	13.0	7,000	A	I	24	28	32	37	43
Citation SII	118	49.8	14.0	12,500	B	II	50	58	67	78	90
General Aviation											
Itinerant "as" C172	64	35.5	8.5	2500	A	I	6,988	8,101	9,391	10,887	12,621
Itinerant "as" C185	92	36	9.3	3100	B	I	2,207	2,559	2,966	3,438	3,986
(Assumed 30% of GA Total)											
(76% C172 and 24% C185)											
Military											
Army National Guard (ARNG)											
ARNG Beechcraft King Air	103	54.5	15.0	12,500	B	II	40	46	54	62	72
ARNG Hercules C130	129	132.1	39.3	155,000	C	IV	24	28	32	37	43
ARNG Shorts 330	96	74.7	16.3	22,000	B	II	120	139	161	186	216
TOTAL ITINERANT OPS							11,855	13,745	15,933	18,469	21,409

	APCH SPD (KTS)	WING SPAN (FT)	TAIL HT (FT)	MTOW (lbs)	APPCH CAT	ADG	Base Year 2015	2020	2025	Growth 3% 2030	2035
LOCAL											
General Aviation											
Local "as" C172	64	35.5	8.5	2500	A	I	16,306	18,903	21,914	25,404	29,450
Local "as" C185	92	36	9.3	3100	B	I	5,149	5,969	6,920	8,022	9,300
(Assumed 70% of GA Total) (76%											
TOTAL LOCAL OPS							21,455	24,872	28,834	33,426	38,750
TOTAL FIXED WING OPS							33,310	38,617	44,767	51,895	60,159
HELICOPTER OPERATIONS											
Commuter/Air Taxi											
NHTI/HEI											
Bell 206 B111	-	-	-	-		-	90	104	121	140	163
DNR Forestry											
Bell 212							44	51	59	69	79
Blackhawk (UH-60)							16	19	22	25	29
Bell UH-1D							4	5	5	6	7
Bell UH-1H							10	12	13	16	18
A-Star AS-350							8	9	11	12	14
Last Frontier Aviation Group											
A-Star AS-350							400	464	538	623	722
Military											
Army National Guard (ARNG)											
Blackhawk (UH-60)							239	277	321	372	432
Other											
Medevac							10	12	13	16	18
TOTAL HELICOPTER OPS							821	953	1,103	1,279	1,482
TOTAL OPERATIONS							34,131	39,570	45,870	53,174	61,641
INSTRUMENT OPERATIONS	-	-	-	-		-	200	232	269	312	361
Based Aircraft											
Single Engine (nonjet)	-	-	-	-		-	137	159	184	213	247
Helicopter	-	-	-	-		-	3	3	4	5	5
TOTAL BASED AIRCRAFT							140	162	188	218	252

APPENDIX E
NOISE EXPOSURE MAP AND ASSUMPTIONS



NOTE:
NOISE CONTOURS REPRESENT AVERAGE ANNUAL DAY NIGHT SOUND LEVELS (DNL) IN DECIBELS

JUNE 8, 2015

NOISE EXPOSURE MAP

HDL HATTENBURG DILLEY & LINNELL
Engineering Consultants

NOISE MODEL ASSUMPTIONS

and

AIRCRAFT SUBSTITUTIONS

1. Under the Palmer Municipal Airport master plan contract, the FAA has funded the development of a Noise Exposure Map (NEM) to evaluate noise. A NEM will be prepared in accordance with Title *14 of the US Code of Federal Regulations (CFR) Part 150, Section 150.21 Noise Exposure Maps and Related Descriptions, and Appendix A - Noise Exposure Maps.*

2. This noise model is not a Part 150 Noise Compatibility Study or Program. Noise measurement and monitoring is not required (Part 150, Appendix A, A150.1(b)), has not been requested by FAA, and is within the scope of this task.

3. The NEM is used to (1) identify an airport's present and future noise patterns and (2) evaluate land use compatibility. Yearly average day-night sound levels (DNL) greater than 65 decibels are considered by FAA to be incompatible with certain noise sensitive land uses such as residences, hotels, mobile home parks, schools, hospitals, and nursing homes which are listed in *Part 150, Appendix A, TABLE 1- Land Use Compatibility with Yearly Day-Night Average Sound Levels*.

4. The Integrated Noise Model (INM) Version 7.0 software is used to generate noise contours based on the fleet mix, time of day (day or night), runway used, and flight tracks.

5. The NEM will present two maps for the present year (2015) and Year 5 (2020) with 65, 70, and 75 DNL noise contours plotted over land uses.

6. Aircraft types and number of operations are based on the FAA-approved Aviation Activity Forecast dated April 30, 2015, with substitutions for aircraft either not in the INM database, or substantially similar to aircraft provided in the software. See Table 2, 3, and 4 for aircraft substitutions.

7. Tracks:
    a. Tracks are based on consultant's field observations, the consultant's actual flying experience at Palmer, and input and guidance from FSS Specialist, Jennifer Hunter who as 30 years experience observing aircraft activity the airport. Not all aircraft will exactly follow the models tracks.
    b. Itinerant and local use the same tracks.
    c. The four helicopter routes directly to and from each helicopter landing point are assumed to be used equally (12.5% of total operations on each track)
    d. The helicopter track between the north and south landing points is assumed to be used in 50% of operations.
    e. Based on discussion with the FSS Specialists, 50% of GA traffic is modeled as touch and go operations.

f. The remaining 50% of GA traffic is modeled as inbound or outbound traffic as follows: 16.5% to-from north, 16.5% to-from west, and 5.5% to-from each southeast, south, and southwest.

8. Day-Night Operations Split: 80%-20%

9. Night operations period: 10:00 pm to 7:00 am

10. Night operations penalty: 10 decibels

11. Arrival-Departure Split: 50%-50%

12. Runway usage is based on wind direction and assumptions in Table 1 below. Wind data was obtained from 88,934 hourly wind observation records between and including years 2004 to 2014 from NOAA's Automated Surface Observing System (ASOS) located at the Palmer Airport.

Table 1 – Percent Runway Usage

Runway	Wind Speed (knots)	Wind Direction (degrees magnetic azimuth from)	Percent of Time by Wind Speed and Direction	Percent of Time by Runway
Runway 16	0-6	ALL	49.4[1]	59.5[3]
	7-10	80-240	4.9	
	11+	120-210	5.2	
Runway 34	0-6	ALL	21.2[1]	36.4[3]
	7-10	10-70, 250-360	8.5	
	11+	10-50, 310-360	6.7	
Runway 9	11+	60-110	4.0[2]	4.0
Runway 27	11+	220-300	0.1[2]	0.1
		TOTAL:	100%	100%

[1] For 0-6 knots, the Palmer FSS estimates Runway 16 / Runway 34 usage split is 70%-30%.

[2] Runway 9-27 generally only used when wind speed exceed 10 knots.

[3] Large aircraft over 12,500 pounds currently not authorized to use Runway 9-27, therefore their use percentages assumed to be 60% for Runway 16 and 40% for Runway 34.

13. Instrument Approaches:

a. Instrument approach noise is captured in the annual operations and visual flight tracks.

14. Aircraft Substitutions:

a. To establish the GA aircraft substitutions for entry in the Integrated Noise Model, a field inventory of the 55 aircraft located on aprons at Palmer was conducted to estimate the percentage of GA aircraft by type. Per Table 2, the field inventory indicated approximately 76% of the general aviation operations would be represented by the Cessna 172 noise profile (approximately 180 HP or lower) and 24% would be represented by the Cessna 185 noise profile

(approximately 285 HP or lower). Hangared GA aircraft were assumed to be proportionally the same as apron GA aircraft. Table 3 and Table 4 represent the commercial and helicopter substitutions. Substitution aircraft were selected to generate equivalent or more noise than the actual aircraft it represents.

Table 2 – General Aviation Fixed Wing Substitutions

GA Aircraft Type	Substitution
American Champ	172
American Citabria	172
Aviat Husky	172
Cessna 140	172
Cessna 150	172
Cessna 172	172
Piper Cub	172
Piper Super Cub	172
Piper Tomahawk	172
Piper Warrior	172
Stinson	172
Taylorcraft	172
Cessna 180	185
Cessna 182	185
Cessna 185	185
Cessna 337	185
Maule	185
Mooney	185
Piper Apache	185
Piper Cherokee	185

Table 3 – Commercial Fixed Wing Aircraft Substitutions

Aircraft Type	Substitution
Piper PA-18	172
Cessna 180	185
Cessna 185	185
Cessna 207	185
Dehavilland DHC-6	208
Dehavilland DHC-3	208
Dehavilland DHC-2	208
Citation SII	Citation III
Aerocommander 500S	Dash 8
Aerocommander 690	Dash 8
Aerocommander 840	Dash 8
Beechcraft 1900	Dash 8
Beechcraft King Air	Dash 8
Cessna 401	Dash 8
Cessna 402	Dash 8
Dehavilland Dash 8	Dash 8
Pilatus PC-12	Dash 8
Piper PA-27-250	Dash 8
Piper Navajo PA-31	Dash 8
Aerocommander 1000	DC-3
Canadair CL-215T	DC-3
Casa 212	DC-3
Douglas DC-3	DC-3
Shorts 330 (C-23)	DC-3
Convair 580	DC-6
Douglas DC-4	DC-6
Lockheed Hercules	C130

Table 4 – Helicopter Substitutions

Aircraft Type	Substitution
Bell 206	B206
Bell 212	B212
Blackhawk UH-60	S70
A-Star AS-350 (Medevac)	SA350D

APPENDIX F
WIND ANALYSIS DATA

Standard Wind Analysis Results for ALL_WEATHER

TITLE: Palmer Municipal Airport 2014

RUNWAY ORIENTATION:	341.93	161.93	DEGREE
CROSSWIND COMPONENT:	16.0	16.0	KNOTS
TAILWIND COMPONENT:	60.0	60.0	KNOTS

WIND COVERAGE: 98.24 %

HOURLY OBSERVATIONS OF WIND SPEED (KNOTS)

DIRECTION	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	> 41	TOTAL
10°	232	530	224	241	238	253	250	119	12	2099
20°	213	438	150	163	194	209	156	70	7	1600
30°	232	402	116	78	53	22	7	3	0	913
40°	254	430	119	34	12	3	0	0	0	852
50°	306	502	109	27	5	0	0	0	0	949
60°	302	509	144	19	5	1	0	0	0	980
70°	276	615	177	31	6	0	0	0	0	1105
80°	318	643	254	98	29	6	3	0	0	1351
90°	396	716	303	190	93	42	6	0	0	1746
100°	459	922	540	411	255	136	56	9	0	2788
110°	444	903	772	1212	669	216	47	7	0	4270
120°	410	930	780	1720	836	102	3	0	0	4781
130°	419	763	411	977	360	16	0	0	0	2946
140°	401	665	205	355	99	4	0	0	0	1729
150°	394	681	122	111	21	1	0	0	0	1330
160°	364	670	89	23	0	0	0	0	0	1146
170°	277	504	62	11	0	0	0	0	0	854
180°	174	334	49	0	0	0	0	0	0	557
190°	194	414	62	1	0	0	0	0	0	671
200°	190	574	116	3	0	0	0	0	0	883
210°	212	714	200	5	0	0	0	0	0	1131
220°	195	628	170	11	1	0	0	0	0	1005
230°	141	439	129	11	1	0	0	0	0	721
240°	106	290	71	22	4	0	0	0	0	493
250°	90	161	43	21	1	0	0	0	0	316
260°	54	115	34	10	1	0	0	0	0	214
270°	56	100	19	6	0	0	0	0	0	181
280°	50	73	14	1	0	0	0	0	0	138
290°	71	53	11	1	0	0	0	0	0	136
300°	77	112	32	4	0	0	0	0	0	225
310°	178	302	96	21	0	0	0	0	0	597
320°	404	1773	1323	475	26	1	0	0	0	4002
330°	623	4465	3024	1755	67	0	0	0	0	9934
340°	577	1960	1122	411	11	2	0	2	0	4085
350°	413	1177	587	193	30	16	12	4	1	2433
360°	288	734	291	199	143	162	153	79	8	2057
Calm	27716									27716
TOTAL	37506	25241	11970	8851	3160	1192	693	293	28	88934

SOURCE: Nevada Desert Research Center Wind Database

REFERENCE: Appendix 1 of AC 150/5300-13, Airport Design, including Changes 1 through 17.

Standard Wind Analysis Results for ALL_WEATHER

TITLE: Palmer Municipal Airport 2014

RUNWAY ORIENTATION:	341.93	161.93	DEGREE
CROSSWIND COMPONENT:	13.0	13.0	KNOTS
TAILWIND COMPONENT:	60.0	60.0	KNOTS

WIND COVERAGE: 96.15 %

HOURLY OBSERVATIONS OF WIND SPEED (KNOTS)

DIRECTION	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	> 41	TOTAL
10°	232	530	224	241	238	253	250	119	12	2099
20°	213	438	150	163	194	209	156	70	7	1600
30°	232	402	116	78	53	22	7	3	0	913
40°	254	430	119	34	12	3	0	0	0	852
50°	306	502	109	27	5	0	0	0	0	949
60°	302	509	144	19	5	1	0	0	0	980
70°	276	615	177	31	6	0	0	0	0	1105
80°	318	643	254	98	29	6	3	0	0	1351
90°	396	716	303	190	93	42	6	0	0	1746
100°	459	922	540	411	255	136	56	9	0	2788
110°	444	903	772	1212	669	216	47	7	0	4270
120°	410	930	780	1720	836	102	3	0	0	4781
130°	419	763	411	977	360	16	0	0	0	2946
140°	401	665	205	355	99	4	0	0	0	1729
150°	394	681	122	111	21	1	0	0	0	1330
160°	364	670	89	23	0	0	0	0	0	1146
170°	277	504	62	11	0	0	0	0	0	854
180°	174	334	49	0	0	0	0	0	0	557
190°	194	414	62	1	0	0	0	0	0	671
200°	190	574	116	3	0	0	0	0	0	883
210°	212	714	200	5	0	0	0	0	0	1131
220°	195	628	170	11	1	0	0	0	0	1005
230°	141	439	129	11	1	0	0	0	0	721
240°	106	290	71	22	4	0	0	0	0	493
250°	90	161	43	21	1	0	0	0	0	316
260°	54	115	34	10	1	0	0	0	0	214
270°	56	100	19	6	0	0	0	0	0	181
280°	50	73	14	1	0	0	0	0	0	138
290°	71	53	11	1	0	0	0	0	0	136
300°	77	112	32	4	0	0	0	0	0	225
310°	178	302	96	21	0	0	0	0	0	597
320°	404	1773	1323	475	26	1	0	0	0	4002
330°	623	4465	3024	1755	67	0	0	0	0	9934
340°	577	1960	1122	411	11	2	0	2	0	4085
350°	413	1177	587	193	30	16	12	4	1	2433
360°	288	734	291	199	143	162	153	79	8	2057
Calm	27716									27716
TOTAL	37506	25241	11970	8851	3160	1192	693	293	28	88934

SOURCE: Nevada Desert Research Center Wind Database

REFERENCE: Appendix 1 of AC 150/5300-13, Airport Design, including Changes 1 through 17.

Standard Wind Analysis Results for ALL_WEATHER

TITLE: Palmer Municipal Airport 2014

RUNWAY ORIENTATION:	341.93	161.93	DEGREE
CROSSWIND COMPONENT:	10.5	10.5	KNOTS
TAILWIND COMPONENT:	60.0	60.0	KNOTS

WIND COVERAGE: 93.39 %

HOURLY OBSERVATIONS OF WIND SPEED (KNOTS)

DIRECTION	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	> 41	TOTAL
10°	232	530	224	241	238	253	250	119	12	2099
20°	213	438	150	163	194	209	156	70	7	1600
30°	232	402	116	78	53	22	7	3	0	913
40°	254	430	119	34	12	3	0	0	0	852
50°	306	502	109	27	5	0	0	0	0	949
60°	302	509	144	19	5	1	0	0	0	980
70°	276	615	177	31	6	0	0	0	0	1105
80°	318	643	254	98	29	6	3	0	0	1351
90°	396	716	303	190	93	42	6	0	0	1746
100°	459	922	540	411	255	136	56	9	0	2788
110°	444	903	772	1212	669	216	47	7	0	4270
120°	410	930	780	1720	836	102	3	0	0	4781
130°	419	763	411	977	360	16	0	0	0	2946
140°	401	665	205	355	99	4	0	0	0	1729
150°	394	681	122	111	21	1	0	0	0	1330
160°	364	670	89	23	0	0	0	0	0	1146
170°	277	504	62	11	0	0	0	0	0	854
180°	174	334	49	0	0	0	0	0	0	557
190°	194	414	62	1	0	0	0	0	0	671
200°	190	574	116	3	0	0	0	0	0	883
210°	212	714	200	5	0	0	0	0	0	1131
220°	195	628	170	11	1	0	0	0	0	1005
230°	141	439	129	11	1	0	0	0	0	721
240°	106	290	71	22	4	0	0	0	0	493
250°	90	161	43	21	1	0	0	0	0	316
260°	54	115	34	10	1	0	0	0	0	214
270°	56	100	19	6	0	0	0	0	0	181
280°	50	73	14	1	0	0	0	0	0	138
290°	71	53	11	1	0	0	0	0	0	136
300°	77	112	32	4	0	0	0	0	0	225
310°	178	302	96	21	0	0	0	0	0	597
320°	404	1773	1323	475	26	1	0	0	0	4002
330°	623	4465	3024	1755	67	0	0	0	0	9934
340°	577	1960	1122	411	11	2	0	2	0	4085
350°	413	1177	587	193	30	16	12	4	1	2433
360°	288	734	291	199	143	162	153	79	8	2057
Calm	27716									27716
TOTAL	37506	25241	11970	8851	3160	1192	693	293	28	88934

SOURCE: Nevada Desert Research Center Wind Database

REFERENCE: Appendix 1 of AC 150/5300-13, Airport Design, including Changes 1 through 17.

Standard Wind Analysis Results for ALL_WEATHER

TITLE: Palmer Municipal Airport 2014

RUNWAY ORIENTATION:	95.41	275.41	DEGREE
CROSSWIND COMPONENT:	13.0	13.0	KNOTS
TAILWIND COMPONENT:	60.0	60.0	KNOTS

WIND COVERAGE: 96.24 %

HOURLY OBSERVATIONS OF WIND SPEED (KNOTS)

DIRECTION	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	> 41	TOTAL
10°	232	530	224	241	238	253	250	119	12	2099
20°	213	438	150	163	194	209	156	70	7	1600
30°	232	402	116	78	53	22	7	3	0	913
40°	254	430	119	34	12	3	0	0	0	852
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110°	444	903	772	1212	669	216	47	7	0	4270
120°	410	930	780	1720	836	102	3	0	0	4781
130°	419	763	411	977	360	16	0	0	0	2946
140°	401	665	205	355	99	4	0	0	0	1729
150°	394	681	122	111	21	1	0	0	0	1330
160°	364	670	89	23	0	0	0	0	0	1146
170°	277	504	62	11	0	0	0	0	0	854
180°	174	334	49	0	0	0	0	0	0	557
190°	194	414	62	1	0	0	0	0	0	671
200°	190	574	116	3	0	0	0	0	0	883
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240°	106	290	71	22	4	0	0	0	0	493
250°	90	161	43	21	1	0	0	0	0	316
260°	54	115	34	10	1	0	0	0	0	214
270°	56	100	19	6	0	0	0	0	0	181
280°	50	73	14	1	0	0	0	0	0	138
290°	71	53	11	1	0	0	0	0	0	136
300°	77	112	32	4	0	0	0	0	0	225
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Calm	27716									27716
TOTAL	37506	25241	11970	8851	3160	1192	693	293	28	88934

SOURCE: Nevada Desert Research Center Wind Database

REFERENCE: Appendix 1 of AC 150/5300-13, Airport Design, including Changes 1 through 17.

Standard Wind Analysis Results for ALL_WEATHER

TITLE: Palmer Municipal Airport 2014

RUNWAY ORIENTATION:	95.41	275.41	DEGREE
CROSSWIND COMPONENT:	10.5	10.5	KNOTS
TAILWIND COMPONENT:	60.0	60.0	KNOTS

WIND COVERAGE: 93.86 %

HOURLY OBSERVATIONS OF WIND SPEED (KNOTS)

DIRECTION	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	> 41	TOTAL
10°	232	530	224	241	238	253	250	119	12	2099
20°	213	438	150	163	194	209	156	70	7	1600
30°	232	402	116	78	53	22	7	3	0	913
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70°	276	615	177	31	6	0	0	0	0	1105
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100°	459	922	540	411	255	136	56	9	0	2788
110°	444	903	772	1212	669	216	47	7	0	4270
120°	410	930	780	1720	836	102	3	0	0	4781
130°	419	763	411	977	360	16	0	0	0	2946
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160°	364	670	89	23	0	0	0	0	0	1146
170°	277	504	62	11	0	0	0	0	0	854
180°	174	334	49	0	0	0	0	0	0	557
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200°	190	574	116	3	0	0	0	0	0	883
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Calm	27716									27716
TOTAL	37506	25241	11970	8851	3160	1192	693	293	28	88934

SOURCE: Nevada Desert Research Center Wind Database

REFERENCE: Appendix 1 of AC 150/5300-13, Airport Design, including Changes 1 through 17.

Standard Wind Analysis Results for ALL_WEATHER

TITLE: Palmer Municipal Airport 2014

RUNWAY ORIENTATION:	341.93	161.93	95.41	275.41	DEGREE
CROSSWIND COMPONENT:	16.0	16.0	13.0	13.0	KNOTS
TAILWIND COMPONENT:	60.0	60.0	60.0	60.0	KNOTS

WIND COVERAGE: 99.45 %

HOURLY OBSERVATIONS OF WIND SPEED (KNOTS)

DIRECTION	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	> 41	TOTAL
10°	232	530	224	241	238	253	250	119	12	2099
20°	213	438	150	163	194	209	156	70	7	1600
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280°	50	73	14	1	0	0	0	0	0	138
290°	71	53	11	1	0	0	0	0	0	136
300°	77	112	32	4	0	0	0	0	0	225
310°	178	302	96	21	0	0	0	0	0	597
320°	404	1773	1323	475	26	1	0	0	0	4002
330°	623	4465	3024	1755	67	0	0	0	0	9934
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Calm	27716									27716
TOTAL	37506	25241	11970	8851	3160	1192	693	293	28	88934

SOURCE: Nevada Desert Research Center Wind Database

REFERENCE: Appendix 1 of AC 150/5300-13, Airport Design, including Changes 1 through 17.

APPENDIX G
PAVEMENT MANAGEMENT PLAN

Pavement Management Plan
Palmer Municipal Airport

For

City of Palmer
Department of Public Works

David Lundin, PE/Principal

HATTENBURG DILLEY & LINNELL
Engineering Consultants

202 W. Elmwood Avenue
Palmer, Alaska 99645
Ph: 907-746-5230
Fax: 907-746-5231

October 25, 2013

Pavement Management Plan

Palmer Municipal Airport

For

City of Palmer
Department of Public Works
231 W. Evergreen Avenue
Palmer, Alaska 99645

HDL Project Number 13-021

Prepared by:
David Lundin, PE/Principal
Hattenburg Dilley & Linnell
202 W. Elmwood Avenue
Palmer, Alaska 99645
(907) 746-5230

October 25, 2013

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Appendices

1.0 Introduction

Since 1995, Federal grant assurances have required that, to continue receiving Federal funding, airports implement a pavement maintenance-management program for any pavement constructed or repaired using Federal money.

Pavement management is a systematic method of: 1) assessing current pavement conditions, 2) determining maintenance and rehabilitation needs, and 3) prioritizing these needs to make the best use of anticipated funding levels.

1.1 FAA Requirements

The Federal Aviation Administration (FAA) has defined an effective pavement maintenance-management program as one that specifies the procedures to be followed to assure that proper preventative and remedial pavement maintenance is performed. An airport sponsor may use any format it deems appropriate, but the program must, as a minimum, include the following:

- a pavement inventory which shows the dimensions, locations, and maintenance history of all paved surfaces,
- a prescribed inspection schedule, which will minimally involve detailed annual assessments (or triennial Pavement Condition Index (PCI) surveys), and monthly drive-by observations,
- record keeping which documents inspection dates, findings, locations of distress, and remedial actions scheduled and performed, and
- a method of data retrieval which would permit a comprehensive presentation to the FAA if they request one.

The triennial pavement condition surveys that the Alaska Department of Transportation and Public Facilities (DOT&PF) perform at Palmer Municipal Airport (PAQ), the monthly drive-by observations made by PAQ maintenance personnel, and this document satisfy all the FAA requirements for an effective pavement management program.

1.2 State of Alaska Airport Pavement Management System

The triennial pavement condition inspections involve visual assessment of representative sample units to quantify the extent and severity of various distresses. Conditions are rated according to the US Army Corps of Engineers Pavement Condition Index (PCI) methods as described in FAA Advisory Circular, AC 150/5380-6B, Guidelines and Procedures for Maintenance of Airport Pavements. This method gives a PCI of 100 for a perfect, new pavement. Deductions are made for measured pavement distresses so that a completely failed pavement would have a PCI of 0. The inspection information is entered into a MicroPAVER database along with pavement age and construction/maintenance histories. The program generates PCI values which are included in annual reports and maps.

General recommendations for pavement maintenance and project work are provided along with PCI maps for various years. These are used as strategies for needed work. The principal set forth here recognizes that pavement maintenance is most efficient and cost effective when done at higher condition ratings. When the PCI falls below minimums, it is most cost effective to rehabilitate the pavement with construction contracts. However, lack of funding and need for safe operations sometimes require that stopgap maintenance be performed on pavements in lower condition categories. The most recent DOT&PF Pavement Inspection Report is included as Appendix A.

2.0 Pavement Condition Assessment

2.1 Pavement Inventory

The construction history information was used to divide the pavement network at PAQ into management units—branches, sections, and sample units. A branch is a single entity that serves a distinct function. For example, a runway is considered a branch because it serves a single function (allowing aircraft to take-off and land). On an airfield, a branch typically represents an entire runway, taxiway, or apron.

Because of the disparity of characteristics that can occur throughout a branch, it is further subdivided into units called sections. A section is a portion of the pavement that has uniform construction history, pavement structure, traffic patterns, and condition throughout its entire length or area. Sections are used as a management unit for the selection of potential maintenance and rehabilitation projects. The guideline used in deciding where section breaks are located is to think of the section as the "repair unit"—a portion of the pavement that will be managed independently and evaluated separately for pavement maintenance and rehabilitation.

Pavement sections are further subdivided into sample units for inspection purposes. The typical sample unit size for asphalt concrete (AC) pavements is 5,000 square feet ± 2,000 square feet. A statistical based sampling rate is used to determine the number of sample units to inspect for each section. The inspected sample units are representative of the overall condition within a section and are then used to extrapolate the condition as a whole.

Table 1 presents the pavement areas at PAQ by branch as determined by DOT&PF.

Table 1: Branch Definition

Use Category	Number of Sections	Area (SF)
Apron	10	1,589,850
Runway	4	773,400
Taxiway	19	918,048
	Airport Total	3,281,298

Figure 1 presents the network definition used by DOT&PF for PAQ and represents the pavements included in the statewide airport pavement management system.

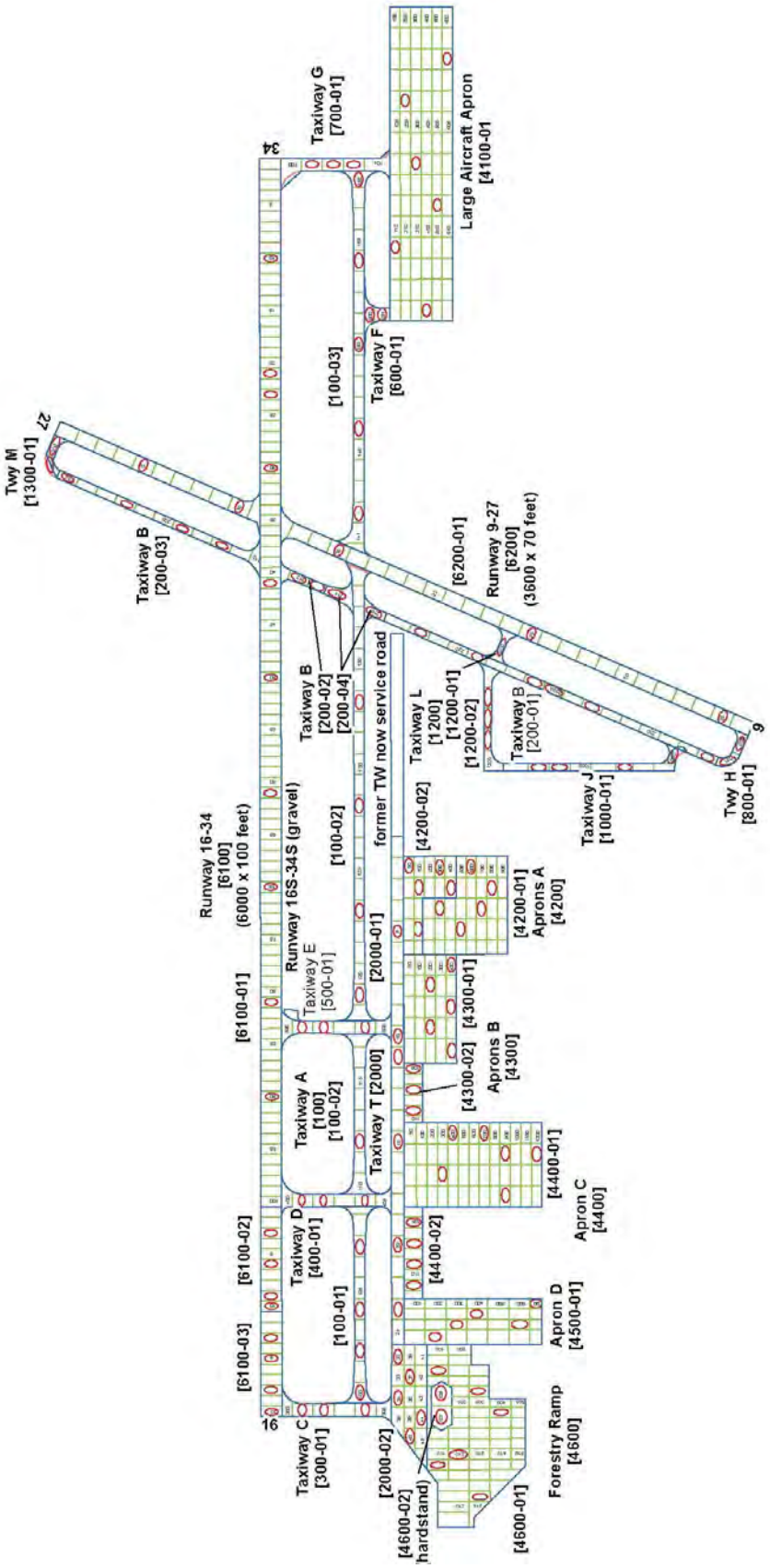


Figure 1: Network Definition at Palmer Municipal Airport (DOT&PF, 2013)

2.2 Pavement Evaluation

The pavement surfaces at PAQ were visually inspected on July 12, 2013 by DOT&PF, using the PCI procedure. During a PCI inspection, inspectors walk over the surface of the pavement and identify visible signs of distress within a sample unit. Each distress type is identified, then classified as low, medium, or high severity, and recorded on field sheets. In general, the higher the severity, the higher the foreign object debris (FOD) damage potential. The quantity, or extent, is measured for each distress/severity combination.

After collecting and summarizing the distress type, severity, and quantity for each of the inspected sample units, the distress data was entered into the MicroPAVER database and a PCI was calculated. The PCI procedure uses established deduct curves to determine the actual number of points to deduct for each distress type/severity combination, depending on the density of the distress. The inspected sample unit PCI values were then averaged to determine an overall PCI for that section.

The PCI value provides a general sense as to the level of rehabilitation that will be needed to repair a given pavement. In general terms, maintenance activities such as crack sealing and patching often provide benefit when the PCI > 60. However, as the pavement continues to deteriorate, more complex and expensive treatments will be necessary. Pavements with a PCI between 40 and 60 are good candidates for a variety of major repairs ranging from overlays to reconstruction. For PCI < 40, reconstruction is typically the only viable alternative. Table 2 presents the PCI rating scale and the corresponding general pavement recommendations used by DOT&PF.

Table 2: PCI Rating Scale

PCI Values	General Pavement Recommendations
85 - 100	Do Nothing or Preventative Maintenance
60 - 84	Preventative / Corrective Maintenance
40 - 59	Rehabilitate
0 - 39	Reconstruct

Preventative and corrective maintenance include activities such as crack sealing, patching, and seal coats that help to slow down the rate that a pavement is deteriorating.

Rehabilitation involves work on the existing pavement, followed by an overlay. Work on the existing surface may include planing the surface smooth, patching and filling cracks. This work will bring the PCI back up to 100 and its performance is dependent on the quality of the work done.

Pavement reconstruction will include at least removal and replacement of the existing pavement. If the need for this occurs prematurely, then improvement of the structural section is warranted. That may include increasing the pavement thickness and/or stabilizing the base and subbase materials. This is project work that will bring the PCI back up to 100.

2.3 Pavement Distress Types

To better understand the cause of pavement deterioration, it is necessary to look at the distress types associated with each PCI. Each distress type has been classified into three groups based on cause—load, climate/durability, or other. Load-related distresses, such as alligator cracking in asphalt pavements, indicate that the structural integrity of the pavement has been compromised. Climate-related distresses indicate that the pavement has aged due to seasonal environmental effects. Distresses that cannot be attributed solely to either load or climate are classified as other. Table 3 presents the asphalt distress types in the PCI procedure, their classification, and identifies which distresses were located at PAQ during the pavement inspection.

Table 3: PCI Distress Types

Asphalt Distresses	Cause Classification
Alligator Cracking	Load
Bleeding	Other
Block Cracking	Climate
Corrugation	Other
Depression	Other
Jet Blast	Other
Joint Reflection Cracking	Other
Longitudinal/Transverse Cracking	Climate
Oil Spillage	Climate
Patching	Other
Polished Aggregate	Other
Weathering/Raveling	Climate
Rutting	Load
Shoving	Other
Slippage Cracking	Other
Swelling	Other

Distresses found at PAQ are denoted with ***bold italic*** text

2.4 PCI Results

The results of the DOT&PF 2013 PCI inspection are presented in Figure 2. The overall area-weighted PCI for PAQ is 75.5. When summarizing PCI values, an area-weighted calculation is used instead of a straight mathematical average because the area-weighted calculations eliminate the skewing of the PCI due to the disparity of the section sizes.

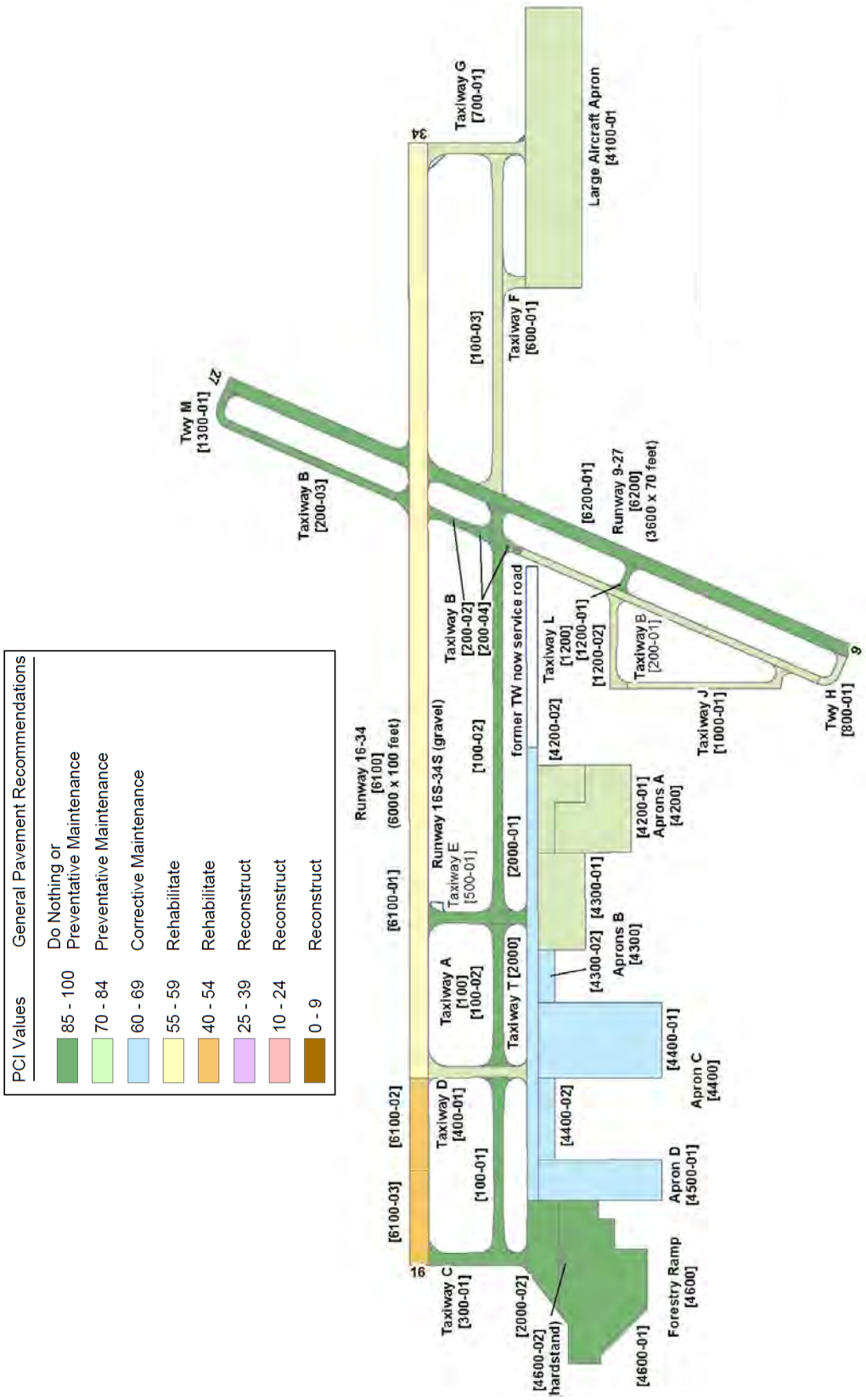


Figure 2: Pavement Condition Index Rating at Palmer Municipal Airport (DOT&PF, 2013)

Table 4 presents the PCI summary for each section at PAQ, including the drop in PCI per inspection. Generally, pavement sections will deteriorate between 1 and 3 PCI points per year. Sections deteriorating at higher rates may need maintenance above the normal application rates and should be closely monitored in case major repairs become necessary.

Appendix A contains the detailed DOT&PF inspection report with sample unit data produced from MicroPAVER.

Table 4: PCI Section Summary Table

Branch ID		Number of Sections	Area (SF)	LCD[1]	2008 PCI	2010 PCI	2013 PCI	Drop[2] in PCI/Yr
0100	Taxiway A	3	315,550	2002	95.67	93.1	87.43	1.1
0200	Taxiway B	4	140,640	2006	92.19	87.19	86.26	2.0
0300	Taxiway C	1	35,400	2002	90	88	87	1.2
0400	Taxiway D	1	25,200	1980	84	89	81	0.6
0500	Taxiway E	1	36,300	2002	95	84	87	1.2
0600	Taxiway F	1	11,900	2002	95	94	82	1.6
0700	Taxiway G	1	35,000	1980	76	74	70	0.9
0800	Taxiway H	1	8,900	2006	91	86	81	2.7
1000	Taxiway J	1	33,098	2004	92	87	78	2.4
1200	Taxiway L	2	29,560	2004	99	86.6	83.92	1.8
1300	Taxiway M	1	8,700	2006	90	90	90	1.4
2000	Taxiway T	2	227,800	1996	73.89	74.29	70.74	1.7
4100	Large Aircraft Apron	1	450,000	1996	82	81	81	1.1
4200	Apron A	2	233,300	2002	87.6	83.92	78.84	1.9
4300	Apron B	2	156,400	1996	68.51	72.03	69.35	1.8
4400	Apron C	2	303,300	1996	74.22	68	67.87	1.9
4500	Apron D	1	144,250	1996	72	70	68	1.9
6100	Runway 16/34	3	600,000	1987	55.92	54	56.92	1.7
6200	Runway 09/27	1	173,400	2007	100	93	95	0.8

[1]LCD = last construction date (original construction, last overlay, or reconstruction [whichever is most recent])

[2]Drop in PCI/Yr = (100-PCI)/age; where age = 2013-LCD

3.0 Recommendations

A maintenance and rehabilitation work plan was developed for PAQ based on the 2013 DOT&PF pavement inspections and the anticipated PCI deterioration for this period. The recommendations are divided into two categories—maintenance and major rehabilitation/reconstruction. Maintenance is intended to address annual maintenance needs such as crack sealing and localized patching. The major rehabilitations and reconstructions are applied globally and are capable of returning the pavement to a nearly distress-free state. The work plans include the following recommended treatments:

- Shallow Patch: remove and replace 3 inches of asphalt and 2 inches of crushed aggregate base course in select areas.

- Deep Patch: remove and replace 3 inches of asphalt, 4 inches of crushed aggregate base course, and 8 inches of subbase in select areas.
- Seal Coat: apply a slurry seal (emulsified asphalt) surface treatment.
- Crack Sealing: for cracks less than ¾-inch wide; rout, clean, and seal the cracks with hot-applied sealant. For cracks more than ¾-inch wide; remove existing filler material, if any, rout, clean, tack coat edges and fill with fine-grained asphalt pavement mix.
- Utility Dig Out: remove and replace utility crossing.
- Reconstruct Taxiway Asphalt Pavement: remove and replace 3 inches of asphalt and 2 inches of crushed aggregate base course.
- Reconstruct Runway Asphalt Pavement: remove and replace 4 inches of asphalt and 2 inches of crushed aggregate base course.
- Reconstruct Taxiway Structural Section: remove and replace 3 inches of asphalt, 4 inches of crushed aggregate base course, and 36 inches of subbase.
- Reconstruct Runway Structural Section: remove and replace 4 inches of asphalt, 12 inches of crushed aggregate base course, and 32 inches of subbase.

3.1 Recommended Maintenance Work Plan

The maintenance work plan presented in Table 5 will bring the PAQ pavement conditions for the identified locations up to acceptable levels. The costs in the table include minor crack sealing in areas where crack sealing is not specifically requested.

Table 5: Recommended Maintenance Work Plan

Location	Treatment	Priority	Estimated Cost
Taxiway G	Shallow Patch, Seal Coat	1	$35,500
Apron A	Shallow Patch, Seal Coat	1	$234,300
Apron B	Seal Coat	1	$156,400
Apron C	Seal Coat	1	$303,300
Apron D	Seal Coat	1	$144,300
Runway 9/27	Crack Sealing	2	$44,000
Taxiway B & H	Utility Dig-Outs	3	$52,500
Taxiway A	Deep Patch, Crack Sealing	4	$28,000
Taxiway E	Shallow Patch, Crack Sealing	4	$11,500
Taxiway L	Shallow Patch, Crack Sealing	4	$55,500
Taxiway C	Crack Sealing	5	$22,000
Taxiway T	Deep Patch	6	$8,800
	Maintenance Total		$1,096,100

3.2 Recommended Major Rehabilitation and Reconstruction Work Plan

As a planning aid to the City of Palmer and FAA, Table 6 provides a summary of recommended pavement rehabilitation/reconstruction Capital Improvement Projects (CIPs) at PAQ. More in-depth project-level engineering evaluations and pavement design will be needed to determine the extent of reconstruction. Routine maintenance should also be programmed annually and coordinated with these rehabilitation recommendations. The pavement sections identified for major rehabilitation in this report are predicted to reach a condition level where either overlays or reconstruction should be considered. The estimates are rough order of magnitude costs and should be further refined after surveying, geotechnical engineering and pavement design determine subgrade strengths and design wheel loads.

Table 6: Recommended Major Rehabilitation/Reconstruction Work Plan

Location	Treatment	Priority	Estimated Construction Cost
Runway 16/34[1]	Reconstruct Runway Structural Section	1	$2,000,000
Runway 16/34[2]	Reconstruct Runway Asphalt Pavement	2	$4,000,000
Taxiway B	Reconstruct Taxiway Structural Section	3	$2,390,880
Taxiway T	Reconstruct Taxiway Asphalt Pavement	4	$1,366,800
	Major Rehabilitation / Reconstruction Total		**$9,757,680**

[1] Displaced threshold area (North 1000 feet)

[2] Remainder of runway (5000 feet)

3.3 Maintenance and Major Rehabilitation Policies

A recommended maintenance policy for asphalt surfaces at PAQ is provided in Table 7 as shown on the next page.

Table 7: Maintenance Policy for Asphalt Surfaces

Distress Type	Distress Severity	Maintenance Treatment
Alligator Cracking	Low	Crack Sealing
	Medium	Deep Patch
	High	Deep Patch
Bleeding	N/A	Monitor
Block Cracking	Low	Monitor
	Medium	Crack Sealing
	High	Crack Sealing
Corrugation	Low	Monitor
	Medium	Deep Patch
	High	Deep Patch
Depression	Low	Monitor
	Medium	Shallow Patch
	High	Deep Patch
Jet Blast	N/A	Shallow Patch
Joint Reflection Cracking	Low	Monitor
	Medium	Crack Sealing
	High	Crack Sealing
Longitudinal & Traverse Cracking (L&T Cracking)	Low	Monitor
	Medium	Crack Sealing
	High	Crack Sealing
Oil Spillage	N/A	Shallow Patch
Patching	Low	Monitor
	Medium	Crack Sealing
	High	Deep Patch
Polished Aggregate	N/A	Monitor
Raveling	Low	Monitor
	Medium	Seal Coat (Sand Slurry)
	High	Shallow Patch
Rutting	Low	Monitor
	Medium	Deep Patch
	High	Deep Patch
Shoving	Low	Monitor
	Medium	Shallow Patch
	High	Deep Patch
Slippage Cracking	N/A	Shallow Patch
Swelling	Low	Monitor
	Medium	Deep Patch
	High	Deep Patch
Weathering	Low	Monitor
	Medium	Seal Coat (Sand Slurry)
	High	Shallow Patch

4.0 References

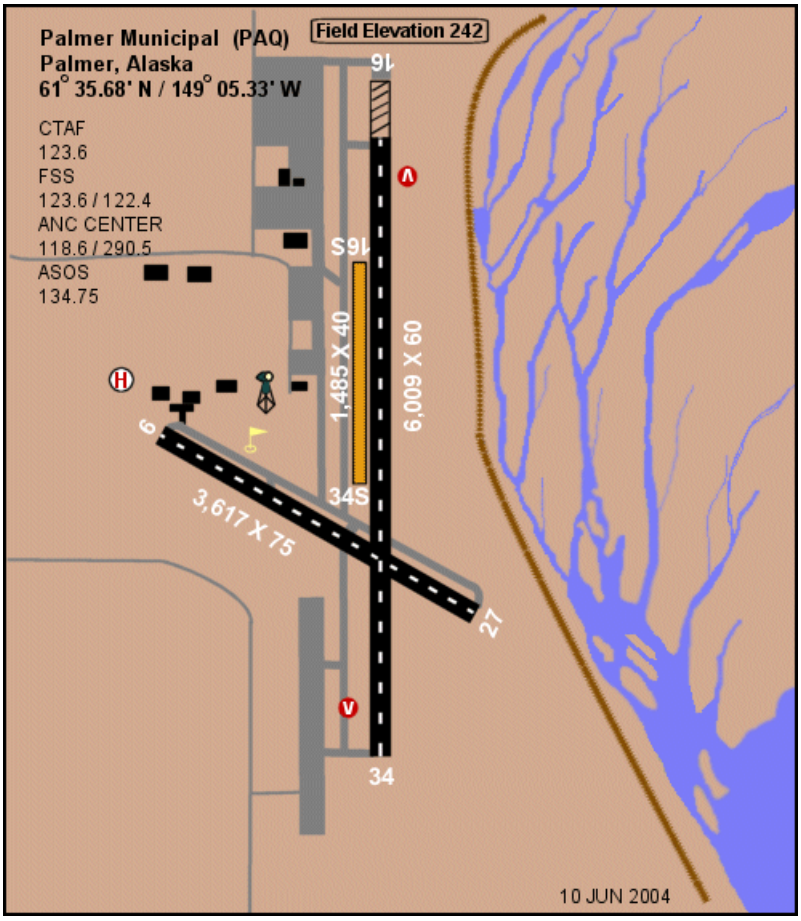
1. *FAA Advisory Circular 150/5380-6B Guidelines and Procedures for Maintenance of Airport Pavements,* Federal Aviation Administration, 2007.

2. *Palmer Airport - Alaska Airport Pavement Inspection Report,* Central Region Materials Alaska DOT&PF, 2013.

3. *ASTM D5340- 12 Standard Test Method for Airport Pavement Condition Index Surveys*, ASTM International, 2012.

Appendix A

Palmer Airport - Alaska Airport Pavement Inspection Report



PALMER AIRPORT

Alaska Airport Pavement Inspection Report

Published September 2013

James Horn
Project Manager
Central Region Materials, Alaska DOT&PF
5750 E. Tudor Road
Phone: (907) 269-6237 Fax: (907) 269-6201
Email: jim.horn@alaska.gov

Date: 7 /12/2013

Branch Condition Report

Pavement Database: PAVERDB_ALL NetworkID: Palmer

Branch ID	Number of Sections	Sum Section Length (Ft)	Avg Section Width (Ft)	True Area (SqFt)	Use	Average PCI	PCI Standard Deviation	Weighted Average PCI
0100 (Taxiway A)	3	5,767.00	50.00	315,550.00	TAXIWAY	87.00	6.38	87.43
0200 (Taxiway B (Parallel 9/27))	4	3,266.00	40.00	140,640.00	TAXIWAY	87.50	2.18	86.26
0300 (Taxiway C)	1	525.00	60.00	35,400.00	TAXIWAY	87.00	0.00	87.00
0400 (Taxiway D)	1	540.00	60.00	35,200.00	TAXIWAY	81.00	0.00	81.00
0500 (Taxiway E)	1	550.00	60.00	36,300.00	TAXIWAY	87.00	0.00	87.00
0600 (Taxiway F)	1	125.00	60.00	11,900.00	TAXIWAY	82.00	0.00	82.00
0700 (Taxiway G)	1	500.00	60.00	35,000.00	TAXIWAY	70.00	0.00	70.00
0800 (Taxiway H)	1	200.00	40.00	8,900.00	TAXIWAY	81.00	0.00	81.00
1000 (Taxiway J)	1	885.00	35.00	33,098.00	TAXIWAY	78.00	0.00	78.00
1200 (Taxiway L)	2	640.00	35.00	29,560.00	TAXIWAY	86.00	4.00	83.92
1300 (Taxiway M)	1	200.00	40.00	8,700.00	TAXIWAY	90.00	0.00	90.00
2000 (Taxiway T)	2	2,840.00	125.00	227,800.00	TAXIWAY	74.00	12.00	70.74
4100 (General Transport Apron)	1	1,500.00	300.00	450,000.00	APRON	81.00	0.00	81.00
4200 (Apron A)	2	650.00	460.00	233,300.00	APRON	76.50	6.50	78.84
4300 (A and B Lots)	2	530.00	305.00	156,400.00	APRON	68.00	2.00	69.35
4400 (C Lot)	2	1,095.00	245.00	303,300.00	APRON	67.50	0.50	67.87

Branch Condition Report

Pavement Database: PAVERDB_ALL NetworkID: Palmer

Branch ID	Number of Sections	Sum Section Length (Ft)	Avg Section Width (Ft)	True Area (SqFt)	Use	Average PCI	PCI Standard Deviation	Weighted Average PCI
4500 (D Lot)	1	655.00	220.00	144,250.00	APRON	68.00	0.00	68.00
4600 (Forestry Apron)	2	710.00	487.50	302,600.00	APRON	89.00	3.00	86.41
6100 (16/34)	3	6,000.00	100.00	600,000.00	RUNWAY	53.67	3.09	56.92
6200 (09/27)	1	2,500.00	70.00	173,400.00	RUNWAY	95.00	0.00	95.00

Branch Condition Report

Pavement Database: PAVERDB_ALL

Use Category	Number of Sections	Total Area (SqFt)	Arithmetic Average PCI	Average PCI STD.	Weighted Average PCI
APRON	10	1,589,850.00	75.10	8.96	76.88
RUNWAY	4	773,400.00	64.00	18.10	65.46
TAXIWAY	19	918,048.00	83.53	7.43	81.60
All	33	3,281,298.00	78.61	11.80	75.51

Date: 7 /12/2013

Section Condition Report

Pavement Database: PAVERDB_ALL NetworkID: Palmer

Branch ID	Section ID	Last Const. Date	Surface	Use	Rank	Lanes	True Area (SqFt)	Last Inspection Date	Age At Inspection	PCI
0100 (Taxiway A)	0100-01	07/01/2002	AC	TAXIWAY	P	0	55,100.00	07/10/2013	11	91.00
0100 (Taxiway A)	0100-02	07/01/2002	AC	TAXIWAY	P	0	161,400.00	07/10/2013	11	92.00
0100 (Taxiway A)	0100-03	07/01/2002	AC	TAXIWAY	P	0	99,050.00	07/10/2013	11	78.00
0200 (Taxiway B (Parallel 9/27))	0200-01	08/01/2006	AAC	TAXIWAY	P	0	45,300.00	07/10/2013	7	88.00
0200 (Taxiway B (Parallel 9/27))	0200-02	08/01/2006	AAC	TAXIWAY	P	0	10,440.00	07/10/2013	7	88.00
0200 (Taxiway B (Parallel 9/27))	0200-03	08/01/2006	AAC	TAXIWAY	P	0	69,200.00	07/10/2013	7	84.00
0200 (Taxiway B (Parallel 9/27))	0200-04	08/01/2006	AAC	TAXIWAY	P	0	15,700.00	07/10/2013	7	90.00
0300 (Taxiway C)	0300-01	07/01/2002	AAC	TAXIWAY	P	0	35,400.00	07/10/2013	11	87.00
0400 (Taxiway D)	0400-01	06/01/1980	AC	TAXIWAY	P	0	35,200.00	07/10/2013	33	81.00
0500 (Taxiway E)	0500-01	07/01/2002	AAC	TAXIWAY	P	0	36,300.00	07/10/2013	11	87.00
0600 (Taxiway F)	0600-01	07/01/2002	AC	TAXIWAY	P	0	11,900.00	07/10/2013	11	82.00
0700 (Taxiway G)	0700-01	06/01/1980	AC	TAXIWAY	P	0	35,000.00	07/10/2013	33	70.00
0800 (Taxiway H)	0800-01	08/01/2006	AAC	TAXIWAY	P	0	8,900.00	07/10/2013	7	81.00
1000 (Taxiway J)	1000-01	09/30/2004	AC	TAXIWAY	P	0	33,098.00	07/10/2013	9	78.00
1200 (Taxiway L)	1200-01	08/01/2004	AAC	TAXIWAY	P	0	7,100.00	07/10/2013	9	90.00
1200 (Taxiway L)	1200-02	09/30/2004	AC	TAXIWAY	P	0	22,460.00	07/10/2013	9	82.00
1300 (Taxiway M)	1300-01	08/01/2006	AAC	TAXIWAY	P	0	8,700.00	07/10/2013	7	90.00
2000 (Taxiway T)	2000-01	08/01/2002	AAC	TAXIWAY	P	0	144,800.00	07/10/2013	11	62.00
2000 (Taxiway T)	2000-02	07/01/2000	AC	TAXIWAY	P	0	83,000.00	07/10/2013	13	86.00
4100 (General Transport Apron)	4100-01	06/01/1996	AAC	APRON	P	0	450,000.00	07/10/2013	17	81.00
4200 (Apron A)	4200-01	06/01/1996	AC	APRON	P	0	74,600.00	07/10/2013	17	70.00
4200 (Apron A)	4200-02	08/01/2002	AC	APRON	P	0	158,700.00	07/10/2013	11	83.00
4300 (A and B Lots)	4300-01	06/01/1996	AAC	APRON	P	0	131,000.00	07/10/2013	17	70.00
4300 (A and B Lots)	4300-02	06/01/1996	AC	APRON	P	0	25,400.00	07/10/2013	17	66.00
4400 (C Lot)	4400-01	06/01/1996	AC	APRON	P	0	264,000.00	07/10/2013	17	68.00

Section Condition Report

Pavement Database: PAVERDB_ALL NetworkID: Palmer

Branch ID	Section ID	Last Const. Date	Surface	Use	Rank	Lanes	True Area (SqFt)	Last Inspection Date	Age At Inspection	PCI
4400 (C Lot)	4400-02	06/01/1996	AC	APRON	P	0	39,300.00	07/10/2013	17	67.00
4500 (D Lot)	4500-01	06/01/1996	AAC	APRON	P	0	144,250.00	07/10/2013	17	68.00
4600 (Forestry Apron)	4600-01	07/01/2000	AAC	APRON	P	0	282,100.00	07/10/2013	13	86.00
4600 (Forestry Apron)	4600-02	07/01/2000	PCC	APRON	P	0	20,500.00	07/10/2013	13	92.00
6100 (16/34)	6100-01	06/01/1980	AC	RUNWAY	P	0	500,000.00	07/10/2013	33	58.00
6100 (16/34)	6100-02	06/01/1987	AC	RUNWAY	P	0	50,000.00	07/10/2013	26	51.00
6100 (16/34)	6100-03	06/01/1987	AC	RUNWAY	P	0	50,000.00	07/10/2013	26	52.00
6200 (09/27)	6200-01	09/27/2007	AC	RUNWAY	P	0	173,400.00	07/10/2013	6	95.00

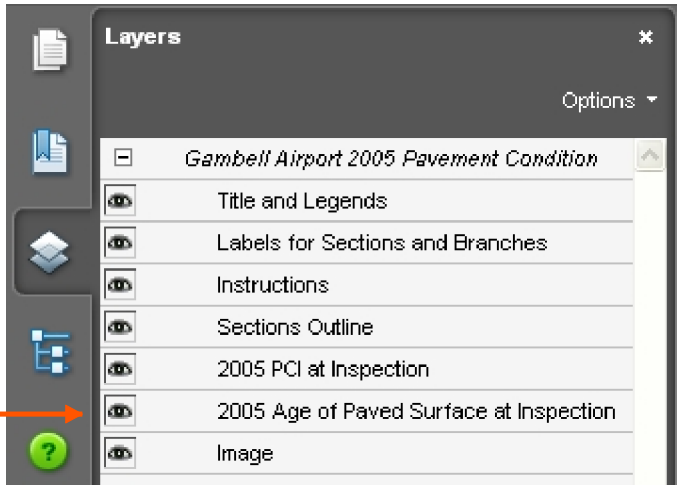
Section Condition Report

Pavement Database: PAVERDB_ALL

Age Category	Average Age At Inspection	Total Area (SqFt)	Number of Sections	Arithmetic Average PCI	PCI Standard Deviation	Weighted Average PCI
06-10	**7.50**	**394,298.00**	**10**	**86.60**	**4.92**	**89.20**
11-15	**11.55**	**1,088,250.00**	**11**	**84.18**	**8.13**	**82.92**
16-20	**17.00**	**1,128,550.00**	**7**	**70.00**	**4.69**	**73.47**
26-30	**26.00**	**100,000.00**	**2**	**51.50**	**0.50**	**51.50**
31-35	**33.00**	**570,200.00**	**3**	**69.67**	**9.39**	**60.16**
All	**14.30**	**3,281,298.00**	**33**	**78.61**	**11.80**	**75.51**

Instructions for Viewing Map Layers

- The map contains layers, and must be opened with Adobe Reader version 8 or later.



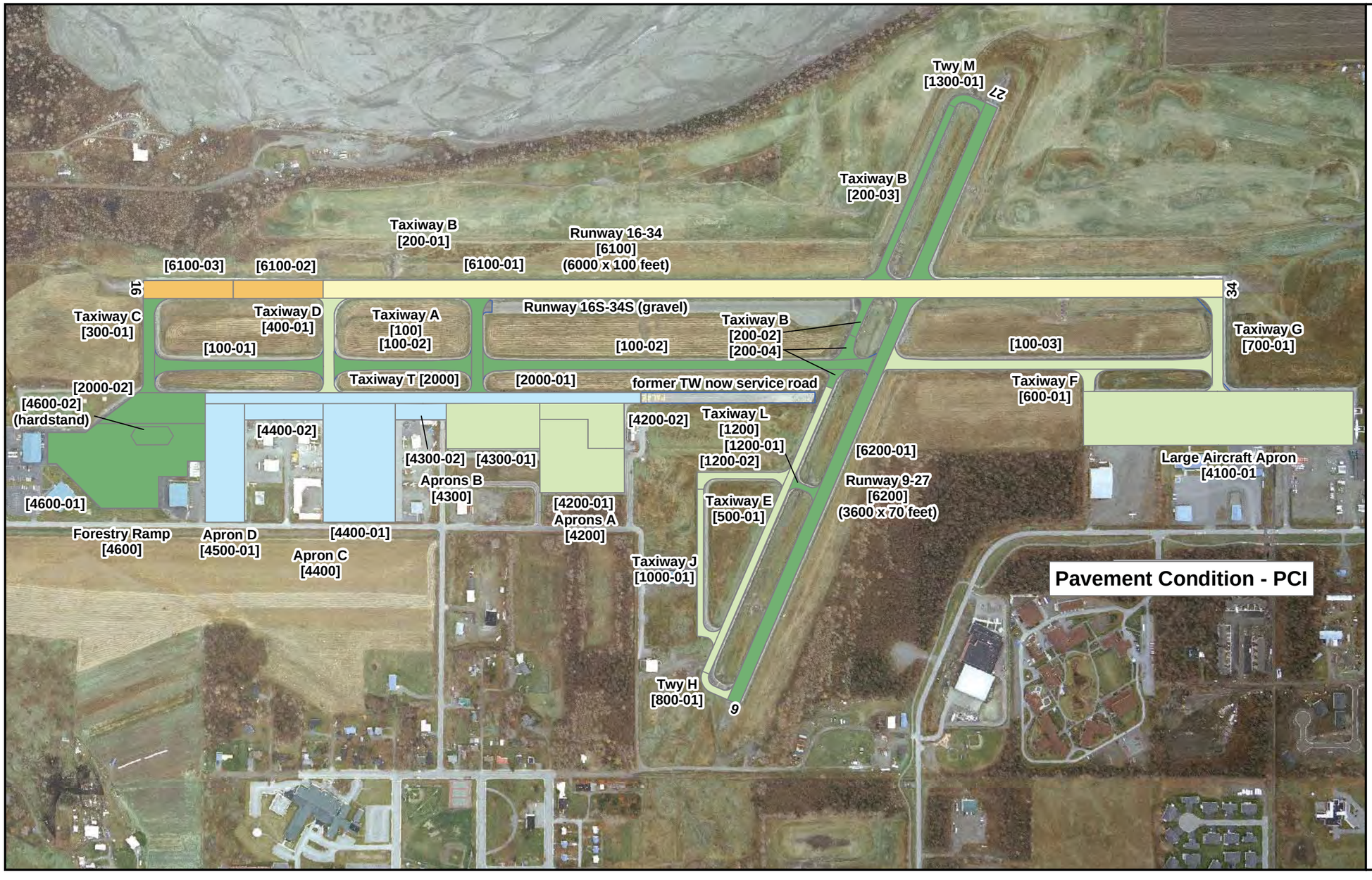
- Click on Adobe's Layer Tab to View Layer Controls
- Click in a layer's box to turn it on/off
- The "eye" symbol shows that the layer is visible.
- These layers draw from the bottom up, which means that a layer higher in the list might block out the information on a lower layer. Turn off the higher layer to see the information on a visible lower layer.

Palmer Municipal Airport

Airport Code: PAQ
Site Number: 50584.*A

2013 Pavement Inspection Results

Map Compiled by Central Region Materials, AK DOT&PF



Pavement Condition Index (PCI)

Target PCI Range for Runways: 70 to 100
Target PCI Range for Taxiways and Aprons: 60 to 100

PCI Values	General Pavement Recommendations
85 - 100	Do Nothing or Preventative Maintenance
70 - 84	Preventative Maintenance
60 - 69	Corrective Maintenance
55 - 59	Rehabilitate
40 - 54	Rehabilitate
25 - 39	Reconstruct
10 - 24	Reconstruct
0 - 9	Reconstruct

Pavement Surface Age

- 0 - 4 years
- 5 - 9 years
- 10 - 14 years
- 15 - 19 years
- 20 - 24 years
- 25 - 29 years
- >30 years

[ ] Branch-Section Identifier

Image: Oct 2006 Aero-Metric, Inc.

N S

0 500 1,000
Feet

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0100 Name: Taxiway A Use: TAXIWAY Area: 315,550.00SqFt

Section: 0100-01 of 3 From: Taxiway C To: Taxiway D Last Const.: 07/01/2002
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 55,100.00SqFt Length: 942.00Ft Width: 50.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 9 Surveyed: 4
Conditions: PCI : 91
Inspection Comments:

Sample Number: 100 Type: R Area: 5,680.00SqFt PCI = 84
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	215.00	Ft	Comments:
52 RAVELING	L	130.00	SqFt	Comments:

Sample Number: 102 Type: R Area: 5,000.00SqFt PCI = 92
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	107.00	Ft	Comments:

Sample Number: 104 Type: R Area: 5,000.00SqFt PCI = 93
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	100.00	Ft	Comments:

Sample Number: 107 Type: R Area: 5,000.00SqFt PCI = 96
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	22.00	Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0100 Name: Taxiway A Use: TAXIWAY Area: 315,550.00SqFt

Section: 0100-02 of 3 From: Taxiway D To: Runway 9/27 Last Const.: 07/01/2002
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 161,400.00SqFt Length: 3,010.00Ft Width: 50.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 30 Surveyed: 5
Conditions: PCI : 92
Inspection Comments:

Sample Number: 112 Type: R Area: 5,000.00SqFt PCI = 94
Sample Comments:

50 PATCHING	L	1.00 SqFt	Comments:
52 RAVELING	L	104.00 SqFt	Comments:

Sample Number: 119 Type: R Area: 5,000.00SqFt PCI = 91
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	95.00 Ft	Comments:
52 RAVELING	L	25.00 SqFt	Comments:

Sample Number: 123 Type: R Area: 5,000.00SqFt PCI = 94
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	50.00 Ft	Comments:
52 RAVELING	L	10.00 SqFt	Comments:

Sample Number: 128 Type: R Area: 5,000.00SqFt PCI = 91
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	65.00 Ft	Comments:
50 PATCHING	L	2.00 SqFt	Comments:
52 RAVELING	L	12.00 SqFt	Comments:

Sample Number: 133 Type: R Area: 5,000.00SqFt PCI = 92
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	105.00 Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0100 Name: Taxiway A Use: TAXIWAY Area: 315,550.00SqFt

Section: 0100-03 of 3 From: Runway 9/27 To: Taxiway G Last Const.: 07/01/2002
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 99,050.00SqFt Length: 1,815.00Ft Width: 50.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 19 Surveyed: 5
Conditions: PCI : 78
Inspection Comments:

Sample Number: 142 Type: R Area: 5,000.00SqFt PCI = 64
Sample Comments:

44 CORRUGATION	M	60.00	SqFt	Comments:
45 DEPRESSION	L	25.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	135.00	Ft	Comments:
52 RAVELING	L	25.00	SqFt	Comments:
52 RAVELING	H	2.00	SqFt	Comments:

Sample Number: 146 Type: R Area: 5,000.00SqFt PCI = 89
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	140.00	Ft	Comments:
52 RAVELING	L	3.00	SqFt	Comments:

Sample Number: 150 Type: R Area: 5,000.00SqFt PCI = 71
Sample Comments:

44 CORRUGATION	M	50.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	190.00	Ft	Comments:
52 RAVELING	H	1.00	SqFt	Comments:

Sample Number: 154 Type: R Area: 5,000.00SqFt PCI = 75
Sample Comments:

44 CORRUGATION	M	50.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	165.00	Ft	Comments:
52 RAVELING	L	5.00	SqFt	Comments:

Sample Number: 158 Type: R Area: 6,100.00SqFt PCI = 87
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	225.00	Ft	Comments:
52 RAVELING	L	25.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0200 Name: Taxiway B (Parallel 9/27) Use: TAXIWAY Area: 140,640.00SqFt

Section: 0200-01 of 4 From: Taxiway M To: Runway 16-34 Last Const.: 08/01/2006
Surface: AAC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 45,300.00SqFt Length: 1,050.00Ft Width: 40.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments: need area adjustment

Last Insp. Date: 07/10/2013 Total Samples: 13 Surveyed: 4
Conditions: PCI : 88
Inspection Comments:

Sample Number: 200 Type: R Area: 4,000.00SqFt PCI = 89
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	140.00 Ft	Comments:

Sample Number: 203 Type: R Area: 4,000.00SqFt PCI = 84
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	140.00 Ft	Comments:
48	LONGITUDINAL/TRANSVERSE CRACKING	M	10.00 Ft	Comments:

Sample Number: 206 Type: R Area: 4,000.00SqFt PCI = 89
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	140.00 Ft	Comments:

Sample Number: 208 Type: R Area: 4,000.00SqFt PCI = 91
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	100.00 Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0200 Name: Taxiway B (Parallel 9/27) Use: TAXIWAY Area: 140,640.00SqFt

Section: 0200-02 of 4 From: RW 16-34 To: 200-04 Last Const.: 08/01/2006
Surface: AAC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 10,440.00SqFt Length: 241.00Ft Width: 40.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 3 Surveyed: 2
Conditions: PCI : 88
Inspection Comments:

Sample Number: 212 Type: R Area: 4,400.00SqFt PCI = 84
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	250.00 Ft	Comments:

Sample Number: 213 Type: R Area: 4,000.00SqFt PCI = 92
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	85.00 Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0200 Name: Taxiway B (Parallel 9/27) Use: TAXIWAY Area: 140,640.00SqFt

Section: 0200-03 of 4 From: 200-04 To: Taxiway H Last Const.: 08/01/2006
Surface: AAC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 69,200.00SqFt Length: 1,725.00Ft Width: 40.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 17 Surveyed: 6
Conditions: PCI : 84
Inspection Comments:

Sample Number: 218 Type: R Area: 4,000.00SqFt PCI = 88
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	145.00	Ft	Comments:

Sample Number: 221 Type: R Area: 4,000.00SqFt PCI = 66
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	138.00	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	H	10.00	Ft	Comments:
50 PATCHING	L	38.00	SqFt	Comments:
50 PATCHING	H	4.00	SqFt	Comments:
52 RAVELING	H	4.00	SqFt	Comments:

Sample Number: 224 Type: R Area: 4,000.00SqFt PCI = 100
Sample Comments:
<NO DISTRESSES>

Sample Number: 225A Type: R Area: 4,000.00SqFt PCI = 66
Sample Comments:

45 DEPRESSION	M	100.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	142.00	Ft	Comments:
50 PATCHING	L	120.00	SqFt	Comments:

Sample Number: 227 Type: R Area: 4,000.00SqFt PCI = 93
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	81.00	Ft	Comments:

Sample Number: 233 Type: R Area: 4,000.00SqFt PCI = 91
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	105.00	Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0200 Name: Taxiway B (Parallel 9/27) Use: TAXIWAY Area: 140,640.00SqFt

Section: 0200-04 of 4 From: 200-02 To: 200-03 Last Const.: 08/01/2006
Surface: AAC Family: DEFAULT Zone: Category: A Rank: P
Area: 15,700.00SqFt Length: 250.00Ft Width: 40.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments: need to confirm construction history

Last Insp. Date: 07/10/2013 Total Samples: 2 Surveyed: 2
Conditions: PCI : 90
Inspection Comments:

Sample Number: 214 Type: R Area: 7,500.00SqFt PCI = 87
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	310.00 Ft	Comments:

Sample Number: 216 Type: R Area: 6,350.00SqFt PCI = 94
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	85.00 Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0300 Name: Taxiway C Use: TAXIWAY Area: 35,400.00SqFt

Section: 0300-01 of 1 From: Runway 16/34 To: Taxiway T Last Const.: 07/01/2002
Surface: AAC Family: DEFAULT Zone: Category: A Rank: P
Area: 35,400.00SqFt Length: 525.00Ft Width: 60.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 6 Surveyed: 3
Conditions: PCI : 87
Inspection Comments:

Sample Number: 301 Type: R Area: 6,000.00SqFt PCI = 91
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	165.00 Ft	Comments:	

Sample Number: 302 Type: R Area: 6,000.00SqFt PCI = 90
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	180.00 Ft	Comments:	

Sample Number: 304 Type: R Area: 6,000.00SqFt PCI = 82
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	260.00 Ft	Comments:	
48 LONGITUDINAL/TRANSVERSE CRACKING	H	3.00 Ft	Comments:	

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0400 Name: Taxiway D Use: TAXIWAY Area: 35,200.00SqFt

Section: 0400-01 of 1 From: RW 16/34 To: Taxiway T Last Const.: 06/01/1980
Surface: AC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 35,200.00SqFt Length: 540.00Ft Width: 60.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments: need area adjustment

Last Insp. Date: 07/10/2013 Total Samples: 6 Surveyed: 3
Conditions: PCI : 81
Inspection Comments:

Sample Number: 401 Type: R Area: 6,300.00SqFt PCI = 79
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	340.00 Ft	Comments:
50	PATCHING	L	180.00 SqFt	Comments:

Sample Number: 402 Type: R Area: 6,000.00SqFt PCI = 86
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	285.00 Ft	Comments:

Sample Number: 404 Type: R Area: 6,000.00SqFt PCI = 77
Sample Comments:

52	RAVELING	H	2.00 SqFt	Comments:
48	LONGITUDINAL/TRANSVERSE CRACKING	L	365.00 Ft	Comments:
52	RAVELING	L	10.00 SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0500 Name: Taxiway E Use: TAXIWAY Area: 36,300.00SqFt

Section: 0500-01 of 1 From: RW 16/34 To: Taxiway T Last Const.: 07/01/2002
Surface: AAC Family: DEFAULT Zone: Category: A Rank: P
Area: 36,300.00SqFt Length: 550.00Ft Width: 60.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments: need area adjustment

Last Insp. Date: 07/10/2013 Total Samples: 12 Surveyed: 3
Conditions: PCI : 87
Inspection Comments:

Sample Number: 501 Type: R Area: 6,500.00SqFt PCI = 87
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	M	60.00	Ft	Comments:
52 RAVELING	L	60.00	SqFt	Comments:

Sample Number: 502 Type: R Area: 6,000.00SqFt PCI = 92
Sample Comments:

52 RAVELING	L	30.00	SqFt	Comments:
52 RAVELING	H	3.00	SqFt	Comments:

Sample Number: 504 Type: R Area: 6,000.00SqFt PCI = 81
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	285.00	Ft	Comments:
52 RAVELING	H	2.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0600 Name: Taxiway F Use: TAXIWAY Area: 11,900.00SqFt

Section: 0600-01 of 1 From: Taxiway A To: Large Aircraft Apron Last Const.: 07/01/2002
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 11,900.00SqFt Length: 125.00Ft Width: 60.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 2 Surveyed: 2
Conditions: PCI : 82
Inspection Comments:

Sample Number: 600 Type: R Area: 7,250.00SqFt PCI = 83
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	310.00 Ft	Comments:
52	RAVELING	L	145.00 SqFt	Comments:

Sample Number: 601 Type: R Area: 4,500.00SqFt PCI = 80
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	300.00 Ft	Comments:
52	RAVELING	L	25.00 SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0700 Name: Taxiway G Use: TAXIWAY Area: 35,000.00SqFt

Section: 0700-01 of 1 From: Runway 16/34 To: Large Aircraft Apron Last Const.: 06/01/1980
Surface: AC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 35,000.00SqFt Length: 500.00Ft Width: 60.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 5 Surveyed: 3
Conditions: PCI : 70
Inspection Comments:

Sample Number: 701 Type: R Area: 6,000.00SqFt PCI = 67
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	400.00	Ft	Comments:
52 RAVELING	L	200.00	SqFt	Comments:
52 RAVELING	M	120.00	SqFt	Comments:
52 RAVELING	H	5.00	SqFt	Comments:

Sample Number: 702 Type: R Area: 6,000.00SqFt PCI = 74
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	375.00	Ft	Comments:
52 RAVELING	L	100.00	SqFt	Comments:
52 RAVELING	H	10.00	SqFt	Comments:

Sample Number: 703 Type: R Area: 6,000.00SqFt PCI = 70
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	480.00	Ft	Comments:
52 RAVELING	L	450.00	SqFt	Comments:
52 RAVELING	H	2.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 0800 Name: Taxiway H Use: TAXIWAY Area: 8,900.00SqFt

Section: 0800-01 of 1 From: Runway 9/27 To: Taxiway B Last Const.: 08/01/2006
Surface: AAC Family: DEFAULT Zone: Category: A Rank: P
Area: 8,900.00SqFt Length: 200.00Ft Width: 40.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 2 Surveyed: 2
Conditions: PCI : 81
Inspection Comments:

Sample Number: 800 Type: R Area: 4,400.00SqFt PCI = 76
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	275.00 Ft	Comments:
52	RAVELING	H	2.00 SqFt	Comments:
56	SWELLING	L	20.00 SqFt	Comments:

Sample Number: 801 Type: R Area: 4,000.00SqFt PCI = 87
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	165.00 Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 1000 Name: Taxiway J Use: TAXIWAY Area: 33,098.00SqFt

Section: 1000-01 of 1 From: TW B To: TW L Last Const.: 09/30/2004
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 33,098.00SqFt Length: 885.00Ft Width: 35.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 10 Surveyed: 4
Conditions: PCI : 78
Inspection Comments:

Sample Number: 1000 Type: R Area: 4,066.00SqFt PCI = 74
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	435.00	Ft	Comments:
52 RAVELING	L	20.00	SqFt	Comments:

Sample Number: 1003 Type: R Area: 3,500.00SqFt PCI = 83
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	210.00	Ft	Comments:

Sample Number: 1006 Type: R Area: 3,500.00SqFt PCI = 77
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	310.00	Ft	Comments:
52 RAVELING	L	15.00	SqFt	Comments:

Sample Number: 1007 Type: R Area: 3,500.00SqFt PCI = 77
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	345.00	Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 1200 Name: Taxiway L Use: TAXIWAY Area: 29,560.00SqFt

Section: 1200-01 of 2 From: RW 9-27 To: TW B, Section 03 Last Const.: 08/01/2004
Surface: AAC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 7,100.00SqFt Length: 140.00Ft Width: 35.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 1 Surveyed: 1
Conditions: PCI : 90
Inspection Comments:

Sample Number: 1200 Type: R Area: 7,080.00SqFt PCI = 90
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	155.00 Ft	Comments:
52	RAVELING	L	35.00 SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 1200 Name: Taxiway L Use: TAXIWAY Area: 29,560.00SqFt

Section: 1200-02 of 2 From: TW B To: TW J Last Const.: 09/30/2004
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 22,460.00SqFt Length: 500.00Ft Width: 35.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 5 Surveyed: 3
Conditions: PCI : 82
Inspection Comments:

Sample Number: 1202 Type: R Area: 3,500.00SqFt PCI = 77
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	225.00 Ft	Comments:
52	RAVELING	H	1.00 SqFt	Comments:

Sample Number: 1203 Type: R Area: 3,500.00SqFt PCI = 82
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	190.00 Ft	Comments:
50	PATCHING	L	1.00 SqFt	Comments:

Sample Number: 1204 Type: R Area: 3,500.00SqFt PCI = 86
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	125.00 Ft	Comments:
50	PATCHING	L	3.00 SqFt	Comments:
52	RAVELING	L	1.00 SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 1300 Name: Taxiway M Use: TAXIWAY Area: 8,700.00SqFt

Section: 1300-01 of 1 From: Runway 9/27 To: Taxiway B Last Const.: 08/01/2006
Surface: AAC Family: DEFAULT Zone: Category: A Rank: P
Area: 8,700.00SqFt Length: 200.00Ft Width: 40.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 2 Surveyed: 2
Conditions: PCI : 90
Inspection Comments:

Sample Number: 1300 Type: R Area: 4,410.00SqFt PCI = 90
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	125.00 Ft	Comments:

Sample Number: 1301 Type: R Area: 4,000.00SqFt PCI = 89
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	135.00 Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 2000 Name: Taxiway T Use: TAXIWAY Area: 227,800.00SqFt

Section: 2000-01 of 2 From: South end of A&B Lots To: North end of D Lot Last Const.: 08/01/2002
Surface: AAC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 144,800.00SqFt Length: 2,340.00Ft Width: 60.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 24 Surveyed: 6
Conditions: PCI : 62
Inspection Comments:

Sample Number: 5 Type: R Area: 6,000.00SqFt PCI = 60
Sample Comments:

43 BLOCK CRACKING	L	6,000.00	SqFt	Comments:
52 RAVELING	L	150.00	SqFt	Comments:

Sample Number: 10 Type: R Area: 6,000.00SqFt PCI = 59
Sample Comments:

43 BLOCK CRACKING	L	6,000.00	SqFt	Comments:
52 RAVELING	L	300.00	SqFt	Comments:

Sample Number: 15 Type: R Area: 6,000.00SqFt PCI = 60
Sample Comments:

43 BLOCK CRACKING	L	6,000.00	SqFt	Comments:
52 RAVELING	L	150.00	SqFt	Comments:

Sample Number: 20 Type: R Area: 6,000.00SqFt PCI = 62
Sample Comments:

43 BLOCK CRACKING	L	6,000.00	SqFt	Comments:
52 RAVELING	L	50.00	SqFt	Comments:

Sample Number: 23 Type: R Area: 6,000.00SqFt PCI = 70
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	935.00	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	60.00	Ft	Comments:

Sample Number: 11A Type: A Area: 6,600.00SqFt PCI = 55
Sample Comments:

43 BLOCK CRACKING	L	6,000.00	SqFt	Comments:
52 RAVELING	L	300.00	SqFt	Comments:
56 SWELLING	M	300.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 2000 Name: Taxiway T Use: TAXIWAY Area: 227,800.00SqFt

Section: 2000-02 of 2 From: North end of D Lot To: T/W C Last Const.: 07/01/2000
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 83,000.00SqFt Length: 500.00Ft Width: 190.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments: need to verify area from CAD

Last Insp. Date: 07/10/2013 Total Samples: 16 Surveyed: 5
Conditions: PCI : 86
Inspection Comments:

Sample Number: 32 Type: R Area: 6,000.00SqFt PCI = 82
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	165.00	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	H	25.00	Ft	Comments:

Sample Number: 34 Type: R Area: 6,000.00SqFt PCI = 82
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	210.00	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	M	20.00	Ft	Comments:
52 RAVELING	L	20.00	SqFt	Comments:

Sample Number: 37 Type: R Area: 5,000.00SqFt PCI = 85
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	265.00	Ft	Comments:

Sample Number: 40 Type: R Area: 5,000.00SqFt PCI = 93
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	85.00	Ft	Comments:

Sample Number: 44 Type: R Area: 5,000.00SqFt PCI = 87
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	200.00	Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4100 Name: General Transport Apron Use: APRON Area: 450,000.00SqFt

Section: 4100-01 of 1 From: South End To: North End Last Const.: 06/01/1996
Surface: AAC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 450,000.00SqFt Length: 1,500.00Ft Width: 300.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 90 Surveyed: 6
Conditions: PCI : 81
Inspection Comments:

Sample Number: 111 Type: R Area: 5,000.00SqFt PCI = 87
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	175.00	Ft	Comments:
52 RAVELING	L	35.00	SqFt	Comments:

Sample Number: 204 Type: R Area: 5,000.00SqFt PCI = 85
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	260.00	Ft	Comments:

Sample Number: 307 Type: R Area: 5,000.00SqFt PCI = 76
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	365.00	Ft	Comments:
52 RAVELING	H	2.00	SqFt	Comments:

Sample Number: 414 Type: R Area: 5,000.00SqFt PCI = 85
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	175.00	Ft	Comments:
52 RAVELING	L	100.00	SqFt	Comments:

Sample Number: 509 Type: R Area: 5,000.00SqFt PCI = 80
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	265.00	Ft	Comments:
52 RAVELING	L	220.00	SqFt	Comments:

Sample Number: 602 Type: R Area: 5,000.00SqFt PCI = 76
Sample Comments:

44 CORRUGATION	L	25.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	365.00	Ft	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4200 Name: Apron A Use: APRON Area: 233,300.00SqFt

Section: 4200-01 of 2 From: Taxilane T To: 4200-02 Last Const.: 06/01/1996
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 74,600.00SqFt Length: 250.00Ft Width: 460.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 16 Surveyed: 5
Conditions: PCI : 70
Inspection Comments:

Sample Number: 90 Type: R Area: 4,800.00SqFt PCI = 69
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	535.00	Ft	Comments:
52 RAVELING	L	20.00	SqFt	Comments:
52 RAVELING	H	1.00	SqFt	Comments:

Sample Number: 101 Type: R Area: 5,000.00SqFt PCI = 71
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	510.00	Ft	Comments:
49 OIL SPILLAGE	N	10.00	SqFt	Comments:
50 PATCHING	L	45.00	SqFt	Comments:

Sample Number: 103 Type: R Area: 4,100.00SqFt PCI = 66
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	440.00	Ft	Comments:
52 RAVELING	L	150.00	SqFt	Comments:
52 RAVELING	H	2.00	SqFt	Comments:

Sample Number: 300 Type: R Area: 5,000.00SqFt PCI = 76
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	525.00	Ft	Comments:

Sample Number: 401 Type: R Area: 5,000.00SqFt PCI = 69
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	550.00	Ft	Comments:
50 PATCHING	L	20.00	SqFt	Comments:
52 RAVELING	L	100.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4200 Name: Apron A Use: APRON Area: 233,300.00SqFt

Section: 4200-02 of 2 From: 4200-01 To: West end Last Const.: 08/01/2002
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 158,700.00SqFt Length: 400.00Ft Width: 460.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 6 Surveyed: 5
Conditions: PCI : 83
Inspection Comments:

Sample Number: 302 Type: R Area: 5,000.00SqFt PCI = 86
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	212.00 Ft	Comments:	
52 RAVELING	L	5.00 SqFt	Comments:	

Sample Number: 503 Type: R Area: 5,000.00SqFt PCI = 85
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	150.00 Ft	Comments:	
52 RAVELING	H	1.00 SqFt	Comments:	

Sample Number: 600 Type: R Area: 5,000.00SqFt PCI = 72
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	H	100.00 Ft	Comments:	
52 RAVELING	L	3.00 SqFt	Comments:	

Sample Number: 702 Type: R Area: 5,000.00SqFt PCI = 91
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	75.00 Ft	Comments:	
49 OIL SPILLAGE	N	20.00 SqFt	Comments:	

Sample Number: 801 Type: R Area: 5,000.00SqFt PCI = 82
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	325.00 Ft	Comments:	

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4300 Name: A and B Lots Use: APRON Area: 156,400.00SqFt

Section: 4300-01 of 2 From: Apron A To: 4300-02 Last Const.: 06/01/1996
Surface: AAC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 131,000.00SqFt Length: 250.00Ft Width: 520.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 25 Surveyed: 5
Conditions: PCI : 70
Inspection Comments:

Sample Number: 201 Type: R Area: 5,000.00SqFt PCI = 66
Sample Comments:

45 DEPRESSION	L	40.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	545.00	Ft	Comments:
52 RAVELING	L	300.00	SqFt	Comments:

Sample Number: 203 Type: R Area: 5,000.00SqFt PCI = 73
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	465.00	Ft	Comments:
52 RAVELING	L	300.00	SqFt	Comments:

Sample Number: 400 Type: R Area: 5,000.00SqFt PCI = 65
Sample Comments:

43 BLOCK CRACKING	L	3,000.00	SqFt	Comments:
43 BLOCK CRACKING	L	300.00	SqFt	Comments:
52 RAVELING	M	5.00	SqFt	Comments:

Sample Number: 402 Type: R Area: 5,000.00SqFt PCI = 75
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	565.00	Ft	Comments:

Sample Number: 404 Type: R Area: 6,000.00SqFt PCI = 70
Sample Comments:

45 DEPRESSION	L	35.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	500.00	Ft	Comments:
52 RAVELING	L	200.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4300 Name: A and B Lots Use: APRON Area: 156,400.00SqFt

Section: 4300-02 of 2 From: south edge To: north edge at Apron C Last Const.: 06/01/1996
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 25,400.00SqFt Length: 280.00Ft Width: 90.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 6 Surveyed: 3
Conditions: PCI : 66
Inspection Comments:

Sample Number: 105 Type: R Area: 4,500.00SqFt PCI = 67
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	650.00	Ft	Comments:
52 RAVELING	L	250.00	SqFt	Comments:

Sample Number: 107 Type: R Area: 4,500.00SqFt PCI = 65
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	710.00	Ft	Comments:
52 RAVELING	L	150.00	SqFt	Comments:

Sample Number: 109 Type: R Area: 4,500.00SqFt PCI = 67
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	685.00	Ft	Comments:
52 RAVELING	L	100.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4400 Name: C Lot Use: APRON Area: 303,300.00SqFt

Section: 4400-01 of 2 From: North End To: South End Last Const.: 06/01/1996
Surface: AC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 264,000.00SqFt Length: 660.00Ft Width: 400.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 52 Surveyed: 6
Conditions: PCI : 68
Inspection Comments:

Sample Number: 1201 Type: R Area: 5,400.00SqFt PCI = 75
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	465.00 Ft	Comments:	
52 RAVELING	L	100.00 SqFt	Comments:	

Sample Number: 302 Type: R Area: 5,000.00SqFt PCI = 66
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	785.00 Ft	Comments:	
52 RAVELING	M	400.00 SqFt	Comments:	

Sample Number: 400 Type: R Area: 5,000.00SqFt PCI = 66
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	640.00 Ft	Comments:	
52 RAVELING	L	30.00 SqFt	Comments:	
52 RAVELING	H	8.00 SqFt	Comments:	

Sample Number: 700 Type: R Area: 5,000.00SqFt PCI = 75
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	510.00 Ft	Comments:	
52 RAVELING	L	1.00 SqFt	Comments:	

Sample Number: 901 Type: R Area: 5,000.00SqFt PCI = 67
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	595.00 Ft	Comments:	
52 RAVELING	L	50.00 SqFt	Comments:	
52 RAVELING	H	4.00 SqFt	Comments:	

Sample Number: 903 Type: R Area: 5,000.00SqFt PCI = 61
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	675.00 Ft	Comments:	
50 PATCHING	L	2.00 SqFt	Comments:	
52 RAVELING	L	500.00 SqFt	Comments:	
52 RAVELING	H	3.00 SqFt	Comments:	

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4400 Name: C Lot Use: APRON Area: 303,300.00SqFt

Section: 4400-02 of 2 From: South End To: North End Last Const.: 06/01/1996
Surface: AC Family: DEFAULT Zone: Category: A Rank: P
Area: 39,300.00SqFt Length: 435.00Ft Width: 90.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 9 Surveyed: 4
Conditions: PCI : 67
Inspection Comments:

Sample Number: 105 Type: R Area: 4,500.00SqFt PCI = 62
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	900.00 Ft	Comments:	
52 RAVELING	L	750.00 SqFt	Comments:	

Sample Number: 107 Type: R Area: 4,500.00SqFt PCI = 70
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	535.00 Ft	Comments:	
52 RAVELING	L	100.00 SqFt	Comments:	

Sample Number: 109 Type: R Area: 4,500.00SqFt PCI = 70
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	510.00 Ft	Comments:	
52 RAVELING	L	150.00 SqFt	Comments:	

Sample Number: 111 Type: R Area: 4,500.00SqFt PCI = 66
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	695.00 Ft	Comments:	
52 RAVELING	L	150.00 SqFt	Comments:	

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4500 Name: D Lot Use: APRON Area: 144,250.00SqFt

Section: 4500-01 of 1 From: West End To: TW T Last Const.: 06/01/1996
Surface: AAC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 144,250.00SqFt Length: 655.00Ft Width: 220.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 28 Surveyed: 5
Conditions: PCI : 68
Inspection Comments:

Sample Number: 203 Type: R Area: 7,000.00SqFt PCI = 68
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	775.00 Ft	Comments:
50	PATCHING	L	1.00 SqFt	Comments:
52	RAVELING	L	1,200.00 SqFt	Comments:

Sample Number: 302 Type: R Area: 5,000.00SqFt PCI = 69
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	610.00 Ft	Comments:
52	RAVELING	L	1,000.00 SqFt	Comments:

Sample Number: 401 Type: R Area: 5,000.00SqFt PCI = 68
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	665.00 Ft	Comments:
52	RAVELING	L	180.00 SqFt	Comments:

Sample Number: 602 Type: R Area: 5,000.00SqFt PCI = 70
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	695.00 Ft	Comments:
52	RAVELING	L	50.00 SqFt	Comments:

Sample Number: 700 Type: R Area: 3,000.00SqFt PCI = 65
Sample Comments:

48	LONGITUDINAL/TRANSVERSE CRACKING	L	275.00 Ft	Comments:
49	OIL SPILLAGE	N	10.00 SqFt	Comments:
52	RAVELING	L	200.00 SqFt	Comments:
52	RAVELING	M	35.00 SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4600 Name: Forestry Apron Use: APRON Area: 302,600.00SqFt

Section: 4600-01 of 2 From: Forestry Building To: D Lot (4400) Last Const.: 07/01/2000
Surface: AAC Family: DEFAULT Zone: Category: A Rank: P
Area: 282,100.00SqFt Length: 470.00Ft Width: 875.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments: need to adjust area from CAD, What year constructed?

Last Insp. Date: 07/10/2013 Total Samples: 57 Surveyed: 6
Conditions: PCI : 86
Inspection Comments:

Sample Number: 102 Type: R Area: 5,000.00SqFt PCI = 89
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 175.00 Ft Comments:

Sample Number: 111 Type: R Area: 5,000.00SqFt PCI = 88
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 195.00 Ft Comments:

Sample Number: 210 Type: R Area: 5,000.00SqFt PCI = 87
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 215.00 Ft Comments:

Sample Number: 304 Type: R Area: 5,000.00SqFt PCI = 83
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 310.00 Ft Comments:

Sample Number: 314 Type: R Area: 5,000.00SqFt PCI = 86
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 235.00 Ft Comments:

Sample Number: 406 Type: R Area: 5,000.00SqFt PCI = 86
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 240.00 Ft Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 4600 Name: Forestry Apron Use: APRON Area: 302,600.00SqFt

Section: 4600-02 of 2 From: South To: North Last Const.: 07/01/2000
Surface: PCC Family: DEFAULT Zone: Category: A Rank: P
Area: 20,500.00SqFt Length: 240.00Ft Width: 100.00Ft
Slabs: 33 Slab Width: 25.00Ft Slab Length: 25.00Ft Joint Length: 1,580.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments: need construction date and slab info, and verify area from CAD

Last Insp. Date: 07/10/2013 Total Samples: 2 Surveyed: 2
Conditions: PCI : 92
Inspection Comments:

Sample Number: 105 Type: R Area: 19.00Slabs PCI = 89
Sample Comments:

62 CORNER BREAK	L	1.00 Slabs	Comments:
63 LINEAR CRACKING	L	1.00 Slabs	Comments:
74 JOINT SPALLING	L	1.00 Slabs	Comments:

Sample Number: 107 Type: R Area: 19.00Slabs PCI = 96
Sample Comments:

62 CORNER BREAK	L	1.00 Slabs	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 6100 Name: 16/34 Use: RUNWAY Area: 600,000.00SqFt

Section: 6100-01 of 3 From: South End To: Taxiway D Last Const.: 06/01/1980
Surface: AC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 500,000.00SqFt Length: 5,000.00Ft Width: 100.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 100 Surveyed: 10
Conditions: PCI : 58
Inspection Comments:

Sample Number: 10 Type: R Area: 5,000.00SqFt PCI = 64
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	445.00	Ft	Comments:
52 RAVELING	L	4,980.00	SqFt	Comments:
52 RAVELING	M	20.00	SqFt	Comments:

Sample Number: 21 Type: R Area: 5,000.00SqFt PCI = 52
Sample Comments:

41 ALLIGATOR CRACKING	L	25.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	455.00	Ft	Comments:
52 RAVELING	L	4,180.00	SqFt	Comments:
52 RAVELING	M	500.00	SqFt	Comments:
52 RAVELING	H	20.00	SqFt	Comments:

Sample Number: 23 Type: A Area: 5,000.00SqFt PCI = 56
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	465.00	Ft	Comments:
52 RAVELING	L	2,000.00	SqFt	Comments:
52 RAVELING	M	1,200.00	SqFt	Comments:

Sample Number: 30 Type: R Area: 5,000.00SqFt PCI = 58
Sample Comments:

44 CORRUGATION	L	10.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	435.00	Ft	Comments:
52 RAVELING	L	4,600.00	SqFt	Comments:
52 RAVELING	M	400.00	SqFt	Comments:

Sample Number: 41 Type: R Area: 5,000.00SqFt PCI = 51
Sample Comments:

44 CORRUGATION	L	40.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	535.00	Ft	Comments:
52 RAVELING	L	4,595.00	SqFt	Comments:
52 RAVELING	M	400.00	SqFt	Comments:
52 RAVELING	H	5.00	SqFt	Comments:

Sample Number: 50 Type: R Area: 5,000.00SqFt PCI = 59
Sample Comments:

44 CORRUGATION	L	40.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	465.00	Ft	Comments:
52 RAVELING	L	4,880.00	SqFt	Comments:
52 RAVELING	M	120.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Sample Number: 61 Type: R Area: 5,000.00SqFt PCI = 54
Sample Comments:

44 CORRUGATION	L	10.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	450.00	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	H	45.00	Ft	Comments:
52 RAVELING	L	4,850.00	SqFt	Comments:
52 RAVELING	M	150.00	SqFt	Comments:

Sample Number: 70 Type: R Area: 5,000.00SqFt PCI = 59
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	450.00	Ft	Comments:
52 RAVELING	L	4,845.00	SqFt	Comments:
52 RAVELING	M	150.00	SqFt	Comments:
52 RAVELING	H	5.00	SqFt	Comments:

Sample Number: 81 Type: R Area: 5,000.00SqFt PCI = 59
Sample Comments:

44 CORRUGATION	L	20.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	285.00	Ft	Comments:
52 RAVELING	L	4,950.00	SqFt	Comments:
52 RAVELING	M	50.00	SqFt	Comments:

Sample Number: 90 Type: R Area: 5,000.00SqFt PCI = 63
Sample Comments:

48 LONGITUDINAL/TRANSVERSE CRACKING	L	175.00	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	M	180.00	Ft	Comments:
52 RAVELING	L	3,000.00	SqFt	Comments:
52 RAVELING	M	50.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 6100 Name: 16/34 Use: RUNWAY Area: 600,000.00SqFt

Section: 6100-02 of 3 From: Taxiway D To: Taxiway C Last Const.: 06/01/1987
Surface: AC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 50,000.00SqFt Length: 500.00Ft Width: 100.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 10 Surveyed: 4
Conditions: PCI : 51
Inspection Comments:

Sample Number: 3 Type: R Area: 5,000.00SqFt PCI = 61
Sample Comments:

43 BLOCK CRACKING	L	3,500.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	390.00	Ft	Comments:
52 RAVELING	L	50.00	SqFt	Comments:

Sample Number: 6 Type: R Area: 5,000.00SqFt PCI = 53
Sample Comments:

44 CORRUGATION	L	60.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	L	560.00	Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	H	145.00	Ft	Comments:
52 RAVELING	M	50.00	SqFt	Comments:

Sample Number: 9 Type: R Area: 5,000.00SqFt PCI = 44
Sample Comments:

43 BLOCK CRACKING	L	5,000.00	SqFt	Comments:
44 CORRUGATION	M	50.00	SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	M	185.00	Ft	Comments:
52 RAVELING	M	175.00	SqFt	Comments:
52 RAVELING	H	2.00	SqFt	Comments:

Sample Number: 10 Type: R Area: 5,000.00SqFt PCI = 48
Sample Comments:

43 BLOCK CRACKING	L	4,000.00	SqFt	Comments:
43 BLOCK CRACKING	M	1,000.00	SqFt	Comments:
44 CORRUGATION	L	100.00	SqFt	Comments:
52 RAVELING	M	250.00	SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 6100 Name: 16/34 Use: RUNWAY Area: 600,000.00SqFt

Section: 6100-03 of 3 From: 6100-02 To: North Threshhold Last Const.: 06/01/1987
Surface: AC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 50,000.00SqFt Length: 500.00Ft Width: 100.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 10 Surveyed: 4
Conditions: PCI : 52
Inspection Comments:

Sample Number: 3 Type: R Area: 5,000.00SqFt PCI = 57
Sample Comments:

43 BLOCK CRACKING	L	5,000.00 SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	H	110.00 Ft	Comments:

Sample Number: 5 Type: R Area: 5,000.00SqFt PCI = 53
Sample Comments:

43 BLOCK CRACKING	L	5,000.00 SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	H	120.00 Ft	Comments:
52 RAVELING	M	5.00 SqFt	Comments:

Sample Number: 8 Type: R Area: 5,000.00SqFt PCI = 49
Sample Comments:

43 BLOCK CRACKING	L	5,000.00 SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	M	165.00 Ft	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	H	50.00 Ft	Comments:
52 RAVELING	M	125.00 SqFt	Comments:

Sample Number: 10 Type: R Area: 5,000.00SqFt PCI = 49
Sample Comments:

43 BLOCK CRACKING	L	5,000.00 SqFt	Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING	M	140.00 Ft	Comments:
52 RAVELING	M	25.00 SqFt	Comments:
52 RAVELING	H	10.00 SqFt	Comments:

Re-inspection Report

PAVERDB_ALL
Report Generated Date: July 12, 2013

Network: Palmer Name: Palmer Airport (Palmer, Alaska)

Branch: 6200 Name: 09/27 Use: RUNWAY Area: 173,400.00SqFt

Section: 6200-01 of 1 From: West Side RW 16/34 To: Taxiway H Last Const.: 09/27/2007
Surface: AC Family: DEFAULT Zone: CENT Category: A Rank: P
Area: 173,400.00SqFt Length: 2,500.00Ft Width: 70.00Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0

Section Comments:

Last Insp. Date: 07/10/2013 Total Samples: 36 Surveyed: 5
Conditions: PCI : 95
Inspection Comments:

Sample Number: 5 Type: R Area: 7,000.00SqFt PCI = 95
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 60.00 Ft Comments:

Sample Number: 10 Type: R Area: 7,400.00SqFt PCI = 92
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 175.00 Ft Comments:

Sample Number: 15 Type: R Area: 7,000.00SqFt PCI = 95
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 81.00 Ft Comments:

Sample Number: 25 Type: R Area: 7,000.00SqFt PCI = 100
Sample Comments:
<NO DISTRESSES>

Sample Number: 35 Type: R Area: 7,000.00SqFt PCI = 93
Sample Comments:
48 LONGITUDINAL/TRANSVERSE CRACKING L 140.00 Ft Comments:

APPENDIX H
SOLID WASTE RECYCLING, REUSE, AND WASTE REDUCTION

1.0 SOLID WASTE RECYCLING, REUSE AND WASTE REDUCTION

1.1 Introduction

The purpose of this Memorandum is to review the existing solid waste recycling activity at the City of Palmer Municipal Airport (Airport). The City of Palmer (City) currently has no formal recycling program at the airport. The scope of this solid waste recycling, reuse and waste reduction review is limited to three City-owned facilities which include the FAA Flight Service Station (FSS) Building, City's Airport Maintenance Shop, and the Old Woods Hangar.

In September 2014, the Federal Aviation Administration (FAA) issued guidance on Airport Recycling, Reuse, and Waste Reduction Plans. Per FAA's Modernization and Reform Act of 2012 (FMRA), a grant for an airport master plan may not be issued until confirmation that the master plan scope of work includes a review of solid waste recycling at the airport. Section 133 of the FMRA requires airports that have or plan to prepare a master plan, and that receive AIP funding for an eligible project, to ensure that the new of updated master plan addresses issues relating to solid waste recycling.

In review of the existing solid waste practices at the Palmer Municipal Airport an effort was made to identify opportunities to implement recycling practices where none currently existing. The following tasks were completed:

1. Review of Current Solid Waste Management Practices (Waste Audit);
2. Review of Current Solid Waste Recycling Activity;
3. Plan for Minimizing Generation of Solid Waste at the Airport;
4. Operation and Maintenance Requirements;
5. Review of Waste Management Contracts; and
6. Potential for Cost Savings or the Revenue Generation.

1.2 Review of Current Waste Management Practices (Waste Audit)

The airport is currently managed and operated by the City's Department of Public Works. The airport has no written recycling program for leaseholders or the City-owned buildings. The airport is located within the service area boundary for Alaska Waste and all airport leaseholders are responsible for managing their own solid waste pickup and disposal.

The FSS building is occupied by the FSS and the Airport Superintendant's Office. The City stores firefighting vehicles below the Airport Superintendent's Office throughout the year. One solid waste dumpster serves the FSS building and is serviced once a week by Alaska Waste. In addition to the dumpster there is one 55-gallon trash receptacle located outside the FSS building for general public use. The 55-gallon trash receptacle is emptied once a month, on average. Approximately 1,500 pounds of waste per week is collected, consisting exclusively of office type waste (Combs 2014).

Waste includes approximately 75 percent mixed paper and cardboard. The remaining 25 percent is made up of kitchen waste, plastics (bottles/containers), and rags from office cleaning.

The Airport Maintenance Shop houses snow removal equipment and a large mower. The City performs general maintenance at this facility such as washing vehicles and placing chains on snow removal equipment, as needed. The volume of waste generated from the Airport Maintenance Shop is less than 400 pounds per year (Wickam 2014). The waste is collected regularly by the City of Palmer and is deposited at the Matanuska-Susitna Borough's Central Landfill. Waste generated consists of office type material. Detailed maintenance, such as oil changes, takes place offsite at the large City Maintenance Shop. All waste oil generated at the Airport Maintenance Shop is taken to the City Maintenance Shop and is recycled in a waste oil burner. All other hazardous materials are recycled with Emerald Services, Inc., located in Palmer. Rarely, scrap metal is encountered, collected, and stored at the Airport Maintenance Shop. All scrap metal is recycled locally on an as need basis.

The Old Woods Hangar is vacant.

The State of Alaska Department of Environmental Conservation encourages solid waste source reduction and recycling under Alaska Statute, Chapter 46.06 RECYCLING AND REDUCTION OF LITTER, but has no restrictive regulations. Waste management practices at the airport follow City Ordinance No. 14-036, Chapter 7.120, Section 7.120.030 General Requirements which include:

a) The holder of a land lease on the Airport shall keep the premises leased by them and the apron and ramp areas used in their operations, clean and clear of oil, grease, waste materials and trash.

b) No person shall keep uncovered trash containers on any part of the airport.

c) No motor vehicle for hauling trash, direct, or any other materials shall be operated on the airport unless the vehicle is constructed so as to prevent the contents thereof from dropping, shifting, leaking, or otherwise escaping.

d) No person shall spill dirt or any other materials from a vehicle on the airport.

e) Areas used for trash or garbage containers shall be kept clean and sanitary at all times.

f) No persons shall dispose of garbage, papers, refuse or other material on the airport except in receptacles provided for that purpose and in accordance with Palmer Municipal Code 8.20.

g) All users of the airport are responsible for preventing debris release and wind scattering of debris. No wind scattered debris shall be allowed at the airport. Any person or company

responsible for wind scattered debris shall be subject to fines and/or associated cleanup costs.

1.3 Current Solid Waste Recycling at the Airport

A recycling program has not been established for the airport.

1.5 Plan for Minimizing the Generation of Solid Waste

The City holds a contract with Ready Recycles, currently providing recycling service for Palmer City Hall, Palmer Library, Palmer Public Works, Palmer Police Department, and the Palmer Fire Training Center. There are voluntary measures the airport could adopt to improve their existing waste management and sustainability practices that other airports have successfully adopted:

- Implement a recycling program in applicable airport offices that promotes proper segregation and disposal of waste material.
- Coordinate with tenants to implement recycling at their facilities.

Opportunities for solid waste recycling airport-wide include developing and implementing a recycling program. Through their current contract with Ready Recycles, the airport could extend current services to include regular collection of recyclable office materials such as mixed paper, cardboard, and plastics. Solid waste recycling options are available through the following:

Scrap metal recycling is available, should the airport ever demolish any existing structures involving large amounts of metal. The scrap metal recycling center is located at Central Landfill.

A tire recycling program could be implemented; however, the infrequency of changing tires would not support development of a program.

1.6 Operation and Maintenance Requirements

There are currently no operation and maintenance requirements for the airport with regard to an airport recycling program.

1.7 Review of Waste Management Contracts

Currently, all solid waste removal is contracted by Alaska Waste whose parent company is Alaska Pacific Environmental Services, Anchorage, LLC. Alaska Waste is responsible for transferring all solid waste to the Matanuska-Susitna Borough's Central Landfill, located approximately 5 miles from the airport.

1.8 Potential for Cost Savings or the Generation of Revenue

The cost of a recycling program for the two functional City-owned buildings at the airport is estimated to be approximately $60 per month. The cost savings would be non-existent because of the very low volume of solid waste generated. The potential for generation of revenue from the solid waste is nil because of the low volume and value of solid waste generated.

1.9 Conclusions

Currently, there is no recycling program at the Palmer Municipal Airport. The cost of implementing a formal program with Alaska Waste would not justify a program with the waste hauler. The City could however establish an informal voluntary recycling program that includes office and shop waste reduction for its two active facilities and work with the Airport Advisory Commission to eventually expand the voluntary program to private leaseholders.

References

Combs, J. 2014. Personal communication between Jeffery Combs, City of Palmer, and Heather Campfield, HDL, on December 2, 2014.

Wickam, G. 2014. Personal communication between Jeffery Combs, City of Palmer, and Heather Campfield, HDL, on December 2, 2014.

APPENDIX I
FAA PART 150 APPENDIX A, TABLE 1

TABLE 1—LAND USE COMPATIBILITY* WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land use	Yearly day-night average sound level (L_{dn}) in decibels					
	Below 65	**65-70**	**70-75**	**75-80**	**80-85**	**Over 85**
RESIDENTIAL						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
PUBLIC USE						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
MANUFACTURING AND PRODUCTION						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

*The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

KEY TO TABLE 1

SLUCM=Standard Land Use Coding Manual.

Y (Yes)=Land Use and related structures compatible without restrictions.

N (No)=Land Use and related structures are not compatible and should be prohibited.

NLR=Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35=Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

NOTES FOR TABLE 1

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.

(5) Land use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

References

Federal Aviation Administration. 2015 November 19. Electronic Code of Federal Regulations. Retrieved from: http://www.ecfr.gov/cgi-bin/text-idx?SID=4c4f6a70a28f2e72024b3c230bbc5df7 &mc=true&node= ap14.3.150_135.a&rgn=div9

APPENDIX J

FAA GUIDANCE FOR AIRPORT SPONSOR PROTECTING APPROACH AND DEPARTURE SURFACES

Federal Aviation Administration

MEMORANDUM

Date: August 18, 2015

To: Regional Airports Division Managers
610 Branch Managers
620 Branch Managers
Airports District Office Managers

From: Director, Office of Airport Safety and Standards (AAS-1)

Director, Office of Airport Planning and Programming (APP-1)

Director, Office of Airport Compliance (ACO-1)

Subject: **Reminder of Responsibilities for FAA Personnel and Airport Sponsors for Protecting Approach and Departure Surfaces**

Introduction

The purpose of this memo is primarily to remind FAA Office of Airports staff about their responsibilities (as well as the responsibilities of airport sponsors) in establishing and maintaining clear approach and departure surfaces at airports. We encourage personnel in all Regions and ADOs to relay this memorandum to all Federally obligated airports and any that are certificated under 14 CFR part 139, as well as all state aeronautical agencies. This memorandum will also be available on the FAA's public website under Safety, Planning and Compliance.

The airport sponsor is ultimately responsible for ensuring clear runway approach and departure surfaces. However, ARP plays an important role in this process. This role is detailed in a separate section below.

The approach and departure surfaces required to be maintained are those identified by Advisory Circular (AC) 150/5300-13A, Airport Design and FAA Order 8260.3B, The United States Standard for Terminal Instruments Procedures (TERPS). The focus of this document is on the TERPS 20:1 surface. While Part 77 civil airport imaginary surfaces are important, they are not the surfaces discussed in this document as they do not directly affect procedures.

Role of the Office of Airports (ARP)

- A core part of ARP's mission is to help maintain and enhance the safety, capacity

and efficiency of airports. ARP is responsible for working with the nation's federally obligated airports to ensure approach and departure surfaces are clear of obstacles to ensure safety and to optimize the full capability of the runway without restrictions. The Air Traffic Organization and Flight Procedures Teams have the responsibility, when necessary, to adjust the procedure(s) based on obstacles penetrating the approach/departure surfaces to protect the traveling public.

- ARP has the authority under both Part 139 and through the Grant Assurances to hold an airport sponsor accountable for clearing their approach/ departure surfaces whenever practicable.

- ARP must be proactive and review penetrations to all applicable approach/ departure surfaces beyond the current focus and actions necessary on the 20:1 TERPS visual area penetrations outlined in the subject Interim Policy Guidance memo dated March 20, 2015.

Actions Necessary by Airports District Office (ADO) Personnel

The term "ADO" refers to staff within an Airport District Office, or Regional Office staff without ADOs. In the case of a block-grant state, we expect the states to exercise the same level of diligence:

- ADO actions start with the planning process. The ADO is expected to ensure that sponsors properly incorporate the identification and planned mitigation of obstacles penetrating the approach and/or departure surfaces into Master Plans, ALP Updates, obstruction studies, Airport Master Record (5010) and the new AGIS Surface Analysis and Visualization (SAV) Tool (as applicable) and other relevant documents. ADO staff must carefully review findings or recommendations about obstacles penetrating the approach and/or departure surface obstacles in these studies.

- The airport sponsor is ultimately responsible for providing the most current survey data to the FAA. The ADO should also remind the sponsor to be proactive on clearing or mitigating obstacles and providing validation of removal to the FAA prior to the FAA's scheduled review of the flight procedures at the airport. While mitigation of obstacles is an on-going objective, validation of obstacle mitigation prior to a schedule review of flight procedures will significantly enhance the likelihood of continued availability of published approaches.

- The ADO is expected to ensure that the sponsor develops a plan for removing or mitigating obstacles and hazards to air navigation. An airport sponsor that has unmitigated obstacles is expected to develop an Obstacle Action Plan (OAP) that details how and when each of the surfaces will be cleared and maintained. This plan needs to include all approach and departure surfaces, not just the 20:1 surface. Details on the OAP are provided below (see "Sponsor responsibilities"). The

clearance of these surfaces needs to be the focus whenever considering any modifications to an existing runway or proposed new runway or other development projects. The Sponsor is expected to submit the OAP for FAA LOB review through an Aeronautical Study (OE/AAA-NRA Case) requesting concurrence on the clearing plan.

- The ADO is expected to work closely with the airport sponsor to get annual updates to the OAP.

- Both the FAA and airport sponsor are expected to consider obstacle mitigation projects as a high priority when discussing other CIP project funding requests.

- Starting in FY 2016, whenever the ADO meets with the airport sponsor to discuss CIP updates or potential funding requests, the ADO should discuss with the Sponsor the need to establish an obstacle disposition data table in the ALP showing actions for each obstacle. In addition, when reviewing the Project Evaluation Report and Development Analysis (PERADA) items prior to awarding any new grant, the ADO is expected to ensure the sponsor is following the OAP (or is in the process of developing the OAP), and is including obstacle mitigation projects to the maximum extent possible. The ADO may review (but not approve) the OAP as it is the sponsor's responsibility to develop and implement the OAP.

- The FAA has an obligation to highlight any unresolved issue that could jeopardize safety or utility, and thus jeopardize past or future Federal investments. The ADO is expected to ensure that airport sponsors understand that the FAA will consider protracted delays in obstruction mitigation to be a negative factor when considering other grant requests. The airport sponsor must demonstrate feasible and prudent attempts to mitigate the obstacles identified in the OAP. However, if the FAA agrees that it is not feasible to mitigate a particular obstruction, then this will not be used as a sole reason for deciding against or deferring a grant offer.

- The ADO is expected to work closely with the ARP Regional Airspace and Procedures Team (RAPT) lead, the Flight Procedures Team (FPT) and the airport sponsor to ensure timely and accurate information regarding obstacles.

Actions Necessary by ARP Regional Personnel

- The ARP regional RAPT member must be engaged at all RAPT meetings and in coordination with the ADO to monitor the FPT's report on 20:1 penetrations as well as the airport sponsor's Obstacle Action Plan (OAP). The ARP regional RAPT members will coordinate any concerns regarding potential violations of grant assurances or other safety related concerns with the Regional Administrator.

Actions Necessary by ARP Headquarters Personnel

- ARP Headquarters personnel are responsible for working with ATO and AFS to create and update all policy guidance pertaining to the 20:1 visual area and all other approach/departure surfaces with particular focus on surfaces that extend off-airport property.

- AAS-100 is responsible for creating and maintaining the AGIS tool to assist airport sponsors in the identification and visualization of the surfaces. This does not relieve airport sponsors, however, from ensuring that the FAA has current and accurate information.

- ARP technical staff in the Airport Engineering Division (AAS-100) and the Airport Planning and Environmental Division (APP-400) will be available to Regional and ADO personnel as a resource for policy implementation.

Roles and Responsibilities of the Airport Sponsor

As noted previously, the Airport Sponsor is responsible to maintain clear airport approach and/or departure surfaces. This responsibility is derived from the following FAA Grant Assurances:

- Grant Assurance 19 (Operations and Maintenance) states that the airport shall be operated in a safe and serviceable condition and in accordance with appropriate minimum standards required by applicable agencies.

- Grant Assurance 20 (Hazard Removal) states that an airport sponsor must also take appropriate action to ensure that terminal airspace will be adequately cleared and protected by removing, lowering, lighting or otherwise mitigating existing airport hazards and by preventing the establishment of future hazards.

- Grant Assurance 21 (Compatible Land Use) says that an airport sponsor must take appropriate action, to the extent practicable, including the adoption of zoning laws, to restrict the use of land adjacent to the airport to uses compatible with normal airport operations.

- Grant Assurance 29 (ALP) says the sponsor must keep the ALP up to date (obstacles are generally shown on the ALP plan and profile sheets).

20:1 Penetrations – On-Airport Property and Off-Airport Property Under Sponsor Control

- In the case of the 20:1 surface on airport property, or off airport property but which property remains under the land-use planning and/or zoning control of the airport sponsor, the sponsor is required to remove or mitigate penetrations to the 20:1

surface to be in compliance with Grant Assurance 20, Hazard Removal and Mitigation. The FAA will require the sponsor to remove, lower, light, or otherwise mitigate the penetration in accordance with the sponsor's OAP.

- Grant Assurance 21, Compatible Land Use, obligates the airport sponsor to take appropriate actions to control existing and planned land uses in the vicinity of the airport to make them compatible with aircraft operations at the airport. Where the sponsor does have authority to zone or control land use adjacent to the airport, the FAA expects the sponsor to implement zoning ordinances or take other measures to restrict the use of land in the vicinity of the airport to activities and purposes compatible with normal aircraft operations, including appropriate action to avoid or mitigate penetrations to the approach/departure surfaces.

20:1 Penetrations – Off-Airport Property Not Under Sponsor Control

- The FAA recognizes that not all airport sponsors have direct jurisdictional control over uses of property near the airport. However, for the purpose of evaluating airport sponsor compliance with Grant Assurance 21, the FAA does not consider a sponsor's lack of direct authority as a reason for the sponsor to decline to take any action at all to achieve land use compatibility outside the airport boundaries.

- The FAA expects airport sponsors to ensure that neighboring municipalities and other entities that own or control land within the 20:1 surface fully understand the purpose of approach/departure obstacle clearance surfaces, including the risks associated with penetrations of those surfaces. Airport sponsors are expected to have a voice in the affairs of the community where a potential risk to the clearance surfaces is located or proposed. The sponsor should make an effort to ensure proper zoning or other land use controls are in place to protect airport approach/departure surfaces.

- The FAA recommends sponsor to seek out opportunities for land acquisition, land exchanges, right-of-first-refusal to purchase, agreements with property owners regarding land uses, or other means of establishing land-use controls.

- In all cases, the FAA expects airport sponsors to actively seek feasible and prudent opportunities to eliminate, reduce or mitigate risks associated with penetrations to the 20:1 surface anytime there is an ALP update or master plan update.

The Airport Sponsor is responsible for completing and updating an Obstacle Action Plan (OAP). This OAP can vary significantly in size and complexity. It could be just a follow-up plan to the obstruction disposition table that is shown on the ALP or a follow-up to the penetrations identified on the AJV 20:1 master list. Regardless of complexity, it needs to demonstrate the phases necessary to accomplish the mitigation of obstacles penetrating the approach and/or departure surfaces in an expedited manner to the maximum extent possible. The OAP must also address the sponsor's action plan to

maintain clear surfaces. The FAA will add an OAP tracking program to the SAV tool in FY 2016. In the interim, the Airport Sponsor must submit an Excel spreadsheet to the ADO (using a template to be provided by AAS-100).

If the clearance of obstacles is not feasible at a particular time, the airport sponsor is expected to provide documentation of its efforts and the FAA should track the item as an open issue to pursue when a future opportunity arises. However, the Office of Airports does not have the authority to waive or agree to deferral of the sponsor's actions, and has no authority to prevent a restriction from being imposed on the affected Instrument Flight Procedure. Any waivers that are requested must be coordinated between the sponsor and the local Flight Procedures Team.