CHAPTER 3

FACILITY REQUIREMENTS

An important phase in the master planning process involves the assessment of airport infrastructure to meet forecast airside and landside demand. It's also important to consider changes to Federal Aviation Administration (FAA) design standards since the last planning process. Comparing the existing conditions of infrastructure at Southwest Wyoming Regional Airport (RKS), which were presented in **Chapter 1 – Inventory of Existing Conditions**, with the predicted growth patterns presented in **Chapter 2 – Forecasts of Aviation Activity**, provides the most effective means of completing this evaluation. Using this approach, this chapter presents the future requirements for airside, terminal, and landside facilities and is organized into the following sections:

- FAA Design Standards
- Airside Facility Requirements
- Terminal Facility Requirements
- Landside Facility Requirements

The findings of this chapter serve as the basis for the development alternatives that are evaluated and presented in the next chapter.

3.1 FAA DESIGN STANDARDS

The physical and operational characteristics of aircraft determine the design of an airfield. FAA Advisory Circular (AC) 150/5300-13B, *Airport Design,* provides design standards and dimensional criteria based on the types of aircraft operating at an airport. The following sections presents the classification systems defined in AC 150/5300-13B, as well as a summary of the application of each to airfield design at RKS.

3.1.1 AIRPORT REFERENCE CODE

The Airport Reference Code (ARC) is a categorization method used in airport design based on the physical and operation characteristics of aircraft. The ARC is based on two components: Aircraft Approach Category (AAC) and Airplane Design Group (ADG). AAC is the first component that relates to the approach speed of an aircraft where letters are used to categorize the grouping of speeds. **Table 3.1** presents the AAC classifications by approach speeds. Typically, the higher the approach speed for an aircraft, increased dimensions of design standards will be needed to accommodate that aircraft safely.

Table 3.1 ***AIRCRAFT APPROACH CATEGORY***

Category	Approach Speed
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

Source: *AC 150/5300-13B, Airport Design (2023)*

The second component that comprises the ARC is ADG, which relates to the wingspan and tail height of an aircraft. ADG categorizes grouping of aircraft by wingspan lengths and tail heights using roman numerals. **Table 3.2** presents the ADG classifications of wingspan lengths and tail heights.

Table 3.2 ***AIRPLANE DESIGN GROUP***

Group #	Tail Height (feet)	Wingspan (feet)
I	Less than 20’	Less than 49’
II	20’ - < 30’	49’ - < 79
III	30’ - < 45’	79’ - < 118’
IV	45’ - < 60’	118’ - < 171’
V	60’ - < 66’	171’ - < 214’
VI	66’ - <80’	214’ - < 262’

Source: *AC 150/5300-13B, Airport Design (2023)*

3.1.2 RUNWAY DESIGN CODE

For planning purposes, the runway design code (RDC) is used to establish the operational capabilities of a runway for aircraft that intend to use the airport. The RDC is based on the most demanding or design aircraft that is expected to use the runway. It is also comprised of the AAC and ADG designation of an aircraft along with the published instrument approach visibility minimums for that runway or runway end. **Table 3.3** presents the categories of runway visual range (RVR) distances used in conjunction with AAC and ADG for the RDC designation of a runway.

Table 3.3 ***RUNWAY DESIGN CODE VISIBILITY MINIMUM CLASSIFICATIONS***

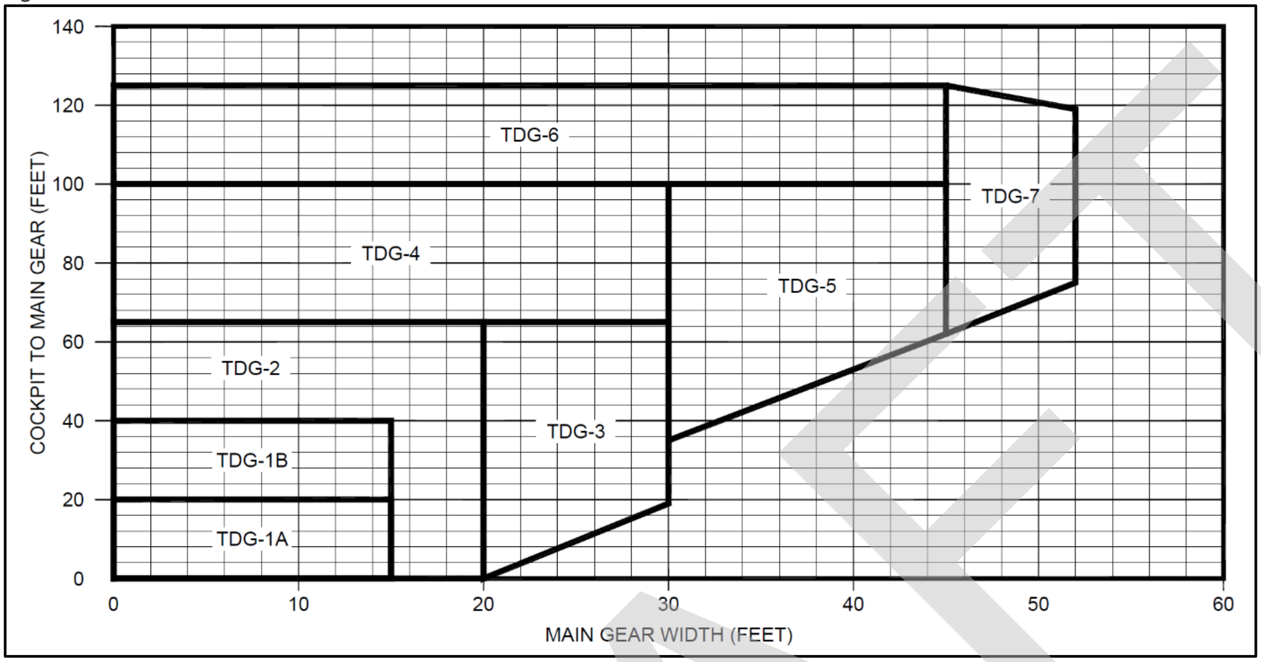
Visibility Minimum Designation	Instrument Flight Visibility Category (in statute miles)
5000	Not lower than 1 mile
4000	Lower than 1 mile but not lower than 3/4 mile
2400	Lower than 3/4 mile but not lower than 1/2 mile
1600	Lower than 1/2 mile but not lower than 1/4 mile
1200	Lower than 1/4 mile
VIS	Visual approach only

Source: *FAA AC 150/5300-13B, Airport Design (2023)*

3.1.3 TAXIWAY DESIGN GROUP

The Taxiway Design Group (TDG) is a classification system used for the design of taxiways and fillets based on the physical characteristics of the width of the main landing gear and its distance to the cockpit. TDG designations at an airport can vary from taxiway to taxiway based on the most demanding aircraft type designed to taxi on each individual taxiway surface. Typically, the largest types of aircraft intended to regularly use the runway factor into the TDG of the parallel taxiway, while the design of connector taxiways factor the specific type of demanding aircraft intended to use each surface. **Figure 3.1** presents the seven TDG classifications identified in AC 150/5300-13B, based on main landing gear width and cockpit to main landing gear distance.

Figure 3.1 **TAXIWAY DESIGN GROUP CLASSIFICATIONS**



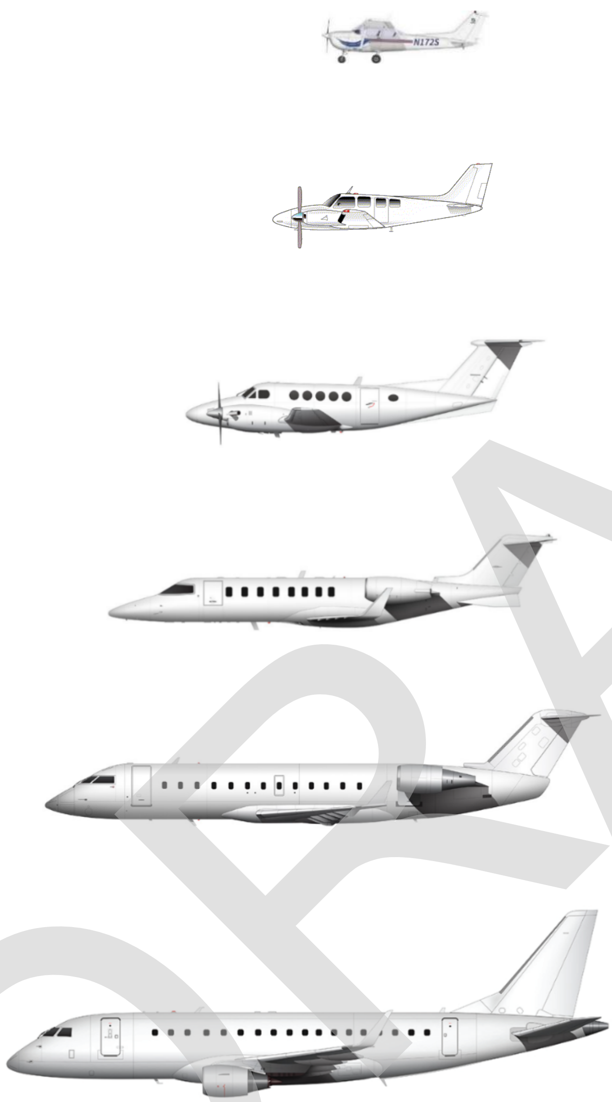
Source: *FAA AC 150/5300-13B, Airport Design (2023)*

3.1.4 CRITICAL AIRCRAFT ANALYSIS AND RDC DETERMINATION

Guidance for determining the current and future critical aircraft at RKS can be found in the FAA AC 150/5000-17, *Critical Aircraft and Regular Use Determination.* A critical aircraft is “the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport.” Regular use translates to 500 annual operations (takeoffs and landings) for federal funding eligibility purposes, excluding touch-and-go operations. Knowing both the existing and future critical aircraft is key to evaluating the current facilities and planning for future aviation activity.

A review of existing aircraft operating at RKS as well as future types anticipated to be conducted at the Airport is presented in Chapter 2*, Aviation Activity Forecasts.* Both the forecasts and the associated critical aircraft determination were approved by the FAA Denver Airports District Office (ADO). This identified the Bombardier CRJ-200 at the current critical design aircraft and the Embraer 175 (E175) as the future critical design aircraft for Runway 9/27. The existing critical design aircraft for Runway 3/21 is a family grouping of B-II aircraft types represented by the Cessna 208 Caravan (C208) and Swearingen Metroliner (SW4). The future critical design aircraft for Runway 3/21 is also a family grouping of B-II aircraft types represented by the Cessna 408 SkyCourier which is planned to replace the Cessna C208 Caravan that provides air cargo feeder operations for FedEx. **Figure 3.2** identifies these aircraft in comparison with aircraft types from other ARC/RDC classifications that typically operate at RKS. The existing RDC for Runway 3/21 is B-II-Visual. The existing RDC for Runway 9/27 is C-II-2400 and the future RDC is C-III-2400.

Figure 3.2 ***COMPARISON OF RDC TYPES OPERATING AT RKS RECOMMENDATOINS SUMMARY***



RDC A-I

Single-Engine Aircraft – 2 to 6 Seats
Cessna 172, Beech Bonanza, Cirrus SR22

RDC B-I

Twin-Piston Aircraft – 4 to 10 Seats
PA 31-310 Navajo, Beech Baron 58, Cessna 414

***RDC B-II**

Twin-Turboprop/Business Jet/Small Cabin Aircraft 6 to 12 Seats – Beach King Air 200, Pilatus PC-12

RDC C/D-I

Business Jets- 6 to 12 Seats
Lear 45, Hawker 400

***RDC C/D-II**

Commercial/Business Jet – 6 to 70 Seats
Bombardier CRJ-200, Embraer ERJ-145

****RDC C/D-III**

Large Commercial/Business jet – 14 to 177 Seats
Embraer 175
Bombardier BD-700 Global Express, Gulfstream G800

** Current critical design aircraft*
*** Future critical design aircraft*

3.2 AIRSIDE FACILITY REQUIREMENTS

The configuration of airfield components such as runways, taxiways, aprons, navigational aids (NAVAIDS), and other facilities supporting aircraft operations collectively define the design of the airfield layout. The following section reviews these airside infrastructure components and how they will be able to accommodate the demand that is projected for the 20-year planning period to ensure the safety, operational efficiency, and economic viability of RKS.

3.2.1 RUNWAYS

The following section presents the analysis that was conducted of the two runways at RKS and their ability to meet existing and future demand. This evaluation included a review of the configuration of the two runways as well as each individual runway's length, width, condition, and strength. The recommended course of action and any improvements found to be needed to meet existing and/or future demand aircraft are discussed at the conclusion of each subsection.

Airfield Configuration

The airfield at RKS consists of two runways, Runway 9/27, and Runway 3/21. Taxiway A runs parallel to Runway 9/27, Runway 3/21 intersects Runway 9/27 approximately 4,500 feet from the Runway 9 approach end. Wind analysis was presented in Chapter 1, *Existing Conditions*, found that for both all-weather combined wind coverage, and instrument flight rules (IFR) weather combined wind coverage, Runways 9/27 and 3/21 have a total wind coverage of greater than 95% for all crosswind components. These findings confirm that no changes are needed to the existing configuration of the airfield to meet wind coverage requirements.

Capacity

Demand/capacity analyses measure the maximum capacity of an airfield to process a given volume of air traffic within a specified time before delays are experienced. Many factors can impact airfield capacity including configuration of runways, number and location of exit taxiways, local weather conditions, and runway use as dictated by the wind. To help account for these factors, the FAA published AC 150/5060-5, *Airport Capacity and Delay,* which offers mathematical formulas and other computational methods to calculate capacity and aircraft delay for airport planning and design.

In general, the AC assumes airfields with a main and crosswind runway, along with a full parallel taxiway are typically capable of accommodating approximately 230,000 annual aircraft operations at which capacity is typically strained for an airfield of that size. RKS anticipates approximately 16,962 annual aircraft operations to occur by 2027, which is well below 230,000 annual operations. As such, the capacity of the airfield meets projected operational demand.

Length

The length of a runway should safely accommodate the landing and takeoff distance requirements of the most demanding types of aircraft intended to regularly conduct operations on its surface. FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidelines to determine the recommended length of a runway based on the critical design aircraft that is anticipated to operate on the surface. The AC lays out methods for determining the needed length of a runway based on aircraft physical and performance characteristics that focuses on type of aircraft and its maximum takeoff weight (MTOW). For RKS, a detailed runway analysis was performed for both runways which is presented in **Appendix D**. A summary of the analysis is provided in the next few paragraphs.

Individual Airport Planning Manuals (APMs) produced by the aircraft manufacturers contain the data tables necessary to determine necessary length requirements for the aircraft that use RKS. These tables factor payload, range, temperature, and density altitude (DA). Density altitude is an important factor in calculating runway length at RKS due to its elevation above sea level (6,764 feet). DA factors into aircraft performance when landing, taking off, and climb at higher elevations. At RKS, the DA during the hottest month, when the ambient air temperature is 87 degrees Fahrenheit, is 9,994 feet AMSL meaning that aircraft will perform as if they were operating at 9,994 feet MSL even though RKSs elevation is 6,765 feet MSL.

The APMs for the CRJ-200 and ERJ-175 were used to determine the recommended length for Runway 9/27. The recommended length for 9/27 is 9,100 feet for the CRJ-200 and 8,800 feet for the ERJ-175. Both these recommended lengths can be accommodated by the current 10,000-foot length of Runway 9/27. For Runway 3/21, aircraft performance curves are provided by the runway length AC are used to determine recommended length. For a family grouping of B-II aircraft, these performance curves determined that the recommended length for 3/21 is 8,200 feet, which is greater than the 5,228 feet currently available. More detail on this can be found in **Appendix D**, *Runway Length Analysis.*

Runway 9/27 meets the runway length needs of the existing and future critical aircraft type operating at their respective operational MTOW and no change in length is anticipated to be needed during the planning period. Runway 3/21 could potentially be lengthened to accommodate the recommended runway length from the runway length design AC; however, extending this runway is likely not feasible given the terrain constraints.

Width

The width of a runway is determined based upon the critical design aircraft. For Runway 9/27, the existing critical design aircraft is the CRJ-200 which is classified as an RDC C-II aircraft and the future critical design aircraft is the ERJ-175 which is classified as an RDC C-III aircraft. According to FAA AC 150/5300-13B, *Airport Design,* the required width of a runway for both C-II and C-III aircraft is 100 feet when visibility minimums are not lower than 3/4 of a mile. Included in the AC is a note pertaining to C-III aircraft over 150,000 pounds which requires the runway width be 150 feet. Runway 9/27 currently has a width of 150 feet which meets this design width requirement. While it is greater than the requirement of 100 feet for C-III aircraft under 150,000 pounds, it is recommended that the current width be maintained to be able to accommodate the C-III aircraft over 150,000 pounds that is projected to increase in operations at RKS over the planning period. For Runway 3/21, the required width of a runway for B-II small aircraft is 75 feet with visibility minimums not lower than ¾ of a mile. Runway 3/21 meets the required width for the ARC designation for B-II small aircraft. No improvements to the widths of Runway 9/27 and Runway 3/21 are necessary.

Pavement Condition

A detailed report of the pavement condition survey provided by Shannon & Wilson is included as **Appendix E**. The following sections summarize this pavement evaluation which was completed in 2023. The pavement condition survey for the airfield pavements included in this evaluation were completed in accordance with the ASTM D6433 – *Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys* (2020). FAA PAVEAIR software was used to calculate pavement section pavement condition index (PCI) values. The recent PCI survey results are in **Table 3.4** below. In general, the RKS airfield pavement network is in good to excellent condition. Runway 9/27 was observed to be in excellent condition, but Runway 3/21, Taxiway C, and Taxiway D was observed to have slightly lower PCI values. Based on the visual observations and the PCI values, the Terminal Road pavements also appear to be near the end of is serviceable life. It is recommended that rehabilitation projects be considered for Runway 3/21, Taxiway C, and Taxiway D as soon as practically feasible. Improvements to the Terminal Road pavements should be planned in the short-term. The remainder of the roadway pavements at RKS should also be considered for improvements in the medium- and long-term planning periods, which span 6 to 20 years.

Table 3.4 ***AIRFIELD PAVEMENT CONDITIONS (2023)***

Pavement Asset		PCI by Year						
Branch	Segment	2005	2007	2009	2012	2016	2020	2023
Runway 9-27	10	98	89	85	83	100	94	87
	20	98	74	64	56	100	92	90
	30	79	64	46	55	100	96	94
	40	98	75	72	61	100	93	89
	Weighted Average	93	76	67	64	100	94	89
Runway 3-21	10	98	80	81	82	93	87	78
	20	98	66	60	60	100	98	95
	30	98	37	56	59	100	100	95
	40	98	71	75	74	94	89	81
	Weighted Average	98	64	68	69	97	94	81
Taxiway C	10	98	100	90	99	90	82	83
Taxiway D	10	--	--	--	--	94	85	81
Terminal Rd	10	PCI Data Not Provided						57

Note: *Historical record engineering reports and record drawings were provided to S&W by Ardurra.*
Source: *Shannon & Wilson (2023)*

Pavement Weight Bearing Capacity

FAA pavement design considers the weight bearing capacity of the pavement needed to accommodate the expected aircraft fleet to intended to frequently use the pavement. No single critical aircraft is designated for pavement strength and pavement design strength does not necessarily prohibit airport use by heavier aircraft. However, if routine use by an aircraft heavier than the pavement strength is anticipated, then it would be recommended that pavement strength be increased.

Three pavement weight bearing capacity values are typically provided to airport users which encompass three different landing gear wheel configurations: single wheel, double wheel, and double tandem. Current weight bearing capacity, as indicated on the FAA airport master record, for Runway 9/27 is 55,000 pounds for single wheel, 240,000 pounds for double wheel, and 503,000 pounds for double tandem. The weight bearing capacity for Runway 3/21 is 59,000 pounds for single wheel, 88,000 pounds for double wheel, and 159,000 pounds for double tandem. A second component of pavement weight bearing capacity is the Pavement Classification Number (PCN), which is a five-part code that describes the load-carrying capacity of a piece of pavement. The first part is a number which is the PCN numerical value, indicating the load-carrying capacity of the pavement. The second part is a letter: either an R or an F, depending on whether the pavement itself is made of rigid or flexible material. The third part is another letter from A to D expressing the strength of the subgrade; Subgrade A being the strongest and subgrade D being the weakest. The fourth part is either a letter, or a number with units expressing the maximum tire pressure that the pavement can support, W-Z are used, W being no tire pressure limit with tire pressure limitations at their greatest with Z. Finally, the fifth part is a letter, either T or U. These describe the method through which the first value was obtained. T indicating a technical evaluation and U, indicating a physical testing method. Describing the method through which the first value was obtained. The PCN for Runway 9/27 is 63/F/A/X/T meaning it has a PCN numerical value of 63, it is made of a flexible material (asphalt), it has a high strength subgrade with a maximum tire pressure of 254 pounds per square inch, and a technical evaluation was completed to determine the PCN numerical value of 63. The PCN for Runway 3/21 is 27/F/A/X/T. The current pavement strength on both runways at RKS meets or exceeds the future critical demand aircraft. No changes to the pavement strength of either runway are needed to accommodate the existing or projected fleet mix.

Runway Blast Pads and Shoulders

A blast pad is located at the threshold of a runway and is marked with yellow chevrons. The primary purpose of a blast pad is to protect the area immediately behind the runway threshold from prop wash and jet blast. Additionally, in case of an emergency, such as a rejected takeoff or long landing, the blast pad becomes a stop way of additional surface on which to slow and stop the aircraft. Blast pads are also beneficial to airport snow removal operations as they provide safe means for equipment to reposition and maneuver. FAA AC 150/5300-13B, *Airport Design*, recommends that runways which serve ADG III aircraft should include blast pads. Therefore, it is recommended that blast pads be installed during the next major maintenance project for Runway 9/27. Runway shoulders are the flat surfaces that are adjacent to the sides of a runway. They are designed to also protect area adjacent to the runway from prop wash and jet blast to mitigate against the ingestion of foreign object debris (FOD) into aircraft engines. Currently, Runway 9/27 does not have paved shoulders; instead, compacted pavement millings are placed along its edge. These millings have the potential to create FOD as noted during a recent annual FAA Part 139 airport certification inspection. Additionally, snow removal operations are benefited by paved shoulders as they allow more room for SRE to maneuver during hazardous conditions. AC 150/5300-13B recommends the installation of 25-foot paved shoulders runways that accommodate ADG III aircraft, and the Airport should consider adding shoulders to Runway 9/27 during the next major maintenance project.

Design Surfaces/Dimensional Criteria

Design surfaces or dimensional criteria at an airport refer to a set of predefined imaginary surfaces integral for ensuring the safe and efficient operation of aircraft while at the Airport. These surfaces play a fundamental role in airport planning and design. Each surface is meticulously designed to provide safety margins and obstacle clearance necessary for aircraft during all operations. The dimensions and criteria for these design surfaces are established by the FAA and are essential components of airport infrastructure planning and construction to guarantee safe operations. Some key surfaces are described in the following paragraphs. **Figures 3.3** and **3.4** show the existing dimensional criteria at RKS while **Table 3.4** compares the existing design standards to the future RDC for each runway.

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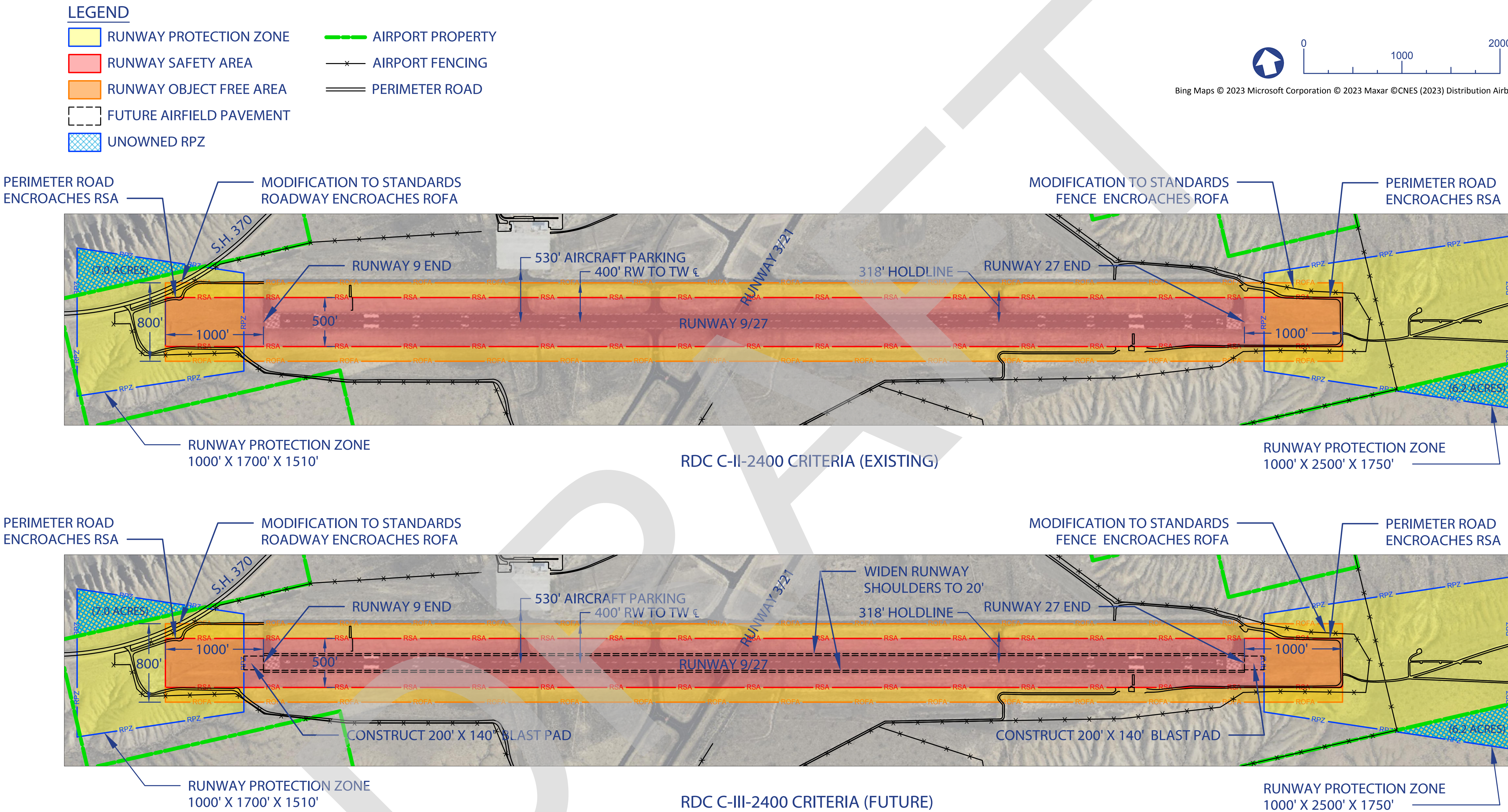

FIGURE 3.3

RUNWAY 9/27 DIMENSIONAL CRITERIA/RDC C-II-2400 (EXISTING CONDITIONS) & RDC C-III-2400 (FUTURE CONDITIONS)

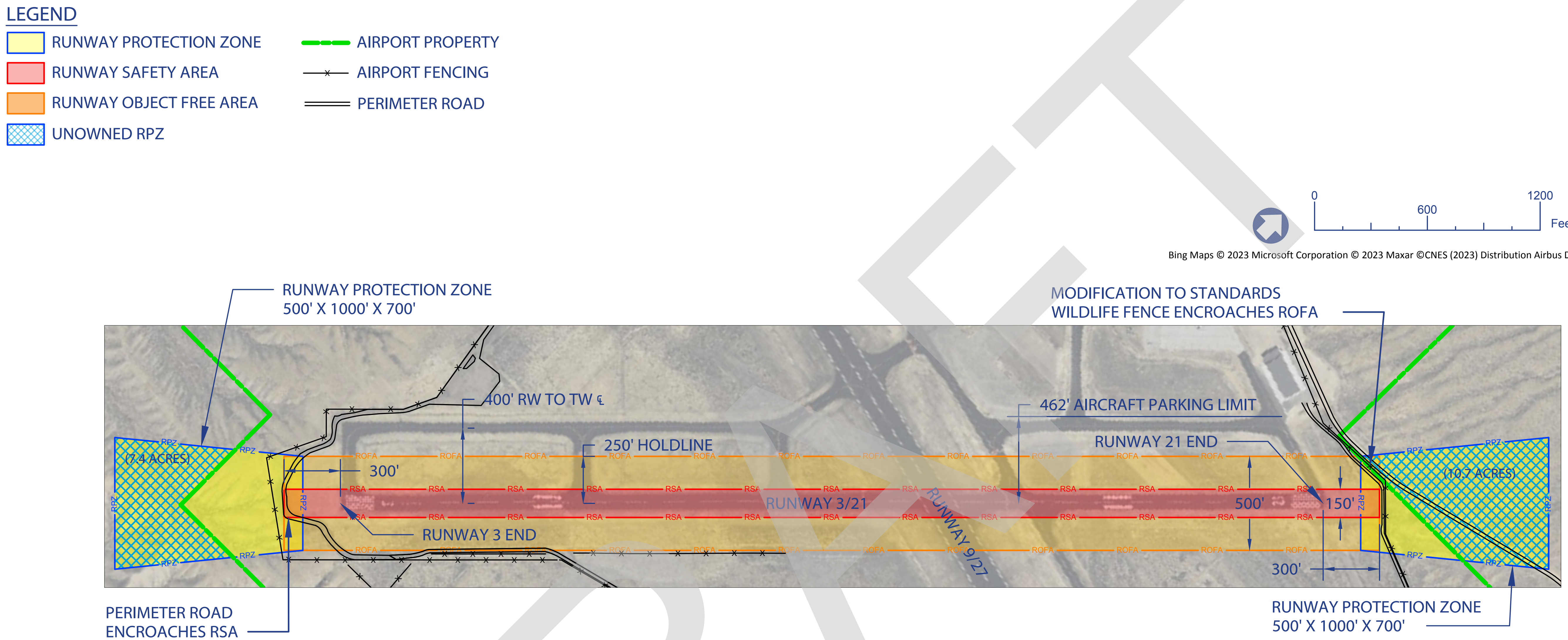

FIGURE 3.4

RUNWAY 3/21 DIMENSIONAL CRITERIA/RDC B-II-VISUAL (EXISTING CONDITIONS)

Runway Protection Zone (RPZ)

The RPZ serves the purpose of protecting people and property on the ground beyond the runway ends. For Runway 9/27, the RPZ is a trapezoidal area starting 200 feet past the runway threshold, with its dimensions determined by factors like aircraft type and visibility requirements. The RPZ should be kept clear of incompatible land uses like residences and places of assembly. The RPZ's dimensions depend on aircraft size and approach speed, with wider and longer zones for larger aircraft and faster approaches. Ideally, airports control RPZs through ownership to clear them of above-ground obstacles. In cases where full clearance isn't possible, collaboration with property owners is recommended to maintain compatibility. As shown in the previous figures, RKS does not own all the land that makes up the RPZs for both runways. Due to the topographical restrictions on developing land immediately surrounding the Airport, it is unlikely that incompatible land use development would be proposed. However, the acquisition of the unowned land within all four RPZs would be in the best interest of RKS.

Runway Obstacle Free Zone (ROFZ)

The ROFZ is a three-dimensional airspace centered above the runway and its extended centerline, where obstacles are prohibited. This space is essential to ensure the safety of aircraft during landing, takeoff, and missed approaches. The ROFZ for both runways at RKS require no improvement over the planning period.

Runway Object Free Area (ROFA)

The ROFA is a critical safety zone centered on the runway surface, designed to remain clear of objects, except for those necessary for air navigation or aircraft ground maneuvering purposes, as outlined in FAA AC 150/5300-13B, *Airport Design*. This two-dimensional ground area's dimensions are determined by the RDC and visibility minimums.

According to FAA standards, the ROFA for Runway 9/27 should be 800 feet wide, centered on the runway centerline, and extend 1,000 feet beyond each runway end. The ROFA for Runway 3/21 should be 500 feet wide, centered on the runway centerline, and extend 300 feet beyond each runway end the primary objective is to ensure aircraft safety during ground operations and landings. While the runways at RKS meet the required standards, there are penetrations to the ROFA at three runway ends. At Runway 9, a portion of County Road 370 is within the ROFA. At Runway 27, there is wildlife fencing within the ROFA. At Runway 21, there is wildlife fencing and a public access road within the ROFA, but it’s important to note that these are below the grade of the ROFA. Currently, these penetrations of the ROFA are listed on the ALP as modifications to standards and are addressed in the Modifications to Standards section below.

Runway Safety Area (RSA)

The RSA is an area surrounding the runway designed to provide a protective area surrounding a runway in the event an aircraft overshoots, understood, or has an excursion from the runway surface. The RSA is also designed to support the weight of maintenance and emergency response vehicles that may require access into this area. According to FAA design standards, the RSA for Runway 9/27 should be 500 feet wide, centered on the centerline, and extending 1,000 feet beyond each runway end. The RSA for Runway 3/21 should be 150 feet wide, centered on the centerline, and extending 300 feet beyond each runway end. Existing conditions are identified below in **Table 3.5**. The RSA must meet specific criteria, including being cleared, graded, and free of hazardous surface variations, adequately drained, and capable of supporting equipment such as snow removal and Aircraft Rescue and Fire Fighting (ARFF). Additionally, it must be devoid of objects, except for those that serve a functional purpose and are constructed on low-impact resistant supports to minimize potential hazards to aircraft. Three runway ends at RKS have nonstandard conditions pertaining to the RSA. Alternatives to address these nonstandard conditions are examined in Chapter 4.

Table 3.5 ***RUNWAY DESIGN STANDARDS MATRIX COMPARISON FOR C/D-III AND A/B-II TO EXISTING CONDITIONS***

Item	Runway 9-27 Dimension (feet)	C/D-III Design Standard	Standard Met	Runway 3/21 Dimension (feet)	A/B-II Design Standard	Standard Met
Runway 9/27				Runway 3/21		
Runway Width	150	150*	Yes	75	75	Yes
Runway Shoulder Width	N/A	25	No	N/A	N/A	N/A
Runway Safety Area Width	500	500	Yes	150	150	Yes
Runway Safety Area Beyond Runway end	806/966**	1000	No	175***/300	300	No
Runway Object Free Area (ROFA) Width	800	800	Yes	500	500	Yes
ROFA Beyond Runway end	1000	1000	Yes	300	300	Yes
Runway Centerline to:						
Parallel Taxiway Centerline	400	400	Yes	400	240	Yes
Aircraft Parking	530	500	Yes	820	250	Yes
Runway Holding position Markings	318	250	Yes	250	200	Yes

SOURCE: FAA Advisory Circular 150/5300-13A-Change 1, Airport Design; and existing conditions at RKS. (2023)
NOTES: N/A: Not applicable. --- Data not available. *- For RDC III aircraft greater than 150,000 pounds **Perimeter Roads encroach upon RSA ***Perimeter Road encroaches upon Runway 3 RSA

Modifications to Standards (MOS)

A Modification to Standards (MOS) is any deviation from, or addition to standards, applicable to airport design, material, and construction standards, or equipment projects resulting in an acceptable level of safety, useful life, lower costs, greater efficiency, or the need to accommodate an unusual local condition on a specific project through approval on a case-by-case basis. According to the 2015 RKS Airport Layout Plan, existing MOS's at RKS include ROFA penetrations by roads and wildlife fences off three runway ends (Runway ends 9, 27 and 21). The justification for the MOS's according to the ALP is that the roads and fences that penetrate the ROFA at these 3 runway ends are located well below the runway end elevation and thus are technically not an issue due to their elevation.

Runway Visibility Zone (RVZ) and Line of Sight (LOS)

The Runway Visibility Zone (RVZ) is an area formed by imaginary lines connecting two physically intersecting runways' Line of Sight (LOS) points. A clear LOS precludes objects not fixed-by-function (e.g., buildings, structures, and parked aircraft) residing within the RVZ from blocking the pilot's view to the intersecting runway. The RVZ provides a visual field of view enhancing pilot situational awareness to avoid conflict with aircraft operating on an intersecting runway. LOS standards also apply to the runway and require that any point located five feet above the runway centerline must be mutually visible with any other point five feet above the centerline for the entire runway length. However, if the runway is served by a parallel taxiway, the distance is reduced to one half the runway length. The RVZ and LOS for the Airport are illustrated in **Figure 3.5**.

3.2.2 TAXIWAY SYSTEM

The RKS taxiway system is comprised of five taxiways which provide aircraft and ground crews access to and from the runway system. The pavement condition report provided by Shannon & Wilson examined Taxiway C and D. Taxiway C reported a PCI of 83 and Taxiway Delta reported a PCI of 81. Taxiway A was excluded from the evaluation as it was rehabilitated in 2021. The existing taxiway dimensions at RKS are evaluated for meeting FAA standard in **Table 3.6**.

Taxiway connectors A2 and C have direct access from aprons to runways, it is recommended in AC 150/5300-13B to stagger the alignment of connecting taxiways from aprons to runways to require aircraft to make at least one turn and to minimize possible incursions. It is recommended that the A2 and C connectors be addressed to eliminate direct access.

Table 3.6 ***TAXIWAY DESIGN GROUP II & III REQUIRMENTS FOR ALL FUTURE CRITICAL AIRCRAFT***

Taxiway Segment	Width (feet)	Safety Area (feet)	Taxiway Object Free Area (TOFA) (feet)	Runway-Taxiway Centerline Separation (feet)	Meets or exceeds current Taxiway design?
Taxiway A (TDG III)	50	118	171	400	Yes
Taxiway C (TDG II)	50	79	124	485	Yes
Taxiway D (TDG II)	50	79	124	485	Yes
Taxiway E (TDG II)	50	79	124	N/A	Yes
Taxiway F (TDG II)	50	79	124	485	Yes

***Source**: FAA (2023)*

Runway Taxiway Separation

Runway taxiway separation is the distance between the centerline of a runway and the centerline of a parallel taxiway. It is determined by the airport elevation, the airplane design group, and the approach category of the aircraft that use the Airport. Runway taxiway separation is important for ensuring the safety and efficiency of airport operations, as it prevents runway incursions, and reduces wake turbulence. The existing runway taxiway separation distances and how they compare to the required distances for the future critical aircraft are included in **Table 3.4**. The distance from 9/27 to Taxiway A meets standards. The distance from 3/21 is greater than standards by 160 feet. While this exceeds standards, no improvements are needed to runway/taxiway separation to accommodate the fleet of aircraft types projected to operate at RKS during the planning period.

3.2.3 NAVIGATIONAL AIDS

The review of navigational aids (NAVAIDS) for RKS concentrates on the visual and non-visual equipment aiding airfield identification, approaches, weather observation, communications and demarcating taxiway and apron areas. This encompasses the lights, signs, wind indicators, landing systems, weather observation systems and pavement markings discussed in this section.

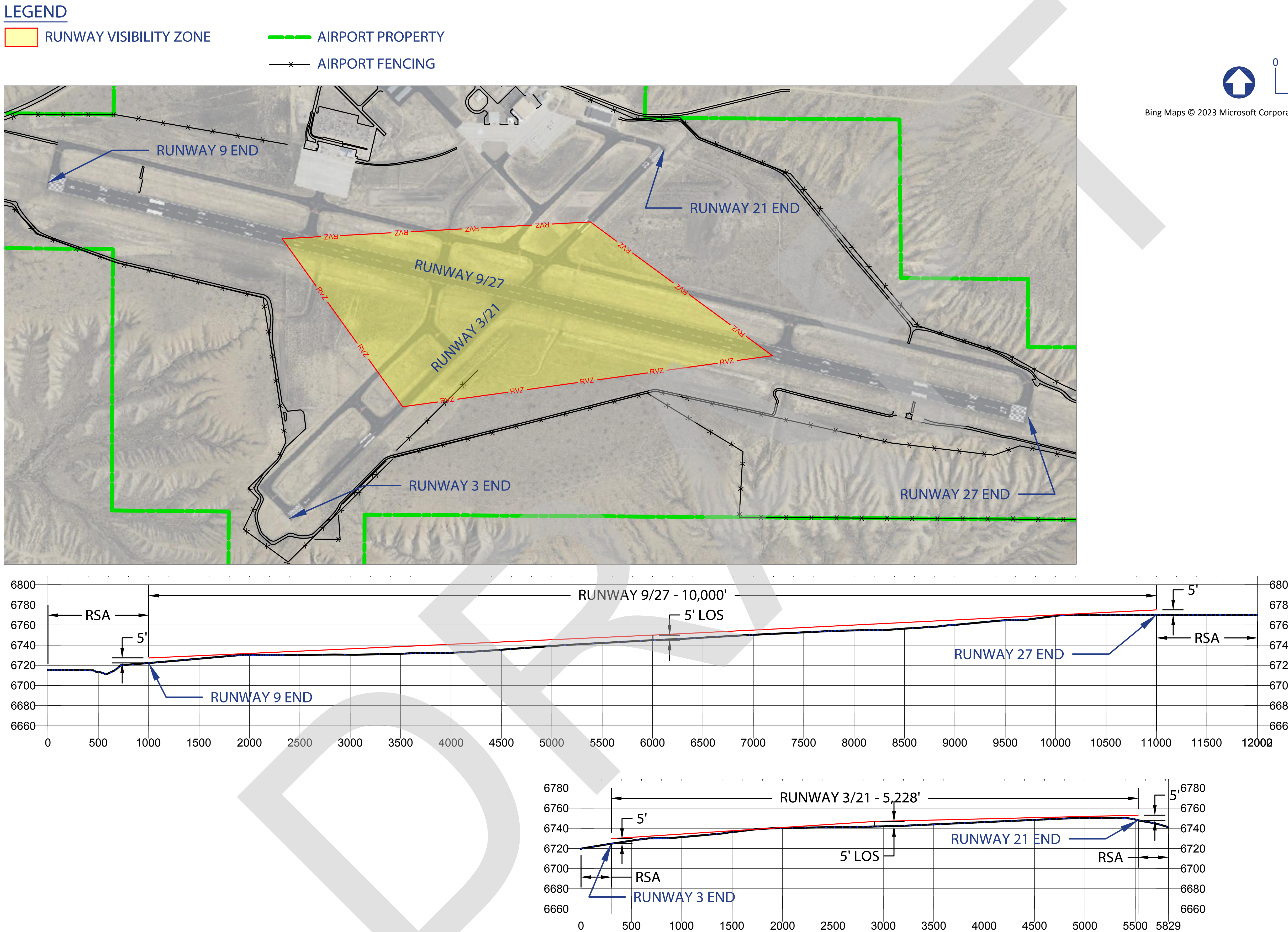

FIGURE 3.5

RUNWAY VISIBILITY ZONE AND RUNWAY LINE OF SIGHT

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Visual Navigational Aids

Visual NAVAIDs provide visual cues to help identify the airfield as well as the boundaries and locations of taxiway and apron surfaces. These comprise the lights, signs, wind indicators, and pavement markings discussed in this section. The following presents the review of visual NAVAIDs conducted as part of the facility requirements review.

Rotating Beacon

The rotating beacon at RKS is located behind the terminal building to the northeast approximately 700 feet. It is in good condition and has no obstructions the blocking the angle of its light. No improvements other than routine maintenance are anticipated to meet operational needs for the planning period.

Wind Indicators

Lighted wind indicators are located at each end of Runway 9/27. The wind indicators are on the north side of the runway within the first 1,000 feet of landing available for both approach ends. The placement of these wind indicators meets design standards, and no relocation of their placement is needed. Only routine inspections and maintenance of the wind indicators to replace worn or faded fabric are anticipated to be needed during the planning period.

Segmented Circle

A segmented circle is a ground-based visual aid used to assist pilots' decision making by presenting traffic pattern procedures and wind indications at non-towered airports. With these two pieces of information pilots can determine the most appropriate runway for landing and the correct way to fly the pattern. A segmented circle is located approximately 1,600 feet southwest of the Runway 9/27 and Runway 3/21 intersection. The segmented circle requires no alterations needed other than regular maintenance during the planning period.

Approach Lighting

A medium intensity approach lighting system (MALSR) is a type of lighting system that helps pilots identify and land on a runway in low-visibility conditions. It has three kinds of lights: green threshold lights at the start of the runway, white light bars along the extended centerline, and white flashing lights that create a moving effect towards the runway. A MALSR provides visual guidance for runway alignment, height perception, and horizontal reference. It is usually installed at airports that have precision approach procedures. The MALSR installed at the approach end of Runway 27 meets FAA siting standards with no improvements necessary for the planning period other than routine maintenance. Runway 9 is equipped with ODALs (Omni-Directional Approach Lights) which are used to identify the approach end and centerline of the runway. No improvements are needed to the approach lighting on Runway 9.

Runway End Identifier Lights (REILs)

REIL lights are a type of airport lighting system that helps pilots to identify the end of the runway during approach and landing. They consist of two synchronized, unidirectional flashing lights that are positioned on each corner of the runway landing threshold, facing the approach area, and aimed at an angle of 10 to 15 degrees. REIL lights are important because they provide a clear and unambiguous visual indication of the runway threshold, especially in situations where the runway is surrounded by other lights, lacks contrast with the terrain, or has reduced visibility. REILS are installed at RKS on both ends of Runway 3/21 and meet FAA design standards with only routine operational maintenance anticipated for the planning period.

Precision Approach Path Indicators (PAPI)

PAPI lights are a type of airport lighting system that helps pilots to descend to the runway during final approach at a safe descent angle. The angle is preset for the runway based on obstacles in the approach path and is typically around 3 degrees. There are two types of PAPI lighting systems, a two-light system, or a four-light system. Both two-light and four-light systems contain lights that display different combinations of white and red lights depending on the angle of view. The ideal glide path is indicated by an even number of red lights and white lights. If the pilot sees more red lights, they are too low; if they see more white lights, they are too high. PAPI lights are important because they provide visual guidance for pilots in low-visibility conditions and enhance the safety and efficiency of landing operations.

RKS utilizes both two-light and four-light PAPI. The four-light units are located at both ends of Runway 9/27 and the two-light PAPI units are located at the approach ends of Runway 3/21. There is a Modification of Standard for the height of the horizontal plane (2 feet) above the elevation of the runway centerline at the intercept point of the visual glidepath with the runway that should only be 1 foot for the PAPI installed on both ends of Runway 3/21. It is recommended that this Modification of Standard should be reviewed as part of the next major project to reconstruct Runway 3/21 or when any changes are needed to the PAPIs. The PAPIs on both ends of Runway 9/27 meet FAA standards with no improvements anticipated during the planning period other than routine maintenance.

Runway/Taxiway Pavement Markings

Runway and taxiway pavement markings help pilots identify points on the runway that can be used as visual aids when taking off and landing while also providing reference points when taxiing. Examples of required runway markings found at RKS include the aiming points, centerline, threshold bars, runway designation marking, side stripes, and touchdown zone distance markers. Both ends of Runway 9/27 have precision runway markings in good condition. As Runway 3/21 is a visual runway it is painted with non-precision markings which are in good condition. Taxiway markings consist of yellow centerline, edge, and enhanced centerline markings while surface painted runway hold position signs are painted with white inscriptions on red backgrounds. Currently, all pavement markings meet standards and will only require recommended routine maintenance for the planning period to maintain reflectivity and visibility standards.

Runway Edge Lighting

Runway 9/27 has High Intensity Runway Lighting (HIRL) while Runway 3/21 is equipped with Medium Intensity Runway Lighting (MIRL). Runway edge lighting on both runways is equipped with Pilot Controlled Lighting (PCL) and can be activated on the common traffic advisory frequency (CTAF). Standards require HIRL systems for runways equipped with a precision instrument approach like Runway 9/27 while MIRL systems are typically installed on visual runways like Runway 3/21. Standards for airfield lighting are defined in AC 150/5340-30, *Design and Installation Details for Airport Visual Aids* and all of the edge lighting at RKS meet these standards. There is only a need during the planning period for routine maintenance of the runway lighting systems at RKS.

Taxiway Lighting

Taxiway edge lighting delineates the edge of a taxiway surface for pilots and ground vehicle operators, which is beneficial during night and inclement weather conditions. The FAA requires airports with commercial airline service to have medium intensity taxiway lighting (MITL) systems that offer three illumination intensities. The MITL system is installed on all airfield taxiways and meets these requirements with no improvements other than routine maintenance needed during the planning period.

Airfield Signs

Airfield signage complements pavement markings by providing locational and directional information to pilots and ground vehicle operators maneuvering on an airfield. Signage found on an airfield includes runway hold position signs, runway distance remaining signs, taxiway location signs, taxiway directional signs, and destination location signs. All airfield signs meet FAA standards set forth in FAA AC 150/5340-18F, *Standards for Airport Sign Systems*, with only routine inspections and maintenance anticipated for the planning period to ensure signs meet reflectivity and visibility standards.

Electronic Navigational Aids

Electronic NAVAIDs serve an important function as they permit operations to occur at an airport when nighttime conditions, inclement weather, or lack of line-of-sight confirmation limit visual navigation capabilities. This section reviews the electronic NAVAIDs at RKS and evaluates the need for improvements to meet existing and future demands.

Very High Frequency Omni Directional Range with Distance Measuring Equipment

A Very High Frequency Omni Directional Range (VOR) is a type of radio navigation system for aircraft that uses very high frequency signals emitted by ground stations. An aircraft with a VOR receiver can determine its position and direction relative to the station by tuning to its frequency and reading the radial (the angle from the station's magnetic north) and the distance. However not all VOR stations have distance measuring equipment (DME) and do not provide that information. VORs help pilots navigate along airways, fly instrument approaches, and locate points of interest. VORs are being phased out as GPS-based navigation becomes more prevalent, but the FAA has designated a certain number of VOR stations to remain in service in case of GPS outages, this is referred to as the minimum operational network or MON.

Located 2.3 miles east of RKS is the Rock Springs VOR/DME antenna. The VOR/DME provides lateral navigation as well as distance information for a VOR-DME approach to runway 27 and lateral navigation for a VOR approach to Runway 9. No improvements or alterations of the VOR-DME are needed during the planning period.

Instrument Landing System (ILS)

Two ground-based systems working in tandem make up an ILS. They are the localizer antenna and the glideslope antenna. The localizer provides the lateral position of the aircraft in relation to the runway centerline. The localizer at RKS is located 1,000 feet from the departure end of Runway 27. The glideslope provides vertical guidance for Runway 27, and it is located on the departure end of Runway 27, and the east end of Runway 9. There does not appear to be a need for lower instrument approach minimums at RKS and no improvements or alterations of the ILS are recommended during the planning period.

Global Positioning System (GPS)

GPS is a satellite-based navigation system that provides location and time information for any device that has a GPS receiver. GPS works by using signals from at least four satellites to calculate the distance and position of the receiver. Use of GPS for the navigation and separation of aircraft is the basis of the FAA's Next Generation Air Transportation System (NextGen) initiative to modernize the nation's air traffic control system. Currently, RKS has two satellite-based instrument approach procedures. Runway 27 and Runway 9 have GPS approaches that offer localizer performance with vertical guidance (LPV). These approaches offer properly equipped aircraft and trained pilots the ability to conduct a GPS-based approach with similar precision to an ILS approach without the need for ground-based equipment. No improvements to the existing GPS approaches so that lower visibility minimums and ceiling height decision levels are anticipated to be needed to meet projected demand for the planning period. However, the addition of a GPS approach to either end of Runway 3/21 would require additional improvements such as enlarged runway protection zones, additional visual NAVAIDS, and precision approach pavement markings.

Automated Surface Observation System

Weather observation at an airport is vital for the safety and efficiency of air traffic operations. It aids pilots, air traffic controllers, and airport managers in making informed decisions about flight planning, routing, landing, takeoff, and ground handling. Additionally, it assists in monitoring and forecasting weather conditions that could impact the airport and its surroundings.

Weather observation data is collected and disseminated through various means, such as automated systems, reports, forecasts, and graphical products. One such system is the Automated Surface Observation System (ASOS), located northeast of Taxiway A5. The automated sensor in the ASOS transmits weather reports via a designated radio frequency, providing weather information on an hourly basis. The data is also transmitted when the weather exceeds preselected thresholds, such as when visibility drops below 3 miles. Another system that could service this purpose is an Automated Weather Observing System (AWOS), a type of automated system that provides real-time weather information to pilots. It measures and reports various weather conditions such as wind speed, visibility, cloud height, temperature, and precipitation. AWOS are typically airport owned and operated.

Due to the age of the current equipment and occasional power outages, there have been instances of ASOS outages. These outages have led to commercial flights being canceled and overall safety of the flights operating at RKS being diminished. The ASOS is owned by the FAA and serviced by the National Weather Service. When the ASOS goes down, service technicians must travel from Riverton which increases the time that it is inoperable. During the planning period efforts should be dedicated to investigating the installation of an airport owned AWOS to limit the number of weather reporting outages.

3.2.4 INSTRUMENT PROCEDURES

Instrument procedures are a series of published precise maneuvers that a pilot can use to transition from an initial approach fix to landing without the use of vision. These procedures are necessary for allowing aircraft to utilize RKS in low visibility conditions. Runway 9/27 is equipped with five instrument approaches, three on approach to Runway 27 and two on approach to Runway 9. The approaches are:

- ILS or LOC Runway 27
- RNAV (GPS) Runway 27
- RNAV (GPS) Runway 9
- VOR Runway 9
- VOR/DME Runway 27

Runway 3/21 is a visual runway and therefore has no instrument approach procedures. Coordination with users of the Airport found that the minimums offered by these approach procedures are sufficient and that there does not appear to be a demand for improved instrument approach procedures. Therefore, the instrument approach capabilities currently offered at RKS appear sufficient with no changes to these procedures anticipated to be needed during the planning period.

3.3 TERMINAL FACILITIES

This section briefly reviews the analysis that was conducted of terminal facilities at RKS for both air carrier and general aviation (GA) operations as well as an assessment of the terminal facilities to accommodate anticipated demand. Also included in this evaluation is an analysis of hangar facilities at RKS and aircraft storage capacity improvements that may be needed.

3.3.1 AIR CARRIER TERMINAL FACILITIES

A Terminal Area Plan (TAP) was completed in 2019 which presented three terminal area alternatives to improve expand and renovate the existing commercial passenger terminal facilities. Recent updates include remodeling of the bathrooms, replacement of the light fixtures, and repainting of the terminal. All updates were completed in 2010. The entry and exit vestibules and doors and the vestibule for deplaning passengers were replaced in 2007 and are in good condition. All other doors and windows in the building are original and are in fair to poor condition. The passenger terminal is located north of Runway 9/27 and is adjacent to the commercial apron.

Following competition of the TAP, a terminal design process was initiated, and terminal improvements are currently under construction. RKS currently needs a temporary terminal structure to accommodate air carrier operations including screening, a suitable waiting area, boarding, bag claim, ticketing, etc. while construction occurs for the expansion of the existing air carrier terminal building. As a result of the most recent terminal area planning and construction at RKS, terminal area needs were not assessed as a part of this master plan effort. While there are no needs for improvement in the near term for the terminal facilities at RKS, space for long term expansion should be reserved for improvements that may be needed outside of the 20-year planning period.

3.3.2 FIXED BASE OPERATOR

There is one fixed base operator (FBO) at RKS, Sweetwater Aviation, it is owned and operated by RKS. This is a full service FBO which provides a wide range of aviation services to both pilots and travelers, such as fueling, maintenance, ground handling, parking, and amenities. It has over seven acres of ramp space, and 24,000 square feet of heated hangar space in a new facility constructed in 2018. The construction of another hangar like the existing itinerant aircraft hangar would allow Sweetwater Aviation to better accommodate the itinerant business jet activity that is projected to grow during the planning period. This hangar should be sized to accommodate the largest of business jet aircraft types like the Bombardier Global 7500 and the yet-to-be certified Gulfstream G800.

3.3.3 AIRCRAFT STORAGE

As of 2023, there are 44 based aircraft including 34 single engine, five multi-engine, one helicopter, and three ultralights. Facilities available to house these aircraft include a large 24,000 square foot community hangar, as well as six rows of T-hangars, four box hangars, and the University of Utah Health AirMed hangar (identified as West Hangar).

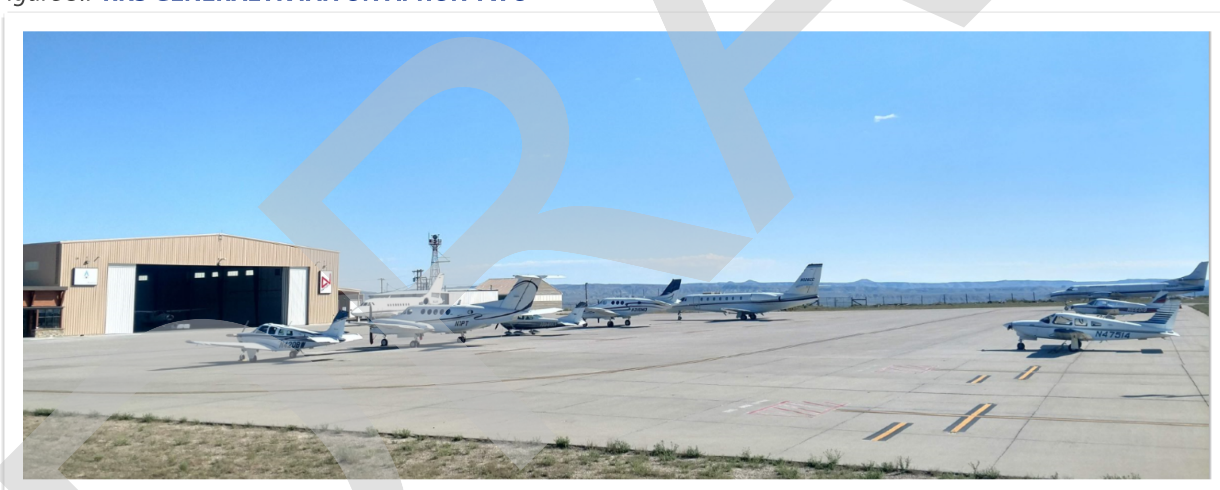
RKS has been able to provide its tenants that desire parking space with the adequate hangars and or tiedowns that have been requested. Hangar capacity currently meets demand. Although there is no waiting list for hangar space forecasts show a growth in based aircraft that includes the potential for based jets. Business jet activity has increased, due to interest from jet charter operators to base these aircraft at RKS given its centralized location to serve communities in Wyoming, Utah, and Colorado. RKS has also been contacted by aviation related business and aircraft owners inquiring about the potential to lease land for large hangar construction. Additional hangars are projected be needed to accommodate the growth not only in based aircraft but for itinerant aircraft activity. The addition of a large community hangar would be beneficial to RKS and its users as aircraft of different sizes could be offered covered storage from elements such as sun and heat from summer as well as snow, ice, and freezing temperatures that are present during the winter. Construction of large box-style hangars would also provide covered storage for itinerant charter jets to be positioned at RKS which provides a centralized location for serving larger geographic regions such as Denver, Aspen, Salt Lake City and Jackson Hole.

The GA apron provides access to hangars and tiedown areas. There is approximately 301,400 square feet available at RKS which accommodates 22 aircraft tiedowns. The total number of tiedowns at RKS is 39 which offers parking space to accommodate both transient and locally based aircraft. The apron at RKS reaches its peak capacity often where available space to maneuver aircraft becomes a safety hazard. Photographs of the apron highlighting the constraints are included following this paragraph. The information presented in the *Forecasts* chapter suggests that based aircraft along with itinerant aircraft will continue to increase and transient aircraft are getting larger. With these increases, more apron space is necessary to alleviate the constraints currently and accommodate the new transient and permanent users of RKS. The existing General Aviation apron is show in **Figures 3.6** and **3.7**.

Figure 3.6 ***RKS GENERAL AVIAITON APRON ONE***

Source: *Airport Staff (2023)*

Figure 3.7 ***RKS GENERAL AVIAITON APRON TWO***



Source: *Airport Staff (2023)*

Available land for additional aeronautical development offers unique opportunities, which is why a phased and calculated approach should be taken when planning for what should be built on the land. This phased approach should be taken for the design of the hangar area layout to maximize the utility of the land available and the maintain the highest level of efficiency and safety when it comes to how the aircraft will move around and use the hangars.

3.4 LANDSIDE FACILITIES

This section presents the analysis of various landside facilities that are used to support the operation of RKS such as vehicle access, operational support services, and utilities. The following section presents the facility requirements review for landside and support services at RKS.

3.4.1 AIRPORT ACCESS

Interstate 80 runs the length of Wyoming running east to west and provides access to RKS. Intersecting with Interstate 80 is State Highway 370 which provides access to RKS until it meets Middle Baxter Road. From Middle Baxter Road, the remaining access route to RKS is provided by Airport Road / County Route 10. RKS also has an unpaved perimeter road that follows the perimeter fence. The service road system provides access to the NAVAIDS, approach lights, and ASOS. Additionally, there is a service road that provides access from Taxiway A to Apron E, and another service road connecting the GA Apron to the Commercial Apron. These perimeter access roads used by maintenance and emergency response vehicles provide efficient access to the airfield, reducing the need for vehicles to access airfield pavement and increase the potential of an airfield incursion. As evaluated during the review of airfield design surfaces, the perimeter road passes through the ROFA creating a non-standard condition. Improvement of lighting along this roadway routing as it approaches the terminal building should be considered to replace those existing fixtures with brighter LED lights as well as to expand the area illuminated to increase visibility during night conditions. No additional improvements to airport access are anticipated to be needed during the planning period.

3.4.2 AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF)

The level of ARFF index required at an airport is defined by the size (length) of aircraft and frequency of air carrier service. If the aircraft makes, on average, five or more daily departures from RKS, that aircraft is used to determine the ARFF index. Currently, RKS is classified as an ARFF index A due to the size of the current commercial aircraft being used (CRJ-200) and the frequency of departures (less than five daily). The Forecast chapter presented the possibility of a low-cost carrier operating narrowbody aircraft types into RKS. This combined with the fact that the future critical aircraft (ERJ-175) is longer than the current aircraft might suggest the ARFF requirement would increase. Frequency of departures for these aircraft will remain at less than five daily meaning the ARFF index requirement will not increase from the current A classification. In addition to this RKS does have the ability to provide Index C service with a prior permission request coordinated with airport operations. ARFF index C requires airports to have two vehicles carrying a Part 139 specified combination of water (3,000 gallons), potassium dry chemical (500 pounds), and Aqueous Film-Forming Foam (AFFF) (100 gallons). RKS meets these requirements with its two ARFF vehicles outlined in **Table 3.7**.

The ARFF facility at RKS is located on the GA apron. The building is two stories tall and has two back-in bays capable of housing the vehicles. Newer ARFF vehicles are larger in size and consideration towards the current ARFF facilities ability to house these vehicles should be taken into consideration. Alteration or expansion may be required during the planning period to adequately house replacement ARFF vehicles.

Table 3.7 ***ARFF VEHICLES AT RKS***

Vehicle	Water (gallons)	AFFF (gallons)	Purple-K (pounds)
2015 Rosenbauer Fire Engine	1500	200	500
2000 Oshkosh Striker 1500	1500	210	500

Source: *Airport Staff (2023)*

3.4.3 SNOW REMOVAL EQUIPMENT (SRE) FACILITY

The snow and ice control plan which is required to be in place for part 139 operators utilizes several different snow removal equipment (SRE) pieces listed below:

- Overaasen blower
- Overaasen multi-function
- Western Star Plow truck
- Oshkosh Plow truck
- Mercedes Benz Unimog Plow truck
- John Deere Loader
- Pickups/trailers equipped with plows and sand distributors.

The SRE is stored in the joint-use SRE/maintenance building located adjacent to Taxiway C. The facility protects the equipment from the elements and ensures that they are in operable condition where they can be deployed with minimal runup time in response to a storm. The SRE/maintenance building was constructed in 2019 and is just over 27,000 square feet. It is equipped with six parking bays, one maintenance bay, parts and material storage, workspaces, and administration space. The SRE/ maintenance facility currently housing RKSs fleet accommodates the needs of the Airport. The previous SRE/maintenance building is potentially being repurposed into a Part 145 Repair Station. While the facilities housing the vehicles are in good condition, some of the vehicles in the fleet are nearing the end of their serviceable life and will need to be replaced with newer models during the planning period.

3.4.4 PRESERVING SPACE FOR FUTURE AERONAUTICAL & NON-AERONAUTICAL DEVELOPMENT

It is recommended that RKS preserve space for future aeronautical & non-aeronautical development should there be interest from existing and future users for these land needs. The infrastructure at RKS and available land near the airfield can be attractive for these types of on-airport land uses. Planning for the intended use of available land is recommended so that RKS can offer aeronautical development opportunities with access to taxiways and runways while landside access for potential non-aeronautical development can be preserved. It is also recommended that the Airport consider the potential for land acquisition of adjacent BLM land for airport purposes. The Airport and Airway Improvement Act of 1982 allows for the BLM to transfer land to an airport sponsor provided that the land is needed for airport purposes.

3.5 SUSTAINABILITY

As part of the Master Plan, RKS intends to proactively integrate sustainable measures into the Airport's long-range planning efforts. Even prior to this formalized plan, RKS has had a long history of incorporating sustainable practices that make sense into its development projects and day-to-day operations. The sections below highlight specific sustainability areas of interest for the Airport.

3.5.1 WATER

RKS's water supply is limited to the capacity of an on-site tank as the Rock Springs municipal water system does not extend to the Airport. The existing passenger terminal domestic water system is supplied through a tank and pumping system which distributes water for fire protection and domestic consumption. Though the passenger terminal building does not currently have a fire sprinkler system, other airport facilities are equipped with such systems. Water is delivered to the on-site tank by truck on a regular basis. The system operates with a 300,000-gallon water tank and pump house located along State Highway 370 to the northwest of the FBO facility. The water tank is 32 feet in height, 40 feet in width, and serves both potable and non-potable water needs. The current system meets the minimum flow rate and pressure requirements for the state, but it also limits the Airport's potential for future development. A Sewer and Culinary Water Capital Facility Plan was completed by TO Engineers (now Ardurra) in May of 2021 which identified these limitations. The current water supply for fire-code requires 180,000 gallons of water to be always available in the tank to satisfy current International Building

Code standards. As the Airport continues to expand there will be an increase in water demand that will exceed the current system's capacity. Future development is currently limited to the amount of water that can be stored on property making it critical to consider future installation of a direct connection to municipal water.

The Sewer and Culinary Water Capital Facility Plan also identifies issues with water quality and the limitations of the current sewer system. The sewer system at RKS is made up of five leach fields that dispose of sanitary waste. As the Airport grows and attracts new tenants this system will become undersized resulting in restricted future development. Ardurra recommended a pressurized sewer system be installed. The benefits of this include increased capacity and ease of permitting. Until RKS has a direct water line, future development will be limited to the amount of water that can be held on site to meet the needs of passengers, operations, and fire suppression requirements.

3.5.2 DIRECT AIR CAPTURE

Direct Air Capture (DAC) technology utilizes chemical reactions to remove carbon dioxide (CO2) from the ambient atmosphere. DAC systems can be paired with geologic sequestration through Class VI Wells for long-term removal or the removed carbon can be re-used for other purposes (i.e., sustainable aviation fuels). DAC technology focuses on atmospheric removal which differs from carbon capture technologies that capture CO2 at the source of emissions, keeping the carbon from ever re-entering the atmosphere. Implementing DAC and geologic sequestration can help airports achieve net-zero targets by removing hard-to-abate greenhouse gas (GHG) emissions. DAC and storage can enhance the environmental performance and social responsibility of airports. RKS is a prime candidate for the critical Class VI wells used to store the carbon removed by DAC technology. There are specific geologic criteria that must be met for drilling Class VI wells which RKS has on airport property. RKS's ability to leverage its geological location for DAC would not only provide environmental benefits through carbon removal but could eventually produce financial benefits through sale of carbon removal offsets.

3.5.3 SOLAR FARM

Solar photovoltaics (PV) capture the sun's energy and convert it into usable, renewable electricity. When installed at scale, a large solar system is referred to as a "solar farm". Solar farms promote environmental sustainability and operational resiliency by reducing the Airport's dependence on fossil fuels, curbing GHG emissions, and by having direct access to a power source and battery storage. RKS recently complete a Solar Feasibility Study and the results and recommendations from that study will be considered in this Airport Master Plan in the development of the capital improvement plan.

3.5.4 LAND USE

RKS recognizes the need to maximize non-aeronautical development revenues to support growth of aeronautical services. Development on RKS property includes benefits such as two runways, utility capabilities for unmanned aerial vehicles, and immediate access to I-80 and Union Pacific Rail. The Airport will continue to advertise opportunities to develop on airport property as a means of financial sustainability.

RKS strives to prioritize adjacent land use compatibility, in this sense, the Airport will continue to collaborate and engage with neighboring landowners including the Bureau of Land Management (BLM), Rock Springs Grazing Association, and the State of Wyoming on existing and future projects. RKS understands that these partnerships will create mutually beneficial outcomes for all parties.

3.6 SUMMARY

The information presented in this chapter analyzed the current facilities and their ability to meet current and future demand efficiently and safely. Below are the major improvement considerations for the facilities at RKS and for consideration of RKS sustainability focus categories.

- Plan for rehabilitation of Runway 3/21, Taxiways A, D and F in the short term.
- Plan for rehabilitation of other airfield pavements in the medium to long term.
- Rehabilitate the terminal road and maintain airfield pavement in accordance with the pavement management plan.
- Plan for additional aircraft parking facilities in the form of hangars, tiedowns, and additional apron space.
- Complete a reconfiguration of the A2 and C connectors to eliminate direct access to runway surfaces and to meet FAA geometric standards.
- Plan for acquisition of necessary ARFF and SRE vehicles.
- Expand the SRE and ARFF facilities to accommodate larger equipment.
- Upgrade streetside lighting.
- Complete routine maintenance of all lighting, markings, NAVAIDS, and facilities.
- Integrate sustainability considerations in all improvements.
- Consider siting and constructing DAC wells and solar farm.

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