CHAPTER
3
FACILITY REQUIREMENTS

COCHISE COLLEGE AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

Chapter Three
Facility Requirements

3.1 INTRODUCTION

One of the primary objectives of this planning study is to determine the size and configuration of airport facilities needed to accommodate the types and volume of aircraft expected to utilize the airport. Data from Chapter 1 and forecasts from Chapter 2 are coupled with established planning criteria to determine what improvements are necessary to airside and landside areas. Then, having established the facility requirements, alternatives for providing these facilities are provided in Chapter 4 to determine the viability of meeting the facility needs.

The time frame for addressing development needs usually involves short-term (0-5 years), medium-term (6-10 years) and long-term (11-20 year) periods. Long range planning primarily focuses on the ultimate role of the airport and is related to development. Medium-term planning focuses on a more detailed assessment of needs, while the short-term analysis focuses on immediate action items and may include details not geared towards long-term development.

The facility requirements described in the initial sections of this Chapter are based on those facilities needed to accommodate the civilian aircraft demand at the airport.

3.2 AIRPORT REFERENCE CODE

The Airport Reference Code (ARC) is a system established by the FAA that is used to relate airport design criteria to the operational and physical characteristics of the aircraft currently operating and/or intended to operate at the airport. The ARC has two components relating to the airport design aircraft. The first component, depicted by a letter, is the Aircraft Approach Category and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the Aircraft Design Group and relates to aircraft wingspan and tail height (physical characteristic). Generally, aircraft approach speed applies to runway dimensional criteria and safety zones prior to and beyond the end of the runway. Aircraft wingspan is primarily associated with separation criteria involving taxiways and taxilanes. **Table 3-1** has been included to provide a definition of both Aircraft Approach Categories and Aircraft Design Groups. **Figure 3-1** shows examples of aircraft and their Airport Reference Codes.

TABLE 3-1 AIRPORT REFERENCE CODE

Approach Category	Approach Speed (knots)
Category A	less than 91
Category B	91 to 120
Category C	121 to 140
Category D	141 to 165
Category E	166 or more

Design Group	Wingspan (ft)	Tail Height (ft)
Group I	less than 49	Less than 20
Group II	49 to 78	20 to 29
Group III	79 to 117	30 to 44
Group IV	118 to 170	45 to 59
Group V	171 to 213	60 to 65
Group VI	214 to 261	66 to 79

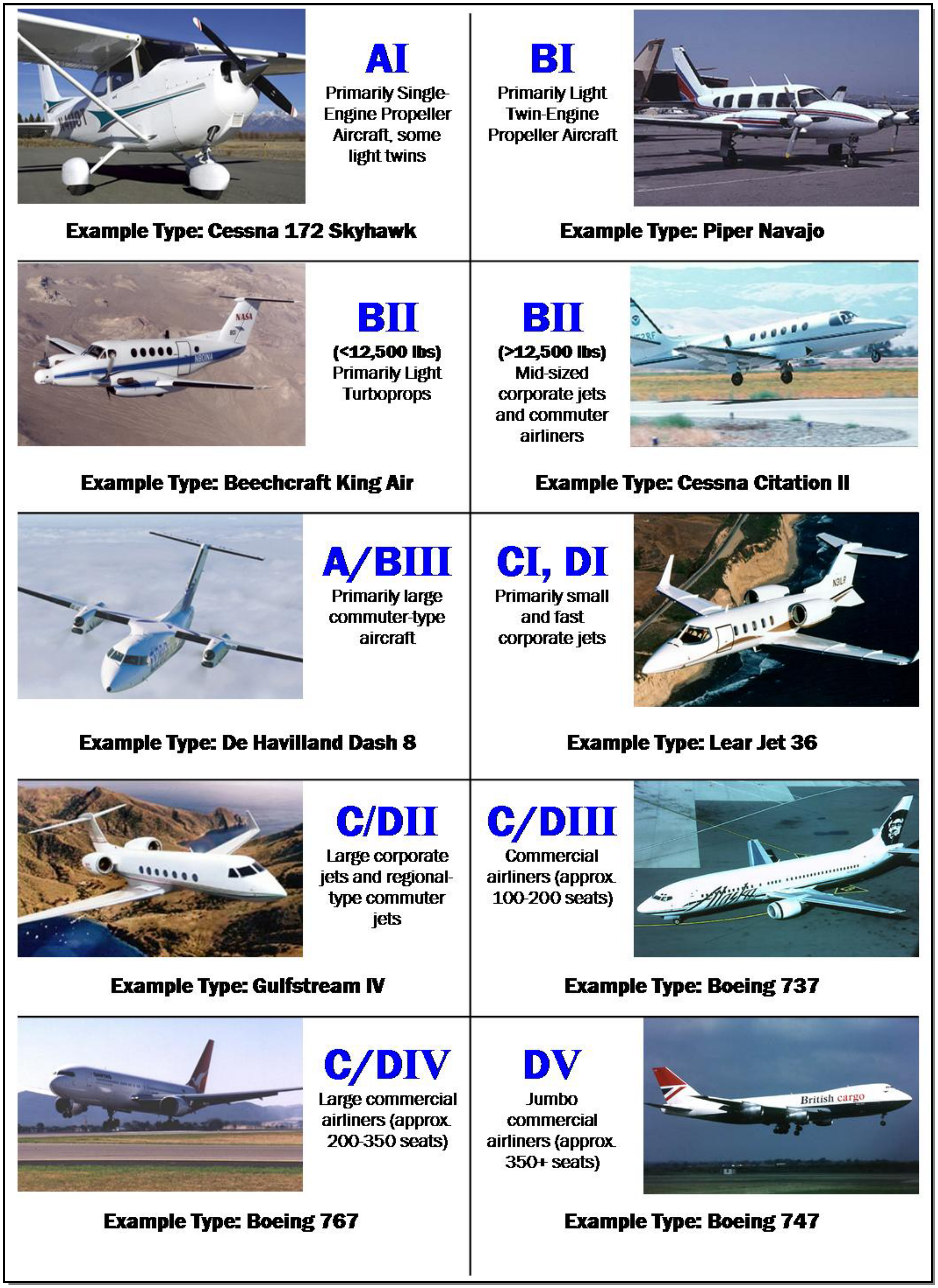


FIGURE 3-1 AIRCRAFT REFERENCE CODES

To ensure that all airport facilities are designed to accommodate the expected air traffic and to meet FAA criteria, the specific ARC for the airport must be determined. In order to designate a specific ARC for an airport, aircraft in that ARC should perform a minimum of 500 annual itinerant operations. The majority of aircraft currently using Cochise College Airport have an ARC of A-I and B-I. Airport users and fleet mix were discussed in Chapter 2. Examples of aircraft with an ARC of A-I and B-I are listed in **Table 3-2**. Examples of aircraft with an ARC of A-II and B-II are listed in **Table 3-3**.

The existing ARC of B-I (small) is considered adequate for the existing and future planning period. Occasional operations by aircraft exceeding and ARC of B-II are expected to occur during the planning period however, operations by these aircraft are not expected to meet or exceed 500 annual operations. 500 annual operations of the largest aircraft using the airport is the threshold for upgrading to the next airport reference code.

TABLE 3-2 EXAMPLE AIRCRAFT HAVING AN ARC OF A-I OR B-I

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Beech Baron 58P	101	37.8	9.1	6,200
Beech Bonanza V35B	70	33.5	6.6	3,400
Beech King Air B100	111	45.9	15.3	11,799
Cessna 150	55	33.3	8.0	1,670
Cessna 172	60	36.0	9.8	2,200
Cessna 177	64	35.5	8.5	2,500
Cessna 182	64	36.0	9.2	2,950
Cessna 340	92	38.1	12.2	5,990
Cessna 414	94	44.1	11.5	6,750
Cessna Citation I	108	47.1	14.3	11,850
Gates Learjet 28/29	120	42.2	12.3	15,000
Mitsubishi MU-2	119	39.1	13.8	10,800
Piper Archer II	86	35.0	7.4	2,500
Piper Cheyenne	110	47.6	17.0	12,050
Rockwell Sabre 40	120	44.4	16.0	18,650
Swearingen Merlin	105	46.3	16.7	12,500
Raytheon Beechjet	105	43.5	13.9	16,100
Eclipse 500 Jet	90	37.9	13.5	5,920
Cessna Citation Mustang	98	43.2	13.5	8,645

Source: FAA AC 150/5300-13 Change 18, Airport Design and Aircraft Manufacturer's Data

TABLE 3-3 EXAMPLE AIRCRAFT HAVING AN ARC OF A-II OR B-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Air Tractor 802F	105	58.0	11.2	16,000
Beech King Air C90-1	100	50.3	14.2	9,650
Beech Super King Air B200	103	54.5	14.1	12,500
Cessna 441	100	49.3	13.1	9,925
Cessna Citation II	108	51.6	15.0	13,300
Cessna Citation III	114	50.6	16.8	17,000
Cessna Citation Bravo	112	52.2	15.0	14,800
Dassault Falcon 50	113	61.9	22.9	37,480
Dassault Falcon 200	114	53.5	17.4	30,650
Dassault Falcon 900	100	63.4	24.8	45,500
DHC-6 Twin Otter	75	65.0	19.5	12,500
Grumman Gulfstream I	113	78.5	23.0	35,100
Pilatus PC-12	85	52.3	14.0	9,920

Source: FAA AC 150/5300-13 Change 18, Airport Design and Aircraft Manufacturer's Data

3.3 AIRSIDE FACILITY REQUIREMENTS

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area and any visual or electronic approach aids.

3.3.1 RUNWAY REQUIREMENTS

Annual Service Volume: The Annual Service Volume (ASV) is a calculated reasonable estimate of an airport's annual capacity; taking into account differences in runway utilization, weather conditions and aircraft mix that would be encountered in one year. When compared to the forecasts or existing operations of an airport, the ASV will give an indication of the adequacy of a facility in relationship to its activity level. The ASV is determined by reference to the charts contained in FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay.

FAA AC 150/5060-5 was used to calculate the ASV for a one runway airport with the forecasted operation levels determined in Chapter 2. Annual Service Volume for the runway configuration is 230,000 operations per year. Under these conditions, the existing runway facilities will adequately meet the demand within the time frame of this study.

Runway Length: FAA Advisory Circular 150/5325-4B, Runway Length Requirements for Airport Design, provides guidance for determining runway length requirements. The FAA AC 150/5325-4B was used to calculate recommended runway length requirements. The information required to execute the program for recommended runway lengths includes airfield elevation, mean maximum temperature of the hottest month and the effective gradient for the runway. The specific information for Cochise College Airport that was used for the purposes of this portion of the study for Runway 5/23 are as follows:

Field Elevation: 4,147' MSL
Mean Maximum Temperature of Hottest Month: 94.8° F (June)
Effective Gradient: 0.7%

With this data, the Airport Design program provides several runway length recommendations for both small and large aircraft according to varying percentages of aircraft fleet and associated takeoff weights. A summary of the data provided by the program is listed in **Table 3-4**.

TABLE 3-4 RECOMMENDED RUNWAY LENGTH

Description	Runway Length
Existing Runway Length	**5,303' (published)** **5,551' (actual)**
Recommended to accommodate:	
Small Aircraft (<12,500 lbs.)	
Less than 10 passenger seats	
75 percent of these small airplanes	4,140'
95 percent of these small airplanes	5,440'
100 percent of these small airplanes	5,760'
10 or more passenger seats	
Large Aircraft (>12,500 lbs., <60,000 lbs.)	
75 percent of these planes at 60 percent useful load	6,770'
75 percent of these planes at 90 percent useful load	8,970'
100 percent of these planes at 60 percent useful load	9,600'
100 percent of these planes at 90 percent useful load	11,020'

Source: FAA AC 150/5300-4B, Runway Length Requirements for Airport Design

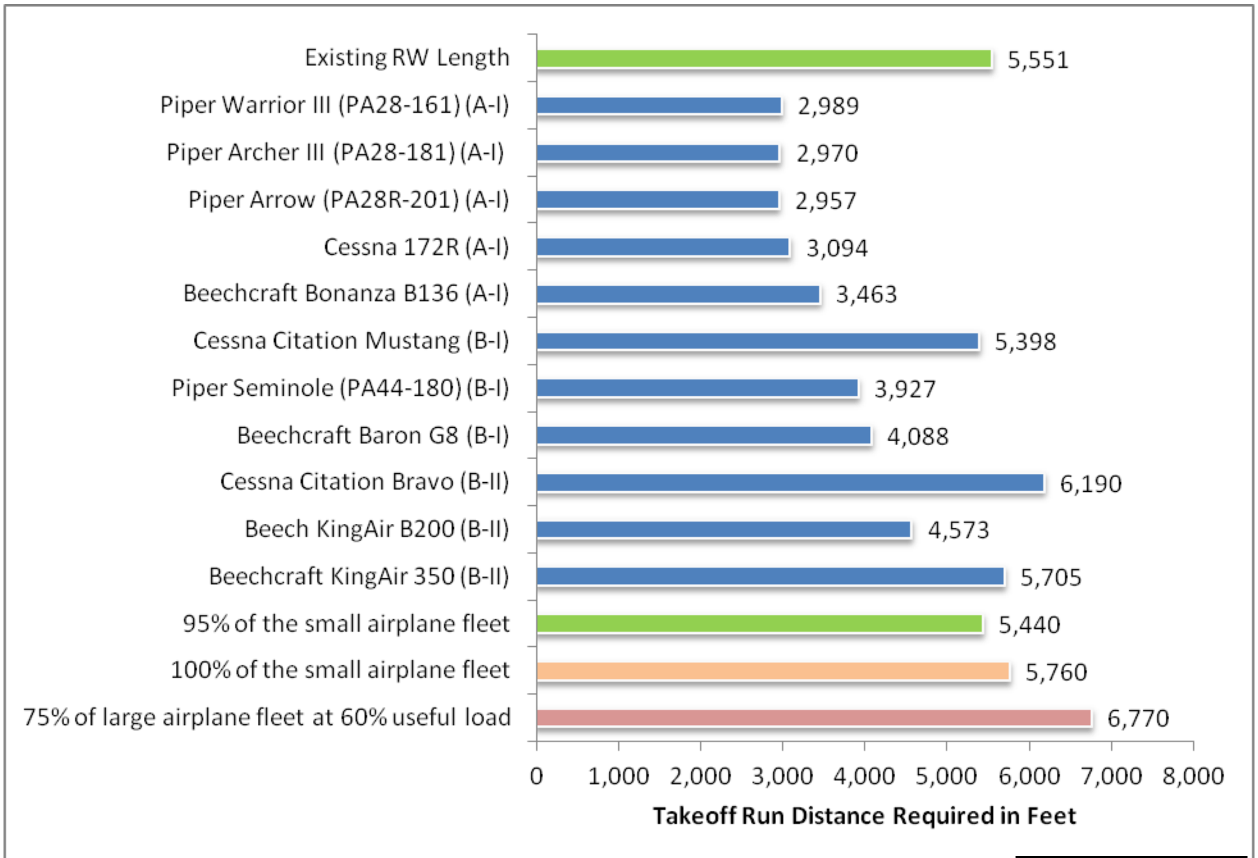


FIGURE 3-2
RUNWAY LENGTH REQUIREMENTS

Source: Aircraft Manufacturer's Data

Note: Aircraft performance data based on a mean maximum temperature of the hottest month of 94.8 F (June) and an airport elevation of 4,147 feet mean sea level (MSL).

Takeoff Distance Requirements: When determining runway length requirements for any airport it is necessary to consider the types of aircraft (aircraft design group and critical aircraft) that will be using the airport and their respective takeoff distance requirements. **Figure 3-2** gives examples of takeoff distance requirements for the aircraft currently using Cochise College Airport and aircraft that are anticipated to use the airport in the future.

Using the results of the FAA's Advisory Circular, it would be fair to suggest that the runway should have a minimum length of 4,140 feet in order to accommodate 75 percent of the small aircraft fleet mix. The ideal runway length would be 5,760 feet which would accommodate 100 percent of the small aircraft fleet. The actual length of 5,551 feet accommodates approximately 97 percent of the small aircraft fleet and is considered adequate for the planning period.

Runway Strength and Width: Runway strength requirements are normally based upon the design aircraft that may be expected to use the airport on a regular basis. The existing strength of Runway 5/23 is 12,500 pounds Single Wheel Gear (SWG). The future pavement strength should be maintained at 12,500 SWG.

FAA design standards for runways serving aircraft having an ARC of B-I (small) require a runway width of 60 feet. The existing Runway 5/23 is 60 feet wide and therefore meets the FAA design standards.

3.3.2 CROSSWIND RUNWAY REQUIREMENTS

The FAA recommends that a runway's orientation provide at least 95 percent crosswind coverage. If the wind coverage of the runway does not meet this 95 percent minimum for the appropriate ARC, then a crosswind runway should be considered. Historical wind data is not available at Cochise College Airport. Wind data from Bisbee-Douglas International Airport located 7.4 nautical miles northeast of Cochise College Airport was used to create a wind rose for Cochise College Airport. The existing Runway 5/23 provides 91.40 percent wind coverage for ARC B-I (small) aircraft; therefore, the airport would have justification for a B-I (small) crosswind runway because the existing runway does not provide 95 percent crosswind coverage. According to the College a crosswind runway is not considered a priority and is not included in the plan at this time.

3.3.3 RUNWAY INCURSIONS

There are currently limited runway incursion mitigation measures in place at Cochise College Airport. The airport has a manual vehicle access gate and pedestrian gate located in the terminal area to minimize the potential for pedestrian, wildlife and vehicle incursions. There are currently no lighted or unlighted hold position signs, directional signs or information signs at the airport. It is recommended that all hold bar markings be 12 inches wide in the future to increase situational awareness for aircraft operators. It is recommended that lighted signs be added to the runway and taxiway system at Cochise College Airport that meet FAA design standards.

3.3.4 TAXIWAY REQUIREMENTS

Length and Width: The primary function of a taxiway system is to provide access between runways and the terminal area. The taxiways should be located so that aircraft exiting the runway will have minimal interference with aircraft entering the runway or remaining in the traffic pattern. Taxiways expedite aircraft departures from the runway and increase operational safety and efficiency.

According to FAA Advisory Circular 150/5300-13, Airport Design, the minimum recommended runway to taxiway separation for an airport with an ARC of B-I (small) with an instrument approach with visibility minimums as low as ¾-mile is 150 feet and lower than ¾-mile is 200 feet. The minimum taxiway width for Group I is 25 feet. There is currently a full length parallel taxiway for Runway 5/23. The parallel taxiway is currently 22 feet wide and located 202 feet from runway centerline to taxiway centerline. It is recommended that the parallel taxiway be kept in its current location since it exceeds the FAA design standards. It is recommended that the parallel taxiway width be increased to 25 feet wide. The existing parallel taxiway is in poor condition and it is recommended that it be reconstructed once funding becomes available. During reconstruction of the parallel taxiway, bypass taxiways and run-up areas should be constructed at both ends of the runway for increased airfield circulation and efficiency.

Strength: The strength of the taxiway should be maintained at a strength equal to that of the associated runway pavement currently constructed to 12,500 pounds SWG.

3.3.5 AIRCRAFT APRON

The apron space requirements as shown in this planning document were developed according to recommendations given in AC 150/5300-13, Airport Design. Consideration must be made in the overall apron requirements for aircraft parking and tiedown requirements, taxilanes, adjacent taxiways and proximity to all aircraft expected to use the airport, including turboprops, business aircraft and rotorcraft.

Future apron space should be planned for both transient and based aircraft. A reconstruction and reconfiguration of the existing apron is recommended as soon as funding is available. An apron expansion is recommended in the medium to long-term to accommodate based and transient aircraft including business aircraft. A recommended layout of the aircraft parking apron is included in Chapter 4.

Tiedown Requirements: Aircraft tiedowns should be provided for those small and medium sized aircraft utilizing the airport. These aircraft risk being damaged or may cause damage or injury in sustained high winds or sudden wind gusts if not properly secured. A number of tiedowns are required to accommodate the peak daily transient aircraft and overnight transient aircraft, plus based aircraft that are not hangared. Tiedown requirements for the 20-year planning period are listed in **Table 3-5**. The current tiedown layout is based on Group I taxilane OFAs. The future apron layout should be planned to provide for Group I taxilane OFAs.

Apron Requirements:
Generally speaking, an apron tiedown area should allow approximately 360 square yards per transient aircraft and 300 square yards per based aircraft. This square yardage per aircraft provides adequate space for tiedowns, circulation and fuel truck movement. Cochise College Airport should plan for additional apron expansion and taxilane expansion to landside development areas.

3.3.6 NAVIGATIONAL AIDS

A Navigational Aid (NAVAID) is any ground based visual or electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Distance Measuring Equipment (DME), Nondirectional Beacons (NDBs) and Tactical Air Navigational Aids (TACANs), as examples. There are no existing NAVAIDs located at Cochise College Airport and no ground based navigational aids are recommended.

3.3.7 APPROACH PROCEDURES

Non-precision Global Positioning System (GPS) approaches do not require ground-based facilities on or near the airport for navigation. The GPS receiver uses satellites for navigation. Therefore, it involves little or no cost for the Airport Sponsor. GPS was developed by the United States Department of Defense for military use and is now available for civilian use. GPS approaches are rapidly being commissioned at airports across the United States, approach minimums as low as 350-foot ceilings and less than ¾-mile visibility are typical for this type of approach.

A future GPS instrument approach with 1-mile visibility minimums is recommended at Cochise College Airport. The development of an instrument approach at the Cochise College Airport would enable flight students to practice instrument approach procedures at the airport. The development of an instrument approach procedure at the airport would also increase the utility of the airport allowing the airport to serve aircraft during adverse weather conditions and enhance the safety of nighttime arrivals. An approach would increase the dimensions of several imaginary surfaces surrounding the airport including 14 Code of Federal Regulations (CFR) Part 77 Airspace surfaces. Implementation of an approach will require an obstruction survey and airspace evaluation.

3.3.8 AIRFIELD LIGHTING, SIGNAGE, MARKING AND VISUAL AIDS

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Lighting and visual aids can consist of a variety of equipment or a combination thereof as described in Chapter 1. The airport's existing inventory of lighting and visual aids includes a rotating beacon, medium intensity runway lights (MIRLs), 8-light runway threshold lights which were recently installed and are in excellent condition, visual runway markings, a segmented circle and precision approach path indicators (PAPIs) to both ends of Runway 5/23 and low intensity taxiway lights (LITLs). The airport terminal area is also equipped with area lighting.

The existing runway edge lights are shown in **Figure 3-3**. Upgrading the existing taxiway lighting is recommended with the installation of medium intensity taxiway lights (MITLs) or light emitting diodes (LEDs) shown in **Figure 3-4**.

FIGURE 3-3
EXISTING MEDIUM INTENSITY RUNWAY LIGHT

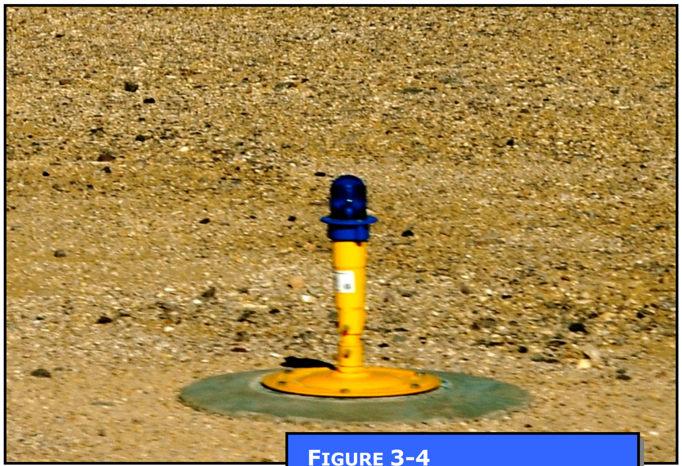


FIGURE 3-4
TYPICAL LED TAXIWAY LIGHT

The installation of lighted holding position signs (**Figure 3-5**), taxiway location signs (**Figure 3-5**) and direction/runway exit signs (**Figure 3-6**) is recommended.

The existing visual runway markings are in excellent condition. Non-precision instrument (NPI) markings are recommended if and when the development of an instrument approach procedure at the airport is conducted.

FIGURE 3-5 TYPICAL HOLDING POSITION SIGN

FIGURE 3-6 TYPICAL DIRECTION/RUNWAY EXIT SIGN

3.4 LANDSIDE FACILITY REQUIREMENTS

Landside facilities are another important aspect of the airport. Landside facilities serve as the processing interface between the College and the airport operating environment. Likewise, it offers the traveler the first impression of the airport and the local area. Landside facilities house the support infrastructure for airside operations.

3.4.1 BUILDING AREA

The building area of a typical general aviation airport usually consists of a fixed-base operator (FBO), offices and/or hangars, a pilot lounge, terminal building, eating facility, additional aircraft hangars, a maintenance building and other related structures. The only existing permanent building at Cochise College Airport is the hangar/classroom facility located adjacent to the taxiway and the sun-shade structure. The facility is home to the aviation program and includes an aircraft maintenance hangar, workshops, classrooms, flight simulators, dispatch area and administrative offices.

3.4.2 UTILITIES

Available utilities at Cochise College Airport include power, water, sanitary and storm sewer, natural gas and phone. Electricity is provided by Arizona Public Service, telephone services are provided by Qwest and natural gas is provided by Southwest Gas. Water is provided by the college owned and operated well. Sanitary sewer is provided by the college owned and operated sewer ponds and solid waste is handled by USA Waste of Arizona. It is recommended that the utilities be extended to the new aviation building along with any future lease parcels.

3.4.3 GROUND ACCESS, SIGNAGE AND PARKING

Access to the airport requires entering the main college entrance located off of State Route 80 (SR-80). The main college vehicle entrance is a two-lane loop roadway with a sign indicating the location of the aviation department building. A vehicle parking lot is located south of the aviation department building for students and faculty. The parking lot is approximately 43,000 square feet and includes 75 regular parking spaces and three handicapped parking spaces. The parking lot is considered to be adequate for the 20-year planning period.

3.4.4 AIRCRAFT FUEL FACILITIES

Fuel services at Cochise College Airport are owned and operated by the college. The college has one 10,000 gallon above ground fuel tank which contains 100 low lead (LL) aviation gasoline (Avgas) and one 10,000 gallon above ground fuel tank which contains diesel and unleaded automobile gasoline. The fuel tanks are double-walled to provide secondary containment in the event of a fuel spill or ruptured tank. The fuel tanks are located east of the college Maintenance Building.

The airport has a mobile fuel truck that contains Avgas with a capacity of 1,000 gallons. The standard operating procedure is to fill the mobile fuel truck at the aboveground storage tank and then drive to the aircraft flight line to fuel the aircraft. Fuel is available to transient aircraft during normal business hours. The existing fuel facilities are adequate for the 20-year planning period.

The U.S. Environmental Protection Agency (EPA) is the permitting authority for all regulated stormwater discharges. Cochise College Airport is located in EPA Region 9 and is required to have a Multi-Sector General Permit (MSGP) that is designed for discharges of stormwater from certain industrial sites that are of a non-construction nature. The airport falls under the standard industrial classification (SIC) code 45; Transportation by Air. Part of obtaining the MSGP is developing a Stormwater Pollution Prevention Plan (SWPPP). Cochise College Airport currently has and maintains a SWPPP.

Aboveground fuel storage tanks are subject to the requirements of a Spill Prevention, Control and Countermeasure (SPCC) Plan in accordance with the EPA and 40 Certified Federal Regulations (CFR) 112. EPA's Region 9 is responsible for the administration and enforcement of the federal SPCC plan requirements in Arizona. It is recommended that the airport maintain a SPCC plan.

3.4.5 AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) EQUIPMENT & STORAGE BUILDING

Aircraft Rescue and Fire Fighting (ARFF) equipment is not required at airports that do not serve scheduled passenger service with aircraft having 10 or more passenger seats. Local municipal or volunteer fire departments typically provide fire protection to general aviation airports in their district. Mutual aid agreements may also be provided and developed with nearby fire departments to assist in emergency situations. In any case, procedures should be in place to ensure emergency response in case of an accident or emergency at the airport. Although statistically very safe, the most likely emergency situations at general aviation airports are an aircraft accident, fuel or aircraft fire or hazardous material (fuel) spill.

The level of protection recommended in FAA Advisory Circular 150/5210-6D, Aircraft Fire and Rescue Facilities and Extinguisher Agents, for small general aviation airports is 190 gallons of aqueous film forming foam (AFFF) supplemented with 300 pounds of dry chemical. Proximity suits should be utilized for fire fighter protection. Aviation rated fire extinguishers should be immediately available in the vicinity of the aircraft apron and fueling facilities. Sunnyside Volunteer Fire is the primary responder to the airport. The Douglas Municipal Fire Department is also available to respond on request.

There is not currently any ARFF equipment or personnel based at Cochise College Airport nor are any required for a general aviation airport. Currently, aviation fire extinguishers are available near the fuel tanks, on the fuel truck, adjacent to the aircraft parking sun shade hangar and at various locations throughout the aviation department.

3.4.6 AIRPORT FENCING AND SECURITY

The primary purpose of airport fencing is to prevent unwanted intrusions by persons or animals on to airport property. Airport fencing provides increased safety and security for the airport. It is normally installed along the perimeter of the airport property and outside any of the safety areas defined by the Federal Aviation Administration (FAA) in Advisory Circular (AC) 150/5300-13, Airport Design and 14 CFR Part 77, Objects Affecting Navigable Airspace. The terminal area is enclosed with a 6-foot high chain link fence and has a manual gate providing vehicle access to the terminal and apron areas as well as a manual pedestrian gate access. The terminal area also has a pedestrian gate to access the apron area and sun shade hangar parking. Access to the airside is also available from the college by entering the aviation building hangar or classroom portion of the complex. The airport perimeter outside of the terminal area is surrounded by a 4.5-foot woven wire fence.

It is recommended that the future aircraft parking apron reconfiguration and expansion be enclosed with a 6-foot high chain link fence. An electronic vehicle access gate is also recommended. Replacing the 4.5-foot woven wire fence with a 6-foot high wildlife fence is recommended for the airport perimeter to prevent unauthorized access to the airport by animals or people.

3.4.7 WEATHER REPORTING

Cochise College Airport currently does not have an Automated Weather Observation System (AWOS) to provide local weather information. An AWOS uses various sensors, a voice synthesizer and a radio transmitter to provide real-time weather data. There are four types of AWOS. An AWOS-A only reports altimeter setting while an AWOS-1 also measures and reports wind speed, direction, gusts, temperature and dew point. AWOS-2 provides visibility information in addition to everything reported by an AWOS-1. The most capable system, the AWOS-3 also includes cloud and ceiling data. The AWOS transmits over a VHF frequency or the voice portion of a NAVAID. The transmission can be received within 25 nautical miles of the site or above 3,000 feet above ground level (AGL). The frequency for the AWOS is published on aeronautical charts as well as in the airport facilities directory. The AWOS is connected to the telephone service allowing pilots to check current weather conditions at the airport.

Local pilots report that meteorological conditions can vary between Bisbee-Douglas International Airport and Cochise College Airport. Therefore; it is recommended that Cochise College Airport install an AWOS-3 and that it be connected to the National Airspace Data Interchange Network (NADIN). This will allow national dissemination of the AWOS observations and allow the National Oceanic and Atmospheric Administration (NOAA) to digitally record the hourly observations and disseminate real-time weather information to Flight Service Stations and other sources. Connecting the AWOS to NADIN will also provide historical wind data for future wind analysis at the airport.

3.5 LAND USE COMPATIBILITY AND CONTROL

3.5.1 AIRPORT PROPERTY

The existing airport property line encompasses approximately 104 acres according to airport management. The airport currently controls the existing ARC B-I (small) RPZs located at both ends of the runway through avigation easements. Each existing RPZ covers an area 8.035 acres. The future RPZs, serving small aircraft with not lower than 1-mile visibility minimums will remain the same size. It is recommended that 1.4 acres of land located near midfield on the north side of the runway be acquired fee simple or through an avigation easement to meet the building restriction line (BRL) setback; however, this is not a high priority unless potential incompatible development is proposed for the land.

A BRL is a function of two Part 77 surfaces further discussed in Section 3.7. The future primary surface width is 500 feet centered on the runway centerline. The location of the BRL on the north side of the runway is 500 feet from the runway centerline. Half of the primary surface extends from the runway centerline out to 250 feet. The transitional surface extends outward and upward from the edge of the primary surface at a slope of 7:1 for an additional 250 feet. Typically the BRL is located at the point where the transitional surface reaches 35 feet above the primary surface assuming the ground elevation is the same as the runway elevation. The purpose of the BRL is to prevent vertical development that would penetrate the transitional surface. Objects may penetrate the transitional surface but may require obstruction markings or lighting so long as they do not pose a hazard to air navigation.

3.5.2 COMPATIBILITY WITH STATE/REGIONAL PLANS

All future state and regional transportation plans should be coordinated with the Airport Master Plan and Airport Layout Plan drawing set included in Chapter 5 to ensure conformance.

3.5.3 ZONING

Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the 14 CFR Part 77 Airspace Surfaces (described in the following section). The FAA, therefore, recommends that all Airport Sponsors implement height restrictions in the vicinity of the airport to protect these Part 77 Surfaces, as well as assuring compatible land uses as discussed in the next section.

3.5.4 COMPATIBLE LAND USE

In addition to ensuring that obstructions to Part 77 surfaces are avoided or appropriately marked and lighted, it is recommended that the Airport Sponsor make reasonable efforts to prevent incompatible land uses from the immediate area of the airport. For example, the FAA states in FAA Advisory Circular 150/5200-33A, Hazardous Wildlife Attractants On or Near Airports, that landfills and/or transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and wastewater treatment plants should also be located this same distance from any point on the runway. Development proposals should also be reviewed to ensure compatibility in the vicinity of the airport.

An off-airport land use drawing along with a 14 CFR Part 77 airspace drawing are included as part of this Airport Master Plan project. The drawings are included in the Airport Layout Plan drawings in Chapter 5.

3.6 SUMMARY OF FACILITY REQUIREMENTS

In summary, the facility requirements for Cochise College Airport are based on the types and volume of aircraft expected to use the airport in the short and long-term timeframes. These facilities will enable the airport to serve its users in a safe and efficient manner. The recommended airside and landside facilities are summarized in **Table 3-5**.

TABLE 3-5 SUMMARY OF AIRPORT FACILITY REQUIREMENTS

Facility		Existing	Future
Runway			
5/23	**Length (feet)**	**5,303' published (5,551' actual)**	**5,551'**
	Width (feet)	**60'**	**60'**
	Strength (pounds)	**12,500 (SWG)**	**12,500 (SWG)**
	Pavement	**Asphalt**	**Asphalt**
Markings	**Runway 5**	**Visual**	**Nonprecision**
	Runway 23	**Visual**	**Nonprecision**
Taxiways			
	Parallel	**Yes**	**Yes**
	Bypass Taxiways/Turnarounds	**No**	**Yes**
	Width (feet)	**22'**	**25'**
	Strength (pounds)	**12,500 (SWG)**	**12,500 (SWG)**
Apron			
	Tie Downs	**19**	**20***
NAVAID			
	Approaches	**Visual**	**GPS/LPV**
	Minimums	**N/A**	**1-mile**
Lighting & Visual Aids			
	Signs	**None**	**Lighted**
	Runway Edge	**MIRL**	**MIRL**
	Taxiway/Apron Edge	**LITL**	**MITL or LED**
	Threshold Lights	**Yes**	**Yes**
	REILs	**Yes**	**Yes**
	Approach Slope Indicator (PAPI)	**PAPI-4 RW 5 & 23**	**PAPI-4 RW 5 & 23**
	Segmented Circle/Wind Cone	**Yes**	**Yes**
	Rotating Beacon	**Yes**	**Yes**
	Approach Lighting System	**No**	**No**
Access & Parking			
	Automobile	**75**	**75***
Hangar Facilities			
	T-Hangars	**None**	**None**
	Box Hangars	**None**	**None**
	Sun Shade Hangar	**10**	**15***
Fuel Storage			
	100 LL (gallons)	**10,000 Tank**	**10,000 Tank**
	100 LL Mobile Fuel Truck (gallons)	**1,000 Truck**	**1,000 Truck**
	Diesel and Unleaded Gasoline (gallons)	**10,000 Tank**	**10,000 Tank**
Other			
	AWOS	**No**	**Yes**
	Unicom	**Yes**	**Yes**
	Terminal Building	**No**	**No**

*As required based on demand

3.7 14 CODE OF FEDERAL REGULATIONS (CFR) PART 77 AIRSPACE SURFACES

14 CFR Part 77 establishes several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in **Figure 3-7**. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in 14 CFR Part 77 are applied to each runway. For the purpose of this section, a visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight and less. A non-precision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight and less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority. A non-precision instrument/larger-than-utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure.

As described previously, Cochise College Airport currently has no instrument approach to the airport. Runway 5/23 is a utility runway. The Part 77 Airspace Surfaces for these classifications are described in the following paragraphs. While it is desirable to eliminate penetrations of Part 77 airspace surfaces, in some cases, penetrations (also known as obstructions) may be mitigated with appropriate markings and/or lighting.

3.7.1 PRIMARY SURFACE

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but do not extend past the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on the type of approach and approach visibility minimums. The current Primary Surface width for Runway 5/23 is 250 feet. The primary surface width would increase to 500 feet if the airport develops an instrument approach with 1-mile visibility.

3.7.2 APPROACH SURFACE

The Approach Surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface is applied to each end of the runway based upon the type of approach available or planned for that runway, either 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the Part 77 runway classification criteria. The current Approach Surface is 20:1 for Runway 5/23. This would remain 20:1 if the airport developed a non-precision, utility, instrument approach with 1-mile visibility minimums. Marking and lighting of all Part 77 obstructions is recommended.

3.7.3 TRANSITIONAL SURFACE

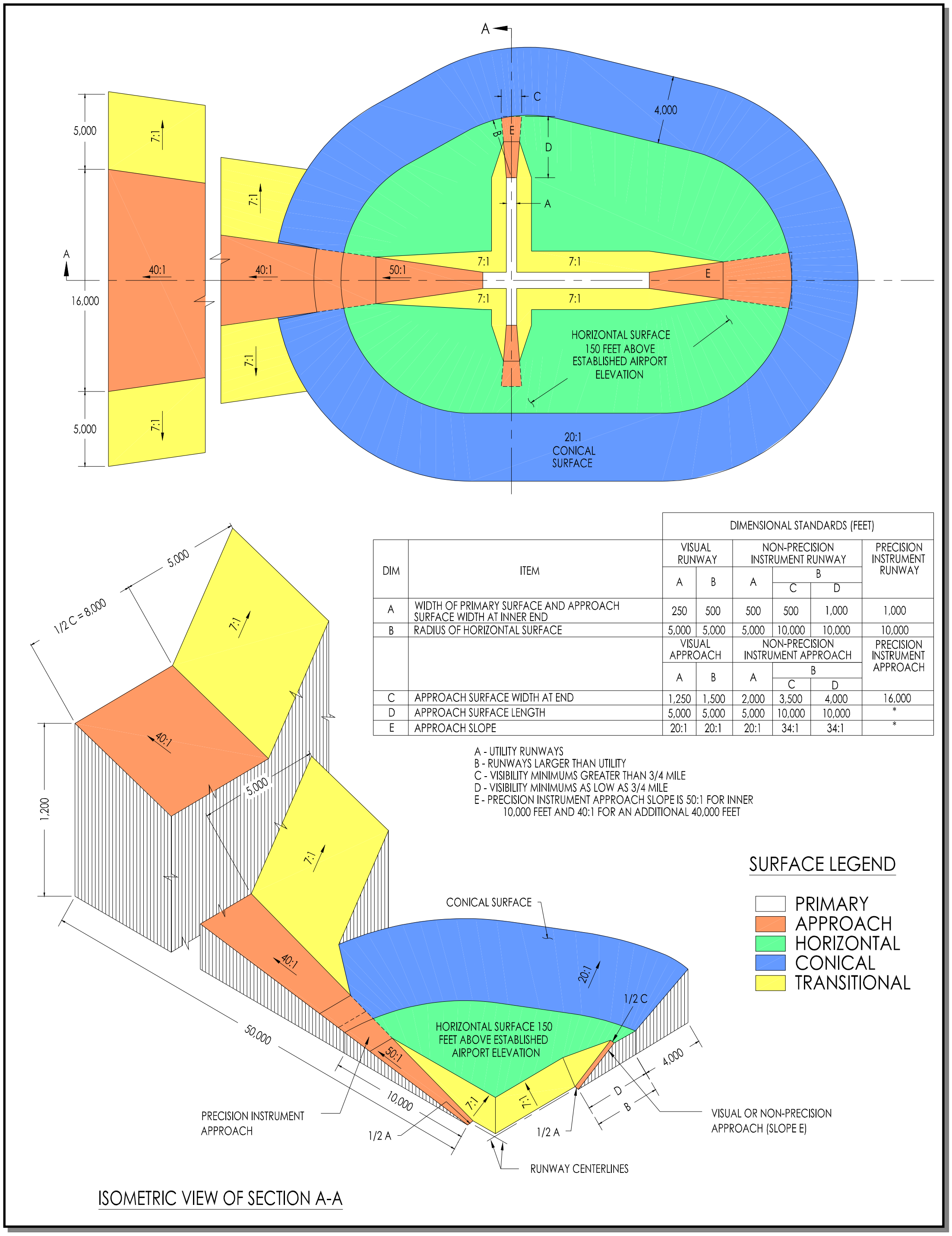
The Transitional Surfaces extend outward and upward at right angles to the runway centerlines from the sides of the Primary and Approach Surfaces at a slope of 7:1 and end at the Horizontal Surface.

3.7.4 HORIZONTAL SURFACE

The Horizontal Surface is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in Part 77, the Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.

3.7.5 Conical Surface

The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.



DIMENSIONAL STANDARDS (FEET)

DIM	ITEM	VISUAL RUNWAY A	VISUAL RUNWAY B	NON-PRECISION INSTRUMENT RUNWAY A	NON-PRECISION INSTRUMENT RUNWAY B C	NON-PRECISION INSTRUMENT RUNWAY B D	PRECISION INSTRUMENT RUNWAY
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH A	VISUAL APPROACH B	NON-PRECISION INSTRUMENT APPROACH A	NON-PRECISION INSTRUMENT APPROACH B C	NON-PRECISION INSTRUMENT APPROACH B D	PRECISION INSTRUMENT APPROACH
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

Source: 14 CFR Part 77

Figure 3-7 14 CFR Part 77 Airspace Drawing

3.8 SUMMARY OF DESIGN STANDARDS

Table 3-6 summarizes the FAA design standards (described in Chapter 1) for the recommended airport facilities.

TABLE 3-6 SUMMARY OF DIMENSIONAL CRITERIA

	Existing B-I (small) Visual Runway	**Future B-I (small) 1-mile visibility minimums**
Runway centerline to parallel taxiway centerline	**150' (202' actual)**	**150' (202' actual)**
Runway centerline to edge of aircraft parking apron	**125' (235' actual)**	**125' (235' actual)**
Runway width	**60'**	**60'**
Runway shoulder width	**10'**	**10'**
Runway Safety Area width	**120'**	**120'**
Runway Safety Area length beyond runway end	**240'**	**240'**
Runway Object Free Area width	**250'**	**250'**
Runway Object Free Area length beyond runway end	**240'**	**240'**
Runway Obstacle Free Zone width	**250'**	**250'**
Runway Obstacle Free Zone length beyond runway end	**200'**	**200'**
Runway Protection Zone RW 5	**1,000' x 250' x 450'**	**1,000' x 250' x 450'**
Runway Protection Zone RW 23	**1,000' x 250' x 450'**	**1,000' x 250' x 450'**
Taxiway width	**25' (22' actual)**	**25'**
Taxiway Safety Area width	**49'**	**49'**
Taxiway Object Free Area width	**89'**	**89'**
Taxilane Object Free Area width	**79'**	**79'**
Runway centerline to aircraft hold lines	**125'**	**125'**
Airspace Surfaces (Part 77)	**Visual Runway Utility**	**Non-Precision Instrument Runway Utility, 1-mile visibility minimums**
Primary Surface width	**250'**	**500'**
Primary Surface length beyond runway ends	**200'**	**200'**
Approach Surface dimensions RW 5	**250' x 1,250' x 5,000'**	**500' x 2,000' x 5,000'**
Approach Surface dimensions RW 23	**250' x 1,250' x 5,000'**	**500' x 2,000' x 5,000'**
Approach Slope RW 5	**20:1**	**20:1**
Approach Slope RW 23	**20:1**	**20:1**
Transitional Surface slope	**7:1**	**7:1**
Horizontal Surface radius from runway	**5,000'**	**5,000'**
Conical Surface width	**4,000'**	**4,000'**

SOURCE: FAA AC 150/5300-13, AIRPORT DESIGN; 14 CFR PART 77, OBJECTS AFFECTING NAVIGABLE AIRSPACE