Chapter

5

FACILITY REQUIREMENTS

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FACILITY REQUIREMENTS

for the Airport Master Plan and Environmental Assessment for the San Carlos Apache Airport

5.0 INTRODUCTION

One of the primary objectives of an airport planning study is the determination of future development requirements for the airport, including the airfield, the terminal areas, and all other areas within the airport property boundaries. This airport planning study was developed to ascertain the level of changes in demand and trends currently experienced by the San Carlos Apache Airport, as well as to determine the airport developments necessary to accommodate future aircraft and passenger demand.

The purpose of this chapter is to establish general facility requirements for future development of the San Carlos Apache Airport. This chapter will lay out the specific airside and landside facilities which will meet the design standards according to the Airport Reference Code (ARC) and design aircraft group as determined in the preceding chapter.

As described in Chapter IV, Forecast of Aviation Activity, the existing ARC for the San Carlos Apache Airport is a B-II weighing less than 60,000 pounds. The San Carlos Apache Airport has a significant number of turbojet operations. In discussions with the FBO, it was determined that the majority of existing turbojet operations have an ARC of B-II; however, a significant number of turbojet operations occur by Gates Learjet 24s, 25s, and the 54-55 series of aircraft. These aircraft have an ARC of C-I. Additional operations occur from aircraft having an ARC of C-II, D-I, and D-II. Consequently, the future design aircraft is categorized as a C-II aircraft weighing less than 60,000 pounds. The airside and landside facility requirements as recommended in this chapter are given according to C-II standards.

5.1 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.

5.1.1 Runway Requirements

Demand/Capacity: The Annual Service Volume (ASV) for the San Carlos Apache Airport was analyzed in Chapter IV, Forecast of Aviation Activity, Section 4.11. It was determined that the San Carlos Apache Airport will operate within its capacity with one runway, even with the forecasted increase of aviation activity for the entire twenty year planning period of this study

Length: The FAA has developed a computer software program entitled "Airport Design" which provides the user with recommended runway lengths and other facilities on an airport according to certain criteria. The information which is 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. This specific information for the *existing* airport site at San Carlos Apache Airport was used for the purposes of this portion of this study:

Field Elevation	3,235 Feet
Mean Maximum Temperature of Hottest Month	97.0° F
Effective Gradient	66 Feet

(*Note: The actual difference in feet from runway end to runway end is required to run the FAA software program and is listed as the effective gradient. However, the effective gradient is usually shown as a percent, which is 1.17 percent for the existing runway at the San Carlos Apache Airport.*)

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 Table V-1.

TABLE V-1
EXISTING AND RECOMMENDED RUNWAY LENGTHS

Description	Runway Length
Existing	
Runway 09/27	5,804 feet
Recommended to accommodate:	
Small Aircraft (< 12,500 lbs.)	
Less than 10 passenger seats	5,180 feet
10 or more passenger seats	5,190 feet
Large Aircraft (> 12,500 lbs, < 60,000 lbs.)	
75 percent of these planes at 60 percent useful load	6,570 feet
75 percent of these planes at 90 percent useful load	9,260 feet
100 percent of these planes at 60 percent useful load	8,630 feet
100 percent of these planes at 90 percent useful load	10,860 feet

Source: FAA computer software program, Airport Design Version 4.1B

Using only the results of the FAA's software program, it would be fair to suggest that the runway at the San Carlos Apache Airport should have a minimum length of 10,860 feet to accommodate all aircraft in the current and future design aircraft group. However, it is important to consider the runway lengths required for those specific aircraft which are projected to use the airport.

Takeoff distance requirements for business jet aircraft with an ARC of B-II, C-I, and C-II: When determining runway length requirements for any airport, it is imperative to consider the type of aircraft (aircraft design group and critical aircraft) which will be using the airport and their respective takeoff distance requirements. As an example, Table V-2 gives examples of takeoff distance requirements for the aircraft determined in Chapter IV to be typical aircraft of various ARCs which currently use, and are expected to be use the San Carlos Apache Airport in the future.

TABLE V-2
PERFORMANCE CHARACTERISTICS FOR AIRCRAFT OPERATING AT THE SAN CARLOS APACHE AIRPORT[1]

Aircraft	Airport Reference Code	Takeoff Weight	Required Runway Length[1]
Citation I	B-II	13,300	4,077
Falcon 20	B-II	26,000	5,705
Falcon 20	B-II	18,000	3,285
Merlin IVC	B-II	12,500	4,500
Merlin IVC	B-II	16,000	6,300
Westwind Astra	B-II	24,650	8,434
Westwind Astra	B-II	23,000	6,536
Learjet 23	C-I	16,500	5,713
Learjet 23	C-I	12,000	6,584
Learjet 25 D/F	C-I	12,000	3,842
Learjet 25 D/F	C-I	15,000	6,084
Learjet 31	C-I	16,500	5,713
Learjet 55	C-I	21,500	7,777
Learjet 55	C-I	17,000	4,723
Grumman G-III	C-II	69,700	7,513
Sabreliner 265-80A	C-II	25,500	7,863
Grumman G-IV	D-II	65,000	6,741
Grumman G-IV	D-II	73,600	9,284

[1] *Aircraft performance data based on density altitude of 6,345 feet using a mean maximum temperature of the hottest month of 97.0°F and an airport elevation of 3,235 feet MSL.*

As shown in the table, a Merlin IVC which has a takeoff weight of 16,000 pounds would require a runway length of 6,300 feet (using specific criteria as noted at the bottom of Table V-2). However, the same Merlin IVC when it weighs 12,500 pounds would require 4,500 feet of runway. Although the aircraft is capable of operating within a shorter runway length, the useful load is significantly reduced. A sacrifice to operate within a shorter runway length must be made by either decreasing the fuel load (thus reducing the range), by decreasing the payload (less passengers and/or less cargo), or a combination of both. In light of any runway length limitations, the aircraft operator may elect to utilize another facility which offers a longer runway. Therefore, providing sufficient runway length for takeoffs at maximum certificated weight is important to the safety and marketability of the airport.

Summary: The FAA's software program, Airport Design, provides recommended runway lengths for airports based on certain information. However, it has also been shown that it is important to study other factors which may contribute to the decision on a recommended runway length. In the case of the San Carlos Apache Airport, the turbojet aircraft which are currently using or are forecasted to use the airport have been shown to require a range of runway lengths at maximum certificated takeoff weight from 4,077 feet (Cessna Citation I) to 9,284 (Grumman Gulfstream IV). The Grumman Gulfstream IV aircraft weighs in excess of 60,000 pounds and is outside of the critical aircraft range (C-II weighing up to 60,000 pounds). Therefore, a recommended future runway length of 6,500 feet will accommodate approximately 75 percent of the critical business jet fleet at their maximum certificated takeoff weights, and an ultimate runway length of approximately 8,500 feet is recommended to accommodate 100 percent of the critical business jet fleet at their maximum certificated takeoff weight.

Strength and Width: Runway strength requirements are normally based upon the design aircraft which may be expected to use the airport on a regular basis. For the San Carlos Apache Airport, the strength of the runway should be a minimum of 60,000 pounds Dual Wheel Gear (DWG) to accommodate the critical fleet of business jets listed in Table IV-14.

The FAA recommends that runways which serve aircraft having an ARC of C-II should have a minimum width of 100 feet. This applies throughout all periods of this study.

5.1.2 Crosswind Runway Requirements

Meteorological data, specifically wind data, can be analyzed to determine the need for a crosswind runway at an airport. The recommendation by the FAA is that a runway should be oriented to handle aircraft at least 95 percent of the time under stipulated crosswind components. These crosswind components are displayed in Table V-3. If the wind coverage of the runway does not meet this 95 percent minimum for the appropriate ARC, then a crosswind runway may be constructed.

TABLE V-3
ALLOWABLE CROSSWIND COMPONENTS

Allowable Crosswind in Knots	Airport Reference Code
10.5 Knots	A-I & B-I
13.0 Knots	A-II & B-II
16.0 Knots	A-II, B-III, & C-I through D-III
20.0 Knots	A-IV through D-VI

As noted in Chapter II, Facility Inventory, analysis of wind data collected in Miami, Arizona indicated sufficient wind coverage with the existing runway alignment at the San Carlos Apache Airport. This analysis was further supported by airport user survey responses, existing planning documents, and airport management personnel. An Automated Weather Observation System should be installed to record wind data at the airport and to provide pilots with current meteorological information.

5.1.3 Taxiway Requirements

Length and Width: The construction of parallel taxiways is considered essential at airports which have at least 20,000 annual operations, and is recommended for airports serving aircraft weighing more than 12,500 pounds. Based on this recommendation and the aviation forecasts developed in Chapter IV, the San Carlos Apache Airport should have a full length parallel taxiway which serves the primary runway. In order to accommodate the airport's existing and ultimate design aircraft groups, this taxiway should be located a minimum of 300 feet from the runway centerline to the taxiway centerline and be at least 35 feet wide.

Strength: At the minimum, the strength of the taxiway should be maintained at a strength equal to that of the primary runway pavement.

5.1.4 Navigational Aids

A Navigational Aid (NAVAID) is any ground based visual or electronic devise used to provide course or altitude information to pilots. NAVAIDS include VORs (Very High Frequency Omnidirectional Range), VORTACs (Very High Frequency Omnidirectional Range with Tactical Information), NDBs (Nondirectional Beacon), and TACANs (Tactical Air Navigational Aid), as examples. Currently, the NDB located at the San Carlos Apache Airport is not in service. The closest NAVAID to San Carlos Apache Airport is the VORTAC at Willie, 55 NM to the west.

Although NAVAIDs provide important information to approaching, departing, and en route pilots. An evaluation of the cost of repairing and recommissioning the NDB at the airport should be accomplished in the short term phase of development. If costs are extensive, the airport should abandon the NDB. Furthermore, the airport should plan for a future nonprecision instrument GPS (Global Positioning System) approach.

Nonprecision GPS approaches do not require ground based facilities on or near the airport, as a GPS 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 on a priority basis. A phase out of all ground based navigational aids is expected by the year 2007.

5.1.5 Airfield Lighting, Signage, and Marking

Currently, Runway 09/27 is lighted with Medium Intensity Runway Lights (MIRLs). This system is used to outline the edges of runways during darkness or restricted visibility conditions. The airfield lighting at San Carlos Apache Airport is particularly important to pilots, since the airport does not have an Air Traffic Control Tower (ATCT) and may not be manned continuously throughout the twenty-four hour period. The MIRLs were installed using direct burial procedures. This has resulted in gophers and other rodents destroying the electrical cable which supplies electricity to the light units. Consequently, the lighting system may not be functional at all times. A recommendation of this study is to install a new lighting system that incorporates electrical conduit and duct. This will reduce the potential of electrical failures in the runway lighting system. The lighting is currently pilot controlled when on CTAF 122.8, activated by clicks of the aircraft microphone; three times for low intensity, five times for medium intensity, and seven times for high intensity.

The parallel taxiway at the airport should be equipped with Medium Intensity Taxiway Lights (MITLs).

The standard rotating beacon should be maintained at the airport for airport identification. Also, the segmented circle and wind cones should continue to be lighted.

The San Carlos Apache Airport should have a project which will update and install airfield signs which will meet the FAA standards in Advisory Circular 150/5340-18C, "Standards for Airport Sign Systems."

The runway should be marked nonprecision instrument markings to coincide with the anticipated GPS nonprecision instrument approach.

5.1.6 Visual Aids

The existing San Carlos Apache Airport is equipped with Visual Approach Slope Indicators (VASIs) at each runway end. The VASIs should be replaced with Precision Approach Path Indicators (PAPIs) when the lighting system is upgraded or when the runway is relocated/extended. PAPIs, like VASIs, provide visual descent guidance information during the approach to the runway. The PAPIs consist of either two or four light units located to the left of the runway and perpendicular to the runway centerline. If the aircraft is above the glidepath, the pilot will see all white lights. If the pilot is on the proper glidepath, the light units closest to the runway will be red and those farthest from the runway centerline will be white. When the pilot is below the glidepath all of the light units will be red. PAPIs have an effective visual range of approximately five miles during the day and up to 20 miles at night.

Runway End Identifier Lights (REILs) should be installed at both runway ends. REILs are synchronized flashing lights located laterally on each side of the runway threshold. They provide rapid and positive identification of the threshold of a runway.

5.1.7 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, proximity to buildings, including the FBO and fueling area. The apron layout should be designed to accommodate all aircraft expected to use the airport, including turboprops and business jets.

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 sudden wind gusts if not properly secured. A number of tiedowns is required to accommodate the peak daily transient aircraft and overnight transient aircraft, plus based aircraft. In the 5-10 year and 11-20 year time frames, additional hangars construction is expected, which will reduce the based aircraft tiedown requirement. Tiedown requirements for the 20 year planning period are listed in Table V-4.

Apron Requirements: Generally speaking, an apron tiedown area must 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. Currently, the aircraft parking apron is approximately 14,000 square yards in area with 50 tiedowns. Numerous times throughout the year, the aircraft parking apron capacity is exceeded. This results in aircraft being parked on the adjoining turf and larger aircraft being parked on the parallel taxiway. A major reason for the apron congestion is the result of having a well known FBO capable of providing excellent service at the San Carlos Apache Airport. Aircraft may be parked on the apron for an extended period of time until the FBO finishes working on them.

Transient aircraft parking, tiedown, and apron requirements have been adjusted upward by 15 additional aircraft (5,400 square yards) to accommodate the additional FBO parking requirement. Based on these factors, the aircraft tiedown requirements and apron pavement requirements were calculated and are depicted in Table V-4.

TABLE V-4
APRON AND TIEDOWN REQUIREMENTS

Year	Based Aircraft	Based Aircraft on Apron[1]	Transient Aircraft[2]	Total Tiedowns Required[2]	TOTAL Apron S.Y. Required[3]
1996	23	18	34	52	18,700
2001	24	19	36	55	18,700
2006	27	17	41	58	19.900
2016	30	20	49	69	23,600

[1] Additional hangars decrease based aircraft parked on apron.
[2]Includes 15 aircraft being serviced by FBO.
[3]Includes additional 5,400 S.Y. to accommodate FBO. (Rounded to nearest hundred).

5.2 LANDSIDE FACILITY REQUIREMENTS

Landside facilities are an equally important aspect of the airport. Landside facilities serve as the processing interface between the surrounding community 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 and often generate substantial revenues for the airport. Landside facility requirements for the San Carlos Apache Airport were developed after a thorough analysis of FAA planning guides which relate to facility requirements for nonhub locations and for general aviation operations.

5.2.1 Terminal Building

The construction of a terminal building at any airport offers many amenities to passengers, local and transient pilots, and airport management. Terminal buildings most often house public restrooms, public telephones, a pilot's lounge, and information regarding airport services. At general aviation airports with minimal passenger throughput, the FBO facility often provides many of the services listed above. A terminal building is normally not warranted if the FBO fulfills these functions.

In the case of the San Carlos Apache Airport, the FBO maintains a pilot's lounge, restrooms, and a pay telephone. Passenger throughput is not significant to warrant a separate terminal building. However, the FBO facilities are currently in poor condition. An effort should be made to remodel or upgrade the facilities.

5.2.2 Hangar Facilities

Hangars are typically classified as either (1) T-Hangars (small single storage units which usually accommodate single engine aircraft only), or (2) Conventional hangars (small to very large units which accommodate a variety of aircraft types or corporate fleets). The number of aircraft that each conventional hangar can hold varies according to the manufacturer and the specifications of the airport owner or operator. Hangar requirements for based and transient aircraft are discussed below and are depicted in Table V-5

Based Aircraft Hangar Requirements: Future facility requirements for based aircraft can be computed by making a determination of the number of tiedown locations, number of shaded spaces, number of T-hangars and number of conventional type hangars required. The forecasts of based aircraft estimates 30 aircraft based at the San Carlos Apache Airport by the year 2016. Although the current proportion of hangared to non-hangared aircraft is approximately 22 percent, all existing hangars are currently occupied, and there is a demand for additional hangars.

Future hangar requirements will likely be met with the construction of T-hangars and sunshades. Sunshades are an economical alternative to hangar construction. Sunshades provide overhead cover without walls or doors. Conventional hangar development may occur for replacement of existing conventional hangars. For future estimates, one-third (approximately 33 percent) of based aircraft are expected to be hangared, one third protected by sunshades, and one-third parked on the open apron.

Transient Aircraft Hangar Requirements: Determining the needs for transient aircraft storage can prove to be difficult at most airports, since conditions can vary drastically from one place to another. It is hard to establish a realistic relationship between transient operations and the need for hangars. Severe weather, in the form of heavy ice and snow or cold is not a concern at the San Carlos Apache Airport; however, sudden thundershowers, sun exposure, and heat are concerns. A demand for sunshades for use by transient aircraft can be expected, especially during the summer months. Approximately one-third of aircraft tiedown spaces should be equipped with sunshades. The FBO hangar, which accommodates four small single-engine aircraft or two twin-engine aircraft should be considered adequate for transient hangar requirements.

General: As discussed in Chapter I, all aircraft storage buildings located at the airport are considered to be in poor condition. The existing buildings will require replacement in the 5-10 year time frame.

It is recommended that the airport sponsor not provide financing to construct hangars, since airside development should be considered a higher priority for local funding. The airport sponsor should provide long-term leases to interested parties for the construction of some form of aircraft storage.

TABLE V-5
AIRCRAFT HANGAR REQUIREMENTS

Year	Based Aircraft	Based Aircraft Hangars	Based Aircraft Sunshades	Transient Aircraft Sunshades	Total Sunshades
1996	23	8	8	12	20
2001	24	8	8	12	20
2006	27	9	9	14	25
2016	30	10	10	17	27

5.2.3 Aviation Fuel Facilities

Fuel storage at the San Carlos Apache Airport includes two below ground 6,000 gallon tanks used for storing 100 Low Lead Aviation Gas (100 LL AV Gas) and one 4,000 tank truck used for storing Jet-A fuel. Precision tank tightness tests were performed on the underground tanks in August, 1996. Both tanks passed the inspection.

Fuel storage requirements are based on the average forecasted number of annual operations and a fuel ratio estimated by analyzing fuel flowage data at the San Carlos Apache Airport provided by Mace Aviation. A review of fuel delivery receipts from Mace Aviation for 1994, 1995, and 1996 indicated an average annual consumption of 9,495 gallons of AV Gas and 7,265 gallons of Jet-A fuel. Dividing the annual consumption by the estimated annual operations results in the estimated average fuel consumption per operation (of fuel provided by Mace Aviation). Multiplying the estimated consumption per operation by the forecasted annual operations results in the forecasted annual fuel requirement at the airport. This annual fuel storage requirement can then be subdivided by delivery frequency to determine storage tank capacity requirements or by storage tank capacity to determine delivery frequency requirements. Fuel deliveries are currently made approximately twice per year for each type of fuel.

TABLE V-6
FUEL STORAGE CAPACITY REQUIREMENTS

Fuel Storage Requirements				
	1996	**2001**	**2006**	**2016**
Annual Operations	9,400	10,500	13,000	17,000
Annual Operations (AV Gas)	8,410	8,750	9,590	11,100
Average AV Gas Fuel Ratio (Gal.)	1.12	1.12	1.12	1.12
Total Annual AV Gas Storage Required (Gal.)	**9,419**	**9,800**	**10,741**	**12,432**
Existing Storage Capacity	12,000	12,000	12,000	12,000
Minimum Delivery Frequency (Deliveries Per Year)	0.8	0.8	0.9	1.0
Annual Operations (Jet-A)	990	1,750	3,410	5,900
Average Jet-A Fuel Ratio (Gal.)	7.34	7.34	7.34	7.34
Total Annual Jet-A Fuel Storage Required (Gal.)	**7,267**	**12,845**	**25,029**	**43,306**
Existing Storage Capacity	4,000	4,000	4,000	4,000
Minimum Delivery Frequency (Deliveries Per Year)	1.8	3.2	6.3	10.8

Deliveries of 100LL AV Gas will be required at least once per year with the current storage capacity. Semi-annual deliveries will most likely continue to avoid allowing the fuel to set in the tanks unused for long periods of time. The current AV Gas storage capacity should be considered adequate for the planning period. By the planning year 2016, deliveries of Jet-A fuel will be required at least ten times per year with the current storage capacity. It is a recommendation of this study that a 5,000 gallon tank for Jet-A fuel be installed in the 5-10 year time frame to supplement the storage capacity of the tanker truck.

Fuel tanks located on an airfield should be situated at least 50 feet from any fixed or movable object. Examples of fixed or movable objects include aircraft parking spaces (tiedowns), hangars, office buildings, and auto parking areas. This not only reduces the risk of possible impacts to the tanks by aircraft, but also aids in the movement of vehicles around the tanks for fueling or tank refilling purposes. When installing fuel tanks on an airport or relocating fuel tanks to a different site, it is also recommended that the tanks be installed in accordance with Environmental Protection Agency regulations to reduce the risk of spills, accidents, and contamination.

5.2.4 Parking

It is recommended that the San Carlos Apache Airport provide adequate parking to accommodate airport employees, visitors, passengers, and pilots. Automobile parking requirements can be estimated as 3.5 automobiles per peak hour operation. Using the peak hour operations

found in Table IV-12, 18 parking spaces would be required in 2001 (5 x 3.5), 21 in 2006 (6 x 3.5), and 28 in 2016 (8 x 3.5). The existing parking area meets this requirement for the entire planning period.

5.2.5 Fencing

The airport property should be protected by a perimeter fence to be located outside of the Runway Object Free Area or Building Restriction Line. For the San Carlos Apache Airport, this fence should be constructed of five strand barbed wire to a height of four feet. The fence is intended to prevent intrusions onto airport property by people and/or animals. It is also recommended that the Airport Sponsor maintain the chain link fence constructed between the automobile parking/public areas and the aircraft maneuvering areas. This will provide a secure area in which only authorized personnel are allowed.

5.2.6 Airport Rescue and Fire Fighting (ARFF) Equipment

Airport Rescue and Fire Fighting Equipment is not required at non-certificated airports; however, procedures should be in place to ensure appropriate ARFF response in case of an accident or emergency. A mutual aid agreement should be established between the City of Globe and San Carlos Fire Department to achieve the most effective fire protection. Additionally the cost feasibility of installing a water supply point at the airport should be further studied. Currently, the closest water resupply point is located at the Apache Gold Casino, approximately 1.5 miles to the northwest. Aviation rated fire extinguisher bottles should be immediately available in the vicinity of the apron.

5.3 LAND USE COMPATIBILITY AND CONTROL

5.3.1 Runway Protection Zones and Approach Surfaces

The existing Runway Protection Zone (RPZ) are established for category A and B aircraft and visual approach minimums. The size of the future RPZ will increase to when the Airport Reference Code is increased from a B-II to a C-II and with the activation on a nonprecision instrument approach with one-mile visibility minimums. The San Carlos Apache Tribe currently owns and controls all land within the existing and ultimate Runway Protection Zones, will be included within the designated airport boundary for the ultimate airport layout. Land uses prohibited within the RPZ are residences and places of public assembly.

The existing Approach Surfaces for both ends of Runway 9/27 are classified as visual for large aircraft with a slope of 20:1. A future nonprecision instrument approach with one-mile visibility minimums is expected to be implemented at the airport, resulting in a larger Approach Surface with a slope of 34:1. The placement of objects which penetrate the

Approach Surface (i.e. obstructions), or any other FAR Part 77 surfaces, should be avoided. When determined that an obstruction is not a hazard to navigable airspace, it should be marked and lighted as specified in the aeronautical study determination.

5.3.2 Airport Height Restriction Zoning

Areas 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 FAR Part 77 Imaginary Surfaces (described in Chapter II, Facility Inventory). Any objects which penetrate a Part 77 airspace surface should be equipped with the appropriate obstruction lighting. The FAA therefore recommends that all Airport Sponsors adopt a zoning ordinance to protect these Part 77 Surfaces. A model of this type of zoning ordinance is included in the Appendix of this study. It is recommended that the San Carlos Apache Tribe establish a zoning ordinance for the San Carlos Apache Airport and periodically review the existing height restrictions to ensure continued compliance with FAR Part 77.

5.3.3 Compatible Land Uses

In addition to ensuring that the Part 77 Surfaces are free from current and future obstructions, it is recommended that the Airport Sponsor make every effort to eliminate all incompatible land uses from the immediate area of the airport. For example, the FAA states in FAA Order 5200.5 (FAA Guidance Concerning Sanitary Landfills On Or Near Airports) and 40 CFR Part 257 (Criteria for Classification of Solid Waste Disposal Facilities) 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 which serves piston type aircraft and 10,000 feet from any point on a runway which serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and waste water treatment plants should also be located this same distance from any point on a runway. There are currently no incompatible land uses in the vicinity of the airport and a land use compatibility assurance letter from the Sponsor is on file.

5.4 SUMMARY

In summary, the facility requirements for the San Carlos Apache Airport are based on the types of aircraft using the existing airport now and those expected to use the airport in the future. The proposed facilities are based on standards set forth in AC 150/5300-13, and in coordination with the Airport Sponsor and the Federal Aviation Administration. These facilities will enable the San Carlos Apache Airport to serve its users in the best possible manner. The recommended airside and landside facilities are summarized in Table V-7 and V-8.

TABLE V-7

Recommended Minimum Airside Facilities					
Facility	**1996 Existing**	**1996 Requirement**	**2001**	**2006**	**2016**
Runway 09/27					
Length (feet)	5,804	5,804	6,500	8,500	8,500
Width (feet)	75	75	100	100	100
Strength (lb.)	12,500 SWG	60,000 DWG	60,000 DWG	60,000 DWG	60,000 DWG
Parallel Taxiway					
Runway Separation (feet)	200	240	300	300	300
Length (feet)	5,600	5,600	6,500	8,500	8,500
Width (feet)	35	35	35	35	35
Strength (lb.)	12,500 SWG	60,000 DWG	60,000 DWG	60,000 DWG	60,000 DWG
NAVAIDS					
Approach Rwy 09	Visual	Visual	GPS NonPrecision	GPS NonPrecision	GPS NonPrecision
Approach Rwy 27	Visual	Visual	GPS NonPrecision	GPS NonPrecision	GPS NonPrecision
Lighting & Visual Aids					
Runway/Taxiway Edge	MIRL / None	MIRL / None	MIRL / MITL	MIRL / MITL	MIRL / MITL
REILS RWY 09/27	None / None	None / None	Yes / Yes	Yes / Yes	Yes / Yes
Approach Slope Indicators	VASI-2	VASI-2	PAPI	PAPI	PAPI
Segmented Circle/Wind Cone/Beacon	Lighted/Lighted/Yes	Lighted/Lighted/Yes	Lighted/Lighted/Yes	Lighted/Lighted/Yes	Lighted/Lighted/Yes
Apron					
Tie Downs	50	52	55	58	69
Apron Pavement (S.Y.)	14,000	18,700	18,700	19,900	23,600

TABLE V-8

Recommended Minimum Landside Facilities					
Facility	**Existing**	**1996 Requirement**	**2001**	**2006**	**2016**
Access & Parking					
Automobile	30	14	18	21	28
Hangar Facilities					
Hangars	5	8	8	9	10
Sun-Shades	0	20	20	25	27
Fuel Storage					
100 LL (gal)	12,000	12,000	12,000	12,000	12,000
Jet-A (gal)	4,000	4,000	4,000	9,000	9,000
Fuel Service	FBO Hours Only	FBO Hours Only	24 hr Self Serve	24 hr Self Serve	24 hr Self Serve
Other:					
AWOS	No	No	Yes	Yes	Yes
Unicom	Monitored 8:00-6:00	Monitored 8:00-6:00	Monitored 8:00-6:00	Monitored 8:00-6:00	Monitored 8:00-6:00