Section 7

AIRPORT SYSTEMS DESIGN

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Airport systems design is the transformation of calculated facility requirements, as outlined in Section 5 of this report, into a conceptual development plan. The plan must take into account existing land improvements and site features that are to be integrated with the development program, plus the engineering, environmental, and economic considerations, and blend these with new airport facilities in a systematically developed plan.

This section describes the three-phase recommended development program that is delineated on the two airport plans (Drawings WRA-2 and WRA-3). These plans are entitled as follows:

WRA-2	Airport Layout Plan
WRA-3	Approach and Clear Zone Plan

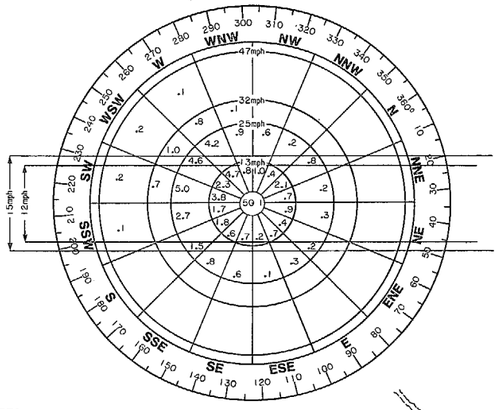
The following subsections describe each of the airport plans and point out specific key features of each system component. The phased development program is conceived in three time periods. The short-range planning period covers 1980 through 1985; intermediate-range from 1986 through 1990; and long-range covers the decade from 1990 through 2000. An underlying principle of the planning approach was to ensure system expansion potential beyond the forecast period of 2000. No specific recommendations are made for the post-2000 period. However, the plan does contain options for facility improvements beyond what is recommended, especially in terminal, tee hangar, and tie-down areas.

7.1 AIRPORT LAYOUT PLAN (WRA-2)

The Airport Layout Plan (ALP) is the key document of the set of airport plans delineating the recommended three-phase development program. The

WIND ROSE

SURFACE WIND VELOCITY FROM JANUARY, 1953 THRU DECEMBER, 1957
GALLUP, NEW MEXICO



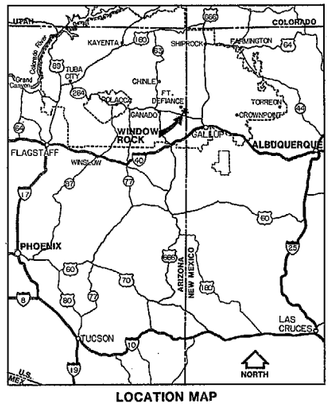
02/20 RUNWAY HEADING
14° EASTERLY MAGNETIC VARIATION
12mph CROSSWIND- COVERAGE=86.1%
15mph CROSSWIND- COVERAGE=91.0%

RUNWAY DATA				
	EXISTING		ULTIMATE	
RUNWAY LENGTH/WIDTH	7000' X 80'		7000' X 100'	
EFFECTIVE GRADIENT %	.58%		.58%	
% WIND COVERAGE	12 mph- 86.19%		15 mph- 91.0%	
PAVEMENT STRENGTH (000 LBS)	30,000		60,000	
LIGHTING (TYPE)	MIRL		MIRL	
MARKING	BASIC		NPI	
RUNWAY END	2	20	2	20
APPROACH AIDS	NONE	NONE	NONE *	NONE *
VISUAL AIDS	NONE	NONE	VASI-2/REIL	VASI-2/REIL
TYPE APPROACH	VIS	VIS	NPI (CIR)	NPI (CIR)
EXISTING APPROACH SLOPE	20:1	20:1	34:1	20:1

* PRESENT APPROACH PROCEDURE UTILIZES VOR OFF OF GALLUP AIRPORT.
TOPOGRAPHY CURRENTLY CONSTRAINS OPPORTUNITY FOR INSTRUMENT APPROACH.

AIRPORT DATA	
AIRPORT ELEVATION	6737.0'
AIRPORT REFERENCE POINT (ARP) COORDINATES	LAT. 35°37'37"N LONG. 109°03'58"W
MEAN MAX. TEMPERATURE OF HOTTEST MONTH	86°F
AIRPORT & TERMINAL NAVAIDS	NONE
AIRPORT CATEGORY (PROPOSED)	BASIC TRANSPORT
MISCELLANEOUS FACILITIES:	

LEGEND		
EXISTING	PROPOSED	ITEM
		BUILDING
		AIRCRAFT PARKING
		VEHICLE PAVEMENT
		AIRFIELD PAVEMENT
		CLEAR ZONE
		BUILDING RESTRICTION LINE (BRL)
		AIRPORT BOUNDARY
		PROPOSED ACQUISITION
6730		GROUND CONTOURS
X X		FENCE



LOCATION MAP

No.	Revision	By	Appr.	Date

THE NAVAJO NATION
By
Date

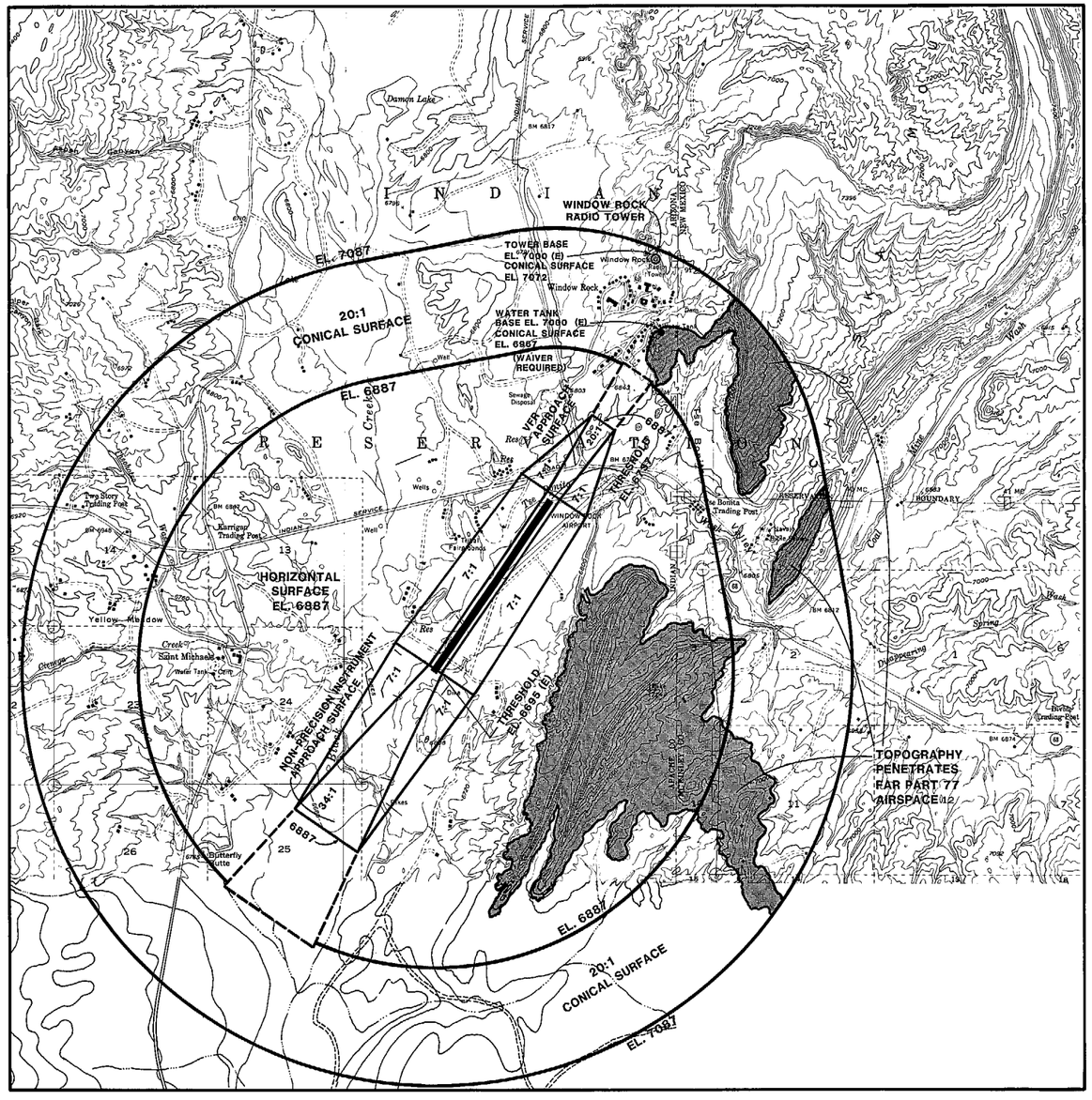
prc Soesa Associates

Designed	Drawn
ROK	SLS
Checked	Date
BC	FEB 1981

AIRPORT MASTER PLAN
WINDOW ROCK AIRPORT

AIRPORT LAYOUT PLAN

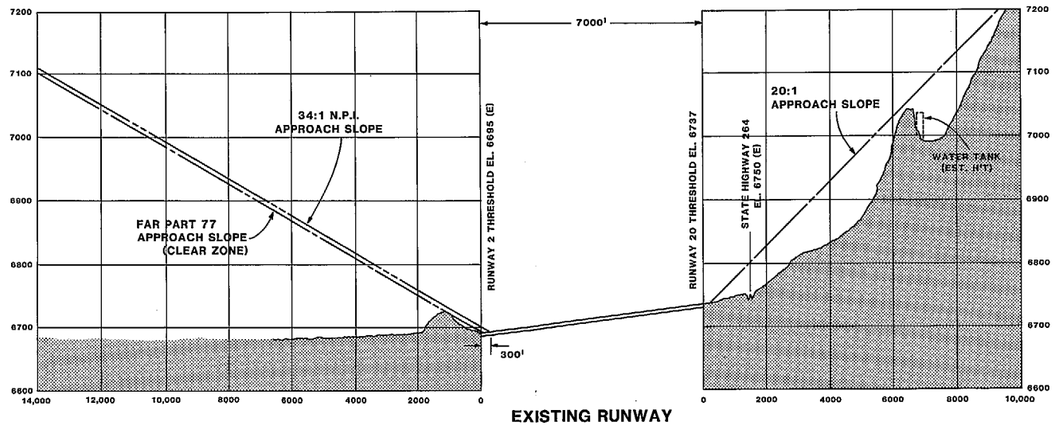
DRAWING NO.
WRA- 2



APPROACH PROFILES

SCALES: HORIZONTAL $1^{II} = 2000^{I}$
VERTICAL $1^{II} = 100^{I}$

NOTE: GROUND PROFILES ARE COMPOSITES OF THE HIGHEST ELEVATIONS ACROSS THE WIDTH OF THE APPROACH SURFACES.



EXISTING RUNWAY 2-20

No.	Revision	By	Appr.	Date

THE NAVAJO NATION
By
Date

prc Speas Associates

Designed	Drawn
ROK	SLS
Checked	Date
BC	FEB 1981

AIRPORT MASTER PLAN
WINDOW ROCK AIRPORT

APPROACH AND CLEAR ZONE PLAN

DRAWING NO.
WRA- 3

plan precisely depicts the location and dimensioning of proposed airport facilities. Therefore, the ALP is an overview of the ultimate airport development. The plan, when approved by the FAA, becomes the basis of federal assistance for eligible improvements under the Airport Development Aid Program (ADAP). Shown on the ALP are the major improvements to the airside and landside systems.

7.1.1 Airside System

The recommended major airside system improvements delineated on the ALP are a paved 7,000-foot-long by 100-foot-wide runway and a 40-foot-wide full parallel taxiway and connector taxiways. The ultimate airport property boundary shown provides for required restrictions on building construction on either side of the runway.

Smaller items of interest that are depicted on the ALP include a lighted wind cone and segmented circle, located on a west side of the runway, intended for the visual display of wind speed and direction; two-box visual approach slope indicators on both runway ends to the left of the runway, looking from the landing direction; runway threshold lighting; and medium-intensity runway lighting. Also recommended, but not shown, is medium-intensity taxiway lighting and non-precision runway and taxiway marking.

A more detailed description of the recommended airside improvements is provided in the basic data tables shown on the ALP, and the capital improvement program presented in Section 8 of this report.

7.1.2 Landside System

Landside system improvements shown on the ALP are located east of the runway. The improvements consist of Navajo Aviation Authority

facilities, fixed base operator facilities, aircraft storage facilities, automobile parking areas, a new access road, and a new terminal. The first fixed base operator is recommended to be located in the existing hangar in the northeast corner of the airport. The combined road/taxiway in front of the hangar would become exclusively a taxiway. A new access road would correct the existing bridge with the terminal area parking by following the original runway alignment. The existing apron in front of the administration building would be converted to automobile parking with an itinerant and based aircraft apron constructed further south and closer to the runway/taxiway system.

A specific site is identified for aircraft parking and foam/water storage in support of the firefighting effort. The apron should be of sufficient strength to handle the fully-loaded PV-2. Finally, a site further to the south is provided for a future second FBO.

7.2 APPROACH AND CLEAR ZONE PLAN (WRA 3)

The Approach and Clear Zone Plan depicts the imaginary surfaces on and about the airport through which no object should penetrate. The dimensioning and criteria utilized in determining the shape and position of the various surfaces are outlined in Part 77 of the Federal Aviation Regulations. A generalized description of the surfaces are as follows: the innermost surface is the primary surface, shown as a rectangular area around the runway at ground level. Transitional and approach surfaces extend outward and upward from the primary surface to the horizontal surface. The transitional surfaces are on an incline at one foot of vertical climb for each 7 feet of outward expansion. The primary surfaces extend outward and upward at one foot of vertical climb for each 34 feet of outward extension (non-precision approach) and one foot to 20 feet (visual approach). The horizontal surface is a level plane 200 feet above the highest point on the runway. The last imaginary surfce shown is the conical surface. This surface extends outward and upward at a 20:1 slope from the horizontal surface until reaching a height 200 feet above the horizontal surface.

The southern tops of Chuska Mountain penetrate the horizontal and conical surfaces to the east and northeast of the runway. A waiver will be required for the water tank located some 6,900 feet off of Runway 02.